ELITECAD

**Course Unit
Renovation Planning**

Version 15

Content

General

How to use this course unit

This course unit is not a manual but a combination of theory and workshops with which to learn the program on a 1-on-1 basis. Every mouse-click and every entry is described in detail, providing you with a teaching resource that lets you learn the basics of the program by yourself. Each chapter provides explanations, information, and a workshop to practice the functions. To enable the workshops to be completed smoothly, the explanations should be read through very carefully. The order of the chapters should not be changed because each workshop is based on the previous one. The program contains examples stored as an ELITECAD file, enabling problematic places to be reviewed on the finished project.

Conventions used in this course unit

The start and end of a workshop are marked as follows:

▼ ▼ ▼ ▼ WORKSHOP

END OF WORKSHOP ▲ ▲ ▲ ▲

TIP
Tips refer to the application of ELITECAD.

NOTE
Notes concern system relevant points (installation etc.).

Functions are written in all capitals. The corresponding icon also appears for new functions.

FUNCTIONS (all capitals)

Functions can be accessed directly using icons (buttons). The functions are grouped together in tool bars or in the tools manager.
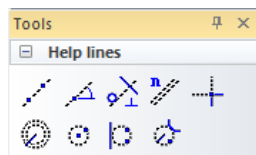
[Enter]

Function keys on the keyboard appear within square brackets.

Input values (bold)

Input values must be entered using the keyboard. When the text is entered in the input line, it must be confirmed with the [Enter] key.

Overview

ELITECAD introduces consistent and intelligent renovation planning in 2D as well as 3D. Visualisations of the different states (demolition, existing construction and new construction) can be freely configured from the original 3D model all the way to the final plans. All project states exist at all times and can be displayed simply with a mouse click. Classification is based on components, thereby avoiding the use of layers.

Numerous construction functions make use of these states and automatically complete what were previously manual tasks (e.g. closing of a wall opening after marking a window for demolition), saving precious processing time. More information in the model leads to more secure plans. This enables, for instance, the Automatic dimensioning to focus only on meaningful combinations of renovation states.

Plan views, views and sections naturally consider each of the states as well as provide representations of renovation projects that conform to the standards without any additional effort.
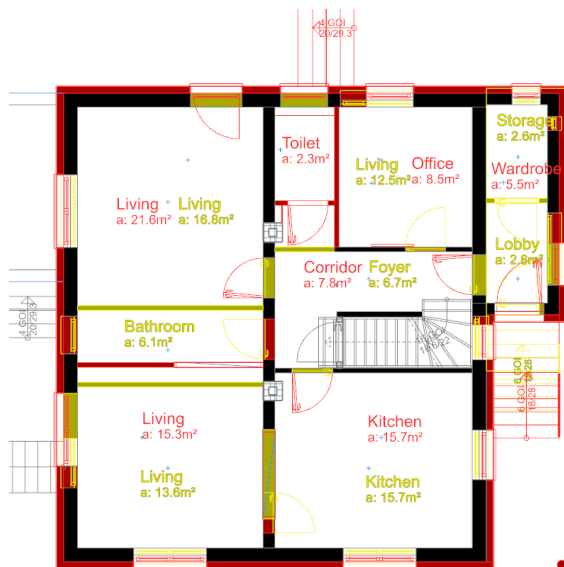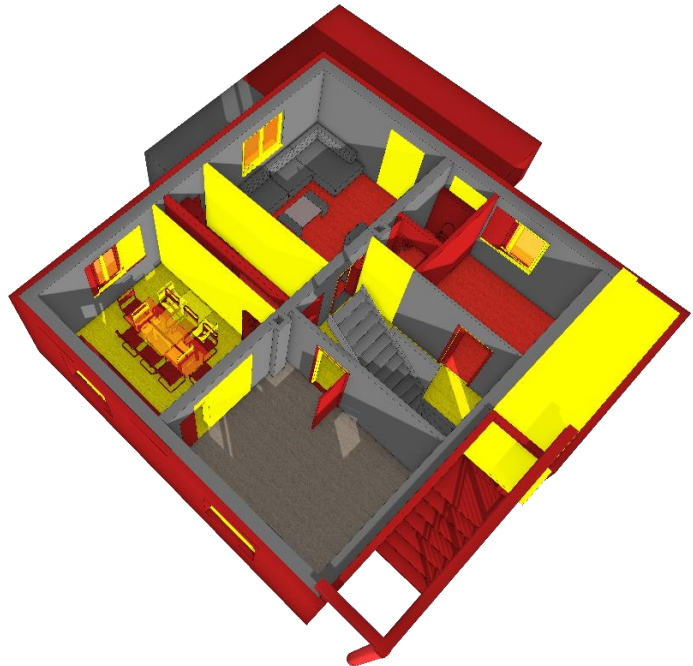
The fully integrated renovation planning in ELITECAD not only supports the user in 3D modelling and layouts, but also in the calculation of dimensions and quantities as well as the creation of reports from the various project states.

The BIM process ensures accuracy of status information via interfaces.

Preparations

Load model

This course unit requires the project *CAD_Object_Renovation_Planning*.
Please start by loading the corresponding project.

Open the project (Please ensure that the correct region is set in the ELITECAD configuration)
Toolbar FILE > OPEN
Choose the correct model, depending on your region and open it.
UK/US: CAD_Object_Renovation_Starting_Position.d

The loaded model should look like this:
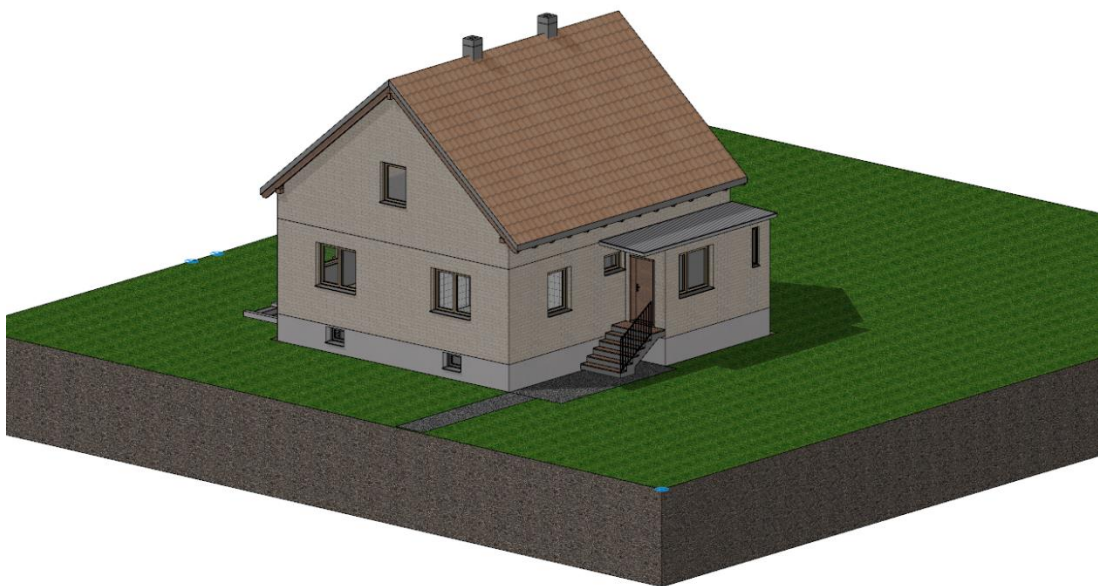
> **TIP**
>
> Not all users have the optional terrain module installed. In order to achieve the same result for all users, the terrain is already prepared for the final state of the renovation, where the basement is given a new insulation layer.
> Depending on your region and various updates over time, some parameter names and screenshots might look different than in the course unit.

Enable the renovation planning functionality in the menu SETTINGS > OPTIONS > WORK PARAMETERS > ARCHITECTURE.
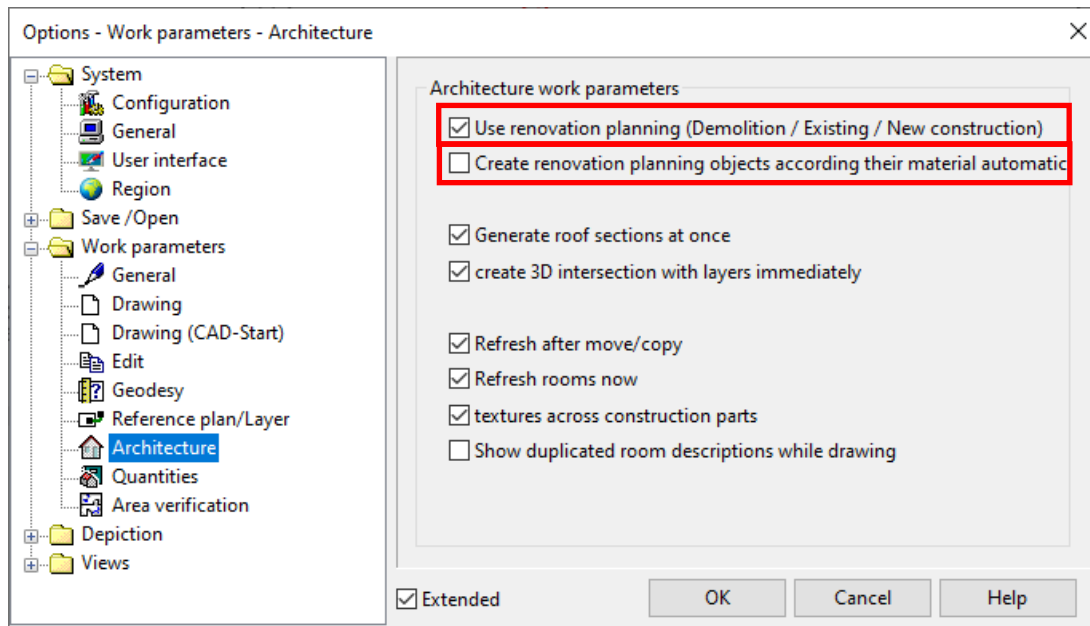
Please note that the second setting "Create renovation planning objects according their material automaticly" is not enabled. This would result in the renovation planning objects being depicted according to the materials, as described in page 9 "Graphical depiction/ Depiction of renovation".
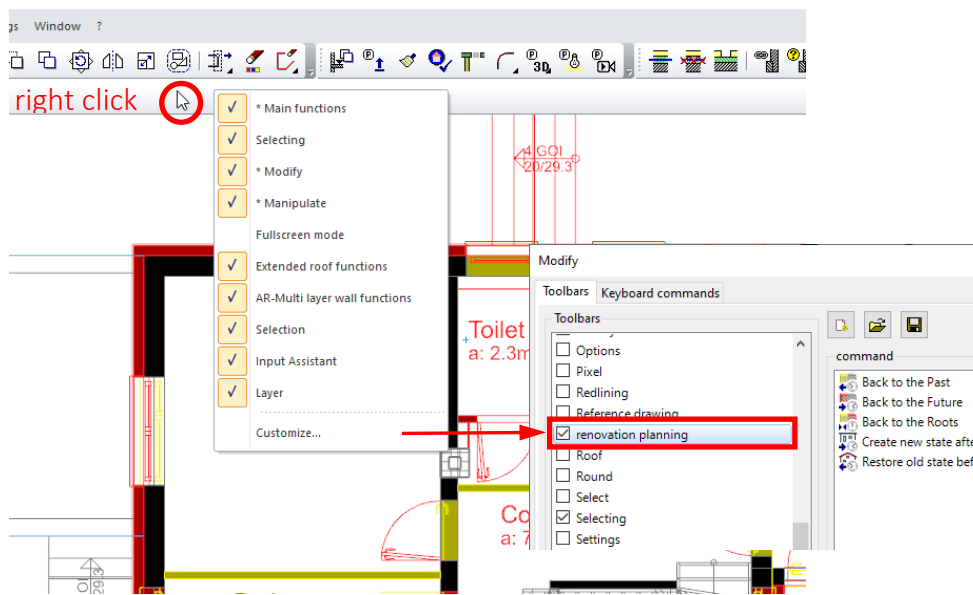
END OF WORKSHOP ▲ ▲ ▲ ▲

TIP

The name renovation planning refers to the states of a renovation planning project. Some objects might be part of the existing construction, while some will be demolished and others will be new constructions. Furthermore, there is a state for unknown. In order to work with the renovation planning, first the renovation planning has to be enabled in the settings. Only after this, will all settings be available. If renovation planning is not required, the workflow with ELITECAD remains unchanged. Renovation planning states are a new property and completely independent of layers.
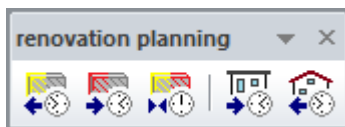
Toolbar Renovation planning

▼ ▼ ▼ ▼ WORKSHOP

The toolbar for renovation planning can be loaded by right-clicking onto the toolbars and choosing *"customize…"* in the context menu. Under the toolbars tab, enable the toolbar *renovation planning* and choose where you want to place it in the menu.

right click

* Main functions
Selecting
* Modify
* Manipulate
Fullscreen mode
Extended roof functions
AR-Multi layer wall functions
Selection
Input Assistant
Layer
Customize...

Modify

Toolbars   Keyboard commands

Toolbars
☐ Options
☐ Pixel
☐ Redlining
☐ Reference drawing
☑ renovation planning
☐ Roof
☐ Round
☐ Select
☑ Selecting
☐ Settings

command
Back to the Past
Back to the Future
Back to the Roots
Create new state afte
Restore old state bef

This is what the toolbar looks like if you load it as an independent (floating) toolbar:
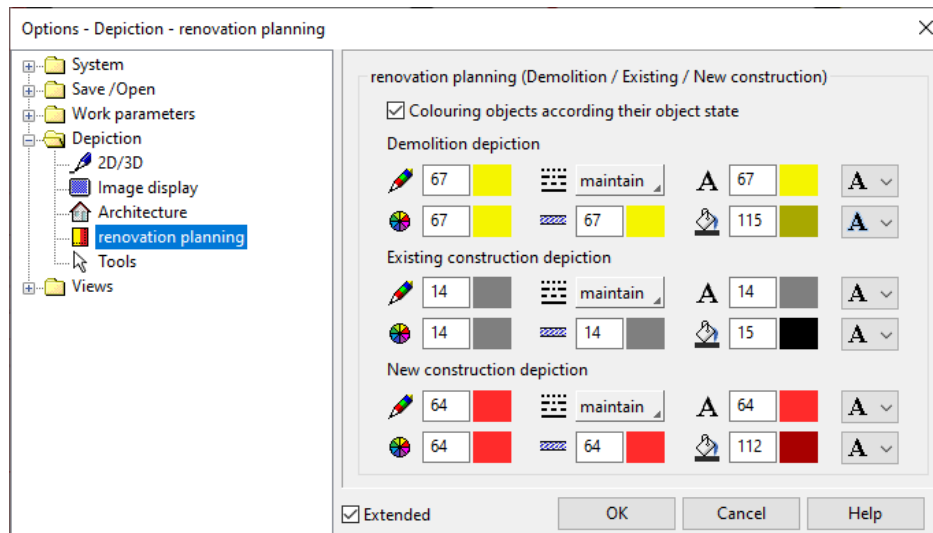
renovation planning

END OF WORKSHOP ▲ ▲ ▲ ▲

Graphical depiction

Pen and colour options

Menu SETTINGS > OPTIONS > DEPICTION > RENOVATION PLANNING

There are two possibilities for each of the three renovation planning states: either the depiction is done according to the material settings of the representation levels (like before), or the depiction can be formatted according to a parameter set that can be configured as desired.

In the options, the representation levels are separately configured for the states *Demolition*, *Existing construction* and *New construction*. The settings include 2D pen colours, line types, the colour of the line hatch, the colour of the infill hatch and the 3D colour.
Attention: The setting of the 2D pen colour only affects the colour, but not the line width or the print colour of the pen, as they are configured in the menu SETTINGS > COLOUR PROPERTIES!

Text options

The text can be depicted either underlined, crossed out, overlined or unchanged. In addition, you can use a boundary line, a background colour or inverted depiction for increasing the contrast.

Texture options

3D objects, which have a texture material assigned, will be overlapped with the set 3D colour. This allows for the state-defined colour while allowing for the texture to still be recognizable.

Views

The coloured depiction of the renovation planning information can be activated for each view and model view individually.
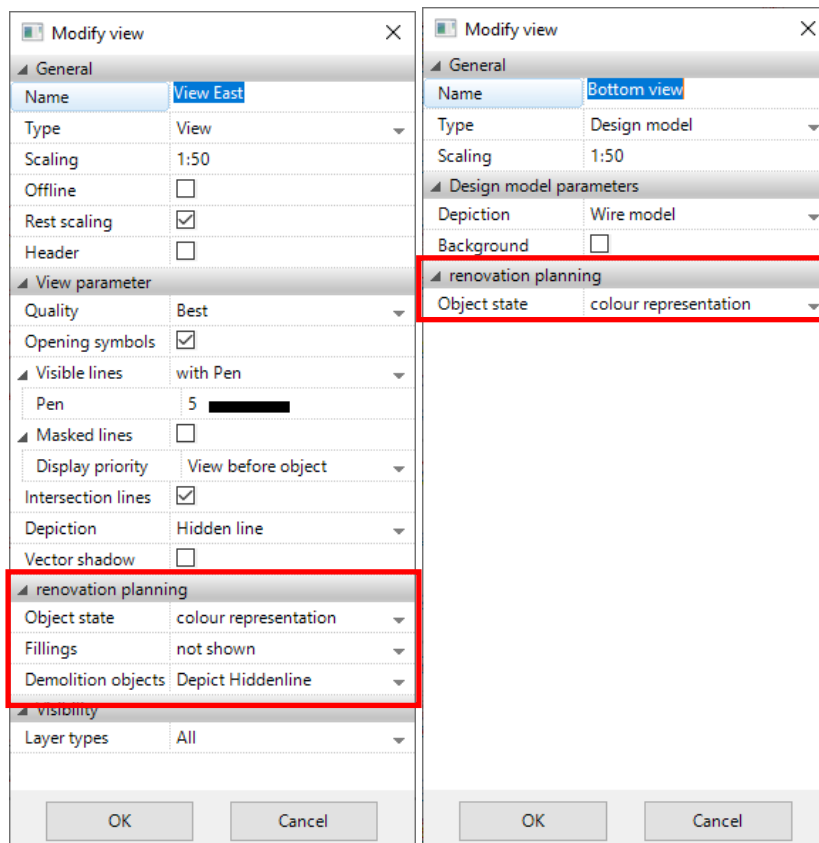
In every view, including the model, the coloured depiction of the renovation planning state can also be activated/deactivated using the shortcut [Ctrl] + J.
Additionally, the coloured depiction can be deactivated entirely in the options menu.
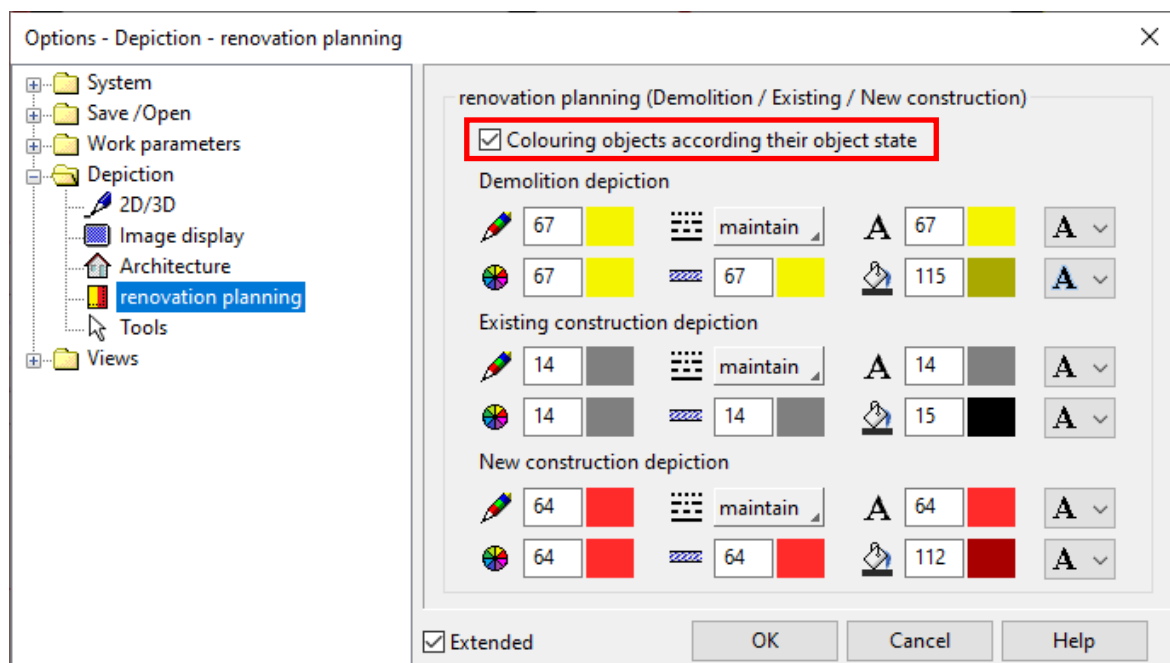
Depiction of renovation

A renovation planning state can be assigned to every element, from construction part to section line. By default, those elements will be coloured corresponding to the settings, even if the elements are assigned a material. In this case, the material will be tinted. If an element is supposed to keep the state, but be depicted according to the actual material, it is also possible to select *renovation planning state by material*.
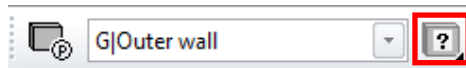

9
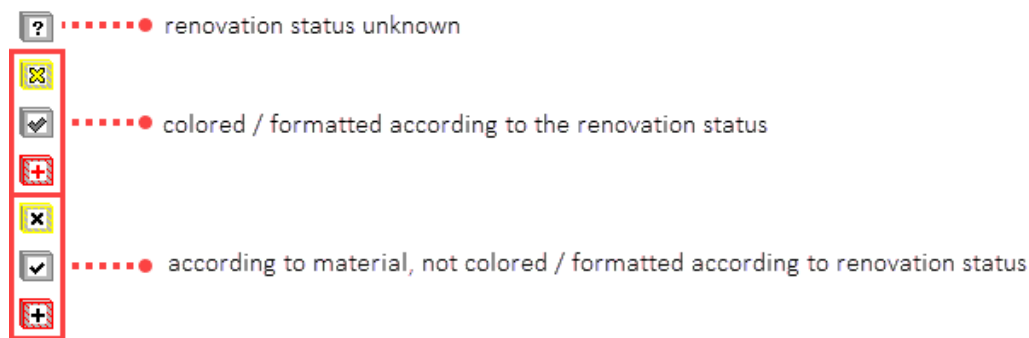
Demolition

▼ ▼ ▼ ▼ WORKSHOP

Define your building as existing construction

If you select an existing component or create a new one after activating the renovation planning, it will show the renovation planning state as *unknown*.
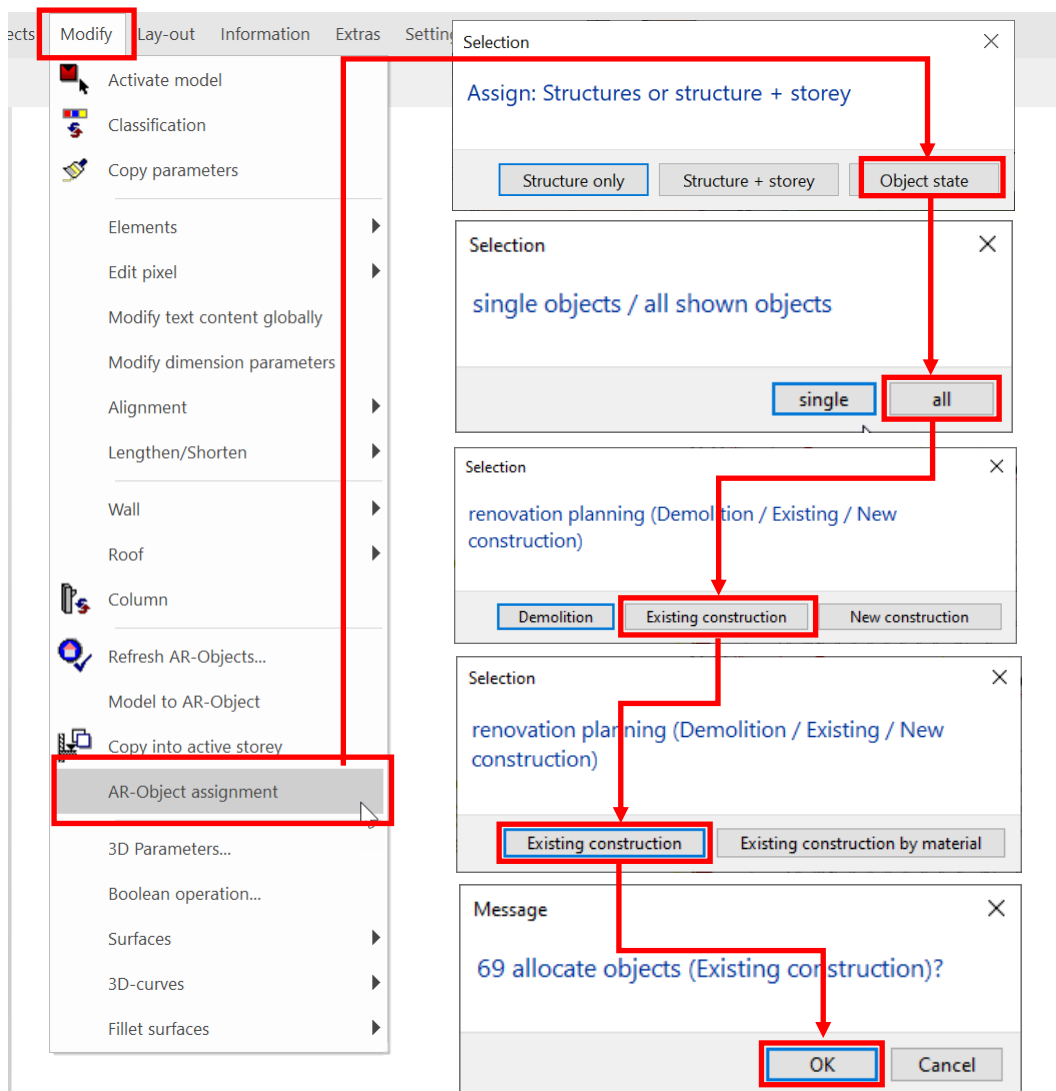

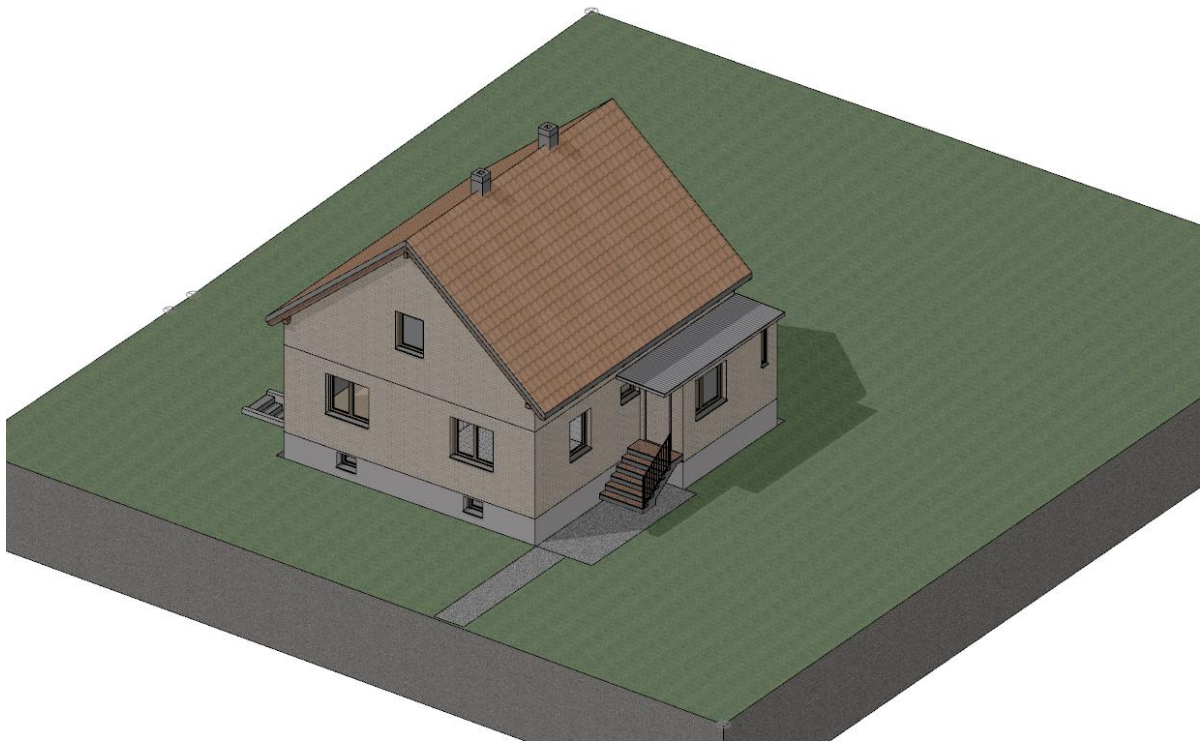Ensure that all components and the terrain are visible.

Select MODIFY > AR-OBJECT ALLOCATION in the menu.
Assign the state *Existing construction* to all objects:

All components are now tinted grey to show they are marked as *Existing construction*.

# Renovation of the building – mark demolition objects

Now let us start to remodel the building. Please note, that the demolition of a window, door or any other kind of opening results in the removal of this opening. The corresponding opening is filled. As an example, we need to remove a window by marking it as *Demolition*, the remaining opening in the wall would then be filled with a wall marked as *New construction*, which is linked to the wall that had the opening. This new piece of wall is by default associated with the window and the wall, and therefore adapts to changes to those elements.

Reduce the visibility to the basement, select the basement window and assign the state *demolition*:
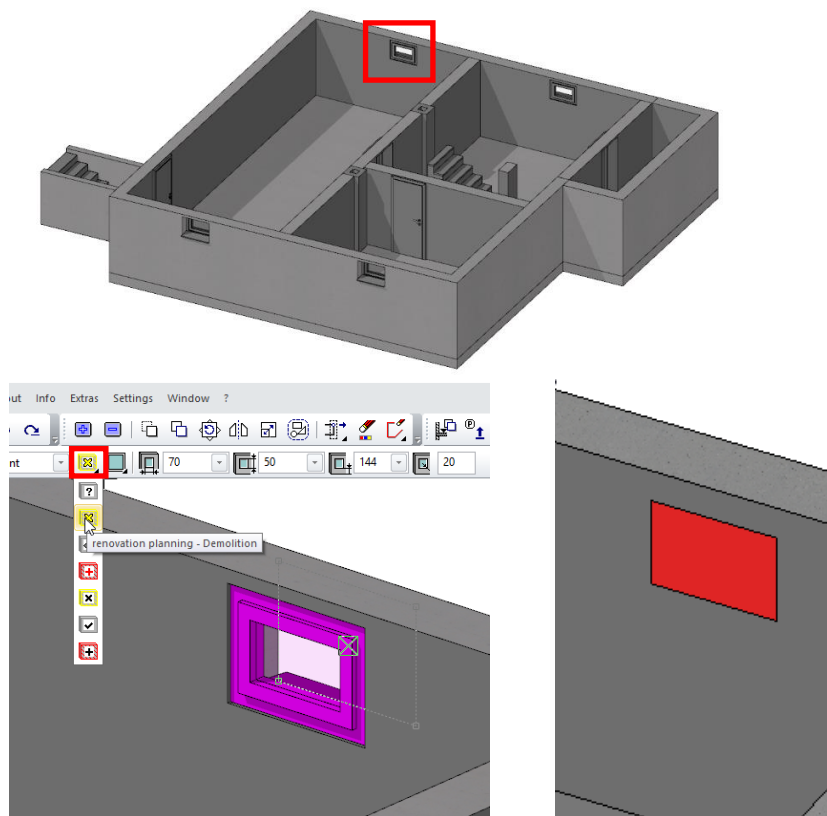
The opening is filled with a red piece of wall. Beside the *select representation level* input field, you will find the input field *Depiction renovation planning* which currently shows *no restriction*. Select *Demolition + Existing construction*. Now you should once again see the window, which is to be removed.

If you have enabled the option CREATE RENOVATION PLANNING OBJECTS ACCORDING THEIR MATERIAL AUTOMATICALLY under SETTINGS > OPTIONS > WORK PARAMETERS > ARCHITECTURE the fill object will not be formatted according to the renovation planning settings (in our case red), but according to the material of the parent wall.
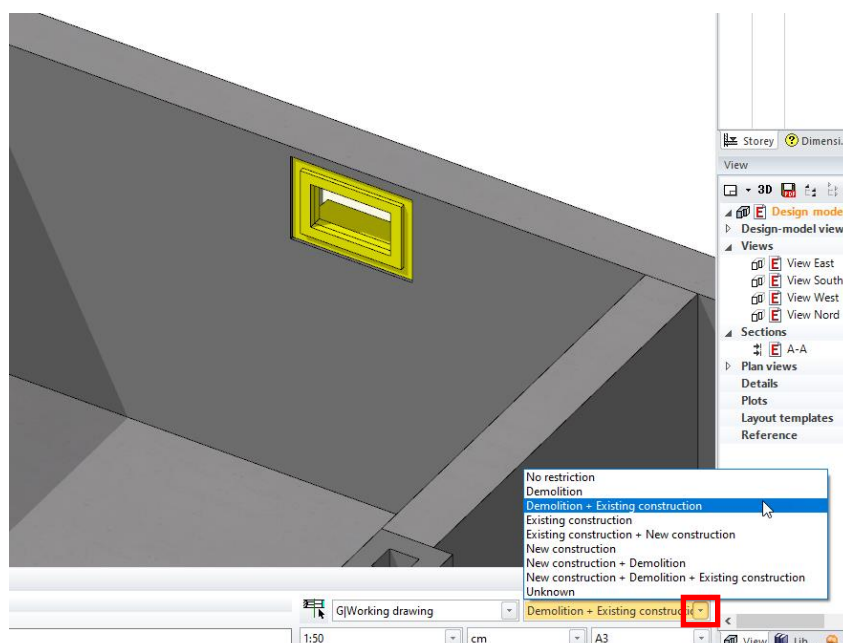
Make the ground floor visible, and mark the following components for demolition:
All windows, the entrance door, the exterior entrance stairs, the pent roof at the entrance as well as the two inner walls indicated below:
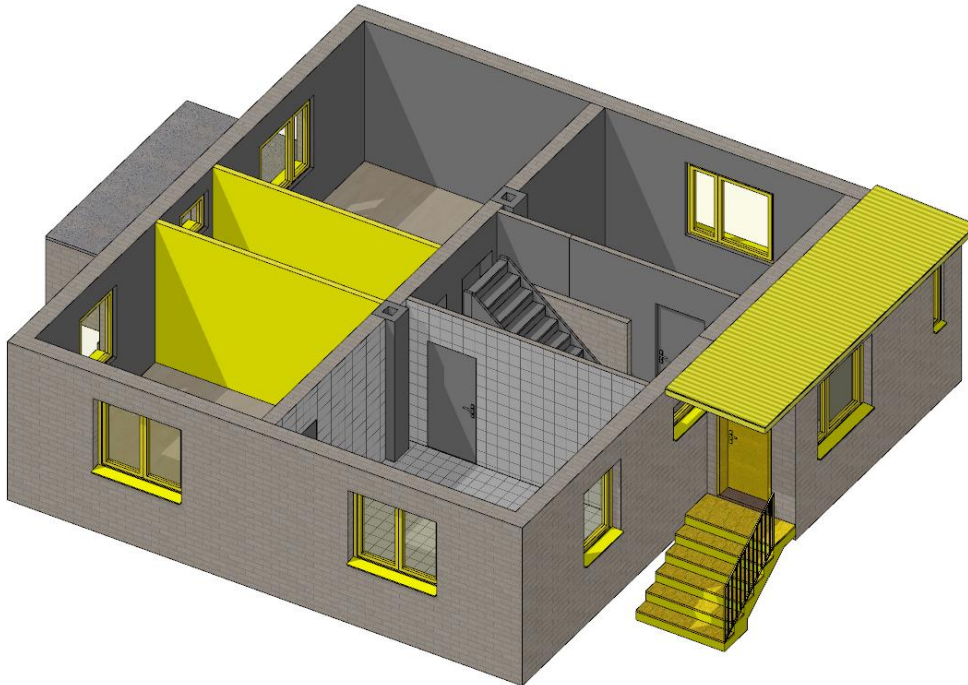

Click on a window and switch the state from *Existing construction* to *Demolition*. If you do not want to do this for every window separately, you can use [Shift] + Click to select multiple windows at once and afterwards set all selected windows to *Demolition*.

Now for the top floor. Here we first mark the entire roof including the truss (layer: *Wood construct*) for demolition and then we hide it. Afterwards the walls, windows and the door should be set to *demolition* as well.

> **NOTE**
> The change of the wall purlin might only be applied after confirmation in the input menu.
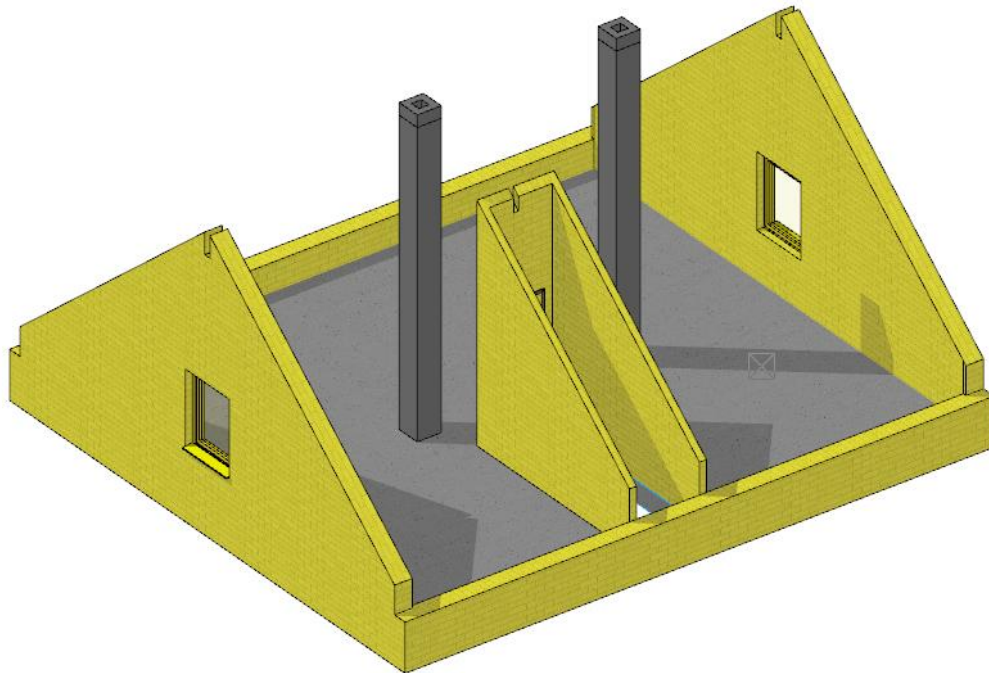
The chimneys are only shortened. Shorten the existing chimneys and set chimneys with free height on top of them. Mark those for demolition. You can activate the chimney using *adopt parameters*, then before placing it, set the correct height and mark it as demolition.
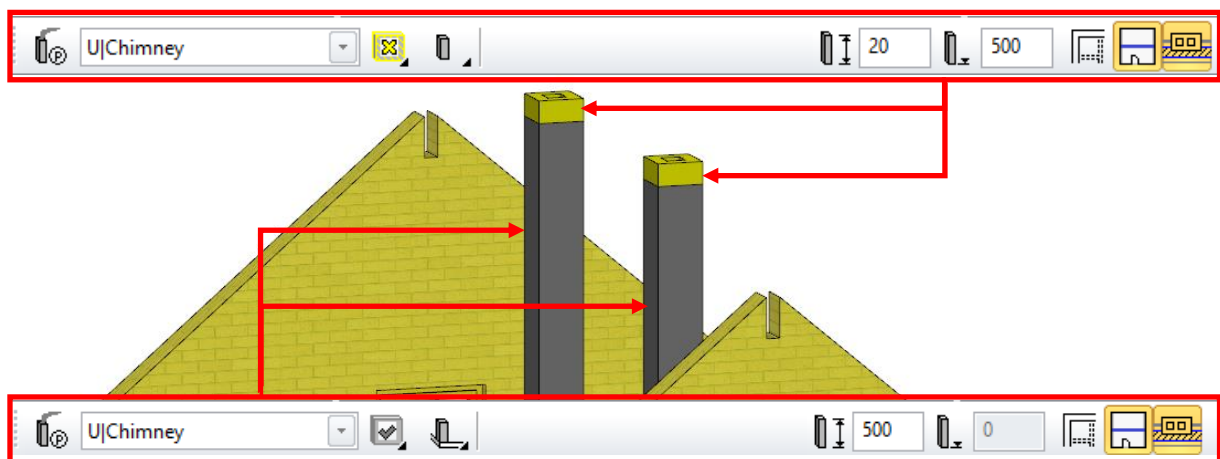
Use the switch *Depiction renovation planning* to see the various combinations of the current state of the renovations.

END OF WORKSHOP ▲ ▲ ▲ ▲

New construction

Automatic model update upon changes of walls

Other typical requirements in renovation planning are dividing walls, demolition of walls and/or the construction of new walls. Walls intersect floors and roofs and limit rooms. During these actions, it is ensured that only appropriate objects will be intersected. Demolition and new construction objects do not influence each other. For instance, the intersection between a demolition wall and a newly constructed roof would make no sense; for this reason, the demolition wall will ignore the newly constructed roof.

Just like wall changes have effects on other objects; the walls themselves take care to only intersect with appropriate walls.

Take care with the visibility of the renovation planning state!

Please note, that components as well as help lines and text are assigned the state *unknown* whenever they are used for the first time in the drawing!

When you are working on the model, you sometimes might filter for different states, but only the states *No restriction* and *Unknown* will show the objects with the state *unknown*.
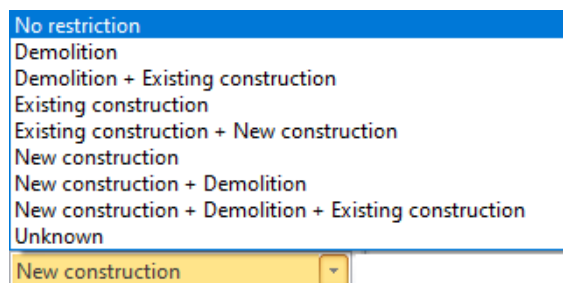

In case you draw something, and it is invisible or you cannot seem to find it, the probability is high that it will reappear when you set the filter to *No restriction*. Then you can assign the correct state to it.

▾ ▾ ▾ ▾ **WORKSHOP**

Modification of walls

Double-click on the ground floor in the storey manager to build it up and switch to the plan view with [Ctrl] + D. Make sure that the *No restriction* filter is activated in the Display renovation planning input field. Now the interior walls of the house are being rebuilt.

Divide the wall between the foyer and the room as shown 125cm from the left end using the Divide wall function:
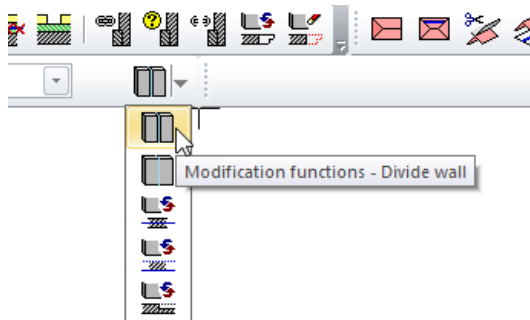
If necessary, add an auxiliary line.

Mark the left section and the displayed doors for *Demolition*. Then draw new 12 cm thick interior walls with the state *New construction* as shown in the picture.
The installation wall behind the toilet is drawn as a simple parapet wall (see settings in the pictured toolbar)
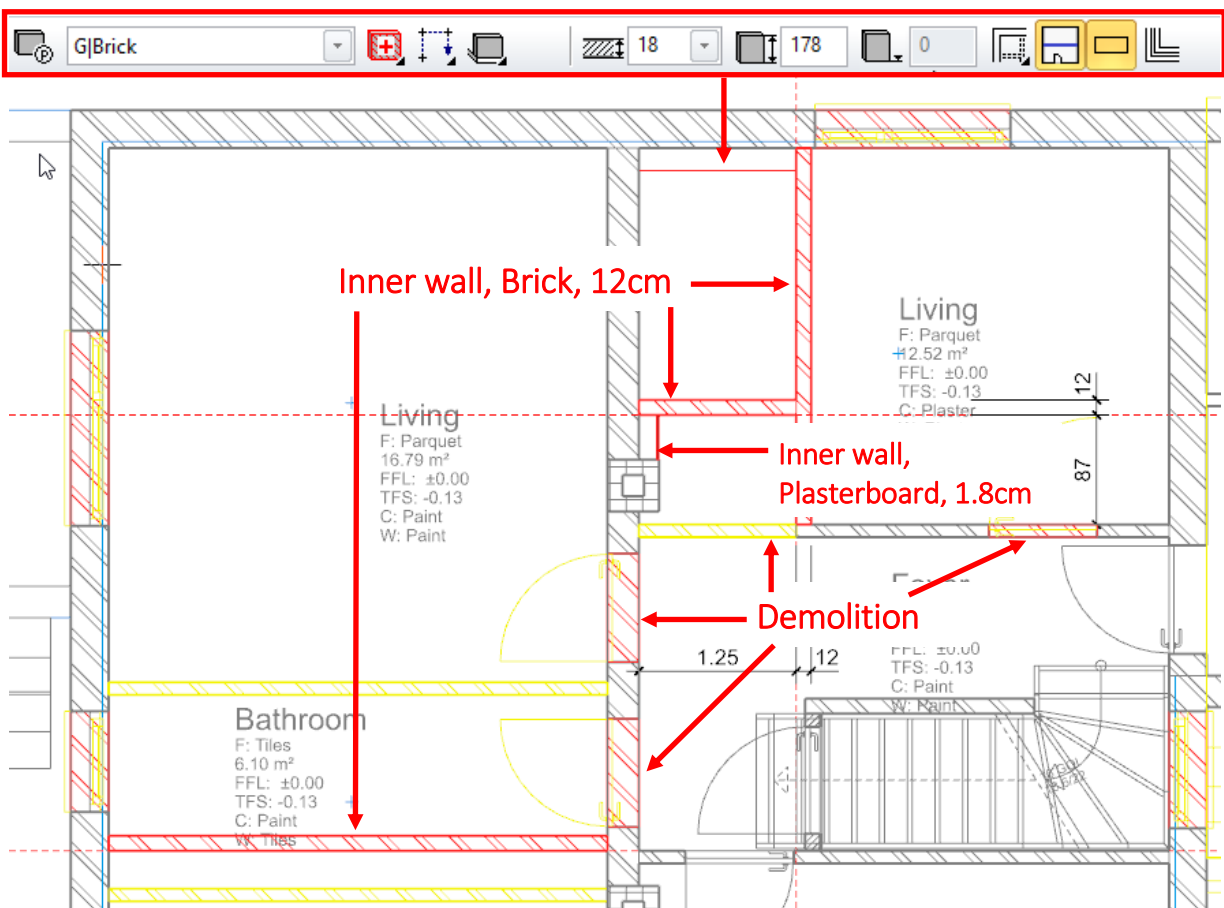
Demolish the partition wall including the door in the entrance area, as well as the two doors that lead into the kitchen:
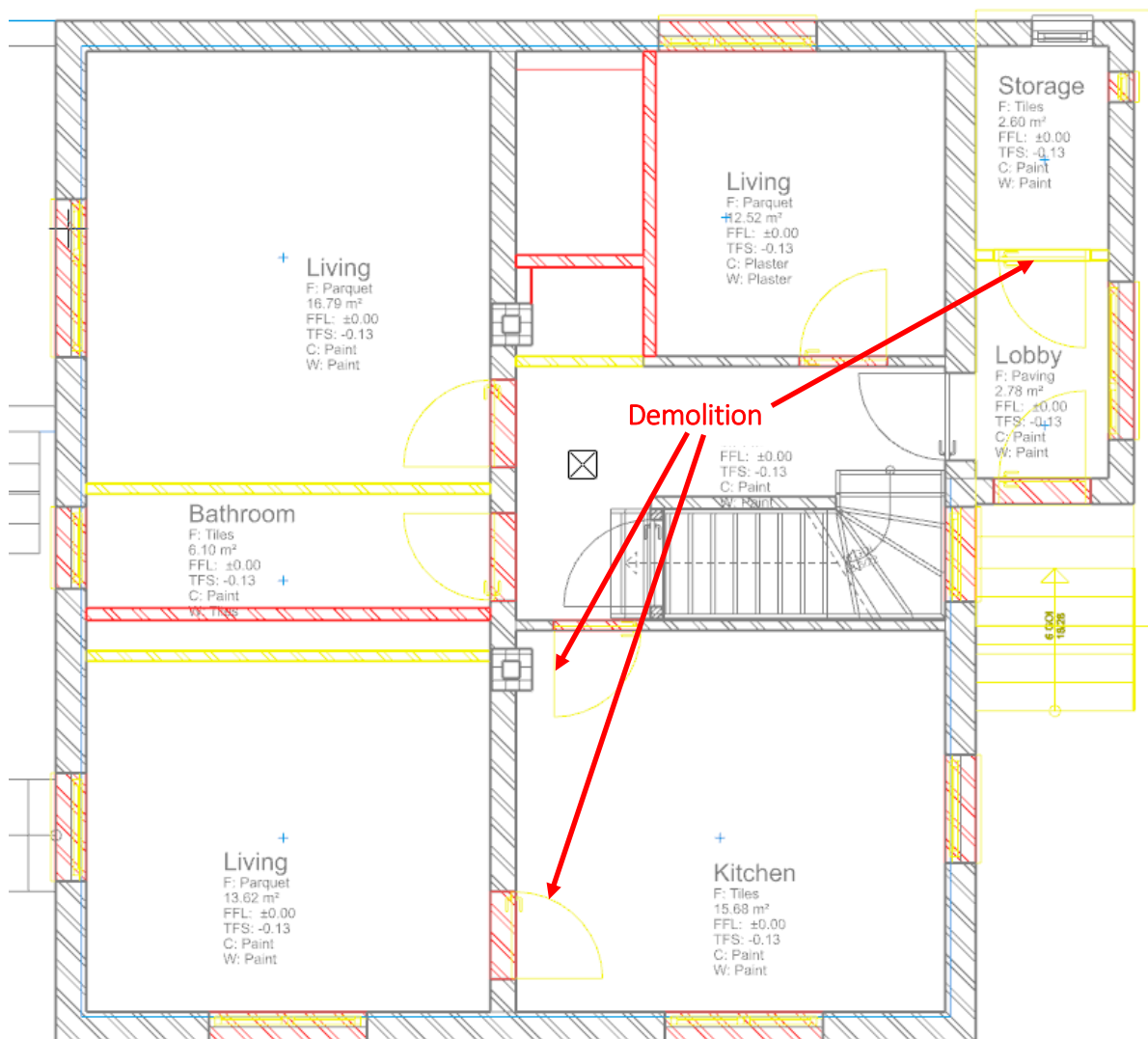
END OF WORKSHOP ▲ ▲ ▲ ▲

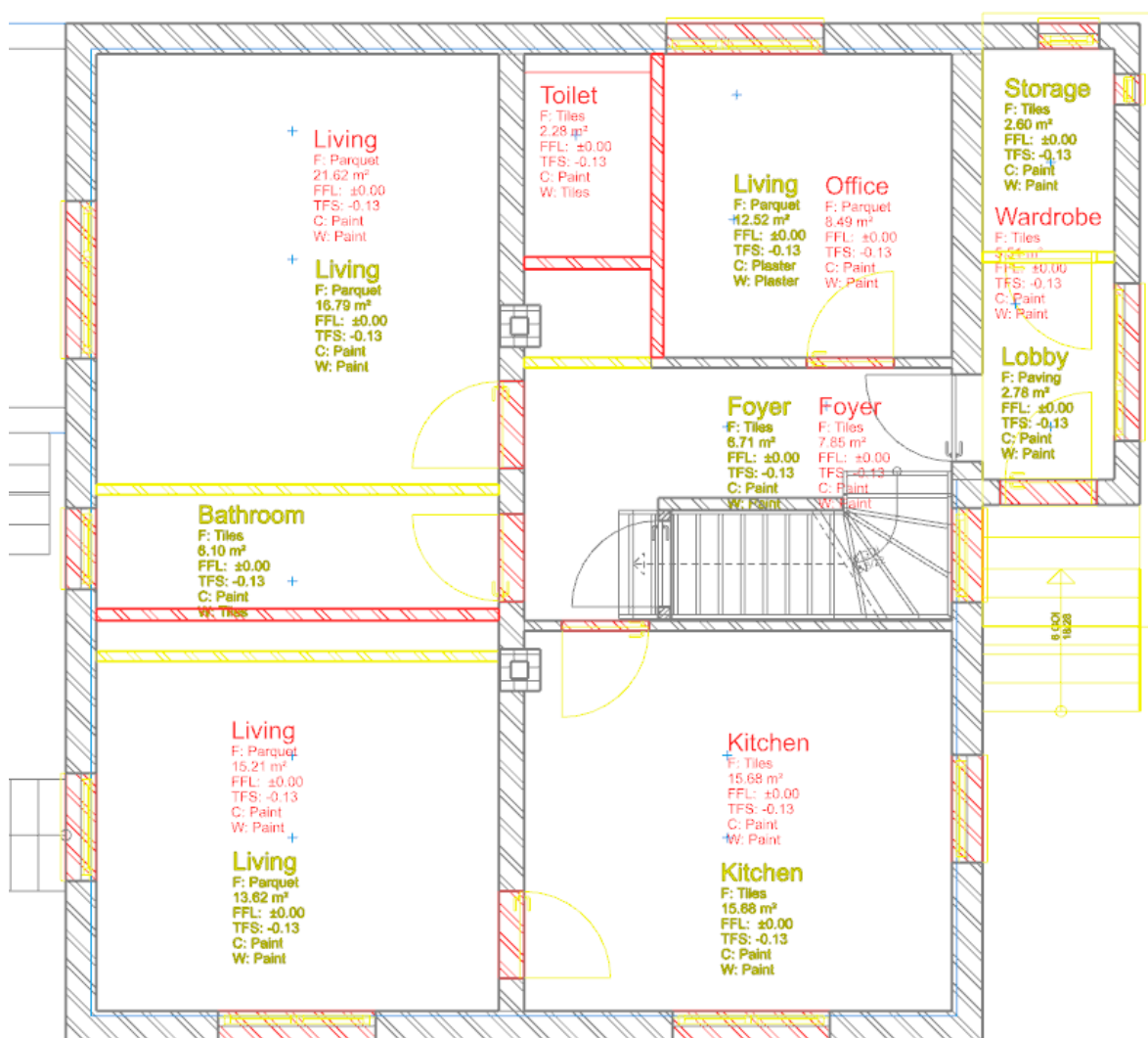▼ ▼ ▼ ▼ WORKSHOP

Modification of rooms

Automatic model update for changing or configuring rooms

The rooms themselves can also be in a state of renovation planning. A room with a certain state only interacts with meaningfully suitable walls, e.g. a demolition room with existing and demolished walls, a new construction room with existing and new walls. Changing walls also has an impact on the room. Rooms can be divided or merged. As a result, the demolition area

and the new building area can partly be in the same position. However, this is not a problem because these two rooms have no influence on each other.

Now set all the rooms to *Demolition* and, using *New construction*, set the new rooms that correspond to your new floor plan. It is best to take over the parameters of an existing room and change the state to *New construction* and, if necessary, the flooring before setting. Use laminate for the living rooms and kitchen, and tiles for the new toilet, foyer and wardrobe. If necessary, move the *Demolition* room stamp to make room for the *New construction* room stamp.

Note that the newly build rooms ignore the demolition rooms and vice versa. Both, however, pay attention to the existing construction:


END OF WORKSHOP ▲ ▲ ▲ ▲

Independence of the filling objects

Wall openings

If you set a wall opening - a window, a door or an empty opening - with the state *Demolition* or *New construction* in an existing wall, the opening is automatically filled with a piece of wall of the other state. So if you tear out a window, its opening will be "bricked up" and if you add a new window, a piece of wall must first be removed.

These filling objects can be influenced. You can switch the automatic creation of the fill objects on or off:
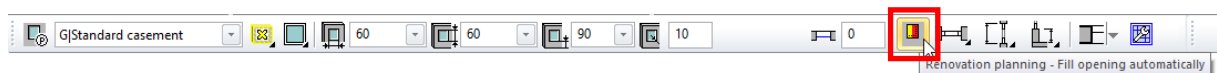
Please be sure that you also have the display of the respective renovation state activated in order have the result displayed.
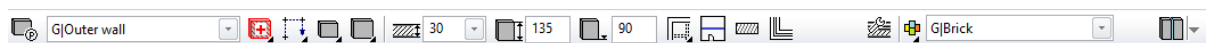
If a filling object is created automatically, it cannot be edited because it is always automatically adapted to the wall as well as to the position and size of the opening . Therefore, when selecting the filling object, its parameters are greyed out and inactive:

In order to edit it, it is uncoupled from its wall opening with the button *Renovation planning - make filling objects independent* and can now be edited as an independent wall segment.
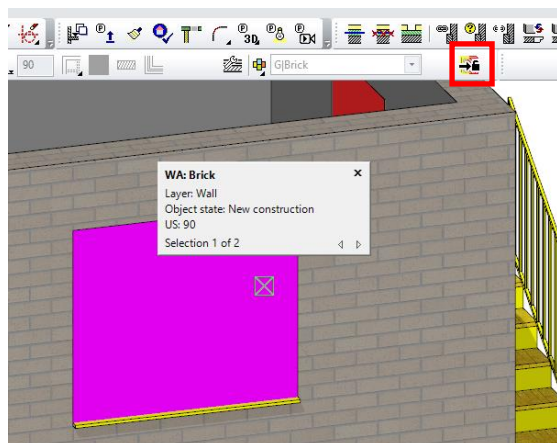
The associated filling object thus becomes a wall with free height and can be edited or deleted throughout.

However, if the option *Renovation planning - fill opening automatically* (see above) is activated again when the window or the door is selected; an automatic filling object is also generated again.
If there is still an independent filling object in the same place, it should be deleted beforehand so that there are not two overlapping objects.

Thermal renovation - thermal insulation on existing wall

In order to provide an existing wall with thermal insulation, the insulation can be drawn around the existing wall as a new wall. In order for window and door openings to run synchronously with the existing wall, these two walls must be linked.

▼ ▼ ▼ ▼ **WORKSHOP**

Modification of windows

The new windows should be set flush with the existing wall so as not to break through the future insulation level. Select the double-leaf living room window from the room adjacent to the kitchen to be demolished and apply the parameters via *Adopt parameters*.


Call up the parameters and set the window to be drawn to *New construction*. Set the depth distance to 0 and define new window sills. Since the thermal insulation will be 16cm thick, set the overhang of the outside window sill to 20cm. Activate the interior window sill and, if necessary, select other materials as you wish under *Materials*.
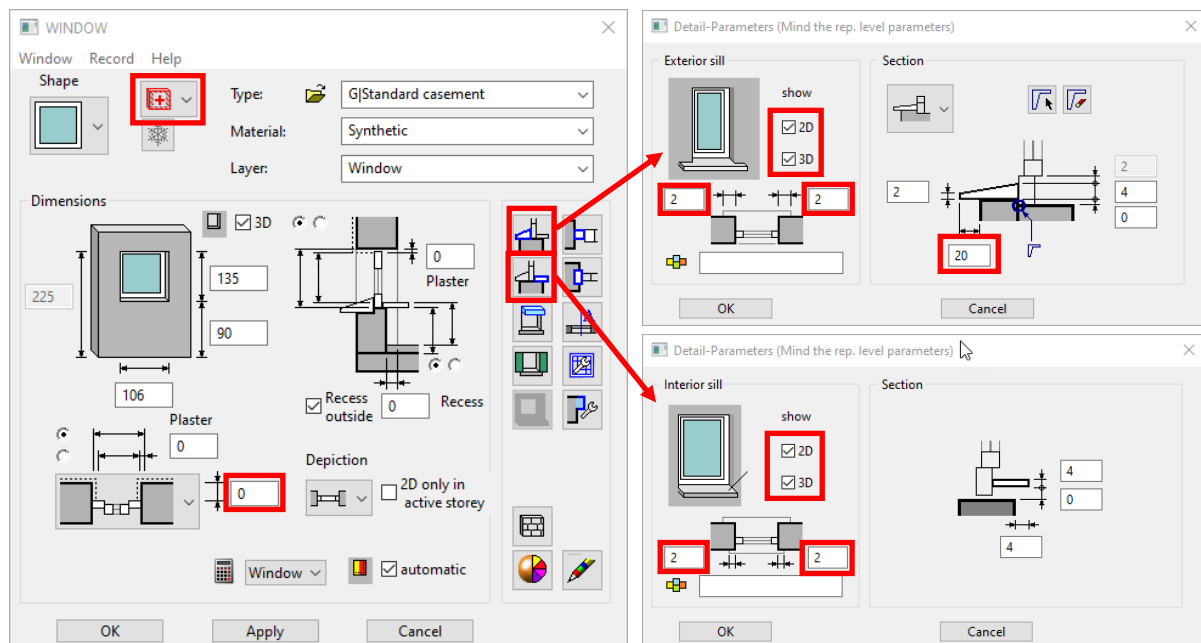

Replace the two windows in the lower wall in their original position and set the left living room window 175cm from the corner of the room. The automatic filling panels disappear where a new window will sit. In the case of the left living room window, however, there are three different zones:
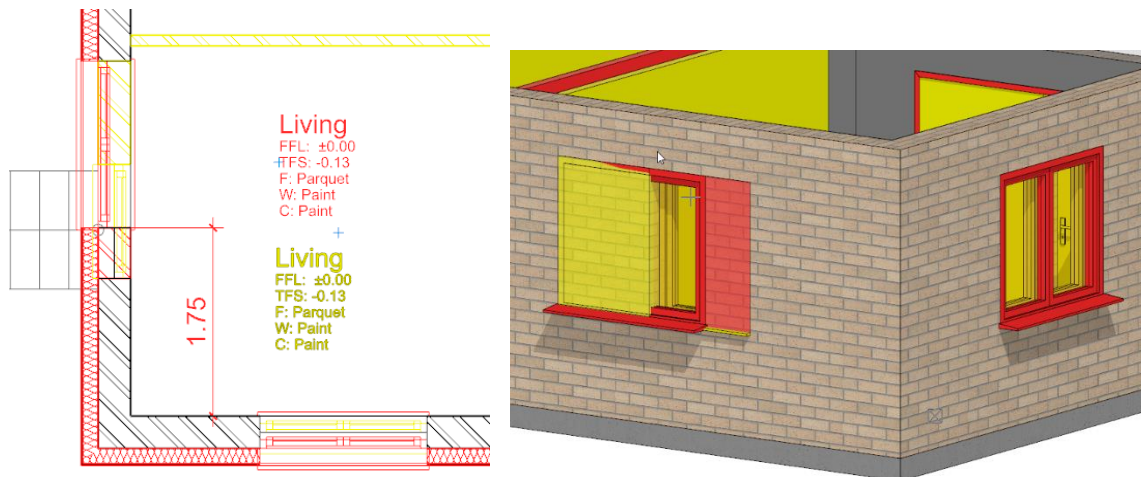
Replace the other living room window, like the windows in the lower wall before, with new windows that are in the same positions. Then place the new windows in the upper wall as indicated so that the right edge of the right window remains congruent (arrow).
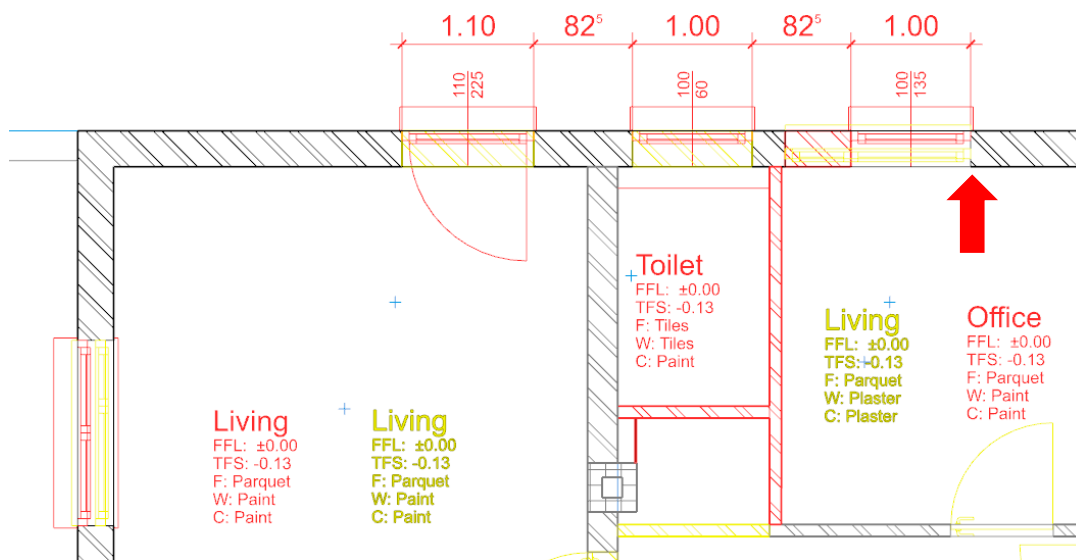
Use the same principles to reset the windows in the entrance area.
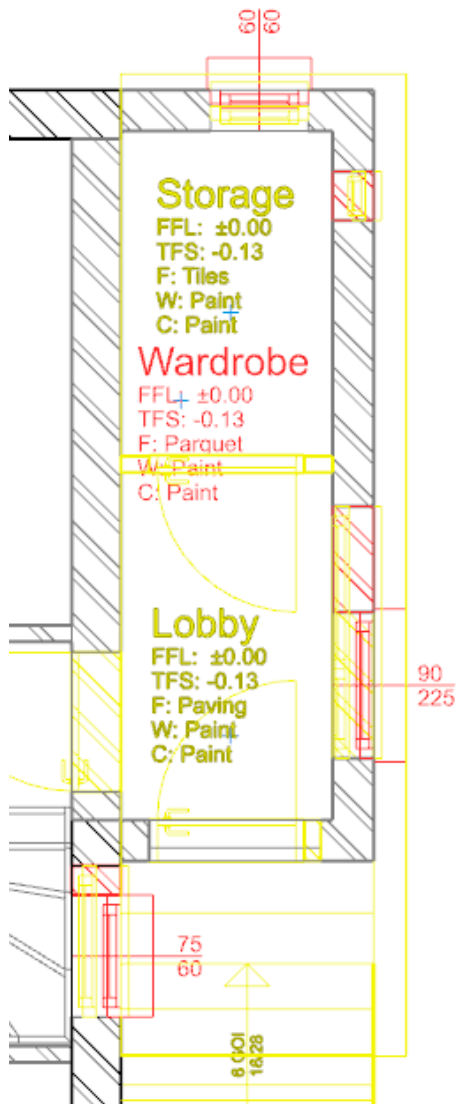
END OF WORKSHOP ▲ ▲ ▲ ▲

▼ ▼ ▼ ▼ WORKSHOP

Modification of outer wall in ground floor

Now create a new wall made of 14cm external insulation and 2cm plaster. Cover the entire ground floor with this wall. So that this new wall is treated as a single wall together with the existing wall of the openings, link these two walls together. Separate the insulation wall where the existing walls are also separated.
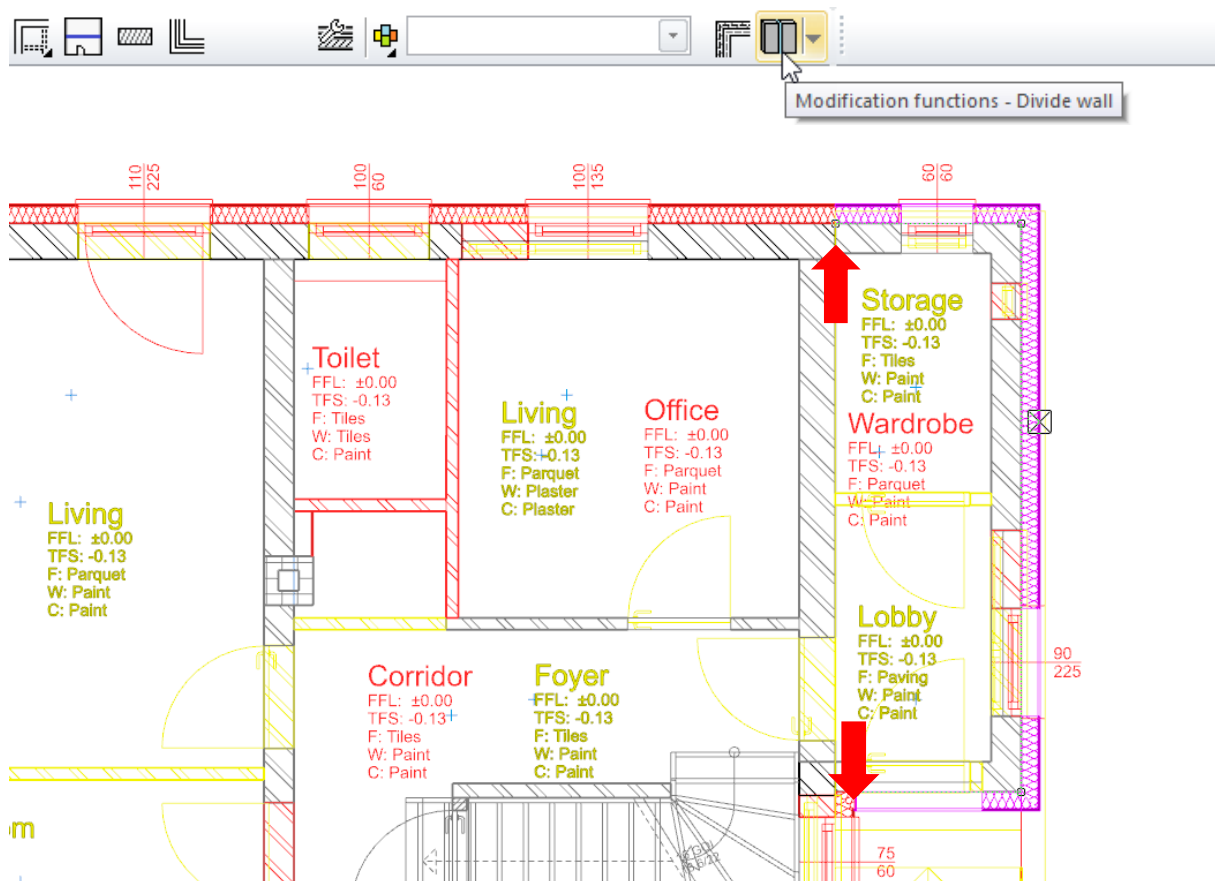
Select *Link Wall logically*, click on the existing wall, then on the insulation wall attached to the outside. Select the command again and link the other existing wall to the new insulating wall. The two walls are now treated as one. Because the insulating wall has a new construction state, only the new windows have an effect on it.
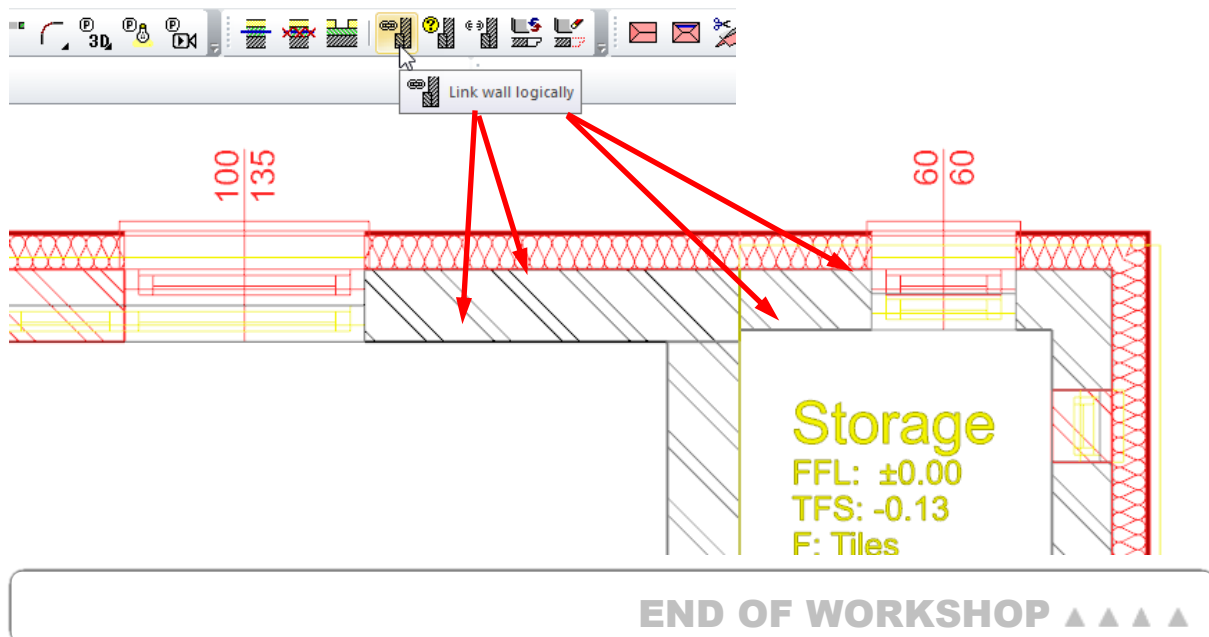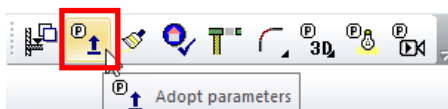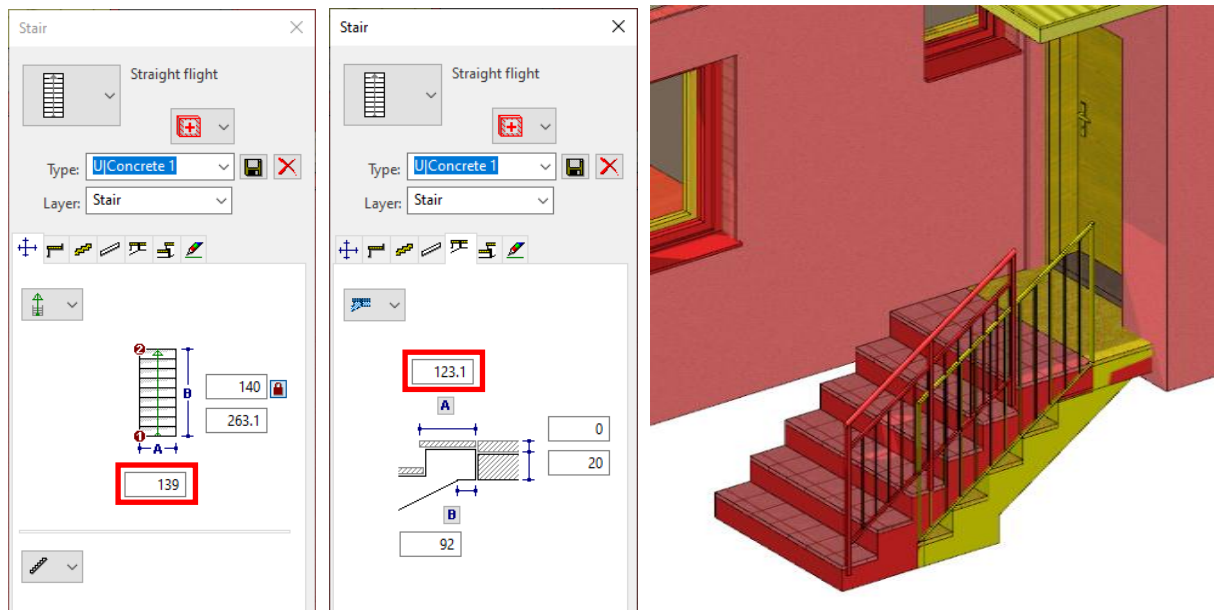

END OF WORKSHOP ▲ ▲ ▲ ▲

Modification of doors

Now put new doors for the entrance and for the interior of the house. The inner doors are essentially put in place of the old doors, but they are 5cm higher. The door to the office is changed to a sliding door, and the door between the kitchen and lower living room is replaced by a passage 180/220, which sits in the middle between the fireplace and the outside wall. Set the same opening as shown between the two living rooms.
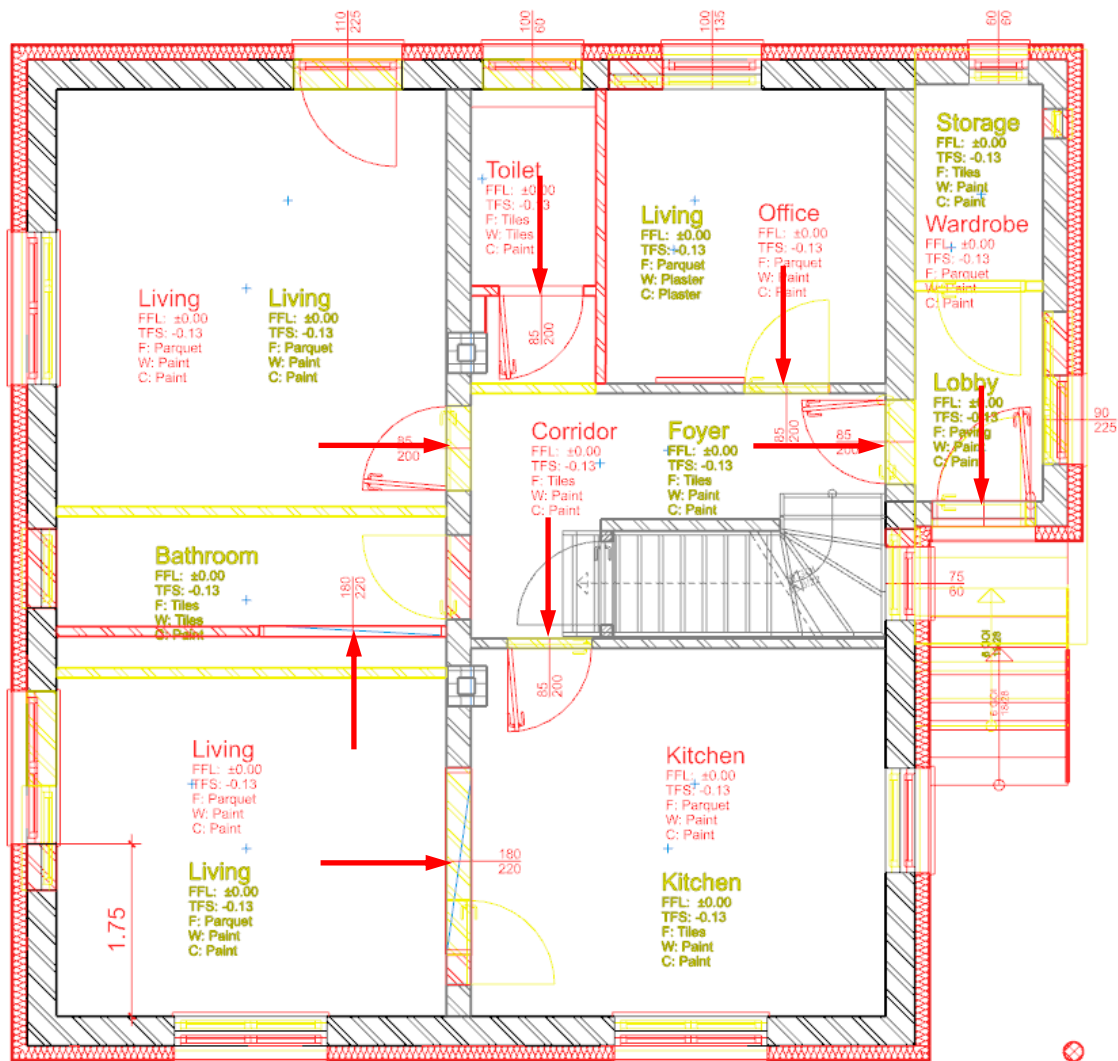
The front door will also be renewed, whereby it should be noted that the new version should sit on the insulation level. The outside access stairs are also being renewed so that they form a larger platform. To do this, record the parameters of the demolition stairs, change the conversion state to *New construction*, enlarge the upper paragraph and reduce the width by the thickness of the new insulation.


Adopt parameters

**END OF WORKSHOP ▲ ▲ ▲ ▲**

▼ ▼ ▼ ▼ WORKSHOP

Modification of outer walls and the roof

Select the upper floor and define a new outer wall based on the Outer wall template so that it corresponds to the renovated wall on the ground floor: 30cm brick, 14cm insulation and 2cm plaster.

Then pull this wall around the upper floor with the ground floor displayed so that it sits flush with the ground floor wall on the outside. For the part above the entry way, use a wall with *Height reference - to ceiling* and set the lower edge to -40cm.
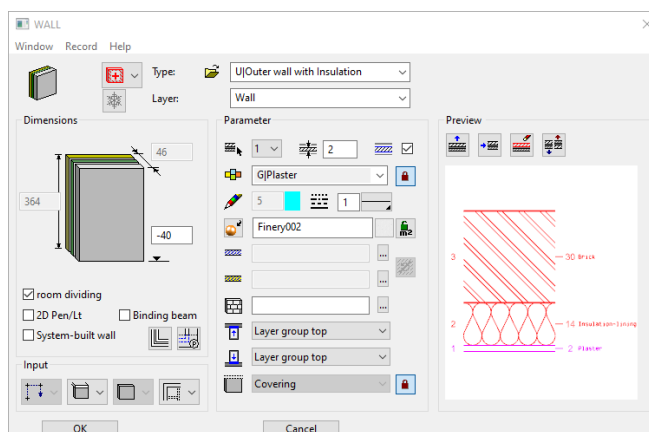

For the time being, the wall is only defined by the height that is provided in the storey settings. Show only *Existing construction* and *New construction*, mark all windows on the ground floor, except for the stairwell window and the small window at the front of the storage, and copy them to the upper floor:
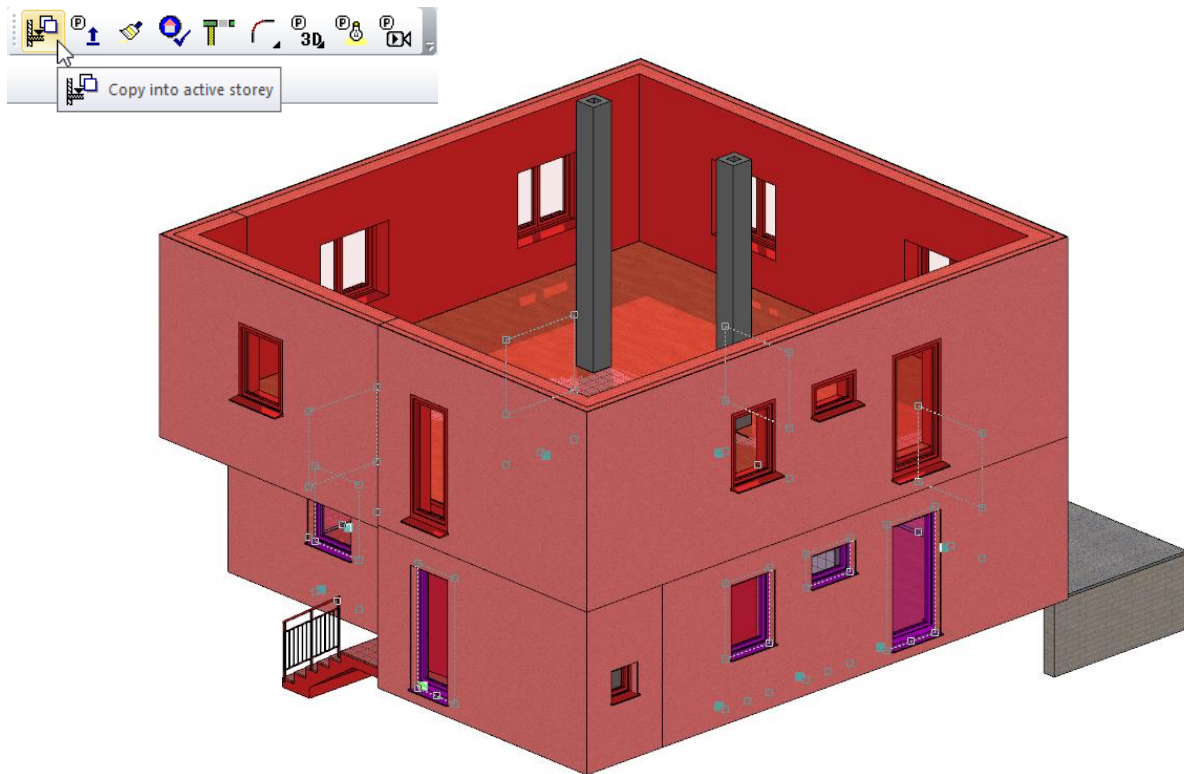
Change the windows as you like, e.g. with a higher height and additional transoms. Since you only have one wall here, you have to correct the depth of the window (+16) and the protrusion of the outer window sills (20-16 = 4). Correct these parameters for a window, build the upper floor by yourself, and transfer these two parameters to the screen with *on image*.


TIP

Walls that are limited by ceilings or roofs also only allow this if it agrees with the renovation status. If a roof marked for demolition, as in this example, a new construction wall will remain unaffected.
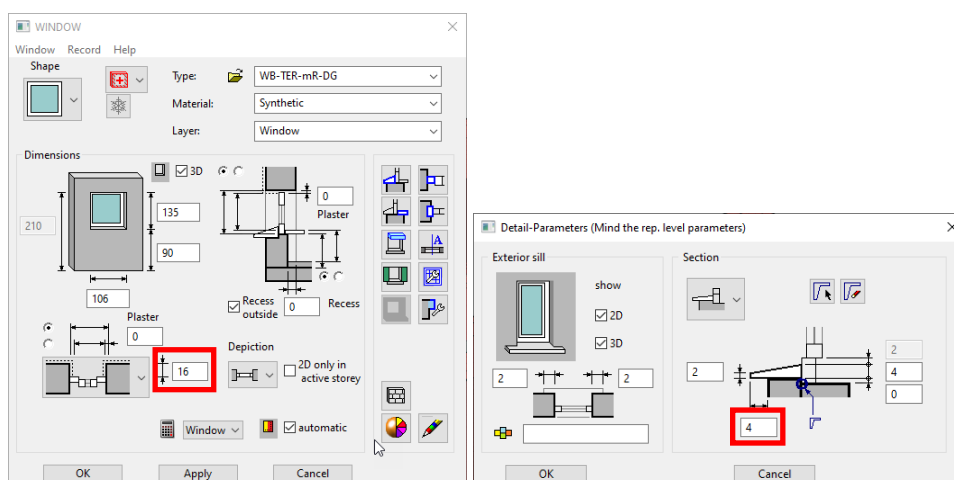

Complete the floor above the wardrobe with a floor that corresponds to the existing building's floor, but is set as a *New construction*. The floor above the entry way becomes the level floor, which is 40cm thick.
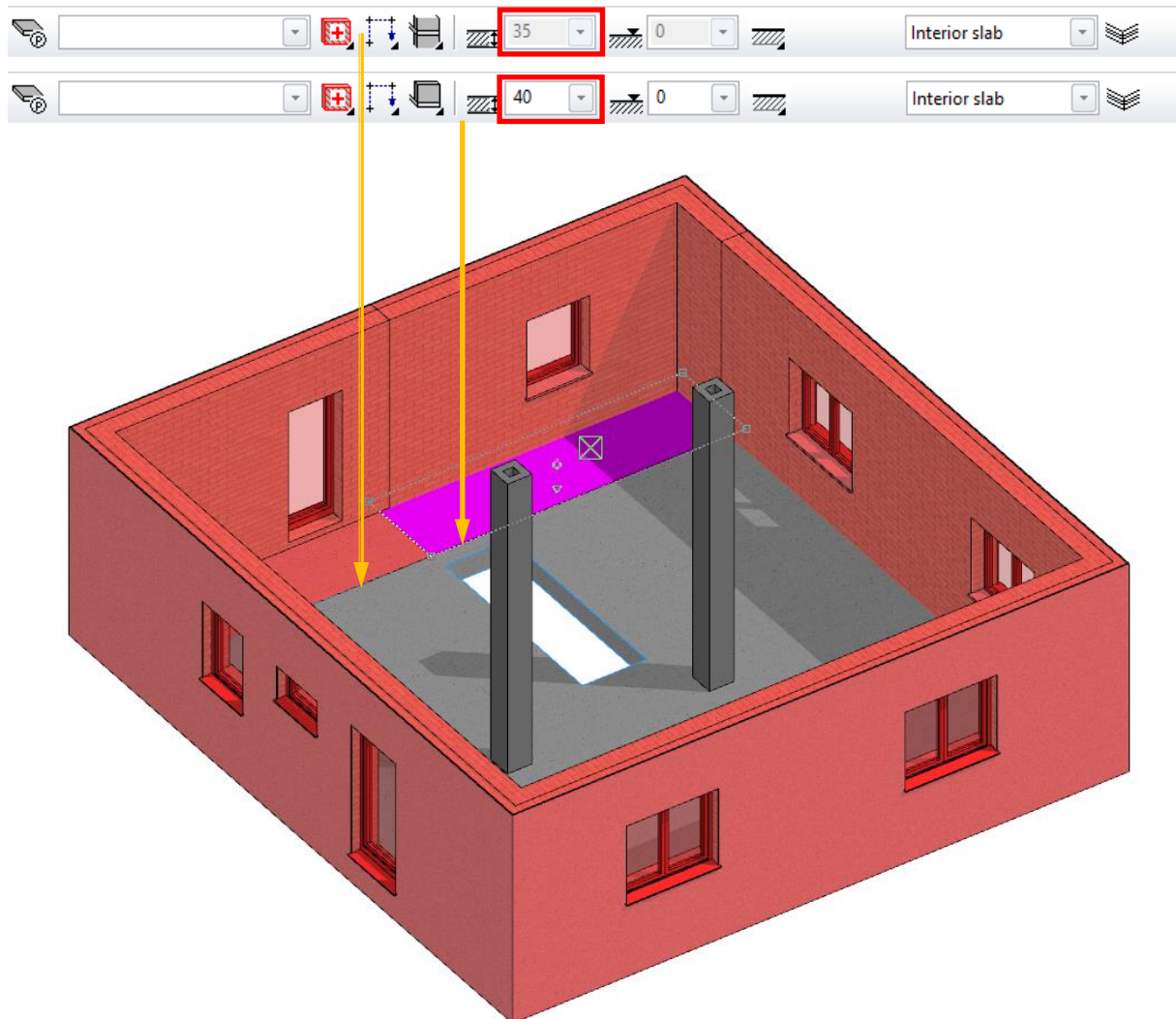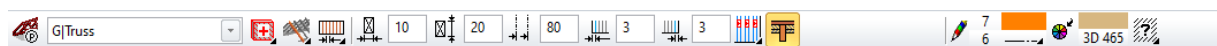
Roof:
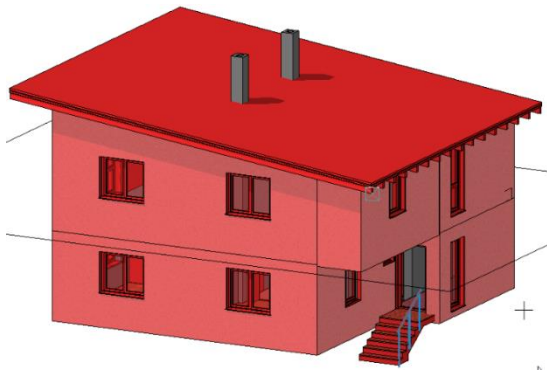
Create auxiliary lines for the shed roof: 120cm overhang on the ridge side, 66cm on the eave and 60cm on the verges. Put a roof *Sloped (Shed) roof* with an pitch of 7 ° and a height of 245 cm in the inside corner of the wall (see picture) after you have layed out the contour.
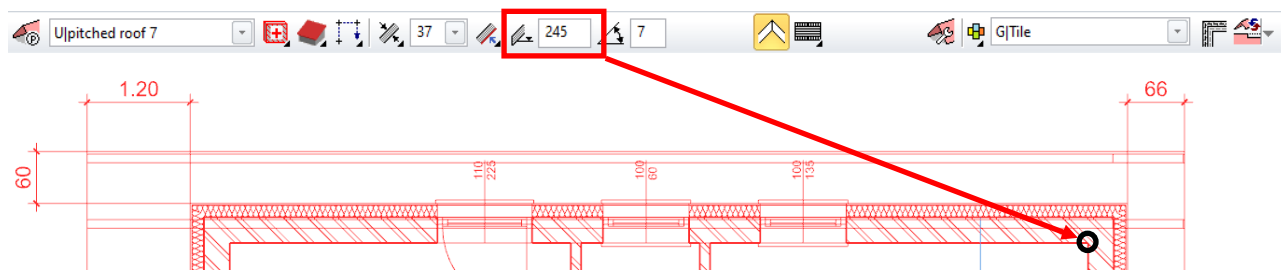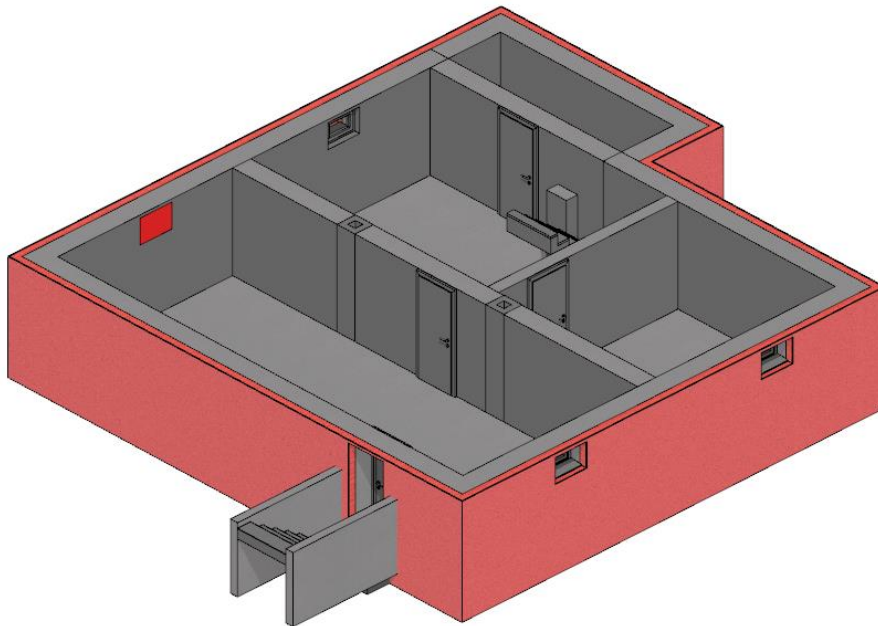

Then place the rafters with the following parameters:

Provide the upper floor with new interior walls and rooms however you like. Example:
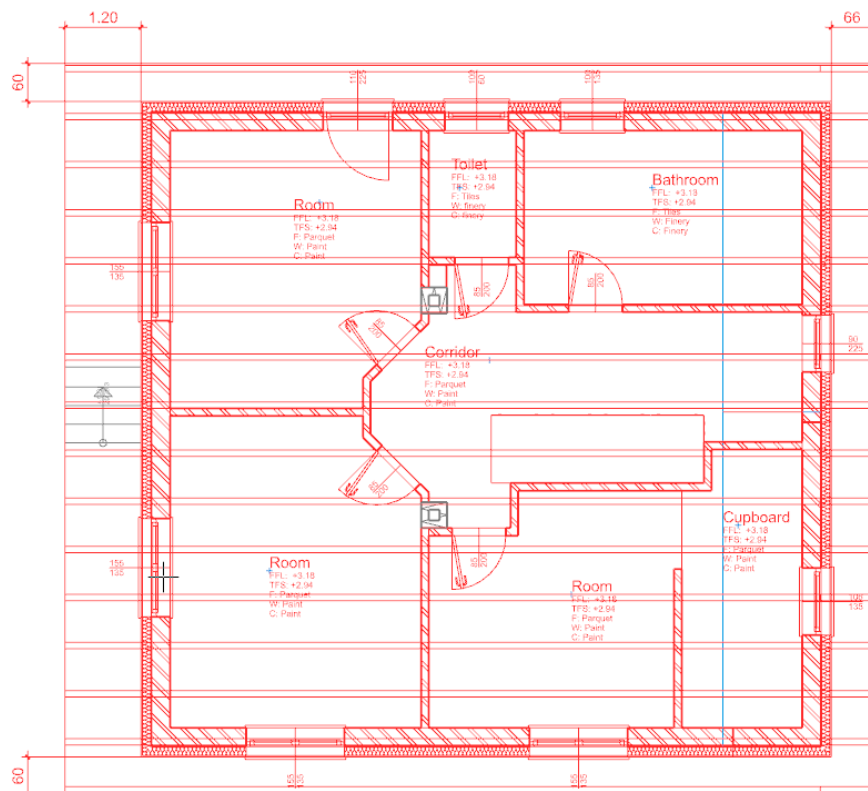
Provide the basement wall with insulation as you did the first floor wall by drawing it around the outside and then linking it to the existing basement walls.

On the ground floor, place a column with a *Height reference - to ceiling* under the corner of the converted upper floor that protrudes over the entry way. Switch the renovation planning to *No restriction*, activate the column and either drag it in 3D mode with its lower handle to the level of the entry way surface, or set its lower edge to -98cm.
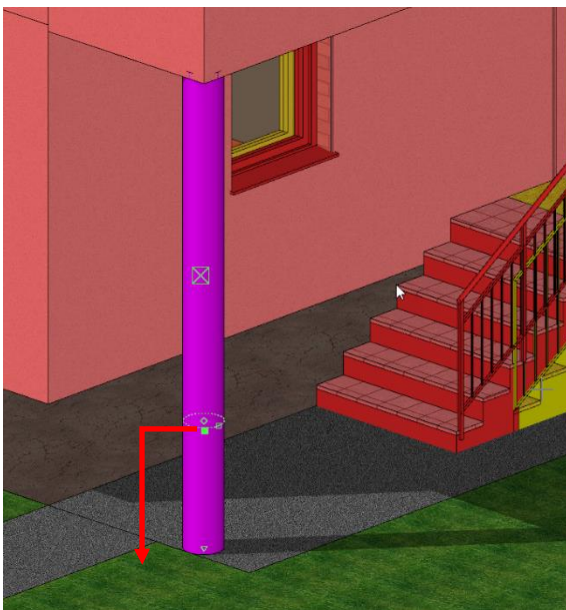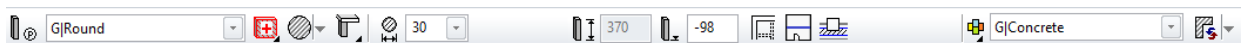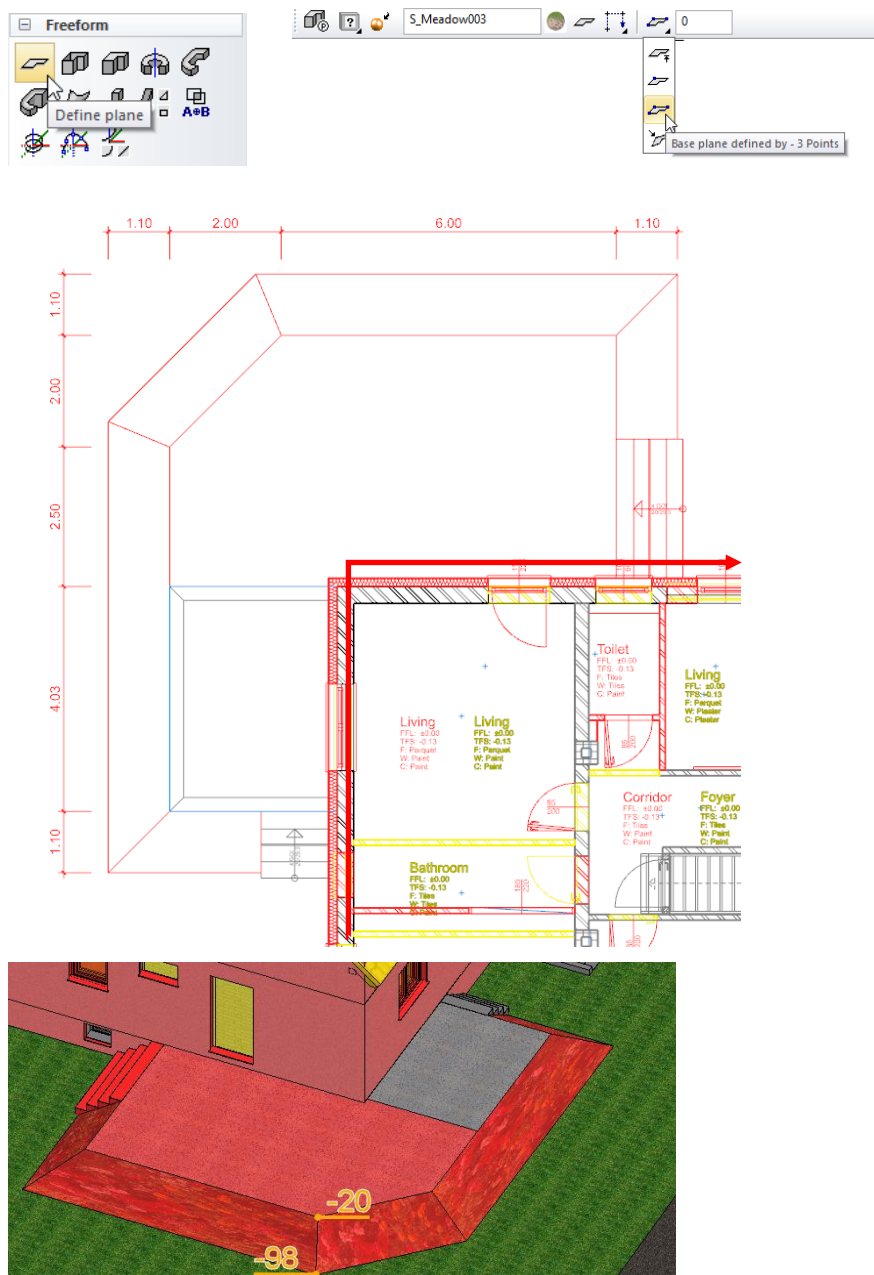

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Modification of the terrace

Extend the terrace according to the parameters of the existing terrace by placing a slab inside the polygon using the specified dimensions, copy the outside staircase to the other side, change its width and create an angled embankment so the top terrain edge is flush with the new terrace slab using *Base plane defined by – 3 points.*
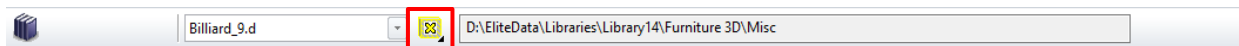
For the creation of surrounding areas, see course unit 4, Enhanced functions, chapter "Surrounding area (inclined over 3 points)", from p. 47


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Exchange of library parts from existing construction to demolition / new construction


Library parts also have renovation planning information and, like other objects, are displayed in the defined colours. The exchange of a library part can also automatically change its state, e.g. from *Existing construction* to *Demolition*, and set the new part to *New construction* during active renovation planning.

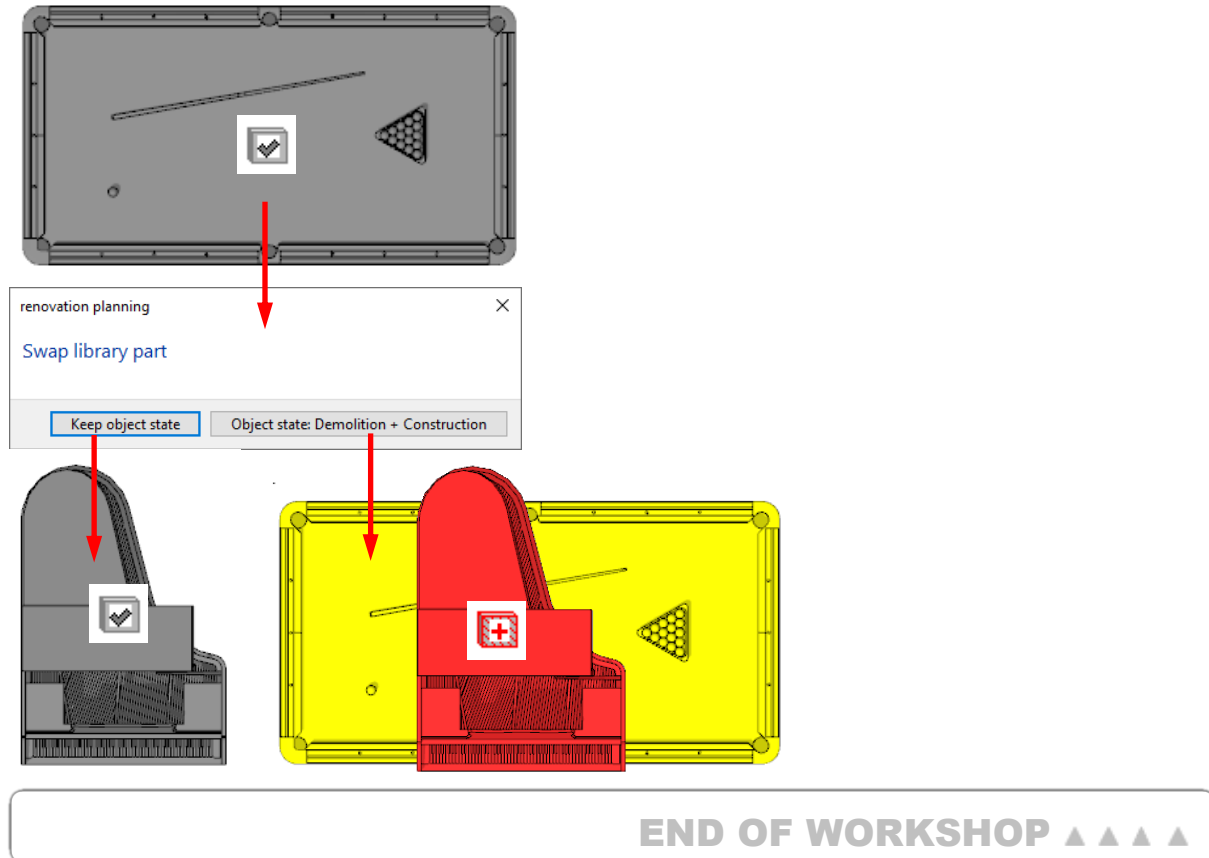For example, a grand piano should replace a pool table:
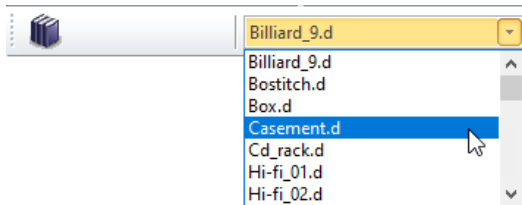
The decisive factor here is the state of the existing library part.

If the library part has the state *Unknown*, it is replaced by the new library part, which is also given the state *Unknown*.
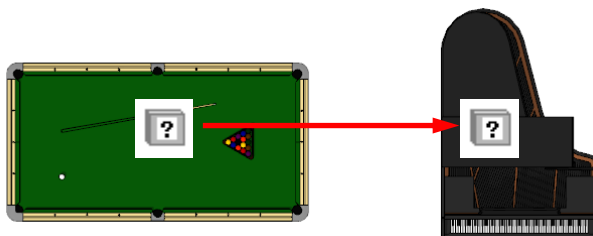
If the library part has the state *Existing construction*, you can choose whether the new object will also be *Existing construction*, or whether it will be set to *Demolition* by the exchange and the new library part will be placed above it in the state *New construction*.


renovation planning   ✕

Swap library part

| Keep object state | Object state: Demolition + Construction |

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Depiction of the results

Depiction of dimensions

The dimensioning also depends on the state of the dimensioned elements. In the case of linked walls, however, it is also important to consider which wall is selected for the opening dimension. In the example here, measurements in the *New construction* state were measured once on the existing wall with the "bricked up" window niches and once on the new building insulation wall.

Changing the state of a dimension, e.g. from *Demolition* to *New construction*, causes the dimension to be updated in real time.
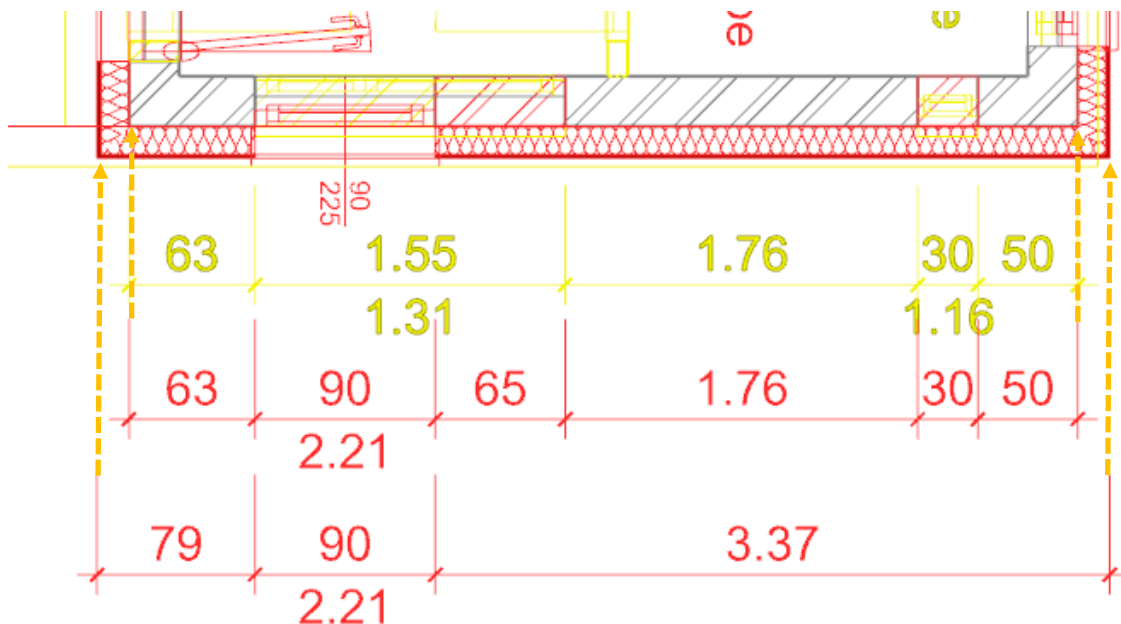
Positions of manually moved opening labels are retained

It is obvious that reconstruction plans have denser information content because several states are superimposed. This may make it necessary to move the opening labels to a different position. The changed relative position is retained when the position of windows, doors, wall openings and/or roof windows changes, but not when the geometry (width, height, etc.) is changed.

Depiction in views and sections

The renovation state is also visible in the views and sections. There are additional options under renovation planning:

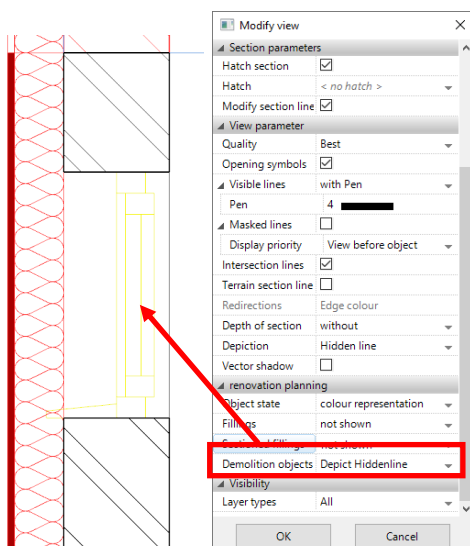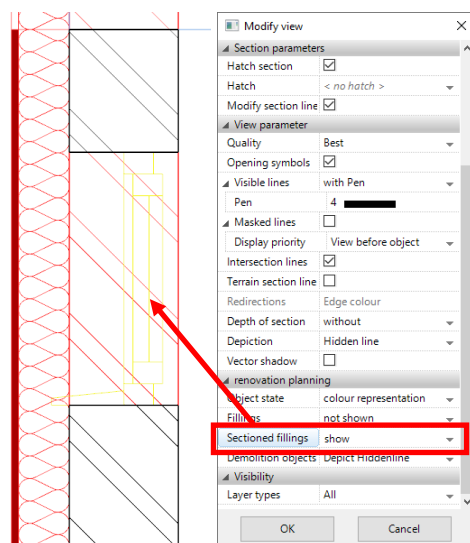## Object state > coloured visualisation / no coloured visualisation:

The line colour of the edges and hatchings corresponds to either the renovation state or the standard setting for the respective edges. Please note: This setting only applies to the edges and not to the coloured areas in the solid display.

Show / not show fill objects:

The filling objects with which demonished or newly created openings are automatically filled can be either displayed or hidden.

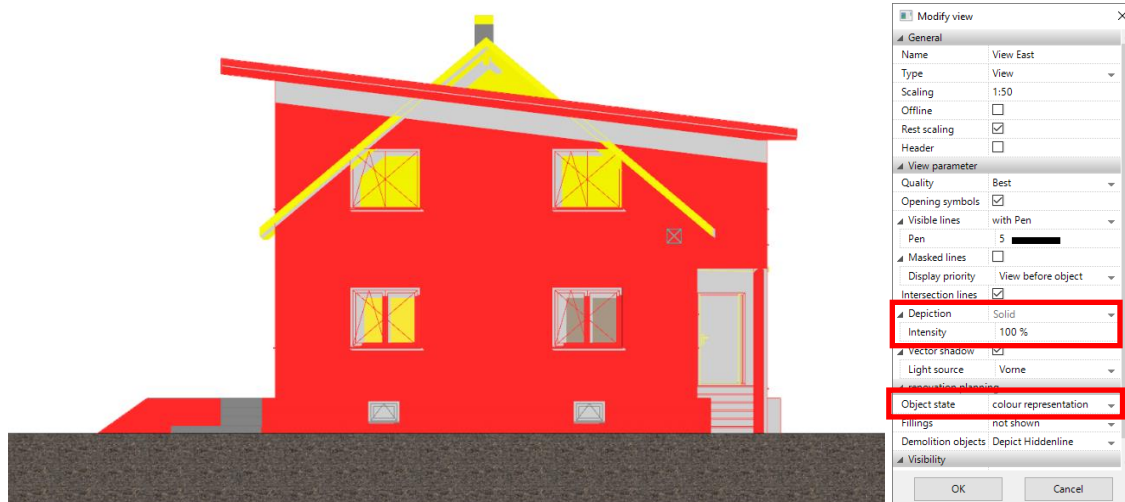## Show / not show sectioned fill objects (only in section):

The automatic fill objects are either shown or hidden in the section.
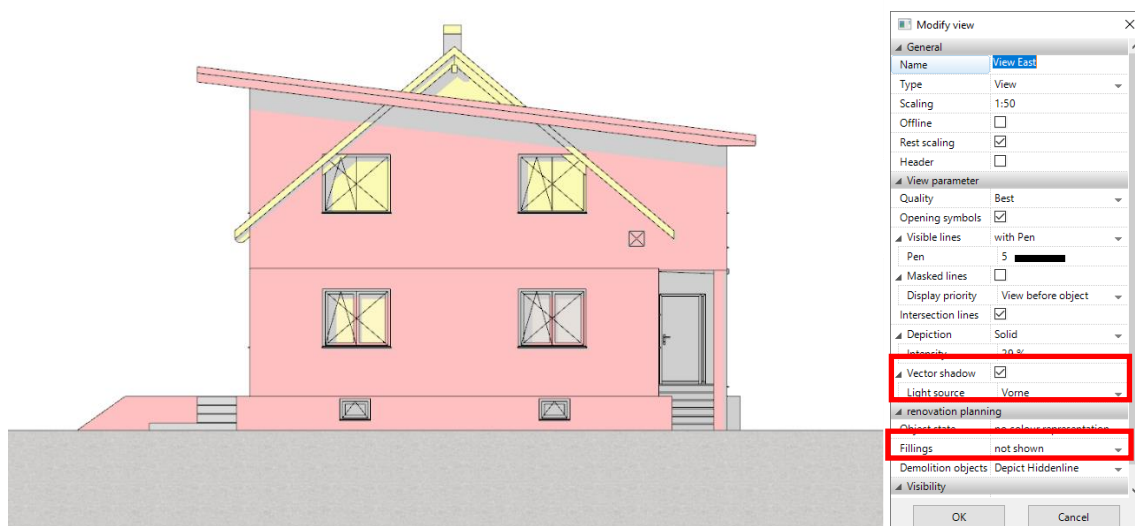See the following examples.

Depiction: Hidden line, object state: coloured visualisation:
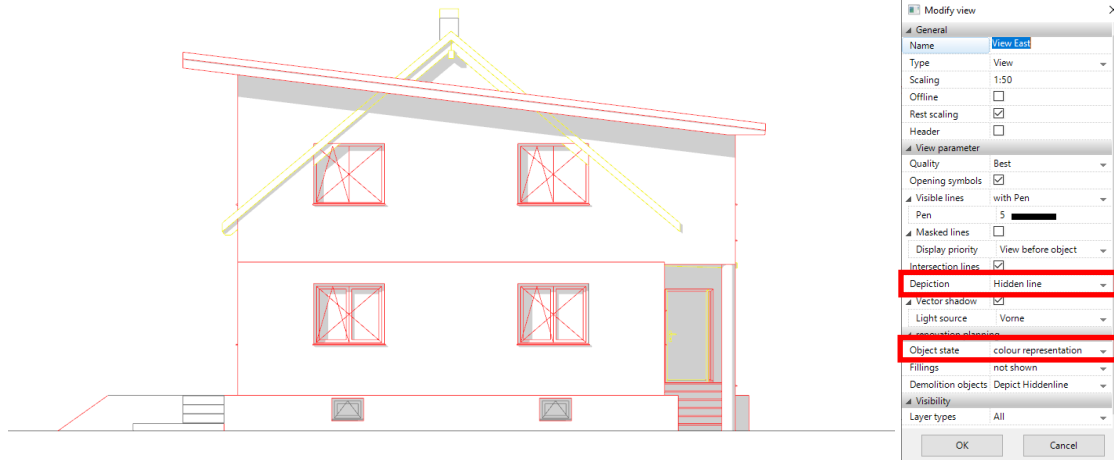
Depiction: Solid, object state: coloured visualisation:

Depiction: solid, intensity: 29% object state: no coloured visualisation:

Switch to state before/after renovation

Restore old state before renovation removes elements with the state *New construction* and updates all others to the state *Unknown.* This creates a conventional ELITECAD drawing of the building before the renovation.

Create new state after renovation removes elements with the state *Demolition* and updates all others to the state *Unknown.* This creates a conventional ELITECAD drawing of the building after the renovation.

Time states

The three time state buttons are used to visualize renovation measures in 3D views and in walking mode.

The result of the first two - *Back to the past* and *Back to the future* - corresponds by default to the state filters *Demolition and Existing construction* or *Existing construction and New Construction*. The third button restores the state before the other buttons were used.

The difference to the regular state filter lies in the animated, gentle cross fading of the states, which is especially useful in walking mode for better clarity. This transition is not visible in the pure 2D line mode.

These buttons can be configured in the SETTINGS > OPTIONS > DEPICTION > ARCHITECTURE menu. Define there which state filter the respective button should call up. Also, set the properties of the transition animation. In addition to the duration of the effect in seconds, the type of transparency calculation can be selected. *Real transparency* is of higher quality, but requires more computing power than the more fluid *Rapid Transparency*.
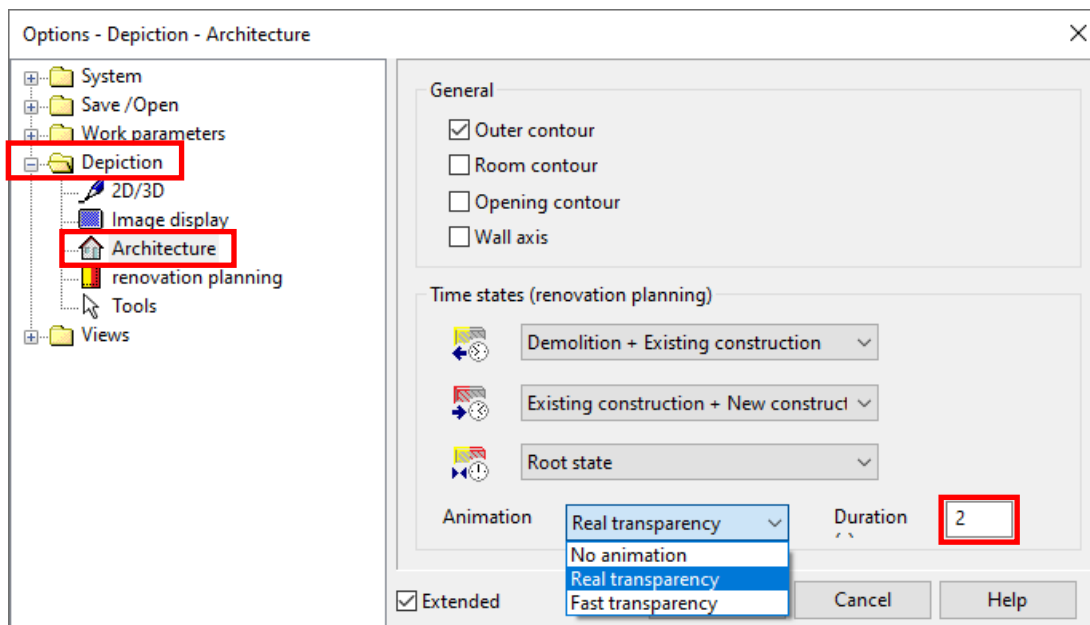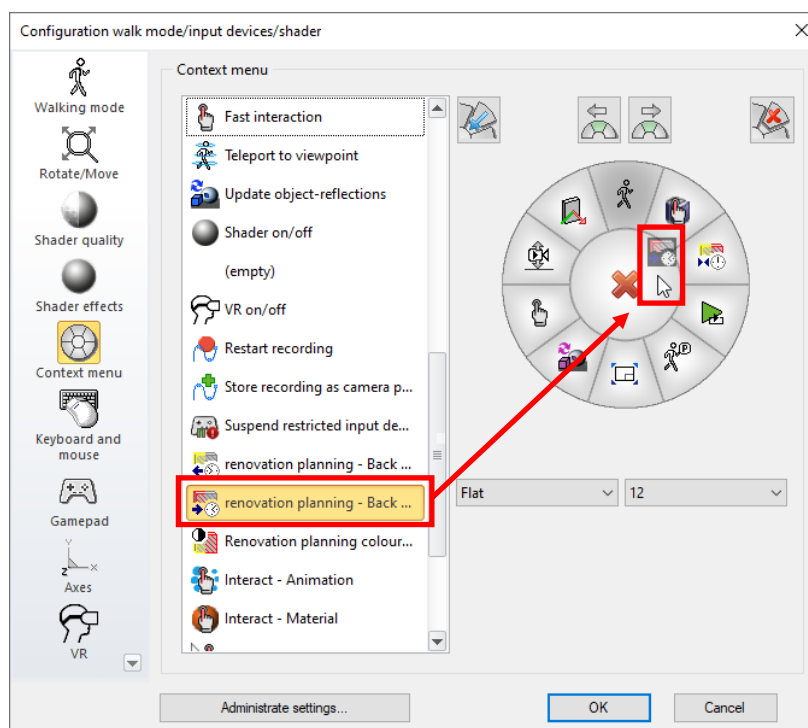
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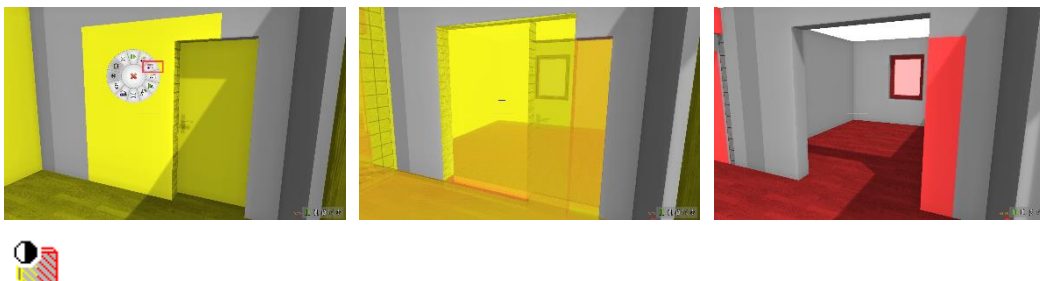
Renovation planning and visualisation

Visualisation

In the *Walking mode* settings, you can include the functions described in the previous section in the context menu and call them up while walking.
Open the configuration menu and drag the corresponding functions into the menu disk.

If you now call up the states while walking, the states and transitions are displayed as they are defined in the options (see previous chapter).
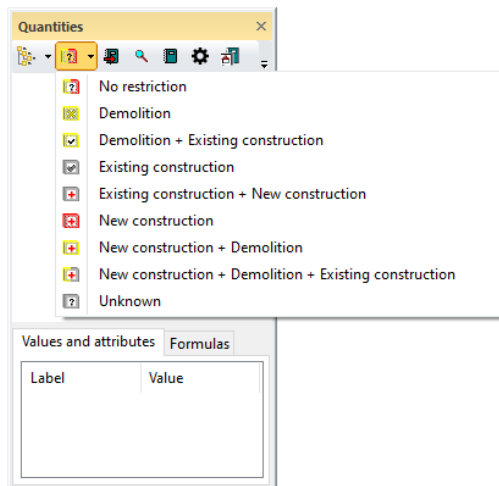

The function in the walking mode configuration *Renovation planning coloured visualisation on/off* corresponds to the shortcut [Ctrl] + J and switches between the conventional display and the renovation display.

Quantities

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Quantities of the renovation planning

Consideration of the property state

The condition of the objects is taken into account when determining the masses and quantities and is saved in the database. Quantity functions consider this state.

Filter according to object state in the Quantities manager

The Quantities manager offers great support for the analysis of the evaluated objects. The state filter enables the specific display of the renovation planning state within the manager.

Filters in reports

In the reports, the objects can be displayed separately depending on their state.

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Export

3DPDF, U3D, SketchUp

When exporting, the renovation planning information is taken into account as a separate level. This creates an additional hierarchy level for the property statuses below the storeys. The export is possible with or without colour information.
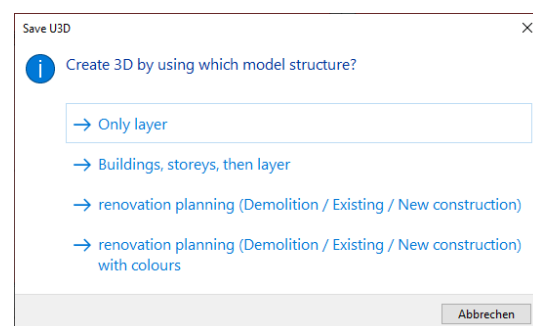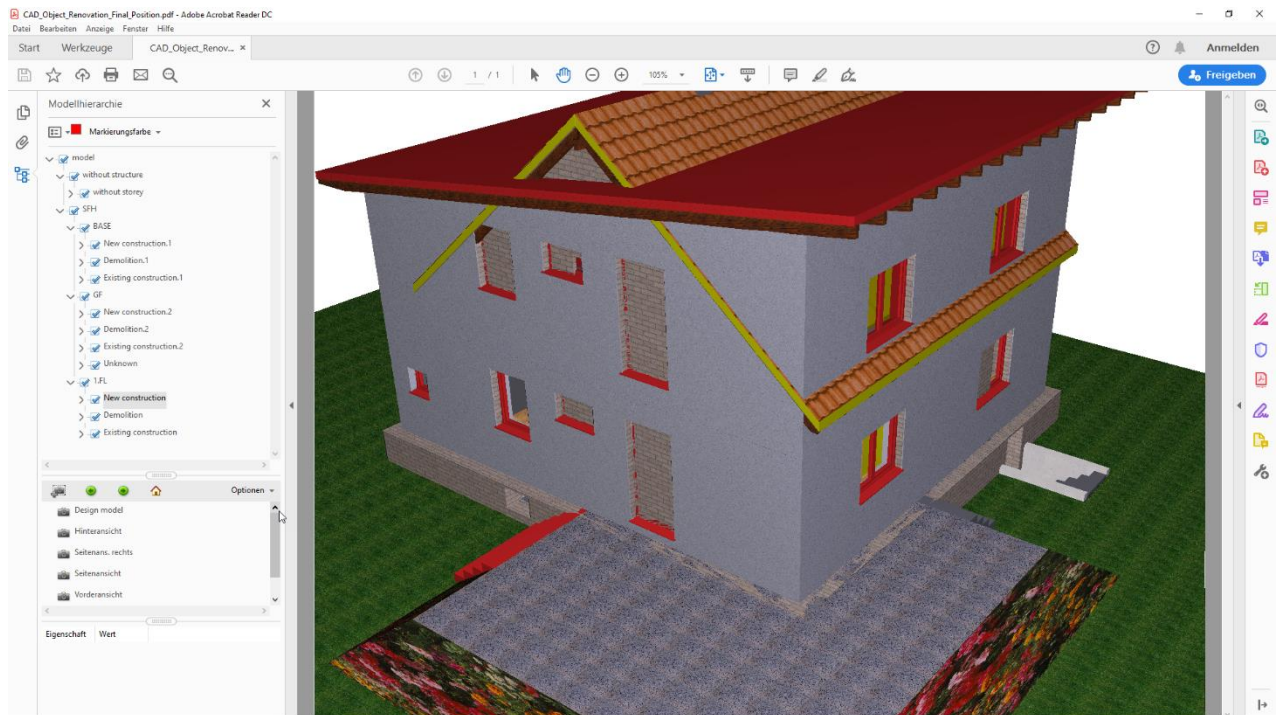
IFC

The object state is adopted during the IFC import and exported again during the IFC export.

DXF

The set formatting is used for the objects during export.
Separate layers for the renovation state are **not** created.

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