1.MANAGING AND ORGANISING

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1.1 General

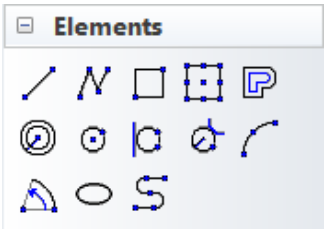
Terms

Work plane
The work plane is the current plane in the room on which you are processing your design model. The position of the work plane can be controlled via the functions in the menu DRAW > WORK PLANE.

Object
The term "object" encompasses architectural or mechanical construction parts as well as 3D objects such as boxes, free forms, etc.

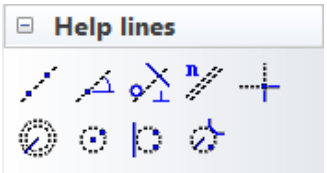
Model
The term model has been used in earlier versions of ELITECAD. A model represents a manually defined component and is therefore an object too. Apart from some special functions, the term model has been replaced by object or component.
It is a free combination of 2D and 3D geometry, like lines, circles, arcs, as well as help lines, hatches, dimensions, texts to a component. Models receive a name and attributes for evaluations programs (e.g. bill of material).

Drawing elements include
Line, polygon, circle, ellipse and spline



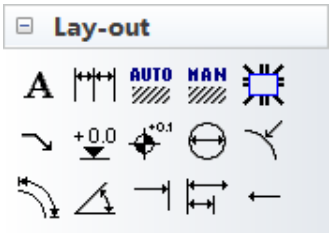
Delimited by start and end point

Help elements are
Help lines and help circle



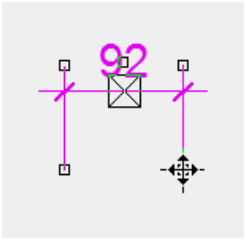
Delimited by edge of monitor (no start and end point)

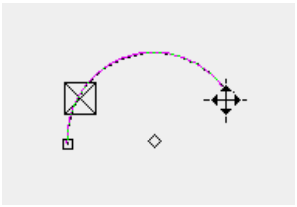
Residual elements include
Dimensioning, Tip arrow, Hatch, Text



Handles
Handles are the small square or triangular symbols that appear when clicking on the edges or surfaces of a part. Various manipulation options are available to you by clicking on a handle for a second time. The manipulation functions can be selected with the cursor from a toolbar or [TAB].
The size and colour of these handles can be set in the OPTIONS.

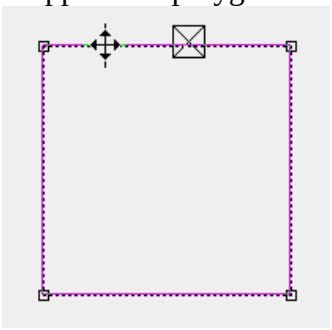
Handles for dimensioning and for an arc

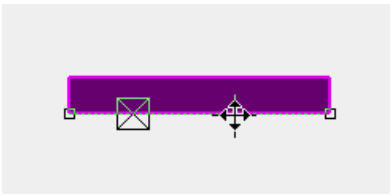




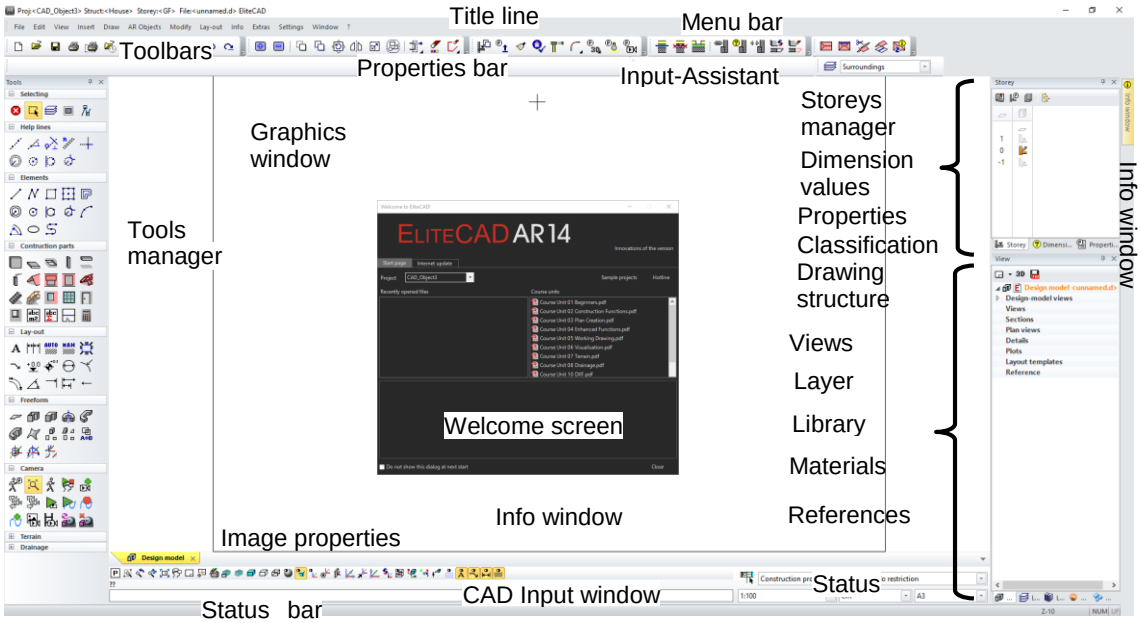
Gripper
Grippers are the symbols that appear with a dotted line on the elements when clicking on a part. Various manipulation options are available to you by clicking on a gripper for a second time. The manipulation functions can be selected with the cursor from a toolbar or [TAB].

Gripper on a polygon and on a wall in ELITECAD Architecture.





1.2 User interface

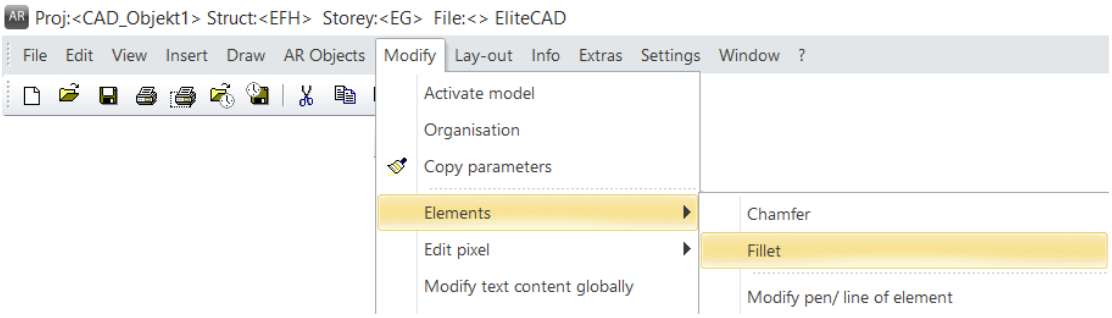


The appearance of the interface may differ, depending on the installation (Architecture, Mechanics, Viewer) and screen resolution.

Title line

The title line of the program shows, which file is opened. In ELITECAD Architecture it show additionally, which project is loaded, in which structure and storey you are currently located.

ELITECAD – Menu bar



The menu bar with opened and extended MODIFY menu.

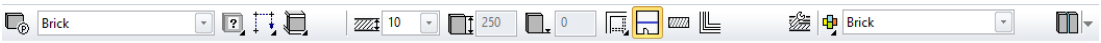
Toolbars

Toolbars offer rapid access to the most important commands. Many of the symbols or icons can also be found with the same meaning in the relevant menu entries.

Tools manager

Multiple toolbars are combined in the tools manager. These can be opened and closed as required, enabling you to fit many functions into a small space. The order in which the bars appear can be adapted and you may add your own new bars.

Properties bar

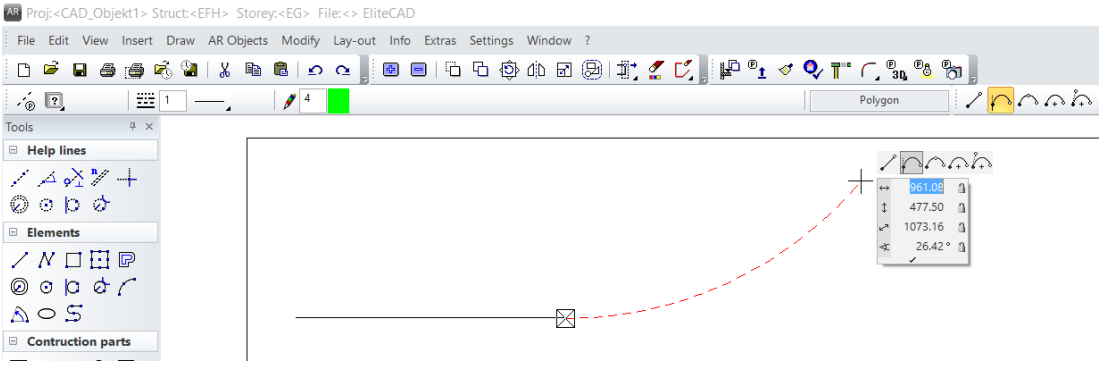


The properties bar always displays the properties of the active part or properties for a manipulation to be performed. There are properties bars for manipulations, elements, hatches, dimensioning, text, 3D objects and construction parts. The example shows the properties bar of the window.

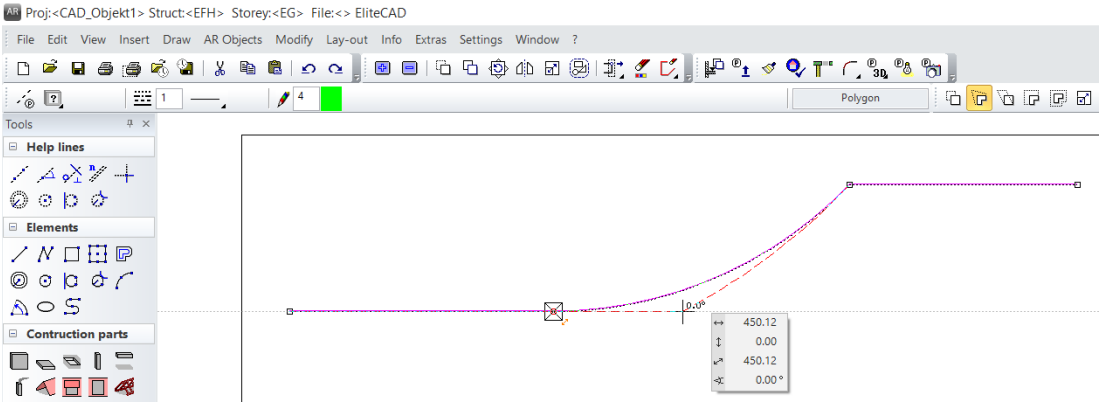
Input Assistant

The Input Assistant consists of additional functions that vary according to the function selected. The functions of the Input Assistant can be displayed on the cursor using the [Tab] key.
Not every function has these extended functions. In principle, these are the create functions and the manipulations on the handle.

Example of the polygon drawing function with the additional functions for arches:



Example of manipulation on the handle of a polygon:



CAD input window

The input window contains the image properties, the information line, the entry line and the status.

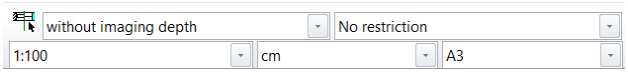
Image properties

These commands are fixed. They control how the data is displayed on the monitor. Zoom factor, cutout, imaging, etc.

Information line
This line contains commands regarding what you must enter or specify within a function.

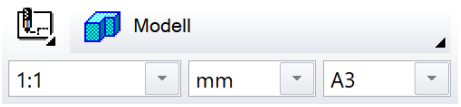
Entry line
Use the entry line to forward information to the program. This information can be texts, coordinates or, in the event of queries, confirmations.

Status for ELITECAD Architecture



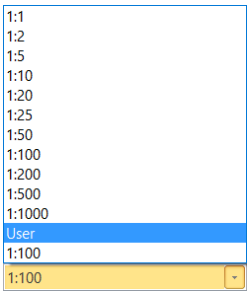
You can select representation level, filter for renovation planning states, scale, units and the page format here.

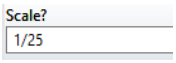
Status for ELITECAD Mechanics



You can select the view, scale, units and the page format here.

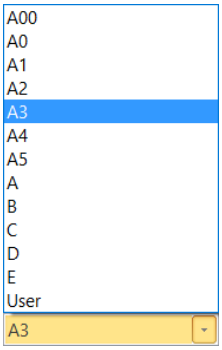
Status – scale
A free scale can be specified in addition to the predefined scales.



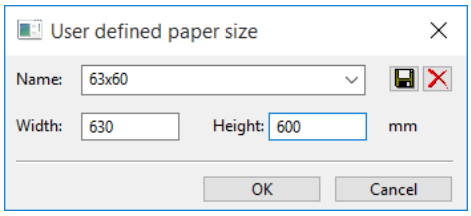


The new scale is defined in the entry line for the user-defined scale.

Status – format



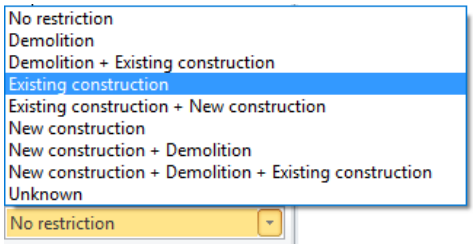
A user-defined format can be created by selecting "User". The special formats can be saved under a parameter name and used again at any time.



Status bar

The left-hand area shows confirmations, e.g. that the data was saved successfully. The active work plane is positioned to the far right. "Z" stands for axis; "-10" indicates the height on this axis.
In ELITECAD Architecture, for example, these coordinates would be in the upper storey, "Z270", and in the basement "Z-260".
If working with classification is active, then the classification (model, group, class, level) from the active object is displayed in the status bar.

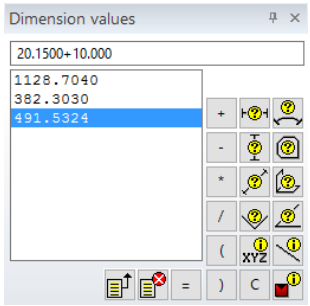
Status – filter for renovation planning state (only ELITECAD Architecture)



Several reasonable combinations of renovation planning states are predefined in this menu. By selecting one item all object are assembled which belong to this state.

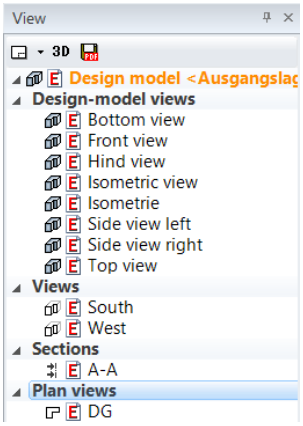
Measurement

The dialog window also displays the measurement functions for lines, arcs, areas, angles and points. Simple calculation operations can be performed using the measurement results.



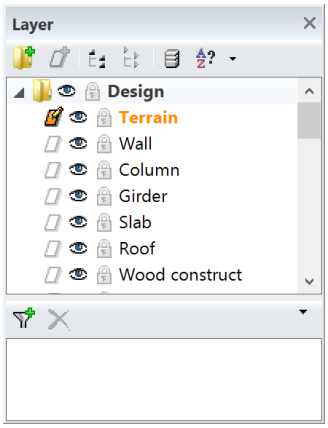
Views management

The management stores the different plans for the design models by type.



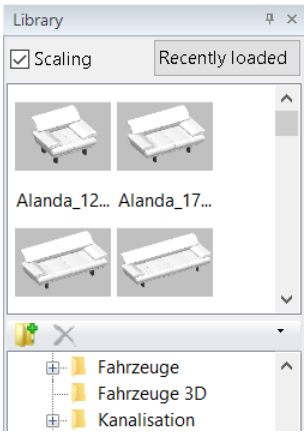
Layer management

The management shows the defined layers and their statuses (used/unused, active/not active, visible/invisible, locked/not locked).



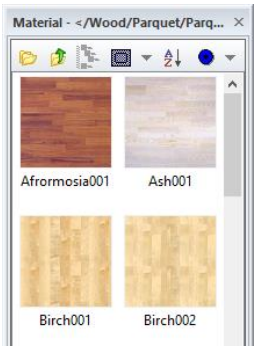
Library management

The standard library parts and users' own parts as well as external 3D formats (i.e. SketchUp, 3DS) can also be organised in the management. The parts most recently loaded are listed in a selection and can be selected again directly.



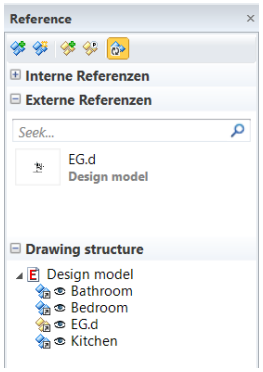
Materials management

Materials management is used for the simple organisation and selection of your materials. The materials can be set or modified in terms of the properties, such as texture image, transparency, mirroring, shine, etc.



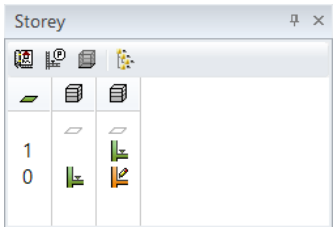
Reference management

Reference management organises the internal and external references.



Storeys manager

The storey management is only available in ELITECAD Architecture.
The defined structures and storeys are defined in the storeys manager. The management controls the correct allocation of the construction parts and the visibility of the individual storeys.



Drawing structure

The drawing structure is displayed in ELITECAD Mechanics in a separate window. In ELITECAD Architecture, the drawing structure is part of the management window for references. In this window, the assembly groups and components are depicted hierarchically.

Properties

An object type and descriptions can be allocated in ELITECAD Architecture to free forms such as boxes, rotation solids and free forms to ensure that these parts are evaluated correctly.

Info window

Special information is displayed in the Info window. This information includes lists of element values, dimensions, structures and information for importing data.
Clicking on the Info window moves it into the foreground or "refilled" with information.

Info balloon

The Info window messages can also be displayed in the Info area (task bar) of the operating system.
Requirement:

Activated option DISPLAY NOTIFICATIONS AS INFO BALLOON under SETTINGS > OPTIONS > SYSTEM > USER INTERFACE

Activated notification in the Windows system
Windows system > Notifications and actions

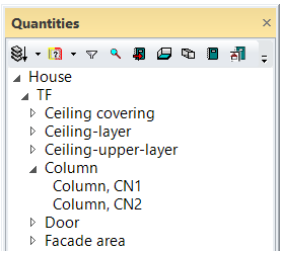
Info window-Delete content

	Window toolbar

The info window may soon be overloaded with data. In order to have a better overview the may be deleted.

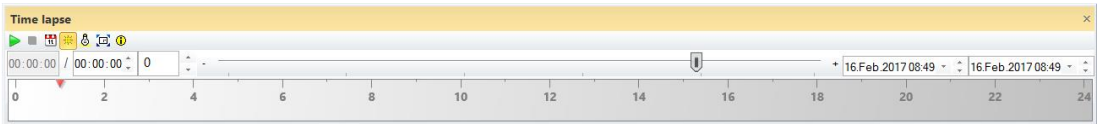
Report management

The management is not visible on the monitor in the default settings.
The management controls the relation of the design model to the numerical evaluation data and contains operating instructions for quantity surveying.



Time lapse

The time lapse is not visible on the monitor in the default settings.
This tool can be used to check the lighting contrast of a project in time lapse mode and present this on the monitor.



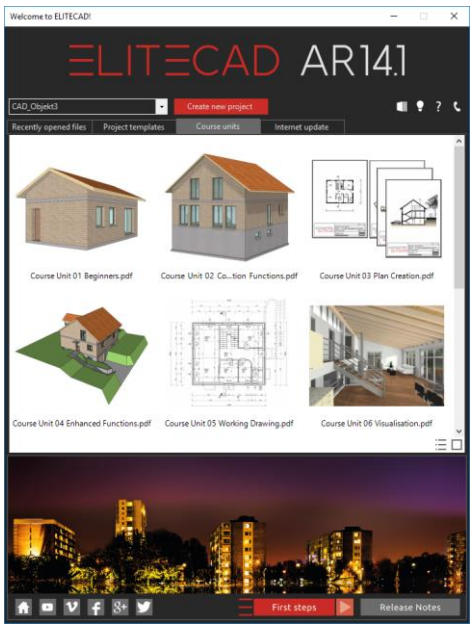
Start dialog window

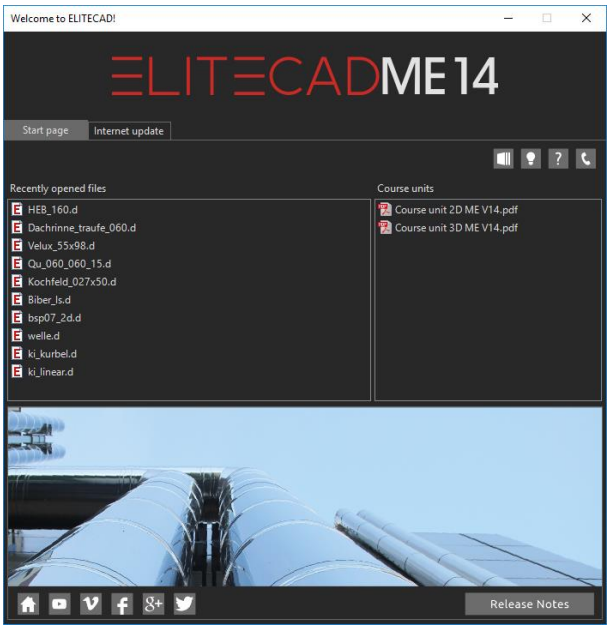
A welcome dialog is displayed when launching ELITECAD. This dialog window assists when staring a new project or it is used to continue the work in the previously edited project.

New project
Clicking the button CREATE NEW PROJECT leads directly to the definition dialog window for new projects.
Alternatively, a project can be created from a project template. The templates are not modified during this process. The path for project templates is defined in the ELITECAD configuration.

Existing project
An existing project can be selected in the menu. The recently edited drawings are available in the according tab.

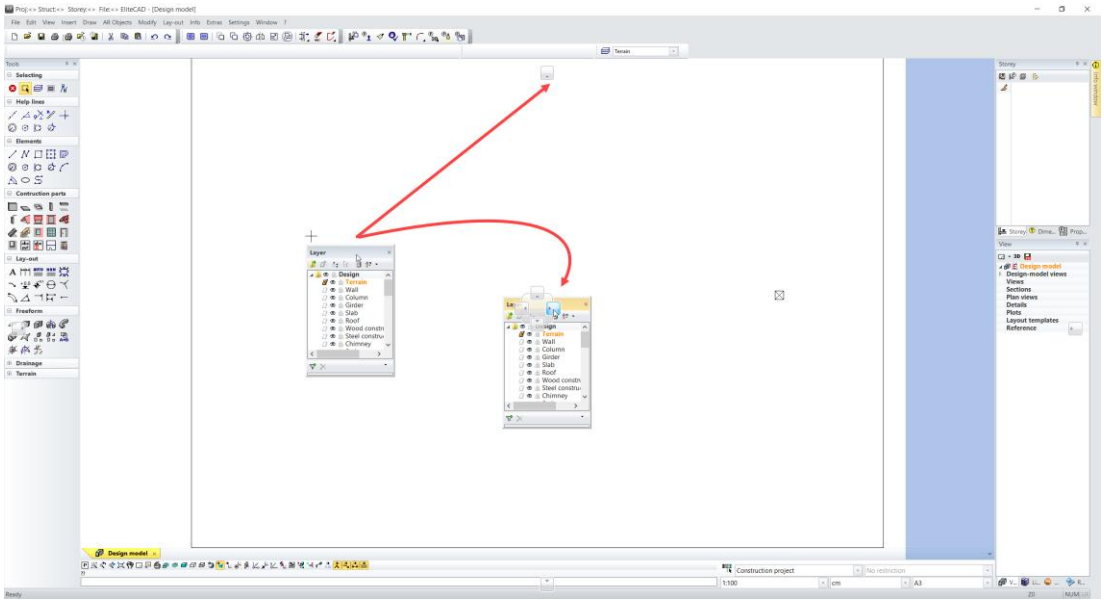
Additionally, the course units, the manual, hotline numbers and available updates can be accessed directly.
The dialog can be opened at any time under menu HELP > WELCOME TO ELITECAD. The automatic appearance of the dialog can be suppressed by setting the OPTIONS.



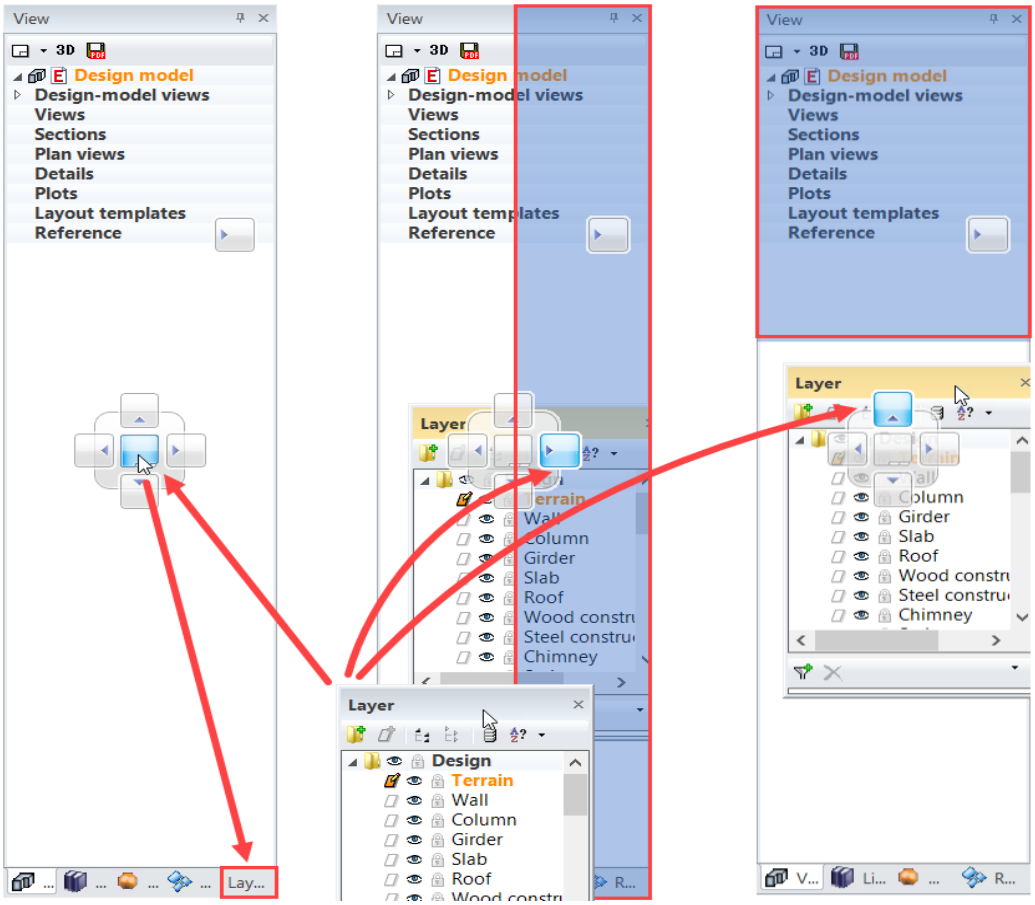


Docking windows

If a management window is placed in the title line, assistance with positioning appears in a graphic preview in order to dock the window in the user interface.



If a management window is moved to the centre of another management window, assistance with positioning also appears.



View layout

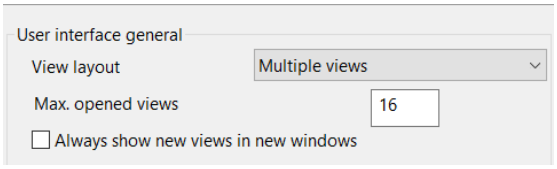
Three possible layouts can be selected:

- Single view
- Multiple views
- Views in tabbed format

Layout settings are made in the menu SETTINGS > OPTIONS > SYSTEM > USER INTERFACE.

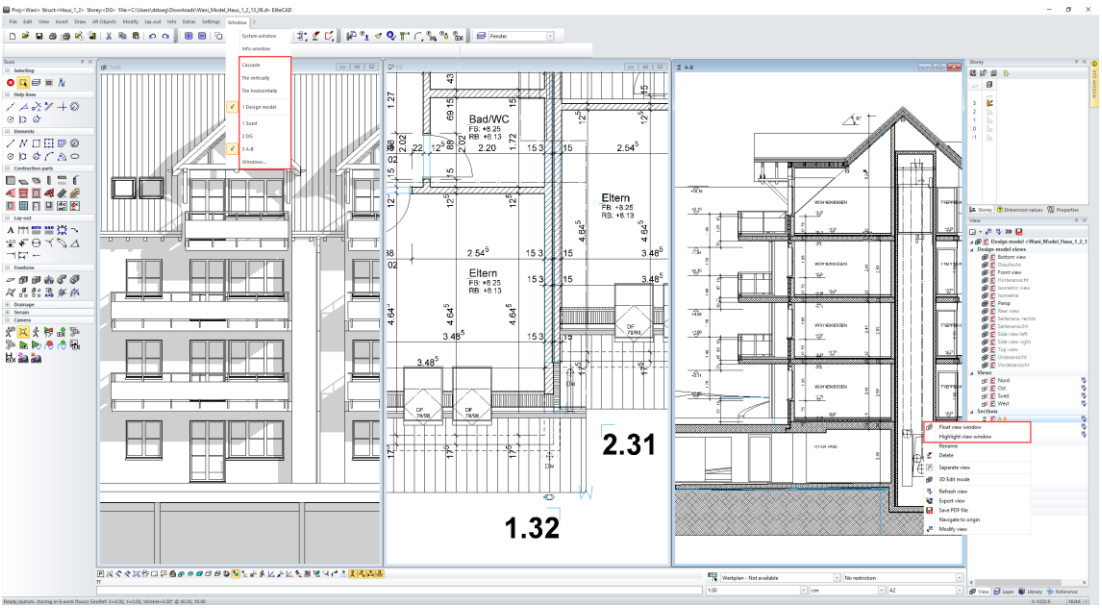
Multiple views

Multiple views can be opened. The maximum number of opened views can be specified.

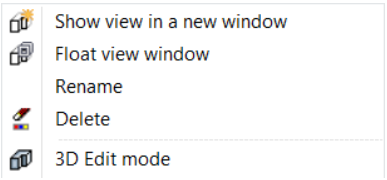


Excerpt from the OPTIONS

Additionally, there is the option to open selected plan views VIEWS > SECTIONS > DETAILS > PLOTS directly always in a new window.
In order to display multiple views on the monitor, either the function described above must be active or the views are opened from the context menu of the views management with the function SHOW VIEW IN A NEW WINDOW. As the first view has been maximised, the views below are not visible. The windows below appear only when the view window is minimised. Automatic arrangement can be selected in the window menu.



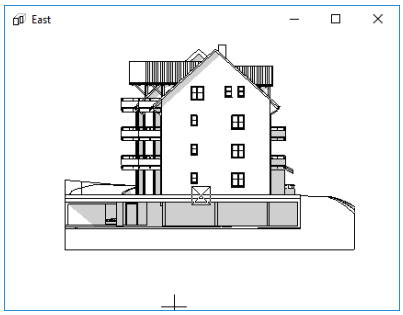
Views management context menu



Display view in a new window

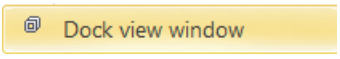
Opens the view in a new window.

Detach view window



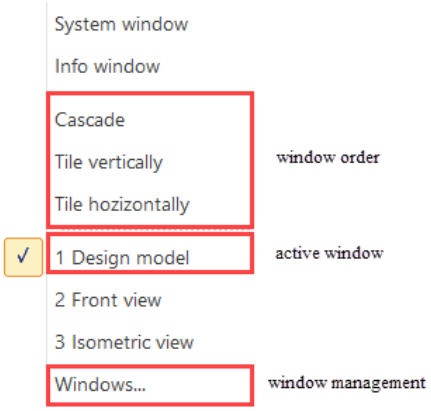
Opens the view in a separate window. This can be moved to a second monitor, for example.

Dock view window



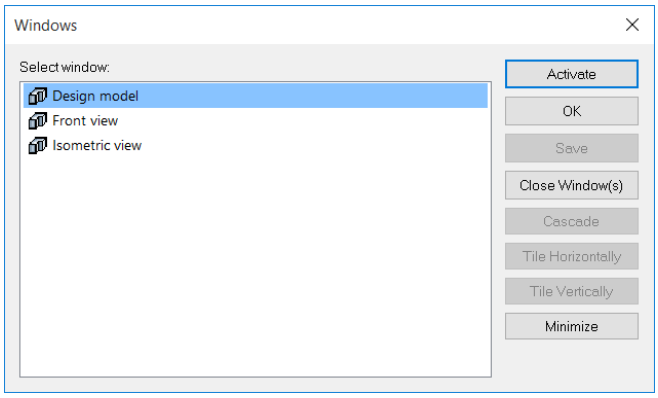
A detached view can be reintegrated into the user interface via the context menu.

Menu window



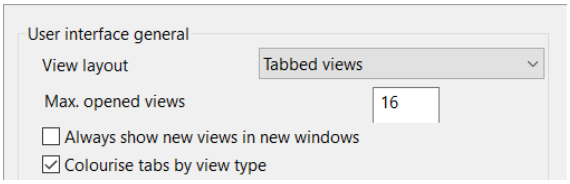
Functions are available for the automatic arrangement of multiple windows.
All opened views are listed in the menu.

All of the open views are listed in the management and the status of each window can be set.



Views in tabbed format

Multiple views can be opened that appear as a tab on the monitor. The maximum number of opened views can be specified.

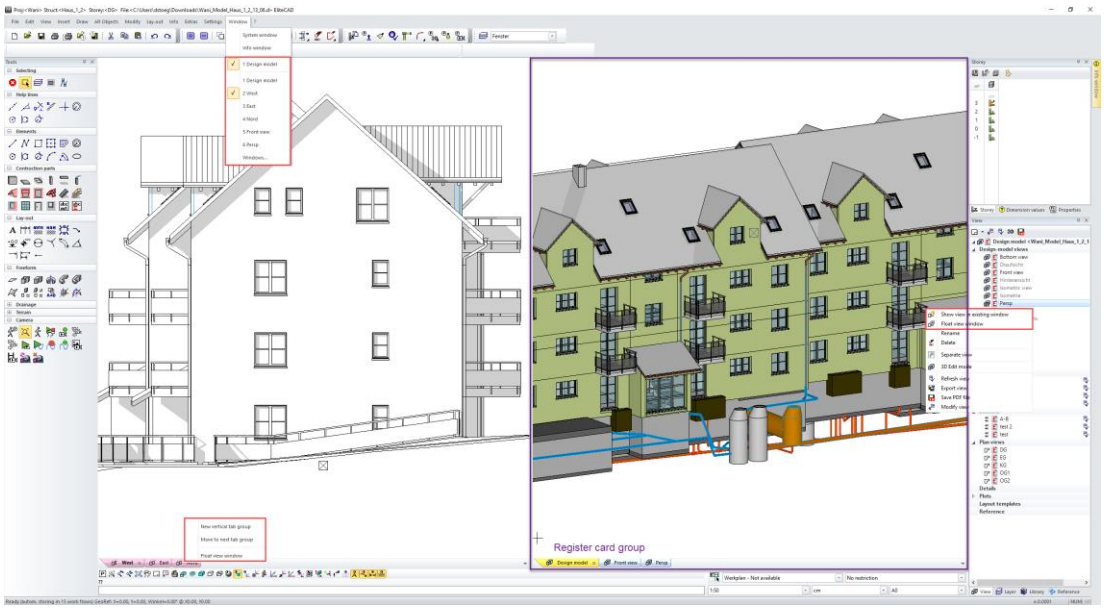


Excerpt from the OPTIONS

Additionally, there is the option to always open selected plan views VIEWS > SECTIONS > DETAILS > PLOTS directly in a new tab, as well as colour coding of the tab headers by view type.

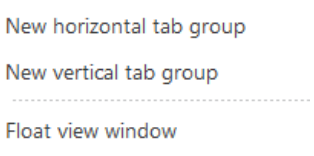
In order to display multiple views on the monitor, either the function described above must be active or the views are opened from the context menu of the views management with the function SHOW VIEW IN A NEW WINDOW. The tabs are lined up at the bottom left of the screen.

An additional tab group can be generated in the context menu of the tab.
The order can be changed and you can switch to a new tab group by pulling on the tab.
The open views are listed in the window menu.



View management context menu

Tabs context menu



New vertical/horizontal tab group
The monitor can be divided into horizontal or vertical tab groups. The group disappears automatically when the last view of the group is deleted or moved.

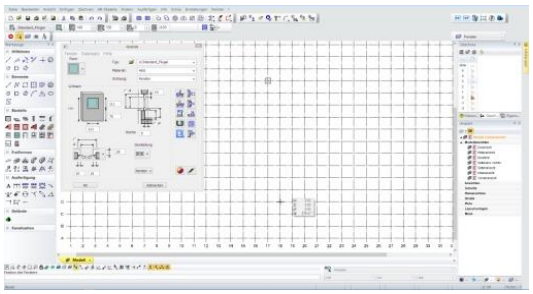
Move to next tab group
Moves the view to the next tab group. The tab can also be moved by mouse to the desired group.

Unpin views

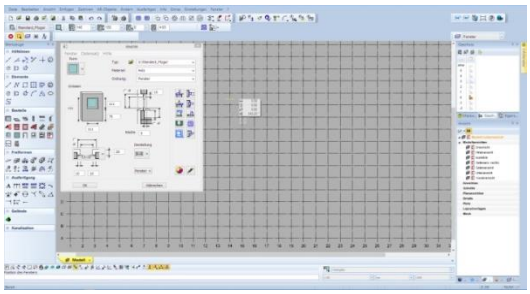
User interface design

Various user interface designs are available. The design can be selected under OPTIONS.
Menu SETTINGS > OPTIONS > SYSTEM > USER INTERFACE

silver

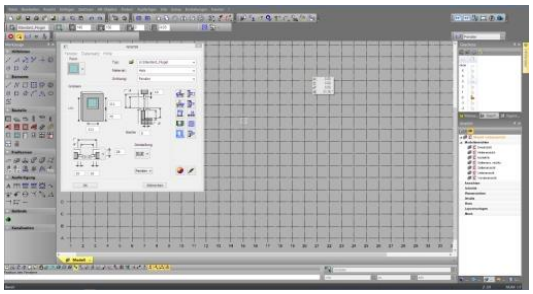


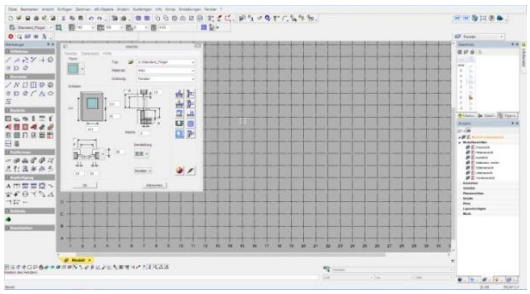
blue



black

granite





etc…..

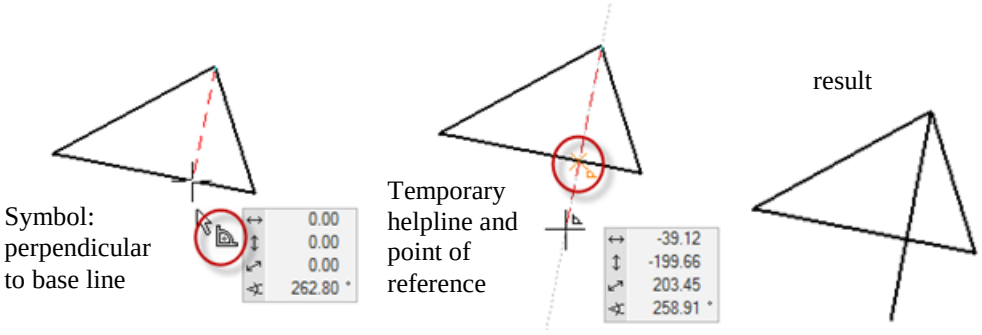
FUNCTIONS IN THE GRAPHICS WINDOWS

Left mouse button

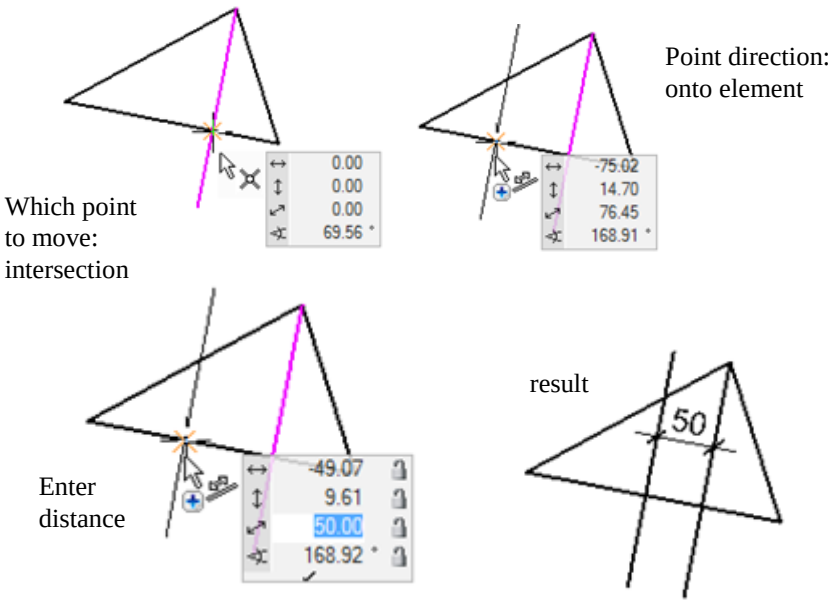
The left mouse button can be used to draw, select and modify. If you move the mouse in the graphics window, crosshairs appear on the cursor. The position of the point most recently clicked on in the graphics window is displayed with the marker in the shape of a crossed square "⊠".

Depending on which function is currently active, the cursor offers additional support by displaying information and help functions. These functions are described below using general examples. You will find further descriptions for the respective functions.

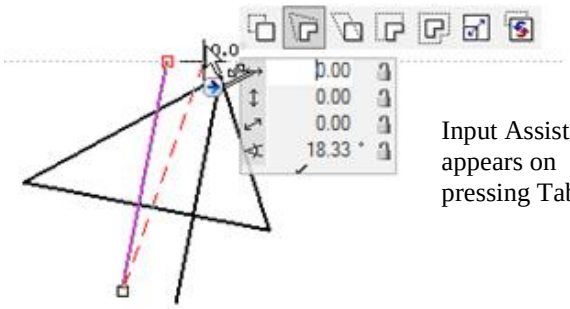
Temporary reference points and help lines
If the system recognises a capturable point when drawing close to an element, it displays this with the capture symbol that is displayed beneath the cursor. The symbols are described in the "Right mouse button" chapter.
Example:



Values field
A distance from the most recently selected point can be entered in the value field. For example, a line is to be copied 50 cm from the other line, parallel and offset. After calling up the copy function and stating the direction, the alignment can be stated directly in the distance field.



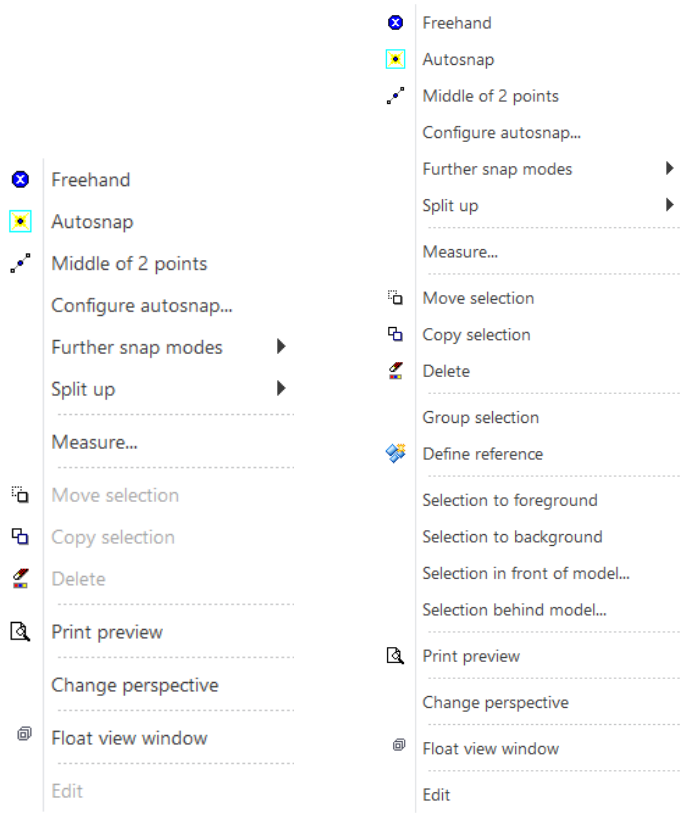
Input Assistant
The Input Assistant appears above the value field when the [TAB] key is pressed. The Input Assistant provides additional options for inputs or processing depending on the function that is currently selected.
A selected line is to be connected to another in the example. The STRETCH function is called up in addition via the Input Assistant.



Input Assistant appears on pressing Tab-Key

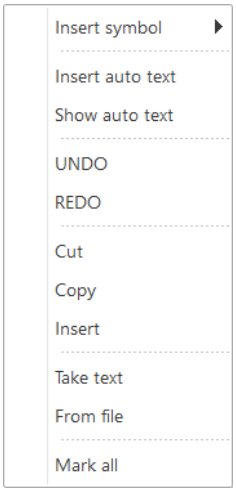
Right mouse button

The context menu may contain various functions.



Standard

for a selection



in a text field

Capture functions
The capture functions are described in chapter 4.1 "Cursor, capture functions".

Divide
A division by number or fixed distance can be displayed on a line or polygon using this function. Temporary capture points are generated that are only deleted when the freehand capture mode is called up.

Number on line
Two points and the number of distances are queried.

Distance on line
Two points and the distance are queried. Division begins at the first point.

Number on polygon
The polygon must first be selected and then the position of the start and end points and the number of distances is queried.

Distance on polygon
The polygon must first be selected and then the position of the start and end points and the distance queried. Division begins at the first point. The side to be divided must also be stated for a closed polygon.

Measure…
This function moves the dimension values window into the foreground.

Move selection
You can use this function to move previously selected parts.

Copy selection
You can use this function to copy previously selected parts.

Delete
You can use this function to delete previously selected parts.

Group selection
An arbitrary selection can be combined into a group using this function.

Ungroup
A previously selected group can be ungrouped using this function.

Selection to foreground
The visibility of a specific selection can be modified and placed in the foreground using this function.

Selection to background
The visibility of a specific selection can be modified and placed in the background using this function.

Selection in front of model
The visibility of a specific selection can be modified and placed in front of a specific model using this function.

Selection behind model
The visibility of a specific selection can be modified and placed behind a specific model using this function.

Middle mouse button

Rotate image
Hold down the middle mouse button (scroll wheel) and move the mouse.

Zoom
Scroll with the middle mouse button (scroll wheel) or hold down the middle mouse button and the [Shift] key together and move the mouse up and down.
The current position of the cursor is the zoom centre when zooming with the scroll wheel.

Move
Hold down the middle mouse button and the [Ctrl] button and move the mouse.
The image section can also be moved using the arrow keys.

The key combination of the functions ROTATE IMAGE and MOVE IMAGE can be switched in the OPTIONS.

Touch Input

Several gestures with the fingers are supported for tablets with touch sensitive displays in the graphics window.

Move
Put one finger on the graphics window and move the finger.

Rotate 2D
Put two fingers on the graphics window and rest one finger. This defines the rotation point. Rotate the second finger around the first. The z-axis remains unchanged.

Zoom
Put two fingers on the graphics window and move them closer or farther away.

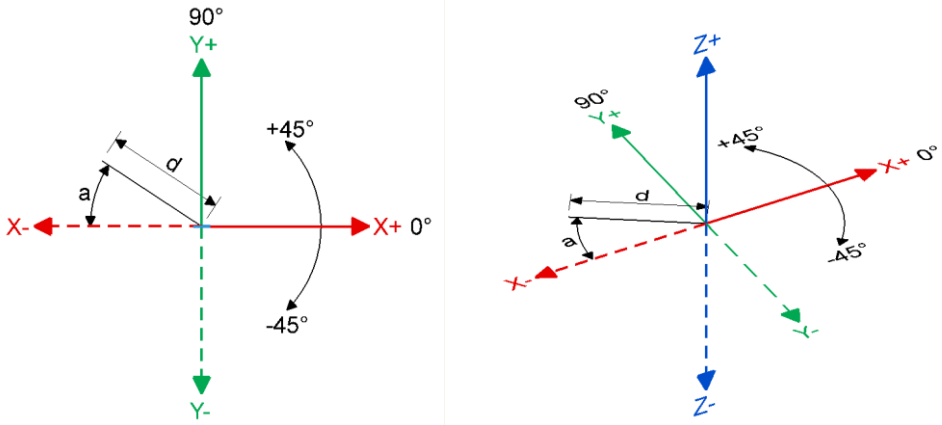
Rotate 3D
Put two fingers on the graphics window and move them up and down. The z-axis is tilted.

Reset view
Put one finger on the graphics window and tap with the second finger.

Functions in the entry line

The crosshairs can be positioned using coordinate entries.
The Cartesian and polar coordinates system are available options.

Cartesian coordinate system: Lines x (X), y (Y) and z (Z)
Polar coordinates system: Polar angle a (A) and radius vector d (D)
Positive direction (direction of rotating) anticlockwise.



(x,y) and (a,d) written in lower case mean relative entry from the perspective of the current location. (X,Y) and (A,D) written in upper case mean absolute entry from the perspective of the absolute reference point (e.g. centre of page). It is also possible to combine relative and absolute coordinates. The system recognises the difference between x and y values by setting a separator sign.
The separator signs for list values and decimal numbers are defined in the OPTIONS. The default sign for lists of values is the comma, for decimal number the point.

The system is set to relative coordinates by default.

Entering special characters

If the right mouse button is pressed above the entry line on "??", a selection of special characters appears.
The character can be copied into a different dialog window using the clipboard.
Copy: [Ctrl]+[C]
Insert: [Ctrl]+[V]
Not all character sets have all special characters.

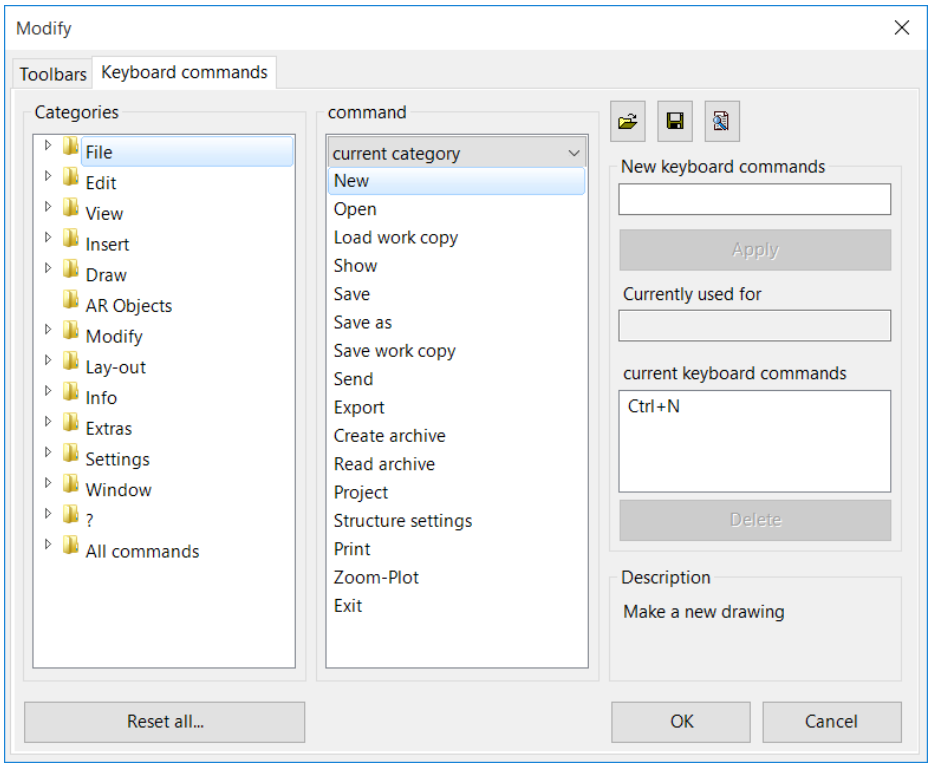
Individual special characters can also be entered by holding down the [Alt] key and entering the corresponding ASCII number. The number must be entered using the numeric keypad (usually on the right of the keyboard).

Examples:
[Alt]+*155* produces "ø" (small diameter character) after releasing the [Alt] key.
[Alt]+*241* produces "±" (plus-minus sign) after releasing the [Alt] key.

Calculating expressions
There is an option for calculating mathematical expressions in the entry line.
This type of calculation is made by pressing [F9].
Example:
50*50 [F9] >> 2500
sin(45) [F9] >> 0.707106781186547

Keyboard commands (short cuts)

Users can create their own keyboard shortcuts or modify existing ones. The keyboard commands can be set in the menu SETTINGS > KEYBOARD COMMANDS.



NOTE

Keep in mind that the following keys on international keyboards may have different inscriptions.
[Ctrl]
[Shift]
[Delete]
[Home]

Categories
All menus and submenus are listed here.

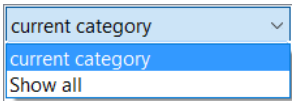
TIP

The commands are organised by toolbars under "All commands".

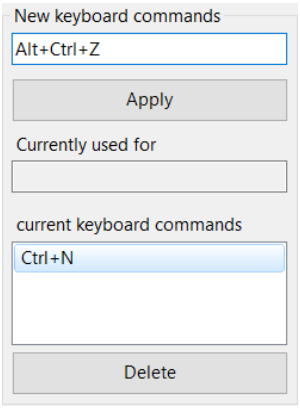
Command
Individual commands are listed by selecting a category.
If a command is selected, the "Current key commands" field will show whether a keyboard combination has already been assigned to this command.

TIP

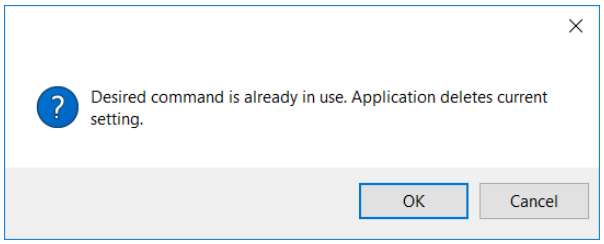
Users can choose between the OPTIONS "Current category" and "Display all". All commands are displayed by selecting "Display all".



New keyboard commands



If a command is selected, the key combination can be entered in the "New key command" field. This is done by pressing the required keys together. If the selected combination is already in use for a different command, the command is displayed in the field "Currently used for".
The new combination is saved by selecting "Apply". If the combination has already been assigned, a warning message appears.



NOTE

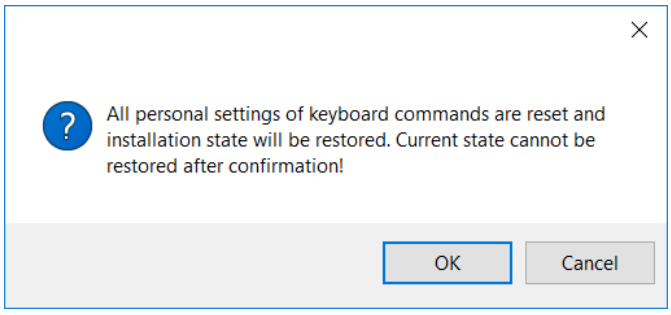
Possible keyboard commands:
A modifier key must be used:
[Ctrl], [Alt] or [Shift]
Letters on their own do not work.
The only single key combinations are the function keys [F1]–[F12].

Current keyboard commands

The current allocation of the command is displayed here. A marked command can also be deleted here.

Reset all

Commands can be reset if you wish to return to the default settings. A warning message appears.

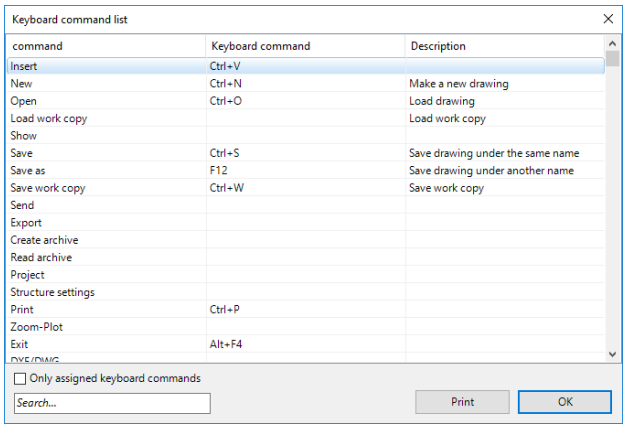


Management functions

The key combinations can be saved or transferred to other computers with the LOAD COMMANDS and SAVE COMMANDS management functions.

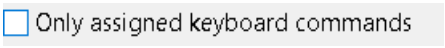
List commands

This function provides a complete list of all keyboard commands and provides a function for printing the list or searching for specific commands.



NOTE

The list can be reduced to keyboard commands already in use.



Search

Enter a word or part of a word into the search field. The current list is filtered based on the text you enter.

TIP

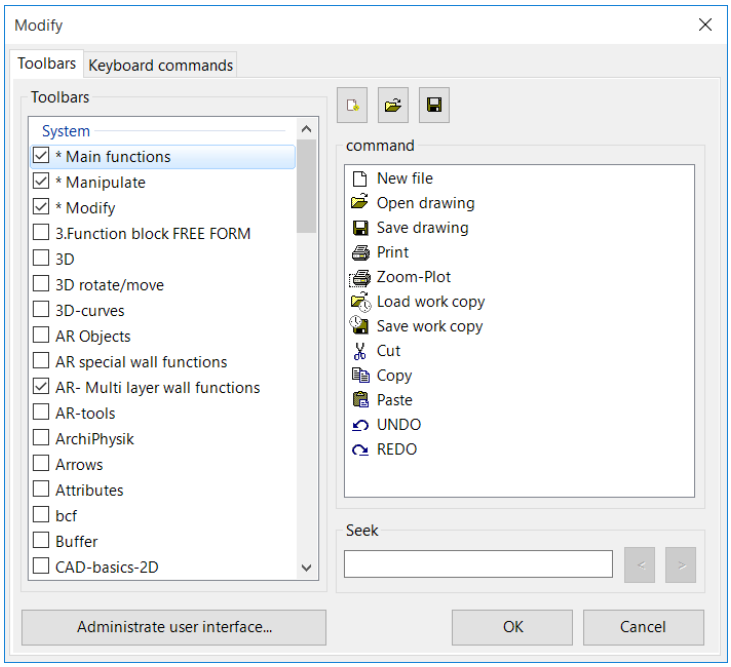
Double-clicking on an entry takes you back to the main dialog window and displays the corresponding command directly.

1.3 TOOLBARS

Functions can be accessed directly using icons (buttons). The functions are grouped together in toolbars or in the large tools manager. There is an icon for almost every function. While the most important functions are displayed on the user interface after installation, various prepared toolbars are available. Alternatively, users can create their own toolbars and populate them with frequently used functions. The most recently used toolbars and their position are loaded automatically when starting ELITECAD.

Modify

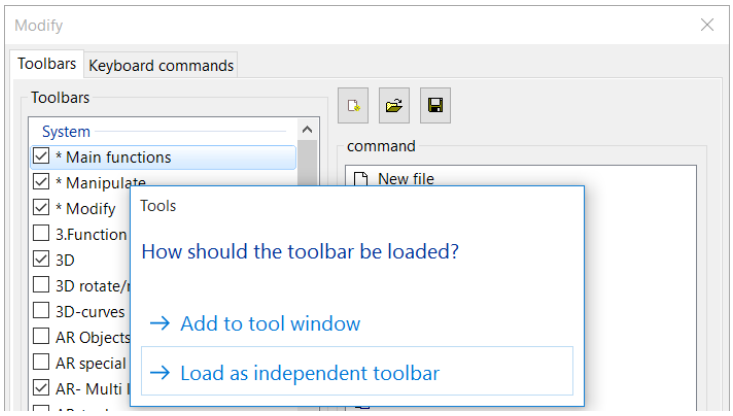
In order to create your own toolbars or display existing bars, the function MODIFY or the menu SETTINGS > TOOLBARS/KEYBOARD COMMANDS must be selected.



The dialog window is divided into two sections. The left-hand column lists all of the toolbars, beginning with custom-made toolbars, then the bars of the system and finally the bars that are integrated into the tools. The right-hand column lists the commands of the marked toolbar.

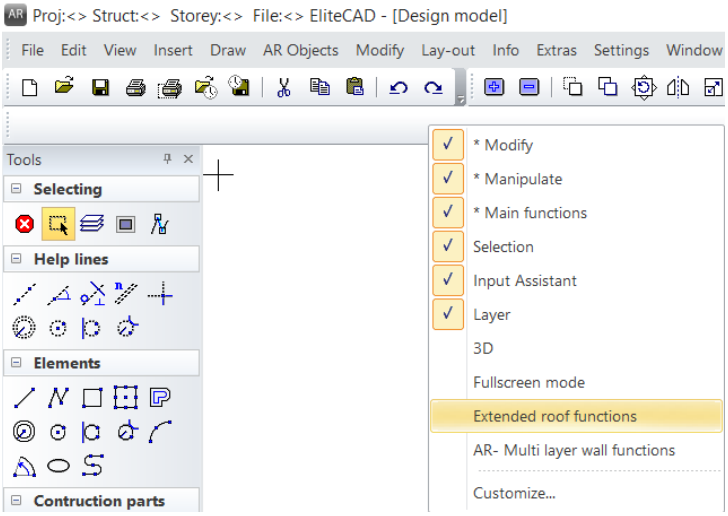
Search command
Users can search for a command in the search field. In addition, the toolbar in which the command is stored is marked in the left-hand column.

Load toolbar
If a toolbar is selected, a query appears asking the user whether the toolbar is to be integrated into the *Tools* window or whether it should be displayed as a separate toolbar on the monitor. The toolbar has three statuses: not loaded, loaded and visible, and loaded and invisible. The active option states that the toolbar is loaded.



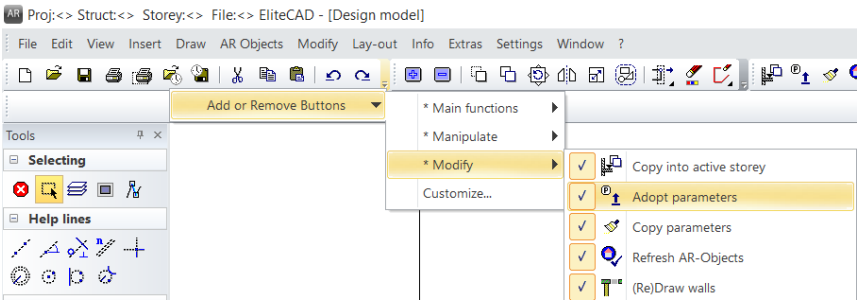
Toolbar visible/invisible

All loaded toolbars are listed in the toolbar context menu. If a toolbar is closed with "x", it is still loaded but invisible.



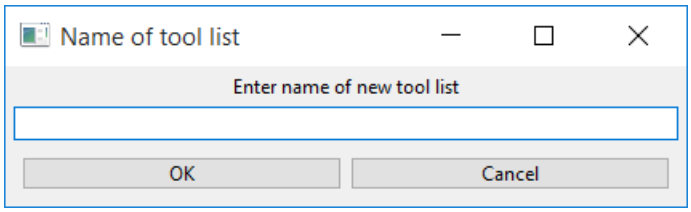
Add or delete buttons

This function is always hidden at the end of a toolbar. The visible toolbars are listed with their functions. Buttons can be switched to invisible or back to visible.



New

Users can open their own toolbar by clicking on "New".

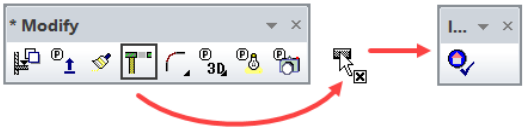


Name the bar and store it in the file structure.
An empty toolbar is displayed at the top left of the screen.

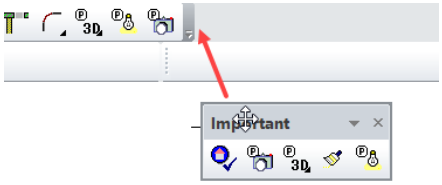
Copy command
Drag the command into the new toolbar with the drag and drop function while holding down the [Ctrl] key.

Move command
Drag the command into the new toolbar with the drag and drop function.

Delete command
Drag the command into the graphics window with the mouse to delete it.



Integrate toolbar into graphics window (docking)
Drag the toolbar into the desired location by clicking and holding its title line.



Change position between integrated and loose
Double-clicking on the "Gripper" or on the title bar toggles between integrated and loose positions.

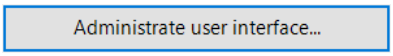
Import toolbar

Custom-made toolbars from previous versions or from other stations can be loaded. The toolbar can be loaded as a separate bar or loaded into the *Tools* window.

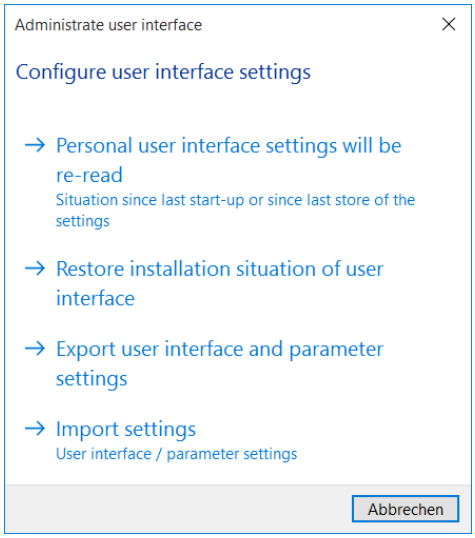
Export toolbar

Toolbars assembled by the user can be exported in order to import them to other stations or back them up.

Manage user interface



The button opens functions for managing the user interface.

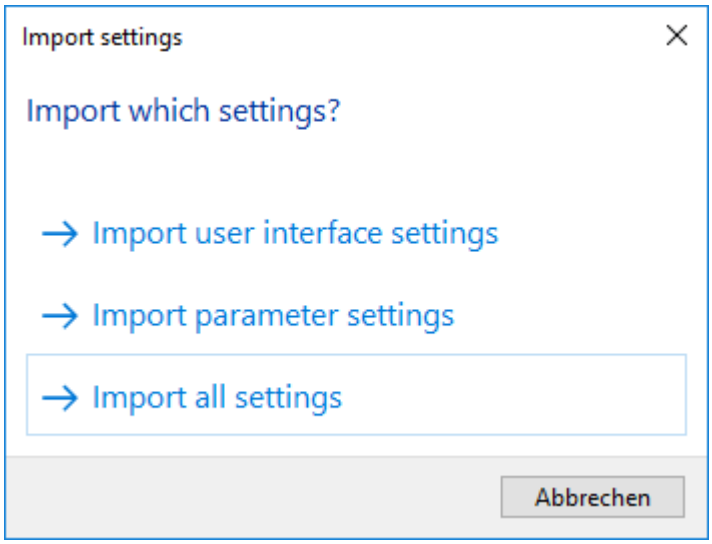


Reload personal user interface settings
All toolbars and management windows are reset to the status from the last time ELITECAD was launched.
All modifications to the toolbars (functions added, deleted, position of the bar changed, etc.) that were made since the last time ELITECAD was launched are lost.

Restore installation situation of user interface
All toolbars and management windows are reset to the installation status. The modifications made to the toolbars and management windows are lost. The function requires the CAD to be rebooted.

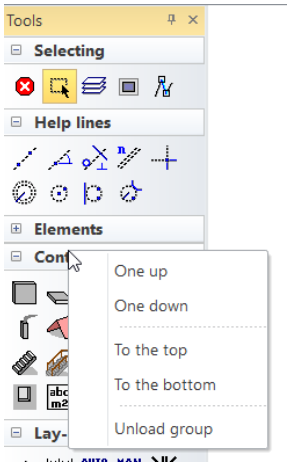
Export user interface and parameter settings
All user interface and parameter settings (elitecfg) are exported to a directory. This function enables the user interface to be copied to another computer. Users should note that the result might deviate from the original if the monitor resolution is different.
A blank directory is required for exporting the settings and ELITECAD must be closed afterwards.

Import settings
Exported user interfaces and parameter settings can be imported. In a second query, users can decide whether only the parameters, only the user interface or both should be imported.



The current settings are deleted when importing the parameters.
ELITECAD must be closed and restarted.

Tools manager



Predefined toolbars are managed in the tools manager. The individual lists can be opened and closed. The internal order of the bars can be controlled or an individual bar unloaded in the context menu of the individual titles.
When loading a toolbar users can choose to integrate the bar into the management.
Only predefined and complete bars can be integrated. In order to add individual commands, the corresponding bar must be unloaded, the new function added, saved, unloaded and then reloaded afterwards.

1.4 Colours

The pen colours, hatch colours, 3D colours and light colours all use the same 1024 pens and colours. This means that hatch no. 433 has the same colour as pen no. 433 or 3D colour no. 433.

TIP

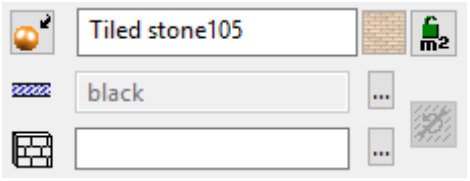
Do not use colours 1–15 for hatches as colours 1–10 are used by the pens by default and the greyscales 11–15 by the architectural construction parts walls, slab, ceiling, etc.

Entry

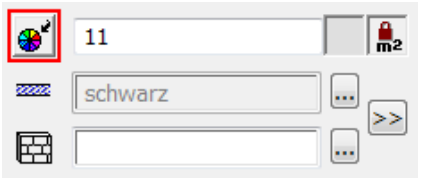
The colour number can be directly entered into the entry fields or selected via the colour table.

Please note that you can switch between the respective colour and material mode. If a material has been defined, it has priority. The entire material name must be deleted in order to display the colour again.

Material mode

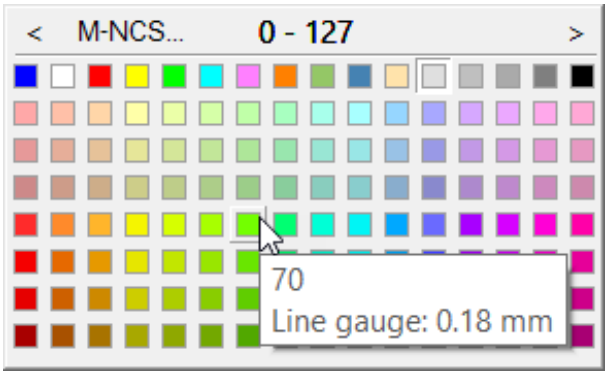


Colour mode

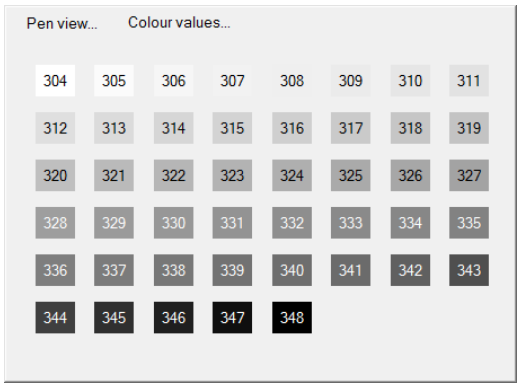


Concept

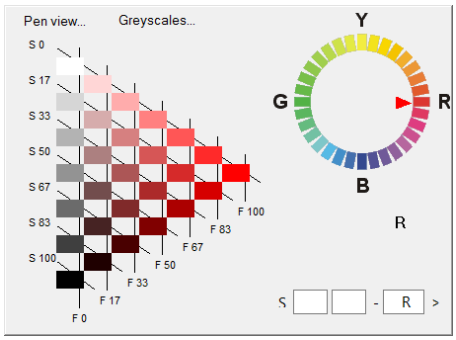
1024 pens are available, each of which can be defined in terms of their stroke strength, monitor colour and print colour. The settings are made in the menu SETTINGS > COLOUR PROPERTIES.
The pen numbers 0–10 are fixed monitor colours that cannot be changed.
The numbers 11–15 are additional greyscales.
Pen numbers 16–127 are general hues that can be brightened or greyed in the various rows.
M-RAL colours are available to be selected from numbers 128–303. The quick info function displays the respective colour name and the M-RAL number.

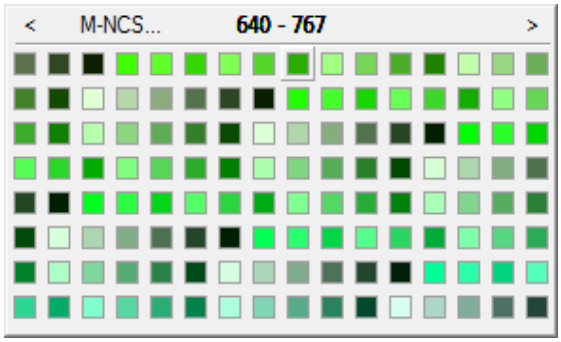


Numbers 303–348 are greyscales.

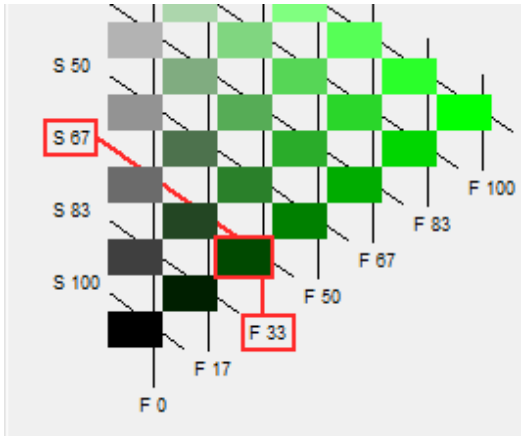


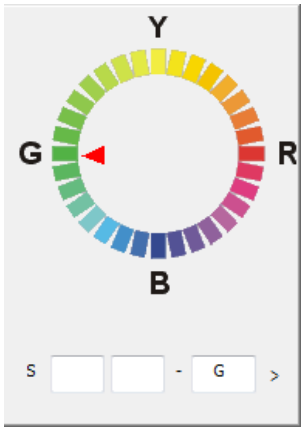
The other colours are assembled based on the M-NCS system. M-NCS (colour triangle) and pen view (table) are available colour display options.





Example colour 699 (S 6733-G)





S 67 stands for 67 % black
F 33 stands for 33 % colour
G stands for colour area

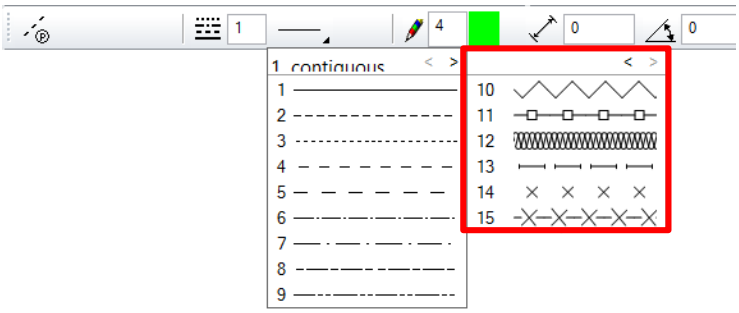
All information and designations for the colours described are subject to the printing quality and are therefore considered as benchmarks.

TIP

Colour fields and colour circles are stored as an ELITECAD file on the system.*<ELITECAD installation path>u\<version>\cad\glob\d*
Print or plot these files. The colours are best chosen by using the printouts.

1.5 LINE TYPES

Nine different standard line types and freely definable line types are available.

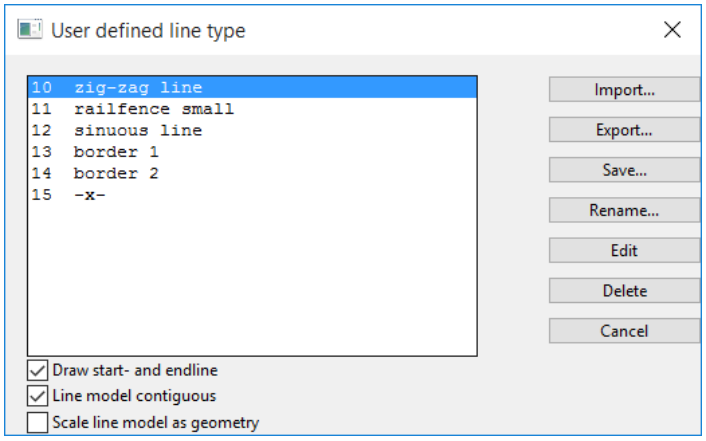


The freely definable line types are not available everywhere.

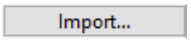
USER-DEFINED LINE TYPES

Properties bar of 2D drawing elements
Settings menu > User-defined line types

Management window for the user-defined line types

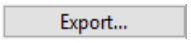


Import



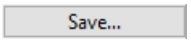
Allows line types that were exported on a different workstation from ELITECAD to be imported.

Export

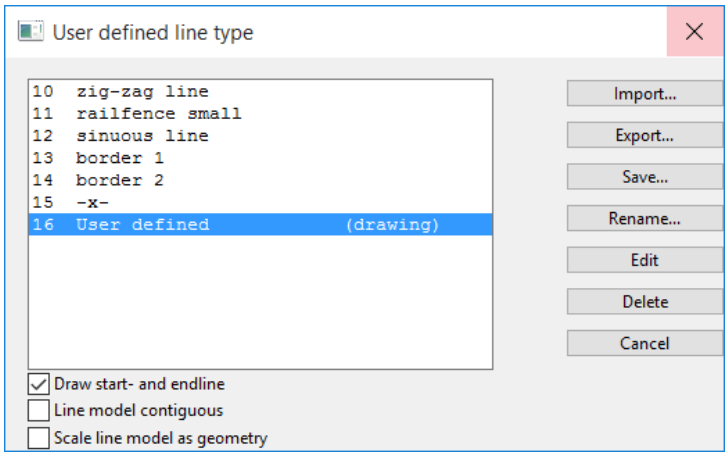


The selected line type can be exported as a file. The line type can be reimported on a different workstation or in a remote office.

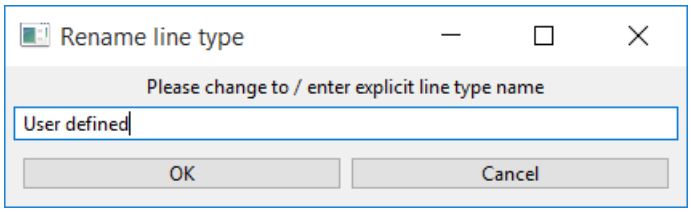
Save



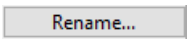
If a drawing is loaded that contains line types that are not available to you, these are labelled in the list in addition (drawing). This is also the case if you have edited a line type.
Line types must be saved in order for them to be permanently available.



If the name of a temporary or editable line type already exists, (.1) is added to the end of the name. If the line type is saved now, a message appears to inform the user that the line type name is not unique. Enter a new name, which may not start with a number.



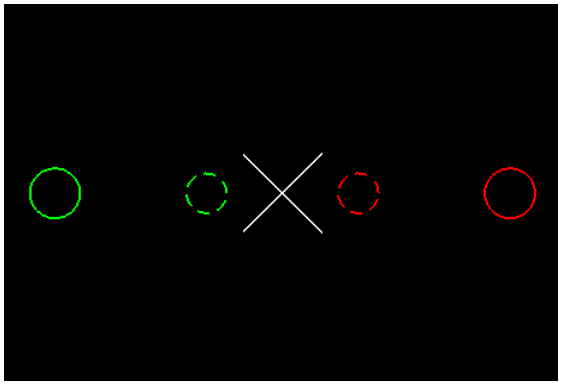
Rename



The line type can be given a new name.

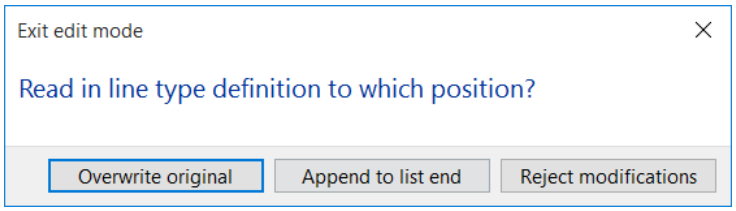
Edit

Allows new line types to be edited and created.
After calling up the function, the line type that is selected in the list is displayed on the monitor.



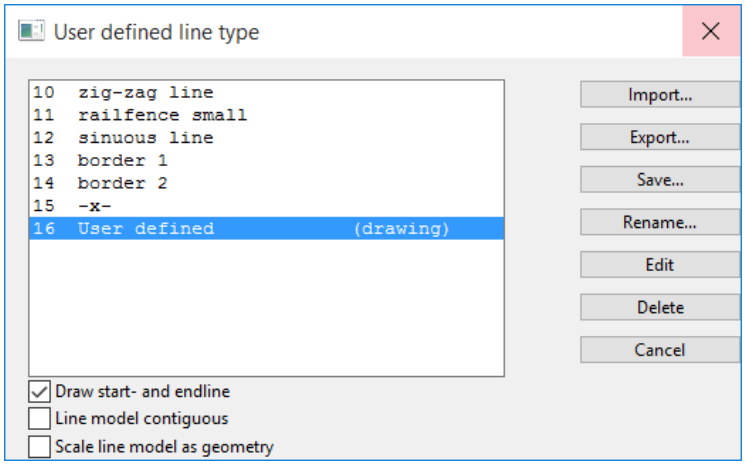
The circles with the larger diameter specify the start and end of the line model.
The small dotted circles are only relevant if the option DRAW START AND END LINE is active. In this case, a line is automatically drawn between the large and small circle.
The white cross in the centre is the actual line model in this example.

If the editing process is complete, a query appears on the monitor.



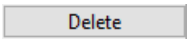
Overwrite original
The editable line type is overwritten. The line type must be saved in order for it to be permanently available.

Append to list end
The modified line type is added at the end of the list. The line type must be renamed and saved in order for it to be permanently available.



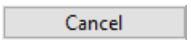
Reject modifications
The modifications made are not saved.

Delete



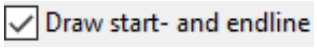
The marked line type is deleted. This is only possible in an empty drawing, however.

Cancel



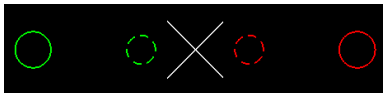
Cancels editing or closes the dialog window.

Draw start and end line

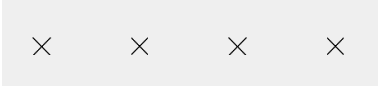


If the option is set, an automatic line is drawn to connect the large and small circle of the line model.

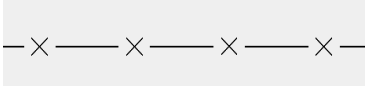
Original example



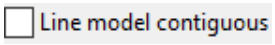
Without start and end line



with start and end line

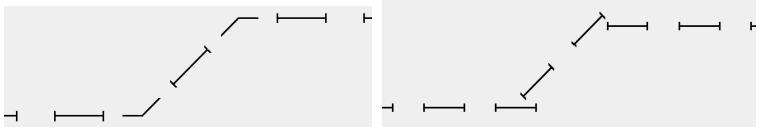


Line model contiguous

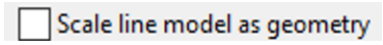


If this option is not active, a direct connecting line is always drawn in the corners if there is no more space in the line model. If this option is selected, the line model is always completely visible even if the corners overlap.

Line model not contiguous Line model contiguous



Scale line model as geometry

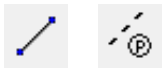


If this option is not active, the size of the line model always stays the same in the printout, regardless of the scale set. If this option is selected, the line model is scaled using the scale of the drawing.

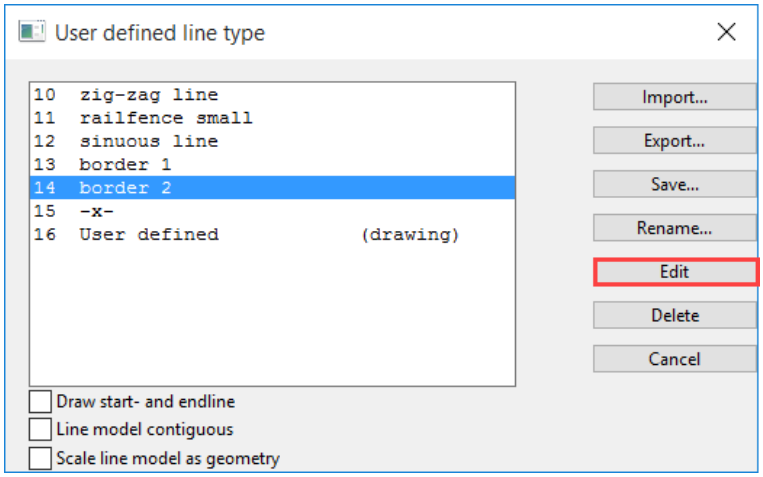
▼▼▼▼ WORKSHOP

Create new line type

Select the function DRAW LINE and then the line parameters in the properties bar.

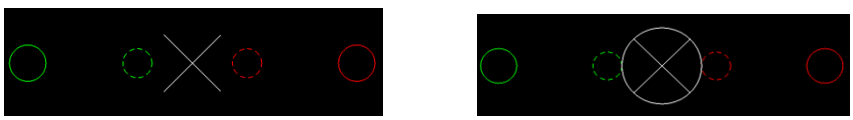


Select the line type (e.g. border 2) and click Edit.



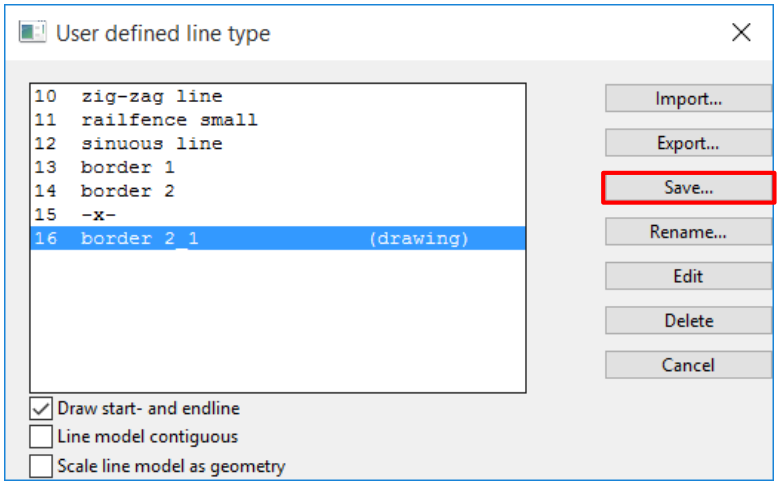
The line model is displayed on the monitor. Add to the drawing using the drawing functions.

Template new line model

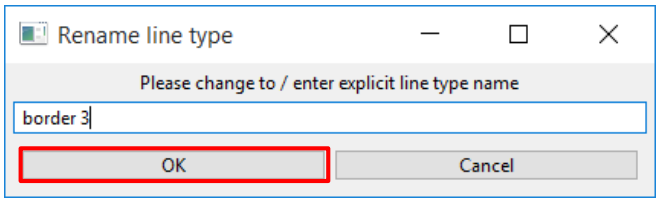


Click "Complete edit" and then on "Append to list end".

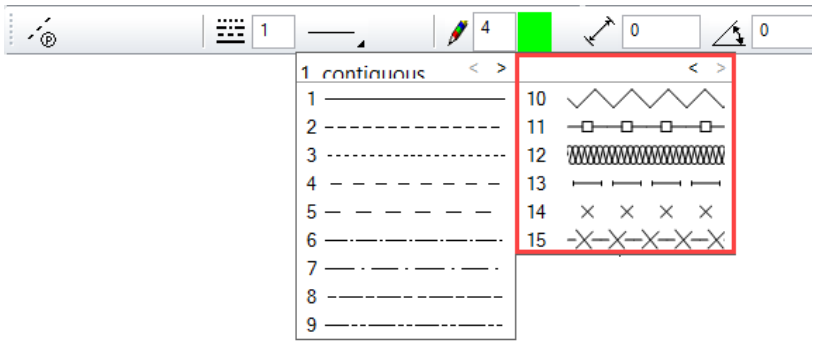
The new line type is displayed in the list. Click on Save.



Enter a new name and confirm it with OK.



The new line type is available for use.



WORKSHOP END

1.6 Layer / Classification

Layers are the preferred method to structure plans in ELITECAD Architecture. ELITECAD Mechanics offers multiple tools to structure objects in a drawing. The classification structure (with model/group/class/level), the layer structure and the hierarchical assembly groups.

Layer

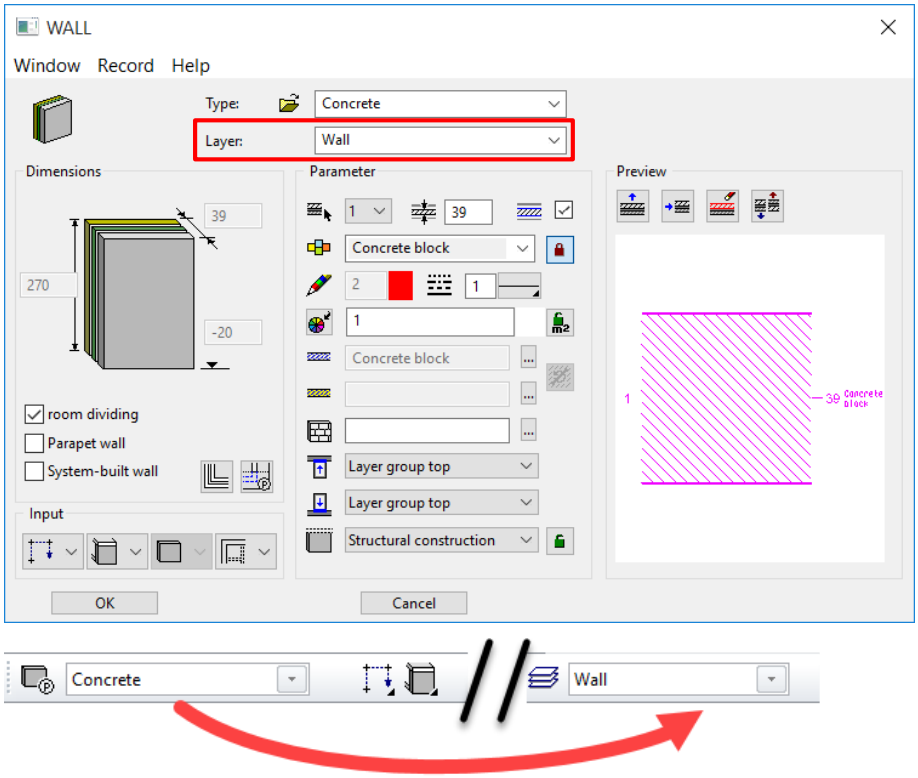
The Layer management is described with examples from ELITECAD Architecture.

Active layer

The current layer is displayed in this field. The program recognises the current layer for the 2D elements (elements, text, hatch) for dimensioning and for each construction part.

If you have made a selection on the screen, you can modify the structure by selecting a different layer.
The layers switched off in layer management are not displayed in the selection.

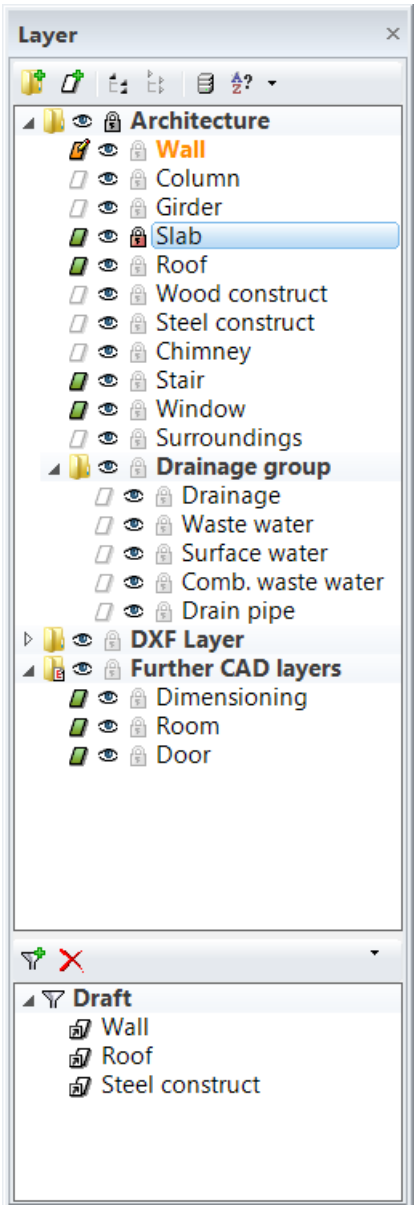
State layer for objects
The architecture objects (walls, ceilings, windows, etc.) are automatically assigned a layer as this can be entered directly in the parameter dialog window.
The layer can be selected or saved with the correct layer in the parameter record in the "Layer" field.



If a parameter record is selected in the wall properties bar, the layer converts automatically to the layer saved in the parameter.

Layer management

Layer management opens with a single click on the layer function.



Header functions
The top row populated with functions in the management window.

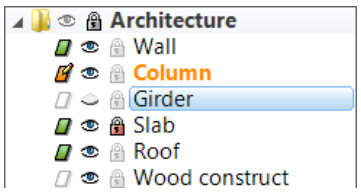
Structure
The layers are structured into main layer groups and layer groups.
In this example:
Main layer group > "Architecture"
Layer group > "Drainage group"

DXF layer
Layers made up of data imported via the DXF/DWG interface are stored in this group.

Further CAD layers
If data is inserted from other ELITECAD design models with layers that are not defined in this project, these layers are stored in the main group "Further CAD layers".
If a layer is deleted from the default structure that still contains data, the layer is also added for the additional CAD layers.
These layers are only listed as long they contain data.

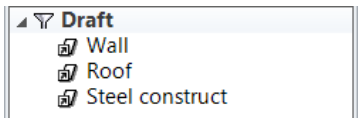
Filter
A filter is an instrument used for switching a certain subset of layers to visible, invisible or visible alone.

Meaning of the symbols in layer management



Layer main group/layer group
Layer without content (as long no objects assigned to this layer)
Layer with content (objects have already been assigned to this layer)
Layer is active
Layer is visible
Layer is invisible

Layer is locked
Layer is not locked



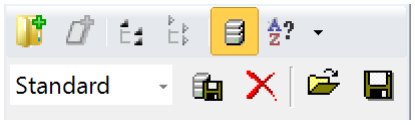
Filter
Layer in filter

Visibility
The "eye" indicates whether a layer is visible or invisible. The active layer is always switched on.

Lock layer
Locked layers may NOT be edited. The capture points can still be selected, however. The active layer may never be locked.
The pen colour with which the locked layers are displayed is specified under SETTINGS > OPTIONS > REFERENCE PLAN.

Select multiple layers
Multiple individual layers can be selected with the [Ctrl] key. A specific area can be selected with the [Shift] key or an area opened up with the cursor.

Layer management header functions



New group

Layers can be combined into a group for the sake of clarity. The function creates a layer group at the end of the list. The name can be edited straight away.

New layer

Creates a new layer. The name can be edited straight away. The insert location depends on the sorting. The layer is created at the end of the list for "user-defined" sorting.

Expand all layer groups

Close all layer groups

Manage/save record

This function shows a second row with record management functions in the header functions.

Manage records in the parameters.

Records with layer structures can be stored, loaded or deleted in the parameters. These records are written to the local parameters.

Import/export records

A layer structure can be exported and imported in order to make it available to other employees.

Sort

User-defined sorting

The order of the layers can be freely defined by moving the layers. If new layers are created in the alphabetical sorting, these are listed in the "user-defined" sorting at the end of the list.

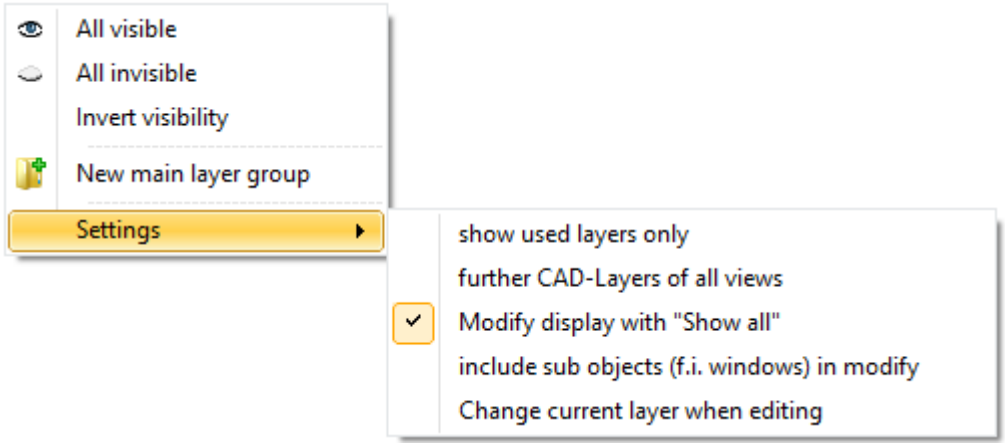
Ascending/descending sorting

The layers are listed alphabetically.

Layer management context menus

There are two context menus in the layer management (right-click). One opens when clicking on a layer name or its symbols; the other opens when clicking on the background.

Background context menu



View all
Switches all layers to visible.

All invisible
Switches all layers to invisible.

Invert visibility
Switches all visible layers to invisible and all invisible layers to visible. The active layer is always visible.

New main layer group
Creates a main layer group at the end of the layer list.

Settings > Display used layers only
Layer management is reduced to the layers used.

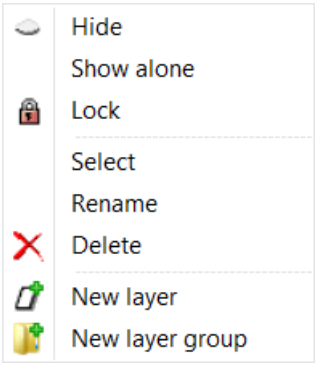
Settings > Further CAD layers from all views
This option is only required in views of the category view, section and detail. You have defined further layers under the heading "Further CAD layers" in a calculated view. You have switched to a different view and require the same layers in this view. The layers are currently not displayed, however, as they do not contain any data. This function searches for defined layers in all created views.

Settings > Modify display with "Assemble all"
If this function is active, the visible layers are shown for the ASSEMBLE function.

Settings > Include sub objects (such as windows) in modify
The sub objects are included when this function is active. If a layer is modified for a wall, the sub objects windows, doors and wall openings are also modified.

Settings > Change current layer when editing
When editing objects (e.g. by clicking) the corresponding layer is displayed in the layer management- If this setting is enabled the layer of the selected object remains as active layer. Otherwise, the previous layer is restored after editing of the object is completed.

Layer name context menu



Hide/assemble
The HIDE or ASSEMBLE function appears depending on whether the layer is visible or invisible.

Assemble alone
Activates the layer and hides all other layers.

Lock
Locks the layer.

Select
All elements/construction parts that belong to the marked layer are marked in CAD. This selection can be used for a manipulation.

Rename
Modify a layer name.

Delete
Deletes the layer. If data has been allocated to the layer, the layer is stored under the heading "Further CAD layers". A layer under the heading "Further CAD layers" may not be deleted if data is still allocated to the layer.

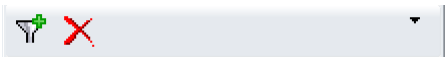
New layer
Creates a new layer. The name can be edited straight away. The insert location depends on the sorting. The layer is created directly beneath the selected layer for "user-defined" sorting.

New layer group
Creates a new layer group (such as *Architecture*), which can contain a number of layers.

Filter

A filter is an instrument used for switching a certain subset of layers to visible, invisible or visible alone.

Filter management header functions



New filter

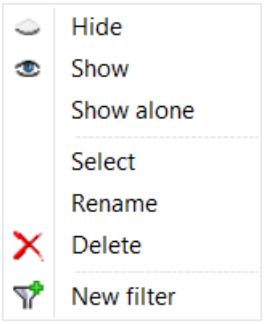
A query appears if an empty filter or a filter with all visible or invisible layers should be created.

Additional layers can be dragged into the filter using drag and drop.

Delete filter

The selected filter is deleted.

Filter management context functions



Hide
Hides all layers of the filter. If the active layer is included, it stays switched on.

Assemble
Displays all layers of the filter.

Assemble alone
Only the layers of the filter are displayed. If the active layer is not contained in the filter, the first layer of the filter is activated.

Select
All elements/construction parts that belong to the layers in the filter are marked. This selection can be used for a manipulation.

Rename
Modify the filter name.

Delete
Deletes the filter. If the context menu is called up for an inserted layer, the entire filter is not deleted but only the individual layer from the filter.

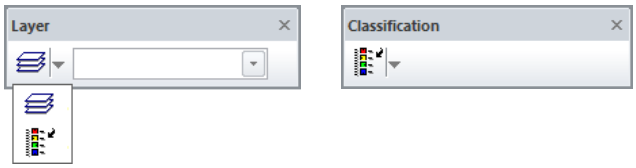
New filter
Creates a new filter.

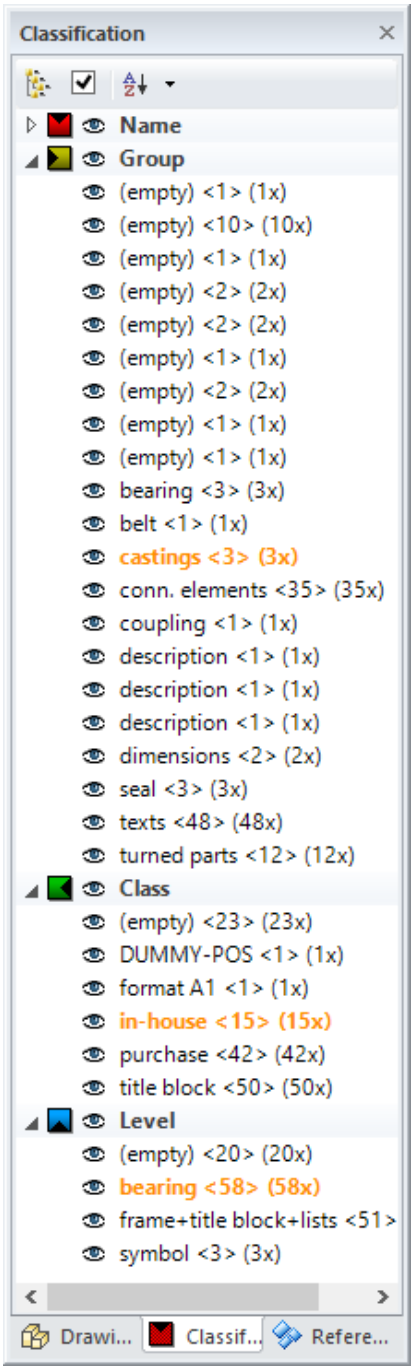
CLASSIFICATION

Classification management is described with examples from ELITECAD Mechanics.

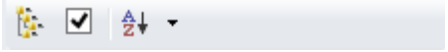
Classification management

The classification manager supports working with classifications and models.
The classification management opens with a single click on the CLASSIFICATION function.





Classification management header functions



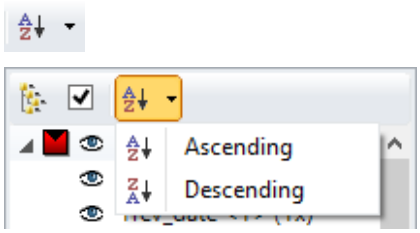
List view / hierarchical view

This function switches between the list view and the hierarchical view.

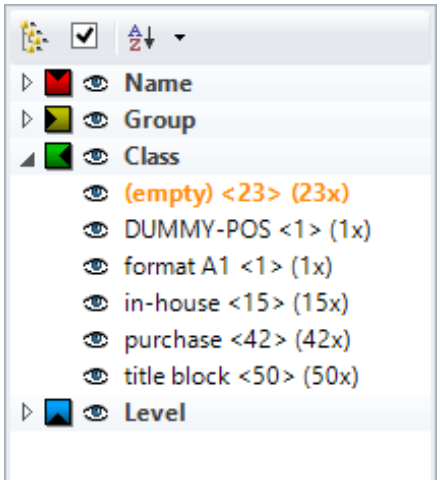
Selection mode

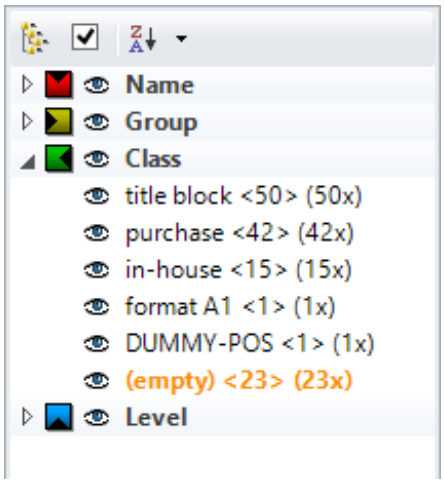
This function activates and deactivates the selection mode

Sorting



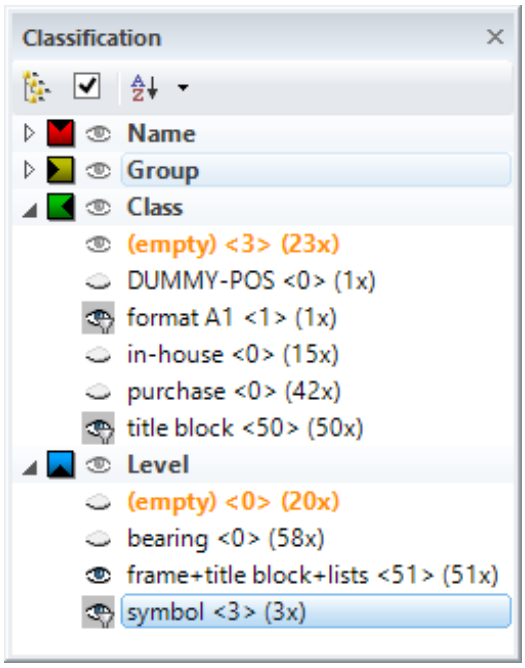
Using the sort function, the lists can be displayed in ascending or descending order. In the list view, the categories model, group, class, and level have a fixed position and will not be resorted.





List view – visibility

Meaning of the symbols



The adjacent name has been chosen in the manager

All models with this name are completely visible

All models with this name are completely invisible

Some models with this name are visible

bearing <1> (58x) One of 58 models with this name is visible

The symbol at the category indicates the overall state

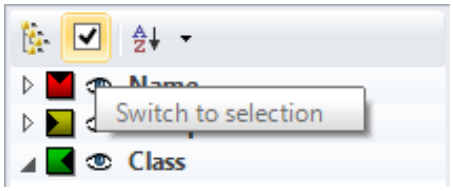
By clicking on the eye icon, the models associated with the adjacent classification name are set to visible and simultaneously displayed in the manager as active (filter symbol).

The visibility of models in other categories results from logical relationships, indicating how many models are visible with the given name. If all models with the given name are visible, an open eye is displayed, if not all models are visible, the entry gets a greyed-out eye and if no models are visible, a closed eye is displayed. The two numbers at the end of each entry also indicate how many models are visible with the given name and how many exist in total.

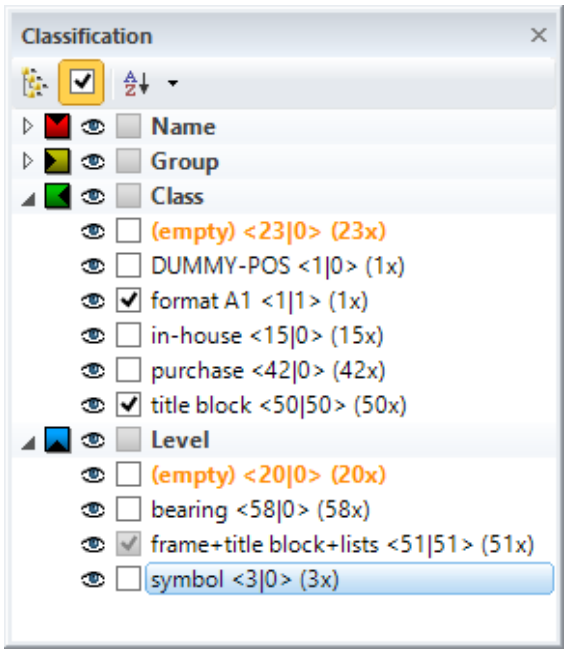
It should also be noted that at least one name of a classification must be active, which manifests itself in the fact that the last active name of the current classification cannot be switched invisible.

List view with selection mode

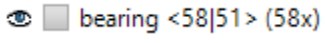
By clicking on the symbol shown, the selection view can be switched on or off.



Meaning of the symbols



☑ The adjacent name has been chosen in the manager
☐ No model with this name is selected
☑ All models with this name are selected
▣ Some models with this name are selected



51 out of 58 models with this name are selected and 58 are visible

The symbol at the category indicates the overall state

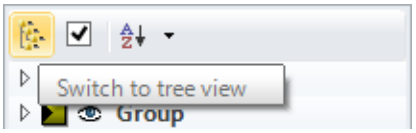
Similar to the visibility view, individual names can also be selected in selection mode by clicking on the checkboxes. The rest of the control is analogous to the visibility mode.

List view – multi selection

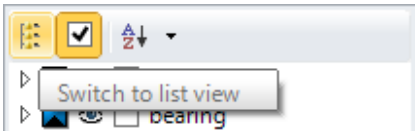
A selection is unique within a category. If, in addition, a selection is made in a further category, those objects that fulfil one of the selected criteria are set to visible or active (not all).

Tree view - visibility

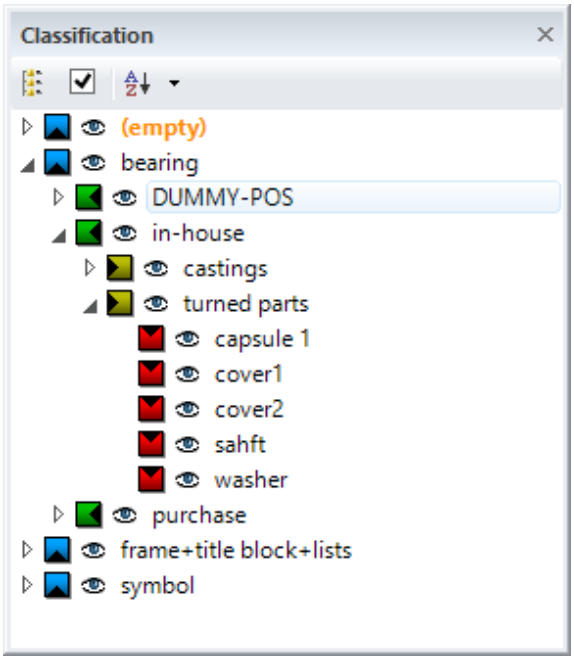
By clicking on the symbol shown, you can switch to the tree view.



By clicking on the symbol shown, you can switch to the list view.



Meaning of the symbols



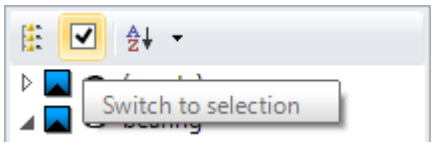
The icons in the tree view are the same as in the list view.

A "check mark" for an entry means that this entry has been activated by the user and that the selected hierarchy is visible. All states of the subordinate models result from logical contexts. If, for example, the class *in-house* is active, all the entries below will be displayed as visible. Conversely, all entries would be invisible if an entry above them has been deactivated.
The further down in the hierarchy levels, the more special is the selection for the visibility, whereby it is possible to specialize down to the model name.

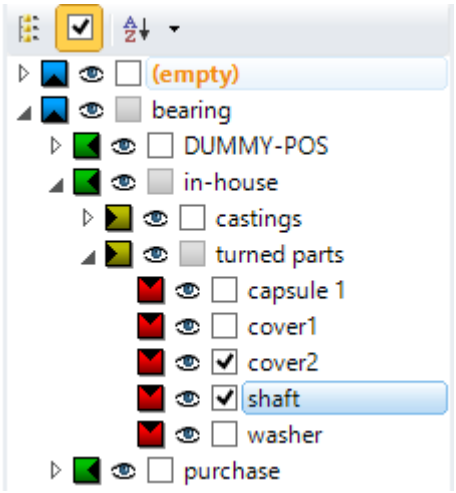
The hierarchical arrangement of the classifications in the manager enables a multitude of logical operations and makes working with the models easier.

Tree view with selection mode

By clicking on the symbol shown, the selection view can be switched on or off.



Meaning of the symbols



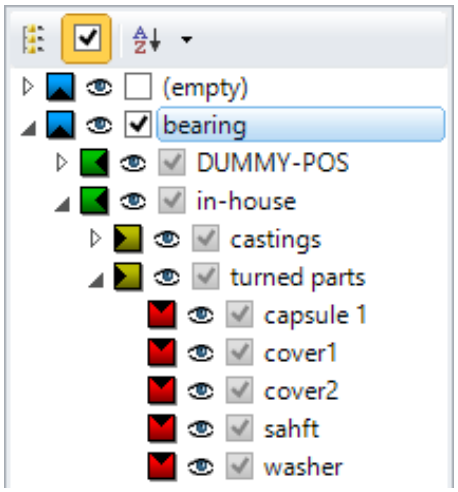
Similar to the visibility mode, individual names can also be selected in selection mode by clicking on the checkboxes. The selection of the hierarchically subordinate classifications or models results from logical relationships. If a hierarchically higher entry is activated (marked with a check mark), all subordinate entries are also selected. The further down in the hierarchy levels, the more special is the selection for the selection, whereby it is possible to specialize down to the model name.

TIP

If a model is not highlighted in the graphics window after being selected in the manager, it may be due to the fact, that this model was previously hidden in the visibility mode.

Tree view - behaviour

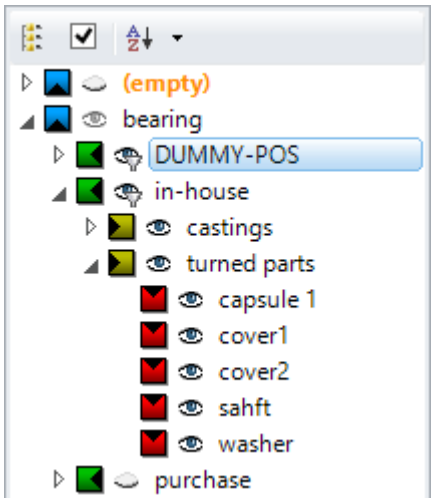
For the operation of the classification manager, there are certain restrictions, which are due to logical relationships and which must be taken into account.
E.g., at least one entry must be active per branch.

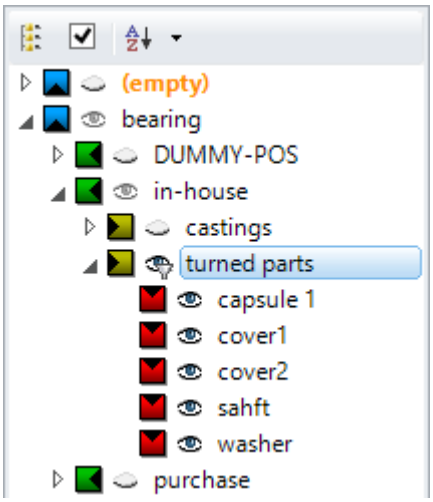


In the example above, the class *in-house* (and thus all models with this class name) could not be deactivated by clicking, since the level *bearing* is already active and therefore all subordinate entries have also been automatically selected. The tick at the class *in-house* represents only a specialization of the selection. If you clicked on the level *bearing* in this case, the specialization would be omitted and all subordinate entries from the level *bearing* would be selected - both *in-house* and *DUMMY-POS*.

The same behaviour applies to the visibility mode, whereby an exception applies to the selection mode, that at the hierarchy level of the levels, the last active entry can also be deactivated (with a simple click), whereby nothing would be selected.

The following example shows the specialization when setting the visibility in the classification manager.





In the first graphic the classes *DUMMY-POS* and *in-house* are activated.
If the user specializes in the selection of the visibility (as shown in the second graphic) by the group *turned parts* (by clicking on the eye symbol), the class *DUMMY-POS* automatically falls out of the selection of visibility, because it was further specialized by clicking on the desired entries. Thus, all models with the classifications *bearing*/*in-house*/*turned parts* are now visible, which is represented by an open eye in the manager. If now another specialization would take place at the level of the model names, only these selected models would be visible.

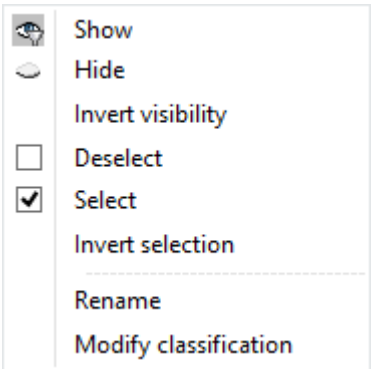
The same behaviour of the automatic activation or deactivation of neighbouring and subentries also largely applies to the selection mode.

TIP

If you only want to switch already in advance e.g. special models names to visible or to select, you can start directly with the specialization at the desired classification level. Hierarchically higher classifications are automatically activated by the manager.

Classification manager context menu

Depending on the position of the mouse pointer (over a classification name or group), different functions may be active or permitted.



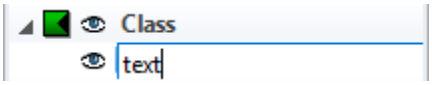
Show / Hide
Depending on whether all models with the selected classification are visible or invisible, the function HIDE or SHOW appears. All models with the selected classification are set to visible or invisible.

Invert visibility
The visibility of all models with the selected classification is inverted.

Select / Deselect
Depending on whether all models with the selected classification are selected or not selected, the function SELECT or DESELECT appears. All models with the selected classification are added to or removed from a selection. This selection can be used for further manipulations.

Invert selection
The current selection is cancelled. All models that do not belong to the current selection are defined as a new selection. The new selection can be used for further manipulations.

Rename
This can be used to change the name of the classification of the model.



This affects all models with the same classification name.

TIP

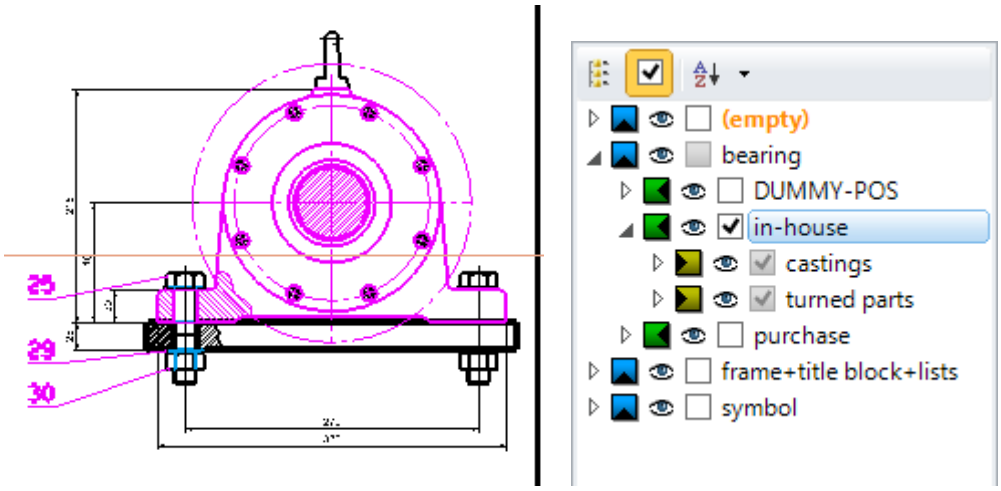
If the desired entry is already selected in the manager, just click on the entry again to automatically start the renaming.

Modify classification
Opens a dialog to change the classification of a selection. If no models have been selected when calling the function, a query appears to indicate a selection.

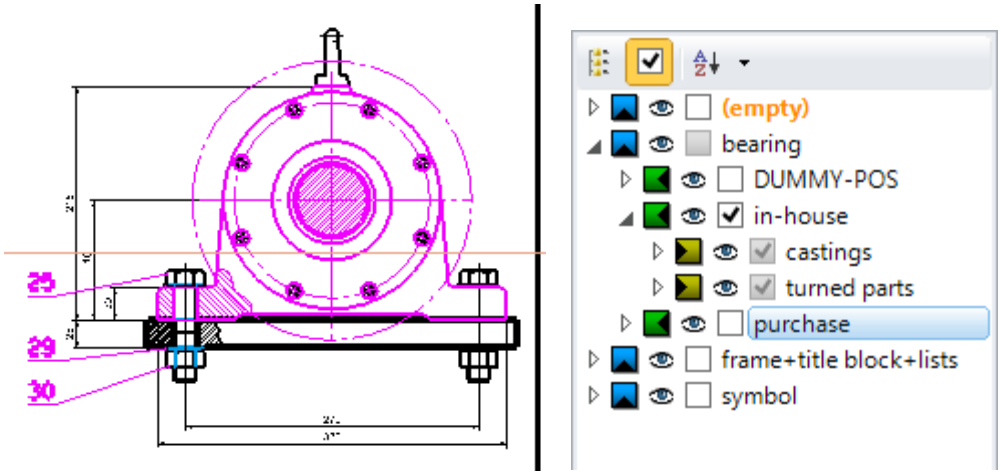
Assigning classifications by drag and drop

Drag and Drop provides the ability to change classifications quickly and intuitively without using the CHANGE CLASSIFICATION dialog. In this case, the classifications are changed by simply dragging classification names from the manager to the desired models in the graphics window. Two variants are available. On the one hand, the possibility of pre-selection of the models to be changed and on the other hand the dynamic selection during the drag and drop process.

Drag and Drop with pre-selection
First, select the model to be changed (via manager or by selecting in the graphics window via mouse)

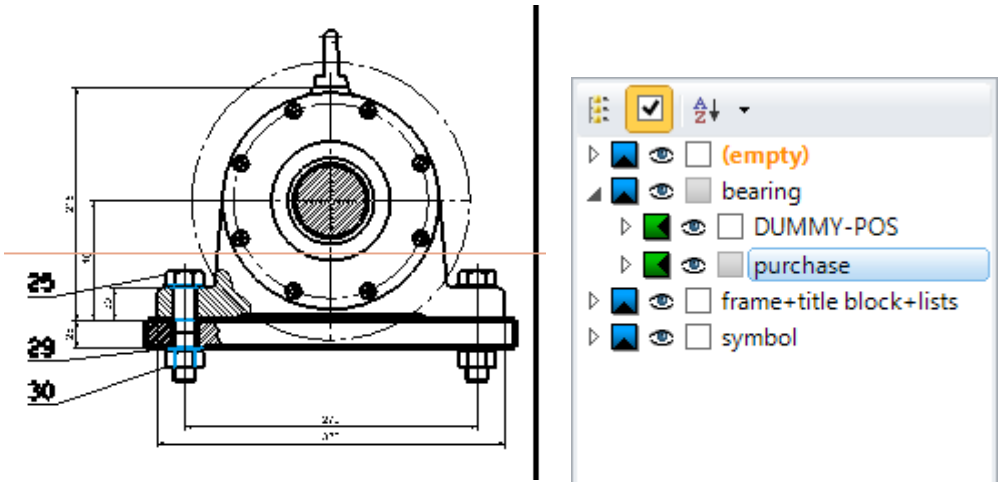


Select the new classification in the manager and drag the entry into the graphics window with the left mouse button pressed.



Release left mouse button on selection.

The group name *in-house* will be replaced with the group name *purchase* for all models of the selection.



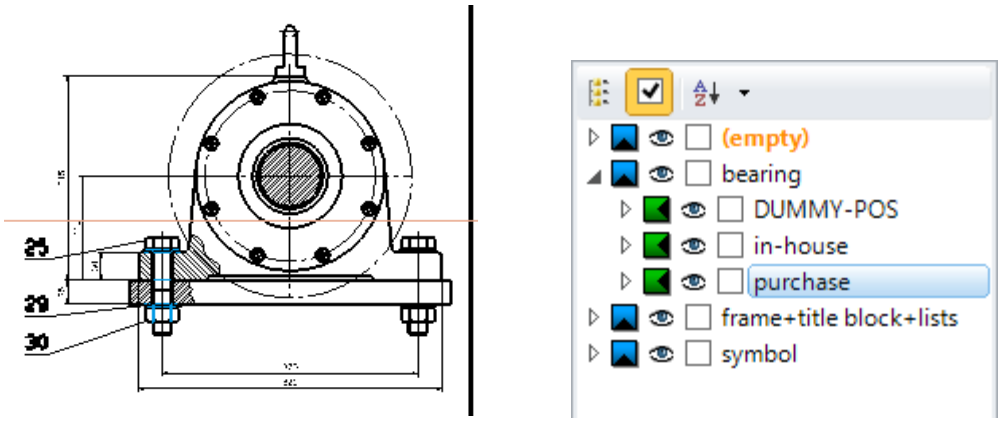
During the process, current information is displayed in the status bar, e.g. *Copy all selected classifications. A*fter the button has been released: *All selected classifications were copied.*

If the drag and drop is started from the tree view, all hierarchically superior classification names (beginning with the entry from where the drag-and-drop was started) are also automatically transferred. If only the current classification name (selected in the manager) is to be transferred, the <Ctrl> key must also be held down during the drag and drop process.

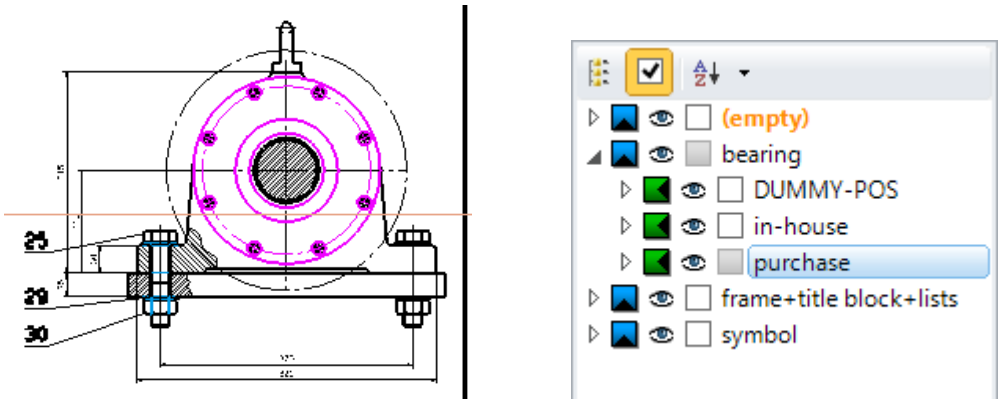
If the drag and drop is started from the list view, then only the name of the classification selected in the manager is transferred.

Drag and Drop without pre-selection
In this case, no preselection of the models to be changed is required, since this is done automatically during the drag and drop process and displayed to the user.

Select new classification in the manager and drag the entry into the graphics window with the left mouse button pressed.

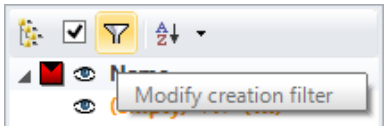


During drag and drop, the model is highlighted at the current mouse position.

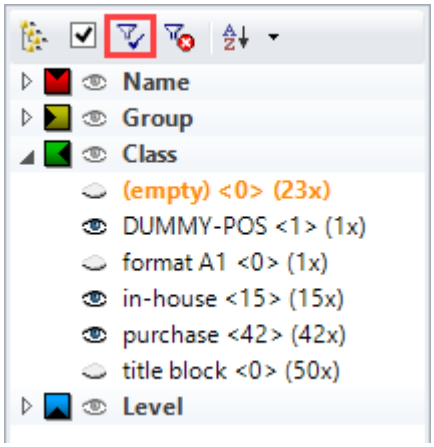


Releasing the left mouse button changes the classifications.

Modify creation filter of a view



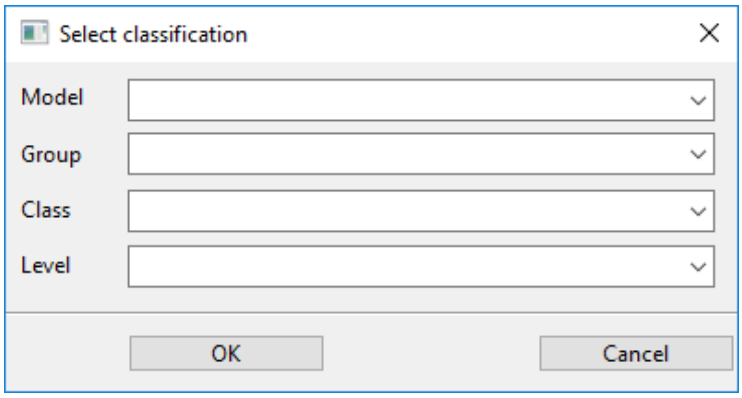
With the filter symbol, the creation filter of a view can be changed quickly and easily afterwards. To do this, switch to the desired, already created view with the filter icon displayed in the toolbar of the manager. After pressing the button, the view's filters can be adjusted by setting the individual classifications in the manager visible or invisible. The process is completed by pressing the confirmation button (green flashing) in the manager toolbar, which updates and displays the view.



New classification

Structure toolbar

This function is used to set the model, group, class, and layer name, provided, that the "group / class / level selection" check box is set in the OPTIONS.
After activating the function, the names for model, group, class and level can be entered in the dialog window displayed. All already defined values can be selected via the combo box.



New group

Structure toolbar

This function sets a new group and starts a new model. New group means that, although the group name remains the same, an intrinsic coupling is set for the following new models. This means that this group can be manipulated independently of other groups with the same name.

REMARK

If a group is copied, the copy is automatically a new group and can be manipulated later, regardless of the original group.

Select classification

Structure toolbar

This function is used to set the model, group, class, and layer name, provided, that the "group / class / level selection" check box is set in the OPTIONS.

After activating the function, the names for model, group, class and level can be entered. The values must be entered in the correct order and separated by "," in the input line. Thereafter, a new model is automatically started.

TIP

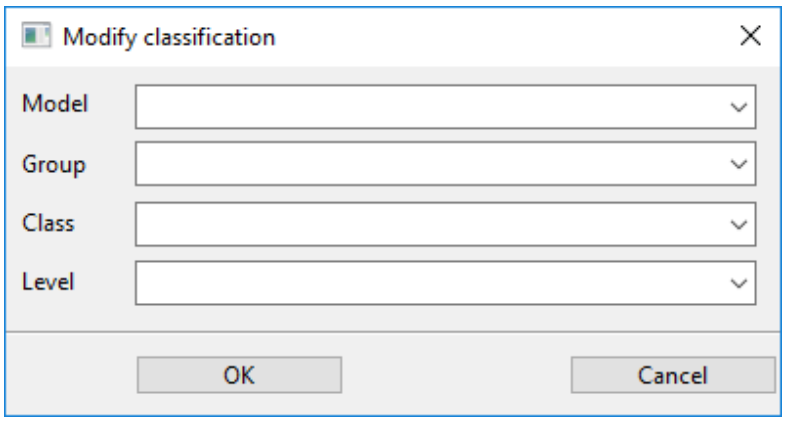
If some values are equal to the current classification, only the changed names are to be specified. The current classification is displayed at the bottom of the screen. To delete an existing classification name, a blank must be entered.
To preserve an existing classification name, place a comma. (For example, if the group should be preserved, the input looks like this: *model,,class,level*.

Modify classification

Structure toolbar
Modify menu > classification

This function is used to set the model, group, class, and layer name subsequently, provided, that the "group / class / level selection" check box is set in the OPTIONS.

After activating the function, the names for model, group, class and level can be entered in the dialog window displayed. All already defined values can be selected via the combo box.



TIP

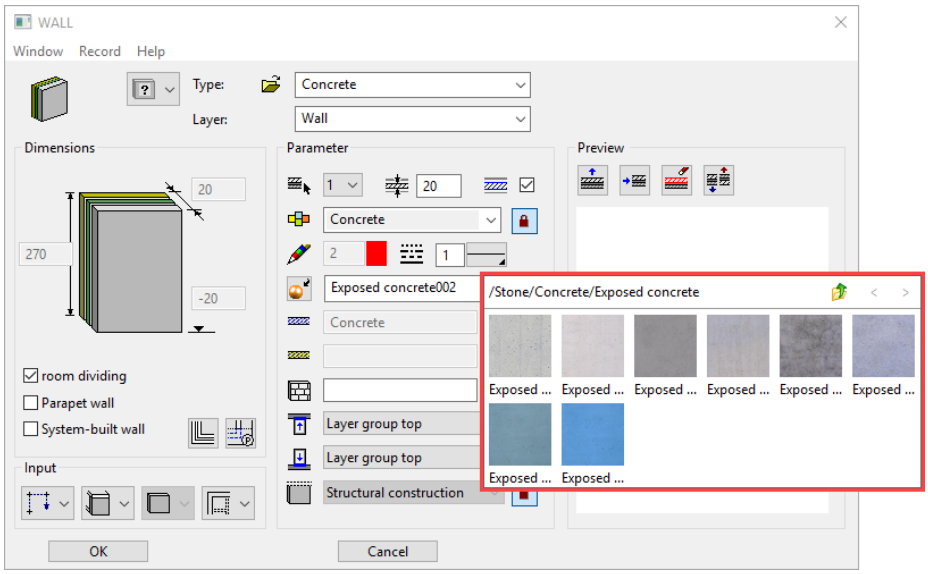
To delete an existing classification name, a blank must be entered.
If no selection is made, this function refers to the current model.
This function can also be called by double-clicking on the classification in the status bar.
If a model is selected, this function is also available in the context menu.

1.7 MATERIALS

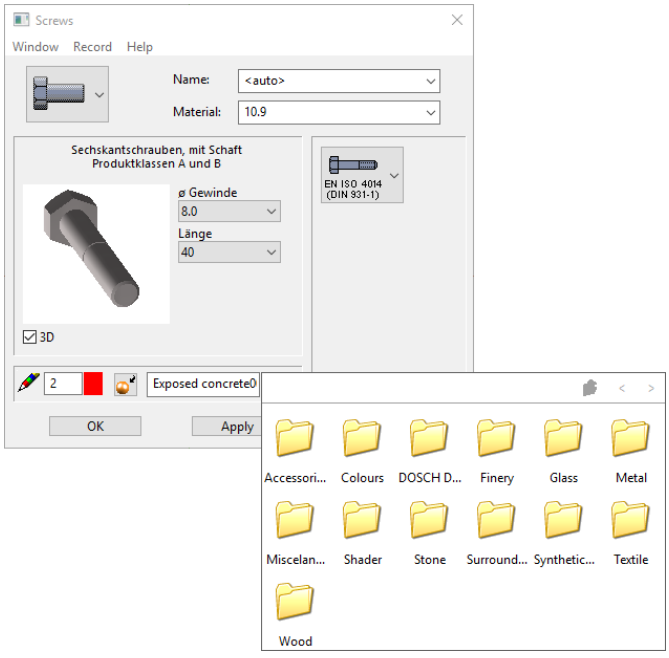
A material consists of surface properties and it can be allocated to an object or a surface. Surface properties include texture image, transparency and mirroring. The materials make it possible for 3D CAD data to be displayed in visualised quality. The materials can be defined in the parameter dialog window when creating the construction parts or allocated afterwards via drag and drop from materials management.

Predefined materials for objects

A function for materials allocation is offered in the respective parameter dialog window.
ELITECAD Architecture

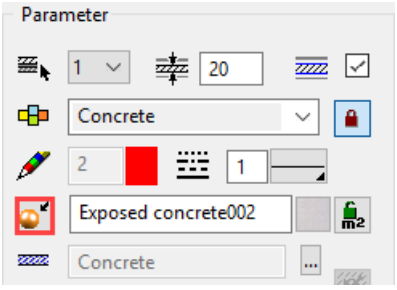


ELITECAD Mechanics

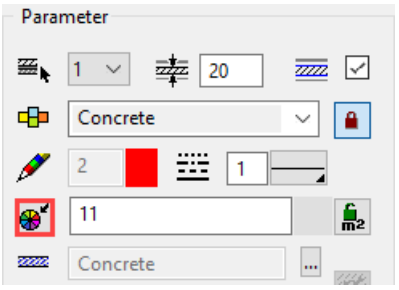


Users can toggle between material mode and colour mode.

Material mode
ELITECAD Architecture



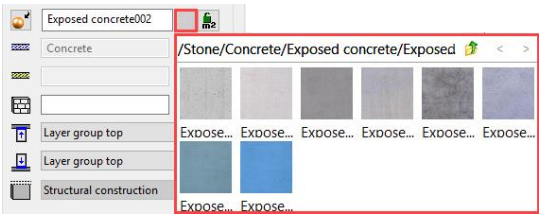
[Colour mode]

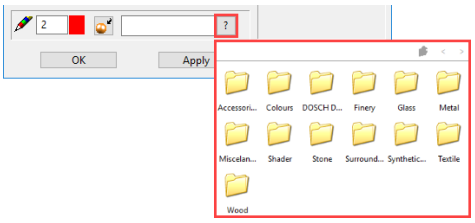


ELITECAD Mechanics

If a material has been defined, it has priority. The entire material name must be deleted in order to display the colour again.

If you are currently in material mode, left-click the selection button to access the material database.





ELITECAD Architecture ELITECAD Mechanics

In this selection dialog window, you can click on a material of your choice that is then transferred to the entry field.

Up

Click on the "Up" symbol to access the higher-level folder.

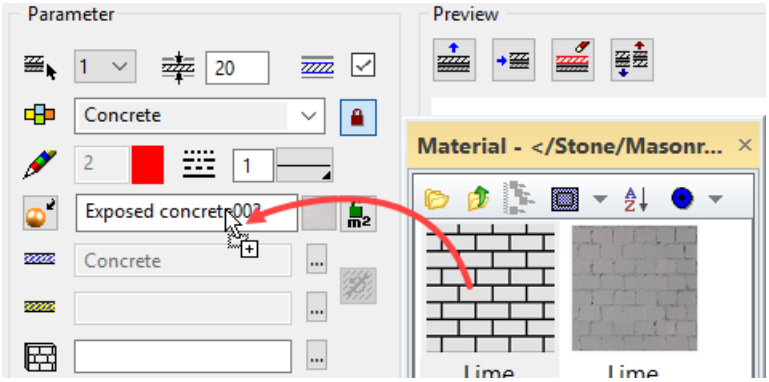
Continue/back

If a folder contains a large number of materials, these two buttons are used for scrolling through pages in the graphics preview.

TIP

You can display the full material name by right-clicking on the "Material selection" button.

A material can be entered into the entry field via drag and drop directly from materials management. To do this, the parameter dialog window and [Materials management] must be open.
To delete a material from the dialog window, simply delete the name from the field. Switching to the colour mode is not sufficient.



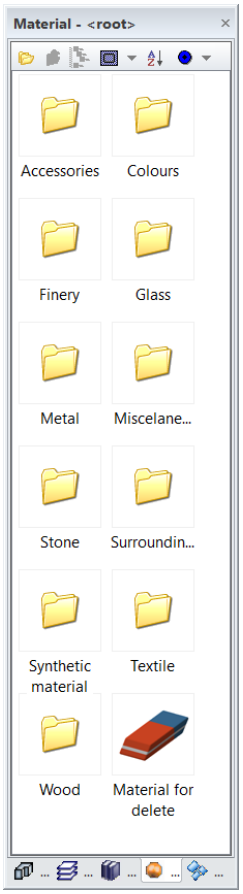
TIP

The material can be saved along with all of the other properties from the parameter dialog window under menu item RECORD > SAVE.

MATERIALS MANAGEMENT

View toolbar
View menu > Window > Material

Materials management is used for organising and selecting materials. Each material has properties such as texture image, transparency, mirroring, shine, etc. that can be set in the Materials editor.
Materials management can be opened via the menu VIEW > WINDOW > MATERIAL.



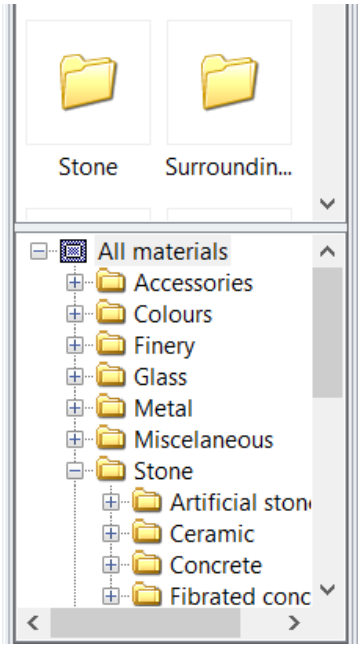
Header functions
The top row populated with functions in the management window.

Left mouse button
The subfolders are displayed by double clicking on a folder icon. If there are no subfolders, the materials are visible. These can be allocated via drag and drop.
Right mouse button
Various options that are described in detail below can be called up by clicking once on a folder, material or background.

Header functions

Folder

If this button is pressed, the materials management window is divided and the folders displayed in an Explorer view in the bottom half.



Further structures are displayed or hidden by clicking once on the plus or minus sign preceding the main titles. If you click on the folder itself, either the subfolders or the materials it contains are displayed at the top.

Up

Click this button to return to the higher-level folder.

Hierarchical/flat display

The respective materials are initially displayed in the bottommost folder in the "Hierarchical view" (default setting). In "Flat display", however, all materials are visible in the same window regardless of the folder they belong to.
This button is only available in the drawing, image and temporary materials "filter".

Filter
The materials are always saved in a database. It may be the case that materials that have not yet been stored are present in a drawing. This may be a result of an external drawing or new materials that you have not yet saved to the database.

The display of the folders and materials in the management window can be controlled in different ways using this toggle key.

All materials

This switch setting always displays all of the materials, regardless of whether they are present in the database or not.

Materials database

Only displays the materials that are not yet saved in the database.

Drawing

Only displays the materials that are used in the drawing.

Image

Only displays the materials that are assembled in the drawing.

Temporary materials

Only displays the materials that are not yet saved in the database.

Sort ascending/descending

Change the sorting to alphabetical order.

TIP

The management window can be refreshed by pressing [F5]

Assignment mode

There are various allocation options for allocating the construction parts with materials. The surfaces are allocated differently depending on the switch setting. The same options can be used for material to be deleted, which deletes the materials again.

EXPLANATION

Materials are allocated via drag and drop. Left-click a material from the management, hold down the mouse button and drag the material to the object or surface that is to receive the material. Depending on the current allocation mode, the material is then additionally allocated to multiple surfaces, e.g. all surfaces in an object.

On object

If the allocation mode is set to object, the entire object is allocated with the material unless it is an "intelligent" construction part such as a window or a door, etc.

Although these are objects, a distinction is made depending on whether the material is allocated to a frame, window sill or glass, etc.

For partial object

The material always only occupies parts of an object.

On surface

Only occupies individual surfaces. Users should note that the allocation disappears if the object is edited and modified.

Replace

If this switch is active, the material that you drag to a surface with drag and drop is allocated to all surfaces that have the same material or colour as this surface.

On selection
If you want to allocate a material on a specific selection, you can make a prior selection on the screen and drag the material into the selection. It does not matter which switch setting is currently active.

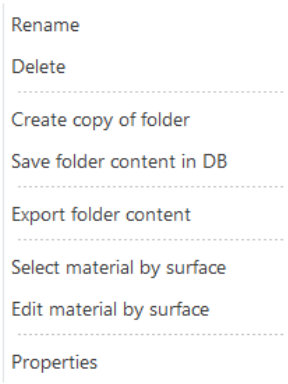
TIP

If you want to allocate the same material to multiple surfaces or objects etc., there is a multiple allocation function. Drag the material onto a surface as normal. However, instead of releasing it, press the [Shift] key on the keyboard or the "+" sign. Click and hold down the mouse and move it to a different surface before pressing one of the two buttons. This can be repeated any number of times.

Right-click functions

Different submenus are displayed by right-clicking a folder, material or background.

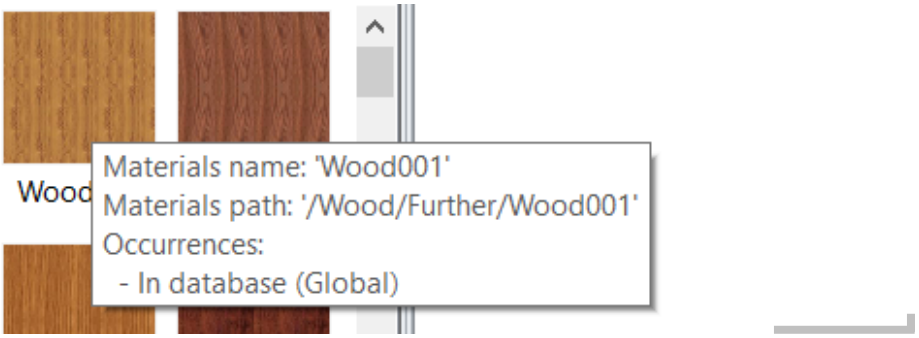
Right-clicking a folder
The following submenu opens.



EXPLANATION

The materials are saved in ELITECAD either as "user" or "global". This depends on the active *storage type* of the parameters under SETTINGS > OPTIONS > SYSTEM > CONFIGURATION.

This switch setting is also used for deleting. If a material has been saved as "global", it cannot be deleted as "user" or vice versa. A copy is created when renaming a "global" material as "user".
The occurrence of a material can be read in quick info.



Rename
Folder names can be changed.

Delete
Folder can be deleted together with their entire contents.

Create copy of folder
Creates a copy of the folder including the entire content.

Save folder content in DB
Saves the entire contents of the folder, depending on the "Storage type", in the database.

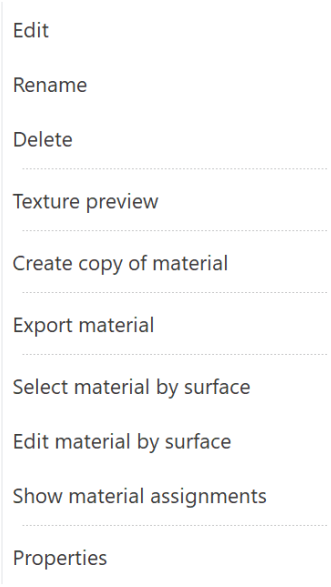
Export folder content
The folder content can be exported as a file. This line type can be reimported on a different workstation or in a remote office.

Select material over surface
See "Right-clicking on the background".

Edit material over surface
See "Right-clicking on the background".

Properties
Displays the properties of the folder.

Right-clicking a material
The following submenu opens:



Edit
The Materials editor opens.

Rename
Materials can be renamed.

Delete
Materials can be deleted.

Texture preview
The original image is displayed.

Create copy of material
Creates a copy of the material.

TIP

If you want to select multiple folders or materials simultaneously, you can do this either by holding down [Shift], [Ctrl] or by dragging a rectangle over the folders and materials. The context menu is shortened.

Export material
Materials can be exported as a file. These files can be reimported on a different workstation or in a remote office.

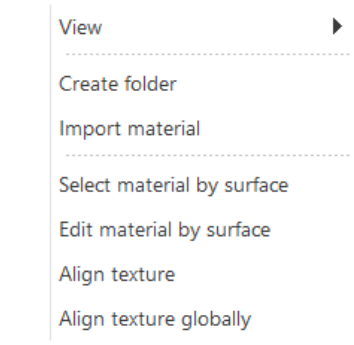
Select material over surface
See "Right-clicking on the background"

Edit material over surface
See "Right-clicking on the background"

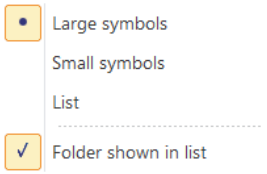
Show material assignments
All objects, sub objects or surfaces, where this material is assigned, are selected.

Properties
Displays the properties of the material.

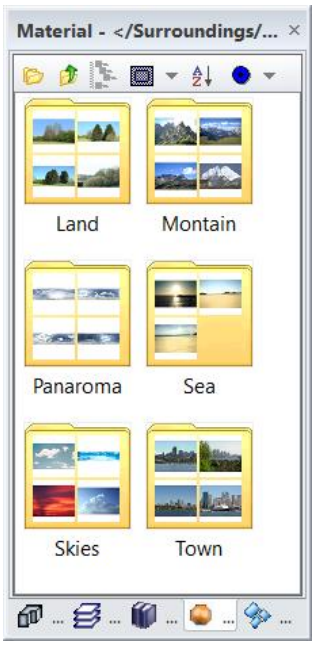
Right-clicking on the background
The following submenu opens:



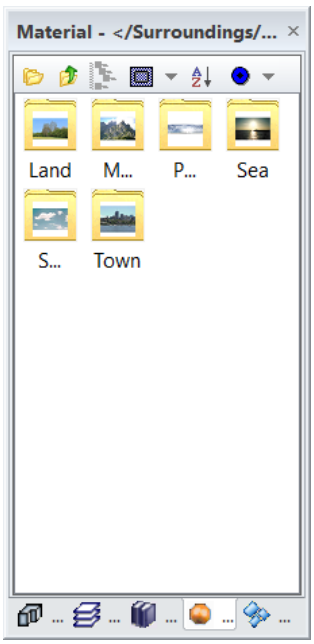
View
A menu appears beneath "View" in which the appearance of materials management can be modified.



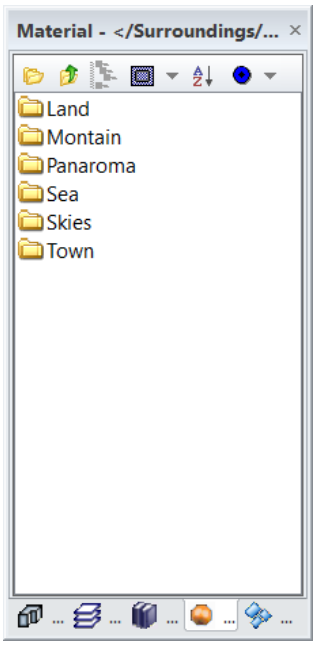
Large symbols



Small symbols



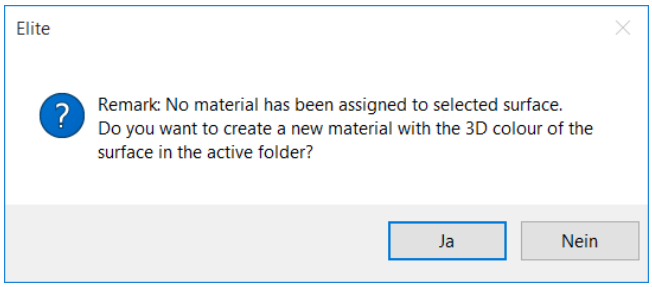
List



Create folder
Creates a new folder in the folder in which the menu item is called up.

Import material
Imports material data that was either exported from materials management (*.mydmp) or saved as parameters (*.par) in Messerli VIS (up to Release 12).

Select material over surface
If this point is selected, a material in the drawing can then be clicked on that is displayed directly in the management window. (Blue frame)
If a surface is selected, that does not have any material but rather a 3D colour, a message is displayed.



Selecting "Yes" automatically generates a new material that can then be processed.
The function is cancelled by selecting "No".

Edit material over surface
This option functions in exactly the same way as "Select material over surface", with the difference that the Materials editor opens straight away for making changes to the settings.

TIP

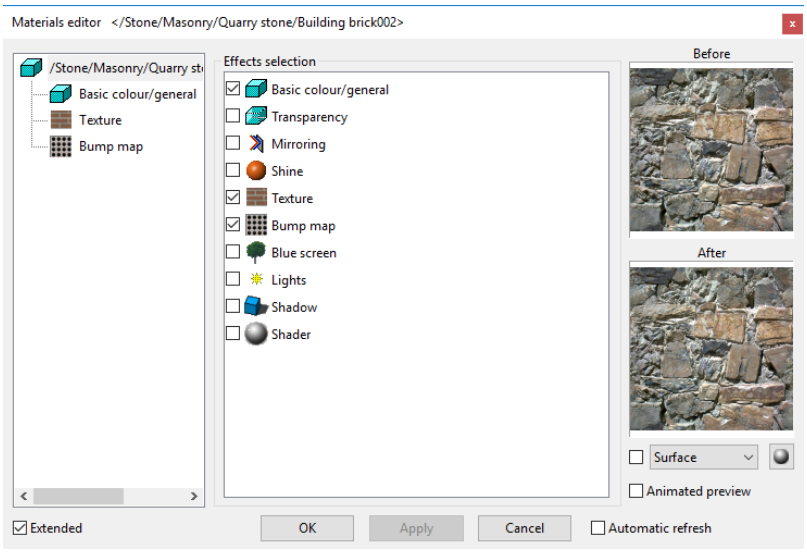
These two options are very useful for finding the material that has already been used and for editing it straight away if required.

Align texture
This function is used for orientating a texture on an edge that can be selected. The exact description of this function can be found in the chapter Layout > Material > Align text.

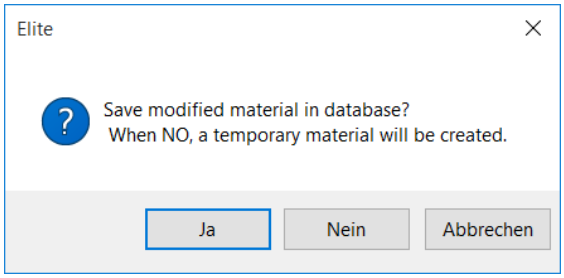
Align text globally
This function is used for orientating multiple textures on an edge that can be selected. The exact description of this function can be found in the chapter LAYOUT > MATERIAL > ALIGN TEXTURE GLOBALLY.

MATERIALS EDITOR

All properties that a material displays such as image texture image, transparency, mirroring, shine, etc. can be set or modified in the Materials editor.



If a material that is saved in a database is modified in any way and you are currently in the "All materials" or "Material database" filter, a query appears asking whether a modification should be saved.
The new settings are saved by clicking "Yes". If this is done under the storage type "user", the "global" material is retained. If the material is deleted as "user", the "global" material appears. If this is done under the storage type "global", an additional message appears informing the user that a global material is being modified.
If "No" is selected, a copy of the material is created and allocated automatically in the drawing. This material is a temporary material for now and can be saved in the database.



However, if you are in the "Drawing" or "Image" filter and modify a material that is located in the database, the material is replaced automatically and assigned to the drawing. The material name is modified.

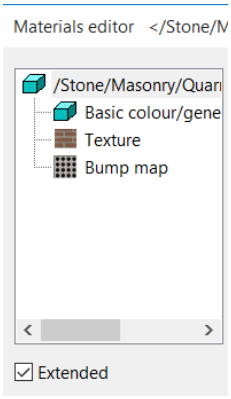
TIP

Please note the quick info for each material.

Please also note that all parameter modifications affect the material itself and have an impact on all surfaces that are covered with this material.

The dialog window is always divided into three parts.

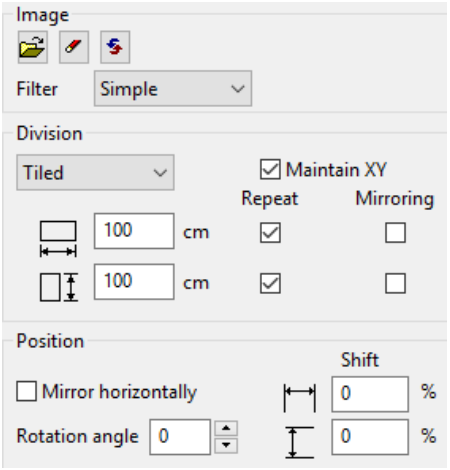
Left area



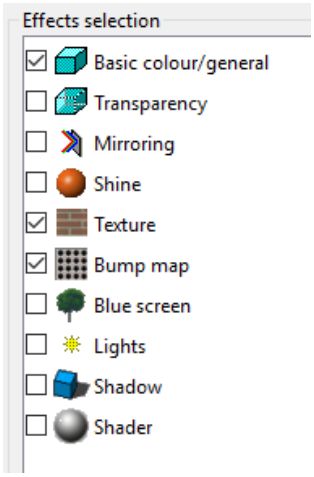
In the left area, you can see which effects have been allocated to a material. If one of these effects is selected, its properties are displayed in the middle area. If no effect but rather the name of the material is selected, all effects that are available to be selected become visible in the middle area.

Middle area

Properties



Effects selection



Right area

There is a small preview window in the right-hand area where any changes to the material are visible.

The following selection options are available for the preview via the selection list beneath the preview window.

Surface:

Cube:

Torus:

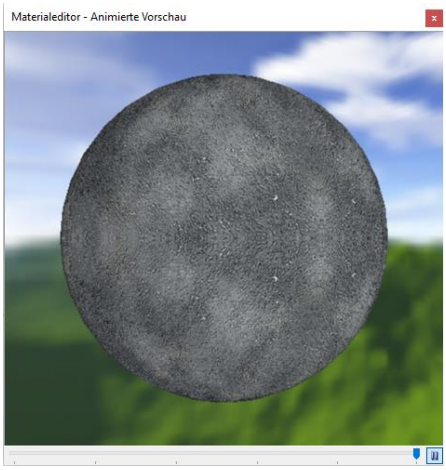
Sphere:

Cylinder:

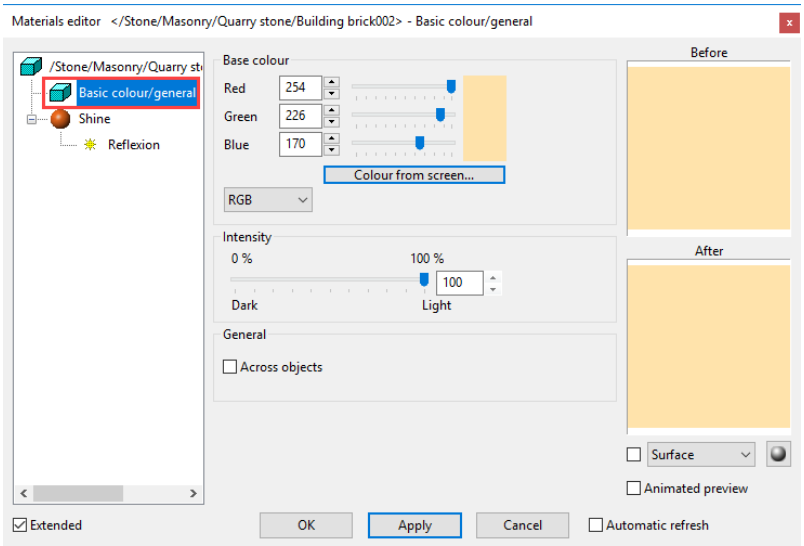
This button defines if shaders are used for the preview.

If the option REFRESH AUTOMATICALLY is active, a change to a material is directly visible on the design model. If it is inactive, it is only refreshed after confirming with "Apply".

If the option ANIMATED PREVIEW is active, a preview window is opened, where the material is displayed on a rotating object. The rotation stops by clicking the little square in the right bottom corner or if the mouse cursor is placed over the preview window. The slider position defines the number of images per second. The window is resizable in order to achieve a bigger preview.



Base colour



Base colour
There are multiple selection options for the base colour. The colour selected is always displayed with the RGB values.

RGB

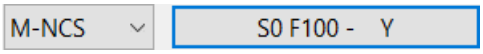
The values can be entered directly into the entry fields or set with the slider.

The standard Windows colour dialog box appears when clicking on the colour button.

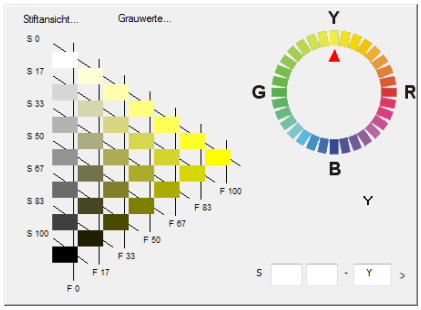
Colour from screen

The cursor switches to a pipette symbol by clicking on this button. You can now click on any surface in the graphics window or in the preview window. This colour value is then set.

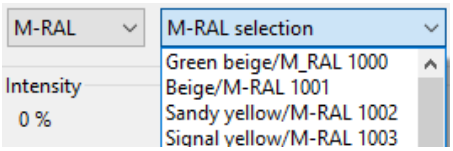
M-NCS



Switch to the M-NCS view by clicking the right-hand selection button.

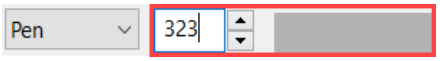


M-RAL

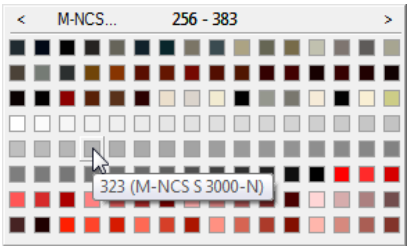


You can select an M-RAL colour by clicking the right-hand selection button.

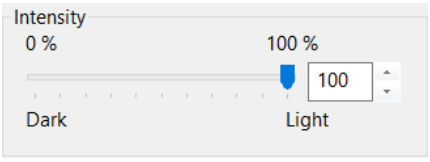
Pen



The pen number can be entered directly into the entry field and you can proceed to the Pen selection menu by clicking the selection button.

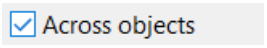


Intensity



You can change the brightness of the base colour with this slider.

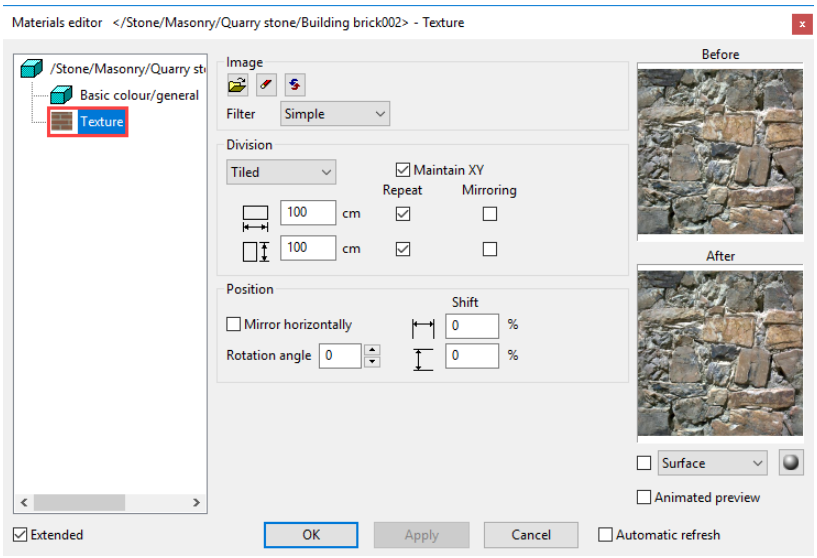
Across objects



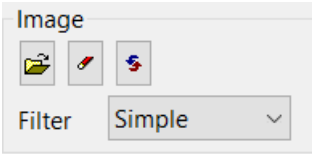
This option is only used in ELITECAD Architecture. If the option is selected, materials that are the same are rendered to overlap for surfaces that meet. For performance reasons, this option may only be selected for materials that have a continuous pattern (exposed masonry, timber formwork).
This button only works if "Textures across construction parts" is active in the OPTIONS (menu SETTINGS > OPTIONS > WORK PARAMETERS > ARCHITECTURE).

Texture

The texture effect offers you extensive options for modifying the characteristics of image files or for making modifications yourself.

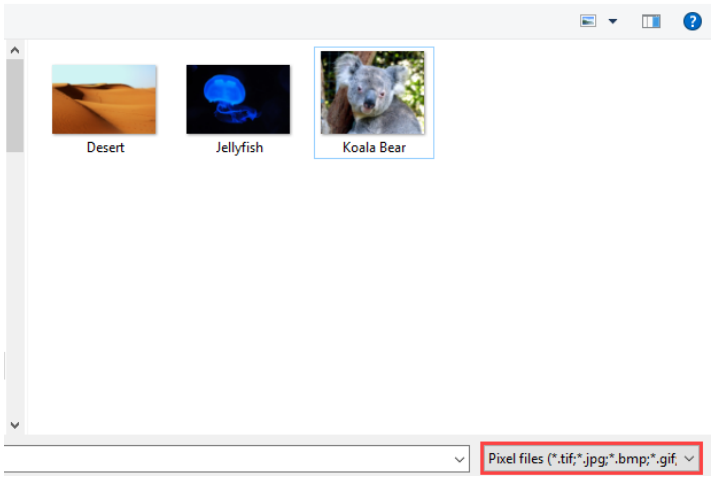


Image



Select image

Opens the standard Windows dialog using which you can select an image file as a texture image.



The following file types can be selected: *.tif, *.jpg, *.bmp, *.gif, *.png

EXPLANATION

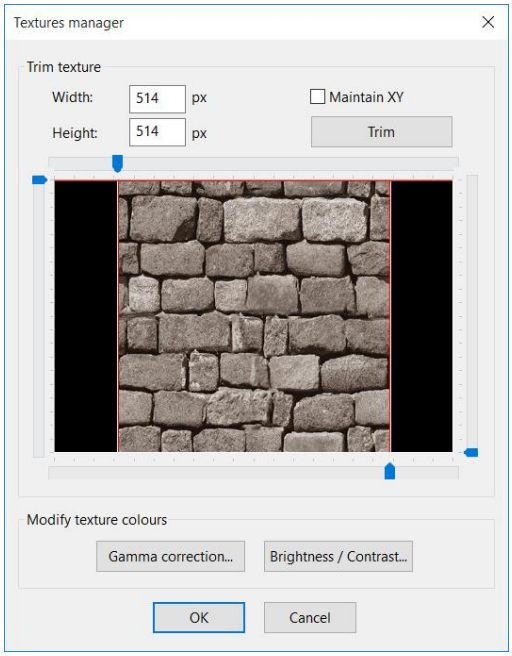
Each texture that is loaded by the program when rendering uses internal memory. Users should note that the textures should not be overly large in terms of their data volume depending on whether they want to view the design model from a distance or close up.

Delete image

Deletes a previously selected image. A confirmation prompt appears to ask you whether you really want to delete the image.

Edit image

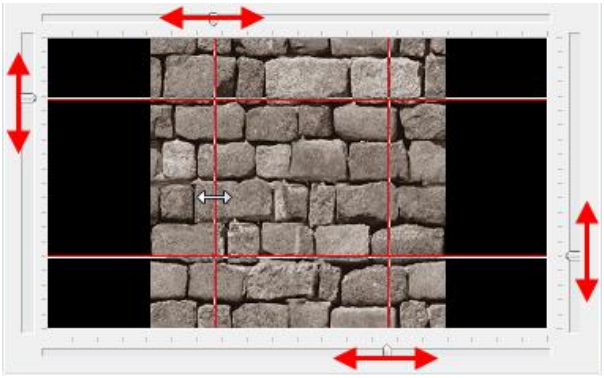
Opens the textures manager.



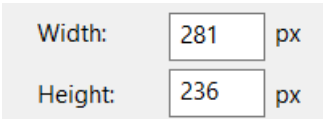
There are different options for changing the texture image in terms of its size or colour.

Trim texture

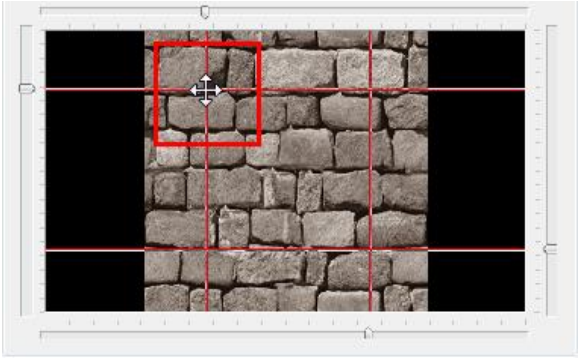
You can reposition the texture on the margins of the preview image or on the trim lines themselves. If you then perform the function TRIM, the image is reduced in size and the image cutout enlarged. You can repeat this until the procedure is confirmed with OK or cancelled with CANCEL.



The new dimensions (pixels) are revised on a continuous basis and can be entered into the entry field manually.

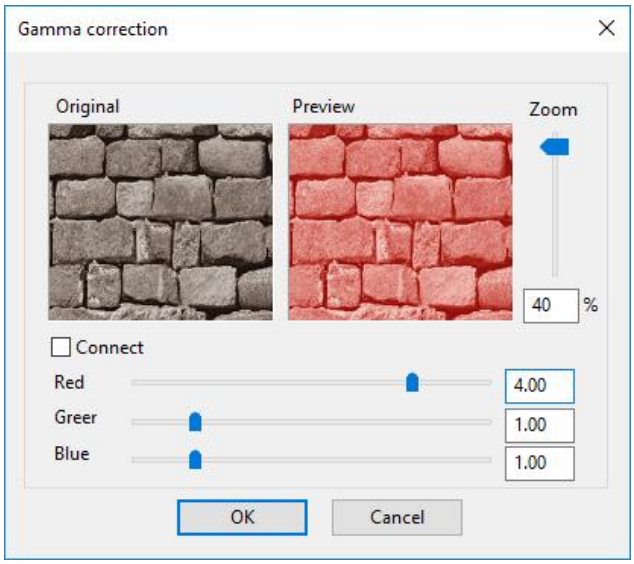


If the option MAINTAIN XY is activated, the trim lines are fixed in their positions and can be moved all together.



Gamma correction

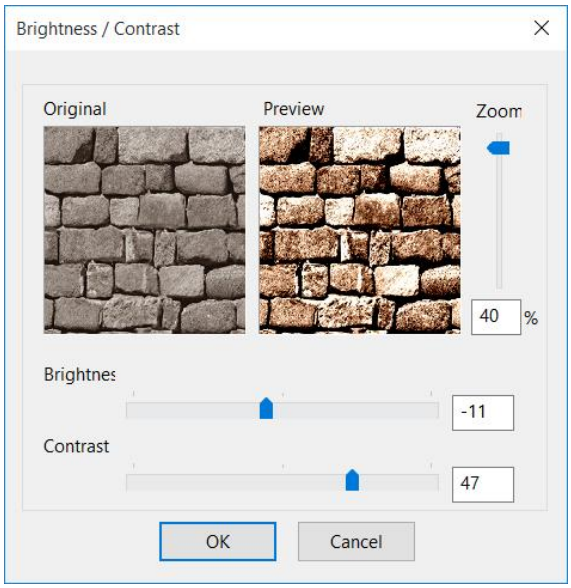
A gamma correction is a change to the colour balance between the separate base colours red, green and blue.



The values can be entered directly into the entry fields or set with the slider. If the option CONNECT is activated, the three sliders are connected.
You can zoom either with the mouse wheel in the preview image or with the slide on the right-hand side. The image section can also be moved by left-clicking it.

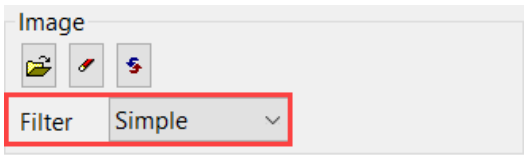
Brightness/contrast

Modifying the brightness and contrast of an image has an impact on highlighting, shadows and mid-range colours. This function is normally used to correct images that are too bright or too dark.



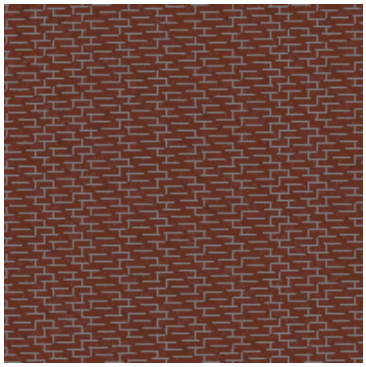
The values can be entered directly into the entry fields or set with the slider.
You can zoom either with the mouse wheel in the preview image or with the slide on the right-hand side. The image section can also be moved by left-clicking it.

Texture filter

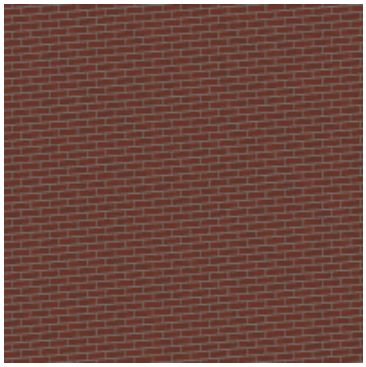


Textures that display brightness fluctuations close to each other and are very small can appear with the so-called moiré effect from a certain distance. This is often the case for exposed masonry or flagging.
If, for example, the joints are smaller than a pixel on the monitor, the graphic/video card and the monitor decide randomly whether a bright or dark pixel is used. To avoid this effect, the texture filter can be set to "Simple", which performs a special kind of smoothing on the texture and corrects the moiré effect. If this effect is still visible despite the simple filter, it can be set to "Tri-linear".
Note that these options increase the memory requirements and the rendering time. Therefore, only use it when necessary.

Without texture filter



with texture filter



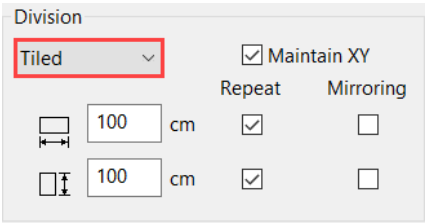
TIP

Texture filters are only applied for image rendering if the option TEXTURE FILTER IS SELECTED in the render parameters.

Division

There are various settings options for displaying materials realistically in the geometry in terms of size and scaling.

Tiled



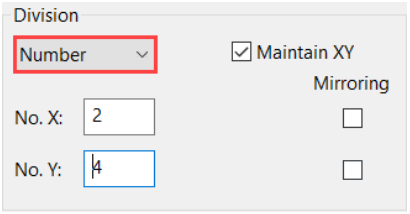
The real size of the texture image can be entered here. The entry always refers to the entire texture image. If you no longer know what the original image looks like, you can display it as a Texture preview here.
If the option MAINTAIN XY is set, the fields for width and height are linked.
If the box "Repeat" is activated, the texture image is laid over the surface multiple times.
Users can specify under "Mirroring" whether a material mirrors or not when covering a surface.

EXPLANATION

Unlike the process for rendering a solid image, which uses the graphic card, the rendering is performed via the ELITECAD software. As the hardware does not feature all functions for rendering the texture image

in all variations, there may be optical differences between the two rendering types.
To ensure that the material appears in its final version, the image should be rendered from time to time. Alternatively, area rendering can be used to avoid having to render the entire image.

Number

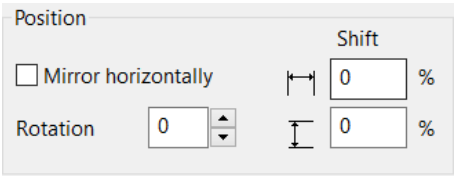


The number of repeats can be entered here. The material is displayed on the surfaces using these inputs.
If the option MAINTAIN XY is set, the fields for the number X+Y are connected.
Under "Mirroring", users can specify whether a material is alternately mirrored when allocating.

Stretched

The material is always projected onto the entire surface with this option, regardless of how large the surface is.

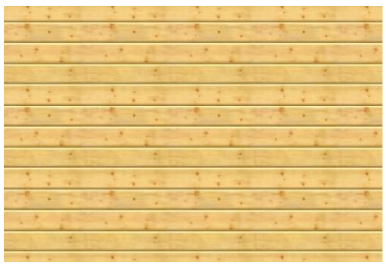
Position
Settings can be made here to specify the position of the texture on the geometry.



If the option MIRROR HORIZONTAL is selected, the original image is folded on the horizontal axis.

The texture image can be rotated between 0° and 360° using the function ROTATE ANGLE.
For example, a formwork with a horizontal orientation can be displayed diagonally.

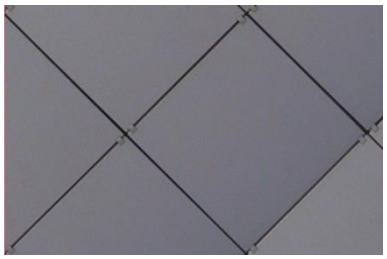
Rotation angle 0° Rotation angle 45°



The texture can be moved to a surface using the "Move" entry fields.

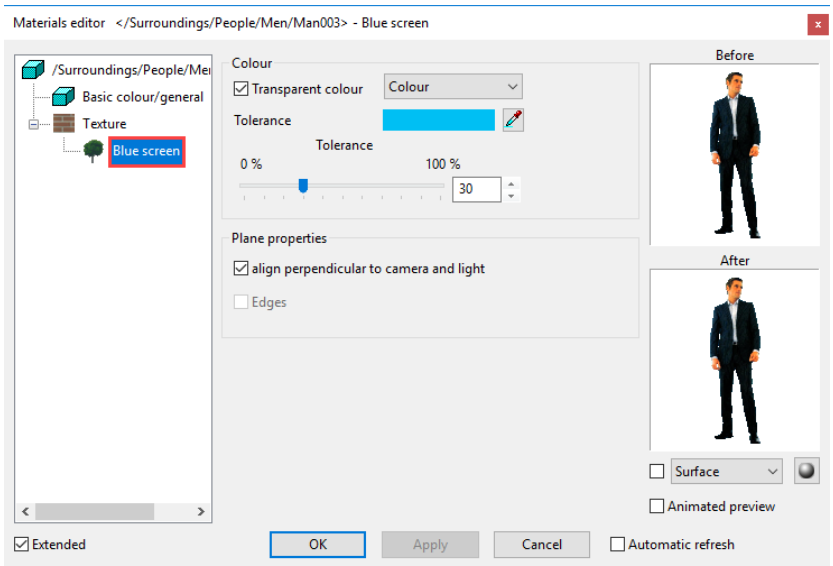
Without shift

with shift

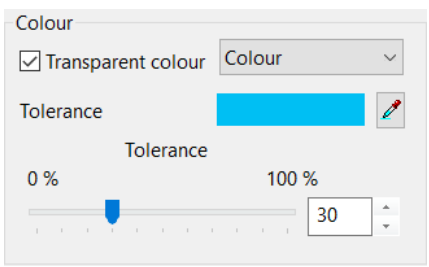


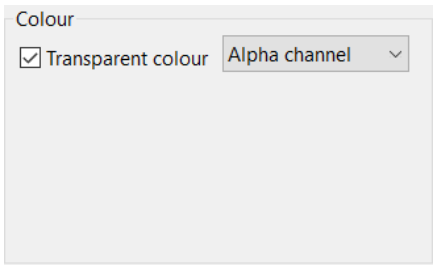
Blue screen

It is possible to switch a specific colour or a texture to transparent via the blue screen procedure. This function is especially suitable for displaying people, animals, plants and objects, etc. without displaying their background. This material must have a single-colour background or an alpha channel that is then transparently rendered to make a person or background visible, for example.
This effect is only available if a texture is available.



Colour





The type of transparency can be set if the option BLUESCREEN ACTIVE is selected.

The transparency values are applied directly from the texture bitmap for the setting "Alpha channel".
A colour can be selected for the COLOUR setting that is to be rendered transparently. The standard Windows colour dialog opens via "Colour selection button". In this case, it makes more sense to use the pipette.
You can click on any surface in the work area or in the preview window and this colour value is then set.
Use the "Tolerance" slider to control the accepted difference of a colour to the transparency colour.

Example:

Tolerance 0 %

Tolerance 30 %

Tolerance 80 %

The material can then be allocated to a surface. It is best to use a freestanding surface that corresponds with the surfaces of the texture in its dimensions.
You can set the texture to cover an entire surface automatically by selecting the division "stretched" in the texture settings.

TIP

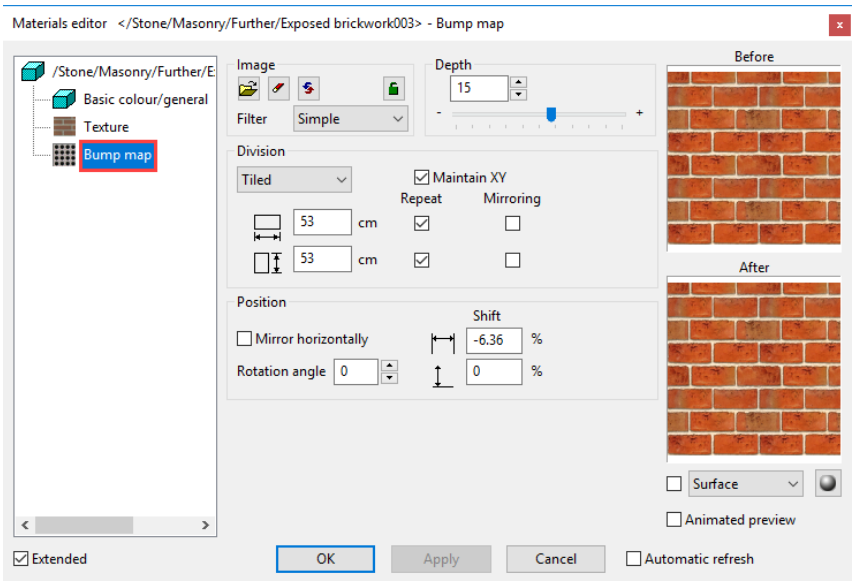
If your texture is not already displayed in front of a neutral background, you can use various image-processing programs for changing the colour.

TIP

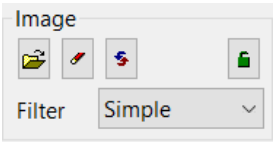
Ensure that the background colour is not used in your actual image, as there may be holes at these locations otherwise.

Bump map

As textures are based on two-dimensional images, they always appear "flat" when being rendered, i.e. with no illusion of depth. This kind of effect can be achieved with the bump map effect.
The depth structure is generated from bright and dark areas of the texture image.



Image



You will find the description for loading, deleting, editing and filtering under Texture.

Link with texture

You can use this option to define whether the image that you have selected under Texture is also to be used as a template for the bump map.
This means that if the little padlock is locked (red), the image and the settings are the same for the texture and the bump map.

TIP

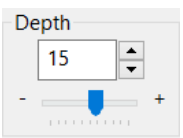
This option can be accessed if a texture image is already present. If the settings such as size and moving are modified for the texture, this also occurs automatically for the bump map.

If the little padlock is unlocked (green), the image file that was loaded for this is used for the bump map.

TIP

This can also be used to create an illusion of depth for a material that does not have its own texture image.

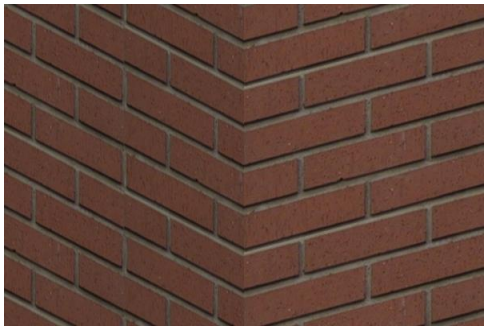
Depth



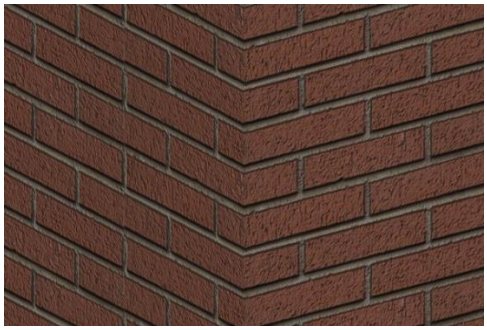
The bright and dark areas are displayed with different depths depending on whether a negative or positive value is entered. For example, bright areas face outwards and dark areas inwards.

Example with texture image and bump map

Without depth



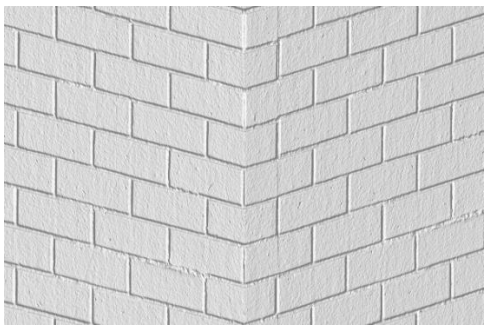
with positive depth



Example without texture image and bump map

Without depth

with negative depth



The other settings such as segmentation and position are described under Texture.

TIP

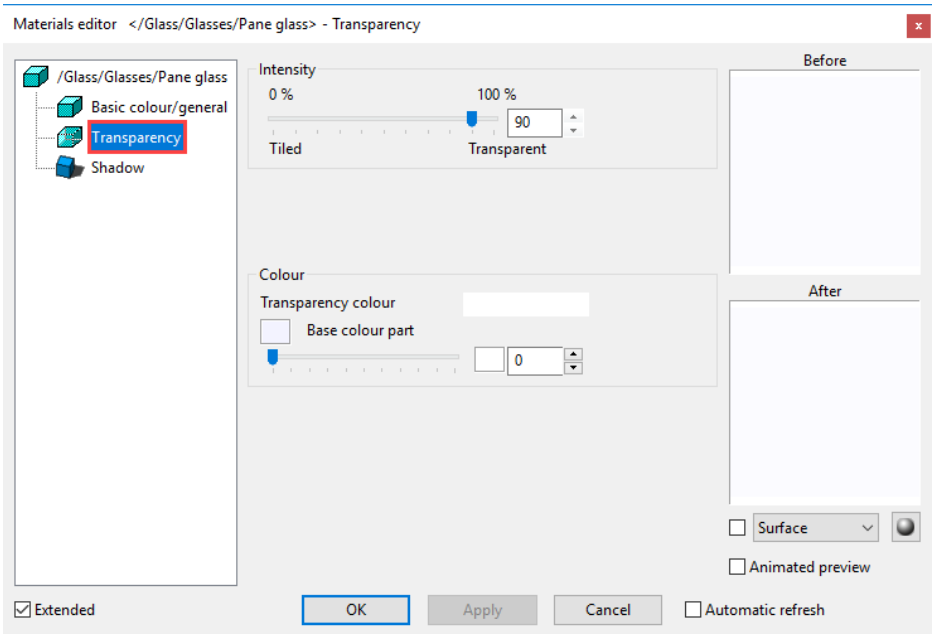
The darker the texture image, the less visible the illusion of depth. This can be compensated with an additional shine effect.

TIP

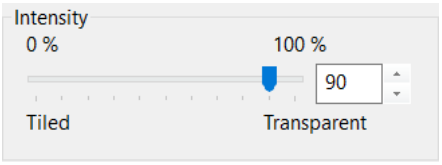
The bump map is only applied for image rendering if the option BUMP MAPPING is selected in the render parameters.

Transparency

The transparent properties for a material can be specified here.

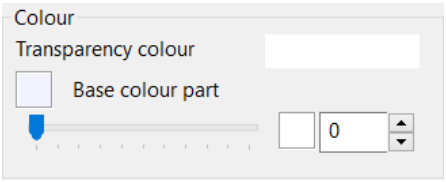


Intensity



Use this slider to define the intensity of the transparency.

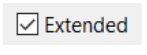
Colour



A special "transparency colour" can be selected that can be different from the base colour. The standard Windows colour dialog opens.
The function BASE COLOUR PART controls the share of the base colour part for the transparency. If the slide is set to 0, the "transparency colour" is applied. If the slider is set to 100, only the base colour is used.

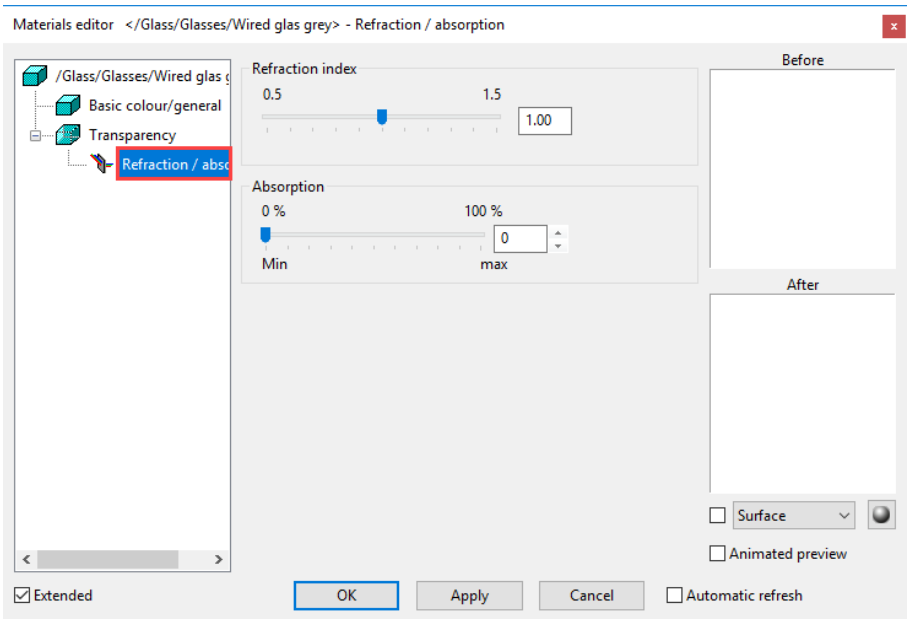
TIP

The option COLOUR is only visible if the "Extended" check box is activated.



Refraction

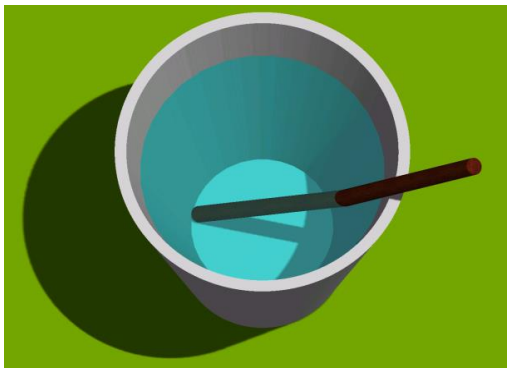
If a light beam hits a boundary surface of two materials with a different refraction index, e.g. air and water, it is "bent", which means it changes its direction. The light is "refracted" at the border surface of the two materials.



The refraction index can be changed from 0.5 to 1.5 with the slider. The value 1 is neutral.

Example with value 1

Example with value 1.33 for water



TIP

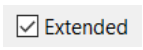
The refraction is only applied for image rendering if the option MIRRORING, REFRACTION is selected in the render parameters.

Absorption

No light is absorbed behind the transparent surface for the value 0. It is dark behind the surface for the value 100.

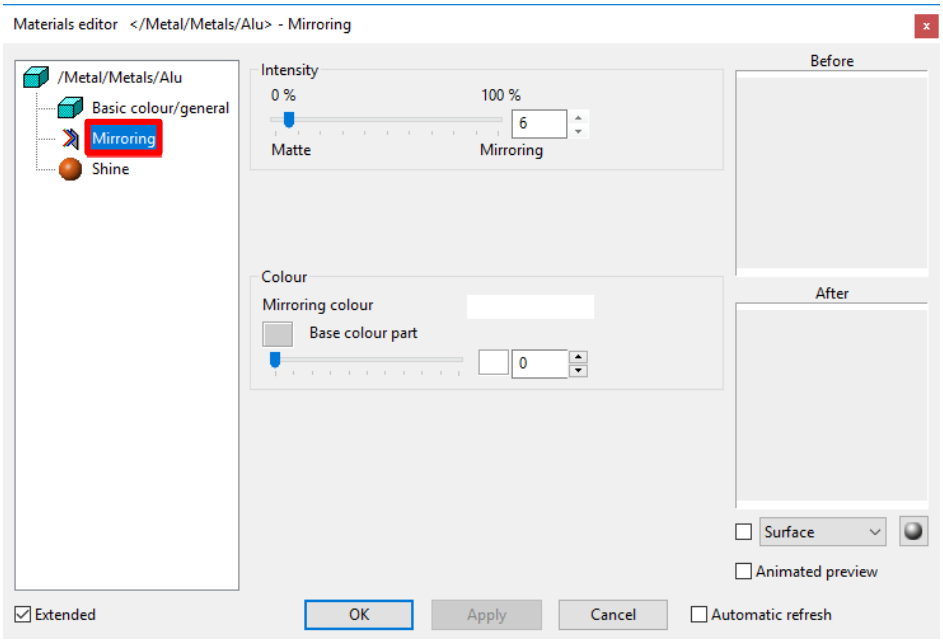
TIP

The option ABSORPTION is only visible if the "Extended" check box is activated. Does not apply for windows and glass elements.

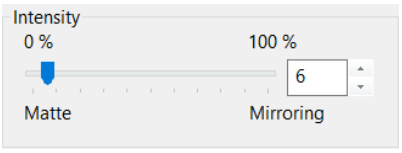


Mirroring

The mirroring properties for a material can be specified here.

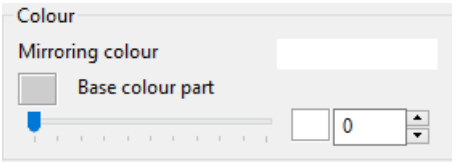


Intensity



Use this slider to define the intensity of the mirroring.

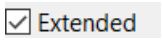
Colour



A special "mirroring colour" can be selected that can be different from the base colour. The standard Windows colour dialog opens.
The function BASE COLOUR PART controls the share of the base colour part for the mirroring. If the slider is set to 0, only the "mirroring colour" is applied. If the slider is set to 100, only the base colour is used.

TIP

The option COLOUR is only visible if the "Extended" check box is activated.

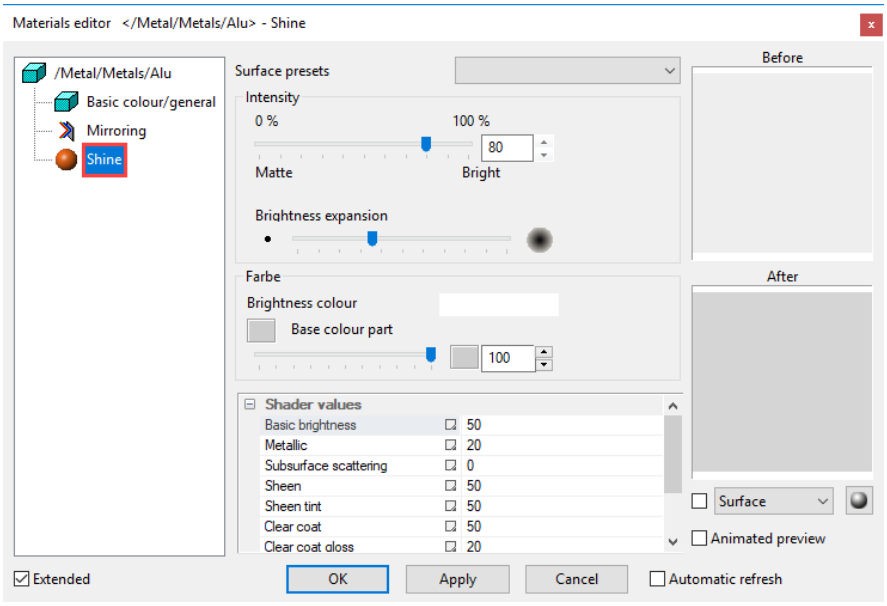


TIP

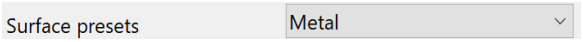
The mirroring is only applied for image rendering if the option MIRRORING, REFRACTION is selected in the render parameters.

Shine

The shine properties for a material can be specified here.

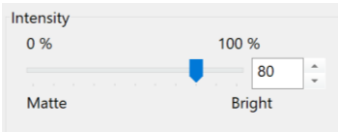


Surface presets



Predefined shine settings for various material types simplify the configuration of shine.

Intensity



Use this slider to define the intensity of the shine.

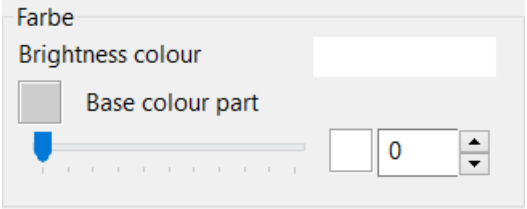
TIP

The intensity can be overridden by up to a value of 600. Enter the corresponding value into the entry field.

Brightness extent

You can specify the width of the shine points with this slider.

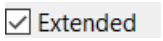
Colour



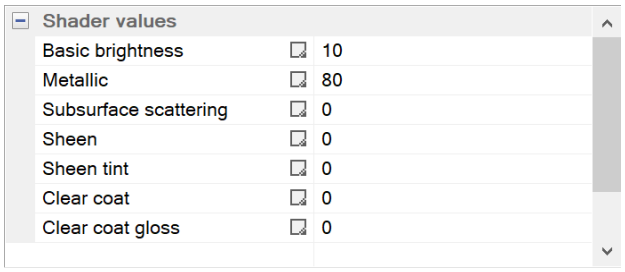
A special "brightness colour" can be selected that can be different from the base colour. The standard Windows colour dialog opens.
The function BASE COLOUR PART controls the share of the base colour part for the shine. If the slider is set to 0, only the "brightness colour" is applied. If the slider is set to 100, only the base colour is used.

TIP

The option COLOUR is only visible if the "Extended" check box is activated.



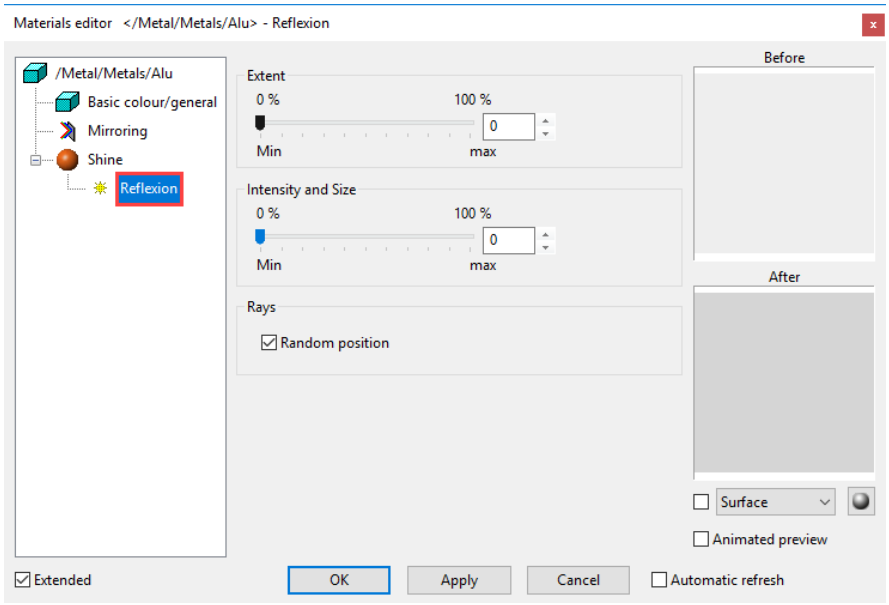
Shader values



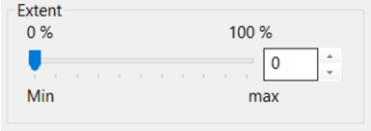
Visualisation of shine is also possible in real-time visualisation mode. It is necessary to activate shader technology first (see chapter SETTINGS > IMAGE PROPERTIES). Select individual values and modify the values using the slider. Modifications are displayed immediately if the preview is enabled.

Reflection

The reflection properties for a material can be specified here.
This effect is only available if a shine is available. The appearance of the reflection points depends on the shine and light settings.

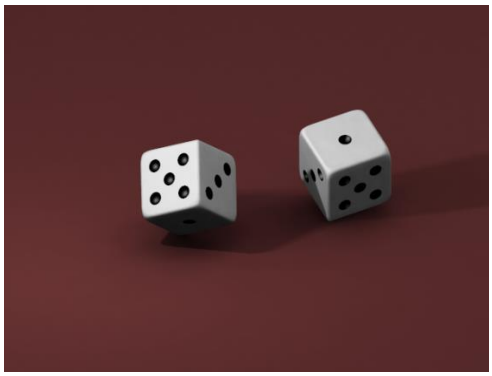


Extent

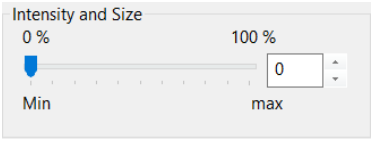


The higher the value you specify, the more likely it is that shine points will be generated.

Extent 0 % Extent increased



Intensity and size

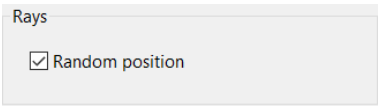


The higher the value you specify, the more intense the shine points generated.

Low intensity

intensity increased

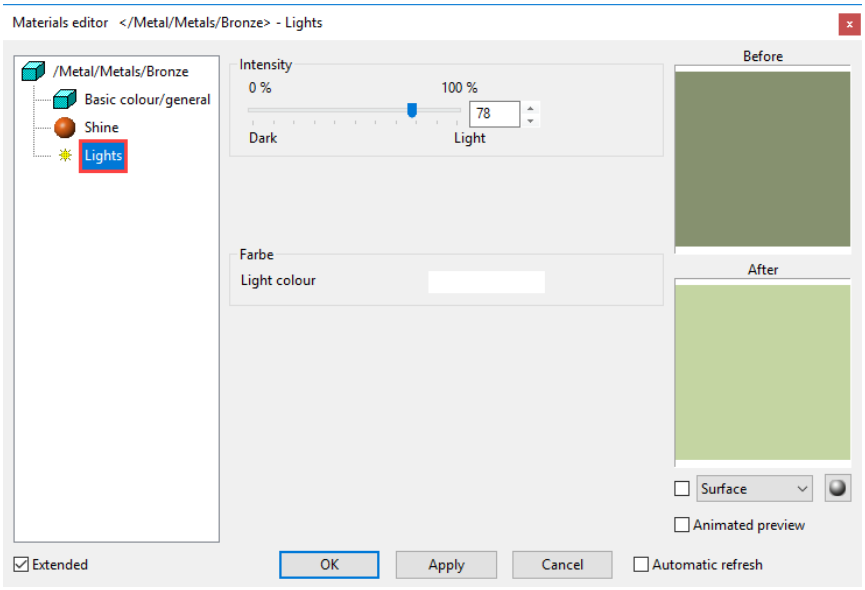
Rays



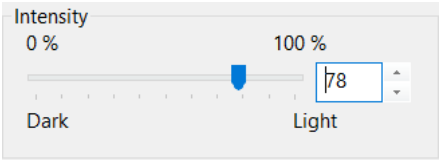
The rays are arranged in random order if this option is selected.

Illumination

You can specify the illumination of a specific material here.

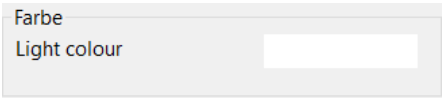


Intensity



Use this slider to define the intensity of the illumination.

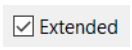
Colour



A special "light colour" can be selected that can be different from the base colour. The standard Windows colour dialog opens.

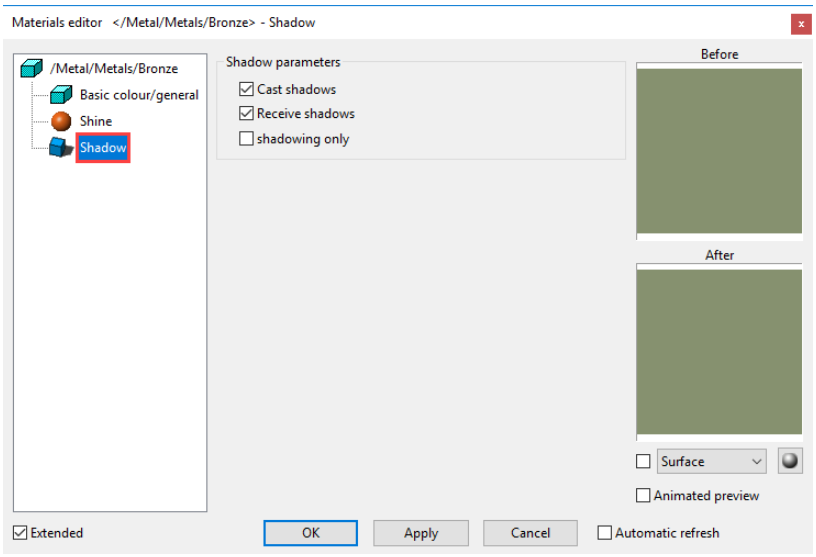
TIP

The option COLOUR is only visible if the "Extended" check box is activated.

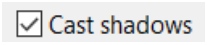


Shadow

You can set the shadow parameters of a material here.

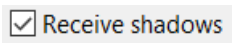


Cast shadows



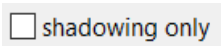
A material casts shadows if this option is selected.

Receive shadows



Shadows are cast on the material if this option is selected.

Shadowing only



If this option is selected, the material is switched to transparent but still receives shadows if the option RECEIVE SHADOWS is selected.

TIP

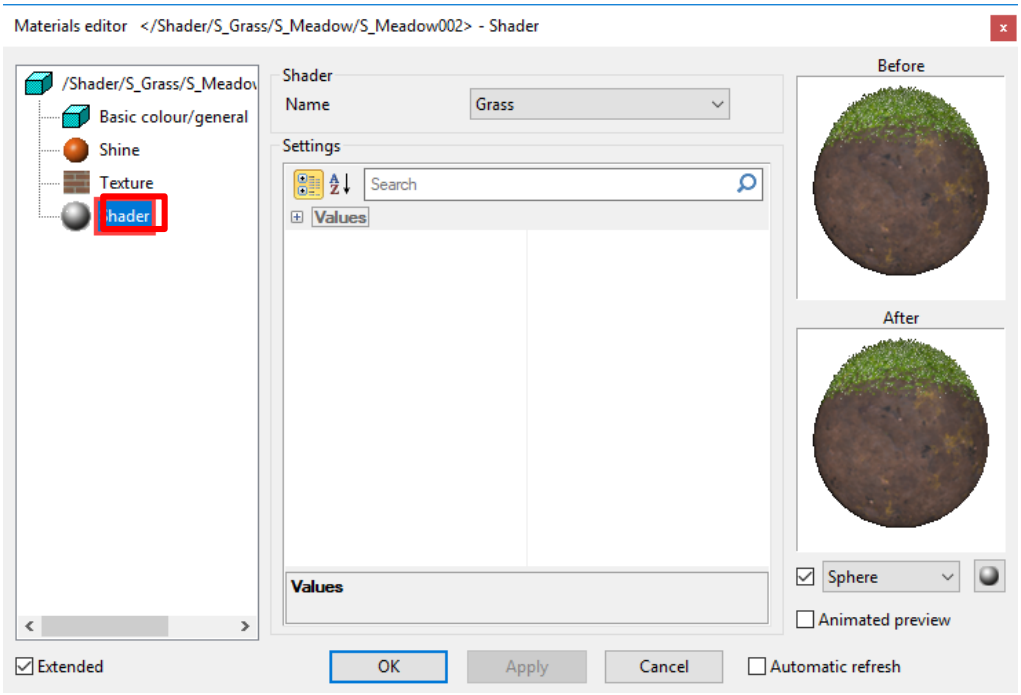
This option is especially suitable for displaying a shadow cast by 3D objects on a background. Draw a surface under the objects and allocate a material for which "Shadowing only" and "Receive shadows" is activated. The colour of the material should preferably be white.

"Shadowing only" inactive

"Shadowing only" active

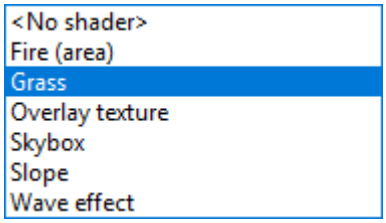
Shader

Here you can set the shader parameters of a material.



Shaders generate material visualisation on 3D surfaces in real-time. Surfaces with complex structures and depth effects are depicted on flat surfaces, which only need little memory. This process takes place on the graphics card and therefore enables huge performance gains.

Name

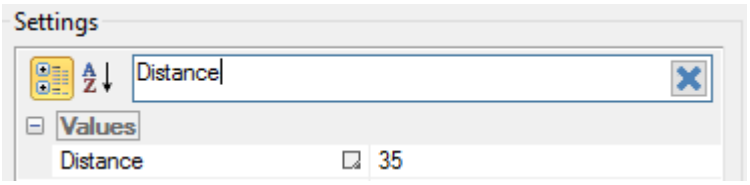


Here you can select the shader type. There is a predefined number of shaders for several material types available.

Settings

In this section, the parameters of the respective shaders are configured. The parameters displayed depend on the type of the shader.
Changes of parameters are immediately displayed in the preview window or in the model if the option is set.

Filter for parameters

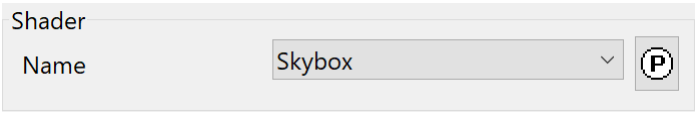


By entering a text, only the values, which fulfil the search criteria, are shown.

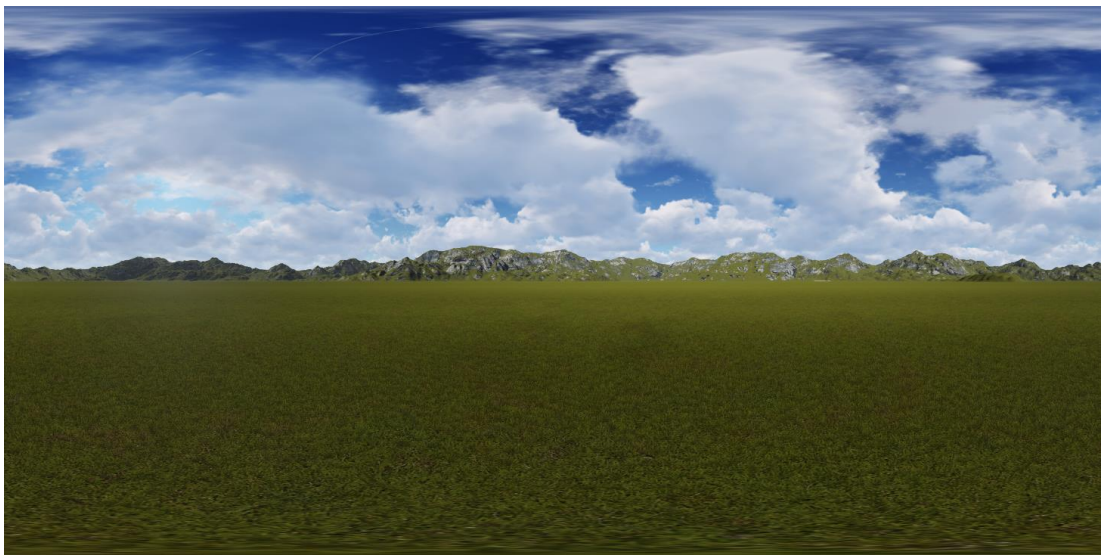
Values

In this area, a description of possible values of the selected parameter is displayed.

Skybox



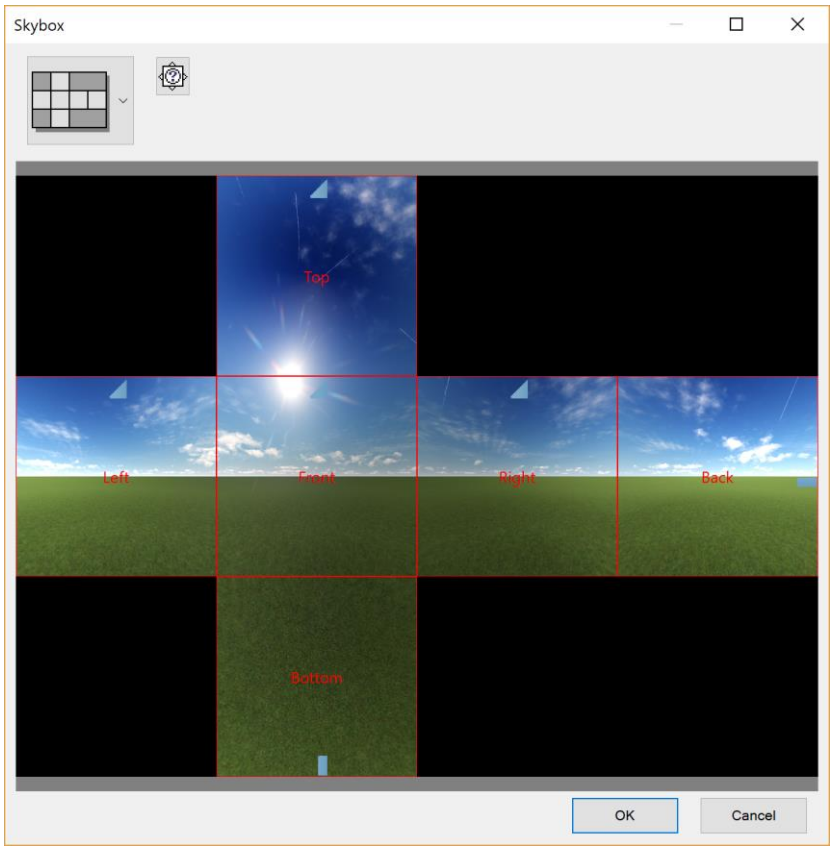
A skybox, also called skymap, is a background image, which automatically adjusts according to the viewing direction. In contrast to the static background images, which only work for one camera position, a skymap can be used for 360° views. Landscape images and views of the sky work particularly well. One can even take their own 360° picture via app or 360° camera of the future building site and load it into ELITECAD.



Configure skybox / skymap

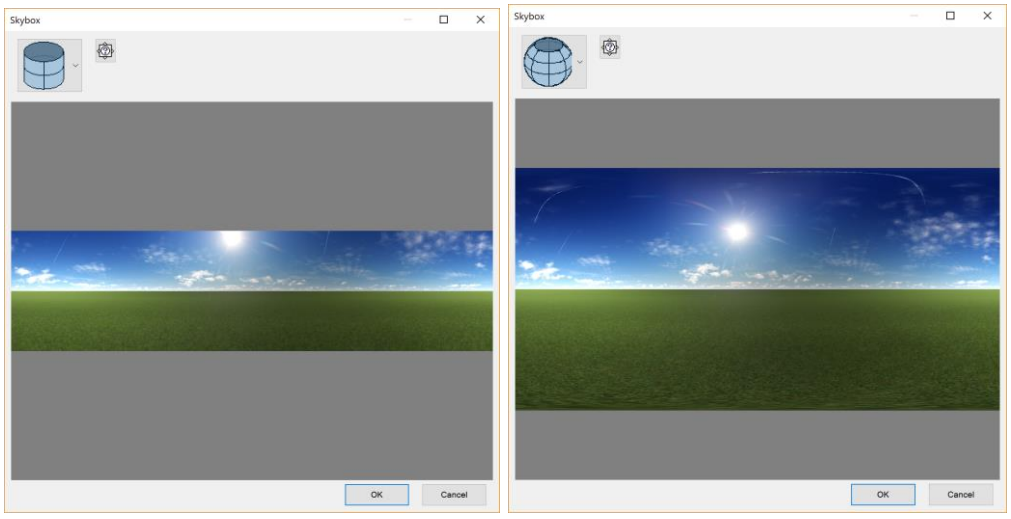
Depending on the type of the image, multiple options can be selected. The button opens a dialog window where the image can be configured.

Skybox
Skyboxes usually consist of the six sides of a cube. ELITECAD tries to identify the six sides automatically. The markers indicate where the sides are connected.



This button starts an automatic identification of the sides.
If the automatic identification does not deliver the correct positions, the six squares can be arranged manually in the graphics window.

Skymap
A skymap is a panorama image either on a cylindrical or on a spherical surface, which encloses the model.



The panorama can be positioned horizontally in order to align the orientation of the model with the panorama image.

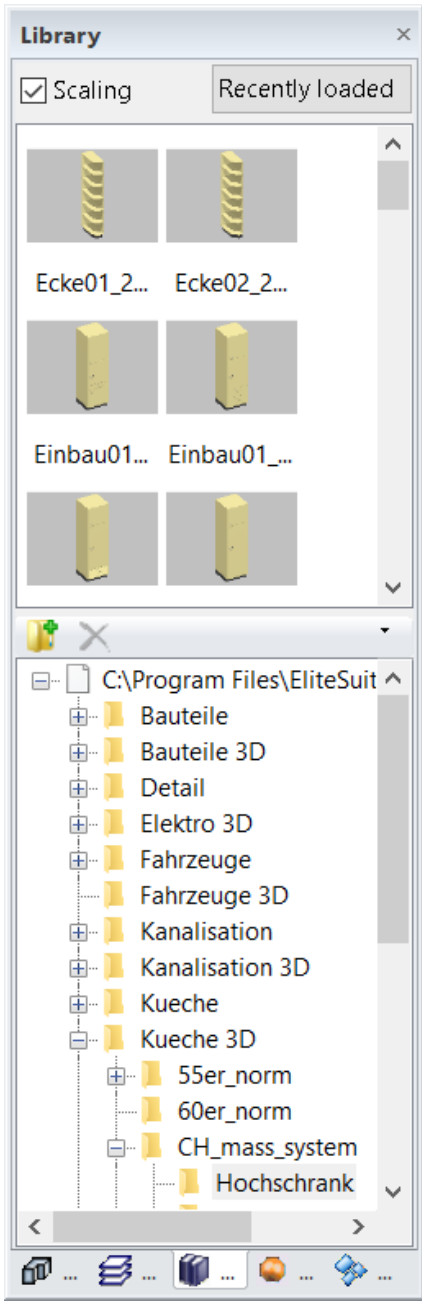
1.8 LIBRARY

Library management

View toolbar

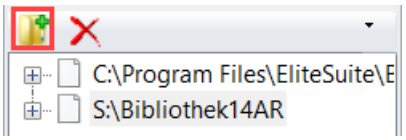
View menu > Window > Library...

Library management allows you to search for a library part via the file structure and offers you a graphic preview for selection (similar to the explorer). A library part can be selected by selecting the preview graphic. Not only the parts saved as a library part but also ELITECAD drawings and external 3D formats (i.e. SketchUp, 3DS) are displayed in management.



The option SCALING enlarges or reduces the library part to the corresponding scale of the drawing (only valid for ELITECAD drawings). No scaling is required in most cases for plan elements graphics (header, north arrow).
If the option RECENTLY LOADED is selected, the most recently loaded library parts are loaded in the preview area and the background of the folder structure is set to grey.

The management window is divided into two areas. The preview of the library parts is displayed in the upper field. The folder structure is shown at the bottom. The folder structure is displayed from a root directory.
Root directories can be added, for example for the parts used in the office or for own parts.



The drawing can be manipulated accordingly using the functions from the Load/position properties bar before being placed.

Properties bar for loading/positioning

The properties bar becomes visible as soon as you insert a file, library part, graphic or data from the clipboard into the drawing. Data can be mirrored, rotated or scaled before they are placed in the drawing.

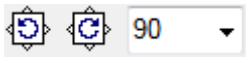
Align to area/terrain

Align on a line

Align automatically to element

Next point of reference

Current library part name



Rotate

Mirroring

Scale

Free selection of reference point

Rotate on X/Y axis

Align to area/terrain

The library parts are automatically aligned by on a surface with this option. If this is a terrain surface, the library part retains its reference to this surface after modifications. If the library part is located within a room and has the option ADJUST TO (FINISHED) FLOOR HEIGHT IN ADDITION, these parts are also adjusted to the new height of the room.

Align on a line

A start direction and then the end direction are defined after placing the library part with the function ALIGN ON A LINE. The library part is rotated on the positioning point from the start direction to the end direction.

Align automatically to element

The selected library part is rotated to the element and a preview is displayed. The library part may be displayed on the other side depending on which side of the line the cursor is located. The position is confirmed with the left-hand mouse button.

Next point of placement

If a library part has been defined with various points of placement, users can switch to the next point of placement by pressing this function.

Current library part name
The file name of the library part to be set appears in this field.

Rotate

Having selected the angle via the "Combobox" or inputting a random angle, the loaded part can be rotated clockwise or anticlockwise with the corresponding function.

Mirroring

The loaded part can be mirrored accordingly by selecting the function MIRROR HORIZONTAL or MIRROR VERTICAL or by entering an arbitrary angle in the entry line.

Scale

Having selected the function, you will be prompted to enter the required scale factor. Following entry of the scale factor, the part is enlarged or reduced around the point of placement and can be placed with the usual crosshairs positioning procedure.

Modify reference point

This function can be used to specify the reference point when positioning, moving or copying.

Activating this function opens a separate window "Modify reference point" with the current selection. The selection can be moved to the required location in this window (by zooming, rotating, etc.). The new reference point (reference point for the manipulation) is set by tapping on it. The window is closed automatically and the selection can be placed via the new point of reference.

Rotate on X/Y axis

This function can be used to rotate objects on the X- or Y-axis before they are placed.

Properties bar for library part

The properties bar becomes visible as soon as you select a library part,

Current library part name

Renovation planning state (only ELITECAD Architecture, see chapter 8.5)

Exchange library part

The library part is replaced as soon as a different file name is selected. The reference point remains the same during this process. The reference point of the new part is located on the reference point of the existing part.

Exchange of library parts in renovation planning (only ELITECAD Architecture)
If renovation planning is active and the library part is assigned to the state *existing construction*, then the part is maintained and set to the state *demolition*. The new part receives the state *new construction*.

Insert library

Insert toolbar
Insert menu > Library....

Instead of using library management, a library part can be called up and set directly via the Windows file selection. The parts adjust to the scale.
The library part can be manipulated accordingly using the functions from the Load/position properties bar before being placed.

Insert symbol

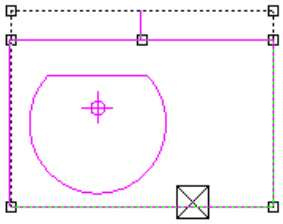
Insert toolbar
Menu Insert > Symbol ...

This function is used for absolute loading and placing of symbols such as title blocks, location symbols, keys, etc. This means that symbols are always read in the same size regardless of the scale and format of the current drawing.
The symbol can be manipulated accordingly using the functions from the Load/position properties bar before being placed.

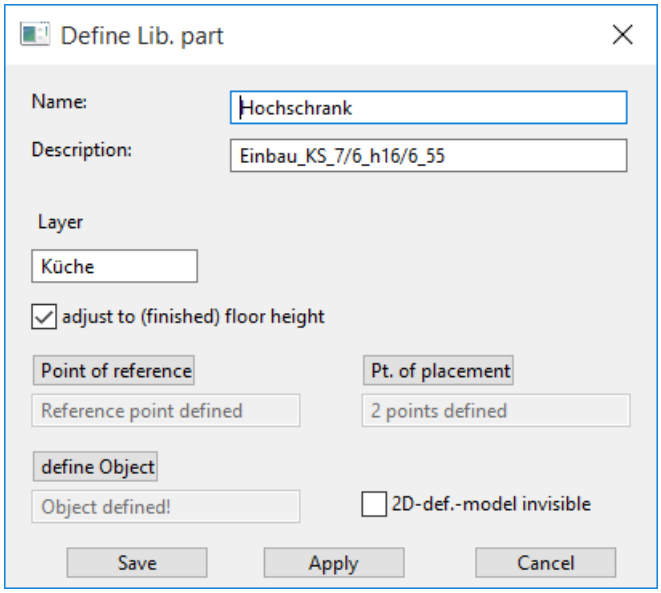
Define Library part

Extras toolbar
Extras menu > Define library part

This function is only available in ELITECAD Architecture. Multiple models with 2D and 3D information can be combined with this function and they can be defined as a furnishing object. All assembled parts are summarised into an object. This object can be manipulated and deleted in its entirety as an object, or part objects can be manipulated and deleted separately.



If a set library part is selected in the drawing, it displays an enclosing rectangle with handles in the corners and placement points. The part can be moved using the handles. If there is a part that is defined as an object among the assembled parts, it becomes active. The associated information is displayed in the dialog window. If no object is yet defined, an object can be created with "Define object".



Name
The name of the library part becomes the file name.

Description
The description turns into quick info. Dimensions and article numbers can be entered here, for example.

Layer
The structure into which the library part is allocated when being applied can be entered.

Adjust to (finished) floor height
If this option is selected, the Library part is adjusted to the height of the floor if it is standing on a floor. The 3D information is adjusted to the height. The 2D floor plan remains "lying" on the work plane applied.

Point of reference
The point of reference is important for the height adjustments for the base. The 3D of the library part adjusts to the height if the reference point is within the room.

Pt. of placement
You can apply multiple placement points for each part.
You can move the Library part precisely to the correct location in the drawing using placement points. If the Library part is selected in the drawing, additional handles appear on the placement points to move the part.

In the case of a table, it would be a good idea to set a point in each corner and in the middle of the table.
When inserting the Library part, the function NEXT PLACEMENT POINT appears in the properties bar.

You can use this function to jump from one point to the next.

Define object
If only a pure 2D graphic is present, you must specify one of the contours as a main model. In the case of 3D data, three options are available to be selected for the 2D display.

Automatic contour
The current detail parameters of the 3D objects are used for the views here. However, they are only displayed in plan views if the option AUTOMATIC HIDDEN LINE is selected in the plan parameters. The detail parameters are always applied in views and sections.

Generate contour
The 2D display is generated using the visible parts and projected onto the floor plan. The 3D object detail parameters are no longer used.

Select contour
A separate contour can be selected for 2D display. The 3D object detail parameters are no longer used.

Dissolve Library part

Context menu in the graphics window

If a library part is selected in the graphics window, then the function DISSOLVE LIBRARY PART is available in the context menu. The object thereby loses the properties of the library part and is available again as a normal object.

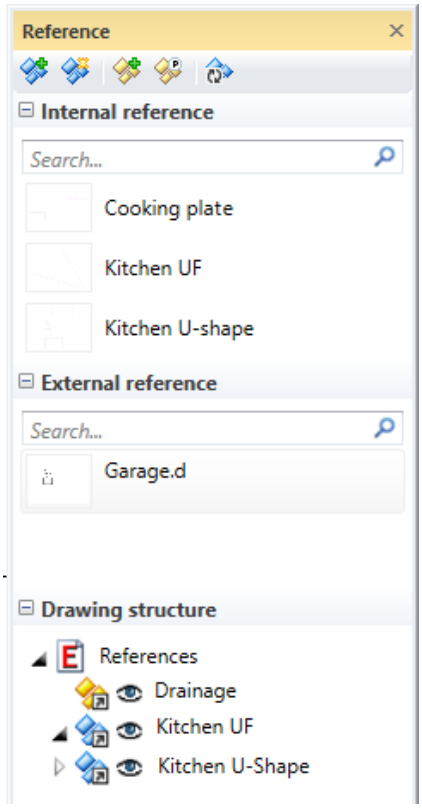
1.9 REFERENCES

The principle behind references is that a construction subset or design model part is defined in order then to use it multiple times in different places, or so that an area that is linked to the drawing as a reference can be worked on externally.
A distinction is made between internal and external reference. The internal reference is managed in the design model file; the external reference is outside the design model file and can be edited independently by other users.
In ELITECAD Architecture, the internal reference is limited to a single storey, the external reference has no limitations for the number of storeys.

REFERENCE MANAGEMENT

View menu > Window > References...

Reference management manages the internal and external references and displays the references that are currently being used.



Header functions
The top row populated with functions in the management window.

Internal references
List of internal references.

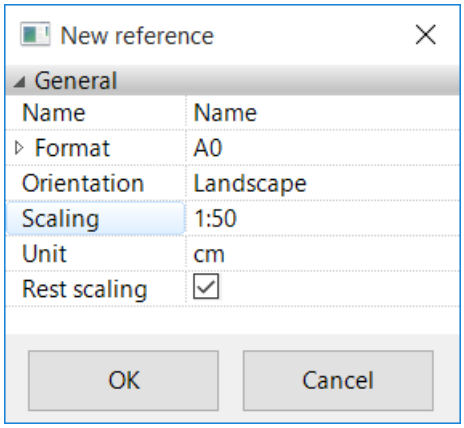
External references
List of external references.

Drawing structure
This overview is only available in ELITECAD Architecture and contains a list of all references in the current view (design model view, section view, etc.).
In ELITECAD Mechanics, this overview is shown in the assembly management.

Header functions

New reference (internal reference)

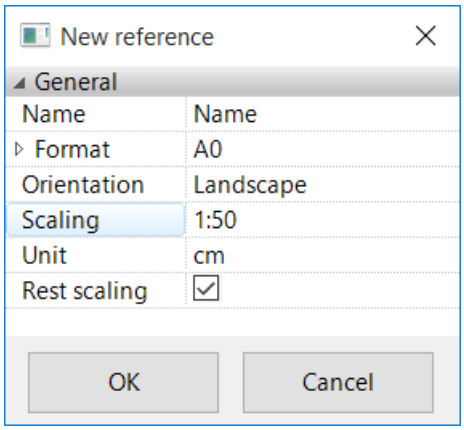
A name must be assigned to the reference.



An empty worksheet is opened on which the reference can be drawn.

Define reference (internal reference)

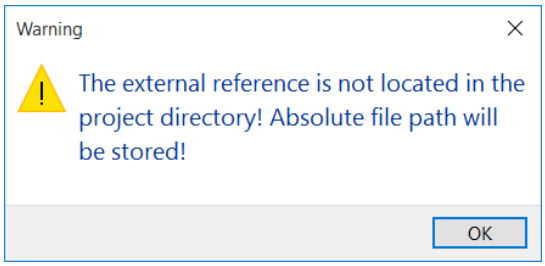
The function defines a reference from a selection. The selection must be limited to a storey. The reference point must be specified if the selection is correct.



The reference is opened with the selection.
The selection is also the first instance of the reference.
Instead of selecting the function in the header bar, it is integrated into the default context menu (only appears if something is selected).

Load external reference

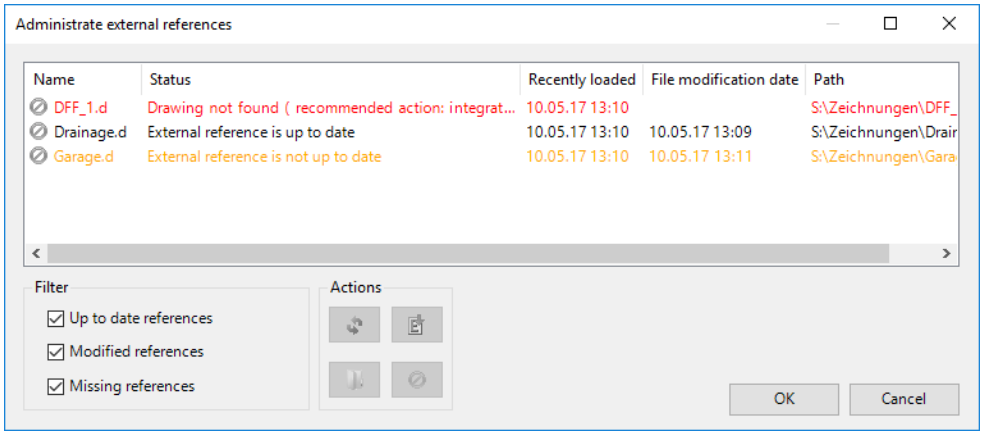
Any ELITECAD file can be loaded as an external reference. The reference is limited to 2D elements if the target location is a view. The reference should ideally be located in the project directory as this ensures that the reference can also be found at other stations. A warning message appears if the drawing is not contained in the project.



A range of commands is provided for positioning the reference in the properties bar for loading/positioning.
If the reference consists of a storey, the file is positioned in the current storey. If the file consists of multiple storeys, it is loaded and the corresponding structures generated. The structure height is aligned to the design model if the structure is not yet present.

Manage external references

The external references have an additional management window, which displays the status of the reference.



State – not found
The file was renamed or moved > Change path
If the file cannot be found, it is advisable to integrate the file so that it can be edited > Integrate

Status – is outdated
The file has now been saved again in a different state. The reference must be refreshed > Reload

Status – active
The file was not modified, which means that the reference is up to date > no action

Change path

A new path can be entered if the file is not found.

Reload

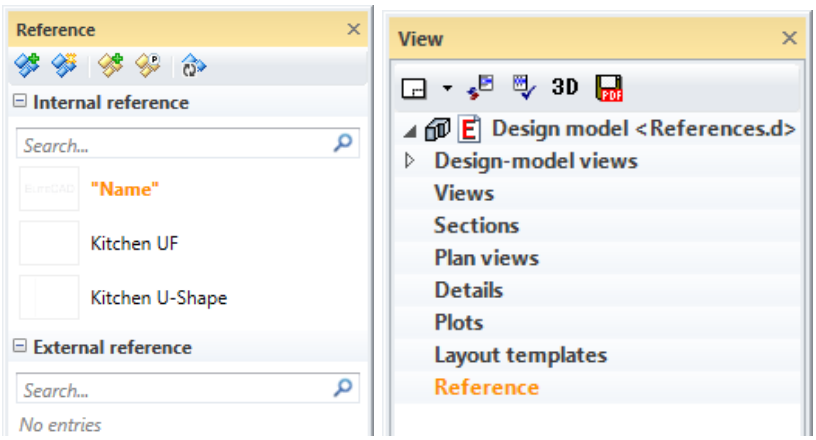
The reference is updated.

Integrate

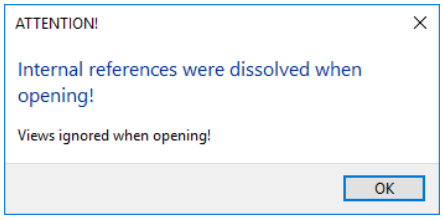
The reference is separated in the drawing. While it can no longer be selected as a reference, all parts can be edited.

Internal reference

The internal reference is managed in the design model file. A new blank reference can be generated (New reference) or a reference created from a selection (Define reference).
The internal reference is used in the same way as a view. The references are listed in reference management. The reference is displayed on the monitor by double-clicking a name. The name is highlighted in management and the title "Reference" is active in views management.



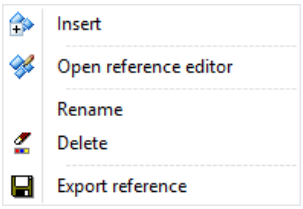
The storeys manager is inactive in ELITECAD Architecture in this status as the internal reference is limited to one storey. The storey that was active when defining the new reference is used.
To leave a reference, users must click on another view in views management or double-click on the name in reference management to switch back to the design model.
The reference can be inserted into the drawing using drag and drop. The reference can be rotated or mirrored in the properties bar before being placed.
When setting a reference, a check is performed for 3D objects to ensure that no construction parts are set in a section or a view but only references with 2D elements.
The instances of a reference are always kept up to date with the original in reference management. If architectural construction parts are present in the reference, it may be the case that the design model must be refreshed after a modification to ensure that all sections of wall, slab, ceiling, base and roof are correct.
References can be exported and imported in order to use them in other design models. The internal references cannot be copied via the clipboard or read into other design models via positioning and loading. The references are inserted separately.



Design model editing in team (chapter 8.4) is not yet possible in ELITECAD Architecture with internal references.

Reference point
The reference point is the anchor point of the reference in the plan. The reference is always removed from this point when modifying the size.
The centre of the page is automatically the reference point in the case of a new empty reference. In the case of a reference from a selection, the reference point for the selection must be selected directly.
The reference point can be modified via the context menu on the reference name. The reference point is displayed with a blue cross.

Context menu for non-active reference



Insert

or drag and drop

Adds the reference to the drawing. The reference is attached to the cursor and can be dropped on the reference point. Furthermore, the properties bar for loading/positioning opens to rotate, mirror, etc. the reference.

Open reference editor

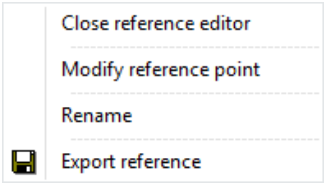
or double-click reference name

The reference must be open in the reference editor to perform modifications to a reference. Modifications are forwarded directly to the instances after closing the reference editor.

Export reference

The internal reference is only saved in the respective design model file. References must be saved externally and reimported in the respective model or station in order to be used in other design models or stations.

Context menu for active reference



Close reference editor

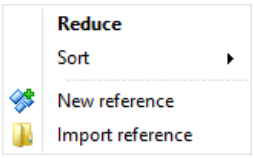
Double-click reference name

Switches from editing the reference back to the design model. Completed modifications are forwarded directly to the instances.

Modify reference point

Export reference

"Internal references" context menu



New reference

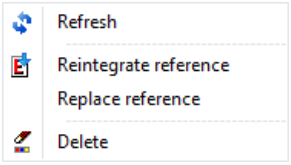
Import reference

Exported references can be imported from other design models.

External reference

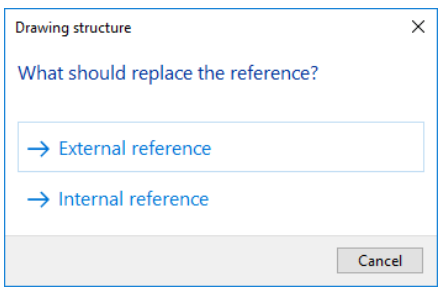
An external file can be loaded into the design model or into a view as a reference. Entire partial design models can be loaded into the design model as a reference. The program checks the structure settings and integrates the design model correctly. If the references are only 2D, they can be set in the views/section.
The external reference is inserted using the function LOAD EXTERNAL REFERENCE. The program checks whether its external references are up to date when opening the drawing. If this is not the case, the management window of the external references opens. This can be opened via the function MANAGE EXTERNAL REFERENCES. The external references and their status are saved in this management window.
References that have since been changed externally can be refreshed.

External reference context menu

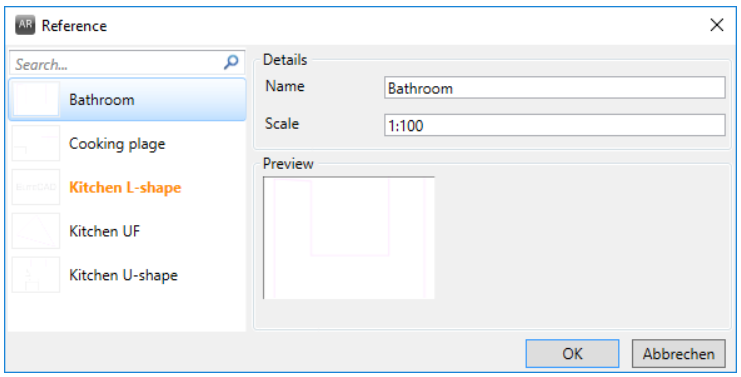


Integrate reference

Replace reference
An internal/external reference can be substituted by another random internal/external reference. All instances are switched for the internal references.

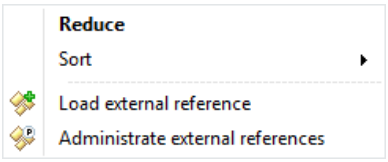


If the reference is substituted by an external reference, a new ELITECAD file can be selected in the file selection. If the reference is substituted by an internal reference, a new dialog window opens for the selection of the reference.



All available internal references are listed in the left-hand column. The properties of the marked reference are visible in the right-hand area.

"External references" context menu



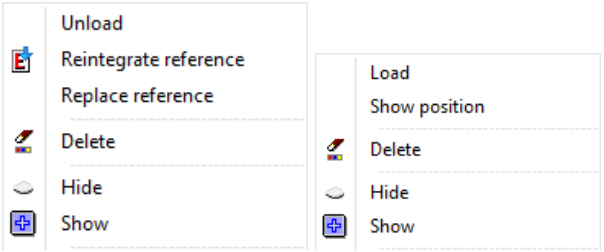
Load external reference

Manage external reference

Drawing structure

This overview is only available in ELITECAD Architecture. In ELITECAD Mechanics, this overview is shown in the assembly management. References for the current view (design model view, section view, etc.) are listed in the drawing structure. The references can be selected, hidden or structured. The storey and layer filter are deleted in the design model.

External reference context menu



Unload/load
The reference is not loaded together with the design model file; the program recognises the position of the reference, however. The reference can be loaded if required again.

Display position
The frame of an unloaded external reference can be switched to visible.

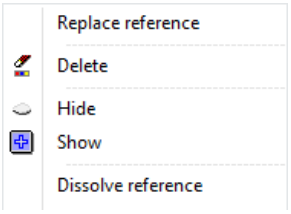
Integrate reference

Replace reference

Display/hide
Controls the visibility of the reference. Other assembly filters are lost.

Assemble
Displays the reference separately on the monitor.

Internal reference context menu



Replace reference

Display/hide
Controls the visibility of the reference. Other assembly filters are lost.

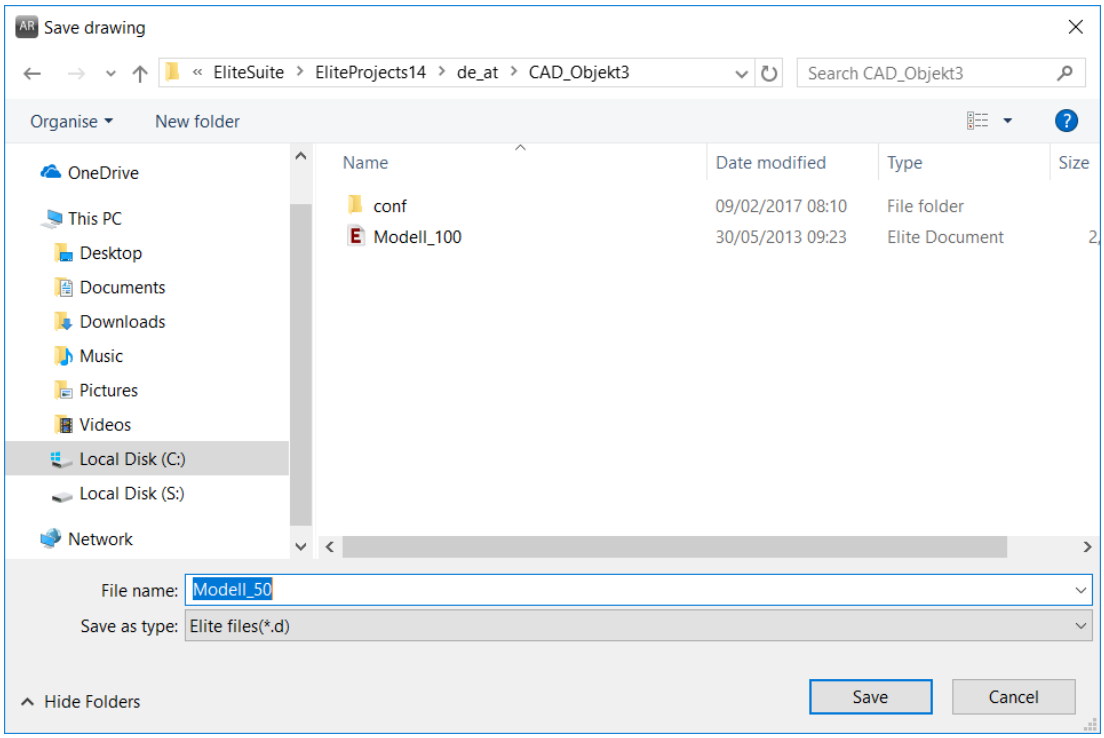
Assemble
Displays the reference separately on the monitor.

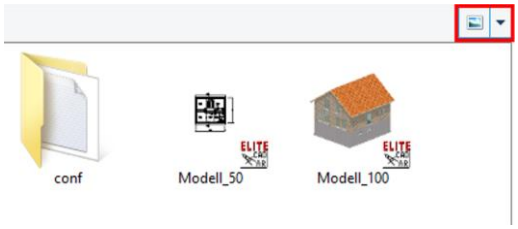
Dissolve reference
The selected instance is dissolved in the plan. While the parts lose their reference to the reference, they can be edited again "normally".

1.10 Open and save

File selection for opening and saving

Opening and saving functions call up the Windows file selection. The dialog window appears differently depending on the operating system.
All files listed under "File type" can be read in.





When selecting a project, the directory path for opening and saving it is set automatically to the project path. The most recently used path is opened for libraries, symbols and graphics.

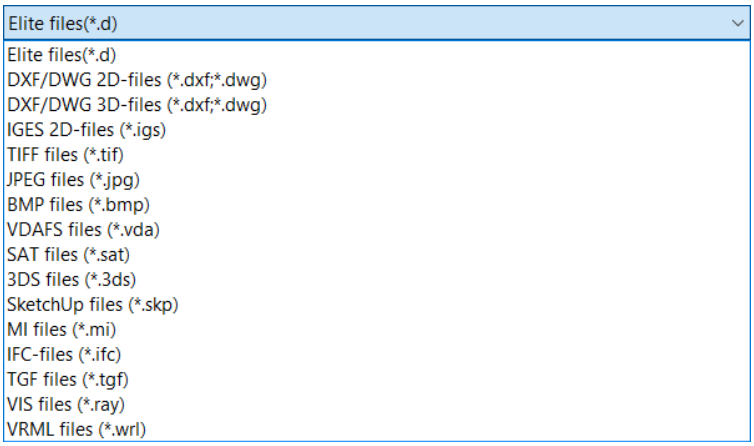
ELITECAD symbol

The display can be switched to "large symbols" to find out more about the contents of the ELITECAD file. A preview image of the file appears.

Via file type, users can filter whether only ELITECAD files or all files (necessary for reading CAD400 files) are displayed. If "ELITECAD files" is set for the file type, the file extension "*.d*" is automatically added to the file name when saving. If the file type is set to "All files", then you need to add this file extension to the file name. Files with the extension "*.d*" are displayed together with the ELITECAD symbol in Explorer.

TIP

All other common file formats can be selected directly under the file type. You therefore do not have to open all user interface dialog windows in order to open certain formats.



New

Toolbar *main functions
File menu > New [Ctrl] + [N]

This function starts a new drawing with the title "unnamed.d".
A number of pre-settings can be made in the OPTIONS.
Menu SETTINGS > OPTIONS > SAVE/OPEN > GENERAL
The name for "New file" can be specified in this directory and the user can decide at the same time whether a master drawing should be loaded.
OPTIONS > WORK PARAMETERS > NEW DRAWING
Various basic parameters can be set for the new drawing here.
Scale, unit, page format, angle unit, etc.
Having selected the function, if a drawing was loaded and modified, a query appears asking whether this drawing should be saved. A new drawing is then started.

Open

Toolbar *main functions
File menu > Open.... [Ctrl] + [O]

If a file has already been loaded and modified, a query appears asking the user if it should be saved. If the work area is empty, the dialog field "Open drawing" appears. The drawing required can now be selected and loaded.

Recently opened files

File menu > Recently opened files

The eight most recently opened files can be displayed with a corresponding path and opened directly.

Load work copy

Toolbar *main functions
File menu > Load work copy

This function opens the most recent work copy.

If the function is called up via the menu FILE > LOAD WORK COPY, a dialog field "Open file" appears and old work copies can be loaded.

Show

File menu > Show

This can be helpful for copying data from existing plans into the current project via the clipboard.

In ELITECAD Architecture, the program is started for a second time.
In ELITECAD Mechanics the ELITECAD Viewer is started.

Insert graphic

Pixel toolbar
Menu Insert > Image

This function is used to read in pixel graphics in TIFF, JPEG, BMP, PNG and GIF format.
The graphic can be manipulated accordingly using the functions from the Load/position properties bar before being placed.
The reference point can also be modified using the function MODIFY REFERENCE POINT.

Position

Insert toolbar
Insert menu > Position ...

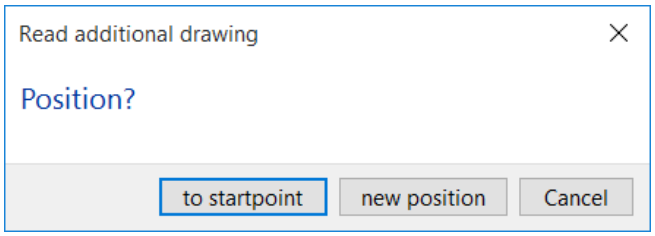
This function reads an existing drawing into the current drawing. In ELITECAD Architecture, the drawing is assigned to the current structure and storey if it does not contain data from multiple storeys. The drawing is loaded in if this is the case.
The drawing is adjusted to the respective scale when being positioned.
The drawing can be manipulated accordingly using the functions from the Load/position properties bar before being placed.
The reference point can also be modified using the function MODIFY REFERENCE POINT.

Load into

Insert toolbar
Insert menu > Load into....

This function reads an existing drawing in ELITECAD Architecture into the current drawing with its specific storey and structure settings. The drawing is adjusted to the respective scale when being loaded.

The following query window for the position appears after activating this function.



To start point
The drawing is applied absolutely (as saved).

New position
The drawing can be placed in any given position.

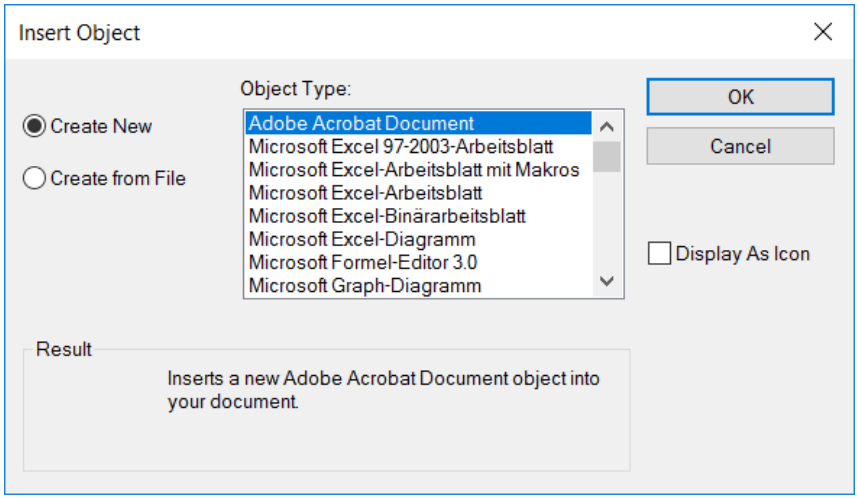
Insert OLE object

Insert toolbar
Menu Insert > OLE object

OLE stands for Object Linking and Embedding. This function allows users to add multiple data to an ELITECAD drawing from multiple other applications. For example, an image that was created in a graphics program can be integrated into ELITECAD. The special feature to note here is that this embedded image can be edited with the original graphics program directly in ELITECAD by double-clicking on it.

The OLE objects are either embedded in ELITECAD or linked with the original file. The OLE functionality is provided by the operating system (Microsoft Windows). OLE does not support all functions and features of third-party programs. For example, only the first page is imported from a text document.

The dialog field "Insert object" appears after activating this function.

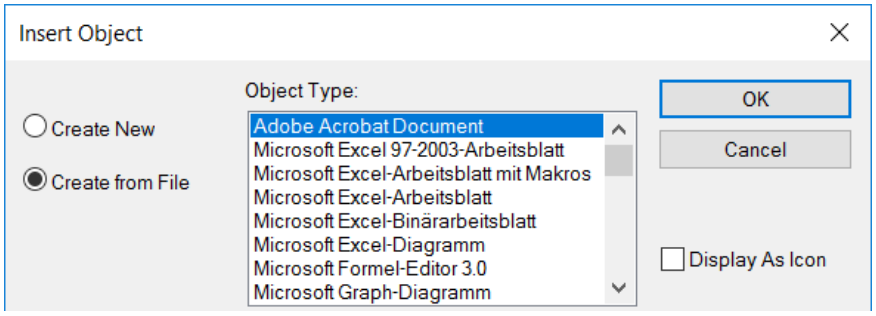


Create new
The corresponding application for generating a file can be selected under "Create new". Confirming with OK always starts the program before the document, worksheet, etc. is positioned in the ELITECAD drawing.

The data has to be saved in the external programs menu for refreshing it in ELITECAD.

Files created in this way are always embedded in ELITECAD.

Create from file



An existing document can be selected and inserted into ELITECAD using this option. If the button "Link" is not active, the document is embedded in ELITECAD. Otherwise it is connected.
If the button "As Symbol" is activated, the file itself is not displayed but only a symbol.

EXPLANATION

OLE objects can either be linked or embedded. Users can find out whether an object is linked with ELITECAD or not via the menu item EDIT > LINKS or in the menu of the open application (refreshing not saving).

Link
A linked object is a reference to data in another document. You can use the same data in multiple drawings. If the original document is modified on this basis, the links in ELITECAD are, depending on their properties, refreshed automatically as soon as the corresponding drawing is loaded. All links can be refreshed via the menu item EDIT > REFRESH LINKS for open drawings. The properties of the links can be modified via the menu item EDIT > LINKS.
Please note that the object can also be edited in ELITECAD by double-clicking on it and that the original document can therefore be modified.

Embed
If an object is embedded, the data from this document is integrated into ELITECAD as a copy and no longer connected to the original document.

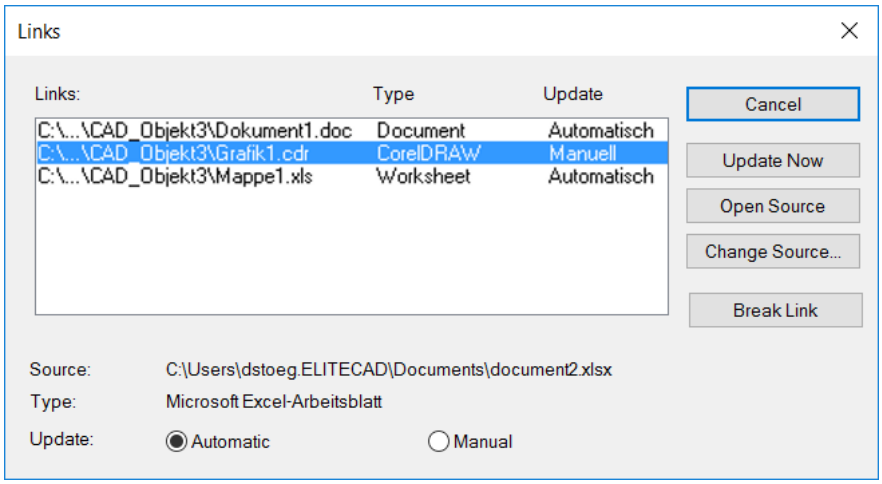
TIP

Parts of documents can be inserted into an ELITECAD drawing with the Windows clipboard. Select the parts to be copied in the corresponding application and move them to the clipboard. These parts can be incorporated into the ELITECAD drawing. These objects are embedded in ELITECAD and can be opened with their original application and edited by double-clicking on them.

Edit links

Edit toolbar
Edit menu > Links...

The properties of linked OLE objects can be modified via this menu item.



All links that are contained in the drawing are always displayed.

Update now
The selected link is refreshed.

Open source
The selected link is opened with the corresponding application.

Change source
A different document can be added to the background of the selected link.

Remove
The selected link is deleted. While the graphic remains in ELITECAD, it can no longer be edited.

Refresh:
If a link is set to "automatic" (default), it will always be refreshed when loaded.
If a link is set to "manual", however, it must be refreshed either via the function UPDATE NOW or via the menu item EDIT > REFRESH LINKS.

Refresh links

Edit toolbar
Edit menu > Refresh links

All links in the loaded drawing are refreshed.

Save

File toolbar
File menu > Save [Ctrl] + [S]

The drawing is saved under its current name and file type, which can be seen in the title line.

TIP

The complete drawing is always saved, regardless of whether "elements", "geometry", "text", "arrows", "dimension" and "hatch" are visible.

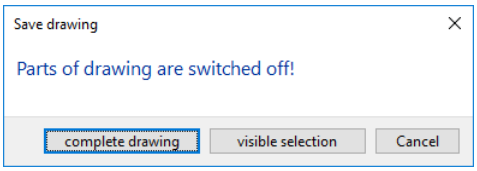
Save as

File toolbar
File menu > Save as … [F12]

This function saves the current screen contents of the existing drawing in a new file. A new file path and file name can be selected in the Windows file selection. If a pre-existing name is selected, a confirmation prompt appears.

EXPLANATION

If not all of the data of the design model is assembled, a query appears asking the user whether the complete drawing or only the visible part of the drawing is to be saved. Parts from the design model can be saved individually as a template in this way.



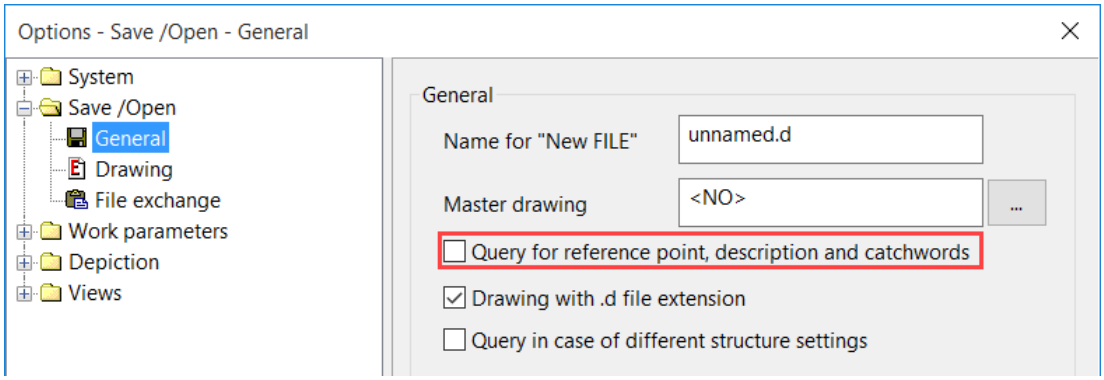
The following file formats can be written instead of an ELITECAD file:

- DXF/DWG 2D files (*.dxf,*.dwg)
- DXF/DWG 3D files (*.dxf,*.dwg)
- IGES 2D files (*.igs)
- TIFF files (*.tif)
- JPEG files (*.jpg)
- BMP files (*.bmp)
- VDAFS files (*.vda)
- SAT files (*.sat)
- 3DS files (*.3ds)
- MI files (*.mi)
- IFC files (*.ifc) (only in ELITECAD Architecture)
- TGF files (*.tgf)
- VIS files (*.ray)
- VRML files (*.wrl)

Data loss occurs if an entire design model is saved in one of these formats as only corresponding areas are saved depending on the format.

Option for Save as

Additional queries can be activated in the OPTIONS. (Standard is switched off)
Attention: These queries must then be confirmed otherwise the drawing will not be saved.



Either the *reference point for a saved drawing* can be assigned with one of the common capture modes or the current origin (centre of page) is used as a reference point by pressing the [Enter] key. This will be the current reference point later on when the drawing is read in with the functions POSITION, LIBRARY and SYMBOL.

The query *Enter description* appears. If the "Graphics preview" is called up for one of the loading functions, this entry is displayed as a tip (quick info) when you hold the mouse over the preview image.

The *keyword* is an additional piece of information for the drawing.

Save work copy

File toolbar
File menu > Save work copy [Ctrl] + [W]

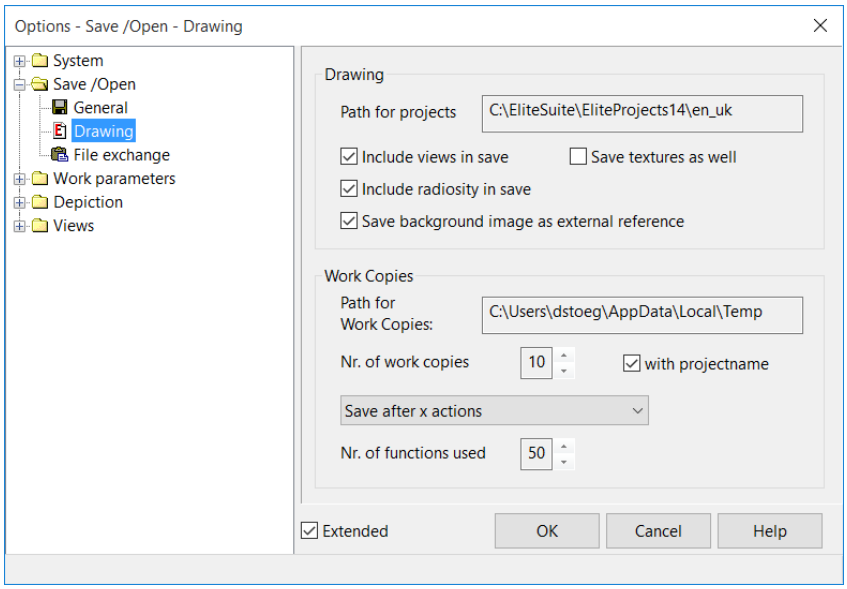
The work copy is a temporary backup of the drawing. A distinction is made between an automatic and a manual work copy.

The function saves a manual work copy. The file is saved in the directory of work copies (ELITECAD configuration). A certain number of work copies can be accessed (SETTINGS > OPTIONS > SAVE/OPEN > DRAWING). A suffix (".0", ".1", ".2", …) is appended to the work copies. The work copy with the suffix ".0" is the most recent.

Work copies can also be saved as project-specific in ELITECAD Architecture (SETTINGS > OPTIONS > SAVE/OPEN > DRAWING). The name is composed as follows: <Project name>_WOCO<Suffix>

Tip:
This function ignores all assembly filters and saves the entire drawing in the backup file.

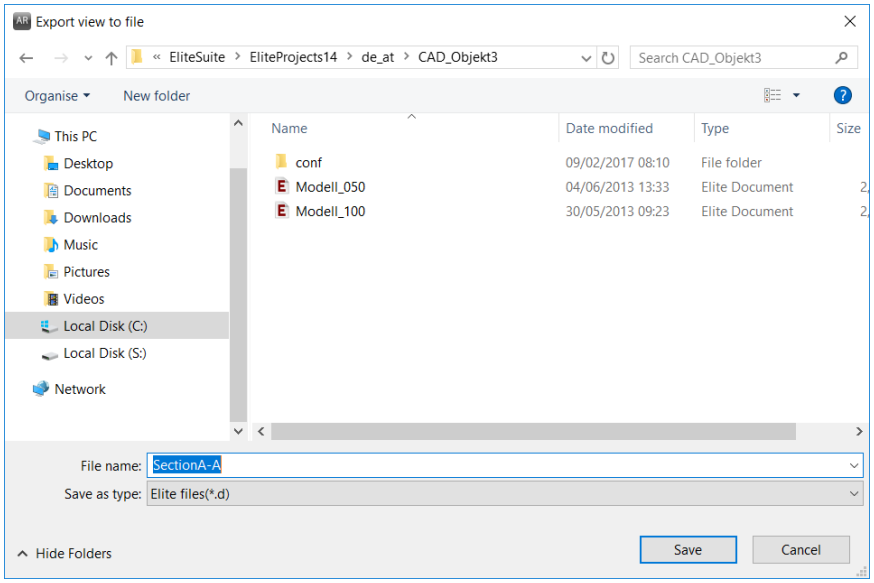
Automatic work copy
An automatic work copy can be activated in the OPTIONS (SETTINGS > OPTIONS > SAVE/OPEN > DRAWING). The work copy is given the extension "_auto" in its name. In the OPTIONS, you can set the number of work steps to be carried out before a work copy is saved. The manual work copies are not affected.



Export

File toolbar
File menu > Export

In order to load all building views, sections, details and plot views generated in ELITECAD individually or to decouple them from the design model, they must be saved as separate drawings with the function EXPORT. When doing this, they lose all object intelligence of the construction parts.



Save for transfer

File menu > Save for transfer

This function can be used for forwarding files, e.g. to a third-party office, without having to worry about any references.
All relevant data is saved into a single file independently of the current settings. (e.g. OLE objects, background images, visualisation materials, views, references)

Create archive

File menu > Create archive

This function can be used for forwarding files, e.g. to a third-party office, without having to worry about any references.
All relevant references such as OLE objects, background images, visualisation materials, etc. are exported into a blank directory to be stated.

Read archive

File menu > Read archive

A previously generated archive is loaded with all references, such as OLE objects, background images, visualisation materials, etc.

Insert reference drawing

Reference drawing toolbar
Insert menu > Reference drawing > Load into

This function inserts an ELITECAD drawing as a reference plan. The reference point of the drawing is transferred. The reference drawing is assigned to the original storey. The reference plan is displayed in a pen colour and can neither be edited nor activated.

The capture points can be selected, however. The settings in SETTINGS > OPTIONS > REFERENCE PLAN apply for the display (pen type) and the procedure for saving and printing.

Position reference drawing

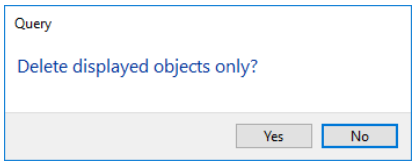
Reference drawing toolbar
Insert menu > Reference drawing > Position

This function inserts an ELITECAD drawing as a reference plan. The position of the reference plan can be redefined. The reference drawing is assigned to the active storey. The reference plan is displayed in a pen colour and can neither be edited nor activated. The capture points can be selected, however. The settings in SETTINGS > OPTIONS > REFERENCE PLAN apply for the display (pen type) and the procedure for saving and printing.

Delete reference drawing

Reference drawing toolbar
Insert menu > Reference drawing > Delete

This function deletes a reference plan. If multiple reference plans are loaded, all are deleted. If reference plans have been hidden, however, a query appears asking you whether you want to delete only the visible reference plans or all reference plans.



Hide reference drawing

The reference drawings can be hidden in the monitor settings [Ctrl]+[Q].

1.11 OTHER FUNCTIONS

Cancel

Create new toolbar
[Esc]

The current function or action is cancelled.

End

File toolbar
File menu > End [Alt]+[F4]

This function is used to end ELITECAD. CAD is closed after the confirmation prompt. When being closed, the current setting of the user interface is saved in the parameters.

Undo

Edit toolbar
Edit menu > Undo [Ctrl]+[Z]

This function is used to remove the most recent program step.
An additional program function is cancelled by activating the function again.

UNDO is reset for the following functions
New file; load work copy; load drawing; save drawing; clean data; modify the number of "undo steps"

TIP

The number of maximum "undo operations" can be set in the OPTIONS under SETTINGS > OPTIONS > WORK PARAMETERS > EDIT.

Restore

Edit toolbar
Edit menu > Restore [Ctrl]+[Y]

This function is used for removing "undo operations" carried out.

Purge data

Special functions toolbar
Extras menu > Special functions > Purge data

This function cleans the data structure.

Macro call

File toolbar
Extras menu > Execute macro …

This function loads a macro (predefined working procedures) into the working storage of the computer and starts it. After activating the function, you can select the macro file.
You can interrupt the currently executed macro via [Esc] or CANCEL.

Performance

Special functions toolbar
Extras menu > Special functions > Performance ….

This function is used to test the graphical performance of the system or for animation. After activating the function, the number of desired rotations of the current design model is queried in the input line. The design model is rotated in steps of 5 degrees. (72 steps produce a full rotation of the design model) A click in the graphics window interrupts the function. Determined characteristic values are the “frames per minute” and timed periods.

TIP

Measured values are only significant if the same design model in the same orientation with the same graphical settings (light, edges, surfaces etc.) is used.

Reconstruct copies

Special functions toolbar
Extras menu > Special functions > Reconstruct copies

This function discovers copied elements, regenerates copies and hence reduces memory usage.
The function can be applied especially for files that were created in versions older than version 11 or after data import via DXF/DWG or other interfaces.
The colour mode ”copies” shows copies of objects graphically.

Memory usage

Special functions toolbar
Extras menu > Special functions > Memory usage

This function delivers statistical values of the loaded design model. The function counts the number of polygons, points and 3D object definitions as well as measured valued for the graphical output.

Polygons
These are the polygons used for the graphical output which were created when faceting 3D objects.

Points
Number of corners of the polygons.

Definitions
Real 3D definitions without copies.

2.SETTINGS

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2.1 SETTINGS

INPUT DEVICES

Configuration input devices

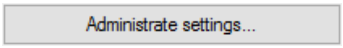
	Camera toolbar
	Menu View > Camera > Configuration walk mode / input devices / shader

General

This dialog window is used to configure input devices in the walking mode. Depending on installed devices, some sub items may not be visible.

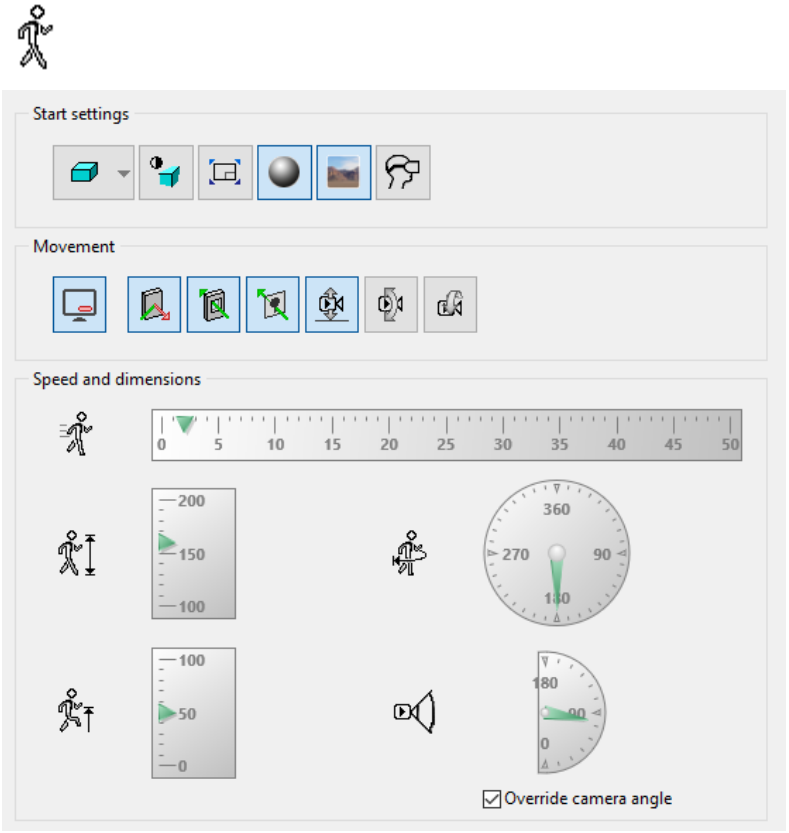
- Walking Mode
- Rotate / Move
- Shader quality
- Shader effects
- Context menu
- Keyboard and mouse
- Gamepad
- SpaceMouse
- Axes
- Virtual Reality
- Leap Motion

Reset

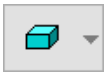


This button opens a dialog window where either the setting of the current page or all settings are set to the previous state.

Walking Mode



Start settings
The start settings define which settings are automatically enabled upon activating the walking mode.
Solid design model



Sets the desired depiction mode. If the mode is set to ‘off’, the current mode will be retained.
Edges

Edges can be blended in and out optionally.
Fullscreen mode

Switches the graphics window to fullscreen mode.
Shader

Activates the shader technology.

Skybox

Displays the skybox, in case it is defined.

Virtual Reality

Activates the Virtual Reality mode and configures the graphics output for VR glasses.

Movement

Status display

When the walking-mode is enabled, there is an optional transparent status bar at the lower part of the display. It features various indicators about which state you are currently in.

Collision control

Virtual objects represent obstacles just like in the real world. They cannot be penetrated in the walking-mode. This is intentional as otherwise one would fall through the floor or would not be able to walk up a flight of stairs. Collision control can be deactivated in order to be able to walk through walls.

Go through openings

This switch is an additional option for the collision control (only in ELITECAD Architecture). If the option is enabled, it is possible to move through closed doors and windows.

Go through bluescreen objects

This switch is another additional option for the collision control. If it is enabled, it is possible to move through bluescreen objects like trees and people.

Gravity

Gravity ensures that during navigation the observer is always dragged to the ground. When gravity is active the free fall stops upon the nearest surface. In case there is no surface underneath the current position, free fall ends at the current floor level.

Align viewing direction horizontally

This option ensures that whenever the user moves up or down, the viewing direction will be aligned automatically with the moving direction. Some users might react sensitive to those automatic movements; therefore, the option is usually disabled.

Roll

This option locks or activates the rolling of the camera. This kind of movement is rather unnatural and therefore it is usually disabled.

Speed and dimensions

Speed

Definition of speed during walking mode in m/s.

Eye level

Definition of eye level in cm.

The level that can be exceeded

Definition of the level that can be exceeded in cm. If it is set too small, curbs or stairs might impose obstacles. On the other hand, if it is set too high, fences and walls could be passed too.

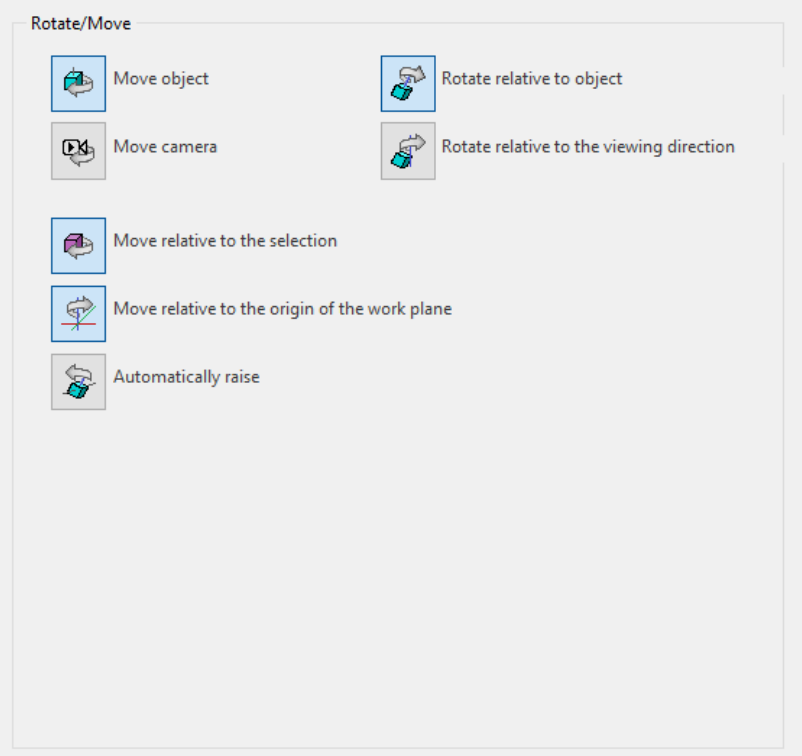
Angular velocity

Definition of the speed for changing the direction of view in degrees/second.

Aperture angle of the camera

This setting has to be set specifically to override the aperture of the current camera. It defines the aperture angle in the walking mode.

Rotate/Move



The settings in this mode are valid for the input devices gamepad and 3D mouse.

Move object / camera

Movements are interpreted relative to the object or relative to the camera. There can only be one of these two options active at any given time.

Rotate relative to object / viewing direction

Rotations are interpreted relative to the object or relative to the camera. There can be only be one of the two options active at any given time.

Move relative to the selection

Activating this option means that, in case a selection is active, the centre point of the selection will be used as fixed point for rotations. Default rotation point is the centre of the screen.

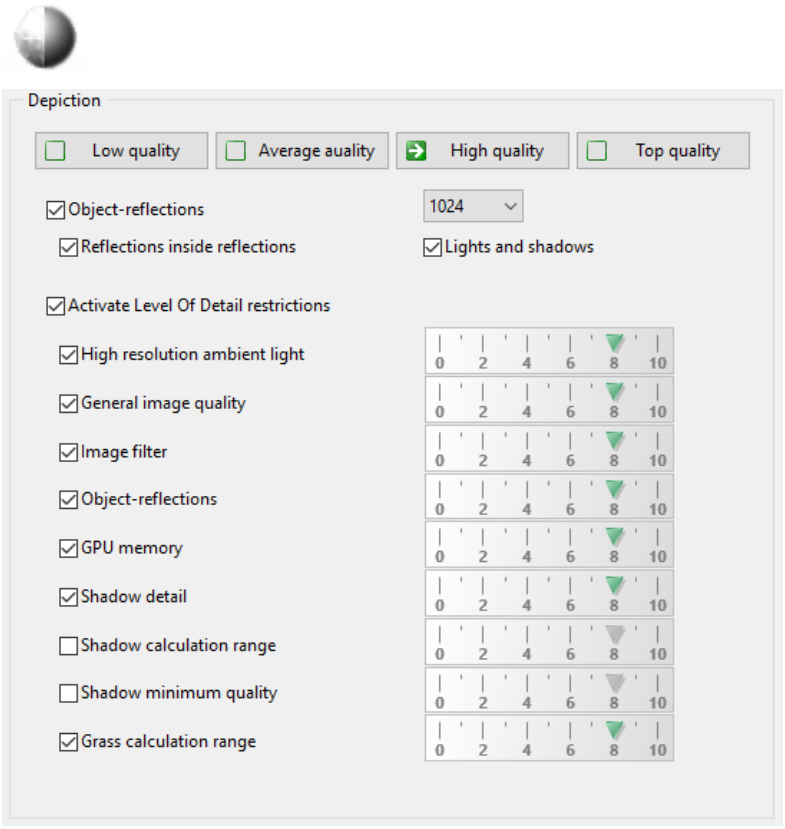
Move relative to the origin of the work plane

Activating this option means that the centre point of the work plane will be used as fixed point for rotations. Default rotation point is the centre of the screen.

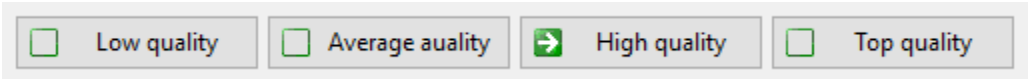
Automatically raise

Usually the z-Axis is aligned vertically to the screen. In case this alignment does not match up anymore, the z-axis will be raised automatically again upon a rotation.

Shader quality



Depiction
Despite their high performance on the graphics card, shaders can take up some time during image rendering. Depending on the ability of your hardware, you can influence the graphics output by reducing the level of detail for instance. An example for this technique is the distance of the camera up until which the grass shader will generate grass stems.

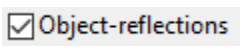


There are four predefined quality settings to facilitate easy configuration.

TIP
When producing photos and videos, LOD can be disabled.

Each setting on this page can be adjusted individually in order to deactivate or emphasize single effects.

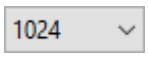
Object-reflections



Object-reflections are pre-calculated once, when the shader technology is enabled. This calculation takes some processing power once, and if new objects are added to the model, only the changes have to be calculated. Optionally it is possible to calculate

reflections in reflections. This increases the quality but also requires more processing power.

Resolution

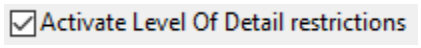


Shininess and reflections are pre-calculated and saved as bitmaps. The larger the resolution, the better the quality. The size however is limited by the available memory on the graphics card. On low-budget graphics cards, this value should be reduced.

Lights and shadows

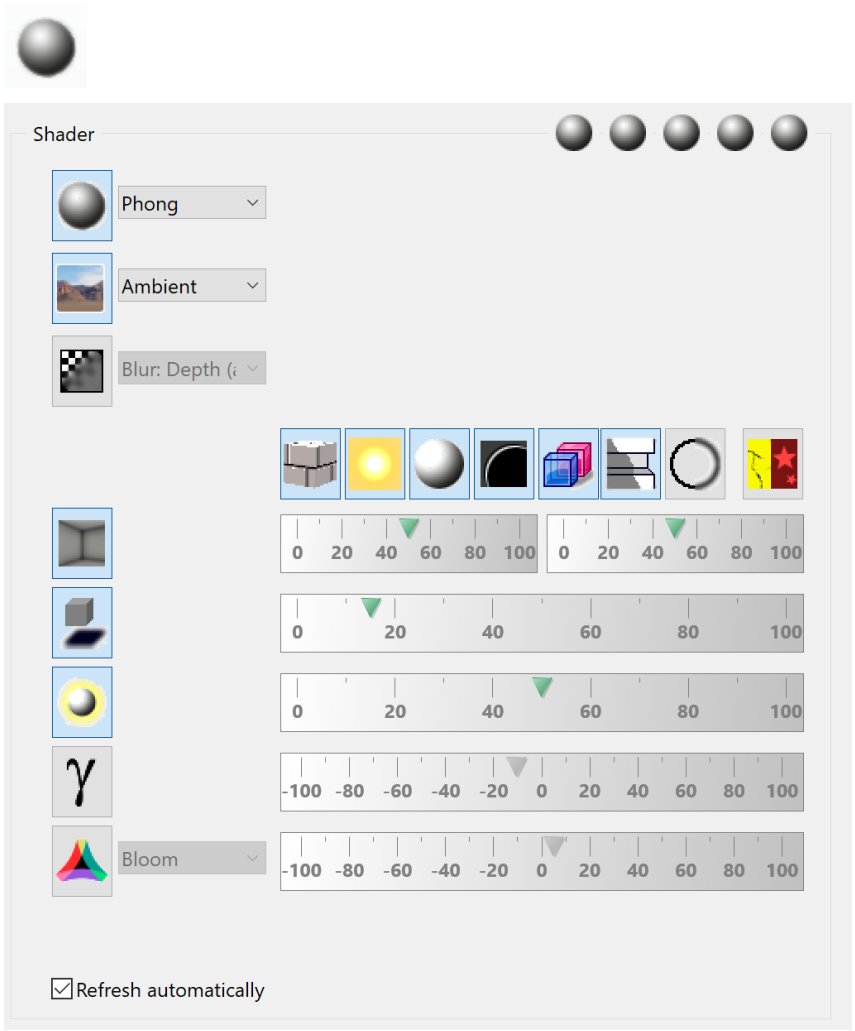
Also soft shadows are pre-calculated and could be deactivated in order to improve performance.

Level of Detail



The main switch activates the possibility to use the level of detail technology. Every single option can be set individually and adapted in quality.

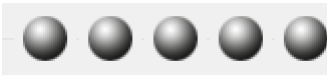
Shader effects



Independent of shader material properties, various effects can be applied to the whole image. Some of those effects, you might already know from image processing

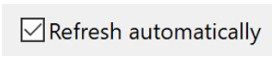
software. In ELITECAD, they are calculated in real time, while you walk through your model.
Some effects have a common technical term, but in the user interface, comprehensible terms were preferred. The technical names are sometimes given in brackets.
There is no special knowledge required. Just select the effect and use the sliders to modify the values. The image is updated in real-time and the effect is visible immediately.

Graphics performance



Depending on the power of your graphics card, more or less spheres are displayed.

Automatic refresh

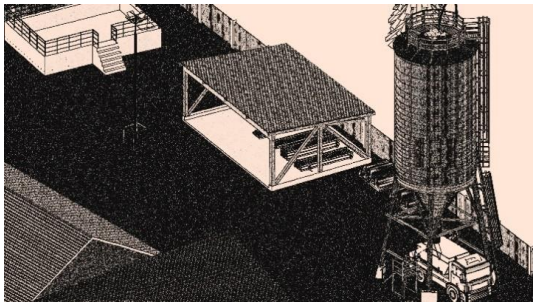


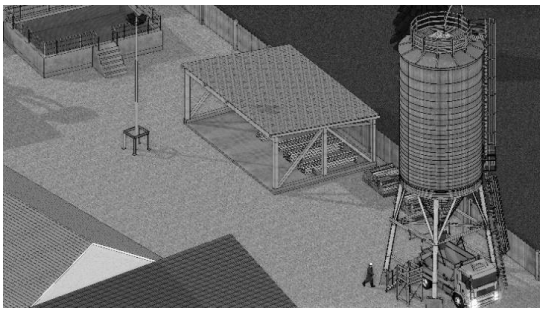
If this option is enabled, every change in the options will be displayed immediately in the graphics window.

Image rendering with shaders

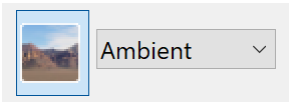
This switch enables the shader technology.

The menu allows you to set different styles of image generation. The standard setting is Phong-Shading. Alternatively, you can generate output as greyscale, or dotted images. Some options have additional parameters, which will be visible on demand.



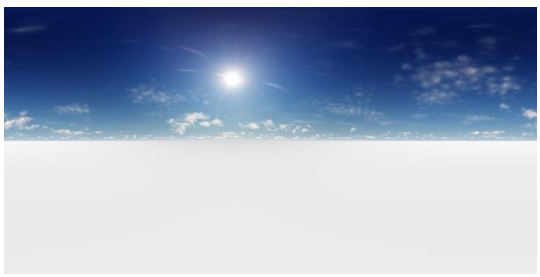


Skybox

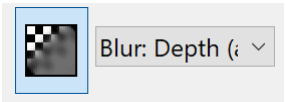


This switch enables the depiction of a skybox.

In the menu, you can select if the skybox gets darker during night scenes. In the state ambient, die darkening of the skybox is enabled.



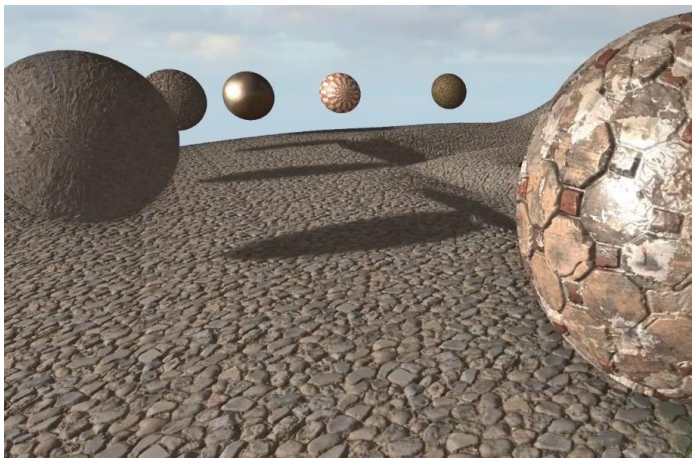
Filter



This switch activates image filters like for instance depth of field.

The menu allows you to choose the type of filter. Some filters feature special parameters that are made visible if required.

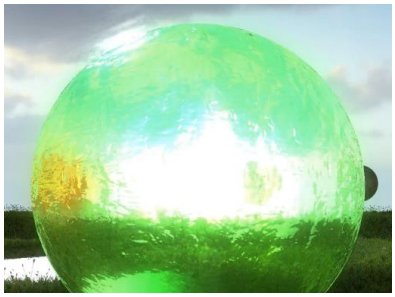
Extended Bump Mapping (Steep Parallax)



Bump maps create depth effects on surfaces. Using additional shadows for bump maps the naturalness of the surface can be enhanced even further.

Extended light model (Micro facets)

Over exposure (Emission)



This over exposure emphasizes very luminous objects.

Rim lighting

Rim light is usually used in movie productions. A light source is placed behind a person, which creates discreet lighting along the silhouette, therefore creating a good contrast with the background.

Surface appearance without visualisation material

For all objects that have not been assigned a visualisation material, a default appearance can be assigned here.

Maximum Filter quality

If this setting is active, then it is attempted to achieve the maximum image quality depending on capabilities of the graphics card but independent of the material settings. Hence, the material may define simple texture filter but the trilinear texture filter is used instead.

Extended transparency calculation

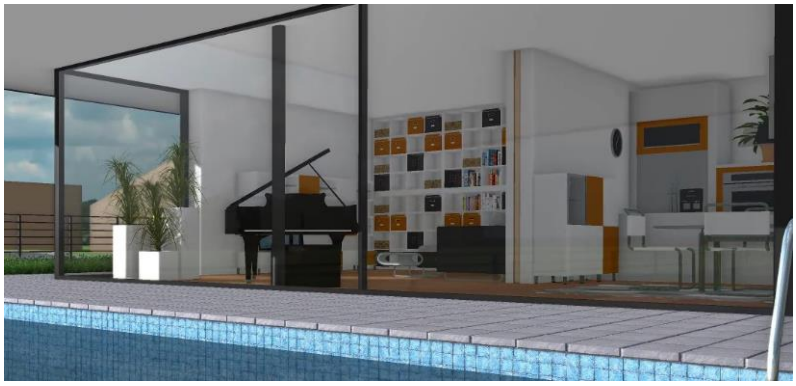
Bump-Map Shadows

Antialiasing

Renovation planning Shader

This special ELITECAD shader is only available in ELITECAD Architecture and takes care of the colouring of renovation planning projects.

Ambient shadows (SSAO)



Ambient shadows enhance the shadows of corners and edges inside the building. This leads to a more contrasting depth perception for example of joining walls having the same colour.

Soft shadows (Shadow Occlusion)

While the sun in nature generates a precise shadow, soft shadows can often be observed with extended light sources.

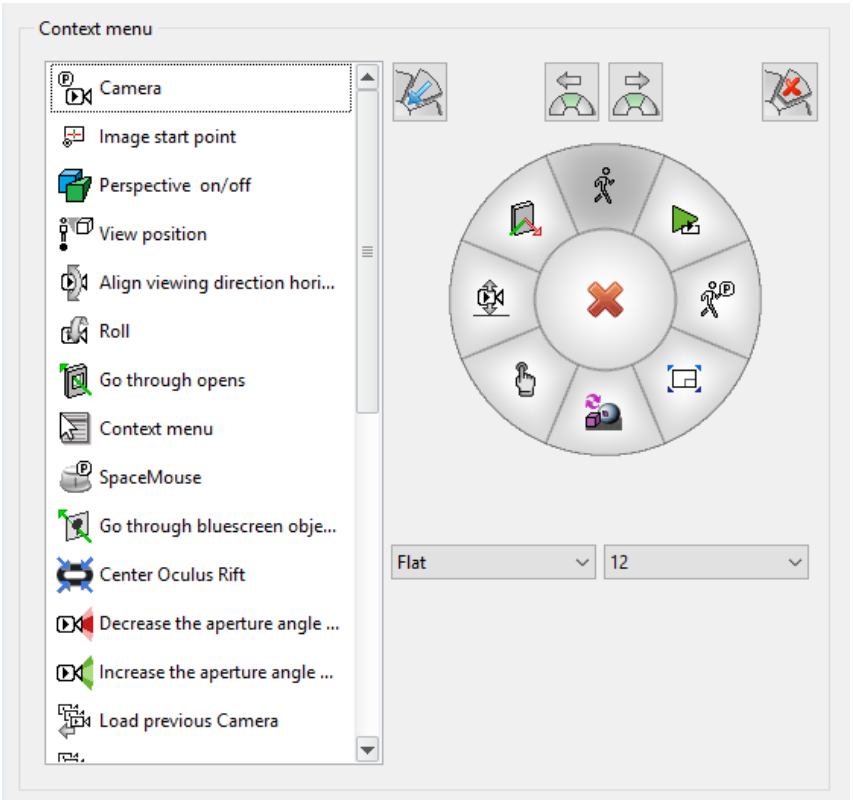
Light aura (Halo)

This effect creates a halo effect around light emitting objects.

Gamma correction

Dynamic range effects (HDR)

Context menu



The walking mode features its own context menu, which can be operated by various input devices. Using this dialog window it is possible to add entries to the context menu, remove them or change their order.

Insert

The selected menu entry from the list will be inserted into the context menu. Alternatively, it is possible to move a menu entry from the list to the menu via drag and drop.

Remove

The selected entry will be deleted from the context menu. Alternatively, it is possible to remove an entry from the list via drag and drop.

Move counter clockwise

The selected menu entry in the context menu will be moved counter-clockwise by one entry. Alternatively, the entry can also be moved in the context menu using drag and drop.

Move clockwise

The selected entry in the context menu will be moved clockwise by one entry. Alternatively, the entry can also be moved in the context menu using drag and drop.

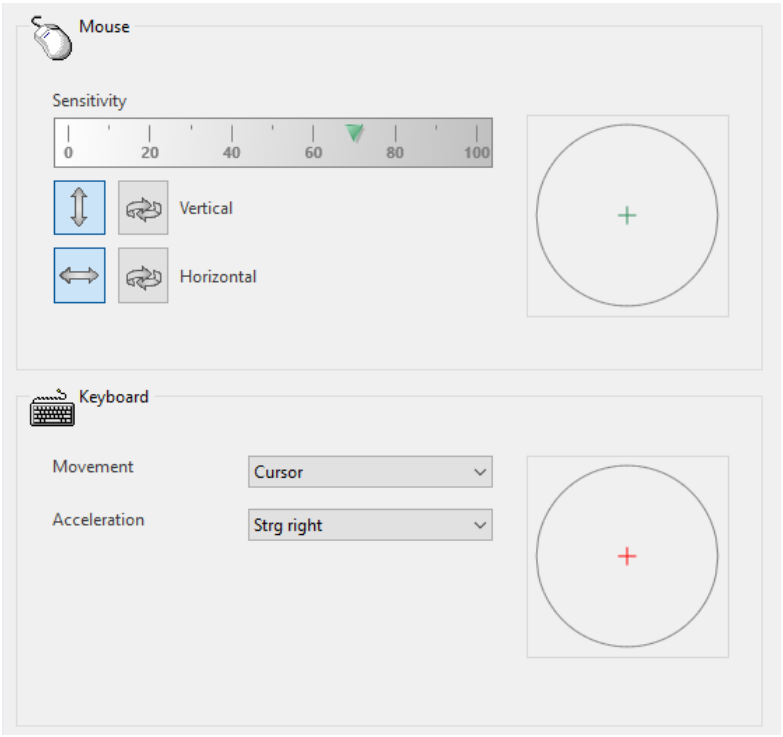
Menu style

Depending on the selection, the menu will be depicted in a different way. For the depiction in a virtual reality environment, a transparent style can be selected as well.

Number of entries

The number of entries in the menu can be increased up to 12 entries.

Keyboard and mouse



Controlling with mouse and keyboard is the standard way of input in the walking mode.

Mouse
The green cross in the circle visualizes the mouse movement.
Sensitivity

The sensitivity of the mouse movement can be set between 0 and 100%.
Vertical / Horizontal

The horizontal and vertical movements can be deactivated independently.
Invert

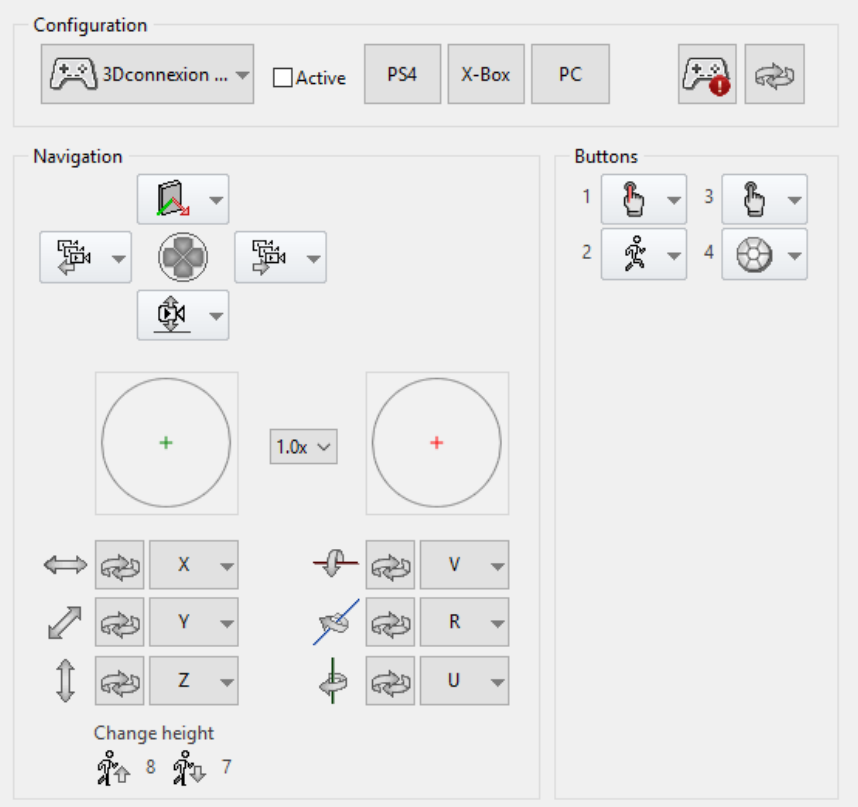
The direction of movement, horizontal or vertical, can be inverted if necessary.

Keyboard
The red cross in the circle shows the keyboard input.
Movement

Movement control with the keyboard can be done using the arrow keys or using the keys W-A-S-D.
Acceleration

The key that is set here allows increasing the speed of movement. This corresponds to the running mode.

Gamepad

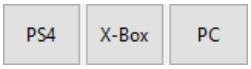


PS4® is a registered trademark of Sony Computer Entertainment.
XBOX® is a registered trademark of Microsoft.
These components are only configurable if they are installed. Depending on the type, there are more or fewer options available for configuration.

Configuration
Device selection

Selection of the gamepad to configure. There can be multiple gamepads active at the same time. The checkbox shows if the gamepad is active.

Pre-settings

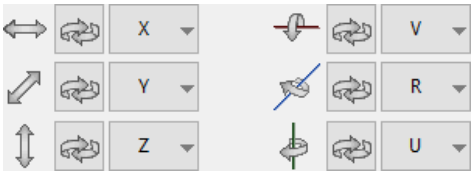


These switches can be used to load presets for the selected controllers.
Restricted input device

A gamepad can also be configured as a restricted input device. This setting is especially useful if multiple gamepads are active. Restricted input devices can be paused with a button, which can be configured in the button assignments.
Invert axis

This switch inverts the axis.

Control
Movement
The control of the gamepads is done with two joysticks. The movement can be checked by looking at the two circles with the red and the green cross.

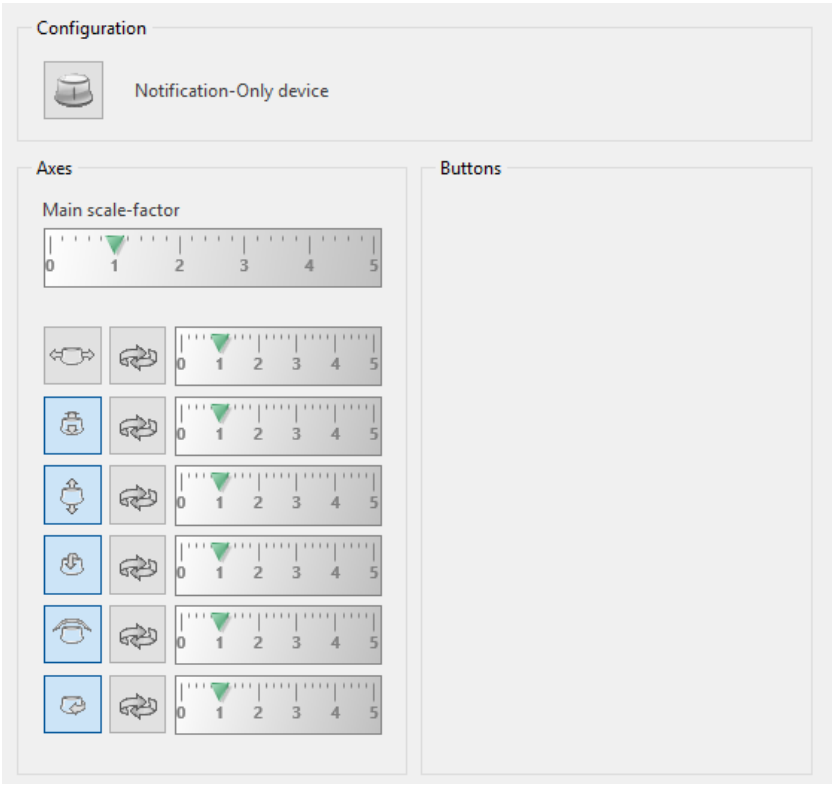


In general, the movement and rotation axis are controlled with the two joysticks. Each direction can be inverted optionally.
Buttons

The buttons on the gamepad can be assigned individually.

Depending on the type of device, there is a variable number of buttons on the device. Pressing a button will be displayed in the dialog window. These buttons can be assigned to functions.

SpaceMouse



SpaceMouse®, SpaceNavigator® und SpacePilot® are registered trademarks of 3Dconnexion GmbH.

These components can only be configured if they are installed. Depending on the type, more or fewer options are shown.
The settings in ELITECAD correspond to the settings in the options dialog of the manufacturer.

Configuration
Settings

Opens the settings dialog of the manufacturer.

Axes
Main scale-factor

There is one global factor as well as several different factors for the 6 degrees of freedom.
Axis on / off

Every axis can be activated independently.
Invert

Every axis can be inverted independently.

Buttons
Depending on the device type, it is possible to assign certain functions to certain buttons of the device.

Axes

In this dialog window, the sensitivity of the input device can be configured. The movement of the joysticks is shown in the corresponding bars. The diagram visualizes the current setting of the sensitivity.

Movement / Rotation
Dead zone

In order not to react to unintended inputs, it is possible to configure a dead zone at the beginning of an input.

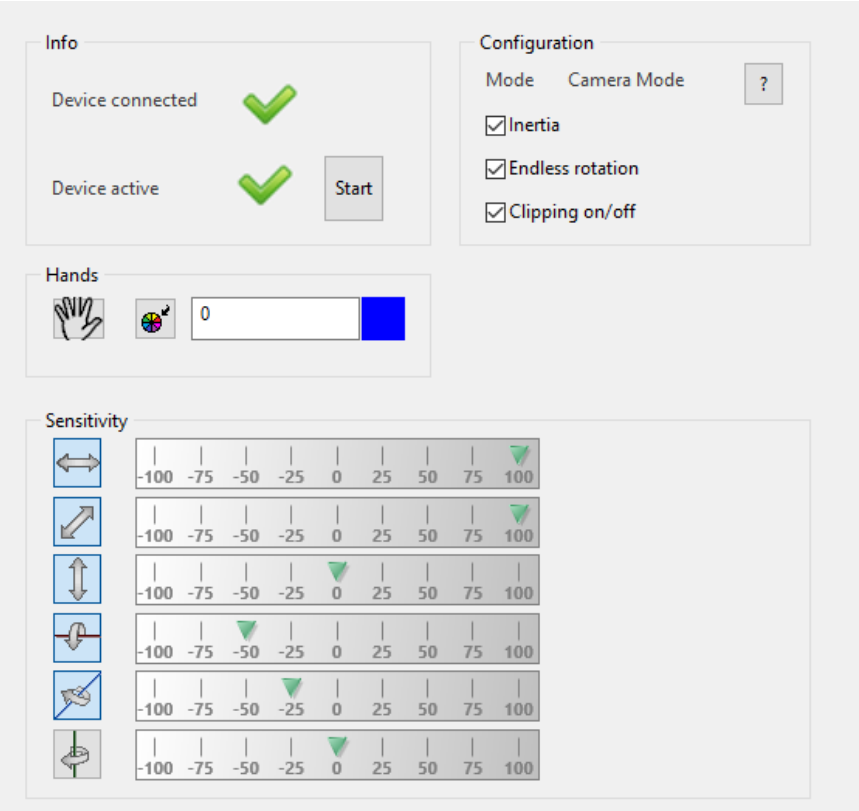
Maximum

After a certain maximum is reached, the reaction to the input joystick is no longer active.

Exponent

The sensitivity between the dead zone at the beginning and the maximum at the end can be configured here. The higher the exponent, the later but also the more intense the system will receive the input.

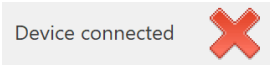
Leap Motion



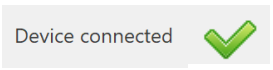
LeapMotion® is a registered trademark of Leap Motion Inc.
The LeapMotion is an input device, which allows for the interaction using gestures. The device can be used to manipulate camera positions or as input device for the walking mode.

Requirements
In order to be able to use the LeapMotion, first the according drivers have to be installed. These can be found on the manufacturer website: https://www.leapmotion.com/setup/desktop/windows

Connection
As soon as the drivers are installed and the device is connected via USB, they LeapMotion will be shown as connected.



Device not connected or drivers not installed

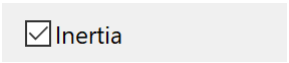


Device connected

Activate gesture control
If the device is connected correctly, the interaction can start. By pushing the Stop button, the interaction can be cancelled at any moment.

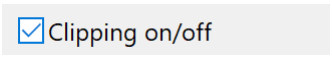
Configuration: Camera mode
The camera mode is activated automatically when a common design model view is open. In this mode, the camera can be moved to observe the model from all angles. To start the interaction the user has to perform a grab movement, to gain control over the model. The following interactions are possible:

- Translation: moving the model along x,y,z axis
- Rotation: tilting and rotating the model around x,y axis



To achieve a more dynamic behaviour it is possible to enable an inertia. This option allows the model to keep moving the direction it was being moved, even after the interaction stops. If for instance, a model is rotated and the user lets go of the model, it will keep rotating for a few moments before it stops completely.

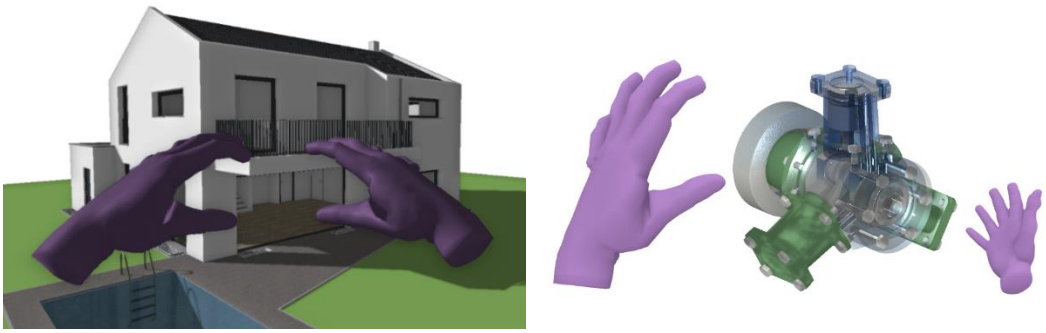
If inertia and endless rotation are enabled, and the model is rotated with a certain speed, an endless rotation can be achieved. This means that the rotation is performed even after the model is let go. The endless rotation can be stopped by grabbing the model again with the hand.



This setting allows dynamically moving the clipping plane with the hand. To achieve this, first select the model with your hand, and then in case the clipping is active, you can move the clipping plane by extending your thumb from the hand.

Configuration: walking mode.
As soon as the walking mode is activated, the LeapMotion starts behaving like a controller. The user has the possibility to move and rotate in all directions. To move in a certain direction it is only necessary to move the hand in the according direction.

Hands

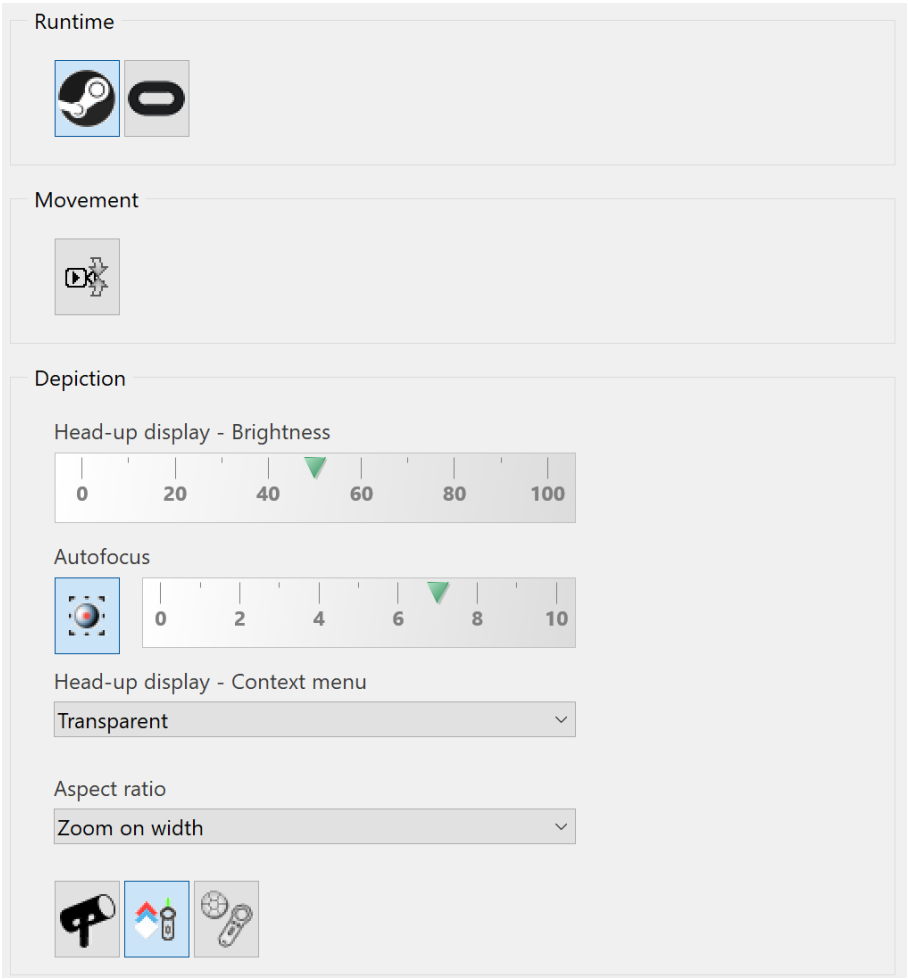


This setting enables you to actually see your hands in ELITECAD and get a visual representation of the movements. To enable the hands, the walking mode has to be enabled first. Furthermore, using the material editor, you can set a custom material or colour to your hand.

Sensibility
Using the 6 sliders for the corresponding axis it is possible to set the sensibility of the interaction. There are 3 sliders for the rotation and 3 for the translation. Using the toggle buttons it is also possible to lock each axis individually.

Tips
The area of interaction of the LeapMotion is a cone, spreading out over the sensor. If the hands are not located inside this cone, there might be issues with detecting the interaction.

Virtual Reality



Runtime

This option allows switching between different runtime libraries of VR headsets. The SteamVR is independent of a manufacturer therefore VR devices like Oculus Rift, HTC Vive, Windows Mixed Reality, etc. can be used. The usage of touch controllers becomes possible as well.

SteamVR runtime

Oculus Rift runtime

SteamVR has to be installed independently and a SteamVR account has to be created. Steam VR should run in parallel to ELITECAD.

Movement
Fix body vertically

This option can be used to fix the observer to an upright position.

Depiction
Brightness head up display

A status bar is displayed inside the VR glasses. In dark environments, the brightness can be reduced at any time.

Autofocus

In a stereoscopic image, the focus is always set to a certain distance. Either this is done automatically, or the distance has to be provided.

Context menu

This option configures the style of the graphical menu.

Aspect ratio

The image the observer sees in Virtual Reality can also be displayed in the graphics window. Various options are available for this setting.

Sensors

If this option is activated the sensors are displayed in the VR-glasses.

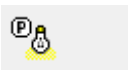
Cross hair / interaction rays

This option switches between the cross hair and the interaction rays of the VR controllers.

Position of the graphical menu

If this option is activated the graphical menu is displayed relative to the VR controllers.

LIGHT SOURCE



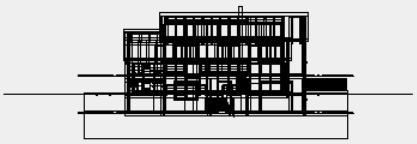
*Modify toolbar
Settings > Light source...

This function is used to configure the light sources in the 4-view window.
The light sources are always saved along with the drawing.
When you open a new file, the most recently used light sources are selected.
The light sources can be switched on or off separately in design model views, views and sections. The intensity of the ambient light can also be adjusted on its own.

4-view window

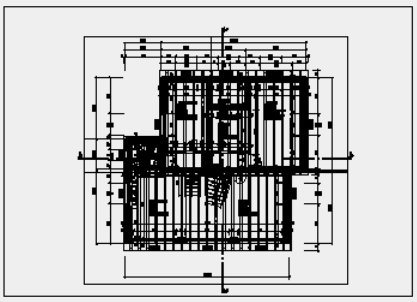
The light sources are configured in the 4-view window. If the light dialog window is open, only the light symbol can be clicked on in CAD. CAD objects cannot be selected or manipulated.

The depiction of the design model view can be controlled separately. If you right-click in this area, a menu opens where you can select how the design model view should be represented. This is also true for the other views, as they are interconnected.

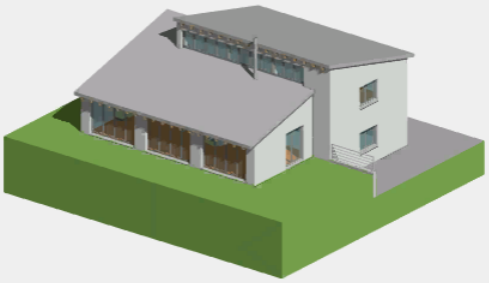


Front view

Side view left



Floor plan



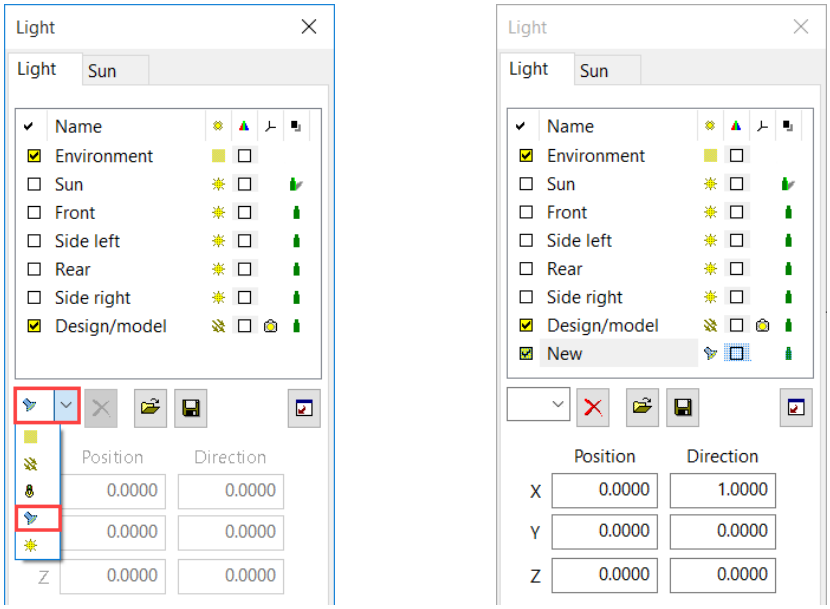
Design model view

TIP

The depiction of the standard view should be in the wire model, if possible, as this speeds up image assembly.

WORKSHOP

Create new light source



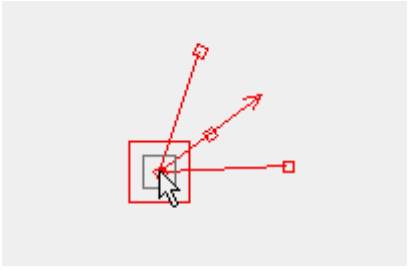
Under "New light source", choose the "Spotlight" type and tick it in the light source list. Now the light source is highlighted in red in the 4-view window and can be aligned.

Using light sources in the 4-view window

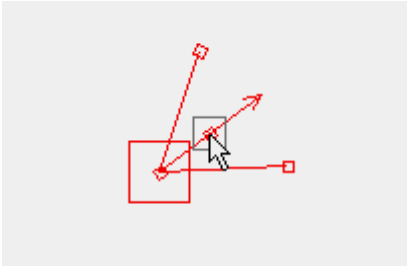
Depending on the light type, there are various handles available, which you can use to manipulate the light type interactively while holding down the left mouse button.

Here is a spotlight, for example:

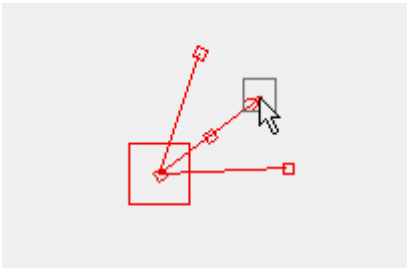
Modify position of light source



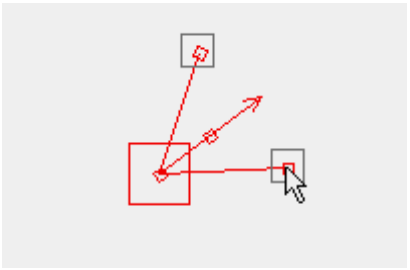
Move light source



Modify direction of light source



Modify opening angle of light source

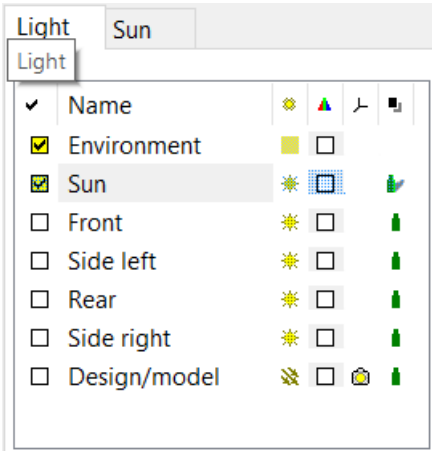


WORKSHOP END

Light mask

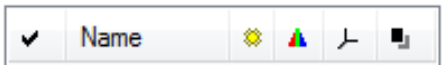
The light dialog window is divided into 5 main groups.

Light source list



This lists all of the light sources present in the drawing.

Symbol and heading columns



By clicking one of the symbols in the columns, the list can be sorted in different ways.

Light status

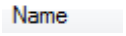
You can use this column to switch the light sources on or off. If a light source is active and you right-click on the on/off symbol, an extended selection is displayed.

- ☑ Visible in the solid and in the render
- ☑ Visible only in the render
- ☐ Is not visible

EXPLANATION

OpenGL image rendering (solid depiction) only permits a limited number of light sources. Depending on the graphic/video card, that could be 8 or 16. The number of light sources selected for the solid depiction can be specified in this sub-menu.

Light name



This column lists the names of the light sources. If you select a light source and right-click on its name, you can modify it.

Light type

This column displays the different light types. If you left-click on a specific light symbol, you can toggle through the different available types. If you right-click on the symbol, a sub-menu appears where you can choose the type directly.

Ambient light:

The ambient light is a diffuse background light that comes from all directions. It helps brighten surfaces that are not lit up by a light source.

Parallel light:

The parallel light matches the sunlight (parallel beams of light from one defined direction). The light source is defined by its position and direction. There is also an option to set the light "absolutely" or "camera relative".

All around light:

All around light is a light source at a specific position that shines in all directions equally. This type of light source can be affected by intensity and range.

Spotlight:

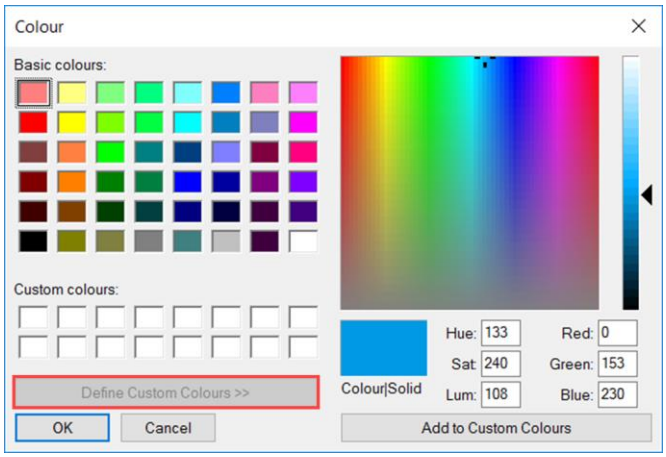
A spotlight is a light that spreads out like a cone. The light source's impact can be modified by adjusting the intensity, range, opening angle and sharpness of this cone of light.

Sun:

Sunlight is a form of parallel light that comes from the distance and shines in from a defined direction. The light source is defined by its position and direction. There is also an option to perform a sun position rendering.

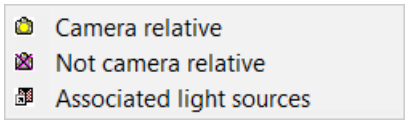
Select colour

Select the light colour in this column. The standard Windows colour dialog opens. If you click the "Define colour" button, the entire menu opens.



Light mask

This column displays the different light masks. If you left-click on the respective symbol, the light mask can be switched on. If you right-click on the symbol, a sub-menu appears where you can choose the light mask directly.



Camera-relative: (only available with parallel light)

The light source is tied to the camera position. The light always comes from ahead and its position cannot be changed.

Not camera-relative: (only available with parallel light)

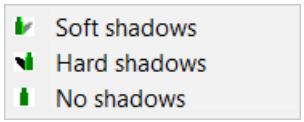
The light source always retains its predefined position. The light's location can be freely modified.

Associative light source:

If this symbol is selected and you close the light dialog window by clicking OK, you can select an associative polygon or object. This associates the light source with that object. If the object is later moved, copied or deleted, the light source follows it. If you want to configure multiple lights that way after closing the light dialog window, assign them in sequence.

Shadow type

This column displays the different shadow types. If you left-click on a shadow symbol, its type can be switched on. If you right-click on the "soft shadow" symbol, an extended selection set appears.



Soft shadow:

This rendering produces a soft shadow that fades outwards. You can also adjust the shadow resolution. This rendering option does not take as much time as a hard shadow does but it does require more memory.

Hard shadow:

This rendering option creates a hard, precise shadow on the edge. The transparencies are also taken into account (slide effect). This rendering option takes more time than a soft shadow, but requires less memory.

Administer light sources

Create new light source

If you select a light type from the DROP-DOWN menu, a new light source is created automatically.

 Ambient light

Parallel light

All around light

Spotlight

Sun

Delete light source

The selected light source is deleted. This procedure cannot be undone.

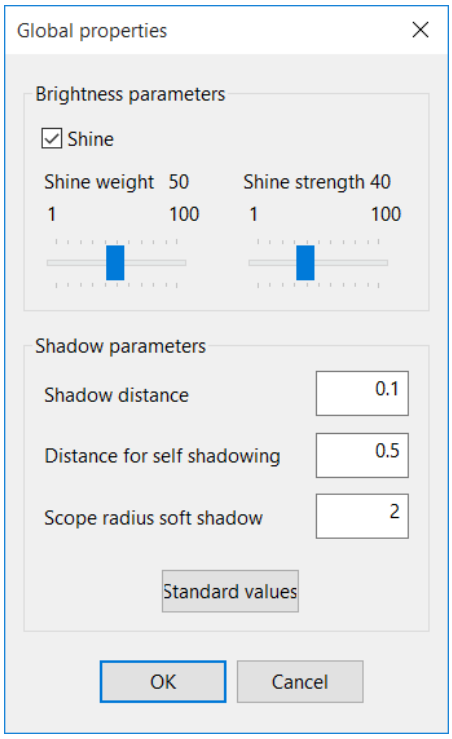
Load light sources from file

This is where you can load a previously saved light source list (*.ld).

Save light sources in file

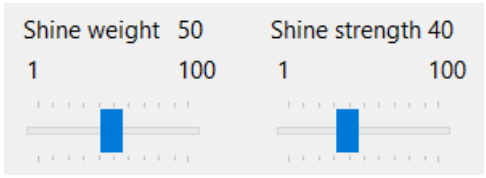
This is where you can save a light source list (*.ld).

Global light source properties



Shine parameters

Using these settings, you can define a shine level for the light that looks good especially for curved surfaces. However, this setting applies only to the solid depiction and not to the rendering. The shine applies to all objects and cannot be limited to individual ones.



The effect can be adjusted via the "shine weight" (shiny or matte) or the "shine strength" (size of shiny area).

Shadow parameter(s)

There are 3 entry fields here for the shadow rendering settings.

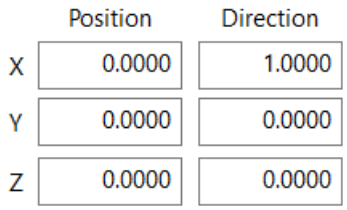
Shadow distance:
The shadow does not take effect until the distance entered here. This is always entered in metre units.

Distance for self-shadowing:
Occasionally, surfaces positioned close to each other may have dark spots, making the shadow seem incorrect. If so, you can raise the value to disable self-shadowing.

Scope radius soft shadow:
This value determines the width of the fading gradient at the edge of the shadow. Lower values generate harder shadows; higher values create softer shadows.

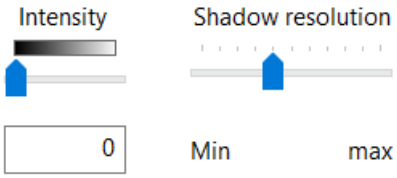
The "Standard values" button resets the values back to their origin.

Position of light sources



This is where you can enter the coordinates for the "Position" and the directional vectors for the "Direction". Either the values are defined using interactive configuration, or you can enter them in the entry fields manually.

Intensity of light and shadow

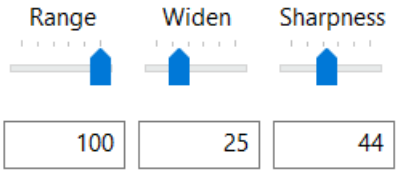


You can use the "Intensity" slider to adjust the strength of the light source. The "Shadow resolution" slider is only available for soft shadows and controls the precision of a shadow's edge.

TIP

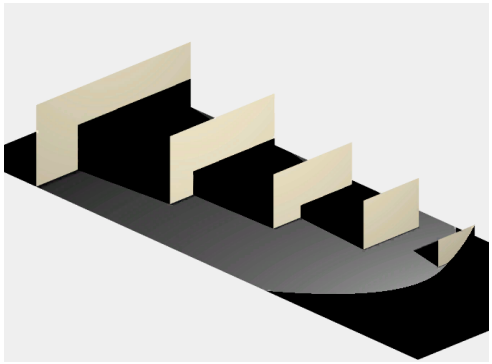
The larger the design model, the finer you should set the shadow resolution. As a fine resolution uses more internal RAM, you should always start with a low resolution. Gradually raise the slider until you are happy with the result.

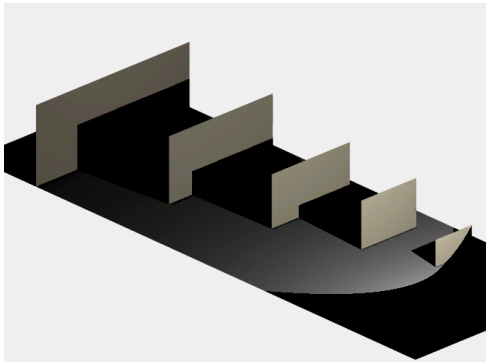
Properties of light sources



The "Range" slider can be used to reduce the light's intensity starting at a specific distance. If you set the "Range" to 100 %, the intensity will hold constant throughout all distances (extent of the model). Depending on that distance, the slider can be adjusted from 0–100 %. Up to the specified distance, the intensity holds constant, then decreases beyond it accordingly.
This setting is only available for the all around light and spotlight light types.

Range 100 % Range reduced

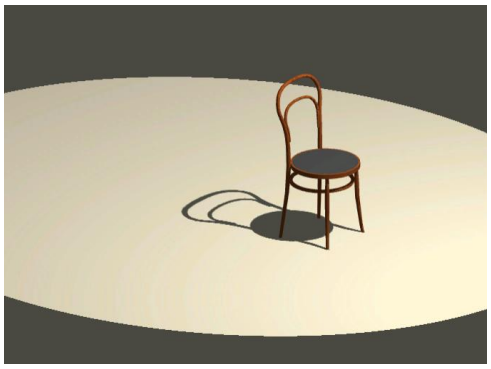




The "Widen" slider can be used to modify the opening angle of a light source. This setting is only available for the spotlight light type.

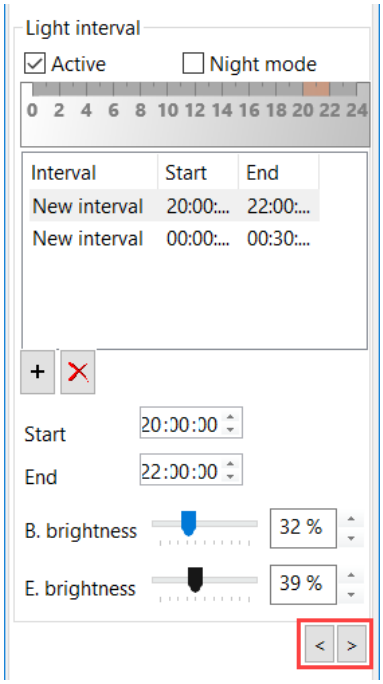
The "Sharpness" slider can be used to reduce the intensity of the cone of light outwards. If you set the slider to 0 %, a sharply demarcated cone of light will be represented. The higher the value you specify, the more rapidly the intensity decreases outwards.
This setting is only available for the spotlight light type.

Sharpness 0 %

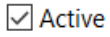


Sharpness increased

Light intervals



Activate

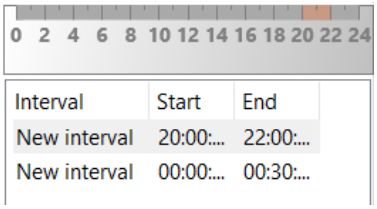


This switch can be used to activate light intervals for this light source.

Night-active

A night active light source automatically is switched on during the nights with the sun position animation. This option has the advantage that the beginning of the activity is independent of the calendar day and the geographical location. Examples of night-active light sources are for instance streetlights.

Intervals

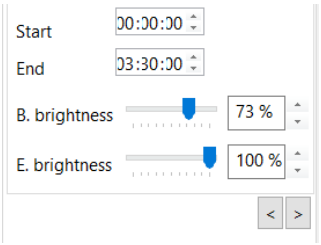


The intervals are listed in columns and the bar on top indicates the brightness. By clicking on them, the name can be changed.

Adding/ deleting intervals

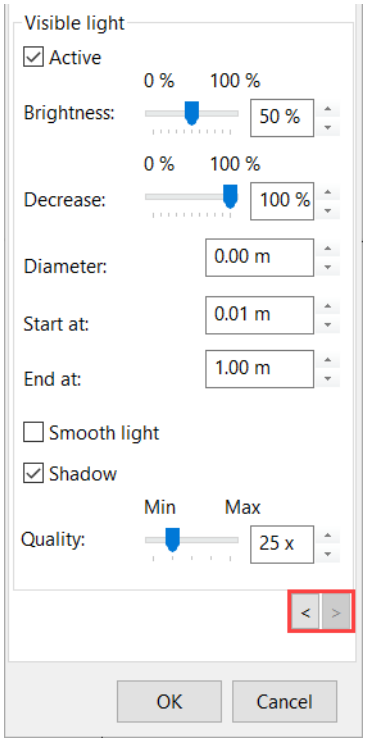
The selected interval is deleted and a new interval can be added.

Interval properties

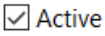


Every interval has a start and ending point, as well as a start and an ending brightness.

Visible light

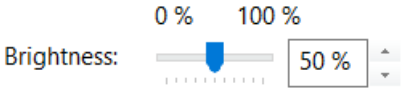


Activate



This check box activates the visible light.

Brightness

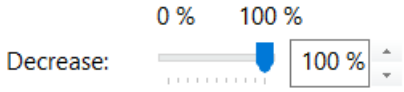


Use this slide to define the intensity of the shine.

TIP

The brightness can be overridden by up to a value of 600. Enter the corresponding value into the entry field.

Decrease

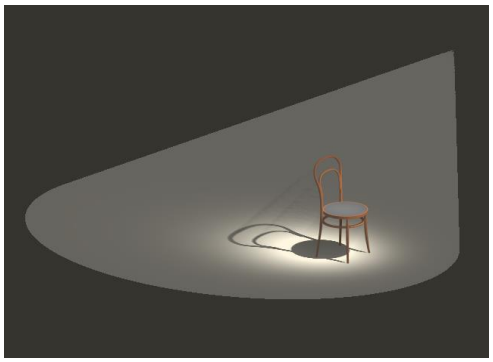


The "Decrease" slider can be used to reduce the intensity of visible light outwards. If you set the slider to 0 %, a sharply demarcated cone of light will be represented. The higher the value you specify, the more rapidly the intensity decreases outwards.

TIP

The decrease can be overridden by up to a value of 600. Enter the corresponding value into the entry field.

Decrease: 0 % Decrease higher



Diameter

This value defines the diameter of the visible light for the sun, parallel light and all around light types. For the spotlight light type, this defines the diameter of the initial opening in the light source.

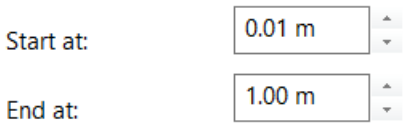
Example of all around light:
Diameter 1 m

Diameter increased

Example of spotlight:
Diameter 0 m

Diameter increased

Start at, end at:

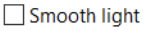


These two values can be used to restrict the cone of light to a specific area.

Start at 0.01 m, end at 5.00 m

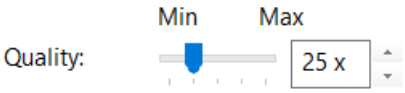
Start at 0.5 m, end at 2.00 m

Smooth light



If this option is switched on, the visible light is rendered more precisely and represented more softly. It should also be taken into account that these options increase the rendering time.

Shadow



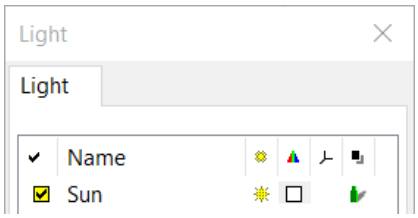
If this option is switched off, the light beam infuses all objects in the path of the cone of light. However, if the option is switched on, a spatial shadow is rendered that is visible within the cone of light.
The "Quality" slider can be used to specify the precision of shadow rendering. Keep in mind, though, that the rendering time is greater the higher the precision.

Without shadow

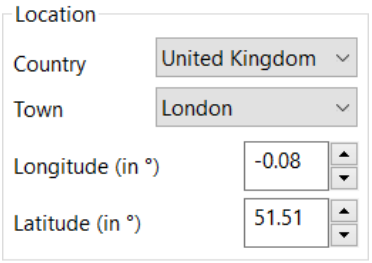
with shadow

Render sun position

If you set the light type to sun, you can also switch to sun position rendering. The dialog window is divided into 4 main groups.

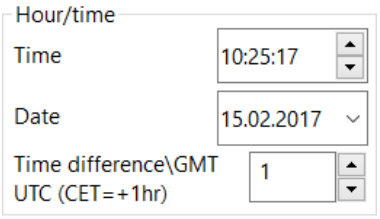


Location

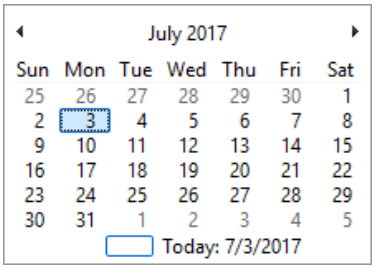


The locations are selected from a list. You can enter the longitude and latitude manually or using the sliders.
You cannot save your own locations.

Hour/time

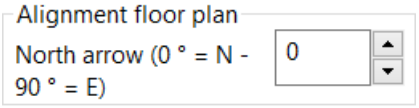


You can either enter the time of day manually or adjust it using the slider.
You can modify the date manually or click on the selection box to open a small calendar. Click the appropriate date to add it into the list.



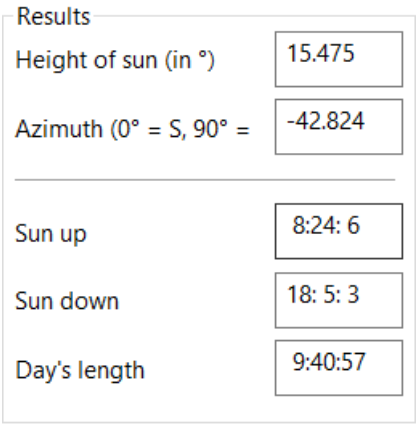
The time offset is always listed as compared to Coordinated Universal Time (UTC), based in Greenwich, England (at 0 degrees of longitude). The time offset for Central Europe (CET) is +1 hours. Central European Summer Time (CEST) has an offset of +2 hours.

Alignment of floor plan



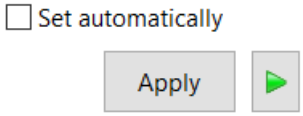
The sun's compass alignment in relation to the floor plan can be modified here.

Results



The calculated values can be read under results.

Clicking "Apply" refreshes the light symbol on the plan. If the "Set automatically" button is active, this is done automatically after every modification.



SUN POSITION ANIMATION

The sun position animation tool can be used to check the lighting contrast of a project in time lapse mode and display it on the screen.

The following simulations are available:

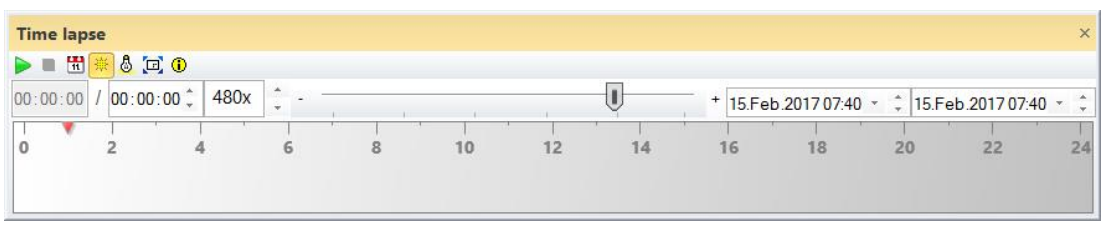
- Whole days
- Sun position

The intervals for time steps and updating the depiction are configurable. During a time-lapse animation, the design model can be rotated and moved. Fullscreen mode is available for a presentation.

Time lapse

View menu > Window > Time lapse;

In the time lapse, you can specify the simulation's properties, start or stop the animation and track the animation in the time toolbar.



Header functions

Start/stop/pause

The animation can be started, interrupted or stopped.

Whole days simulation type

An image is calculated at the same time for each day, configurable for any duration (several months to a year).
Example:
Sun position at 12:00 pm over the course of a year

Sun position simulation

The path of the sun is simulated on one day from morning to evening. The start and end time can be specified. If the animation extends across multiple days, night-time is simulated as well.
Example:
Path of the sun from 21 June at 4:00 am to 11:00 pm

Light source

Opens the light dialog window to configure the sun for the animation. The animation requires a light source of the type "Sun". The sun's location and floor plan direction are to be configured and confirmed using APPLY. The date is not adopted. Ambient light should also be switched on. The lights are automatically dimmed at twilight.

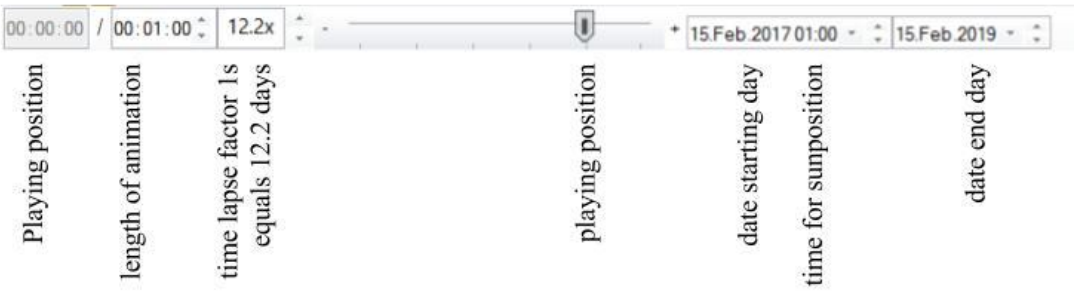
Fullscreen mode

The animation can be viewed in fullscreen mode.

Display time lapse values

If the check box is active, various details regarding the solar calculations are displayed in the info window/balloon during playback of the animation.

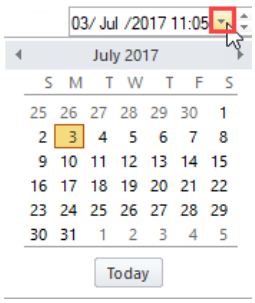
Value settings
Depending on the active simulation type, other value settings are to be configured.
Whole days



Sun position simulation

To implement a date or time, the number must be highlighted. Then a number can be entered manually or adjusted using the switch.

To change the date, a calendar can be opened.



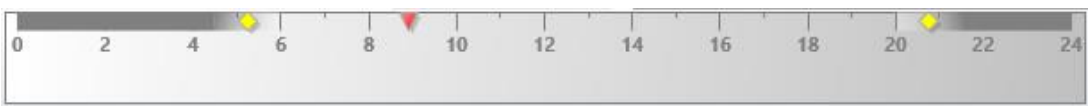
Time bar

Depending on active simulation type, the time bar may be structured in one of several ways.

Whole days

The days are shown in the first row. The animation (red marker) runs from day 1 to day x. The second row displays the time of day for the sun's position. This position remains the same for the duration of the animation.

Sun position simulation



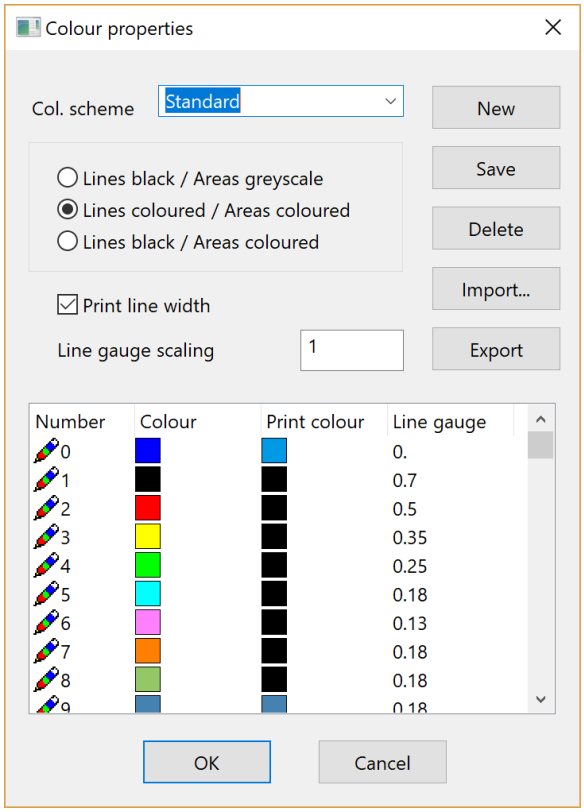
The hours are shown in the first row. The animation (red marker) runs from the start time up to the end time. The yellow diamonds represent sun up in relation to sun down. In the grey area of the beam, the light source is dark (night-time).

COLOUR PROPERTIES...

Settings toolbar
Settings menu > Colour properties...

The line thicknesses and colours for output on the printer and on the screen are managed here. These settings take effect when printing, plotting or in Colour mode > Printer.

Colour properties – Main dialog window

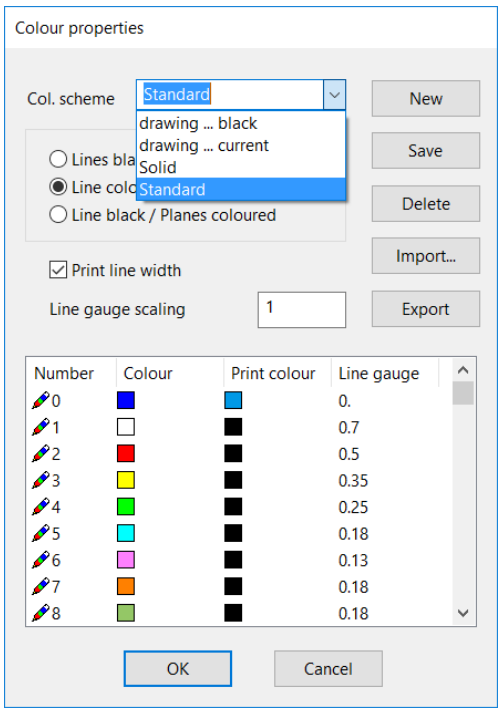


Colour scheme functions

Colour scheme
In this dialog window, you can define all print-specific parameters and save them as a custom parameter record (colour scheme). You can do so by clicking *New* to create a new colour scheme. Next, save the new colour scheme by clicking *Save*. Click *Delete* to remove an existing colour scheme.

When saving a drawing all existing colour schemes are stored in the drawing file. This concerns all colour schemes of the own ELITECAD – configuration, the current colour scheme (if it differs from colour schemes of the configuration), as well as all temporary colour schemes of a previously opened drawing (if they differ from colour schemes of the configuration).

If a drawing is opened, imported colour schemes will be temporarily displayed in the selection list of colour schemes (only if they differ in name or content from the own colour scheme). Temporary displayed colour schemes are shown in a specific manner.



Here the last two colour schemes originate from a recently opened drawing. They can be selected as usual like other colour schemes. But they won't be transferred to the ELITECAD configuration unless they are explicitly saved using the SAVE button.

Lines / areas colour
If you tick a check box, you can configure the line and plane colours separately.

Print line width
If this check box is ticked, drawing elements that were created using this pen are displayed with the specified width. If the check box is not ticked, the output is a thin line (1 pixel in the printer).

Line gauge scaling
This value defines an additional scale value, used to additionally scale all defined line width settings uniformly, before creating an output on a printer. If the toggle *print line width* is disabled, the scale factor has no effect.

Import
Using this function, you can import a colour scheme. This way a colour scheme that you have created yourself can be read on different workstations.

Export
Using this function, a colour scheme can be saved as a text file and read on other workstations.

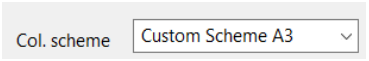
▼▼▼▼ WORKSHOP

Create and save new colour scheme

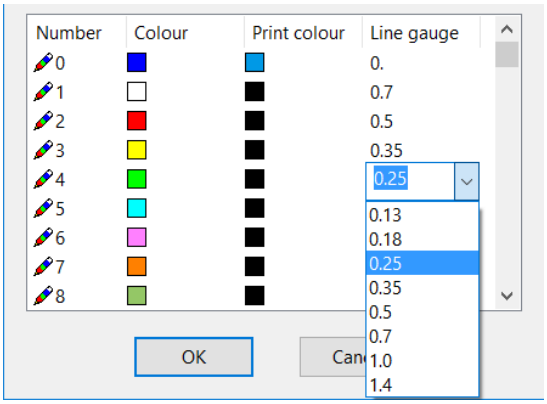
Start new colour scheme.

Required line and area colours depending on the printer.

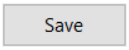
Specify a freely chosen parameter name.



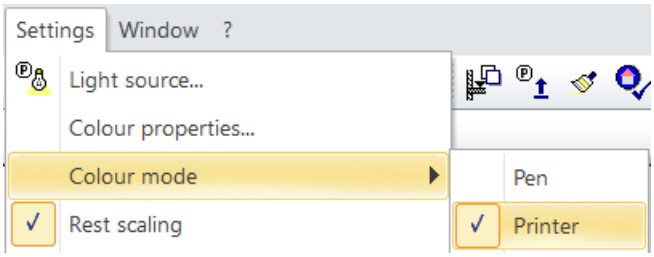
Assign the print colour and line width of the respective pen if necessary. The standard Windows colour dialog box appears when clicking on the standard Windows colour mixing dialog.



Saving colour scheme



Depiction of a saved colour scheme



Switch the screen background colour several times with [Ctrl]+[B] until the drawing's print preview can be viewed clearly.
You can also change quickly between the printer and pen colour modes via the image properties on the bottom left.

WORKSHOP END

COLOUR MODE

The colour depiction of the data on the screen can be configured according to various criteria. This is known as the colour mode. ELITECAD has 9 colour modes. Pen mode

is the default mode to use when working; you can switch to other modes temporarily to see how they look. Under OPTIONS, you can specify the default mode.
You can also change quickly between the printer and pen colour modes via the image properties on the bottom left.

Pen

Colour mode toolbar
Settings menu > Colour mode > Pen

Elements are represented in accordance with the pen colours.

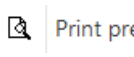
Printer

Colour mode toolbar
Settings menu > Colour mode > Printer

Depiction in accordance with the configured print parameters. (See the function under SETTINGS menu > COLOUR PROPERTIES...)
The pens are represented in their "actual width" and/or "actual colour".

TIP

The "Print preview" can be activated in the context menu. This depiction matches the printer output. To switch to the previous depiction, the "Print preview" must be called up again.



Mono

Colour mode toolbar
Settings menu > Colour mode > Mono

Monochrome depiction of entire drawing.

Model

Colour mode toolbar
Settings menu > Colour mode > Model

Different colour for each model.

Group

Colour mode toolbar
Settings menu > Colour mode > Group

Different colour for each group.

Class

Colour mode toolbar
Settings menu > Colour mode > Class

Different colour for each class.

Level

Colour mode toolbar
Settings menu > Colour mode > Level

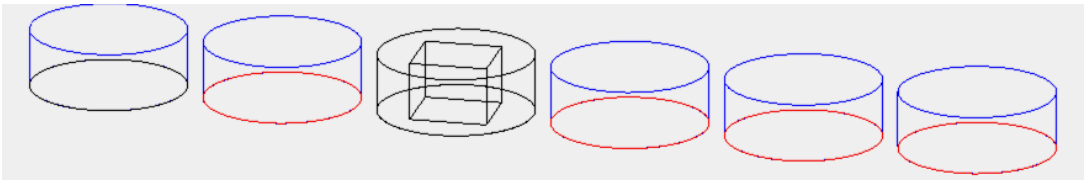
Different colour for each level.

Copy

Colour mode toolbar
Settings menu > Colour mode > Copy

Black and white depiction signifies the original of a 2D model or 3D part.

Red depiction signifies a copy of an original model.
Blue depiction signifies copies with original 3D parts.



Layer

Colour mode toolbar
Settings menu > Colour mode > Layer

Different colour for each layer.

REST SCALING

Settings toolbar
Settings menu > Rest scaling

Rest scaling on
Elements and all other features of the design model (the "rest": text, hatches, dimensions, arrows) are scaled to size when calling functions.

Rest scaling off
Only elements are scaled to size for functions.
When you restart the program, the current setting under OPTIONS is taken into account.

REFERENCE POINT...

Settings toolbar
Settings menu > Reference point

Move the standard zero point (centre of screen)
X-, Y-coordinates of the new reference point
Rotation of coordinate system
Drawing moving as well
From now on, the X- and Y-coordinates of all other points you define will be based on the new reference point.

Query function

Reference point (RETURN for centre of page)
Specifying point by clicking on screen

X-,Y-coordinates for this point
By default, the reference point has the coordinates of (X = 0, Y = 0). You may also assign specific coordinates to it, e.g. (X = 10000, Y = 15000).
By default, the rotation is 0 degrees (or radian). However, you may also enter another angle in order to take into account the difference between north and the verticals for surveying.

Move active drawing as well?
By default, the drawing is not moved as well. In other words, existing objects remain at the same position on the screen. However, the INFO > COORDINATES OF POINT function will display other coordinates after you change the reference point.

If you respond to this query with "Y", the contents of the screen will be moved to a new screen position so that the INFO > COORDINATES OF POINT feature will still display the same coordinates as before after the change in reference point. This option is especially significant for surveying.

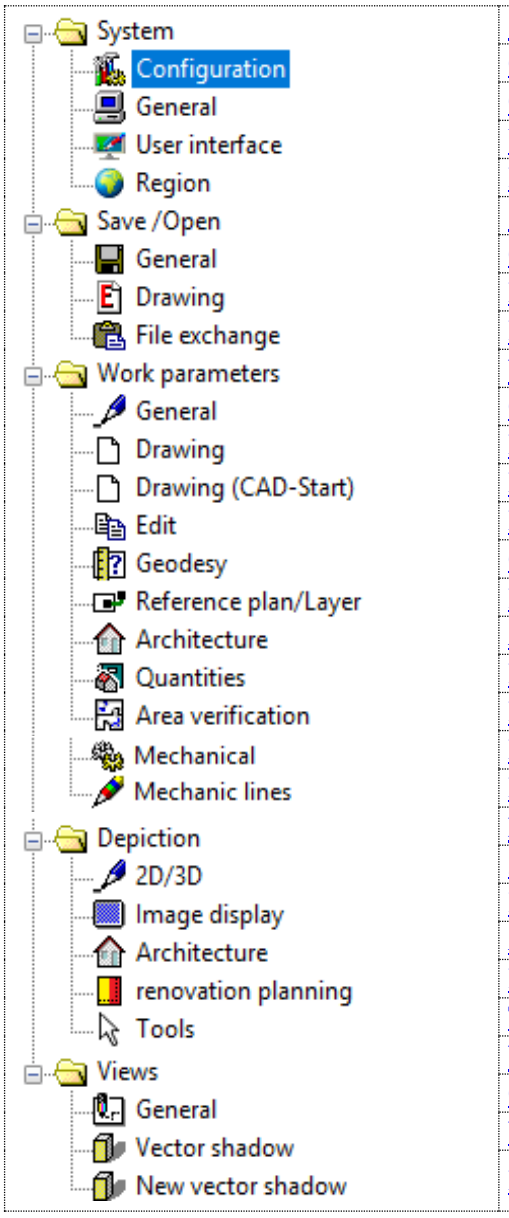
TIP

3D Axes on/off
The system normally uses the centre point of the screen as the reference point. The 3D AXES ON/OFF function displays the original axes through the centre of the screen.

2.2 OPTIONS

OPT	Settings toolbar
	Settings menu > Options

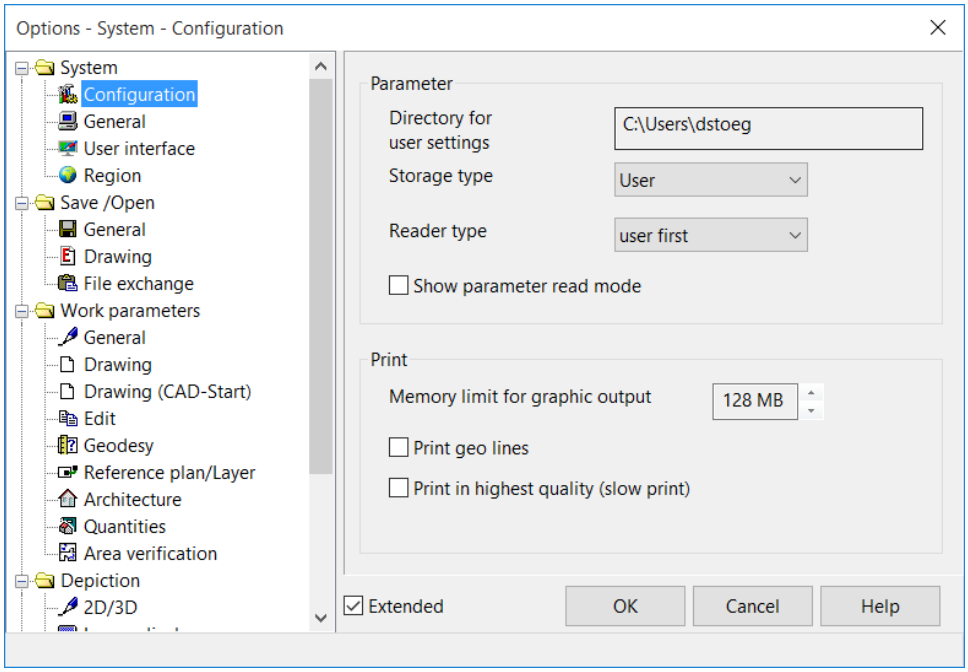
The options window includes the following settings, which are described below in more detail.



System
Configuration
General
User interface
Region
Save /Open
General
Drawing
File exchange
Work parameter(s)
General
Drawing
Drawing (CAD-Start)
Edit
Geodesy
Reference plan/Layer
Architecture
Reporting...
Plane(s) verification
Mechanical
Mechanic lines
Depiction
2D/3D
Image assembly
Architecture
Renovation planning
Tools
Views
General
Vector shadow
New vector shadow

SYSTEM

Configuration



Extended settings

☑ Extended

Only visible if active:

☐ Show parameter read mode

Parameter – Storage directory for user settings
All parameters that you set yourself are saved in the user settings. You can save your own parameter records in almost every dialog window of ELITECAD. All personal parameter records are stored in the "elitecfg" subfolder of this storage directory. You can define the directory under ELITECAD configuration (WINDOWS START menu). You can find extended details in manual of the ELITECAD configuration.
In ELITECAD, the value settings are saved in country-specific subfolder. The subfolder name in ELITECAD Architecture is <language>_<region>. In ELITECAD Mechanics only <language> is used for the name.
Examples for ELITECAD Architecture:
German-Austria: *de_at*
German-Germany: *de_de*
German-Switzerland: *de_ch*
English-UK: en_*uk*
French-Switzerland: fr_*ch*
Examples for ELITECAD Mechanics:
German: *de*
English: *en*

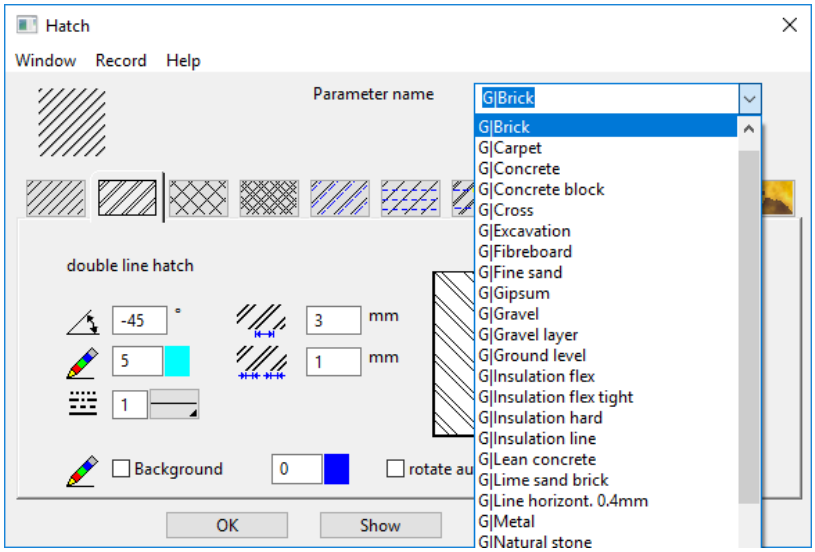
TIP

Periodically include your user parameters in a data backup.

Parameter – Storage type
This is where you specify whether parameters should be saved by user or globally.
The *User* and *Global* storage modes apply to architectural, mechanical and basic parameters. The default user can only save *User* parameters. In order to save *Global* parameters, parameter management must be set up.
You can find extended details in manual of the ELITECAD configuration.

Parameter – Interpretation
The reader type specifies which parameters should be displayed and which ones take priority in the event of redundant designations. With the *only global* or *only user* reader type, you can check which option has been assigned to which parameters.

Parameter – Show parameter read mode
(Extended setting)
In *Read mode*, a "*U*" (for *User*) or a "G" (for *Global*) is prefixed before the parameter names in type selection menus.
This option should only be used temporarily, as it slows down parameter access.



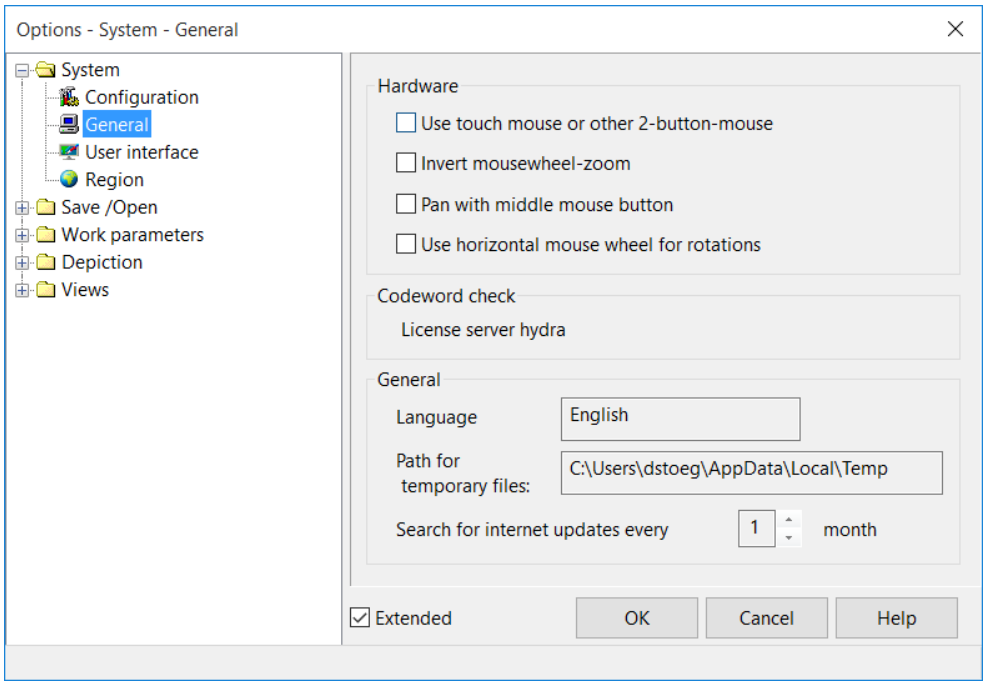
Print – Memory limit for graphic output
The memory limit can be set from 128 MB up to 1 GB. This is the maximum size of the file that is generated and sent to the printer when printing a plan. How high this value can be set depends on the hardware.
Larger files are produced when high-resolution bitmap images are integrated into the plans.

If the output file is larger than the memory limit, ELITECAD will halve the plan's resolution. This is listed in the info window.

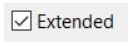
Print – Print help lines
Define here whether help lines will appear when printing.

Print – Print in highest quality (slow print)
The printer is not sent the individual objects (lines, hatches, text), but rather a completely rendered image. This is necessary if the output device cannot handle transparency or colour gradients. You must also activate the option for a plan with bitmap images if an image fails to appear.

General



Extended settings



Only visible if active:

Hardware – Use a touch pad or another 2-button mouse
Bypassing mouse drivers on laptops. Can be used if a three-button mouse is not correctly recognised by a laptop.

Hardware – Invert mouse wheel-zoom
This option reverses the scroll wheel's zoom function.
Standard: Scroll wheel backwards, image is reduced

Hardware – Move using middle mouse button (scroll wheel)
This option changes the function of the middle mouse button (scroll wheel) from the ROTATE CAMERA function to MOVE IMAGE. If the option is set and you move the mouse while holding down the middle mouse button (scroll wheel), this moves the image.
If you press the [Ctrl] key at the same time, the design model will rotate.

Hardware – Use horizontal mouse wheel for rotations
Using the scroll wheel, you can move the camera in the design model. This is only possible with mice with scroll wheels that can be tilted left/right.

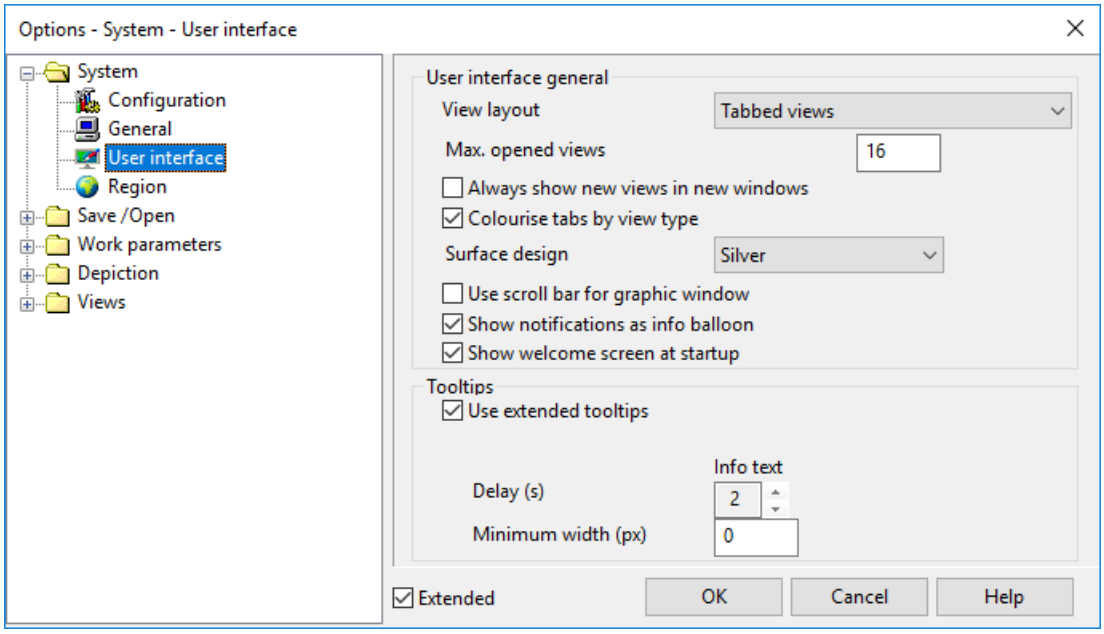
Codeword check
Displays whether the codeword check works using a dongle or a network card. You can define this setting under ELITECAD configuration (WINDOWS START menu).

General – Language
Display of language settings.
You can define this setting under ELITECAD configuration (WINDOWS START menu).

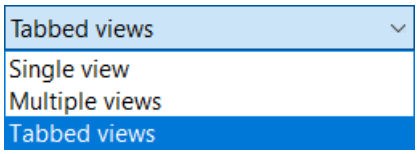
General – Path for temporary files
Display of path of temporary files.
You can define this setting under ELITECAD configuration (WINDOWS START menu).

General – Internet update
After a configurable length of time, the program searches for new online updates to the CAD. The online update can be switched off by setting the interval to ~ months.

User interface



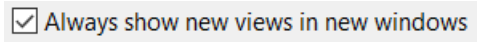
User interface general – View layout



Single view
The active view is shown.

Multiple views
Multiple views can be opened. The maximum number of opened views can be specified.

Views in the tab format
Multiple views can be opened. The views you open are presented in tab format. The maximum number of opened views can be specified. The tabs can be colour-coded by view type.



If a new view is selected in views management, it is opened in a new window or new tab.

User interface general – Colour by view type
Tabs can be colourised. E.g., all section in the same colour.

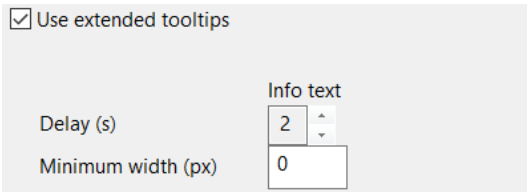
User interface general – Colour scheme
Various user interface designs are available for selection.

User interface general – Scrollbar
To facilitate navigating around the user interface, horizontal and vertical scrollbars can be added.

User interface general – Notifications
In addition to showing notifications in the info window, the messages can also be displayed as info balloons in the Windows taskbar.

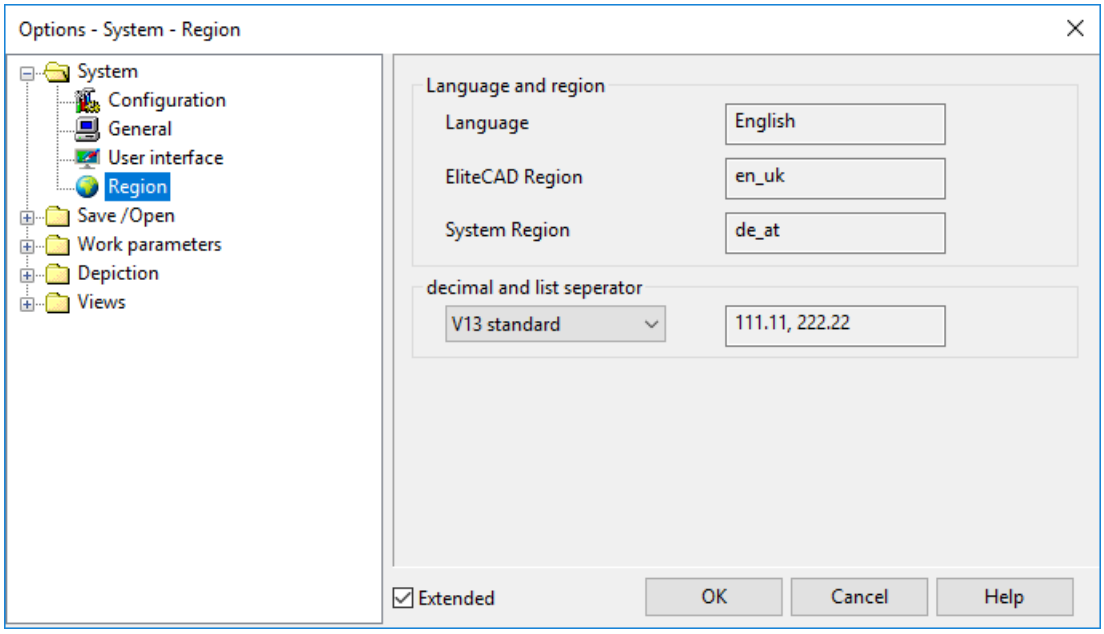
User interface general – Welcome screen at start-up
The welcome screen shows notifications about updates during the start of ELITECAD and offers quick access to recently loaded drawing. Showing the welcome screen during the start-up can be disabled.

Tooltips (quick info)
If you hover your cursor over a function, a description of it appears. If you continue hovering, the extended description is shown.

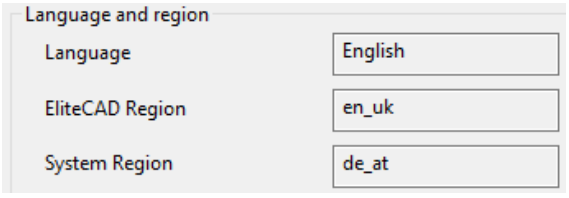


You can configure the number of seconds of hovering before the extended description appears.
You can specify the display size in pixels in the minimum width field. If you set the minimum width to "0", the width is determined automatically.

Region

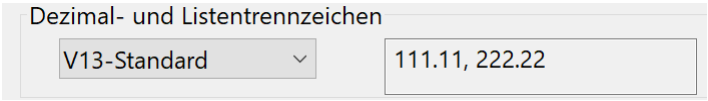


Language and region



Display of the language for the user interface and the ELITECAD region for parameter management. You can define these settings under ELITECAD configuration (WINDOWS START menu).
The System Region is defined in the Windows settings.

Decimal symbol and symbol for separating values



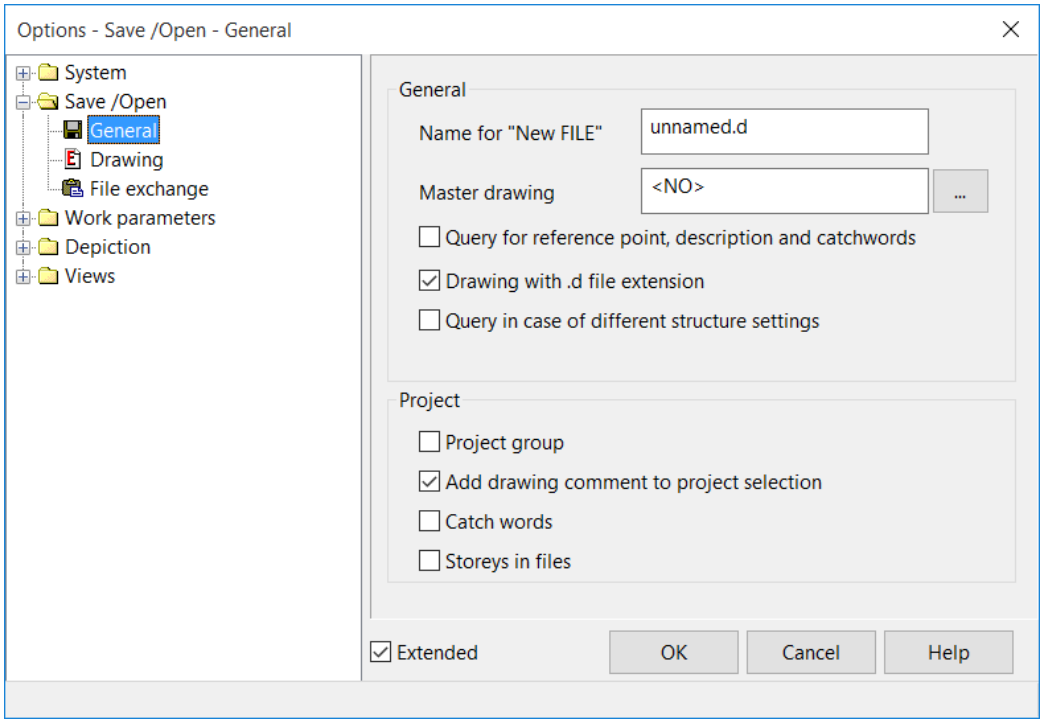
The ELITECAD standard setting for the decimal symbol is the point, or separating values the comma. Optionally the Windows regions settings could be applied. These settings are valid for all entries of coordinate values.

TIP

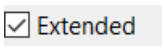
Macros always use ELITECAD standard settings.

SAVE/OPEN

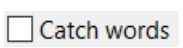
General



Extended settings



Only visible if active:



General – Name for "New file"
Name recommended for an unsaved ELITECAD file right after clicking the NEW FILE function or starting ELITECAD. This name is displayed on the title bar of ELITECAD. Using the SAVE AS function, you can change this name.

General – Master drawing
File that is automatically loaded after every NEW FILE command. All file extensions permitted in ELITECAD are also allowed here.

General – Query for reference point, description and catchwords
If this option is set, the system also prompts the user for a reference point, a description and catchwords when using "Save as". Each of these must be confirmed by pressing [Enter].

General – Drawing with .d file extension
If this check box is not ticked, the file extension is switched off in the Save dialog. The file extension *.d* is no longer recommended for ELITECAD drawings. Doing so also switches off all other possible file saving types.

General – Query in case of different structure settings
This option is only available in ELITECAD Architecture. If a drawing is opened with different structure settings, a query appears how to deal with the differences.

Project
The project options are only available in ELITECAD Architecture.

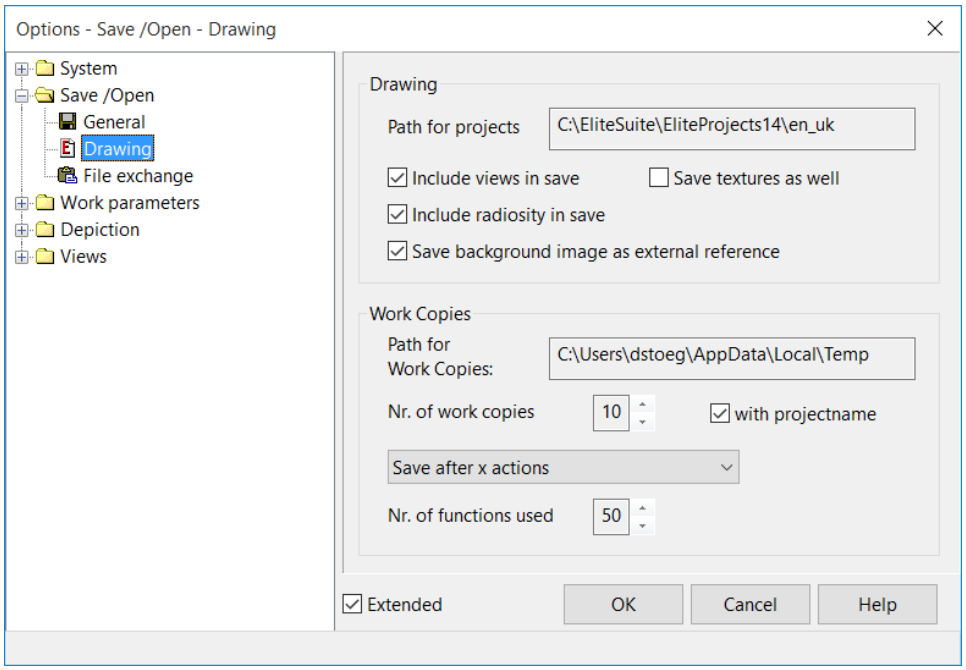
Project – Project group
To make projects more comprehensible, you can introduce project groups. These project groups can be organised by client, department or year. This can be activated in Setup under Settings or via this check box.
When this is enabled, the system creates an additional subdirectory under the drawing directory with the name of the group, and then creates a folder with the project name under that subdirectory. When using multiple workstations, they should all be configured with the same option for this setting.

Project – Add drawing comment to project selection
The standard setting is switched on.
In this state, when you read an architecture ELITECAD file that was saved with Release 12 or above, the project data is generated in the project directory. The save path is also set to the project directory.

Project – Catchwords
Adopt project name as a suggestion for entering catchwords when saving a drawing.

Project – Storeys in files
If this option is selected, when someone tries to load/activate a storey, the system prompts whether it should be loaded "for editing" or only as "reference".
For more detail, see chapter 8.3 "Working with storeys".

Drawing



Drawing – Path for projects
You can define this setting under ELITECAD configuration (WINDOWS START menu). The active state is displayed here.

Drawing – Include views in save
This parameter is only active for the SAVE AS function and makes it possible to save parts of drawings (e.g. Lib parts) without also saving all views. This reduces file size for individual parts. For the SAVE function, all views are always saved as well.
If this parameter is selected, the SAVE AS function must be confirmed with a confirmation prompt.

Drawing – Include radiosity in save
This option controls whether or not the radiosity results are saved along with the drawing. The data is not part of the drawing itself, but is stored as external references and loaded as needed.

Drawing – Save background image as external reference
This setting controls whether or not the rendered background images are saved in the views as external references. These images are then loaded as needed.

Drawing – Save textures as well
The textures are stored in a database and must not necessarily be saved along with the drawing. Then the drawing only contains the settings for the texture images, but not the data itself.
If a plan is forwarded to someone without access to the same database, such as a partner's office, it is recommended to save the textures along with the drawing.

Work copies – Path for WOCOs
You can define this setting under ELITECAD configuration (WINDOWS START menu). The active state is displayed here.

Work copies – No. of work copies (WOCOs)
Lists how many manual and automatic work copies have been created. These are numbered sequentially with numbers starting with 0 up to the specified value. The lower the number, the earlier the work copy. If the number of work copies exceeds the

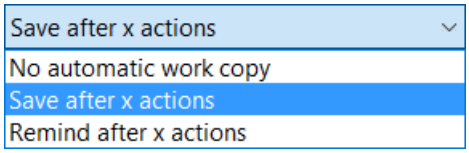
specified value when clicking "Save work copy", the oldest one is removed. If the number is too large (above 10), this slows down the saving process.

With project name
This option is only available in ELITECAD Architecture. The work copies are stored for each project when this function is selected. The name of the work copy is prefixed with the project name.

EXPLANATION

This option can lead to too many work copies amassing and taking up a large amount of memory. Periodically, work copies that are no longer needed should be deleted manually.

Work copies – Selection



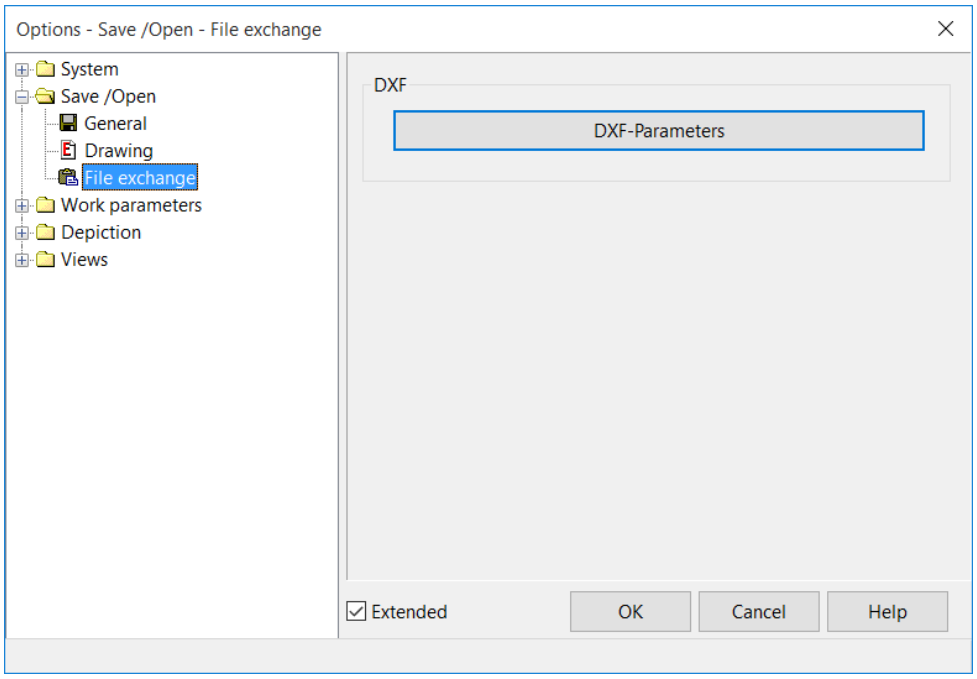
The automatic work copies are saved in the same directory as the manual work copies but have names with "woco.auto..."

Work copies – No. of functions used
When setting SAVE AFTER X ACTIONS or REMIND AFTER X ACTIONS, you can specify the number for "x".

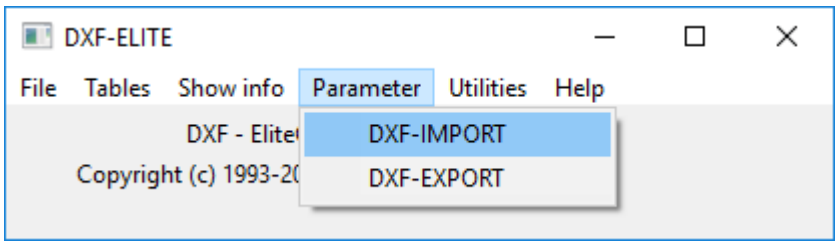
EXPLANATION

If you set "No. of functions used" to 50 that means that an auto-save or reminder will occur after 50 main functions.

File exchange



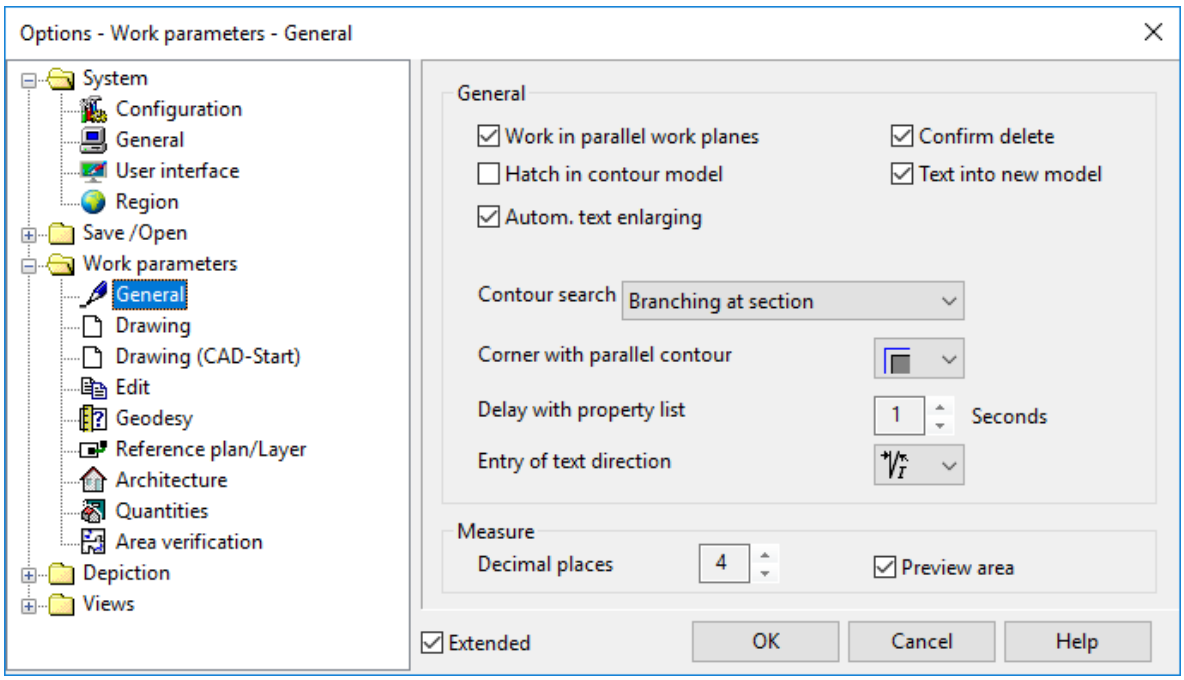
DXF parameters



This field takes you to the DXF import and DXF export parameters.

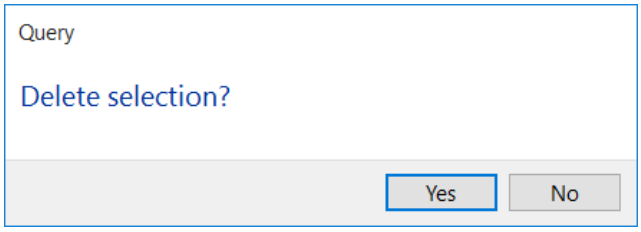
WORK PARAMETERS

General



General – Work in parallel work planes
When this option is selected, it not only takes into account elements on the current work plane (as would be the case when the option is switched off), but also elements located on work planes that are on a different height parallel to the active work plane. In the default state, capture points are found on all storeys in ELITECAD Architecture.

General – Confirm delete



When this option is selected, after you attempt to delete, a dialog window opens asking you to confirm the deletion.

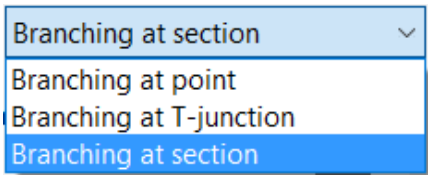
General – Hatch in contour model
This setting is only meaningful if you are working in the "V11 user interface".

The hatch is assigned to the model of the hatched contour. If the contour consists of multiple patterns, the hatch is assigned to the one pattern that shares the largest part.

General – Text into new model
This setting is only meaningful if you are working in the "V11 user interface".
The text is assigned to a new model.

General – Automatic text enlargement
Small texts are displayed enlarged during entry or when editing.

General – Contour search



Here you can specify branching mode for contour search (Measure area, Hatch).
You can use this function to specify the automatic process for a drawn contour.

Branching at point
The crosshairs move onto where the start/end points of two lines meet.

Branching at T-junction
If the start/end point of line is on another line, the crosshairs continue at this branching point.

Branching at section
If two lines cross, the crosshairs continue onto the other line.

TIP

Contour search is used for the following functions: HATCH, AUTO-HATCH, PLANES, EXTENT, PLANE FOCAL POINT AND PARALLEL CONTOUR.

General – Corner with parallel contour

The option specifies how corners are treated when generating a parallel contour.

- No other elements are added.
- Corners are added matching the existing contour.
- The corners are treated as curves whose radius corresponds to the distance of the parallel contour.

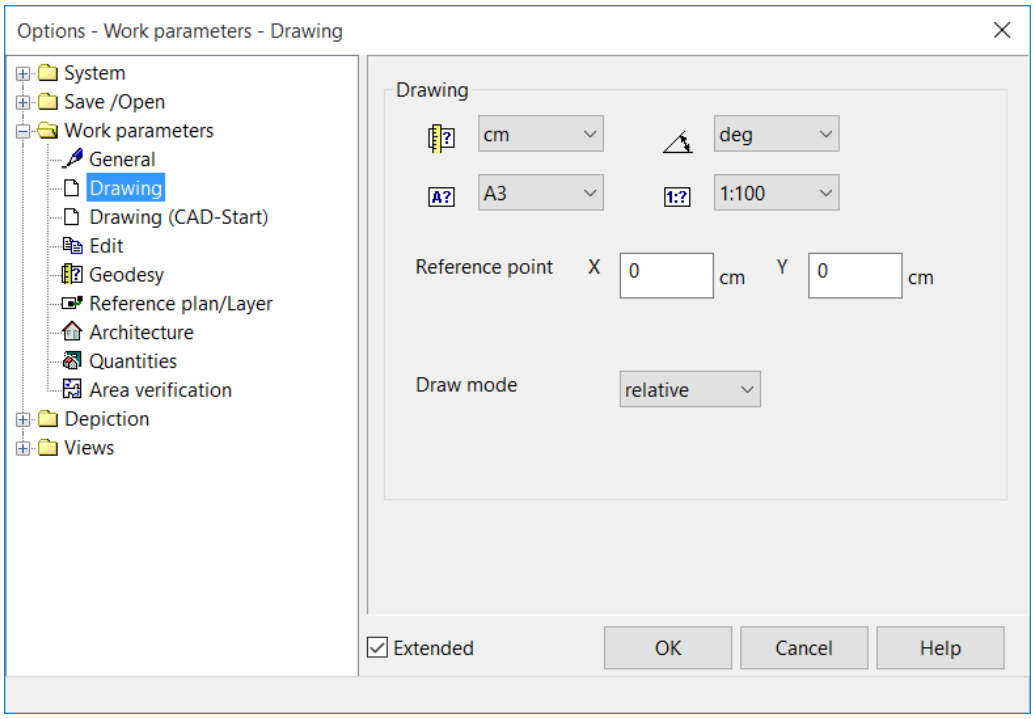
Delay with properties bar
If an entry is changed in the properties bar, the length of time specified here is how long it takes until the value is adopted.
If the "tilde character~ " is selected, the change must be confirmed by pressing [Enter].

Entry of text direction
Determines how the angle is measured for the text slant. This entry is only available for CAD character sets, not for TTF fonts.

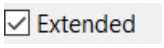
Measure – Decimal places when measuring
The output of decimal places is rounded to the specified value. Applies only to outputs. Internally, renderings use all available decimal places.

Measure – Preview area
If the MEASURE AREA function is selected, the contour in focus is highlighted.

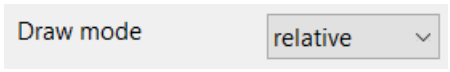
Drawing



Extended settings



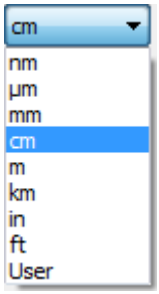
Only visible if selected.



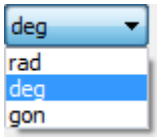
Drawing parameter(s) of active drawing

This tab displays the parameters of the active loaded drawing. If no drawing is loaded or the drawing has no saved parameters, the parameters saved in NEW DRAWING are displayed.

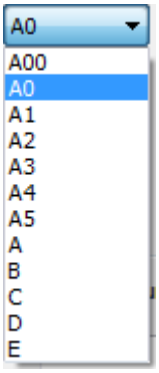
Drawing – Unit



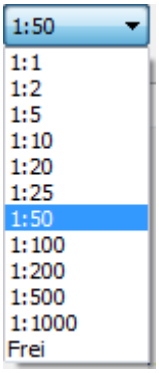
Drawing – Angle unit



Drawing – Format



Drawing – Dimension

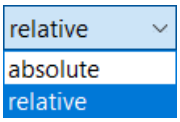


Drawing – Reference point

The X and Y values list how far the reference point is in centimetres from the start or, after NEW FILE, from the centre of the screen. This is also the absolute zero point (X=0, Y=0).

Drawing – Draw mode

(Extended setting)



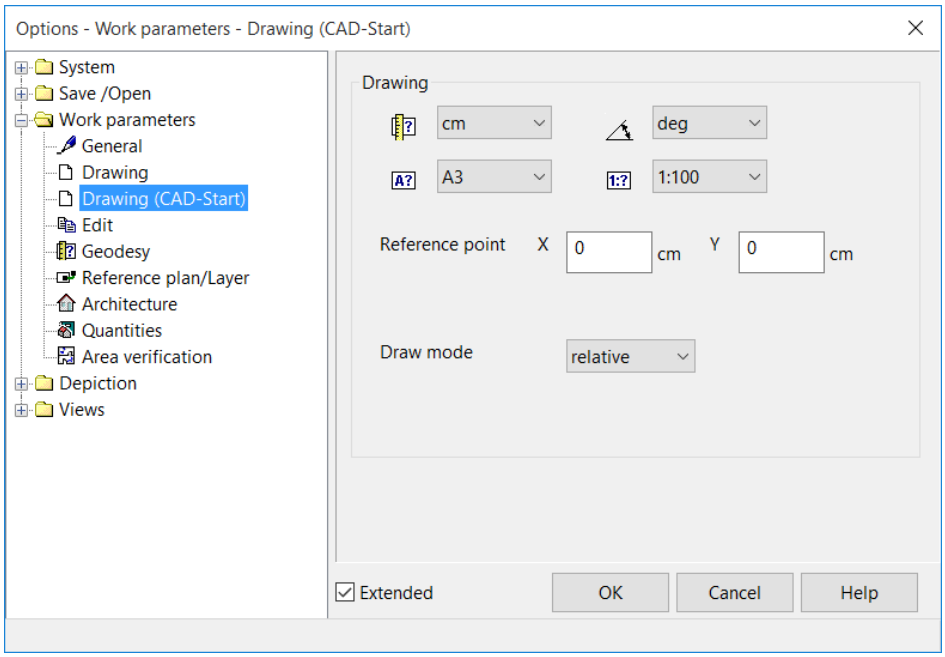
The default setting is RELATIVE. With this setting, enter all figures for a point request in the entry line *relative* to the current CAD cursor position.
With the ABSOLUTE setting, the figures you enter are always calculated based on the CAD reference point. This is normally in the centre of the screen in CAD.

TIP

You can click on the symbol adjacent to the value in the value field to switch between "relative" and "absolute".

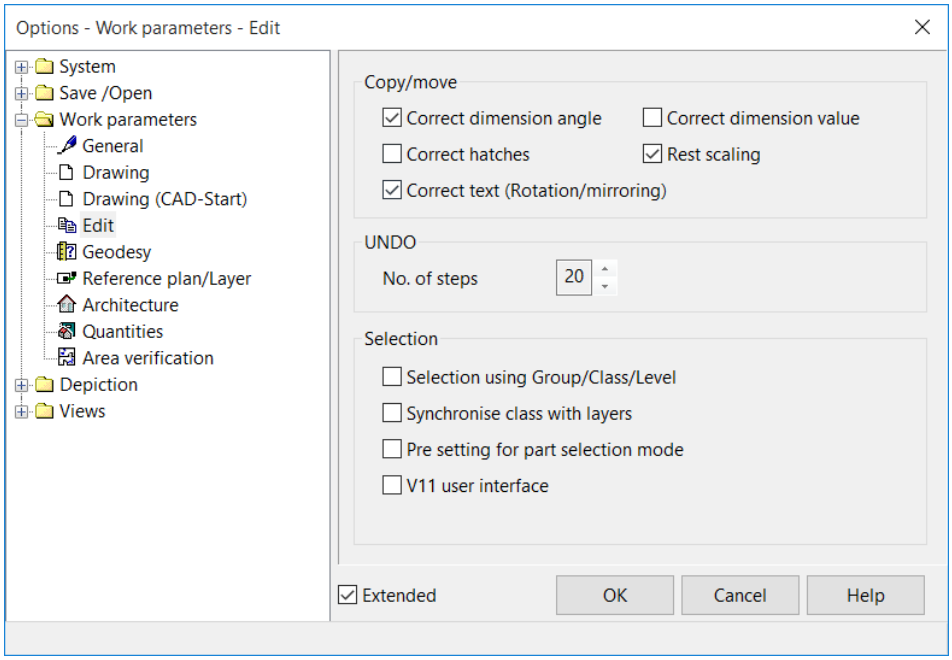
Characters for absolute
Characters for relative

Drawing (CAD start)

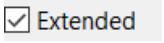


This tab displays the pre-settings. These settings take effect after NEW FILE or right after ELITECAD is launched.
The parameters are the same as those described under DRAWING.

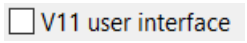
Edit



Extended settings



Only visible if selected.



Copy/move – Correct dimension angle
If this parameter is set, dimension texts are adjusted with the rotation so they are not upside-down.

Copy/move – Correct dimension value
If this parameter is set, dimension texts (single dimensions) are automatically adjusted after manipulations (move, copy, rotate, scale, etc.). The architecture dimension (chain dimension) is always adjusted automatically.

TIP

Be careful with modified dimension texts:
If dimension texts were modified, they are corrected back to the true value after manipulations.

Copy/move – Correct hatches
If this parameter is set, hatches are rotated during manipulations.

Copy/move – Rest scaling
With functions that use scaling, when REST SCALING is selected, the "rest" items are scaled (text, dimensions, arrows and hatches).

Copy/move – Correct texts (Rotation/mirroring)
If this parameter is set, texts are adjusted with the rotation so they are not upside-down. In keeping with the standard, the check box must be selected so that texts are always represented visibly.

Undo – No. of steps
Can be configured between 0 and 100 %. As increasing the number of steps also increases the number of saved operations; this number also has an effect on performance depending on the hardware.

Selection – Selection using Group/Class/Level
If this check box is ticked, you can work with the full organisational scheme. If the drawing is structured using layers, the option should not be selected.

TIPP

We recommend no changing of the presets in ELITECAD Architecture.

When this is selected, the organisational structure of the active model is displayed in the status bar on the bottom right. (M: G: C: L:)

The "Selection" toolbar displays the ACTIVATE MODEL and NEW MODEL functions and the selection mode for model, group, class and layer.

Selection – Synchronise class with layer(s)
This function is important for carrying over plans from version 9.2 or earlier.
When this option is selected, the classes are linked with the layer. The layers have the same names as the classes. The option should be selected if you are working with plans from version 9 and have used the plan filter.

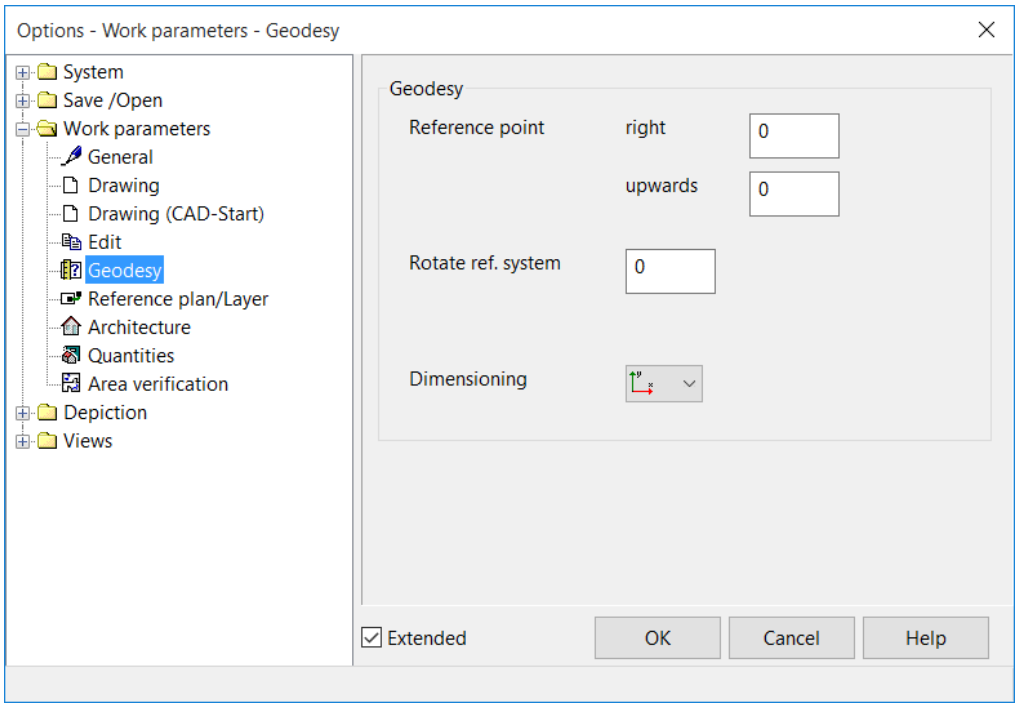
Selection – Pre-setting for part selection mode
When it is selected, the "Selection mode for part" is selected, if the "V11 user interface" is activated.

Selection – V11 user interface
If this option has been selected, you can use the same user interface as in version 11.

Selection – De-activate object lock
The option is only available if the "V11 user interface" check box is ticked.

If the object lock is deactivated, the architectural or mechanical objects are no longer protected from manipulations that destroy the objects, such as the DELETE SECTION function.

Geodesy

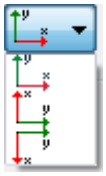


Geodesy – Reference point alignment right
The value you enter here is taken into account in the COORDINATES OF POINT function and all specified coordinates.

Geodesy – Reference point alignment upwards
The value you enter here is taken into account in the COORDINATES OF POINT function and all specified coordinates.

Geodesy – Rotate ref. system
The value you enter here in degrees is taken into account in the COORDINATES OF POINT function and all specified coordinates.

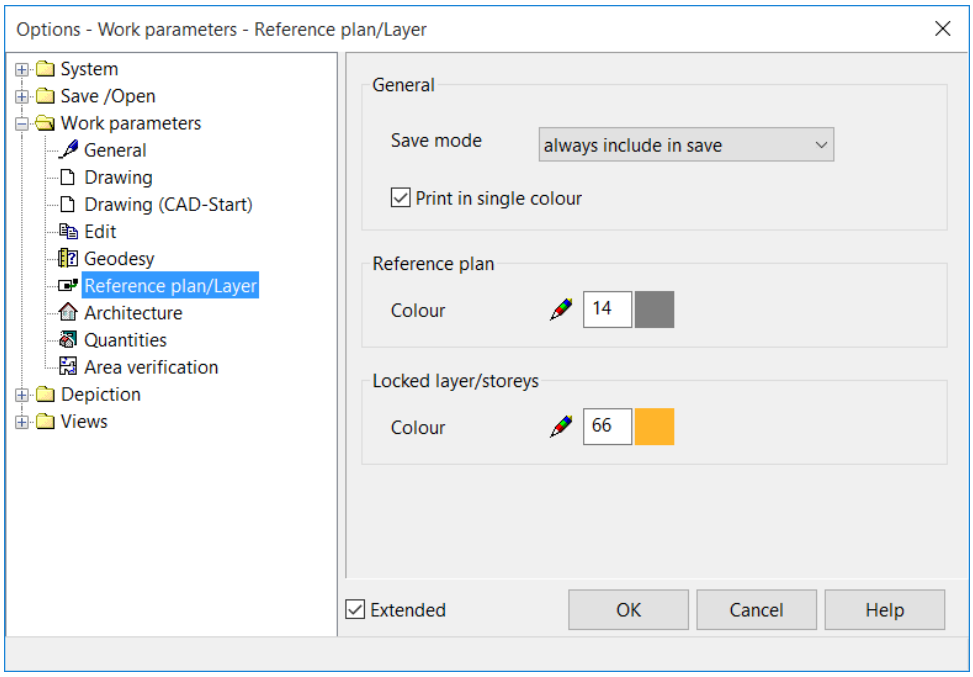
Geodesy – Dimensioning coordinates



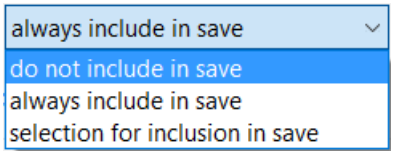
Y: upwards, X: rightwards

The first coordinate for entry and output is the X-value, and then comes the Y-value. Positive X upwards, Y rightwards
The first coordinate for entry and output is the Y-value, and then comes the X-value. X: downwards, Y: rightwards
The first coordinate for entry and output is the X-value, and then comes the X-value. Here, the positive x-axis points downward.

Reference plan / layer



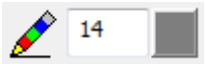
Storage mode



Behaviour of reference plan when saving. With "selection for inclusion in save", a query appears.

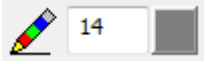
Print in single colour
Behaviour of reference plan when printing.

Colour of reference plan



Specifying pen colour for reference plan.

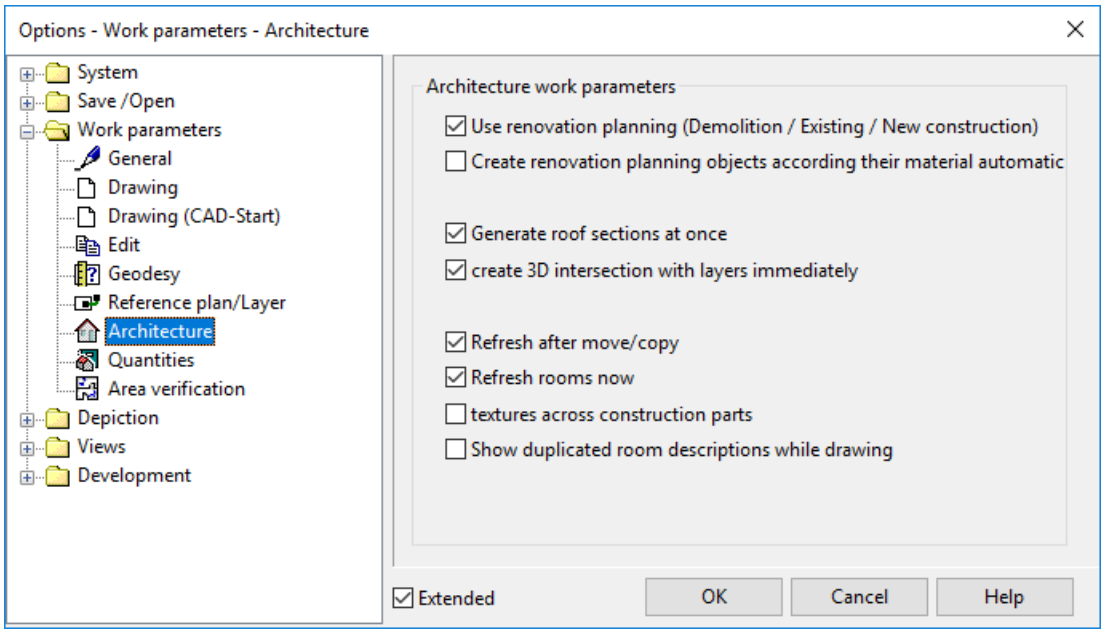
Colour of blocked layer/storey



Specifies the pen colour of the locked layer and locked storeys (only in ELITECAD Architecture).

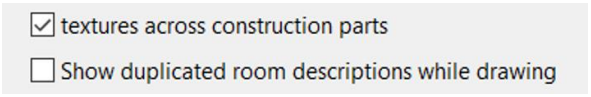
Architecture

This option is only available in ELITECAD Architecture.



Extended settings

Only visible if selected.



Architecture work parameters – Use renovation planning
This setting is the main switch to activate renovation planning. Only if the option is active, the objects may be assigned to a renovation planning state and the assembly filter for the states can be used.

Architecture work parameters – renovation planning objects according material
Some renovation planning objects are created automatically (e.g. filling walls for demolished windows). You can select the depiction mode for these new objects, which is done either coloured using the defined depiction parameters of the states or according to the material settings of the representation levels.

Architecture work parameters – Generate roof sections at once
Deselecting this reduces the processing needed and increases performance. The update can be made later using the REFRESH AR-OBJECTS function.

Architecture work parameters – Create 3D intersection with layers immediately
Deselecting this reduces the processing needed and increases performance. You can refresh this later via the menu item REFRESH AR-OBJECTS.

Architecture work parameters – Refresh after move/copy
Deselecting this reduces the processing needed and increases performance. You can refresh this later via the menu item REFRESH AR-OBJECTS.

Architecture work parameters – Refresh rooms now
If this option is deactivated, the rooms are not automatically adjusted if the walls around the rooms change. You can refresh this later via the menu item LAY-OUT > REFRESH ROOMS.

Architecture work parameters – Textures across construction parts
If this option is selected, all construction parts are given the same texture so that no textural transition is visible between storeys or at the meeting points of walls.

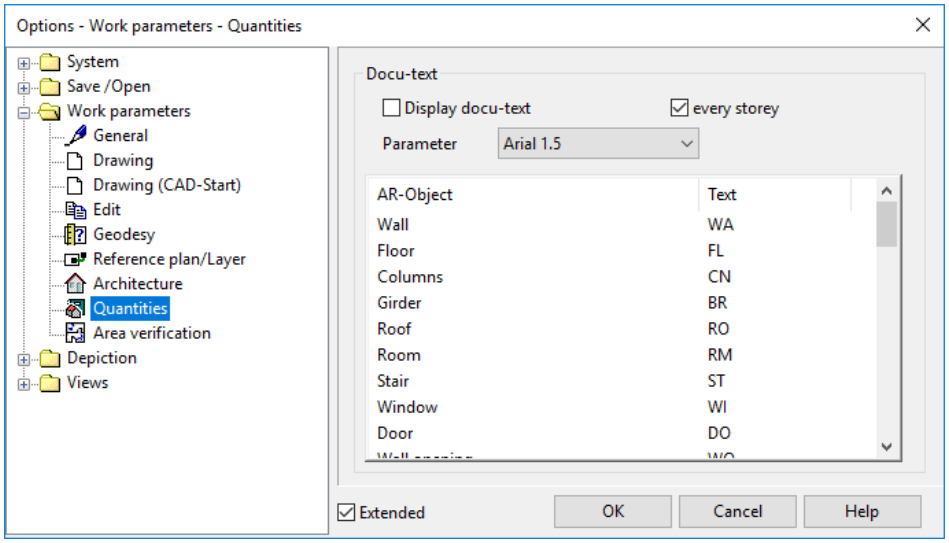
TIP

This option should be deselected for larger projects for the sake of quicker processing. This is not necessary for an EFH or for smaller objects.

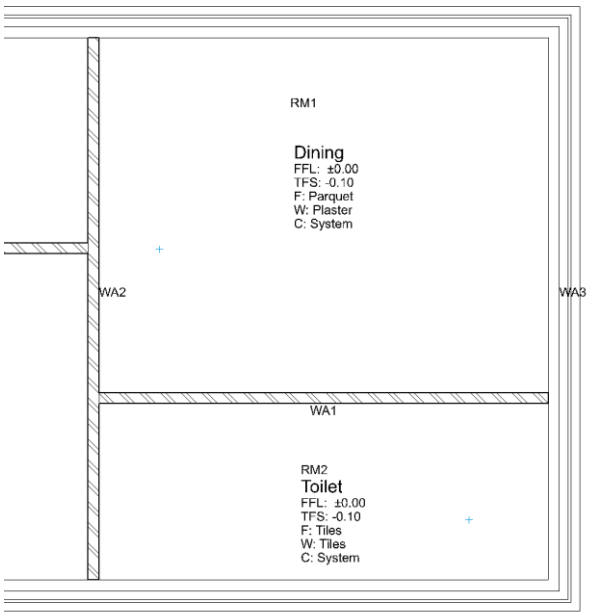
Architecture work parameters – Show duplicated room descriptions while drawing
This option helps the person drawing avoid creating room contours that are no longer closed when performing manipulations in the floor plan.

Quantities

This option is only available in ELITECAD Architecture.



Quantities – Display docu-text
When this is selected, an additional text is written into the plan for all architecture objects following the SUMMARY TO PROJECT BOOK function. The name consists of an architecture object abbreviation and a serial number.
For example, WA1, etc. Wall Number 1, RM1, etc. Room Number 1, etc.



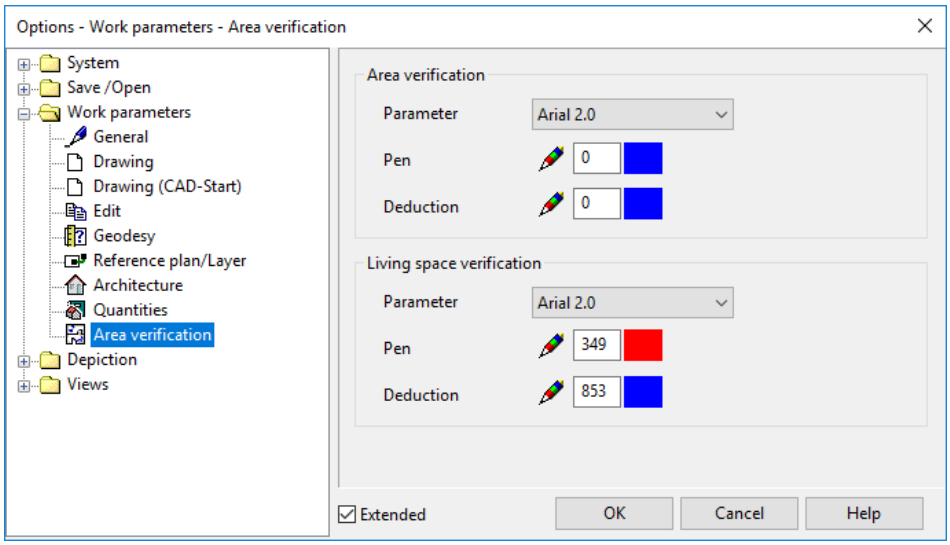
General – By storey
The assignment of docu-texts can be defined for each storey.

General – Parameters
Text parameters for the docu-text.

General – AR-object | Text
This table can be used to define the assignment of abbreviations to architecture objects. You can enter the abbreviations in the text fields.

Area verification

This option is only available in ELITECAD Architecture.

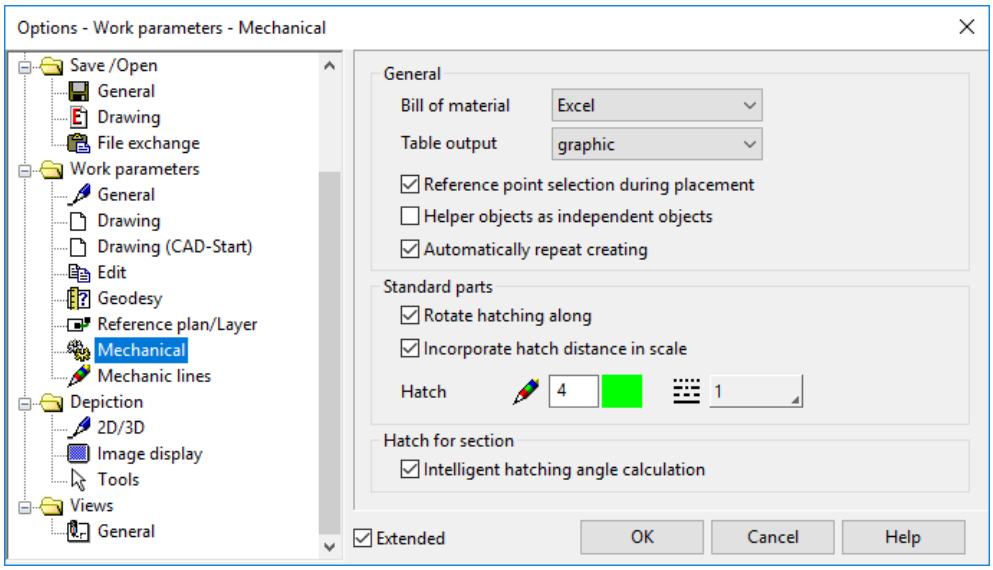


Plane(s) verification
Settings parameter for the area verification that is generated using the AREA VERIFICATION function in the EXTRAS menu > QUANTITIES.

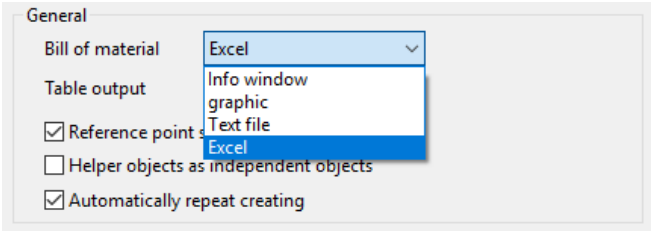
Living space verification
Settings parameter for the living space verification that is generated using the LIVING SPACE VERIFICATION function in the EXTRAS menu > QUANTITIES.

Mechanical

These options are only available in ELITECAD Mechanics.



Mechanical – General – Bill of material



With ELITECAD, you currently have four possibilities to generate a bill of material.

- **Info window**
  Bills of material in the info window are used for a quick check of the entries and assigned attributes. Information printed in the info window are replaced by the subsequent output into the info window like object information.

- **Graphic**
  A bill of material can be positioned into your ELITECAD drawing using the snap functions. A subdivision point is queried which is used to split long lists and the second part could be positioned on a different position. Use the [Esc] key in order to undo a split or positioning operation. The positioning operation of the bill of material is completed with the [Enter] key.

Calling the bill of material function once again allows modifying later. The complete bill of material can be selected with the mouse and repositioned with the manipulation function or it can be deleted with by selecting and pressing the [Del] key.

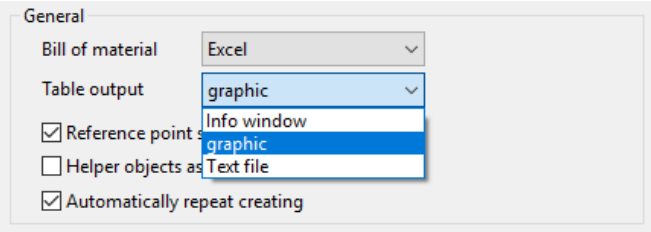
Bill of material drawings *(<ELITECAD installation path>\u\<version>\me \glob\l\table\bom_def_standard.d* and *bom_tail_standard.d*) can be adjusted to your needs. These ELITECAD files define the layout of the bill of material by the drawn geometry, the elements (pen/line type) and texts (size, colour, reference point, etc.).

- **Text file**
  After having defined the file name for the bill of material, it is opened with an editor (Notepad) for checking.

The bill of material definition file (<*ELITECAD installation path*>\u\<*version*>*me**glob**dflt**mecha.bom*) can be adjusted with a text editor.

- **Excel**
  See chapter 12.3: Creation of bill of materials, section Excel.

Mechanical – General – Table output



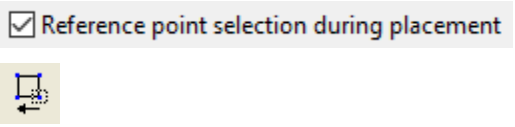
With ELITECAD, you currently have three possibilities to display calculation results and other data.

- **Info window**
  Data is displayed in the info window for quick checks.
- **Graphic**
  Data is positioned as a table into the drawing.
- **Text file**
  Data is written into a specified ASCII-file

This setting is valid for the output of following tables:
- Tolerance table
- Fittings table
- Result of the calculation of the moments if inertia
- Result of the calculation of the area

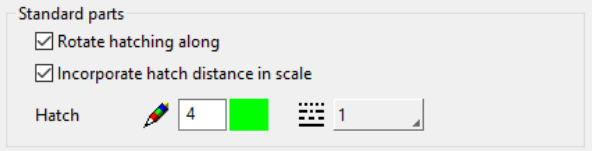
These options have no influence to the results of the measure functions.
The results are always displayed in the CAD info window.

Mechanical – General – Reference point selection during placement



Mechanical – General – Helper objects as independent objects

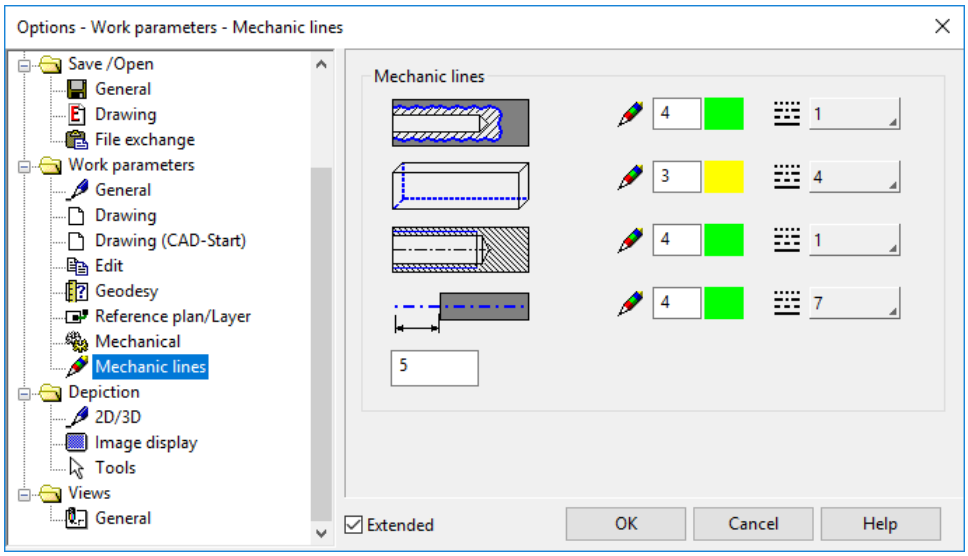
Mechanical – Standard parts



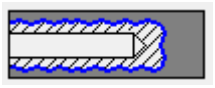
In diesem Teil der Maske können Einstellungen über das Verhalten von Normteilschraffuren bei Manipulationsfunktionen sowie Stiftfarbe und Linientyp getätigt werden.

Mechanic lines

These options are only available in ELITECAD Mechanics.



Mechanic lines – break lines

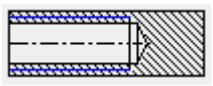


This is the setting for the line parameters pen and line types for the depiction of break lines of partial sections and detail cut-outs.

Mechanic lines – hidden lines

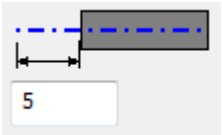
This is the setting for the line parameters pen and line types for the depiction of hidden lines of invisible component contours.

Mechanic lines – thread lines



This is the setting for the line parameters pen and line types for the depiction of thread lines of standard parts.

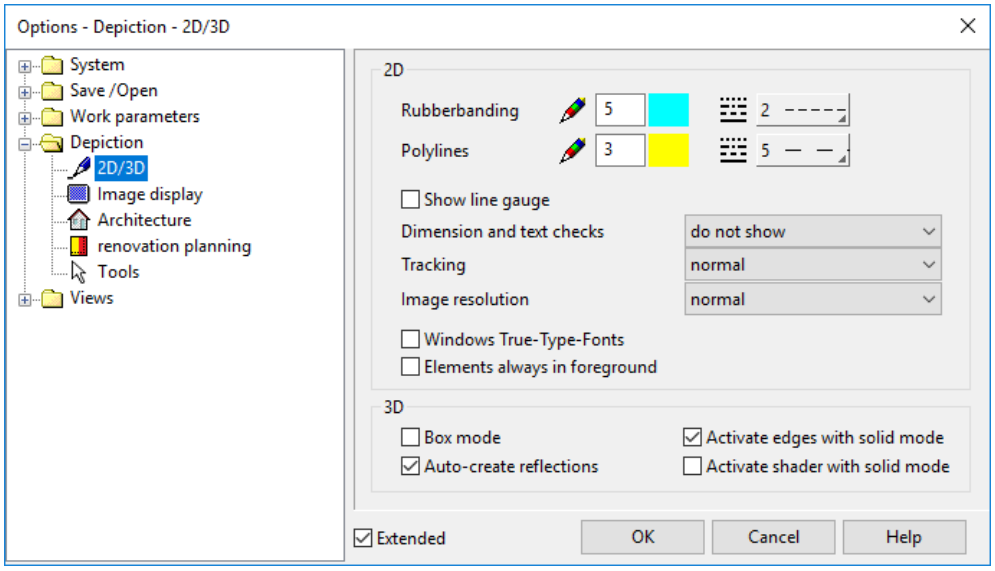
Mechanic lines – centre lines



This is the setting for the line parameters pen and line types for the depiction and the extent over the component boundaries for centre lines of rotational objects and circle centre lines.

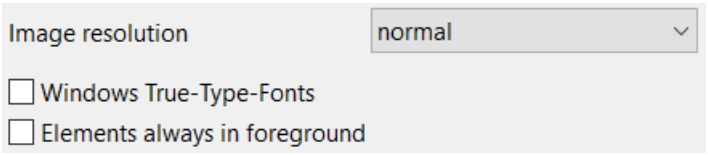
Depiction

2D/3D



Extended settings

Only visible if selected.

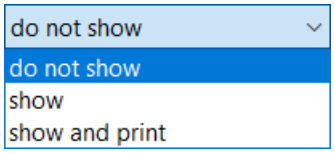


2D – Rubberbanding
This is where you specify the pen and line type for rubberbanding (an elastic band attached to the cursor).

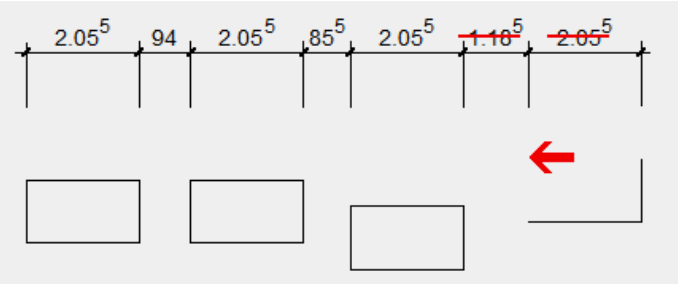
2D – Polylines
This is where you specify pen and line types for representing the lines (e.g. for selection with block/section functions).

2D – Show line gauge
On screen, the line gauge is represented according to the width for each pen in the colour settings.

2D – Dimension and text checks



In order to determine whether linear dimensions no longer possess any association, this can be displayed optically. The depiction uses red arrows and highlights the dimension text in red. A red arrow means that the point at which the dimension was set has lost its association and no longer matches the represented size.



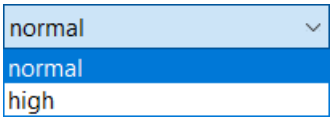
2D – Windows True-Type-Fonts
(Extended setting)
TTF ELITECAD texts are selected and depicted with real Windows True Type Fonts. Otherwise, there is an approximate depiction.

2D – Elements always in foreground
(Extended setting)
If the option is inactive (default setting), the individual object's visibility is controlled by the sort order.
If this option is selected, elements, texts, line hatches, dimensions and arrows are always represented before the infill hatch no matter the sequence of the objects.

EXPLANATION

As the control of foreground/background was not available in versions before V11, this option is set automatically if you load plans from versions before V11 in order to prevent the plan image from changing. If a new drawing is open, the check box is automatically reset again.

2D – Image resolution



This function is used to convert monochrome bitmaps into greyscale.
Once you switch to high quality, all monochrome bitmaps are represented in greyscale. Likewise, upon switching to normal quality, they are represented in monochrome.

TIP

For colour images, the IMAGE RESOLUTION function does NOT have an effect, as colour images are always represented in high quality. If there are both monochrome and colour images on the screen, the monochrome images are NOT converted either.

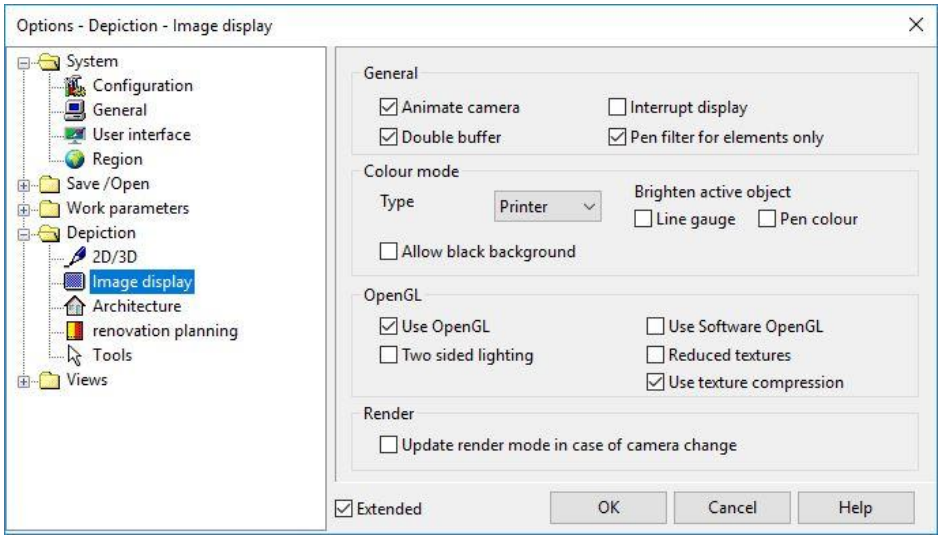
3D – Box mode
Using the "3D – Box mode" check box, you can depict a box outlining a part instead of its exact 3D depiction. This drastically accelerates image assembly.
The only objects represented as a 3D-encasing box are those that are predefined by selecting them and pressing [Ctrl]+[Num]. You can remove this depiction type from the current selection by pressing [Ctrl]+[Num].

3D – object reflections automatically
When the shader technology is switched on and the option is active, the object reflections are automatically calculated or updated.

3D – Activate edges with solid mode
If you switch to solid mode, the edges are automatically activated.

3D – Activate shader with solid mode
If you switch to solid mode, the shader technology is automatically activated.

Image display



Extended settings

☑ Extended

Only visible if selected.

☐ Use OpenGL

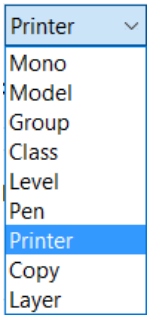
General – Animate camera
If you move the rotated design model back to its starting position using the IMAGE START POINT function, the camera is shifted gradually, not jerkily.

General – Interrupt assembly
The "Interrupt assembly" parameter cancels the image assembly as soon as a new image assembly becomes necessary due to a modification (zoom, move, change window size, etc.). This speeds up the system, as that way an individual image assembly is not carried out completely before being overwritten anyway.

General – Double buffer
The "Double buffer" check box only takes effect in combination with OpenGL. This is normally always switched on and enables smooth, dynamic rotation in 3D without jerky movements.

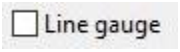
General – Pen filter for elements only
When this check box is selected, the pen filter (View > Pens...) only applies to elements, but NOT to dimensions, hatches or arrows.
The selected pen filter is only used for the image view but not for manipulation functions.

Colour mode – Type
Default colour mode setting for ELITECAD start or in *New file*.



For an explanation, see Colour mode.
For "Printer" colour mode, the option ALLOW BLACK BACKGROUND also appears. For the "Model, Group, Class, Layer" colour modes, the colours can be specified.

Colour mode – Highlight active object by
The active (current) object/model can be highlighted in two different ways in order to make it better distinguishable from others.



It is displayed brighter (greater line width) than all others.

It is depicted with the pen colour in the colour mode "Mono". In other colour modes, this option is not recognizable very well.

Colour mode – Allow black background
When switching the background colour, switching to black is prevented, in case also lines are displayed in black. If this option is active, then this combination is permissible.

OpenGL – Use OpenGL
On by default. If this check box is deselected, the GDI graphic display is always used except in solid mode.

OpenGL – Two sided lighting
Off by default. In this state, ELITECAD takes over rendering of lighting.

OpenGL – Use OpenGL
(Extended setting)
In rare cases, if there is an error when rendering with the graphic/video card, it may be necessary to select this check box. Then ELITECAD takes over rendering images. However, this leads to worse performance.

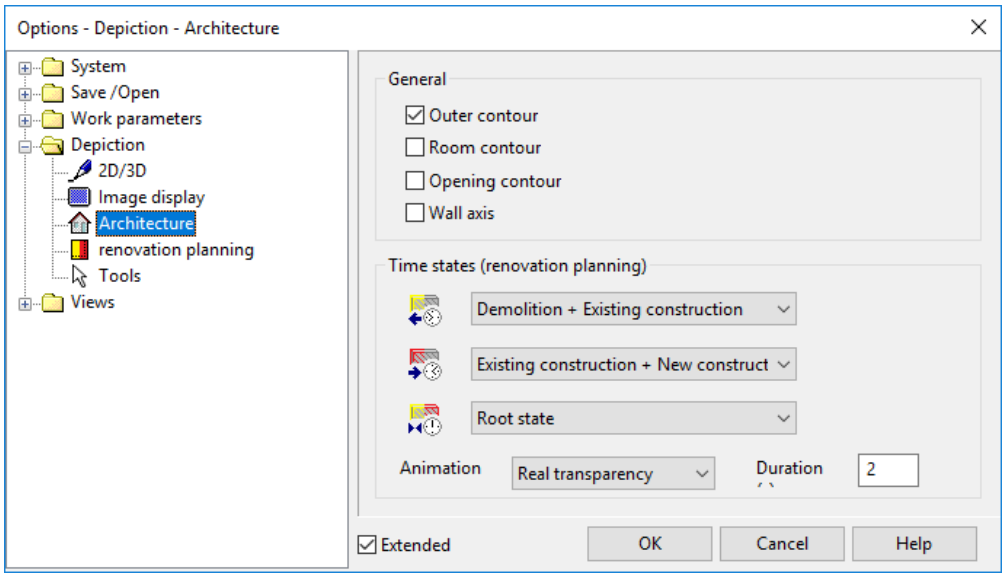
OpenGL – Reduced textures
Texture images with large amounts of data can be represented in OpenGL with reduced quality in order to save memory and rendering time.
This option controls whether or not high-resolution textures are to be used.

OpenGL – Texture compression
Texture compression is a procedure for reducing the storage need of textures. This also carries a benefit in terms of speed.

Render – Update render mode in case of camera change
If this option is selected, rendering is automatically restarted after each change to the camera (zoom, rotate). When it is deselected, the design model is restored to the solid depiction and rendering must be re-triggered manually.

Architecture

This option is only available in ELITECAD Architecture.



General – Outer contour
Show or hide outer contours.

General – Room contour
Show or hide room contours.

General – Opening contour
When the opening contour is selected, the floor plans of window openings, doors and wall openings are displayed as graphical aids.

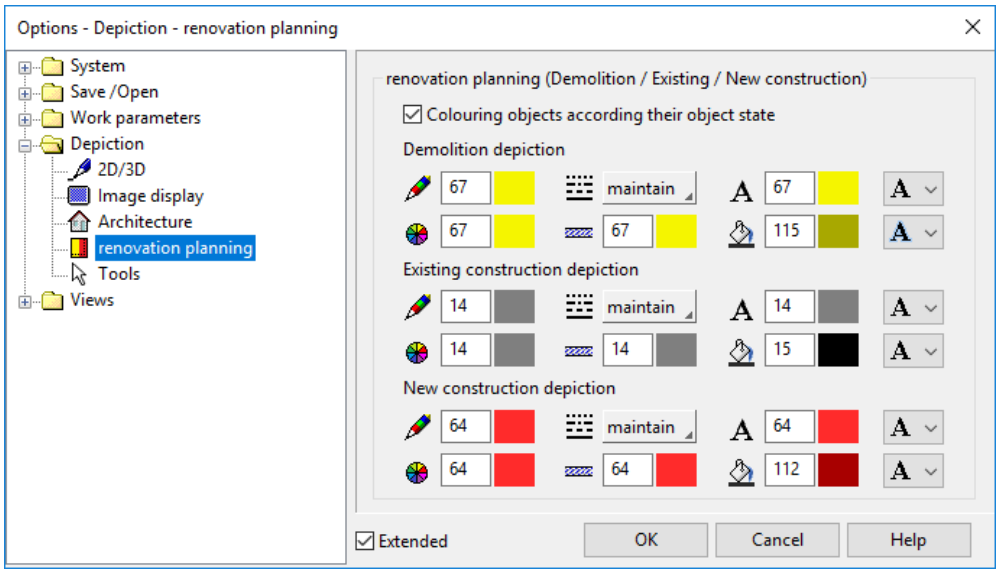
General – Wall axis
Show or hide wall axis. Switching on wall axes helps connect two walls. The axis is represented in blue pen.

Time states (renovation planning) – Visibility filters
Three time states are configurable: Before or after the renovation, as well as a working state. Switching is possible via functions in the RENOVATION PLANNING toolbar.

Time states (renovation planning) – Animation
The change between two time states can be animated with simple and good transparency quality. The duration of the animation is set in seconds.

Renovation Planning

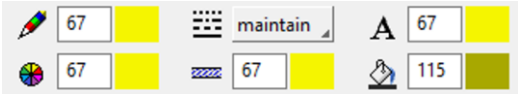
This option is only available in ELITECAD Architecture.



Object colouring

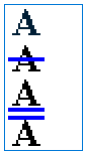
The depiction of objects is done either coloured with the defined depiction parameters of the states or according to the material settings of the representation levels.
For each of the states demolition, existing and new construction the same colours, line type settings and text options available.

Colour settings

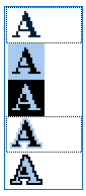


You can select the colour for lines, 3D surfaces, texts, line hatches and filling hatches. The line type remains or is overwritten.

Text settings

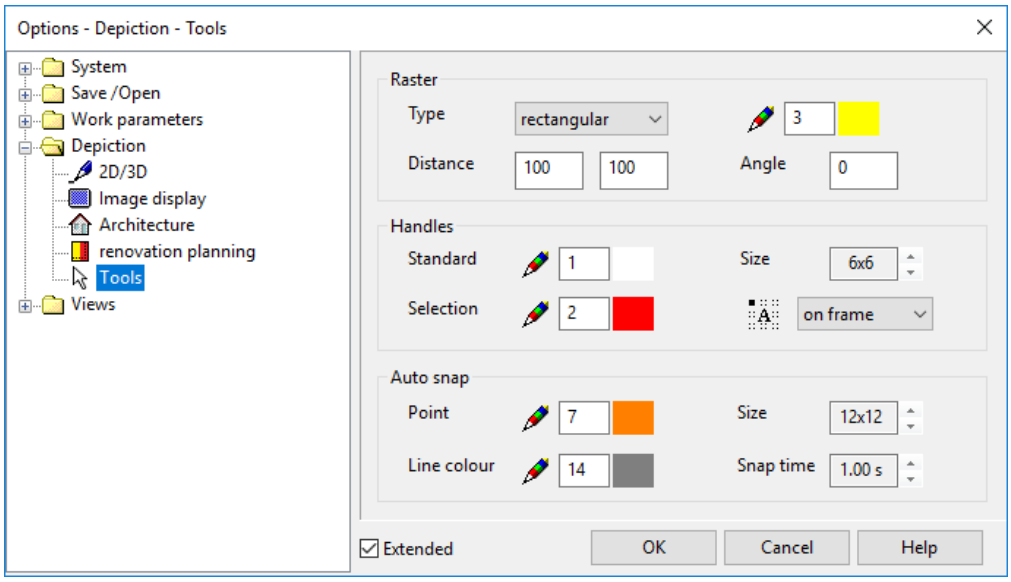


Texts may remain unchanged or are underlined, crossed out or over lined.

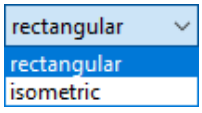


The background of texts may remain unchanged or is depicted with a fill colour or inverted. It may also be depicted with a borderline or inverted with borderline.

Tools



Grid – Type



This function specifies the grid type.

Grid – Pen

Pen colour of grid.

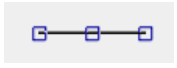
Grid – Distance

The first value matches the point distance of the grid in the X-direction.
The second value matches the point distance of the grid in the Y-direction in terms of the configured units.

Grid – Angle

The value specifies the desired angle of the grid.

Handles – Standard

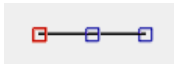


Pen colour of handles.

Handles – Size

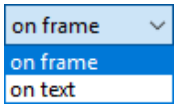
The size of the handles can be configured from 3x3 pixels up to 10x10.

Handles – Selection



Pen colour of a selected handle.

Handles – Text:



Specify the position of text handles here. If the option is set to "on frame", the handles have a specific distance from the text. For the ON TEXT option, the handles are directly on the text.

AUTOcapture mode – Point colour
Specify the pen colour of temporary capture points here.

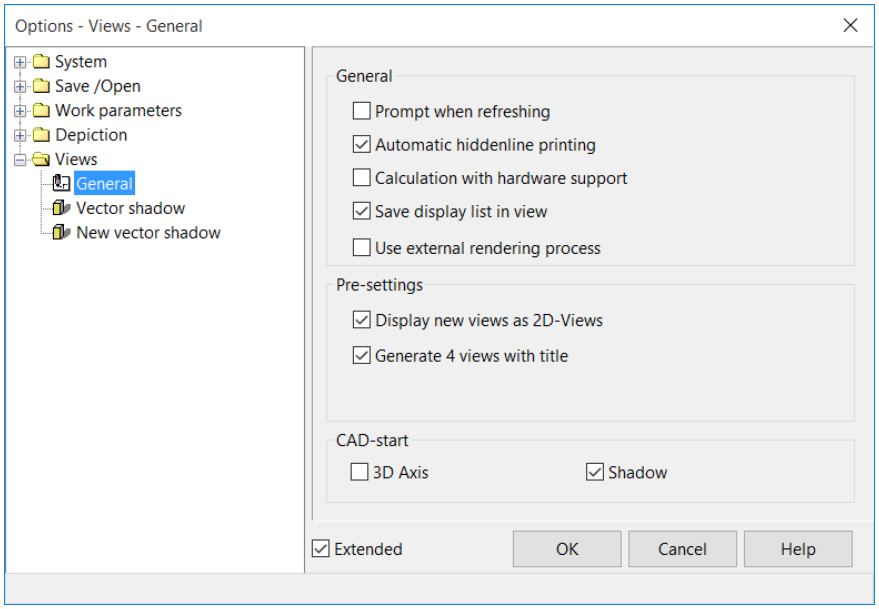
AUTOcapture mode – Size
The size of the temporary capture points can be configured to be from 10x10 up to 20x20 pixels.

AUTOcapture mode – Line colour
Pen colour of temporary help lines.

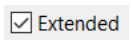
AUTOcapture mode – Snap time
If you hover over a point with the cursor, it take the length of time specified here until the temporary capture point is shown.

Views

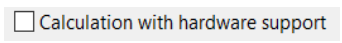
General



Extended settings



Only visible if selected.



General – Prompt when refreshing
If this is selected, the user will be prompted upon changing into a view whether it should be refreshed.

General – Automatic hiddenline printing
Automatically renders a hidden line depiction when calling up the printer. Otherwise, the printout will match the representation on the screen.

General – Calculation with hardware support
(Extended setting)

When this is selected (default setting), the graphics hardware is used for various renderings. This raises performance when using hidden lines, views where shadows are cast or views with intersection lines.
In rare cases, if there is an error when rendering with the graphic/video card, it may be necessary to deselect this check box. Then ELITECAD takes over rendering. However, this leads to losses in performance.

General – Save display list in view
When this is selected (default setting), information from individual views is kept in the RAM and facilitates switching more rapidly between the different views. If there is not enough memory for specific drawings, this option can be deselected.

General – Use external rendering process
If there is a large number of render graphics in high resolution, it may be the case that the RAM becomes fragmented and is no longer fully available after a period. As such, the render graphics can no longer be rendered. To circumvent this, the external render process may be used. However, only activate this option if necessary.

Pre-setting – Display new views as 2D-Views
When this option is selected, (unchanged views) are inserted as the VIEW type into the plots.
When this option is **de**selected, (unchanged views) are inserted as the DESIGN MODEL type into the plots.
This way you can define the basic way that views that have not been changed are inserted into the plots.

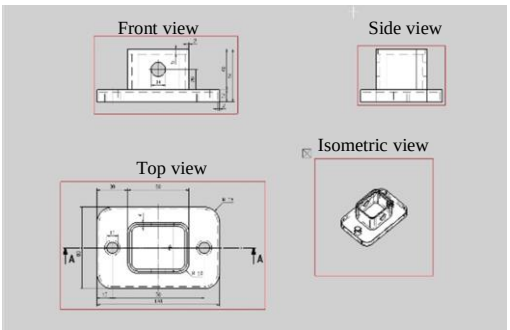
Pre-setting – Generate 4 views with title
If 4-views are inserted into a plot, a title is displayed above each view.
The following views are inserted when inserting "4-views":
Top view
Isometric view
Side view left
Front view

CAD-start – 3D axes
If this option is selected, the 3D axes are selected after NEW FILE or after ELITECAD is launched.

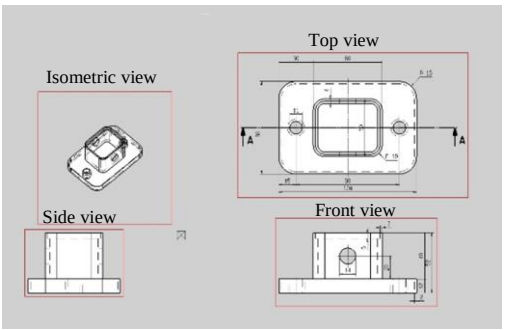
CAD-start – Shadow
If this option is selected, the drop shadow in solid mode is selected after NEW FILE or after ELITECAD is launched.

Pre-setting - 4 views according to ISO/ANSI
This setting is only available in ELITECAD Mechanics and defines according to which standard the four views are inserted into a plot view.

ISO

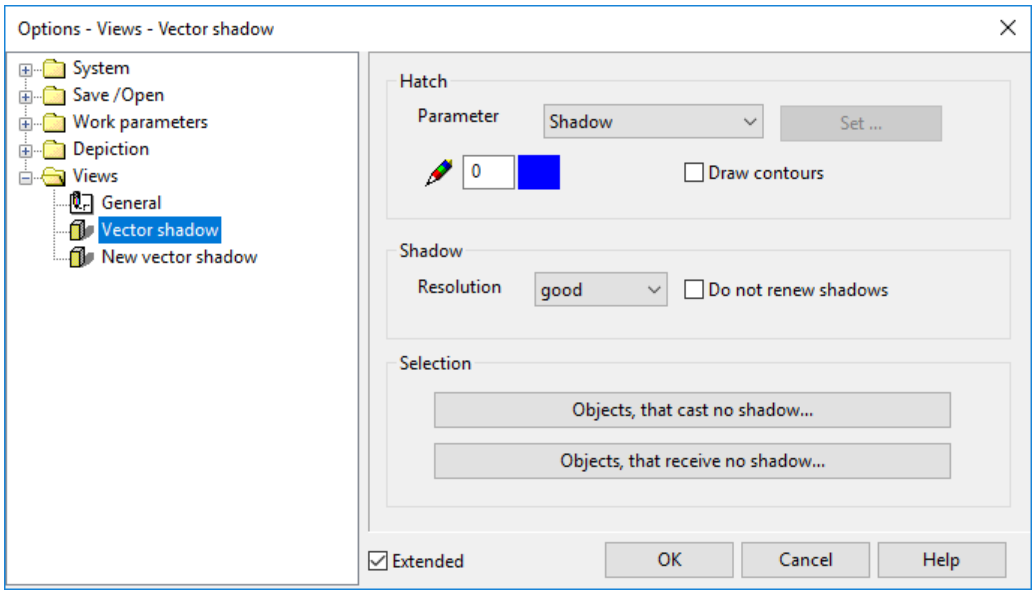


ANSI



Vector shadow

This option is only available in ELITECAD Architecture.



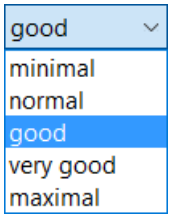
Vector shadow parameters for the active drawing
This tab displays the parameters of the active loaded drawing. If no drawing is loaded or the drawing has no saved parameters, the parameters saved in NEW VECTOR SHADOW are displayed.
To modify the settings, you must save them by clicking OK.

Hatch – Parameter
Selection of a hatch parameter with which the shadow will be filled.

Hatch – Pen
Pen colour in which the shadow contours will be drawn if the "Draw contours" check box is selected.

Hatch – Draw contours
Select or deselect drawing the shadow contours.

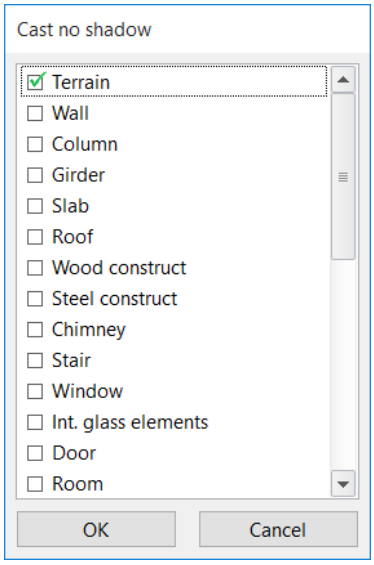
Shadow – Resolution



Resolution	Details	Calculation time
minimal	few	small
normal	↓	↓
good		
Very good		
maximal	all	large

Shadow – Do not renew shadows
Off by default. When off, the shadow is always re-rendered, which may require more or less time depending on the drawing's size. By selecting this, you can suppress shadow rendering. An existing shadow is retained.

Selection – Objects that cast no shadow



The window displays a selection of available layers.
When a layer is selected, a shadow is not rendered from any objects assigned to that layer.

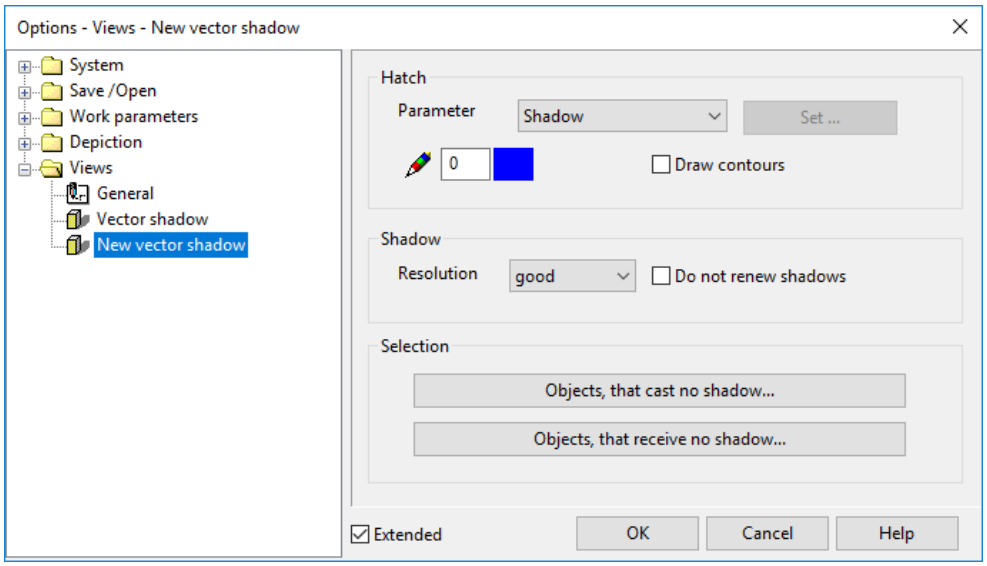
TIP

When rendering the vector shadow in the presence of terrain, the OBJECTS THAT CAST NO SHADOW check box should be selected for the terrain. This saves rendering time.

Selection – Object that receive no shadow
The window displays a selection of available layers.
When a layer is selected, a shadow is not rendered onto any objects assigned to that layer.

New vector shadow

This option is only available in ELITECAD Architecture.



This setting displays the pre-settings. These settings take effect after NEW FILE or right after ELITECAD is launched. To modify the settings, you must save them by clicking OK.
The parameters are the same as those described under VECTOR SHADOW.

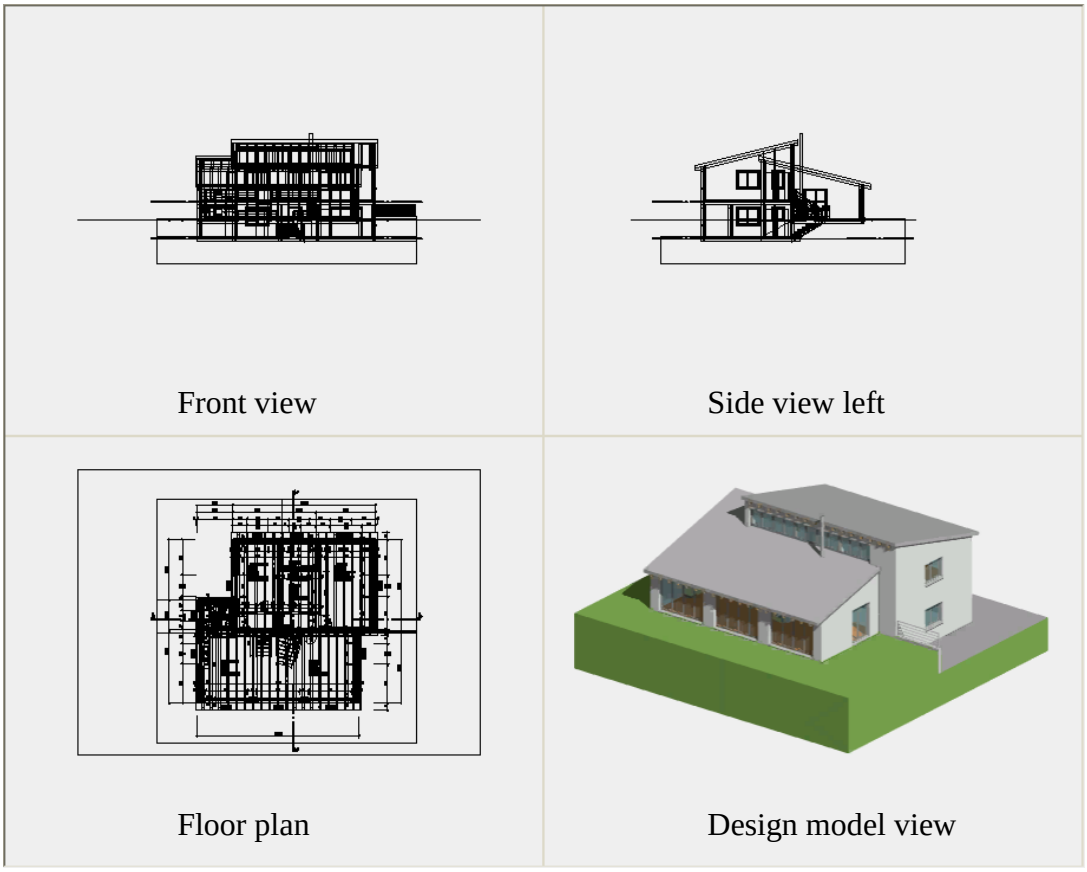
2.3 CAMERA

	*Modify toolbar
	View menu > Camera

The dialog window is used to set the current camera.

4-VIEW WINDOW

The camera is set up in the 4-view window. If the camera dialog window is open, only the camera symbol can be clicked in CAD. CAD objects cannot be selected or manipulated.
The depiction of the design model view can be controlled separately. If you right-click in this area, a menu opens where you can select how the design model view should be represented. This is also true for the other views, as they are interconnected.



Front view | Side view left

Floor plan | Design model view

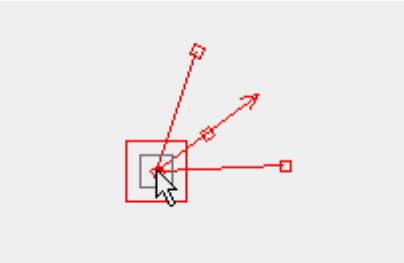
TIP

The depiction of the standard view should be in the wire model, if possible, as this speeds up image assembly.

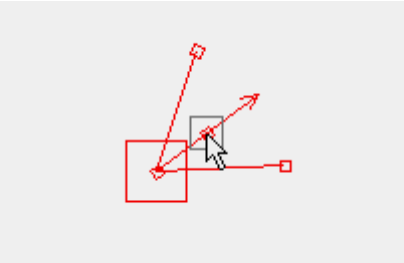
Using camera in the 4-view window

There are various handles available, which you can use to manipulate the camera interactively while holding down the left mouse button.

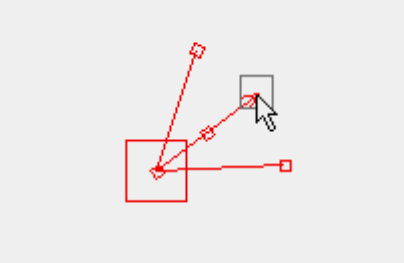
Modify position of camera | Move camera

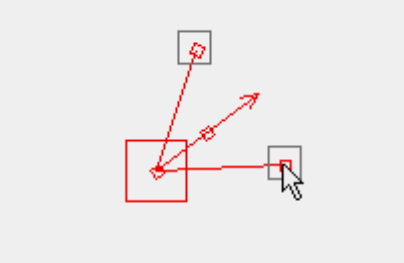


Modify direction of camera

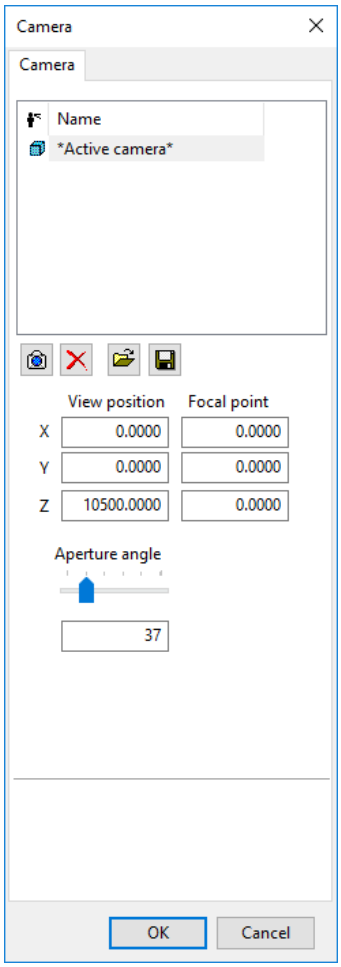


Modify opening angle of camera





MAIN CAMERA WINDOW



The camera dialog window manages a list of named camera positions. The active camera is always visible. By selecting one entry in the list, a previously saved camera is activated again.

Save camera

The save function stores the active camera as a new entry in the list of cameras. By clicking on the name, the camera can be renamed.

TIP

Camera positions can also be created with the SNAPSHOT function.
This is very practical in the walking mode.

Delete camera

The camera selected in the list is deleted.

Camera export and import

All camera positions are saved into a file or read back from a file.

Camera status

If you left-click on this symbol, you can switch between perspective and parallel projection. If you right-click on the symbol, a sub-menu appears where you can choose the projection directly.

Camera position

	View	Focal point
X	0.0000	0.0000
Y	0.0000	0.0000
Z	10500.0000	0.0000

Here, enter the coordinates for the "View position" and "Focal point". The values are either defined using interactive configuration, or by entering them in the entry fields manually.

Opening angle

The opening angle can be modified using this slider. The value is defined using interactive configuration, or by entering it in the entry field manually.

Save camera

Camera toolbar
Menu View > Camera > Save camera

With showing the camera save dialog, a snapshot is saved with preconfigured quality settings and is added to the list of cameras. That allows returning to interesting positions later.

Load next camera

Camera toolbar
Menu View > Camera > Load next camera

This function switches to the next camera in the camera list.

Load previous camera

Camera toolbar
Menu View > Camera > Load previous camera

This function switches to the previous camera in the camera list.

Camera mode Rotate/Move

Camera toolbar
Menu View > Camera > Camera mode Rotate/Move

This function activates the camera mode Rotate / Move.

Fundamentally, the viewing point of the observer is defined as a camera position. In the Rotate/Move the model is rotated and moved in space in front of the observer. Zooming merely changes the angle of aperture, but does not change the distance from the observer to the model

Camera mode Walk

Camera toolbar
Menu View > Camera > Camera mode walk

This function turns on the camera mode walk.

The walking-mode on the other hand changes the position of the camera, and allows navigating through a model.
Changing the position is implemented in various ways through supporting multiple input devices. The simplest way to do this is with a gamepad, but also mouse and keyboard can be used. The Behaviour in the walking mode and the usage of input devices is described in the chapter Settings > input devices.

TIP

It is recommended to activate real-time visualisation for presentations in the walking mode.

FUNCTIONS IN THE CAMERA MODE WALK

Some functions only make sense in the camera mode walk and are not available in the traditional menu. Nevertheless, it is possible to assign functions to buttons on input devices or put them into the graphical menu (see Settings > Input devices). The graphical menu is displayed via the right mouse button in the walking mode. Alternatively, the menu display can be assigned to a button on the gamepad. This section only contains a description of functions that are exclusively available in the walking mode.

Interaction

Interaction in direction of view

Graphical menu in the walking mode

During walking-mode or in a virtual reality environment it is possible to interact with the model without switching to the traditional ELITECAD interface. A small cross hair indicates the focal point. Depending on, which object is in focus, the interaction button shows available actions.

Fast interaction

Graphical menu in the walking mode

When quick interaction is used, the selection with the highest priority will be chosen (e.g. library part before material).

Exchange of skymaps

Graphical menu in the walking mode

The new graphical menu offers all skymaps, which are located in the same folder as the selected skymap and displays preview images.

Exchange of material

Graphical menu in the walking mode

The new graphical menu also shows all materials, which are located in the same folder and displays preview images. The rendered effects, like reflections, are preserved upon a change of material or are recalculated again.

Exchange of library parts

Graphical menu in the walking mode

The graphical menu shows all library parts, which are located in the same folder and displays preview images.

Selection

Graphical menu in the walking mode

This function is used to select an object. If the property bar is visible, the object properties will also be displayed in the full screen mode.

Object Information

Graphical menu in the walking mode

This function is used to display the properties of the selected object.

Teleport

Graphical menu in the walking mode

With this function, the position is changed to the focused point (hair cross). If camera animation is active, the movement is displayed animated.

Increase the aperture angle

Graphical menu in the walking mode

The camera aperture angle is defined in the configuration of the walking mode. With this function, the angle can be increased dynamically.

Decrease the aperture angle

Graphical menu in the walking mode

The camera aperture angle is defined in the configuration of the walking mode. With this function, the angle can be decreased dynamically.

Show context menu

Graphical menu in the walking mode

The context menu of the traditional user interface can be displayed over the graphical context menu.

Show graphical menu

Button configuration of input devices

This function can be assigned to a button of an input device and allows the display of the graphical menu.

Jump

Button configuration of input devices

This function can be assigned to a button of an input device and allows jumping in the walking mode.

Run

Button configuration of input devices

This function can be assigned to a button of an input device. Walking speed is increased by pushing and holding the button.

Crawl

Button configuration of input devices

This function can be assigned to a button of an input device. Crawling is enabled by pushing and holding the button.

Walk slowly

Button configuration of input devices

This function can be assigned to a button of an input device. Walking speed is slowed down by pushing and holding the button.

Rotate slowly

Button configuration of input devices

This function can be assigned to a button of an input device. Rotation speed is slowed down by pushing and holding the button.

Fly up

Button configuration of input devices

This function can be assigned to a button of an input device and allows moving up in the walking mode. If gravity is turned on, the observer position is automatically going down after releasing the button.

Fly down

Button configuration of input devices

This function can be assigned to a button of an input device and allows moving down in the walking mode. If gravity is turned on, the observer position is automatically going further down after releasing the button.

Suspend restricted input devices

Graphical menu in the walking mode

Multiple gamepads can be used simultaneously in the walking mode. The presenter usually uses the main gamepad. All other gamepads are defined as restricted gamepads in the configuration of input devices.

With this switch, all restricted gamepads are deactivated and the presenter takes control alone. Now the presenter can walk to new positions.

Reactivation of the functions resumes the suspended gamepads.

Suspend audio output

Graphical menu in the walking mode

This function is used to turn the audio output for effects on and off.

Flashlight on/off

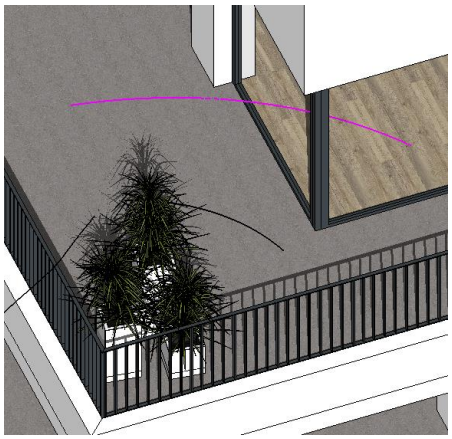
Graphical menu in the walking mode

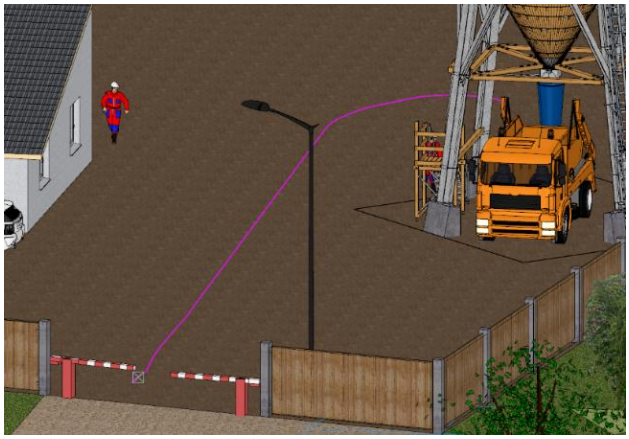
This function is used to turn the flashlight on and off.

CAMERA PATH

The camera path is represented as a 3D line, is an individual object and can also be saved separately. Multiple camera paths are supported for every model.

Automatic recording in camera mode Walk





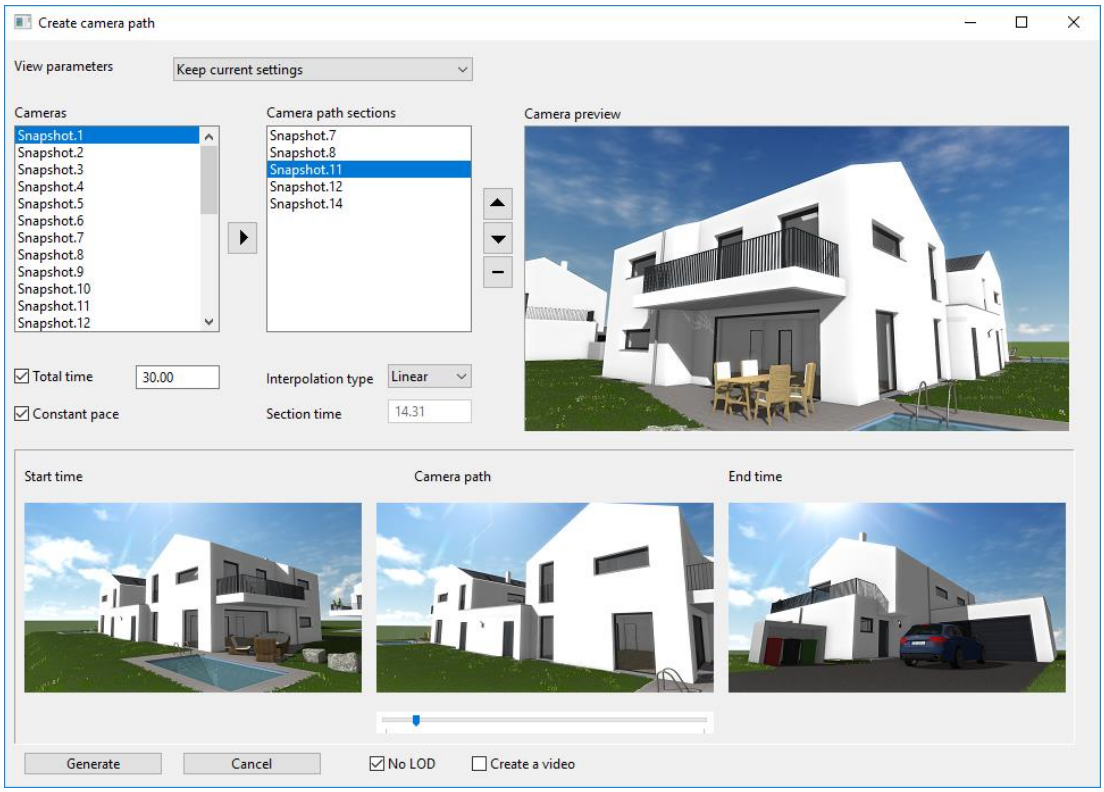
Whenever the user navigates through the model in walking-mode, ELITECAD is recording all movements as intelligent camera path

Create camera path

Camera toolbar

Menu View > Camera > Create camera path

As an alternative to the automatic recording in the camera mode walk the camera path can be defined manually. For that purpose, multiple camera positions are necessary. The movement is interpolated between the positions. Each section is individually configurable.



View parameters
For the generation of preview images either the current settings or the settings from the camera mode *walk* are used.

Cameras
The list shows all previously saved camera positions. The last selected entry is displayed in the camera preview.

Adds the selected entry to the camera path

Camera path sections
The list shows all selected camera positions. The camera path is a result of the current order. The last selected entry is displayed in the camera preview.

Changes the sequence

Removes the current entry

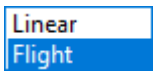
TIPP

A camera position can be used multiple times. If the same position is used twice in a row, a break with configurable length can be inserted.

Total time
The total time of the camera animation is indicated here. Either the total time or the time for the sections can be defined.

Constant pace
This setting is only available if the total time is defined. Either each section has the same duration or the movement has a constant pace. If the speed remains constant, then sections will have different times depending on their length.

Interpolation type



This setting applies to movement towards the selected entry in the camera path sections.
The line of sight of the camera is interpolated during the transition between two positions. The rotation of the line of sight is performed either smoothly over the whole distance or behaves like a flight. The flight mode aligns the line of sight in the beginning to the direction of movement. Then the camera moves towards the target. Finally, the line of sight rotates to the end position.

Section time
This setting applies to movement towards the selected entry in the camera path sections.
The time for a single section is indicated here. Either the total time or the time for the sections could be defined.

TIPP

A duration of 0 seconds creates an immediate move from one position to the next.

Start time-camera path-End time
The camera path is animated in this area.

Create
A click on the create button creates the camera path.

No LOD
This switch deactivates the level of detail options for the calculation of preview images.

Create a video
If this check box is ticked, then a click on the create button opens the dialog window for creating a video and the defined camera path will be loaded.

Play current recording

Camera toolbar
Menu View > Camera > Play current recording

The current camera path or a saved camera path can be played automatically. The experience resembles driving a car along the saved path.

Load and play camera path

Camera toolbar
Menu View > Camera > Load and play camera path

A saved camera path has to be selected first and is then automatically played. The experience resembles driving a car along the saved path.

Restart recording

Camera toolbar
Menu View > Camera > Restart recording

This function is used to define a specific starting point for saving a camera path manually.

If the function is not executed via the gamepad, the user is asked whether the current camera path should be saved first.

Save recording as camera path

Camera toolbar

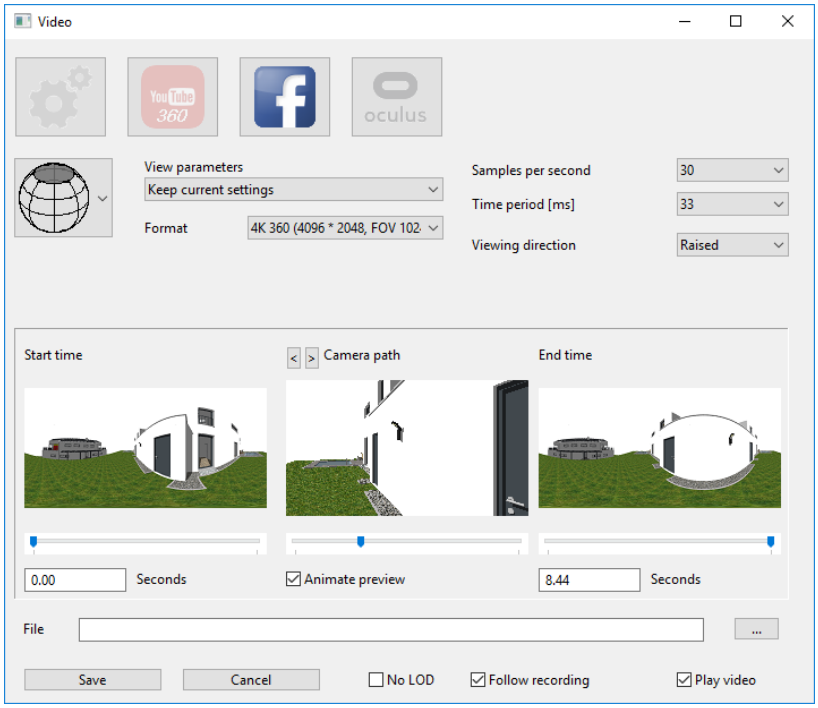
Menu View > Camera > Save recording as camera path

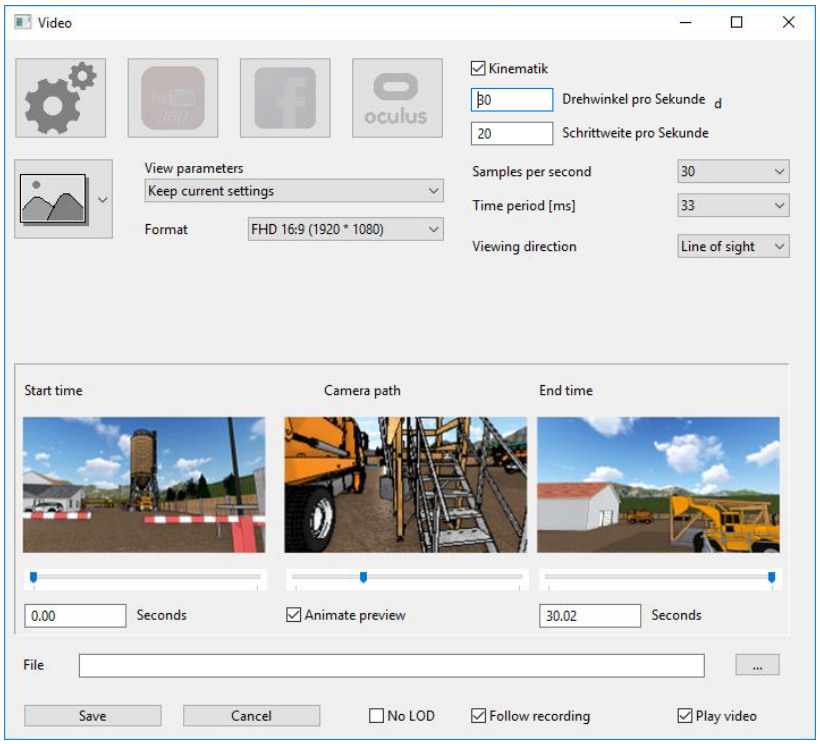
This function is used to manually define a specific end point for saving a camera path. If the function is not executed via the gamepad, the user is asked at the end of the function, whether the recording of the current camera path should be continued saved first or if a new camera path should be started.

Create a video

Camera toolbar

Menu View > Camera > Create a video





The camera path can be exported as video with numerous graphical effects. If multiple camera paths exist, the desired path can be selected after starting the function.
The preview window in the middle shows the selected path- The left window shows the starting frame and the right window displays the last frame.

Pre-sets

Free configuration of the presets

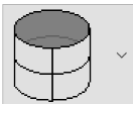
Presets for a YouTube 360° video

Presets for a Facebook 360° video

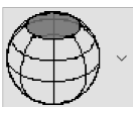
Presets for a Oculus Rift 360° video

Video mode

2D video



Panorama video



360° video

View parameter
For the image generations you can use either the current settings or the settings from the walking mode.

Format
Here you can set the image resolution in pixels. The available options depend on the type of the video. If you choose custom type, you can choose the resolution freely.

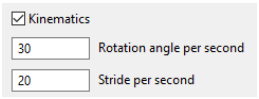
Samples per second
The bitrate defines he frames per second. Entering a value here also sets the period value (period = 1000 / frame rate).

Time period [ms]
Here you can choose the period [ms] that every frame is displayed. Entering a value here also sets the bitrate (Bitrate = 1000 / period).

Viewing direction
You can choose between three viewing directions:

- Current direction
- Up
- North

Kinematics
In ELITECAD Mechanics, kinematics and video export can be combined.



This option is only visible if a kinematics system is defined and can be activated optionally. Depending on the type of simulation, the increment distance or the angle is synchronized with the time control of the video.

Start time
The start time is a value in seconds, and can be entered manually or with the help of a slider. The position in the camera path is displayed in the preview window.

End time
The end time is a value in seconds, and can be entered manually or with the help of a slider. The position in the camera path is displayed in the preview window.

Camera path
The window in the middle shows the preview between start and stop frame.

Select camera path

If multiple camera paths exist, these buttons can be used to switch between the paths.

Animate preview
If this option is set, the window in the middle will show an animated preview of the video.

File
This text field can be used to enter a target file. This selection can also be made by using the button next to it.

No LOD
The settings for Level of Detail are described in Settings > Input Devices, and reduce the graphical effects. For image generation the Level of Detail can be deactivated. This leads to a better image quality, but also takes more time.

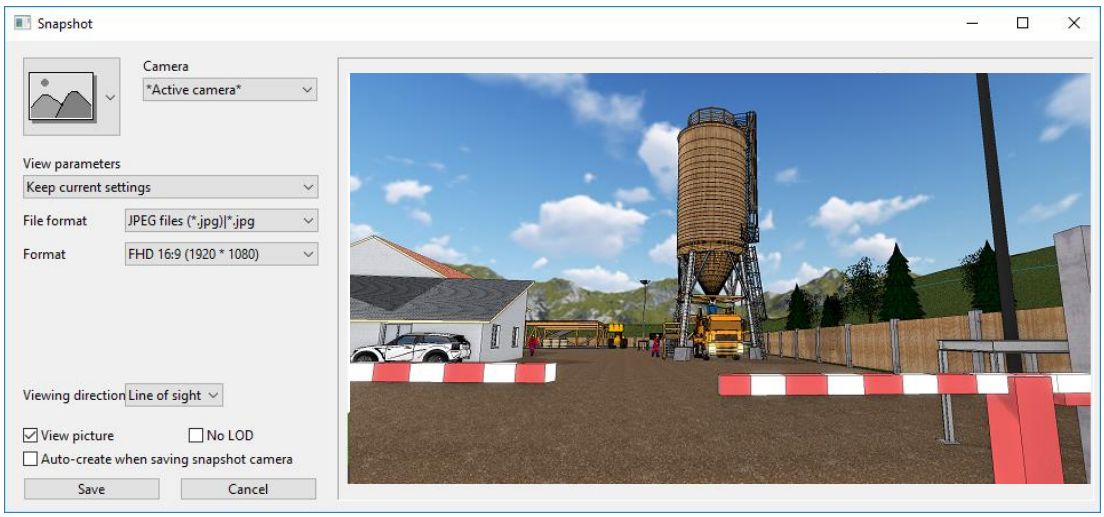
Follow recording
The rendering of images can be observed in the window.

Play video
At the end of the video generation, the video can be played optionally.

CREATE A SNAPSHOT

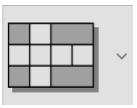
Camera toolbar
Menu View > Camera > Create a snapshot

Using the SNAPSHOT function, you can create high-resolution images of the current camera position.

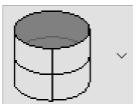


Type of image

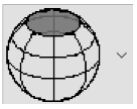
2D image



Cubemap



Panorama



360° image

Camera
Using this menu, you can choose the desired camera position from the list of saved camera points.

View parameter
For image generation use either the current settings, or the settings of the walking mode.

File format
Here you can choose the file format.

Format
Here the resolution can be set in pixels. If you choose user defined, the resolution can be entered freely.

Viewing direction
Three different viewing directions are available:

- Current viewing direction
- Up
- North

View picture
At the end of the image generation, the image can be displayed optionally.

No LOD
The settings for Level of Detail are described in Settings > Input Devices, and reduce the graphical effects. For image generation the Level of Detail can be deactivated. This leads to a better image quality, but also takes more time.

Auto-create when saving snapshot camera
If this setting is active, every time a snapshot is saved, an image will be save das well.

VIRTUAL REALITY

VR on/off

Image properties

After activating the function, the output of the current camera image is enabled in the VR glasses. To be able to use the VR glasses the drivers have to be installed appropriately. At the same time the image is displayed in the graphics window according to the setting in the dialog CONFIGURATION INPUT DEVICES > VR.

VR quickstart

Camera toolbar

This function executes multiple functions at the same time.

- Image display in the Oculus Rift is activated.
- The fullscreen mode is activated
- If a camera path is present, it is replayed.

Control

Moving the head changes the viewing direction, exactly as it would be in the real world. The recognition of the movement is done by sensors, in a similar way as smartphones detect movements. The control of the body (walking direction) is done by a controller or other input devices like mouse and keyboard. All interactions that are possible in the walking-mode are also possible in Virtual Reality.

Stereoscopic autofocus hair cross

In the centre of the image (which corresponds to the viewing direction) a small hair cross is displayed. This point is used to set the depth for the autofocus of the stereoscopic image.

Centre VR headset

Graphical menu in the walking mode

This function is used to reconnect the VR headset with the sensor and to adjust the VR glasses.

2.4 IMAGE PROPERTIES

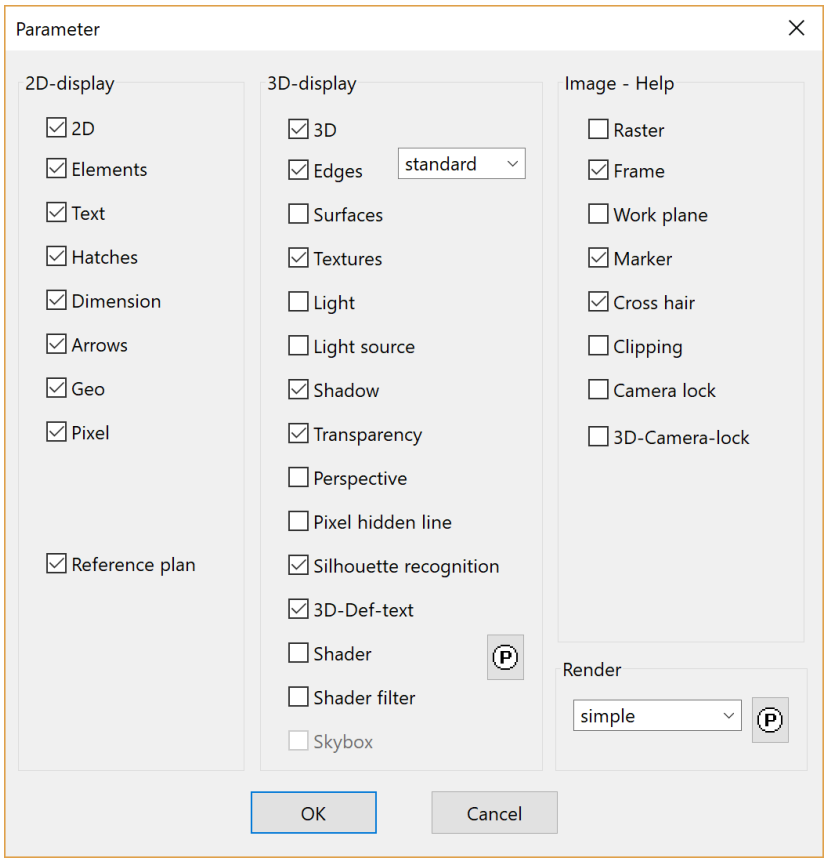
The image properties are docked in the CAD input window above the entry line.

- Parameter view
- Zoom by 2 points
- Last zoom
- Fit to screen
- Fullscreen mode
- VR on/off
- Zoom on format
- Image start point
- Colour mode of printer/pen
- Area renderer
- Render design model
- Solid design model
- Pixel hidden line
- Wire frame model
- Shader on/off
- Edges on/off
- 3D Axes on/off
- Reset work plane
- Work plane on surface
- Work plane through 3 points
- Select work plane origin
- Create work plane using normal
- Change work plane
- Clipping on/off
- Camera pivot point
- Define coordinate system
- View position
- Grid on/off
- Texts on/off
- Arrows on/off
- Dimensions on/off
- Hatches on/off

IMAGE PROPERTIES

View toolbar
View menu > Screen parameters [Ctrl] + [Q]

All image properties for the depiction of wire models, pixel hidden lines, solid design models (with or without shader technology) and rendering can be selected or deselected.
A preset record can be selected for the render settings. The render parameters for a custom setting can be called up via the Parameters button.
For real-time visualization, the shader technology has to be activated first. The Shader Effects and Level of Detail for a custom setting can be called up via the Parameters button.



TIP

The settings can be controlled separately for each view.

REAL-TIME VISUALISATION

The term real-time visualisation means display of a 3D model close to reality while changing the camera. As opposed to this, the rendering generates a static image or video.
Because the camera remains changeable, a fast screen refresh is required. This is accomplished using the shader technology.
Shaders generate material visualisation on 3D surfaces in real-time. Surfaces with complex structures and depth effects are depicted on flat surfaces, which only need

little memory. This process takes place on the graphics card and therefore enables huge performance gains.

WORKSHOP

For the efficient usage of real-time visualisation, a few steps are necessary.
Activate the Shader-Technology in the solid mode.
Use visualisation materials with shader material properties (e.g. grass, water, bump maps).
Activate the shader effects under Settings > Input devices.
Define a 360° background image for the current view in the view parameters. 360° background images can be stored in the material management.
Switch to the walking mode.
Use a gamepad for navigation through the model.
An optimal experience of a virtual 3D model is achieved in a Virtual Reality environment. If available, activate VR glasses.

WORKSHOPENDE

Shader on/off

Image properties

This check box controls the use of shader technology in the solid model.
Depending on whether the check box is selected, the shaders are activated or deactivated.
Object reflections for mirroring surfaces are pre-calculated only once. Depending on the model size, this process can take several minutes. According to the configuration, reflections are automatically calculated when activating the shader technology (SETTINGS > OPTIONS > DEPICTION > 2D/3D), the walking mode (VIEW > CAMERA > CONFIGURE INPUT DEVICES > WALKING MODE) or the calculation is manually launched.

Re-create object reflections

Camera toolbar
Menu view > Camera > Re-create object reflections

This function is used to re-create the object reflections for the shader mode. An automatic calculation can be activated in the OPTIONS under DEPICTION > 2D/3D.

Delete object reflections

Camera toolbar
Menu view > Camera > Delete object reflections

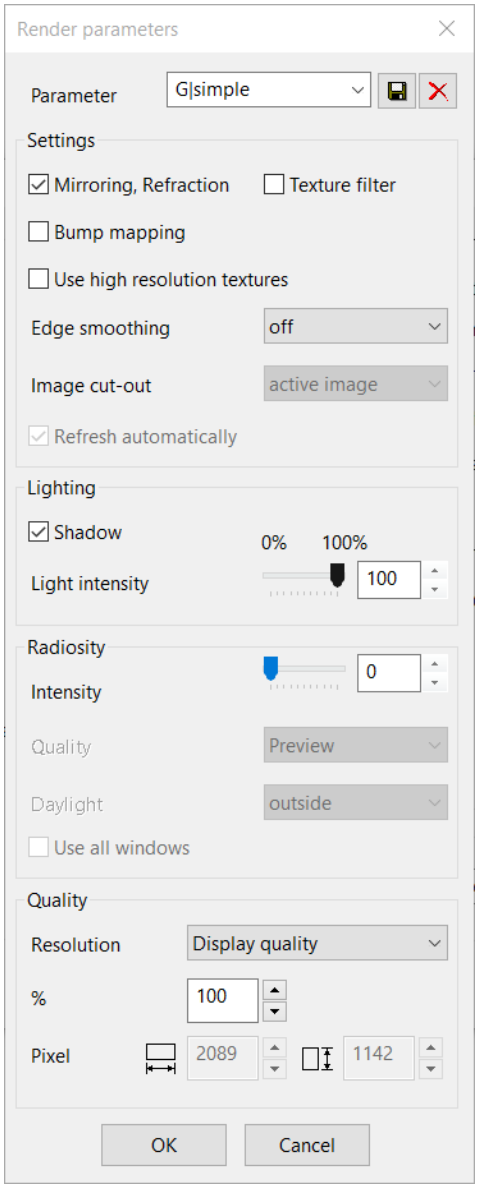
This function is used to delete the object reflections for the shader mode. An automatic calculation can be activated in the OPTIONS under DEPICTION > 2D/3D.

Update object reflections

Camera toolbar
Menu view > Camera > Update object reflections

This function is used to update the object reflections for the shader mode. An automatic calculation can be activated in the OPTIONS under DEPICTION > 2D/3D.

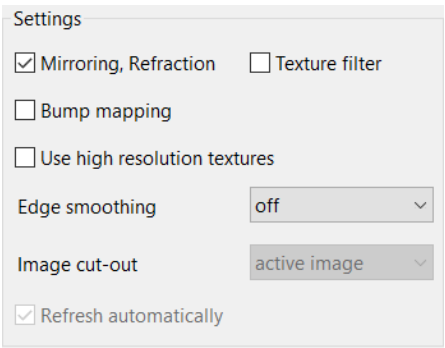
Render parameters



Parameter

Here you can call up, save or delete settings.

Settings



Mirroring, Refraction
This setting determines whether mirroring and refraction are rendered as configured in each material during the render model's render process.

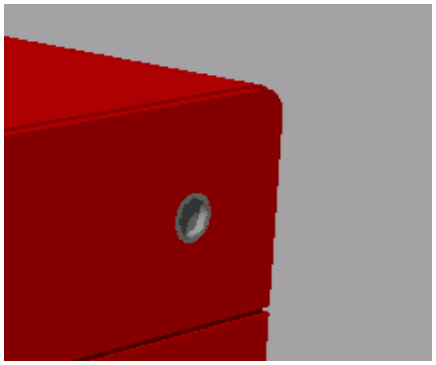
Bump mapping
This setting determines whether bump mapping is rendered as configured in each material during the render model's render process.

Use high resolution textures
Texture images with large amounts of data can be represented in the render with reduced quality in order to save memory and rendering time.
This option controls whether or not high-resolution textures are to be used.

Texture filter
This setting determines whether texture filters are rendered as configured in each material during the render model's render process.

Edge smoothing
As the image is rendered pixel by pixel and is independent of the resolution, it is often possible for slanted edges to appear staircase-like. If you select edge smoothing, each pixel is virtually subdivided into smaller points, improving image quality.
Note that these options increase the memory requirements and the rendering time. Therefore, only use it when necessary.

Without edge smoothing



with edge smoothing

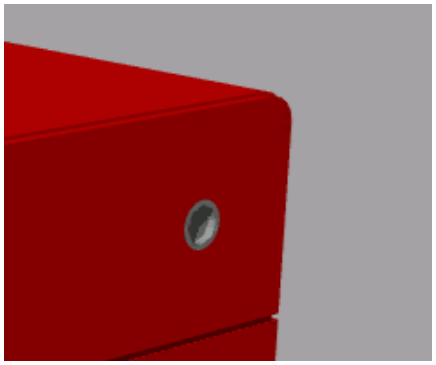


Image section
The IMAGE SECTION option has differing availability in the various views.

Active image:
With this setting, only the active image section is ever rendered.

Format:
With this setting, the configured format is rendered.

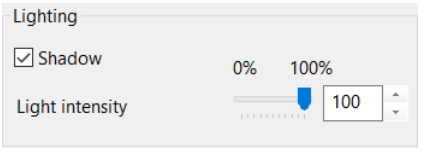
Total scene:
When doing so, the total scene is always calculated.

Refresh automatically
This check box is only available in the design model views.
If the option is not set, the rendered build is "frozen" and must be manually refreshed in case of any changes. If it is set, the design model view is re-rendered when you switch to it.

TIP

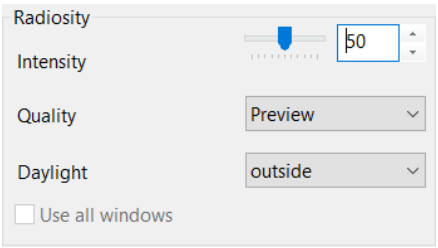
If you add design model views to the plot, they should not be automatically refreshed any more, if possible. Instead, the image should be re-rendered every time you switch to the plot view.

Lighting



This setting determines whether shadows are represented during the render model's render process. Using the LIGHT INTENSITY option, you can change the brightness of all light sources globally.

Radiosity



Daylight rendering is a process for rendering the energy distribution of atmospheric light in the scene. If the light strikes planes, they reflect it and diffuse it back into the room. In this process, the light energy is progressively reduced with distance.
This energy diffusion enables a basic illumination level as would be found on a cloudy day, which you can combine with other light sources.

Intensity
If the slider is set to "0", the other options are blocked and the rendering is not run. If a value is entered, the radiosity rendering is started the next time rendering is started. After rendering has been completed, the intensity of the result can be adjusted retroactively without the need to run the rendering again. If you reset the slider to "0", the radiosity result is deleted.

Quality
You can distinguish between "preview", "simple", "good" and "optimal", each requiring progressively more rendering time. While working, it is recommended to only use the "preview" depiction and only use the optimal rendering for the final image.

Preview:

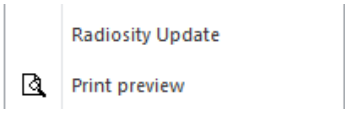
Simple:

Good/optimal:

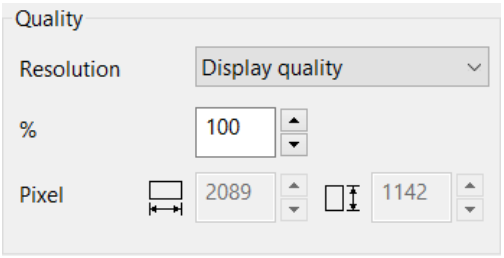
Daylight
You can choose between OUTSIDE and INSIDE. The OUTSIDE option simulates light from the entire sky, while the INSIDE option simulates the light entering through the window.
Accordingly, only use INSIDE daylight for interior perspectives.

Use all windows
This check box is only available if daylight is set to INSIDE.
If the option is not selected, the radiosity lighting only uses the windows that are visible from the position of the camera. If the option is selected, all included windows are used for rendering, which may potentially lead to prolonged rendering time.

Radiosity Update
Once the radiosity has been rendered, it is not automatically refreshed when the geometry is modified. The daylight rendering process must be manually restarted. In the Render depiction (design model view only), right-click in the graphic window and then on "Radiosity Update".



Quality



You can control the quality of the rendered image in this area.

Resolution
There are three options available for selection.

Display quality:
ELITE's current work area is used no matter which format is selected. The screen's resolution also has an effect. That is why the quality is expressed as a percentage and not in DPI.

Print quality:
The quality is dependent upon the format and the selected image section. Based on the calculated pixels, the quality in DPI (dots per inch) can be specified.

Free:
You can enter the pixel values manually.

TIP

Do not set the quality unnecessarily high while working. Only do so before rendering the final image.

ZOOM BY 2 POINTS

	View toolbar
	Image properties

This function is used to enlarge details of the drawing to fill the screen.
After you activate the function, enter the lower left and upper right corner of a "range" that contains the detail to be enlarged. You can also highlight the upper right corner before the lower left corner.

LAST ZOOM

View toolbar
Image properties

When this function is selected, the previous zoom area of the active window is represented.
If you are already working in an image section and require a greater enlargement, simply select a new zoom level to continue working at that level.
To return to your original zoom cutout, use the LAST ZOOM function.

FIT TO SCREEN

View toolbar
Image properties

Selecting this function sets a zoom for all visible elements.
You can run this function periodically to check whether data exists outside of the format (e.g. after importing DXF data).

ZOOM WITH FACTOR

Options toolbar
Image properties

This function enables the enlargement of an existing depiction around a point to be specified.
After you activate the function, specify the zoom factor (enlargement factor) and the position of the reference point. The position of the reference point corresponds to individual keys on the numeric keypad. That means that you should enter the number 7 to set the reference point to "upper left". The number 1 stands for "lower left", and so forth.
Finally, you must specify the reference point for zoom area. This can be performed by clicking the position or entering the coordinates using your keyboard. Pressing [Return] without coordinates corresponds with the centre of the page.

ZOOM ON FORMAT

View toolbar
Image properties; View menu

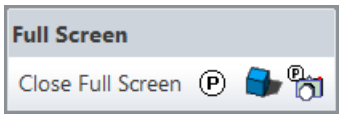
This function returns the drawing in the current window to the state without zoom.

FULLSCREEN MODE

Fullscreen mode toolbar
Image properties; View menu > Fullscreen mode

The working area is scaled to the size of the screen and all controls except for the fullscreen mode toolbar are hidden.

Fullscreen mode toolbar



Fullscreen mode off

Switches back to the standard user interface.

Show properties bar in fullscreen mode

Shows the properties bar in order to modify construction parts.

Render

Renders the active image with the selected render parameters.

VR ON/OFF

Image properties

After activating the function, the output of the current camera image is enabled in the VR glasses. At the same time the image is displayed in the graphics window according to the setting in the dialog Input devices > VR.
To be able to use the VR glasses the drivers have to be installed appropriately.

IMAGE START POINT

View toolbar
Image properties

Key combination [Ctrl]+[Home]
After you activate the function, the image is represented in its original position.
That means that the 3D axes of the active design model are aligned parallel to the screen's axes.

COLOUR MODE PRINTER/PEN

Image properties

This function leads you through switching from the pen to the print view and vice versa.

TIP

If you right-click inside a view, the context menu appears with the item "Print preview". If you select this option, the screen output will match

the printout. If you leave the view or call up the menu item again, the previous depiction is restored.

Print preview

AREA RENDER

Image properties

For larger design models, the complete rendering process may require a long time. That is why there is an option to use range rendering to represent a specific range of the drawing as a rendering design model. The active render parameters are taken into account. The rest of the image is preserved in the previous depiction.

TIP

The function is a constraint. (Also in the context of materials management)

RENDER MODEL

Image properties

This function is used to create a photo-realistic depiction that accounts for light, the casting of shadows, the colour scheme, etc. The quality is dependent on the render parameters.

SOLID DESIGN MODEL

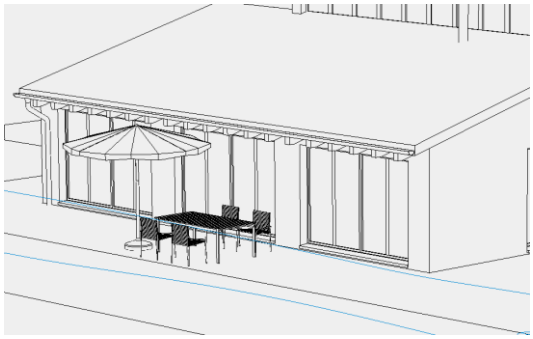
Switches toolbar

Image properties … [Ctrl] + [D]

This function is used to represent the 3D image in colour.
After you activate the function, the edges and 3D elements are hidden. The planes are represented in colour with the defined 3D colours.

PIXEL HIDDEN LINE

Image properties … [Ctrl] + [H]



Enables a hidden line depiction that is rendered and displayed during dynamic rotation/movement.
Switch on/off with [Ctrl]+[H].

WIRE FRAME MODEL

Switches toolbar
Image properties

This function is used to represent the image as a wire model.
After you activate the function, the surfaces are hidden. The edges and 2D elements are shown.

EDGES ON/OFF

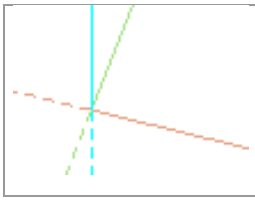
Switches toolbar
Image properties... [Ctrl] + [C]

This check box controls the depiction of edges on the screen.
Depending on whether the check box is selected, the 3D edges are either displayed or hidden.

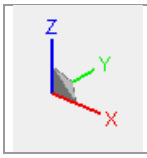
3D AXES ON/OFF

Switches toolbar
Image properties

This check box is used to display or hide the axes on the work plane.
Depending on whether the check box is selected, the axes are either displayed or hidden.



Meaning of lines	
Red contiguous line	Positive X-axis
Red dashed line	Negative X-axis
Green contiguous line	Positive Y-axis
Dotted lines	Negative axes



In addition, the original axes are shown in the lower left corner of the CAD window.

RESET WORK PLANE

Create New toolbar
Draw menu > Work plane > Reset work plane, Image properties

This function is used to place the edit plane back into the original floor plan plane of the current storey.

WORK PLANE ON SURFACE

Create New toolbar
Draw menu > Work plane > Work plane on surface, Image properties

Use this function if you want to place a new edit plane precisely on top of an existing surface.

After you activate the function, you must click the desired plane in 3D.

TIP

Curved surfaces can also be selected. The Edit plane is then placed tangential to the plan.

WORK PLANE OVER 3 POINTS

Create New toolbar
Draw menu > Work plane > Work plane on surface, Image properties

Use this function if you want to place a new edit plane to pass precisely through 3 specific points in the room.
You need to enter 3 points for which the entry row or 3D capture function can be used. The first point defines the origin, the second point the direction of the X-axis and the third point determines the XY-level.

Examples of point entries:

With an entry line:

- X50, Y-100, Z50
- X50, Y100
- ,,50
- a45, d100, Z50, etc.

With 3D point capture mode:

- Any points of a box, etc.

SELECT WORK PLANE ORIGIN

Create New toolbar
Draw menu > Work plane > Select work plane origin, Image properties

This function is used to place the origin of the coordinate system on the desired point.

Given a point entry, the work plane undergoes a geometrical translation that places the origin of the coordinate system at the specified point.

CREATE WORK PLANE USING NORMAL

Create New toolbar
Draw menu > Work plane > Create work plane using perpendicular, Image properties

Use this function if you want to place a new edit plane to connect two points normally.

The first point defines the position of the origin of the axes of coordinates of the new edit plane. The second point defines the direction of the Z-axis by taking the connection between the first and second points as a normal vector for the edit plane.

TIP

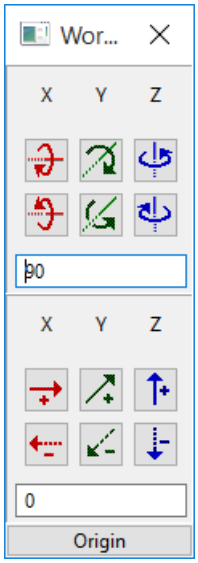
In this process, the direction of the X-axis is set to be horizontal.

CHANGE WORK PLANE

Create New toolbar

Draw menu > Work plane > Change work plane, Image properties

In a separate window, the work plane can be rotated around one of the axes or moved.



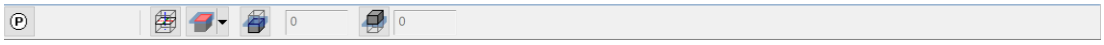
CLIPPING ON/OFF

View toolbar

Above the entry line... [Ctrl] + [I], Image properties

This function is used to trim the 3D image area temporarily. This gives you a better overview during 3D editing.

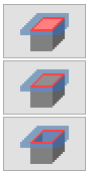
Once clipping has been selected, the clipping property bar is displayed. The active work plane is used as clipping plane.



Clipping on/off

This switch turns Clipping on and off.

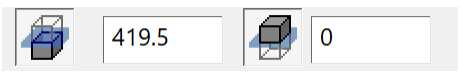
Section surface



- Section surface uni coloured
- Section surface on
- Section surface off

This setting defines if the section surface should be displayed or not. Either the depiction is done with the colour of the object or mono coloured. The section surface is only displayed if just the upper clipping plane is active.

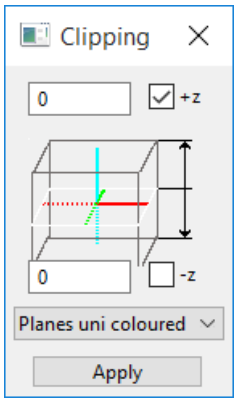
Upper and lower clipping plane



Upper and lower clipping plane can be switched on and off independently. The value fields define the distance to the current working plane.

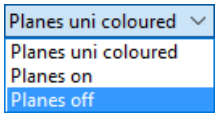
Clipping parameter

The parameter button opens the clipping dialog window.



For "z", you can enter the distance from the work plane in a positive or negative Z-direction. If you do not enter a value for the Z-distance, the default value is 0. When you click APPLY, the specified Z-values are applied and the image is refreshed.

If only the positive range is clipped, there are three different options for representing the section plane.

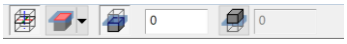


Change clipping

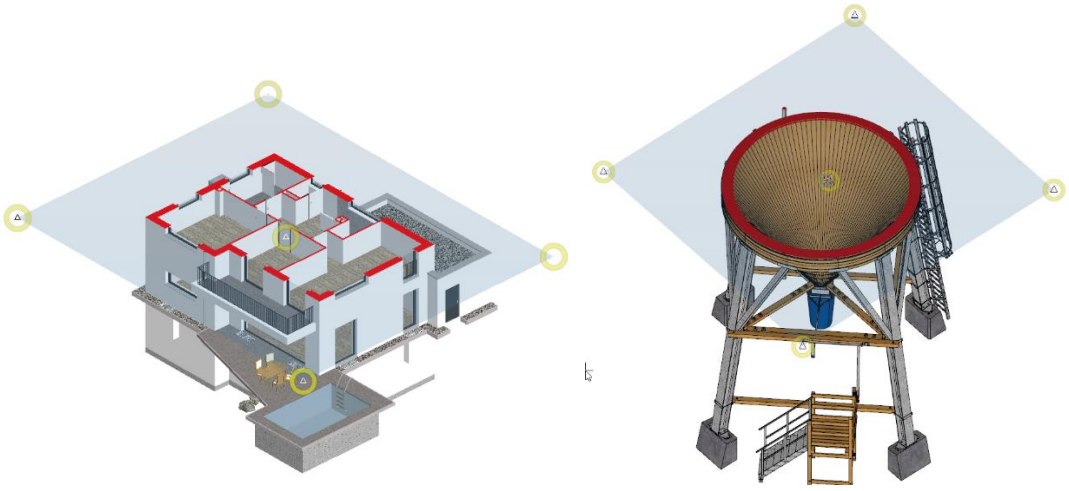
Changing the values in the property bar or in the parameter dialog window moves the clipping plane. Alternatively, the clipping plane is moved in parallel direction using the handles.
The orientation of the clipping plane is modified by changing the work plane.

WORKSHOP

Clipping applies to the current image and work plane.
Set the following switches in the property bar.



Now you can move the clipping plane through the model using the handles.



WORKSHOP END

CAMERA PIVOT POINT

View toolbar
Image properties

This function is used to realign the camera pivot point.
Normally, the camera pivot point is the centre of the screen. If you want to rotate objects that are far from the zero point, it is better to reset the centre point for the rotation to enable precise navigation. You can do this by clicking the object in question (which selects the centre point of the surrounding rectangle) or via point entry.

TIP

The pivot centre point is reset every time the image section is modified.

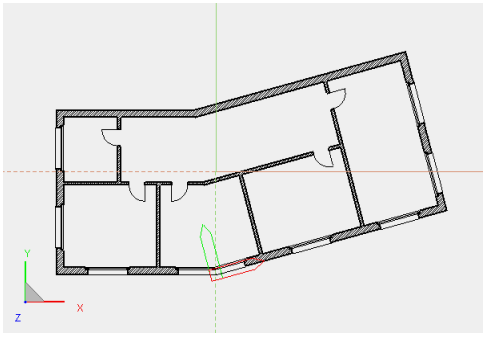
DEFINE COORDINATE SYSTEM

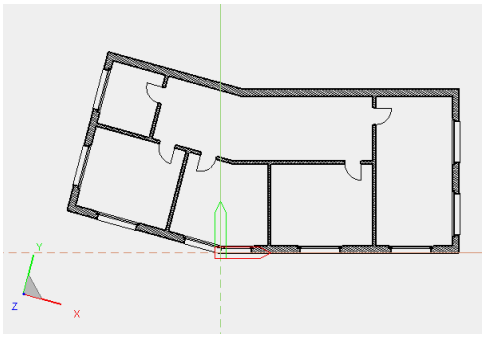
Settings toolbar
Image properties

The coordinate system can be rotated via an angle or point entry. All inputs and manipulations (e.g. vertical or horizontal) will then refer to the new coordinate system. The new entry generates a symbol on the screen. Double-clicking a coordinate symbol switches to that coordinate system. Double-clicking the main coordinate symbol in the lower left corner switches back to the original work plane.
If custom coordinate systems have been saved with the drawing, they are automatically displayed when it is loaded.

Origin

Coordinate system rotated





TIP

A coordinate symbol can be selected and deleted.

VIEW POSITION

View toolbar

Image properties

This function is used to view the 3D object from any point in any direction. You can finely tune the direction of view via the subsequent Camera dialog window. The design model depiction is automatically set to be in perspective.
After you activate the function, you will be prompted for:
The digitisation of the view position by entering a value or capture mode.
The height of the view position (Z-value compared to the active work plane)
The digitisation of the focal point by entering a value or capture mode.
The height of view point (Z-value compared to the active work plane)
Now the 3D image is rendered according to the configured parameters and represented in the 4-view window.

GRID ON/OFF

Switches toolbar

Image properties

This check box controls the depiction of a grid on the screen.
Depending on whether the check box is selected, the grid is either displayed or hidden.
You can define the grid settings under the SETTINGS menu > OPTIONS > DEPICTION > TOOLS.

TEXTS ON/OFF

Switches toolbar

Image properties

This check box controls the depiction of texts on the screen.
Depending on whether the check box is selected, the texts are either displayed or hidden.

ARROWS ON/OFF

Switches toolbar

Image properties

This check box controls the depiction of arrows on the screen.
Depending on whether the check box is selected, the arrows are either displayed or hidden.

Dimensions on/off

Switches toolbar
Image properties

This check box controls the depiction of dimensions on the screen.
Depending on whether the check box is selected, the dimensions are either displayed or hidden.

Hatches on/off

Switches toolbar
Image properties

This check box controls the depiction of hatches on the screen.
Depending on whether the check box is selected, the hatches are either displayed or hidden.

Perspective on/off

Switches toolbar
View menu > Switches > .... [Ctrl] + [Shift] + [P]

This check box controls the depiction of perspective. When you switch on perspective, differences in rendered size aim to create an illusion of depth.

Line types (single) on/off

Switches toolbar
View menu > Line types...

Your entry defines whether specific line types are taken into account for the output (screen, printer) or for manipulation operations (such as "Delete block/section").
If the check box is selected, specific line types can be selected by entering their line type numbers. All other line types are hidden but are not lost. By entering "-1" as the line type number, you can reactivate all line types.
If you prefix the line type number with a "^", it excludes the designated line type, e.g. "^2" means all line types should be displayed except for line type 2.

Pens (single) on/off

Switches toolbar
View menu > Pens...

Your entry defines whether specific pens are taken into account for the output (screen, printer) or for manipulation operations (such as "Delete block/section").
If the check box is selected, specific pens can be selected by entering their pen numbers. All other pens are hidden but are not lost. By entering "-1" as the pen number, you can reactivate all pens.
If you prefix the pen number with a "^", it excludes the designated pen, e.g. "^2" means all pens should be displayed except for pen 2.

See also Pen filter for elements only.

Light on/off

Switches toolbar

View menu > Switches > Light... [Ctrl] + [L]

This check box controls how light sources are taken into account for the colour depiction in the solid model. Key combination [Ctrl] +[L]

3.File Exchange

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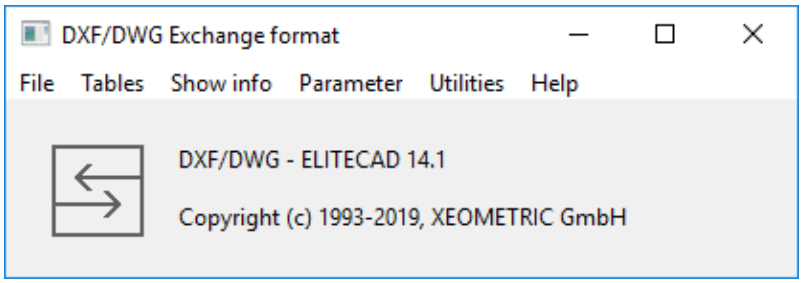
3.1 DXF/DWG

	File exchange toolbar
	File menu > File exchange > DXF/DWG

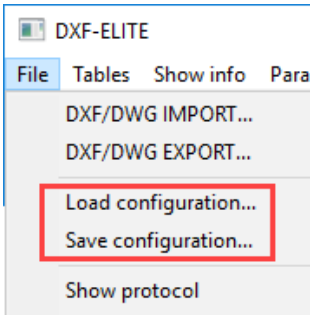
General

The DXF file exchange in ELITECAD offers the user a clear configuration of the data transfer. The program processes drawings in DXF and DWG formats up to AutoCAD 2019 2D or 3D.

FILE menu > FILE EXCHANGE > DXF/DWG calls up the DXF file exchange.



Load/save configuration



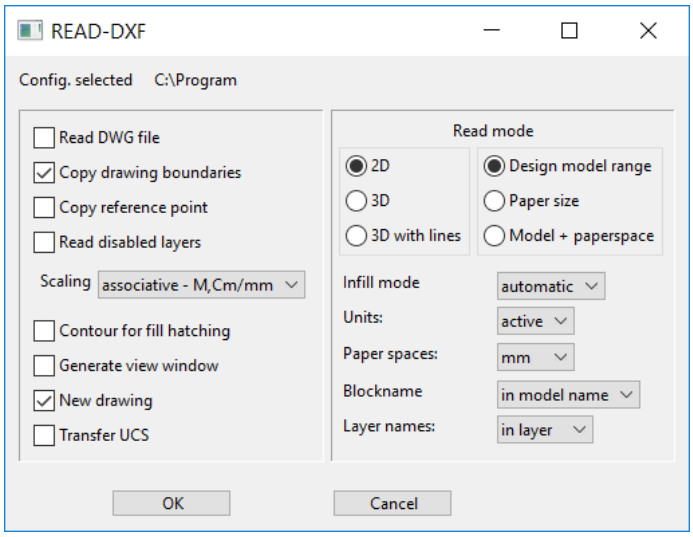
These functions serve to read and save a configuration including all settings in the tables.

The dialog fields *Load Dxf table* and *Save Dxf table* appear after activating this function. The desired configuration can then be selected and loaded, or the active configuration can be saved as a new file.

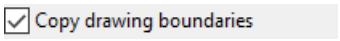
DXF/DWG - Import

Main settings

This function is used to read a DXF/DWG file.



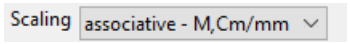
ON: When selecting a file, only DWG files (*.dwg) can be selected. The selected file is automatically converted into a DXF file (*.dxf).
OFF: When selecting a file, DXF files (*.dxf) appear.



ON: The maximal values saved in the DXF file are applied to the drawing dimensions. These drawing boundaries determine the scale, which is set, in case the active scale is too small.
OFF: The drawing boundaries are automatically calculated.

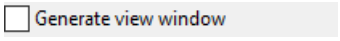
ON: The drawing's origin saved in the DXF file is used.
OFF: The drawing is centred.

ON: Layers that are marked and saved in DXF as frozen (meaning: hidden) are read.
OFF: Only "visible" layers are read.

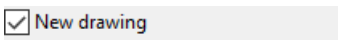


Associative - M,Cm/mm. The dimensioning including exponents is associatively applied in full.
associative: The dimensioning is associatively applied in full. Dimensions, which are not available in ELITECAD, can be incorrectly converted.
free: Non-associative dimensioning is generated. This is fully handled as dimensioning but not corrected after block stretch.
Line + Text: Dimensions are converted to lines and text.

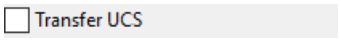
ON: A contour of the infill hatch is displayed.
OFF: No contour of the infill hatch is displayed.



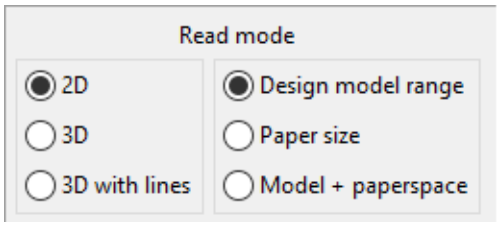
ON: A view window is generated when reading the paper space.
OFF: No view window is generated.



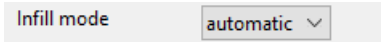
ON: A drawing is started before an import.
OFF: The import of data occurs in the active drawing.



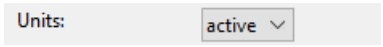
User-defined coordinate system (German BKS, English UCS)
ON: A coordinate system defined by a user becomes the standard coordinate system.
OFF: The standard coordinate system is applied.



2D: Only 2D data can be read.
3D: Both 2D and 3D data can be read.
3D with lines: 3D information, which does not create 3D-objects (for example, height markers), is taken into account.
Design model range: If this check box is ticked, the design model range can be read.
Paper space: If this check box is ticked, the paper spaces can be read.
Model + paper spaces: If this check box is ticked, the design model range and all present paper spaces can be read. Paper spaces are automatically converted to plots and listed in views management.



automatic: after every ACAD setting
ON: Infill hatch is automatically generated.
OFF: No infill hatch is created.



Because no units have been saved in the DXF file, the correct unit can be selected here.
active: The units set in CAD are used.
mm: Data is read in millimetres.
m: Data is read in metres.

A separate unit can be chosen for the paper space (plot view).
active: The units set in CAD are used.
mm: Data is read in millimetres.
m: Data is read in metres.

in model name: The block names are used as model names.
In attr. block: The block names are saved in the "block" attribute.
Do not adopt: The blocks are not adopted.

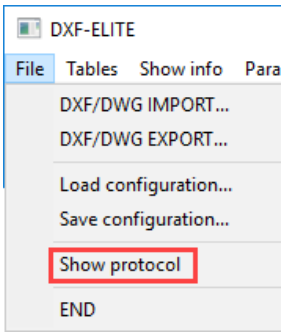
NOTE

If the IN ATTR. BLOCK option is selected, an attribute file needs to have been loaded beforehand.
Start the ATTRIBUTE-PARAMETER function from the ATTRIBUTES toolbar, enter the following path into the entry row
<ELITECAD installation path>\u\<version>

\int\dxf\dflt\de\dxf.attr and confirm with [Enter].

in group: The layer name is attributed to the classification GROUP.
in class: The layer name is attributed to the classification CLASS.
in level: The layer name is attributed to the classification LEVEL.
in layer: The layer name is saved in the layer attribute and the layer manager is automatically made available.

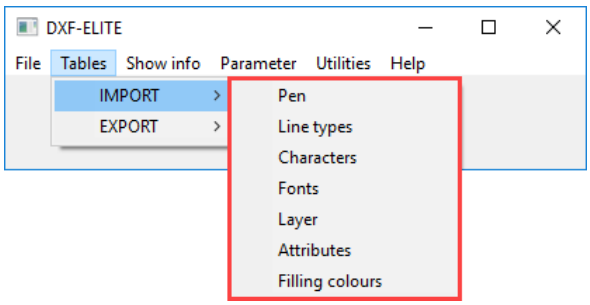
Show protocol



This function is used to display the protocol file *dxf.proto* from the home directory.

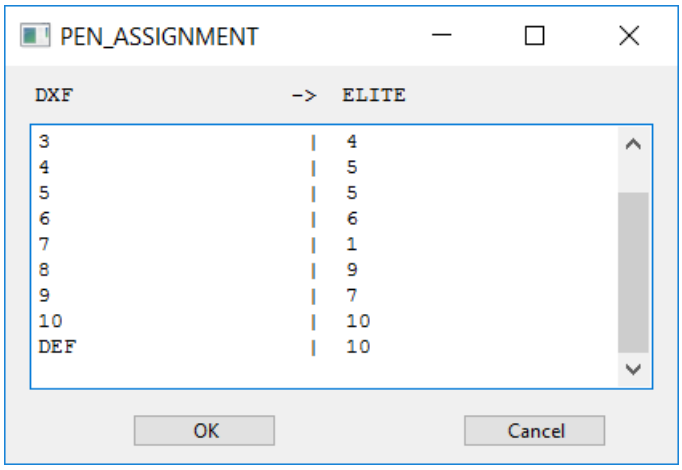
After activation of the function, a window is opened that displays all previous working steps.

Default settings for the import



Pens
This function is used to allocate the DXF colours to the ELITECAD pens.

An ELITECAD pen is allocated to a DXF pen in the set-up dialog window. All of the non-listed "DEF" pens are allocated in this case to Pen 10 in ELITECAD. The table can be extended in any way and saved as a new configuration.

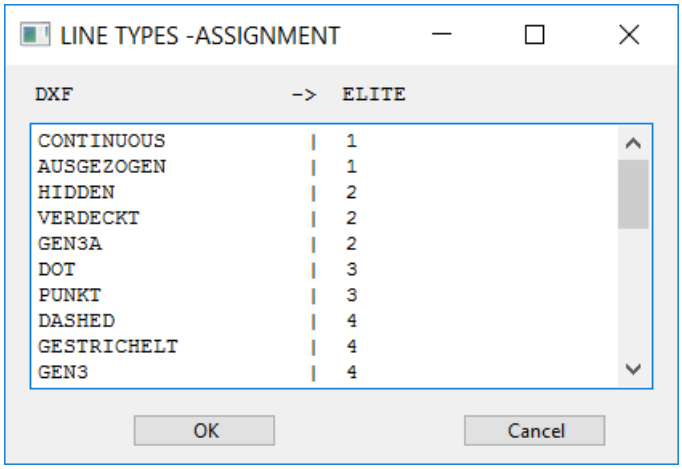


The following must be noted when entering the desired allocation (this applies to all following tables):

- At least one blank space must be present between two values.
- The table is completed by an empty row.
- All entries after the empty row will be ignored.

Line types

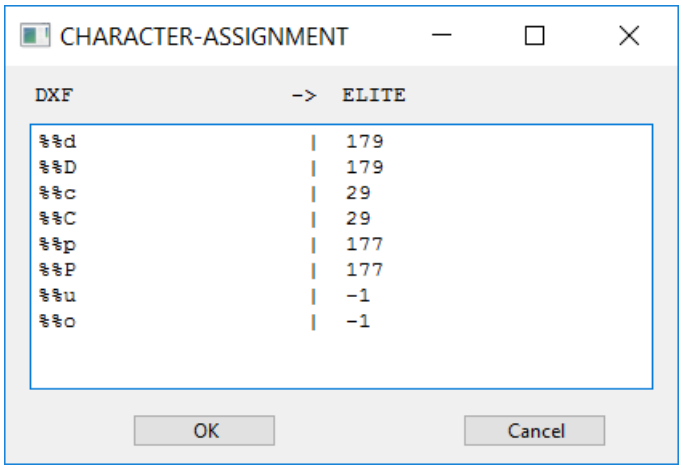
The line types defined in DXF are allocated a line type number. The table can be extended in any way and saved as a new configuration.



Undefined line types are automatically assigned as line type 1.

Characters

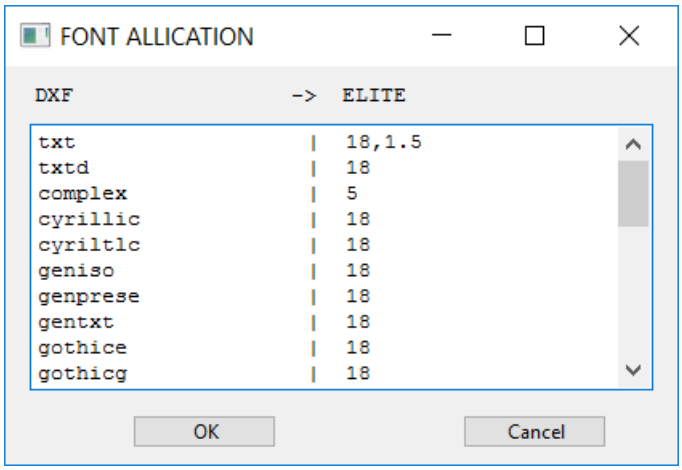
This function is used for the allocation of DXF text sequences (%%..) and special characters to the ELITECAD ASCII code. The table can be extended in any way and saved as a new configuration.



Tip:
The ELITECAD character "-1" (minus 1) means that the relevant DXF character is deleted.

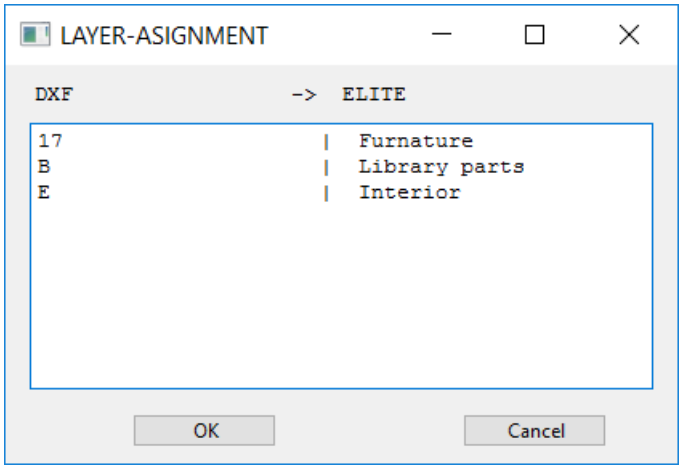
Fonts

This function is used to allocate DXF fonts to ELITECAD fonts with optional character width (space) separated from the font number by a comma. The table can be extended in any way and saved as a new configuration.



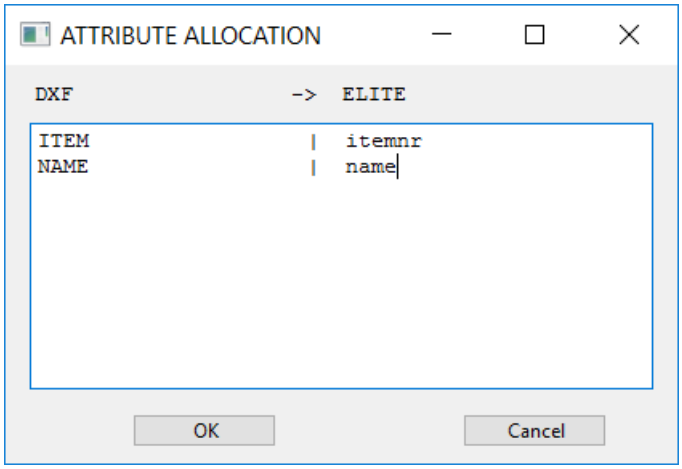
Layer

This function is used to allocate the layers. The table can be extended in any way and saved as a new configuration.



Attributes

This function is used to allocate the DXF attributes to ELITECAD attributes. The table can be extended in any way and saved as a new configuration.



Filling colours

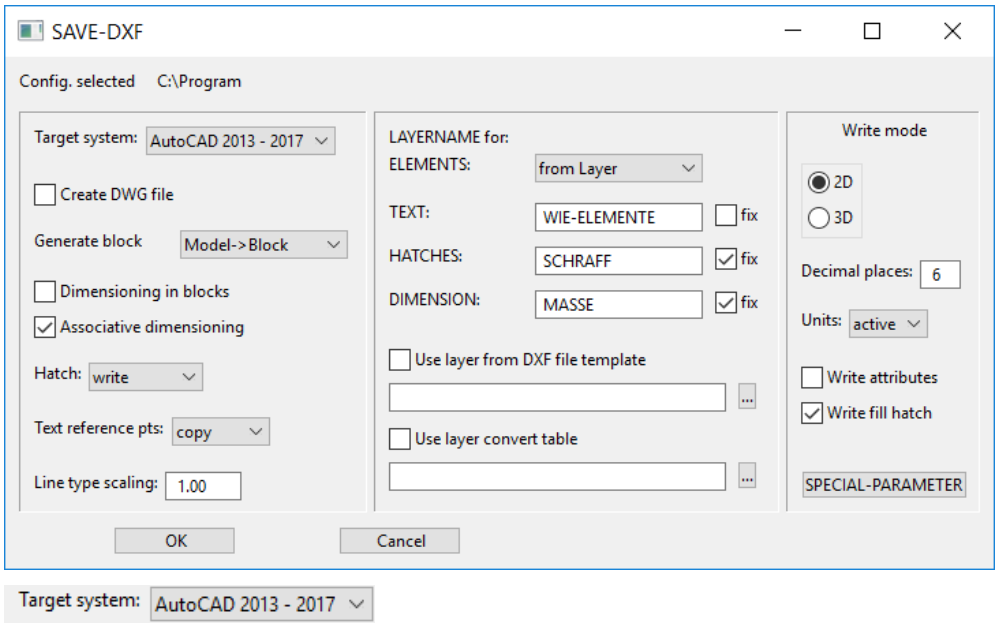
This function is used to allocate the filling colours.

(According to the allocation in the pen colour table)

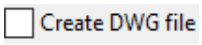
DXF/DWG – Export

Main settings

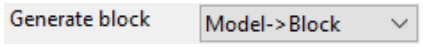
This function is used to write the active drawings as DXF/DWG files.



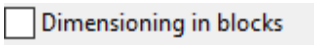
The desired AutoCAD/DXF-Version needs to be entered here. The generated data can be adjusted to the specified DXF-Version.



ON: When saved, a DXF file is generated which is automatically converted into a DWG file (*.dwg).
OFF: A DXF file is generated.



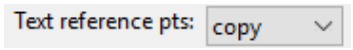
Model > *Block*: Every model becomes a block; the model name becomes a block name.
Level > *Block*: Every level becomes a block; the level name is applied.
Class > *Block*: Every class becomes a block; the class name is applied.
none: No blocks are generated. (Exception: dimension blocks)



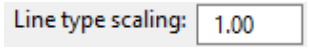
ON: The dimensioning (dimension blocks) is entered into the model blocks. (Rather uncommon in DXF)
OFF: The dimensioning blocks are generated as separate blocks.

ON: DXF dimensions (DIMENSION) are generated.
OFF: Blocks with geometry and text are generated.
Special case: If the target system is set to *easy geometry* and the check box *NO* for *generate blocks* is selected, then no blocks will be generated for the dimensions. This setting is especially for data transfer to CAD systems having problems with blocks.

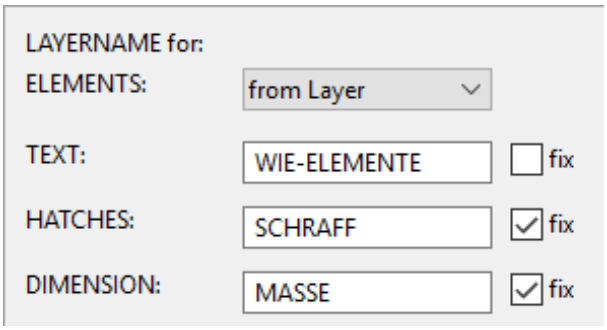
do not write: Line hatches will not be written.
write: Line hatches will be written for up to AutoCAD13. (Attention: Files can become very large.) From AutoCAD14, hatches will be written as associative hatches.
as block: The line hatches are written as blocks.



adopt: The ELITECAD reference points (1-9) are adopted in DXF.
adjusted: The text is adjusted between two points. In other words, the overall text spacing always stays the same. For this reason, changes made to the text length always affects the text parameters.
aligned: The text parameters always remain the same independent of the text length. In other words, if text becomes longer due to changes made, it will also need more space.

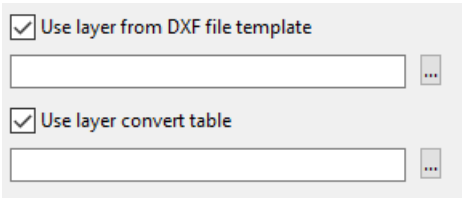


The scaling factor of the line types can be defined here.



LAYER NAME for ELEMENTS:
from Group: The layer name is read from the classification GROUP.
from Class: The layer name is read from the classification CLASS.
from Level: The layer name is read from the classification LEVEL.
from Layer: The layer name is read from the layer attribute.

LAYER NAME for TEXTS / HATCHES / DIMENSIONS
fix OFF: Layer names for texts such as elements from the layer or attribute are read.
fix ON: The content of the text fields is used for the layer names.

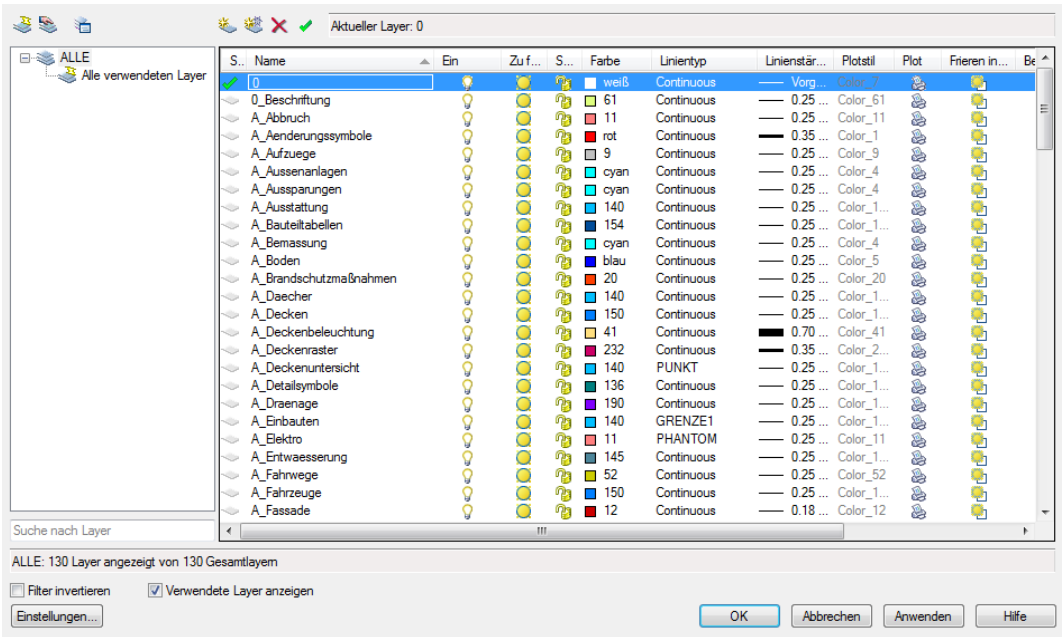


The USE LAYER FROM DXF FILE TEMPLATE option can be used in order to add an additional layer from the template to the DWG file.

If the USE LAYER FROM DXF FILE TEMPLATE option is activated, the properties "Colour from layer", "Line type from layer" and "Line thickness from layer" are additionally added to a DWG file.

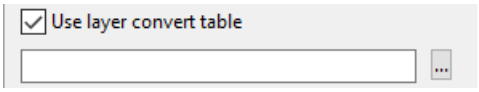
ON: A selected DXF file is used as a template for the conversion.
OFF: The properties of the individual object are transferred.

An example of a DXF layer template:



EXPLANATION

In AutoCAD, colours, line types and line thickness are often governed by the layer properties manager and not by the object itself. If these layer properties are desired by the recipient, this option can be used here.
The same layers must be defined as such in ELITECAD or be assigned in the conversion table. If the template does not contain a layer from ELITECAD, a notification will appear in the info window. This layer is then treated as a normal layer and is not assigned the FROM LAYER option

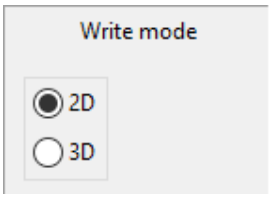


With the help of this option and an appropriate Excel file, the layers from the construction parts can be divided even further apart, either in another layer or with a layer name extension.

ON: A selected Excel file is used as a template for the conversion.
OFF: No additional layer conversion is made.

An example file (layerconv.xls) can be found under *<ELITECAD-installation path>\u\<version>\int\dxf\dflt*.

	A	B	C	D	E	F	G
1	Command	Layer	Pen,Linetype	Destination-Layer			
2	WallHatch			<>__FIL			
3	WallUncut			<>__ANS			
4	Hatch	212_ABBRU		<>__FIL			
5	Text	212_ABBRU		<>__TXT			
6	Text	003_DETAI		<>__TXT			
7	Text	004_AENDR		<>__TXT			
8	Hatch	005_GRAFK		<>__FIL			
9	Text	005_GRAFK		<>__TXT			
10	Hatch	212_ABBRU		<>__FIL			
11	Text	212_ABBRU		<>__TXT			
12	Text	300_BAUKO_BES		<>__TXT			
13	Text	300_BAUKO_HOZ		<>__TXT			
14	Text	300_BAUKO_MWK		<>__TXT			
15	Element	300_BAUKO_MWK	4.7	<>__VRD	Ist ein Beispiel: Stift + Linientyp anpassen		
16	Hatch	300_BAUKO_STA		<>__FIL			
17	Text	300_BAUKO_STA		<>__TXT			
18	Hatch	300_BAUKO_STB		<>__FIL			
19	Text	300_BAUKO_STB		<>__TXT			
20	Hatch	300_BAUKO_STB_BES		<>__FIL			
21	Hatch	300_BAUSK_GIK		<>__FIL			
22	Text	300_DBELO		<>__TXT			
23	Text	300_DBHLS		<>__TXT			
24	DoorAxis			300_TUERE__AXS			
25	DoorText			300_TUERE__TXT			
26	WindowAxis			330_FASSA__AXS			
27	WindowText			330_FASSA__TXT			
28	Text	350_TREPP		<>__TXT			
29	Element	350_TREPP	4.7	350_TREPP__UEB	Ist ein Beispiel: Stift + Linientyp anpassen		
30	Hatch	386_BRAND		<>__FIL			
31	Hatch	387_SICZO		<>__FIL			
32	Text	461_AUFZG		<>__TXT			
33	Hatch	510_GELAE		<>__FIL			
34	Text	520_BEFST		<>__TXT			
35	ColumnHatch			<>__FIL			



2D: Only 2D data can be written.

3D: All data (2D + 3D) can be written.

Decimal places: 6

Specifying the precision of the numbers (decimal places) for the DXF file.

Units: active

active: The units set in CAD are used.
mm: The data is exported in millimetres.
m: The data is exported in metres.

Write attributes

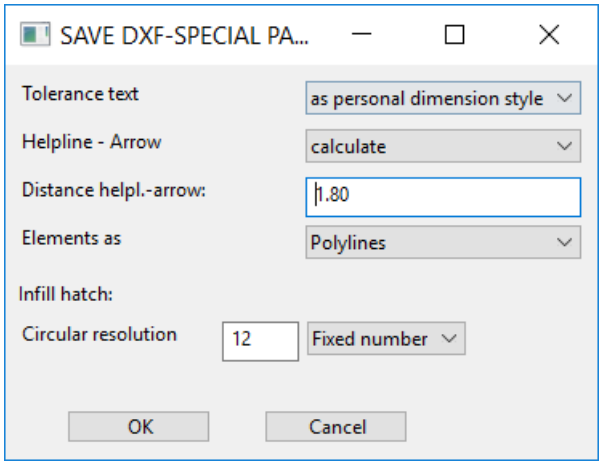
ON: The ELITECAD attributes and layers are written as DXF attributes. The ELITECAD attributes are written as being converted 1:1 where the conversion file is not otherwise stated; in other words, the attribute *id* becomes the DXF attribute *id*.
The ELITECAD *model, group, class, level* classifications are converted to the DXF attributes *HD_PATTERN, HD_GROUP, HD_CLASS* and *HD_LAYER*.
If the ELITECAD classifications or attributes are visible and the ELITECAD text only contains the classification or attribute names, these are written as visible DXF attributes, or as DXF text and invisible DXF attributes. The invisible attributes are arranged one below the other in order to ensure an overview when changing visibility e.g. in AutoCAD.
OFF: No ELITECAD attributes or layers are written as DXF attributes.

Write fill hatch

ON: Infill hatches are written as associative hatches (HATCH).
OFF: No infill hatches are written.

SPECIAL-PARAMETER

After activating the switch, the following set-up dialog window appears.

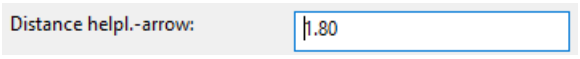


Tolerance text as personal dimension style

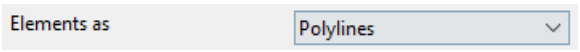
As personal text: The two-line tolerance text is generated separately from the dimensioning block as independent text with the same layer.
As personal dimension style: For every different tolerance text, a separate DIMSTYLE (dimension parameter) is generated.
In dimension block: The two-line tolerance text is also stored in the dimension block. Tolerance text is lost in AutoCAD if stretched.

Helpline - Arrow calculate

constant: The specified distance between the dimensions and the start of the dimension help line is used.
calculate: The distance is calculated from the dimension geometry and saved in the DXF dimension parameter. For architectural dimensions (constant length of help lines) the settings are useless because another distance is given for every dimension.



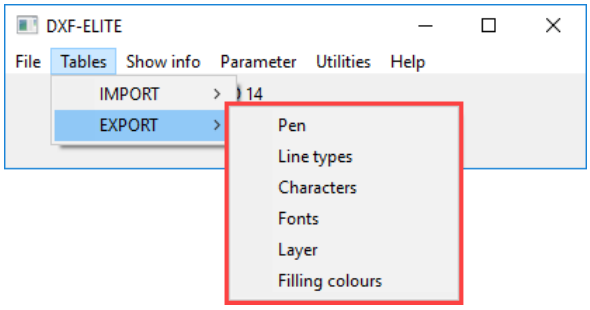
Value for the *constant* setting.



Lines + arcs: ELITECAD elements are written as individual lines and arcs, e.g. 1 rectangle > 4 lines
Polylines: successive ELITECAD elements are written as polylines, e.g. 1 rectangle > 1 polyline

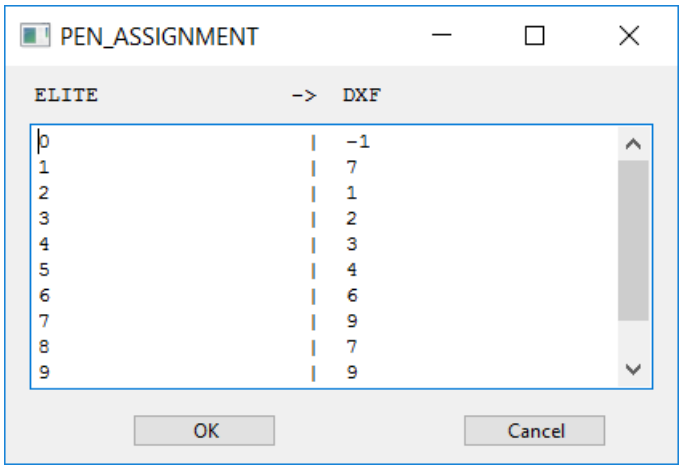
(Up to ACAD Release 12)
Circular resolution: Number of segments or curve lengths.
Fixed number: Number of segments for every full circle.
Curve length: Segment lengths in the active unit. To avoid unwanted results, the number of segments per curve in the program is limited to a minimum of three and a maximum of 100.

Default settings for the export



Pens
This function is used to allocate the ELITECAD pens to the DXF colours.

Because Version 8 and higher of ELITECAD have over 1024 pens to choose from, whereas the DXF file format (and also AutoCAD) only has 256 pens, several ELITECAD pens must be assigned to a DXF colour. For this to work, ELITECAD has predefined conversion tables for IMPORT and EXPORT.
Consequently, and from the fact that the conversion tables were created based on the most similar colour, the pen numbers can be changed after EXPORT and subsequent IMPORT, e.g. ELITECAD pen no. 94 becomes ELITECAD pen no. 78 after DXF-EXPORT and subsequent DXF-IMPORT.
If this is not required, separate entries for the desired pens must be created in the conversion tables, e.g.
EXPORT 94 > 55 and IMPORT 55 > 94

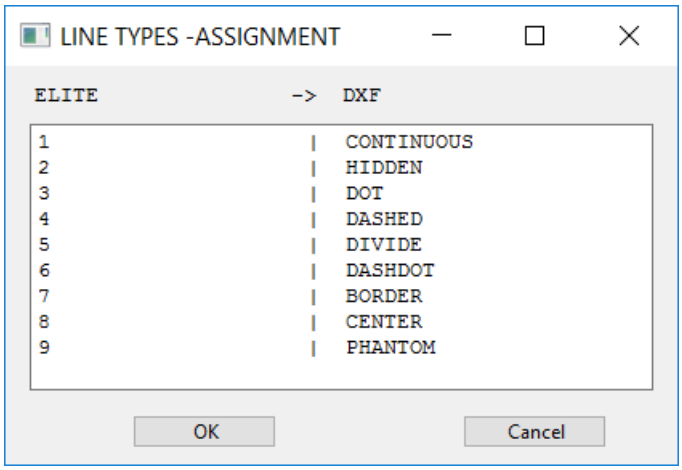


Tip:
The DXF pen "-1" (minus 1) means that the respective ELITECAD pen is not written into the DXF file.

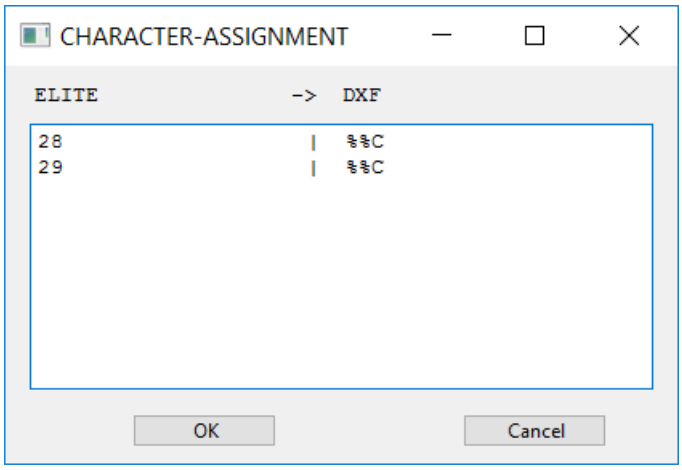
The following must be noted when entering the desired allocation (this applies to all following tables):

- At least one blank space must be present between two values.
- The table is completed by an empty row.
- All entries after the empty row will be ignored.

Line types
This function is used to allocate the ELITECAD line types to the DXF line types.



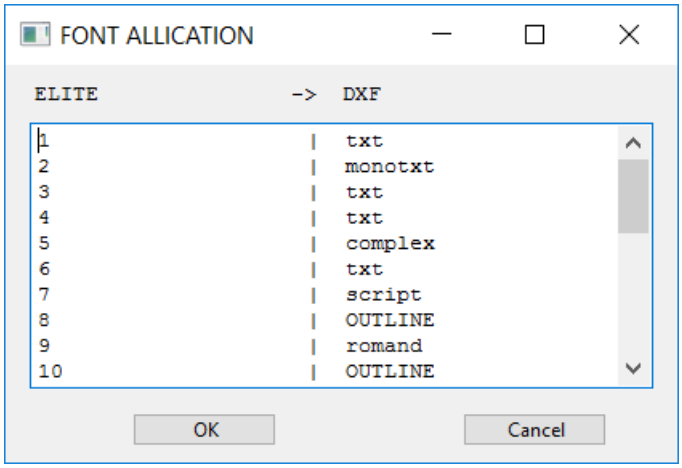
Characters
This function is used for the allocation of ELITECAD special characters to DXF text sequences (%%...) and other special characters.



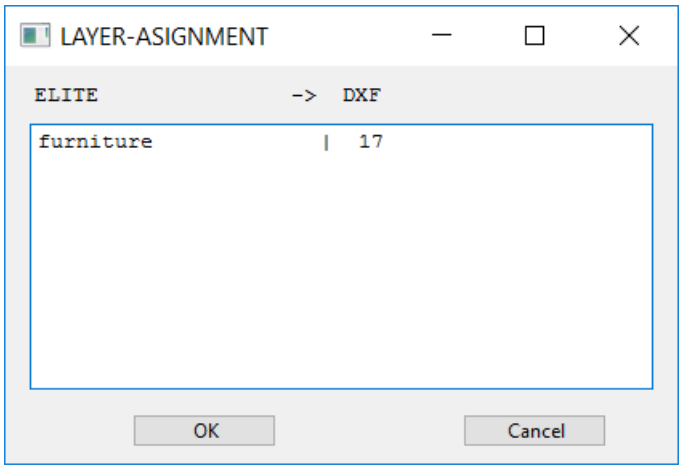
Tip:
"^5" stands for exponent 5 in the M,cm/mm dimensioning. Numbers 1 - 9 can be used here.

Fonts

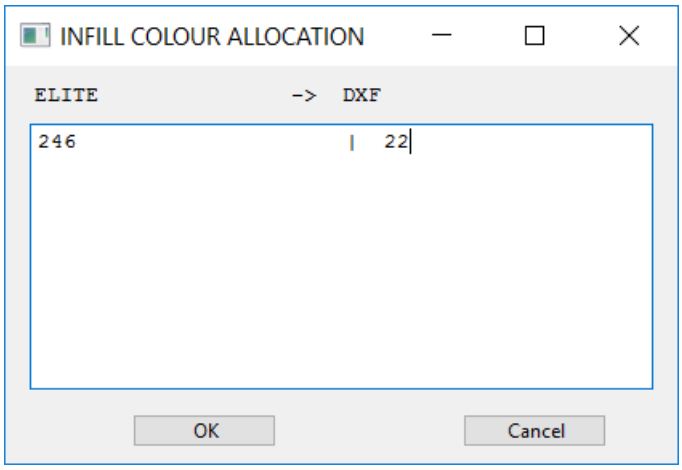
This function is used for the allocation of ELITECAD fonts to DXF fonts.



Layer
This function is used for the allocation of ELITECAD layers to DXF layers.
After activating the function, the following set-up dialog window opens.

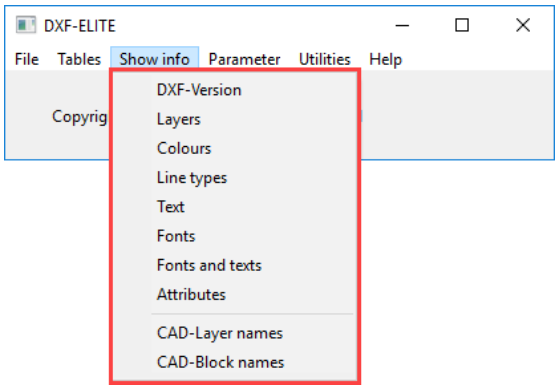


Filling colours
This function is used to allocate the filling colours.

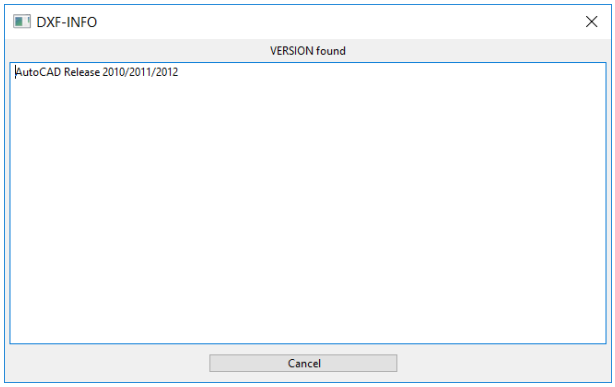


READING THE INFORMATION

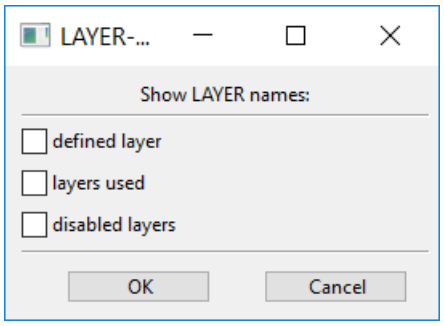
In order to increase the quality of the imports, previous information can be read from the DXF file. The basic criteria of a DXF file are displayed on dialog windows and can be applied to the import tables. Both "CAD-Layer names" and "CAD-Block names" functions list the values from the active drawings on the screen. To read the information in a DWG file, the file must first be converted into a DXF file in Converter.



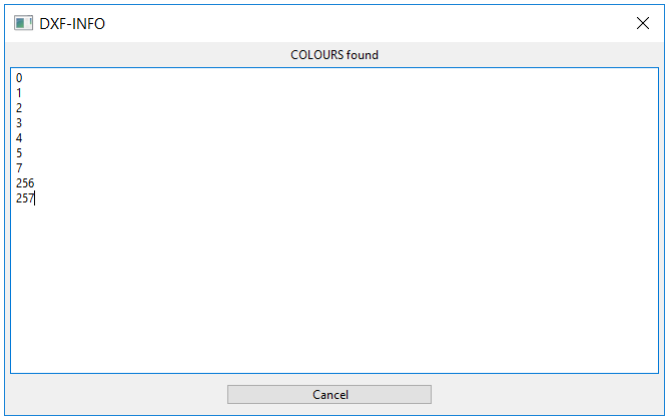
DXF-Version
This function is used to show the DXF-Version that is being used.



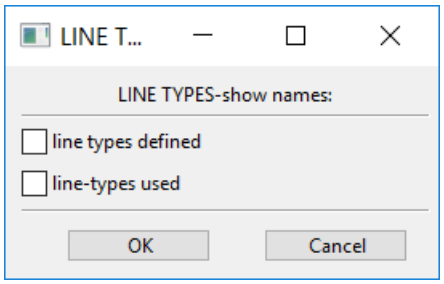
Layer
This function is used to show the layers that have been defined, are used or are frozen in DXF.



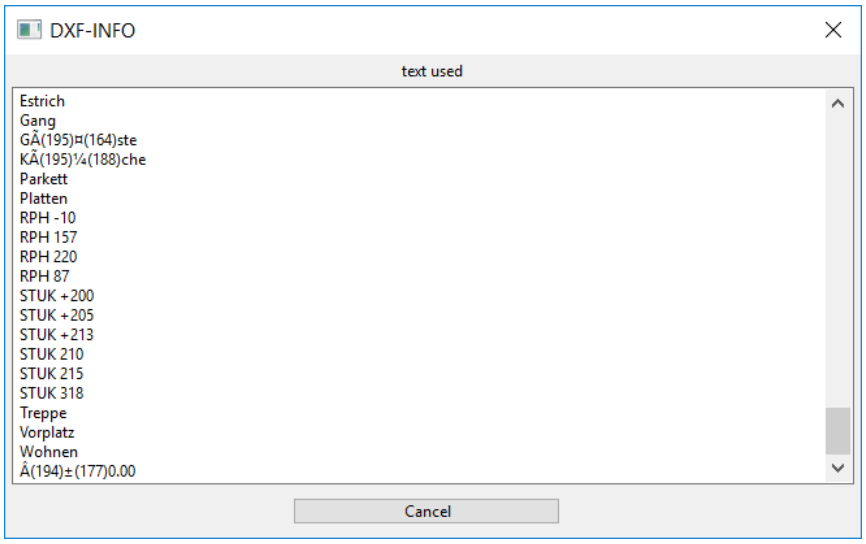
Colours
This function is used to show the colours used in DXF.



Line types
This function is used to show the line types that have been defined or are used in DXF.



Texts
This function is used to show texts used in DXF. For special characters, the ASCII code is subsequently written in parentheses. If the characters are incorrectly imported, the character has to be amended in the import tables.



TIP

Converting special characters:

When reading a file, the text reads as follows, for example: "10.95 m»" This text should be changed to "10.95 m²".

All text in the DXF file can be listed with the SHOW INFO > TEXT function. Special characters' ASCII codes are marked with parentheses.

Result: "10.95 m» (253)" or "10.95 m (253)"

The character code for the special character in ELITECAD can be identified with the function HELP > CHARACTER SET. In this case, it is 178. Now all you need to do is insert 178 for the value 253, and on rereading the file, "10.95 m²" appears instead of "10.95 m»".

Fonts
Shows the used DXF font definitions.

Fonts and texts
Shows the used DXF font definitions including the texts used.

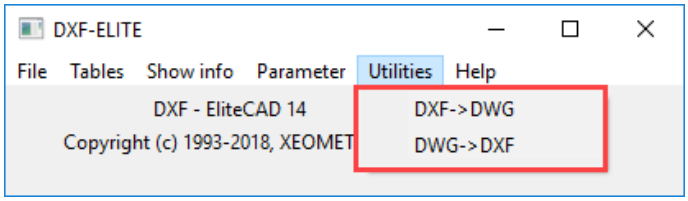
Attributes
Shows the used DXF attributes and their content.

CAD-Layer names
Layers used in the active images are displayed in the info window.

CAD-Block names
Blocks used in the active images are displayed in the info window.

Utilities

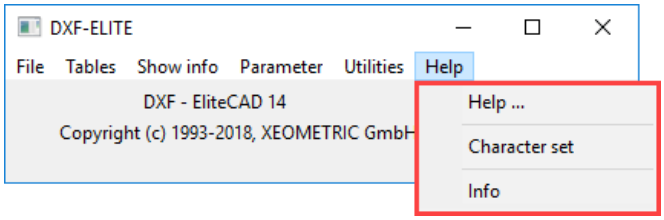
DXF > DWG/DWG > DXF



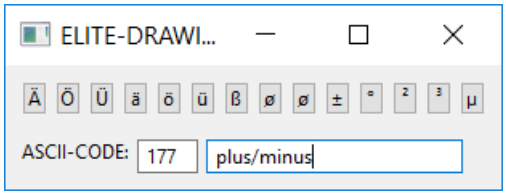
Converts a DXF file into a DWG file or a DWG file into a DXF file.

Help

Character set



This function is used to show the important ELITECAD special characters and their internal ASCII code.



3.2 IFC

The IFC-interface is only available in ELITECAD Architecture.

In the frame of IFCs (Industry Foundation Classes), all construction parts existing within the construction are defined as objects and are identified as such in programs, which support this standard. Compared to the conventional exchange of simple 2D and 3D line drawings, the IFCs make "intelligent" data models for general programs available to the user.

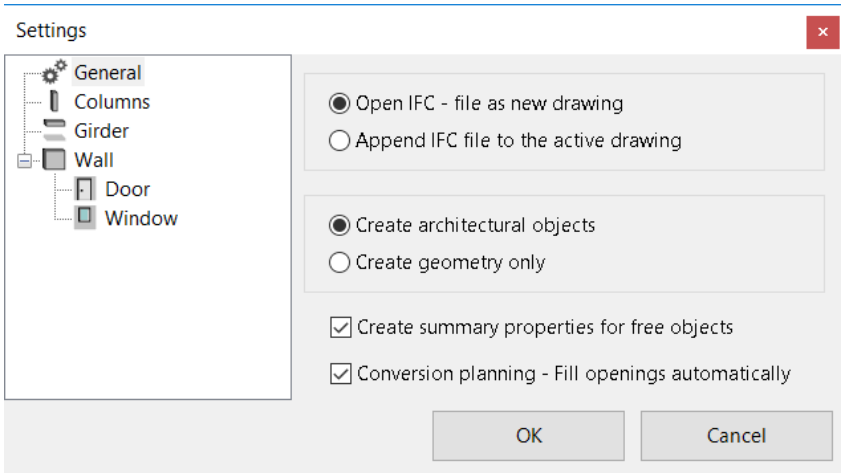
Version
The version IFC2x3 2nd level supports the most important architectural construction parts. A detailed list is outlined in the IFC user handbook: http://www.buildingsmart.co.uk

The IFC-interface is continuously being further developed by the relevant associations.

READ IFC2x3

	File exchange toolbar
	File menu > File exchange > Read IFC2x3

General



Open IFC-file as new drawing
The current drawing will be deleted and the IFC file will be loaded.

Append IFC-file to the active drawing
The current drawing remains unchains and the IFC file will be loaded into the current drawing.

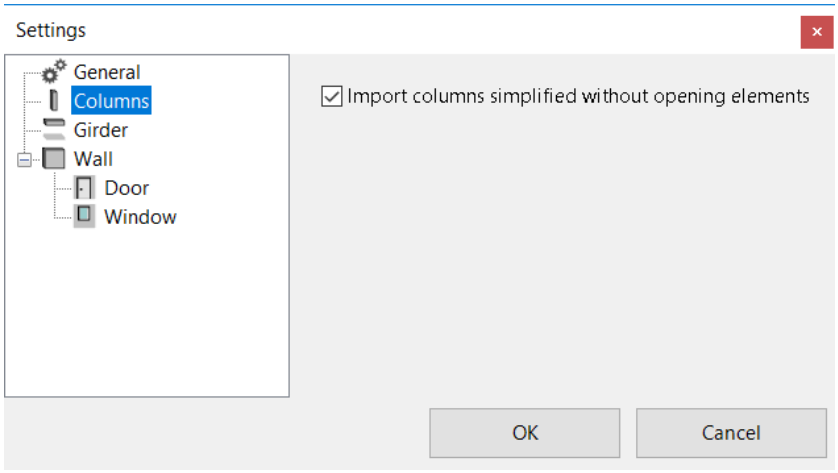
Generate architectural objects
The IFC data is generated as architectural objects if this information is present.

Generate geometry only
The IFC data is only generated as 3D geometry and cannot be edited as architectural objects.

Create properties for free objects
A set of free properties is assigned to nonparametric objects.

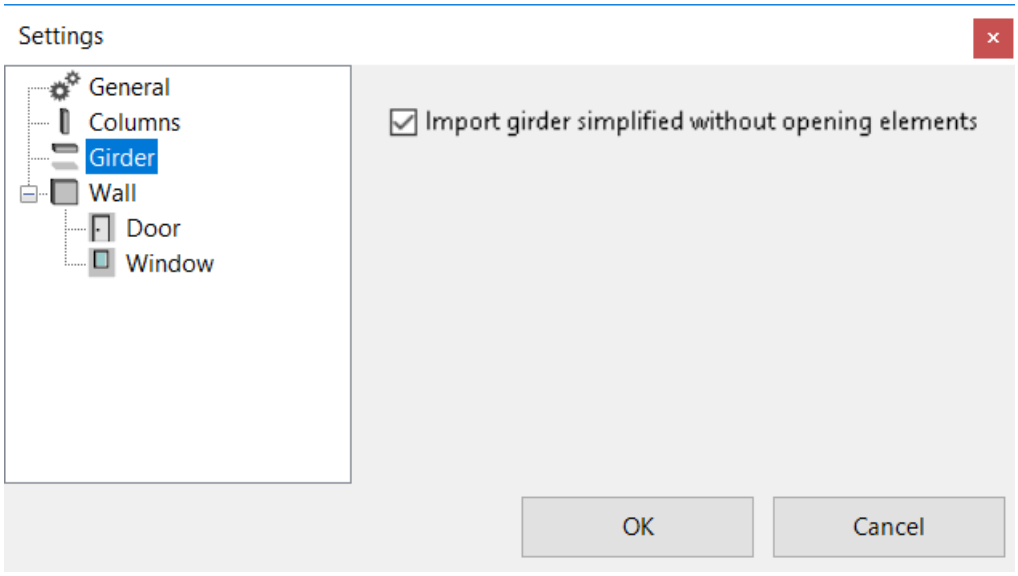
Renovation planning – fill openings automatically
Opening objects belonging to demolition state automatically receive the ELITECAD property that the opening is automatically filled.

Column



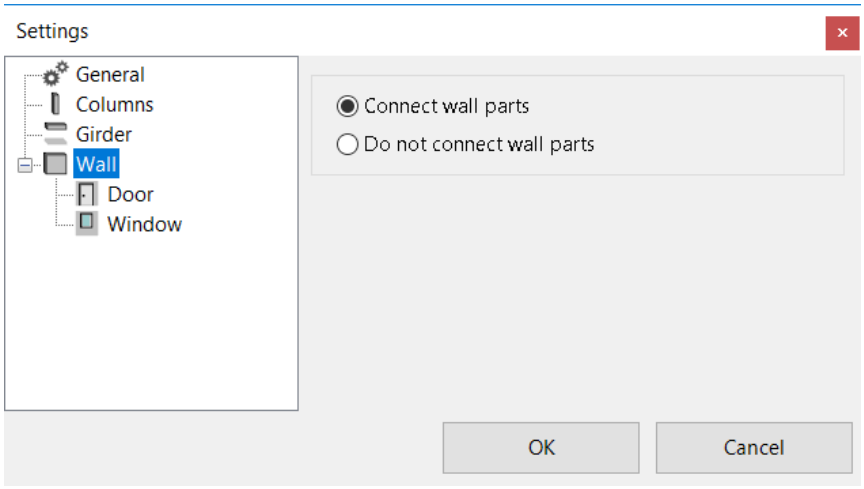
Import columns simplified without opening elements
OFF: Columns are imported with openings. Can take longer. (Standard)
ON: Columns are read simplified (without openings).

Girder



Import girders simplified without opening elements
OFF: Girders are imported with openings. Can take longer. (Standard)
ON: Girders are read simplified (without openings).

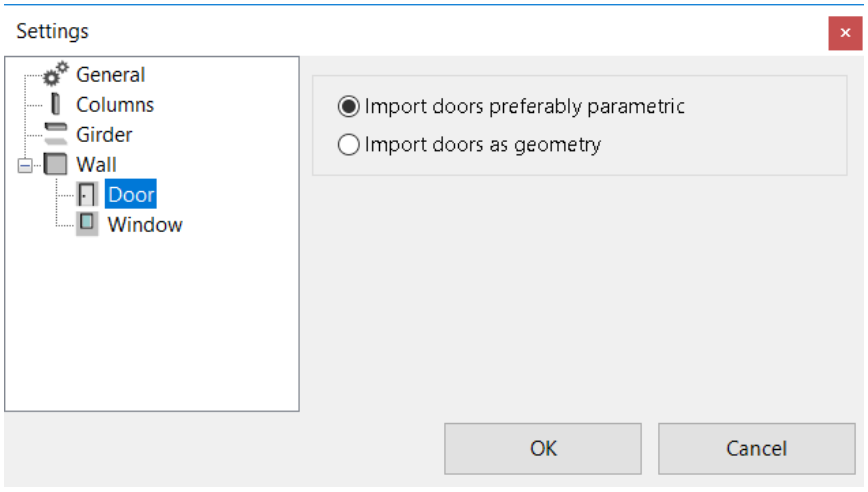
Wall



Connect wall parts
Wall parts are connected together if this information is present.

Do not connect wall parts
Every wall section forms an individual object.

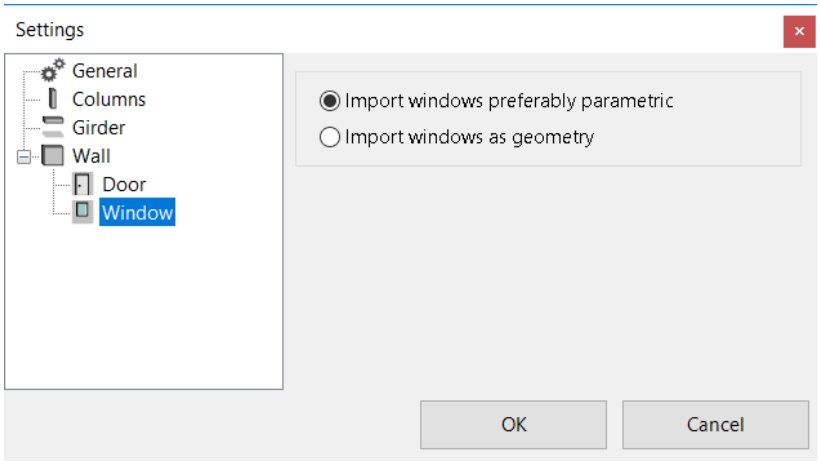
Doors



Import doors preferably parametric
Doors are read as parametric objects if this information is present.

Import doors as geometry
Doors are generated as 3D geometry.

Windows



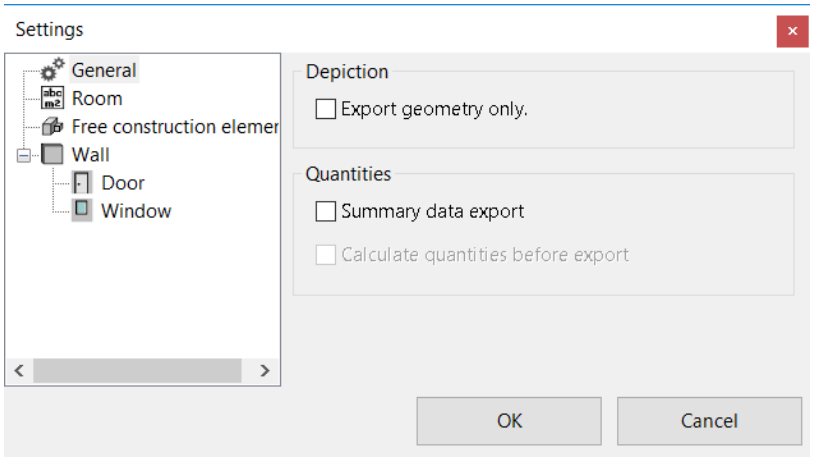
Import windows preferably parametric
Windows are read as parametric objects if this information is present.

Import windows as geometry
Windows are only generated as 3D geometry.

WRITE IFC2x3

IFC	File exchange toolbar
	File menu > File exchange > Write IFC2x3

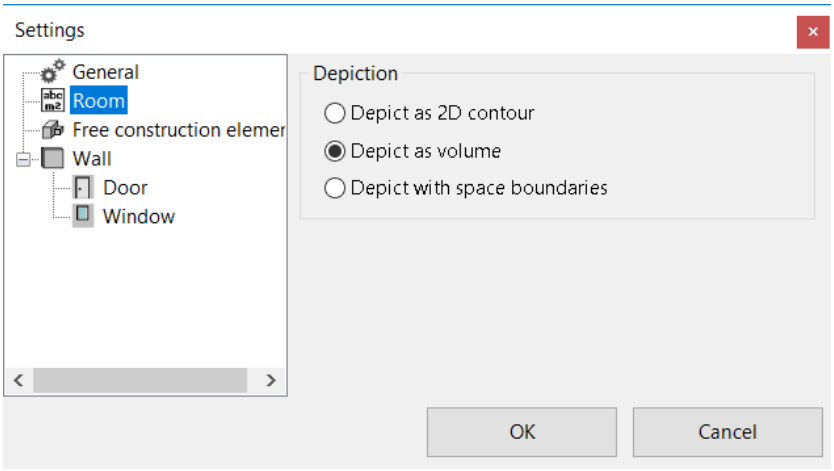
General



Generate geometry only
ON: The IFC data is only generated as 3D geometry and cannot be edited as architectural objects.
OFF: The IFC data is generated as architectural objects.

Quantities export
Quantities are written into the IFC file if desired.

Room

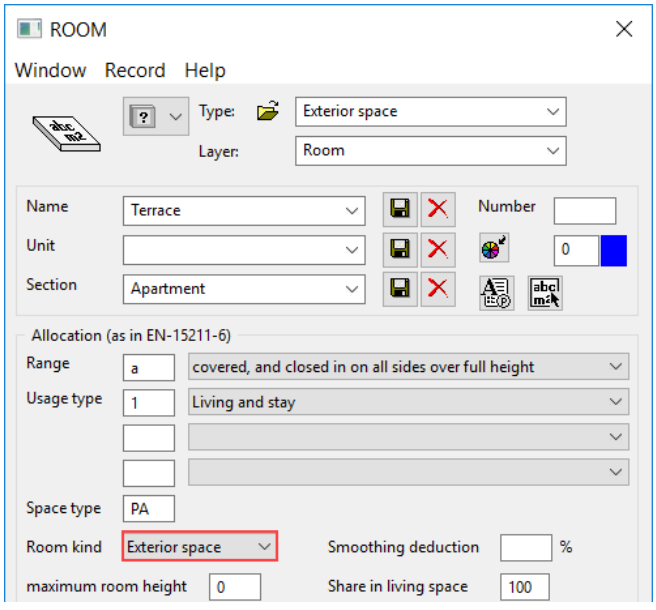


Represent as 2D contour
Room volume is not exported as 3D.

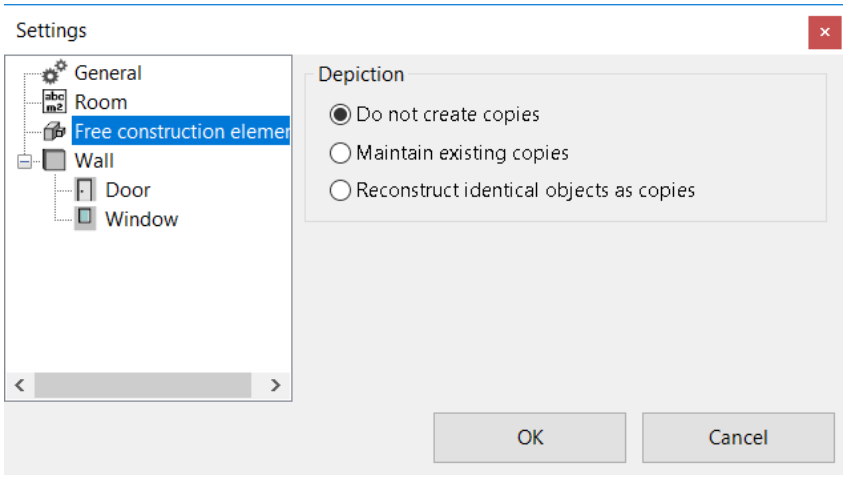
Represent as volume
Room volume is also exported as 3D. This begins from TS Floor and goes up to the lower edge of the ceiling.

Represent with levels of room boundaries
With this option, boundaries of the room are determined and saved according to the surrounding building elements such as the walls, windows, doors, floors, ceilings or other room separators.
This is important for energy calculation programs that need to know which construction elements surround the rooms and in which manner.

The following rules are in force
Exterior space:
The room kind for the room label must be set to "Exterior space".



Free construction element

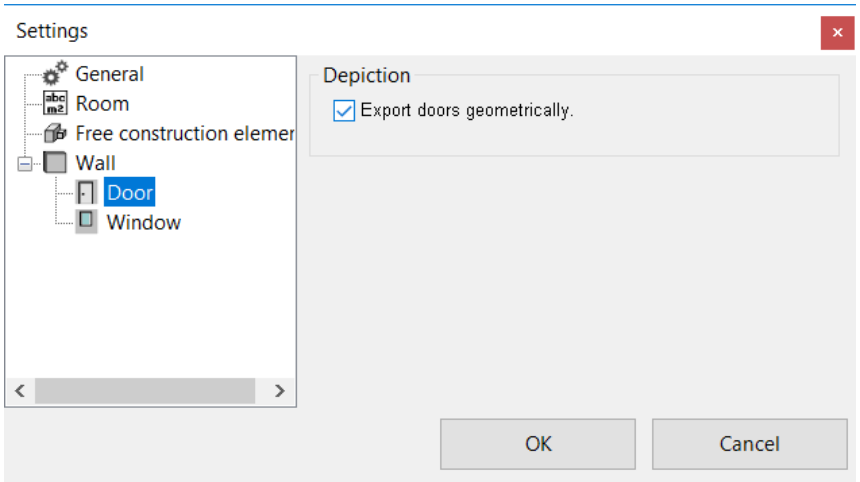


Do not generate copies
Identical library parts are never generated as copies.

Maintain existing copies
Identical library parts are generated as copies.

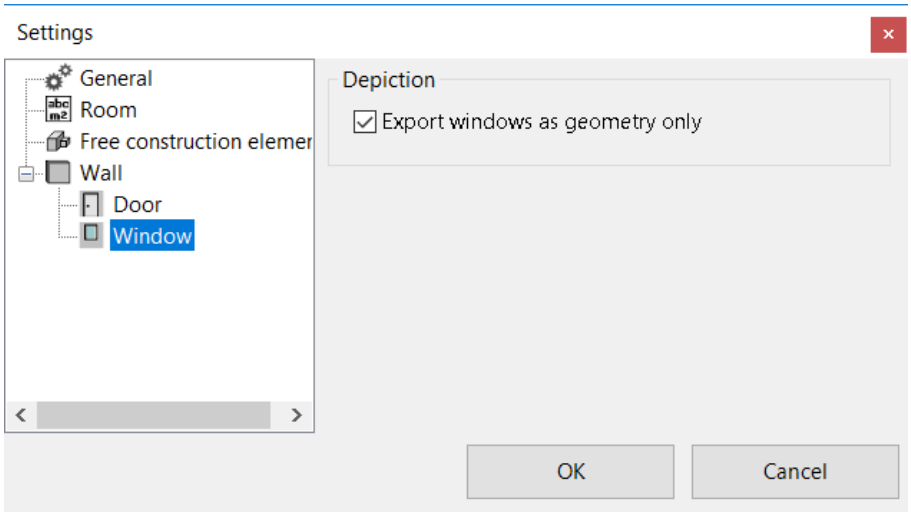
Search for equal objects and reconstruct as copies
Identical library parts are checked and generated as copies.

Doors



Export doors geometrically
ON: Doors are generated as 3D geometry.
OFF: Doors are exported as parametric objects.

Windows



Export windows geometrically
ON: Windows are generated as 3D geometry.
OFF: Windows are exported as parametric objects.

3.3 BCF

BCF	File exchange toolbar
	File menu > File exchange > BCF

The BCF-interface is only available in ELITECAD Architecture.

For collaborating with your partners, the support of BCF (BIM collaboration format) ensures for a smooth exchange of information, and is another milestone in the BIM process. The BCF format is developed by the BuildingSmart organisation and provides a data interface to easily exchange information during collaboration of different project partners in addition to an IFC model. It enables a model-based communication between various users and contains information about state, location, viewing direction, component, comments, users and time stamps in the IFC data model.
In case all people involved in a project are working with ELITECAD, the possibility to exchange information using BCF is also provided using ELITECAD models instead of IFC models.

Basics

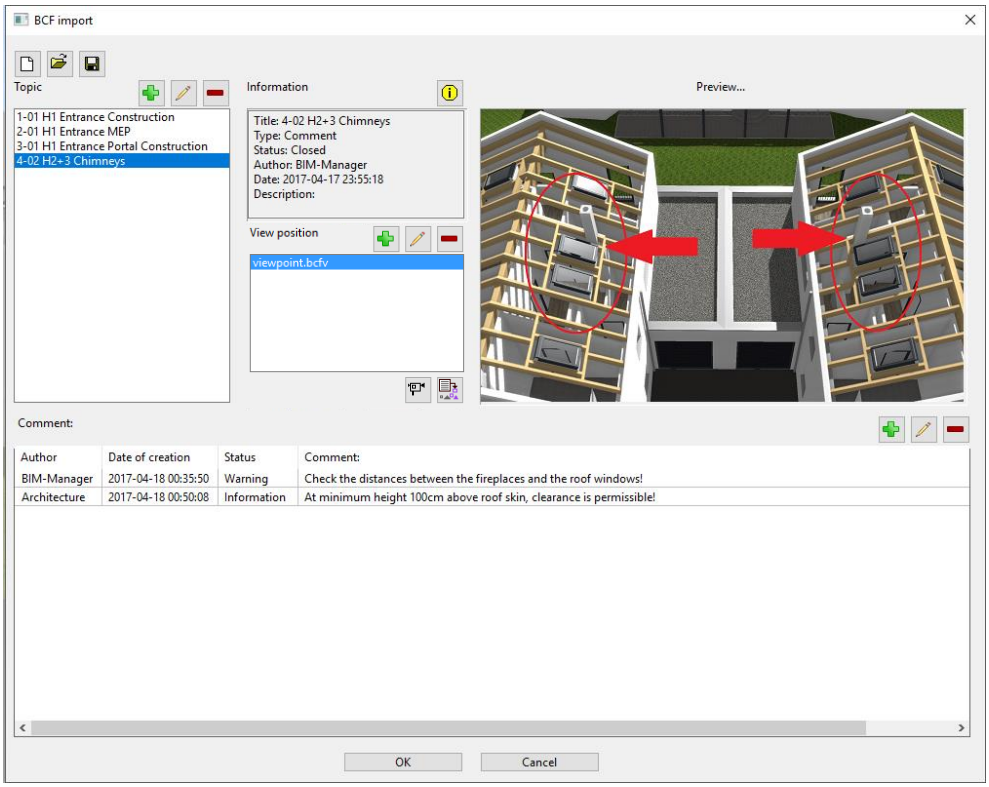
A BFC file contains different topics. Each topic is intended to describe one independent issue. For each topic, there is some detail information available:

- general data for the topic
- image
- camera
- involved objects
- comments

In order to identify objects in an IFC file or in the ELITECAD design model, the objects need a unique id, the so-called Globally Unique ID, short GUID. GUIDs are saved in the ELITECAD drawing as well as in an IFC file.

BCF dialog window

After calling the function, the BCF dialog window is opened.



BCF file new, load, save

Via these functions, BCF files are created, selected for editing or saved.

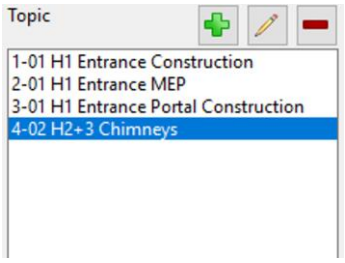
Update GUIDs

GUIDs are created when the BCF function is called in ELITECAD. If the design model changes or a new file is opened while the BFC dialog is on the screen, the GUIDs can be updated with this function.

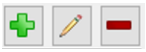
Link BCF-file with drawing

The name of the corresponding drawing is saved in the BCF file.

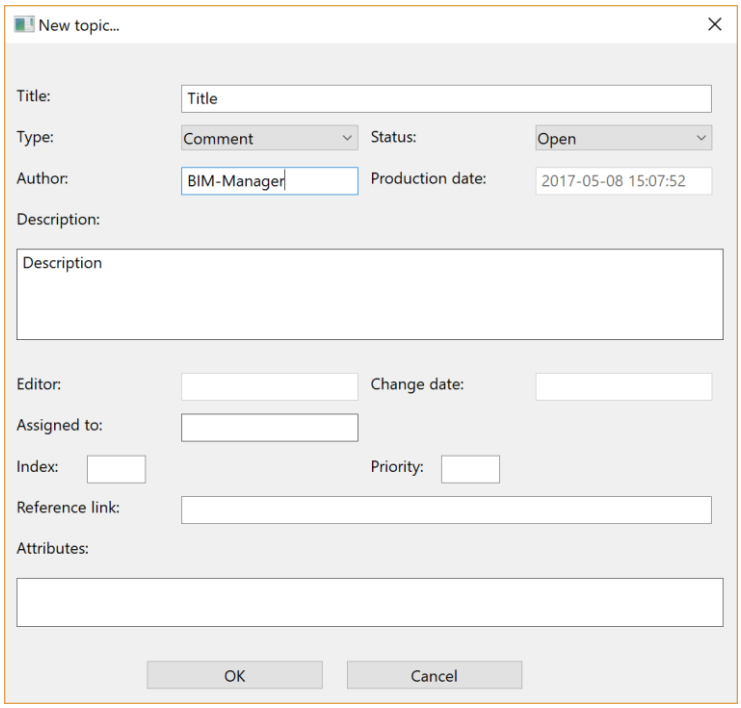
Topic



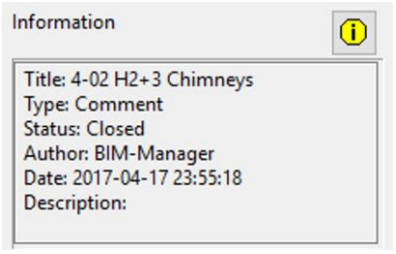
In the left top area of the dialog window, all existing topics are listed. There is always one topic active. In the large BCF dialog window, all information of the currently selected topic is displayed.



These buttons are intended to create, delete and rename a topic. All fields of the topic properties can be filled as needed.



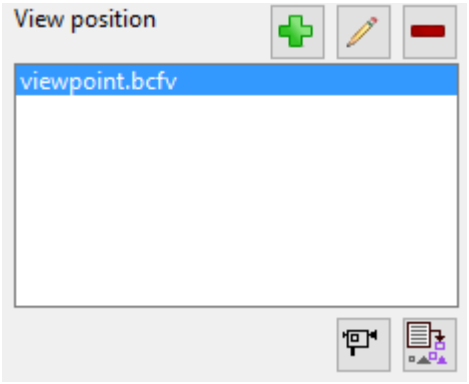
Information



The information area displays general data of the current topic. Examples are the author, description, date of creation or the state of a topic.

The information button displays the link from the BCF file to the ELITECAD drawing.

View point

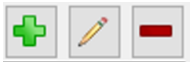


Viewpoints and involved objects can be retrieved from the design model currently loaded in ELITECAD. Viewpoints can be reactivated afterwards. Objects are visualised if needed and added or removed afterwards as well.

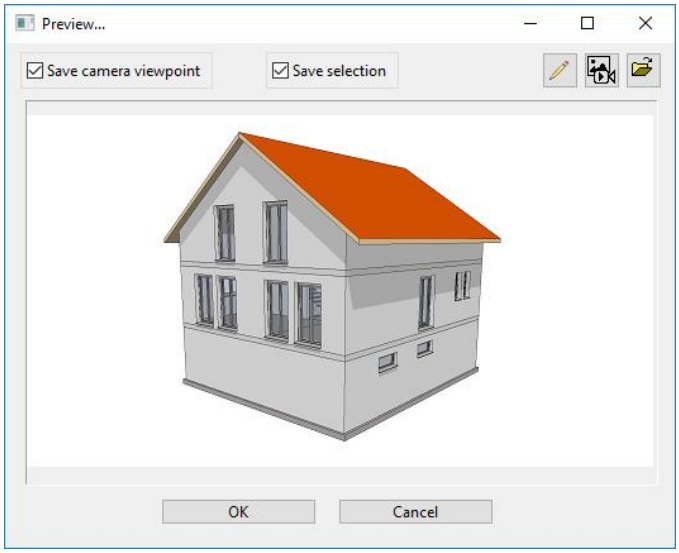
Show viewpoint

This function activates the saved viewpoint in ELITECAD.

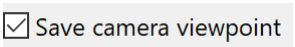
Create, edit, delete viewpoint



These buttons are used to create, edit and delete viewpoints. For creation and editing a dialog window with a preview image opens.

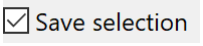


Save camera viewpoint



The camera viewpoint is required in order to return to the position where the image was saved.

Save selection



In addition to the image, involved objects can be saved as well. The objects have to be selected before saving.

Edit image

With this function, the snapshot is opened in Microsoft Paint® and can be edited or supplemented with graphical notes (arrows, circles). After saving and closing Paint, the modified image is substituted.

Create snapshot from CAD

By activating this function, the image of the current view is saved with the SNAPSHOT function and displayed in the preview area.

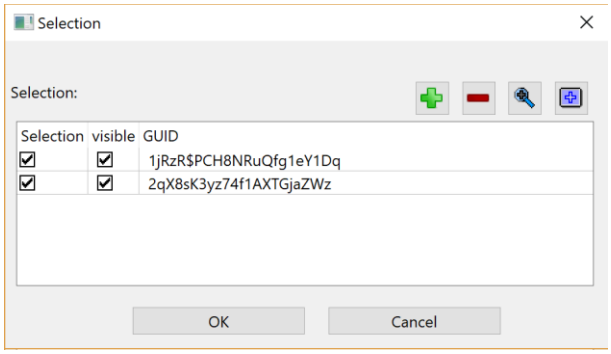
Select saved image

A saved image file can be used instead of creating a snapshot.

Object list

This function becomes active after the first viewpoint was saved.

Involved objects are saved optionally when creating a snapshot. The function opens a dialog window where the saved objects are listed. This function is used to add further objects to the list or to remove objects.



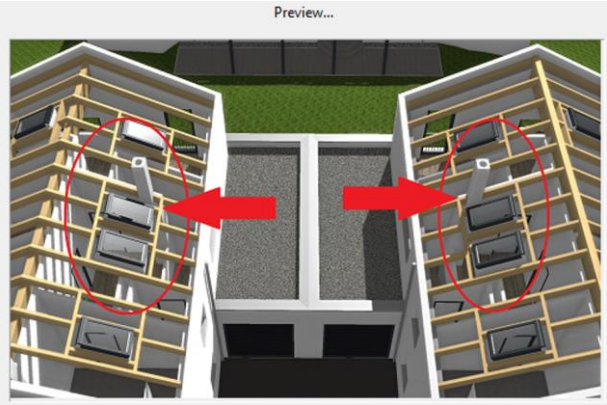
Add / delete objects

With the + sign all selected objects in ELITECAD are added to the list. With the – sign the selected entries are removed from the list. Adding new objects is only available after the creation of GUIDs.

Show / hide objects

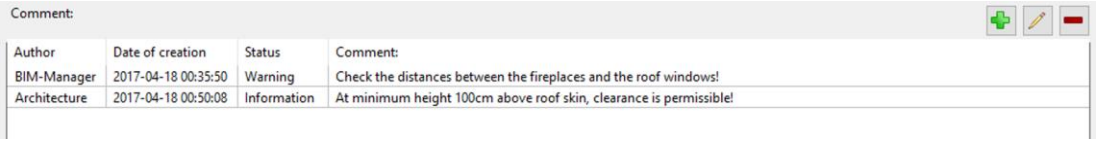
These two functions either set the objects visible exclusively or set the whole design model visible in the graphics window.

Preview



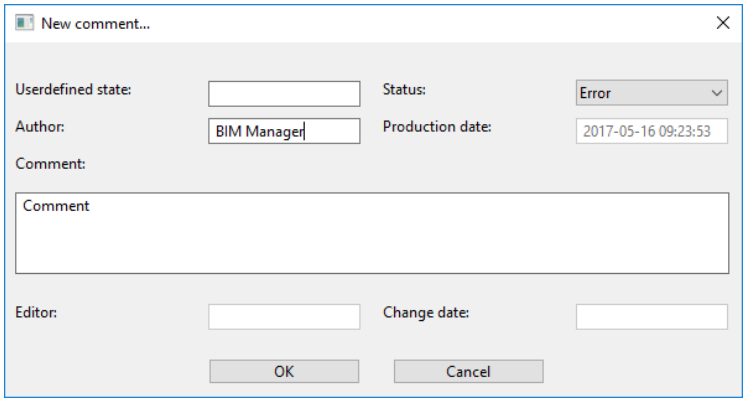
Optionally an image for a better explanation of a topic can be saved. This image is created via the VIEWPOINT function and displayed in the preview area.

Comment



Comments are sequential documentations of a topic, which are added by different project partners.

These buttons are intended to create, edit and delete comments. Comments are used for communication or remembering detail information, as well as documenting completed tasks.



3.4 IMAGE

File menu > File exchange > Write pixel format

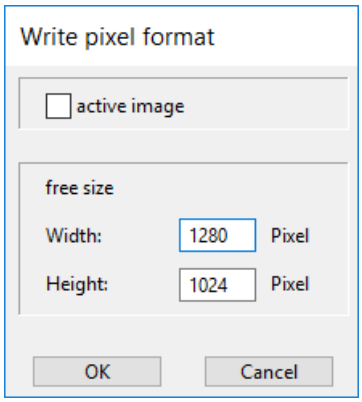
WRITE PIXEL FORMAT

This function is used to save the image in pixel format.

The following formats are possible:

- TIFF
- JPEG
- Windows BMP
- PNG

If the active view is rendered, the dialog window directly appears. Otherwise, the corresponding dialog window with the resolution details is shown first.



Under ACTIVE IMAGE, the desired pixel size from the active screen settings can be applied.

Under WIDTH and HEIGHT, the desired pixel size can be set. The relationship between width and height should be retained.

CREATE SNAPSHOT

Camera toolbar

Menu View > Camera > Create a snapshot

Description see chapter SETTINGS > CAMERA > CREATE A SNAPSHOT.

CREATE VIDEO

Camera toolbar

Menu View > Camera > Create a video

Description see chapter SETTINGS > CAMERA > CAMERA PATH > CREATE A VIDEO.

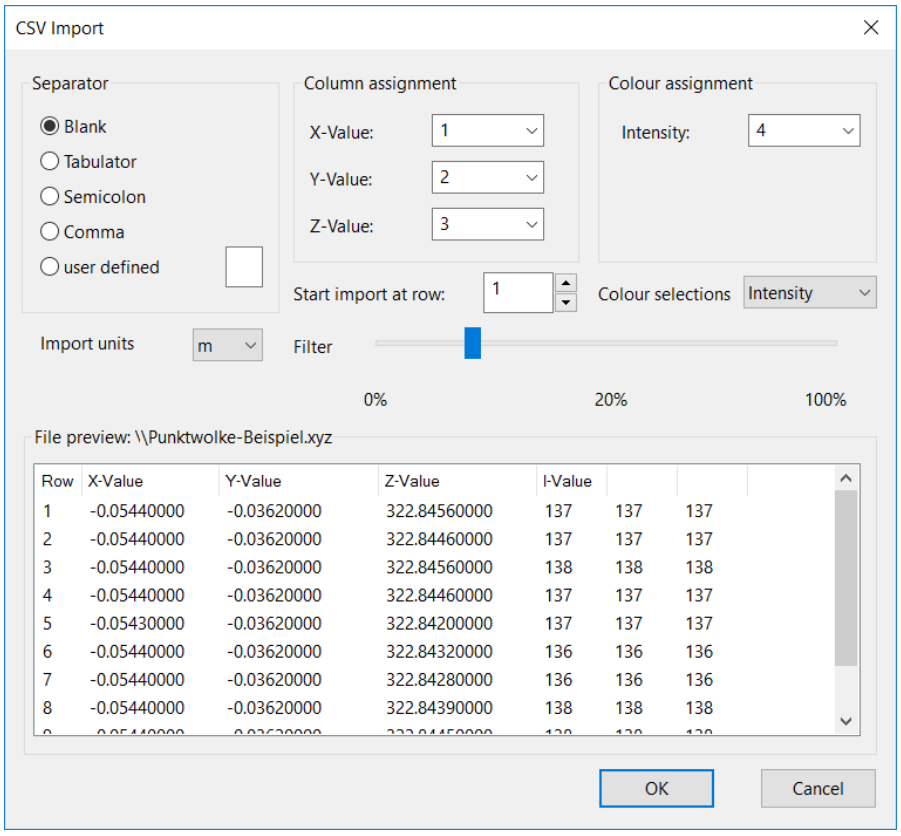
3.5 POINT CLOUDS

Point clouds are usually generated using laser scanners and are provided as text files. In general, each line represents the XYZ coordinates of a single 3D point. A line may eventually also contain the colour of a point defined as RGB value or an intensity value. Depending on the scanner software, a line may additionally contain data like point number or other values.

Read point cloud

File menu > File exchange > Read point cloud

The point cloud file has to be selected. A dialog window showing a preview of the first lines opens.



Following settings can be made:

- The separator for the values in between a row
- Columns for the X-, Y-, and Z-value
- Columns for the R-, G-, and B-value (if colour import is active)
- The number of rows for the header or from which row the point import should begin
- The mode of colour import (no colour, RGB, intensity)

In practice, there are often enormous amounts of data with millions of points that are at the expense of performance during the processing and frequently not even necessary in this level of detail. For this reason, ELITECAD offers the possibility to reduce the number of acquired points via a controllable filter.

After the selection has been made, you can start the import with OK.

Each import process generates a new point cloud object. When combining multiple files it is necessary to assure that all files refer to the same origin.

Imported points can be selected using all snap functions and can be used for measuring.

3.6 VRML

File exchange toolbar

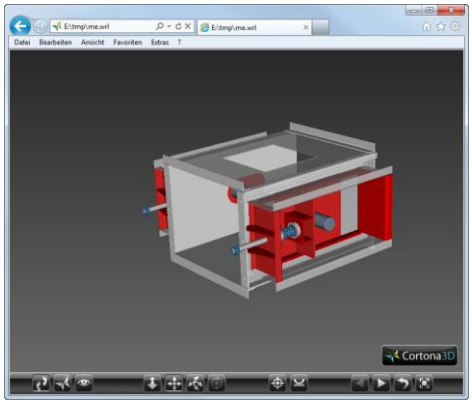
File menu > File exchange > Write VRML

The Virtual Reality Modelling Language (VRML) generates 3D models including illumination and surface colours. The files are saved in VRML 2.0 format with file name extension ".wrl".

Use:

The models can be presented within a web browser with an additional plugin.

Various render programs can read VRML files.



Internet Explorer 10.0 with the Cortona3D Viewer plugin is one such example.

3.7 MESSERLI VIS

File exchange toolbar
File menu > File exchange > Write Messerli VIS

From Release 12 (*.ray)
The RAY format is the native format from Messerli VIS 12.14 and Gamma-Ray 15.16. All textures that were assigned in ELITECAD are applied here. This file can be read and edited in Messerli VIS Releases 12 and 14.

Up to version 11 (*.tgf)
The TGF format is a file exchange format, which can be read in Messerli VIS. Only geometry without textures can be applied. This file can be read and edited in Messerli VIS up to version 11.

3.8 SAT

The file exchange supplies a volume model according to the ACIS standard.
Used typically as 3D file exchange for other mechanical CADs.

Read SAT

File exchange toolbar
File menu > File exchange > Read SAT

The dimensions of the entry design model need to be checked and scaled where necessary. The SAT design model is ideally read in an empty drawing so that the quality and orientation can be checked to make sure they are correct before the model is placed into the correct drawing.

Write SAT

File exchange toolbar
File menu > File exchange > Write SAT

Currently visible 3D data is saved in SAT format. The written SAT file should always be checked by reading it back. Several construction parts / free forms are not exported. (e.g. roof)

TIP

It is also possible to save 3D data in an older SAT version. The version is defined in the file type menu.

3.9 3DS

3DS is an Autodesk 3D Studio max file. This format saves 3D models including textures. The format provides better quality than a 3D-DXF.
Use:

- There are thousands of library parts on the internet in this format such as furniture, amenities, vehicles, plants.
- Manufacturers (for example Villeroy & Boch) deliver their parts in this format.
- Data exchange for render programs

Read 3DS

File exchange toolbar
File menu > File exchange > Read 3DS

The dimensions of the entry design model need to be checked and scaled where necessary. The 3DS model is ideally read in an empty drawing so that the quality and orientation can be checked to make sure they are correct before the model is placed into the correct drawing.

Write 3DS

File exchange toolbar
File menu > File exchange > Write 3DS

Currently visible 3D data is saved in 3DS format. The written 3DS file should always be checked by reading it back.

3.10 U3D

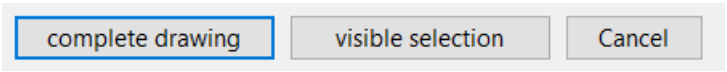
Write U3D

File exchange toolbar

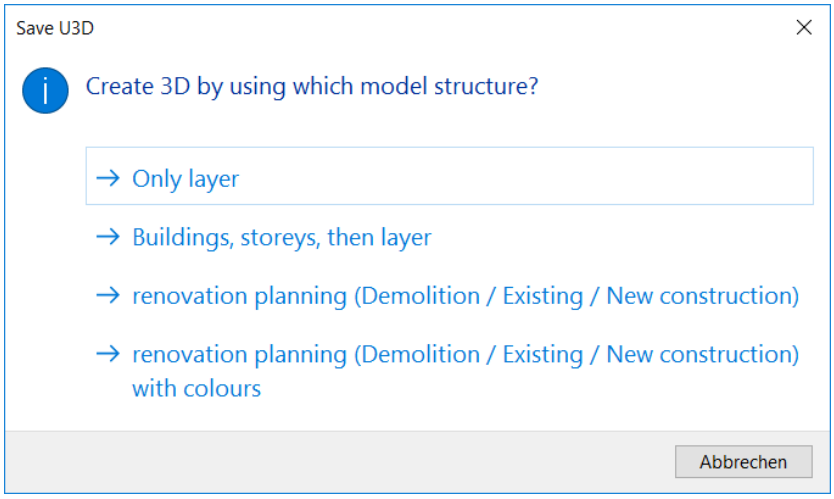
File menu > File exchange > Write U3D

The Universal 3D (U3D) is a format for 3D models and was standardised as ECMA-363.

If not the entire design model is assembled, on saving the U3D it can be determined whether only the assembled objects or the entire design model could be converted. This allows partial areas of the design model to be exported.



Additionally in the hierarchical structure can be written in the U3D file as well. Optionally the building and storeys are exported in ELITECAD Architecture in addition to the layers. In ELITECAD Mechanics either layer, classification or asseblies are exported.
Renovation planning information is optionally also exorted in ELITECAD Architecture as a separate hierarchical structure. If neccessary the renovation clour settings are used for the export.



3.11 PDF

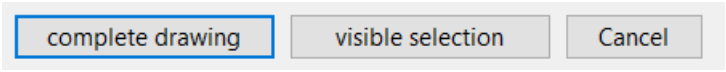
Write PDF3D

File exchange toolbar

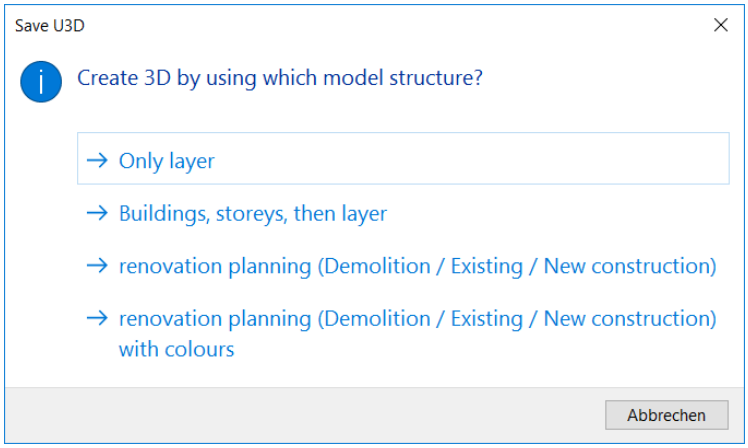
File menu > File exchange > Write PDF3D

The file exchange generates a 3D model in PDF format which can be opened in Adobe Reader ®. The viewer can freely rotate the design model in a PDF. This allows for a smooth exchange of data in a very popular program. The file exchange is very extensive and in addition to geometry includes light sources, textures and camera angles, as well as the layer and model structure.

If not the entire design model is assembled, on saving the PDF3D it can be determined whether only the assembled objects or the entire design model could be converted. This allows partial areas of the design model to be exported.

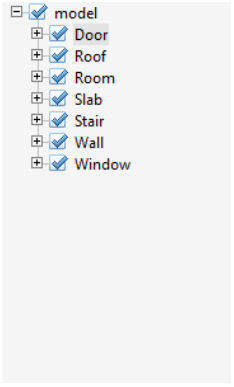


Additionally in the hierarchical structure can be written in the PDF3D file as well. Optionally the building and storeys are exported in ELITECAD Architecture in addition to the layers. In ELITECAD Mechanics either layer, classification or asseblies are exported.
Renovation planning information is optionally also exorted in ELITECAD Architecture as a separate hierarchical structure. If neccessary the renovation clour settings are used for the export.

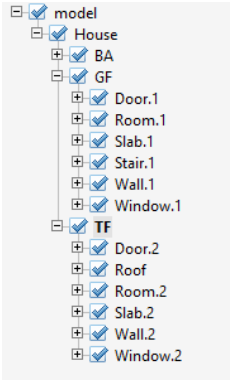


Result in ELITECAD Architecture:

"Only layer"

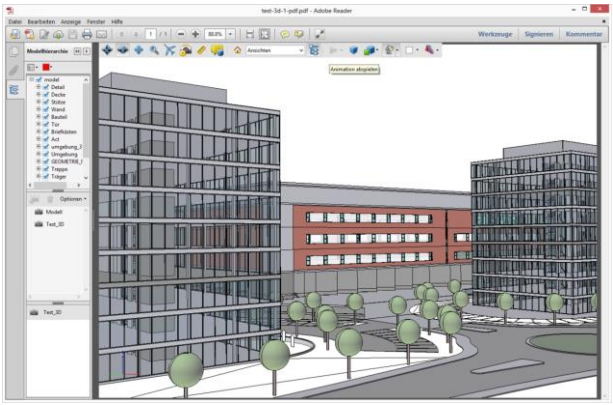


"Building, storey, then layer"



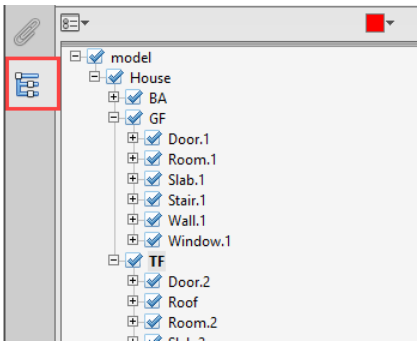
Adobe Reader ®

A range of possibilities is available in Adobe Reader as to how the design model can be viewed.



Model hierarchy

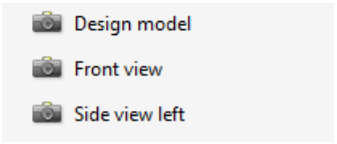
on/off



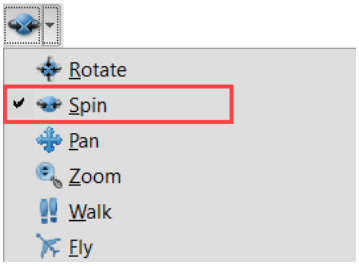
Control visibility of the structure, storeys, layer and objects.

Camera angles

The design model views are added to the PDF and can be selected in Reader.

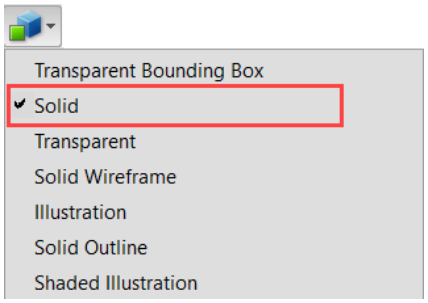


Rotate (horizontal)



"Rotate horizontally" allows the design model to be rotated in fashion similar to ELITECAD.

Display



The design model can be rendered in different display modes.

Read PDF

File exchange toolbar

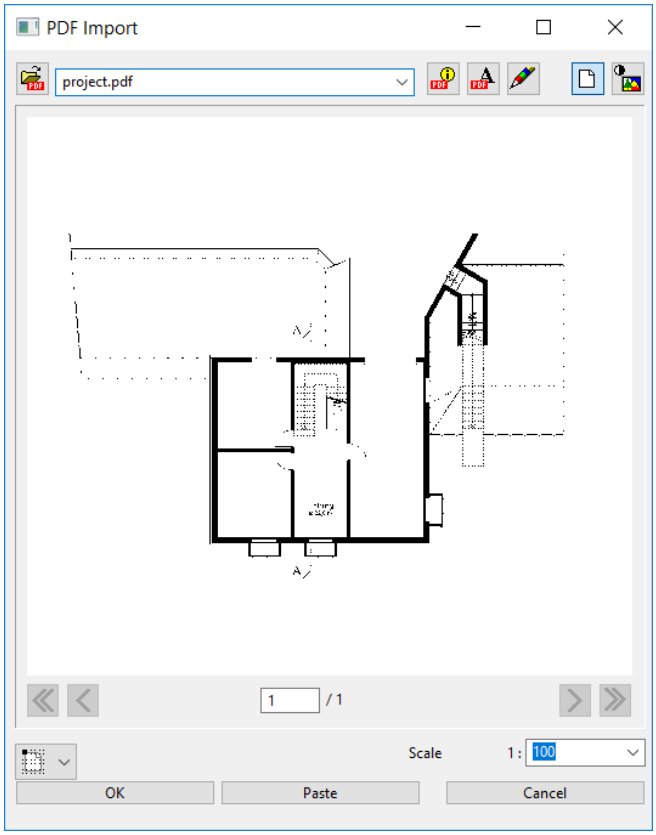
File menu > File exchange > Read PDF

PDF documents can be read in vector format. This allows changes to be made to this data later on. It is necessary for the PDF to be generated with vectors and not as an image.

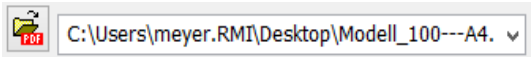
Settings can be changed in the import dialog window for optimal import. The imported PDF page is always grouped. The grouping can be cancelled (context menu) so that the individual parts can be manipulated.

The imported PDF is not 100 % true to scale to the original because inaccuracies already arise already when generating the PDF file (rounding to a multiple of 1/72 inch).

PDF import dialog window



Path for PDF file



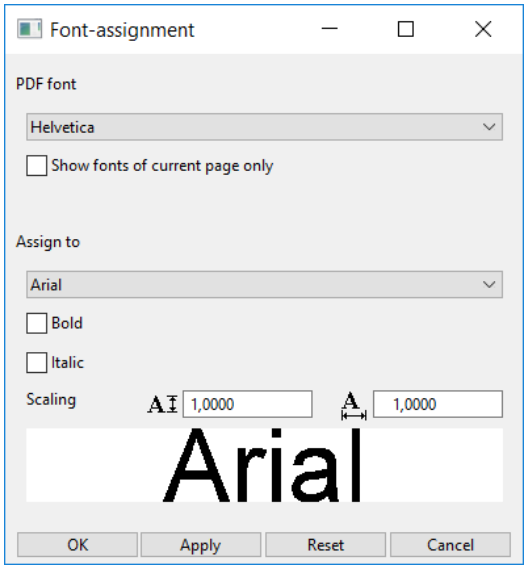
Select PDF file.

Information

Opens a window with the information from the PDF file (author, creator, subject ...).

Font-assignment

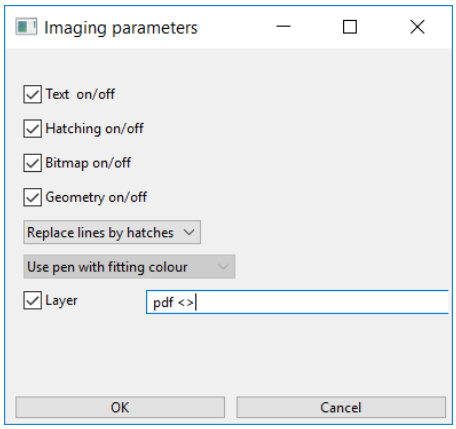
Fonts from the PDF can be assigned new fonts in ELITECAD. For example, the font in the PDF is Helvetica; in ELITECAD, the font should be Arial.



The ONLY SHOW FONTS OF THE ACTIVE PAGE option must be active so then only these fonts will be listed in the first row.
The selected font (for instance "Helvetica") can be assigned a new font (for instance "Arial"). The "Bold" and "Italic" formatting can also be selected.
The text size can be uniformly changed by scaling.

Depiction parameters

The different PDF elements (text, hatch, bitmap and geometry) can be deselected for the import.



Lines can be created as polylines or replaced by a hatch.
So that the lines have the desired pen on import, either select "Use pen with fitting line width" or "Use pen with fitting colour".

Select page/Select object

A toggle switch between the import of an entire page and the import of individual objects from the page. If "Select object" is active, a selection list of objects from the PDF page also opens. The page must have individual objects.

Page navigation

In PDF files that have several pages, the desired pages can be selected. For every import, only one page is imported.

Fix reference point

Choice of reference points to apply the PDF file to the drawing.

Scale

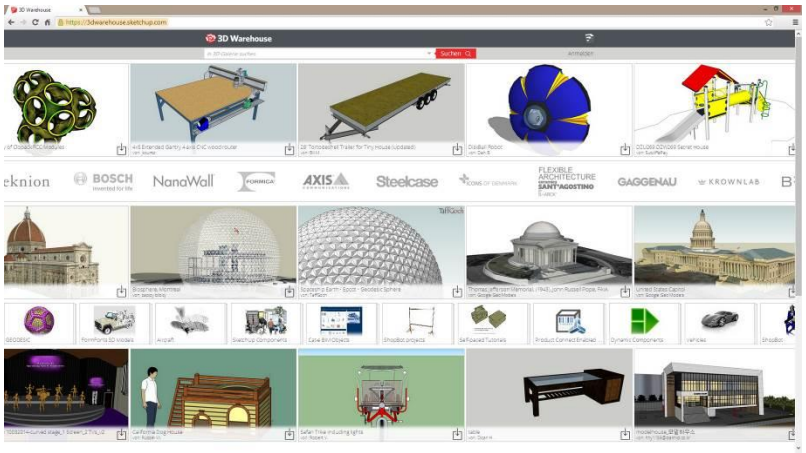
For a correct scaling of the PDF file, a scale can be set.

Insert / OK
INSERT reopens the import dialog window after the PDF page has been applied in order to import the next page or another PDF file. OK cancels the function after the PDF page has been placed.

3.12 SketchUp

SketchUp (.skp) is a widely used format for 3D models. The area of use contains illustrating, product design, design models for architectural visualization, building models for Google Earth, numerous library parts and so forth.

SketchUp is a trademark of Trimble Navigation Limited.



Read SketchUp

File exchange toolbar

File menu > File exchange > Read SketchUp

The imported model has to be checked if its dimensions are correct and scaled if necessary. Ideally, the SketchUp model is imported into a new drawing, in order to be checked if its quality and orientation are correct before it is positioned in the final drawing.

Textures belonging to the imported model are automatically read and grouped in the material management.

Write SketchUp

File exchange toolbar

File menu > File exchange > Write SketchUp...

Currently visible 3D data is saved in SketchUp format. The written SketchUp file should always be checked by reading it back.

TIP

It is also possible to save 3D data in an older SketchUp version. The version is defined in the file type menu.

3.13 IGES

The IGES 3D import/export interface is an add-on and requires a separate codeword.

READ IGES

File exchange toolbar
File menu > File exchange > Read IGES

The dimensions of the IGES drawing need to be checked and scaled where necessary. The IGES drawing is ideally read in an empty drawing so that the quality and orientation can be checked to make sure they are correct before the IGES drawing is placed into the correct drawing.

WRITE IGES

File exchange toolbar
File menu > File exchange > Write IGES

Currently visible 2D data is saved in IGES format. The written IGES file should always be checked by reading it back.

READ IGES 3D

File exchange toolbar (optional)
File menu > File exchange > Read IGES 3D

The dimensions of the entry design model need to be checked and scaled where necessary. The IGES 3D design model is ideally read in an empty drawing so that the quality and orientation can be checked to make sure they are correct before the model is placed into the correct drawing.

WRITE IGES 3D

File exchange toolbar (optional)
File menu > File exchange > Write IGES 3D

Currently visible 3D data is saved in IGES 3D format. The written IGES 3D file should always be checked by reading it back.

3.14 STEP

The STEP import/export interface is an add-on and requires a separate codeword.

READ STEP

File exchange toolbar (optional)
File menu > File exchange > Read STEP

The dimensions of the entry design model need to be checked and scaled where necessary. The STEP design model is ideally read in an empty drawing so that the quality and orientation can be checked to make sure they are correct before the model is placed into the correct drawing.

WRITE STEP

File exchange toolbar (optional)
File menu > File exchange > Write STEP

Currently visible 3D data is saved in STEP format. The written STEP file should always be checked by reading it back.

3.15 VDAFS

The VDAFS import/export interface is an add-on and requires a separate codeword.

Read VDAFS

File exchange toolbar (optional)
File menu > File exchange > Read VDAFS

This function is used to import data in the VDAFS format.
After activation of the function the dialog window *Read VDAFS* opens. Having selected the desired file, the following query appears:
"2D depiction projected [0], rectangle [1] or without elements [2]"

- Projected: the wire frame is projected in the current workspace
- Rectangle: the bounding box is created as a rectangle in current workspace
- No elements: an empty object is created

NOTE

The protocol contains the header of the VDA file and a statistic, which is written after completion of the import process. Additionally, the dimensions of the bounding box are noted. Hints for the scaling may be contained as well.

Write VDAFS

File exchange toolbar (optional)
File menu > File exchange > Write VDAFS

Currently visible 3D data is saved in VDAFS format. The written VDAFS file should always be checked by reading it back.

After activation of the function the dialog window *Write VDAFS* opens.

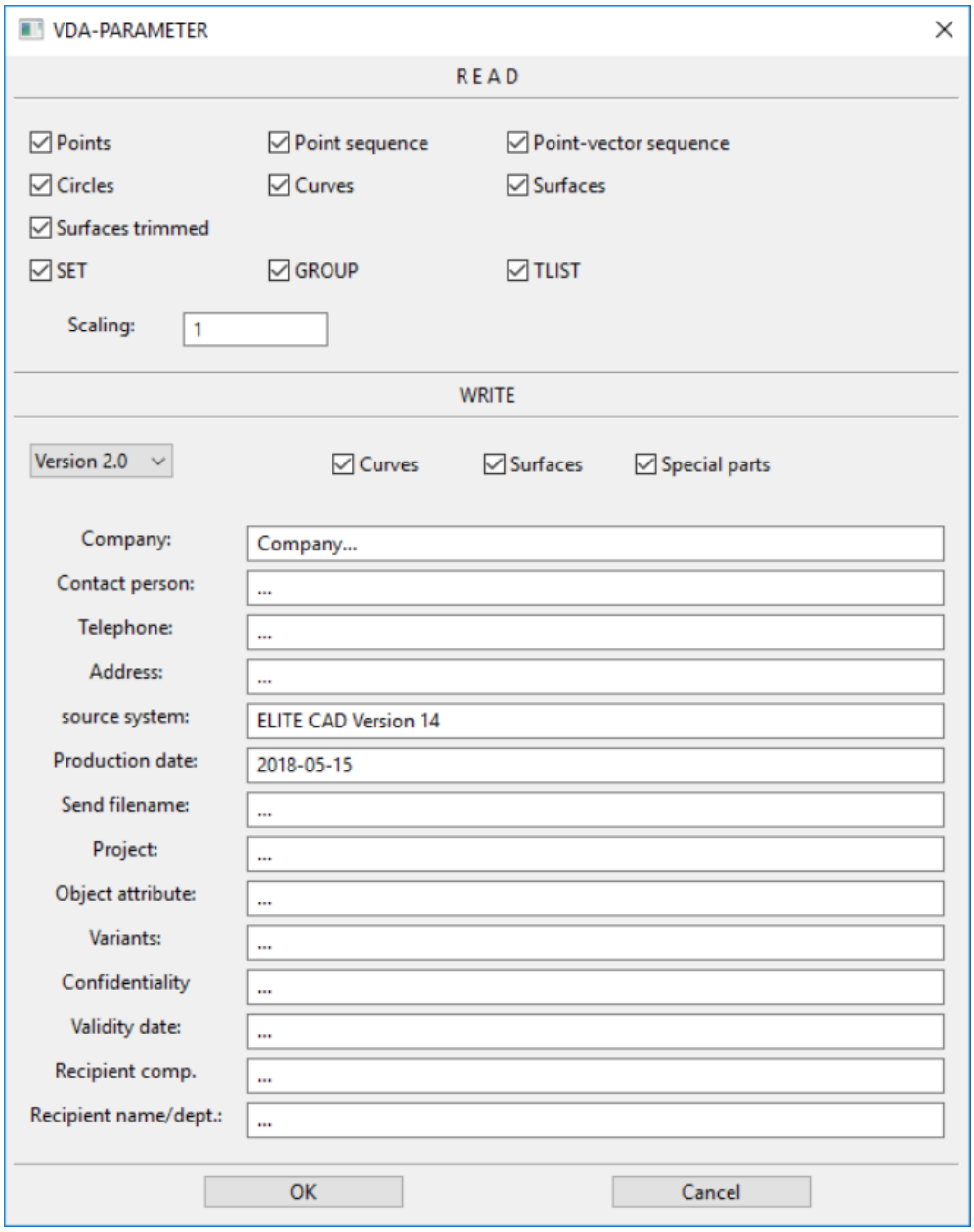
NOTE

A statistic is displayed in the info window.

VDAFS Parameter

Menu Settings > Options > Save/Open > File exchange > VDA-FS-Parameters

This function is used to set the parameters for the VDAFS import and export. After activation of the function the VDAFS parameter window appears.



Parameters for the import

Some element types can be switched on or off.

- *points*
- *point sequence (polylines)*
- *point-vector sequence (polylines with normal vectors)*
- *circles*
- *curves*
- *surfaces*
- *trimmed surfaces*
- ATTENTION: trimmed surfaces consist of curves and surfaces

The switched SET and GROUP define, if the VDAFS types SET and GROUP are considered for the import.

TLIST

In the field *Scale* the desired factor can be specified (default = 1)

Parameters for the export

In the field *Version* the desired VDAFS version is specified (default = 2.0)

Some element types can be switched on or off.

- *curves*
- *surfaces*

The switch *special parts* defines, if special parts are written into a separate group or not.

The field *company* needs always an entry. Otherwise, the ELITECAD file cannot be converted into a VDAFS file. The other fields are optionally filled.

3.16 CATIA

The CATIA import/export interface is an add-on and requires a separate codeword.

CATIA is a trademark of Dassault Systemes.

READ CATIA V4

File exchange toolbar (optional)

File menu > File exchange > Read CATIA V4

The dimensions of the entry design model need to be checked and scaled where necessary. The CATIA V4 design model is ideally read in an empty drawing so that the quality and orientation can be checked to make sure they are correct before the model is placed into the correct drawing.

WRITE CATIA V4

File exchange toolbar (optional)

File menu > File exchange > Write CATIA V4

Currently visible 3D data is saved in CATIA V4 format. The written CATIA V4 file should always be checked by reading it back.

READ CATIA V5

File exchange toolbar (optional)

File menu > File exchange > Read CATIA V5

The dimensions of the entry design model need to be checked and scaled where necessary. The CATIA V5 design model is ideally read in an empty drawing so that the quality and orientation can be checked to make sure they are correct before the model is placed into the correct drawing.

WRITE CATIA V5

File exchange toolbar (optional)

File menu > File exchange > Write CATIA V5

Currently visible 3D data is saved in CATIA V5 format. The written CATIA V5 file should always be checked by reading it back.

3.17 PTC Creo – Pro/Engineer

The PTC Creo – Pro/Engineer import interface is an add-on and requires a separate codeword.

Creo und PTC are trademarks of PTC.

Read Creo – Pro/Engineer

File exchange toolbar (optional)

File menu > File exchange > Read Pro/E

The dimensions of the entry design model need to be checked and scaled where necessary. The Creo or Pro/Engineer design model is ideally read in an empty drawing so that the quality and orientation can be checked to make sure they are correct before the model is placed into the correct drawing.

3.18 AUTODESK INVENTOR

The AUTODESK INVENTOR import interface is an add-on and requires a separate codeword.

Inventor is a trademark of Autodesk.

READ INVENTOR

File exchange toolbar (optional)

File menu > File exchange > Read Inventor

The dimensions of the entry design model need to be checked and scaled where necessary. The Inventor design model is ideally read in an empty drawing so that the quality and orientation can be checked to make sure they are correct before the model is placed into the correct drawing.

3.19 MI

MI is the file format of ME10, today OneSpace Designer Drafting.
ME10 and OneSpace Designer Drafting are trademarks of CoCreate.

Read MI

File exchange toolbar
File menu > File exchange > Read MI

The dimensions of the drawing need to be checked and scaled where necessary. The MI drawing is ideally read in an empty drawing so that the quality and orientation can be checked to make sure they are correct before the drawing is placed into the correct drawing.

Write MI

File exchange toolbar
File menu > File exchange > Write MI

Currently visible 2D data is saved in MI format. The written MI file should always be checked by reading it back.

4.BASIC FUNCTIONS

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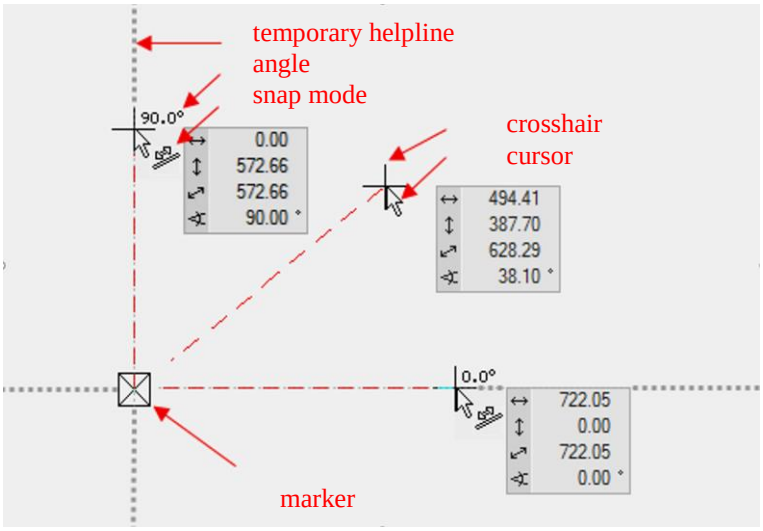
4.1 CURSOR, CAPTURE FUNCTIONS

CURSOR

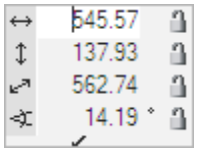
The cursor displays the marker, the cross hair, the arrow and, if a point is entered, the values field as well. The marker always specifies the last position. As soon as the cursor is at right angles to the last position, temporary reference lines appear with display of the angle. This means you can check whether you are drawing at right angles.



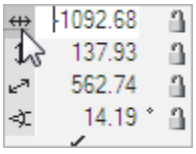
Values field

The values field is shown as soon as a point input is required.
You can switch to the values field with the [Tab] key. The values shown are relative to the marker or to a temporary reference point. To enter absolute values (from the zero point), you must click on the symbol at the start of the line. A value can be fixed. The values field can be exited with the [Enter/Return] key or by clicking on the tick.

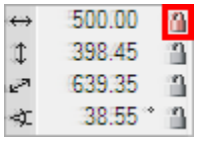
Relative



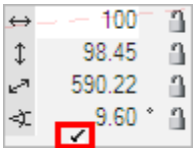
Absolute



Fixed value



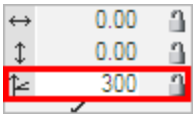
Confirm



The direct input of coordinates is still implemented in the same way as in release 11. Without switching to the values field with the [Tab] key, you can make entries such as "**30,60**" or "**,100**". The values are correctly entered into the values field.

SPECIAL FEATURE

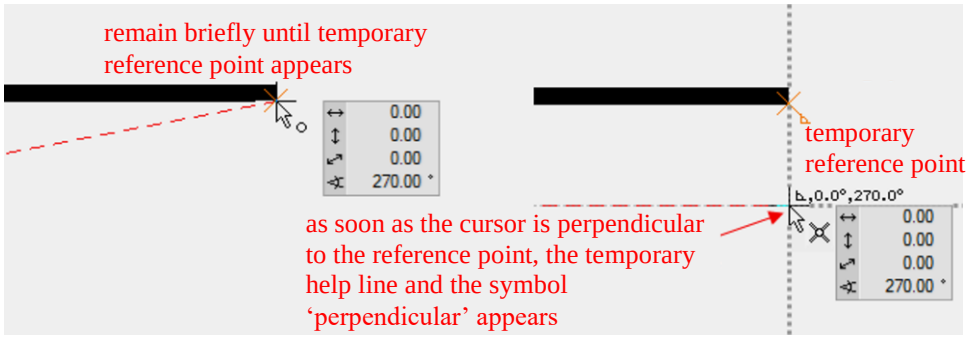
Entering **"value"** for a movement along the z-axis changes the values field to an x,y,z input.



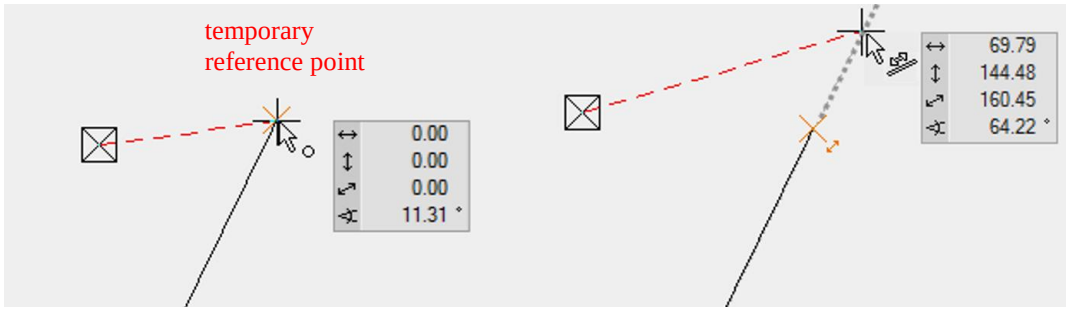
Temporary reference points and help lines

When you are drawing, references often need to be made to the geometry that has already been created.
You create a reference point by hovering the cursor briefly over the desired point; the program displays the reference point as an orange cross.
Instead of hovering over the point, you can press the [Shift] key.
The temporary reference points are deleted again after every click. The points can be deleted manually the same way they were created.

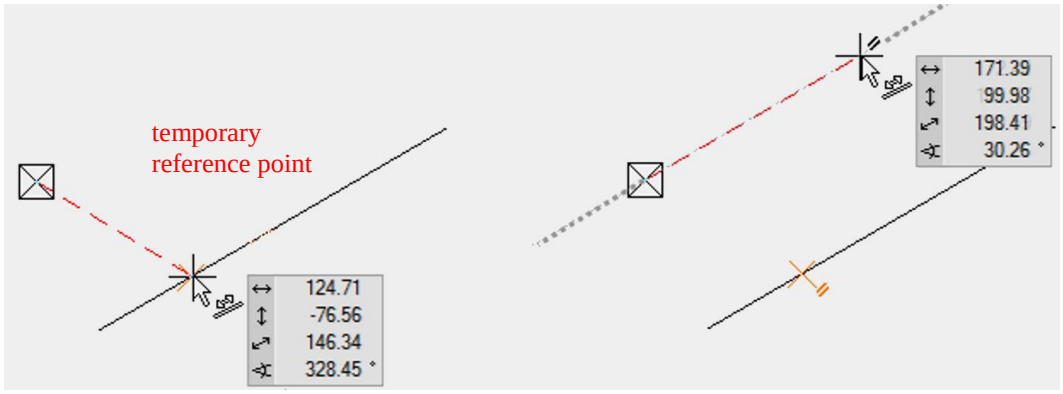
Drag the line perpendicularly beneath a wall corner



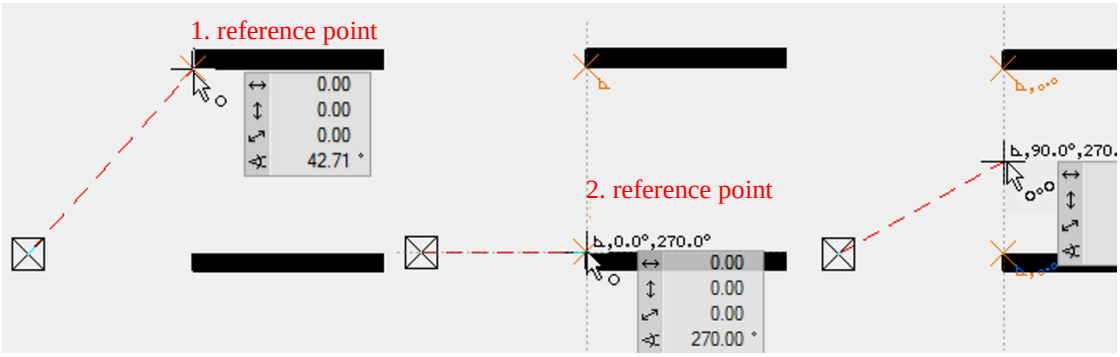
Drag the line into the extension of an existing line



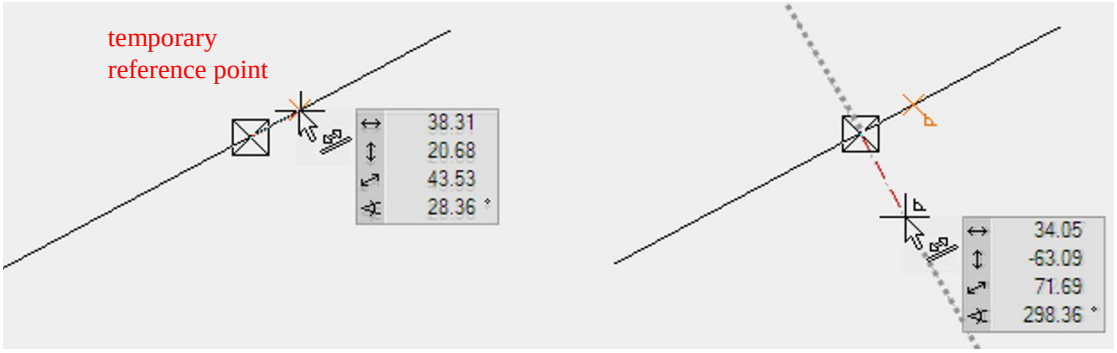
A new line/help line should lie parallel to an existing line/help line.



Draw a line in the middle of two points.



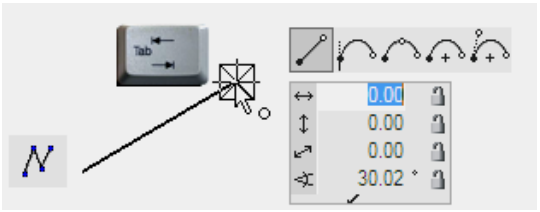
Draw a line perpendicular to a line.



The snap time until the reference point appears can be set in the options.

Input assistant

The input assistant consists of additional functions that appear either at the cursor or in the INPUT ASSISTANT toolbar. The input assistant at the cursor can be displayed using the [Tab] key. The toolbar always shows the available functions.



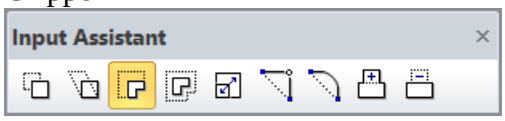
Which functions have an input assistant?
When you draw a polygon, the curve functions are also available.

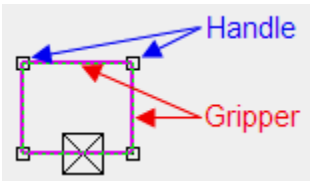
When you draw a contour for an object (3D, architectural, mechanical) the drawing functions are available.

When you click on a handle or gripper (element, text, hatch, 3D, object), manipulation options appear. The functions change depending on the type.

Handle

Gripper

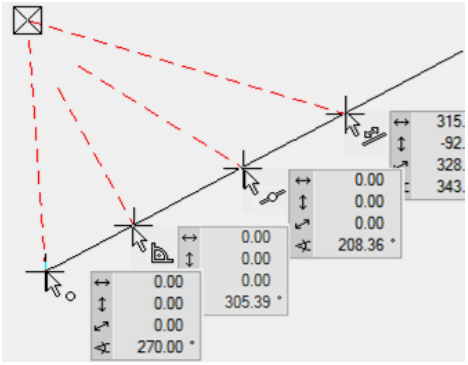


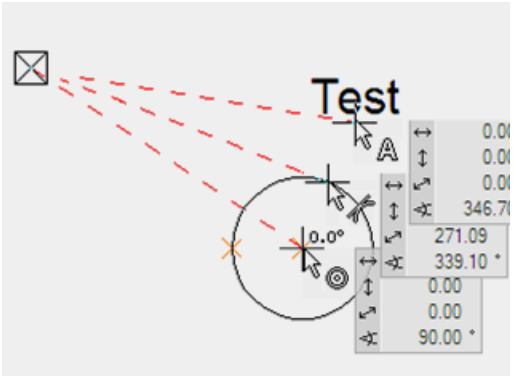


CAPTURE FUNCTIONS

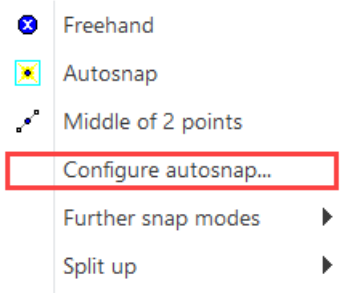
AUTOcapture mode

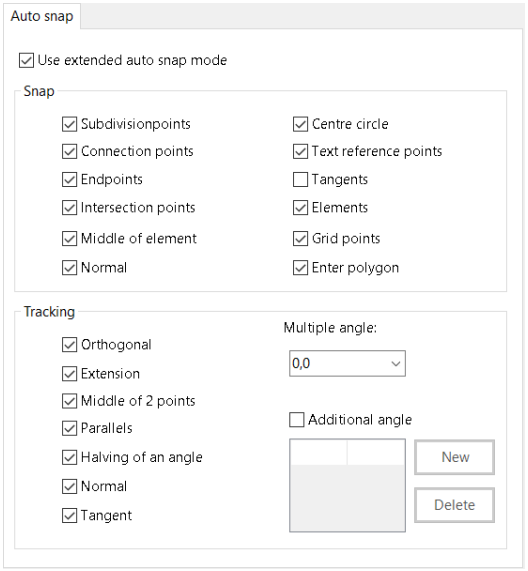
The cursor responds as soon as it is positioned near a capture point and indicates the type of capture point by means of a symbol.





In the AUTOcapture mode configuration, the individual capture options are enabled or disabled in the context menu.

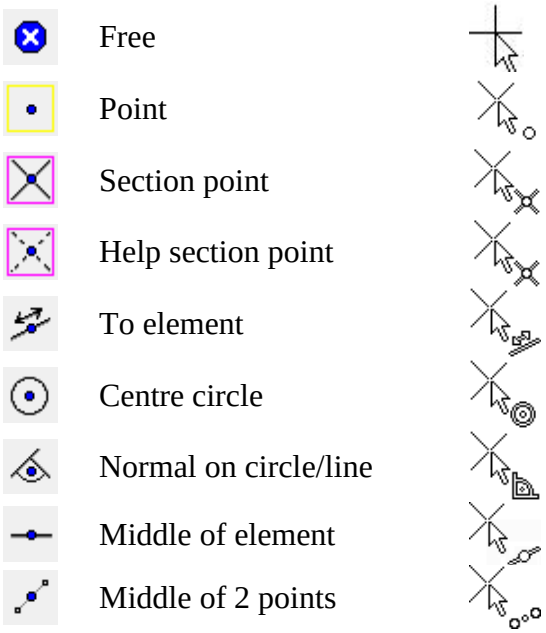




Cross hair

Display

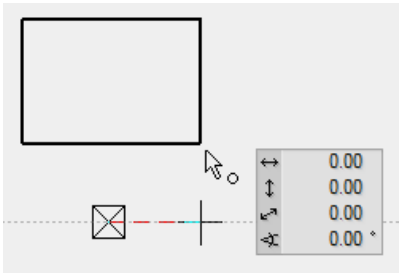
The most frequently used capture functions can be distinguished by the different cross hairs.



Orthogonal with arrow key
When the arrow key is pressed on the keyboard, the cross hair only moves orthogonally on the screen. The [↑] [↓] arrow keys lock the cross hair vertically and the [←] [→] arrow keys lock the cross hair horizontally.

TIP

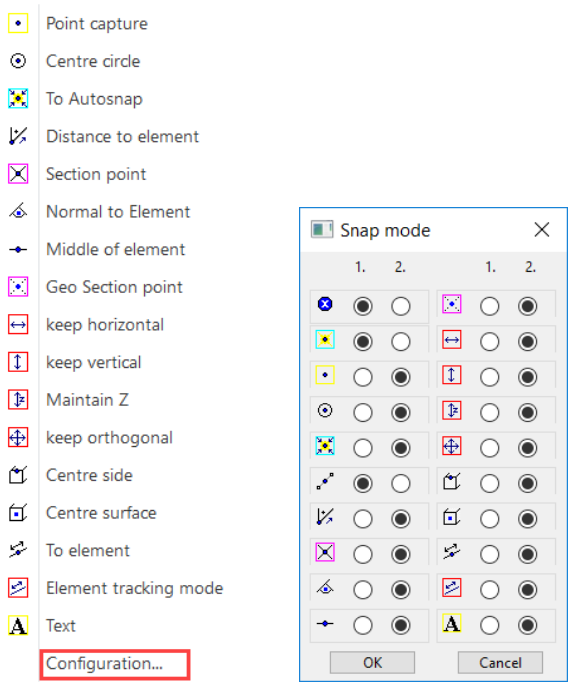
As soon as you lock the cross hair horizontally or vertically with the arrow keys, you can also specify a reference point with any capture mode using the cursor.



For the end point of the line, first select point capture, then press and hold the left or right arrow key and move the cursor to the corner of the rectangle. You will notice that the cross hair snaps to the corner as you approach it.

Alternative capture modes

AUTOcapture and free capture mode are usually sufficient. The capture modes that appear on the first page of the context menu can be set in the *Further Capture modes* menu item.



AUTOcapture

	Capture mode toolbar
	Context menu (right mouse button)

This capture mode is a convenient capture function that searches hierarchically for various capture criteria.

When this function is activated, the subsequently digitised position is evaluated according to the criteria listed below and the cross hair is positioned accordingly.

Search sequence:
No point found, then section point
No point found, then help section point
No point found, then element
No element found, then freehand

TIP

You can recognise which capture function is being used currently to focus on a position by the display of the cross hair.
This capture function always finds a position on the screen.

Orthogonal locking
When the cursor is at a right angle to the reference point, a temporary help line is displayed and the cursor easily snaps to this position.

To AUTOcapture

	Capture mode toolbar
	Context menu (right mouse button)

Using the TO option, it is possible to select any reference point regardless of the current location (small white rectangle) and to effect a movement from here (e.g. by entering values).

When this function is activated, the subsequently digitised position (reference point) is evaluated according to the criteria listed below.

Search sequence:
No point found, then section point
No point found, then help section point
No point found, then element
No element found, then freehand

Now the final position of the cross hair must be determined (e.g. by entering values).

TIP

The MOVE AUTOMATICALLY TO capture mode can also be supplemented with an additional capture mode:
If the destination point is a certain distance from the centre of a circle, it can be reached with the following input: Select the MOVE AUTOMATICALLY TO capture mode and select CENTRE CIRCLE capture. Place the reference point into the centre of the circle and now enter the desired distance from this point.

Freehand

Capture mode toolbar
Context menu (right mouse button)

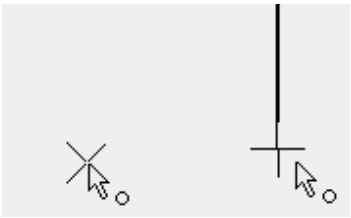
This function allows you to position the cross hair at any freely selectable location (by freehand).

Point capture

Capture mode toolbar
Context menu (right mouse button)

This function allows you to position the cross hair at the start or end of an existing drawing element.

When this function is activated, the cross hair is tilted through 45°. When you approach a point, the cross hair becomes orthogonal and you can confirm the point by clicking with the left mouse button. Then the cross hair jumps to this point.

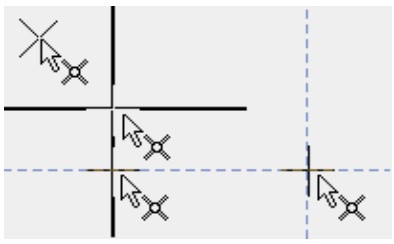


Section point

Capture mode toolbar
Context menu (right mouse button)

This capture mode allows you to position the cross hair at the intersection of two drawing elements, of one drawing element and a help element, or of two help elements.

When this function is activated, the cross hair is tilted through 45°. When you approach a section point, the cross hair becomes orthogonal and you can confirm by clicking with the left mouse button. Then the cross hair jumps to this section point.

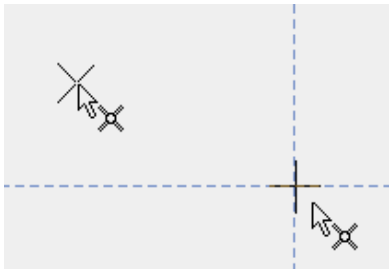


Geometry section point

Capture mode toolbar
Context menu (right mouse button)

This function allows you to position the cross hair at the intersection of two help elements.

When this function is activated, the cross hair is tilted through 45°. When you approach a help element section point, the cross hair becomes orthogonal and you can confirm by clicking with the left mouse button. Then the cross hair jumps to this help element section point.

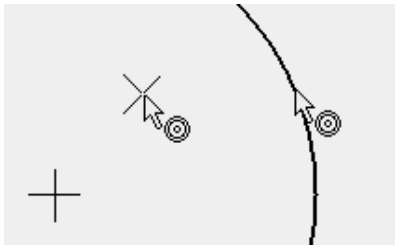


Centre circle

Capture mode toolbar
Context menu (right mouse button)

This function allows you to go to the centre of a circle or arc.

When this function is activated, the cross hair is tilted through 45°. When you approach a circle or arc (drawing or help element), the cross hair becomes orthogonal and jumps to the centre. Confirm with the left mouse button.



TIP

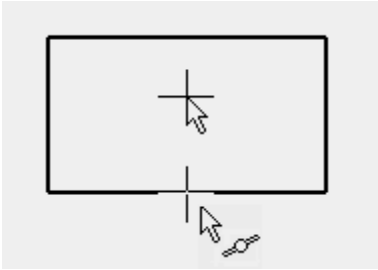
The centre of the circle may also lie outside the drawing format.

Middle of element

Capture mode toolbar
Context menu (right mouse button)

This function allows you to go to the centre of a drawing element.

When this function is activated, the cross hair is tilted through 45°. When you approach a drawing element, the cross hair becomes orthogonal and jumps to its centre. Confirm with the left mouse button.



TIP

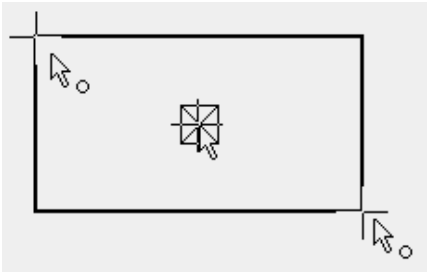
This function can only be used for drawing elements.

Middle of 2 points

Capture mode toolbar
Context menu (right mouse button)

This function allows you to go to the middle of 2 points.

When this function is activated, the two points must be clicked. Then the cross hair jumps to the middle of the imaginary line connecting the specified points.



Normal to element

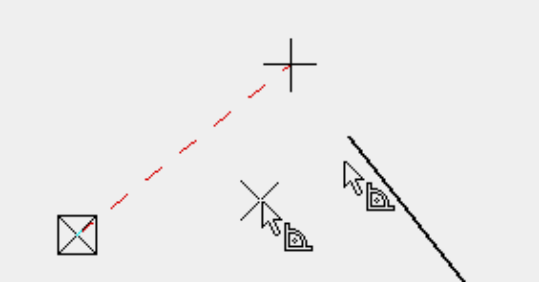
Capture mode toolbar
Context menu (right mouse button)

This function allows you to automatically calculate and display the normals to a drawing or help element (straight and circle/arc) from the current position.

When this function is activated, the cross hair is tilted through 45°. When you approach a drawing or help element, the cross hair becomes orthogonal and jumps to the section point that is normal to the current position. Confirm with the left mouse button.

TIP

The section point of the normals from the current position to the selected element need not necessarily be on this selected element, but may lie outside it.



Distance to element from point

Capture mode toolbar

Context menu (right mouse button)

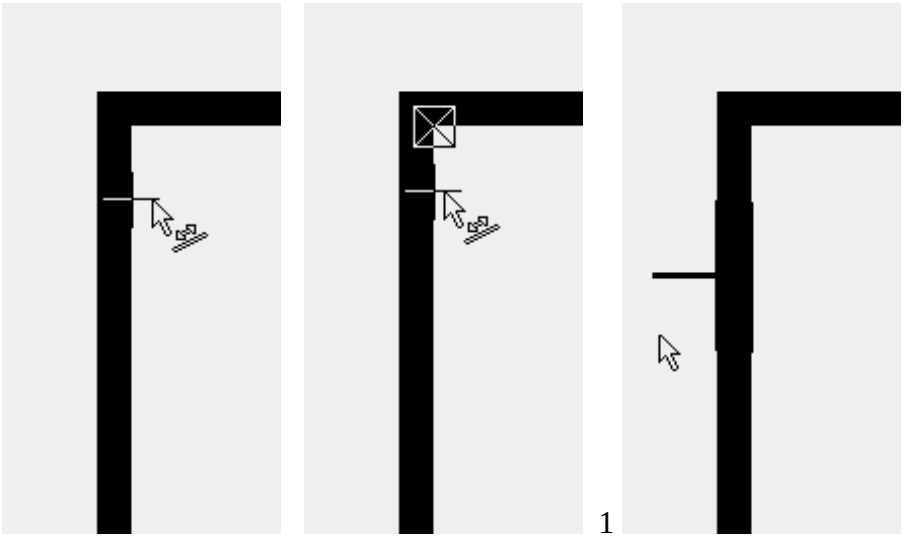
This capture mode allows you to position the cross hair on an element and to specify a distance to the nearest point.

When this function is activated, the element in question must be clicked. Then the cross hair jumps to the point nearest to the element. Now the desired distance from this point can be specified. Then the cross hair is set to the calculated position.

WORKSHOP

Distance to element from point

Place a window in ELITECAD Architecture in a wall at one metre from the wall corner.
Pick a window
Image 1: Activate the *Distance to element from point* capture mode and click on the wall in which the window is to be placed, near to the corner from which you wish to specify the distance. Do not click in the corner. Otherwise, you will not know whether the window will be placed in the horizontal wall or the vertical one.
Image 2: When you click on the wall, the ⊠ marker jumps to the corner. Check whether it is the correct corner. If you have clicked on the inside of the wall, it must not switch to the outside. If the marker is in the wrong location, select capture mode again and click the wall nearer to the corner.
Image 3: In the input line, enter and confirm the distance. The marker jumps to the specified position and the window can be placed. Because you click on the element to which the distance is to be applied, there is no need to enter a direction using x and y values or +/-.



1

WORKSHOP END

Tangent

Capture mode toolbar

This function allows you to calculate automatically the tangents from an initial location (defined location **outside** the circle) to a clicked circle or arc.

When this function is activated, the cross hair is tilted through 45°. When you approach a circle or arc (drawing or help element), the cross hair becomes orthogonal and jumps to the tangent point. Confirm with the left mouse button.

TIP

This process can also be used for measuring.

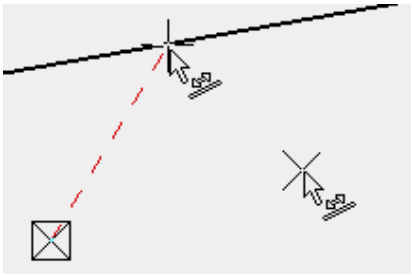
To element

Capture mode toolbar

Context menu (right mouse button)

This capture mode allows you to specify an existing drawing or help element (line or arc) as a guide for the cross hair.

When this function is activated, the cross hair is tilted through 45°. When you approach a drawing or help element, the cross hair becomes orthogonal and you are guided along the element as if on "tracks". Confirm with the left mouse button when you have reached the required position.



Grid

Capture mode toolbar

This function allows you to position the cross hair in a defined grid. This is particularly useful for electrical and hydraulic plans, and for the exact positioning of the scale and text.

When this function is activated, the cross hair jumps to the nearest grid point.

Keep orthogonal

Capture mode toolbar
Context menu (right mouse button)

This function allows you to move the cross hair freehand while keeping it horizontal or vertical. It is particularly suitable for underlining, information arrows, centre lines, etc. and also for positioning objects.

When this function is activated, the cross hair is restricted to horizontal and vertical movements when it is moved freehand. Whether it moves horizontally or vertically depends on what is nearest to the current cross hair position.

TIP

The arrow keys [↑] [↓] [←] [→] on the keyboard have the same effect as this capture mode.

Keep horizontal

Capture mode toolbar
Context menu (right mouse button)

This function forces the cross hair to be guided in a horizontal direction. This function can be combined with the other capture functions. Missing parameters can thus be constructively determined directly from the drawing without the corresponding measurements having to be taken.

When the function is activated, the cross hair is guided horizontally on the screen. A second capture function can now be selected and used in combination.

TIP

The arrow keys [←] [→] on the keyboard have the same effect as this capture mode.

Keep vertical

Capture mode toolbar
Context menu (right mouse button)

This function forces the cross hair to be guided in a vertical direction. This function can be combined with the other capture functions. Missing parameters can thus be constructively determined directly from the drawing without the corresponding measurements having to be taken.

When the function is activated, the cross hair is guided vertically on the screen. A second capture function can now be selected and used in combination.

TIP

The arrow keys [↑] [↓] on the keyboard have the same effect as this capture mode.

Element

Capture mode toolbar
Context menu (right mouse button)

This capture mode allows you to position the cross hair on an imaginary beam in the direction of a definable drawing element.

When this function is activated, you click on the element that determines the direction. The cross hair is now locked on this beam.

Centre edge

Capture mode toolbar
Context menu (right mouse button)

This function allows you to go to the middle of an edge in 3D.

When this function is activated, the cross hair is tilted through 45°. When you approach a 3D edge, the cross hair becomes orthogonal and jumps to the centre of the edge. Confirm with the left mouse button.

Centre surface

Capture mode toolbar
Context menu (right mouse button)

This function allows you to go to the middle of a surface in 3D.

When this function is activated, the cross hair is tilted through 45°. When you approach a 3D surface, the cross hair becomes orthogonal and jumps to the centre of the surface. Confirm with the left mouse button.

TIP

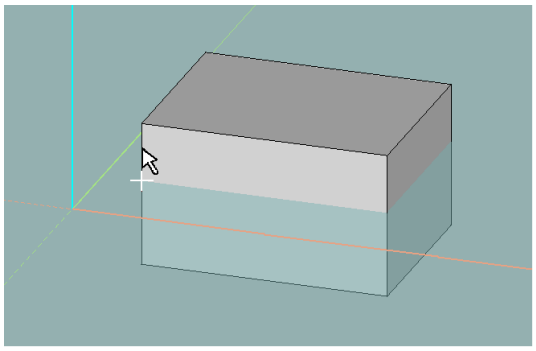
The centre of a surface is calculated as the centre of gravity.
This capture mode cannot be used for the lateral surfaces of boxes and extrudes or for trimmed surfaces.

Section of work plane with surface

Capture mode toolbar

This function allows you to capture a section point between a surface edge and the current work plane.

When this function is activated, the cross hair jumps, but a surface edge must be sighted with the cursor. When you approach an edge, the cross hair jumps to the section with the current work plane.



Straight/surface section

Capture mode toolbar

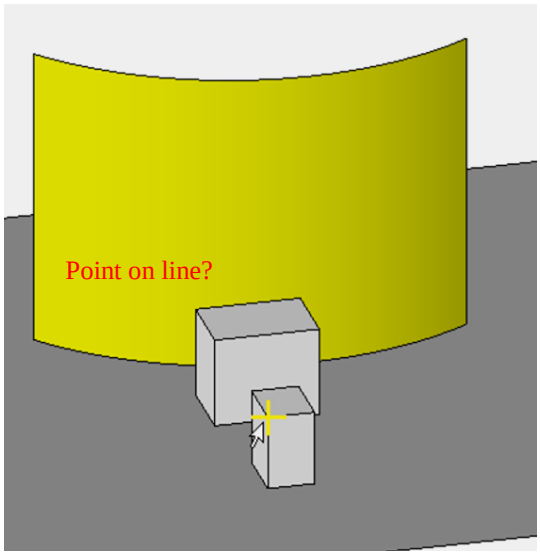
This function allows you to capture a section point between a straight and a surface.

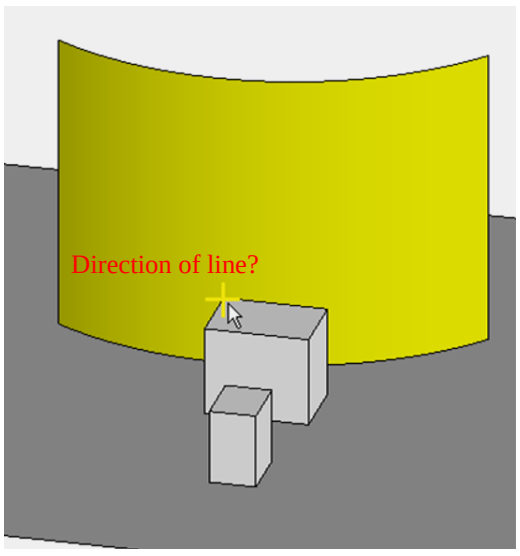
When you select this function, you are prompted for a point on the straight (start point) and its direction (end point). Then the surface that it will intersect must be entered. The marker is set to the section point as a result.

WORKSHOP

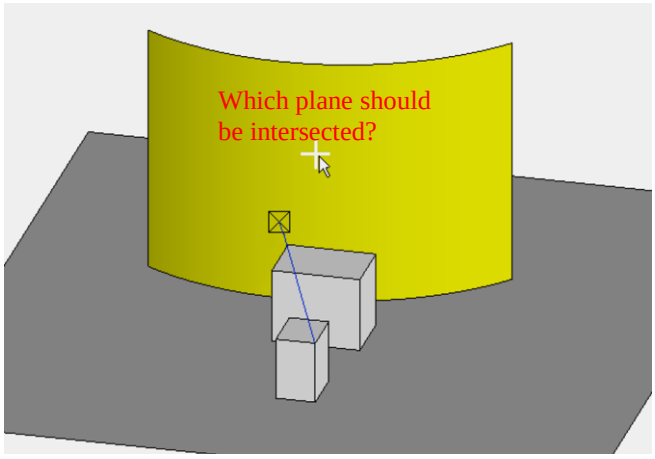
Straight/surface section capture mode

The straight is specified by two points. Points that do not lie on the current work plane can also be selected with the POINT capture mode.





When the two points of the straights have been entered, the surface must be defined.



A virtual straight is generated along the two specified points. The marker is set at the point where the straight intersects the surface of the extrude.

WORKSHOP END

Quadrants

Snap mode toolbar

The snap mode "quadrants" is only available in ELITECAD Mechanics. It snaps four special points on a circle or arc – especially intended as an assistance for diameter measurements.

Set the workspace in the plane of the circle before applying this snap function. The points represent the quadrant boundaries on the arc or circle relative to the X-Y plane of the current workspace. It is not mandatory to set the workspace in the circle plane.

In detail, the snap mode snaps the intersection points of the arc or circle with a plane that is normal to the X- or Y-direction of the current workspace and goes through the centre of the circle. If the Z-direction of the current workspace is orthogonal to the normal direction of the circle, the Z normal plane is used for snapping instead of the X normal plane, so to say the Y-Z plane.

The procedure of the snap function is as follows:

Determination of the closest edge near the selected point.
If the edge is circular, the four quadrant boundaries are determined.
Finally, the closest of these four points is selected.

TIP

In order to facilitate correct snapping the mouse cursor should be positioned on the surface where the edge belongs to, as close as possible to the edge. The snap mode may eventually not work properly for surfaces generated in old ELITECAD versions or surfaces imported by interfaces.

Move cross hair

Snap mode toolbar

The function performs a SINGLE movement step, independent of the current position of the cross hair.

After activating the function, the cross hair can be moved additionally. The point input can be done by value input. The procedure can be repeated for multiple consecutive relative movements.

To point

Snap mode toolbar

This function allows selecting a point as a new reference point for point inputs, independently of the current position (indicated by the marker – a small white rectangle). The new reference point is then used to enter a movement relative to it (e.g. by entering a value). The result is the distance between the current position (start position) and the end position of the cross hair.

After activating the function and when moving the cross hair near a point, it jumps to it. From here, the new position of the cross hair is defined relatively (e.g. by value input).

TIP

The current position is not modified by the snap mode TO POINT. Only by further inputs (e.g. by entering a value), the position is changed.

To section

Snap mode toolbar

This function allows selecting an intersection point as a new reference point for point inputs, independently of the current position (indicated by the marker – a small white rectangle). The new reference point is then used to enter a movement relative to it (e.g. by entering a value). The result is the distance between the current position (start position) and the end position of the cross hair.

After activating the function and when moving the cross hair near an intersection point, it jumps to it. From here, the new position of the cross hair is defined relatively (e.g. by value input).

TIP

The current position is not modified by the snap mode TO SECTION. Only by further inputs (e.g. by entering a value), the position is changed.

To centre circle

Snap mode toolbar

This function allows selecting the centre of a circle as a new reference point for point inputs, independently of the current position (indicated by the marker – a small white rectangle). The new reference point is then used to enter a movement relative to it

(e.g. by entering a value). The result is the distance between the current position (start position) and the end position of the cross hair.

After activating the function and when moving the cross hair near a circle, it jumps to its centre. From here, the new position of the cross hair is defined relatively (e.g. by value input).

TIP

The current position is not modified by the snap mode TO CENTRE CIRCLE. Only by further inputs (e.g. by entering a value), the position is changed.

To middle of element

Snap mode toolbar

This function allows selecting the middle point of an element as a new reference point for point inputs, independently of the current position (indicated by the marker – a small white rectangle). The new reference point is then used to enter a movement relative to it (e.g. by entering a value). The result is the distance between the current position (start position) and the end position of the cross hair.

After activating the function and when moving the cross hair near an element, it jumps to its middle point. From here, the new position of the cross hair is defined relatively (e.g. by value input).

TIP

The current position is not modified by the snap mode TO MIDDLE OF ELEMENT. Only by further inputs (e.g. by entering a value), the position is changed.

4.2 POLYGONAL CHAIN

The polygonal chain is often used when a selection is manipulated (e.g. block, section, stretch, etc.), a parallel contour is created, a hatch contour is defined, or during contour specification when an area is measured.

Direct polygon input
For the stretch functions and the block and section manipulation functions, you are directly prompted for a polygon. A rectangle can be defined via the diagonal points of a polygon via individual points.

Example of a polygon via diagonal points:

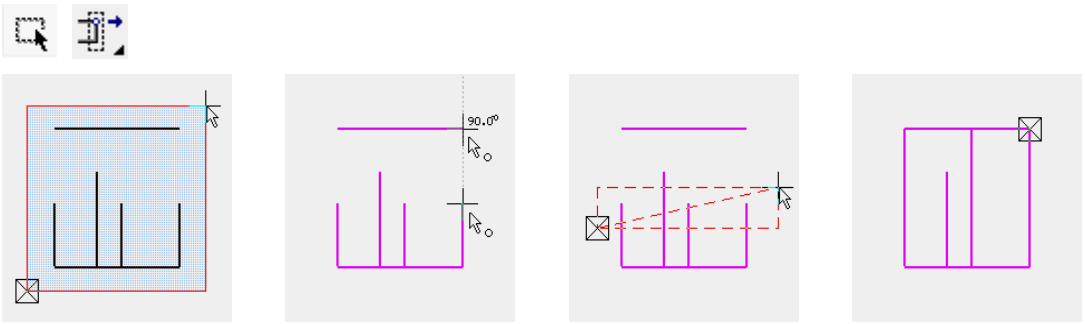


Image1: Select elements and call up the STRETCH POINT OR LINE function.
Image2: Enter the existing point and its new position.
Image3: Set the start point of the polygon on the outer left and double-click the second point on the outer right.
Double-click = close polygon
Image4: Result

Example of a polygon via individual points:

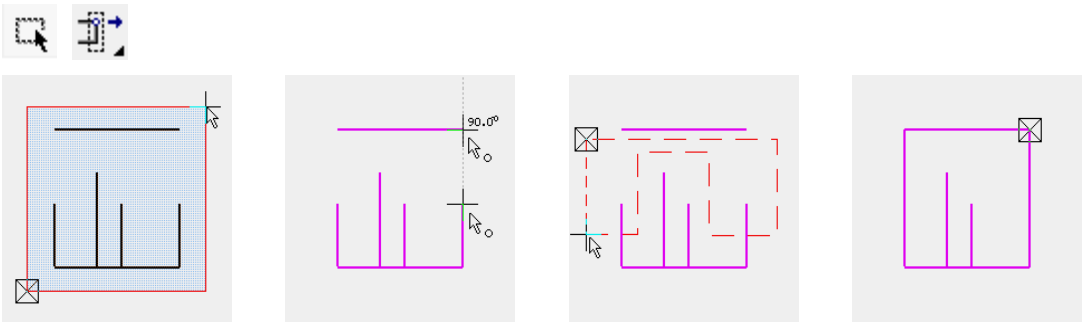


Image1: Select elements and call up the STRETCH POINT OR LINE function.
Image2: Enter the existing point and its new position.
Image3: Draw a polygon that includes the two ends of the outer lines. The lines in the centre must not be stretched at the same time.
The polygon is closed automatically when you select the start point again.
Image4: Result

Polygon functions in properties bar
The polygon functions appear directly in the properties bar for the HATCH and MEASURE AREA functions.
Example of hatch properties bar:

Polygon

This function allows you to specify the unclosed contour of recesses or surfaces.
If the contour search comes to a halt at an open position, the polygon is automatically started and further points can be entered.

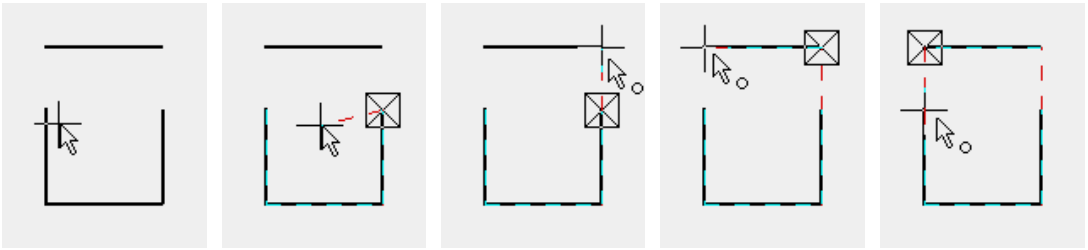


Image1: Select the MEASURE AREA/START HATCH function. Click on the contour.
Image2: The contour is tracked up to the opening.
Image3: Set the first point
Image4: Set the second polygon point
Image5: Click on the end point. The polygon is automatically closed. The values can be read off from the info window for the MEASURE AREA function. When START HATCH is selected, the polygon is filled with the required hatch.

TIP

When the POLYGON function is selected, additional functions are made available in the input assistant.

TIP

An open polygon can also be closed by double-clicking or pressing [Enter].

Next contour

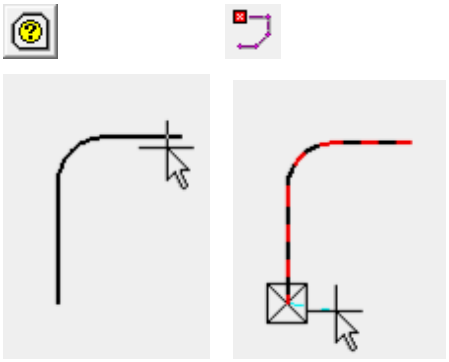
The NEXT CONTOUR function allows you to jump to the next contour so that the contour search automatically tracks along it.

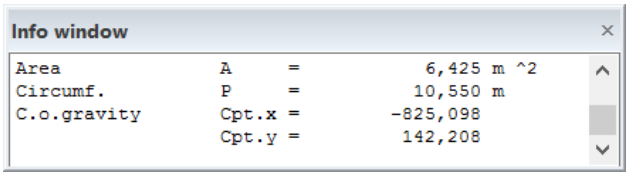
Contour end

This function is used to close an open polygon chain. This function comes into effect for a parallel contour and for measuring a line.

Example: Measure the length of a certain line, e.g. Pitch line on a stair
Start the MEASURE AREA function
Click on the contour
CONTOUR END function

The length (circumference) can be read off from the info window.





TIP

If an open profile is automatically tracked by the cross hair, it begins at the marked point and runs anticlockwise. If only one element of the contour is followed by the automatic tracking, you have positioned the cross hair at the wrong end. You should therefore try moving the cross hair to the other end of the contour.

4.3 MEASURE

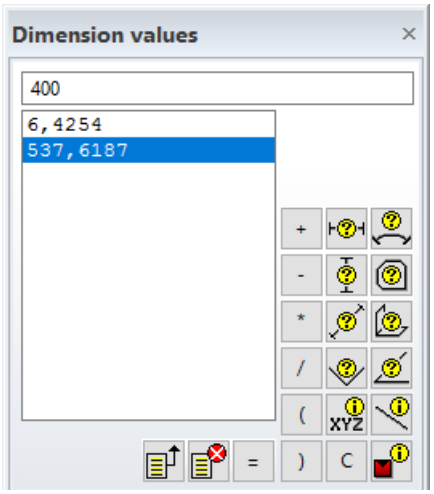
Show dimension values

Measure toolbar
Context menu (right mouse button) > Measure; Info menu > Measure > Show dimension values

This function opens the dimension values dialog window.

DIMENSION VALUES

The measurement functions can be called up at any time via the MEASURE context menu (right mouse button).



In addition to the measurement functions, there is a list, a calculation line and calculation operations.
This window is a docking menu and behaves in the same way as the layer, storey and views windows.

List

The 20 most recently measured values appear in this list; it does not matter whether the dialog window is open or closed. The most recently measured value is always at the bottom and highlighted in blue. The unit of the values is the unit set in the status window. When you double-click a value, the number is copied to the calculation line. The rounding of the figures in the list can be set in the SETTINGS menu > OPTIONS > WORK PARAMETERS > GENERAL.

TIP

To copy a value from the list to the input line or a field in a dialog window, the value must first be copied to the calculation line.

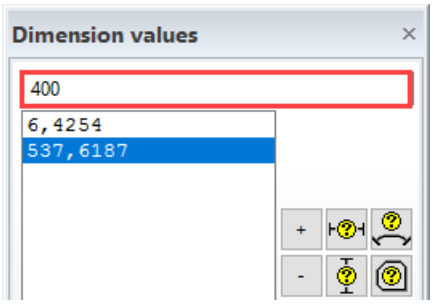
Delete list

This function deletes all values from the list.

Copy selected value from list

This function transfers the active value (highlighted blue) from the list and copies it to the calculation line.

Calculation line



The values from the list can be transferred to the calculation line by double-clicking them, or you can enter new values here using the keyboard. The calculation operations can be entered with the relevant button or via the keyboard. Clicking the buttons always enters the operations at the end of the line. In order to enter an operation subsequently, the input cursor must be in the correct position and the operation entered via the keyboard.
Rounding to a number of decimal places can be set in the OPTIONS.

Equals

The equals button shows the result of a calculation.

Clear

The clear button deletes all values in the calculation line.

Add, subtract, multiply, divide, bracket open, bracket close

The main operations are available as buttons so that you can enter a calculation operation in the calculation line. The operations can also be entered via the keyboard, but you must make sure that you put the input cursor in the correct place first. Clicking the buttons always enters the operations at the end of the line.

Behaviour of measurement functions

> only applies if the measurement function is called up via the dimension values dialog window.
The behaviour of the measurement functions differs depending on a function was active when a measurement function was selected or whether the measurement function was started within another function.

No function active:
The measured value is shown in the status bar for information and written to the list in the measurement dialog window for further processing. It makes no difference whether the measurement window is open or not.
This measurement function remains active.

Within a function:
The measured value is written to the status bar for information and directly to the input line in the measurement window. The value can therefore be used immediately.
This measurement function does not remain active.

MEASUREMENT FUNCTIONS

Measure horizontal

Measure toolbar
Context menu (right mouse button) > Measure; Info menu > Measure > Horizontal

This function measures the horizontal distance between two points in the drawing.

After the function is activated, the two points in the drawing can be specified.
See the Behaviour of measurement functions chapter for information about where the dimension values appear and how they can be further processed.

TIP

The two points you enter do not need to be at the same horizontal height.

Measure vertical

Measure toolbar
Context menu (right mouse button) > Measure; Info menu > Measure > Vertical

This function measures the vertical distance between two points in the drawing.

After the function is activated, the two points in the drawing can be specified.
See the Behaviour of measurement functions chapter for information about where the dimension values appear and how they can be further processed.

TIP

The two points you enter do not need to be at the same vertical height.

Measure now

Measure toolbar
Context menu (right mouse button) > Measure; Info menu > Measure > Measure now

This function measures the direct distance between two points in the drawing.

After the function is activated, the two points in the drawing can be specified.
See the Behaviour of measurement functions chapter for information about where the dimension values appear and how they can be further processed.

Measure arc length

Measure toolbar
Context menu (right mouse button) > Measure; Info menu > Measure > Arc dimension

This function measures an arc length, either the length of the entire arc or part of the arc. The arc must be a drawing element.

Once the function is activated, the arc to be measured must be selected. The element capture function is activated for selecting the arc.
If you confirm with [Return], the entire arc length is measured. Instead of confirming, you can also set a start and end point on the arc to allow partial measurements of an arc.

Measure area

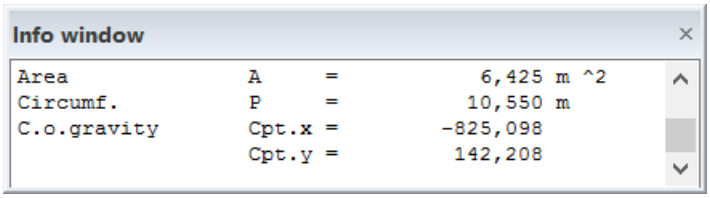
Measure toolbar
Context menu (right mouse button) > Measure; Info menu > Measure > Measure area

This function measures the specified area, calculates the circumference and positions the cross hair in the centre of gravity of the area.

Properties bar

The toggle button "hatches" defines if hatches or 2D contours may be selected for area measurement. The polygon functions allow you, to draw a contour manually. The graphic preview of the area can be deactivated with the "Preview area" switch. If cut-outs are to be extracted within the area, the "Include cut-outs" switch must be activated. The unit for the measurement results can be defined separately.

Closed contour
When this function is activated, you are prompted to position the cross hair on the required contour. The circumference of the contour, the area and the centre of the area are calculated. The reference point is set at the centre of the area. The calculated values are shown in the info window. The centre point coordinates relate to the current reference point on the drawing.



TIP

This function takes account of the branching parameters of the contour search under SETTINGS > OPTIONS > WORK PARAMETERS > GENERAL.

Open contour/polygon functions
Additional polygon functions are available in this properties bar. These polygon functions allow you to track along even imaginary surfaces that do not have a contour, to follow contours that have open points, or to determine a profile length.
See the Polygon chain chapter for information about what the polygon functions can do.

Measure angle between 2 surfaces

Measure toolbar
Context menu (right mouse button) > Measure; Info menu > Measure > Angle between 2 surfaces

You can use this function to determine the angle between two surfaces.

After you activate the function, you are prompted to specify the surfaces between which the angle is to be determined. The value appears in the info window.
If a surface is curved, the tangent plane is used in the specified point.

Measure angle between 2 lines

Measure toolbar
Context menu (right mouse button) > Measure; Info menu > Measure > Angle between 2 lines

You can use this function to determine the angle between two straights (element or help line).

After you activate the function, you are prompted to specify the lines between which the angle is to be determined.

TIP

The relevant angle is calculated when you click the inside or outside of the elements with the cross hair.

Measure angle of a line

Measure toolbar
Context menu (right mouse button) > Measure; Info menu > Measure > Angle of a line

You can use this function to determine the angle of a straight (drawing or help element) that it forms with the horizontal.

After you activate the function, you are prompted to specify the straight for which you wish to determine the angle.

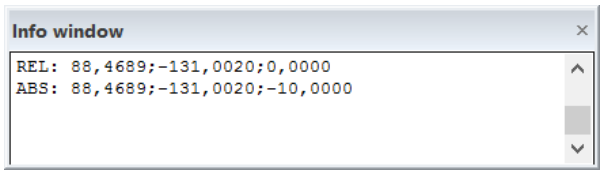
The angle units DEGREE, GRADIAN or RADIANT can be set in the OPTIONS.

Coordinates of point

Measure toolbar
Context menu (right mouse button) > Measure; Info menu > Measure > Coordinates of point

This function allows you to display the absolute and relative x,y,z coordinates of any point on the drawing. The coordinates are displayed in the info window.

After the function is activated, the point in question is marked. The coordinates are displayed as follows:
REL/ABS: X value, Y value, Z value



TIP

The relative Z value is always measured from the current work plane and the absolute Z value is measured from project null.

Element information

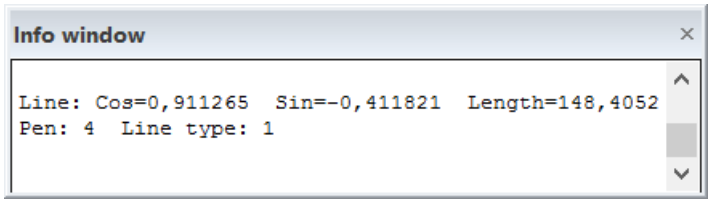
Measure toolbar

Context menu (right mouse button) > Measure; Info menu > Measure > Element information

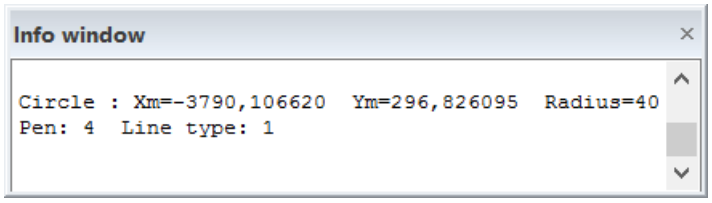
This function allows you to list the geometry information for an element shown on the screen.

When you select the command, the required element is marked with the cross hair. The following information is shown in the info window:

Line



Circle



TIP

If an element attribute is available, this is shown in the info window.

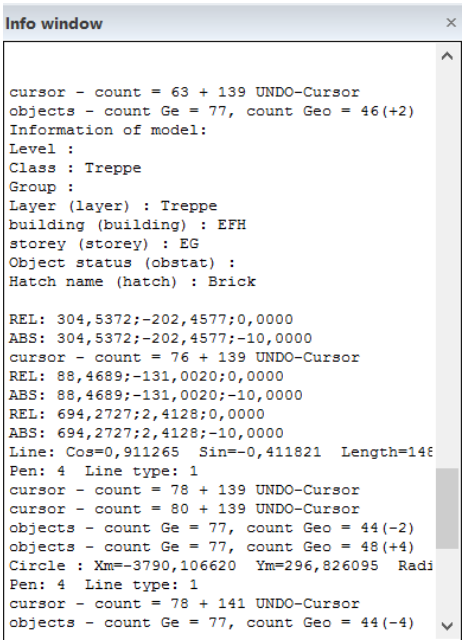
Model information

Measure toolbar

Context menu (right mouse button) > Measure; Info menu > Measure > Model information

This function lists the details of a selected model. This information includes model name, all attributes, number of points, groups, classes, levels, and so on.

When you activate this function, the information is listed in the info window. Example of a wall:



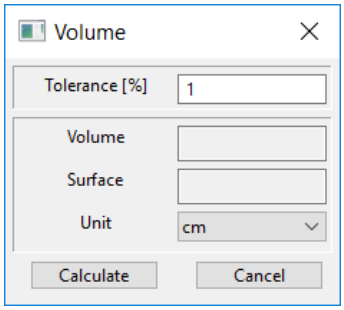
Volume calculation

Measure toolbar

Info menu > Measure > Volumes...

This function allows you to calculate the volume that is enclosed by the currently constructed surfaces.

When the function is activated, the settings dialog window on the left appears.



Tolerance [%]:
The value entered here corresponds to the specified precision of the volume in per cent.

Volume:
The calculated volume is displayed here.

Surface:
The calculated surface is displayed here.

Calculate:
This button starts the calculation. The calculated volume is also shown in the info window in the current cubic user unit, litres, and millilitres.

Cancel:
This button allows you to cancel the calculation process at any point.

The progress bar in the status line shows the progress of the volume calculation. The indicator starts every calculation at 0%.

TIP

The volume is precisely calculated for boxes with any contour. All other objects are calculated approximately. The calculation is repeated with increasing precision until the desired tolerance is achieved.
If the tolerance is zero, the calculation is repeated with increasing precision until the CANCEL button end the process.

The new approximation is shown in the dialog window and in the info window after each run. Only closed objects without protrusions can be calculated. Cavities are possible.

Height in point

Measure toolbar / Roof / Extended roof functions
Info menu > Measure > Height in point

This function is only available in ELITECAD Architecture and is used to measure the height inside the roof. Click any point in the roof area and upper and lower edge of the roof point is shown in the info window in reference to the top floor level.

4.4 HELP GEOMETRY

GENERAL

The help geometry elements (or help lines for short) are intended for the design. They are **not** for permanent auxiliary designs. The help lines are always deleted again so that the plan is clearly presented. The help lines are not printed by default. If the help lines are to be printed out, the PRINT HELP LINES option can be activated in SETTINGS > OPTIONS > SYSTEM > CONFIGURATION.

TIP

For permanent help lines, a line with pen colour "0" (blue) can be used.
These lines are not printed.
The help lines can be hidden in the screen settings.

FUNCTIONS

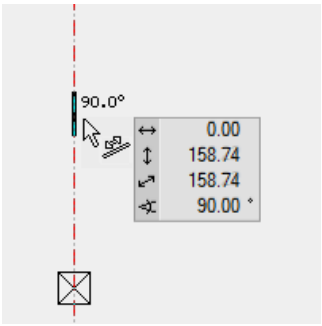
Straight line through points/to circles

Help lines toolbar
Draw menu > Help geometry > Straight line by two points

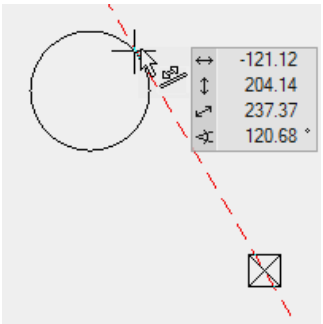
This function allows you to create a help line through two points. If a circle is selected, this allows you to use an automatically calculated tangent point.

Options

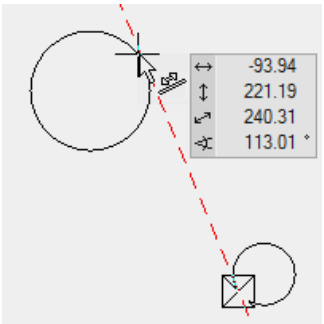
2 points



point + circle



2 circles



After this function is activated, the two points must be defined. You see a preview of the help line. If you want to run a line tangent to a circle, click on the arc near to the final tangent point.

TIP

The function remains active.
You can see which capture mode is active by the appearance of the cross hair. This means you can see whether a tangent will be created or a straight through a point. While element capture is active, a tangent will be generated.

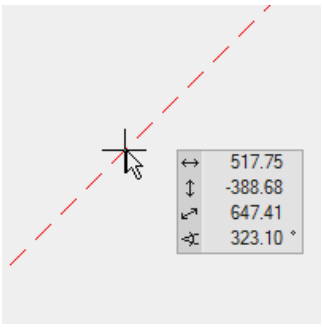
Straight with angle through a point/on a circle

Help lines toolbar
Draw menu > Help geometry > Straight line by angle and point

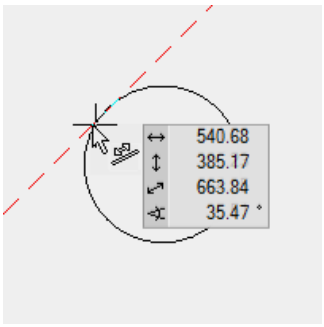
This function allows you to create a help line with a given angle through a point or tangent to a circle.
If several angles are entered, several help lines can be created at once.

Options

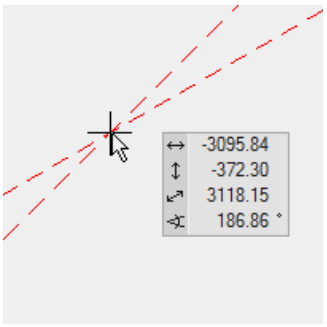
through point



tangent to circle



through point with 2 angles



After this function is activated, the properties bar appears. Enter the appropriate angle in the field of the properties bar or select a previously entered value from the list. Now the cross hair can be set at the point through which the help line should run at the specified angle.

This option offers the possibility to apply the angle relative to a selected line

TIP

Up to 10 values can be entered for the value in the properties bar field separated by commas.
The value entered is always measured from the x-axis. Once the angles are defined, any number of points can be selected.

Tangent/straight through point normal to line

Help lines toolbar
Draw menu > Help geometry > Straight line by point - normal on line

This function allows you to create a help line through a point normal to a line or a tangent normal to a line.

After the function is activated, a point or a circle must be defined. Then the line can be selected to which the help line should be normal.

TIP

The function remains active.
You can see which capture mode is active by the appearance of the cross hair. This means you can see whether a tangent will be created or a straight through a point. While element capture is active, a tangent will be generated.

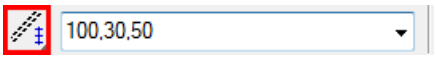
Parallel lines

Help lines toolbar
Draw menu > Help geometry > Parallel lines

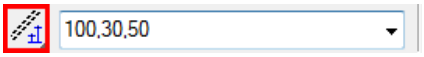
This function allows you to draw parallel help lines with a certain distance between them and to copy them multiple times. Relative or absolute distances can be entered.

Entry mode
This function determines whether the distances are measured absolutely or relatively.

Relative means that the distances are measured sequentially.



Absolute means that the distances are always measured from the start point.



Number of repeats

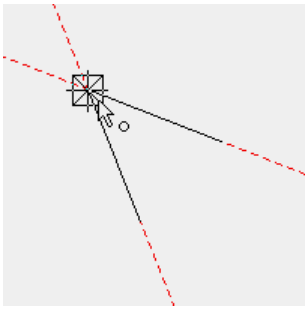
The number of repeats is only active if the input mode is set to "relative". A maximum of 100 repeats can be entered.

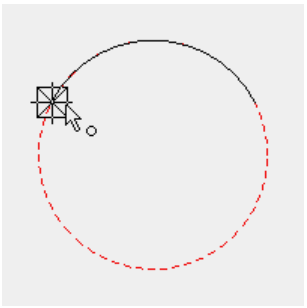
Geometry at single point

Help lines toolbar
Draw menu > Help geometry > Geometry at single point

This function allows you to create the help geometry at a point of an element. If several elements border this point, one help line is created for each element.

When the function is activated, the cross hair is placed next to the required points. Then the geometry elements are drawn as explained above.



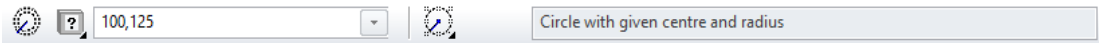


Circle with given centre and radius

Help lines toolbar
Draw menu > Help geometry > Circle with given centre and radius

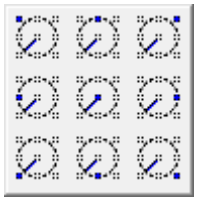
This function allows you to create one or more circles by entering the radii.

When the function is activated, the properties bar opens and you can specify the radii and the circle's reference point.

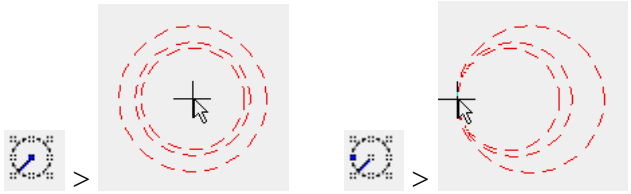


Radius
Up to 10 radii can be entered, separated by a comma.

Reference point



The reference point determines the point at which the circle is attached to the cross hair.



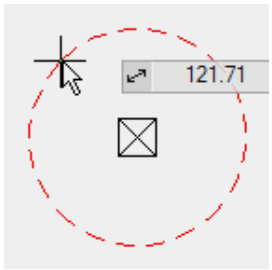
Circle by centre

Help lines toolbar
Draw menu > Help geometry > Circle by centre

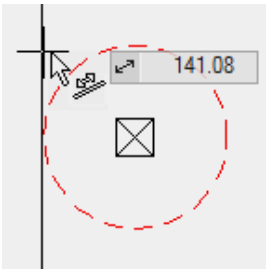
This function allows you to create a help circle by stating its centre point and a point on the circle's circumference. The circle can also be added as a tangent to an element (drawing, help line, line or curve).

Once the function is activated, the centre point is determined. Then the extent of the circle is determined with a point on the circumference or an element to which the circle should be tangentially arranged.

by point



Tangent to element



TIP

The function remains active.
You can see which capture mode is active by the appearance of the cross hair. This means you can see whether the help circle will be created tangentially to an element or using a point. If you move over an element with the element capture mode, the help circle will be generated tangentially to the element.

Circle by 3 points or tangents

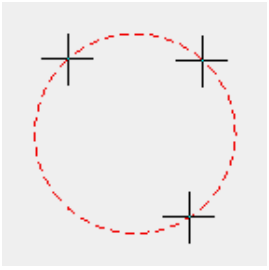
Help lines toolbar

Draw menu > Help geometry > Circle by 3 points or tangents

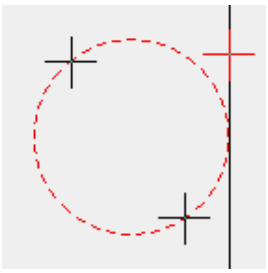
This function allows you to create a help circle, which is defined by the input of 3 "locations". These "locations" can be either free points or tangential points.

Options

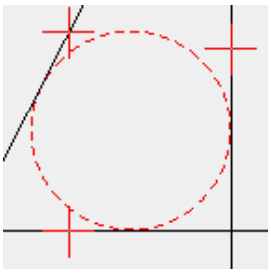
by 3 points



mixed



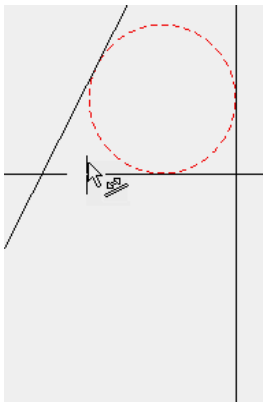
by tangents



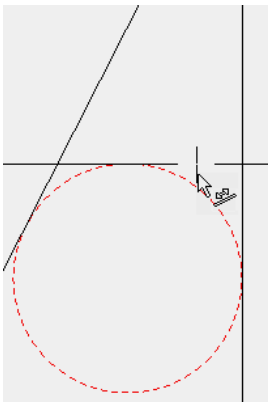
Cursor position

The direction changes depending on the position of the cursor in relation to the cross hair.

Cursor above cross hair



Cursor below cross hair



TIP

The solution for a circle touching 3 tangents is very complicated and is based on an interactive process. If no solution is found, you are prompted to try again by entering more precise boundary points, i.e. the boundary points should be marked so that they correspond as closely as possible to their actual position on the circumference of the help circle you are attempting to create.
You can see which capture mode is active by the appearance of the cross hair. This means you can see whether the help circle will be created tangentially to an element or using a point. If you move over an element with the element capture mode, the help circle will be generated tangentially to the element.

Circle by radius

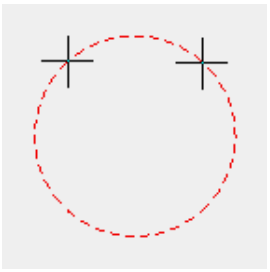
Help lines toolbar

Draw menu > Help geometry > Circle by radius

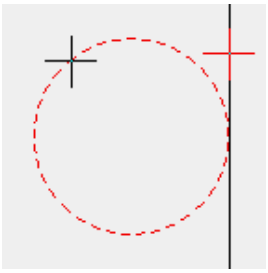
This function allows you to create a help circle with a certain radius by specifying two "locations". These two "locations" can be either free points or tangential points.

Options

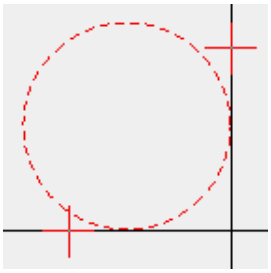
by 2 points



mixed



by tangents

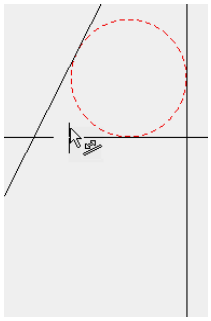


When the function is activated, the properties bar opens and you can specify the radii. The points or elements, which must form tangents to the help circle, must be selected one by one.

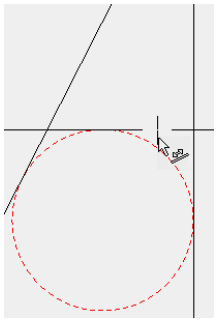
Cursor position

The direction changes depending on the position of the cursor in relation to the cross hair.

Cursor above cross hair



Cursor below cross hair



TIP

The function remains active.

You can see which capture mode is active by the appearance of the cross hair. This means you can see whether the help circle will be created tangentially to an element or using a point. If you move over an element with the element capture mode, the help circle will be generated tangential to the element.

DELETING HELP GEOMETRY

Deleting a single geometry element

Toolbar. Help geometry

This function deletes single help lines. Instead of using this function, you can highlight the help lines and delete them with the [Delete] key. If you hold down the [Shift] key, you can highlight several help lines.

Deleting all help geometry

Toolbar. Help geometry

This function deletes all help lines from the plan, including hidden lines.

4.5 MANIPULATE

Assemble selection

*Manipulate toolbar
View menu > Assemble selection

This function is used to assemble a certain selection.
If there is no current selection, everything is assembled.

Hide selection

*Manipulate toolbar
View menu > Hide selection

This function is used to hide a certain selection.
Everything is re-assembled with the ASSEMBLE SELECTION function.

TIP

If you use the [F5] key (Assemble storey filter), you only assemble objects from the previous storey filter.

Move selection

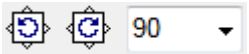
*Manipulate toolbar
Edit menu > Selection > Move selection

This function is used to move a certain selection.

When the function has been selected, you can select the point to move and the new position.
Once the selection has been placed at the new point, the function remains active, so that the end point can be placed elsewhere until the selection is in the required location. The function is exited with [Esc].

Additional functions
When the selection being moved is "attached" to the cursor (after the points of the selection to be moved have been determined), a properties bar appears with additional manipulation functions.

Rotate



Rotates the selection clockwise or anticlockwise by the value entered in the "rotation angle" field.

3D rotate

This function can be used to rotate objects about an axis in the space.
Once the function is activated, the second point of the rotation axis must be digitised. This point must not be identical to the first point. The two points describe the rotation axis. The value for the desired angle must then be entered in the input line.

Rotate on x-axis

This function rotates the selection by 90° about the x-axis.

TIP

This option is useful if you have drawn a cross-section on the floor plan and wish to convert it to 3D.

Rotate on y-axis

This function rotates the selection by 90° about the y-axis.

TIP

This option is useful if you have drawn a cross-section on the floor plan and wish to convert it to 3D.

Mirror vertical

This additional function mirrors the selection vertically. No additional input is required. The axis of symmetry is placed through the current reference point.

Mirror horizontal

This additional function mirrors the selection horizontally. No additional input is required. The axis of symmetry is placed through the current reference point.

Mirror over arbitrary axis

This additional function mirrors the selection along an axis of your choosing. Once the function is activated, the angle of the symmetry axis must be entered in the input line. The axis of symmetry is placed through the current reference point.

Mirroring 3D

This additional function mirrors the selection along the current work plane. The work plane corresponds to the axis (plane) of symmetry.

When the function is activated, the selection made is mirrored along the current work plane. No additional input is required.

Scale

This additional function allows you to also make the selection larger (>1) or smaller (>0 and <1).

Once the function is activated, the scaling factor must be entered in the input line. The factor is greater than 1 to increase the size or less than 1 to make it smaller.

Move on circle

This additional function allows you to rotate a selection about a certain point without it being rotated in itself. After the function is activated, you are prompted to enter the rotation point. The selection is then moved through the previously entered rotation angle. This may be positive or negative.

Free selection of reference point

The reference point is the point to which the selection is "attached". If you notice that you have selected an incorrect point as you make your entry, you can redefine the reference point using this additional function.

When this function is activated, a new window opens containing the selection. A new reference point can now be defined by clicking with the mouse. Once you click, the window disappears and the selection is "attached" to the new reference point.

Copy selection

*Manipulate toolbar
Edit menu > Selection > Copy selection

This function is used to copy a certain selection.

When the function has been selected, you can select the point to copy and the new position for this point.
Once the selection has been placed at the new point, the function remains active, so that the selection can immediately be copied multiple times. The function is exited with [Esc].

Additional functions
When the selection being copied is "attached" to the cursor (after the points of the selection to be copied have been determined), a properties bar appears with additional manipulation functions.

Rotate

Rotates the selection clockwise or anticlockwise by the value entered in the "rotation angle" field.

3D rotate

This function can be used to rotate objects about an axis in the space.
Once the function is activated, the second point of the rotation axis must be digitised. This point must not be identical to the first point. The two points describe the

rotation axis. The set angle is adopted. Then the desired placement point must be entered.

Rotate on x-axis

This function rotates the selection by the set angle about the x-axis.

TIP

This option is useful if you have drawn a cross-section on the floor plan and wish to convert it to 3D.

Rotate on y-axis

This function rotates the selection by the set angle about the y-axis.

TIP

This option is useful if you have drawn a cross-section on the floor plan and wish to convert it to 3D.

Mirror vertical

This additional function mirrors the selection vertically. No additional input is required. The axis of symmetry is placed through the current reference point.

Mirror horizontal

This additional function mirrors the selection horizontally. No additional input is required. The axis of symmetry is placed through the current reference point.

Mirror over arbitrary axis

This additional function mirrors the selection along an axis of your choosing... Once the function is activated, the angle of the symmetry axis must be entered in the input line. The axis of symmetry is placed through the current reference point.

Mirroring 3D

This additional function mirrors the selection along the current work plane. The work plane corresponds to the axis (plane) of symmetry.

When the function is activated, the selection made is mirrored along the current work plane. No additional input is required.

Scale

This additional function allows you to make the selection larger or smaller.

Once the function is activated, the scaling factor must be entered in the input line. The factor is greater than 1 to increase the size or less than 1 to make it smaller.

Move on circle

This additional function allows you to rotate a selection about a certain point without it being rotated in itself. After the function is activated, you are prompted to enter the rotation point. The selection is then copied through the previously entered rotation angle. This may be positive or negative.

Free selection of reference point

The reference point is the point to which the selection is "attached". If you notice that you have selected an incorrect point as you make your entry, you can redefine the reference point using this additional function.

When this function is activated, a new window opens containing the selection. A new reference point can now be defined by clicking with the mouse. Once you click, the window disappears and the selection is "attached" to the new reference point.

Multiple copy

This function is used to repeat a manipulation.

After you activate the function, you are prompted to specify the number of repeats required in the input line.

TIP

"Multiple copy" can be combined with any number of additional functions. For example, a selection can be rotated and copied multiple times.

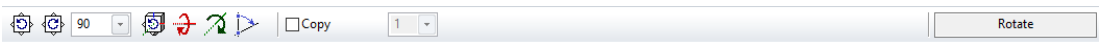
Rotate Selection

*Manipulate toolbar
Edit menu > Selection > Rotate selection

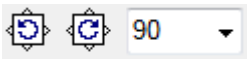
This function is used to rotate a certain selection.

When this function is selected, you define the point about which the selection will be rotated.
You can then enter a rotation angle in the input line or enter "0" to define two points, the output direction and the end direction.

Additional functions
When the selection being rotated is "attached" to the cursor (after the points of the selection to be rotated have been determined), a properties bar appears with additional manipulation functions.



Rotate



Rotates the selection clockwise or anticlockwise by the value entered in the "rotation angle" field.

Rotate around X-axis or Y-axis

Rotates the selection by the value entered in the "rotation angle" field around the X- or Y-axis.

Rotate around a free 3D-axis

Rotates the selection by the value entered in the "rotation angle" field around a free 3D-axis. The second point of the axis has to be entered.

Rotate by point entry

This additional function allows you to determine the angle of rotation through an output and end direction.

Copy

Activating the COPY additional function rotates a copy and leaves the original as it is. You can also rotate and copy a selection multiple times simultaneously by entering a number.

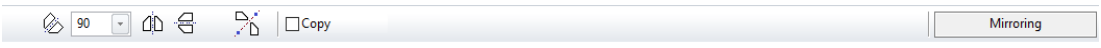
Mirror selection

*Manipulate toolbar
Edit menu > Selection > Mirror selection

This function is used to mirror a certain selection.

When this function is selected, you define the point along which the selection will be mirrored.
The angle of the symmetry axis can now be entered in the input line.

Additional functions
When the selection being mirrored is "attached" to the cursor (after the point of the axis of symmetry has been determined), a properties bar appears with additional manipulation functions.



Mirror over arbitrary axis

Mirrors the selection by the value entered in the "Angle of the symmetry axis" field.

Mirror vertical

This additional function mirrors the selection vertically. No additional input is required. The axis of symmetry is placed through the specified point.

Mirror horizontal

This additional function mirrors the selection horizontally. No additional input is required. The axis of symmetry is placed through the specified point.

Symmetry axis by 2nd point

This additional function allows you to define the axis of symmetry through a second point.

Copy

Activating the COPY additional function mirrors a copy and leaves the original as it is.

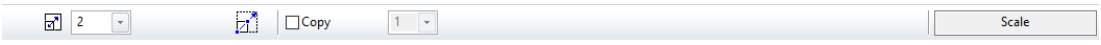
Scale selection

*Manipulate toolbar
Edit menu > Selection > Scale selection

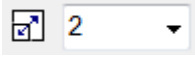
This function is used to make a certain selection larger or smaller.

When this function is selected, you define the point from which the selection will be scaled up or down.
A scaling factor can now be entered in the input line. The factor is greater than 1 to increase the size or less than 1 to make it smaller.

Additional functions
When the selection being scaled is "attached" to the cursor (after the point from which it will be scaled has been determined), a properties bar appears with additional manipulation functions.



Scale



Scales the selection by the value entered in the "Factor" field.

Scale by point entry

This additional function allows you to determine the scaling through a start and an end point.

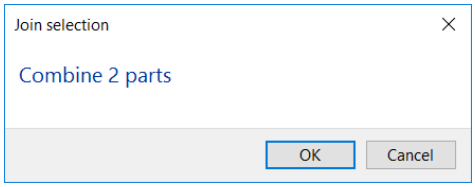
Copy

Activating the COPY additional function scales a copy up or down and leaves the original as it is. You can also scale and copy a selection multiple times simultaneously by entering a number.

Join selection

*Manipulate toolbar
Edit menu > Selection > Join selection

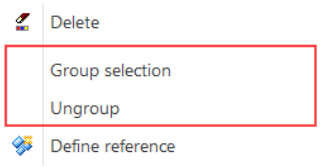
You can use this function to join individual lines or polygons to a polygon. The lines must result in a logical sequence. If the lines do not touch or are on a different work plane, they will not be taken into account.



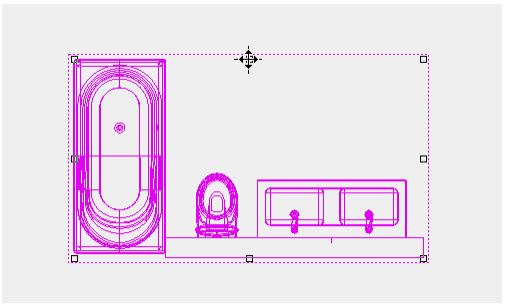
Grouping

Grouping toolbar
Edit menu > Grouping

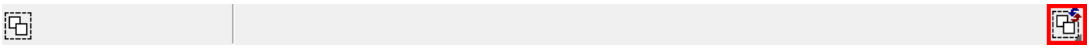
A selection of individually drawn parts can be grouped. This allows elements, text, hatches, etc. that belong together to be combined and manipulated as a group. The parts to be grouped must be in the same storey. Groupings can be nested.
The preset keyboard command for "Group selection" is [Ctrl]+[G] and for "Ungroup" it is [Ctrl]+[Shift]+[G]. Alternatively, the options are included in the context menu.



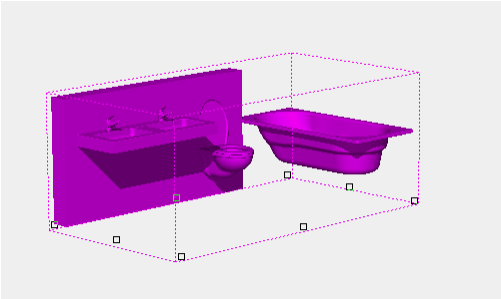
A selected group is highlighted in colour and given a frame with handles. The group can be moved or copied using the handles.

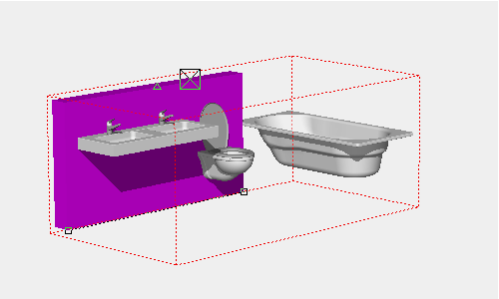


A group can either be edited using the properties bar or by double-clicking. When a group is in editing mode, the individual objects can be changed or new parts added.



Grouping selected Edit group





In the group editing mode, a selection of parts can be removed from the group using the REMOVE SELECTION FROM GOUP function in the context menu.
To incorporate a selection of parts into the group, the EXPAND GROUP function must be activated in the context menu. The selection can be made and then ended again via the context menu function CLOSE EXPANSION OF GROUP, or cancelled via the CANCEL EXPANSION OF GROUP function.

Remove selection from group
To remove elements from the group, a selection can be made in the group editing mode and confirmed in the context menu with REMOVE SELECTION FROM GROUP.

Expand group
If new parts are drawn in group editing mode, these automatically belong to the group. To incorporate a selection of elements that are already drawn into the group, the EXPAND GROUP function must be activated in the context menu and the required elements then selected. To exit, select the CLOSE EXPANSION OF GROUP function from the context menu. The function can be cancelled in the context menu.

Stretch at point or line

*Manipulate toolbar
Edit menu > Selection > Stretch selection

This function applies to the current selection and stretches or compresses the elements enclosed in a polygon.

The stretch can be defined via a line or two points.

Via points
After activating the function, you are prompted to first specify a point in the current image and then a new position for this point. Then you are prompted to enclose the section of the current image that is to be moved in a polygon. The polygon chain is closed by clicking again on the last position. The polygon chain not only relates to the current work plane, but is actually a cuboid, which extends infinitely at right angles to the work plane. All the elements included in the cuboid are moved towards the new point by the distance between the two points – the connecting lines are "stretched" or "compressed" accordingly.

Stretching is according to the following criteria:
If possible, the 2D objects are stretched in their work plane.
If boxes, extrudes or surface definitions are stretched along the z-axis, their 3D definition parameters change.
If the stretch vector is along the z-axis and the entire object is in the cuboid, the entire object will be moved.
If only part of a 3D object is in the cuboid, the surfaces are stretched.

Via a line
When the function has been activated, you indicate the line that specifies the direction for the stretch. When you click on the line, the current length of the line appears in the input line. Entering the new line length determines the length of the stretch. Then you are prompted to enclose the section of the current image that is to be moved in a polygon. The polygon chain is closed by clicking again on the last position. All the elements included in the cuboid are moved along the line by the distance – the connecting lines are "stretched" or "compressed" accordingly.

Lengthen/Shorten at corner

*Manipulate toolbar

The function connects either 2 elements or 2 walls to a corner.

Lengthen/shorten single element

*Manipulate toolbar and Lengthen/Shorten

The function lengthens or shortens either elements or walls to each other. When the function is called up, the delimiting object is clicked first and then the one to be lengthened. If elements or walls are crossed, the side that is clicked with the mouse remains in place.
For delimiting of elements also help lines and circles can be selected.

Lengthen/shorten multiple elements

*Manipulate toolbar and Lengthen/Shorten

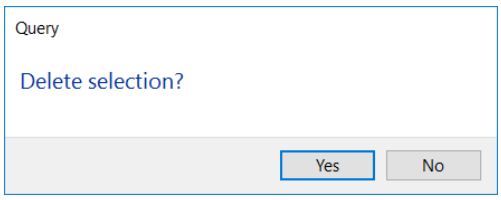
The function lengthens or shortens either multiple elements or walls to each other. When the function is called up, the delimiting object is clicked first and then the objects to be lengthened one after another. The function is retained until it is cancelled with [Esc]. If elements or walls are crossed, the side that is clicked with the mouse remains in place.
For delimiting of elements also help lines and circles can be selected.

Delete selection

*Manipulate toolbar and Lengthen/Shorten
Edit menu > Selection > Delete selection

This function is used to delete a selection.

The deletion must be confirmed.



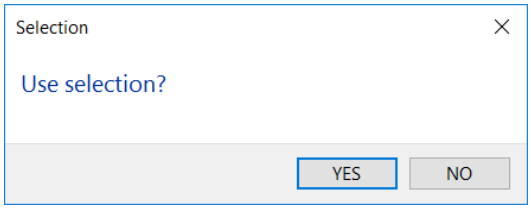
TIP

Confirmation of the deletion process can be switched off under SETTINGS > OPTIONS > WORK PARAMETERS > GENERAL.

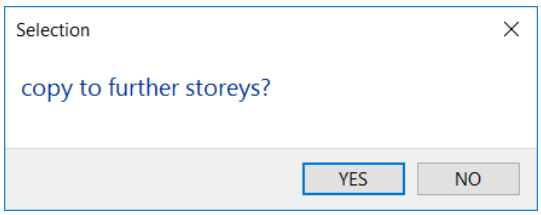
Copy into active storey

*Modify toolbar
Modify menu > Copy into active storey

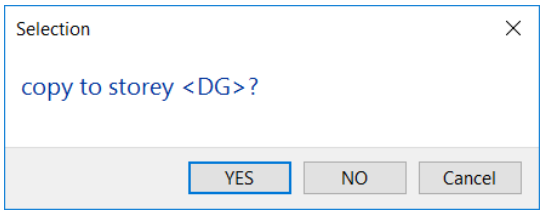
This function is only available in ELITECAD Architecture and is used to copy individual objects or a selection of objects on a storey to a different storey.
The target storey must be active.
If the object in question has sub objects (such as walls with windows and doors), the associated sub objects are also copied. The heights of walls are adapted to the storey concerned. In the same way, copied slabs adapt the thickness set in the storey list. A wall must be present for windows, doors and wall openings to be copied to a storey.
If you wish to copy a selection, the selection must first be made and then the function started.



The selection can be copied to further storeys.



You are asked about each storey and can answer Yes or No.



TIP

This function only works within the same structure.

CLIPBOARD

Cut

*Main functions/Edit toolbar
Edit menu > Cut [Ctrl] + [X]

This function is used to move a certain selection between drawings or views.

When the function is called up, the reference point for the move can be selected. The selection is deleted from the current drawing and placed on the ELITECAD clipboard for further use.

Copy

*Main functions/Edit toolbar
Edit menu > Copy [Ctrl] + [C]

This function is used to copy a certain selection between drawings or views.

When the function is called up, the reference point for the copy can be selected. The selection is placed on the ELITECAD clipboard for further use.

Paste

*Main functions/Edit toolbar
Edit menu > Paste [Ctrl] + [V]

Pastes the content of the ELITECAD clipboard into the current drawing. The pasted content is automatically adjusted to the scale and, in the architecture version, assigned to the current floor. This function is also used to paste the ELITECAD clipboard between ELITECAD sessions that are open at the same time.

Absolute paste

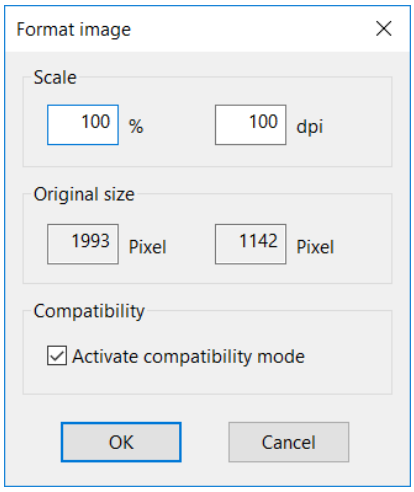
Edit toolbar
Edit menu > Absolute paste

Pastes the content of the ELITECAD clipboard into the current drawing. The content is imported regardless of the current scale.

Image to clipboard

Edit toolbar
Edit menu > Image to clipboard [Ctrl] + [Shift] + [C]

This function is used to copy the screen content to the Windows clipboard. The content of the clipboard can be transferred to other applications using Edit > Paste or [Ctrl] + [V].



A settings dialog window appears for the IMAGE TO CLIPBOARD function. This allows you to control the quality. For a transfer to MS Word, the scaling can be increased to 300 % or even 600 % if high quality is required. Depending on the scaling, however, this may take up 100 MB or more of memory.
Compatibility mode is required to generate the clipboard for programs that have restrictions. If this mode is switched off, the entire image section is saved to the clipboard. If the mode is switched on, Windows only calculates the used part. Whether the line gauge should be used is defined in the colour properties dialog window (SETTINGS menu > COLOUR PROPERTIES).

4.6 SELECTING

GENERAL

For each selection, the following principles are true:

- A selection is highlighted in magenta.
- If possible, the corresponding property bar and handles of the selection are displayed.
- A selection can be further manipulated with the manipulation functions.

SELECTION BY MOUSE CLICK

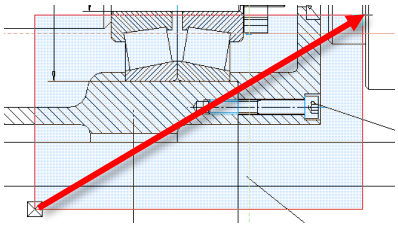
A click with the left mouse button in the graphics window means **SELECTING and EDITING**. If there is nothing selected and no special selection function is active, the selection by rectangle starts.

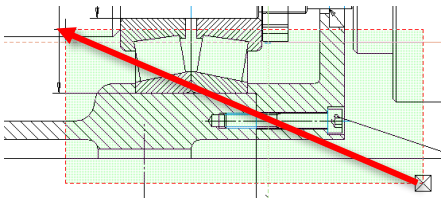
With a single click, the property bar of the selected object is displayed. A double click opens, if available, the big parameter dialog window. The text has different behavior – a double click on texts starts the editing function of the text.

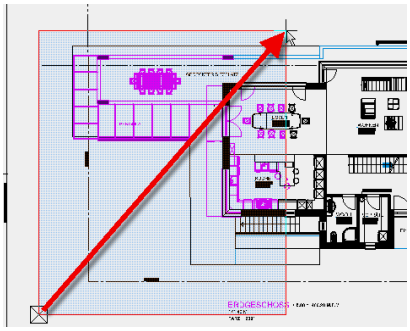
The [Shift] key enables adding or removing something to the selection. Selected objects are displayed in magenta and their corresponding handles are shown, provided there is no mixture of incompatible objects.

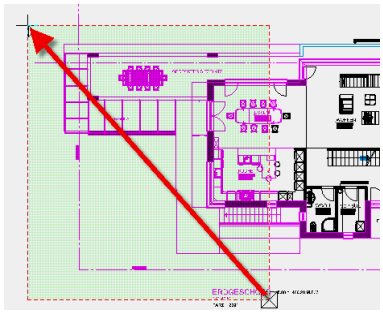
SELECTION BY RECTANGLE

The selection rectangle is used to make a selection. If the selection is made from left to right, a blue rectangle appears, which selects only those parts that are fully included in it. If the selection is made from right to left, a green rectangle appears, which selects all parts that it covers. You can use [Shift] + [click] to select additional parts or to deselect parts.





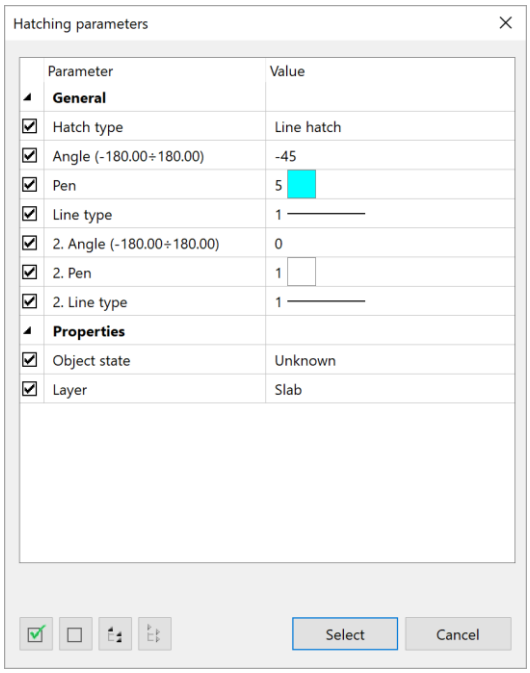




SELECTION BY PARAMETER

Select toolbar
Edit menu > Select > Parameter

With this selection function, a selection is made via object parameters. Therefore, an object has to be selected in the graphics window. If an object is already selected when the function is launched, the query is obsolete and the selected object is used immediately.
All parameters of the selected object are displayed in a dialog window in a list. These parameters are available as search criteria.
Example for hatching parameters:



Selection

☑

In this column, you can select, which parameters should be used for the search and which should not. If the box is ticked, the parameter will be used.

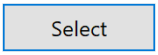
All / None

These options allow you to select or deselect all parameters.

Open / close all groups

With these functions, all parameter groups can be opened and closed all together.

Select



With a click on this button, the selection will be made.

SELECTION SETTINGS

Selection with group/class/level

Working with the classification structure model/group/class/level is possible, if the switch "Selection with group/class/level" is enabled under SETTINGS > OPTIONS > WORKING PARAMETERS > EDIT.

The default setting for ELITECAD Mechanics is working with the classification structure and in ELITECAD Architecture without classification structure.

TIP

It is recommended not to change the presets.

Selection element/part

Selecting toolbar

The part selection mode allows access to:

- Single lines of a polygon
- Single dimension of a chain dimension
- 3D-Object without 2D
- The last 3D operation (e.g. Boolean operation)

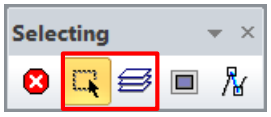
The selection mode is permanently changed in selection toolbar.
For a single application of a part selection, a selection per [Alt] + click is available.
There is no access in part selection mode for objects generated by the program.

SELECTING TOOLBAR

The preset in ELITECAD is a selection per mouse click or per selection rectangle. Special functions for selecting are launched directly via the menu EDIT > SELECT. Functions related to selecting which are used very often are combined into the SELECTING toolbar.
The available functions in the toolbar depend on the setting SELECTION WITH GROUP/CLASS/LEVEL. This is the reason why the presets differ between ELITECAD Architecture and Mechanics. The functions ABORT and SELECTION ELEMENT/PART are always visible.

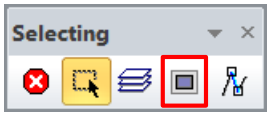
Selecting in ELITECAD Architecture

Selection mode mouse click/rectangle and layer



One can switch between the two selection modes mouse click/rectangle and layer. Selection in layer mode selects parts based on the layer they belong to.

Selection image



Selection of all assembled parts.

Selecting in ELITECAD Mechanics

Selection mode mouse click/rectangle and object

One can switch between the two modes mouse click/rectangle and object. In the object mode objects are always selected completely.

New object

This function starts a new component (analogously to NEW CLASSIFICATION, see chapter 1.6 layer / classification).

TIP

An existing component is ACTIVATED by [Ctrl] + click. Activating an object also activates the workspace of the selected object. The classification of the selected object becomes the active classification.

Select

Offers quick access to the select functions.

SELECTING

All

	Select toolbar
	Edit menu > Select > All

This function selects everything, including quantities not shown on the screen.

Image

	Select toolbar
	Edit menu > Select > Image

With this function, the current image is selected, i.e. just what is shown on the screen currently, but regardless of the zoom.

Layer

Select toolbar
Edit menu > Select > Layer

This function includes objects depending on their layers in the selection.

When you activate the function, the layer is selected. There are several options for this:

- If the selection is made by clicking, several layers can be marked with the cross hair. To remove a layer from the selection again, simply click it again. Once you have specified all the layers, complete the function with [Return].
- The selection can be made by entering the layer name in the input line. When you confirm the name with [Return], more layers can be clicked or the selection ended with [Return]. Several layer names can be entered together in the input line. Each layer name must be separated with a comma.
- If you only press [Return], the current layer is selected.

Block

Select toolbar
Edit menu > Select > Block

With this function, the lines contained by a polygon are selected if the elements are **fully** contained within the polygon.

TIP

ATTENTION
Architectural objects such as walls, ceilings, windows, etc., or mechanical objects such as screws, profiles, etc. cannot be selected with this function. The objects are protected.

After the function is activated, the elements in question are enclosed within a polygon. The polygon chain is closed by clicking again on the last position.

Section

Select toolbar
Edit menu > Select > Section

Lines contained by a polygon are selected and the lines are severed at the point where they intersect the polygon.

TIP

ATTENTION
Architectural objects such as walls, ceilings, windows, etc., or mechanical objects such as screws, profiles, etc. cannot be selected with this function. The objects are protected.

After the function is activated, the elements in question are enclosed within a polygon. The polygon chain is closed by clicking again on the last position.

Exterior block

Select toolbar
Edit menu > Select > Exterior block

With this function, the lines excluded by a polygon are selected if the elements are **fully** outside the polygon.

TIP

ATTENTION
Architectural objects such as walls, ceilings, windows, etc., or mechanical objects such as screws, profiles, etc. cannot be selected with this function. The objects are protected.

After the function is activated, the elements in question are excluded outside a polygon. The polygon chain is closed by clicking again on the last position.

Exterior section

Select toolbar
Edit menu > Select > Exterior section

Lines excluded by a polygon are selected and the lines are severed at the point where they intersect the polygon.

TIP

ATTENTION
Architectural objects such as walls, ceilings, windows, etc., or mechanical objects such as screws, profiles, etc. cannot be selected with this function. The objects are protected.

After the function is activated, the elements in question are excluded outside a polygon. The polygon chain is closed by clicking again on the last position.

Object

Select toolbar
Edit menu > Select > Object

The object mode is only available in ELITECAD Mechanics and adds objects to the selection. It is intended primarily for self-defined components, because the objects generated by the program are always chosen as a whole anyway. With the corresponding shortcut key [F4] (default), the object mode can be activated and deactivated.

In object mode, no rectangle selection is possible. Instead, the function EDIT > SELECT > BLOCK MODEL can be used.

After activating the function, the objects are selected. There are several possibilities:

- If the selection is made by clicking, several objects can be marked with the crosshairs. To remove an object from the selection, it has to be clicked again. If you have specified all objects, the function must be terminated with [Return].
- If you only press [Return], the current object will be selected.

Model

Select toolbar
Edit menu > Select > Model

This function includes objects into the selection based on their model name.

After activating the function, the models are selected. There are several possibilities:

- If the selection is made by clicking, several models can be marked with the crosshairs. To remove a model from the selection, it has to be clicked again. If you have specified all models, the function must be terminated with [Return].
- If the selection is made by specifying the model name, all models with this name are selected. After confirming [Return] of the name, further models can be clicked or the selection can be ended with [Return]. It is also possible to enter several model names in the input line. The respective model names must be separated by a comma.
- If you only press [Return], the current model will be selected.

Block model

Select toolbar
Edit menu > Select > Block model

This function selects the models touched by a polygon, with only one element of the model partially contained in the polygon. The models defined by the polygon are selected entirely.

After activating the function, the patterns affected by the polygon are marked. The polygonal chain is completed by a second click on the last position. Subsequently, the selection made can be manipulated.

TIP

In contrast to the selection functions CUT and BLOCK, the BLOCK MODEL selection function also includes all 3D and object information. An architectural or mechanical object can therefore be processed further.

Group

Select toolbar
Edit menu > Select > Group

This function includes objects into the selection based on their group name.

TIP

The selection GROUP only appears in the selection options of the manipulations if the option SELECTION WITH GROUP / CLASS / LEVEL is activated in the working parameters.

After activating the function, the groups are selected. There are several possibilities:

- If the selection is made by clicking, several groups can be marked with the crosshairs. To remove a group from the selection, it has to be clicked again. If you have specified all groups, the function must be terminated with [Return].
- If the selection is made by specifying the group name, all groups with this name are selected. After confirming [Return] of the name, further groups can be clicked or the selection can be ended with [Return]. It is also possible to enter several group names in the input line. The respective group names must be separated by a comma.
- If you only press [Return], the current group will be selected.

Class

Select toolbar
Edit menu > Select > Class

This function includes objects into the selection based on their class name.

TIP

The selection CLASS only appears in the selection options of the manipulations if the option SELECTION WITH GROUP / CLASS / LEVEL is activated in the working parameters.

After activating the function, the classes are selected. There are several possibilities:

- If the selection is made by clicking, several classes can be marked with the crosshairs. To remove a class from the selection, it has to be clicked again. If you have specified all classes, the function must be terminated with [Return].
- If the selection is made by specifying the class name, all classes with this name are selected. After confirming [Return] of the name, further classes can be clicked or the selection can be ended with [Return]. It is also possible to enter several class names in the input line. The respective class names must be separated by a comma.
- If you only press [Return], the current class will be selected.

Level

Select toolbar
Edit menu > Select > Level

This function includes objects into the selection based on their level name.

TIP

The selection LEVEL only appears in the selection options of the manipulations if the option SELECTION WITH GROUP / CLASS / LEVEL is activated in the working parameters.

After activating the function, the levels are selected. There are several possibilities:

- If the selection is made by clicking, several levels can be marked with the crosshairs. To remove a level from the selection, it has to be clicked again. If you have specified all levels, the function must be terminated with [Return].
- If the selection is made by specifying the level name, all levels with this name are selected. After confirming [Return] of the name, further levels can be clicked or the selection can be ended with [Return]. It is also possible to enter several level names in the input line. The respective level names must be separated by a comma.
- If you only press [Return], the current level will be selected.

Attribute

Select toolbar
Edit menu > Select > Attribute

This function includes objects into the selection based on their attributes.

TIP

With the help of the INFO> MODEL INFORMATION function, the various attributes and their values can be viewed.

After activating the function, the desired attribute name is entered in the input line. Thereafter, the value of the attribute, which is to be selected, is entered. This process is carried out as often as required until the appropriate selection has been made and finally ended with [Return].

TIP

The prerequisite is that a corresponding attribute file is loaded with the function ATTRIBUTE PARAMETERS.

Buffer

The buffer provides a special selection function. The buffer can **temporarily** store a mixed selection.
The buffer will remain until the drawing is deleted.

TIP

A buffer is not stored in a work copy.

Select buffer

Buffer toolbar
Menu Edit > Select > Buffer

This function is used to select a defined buffer for subsequent manipulation.

After activating the function, the desired buffer name is entered in the input line. The buffer content is marked and can then be further processed with the manipulation functions.

In Buffer

Buffer toolbar
Menu Edit > Select > In Buffer

This function causes an assignment of the defined selection to the specified buffer, whereby it adds to an already existing content additively.

Before activating the function, the selection is defined. Then the function is called and the name of the desired buffer is entered. The selection made is added to the buffer contents.

From Buffer

Buffer toolbar
Menu Edit > Select > From Buffer

This function removes the selection made from the specified buffer.

Before activating the function, the selection is defined. Then the function is called and the name of the desired buffer is entered. The selection made is removed from the buffer.

Block copy in buffer

Buffer toolbar

This function copies the lines delimited by a polygon to the specified buffer. Only lines that are **completely** contained in the polygon are affected by this operation. This function creates copies, the original objects remain unchanged.

After activating the function, the polygonal chain limits the affected elements. The polygon is completed by a second click on the last position. After closing the polygon, the name of the buffer must be entered in the input line. Now the elements are copied and can be called up and manipulated by means of the function SELECT BUFFER.

Section copy in buffer

Buffer toolbar

This function copies the lines delimited by a polygon to the specified buffer, dividing the lines at the intersection with the polygon. This function creates copies, the original objects remain unchanged.

After activating the function, the polygon chain limits the affected elements. The polygon is completed by a second click on the last position. After closing the polygon, the name of the buffer must be entered in the input line. Now the elements are copied and can be called up and manipulated by means of the function SELECT BUFFER.

Clear buffer

Buffer toolbar

Menu Edit > Select > Clear Buffer

This function clears the specified buffer. That means, after calling the function and specifying the buffer name, the affected buffer is empty.

4.7 General parameters

Editing parameters

When you click on an element, a rest (text, hatch, scale) or an architectural or mechanical object, the properties bar opens and the properties can be changed.

Adopt parameters

*Modify toolbar
Edit menu > Adopt parameters

This function adopts a current parameter and opens the relevant creation function so that this parameter can be used to create other elements, rests (text, hatch, dimensions) or architectural or mechanical objects.

The function can be called up in two different ways. First, select the function and then click on the relevant object or, if you are already in editing mode, select the function afterwards. In both cases, the associated creation function is opened.

▼▼▼▼ WORKSHOP

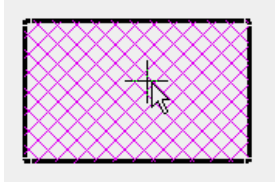
Adopting parameters for a hatch

When you select the AUTOMATIC HATCH function to create a hatch, the properties bar always opens with the parameter settings of the hatch you created most recently.

In this case, a "brick" hatch was created.
Now you already have a hatch on your plan and you want to generate an identical one.

Select the ADOPT PARAMETERS function.

Click on the hatch from which you want to adopt the parameters.



The properties bar opens with the correctly set values and you can create the hatch.

WORKSHOP END

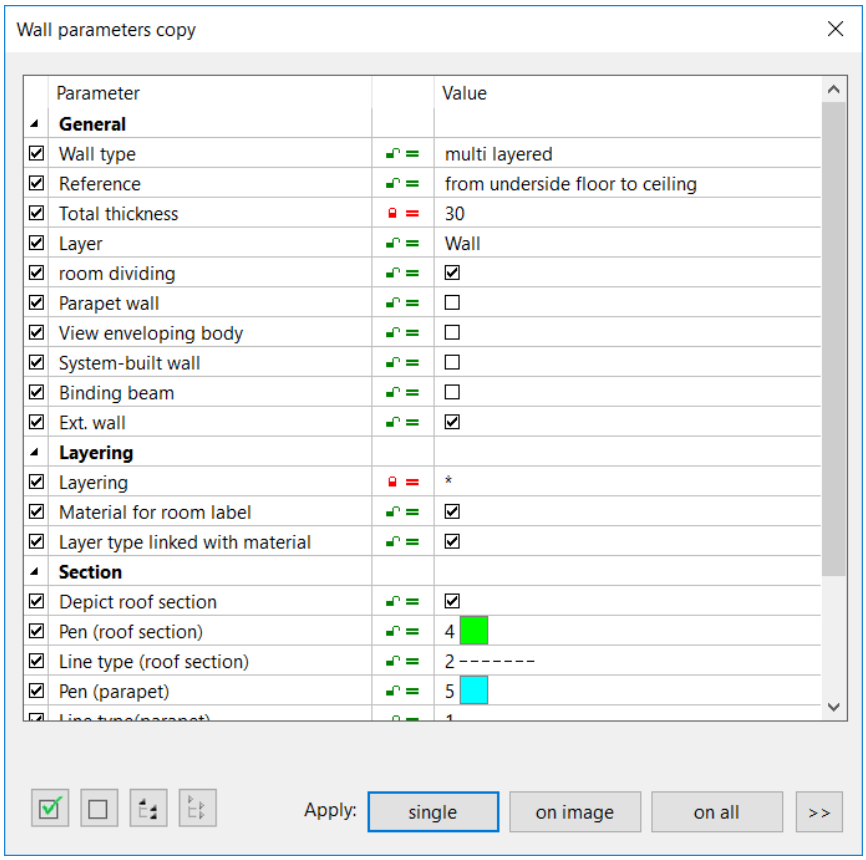
COPY PARAMETERS

*Modify toolbar
Modify menu > Copy parameter(s)

This function transfers the parameters from an existing element, rest (text, hatch, dimensions) or architectural or mechanical object to another of the same type.

The function can be called up in two different ways. First select the function and then click on the relevant object or, if you are already in editing mode (double-click), select the function afterwards. In both cases, the associated dialog window is opened.

Parameter



Selection

☑

In this column, you can select which parameters should be copied and which not. If the box is ticked, the parameter will be copied.
If all parameters are selected, the parameter record name will also be copied for the following objects: dimension, hatch, text, column, door, girder, floor, wall, window.

Parameter

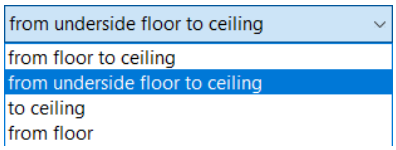
Reference
Total thickness
Layer

The parameters that can be copied are listed here.

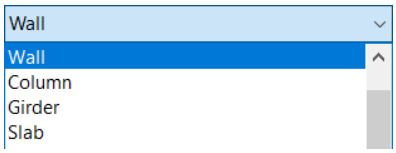
Modify value locked

In this column you can see, which of the values can be modified and which cannot. If the padlock is open (green), the value to the right can be changed. If the padlock is closed (red), the parameter can be copied but not changed.
If several objects are selected for copying parameters, the parameters of the first object selected are used and a ≠ indicates parameters that are not the same for all selected objects.

Value



The various values for the individual parameters are listed here. These values can be changed, depending on the status of the padlock symbol.
If the padlock is open (green) and you click in the field, a selection list appears.

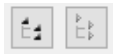


Selection and copying options

All / None

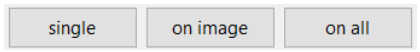
These options allow you to select or deselect all parameters.

Open / close all groups



With these functions, all parameter groups can be opened and closed all together.

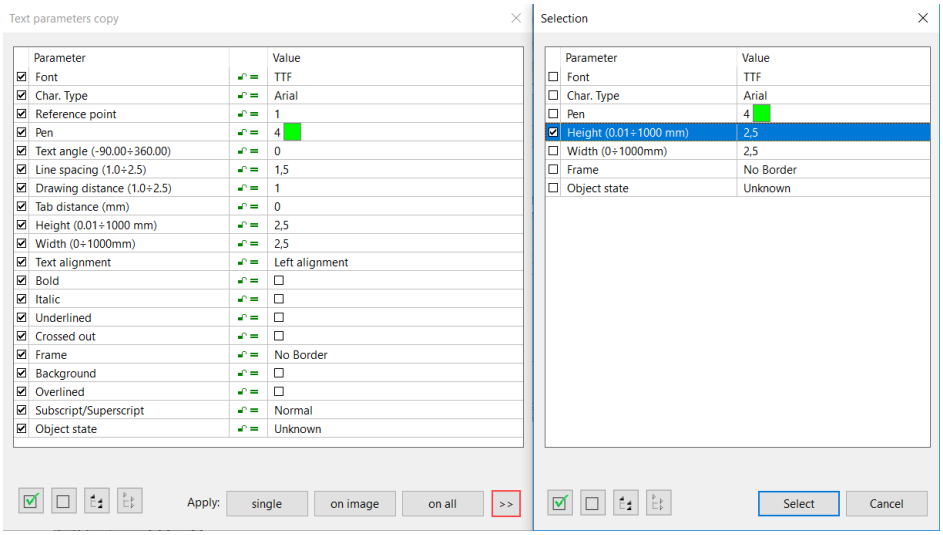
Copy to single/on image/on all



The parameters can either be inherited by individual parts, by visible parts or by all.
If you select the SINGLE option, you can then click on the relevant objects in the plan.
If you select the ON IMAGE option, the parameters are applied to the appropriate objects that are visible on the screen.
If you select the ON ALL option, the parameters are applied to the appropriate objects, even if they are not visible on the screen.

Selection

For the ON IMAGE and ON ALL copying options, there is an additional option in addition to the selection regarding visibility.



If you make only the selection "Text height" (5) in the window, for instance, and close with "Select" and "on image", only the text that is visible on the screen and has text height 5 will be changed. With the copying option ON ALL, all text with text height 5 will be changed.
If you close the selection dialog window and then click on "Copy to single", the selection will be ignored.

▼▼▼▼ WORKSHOP

Copying parameters for lines

You have a thin, dotted line and thick, solid lines. You now want to change the solid lines to thin, dotted lines.

Select the COPY PARAMETER(S) function and click on the dotted line.

Select the SINGLE option and click on the elements one by one that you want to change. If you want to change all the elements visible on the screen, select the ON IMAGE option.

CANCEL function

WORKSHOP END

5.2D OBJECTS

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5.1 ELEMENTS

Drawing lines

Draw toolbar
Draw menu > Draw line

Draw single lines from a start point to an end point.

Line properties bar

The line type and line colour can be selected from the line properties bar. In ELITECAD Architecture the renovation planning state can be selected.
Line length and line angle also appear when editing. Changes of the length are applied relative to the start point.

Draw polygon

Draw toolbar
Draw menu > Draw

This is used to draw a continuous line. In order to complete the line, the last point can be selected again. The function remains active and more lines can be drawn. If a line has been completed, a new line can be started by selecting another start point. Press the [Esc] key or click the CANCEL function in order to end this function.
A polygon can be selected with a single click. If the Selection mode element part is active, single elements can be accessed.

Polygon properties bar

The line type and line colour can be selected from the line properties bar.
In ELITECAD Architecture the renovation planning state can be selected.

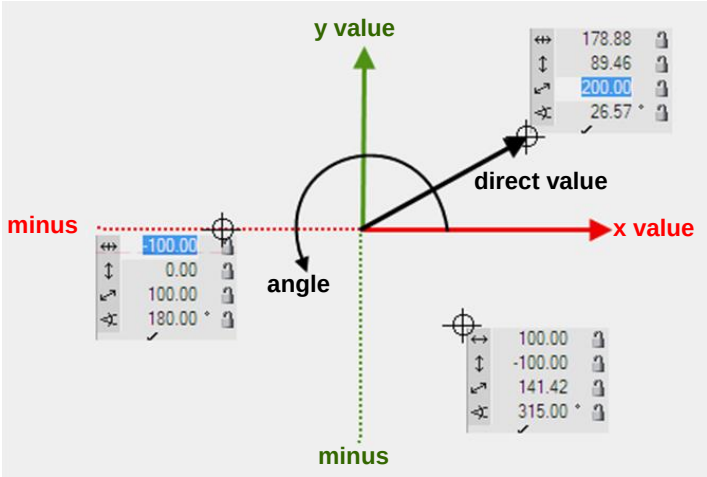
TIP

The program shows the additional functions, which are useful when drawing in the input assistant. The functions can be displayed either in a separate input assistant toolbar or on the cursor by pressing the [Tab] key.

Polygon via entry of coordinates

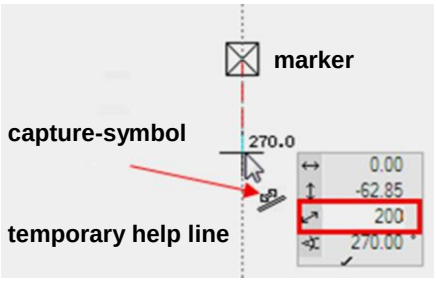
Very often it is not possible to capture a point, a certain line length is predefined. These lines can of course be constructed with help lines. It is much easier and more efficient to enter a polygon using coordinates.

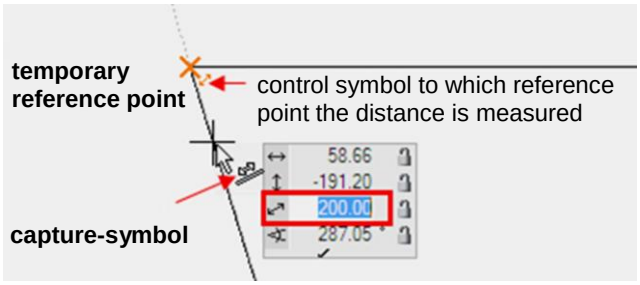
Values field
Lengths can be entered directly in the values field. To move to the values field, press the [Tab] key. In the values field the x value (horizontal), the y value (vertical), the direct value or the angle can be entered.



Value on element or help line

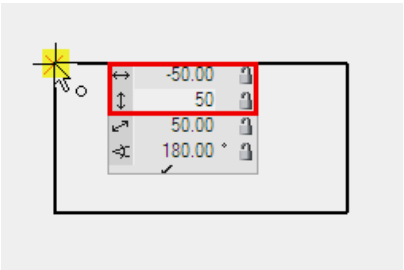
If, when a value is entered, the cursor is on an element or a help line that passes through the marker or a temporary reference point, the entry switches to the direct value and you need only enter the distance, without worrying about the angle or the minus range.

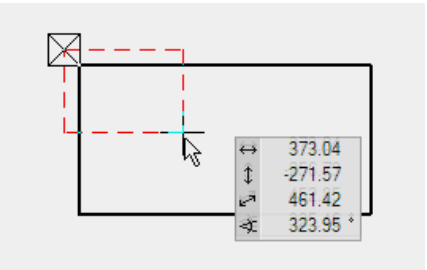




x, y distance from a given point (capture mode *to AUTOcapture*)

The capture mode *to AUTOcapture* is directly integrated into the AUTOcapture mode. If, when a value is entered, the cursor is on a point, the values of this point are removed. The sign for the direction must be taken into consideration.

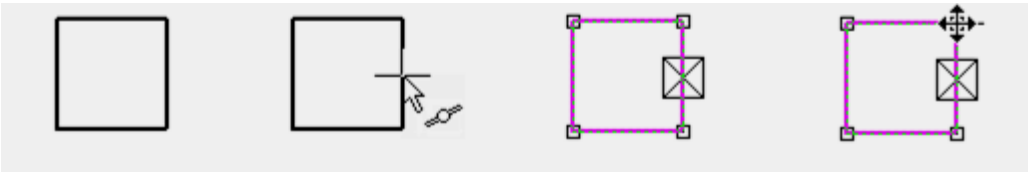




Manipulate Polygon

A created polygon can be modified. The 1st click on the polygon selects it and the handles appear at the corners.

1st click 2nd click

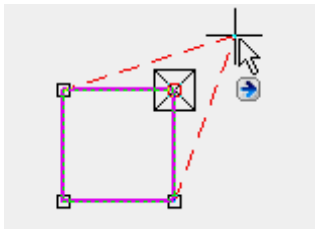


The second click decides which corner or which edge to modify. So that you can tell that the cursor is over a changeable element, it changes its appearance to a quadruple arrow.
Other manipulation functions appear depending on whether a line, a curve, a corner or an end point was clicked. The function last selected is immediately active.

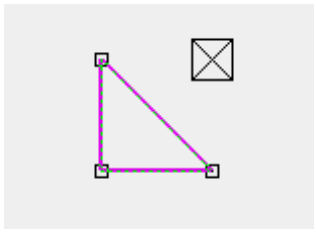
The available manipulation options can be displayed in a separate input assistant toolbar either by pressing the [Tab] key or on the cursor.

Manipulation options on a corner

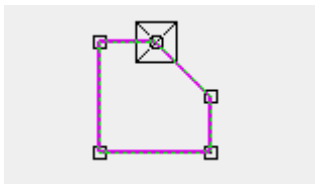
Stretch point



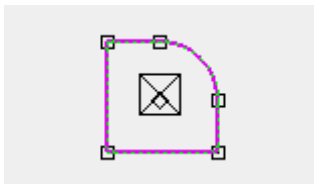
Delete point



Chamfer

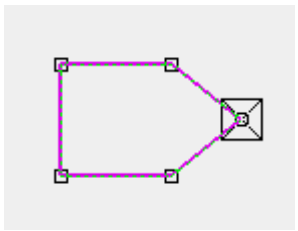


Fillet

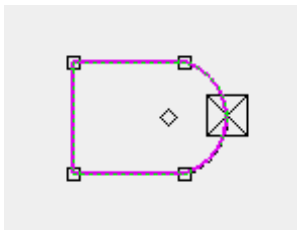


Manipulation options on an edge

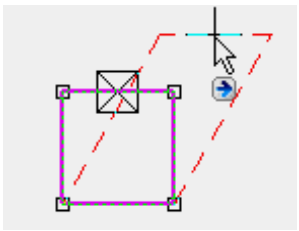
Insert point



Round edge



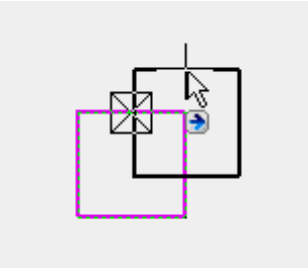
Stretch element

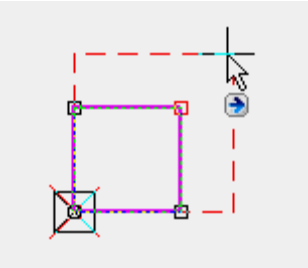


Manipulation options for a corner or edge

Move selection

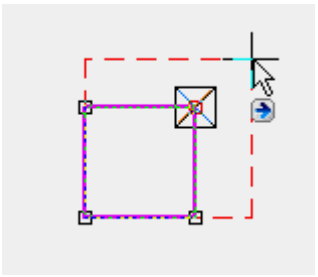
Scale element



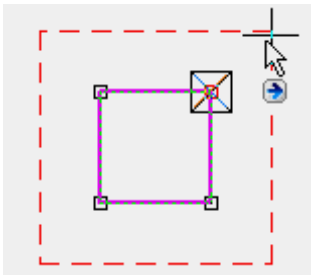


By pressing the [Ctrl] key at the same time, the selection can be copied when moved. When scaling, a reference point must be set as the starting point for scaling.

Move elements parallel



Move all edges parallel



Selection element part

For certain manipulations such as move selection or extend elements/move in parallel, it makes sense to perform the manipulation not on the entire polygon but only on certain elements.

To enable individual elements to be selected, the selection mode must be switched to Selection element part. Alternatively, press the [Alt] key. Multiple selection is possible with [Shift].

Change polygon

A distinction is made between whether a closed or an open polygon is to be modified.

After selecting the CHANGE function, the drawing functions with which the change can be drawn appear in the input assistant.

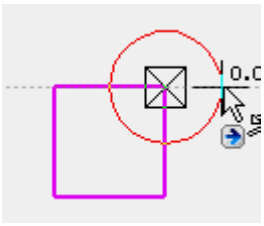
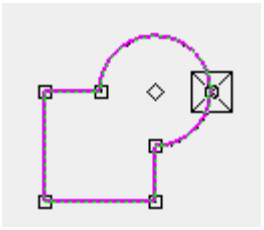
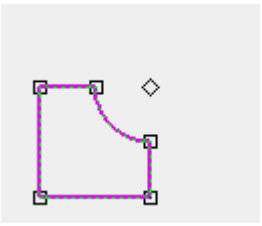
Expand/reduce closed polygon by one circle:

First, select the EXPAND OR REDUCE POLYGON function followed by the drawing function CIRCLE.

Drawing function Extend circle

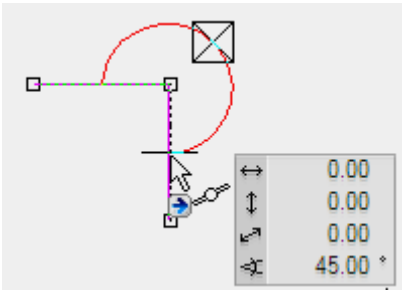
Polygon

Reduce polygon

Open polygon:

For the open polygon, the extension polygon must be started on the geometry and ended by double-clicking on the geometry. An exception is when you start on an end point. If the polygon cannot be closed properly, the change is not carried out.



Rectangle by diagonal

Draw toolbar
Draw menu > Rectangle by diagonal

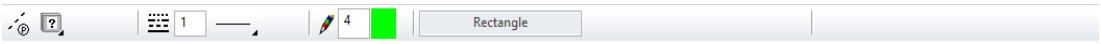
Creating a rectangle by entering two points over a diagonal.
While drawing a rectangle the entry mode can be changed in the input assistant. Three options are available.

Rectangle by diagonal

Rectangle by dimensions and reference point

Rectangle by edge and height

Rectangle properties bar



The line type and line colour can be selected from the properties bar.
In ELITECAD Architecture the renovation planning state can be selected.

Rectangle by dimensions and reference point

Draw toolbar
Draw menu > Rectangle by dimension and reference point

This function enables the drawing of a rectangle by entering its width and height as well as the optional reference point and a display angle.
While drawing a rectangle the entry mode can be changed in the input assistant. Three options are available.

Rectangle by diagonal

Rectangle by dimensions and reference point

Rectangle by edge and height

Rectangle properties bar

The line type, line colour, width, height, angle and reference point can be selected from the properties bar.
In ELITECAD Architecture the renovation planning state can be selected.

Parallel contour

Draw toolbar
Draw menu > Parallel contour

This function creates a new contour on one side of the original contour (open or closed) which is displaced so that all points are parallel to the desired distance.

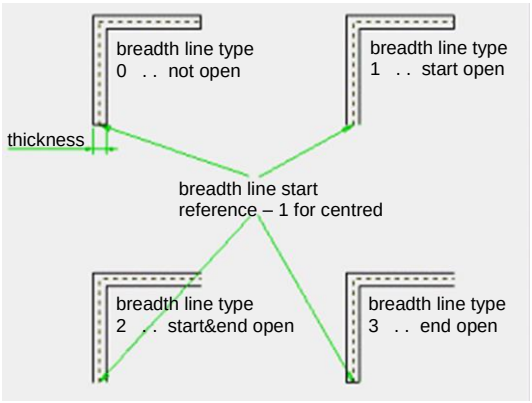
After activating the function, enter the contour distance into the properties bar. After selecting the contour, the direction of the parallel contour can be selected by flipping. The selected contour is automatically scanned or the points can be marked over a polygonal chain. Closed profiles are automatically recognised, open profiles must be completed by specifying the end point (close polygon).

In ELITECAD Architecture the renovation planning state can be selected.

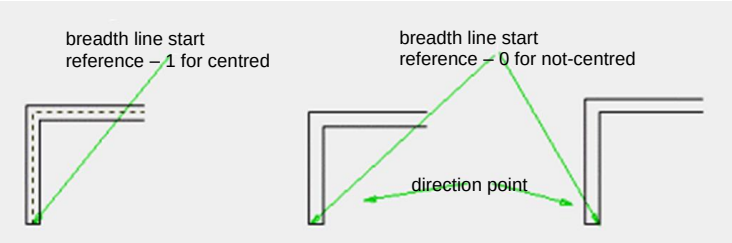
Breadth line

Geometry toolbar
Draw menu > Geometry > Breadth line

This function enables you to create a breadth line (e.g. pipe, wall) easily. Only either one side or the breadth line's centre line must be drawn.
After activating the function, the gauge, breadth line type and line reference are given and separated by a comma.
Breadth line type



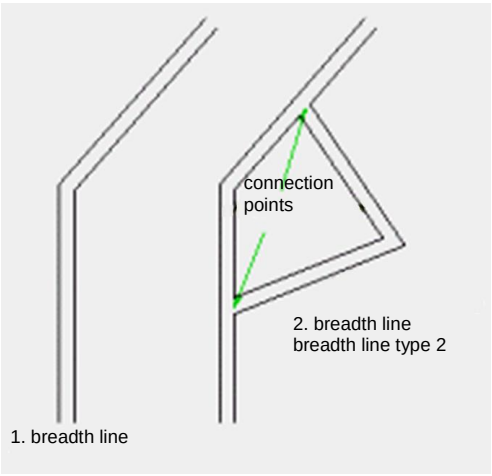
Line reference



After setting the starting point, the direction for the breadth line thickness needs to be indicated by clicking it in case the line preference is not centred. The line is then specified by the input of further points. The input is completed when the last point is entered twice. The system automatically draws the second line and finalises the breadth line corresponding to the breadth line type.

TIP

If a breadth line joins an already existing one that requires a breadth line type, the connection point is assumed.



Halving of an angle

Geometry toolbar

Draw menu > Geometry > Halving of an angle

This function enables elements or help lines with half angles to be generated.

After activating the function, a first and a second element are requested. If two help lines are clicked, a help line is generated.
If at least one element is selected, a line with an active pen/line type is drawn and an additional query for the position of the start and end points appears. The suggested position can be confirmed by hitting [Enter] each time or by clicking the specific points with the mouse.

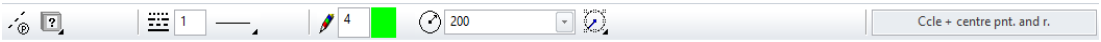
5.2 CIRCLE FUNCTIONS

Circle with given centre and radius

Draw toolbar
Draw menu > Circle with given centre and radius

This function enables the construction of one or more circles by entering the radii.

Circle properties bar

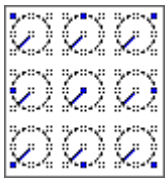


The line type, line colour, radii and the circle's reference point can be specified in the properties bar.
In ELITECAD Architecture the renovation planning state can be selected.

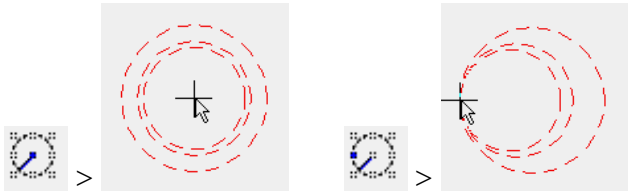
Radius

Up to 10 radii can be entered separated by commas.

Reference point



The reference point determines which point the circle is attached to the crosshair.

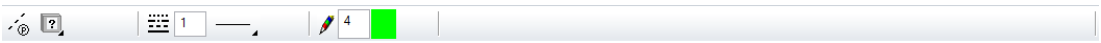


Circle by centre

Draw toolbar
Draw menu > Circle by centre

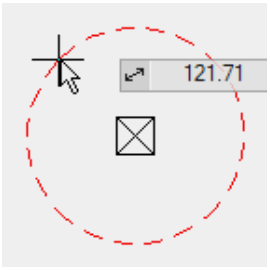
This function creates a circle by specifying the centre point as well as a point on the circle's circumference. The circle can also be established tangentially to an element (drawing line, help line or line, curve).

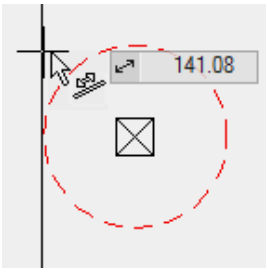
Circles properties bar



The line type and line colour can be selected from the properties bar.
In ELITECAD Architecture the renovation planning state can be selected.

Through point Tangent to element





TIP

You can see which capture mode is active by the appearance of the crosshair. This means you can see whether a circle will be created tangential to an element or straight through a point. As long as you position the element with the element mode, the circle will be generated tangential to the element.

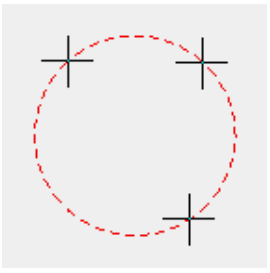
Circle by 3 points or tangents

Draw toolbar
Draw menu > Circle by 3 points or tangents

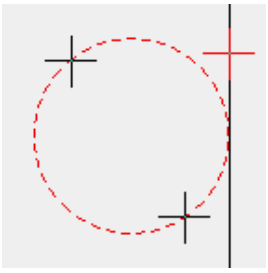
This function enables the construction of a circle, which is specified by three "locations". These "locations" can be either free points or tangential points.

Options

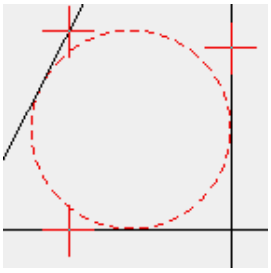
By 3 Points



Mixed



By tangents

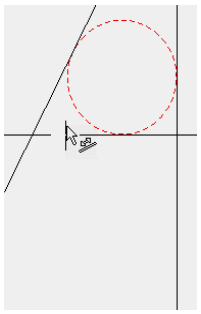


After activating the function, the points or elements to which the circle needs to be tangential must be selected one by one.

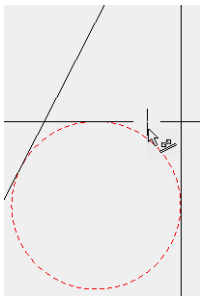
Cursor position

The direction changes depending on the cursor's position over the crosshair.

Cursor above crosshair



Cursor below crosshair



Circle by radius

Draw toolbar
Draw menu > Circle by radius

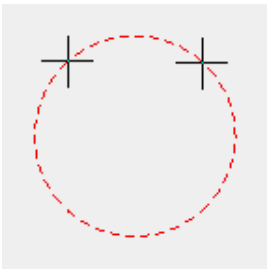
This function creates a circle with the radius value specified in the properties bar and then prompts for two more points or tangential elements.

TIP

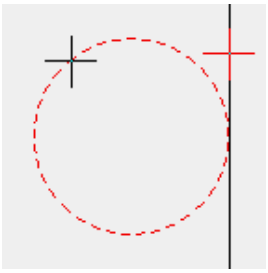
The radii of circles can be retrospectively modified by selecting the circle.

Options

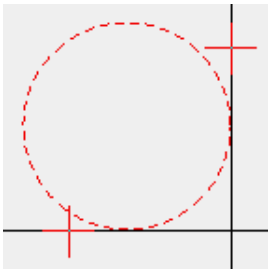
By 2 points



mixed



by tangents

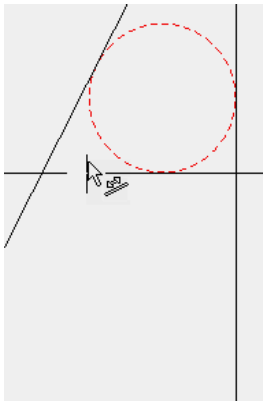


When the function is activated, the properties bar opens and you can specify the radii. The points or elements to which the circle needs to be tangential must then be selected one by one.

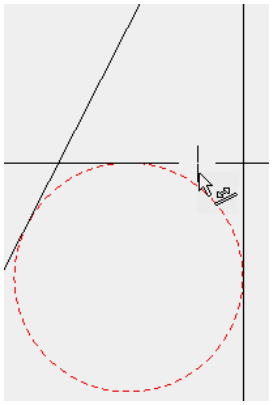
Cursor position

The direction changes depending on the cursor's position over the crosshair.

Cursor above crosshair



Cursor below crosshair



Curve by 3 points

Draw toolbar

Draw menu > Curve by 3 points

This function creates a curve through a given start point, point on the circumference and end point.

While drawing a curve the entry mode can be changed in the input assistant. Three options are available.

Curve by 3 points

Curve by centre point

Curve by tangent Curve by centre point

Curve properties bar

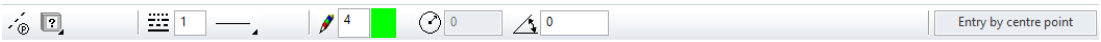
The line type and line colour can be selected from the properties bar. The curve radius and angle are displayed when editing.
In ELITECAD Architecture the renovation planning state can be selected.

Curve over angle, direction and centre point

Draw toolbar
Draw menu > Curve over angle

This function enables a curve through a given start point, angle and the curve's centre point.

Curve properties bar



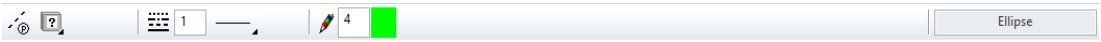
The line type and line colour can be selected from the properties bar. The curve radius and angle are displayed when editing.
In ELITECAD Architecture the renovation planning state can be selected.

Ellipse

Geometry toolbar
Draw menu > Geometry > Ellipse

This function is used to create an ellipse.
Create an ellipse by inputting two vertices on an axis and clicking on a third.

Ellipse properties bar



The line type and line colour can be selected from the properties bar.
In ELITECAD Architecture the renovation planning state can be selected.

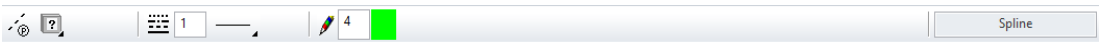
Spline

Geometry toolbar
Draw menu > Geometry > Spline

This function enables the creation of a smooth interpolation curve with a random number of points (cubic splines).

After activating the function, you can specify the points of the polygon and once again tap the end of the last point. In this case, the curve is incomplete and you will be prompted to enter an inclination angle in the start and end points.

Spline properties bar



The line type and line colour can be selected from the properties bar.
In ELITECAD Architecture the renovation planning state can be selected.

5.3 Edit

Fillet

*Modify toolbar
Modify menu > Elements > Fillet

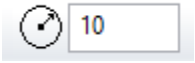
This function rounds line or wall corners (in ELITECAD Architecture). Joints, which have already been rounded, can be modified or restored to a corner. After entering the desired radius, you must click INSIDE the filleted corner.

Fillet property bar

Fillet

The symbol indicates that the FILLET function is active. You can switch to CHAMFER or NOTCH here.

Radius



Enter the radius, which is used for the fillet operation.

Modify

This function modifies or deletes previously defined fillets. Enter a "0" in order to delete a fillet.

TIP

- More corners with the same radius are filleted when you indicate more points.
- T-joints with these functions are also editable. The function affects the entire picture and not just the active object.

Notch

*Modify toolbar > Fillet > property bar
Modify menu > Elements > Fillet

This function generates a notch in the corner of two lines or it is used to modify existing notches. After entering the desired radius, you must click INSIDE the corner. The notch is generated automatically.

Notch property bar

The functions on the property bar are identically to the FILLET function.

Chamfer

*Modify toolbar > Fillet > property bar
Modify menu > Elements > Chamfer

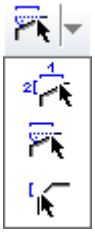
This function generates a chamfer in the corner of two lines or walls (in ELITECAD Architecture) by specifying the chamfer distance and chamfer angle or the function is used to modify existing fillets. The chamfer distance and angle ("0" if the fillets are symmetrical) can be specified. The point of both lines will subsequently be marked by the crosshair, which will need to be moved closer to the line, and which is then used as a reference for the angle and parallel distance.

Chamfer property bar

Chamfer

The symbol indicates that the CHAMFER function is active. You can switch to FILLET or NOTCH here.

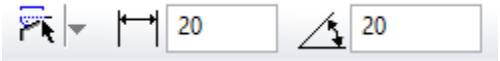
Chamfer type
There are three options to define a chamfer.



Chamfer by two distances

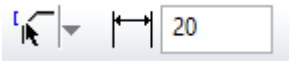
This option defines a chamfer by two distances measured from the corner.

Chamfer by distance and angle



This option defines a chamfer by a distance and an angle.

Chamfer symmetrically by distance



This option uses two symmetrical distances from the corner point to define the chamfer.

Modify

This function modifies or deletes a previously defined chamfer. In order to delete a fillet, switch to "symmetrically by distance" and enter a "0".

TIP

The function is only applicable to straight lines (not curves). Both lines can represent different models. More identical fillets are created by specifying more points. Should the fillets need modifying, this can be done by entering "0". The active values of displayed fillets are taken into account when the entry for the angle or distance (value maintained) is changed to "-1". It is then possible that, for example, multiple fillets with different angles the same fillet distances apart and vice versa can be modified. A change in angle and distance for existing fillets is also possible.

Divide element

*Modify toolbar
Modify menu > Elements > Divide element

Divide an element to a particular location. This can be applied to lines, polygons or rectangles.

Join element

*Modify toolbar
Modify menu > Elements > Join element

Connect adjacent elements lying on a straight line. Only one line needs to be selected. The system combines all possible lines to one line.

Name element

Elements toolbar
Modify menu > Elements > Name element

This function allows assigning names to elements.
An element has to be selected.

Element names a assigned by functions or by external programs. Used element are described in the corresponding documentation.

Pen/line type of element

Elements toolbar
Modify menu > Elements > Modify pen/line type of element

This applies to an element's pen and line type settings. These settings become active when a drawing function is called up (line, rectangle, circle ...).

Modify pen/line type of segment

Elements toolbar
Modify menu > Elements > Pen/line type of segments

This enables changes to a segment's pen and line type settings (segment = part of an element). Multiple segments can be selected until the function is exited. The chosen segment is separated from the line and remains as a separate line.

TIP

Intersection points with geometric lines are not taken into account.

Modify pen/line type of element

Elements toolbar
Modify menu > Elements > Modify pen/line type of element

This enables changes to an element's pen and line type settings. Multiple segments can be selected until the function is exited.

Globally modify pen/line type of elements

Elements toolbar
Modify menu > Elements > Globally modify pen/line type of elements

This functions allows you to globally modify elements of a desired pen/line type by choosing the pen and line type in the active image.
After activating the function, a query dialog appears with a selection of elements for pen and line type where the single values are entered and separated by commas. The pen/line type is consequently entered, which should modify the elements.
To change elements with pen 1 and line type 1 to pen 3 and line type 4, enter "**1.1**" to select them and "**3.4**" for the new pen and line type.

Modify pen/line type of elements from a selection

Elements toolbar
Modify menu > Elements > Modify pen/line of selection

This function allows you to modify the pen number and line type of an already drawn element from a selection.

After activating the function, both the pen number and line type, which are to be changed, are entered. The new pen number and new line type are subsequently entered.

Delete element

Elements toolbar

This function deletes an element.

TIP

You can also delete an element by directly clicking on it or by selecting it from the selection mode "element/part", and then pressing the [Delete] key. Depending on the settings under OPTIONS, a confirmation prompt appears.

Delete segment

*Manipulate toolbar; Elements

This function deletes part of an element. The part needs to be marked off with another element (line or circle).

Delete polygon

*Manipulate toolbar

This function deletes an entire sequence of lines.

Delete last drawn element

*Manipulate toolbar

This function deletes the last drawn line. When drawing a line, it is preferable to use this function if a point is incorrectly set and you wish to go back without ending the drawing.

TIP

Alternatively, the UNDO function [Ctrl]+[Z] can be used.

Delete block

*Manipulate toolbar

This function deletes all parts, which **fully** lie within a determinable polygon.

TIP

If 3D objects can only be partly found in a polygon, a message appears saying that parameterised objects can be found in the block. In this case, the polygon must be drawn differently or you can remove the object lock under SETTINGS > OPTIONS > WORK PARAMETERS > EDIT (a conversion from the V11 user interface).

Delete section

*Manipulate toolbar

This function deletes all parts, which lie within a determinable polygon. Elements or hatches are cut.

TIP

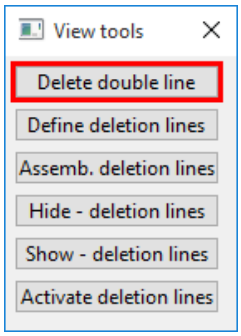
If 3D objects can only be partly found in a polygon, a message appears saying that parameterised objects can be found in the block. In this case, the polygon must be drawn differently or you can remove the object lock under SETTINGS > OPTIONS > WORK PARAMETERS > EDIT (a conversion from the V11 user interface).

Delete double line

Special functions toolbar

Extras menu > View tools/deletion lines

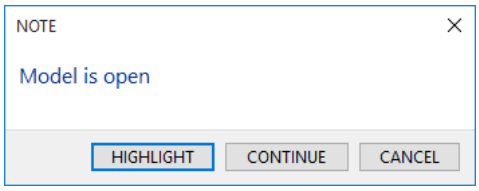
The function DELETE DOUBLE LINES can be found under View tools. This function **eliminates** superimposed lines with the same stroke thickness.



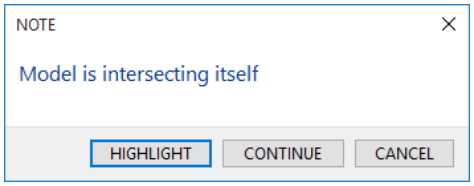
Verify 2D model

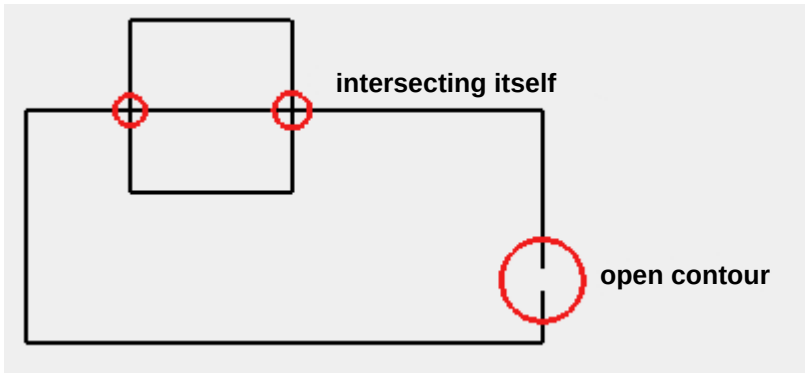
Info toolbar
Info menu > Verify 2D model

It only makes sense to use this function when you are working with the classification structure (model). This function checks whether the model is a closed contour. A query dialog appears in an open model asking whether it should visualise where the contour is open. The crosshair is set at the open location.



Secondly, the model is checked to see if the model's lines cross each other. These locations can also be visualised.





Stretch single point

Elements toolbar
Modify menu > Elements > Stretch single point

This function enables you to stretch or compress an element by moving a boundary point.

After activating the function, you are prompted to specify the point to be moved. You are then prompted to publish the new position. The element concerned is

subsequently moved towards the new point by the distance between the two points and is "stretched" or "compressed" accordingly.

TIP

The same can be achieved by clicking on element and manipulation via the handle.

Stretch selected points

Elements toolbar
Modify menu > Elements > Stretch selected points

This function enables you to stretch or compress one or all combined elements in a point by moving a boundary point.

After activating the function, you are prompted to specify the point to be moved. You are then prompted to indicate the new position. The elements, which should be stretched / compressed, can now be accessed. These are moved towards the new point by the distance between the two points and are "stretched" or "compressed" accordingly.

TIP

The same can be achieved by clicking on element and manipulation via the handle. You can select multiple elements by holding down the [Shift] key.

Stretch all points

Elements toolbar
Modify menu > Elements > Stretch all points

This function enables you to stretch or compress all combined elements in a point by moving a boundary point.

After activating the function, you are prompted to specify the point to be moved. You are then prompted to publish the new position. All elements concerned are subsequently moved towards the new point by the distance between the two points and is "stretched" or "compressed" accordingly.

TIP

The same can be achieved by clicking on element and manipulation via the handle. You can select multiple elements by holding down the [Shift] key.

5.4 IMAGE

Load bitmap file

Bitmap toolbar
Menu Insert > Image

This function is used to read an image in bitmap format.
The dialog field *Load bitmap* appears after activating this function. The desired bitmap image can now be selected and positioned. Whilst positioning it, other possibilities such as stretching, mirroring, etc. are available in the manipulation bar.

The manipulation of bitmap images such as *stretch*, *mirror* etc. can also be performed retrospectively with the normal edit function.
In ELITECAD Architecture the renovation planning state can be selected.

TIP

Available bitmap formats for import are TIFF, JPEG, BMP and PNG.

Delete bitmap image

Bitmap toolbar
Menu > Modify > Edit bitmap > delete

This function is used to delete one or multiple bitmap images.
When the function is activated, the existing bitmap image is deleted.

Deleting bitmap images is also possible by selection.

TIP

If multiple bitmap images can be found on the plan, you will be asked which bitmap image you wish to delete.

Crop bitmap image

Bitmap toolbar
Menu > Modify > Edit bitmap > Crop

This function is used to crop an image section. The rest of the bitmap image is automatically deleted. After activating the function, the desired cut-out is defined by the entry of two points (defining rectangle) or a free polygon.

TIP

If multiple bitmap images can be found on the plan, you will be asked which bitmap image you wish to edit.

Invert monochrome bitmap

Bitmap toolbar
Menu > Modify > Edit bitmap > Invert colour

You can use this function to swap the monochrome (B/W) bitmaps in the background with those in the foreground. The white pixels will turn black and vice versa.

TIP

If multiple bitmap images can be found on the plan, you will be asked which bitmap image you wish to edit.

Delete bitmap range

Bitmap toolbar

Menu > Modify > Edit bitmap > Delete range

This function is used to cut a defined range of bitmap images. The ranges of the bitmap images, which are not needed, can be deleted with this function.
After activating the function, the cutout to be deleted is defined by the entry of two points (defining rectangle) or a free polygon.

TIP

If multiple bitmap images can be found on the plan, you will be asked which bitmap image you wish to edit.

Copy range

Bitmap toolbar

Menu > Modify > Edit bitmap > Copy range

You can use this function to copy ranges from bitmap images.
After activating the function, the range to be copied over is defined by the diagonal of a rectangle.

TIP

The background of the set copy is no longer visible after it has been placed. If multiple bitmap images can be found on the plan, you will be asked which bitmap image you wish to edit.
The copy can only be pasted into the bitmap image out of which the copied range was selected.

Copy range transparent

Bitmap toolbar

Menu > Modify > Edit bitmap > Copy range transparent

You can use this function to copy transparent ranges from monochrome (B/W) bitmap images whose background is inverted to black where necessary by means of the pixels. After activating the function, the range to be copied over is defined by the diagonal of a rectangle.

TIP

If multiple bitmap images can be found on the plan, you will be asked which bitmap image you wish to edit.
The copy can only be pasted into the bitmap image out of which the copied range was selected.

High quality on/off

Bitmap toolbar

Menu > Modify > Edit pixel > High quality on/off

This function is used to convert monochrome bitmap images into greyscale.
After activating the function, all monochrome bitmap images are depicted in either greyscale or back to monochrome.

TIP

For colour images, this function does not have an effect, as colour images are always depicted in high quality. If there are both monochrome and colour images on the screen, the monochrome images are not converted either.

Assign transparent colours

Bitmap toolbar
Menu > Modify > Edit pixel > Assign transparent colours

You can use this function to switch on the transparency of a particular colour of a bitmap image. After activating the function, the cursor becomes a pipette icon and the appropriate colour can be selected.
The tolerance value can subsequently be entered into the input line. You can then control the intensity of the transparency colour. The higher the value, the more transparent is the colour.

Example:

Tolerance 0% Tolerance 30% Tolerance 80%

TIP

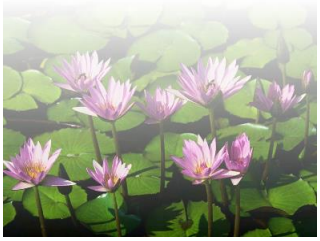
If multiple bitmap images can be found on the plan, you will be asked which bitmap image you wish to edit. The transparency can be deleted with the DELETE TRANSPARENCY function.

Transparency gradient

Bitmap toolbar
Menu > Modify > Edit pixel > Transparency gradient

A bitmap image is allocated a transparency gradient with this function. After activating this function, you will be asked for the start and end transparency as well as the start distance (gradient starts at 0-50%). The values are each separated by a comma. The angle of the gradient is subsequently requested.

Example:

Transparency: 0-100 Start distance 0 Angle 0	Transparency: 80-80 Start distance 0 Angle 0	Transparency: 0-100 Start distance 0 Angle 90
		

TIP

If multiple bitmap images can be found on the plan, you will be asked which bitmap image you wish to edit. The transparency can be deleted with the DELETE TRANSPARENCY function.

Delete transparency

Bitmap toolbar

Menu > Modify > Edit pixel > Delete transparency

This function deletes transparent colours or gradients from bitmap images.

TIP

If multiple bitmap images can be found on the plan, you will be asked which bitmap image you wish to edit.

Bitmap image: export to file

Bitmap toolbar

Menu > Modify > Edit pixel > Bitmap image: export to file

This function is used to export a bitmap image from an ELITECAD drawing into a file. The dialog field "Bitmap image: export to file" appears after activating this function. A new file name can be entered here or an existing one chosen and confirmed with "Save". If a pre-existing name is selected, a confirmation prompt then appears which needs to be confirmed with either OK or CANCEL.

The following data formats can be written: TIFF, JPEG, BMP and PNG.

TIP

If multiple bitmap images can be found on the plan, you will be asked which bitmap image you wish to edit.

Bitmap image: delete from file

Bitmap toolbar

Menu > Modify > Edit pixel > Bitmap image: delete from file

This function is used to replace an already existing bitmap image with another whereby the dimensions of the existing image are applied.

TIP

If multiple bitmap images can be found on the plan, you will be asked which bitmap image you wish to edit.

6.LAY-OUT

6.1 DIMENSIONING 378

6.2 HEIGHT MARKER 403

6.3 HEIGHT MARKER OF FLOOR PLAN 407

6.4 ARROW 410

6.5 HATCH 413

6.6 TEXTS 427

6.7 MATERIAL 442

6.8 TITLE BLOCK 444

6.9 FORMAT FRAME 450

6.1 DIMENSIONING

GENERAL

The dimensioning is part of the rest.

Visible/invisible

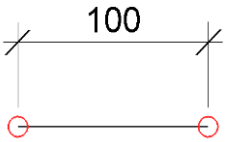
Dimensions can be switched off temporarily using the image control functions.

Switch on/off
VIEW menu > SWITCHES
If you switch off the dimensions using this check box, the dimensions are not saved during "Save as" unless the subsequent dialog window is confirmed with "visible selection".

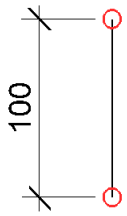
Rest scaling
SETTINGS menu > REST SCALING on/off
If rest scaling is switched off, the dimensions are not enlarged or reduced when scaling or modifying the scale.

Behaviour when positioning dimensions

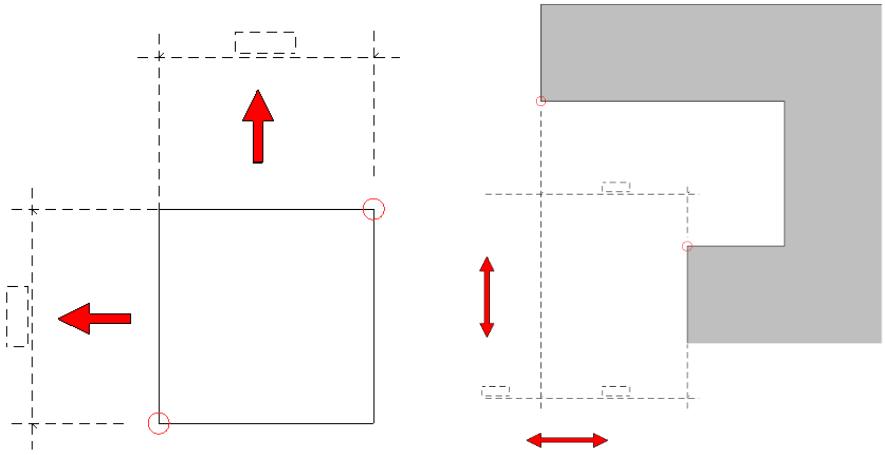
When you position a dimension line, the system always prompts for two points to be dimensioned. It does not matter whether this is a chain dimension or a single dimension.
If the points lie horizontally on a line, this results in a horizontal dimension:



If the points lie vertically on a line, this automatically results in a vertical dimension line:



If the points lie neither horizontally nor vertically on a line, you can specify the desired direction when defining the dimension line.

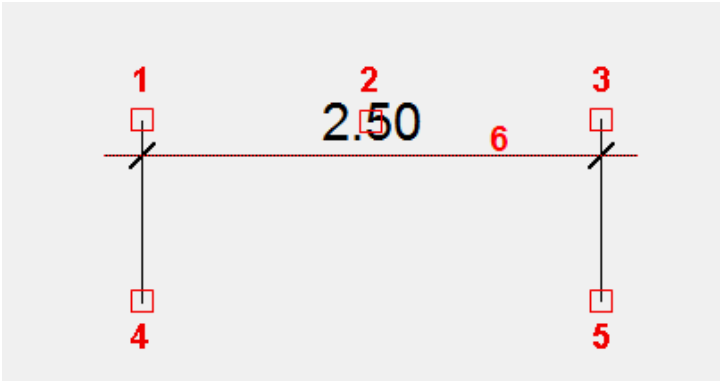


As you position the dimension lines, you are aided by "dimension tracking", which gives a preview of where the dimension will lie.

Handle behaviour

If you click on a dimension, the handles appear on screen.

Handles:



Handle 1: Used for lengthening or shortening the help line
Handle 2: Used for positioning/moving text
Handle 3: Used for lengthening or shortening the help line
Handle 4: Used for lengthening or shortening the help line
Handle 5: Used for lengthening or shortening the help line
Gripper 6: Used for moving the dimension chain

Refresh dimension associations

Extras menu > Special functions > Refresh dimension associations

This function is only available in ELITECAD Architecture and checks all dimensions, cleans up existing dimension associations and adds missing dimension associations to architectural objects.
You should run this function if you modify architectural objects and their dimensions do not adapt accordingly.

TIP

In the SETTINGS > OPTIONS > DEPICTION > 2D/3D menu, under the DIMENSION AND TEXT CHECKS function, you can view the non-associative dimensions.

SINGLE DIMENSION

Toolbar * Create new
Lay-out menu > Dimensions > Single dimension

This function is only available in ELITECAD Mechanics and is analogue to the first dimension of a chain dimension.

CHAIN DIMENSION

Toolbar * Create new
Lay-out menu > Dimensions > Chain dimension

This function is used to enter a sequential dimension.

Chain dimension properties bar

You can select the dimension's main values in the properties bar. In the rear area, you can select options for defining dimension points. However, the dimensions are fine-tuned under the dimension parameters. The property bar in ELITECAD Architecture and Mechanics is different.

Properties bar in ELITECAD Architecture

Properties bar in ELITECAD Mechanics

[Dimension parameters]

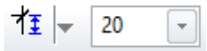
[Dimension position]

[Dimension parameters group (only Architecture)]

[Parameter name]

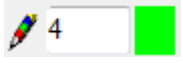
Renovation planning state (only in ELITECAD Architecture, see chapter 8.5)

[Font size]



[Dimension help line length (only Architecture)]

[Dimension limitation (only Mechanics)]



[Dimension help line colour (only Mechanics)]

[Diameter character, square, arc, M or R]

[M,cm/mm dimensioning (only Architecture)]

[Tolerance (only Mechanics)]

Dimension on arc

Regenerate chain dimension

Define dimension point

Delete dimension point

Section line/opening dimension (only Architecture)

Section line/delete definition line (only Architecture)

Parameter for opening dimension (only Architecture)

Parameter for multi-layer dimension (only Architecture)

Dimension parameters

Opens the Dimension parameters dialog window.

Dimension positioning

Automatic

Horizontal

Vertical

Direct

The dimension direction can be fixed: horizontal, vertical, automatic (horizontal and vertical) or direct.
After generating dimensions, you can change the direction via the context menu.

Dimension parameters group
This field is only available in ELITECAD Architecture and only visible if a representation level has been activated.

Without parameter group

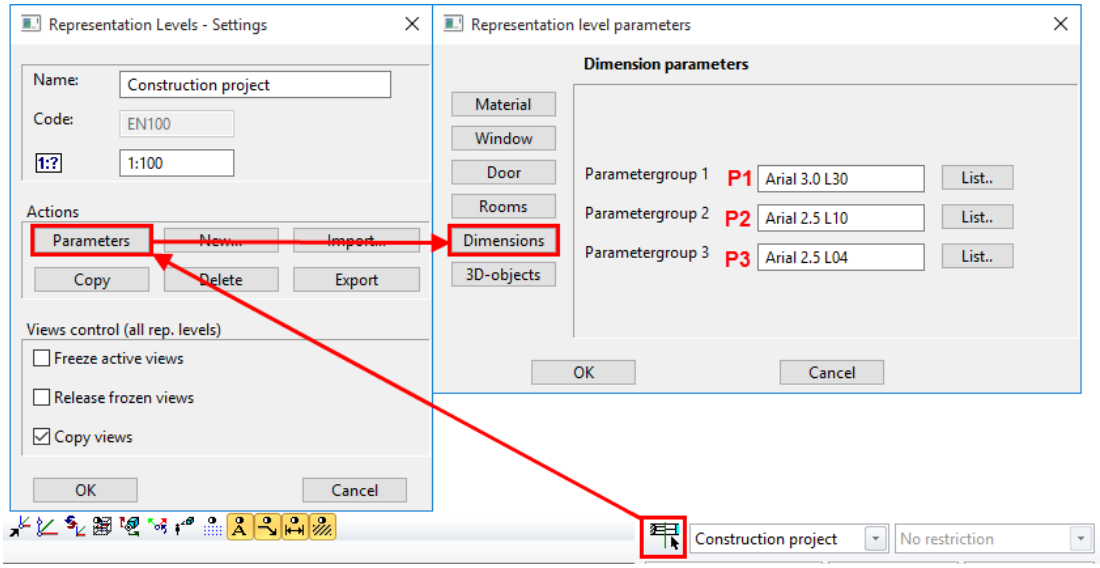
Parameter group 1

Parameter group 2

Parameter group 3

The parameter group is a quick selection of preset types. If you select a parameter group, the associated parameter type is displayed. If you select "Without parameter group", the current settings are adopted.

Parameter groups are assigned to individual parameter types for each representation level in the representation level parameters.



Parameter name
The "Parameter name" field displays all records. You can save additional records from the dimension parameter dialog window.

Font size
Use this field to change the font size of the dimension text. The superscript is enlarged proportionally to the main text.

Dimension help line length
This setting is only available in ELITECAD Architecture.

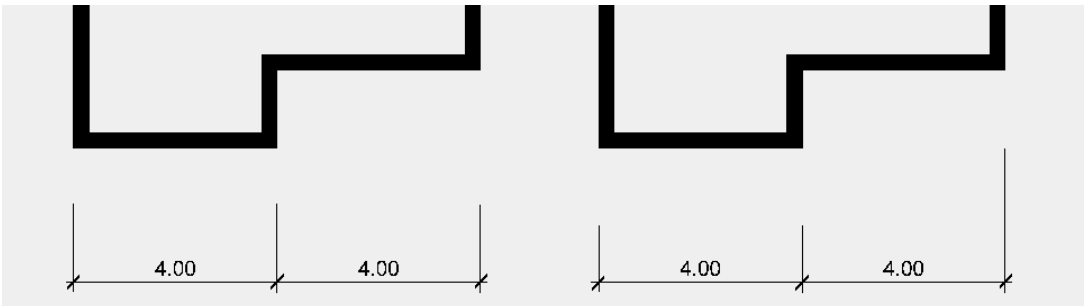
Fixed length of dimension help line

Fixed distance to dim. point

You can determine the length of dimension help lines in one of two ways.

Fixed length of dimension help line

Fixed distance to dim. point



The distance is specified in paper millimetres.

Dimension limitation
You can select from various dimension limitations.

without

Arrow

Circle

Backslash, pen like dimension line

Backslash, pen configurable

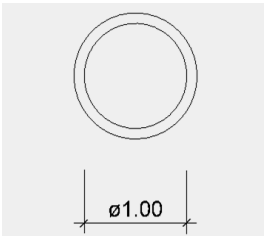
The dimensions are configured using the **DIMENSION ARROW PARAMETERS** detail parameter.

Dimension help line colour

Adjust the colour of dimension help lines in this field.

Diameter character

If the DIAMETER CHARACTER option is activated, a diameter character is added before the dimension figure. For a chain dimension, this option always applies to the entire chain. For the dimension parameters, you can specify under the DETAIL PARAMETERS menu > TEXT PARAMETERS whether to display a small or large character.



When dimensioning thread diameters in ELITECAD Mechanics these dimensions are recognised and the letters M and R will be added automatically, provided, that the thread has been created with the drill/sink functions of ELITECAD.

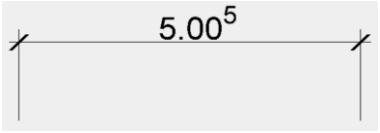
TIP

If you only want to add a diameter character to one dimension figure, you can do this by editing the dimension figure after it has been added: Right-click dimension figure > Modify dimension text

M,cm/mm dimensioning

The m,cm/mm dimensioning is a special depiction of the tolerance text for architectural dimension figures.

This rounds the millimetres to the nearest half centimetre and adds them in superscript. Metres are separated with a decimal point.



If a tolerance is switched on with the TOLERANCE function, m,cm/mm dimensioning is deactivated.

Tolerance (not available for chain dimension)

Here, enter how the **tolerance text** should be displayed. If the tolerance text is switched on, m,cm/mm dimensioning is automatically switched off.

The tolerance text is not displayed.

Having set the dimension line, the tolerance text is queried.

Having set the dimension line, the lower and upper tolerance text is queried.

Having set the dimension line, the lower and upper tolerance text is queried and integrated into the dimension text.

Dimension on arc

The DIMENSION ON CURVE function places the dimension point tangential to a circle or curve of your choosing. The function is only active once. You must select it another time to use it again.

Regenerate chain dimension

This function resets all dimension texts in a dimension chain that were moved by hand to their original positions.

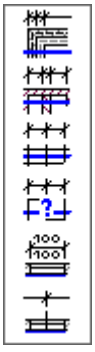
Define dimension point

This function enables you to specify additional dimension points during editing. You may also add individual dimension points to a dimension chain that was created with a section line or opening dimension.

Delete dimension point

The function enables you, during creation or editing, to delete dimension points that have been placed. You can also delete individual dimension points that were created with a section line or an opening dimension.

Dimensioning options
The dimensioning options are only valid for ELITECAD Architecture.



Define section line for walls

Define section line for walls contours

Section line

Define section line for axis grid

Opening dimension/set definition line **(size)**

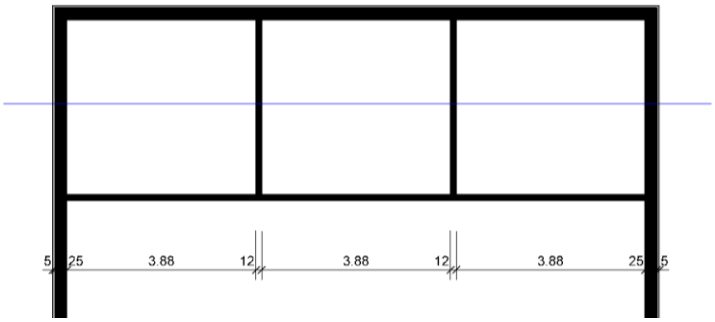
Opening dimension/set definition line **(axis)**

To use a dimensioning option, you must select it or click it. The same applies to all other dimensioning. The section or definition line is visible when editing a dimension chain. If such a dimension chain is copied into another storey, the new elements or windows are immediately dimensioned automatically on the respective section or definition line. Certain modification actions automatically trigger a refresh via the

REFRESH AR OBJECTS function so that the dimension chain recognises the new dimension points.

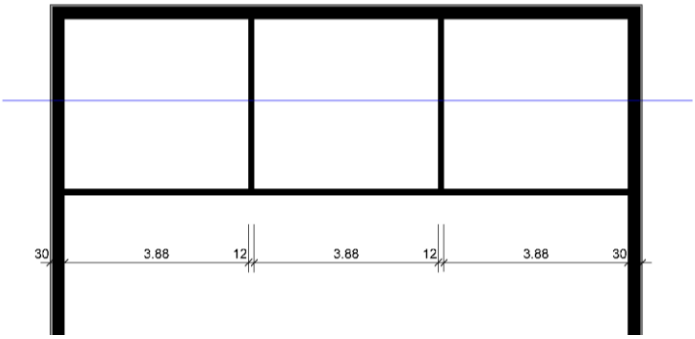
Define section line for walls

The dimensioning option is only available in ELITECAD Architecture and dimensions all walls **with layers** on a section line that were generated using the CREATE WALL function. Make sure that the section line is orthogonal (unless you prefer it otherwise). The section line must not go through the same point as the dimension chain.



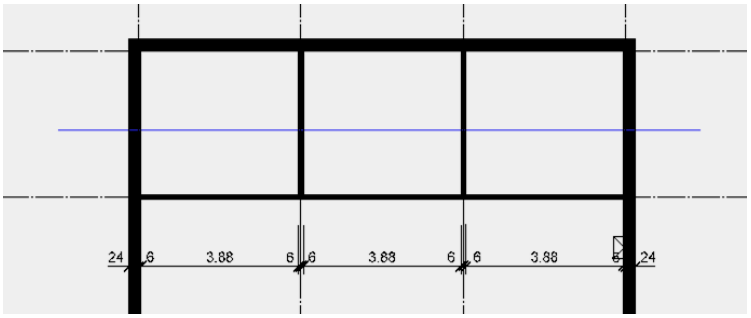
Define section line for walls contours

The dimensioning option is only available in ELITECAD Architecture and dimensions all walls **without layers** on a section line that were generated using the CREATE WALL function. Make sure that the section line is orthogonal (unless you prefer it otherwise). The section line must not go through the same point as the dimension chain.



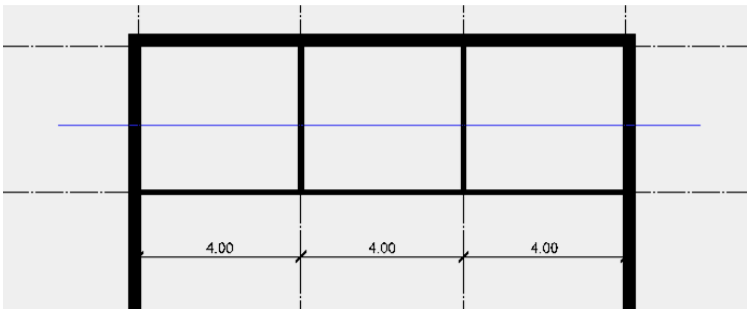
Section line

This dimensioning option is only available in ELITECAD Architecture and dimensions all elements on a section line. Make sure that the section line is orthogonal (unless you prefer it otherwise). The section line must not go through the same point as the dimension chain.



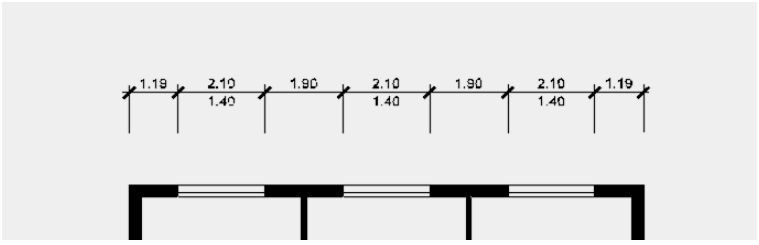
Define section line for axis grid

The dimensioning option is only available in ELITECAD Architecture and dimensions all axes on a section that were generated using the AXIS-GRID function in the AR OBJECTS menu. Make sure that the section line is orthogonal (unless you prefer it otherwise). The section line must not go through the same point as the dimension chain.



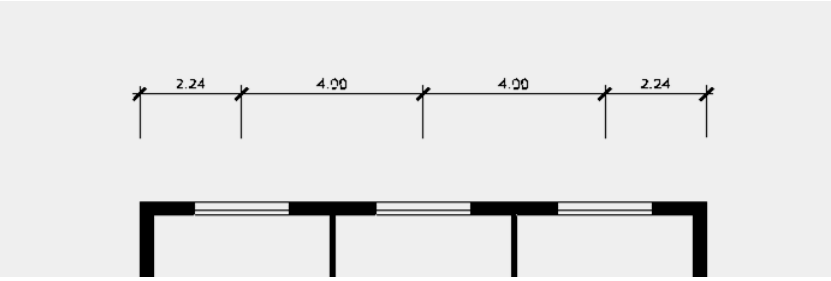
Opening dimension/set definition line (size)

This dimensioning option is only available in ELITECAD Architecture and dimensions all window, door and wall openings on a definition line. The definition line must lie on the exterior or interior surface of the wall, and the exterior or interior wall opening is dimensioned accordingly. For the opening width, the opening height is written under the dimension line.



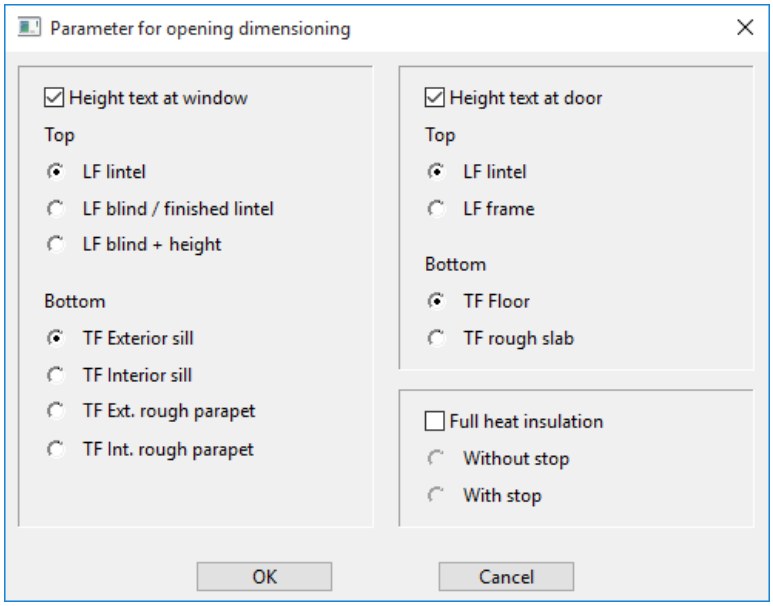
Opening dimension/set definition line (axis)

This dimensioning option is only available in ELITECAD Architecture and dimensions all window and door axes on a definition line. The definition line must lie on the exterior or interior surface of the wall.



Opening dimension/parameter for opening dimension

On this parameter dialog window, you can define in ELITECAD Architecture, which heights are to be dimensioned if **definition line with sizes** is used. There are separate value settings for windows and doors.



TIP

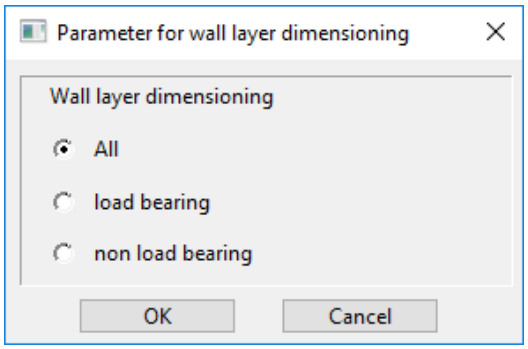
If the FULL HEAT INSULATION option is set, the dimension points react to the bare masonry itself and not to the insulation.

Section line/delete definition line

This function is only available in ELITECAD Architecture and deletes a chain dimension's section line or definition line. This makes sense if a chain dimension consists of multiple section lines/definition lines.

Parameter for multi-layer dimensioning

On this parameter dialog window, you can define in ELITECAD Architecture which wall layers are to be dimensioned.



COORDINATE DIMENSION

Toolbar * Create new
Lay-out menu > Dimensions > Coordinate dimension

This function launches coordinate dimensioning. Then it creates a horizontal or vertical dimension line passing from the point to be dimensioned to the dimension text position in the drawing. (The execution depends on the **parameter setting for coordinate dimension**). The correct horizontal distance between the reference point and points to be dimensioned is calculated and represented.

After the function is activated, define the reference point and the point to be dimensioned using one of the standard positioning procedures. The desired location for the dimension line and the dimension details are marked the same way.

TIP

If the "Query text" check box located in the Dimension parameters dialog window under the DETAIL PARAMETERS menu > TEXT PARAMETERS is selected, computer-generated dimensions can be modified via keyboard entry. Next, enter the next point to be dimensioned or end coordinate dimensioning.

REFERENCE VALUE

Toolbar * Create new
Lay-out menu > Dimensions > Reference value

This function launches reference dimensioning. Then it creates a horizontal or vertical dimension line passing from the reference point to the point to be dimensioned in the drawing. (The execution depends on the **parameter setting for reference dimension**.) The correct horizontal distance between these points is calculated and represented.

After the function is activated, define the left-hand (reference) point and right-hand point between which the horizontal dimensioning is to be displayed using one of the standard positioning procedures. The desired location for the dimension line and the dimension details are marked the same way. If the *Query text* check box located on the Dimension parameters dialog window under DETAIL PARAMRETERS > TEXT PRAMETERS is selected, computer-generated dimensions can be modified via keyboard entry. Next, enter the next point to be dimensioned or end reference dimensioning.

Floating dimension

Toolbar * Create new
Lay-out menu > Dimensions > Floating dimension

The function draws a horizontal or vertical floating dimension line between two points in the drawing, calculates the vertical distance between the points and represents it.

After the function is activated, use one of the standard positioning procedures to specify the lower and upper point between which the direct dimension is to appear. The desired location for the dimension line and the dimension details are marked the same way. If the *Query text* check box located on the Dimension parameters dialog window under DETAIL PARAMETERS > TEXT PARAMETERS is selected, computer-generated dimensions can be modified via keyboard entry.

Diameter dimension

Toolbar * Create new
Lay-out menu > Dimensions > Diameter dimension

The function draws diameter dimension lines, calculates the correct diameter dimensions and represents them.

After the function is activated, select the circumference of the circle or segment with the cross hair. Then specify the position of the dimension text. The dimension line is drawn passing through this point and the circle's centre point.

TIP

The dimension figure is not centred, enabling multiple concentric circles to be dimensioned cleanly. When positioning the dimension text for small circles, you may encounter the message "Text does not fit! Where to?" (RET = unchanged). Then you can place the text outside the circle or press [Return] to keep it inside the circle.

Radius dimension

Toolbar * Create new
Lay-out menu > Dimensions > Radius dimension

This function draws radius dimension lines, calculates the correct radius dimensions and represents them.

For the radius dimension, you must select the curve in question with the cross hair then enter the desired position where the dimension should be listed. A dimension line is drawn to it.

TIP

The required parameters for dimension line and dimension details must be defined in advance under **Dimension parameters**.

ANGLE DIMENSION

Toolbar * Create new
Lay-out menu > Dimensions > Angle dimension

This function displays a dimension curve between two lines, calculates the correct angle dimension and represents it.

After this function is activated, the two lines for angle dimensioning must be selected with the cross hair. The dimension curve is drawn anticlockwise from the first selected line to the second one. You are also prompted to enter the radial position of the dimension curve; the position of the dimension figure is automatically calculated based on the position of the dimension curve.

TIP

The calculated angle is listed in the defined unit (degrees, gradian/gon, or radian).

ISOMETRIC DIMENSION

Toolbar * Create new
Lay-out menu > Dimensions > Isometric dimension

This function is used to enter an isometric dimension. To do so, enter the incline of the dimension help line from a reference line and enter the dimension text manually. (The measured length is not automatically specified by the system, as isometric views are generally not to scale.)

After the function is activated, first specify the direction of the help line, which can be an element or a help line (e.g. a pipe axis). Then the system automatically switches to point entry (but you can select any other capture function). Now, the left and right end point of the dimension is marked (which also defines the dimension line's direction). After you have specified the text's position, enter the text itself.

TIP

The position of the dimension help lines can be at any angle. The tolerance check box can also be used during isometric view dimensioning.

CURVE DIMENSION

Toolbar * Create new
Lay-out menu > Dimensions > Curve dimension

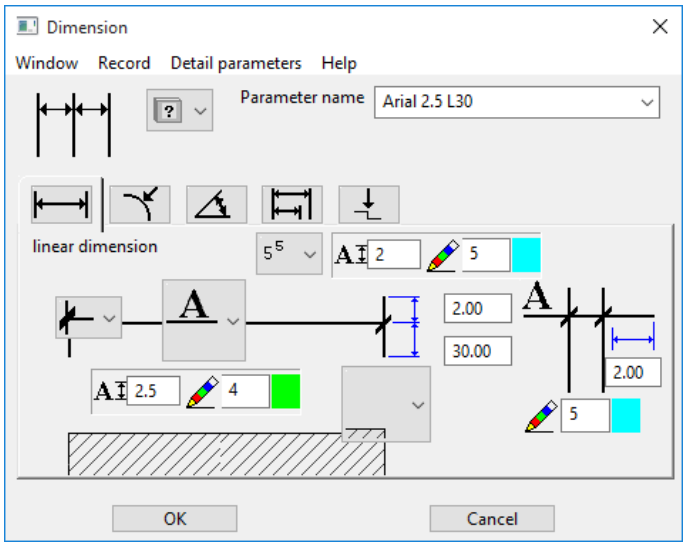
This function is used to enter a curve dimension. The measured length is automatically calculated by the system.

After the function is activated, the system begins by asking you to specify the curve to be dimensioned. After you have placed the start and end point of the curve, you can place the curve dimension using the preview.

DIMENSION PARAMETERS DIALOG WINDOW

Toolbar Dimension
Property bar dimension

Here, you can define all dimension-specific parameters and save them as a custom parameter record.

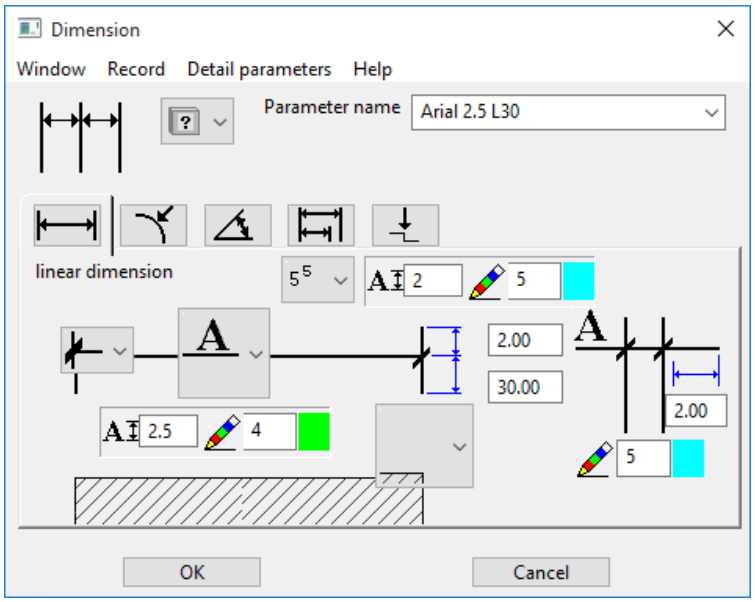


Parameter name
All parameters for dimensioning are specified on the dimension parameter dialog window. These can also be stored under any parameter name.
The name of the selected parameter record can be found in the "Parameter name" selection box. It can be defined freely. By selecting various types, you can see how the values in all the other entry fields are automatically modified. This way, once you have saved a dimension type as a custom defined type, you can call it up repeatedly.

Record
To generate a new type, simply enter the new name in the text box and modify all the values in the dialog window as desired. Next, you can insert the new type into the selection list via the menu item RECORD > SAVE. To delete a type that is no longer needed, use the menu item RECORD > DELETE.

Detail parameter:
From the **DETAIL PARAMETERS** menu, you can configure the arrow parameter, the text parameter and the tolerance parameter.

Linear dimension



Dimension limitation line
You can select from various dimension limitations.

without

Arrow

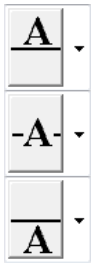
Circle

Backslash, pen like dimension line

Backslash, pen configurable

The dimensions are configured using the **DIMENSION ARROW PARAMETERS** detail parameter.

Dimension text
You have the following three options when setting the dimension figure.



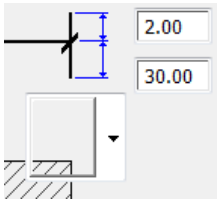
Dimension text over dimension line

Dimension text on dimension line

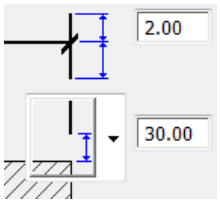
Dimension text under dimension line

You can configure the dimension and pen colour directly on the parameter dialog window. You can configure other parameter settings for the dimension text in the **DIMENSION TEXT PARAMETERS**.

Dimension help line
There are two configuration options available for selection.

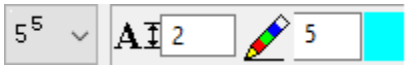


Configure the length of the dimension help line.



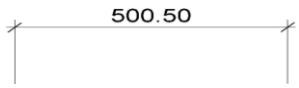
Configure the distance between the dimension help line and the dimension point.

Tolerance text

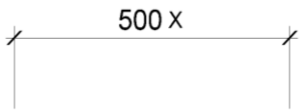


There are various depiction modes for the tolerance text. The text size and pen colour can also be configured directly. You can configure other settings for the tolerance text in the **TOLERANCE PARAMETERS**.

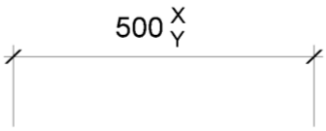
Tolerance text is not represented.

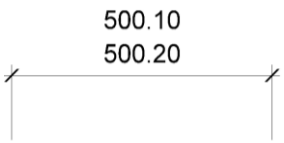


After the dimension line is set, the user is prompted for tolerance text.

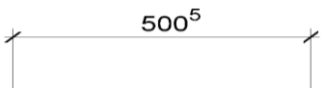


After the dimension line is set, the user is prompted for the upper and lower tolerance text.

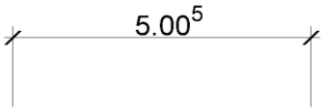




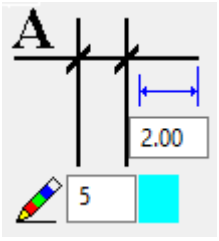
The tolerance text is written in superscript.



When **M,cm/mm dimensioning** is active in the toolbar.

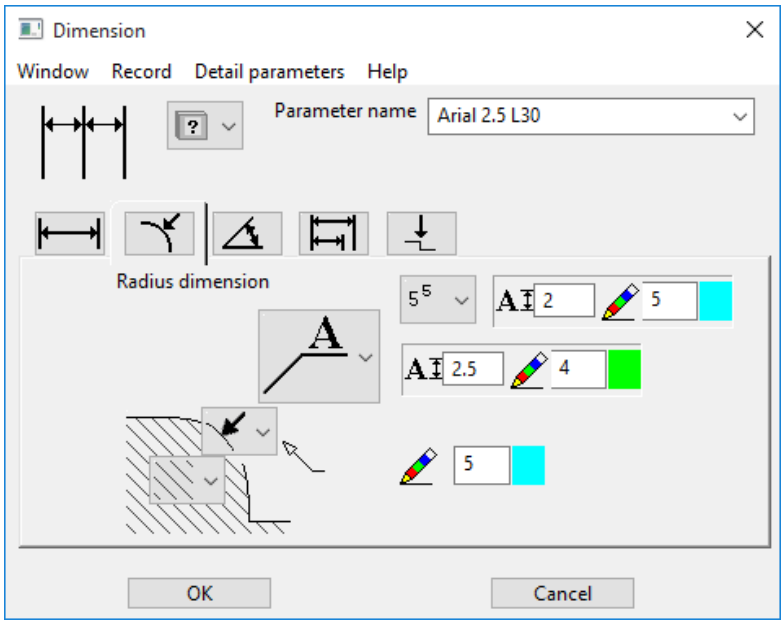


Dimension line



Pen for the dimension line and dimension help line.
You must activate the dimension line overhang in the **DIMENSION ARROW PARAMETERS** detail parameter so that the value adjusts accordingly and the overhand is displayed.

Radius dimension



Dimension line

Pen of dimension line

The dimension line can be lengthened up to the centre point of the circle.

Dimension limitation line
You can select from various dimension limitations.

without

Arrow

Circle

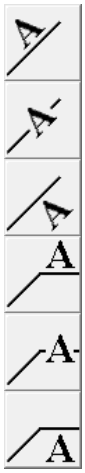
Backslash, pen like dimension line

Backslash, pen configurable

The dimensions are configured using the **DIMENSION ARROW PARAMETERS** detail parameter.

Dimension text

The following options are available when placing the dimension figure.



Dimension text over dimension line

Dimension text on dimension line

Dimension text under dimension line

Dimension text (with horizontal ending) over dimension line

Dimension text (with horizontal ending) on dimension line

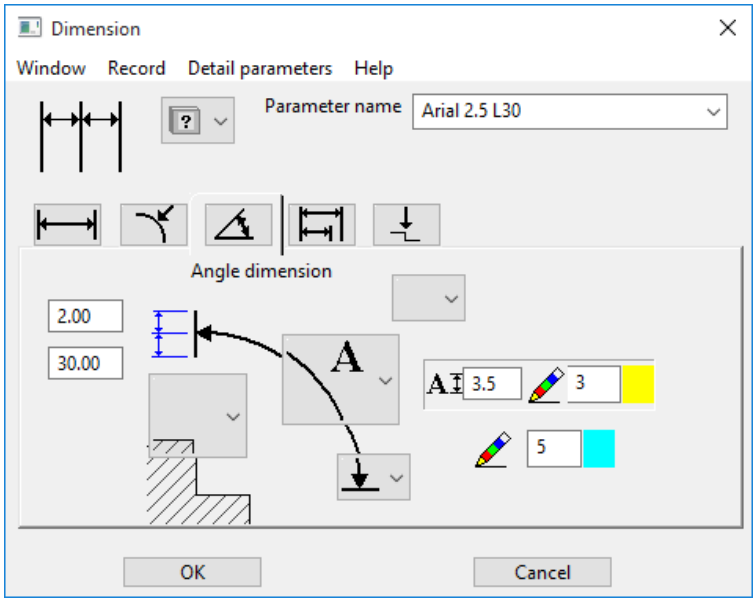
Dimension text (with horizontal ending) under dimension line

You can configure the dimension and pen colour directly on the parameter dialog window. You can find other parameter settings for the dimension text in the **DIMENSION TEXT PARAMETERS**.

Tolerance text

Here you have the option to define the depiction type, size and pen colour of the tolerance text. You can find other parameter settings for the tolerance text in the **TOLERANCE PARAMETERS**.

Angle dimension



Dimension line

Pen of dimension line

Dimension limitation line

You can select from various dimension limitations.

without

Arrow

Circle

Backslash, pen like dimension line

Backslash, pen configurable

You can configure the dimensions in the **DIMENSION ARROW PARAMETERS** detail parameter.

Dimension text

The following options are available when placing the dimension figure.

Dimension text orthogonal on dimension line

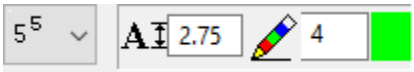
Dimension text tangential on dimension line

Dimension text tangential between dimension line

Dimension text tangential under dimension line

You can configure the dimension and pen colour directly on the parameter dialog window. You can find other parameter settings for the dimension text in the **DIMENSION TEXT PARAMETERS**.

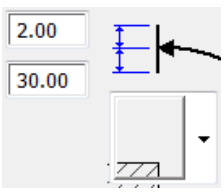
Tolerance text



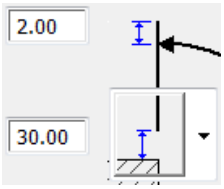
Here you have the option to define the depiction type, size and pen colour of the tolerance text. You can find other parameter settings for the tolerance text in the **TOLERANCE PARAMETERS**.

Dimension help line

You have two configuration options for the dimension help lines.



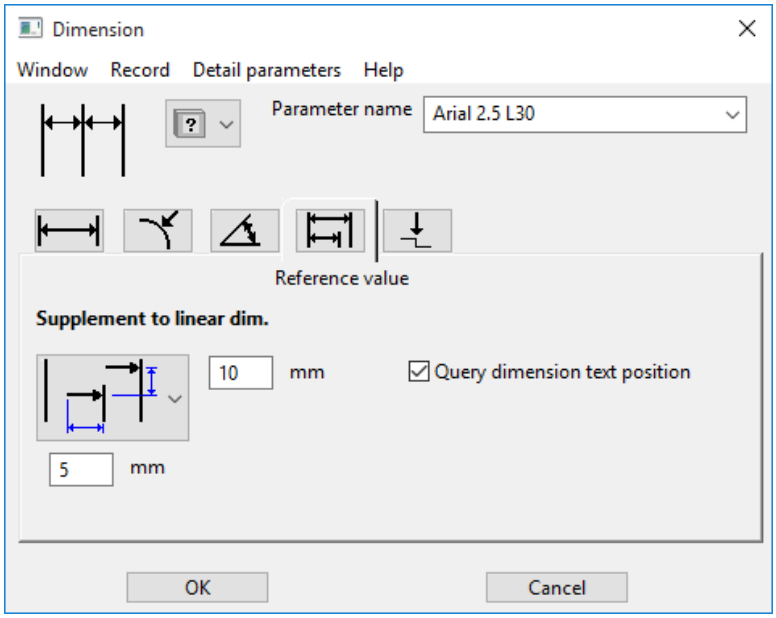
With this option, you define the length of the dimension help line regardless of where the dimension point is placed.



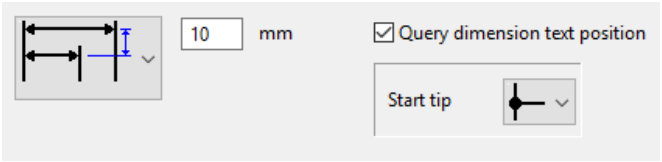
With this option, you define how far away the dimension help line is from the defined dimension point.

Reference value

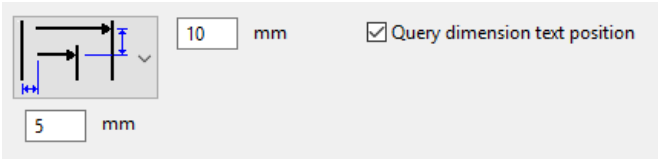
Only supplemental parameters are located under the reference value. The general parameters are adopted from the Linear Dimension.



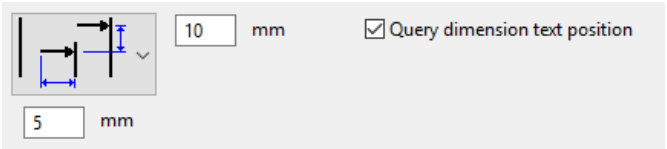
Distance of individual dimension lines and selection of the start tip. Optionally, the position of the dimension text can be prompted.



The distance between the individual dimension lines and their start offset. Optionally, the position of the dimension text can be prompted.

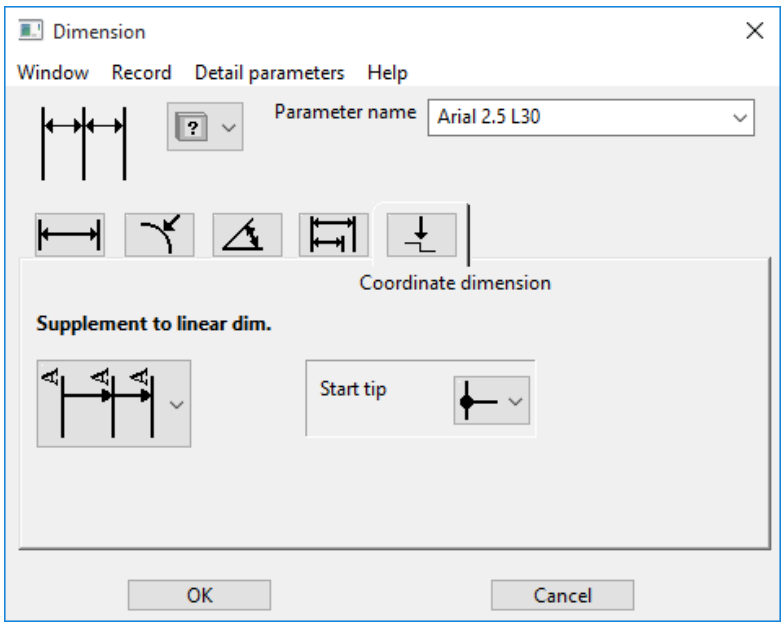


The distance between the individual dimension lines and their length. Optionally, the position of the dimension text can be prompted.

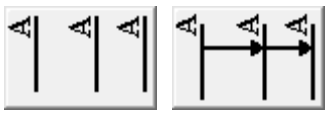


Coordinate dimension

Only supplemental parameters are located under the coordinate dimension. The general parameters are adopted from the Linear Dimension.



There are two additional options provided.



Place dimension

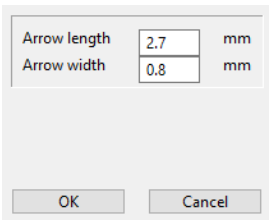
In the properties bar, you can activate the PLACE DIMENSION function while defining the dimension points. By entering additional points, the dimension help line can be created in place.

DIMENSION DETAIL PARAMETERS

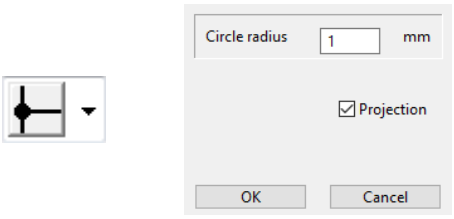
Dimension arrow parameters

Depending on the setting for dimension limitation in the dimension parameter dialog window, the dialog window that appears for the dimension arrow parameters may vary.

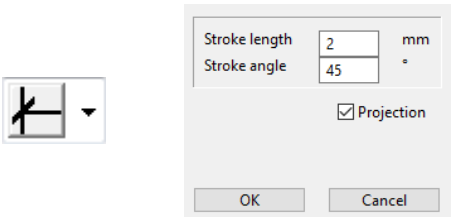
If a dimension arrow is not selected, no other settings are possible.



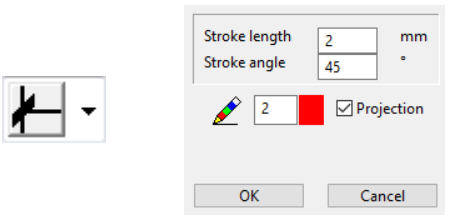
If an arrow is selected as the dimension arrow, you have the option to configure the arrow length and arrow width for the arrow parameter detail parameter.



If a circle is selected as the dimension arrow, you have the option to configure the circle's radius for the arrow parameter detail parameter. The PROJECTION option refers to the overlap of the dimension line and the dimension chain.

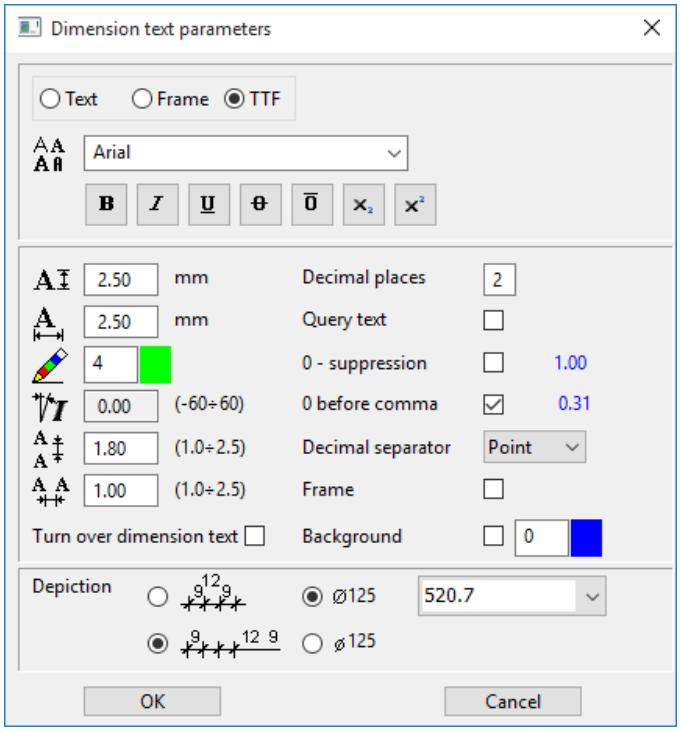


If a stroke is selected as the dimension arrow, you have the option to configure the stroke length and the stroke angle. The PROJECTION option refers to the overlap of the dimension line and the dimension chain.

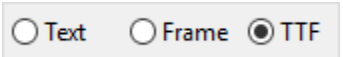


If a stroke is selected as the dimension arrow, you have the option to configure the stroke length and the stroke angle. As the pen colour is configurable here too, you can select a thicker pen. The PROJECTION option refers to the overlap of the dimension line and the dimension chain.

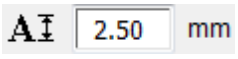
Dimension text parameters



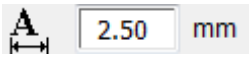
If certain settings are blocked for the dimension text parameters, this is because not all settings are possible when using TrueType fonts.



Selection of text, frame or TrueType font

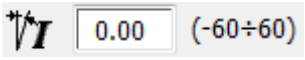


Height dimension figure

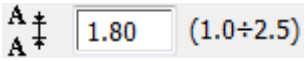


Width dimension figure

Pen type dimension figure



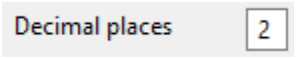
Inclination dimension figure



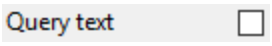
Distance of dimension text to dimension line
1: Dist. = 0;
2: Dist. 50 % text height
2.5: Dist. 75 % text height

Character spacing

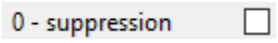
Rotates the dimension figure to the other side of the dimension help line



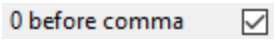
How many digits after the decimal point



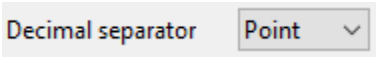
If the QUERY TEXT option is switched on, you must enter the dimension figure.



No 0 after the decimal point (1, not 1.0)

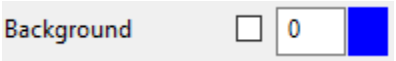


One 0 before decimal point (0.31)



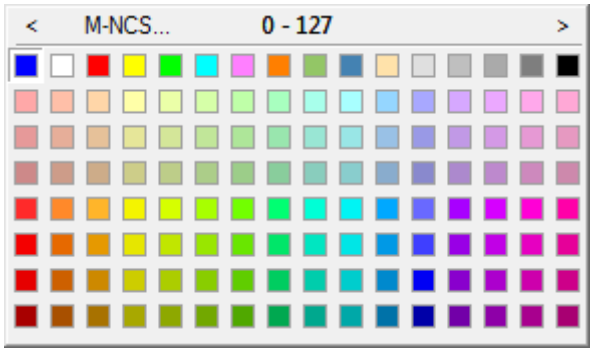
Selection of decimal point character

Frame on/off

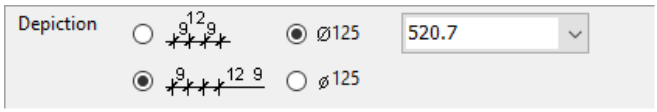


Background colour on/off

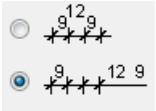
Background
There is an option to set an infill hatch as the background.
The 0 pen is invisible and is used to cover things.



Depiction



Assignment

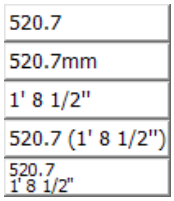


You can select here whether dimension texts that have no room between the dimension help lines should be written upwards or sideways.

Diameter character

Specify here whether to use a large or small diameter character.

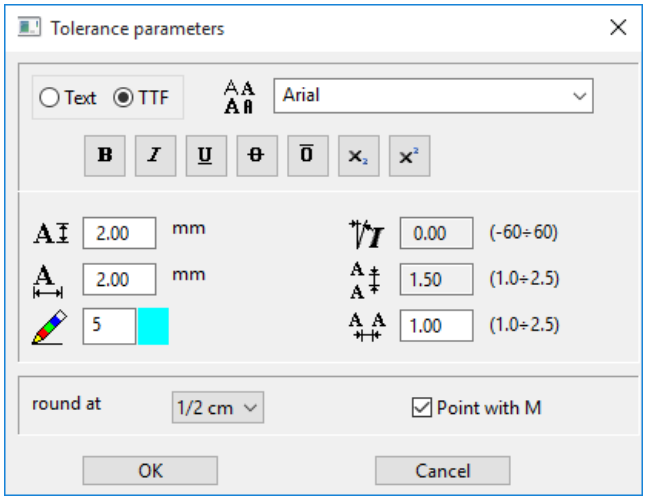
Depiction



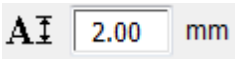
Select here how the dimension should appear.

Tolerance parameters

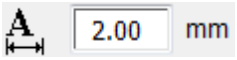
DETAIL PARAMETERS > TOLERANCE PARAMETERS
When TrueType fonts are selected, certain settings are also blocked in the tolerance parameters.



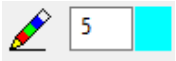
Selection of text or TrueType font



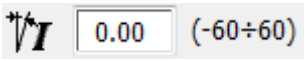
Height dimension figure



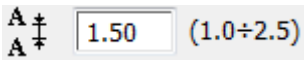
Width dimension figure



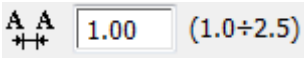
Pen type dimension figure



Inclination dimension figure



Distance of dimension text to dimension line
1: Dist. = 0;
2: Dist. 50 % text height
2.5: Dist. 75 % text height



Character spacing

The following options can only be selected when m,cm/mm dimensioning ( ) is activated:

round at 1/2 cm	Rounds to the nearest half-centimetre or millimetre
☑ Point with M	The "metres place" is separated with a point.

6.2 HEIGHT MARKER

SPECIFY HEIGHT MARKER

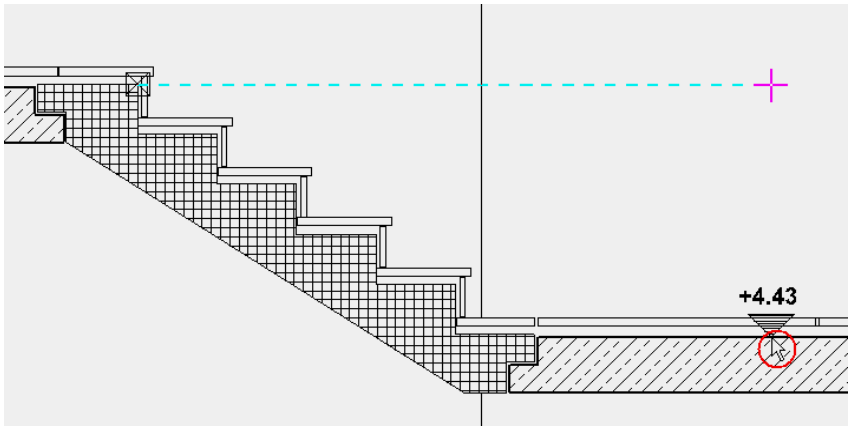
Toolbar * Create new

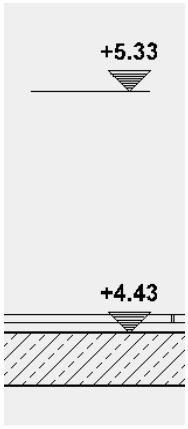
Lay-out menu > Dimensions > Height marker

The HEIGHT MARKER function can be found among the dimension functions.

Height marker dimensioning places a symbol for which the height is always automatically calculated. Usually, the height position is calculated from the coordinate origin (X0, Y0 = format middle).
The symbol can be changed in any way.

Set levels
To launch it, click the HEIGHT MARKER function.
Dimension which point?
On the plan, enter the point that you would like to dimension with a height marker.
Position of height marker
You can only move horizontally to the point at which the marker should be placed. You can also move the cursor to a pre-existing height marker to align the new marker to it. Finally, you can define the marker's position by flipping it.





Associations
A marker that is placed in a view or section linked with the design model is retained if changes are made to the geometry. After the view/section is refreshed, the height marker is recalculated.

Edit/modify text
You can edit the marker's text in the element part selection mode ([Alt] key).

HEIGHT MARKER PROPERTIES BAR

[Height marker – Parameters]

Renovation planning state (only in ELITECAD Architecture, see chapter 8.5)

[Select symbol]

[Height marker – Offset over point]

[Height marker – Offset]

[Height marker – Leading text]

[Height marker – Trailing text]

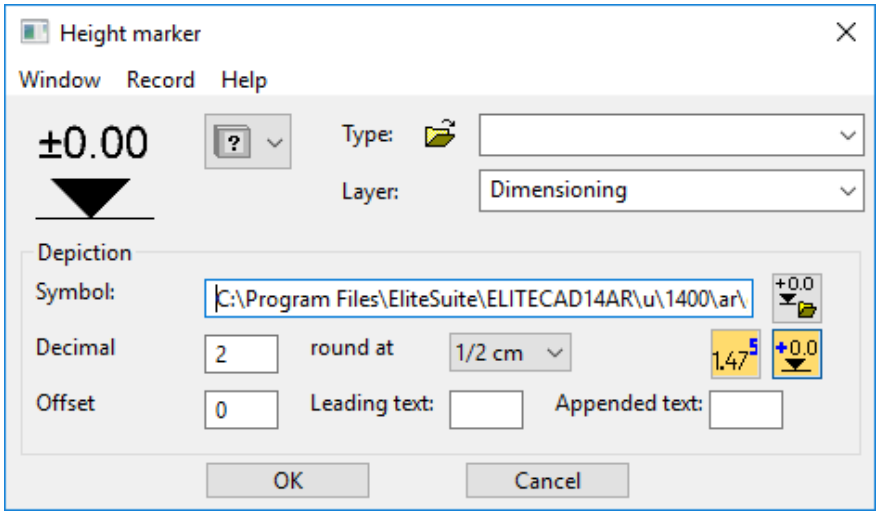
[M,cm/mm dimensioning: Tolerance text is written in superscript (only in ELITECAD Architecture)]

[Plus sign]

[Modify height marker over polygon]

Height marker parameter

In the height marker parameters, you can configure settings for the height marker. You can select the symbol from which the height marker should be generated and you can configure how it will be depicted.



General parameters

- Status renovation planning (only in ELITECAD Architecture)
- Freeze (only in ELITECAD Architecture)
- Type (name of the record)
- Layer

The general parameters for objects are described in chapter 8.5.

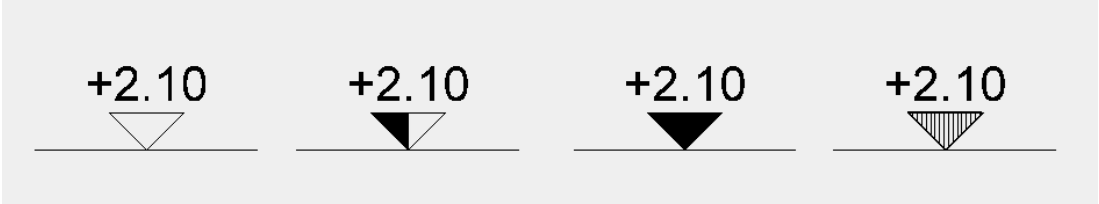
Symbol

Here, select the symbol that should be used to create the marker. You can select the file directly using the Selection button.

The standard path for the symbols is:
<ELITECAD installation path>\u\<version>\<ar|me>\glob\symbol\...

Own symbols
You can create as many of your own symbols as you like. Important: The reference point for each symbol should always be on the arrow tip, as that is the point from which the height is calculated.

Examples:



TIP

If you would like to create a symbol of your own, it is best to load a template from the path listed above, adapt it as you wish, and save it under a new name.

Offset
Using the offset, you can specify a displacement value in the current unit by which to move the reference level in relation to the coordinate origin.
The option is needed if a part is cut for space reasons in a detail section, for instance.

TIP

The value matches the one in the properties bar.

Height marker – Offset over point

Instead of a manual entry for the offset, you can specify a point digitally with the mouse. The measured height from the coordinate origin is entered into the "Offset" field and the height of the marker is recalculated.

Height marker – Offset

Using the offset, you can specify a displacement value in the current unit by which to move the reference level in relation to the coordinate origin.

Height marker – Leading text/Trailing text

You can enter additional text in these fields to be added to the calculated height text.

Plus sign

This setting is used to add a plus sign as a pre-text before the value.

M,cm/mm dimensioning

The m,cm/mm dimensioning is only available in ELITECAD Architecture and writes the millimetres in superscript. In the height marker parameters, you can configure rounding to the nearest half centimetre or nearest millimetre. When m,cm/mm dimensioning is activated, the number of decimal places is irrelevant for height marker parameters.

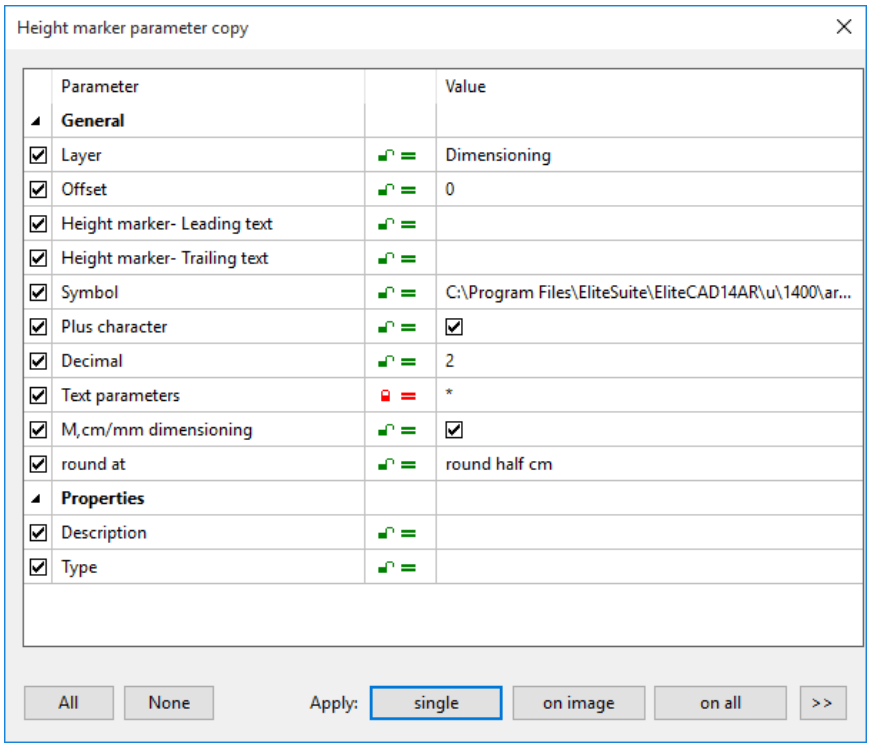
Modify height marker over polygon

Using this function, you can modify the offset of multiple markers at the same time.

After calling this function, you can place a polygon over the markers to be changed. Next, enter the offset for these markers in the entry line. The entry is always entered in the current unit and must be confirmed with [Enter].

Modify height marker via Copy parameters

If you click on a marker after the COPY PARAMETERS function, there are additional options available for global modifications.



6.3 HEIGHT MARKER OF FLOOR PLAN

SPECIFY HEIGHT MARKER

Toolbar * Create new
Lay-out menu > Dimensions > Height marker of floor plan

The HEIGHT MARKER OF FLOOR PLAN function can be found among the dimension functions and is only available in ELITECAD Architecture.

Height marker of floor plan dimension places a symbol that is automatically labelled with the height of the bare floor top surface (BTS) and the top surface of the bare ceiling (TSBC).

Edit/modify text
You can edit the marker's text in the element part selection mode ([Alt] key).
1

HEIGHT MARKER OF FLOOR PLAN PROPERTIES BAR

The properties bar becomes visible if you select the HEIGHT MARKER OF FLOOR PLAN function to generate a marker or if you click an existing marker to edit it.

[Height marker – Parameters]

Renovation planning state (in ELITECAD Architecture , see chapter 8.5)

[Height marker – Offset]

[Height marker – Leading text]

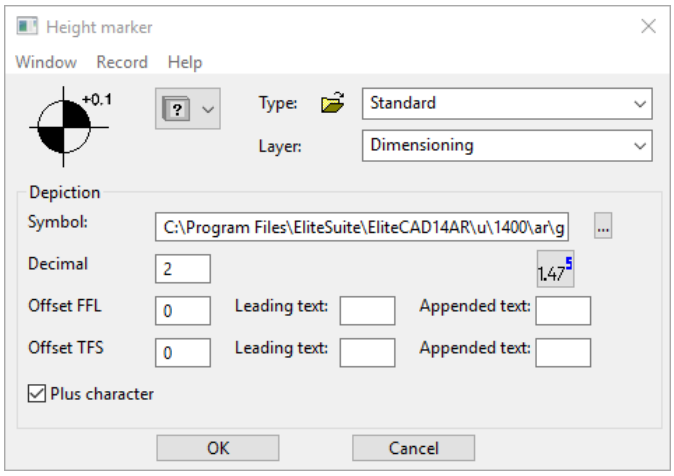
[Height marker – Trailing text]

[M,cm/mm dimensioning:] [Tolerance text is written in superscript]

[Modify height marker over polygon]

Height marker parameter

In the height marker parameters, you can configure settings for the height marker. You can select the symbol from which the height marker should be generated, the number of decimal places, the height marker offset and whether or not the height marker should include a "plus" sign.



Symbol
Here, select the symbol that should be used to create the marker. You can select the file directly using the Selection button.
The standard path for the symbols is:
<ELITECAD installation path>\u\<version>\<ar|me>\glob\symbol\...

Own symbols
You can create as many of your own symbols as you like. Important: The reference point for each symbol should always be in the centre of the circle, as that is the point from which the height is calculated.

TIP

If you would like to create a symbol of your own, it is best to load a template from the path listed above, adapt it as you wish, and save it under a new name.

Height marker – Offset

Using the offset, you can specify a displacement value in the current unit by which to move the reference level in relation to the coordinate origin. The offsets can be configured separately for BTS and TSBC.

Height marker – Leading text/Post-text

You can enter additional text in these fields to be added to the calculated height text. The text can be configured separately for BTS and TSBC.

M,cm/mm dimensioning
The m,cm/mm dimensioning writes the millimetres in superscript. In the height marker parameters, you can configure rounding to the nearest half centimetre or nearest millimetre. When m,cm/mm dimensioning is activated, the number of decimal places is irrelevant for height marker parameters.

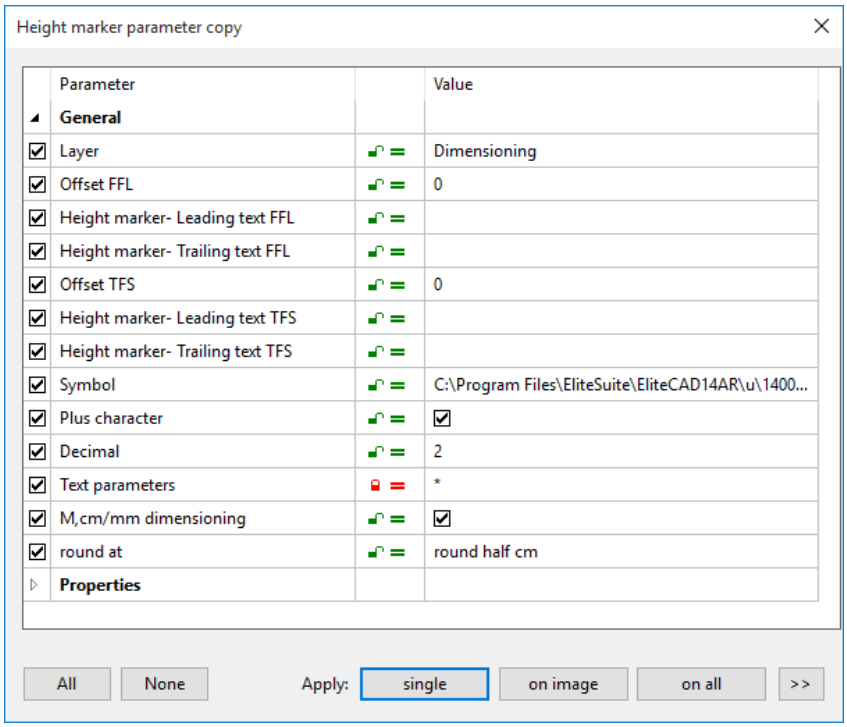
Modify height marker over polygon

Using this function, you can modify the offset of multiple markers at the same time.

After calling this function, you can place a polygon over the markers to be changed. Next, enter the offset for BTS and TSBC in the entry line. The inputs are always entered in the current unit and must be confirmed with [Enter].

Modify height marker via Copy parameters

If you click on a marker after the COPY PARAMETERS function, there are additional options available for global modifications.



6.4 Arrow

The arrow is part of the rest.

Visible/invisible

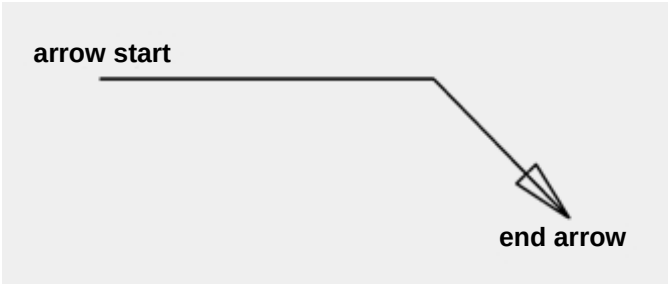
Arrows can be temporarily switched off using the image control functions.

Switch on/off
VIEW menu > SWITCHES
If you switch off the arrows using this check box, the arrows are not saved during "Save as" unless the subsequent dialog window is confirmed with "visible selection".

Rest scaling
SETTINGS menu > REST SCALING on/off
If rest scaling is switched off, the arrows are not enlarged or reduced when scaling or modifying the scale.

Toolbar * Create new
Lay-out menu > Arrows

When you click the CREATE ARROW function, the settings are copied from the most recently placed arrow and the arrow can be placed immediately. The *Arrow start?* query appears in the entry line. Now draw the arrow on the plan. You can complete the arrow by double-clicking or using the END ARROW function.



Arrow properties bar

The properties bar becomes visible if you select the CREATE ARROW function to generate an arrow or if you click an existing marker to edit it.

[Arrow parameters]

[Type]

Renovation planning state (in ELITECAD Architecture, see chapter 8.5)

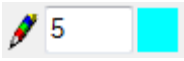
[Arrow type]

[Line type]

[Arrow length and arrow width]

Circle radius

Line length and angle



Pen colour

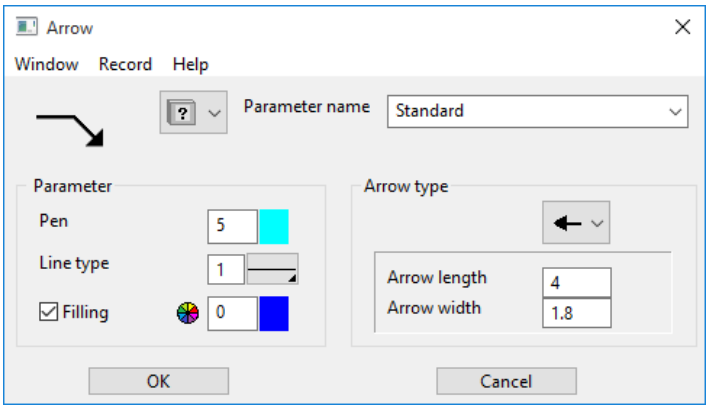
Start arrow

End arrow

At text balloon

Background

ARROW PARAMETERS



In this dialog window, you can configure all parameters for note arrows. These can also be stored under any parameter name (Menu RECORD > SAVE).

Parameter name

Using the RECORD menu, you can save new parameter records or delete existing ones.

Arrow type

None

Arrow

Circle

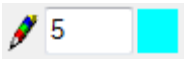
Stroke

You can select the type of arrow tip.

Line type

The line type can be selected.

Pen colour



Pen colour of arrow, incl. head.

Start arrow

"Start arrow" is automatically run when you click the ARROW function, and the arrow can be drawn immediately. To complete the arrow, simply double-click or use the END ARROW function.

End arrow

This function completes the START ARROW function.

TIP

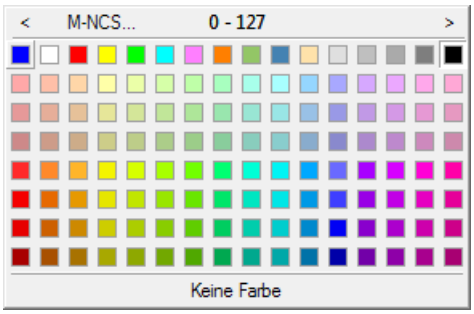
To complete the arrow, simply double-click.

At text balloon

You can also select this option. At the start or end of the arrow, click the function and then click a text.

Background

There is an option to set an infill hatch as the background.
The 0 pen is invisible and is used to cover things.



6.5 HATCH

The hatch is part of the rest.

Visible/invisible

The hatching can be temporarily switched off using the image control functions.

Switch on/off
VIEW menu > SWITCHES
If you switch off the hatching using this check box, the hatching is not saved during "Save as" unless the subsequent dialog window is confirmed with "visible selection".

Rest scaling
SETTINGS menu > REST SCALING on/off
If rest scaling is switched off, the hatching is not enlarged or reduced when scaling or modifying the scale.

Print sequence
A newly created hatch is automatically placed in the foreground, but this can be changed using Control foreground/background in the context menu.
Under the SETINGS menu > OPTIONS > DEPICTION > 2D/3D, you can also select a check box specifying that elements are always in front of infill hatch. This check box is automatically selected if plans are loaded from versions earlier than V11.

AUTO HATCHING

Toolbar * Create new
Lay-out menu > Hatch > Automatic hatch

Use this function to launch a hatch process where existing contours and texts/dimension texts are automatically recognised as gaps.

MANUAL HATCH

Toolbar * Create new
Lay-out menu > Hatch > Manual hatch

For manual hatching, you can also select additional contours and define texts/dimension text as gaps. The end of the hatch procedure must be selected.

PROPERTIES BAR HATCHING

Hatching parameters

Hatch type

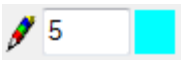
Renovation planning state (in ELITECAD Architecture, see chapter 8.5)

Hatch type preview

Toggle Auto hatching / Manual hatching

Toggle hatch / covering hatch

Assignment



Colour selection over table

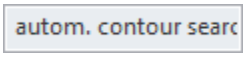
Start hatch

End hatch

Polygon

Next contour

Preview area



contour of search mode display

Align hatch

After you activate the function, you are prompted to define the outer contour of the surface to be hatched by clicking on it. The start element will proceed around clockwise from the perspective of the point you clicked. A closed contour is hatched without any additional query. With an open contour, additional functions are available at the cursor via the Input Assistant or by pressing [TAB].

Hatch type
Saved hatches.

Hatch type preview
The standard hatches that are provided with the program come with a small preview. Custom created hatches do not have a preview image.

Assignment layer
The hatch can be assigned to the active layer or to the layer of the selected contour. This selection is only available if the "Selection using Group/Class/Level" switch is deactivated in the OPTIONS.

Hatch to contour layer

Hatch to active layer

Assignment object
The hatch can be assigned to the active object or to the object of the selected contour. This selection is only available if the "Selection using Group/Class/Level" switch is activated in the OPTIONS.

Hatch to object of the contour

Hatch to active object

TIP

In calculated views or section views, the assignment to the object of the contour has to be handled with care. Objects that are related to the design model are deleted when refreshing the view!

Colour selections
For colour selections, there is a distinction between line hatch and infill hatch. For line hatch, the pen colour must be defined; for infill hatch, the plane colour.

Start hatch

The function launches the manual hatch process.
After you activate the function, you must define the outer counter of the surface to be hatched by clicking on it. The start element will proceed around clockwise from the perspective of the point you clicked. When it is closed, you must confirm the contour using END HATCH or [Enter]. For an open contour, additional functions are available at the cursor in the Input Assistant or by pressing [Tab].

End hatch

or [Return]

Ends the manual hatch process and generates the hatch.

Polygon functions
Using polygon functions, you can complete the definition of open contours or create hatches using only a single polygon, if no contour exists.

Use the POLYGON function in order to define any contour for the hatch.

Use the NEXT CONTOUR function if the contour consists of multiple open polygons and you want to connect the contour you clicked first with the next contour.

TIP

The auto hatching function uses the branching parameter that is configured under SETTINGS > OPTIONS > WORK PARAMETERS > GENERAL.

Preview area

The preview area shows a preview of the selected contour. You can switch this preview on/off, as it uses a large amount of performance for dense plans.

HATCHING PARAMETERS

In the hatching parameters, you can define all of the hatch's specific parameters and save them as a custom parameter record. There are parameter masks for line hatches, model hatches and infill hatches.

Parameter name
In the RECORD menu, you can create a new function with the SAVE function or use the DELETE function to delete an existing parameter.

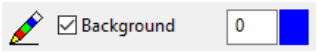
Boundary

The hatch can be generated with a boundary. The boundary has the same pen as the hatch. The line type is solid (no. 1).

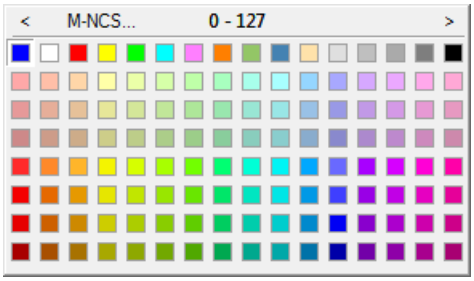
Line hatch

The line hatch can be created with one of the first seven tabs. This is the location of the settings parameters such as inclination, pen number, line type and line spacing.
The SHOW function displays a preview of the current settings in the preview window.

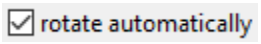
Background



All line hatches have the option to switch to an infill hatch as the background.
The 0 pen is invisible and is used to cover things.

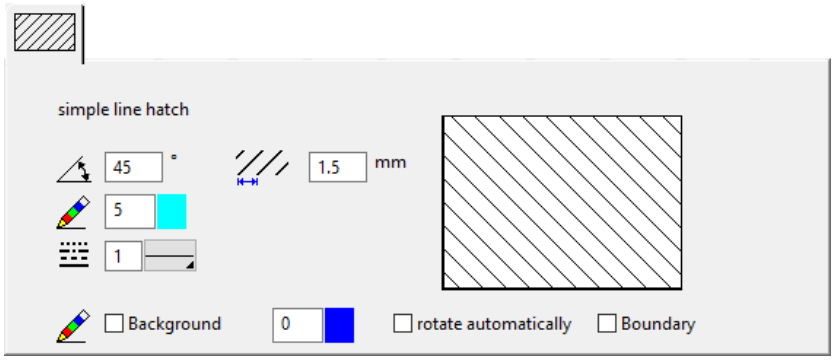


Rotate automatically

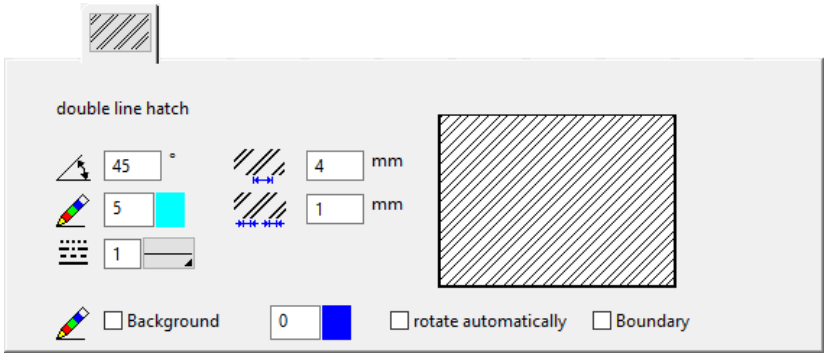


Line hatches can be rotated automatically. The hatch is always aligned based on the longest line in the contour. When changes are made to the contour, the hatch is recalculated.

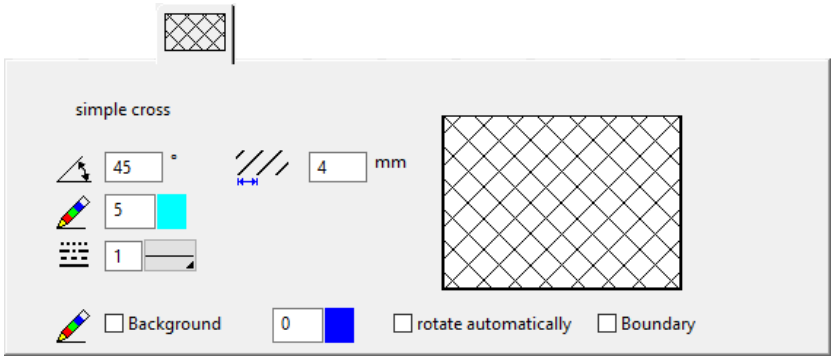
Simple line hatch
Defined by an angle and a line type.



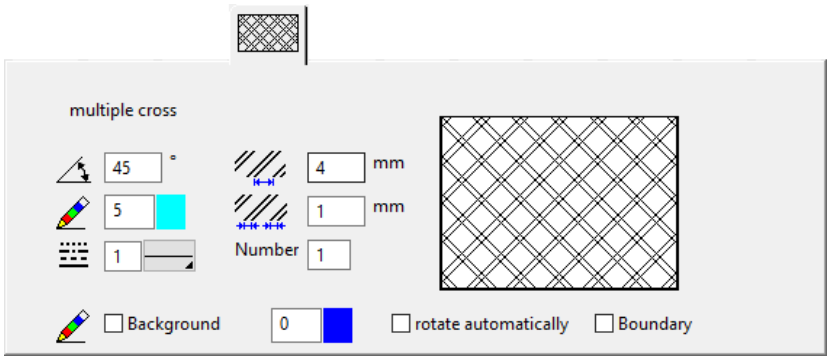
Double line hatch
Defined by an angle and two lines of the same type with a different distance.



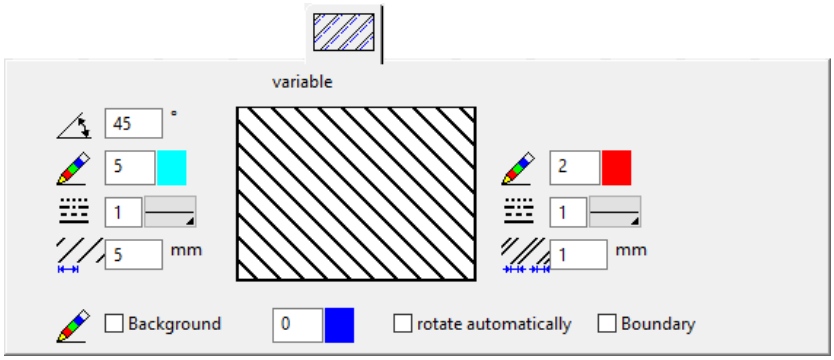
Simple cross hatch
Defined by an angle and a line type.



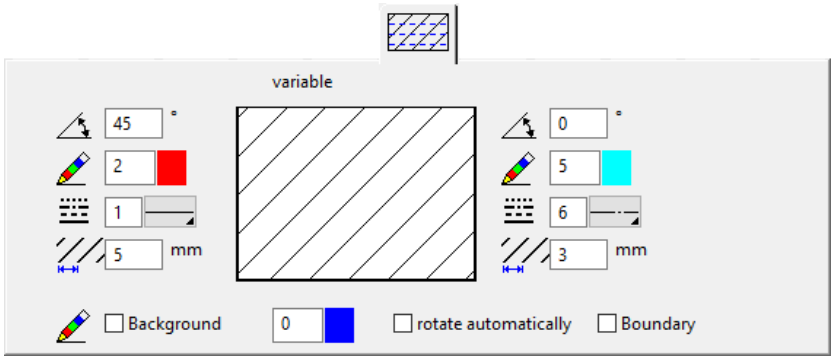
Multiple cross-hatching
Defined by an angle and two lines of the same type with a different distance.



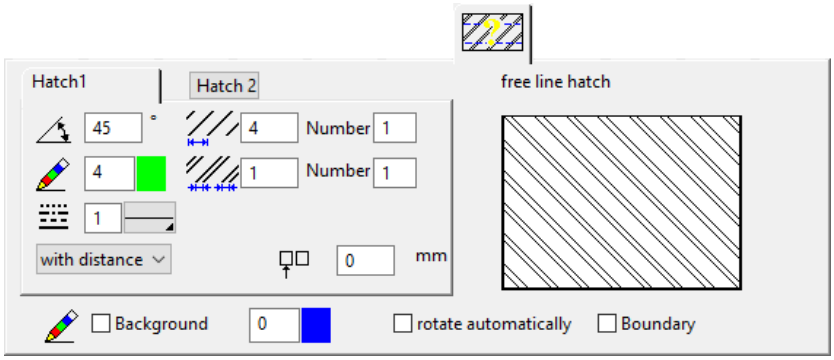
Variable double-hatch
Defined by an angle and two lines of different types with a different distance.



Variable cross-hatch
Defined by two angles and two lines of different types with a different distance.

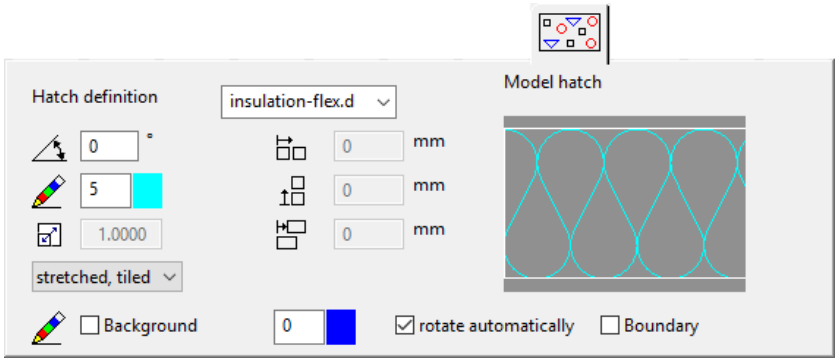


Free line hatch
Consists of two hatches, each defined by an angle and multiple lines of the same type with a distance.



Model hatch

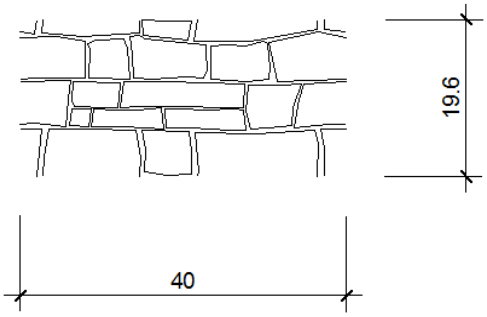
A model hatch consists of a hatch definition (*ELITECAD file*) that can be used as a tile and distributed across the surface in various ways.



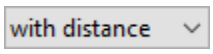
If the 2D elements of the hatch definition consist only of one colour, the colour of settings will be applied. Otherwise, the colours remain unchanged.

Hatch definition
The definition files are located in the path:
<ELITECAD-installation path>\u\<version>\cad\glob\hatch\<region>
Depending on the settings, a different subfolder has to be chosen. In ELITECAD Architecture *<region>* stands for *language_region*, e.g. *de_de* for Germany, *de_at* for Austria, *en_uk* for UK. ELITECAD Mechanics *<region>* stands for *language* alone, e.g. *de* for German, *en* for English.

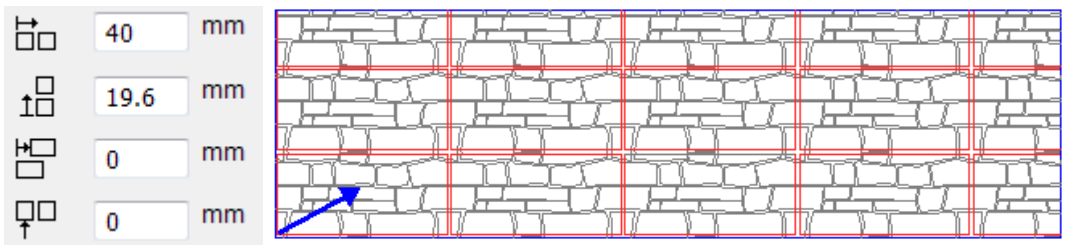
Example of a hatch definition: Stonework



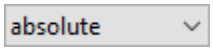
Segmentation – With distance



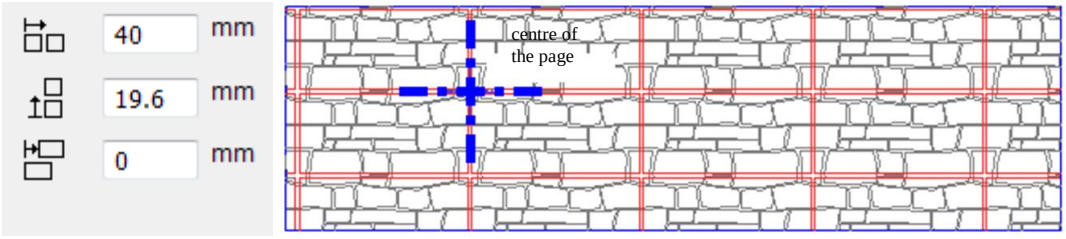
The tile width and height must be entered. The origin of the hatch lies in the lower left corner of the hatch contour. A vertical distance can be added to the hatch.



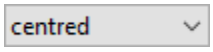
Segmentation – Absolute



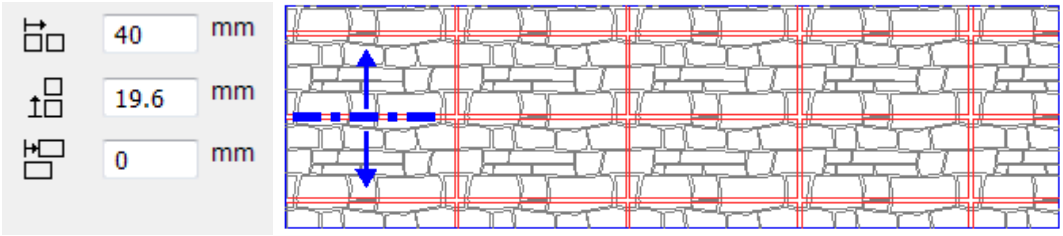
The tile width and height must be entered. The origin of the hatch lies in the centre of the page. To place multiple hatches seamlessly alongside each other, "absolute" segmentation must be selected for each of them.



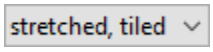
Segmentation – Centred



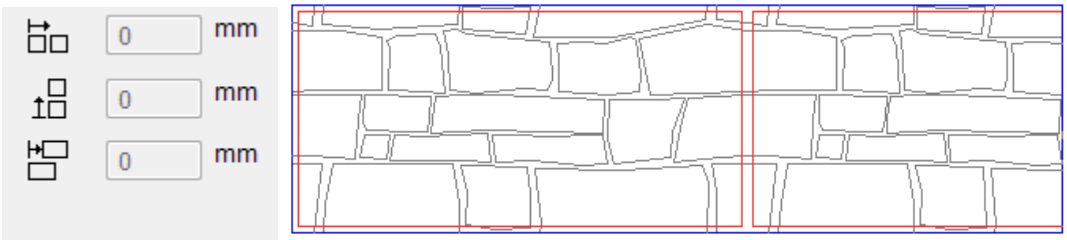
The tile width and height must be entered. The origin of the hatch is centred vertically.



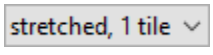
Segmentation – Stretched, tiled



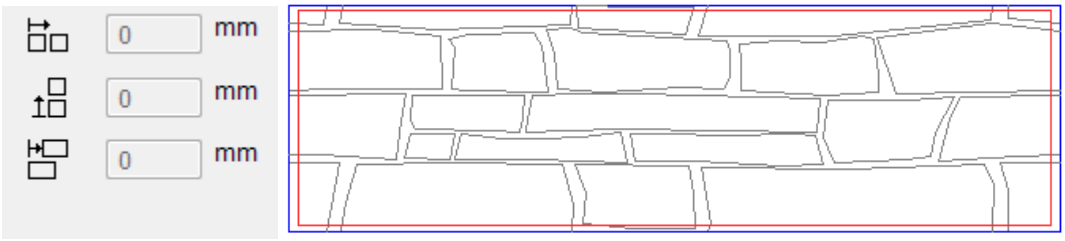
The tile is scaled until it touches the first side of the contour. Then the hatch is tiled in the other direction. The hatch automatically adjusts to the height, and is therefore ideal for hatching layers.



Segmentation – Stretched, 1 tile

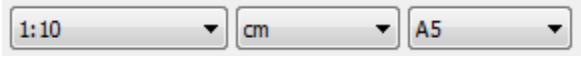


The hatch is only placed into the contour once. A rectangle is placed around the contour to be hatched, and the hatch tile is stretched in all directions to fit it.

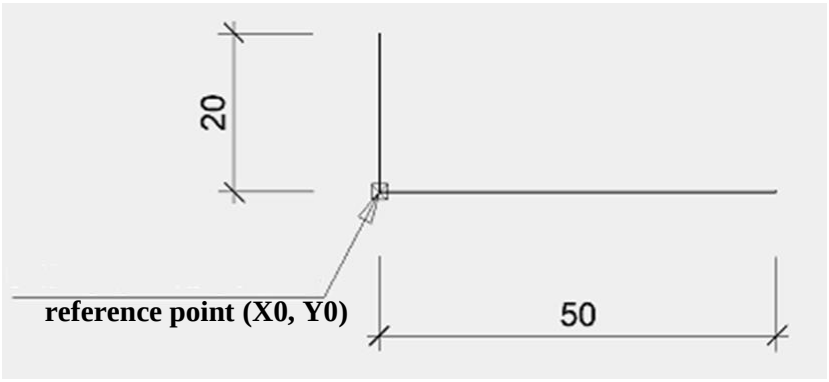


Create new model hatch

Create a panelling hatch for a 50x20 cm artificial stone panel.
It is best to create the *template* file on a new plan.
FILE menu > NEW
Select an appropriate scale.



Begin creating a panel at the zero point (X0,Y0).

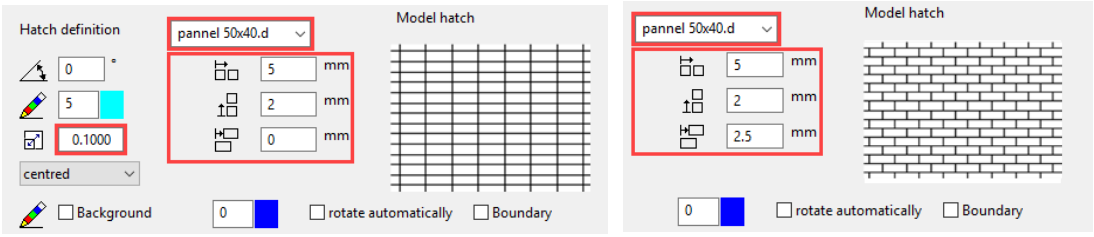


TIP

Template drawings consist of elements. Rest elements such as text, hatches and dimensions cannot be used.

Save the file. The file must be saved to the "hatch" directory. This directory contains all template files for model hatches.
FILE menu > SAVE AS
<ELITECAD installation path>\u\<version>\cad\glob\hatch\<region>
Depending on the settings, a different subfolder has to be chosen. In ELITECAD Architecture *<region>* stands for *language_region*, e.g. *de_de* for Germany, *de_at* for Austria, *en_uk* for UK. ELITECAD Mechanics *<region>* stands for *language* alone, e.g. *de* for German, *en* for English.
Navigate to the "hatch" directory and enter "Panel50x20" as the file name.

Draw a 500x400 cm rectangle at 1:100 scale and generate the panel hatch with the following settings for the hatching parameters:

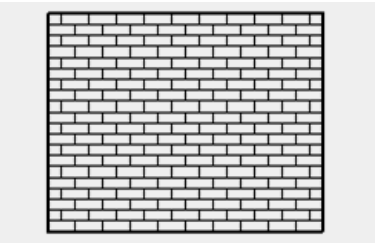


Along with the X and Y offset, you must configure the value for how many times the model drawing should be repeated. The panel is 50 cm wide and should be created to 1:100 scale, so it must be 5 mm on the plan. The alignment can be used to shift the panels.

TIP

Since the original was drawn at 1:10 scale, but the hatch is defined at 1:100 scale, the scaling must be 0.1.

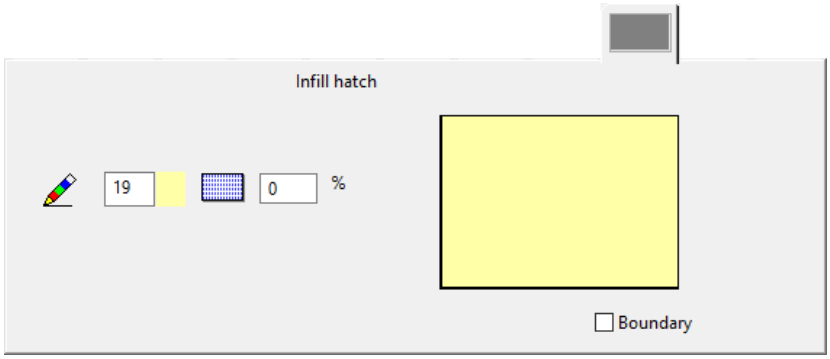
Place the hatch in the outline.



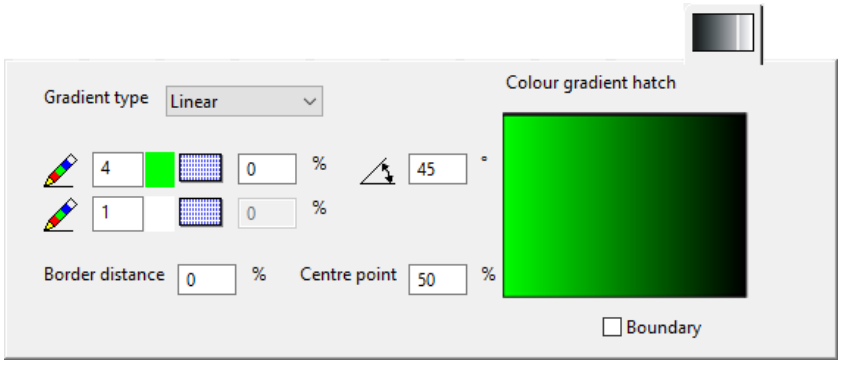
WORKSHOP END

Infill hatch

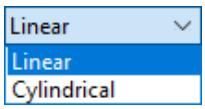
Infill hatch
The infill hatch is defined via a colour selection (pen number). The hatch can be extended with a transparency.



Colour gradient hatch
Two infill hatches are mixed together, for which transparency, angle, border distance and centre point can be defined.

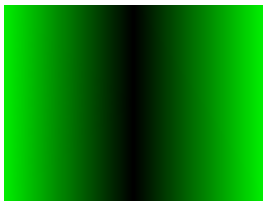


Gradient type

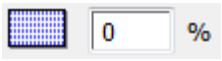


For "Linear", the midpoint of the mixture is precisely midway between the two colours, whereas the midpoint is the second colour for "Cylindrical".

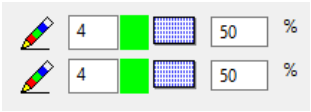
Example with the midpoint at 50 %:
Linear Cylindrical

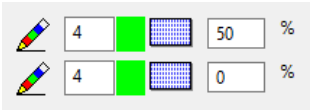


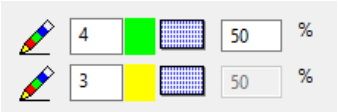
Transparency

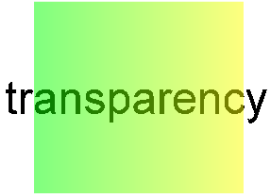


If two different colours are selected, only one field is free and the value applies to both colours at the same time.
If the same colour is selected twice, both fields are free and you can enter different values, e.g. for a transparency gradient.







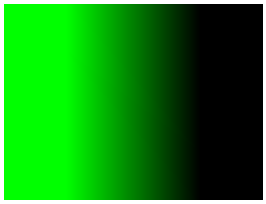


Angle
Specify the angle of the gradient direction.

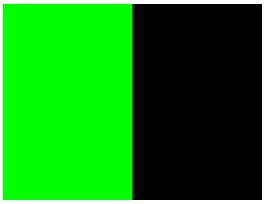
Border distance
Here you can define the border distance, which will apply to both sides equally. In this area, the base colour remains constant before the gradient starts.

Example with border distance:
0 %

25 %

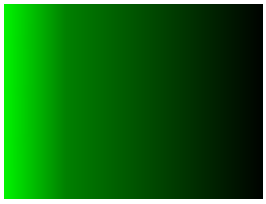


50 % (maximum)



Centre point
Specify here where the midpoint of the mixture is to lie.

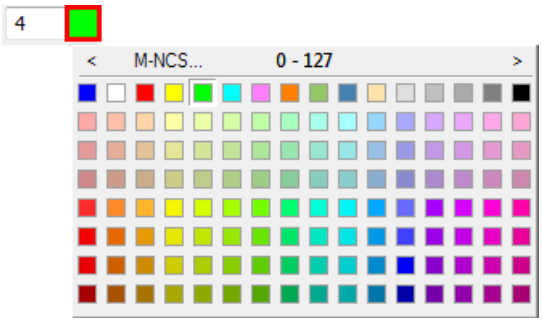
Example with centre point:
25 %



50 %

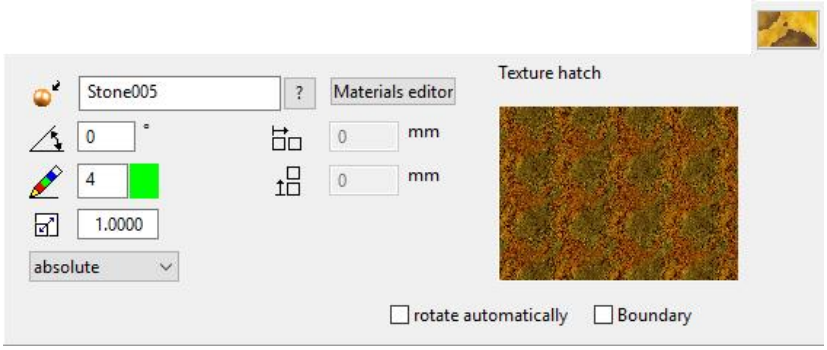
75 %

Pen number selection

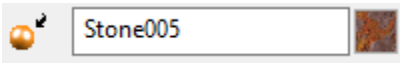


The SHOW function displays a preview of the current settings in the preview window.

Texture hatch
The hatching area will be filled with a texture from the material database. A texture hatch has the same settings like a model hatch. The only difference is that a texture will be used instead of the model used for filling the area.



Texture



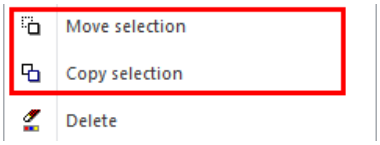
The texture can be selected from the defined materials. The button materials editor leads to the material parameters.

TIP

The order can be changed using the Foreground/Background control.
Hatches that lie on top of one another are not mixed by default.

EDIT HATCH

Move/copy hatch
The selected hatch can be moved or copied using the context menu (right-click).



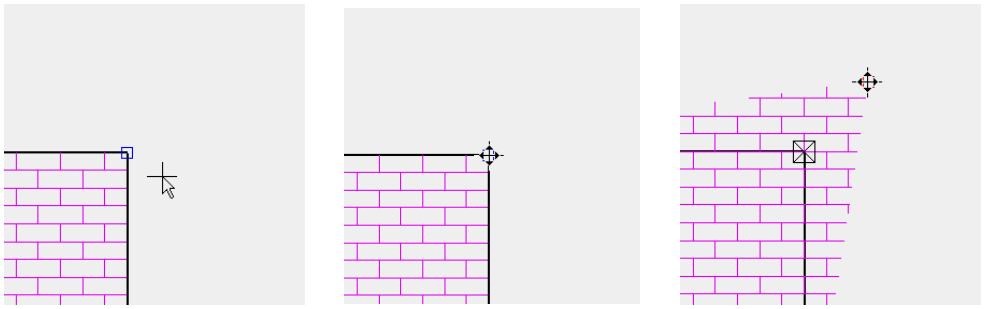
The query *Move which point?* appears.
After you click a point, the query *Position where to?* appears.
Place the hatch in the new location.

Modify hatch

When the hatch is selected, the properties bar is displayed and the handles and grippers appear on the contour of the hatch. You can modify the hatch parameters in the properties bar.

With the handles and grippers, you can modify the shape of the hatch. Move the cursor onto a handle or gripper until the cursor's depiction changes to a four-direction arrow. Click to confirm. The additional functions are available at the cursor in the Input Assistant or by pressing [Tab].

Change shape using handle



TIP

If a polygon is congruent with the hatch contour and is selected, the change affects both items.

Align hatch

The function to align the hatch is launched vie the property bar of the hatch. First, an arbitrary point has to be selected. A new location has to be indicated and the elements of the hatched are aligned accordingly.

HATCH FUNCTIONS

Element hatching

Hatch toolbar

The hatch is converted to elements. The hatch is preserved.

Delete hatch

Hatch toolbar

This function only deletes hatches.

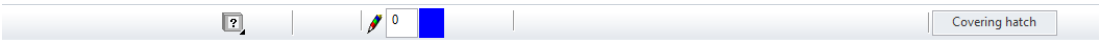
COVERING HATCH

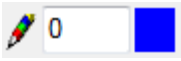
Toolbar * Create new

Lay-out menu > Hatch > Covering hatch

This function is used for covering a specific area of the drawing.

Covering hatch properties bar





Pen colour

After activating the function, you are prompted to specify the first point of the polygon. Next, you can continue moving around the polygon until it is closed again.

Pen colour
Select the pen type to be used to represent the frame. You cannot change the infill here.

Modifying covering catch
See Edit hatch

6.6 TEXTS

The text is part of the "rest".

Visible/invisible

The text can be temporarily switched off using the image control functions.

Switch on/off
VIEW menu > SWITCHES
If you switch off the text using this check box, the text is not saved during "Save as" unless the subsequent dialog window is confirmed with "visible selection". That way you can create a plan without text.

Rest scaling
SETTINGS menu > REST SCALING on/off
If rest scaling is switched off, the text is not enlarged or reduced when scaling or modifying the scale.

CREATE TEXT

A	Toolbar * Create new
	Lay-out menu > Texts

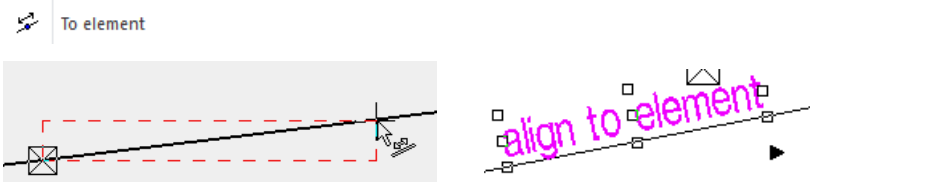
You can use this function to create texts. The line length is limited to 160 characters. After activating the function, you have two options for positioning the text.

Entry by rectangle

Expand a rectangle, where the first point placed becomes the **reference point** and a continuous text can be written. The text has automatic line breaks for the provided width.
If the width of the text box is changed using the handles, the line breaks are automatically adapted.

TIP

If you want to align the text to a slanted line, you must select the "To element" capture mode.



Entry by reference point

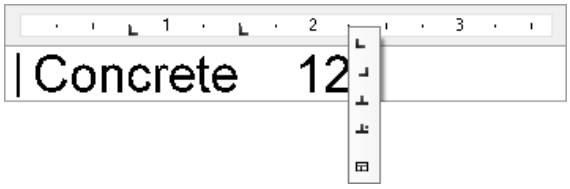
When setting the text's reference point, the line breaks must be manually added with Enter. If the text box's width is modified using the handles, these line breaks are retained.
For an additional text, you do not need to call up the function again, but simply click the new position.

Automatic text enlargement
The text is displayed for entry and editing to be ideal for the screen, no matter the text size and text angle. A vertical text at 90° is written horizontally during entry, and then rotated once the text function has been exited. The same applies to the text's size and position. If you do not want this effect, you can switch off the option under SETTINGS > OPTIONS > WORK PARAMETERS > GENERAL.

Tabulator (tabs)

You can use tabs to align the text to the left or right, centre it, or align it to a decimal point.
When text is being written or edited, the ruler appears above the text box, where you can set and view the tabs.

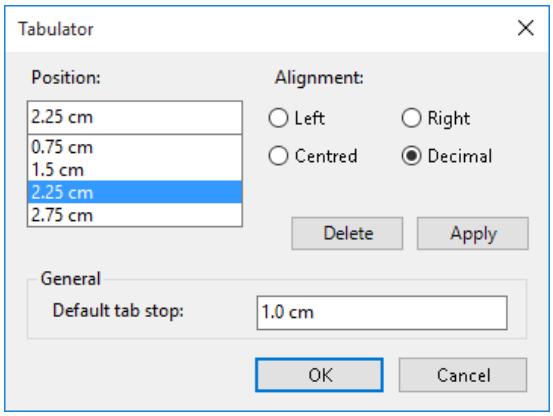
To set a tab, right-click the ruler in the desired position and select one of the four tabs from the context menu.



TIP

The type of an existing tab can be modified using the context menu.

You can open the settings dialog window either via the option at the end of the list or by double-clicking the ruler.



In order to specify new spacing, enter the value in the "Position" field and confirm it with "Apply".
You can only change an existing position by deleting it and recreating it. "Apply" always makes a new entry. The old position must therefore still be deleted.

TIP

You can also drag the tab symbol to the new position directly on the ruler. To delete a tab, simply drag the symbol down from the ruler.

TEXT PROPERTIES BAR

The properties bar appears when you are creating or editing a text.

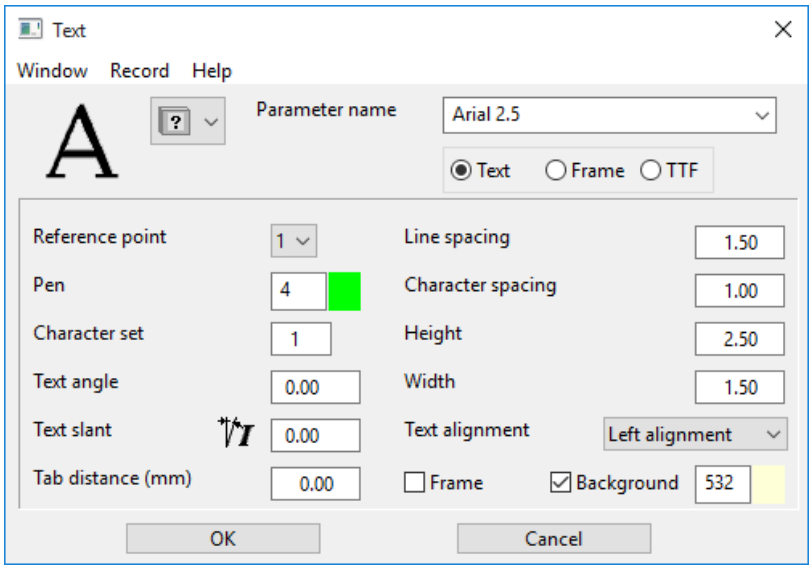
	Text parameters
Arial 2.0	**Parameter type**
	Renovation planning state (in ELITECAD Architecture, see chapter 8.5)
Arial	**Font**
4	**Pen type**
2.5	**Text size**
0	**Angle**
	Entry style
	Reference point
F	**Bold**
K	**Italic**
U	**Underlined**
θ	**Crossed out**
0	**Overlined**
x₂	**Subscript**
x²	**Superscript**
	Text alignment
	Background colour

TEXT PARAMETERS

Here, you can define all text-specific parameters. The parameter dialog window is subdivided into Text, Frame and TrueType font. You can save your own parameter records in the RECORD menu.

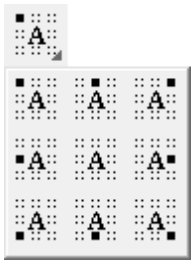
Difference between text and TrueType font
All vector-based fonts are stored under "Text". Each of these fonts is created out of individual lines.
All fonts that are installed on your PC (C:\WINDOWS\Fonts) are stored under "TrueType font". TrueType fonts include Arial, Times New Roman, etc.

Text



Reference point
The reference point specifies how the text should be positioned relative to the digitised point.
Specify this by entering a number from 1 to 9.

The reference point is displayed visually on the properties bar.



Pen
Select the pen type to be used to represent the text. The pen numbers range from 0 to 1023. The pen affects how the texts are printed. You can achieve bold text by selecting a thicker pen.

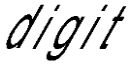
Character set
The most common character sets:

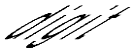
1	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
2	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
5	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
6	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
7	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
8	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
10	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
12	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
13	ABCDEFGHIJKLMNOPQRSTUVWXYZ
18	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
20	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
22	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
60	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
100	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
101	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
102	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
111	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
202	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
205	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
207	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
209	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
211	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
212	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
216	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
229	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
231	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
233	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
235	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz

Text angle (-90 – 360)

Angle of texts from the horizontal.

Text slant (-60 – 60)
Inclination angle of text, from -60° up to +60°.

e.g. a = 30° 

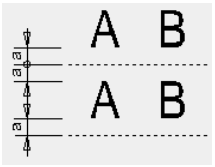
e.g. a = 60° 

TIP

The way the angle is measured depends on the setting of the check box "Entry of text direction" under SETTINGS > OPTIONS > WORK PARAMETERS > GENERAL.

Tabulator offset
Default tab stop is listed in mm of paper.

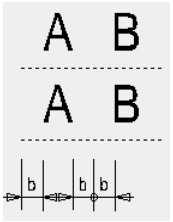
Line spacing (1.0 – 2.5)



This "**LS**" (line spacing) factor sets the distance from the text to the invisible baseline.
The vertical spacing between the characters in two lines is the doubled distance "**a**" (see figure).
Formula to calculate the "LS" (line space) factor:

$$LS = \frac{\text{2 x "a" text spacing in mm}}{\text{Text height in mm}} + 1$$

Character spacing (1.0 – 2.5)



This "**CS**" (character spacing) factor sets the character distance.
Formula to calculate the "CS" (character spacing) factor:

$$CS = \frac{\text{2 x character spacing "b" in mm}}{\text{Character width mm}} + 1$$

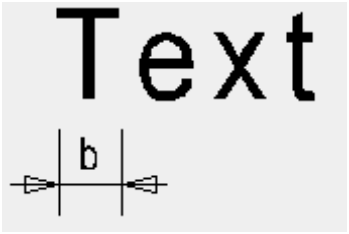
Examples

	Text height - factor "LS" or character width - factor "CS"									
desired line spacing "a" or character spacing "b" in mm	2,00	2,50	3,00	3,50	4,00	5,00	6,00	8,00	10,00	12,00
0,5	1,50	1,40	1,33	1,29	1,25	1,20	1,17	1,13	1,10	1,08
1	2,00	1,80	1,67	1,57	1,50	1,40	1,33	1,25	1,20	1,17
1,5	2,50	2,20	2,00	1,86	1,75	1,60	1,50	1,38	1,30	1,25
2			2,33	2,14	2,00	1,80	1,67	1,50	1,40	1,33
2,5				2,43	2,25	2,00	1,83	1,63	1,50	1,42
3					2,50	2,20	2,00	1,75	1,60	1,50
4							2,33	2,00	1,80	1,67
5								2,25	2,00	1,83
6									2,20	2,00
8	**factor "LS" / "CS"**									2,33

Height (0.01 – 1000 mm)

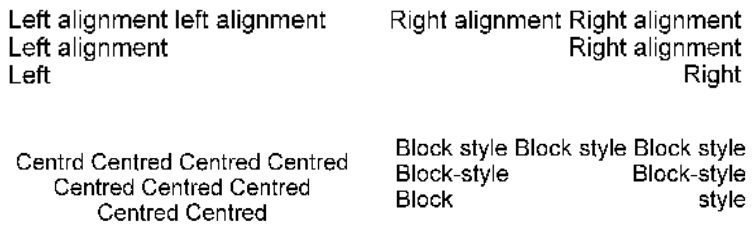
You can enter character heights from 0.01 – 1000 mm.

Width (0 – 1000)



You can enter numeric widths from 0 – 1000 mm.

Text alignment
Select one of the four available text alignments:
Left alignment, right alignment, centred or block style

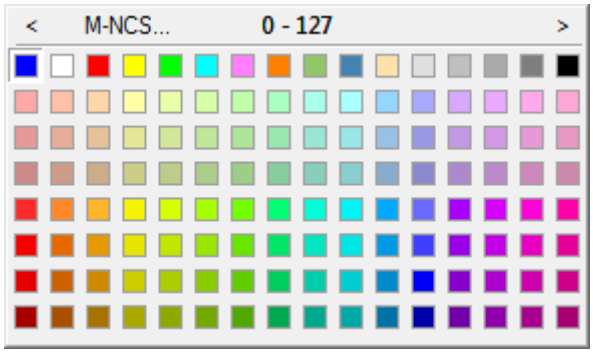


TIP

The block style only takes effect if there are spaces between words in the text.

Frame
If this field is activated, the text is given a frame. You can format the frame on the "**Frame**" tab.

Background
There is an option to set an infill hatch as the background.
The 0 pen is invisible and is used to cover things.

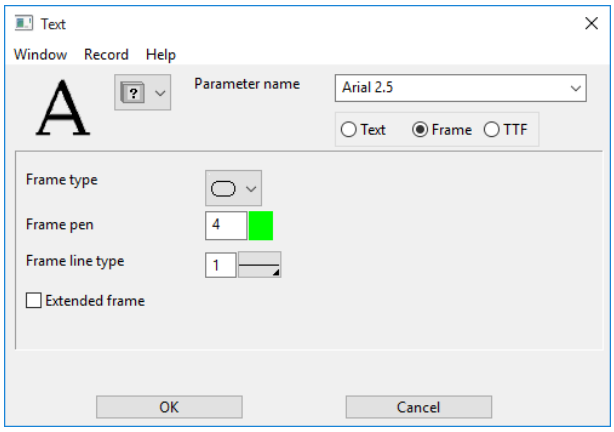


TIP

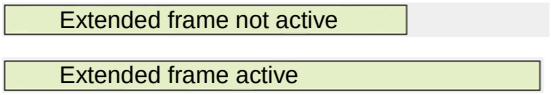
The background colour can also be controlled via the properties bar.

Frame

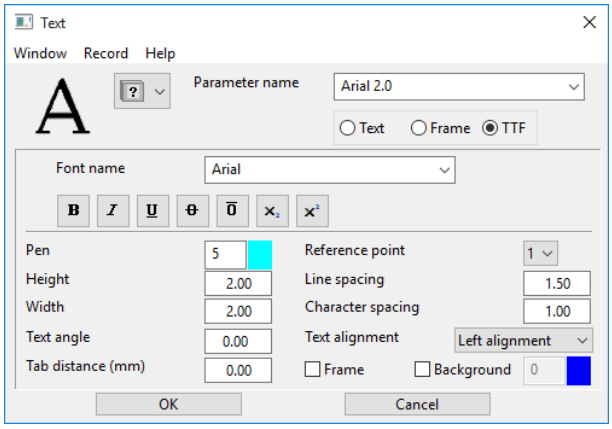
Properties bar Text: Text parameters: Frame



This mask specifies the pen type, line type and the shape of the text frame. Whether a text frame is used depends on the setting of the "Frame" check box on the Text and TTF tabs.
If the EXTENDED FRAME option is not selected, the frame is only as large as the text itself. Otherwise, the frame fills the entire text box.



TrueType font



Font
All TrueType fonts installed on the PC are listed. The fonts are in the "Fonts" Windows directory. The number of fonts varies from PC to PC.

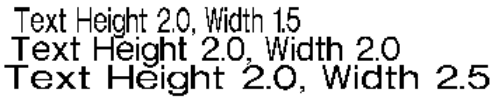
Formatting: bold, italic, underline, strike-through, overlined, subscript
If desired, activate the respective switch.

Pen
Select the pen type to be used to represent the text. As the TrueType fonts have a given type face, the pen does not affect printing.

Height (0.01 – 1000 mm)

You can enter character heights from 0.01 – 1000 mm.
As the TrueType fonts have a given type face, the width of the characters is modified in proportion to the height.

Width (0 – 1000)



You can enter numeric widths from 0 – 1000 mm.

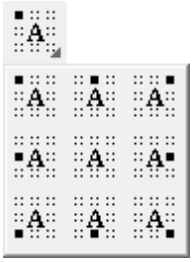
Text angle (-90 – 360)

Angle of texts from the horizontal.

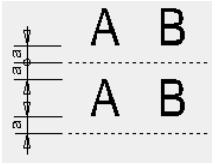
Tabulator offset
Default tab stop is listed in mm of paper.

Reference point
The reference point specifies how the text should be positioned relative to the digitised point.
Specify this by entering a number from 1 to 9.

The reference point is displayed visually on the properties bar.



Line spacing (1.0 – 2.5)

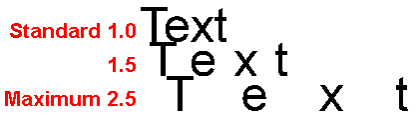


This "**LS**" (line spacing) factor sets the distance from the text to the invisible baseline.
The vertical spacing between the characters in two lines is the doubled distance "**a**" (see figure).
Formula to calculate the "LS" (line space) factor:

$$\text{"LS" factor} = \frac{\text{2 x "a" text spacing in mm}}{} + 1$$

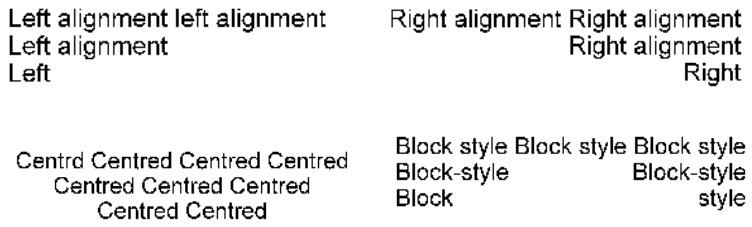
Text height in mm

Character spacing



The character spacing can be enlarged up to a factor of 2.5.

Text alignment
Select one of the four available text alignments:
Left alignment, right alignment, centred or block style

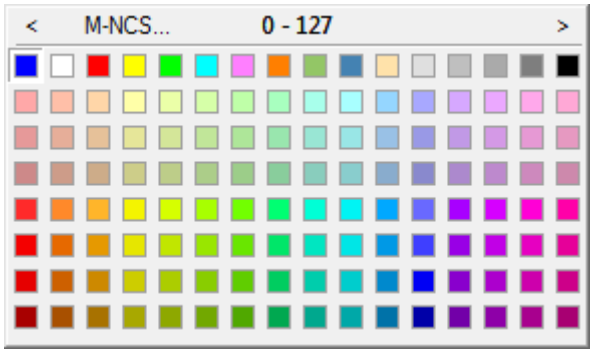


TIP

The block style only takes effect if there are spaces between words in the text.

Frame
If this field is activated, the text is given a frame. You can format the frame on the "**Frame**" tab.

Background
There is an option to set an infill hatch as the background.
The 0 pen is invisible and is used to cover things.

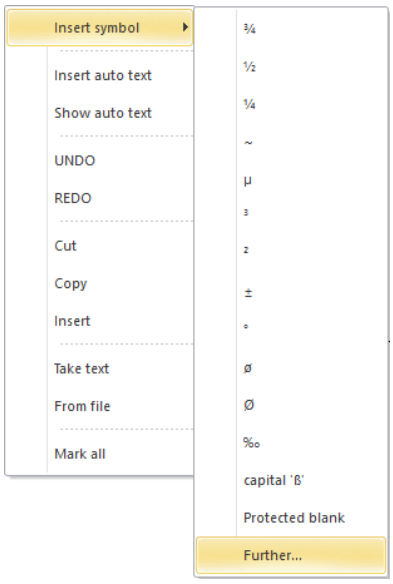


TIP

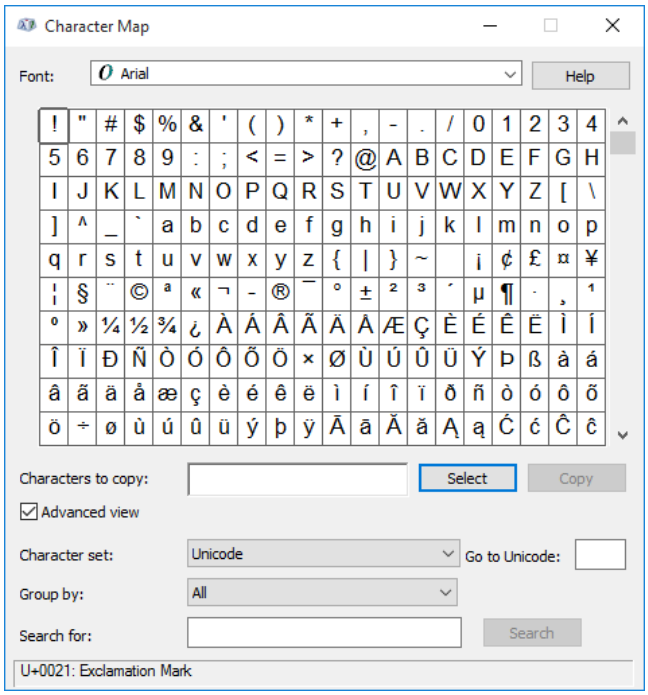
The background colour can also be controlled via the properties bar.

Special characters

Insert symbol
If you right-click inside the text box while creating or editing a text, the item "Insert symbol" appears in the context menu. Selecting a character inserts it at the current cursor position.



If you click on "Further...", the Windows Character Map appears.

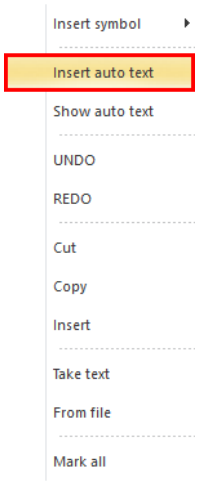


You can use the character map to view characters that are available in the selected **font**. You can copy individual characters or a group of characters to the **clipboard**, and then paste them into ELITECAD.

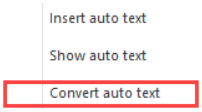
Autotext

If you right-click inside the text box while creating or editing a text, the item INSERT AUTO TEXT appears in the context menu. An auto text item is a placeholder where ELITECAD displays data that is subject to change. Variable auto text items such as the date or time are not constantly refreshed, but they are updated when printing at the latest.

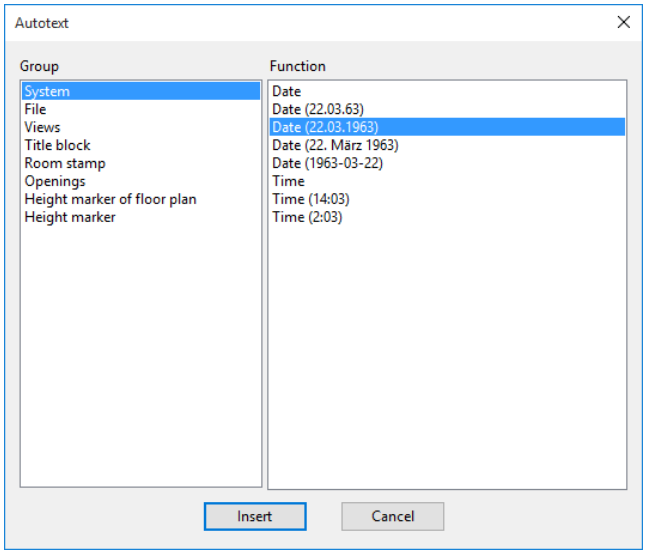
If the SHOW AUTO TEXT item is activated, auto text is displayed as normal text, not as placeholders.



An auto text item can be converted to normal text. During editing, an item appears in the context menu: CONVERT AUTO TEXT.



An easy example of auto text is the date. This generates text that automatically displays today's date. Various formats are possible.

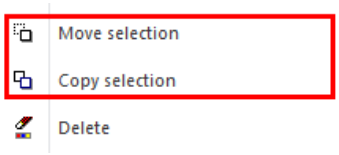


General auto text items can be found under the System, File and Views groups.
You can use the Title block, Room stamp, and Openings groups to create your own Lib parts for each function.

MODIFY TEXT

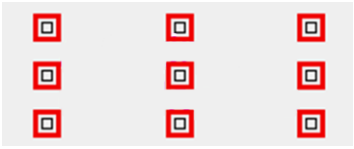
Modify text
You can modify the text by double-clicking it to edit it.

Move/copy text
If you click on a text, then right-click to open the context menu, you can move or copy the text using the respective functions shown here.



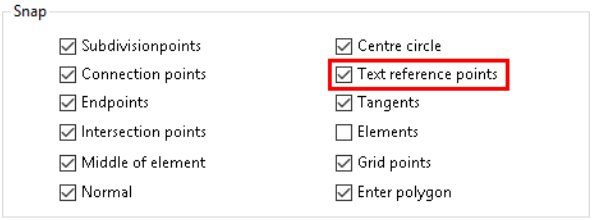
The query *Move which point?* appears.
After you click a point, the query *Position where to?* appears.
Place the text at the new location.

Handles
Alternatively, you can also move or copy the text by clicking on a handle around the selected text. The text now "sticks" to the cursor and can be placed in the new location. If you also click and hold the [Ctrl] key while dragging it, a copy is made.



You can modify the text box using the two handles underneath the text.

Capture mode for the text
If you right-click inside the graphic window, you can specify under CONFIGURE AUTO CAPTURE whether or not to snap to text reference points.



Context menu
If you right-click inside the text box while creating or editing text, a context menu appears.

Take text
You can use this option to use any text that has already been placed. Instead of laboriously typing in text, you can paste existing text in the current text position.
To do so, select a text by clicking on it after activating the function.

From file
This function enables you to import the alphanumeric text of an *ASCII* file into a CAD drawing. E.g., a text file with the ".txt" extension (file type). You cannot adopt any formatting such as tabs, spacing, etc.

After activating the function, you can select the text file.

TEXT FUNCTIONS

Text on line

Text toolbar

You can use this function to align the text you entered directly to the inclination of a line, help line or curve. The current text parameters apply, including reference point. The line you clicked is snapped to a right angle. This point then becomes the reference point for the text.

Copy text

Text toolbar

Copies (duplicates) an existing text at another location. The function remains active.

Move text

Text toolbar

This function is used to move a text to a new location in the drawing. The function remains active.

Modify text

Text toolbar

Take text

Text toolbar

Text from file

Text toolbar

Delete text

Text toolbar

This function is used to delete selectively a text in the drawing.

Insert text balloon

Text toolbar

This function generates a frame around an existing text.

After activating the function, you are prompted to select the text to be framed. The text is framed following the previously configured frame parameters and the system is ready to frame other texts.

Delete text balloon

Text toolbar

This function deletes an existing text frame.

After this function is activated, you are asked to select the desired frame. In doing so, you must position the cross hair inside the frame. The frame is deleted and the system is ready to delete another frame.

Modify text content globally

Modify menu > Modify text content globally

You can use this function to search for a text string such as a word in all existing texts and replace it with another text string.
The text to be replaced and the new text can also be a part of a word or multiple words.
The search is case-sensitive and takes account of spaces at the start or end of the text.

6.7 MATERIAL

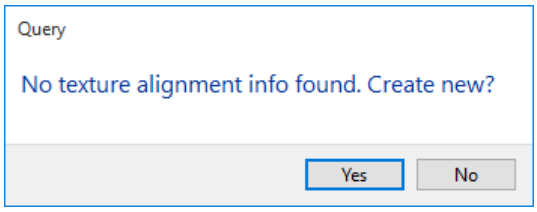
You can change the alignment by which texture images are applied to 3D objects after they have been added. These options only have an effect if the texture in question is tiled.

ALIGN TEXTURE

Lay-out menu > Material > Align texture

You can use this function to align the texture on an individual surface. After you call up the function, you must click the desired surface. Next, you can specify the reference point and the new position for the shift.

If a surface does not yet have any texture alignment information, a query appears asking whether this should be generated. You must confirm the prompt with "Yes". This is the case for 3D objects such as surfaces, boxes, freeform, etc.



EXPLANATION

When an object is edited or refreshed, the texture alignment is reset.

ALIGN TEXT GLOBALLY

Lay-out menu > Material > Align text globally

This function can be used to align the texture of multiple surfaces at the same time. After you call up the function, you must click on an appropriate surface. Next, you can specify the reference point and the new position for the shift.

TIP

You can shift the first surface you click on in any direction, but you can only shift the height for the other surfaces that have the same texture.

EXPLANATION

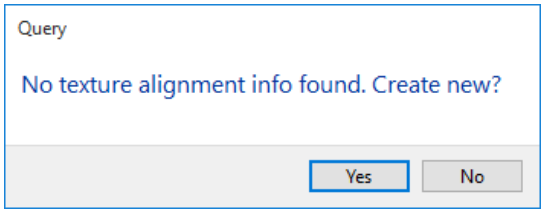
Architecture objects in the same structure automatically have a texture alignment and are already combined. For 3D objects such as surfaces, boxes, freeforms, etc., you must first run the function **JOIN TEXTURE ALIGNMENTS**.

JOIN TEXTURE ALIGNMENTS

Lay-out menu > Material > Join texture alignments

You can use this function to combine texture alignments. After you call up this function, you must click on the first surface to align. Then select the other surfaces and complete the function by pressing [Enter].

If the first surface you click on does not have any texture alignment information, a query appears asking whether this should be generated. You must confirm the prompt with "Yes". This is the case for 3D objects such as surfaces, boxes, freeforms, etc.



REMOVE TEXTURE ALIGNMENT INFO

Lay-out menu > Material > Remove texture alignment info

This function deletes the texture alignment information of a specific surface.
After you call up the function, you must click the desired surface.

6.8 TITLE BLOCK

Title blocks are ELITECAD drawings with prepared auto text items (project, plan name, etc.) that are stored in a separate folder. The PLACE TITLE BLOCK function opens the title block directory directly. You can use the COMPLETE TITLE BLOCK function to fill in the auto texts that are integrated in the title block.
The appendix to course unit 3 shows how to create your own title block.

PLACE TITLE BLOCK

Lay-out toolbar
Lay-out menu > Place title block

When you place a title block, a file selection window opens, where you can select and load the desired title block.

TIP

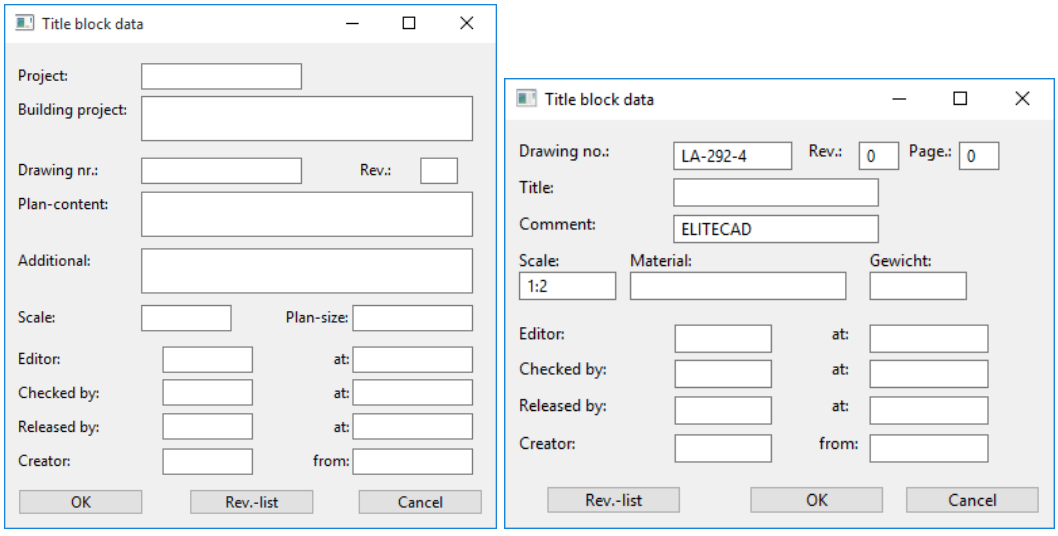
This first checks whether the current project directory has a "head" subfolder. If one is not found, the directory of the default title blocks *<ELITECAD installation path>\u\<version>\<ar|me>\glob\l\head* opens.
This way you can easily manage and load project-specific title blocks that include specific information or have a specific layout.

You can use this function to import any custom title blocks or parts of title blocks. However, you only have the option to fill in the title blocks automatically if the corresponding auto texts are in use.

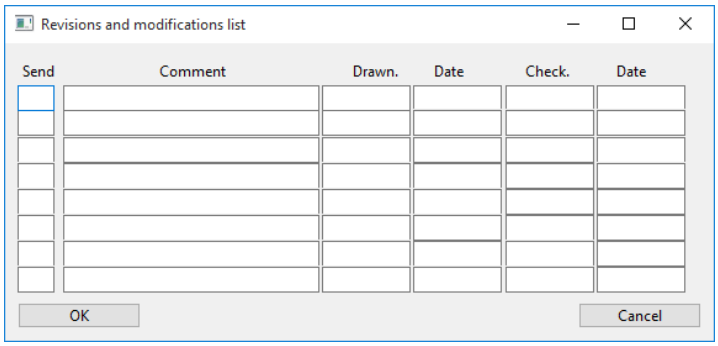
COMPLETE TITLE BLOCK

Lay-out toolbar
Lay-out menu > Complete title block

After you place a title block, a window opens where you can enter the information via the COMPLETE TITLE BLOCK function.



If there is already a filled-in title block on the plan, the information is copied over from it. The *Scale, Page format, Editor* (login) and *Date* are automatically filled in but can be changed.
THE DATA IS ONLY WRITTEN INTO THE TITLE BLOCK IF IT WAS GENERATED WITH THE CORRESPONDING AUTO TEXTS.
> SEE THE CHAPTER "MODIFY TITLE BLOCK".
You can also call up or enter revision comments via the "Rev. list" button. These comments are also filled in automatically.

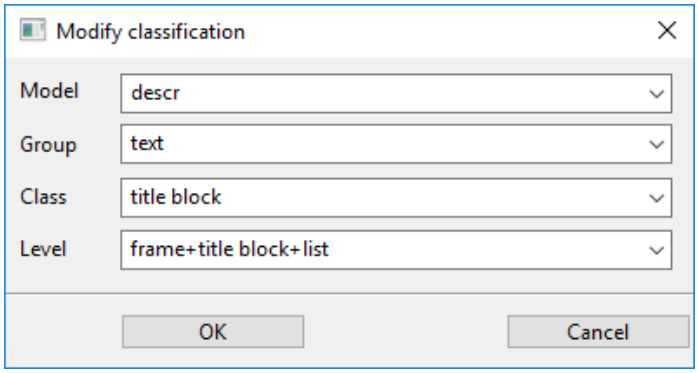


A maximum of 8 revision comments are possible.

CONFIGURE CLASSIFICATION TITLE BLOCK

Up to ELITECAD version 12.0 the title block was defined by objects with specific classification structure. Classification title blocks can still be used in parallel to title blocks with auto texts.

In case you create your own classification title blocks, you have to consider that the text that is generated automatically by the function COMPLETE TITLE BLOCK, belongs to an object with a specific name.
The title block needs a specific classification structure. You can modify the classification by the function CHANGE > CLASSIFICATION.
Select all objects of the title block and enter the following values.



TIP

Each of the texts that are filled out need to be an individual object with specific name. The easiest way to achieve this is to take an existing title block and copy single objects in your title block.

Following object names are defined for the title block

material	Material.pre-product
pageno	Page number
id	Drawing number
rev	Revision
descr	Plan description
comm	Comment
scale	Scale
weight	Weight
cre_usr	Edited by
cre_date	Edited on
chk_usr	Checked by
chk_date	Checked on
free_usr	Approved by
free_date	Approved on
ori_usr	Creator
ori_date	Creation date

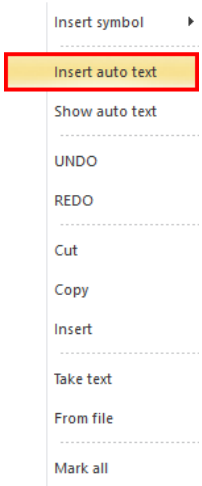
Following object names are defined for revision marks

*rev_rev	State (revision)
*rev_descr	description
*rev_usr	User
*rev_date	Revision date
*rev_chk	Checked by
*rev_cdate	Checked on

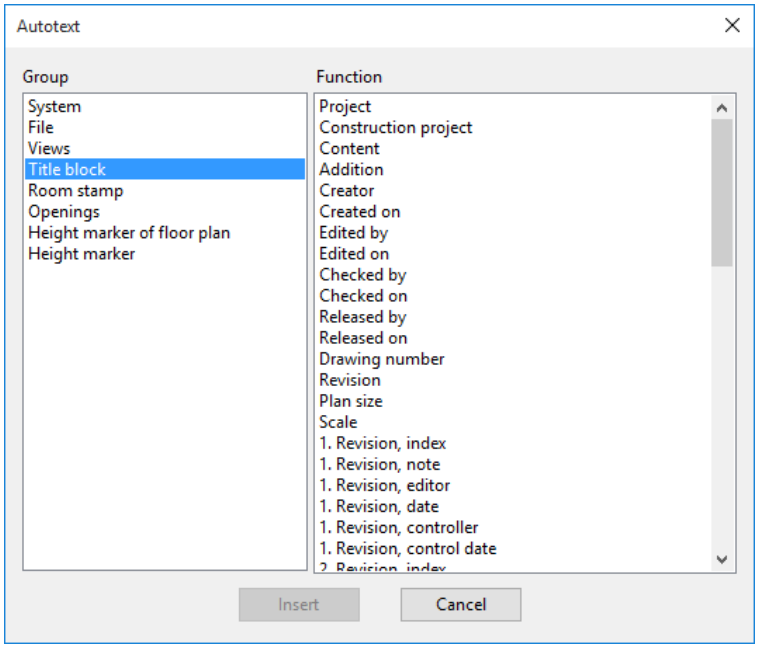
Enter the revision number instead of the asterisk at beginning of the object name (number between 1 and 8), e.g. *1rev_rev*, *2rev_rev*.

MODIFY AUTO TEXT TITLE BLOCK

Title blocks can be personalised. The AUTO TEXT function can be used to add fields.
If you right-click inside the text box while creating or editing a text, the item "Insert auto text" appears in the context menu.



All the options are listed under the Title block group.



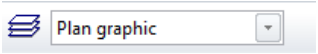
CREATE CUSTOM TITLE BLOCK

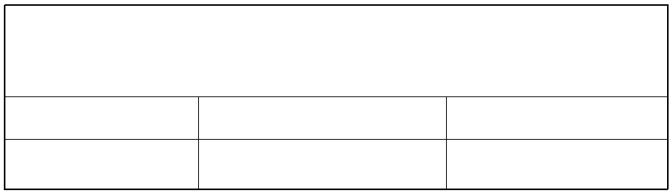
WORKSHOP

Open new drawing.

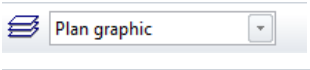
1. Select the function FILE NEW and change the scale to 1:1.

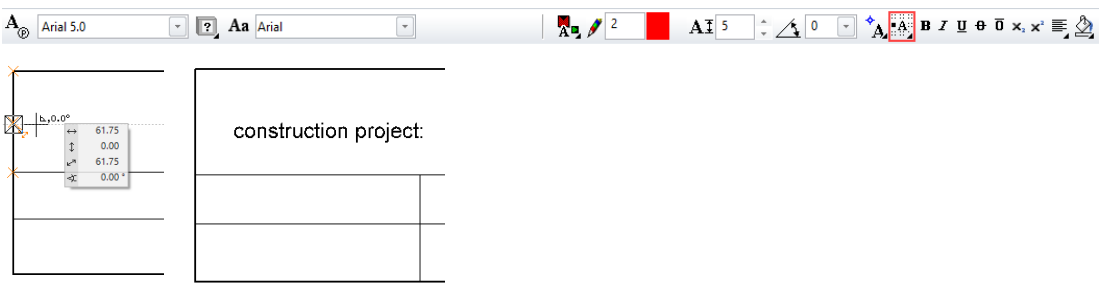
2. Draw the frames for the different fields, ensuring that all elements are in the *Plan graphic* layer.



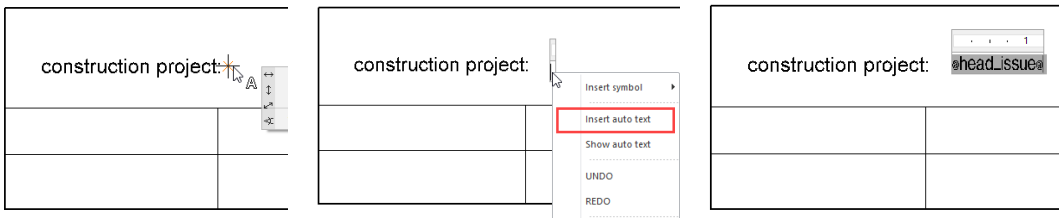


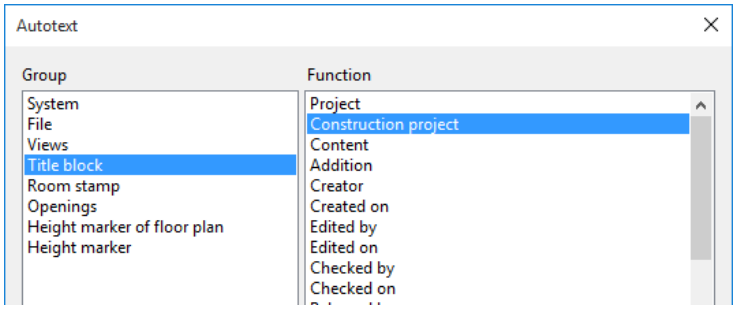
3. Add text. To enable a text to be created vertically in the centre of a field, the text reference point must be set to *Centre left*.



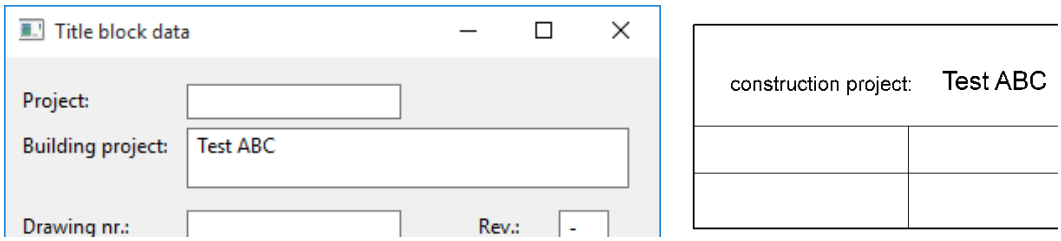


4. Auto texts can now be added to the title block. There are auto texts that are filled out directly by the program (project, MST, file name, etc.) and auto texts that are filled in via the screen *Complete title block* (plan content, building project, etc.).

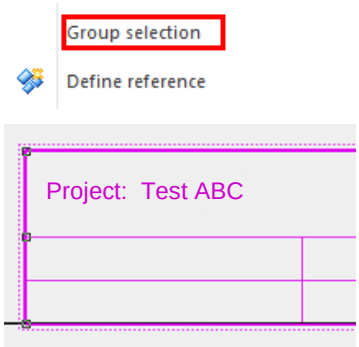




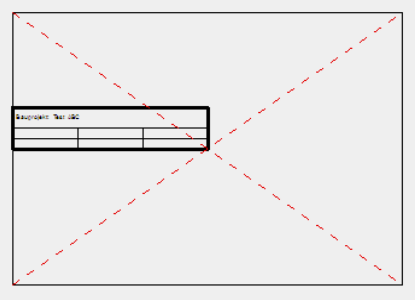
5. As a test the title block can be filled out:
LAY-OUT MENU > COMPLETE TITLE BLOCK.



6. To enable the title block to be selected with a single click, it must be grouped together. Select the title block and from the context menu select GROUP SELECTION.



7. Move the title block in such a way that the point of the title block is located in the middle of the page; later on the title block will be attached to this point when you locate it using your cursor.



8. Save the title block to your library.
FILE MENU > SAVE AS

WORKSHOP END

6.9 FORMAT FRAME

DIN/ANSI FORMAT

Lay-out toolbar
Lay-out menu > Format frame

This function is used to load a format frame.

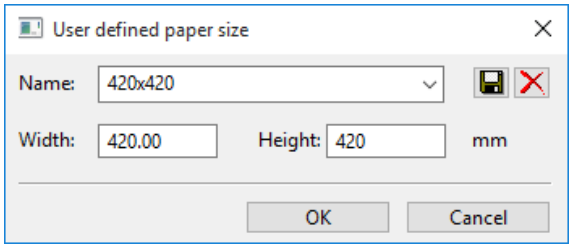
After the function is activated, the format frame is automatically loaded based on the current format settings (DIN, ANSI). In the A3 format only, enter the number of the desired DIN format (A3 or A4).

TIP

The symbols used for that are stored in the *<ELITECAD installation path>\u\<version>\cad\glob\l* directory under the name *a00 -a4* for DIN formats and *a–e* for ANSI formats. These symbols can be opened normally, like an *ELITECAD file*, then changed and finally saved again in the same directory under the same name. That way you can change pens, draw double frames or modify folding lines, for instance.

User-defined paper sizes

You can save your own format frames for user-defined paper sizes. They only need to have the same name as the saved template and be saved under the *<ELITECAD installation path>\u\<version>\cad\glob\l* directory.



7.3D-OBJECTS

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7.1 General 3D parameters

Common Parameters

In the properties bar and in the big parameter dialog window for 3D objects, some parameters and functions are equal for all 3D objects and are described in this chapter together for all types.

Layer/Name

Either the layer or the name of the object is edited here. The name is available if working with group/class/level is activated in the OPTIONS. This is the preferred setting in ELITECAD Mechanics.

Material

This setting is only available in ELITECAD Mechanics. The assigned material is added as an attribute to the object and listed in the bill of materials. This information is used to calculate the weight of an object if the volume is available. Additionally, the hatch for sections is defined by the material. A necessary requirement for the calculation is a specific weight for the material defined in the database.

Colour/Material

Here you can select the colour and transparency, as well as the material for 3D depiction.

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

Representation level

This function is only available in ELITECAD Architecture.

The depiction of 3D objects in views depending on the representation level can be changed here.

Renovation planning state

This function is only available in ELITECAD Architecture.

This function is used to set the renovation planning state. See chapter 8.5.

Kind of 3D definition

You have two options available for generating a 3D objects: Either draw the contour directly, or you can draw a closed polygon before accessing the function and "define" it as a 3D object.
For some 3D objects, it is required that the contour is a closed polygon.

TIP

If polygons are nested and were drawn or clicked from outside inwards, or are in the selection, cut-outs are produced.

Over contour entry

The definition is done by directly drawing a polygon. Once you have reached the start point of the drawing again, the function defines the 3D object immediately.
If open contours are allowed, the polygon input is terminated by entering the last point twice.

Over select contour

Click on the outline of the polygon to generate the 3D object.

Over selection
If a selection has already been made when this function is selected, a query appears as to whether this selection should be used.

Resolution

This function is used to set parameters for the resolution. You find a detailed description at the chapter MODIFY>RESOLUTION.

Modify contour

Using this function, you can change the contour of the surface at a later point.
Once you have clicked on the function, the 2D contour of the 3D object is automatically displayed.
For objects, which are defined by multiple contours, a selection window appears at the top left corner of the screen, where the desired contour is chosen. The selection is confirmed by either the [ENTER] button or by the clicking confirmation in the dialog.
Now change the contour with the usual 2D drawing functions. Close the function with the "Contour finished" button at the top left corner of the screen.

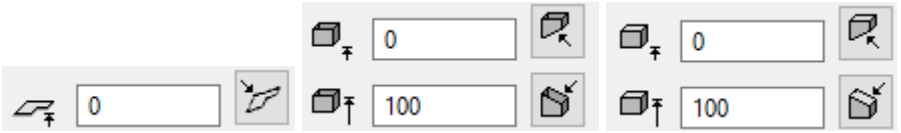
TIP

After selecting the surface, click on a handle or gripper of the contour to access manipulation functions directly in a tool bar or by using [TAB] with the cursor.

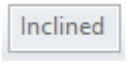
TYPE-SPECIFIC PARAMETERS

In the properties bar and in the big parameter dialog window for 3D objects, some parameters and functions are equal for multiple 3D objects and are described in this chapter together for corresponding types.

Planar Surface, extrude and box



The height is the distance of the planar surface from the work plane.
The base and upper heights for extrude and box are the limitation planes perpendicular to the work plane.



If the limitation plane is not perpendicular to the work plane, then instead of the height value the note "inclined" is displayed.

Height entry mode

Limitation plane over heights

The height can be entered as a numerical value (in the unit currently set) in the properties bar.

Limitation plane over point entry

The height can be directly defined using the CAPTURE FUNCTIONS by selecting a height marker in the 3D model.

Limitation plane over 3 points

This defines the surface over three points. The height is queried for each point. The definition of three Z-coordinate points for the slanted surface can take place anywhere on the screen, and is not linked to the contour elements!

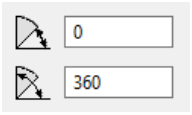
TIP

It is also possible to select points directly in the 3D model here. The clicked height is recommended above the entry line and can be easily confirmed with [Enter].

Limitation plane over surface

Clicking on an existing surface defines the position.

Rotation extrude and rotation box



The start and end angles for rotation are entered here.

Rotation type for trans surface, trans box, design surface, design box, free form surface, 2-views curve

The most common rotation types can be selected in the property bar for the trans box and trans surface.

parallel (type 1)

symmetrical (type 5)

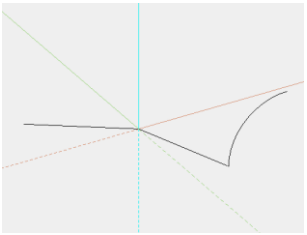
In ELITECAD Mechanics, there is a second creation method for the types 1-8 numbered 101-108

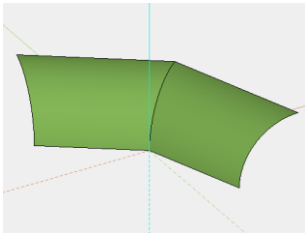
standard (type 102)

standard rounded (type 108)

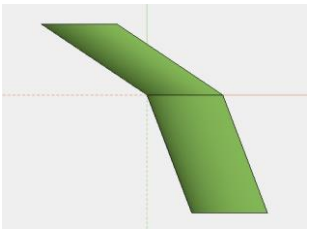
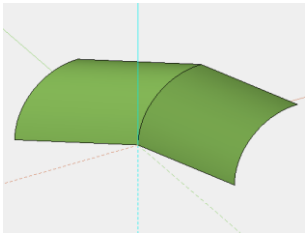
The rotation type for the remaining 3D definitions is set in the respective big parameter windows. The free type offers the possibility to enter the number of the type manually.

Starting position for the examples is a trans surface with the following origin:

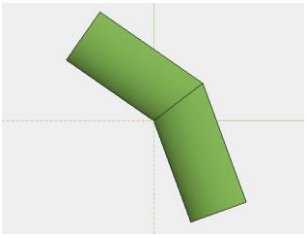
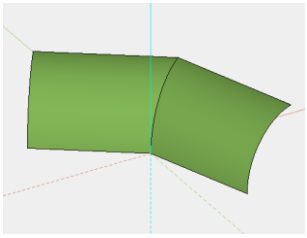




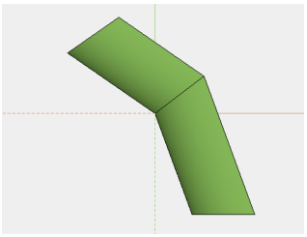
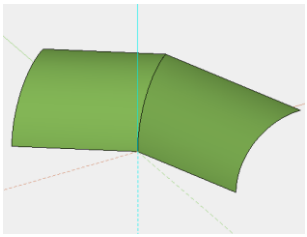
Type 1:
The contour is moved along the path without changing its position in space.

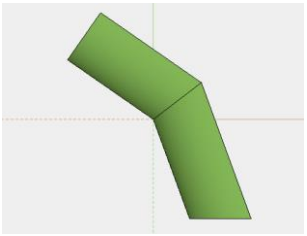
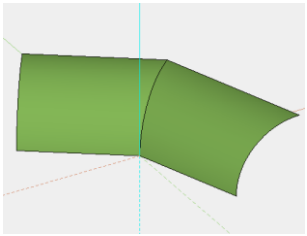
Type 2:
The contour is moved perpendicular to the path. The edge of the surface is perpendicular to the path.

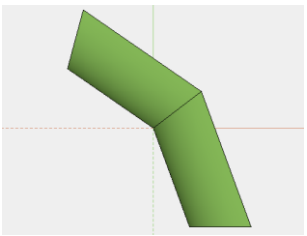
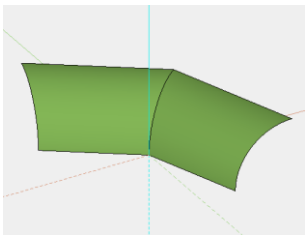
Type 3:
The contour is moved perpendicular to the path. The edge of the surface is at the same angle to the path at the start and the end. The angle corresponds to the angle between the contour and the path.

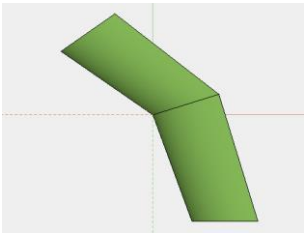
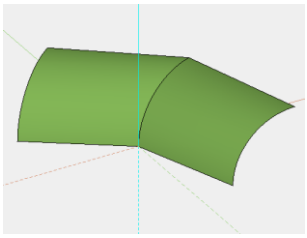
Type 4:
The contour is moved perpendicular to the path. The edge of the surface maintains the angle between the contour and path on one side and ends perpendicular on the other side.

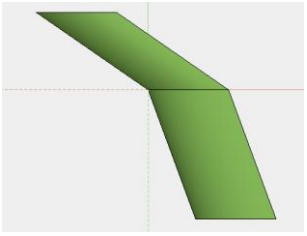
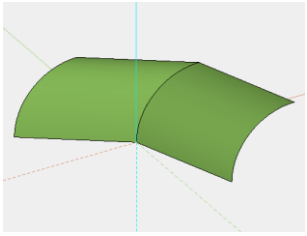
Type 5:
The contour is moved perpendicular to the path. The edge of the surface maintains the angle between the contour and path on one side and ends symmetrical on the other side.

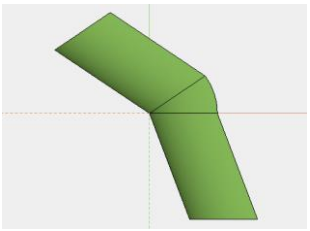
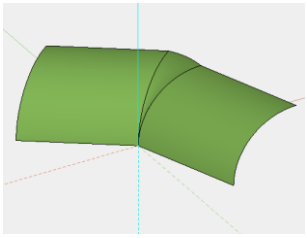
Type 6:
The contour is moved along the path and maintains the enclosed angle. Holes that result from buckles are filled.

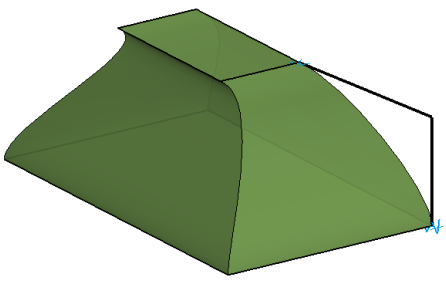
Type 7:
The contour is moved along the path and maintains the enclosed angle. The angle changes if there are buckles.

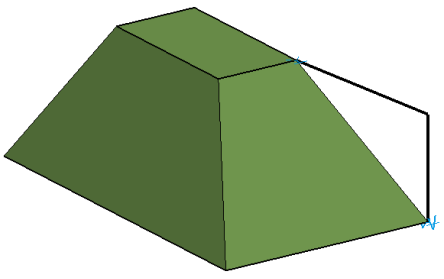



Type 8:
The contour is moved along the path and maintains the enclosed angle. Holes that result from buckles are filled with a round joint.

Type 101, 102 for design box and design surface:
This special type is only available in ELITECAD Mechanics and is valid for the 3D types design box and design surface.
The type 102 uses the direction of the direction of the way contour in the start and end point as a tangent for the surface. With the type 101 the way contour is irrelevant for the generation. The surface with the shortest connection is created for the type 101.


type 102


type 101

Delta
The tolerance with which two border curves are considered being connected. Default value is 0.01 mm. Only displayed for 3D objects defined in the Window Manager of ELITECAD 6.0.

Height
Only displayed for 3D objects defined in the Window Manager of ELITECAD 6.0.

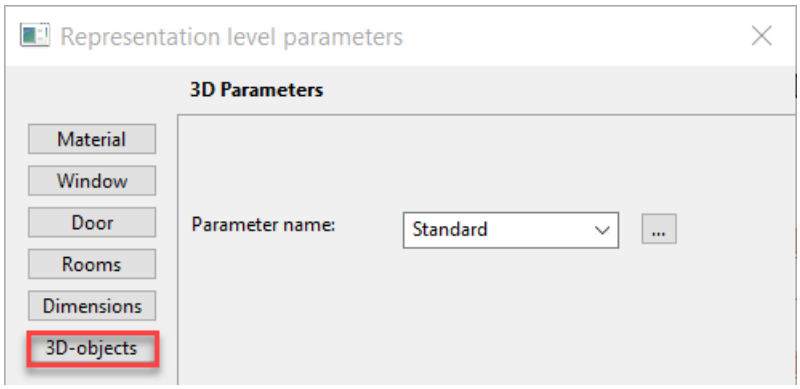
Operator definition
The following types of operations are possible:
Minus operation, join, section, and fillet.

Online
The definition is only updated if online is switched on.

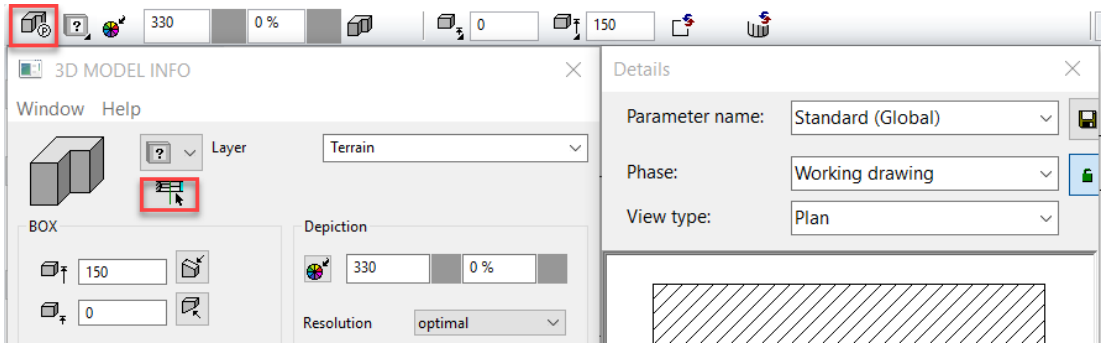
Radius
Only possible for fillet operations; radius for fillet surface.

Depiction

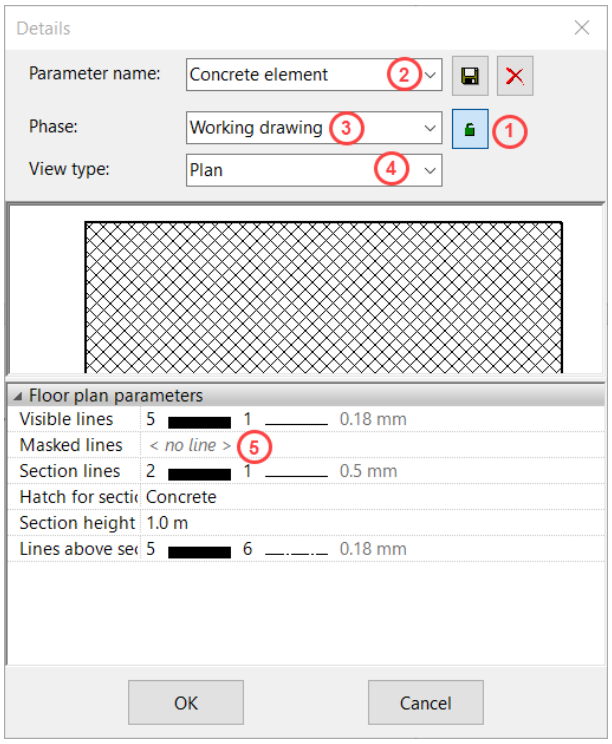
This function is only available in ELITECAD Architecture.
3D objects are subject to the representation level, therefore allowing a depiction that is true to the material for views, sections and floor plans each at the appropriate scale. Each newly defined 3D definition is automatically assigned the default parameters from the representation level.



To obtain an individual depiction of single definitions, a created definition is assigned its own material.



Once the link (1) is detached from the representation level, an existing parameter can be selected (2) or a new parameter record can be directly created. The settings (5) must be made per representation level (3) and view type (4). The settings (5) differ for each view type.


Details
Parameter name:
Concrete element
2
Phase:
Working drawing
3
1
View type:
Plan
4
Floor plan parameters
Visible lines
5
1
0.18 mm
Masked lines
< no line >
5
Section lines
2
1
0.5 mm
Hatch for secti
Concrete
Section height
1.0 m
Lines above se
5
6
0.18 mm
OK
Cancel

7.2 CREATION

PLANAR SURFACE

Define planar surface

	3D tool bar, Free forms tool bar (AR), 3D-Object tool bar (ME)
	Draw menu > 3D > Surface

This function is used to define a surface from a closed 2D contour.
Click on the Create planar surface function to enable the settings for the last planar surface drawn. The contour can now be drawn.

TIP

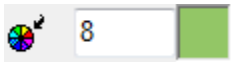
If the 2D contour is open at one point, the surface is not created. The contour must first be correctly closed for the surface to be generated.

Planar Surface properties bar

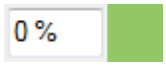
The properties bar becomes visible as soon as the DEFINE SURFACE function is started or if an existing surface is edited.

3D object parameters

Renovation planning state (only in Architecture)



Colour selection (colour mode)



Transparency in percentage (colour mode)

Material selection (material mode)

Kind of 3D definition

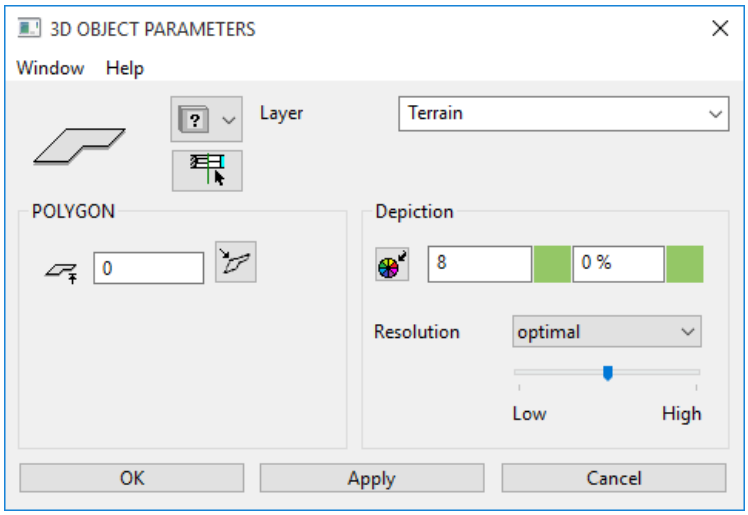
Entry mode for the base height

Modify contour

Resolution

General properties see chapter General 3D parameters.

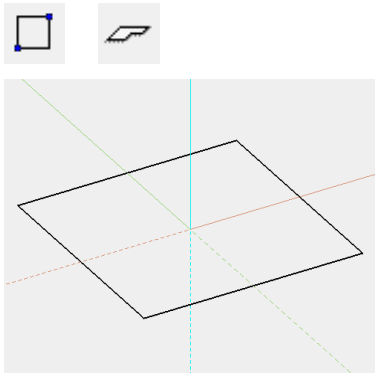
3D object Parameters

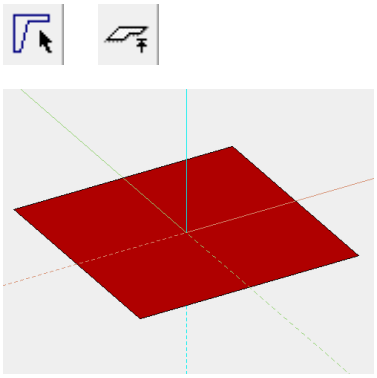


WORKSHOP

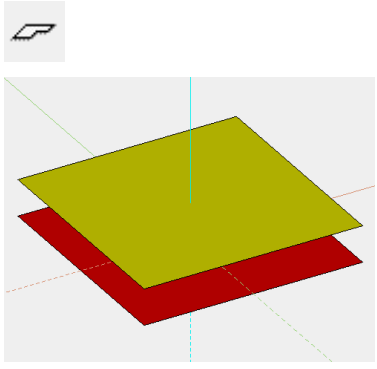
Define surface

Draw a rectangle, then click on DEFINE SURFACE and set the *Kind of 3D definition* to *Select contour*. Set the height to **0**, the colour to **2** and click on the rectangle.





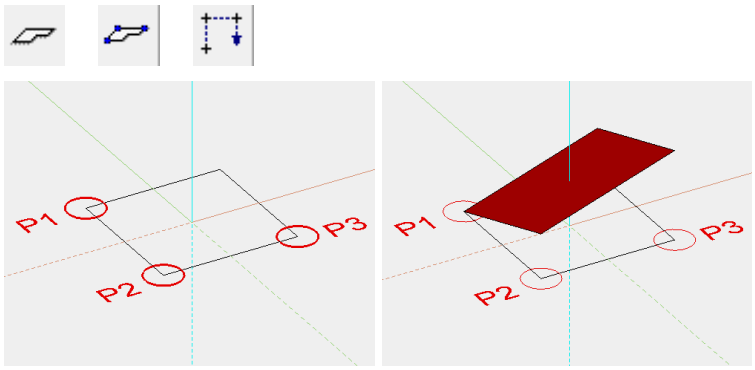
Several definitions can even be stored for the same contour.
Now set the height to **50**, the colour to **3** and click on the rectangle again.



TIP

The individual parameters of the surfaces can be modified with Selection element part.

To create a slanted surface, set the *Entry mode* to *3 points*. After you have drawn the contour, click on point **1** and enter a height of **0**. Then click on points **2** and **3** and enter the heights **100** and **200**. This creates a slanted level.



WORKSHOP END

EXTRUDE

Define extrude

3D tool bar, Free forms tool bar (AR), 3D-Object tool bar (ME)
Draw menu > 3D > Extrude

This function is used to define an extrude from 2D lines.
Click on the Create extrude function to enable the settings for the last extrude drawn.
The contour can now be drawn.

Extrude properties bar

The properties bar becomes visible as soon as the DEFINE EXTRUDE function is started or if an existing extrude is edited.

3D object parameters

Renovation planning state (only in Architecture)

Colour selection (colour mode)

Transparency in percentage (colour mode)

Material selection (material mode)

Kind of 3D definition

Entry mode for the base height

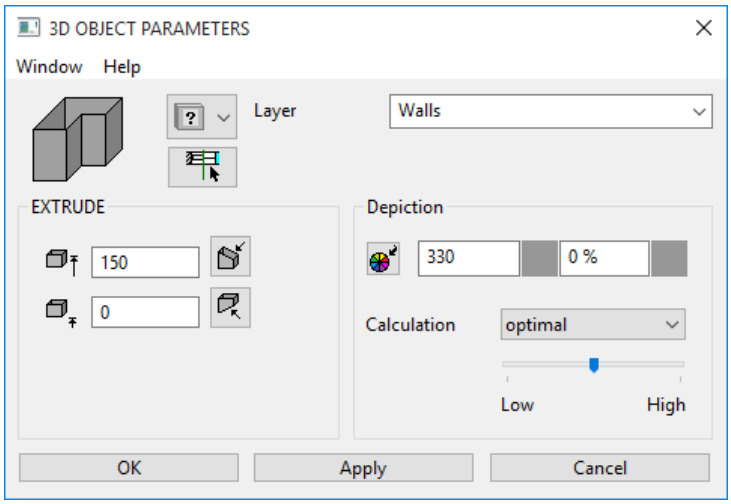
Entry mode for the upper height

Modify contour

Resolution

General properties see chapter General 3D parameters.

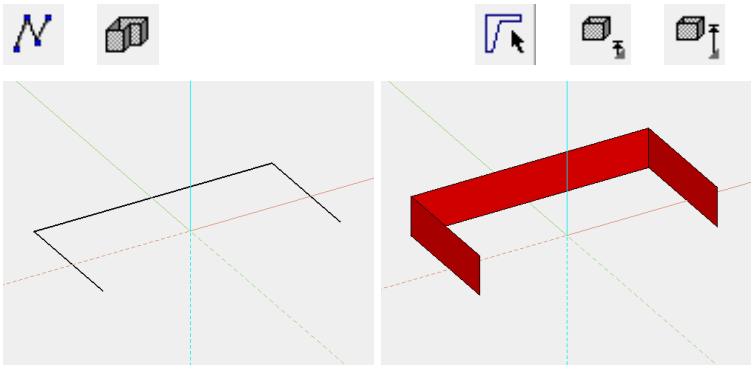
3D object parameters



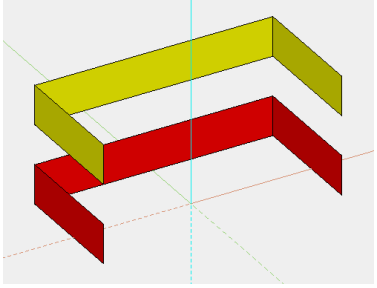
WORKSHOP

Define extrude

Draw a contour then click on DEFINE EXTRUDE and set the *Kind of 3D definition* to *Select contour*. Set the base height to **0**, the upper height to **100**, the colour to **2** and click on the contour.



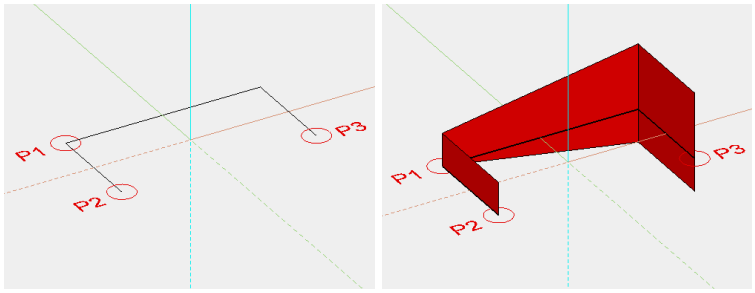
Several definitions can even be stored for the same contour.
Now set the base height to **200**, the upper height to **300**, the colour to **3** and click on the contour again.



TIP

The individual parameters of the extrudes can be modified with Selection element part.

To create a slanted extrude, set the *Entry mode* to *3 points*. After you have drawn the contour, click on point **1** and enter a height of **0**. Then click on points **2** and **3** and enter the heights **0** and **-100**. Proceed in exactly the same way for the upper height and enter the heights **100** and **200**. Slanted levels are then produced.



WORKSHOP END

Box

Define box

3D tool bar, Free forms tool bar (AR), 3D-Object tool bar (ME)
Draw menu > 3D > Box

This function is used to define a box from 2D lines.
Click on the CREATE BOX function to enable the settings for the last box drawn. The contour can now be drawn.

TIP

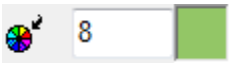
If the 2D contour is open at one point, the box is not created. The contour must first be correctly closed for the box to be generated.

Box properties bar

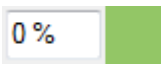
The properties bar becomes visible as soon as the DEFINE BOX function is started or if an existing box is edited.

3D object parameters

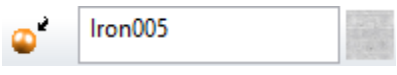
Renovation planning state (only in Architecture)



Colour selection (colour mode)



Transparency in percentage (colour mode)



Material selection (material mode)

Kind of 3D definition

Entry mode for the base height

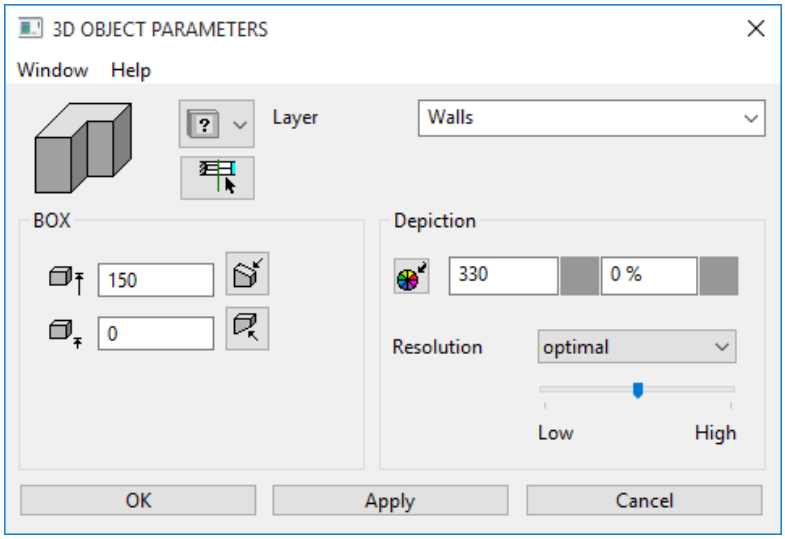
Entry mode for the upper height

Modify contour

Resolution

General properties see chapter General 3D parameters.

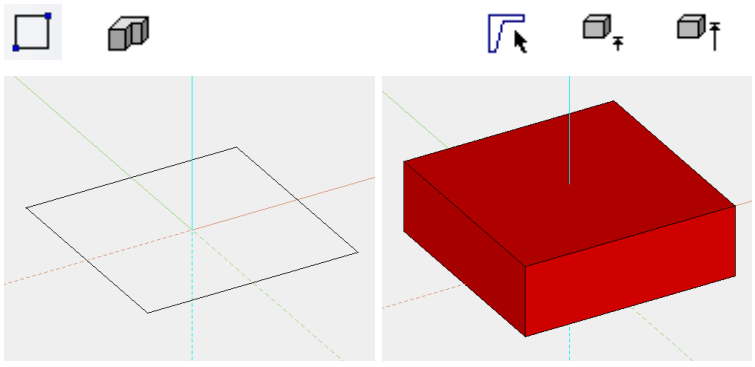
3D object parameters



WORKSHOP

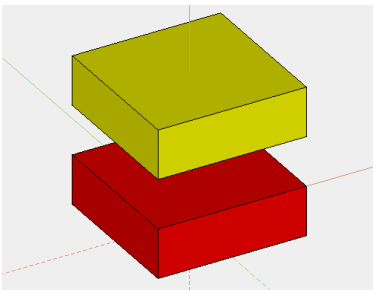
Define box

Draw a rectangle then click on DEFINE BOX and set the *Kind of 3D definition* to *Select contour*. Set the base height to **0**, the upper height to **100**, the colour to **2** and click on the contour.



Several definitions can even be stored for the same contour.

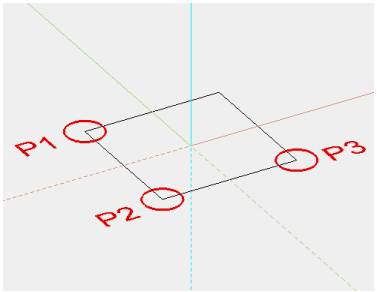
Now set the base height to **200**, the upper height to **300**, the colour to **3** and click on the rectangle again.

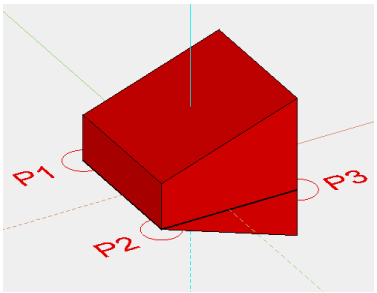


TIP

The individual parameters of the boxes can be modified with Selection element part.

To create a slanted box, set the *Entry mode* to *3 points*. After you have drawn the rectangle, click on point **1** and enter a height of **0**. Then click on points **2** and **3** and enter the heights **0** and **-100**. Proceed in exactly the same way for the upper height and enter the heights **100** and **200**. Slanted levels are then produced.





WORKSHOP END

ROTATION EXTRUDE

Define rotation extrude

3D tool bar, 3D-Object tool bar (ME)
Draw menu > 3D > Rotation extrude

This function is used to define a rotation extrude from 2D lines.
Click on the CREATE ROTATION EXTRUDE function to enable the settings for the last rotation extrude drawn. The contour can now be drawn.

EXPLANATION

Use the tool bar to start the ROTATION BOX function and switch to rotation extrude in the properties bar.

TIP

The axis may not intersect the contour, otherwise an error occurs and the contour is represented with the pen 0.

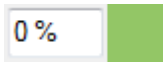
Rotation extrude properties bar

The properties bar becomes visible as soon as the DEFINE ROTATION EXTRUDE function is started or if an existing rotation extrude is edited.

3D object parameters

[Renovation planning state (only in Architecture)]

Colour selection (colour mode)



Transparency in percentage (colour mode)

Material selection (material mode)

Kind of 3D definition

Start angle

End angle

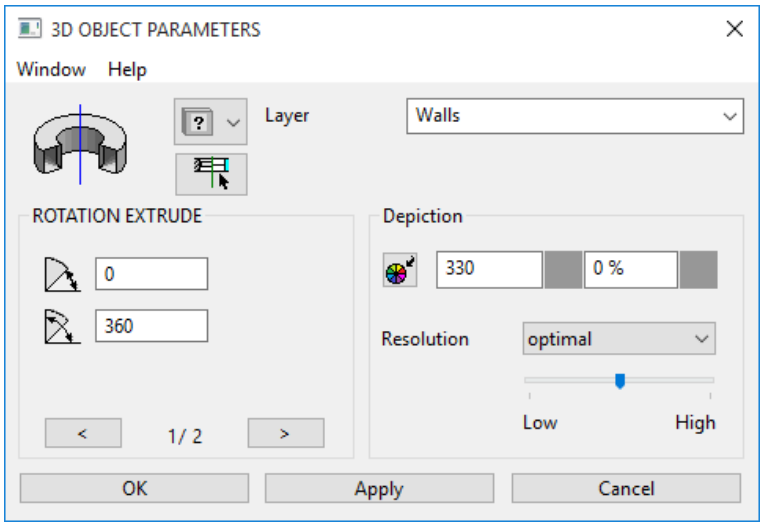
Modify contour

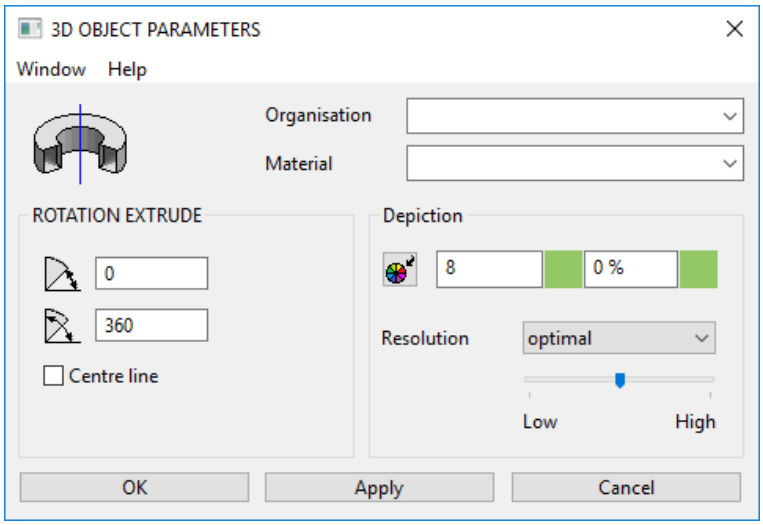
Modify rotation axis

Resolution

General properties see chapter General 3D parameters.

3D object parameters



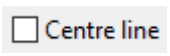


Entry

Start angle, end angle

At this point, the start and end angles of the rotation extrude are displayed.

Centre line



This option is only available in ELITECAD Mechanics. If the option is active, a centre line is created along the rotation axis, which adjusts to the extent of the 3D object. The depiction settings are defined in the menu SETTINGS > OPTIONS > WORKING PARAMETERS > MECHANICAL LINES.

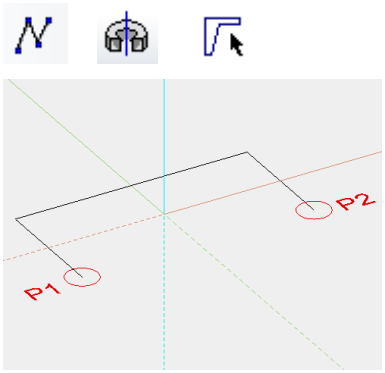
Modify rotation axis

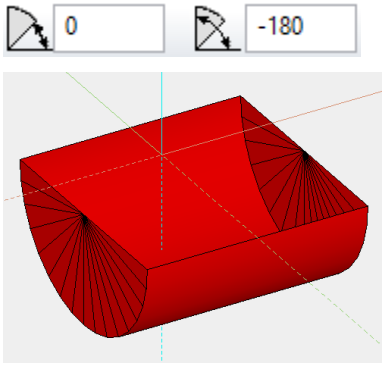
Press this function to redefine the axis for the rotation extrude.

WORKSHOP

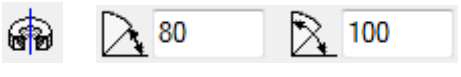
Define rotation extrude

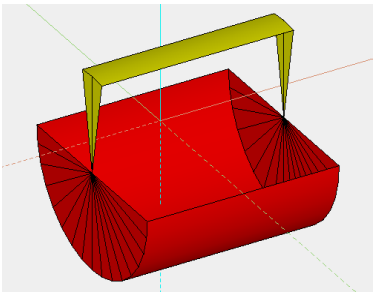
Draw a contour, then click on DEFINE ROTATION EXTRUDE and set the start angle to **0**, the end angle to **-180** and the colour to **2**. For the position of the axis, click on points **P1** and **P2** and click on the contour.





Several definitions can even be stored for the same contour.
Then simply click again on DEFINE ROTATION EXTRUDE and set the start angle to **80**, the end angle to **100** and the colour to **3**.
Click once more on points **P1** and **P2** and click on the contour.





TIP

The individual parameters of the rotation extrude can be modified with Selection element part.

WORKSHOP END

ROTATION BOX

Define rotation box

3D tool bar, Free forms tool bar (AR), 3D-Object tool bar (ME)
Draw menu > 3D > Rotation box

This function is used to define a rotation box from 2D lines.
Click on the CREATE ROTATION BOX function to enable the settings for the last rotation box drawn. The contour can now be drawn.

TIP

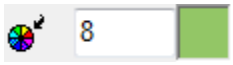
If the 2D contour is open at one point, the box is not created. The contour must first be correctly closed for the box to be generated.

Rotation box properties bar

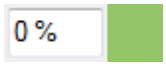
The properties bar becomes visible as soon as the DEFINE ROTATION BOX function is started or if an existing rotation box is edited.

3D object parameters

Renovation planning state (only in Architecture)



Colour selection (colour mode)

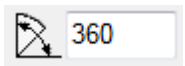


Transparency in percentage (colour mode)

Material selection (material mode)

Kind of 3D definition

Start angle



End angle

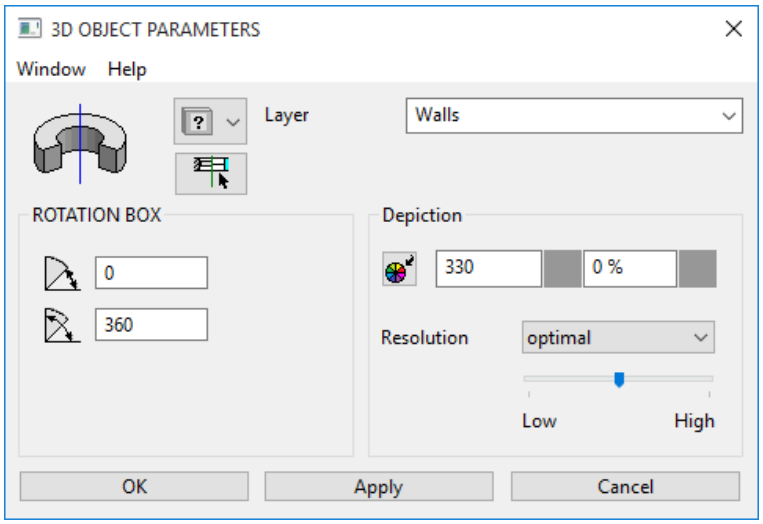
Modify contour

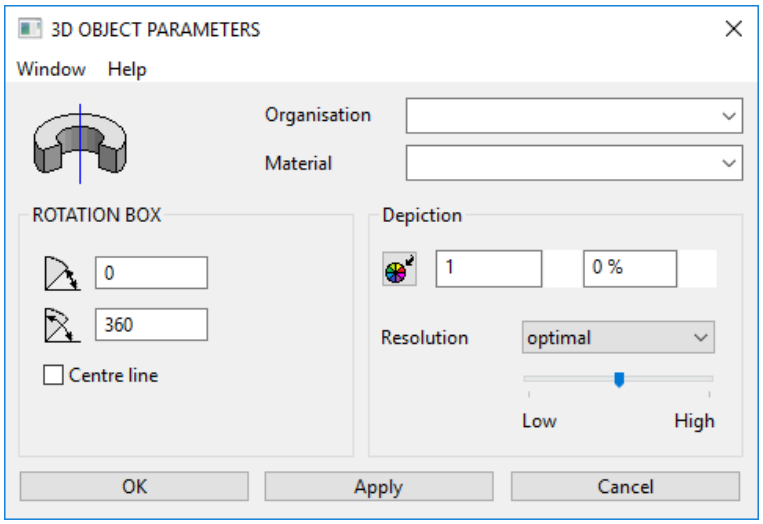
Modify rotation axis

Resolution

General properties see chapter General 3D parameters.

3D object parameters





Entry

Start angle, end angle

At this point, the start and end angles of the rotation box are displayed.

Centre line

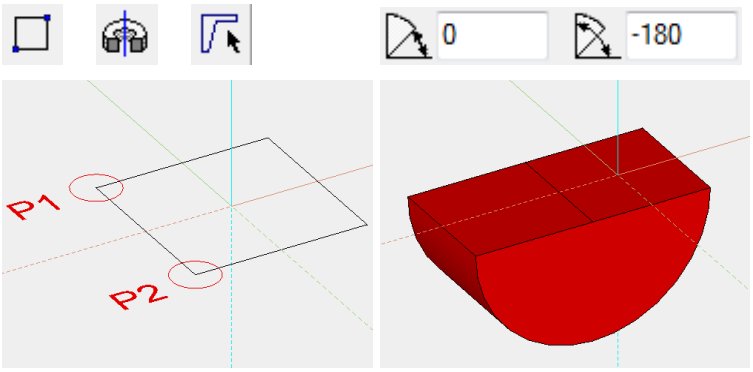
This option is only available in ELITECAD Mechanics. If the option is active, a centre line is created along the rotation axis, which adjusts to the extent of the 3D object. The depiction settings are defined in the menu SETTINGS > OPTIONS > WORKING PARAMETERS > MECHANICAL LINES.

Modify rotation axis

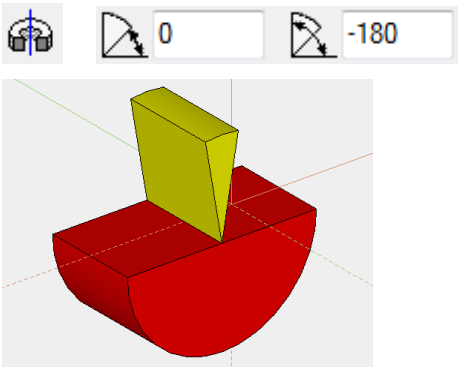
Press this function to redefine the axis for the rotation box.

Define rotation box

Draw a contour, then click on DEFINE ROTATION BOX and set the start angle to **0**, the end angle to **-180** and the colour to **2**. For the position of the axis, click on points **P1** and **P2** and click on the contour.



Several definitions can even be stored for the same contour.
Then simply click again on DEFINE ROTATION BOX and set the start angle to **80**, the end angle to **100** and the colour to **3**.
Click once more on points **P1** and **P2** and click on the contour.



TIP

The individual parameters of the rotation boxes can be modified with Selection element part.

WORKSHOP END

TRANS SURFACE

Define trans surface

	Free forms / curve tool bar, Free forms tool bar (ME)
	Draw menu > Free form > Trans surface

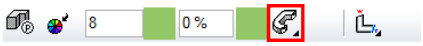
This function allows you to generate a surface using one or more contours that are moved along a path.
After activating this function, click on the contour and confirm with [Enter]. The selected contour is represented in purple. Then click on the path and the trans surface is created.

The following options are available for selection as a contour or path:

2D contour
2-views curve
Extracted border curve

EXPLANATION

Use the tool bar to start the TRANS BOX function and switch to trans surface in the properties bar.



TIP

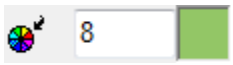
The contour and path do not have to be connected.

Trans surface properties bar

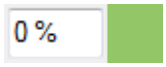
The properties bar becomes visible as soon as the DEFINE TRANS SURFACE function is started or if an existing trans surface is edited.

3D object parameters

Renovation planning state (only in Architecture)



Colour selection (colour mode)



Transparency in percentage (colour mode)

Material selection (material mode)

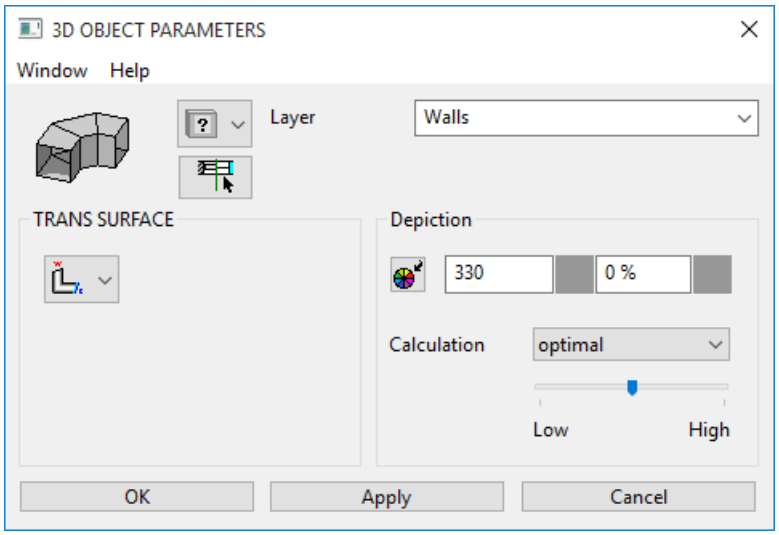
Rotation type

Modify contour

Resolution

General properties see chapter General 3D parameters.

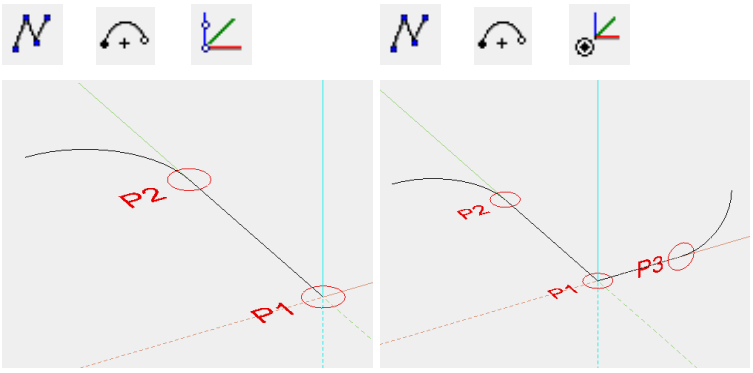
3D object parameters



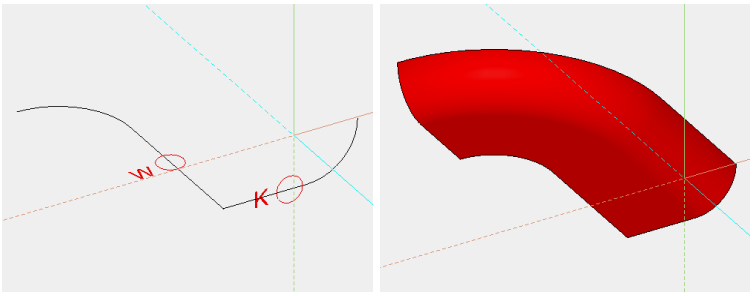
WORKSHOP

Define trans surface

Draw a line with a connecting curve over centre point.
The work plane on which the contour is drawn must be perpendicular to the current work plane. To do this, use the CREATE WORK PLANE AS NEW USING NORMAL function. After starting the function, click on points **P1** and **P2**. Use **[Ctrl]** + **[space]** to get to the starting position of the new work plane.
Draw a line again with a connecting curve. You can also start the first point of the line with **0 [Enter]**. This means that the current cursor position (P1) is the start point. After drawing, reset the work plane.



Now click on the DEFINE TRANS SURFACE function. The contour **K** must be clicked first, then the path **W**.



TRANS BOX

Define trans box

Free forms / curve tool bar, Free forms tool bar
Draw menu > Free form > Trans box

This function allows you to generate an object using a closed, planar contour (optional with cut-outs), that is moved along a path.
The procedure for defining an object is identical to that for defining a TRANS SURFACE, as the lateral surface of the trans box is a trans surface. Floor and slab surfaces are generated from the closed contour.

TIP

If polygons are interleaved and were clicked from outside inwards, cut-outs are produced.

TIP

If the 2D contour is open at one point, the trans box is not created. The contour must first be correctly closed for the object to be generated.

TIP

The contour and path do not have to be connected.

Trans box properties bar

The properties bar becomes visible as soon as the DEFINE TRANS BOX function is started or if an existing trans box is edited.

3D object parameters

Renovation planning state (only in Architecture)

Colour selection (colour mode)

Transparency in percentage (colour mode)

Material selection (material mode)

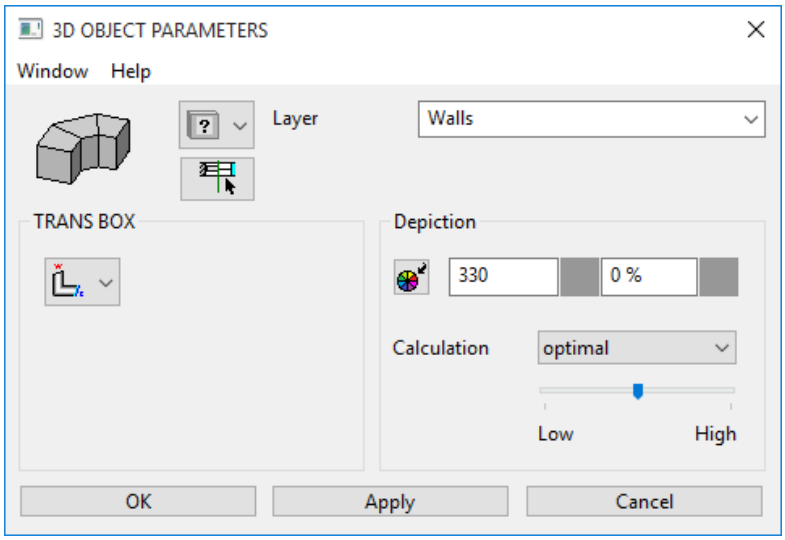
Rotation type

Modify contour

Resolution

General properties see chapter General 3D parameters.

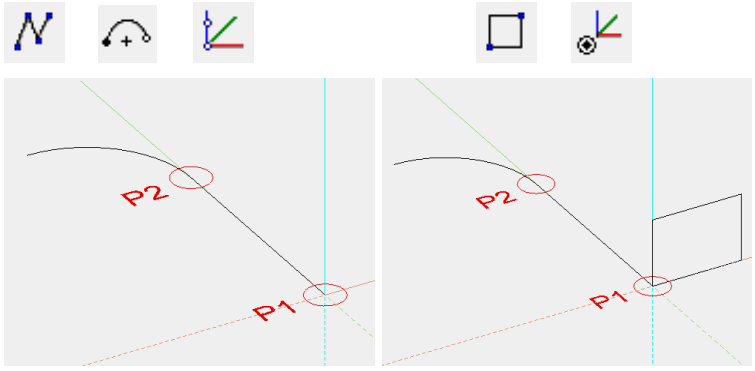
3D object parameters



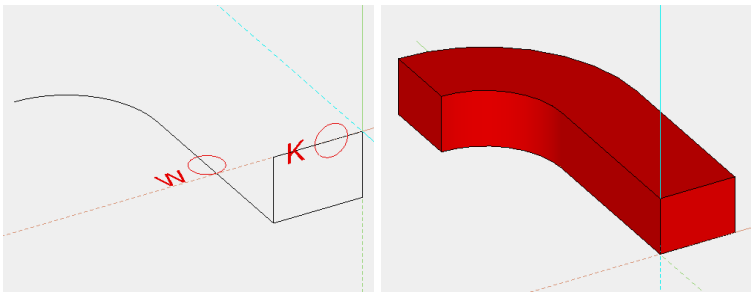
WORKSHOP

Define trans box

Draw a line with a connecting curve over centre point.
The work plane on which the contour is drawn must be perpendicular to the current work plane. To do this, use the CREATE WORK PLANE AS NEW USING NORMAL function. After starting the function, click on points **P1** and **P2**. Use **[Ctrl]** + **[space]** to get to the starting position of the new work plane.
Now draw a rectangle. You can also start the first point of the rectangle with **0 [Enter]**. This means that the current cursor position (P1) is the start point. The second point can be freely set. Reapply the work plane.



Now click on the DEFINE TRANS BOX function. The contour **K** must be clicked first, then the path **W**.



WORKSHOP END

DESIGN SURFACE

Define design surface

Free forms / curve tool bar, Free forms tool bar (ME)
Draw menu > Free form > Design surface

This function allows you to generate a surface using a contour that is transformed into a second contour along a path.
After activating this function, click on the first contour. The selected contour is represented in purple. Then click on the path. The selected path is represented in purple. After you click on the second contour, the design surface is created.

The following options are available for selection as a contour or path:
2D contour
2-views curve
Extract border curve

EXPLANATION

Use the tool bar to start the DESIGN BOX function and switch to design surface in the properties bar.

TIP

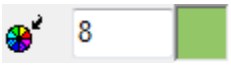
The contour and path do not have to be connected.

Design surface properties bar

The properties bar becomes visible as soon as the DEFINE DESIGN SURFACE function is started or if an existing design surface is edited.

3D object parameters

Renovation planning state (only in Architecture)



Colour selection (colour mode)

Transparency in percentage (colour mode)

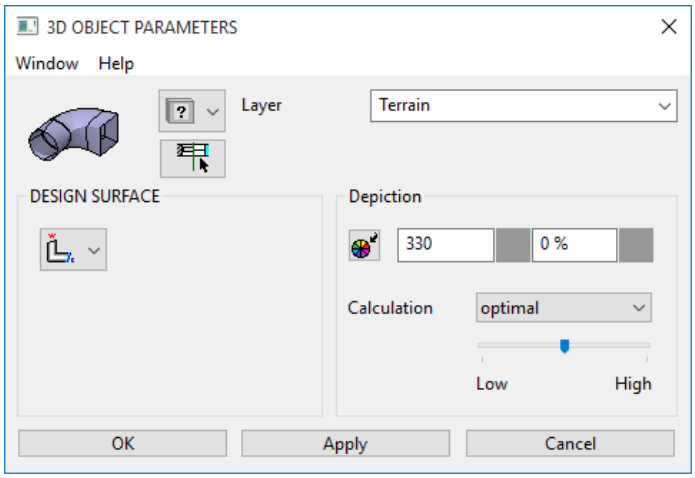
Material selection (material mode)

Modify contour

Resolution

General properties see chapter General 3D parameters.

3D object parameters

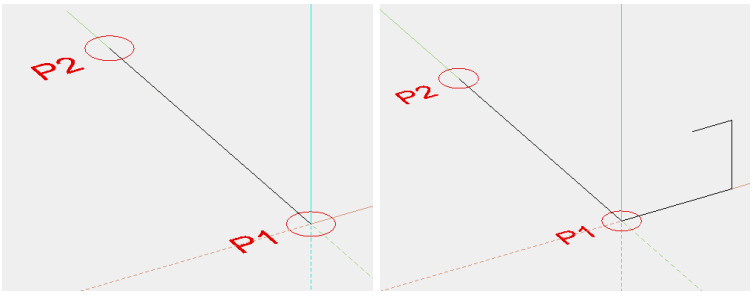


Rotation type

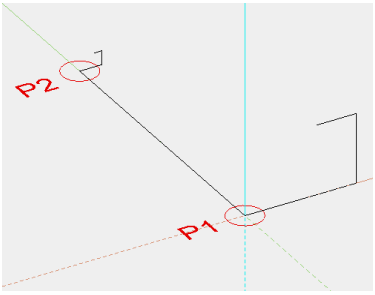
WORKSHOP

Define design surface

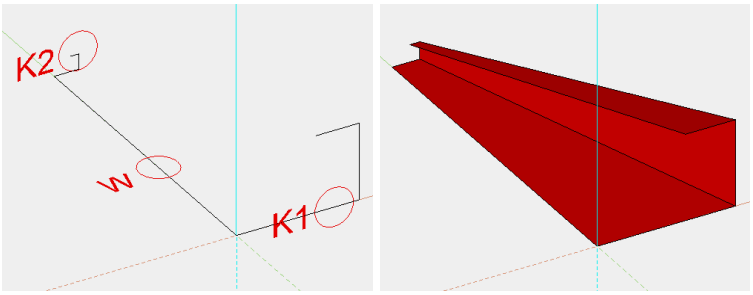
Draw a line for the path on the floor plan.
The work plane on which the contours are drawn must be perpendicular to the current work plane. To do this, use the CREATE WORK PLANE AS NEW USING NORMAL function. After starting the function, click on points **P1** and **P2**. Use **[Ctrl]**+**[space]** to get to the starting position of the new work plane.
Draw a connecting line. You can also start the first point of the line with **0 [Enter]**. This means that the current cursor position (P1) is the start point. After drawing, reapply the work plane.



Now you need a second contour, which is copied and scaled in this example. Select the first contour and click on COPY SELECTION.
Following the query *Move which point?* click on point **P1**. In the properties bar that now appears, you can also scale in addition to copying. Click on the SCALE button, enter the value **0.2** and confirm the entry with **[Enter]**. Apply the smaller contour to point **P2**.



Now click on the DEFINE DESIGN SURFACE function. The contour **K1** must be clicked first, then the path **W** and finally the second contour **K2**.



WORKSHOP END

DESIGN BOX

Define design box

Free forms / curve tool bar, Free forms tool bar
Draw menu > Free form > Design box

This function allows you to generate an object using a closed, planar contour that is converted to a second closed, planar contour along a path.

The procedure for defining an object is identical to that for defining a DESIGN SURFACE, as the lateral surface of the design box is a design surface. Floor and slab surfaces are generated from the contours.

TIP

If the 2D contour is open at one point, the design box is not created. The contour must first be correctly closed for the object to be generated.

TIP

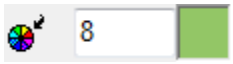
The contour and path do not have to be connected.

Design box properties bar

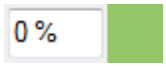
The properties bar becomes visible as soon as the DEFINE DESIGN BOX function is started or if an existing design box is edited.

3D object parameters

Renovation planning state (only in Architecture)



Colour selection (colour mode)



Transparency in percentage (colour mode)

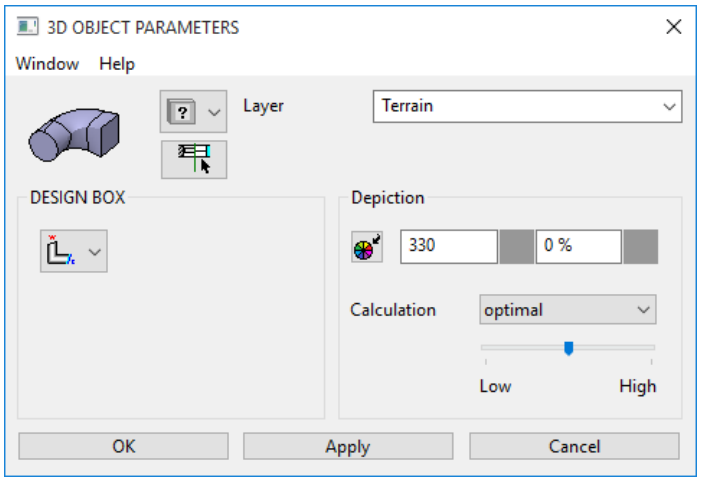
Material selection (material mode)

Modify contour

Resolution

General properties see chapter General 3D parameters.

3D object parameters

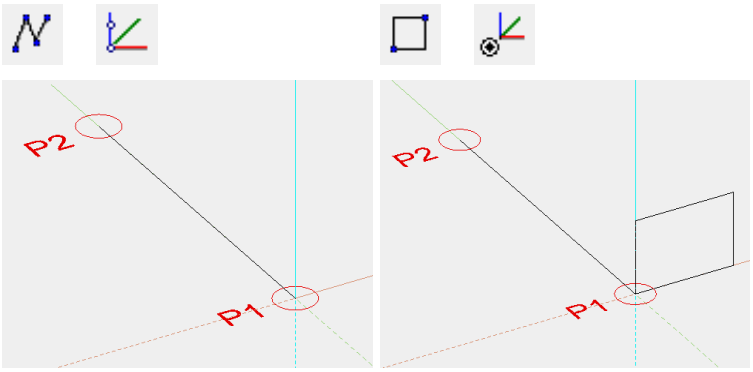


Rotation type

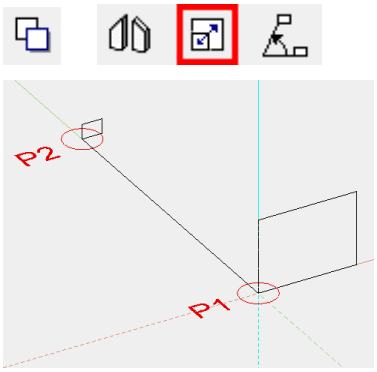
WORKSHOP

Define design box

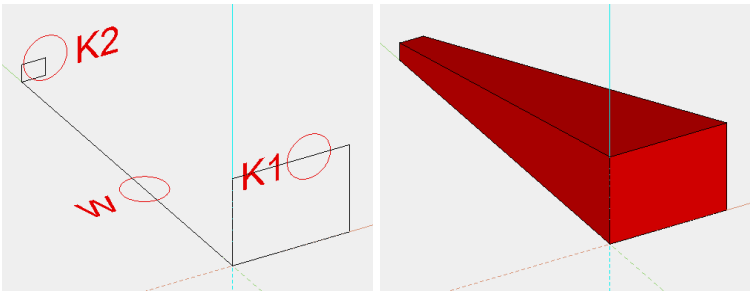
Draw a line for the path on the floor plan.
The work plane on which the contours are drawn must be perpendicular to the current work plane. To do this, use the CREATE WORK PLANE AS NEW USING NORMAL function. After starting the function, click on points **P1** and **P2**. Use **[Ctrl]**+**[space]** to get to the starting position of the new work plane.
Now draw a rectangle. You can also start the first point of the rectangle with **0 [Enter]**. This means that the current cursor position (P1) is the start point. The second point can be freely set. Reapply the work plane.



Now you need a second contour, which is copied and scaled in this example. Select the first contour and click on COPY SELECTION.
Following the query *Move which point?* click on point **P1**. In the properties bar that now appears, you can also scale in addition to copying. Press on the additional function "Scale", enter the value **0.2** and confirm the entry with **[Enter]**. Apply the smaller contour to point **P2**.



Now click on the DEFINE DESIGN BOX function. The contour **K1** must be clicked first, then the path **W** and finally the second contour **K2**.



WORKSHOP END

FREE FORM SURFACE

Define free form surface

Free forms / curve tool bar, Free forms tool bar
Draw menu > Free form > Free form surface

This function allows you to generate a surface using four limit lines (2 contours and 2 paths).
After activating this function, click on contour 1. The selected contour is represented in purple. Then click on path 1. Once you have clicked on contour 2 and path 2 the free form surface is created.

The following options are available for selection as a contour or path:
2D contour
2-views curve
Extract border curve

TIP

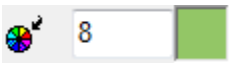
Contours and paths must be connected to the start and endpoints.

Free form surface properties bar

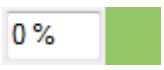
The properties bar becomes visible as soon as the DEFINE FREE FORM SURFACE function is started or if an existing free form surface is edited.

3D object parameters

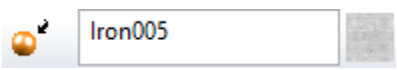
[Renovation planning state (only in Architecture)]



Colour selection (colour selection)



Transparency in percentage (colour selection)



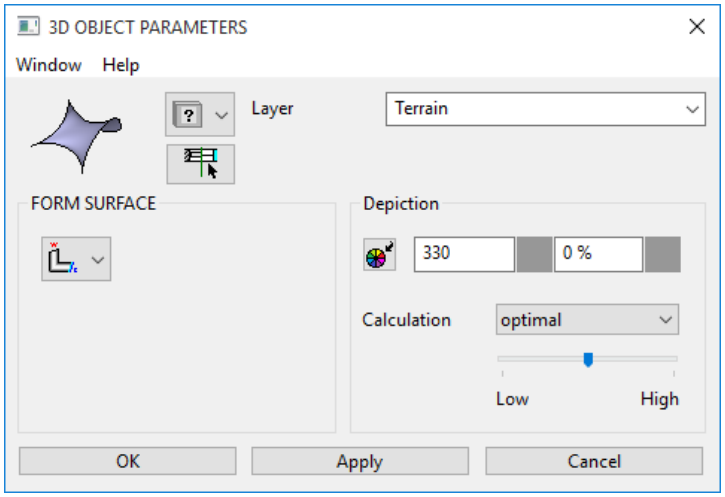
Material selection (material mode)

Modify contour

Resolution

General properties see chapter General 3D parameters.

3D object parameters

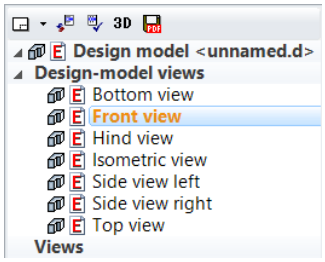


Rotation type

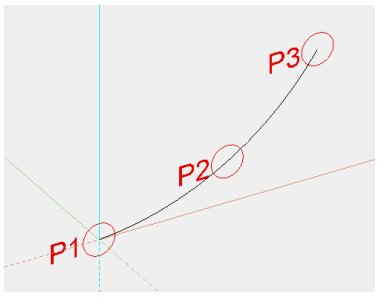
WORKSHOP

Define free form

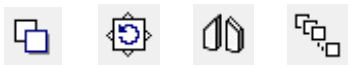
In this example, the first contour is drawn in the front view. In views management, switch to the front view.

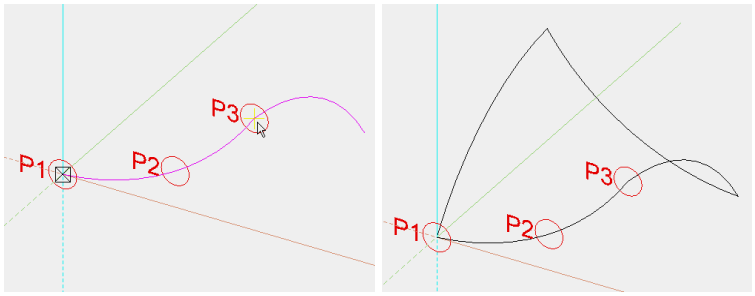


Now draw a CURVE BY 3 POINTS.
You can start the first point of the curve **P1** with **0 [Enter]**. This means that the current cursor position (P1) is the start point. The second point **P2** and the third point **P3** can be freely set. Then switch back to the model view.

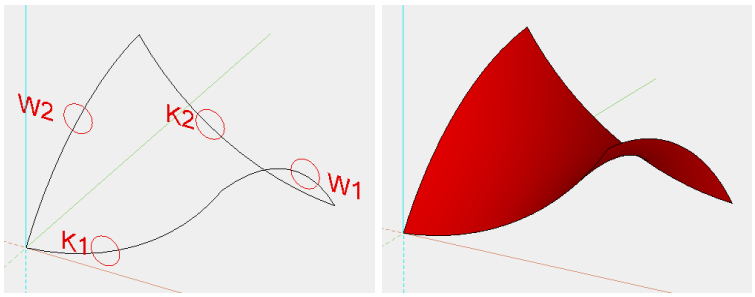


Now select the contour and go to the COPY SELECTION function. Following the query *Move which point?* click on point **P1**. In the properties bar that now appears, you can also rotate, mirror and copy multiple times in addition to copying. Press the additional functions ROTATE, MIRRORING 3D and MULTIPLE COPY one after the other. Now the query *How often?* appears in the entry line. Enter the number **3** and confirm with **[Enter]**. Now the contour can be placed in its new position. Click on point **P3**.





Select the DEFINE FREE FORM SURFACE function. Now click on contour **K1**, path **W1**, contour **K2** and finally path **W2** one after the other.



WORKSHOP END

2-VIEWS OBJECT

Define 2-view object

3D tool bar, Free forms tool bar (AR), 3D-Object tool bar (ME)
Draw menu > 3D > 2-views object

This function is used to generate a 3D object from its projections in two non-parallel planes.
Before accessing the function, a planar, closed contour must be created for each of the first and second view.
After activating this function, the two views must be selected by clicking and confirming with [Enter]. After you click on the two contours, the 3D geometry is created.

TIP

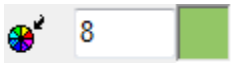
If polygons are interleaved and were clicked from outside inwards, cut-outs are produced.

2-views object properties bar

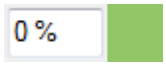
The properties bar becomes visible as soon as the DEFINE 2-VIEWS OBJECT function is started or if an existing 2-views structure is edited.

3D object parameters

Renovation planning state (only in Architecture)



Colour selection (colour mode)



Transparency in percentage (colour mode)

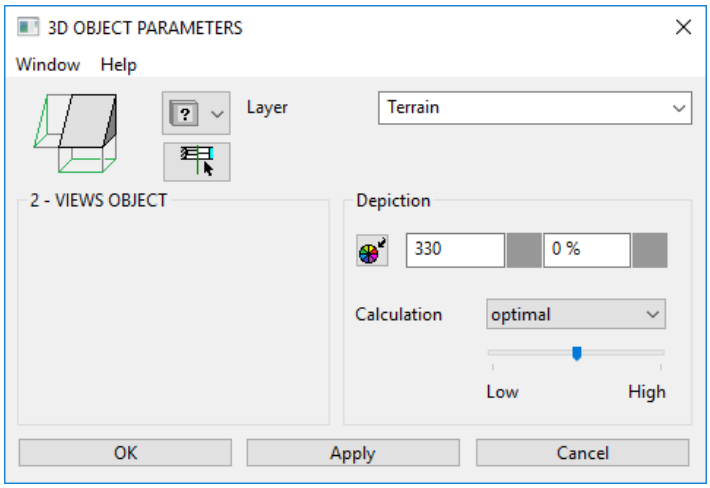
Material selection (material mode)

Modify contour

Resolution

General properties see chapter General 3D parameters.

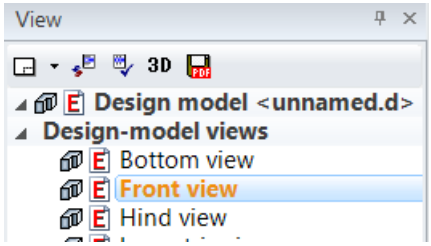
3D object parameters



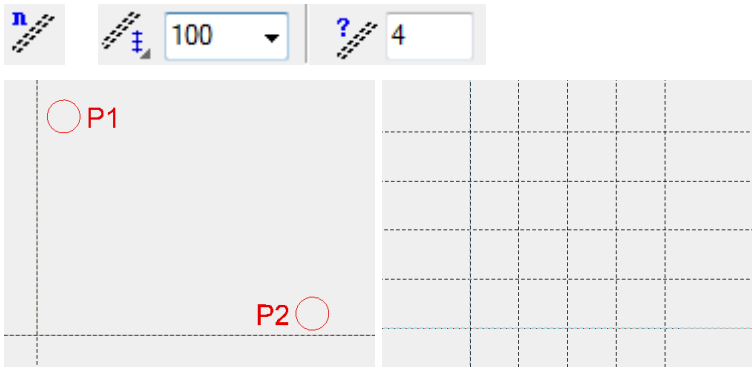
WORKSHOP

Define 2-view object

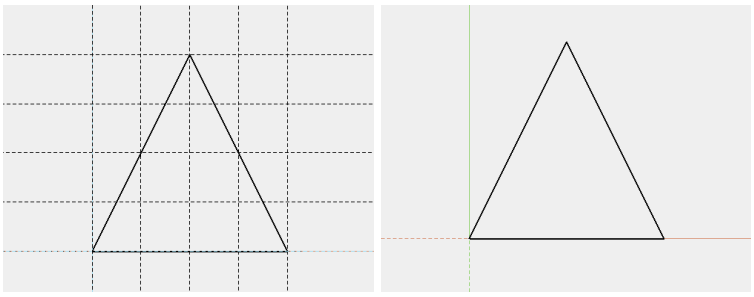
In this example, the first contour is drawn in the front view. In views management, switch to the front view.



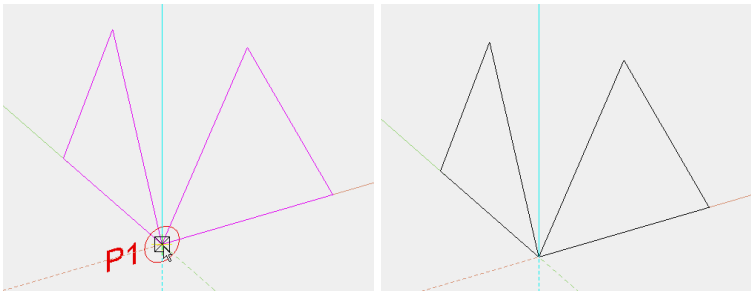
Create **four** parallel help lines with the distance **100 cm** to each of the points **P1** and **P2**.



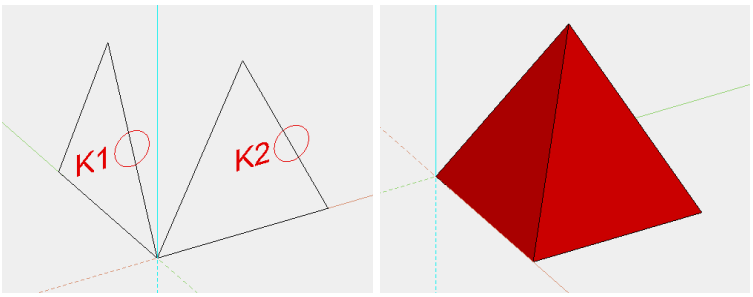
Now draw a triangle. The help lines can then be deleted again. Then switch back to the model view.



Now select the contour and go to the COPY SELECTION function. Following the query *Move which point?* click on point **P1**. In the properties bar that now appears, you can also rotate 90 degrees to the left in addition to copying. Press the additional function ROTATE. Now the contour can be placed in its new position. Click on point **P1** again.



Select the DEFINE 2-VIEW OBJECT function. Click on the contours **K1** and **K2** and confirm each with [Enter].



WORKSHOP END

3-VIEW OBJECT

Define 3-view object

	3D tool bar, Free forms tool bar (AR), 3D-Object tool bar (ME)
	Draw menu > 3D > 3-views part

This function is used to generate a 3D object from its projections in three non-parallel planes.
Before accessing the function, a planar, closed contour must be created for each of the three views.

After activating this function, the three views must be selected by clicking and confirming with [Enter]. After you click on the contours, the 3D geometry is created.

TIP

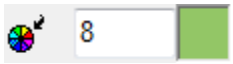
If polygons are interleaved and were clicked from outside inwards, cut-outs are produced.

3-views object properties bar

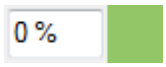
The properties bar becomes visible as soon as the DEFINE 3-VIEWS OBJECT function is started or if an existing 3-views object is edited.

3D object parameters

Renovation planning state (only in Architecture)



Colour selection (colour mode)



Transparency in percentage (colour mode)

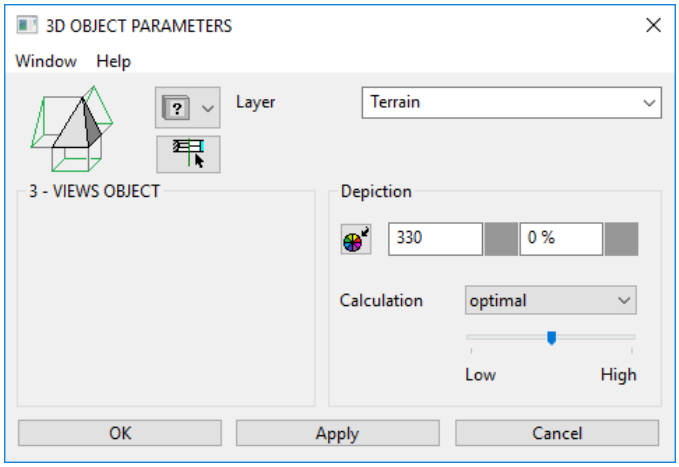
Material selection (material mode)

Modify contour

Resolution

General properties see chapter General 3D parameters.

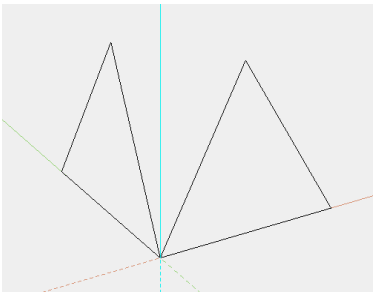
3D object parameters



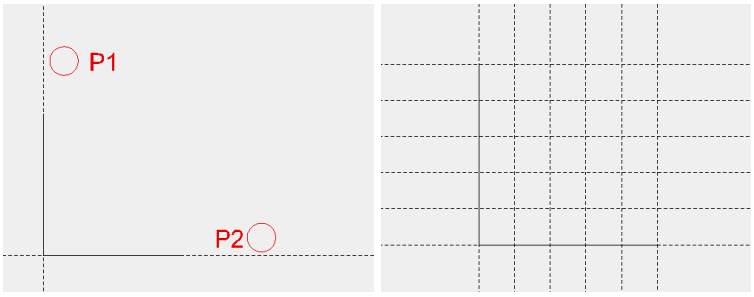
WORKSHOP

Define 3-views object

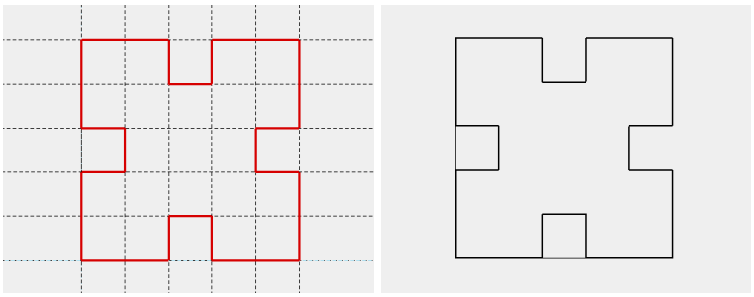
To draw the first two contours, proceed in exactly the same way as in the workshop for the 2-VIEWS OBJECT.



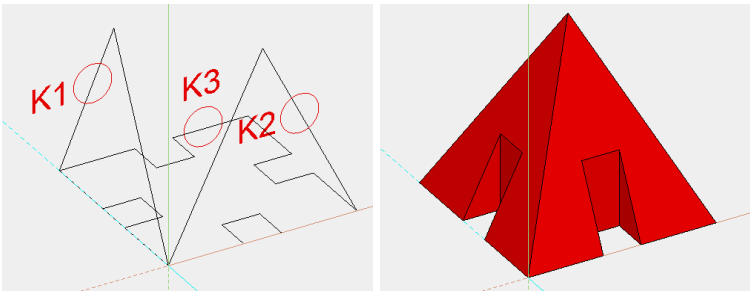
Use **[Ctrl]**+**[space]** to return to the starting position and transfer **five** parallel help lines with the distance **80 cm** to each of points **P1** and **P2**.



Now draw a polygon as illustrated below. The help lines can be deleted again afterwards.



Select the DEFINE 3-VIEWS OBJECT function. Click on the contours **K1** to **K3** and confirm each with [Enter].



WORKSHOP END

2-VIEW CURVE

Define 2-view curve

Free forms / curve tool bar (AR), 3D-Object tool bar (ME)

Draw menu > Curve > 2-views curve

This function is used to generate a 3D curve from its projection to two planes that are perpendicular to each other.
Before accessing the function, a planar, closed contour must be created for each of the first and second views, if not already available.
After activating this function, the two views must be selected by clicking, and the 3D curve is created.

TIP

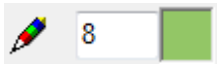
Both views must be in two work planes that are perpendicular to each other. The start and endpoints of the first and second view must uniquely match each other.

2-views curve properties bar

The properties bar becomes visible as soon as the 2-VIEWS CURVE function is started or if an existing 2-views curve is edited.

3D object parameters

Renovation planning state (only in Architecture)



Colour selection – direct entry

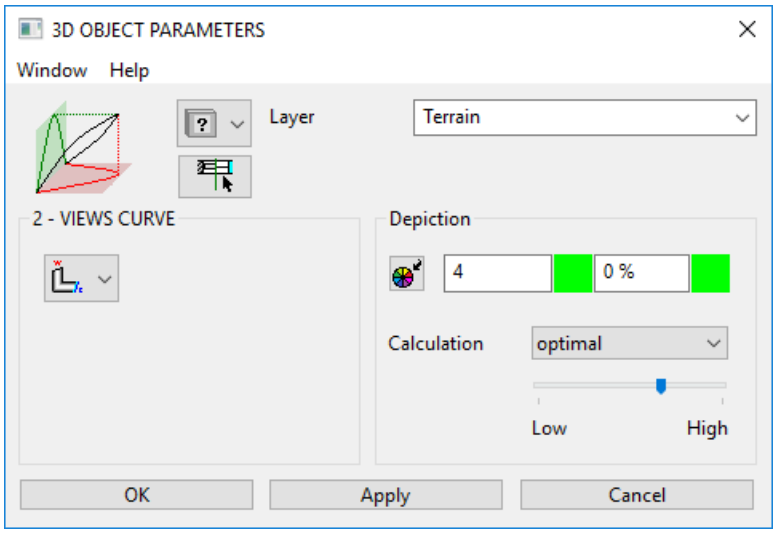
Selection of line type

Modify contour

Resolution

General properties see chapter General 3D parameters.

3D object parameters

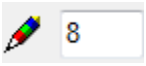


[Rotation type]

Colour selections

The exact description of the COLOUR SELECTION menu can be found in the chapter 1.4 "Colours".

Colour selection – direct entry



The surface colour can be entered directly (from 0-1023).

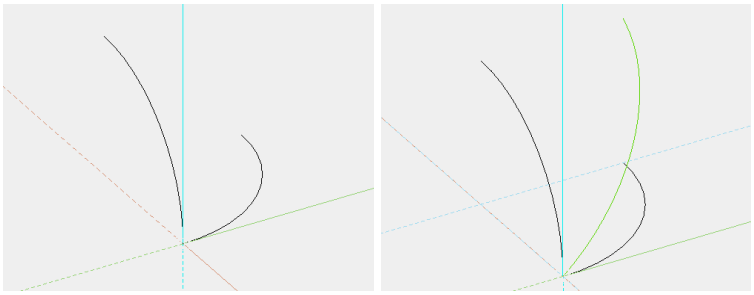
Colour selection over table

Here the colour is selected using a colour table.

Line type

Here you can select the desired line type.

Example:



The new 3D curve is now available for other 3D functions.

CURVE BY UNFOLD CONTOUR

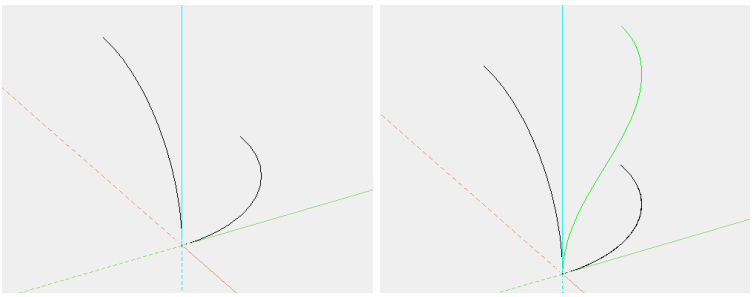
Free forms / curve tool bar, Free forms tool bar (AR), 3D-Object tool bar (ME)
Draw menu > Curve > by unfolded contour

This function is used to create a 3D curve from a path (projected 3D curve) and a contour, which represents its unfolded curve. In addition, the surface described by path contour and spatial curve can also be created.
After activating this function, identify the 2D contour for the path, and the unfold contour, by clicking on them. Then you are asked for the colour desired (pen number) for the 3D curve. A 3D curve is created.

TIP

- The path and unfold contour must be 2D contours.
- The contours can be in any work planes.
- Both contours must have the same origin (important for the orientation of the 3D curve).
- The contour may not be closed, excepting multiple circles superimposed upon each other to generate a helix with multiple coils.
- The path contour is used for the X and Y-coordinates of the 3D curve. If both contours are in one work plane, the Y-coordinate of the unfold contour is used for the Z-value of the 3D curve. If the path contour and the unfold contour are in different work planes, the projection contour is converted into the work plane of the path contour and used to define the Z-values.

Example:



The new 3D curve is now available for other 3D functions.

CURVE OVER COORDINATES

Free forms / curve tool bar, Free forms tool bar (AR), 3D-Object tool bar (ME)
Draw menu > Curve > Over points

This function is used to generate a spatial line.
After activating this function, you can enter as many points as you wish either using the values field, or by clicking on them.

TIP

The 3D curve is available for free form surface definitions. Existing 3D curves can be modified via the menu MODIFY > 3D CURVES.

Curve over coordinates properties bar

The properties bar becomes visible as soon as the CURVE OVER POINTS function is started or if an existing curve is edited.

3D object parameters

Renovation planning state (only in Architecture)

Colour selection – direct entry

Rounding radius

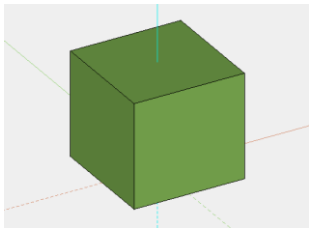
General properties see chapter General 3D parameters.

STANDARD 3D OBJECTS

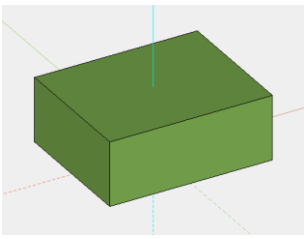
Standard 3D objects tool bar
Draw menu > 3D > Standard 3D objects

This function is used to create standard 3D objects easily. You can select from the symbols illustrated below.
After clicking on each function, the corresponding queries appear above the entry line.

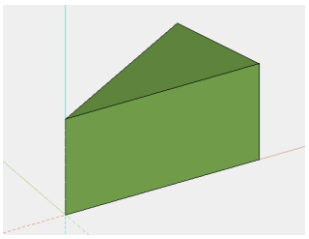
Cube



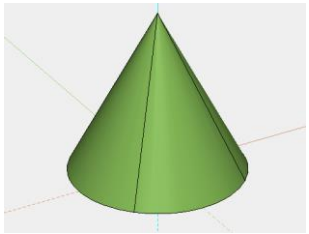
Cuboid



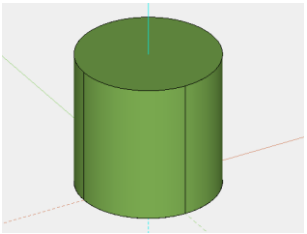
Prism



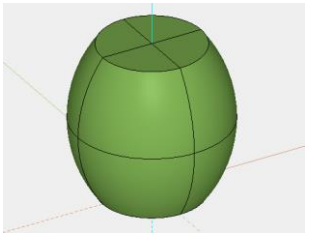
Cone



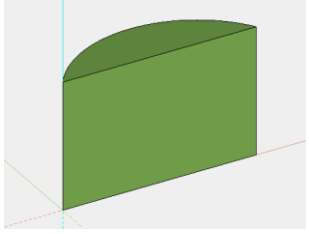
Cylinder



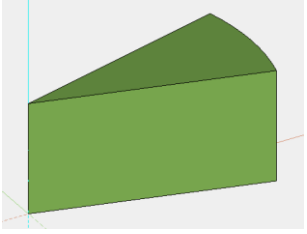
Barrel



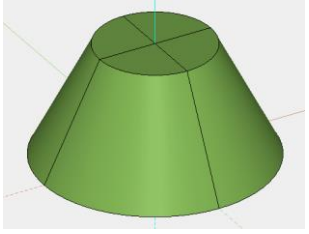
Segment



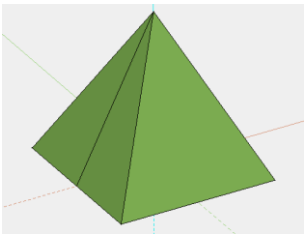
Circle sector



Cone stump



Pyramid



7.3 MODIFY

3D OBJECT PARAMETERS

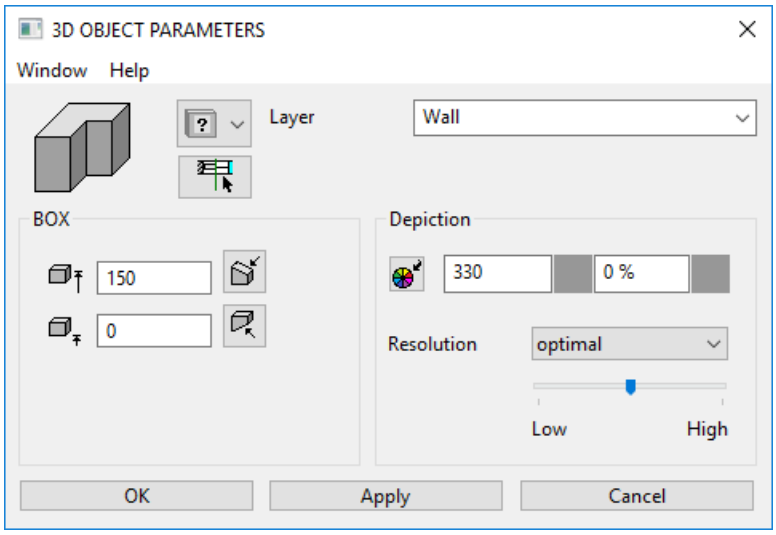
Ⓟ 3D	*Modify tool bar
	Modify menu > 3D object parameters

This function is used to display and modify the parameters of a 3D object.

TIP

The same window can also be started in the properties bar. To edit an object, click on "3D object parameters".

After activating this function, the desired object is selected by clicking on it, and the 3D object parameters dialog appears. Depending on the type, different parameters appear (e.g. for BOX).



Parameters
You can find a description of the parameters in the chapter General 3D parameters.

Multiple 3D objects

< >

These buttons are used to scroll forwards and backwards if the current contour belongs to more than one object.

OK
This button applies the set values and closes the window.

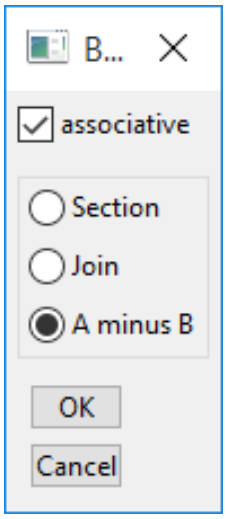
Apply
This button applies the set values with immediate effect (e.g., colours change).

Cancel
This button closes the window without applying the set values.

BOOLEAN OPERATION

A⊕B	Modify tool bar, Free forms tool bar (AR), 3D-Object tool bar (ME)
	Modify menu > Boolean operation

You can use this function to execute Boolean operations with objects (e.g. box). The following settings window appears after activating this function. Select the desired option and close the window with OK. You can now click on the 3D objects.



Associative
When enabled, the result is associatively linked with the starting definition. If a starting definition is changed, the result automatically updated.

Section
The result is the section (intersection) of the specified object.

Join
The objects specified are joined.

A minus B
The objects are subtracted.

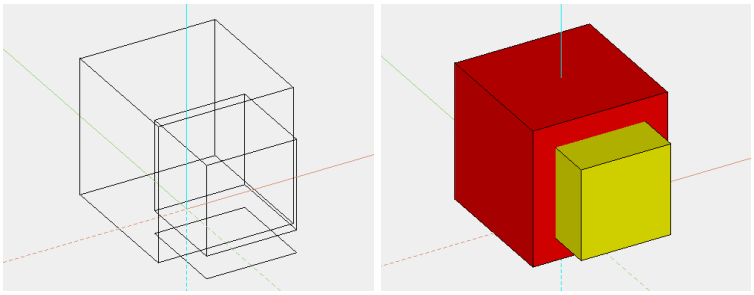
EXPLANATION

- The Boolean calculation produces a new definition (except for the A object which is already a Boolean definition). With A and B objects, the 3D definition is hidden.
- Boolean operations can also be applied to free form surfaces.
- For Boolean operations with surfaces, the normal vector direction determines which side of the object remains.

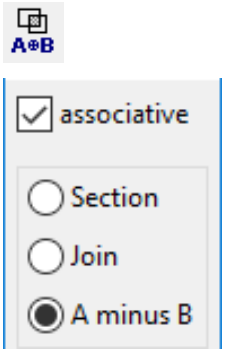
WORKSHOP

Boolean operation

The basis for this example is two boxes inside each other.
Draw two rectangles and use them to define boxes.



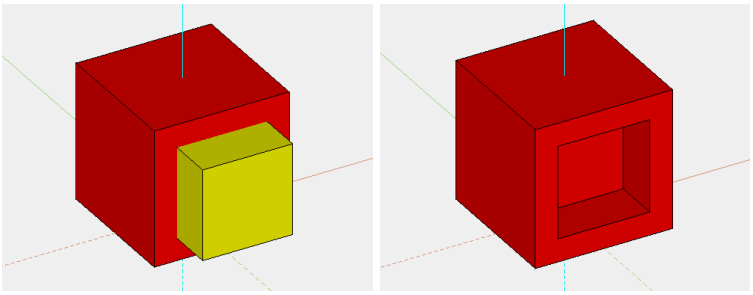
Then click on the BOOLEAN OPERATION function and make the following settings. Confirm with OK.



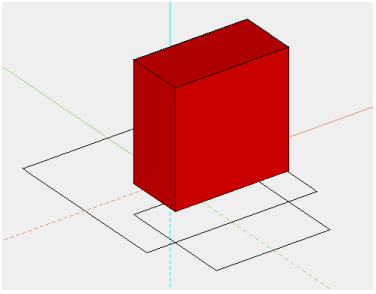
Please click definition A (ENTER = End)

Use the mouse to click on the larger of the two boxes and then confirm with **[Enter]**.
Please click definition B (ENTER = End)

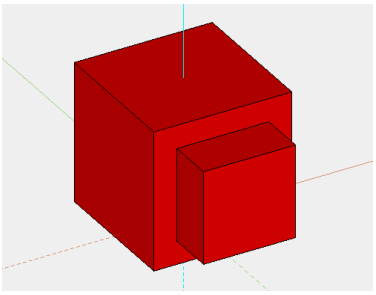
Now the object that is to be removed can be specified. Click on the smaller box and confirm this with **[Enter]**.



The SECTION option produces the following result.



The JOIN option produces the following result.



WORKSHOP END

TIP

When selecting the different definitions "A" or "B", you can select as many objects as you wish, before ending the process with [Enter].

ROUND EDGES

*Modify toolbar, Modify toolbar (ME)
Menu Modify > Round edges

This function is only available in ELITECAD Mechanics.
With this function, the edges of a closed body can be rounded off or chamfered. Depending on the selected setting, individual edges or several connected edges can be edited. Processing takes place either with a constant radius, as a constant chamfer or as a rounding with a variable transition. In addition, various options for editing vertices are possible.

Define edge blend

First, the 3D definition to be edited is selected. If a 3D definition was selected on which edge rounding is possible in principle, the ROUNDING menu appears.

REMARK

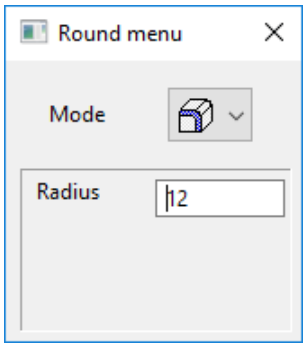
The ROUND EDGES function requires a special description of the model. If the selected definition is not yet available in the structure required for the function, the program will perform an internal conversion. For special parts from older ELITECAD versions (before version 10) or VDA data, the necessary description may not be generated. EDGE ROUND is not possible in such cases.

An edge rounding operation may consist of several individual fillets. To define each single fillet, perform the following steps:

1. Select the mode (BEFORE selection)
2. Enter required parameter (BEFORE selection)
3. Select edge or vertex
4. Confirm selection with [Enter]

[Enter] without edge or vertex selection completes the entire input and starts the calculation.

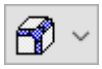
Edge blend parameters



The parameters displayed depend on the current mode.

Blend mode

Blend sequence
A series of tangentially connected, rounded edges of constant radius.



Vertex blend
A rounded vertex. Attention: All subsequent edges must also be rounded, either constant or variable. A mixture with chamfers is not possible.

Single blend
A rounded single edge with a constant radius.

Variable single blend
A rounded single edge with linearly interpolated radius profile between two specified values (linearly interpolated over the edge length).

Variable blend sequence
A series of tangentially connected, rounded edges with a linearly interpolated radius profile between two given values (linearly interpolated over the entire length).

Single chamfer
A 45 ° chamfer running parallel to the edge to be defined. A chamfer is only possible with adjacent planar or cylindrical surfaces.

Chamfer sequence
A series of tangentially connected 45 ° chamfers running parallel to the defining edges. A chamfer is only possible with adjacent planar or cylindrical surfaces.

Radius
Depending on the mode, this value has a different meaning:
Rounding radius for constant rounding
Starting radius with variable rounding (starting point marked via box)
Edge distance for chamfers

End radius
The end radius can only be selected with variable fillets.
The variable rounding is interpolated linearly between the start and end radius over the length of the selected edge or edge sequence.

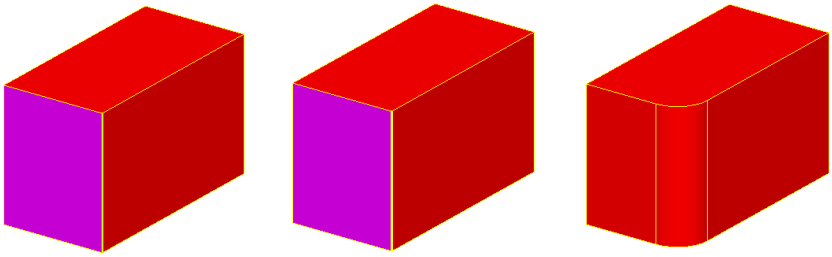
Offset
The offset can only be selected in the mode vertex blend.
The corner surface is set back by this value from the corresponding corner point (marked by 3D cross). The offset should be larger than the radius otherwise, there will be no effect.

Bulge
A bulge can only be selected in the mode vertex blend.
You can enter comma values from 0 to 2 for the degree of bulging of the vertex blend.
0 => as flat as possible
1 => default
2 => maximal bulge

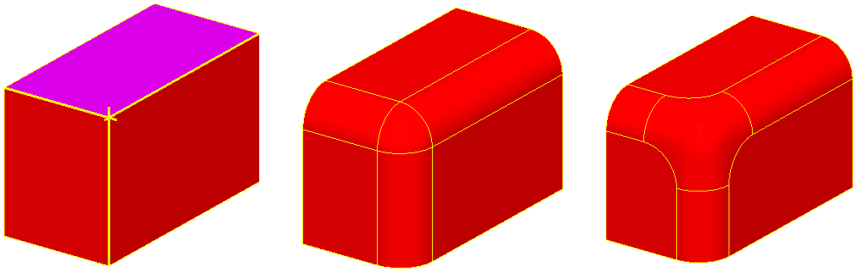
Define blend

Enter the selection
The edge or corner to be edited is to be selected in the graphics window with the mouse. Depending on the current mode, the program searches for corresponding further edges (for vertex blends all single edges not yet selected, starting from the vertex, for sequences all edges tangent to the selected edge).

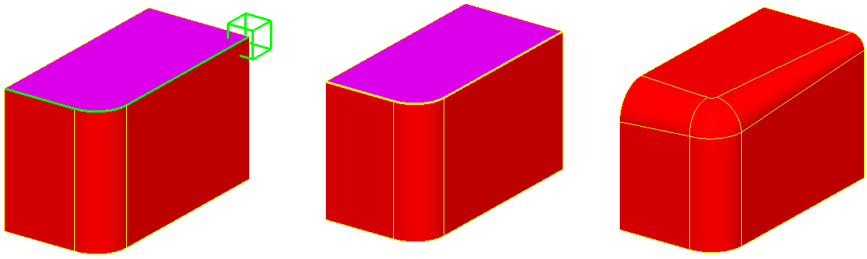
Visualise the selection
Edges with defined fillets are clearly enhanced.
GREEN highlighted areas always correspond to the CURRENT SELECTION.
All confirmed selections, the CONFIRMED SELECTION, will be highlighted YELLOW.



Defined vertex blends are indicated with 3D crosses.



For variable fillets, the start points automatically selected by the program are visualised by means of boxes (only visible in CURRENT SELECTION).

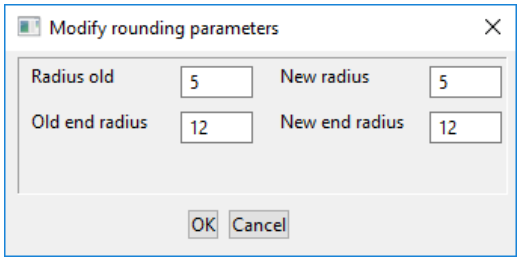


Confirming the selection
With [Enter] the selection GREEN is confirmed. In this case, the previously set parameters are taken from the respective edges or from the vertex.

Modify or delete entry
To be able to change something, there must already be a CONFIRMED SELECTION, that is, any yellow highlighted edges or vertices. You change these as follows:

Set the mode of the selection to be changed (if you want to change a vertex blend, set the vertex blend mode, etc.)
Set new parameters. A radius value of 0 (with variable rounding both radii 0) corresponds to a deletion operation.
Select edge or corner point from the CONFIRMED SELECTION.

If the selection was successful, the associated selection will again be highlighted in GREEN, as in the case of reselection, since this is the current CURRENT SELECTION. In addition, a dialog window appears. This displays the old and the new parameters set.



With OK, the new values are accepted, with CANCEL the old values remain.

If the selection was unsuccessful, the set mode usually does not match the mode of the selected selection. A note about this is below the input line like *selection edge belongs to ....*

Complete edge rounding operation
[Enter] without edge or vertex selection calls the calculation.
If the algorithm fails due to mathematical (such as radius to large) or algorithmic constraints, the state is restored like it was before the calculation was executed. In this way, parts of the selection can be changed without having to redo the entire selection.

Remarks

A vertex blend corresponds to a rounded corner point. However, this operation is not possible if only one edge belonging to that vertex does not have a fillet. In order to avoid that such cases occur (failure due to a non-selected edge), all not rounded individual edges of a vertex blend are automatically selected during the selection. Of course, these edges can be changed individually or even deleted, by addressing them in single rounding mode. Before the calculation, however, all deleted and not reset individual edges of the vertex blend again receive the default radius of the assigned vertex blend, i.e. the value that stood in the selection of the vertex blend in the parameter dialog window.
The temporary deletion of a single rounding involved in a vertex blend is suitable, if one wants to replace the automatically selected single rounding by a rounding sequence (However, it is more elegant, first to put on the rounding sequence, and then put a vertex blend on it).
Inaccuracies in the model increase the likelihood of edge rounding failure, if mathematically possible.
Placing vertex blends on corner points where multiple edges converge will sometimes increase the likelihood of a successful rounding operation.
Doubtful fillets, such as rounding off only half of the edge of a cylinder, are indeed partially executed, but do not necessarily provide useful models.

DRAFT

*Modify toolbar, Modify toolbar (ME)
Menu Modify > Draft

This function is only available in ELITECAD Mechanics.
With this function, the surfaces of a closed body can be inclined by a free angle. The inclination is performed relative to a REFERENCE PLANE, which is either a selected surface of a 3D object or the current workspace plane.

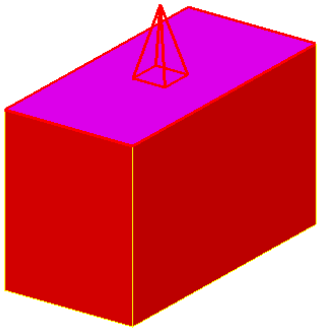
Define draft

Select 3D definition
First, the 3D definition to be edited is selected. If a 3D definition was selected on which a draft is possible in principle, the reference plane is queried next.

REMARK

The DRAFT function requires a special description of the model. If the selected definition is not yet available in the structure required for the function, the program will perform an internal conversion. For special parts from older ELITECAD versions (before version 10) or VDA data, the necessary description may not be generated. A DRAFT is not possible in such cases.

Select reference plane



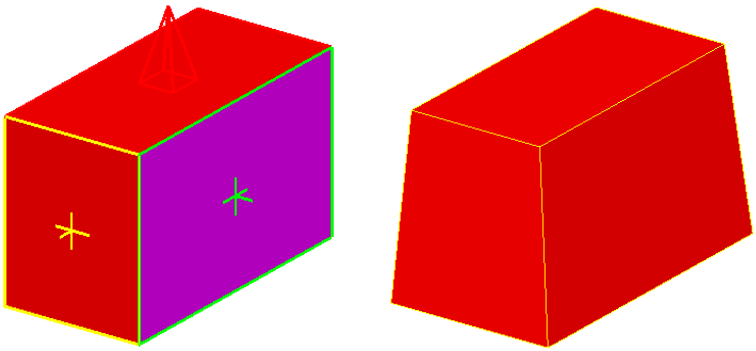
The selection of a reference plane is done by selecting the desired surface in the graphics window, where a confirmation takes place, since this definition remains fixed for the other selections. If confirmed, the reference plane (RED) including the TAPERING DIRECTION, shown as a pyramid in the centre of the surface, is displayed. If no surface is selected by pressing [Enter], the current workspace plane is used as the reference plane, whereby the direction of taper here corresponds to the positive Z direction. This choice is not highlighted graphically, because there is still the option to display the coordinate system.

REMARK

The difference between choosing a surface and selecting the workspace plane as the reference plane is that the slope in the first case is around the common edges of reference and selected surfaces, but in the second case around the intersection edges of the workspace plane with the selected surfaces (these edges stay fixed). The angle of inclination applies relative to the tapering direction in the middle of the reference surface, represented by a pyramid, or, when the workspace plane is selected as the reference plane, the Z-direction.

Select single surfaces
After selecting the reference plane, the SINGLE SURFACES involved in the draft are selected. The selection is made by clicking on it, which makes it appear in the colour of the CURRENT SELECTION (GREEN). For the newly selected surface, an inclination angle can be specified in the input line. The angle of inclination refers to the tapering direction, which is illustrated either by the illustrated pyramid, or

corresponds to the Z-direction of the current workspace. If the CURRENT SELECTION (GREEN) is confirmed with the value indicated in the input line by [Enter], it will go to the CONFIRMED SELECTION (YELLOW), assuming the set inclination angle.



REMARK

If a certain surface of the 3D model has been selected as the reference plane (RED, with pyramid), then all surfaces that are selected for the draft must have at least one common edge with it. Furthermore, all adjacent further surfaces, which are tangential to the selected surface and have at least one common edge with the reference surface, are automatically selected. This is the desired situation in most cases.

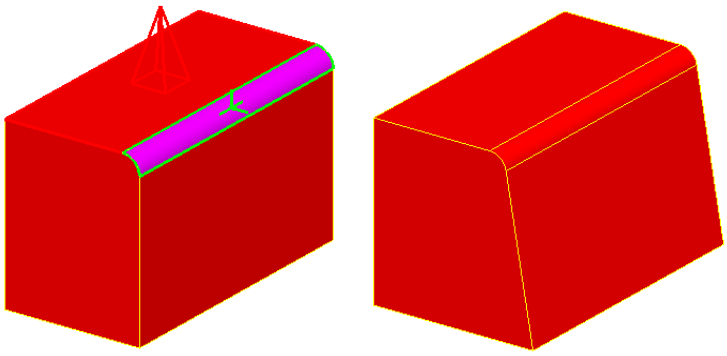
If this automatic selection is not desired, then you can specify a suitable workspace plane as the reference plane. Subsequently, any surfaces can be selected and assigned different values. An automatic selection does not occur in this mode.

Complete draft
When all selections have been made, pressing the [Enter] key again executes the calculation phase, attempting to perform the draft in the desired form. Should the algorithm fail due to mathematical (such as unrealistic angles) or algorithmic constraints (the surfaces to be tapered must satisfy certain properties in relation to the tapering direction), the state before the calculation is made is restored, including any selection made. This allows parts of the selection to be changed without having to repeat the entire selection.

Modify or delete entry
By re-selecting a surface of the CONFIRMED SELECTION (YELLOW), it can be assigned a new angle of inclination. The surface is again marked in the colour of the CURRENT SELECTION (GREEN); the old value of the inclination angle appears in the input line. The adoption of a new value is the same as in the first selection of the surface. Assuming an angle value 0 in this context means deleting the CURRENT SELECTION (GREEN) from the CONFIRMED SELECTION (YELLOW).

Shadow draft

A special case is the choice of a reference surface (RED, with pyramid) in the 3D model and the selection of another, adjacent surface, which is tangentially connected to the reference surface along the common edge. Because the simple tilting of the selected surface along the edge in is not desired in most cases (this would cause the tangency to be lost), the program interprets this operation as a shadow shape slope.



The angle reference is also done in this case in relation to the tapering direction of the reference surface, the shadow is to fall in the shadow of this direction along the selected surface, tangency is retained here. The SHADOW DRAFT is subject to certain geometric limitations and is not always possible.

DELETE SURFACES

*Modify toolbar, modify toolbar (ME)
Menu modify > Delete surfaces

This function is only available in ELITECAD Mechanics.
First, the definition to be edited is selected by clicking. Afterwards, the surfaces to be deleted are selected by clicking on them.
The selected surfaces are not only deleted, but the function also tries to close the resulting hole in the body by extending the adjacent surfaces.

VERIFY 3D TREE

Special functions toolbar
Menu Extras > Special functions > Verify 3D tree

This function is only available in ELITECAD Mechanics.

Basics

A series of interdependent 3D operations can be represented as a tree. The 3D base definitions, such as boxes or extrudes or any special parts, are located at the lower positions. Each further processing step is one level higher in the tree. Boolean operations merge multiple branches into one. At the top is the current end result.

If a change is now made to an intermediate step, generally all dependent results also change. The program tries to recalculate all dependent 3D operations of a changed definition (unless the user sets an operation to "offline").

Because of these changes, various operations defined as intermediate steps generally change, or some operations are no longer possible. This is especially true for operations related to certain edges or faces of the model, such as edge fillets, chamfers or draft operations.

In order not to destroy the model when re-calculating, or to create a wrong model, the update is interrupted when an operation fails or cannot be uniquely assigned, such as if a rounded or chamfered edge is no longer found or a surface of a draft operation has changed.

REMARK

If an assignment cannot be performed automatically, then the original operations are not lost. However, the result is displayed in 3D with a blue colour.

Operation

With the function VERIFY 3D TREE, the user can manually assign the new 3D objects to the previously defined surface and edge operations. The newly assigned operations are taken over from there on.

3D TREE INSPECTION works hierarchically. The tests are repeated until all errors have been corrected or the user cancels. If an error is not resolved, the test function does not pass over this point. The successful completion of the 3D tree check is displayed with the message *Check completed*.

Step 1 – 2D check
It is checked whether a 3D basic definition could not be generated from the associated 2D contour. One reason might be that in a box the modified 2D contour is open or intersects itself. The user receives the following message: *Model #n cannot be*

generated. Verify 2D model, where #n is the number of the model. The test corresponds to the function VERIFY 2D MODEL.

Step 2 - 3D check
It is checked whether an error has occurred during further calculation. An error has occurred if surfaces or edge operation could not be mapped, or the operation failed otherwise.
If surfaces or edges could not be mapped, the user is prompted to fix it. The originally selected surface or edge is displayed with the previous parameters. It can either be reassigned or deleted. The remapping takes place with the specified parameters and modes. A not found single edge is assigned about a single edge, a single surface not found a single surface, etc.

Step 3 – delete and add
Once all affected surfaces or edges of a calculation step have been treated this way, the user can still modify or extend the entire operation if he wishes. This makes sense, since there may well be cases in which the simple assignment of a previous surface or edge to a new one does not correspond to the desired result, if, for example, tangential gradients have resulted from a change, which should now be taken into account. To this end, questionable surfaces and edges can be deleted and reset. Deleting and setting works the same as with the corresponding functions ROUND EDGE and DRAFT.

CONNECT SURFACES

Surfaces tool bar
Modify menu > Surfaces > Connect

This function creates a connecting surface between two surfaces. The transition of surfaces to the connecting surface can be tangential or edge-on-edge.

The following queries appear after activating this function:

Transition tangential on both surfaces?
If you confirm this query with "Y", the transition of the surfaces to the connecting surface is smooth. Enter "N" and the surface is drawn with sharp edges.

Please click on the surface in the 3D view
The points of the surfaces that are to be connected can be clicked on with the mouse.

This surface?
If the surface that has turned purple is the desired surface, confirm the query with "Y" [Enter]. However, if the purple surface is not the desired surface, respond to the query with "N" [Enter]. In this case, the query *Please click on the surface in the 3D view* appears again.

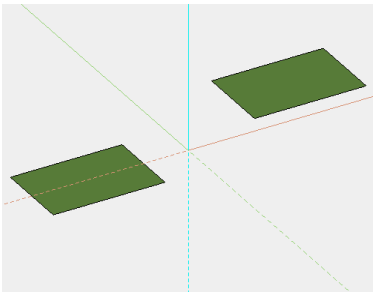
TIP

If the transition is not tangential, the first query is *Please select definition*. Then click on the border curve in the 3D view and confirm that this is correct.

WORKSHOP

Connect surfaces

First, create two surfaces with different heights. The exact description can be found in the workshop DEFINE SURFACE.



Select the CONNECT SURFACE function.
Transition tangential on both surfaces?

Confirm with "Y" **[Enter]**.
Please click on the surface in the 3D view

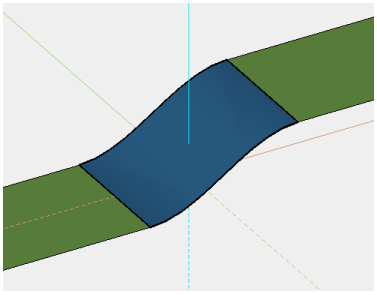
Use the mouse to click on the point where you want to connect.
Make sure that you click on the side of the surface that is to be connected.
This surface?

Confirm with "Y" **[Enter]**.
Please click on the surface in the 3D view

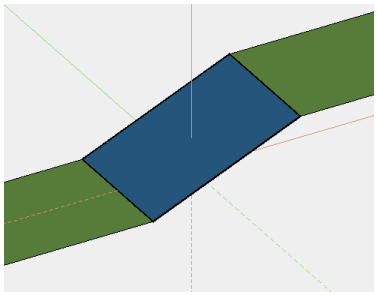
Use the mouse to click on the other surface to which you want to connect.
Here too, make sure that you click on the side of the surface that is to be connected.
This surface?

Confirm with "Y" **[Enter]**.
The connecting surface is created.

Tangential transition



Non-tangential transition



WORKSHOP END

SMOOTH SURFACE

Surfaces tool bar
Modify menu > Surfaces > Smooth

This function is used to create a tangential transition between two trans, design or free form surfaces. The border curves are retained.

The following queries appear after activating this function:

Please click on the surface in the 3D view
Now select the desired surface by clicking on it.

This surface?
If the surface that has turned purple is the desired surface, confirm the query with "Y" [Enter]. However if the purple surface is not the desired surface, respond to the query with "N" [Enter]. In this case, the query *Please click on the surface in the 3D view* appears again. This cycle is continued until positive confirmation is received for the query *This surface?*

Please click on the surface in the 3D view [ENTER=calculation]
Here you can select another surface by clicking on it, or smooth the interior of the selected surface by pressing [Enter]. If another surface is selected, the query *This surface?* appears again (as described above).

Tangential to the first surface?
If you press "Y" [Enter] the first surface is not changed, and the second is connected to the first surface tangentially. If you press "N" [Enter], the transition to both surfaces is adapted.

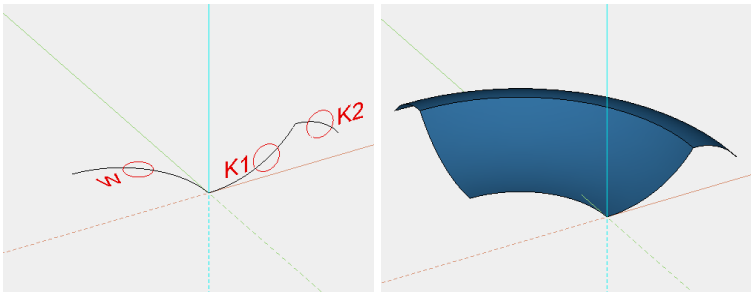
TIP

Contour or path must be connected to the start or endpoints.

WORKSHOP

Smooth surface

Draw two trans surfaces from one path and two contours. The exact description can be found in the workshop DEFINE TRANS SURFACE.



Select the SMOOTH SURFACE function.
Please click on the surface in the 3D view

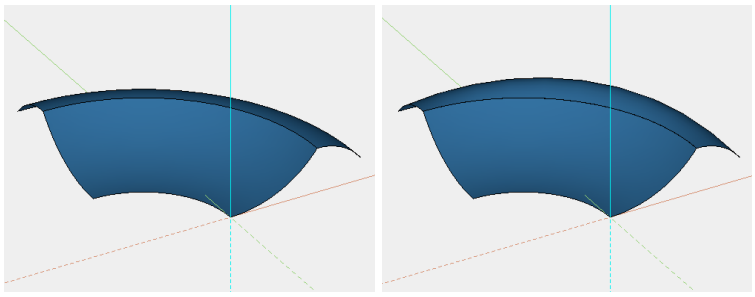
Now select the desired surface by clicking on it.
Click on the base surface.
This surface?

Confirm with "Y" **[Enter]**.
Please click on the surface in the 3D view [ENTER=calculation]

Click on the other surface and confirm the query *This surface?* with **[Enter]**.
Tangential to the first surface?

Confirm with "Y" **[Enter]**.

Before smoothing after smoothing



WORKSHOP END

JOIN SURFACE

Surfaces tool bar
Modify menu > Surfaces > Join

This function is used to connect trans, design or free form surfaces with a common border curve. This is particularly desirable in mould construction, so that one single surface can be formed from several individual surfaces, and this one surface can be shaped or manipulated further.
The result is a new surface and the starting surfaces are deleted. The parameters of the new surface (e.g. colour) are transferred from the first surface selected.

The following query appears after activating this function:

Please click on the surface in the 3D view [ENTER=calculation]
Now select a desired surface by clicking on it.

This surface and parameters?
If you confirm with "Y" [Enter], the surface is included in the calculations. However, if the query is confirmed with "N" [Enter] the query *Please click on the surface in the 3D view [ENTER=calculation]* appears again. This cycle is continued until positive confirmation is received for the query *This surface and parameters?*

TIP

- The connecting surfaces must be selected in the order in which they are to be joined.
- The Join surface function works for as many surfaces as you wish, if they share a common border curve.
- Otherwise, Join surfaces only works for two surfaces at a time. To connect as many surfaces as you want, you have to repeat the function.

EXPLANATION

If the selected surfaces do not have a common border curve, one of these two messages appears in the info window:

- First and second surface have no common border curve.
- Two of the surfaces have no common border curve.

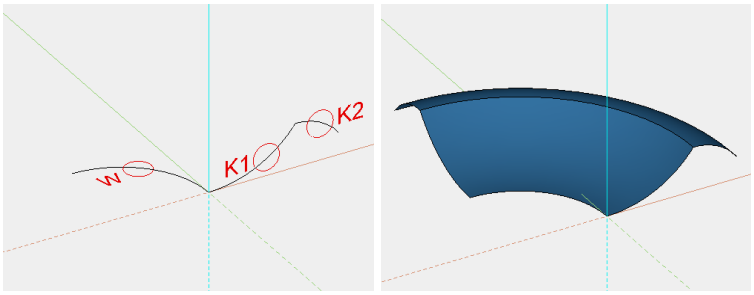
If joining does not work in principle, the following message appears:

- Merge surfaces cancelled.

WORKSHOP

Join surface

Draw two trans surfaces from one path and two contours. The exact description can be found in the workshop DEFINE TRANS SURFACE.



Select the JOIN SURFACE function.
Please click on the surface in the 3D view [ENTER=calculation]

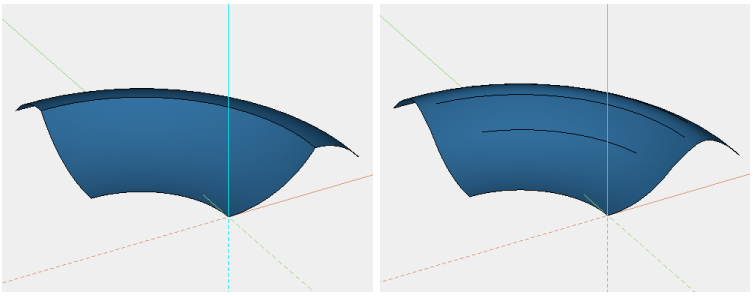
Click on the base surface.
This surface and parameters?

Confirm with "Y" **[Enter]**.
Please click on the surface in the 3D view [ENTER=calculation]

Click on the other surface and confirm the query *This surface and parameters?* with "Y" **[Enter]**.

The function can now be closed with "Y" **[Enter]**.

Before joining after joining



WORKSHOP END

LENGTHEN SURFACES

Surfaces tool bar
Modify menu > Surfaces > Lengthen

This function is used to lengthen a surface tangentially.

The following query appears after activating this function:

Please select definition.
Now select a desired surface by clicking on it.

Please click the surface on the desired edge in 3D view

Now the side that you want to lengthen must be specified, by clicking inside the surface.

Lengthen surface?
If the surface that has turned purple is the desired surface, confirm the query with "Y" [Enter]. However if the purple surface is not the desired surface, respond to the query with "N" [Enter]. In this case, the query *Please click surface on the desired edge in the 3D view* appears again.

Please enter length
Now enter the new desired length.

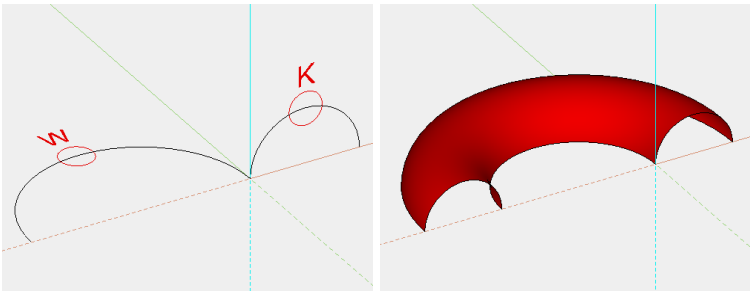
TIP

For trimmed surfaces, a new surface is created which joins tangentially.
If the starting surface is not trimmed, the starting surface is lengthened.

WORKSHOP

Lengthen surfaces

Draw a trans surface from one path and one contour. The exact description can be found in the workshop DEFINE TRANS SURFACE.



Select the LENGTHEN SURFACE function.
Please select definition.

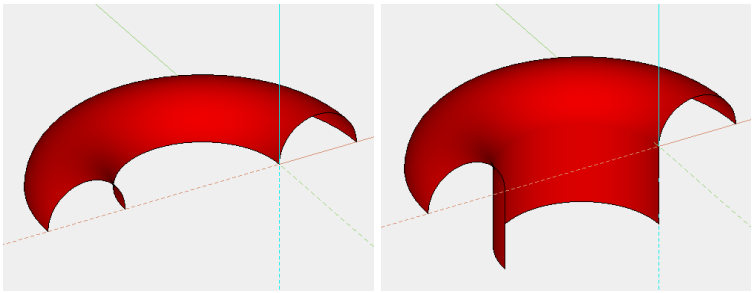
Click on the surface you want to lengthen.
Please click the surface on the desired edge in 3D view

Click on the inner edge of the surface.
Lengthen surface?

Confirm with "Y" **[Enter]**.
Please enter length

Enter a value (200) and confirm it with **[Enter]**.

Before lengthening after lengthening



WORKSHOP END

INVERT SURFACES

Surfaces tool bar
Modify menu > Surfaces > Invert

This function can be used to reverse the normal vector direction of a surface.

The following queries appear after activating this function:

Please click on the surface in the 3D view [ENTER > END]
Now select one of the desired surfaces by clicking on it. The selected surface is then coloured purple.

This surface?
Confirm this query with "Y" [Enter] and the direction of the normal vectors (represented in red) is reversed. However if the purple surface is not the desired surface, respond to the query with "N" [Enter]. In this case, the query *Please click on the surface in the 3D view [RETURN > END]* appears again.

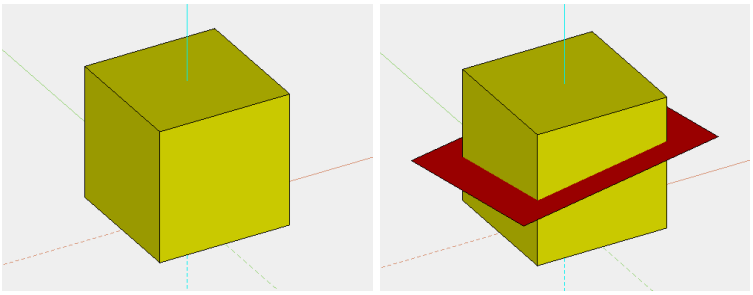
TIP

This preparation of surfaces makes it possible for the radius for all surfaces to be entered with the same sign when performing TRIM/FILLET. This prevents errors through incorrect inputs.

WORKSHOP

Invert surfaces

First, draw a box and a slanted surface over three points. The exact description can be found in the workshops DEFINE BOX and DEFINE SURFACE.



Select the INVERT SURFACES function.
Please click on the surface in the 3D view [ENTER > END]

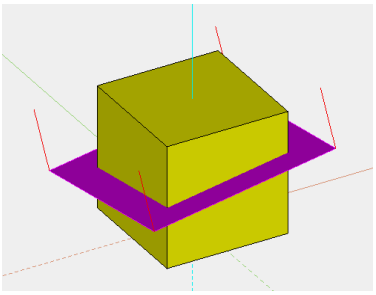
Click on the slanted surface.
This surface?

Confirm with "Y" **[Enter]**.

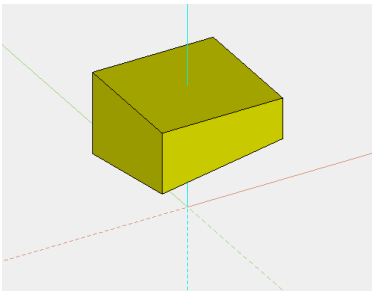
The function can now be closed with **[Enter]**.

Example with Boolean operation:

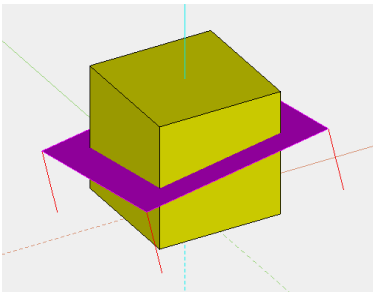
Normal vectors upwards



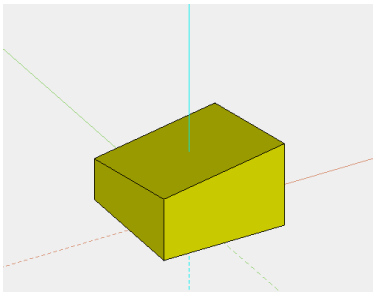
Result after Boolean operation



Normal vectors downwards



Result after Boolean operation



WORKSHOP END

PARALLEL SURFACES

Surfaces tool bar
Modify menu > Surfaces > Parallel

This function allows you to generate a surface that is the same distance from a given surface at one point.

The following queries appear after activating this function:

Please click on the surface in the 3D view
Click on the surface. It is then coloured purple.

This surface?
If the surface that has turned purple is the desired surface, confirm the query with "Y" [Enter]. If not, confirm the query with "N" [Enter]. You will have another chance to select the surface.

Please enter offset
Enter the desired distance.

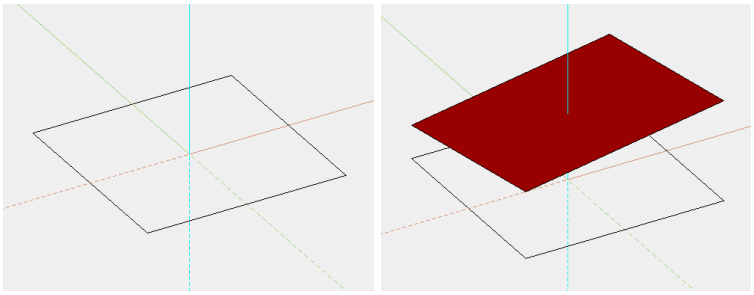
TIP

A positive value is assessed in the direction of normal vectors, a negative value is the reverse.

WORKSHOP

Parallel surfaces

First, draw a slanted surface over three points. The exact description can be found in the workshop DEFINE SURFACE.



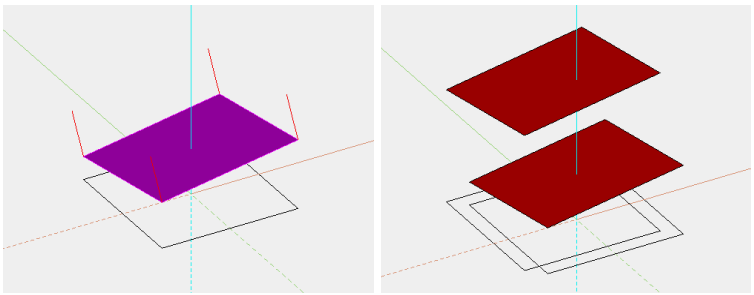
Select the PARALLEL SURFACES function.
Please click on the surface in the 3D view

Click on the surface.
This surface?

Confirm with "Y" **[Enter]**.
Please enter offset

Enter the desired distance (400) and confirm with **[Enter]**.

The parallel surface is displayed automatically.



WORKSHOP END

OUTLINE MODEL

	Surfaces tool bar
	Modify menu > Surfaces > Outline model

Use this function to outline any 2D contour on a surface (e.g. fonts, logos, etc.).

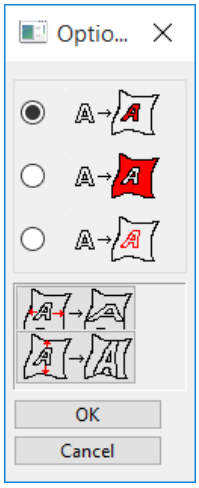
EXPLANATION

Following the query *Which model as border (Select point)? (ENTER = Cancel outline)*, a corresponding 2D model can be clicked on the reference point and entered onto a specific surface.
However, if you want to delete an existing outline model again, you can do so with [Enter]. Then click on the surface from which the outline model is to be removed.

TIP

For the options APPLY DIRECT and APPLY AS HOLE, the 2D model must be closed. Changes to the shape and position of the 2D model automatically affect the surface.

Options



Apply model direct

Use the option APPLY MODEL DIRECT to cut out the surface. The selected model remains.

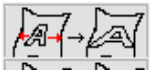
Apply model as hole

The surface is also cut out with this option, however the model selected is removed from the surface.

Apply model as curve

When the model is applied "as curve", a 3D curve is created, which you can continue to edit. The surface is not changed.

Adjust horizontally



The selected model is adjusted to be the same width as the surface.

Adjust vertically

The selected model is adjusted to be the same height as the surface.

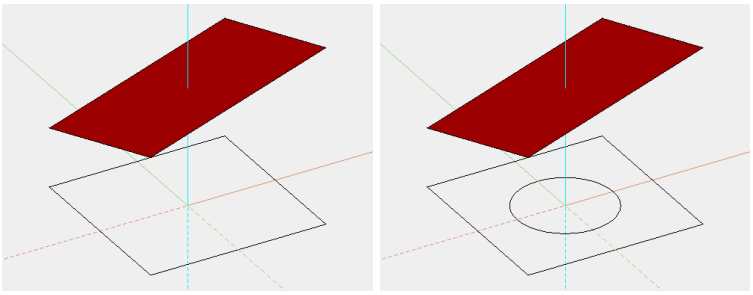
TIP

When you apply the 2D model without adjustment, an attempt is made to apply the model to the surface to scale (1:1). (For free form surfaces, this is only possible with a distortion). If the model protrudes over the edge of the surface, it is scaled.

WORKSHOP

Outline model

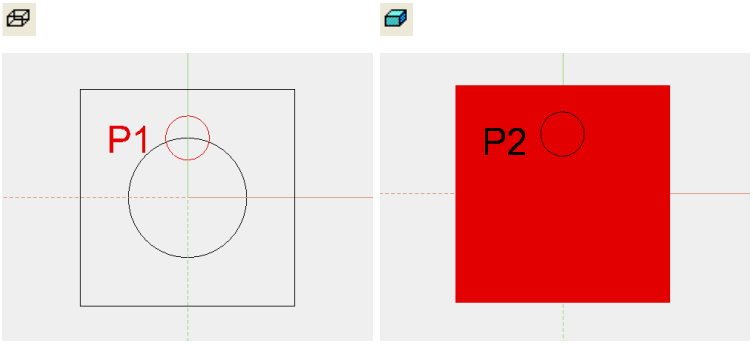
First, draw a slanted surface over three points. The exact description can be found in the workshop DEFINE SURFACE.
Then a circle can be drawn inside the rectangle in a new model.



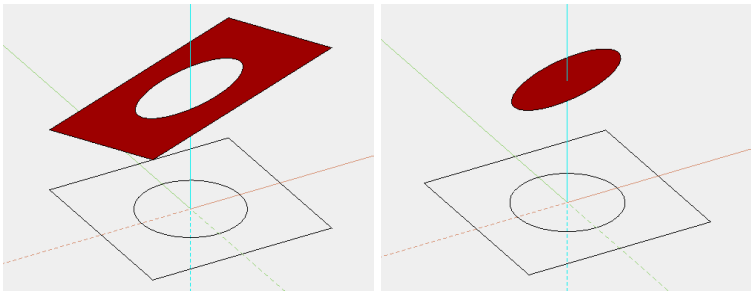
The following queries appear after activating this function:
Which model as outline (Select point)? (Enter = Remove outline)

The corresponding 2D model can now be clicked on the reference point.
Click on point **P1** on the circle in the wire model.
Apply onto which surface (select point)

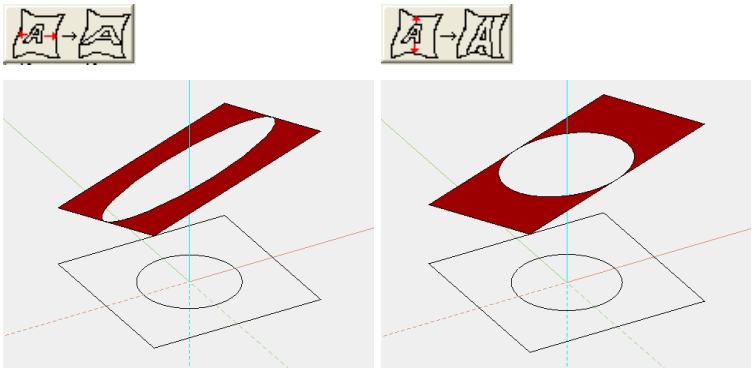
Now switch to the solid design model and click on point **P2** on the surface. This also determines the position of the reference point.



The options window opens.
Now click on one of the following options and confirm the window with OK. The surface is cut out.



Examples with the Adjust option



WORKSHOP END

DELETE TRIMMING

Surfaces tool bar
Modify menu > Surfaces > Delete trimming

This function is used to restore trimmed surfaces that have been edited using the function TRIM SURFACES. These surfaces are then re-displayed as untrimmed surfaces.

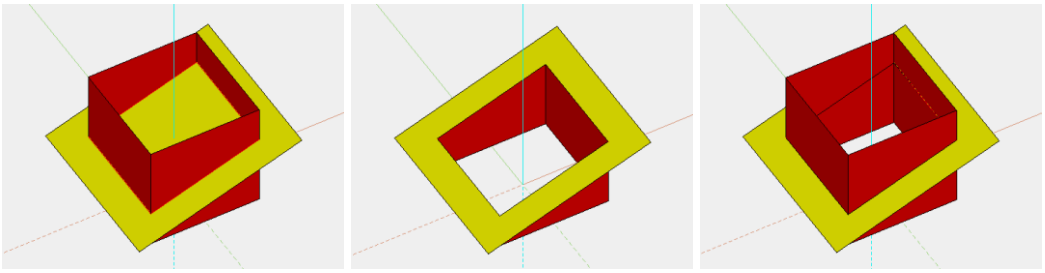
TIP

To restore trimmed surfaces, they must not have been trimmed using the associative function.

After activating this function, select the desired surface by clicking on it. The selected surface is then represented in purple. Before it is restored, you must confirm this is correct with [Enter].

Example

Origin | Surfaces trimmed | Trimming deleted



DELETE SINGLE SURFACE

Surfaces tool bar

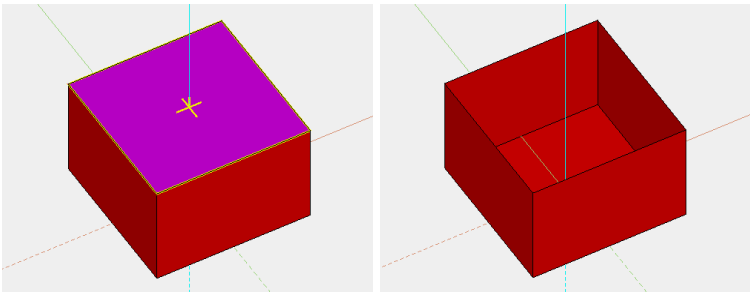
Modify menu > Surfaces > Delete single surface

Use this function to delete a single surface from a definition.
After activating this function, select the desired surface by clicking on it. The selected surface is then represented in purple. Before it is deleted, you must confirm this is correct with [Enter].

TIP

Clicking on the surface again deselects it.

Example



SURFACE-DIVISION OPERATION

Modify menu > Surfaces > Surface-division operation

This function is used to divide connecting free form surfaces. After activating this function, select the desired object by clicking on it.

EXTRACT BORDER CURVE

3D curves tool bar
Modify menu > 3D curves > Extract border curve

This function is used to generate 3D NURBS curves from surface borders.
The following queries appear after activating this function.

Please select definition
Click on the surface. It is then coloured purple.

Please click on the border curve in the 3D view (ENTER=End)
Now identify the desired surface border by clicking on it. The selected curve is represented in yellow.

This curve?
If the yellow curve is the desired curve, confirm the query with "Y" [Enter].
However, if the yellow curve is not the desired curve, respond to the query with "N" [Enter]. In this case, the first query appears again.

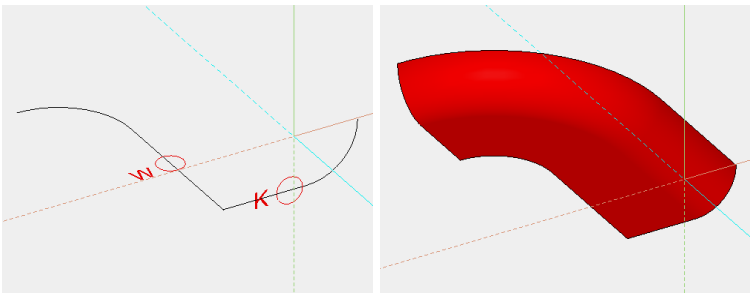
Please click on the border curve in the 3D view (ENTER=End)
Now you can click on another surface. However, this surface must border the current border curve (represented in yellow). If this is not the case, the following message appears: "Curves are not connected" and the query *Please click on the border curve in the 3D view (ENTER=End)* appears again.

Press [Enter] to end the selection. A NURBS curve and a 2D model that corresponds to the projection for this curve in the work plane are then produced.

▼▼▼▼ WORKSHOP

Extract border curve

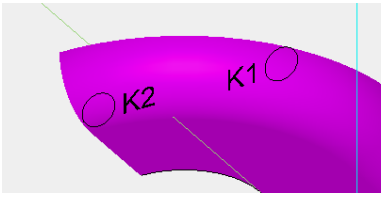
First, draw a trans surface. The exact description can be found in the workshop DEFINE TRANS SURFACE.



Select the EXTRACT BORDER CURVE function.
Please select definition

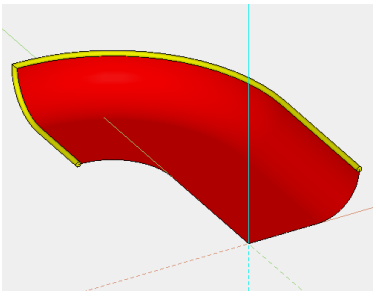
Click on the surface.
Please click on the border curve in the 3D view (ENTER=End)

Click near the upper curve **K1**.
This curve?



Confirm with **[Enter]**.
Please click on the border curve in the 3D view (ENTER=End)

Repeat the process again with curve **K2**.
The new 3D curve is now available for other 3D functions.



WORKSHOP END

FILLET CURVES

Modify menu > 3D curves > Fillet

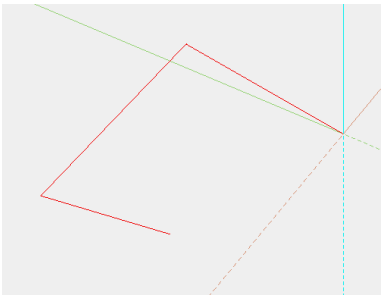
After selecting the 3D curve, you will be asked for a manipulation point. For the point specified here, the next point positioned on the curve is searched for, which either corresponds to a point or is assigned to a fillet. In the case of a point, a fillet can be defined; if a fillet already exists, the existing radius can be changed (radius 0 means a corner is restored).

TIP

To better define the manipulation point, it is recommended to capture points on the curve.

Example

3D curve with corners



Filleted 3D curve

CONNECT CURVES

3D curves tool bar
Modify menu > 3D curves > Connect

Several 3D curves that follow on from each other can be connected into one single curve, if the curves adjoin each other. To do this, select the curves one after each other using this function and complete the selection with [Enter].

SPLIT CURVES

3D curves tool bar
Modify menu > 3D curves > Split

After selecting the 3D curve, you will be asked for a partition point. For the point specified here, the next point positioned on the curve is identified as the actual partition point, and the curve is split there. The splitting operation results in two part curves that are each assigned to a model.

TIP

To better define the partition point, it is recommended to capture points on the curve.

DELETE SINGLE CURVE

3D curves tool bar
Modify menu > 3D curves > Delete single curve

You can use this function to delete single 3D or section curves. Start the function and then click on the desired curve.
It is deleted.

FILLET SURFACES

Fillet tool bar
Modify menu > Fillet surfaces > Fillet

This function can be used to fillet a surface with as many surfaces as you wish.

The following queries appear after activating this function:

Fillet radius?
The desired radius is entered in user units.

Associative? (Y/N)
If this query is responded to with N, the surfaces are trimmed and filleted. The fillet surface is created as a separate definition. The radius can no longer be changed. If "associative" is selected, the surfaces involved are combined into one object. This object also has the fillet surface. There is an association with the starting surfaces, so that each change results in the fillet being recalculated. The fillet radius can be changed in the properties bar.

Fillet which surface?
Now select the surface to be filleted by clicking on it. With surfaces that interpenetrate each other there are four options for filleting. The position of the points clicked on the surfaces determines the position of the fillet surface. Filleting happens in the direction of the points.

Fillet using which surface? (ENTER = End)
Now you can select other surfaces to be filleted by clicking on them. Once all surfaces are selected, this function is closed with [Enter].

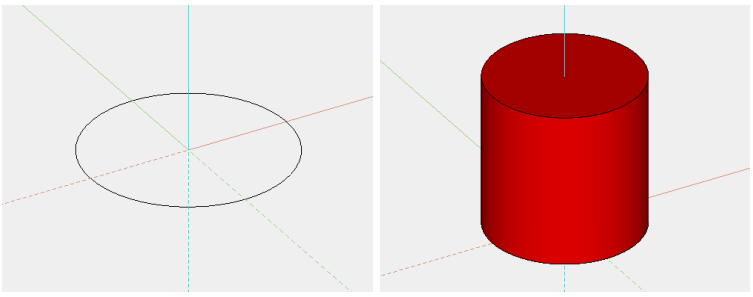
TIP

- At least two surfaces must be specified, otherwise the message "Only one surface was specified!" appears.
- If it is not possible to fillet the surfaces, the message "Filleting cancelled" appears.
- Delete filleting:
- If the fillet was created associatively, it can be removed again using the 3D DELETE function. Otherwise, it is restored when the fillet surface is deleted.
- Associative filleting:
- Changes to the starting surface can only be correctly recalculated if no additional surfaces are affected by the filleting.
- If a surface is filleted with several other surfaces, you must make sure that these surfaces connect to each other tangentially in the fillet area.

WORKSHOP

Fillet surfaces

First, draw a circle with a radius of 100 cm and use it to define a box. The exact description can be found in the workshop DEFINE BOX.



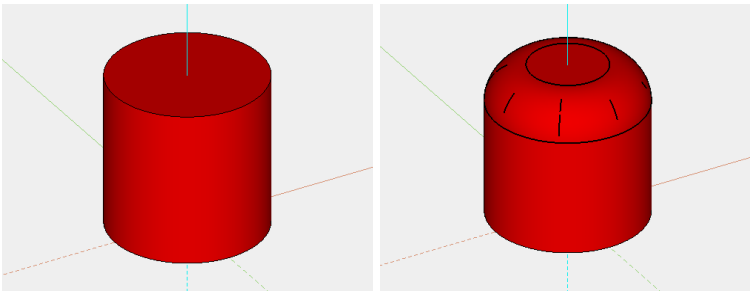
Select the FILLET SURFACES function.
Fillet radius?

Enter the value **50 cm** and confirm with **[Enter]**.
Associative? (Y/N)

Confirm with "Y" **[Enter]**.
Fillet which surface?

Click on the lateral surface with your mouse.
Fillet using which surface? (ENTER = End)

Click on the slab surface and end the function with **[Enter]**.



WORKSHOP END

TRIM SURFACES

Fillet tool bar
Modify menu > Fillet surfaces > Trim

This function can be used to trim a surface with as many surfaces as you wish.

The following queries appear after activating this function:

Associative? (Y/N)
If this query is responded to with N, the surfaces are trimmed. This process can no longer be changed. If "associative" is selected, the surfaces involved are combined into one object. There is an association with the starting surfaces so that each change results in the trim being recalculated.

Trim which surface?
Now select the surface to be trimmed by clicking on it – it is then coloured purple. With surfaces that interpenetrate each other there are four options for trimming. The section curve splits each surface into two halves. The surfaces must be clicked on each side that is to remain after the operation.

Trim using which surface? (ENTER = End)

Now you can select other surfaces to be trimmed by clicking on them. Once all surfaces are selected, this function is closed with [Enter]. The result is that the surfaces are trimmed and the section curve displayed.

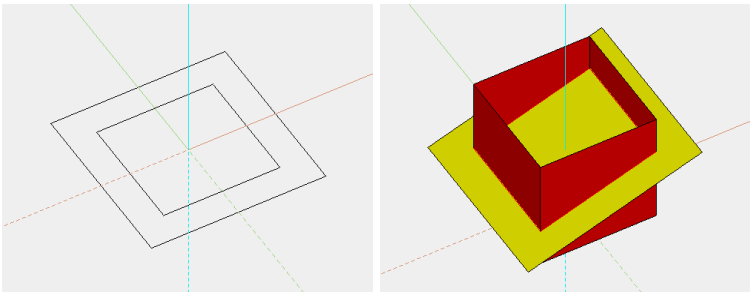
TIP

- At least two surfaces must be specified, otherwise the message *Only one surface was specified!* appears.
- If it is not possible to trim the surfaces, the message "Trimming cancelled" appears.
- Delete trimming:
- If the trimming operation was created associatively, it can be removed again using the 3D DELETE function. Otherwise, it is restored when the section curve is deleted.

WORKSHOP

Trim surfaces

First draw an extrude and a slanted surface over three points. The exact description can be found in the workshops DEFINE EXTRUDE and DEFINE SURFACE.

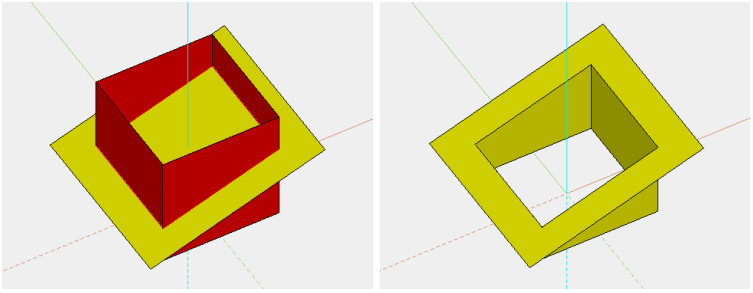


Select the TRIM SURFACES function.
Associative? (Y/N)

Confirm with "Y" **[Enter]**.
Trim which surface?

Click on the outer edge of the slanted surface.
Trim using which surface? (ENTER = End)

Click on the base edge of the extrude and end the function with **[Enter]**.



WORKSHOP END

CHAMFER SURFACES

Fillet tool bar
Modify menu > Fillet surfaces > Chamfer

This function can be used to chamfer a surface with as many surfaces as you wish.

The following queries appear after activating this function:

Chamfer distance?
The desired distance is entered in user units.

Chamfer angle? (0:symmetric)
The desired angle is entered in user units.

Associative? (Y/N)
If this query is responded to with N, the surfaces are trimmed and chamfered. The chamfer surface is created as a separate definition. The chamfer distance can no longer be changed. If "associative" is selected, the surfaces involved are combined into one object. This object also has the chamfer surface. There is an association with the starting surfaces, so that each change results in the chamfer being recalculated. The chamfer distance can be changed in the properties bar.

Chamfer which surface?
Now select the surface to be chamfered by clicking on it. With surfaces that interpenetrate each other there are four options for chamfering. The position of the points clicked on the surfaces determines the position of the chamfer surface. Chamfering happens in the direction of the points.

Chamfer using which surface? (ENTER=End)
Now you can select other surfaces to be chamfered by clicking on them. Once all surfaces are selected, this function is closed with [Enter].

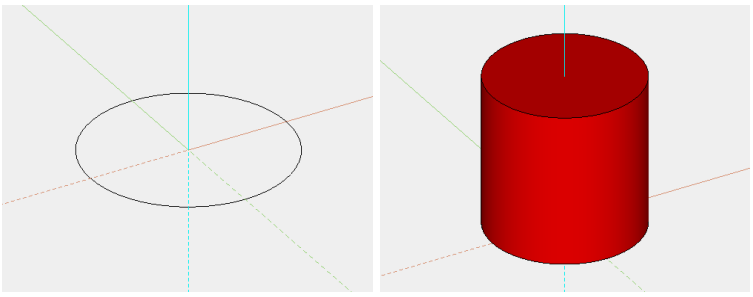
TIP

- At least two surfaces must be specified, otherwise the message *Only one surface was specified!* appears.
- If it is not possible to chamfer the surfaces, the message "Chamfer cancelled" appears.
- Delete chamfer:
- If the chamfer was created associatively, it can be removed again using the 3D DELETE function. Otherwise, it is restored when the chamfer surface is deleted.

WORKSHOP

Chamfer surfaces

First, draw a circle with a radius of 100 cm and use it to define a box. The exact description can be found in the workshop DEFINE BOX.



Select the CHAMFER SURFACES function.
Chamfer distance?

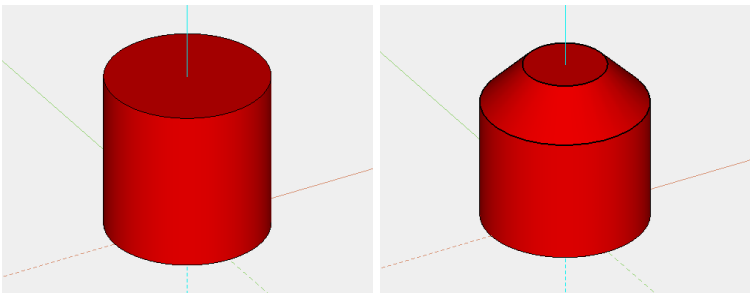
Enter the value **50 cm** and confirm with **[Enter]**.
Chamfer angle? (0:symmetric)

Enter the value **50** and confirm with **[Enter]**.
Associative? (Y/N)

Confirm with "Y" **[Enter]**.
Chamfer which surface?

Click on the lateral surface with your mouse.
Chamfer using which surface? (ENTER=End)

Click on the slab surface and end the function with **[Enter]**.



WORKSHOP END

SECTION CURVE

Fillet tool bar
Modify menu > Fillet surfaces > Section curve

This function can be used to section a surface with as many surfaces as you wish and then calculate their intersection lines.

TIP

- At least two surfaces must be specified, otherwise the message "Only one surface was specified!" appears.
- If it is not possible to section the surfaces, the message "Sectioning cancelled" appears.

The following queries appear after activating this function:

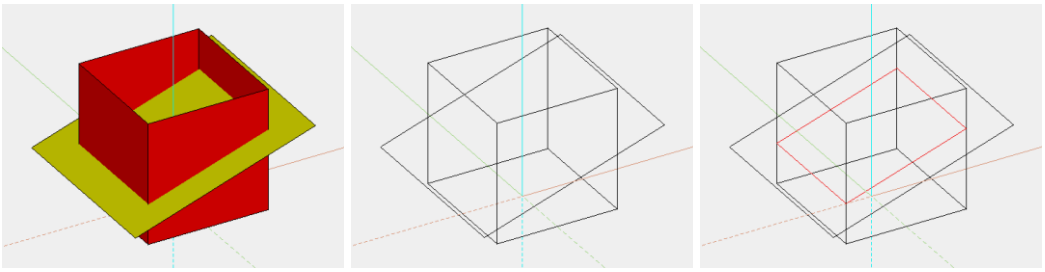
Associative? (Y/N)

If you respond to this query with "N", the surfaces are retained and the section curve is created in a new model. This process can no longer be changed. If "associative" is selected, the surfaces involved are combined into one object. There is an association with the starting surfaces, so that each change results in the section curve being recalculated.

Section which surface?
Now select the surface to be sectioned by clicking on it.

Section using which surface? (ENTER = End)
Now you can select other surfaces to be sectioned by clicking on them. Once all surfaces are selected, this function is closed with [Enter].

Example:



TRIM/FILLET

Fillet tool bar
Modify menu > Fillet surfaces > Trim/Fillet

This function can be used to:

Fillet a surface with as many surfaces as you wish. The user can choose from several kinds of execution.
Trim a surface with as many surfaces as you wish. This is also possible with an offset.

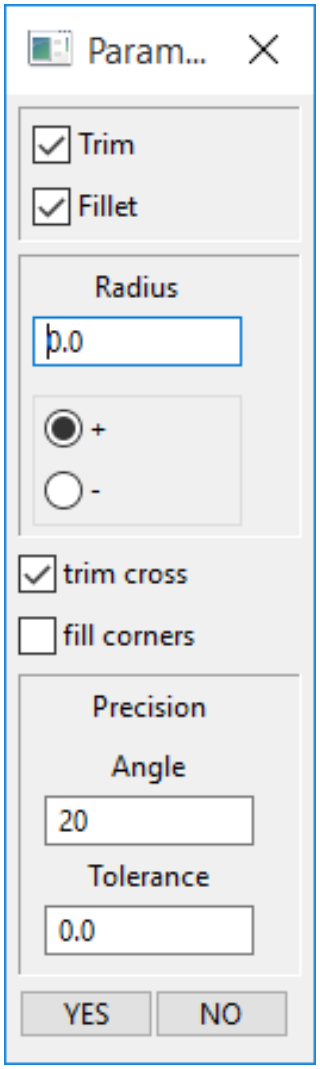
TIP

- At least two surfaces must be specified, otherwise the message "Only one surface was specified!" appears.
- To trim a surface with an offset, a radius must be specified and the FILLET option switched off.
- If it is not possible to trim/fillet the surfaces, the message "Trim/Fillet cancelled" appears.
- If a surface is filleted with several other surfaces, you must make sure that these surfaces connect to each other tangentially in the fillet area.

The following queries appear after activating this function:

Please click on the surface in the 3D view [ENTER=calculation]
Now select the desired surface by clicking on it.

The following parameter window appears.



Trim:
The selected surface is trimmed.

Fillet:
A new surface with the specified radius is added to the surface selected. If neither option (trim/fillet) is checked, the selected surface remains unchanged.

+/-:
This switch indicates the direction of the radius. "+" indicates the positive normal vector direction.

Trim cross:
If this option is activated, each part area on which the cross hair is located is trimmed. Otherwise, these part areas are retained. This check box only takes effect in combination with trimming.

Fill corners:
If this option is activated, the fillet surface is continued up to the edge of the first surface.

Precision:
The values set here for level and tolerance should not be changed.

Angle:
The smaller the angle, the more precise the render (time!)

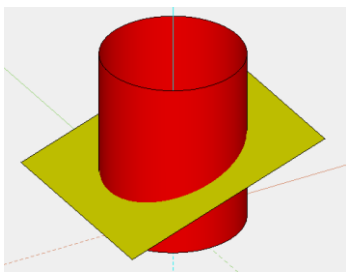
Tolerance:
Precision for the transition of the fillet surfaces (in user unit).

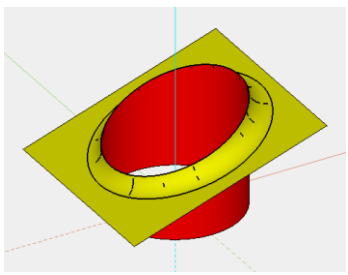
The values set apply to the selected surface. If the surface that has turned purple is the desired surface, press the YES button. However if the purple surface is not the desired surface, press the NO button.

"Please click on the surface in the 3D view [ENTER=calculation]"
Now you can select another surface. (As described above)

Once all surfaces are selected, this function is closed by pressing [Enter] following the query "Please click on the surface in the 3D view [ENTER=calculation]".
The selected surfaces are then trimmed and/or filleted.

Example:





VARIABLE TRIMMING/FILLET

Fillet tool bar
Modify menu > Fillet surfaces > Variable fillet

This function can be used to:

Fillet a surface with as many surfaces as you wish. The user can choose from several kinds of execution.
Trim a surface with as many surfaces as you wish. This is also possible with an offset.

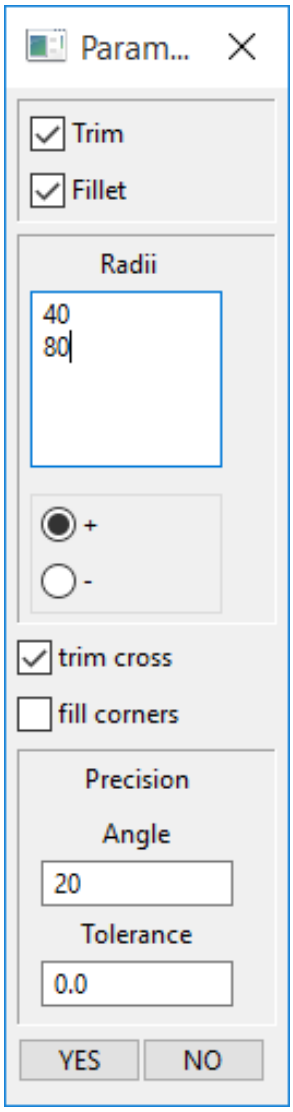
TIP

- At least two surfaces must be specified, otherwise the message "Only one surface was specified!" appears.
- To trim a surface with an offset, a radius must be specified and the FILLET option switched off.
- If it is not possible to trim/fillet the surfaces, the message "Trim/Fillet cancelled" appears.
- If a surface is filleted with several other surfaces, you must make sure that these surfaces connect to each other tangentially in the fillet area.

The following queries appear after activating this function:

Please click on the surface in the 3D view [ENTER=calculation]
Now select the desired surface by clicking on it.

The following parameter window appears.



Trim:
The selected surface is trimmed.

Fillet:
A new surface with the specified radius is added to the surface selected. If neither option (trim/fillet) is checked, the selected surface remains unchanged.

Radii:
Several radii (in user units) can be entered here. It is only possible to enter one radius per row.

+/-:
This switch indicates the direction of the radius. "+" indicates the positive normal vector direction.

Trim cross:
If this option is activated, each part area on which the cross hair is located is trimmed. Otherwise, these part areas are retained. This check box only takes effect in combination with trimming.

Fill corners:
Currently not supported

Precision:
The values set here for level and tolerance should not be changed.

Angle:
The smaller the angle, the more precise the render (time!)

Tolerance:
Precision for the transition of the fillet surfaces (in user unit)

The values set apply to the selected surface. If the surface that has turned purple is the desired surface, press the YES button. However if the purple surface is not the desired surface, press the NO button.

"Please click on the surface in the 3D view [ENTER=calculation]"
Now you can select another surface. (As described above)

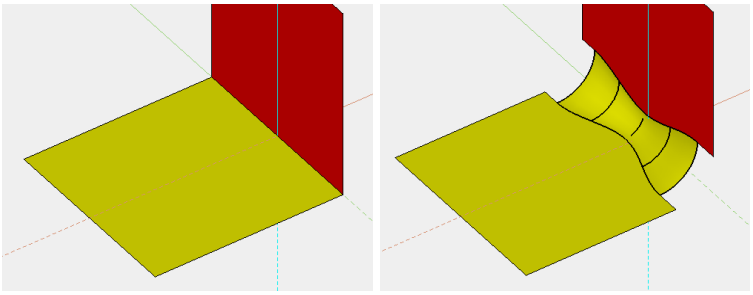
Once all surfaces are selected, this function is closed by pressing [Enter] following the query "Please click on the surface in the 3D view [ENTER=calculation]".
All curves with constant radii are then displayed on the screen, and the following query appears:

Please click points on the guide curve [ENTER=calculation]
Now indicate all points, in the desired order, on the curves displayed by clicking on them. Each individual point is checked with the query "This point?" and confirmed with "Y/N". Press [Enter] to end the selection of points.

Please enter interpolation type 0=point,1=tangent,2/3=radius
The interpolation type must be specified here by entering the corresponding numbers.

Point: Points are connected by lines
Tangent, radius: Points are connected by flat curves

Example:



INVERT TRIMMING

Fillet tool bar
Modify menu > Fillet surfaces > Invert trimming

This function can be used to select the remaining surface (inverse surface). This means that this function saves you from having to redefine incorrectly trimmed surfaces.

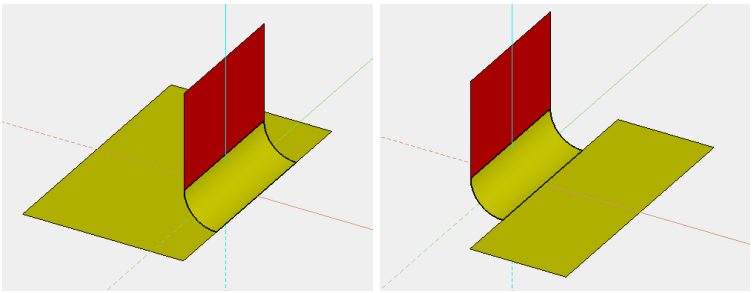
The following queries appear after activating this function:

Please click on the surface in the 3D view
Now select the surface to be trimmed by clicking on it – it is then coloured purple.

Invert surface?
If the surface that has turned purple is the desired surface, confirm the query with "Y" [Enter]. However, if the purple surface is not the desired surface, respond to the query with "N" [Enter]. In this case, the query *Please click on the surface in the 3D view* appears again. This cycle is continued until positive confirmation is received for the query *Invert this surface?*

Then the desired surface is inverted.

Example:
Incorrectly trimmed surface Inverted trimming



BLEND CORNER

Fillet tool bar
Modify menu > Fillet surfaces > Blend corner

This function is used to fillet three converging fillet surfaces.

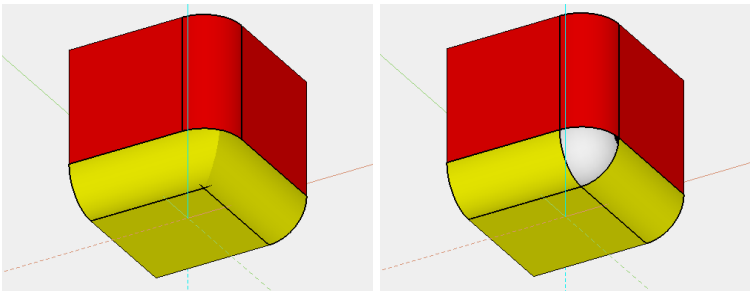
The following queries appear after activating this function:

Please click on the surface in the 3D view
Now select a fillet surface by clicking on it. The selected surface is then coloured purple.

This surface?
If the surface that has turned purple is the desired surface, confirm the query with "Y" [Enter]. However, if the purple surface is not the desired surface, respond to the query with "N" [Enter]. In this case, either the query *Please click on the surface in the 3D view* appears again, or if several surfaces are possible, the next is proposed. This cycle is continued until positive confirmation is received for the queries *This surface?*

Then the blend corner is created.

Example:



MODIFY RESOLUTION

Settings menu > Resolution

This function is used to configure the parameters for 3D resolution. You can choose between equal resolution and curve-dependent resolution. The analytical data model with NURBS is an exact description of curves and surfaces. For the graphic display, facets must be harmonised – however the resolution representation can be as high as you wish. The higher the resolution representation, the better the graphics but the longer the rendering time.

There are multiple options for configuring the detail of depiction.

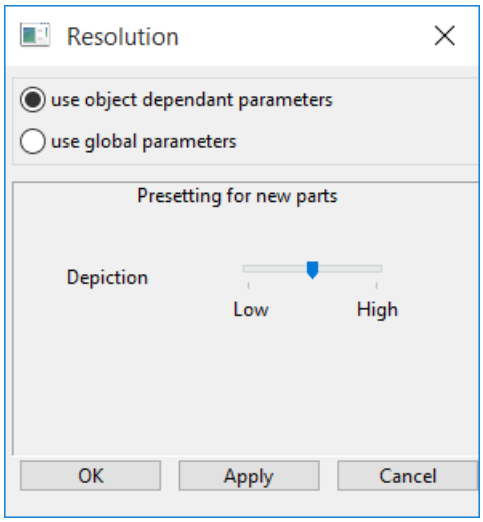
Configuring the parameters for each definition individually:
In the properties bar for the relevant definition
Tool bar * Modify > 3D OBJECT PARAMETERS
MODIFY menu > 3D OBJECT PARAMETERS

Configuring the parameters globally:
SETTINGS menu > RESOLUTION

This has the following advantages:

Using global resolution, high or low resolution can be quickly configured for the entire image. If individual parameters are changed, an individual object can be represented in high resolution without requiring a lot of rendering time for the others.

Parameters

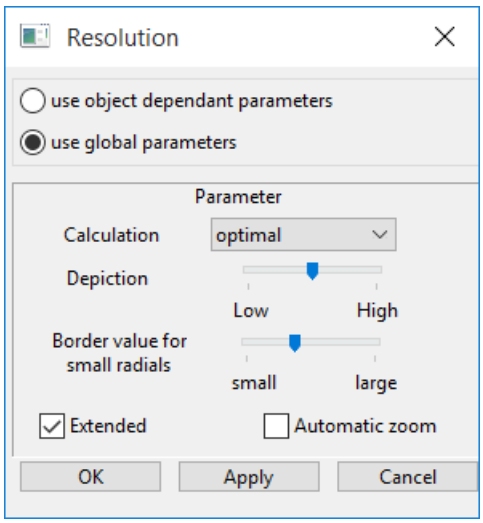


Use object dependent parameters
The depiction resolution configured here is used as a default setting for new 3D objects.

Use global parameters
If this option is activated, the configured values for depiction are used for all 3D definitions. If this option is not activated, the parameters entered for the definition are used for depiction.

Use the EXTENDED option to differentiate between different calculation modes. In addition, there is the AUTOMATIC ZOOM option. If this option is activated, complex 3D objects are only exactly displayed if they are zoomed in. This has an impact on performance speed.

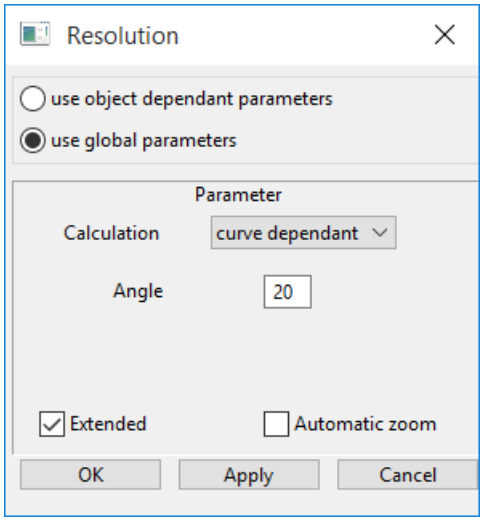
Optimal



Depiction
Use the slider to move from low to high depiction.

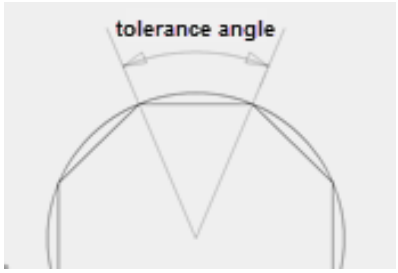
Limit for small radials
Use the slider to move from a small to a large limit.

Curvature dependent resolution

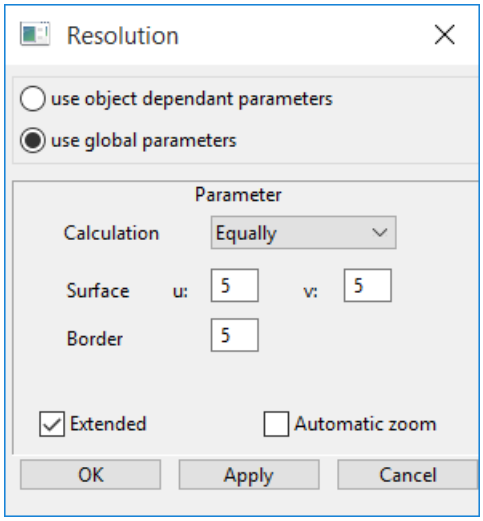


Curvature-dependent resolution means that the surfaces are only divided where a configurable curvature value is exceeded. Sufficiently flat facets are not divided any further. This results in the number of points being considerably smaller than with equal resolution, and dynamic movements are faster.

Angle
The tolerance angle indicates to what maximum degree the surface normal may differ to the left and right edge of a facet (or above – below). The tolerance angle can also be considered being the maximum change of one facet in regards to the adjoining facet. The smaller the tolerance angle, the higher the resolution.



Uniform resolution



EXPLANATION

NURBS surfaces are made up of segments. A straight part or a quadrant is normally converted into one segment (e.g. the lateral surface of a cuboid or a cylinder comprises four segments).

Surface
The surface resolution indicates how often a segment is to be divided. A rectangular surface can be divided in two directions at different resolutions. The directions are usually referred to as U and V. In general, the U resolution is the direction of the model and the V resolution the extrude or rotation direction. With free form surfaces made up of two, three or four border curves, the U direction is generally the contour and the V direction the path.

Border
The border resolution indicates to what degree the border of a facet should be divided. This value is also used for segmenting trimming curves.

OK
This function applies the values and then removes the entry mask from the screen.

Apply
This function applies the configured values without removing the entry mask from the screen.

Cancel
This function removes the dialog window from the screen without adopting the values.

TIP

Optimisations:
For some surfaces, the resolution is optimised. It is of no use fragmenting a planar rectangular surface into several facets – quite the contrary, as this increases processing time and memory usage. For surfaces that are planar in at least one direction (polygon, extrude, box), the configured resolution is ignored. A cuboid does not need to be divided further in the direction of the extrude – surface resolution 1 would suffice. The resolution can also be kept lower for a cylinder. The lateral surface is fragmented into eight facets (curved) by default, with a high-resolution border. However, to give users the chance to implement their settings for optimal graphics, optimisation is switched off for surface resolution > 10.

MODIFY FACET COLOUR

Modify tool bar (ME)

This function can be used to change the colour of a 3D object or even single colours in a free definition (also special parts from CAD400, DXF or ELITECAD V4) or of special parts from ELITECAD V7.

After activating this function, select the colours to be changed by clicking on them, and assign another colour by entering the colour number or using the menu (m).

ENTRY MODE

Change toolbar

This special function is mainly intended for the usage with the classification structure in ELITECAD Mechanics. This switch controls if certain functions consider just the current object/model or the current image. Hence, some operations can be applied to a complete selection. In general, this behaviour is achievable with selection of multiple objects without this switch too.

After activation of this function, the current setting is displayed in the status bar:
3D-Definitions are related to ACTIVE MODEL
3D-Definitions are related to IMAGE
If the option is active, a notification in the property bar is displayed in the status bar.
WARNING: All entries relate to all models in the IMAGE!

CHANGE WIREFRAME COLOUR

3D toolbar

This special function is mainly intended for the usage with the classification structure in ELITECAD Mechanics. It works in dependence of the switch ENTRY MODE.

For 3D objects that are created by a 2D contour, the colour of the edges is taken from the colour of the 2D contour. There are also 3D objects that exist without 2D contour, like free definitions or surfaces that are imported via 3D interfaces. In order to make these objects better distinguishable by their colour this function is used to assign a new edge colour for a 3D object.

CHANGE ROTATION ANGLE

3D toolbar

This special function is mainly intended for the usage with the classification structure in ELITECAD Mechanics. It works in dependence of the switch ENTRY MODE.

This function is used to add a new start and end angle for 3D definitions created as ROTATION BOX or ROTATION EXTRUDE.

After activation of the function the start and end angle for the rotation is queried. The angles are entered in degrees and confirmed with [Enter].

A start angle of 0 degrees and an end angle with 360 degrees describe a complete rotation. If no full rotation is necessary, the direction of rotation is essential (sign!).

CHANGE ROTATION AXIS

3D Toolbar

This special function is mainly intended for the usage with the classification structure in ELITECAD Mechanics. It works in dependence of the switch ENTRY MODE.

After activation of the function the first and second point of the new rotation axis have to be entered. 3D definitions created as ROTATION BOX or ROTATION EXTRUDE are rotated around this new axis.

CHANGE SIZE

3D toolbar

This special function is mainly intended for the usage with the classification structure in ELITECAD Mechanics. It works in dependence of the switch ENTRY MODE.

This function is used to change the size of 3D definitions created as PLANAR SURFACE, EXTRUDE or BOX.
After activation of the function, the height (Z coordinate) of the lower and upper limitation plane is queried.

1. Plane is parallel to the workspace:
   The height is entered as a numerical value (in current units).
   The height is entered by snapping a height point in the graphics window (CAD snap mode).

2. Plane is not parallel to the workspace (enabled by entering "e" or "f"):
   With "e", the plane is defined by three points (point entry as number or CAD snap mode).
   With "f", a plane is defined by selecting a surface in the graphics window.

CHANGE COLOUR

3D toolbar

This special function is mainly intended for the usage with the classification structure in ELITECAD Mechanics. It works in dependence of the switch ENTRY MODE.

This function is used to change the colour and transparency of 3D definitions.

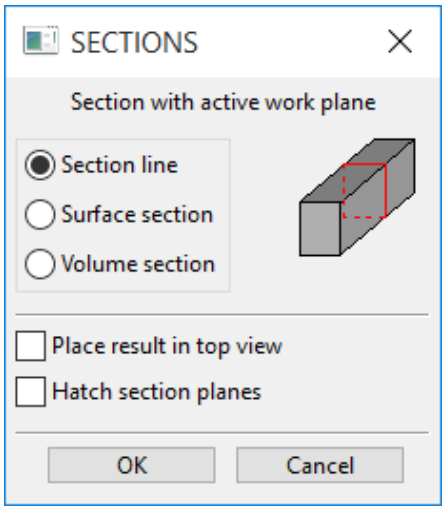
After activation of the function a new colour and/or transparency is entered by the new colour number (0-1024) and transparency value (0-100%; 0 ... opaque).

SECTIONS

Extras tool bar
Extras menu > Sections

This function is used to generate a planar section using the current 3D image. The current work plane is always used as the section plane.

The following settings window appears after activating this function. Select the desired option and close the window with OK. The intersection is calculated.



Section line

Used to create a section profile from 3D objects as a 2D contours. A new 2D object is created for each surface.

Surface section

Used to trim the current visible objects.

Volume section

Used similarly to the surface section to trim the current visible objects, whereby additional end surfaces are created.

Place result in top view:
The result of the section can be placed either in the current work plane or in the top view. This option is only possible with section lines.

Hatch section areas:
If this option is selected, hatching is created for the section area with the current hatching parameters. This option is only possible with volume sections.

TIP

- The original part (3D model) is not changed. The section is created as a separate object. The current layer name is used for newly created objects. If the layer name has not yet been defined, it is stored with *cut.* The resulting model receives the attribute object= *cutline, cutvolume, cutsurf,* depending on the section type.

EXPLOSION

Extras toolbar, view toolbar (ME)
Menu Extras > Explosion

This function is only available in ELITECAD Mechanics and is used to create an exploded view of the currently visible 3D model.

When creating an explosion view the positions of the 3D objects are shifted in space without rotation or resizing. The positions of the 3D objects are scaled relative to the origin of the current workspace.

Different values can be entered for different directions.
Factor < 1 => the design model is shrunk
Factor = 1 => the design model remains unchanged
Factor > 1 => the design model is stretched
A scaling may be reverted by the invers factor (e.g. the factor 2 is inverted by the factor 0.5).
Only visible objects are considered. Hence, the design model is exploded very flexibly through multiple calls of the function with different 3D objects visible.

REMARK

This functions is not intended for visualisation purposes only, it changes the design model. 2D elements remain unchanged. 3D definitions change their position. If you want some objects to be keep their position relative to each other, you have to combine them into a special part first.

DEFINE SPECIAL PART

Extras tool bar

This section is used to combine the current 3D image into a single new object with 3D information.

After activating this function, you will be prompted:

2D display with rectangle?
If the 2D display of the special part is to be drawn as a defining rectangle, confirm the query with "Y" [Enter]. If you do not want a 2D display, respond to the query with "N" [Enter].

TIP

The 3D objects that are combined into one special part can no longer be edited in their original form. The new special part object is converted into a free definition and only its colour, transparency and resolution can be changed.

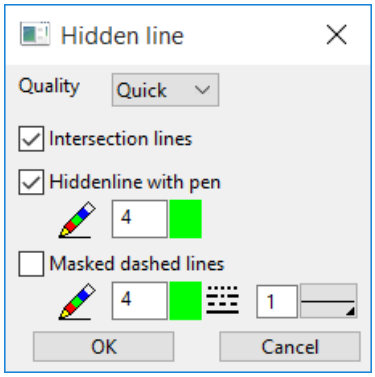
Hidden line

Extras tool bar
Extras menu > Hidden line

This function is used to calculate a 2D image from 3D objects.

The result is converted into a new 2D model and a new layer (hidden line), i.e. copied into the 2D data format and entered in the selected plane.
This new 2D model can now be used with all the 2D functions.

The following settings window appears after activating this function. Select the desired option and close the window with OK. The 3D image is then calculated as hidden line.



Quality
Here you can select the quality of the hidden line. If you are not satisfied with the result, the quality can be increased.

Intersection lines
If this option is activated, the surfaces of the model are intersected with each other to obtain intersection lines. (Lengthens rendering time!)

Hiddenline with pen
Here you can configure whether the 2D image is rendered with a pen or whether the edging colours of the 3D object are used. The pen can be configured.

Masked dashed lines
If you want to include hidden lines in the rendering, this option can be activated. The pen and line type can be configured.

TIP

The rendering only involves the parts of the 3D object that are visible on the screen.

Surface to surface

Manipulation tool bar

Use this function to position objects by assigning one surface to another. The selection must be made beforehand.

The following queries appear after activating this function:

Copy?

If the current selection is to be copied, respond to this query with "Y" [Enter]. If you do not want a copy, respond to the query with "N" [Enter].

Assign which surface?
The surface that is to be reassigned must be clicked on in the 3D view.

Assign to which surface?
Now click on the surface to which the previously selected surface should be assigned. The action is performed after confirming the confirmation prompt *To this surface?*

TIP

This function is only possible for the following definitions:
Surface, extrude, box, rotation extrude and rotation box
Position and orientation of the assigned object on the selected surface are undefined and can be changed using the manipulation functions.

MODIFY SMOOTHING TOLERANCE ANGLE

Surfaces tool bar

With free form surfaces, buckles in the borders of the surface can be sustained or ignored. The tolerance angle indicates up to what value the buckles are ignored.

After activating this function, you will be prompted:

Please enter tolerance angle (degree) for internal smoothing
Enter the desired value. The default value is 5 degrees.

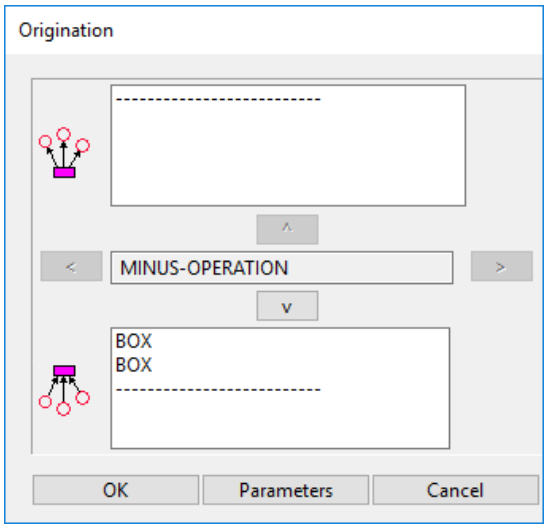
3D OBJECT HISTORY

Info tool bar
Info menu > 3D obj. evolution

This function is used to analyse the evolution history of a 3D object, which was created from associative operations.

The following query appears after activating this function:

Analyse which definition?
Select the desired object by clicking on it. The entire 3D object is represented in purple and the entry window appears.



In the middle text field, the type (e.g. MINUS OPERATION) of the selected definition is displayed. The top text field contains a list of links to objects, which the object represented in purple helped to create. Initially this field is empty. The bottom text field contains a list of links to those objects that helped to create the object represented in purple.
If both the top and bottom text fields are empty, the object exists on its own and does not depend on other objects.

Use the PARAMETERS button to display and modify the parameters of the purple object (see also MODIFY > 3D object parameters).

If the purple object was created through an associative operation (e.g. section, join, minus operation, fillet operations), you can scroll back one step in the creation process by clicking "v". The purple object becomes invisible and all objects that helped to create it become visible (e.g. all A and B parts in a Boolean operation). The first object in the list becomes purple and its type is displayed in the middle text field. The previous purple object moves to the top list and the links associated with the current purple object are displayed in the bottom list.

You can switch between A and B definitions using "<" and ">", and the middle and bottom text fields are updated accordingly.

Use the "^" button to move up a level. You can scroll through the creation process until no more dependencies can be found.

Use the buttons OK and CANCEL to close the window; the original object is now visible again.

TIP

- It is not just possible to change the parameters of visible objects – you can also modify their 2D geometry.
- If the middle object is the result of a Boolean operation, there is one entry for each A and B part in the bottom list.
- For associative fillets, an entry is provided for each surface.

List 3D colours

Info tool bar

This function lists the 3D colours used in the design model in the info window.

Modify 3D colours globally

* Modify tool bar

This function can be used to change one colour to another colour for all objects that are visible on the screen.
Select the colour to be changed by clicking on it or entering the colour number. The new colour is then assigned by entering the colour number or using the menu (m).

TIP

The exact description of the colour selection menu can be found in the chapter 1.4 Pen colours.

7.4 Delete

Delete 3D

Manipulate tool bar

This function is used to delete the 3D definitions.

After activating this function, select the desired definition by clicking on a surface or curve. The selected surface is then represented in purple. Before it is deleted, you must confirm this is correct.

TIP

If a 3D definition is selected with Selection element part ([Alt] key pressed), the 3D definition can also be deleted with [Del]. Multiple selection is possible with [Shift].

Delete 3D by type

These special functions are mainly intended for the usage with the classification structure of ELITECAD Mechanics. They delete exactly those 3D definitions, which have a specific type depending on the switch ENTRY MODE. The 2D data remains.

TIP

Consider the switch ENTRY MODE before deleting! Either the appropriate 3D definition in the active object is deleted or all appropriate 3D objects that are visible on the screen.

The following functions are working similarly and differ only in the type of the 3D definition to be deleted.

Delete planar surface

3D toolbar

Delete extrude

3D toolbar

Delete box

3D toolbar

Delete rotation extrude

3D toolbar

Delete rotation box

D toolbar

Delete trans surface

Freeform / curve toolbar

Delete trans box

Freeform / curve toolbar

Delete design surface

Freeform / curve toolbar

Delete design box

Freeform / curve toolbar

Delete free form

Freeform / curve toolbar

Delete 2-view curve

Freeform / curve toolbar

Delete 2-view object

3D toolbar

Delete 3-view object

3D toolbar

Delete Boolean operation

Change toolbar

8. ARCHITECTURE OBJECTS

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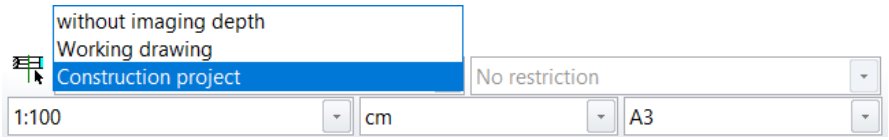
8.1 REPRESENTATION LEVEL

The display of the *3D* and *architecture objects* in the floor plan and section is controlled by using *representation levels*. The appearance and label of windows and doors, room stamps and architectural dimensioning vary according to the selected *representation level*.

The *representation level* does not need to be automatically linked to the scale but can be selected according to the planning stage (design, permission, execution, etc.). These planning stages are of course linked to a certain SCALE setting, so the hatch, text and dimension parameter settings as well as the preciseness of the details of the *AR Objects* must be taken into account accordingly.

SELECT REPRESENTATION LEVEL

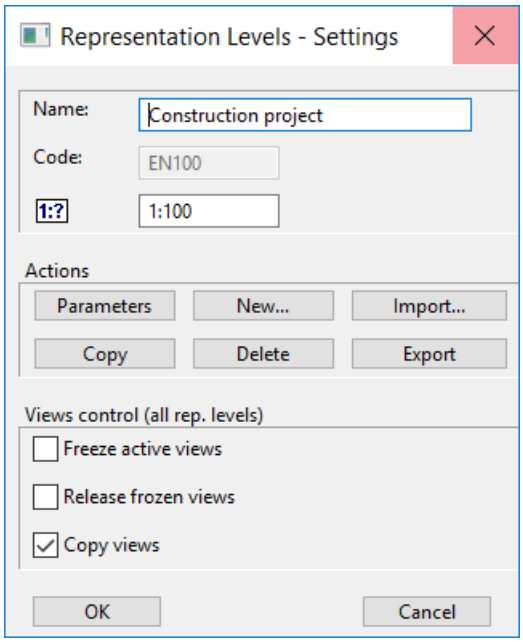


The representation level is defined in the status bar.

The state "**without representation level**" specifies that the file will be worked on without representation levels. The possibility of implementing the planning stages "at the touch of a button" from the entry planning to the work drawing, for example, is then no longer applicable. The settings of the respective functions are used under "without representation level".

Representation level settings

	Settings tool bar
	Menu > Settings > Representation levels...



The fields Name, Code and Scale represent the values of the active representation level. The code is a unique characteristic as the names of the representation levels mostly stay the same during import or export.

Parameters
The detailed settings of the active representation level.

New...
Creates a new EMPTY representation level. Check whether it is easier to use the COPY function and then make changes. When creating a representation level, the parameter's storage type under SETTINGS > OPTIONS > SYSTEM > CONFIGURATION determines whether the representation level is created for *User* or *Global*.

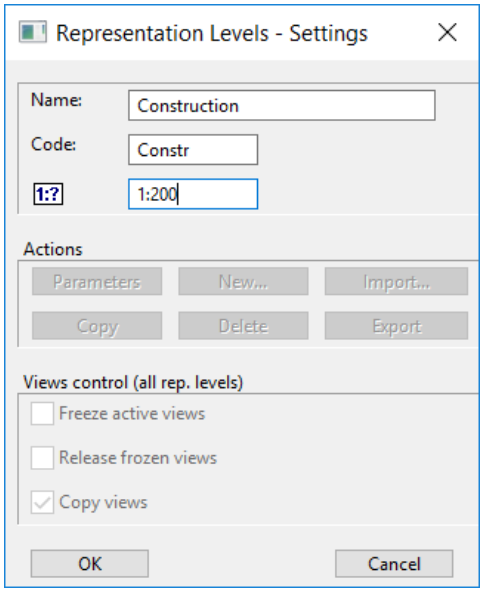
Copy
Creates a new representation level with the same settings as the active representation level.

Delete
Removes the active representation level. If the message "*not authorised*" appears when you delete a representation level, this means that in this case it is a global representation level, which can only be removed by an administrator.

Import
You can import a representation level using this function. This way, a representation level that you have created yourself can be read on different workstations.

Export
Using this function, a representation level can be saved and read on other workstations.

When creating a new file, a dialog window opens in which the name, a unique code and optional scale for the representation level must be entered.



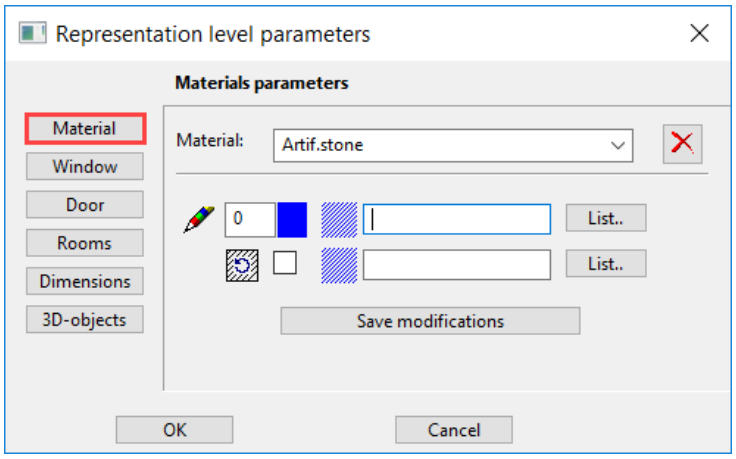
OK creates the name of the representation level. All specified materials (accessible via the *Parameter* button) are adopted into the new representation level and must now be adjusted according to your needs.

Parameters

Clicking the parameter icon, takes you to the settings dialog window of the active representation level (see display in *Status-Window*)

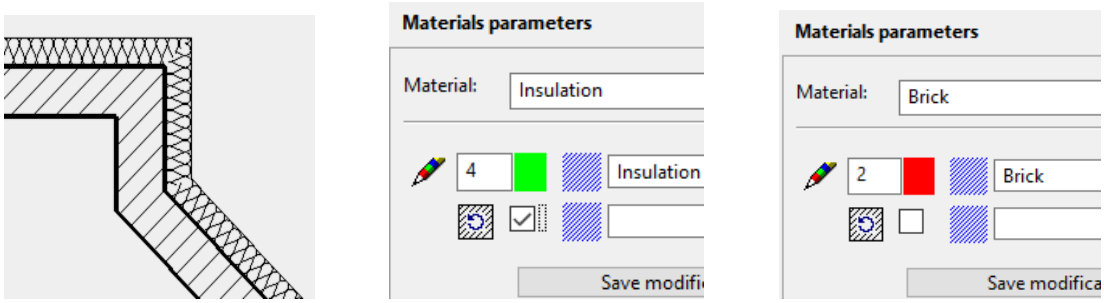
Materials management

The line widths and hatch parameters used to display the materials of **walls**, **floors**, **girders**, **chimneys**, **stairs** and **columns** in the floor plan and section views are defined in materials management.



Existing materials can be selected from the selection box where the pen and hatch parameters always refer to the active material. The hatch parameter can be selected from **<List..>**, i.e. from a list of all of the settings created under *Hatch – Parameter*. If the hatch field is empty, no hatch is implemented.
Materials can also consist of two hatches: a grey preview hatch and a line hatch over it.

If this option is activated, the hatch rotates with the material.



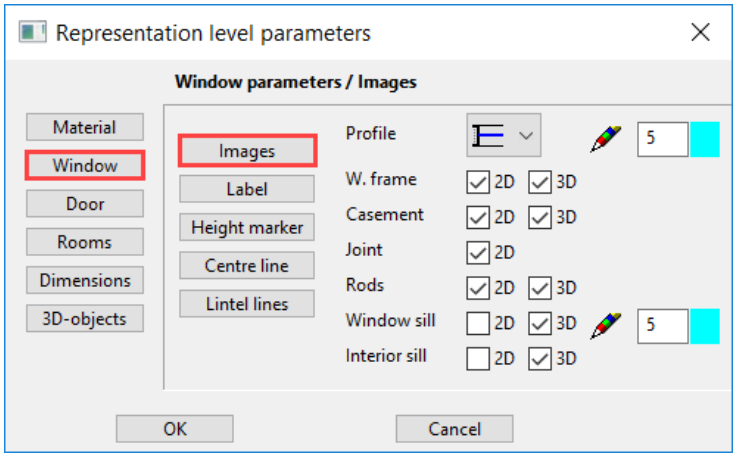
The "insulation" material rotates with the wall; the "brick" material does not.

Should a new material be created, you can enter the desired name into the selection box, specify the pen and hatch parameters and confirm with **<Save modifications>**. This material name is now equally available in all of the other representation levels and can be individually customised to each representation level.
<Delete> removes the active material from all of the representation levels.

Window parameters

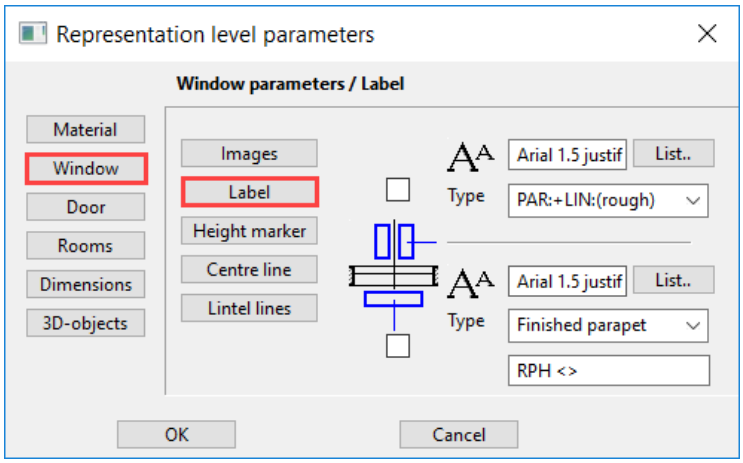
The settings for displaying windows in 2D and 3D can be defined here. In addition, you can also modify the type of label and the text parameters to be used, the length and the pen for the centre line, and the pen and line types for the lintel lines.

Display



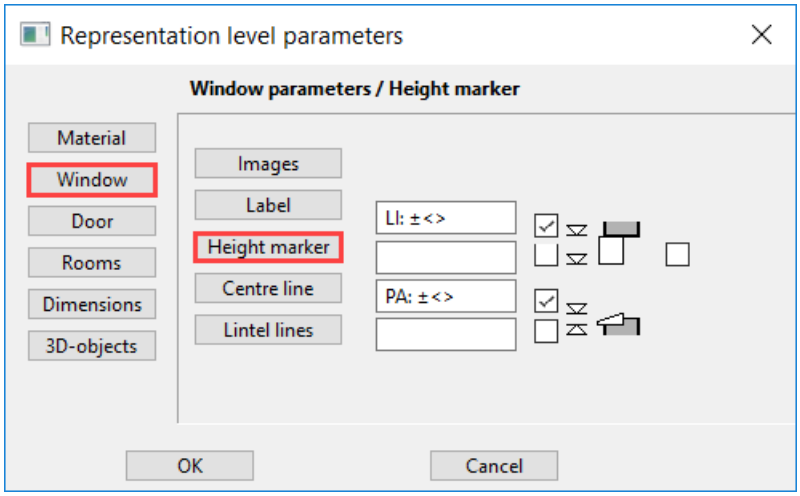
The window profile can be generated in the floor plan as a 1-dash, frame or off-centre frame depiction, in which the lines for the frame, casement and dummy f./joint (different gross clearance/finished clearance) can be switched on or off and whose pens can be changed. The frame, muntins, exterior and interior windowsills are individually routed to create a 3D depiction.

Label



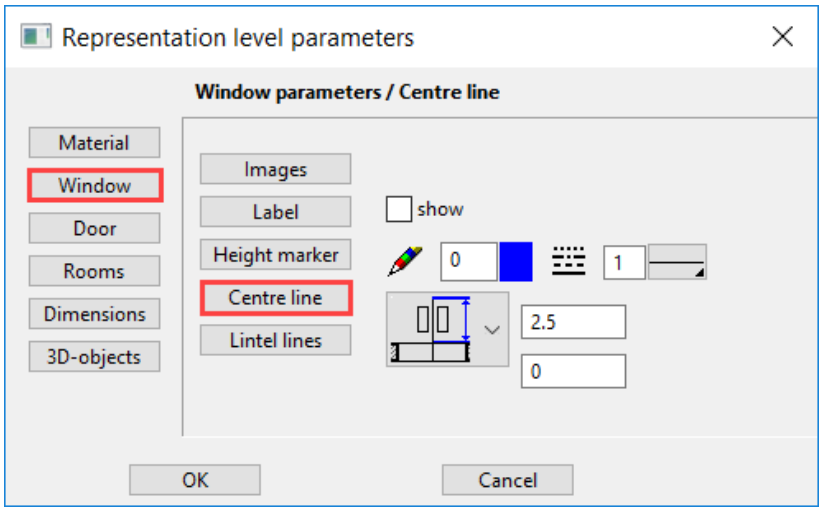
The centre line dimensioning of the window size can take place in the gross or finished clearance or as an absolute marker for the parapet and lower edge of the lintel (Swiss standard).
The parapet height's label is toggled between the gross or finished parapet and the text formatting is entered (< > is the placeholder for the value). Please also refer to *Window-Label parameters.*
Under **<List..>** you can select the text parameters to be used (all of the settings created under *Text parameters*).
In addition, you can deactivate the label of the size entry and parapet height (tick boxes).

Height markers



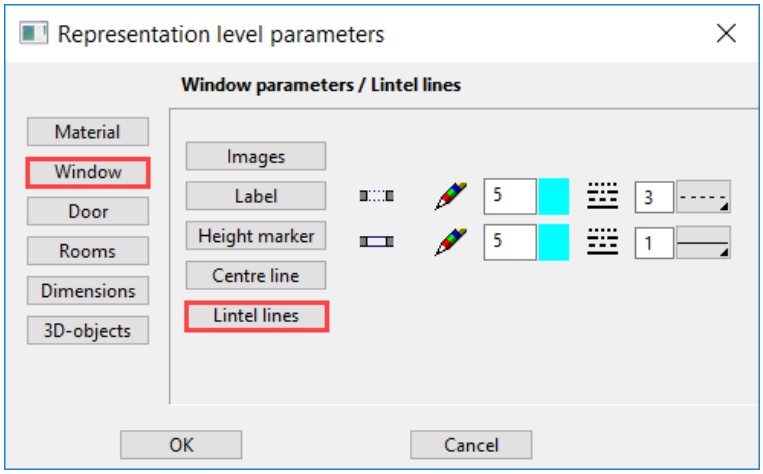
If the windows are worked on using the height markers, you can specify here which markers are to be written with which text. The characters <> are placeholders for the calculated value.

Centre line



The length of the centre line can be defined in absolute lengths or as a distance dimension to the label text. The value of this is always given on the plan in *mm*. The depiction of the centre line can be switched off using the tick box, however the length of the centre line applies to the distance of the label to the wall outer edge, even when it is **not** displayed.

Lintel lines

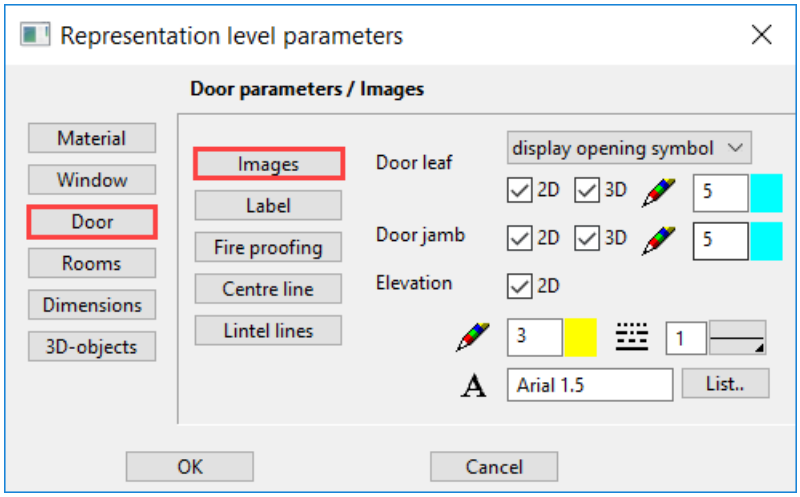


Here you can set the pen and line types of the lintel lines for the hidden and visible depiction (see window lintel).
You can then preserve dashed lintel lines in, for example, a window without parapet in one representation level and not in another representation level (with pen 0 = not printed).

Door parameters

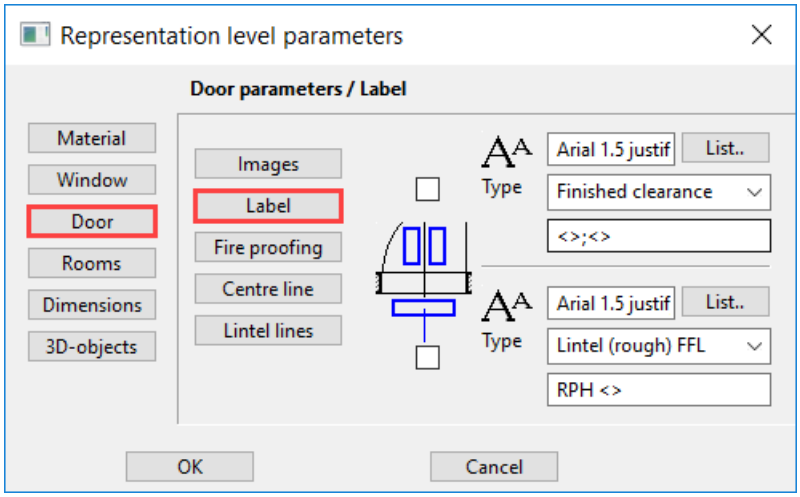
The settings for the depiction of doors in 2D and 3D can be defined here. In addition, you can also set the type of label and the text parameters to be used, the length and the pen for the centre line, and the pen and line types for the lintel lines.

Display



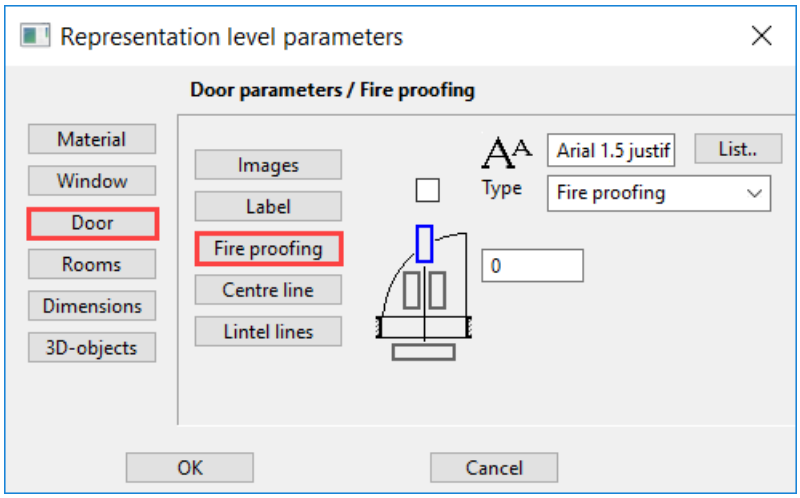
Door leaf and door jamb can be represented in either 2D or 3D. The door's split level line (stop line) can be configured with the pen/line type and can be suppressed. The split level line can then be shown or suppressed in a representation level.

Label



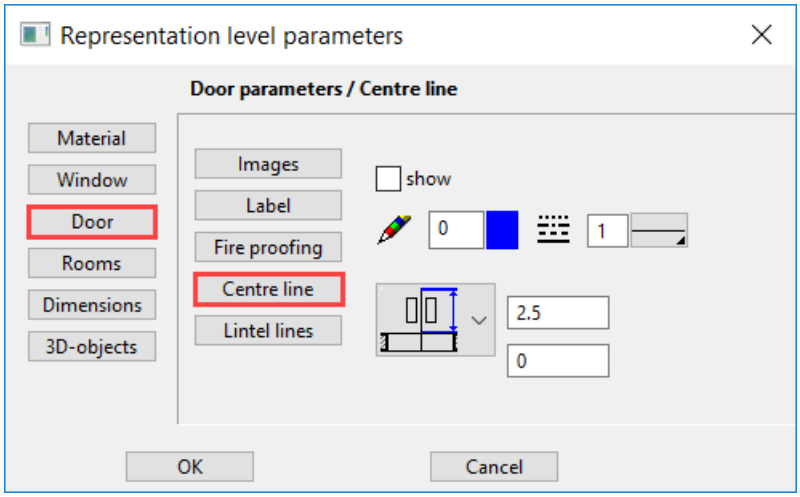
The centre line dimensioning of the door size can take place in the gross or finished clearance, in floor clearance (OKFFB up to UK lintel) or as an absolute marker for threshold and lower edge of the lintel (Swiss standard). The lintel height's label is toggled between gross or net lintel height or lintel (gross) FFL and the text formatting is entered (< > is the placeholder for the value).

Fire proofing



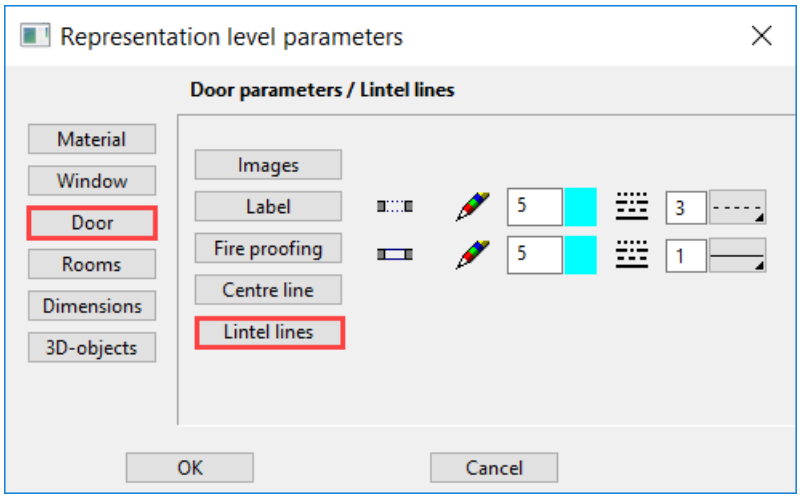
Optionally to the door labelling an additional fire proofing labelling may be depicted. Any symbol that follows the ‚~' sign, will be depicted subscripted. The ‚~' sign itself is not depicted.
You can select the text parameters to use under <List..>.
In addition, you can deactivate the label of the size entry and parapet height (tick boxes).

Centre line



The length of the centre line can be defined in absolute lengths or as a distance dimension to the label text. The value of this is always given on the plan in *mm*. The depiction of the centre line can be switched off using the tick box, however the length of the centre line applies to the distance of the label to the wall outer edge, even when it is **not** displayed.

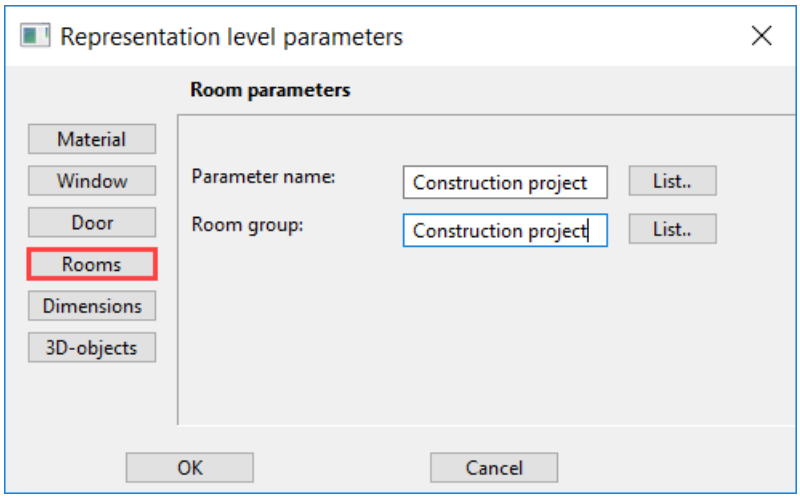
Lintel lines



Here you can set the pen and line types of the lintel lines for the hidden and visible display (see lintel).
You can then preserve dashed lintel lines in doors in one representation level and not in another representation level (with pen 0 = not printed).

Room parameters

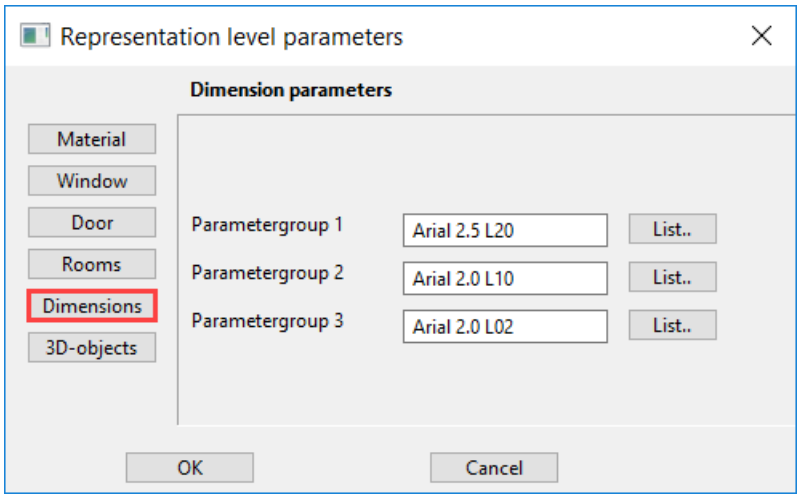
Room labels and room groups are linked with the representation level. The parameter name defines the label parameter saved under the ROOM function. This is also true of the ROOM GROUP.



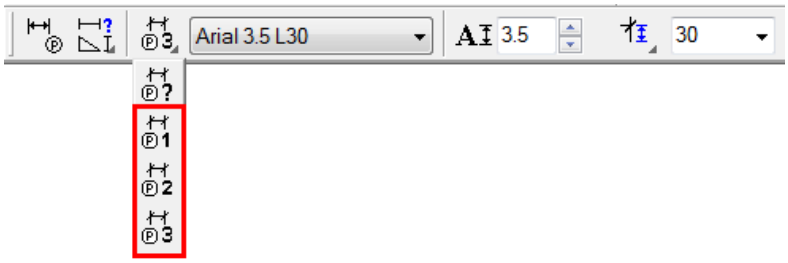
You can select the desired parameter under **<List..>**. The set parameters for the ROOM and ROOM GROUP functions are loaded when the representation level is converted.

Dimension parameters

On this dialog window, you specify the dimension parameters for the parameter group 1-3 to be used during architectural dimensioning.

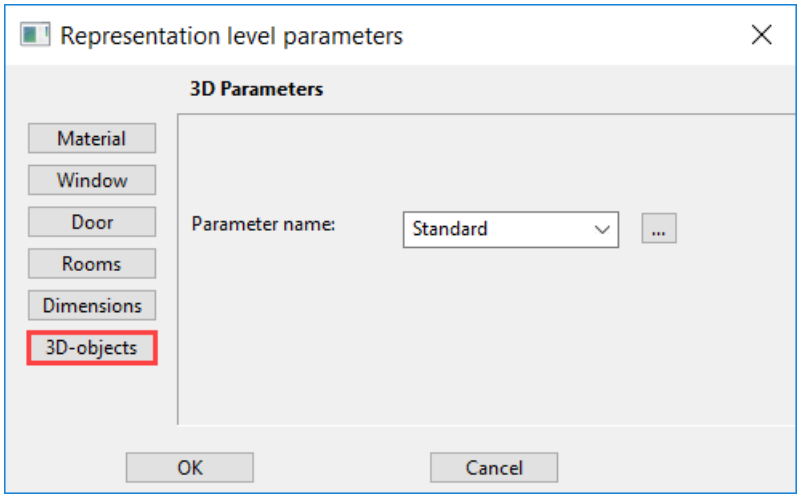


The dimension parameter must be selected from <List..>, i.e. from a list of all of the settings created under the function DIMENSION PARAMETERS > PARAMETER NAME. Selecting a representation level automatically converts the active dimension parameter.
The three parameter records are linked with the parameter groups P1, P2, P3 in the dimension properties bar.



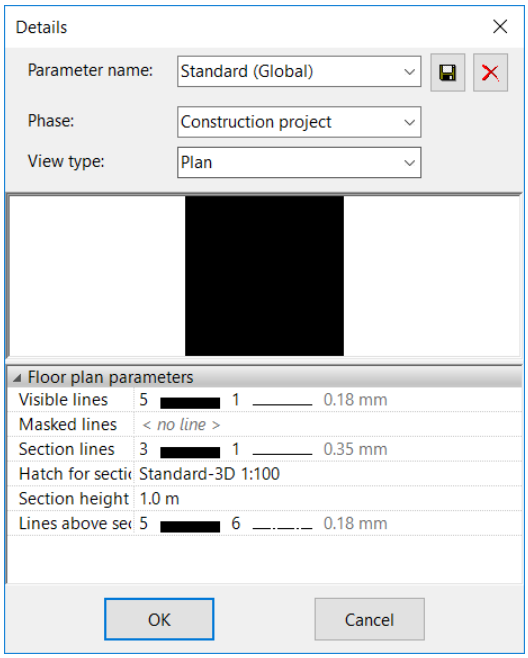
3D objects

Free 3D definitions (box, trans boxes, etc.) are subject to the representation level and therefore allow a depiction that is true to the material for views, sections and floor plans at the appropriate scale.



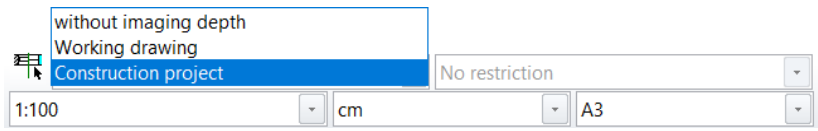
You can select the desired parameter under "Parameter name". This set parameter is then loaded for the 3D-objects, which are linked to the representation level when the representation level is switched.

The detail settings can be called up directly under <...>.

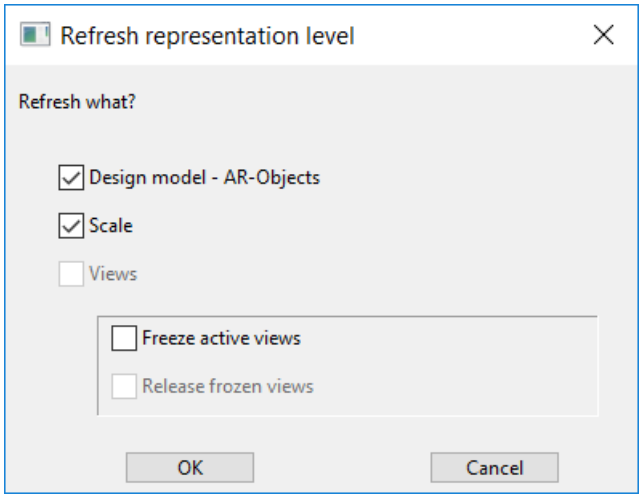


Existing templates can be modified here or reopened. The settings can be made for all representation levels.

Refresh representation level



If a drawing is loaded and the representation level is changed under the status list, you can select what should be refreshed in the *Refresh representation level* dialog window.



If you would like to refresh a representation level without converting it, click the parameter button to access this dialog window.

Design model – AR Objects
All architecture objects such as walls, windows, doors, etc. are regenerated in the selected representation level.

Scale
If a default scale is specified for the representation level, you can decide here whether another scale should be used for the refresh. The scale can also be retroactively adjusted via the status list.

Views
Material depictions and architectural dimensions are updated in the views and sections with the selected representation level's settings.

Freeze active views

When activated, all existing views of the view, section, plan, detail and plot type are frozen in the active status.
These views are specially marked with a frozen symbol in the view manager and additionally retain the representation level's description in their names.

Frozen views except for the plot views cannot be refreshed.
If the representation level has been changed and modifications to the design model have been made, selecting *Refresh view* can bring a frozen plot view back to its active status.

If you try to refresh a frozen view of the section or plan type, the following message appears:
View is OFFLINE!

Release frozen views
To return to an already existing representation level, unfreeze and refresh the already created views.
Should the status of the existing views remain the same, deactivate the switch. If the representation level then changes back and the views are again frozen, the marker _1 is added to the name.

8.2 PROJECT

The project is the highest hierarchical level in the file organisation. All of the data of a building project is stored in a folder. The default when starting a new project is that a folder with the new project name is stored in the ELITECAD-*Installation directory* e.g. *C:\ProgramFiles\ELITECAD\z\<projectname>*.

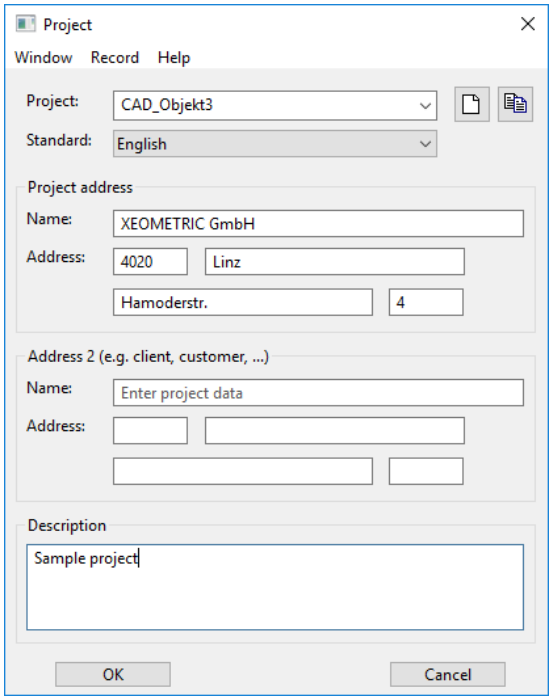
The settings can be configured in the setup. You can retroactively modify these settings in START > PROGRAMS > ELITECAD[VERSION]AR > ELITECAD CONFIGURATION.

To make projects more comprehensible, you can introduce project groups. These project groups can be organised by client, department or year, etc. This can be activated in Setup under Settings or retroactively under SETTINGS > OPTIONS > SAVE/LOAD > GENERAL.
When this is enabled, the system creates an additional directory under the project path with the name of the group, and then creates a folder in it with the project name.

Project

Storeys manager > Project settings
File menu > Project

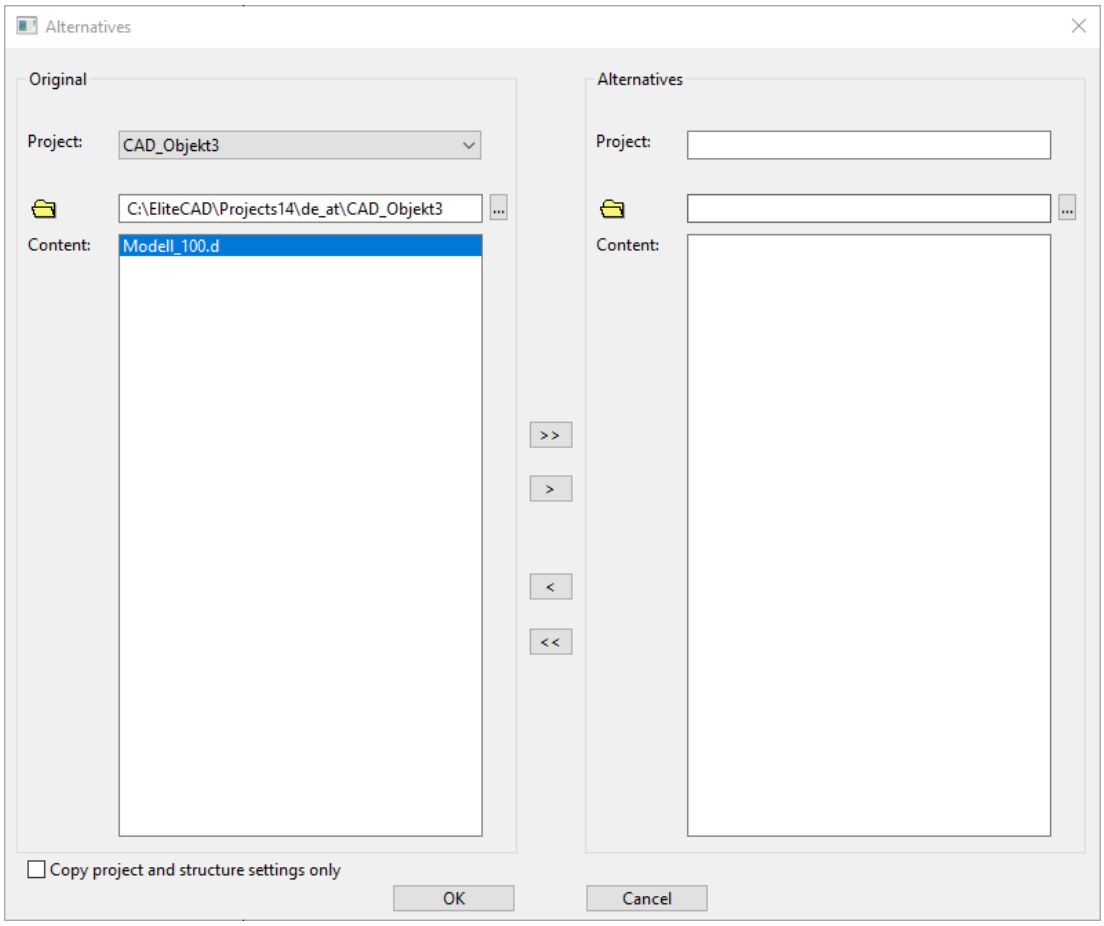
The PROJECT function opens the project settings dialog window.



An existing project can be selected from the **Project** field.

The button creates a new project. The dialog window is emptied and can be fill with the new data.

The button creates a variant of the project. A dialog window opens where the drawings to be copied can be selected individually.

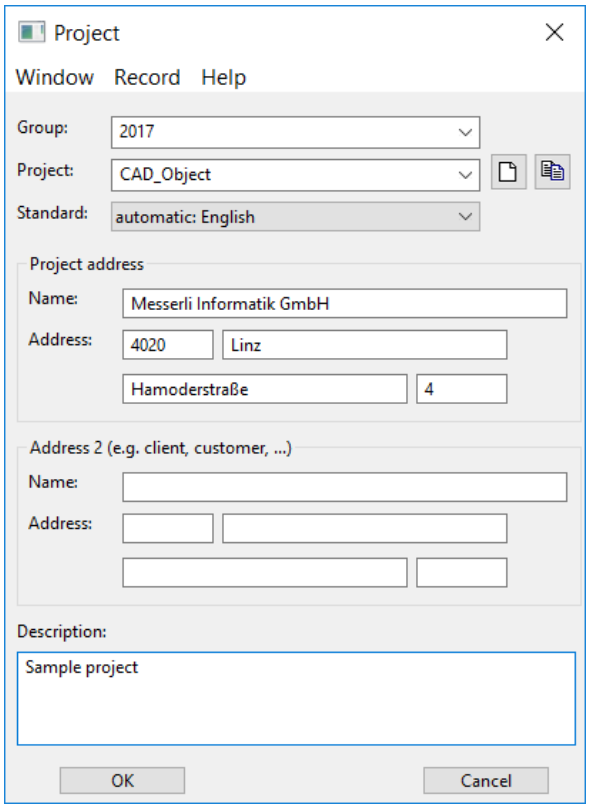


When a new project is created, punctuation should not be used in the name (exceptions: hyphen "-", underscore "_") and the name should have a maximum of 80 characters.

The **Standard** defines which country specific standard should be used for quantification. (E.g. DIN, Ö-Norm, SIA).

The name of the owner, for example, can be entered in the **Name** field, and additional information about the building project can be entered under **Description**. The entry in the **Project** field creates a folder with the same name and is always the project name that ELITECAD uses. The **Name** field is used in the project book's reports. The content of the "Description" field only serves the documentation.
In the section Address 2 the same fields are available for entering a second name and address.

If the Project group option is activated, the project dialog window displays another **Group** field.



New groups can be created by entering the name into the **Group** field and confirming with [Enter]. A folder with the group's description is automatically created.
If a group is selected, only the corresponding projects appear in the **Project** field. As before, the NEW button creates a new project.

The RECORD > SAVE function creates a new project without having to close the window.

TIP

When creating a new project, specify your project's most important properties in the following order: "Structure" > "Building" > "Height section" and "Storeys". The active project can also be modified in the same dialog window. Whilst the structure settings are being edited, the project dialog window is locked for all of the other users. Thus, when several employees are working on the same project, the structure window of this project can only be opened once. This prevents any unintended overwriting.

Project template

Alternatively, a project can be created in the start dialog window from a project template. The templates are not modified during this process. The path for project template is defined in the ELITECAD configuration.

8.3 STRUCTURE

What is a structure?
A structure is treated as a continuous and self-contained building in ELITECAD. The structure can be comprised of multiple storeys but this is not a necessity. The classification into different structures allows you to manage buildings with different height levels. Two structures can both have an upper storey named "NF1" on differing levels.

Structures are generally used as filters. They can be understood as a combination of the different storeys, which can be selected separately. This creates a variety of possibilities for the editing of the design model, as well as by several employees. The structure "without structures" is automatically assigned to all of the drawing objects to which the program cannot assign a unique structure (or storey).

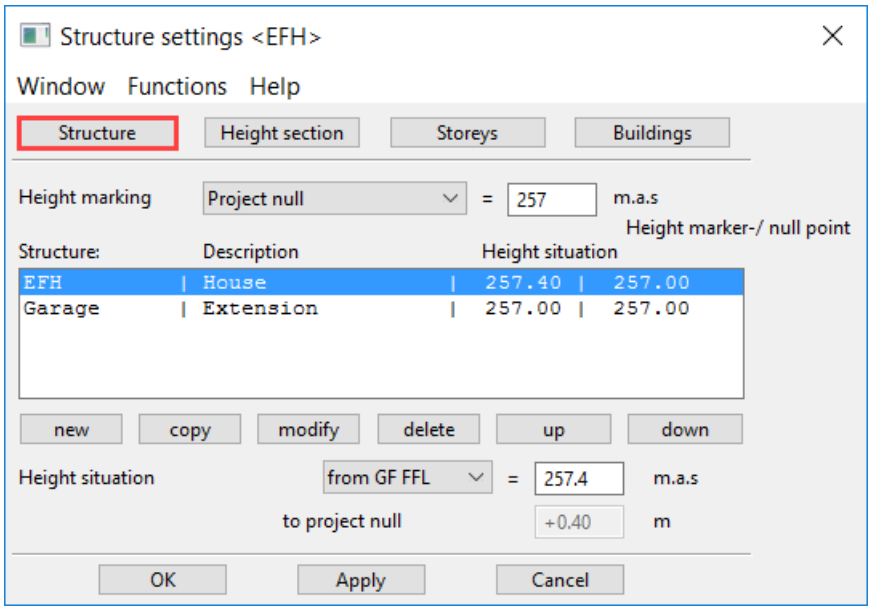
TIP

The division of the building project into different structures should be carefully considered. On the one hand, separated buildings create a better structuring of the project, but on the other hand it is not very useful to divide a building with shifted floor levels in one storey into two structures, for instance (...which of the two do the continuous exterior walls belong to?).

STRUCTURE SETTINGS

Storeys manager > Project settings
File menu > Structure settings

Creating a new project opens the structure settings dialog window, which can also be called up any time during editing via the storeys manager functions.



The dialog window is comprised of four different entry ranges: Structure, height section, storeys and buildings.

Whereas the OK button saves and quits the dialog window, APPLY also saves the entries but does not close the dialog window.

TIP

Should the entered values be saved as standard, the option SAVE AS DEFAULT in the FUNCTIONS menu needs to be used. (See description below)

Structure

This entry range consists of four parts.

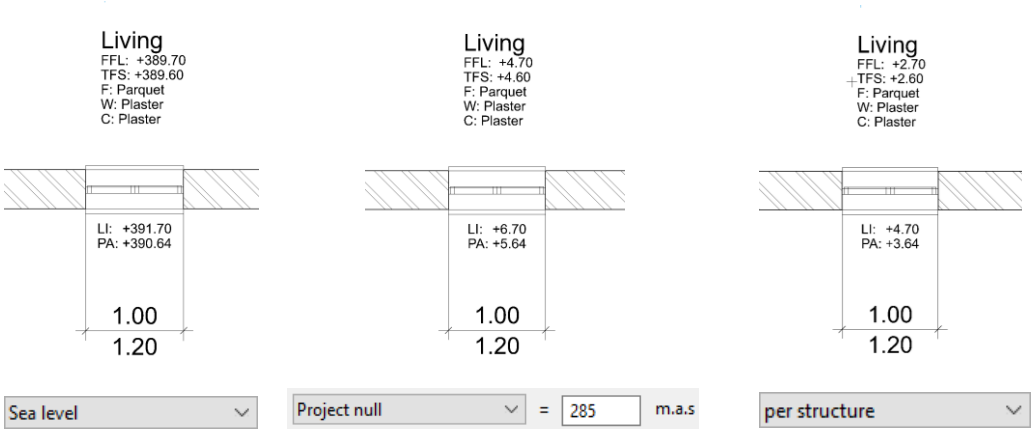
- The general height marking of the project
- The list of structures
- Commands to create and modify the structure
- Height reference (±0.00) and height situation of the single structures

Entries and modifications always refer to the active structures, even in the other entry ranges. This is shown in the title of the structure dialog window and ELITECAD window.

Height marking

Three different settings are possible:

- Sea level: The structure's height situation is decisive.
- Project null: The +/- 0.00 corresponds to the height of the reference point.
- Per structure: Every structure has its own height situation.



This information only affects the automatic height marking of the window and room label.

Structure list

Defined structures are shown here with their main properties.
You can easily activate the desired structure by selecting it from the list. If different structures are created with differing **height situations**, a difference in level for this to project null, which can be read in the grey-shaded field, appears.

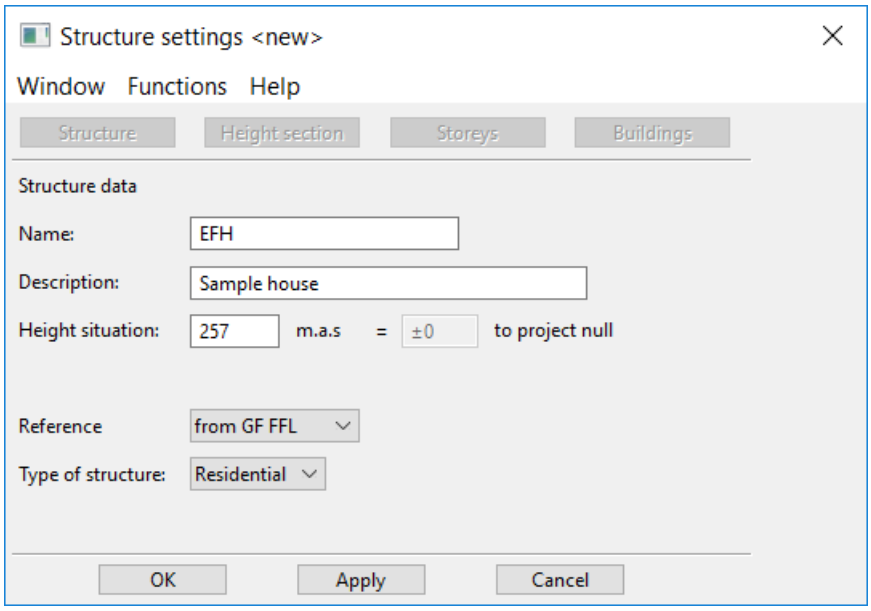
TIP

At a later point in time, if it becomes necessary to modify the height of the project null, the reference heights of the individual structures must be adjusted accordingly.

Commands to create and modify the structure

New/modify

This function opens the parameter dialog window of the structure settings in order to either create a new structure or amend the values of an existing structure.



Name
The name appears in both the settings dialog window and in the quick info in the storeys manager window. It is therefore worth choosing a short and unambiguous term. A new structure is automatically called "new" when it is first created.

Description
This information is used to clarify the chosen name. This only appears in the structure settings overview.

Height situation
The height situation can be entered here and the difference in level to project null can be read in the grey-shaded field.

Reference
With this switch, you can specify whether the +/- 0.00 is located on the finished floor level (FFL) or on the ground floor's bare ceiling TS (TSBC).

Type of structure
This switch allocates a building type to the structure. Standard heights then appear in the **Height section** entry range (if such had been deposited via the **Building** entry range).

Either OK or APPLY writes the information back and the display switches to the **Height section** entry range.

Delete
Deletes the selected structure's data from the list provided, that it contains no elements.

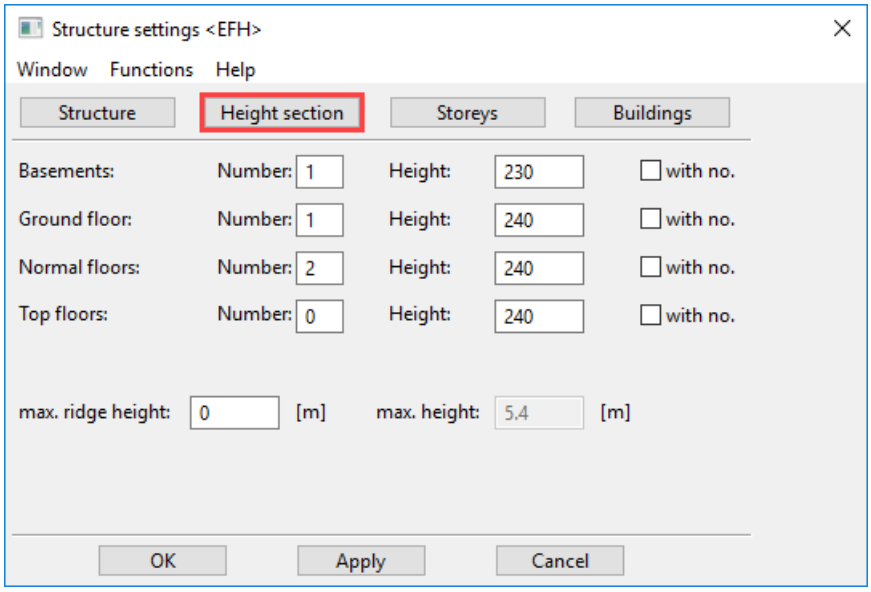
Copy
Creates a copy of the active structure settings with the same name+1.

Upwards/downwards
The buttons UPWARDS and DOWNWARDS sort the structures. Sorting these in descending order also applies for sorting the storey management window from left to right.

Height reference (±0.00) and height situation of the single structures
You can specify the active structure's height reference and height situation here. The difference in level to project null is shown in the grey-shaded field.

Height section

You can specify the number of storeys as well as their height for the active structures in this entry range. All information is entered in the "active unit"; only the ridge height and the maximal building height are always entered in [m].



Number
Enter the number of the same type of storey here. The possibility of being able to define multiple ground floors is used to manage differing height levels within the structure.

Height
Enter the standard value for the **room clearance** (FFL to lower edge false ceiling) of each type of storey here.
(N.B: In contrast to the **room height** clearance, the dimensions for the "installation height" and "floor finish" are included for the **framing height** clearance. These values are defined in the entry range's **Storey** field.)

With no.
This function provides the storeys with a consecutive number to reach the same storey description. If you have a project with two structures and one of the two only has one normal storey, the active numbering identifies the storey as "NF1" instead of "NF".

"Padlock" – Controlling the height of multiple storeys of the same type
The number of similar storeys can be entered in the height section.
If the room clearance of such storeys differs from the values of the height section, a green **padlock** appears next to the "Height" field.

The padlock has two functions:

If it is closed with a click (colour switches to red) and the entry is confirmed with APPLY, all room heights in the entry range "Storeys" are reset to the height section's standard values.
E.g.: The value for NF1-NF3 = 3 m but all values in NF4 = 4 m are then reset to 3 m.

If the padlock stays open and a new height is entered into the entry field and confirmed with APPLY, the net clearance of all of this type of storey is changed by the difference between the old and new value.
E.g.: If NF2 is increased from 3 m to 3.50 m, all storeys are increased by 0.50 m.

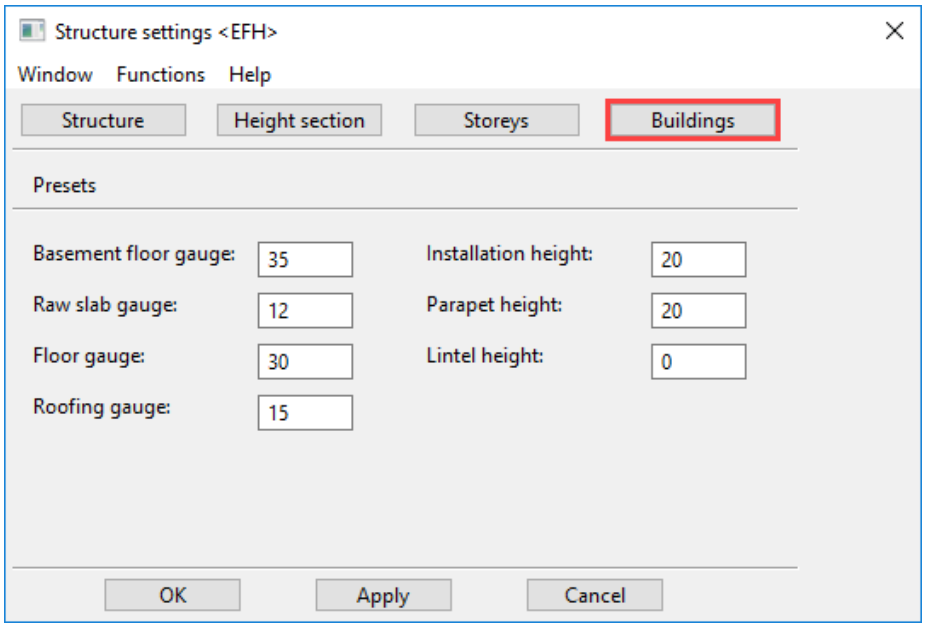
Maximal ridge height and maximal height
The heights of all of the active storeys above FFL GF is shown in the "max. height" field. A warning appears if it is higher than the max. entered ridge height.

If the entered height indication as well as the settings from "Building" should be available by default, these can be saved with the "Type of structure" under FUNCTIONS > SAVE AS DEFAULT. These settings are once again called up when a new structure is created by selecting the relevant type of structure.

In addition, please read the paragraph on the "graphic height section" below.

Building

The pre-settings for the active structure can be specified in the entry range BUILDING. The values assigned here can be overwritten at any time.



Gauge for walls and columns
General construction data for active types of structure can be noted here. The information is solely for documentation purposes and has no effect on the design model.

Presets
These values are suggested for the height section's settings.

Basement floor gauge/Raw slab gauge
The information describes the slab's framing dimension.

Floor gauge
The value stands for the floor finish. This is the dimension from the structural floor level (SFL) to the finished floor level (FFL).

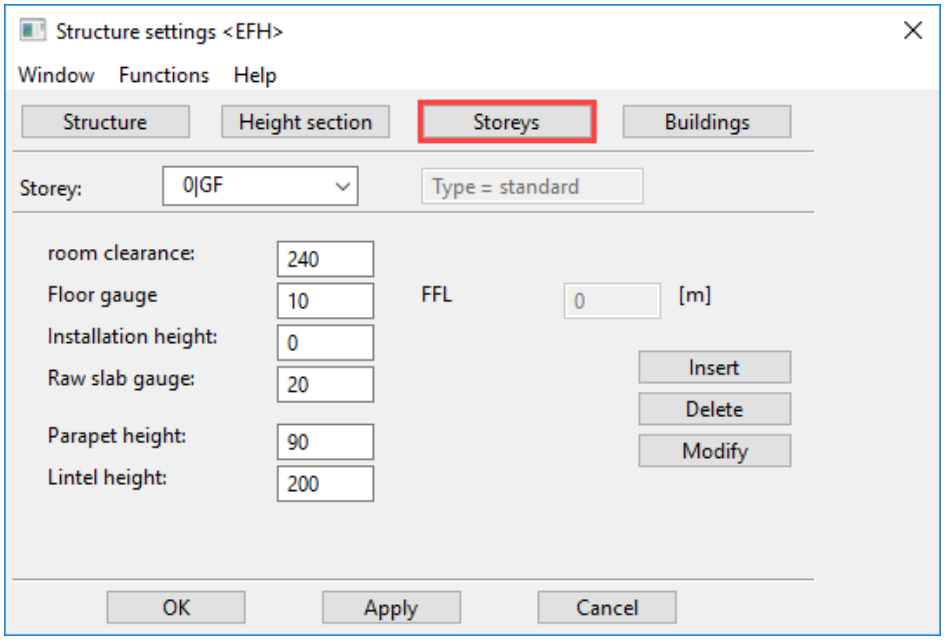
Installation height
The value stands for the height of the false ceiling construction.

Parapet height/lintel height
These values are used for the AR OBJECTS > FAÇADE GRID function.

APPLY writes the data into the project database and allows you to continue editing the structure settings' sub-dialog window.

Storeys

If the information under the height section is finalised with APPLY, these standard values are also available in the STOREYS entry range.
Now you can specify the single storeys more precisely if needed. Select the desired storey from the dropdown box. The "Type = standard" entry refers to the storey that has been entered into the height section; "Type = free" means that it has been set by the INSERT function.



Room clearance
This information is finished measurements (FFL to lower edge gross ceiling).

Floor gauge
The value stands for the floor finish. This is the dimension from the structural floor level (SFL) to the finished floor level (FFL).

FFL:
The height of the finished floor in the active storey is shown on the right-hand side of the page.

Installation height
The value stands for the height of the false ceiling construction.

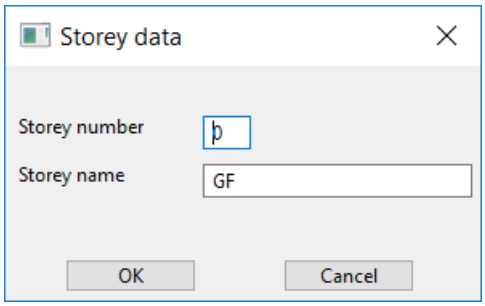
Raw slab gauge
Always enter the ceiling of the storey located below in the field. As a rule, this belongs to the respective storey.

Label and lintel height

The information is for framing dimensions!Insert
This function inserts another storey between storeys or at the end of the list. The storey number (level) and storey name are to be entered in the entry line and the values for the new storey completed in the storey dialog window. Free storey descriptions can be used here (GF instead of BA; gallery or similar).

Delete
This function deletes a storey from the storey dialog window when it is empty, meaning that no elements are linked to it.

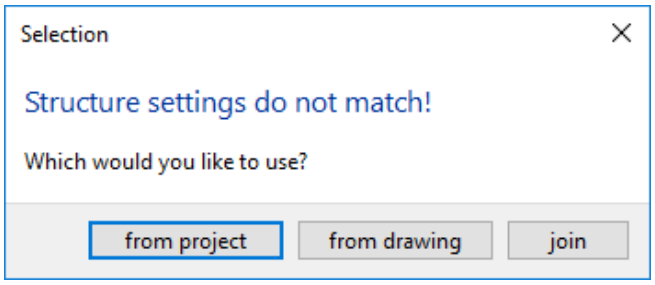
Modify
Via MODIFY you can amend the "Storey number" (level) as well as the "Storey name". If a storey number has already been assigned, the current storey is given this number and the other is moved to a different position. Your own storey descriptions, for instance, can be used here (GF instead of BA; gallery or the like)



After modification, the design model is updated automatically.

If the design model had not been loaded at the time of the modification, a query appears when loading that the structure settings are different.

The dialog appears depending on the option QUERY IF STRUCTURE SETTINGS DO NOT MATCH under SETTING > OPTIONS > SAVE/OPEN > GENERAL. If the dialog is not displayed, the drawing settings are applied.

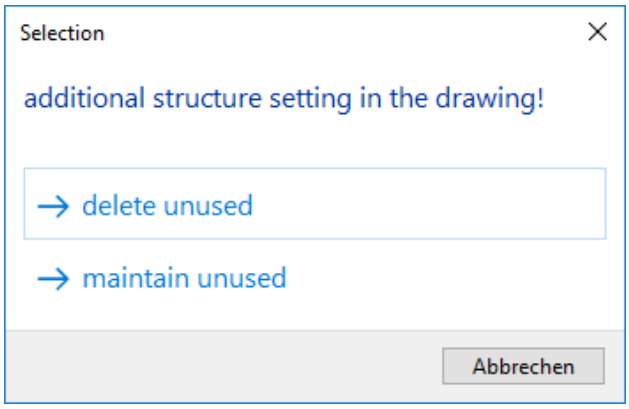


This dialog also appears when you load a drawing from a previous project, which does not match that of the active one.

If "from project" is selected, the design model is automatically refreshed according to the new occurrences. All walls, windows, doors, columns, ceilings and roofs, which refer to the height section, are adjusted in level and height.
If "from drawing" is selected, the active project settings are overwritten by the project settings saved in the drawing. The drawing will then be read, as it has been stored.

If "join" is selected, the drawing is read as it was saved, the modified structure still appears in management and is renamed in [Structure name].

If drawing A had fewer structures than the previously loaded drawing B from the same project, the storeys manager specifies the difference and queries whether the unmodified structure should be deleted or whether it must be kept (as an empty structure).



The dialog appears depending on the option QUERY IF STRUCTURE SETTINGS DO NOT MATCH under SETTING > OPTIONS > SAVE/OPEN > GENERAL. If the dialog is not displayed, the unused structures are deleted.

Functions

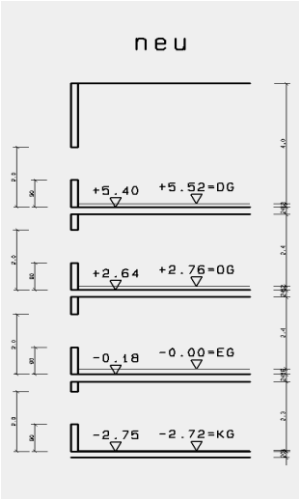
Different commands are available in the FUNCTIONS menu:

Save as default
The function saves all of the structure's settings but of course without the list and number of storeys. In this way, the settings, which have been made once, can be predefined for future projects. These default settings are saved for every selected type of structure (entry range STRUCTURE > MODIFY > TYPE OF STRUCTURE)!

Modify in image
This command will be described in the next chapter "The graphic height section".

Regenerate storey dialog window
This function calculates a new height section from the starting values of the "Height section" and "Building" ranges. If, for example, the gauge of all raw ceilings in the project is modified, this value can be modified in the building entry range and generally assigned via the **Regenerate storey dialog window**.

Graphical height section



By selecting the command MODIFY IN IMAGE under the FUNCTIONS menu and clicking the concerned parts in the graphic, the storey values can be modified.

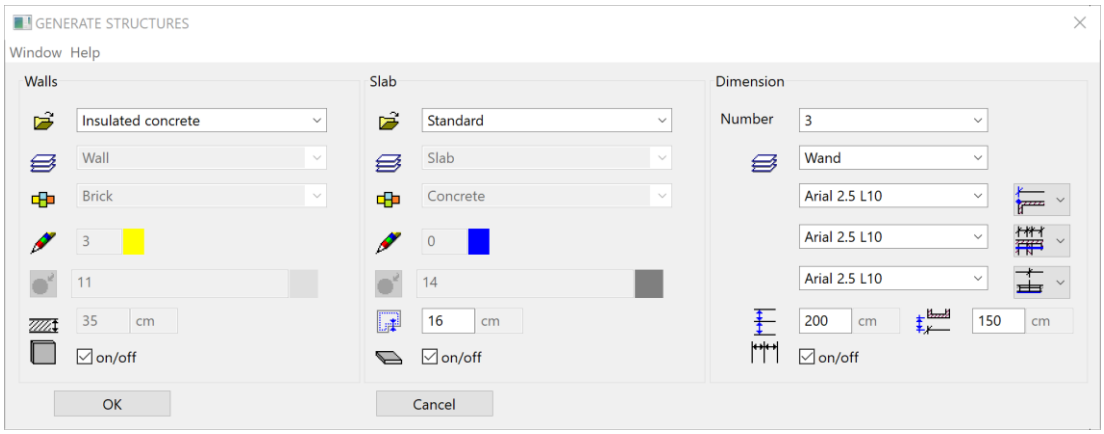
TIP

Type near a graphic depiction, e.g. the parapet: You can now modify the value of the parapet height in the entry line. This is also true when you click on the dimension figure for the parapet height. The data in the storey settings is automatically refreshed and the height section is regenerated.

CREATE STRUCTURE

Storeys manager; Tool bar *Create new AR Object
AR Objects menu > Structure

The CREATE STRUCTURE function generates a building volume from the storey ceiling and/or outer walls based on the structure settings and an outline and optionally creates the dimensions.
The outline must be from a closed polygon, which was previously defined. It does not matter to which storey the outline belongs. A storey of the desired structure must be active when the CREATE STRUCTURE function is started.



Parameter

Predefined parameter set can be selected for walls and slabs by their names. This option offers the possibility for the usage of multi-layered components.

Layer
Choice of relevant layer.

Material

The material is defined in the representation level by a pen and hatch. A suitable depiction of the construction part is mapped in the plan.

Texture / 3D-Colour

A texture or 3D colour can be assigned to walls and ceilings.

Switch on/off

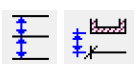
The walls can be switched off for a skeleton construction.

Offset ceiling
The ceilings can be allocated an offset, which resets the value.

Dimensions

Depending on the choice, up to three different dimensions can be selected.

Dimension offset



The horizontal and vertical offset can be entered here.

8.4 Work with storeys

The correct and logical allocation of every individual object drawn in ELITECAD is a prerequisite for orderly and fast work with the program.

In addition to the variety of possibilities of condensing objects through layers or groupings, project management comes first. The top of the pyramid forms the "project" with its project name. The different "structures" to which different "storeys" are assigned in turn are managed under it.

Every object in ELITECAD is clearly allocated according to the project, structure and storey. Ensure that there is also a structure called "without structures" and a storey called "without storey".

This is the basic hierarchy of the architecture program and should always be kept in mind when drawing. In ELITECAD's program title bar, the current project, the active structure and active storey are always on display next to the loaded file.

Storey and structure allocation

A structure, which has no storey, is managed within every project. This is the structure "without structures". All objects which do not belong to a structure should be located on the "without structures" (and therefore also on "without storey"). These can for instance be the components of the exterior construction, development or similar.

If ELITECAD is restarted and no structure or storey is selected, all newly drawn objects are allocated as "without structures".

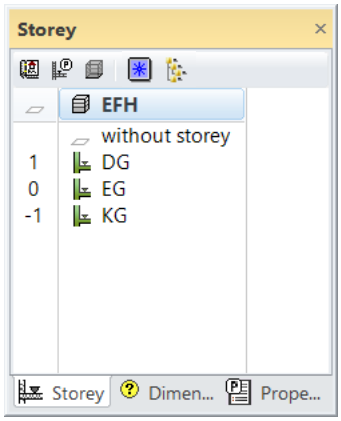
For the allocation of storey-transcending elements such as exterior chimneys, rainfall guttering, curtain facades (not by a multi-layered wall), the storey "without storey" can be used in the relevant structure.

Active storey

As long as a storey is active, all newly drawn elements are assigned to it.
The single storeys are activated, among other things, by the storey functions described below. In addition, storeys can also be activated by switching views and either activated or deactivated by loading "Storeys" and "work copies". The storey dialog window is set to "empty" with a combination of "Select all + Delete" or NEW FILE from the menu item.

Storeys manager

	View tool bar
	View menu > Storeys [Ctrl] + [G]



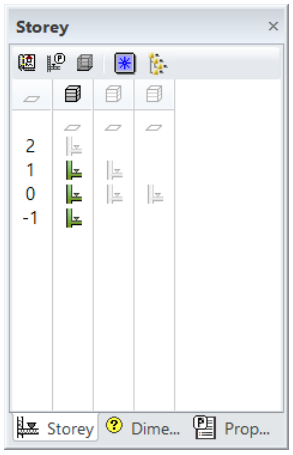
This dialog window has two ranges. Project, structure and depiction of the storey dialog window can be configured in the header line. A table then appears with the defined storeys as icons.

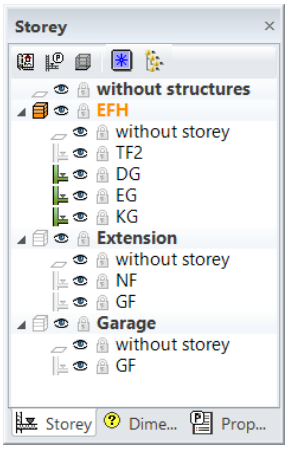
Functions in the header line

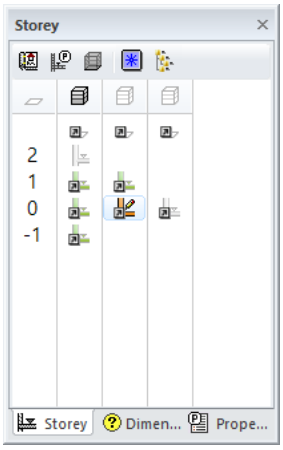
- Manage project settings
- Manage structure settings
- Create structure
- Show all storeys
- Switch the depiction of the storeys from table to list view

Depiction of the storey dialog window

Table List overwrite protection active





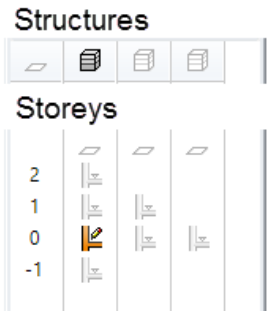


Meaning of the different icon colours

grey:	light green:	dark green:	orange:	padlock:
not loaded	invisible	visible	active	locked

Directly click on the icons in the storey dialog window to control the storey's display. These commands can be found amongst others in the Context menu.

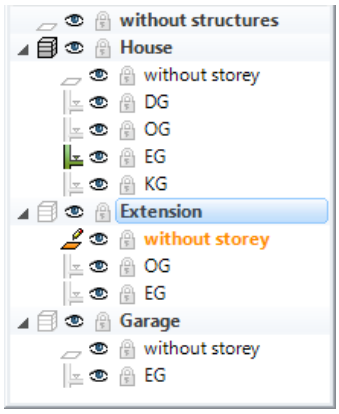
Table view



The symbols for the "without storey" structure are arranged in the header line. The symbol for the "without structures" structure is in the first field on the left.

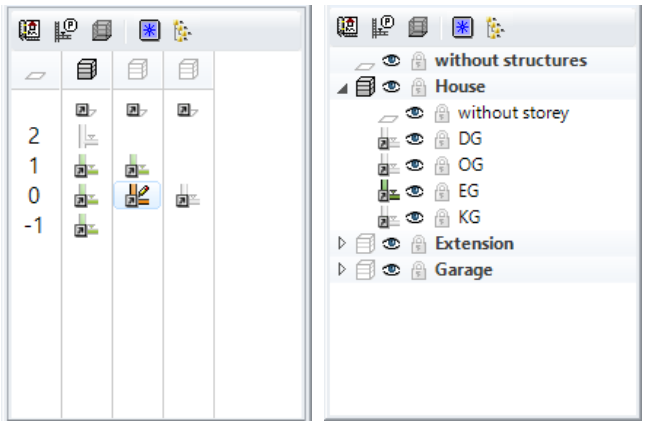
Storey table: The storeys are arranged in the rows according to their number and in the columns according to their structure.
The visibility of the single fields or entire rows/columns is controlled via the context menu.
The structure and storey names appear in the quick info of the individual fields.

List view



The list view provides direct access to the visibility and save function for the individual storeys or the entire structures.
This is provided similarly to the layer list.
The display can be switched on or off with the "eye", and the padlock locks the storey or structure. These are then shown as grey; the capture points are accessible but the elements cannot be modified.

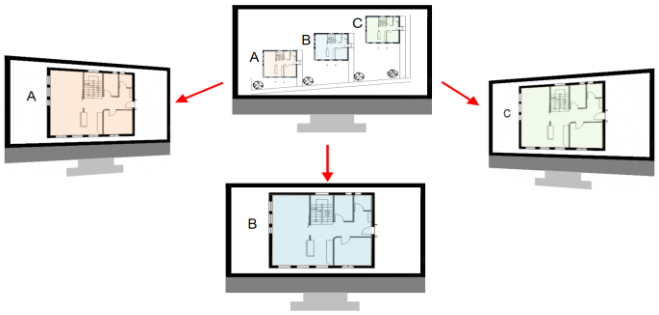
View from the active overwrite protection



In this mode, the storey icons have an arrow added to those, which are loaded as reference. This allows you to instantly see that the overwrite protection is active.

Design model editing in team

The storeys manager provides support when several people wish to work on the same design model. This consists of the corresponding Functions in the context menu, in addition to the status indication in the storey dialog window and precautions in order to prevent involuntarily overwriting.

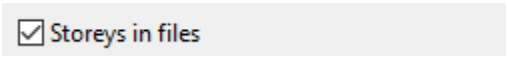


Requirements

- Project, structure settings and storeys are defined.

Storeys in files – Requirements for team functions

The STOREYS IN FILES option is activated under SETTINGS > OPTIONS > SAVE/LOAD > GENERAL.



This function must be at least activated in the team in every workstation.
It unlocks the save and load functions for the teamwork and caters for another depiction of the storey symbols in the management:

As reference

Locked

It also guarantees that only one team member at any one time can perform any modifications to the design model range that he has loaded.

Preparation

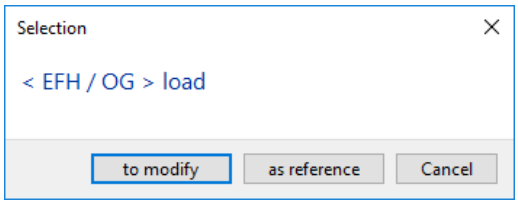
Because the team function sets up its own file storage, it is sensible to work with a master file from the very beginning. This could contain minimal information, for example the axis-grid in every storey. The storey files are generated with the SAVE ALL STOREYS context function. The team workers can now develop their design model ranges individually.

Edit design model

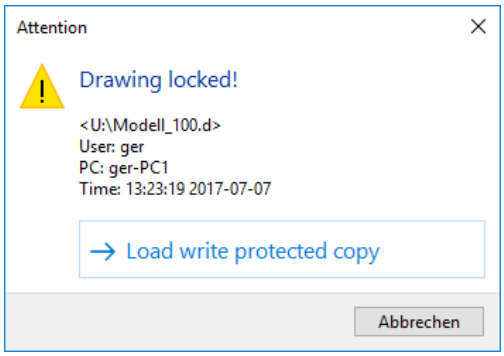
The internal structure of the project with structures and storeys determines the possible design model ranges, which can be edited at the same time at different workstations. "Design model range" means at least a storey or any choice of storeys or structures.

The same design model range can only be saved in the workstation where it was first loaded. A restriction is that the loading and saving of the ranges are exclusively performed via the storey dialog window.

Loading a design model range via the context menu determines whether the range obtains the "to modify" or "as reference" status. If the range has already been loaded in another workstation with the "to modify" status, it can only be loaded "as reference".



If you then attempt to load it with the "to modify" status, an error message appears. The same message appears when you attempt to save a design model range, which was loaded as reference, via the context menu as long as it is opened at another workstation with the "to modify" status.

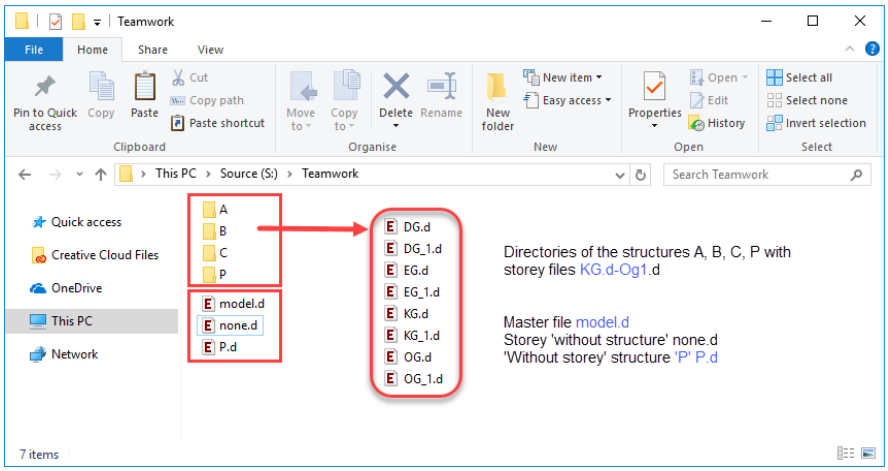


In order to see all changes in the entire design model range, all design model ranges are reloaded in a workstation. The views can then be generated and FILE > SAVE AS... saves the design model and views in the master file.

TIP

The complete file (master file) should be saved at regular intervals with a version identification. Load the last master file, then reload all storeys via the storey dialog window and save under FILE > SAVE AS

The team function's file storage



When "Save all storeys" is first performed in the context menu, ELITECAD executes it in the following steps:

The drawings of storeys "without structures" and "without storeys" are saved in the project directory provided that something has already been drawn.
Subdirectories with the name of the structures are then created. The drawings of the single storeys are stored here.
When you later save this again, a one (_1) is added to the name of the existing file. The previous stage can then always be accessed.

The access to the storey remains locked until the user unloads it from his design model. The following also removes the lock: NEW FILE/OPEN, LOAD WORK COPY or DELETE ALL.

Objects, which are located on the structure "without structures" are stored in the *none.d* file.

Objects, which are assigned a structure but not a storey (without storey) are saved in the storey path in the *none.d* file.

TIP

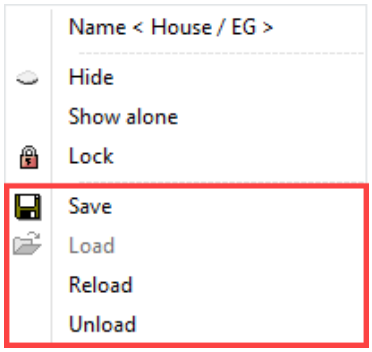
Restricted access is generated by creating a file of the same name but with the prefix "~$" (e.g. house.d > ~$house.d). If the restricted access was not automatically removed, the manual deletion of this file can be revoked. These filenames are indeed visible in Windows Explorer after the appropriate modifications have been made to the settings.

Saving via the context menu does not affect the master file.

Single functions of the storey dialog window

Additional commands for the storeys manager are available in the context menu (right-click on the storey or structure).

Context menu of storey icons



Descriptions of structures/storey

View options: Show/Hide/Visible alone/Locked – no modifications possible

Functions for team editing:
(Available when STOREYS IN FILES is active)

Save/Load/Reload and unload the selected storey/structure

View options

Show/Hide
Controls the storey's display. If it is the active storey, it cannot be hidden. This function is available by clicking the "eye" in the list view.

Assemble alone
Activates the storey and switches all other loaded storeys to invisible. Double-clicking the storey icon has the same effect.

TIP

Double-clicking on any icon assembles the respective content alone.
A single click on the storey's icon assembles this and activates it. A single click on the structure's icon assembles the storey "without storey" and activates it.

Lock
The function locks the storey, which is only displayed in one colour. It can be shown or hidden. If you click on the icon, a query appears asking whether the lock should be removed. The pen colour with which the locked storeys are displayed is specified under SETTINGS > OPTIONS > REFERENCE PLAN.

Functions for team editing
The following functions for the design model editing in team are available as soon as STOREYS_IN_FILES has been activated. They make management easier when individual storeys are edited by different people. The selected storey or selected structure can be saved, deleted and loaded directly via the storeys manager without going through the file menu's usual functions.

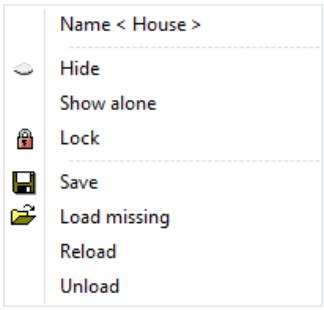
Save
You will be asked whether the storey should be saved. Confirming stores the storey in the project path in a directory with the name of the respective structure (e.g. as GF.d). If the file already exists, the file will be named GF_1.d when saved.
Activating the file lock only allows the storey to be deleted by the user who locked the storey or who had loaded it to modify. Removing the storey deletes the restricted access.

Load
Loads the storey file. The name of the storey is shown in the title line. If overwrite protection is activated, this checks to see if the storey has already been loaded by one of the other users. If this is the case, then the storey can only be loaded as reference.

Reload
Replaces the storey in question with the saved version. All of the storey's existing elements are also deleted! The name of the storey is shown in the title line. If overwrite protection is activated, this checks to see if the storey has already been loaded by one of the other users. If this is the case, then the storey can only be loaded as reference.

Unload
This function deletes the storey from the design model. A backed up storey file is, however, not deleted from the structure path!

Structure icon context menu



Description of the selected structure

View options: visible/exclusively visible/locked

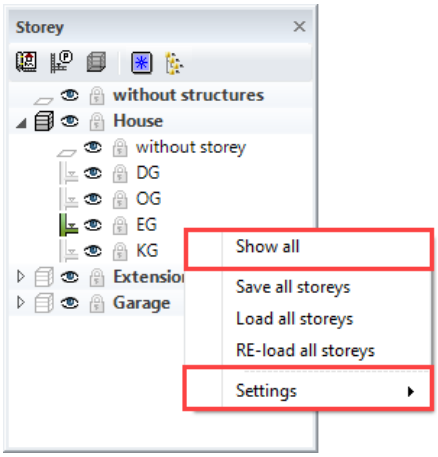
Functions for team editing:
Save/Load missing (storeys)/Reload and unload

The same commands, with one exception, as those in the storey's context menu are available here. The function LOAD MISSING is additionally present here.

Background context menu

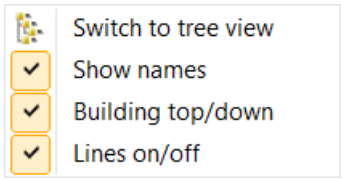
If you right-click in the storey dialog window's empty range, a menu with additional commands appears. The visibility control is on the one side (always available) and the loading/saving of all storeys on the other. These commands are only available under the active STOREYS IN FILES option.

Visibility control and depiction in the storey dialog window

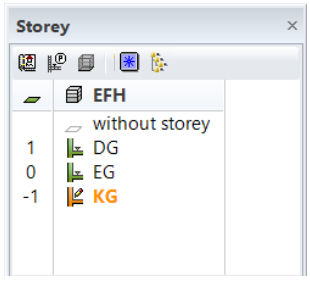


Assemble all sets all loaded storeys as "visible".

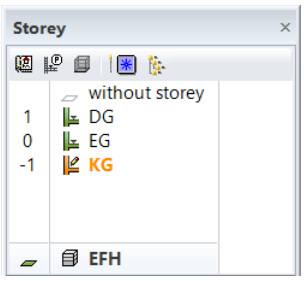
Settings modifies the depiction of the storey dialog window:



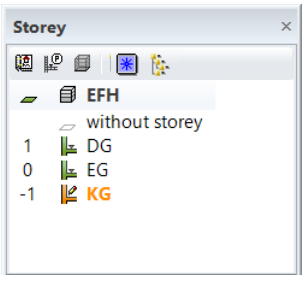
Show names

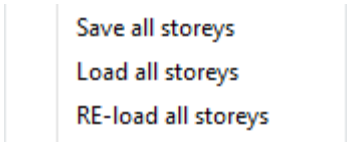


Building top/down



Lines on/off





Save all storeys saves all of the loaded storeys.
See Information on file storage above.

This command can also be used when all storeys up until now had been saved under a name (e.g. model.d) and the design model should now be disassembled into single storey files.

The LOAD ALL STOREYS function only loads the stored single storeys whose storeys in the current file are empty.

The RELOAD ALL STOREYS function deletes all loaded data after a confirmation prompt and then loads all saved single storeys (including none.d).

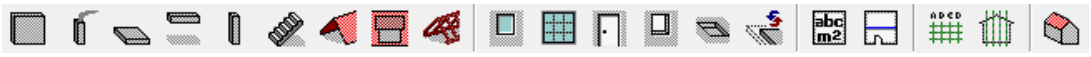
Assemble storey filter

View tool bar
[F5]

This function assembles all of the objects from the former storey filter.

This has the following advantages:
If single objects are shown or hidden from an active storey filter (visible storeys), this function can quickly be set back to the former view without having to again redefine the visibility in the graphic storey dialog window.

8.5 ARCHITECTURE OBJECTS



This chapter explains the basic properties and mechanisms of architectural objects. The individual objects are explained in the framing and extension chapters.

What are objects?

The bases of architecture are "objects". These objects always consist of images (2D/3D) and their parameters which belong to the object in the form of "attributes" (an object's attributes are listed under INFO > MODEL INFORMATION).

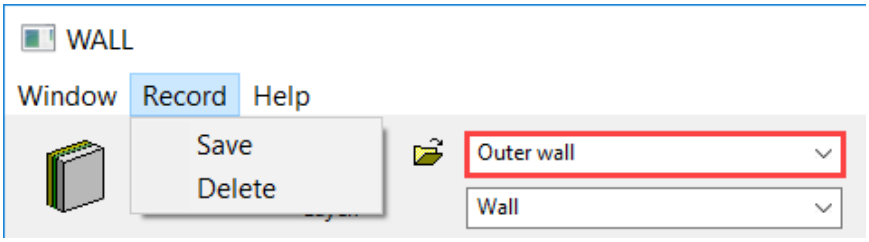
An object can also contain multiple sub objects. The door in a wall is a sub object of the wall object. If the wall is selected, the built in windows and doors for example are also selected. If, however, a door is clicked on, the wall is not selected with it.

The corresponding property bar appears when you call up the function or click on an object. The most important settings can be modified here. In order to specify all details of an object, use the appropriate big parameter dialog window. The big parameter dialog window also opens by double-clicking an object.

Parameters of objects

Object parameters are settings of an object that can be configured in the parameter dialog window. Settings can be saved as a record for every kind of object.

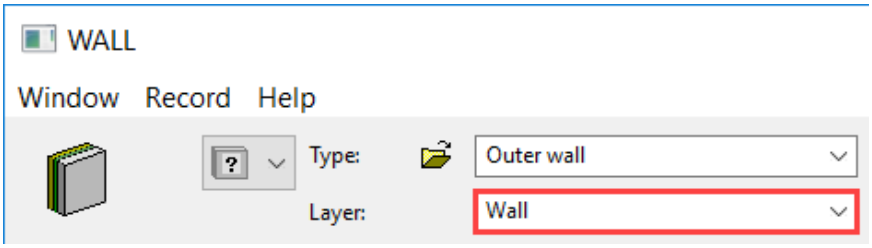
Type
Selection with predefined records.



Example: wall dialog window

To save each separate type, the dialog window of the desired construction part must be set, a new name entered in the text field and finally saved in the menu RECORD > SAVE.
To delete a type that is no longer needed, use can the menu item RECORD > DELETE.

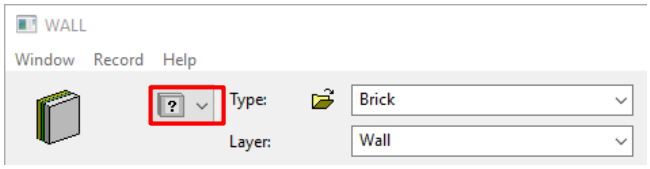
Layer



Example: wall dialog window

Every construction part has the layer field in the record with the layer selection. It is then guaranteed that the construction parts already lie in the correct layer when they are generated.
You can generate a new layer by entering its name into the text field.

Renovation planning state

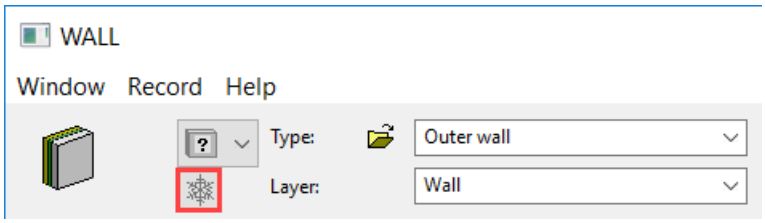


Example: wall dialog window

This option menu is only visible if the renovation planning mode has been activated under SETTINGS > OPTIONS > WORK PARAMETERS > ARCHITECTURE.

A renovation planning state can be assigned to every object. If an object has not been assigned to one of the three states *demolition*, *existing construction* or *new construction*, then it belongs to the state *unknown*.
For each of the three renovation planning states there are two depiction possibilities. Either the depiction is done unchanged (according to the material settings defined in the representation levels) or the depiction is done with according to the depiction parameters for demolition, existing construction and new construction. These parameters can be defined under SETTINGS > OPTIONS > DEPICTION > RENOVATION PLANNING.

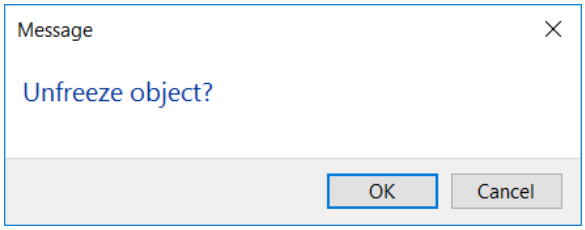
Freeze construction part



Example: wall dialog window

If a construction part is edited, a symbol appears in the parameter dialog window to freeze the object. If you press this symbol, the dialog window automatically closes and the object is frozen. From this moment, the object is exempted from any update functions.

If a frozen object is edited, a message appears on the screen asking whether this should be unfrozen.



Copy parameters
Object parameters can be copied as single items, grouped items or specific items from one object to another or to multiple objects. This allows construction parts to be globally adjusted according to changes made to the project.
Function description chapter 4.8

Adopt parameters
The function takes the properties of an existing construction part and starts the CREATION function to locate the construction part.
Function description chapter 4.8

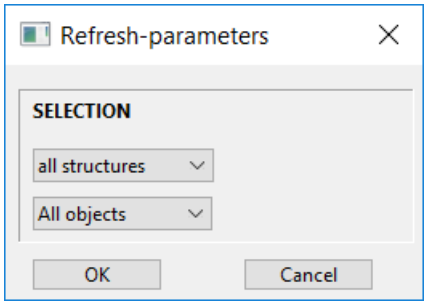
GENERAL FUNCTIONS

Functions, which allow objects to be manipulated, are described below.

Refresh AR Objects

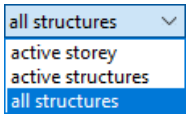
Modify tool bar
Modify menu > Refresh AR Objects

Depending on the settings, architectural objects are not automatically refreshed. A manual refresh can be triggered via this function. You can then set whether a refresh should be carried out for all or for just selected parts.

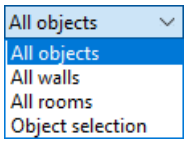


Both "Refresh 3D" and "Reorganize properties" are generally switched on. You can determine from the selection which subset of projects should be refreshed.

Storey / Structure



Object selection



AR Object allocation

Modify tool bar
Modify menu > AR Object allocation

The function allocates objects to the active storey and structure.

When allocating the **single objects**, the active storey and active structure are shown in the question text. In order to avoid errors in clicking, a message also appears each time an object is selected asking whether the correct object has been chosen.

When allocating via **All**, the number of found objects is given before the allocation. Only visible objects are allocated.

Purge objects

Special functions tool bar

Extras menu > Special functions > Purge objects

This function checks all of the AR Objects and purges them. This function also restores defects in the openings of doors and windows in walls.

(Re)Draw walls

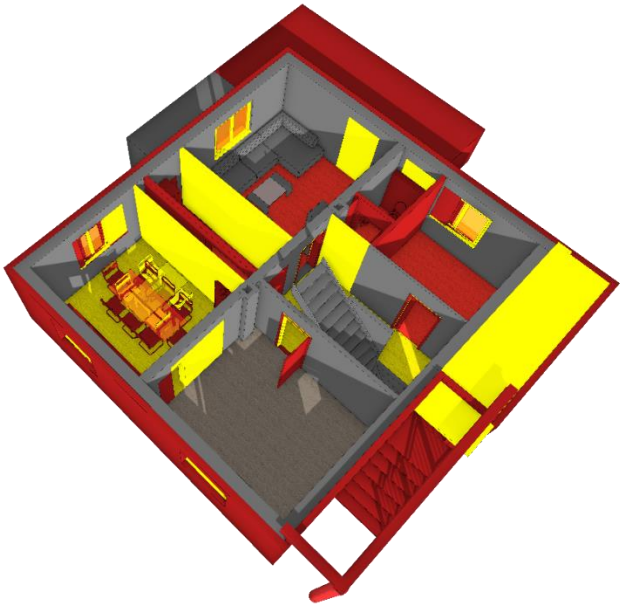
*Modify tool bar

The (RE)DRAW WALLS function hides all 3D information and (re)draws the walls. All superfluous lines are switched off. This function is preferably used in the design model.

8.6 RENOVATION PLANNING

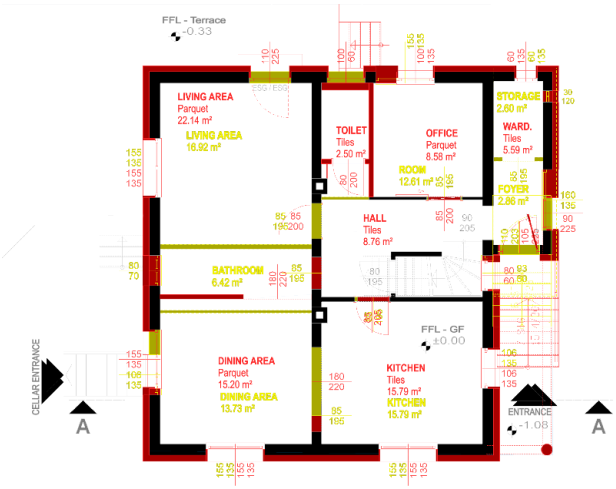
OVERVIEW

Renovation planning with ELITECAD AR is possible consistently in 2D and 3D. The depiction of the states demolition, existing construction and new construction is freely configurable from the 3D model down to the plans.



All project states exist simultaneously and can be set visible or invisible with a single mouse click. Classification is done at the level of construction parts without the need of utilizing layers.

Numerous functions for construction use this state information and manage tasks automatically (i.e. closing of a wall opening when setting a window to demolition state). Even the automatic dimensioning only refers to meaningful combinations of states.



The fully integrated renovation planning in ELITECAD supports the user not only in the 3D modelling process and plan layouting, but also in the calculation of masses and dimensions, as well as in the generation of reports for the desired project states.

During the BIM process, the interfaces grant the transfer of state information.

Visualisation of renovation planning in a virtual reality environment demonstrates very impressively how a building changes.

BASICS

States

ELITECAD manages the time dependent states of a renovation planning project. The renovation planning states are a completely independent property of architectural objects as well as of basic elements. (E.g. texts, dimensions, help lines).

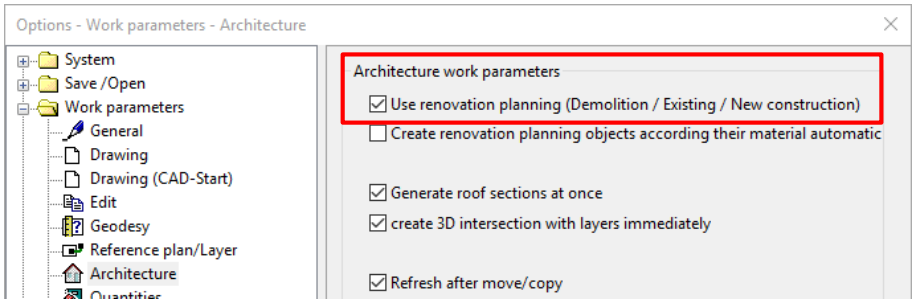
Following states are available:

- Existing construction
- Demolition
- New construction

If no state has been assigned to an object, then the object is said to be in the state *unknown*.

Activating renovation planning

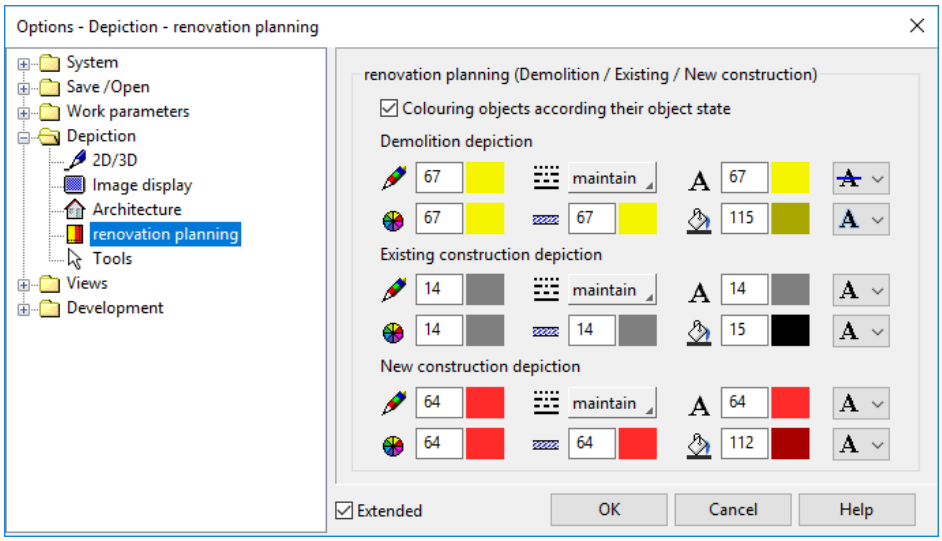
Before working with these states, the renovation planning has to be activated under SETTINGS > OPTIONS > WORK PARAMETERS > *ARCHITECTURE* first. Only then, all related settings are active or visible.



Graphical depiction

Pen, colour, text

The depiction parameters are configured individually under SETTINGS > OPTIONS > DEPICTION > RENOVATION PLANNING for the states demolition, existing and new construction.



The coloured depiction can be generally deactivated here.

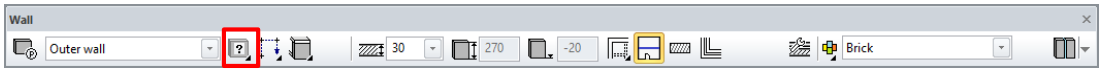
Views

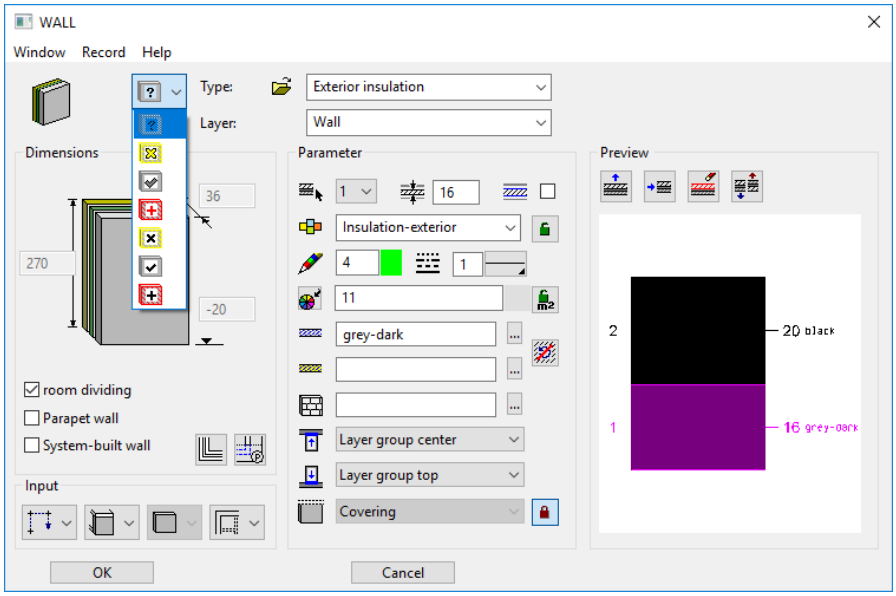
The coloured depiction of renovation planning states can be activated per view.

MANAGEMENT

Objects

When renovation planning is active, a selection menu for the object sate appears in the property bar as well as in the big parameter dialog windows. A renovation planning state can therefore easily be assigned to an object.

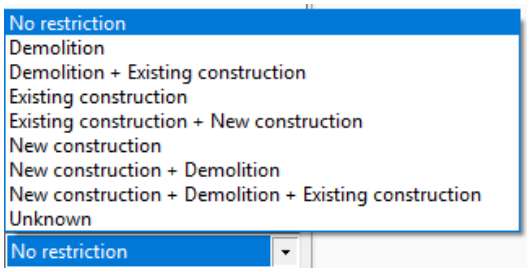




For each of the three renovation planning states there are two possibilities. Either the depiction is done with the material settings defined in the representation levels or the depiction is done according to the depiction parameters for renovation planning that are defined in the OPTIONS.

This state can be passed onto other objects.

Visibility filter



After switching on renovation planning the selection menu for visibility becomes active in the status window.

Renovation planning states are set visible or invisible via this menu and are combined with the current structure, storey and layer filter. Useful prepared combinations of states accelerate the selection of visible objects, i.e. setting only demolition visible or demolition plus existing construction.

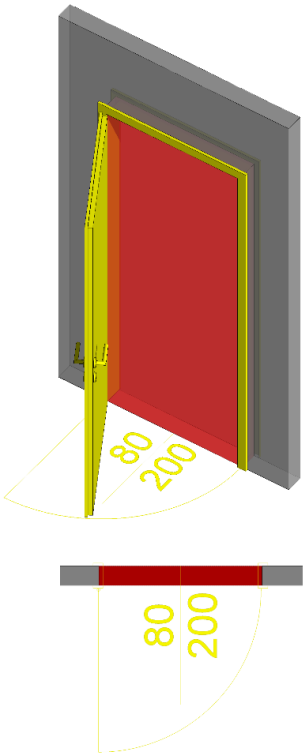
The filter is saved view dependent that means one view may display the state at the start of a project and another view may show the final state.

The visibility filter for three commonly used states can be preconfigured under SETTINGS > OPTIONS > DEPICTION > ARCHITECTURE. There is a quick way to enable them in the RENOVATION PLANNING toolbar. The default states are:

	Back to the past	demolition + existing construction
	Back to the future	new + existing construction
	Back to the roots	previous state

EDITING

Fill openings automatically



Objects creating openings (windows, doors, walls and floor openings) can be closed in a renovation planning project. In the terminology of renovation planning this means, the opening is set to demolition. By performing this change, each opening object automatically creates a filling wall / filling slab in order to close the opening. The filling wall / slab automatically receives the state new construction.

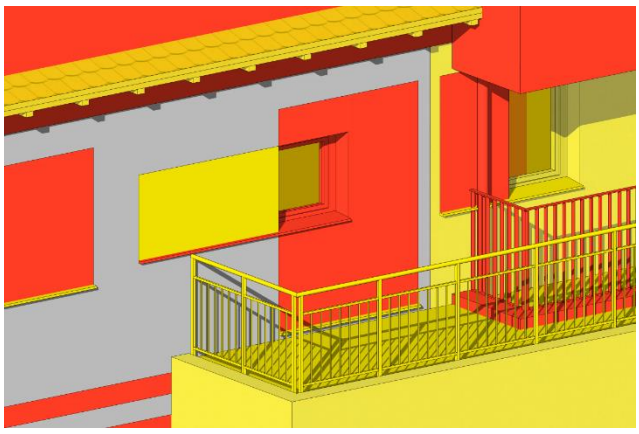
This process can be deactivated via a toggle individually for each object.
Filling walls / slabs can be detached from the opening and could be edited manually afterwards.

In the OPTIONS it can be defined how the automatically created filling objects should be depicted. There are two possibilities: Either according to the material or coloured.

Defining wall openings

The inverse process of closing openings is the creation of openings. In that case, the window or door is the new construction object. A part of the wall is extracted from the wall during this process and remains as an independent demolition wall.

It is definitely realistic, that areas, which are supposed to be closed, may overlap with new openings.



An example: A terrace door should be removed – demolished and on the same place a wide window should be located – a new construction object. One part of the wall opening remains, one part of the wall down to the floor is bricked and one region of the opening will enlarged at the side. All these steps are automatically accomplished in ELITECAD with well-known functions. The door

has to be set to demolition state and a window with state new construction has to be placed.

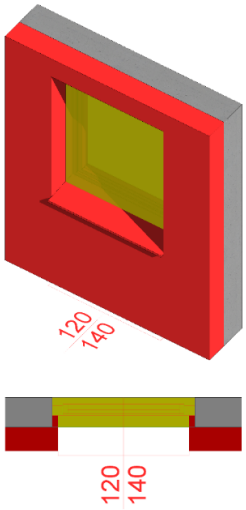
Defining floor openings

For floor openings, the same principles like for walls are valid. A part of the slab is extracted from the existing slab and remains as a slab with the state demolition. Here areas that may be opened or closed may partially overlap as well.

Logically linked walls

An example for a logically linked wall is an existing wall that is linked with a new wall used for insulation.

For logically linked walls, individual stops for openings are possible.



Modifying walls

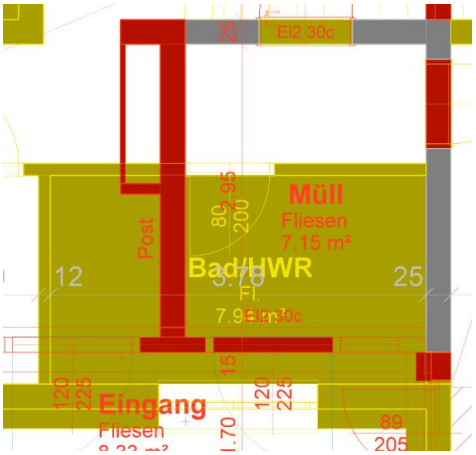
Further typical tasks in the renovation planning process are splitting of walls, demolition of walls or drawing new walls.

Automatic model adaption when modifying walls
Walls intersect with slabs and roofs and limit rooms. When performing these actions, it is ensured that only compatible objects intersect. Demolition objects and new construction objects clearly do not influence each other, i.e. an intersection of a demolition wall with a newly constructed roof makes no sense.

Intersection of matching walls
In the same way that wall changes affect other objects, the walls themselves take care that they only intersect with matching walls.

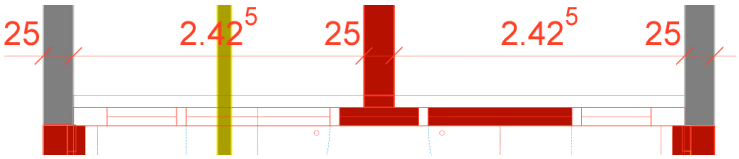
Modifying rooms

Even rooms may possess a renovation planning state. A room with a certain state only interacts with reasonable walls, i.e. a demolition room with existing or demolition walls, a new construction room with existing and new construction walls.



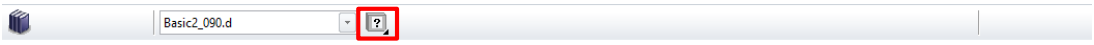
Changing walls also has impact on the room. Rooms can be divided or combined. Hence, demolition and new construction rooms can partially lie on the same location. This introduces no problems because these rooms do not influence each other.

Dimensioning



Dimensions play a special role in renovation planning. They may not only receive a state like other objects in order to be filterable and depicted in corresponding views. The state of a dimension also defines which objects should be considered for dimensioning. An opening dimension of the type demolition ignores new walls. Changing the state of a dimension, i.e. from demolition to new construction involves an immediate update of the dimension and at the same instant, completely different objects are considered.

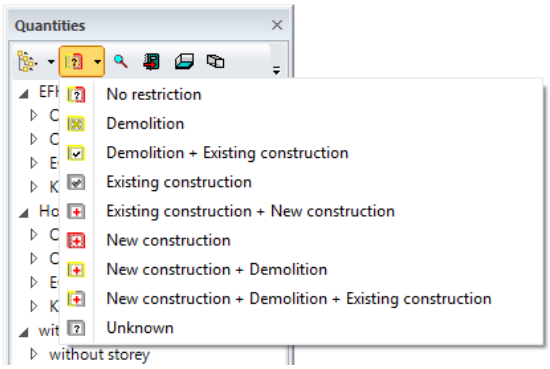
Exchanging library parts



Library parts contain renovation planning information as well. They are depicted like all the other objects in the defined colours. When renovation planning is active, exchanging a library part also changes its state, i.e. from existing to demolition and sets the new object to new construction.

QUANTIFICATION

The object state is taken into account when calculating the masses and dimensions and stored in the database. Quantification functions consider this information.



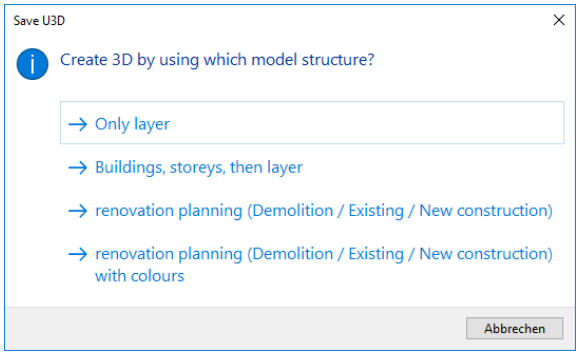
Filter in the quantification manager
A status filter offers the filtered display of renovation planning states in the manager.

Filter in reports
The reports list the objects separately depending on the object state.

INTERFACES

3DPDF, U3D, SketchUp

During the export, the renovation planning information is considered. One level below the storey another hierarchy level for the object sates is introduced. The export is done optionally with or without the configured colour options.



IFC

The IFC import reads the object sate and exports the state during the IFC export.

VISUALISATION IN THE WALKING MODE

During the walking mode, three combinations of states can be changed with a single button click (before, after, back to the previous state). A change between the states at the beginning and at the end of a renovation planning project is thus possible in a virtual reality environment. The functions can be integrated into the graphical menu of the walking mode. See chapter Visibility filter.

FINALISE RENOVATION PLANNING

Create new state after renovation

Renovation planning toolbar

Extras menu > Renovation planning > Create new state after renovation

After the renovation planning has been completed, a new design model, representing the state after the renovation, can be created automatically from the design model with renovation planning information out of the existing and new construction data.
During this process, all data belonging to the status demolition will be deleted. If necessary, data with the status existing and new construction are combined (for example, existing wall with a new filling wall of a bricked-up window). Finally, the information existing and new construction are deleted from the objects, so that in the end a design model remains that corresponds to the new state and has no renovation planning information.

Views, sections, plot views, etc. are not updated automatically. Manually adjusted and unnecessary views should be corrected after review.

Restore old state before renovation

Renovation planning toolbar

Extras menu > Renovation planning > Create old state before renovation

If necessary, the state before the renovation can be restored from the design model with renovation planning information automatically from existing construction and demolition data.
During this process, all data belonging to the status new construction will be deleted. If necessary, data with the status existing and demolition are combined (e.g., existing wall with a demolition wall of an intended wall opening). Finally, the information existing construction and demolition are deleted from the objects, so that in the end a design model remains that corresponds to the old state and contains no renovation planning information.

Views, sections, plot views, etc. are not updated automatically. Manually adjusted and unnecessary views should be corrected after review.

9. FRAMING

9.1 GRID 593

9.2 WALL 597

9.3 BASE, FLOORS AND LANDINGS 618

9.4 COLUMNS 633

9.5 GIRDER 639

9.6 STAIR 643

9.7 ROOF 660

9.8 DORMER 682

9.9 TRUSS 688

9.10 CHIMNEY 703

9.1 GRID

CREATE AXIS-GRID

AR Objects toolbar
AR Objects menu > Axis-grid

Click on the CREATE AXIS GRID function to enable the settings for the last axis-grid drawn. The axis-grid can immediately be placed.
The axis grid consists of two orthogonal axes, the horizontal X-axis and the vertical Y-axis. For rotated axis systems, you must create the grid on a rotated coordinate system: See DEFINE COORDINATE SYSTEM function (chapter 2.3).

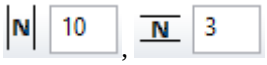
AXIS GRID PROPERTY BAR

The property bar is visible as soon as the function CREATE AXIS GRID is started or an existing axis grid is edited. The property bar is used to modify the main properties of an axis grid.

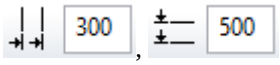
[Axis grid parameters]

[Type]

Renovation planning state (see chapter 8.5)

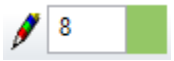


[Number of grid lines along X- or Y-axis]

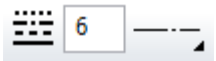


[Distance between two grid lines]

[Grid line start offset]



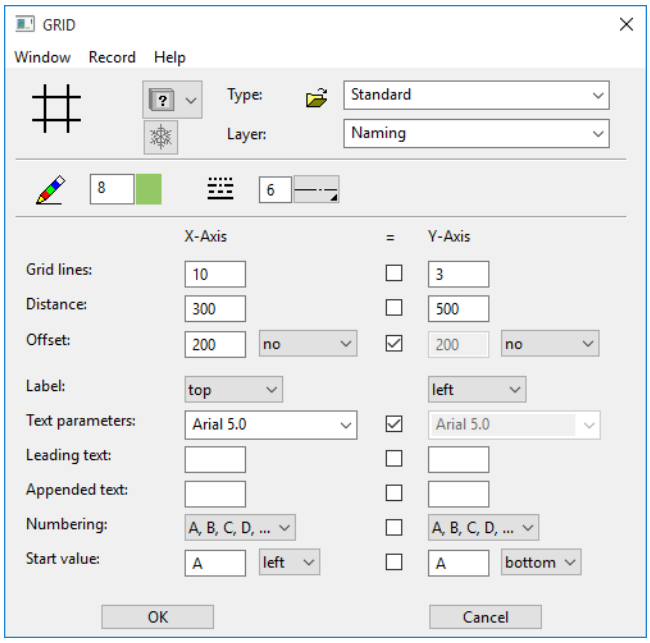
[Grid line pen]



[Grid line type]

AXIS GRID PARAMETERS

You can open the axis-grid parameters via the properties bar or by double-clicking the axis-grid to be modified.

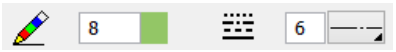


General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

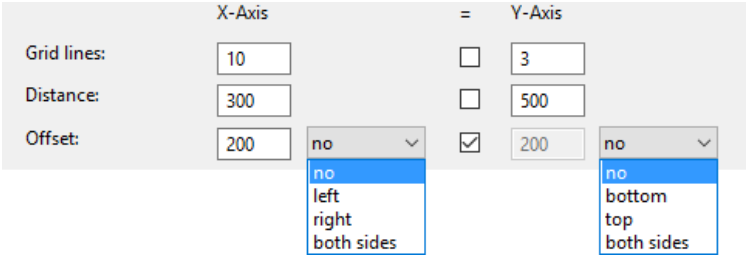
Pen- / Line type



Pen- and line type of grid lines.

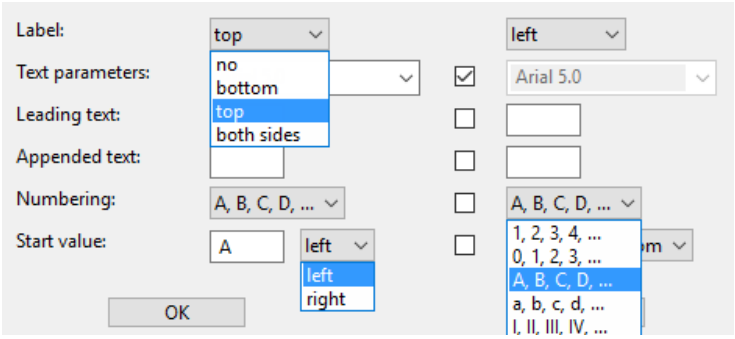
Geometry

The settings are subdivided into one column for the X-axis and one column for the Y-axis. If the Y-axis is the same as the X-axis, you can set the option SAME in the middle column.



In the first two rows, specify the number of grid lines in the X- and Y-direction along with their spacing.
The offset defines the overlap of the axes over the axis section points along the edges of the grid surface. The offset can be on one or both sides.

Label

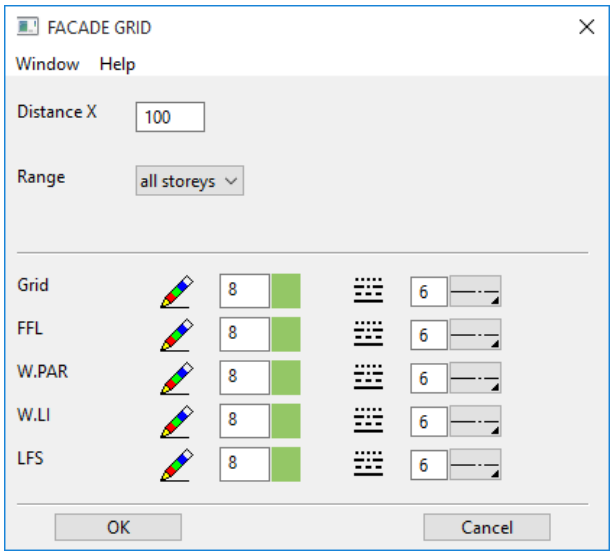


The axes can be labelled on one or both sides. The text is controlled by a predefined text parameter. There are various formats available for the numbering. You can specify the start value of the numbering as well as whether the numbering should rise from left to right or from right to left.

CREATE FACADE GRID

AR Objects toolbar
AR Objects menu > Facade grid

The facade grid copies the heights from the structure settings and can be placed on a building's outer facade.



The recommended value for the X-spacing (grid) is adopted from the structure settings dimension system. The spacing values of all height lines come from the values in the structure settings and only their pen and line type can be modified in this window.

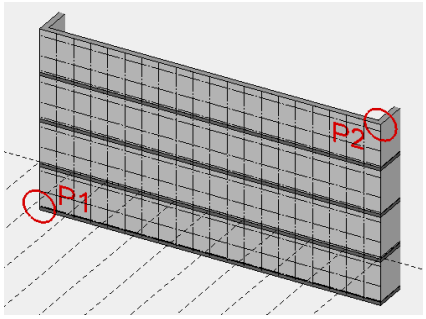
BTS = top side of complete floor
B.Us = window bottom edge
B.Ts = window top edge
US GC= bottom side of raw slab

▼▼▼▼ WORKSHOP

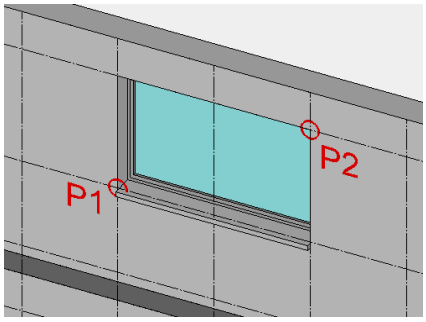
Create facade grid

Before executing this function, place your work plane on a facade exterior surface.

Open the CREATE FACADE GRID dialog window, enter the desired values and confirm by clicking OK. You will be prompted for the lower left and upper right positions of the axis grid.



After the facade grid has been placed, you can open up the space for the windows on the same work plane. All windows are automatically assigned to their associated storey, even if that storey is not the current one at the time of installation.



WORKSHOP END

9.2 WALL

CREATE WALL

Construction parts toolbar
AR Objects menu > Wall

When you click the CREATE WALL function, the settings of the most recently drawn wall are active and the path of the wall can be drawn immediately. Depending on the selected setting for the ENTRY MODE option, the first wall query appears in the entry line, e.g. *1st axis point*.

TIP

Draw complex walls in multiple pieces, especially if the top edge of the wall will intersect the roof.

TIP

Demolition wall
You can define demolition walls with a wall height of "0". These are not represented in the 3D view. The height reference must be set to parapet so that the height of "0" can be specified.

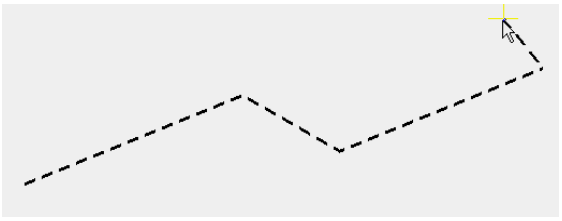
WORKSHOP

Create wall

Launch the CREATE WALL function.

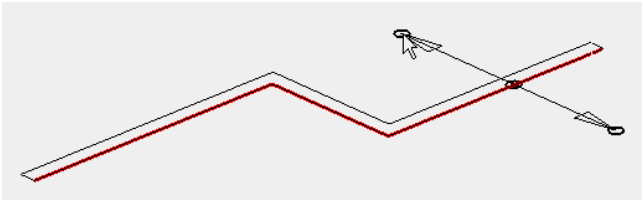
Set the type of wall entry in the properties bar to "Create wall by polygon".

Now draw the wall axis. Later you will define whether this will become the wall's middle, outside, or inside contour. To end wall entry, click again on the last point.

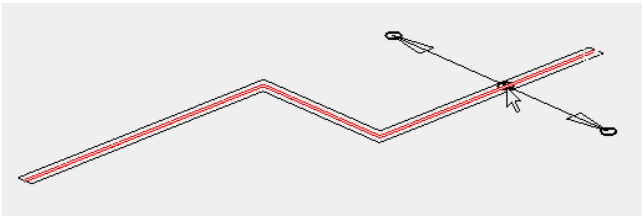


Now define the direction in which the wall should be drawn. Move the mouse in the middle of a wall segment from one side to the other. Once you have reached the correct position, confirm by left-clicking.
Keep in mind that the wall gauge is always modified from the axis outwards. You can move the axis later using the MOVE WALL AXIS function.

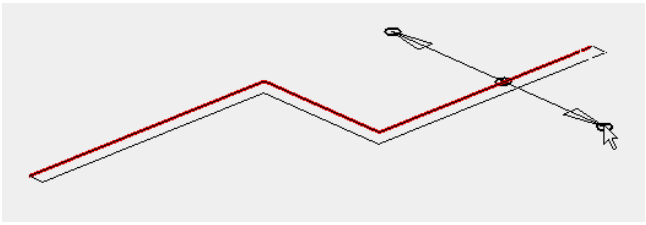
Contour exterior



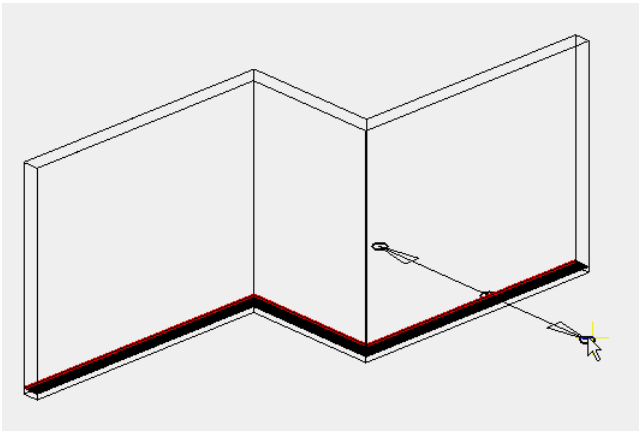
Contour centred



Contour inside



Confirm the position by left-clicking.



The function remains active. You can begin with the next wall right away.

WORKSHOP END

WALL PROPERTIES BAR

The properties bar is visible as soon as the CREATE WALL function is started or if an existing wall is edited.
You can manipulate the main values in the wall's properties bar.

Wall parameters

Type

Renovation planning state (see chapter 8.5)

Entry mode

Height reference

Wall gauge

Wall height

Height difference from the wall's bottom edge to the current work plane

Wall type

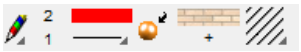
Room dividing

Parapet wall

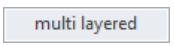
View with envelope

Editing functions for multi-layered walls

Properties of wall (material)



Properties of wall (depiction)

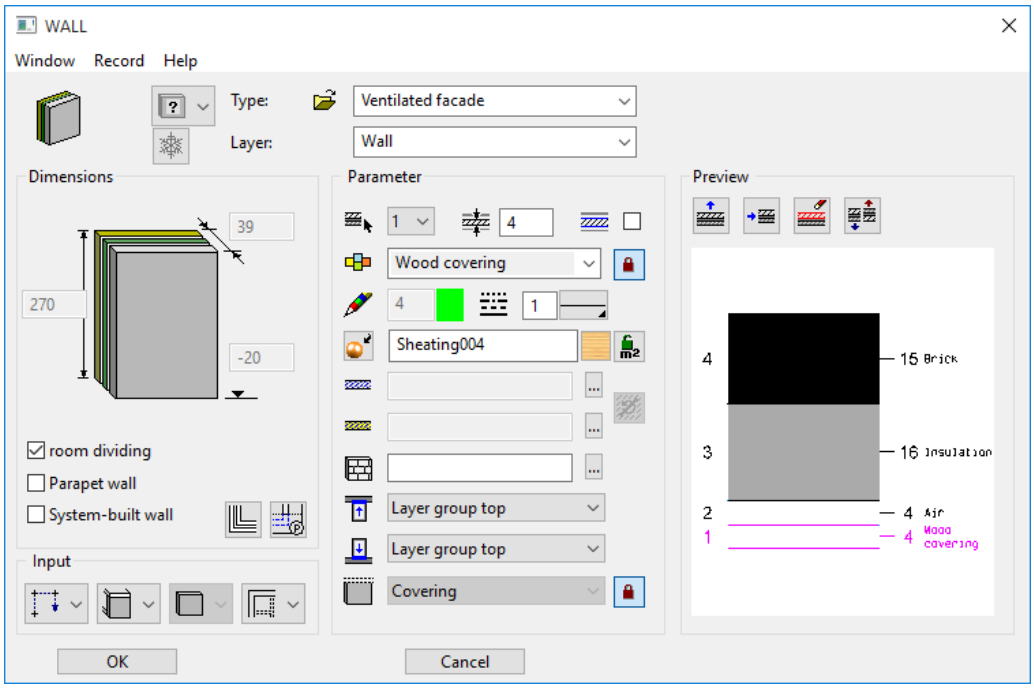


If the wall is multi-layered, the properties are deactivated

Modification functions

WALL PARAMETERS

You can open the wall parameters via the properties bar or by double-clicking the wall to be modified. The dialog window has three columns. First, the General Settings including the sizes and entry, then the settings of each layer and finally the preview.

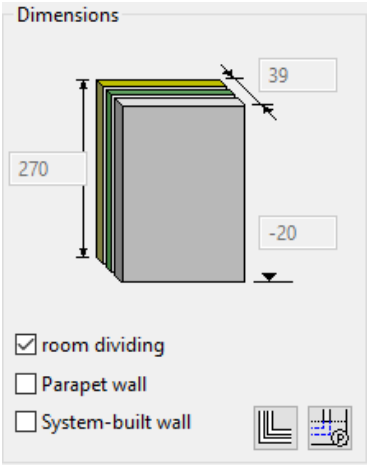


General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Dimensions



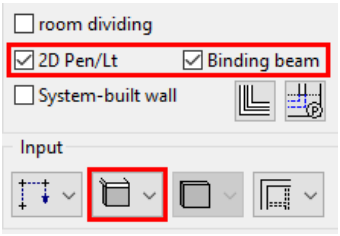
Depending on the selected height reference, you can configure the bottom edge and height values freely.

Room dividing

This property should always be selected by default. Non–room dividing walls would include toilet stall walls, dormer walls, facing panels and the like. If a wall is not room dividing, it does not divide surfaces when calculating room area.

Parapet wall
If a wall is labelled a parapet wall, the hatch is automatically hidden in the floor plan and the settings are used in the "**Roof section/secondary wall detail parameter**" for the floor plan depiction. The hatch is preserved in the section.

Binding beam



If "Wall to ceiling" or "Free wall reference" is selected for the height reference, the BINDING BEAM option also appears. When this option is selected, the wall is reported as a binding beam. The 2D PEN/LT option corresponds to a parapet wall.

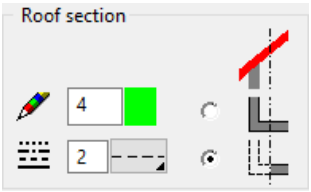
System-built wall
When this option is selected, the wall is reported as a whole and not by layers.

Main wall
This option only appears if multiple walls are **linked** with each other. If a construction is labelled the "Main wall", it is the one represented in the floor plan as the cross-section. If a wall is a "Secondary wall", the cross-section does not appear and the depiction follows the settings under "**Roof section/secondary wall detail parameter**".

View with envelope

For multi-layered walls, the depiction in views can optionally be with the envelope only.

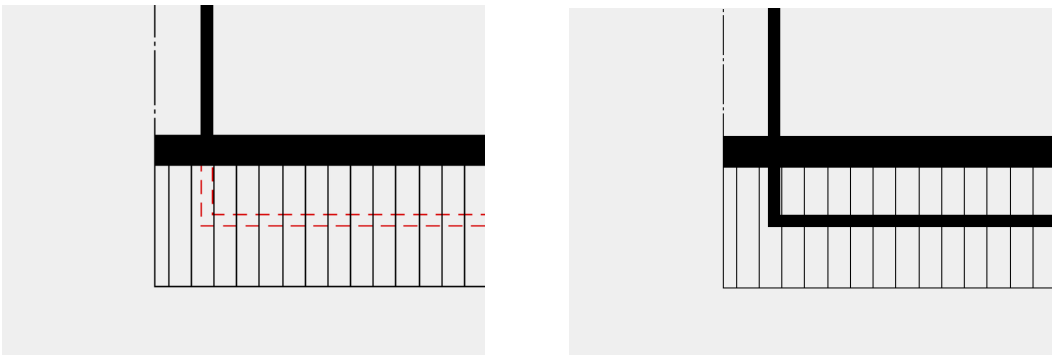
Roof section/secondary wall detail parameter

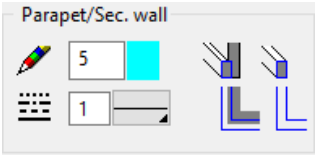


Here, you can configure the pen and line type for the areas that are not visible for a roof section. However, you can also switch off depiction.

Switched on

Switched off





Here, you can configure the pen and line type for the floor plan, if the parapet wall, 2D pen/lt or secondary wall options are selected.

Entry

Entry mode

Create wall by polygon

Entry is via the wall axis. This is a freely definable polygon or rectangle. If at the end the polygon leads back to its start, the wall is drawn immediately. In all other cases, the wall polygon is closed by entering the same endpoint twice.
For the query *Which direction?*, you can define the wall's direction, i.e. the position of the wall axis. The options are the centre, the right side of the wall or the left side of the wall. This axis is adopted as the reference line for later changes to the wall gauge.

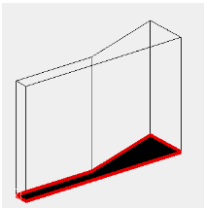
Create wall from existing contour

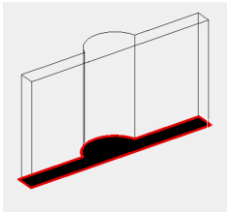
First, you must draw a contour that follows the desired wall path. Always place this contour on the storey plane, even if the wall is to relate to a shifted level floor. After defining the contour, you must define the position of the axis (wall direction) with the cursor.

Define wall from outline

The first two entry options are used to draw the wall axis. This always results in a uniformly thick wall. With this option, the entire outline of the wall is drawn as a closed polygon. This makes it possible to create tapered walls as well. This entry mode is only available for single-layered walls.

Examples:





Height reference

Choosing the correct height reference simplifies entry and has advantages for later modifications to the structure settings.

Walls that use a ceiling as a reference automatically adjust themselves if the ceiling is modified (height reference of ceiling: **Storey ceiling or level floor**). A free wall never adjusts itself.

Height reference – Wall from floor to ceiling (Standard)

You can save the effort of entering heights, as this wall is always located between the storey slabs of two storeys. The slabs must have **storey slab or level floor** as their height references to be accounted for by the walls. This is the typical setting for interior walls.

If the wall has a roof over it (that belongs to the same storey and the same structure), the storey wall connects automatically.

Height reference – Wall – underside floor to ceiling

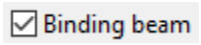
The wall begins at the underside of the floor and goes up to the underside of the ceiling. This reference is used for the exterior wall in order to create a closed outer shell.

Height reference - Wall to ceiling

This wall is oriented with its upper edge on the next ceiling or a roof within the same storey. The underside is connected to the raw slab.

NOTE

If you also select the BINDING BEAM option for this wall reference, the wall is reported as a binding beam.



Height reference - Wall from floor

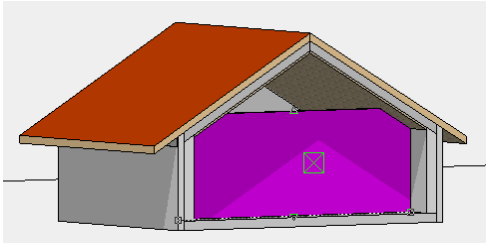
Wall from floor is for a parapet wall standing on a floor. References a **storey slab or level floor**. The height can be freely configured and references the top edge of the slab. Roofs or storey slabs of higher storeys are not accounted for.

Height reference - Wall from floor underside

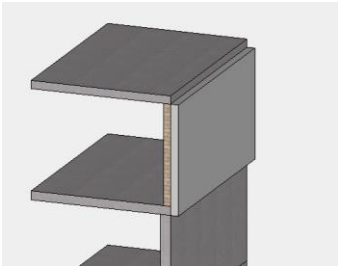
The wall from the floor underside starts at the lower edge of the storey ceiling and is defined with any height starting at that marker. The wall does not account for level floors.

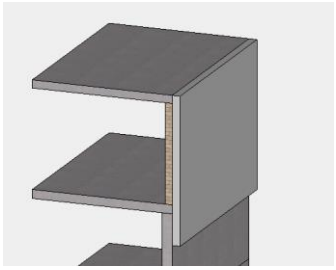
Height reference - Wall up to roof with max. height

The wall has a maximum height and accounts for **storey ceilings or level floors**. The lower edge and height can be configured. This height reference has two usage areas. The first usage is for a wall on the top floor that should adjust to fit the roof but only up to a specific wall height.



The other usage is for exterior walls, which have wall layers that are not clamped between the ceilings and have other heights.





Height reference - Dormer walls

Wall between two roofs. After you specify the axis and direction of the wall, both roofs are queried for the limitation. The wall remains associated with both roofs.

Height reference - Free wall reference
Free walls do not reference floors or roofs.
Once the free wall is selected, you can also define the wall's shape in the adjacent dropdown selection box (only available for this wall type). The free wall entry is always defined by a combination of two fields. Depending on the selected shape, you are prompted to provide different details.

Below and above straight

For the straight shape, specifying the lower edge in reference to the ground floor (TS slab) and the wall height clearly defines the position of the wall in the storey.

Slanted below

This shape is well suited to defining dormer walls. The top edge of the wall is determined based on the specified height and the value for the lower edge (which only applies as a reference for the height dimension). You can either determine the lower section using a previously drawn 3D surface/box (e.g. a roof plane) or by entering the height of three free points. If you select the entry by points, simply imagine you are defining a plane in 3D space using the points. This "plane" slices off the bottom of the wall.

Slanted above

The SLANTED ABOVE shape functions similarly to the previous SLANTED BELOW function, except the top edge is the slanted one. This wall works well for firewalls that run above roofs, free facades, dormer walls or furrowed roofs.

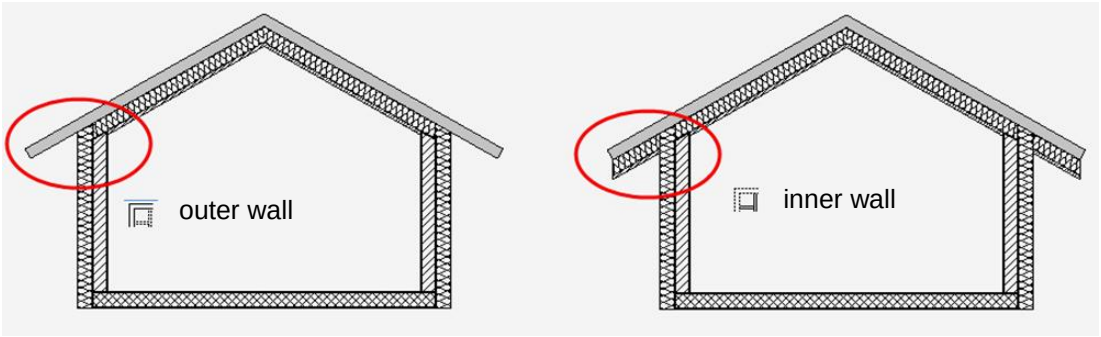
Slanted below and above

The SLANTED ABOVE AND BELOW shape combines the two aforementioned wall shapes.

Define wall from lateral contour

The wall shape with a lateral contour is generated from the definition of a view. Draw the wall view as a closed polygon on the work plane in which the wall should be positioned (wall plane). After you launch the WALL function, the path of the wall is drawn. Finally, you must provide your drawn contour of the side view.

Outer wall/Inner wall
It is relevant for the sections with floors and roofs whether a wall is inside or outside. If the outer walls form a closed contour, the layer groups sectioned by the outer wall are no longer represented in the area in front of the roof.



Assign the correct surface area according to OE standard 1800 (2011) and EN 15221-6 in the reporting lists.

Outer wall

Inner wall

Partition wall

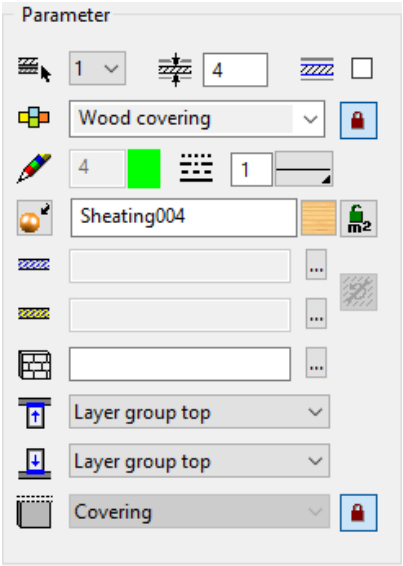
Dividing walls for office buildings

Flexible partition wall

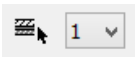
Basement separation, toilet separation wall
Floor is created up to the wall axis.

Parameter

The parameter section displays the settings of the active wall layer.

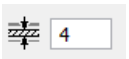


Number of active layer



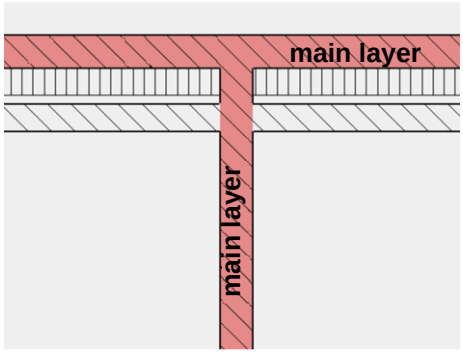
For multi-layered walls, you can select the desired layer in order to configure its settings. Instead of selecting the number, you can click directly on the layer in the preview.

Gauge of active layer

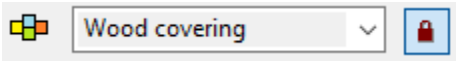


Main layer / supplementary layer

If a wall layer is defined as the main layer, it automatically intersects other main layers.

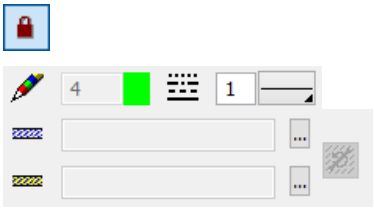


Material and its linkage



The materials and their corresponding settings are saved in the representation level. When linkage to the representation level is selected (recommended), the pen and hatch settings are adopted and cannot be manipulated ("greyed out").
The material is relevant to reporting.

Pen and hatching parameters



When the linkage of the material is active, only the line type can be modified.

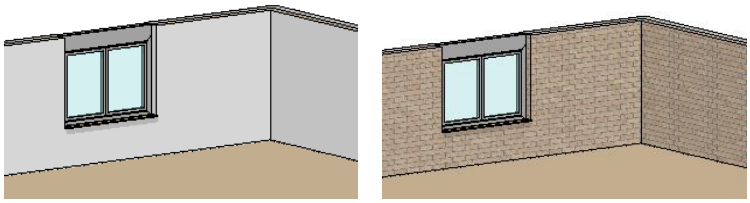
If you unlink the materials, the pen type and hatches can be modified. The settings are described in chapter 8.1 Representation level > Materials management.

Colour mode/Material mode

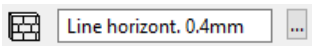
Switch between colour mode and material mode. If a texture is defined, it takes precedence. The 3D colour appears for the empty texture field. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

Material for room label

If the lock is not set (open lock), the material configured in the room parameters takes precedence over the wall material. If the lock is set (lock closed), the material of the wall is represented and not that of the wall label. Reporting does not account for these settings and uses the "material for room label" for the entire room.



3D hatch

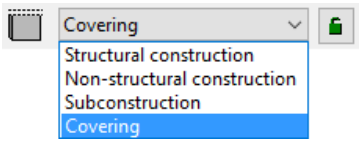


The wall can be assigned a line hatch that appears in the calculated hidden line views.

Wall limitation top/bottom

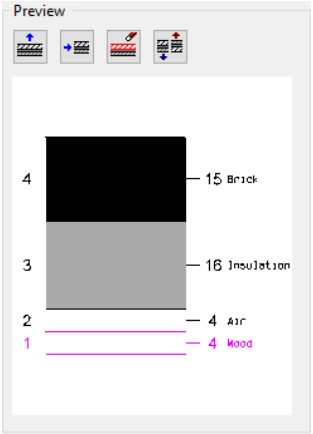
If the wall layer affects a **slab** or a roof, the sectioning settings take effect. They define which layer group the wall layer should lead up to. This can be specified for the upper and lower wall connection.

Layer type



For the reporting to be correct, a layer type must be assigned to the layer.
If the linkage to the material is detached, you can make the assignment independently. If the linkage is active, the layer type is read from the reporting database using the material name.

Preview



The current construction is represented in the preview. Layers can be added, deleted or replaced. The wall axis is on wall layer 1. If you click on a layer in the preview, its parameters are displayed.

Add layer

The function adds a new layer to the last layer. This layer has the same settings as the current layer.

Insert layer

The function adds a new layer above the active layer.

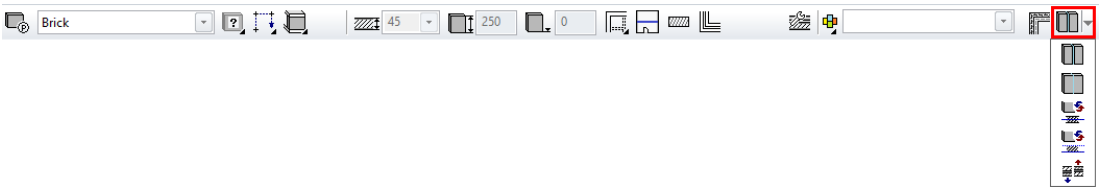
Delete layer

Deletes the active layer.

Mirror layers

This function rotates the group of layers by 180 degrees.

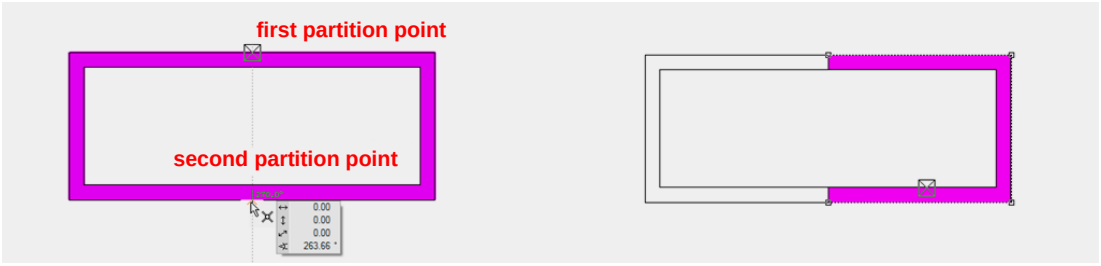
MODIFICATION FUNCTIONS



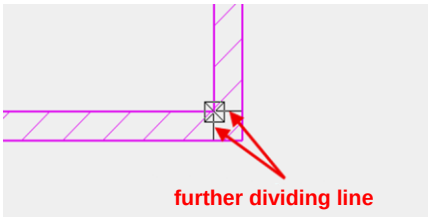
When a wall is being edited, modification functions are available at the end of the properties bar, or you can call up the functions under the MODIFY menu > WALL.

Divide wall

The DIVIDE WALL function divides a wall into two parts.
For a closed wall, you are prompted for two partition points.



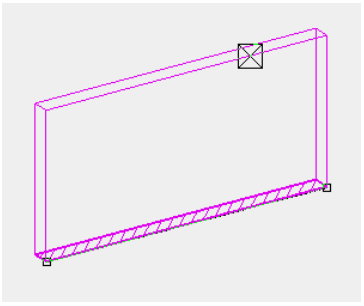
If you place the partition point on a corner of a wall that has a right angle, the program offers two possible partition lines. You can select the desired one.

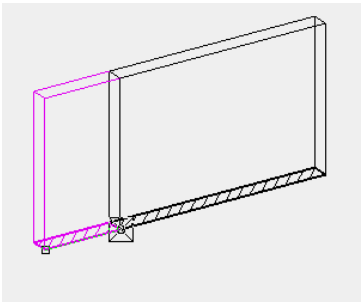


If you place the partition point on a wall corner that does not have a right angle, the wall is divided by a line that splits the angle in half.

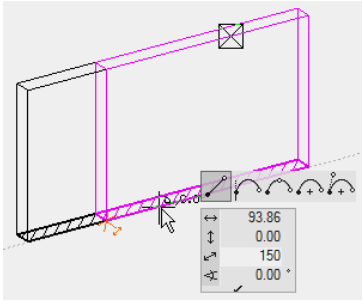
WORKSHOP

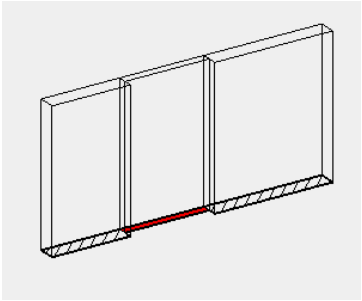
You would like to give an area of wall a different construction. To do so, the wall must be divided. Click on the wall, select the DIVIDE WALL modification function, and set the partition point.





Divide the longer wall section. To do so, move the cursor to the beginning of the wall and hover it until the cross appears. Then move the cursor in the direction where the division is to be made, enter the distance and confirm with [Enter].





Now you can delete the middle wall slab or simply convert it to another wall type.

WORKSHOP END

Join wall

Joins two divided walls of the same gauge into one wall. If the two walls have different properties, such as height, material, pen, etc., the settings for the wall you clicked are adopted.
You can only click on walls that belong to the same storey and structure. It is also only possible to join two walls that are touching and have their wall axis on the same side. If that is not the case, you can use the **MOVE WALL AXIS** function to change the position.

Modify wall axis

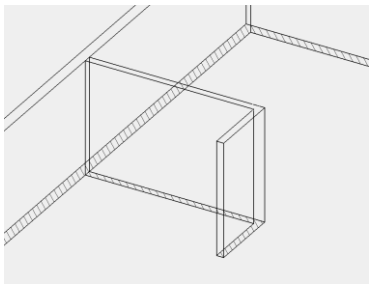
The function enables you to modify the contour of an existing wall. The function completely rebuilds the wall from the wall axis.
After the function is launched, the wall is reduced to the wall axis. The wall axis can be modified using the DRAWING function. Make sure that the wall axis produces a complete polygon. To complete the function, you must run the WALL AXIS READY function. This appears in the top left of the work area.

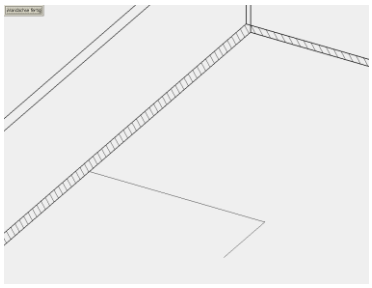
TIP

If you click a contour handle or gripper after selecting the wall, a variety of manipulation functions is available in the input assistant.

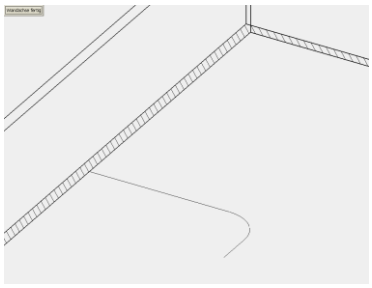
WORKSHOP

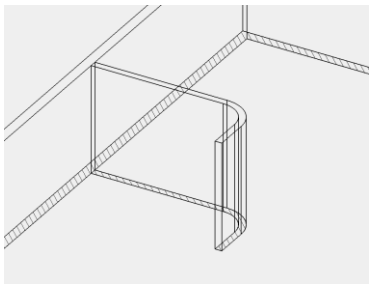
Example 1:
After you have selected the function, the 3D is hidden for the wall and the wall axis becomes visible.





Now you can modify this axis as you wish. You can fillet the corner of a wall, for example. To do so, use the FILLET function. To complete the function, click WALL AXIS READY.





WORKSHOP END

Move wall axis

When you modify the gauge of wall, the position of the wall axis is important, as it determines the direction of the gauge change modification. Normally, wall axis display is switched off (see SETTINGS > OPTIONS > DEPICTION). While this function is selected, the wall axis is displayed and can be moved using the flip cursor.

Modify wall contour

You can modify the contour of a single-layered wall. The wall can be assigned to any outline.
After launching the function, the wall is reduced to the outline. You can use the 2D drawing functions to edit the outline. Make sure that the new contour produces a closed polygon again. To complete the function, you must click the WALL CONTOUR READY function. This appears in the top left of the work area.

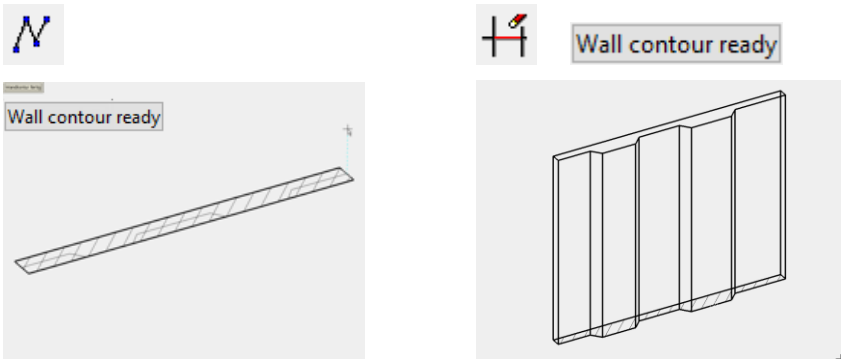
After the contour modification, the wall has a free contour and not all of the editing functions are available.

TIP

The wall should be divided in the area of the modification so that only part of the wall has a free contour.

WORKSHOP

After you call up the function, you can draw the new wall path using the normal drawing functions. Afterwards, you should edit the wall polygon to produce a closed polygon again (Delete segment, etc.).



End the function using WALL CONTOUR READY. The wall is drawn. Make sure that the wall has become a free contour. There should no longer be all of the editing options available.

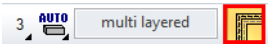
WORKSHOP END

Switch between main contour / layer contour

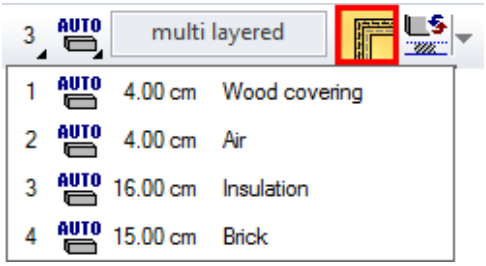
This selection box gives access to the individual layers so that you can modify them independently of the main wall's geometry. To make a horizontal change, the layer must be independent. To make a vertical change, the "Auto" selection box must be switched to any height reference.

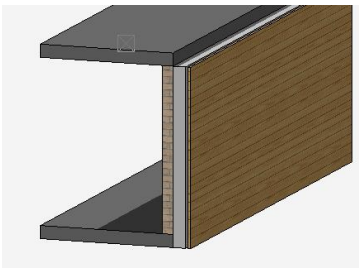
Control height of single layers

You can change individual layer's heights independently of the wall's height reference. To do so, switch to the layer contours on the properties bar.



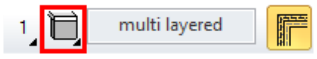
All the individual layers are listed. Currently, all of them still have the wall's global height reference.

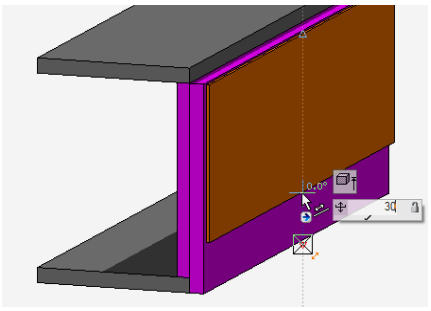




In this example, the wood panelling should not go up to the lower edge of the wall.

Select the layer and switch the height reference from "Auto" to "Wall to ceiling".
The layer's behaviour can now be modified individually, separate from that of the wall.

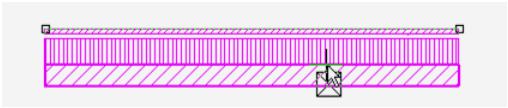




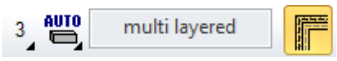
The individually configured layer will no longer react to changes to the wall.

Control single layers in floor plan
If multi-layered walls intersect each other or have **independent wall layers**, the display of the handles can be switched between the main axis and the local axes.

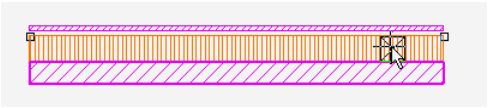
Main axis



Local axes

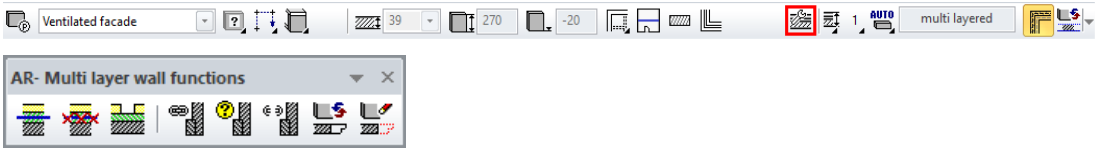


Select the desired layer



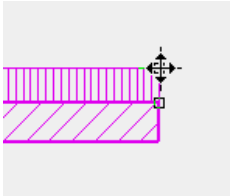
MULTI-LAYERED WALL FUNCTIONS

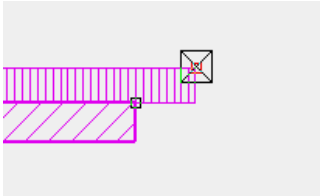
On the wall's property bar, you can display the "Editor functions for multi-layered walls" toolbar.



Manually create wall-layer

This function creates a separate wall axis for each selected layer. That way, the layer can be lengthened or shortened.





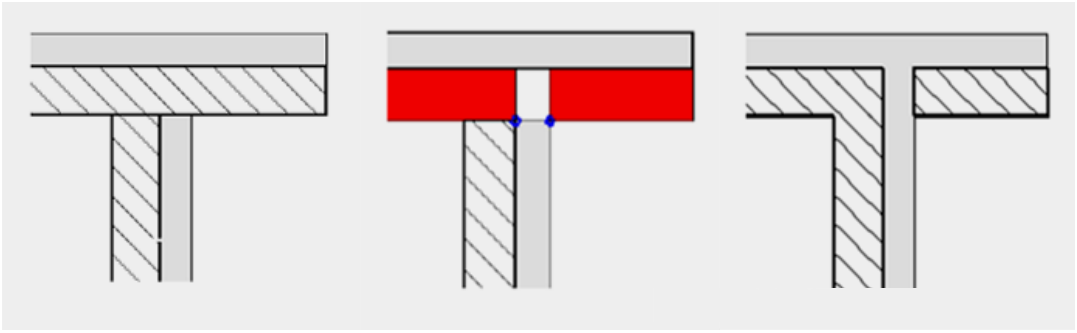
If you have made a layer of a wall independent, the next time you click the wall individual handles appear on the wall once the display has been switched to **"Local axes"**.

Cancel independence of wall layer

This function deletes the additional created wall axis for individual layers. The stretch or modification of this axis is automatically undone.

Divide wall layer

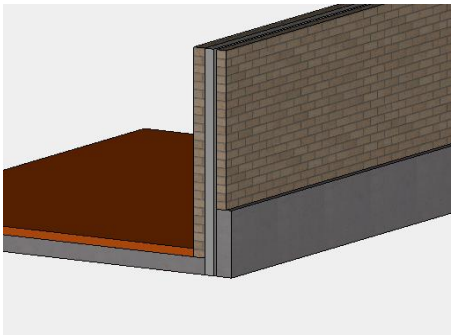
This function interrupts a layer for a specific distance. The layer is always divided completely.

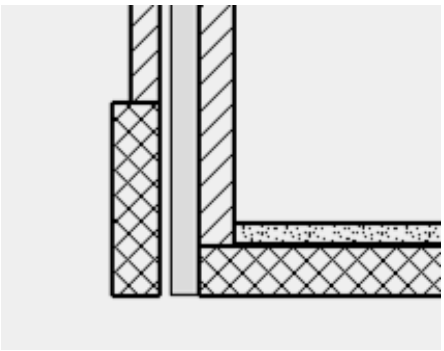


First, select the function then select the layer to divide then specify the two division points.

Link wall logically

If multiple walls are drawn on top of each other, e.g. a plinth wall and a multi-layered wall, they can be linked with each other to adapt the wall layers to each other automatically. When doing so, the wall positioned higher is always cut out. You can specify which wall should be represented as sectioned in the wall parameters dialog window using the **MAIN WALL** option.





Windows, doors and wall openings can also be placed in this type of linked wall constructions. If a height is changed for linked walls, the walls must be refreshed using the REFRESH AR OBJECTS function.

Show logical links

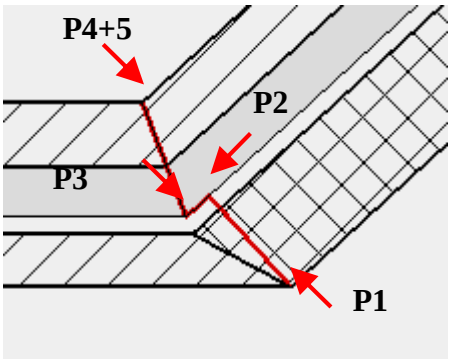
If you click a wall after calling the function, all possible walls to link are displayed.

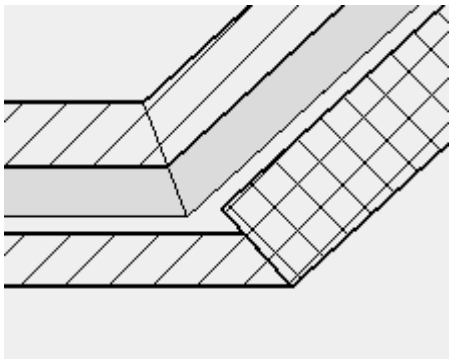
Delete logical links

Deletes the linkage for walls.

Define wall ending

You can use this function to give a wall construction a freely drawn wall ending. This is especially useful when wall layers end at an angle.
After you call up the function, you must click the desired wall. You are then prompted for the "Start point of end contour". The contour must pass from one side of the wall to the other at the least. To complete the contour, you must click on the same point twice.





Delete wall ending

This function deletes a defined wall ending. After you call up the function, you must click the desired wall. You are then prompted for the side to be deleted. When you click it, the wall ending is deleted.

OTHER WALL COMMANDS

Hatch walls

LAY-OUT menu > HATCH WALLS

If automatic wall hatching is switched off (*Generate hatch at once* under SETTINGS menu > OPTIONS > WORK PARAMETERS > ARCHITECTURE), you can click this button to hatch all constructed walls on command.

(Re)Draw walls

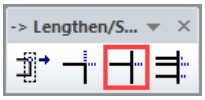
With this function the plan depiction of doors and windows either are given lintel lines or the lintel lines are removed, depending on the settings. Additionally, the connection lines for walls of the same material are removed in the plan.

Modify wall connection

Using this function, you can correct the wall connection, if the connection angle has changed, for example. You can correct walls whose wall axes touch the edge of another wall.
Call the command MODIFY WALL CONNECTION under the MODIFY menu > WALL. When executing the function, click the wall whose ending is to be corrected.

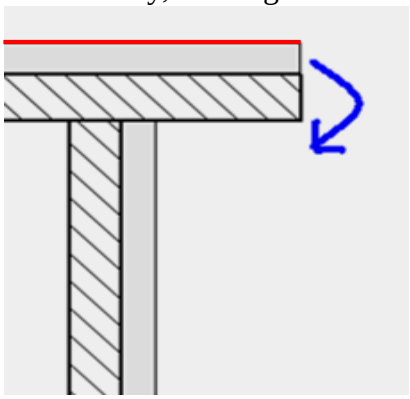
TIP

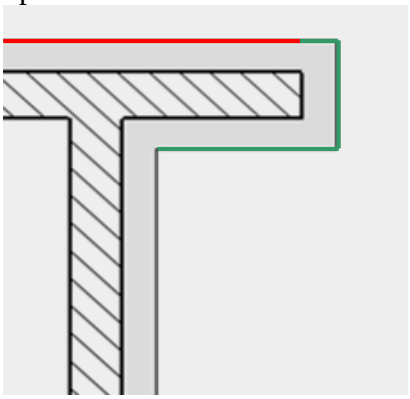
Alternatively, the LENGTHEN/SHORTEN SINGLE ELEMENT function can be used.



Lengthen wall layer

The layer being edited automatically receives an independent wall axis.
For an independent wall layer a new axis can be added. The new wall axis is always positioned on the outer side of the wall.
After you click the layer to be lengthened, you can immediately continue drawing the axis. Finally, click again in the same spot.





Please note that edits to the wall may undo the lengthening.

TIP

Beforehand, **split** the wall in the area where you would like to make the addition.

Show exterior/interior walls

	Extras menu > Show exterior/interior walls

This function opens a dialog window to set the visibility of walls.

9.3 Base, Floors and Landings

Create slab

Construction parts toolbar
AR Objects menu > Floors

When you click the CREATE SLAB function, the settings of the most recently drawn slab are active and the path of the slab can be drawn immediately. Depending on the selected setting for the ENTRY MODE option, a query appears in the entry line.
ELITECAD uses the term "slab" for bases, floors and landings.
In general, a storey should contain the slabs that lie within its height range. This includes the slab on which the walls stand. Sometimes exceptions must be made to this rule, e.g. if rooms extend over multiple storeys. The "ceiling over a storey" should always belong to the storey above it.

The polygon of the floor outline is always part of the plan graphics (on the storey level), even if the height situation of the 3D slab is located above or beneath it.

Properties bar of slab

The properties bar is visible as soon as the CREATE SLAB function is started or if an existing slab is edited.
You can select the slab's main values in the properties bar.

Slab parameters

Type

Renovation planning state (see chapter 8.5)

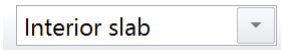
Entry mode

Height reference

Floor gauge

Floor height

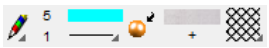
Slab type



Reported as

View with envelope

Properties of slab (material)



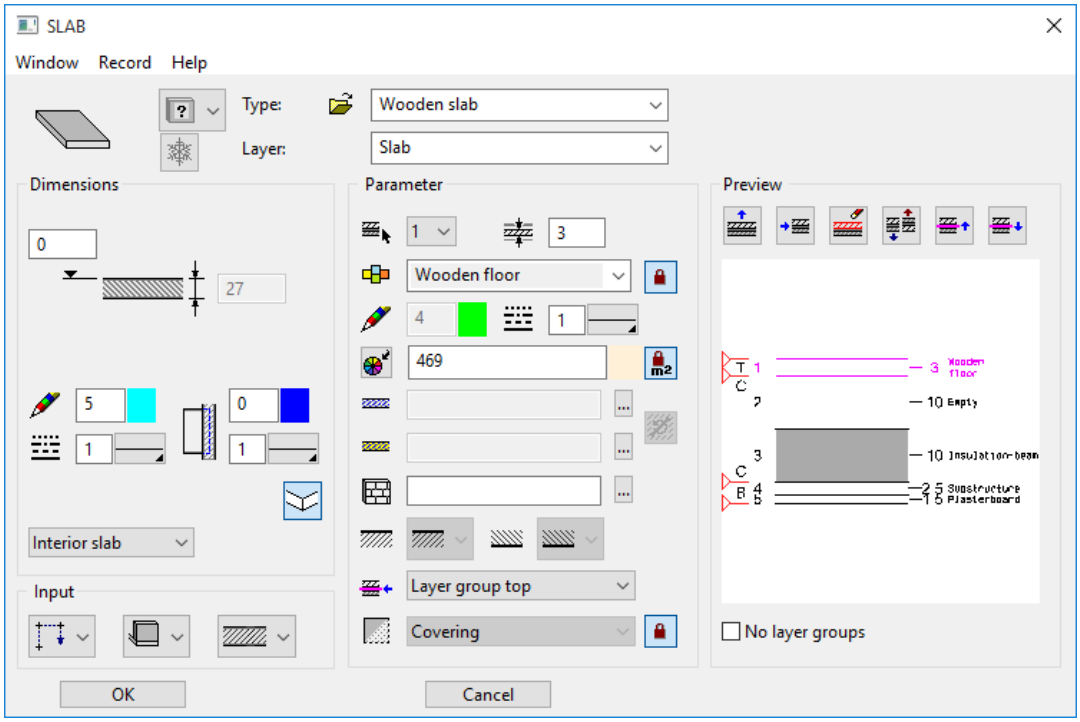
Properties of slab (depiction)

Switch between main contour / layer contour

Modification functions

SLAB PARAMETERS

You can open the slab parameters via the properties bar or by double-clicking the slab to be modified. The dialog window has three columns. First, the General Settings including the sizes and entry, then the settings of each layer and finally the preview.

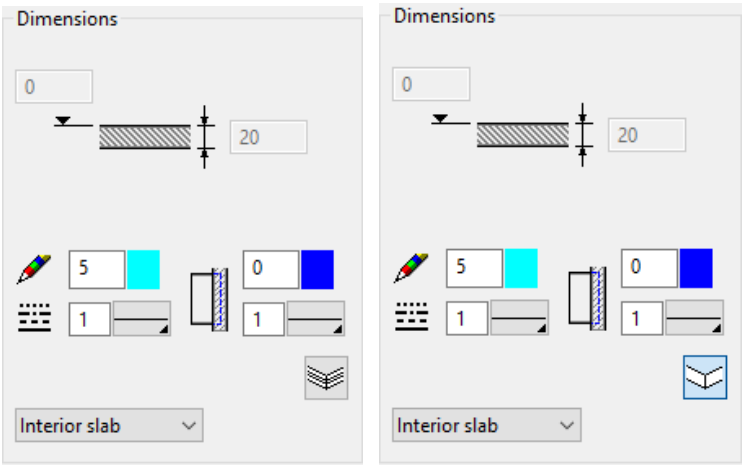


General parameters

- Status renovation planning
- Freeze
- Type
- Layer

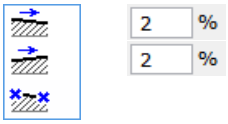
The general parameters for architectural objects are described in chapter 8.5.

Dimensions



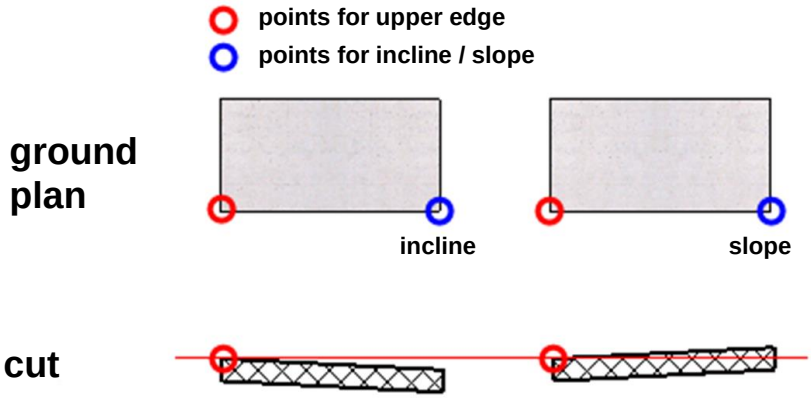
Use this field to specify general values such as gauge, height situation, incline settings, floor plan depiction and the side view depiction.

Incline settings
These settings are only visible with a **sloping slab**.
There are 3 definition types



Incline
Slope
Define by 3 points

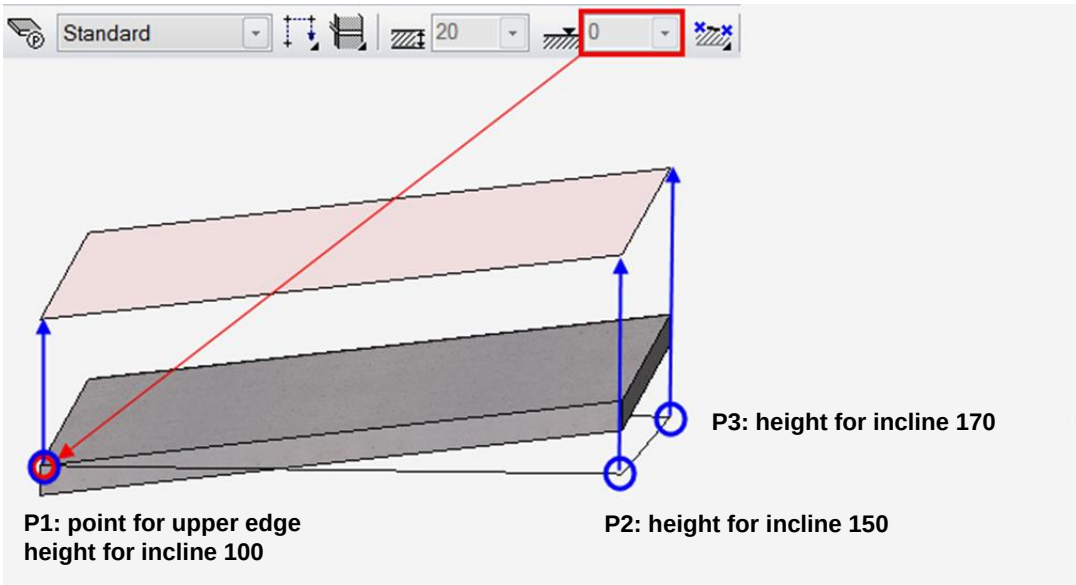
The slab is defined by 2 points for the *Incline* and *Slope* definition types.



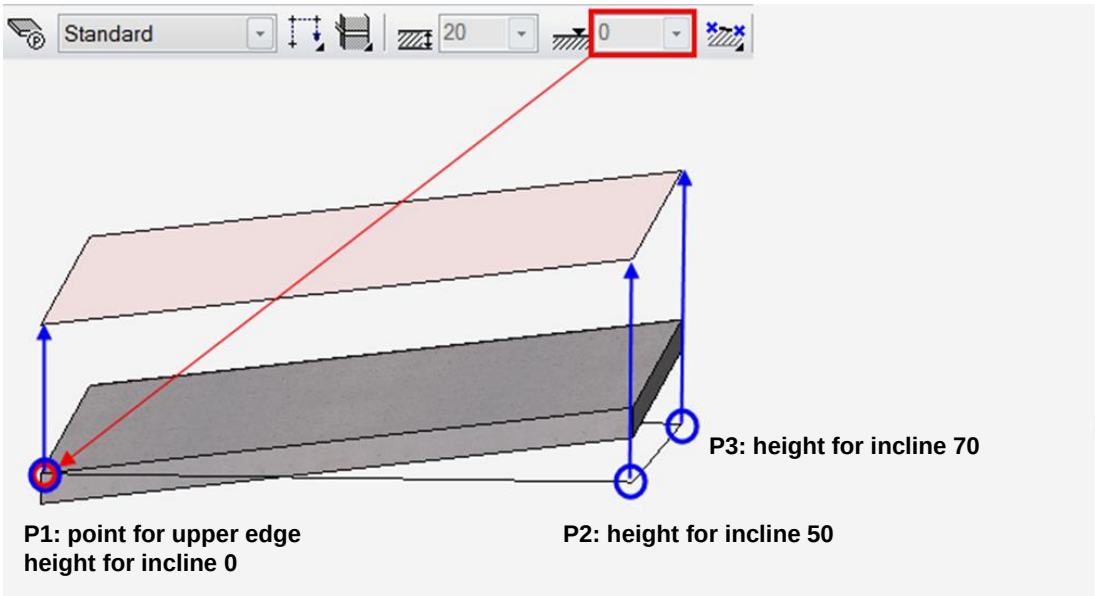
First point: Point for top side
This point is used to measure the height situation of the slab.

Second point: Point for incline/slope direction
This point specifies the direction of the incline or slope.

The *Define by 3 points* definition type determines the inclination via 3 points.
When you create the slab, the first point sets the height of the slab. You must also specify the height for the inclination to start then the other two points follow with a query for the respective inclination height. The three height points situate an imaginary surface, which moves in parallel until the surface leads to the point for the upper edge.

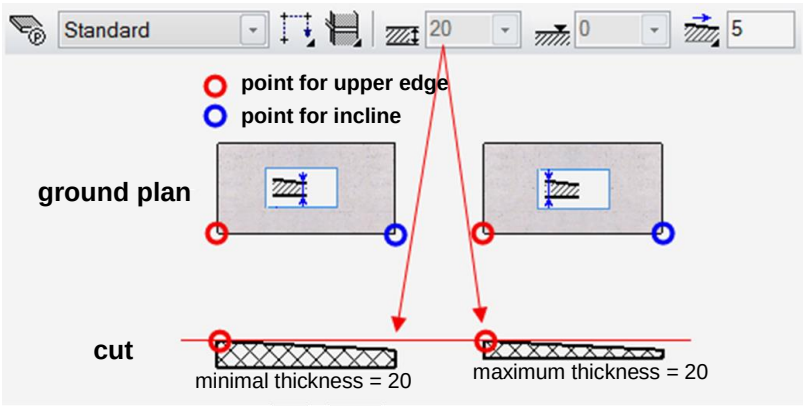


If you enter the same value for the first point's inclination height as for the height situation field, the slab passes directly through the 3 points.

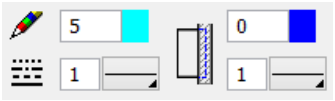


Layer gauge for tapered slab

If the slab's upper edge is not parallel to its lower edge (configurable in the individual layers), you must specify whether the layer gauge is the maximum or minimum value.

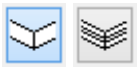


Floor plan depiction

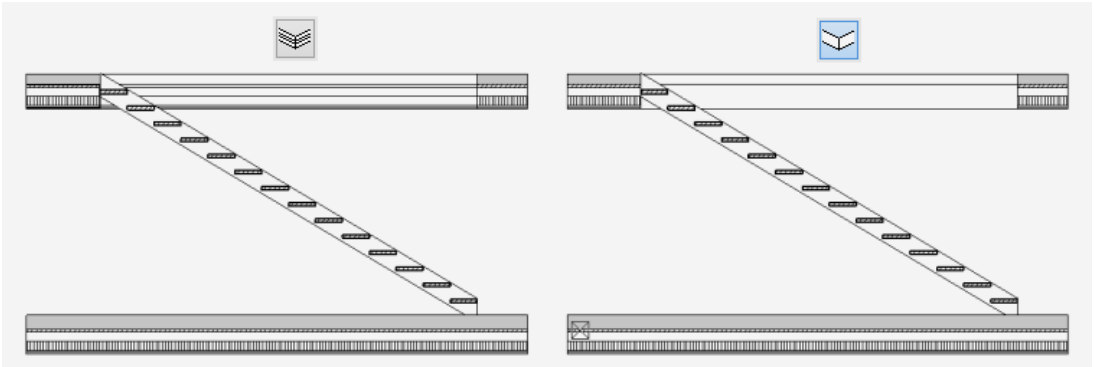


The two values are for the depiction of the slab in the floor plan. The floor plan contour always matches the main drawn contour. Individual layer changes are not displayed. The left column is for freely lying edges of the slab, while the right column is for the edges under a wall.

View enveloping body



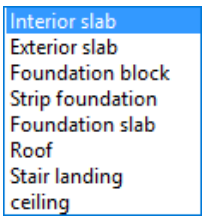
For multi-layered slabs, it may make sense only to display the enveloping body. This example shows a section through a stairwell with a view of a multi-layered slab.



Section through stair

Reported as

The SLAB function can be used for various construction parts. For the construction parts to appear in the correct reporting lists, their applications must be defined.



Entry

Entry mode

There are two entry types available for selection.

Entry directly by polygon
Entry by a predefined contour

Draw contour manually

The Input Assistant offers the drawing options of Polygon, Rectangle, Circle, Ellipse and Spline.

If you use Polygon, make sure to close it.

Define slab with predefined contour

Before starting the SLAB function, you must draw an outline using the drawing functions. The slab is generated from this outline.

Height reference
The height reference determines the relationship to the design model. The references "Free slab", "Storey floor" and "Level floor" are available as options.

Free slab

A free slab is represented as an independent slab. It does not section any walls, and floors are not accounted for.
Possible application: Representing hanging ceilings, landings, foundations (if no separate foundation storey has been defined).

Storey floor according to height section

The gauge and height situation of the storey floor is determined by the storey list. For that reason, the gauge and upper edge entry fields are "greyed out". The storey floor is always the raw slab of the active storey. All storey walls of the active storey begin at the storey floor or a level floor of the storey.

Level floor for shifted storeys

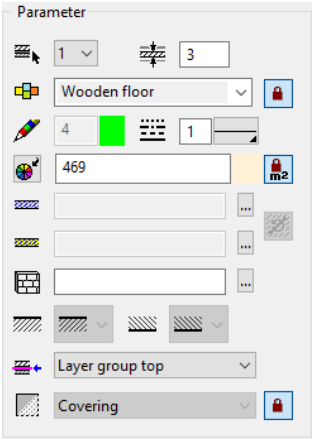
The height and gauge of the level floor can be freely defined. All storey walls of the active storey begin at the storey floor or at a level floor of the storey. If a storey floor and level floor are positioned over each other, the storey walls always begin at the higher-up floor.

Slab type

You can choose between a horizontal and a sloping slab.

Parameter

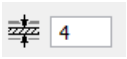
The parameter section includes the settings of the active slab layer.



Number of active layer

For multi-layered slabs, you can select the desired layer in order to configure its settings. Instead of selecting the number, you can click directly on the layer in the preview.

Gauge of active layer



Material and its linkage

Pen and hatching parameters

Colour mode/Material mode

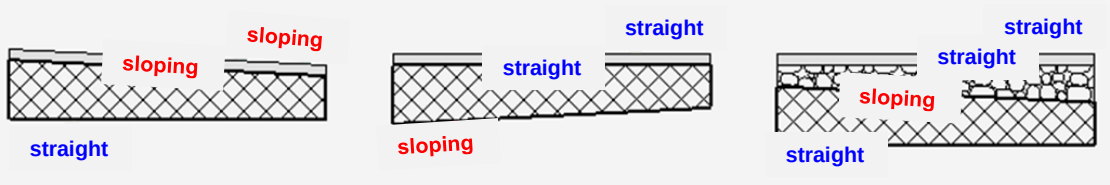
Material for room label

3D hatch

Layer slope

This option is only active for a **sloping slab**.
You can specify for each layer border whether it is on the incline.
A slab may only have one inclination, but be horizontal overall when you consider both the top and bottom surfaces.

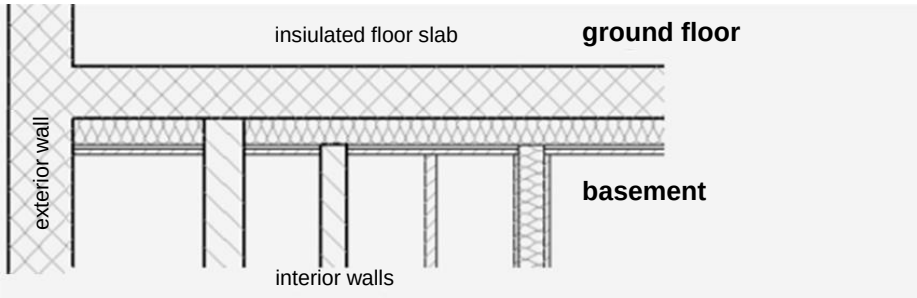
Examples:



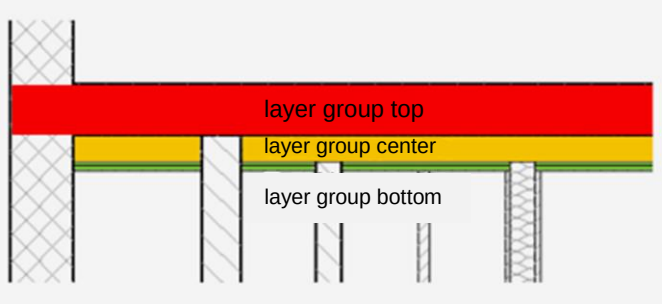
Layer group

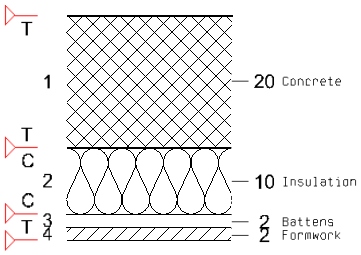
The layers are divided into layer groups. Three layer groups are available: upper, middle and lower. The layer groups govern sectioning with the wall's layers. The sectioning is performed by assigning which **wall layers** should lead to which layer groups. For the assignment of a layer group, the entire construction with the wall must be accounted for.

Example section through basement ceiling:
Situation

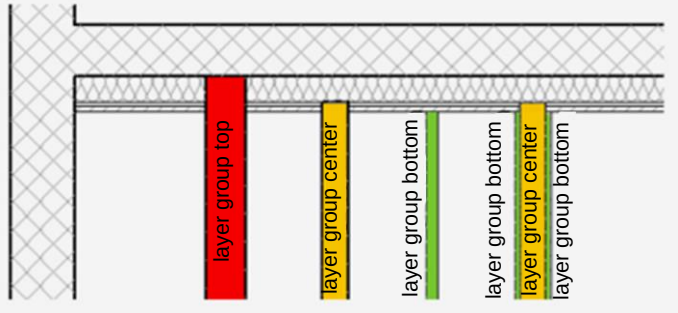


Assign each slab layer to a layer group.

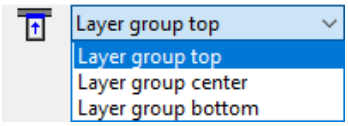




For the individual wall layers, use the **WALL LIMITATION TOP** setting to assign the layer group of the slab they should lead up to.

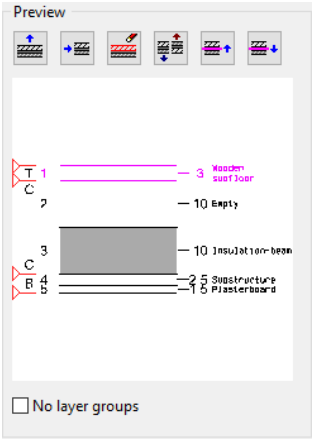


Wall layer intersection



Layer type

Preview



The current construction is displayed in the preview. Layers can be added, deleted or replaced. Each layer must be assigned to a layer group. The layer group is labelled with T, C and B (top, centre and bottom). If you click on a layer in the preview, its parameters are displayed.

Append floor layer

Insert floor layer

Delete floor layer

Swap slab layers

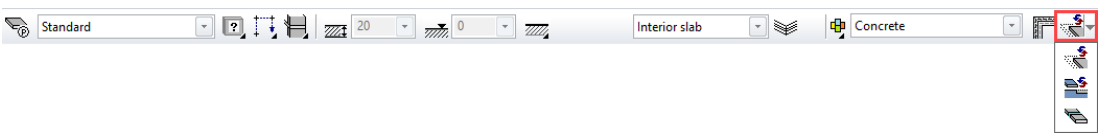
Extend layer group up/down

The layer group of the active layer is extended one layer up or down.

No layer groups

The layer groups are removed. The walls will only account for the slab's height reference or manually modified layer contours.

MODIFICATION FUNCTIONS



When a slab is being edited, modification functions are available at the end of the properties bar.

Slab offset

This function can be used to shift a storey slab into the building. If the slab is drawn justified with the outer skin, the slab can be reduced as a whole in order to gain room for insulation, for example.

TIP

You can also enlarge the slab by entering a negative value.

Modify slab contour

You modify the contour of an existing slab or add openings to it.
After the function is launched, the slab is reduced to the 2D contour.
You can use the 2D drawing functions to edit the contour. Make sure that the new contour produces a closed polygon again. To complete the function, you must click the SLAB CONTOUR READY function. This appears in the top left of the work area.

TIP

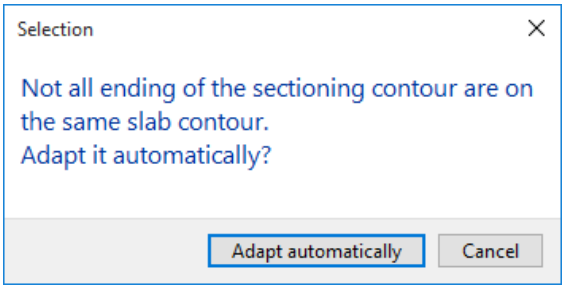
If you click a contour handle or gripper after selecting the slab, manipulation functions are available in the Input Assistant.

Split slab

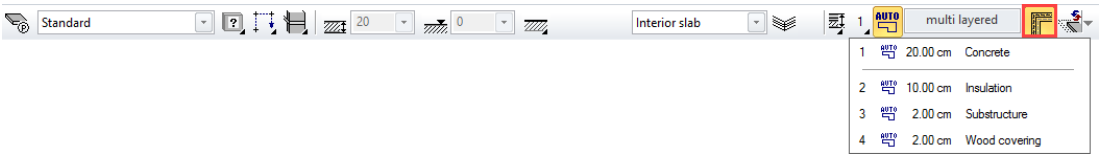
You can use this function to divide a slab into two independent parts.
The division line should start and end on the floor's outer contour. When you are finished, double-click to complete the function.

TIP

If the start or end point of the division line is not positioned exactly on the outer contour, you can automatically adjust it by confirming the shown message.

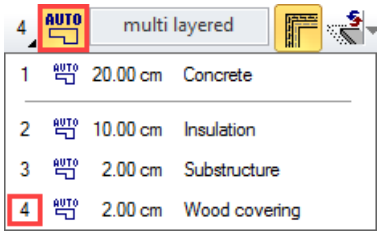


Switch between main contour / layer contour

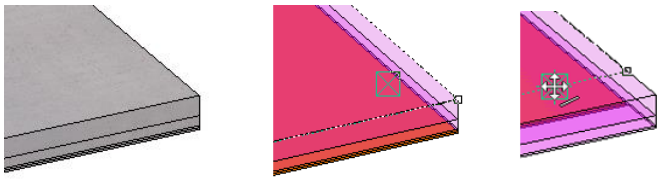


This selection box gives access to the individual layers so that you can modify them independently of the main contour's geometry. The selection box provides a list of the layers.

Change layer contour manually
The slab has a main contour. If the main contour is modified (MODIFY FLOOR CONTOUR function), all layers adjust accordingly. To modify an individual layer, the layer must be switched to manual.
Select the layer and switch the selection box from automatic to manual. The change is shown in the list.



At the same time, the layer in solid mode is highlighted in colour and the remaining layers are represented as transparent.



In this state, the handles and grippers only react to the selected layer and no longer to the main contour. You can change the contour in any way as long as it remains inside the main contour. It is also permissible to cut holes from the layer.

ADDITIONAL FLOOR FUNCTIONS

FLOOR OPENING

	Construction parts toolbar
	AR Objects menu > Floor opening

You can use this function to define floor openings and slits in 2D and 3D.

When you click the CREATE SLAB OPENING function, the settings of the most recently placed opening are active and the slab opening can be placed immediately.

Floor opening properties bar

The properties bar is visible as soon as the CREATE FLOOR OPENING function is started or if an existing opening is edited.

You can manipulate the main values in the properties bar.

Floor opening parameters

Type

Renovation planning state (see chapter 8.5)

Opening type

Shape

Shadow type

Opening width

Opening height

Close openings automatically (renovation planning)

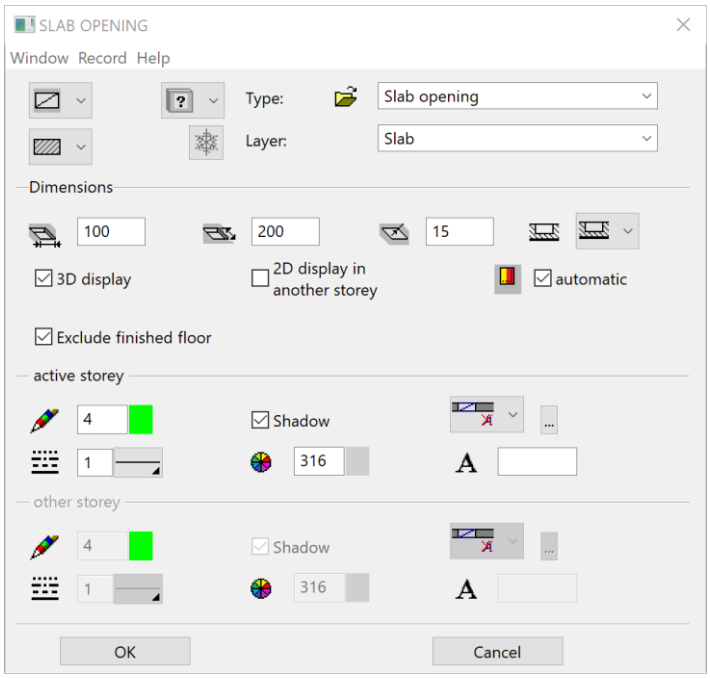
2D depiction in own storey

2D depiction in other storey on / off

2D depiction in other storey

Floor opening parameters

You can open the floor opening parameters via the properties bar or by double-clicking the floor opening to be modified.
After you enter the values and confirm with OK, you are prompted for the position of the opening. Once you enter a point, you can define the position of the opening using the flip cursor.



General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Style

Slab opening

Ceiling opening

Slab slot

Ceiling slot

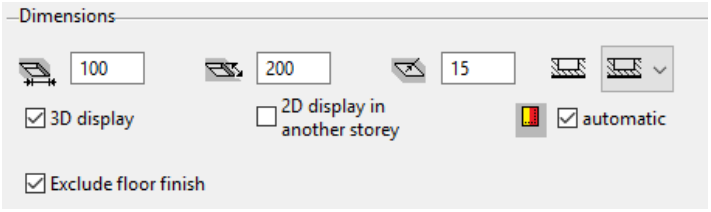
Shape

The shapes rectangular, circular and free contour are available. The rectangular and circular shapes are defined over parameters whereas for the free contour a previously created contour has to be selected.

Shadow

Shadow depiction can be turned off optionally.

Dimensions



Width / height
Dimensions of opening

Depth
For a slot, lists the depth of the opening.

3D depiction
Define here whether the opening should be visible in 3D.

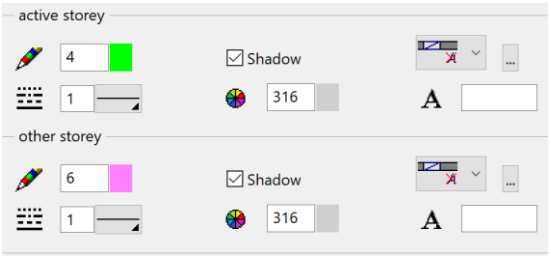
2D depiction in other storey
Define here whether the 2D depiction should be visible in the storey above or below the current one.

Automatically
If a slab opening is set to demolition state, this option can be used to generate a slab in order to fill the opening automatically.

Exclude floor finish
The slab opening will also be applied to the room.

Use only free ceilings in active storey
This option is only available for ceiling openings.

Parameters



Pen and line type

Here you can select the pen/line type for the 2D depiction.

Shadow
If you switch on "Shadow", the opening is represented with a shadow and the configured hatch colour for the shadow is used as an infill hatch. However, hatch is only used for floor openings and slots. The shadow for the ceilings is represented diagonally from the floor shadow and is not hatched.

Hatch
Here, enter the pen number for the infill hatch of the shadow.

Text symbol

Symbol is switched off

Symbol is switched on

Pre-text

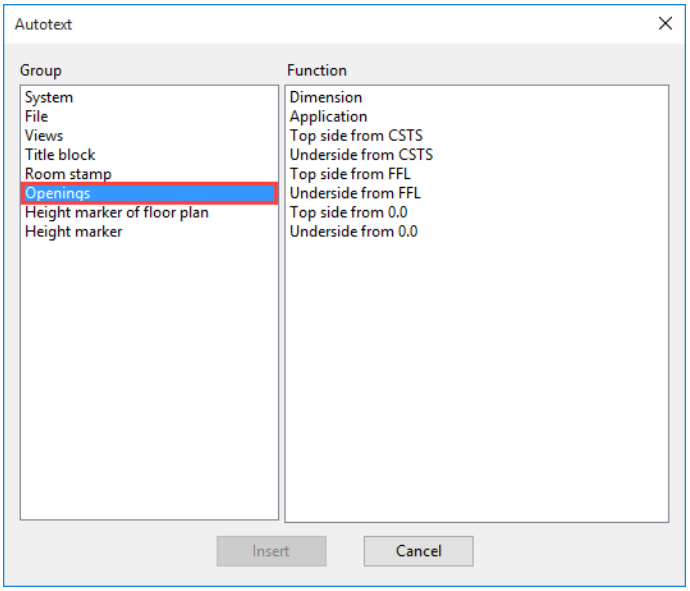
A free text can be entered here.

Selection of library part

Here, you can select a specific library part for the symbol. The standard symbols are stored under *<ELITECAD installation directory>\u\<version>\ar\glob\symbol*.

TIP

If you would like to create a symbol of your own, it is best to load a template from the path listed above (wd_text.d or wd_text_new.d). Adapt the symbol as you wish, and save it under a new name. Make sure the placing point of the symbol is in the centre of the page.
Autotext entries for the slab opening:



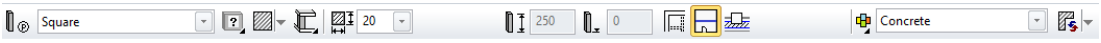
9.4 COLUMNS

CREATE COLUMNS

Construction parts toolbar
AR Objects menu > Column

Click on the CREATE COLUMN function to enable the settings for the last column drawn. The column can immediately be placed.

COLUMN PROPERTIES BAR



The properties bar is visible as soon as the CREATE COLUMN function is started or if an existing column is edited.
You can manipulate the main values in the column's properties bar.

Column parameters

Type

Renovation planning state (see chapter 8.5)

Shape of columns

Height reference

Column width

Column length

Column height

Height difference from the column's bottom edge to the current work plane

Exterior column

Room dividing

Remove column from wall

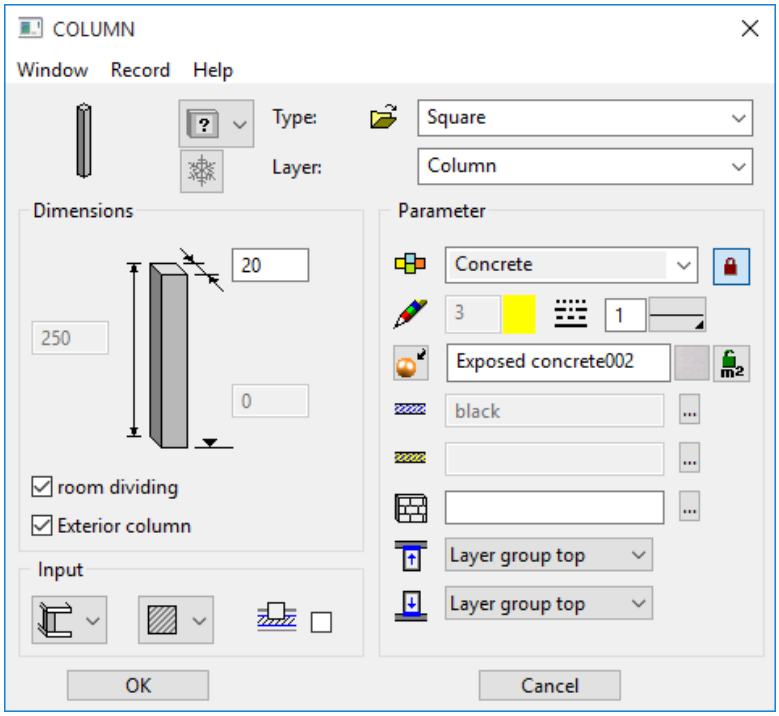
Properties of column (material)

Properties of column (depiction)

Modification functions

COLUMN PARAMETERS

You can open the column parameters via the properties bar or by double-clicking the column to be modified.

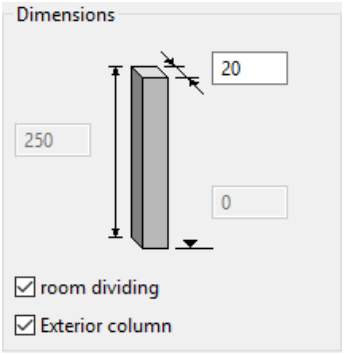


General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Dimensions



Depending on the selected height reference, you can configure the bottom edge and height values freely.

Exterior column

The report differentiates between interior and exterior columns.

Room dividing
If a column is not room dividing, it is not recognized as a boundary when calculating room areas.

Entry

Height reference
Choosing the correct height reference simplifies entry and has advantages for later modifications to the structure settings.
Columns that use a ceiling as a reference automatically adjust themselves if the ceiling is modified (height reference of ceiling: **Storey ceiling or level floor**). A free column never adjusts itself.

Column from floor to ceiling **(Standard)**

Column from underside floor to ceiling

Column to ceiling

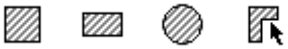
Column from floor

Column from underside floor

Free columns

Free columns do not reference floors or roofs.

Column shape



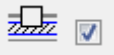
You can select pillars with a rectangular, square, round or free cross-section. For a free column, you must create a closed polygon in advance.

When you create a circular column, you can also specify an angle-dependent circular resolution in 3D.

TIP

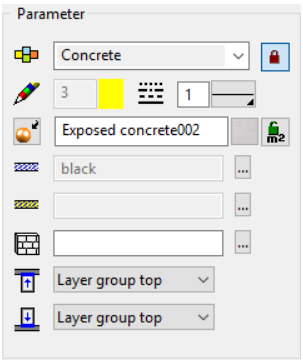
A hollow column can be generated as a free column using 2 concentric circles, for example.

Remove column from wall



If you select this option, walls in which columns are placed are automatically removed in 2D and in 3D. That way you can draw columns directly into a wall.

Parameter



[Material and its linkage]

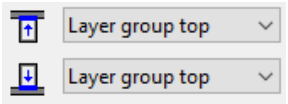
[Pen and hatching parameters]

[Colour mode/Material mode]

[Material for room label]

[3D hatch]

[Column intersection top/bottom]



Modification functions

When a column is being edited, modification functions are available at the end of the properties bar.

Modify column contour

You can modify an existing column contour.
After the function is launched, the column is reduced to the 2D contour.

You can use the 2D drawing functions to edit the contour. To complete the function, you must click the COLUMN CONTOUR READY function. This appears in the top left of the work area.

TIP

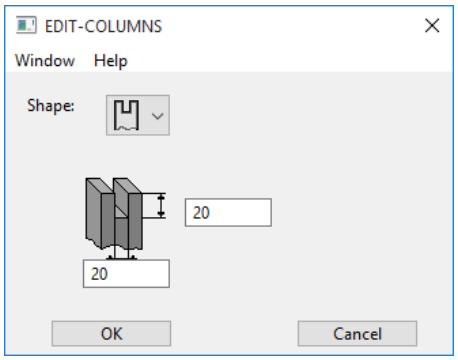
If you click a handle or gripper after selecting a column from free contour, manipulation functions are available in the Input assistant.

Edit columns

The function enables you to add pillar heads with forked columns or supports. The pen of the column is used for the groove or bracket. You also can call up the function from the MODIFY menu > WALL.

Forked column

You can only add forked heads to square or rectangular pillars.



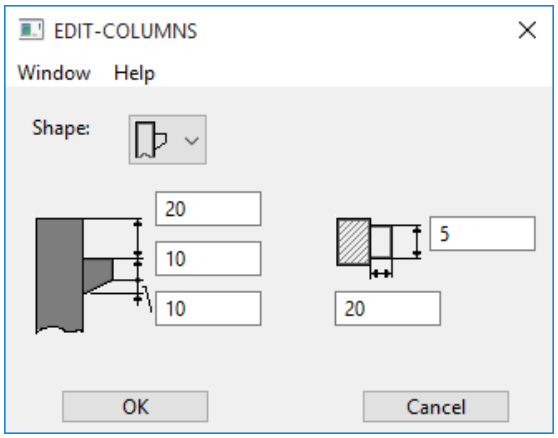
The forked column is always centred on top. When prompted "*connect to which side of column*", click the side on the floor plan that should be grooved.

TIP

To delete the groove, you can select it as a sub-object in the floor plan and delete it. The 3D depiction refreshes automatically.

Support

You can only add bearing brackets to square or rectangular pillars.



The bracket is always centred on the pillar's cross-section. When prompted "*connect to which side of column*", click the side on the floor plan that should be given the bearing bracket.

TIP

To delete the console, you can select it as a sub-object in the floor plan and delete it.

9.5 GIRDER

CREATE GIRDER

Construction parts toolbar
AR Objects menu > Girder

When you click the CREATE GIRDER function, the settings of the most recently drawn girder are active and the path of the girder can be drawn immediately.
You can use this function to generate orthogonal or free girder profiles. Girders are not room dividing, so they are not accounted for when determining room area.

GIRDER PROPERTIES BAR

The properties bar is visible as soon as the CREATE GIRDER function is started or if an existing girder is edited.
You can manipulate the main values in the girder's properties bar.

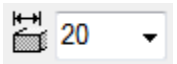
Girder parameters

Type

Renovation planning state (see chapter 8.5)

Girder shape

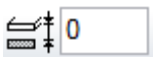
Height reference



Girder width

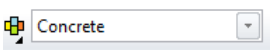
Girder height

Heights of top edge of girder to raw slab



Distance from girder's top edge

Exterior girder

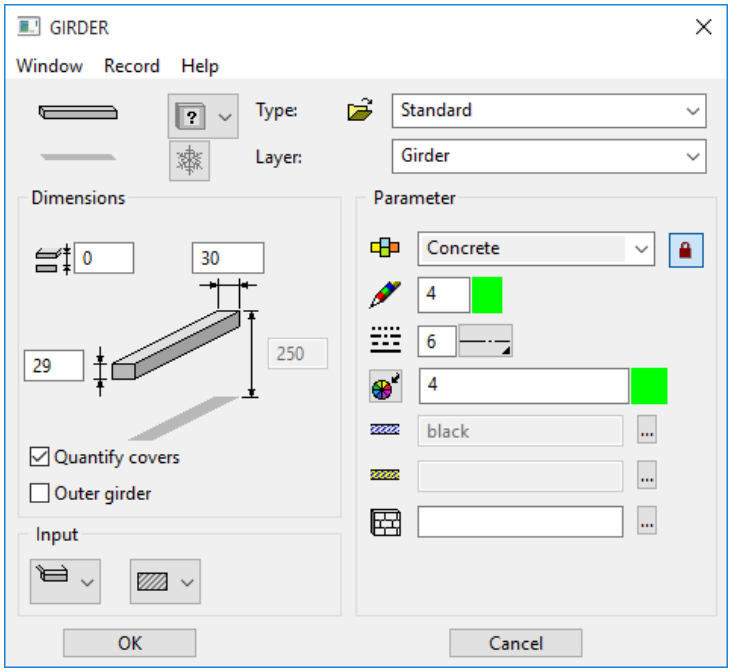


Properties of girder (material)

Properties of girder (depiction)

GIRDER PARAMETERS

You can open the girder parameters via the properties bar or by double-clicking the girder to be modified.

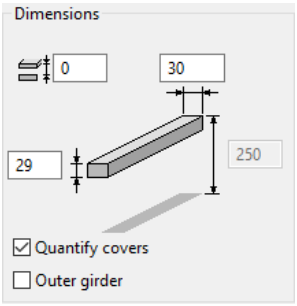


General parameters

- Status renovation planning
- Freeze
- Type
- Layer

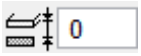
The general parameters for architectural objects are described in chapter 8.5.

Dimensions



The girder's cross-section (rectangular, free) and height section determine which of the fields are configurable or "greyed out".

Distance from girder's top edge



Only active with the "Girder to ceiling" height reference. If the girder is not attached to the ceiling, but has a fixed distance to it, you should configure that distance instead of setting the height reference to free. This reduces the effort required when modifying the structure settings.

Quantify covers

The surfaces are added with the cover of the room label for the room's ceiling covering.

Exterior girder
The report differentiates between interior and exterior girders.

Entry

Height reference - Girder to ceiling

The top edge of girder to ceiling always reaches the storey height. Level floors and roofs are not accounted for.

Height reference - Free girder

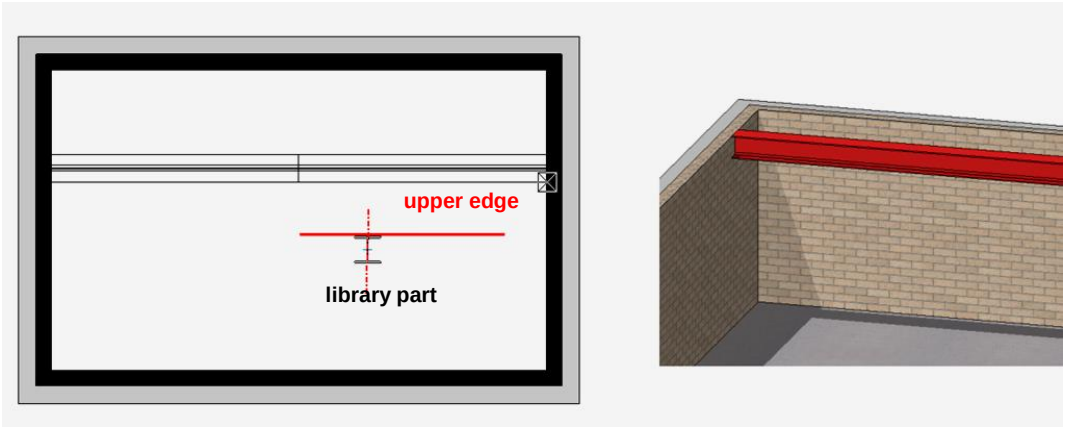
The girder's height situation can be freely configured. When modifying the structure settings, the position does not change.

Shape of the girder – Right-angled

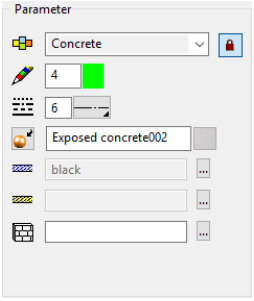
Enter the sizes via their widths and heights.

Shape of the girder – Free

Beforehand, you must draw a cross-section. The cross-section can easily be drawn normal to the viewer in the floor plan. This can also be a library part (steel girder). When you create the girder, you are prompted for a contour, then the start and end points and finally the direction.



Parameter



Material and its linkage

Pen/line type for floor plan

Pen and hatching parameters

The pen for the section depiction cannot be selected. It is copied from the material's representation level.

Colour mode/Material mode

3D hatch

9.6 Stair

Create stair

Construction parts toolbar
AR Objects menu > Stair, ME Objects menu > Stair

Click on the CREATE STAIR function to enable the settings for the last stair drawn. The stair can immediately be placed. References to storey are only valid in ELITECAD Architecture.

Stair properties bar

The properties bar is visible as soon as the CREATE STAIR function is started or if an existing stair is edited.

You can manipulate the main values in the stair's properties bar.

Stair parameters

Type

Renovation planning state (only in ELITECAD Architecture, see chapter 8.5)

Shape of stair

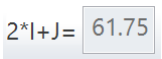
Height reference

Start height and rise

Number of steps

Step height

Step width



Slope ratio

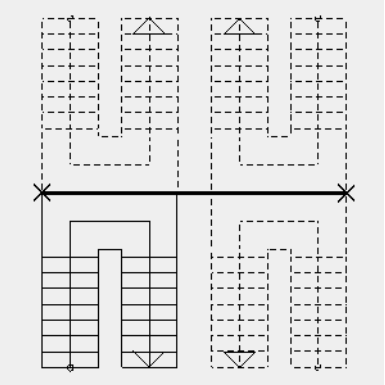
Stair width

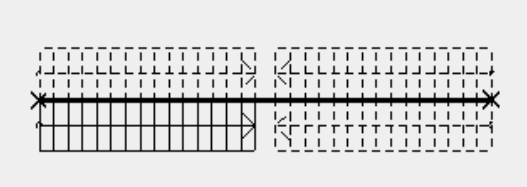
Stair length

Placing a stair

The stair is placed via two points. For a "straight stair", provide the start and end point of the stringer. For a "corner stair" or a "dog leg" staircase, provide the corner points of the second stringer.
After specifying the points digitally, you can flip to define the position of these points.

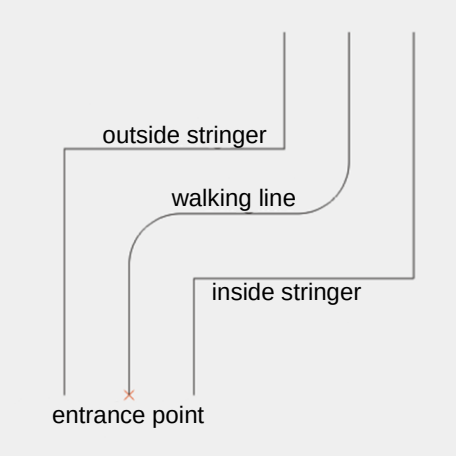
For straight stairs, you can use the left/right position of the line, or use the first or second point as the start point of the stair.
For "corner" or "dog leg staircases", the position can be mirrored over the line, or you can specify whether the corner point is in between the first or second stringer of the first or second provided point.
Confirm the desired position digitally.





You can flip to mirror over the stringer and change the start/end point or corner point. The stair is not generated until you click again to confirm the position. You can then modify it via the parameter window and <*Apply*>.

The definition of a "free form stair" requires three polygons. These polygons represent the outer borderline of the inside and outside stringers as well as the walking line. Depending on the entry mode, the inner and outer stringer can be generated as a parallel contour. Activate in ELITECAD Architecture the storey where the staircase begins. Draw the required polygons on the storey level or in the active work plane in ELITECAD Mechanics. Each line must be continuous. Elements may not be superimposed.



Entry mode
The free form stair offers different entry modes.

drawing all polygons

selecting all polygons

drawing the walking line, stringers over parallel offset

selecting the walking line, stringers over parallel offset

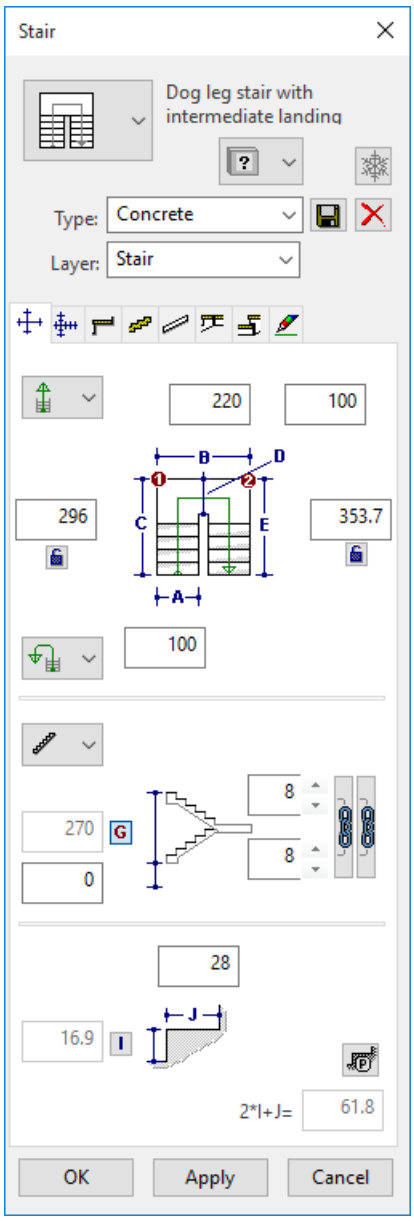
When selecting, click on the walking line with its entrance point.

TIP

If possible, draw the polygons to be longer than the expected end point of the stair, as changing the **number of steps** or **tread width** can shorten a free form stair but can never lengthen it. Once set, you cannot modify the start point.

STAIR PARAMETERS

The first time you call up the parameter window, it is populated with pre-set values. When it is called up subsequently, the most recently specified values are retained (provided the parameter window was closed by clicking OK).



Stair shapes

Straight flight

Straight flight with intermediate landing

Quarter turn stair with intermediate landing

Dog leg stair with intermediate landing

Spiral stair

Quarter turn staircase

Full dog leg winding staircase

Dog leg winding stair

Free form stair

Modular stair

In practice, you can use these stair types to generate most necessary stairs. If any other stair shapes are necessary, you can usually generate them out of a combination of the pre-set stair types or simply through the various 3D functions.

General parameters

- Status renovation planning (only in ELITECAD Architecture)
- Freeze (only in ELITECAD Architecture)
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Main registers

Stair geometry

Landing and step winding

Step lay out

Stringer

Bearing construction

Stair head

Stair foot

Plan graphics

General information about the stair parameters

The appearance of the parameter window and the types of configurable values vary depending on the stair shape.

Entrance/exit

Rotational direction

Height definition

Limitation values

The stair mask has "calculation fields". These are greyed-out values and the results of calculations based on other configured values:

For example, changing the suggested rise naturally also leads to changing the run length of the stair. Likewise, changing the number of steps results in adjusting the slope measurement.

To generate the stair in ELITECAD Architecture, select the storey on which the stair should stand from the storey list. This is also, where the plan graphics is generated. Keep in mind that the program always considers the value provided for the entrance level to be relative to the storey level. In ELITECAD Mechanics the stair is placed on the active work plane.

The entry for placing the stair is already active once the parameter window has been opened.
You cannot close the parameter window with OK until the stair has been placed.
You cannot make additional modifications from the parameter window until you have confirmed with APPLY.

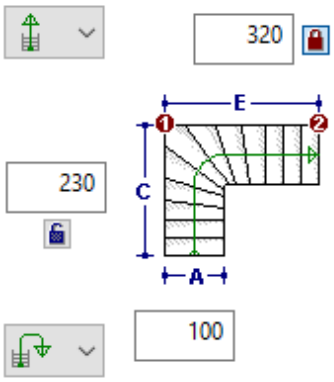
If you modify the stair (by double-clicking), the parameter window with the respective settings opens.

Stair geometry

The parameter window displays graphics and entry values for the stair geometry depending on the stair shape. Based on the shape, the geometry distinguishes between "straight" stairs, stairs "with intermediate landing" and "spiral" stairs.

Floor plan geometry
The graphics and entry fields vary depending on the stair shape,

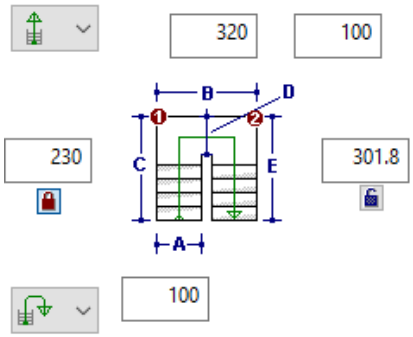
e.g. quarter turn staircase



Lock

Activating a value's "lock buttons" blocks that value from affecting the geometry calculations. If you change the tread width, the locked values for the stair length are not recalculated.
If both length values are locked and you change the tread width, the number of steps is automatically corrected.

Example: dog leg stair with intermediate landing



Lock

If one of the "lock buttons" is selected for a dog leg stair with intermediate landing, the value is only fixed if "Free offset" is set under the **Landing** options. For all other LANDING options, stair length is automatically calculated. If both stair lengths are fixed, this is automatically adjusted.
In the absence of fixed values, the system attempts to include as many steps as possible with the shortest possible stride length in a flight.
A stringer length can be shortened or lengthened by increasing or decreasing the step number of the lower section or upper section. You can also adjust the stringer length via the step offset on the landing.

Change exit and entrance

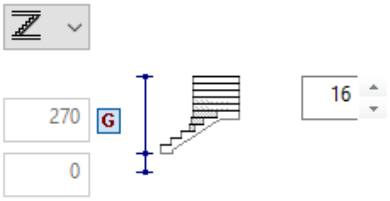
Change rotational direction of stairs

You can use these functions to change the position after the stair has been placed or when modifying it.

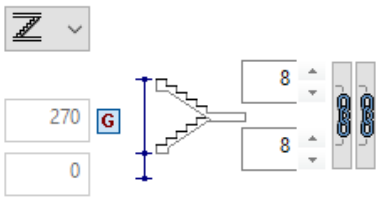
Start height and number of steps

When you open the parameter window in ELITECAD Architecture, the storey height of the current storey is adopted as the "start height". The number of steps is based on the **maximum rise of step**.

e.g. Quarter turn staircase



e.g. Dog leg stair with intermediate landing



There are three options available from the height definition.

Free height and entrance level

Free height from storey level

Storey height from storey level

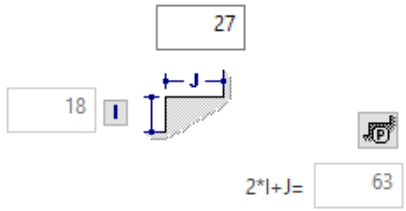
For storey height, the rise height is determined from the entries in the storey list. Likewise, the **gauges of slabs and floor compositions** are automatically adopted and thus cannot be modified directly.
In order to enter a custom entrance height, you can remove the fixing of value G, enter a new value, and re-fix it. The number of steps is automatically calculated or can be configured manually if "Optimizing" is switched off for the **limitation values**.

When the "Maintain step sum" button is pressed for stairs with an intermediate landing, changing the **stringer lengths** does not increase the number of steps, but only shifts them between the step number for the lower section and upper section.
If you remove this fixing, changing the string lengths calculates a new number of steps for the respective flight.

Retain number of steps

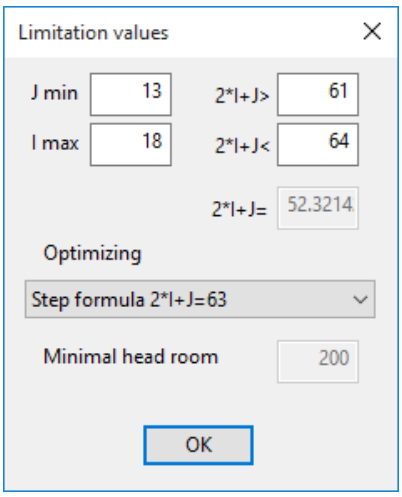
Slope ratio

The "rise of step" is given from the **rise** and the **number of steps**. The "tread width" (J) is calculated using the formula 2*I+J = 63, for which you should configure the possible lower and upper value for the "step length" under **Parameter limitation values**.
You can change the "tread width" manually within these limitation values. That automatically changes the **stringer lengths**.
If the stair's "rise" is not fixed, you can also enter the "rise of step" (I), and the rise will be calculated from the stringer lengths and the number of steps.



Parameter limitation values

On this dialog window, you can define the upper and lower limitation values for the "*stride length*", within which you can adjust the "*rise of step*" or "*tread width*". You should also configure the "*maximum rise*" and the "*minimum tread width*" for winding with spiral staircases.



J min: Minimal tread width when winding

I min: Maximum rise

2*I+J>: Bottom limit for tread depth

2*I+J<: Upper limit for tread depth

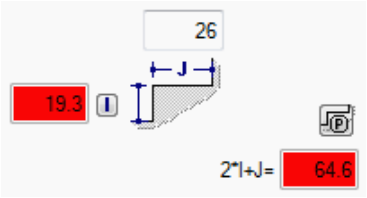
2*I+J=: Active tread depth

For "Optimizing", you can select between "No optimizing", the "Step formula", or the "Security rule".

Finally, you can define the "Minimal head room".

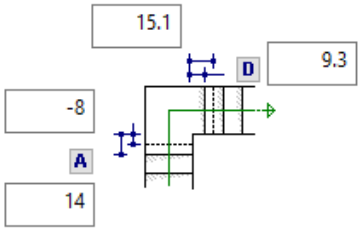
TIP

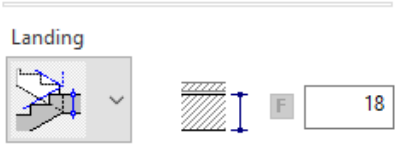
To create a stair that does not always recalculate itself if you change a value, you can set "Optimizing" to "No optimizing". Despite this, you will still recognise if the limitation values are exceeded, as the fields will be highlighted in red.



Landing design

Here, for "intermediate landings", you can specify the offset of the entrance and exit to the landing edge as well as the landing base gauge.





The landing base gauge is fixed in three cases by the assumption that the sectioning edge (bending line) is continuous for a dog leg stair and flush with the stair width for an angled stair.

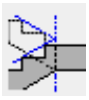
Free alignment

You can specify any alignment via the front step edges and the sectioning edges of the lower edge of the tread. The bending line is based on the landing base gauge.

Shift the lower section by one step

The front step edge for the lower flight is offset one step width from the landing. The landing base gauge is calculated (narrowest landing base gauge).

Shift the lower and upper sections by a half step



The front step edges for both flights are shifted by a half step width from the landing. The landing base gauge is calculated.

Shift the upper section by one step

The front step edge for the upper flight is offset one step width from the landing. The landing base gauge is calculated (largest landing base gauge).

Changing the "offset" also simultaneously changes the **stringer lengths** on the floor plan and vice versa.
To achieve a specific alignment (e.g. half a step), you can first use the fix alignment and then define the landing base gauge accordingly using "Free offset". The offset of the bending lines is calculated from the landing base gauge.

When entering via "Free offset", the bending line of the tread underside is not tied to the landing edge, but may also extend into the landing for the lower flight.

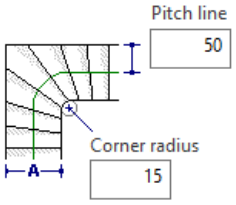
An automatic material hatch is not currently implemented for the section depiction.

TIP

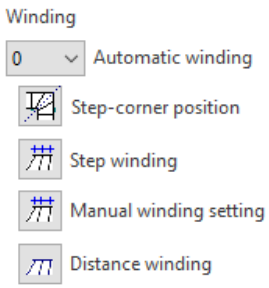
You cannot specify the shape of the landing using this function. However, you can define the shape either in the floor plan depiction or in 3D using standard 2D functions.

Step winding

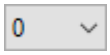
For spiral staircases, enter both the "pitch line" position as well as the "corner radius" of the inside stringer.



When the stair is generated, the winding is automatically configured based on the lowest number of steps for entrance or exit. The winding is built up symmetrically starting from the corner step (minimum "tread width").
The **smallest "tread width"** is defined via the limitation value (*J min*).



Automatic winding

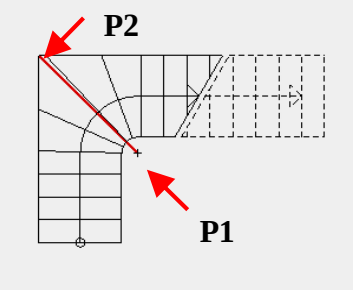


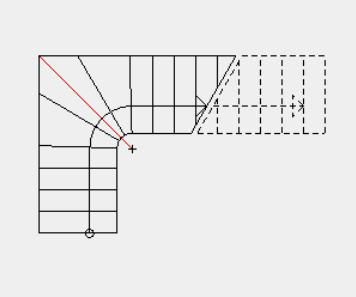
The number of steps can be changed accordingly. If you select a number of steps that is too low (below the minimum "tread width"), the system calculates the closest possible number of steps that satisfies the conditions. If you enter the value "0", all steps are realigned to be "normal to the pitch line".

Step-corner position

You can use this function to draw a reference line representing either the edge or the middle of the steps. The position of the pitch line is corrected automatically.

Specify first and second point 1 for middle of step





TIP

For a quarter-turn stair, you must complete the function after the first line with [Enter].

Step winding

Enter offset area via the first and last step. The "**tread width**" is retained on the pitch line.

Manual winding setting

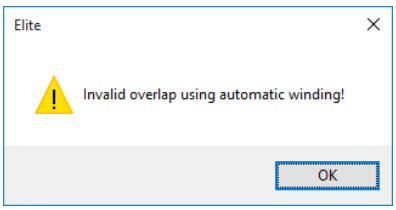
You can wind each individual step based on its position on the inside or outside stringer.
There is also an option to switch off the fixing to the pitch line. Once the function is activated, the value can be entered in the entry line. Entering "0" removes the fixing. Entering "1" keeps the rotation point for winding on the pitch line.

Distance winding

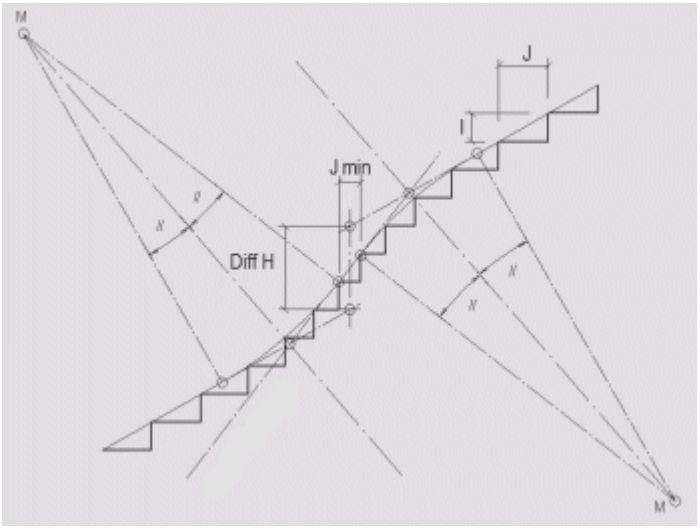
You can wind individual steps based on the distance to the previous step.
There is also an option to switch off the fixing to the pitch line. Once the function is activated, the value can be entered in the entry line. Entering "0" removes the fixing. Entering "1" keeps the rotation point for winding on the pitch line.

TIP

You can combine stair winding with any other options if automatic winding is switched off.
When the subsequent warning appears, you must first set "automatic winding" to "0".



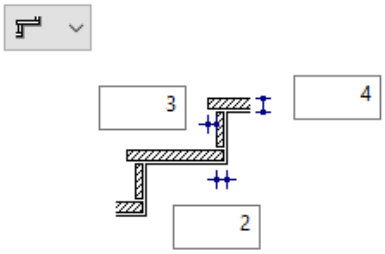
The step winding is constructed on the inside stringer following the projection method. With "automatic winding", the range of winding is adopted symmetrical to the wedge-shaped step (corner step).



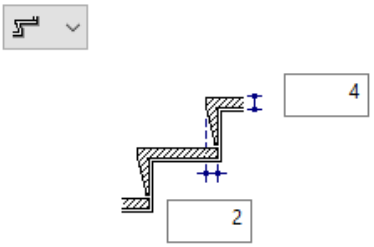
Step lay out

There are two designs available: one with a "nosing over step riser" and another with an "angled riser". These layouts are also represented in 3D. In the 2D graphics, the front step edge and the raw edge are represented. If you change the "nosing" of the tread or angled riser or the "gauge of the step riser", the position of the front step edges remains fixed and the construction is shifted towards the pitch line.

With nosing over step riser



with angled riser



The third option is for all dimensions to relate to the raw stair. This can be used for a prefabricated stair, for example.

Material and its linkage

This setting is only available in ELITECAD Architecture.
The settings for a stair's pen and hatch can be stored together under one name. This "material name" is managed within the representation levels. The material settings are specific to the representation level; in other words, they are different depending on which representation level is active. For more information in this regard, please refer to the "Representation levels" chapter.

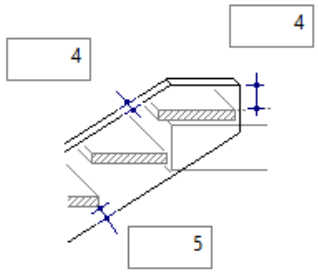
Pen and hatching parameters

If the material is linked with the parameter record, you cannot change the configured pen or the hatch name. If you undo the link (by "unlocking" the lock icon), you can configure the pen and hatch via the combo box or selection list. However, that does

not change the material's stored settings. These can only be changed within representation level management.

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 Colours and 1.7 Materials.

Stringer



Here, you can enter three values for the stringer: the bottom height, upper height and stringer gauge.

Material and its linkage

This setting is only available in ELITECAD Architecture.
The settings for a stair's pen and hatch can be stored together under one name. This "material name" is managed within the representation levels. The material settings are specific to the representation level; in other words, they are different depending on which representation level is active. For more information in this regard, please refer to the "Representation levels" chapter.

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These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 Colours and 1.7 Materials.

Bearing construction

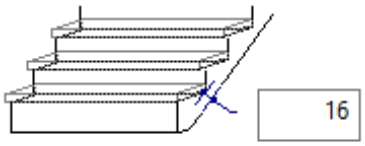
You can select one of three different designs for the bearing construction. Currently, you can only use the beam for straight flights of stairs.

Centred beam

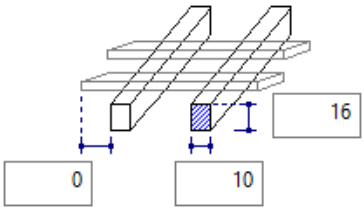
2 symmetric beam

Tread (full stair width)

e.g. tread



2 symmetric beams



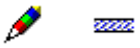
TIP

For the tread, you can also choose between a straight and an offset bottom view.

Material and its linkage

This setting is only available in ELITECAD Architecture.
The settings for a stair's pen and hatch can be stored together under one name. This "material name" is managed within the representation levels. The material settings are specific to the representation level; in other words, they are different depending on which representation level is active. For more information in this regard, please refer to the "Representation levels" chapter.

Pen and hatching parameters



If the material is linked with the parameter record, you cannot change the configured pen or the hatch name. If you undo the link (by "unlocking" the lock icon), you can configure the pen and hatch via the combo box or selection list. However, that does not change the material's stored settings. These can only be changed within representation level management.

These two buttons allow you to switch between colour mode and material mode.
For more details, see chapter 1.4 Colours and 1.7 Materials.

TIP

You can switch off the depiction of the tread. This may be useful if you want to represent a stringer stair, for instance.

Stair head

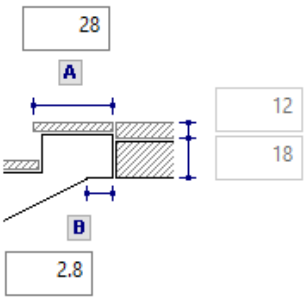
There are three options available for the design of the stair head.

Vertical termination

Horizontal termination

With protruding nosing

Example with vertical termination



The "A" and "B" values lock each other. In other words, if the "B" value is fixed, its value is preserved when changing the **tread gauge** and the "A" value is adjusted accordingly.

If the **height indication** was set at storey height in ELITECAD Architecture, the gross ceiling and slab gauges are set by Storey management and cannot be changed.

Stair foot

You can select among five options for the design of the *stair foot*.

Horizontal support (for slab or foundation)

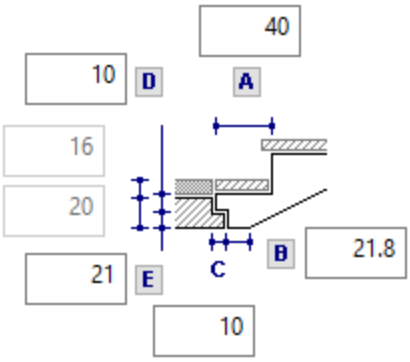
Partly vertical connection

Fully vertical connection

Vertical connection to lower tread

With protruding nosing

Example with protruding nosing

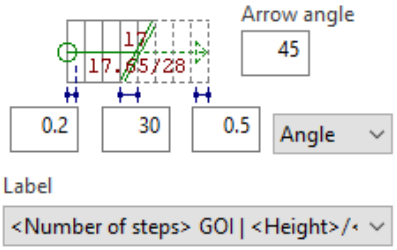


The values on the parameter window refer to the design of the connection to the tread. The *A* and *B* values lock each other. In other words, if the *B* value is fixed (*B* button), its value is preserved when changing the **tread gauge** and the *A* value is adjusted accordingly.
Similarly, you can use *D* and *E* to determine the height of the bracket, and can also fix it when modifying the gross ceiling gauge or the floor composition.
The support width is defined by the *C* value.

If the **height indication** was set at storey height in ELITECAD Architecture, the gross ceiling and slab gauges are set by Storey management and cannot be changed.

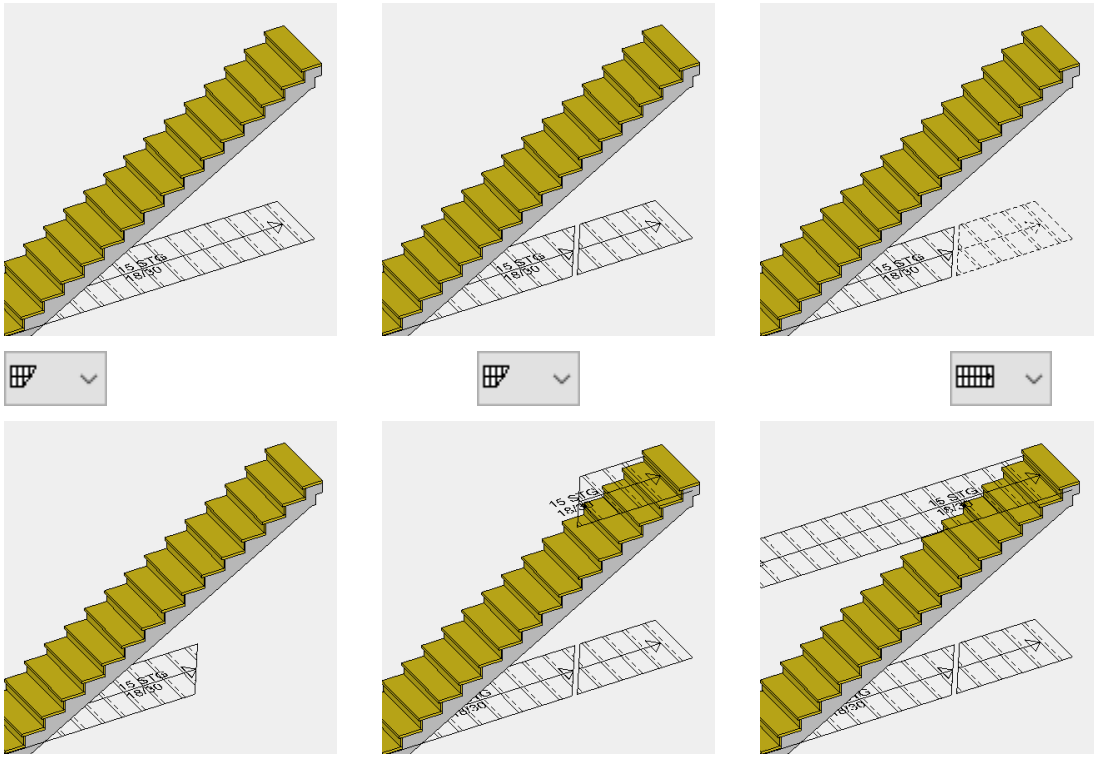
Plan graphics

The floor plan depiction contains both the stair flights as well as the landing contour.

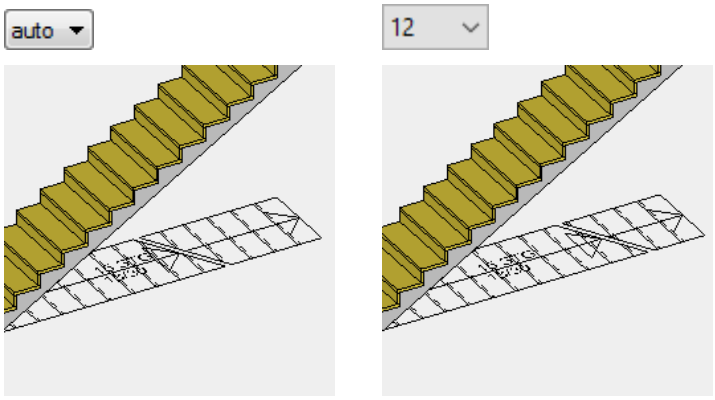


The factors for circle radius and arrow length are based on the "tread width". For the section line, you can select either factor or angle.
The type of text can be selected from the "selection box" where all records saved under the text parameters are listed.

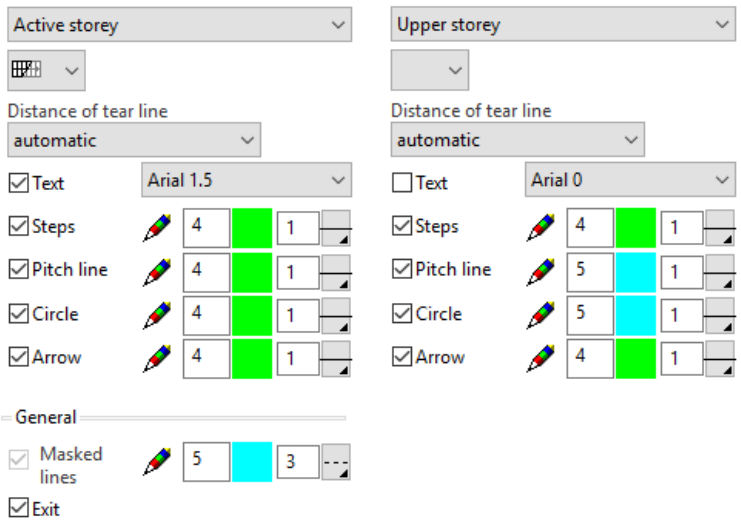
In ELITECAD Architecture, there are four different types of depiction on the lower storey and two types for the upper story. In ELITECAD Mechanics, there is no options available.



You can determine the position of the section line automatically or manually.



You can also separately configure or switch off the pen/line type for steps, the section and pitch line, the circle at the entrance and the arrow at the exit. Later you can specify whether the exit should be represented in 2D.



EDIT STAIRS

Stairs can be edited and modified at any time by double-clicking them. All detail settings can be modified at a later point. It is also possible to modify the stair type, except with a free form or modular stair.

In ELITECAD Architecture, you can use COPY INTO ACTIVE STOREY to adopt stairs into a storey, automatically adapting the "rise".

9.7 Roof

Create roof

Construction parts toolbar
AR Objects menu > Roof

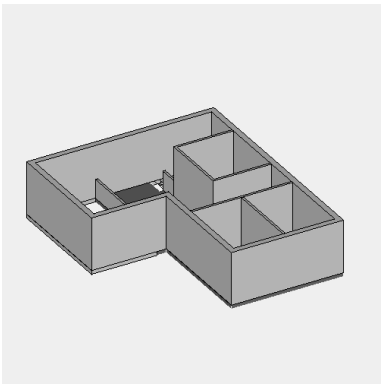
When you click the CREATE ROOF function, the settings of the most recently drawn roof are active and the path of the roof can be drawn immediately. Depending on the selected setting for the ENTRY MODE option, the first contour query appears in the entry line, e.g. *Start point*.

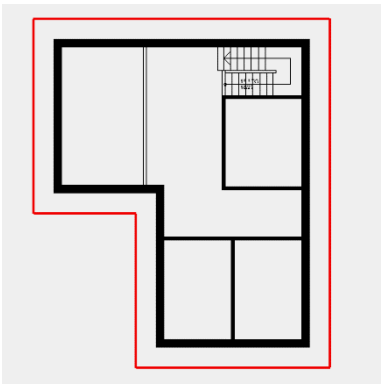
The roof is created on the storey in which the walls are sectioned with the roof. A roof can also be defined over multiple storeys.

WORKSHOP

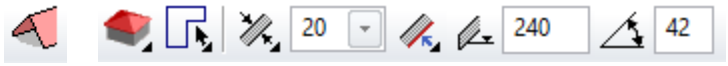
Draw roof

In the storey list, select the top floor of your project and draw the outline of the eaves or gables.

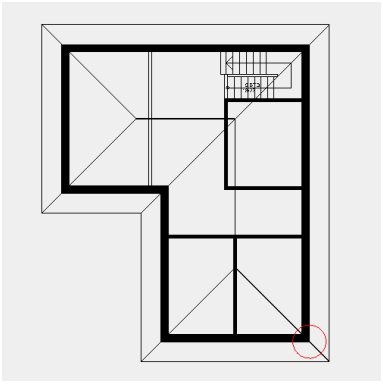


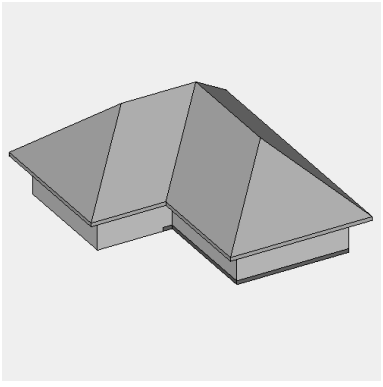


Now click the CREATE ROOF function and define the values as shown below.



Once you are satisfied with the settings, click on the previously drawn polygon. As the height marker, you can select a building corner, for instance.





ROOF PROPERTIES BAR

The properties bar is visible as soon as the CREATE ROOF function is started or if an existing roof is edited.
You can manipulate the main values in the roof's properties bar.

[Roof parameters]

[Type]

Renovation planning state (see chapter 8.5)

[Roof shape]

[Entry mode]

[Roof gauge]

[Gauge direction]

[Roof height]

[Roof pitch]

[View as envelope]

[Roof section on/off]

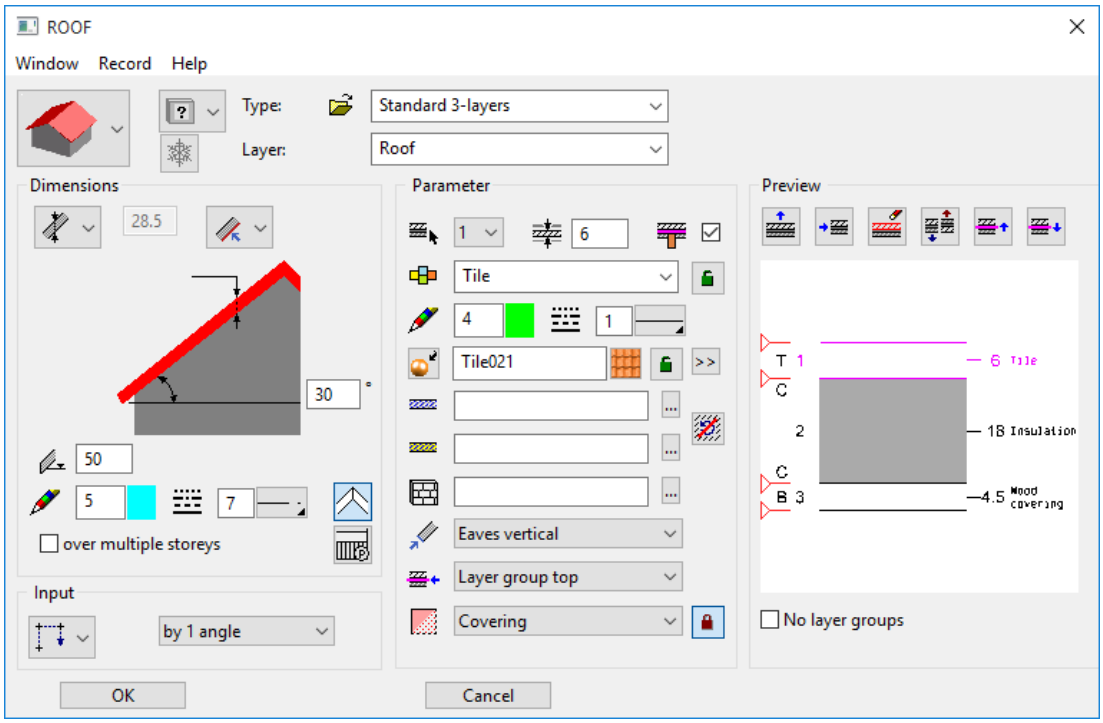
[Display extended roof functions]

Properties of roof (depiction)

[Modification functions]

ROOF PARAMETERS

You can open the roof parameters via the properties bar or by double-clicking the roof to be modified. The parameter window has three columns. First, the dimensions including the sizes and entry, then the parameters of each layer and finally the preview.

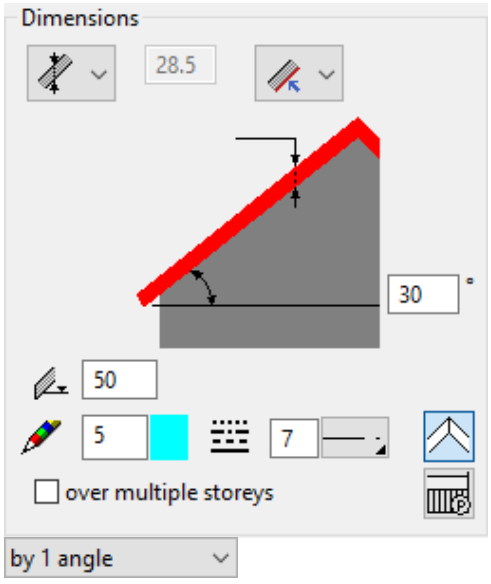


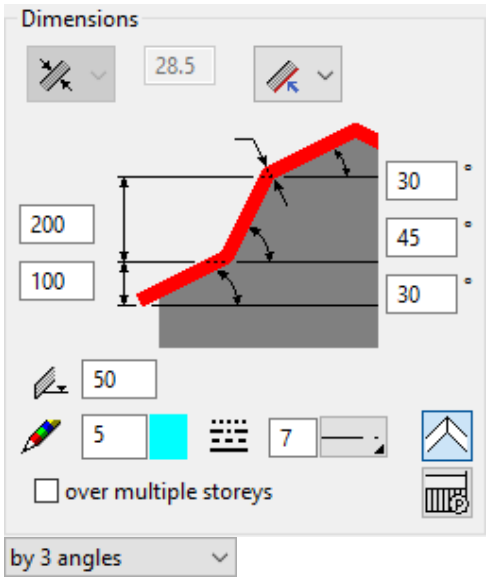
General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Dimensions

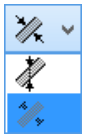




Gauge

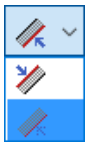
The roof gauge is the sum of all individual layers.

Gauge indication



You can enter the gauge indication as either *normal* or *vertical* to the roof plane.

Gauge direction



Starting from the height marker, the roof is generated upward or downward.

Height

When you place the roof, you are asked for the point at which the height is to be measured.
The height is measured from the raw slab of the active storey.

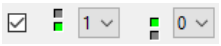
Angle

Pen/line type of floor plan depiction
The floor plan depiction corresponds to the main contour of the roof. Manually modified layers are not represented.

View enveloping body

If you do not want to have a line at the location and eaves of each layer, you can activate the VIEW ENVELOPING BODY option.

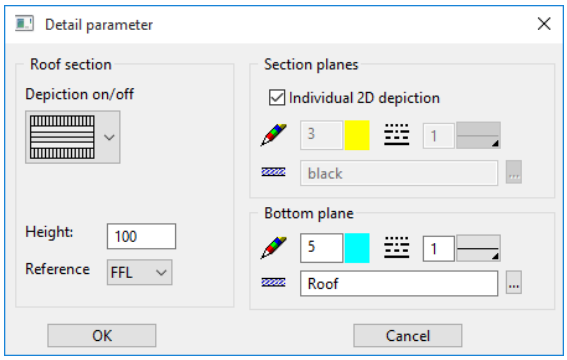
Roof over multiple storeys



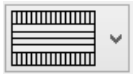
Walls are only intersected with the roof if they are located on the same storey as the roof. If the roof is to be sectioned with walls from other storeys, you must select this option. The first value specifies the number of storeys above and the second value specifies the number of storeys below. The roof section is only displayed on the storey in which the roof is created.

Detail parameters roof section in floor plan

The roof section is the sectioned depiction of the roof on the floor when the jamb wall has a low height.



Depiction on/off

On:  Off:

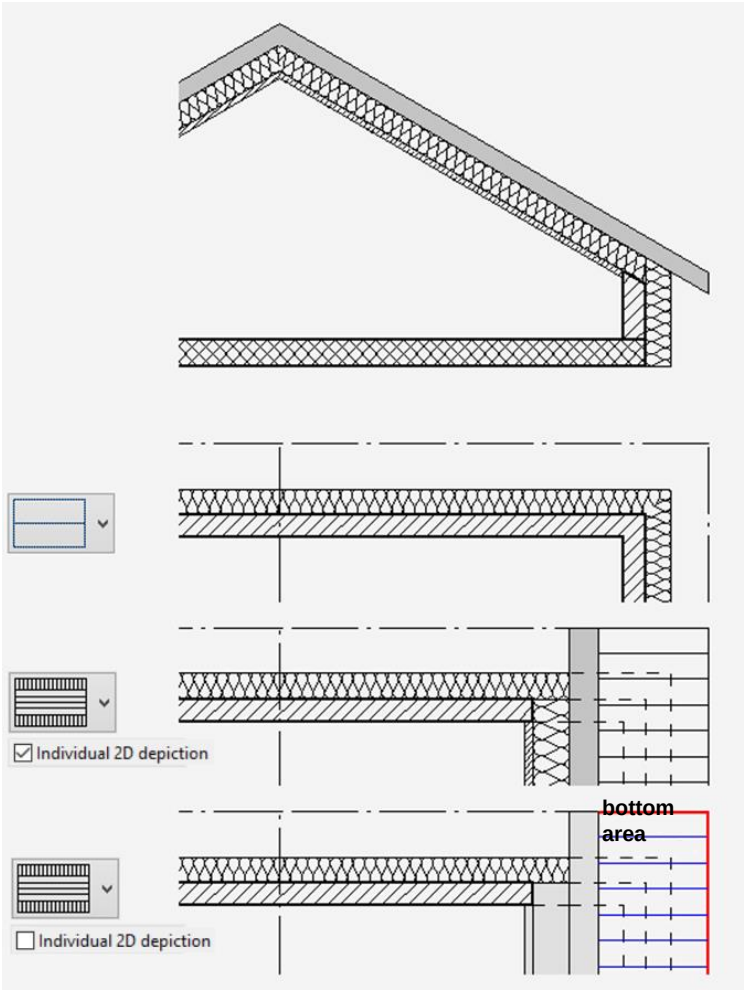
Height / Reference

The position of the roof section is controlled by the section height. The height is measured from the raw slab or from the finished floor.

Individual 2D depiction

If the option is active, the roof section is represented similarly to the section. The settings are adopted form the individual layers.

For the general depiction, all layers are generated with the executed pen/line type and hatch.



Bottom area
You can determine a hatch and a pen/line type for the top view of the roof plane underneath the roof section (see graphic above).

The appearance of the parameter window and the types of queries are highly dependent on the selected construction part and are therefore described below in the discussion of each **roof types**.

Entry

Entry mode
There are two entry types available for selection.
Entry directly by polygon
Entry by a predefined contour

Draw roof contour manually

The Input Assistant offers the drawing options of Polygon, Rectangle, Circle, Ellipse and Spline.

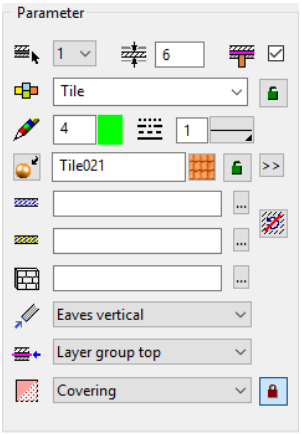
If you use polygon, make sure to close it.

Create roof from existing contour

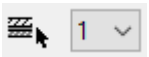
Before starting the ROOF function, you must draw an outline using the drawing functions. The ceiling is generated out of this outline.

Parameter

The parameter section includes the settings of the active roof layer.



Number of active layer



For multi-layered roofs, you can select the desired layer in order to configure its settings. Instead of selecting the number, you can click directly on the layer in the preview.

Gauge of active layer

Layer reference to rafter structure

This option defines the layer under which the rafters are to be generated. This option can only be active for one layer.

Material and its linkage

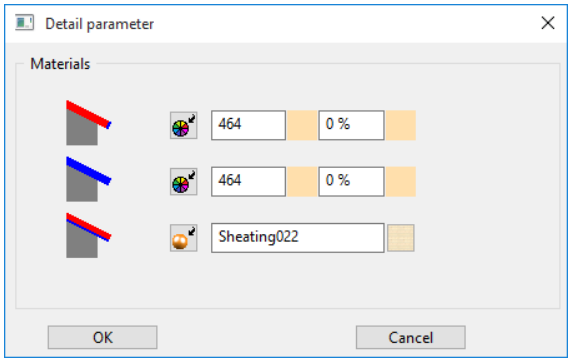
Pen and hatching parameters

Colour mode/Material mode

Individual 3D depiction

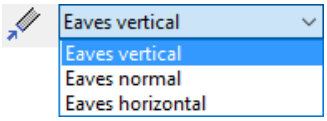
When it is locked, only one colour or one material is used for the layer.

When it is unlocked, another option appears with extended settings for eaves, location and roof lower layer.



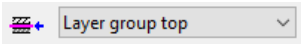
3D hatch

Roof completion



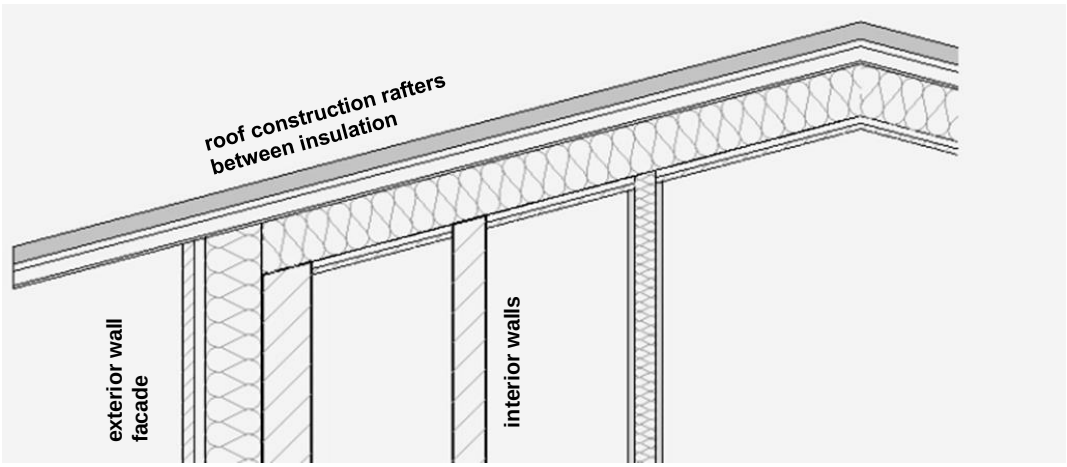
The eaves ending can be generated as either "vertical" (up and down), "normal" (perpendicular to the roof plane) or "horizontal". For the pent or shed roof, the completion can be selected for both sides.

Layer group

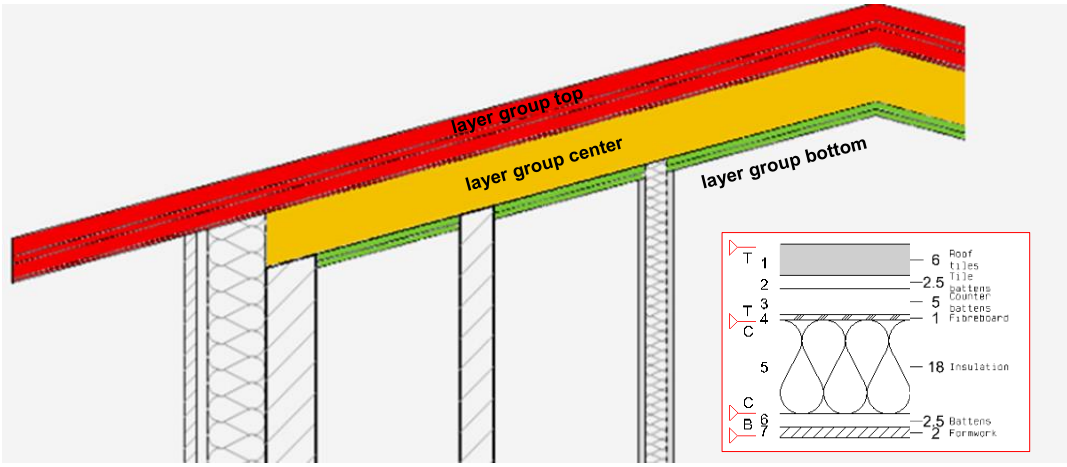


The layers are divided into layer groups. Three layer groups are available: top, centre and bottom. The layer groups govern sectioning with the wall's layers. The sectioning is performed by assigning which **wall layers** should lead to which layer groups. For the assignment of a layer group, the entire construction with the wall must be accounted for.

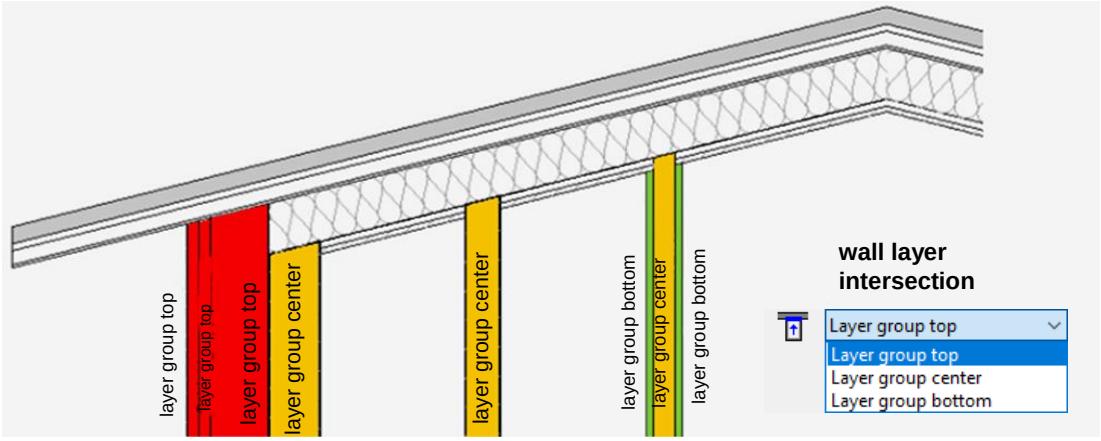
Example: Section by top floor:
Situation



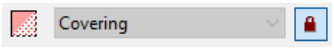
Assign each roof layer to a layer group.



For the individual wall layers, use the **LIMITATION TOP** setting to assign the layer group of the roof up to which they should lead.

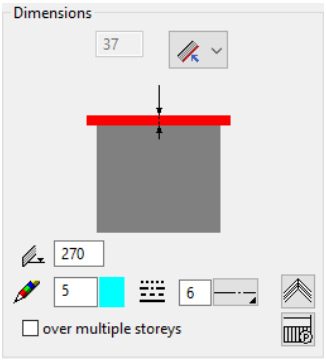


Layer type



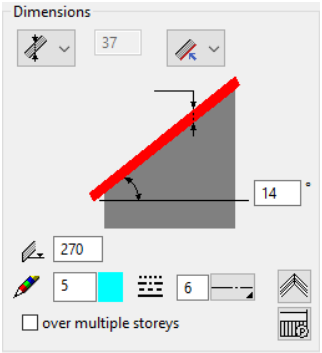
Roof Shape

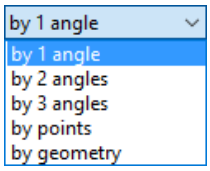
Flat roof



Horizontal roof. You can add skylight domes to a flat roof.

Pent or shed roof



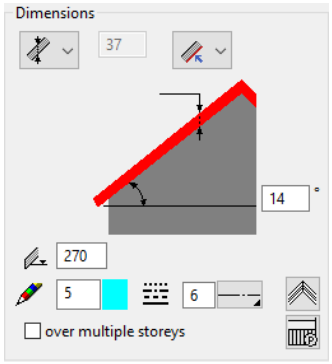


By angle
You must enter the roof height for two points. The two points are usually the eaves or are on the jamb wall.

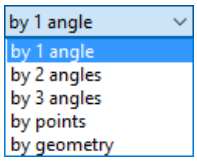
By points
The roof is defined by 3 points. For example, 2 points on the eaves and one point on the ridge. You can also select points in 3D directly. The program suggests the appropriate height in the entry line.

By geometry
This definition adopts a single pre-defined line as the reference line for the roof pitch. It is recommended to draw this line on a work plane that is normal to the storey plane, e.g. via the WORK PLANE ON SURFACE function and then select the gable wall. The line, the length of which is irrelevant, serves as the reference edge for the entire pent or shed roof.

Gabled roof



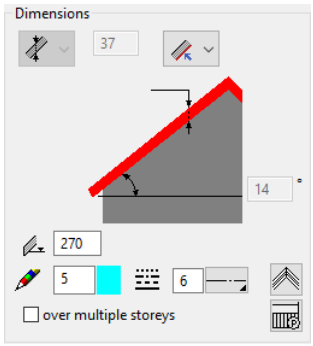
The ridge of a gabled roof is always horizontal, that is, parallel to the storey plane. The eaves are adjusted based on the geometry of the roof edge. If they are not parallel to the ridge, there will be incline drain pipes.



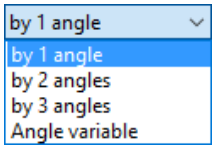
By angle
First, you must define the ridge via two points, then the point for the roof height. This point may lie on the eaves, on the knee wall, on the ridge, or anywhere on the roof.

By geometry
Selecting "By geometry" generates a gabled roof using two lines that describe the trajectory lines of both roof planes as with the pent or shed roof. This way you can generate a gabled roof with various roof plane inclinations.
The lines must lie on the same work plane (e.g. on the gable wall). The ridge is normal to the trajectory lines and passes through the section point of the two definition lines.

Hip roof



The roof edges of a hip roof are surrounded by eaves and it has no gable (except when defined by an angle variable). The eaves for this roof shape are always horizontal, that is, parallel to the storey plane. In contrast, the ridge or ridges are always the sectioning lines of the individual roof planes. The number of roof planes generated corresponds with the number of lines in the roof edge polygon. Arcs are permitted, but are cut up into straight segments.



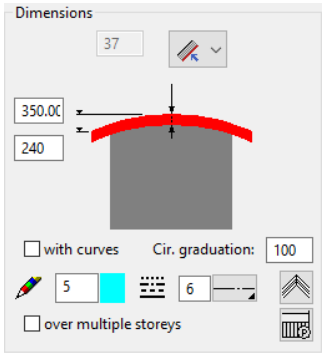
By angle
The functions generate a hip roof whose individual roof planes have the same angle.

By angle variable
The setting prompts you interactively for the inclination of each roof plane, which you must enter and confirm with [Enter]. The flag jumps to the respective eaves whose angle you need to enter next. You can only enter the roof gauge vertically.

TIP

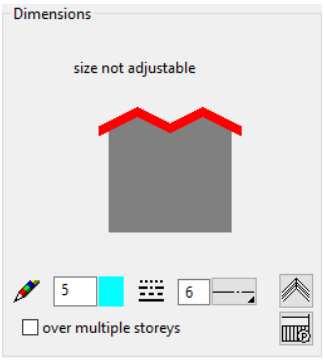
If you enter "90" for an inclination, a gable wall is created in that position instead of a roof plane.

Barrel roof



A barrel roof is defined using the floor plan polygon, the eaves height and the peak (ridge) height. You also need to enter the direction of the trajectory line (reference edge) via two points. The peak of the barrel is always horizontal and normal to the midpoint of the trajectory line. You can only configure roof openings to have a vertical reveal. Roof windows cannot be placed.

Free roof

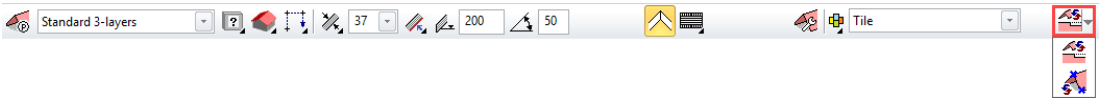


Before running the function for the FREE ROOF, in addition to drawing the floor plan polygon, you must also draw a cross-section of the roof structure. This should be a closed polygon and represents a view/section of the roof panel. For the cross-section, the **work plane** must be perpendicular to the storey plane. This room form is only possible if single-layered. You can only configure roof openings to have a vertical reveal. Roof windows cannot be placed.

TIP

You can only create a skewed roof with the free-form functions.

MODIFICATION FUNCTIONS



When a roof is being edited, modification functions are available at the end of the properties bar.

Modify roof contour

You can modify the contour of an existing roof or add openings to it.
After the function is launched, the roof is reduced to the 2D contour.
You can use the 2D drawing functions to edit the contour. Make sure that the new contour produces a closed polygon again (for each roof plane). To complete the function, you must click the ROOF CONTOUR READY function. This appears in the top left of the work area.

TIP

If you click a handle or gripper after selecting the slab, manipulation functions are available in the Input Assistant.

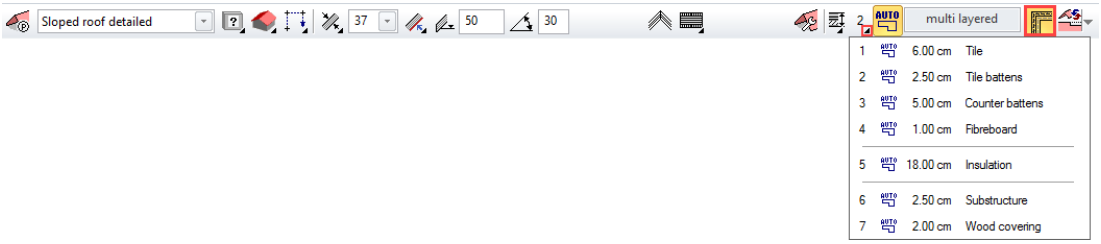
Modify definition point

Press this function to redefine the position of the existing definition points. You will be prompted to re-enter all the points that were necessary for configuration.

TIP

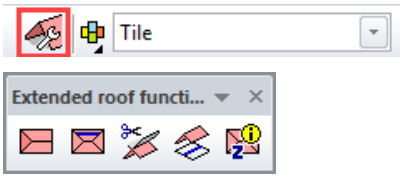
To leave a point unchanged, you can skip it by entering "0" and pressing [Enter].

Switch between main contour / layer contour



This selection box gives access to the individual layers so that you can modify them independently of the main contour's geometry. The selection box provides a list of the layers. You can select any layer and change it manually.
This works just as for a **slab**.

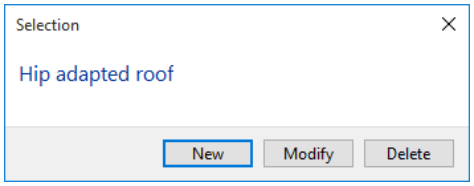
EXTENDED ROOF FUNCTIONS



You can call up the extended roof functions in the roof's properties bar. The functions have their own toolbar. They can be deleted again at any time. You also can call up the functions from the MODIFY menu > ROOF.

Create special hip for roof

You can create a hip-adapted roof at the gable of a roof. This gable can be defined using a gabled roof or a hip roof with variable incline (plane with 90°).



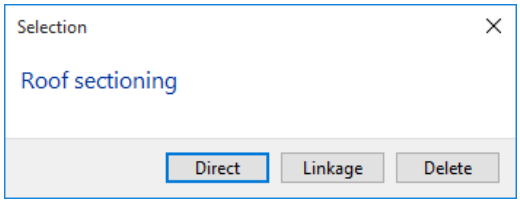
Under "New", you are prompted for the "Position of hip" (the ridge point of the gable) and the "Roof pitch". Next, you must specify the height of the edge of the eaves for the hip-adapted roof. The program calculates the existing ridge height and suggests it. Using "Modify", you can select an existing hip-adapted roof to edit it. Using "Delete", you can click a hip-adapted roof to delete it.

Height section line

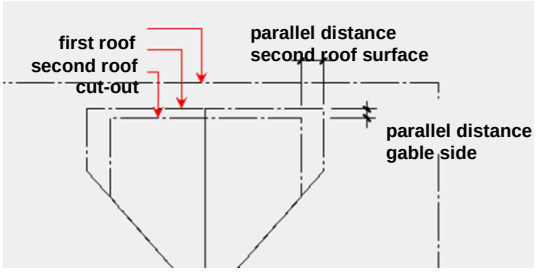
The height section line is described in detail in the next chapter.

Trimming roof planes

This function is used for trimming roof planes.
There are 3 options available for selection.
Direct: The roof is trimmed; modifications are not adapted.
Linkage: Modified angles and heights for both roofs are refreshed.
Delete: An intersection can be deleted.

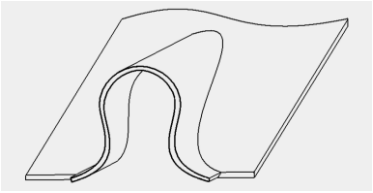


Generally, the higher part of a roof plane always trims the lower part. For the sectioning, always select the roof plane that should receive the cut-out first. For the second roof plane, you can enter parallel distances that reduce the cut-out on the main roof.



EXPLANATION

Overhanging roof shapes are not suitable for trimming.



Section lines of roof planes

You can use this function to generate the sectioning line of the lower roof edge of two roof planes. This function aids in creating the alignment of various suitable roof planes. These can be corrected for these lines with the **Modify roof contour** modification function.
The section line is generated with current pen/line type and its 3D view is also visible.

Height in point

Measures the roof's upper and lower edges at a given point in the roof range in relation to the storey plane (raw slab). The values are shown in the info window.

CREATE HEIGHT SECTION LINE

The HEIGHT SECTION LINE function generates a 2D line, which represents the intersection of a roof with a horizontal plane at a given height.

Height section line properties bar

The properties bar is visible as soon as the HEIGHT SECTION LINE function is started or if an existing height section line is edited.
You can manipulate the main values in the height section line's properties bar.

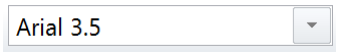
There is no parameter dialog window

Type

Renovation planning state (see chapter 8.5)

Save / delete record

Label on / off



Label font

M, cm/mm dimensioning

Properties of height section line (depiction)

Roof side

Height

Height reference

Label height reference

Single roof plane / whole roof

Automatically / manually

General parameters

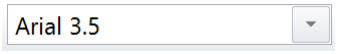
- Status renovation planning
- Type
- Save / delete record

The general parameters for architectural objects are described in chapter 8.5.

Label

Labelling can be activated and deactivated.

Font



Here the font for the label can be selected.

M, cm/mm dimensioning

Toggles the type of dimensioning.

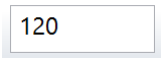
Properties for 2D depiction

2D depiction of the height line.

Roof side

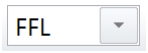
Indicates the roof side, which will be used for intersection.

Height



This value determines the height for intersection.

Height reference



The height reference is either FFL or SFL.

Single roof plane / whole roof

The height section line is either generated for a single roof plane or for the whole roof at once.

Automatically / manually

If automatically is active a number of fields are deactivated and the setting are automatically chosen.

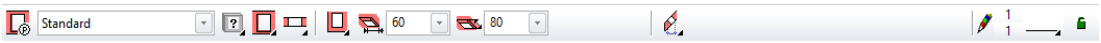
CREATE ROOF OPENING

Construction parts toolbar
AR Objects menu > Roof opening

The function creates openings or slots in the roof.
When you click the CREATE ROOF OPENING function, the settings of the most recently placed opening are active and the roof opening can be placed immediately.

Once the values have been entered in the parameters, a roof plane must be selected for positioning the opening, and then the position in the floor plan and finally the direction of the opening are set.

Roof opening properties bar



The properties bar is visible as soon as the CREATE ROOF OPENING function is started or if an existing opening is edited.
You can manipulate the main values in the properties bar.

Roof opening parameters

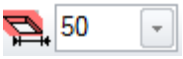
Type

Renovation planning state (see chapter 8.5)

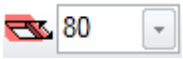
Opening shape – orthogonal / free contour

[Style – hole /slot]

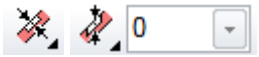
[Size on - storey plane / roof slope]



[Width]

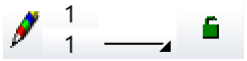


[Length]



[Depth (only for slot) normal / vertical]

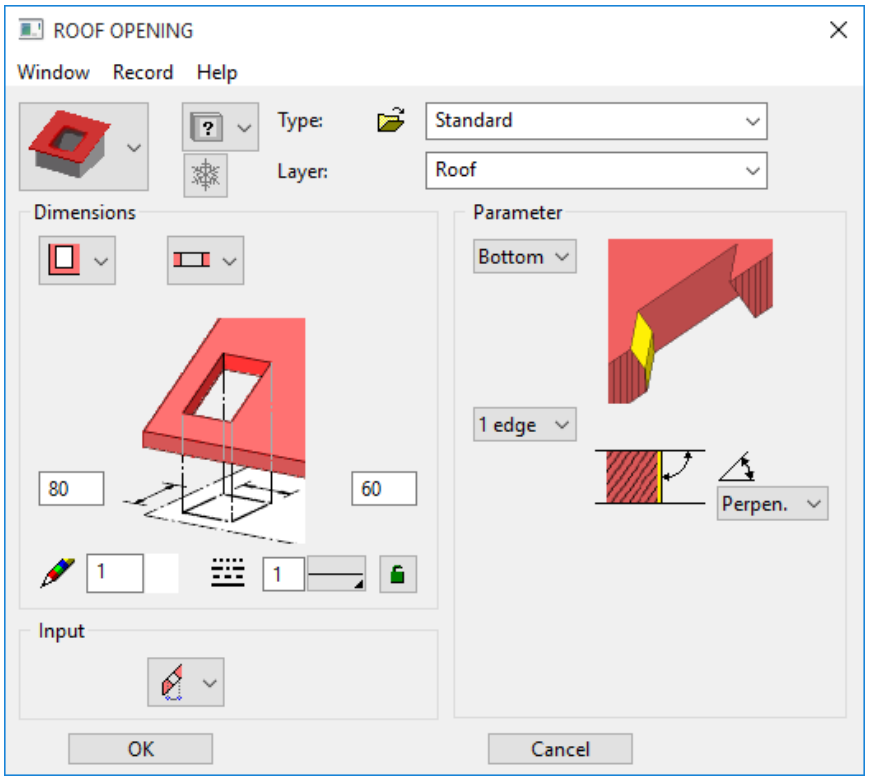
[Position in top view / position by height]



[2D depiction / (not) copy from roof]

Roof opening parameters

You can open the roof opening parameters via the properties bar or by double-clicking the roof opening to be modified.

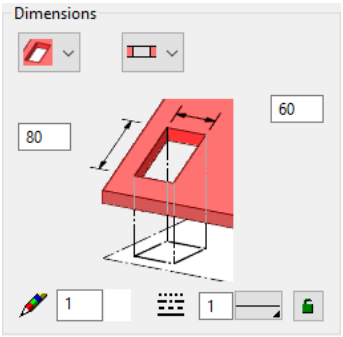


General parameters

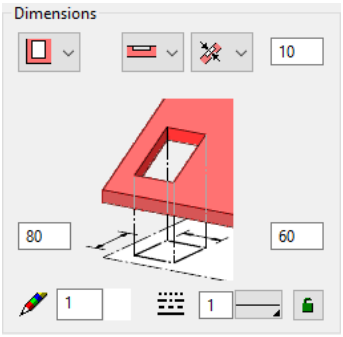
- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

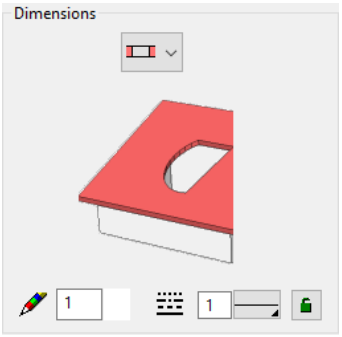
Dimensions



Shape: right-angled
Size on roof slope
Hole



Shape: right-angled
Size on storey plane
Slot



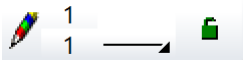
Shape: free

Hole

Size on - storey plane / roof slope
The dimensions can be measured on the roof slope or on the storey plane. This setting is accounted for when you modify the roof slope.

Style – hole / slot
You can create the opening as a hole or only as a slot with a specific depth. The slot can only be from above. The depth of the slot can be set to be normal or vertical.
Usage: To add solar collectors to an area of the roof instead of roof shingles.

2D depiction



An open padlock indicates that pen and line type for the 2D Depiction can be entered. A closed padlock indicates that pen and line type for the 2D depiction are copied from the roof parameters.

Entry

The entry process differs depending on the selected shape of the opening.

Roof opening – free

Entry directly by polygon

Entry by a predefined contour

Roof opening – right-angled

The roof opening can either be set in the floor plan or placed above the height of the lower edge of the opening. If the roof height or inclination is changed, the roof opening is refreshed according to the entry.

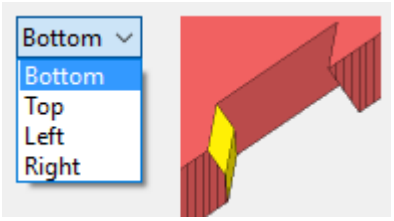
Position by floor plan

Position by height

The height of the roof at any point can be measured with the HEIGHT IN POINT function.

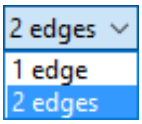
Parameter

Active side



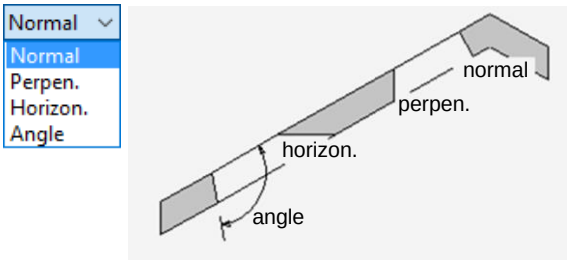
The settings in the parameter window always refer to the active side.

Number of edges



A side can consist of an edge or two edges. All sides should have the same number of edges to avoid geometric errors.

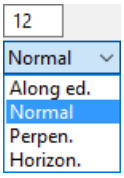
1 edge



An edge can run in four ways. Any angle can be entered in the "Angle" variant. If the opening does not have enough space in the roof with the specified angle, the edge is created vertically.

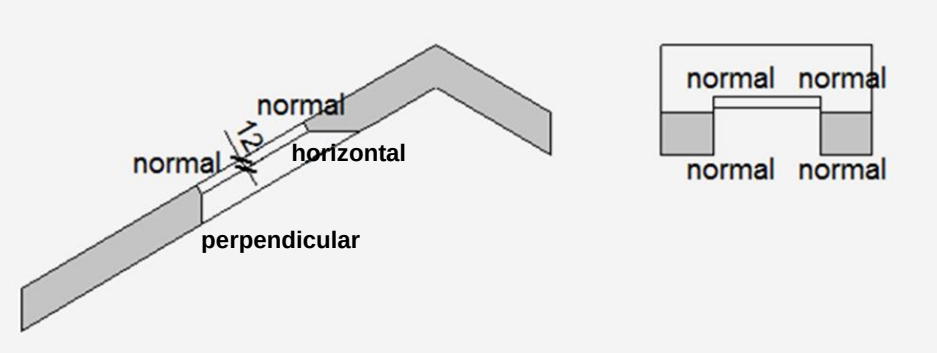
2 edges

The lengths can be determined for the first edge. You can select how the length is measured. An edge can be horizontal, but the distance is measured perpendicularly to the roof plane. All sides should have the same length to avoid geometric errors.

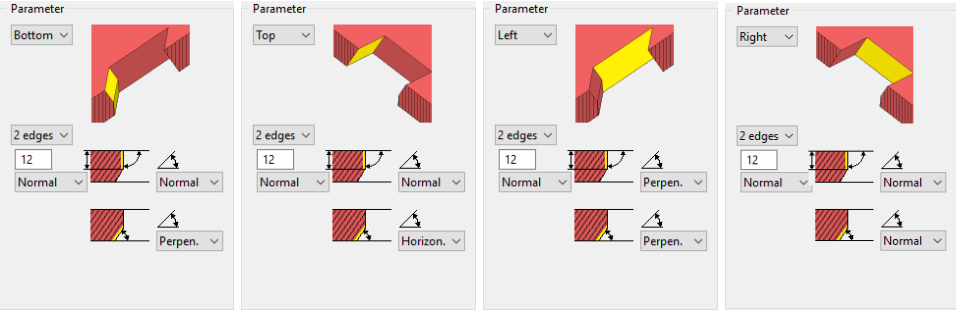


One of the four alternatives for the edge can be selected for each partial edge.

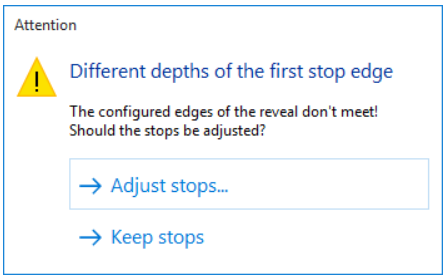
Example of an opening with two edges. Both "right" and "left" sides are also defined with two edges, although one edge would suffice.



Cross-section Long section

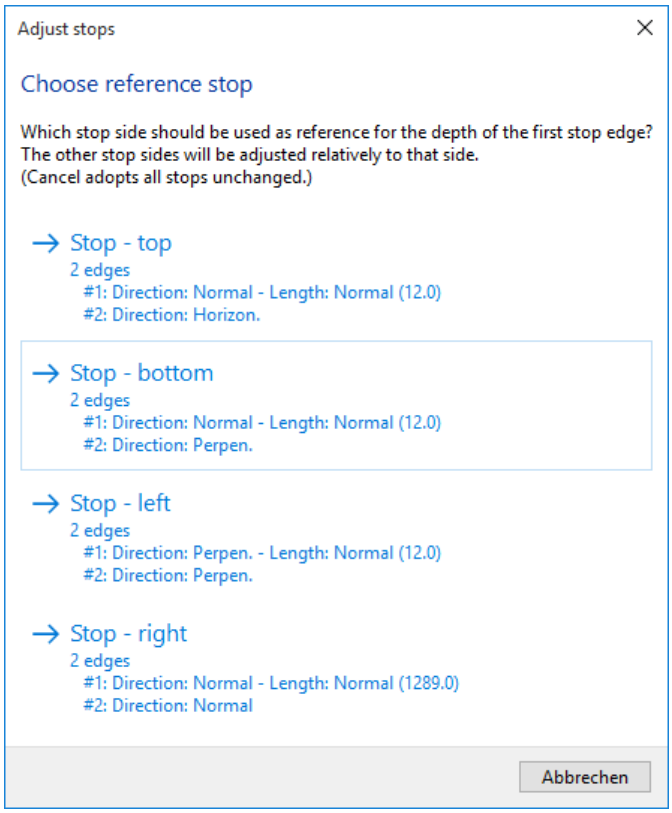


A warning appears if the edges do not meet at the corners.



Keep stops:
In this case you will have to take geometric errors into account.

Adjust stops:
In this case, a dialog window appears with all of the settings for each side. You can decide which stop should be used as a reference.


Adjust stops
Choose reference stop
Which stop side should be used as reference for the depth of the first stop edge?
The other stop sides will be adjusted relatively to that side.
(Cancel adopts all stops unchanged.)
Stop - top
2 edges
#1: Direction: Normal - Length: Normal (12.0)
#2: Direction: Horizon.
Stop - bottom
2 edges
#1: Direction: Normal - Length: Normal (12.0)
#2: Direction: Perpen.
Stop - left
2 edges
#1: Direction: Perpen. - Length: Normal (12.0)
#2: Direction: Perpen.
Stop - right
2 edges
#1: Direction: Normal - Length: Normal (1289.0)
#2: Direction: Normal
Abbrechen

9.8 DORMER

CREATE DORMER

Construction parts toolbar
AR Objects menu > Dormer

The DORMER function is a tool for generating roof structures. There are four basic shapes available for selection.
When you click the CREATE DORMER function, the settings of the most recently drawn dormer are active and the dormer can be created immediately.

DORMER PROPERTIES BAR

The properties bar is visible as soon as the CREATE DORMER function is started or if an existing dormer is edited.
You can manipulate the main values in the dormer's properties bar.

Dormer parameters

Type

Renovation planning state (see chapter 8.5)

Dormer type

Entry style

Dimensions (depending on dormer type)

Click dedendum

Dormer roof pitch

Click the clearance (breadth)

Gables overhang

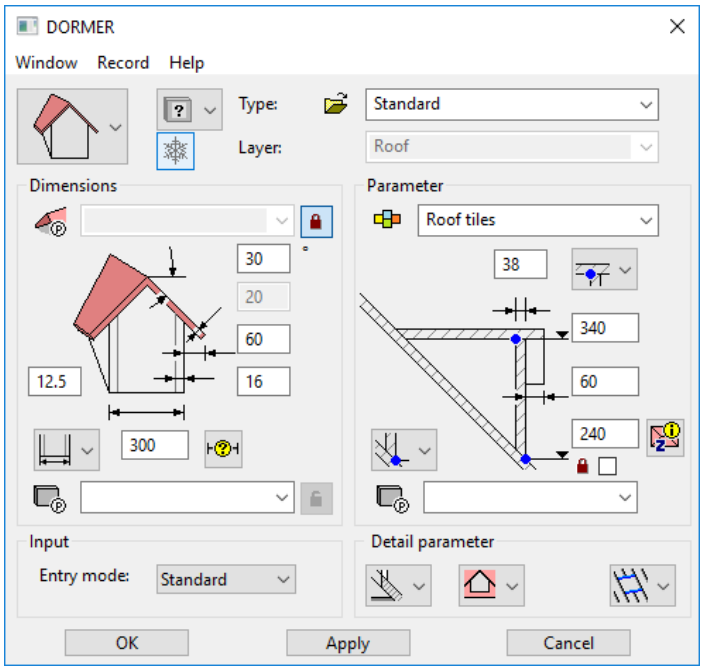
Type of wall opening

Lower termination of front wall

Create trimmer

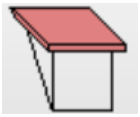
DORMER PARAMETERS

The upper part of the parameter window displays the pre-set parameters. You can use the other entry fields to define the sizes, material, layer, depiction and dormer features.



Dormer shapes

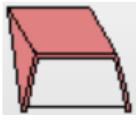
Here you can select one of the various dormer shapes.



Shed dormer

Gable dormer

Spiry dormer



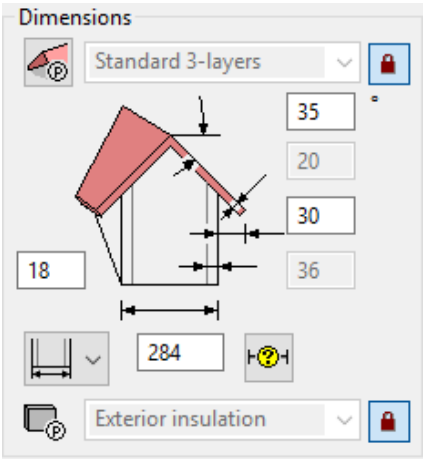
Trapezoid dormer

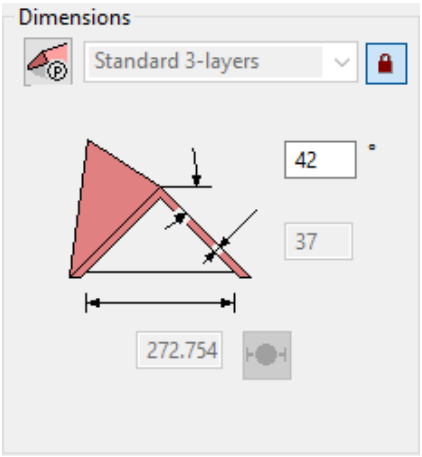
General parameters

- Status renovation planning
- Freeze
- Type
- Layer (is taken from roof)

The general parameters for architectural objects are described in chapter 8.5.

Dimensions

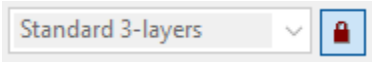




Here you can enter or modify the dimensions of the dormer.
The parameter window looks different depending on the selected dormer shape. For the shed or gable dormer, you can enter the roof pitch, roof gauge, roof overhang and wall gauge. The entries for spiry and trapezoid dormers are limited to roof pitch and roof gauge.

Roof parameter

This button opens the dialog window for roof parameters.



Selection of roof parameter settings. If the roof parameters of the main roof have to be applied, then the lock has to be closed. The SELECTION menu will be deactivated.

Net clearance (breadth) outside

The entered width is the outer dimension of the dormer.

Net clearance (breadth) inside

The entered width is the inner dimension of the dormer.

Click the clearance (breadth)

You can use this function to measure the net clearance (breadth) from the floor plan and automatically enter it into the adjacent field.

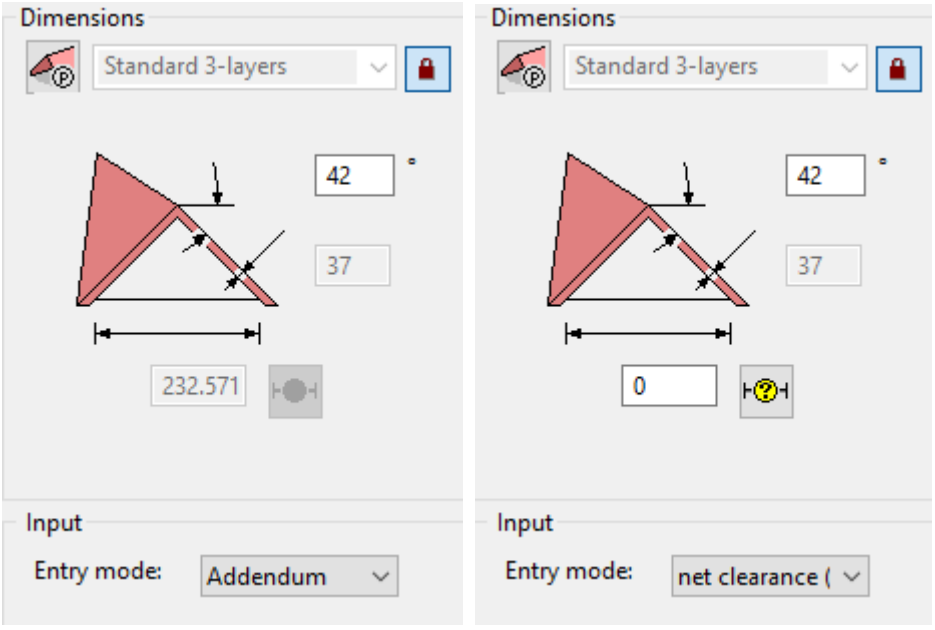
Side wall parameter

This button opens the dialog window for side wall parameters.

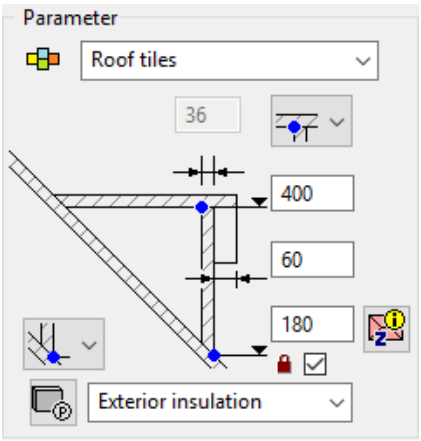
Selection of side wall parameter settings. If the wall parameters of the main wall have to be applied, then the lock has to be closed. The SELECTION menu will be deactivated.

Entry

You can only change the entry style for a spiry dormer.



Parameter



Here you can enter or modify other dimension and height values for the dormer.
The parameter window looks different depending on the selected dormer shape. In general, you can enter the addendum, dedendum, wall gauge, and roof overhang.

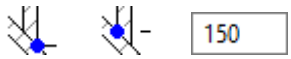
Materials

The material is taken into account in the report. A name can be freely chosen, simply entered in the dropdown box and confirmed with [Enter]. If you want to remove a name from the dropdown list, enter it with a preceding minus sign and confirm with [Enter].

Addendum

The addendum entered is measured on the inside or outside depending on the configuration.

Dedendum



The dedendum entered is measured on the inside or outside depending on the configuration.

Click dedendum

You can use this function to measure the dedendum from the floor plan and automatically enter it into the adjacent field.

Lock dedendum

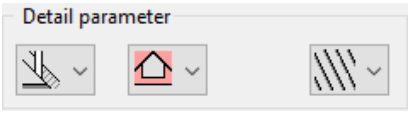
If the height of the main roof is modified, the dedendum of the dormer is retained. If this tick box is not selected, the height of the dormer is shifted with that of the main roof.

Front wall parameter

This button opens the dialog window for front wall parameters.

Selection of front wall parameter settings.

Detail parameter



Lower termination of front wall

Top of roof

The gable wall begins at the top edge of the roof.

Underside of roof

The gable wall begins at the lower edge of the roof.

Slab

The gable wall rests on the raw slab.

None

No wall is drawn.

Roof opening

Enter here whether the main roof should only be cut out in the area of the dormer or up to the eaves.

Trimmer

Here you can decide whether a replacement should be drawn for the roof cut-out.

9.9 Truss

Create truss

Construction parts toolbar
AR Objects menu > Truss

Using the TRUSS function, you can create various truss elements or a beam position. Before creating construction parts attached to the roof pitch (such as rafters, wall plates, etc.), a roof must be defined. It is also possible to define bearing constructions for balconies and terraces with beams, balusters and braces.

When you click the CREATE TRUSS function, the settings of the most recently drawn truss are active and the truss can be created immediately.

Truss properties bar

The properties bar is visible as soon as the TRUSS function is started or if an existing truss element is edited.
You can manipulate the main values in the truss properties bar.

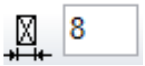
[Truss parameters]

[Truss type]

Renovation planning state (see chapter 8.5)

[Truss element]

Entry mode (depending on element)



Dimensions (depending on element)

Properties of truss

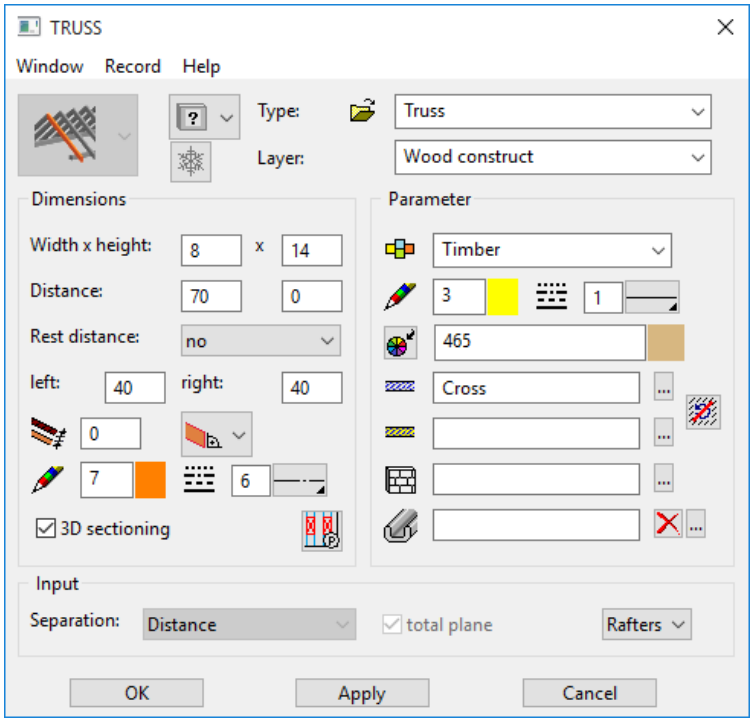
[Truss section on/off]

[3D intersection with layers]

[Modification functions]

Free parameters

TRUSS PARAMETERS



The appearance of the parameter window and the types of queries are highly dependent on the selected construction part and are therefore described below in the discussion of each construction part.

Height indications
All height indications related to the top or bottom edges of wall plates, beams and balusters (spindles) are based on the raw slab (storey zero) of the active storey.

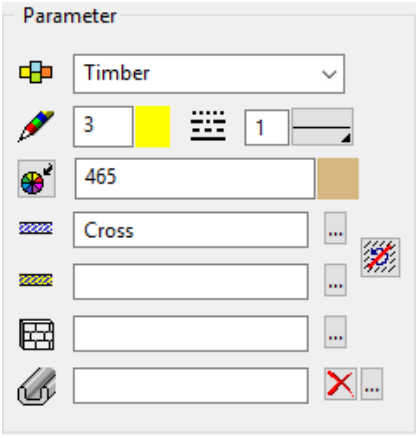
Plan graphics
The depiction for the plan graphics is automatically situated in the storey where the roof was defined. For construction parts that are not directly associated with the roof, you can use the storey list beforehand to select the storey in which the plan graphics are to be represented.

General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Parameter



Material
The material is for reporting. It is not dependent on representation level.

Section depiction
The pen/line type and hatches are for the depiction in the sectioned state.

Colour/Material mode

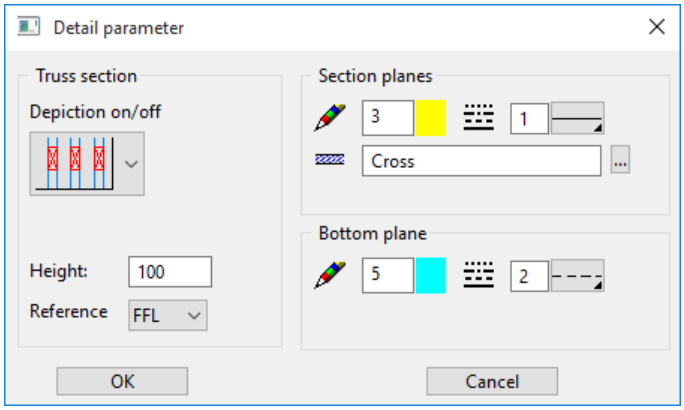
3D hatch

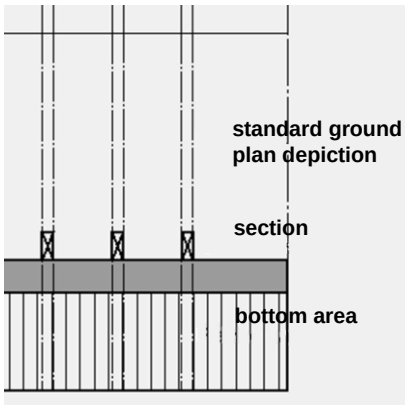
Free cross section

A library part with a free cross section can be selected here.

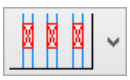
Truss section in floor plan detail parameters

The roof section is the sectioned depiction of the truss on the floor plan when the jamb wall has a low height.
This option is only definitive for rafters, including hip rafters and valley rafters.





Depiction on/off

On:  Off:

Height / Reference
The position of the roof section is controlled by the section height. The height is measured from the raw slab or from the finished floor.

Section planes

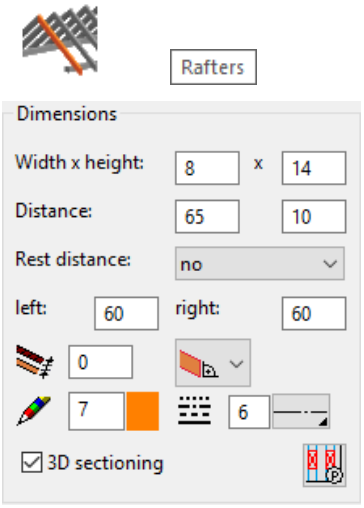
The area in which the truss elements are represented as sectioned.

Bottom plane

Truss elements underneath the section height. These elements are mostly covered by the roof and are therefore represented by dotted lines.

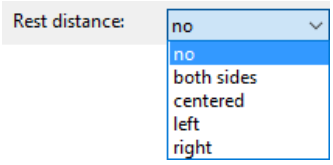
THE CONSTRUCTION PARTS

Rafters

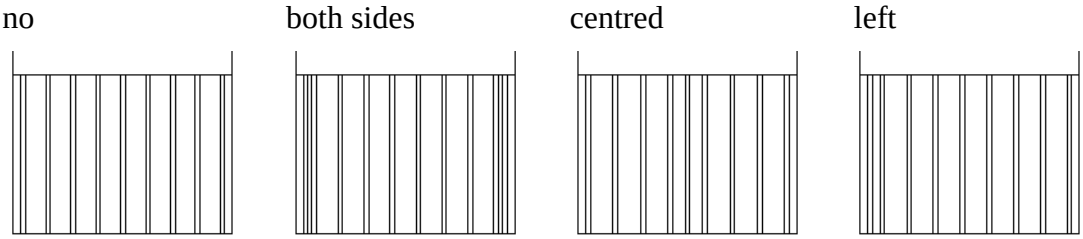


Dimensions
Enter the dimensions of the rafters via their "height" and "width". Depending on the separation type, you can enter a rafter distance (jump dimension) or the number of rafters. For the "Distance" separation type, a rest distance is left over.

Rest distance



For the distance, there are various options as to how the rest (remainder) is treated. "No" means that value for the distance is treated as a maximum.



Offset left/right

If the rafters are distributed across the entire roof plane (TOTAL PLANE option), you can specify an offset on the left and right of the roof. The roof is always viewed from

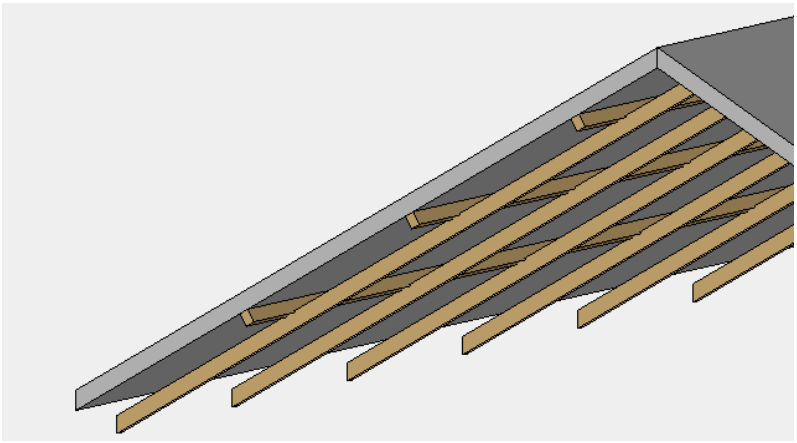
the side of the eaves. The distance is from the outer edge of the roof to the start of the first rafter.

Rafter distance to eaves edge
Here an automatic shortening (positive value) or enlargement (negative value) of the rafters to eaves edge can be configured.

Roof connection, Layer reference to rafter structure
In the **Roof parameters**, you can specify the roof layer under which the rafters are to be placed.

Roof distance

The rafters can be created at a distance from the specified roof layer. Use for vaults located at a different height from the rafters if the rafters do not begin under a layer boundary or are used for large hall roofs as a connector (see image).



Rafter head
You can define the "rafter head" design as one of three options.

Perpendicular (perpendicular to the roof pitch)

Horizontal/vertical (with specified front height)

Horizontal/normal (with specified front height)

Vertical

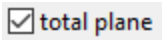
Floor plan depiction pen/line type
Plan graphics of rafters in the floor plan.

3D sectioning
When this is activated, the truss elements cut out the walls.

Truss section in floor plan detail parameters

Separation - Distance
Here, you should also specify the "Rafter distance" (axis distance) and the position of the **rest distance**. You can specify the latter as "both sides", "centred", "left" or "right".

Total plane/range



The TOTAL PLANE setting distributes the rafters across the entire width of the roof plane. In addition, you can define **rest distances** on the left and right sides. If this option is not used, they are distributed across a range defined by two points, which are to be specified from left to right from the perspective of the edge of the eaves up to the outer edge of the rafters.

Position
The rafters are distributed on the trajectory line of the roof pitch. You can combine multiple separation ranges and separations within the same roof plane.

Select to apply the roof plane.

Separation – Number
Generates a set number of rafters across the entire roof plane, accounting for the **left/right offset** or a range of the roof plane.
For the dimensions, specify the number of rafters.

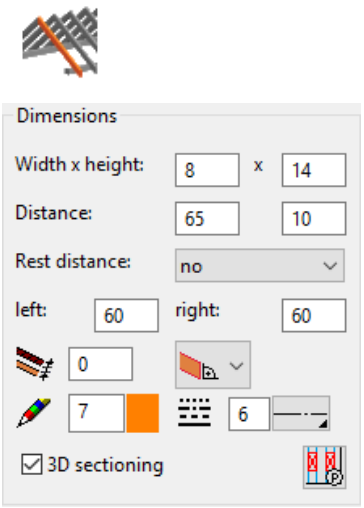
Total plane/range (see above, under division by distance)
Select to apply the roof plane.

Separation – Single
Generates a single rafter across the entire roof plane.
Select the roof plane, and then define a point on the middle axis of the rafter.

Separation – Single (manually)
Generates a single rafter with its start and end point.
Select the roof plane, and then define the start and end point on the middle axis of the rafter.

Separation – Copy rafter lay out
Copies the dimensions and the rafter row of a facing rafter.
Select the roof plane, and then select a rafter from the facing roof plane.

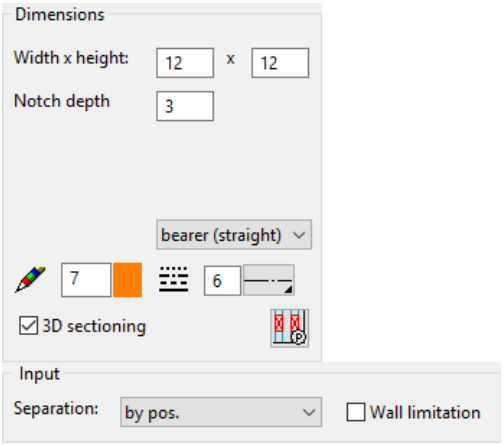
Beam position



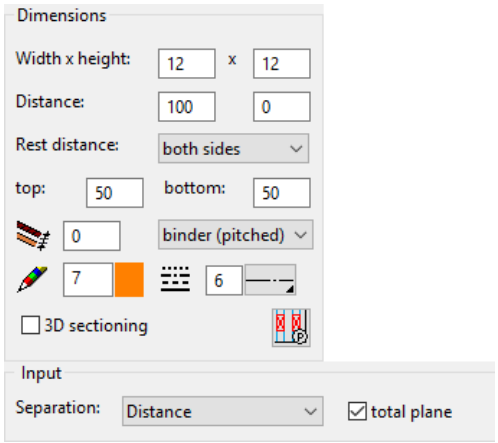
A beam is assigned to a slab, not a roof.

The settings are the same as those for a **rafter**. Values such as "Rafter head" and "Detail parameters truss section in floor plan" do not apply.

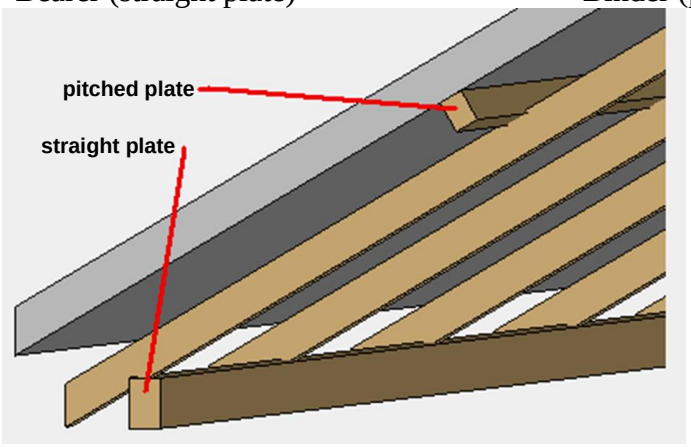
Wall plates



"Bearer (straight plate)"



"Binder (pitched plate)"



There are two available types of "wall plates". Depending on the separation type, a "bearer (straight plate)" or a "binder (pitched plate)" is created.

Enter the dimensions of the wall plate via its "height" and "width".

Separation – Position
The position of the wall plate is defined by the start and end points of the middle axis. The lower edge is calculated using the dimension of the rafter you click and the notch depth.

Separation – Lower edge
Define the "lower edge" of the wall plate. When you click the rafter, the resulting middle axis position is shown as a dashed line, and you can now enter the start and end points. You can also determine the points outside of the displayed axis. If you do so, the position is projected normal to the middle axis.

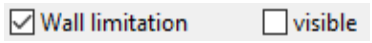
Plate distance to roof edge
Only active for pitched plate.
Here an automatic shortening (positive value) or enlargement (negative value) of the plate to the roof edge can be entered.

Separation – Distance

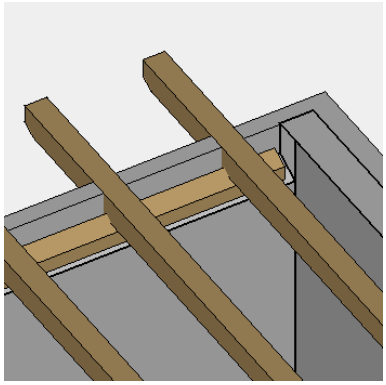
Separation – Number

Separation – Single (manual)

Wall limitation



Only active for "bearer (straight plate)".
You can use this option to section a specific range of a wall at the height of the wall plate's lower edge. If the wall plate rests on top of a cap stone, the range can be given a limitation using a 2D contour. This contour must be drawn first. After you define the position in the top view, you can select this contour.

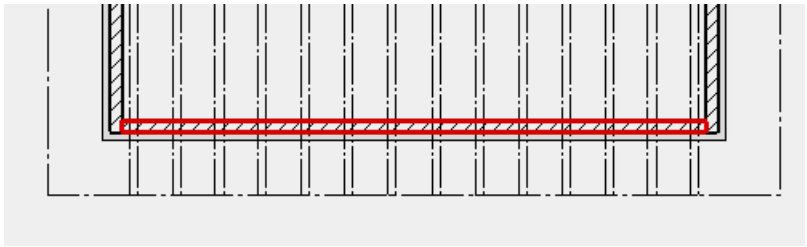


WORKSHOP

Wall plate with wall limitation

The rafters must be placed before you can define a wall plate.

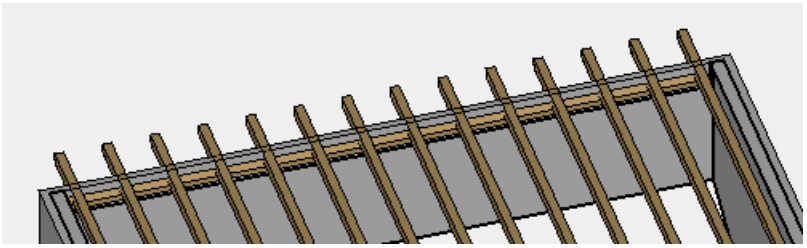
Now draw a rectangle of the range that will become the height of lower edge of the wall plate.



Open the "Truss" parameter window.

Select the WALL PLATE function then select the option for wall limitation.

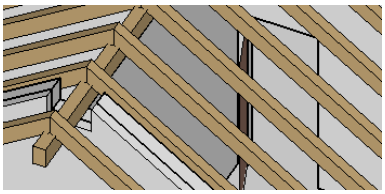
Next, click APPLY. Select the rafter under which you would like to place the wall plate, and then select the position of the wall plate. When the *Select contour for wall ending* prompt appears, click on the rectangle you drew earlier.
The height of all walls located under this wall limitation should now have changed.



WORKSHOP END

TIP

You can also define a ridge piece using the WALL PLATE WITH LIMITATION function. That way you can also specify the height for the walls' supports.



Ridge piece

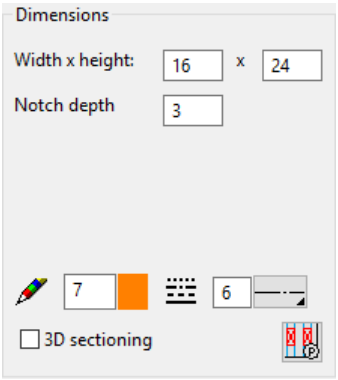
Dimensions
Enter the dimensions of the wall plate via its "height" and "width".

Floor plan depiction pen/line type
Plan graphics of ridge pieces in the floor plan.

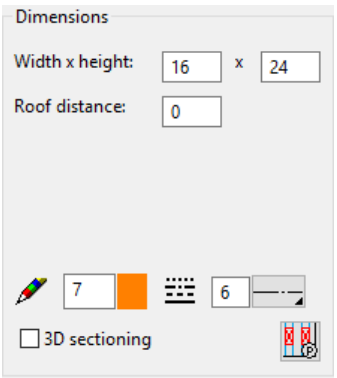
3D sectioning

Truss section in floor plan detail parameters

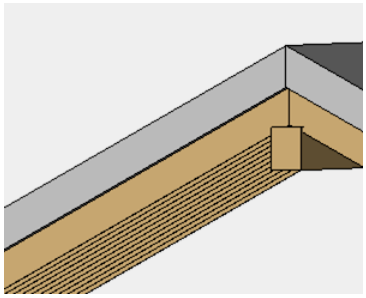
You can place the ridge pieces either below the roof or below the rafters.



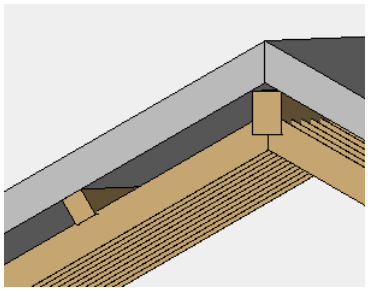
"Below rafters"



"Below roof"



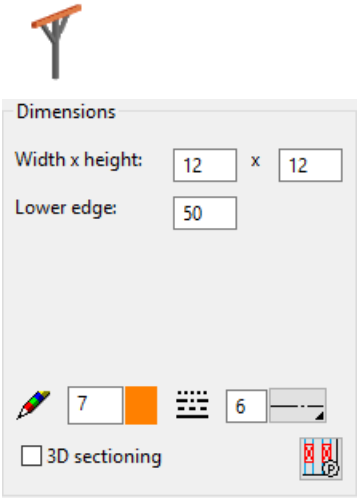
The "notch depth" defines the depth of the notch in the rafter normal to the roof pitch.



The beam cross-section is positioned at the set roof distance distance from the defined roof layer.

Limitation by roof
You cannot draw a ridge piece beyond the edge of the roof.

Beam



Dimensions
Enter the dimensions of the beam via its "height" and "width".

Height situation over lower edge/upper edge
For the positioning, you can switch between "lower edge" and "upper edge". The system always measures from the raw slab (storey plane).

Floor plan depiction pen/line type
Plan graphics of beams in the floor plan.

3D sectioning

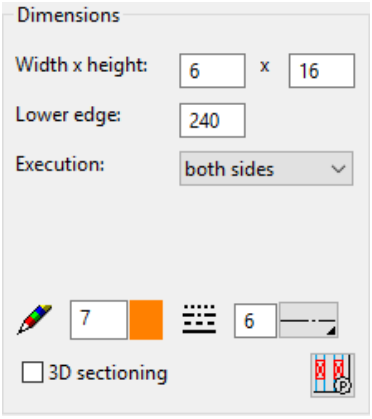
Truss section in floor plan detail parameters

Assign to roof
The beam can be assigned to a roof.

The position is defined using its start and end points via the beam's middle axis.

The length can be modified by stretching.

Collar



Dimensions
Enter the dimensions of the collar via its "height" and "width". The distance between the collars is determined based on the rafter you click on.

Height situation
The height of the collars is determined based on the "lower edge".

Execution
For the execution of the collars, you can select between "both sides", "left" or "right" as seen from the edge of the eaves of the specified rafters.

Define the range of the distribution by clicking on the first and last rafter. You should also select one of the facing rafters. The collars are limited by the upper edge of the rafters.

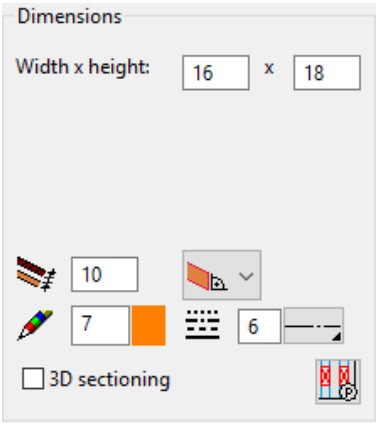
If the rafter cross-section or rafter spacing is changed, the collars do not adjust themselves automatically and must be moved manually or recreated. If the collars are limited for a range by a recess in the building that is perpendicular to the wall, you can move individual collars via the side view.

Floor plan depiction pen/line type
Plan graphics of collars in the floor plan.

3D sectioning

Truss section in floor plan detail parameters

Hip rafter/valley rafter



Enter the dimensions via "height" and "width". If you specify "0" for the height, the rafter height results from the height of the connecting rafter clicked on.

Specify the position by clicking on the start and end points on the axis of the hip/valley.

Roof distance

The rafters can be created at a distance from the specified roof layer.

Rafter head

Currently, the only type of rafter head provided has a "vertical termination".

Floor plan depiction pen/line type
Plan graphics of rafters in the floor plan.

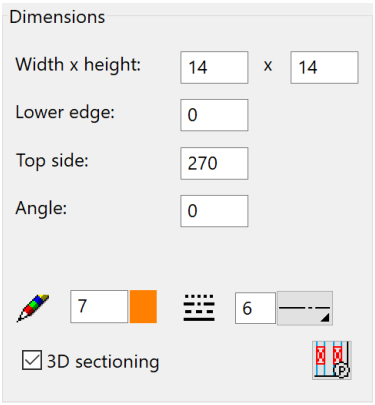
3D sectioning

Truss section in floor plan detail parameters

Redefining a hip/valley rafter does not automatically shorten the rafters. To do so, you must refresh the rafter separation via Edit. If the hip/valley rafters already exist, the rafters are connected automatically.

The length can be modified by stretching. For the 3D to adapt too, you must edit the hip and confirm the dialog window with OK or APPLY.

Balusters (spindle)



Dimension
Enter the dimensions of the cross-section via its "height" and "width".
The length of balusters is defined via its lower edge and top side.
The angle defines the rotation in the floor plan.

Floor plan depiction pen/line type
Plan graphics of balusters in the floor plan.

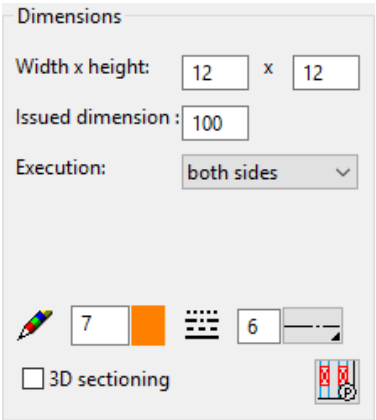
3D sectioning

Truss section in floor plan detail parameters

Entry
When entering a baluster, you can either select a beam or enter a height value. This is available for the lower edge and top edge of the post.

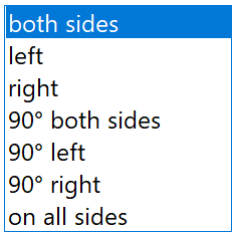
Existing braces are not automatically adjusted to fit a new cross-section.

Braces



Dimension
In addition to the dimension, enter the "issued dimension", the outer notch of the strut.

Execution
For the execution of the braces, you can select between following modes:



Floor plan depiction pen/line type
Plan graphics of braces in the floor plan.

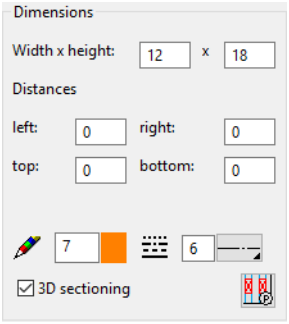
3D sectioning

Truss section in floor plan detail parameters

Entry
Braces can only be defined for balusters (spindles) that are positioned under a beam or wall plate. Click on the baluster that is to be linked to the braces. The braces are created on the middle axis facing the beam/wall plate above them.

If you change the baluster's (spindle's) cross-section later, the braces are not automatically adjusted. You must delete them and recreate them.

Trimmer



Dimension
The cross-section of the trimmer is defined via its "height" and "width". The lateral filler wood is executed in the cross-section of the rafters.

Distances
You can enter a distance to the opening from all four sides.

Floor plan depiction pen/line type
Plan graphics of trimmers in the floor plan.

3D sectioning

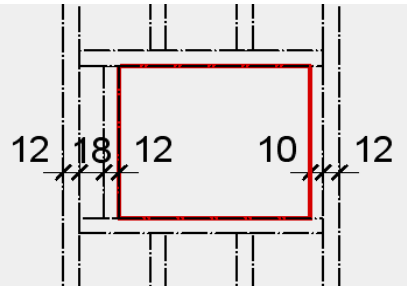
Truss section in floor plan detail parameters

Entry
Define the clearance opening of the trimmer on the floor plan by diagonal via two points.

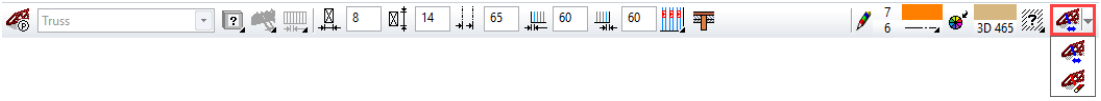
If the rafter spacing is changed, the trimmers do not adjust themselves automatically. You must edit them and confirm the dialog window with OK or APPLY.

TIP

The lateral filler wood is not shown until the clearance distance to the rafters is greater than the rafter width.



EDIT TRUSS



Construction parts of the truss can be edited and modified later by double-clicking them. The parameter window with the corresponding settings opens.

Once the height situation is set, you can only edit it for beams, but not for wall plates or balusters (spindle).

You can move or delete individual rafters via the modification functions in the properties bar.

9.10 CHIMNEY

CREATE CHIMNEY

Construction parts toolbar
AR Objects menu > Chimney

Click on the CREATE CHIMNEY function to enable the settings for the last chimney drawn. The chimney can immediately be placed. A chimney is generated from previously drawn contours or from a library part.

CHIMNEY PROPERTIES BAR

The properties bar is visible as soon as the CREATE CHIMNEY function is started or if an existing chimney is edited.
You can manipulate the main values in the chimney's properties bar.

Chimney parameters

Type

Renovation planning state (see chapter 8.5)

Height reference

Chimney height

Height difference from the chimney's bottom edge to the current work plane

Exterior chimney

Room dividing

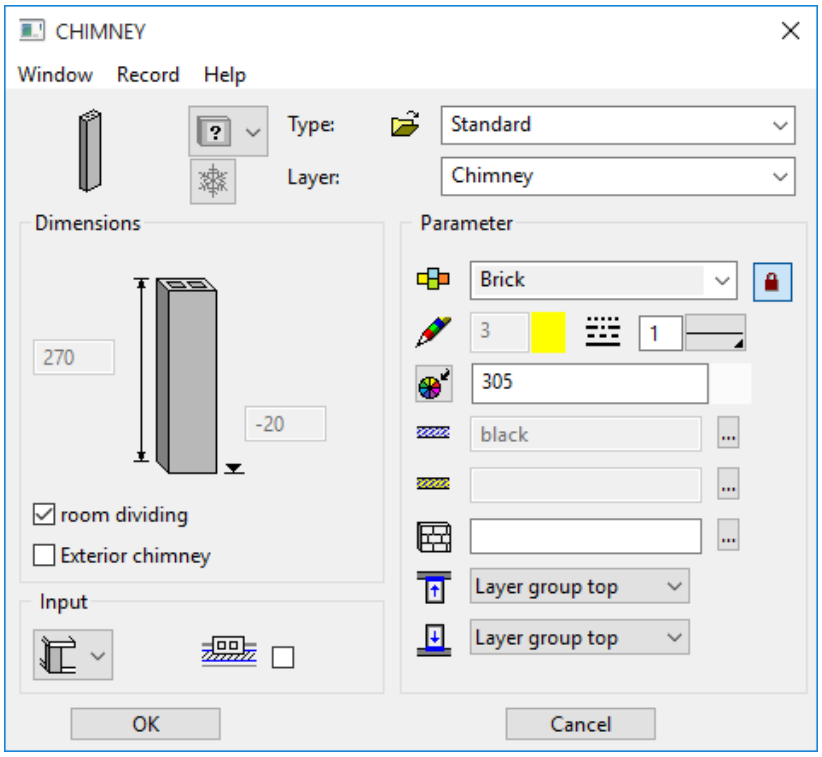
Remove chimney from wall

Properties of chimney (material)

Properties of chimney (depiction)

CHIMNEY PARAMETERS

You can open the chimney parameters via the properties bar or by double-clicking the chimney to be modified.

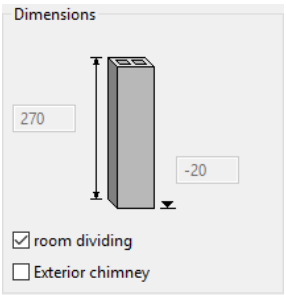


General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Dimensions



Depending on the height definition, you can enter the lower edge and the chimney height.

Room dividing
If a chimney is dividing rooms, then it is treated as boundary for the calculation of room areas.

Exterior chimney
A chimney can be classified as exterior or interior chimney.

Entry

Height reference
The chimney does not react to level floors or roofs. The heights are read from the height section.

Chimney with free height

The lower edge and height of this chimney can be freely defined.

Chimney from slab to ceiling

The chimney leads from the upper edge of the slab to the lower edge of the ceiling.

Chimney from underside floor to ceiling

The chimney leads from the lower edge of the floor to the lower edge of the ceiling.

Chimney to ceiling

The chimney leads from any specified height to the lower edge of the ceiling. This would apply to a stove with a chimney that only starts at a specific height.

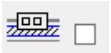
Chimney from floor

The chimney leads up from the upper edge of the floor to any specified height. This reference should be selected for the top floor in order to lead the chimney out of the roof.

Chimney from underside floor

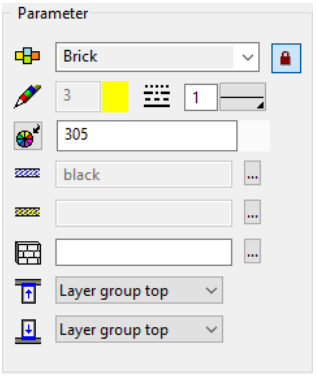
The chimney leads from the lower edge of the floor to any specified height. This reference should be selected for the top floor in order to lead the chimney out of the roof.

Remove chimney from wall



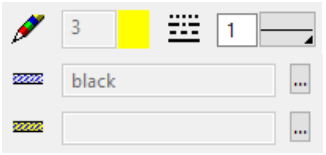
If the chimney is placed in a wall, this option must be selected so that the wall is automatically removed.

Parameter



[Material and its linkage]

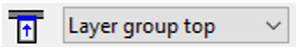
[Pen and hatching parameters]



[Colour mode/Material mode]

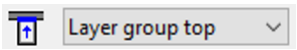
[3D hatch]

[Limitation top]



The chimney can be limited at the top end with a certain layer group of the ceiling.

[Limitation bottom]

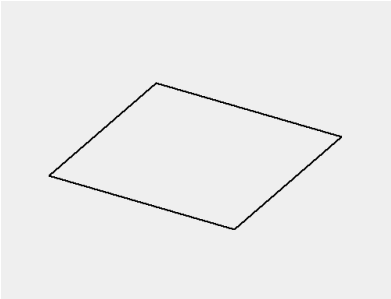


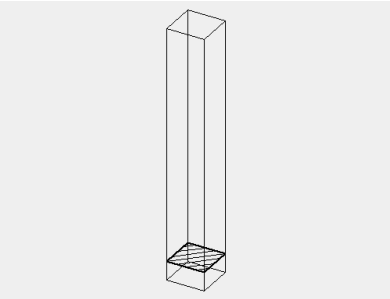
The chimney can be limited at the bottom end with a certain layer group of the floor.

▼▼▼▼ WORKSHOP

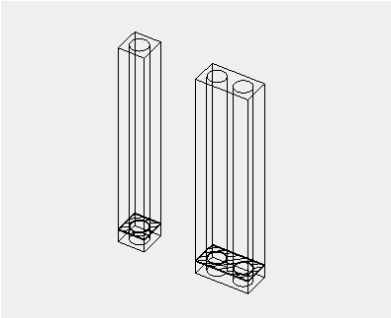
Create chimney

After launching the CREATE function, you are prompted for a contour to serve as the basis of the chimney definition. After you click on this contour (which should have been created in advance), a 3-dimensional chimney is generated from it according to the settings on the parameter window.

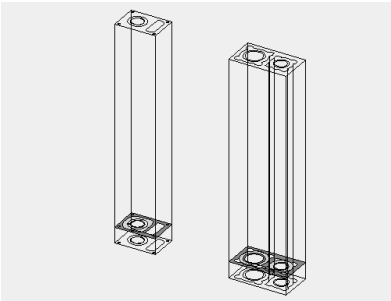




For a simple chimney, you can also use two attached contours. The chimney hatch is always generated solely between the two outer polygons of the chimney's definition. When making your selection, you must always click the outer contour first.



However, the 2D depiction may be significantly more complex (e.g. libraries from chimney manufacturers).



WORKSHOP END

10.Extension

10.1 DOORS 709

10.2 WINDOW 722

10.3 GLASS ELEMENTS 766

10.4 WALL OPENING 780

10.5 BANISTER 786

10.6 ROOM 799

10.7 ROOM SEPARATOR 813

10.8 ROOM GROUP 815

10.1 Doors

Construction parts toolbar
AR Objects menu > Door

Click on the CREATE DOOR function to enable the settings for the most recently placed door. The door can now be placed. The *Position of door* query appears in the entry line.

Door properties bar

The properties bar becomes visible as soon as the CREATE DOOR function is launched or if an existing door is edited.
You can manipulate the main values in the door's properties bar.

Door parameters

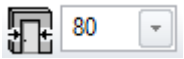
Type

Renovation planning state (only in ELITECAD Architecture, see chapter 8.5)

Door shape

Symbol type

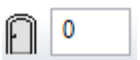
Elevation in floor plan



Door width

Door height

Threshold height



Vault height (only active for segment curve door and Pointed arch door)

Opening angle

Modify door stop (only active when modifying)

Close openings automatically (renovation planning)

Lintel depiction

Finished clearance / gross clearance

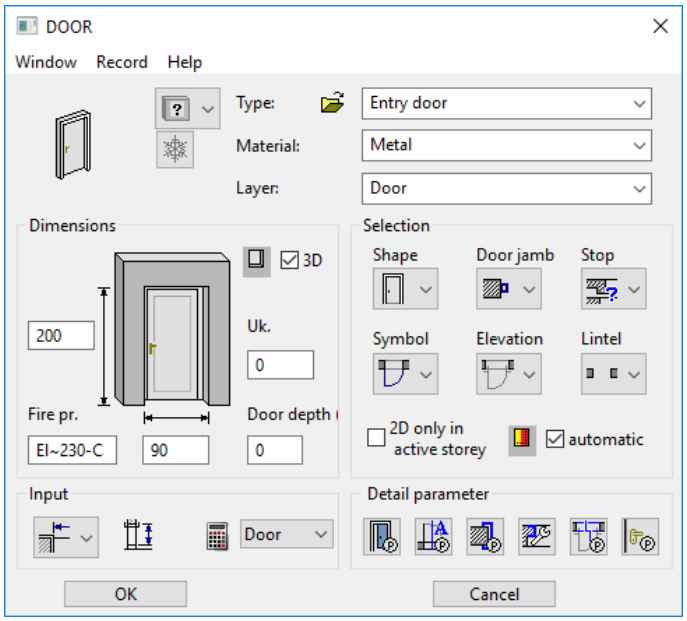
Door jamb type

Switch stop on/off

[Door handle parameters]

DOOR PARAMETERS

You can open the door parameters via the properties bar or by double-clicking the door to be modified.



General parameters

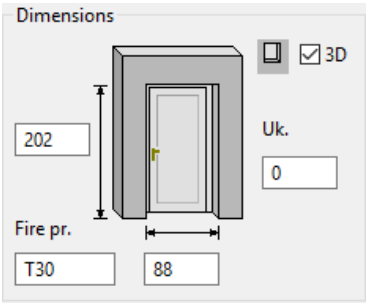
- Status renovation planning (only in ELITECAD Architecture)
- Freeze (only in ELITECAD Architecture)
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Material

The material is taken into account in the report. Any name can be chosen, simply entered in the dropdown box and confirmed with [Enter]. If you want to remove a name from the dropdown list, enter it with a preceding minus sign and confirm with [Enter].

Dimensions



Door height
The door height depends on the entry style:
Finished clearance, gross clearance, gross clearance from "finished higher floor"

TIP

If a threshold higher than the floor is defined, the height is calculated from the threshold.

Door width
The door width depends on the entry style:
Gross clearance or finished clearance

TIP

If a pre-existing door is edited, the original placement point of the door is indicated. A modification to the door width always takes effect from this point.
The point can be moved to the reference points on the left, right and in the centre using the mouse.

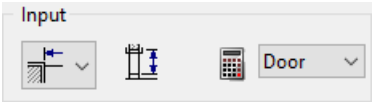
Threshold height
The threshold must always be entered from "raw slab", regardless of which entry style setting is active.

Fire protection
Additionally to the labelling of the door, the fire protection class is added. Any symbol that follows the ‚~‘ symbol, will be displayed subscripted, The ‚~‘ symbol itself is not displayed.
The "fire protection" field is written into the project book for each report and is used in the door report.

Opening in 3D

This setting is generally active. Optionally a generation of an opening into the 3D wall can be deactivated. In that case, only a 2D depiction of a door is generated in the wall.

Entry



In order to account for different entry styles, there are various options available for entering dimensions.

Finished clearance

The finished clearance describes the finished passage dimension: the width between the door jambs and the height from the finished higher floor to the lintel door jamb. If a threshold higher than the floor is defined, the height is measured from the threshold.

Gross clearance

The gross clearance describes the width of the raw wall opening.
If you select gross clearance as the entry style, an additional dropdown box opens for entering the height of the rough dimensions.

Upper edge finished floor level up to lintel lower edge

Height from higher finished floor up to gross lintel lower edge. If the threshold is higher than the floor, the dimension is measured from the threshold.

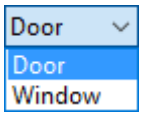
TIP

The (finished) floor height defined in the structure settings for the storey is taken into account for the FFL height (top edge of finished floor height). However, if a room name has been assigned, the (finished) floor height used in it takes precedence over the "general (finished) floor height)" in the structure settings.

Top of slab up to lintel lower edge

Height from raw slab to lintel lower edge entered. If a threshold is entered, the dimension is measured from the threshold.

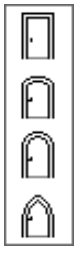
Report object as



Using this setting a door can be reported as a window in the quantification.

Selection

Door shape



Rectangular door

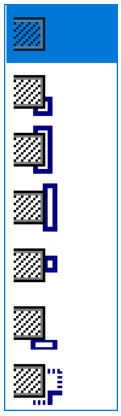
Segment curve door

Round-arch door

Pointed arch door

Four door shapes are available; rectangular door, segment curve door, round-arch door and pointed arch door. If the segment curve or pointed arch door is selected, the segmental arch height can be entered in the door parameters under dimensions or in the properties bar using the segmental arch height symbol.

Door jamb



Without door jamb

Corner jamb

Embracing jamb

Wooden jamb

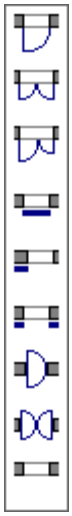
Dummy jamb

On wall frame

Free contour

Here you can specify the style of door jamb. Note that the settings in the door jamb parameters have an effect on the difference between finished clearance and gross clearance. The detailed setting of individual door jambs can be configured in the door parameters in the detail parameters.

Door symbol



Standard curve

Symmetric double casement

Asymmetric double casement

Sliding gate

One-sided sliding door

Two-sided sliding door

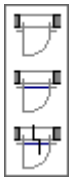
Swing door

Double swing door

Passage

Symbol selection first only refers to the symbol type. The stop direction and stop side are specified by the flip cursor when installing the door. If you need to modify the stop direction later, you can do this with the MODIFY DOOR STOP function in the properties bar.
When installing a double door with different door leaf widths (asymmetric), you are asked for the width of one of the casements when installing. The installation side can then be specified with the flip cursor.

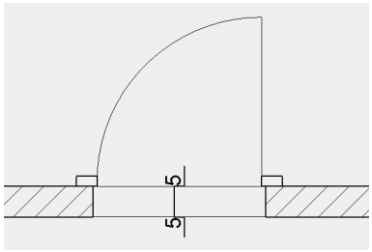
Elevation in floor plan



None

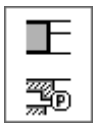
Line

Symbol



You can specify whether a threshold or a height difference of the floor should be represented.
The representation can be switched off, or displayed as a line or as a line with symbol.
The detailed setting of the slab elevation can be configured in the detail parameter of the slab elevation.

Door stop

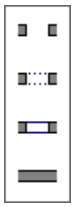


Without stop

With stop

If "with stop" is selected, on the left you have the option to set the *"door depth (in frame)"*. Here the *door depth (in frame)* describes the gauge of the stop.
The detailed setting of the stop can be configured in the detail parameter of the stop.

Door lintel



Type1

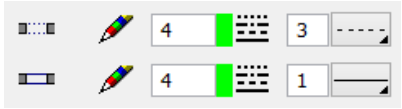
Type2

Without lintel

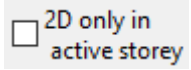
Not visible

The lintel line depiction in the floor plan is set using this button. There are two different types of lintel lines, which can be specified. The types are set in the representation levels: The top selection option here is type1, the middle type2. Type1 is dashed by default and type2 is a solid line. The third selection switches the lintel line depiction off, and the hatching is contiguous in the fourth.

Lintel lines setting in representation level



2D only in active storey

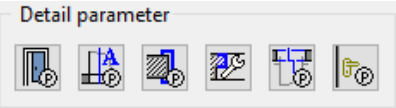


The 2D depiction for multi-storey doors can be either in the own storey or in other storeys.

Renovation planning – fill automatically

If the status of a door is changed to demolition, the automatic generation of a wall that fills the hole can be triggered with this option.

Door detail parameters



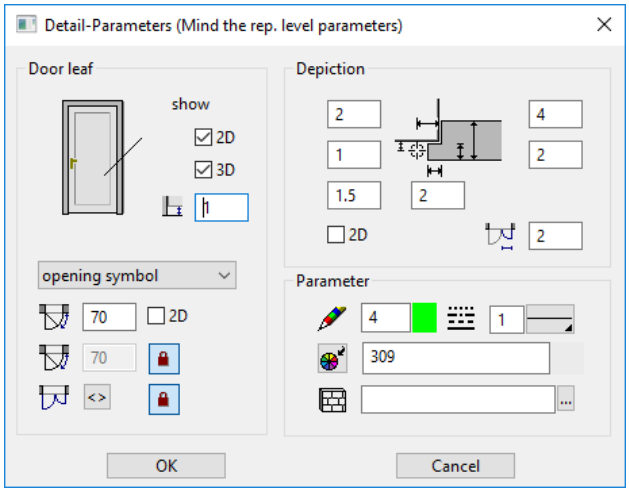
Here you will find other setting options for an individually customised door. Each of the buttons shown leads to another separate parameter dialog window.

TIP

Various settings in the detail parameter dialog window depend on the representation level. This means that when the representation level is refreshed, the doors are regenerated and adapted to the settings in the representation level.

Representation levels create the conditions for covering several planning phases with one design model. This means that by simply switching, a door can be generated without a door jamb for the entry planning, and with a door jamb and an additional lintel height label for the work planning, for example. This always relates to the same door. Please also refer the *Views* chapter.
If the representation levels are switched on (LAY-OUT > REPRESENTATION LEVELS), their settings take precedence. If you switch the representation levels off at this point or modify a door, the detail parameter window settings are taken into account. For more information in this regard, please refer to the "Representation levels" chapter.
In order to express this dependency clearly, the respective sections of the representation level dialog windows are listed in addition to the detail dialog windows shown below.

Door leaf parameters



The 2D and 3D fields activate the door leaf.

Symbol
An opening symbol and angle can be selected for the door leaf. The opening angle only relates to the representation of the 3D door leaf; in the plan graphics the door curve is always shown as 90°. Note that all opened doors are hidden when creating a building section.

Dimensions
The dimensions for the 3D door leaf depend on the door type.

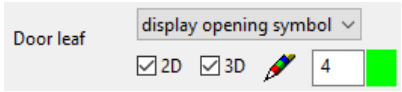
Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

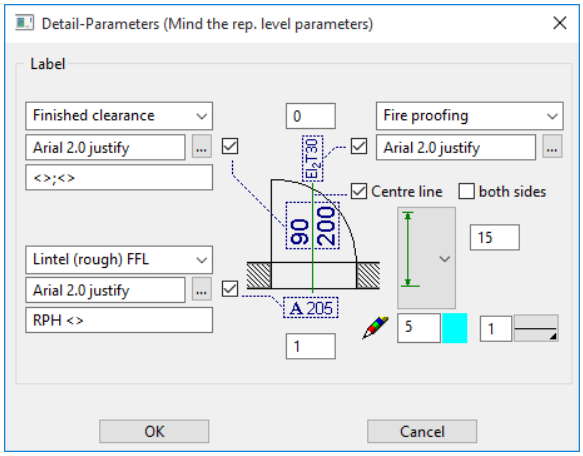
3D hatch

The wall can be assigned a hatch that appears in the calculated hidden line views.

Door leaf settings in the representation level



Labelling parameters



This dialog window covers the representation of automatically generated door labels. These can be fully switched on or off using the three tick boxes.

The pen can be selected for the **centre line**. The length of the centre line can be entered absolutely or relatively to the length of the label.

TIP

Even when the centre line is switched off, the length of the centre line is used to determine the distance of the text from the door.

The **label** is divided into two blocks, inside and outside the door.

Opening-side label (above both selection boxes)

- "Gross clearance" is the size of the wall opening (height of top of slab up to lintel bottom edge)
- "Finished clearance" is the finished door clear opening (height of top edge of finished floor level up to door jamb bottom edge).
- "Start pt net clearance" is the size of the exterior wall opening of a stop door (height of top of slab up to lintel bottom edge)

- "Start pt net clearance" is the size of the inner wall opening of a stop door (height of top edge finished floor level up to lintel bottom edge)

- "Gross clearance from FFL/Thr." measures the height of the finished floor level top edge up to the lintel bottom edge.
- "SW:+ST: (raw)" Swiss standard: here the lintel and threshold height of the door is counted towards the opening side depending on the setting of the specified lintel height parallel to the door.

In the second selection box, the associated text parameters can be selected from the text database. The text parameters themselves can only be manipulated in the **text parameter dialog window**.

Label of the specified lintel height (bottom three selection boxes)

- "Gross lintel height" is top of slab up to lintel bottom edge
- "Net lintel height" is top of slab up to door jamb bottom edge
- "Lintel (gross) FFL" is top edge finished floor level up to lintel bottom edge
- "Gross lintel from 0.0" is ±0.00 up to lintel bottom edge

In the second field, the text parameter can be specified in turn.
In the third field, a pre-text or post-text can be entered.
A placeholder "< >" must be entered for the calculated value.

Fire proofing labelling (two selections on the right)

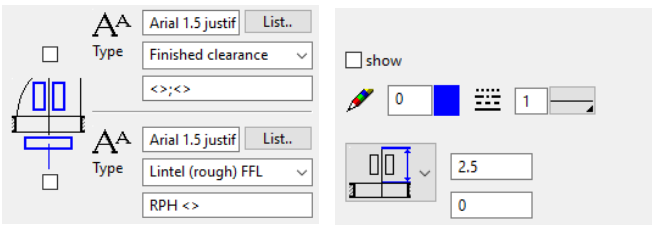
- "fire proofing" is oriented along the centre line
- "fire proofing rotated" is oriented perpendicular to the centre line

In the second menu, the text parameter can be selected.
The checkbox enables or disables fire-proofing labelling.
The fire proofing class is entered in the main dialog window.

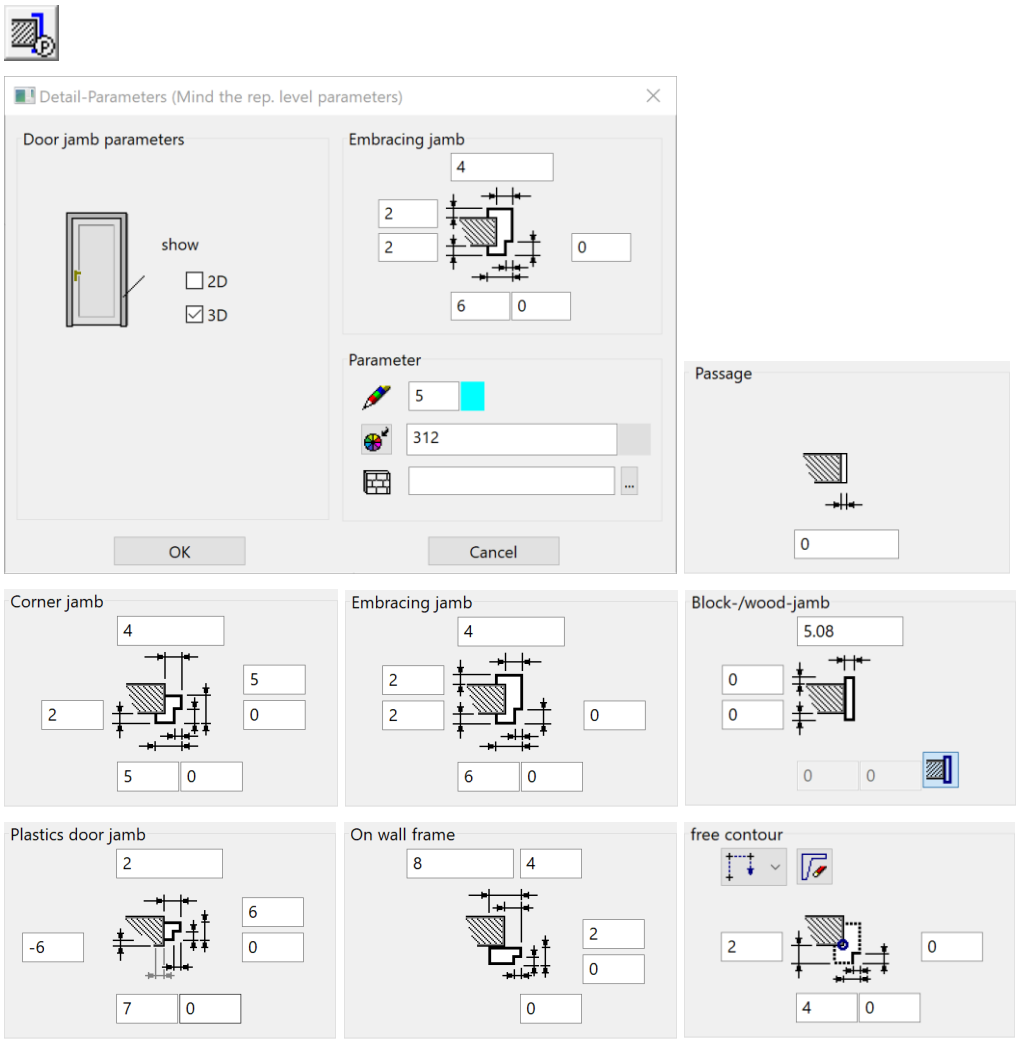
TIP

The (finished) floor height defined in the structure settings for the storey is taken into account for the FFL height. However, if a room name has been assigned, the (finished) floor height used in it takes precedence over the "general (finished) floor height" in the structure settings.
All settings options in this dialog window depend on the representation level.

Label settings in the representation level



Door jamb parameters



As well as the pen, 3D colour and material, the door jamb and the dimensions of the different door jamb types can also be entered. The dialog window appears differently depending on the door jamb type selected.
In the left-hand column, the door jamb can be switched on/off in 2D and 3D. The line type is adopted from the door leaf parameters.

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

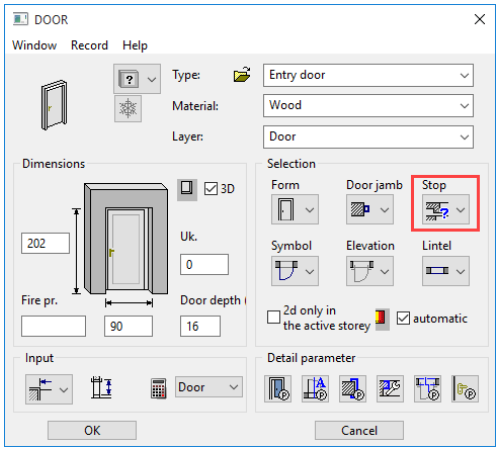
Door jamb settings in the representation level

3D hatch

The 3D hatch is use for depiction in calculated hidden line views.

Stop parameters

A stop for the doors can be defined in the stop parameters. Settings in this dialog window only make sense if the stop is activated in the main parameter window.

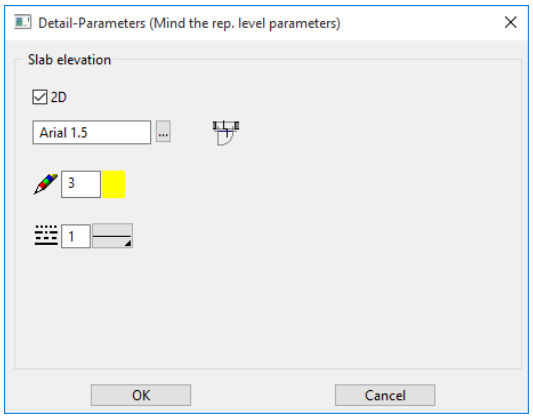


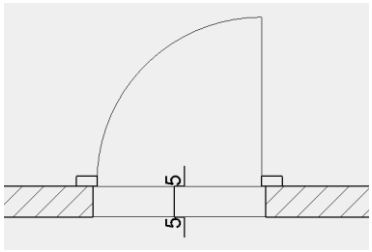
The shape of the individual wall layers in the stop area depends on the wall construction. As the wall composition is yet unknown when placing a new door, there is no preview and no settings can be configured yet.
The correct layer gradient of the wall can only be determined when the existing door is edited.

The stop detail editor consists of the preview, the list of the individual wall layers and the control.

The stop editor for doors is identical with the stop editor for windows. The stop editor is documented in the chapter windows.

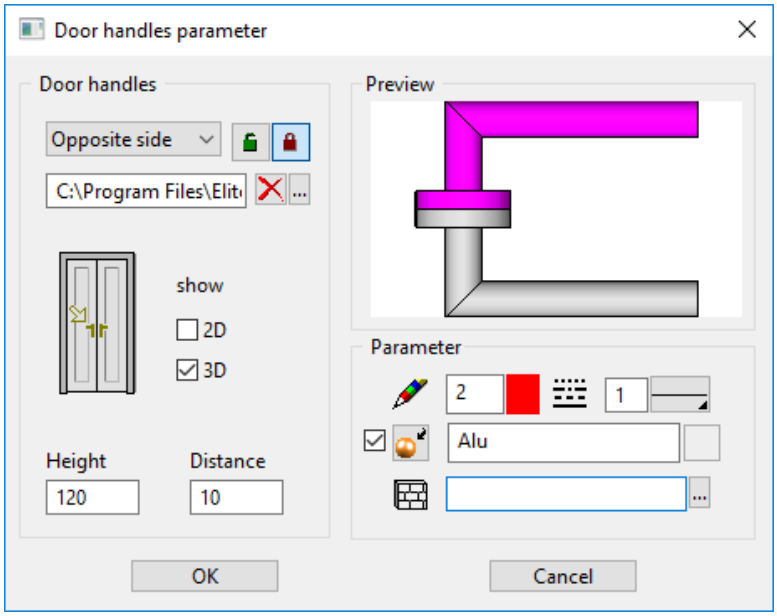
Slab elevation parameters





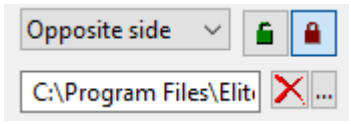
In the detail parameters, you can specify the text parameter, the pen and line type of the slab elevation symbol.

Door handle parameters



The 2D and 3D fields activate the door handles.

Selection



A library part for the handle can be selected here.
The menu which of up to 4 handles are configured (stop side and opposite side and optionally two more for a double casement door). If the first padlock is closed, the settings of stop side and opposite side are identical. If the second padlock is closed, the settings for both door leafs are identical.

Dimensions
The height and distance are measured relative to the door leaf.

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

3D hatch

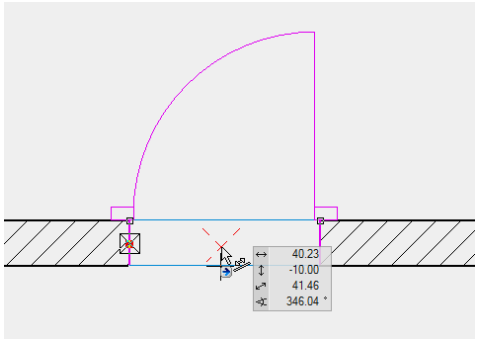
The door handle can be assigned a hatch that appears in the calculated hidden line views.

MODIFICATION FUNCTIONS

Modify door stop

This function is only active when the door is being edited. Once the door is placed, this function allows you to modify the hinge side and the opening side again.

Placement points
If a pre-existing door is edited, the original placement point of the door is indicated. A modification to the door width always takes effect from this point.
The point can be moved to the reference points on the left, right and in the centre using the mouse.



TIP

After selecting the door, click on a handle or gripper of the contour to access manipulation functions directly in a toolbar or by using [TAB] with the cursor.

10.2 Window

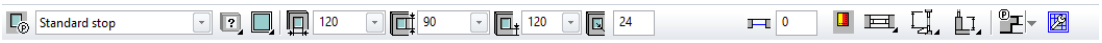
	Construction parts toolbar
	AR Objects menu > Create window

The window and the **roof windows and flat roof windows** are joined in one function, but differ in principle in their setting options. This chapter is therefore divided into two sub-chapters.

Window

When you click the CREATE WINDOW function, the settings are copied from the most recently placed window and the window can be placed immediately. The *Position of window* query appears in the entry line.

Window properties bar



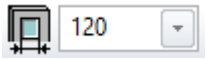
The properties bar becomes visible as soon as the CREATE WINDOWS function is launched or if an existing window is edited.
You can manipulate the main values in the properties bar.

Window parameters

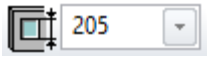
Type

Renovation planning state (see chapter 8.5)

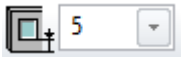
Window shape



Window width

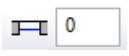


Window height



Height of w-base

Depth



Niche

Fill automatically (renovation planning)

Lintel depiction

Window height

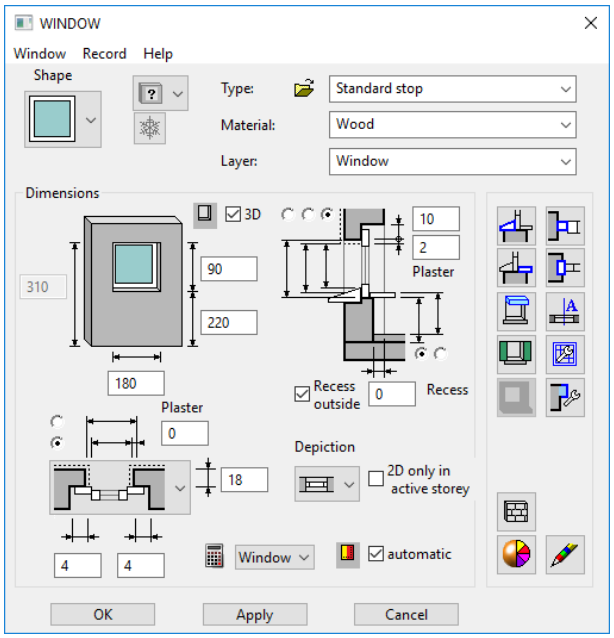
Entry from

Division editor

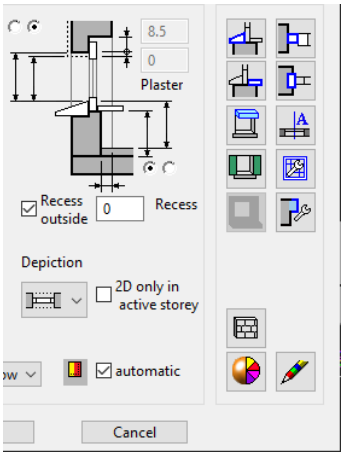
[Stop type](#) / [Stop editor](#)

WINDOW PARAMETERS

You can open the window parameters via the properties bar or by double-clicking the window to be modified.



CH+F:



General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Material

The material is taken into account in the report. Any name can be chosen, simply entered in the dropdown box and confirmed with [Enter]. If you want to remove a name from the dropdown list, enter it with a preceding minus sign and confirm with [Enter].

Parameter management

The settings are saved in the ar (architecture)-config.val (see document for ELITECAD configuration).
A drawing with the name window_*parametername.d* is also saved in the same directory. The drawing for the most recently used current parameter with the name window_act_.d is also saved there.
All special settings such as free contours and free stops are also saved in the drawing.

Recommendation
The following procedure is recommended in order to limit the time required for assembling the parameter list:
Reduce saved parameters to the essentials.
Save windows with special settings with the corresponding wall construction in a separate overview drawing or library. If one of these windows is required later, it can be edited and saved as a parameter.

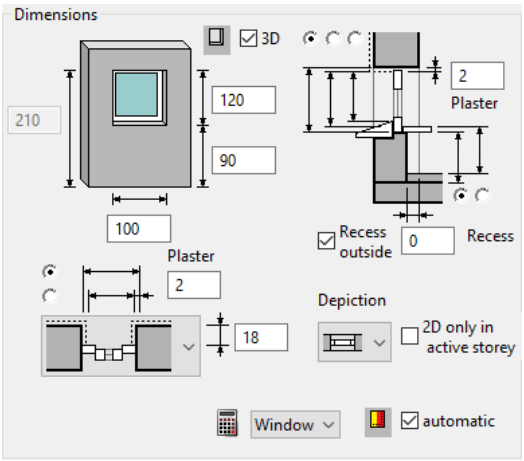
You can find a large number of window examples in the "Glass constructions" example object. This can be adopted as a parameter and saved.

Stop type

Overview
The settings in system control, region and language options influence the gross clearance/finished clearance window dimension entries.
For the country settings Switzerland and France, the outer sill is always measured from the top side.

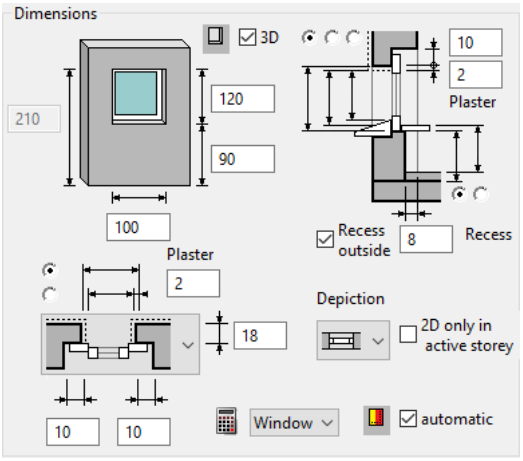
In all other settings, the inner bare parapet top side is definitive for the gross clearance. For the finished clearance, the finished inner parapet top side (inner window sill) or exterior window sill can be selected.

Window without stop



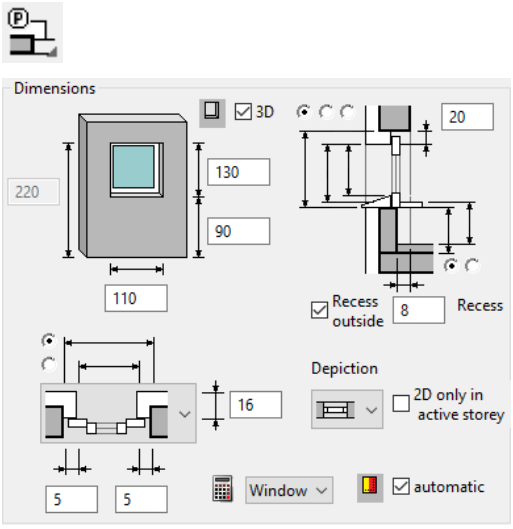
Gross clearance and finished clearance. Difference due to plaster gauge and blind

Window with stop

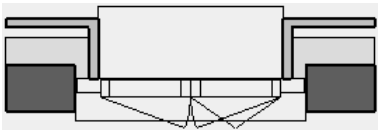


Gross clearance and finished clearance as for the window without stop.
The gauge of the stop stone for the cavity wall is determined by the exterior wall layer as standard. This can be edited in the stop editor.

Window with external insulation (composite thermal insulation system) and back-ventilated facades

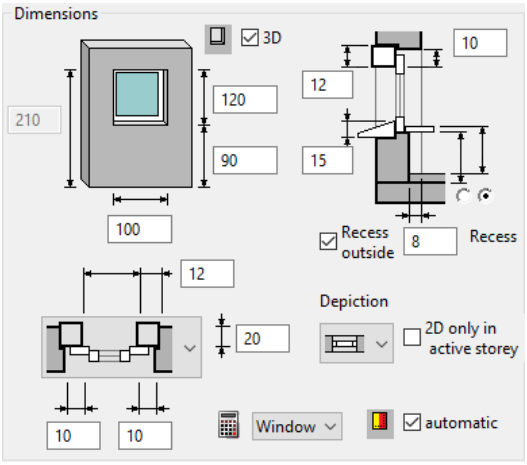


The gross clearance refers to the solid wall. The stop width and blind reduce the gross clearance to finished clearance.
As standard, the outer layers are drawn into the reveal without an air layer. This reduces the total gauge of the layers to the stop width.



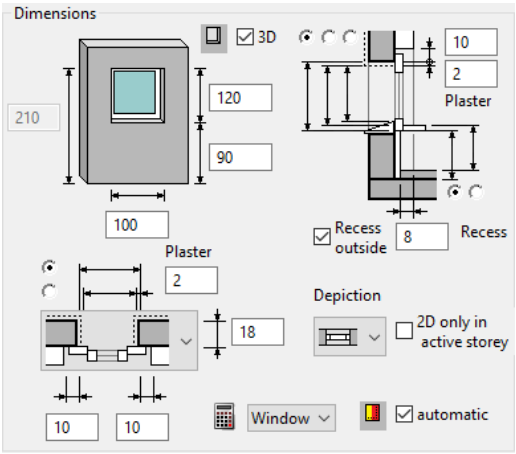
The gross clearance (wall aperture) can be selected for the opening dimension.

Walling



Walling clearance dimension

Window with internal insulation



Gross clearance and finished clearance. Difference due to plaster gauge and blind

Copy parameters

	Stop		
☑	Stop parameters	=	*

Window dimensions

There are different entry fields available depending on the selected **window shape**. The numerical data with a grey background on the left of the field provides entry help. This is always the addition of the window height and parapet height depending on the remaining entries (e.g. from raw slab).

Entry

Gross clearance/Finished clearance
There is a choice between the entry style *gross clearance (wall clearance)* and *finished clearance* for entering the window opening dimension clearance.
The difference depends on the stop type selected.

TIP

The window is represented in 3D without side joints between the on wall frame and the raw opening. When the joint is switched on, a 2D line is represented in the plan graphics.

Parapet height entry style
The *parapet height entry style* only applies how you enter your dimensions for the parapet, so whether you specify a rough dimension or a finished dimension.
Bare parapet height = raw storey floor top edge or level floor to bare parapet top edge without window sill.
Finished parapet height = top edge finished floor to top edge interior sill. For the France and Switzerland country setting, up to window sill top edge.
The (finished) floor height is defined for storeys in the structure settings. If a room name is set, the (finished) floor height assigned there takes precedence over the structure setting.

External reveal depth

Entry in the properties bar (illustration) or in the window parameter.

Recess/Recess for radiator
The width corresponds to the external frame dimension plus joints. Input in the window parameters.
Window doors: If the lower window frame is at floor height, a recess must always be set with the depth of the inner reveal.

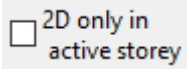
Outside recess
If this option is activated, the floor/outer covering is drawn as a recess to the window frame as soon as the bottom edge of the frame lies lower than the top edge of the outer covering.

Report as
The window can be quantified as a window or a door.

Opening in 3D

This setting is generally active. Optionally a generation of an opening into the 3D wall can be deactivated. In that case, only a 2D depiction of a window is generated in the wall.

2D only in active storey



The 2D depiction for multi-storey windows can be either in the own storey or in other storeys.

Renovation planning – fill automatically

If the status of a door is changed to demolition, the automatic generation of a wall that fills the hole can be triggered with this option.

Renovation planning

If a window is changed to demolition state, a wall is created to fill the opening automatically.

Copy parameters

	General		
☐	Window shape		
☑	Width		
☑	Height		
☑	Parapet height		
☑	Depth		
☑	Recess for radiator		
☑	Outside recess		
☐	Layer		
☐	Material		
☐	Casement rod lay out		*
☐	Glass composition		
☐	Lintel		dashed
			contiguous
			without
			contiguous
			contiguous with window
☑	Enter size		Gross clearance
			Net finished dim. from inner sill
			Net finished dim. from outer sill
☑	Enter the start height		Input from bare base
			Input from finished floor
☑	Gross/finished lintel		
☑	Side plaster gauge		
☑	Report		
☐	Frame		
☐	Floor plan depiction		

Window shape

There are 14 different shape types available for selection. The first 12 of these shapes are standard shapes, which have clearly defined outer contours (shape of the window reveal).

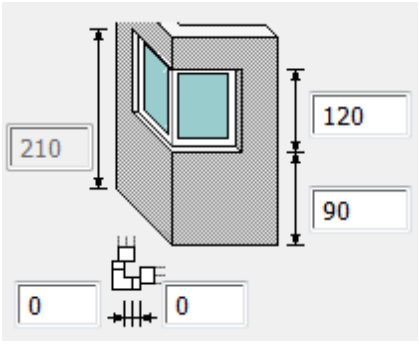
▼▼▼▼ WORKSHOP

Corner window

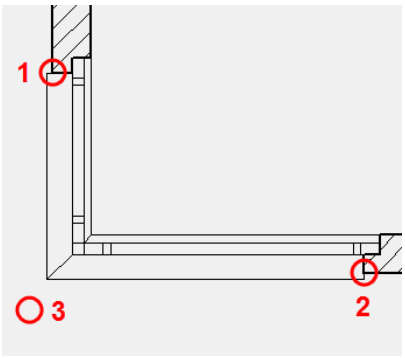
Work plane is on the normal storey work plane.
1. CREATE WINDOW function

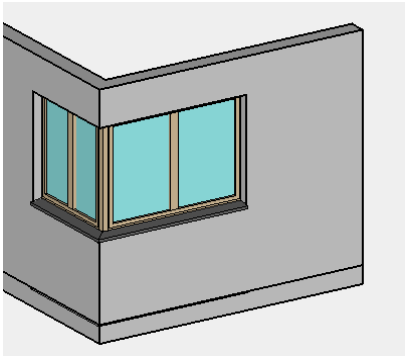
2. Select corner window shape.

3. As an additional value for corner windows, the window frame widening of the corner frame (left) and the window frame width for the corner frame (right) can be set. The window frame width = 0 setting transfers the window frame width from the frame detail parameter.



4. Place the window by entering both corner points and the direction of the corner window.





5. In order to define a frameless corner window it is necessary to deactivate to corner column. Additionally the frame width at the corner has to be set to 0. In such cases, the corner element may not be defined as a window that can be opened.

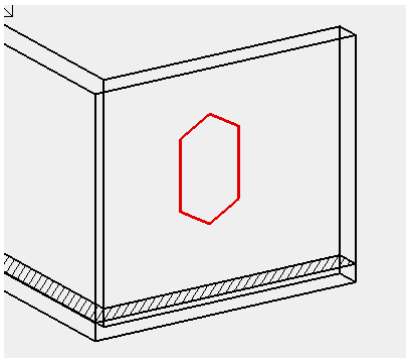
WORKSHOP END

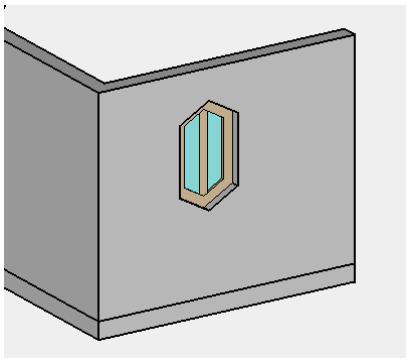
The **window by free form** shape allows you to define a free window contour. This contour should lie "on the wall" i.e. the work plane is positioned on the wall surface and a closed polygon is drawn there. Note here that windows of this shape are generally installed from the outer side of the wall. Various options (blinds, window sill, walling, etc.) are not available for this shape.

WORKSHOP

Window by free form

Place your work plane on the building outer shell (so that the window opens inwards). There are various ways to do this, e.g. by switching on the solid view [Ctrl]+[D], opening the WORK PLANE ON SURFACE function and selecting the wall view.





Draw a closed polygon as an exterior window contour. All of the drawing functions and help geometry are available here.
Run the WINDOW function to convert to a window. Select the WINDOW BY FREE FORM window shape and assign this to the drawn contour.

WORKSHOP END

The **window by free rectangle** shape is a simple tool for entering rectangular windows in 3D. Position the work plane on the wall. When opening the WINDOW function, only the bottom left and top right corner of the opening are queried. All further depiction variants result from the parameters set.

WORKSHOP

Window over multiple storeys

A window over multiple storeys can normally be set in the floor plan in the lowest involved storey. The correct height can be directly entered for the window height. The window is created contiguously in all storeys with one floor plan per storey. The wall axes must be exactly over each other.

You can also proceed in the same way as the WINDOW BY FREE FORM function (**previous workshop**) and place the work plane on the wall.
Drag the window to the facade with the WINDOW BY FREE RECTANGLE function. Left lower corner, then right upper corner.

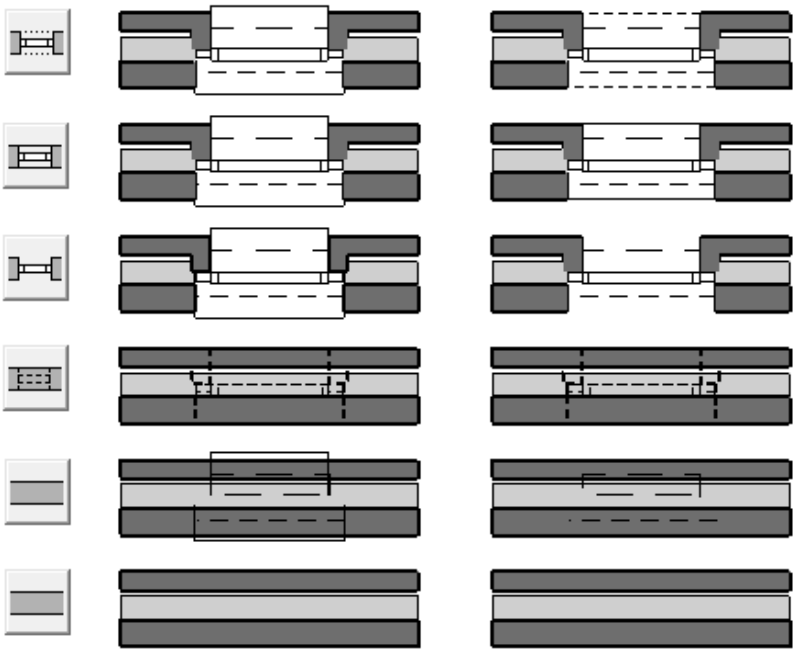
WORKSHOP END

Copy parameters

	General		
☑	Window shape		

Depiction

With window sills **without window sills**



Example with window recess and blind. Representation type 5 is shown above twice: the second-lowest series with window sills, blinds and recesses switched on.

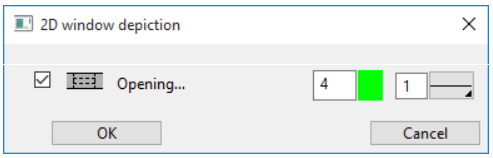
No lintel lines are shown when window sills are switched on.

- Type 1 dotted lintel lines.
- Type 2 solid lintel lines.
- Type 3 no lintel lines.
- Type 4 contiguous lintel (hatch) with window. Blinds and recesses are switched off in the example.
- Type 5 contiguous lintel (hatch).

The window sills, blinds, recesses etc. can be switched on or off for all types in the 2D depiction.

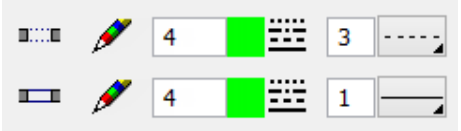
TIP

For type 4 "Lintel continuous with window", the pen and line type for reveals and frames can be selected in the 2D representation.



Representation levels parameters

Type 1 + 2 are set in the representation levels parameters dialog window.

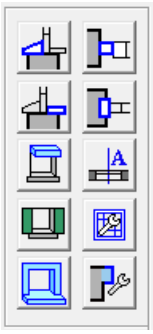


If the representation level is refreshed or changed, then the settings of the representation level parameters are adopted.

Copy parameters

☑	Lintel		dashed
			contiguous
			without
			contiguous with window
			contiguous

Window detail parameters



Here you will find additional settings options for an individually customised window. Each of the buttons shown leads to another separate set-up dialog window.

TIP

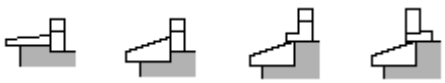
Various settings in the detail parameter dialog windows depend on the representation level. This means that when the representation level is refreshed, the windows will be regenerated and adapted to the settings in the representation level.

Representation levels create the conditions for covering several planning phases with one design model. This means that by changing the representation level, the window can be provided with a profile representation for the input planning which differs from that in the work planning. This always relates to the same window.
If the representation level is changed or refreshed (SETTINGS > REPRESENTATION LEVELS) and "Refresh design model + views" is confirmed with OK, then the pre-settings of the representation level are adopted.

In order to express this dependency clearly, the respective sections of the representation level dialog windows are listed in addition to the detail dialog windows shown below.

Outer sill

Overview

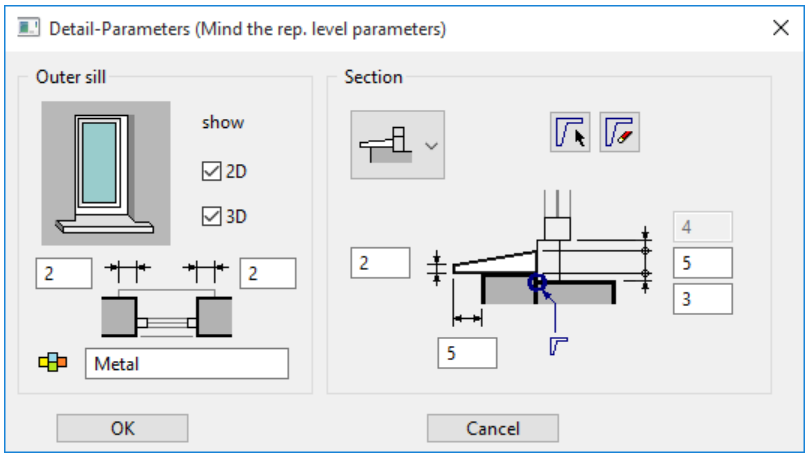


Window sills of type 1 and 2 are in front of the window frame.
Window sill type 3 corresponds to the French construction type.
Window sill type 4 is for windows, which open outwards.

The 2D and 3D fields activate the window sill.
If 2D is activated, the lintel line is shown with pen 0 (=not printed).

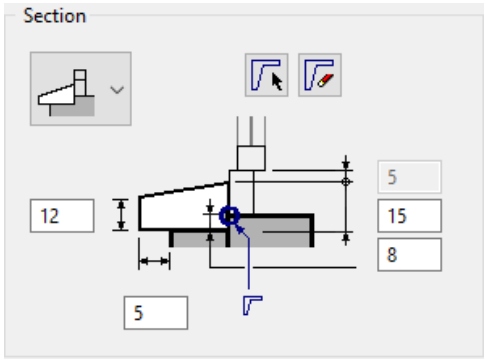
The side widenings can have different values on the left and right.

Low window sill (type 1)



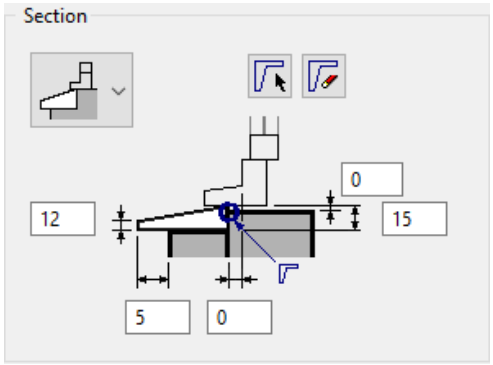
The cross-section is defined with front height, sill height and projection.
"Parapet offset" defines the difference in height between the bare parapet on the inside and outside.
The value with a grey background shows the protrusion of the top edge of the frame over the window sill.

High window sill (type 2)



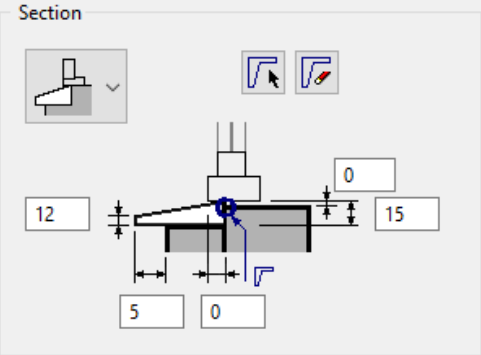
Entries the same as type 1

France window sill (type 3)



The cross-section is defined with the front height and the height, the projection (offset) and the distance to the frame line ("sill depth offset).
"Parapet offset" defines the difference in height between the bare parapet on the inside and the top edge of the window sill.

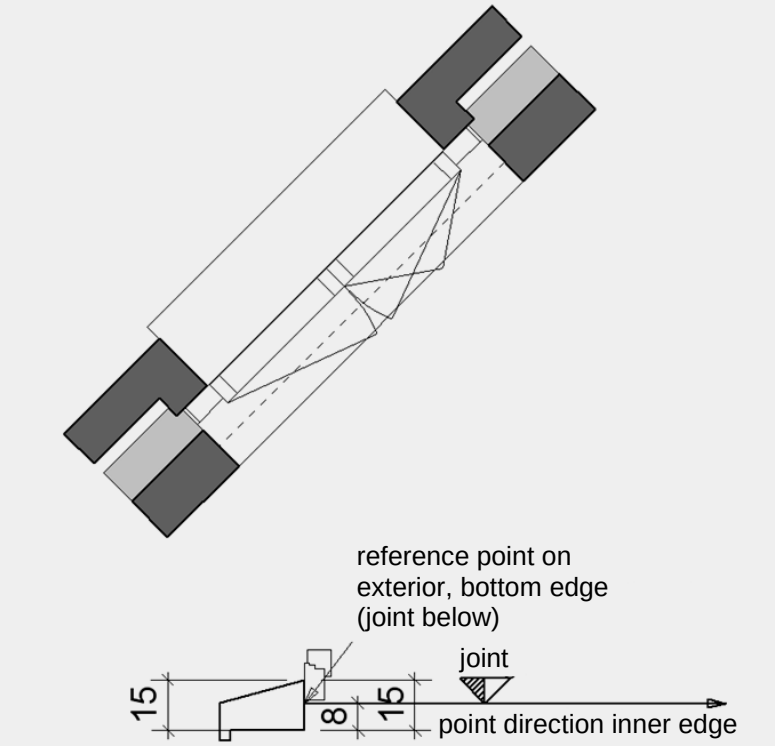
Window sill for windows which open outwards (type 4)



Entries the same as type 3

Create sill from free contour

1. Before the free contour can be defined as a window sill, the dimensions and positions must be preset in the detail parameter.
2. Draw the window sill contour in the floor plan according to the main dimensions of the existing window sill. The contour should remain upright regardless of how the window axis is lying in the floor plan.



3. Edit window (click on the window) and open the WINDOW PARAMETERS set-up dialog window.
4. Start definitions with the button "Define window sill from free contour" in the outer sill detail parameter.

5. Capture point of reference (exterior, bottom edge of joint below)
6. Define any point in the direction of the inner edge.
7. Close all set-up dialog windows by clicking OK.

Alternatives when defining

With the WORK PLAN ON SURFACE function, click on the surface of the frame side.
Draw the frame contour in this work plane and then proceed as above.

Note
This window can be saved as a parameter.
The sill depth is also fixed when modifications are made to the w-frame depth (in wall).
The values cannot be changed in the outer sill detail parameter, with the exception of the side widenings.

Delete free window sill

The window sill is reset to a standard cross-section using the "Delete free contour" button.

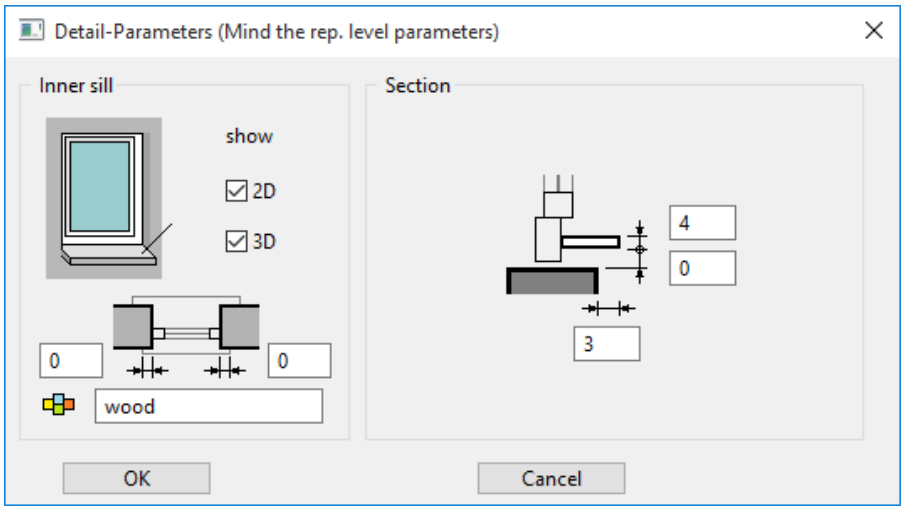
Representation levels parameters

Representation in 2D/3D and the 2D depiction pen depend on the representation level.

Copy parameters

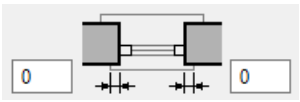
	Outer sill		
☑	Represent in 2D		
☑	Represent in 3D		
☑	Sill type		
☑	Height		
☑	Front height		
☑	Offset		
☑	Parapet offset		
☑	Side widening left		
☑	Side widening right		
☑	Sill depth offset		
☑	Cross section contour		
☑	Pen		
☑	3D depiction		
☑	Material		

Inner sill



The 2D and 3D fields activate the window sill.
If 2D is activated, then the 2D depiction of the lintel is switched off.
If there is no inner sill (e.g. the parapet has tiles in the bathroom), then neither 2D nor 3D should be switched on.
The following does not apply for the country setting France and Switzerland:
"Take gauge as plaster" should be activated for finished dimensions from the top edge of the inner window sill. Otherwise, the sill height is set to 0 cm. This means that both the finished parapet height and the finished clearance can be set correctly.

Side widenings



The side widenings can have different values on the left and right.

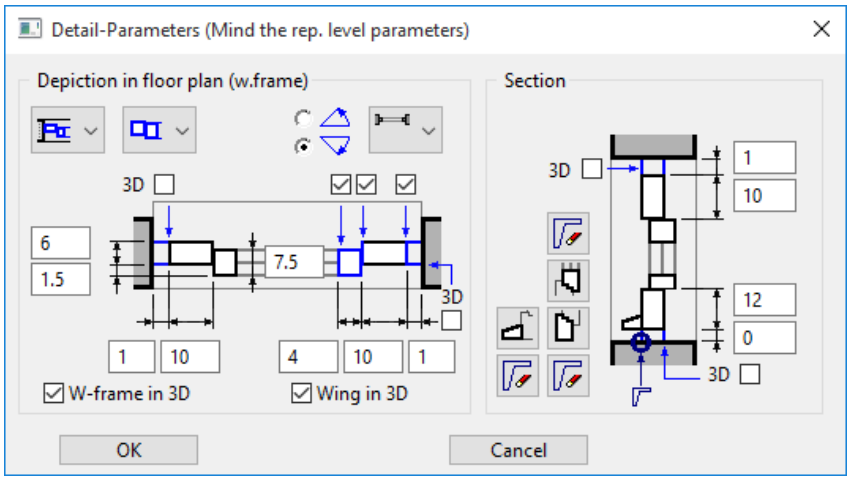
Inner sill from free contour
An inner sill can be defined as well as the frame leg in the **w. frame parameters**.

Representation levels parameters
Representation in 2D/3D and the 2D depiction pen depend on the representation level.

Copy parameters

	Inner sill		
☑	Represent in 2D		
☑	Represent in 3D		
☑	Gauge		
☑	Offset		
☑	Offset sill		
☑	Pen		
☑	Line type		
☑	3D depiction		
☑	Material		

Window frame parameters



The floor plan detail and a section of a window are shown in the dialog window.

2D depiction in floor plan (w.frame)

Three profiles are available for selection in the floor plan:
Simple 2D line. The 3D depiction can be set independently of this.
Double 2D lines with frame and casement limitations.
Frame and casement with different gauges and offset.
Block frame and casement (window opening outwards).

Copy parameters

	Frame		
☑	Floor plan depiction		Line
			W.frame and casement equal
			W.frame and casement separated

Style of the casement stop

Frame settings

The tick boxes for casements, frames and joints affect the 2D depiction in the floor plan. The side joints are represented in 3D.
In the section, you can use the tick box to select whether the joint should be represented in 3D for the top and bottom joints. For a type 5 blind lying above, the joint widths above the blind height should correspond.
W-frame in 3D and *Casement in 3D* switches the entire representation of the window profile in 3D on or off (when switched off, glazing can be generated in the raw window cavity!)

Copy parameters

	Frame		
☐	Floor plan depiction		Line
			W.frame and casement equal
			W.frame and casement separated
☑	Normal frame/block frame		Normal frame
			Block frame

☑	Casement gauge		
☑	Casement offset		
☑	Window frame gauge		
☑	Casement		☑
☑	Casement frame width		
☑	Frame		☑
☑	Side joint		☑
☑	Side joint width		
☑	W-frame in 3D		☑
☑	Casement in 3D		☑
☑	Frame width up		
☑	Frame width bottom		
☑	Frame width left		
☑	Frame width right		
☑	Top joint width		
☑	Bottom joint width		
☑	Top joint in 3D		☑
☑	Bottom joint in 3D		☑
☑	Left joint in 3D		☑
☑	Right joint in 3D		☑
☐	Pen		
☐	Line type		
☐	3D frame representation		
☐	3D casement representation		

Opening symbol floor plan

No symbol
Turn casement 1/3 open
Turn&tilt casement 1/3 open
Turn casement open
Turn&tilt casement opened

Copy parameters

	Symbols		
☐	Pen		
☐	Line type		
☑	Floor plan depiction opening		No symbol
			Turn casement 1/3 open
			Turn&tilt casement 1/3 open
			Turn casement open
			Turn&tilt casement opened
☑	Geometry		*

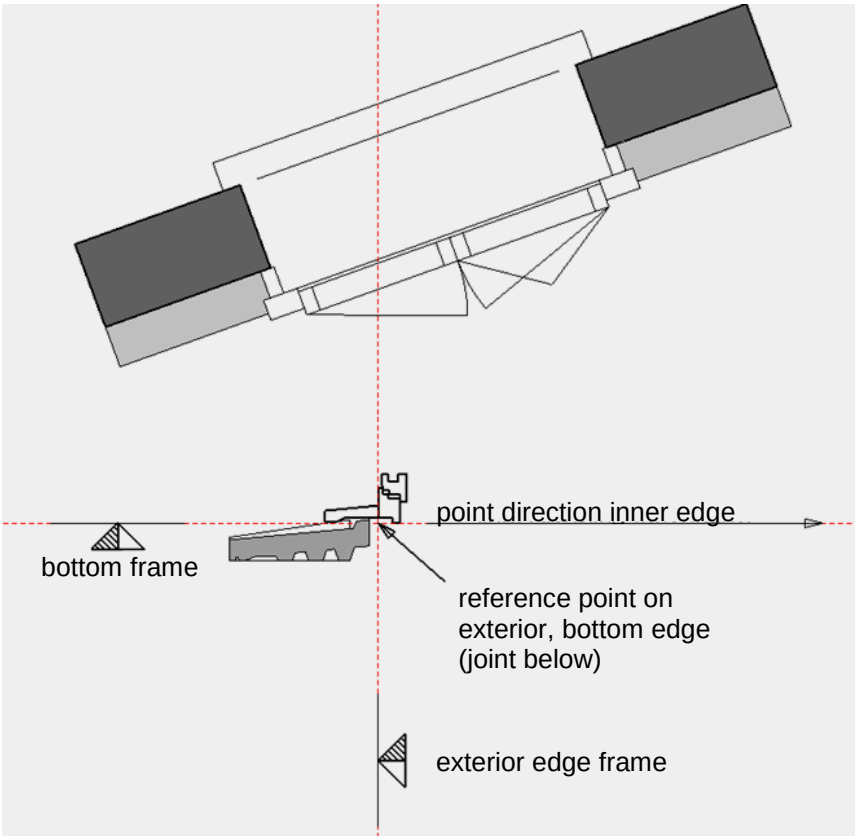
Opening direction

Opening inwards or outwards

Define frame, limb and casement frame from free contour.

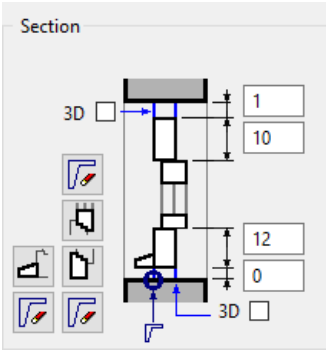
1. Before the free contour can be defined, the dimensions and position must be preset in the detail parameter.
2. The profiles are created using the desired detailing. The contours should remain upright regardless of how the window axis is lying in the floor plan. Each contour must be an individual polygon.

3. Using help lines, fix the frame outer edge and bottom edge of the frame.

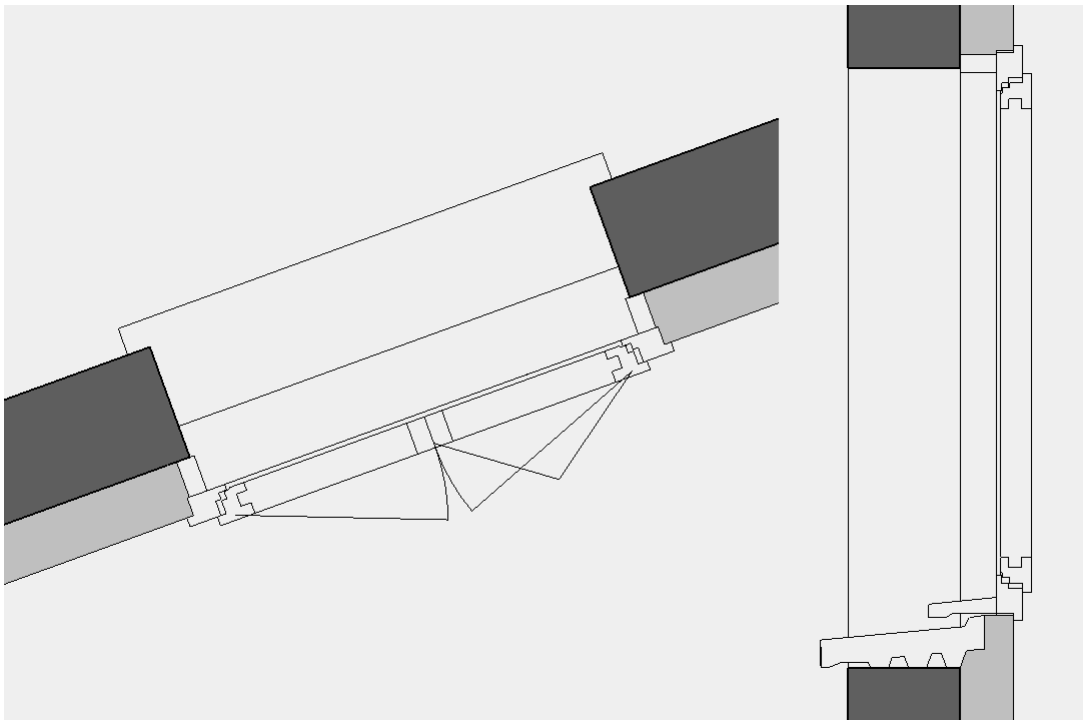


Example: France window construction with padding

4. Edit window (click on the window) and select Frame in the window parameter detail parameter.



5. Start definitions using the contour button.
6. Capture point of reference (exterior, bottom edge of joint below).
7. Define any point in the horizontal direction of the inner edge. The contour is adopted with <APPLY>.
8. Close input window with OK.



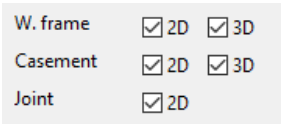
Window defined with free contours for window sill + window frame

Note
The contour is adjusted to the required width for different window frame widths (according to the frame detail parameter).

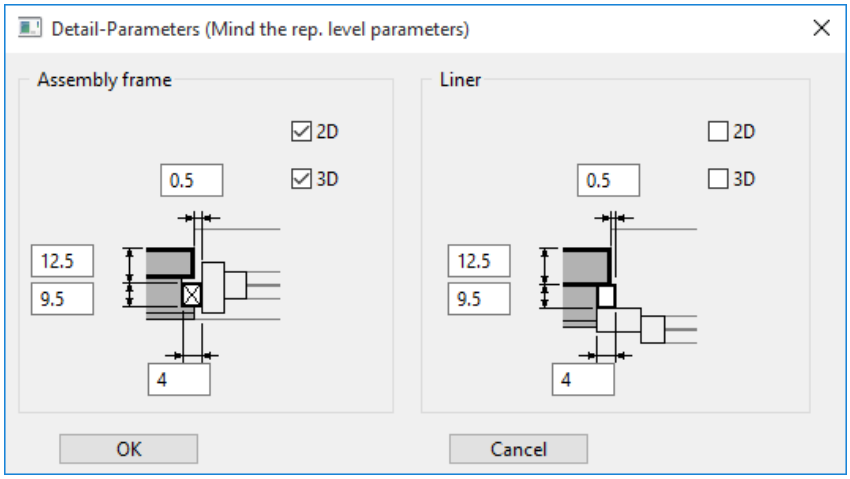
An inner window sill can also be defined with the frame leg.

The contours can also be defined using the window editor.

Representation levels parameters
All profile depictions including the profile pen depend on the representation level.

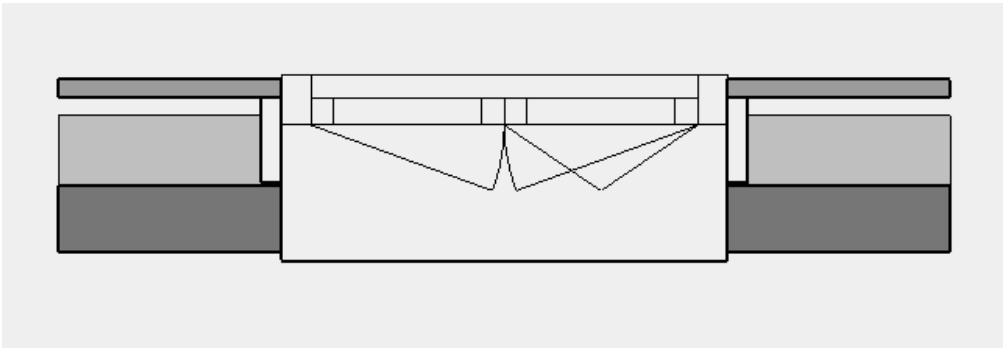


Assembly frame + padding



An assembly frame or padding can be specified using this dialog window.

Assembly frame



An assembly frame can be defined on the four sides of the window frame.
The position is determined by the distance to the window frame (joint/net offset) and by the depth (offset).
The cross-section is given from the width and the gauge.
The 2D and 3D fields activate the assembly frame.
The assembly frame can also be used for a dummy frame.

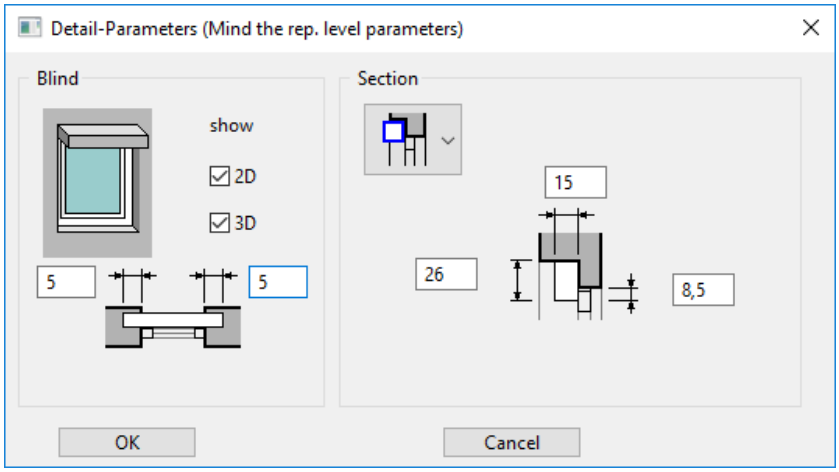
Padding
Padding can be defined on the side and at the top (see illustration in last chapter).
The position is determined by the difference to the outer gross clear dimension (joint / net offset) and by the depth (offset).
The cross-section is given from the width and the gauge.
The 2D and 3D fields activate the padding.

Copy parameters

	Assembly frame/padding		
☑	Represent in 2D		☑
☑	Represent in 3D		☑
☑	Execution		Assembly frame
			Padding
☑	Width		
☑	Depth		
☑	Offset		
☑	Joint / net offset		
☐	Pen		
☐	Line type		
☐	3D depiction		

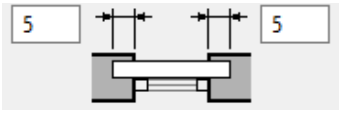
Blind / net curtain

Overview



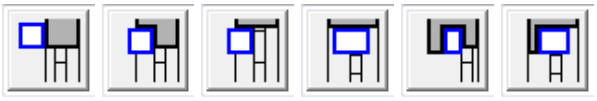
The 2D and 3D fields activate the blind.

Side widenings



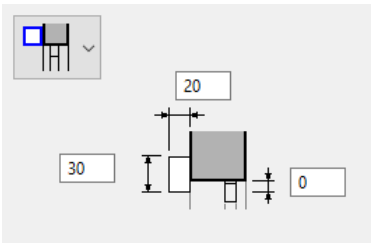
The side widenings can have different values on the left and right.

Types



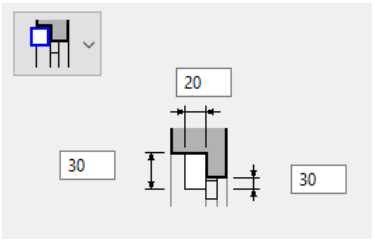
Type 1 on facade outer side
Type 2 + 3 on outer side of frame
Type 4 for renovations between lintel and frame
Type 5 for external insulation and back-ventilated facade, position freely definable
Type 6 over the frame, for solid angle constructions

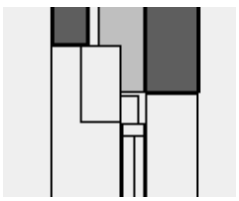
Blind on facade (type 1)

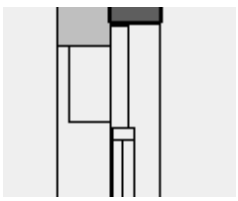


The offset causes the position to be adjusted to the finished net clearance.

Blind on outside of frame (type 2)



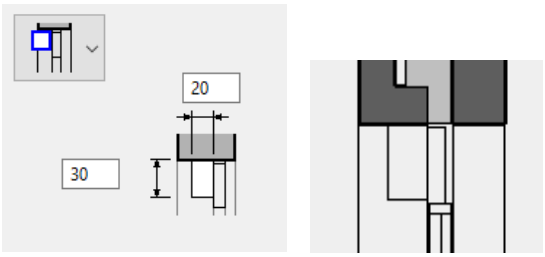




The offset can also be larger than the cabinet height (illustration on right).
No wall layers are imported in the lintel in type 2 (centre illustration).

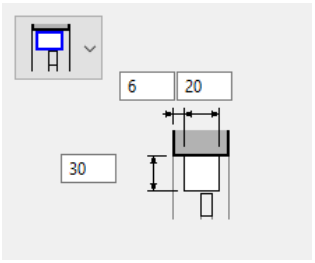
Reference marker for opening dimension and height marker:
Gross lintel inside and bottom edge of cabinet (net lintel height).

Blind on outside of frame (type 3)



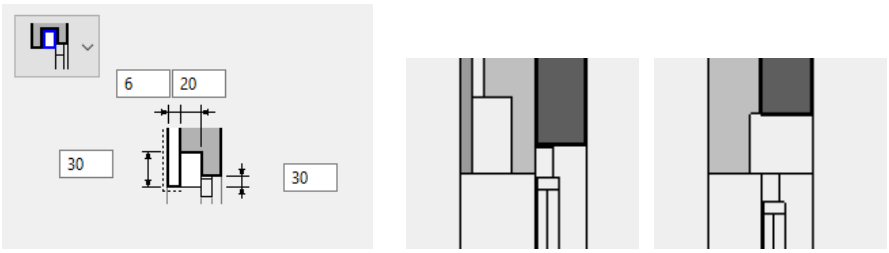
For type 3, the wall layers are imported according to the STOP setting.

Blind between window frame and lintel (type 4)



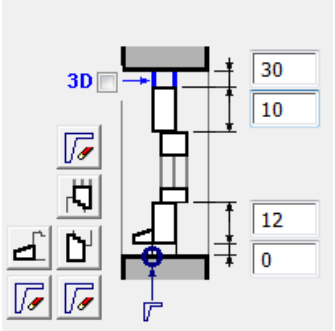
The top edge of the window frame is automatically adjusted due to the cabinet height.

Blind position freely definable (type 5) for walls with external insulation



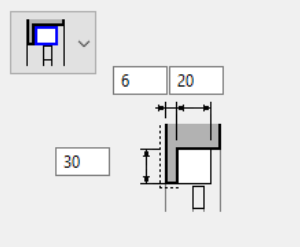
Blind type 5 is particularly suitable for facades with external insulation.
The cabinet can be positioned on the outer side of the frame (e.g. for gathered slat blinds) or can lie above the frame (blind).
The entry style differs somewhat from the other types as a result.

- Offset: Value for the difference between finished clearance and gross clearance. The offset must equal the cabinet height for blinds above the frame. This dimension determined for the offset is important for the entry of gross clearance and finished clearance, as well as for the opening dimension.
- The position of the cabinet is independent of the frame.
- If the blind cabinet is above the frame and the lintel over the cabinet, the cabinet height must be entered for the joint above and for the offset.



Reference marker for opening dimension and height marker:
Gross lintel inside and bottom edge of the cabinet (net lintel height) = bottom edge of insulation.

Blind with angle (type 6)



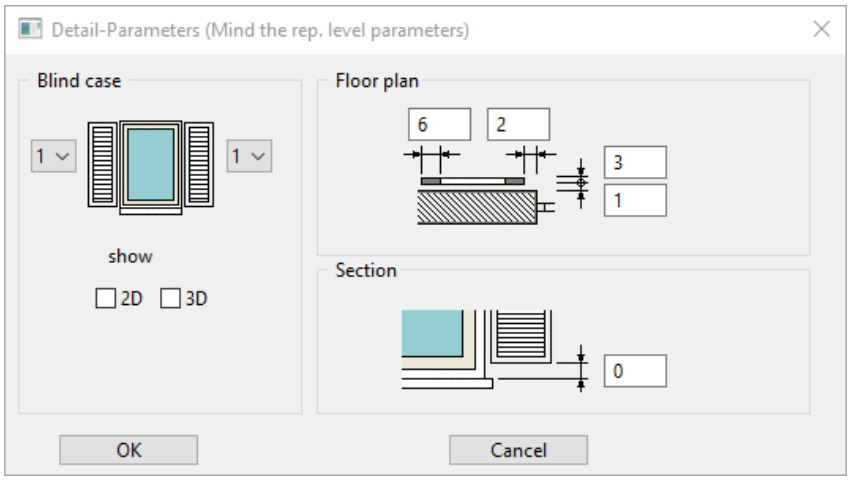
Blind type 6 is suitable for solid constructions.
Reference marker for opening dimension and height marker:
Gross lintel exterior and cabinet height
Inside label: The reference height for the lintel height is measured for the top edge of the cabinet.

Copy parameters

	Blind		
☑	Represent in 2D		
☑	Represent in 3D		
☑	Blind type		
☑	Width		
☑	Height		
☑	Offset		
☑	Depth		
☐	Pen		
☐	Line type		
☐	3D depiction		

For all types, the offset is the difference between gross lintel and the bottom edge of the blind (net lintel height).

Blind case



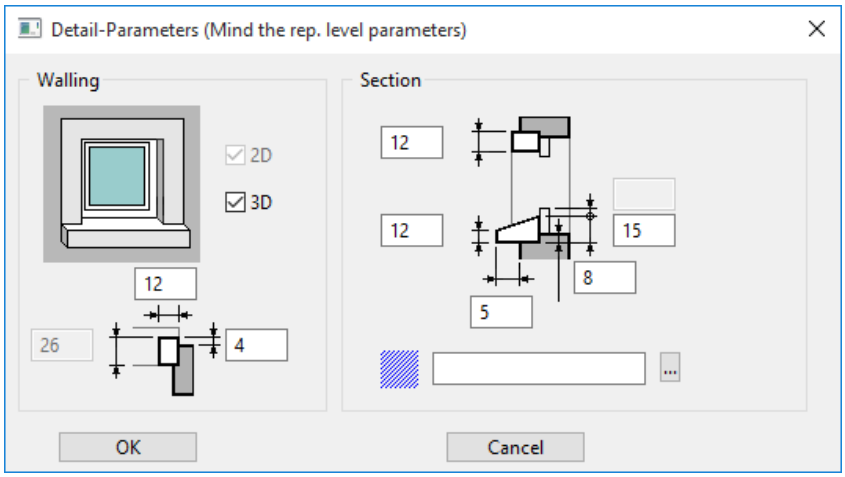
The 2D and 3D fields activate the blind case.
The position is determined by the distances to the wall and reveal.
The shape is given by the window frame width and the gauge.

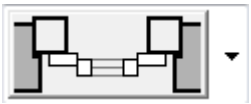
The CAD calculates the blind width and height from the settings of the window opening and the number of blinds.
The 3D hatch is set as the blind infill and can be seen in views and sections.

Copy parameters

	Blind case		
☑	Represent in 2D		
☑	Represent in 3D		
☑	Number left		
☑	Number right		
☑	Window frame width		
☑	Distance to reveal		
☑	Gauge		
☑	Distance to wall		
☐	Pen		
☐	Line type		
☑	3D hatch		
☐	3D depiction of frame		
☐	3D depiction of interior part		

Window walling





This is activated with the stop for the window walling.
The lintel gauge, side gauge and walling offset produce the side and upper cross-section depending on the w-frame depth (in wall).
The window sill is determined with the window sill height, front height and offset.
The difference from the inner to the outer parapet is entered for the parapet offset.
The cross-sections are hatched in the floor plan and section using the hatching parameters.

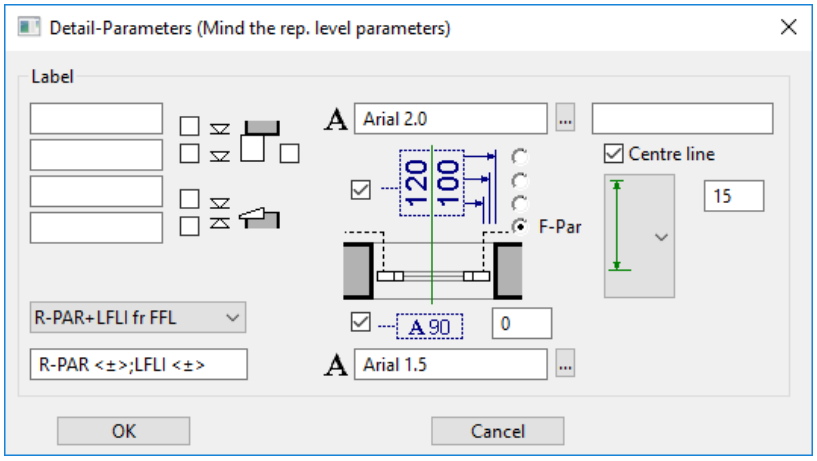
Copy parameters

	Walling		
☑	Represent in 2D		
☑	Represent in 3D		
☑	Gauge		

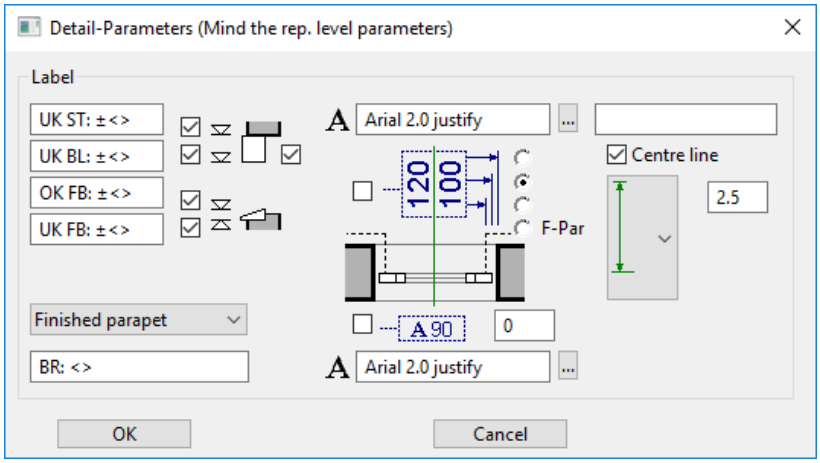
☑	Offset		
☑	Parapet offset		
☑	Pen		
☑	Line type		
☑	Hatch		
☐	3D depiction		
	Lintel		
☑	Gauge		
	Outer sill		
☑	Represent in 2D		
☑	Represent in 3D		
☑	Height		
☑	Front height		
☑	Offset		
☑	Parapet offset		
☐	Side widening left		
☐	Side widening right		
☐	Pen		
☐	3D depiction		

The side widenings of the window sill are not active for the walling.

Labelling parameters



Alternative 1: Label inside, centre line and large text on centre line

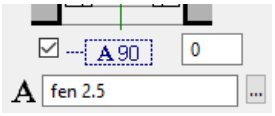


Alternative 2: Height marker

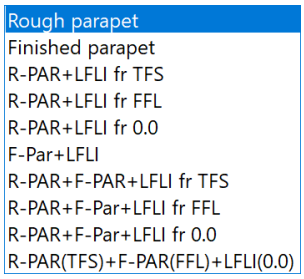
General
A pre-text and a placeholder with <> for the value calculated by the CAD are entered for each label field.
The text parameters are selected from the general parameter database.
In order to manipulate text parameters, please select the dialog window for the text parameters in the menu LAY-OUT > TEXT > TEXT PARAMETERS.

Height marker (Switzerland)
The height markers are activated at the top left. This switches off the large text on the centre line. If the selection box on the right of the blind is activated, the bottom edge of the blind is only given if a blind is present.
The pre-text (e.g. top edge floor height) and ±<> is written into the floor plan.
The font parameter is selected above. A parameter should be selected in the block style for an optimal representation.
The distance of the text block is determined on the right (for the centre line).

Inside label (Austria)



Activation using the box under the floor plan.



The label corresponds to the specifications of OE standard A 6240-2.
Bare parapet = rough dimension top of slab up to bare parapet height (without inner window sill).
Finished parapet = finished dimension top edge of finished floor level to top edge of interior sill.
For the markers GR-PAR = bare parapet, F-par = finished parapet, and LIN-US = bottom edge of inner lintel, the initial height can be selected from the top edge of the bare ceiling, finished floor or from ±0.00.
The type of output in the floor plan is determined in the dropdown box (illustration above).
If the markers for GR-PAR+LIN-US are selected, the values should be separated with ";" e.g.
GR-PAR <>;LIN-US <>
The font parameter is selected in the centre at the bottom.

TIP

The types rough or finished dimension write the actual dimension of the drawn window into the plan graphics, regardless of which entry style is used for constructing the window!
The (finished) floor height defined in the structure settings for the storey is taken into account for the FFL height. However, if there is a **room name**, the (finished) floor height used in it takes precedence over the "general (finished) floor height)" in the structure settings.

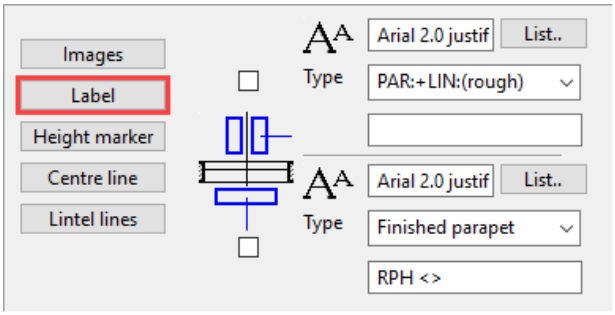
Large text on centre line
Activation of large text in the dialog window using the box on the left. This switches off the height markers.
You can select:

- Gross clear dimension
- Finished clear dimension from the outer window sill (architecture line)
- Finished F-par clear dimension from the inner window sill (OE standard)

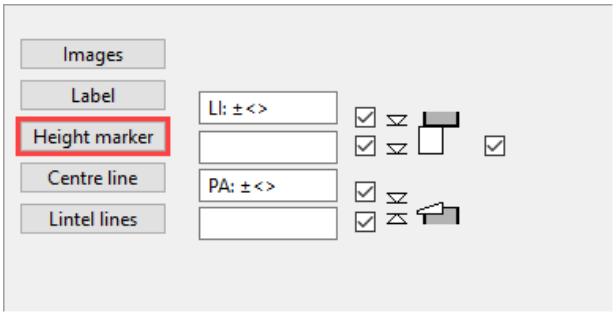
The rough dimensions are calculated without stop width when the stop type "**Window with external insulation**" is switched on.
Recommendation for finished clear dimension: Use F-Par type when this style is selected for entering window dimensions.

Centre line and distance of height marker to the window.
On the right, the length of the centre line can be entered absolutely or relatively to the length of the label. The distance of the height markers is determined at the same time.

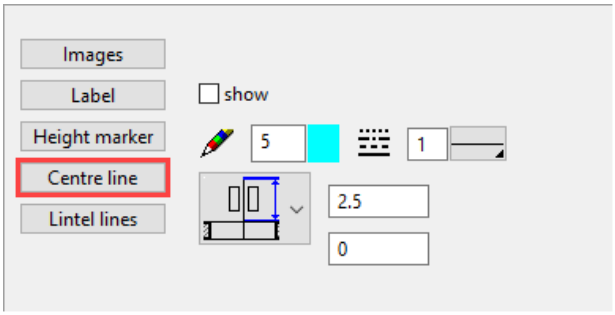
Representation levels parameters
The following settings are active when a representation level is changed or when refreshing the representation level:



The above font parameter also applies for the height markers.



The button on the right of the blind cabinet is used to write only the bottom edge of the blind when a blind housing is present.

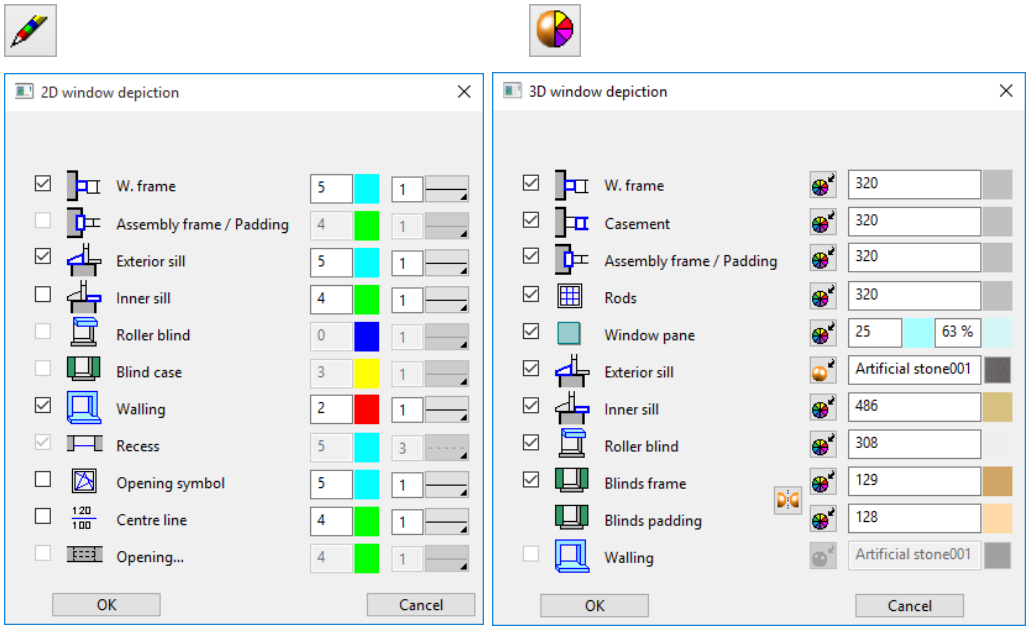


Copy parameters

	Label		

☑	Window height marker		
☑	Depict large text		
☑	Large text		Gross clearance
			Finished clearance
			F-Par
☑	Size/Height notation text parameters		
☑	Depict parapet text		
☑	Parapet text		Bare parapet
			Finished parapet
			Gr-PAR+LIN-US fr US Slab
			Gr-PAR+LIN-US fr FFL
			Gr-PAR+LIN-US from +/- 0.00
☑	Parapet text parameters		
☑	Parapet text format		
☑	Parapet text spacing (mm)		
☑	Centre line		
☑	Length of centre line over		Length
			Distance to window
☑	Length of centre line (mm)		
☐	Pen for centre line		

2D/3D depiction



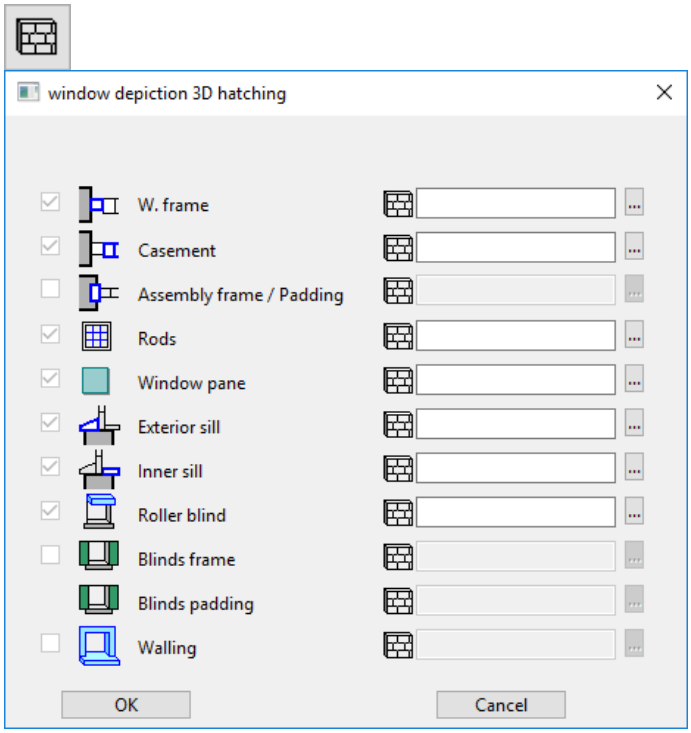
2D depiction
Setting the pen and line type 2D depiction for all window parts activated in the dialog windows. The 2D can be switched off in the tick boxes.
The grey background means "undefined".
This makes the components of the window immediately apparent.
Opening in special case: Active if "**Lintel continuous with window**" is selected for the representation.

3D depiction

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

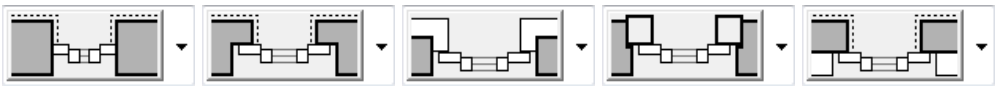
3D hatch



Every sub element of a window can be assigned a hatch that appears in the calculated hidden line views.

Stop editor

Stop editor in the window parameters



Selection of stop in the window parameters

Open the stop editor to select the stop in the properties bar.

1. Without stop
2. Stop for solid construction
3. Stop for facades with external insulation
4. Stop for window walling
5. Stop for walls with internal insulation

The stop editor can be opened directly in the properties bar.

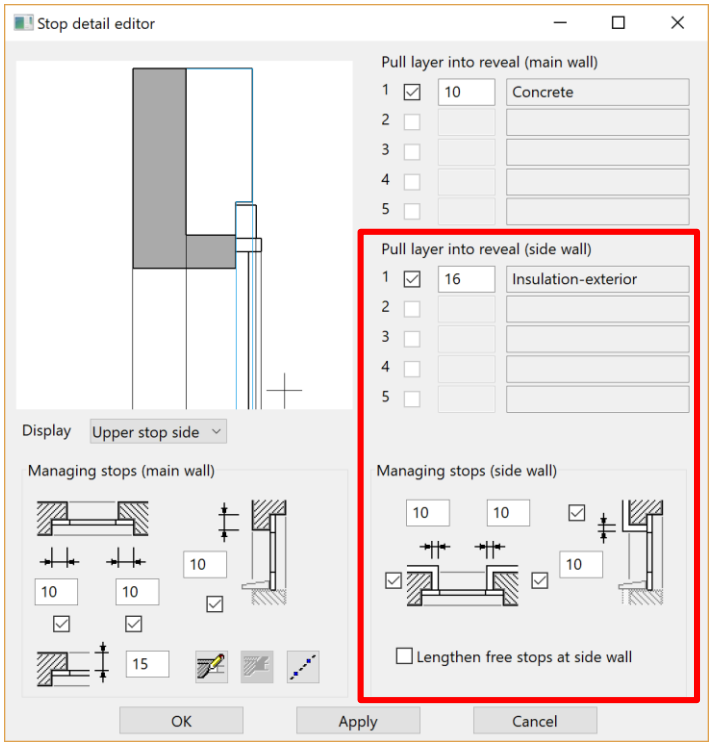
The gradient of the individual wall layers in the stop area depends on the wall construction and the stop type. As the wall composition is yet unknown when placing a new window, there is no preview and you cannot yet configure settings.
The correct layer gradient of the wall can only be determined when the existing window is edited.
Depending on the stop type chosen, the stops are defined differently by the CAD.

The stop detail editor consists of the preview and the list of the individual wall layers.

Preview
A preview first appears when you edit a window.
It is preferable to work in contour mode: CTRL + K.

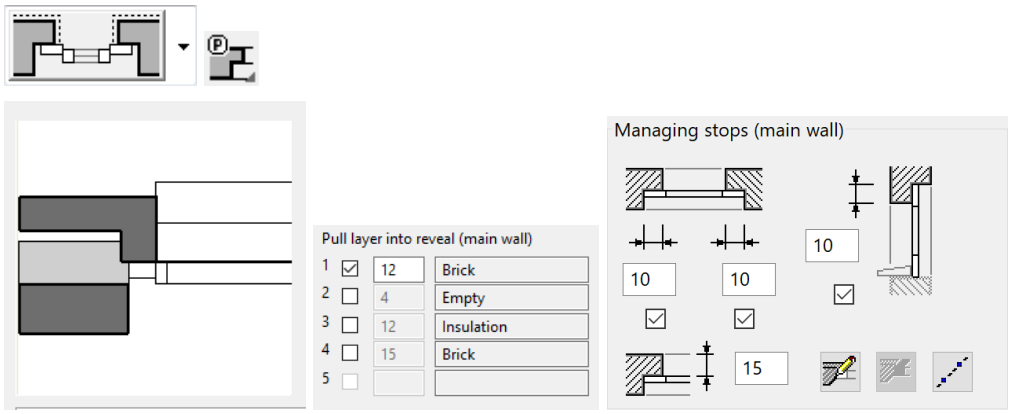
The OPTION menu defines which region is displayed in the preview window.

Main wall / side wall



The red marked area is only active if a side wall exists. Here the stop settings for a side wall can be configured.
The settings for the main wall are configured below the graphics window and for the main wall layers right beside the graphics window.

Stop for solid constructions

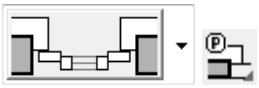


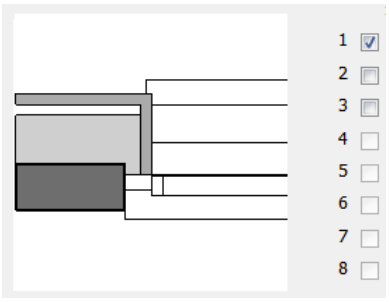
For the stop for solid construction, the external layer is imported with the layer gauge and the insulation is cut out.

List of wall layers

The wall layers are listed here. This list is only correct if you edit a window; when you place a window, the last values are always shown, as the program assumes that you are placing the window in the same wall.
In the column "Draw wall layer into reveal", you can decide for each layer with a tick in the tick box whether the respective layer should be drawn into the reveal.
For each individual layer, the value of the gauge with which the layer goes into the reveal can also be manipulated.

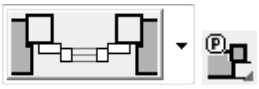
Stop for facades with external insulation





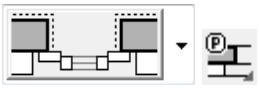
For the stop for facades with external insulation, the exterior layer is imported with the layer gauge. The CAD calculates the gauge of the insulation layer drawn into the reveal: Stop width less cladding. The "air" layer is treated by the CAD as a special layer and is not taken into account.
For the opening dimensioning, the raw opening of the load-bearing layer can be dimensioned using this stop type.

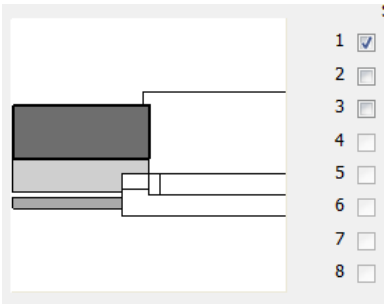
Stop for walling



Walling requires additional settings. These are entered in the window walling detail parameter.

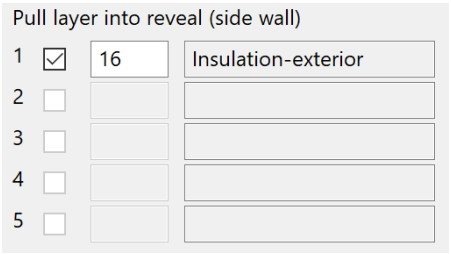
Stop for walls with internal insulation

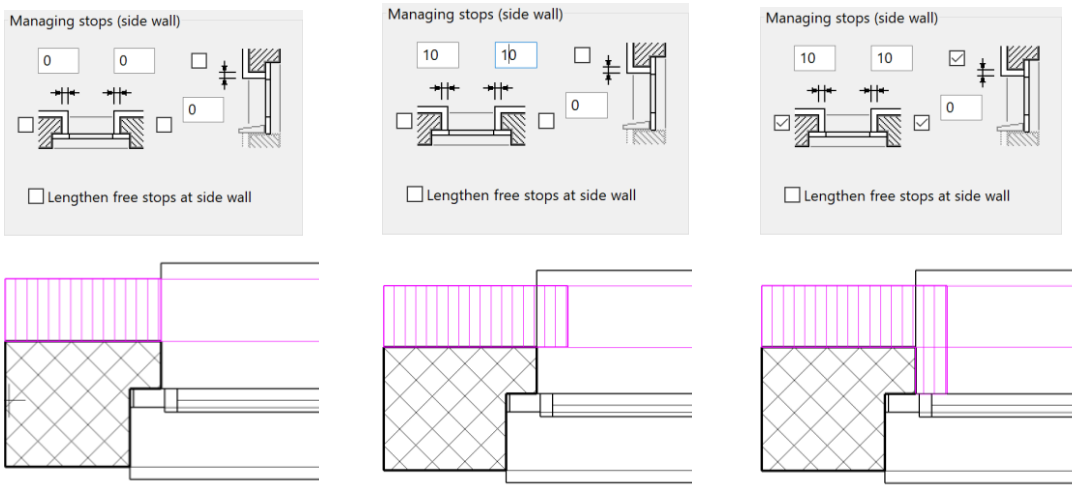




If the outermost layer should not be dragged inside, set the gauge to 0.

Side wall

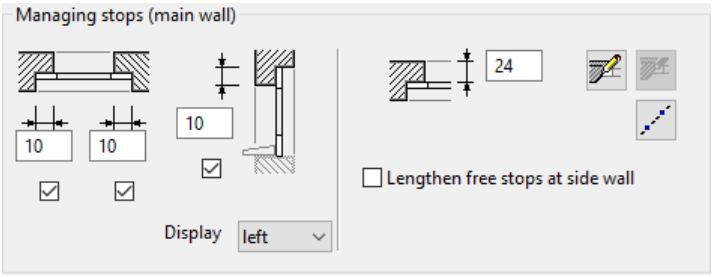




No value | with extension | drag into reveal

The option LENGTHEN FREE STOPS AT SIDE WALL means that the stop is tangentially extended to the side wall.

Control



Stop
Left, right, top and bottom.
If the lintel stop is inactive, this is overridden by a blind setting.

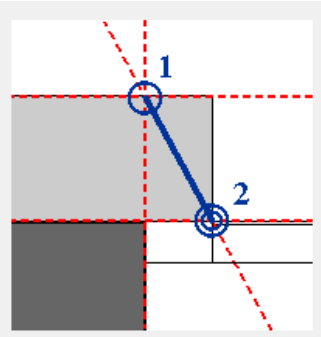
Window combinations
In order for two individual windows to be closed together (e.g. window with window doors), the stop must be set to 0 for the combination and the tick removed in the box below it (in the illustration for the stop on the right).

Define free stops
In order for free stops to be defined, the window must have been set previously with normal stops.
The free stops are drawn directly into the preview window.
Free stops are only defined for the wall layers, which differ from the automatic stop.
The window can be saved as a parameter.
Limitation: Free stops do not match modified window depths (in wall).

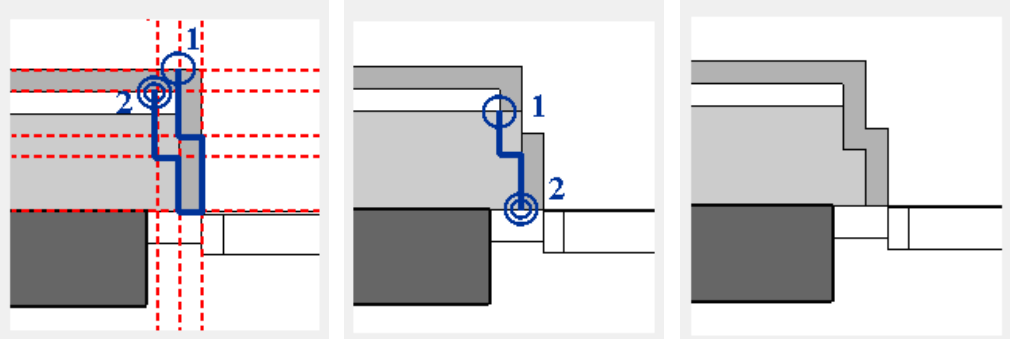
Procedure
Select the stop side with the Display button.

Set the contour in the preview window using the help lines.

Draw contour for layer in the preview window: From layer outer side point 1 to layer inner side point 2. Double-click to close. It can also be started from the layer inner side.



An individual contour must be drawn for each layer to be modified.



The parameters of this type of window can be passed on using the COPY PARAMETERS function.

The function DELETE FREE STOP removes a drawn stop again. You need to click it with the mouse in the preview window.

Notes
Windows with free stops can be saved as parameters.

Modify wall layer gauges and w-frame depth (in wall):

- Point 1 + 2 stay on the layer border.
- All elements of the contour maintain their original length, with the exception of the last element for point 2.
- If the contour only consists of one element (as in the first example), then this is dragged to the new length between point 1 + 2.
- It follows from this that: A change to the w-frame depth (in wall) requires a modification of the layer gauge and is only possible for simple contours (first example).

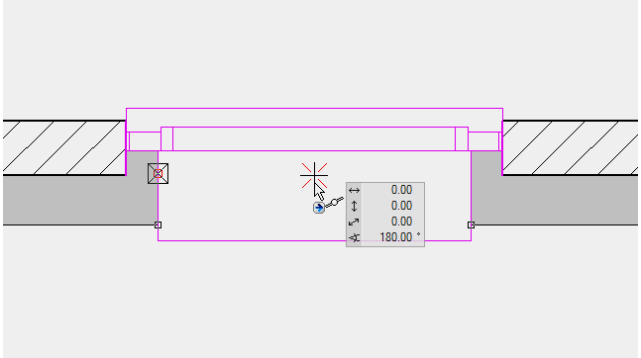
Tool for window division/muntins

The window editor can be launched using the button in the window parameter or in the properties bar.
This tool allows you to set the window divisions manually. All window divisions, which are no longer possible with the WINDOW DIVISION or MUNTINS function,

can be set using this function without any problems. The functionality is explained in the **Glass element** section.

MODIFICATION FUNCTIONS

Placement points
If a pre-existing window is edited, the original placement point of the window is indicated. Modifications to the window width always take effect from this point.
The point can be moved to the reference points on the left, right and in the centre using the mouse.



Move the placement point with the mouse.

TIP

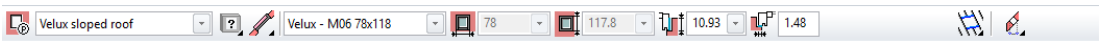
After selecting the door, click on a handle or gripper of the contour to access manipulation functions directly in a toolbar or by using [TAB] with the cursor.

ROOF WINDOW

When you click the CREATE WINDOW function, the settings are copied from the most recently placed window and the window can be placed immediately.

Once the values have been entered in the parameters, a roof plane must be selected for positioning the roof window then the position in the floor plan and finally the direction of the opening are set.
If the roof window is placed on a flat roof, the horizontal orientation can also be determined.

ROOF WINDOW PROPERTIES BAR



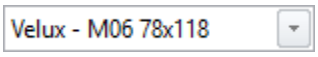
The properties bar becomes visible as soon as the CREATE WINDOW function is launched or if an existing window is edited.
You can manipulate the main values in the properties bar.

Window parameters

Type

Renovation planning state (see chapter 8.5)

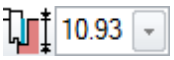
Window shape



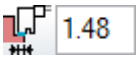
Predefined window

Window frame width

Window frame length



Installation depth



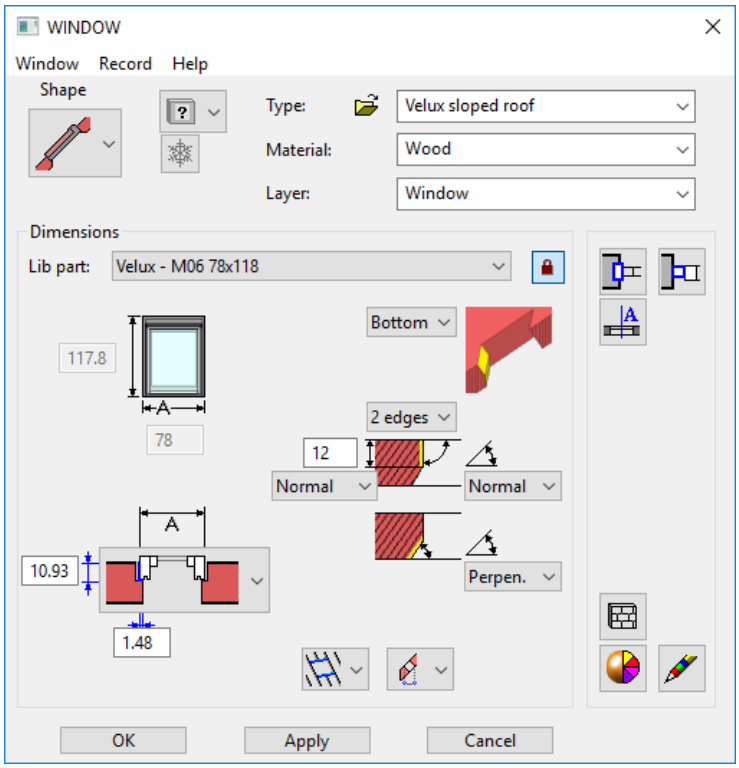
Frame bearing area

Trimmer

Style of position

WINDOW PARAMETERS

The set-up dialog window for the window is opened with the WINDOW PARAMETER function. The settings of this dialog window are maintained. If the dialog window is closed and reopened, the status most recently set is still available.



General parameters

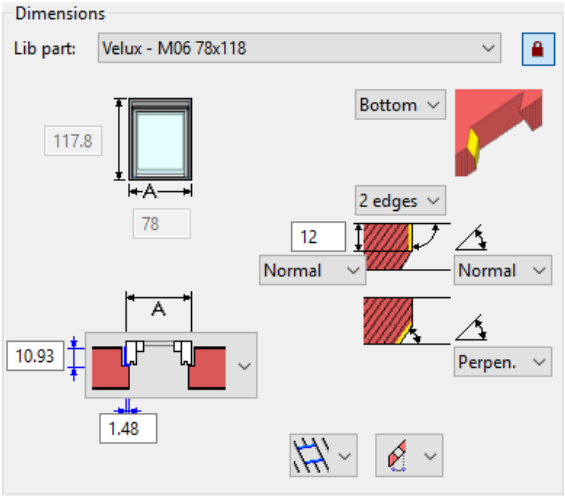
- Status renovation planning

- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Material
The material is taken into account in the report. Any name can be chosen, simply entered in the dropdown box and confirmed with [Enter]. If you want to remove a name from the dropdown list, enter it with a preceding minus sign and confirm with [Enter].

Dimensions



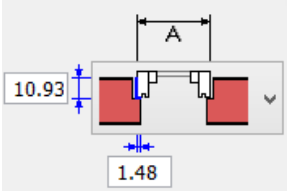
Lib part:

Predefined window

free window

Here you can either select from a list of predefined windows (library part in combination with predefined manufacturer dimensions) or you can select a library part using a free mode and the desired dimensions can be freely defined.
The free Lib parts with the corresponding attributes are stored under
<ELITECAD installation directory>u\<version>\ar\glob\l\roofwindow\slant, or
<ELITECAD installation directory>u\<version>\ar\glob\l\roofwindow\flat

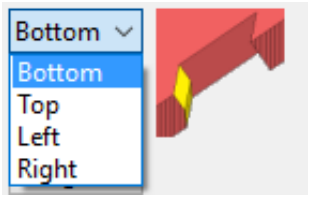
Stop



The installation depth can be determined here and also the frame bearing area for roof windows.

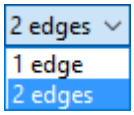
Parameter

Active side



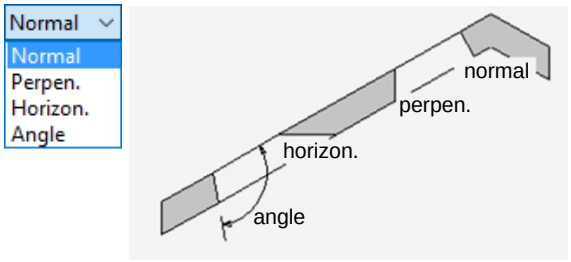
The settings in the dialog window always refer to the active side.

Number of edges



A side can consist of one edge or two edges. All sides should have the same number of edges to avoid geometric errors.

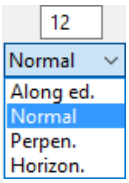
1 edge



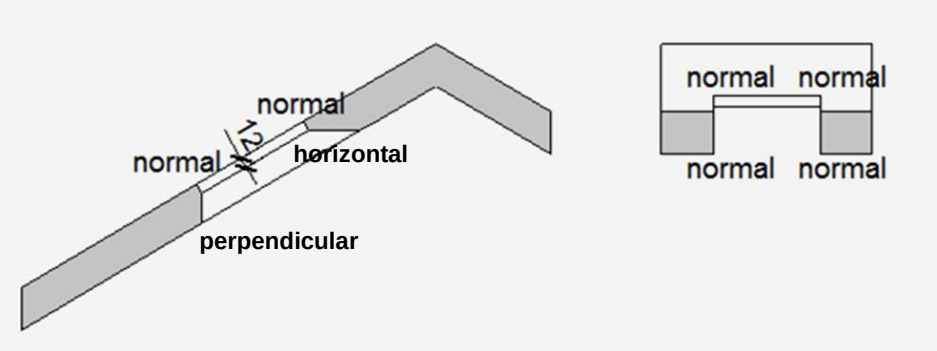
An edge can run in four ways. Any angle can be entered in the "Angle" variant. If the opening does not have enough space in the roof with the specified angle, the edge is created vertically.

2 edges

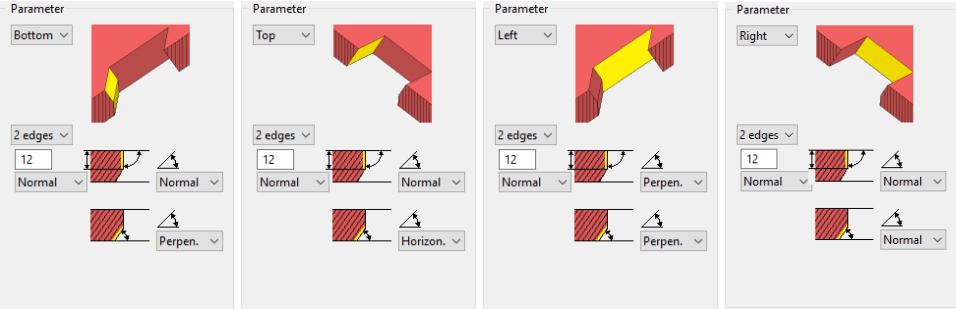
The lengths can be determined for the first edge. You can select how the length is measured. An edge can be horizontal, but the distance is measured perpendicularly to the roof plane. All sides should have the same length to avoid geometric errors.



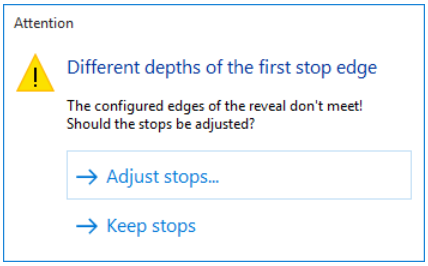
One of the four alternatives for the edge course can be selected for each partial edge. Example of an opening with two edges. Both "right" and "left" sides are also defined with two edges, although one edge would suffice.



Cross-section Long section

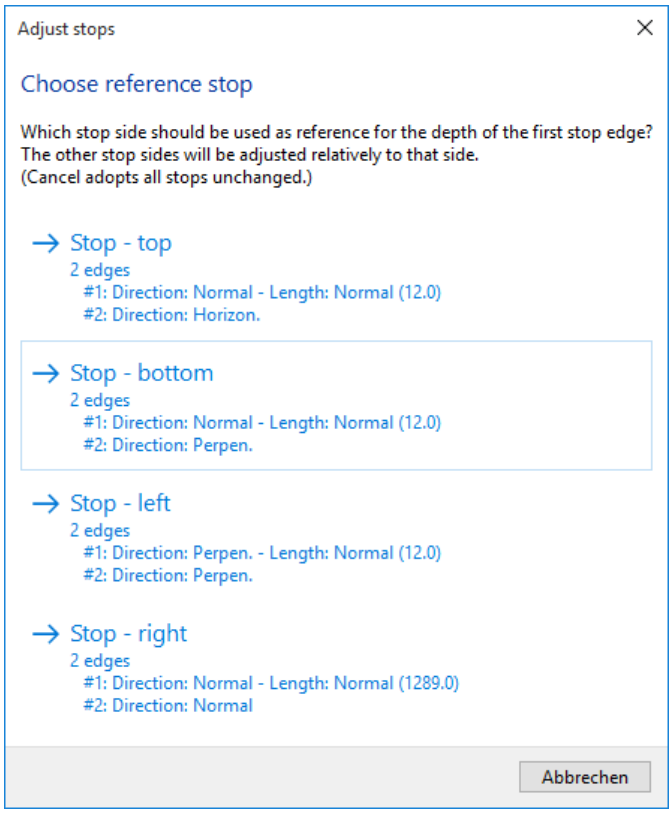


A warning appears if the edges do not meet at the corners.



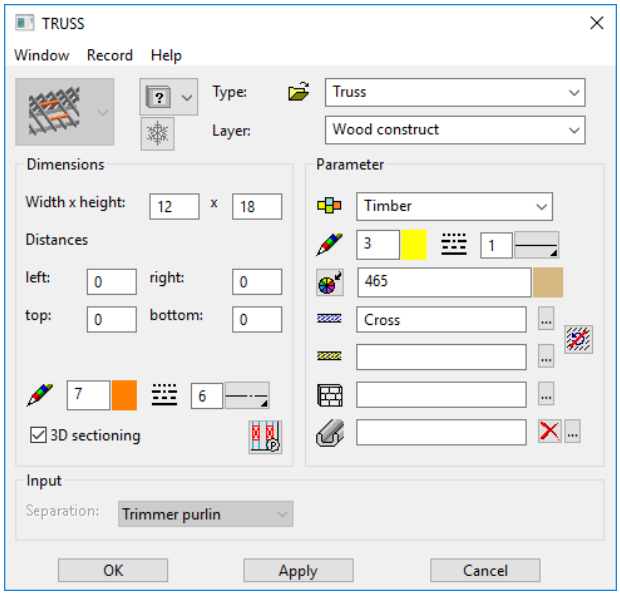
Keep stops:
In this case, you will have to consider geometric errors.

Adjust stops:
In this case, a dialog window appears with all of the settings for each side. You can decide which stop should be used as a reference.



Trimmer

Here you can decide whether a trimmer should be drawn for the roof cut-out.
The trimmer distances correspond to the manufacturer's information but can be adjusted if necessary. The trimmer parameter dialog window opens if only the trimmer is edited.



Description chapter 9.9

Entry:
The roof window can either be set in the floor plan or placed above the height of the bottom edge. If the roof height or inclination is changed, the roof opening is refreshed according to the entry.

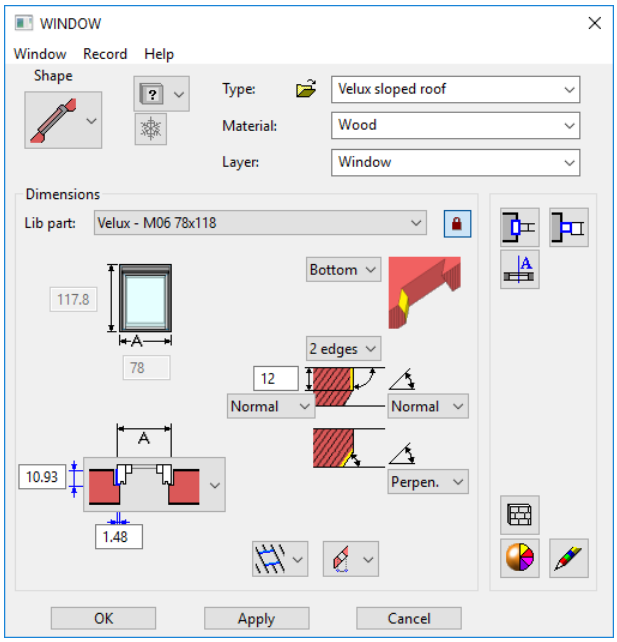
Position by floor plan

Position by height

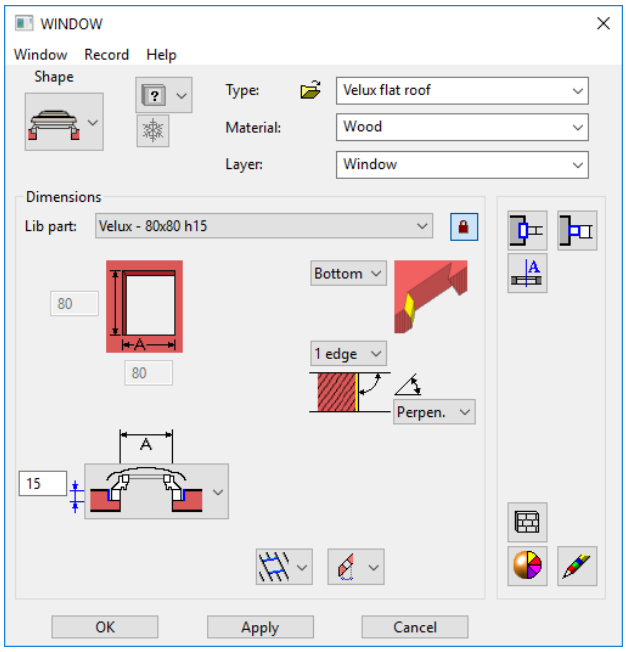
The height of the roof at any point can be measured with the HEIGHT IN POINT function.

Window shape

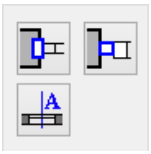
Roof window



Flat roof window

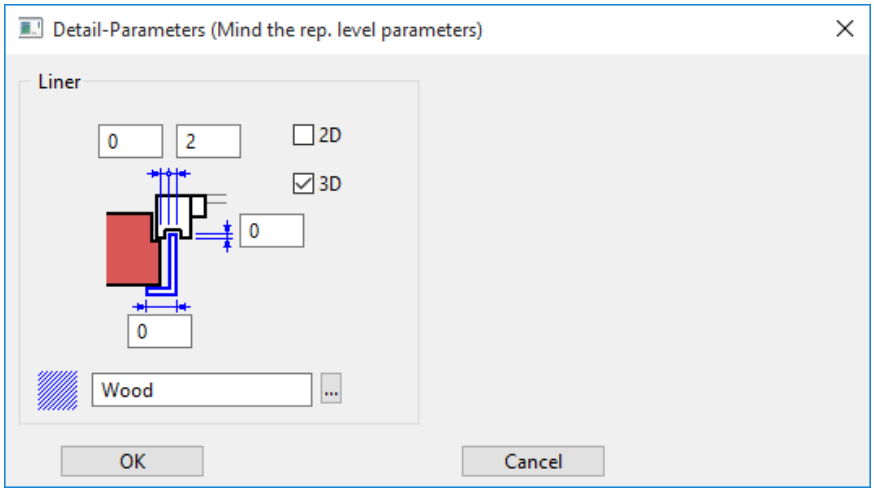


Window detail parameters



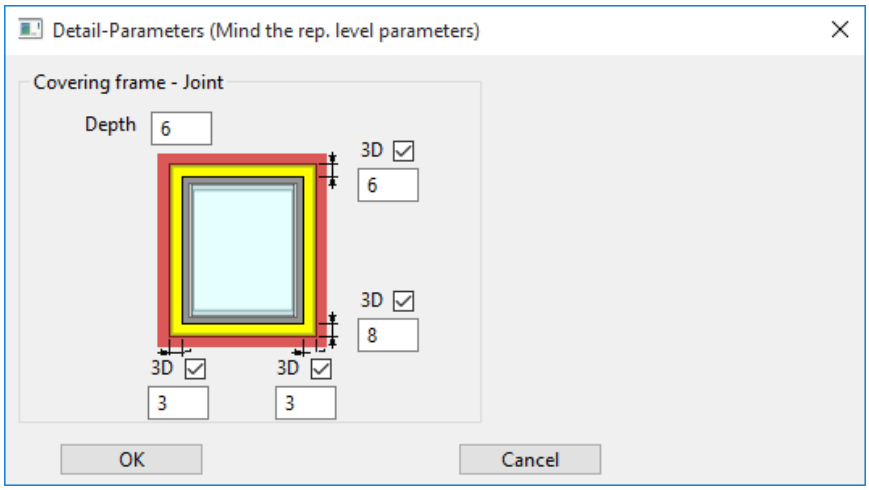
Here you will find additional settings options for an individually customised window. Each of the buttons shown leads to another separate set-up dialog window.

Padding



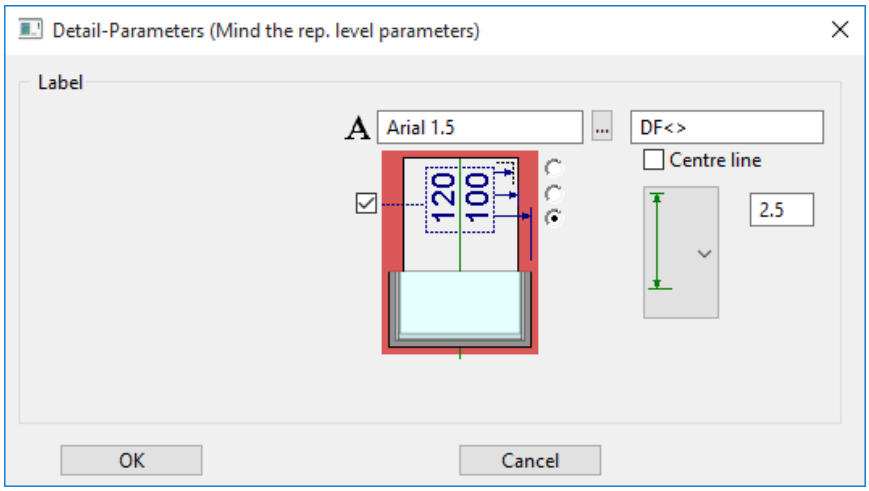
The distance, gauge, width and lengthening can be entered.
The 2D and 3D fields activate the padding.

Covering frame - Joint



A depth and the distances can be entered.
The 3D fields activate the joint.

Labelling parameters

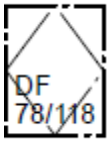


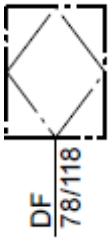
Label
The text parameters are selected from the general parameter database.
A pre-text and a placeholder with <> for the value calculated by the CAD are entered in the label field.

Large text
The external frame dimension, the gross clearance or the finished clearance (lining dimension) can be labelled.

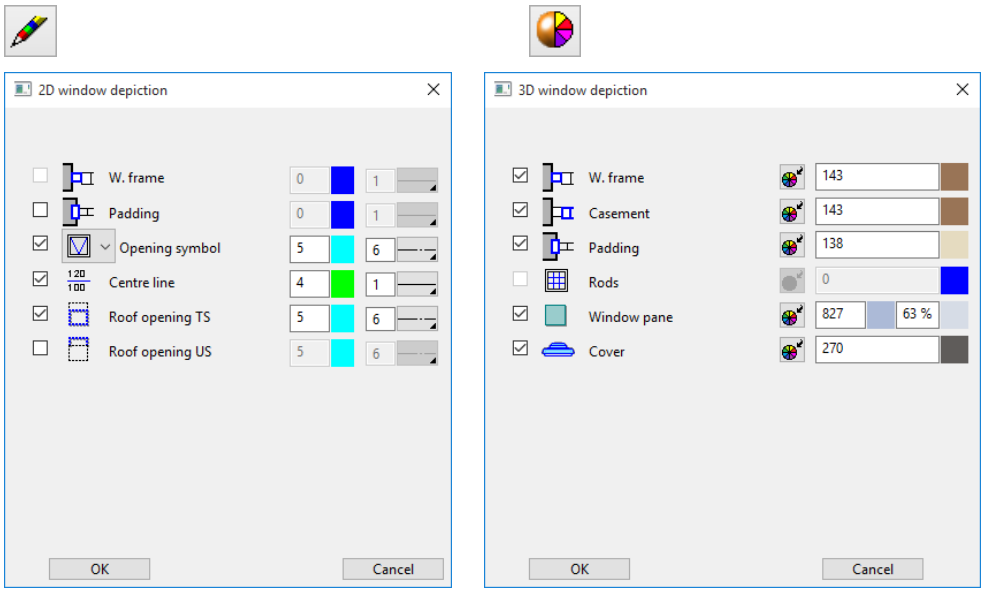
Centre line
Here, the length of the centre line can be entered absolutely or relatively to the length of the label.

Representation without centre line Representation with centre line





2D/3D depiction



2D depiction

Setting the pen and line type 2D depiction for all window parts activated in the dialog window. The 2D can be switched off in the tick boxes.
The grey background means "undefined".
This makes the components of the window immediately apparent.

3D depiction

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

10.3 GLASS ELEMENTS

Construction parts toolbar
AR Objects menu > Glass element

The advantage of the window glass element is that a glass element does not require a wall.
This creates the option of constructing glazing anywhere in the room for all variation options, or whole glass facades or conservatories. It is preferable, however, to create glazed roofs with the ROOF function, as these separate the volume (important for volume calculations for rooms).

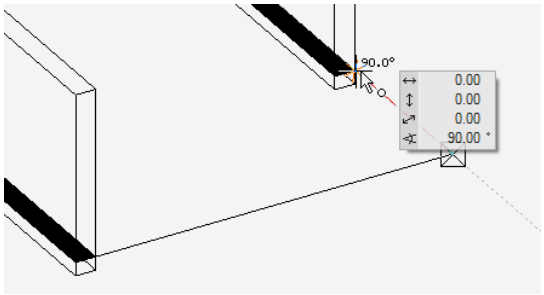
WORKSHOP

Create glass element

START GLASS ELEMENT function.

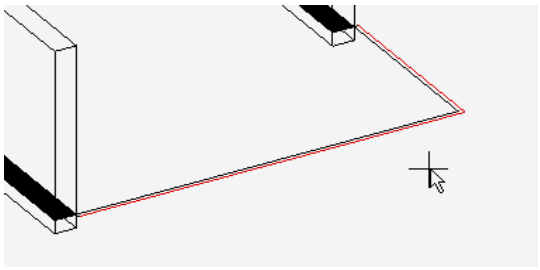
Set the entry mode in the properties bar to "Draw roof contour manually".

Now draw the glass element's axis. Later you will define whether this is the outer or inner side.
To end entry, click again on the last point.

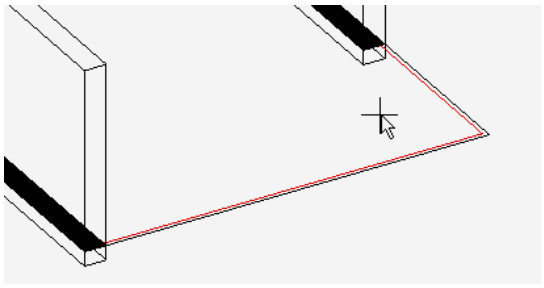


Now define the direction in which the glass element should be drawn. Move the mouse from one side to the other. One you have reached the correct position, confirm by left-clicking.
Keep in mind that the glass element gauge is always modified from the axis outwards.

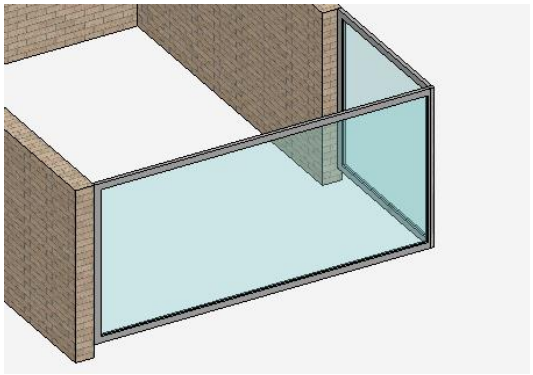
Contour exterior



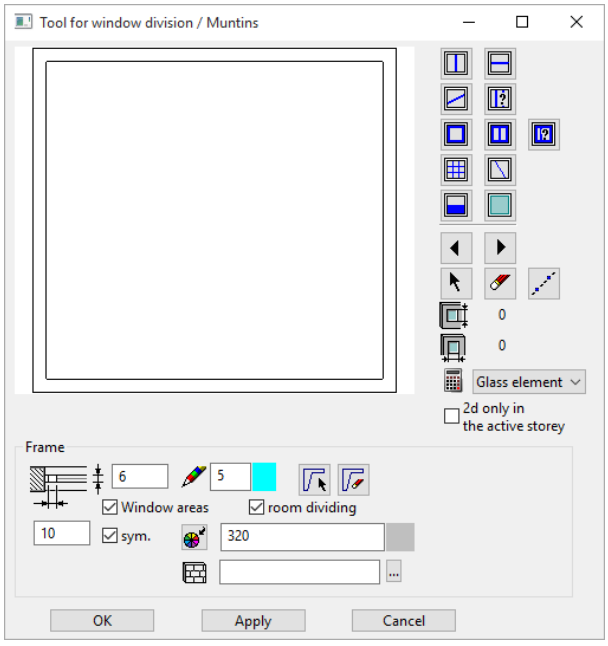
Contour inside



Confirm the position by left-clicking.



Once the direction is confirmed, the glass element is created and a dialog window opens for the window division of the first part.



Enter the properties for the frame: dimensions, colour properties. You can also make adjustments by clicking on the glass parameter ( ). You can return to the frame properties with the control arrows ( ).
In each case, do not forget to click the "Apply" button to adopt the settings.

WORKSHOP END

Alternatives to glass element

Window
For perpendicular, rectangular constructions, the window can have advantages over the glass element in many areas.
A wall must be drawn with the length, height and gauge of the frame. Then a window without a stop is set with depth 0.
Advantages:
Blinds and window sills can also be set.
The corner window also has additional settings options in corner areas.

Roof
The roof construction can also be used for glass construction by setting transparency for the 3D colour. The position of the bearing construction can be more precisely determined with the truss elements (rafters, etc.).

General

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

GLASS ELEMENT PROPERTIES BAR

The properties bar is visible as soon as the CREATE GLASS ELEMENT function is launched or if an existing glass element is edited.
You can manipulate the main values in the glass element's properties bar.

[Glass element parameters]

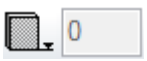
Renovation planning state (see chapter 8.5)

[Entry mode]

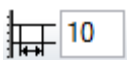
[Height reference]

[Glass element width]

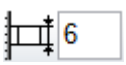
[Glass element height]



[Height difference from the glass element's bottom edge to the current work plane]



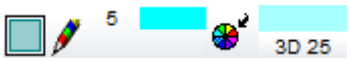
[Window frame width]



[Window frame gauge]

[Room dividing]

Properties of frame (depiction)

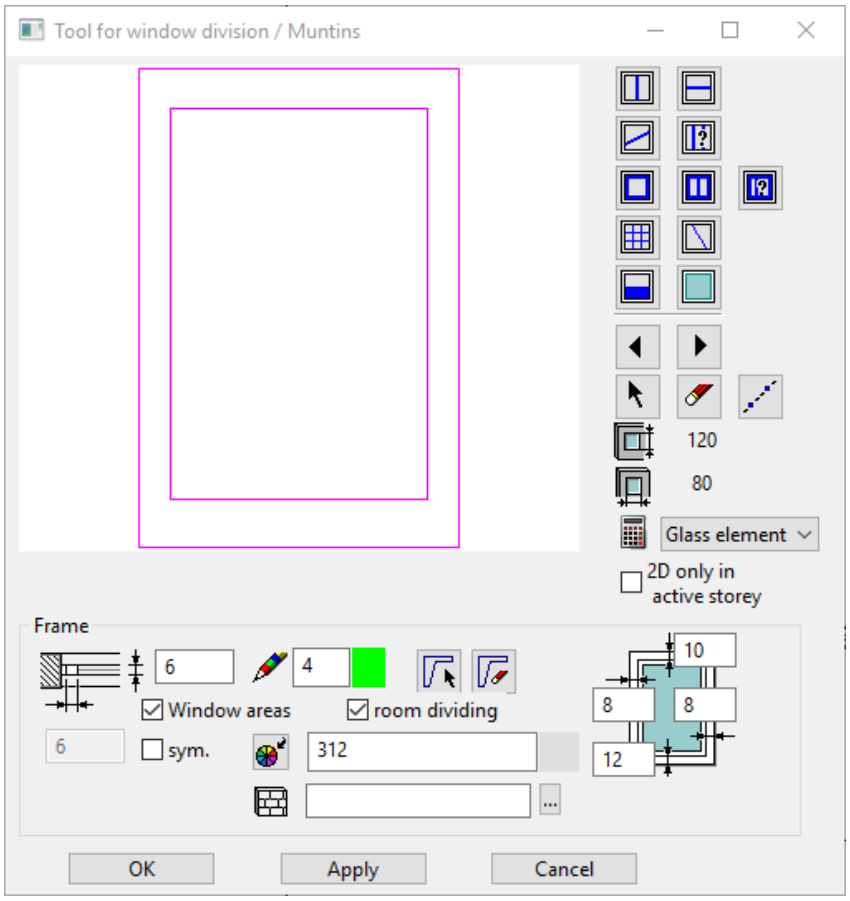


Properties of window pane (depiction)

TOOL FOR WINDOW DIVISION / MUNTINS

For glass elements:
As soon as a glass element is selected, the editor dialog window "Tool for window division / muntins" opens.

For windows:
The window can already be defined in more detail in the window parameter before it is applied.



Your current window/glass element is always visible in the right dimension in this editor window. Divisions, muntins and padding are applied, deleted or selected with the tools on the right-hand side of the dialog window. In the lower area of the dialog window, in each case enter the dimensions and colours of the respective active element. (Frame, division, casement, muntins, infill or glass). The active element is represented in purple.
You can work with various ELITECAD functions in the working window of the editor: Measure, Convert to solid, Wire model, Zoom, and Move.

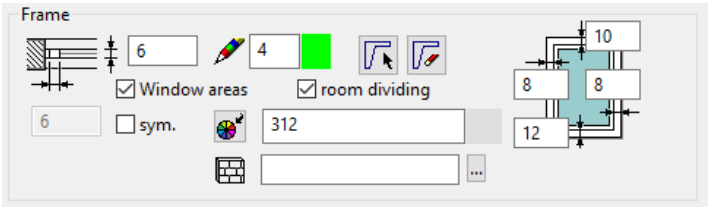
Help lines

This button allows you to draw help lines in the preview window, which help you to place the individual window parts.

3D hatch

Every sub element of a glass element can be assigned a hatch that appears in the calculated hidden line views.

Frame



Entry options:

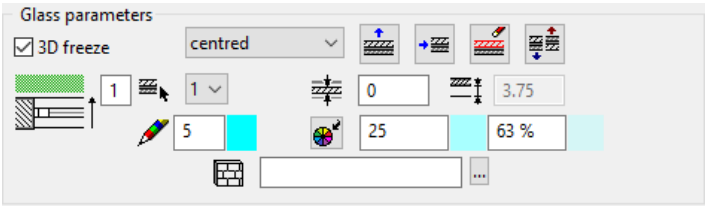
Window frame width, window frame gauge.
Pen, 3D colour and material, 3D hatch.
Window area (consider for calculating the sum of all window areas)

Room dividing

If a glass element is not room dividing, it is not recognized as a boundary when calculating room areas.

The frame and frame leg are defined by **free contour / delete contour** (Chapter 10.2 Window).
Options for whether the glass element surface should be taken into account in the room label of the window area, and whether it should divide the room or not (not available for windows).

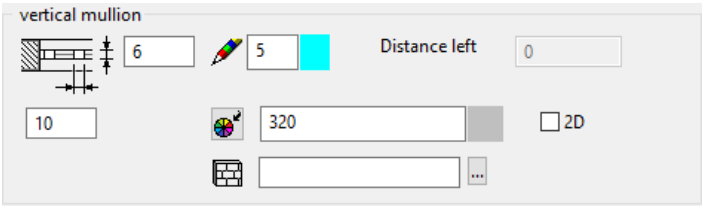
Glass



Entry options:
Position of window pane
Append, insert, delete or swap layers.
Display of number of layers
Number of active layer
Gauge of active layer (not represented in 2D and 3D)
Display of distance from the interior edge
Pen, 3D colour and material, 3D hatch.

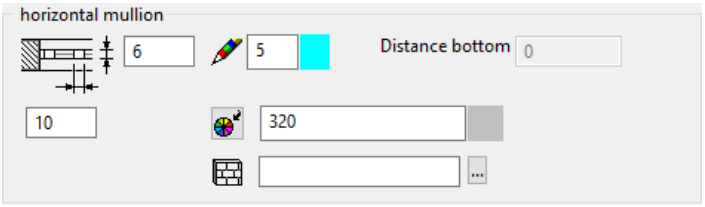
Transparency in percentages.
3D freeze active is the standard setting. If the 3D is not frozen, then the model for window casement and glass can be moved/rotated for temporary representations.

Vertical division



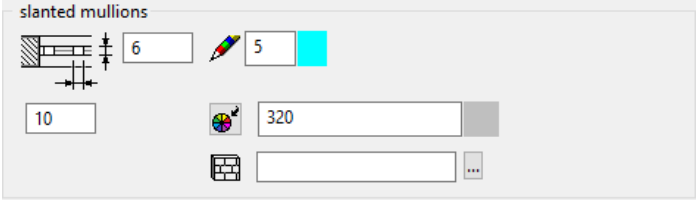
Entry options:
Dimensions.
Pen, 3D colour and material, 3D hatch.
2D option for floor plan depiction.
It is useful to set a help line for the axis beforehand.
The position in the glass area is determined in the preview window.
When editing a division, the distance from the division axis to the left outer edge of the frame must be specified. This value can be directly adjusted.
Keep in mind that depending on the division width you specify another casement may be incorporated in the division.

Horizontal division



Entry options:
Dimensions.
Pen, 3D colour and material, 3D hatch.
It is useful to set a help line for the axis beforehand.
The position in the glass area is determined in the preview window.
When editing a division, the distance from the division axis to the bottom outer edge of the frame must be specified. This value can be directly adjusted. Keep in mind that depending on the division width you specify another casement may be incorporated in the division.

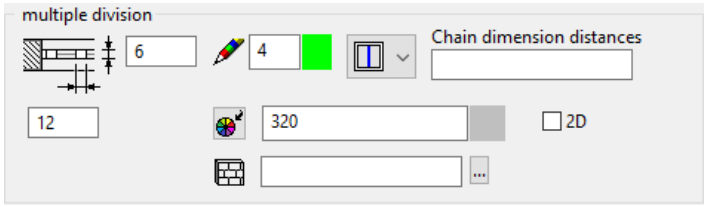
Slanted division



Entry options:
Dimensions.

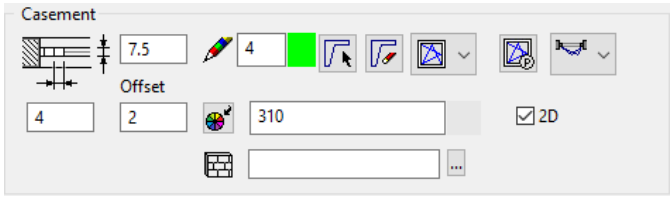
Pen, 3D colour and material, 3D hatch.
It is useful to set a help line for the axis beforehand.
The start and end points of the division are entered in the glass area in the preview window. Both points can be placed anywhere on the axis. However, they must not be outside of the window.

Multiple division



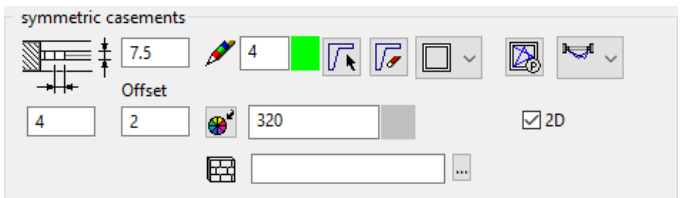
Entry options:
Dimensions.
Pen, 3D colour and material, 3D hatch.
2D option for floor plan depiction.
Horizontal/vertical selector.
Distances.
Enter the distances (separated by a comma) and specify the glass area into which the division must be integrated.

Casement



Entry options:
Dimensions and casement offset to frame.
Pen, 3D colour and material, 3D hatch.
Define casement from free contour/Delete free definition.
2D option for floor plan depiction.
Opening symbol of the casement with the detail parameter for the **opening symbol**.
Floor plan depiction of the opening symbol. Note that the floor plan symbol is only shown if the corresponding opening symbol is also defined.
The position of the casement is determined in the glass area in the preview window.

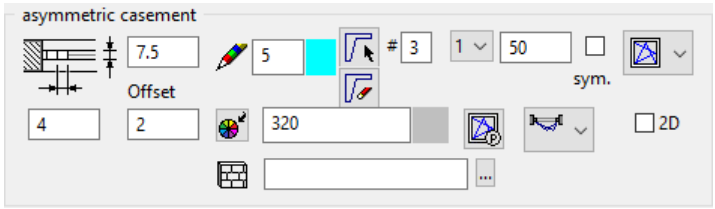
Symmetric casements



Entry options:
Dimensions of casement offset to frame.

Pen, 3D colour and material, 3D hatch.
Selection for casement from free contour.
2D option for floor plan depiction.
Opening symbol of the casement with the detail parameter for the **opening symbol**.
Floor plan depiction of the opening symbol. Note that the floor plan symbol is only shown if the corresponding opening symbol is also defined.
The position of the double casement is determined in the glass area in the preview window.

Asymmetric casements

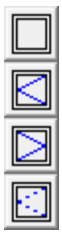


Entry options:
Dimensions of casement offset to frame.
Pen, 3D colour and material, 3D hatch.
Selection for casement from free contour.
2D option for floor plan depiction.
Characters #: Number of casements.
Next to it on the right-hand side is the button used to define each individual casement width when the sym. option is switched off. The casement is equally divided with width 0.
Opening symbol of the casement with the detail parameter for the **opening symbol**.
Floor plan depiction of the opening symbol. Note that the floor plan symbol is only shown if the corresponding opening symbol is also defined.
The position of the casements is determined in the glass area in the preview window.

Window opening symbol

Button for casements
Depending on the setting in the window division (single or double-casement window), other opening symbols are available.
In the **opening symbol parameters** formatting settings can be configured depending on the selected symbol.

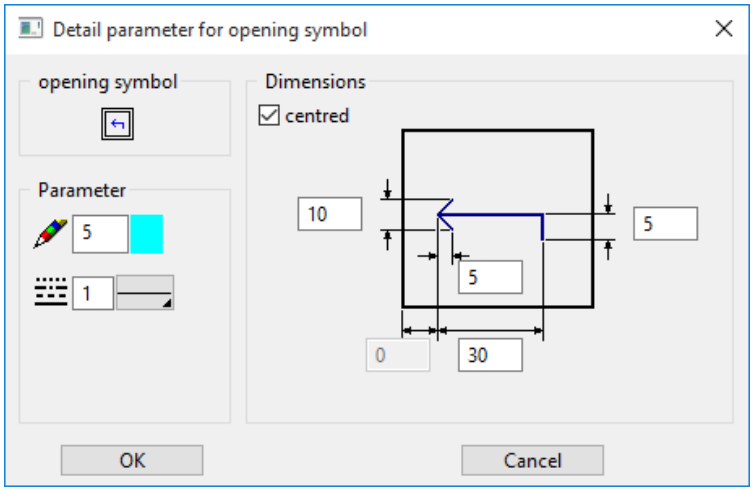
Single-casement:



Double-casement:

Opening symbol parameters

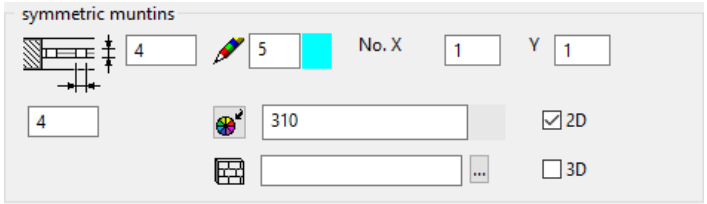
Button for casements



The pen can be set in the parameter. The arrow symbol can be formatted with the sliding door and the lift-up sliding door symbol. If the CENTRED option is activated, the symbol is automatically horizontally centred on the window pane. The symbol is always centred vertically. The dimensions refer to the current dimension unit and the current scale.

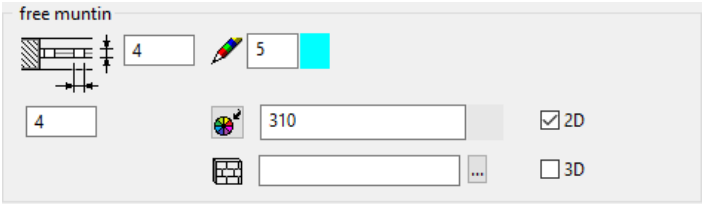
No values in this dialog window depend on the representation level.

Muntins



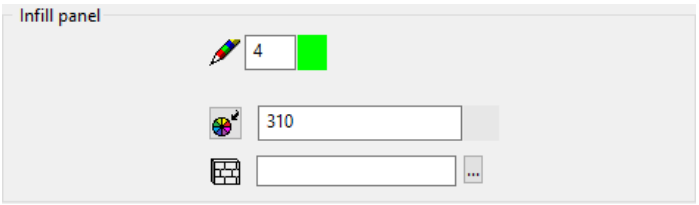
Entry options:
Dimensions.
Pen, 3D colour and material.
2D option for floor plan depiction.
The number of muntins in the x-direction (horizontal) and number in the y-direction (vertical). The value "0" does not generate any muntins in this direction.
You can click in the glass area to place the muntins.

Free muntins



Entry options:
Dimensions.
Pen, 3D colour and material, 3D hatch.
2D option for floor plan depiction.
It is useful to set a help line for the axis beforehand.
The start and end points can be set anywhere on the axis between the frame or casement frame.

Infill



Entry options:
Pen, 3D colour and material, 3D hatch.
The infill fills a window with a fixed colour. The infill is always between the fixed elements of a window such as frames and transoms. If when defining an infill there is a casement on the glass part, this is deleted by the program. Additional definitions of muntins are possible.

Select previous part / Select next part

With these control arrows, you can switch between the individual window parts (frame, glass, divisions, casement, muntins, and infill) to check the settings, make modifications or delete the window part.
The selected part is always marked as active (purple).

TIP

You can also change to solid view for a better view of the active element.
Key combination: [Ctrl]+[D]

Select part

You need to select a particular window part (frame, glass, divisions, casement, muntins, and infill) in order to edit it. Use the function to select the window part. The selected part is always marked as active (purple).

TIP

You can also change to solid view for a better view of the active element.

Key combination: [Ctrl]+[D]

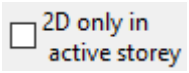
Delete part

This function deletes the active window part (divisions, casement, muntins, and infill). The frame and the glass cannot be deleted.
To activate a window part, use the SELECT PART function or switch to the desired part using control arrows.

Report as

The glass element can be quantified as a window, door or glass element.

2D only in active storey



The 2D depiction for multi-storey glass element can be either in the own storey or in other storeys.

Copy parameters for windows

	General		
☑	Casement rod lay out	🔒 =	
☑	Glass composition	🔒 =	
	Frame		
☑	Floor plan depiction	🔓 =	Line
			W.frame and casement equal
			W.frame and casement separated
☑	Casement gauge	🔓 =	
☑	Casement offset	🔓 =	
☑	Window frame gauge	🔓 =	
☑	Casement	🔓 =	☑
☑	Casement frame width	🔓 =	
☑	Frame	🔓 =	☑
☑	W-frame in 3D	🔓 =	
☑	Frame width up	🔓 =	
☑	Frame width bottom	🔓 =	
☑	Frame width left	🔓 =	
☑	Frame width right	🔓 =	
☑	Pen	🔓 =	
☑	Line type	🔓 =	
☑	3D frame depiction	🔓 =	
☑	3D casement depiction	🔓 =	
	Muntins and pane		
☑	Represent muntins in 2D	🔓 =	
☑	Muntins gauge	🔓 =	
☑	Muntins depth	🔓 =	
☑	Pen for muntins	🔓 =	
☑	3D depiction of muntins	🔓 =	
☑	Depict pane	🔓 =	☑
☑	3D depiction of pane	🔓 =	
☑	3D freeze	🔓 =	☐
	Symbols		
☑	Pen	🔓 =	
☑	Line type	🔓 =	
☑	Floor plan depiction opening	🔓 =	No symbol

			Turn casement 1/3 open
			Turn&tilt casement 1/3 open
			Turn casement open
			Turn&tilt casement opened
☑	Geometry		*

Copy parameters for glass element

	General		
☑	Layer		
☑	3D freeze		
☑	Material		
☑	Exterior		
☑	Report		Glass element Window Door
☑	Room dividing		
☑	Height reference		free height ref. from floor to ceiling from underside of floor to ceiling to ceiling from floor
☑	Width		
☑	Height		
☑	Bottom edge		
	Frame		
☑	Dimensions		*
☑	Pen		*
☑	3D depiction		*
☑	Casement/muntins division		*
☑	Glass composition		*
	Transom		
☑	Dimensions		*
☑	Pens		*
☑	3D depictions		*
	Casement		
☑	Dimensions		*
☑	Pens		*
☑	3D depictions		*
☑	Symbol parameters		*
	Muntins		
☑	Dimensions		*
☑	Pens		*
☑	3D depictions		*
	Padding		
☑	Pens		*
☑	3D depictions		*
	Properties		
☑	Glass composition		*

Entry mode

Draw roof contour manually

The Input Assistant offers the drawing options Line, Polygon, Rectangle, Curve, Circle, Ellipse and Spline. The circle is always a lying glass element.

Define using existing contour

First, you must draw a contour that follows the desired shape, with a circle always generating a lying glass element. After setting the contour, you must define the position of the axis with the cursor.

Height reference
Choosing the correct height reference simplifies entry and has advantages for later modifications to the structure settings.

Height reference – lying

The glass element is created as lying and required a closed contour.
This height reference is used automatically if the work plane does not correspond to the storey plane.

Height reference – free height reference

The lower edge and height of this glass element can be freely defined.

Height reference – from floor to ceiling

The glass element begins at the top side of the slab and goes up to the underside of the ceiling. You can save the effort of entering heights, as this glass element is always oriented to the structure settings.

Height reference – from underside floor to ceiling

The glass element begins at the underside of the slab and goes up to the underside of the ceiling. You can save the effort of entering heights, as this glass element is always oriented to the structure settings.

Height reference – to ceiling

The glass element is oriented with its top edge to the storey ceiling. The bottom edge can be freely configured and references the top edge of the slab.

Height reference – from floor

The glass element starts from the upper edge of the slab and is defined with any height starting at that marker.

Height reference – from floor underside

The glass element starts from the lower edge of the slab and is defined with any height starting at that marker.

Edit glass element

Glass elements can be edited and modified at any time by double-clicking them. All detail settings can be modified at a later point.

TIP

After selecting the glass element, click on a handle or gripper of the contour to access manipulation functions directly in a toolbar or by using [TAB] with the cursor.

10.4 WALL OPENING

Construction parts toolbar

AR Objects menu > Create wall opening

Click on the CREATE WALL OPENING function to enable the settings for the most recently placed wall opening. The wall opening can now be placed. The *Position of opening* query appears in the entry line.

WALL OPENING PROPERTIES BAR

The properties bar is visible as soon as the CREATE WALL OPENING function is launched or if an existing wall opening is edited. You can manipulate the main values in the wall opening's properties bar.

Wall opening parameters

Type

Renovation planning state (see chapter 8.5)

Opening shape

Opening type

Wall opening width

Wall opening height

Wall opening bottom

Wall opening depth

Labelling

Close openings automatically (renovation planning)

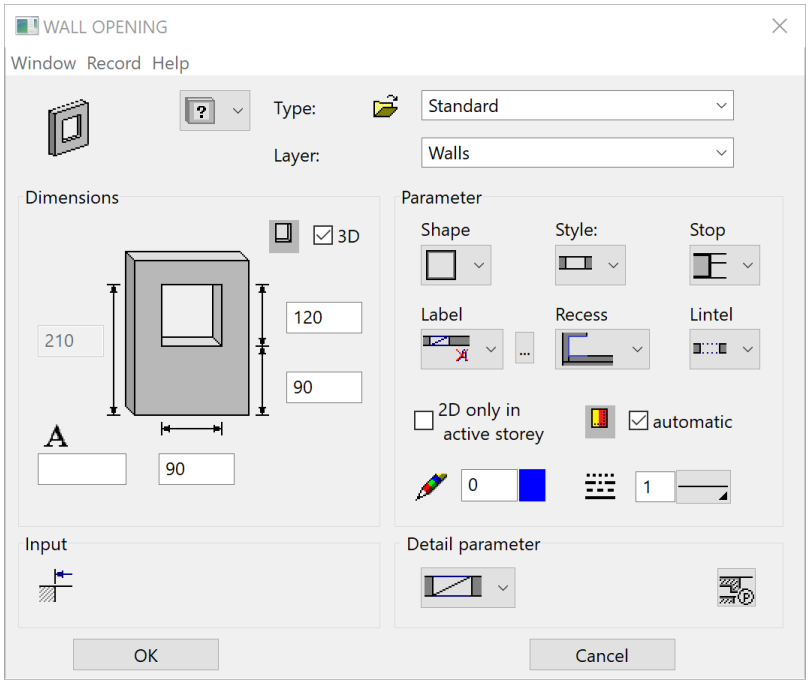
Lintel line depiction

Diagonals

Wall opening properties (depiction)

WALL OPENING PARAMETERS

You can open the wall opening parameters via the properties bar or by double-clicking the wall opening to be modified.

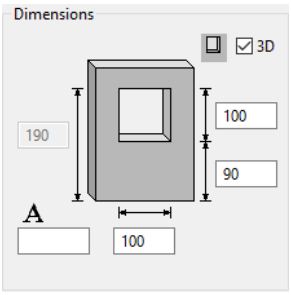


General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Dimensions



Wall opening height
Enters the height of the opening from the underside to the lintel.

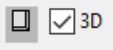
Wall opening width
Enters the width of the opening.

Wall opening bottom
The height of the bottom edge is entered from "raw slab".

Wall opening text
If the text symbol is switched on in the **parameters**, the text entered here is appended to the symbol.

Wall opening depth
If the trench is selected as the **wall opening type**, the depth of the opening can be manipulated with this value.

Opening in 3D



This setting is generally active. Optionally a generation of an opening into the 3D wall can be deactivated. In that case, only a 2D depiction of a wall opening is generated in the wall.

Selection

Shape

Rectangle
Circle
Semi circle
Round-arch
Segment curve
Pointed arch
Diamond
half triangle right
half triangle left
Isosceles triangle
Select free contour
Rectangle by diagonal
Use free volume

There are 13 different shape types available for selection. The first 10 of these shapes are standard shapes, which have a clearly defined outer contour (shape of the reveal).

The **select free contour** shape allows you to define a free wall opening contour. This contour should lie "on the wall" i.e. the work plane is positioned on the wall surface. A closed polygon can be drawn there.

The **rectangle by diagonal** shape is a simple tool for entering rectangular wall openings in 3D. Position the work plane on the wall. When launching the function,

only the bottom left and top right corner of the opening are queried. All further representation variants result from the parameters set.

The **use free volume** shape offers the option to generate an opening by defining a "deduction" beforehand. This can be a 3D box which is "embedded in the wall", which by definition means that a "hole in the wall" appears by taking the deduction away.
After activating the function, the volume, which is taken away must be selected, and then the wall in which the process is to take place.

TIP

The volume of the deduction must not be coincident with the underside or top side of the wall. Always leave some free space, even if it just a millimetre.

Style

Opening

Trench/recess

The style of wall opening determines whether it is a wall opening or a wall trench/recess.
If the wall trench is selected, the field for entering the **wall opening depth** appears in the dialog window.

Stop

Without stop

Free stop

If the free stop is selected, the field for entering the **wall opening depth** appears in the dialog window.

Stop editor

The **stop editor** is identical to the window stop editor and documented in the window chapter.

Parameter

Floor

Floor runs into niche

Floor is limited with wall

Text symbol

Symbol is switched off

Symbol is switched on

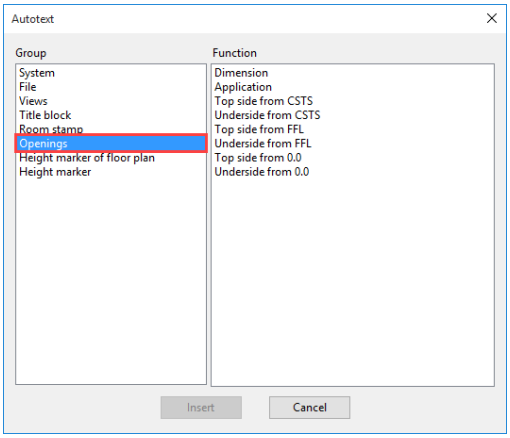
Selection of Lib part

Here, you can select a specific Lib part for the symbol. The standard symbols are stored under *<ELITECAD installation directory>u\<version>\ar\glob\symbol* .

TIP

If you would like to create a symbol of your own, it is best to load a template from the path listed above (wd_text.d or wd_text_new.d). Adapt the symbol as you wish, and save it under a new name. Make sure the placing point of the symbol is in the centre of the page.

Entries in auto text



Lintel line depiction

Type1

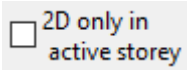
Type2

Without lintel

Not visible

The lintel line depiction in the floor plan is set using this button. There are two different types of lintel lines, which can be specified. The types are set in the representation levels for windows: The top selection option here is type1, the middle type2. Type1 is dashed by default and type2 is a solid line. The third selection switches the lintel line depiction off, and the fourth shows no wall opening at all.

2D only in active storey



The 2D depiction for multi storey windows can be either in the own storey or in other storeys.

Renovation planning – fill automatically

If the status of a door is changed to demolition, the automatic generation of a wall that fills the hole can be triggered with this option.

Pen- and line type

Here you can select the pen/line type for the 2D depiction.

Floor plan depiction

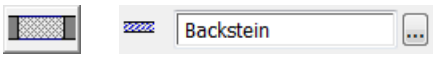
Only pen/line type

Only pen/line type

Additional colour selection

Additional colour selection

Additional colour selection

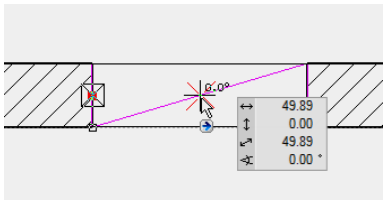


Additional hatch selection

MODIFICATION FUNCTIONS

Placement points

If a pre-existing wall opening is edited, its original placement point is indicated. Now if you modify the wall opening width, the modification always takes effect from this point. The point can be moved to the reference points on the left, right and in the centre using the mouse.



Move the placement point with the mouse.

TIP

After selecting the wall opening, click on a handle or gripper of the contour to access manipulation functions directly in a toolbar or by using [TAB] with the cursor.

10.5 BANISTER

Construction parts toolbar

When you click the CREATE BANISTER function, the settings are copied from the most recently drawn banister and the banister can be placed immediately.

BANISTER PROPERTIES BAR

Create

Change

The properties bar is visible as soon as the CREATE BANISTER function is launched or if an existing banister is edited.
You can manipulate the main values in the banister's properties bar.

The appearance of the properties bar depends on the selected construction part.

Banister parameter

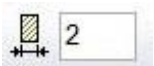
Renovation planning state (see chapter 8.5)

Entry mode

Construction part

Shape

Height



Width

Height of construction element

Level of construction element

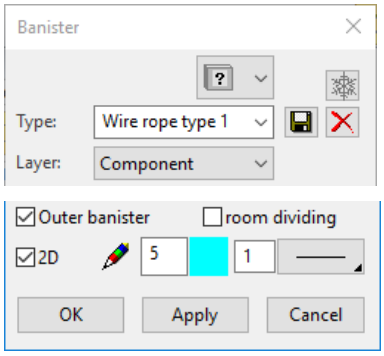
Exterior / interior banister

Room dividing

Properties of banister (depiction)

BANISTER PARAMETER

You can open the banister parameters via the properties bar or by double-clicking the banister to be modified.

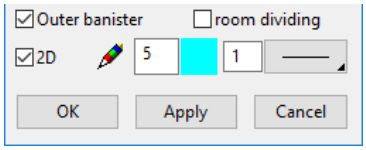


General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Plan graphics

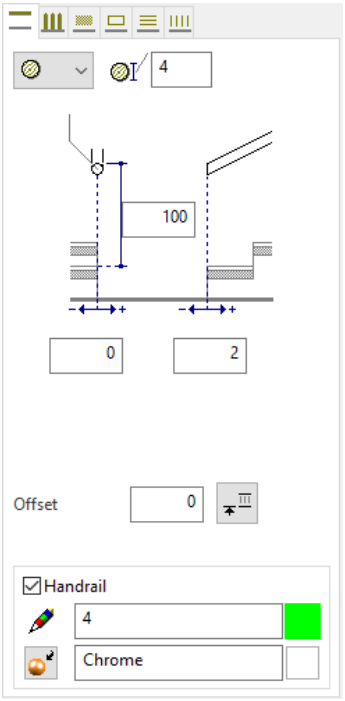


Exterior banister
The banister can be quantified as an exterior or interior banister.

Room dividing
If a banister is not room dividing, it is not recognized as a boundary when calculating room areas.

2D depiction
Here you can also set whether or not the banister should have a 2D representation. The pen and line type can be determined.

Handrail

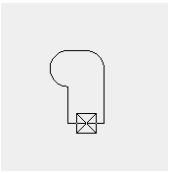


Shape of the handrail

Select from a round, rectangular or free profile.
For a free profile, you have the option to draw any cross-section yourself and use it as a handrail.

TIP

The *free profile* is a self-drawn cross-section saved as an ELITECAD file. The cross-section must be a successive contour. No 3D definitions! The reference point must always be at the bottom in the centre when saving.



Handrail height
The handrail height is always measured in ELITECAD Architecture from the top side of the storey floor or from the front edge of the tread on a stair. In ELITECAD Mechanics the height reference is relative to the active work plane.

EXPLANATION

If a banister is generated from a polygon that is not drawn in the floor plan level, the handrail height is measured from this definition.

Position of handrail
In the floor plan, the handrail is fixed by two dimensions, one for the distance of the handrail axis to the stairway, and one for the start of the handrail in relation to the first step. The end of the handrail is symmetric to the start.

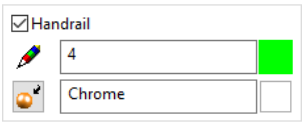
Offset

Using the offset, you can enter a displacement value in the current unit by which to move the reference level in relation to the coordinate origin.

Enter height

Instead of a manual entry for the offset, you can specify a point digitally with the mouse. The measured height from the coordinate origin is entered into the "Offset" field.

Parameters

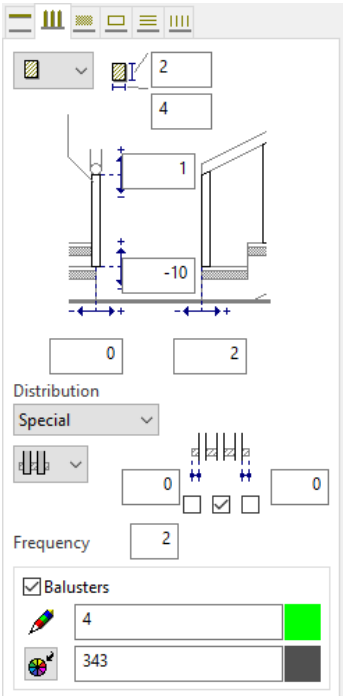


You can switch the handrail on or off using the tick box.
You can also specify the pen, 3D colour and material.

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

Balusters



Shape of baluster

Select from a round, rectangular or free profile.
For a free profile, you have the option to draw any cross-section yourself and use it as a baluster.

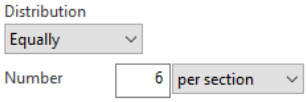
TIP

The *free profile* is a self-drawn cross-section saved as an ELITECAD file. The cross-section must be a successive contour. The reference point must always be in the centre of the contour when saving.
If a 3D part is loaded, this is adopted as balusters as a whole. The reference point must also be in the centre and under the 3D part when saving here.

Position of baluster

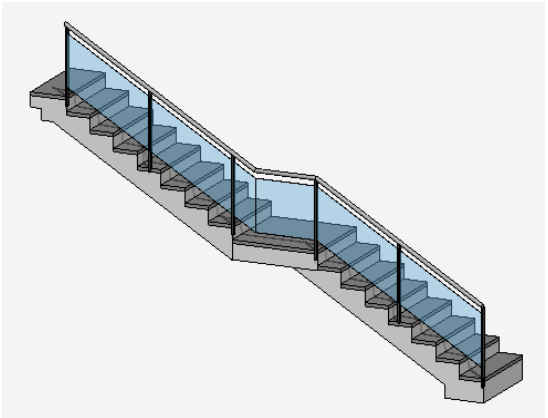
For the baluster top edge, the value 0 is measured underneath the handrail.
For the baluster underside, the value 0 is measured flush to an imaginary line connecting the stair edges.
In the floor plan, the baluster is fixed by two dimensions, one for the distance of the baluster axis to the stairway, and one for the start of the baluster in relation to the first step. The end of balusters is symmetric to the start.

Equal distribution

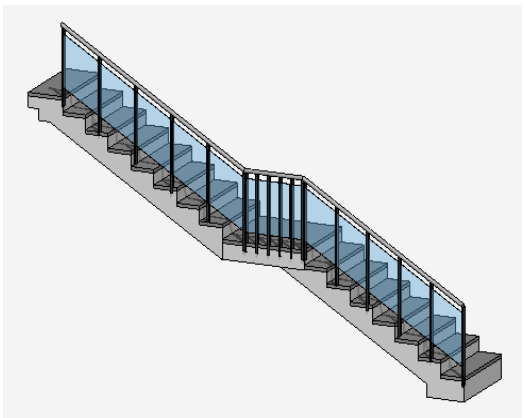


Enter the number of balusters, which should be distributed along the banister. "Per side" means that all connected banister parts are divided as a whole. "Per section" applies for each direction modification of the banister anew.

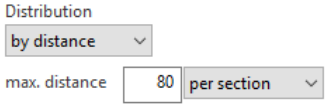
Per side



per section

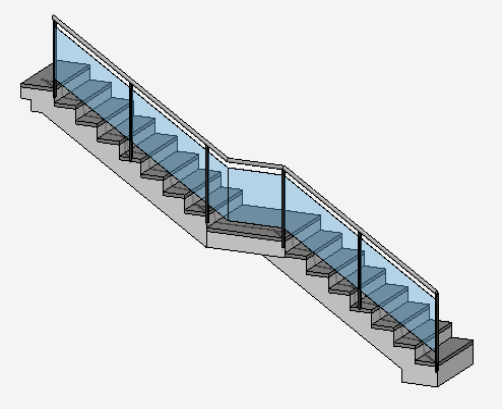


Distribution over maximal distance

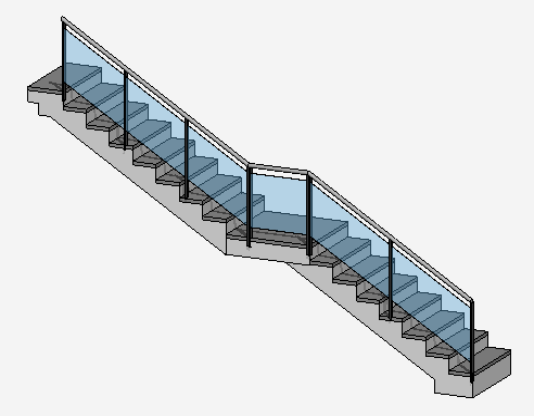


Here you can enter a maximum distance of the balusters. "Per side" means that all connected banister parts are divided as a whole. "Per section" applies for each direction modification of the banister anew.

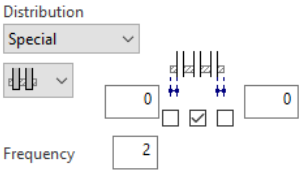
Per side



per section



Special distribution (only active for stair)



In "special" distribution, you can set balusters **per** step. There are several options, which you can activate with the tick box:
Centred balusters, balusters with distance to step front or back edge, or combined solutions.

The bottom edge of the balusters can be created in two different executions.
Here, the frequency determines the number of steps after which the selected balusters are set in each case. Value "1" would be for every step.

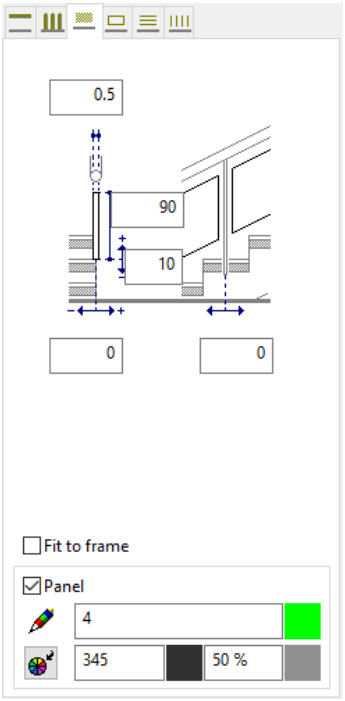
Parameters

You can switch the panels on or off using the tick box.
You can also specify the pen and the 3D colour.

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

Panel

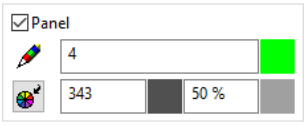


Dimension of panel
The panel gauge can be set.

Position of panel
For the panel underside, the value 0 is measured flush to an imaginary line connecting the stair edges. The height of the panel is measured from the bottom edge.
In the floor plan, the panels are fixed by two dimensions, one for the distance of the panel axis to the stairway, and one for the distance of the panel from the baluster.

Fit to frame
This option can be selected if a frame is defined. The panel is then automatically adjusted to the frame geometry.

Parameters

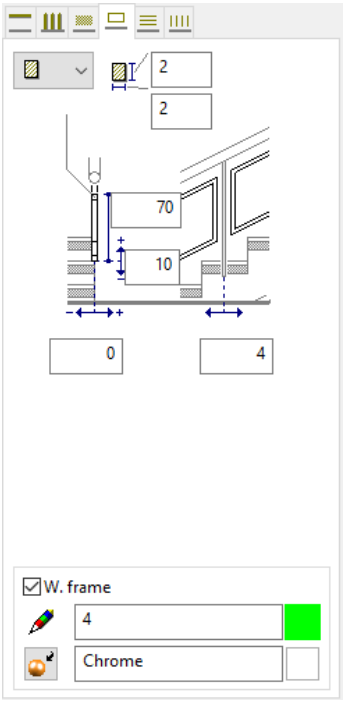


You can switch the panels on or off using the tick box.
You can also specify the pen, 3D colour, transparency and material.

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

Frame

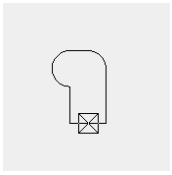


Shape of frame

Select from a round, rectangular or free profile.
For a free profile, you have the option to draw any cross-section yourself and use it as a frame.

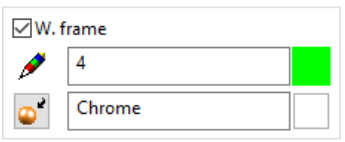
TIP

The *free profile* is a self-drawn cross-section saved as an ELITECAD file. The cross-section must be a successive contour. No 3D definitions! The reference point must always be at the bottom in the centre when saving.



Position of frame
For the frame underside, the value 0 is measured flush to an imaginary line connecting the stair edges. The height of the frame is measured from the bottom edge.
In the floor plan, the frame is fixed by two dimensions, one for the distance of the frame axis to the stairway, and one for the distance of the frame from the baluster.

Parameters

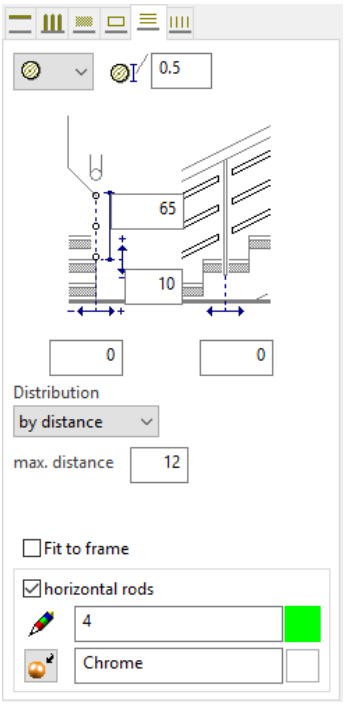


You can switch the frame on or off using the tick box.
You can also specify the pen, 3D colour and material.

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

Horizontal muntins

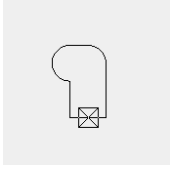


Shape of horizontal muntins

Select from a round, rectangular or free profile.
For a free profile, you have the option to draw any cross-section yourself and use it as a horizontal muntin.

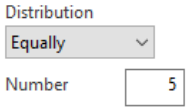
TIP

The *free profile* is a self-drawn cross-section saved as an ELITECAD file. The cross-section must be a successive contour. No 3D definitions! The reference point must always be at the bottom in the centre when saving.



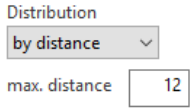
Position of horizontal muntins
For the bottom edge, the value 0 is measured flush to an imaginary line connecting the stair edges. The height of the horizontal muntins is measured from the bottom edge.
In the floor plan, the horizontal muntins are fixed by two dimensions, one for the distance of the muntin axis to the stairway, and one for the distance of the muntins from the baluster.

Equal distribution



Enter the number of muntins

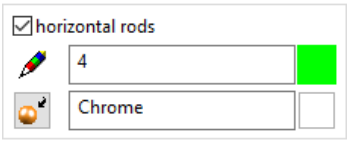
Distribution over maximal distance



Here you can enter a maximum distance of the muntins.

Fit to frame
This option can be selected if a frame is defined. The horizontal muntins are then automatically adjusted to the frame geometry.

Parameters

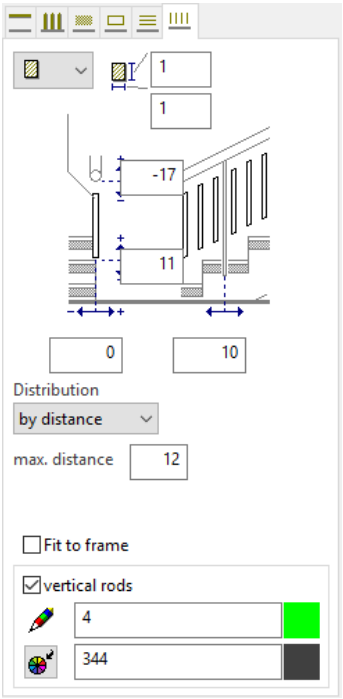


You can switch the muntins on or off using the tick box.
You can also specify the pen, 3D colour and material.

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

Vertical muntins



Shape of horizontal muntins

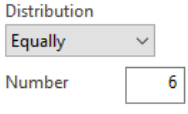
Select from a round, rectangular or free profile.
For a free profile, you have the option to draw any cross-section yourself and use it as a vertical muntin.

TIP

The *free profile* is a self-drawn cross-section saved as an ELITECAD file. The cross-section must be a successive contour. The reference point must always be in the centre of the contour when saving.
If a 3D part is loaded, this is adopted as muntin as a whole. The reference point must also be in the centre and under the 3D part when saving here

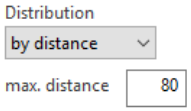
Position of vertical muntins
For the baluster top edge, the value 0 is measured underneath the handrail.
For the muntin bottom edge, the value 0 is measured flush to an imaginary line connecting the stair edges.
In the floor plan, the vertical muntins are fixed by two dimensions, one for the distance of the muntin axis to the stairway, and one for the distance of the muntins from the baluster.

Equal distribution



Enter the number of muntins, which should be distributed along the banister. The options PER SIDE and PER SECTION are only available if no balusters are active.

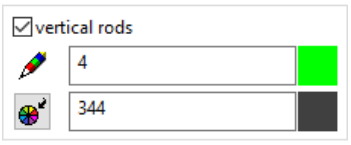
Distribution over maximal distance



Here you can enter a maximum distance of the balusters. The options PER SIDE and PER SECTION are only available if no balusters are active.

Fit to frame
This option can be selected if a frame is defined. The vertical muntins are then automatically adjusted to the frame geometry.

Parameters



You can switch the muntins on or off using the tick box.
You can also specify the pen, 3D colour and material.

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

Entry

Stair

A stair can be selected later with this option. Blue contours are shown where a banister is possible. Several contours can also be selected, and the selection confirmed with [Enter].

Draw roof contour manually

The drawing functions LINE, POLYGON, CURVE and SPLINE are available for selection in the Input Assistant. You need to double-click to enter via the polygon and the spline.

Create banister from existing contour

With this option, one or several 2D contours can be selected. The selection is confirmed with [Enter].

TIP

A banister can be generated from a polygon that is not drawn in the floor plan level. This allows banisters to be generated on a slanted retaining wall, for example. A definition from 3D curves is also possible.

Edit banister

Banisters can be edited and modified at any time by double-clicking them. All detail settings can be modified at a later point.

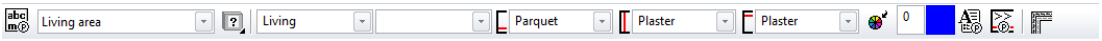
10.6 Room

	Construction parts toolbar
	AR Objects menu > Room

The room label creates the room label block in the floor plan, but also a floor and the materials for walls, floors and ceilings for the report.
In order for the room to be placed automatically, there must be a surrounding room-limiting area. Walls with doors and windows, glass elements, columns, chimneys and room separators are delimiters.

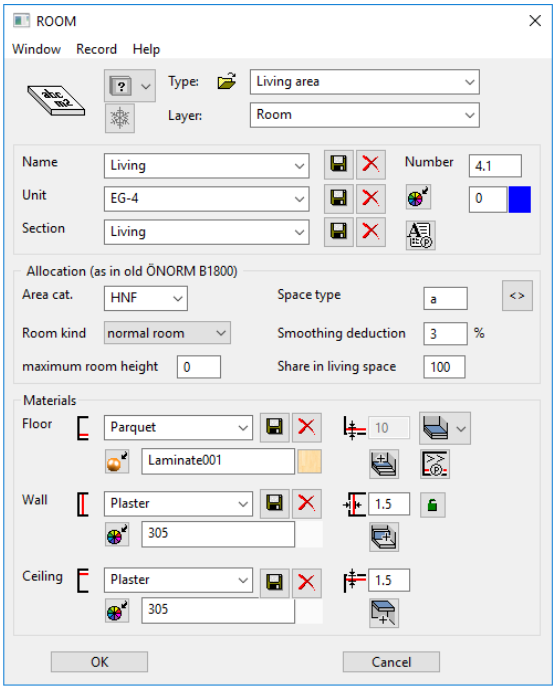
Room properties bar

The properties bar is visible as soon as the ROOM function is launched or if an existing room is edited.

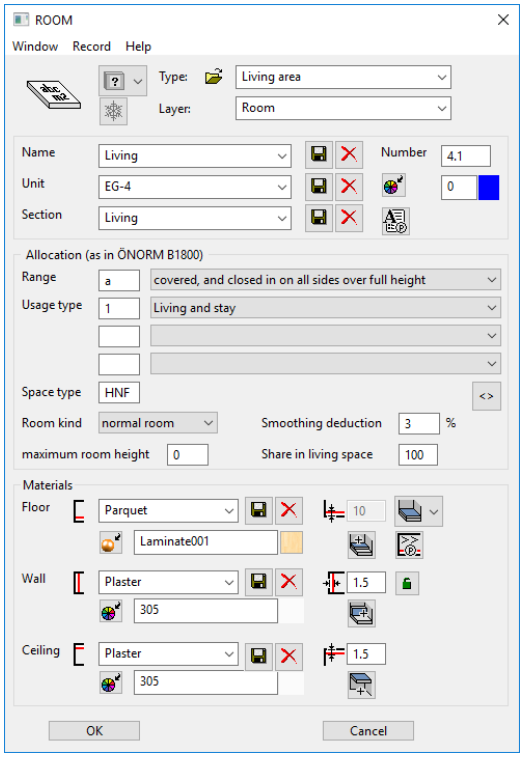


	Room parameters
Living area	**Room name**
	Renovation planning state (see chapter 8.5)
Living	**Unit name**
Parquet	**Floor covering**
Plaster	**Wall finish**
Plaster	**Ceiling covering**
0	**Colour**
	Labelling
	Parameter
	Switch between main contour / layer contour
	Modification functions

ROOM PARAMETERS



Switzerland/Austria



Germany

General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Name
Name of the room.

Unit
Several rooms are compiled into one unit. In residential construction, this unit would be a flat, and in the commercial sector, a rental unit.

Section
A combination of several accommodation units within a structure or a separation of different uses e.g. office, production, sales, residential.

Number
Room number

Util. type (Switzerland/Austria) Area type (Germany)
Areas according to standard (e.g. MUA main usage area).
Austria: ÖNORM B1800 (Austrian Standards Institute), Section 4.3 Net footprint.
Switzerland: SIA 416, Section 2.1 Net storey area and section 3.1 Exterior net storey area.
Germany: DIN 277-2, table 1 (net floor areas) (e.g. NF1).

Area type (Switzerland/Austria) Range (Germany)
Boundary type of the rooms for the report.
For Austria, the field "Area type" of the range according to ÖNORM B 1800, section 4.1.1 (a, b or c) is used.
Germany: according to DIN 277, section 3.1.1 (a, b or c).

Usage type (only Germany)
According to DIN 277-2, up to 3 places

Area style
In addition to the "normal areas", there are special areas, which must be declared for a correct report. This includes an air space, exterior room, courtyard, stairwell, or whether the plane counts as a construction surface according to ÖNORM B 1800, DIN 277, SIA 416.

Infill hatch
In order to show the assignment (unit 1, 2, etc. or use of wet rooms) of rooms in different colours in the plan, an infill hatch can be assigned.
Room infill hatches can also be switched on or off globally via the function EXTRAS > ROOM HATCHES ON/OFF.

Max. room height
Room height, according to the standards ÖNORM B 1800, DIN 277 and SIA416, which is definitive for the net volume. A 3D surface is created at this height using the function QUANTIFY.

Proportion of living space
The field is provided for verifying the living space. The permissible proportion of the surface is entered in percent, which includes the surface for living space according to the standard. Germany: Living spaces ordinance (WoFlV).
If no value is entered, the value up to 100 % of living space is included in the report.

Deduction for plaster (only Germany)
The deduction for plaster in % is no longer permissible according to the living spaces ordinance (WoFlV), but can be used for comparative purposes.

Apply free contour

A previously drawn 2D contour can be defined as a room contour. Walls or room separators do not necessarily need to be present. This function is used if the basis is a 2D plan, but the room areas should be calculated.

Modify free contour

If an individual contour is used as a room contour, the room has grippers and handles along the contour during editing. The contour can be modified with polygon manipulations, or the function MODIFY FREE CONTOUR is used at the end of the properties bar, which reduces the room back to a 2D contour, which can be edited. To complete the function, you must click the ROOM CONTOUR READY function. This appears on the dialog window at the top right.

Materials

The names of materials are always directly "connected" to the respective component for the dimension report. The "dimension" of a wall can therefore be identified by its geometric data and its material label.
However, the report of plaster surfaces, for example, cannot simply be linked with a wall component, as surfaces must be deducted from abutting walls. Therefore, the "room skin", i.e. all material layers, which are shown in the room (namely the difference from bare construction to extension) are assigned to the room.
The name "TILES" can be assigned to the material for the **floor**, and e.g. "PLASTER" for the **walls** and **ceiling** with its respective gauge. For the surface of a drywall, "PAINTED" will suffice with gauge "0", as the plasterboard layer belongs to the wall and should not be included in the calculation.

TIP

The names of materials entered can be saved individually or deleted again.

Colour mode/Material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

EXPLANATION

For the construction parts wall, column and slab, for the colour or material selection there is a button which specifies whether the material for room label is shown or not.

If the lock is not set (open lock), the material configured in the room parameters takes precedence. However, if the lock is set (lock closed), the material of the respective construction part is represented and not that of the room label. This setting has no effect on the report.

Floor gauge
The gauge of the floor can also be controlled using the height reference.

Height reference active

If the height reference is active, the gauge of the floor is calculated from the height section of the structure settings and cannot be adjusted in this dialog window. In general, this option should be selected, as this is the only way to make a global modification in the structure settings.

Height reference free

The free height reference is used if a floor of the storey has another composition (e.g. cement layer instead of a subfloor/screed).

TIP

The floor gauge which can be defined in the room dialog window influences the parapet heights/lintel heights of windows and doors insofar as these have been entered via *finished parapet*, *finished clearance* or *lintel (gross) FFL*. The higher floor composition is always used for doors (not the opening direction side!). If no room name is available when placing, the (finished) floor level defined in the structure settings is taken into account.
In the case of library parts defined as furniture, the 3D information about the height of the floor composition is moved in the Z-direction.

Parameters for floor construction

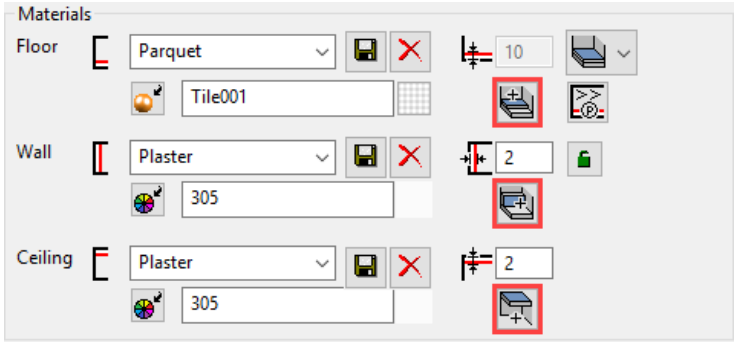
The floor composition with its own layers can be specified in the parameter.

Thickness of wall finish

The gauge of the wall finish can be defined. This layer is not shown in the design model, but is only relevant in the report (wall finish, living spaces). In active linkage (red lock), each wall side of the room is checked for the substrate material, and if the material is stored in the report database, use the corresponding gauge from the database. For walls without a substrate material in the database, the gauge entered in the dialog window is used. The gauge from the database is only taken into account in living space verification. This is not taken into account for the wall covers.

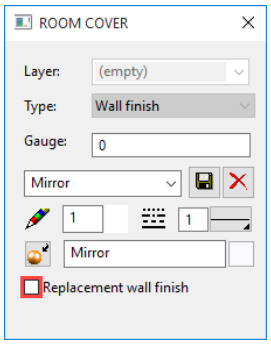
Ceiling covering gauge
Gauge of ceiling covering

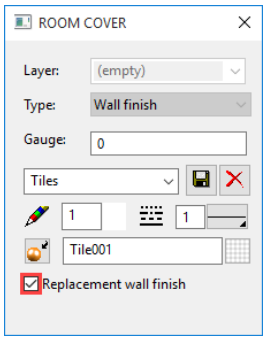
Additional covers
If an existing room is edited, additional room covers can be appended.

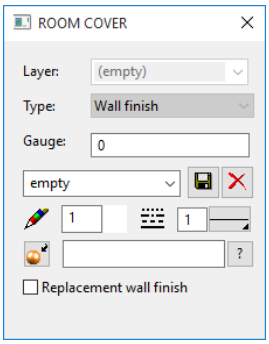


Definition of an additional covering
There are three different types:

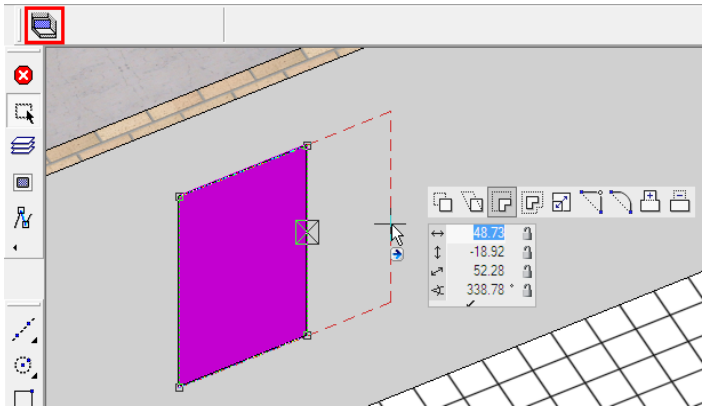
Addition replacement deduction





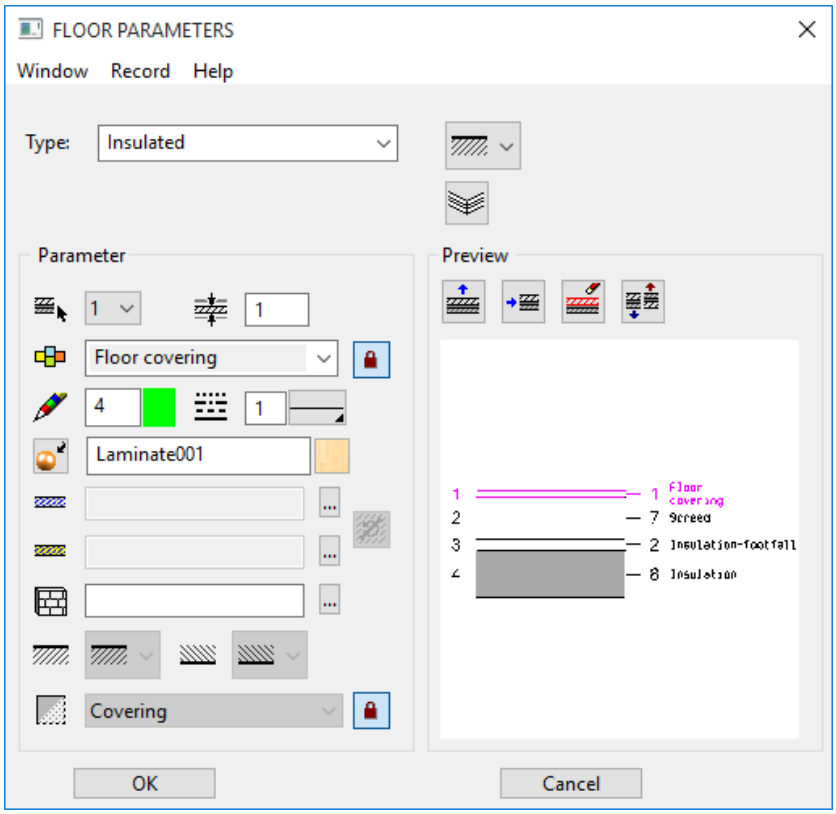


For the *Additional* type, the plane is quantified twice, for the basic material and for the additional material. If the basic material is replaced, only the new covering is quantified. The material and texture field is empty for the *Deduction* type. The plane is not quantified. This type is used, for example, for a fitted cupboard, which is not cleaned behind, or if there is no floor covering under the bathtub.
All of the drawing functions are available in the Input Assistant for creating the planes. The work plane does not need to be set on a wall, but rather the system notices independently which wall should be added.
An existing, additional room finish can be selected and manipulated with the handles and grippers; the value settings of the material can be seen via the properties bar or the marked covering can be deleted.



Parameters for floor construction

The individual layers of the floor can be defined and materialised. The layers can be created with an inclination.



Type
Description chapter 8.5

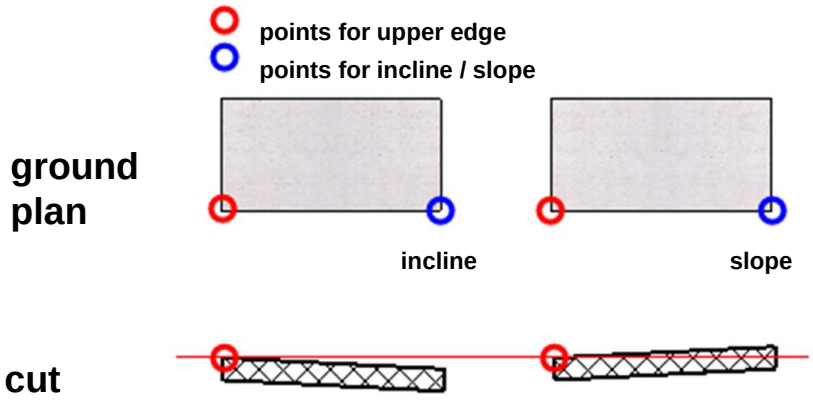
Floor (finish) type

	straight	No incline settings
	Slanted above and below	Incline settings active
	Slanted above	Incline settings active

Incline settings
These settings are only visible with a sloping floor.
There are 3 definition types

	2 %	Incline
	2 %	Slope
		Define by 3 points

The floor is defined by 2 points for the INCLINE and SLOPE definition types.



The DEFINE BY 3 POINTS definition type determines the inclination via 3 points. When creating the floor, the point is always queried first then the associated height must be entered. An imaginary plane is defined through the three height points, which is then moved in parallel until the layer has the defined minimum or maximum value.

Layer gauge minimum or maximum value

Maximum value

Minimum value

The layer gauge is measured on the thickest cross-section or on the thinnest cross-section. For the maximum value, it must be ensured that the layer does not approach zero.

Parameters

Number of active layer

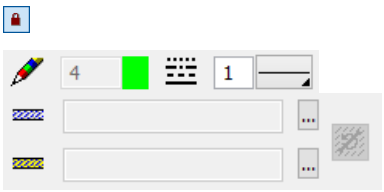
For multi-layered floors, you can select the desired layer in order to configure its settings. Instead of selecting the number, you can click directly on the layer in the preview.

Gauge of active layer

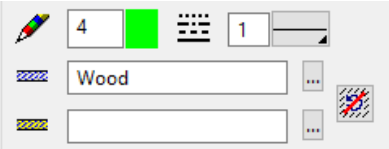
Material and its linkage

The materials and their corresponding settings are saved in the representation level. When linkage to the representation level is selected (recommended), the pen and hatch settings are adopted and cannot be manipulated ("greyed out")

Pen and Hatching parameters



When the linkage of the material is active, only the line type can be modified.



If you unlink the materials, the pen type and hatches can be modified.
The settings are described in chapter 8.1 Representation level > Materials management.

Colour mode/Material mode

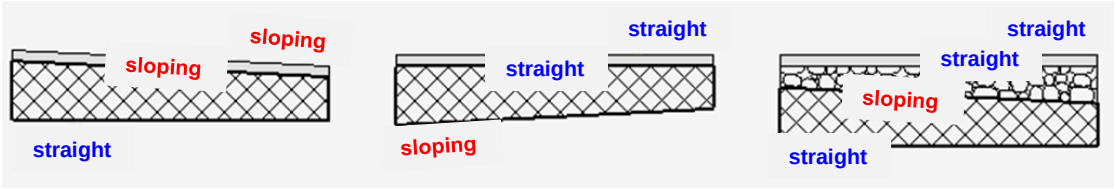
These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

3D hatch

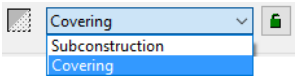
The floor layer can be assigned a line hatch that appears in the calculated hidden line views.

Layer slope

This option is only active for a sloping floor.
You can specify for each layer border, whether it is on the incline.
A floor may only have one inclination, but be horizontal overall when you consider both the top and bottom surfaces.
Examples:

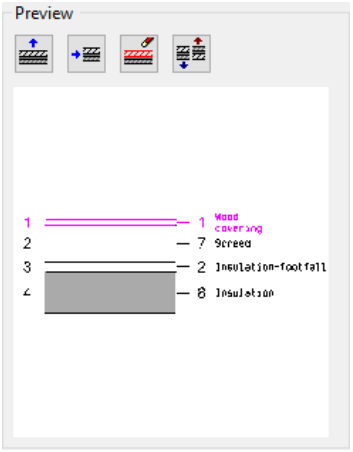


Layer type



For the report to be correct, a layer type must be assigned to the layer.
If the linkage to the material is detached, you can make the assignment independently.
If the linkage is active, the layer type is read from the report database using the material name.

Preview



The current construction is depicted in the preview. Layers can be added, deleted or replaced. If you click on a layer in the preview, its parameters are displayed.

Add layer

The function adds a new layer to the last layer. This layer has the same settings as the current layer.

Insert layer

The function adds a new layer above the active layer.

Delete layer

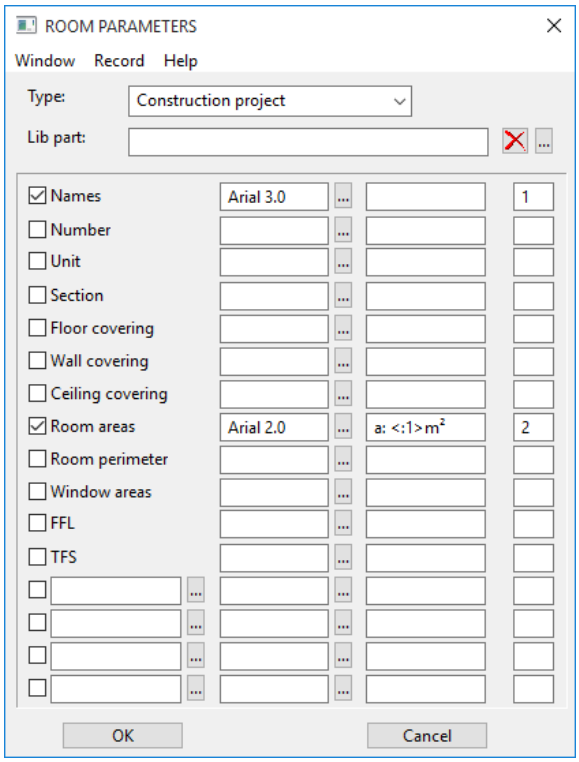
Deletes the active layer.

Mirror layers

This function rotates the group of layers by 180 degrees.

Label

The room label style can be set individually for each representation level. In the permission planning, only the room name and the square metre surface are shown; the (finished) floor heights and the materials should also be labelled in the execution planning.



Type
Description chapter 8.5

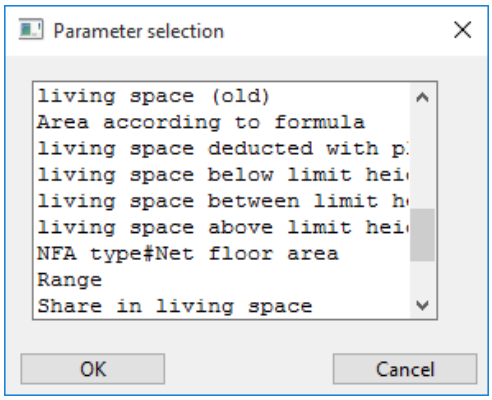
Label options
Each row has a tick box, which is used to activate the label attribute.

Text parameters
A text parameter must be entered for each entry.

Formatting option
The formatting option allows pre-texts and post-texts to be generated. If the calculated room area is provided with the post-text "m²", the formatting "<> m²" must be entered. The sequence of "greater than" and "less than" signs are placeholders for the value which is being calculated.
The room area is set to have 2 decimal places by default. If you want to use a different rounding algorithm, you can control this with additional entry between the placeholder symbols.
If only one decimal place should appear, the entry must be "<:1> m²".
For rounding to a half square meter, it must be "<:05> m²".

Numbering
The numbering of the values sets the order of the texts. The text with the lowest number (here "1") begins at the height of the room model ("small blue line"), all other texts are generated under it.

Additional label options
At the bottom of the dialog window there are four free rows available, which can be used for each attribute, which is connected to the room label object. However, some attributes are added to the room name first by the function SUMMARY TO PROJECT BOOK.

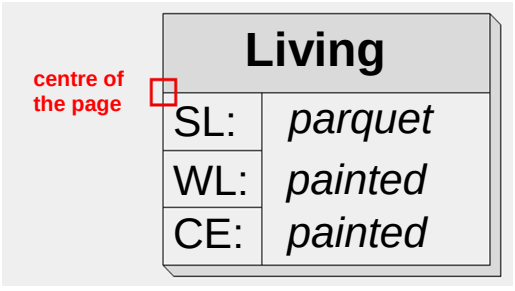


areanorm	Room areas incl. height check and percentage deduction for plaster
areanormnew	Room areas incl. height check and effective deduction for plaster
areanorm1	Room area under limit height (DIN 277: 1.50 m)
areanorm2	Room area over limit height (DIN 277: 1.50 m)
areanorm0	Area from living space calculation below limit height 1
areanorm50	Area from living space calculation between limit height 1 and limit height 2
areanorm100	Area from living space calculation above limit height 2
use	Net storey area type
areatype	Area (a, b or c in accordance with DIN 277 and ÖNORM B 1800)
areapercent	Proportion of living space in %
plaster deduction	Percentage deduction for plaster in living space calculation (in accordance with the old Second German Calculation Ordinance)
roomheight	Room height
minroomheight	Minimal net clearance

For more information about setting the limitation values for living space calculation, please refer to the Report chapter, "Deduction limits, height specification and formula settings" section.

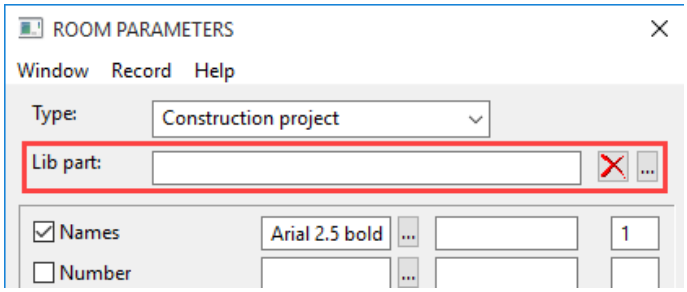
Simplified input of additional room labels
When activating a room label automatically a default value is set as text parameter and the room label is numbered.

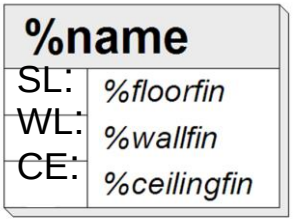
Library part
The room stamp graphics can also be controlled by a library part. This library part can include lines, hatches, fixed texts and autotexts. The room stamp should preferably be drawn in the centre of the page, as this reference point will later also be the placing point of the library part.



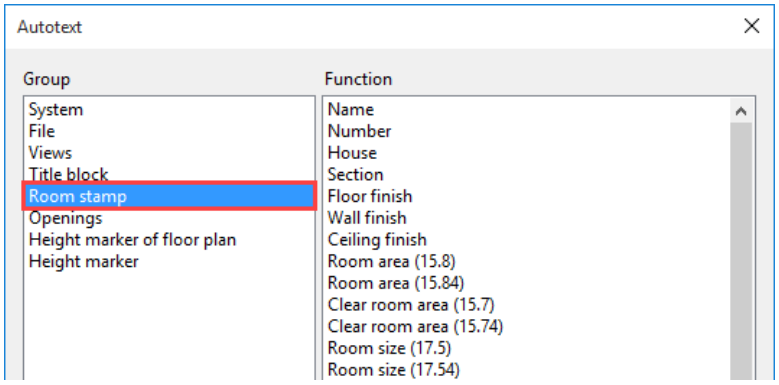
The library part can be saved to a parameter record and is therefore dependent on the representation levels. If a library part is selected, the attributes have a grey background,

as the autotexts in the library part already determine which attribute is represented, and how and where.





In the *Room stamp* group, all attributes with the most common rounding variants are included in the autotext.



If the desired rounding is not available, the autotext can be adjusted manually.
"@format(%floortop,+zm.2)@"
'+' means with a sign in all cases
'**z**' means '±' for value 0
'**m.2**' means AT LEAST two decimal places

@format(0.00,+zm.2)@	±0.00	@format(0.00,+m.2)@	+0.00	@format(0.00,m.2)@	0.00
@format(0.015,+zm.2)@	+0.015	@format(0.015,+z.2)@	+0.01	@format(0.1,+zm.2)@	+0.10
@format(0.5234,.0)@	1	@format(0.5234,.1)@	0.5	@format(0.5234,.2)@	0.52

@format(%floorstart,+zm.2)@

ROOM REPORT

Only contours of the construction parts wall, lintel, chimney, vertical glass elements and the room separators are used for the room report. These 2D geometries must be on the work plane of the current storey (bare ceiling level). Construction parts of other structures are **not** taken into account. Bordering rooms (provided, that walls are only defined in one structure) are completed with *room separators*.
The must not be any crossover of bordering walls. Equally, for walls lying one above another, only one wall in each case may be definitive for the room contour (*room dividing*).

ROOM MODIFICATIONS

Move
If you move a room name, the room data is immediately recalculated when it is set back down. The blue placing cross must always be inside the room to be calculated.

TIP

If the text should be outside of a room, it can be moved after clicking the handle. The blue placing cross stays inside the room here.

Copy
You can copy a room name as an object at any time. All changes (such as a change of storey) are refreshed immediately. However, please note that it may be difficult for you to differentiate between two rooms with the same name in the same storey (the unit label stays the same when copied) in the list output. You should therefore edit your room names as soon as you have copied them. Otherwise, you can easily forget to do this!

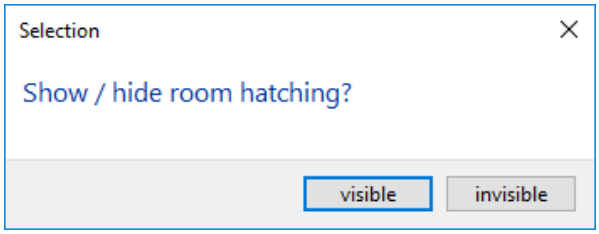
Edit
Clicking on the room label opens the properties bar where you can make modifications or you can open the room parameters dialog window for more detailed settings. Please do not use the MODIFY TEXT function to modify the room names, otherwise the room name will not be able to determine dimensions automatically.

Refresh
If the extent of the room is manipulated, i.e. by shifting walls, stretching room separating lines or whole rooms, the room name is refreshed automatically. If you delete walls and lintels or add new ones to a room, the room name must be refreshed using the function REFRESH ROOMS from the LAY-OUT menu. This also applies for the window and glass elements. If this is changed, the room label must be refreshed, so that the window area is correctly indicated.

SHOW ROOM HATCHES

Extras menu > Room hatches on/off

This function opens a dialog window to set the visibility of room hatches.



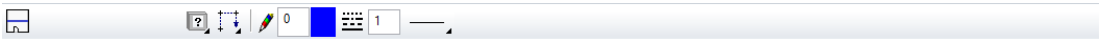
10.7 ROOM SEPARATOR

Construction parts toolbar
AR Objects menu > Room separator

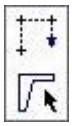
In some cases, you will want to show parts of rooms. You can delimit rooms using the room separator, a special polygon.
In the same way as for the walls, the program needs closed contours to identify rooms! Therefore, please ensure that you always make connections of room separators with the corresponding capture modes, so that no "holes" develop.

ROOM SEPARATOR PROPERTY BAR

The property bar is visible as soon as the function ROOM SEPARATOR is started or an existing room separator is edited.



Entry mode



Draw contour

Select contour

Line type

Line type used to draw the room separator.

Pen

Pen used to draw the room separator. Room separators may also be drawn with pen "0" (will not be printed).

TIP

Further examples of room separators:

- Using room separators, large rooms in departments (large offices/department stores/cost centres) can be divided.
- Exterior areas such as balconies and terraces can be recorded as quantifiable rooms.

WORKSHOP

Set room separator

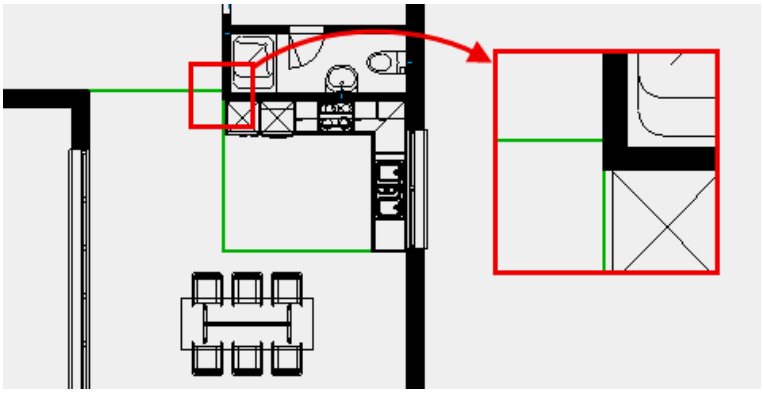
Example:
Split a living room with an attached kitchen so that both areas can be shown separately. Draw the room separator from "wall to wall", so in this case also along the working area edge.

The separation line will not be printed. If you want to show a separation line due to a change of covering, you can change the pen colour with the PEN/LINE FROM ELEMENT function.

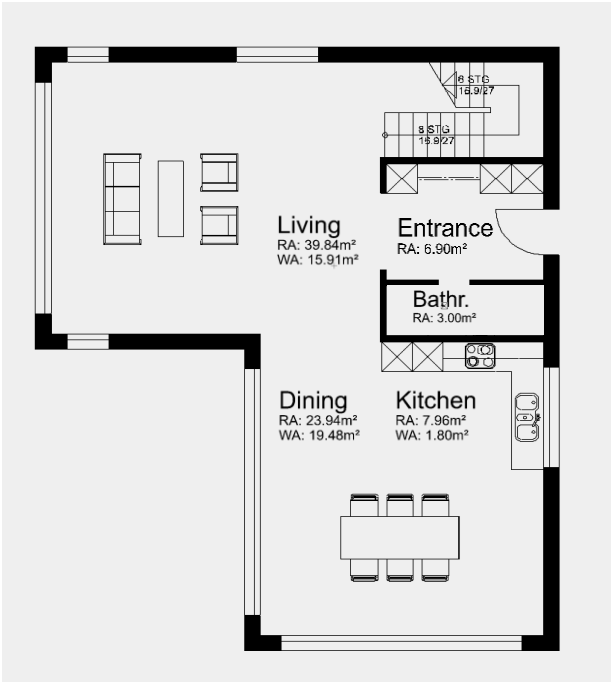
Select function

If you have not yet created a polygon, you will need to select the option DRAW CONTOUR.

Draw the room separator. Line type and pen colour are not relevant.
Attention: Only draw a room separator between the walls and never over them.



You must not press the [Esc] button to end the contour, but click again on the last point of the room separator contour in the same way as for the wall.



WORKSHOP END

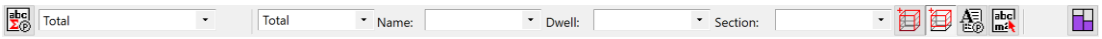
10.8 ROOM GROUP

Construction parts toolbar
AR Objects menu > Room group

Multiple rooms are grouped into a room group. An application of room groups is the combination of multiple rooms into an apartment.

ROOM GROUP PROPERTY BAR

The properties bar is visible as soon as the ROOM GROUP function is launched or if an existing room group is edited. You can manipulate the main values in the room group's properties bar.

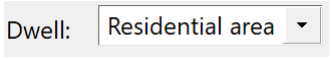


Type

Description

Renovation planning sate (see chapter 8.5)

Room name



Unit

Section

Storey transcening

Structure transcening

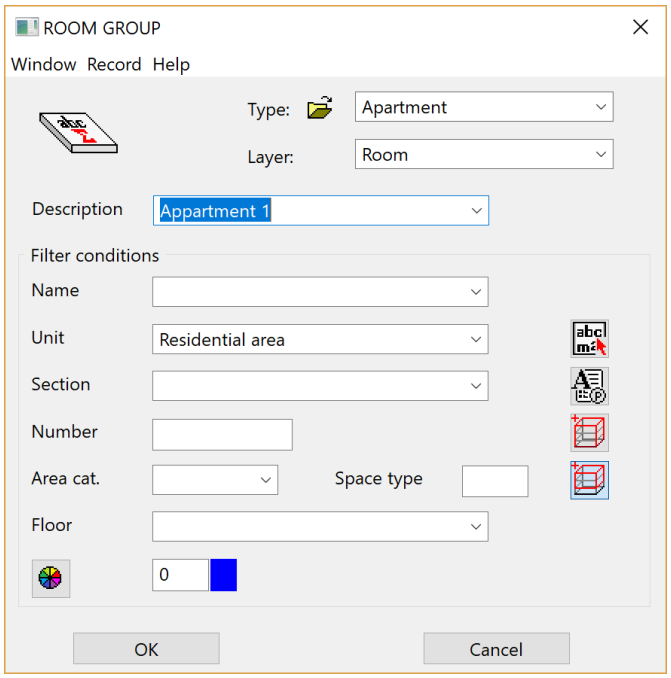
Label

Copy values of room

Show grouped rooms

ROOM GROUP PARAMETERS

You can open the room group parameters via the properties bar or by double-clicking the room group to be modified.



General parameters

- Status renovation planning
- Freeze
- Type
- Layer

The general parameters for architectural objects are described in chapter 8.5.

Description

The description corresponds to the room name in the room label.

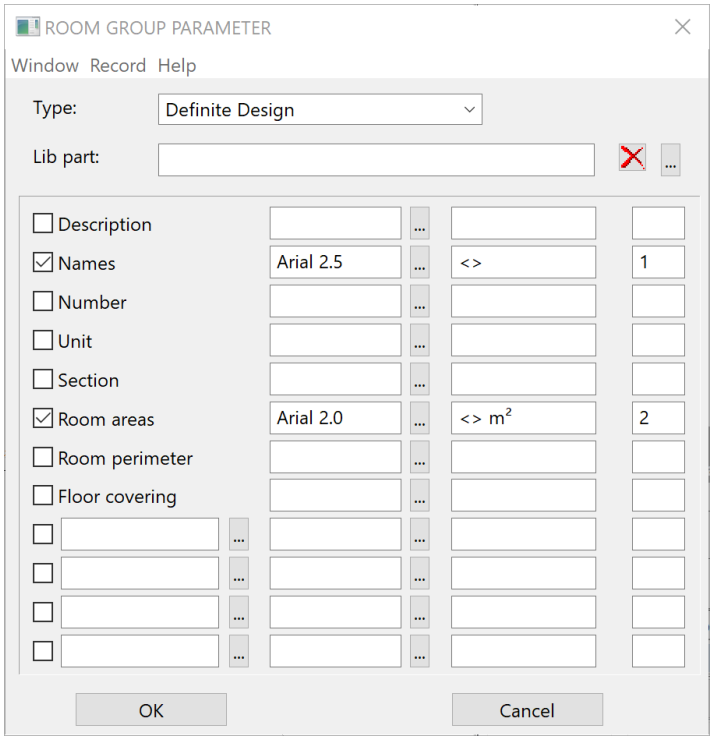
Filter criteria

The room group parameters correspond to the parameters of the room. They define how rooms are grouped according to which criteria. Empty fields are not user for filtering.

In order to avoid entering all values, parameters can be copied from a room. Parameters that are not needed are easily deleted.

It is allowed that room group are storey or structure transcending. If a storey or building transcending filtering is deactivated, the filtering considers only the same storey or structure of the room group. Special treatment is performed if structure transcending without storey transcending is activated. That configuration considers storey of all structures having the same storey number like the room group.

LABELLING PARAMETER



The labelling parameters of the ROOM GROUP function are identically to the labelling parameters of rooms. The only difference is that areas correspond to the sum of areas of the grouped rooms.
If the option UPDATE ROOMS AUTOMATICALLY is active, then the sums of rooms are automatically calculated.

11.Output

11.1 VIEWS..... 819

11.2 PRINT 876

11.1 Views

What is a view?

In ELITECAD, the word "view" summarises the following terms:

- General view (building view, facade, standard view like front, rear, isometric)
- Plan view
- Section
- Detail
- Plot view

A view is synonymous with a "defined view angle" of the 3D model. Depending on the view type, this view angle can display different properties, such as the depiction of the model as a floor plan, a 3D hidden line or section. In addition, a filter can be defined that determines which components of the design model are to be displayed. Additions can be made in the views that are not visible in the design model. The design model can therefore be edited without being disrupted by a multitude of lines that originate from floor plans, sections, views and details.
A view is determined (e.g. 3D rotated and zoomed) and saved under any name.
There is a direct connection between 3D model and plan views. All other view types can be refreshed as required. If the project is modified in the design model, the changes are also displayed in all defined views and plots. The greater part of project processing and the associated creation of plan documents can be generated from a single 3D model by using views. This helps to avoid inputting and executing redundant CAD inputs in ELITECAD as much as possible.

TIP

In ELITECAD Architecture views are only backed up once all storeys have been saved together (e.g. as *model.d*). This must be borne in mind especially when working with separate storey files (see chapter 8, team function).

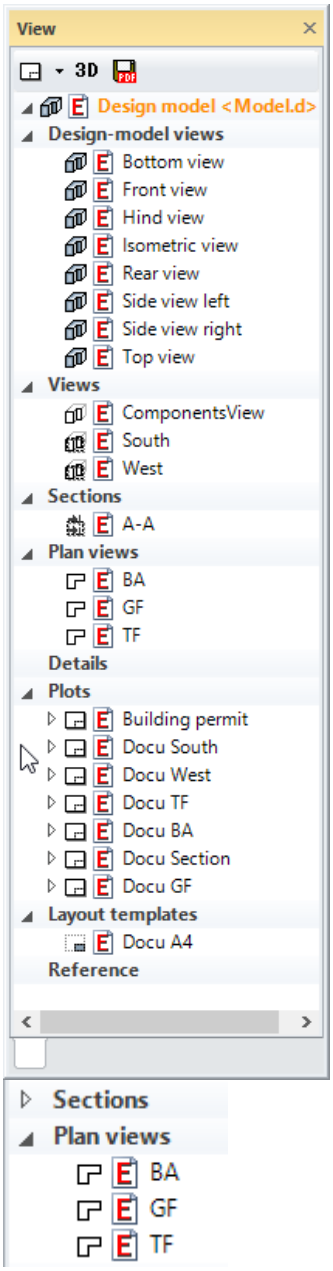
TIP

The option SAVE VIEWS can be deactivated in the OPTIONS. This is used for instance to create library with reduced size.

Views management

View toolbar
View menu > Window > Views...

Views management is used for managing the individual views in the model. Views management helps to create an optimum overview, either for the management or for creating plans.
If the window is not visible on the user interface, it can be opened or moved to the foreground via VIEW > WINDOW > VIEWS....
There are different options for positioning the dialog window on the screen. These are described in the chapter on the user interface.



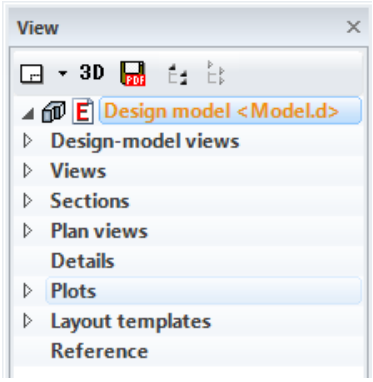
Header functions
Functions are in the top row. They change depending on which view type (design model, views, sections, etc.) is selected.
If not all functions are visible, the window is too narrow and must be widened for the user to be able to access the functions.

Left mouse button
A view can be selected with the left mouse button. The name is marked and the view is shown in the work area. Open the parameter dialog window of the respective view by double-clicking it.
A view can be inserted by drag and drop into a plot with the left mouse button.

Right mouse button
A new view can be created, the sorting order determined or a group (sub directory) created by clicking once on the title of a view type.
Different functions are available depending on the type by clicking once on a view.

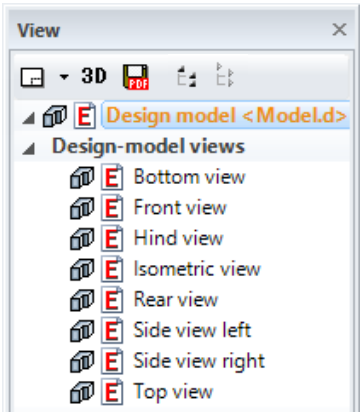
Structure view
Further structures are displayed or hidden by clicking once on the triangle preceding the main titles. Double-clicking on the main title achieves the same result.

What types of views are there?
The main work takes place in the view *Design model*.
The views are structured by type.
- Design model views
- Views
- Sections
- Plan views
- Details
- Plots
- Layout templates
- Reference



Predefined views
In ELITECAD Mechanics only the Design model views exists when a new construction is started. All other views have to be manually created by you when needed.

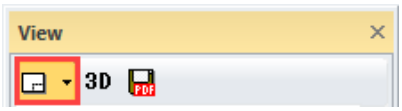
In ELITECAD Architecture some views are available from the outset. These are three-dimensional design model views with predefined view position and focal point. For instance, the design model view "Top view" displays the design model from above. When rotating it in 3D, it becomes apparent that it is a design model view. A design model view always displays the current model, but just from a different angle.



NOTE

Views can be detached from the main window for simultaneous processing in a separate window. This function is located in the context menu of the view and is described in chapter 1.2 USER INTERFACE > VIEW LAYOUT.
References are described in chapter 1.9

Header functions of views management
Other functions are available depending on which view type is selected.



Functions to create new views

New main group

3D edit mode (only available in ELITECAD Architecture)

Save PDF file

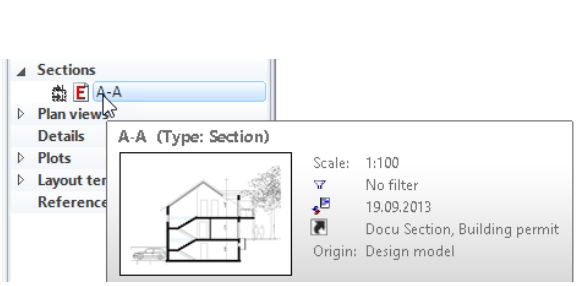
Expand all view groups

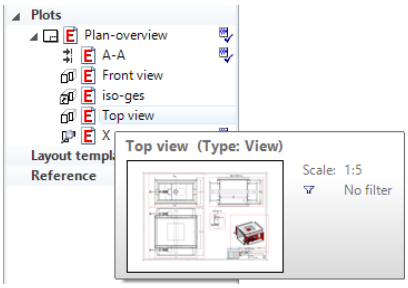
Close all view groups

Quick info

If the cursor is moved over a view name, a window containing the most important information for this view appears temporarily. The type of the displayed data depends on the type of view.

The preview image is only available once the view has been loaded for images that have been created prior to ELITECAD V12.



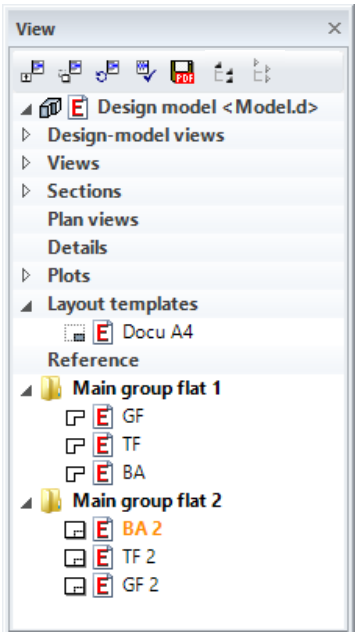


Structuring

Free groups and subgroups can be created under each view type that only contain views of this type.

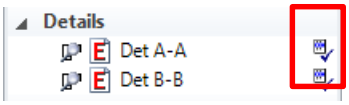
Main groups can also be created parallel to the view types. The function NEW MAIN GROUP can be accessed via the header functions, via the context menu of the *Design model* view or the context menu of the background of views management.

Views of different types can be combined in self-defined main groups.



Refresh views

Views that are no longer up to date are marked with a symbol. The view is refreshed by clicking on this symbol.



TIP

If multiple views are marked by holding down the [Ctrl] or [Shift] key, they can be refreshed simultaneously via the context menu.

FUNCTIONS IN VIEWS

Many functions in views of different types are identical and described in this common section.

Show view in a new window

This function is only available if "Multiple views" is switched on in the OPTIONS and the view is not active. The view is opened in a new window.

Float view window

This function is only available if "Multiple views" is switched on in the OPTIONS. The view is opened in a separate window, which can be displayed on a second monitor.

Rename

The view can be given another name.

TIP

The predefined design model views cannot be renamed or deleted.

Delete

The current view is deleted. The function must be confirmed in a query. The program switches to design model view.

3D edit mode

Modifying in 3D edit mode is only available in ELITECAD Architecture. The 3D edit mode is relevant for views with type "view", "section" and "detail". In model and plan views, one is always working in the 3D edit mode.
Modifications or additions in the 3D edit mode can be made directly in the 3D objects. A more detailed description can be found in the chapter EDIT VIEWS.

Export view

The function creates a 2D file of the view. The file loses all relation to the original design model and therefore cannot be refreshed.

Modify view

The settings dialog window of the view opens and the values, especially the type, can be modified.

TIP

The view can also be modified by double-clicking on the view name.

Separate view

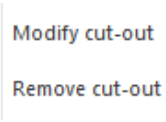
This function is only available in ELITECAD Mechanics. This function is used to store the view as separate drawing. The view remains associated with the design model as an external view. You find a detailed description in the section External views.

Define, modify or delete cut-out

The menu item DEFINE CUT-OUT appears by right-clicking on the graphics window (context menu). If the cut-out already exists, MODUIFY CUT-OUT appears.

The function DEFINE CUT-OUT determines an area to which the visibility of the view is restricted. Partial areas can therefore be defined from larger views. This functionality is not available in all views, excluded are the design model view, plot views and predefined standard views.

The handles of the definition contour of the cut-out become visible with the function MODIFY CUT-OUT. Additionally, the cut-out can be modified via the middle mouse button and zoom functions (in model views the view angle). The camera position and the cut-out are saved by pressing [Esc] or CANCEL.



The view angle in model views can be modified via VIEW > CAMERA. The most recent camera setting is saved once the camera dialog window is confirmed with OK.

The context function DELETE CUT-OUT cannot be used for perspective views of "Design model view" type.

General view parameters

Many parameters in the settings dialog window of views of different types are identical and hence described in this common section.

Name

The description of the view must be unique. If a view with the same name already exists, a query appears asking the user whether the existing view is to be overwritten.

Type

During creation, the type is fixed. Having been created, the type with the function MODIFY VIEW can be switched. Only compatible view types are offered, some view types do not allow type changes at all.

Offline

If the option OFFLINE is selected, the view cannot be refreshed.

Format

Standard formats such as A5 to A00 can be selected or a user-defined paper format can be set. In this case, the height and width can be entered directly or saved with a name using the OPEN button. The format can be adjusted at a later stage.

Orientation

Users can select between portrait format and landscape format here.

Rest scaling

Hatch, text, arrows and dimensions are denoted with "Rest".
Rest scaling is available for views with type "view", "section" and "detail". If the scale of the view is selected differently than in the model, this option controls whether the rest is enlarged or reduced like the geometry.

EXPLANATION

The check box only modifies the rest that derives from the design model or an original view. If hatches, texts or dimensioning have been drawn in the view, these depend on the switch settings in the menu SETTINGS > REST SCALING in the case of a change to scale.

Renovation planning

The settings for renovation planning are only available in ELITECAD Architecture.

Object state

colour representation
no colour representation

The coloured depiction of renovation planning states can be activated per view. Additionally, the renovation planning has to be activated in the OPTIONS.

Fillings

not shown
show

Fillings for walls and slabs are displayed in the view according to the setting of this option.

Demolition objects

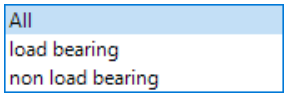
Depict Wireframe
Depict Hiddenline

Demolition objects can be depicted in wireframe mode if necessary. In that case, they have no impact on the calculation of shadows.

Visibility

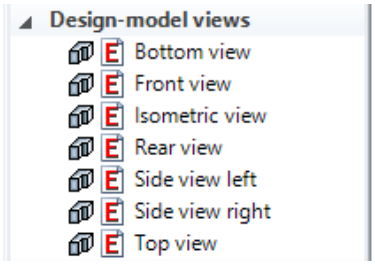
The settings for renovation planning are only available in ELITECAD Architecture.

Layer types



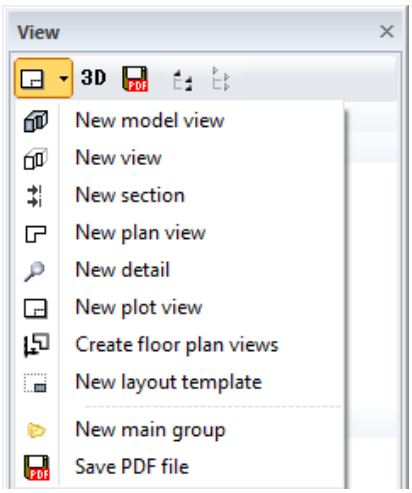
This setting defines the visibility of multi-layered objects. Depending on this setting e.g. only load-bearing layers of a wall are depicted in a view.

DESIGN MODEL VIEW



A model view displays the model from a specific angle and in a specific depiction type, such as wire model, hidden line and render. As this is a view of the design model, it always shows the current state of the design model unless it is a view of the rendering type, which you must refresh manually.

Header functions for design model views



New model view

New view

New section

New plan view

New detail

New plot

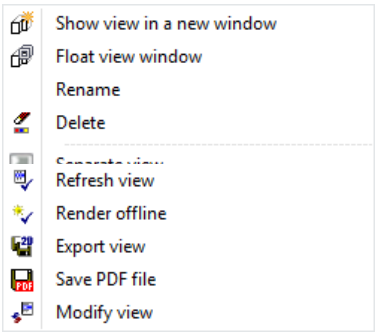
Create floor plan views

New layout template

	New main group
	Modify
	Refresh
3D	3D edit mode (only available in ELITECAD Architecture)
	Save PDF file
	Expand all view groups
	Close all view groups

Context menu of a design model view

If you right-click on a created view, the following options are available:



Show view in a new window

Float view window

Rename

Delete

Refresh view
If a model view is in the "Rendering" depiction, the image is frozen and is no longer refreshed automatically. The view can be updated with the function REFRESH VIEW.

Render offline
If there is a large number of render graphics in high resolution, it might happen that the RAM becomes fragmented and is no longer fully available after a while. As such, the render graphics can no longer be rendered. To avoid this, the rendering of the image can be launched in a separate Windows process using this function.

Export view
If a model view is in the "Rendering" depiction, the image can be saved as a separate *ELITECAD file*. This plan only contains the graphic and can no longer be refreshed.

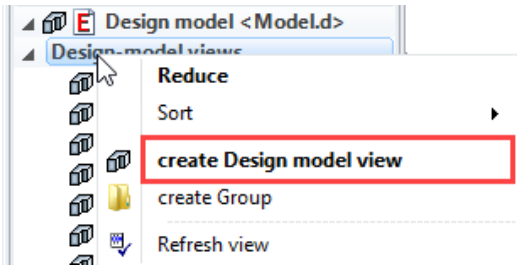
Save PDF file

Modify view

Create new design model view

	New model view views management
	Insert menu > View (design model type)

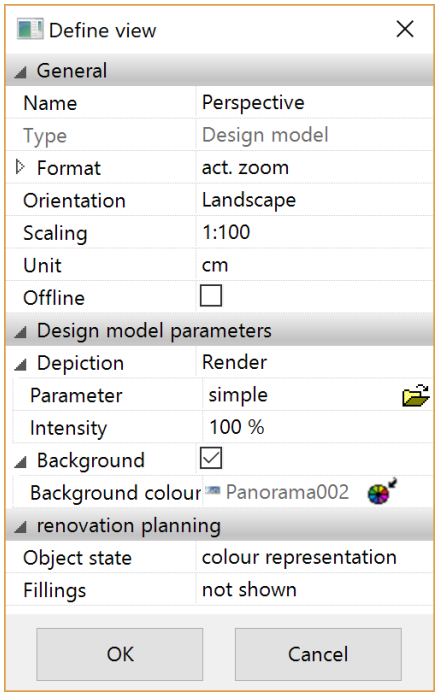
This function saves the current viewing angle of the CAD model in a new model view.



A new design model view can be generated via a corresponding header function or via the context menu of the model views if a model view is selected.

The desired settings have to be entered in the settings dialog window of the view. By clicking on OK, the settings are saved and the view is created. The function MODIFY VIEW allows to change the settings of the view after creation.

Settings of a design model view



General parameters

Name

Type

Format

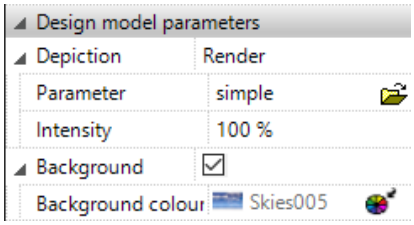
Orientation

Offline

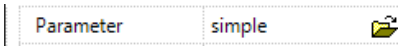
View specific parameters

Depiction
The 3D model can be saved in the depiction type wire model, hidden line, solid or rendering. The type can be adjusted at a later stage via MODIFY VIEW.

Additional settings for rendering



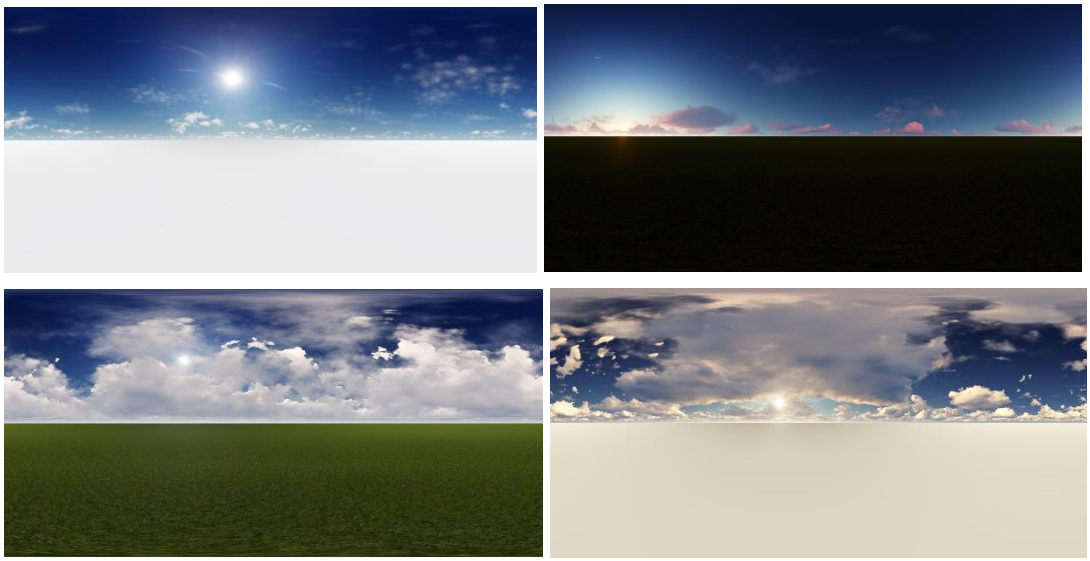
Render parameters



The render parameters can be opened directly or the saved records called up here in addition.

Background

If this option is selected, a colour or a texture from the material database can be selected for representing the background image.
Skymap can be selected as background image as well. Skymaps are 360° images, which offer a background in the walking mode for each viewing direction.



Skymaps are provided as materials with the material property skybox shader (see chapter Managing and organising > Materials).

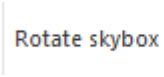
Renovation planning (only in ELITECAD Architecture)

Object state

Fillings

Functions in the graphics window context menu

Rotate skymap
In order to adjust the skymap with the design model a skaycube/skymap can be rotated. The corresponding functions can be found in the context menu of the graphic window. The skymap can be manipulated with the mouse in graphics window.

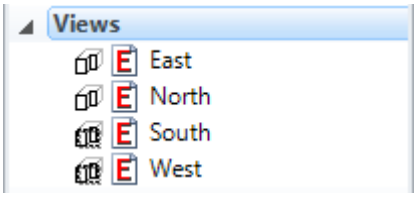


Move/scale background image
Depending on the camera setting and angle, moving or scaling the background image is required so that it fits correctly. The corresponding functions can be found in the context menu of the graphic window. If you press [Ctrl] when scaling, the image can be modified maintain the aspect ratio.

Functions in the graphics window context menu

Define, modify or delete cut-out

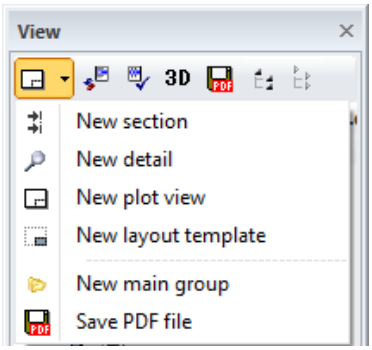
VIEWS



The views are generated 2D plans.

Editing of views is described in the chapter EDIT VIEWS.

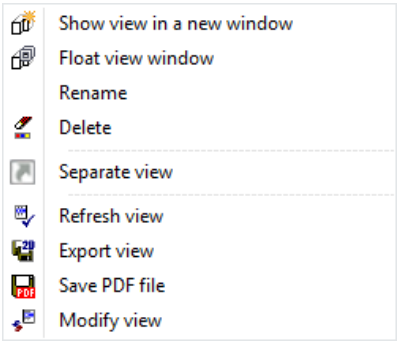
Header functions for the views

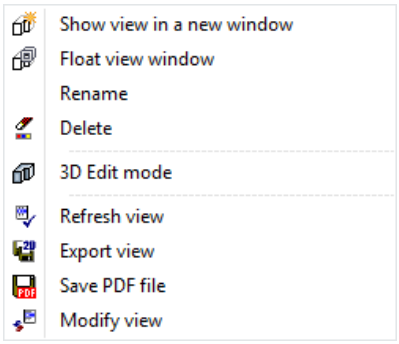


	New section
	New detail
	New plot
	New layout template
	New main group
	Modify
	Refresh
3D	3D edit mode (only available in ELITECAD Architecture)
	Save PDF file
	Expand all view groups
	Close all view groups

Context menu of a view

If you right-click on a created view, the following options are available:





Show view in a new window

Float view window

Rename

Delete

3D edit mode (only available in ELITECAD Architecture)

Separate view (only available in ELITECAD Mechanics)

Refresh view
Modifications to the model are included in the generation of the view. The design model data for the view valid up until now is replaced by data from the current design model. Newly drawn 2D elements are retained, as are edited elements of refreshed objects (e.g. deletion lines).

Undesired elements are deleted or modified when post-editing a newly generated view. Instead of actually deleting the elements, the system draws "deletion lines" over the selected elements. These hide the original lines when refreshing. If the deletion lines are deleted, the original elements reappear after refreshing.

TIP

The deletion lines are assigned a separate layer automatically that can be hidden or displayed as required.

TIPP

When working with the classification structure group/class/level, care has to be taken that newly drawn 2D data is not added to an object, which will be updated. For instance, the hatch should not be added to the contour model.

Export view

Save PDF file

Modify view

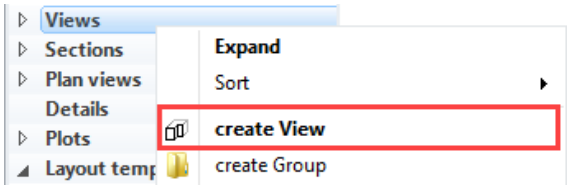
Create new view

New view views management
Insert menu > View (view type)

The currently set view angle on the model is displayed as a hidden line in 2D form. Hidden line means that all visible edges are rendered.

TIP

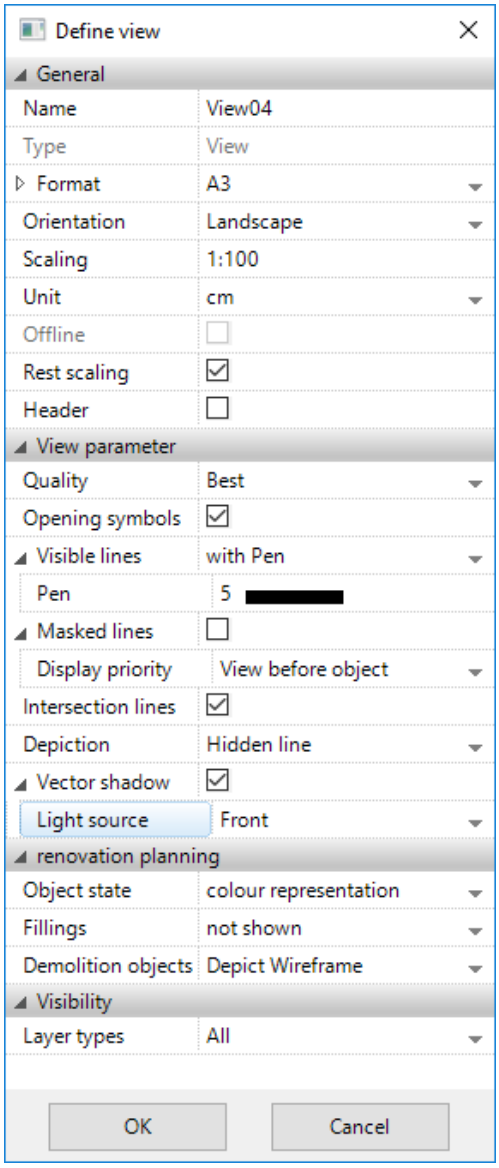
WORK PLANE ON SURFACE can also be used for generating a facade and the function VIEW POSITION used for a perspective view of it (chapter 2.3 image properties).



A new view can be generated via a corresponding header function or via the context menu of the views if a design model view is selected.

The desired settings have to be entered in the settings dialog window of the view. By clicking on OK, the settings are saved and the view is created. The function MODIFY VIEW allows to change the settings of the view after creation.

Settings of a view



General parameters

Name

Type

Format

Orientation

Offline

Rest scaling

Heading
The heading can be switched on or off. The name of the view is used as a heading. The parameters of the heading can be defined. The header is written in the centre above the view.

Title
The title can be switched on and off.
ELITECAD Architecture uses the name of the view as a title. The text parameter of the tile can be specified.

ELITECAD Mechanics uses a predefined text block for the title. Depending on your choice, the name of the view, the type of the view or the scale is used for instance. The text blocks are saved as templates in the directory *<ELITECAD installation path>\u\<version>\me\glob\symbols\title* and are selected by their name. The text parameters are taken from the template.

Title position
In ELITECAD Architecture, the title is positioned centred above the view.

In ELITECAD Mechanics, the view title can be positioned centred below or centred above the view when creating the view. If the title is moved is afterwards in the graphics window, this is indicated in the menu as a free position. The view title position is maintained during regeneration of the view. A free position may be reset manually.

TIP

The header of the views can be moved individually in the plots.

View specific parameters

Quality
The higher the quality set, the higher the precision of the rendering. The rendering time increases, however.

Options: Preview, Fast, Exact in ELITECAD Mechanics.

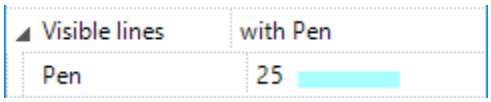
The setting PREVIEW uses a fast calculation method to detect the visibility of edges. In consequence of certain guesses, small errors may occur at the boundaries of curved surfaces.

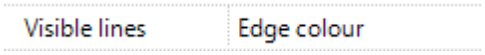
The setting FAST uses the data that are used for the display to detect the visibility of edges. This 3D data depends on the RESOLUTION setting, which means that boundaries of round surfaces are approximated by lines. If possible, arcs are used but the precision is not guaranteed. Just like in in the setting PREVIEW there is no correct treatment of tangential transitions possible.

The setting EXACT uses the analytical description of the geometry to determine the visibility of edges.

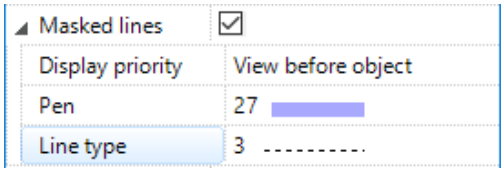
Opening symbols
This option is only available in ELITECAD Architecture. If this option is selected, the opening symbols are automatically displayed in the rendered view. The opening types must be set in "Tool for window division/muntins" of the individual windows.

Visible lines
Users can select between two options:
All with the same pen or the pen is adopted from the edge colour.



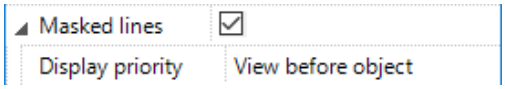


Hidden lines



All edges that are behind the visible surfaces can be displayed in a specific pen and line type.

Display priority
This option is only available in ELITECAD Architecture.



With the setting OBJECT BEFORE VIEW the invisible lines of a 3D object are displayed in accordance with the representation level parameters of the 3D object.

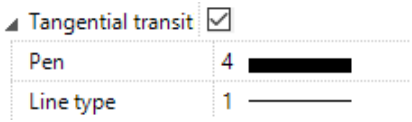
TIP

With the setting OBJECT BEFORE VIEW the invisible lines of single objects can be displayed, although they are generally deactivated in the view.

Intersection lines
If two 3D objects intersect, the resulting intersection lines are created with this check box.

In ELITECAD Mechanics no intersections lines are calculated when the quality setting is set to EXACT. Objects that intersect each other may produce wrong results with this setting. Intersection lines have to be generated as real edges of the object using the 3D editing functions.

Tangential Transitions
This setting is only available in ELITECAD Mechanics.

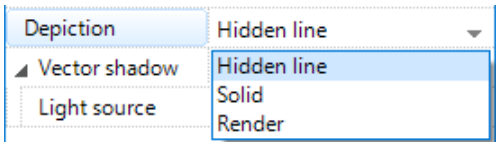


All visible edges (surface boundaries) that do not represent sharp edges can be depicted in an individual pen and line type. (e.g. transition between a planar surface and a cylindrical surface). Transitions between two surfaces of the same type (e.g. two halves of a cylinder) are never depicted.

This option is only available for the quality setting EXACT.
Hidden tangential transitions are depicted with the settings for invisible lines.

Centre lines
This setting is only available in ELITECAD Mechanics.
When this option is active, centre lines from the design model are depicted.

Depiction



This menu can be used to determine whether a solid image or a render image is stored in addition to the lines for the view.

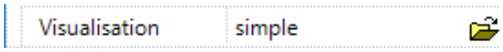
Hidden line
Only lines are displayed.

With solid image
The colour surfaces are added to the background of the line depiction.

With render image
The render image is added to the background of the line depiction.

If "Render" is selected, rendering parameters also appear.

Render parameters



The render parameters can be opened directly or the saved records called up here.

Vector shadow
This option is only available in ELITECAD Architecture.

In order to render a vector shadow, a light source with the light type "parallel light or sun" must be present. This must be set beforehand via the function LIGHT PARAMETERS. The "parallel light" may not be "camera relative" but must have a fixed position. If there is no such light source, the selection field remains blank and no shadow can be rendered.
The orientation of the light source can be changed at any time via LIGHT PARAMETERS.

TIP

Create a separate light source for each view. This is the only way to set an optimal position of the sun for each individual view. If you use the same sun for each view and keep moving the position, the views may not be refreshed.

Users can select which layers cast or receive shadows in SETTINGS menu > OPTIONS > VIEWS > VECTOR SHADOW. The hatch parameter that is used for the shadow can also be set here.

Renovation planning parameters (only in ELITECAD Architecture)

Object state

Fillings

Demolition objects

Visibility (only in ELITECAD Architecture)

Layer types

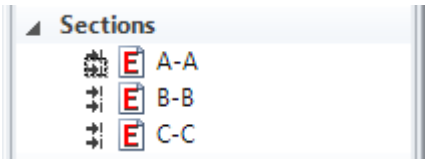
General functions

Storey division lines
This option is only available in ELITECAD Architecture. The storey division lines and vertical division lines of walls and columns disappear if the same material has been selected.

Functions in the graphics window context menu

Define, modify or delete cut-out

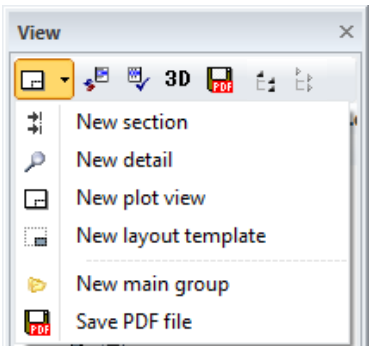
SECTIONS



The sections are generated 2D plans.

Editing of section views is described in the chapter EDIT VIEWS.

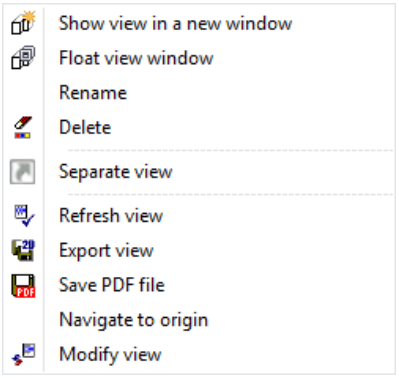
Header functions for section views

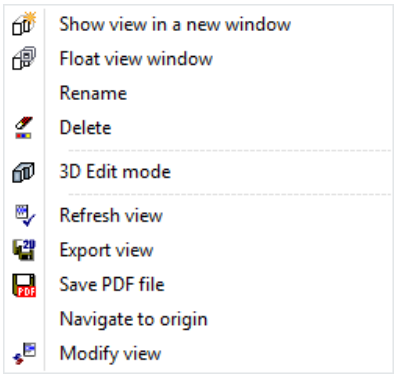


- New section
- New detail
- New plot
- New layout template
- New main group
- Modify
- Refresh
- 3D edit mode (only available in ELITECAD Architecture)
- Save PDF file
- Expand all view groups
- Close all view groups

Context menu of a section view

If you right-click on a created view, the following options are available:





Show view in a new window

Float view window

Rename

Delete

3D edit mode (only available in ELITECAD Architecture)

Separate view (only available in ELITECAD Mechanics)

Refresh view

Export view

Save PDF file

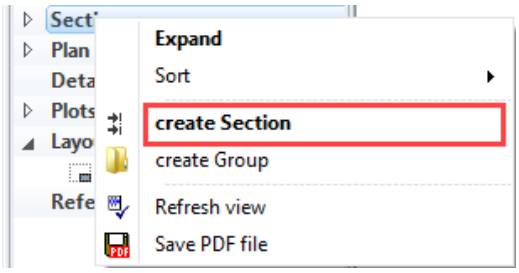
Navigate to origin
Clicking this function switches to the view in which the section view was defined. The visible cut-out is set to the section line.

Modify view

Create section

	New section views management
	Insert menu > Section

A new section is defined in the model. All relevant data should be assembled.



A new section can be generated via a corresponding header function or via the context menu of the views if a design model view is selected.

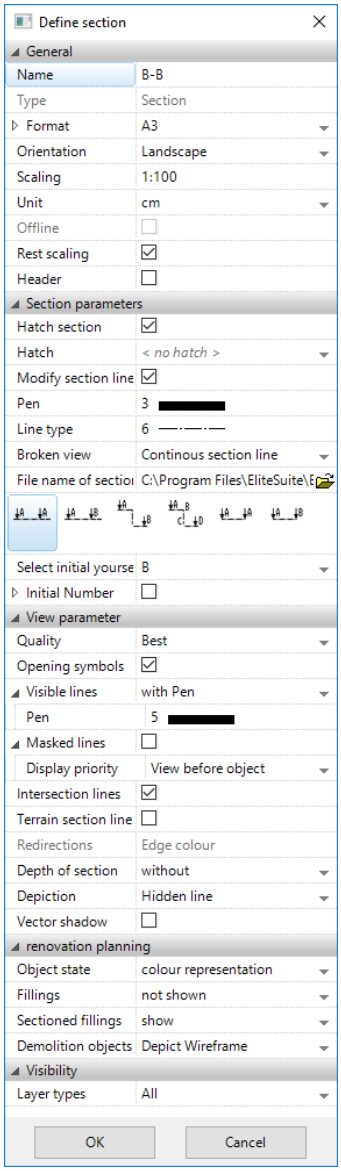
The desired settings have to be entered in the settings dialog window of the view. By clicking on OK, the settings are saved and the view is created. The function MODIFY VIEW allows to change the settings of the view after creation.

TIP

In ELITECAD Mechanics, a section view can be created directly in the plot view. After definition of the section line, the section view is placed

in the plot view. The position of the section view is associated with the section line. When moving the origin view the section view is shifted as well. In order to suppress this behaviour, click the frame of the view and select CANCEL POSITION LINK from the context menu.

Settings of a section view



General parameters

Name

The name is suggested automatically but can be modified. The program begins with the name "A-A" and continues with the name "B-B". If a name is used that already exists, a query appears asking the user whether the existing view is to be overwritten. It does not matter under which view type this is saved.

Type

Format

Orientation

Offline

Rest scaling

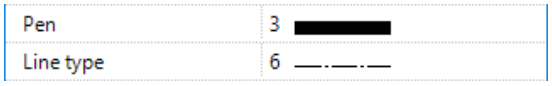
Heading

Section parameters

Hatch section
A section is hatched in ELITECAD Mechanics with the defined hatching parameters if the HATCH SECTION option is selected.
A section is hatched in ELITECAD Architecture depending on the material definition of the individual sections of construction parts if the HATCH SECTION option is selected. The associated hatching parameter therefore does not need to be set.

Modify section line
This option is only available in ELITECAD Architecture. The borders of the sectioned planes are normally drawn with the same pen that the construction part section has in the model. Selecting this option modifies these lines in the same way as the sectioned construction parts are displayed in the floor plan. Floors and girders are an exception. The pen from the material definition of these two objects is used here in accordance with the display depth.

Section line



A section line is generated automatically for each set pen and line type in section control.

A section arrow that was saved as a symbol is set at each end of this line. An example symbol *sectionsymbol.d* is saved here:
<ELITECAD installation path>\u\<version>\<ar|me>\glob\symbol
Separate symbols can also be created.

There are three different types of section lines: straight, offset or limited.
Users can choose between the same or a continuous designation for each type.

Normal section / label A-A (entire model appears as a section)

Normal section / label A-B (entire model appears as a section)

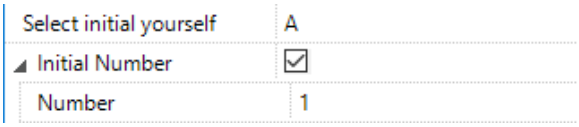
Section stepped multiple times / label A-B

Section stepped multiple times / label A-B C-D

Limited section / label A-A

Limited section / label A-B

The letter for the section label can be freely selected.



Optionally a number be used. This creates possibilities for cut labelling such as "A1-A1", "B2-B2" or "Z1-Z3". Alternatively, the letter can also be omitted so that the name consists only of digits, i.e. "1-1", "2-2" or "1-3" etc.

TIP

In ELITECAD Architecture the section line is added to the active storey during section creation. The section line can be adopted in the other storeys using the function COPY INTO ACTIVE STOREY.

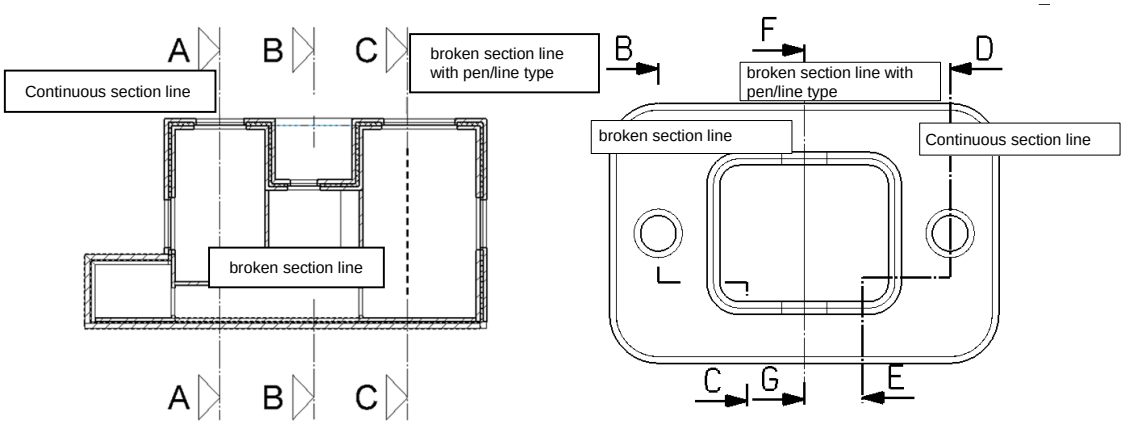
Modify section line parameters

If an existing section line is clicked on, separate parameters such as pen and line type can be modified in the properties bar, or the shape may be changed via handles.

Broken section line:
The section line is divided between the arrows.

Continuous section line:
Removes the division described above.

Broken section line with pen/line type:
The section line is divided between the arrows. The divided interval can be drawn with a user defined pen/line type. If this option is selected, the new parameters appear in the property bar.

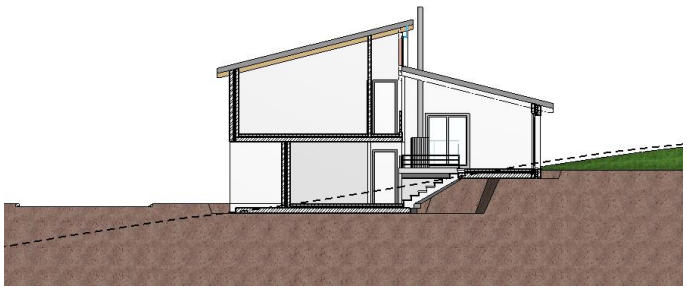


View specific parameters

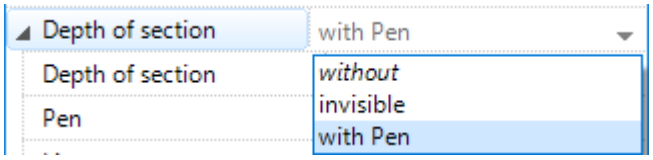
See chapter Settings of a view for a description of the general view parameters.

Terrain section line

If a terrain is visible in the section view this option activates the depiction of a section line of the corresponding original terrain (only possible if a reference terrain exists).

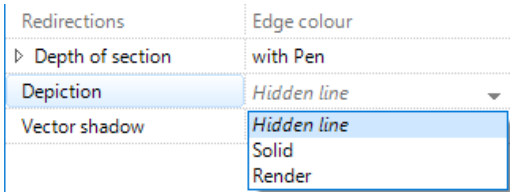


Redirections



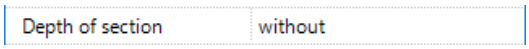
For stepped sections the appearance at the redirections can be defined. With the option EDGE COLOUR the colour of the actual object in the 3D model is used. The option INVISIBLE draws the redirections with pen 0. A user defined appearance can be chosen with the option WITH PEN, where pen and line type can be selected.

Depth of section

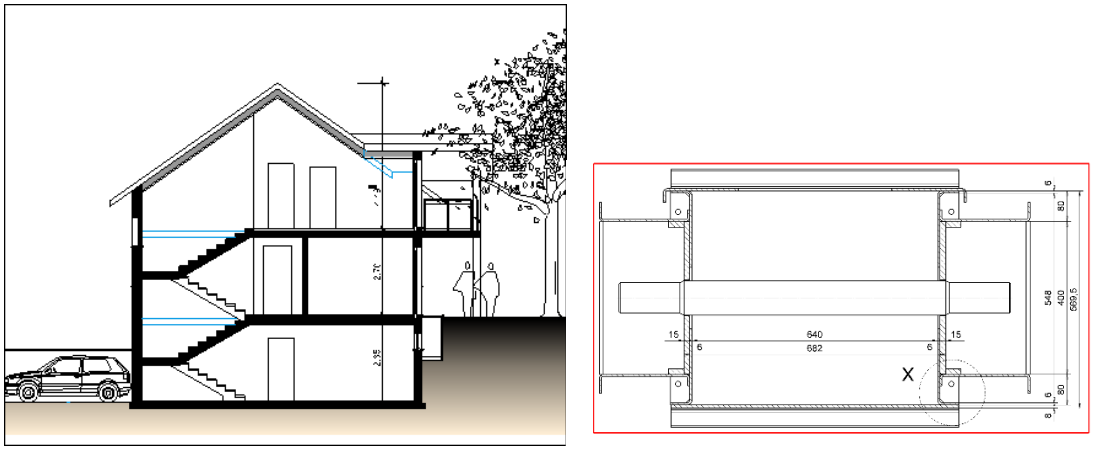


For planar and limited section views, an arbitrary section depth can be defined. Depending on the selected option, objects that lie behind the entered depth are not displayed or displayed using a defined pen and line type. The depth distance is entered in current units.

Depth of section - without

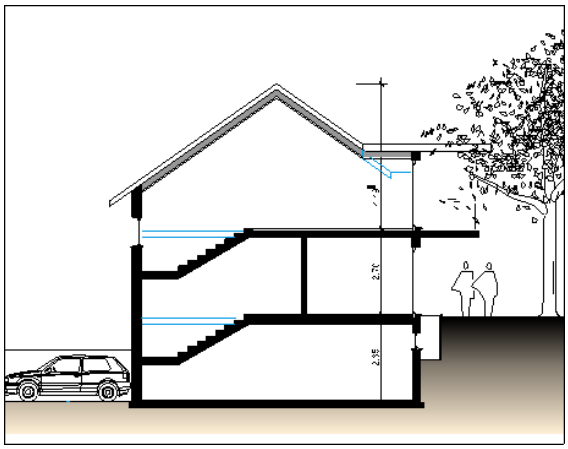


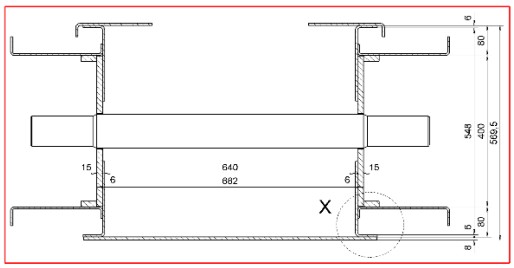
Without a defined depth, all visible objects behind the section plane are displayed.



Depth of section - invisible

Objects lying behind the defined depth of section are not displayed.

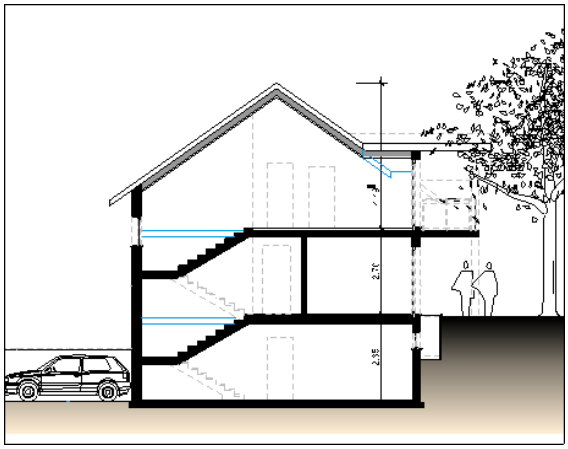


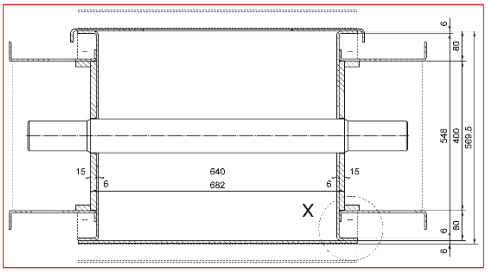


Section depth – with pen

Depth of section	with Pen
Depth of section	1.0
Pen	12
Line type	3

Objects, lying behind the defined depth of section are displayed with the selected pen and line type.





Renovation planning parameters (only in ELITECAD Architecture)

Object state

Fillings

Sectioned fillings

not shown
show

Sectioned fillings for walls and slabs are displayed in the view according to the setting of this option.

Demolition objects

Visibility (only in ELITECAD Architecture)

Layer types

Functions in the graphics window context menu

[Define, modify or delete cut-out]

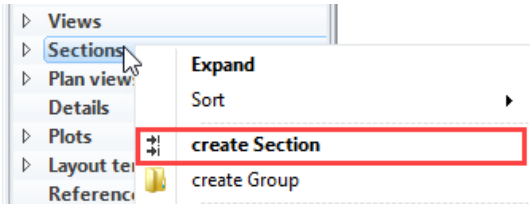
WORKSHOP

Generate sections

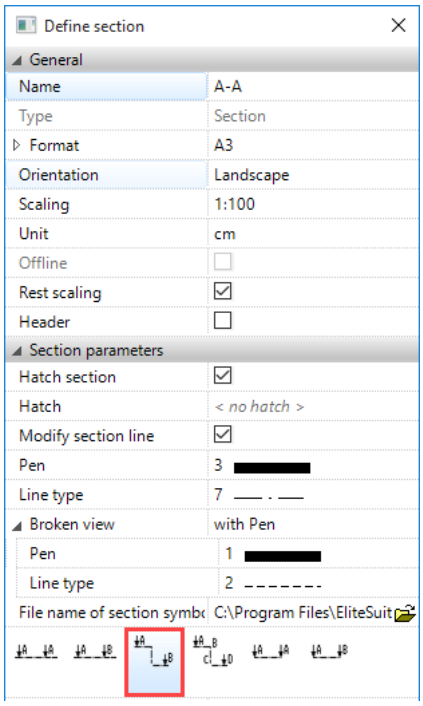
Ideally, a new section is defined from the model. All relevant design model data must be assembled.

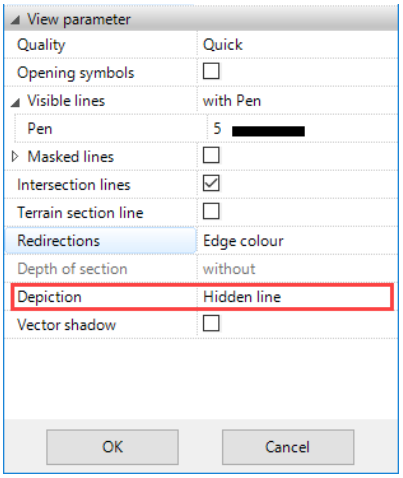
Click on the function CREATE NEW SECTION

or with the right mouse button on the title "Sections" in views management



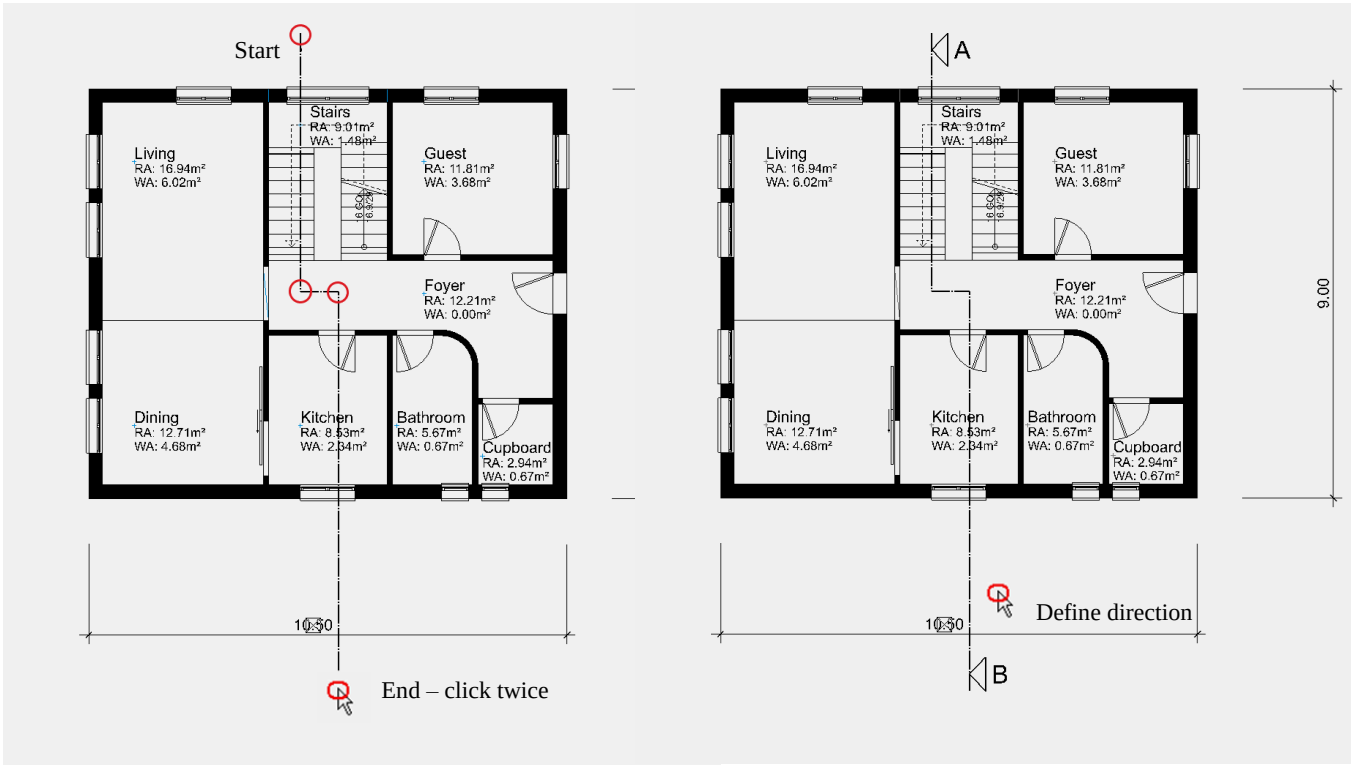
Set section dialog window with stepped section line

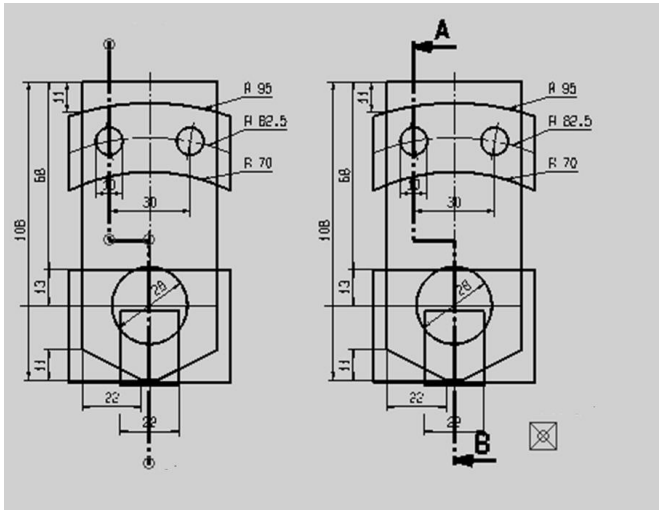




Enter point 1 for section gradient [identical point > end]
Enter one point of the section line after the other. Click a second time on the last point to close.

Which direction?
The viewing direction of the section can be defined depending on the side you move the cursor to. This can be easily controlled using the alternating arrow symbols.



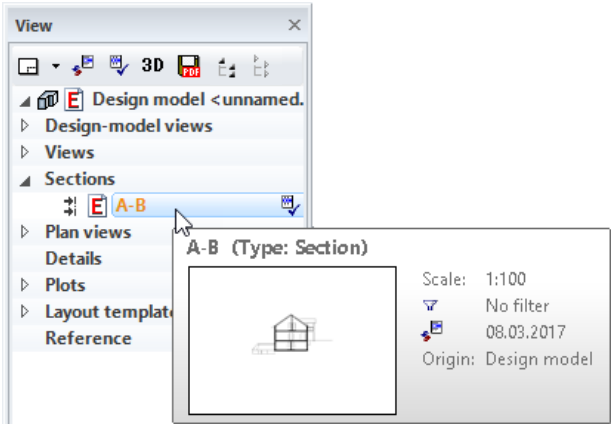


The section is calculated having set the direction.

In ELITECAD Architecture, all opened door leaves are temporarily hidden during section control so that they are not visible in the section. All sections of the construction parts are hatched in accordance with their material definition.

In ELITECAD Mechanics all sectioned construction parts are automatically hatched.

The section has now been added in the views management and can be selected.



WORKSHOP END

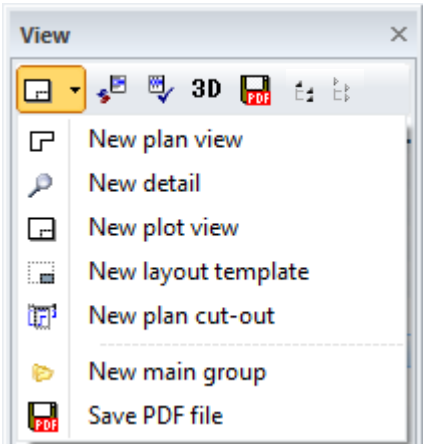
Plan views

In ELITECAD Mechanics 3D plan views are usually not used.
In ELITECAD Mechanics 2D a plan view can be used to manage cut-outs of the model.
In ELITECAD Architecture the plan view displays the 2D-relevant architectural data of the model as a floor plan. These are usually the drawing elements displayed in the plan graphics of a storey floor plan.
Unlike a section or a view, the plan view always refreshes itself with the model and vice versa. If a door is moved in the floor plan, this modification is immediately visible in the design model.
Each plan view may have a separate visibility control of the layers. As such, there may be multiple plan views of a storey in which different structures are visible.

TIP

The design model and the plan view refresh each other. All plan views are therefore always consistent with the latest version of the model. This is why lines from the 2D floor plan cannot be deleted arbitrarily without compromising the 3D geometry.

Header functions for the plan views



New plan view

New detail

New plot

New layout template

New plan cut-out

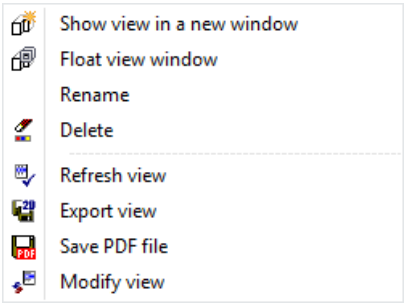
 New main group

Modify

	Refresh
3D	3D edit mode (only available in ELITECAD Architecture)
	Save PDF file
	Expand all view groups
	Close all view groups

Context menu of a plan view

If you right-click on a created view, the following options are available:



Show view in a new window

Float view window

Rename

Delete

Refresh view
Creates a new image assembly

Export view

Save PDF file

Modify view

TIP

The type must be set to "Design model" in order to modify the selection of the design model data for the current plan view. The view now appears under the design model views. All data from the model appear with ASSEMBLE. The selection can now be redefined via storey and/or layer management. The type is set back to plan with MODIFY VIEW.

Generate floor plan views

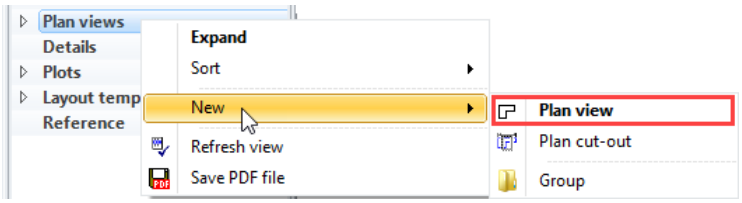
	Views management > Generate floor plan views
	Insert menu > Floor plan views

This function is only available in ELITECAD Architecture and creates all floor plan views of the model. Floor plans are plan views. Designation is performed in accordance with the designation of the individual structure settings of the individual storeys. All storeys that have the same storey number are displayed in the same floor plan view (e.g. "-1, 0, 1, 2") for multiple structures. If different storey names are on

the same level, the individual plans are given the names "Level 0", "Level 1", "Level 2", etc.

Create new plan view

New plan view views management
Insert menu > view (plan type)



A new plan view can be generated via a corresponding header function or via the context menu of the views if a model view is selected.

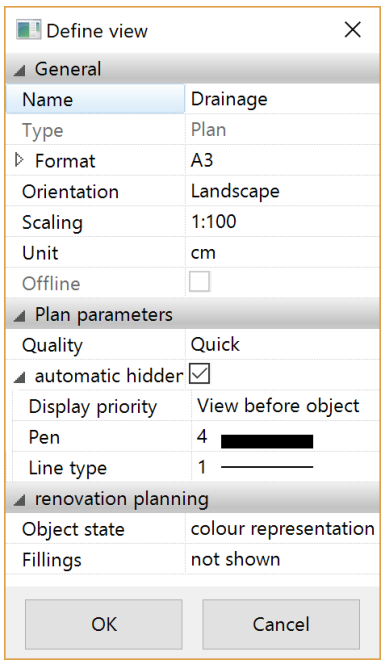
The desired settings have to be entered in the settings dialog window of the view. By clicking on OK, the settings are saved and the view is created. The function MODIFY VIEW allows to change the settings of the view after creation.

In ELITECAD Architecture plan views are typically created by the function GENERATE FLOOR PLAN VIEWS. The function CREATE NEW PLAN can be used to define exactly which data appears in the plan. Each plan view may have a separate visibility control of the layers. It is therefore possible to design multiple plan views for the same storey with different contents (e.g. for electronic installation or furnishing).

TIP

You also have the option to display storeys from different structures in the same plan. E.g. Ground floor of structure A with the basement parking of structure B.

Settings of a plan view



General parameters

Name

Type

Format

Orientation

Offline

Plan parameters

Automatic hidden line
This option is only available in ELITECAD Architecture. If a plan view is defined with a storey filter, all 2D data belonging to the storey is displayed. In addition, a hidden line is created with this option for all 3D objects of the storey for which there are no 2D lines parallel to the storey level.

Renovation planning parameters (only in ELITECAD Architecture)

Object state

Fillings

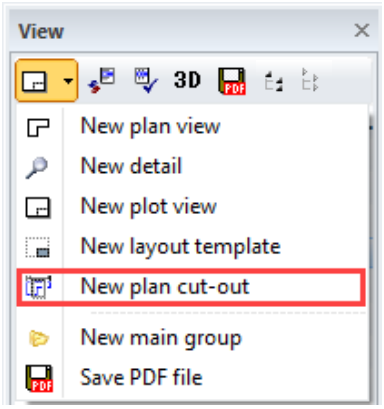
Functions in the graphics window context menu

Define, modify or delete cut-out

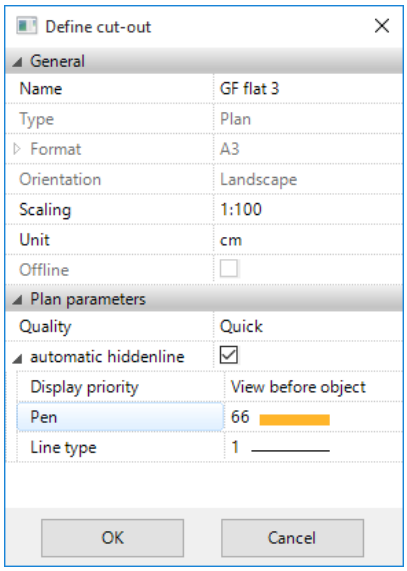
New plan cut-out

Views management > Create plan cut-out

The plan cut-out is an area of an entire plan. The plan cut-out is always up to date with the plan as well as the model. The plan cut-out behaves in the same way as a plan view. Data that is added in a plan cut-out is also added directly in the plan and design model. The plan cut-out is used if the plan view has a format that is too large and must be divided into separate cut-outs for a printout. In ELITECAD Architecture an apartment building can be separated from the whole. The plan cut-out can be saved in a different scale than the plan view. An area can be zoomed in when displayed on the border.



The plan view can only be created from a plan view. As soon as the plan view is selected, the option NEW PLAN CUT-OUT appears in the header functions.



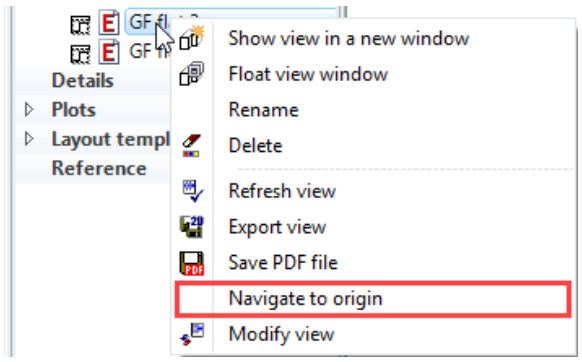
Once the name of the plan cut-out and the other settings have been defined, a properties bar opens in which the line type and colour of the bordering can be determined. (Pen colour 0 = invisible on printout)
The cut-out in the plan is then defined via two diagonal points.

The plan section is listed in the plan views.
The same editing rules apply as for the plan views.

TIP

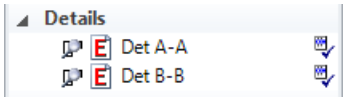
The detail frame should not be deleted from the original plan. The user therefore always has the option to stretch or move it and to refresh the plan cut-out again.

Plan section context menu



Navigate to origin
Clicking this function switches to the view in which the plan cut-out was defined. The visible cut-out is set to the cut-out contour.

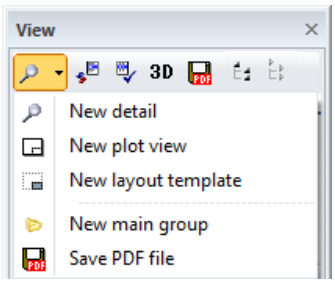
DETAILS



A detail is a generated 2D plan.

Editing of detail views is described in the chapter EDIT VIEWS.

Header functions for the views



New detail

New plot

New layout template

New main group

Modify

Refresh

3D edit mode (only available in ELITECAD Architecture)

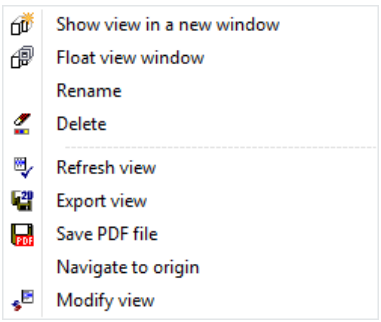
Save PDF file

Expand all view groups

Close all view groups

Context menu of a detail view

If you right-click on a created view, the following options are available:



Show view in a new window

Float view window

Rename

Delete

Separate view (only available in ELITECAD Mechanics)

Refresh view
This function refreshes the detail. Innovations that have been created in the original view are taken into account. When refreshing, all data that was rendered from the original view is first deleted and then the newly rendered data read in. Newly drawn 2D objects are retained.
Modified or deleted elements of objects being refreshed are returned to the state in which they were created in the original view.

TIPP

When working with the classification structure group/class/level care has to be taken that newly drawn 2D data is not added to an object, which will be updated. For instance, the hatch should not be added to the contour model, because it will be deleted when updating the view.

Export view

Save PDF file

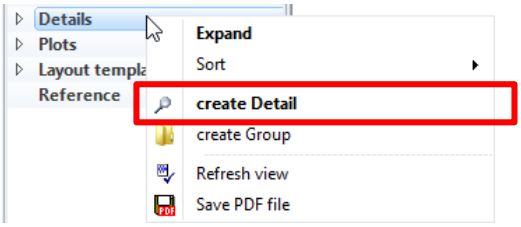
Navigate to origin
Clicking this function switches to the view in which the detail was defined. The visible cut-out is set to the detail contour.

Modify view

Create new detail

	New detail views management
	Insert menu > Detail

The detail view allows you to define cut-outs of your design model, cut-outs from the plan view (normal case) and from the section or a view.



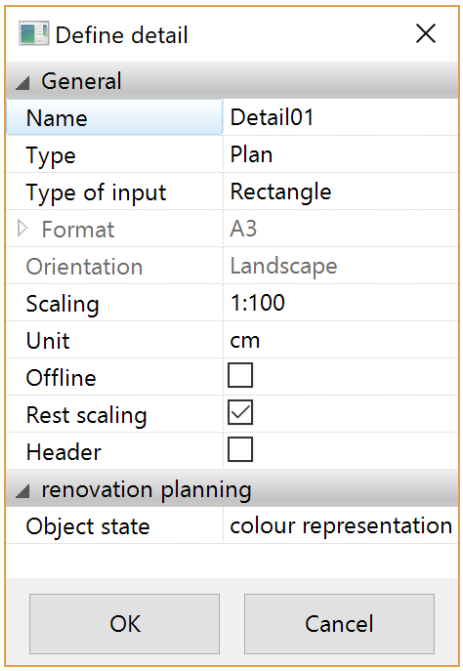
A new detail is generated using the corresponding header function or via CREATE DETAIL in the context menu of the title bar.

The desired settings have to be entered in the settings dialog window of the view. By clicking on OK, the settings are saved and the view is created. The function MODIFY VIEW allows to change the settings of the view after creation.

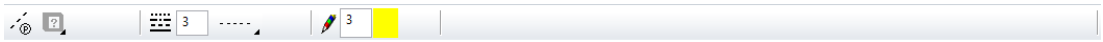
TIP

In ELITECAD Mechanics, a detail view can be defined directly in the plot view. You have to activate the desired sub view in the plot view. After defining the detail contour, the position of the detail label has to be indicated. Afterwards the detail view is placed in the plot view.

Settings of a detail view



While drawing the detail contour the pen and line type for the contour can be selected in the property bar.



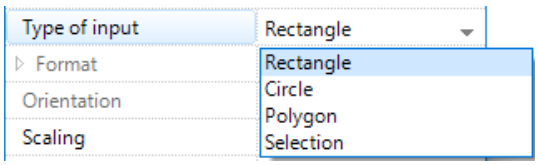
General parameters

Name

Type

The type of detail depends on the type of the original view. If it was generated from a design model or design model view, it can be defined with the types "design model", "view" or "plan". A detail is generated from a view, a plan, a section or a detail and may only have the type "plan".

Entry mode



The area of the data that is to be transferred into the detail can be determined with four different options.
There are two pre-defined shapes, rectangle and circle, as well as the polygon, which can be used to define any outline.
The option SELECTION creates a detail from the objects visible on the screen. The detail is set automatically to "Offline" and can no longer be refreshed.

Format

Orientation

Offline

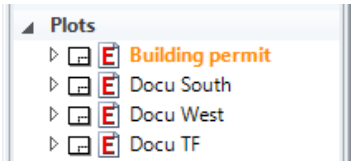
Rest scaling

Heading

Renovation planning parameters (only in ELITECAD Architecture)

Object state

PLOTS



The plot generates an empty page on which the plan layout is set up. Everything that needs to be drawn or loaded in addition (plan frame, title block, legend, labels) belongs to this plot. The previously defined views (plans, sections, views, details) can be placed as required. The views are only inserted as a reference. These sub views can be edited directly in the plot. Modifications in the original are added to the plot immediately. A plot is simply a set of different views.

Header functions for the views

Insert view

Move view

Rotate view

Refresh view

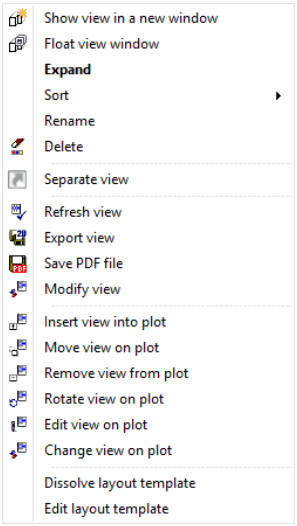
Save PDF file

Expand all view groups

Close all view groups

Context menu of a plot view

If you right-click on a created view, the following options are available:



Show view in a new window

Float view window

Expand/Reduce
The sub views are displayed or hidden. Double-clicking on the plot name achieves the same result.

Sort
The sub views are arranged in ascending or descending order.

Rename

Delete

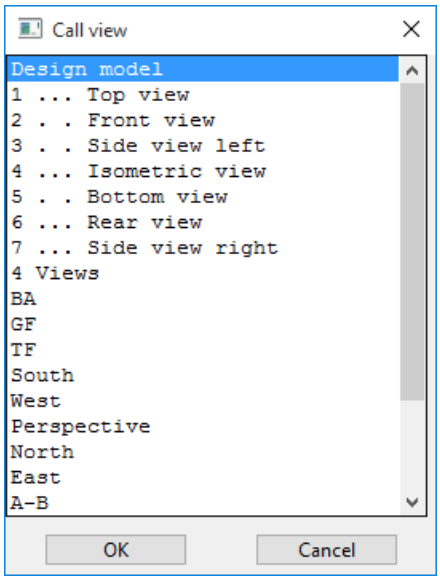
Separate view (only available in ELITECAD Mechanics)

Refresh view
This function refreshes all sub views on the plot.

Export view

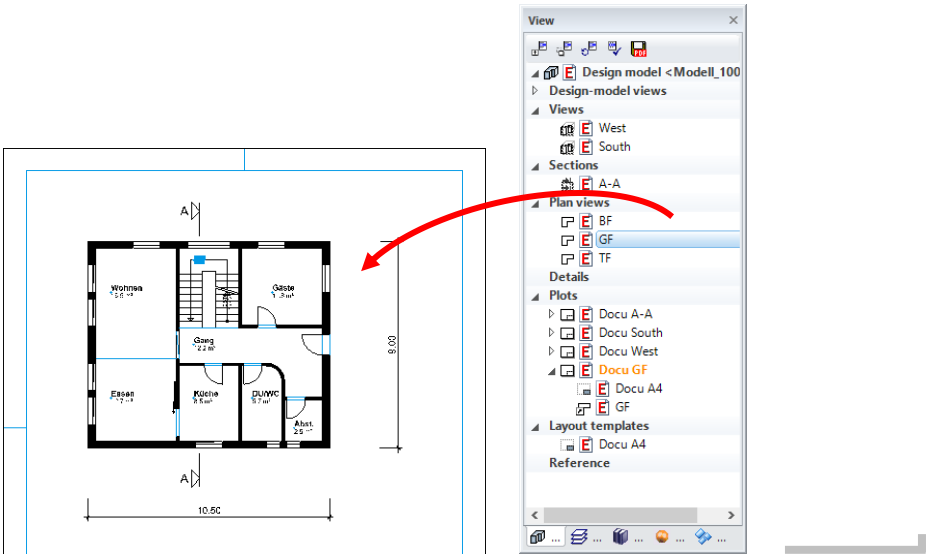
Save PDF file

Insert view into plot
This function opens a selection dialog window in which all views are listed. The required view can be marked, confirmed with OK and positioned in the plot.
In the selection menu to insert new views into a plot view there are entries for predefined views, the design model view, the entry "4 views" and the manually defined views. In ELITECAD Architecture, all manually defined views are listed. In ELITECAD Mechanics, only those views are listed that are not assigned to a plot view or that are assigned to the active plot view. If they are assigned to a plot view, then the name of the corresponding plot view is given in brackets. Hereby it is possible to create sub views with identical names in different plot views. (e.g. different section views with the name A-A can exist in different plot views).



TIP

The view can also be inserted into the plot using drag and drop.
Activate the plot in which the view is to be positioned. Drag the NAME of the view into the plot with the left mouse button. As soon as you are in the work area, you can release the mouse button and position the view in the correct place.



Insert four views into plot

With this choice, four standard views (front view, top view, side view and isometric view) are inserted into a plot view. These are adjusted horizontally and vertically in the plot view and created according to the settings under SETTINGS > OPTIONS > VIEWS > GENERAL. Sections and further defined views can be inserted later. In ELITECAD Mechanics, these four views keep their relative position when moving one of the connected views.

Add a view relative to another view

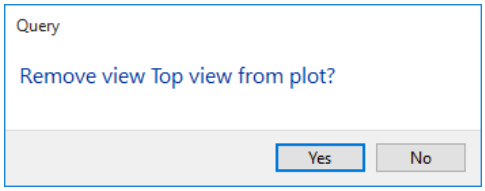
In ELITECAD Mechanics, there is a further option to insert a view. If a view is already selected by its frame when starting the function INSERT VIEW INTO PLOT, the selection window is not displayed. Instead, new views are inserted relative to the selected view by folding. The position of the new view is associated with the origin view. When moving the origin view, the new view is shifted as well. In order to

suppress this behaviour click the frame of the view and select CANCEL POSITION LINK from the context menu.

Move view
The inserted views can be moved with this function.

In order to move multiple sub views simultaneously, the placeholders (white/red bordering) that are to be moved are selected by holding down the [Shift] key and then clicking on the function MOVE SELECTION.

Delete view
Deletes placed sub views.
The view to be deleted is queried. It must be selected via the placeholder (white/red bordering). This function must be confirmed.



Multiple sub views can be deleted from the plot simultaneously. To do this, the required sub views must be selected via their placeholder (white/red bordering) with the [Shift] key held down and deleted with the [Del] key.
This deletes the sub view from the plot. Deleting each view must be confirmed.

Rotate view
The function ROTATE VIEW allows users to modify the orientation of the view. Sections can therefore be placed in the direction of projection for the floor plan, for instance.

Edit view
The function EDIT VIEW can be used to switch temporarily to the selected sub view in order to make any modifications required there. The corresponding plot must be clicked in views management in order to switch back to the plot view.

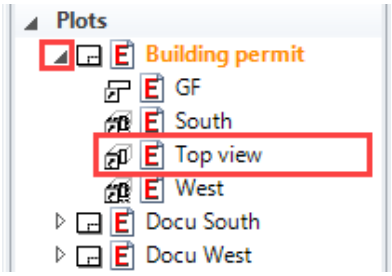
Modify view
The detail parameters of the sub view can be changed later on with the function MODIFY VIEW.

Edit layout template
When selecting this function, the view is switched to the layout template and then it can be modified.

Delete layout template
The layout template will be removed from the active plot view. The layout template remains.

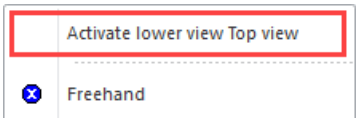
Sub views

If the structure is extended for a plot, all sub views appear that were inserted in the plot. If one of these sub views is clicked on, it can be edited within the plot. Placeholders (white/red bordering) are temporarily displayed in bold and red to differentiate them optically. The view is deselected and the placeholder displayed as normal when the name of the plot is clicked on.
Texts, dimensioning, etc. can therefore also be aligned to each other in the plot compilation.

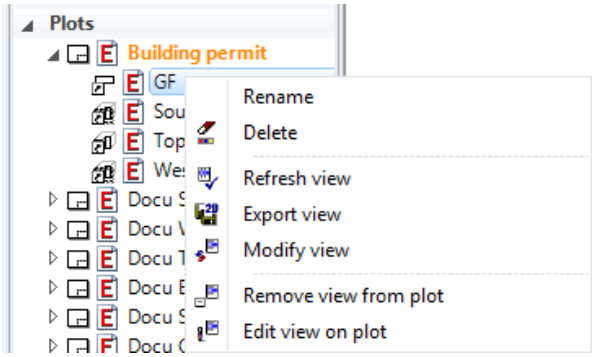


TIP

The sub view can also be selected by double-clicking a placeholder. The view can be deselected by clicking outside the placeholder.
Alternatively, the placeholder can also be selected or deselected via the context menu. Select the placeholder and right-click on the user interface.



A range of commands can be carried out directly by right-clicking on a sub view.



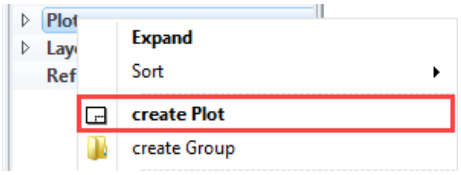
Create new plot

	New plot views management
	Insert menu > Plot

Plots can be taken to mean a set of different views.

TIP

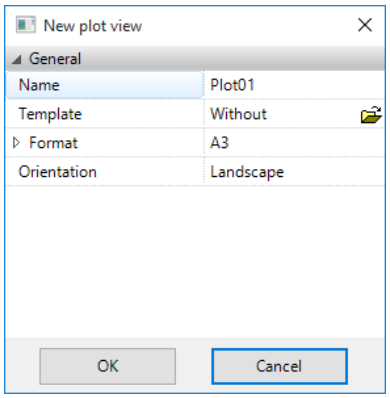
Views and details with different scales can be combined in a plot.



A new plot is generated using the corresponding header function or via CREATE PLOT in the context menu of the plot title bar.

The desired settings have to be entered in the settings dialog window of the view. By clicking on OK, the settings are saved and the view is created. The function MODIFY VIEW allows to change the settings of the view after creation.

Settings of a plot view



General parameters

Name

Template
Previously defined layout templates can be selected here.
Layout templates can be created and managed in the view management window. Use layout templates to define plan descriptions only once and to add them in multiple plot views. The combo box only lists templates that are already loaded.
The OPEN button allows adding already saved templates. *Here *.d* files can be opened, which have been saved as layout templates.

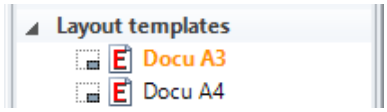
TIP

In order to add a layout template to an existing plot view or to replace an existing layout template, the template can be dragged using the mouse with drag and drop from the view management window onto the plot view.

Format

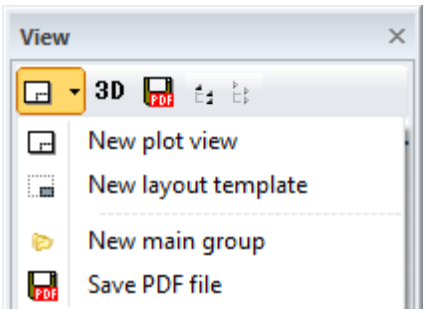
Orientation

LAYOUT TEMPLATES



A layout template contains data (e.g. texts, frames, keys) that are displayed in the background of plot views. A layout template can be used in multiple plot views. The layout template data cannot be selected or modified in the plot view.

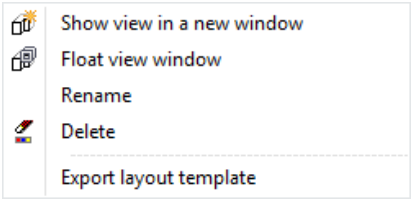
Header functions for the layout templates



	New plot
	New layout template
	New main group
3D	3D edit mode (only available in ELITECAD Architecture)
	Save PDF file
	Expand all view groups
	Close all view groups

Context menu of a layout template

If you right-click on a created view, the following options are available:



Show view in a new window

Float view window

Rename

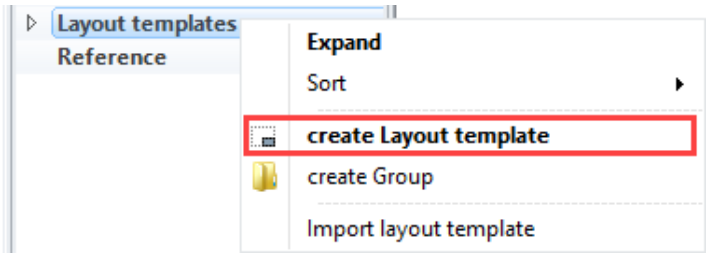
Delete

Export layout template
A layout template can be exported as a separate file. Saved templates can therefore also be used in other drawings.

Create new layout template

	New layout template views management

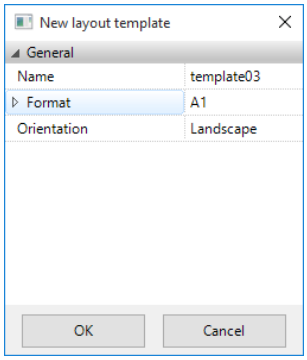
New layout templates are defined via their names and are assigned a paper format. Like views, layout templates can be selected and then edited.



A new layout template is generated using the corresponding header function or via CREATE LAYOUT TEMPLATE in the context menu of the layout title bar.

The desired settings have to be entered in the settings dialog window of the layout template. By clicking on OK, the settings are saved and the layout template is created.

Settings of a layout template



General parameters

Name

Format

Orientation

Replace a layout template

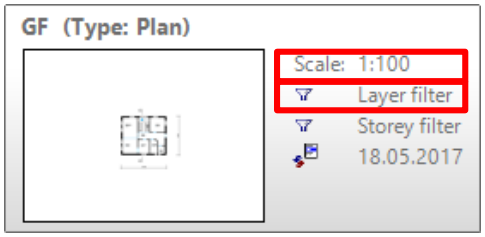
To add a layout template to a plot view or replace an existing template at a later stage, the template can be dragged into views management via drag and drop.

Filter in views

Filters can be used to define which data of the model is displayed in a view. The primary used filters in ELITECAD Architecture are the storey and the layer filter, as well as the filter for renovation planning states. In ELITECAD Mechanics, the preferred filters are the assembly and classification filters. Additionally, there is an object filter available for both applications.

It is essential which data is assembled when creating a new view, because the filter of the current view is saved in the new view. If the whole design model should be contained in the view, it is recommended that the whole design model is assembled before. Otherwise, the desired filter has to be set before. Objects created after a view was created are only visible in views if they belong to the filter. The object filter restricts the visibility only to certain objects, therefore new objects do not appear in views with object filters. Hence, object filters have to be applied with care.

If filters are active in a view, they are displayed in the views preview (move the mouse of the title of the view).



Setting the filter when creating the view
When creating a view, the filter of the current view is passed to the new view and saved as the filter for the new view.

In ELITECAD Architecture, the filter for a plot view is irrelevant. In ELITECAD Mechanics, it is already essential, which construction parts are assembled when creating a new plot view, because the current selection is saved as a generation filter for views, which are assigned to the plot (see Filter for plot views).

Modify the filter while editing the view
The behaviour depends on the type of the view.

In views with the type section, view or detail the filter which has been saved when creating the view, (generation filter) is used to generate a 2D view from the design model. Modification of a filter while editing a view only affects the visibility of the generated 2D data (display filter).
Example:
Layers can be switched on and off. A new layer filter is created. The elements of the layers are only displayed without the objects appearing behind them. Example facade, type view: Hide wall layer; building interior does not appear.

In contrast, model and plan views directly show data from the design model. Therefore, it is not differentiated between generation filter and display filter for these views.

In a plot view there is only a visibility filter for the 2D data drawn in the plot view.

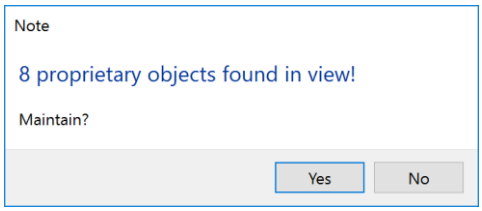
Modify the generation filter
Modification of the generation filter is possible for views of the type plan, section and view and depends on the type of filter.

The layer filter is directly modifiable (see Modification of the layer filter).
In order to change the layer filter of sections and views the view must be switched to 3D editing mode in ELITECAD Architecture. In this mode, you are temporarily in the model and are able to modify the filter. The new layer filter is saved when exiting the 3D editing mode.

Layer filter, classification filter and assembly filter in ELITECAD Mechanics can be modified analogously to the storey filter, which is described below. The classification filter can additionally be modified directly in the classification manager (see chapter 1.6 Layer/Classification).

When editing a view of the type plan, view or section, a storey filter cannot be modified directly in the storey manager. In order to reset the visibility of storeys the following procedure is required.

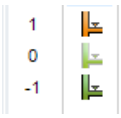
The view must be edited with the function MODIFY VIEW from the context menu of views management. The type must be switched to "Design model". The view now appears under the design model views in views management.
The elements added in the view such as dimension, levels, library elements, etc. must be retained.



The filter can now be reset. To fix the modification, edit the view again with the function MODIFY VIEW and set the type back to the previous type. The view now appears under the previous category in views management. The parts modified or added in the original view are displayed again.

Storey filter

The storey filter is only available in ELITECAD Architecture and is set in the storeys manager.



active and visible
invisible
visible

This filter allows to control the visibility of storeys and/or entire structures.

Modify storey filter

This is only possible in design model views.

It is not possible to modify the filter of views of the detail type.

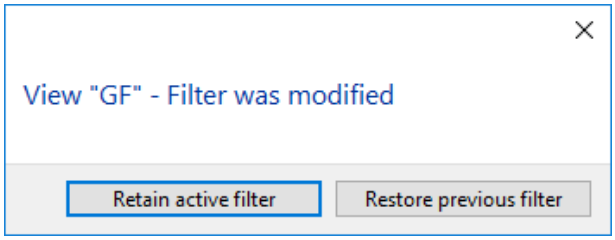
Views of the plan, section and view type can be switched to the design model view type via MODIFY in the context menu, where the visibility can be re-adjusted (see Modify the generation filter).

Layer filter

The layer filter is set in layer management.
Check boxes in layer management: visible invisible

Layers can be switched to visible/invisible in all views. This is useful if, for example, only specific structures should be visible for specialist plans (electronic plans, installation plans...) etc.

Modify layer filters in plan views
If a filter is modified at a later stage, the system queries whether the current (i.e. the modified) filter is to be retained before leaving the view.



A LAYER setting is saved in the view and is retained when changing the view once the query above has been answered accordingly.

Modification of the layer filter in sections and views
In views of the type section and view, a modification of a layer filter only affects the visibility of the generated and added 2D data (display filter).
In order to modify the visibility of the design model data in views and sections, the generation filter has to be modified (see Modify the generation filter).

Renovation state filter

The filter for renovation states is only available in ELITECAD Architecture and is set in the status window. Setting a filter for renovation planning sates is only possible if renovation planning was activated in the options. In order to set the visibility in views several reasonable combinations of states are predefined.

Assembly filter

The assembly filter is only available in ELITECAD Mechanics and is defined in the assembly manager window.
Switches in the assembly management: visible invisible
Assembly groups can be set visible or invisible in all types of views.

TIP

In the context menu of an assembly group in the assembly management window, a plot view of the respective assembly group can be defined directly.

Modification of the assembly filter in sections views and details
In views of the type section and view, a modification of filter only affects the visibility of the generated and added 2D data (display filter).
In order to modify the visibility of the model data in views and sections, the generation filter has to be modified (see Modify the generation filter).

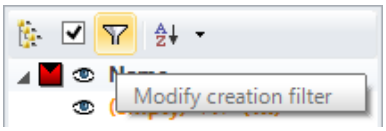
Classification filter

The classification filter is only available if the option WORK WITH GROUP/CLASS/LEVEL has been activated in the OPTIONS. This is the preferred option in ELITECAD Mechanics.

The classification filter is set in the classification management window.
Switches in the classification management: visible invisible

The classification can be set visible/invisible in all types of views.

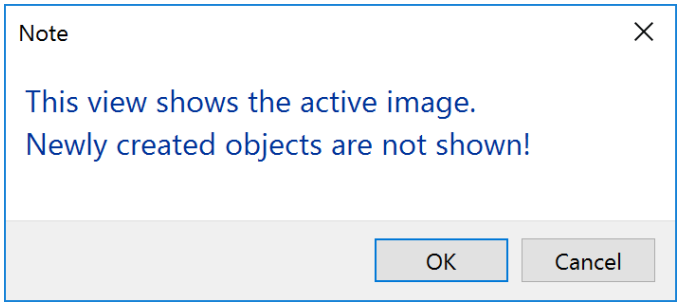
Modification of the classification filter in sections views and details
In views of the type section, view and detail, a modification of filter only affects the visibility of the generated and added 2D data (display filter).
In order to modify the visibility of the model data in views and sections, the generation filter has to be modified (see Modify the generation filter).
Alternatively, the generation filter can be modified directly in the classification management. Activate the filter symbol, which displays the design model data. The filter can be readjusted.



You find a detailed description in chapter 1.6 Layer/Classification.

Object filter

This filter is created when individual objects are switched off (functions HIDE/ASSEMBLE > SELECTION). This filter type should be avoided, as newly drawn objects do not appear in the view. The view only recognises the visible objects. Modified or new objects are not displayed.
If an object filter is selected when creating a view, a message is displayed alerting the user to the problem.



If only one object is to be hidden in a view, it is advisable to assign the object to a separate layer and hide the layer in the layer filter.

Modify the object filter in sections, views and details
In views of the type section, view and detail, a modification of a filter only affects the visibility of the generated and added 2D data (display filter).
In order to modify the visibility of the model data in views and sections, the generation filter has to be modified. This is possible with 3D editing mode (see Modify the generation filter).

Filter for model views

In model views, all filters can be modified arbitrarily. When switching to another view, the current filter is saved when leaving a view, so that the filter is available when activating the view again.

Filter for plan views

In ELITECAD Architecture, a storey filter is usually active in the plan views: When generating floor plans a plan view with a single visible storey is created for each storey. E.g. Ground floor plan => only ground floor visible.

Layers can be switched off when generating and later on when editing (see Modify the layer filter for plan views).

While editing a plan view the storey filter cannot be set anymore in the storey manager (see Modify the storey filter)

Filter view, section and detail

Creating a view
The current filters are applied when defining a view.
Examples for ELITECAD Architecture:
One structure can be switched off for a model with two structures in order to have a free view of the other or the basement level is switched off so that it does not appear. If elements are of the environment are not needed, they can be switched off via a layer so that the facade behind them appears in the image.
Layers that are not being used can be hidden for a detail from a plan view. For example, the dimensioning, as it must be much more detailed in the new detail.

Editing a view
Modifications of the filter while editing a view only affects the visibility of the generated or added 2D data (display filter).

Modifying the generation filter
In order to change the visibility of the design model, the creation filter has to be modified. (see Modify the generation filter).

Filter for plot views

Editing a view
Filter in plot views control the visibility of the 2D data drawn in the plot view (display filter) like format frame, title block. Inserted sub-views have an independent filter.

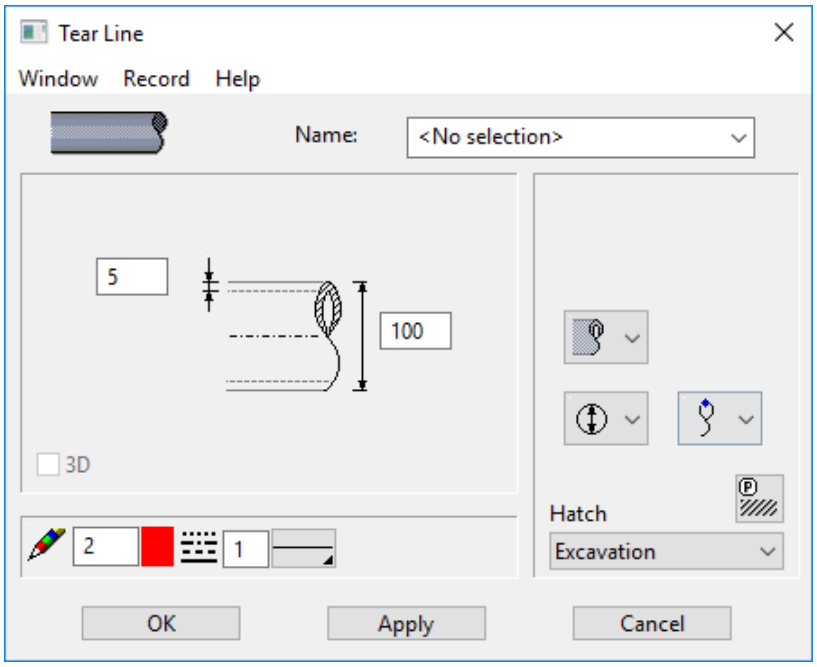
Generation filter
In ELITECAD Mechanics it is essential which construction parts are assembled when defining a plot view, because the current selection (e.g. an assembly) is stored while defining a plot view (generation filter of a plot view). If predefined standard views are inserted into the plot view, these views will automatically apply the generation filter of the plot view (even when inserting four views).
If plot views have already been defined in ELITECAD Mechanics when defining a new view, a query appears whether the new view should be assigned to an existing plot view. This guarantees that the new view uses the same filter like the plot view without setting the filter for the required construction parts manually before.
The generation filter for plot views cannot be modified.

Break view

This function is only available in ELITECAD Mechanics. Uniform long work pieces can be depicted in a shortened mode. Shortening positions are represented as tear-lines, which are drawn as zigzag lines, shaft- or pipe tear-lines.

In order to create a view shortening, the desired view has to be selected in the plot view first. Start the function via the menu FINISH > TEAR-LINE or via menu entry TEAR-LINE in the context menu that opens by a click with the right mouse button in the graphics window.
Existing tear-lines are edited via the context menu entry EDIT TEAR-LINE or deleted via the context menu entry DELETE TEAR-LINE.

After starting the function, the following parameter window appears:



Once defined, parameters can be saved by RECORD > SAVE under an arbitrary name and later reused again.

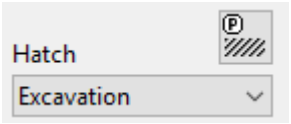
Select the type of the tear-line in right section of the parameter window.

shaft

pipe

zig-zag

The hatch for pipes and shafts can be selected too.



name of the hatch

In the main section of the window the dimensions are defined. Lengths and distances for the height of the tear-line, dstances to the view shortening and the pipe thickkness.

The fields in lower section have the following meaning:

tear-line pen

tear-line line type

The completed dialog window is confirmed with OK. A preview of the view shortening is displayed. Enter two points to define the position and the width of the shortening. The start- and endpoints of the tear-lines can be positioned by dragging with the mouse.
All settings can be edited afterwards using the same parameter window. Select the view shortening and select the symbol for editing or use the function EDIT TEAR-LINE.

Shortened views are only displayed shortened in plot views. If a view is activated for editing, the shortened region is displayed in its full extent.

EDIT VIEWS

Views and sections

Modify in 2D mode
Views and sections are 2D depictions that are linked in the background with the 3D design model. They can be edited with 2D functions. Modifications or additions to the views are not taken into consideration in the design model. Changes in the design model that affect the view are applied via the function REFRESH VIEW.

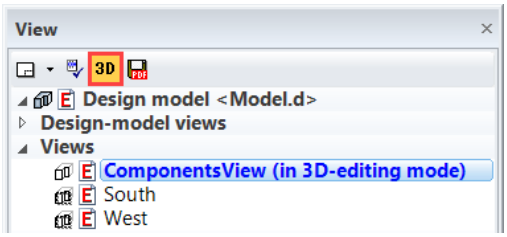
A deletion line, which hides the original line when refreshing the view, is automatically drawn when deleting elements or modifying line thicknesses. These deletion lines are assigned a separate layer automatically that can be hidden or displayed as required.

The object structure is retained when creating views (e.g. lines of a wall). The selection mode "Element part" ([Alt] key held down) can be used in order to edit individual elements of an object.

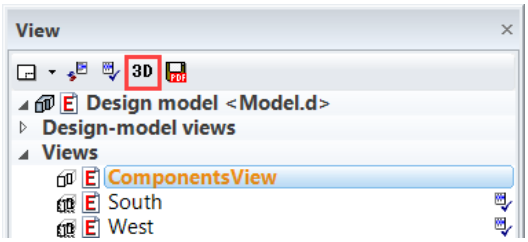
Modify in 3D editing mode
Modifying in 3D editing mode is only available in ELITECAD Architecture. 3D objects can be modified directly in views and sections by switching to the 3D editing mode. The name of the current view is displayed in blue. If this check box is ticked, it applies for all views until it is deactivated.

Modifications or additions to 3D objects have an effect on the model. Newly added 2D objects are only displayed in the corresponding view.

3D editing mode on



3D editing mode off



Details

A detail is a 2D copy of the cut-out that was defined when being generated. The cut-out is denoted in the original with a blue dashed border. If this frame is deleted, the detail is set automatically to Offline and can no longer be refreshed.

The detail can be edited with 2D functions. Modifications to the detail are not taken into consideration in the design model or original plan.

A detail can be stored as an "online" or "offline" detail. An "online" detail applies changes in the original view (plan, section, view) when it is refreshed.

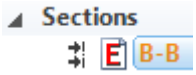
EXTERNAL VIEWS

Working with external views is only available in ELITECAD Mechanics. Views of the type section, detail, plot or view can be saved as independent drawings. They remain connected as external views with the design model.

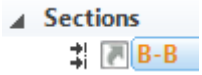
This option offers the advantage that it is not necessary to load all views when loading the design model. Additionally, external views are available as simple 2D plans for printing or examination, which are loaded faster individually than loading the design model plus the views.

The process of separating view data is called SEPARATING. The function SEPARATE VIEW is accessible in the context menu of the views in the views management. The external view is saved as a *drawing file* in the same directory like the *design model file*. During this process, the view is removed from the working storage.
External views are LOADED and UNLOADED back to the working storage via the context menu. After opening a drawing all external views are unloaded.
A separated view can be reintegrated later via REINTEGRATE VIEW from the context menu to be part of the *design model file again*. The external *view file* is deleted during this process.

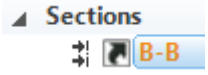
The view state is displayed in the views management window with a specific symbol:



normal view



Separated view, not loaded



Separated view, loaded

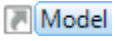
Separated view, loaded with write protection

TIP

Please consider that external views are not missing when handing over drawings. Optionally use the function FILE > CREATE ARCHIVE, which creates a *drawing file* where all external views are reintegrated.

Editing separated views

If external views are loaded together with the design model view, they can be treated like normal views, updated and modified. When the model is saved, the loaded external views are automatically saved together with the model.
External views can be opened as independent drawings. In this case, only additions are possible, because there is no access to the design model. Especially, the addition of attributes, position numbers and dimensioning requires access to design model information. The absence of the design model is indicated with a symbol in the views management window.



EXPORT VIEWS TO PDF

Which views can be exported?
Following views can be exported:

- Model view
- Plan view
- Section view
- Plot view

Each view is exported using its scale and format. The model view is exported as a 3D model.

Which preconditions have to be fulfilled?
In order to create PDF-files using ELITECAD the following software packages have to be installed:

The installation is described for the Bullzip PDF printer, but any other PDF printer may be used as well.

1. Bullzip PDF printer:
Bullzip PDF printer is used for creation of PDF files. The current version can be downloaded from http://www.bullzip.com/products/pdf/info.php. A tested version is also available on the installation media of ELITECAD in the directory "\Tools\ BullZipPDFPrinter\".

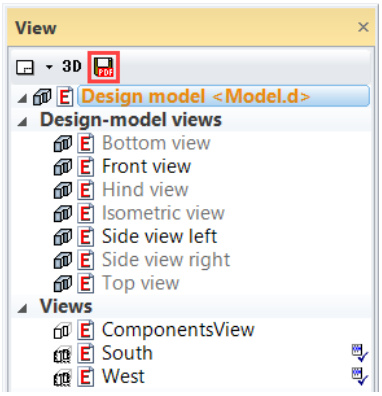
2. Ghostscript:
Ghostscript is required for the conversion of postscript-files into PDF-files. The current version can be downloaded from http://www.ghostscript.com. A tested version is also available on the installations media of ELITECAD in the directory "\Tools\Ghostscript\".

A complete installation description is available in *<ELITECAD installation path>\u\<version>\doc\de\cad\PS-PDF.pdf.*
See Views cannot be exported.

Export

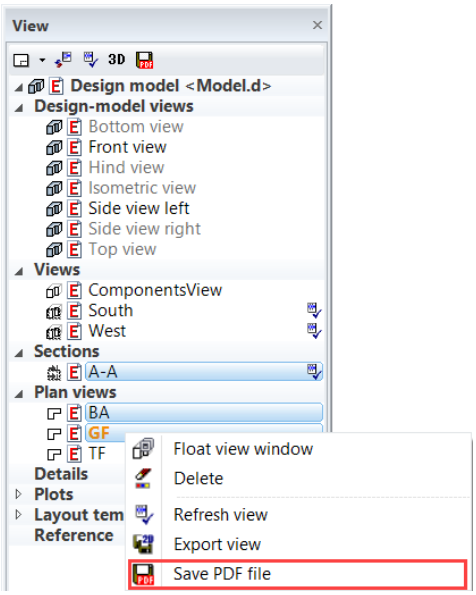
	View management
	Save PDF

Views that should be exported have to be selected. A click on the symbol opens the export dialog window.

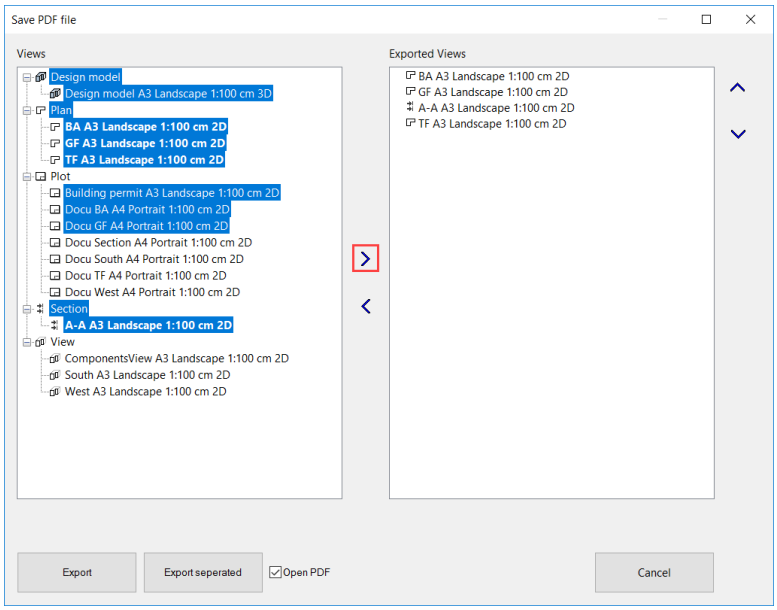


TIP

If multiple views are marked with [Ctrl/Strg] or [Shift] key, they could be exported together using the export item from the context menu.



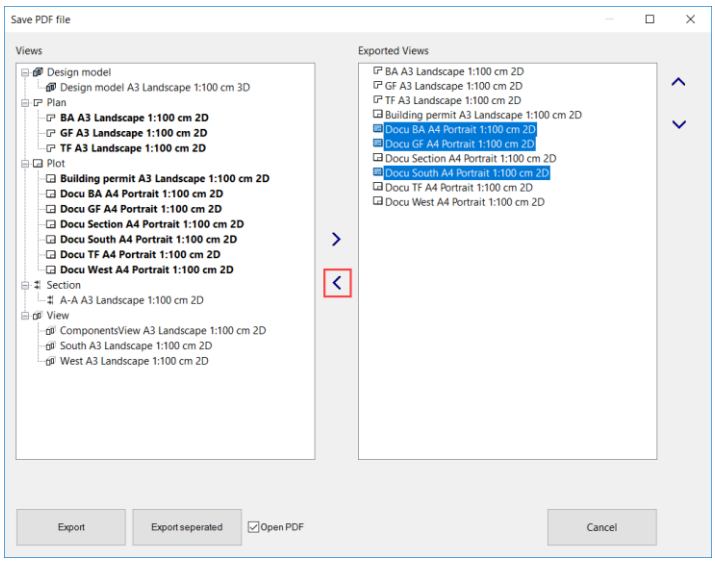
Export-dialog



The tree on the left side shows all views that can be exported. By clicking the button with the arrow pointing to the right, all marked views are added to list of views to be exported.

TIP

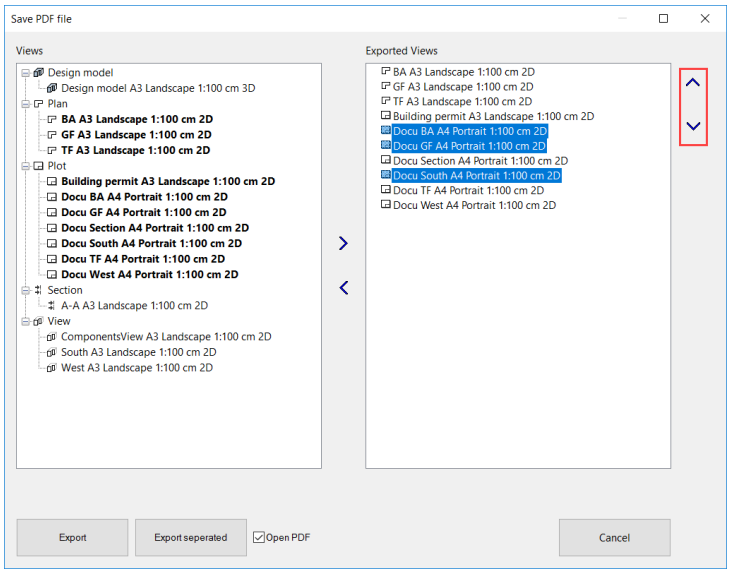
If multiple views are marked with [Ctrl/Strg] or [Shift] key, they could be exported together.



The list on the right side shows all views that are selected for export. By clicking the button with the arrow pointing to the left, all marked views are removed from the list of views to be exported.

TIP

If multiple views are marked with [Ctrl/Strg] or [Shift] key, they could be removed together.



The order of the views in the list of views to be exported defines the sequence how the views are appended to the PDF document. By clicking, the button with the arrow pointing up or down the order can be modified. All selected views are shifted up or down by one position.

TIP

If multiple views are marked with [Ctrl/Strg] or [Shift] key, they could be moved together.

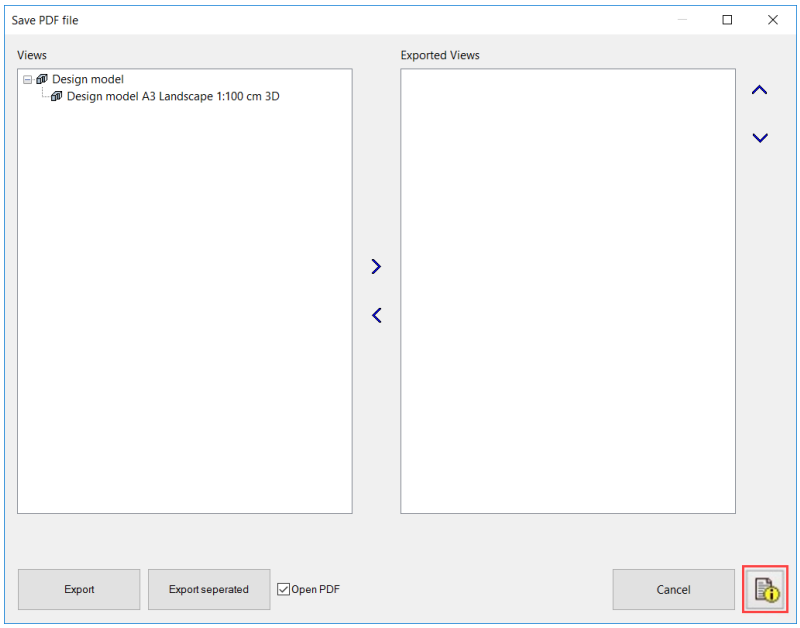
If the checkbox "Open PDF" is selected, the PDF-document is opened after creation using the configured standard PDF-reader.

By clicking the button "Export" all views are exported into a common PDF document. The order of the views in the list of views to be exported defines the sequence how the views are added to the PDF document. Each view will be added as a separate page into the document.
After clicking the button, the explorer appears and asks for a PDF document.

By clicking the button "Export separated", all views are exported into a separate PDF document.
After clicking the button, the explorer appears and asks for a PDF document.
Each view will be exported into a file. The file name is a combination of the selected PDF document and the view name.

Once the settings in this dialog have been made, they will remain. If the dialog is opened again, the same views are selected for export.
If the drawing is saved, the information which views were selected for export is saved as well.

Views cannot be exported

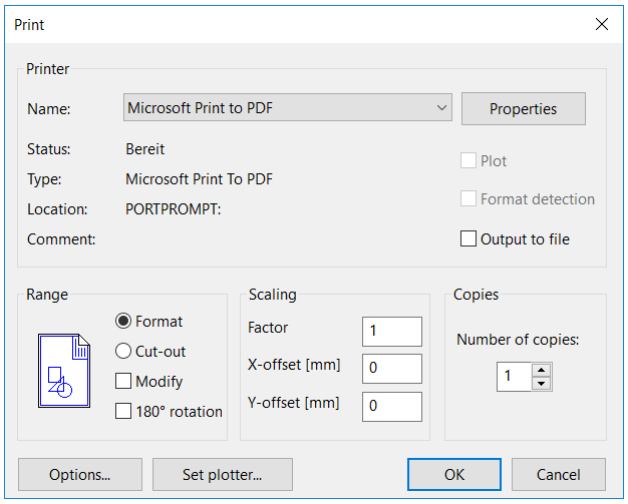


If **Bullzip PDF printer** or **Ghostscript** are not installed properly, only the model view can be exported as a 3D model.
Clicking the help button at the lower right corner opens an installation description how to solve this problem.

11.2 PRINT

Toolbar * main functions
File menu > Print

This function is used to output a print copy. All printers in Windows can be communicated with, however. Each device must have been created under Windows as a printer (⊞ key > Devices and printers; Windows8: [⊞ KEY +I > CHANGE PC SETTINGS > DEVICES > ADD DEVICE).
UNIX printers in the network can be communicated with by adding a connection with "LPR Port" and a host and spool name.
All images and vector graphics can be output. The colour and pen widths of the lines and the infill hatches are determined under SETTINGS > COLOUR PROPERTIES.
If colour gradient hatches or transparencies exist in plans, certain printer drivers may not print them as transparent. In this case, the option PRINT IN HIGHEST QUALITY must be selected under SETTINGS > OPTIONS > SYSTEM > CONFIGURATION.
The following entry dialog window appears after activating this function.



Name
Names of available printers. The user can select a type of printer as an output device.

Properties
Opens the driver of the printer set. The format and resolution are defined here in particular.

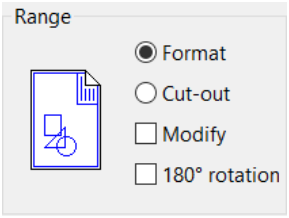
Print
The print format can be used for all printers and plotters.

Plot
The plot format is used for printers or plotters that support HP/GL2. This check box is only available once a corresponding assignment is made with SET PLOTTER.

Format detection
This check box is only available in connection with plotting. If the check box is ticked, the current drawing format is used. However, if this is not required or possible (e.g. A00 or oversize format), this check box must be deactivated and the corresponding paper format (paper size, portrait/landscape format) selected via *Properties*.

Output in file
If this check box is ticked, the *output files* are redirected into a file. The dialog field *Save file* appears.

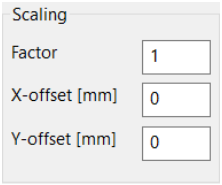
Format/cut-out



Users can select here whether the entire drawing or the currently zoomed cut-out of the drawing is to be printed.

Modify
If this check box is ticked, the drawing is adjusted to the selected output format. The ISO page border becomes visible.
The check boxes *Cut-out* and *Modify* must be ticked in order to print a zoomed area to fill a page.

Rotate 180°
Selecting this function prints the entire printout rotated 180°.

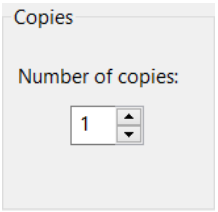


If the check box *Modify* is ticked, scaling is not possible.

Factor
Enter here the value that should be used for scaling.

X-offset/Y-offset
The user can state moves of the printout in X- and Y-axis direction. Given in mm. This is necessary in the event that the printout is centred on the format but is to be placed on the margin on paper.

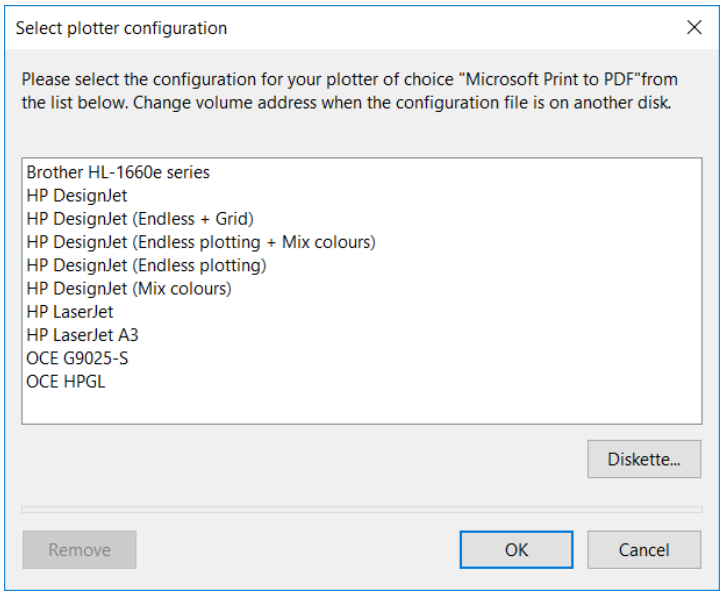
Number of copies



This check box is used for defining the print run.

Options
Printing parameters can be set here. The same window opens as under SETTINGS > COLOUR PROPERTIES

Set plotter
A plotter configuration can be assigned to the selected printer/plotter via this check box. This creates a file in the directory *<ELITECAD installation path>\u\<version>\cad\glob\hpglconf* with its name consisting of the type designation (entry for type in the printing main dialog window) and the file extension *.hgc*. The *Plot* check box can now be ticked and plotting can commence.



During plotting (on a laser printer e.g. LaserJet), as the drawer is determined when creating the device (e.g. A4 drawer, manual feeder), it is not possible to switch between different drawers later on for outputs (e.g. A3/A4 drawer). Multiple plotters can be created for the same printer.

Diskette
This check box is used for loading a plotter configuration from an external data carrier.

Remove
If a configuration has already been assigned to a plotter, it can be deleted with *Delete*.

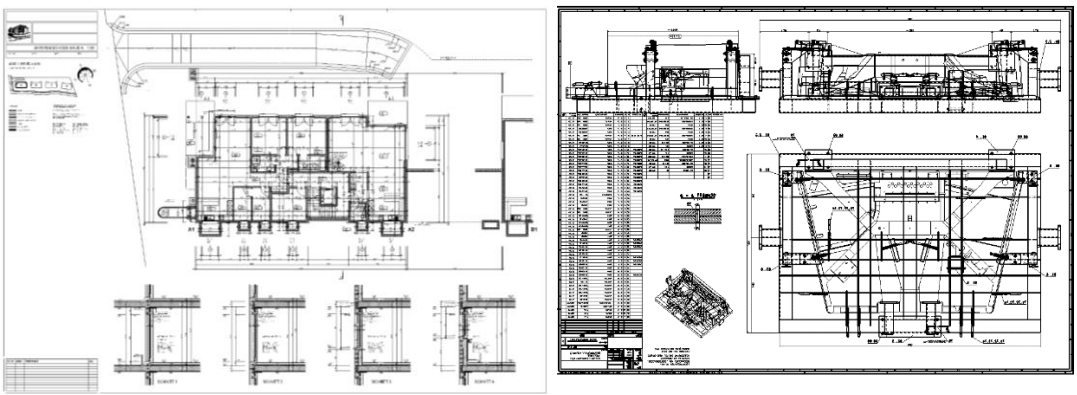
Vanishing point plotting
The configuration HP DesignJet (vanishing point plotting) must be selected for vanishing point plotting. A vanishing point plot occurs if the drawing protrudes over the edges of the format boundaries, e.g. width A1 and length 2 A1 (594 x 1682 mm)

TIP

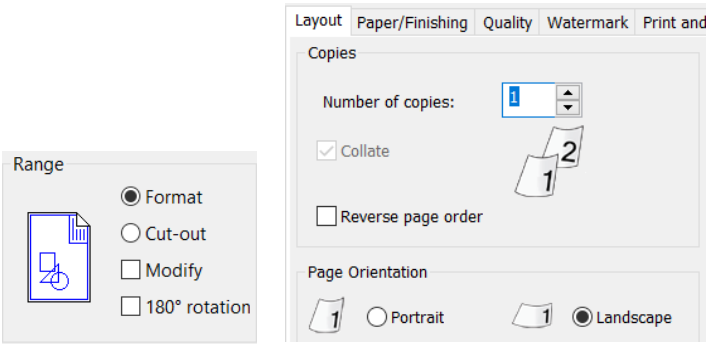
You can also generate and print a *TIFF*, *JPEG* or *BMP* file to print a solid view with FILE > FILE EXCHANGE > WRITE GRAPHICS.

EXAMPLES

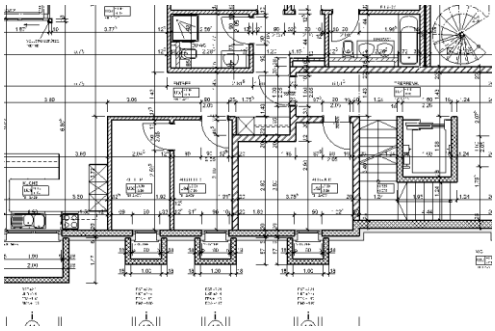
The basic drawing is a work drawing with details in A0 format, scale 1:50

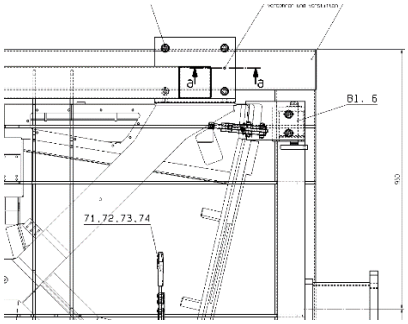


Default setting A4 format



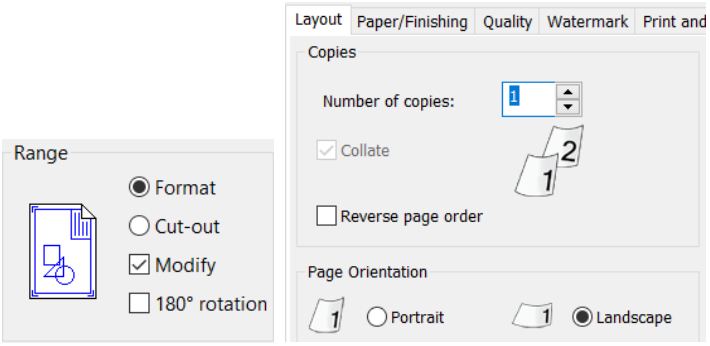
Result: A cut-out of the drawing. The drawing is cut around the centre. **The cut-out remains to scale.**



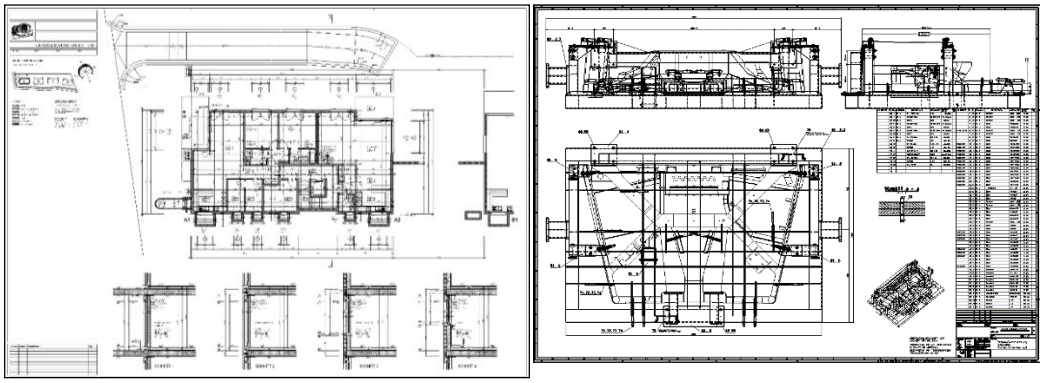


Format with modify

This setting means that **everything** is always output on the selected printing format regardless of the format on the screen. **The printout is not to scale.**

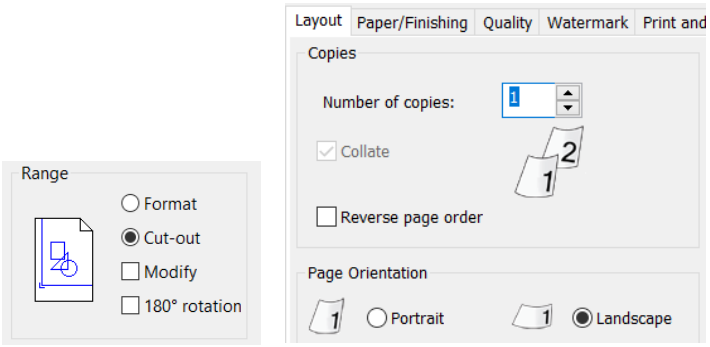


E.g.: A drawing in A0 format is adjusted to the format that is set under properties (e.g. A4).
CAUTION: If the lines are too thick in this case, they can be set under SETTINGS > COLOUR PROPERTIES. This means that A0 can also be output on lasers in A4 format (still visible).
Result: Complete drawing but not to scale.

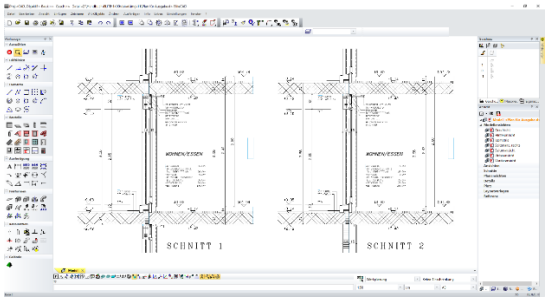


Cut-out

The **current zoom cut-out** is output in the selected format that is set under properties (e.g. A4) using the CUT-OUT function. **This printout remains to scale.** No defined zoom can therefore be output with this method. This is possible using the functions CUT-OUT and MODIFY.

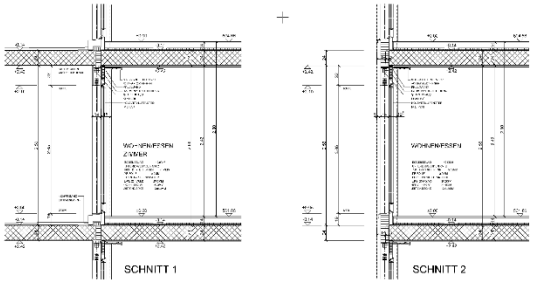


Zoom on screen

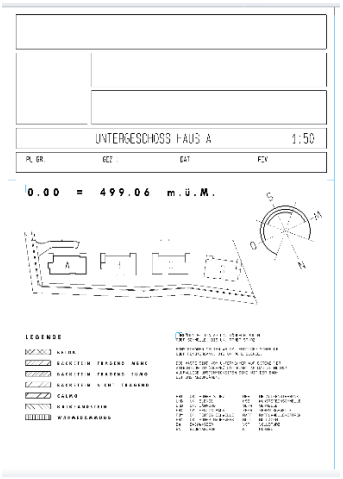


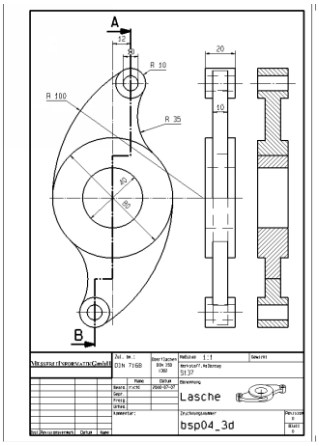
Result:

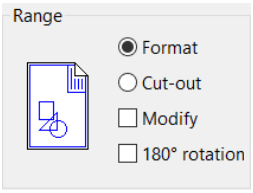
To scale cut-out area

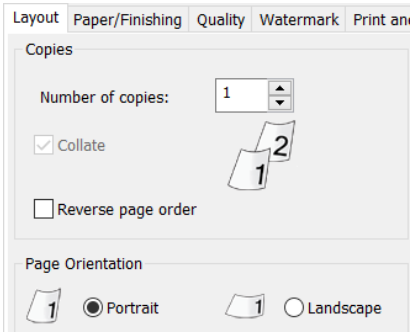


A3 format with upright A4 format





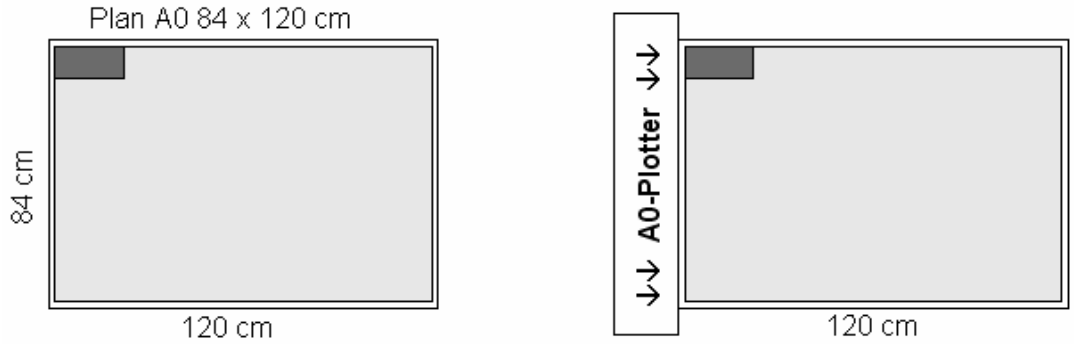




Switch to portrait format in the properties to ensure that the output is correct.

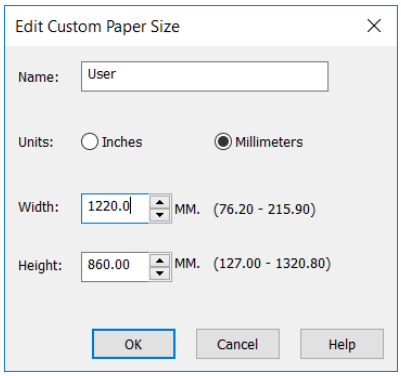
A0 plan

Some example settings for HP DesignJet 1055C A0 plotters:

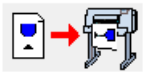


Printing command
Landscape format

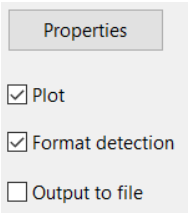
User-defined paper size 1220 x 860 mm



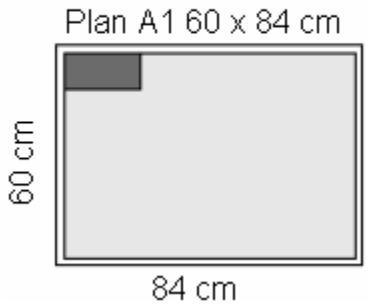
Activate automatic rotation and printing area in the plotter settings.

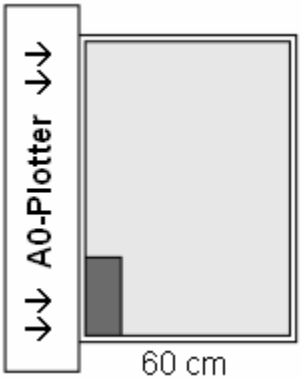


Plotting command
Activate plotting and format detection
Landscape format



A1 plan

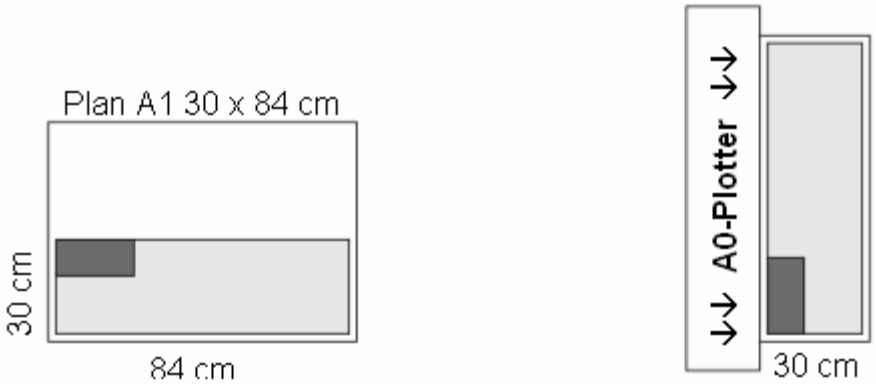




Printing command
Landscape format
User-defined paper size 860 x 620 mm
Paper source: 36-inch roll
Activate automatic rotation and printing area

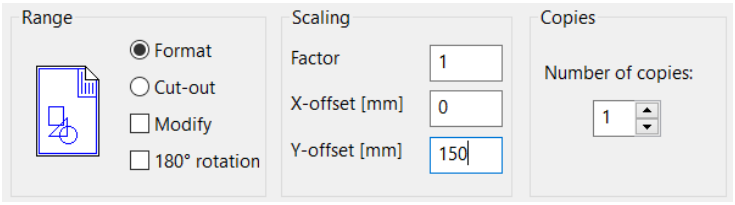
Plotting command
Activate plotting and format detection
Portrait format
Paper source: 36-inch roll

A1 plan halved in height



Printing command:
The PRINT command takes the centre of the page as the point of reference. A Y-offset can be entered for vertical moving and an X-offset for horizontal moving to move the reference point.

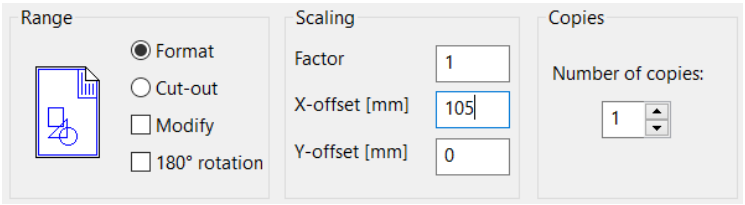
Y-offset scaling of 150 mm
Landscape format
User-defined paper size 860 x 320 mm
Paper source: 36-inch roll
Activate automatic rotation and printing area



Plotting command
Activate plotting and format detection
Portrait format
Paper source: 36-inch roll

A4 plan

Printing command
X-offset scaling of 105 mm



Portrait format
User-defined paper size 230 x 320 mm
Paper source: 36-inch roll
Activate automatic rotation and printing area

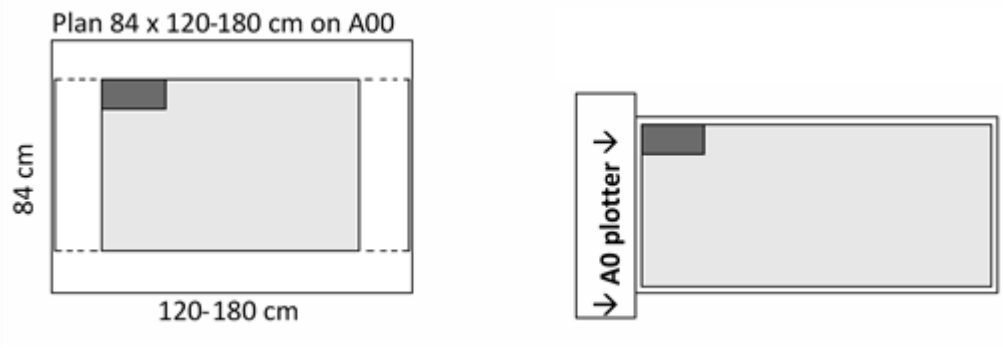
Plotting command
Activate plotting and format detection
Portrait format

Paper source: 36-inch roll

Plan between A0 and A00

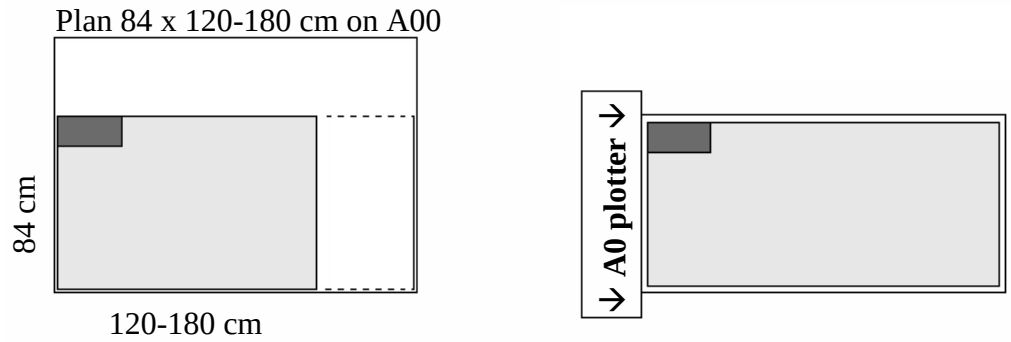
Plan 90 cm high, 120-180 cm long

Printing command
Format must be centred to A00



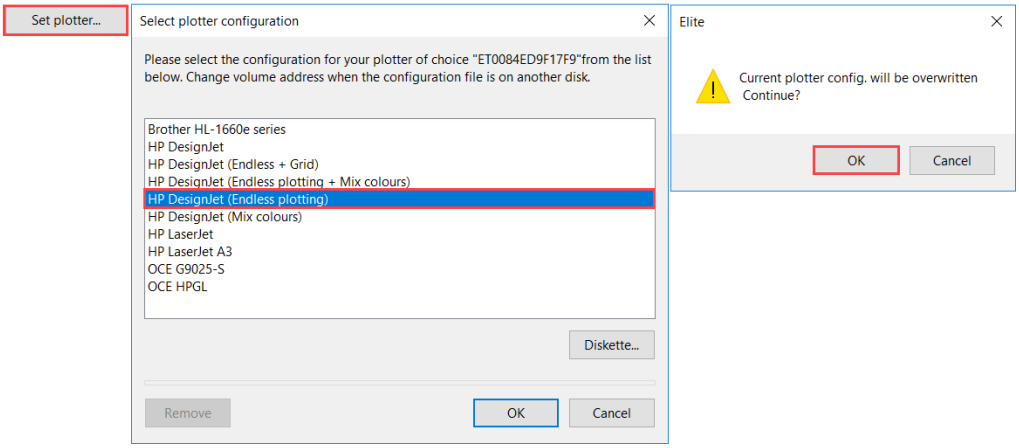
Landscape format
User-defined paper size 1220-1820 x 920 mm
Paper source: 36-inch roll

Plotting command
The plan must be left aligned on the A00. The vertical position of the plan is not important.

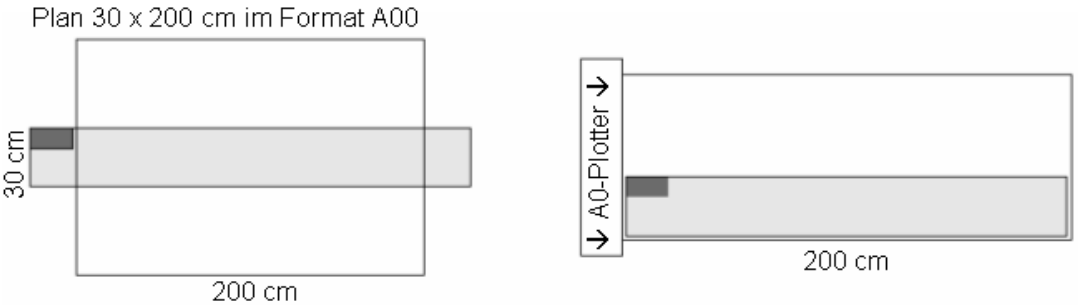


Activate plotting and format detection
Landscape format
Paper source: 36-inch roll

A special plotter configuration must be installed for formats larger than A0:
HP DesignJet (vanishing point plotting)
(If plotting is performed again with A0 size, the default configuration must be set up again)



Plan with excess length



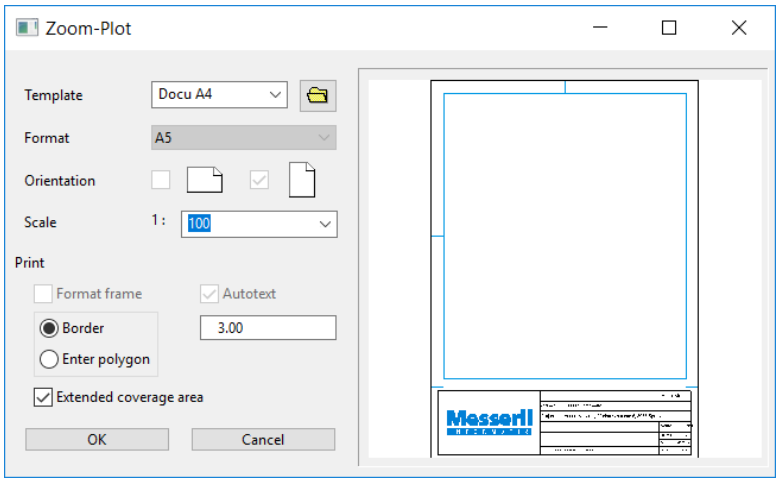
Printing command
Landscape format
User-defined paper size 2020 x 320 mm
Paper source: 36-inch roll
Activate automatic rotation and printing area

Plotting command
The plotter must be installed with the option ENDLESS PLOTTING.
Activate plotting, format detection deactivated
Landscape format
User-defined paper size 2020 x 320 mm
Paper source: 36-inch roll

Zoom plot

	Toolbar * main functions
	File menu > Print

A plan cut-out can be selected and output directly on a printer or in a PDF file with the ZOOM PLOT function. Users can choose between A4, A3 and a freely definable printing format.



Template
A previously created layout template is used as a template. A layout template appears in the preview window when selected. Any scale can be entered or selected from the list. Settings that were already defined by the Layout template can no longer be selected (format, orientation, format frame, display autotext).

Format
Formats from A5-A00, A-E as well as A4 and A3 portrait format can be selected. The format must also be set in the printer driver.

Orientation
Landscape or portrait format. The orientation must also be set in the printer driver.

Scale
A scale can be selected from the list or entered directly into the field.

Print
FORMAT FRAME active: A frame is printed out along with the drawing. The frame drawing can be found here:
<ELITECAD installation path>\u\<version>\cad\glob\l
AUTOTEXT active: Auto texts of the format frame drawing are printed.
BORDER active: A covering border with the entered width (in cm) is inserted.
POLYGON active: If the centre point is set, a polygon dialog appears and the Input Assistant tools are displayed.
EXTENDED COVERAGE AREA: The entire drawing is hidden with the exception of the cut-out to be printed.

12.TERRAIN

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Terrain is an add-on and requires a separate codeword.

12.1 Overview

The terrain module is an optional extension to ELITECAD. This module can be used to model natural landscapes using height lines or dimensioning points, or to import terrain data in different formats. Streets, paths, external borders, excavation ranges and landfill/dispersal ranges are defined by parameterised editing functions in order to provide a building's or a plant's surroundings with the desired final appearance. The excavation volume or quantity of soil dug up is refreshed with every modification and provides a substantial tool for the calculation.
The 2D excavation plan contains slopes with the inclines indicated and automatically generated height lines. Points with the height values displayed are always up to date. The 3D design model depiction follows either with a finished building or as a 3D excavation plan. Height lines are transferred into the views; a section depiction is similarly possible.
References to structures and projects settings in this chapter are only valid for ELITECAD Architecture.

TIP

In the course unit "Terrain" you can then see the functions in a practical example. In the pre-installed example project "Terrain" there is also an example file (*Example_terrain*) available.

12.2 Basis

Terms

Terrain model:
The terrain model is always an object in ELITECAD that contains all of the 3D data, modifications, parameters, etc.

Height lines:
Height lines are used to display height information in a planar depiction. Points of equal height are connected at regular height intervals with a curve.

Height points:
These are measuring points on the surface.

Excavation:
Removed material.

Landfill/dispersal:
Dug up material.

Reference terrain:
A terrain's frozen state.

Function

A terrain model is created in two basic steps.

1. The shape of the original terrain is defined by:
- Height lines
- Height points
- Perimeter contour

The data is either manually created or read in different formats and describes the shape of the parcel of land before each modification. This state can be saved as "reference terrain".

You can then edit the terrain. There are two different ways of making changes:

2.a The original terrain surface is manipulated by:
- modifying the height lines
- modifying the height points
- inserting terrain edges/areas

The result of this step is a new terrain surface showing how the parcel of land should ultimately look.

2.b Architectural measures:
- Streets/paths (with slopes)
- Terrain excavation (e.g. cellar)
- Landfill/dispersal (e.g. car park, terrace)
- Free excavation

The architectural measures are saved as "modifying objects" which are integrated into the terrain surface.

If you make changes to the definition data (points, height curves), the architectural modifications will be added to the refreshed terrain.
The finished terrain ultimately has a positive or negative volume difference to the reference terrain. A positive difference means that material needs to be added; a negative one means that material needs to be removed.

A plan view can then be created from a fully defined terrain. Theo plan view is always updated even when making modifications and contains information relevant for an excavation plan.
In a section view the visibility of the reference terrain can be activated in the view parameters.

3. Completion of the excavation plan

- Specify height marker
- Generate view
- Activate hatch and height sections

LIMITATIONS

- The terrain must neither overhang nor contain any holes.
- There can only be one terrain object per drawing.
- Excavation contours, landfill/dispersals and the perimeter contour must not contain any holes.
- Height curves should not intersect each other. This is not prohibited but the differing heights produce a situation which does not naturally occur.
- The external borders (perimeter contour) must lie within the points and curves. The contour is checked when regenerated. If the perimeter contour is later modified so that the perimeter contour lies in an undefined range, the result is undefined.

12.3 CREATE TERRAIN

	Terrain toolbar
	Extras menu > Terrain

Click the TERRAIN function to start a terrain model. The terrain properties bar appears and an empty terrain object is created. All further data is automatically inserted into this object.

TERRAIN PROPERTIES BAR

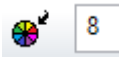
The properties bar becomes visible if you select the TERRAIN function to generate a terrain or if you click an existing terrain to edit it.

Terrain options

Renovation planning state (only in ELITECAD Architecture)

Generate

Terrain mode



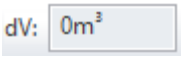
Colour selection – direct entry

Colour selection over table

Entry mode

Switch on height lines

Switch on slope



Volume

Save reference terrain

New definition point

New height line

New terrain edge/area

Move points and curves in Z direction

Perimeter contour

Excavation

Landfill/dispersal

Free excavation

Street

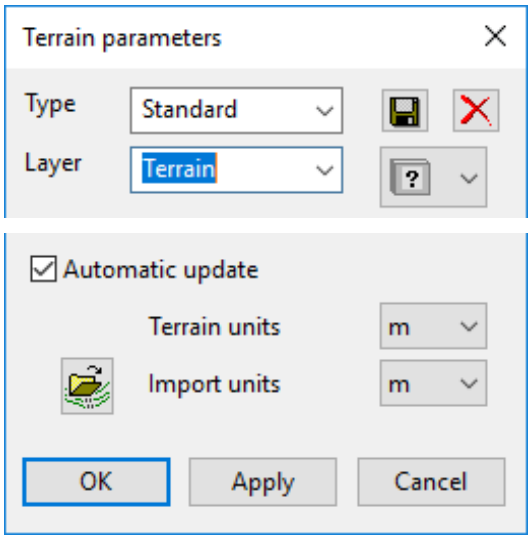
Path

Height point

TERRAIN OPTIONS

The "Parameter(s)" button calls up the detailed terrain options.
All parameters relevant to generating a terrain are saved with the terrain object. If you load a drawing with terrain, these are adopted and applied to the active parameters.

General parameters



Type

Used to select predefined parameters.
In order to save a new record, the parameters have to be set and a new name has to be entered into the text field.

Saving a record

Deleting a record

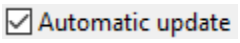
Layer

Every construction part has the layer field in the record with the layer selection. It is then guaranteed that the construction parts already lie in the correct layer when they are generated.
You can generate a new layer by entering its name into the text field.

Renovation planning state

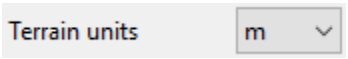
This option is only available in ELITECAD Architecture and is described in chapter 8.5.
The stat is valid for the whole object and is not for single terrain modifications.

Automatic update



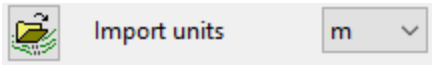
If this is switched on, any modifications made to the terrain are implemented immediately. Some actions, however, require manual recalculation.
For performance reasons, this switch can be switched off. You can then only trigger a calculation via the GENERATE function.

Terrain units



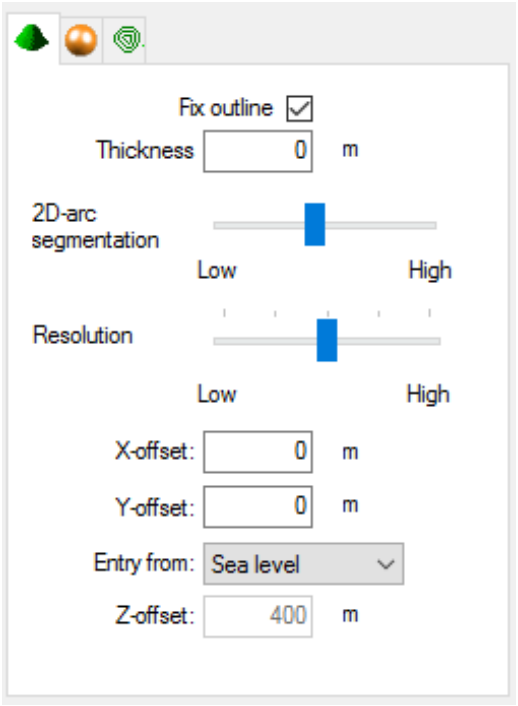
The unit is used to show and enter height values. It is also used for labelling height lines and showing the volume difference.

Import Terrain and import units

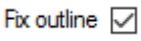


This function loads a terrain from a file as a reference terrain using the defined units.

Generation parameter



Fix perimeter contour

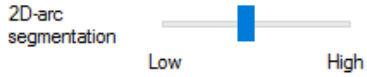


Once the reference terrain is saved and the option is activated, the height along the perimeter contour is no longer modified.

Thickness

The terrain is represented as a volume object and also has a surface on its underside. The height of the underside must be arbitrarily specified. The thickness indicates how far the underside should be away from the lowest point of the top surface.

2D-arc segmentation

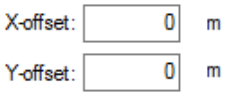


This affects the drawn contours of the street, excavation, etc. If needed, existing curves are replaced by one or more lines, depending on the setting.

Resolution

The calculated surface's precision can vary. Even the "low" selection requires a minimum amount of precision.

XY-offset

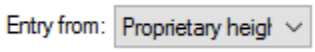


The XY shift of the reference point is entered and read in this field.

EXPLANATION

A terrain which is imported always appears centred in the middle of the page. So that the height points still show the original XY-coordinates when they are selected, the corresponding offset is automatically added.

Entry from
Different options for entering the heights can be selected here. References to buildings and project settings are only valid for ELITECAD Architecture.



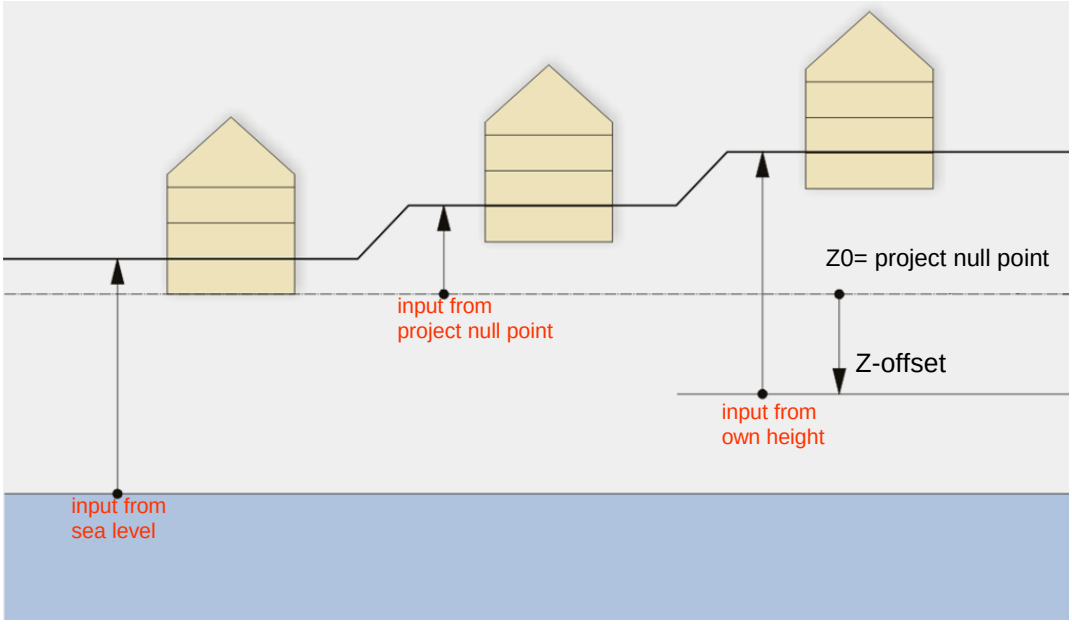
The terrain's default Z height is always zero. The effect this zero point has on the structure is dependent on the structure settings. If, for example, the "sea level" or "per structure" height marking system is selected here, the first entered structure is always at the zero Z-height, so just as high as the terrain's zero point regardless of its height situation. If the "project null" height marking system is chosen, the project's null point is at the height entered here.

If the terrain's entry height is modified after its creation, do not correct the terrain's height itself but the values of the height curves, height lines, excavation, label, etc. If you would like to move the terrain's height, you must use the MOVE POINTS AND CURVES IN Z DIRECTION function.

Proprietary height
This switch setting frees the Z-OFFSET field in which a particular value can be added. If, for example, you select 20 m as the offset and define the heights with 20 m, the points are at the zero Z height.

Project null
This option automatically sets the "Z-offset" to 0 and the height entries are entered from project null. If the heights are defined with a 0 value, the points are at the zero Z-height.

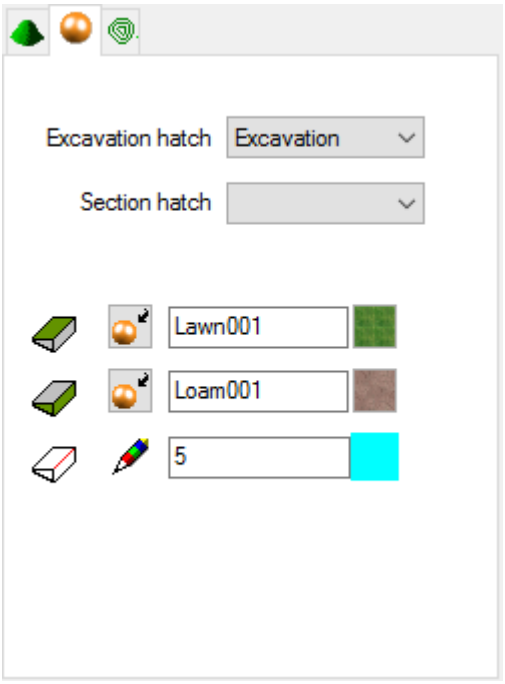
Sea level
If the SEA LEVEL option is selected, the height situation of the first entered structure is shown. Always indicate the heights in real sea levels.



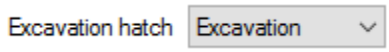
Offset

The Z-offset is either entered or read in this field.

Surface parameters



Excavation hatch



This is used for representing the slopes in an excavation plan.

The type of hatch can be selected from the "selection box" where all records saved under the hatching parameters are listed.

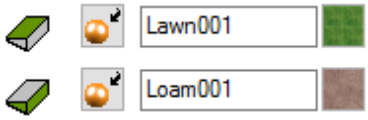
TIP

All line hatches are always automatically shown perpendicular to the excavation edges regardless of the angle with which they were saved. Cross hatches are also represented with only one line.

Section hatch

This is used while creating a section view in order to hatch a section of the terrain. The type of hatch can be selected from the "selection box" where all records saved under the hatching parameters are listed.

Colour/material for surfaces and sides

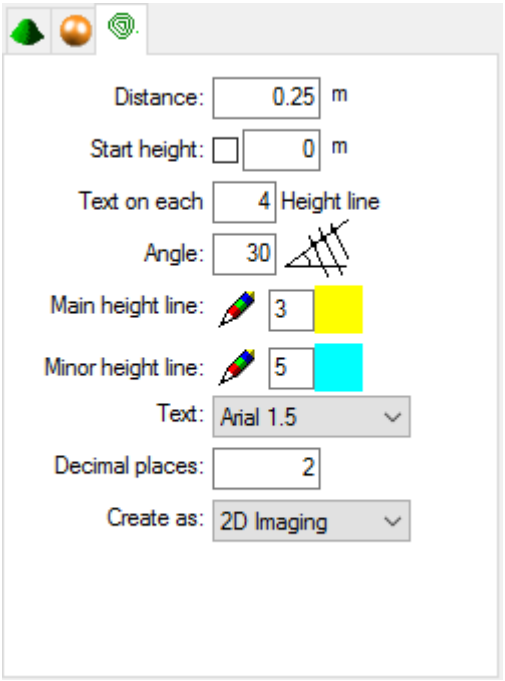


Colour mode/material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

Edge colour

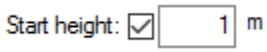
Height line parameters



Distance

The entry determines the height distance with which the height lines will be drawn.

Start height

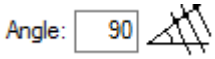


The height lines are displayed and labelled from this height.

Height line text

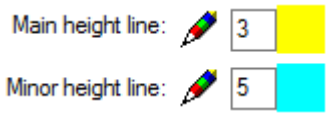
You can indicate here on which height line the text should be. The first pen from the Colour selections simultaneously affects the height lines.

Angle



The angle indicates an approximate guideline for the text position.

Colour selections

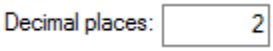


The first pen applies to the labelled height lines and the second pen for the height lines in between.
The pen colours can be directly entered or selected via the colour table. (from 0-1023)

Text parameters

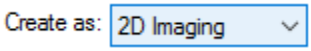
The type of text can be selected from the "selection box" where all records saved under the text parameters are listed.

Decimal places



Enter how many digits there will be after the decimal point.

Depiction



Enter whether the height lines will be generated in the floor plan or in their actual height.

GENERATE

The terrain is recalculated using the "Generate" button. All definition curves and definition points are used. In case a perimeter contour was defined, the terrain is restricted by this contour.

TERRAIN MODE

Depict with structure

Edits are generally carried out in this depiction mode. The terrain is displayed in the wire design model, pixel hidden line or solid design model, depending on the screen parameters. The excavation contours are integrated perpendicularly upwards and without side distance into the terrain. The final edited terrain then directly connects to the building.

Depict with excavation

The terrain is represented as a 3D excavation plan with all slopes in this depiction mode. The terrain is recalculated when toggling between depiction modes.

Depict without excavation

In this depiction mode, you can switch to the reference terrain. Should this not be present, the terrain is displayed without architectural measures. In this case, a warning message appears.

COLOUR/MATERIAL MODE

Colour mode/material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

ENTRY

Entry mode
You have two options available for generating a terrain edge/area, perimeter contour, excavation, landfill/dispersal, street or path: Either draw the contour directly, or you can define a polygon before accessing the function and select it.

Contour entry

You can draw a contour directly.

Select contour

You can select an existing polygon.

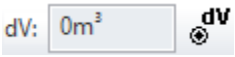
Switch on height lines

Height sections can be activated in the properties bar using this switch. Planar horizontal sections are calculated and the result is projected as 2D curves into the XY-plane. The calculation follows according to the set parameters with distance and label. These curves serve as a result for the excavation plan and are not provided for modifying the terrain.

Switch on slope

Slope hatches can be activated in the properties bar using this switch. The outlines of the excavation contour's slopes are hatched according to the selected parameters. If the hatch in use is a line hatch, then the lines point in the direction of the steepest incline.

Reference terrain and volume



If no reference terrain exists, the excavation volume is determined as follows:
The terrain surface is generated from definition curves and points. This state is adopted as its initial state. Excavation, landfill/dispersal, streets, etc. are integrated into the surface and result in a new edited surface. The difference between the initial state and the edited surface is displayed as volume in the properties bar. (A positive value means: material must be added; negative means: material must be removed)
In practice, the terrain appears different on an undeveloped parcel of land as it should finally look. Height points are generally determined from the geometer and describe an original terrain. The volume difference should optionally refer to the original terrain. In order to reach this, you must first define the original terrain and then freeze this state using the "Save reference terrain" buttons. This frozen terrain is referred to as reference terrain. Points and curves can later be modified in such a way that the final surface is created. If the reference terrain has been created once, the calculation of the volume difference refers to the difference between the reference terrain and the finished, edited surface.
The reference terrain can no longer be edited but can be replaced by recreating another. If the perimeter contour is modified, then the reference terrain should be reset since the difference would not give a meaningful value.

12.4 NEW DEFINITION POINT

You can switch between the terrain and the point properties bars using the "New definition point" button.

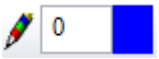
HEIGHT POINTS PROPERTIES BAR

The properties bar becomes visible if you select the NEW DEFINITION POINT function to generate a height point or if you click an existing marker to edit it.

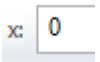
New point

Delete point

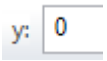
Colour selection direct entry



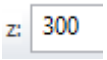
Colour selection over table



X-coordinate



Y-coordinate



Z-coordinate

To terrain property bar

New point

Click this button to define new height points.

The following query appears after activating this function:

Please enter point [Enter = End]
The easiest would be to enter the height points into the top view. Here you can enter the desired Z-value in the properties bar and click on the floor plan position. The cursor's coordinates are shown in the point properties bar.
The height point's settings must be confirmed with [Enter]. If the AUTOMATIC UPDATE option is activated, the terrain is automatically recalculated. Otherwise you must trigger the GENERATE function.

Delete point

Existing points can be deleted and moved. Clicking on the height point symbol shows the point properties bar. Handles (small squares) then appear on the symbols; the active point's handle is shown in another colour.

Points which are no longer used must first be selected and then deleted either using the "Delete point" button or by hitting the [Delete] key.

Colour selections

The points are displayed via a symbol and their colour can be set here.

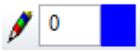
TIP

The point symbols are only visible in the 3D design model and have two different colours. One color is used for imported points and one color is used for manually added points.

Colour selection – direct entry

The pen colour can be entered directly. (from 0-1023)

Colour selection over table



The pen colour is selected here via the colour table.

Coordinates

Here the coordinates of the active height point are displayed.

To terrain properties bar

Once all of the points have been entered, you can go back to the terrain properties bar using the back button.

Modify height points

Existing points can be deleted and moved. Clicking on the height point symbol shows the point properties bar. Handles (small squares) then appear on the symbols; the active point's handle is shown in another colour. The active point's coordinates are shown in the properties bar. After a short wait, any change made to the values is applied and the point changes position. Alternatively, the point can be moved with the mouse. In the top view, only the X- or Y-values can be modified with the mouse. In a rotated view you can see the projection of a line on the work plane by moving the point. The shift takes place in a plane which lies perpendicular to the angle of view.

12.5 NEW HEIGHT LINE

You can switch between the TERRAIN functions and the height line properties bars using the NEW HEIGHT LINE button. Height lines are created as NURBS curves.

HEIGHT LINE PROPERTIES BAR

The properties bar becomes visible if you select the NEW HEIGHT LINE function to generate a height line or if you click an existing height line to edit it.

[NURBS begin](#)

[NURBS end](#)

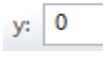
[NURBS close](#)

[Line type](#)

[Colour selection – direct entry](#)

[Colour selection over table](#)

[X-coordinate](#)



[Y-coordinate](#)

[Z-coordinate](#)

[Delete point](#)

[Delete line](#)

[To terrain properties bar](#)

NURBS begin

Click this button to define new height lines. This function must be restarted for every new height line.

The following query appears after activating this function:

Please enter 1st point [Enter = End]
The easiest would be to enter the height curves into the top view. Here you can enter the desired Z-value in the properties bar and enter points onto the curve with the mouse. The cursor's coordinates are shown in the curve properties bar. The height

curve is calculated by entering these points and is displayed as a preview. The resulting curve is generated as a smooth NURBS curve. As a result, it is not possible to create corners. All of the points lie on a level, even if the curve is created in a rotated view.

The height line's settings can be confirmed with [Enter], "NURBS end", "NURBS close" or by double-clicking.
If the AUTOMATIC UPDATE option is activated, the terrain is automatically recalculated. Otherwise you must trigger the GENERATE function.

TIP

A curve can be either open or closed.

NURBS end

This confirms an entry of an open curve.

NURBS close

This confirms an entry of a closed curve either by selecting the start point or by using the "NURBS close" button. The transition from the start to end point is also smoothly calculated.

TIP

Using either "NURBS end" or "NURBS close", the form can later be switched between open and closed by editing the height line.

Line type

The curves are represented by a line. The line type can be adjusted here.

Colour selections

The curves are represented by a line. The colour can be adjusted here.

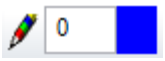
TIP

The curves are only visible in the 3D design model and can have different colours.

Colour selection – direct entry

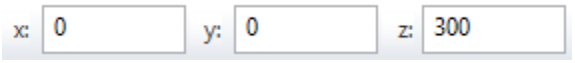
The pen colour can be entered directly. (from 0-1023)

Colour selection over table



The pen colour is selected here via the colour table.

Coordinates



At this point, the coordinates of the active points of a height line are displayed.

Delete point

Clicking on a definition curve shows the curve properties bar. Handles (small squares) then appear by the originally entered points; the active point's handle is shown in another colour.

A height line's points which are no longer in use must be selected and deleted individually from the curve using the "Delete point" button.

Delete line

This deletes the selected existing curve.

To terrain properties bar

Once all of the curves have been created, you can go back to the terrain properties bar using the back button.

Modify height lines

Clicking on a definition curve shows the curve properties bar. Handles (small squares) then appear by the originally entered points; the active point's handle is shown in another colour. The active point's coordinates are shown in the properties bar. After a short wait, any change made to the values is applied. The point changes position and the curve is recalculated. Alternatively, the point can be moved with the mouse and a preview of the new curve is shown. In the view, only the X- or Y-values of a point can be modified with the mouse. Modifying the Z-value in the entry field moves the entire curve.

12.6 NEW TERRAIN EDGE/AREA

Edges and area can be integrated into the terrain using this function. Terrain edges are calculated before all of the other modifications (street, path, landfill/dispersal, excavation).

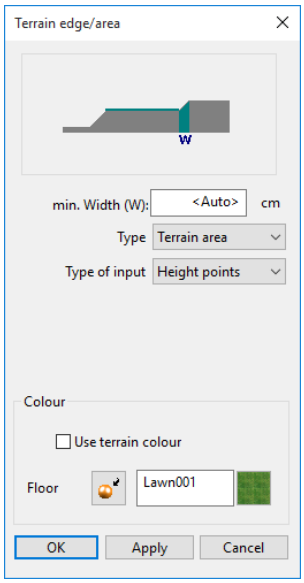
The "New terrain edge/area" button prompts you either to draw a contour or to select an existing polygon, depending on which Entry mode is selected. This contour must meet the following requirements:

- The polygon is an open or closed continuous contour.
- The contours must not intersect each other.
- The contour lies in a level parallel to the floor plan level.

TIP

A straight line can also be divided into multiple line pieces and provided with different height values.

The following dialog window appears.



Minimal width

The minimal width defines a distance to a terrain edge or area within height points and curves are ignored except height points lying on the contour which are used to define the height of the edge/area. If the terrain edges/areas overlap with height curves or if there are any height points or curves within that distance, then the height values of the contour take precedence. The width is necessary to create a smooth transition between the terrain edge/area and the remaining terrain surface. The smaller the width, the steeper is the transition.
If the value is deleted, the distance is set automatically. (Approx. 5% of the whole terrain extent).

The points, which no longer have any effect on the terrain because of this entry, are identified by a rhombic handle.

Height point on a terrain edge or area

Ignored height point

Standard height point

Type
For closed contours, one can define if just the contour or if the whole area should be taken into account. If the area type is selected, height curves and height points lying within the area are ignored.

Entry mode
Here the mode of height definition is defined.

1. Height entry by value.
2. Applying the height from the reference terrain, if defined.

TIP

This setting is used to fix the height along a contour. (I.e. a property boundary).

3. Height definition by height points on the contour.
   The following rules are in force:
   - 1 point — The whole contour lies on this height.
   - 2 points — Gives the direction of the steepest descent.
   - 3 points — Gives a plane.
   - Multiple points — Results in a variable height gradient. The height is interpolated between height points.

TIP

Height points can be used for multiple contours.

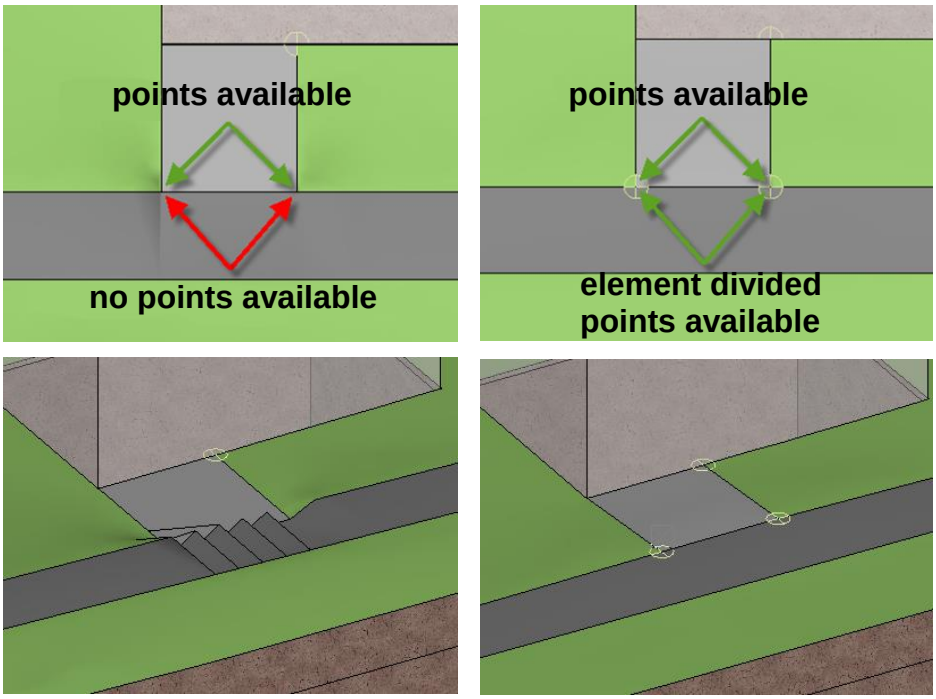
Limitations:

- Height points can only be entered onto the endpoints of a line.
- Two height points must not lie next to each other.
- The terrain edges must not intersect each other.
- Avoid very small areas.

EXPLANATION

If terrain edges/areas are located exactly on top of each other, the 3D nodes are identical. After selecting the terrain area, you can insert additional points by clicking on a handle or gripper of the contour.

Click on the terrain area and divide the element at the relevant points.
Height points must be set on these 3D nodes.



Use terrain colour
If the option is active, the same colour or same material is used as that in the terrain area.
A colour or material for the terrain area can otherwise be selected. The range is "superimposed" onto the terrain.

Colour mode/material mode

These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

TIP

It is only possible to enter a colour or material for a closed contour.

12.7 Move points and curves in Z direction

All definition curves and points are modified using this button. The height of the entire terrain is shifted.
This is particularly necessary if the imported terrain data should be aligned to the drawing.

The following query appears after activating this function:

Distance?
A positive or a negative value (in an active unit) can now be entered and confirmed with [Enter].

12.8 PERIMETER CONTOUR

If no perimeter contour has been defined, the terrain's outer border is based on the definition curves and definition points. It is not extrapolated outwards.

The "Perimeter contour" button prompts you to either draw a contour or to select an existing polygon, depending on which Entry mode is selected.

The perimeter contour generally marks the limits of the piece of land. Naturally, every polygon can be selected as a perimeter contour that meets the following requirements:

- The contour is closed
- The contour has no holes
- the contour lies within the points and curves
- The contour lies in a plane parallel to the floor XY-plane

TIP

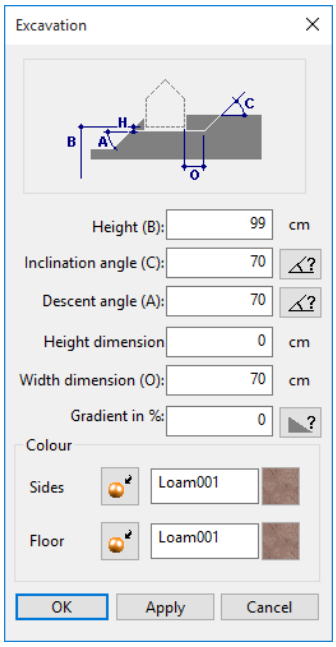
If the function is performed for the second time, a new perimeter contour can only replace the previous one. The reference terrain is also deleted.

12.9 EXCAVATION

The "Excavation" button prompts you either to draw a contour or to select an existing polygon, depending on which Entry mode is selected. This contour must meet the following requirements:

- The contour is closed
- The contour has no holes
- The contour lies in a level parallel to the floor XY-level
- The contour should contain no narrow recesses (due to slopes).

The following dialog window appears.



Height (B):
Height of the excavation base.

Inclination angle (C):
Upward slope angle.

Descent angle (A):
Downward slope angle.

EXPLANATION

Slope angles are used in the generation of slope angle hatches in the excavation plan as well as in "Depict with excavation". In the depiction with structures, upward angle slopes are always perpendicular and downward angle slopes are slanted according to the angle (in case the slab contour protrudes from the terrain).

Variable slope angle:

The slope angle can be individually specified for each line. Two interactive functions (for upward and downward) query the angle for every element. In order to identify the active element, a marker is set in the middle of the element. The values are only specified when the function has ended. Cancelling deletes it – the value from the parameter window then applies.

EXPLANATION

Variable angles can lead to undefined situations, especially concerning curves with tangentially attached lines.

Height dimension (H):
Ground clearance (e.g. for a foundation)

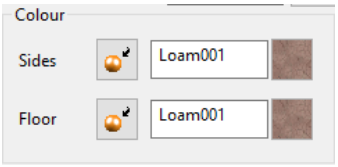
Attention:
This entry, together with the "Height (B)", is added and produces a new marker for the excavation base.

Width dimension (O):
Side distance (work plane)

Gradient in %:

Enter the inclination into the text field.
2 points define the direction of the slope.

Colour mode/material mode



The colours or material can be entered separately for the sides and floor.

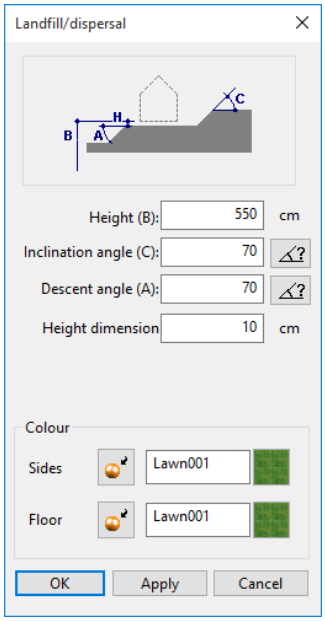
These two buttons allow you to switch between colour mode and material mode. For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

12.10 LANDFILL/DISPERSAL

LANDFIL/DISPERSALis used to erect a planar platform such as a car park or a terrace.

The LANDFILL/DISPERSAL function is defined similarly to EXCAVATION. There are two differences: There is no configurable side distance and the depiction of the slopes in a 3D design model is always slanted in all of the depiction modes.

The following dialog window appears.



12.11 FREE EXCAVATION

A free excavation is used to define fixed given surfaces embedded in the terrain or overhanging ranges such as a tunnel or an earth cellar.

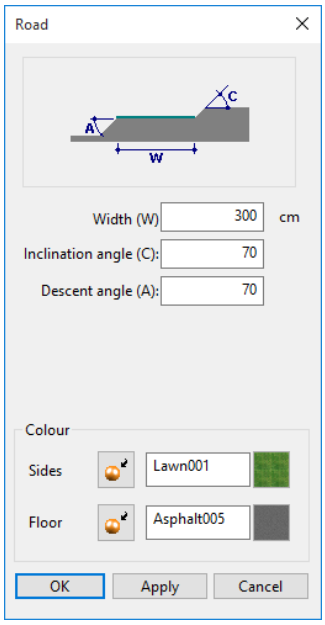
To define a free excavation, you must first create a 3D object that forms the desired cut-out. After selecting the function, select the 3D object, which is subtracted from the terrain. The colour of the surfaces is then adopted from the 3D object.

12.12 Street

The "Street" button prompts you either to draw a contour or to select an existing polygon, depending on which Entry mode is selected. The definition contour is used as a centre line. This contour must meet the following requirements:

- The contour is open
- The contour is uninterrupted
- The contour lies in a level parallel to the floor XY-level
- The contour should contain no curves/recesses which are too narrow (due to slopes)

The following dialog window appears.

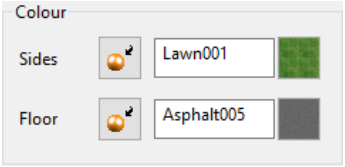


Width (W):
Width of the street

Inclination angle (C):
Upward slope angle.

Descent angle (A):
Downward slope angle.

Colour mode/material mode



The colours or material can be entered separately for the sides and floor.

These two buttons allow you to switch between colour mode and material mode.
For more details, see chapter 1.4 "Colours" and 1.7 "Materials".

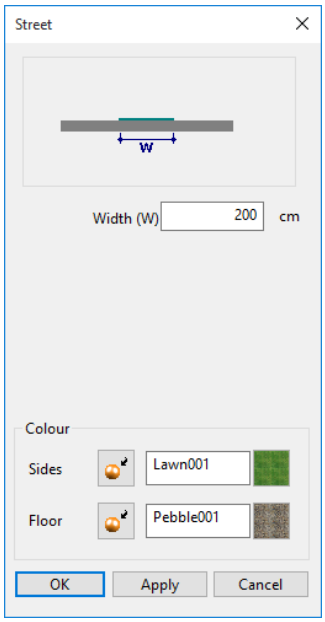
TIP

The street's height gradient is based on the line's endpoints and the contour's curves. The height value from the terrain to these points is determined and the heights in between are equally interpolated. If you want to specify the heights exactly then you should lay the desired street point on a terrain edge.

12.13 PATH

The PATH function is defined similarly to STREET. The only difference being: The slope angle is not configurable because the path is always restricted to being perpendicular downwards.

The following dialog window appears.



12.14 HEIGHT POINT

The "Height point" button requires you to specify the positions for the height points. The height values are shown as text in these positions. Changes made in the terrain are automatically updated in the height markers when refreshed.

12.15 MODIFY TERRAIN

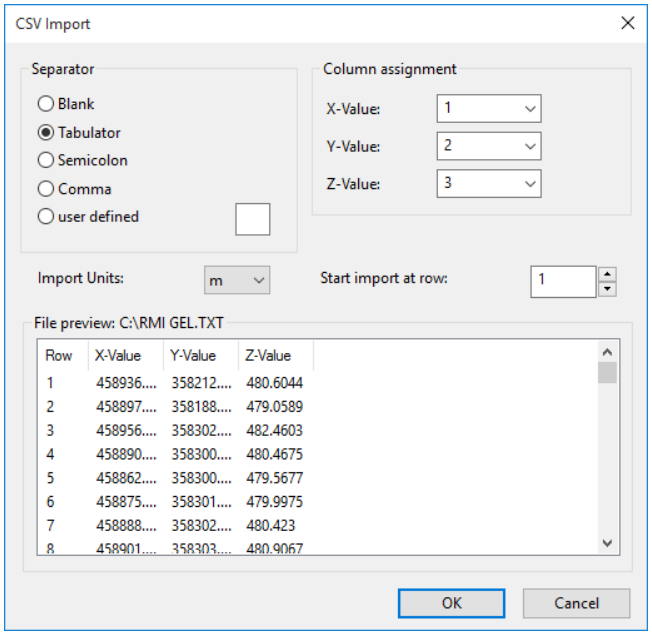
Every single definition can be selected again at a later point and can be deleted or modified in their properties.

12.16 TERRAIN IMPORT

The following formats are supported:

- ASCII files with unsorted XYZ-coordinate points (*.txt). One point per row.
- ASCII files with sorted XYZ-coordinate points on a rectangular grid.
- ASCII files with XYZ-coordinate points that form triangles.
- Import of terrain information from the INTERLIS format. Either *.*ili* or *.*itf* files can be selected here. Only the height points are transferred from this format. Additional 2D data from INTERLIS can be transferred via the DXF conversion.
- Import files in Shape format. Files with *.shp extension can be selected here.

There are different formatting styles when importing terrain data from ASCII files. A concise selection of relevant rows and columns can be freely configured on import.



Three settings can be arbitrary chosen:

- The columns for the X, Y and Z value
- The separator for the values in between a row
- The number of rows for the header or from which row the points begin
- The units of the points to be imported

After the selection has been made, you can start the import with OK.

External data often contains height information in metres above sea level. This data is also always imported on its absolute height. If the structure settings have no defined height situation for the structure, the terrain is widely read over the building. In this case, simply correct the structure's and project null's height situation to the correct sea level.
If the height information is not given in metres above sea level, the imported terrain's height must be adjusted if required. For this, always use the MOVE POINTS AND CURVES IN Z DIRECTION function.

13.DRAINAGE

13.1 OVERVIEW 921

13.2 CREATE PIPING NETWORK 922

13.3 GENERATE PIPING NETWORK 933

13.4 EDIT PIPING NETWORK 934

13.5 LAY-OUT PIPING NETWORK 937

13.6 LABEL 938

13.7 REPORT 941

13.8 SHOW INFO 943

Drainage is an add-on and requires a separate codeword.

13.1 Overview

The drainage module is an optional extension to ELITECAD. With this module, you can create a piping network using special functions. Chambers, piping and load points are defined using the entry dialog window and automatically generated, along with shaped parts, in 2D and 3D. You can define the set drop and modify the pipe diameter using the respective functions. Chamber and piping labels are placed on the specified points at the touch of a button.

TIP

We recommend reading course unit "drainage". You can then see the functions in a practical example.

Overview of functions

Load point

Chamber

Library part

Piping

Slope calculation

Set height

Dimension

Set drop

Raise/lower load points

Three-line

Label

Parts list

Display bottom of pipe

13.2 CREATE PIPING NETWORK

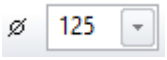
SET LOAD POINT

	Drainage properties bar

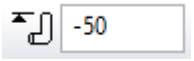
The load points must be set at the upper end of the drainage network.
Horizontally e.g. for the chamber outlet, vertically e.g. for the connections to the building drainages fall pipes. The load points must always be set in the same storey.

LOAD POINT PROPERTIES BAR

The properties bar becomes visible if you select the LOAD POINT function to generate a load point or if you double-click on a load point to modify it.



[Dimension]



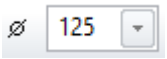
[Height]

[Height reference]

[Select toolbar]

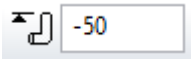
[Connection type]

Dimension

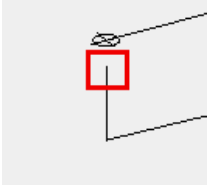


The load point's dimension can be either selected or entered here.

Height



The floor height can be entered here. The unit is dependent on the set height reference. If the load points have been increased or decreased, the height of the connection points is entered. The floor height can be read in the grey field.



Height reference

There are three different types of height reference.

Sea level

The entry is in metres above sea level.

±0.00

The entry is in metres above the project null point.

Storey

The entry is from the active storey and in the active unit.

Separate load points

Separate load points can be inserted with the SELECT DIRECTORY function.
The functionality is only guaranteed if the necessary attributes are present.

Creating separate load points
An existing load point must be read and modified as a drawing.

From the standard directory *"ELITECAD installation directory"* *\u\<version>\ar\bs\sa\l* you can load the load points as a template. It is important that the model is activated under ACTIVATE MODEL before modification. The load point can then be saved under the same in its own library directory.

Connection type

There are three different types of connection type.

Up

This can, for example, be used to connect a drain pipe to a fall pipe.

Horizontal

This can be used for a chamber output, for example.

Downward

This can be used for a mud drum dip pipe, for example.

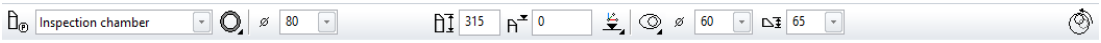
CREATE CHAMBER

	Drainage properties bar

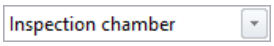
You can use this function to create chambers in 3D.

CHAMBER PROPERTIES BAR

The properties bar becomes visible if you select the CHAMBER function to generate a chamber or if you double click on a chamber to modify it.
You can manipulate the main values in the properties bar. However, fine-tuning can be done under the chamber parameters.

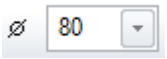


[Chamber parameters]



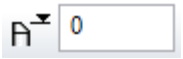
[Type]

[Geometry]



[Diameter]

[Chamber height]

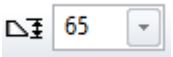


[Top side]

[Height reference]

[Cone type]

[Cone diameter]

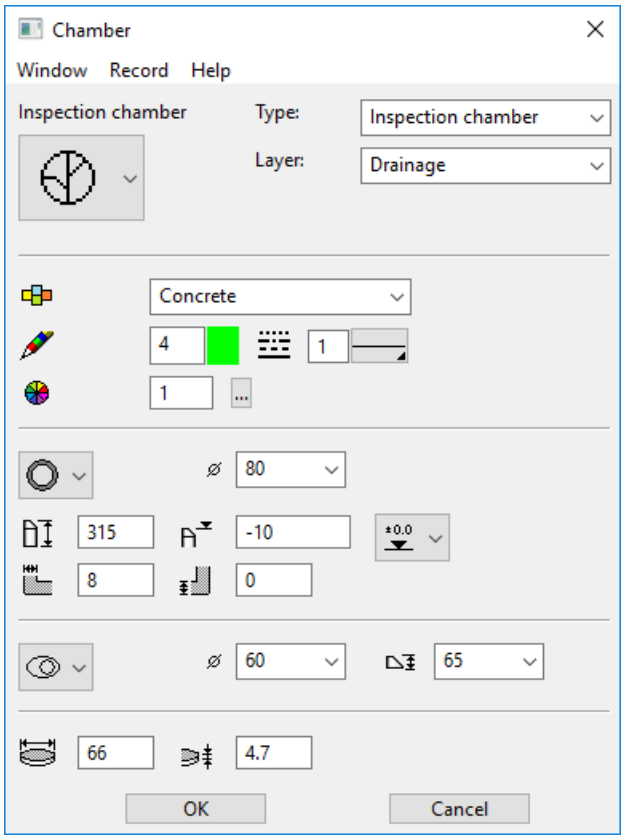


[Cone height]

[Place]

CHAMBER PARAMETERS

The set-up dialog window for the chamber is opened with the CHAMBER PARAMETER function. The settings of this dialog window are maintained. If the dialog window is closed and reopened, the status most recently set is still in place. If you would like to keep the set parameters for later use, assign it a name in the "Type" field and save it using the function RECORD > SAVE.



Type
The name of the selected parameter record can be found in the "Type" selection box. It can be defined freely and refers to the chamber type. By selecting various types, you can see how the values in all of the other entry fields are automatically modified. This way, once you have saved a chamber type as a custom defined type, you can call it up repeatedly.
To generate a chamber type, simply enter the new name in the text box and modify all the values on the dialog window as desired. Next, you can insert the new type into the selection list via the menu item RECORD > SAVE. To delete a type that is no longer needed, use the menu item RECORD > DELETE.

Layer
You can assign a layer to the chamber in the "Layer" field.

Parameters

Material

The chamber material can be selected here.

2D depiction

Here you can select the pen for the 2D depiction.

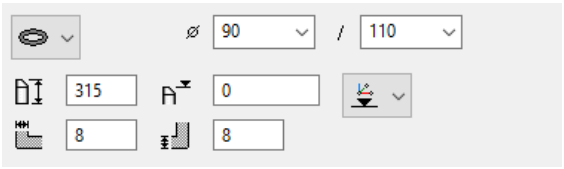
Line type

Here you can select the desired line type.

3D depiction

Here you can select the pen for the 3D depiction.

Sizes/Dimensions



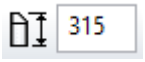
Shape

Users can select between circular and elliptical:

Diameter

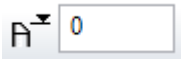
Here you can select the desired diameter.

Chamber height



The chamber height can be defined here.

Chamber upper edge



The chamber height can be entered here. The unit is dependent on the set height reference.

Height reference

There are three different types of height reference.

Sea level

The entry is in metres above sea level.

±0.00

The entry is in metres above the project null point.

Storey

The entry is from the active storey and in the active unit.

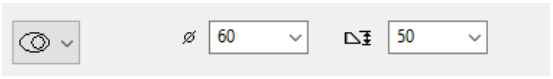
Wall thickness

The wall thickness can be defined here.

Floor gauge

The floor gauge can be defined here.

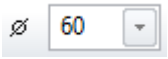
Cone



Shape

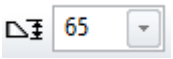
You can select between none, central or eccentric cone.

Cone diameter



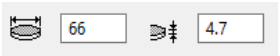
Here you can select the cone diameter.

Cone height



Here you can select the cone height.

Lid



Lid diameter

The lid diameter can be defined here.

Lid height

The lid height can be defined here.

Place

The drawing can be manipulated accordingly via the properties bar before being placed.

Properties bar for place

For more details, see chapter 1.8 Open and save > Properties bar for loading/positioning.

SET LIBRARY PARTS

Drainage properties bar

This function is used for relative loading and placing of library parts. The library parts are aligned to the respective scale when being placed.

For more details, see chapter 1.8 Open and save > Insert library.

TIP

ELITECAD's library has two subdirectories with complimentary drainage parts for 2D and 3D.
The directory structure is independent of the normal insertions of the library parts.

CREATE PIPING

Drainage properties bar

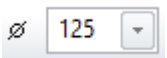
You can use this function to create piping in 3D. If it is necessary to modify the route of the parts, these can be deleted and redrawn.

PIPING PROPERTIES BAR

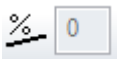
The properties bar becomes visible if you select the PIPING function to generate piping or if you double-click on the piping to modify it.
You can manipulate the main values in the properties bar. However, fine-tuning can be done under the piping parameters.

Piping parameters

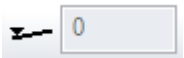
Type



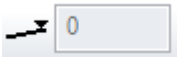
Diameter



Actual incline (only visible when editing)



Height 1 (only visible when editing)



Height 2 (only visible when editing)

Height reference (only visible when editing)

Polygon functions

Polygon functions

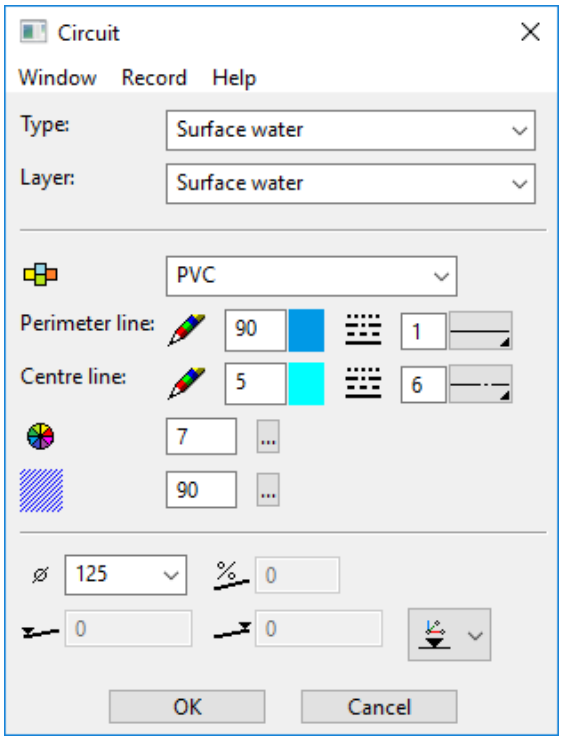
Polygon functions

Piping properties bar (material)

Piping properties bar (depiction)

PIPING PARAMETERS

The set-up dialog window for the piping is opened with the PIPING PARAMETER function. The settings of this dialog window are maintained. If the dialog window is closed and reopened, the status most recently set is still in place. If you would like to keep the set parameter for later use, assign it a name in the "Type" field and save it using the function RECORD > SAVE.



Type

The name of the selected parameter record can be found in the "Type" selection box. It can be defined freely and refers to the type of piping. By selecting various types, you can see how the values in all of the other entry fields are automatically modified. This way, once you have saved a type of piping as a custom-defined type, you can call it up repeatedly.

To generate a type of piping, simply enter the new name in the text box and modify all the values in the dialog window as desired. Next, you can insert the new type into the selection list via the menu item RECORD > SAVE. To delete a type that is no longer needed, use the menu item RECORD > DELETE.

Layer
You can assign a layer to the piping in the "Layer" field.

Parameters

Material

The piping material can be selected here.

Perimeter line

Here you can select the pen and line type for the 2D depiction of the perimeter line.

Centre line

Here you can select the pen and line type for the 2D depiction of the centre line.

3D depiction

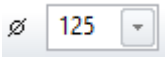
Here you can select the pen for the 3D depiction.

Hatch

Here you can select the hatch colour for the 2D depiction.

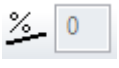
Dimension/incline

Diameter



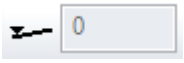
Here you can select the desired diameter.

Actual incline



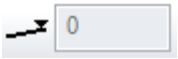
The piping unit's current incline is shown here.

Height 1



The piping unit's current lowest point is shown here.

Height 2



The piping unit's current highest point is shown here.

Height reference

There are three different types of height reference.

Sea level

The height indication is given in metres above sea level.

±0.00

The height indication is given in metres above the project null point.

Storey

The height indication is from the active storey and in the active unit.

Polygon functions

Start piping

This function can be used to start a new piping unit.

End piping

This function can be used to end a piping unit.

TIP

You can also end a piping unit by double-clicking or by pressing the [Esc] key.

Piping back

This function can be used to reset the most recent part without interrupting the function. You can then continue the piping from this point.

TIP

Parts of a piping network can be deleted by selecting them and pressing [Delete]. Multiple selection is possible with [Shift].

EXPLANATION

If a part of the piping network is shown after the slope calculation, the slope calculation needs to be performed again.

13.3 GENERATE PIPING NETWORK

START SLOPE CALCULATION

Drainage properties bar

This function can be used to create a 3D line in the piping network (one-line 3D) The piping network can be edited (e.g. height modifications)

The load points must be set and the piping must be created before you can carry out the slope calculation.

After you call up the function, click the lower end of the piping network. The intended slope is then requested. The intended slope is once again removed by entering "x".

EXPLANATION

An intended slope in a piping network is not undercut. Modifying the heights of the parts also does not undercut the intended slope. In this case, you are able to set a drop.

EXPLANATION

If after the slope calculation, a load point is changed with the SET HEIGHT function, the height of the entire piping network is automatically changed so that the intended slope is not undercut anywhere.

EXPLANATION

If a single point in a piping network is modified using the SET HEIGHT function, which causes the intended slope in the piping to be undercut, an error message (a large X) appears.

13.4 EDIT PIPING NETWORK

SET HEIGHT

Drainage properties bar

This function can be used to bring the piping network to a final height gradient. The height of a piping network's load points, raised load points as well as branching and end points can also be fixed or modified. To set the heights, you must first generate the piping network.
If the heights of points within a piping network are modified, these same changes are applied to the lower piping parts on the intended slope. A drop can then be defined in the resulting piping section.

SET HEIGHT PROPERTIES BAR

The properties bar appears when you select the SET HEIGHT function.

Height reference

Height reference

There are three different types of height reference.

Sea level

The height indication is given in metres above sea level.

±0.00

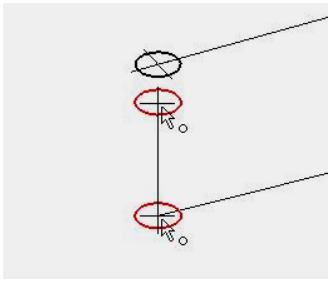
The height indication is given in metres above the project null point.

Storey

The height indication is from the active storey and in the active unit.

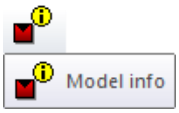
TIP

If the RAISE/LOWER LOAD POINTS function is performed, the height of the upper or lower point can be modified. The desired point in the wire design model is then easy to select.



TIP

If modifying the height undercuts the intended slope in the piping, an error message in the form of a large X appears.
This message can be requested with the model information (measurement functions). These are then output in the info window.



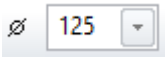
DIMENSIONS

Drainage properties bar

This function can be used to modify the cross-section of multiple pipings simultaneously. The load points must be set before you can set a dimension.

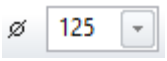
DIMENSIONS PROPERTIES BAR

The properties bar appears when you select the DIMENSIONS function.



Dimension

Dimension



The load point's dimension can be either selected or entered here.

After you call up the function, the new cross-section in the properties bar is set and you can click the desired pipings. The function is confirmed with [Enter].

SET DROP

Drainage properties bar

This function can be used to set a drop in the piping sections. To set a drop, you must first generate the piping network and set the effective incline to be greater than the intended slope. To do this, you must shift the height of a particular 3D node.

Likewise, the maximal possible height difference must be great enough for the necessary curves to be generated.

After you call up the function, you must click the desired piping section. The prompt *"Set slope at what point or <ENTER> for automatic?"* then appears. The point for the drop can then be specified or the query confirmed with [Enter]. In this case, the drop at the lowest possible point is set.
If the requirements for a drop are met, the maximal possible height difference is shown in the entry line. This can be adopted or overwritten by a lower difference. The angle for the offset is subsequently requested.
If the default is not used and the angle does not come to 90°, the query *"Shift in which direction?"* appears. If you click on the upper end of the piping, the previously selected point for the "offset" is the lower start of the drop. The lower end shown is then the upper point of the drop.

RAISE/LOWER LOAD POINTS

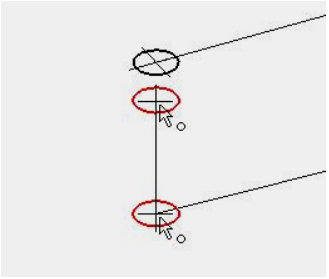
Drainage properties bar

The function is used to add 3D lines upwards or downwards to vertical load points. The floor height remains unchanged. To raise/lower load points, the vertical load points must be present and the slope calculation must be carried out.

After you call up the function, you must click the desired piping network.

TIP

Both the floor height and the raised/lowered point can be further modified with the SET HEIGHT function.



13.5 Lay-out piping network

Three-line

Drainage properties bar

The function is used to generate the pipes and shaped parts according to the preceding settings. The pipes and shaped parts are generated in 3D and 2D. A generated and edited piping network (one-line 3D) is required for the three-line. The 3D line (one-line) then remains.

EXPLANATION

A piping network's pipes and shaped parts always create a specific object. These can be deleted and regenerated at any time.

To generate:

- An elbow pipe: this is generated for every change in direction.
- A double elbow pipe (2 x 45°): this is generated by a drawn right-angled piping shape.
- A tee and a 45° elbow pipe: these are generated by tee piping connected at right angles.
- A reduction: this is generated between piping with different dimensions.
- An elbow pipe and a pipe: these are generated by raised/lowered load points.

EXPLANATION

To modify a piping network, the pipes and shaped parts must first be deleted (they form an object). The 3D line (one-line) is then maintained. Once modified, the slope calculation must be refreshed before the three-line can be regenerated.

TIP

A piping network or part of it can also be stretched. The shaped parts must also first be deleted. Once stretched, the slope calculation must be refreshed before the three-line can be regenerated.

13.6 LABEL

	Drainage properties bar

These three functions are used to automatically label the piping, floors and chambers.

The text parameters for the labelling of the piping and bottoms of pipes are stored in the text editor under the "piping" record. Chambers are stored in the "chamber" record. If these records are no longer available, the active text parameters are used.

TIP

The text in each case belongs to the object that was clicked. If a piping or chamber is deleted, the accompanying text automatically disappears. If you want to delete just the text, you must do this using the Selection mode element part ([Alt] key pressed). Multiple selection is possible with [Shift].
If you press the [Alt] key and double-click on the text, the text parameters appear and can be modified.

Label piping

To label the pipings, you must first generate the piping network. The material is labelled in Ø mm, the incline in % and with an arrow indicating the direction.

After you call up the function, you can click the desired piping network using the mouse.

TIP

The function is retained and is available until it is cancelled with [Esc].

TIP

If piping is labelled and the incline modified, the text is automatically adjusted.

Label bottom of pipe

To label the bottom of a pipe, you must first generate the piping network. The labelling is dependent on the height reference, which can be defined in the properties bar.

Calling up the function requests you to specify the point to which the floor height should be measured. The text can then be placed.

Height reference

There are three different types of height reference.

Sea level

The labelling is given in metres above sea level.

±0.00

The labelling is given in metres above the project null point.

Storey

The labelling is from the active storey and in the active unit.

TIP

The function is retained and is available until it is cancelled with [Esc].

EXPLANATION

The floor height's text is not automatically adjusted if any changes are made.

Label chamber

To label the bottom of a pipe, you must first generate the piping network and set the chambers. The labelling is dependent on the height reference, which can be defined in the properties bar after selecting the chamber.

Calling up the function requests you to specify which chamber should be measured. You can then click the inlets and place the text. If you press the [Esc] key, you are asked for the outlet point. After placing the text, the entire chamber text can be set.

EXPLANATION

The text is then placed.

Height reference

There are three different types of height reference.

Sea level

The labelling is given in metres above sea level.

±0.00

The labelling is given in metres above the project null point.

Storey

The labelling is from the active storey and in the active unit.

EXPLANATION

The chamber label's text is not automatically adjusted if any modifications are made.

13.7 Report

Parts list

Extras menu > Quantities > Report

A requirement for the parts list is that you have to layout the piping network.

The parts list function generates a list of all the drainage parts built in the image using the following values:

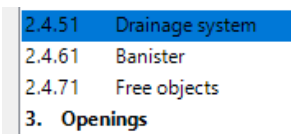
- Pipes
  Material, nominal width, length, total length, number
- Curves
  Material, nominal width, angle, number
- Tee
  Material, nominal width, angle, number
- Reductions
  Material, nominal width, number
- Chambers
  Material, chamber: nominal width + height, cone: nominal width + height
- Elements (floor drainage, channels, roof water chambers, etc.)
  Name, description, material, length, width, height, number

The parts list is written in the *san_bom.txt* file in the project directory and immediately opened in Windows Editor.
The file can of course be adapted to other uses, saved under different names and be printed.

The curves and tees may have unusual degree information. These values are exactly calculated and rounded to a degree.
The slope calculation of multiple load points is very complex.
It is almost impossible for 15° steps and 45° tees to result in anything.
Such differences in the connecting sleeves are offset on the construction site.

TIP

The function REPORT > REPORT MANAGER generates a formatted parts list (following report in DB after its execution).



Project	CAD_Object_Drainage
Alternatives	Drainage.d

unknown

Structure	Hous

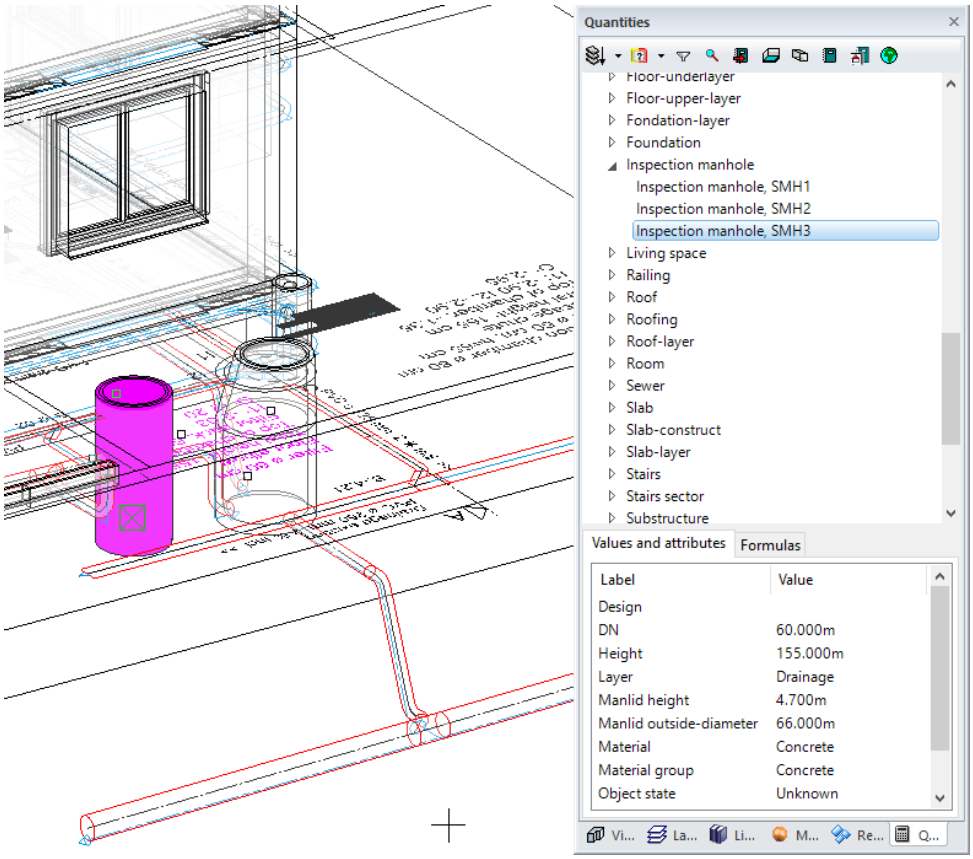
Pipes	PVC	DN	100 mm

Nr.	Length	Number	Total
SPI1.4, SPI1.10	0,35 m	2	0,35 m
SPI1.2	0,69 m	1	0,69 m
SPI1.7	0,94 m	1	0,94 m
Total		**4**	**1,98 m**

Pipes	PVC	DN	125 mm

Nr.	Length	Number	Total
SPI1.20, SPI1.31	0,13 m	2	0,13 m
SPI2.8	0,17 m	1	0,17 m
SPI5.1	0,18 m	1	0,18 m
SPI6.16	0,19 m	1	0,19 m
SPI3.8, SPI6.8	0,19 m	2	0,19 m
SPI5.9	0,20 m	1	0,20 m
SPI3.25	0,29 m	1	0,29 m
SPI1.18, SPI1.27, SPI4.12, SPI4.18	0,38 m	4	0,38 m
SPI3.19	0,39 m	1	0,39 m
SPI1.15	0,40 m	1	0,40 m
SPI4.15	0,41 m	1	0,41 m
SPI3.2, SPI6.2, SPI6.10	0,45 m	3	0,45 m

If an individual element is clicked on, its values appear in the properties field of the Report Manager.



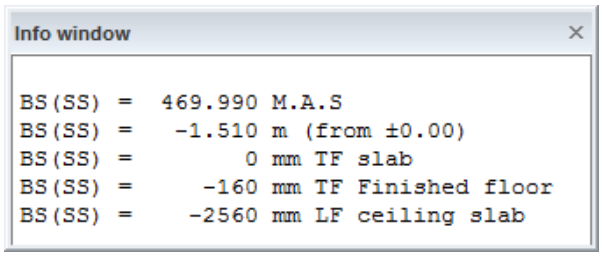
13.8 SHOW INFO

DISPLAY BOTTOM OF PIPE

Drainage properties bar

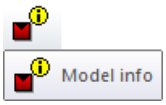
The function is used to output height information in the info window.

To label the pipings, you must first generate the piping network.



EXPLANATION

If it is not possible to generate a piping network, e.g. because of a negative intended slope or because of incorrect height modifications etc., an error message in the form of a large X appears. These crosses show the source of the error and can be requested with the MODEL INFORMATION function in the measurement dialog window. The message is output in the info window.



You must correct or redraw at these points.
The crosses can be removed again through selection and deletion.

14. QUANTITIES

14.1 FUNCTIONALITY 945

14.2 FUNCTIONS 946

14.3 QUANTITIES MANAGER 950

14.4 OBJECT TYPES 957

14.5 SETTINGS / RULES 968

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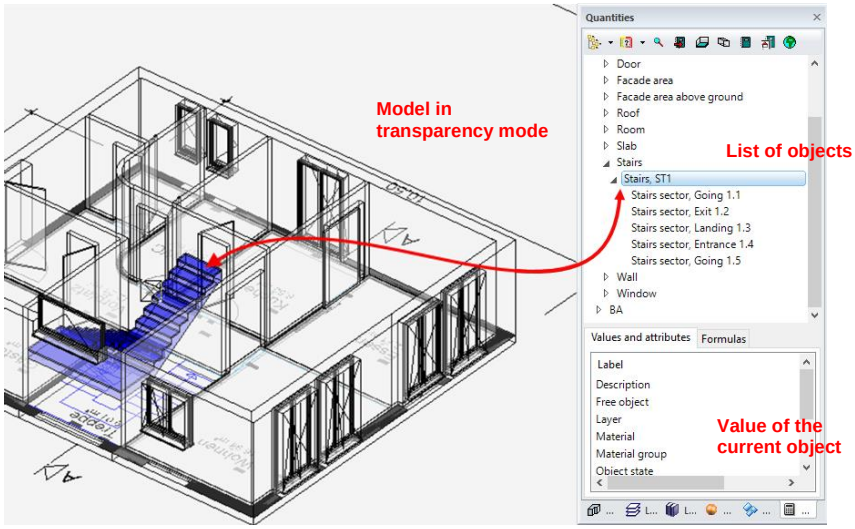
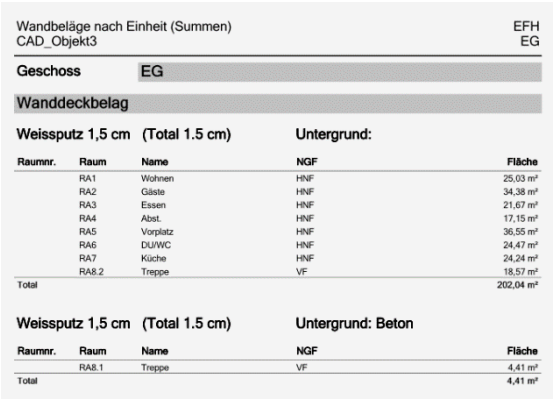
14.7 CHECKING THE ELITECAD MODEL 983

14.1 FUNCTIONALITY

A model must be available in order to calculate the quantities. Using the function CALCULATE QUANTITIES the masses of the model are written storey and structure related to the database. Quantities of the complete model is always calculated, including the currently hidden objects.
The quantified masses are represented in the Quantities Manager.
Objects can be selected in the graphics window or in the quantities manager. The values of the current object are displayed. In order to enhance the visibility of the objects inside the model, the model is switched to Transparency mode when the quantities manager is shown.



From the quantities manager the settings can be accessed and various types of Excel reports can be displayed. The Quantities manager provides a dialog for project management and maintaining master data.



Wandbeläge nach Einheit (Summen) EFH
CAD_Objekt3 EG

Geschoss EG

Wanddeckbelag

Weissputz 1,5 cm (Total 1.5 cm) Untergrund:

Raumnr.	Raum	Name	NGF	Fläche
	RA1	Wohnen	HNF	25,03 m²
	RA2	Gäste	HNF	34,38 m²
	RA3	Essen	HNF	21,67 m²
	RA4	Abst.	HNF	17,15 m²
	RA5	Vorplatz	HNF	36,55 m²
	RA6	DU/WC	HNF	24,47 m²
	RA7	Küche	HNF	24,24 m²
	RA8.2	Treppe	VF	18,57 m²
Total				202,04 m²

Weissputz 1,5 cm (Total 1.5 cm) Untergrund: Beton

Raumnr.	Raum	Name	NGF	Fläche
	RA8.1	Treppe	VF	4,41 m²
Total				4,41 m²

Sample model and course unit for calculating quantities

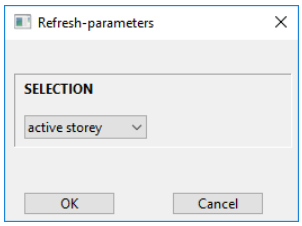
Recommendation
In order to obtain a better understanding of the Quantities and master data and prior to making adjustments to the settings, it is recommended to load and calculate the quantities of the sample model from the project CAD_Object_Quantities.
The quantities calculation using this model is described in detail in the course unit Quantities.

14.2 FUNCTIONS

Area verification

Menu Extras > Quantities > Space verification

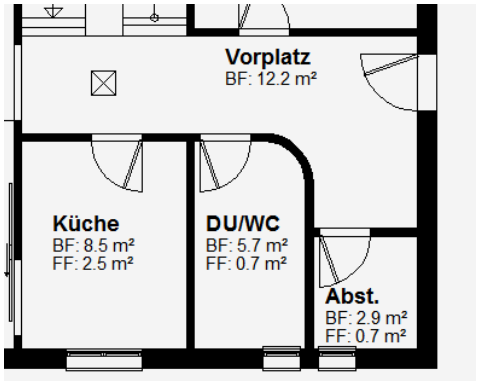
The function AREA VERIFICATION divides the room areas into calculable parts (rectangles, triangles and circular segments). These are depicted in the floor plan and numbered in order to guarantee optimal traceability.
You can choose the storeys in which the area verification shall be generated.



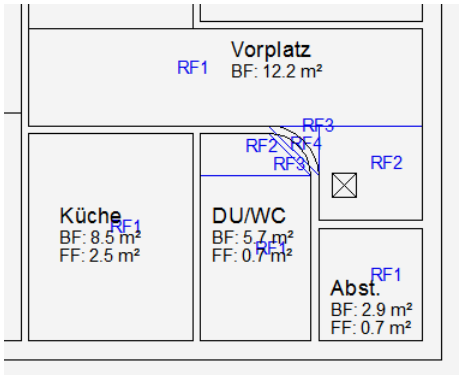
The data are generated and added to the layer "Area verification". The room areas are divided into calculable parts and numbered. The pen and text formatting settings can be defined under SETTINGS > OPTIONS > WORK PARAMETERS > AREA VERIFICATION.
These are documented by the subsequent CALCULATE QUANTITIES.
The function AREA VERIFICATION is solely required if the area parts have to be documented in a plan.
The function CALCULATE QUANTITIES also calculates the area parts without any previously generated area verification.

Example of area verification

Situation:



Plan view GF



Area verification

Excerpt from the report "Area verification – base sizes"

RA5	FORECOURT	MUA	A	100%
No. / Form	Calculation			area
RA5.1/Rectangle	6.250x1.535			9.59 m²
RA5.2/ Rectangle	1.650x1.500			2.48 m²
RA5.3/Triangle	(0.800x0.800)/2			0.32 m²
./.RA5.4/Circular segment	0.800²x(90.00°x pi/180-sin(90.00°))/2			-0.18 m²
Total				12.21 m²

RA6	SHOWER/TOILET	MUA	A	100%
No. / Form	**Calculation**			**area**
RA6.1/ Rectangle	2.600x1.760			4.58 m²
RA6.2/Trapezium	(1.080+1.760)x0.680/2			0.97 m²
RA6.3/ Circular segment	0.680²x(90.00°x pi/180-sin(90.00°))/2			0.13 m²
Total				**5.67 m²**

Excerpt from the report "Floor area and cubic contents"

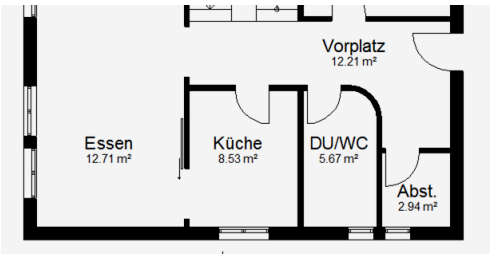
Room	Room no.	RA	NFA	Area	Base surfaces without niches	Plaster	Clear areas	Minimum height.	Max.	Volume NGV
Store room		RA4	HNF	a	2.94 m²	1.5 cm	2.84 m²	2.40 m	2.40 m	7.05 m³
Shower/WC		RA6	HNF	a	5.67 m²	1.5 cm	5.53 m²	2.40 m	2.40 m	13.62 m³
Dining		RA3	HNF	a	12.71 m²	1.5 cm	12.72 m²	2.40 m	2.40 m	30.50 m³
Guests		RA2	HNF	a	11.81 m²	1.5 cm	11.60 m²	2.40 m	2.40 m	28.34 m³
Kitchen		RA7	HNF	a	8.53 m²	1.5 cm	8.44 m²	2.40 m	2.40 m	20.47 m³
Stair		RA8	VF	a	9.01 m²	1.5 cm	8.87 m²	0.00 m	2.70 m	21.60 m³
Forecourt		RA5	HNF	a	12.21 m²	1.5 cm	11.97 m²	2.40 m	2.40 m	29.29 m³
Living		RA1	HNF	a	16.94 m²	1.5 cm	16.92 m²	2.40 m	2.40 m	40.67 m³
Total					**79.81 m²**		**78.89 m²**			**191.53 m³**

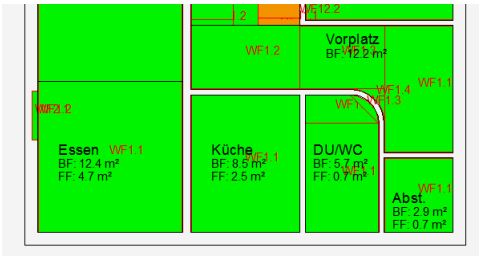
Living space verification

Menu Extras > Quantities > Living space verification

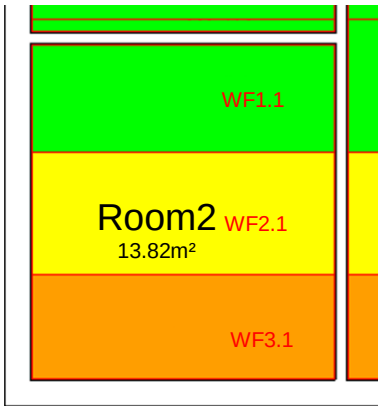
The function LIVING SPACE VERIFICATION works identically to the AREA VERIFICATION, except that the calculation is based on the clear room area and comprises the limiting heights. The thicknesses of the wall upper layer from the room dialog window are taken into consideration.
In Germany, the verification is generated in accordance with the Living Space Regulations (window recesses down to the ground and deeper than 13 cm are included).

Germany as an example:





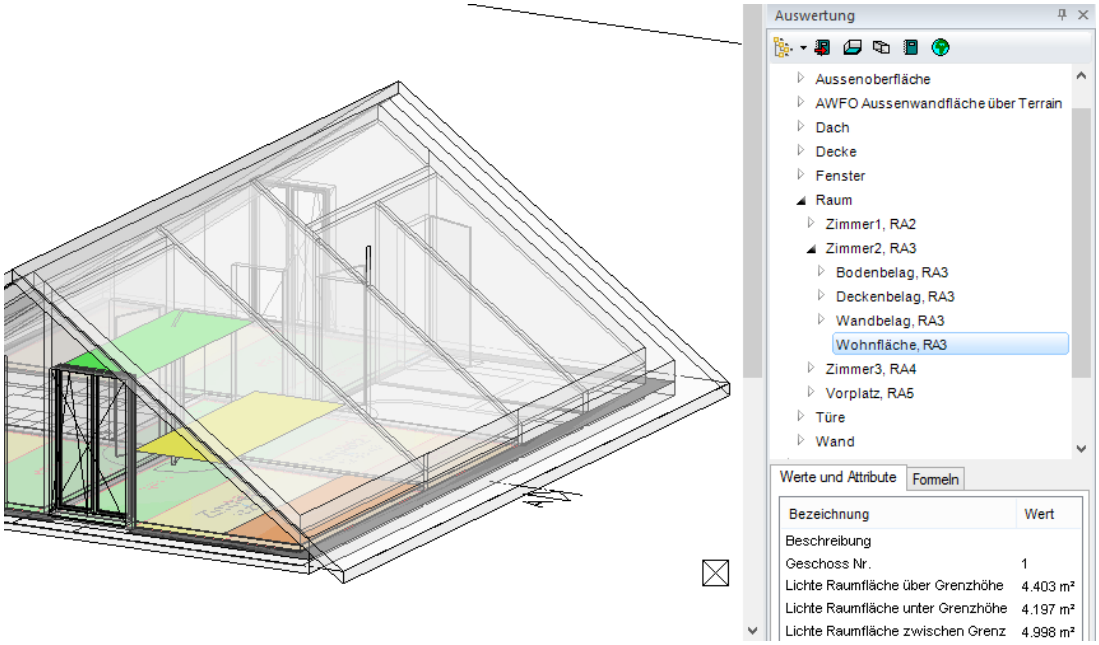
Example under the roof: Visual representation of the various limiting heights



Report "Living space verification"

RA3	ROOM2	MUA	A 100%
Above the limiting heights (factor: 1.0)			
No. / Form	**Calculation**	**Surface**	**Living spaces**
WF1.1/rectangle	3.500x1.258	4,403 m²	4,403 m²
Total		**4,403 m²**	**4,403 m²**
Between the limiting heights (factor: 0.5)			
No. / Form	**Calculation**	**Surface**	**Living spaces**
WF2.1/ rectangle	3.500x1.428	4,998 m²	2,499 m²
Total		**4,998 m²**	**2,499 m²**
Below the limiting heights (factor: 0.0)			
No. / Form	**Calculation**	**Surface**	**Living spaces**
WF3.1/ rectangle	3.500x1.199	4,197 m²	0,000 m²
Total		**4,197 m²**	**0,000 m²**

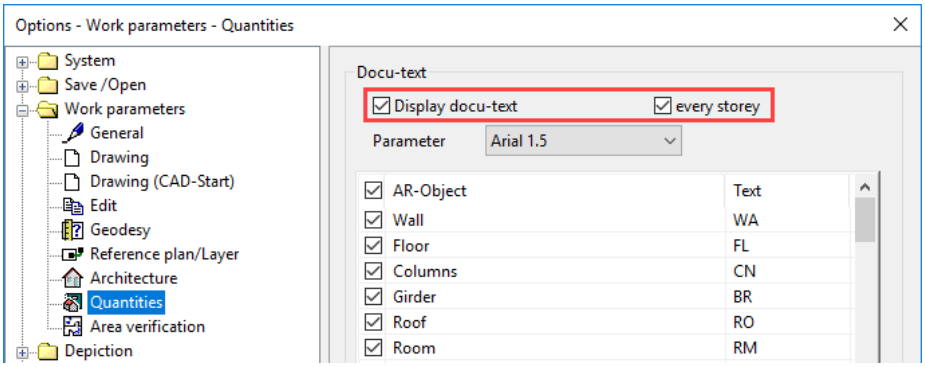
The limiting heights and the values of the individual areas can be displayed and controlled directly within the model.



Documentation plan

If the quantities shall be documented in the plan, the field "Display docu-text" needs to be activated in SETTINGS > OPTIONS > WORK PARAMETERS > QUANTITIES and a

parameter (text) needs to be set. The Docu-text is a numbering of the object types and object subtypes.



The docu-texts are assigned to the layer "Docutext".

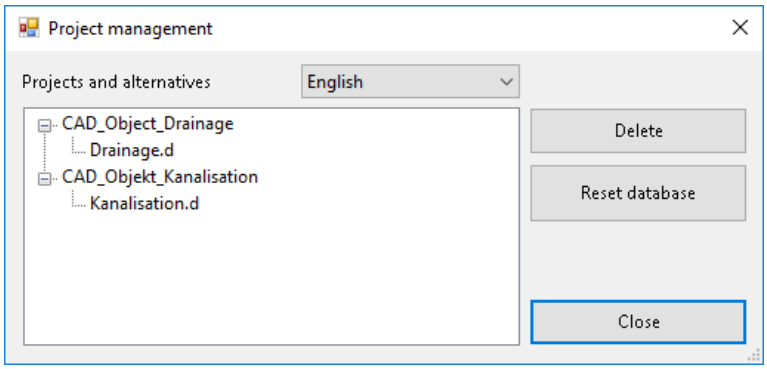
The field "every storey" determines whether the numbering of the documentation shall restart at every new storey or whether it shall be unique for the entire project.
The pretext for the docu-text can be defined in the column "Text" of the chart.

The 2D depiction can be individually configured for each type. This has no impact to the quantities and reports.

Project management

Menu Extras > Quantities > Project management

Any quantified projects as well as their models are listed in the project management. Data of these models, which already exist in the database, are replaced during every new quantities calculation.



The display of quantified design models and projects is filtered according to the standard, which was used for quantification. When the project management is opened, the standard, which was selected in the project settings, is set. Changing the filter has no effect to the standard of the project settings. If the standard is changed in the project settings requires the quantification to be performed again. Old data remains during this process.

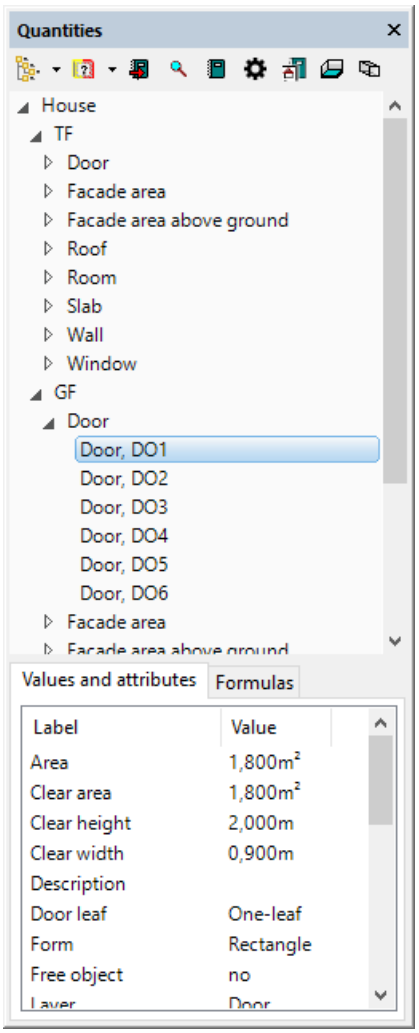
The function DELETE is used to purge unused projects and design models.

The function RESET DATABASE deletes all quantified data, inclusive project and design models that have been quantified according to standards different to the standard that is currently used for filtering.

14.3 QUANTITIES MANAGER

Toolbar *Construction Parts
Menu Extras > Quantities > Quantities manager
Toolbar Quantities > Quantities manager

If the window of the quantities manager is shown, the representation of the model switches to the Transparency mode. If a storey or structure is selected in the quantities manager, the representation switches to the solid mode.



Header functions

Listing

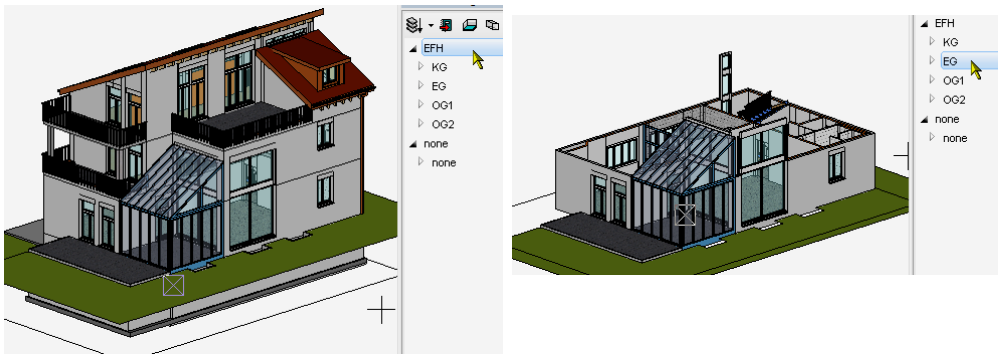
Active object

Values and attributes / Formulas

[Representation](#)
[Filter for renovation planning](#)
[Calculate quantities](#)
[Zoom to selected objects](#)
[Create and print reports](#)
[Settings / Rules](#)
[Project management](#)
[Room volume depiction](#)
[Define transparency](#)

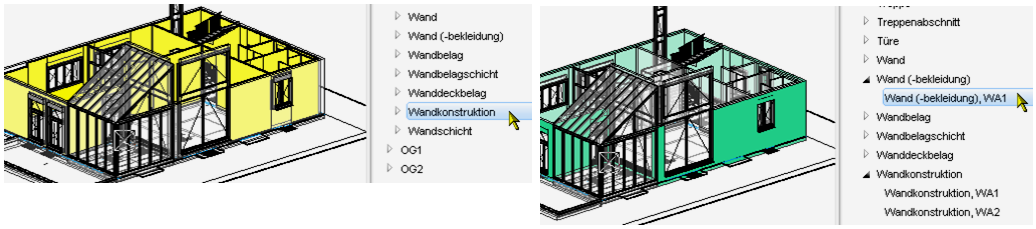
Navigation within the quantities manager

Show a structure / storey



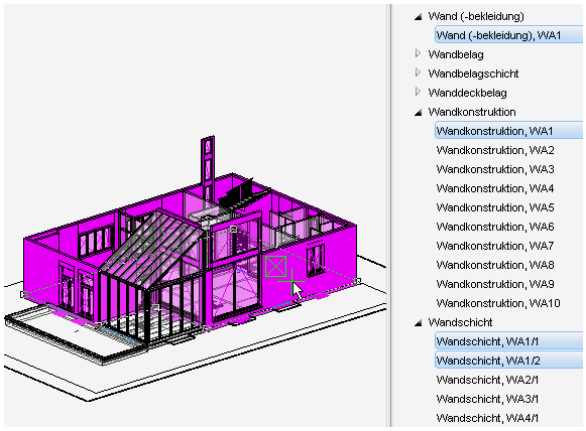
Showing by selecting the structure or storey in the quantities manager

Visualize a group of object types / an object type



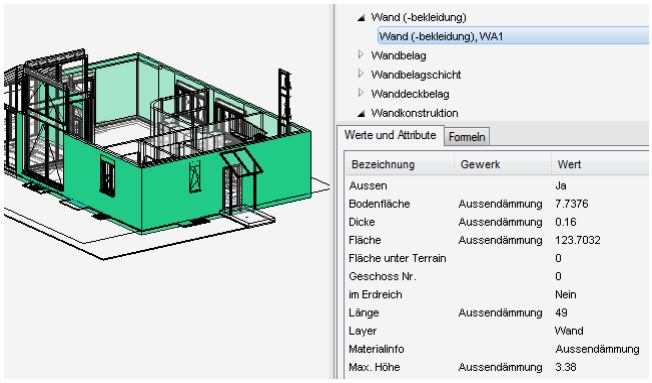
Visualization by selecting the group of object types or the object type in the quantities manager. The calculation results are displayed with the object type.

Select an object in the CAD

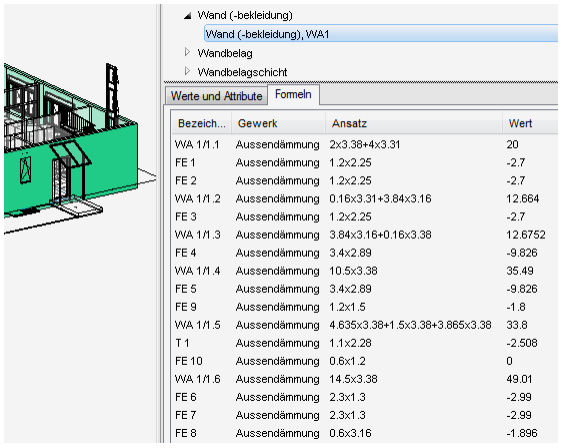


If an object is selected in the CAD, the object types belonging to it are marked in the quantities manager.
An individual object type is subsequently selected in the quantities manager and the calculation results are displayed.

Display calculation results



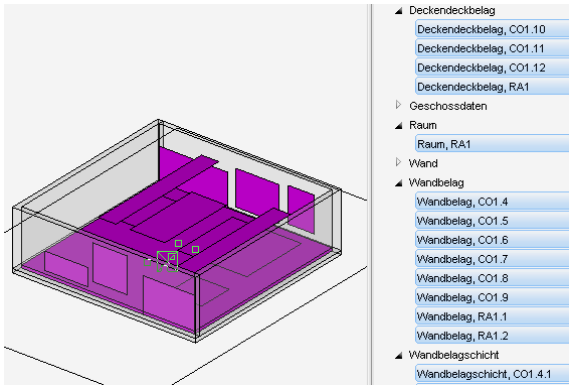
The object type is selected in the quantities manager.
The same is visualized in the CAD together with the location, the measuring type (here at the facade surface) and, as far as possible, which openings will be ignored (here a small window to the left of the door)
The results are displayed in the tab "Values and attributes".



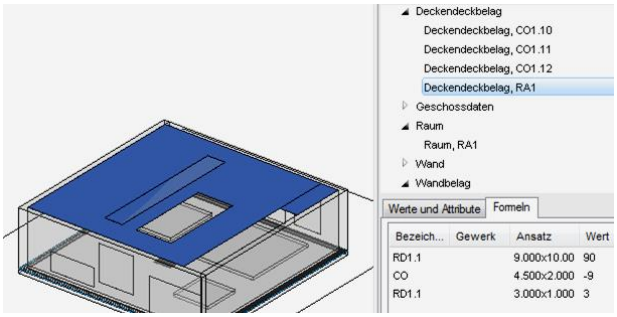
The detailed calculation including any deductions is represented in the tab Formulas.

Navigation inside of rooms

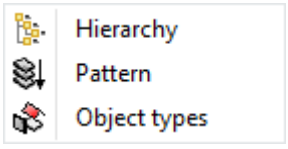
In the case of rooms, it usually makes sense to select the room in the CAD beforehand.



The object types belonging to them are marked in the quantities manager.
The desired object type is subsequently selected in the quantities manager.

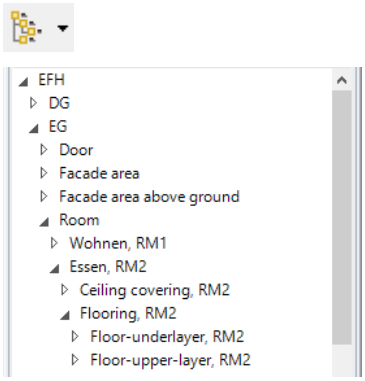


Representation



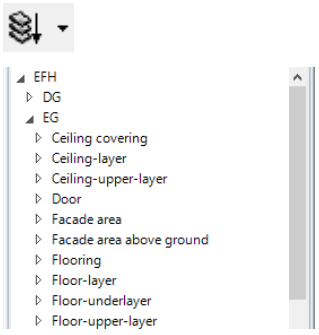
The object types can be listed using various kinds of structures.

Choosing hierarchy:
The object types are subordinate to the rooms, walls and ceilings which are, in turn, classified per storey.



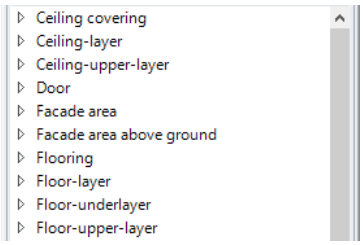
The object type "Floor layer" is assigned to the flooring of the corresponding room and storey.

Choosing structure:
The object types are subordinate to the storeys.



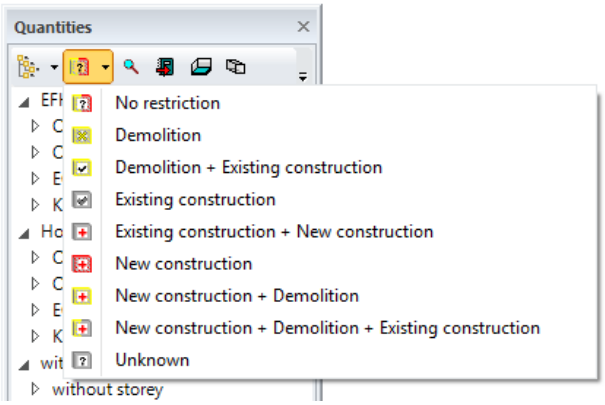
For each storey the object type "Floor layer", in which any floor layers of this storey are listed, exists.

Choosing object types:
The objects types are not subordinate to the storeys.



All floor layers of the entire project are listed under the object type "Floor layer".

Filter for renovation planning



The renovation planning state is noted for each object. The filter only displays data in the quantities manager that correspond to the selected state.

Zoom to selected objects

In some cases, it is difficult to locate objects being selected in the quantification manager in the drawing because they are too small or outside the field of view. The function ZOOM TO OBJECT displays the selected objects as large as possible in full screen size.

Calculate quantities

Toolbar AR-Lay-out > Calculate quantities
Menu Extras > Quantities > Calculate quantities
Quantities manager > Calculate quantities

The masses of the currently loaded model are calculated and written to the database. Any hidden parts also have been quantified.

Project and model
The project name as well as the model name (drawing name) are saved. This enables to save several variations of a project under varying model names (Project management).

Quantified AR objects

Areas and volumes of rooms and constructions
According to DIN 277, ÖNORM B 1800 and SIA 416

Living spaces
Quantified living spaces (e.g. German Living Space Regulations)

Area verification
Room areas divided into parts

Floor
Solid ceilings, wooden joist ceilings, balconies, roofs, platform half-space landing, room ceilings, and foundations
Volume and floor areas

Roof
Individual layers
Area in real projection
Roof edges (roof ridge, roof valleys, roof cut-outs etc.) in the measure of length.

Truss
Carcassing timber

Walls
Interior / exterior walls, System-built walls, water-proof concrete walls, brick walls, dry-wall construction, changing-room partitions, exterior insulations, ventilated wall linings, massive wooden wallboards, wooden single plank walls.

Columns
Without consoles and notched columns

Girders / binding beam

Chimney

Free objects

Windows, roof windows and glass elements
Window sills and cornices

Doors

Openings
Wall openings, floor openings, ceiling openings and roof openings

Stairs

Banisters

Room
Room area depending on the type of usage and enclosing
Calculation of living spaces with 2 limit values, usable area beyond the limiting height
Room value depending on the enclosing

Floor finish planes

Wall coverings

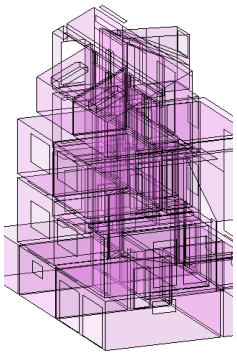
Exterior wall areas

Ceiling coverings

Room list
Compilation depending on the room

Furnishings
From the library.

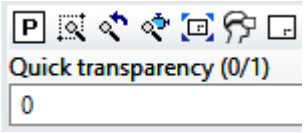
Room volume depiction



This representation visualizes the assembled rooms as boxes.
If an individual room is shown, the same is solely displayed in this room volume depiction.
Deduction planes may also be defined in this representation (see chapter 10.6 Room)

Define transparency

Adjustment of the transparency for the model depiction if object type representation is chosen as structure.



The quality of the transparency is selected in the entry line using 0 or 1.

1 = rapid transparency
The imaging is faster, the resolution of the transparency is coarser.

0 = fine transparency
The imaging takes longer; the resolution of the transparency is finer.

The transparency is subsequently adjusted.
0: The model is not displayed transparently
255: Highest transparency value.

Note
The transparency mode is only possible in the active quantities manager.

14.4 Object types

All object types, including those, which are only evaluated in BIM2COST, are described in the following list.
A single-layer CAD building part can be quantified into several object types, consisting of an object type and object subtypes. These are listed in the quantities manager equally (and not hierarchically).

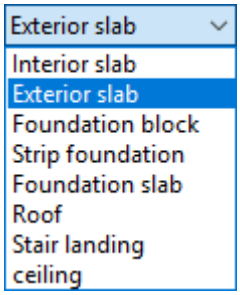
Docu-text

The architectural objects are quantified and written storey and structure related to the MySQL-database.
Every quantified object obtains a documentation text (e.g. WA3), which is composed a pretext for the CAD object type (e.g. WA) and a consecutive documentation number (e.g. 3).
In the case of room surfaces on walls, the documentation number is indicated as decimal if various groundings exist. The room number is positioned in front of the decimal point and the number for the various groundings behind the decimal point.
In the quantities manager, the documentation text is indicated behind the object type.

Object types and object subtypes

The division into object types and object subtypes is described in detail in the following sections CAD-floors, inner plate and outer plate. The same method of apportionment applies to all CAD objects.
An object type is constantly quantified in the case of a CAD object, which could be divided into various layers. If a CAD object could be composed of several layers (e.g. due to the import of an IFC model for which a roof being composed of several layers was defined in an external CAD or by the division into various layers in BIM2COST), object subtypes "Layer" are quantified.
In addition, object subtypes, which have the feature of a construction or covering, are quantified. A covering can be composed of several layers.

CAD-FLOORS



Independent foundations, strip foundations and foundation plates

Object type: Foundation
Differentiation in the window "Values and attributes" by the attribute Form.

Inner plate and outer plate

Object type: Ceiling
The object type ceiling contains the following object subtypes:

Object subtype: Bottom layer
The ceiling normally contains only one bottom layer.
However, several bottom layers can be created due to the import of IFC models if CAD floors have been defined as such in an external CAD.

Object subtype: Floor construction
The floor construction is equal with the feature supporting structure.
In BIM2COST, this object type is used for the determination of costs.

Object subtype: Floor covering
Only in BIM2COST. If a layer of the layer type E (covering) is defined in BIM2COST using the Layer Editor, the feature floor covering is attributed. All object types with the designation covering can be composed of several layers.
(If works are carried out in BIM2COST using the Layer Editor, only the features but not the representation in the CAD are changed).

Roof

Note
This option of CAD floors is especially intended for users who work with the Swiss cost estimation method eBKP-H and with BIM2COST.
According to eBKP-H, ceilings, which are below the exterior rooms or the outer shell of the building, have to be defined as roofs.

In the particular list concrete ceilings, CAD-floors, which were designated as roofs, were indicated under roof cladding or concrete ceilings under roofs (Switzerland).

Recommendation
Designate CAD-floors in ELITECAD as exterior slab to enable that the term will be indicated in the list concrete ceiling.
In BIM2COST, this definition can subsequently be changed to roof.

Object type: Roof
The object type roof contains the following object subtypes

Object subtype: Roof layer
One roof can be composed of several layers

Object subtype: Roof construction
Feature: Supporting structure.

Object subtype: Roof cladding
Only possible in BIM2COST using the Layer Editor or in the case of IFC models.
The roof cladding can be composed of several layers.

Material

A CAD-floor made of the material concrete (or a synonym) is assigned to the discipline (craftsmen's differentiation) concrete ceilings and included in the list of the same name.

WALLS

Note on BIM2COST
Users who work with BIM2COST have to set the feature exterior or interior

Load-bearing/non-load-bearing
The adjustment at the walls has an influence on the object subtypes.

Object type: Wall
The object type wall contains the following object subtypes:

Object subtype: Wall layer
One wall can be composed of several layers

Object subtype: Wall construction
Feature description:
Single-layer walls are always quantified as wall construction, irrespective of whether these were defined as load-bearing or non-load-bearing (exceptional case in ELITECAD).
In the case of multi-layer walls, the load-bearing layer is quantified as wall construction.

Object subtype: Wall (covering)
The object type wall (covering) is evaluated in the case of wall coverings and single-plank walls.
Feature description for non-load-bearing layers: Any non-load-bearing layers are evaluated as wall coverings and can be composed of several layers.

Wall coverings are measured at the wall axis.

Multi-layer exterior walls have to be designed in a way that the wall axis is located on the outside. Any layers of the covering (e.g. exterior insulation, thermal insulation composite systems) are measured on the outside and are, depending on the names of the materials, indicated in the list exterior insulation.

In the case of system walls, e.g. single plank walls with plaster boards, all layers have to be defined as non-load-bearing. If a wall solely consists of non-load-bearing layers, the same is equally quantified as object type wall (covering) and, depending on the names of the materials, listed under plaster boards.
All layers are afterwards indicated in their entirety in the list Dry Walls (in the same way as the system walls are measured and billed).

Material

The material names of the layers control the attribution to the discipline (craftsmen's differentiation).

CAD-ROOF

Object type: Roof
The object type roof contains the following object subtypes

Object subtype: Roof layer
Normally: 1 roof layer. Several roof layers are possible in BIM2COST

Object subtype: Roof construction
Feature: Bearing construction.

Object subtype: Roof cladding
Only possible in BIM2COST using the Layer Editor or in the case of IFC models.
The roof cladding can be composed of several layers.

Object subtype of the truss
Special case: All object types of the truss are also object subtypes of the roof

Material

CAD-roofs made of the material concrete are indicated in the list concrete ceilings at roof cladding or in the list concrete roofs at foundations and ceilings. The remaining materials are included in the list Roof surface areas and edges at roofs.

TRUSS

Object type: Truss
The object type truss summarizes those carcassing timbers, which were designed in the same working process.
Example for the designation documentation text: truss, DK117

Object subtype: Construction timber
For construction timber, the object type truss is divided into construction timbers of the same type. The rafters, which adjoin valleys and arris, do not have the same length. The timbers of the same length are summarized.
The documentation text indicates the type of construction timber. Example for rafters: construction timber, SP117.4 (rafter of the truss DK117, section 4)

STAIRS

Object type: Stair

Object subtype: Stair section
Divided into landings and stair flights

Material

In BIM2COST, the attribution to the cost element is controlled via the stair material.

Banisters

Object type: Banister

Binding beam

Object type: Binding beam

Columns

Object type: Column
In BIM2COST, the attribution to the cost element is controlled using the designation interior/exterior.

Window

Object type: Window
The feature interior/exterior is taken over by the wall and enables to control the attribution to the cost element in BIM2COST.

Material

In BIM2COST, the attribution to the cost element is controlled using the window frame material.

Glass element

Object type: Glass-element

Doors

Object type: Door
The feature interior/exterior is taken over by the wall and enables to control the attribution to the cost element in BIM2COST.

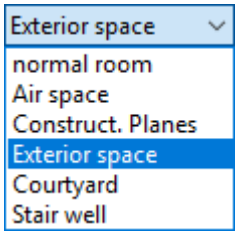
Rooms

Object type: Room
Listing of

- Room area in accordance with the standards SIA 416, ÖNORM B 1800 and DIN 277
- Area distribution in accordance with the standards SIA 416, ÖNORM B 1800 and DIN 277
- Area type in accordance with the standards ÖNORM B 1800 and DIN 277
- Room volume in accordance with the standards SIA 416, ÖNORM B 1800 and DIN 277
- Evaluated living space
- Further values, however, without room covers (room covers in special object types)

It shall be kept in mind that the different floor plan areas in the room can vary. For example: A low front-resistant masonry, e.g. for installations, does not reduce the room area but the floor covering.
All room covers are object subtypes of the object type room.

Room kinds



- Normal room
- Air space: In the case of air spaces which are on all sides enclosed by room-dividing walls or room divisions. Air spaces, which laterally adjoin a roof, must not be defined as air space. In this case, the room covering wall of the lower room is automatically hoisted.
- Construction area: For room areas which have to be added to the construction area in accordance with DIN 277, ÖNORM B1800 and SIA 416. However, the room label can be omitted for such rooms. ELITECAD calculates the construction area as a subtraction of the gross floor area and the room areas.
- Exterior space: With this kind, the room covers are assigned the feature exterior. In this way, the attribution to the cost elements is controlled in BIM2COST.
- Courtyard: Courtyards are outside areas and are not added to the internal or external floor area.
- Stair well: On top of stair flights for which no 3D floor shall be generated.

Room designation for stairs
The room label for stairs always has to be added in the top most storey (at the exit). In this way, it is no longer necessary to add a room label, which is separated from the rest of room in the lowest storey below the stairs.
The standards of DIN 277, ÖNORM B 1800 and SIA 416 are consequently complied with (room in the case of stairs is measured in the upper storey).

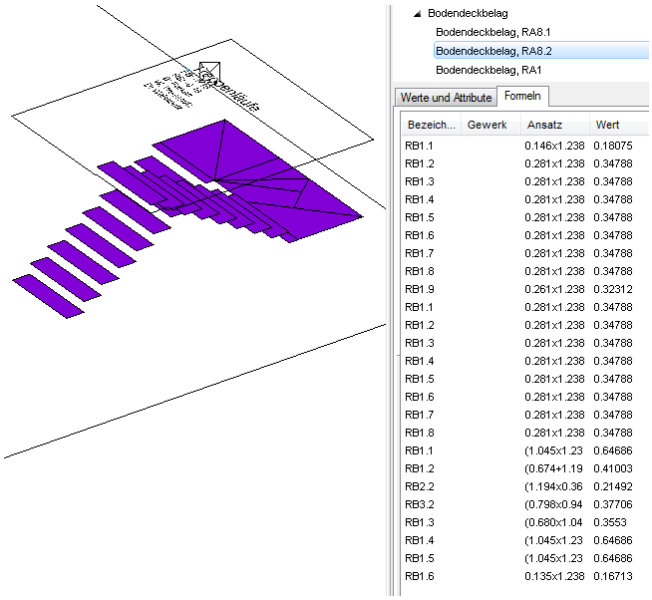
Deduction and addition planes

Chapter 10.6 Room describes how room surfaces can be overlaid with additional materials. These surfaces are taken into consideration during the quantities.

Room covering floor

Room covers also rank among the object subtypes of rooms. See Navigation in the case of rooms

Flooring for stairs
The floor plan areas are automatically accounted as floor covers when using the room definition above the stairs. The same can be visualized at the object subtypes.



Object type: Flooring
The labelling of the flooring is complemented by the documentation text of the room, e.g. flooring, RA1. Deduction and addition planes are assigned the documentation text CO with the room number and number of the plane, e.g. CO1.1
The object type flooring contains all of the following object subtypes

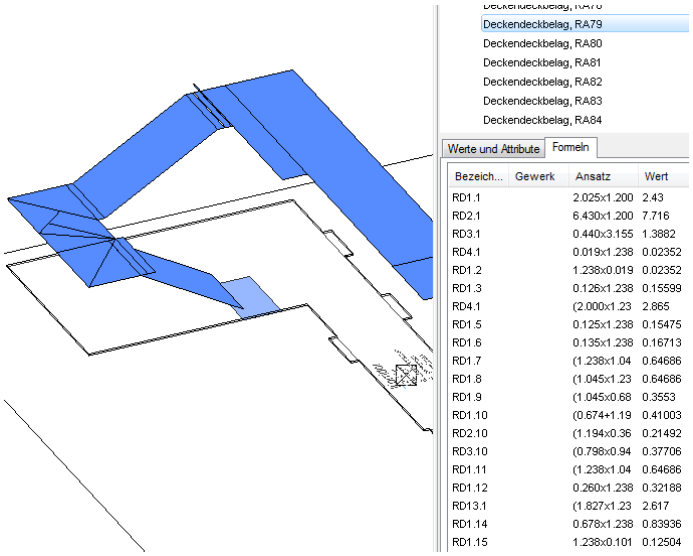
Object subtype: Floor layer
A floor layer can be divided into several layers.
Labelling: Documentation text of the room, layer number,
e.g. floor layer, RA1.1.1 or in the case of deduction and addition planes CO1.1.1

Object subtype: Floor upper layer
Feature labelling. A floor upper layer can be composed of several layers.
Labelling analogous to the flooring, e.g. floor upper layer, RA1.1 (CO1.1)

Object subtype: Floor under layer
Feature designation for layers below the floor overlay. The object type floor under layer can be composed of several layers.
Labelling analogous to the floor upper layer, e.g. floor-under layer, RA1.1 (CO1.1)

ROOM COVERING CEILING

Ceiling covering for stairs
The true space is automatically calculated in the stairs' bottom view (measured obliquely in the case of stair flights) for stairs, which are beyond a room definition.



Object type: Ceiling covering
Labelling: Ceiling covering, RA1 / ceiling covering, CO1.1

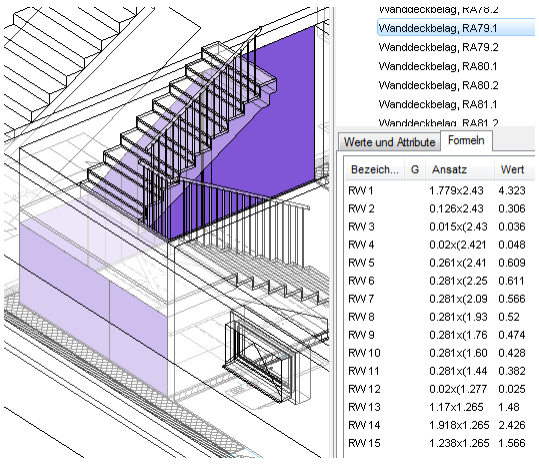
Object subtype: Ceiling finishing ply
Labelling: Ceiling finishing ply, RA1.1.1/ ceiling finishing ply, CO1.1.1

Object subtype: Ceiling upper layer
Feature labelling: Ceiling upper layer, RA1.1 / ceiling upper layer, CO1.1

Object subtype: Ceiling under layer
Feature labelling: Ceiling under layer, RA1.1 / ceiling under layer, CO1.1

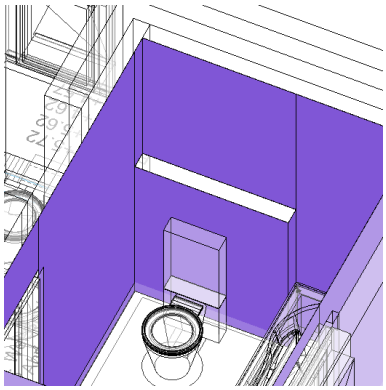
ROOM COVERING WALL

Wall coverings in the case of stairs
The wall covering is interrupted in the case of stairs, which adjoin the wall. Below the stair, the wall covering is added to the lower storey, and the part above it to the upper storey.



Covering underlay
The covering underlay (wall material) is also quantified.
This feature is used in BIM2COST for the attribution to the cost elements.

Wall covering on non-load-bearing walls
Wall coverings are calculated on all walls, which are located in the room.



Deduction test
Openings are deducted if the opening is larger than the limit value.

Object type: Wall covering
Labelling including numbering for the sub-floors: wall covering, RA1.1 / wall covering, CO 1.1

Object subtype: Wall covering layer
Labelling including numbering for the sub-floors and layers: wall covering layer, RA1.1.1 / wall covering layer, CO1.1.1

Object subtype: Wall overlay
Feature labelling: Wall overlay, RA1.1 / wall overlay, CO1.1

Object subtype: Wall covering underlay
Solely in BIM2COST
Feature labelling: Wall covering underlay, RA1.1 / wall covering underlay, CO1.1

DRAINAGE

Sewage systems, which are designed according to the module drainage, are quantified. All sewer parts are included in the list titled sewage system.

Object type: Sewer line
The sewer line is composed of several parts: It starts with the outlet into a manhole or the like and contains any pipes and moulded parts, which lead from the outlet upward. The length is quantified.
Labelling: Sewer line, KA1

Object subtype: Sewage pipes
The sewage pipes contain all moulded parts. At "Values and attributes" these are differentiated according to the moulded parts. The documentation text is composed of the string number and the pipe number.
Labelling: Sewage pipes, KA1.1

Object type: Manhole
Labelling: Manhole, 1

STOREY DATA

Object type: Storey data
Areas and room volumes according to SIA416, DIN277, ÖNORM B1800

Exterior surface

Object type: exterior surface
The external surface is divided according to the sub-floors (wall material).

Exterior wall area above ground level

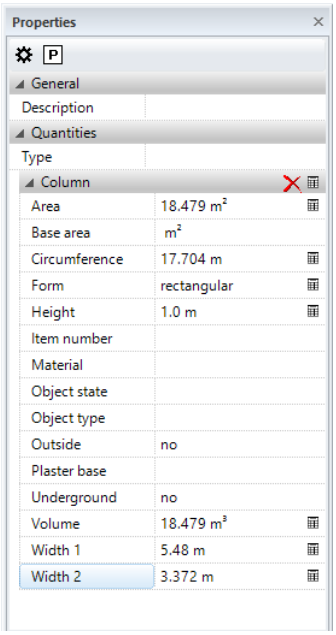
Object type: AWFO exterior wall area above ground level
Unless being processed in BIM2COST this object type corresponds to the exterior surface. In BIM2COST, the ground wall line can be designed using the function DEFINE THE SUBSIOL.

Exterior wall area below ground level

Object type: AWFU exterior wall area below ground level
Only in BIM2COST after the definition of the ground line.

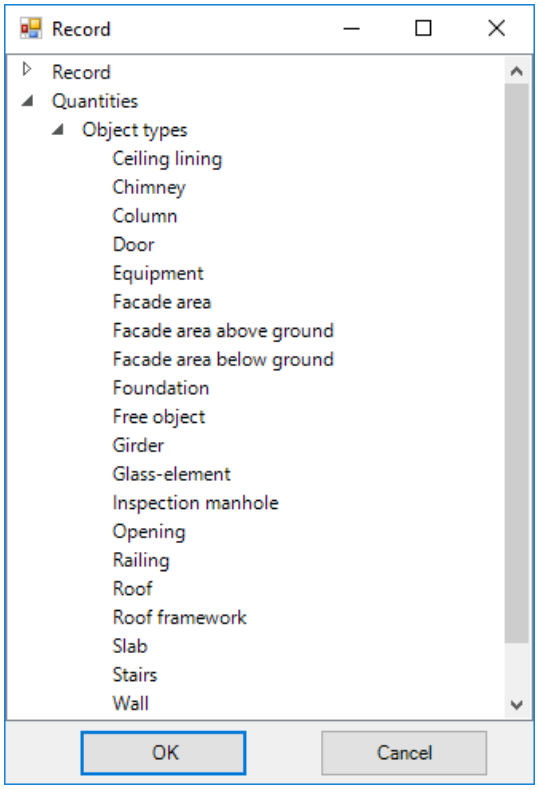
Free Objects

In order to calculate quantities of user defined 3D objects, properties have to be assigned to these objects. When the object is selected, its properties are displayed in the properties manager. Beside some fields, a calculator symbol is shown. A click on this symbol calculates the values from the geometric representation and enters these values into the fields.



The first button in the properties manager opens the assignment dialog for free objects. In this dialog window it can be defined which object type and corresponding properties will

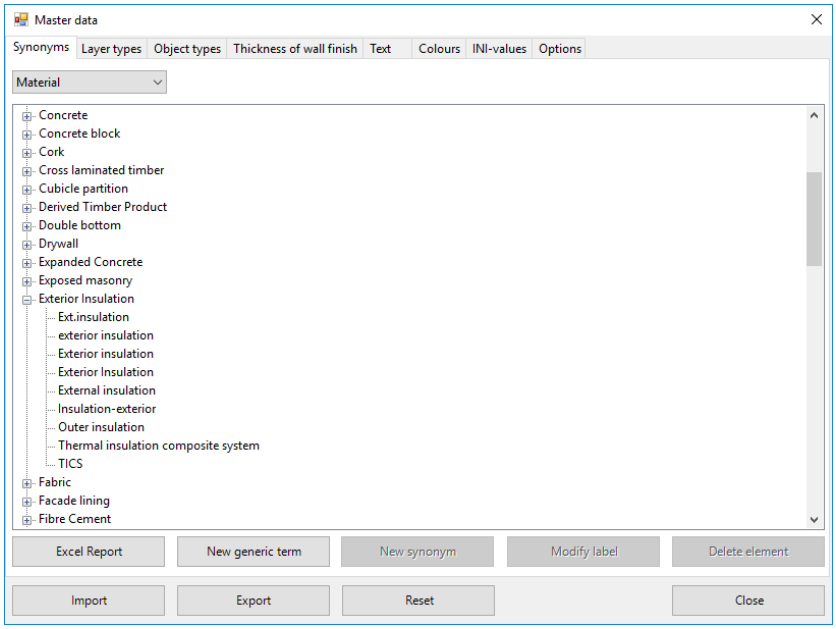
be used for the quantification of the selected free 3D object. Multiple properties can be selected, which can also be saved as template using the parameter button.



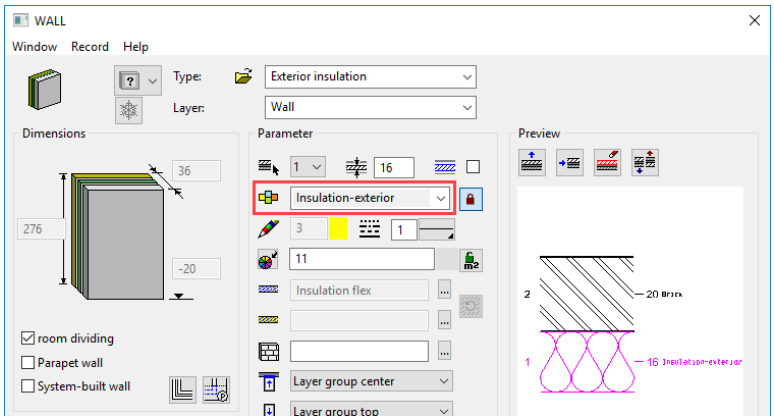
14.5 Settings / Rules

The function can be accessed in the quantities manager.

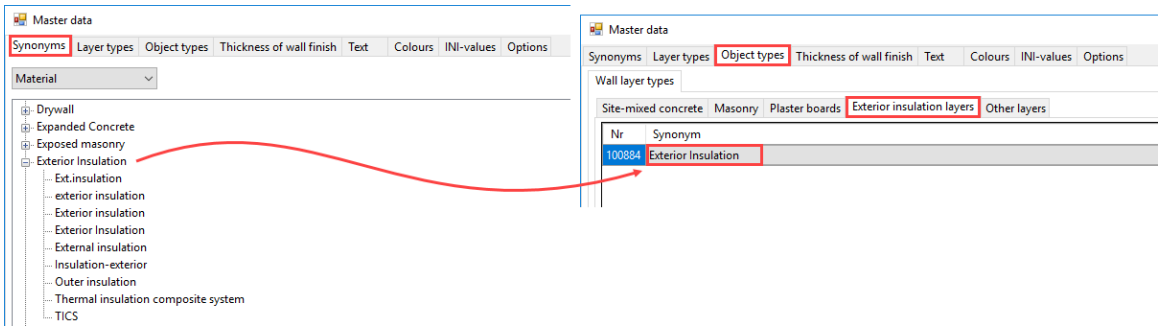
Synonyms



The example shows which material names are quantified as external insulation. As soon as one of these material names is used in the room dialog window, the material is quantified as external insulation.



By summarizing the subordinate terms into a generic term, only the generic term needs to be assigned to a discipline.



Purpose of the synonyms

During the quantification, the attribution of disciplines is controlled via the synonyms (materials).
Generic terms and related subordinated terms (synonyms) of materials are contained in the synonym window.
The tab "Object types" subsequently determines which generic terms shall be attributed to which discipline (craftsmen's differentiation).

The synonyms "concrete, waterproof", "water-repellent concrete" and "waterproof concrete" are in the above example contained in the generic term sealing concrete.
During quantification, this generic term is assigned to the building component.
Therefore, not every single material needs to be listed in the tab "Object types".

Country and region setting
The MySQL-database is structured in a way that, depending on the settings of Windows (CONTROL PANEL > REGION AND LANGUAGE OPTIONS), materials specific to the region are listed.
For Switzerland, the materials from the collection of material parameters and from the catalogues of NPK are used.
For Austria, the materials of LB-HB have been gathered.
For Germany, the materials of different German documents are in use.

Spelling
The exact entry of the material names is compared during the attribution to the generic terms. Lower case is not substituted for upper case.
The sharp S symbol "ß" which is common in Austria and Germany is not synonymous with the double S "ss".

Entry and adaptation of synonyms

The push button "New generic term" enables to enter new generic terms.
If a generic term is marked in the window, a new subordinate term can be entered using the push button "New synonym".
The push buttons "Modify label" and "Delete element" enable to carry out changes.
In the same way, changes can be carried out by clicking twice on a term.
During the quantification, the CAD checks, which materials do not yet exist, and which can be added directly to the list.

Import and export

The push buttons "Import" and "Export" allow to secure these changes and to transfer these to other stations.

Since, as a general rule, all work stations access the same MySQL-server, all changes are available at all work stations and export as well as import for other stations is consequently not necessary.

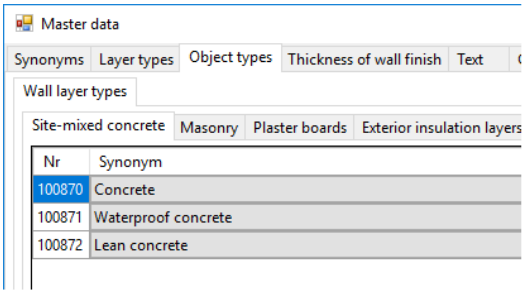
Reset

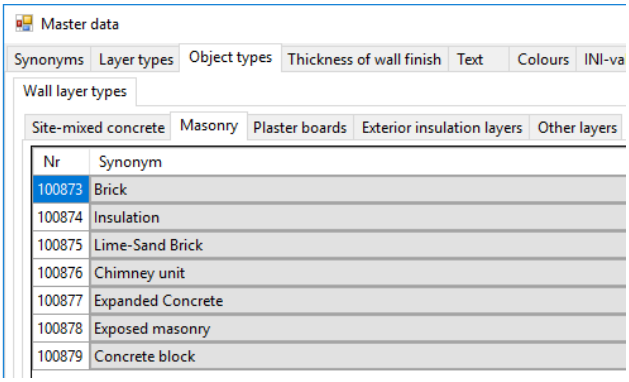
All values can be reset to the delivery state. If multiple used work with the same database, resetting is only accessible for the person who works with the most recent ELITECAD version.

OBJECT TYPES

Tab types of wall layers

Attribution of disciplines (craftsmen's differentiations).
The lists differentiate between "brick walls" and "concrete walls". The material in the room dialog window determines which wall layer is quantified into which list. The material is entered in the object types via the synonyms. The tab for site-mixed concrete and for masonry are available. Depending on the tab in which the synonym is deposited, it appears in the corresponding list. If a wall layer does not appear in the corresponding list, the error needs to be searched in these two tabs.





Tab site-mixed concrete construction

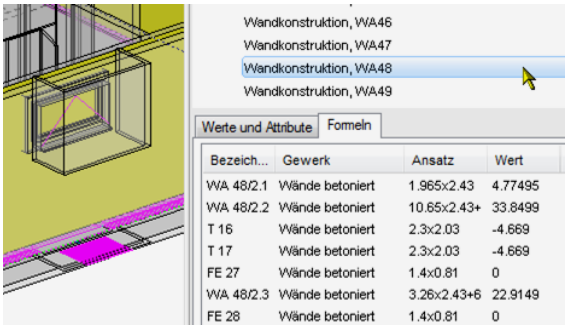
As an exception, this setting does not only apply to walls but also to CAD-floors.

Adaptation of attributions
Adaptations can be carried out using the push buttons "Remove" and "Add".

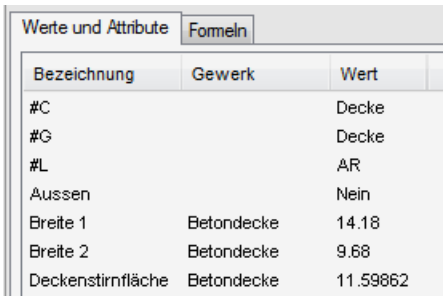
Quantification of concrete walls
In the lists, the object type wall construction is used for concrete walls, if the wall consists of one layer or if the wall layer is designated as load-bearing. These are measured at the centre of the layer. The deduction test for openings is carried out according to the OPTIONS.
The object type wall layer is used in the case of non-load bearing layers. The wall layer is indicated as a volume body. The volume body is not contiguous in the case of ignored openings.
Every single layer is measured.

The visualization for the object type wall construction indicates whether openings are deducted or not. In the example below, the small window openings are not deducted and the corresponding visualization area is contiguous at the window.

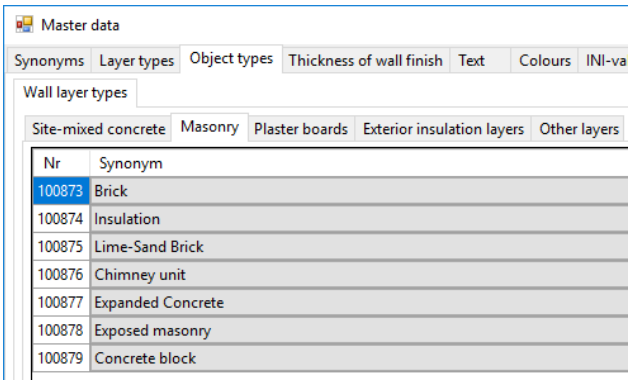
In the tab Formulas, it is indicated using zero values at the openings that these were not deducted.



After the quantification of walls, "concrete walls" appears in the quantities manager at the tab "Values and attributes" in the column "Discipline" in the case of concrete walls and "concrete ceiling" in the case of CAD-concrete floors.



Tab Masonry



Insulation material

Differing names for insulations have to be used in order to be able to differentiate between the insulation designations for the disciplines. In the basic setting of ELITECAD, different names for the exterior insulation layers and the insulation layers of plaster boards were used. The user needs to adapt this setting optimally to his working method. If for example the material name insulation is used for exterior insulations, the material name insulation needs to be deleted in the tab Masonry.

Quantification of masonry

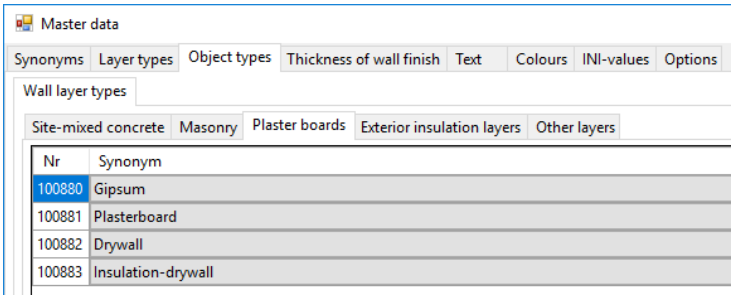
In the lists for Masonry the object type wall construction is used for the concrete walls, if the wall consists of one layer or if the wall layer was designated as load-bearing. These are measured at the centre of the layer. The deduction test for openings is carried out according to the OPTIONS.

The object type wall layer is used in the case of non-load bearing layers. The wall layer is indicated as a volume body. The volume body is not contiguous in the case of ignored openings.

Every single layer is measured.

After the quantification in the case of walls, "Masonry" from the tab Masonry appears in the row "Discipline" in the tab "Values and attributes".

Tab plaster boards (dry construction)



This list shall include all materials, which are also used for system walls (single-plank walls with plaster board).

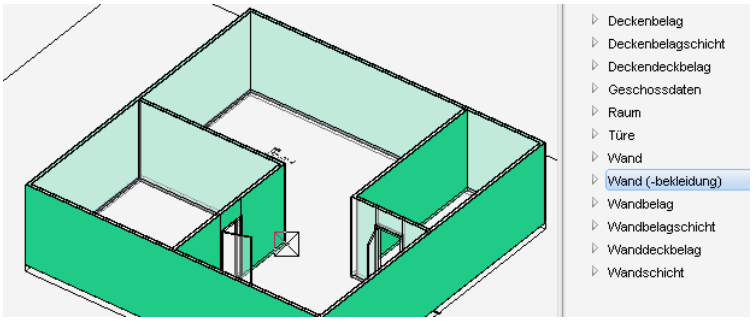
Insulation of system walls
The name of the insulation also needs to be different in order to enable a distinction from other disciplines (craftsmen's differentiations). Here the name "Insulation-drywall" was entered for this purpose.

Quantification of dry walls
The above listed materials are used in the lists for dry walls.

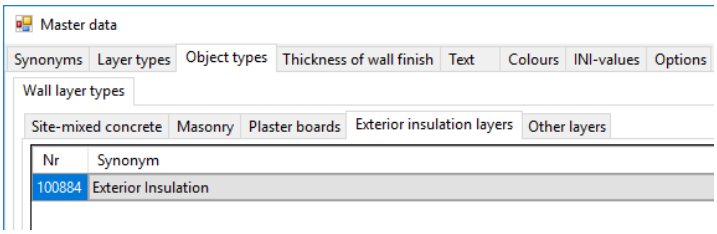
After the quantification of walls made of the above listed materials, "Dry wall" appears in the quantities manager at the tab "Values and attributes" in the row "Discipline".

One-layer dry walls
The object type wall construction is used for lists in the case of one-layer dry walls. The visualization surface is contiguous in the case of ignored openings.

Multi-layer dry walls (system walls such as single-plank walls)
Prerequisite:
All layers are defined as non-load-bearing.
All layers are included in the above list.
Walls, which comply with these conditions, are indicated in the list under the object type "Wall (covering)". All layers are summarized and measured at the side of the wall axis.
In the example below, the wall axis at the right interior wall should be changed since measurements will always be carried out on the outside edges.



Tab Exterior insulation layers



This list shall contain all materials, which are used for exterior insulation systems such as thermal insulation composite systems.

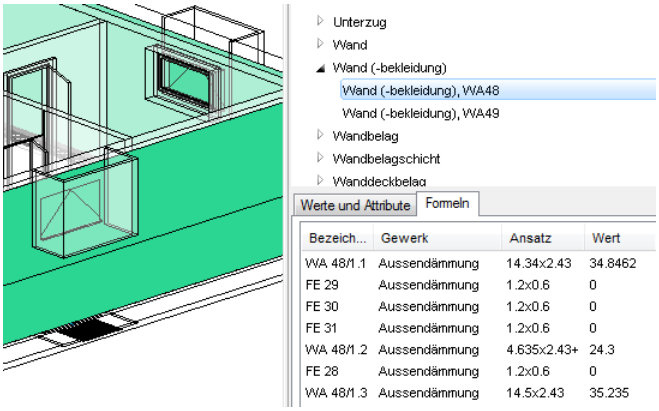
Insulation for exterior insulations
In order to enable a distinction from other disciplines (craftsmen's differentiations), the name of the insulation also needs to be different. Here the name "Exterior insulation" was entered for this purpose.

Quantification of external insulations
The above listed materials are used in the lists for dry walls.

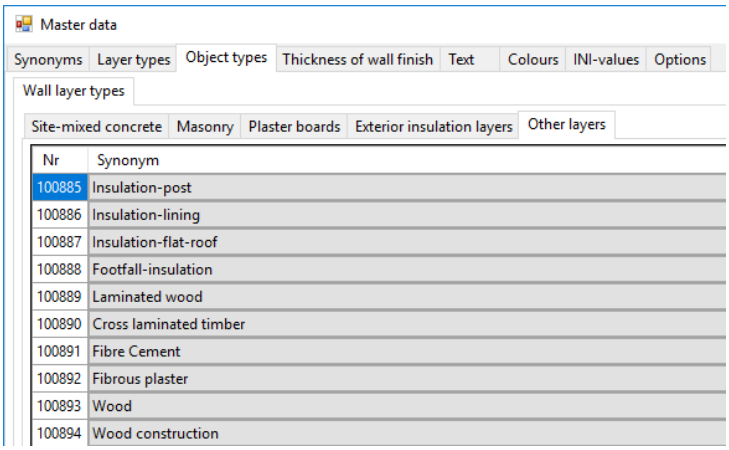
After the quantification of wall coverings made of the above listed materials, "Exterior insulation" appears in the quantities manager at the tab "Values and attributes" in the row "Discipline".

Requirements
All the layers need to be defined as non-load-bearing.

Coverings, which comply with these requirements, are contained in the list under the object type "Wall (covering)". All layers are summarized and measured at the side of the wall axis.
The visualization surface is contiguous in the case of ignored openings.



Tab "Other layers"



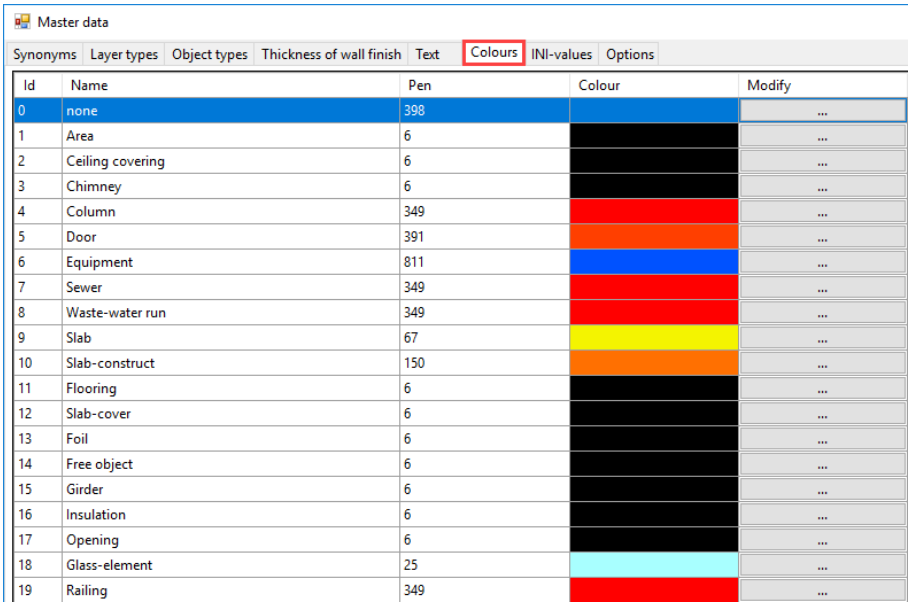
The tab "Other layers" contains materials, which shall be calculated using a deduction test. The deduction test is applied in accordance with the setting for masonry.

These materials are measured at the centre of the layer and included in the list "Various types of walls".

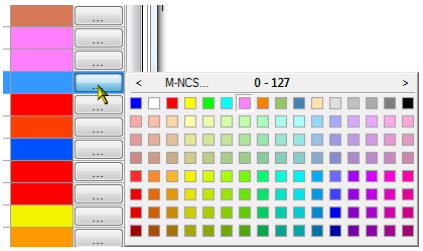
Walls made of non-listed materials

Materials, which are not listed in the wall layer types tabs, will be evaluated without deduction tests and listed as "Various types of walls".

COLOURS

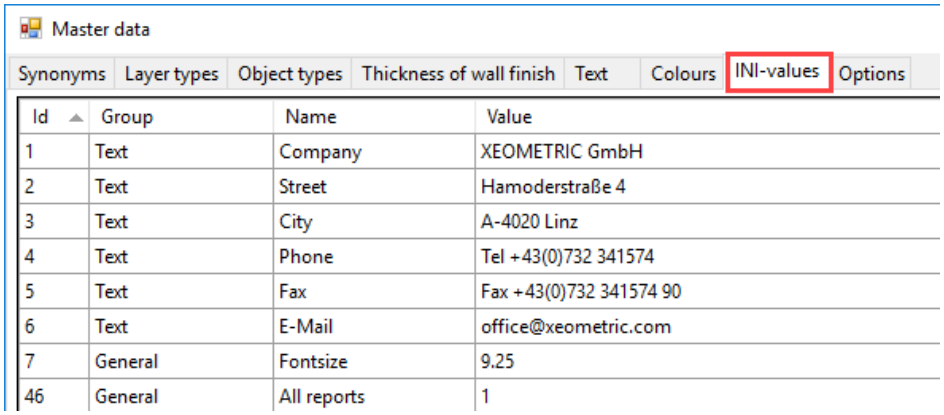


The tab colours lays down with which 3D-hatching the object types are represented.



The colour is adjusted using the buttons at "Modify".

INI-VALUES

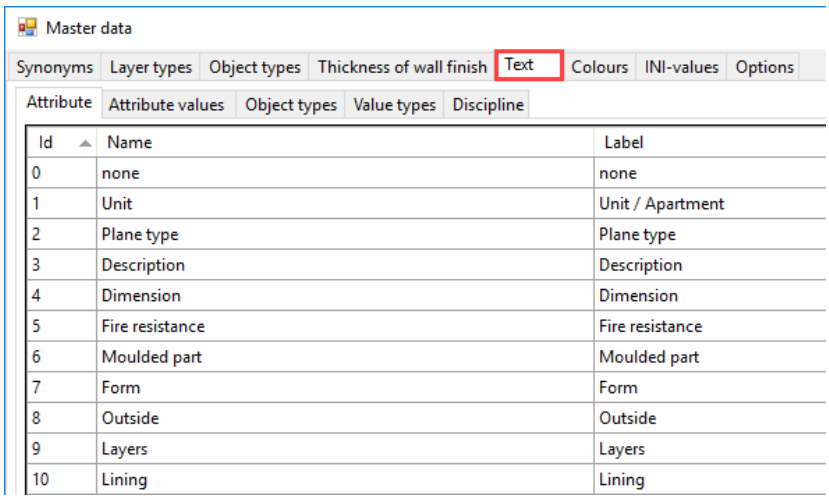


Id	Group	Name	Value
1	Text	Company	XEOMETRIC GmbH
2	Text	Street	Hamoderstraße 4
3	Text	City	A-4020 Linz
4	Text	Phone	Tel +43(0)732 341574
5	Text	Fax	Fax +43(0)732 341574 90
6	Text	E-Mail	office@xeometric.com
7	General	Fontsize	9.25
46	General	All reports	1

The company data for the reports are entered at the tab INI-values
The font size is changed at Id 7.

TEXTS

Any texts from the quantities manager can be renamed.



Id	Name	Label
0	none	none
1	Unit	Unit / Apartment
2	Plane type	Plane type
3	Description	Description
4	Dimension	Dimension
5	Fire resistance	Fire resistance
6	Moulded part	Moulded part
7	Form	Form
8	Outside	Outside
9	Layers	Layers
10	Lining	Lining

The texts, which are used in reports, are directly adjusted at the reports.

Attributes
The feature designations of the attributes are listed.
The name of the attribute is adapted for the attribute values at the settings.

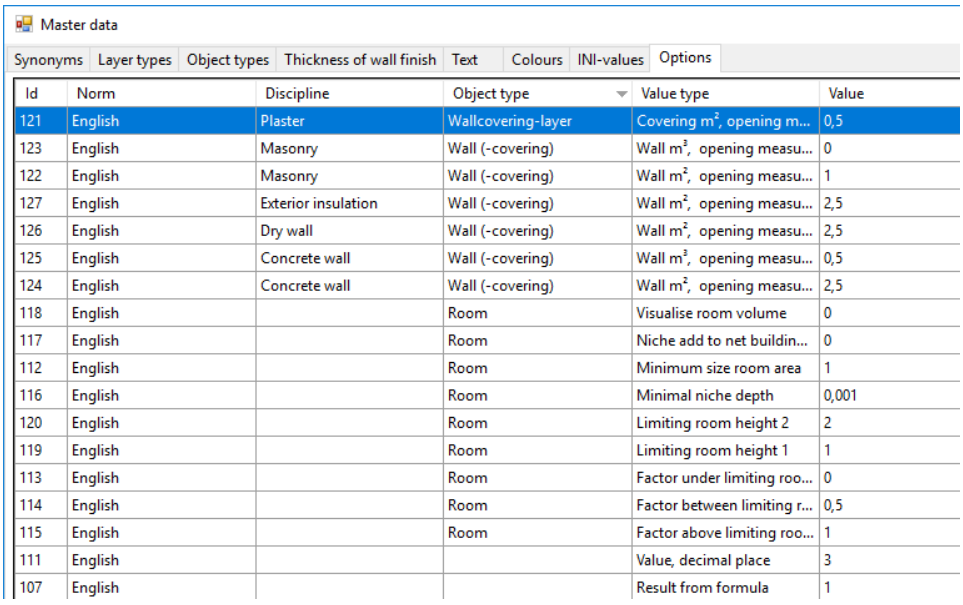
Object types
The object types can be renamed.

Value types
Value types are predominantly measurable sizes such as length, angle, minimum size etc.

Discipline
Craftsmen's differentiation.

Options

In the options threshold values and other parameters of the standard can be adjusted.



Id	Norm	Discipline	Object type	Value type	Value
121	English	Plaster	Wallcovering-layer	Covering m², opening m...	0,5
123	English	Masonry	Wall (-covering)	Wall m³, opening measu...	0
122	English	Masonry	Wall (-covering)	Wall m², opening measu...	1
127	English	Exterior insulation	Wall (-covering)	Wall m², opening measu...	2,5
126	English	Dry wall	Wall (-covering)	Wall m², opening measu...	2,5
125	English	Concrete wall	Wall (-covering)	Wall m³, opening measu...	0,5
124	English	Concrete wall	Wall (-covering)	Wall m², opening measu...	2,5
118	English		Room	Visualise room volume	0
117	English		Room	Niche add to net buildin...	0
112	English		Room	Minimum size room area	1
116	English		Room	Minimal niche depth	0,001
120	English		Room	Limiting room height 2	2
119	English		Room	Limiting room height 1	1
113	English		Room	Factor under limiting roo...	0
114	English		Room	Factor between limiting r...	0,5
115	English		Room	Factor above limiting roo...	1
111	English			Value, decimal place	3
107	English			Result from formula	1

General
Number of decimals for the rounding

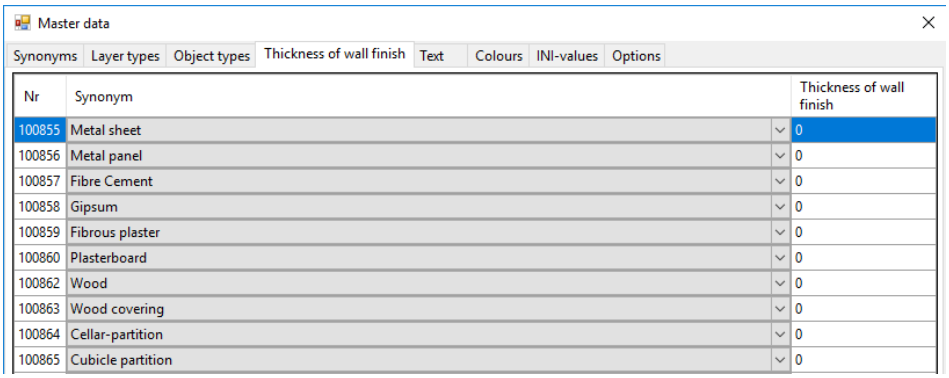
Room

- Display limitations of space including 3D-surfaces and living space limiting values
- Adjust the factors and limiting heights for the calculation of living spaces
- Calculate window niche to the NFA for ground surfaces according to SIA 416, DIN 277 and ÖNORM B1800
- Minimum room size, so that small empty spaces/joints between building components are recognized as rooms
- Minimum niche depth for the calculation of living spaces. 0 values signify that window niches are not calculated. Settings for Germany need to be defined in accordance with the Living Space Regulation 0.13.

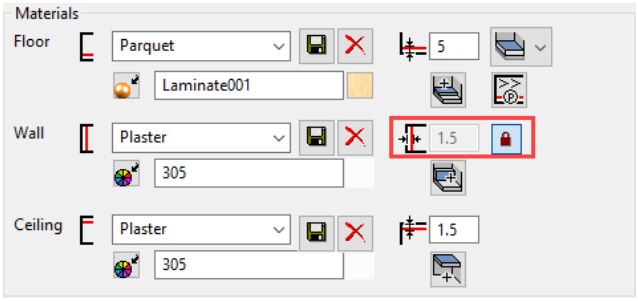
Disciplines (craftsmen's differentiation)
It can be defined individually for the various disciplines exterior insulation, dry construction, concrete walls in square meters and plasters until which point including indication of size an opening shall be ignored.

Thickness of the wall finish

These values only have an influence on the living space verification.



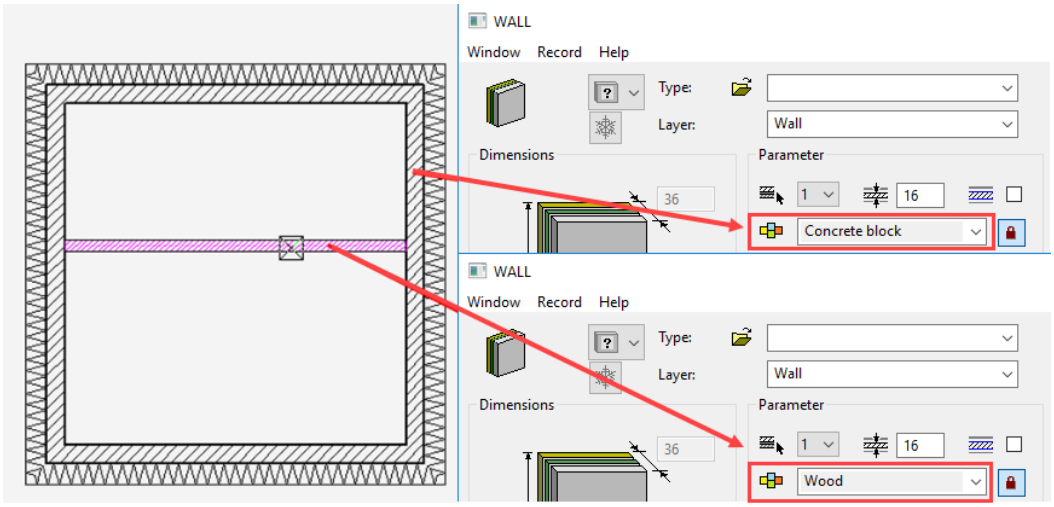
Synonyms are listed and a corresponding plaster thickness (thickness of the wall finish). As a standard, materials, which shall not be overlaid with an additional cover, are listed. The thickness of the wall finish is defined at the wall material in the room dialog window.



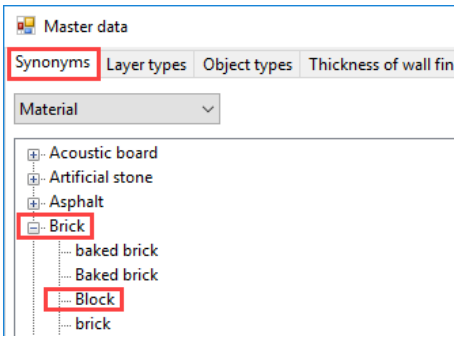
Upon an active linking (red padlock) every wall side of the roof is checked with regard to the basement material (material of the wall layer) and if the material has been entered in the quantities database, the corresponding thickness of the database is applied. The thickness which was been entered in the mask is used for walls of which the material has not been entered in the quantities database.

Example:

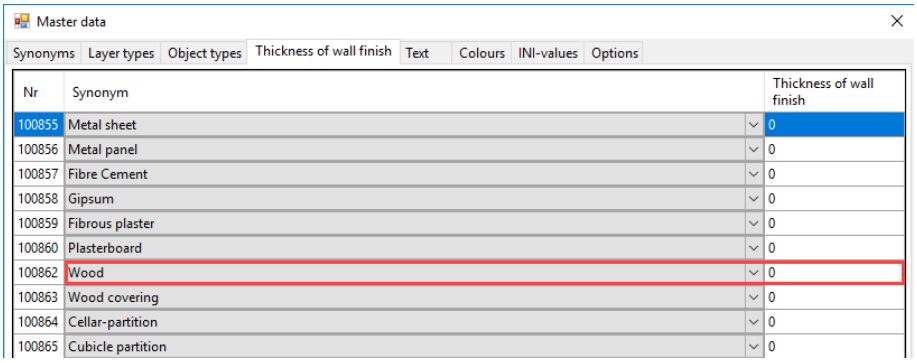
2 rooms with a separating wall made of the material wood, exterior wall made of the material bricks.



The materials block and wood have to be searched in the list of synonyms.
Wood is a material; block becomes a synonym of brick.



The material brick is not contained in the tab thickness of wall finish. In this way, for all walls of the material brick the thickness of the wall finish is defined using the value of the room dialog window.
The material wood is included in the list with the thickness of the wall finish amounting to 0. This means that the wooden wall has no wall covering layer.

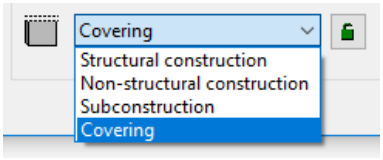


The setting can be controlled via the living space verification.

Room 1 is not linked to the database and consequently a wall covering with a thickness of 3cm is applied on all adjoining walls.
Room 2 is actively linked to the database and consequently the ground surface at the wooden wall is calculated up to the wall.

LAYER TYPES

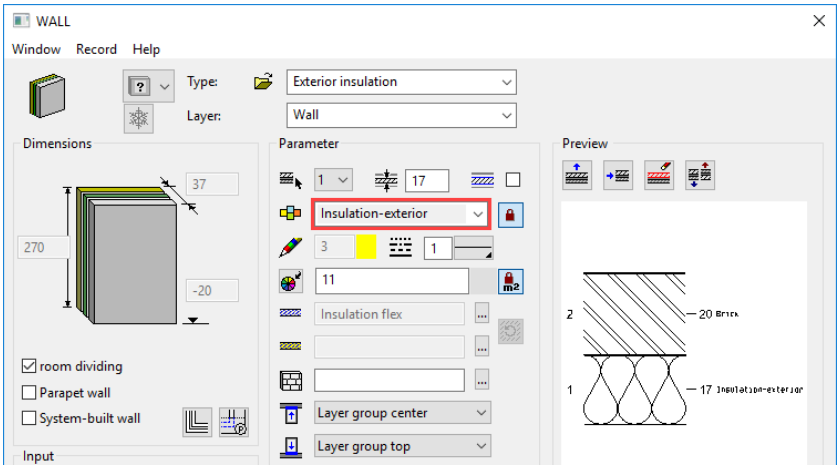
The layer type has to be determined for "Layer"-related building components (wall, ground, roof and floor).



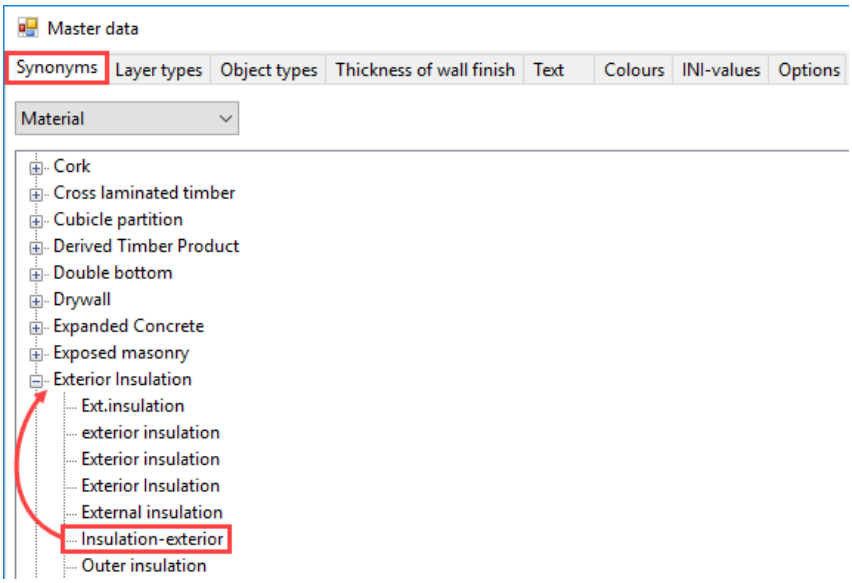
In order to guarantee a correct quantification, a layer type needs to be attributed to the layer. If the chain to the material has been dissolved, an attribution can be carried out independently. If the chain is active, the layer type is read from the quantities database using the name of the material.

Chained with material

The material of the layer first searches the list of synonyms in order to be able to switch to the generic term of the material.

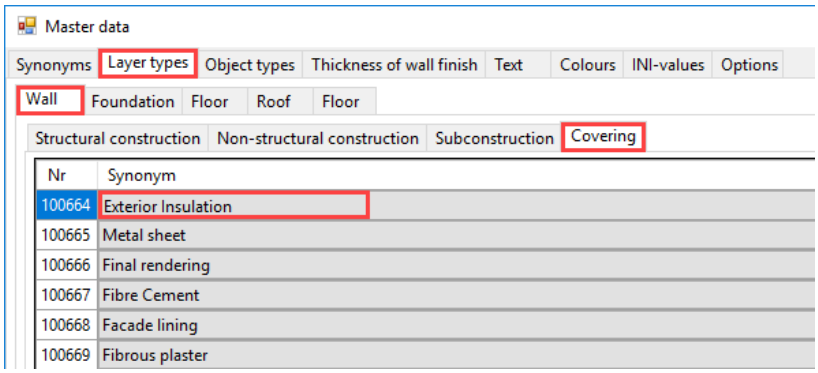


In this example, the material is "Insulation-exterior"

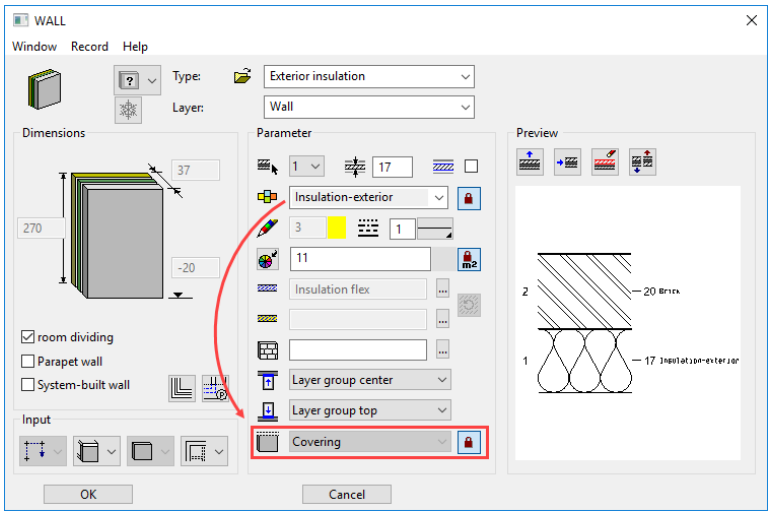


"Insulation-exterior" becomes the generic term exterior insulation.

In the tab layer types the materials of each component type are divided into the four layer types "Load-bearing construction", "Non-load-bearing construction", "Sub-construction" and "Covering".



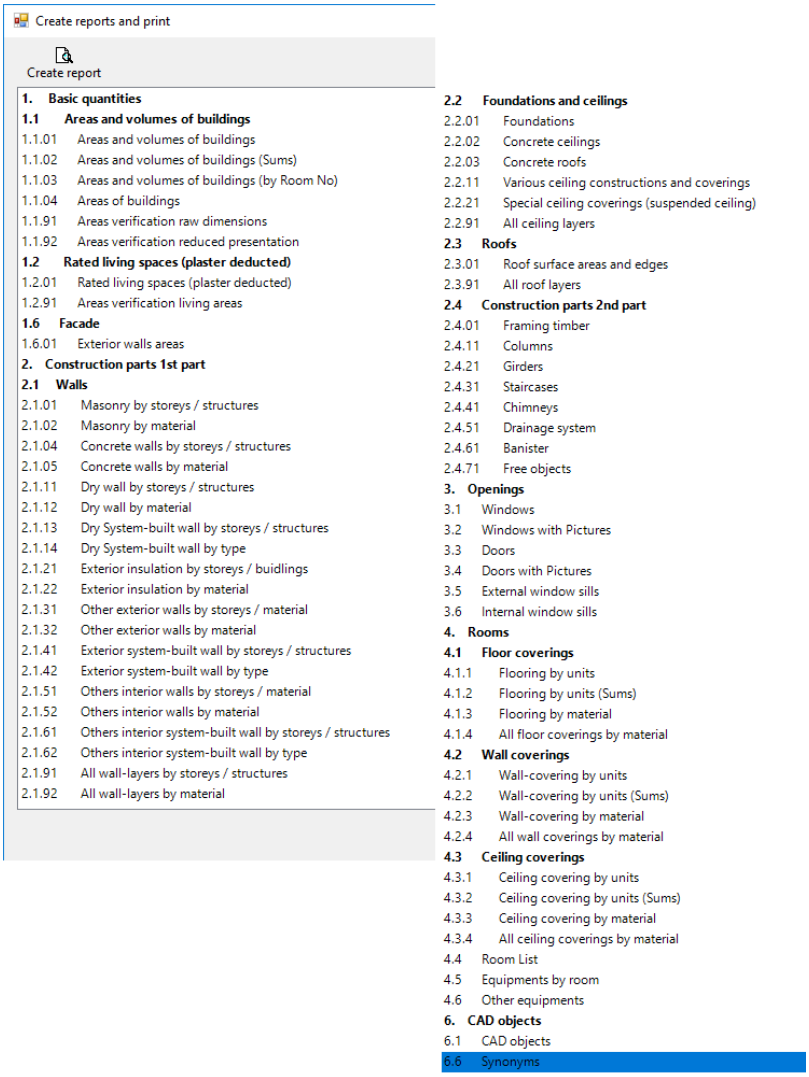
The example is a wall and the material exterior insulation is a covering layer. In this way, the layer will be changed automatically to covering when the link is active.



This automatism attributes the correct layer type to standard constructions and correctly quantify the component without manual interventions.

14.6 LISTS / REPORTS

	Toolbar AR lay-out> Create and print reports
	Menu Extras > Quantities > Reports
	Quantities manager > Create and print reports



CREATE AND PRINT REPORTS

The report is opened by double clicking on its name.

Requirement
The model needs to be loaded and quantified. In order to open the created reports it is required that Excel is installed. This is not a requirement for the generation of reports. It is possible to open the reports with other software that supports the standard *Office Open XML* (e.g. LibreOffice or OpenOffice) but more or less differences may occur.

Contents of reports
All reports including their contents and attachments are described in detail in the course unit Quantification in the chapter 10.2.

Templates
For the generation of reports templates in Excel-format are provided and located in the directory *<ELITECAD-installation-directory>\u\<version>\ar\calc\reports* or in

subdirectories for variants of standards. Format modifications (fonts, frame, …) are easily done using standard Excel functions.
In order to avoid an overwriting of these user modifications of the templates by updates, a parallel directory *<ELITECAD-installation-directory>\u\<version>\ar_c\calc\reports* has to be created and the desired report has to be copied into this directory. Changes of the report content require special knowledge about the variables and report generation. This topic is not documented in this manual. Please contact your ELITECAD reseller.

Header and Footer
The file *HeaderFooter.xlsx* is intended for changes in header and footer. Before making any modifications this file has to be copied into a parallel directory as described in the previous section. Changes are automatically applied to all reports where this header / footer template is included.

Renovation planning
When renovation planning is active a filter is displayed, which filters data according to the renovation planning state. Combinations of states are allowed as well. A new hierarchy is introduced in the reports for the renovation planning state.

14.7 CHECKING THE ELITECAD MODEL

Check room contours

The following rules need to be complied with in order to be able to determine the room contours of the CAD:
• Room-dividing elements must not overlay.
• No room divisions along room-dividing walls or room-dividing glass elements.
• No room-dividing building components such as walls, glass elements above each other with the active option ROOM DIVIDING. This option is allowed to be selected for only one building component.

Show room separating objects

Menu Extras > Quantities > Show room separating objects

All room-dividing building components of the current story are shown.

Check room contours

Menu Extras > Quantities > Check room contours

Assembly of room contours (model).
The desired storey has to be active. The contours are attributed to the layer "Room-check-contours".

TIP

The individual contours can be checked using the function VERIFY 2D MODEL (Menu INFO) to determine if the contour is faulty (open).

Delete room contours

Menu Extras > Quantities > Delete room contours

Room contours, which have been generated by the CHECK ROOM CONTUR function, will be deleted by this function.

Check wall axes

Menu Change > Wall > Change wall axes

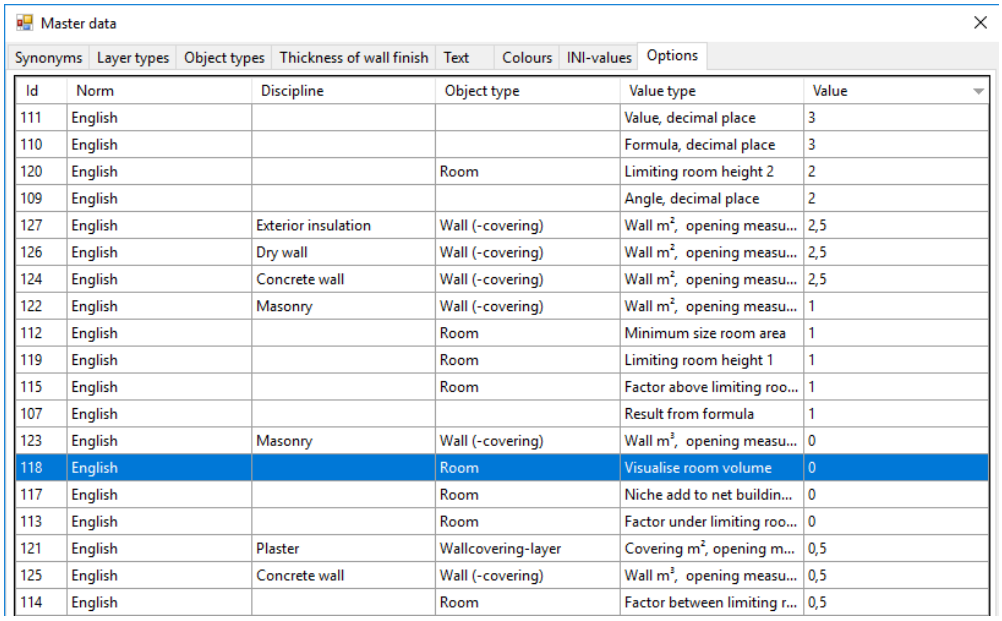
In order to ensure a correct quantification of the walls and the wall surfaces, it is important that all walls have been created correctly. The wall axes have to adjoin the wall contour.

Check external contours

An external contour is generated for every storey during the quantification.
These contours can be created using the layer "External contour".
These contours are only indicated if the room contours are switched on.
Activate "Room contour" under SETTINGS > OPTIONS > DEPICTION > ARCHITECTURE.

Function of the height control

Menu Extras > Quantities > Quantities Manager > Push button Settings/Rules



Id	Norm	Discipline	Object type	Value type	Value
111	English			Value, decimal place	3
110	English			Formula, decimal place	3
120	English		Room	Limiting room height 2	2
109	English			Angle, decimal place	2
127	English	Exterior insulation	Wall (-covering)	Wall m^2, opening measu...	2,5
126	English	Dry wall	Wall (-covering)	Wall m^2, opening measu...	2,5
124	English	Concrete wall	Wall (-covering)	Wall m^2, opening measu...	2,5
122	English	Masonry	Wall (-covering)	Wall m^2, opening measu...	1
112	English		Room	Minimum size room area	1
119	English		Room	Limiting room height 1	1
115	English		Room	Factor above limiting roo...	1
107	English			Result from formula	1
123	English	Masonry	Wall (-covering)	Wall m^3, opening measu...	0
118	English		Room	Visualise room volume	0
117	English		Room	Niche add to net buildin...	0
113	English		Room	Factor under limiting roo...	0
121	English	Plaster	Wallcovering-layer	Covering m^2, opening m...	0,5
125	English	Concrete wall	Wall (-covering)	Wall m^3, opening measu...	0,5
114	English		Room	Factor between limiting r...	0,5

At the tab Options the option VISUALISE ROOM VOLUME set to 1.
New 3D-objects at the "further CAD layers" are generated during the quantification. If the option is reset to 0, these objects will be deleted during the next quantification.
These objects are only visible in the wire and solid model. If these should be released in a plan view, a hidden line over the Menu EXTRAS > HIDDEN LINE needs to be calculated in advance.

Layer **Room boundaries**:
Horizontal and vertical 3D-surfaces show the limitations of the room. The lower surfaces are located at the height TF rough slab. The setting MAXIMUM ROOM HEIGHT of the room definition is taken into consideration.

Layer **Room boundaries _100%**:
3D-surfaces at the height of the upper limit value for the calculation of living spaces.
The height is calculated starting from TF finished floor.

Layer **Room boundaries _50%**:
3D- surfaces at the height of the medium limit value for the calculation of living spaces.
The height is calculated starting from TF finished floor.

Layer **Room boundaries _0%**:
3D- surfaces at the height of the lower limit value for the calculation of living spaces.
The height is calculated starting from TF finished floor.

Layer **Room boundaries**:
Horizontal and vertical 3D-surfaces show the limitations of the storey.
The horizontal surfaces are located at the height of LF ceiling slab (LF ceiling).