COURSE UNIT 3

Plan Creation

Table of Contents

INTRODUCTION

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 programme on a 1-to-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 programme by yourself. Each chapter provides explanations, information, and a workshop to practise the functions. To enable the workshops to be completed smoothly, the explanations should be read through very carefully. The order of chapters should not be changed because each workshop builds on the previous one.

The programme DVD contains examples stored as an ELITECAD file, enabling problematic places to be reviewed.

Conventions used in this course unit

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

▼ ▼ ▼ ▼ WORKSHOP ──────────────────────

────────────────────── WORKSHOP END

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

FUNCTIONS (BLOCK CAPITALS)

Functions can be accessed directly using icons (buttons). The functions are grouped together in toolbars or in the large tool management.
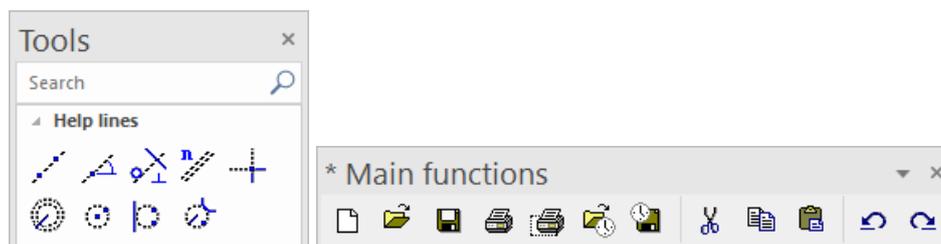
[Enter]
Function keys on the keyboard appear within square brackets.

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.

PREPARATION

In this course unit we start either with the project that you created in course unit 2 or you use our example supplied (CAD_Object2).
First, load the project.

1. Open the project settings.

Storey   ×
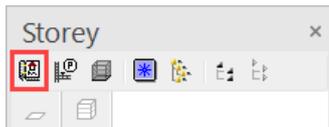
Existing model from course unit 2

Project   ×

Window   Record   Help

Project: test course

Standard: English
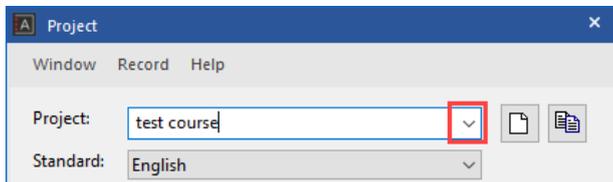
Without model from course unit 2

Project   ×

Window   Record   Help

Project: CAD_Object2

Standard: English
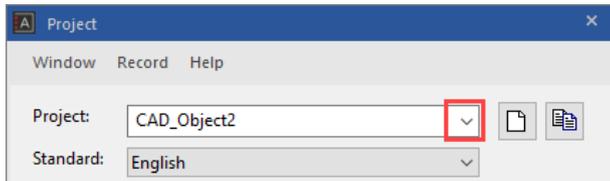
Select the relevant project and confirm with OK.

2. Load the corresponding model file with the menu FILE > OPEN.

Select the model and open it.
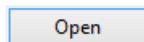
Open

The opened model should have this status.
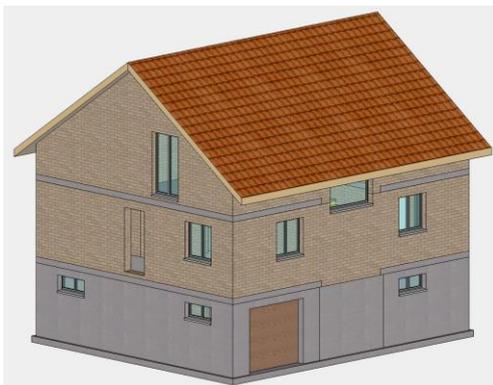
GENERATE FLOOR PLAN VIEWS

Until now you have performed all functions in the 3D model. The corresponding floor plans, views and sections can be created from the model.

▼ ▼ ▼ ▼ WORKSHOP

Generate the 2D floor plans.

1. Access views management. If the views management tab is not visible, it can be accessed using the key combination [Ctrl]+[5] or from the menu by selecting View > WINDOW > VIEWS… .
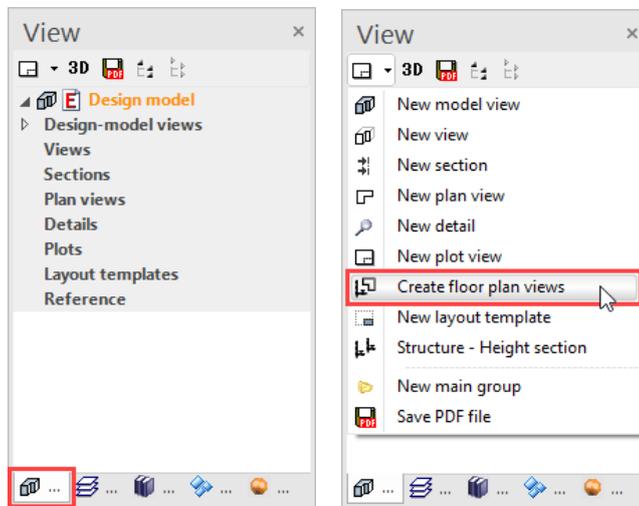
2. Create the floor plans using the function GENERATE FLOOR PLAN VIEWS.

3. The floor plans are listed under the title "Plan views".
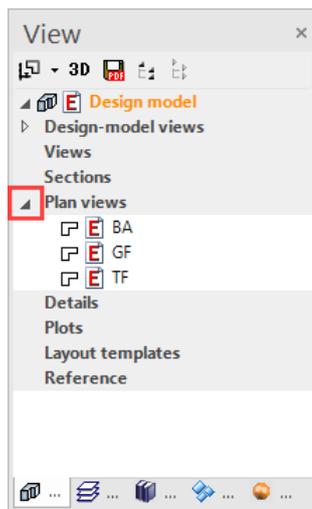
DEFINE SECTION

When defining the section, all of the relevant storeys must be visible. Storeys or individual layers can be hidden.
You can choose between simple, stepped or limited section control.

▼ ▼ ▼ ▼ WORKSHOP

Create a cross section.

1. Check whether you are currently in the model view.
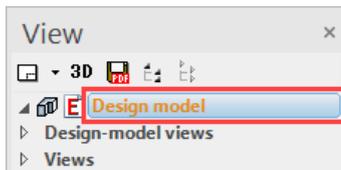
2. Use the ASSEMBLE function to assemble everything and specify the basement as active storey.
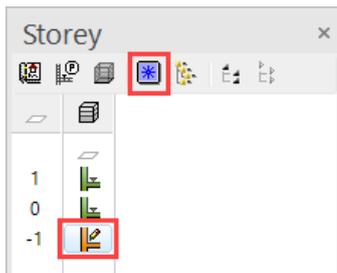
3. Create a help lines construction to set down the section line accurately.

Horizontal: Distance of **160** cm from the foundation slab on both sides
Vertical: **80** cm distance to wall in staircase
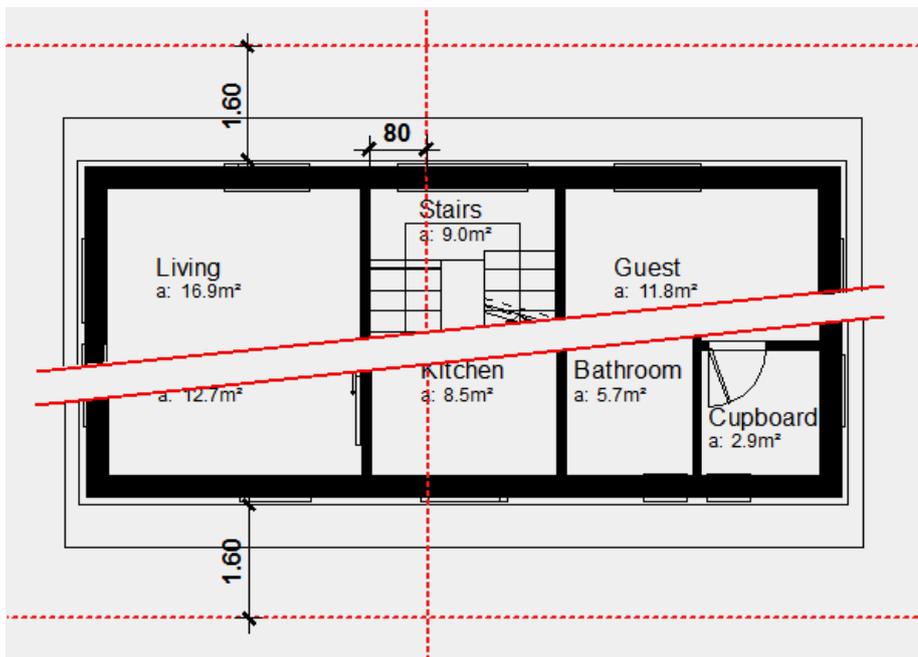
4. In views management select the function NEW SECTION.
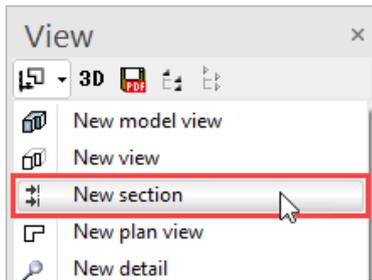
5. Enter the settings for the section.
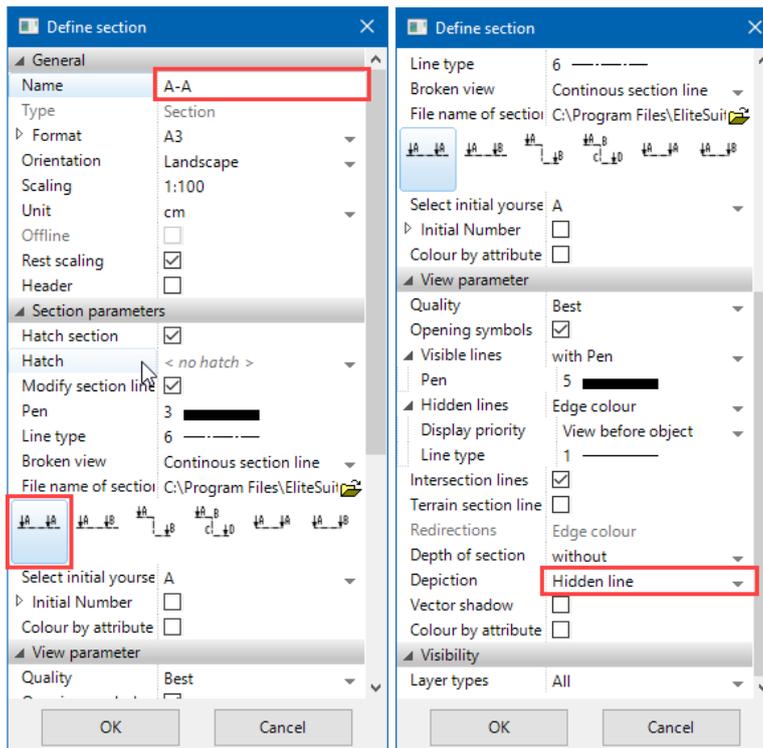
6. Specify the points **P1** and **P2** for the section control.
The last entry determines the direction of the section > **P3**.
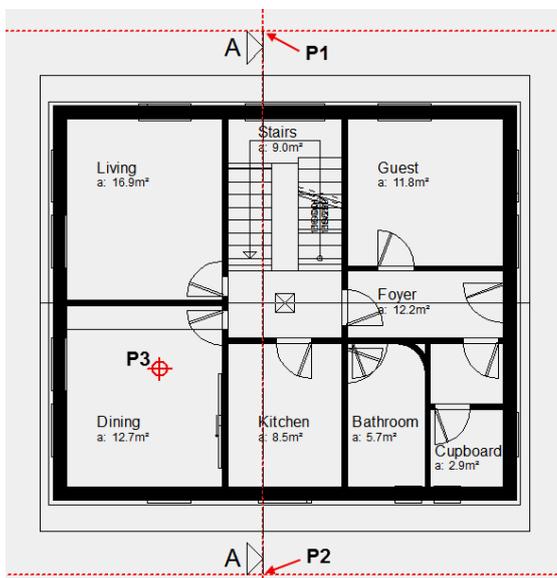
7. Delete the help lines.

The section symbol with the section line is very important for the CAD. When a section is updated the system refers back to the section line. The section line can be moved in the model to be able to respond to a change in the floor plan. What you must not do is delete the section line from the plan since otherwise the section view will no longer have a reference to the model.

The section line should be displayed as a dotted line:

8. Select section line

9. In the properties bar select the option *Broken section line*.

10. Cancel the function.

The section line is only in the current storey; copy the symbol to the upper storeys.

11. Select the section line.

12. Specify the ground floor as "current".
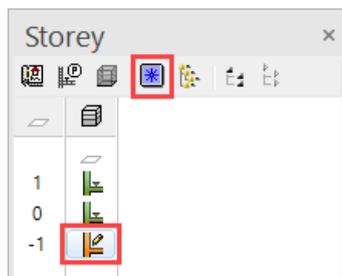
13. Start the function COPY TO CURRENT STOREY.

14. Confirm the following three dialogue windows with YES
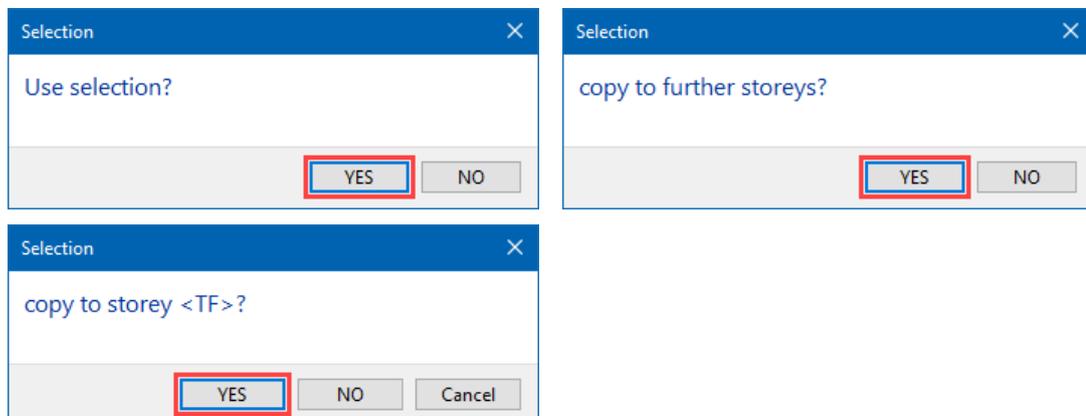
The section symbol is now located in all 3 storeys.

15. In views management select the section *A-A*.
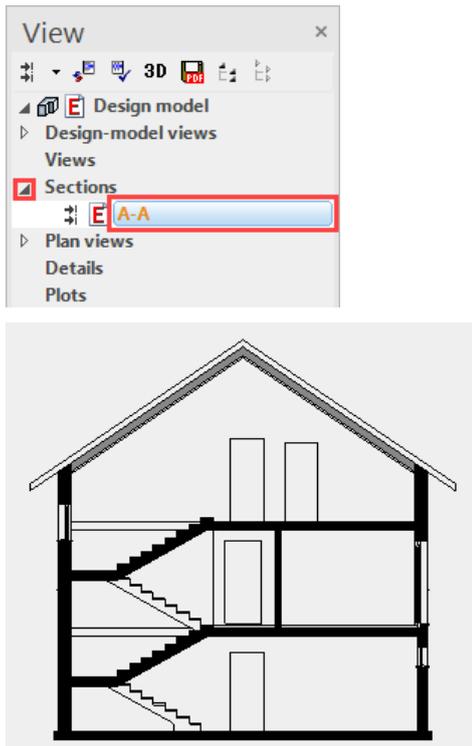
The finished floor is not displayed in the basement and top floor because on these floors the rooms have not yet been labelled.

WORKSHOP END

TIP

If you right-click on a title or a view in views management, subfunctions appear.
The function DELETE VIEW deletes the view visible on the screen.
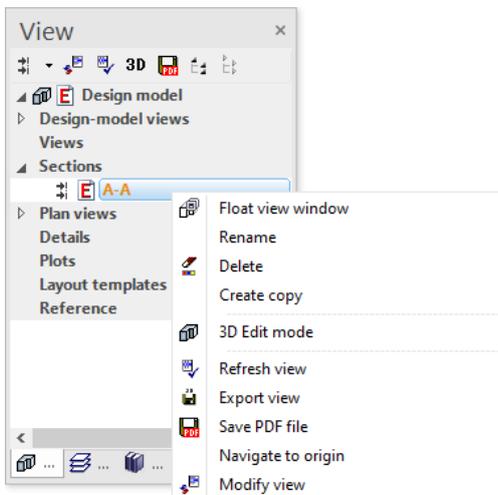
DEFINE VIEW

A view is generated from the model or from a model view. The current 3D view angle on the model is represented as a hidden line (visible lines) in 2D form in a view.

▼ ▼ ▼ ▼   WORKSHOP ──────────────────────────────────

Generate a south and a west view.

1. Standard model views are available which automatically rotate the model into the correct position so that the façade views can be rendered.
In views management, select *Front view* from among the model views.
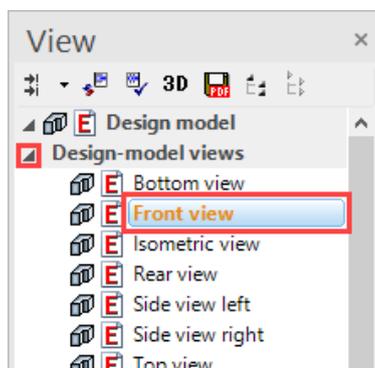
2. In views management select the function NEW VIEW.
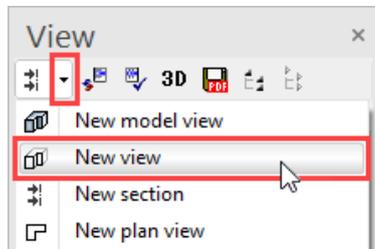
3. Label the view **South** and make the rest of the settings.
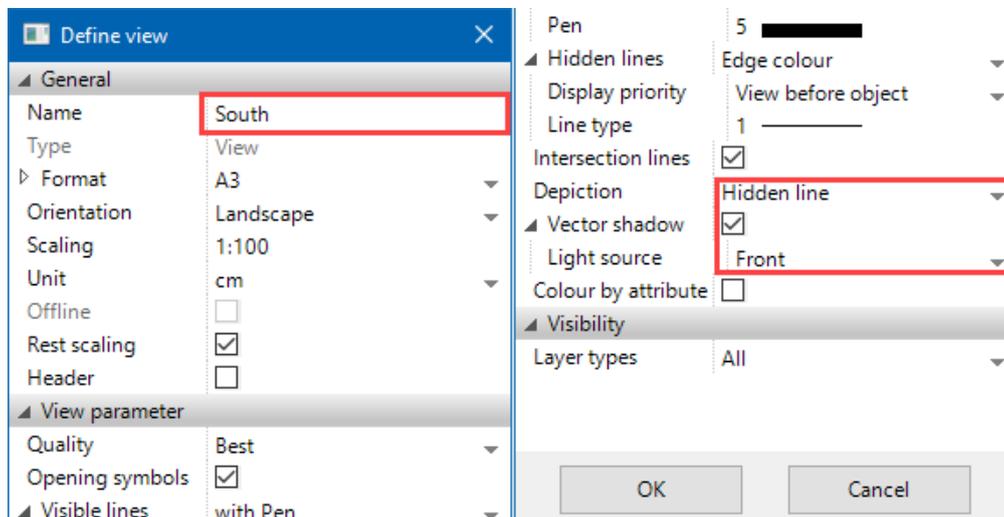
The view will be calculated.

4. Generate the west view.

In views management under model views select the side view left and define a new view with the name **West**. For the vector shadow use the light source *Side left*.
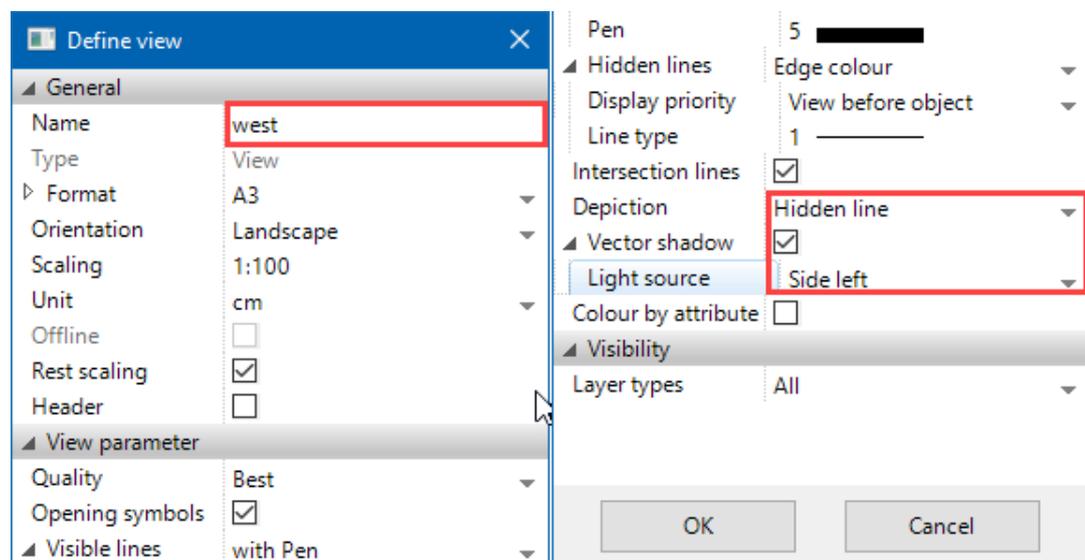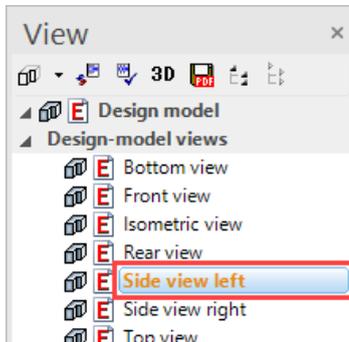
5. The two generated views are listed under the views. **South view**   **West view**
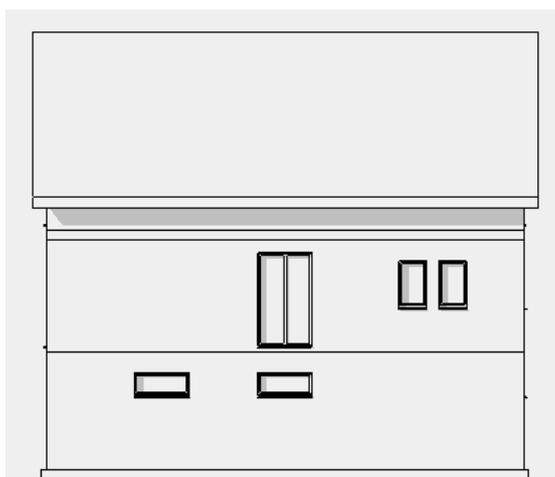
If the option *Opening symbols* is activated in views, these symbols will be displayed in the view.

WORKSHOP END

EDIT SECTION

The section view is purely a 2D plan. Lines or segments can be deleted without hesitation in this view. Pen and line types can be modified.

A section view is uncoupled from the model until you adapt it to the latest version of the model using the UPDATE VIEW function.

Any newly added lines, dimensionings, trees, etc. are retained. If lines are modified or deleted, a "Deletion line" is automatically generated which hides the original line. The "Deletion lines" automatically create a separate layer.

▼ ▼ ▼ ▼ **WORKSHOP**

1. First, load the section onto the screen.
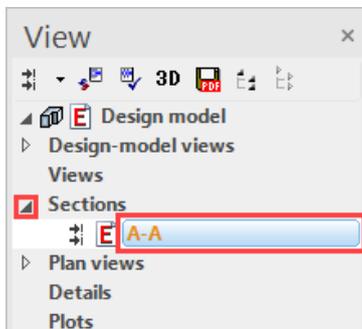
2. Delete the view lines of the concrete ceilings in the staircase using the function DELETE ELEMENT.

Delete the red lines.
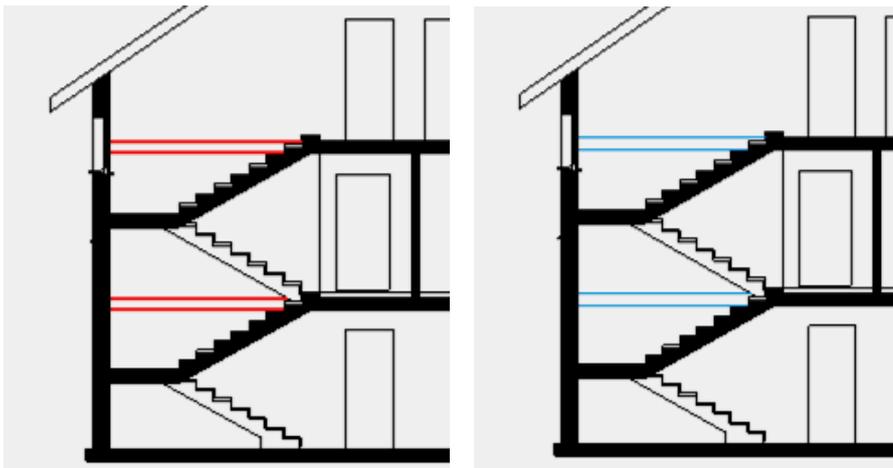
EXPLANATION

In place of the black line, the programme generates a blue deletion line that is not printed. The deletion lines should not be deleted because they automatically delete the view lines when the section is updated.

3. Add a light shaft and the terrain lines to the surroundings.
Use the help lines for the preliminary sketch and do not forget to set the correct layer, the line type and the pen type before beginning to draw.

Light shaft:

> View line

> Section lines
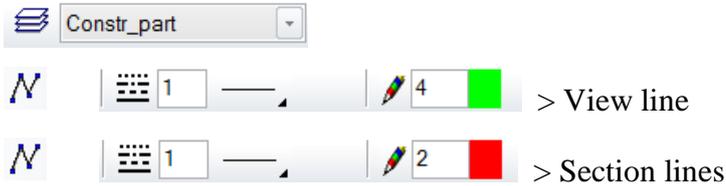
Terrain:
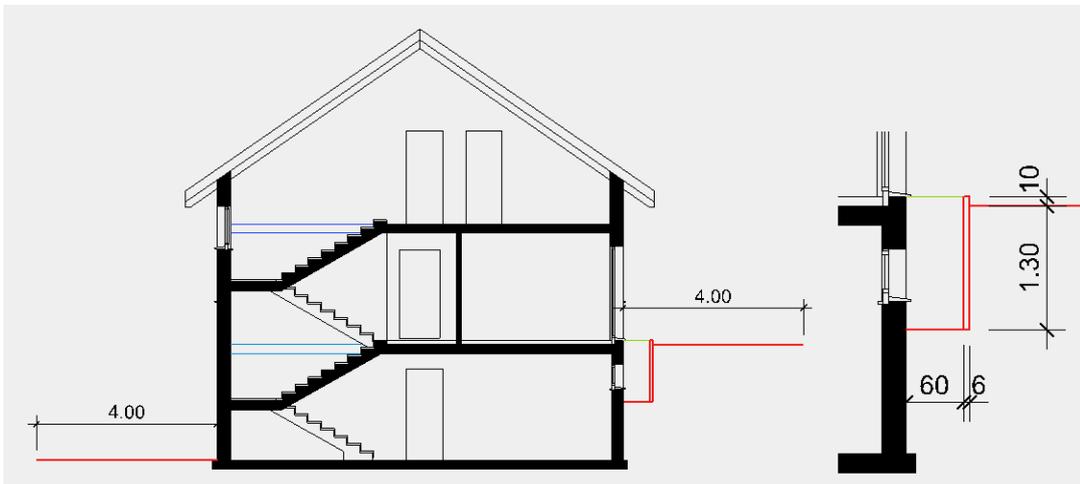
4. The floor finish is missing from the top floor and the basement.
In Storeys Manager, double-click on the top floor to switch back to the model and simultaneously create it alone.
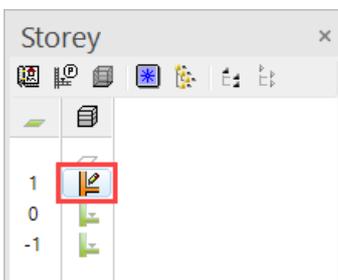
TIP

When you select a storey the system switches back directly from section/view to the model.

5. Draw a room separator between staircase and corridor > **P1**-**P2**.
To complete the room separation, select the end point **P2** again.
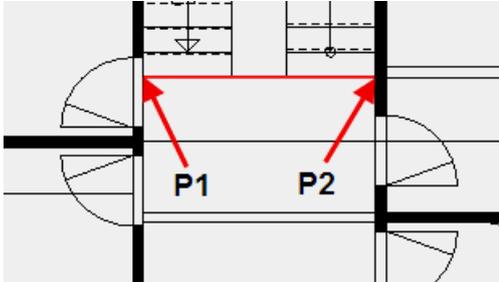
6. The last step projects into the door opening. The wall and the two doors must be moved.
First select the 3 objects concerned:
[**Shift**]-click to select the two doors and the wall.
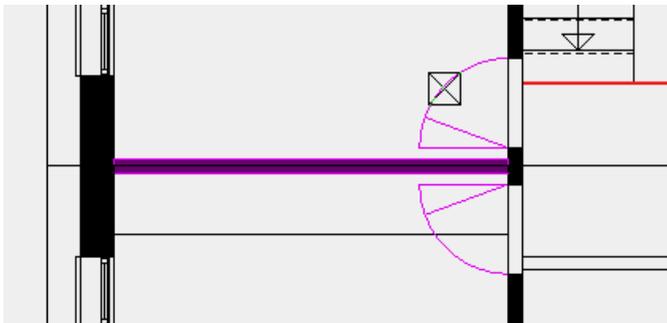
7. Select the function MOVE SELECTION.

8. Move the door reveal to the edge of the last step. Select the point that you wish to move (door reveal), then specify its new position (edge of last step).
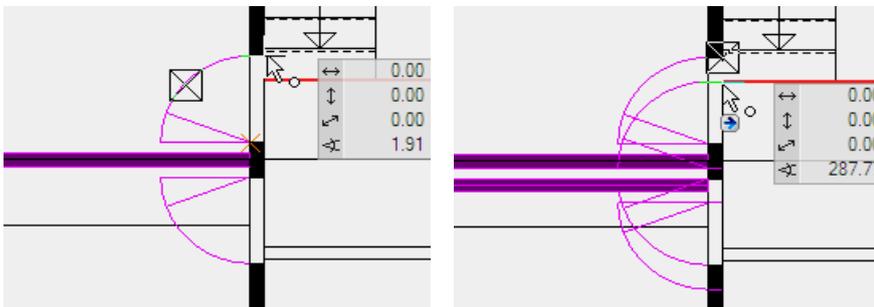
9. Cancel the function. The door reveal is located on the alignment of the last step.
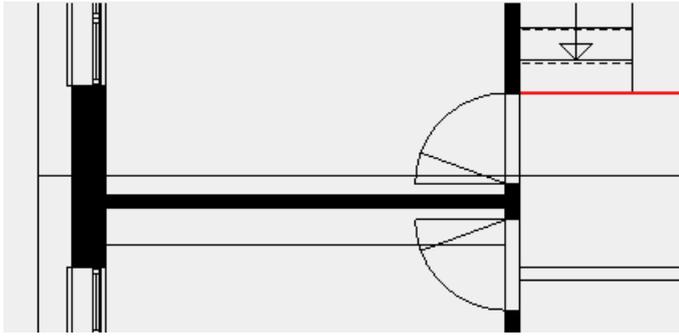
10. The preparations are completed, the room label of the forecourt can be positioned.
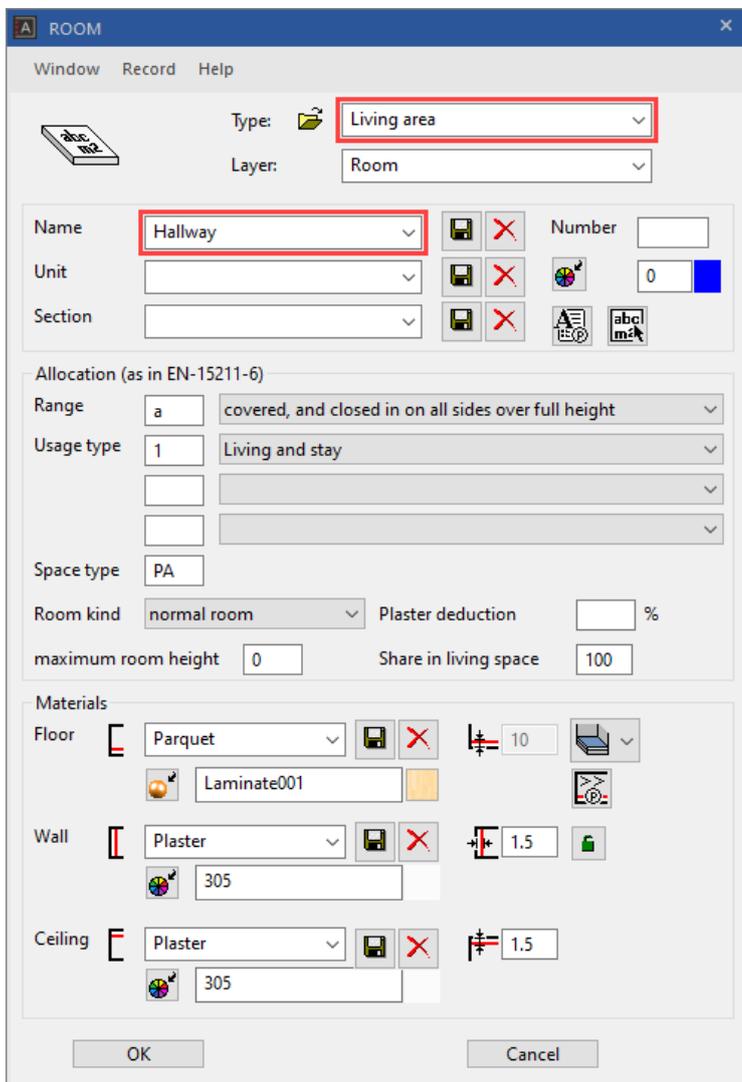
Apply room label.
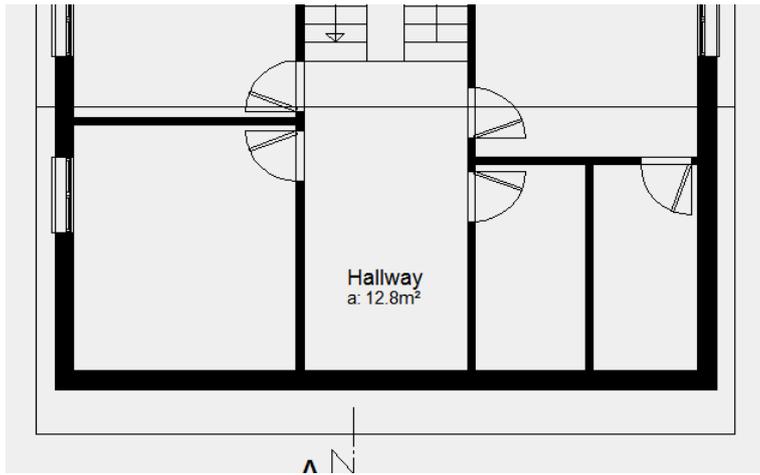
11. Switch to the basement and apply a room label there as well. Room separation as found on the top floor is no longer required.

On the room mask select the parameter "Cellar area" and change the room name. In this parameter the materials are set accordingly. In the floor parameter check, whether the correct parameter is active and that the thickness of the assembly is **5** cm.
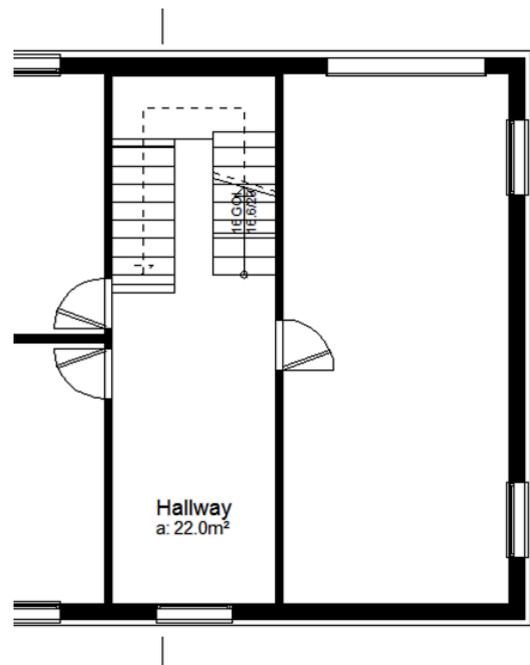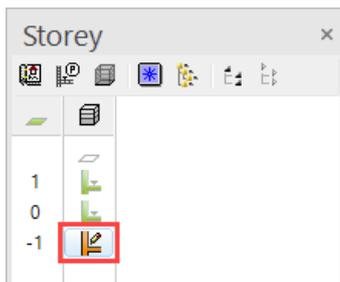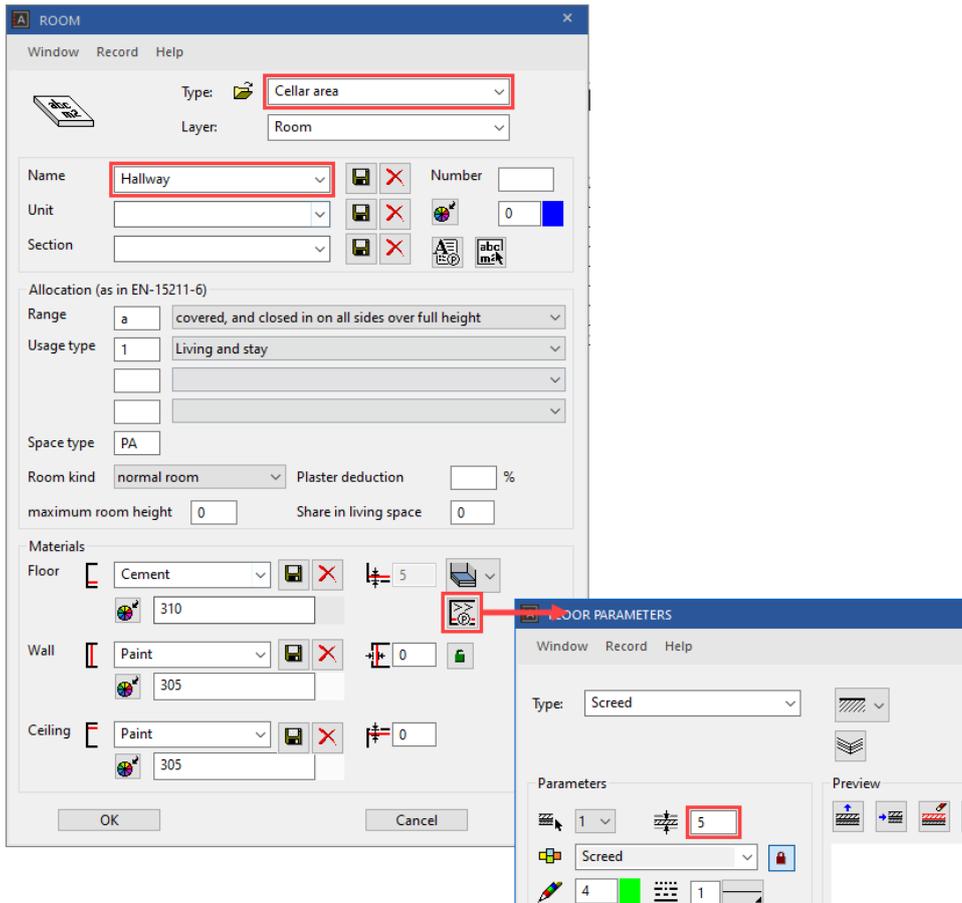
12. Switch to the section "A-A" and update the section with the function REFRESH VIEW at the end of the line or in the title line.
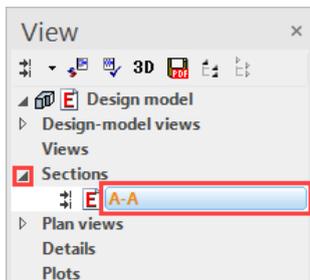
The missing floor finishes are now added to the section.
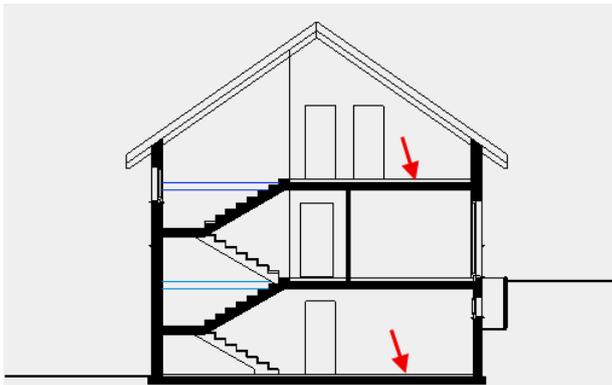
WORKSHOP END

EDIT VIEW

The view is a calculated plan and behaves in the same way as a section.

▼ ▼ ▼ ▼ WORKSHOP ———————————————————————————

Larger areas can be concealed by a covering hatch.

1. Load the west view onto the screen.
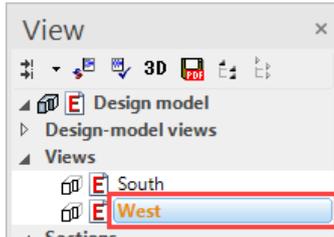
2. Select the function COVERING HATCH.

3. Set the first point to the bottom left outside the building. For the second point, a temporary reference point must initially be set. Move with the cursor to the right onto the temporary help line and enter the direct value **50** in the value field.
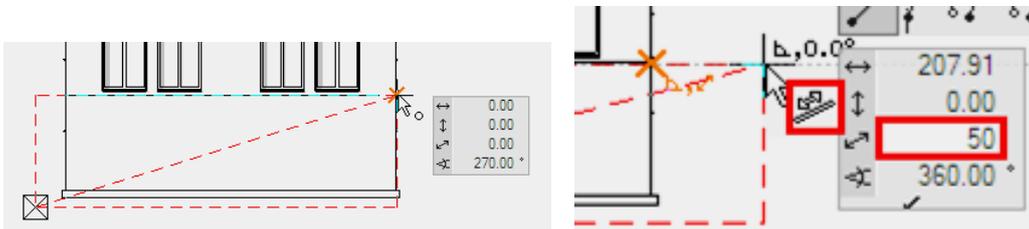
To complete the hatch, click again on the end point.
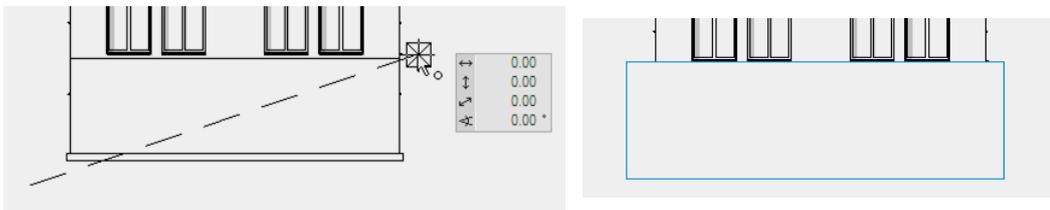
4. Cancel the function.

5. Adding lines.

Prepare the location of the terrain lines again with an auxiliary drawing with help lines. Caution: The lines below the covering hatch will be taken into account by the auto capture mode.
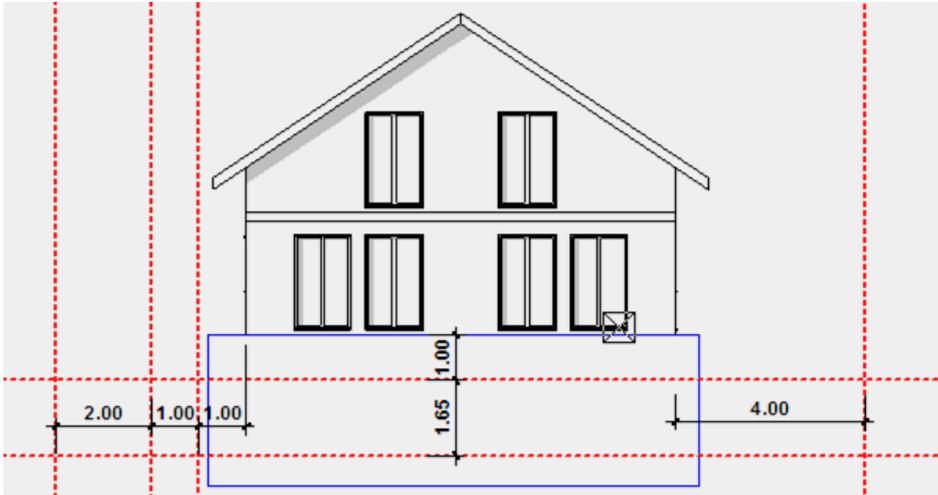
6. Switch to the "Surroundings" layer.

7. Select the DRAW function and create the terrain lines.
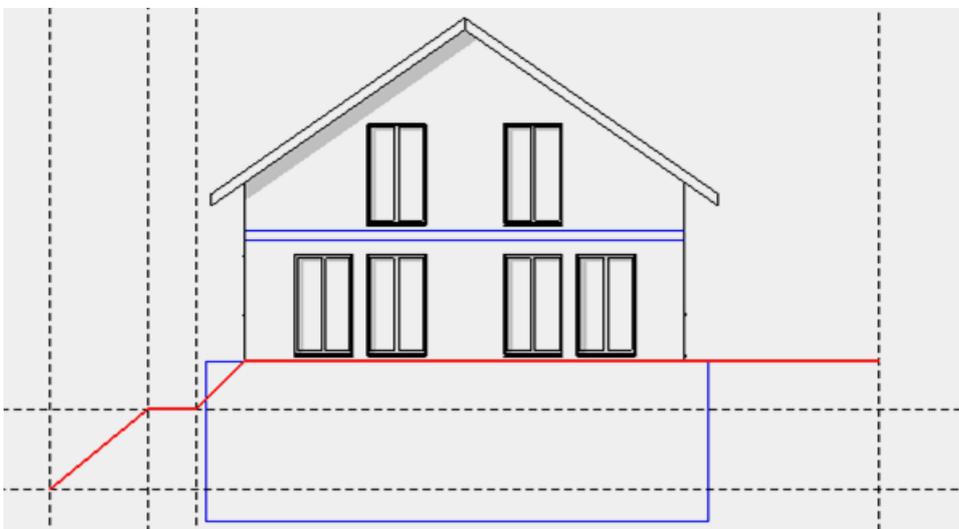
8. Use the DELETE element function to delete the view lines of the slab face.

9. Delete the help lines.

10. Now process the south view in the same way.
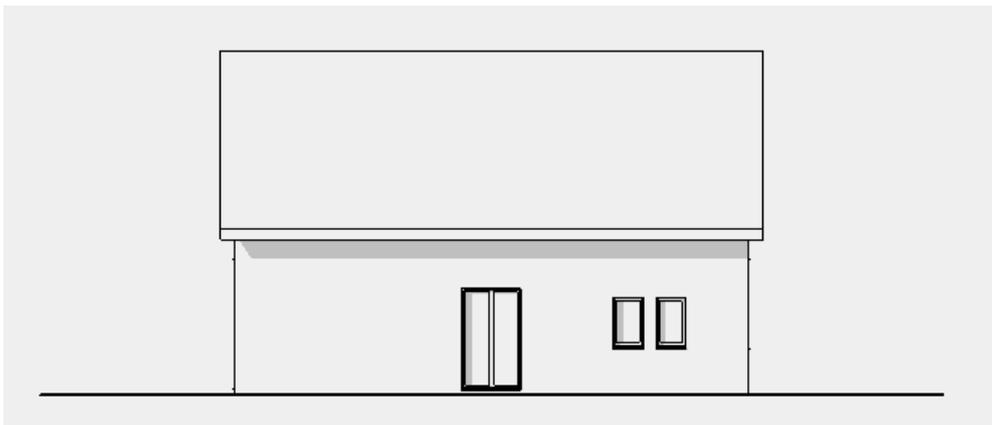
WORKSHOP END

TIP

If the wrong parts were deleted or incorrectly drawn, etc. this can be corrected with the functions UNDO and RESTORE.

SET LIBRARY PARTS

Library parts are set using library management. If the management window is not visible on screen, it can be shown in the menu by selecting VIEW > WINDOW > LIBRARY.

Library Tab symbol of library (**1**)

The management window is divided into two parts. The preview (**2**) of the library parts is displayed in the upper field. The folder structure (**3**) is shown in the lower area. The folder structure is represented starting from a root directory (**4**). Additional root directories can be added independently (**5**).

The Scale (**6**) option scales the library part to the relevant scale of the drawing. In most cases, no scaling is required for plan elements graphics (header, north arrow).

If the option "Recently loaded" (**7**) is enabled, in the preview area (**2**) the library parts recently loaded will be displayed and the folder structure (**3**) appears with a grey background.
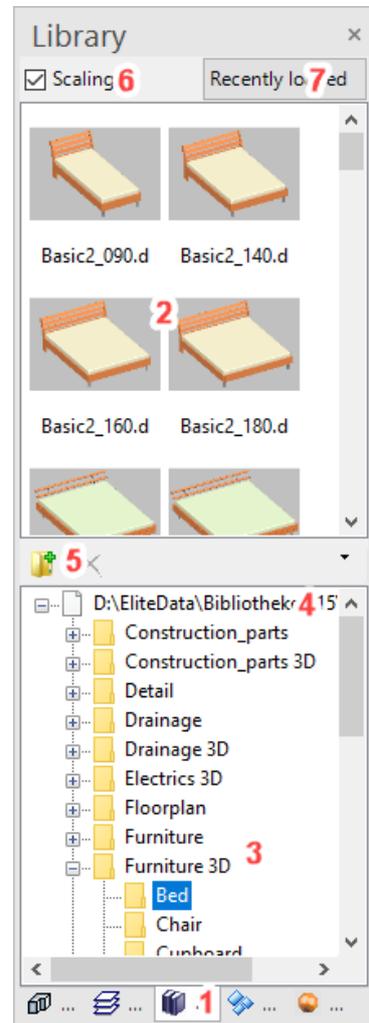
Properties bar of the library parts

WORKSHOP

The views and the section must be completed with plants, persons and cars.

1. Load the west view onto the screen.
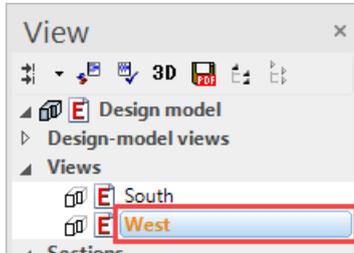
2. Bring library management to the foreground.

3. Open the path *surroundings\trees\view* and select the library part **tree040_h0900.d**.
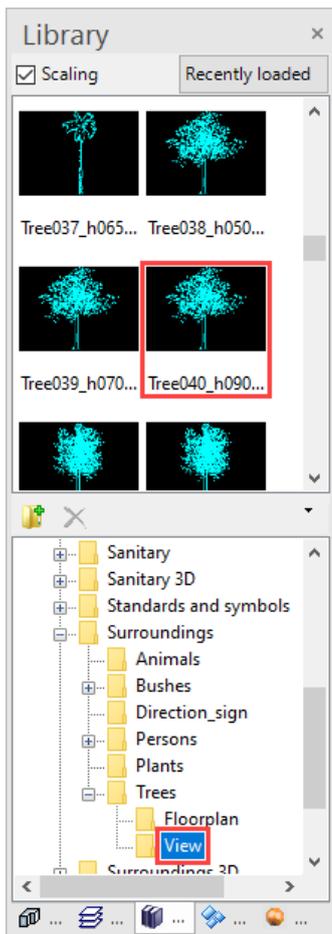
Following selection, move the cursor into the work area. The tree is "attached" to the cursor and can be positioned.

4. Set the tree at the desired position in the view. The tree can now continue to be set until you cancel the function with **[Esc]**.

5. Bushes are to be located on the other side of the house.
Switch to the *surroundings\bushes\view* and select the bush **bush008_h0100.d**.
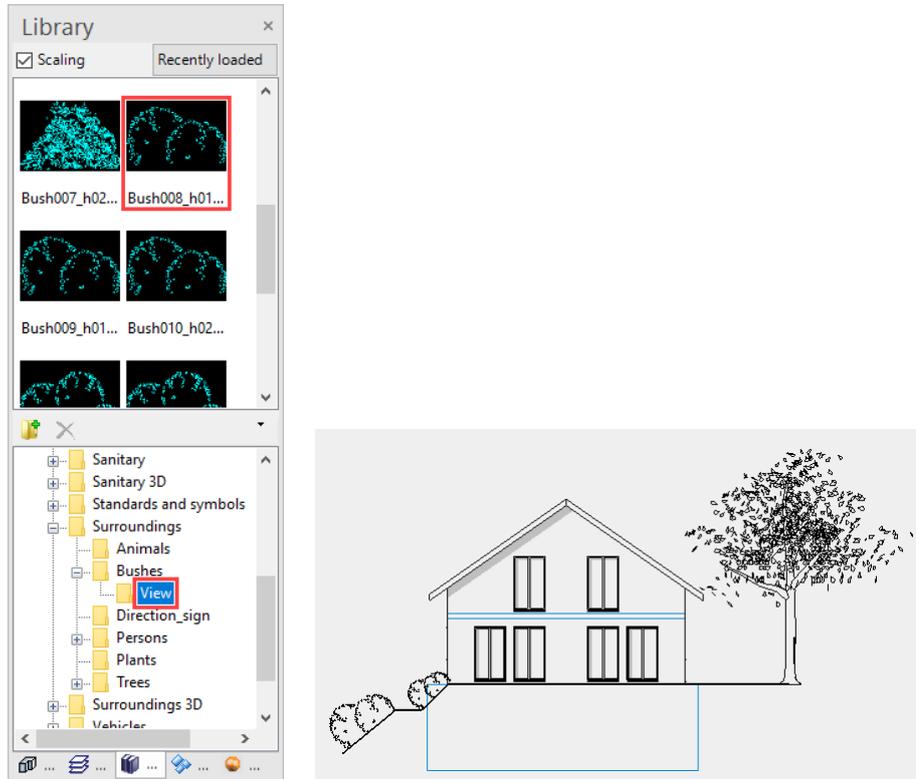
6. In the properties bar switch to ALIGN AUTOMATICALLY TO ELEMENT.

Position your cursor onto the sloping line. The bush is automatically tilted. Depending on which side of the line the cursor is located, the bush is shown on the other side. As soon as the position is correct, confirm it by left-clicking.
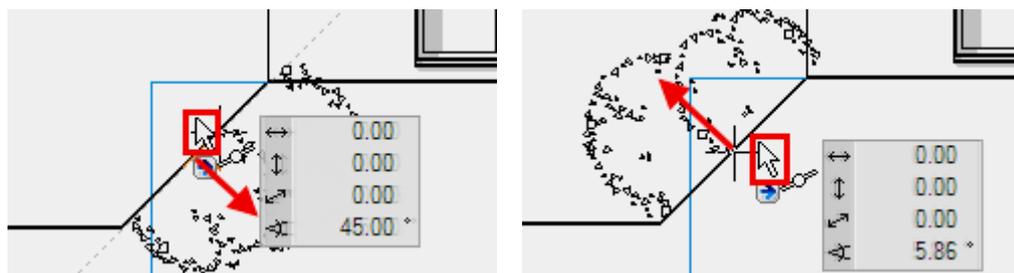
7. The lower of the two bushes has a height of 150 cm. Switch to the library part **bush009_h0150.d** and set it on the lower slope.
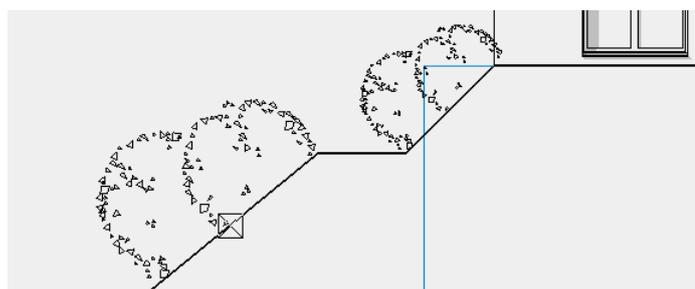
8. In Library Management switch to the folder *environment\persons* and position the two library parts **a_pers01.d** and **a_pers06.d** in the view.
Before they are positioned, library parts can be rotated, mirrored or scaled.
Mirror the person **a_pers01.d** before you set the library part in the view.
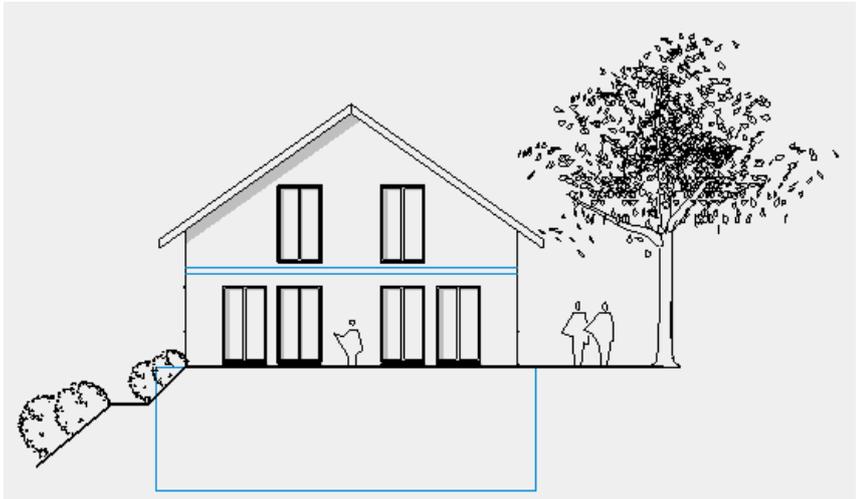
9. Now complete the south view and the section with library parts.

South façade
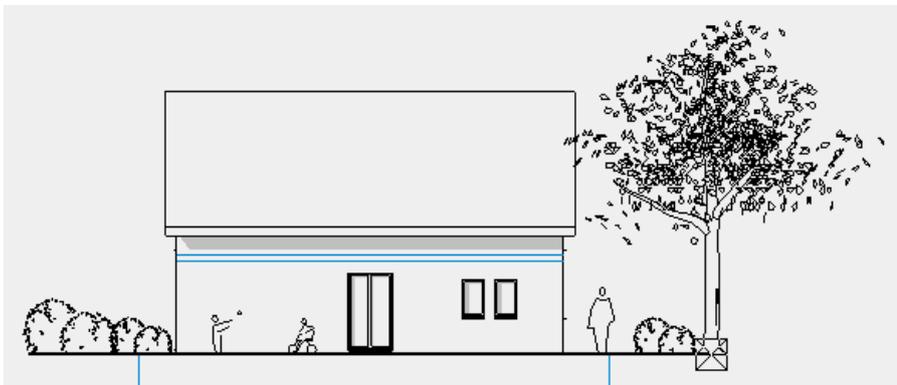
Section
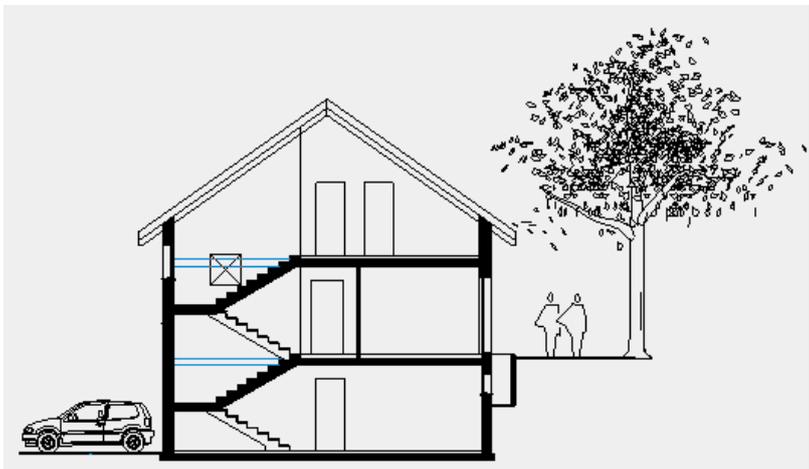
WORKSHOP END

HATCHING

Hatches must be added to the views.

▼ ▼ ▼ ▼ WORKSHOP ────────────────────

1. In the south view you must add a vertical line hatch to the roof. First switch to the south view.
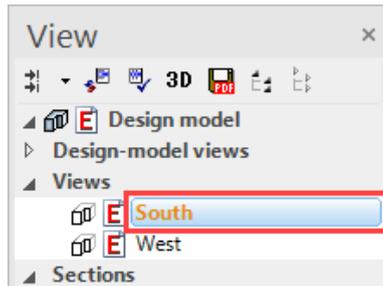
2. Select the layer "Roof".

3. Select the function AUTOMATIC HATCH and in the properties bar the HATCH PARAMETER.

4. Select "Simple line hatch" and adjust the values.
The angle of the hatch must be **90°** and the distance of the lines is **4** mm. The unit "millimetre" is the actual value on the expression. The preview is updated when you click on SHOW.
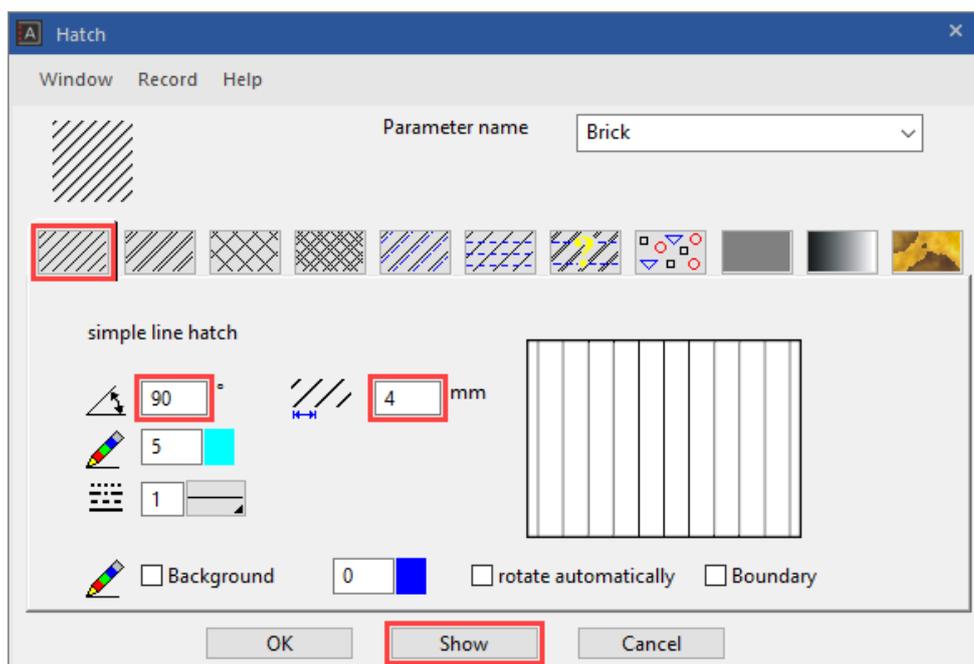
5. Now click on the roof contour **P1**. Ensure that you click on the page on which you wish to add hatches.
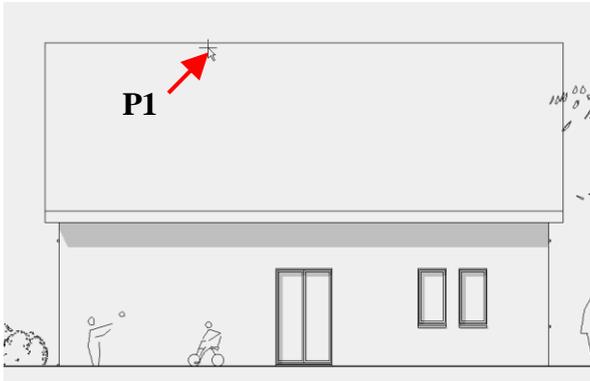
6. Cancel the function.
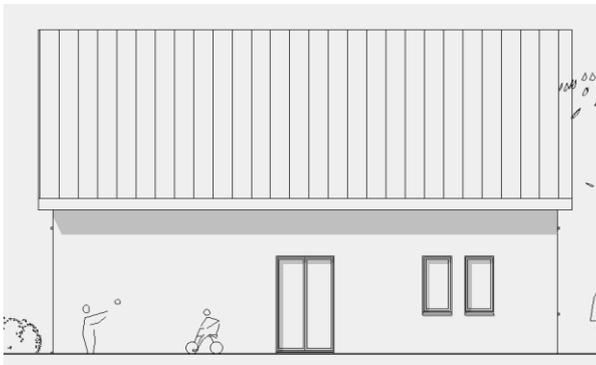
――――― TIP

The contour may be ambiguous, for example if certain parts extend into the contour.
In such cases the contour can be followed up with the polygon functions.

Polygon access in the properties bar:
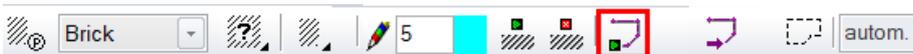
Input assistant with additional circular functions:

7. Access the section *A-A* in Views Management.
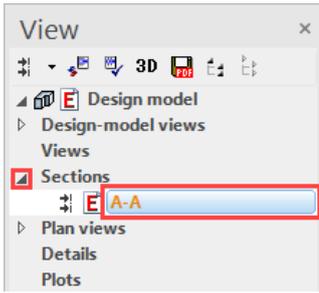
8. Select the function AUTOMATIC HATCH and in the properties bar the hatch type "black". So that the hatch receives the layer of the contour, the option "Hatch to contour layer" must be set.

9. Click within the light shaft.
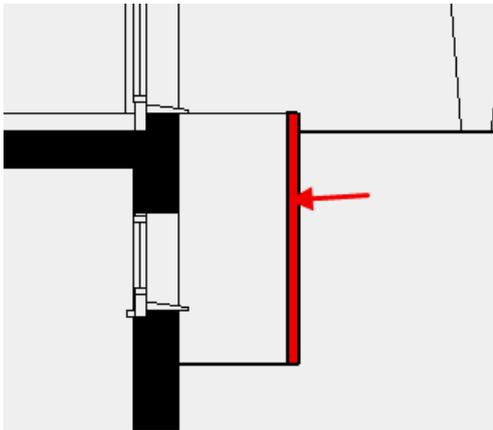
10. Hatch the terrain with a colour gradient hatch. The hatch must be in the "surroundings" layer. This time the layer must be set since you will create the contour yourself.
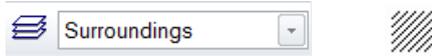
11. Select the colour gradient hatch and set the parameter correctly.
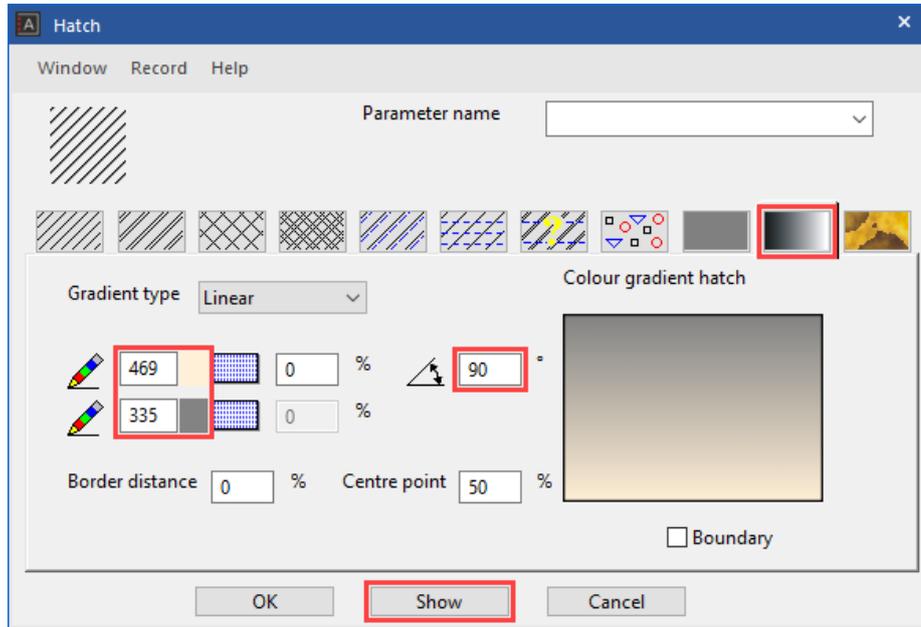
12. The contour must be entered manually. Start the polygon with the function POLYGON in the properties bar.

13. Start at point **P1**, then **100** cm further down. For the lower right point, you must set a temporary reference point on the corner of the tree >**RP**.
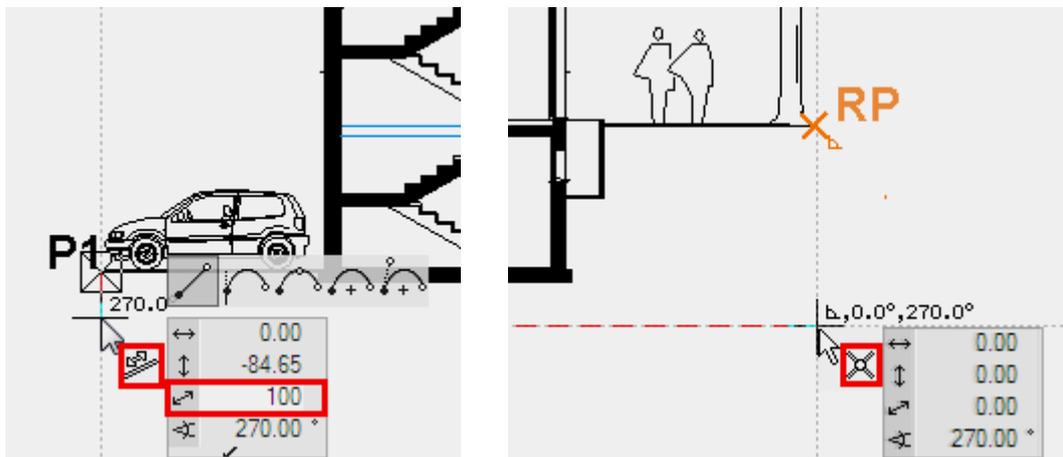
Move the polygon along the terrain and the foundation slab until you are back at point **P1**.

14. Cancel the function.
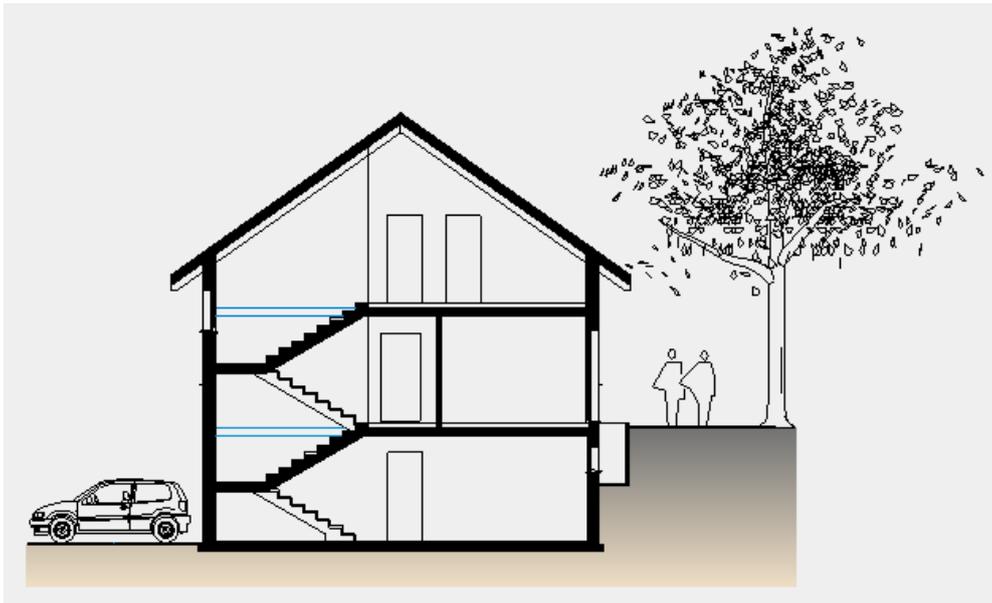
15. Switch to the south view to add the terrain hatch to this view as well.

16. Select the layer "Surroundings".

─── EXPLANATION

Until now you have used auto hatching. This has the specification that it automatically removes elements (lines, texts, dimension). The basement windows are located below the covering hatch already defined. The auto-hatch function would therefore remove these during hatching.
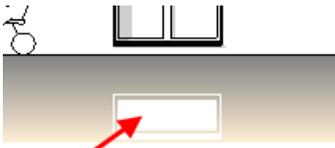
17. Select the function MANUAL HATCH and start the polygon.

18. Draw the polygon using the same procedure as for the section. When you complete the polygon you have the option to select cut-outs or, as in this case, to end the hatching.

 or [Return]
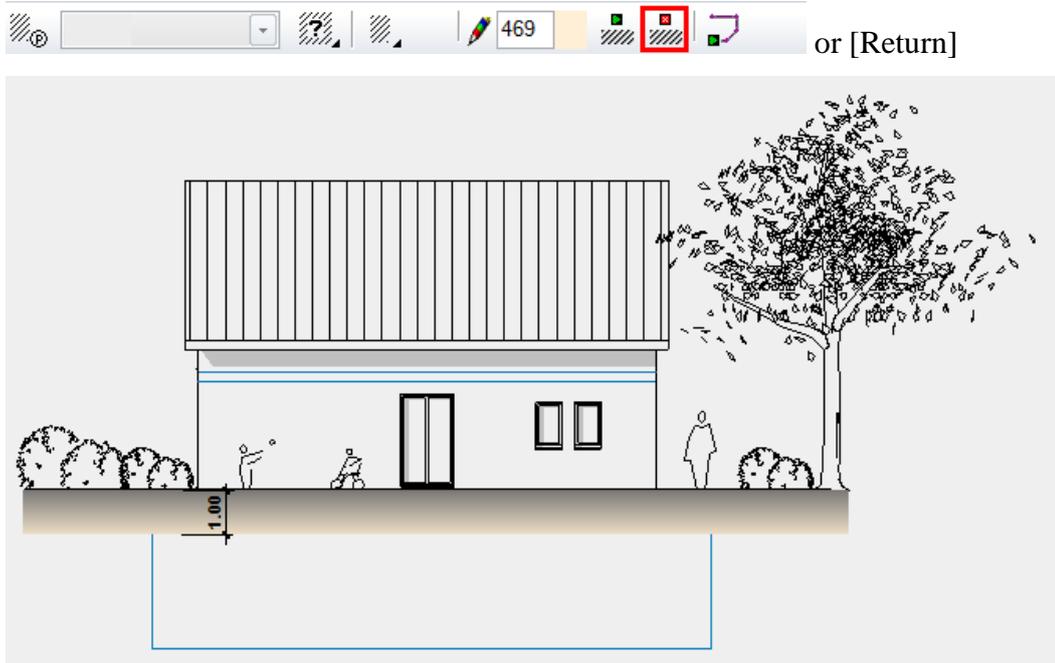
19. Now add the terrain hatches to the west view.

WORKSHOP END

LABELS

Text parameter:
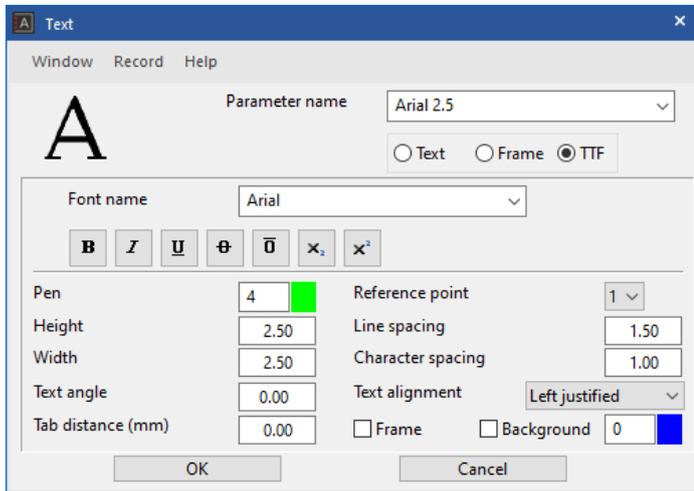
Reference point:

The reference point specifies how the text is to be positioned regarding the reference point. This reference point is determined by selecting a number between 1 and 9. The position of the reference point is the same as the arrangement of the numbers of the number pad on the right-hand side of your keyboard, or the symbols in the properties bar.
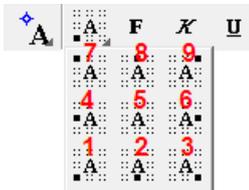
The reference point is automatically set correctly, when you define the text panel via a rectangle.
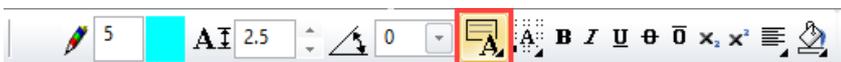
Line spacing (1.0-2.5):

The line spacing is defined by a factor with reference to the text height.

factor 1.0
factor 1.0

factor 1.5
factor 1.5

factor 2.0

factor 2.0

Text alignment:

left-justified left- justified left- justified	right- justified right- justified right- justified
left- justified left- justified	right- justified right- justified
left- justified	right- justified

centered centered centered	grouped grouped grouped
centered centered	grouped grouped
centered	grouped

Changing text:
Double-click on the text to put it into edit mode. The text can be selected and modified, deleted or added to. Right-click in the text field to make the most common special characters appear or click the option *Continue* to display the Windows character table.
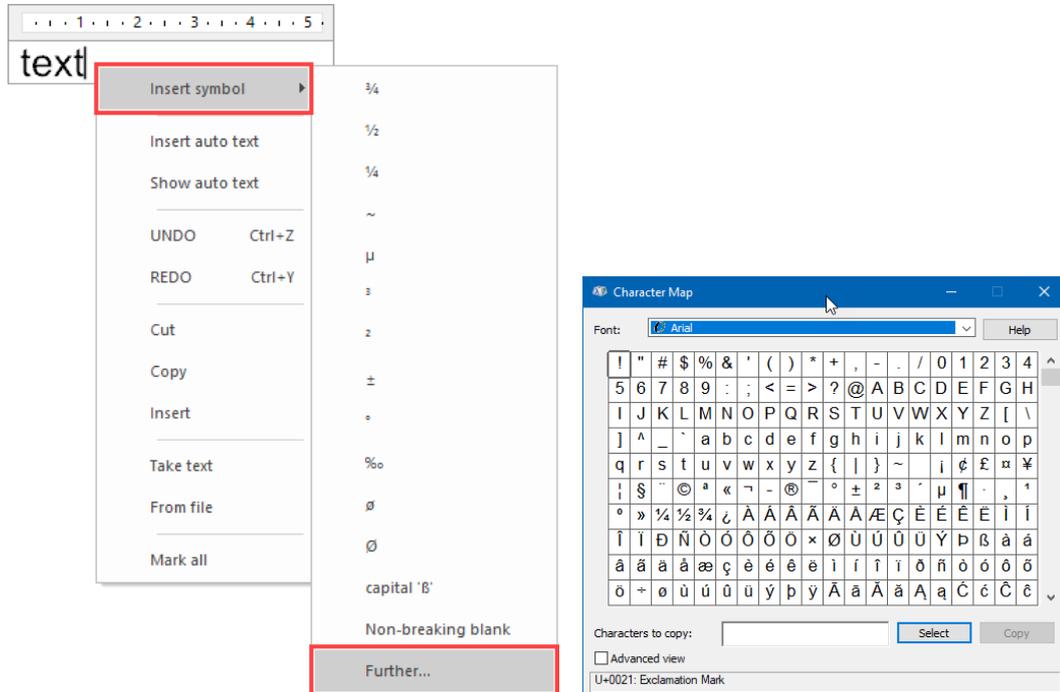
Move/copy text:
Click on a text to make the handles appear and the text can then be moved or copied to the correct position.
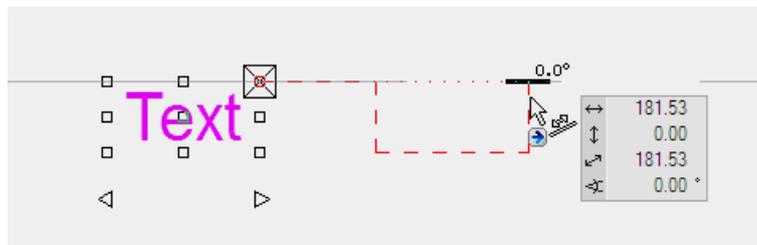
DIMENSIONING

To generate a dimension, first define two dimension points **P1** and then fix the location **P2** of the dimension. Next you can add further dimension points **P3**.
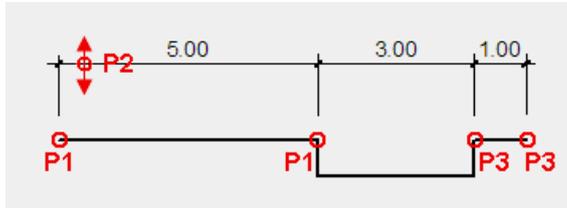
▼ ▼ ▼ ▼ WORKSHOP ──────────────────────────────

Generate the main dimension in the floor plan and in the section.
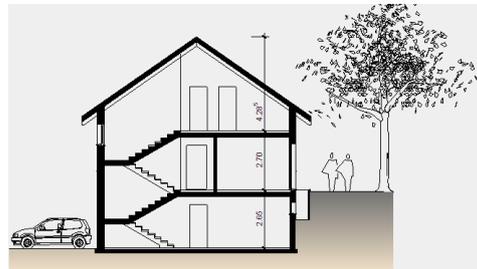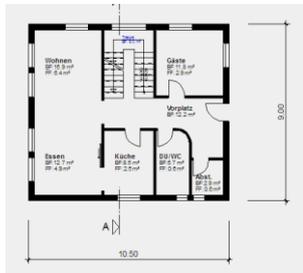
1. Switch to the plan view GF (ground floor).
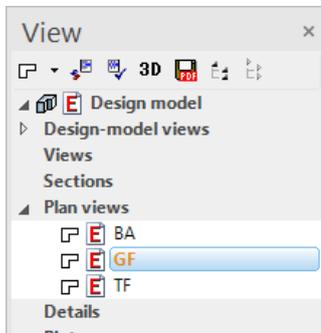
2. Select the function CHAIN DIMENSION

Select the parameter group 1.
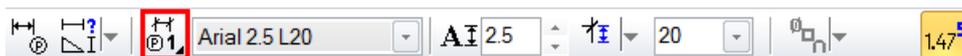
──── TIP

The parameter groups give you rapid access to the 3 most frequently used dimension parameters in the representation mode concerned. Parameters are assigned in the representation mode settings.

3. Set the dimension points of the horizontal dimension.
Click on the corner at point **P1** and then on the corner at point **P2**. Move the cursor vertically below point **P2** so that the temporary help line appears and enter the direct distance **300** cm.
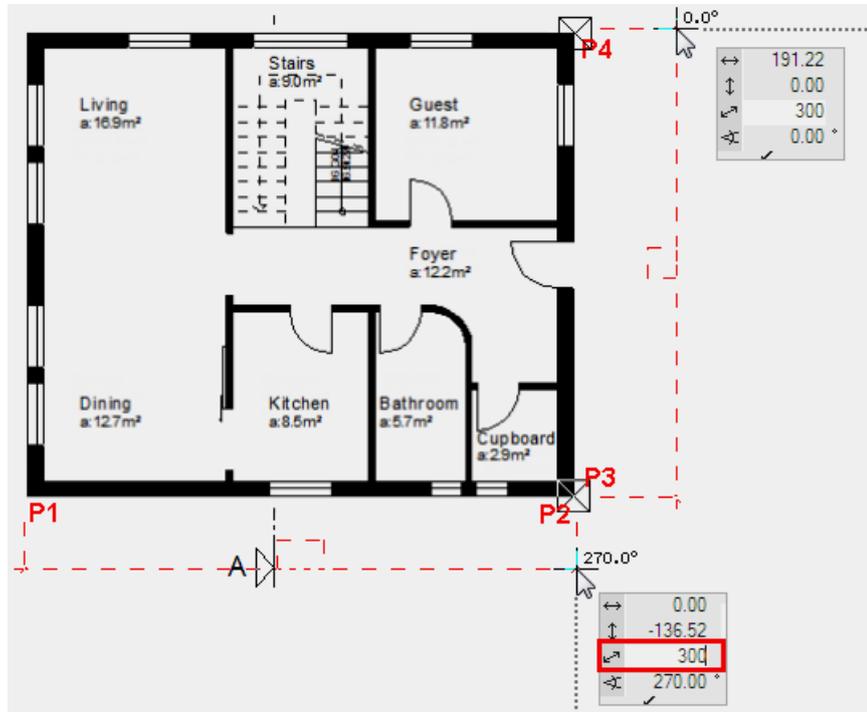
4. Each additional click generates further dimension points for this chain dimension. Select the function CHAIN DIMENSION again to finish the dimension chain and to start a new chain dimension.

5. Set dimension points of the vertical dimension.
Click on the corner at point **P3**, then on the corner at point **P4**. Move the cursor to the right alongside point P4 so that a horizontal help line appears. Enter the direct distance **300** cm.

6. Cancel the function with [**Esc**].

7. Switch to the section view *A-A*.

8. Select the function CHAIN DIMENSION

⊦⊩⊦⊦|

Select parameter group 3.

9. Set the two dimension points **P1** and **P2** and then determine the location **P3** of the dimension.
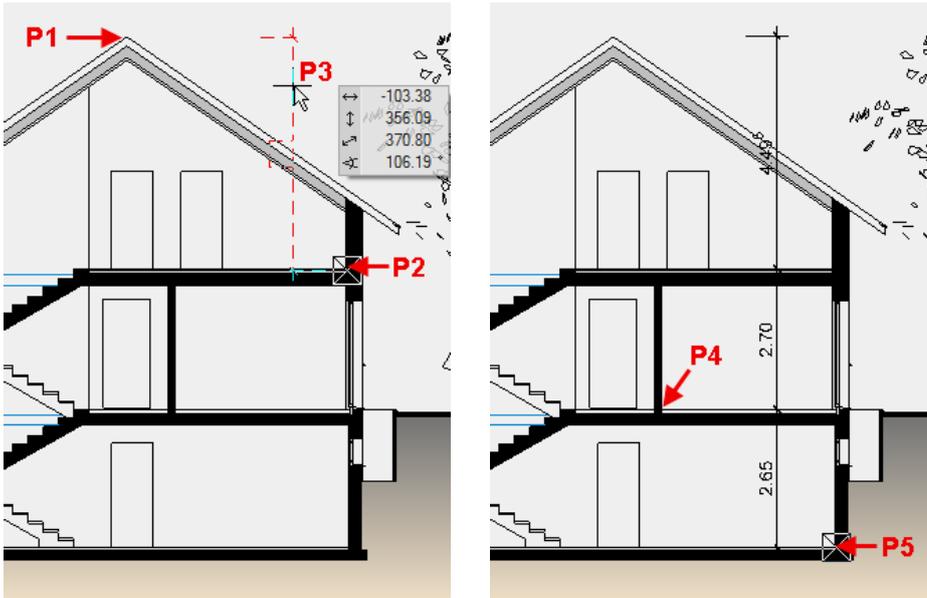
10. Add the two dimension points **P4** and **P5** to the dimension.

11. Cancel the function with [**Esc**].

12. Select the dimension just created with a click. The handles of the dimension lines and dimension texts appear. Move the dimension text using its handle.
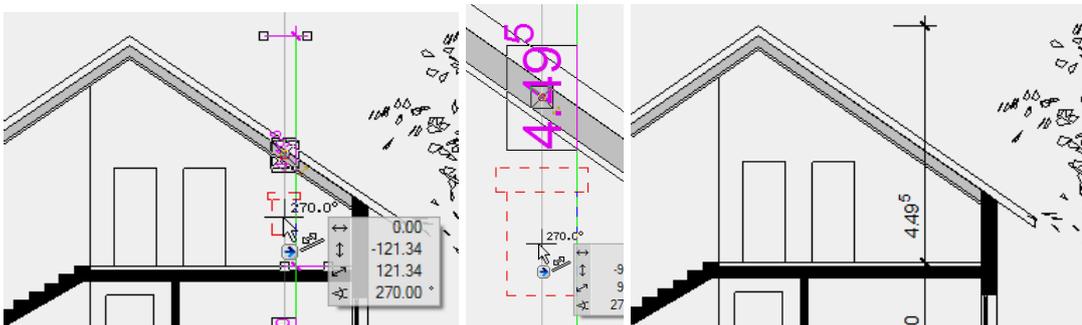
WORKSHOP END

─────── EXPLANATION

Dimension parameter:
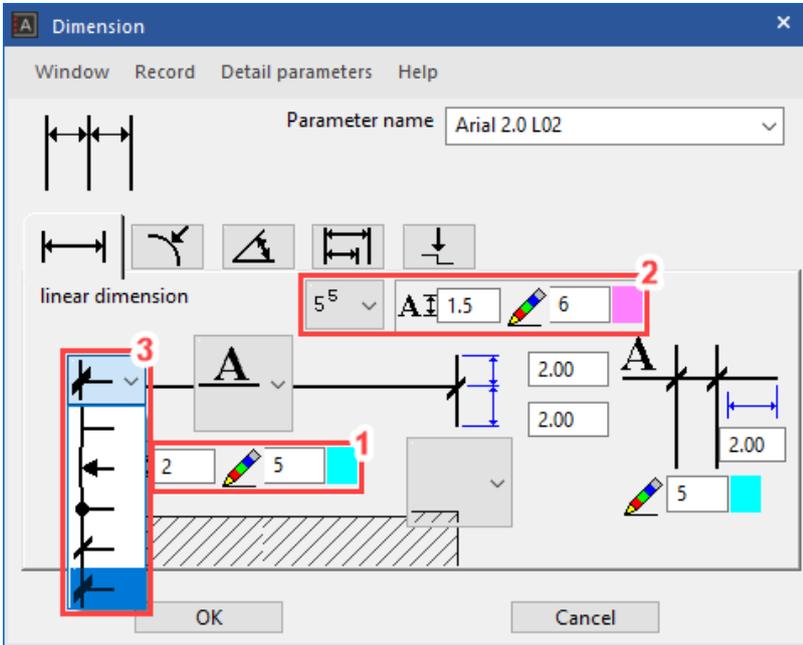
The settings for the dimension text (**1**), the tolerance text (**2**) and the dimension limitation element (**3**) (arrow parameter) are saved on the dimension parameter screen.

Text parameter:

Extended settings for the dimension text are located in the menu DETAIL PARAMETERS > TEXT PARAMETERS.
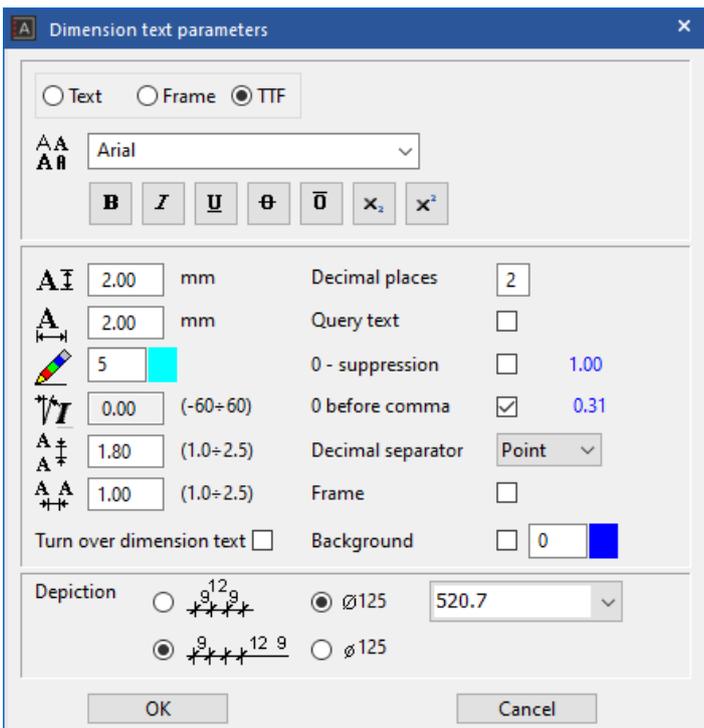
Tolerance text parameters:

Extended settings for the tolerance text can be found in the menu DETAIL PARAMETERS > TOLERANCE TEXT PARAMETERS.
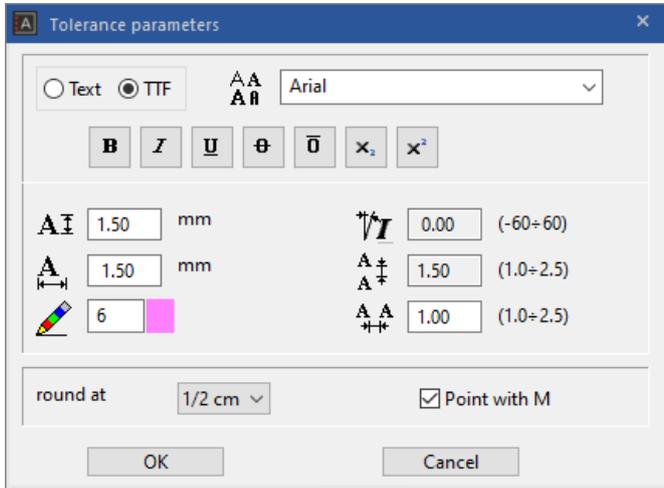
Arrow parameters (dimension limitation element)**:**

Extended settings for the relevant type can be found in the menu DETAIL PARAMETERS > ARROW PARAMETERS.
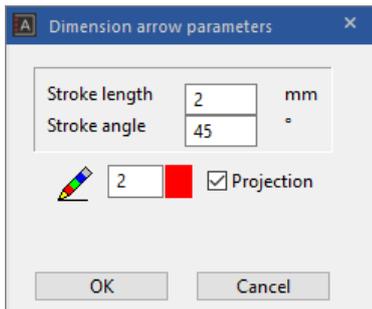
DEFINE LAYOUT TEMPLATE

A layout contains plan-graphical elements that are the same for every plot. This can be a plan edge, title block or a legend.

▼ ▼ ▼ ▼ WORKSHOP _____

1. In Views management, right-click on the title Layout templates to generate a new layout template.
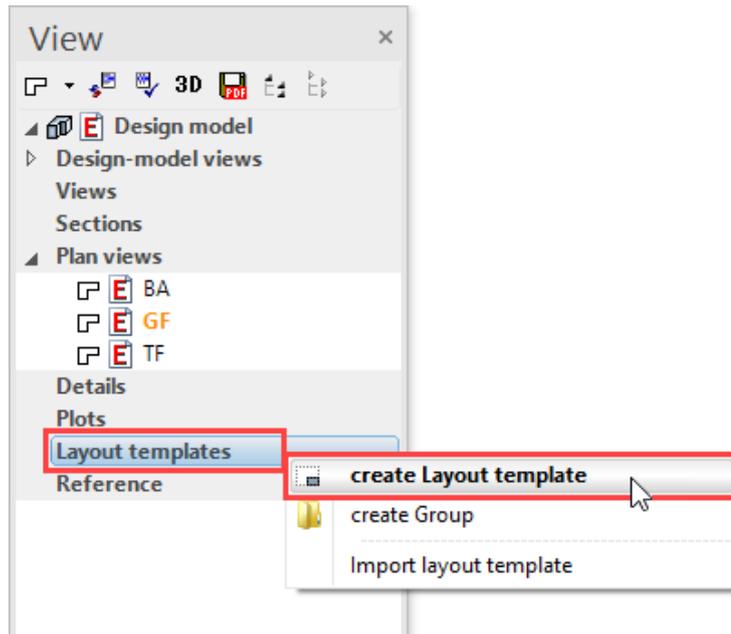
2. Give the layout template the name *Docu A4* and switch the orientation to portrait. The stored user format *A4portrait* is loaded. Close the screen.
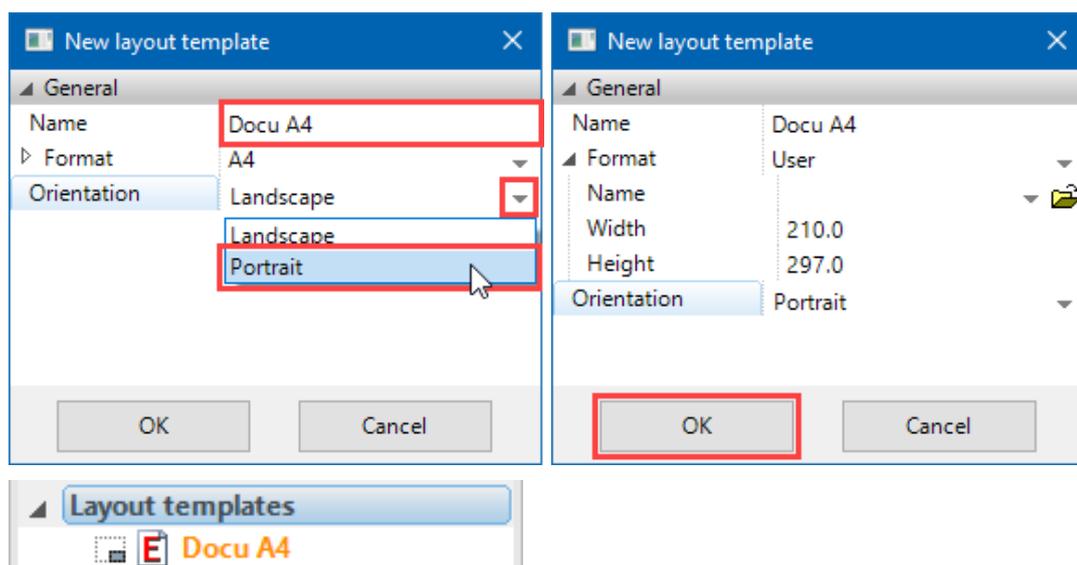
3. Create a plan edge using the function *Rect. By dimensions and reference pt*.
   ⊞ Remember: In layout, you draw in [cm] by default..

4. Select the menu LAY-OUT > PLACE TITLE BLOCK. Open the title block *title_block_1.d* from the *en* directory, place it in the bottom right corner and then cancel the function.
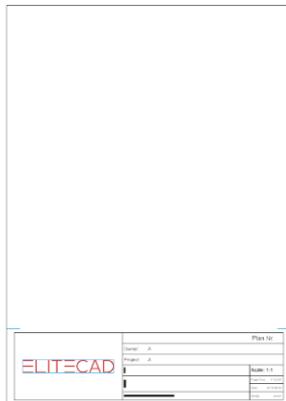
5. Click on the title block. The entire title block is located within a dotted selection with corner handles. This is the sign that you have selected a group.
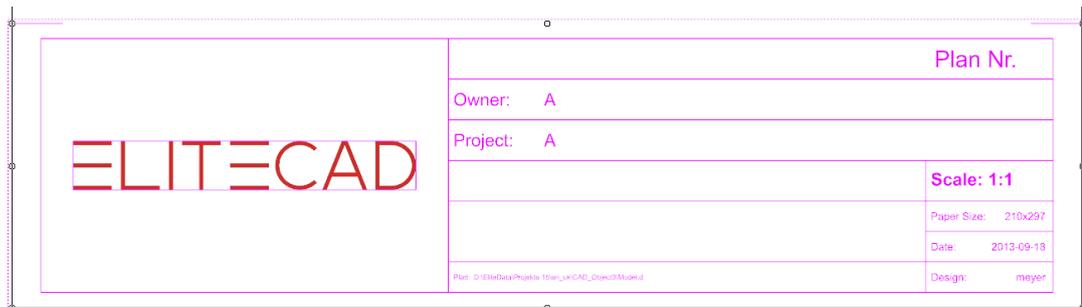
6. Double-click to process elements in a group. Double-click to select the title block. You are now in the edit mode for the group and can edit its elements. The frame is marked with a dotted red line and the corner handles disappear. Click outside the group to exit the edit mode for the group.
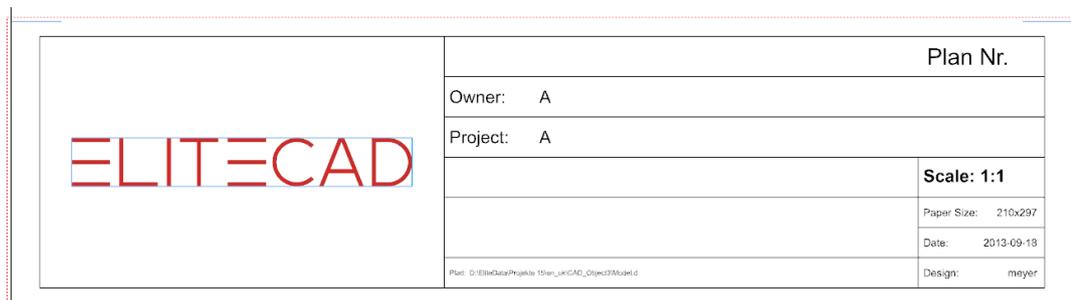
7. Add the text *Owner: A* to **owner: XEOMETRIC GmbH**. To access text editing mode, double-click on the text.

8. Also add to the "Construction project" field by double-clicking on the text *Construction project: A* and adding the following information: **Project: House XEOMETRIC, Hamoderstrasse 4, 4020 Linz**.

9. Cancel text entry with **[Esc]**.

10. Click outside the frame with the dotted red line to end editing of the group.

11. Create an auxiliary drawing with help lines with the pen 0 so that the individual plans can afterwards be set accurately in the plot view.
Parallel auxiliary line with **1** cm gap
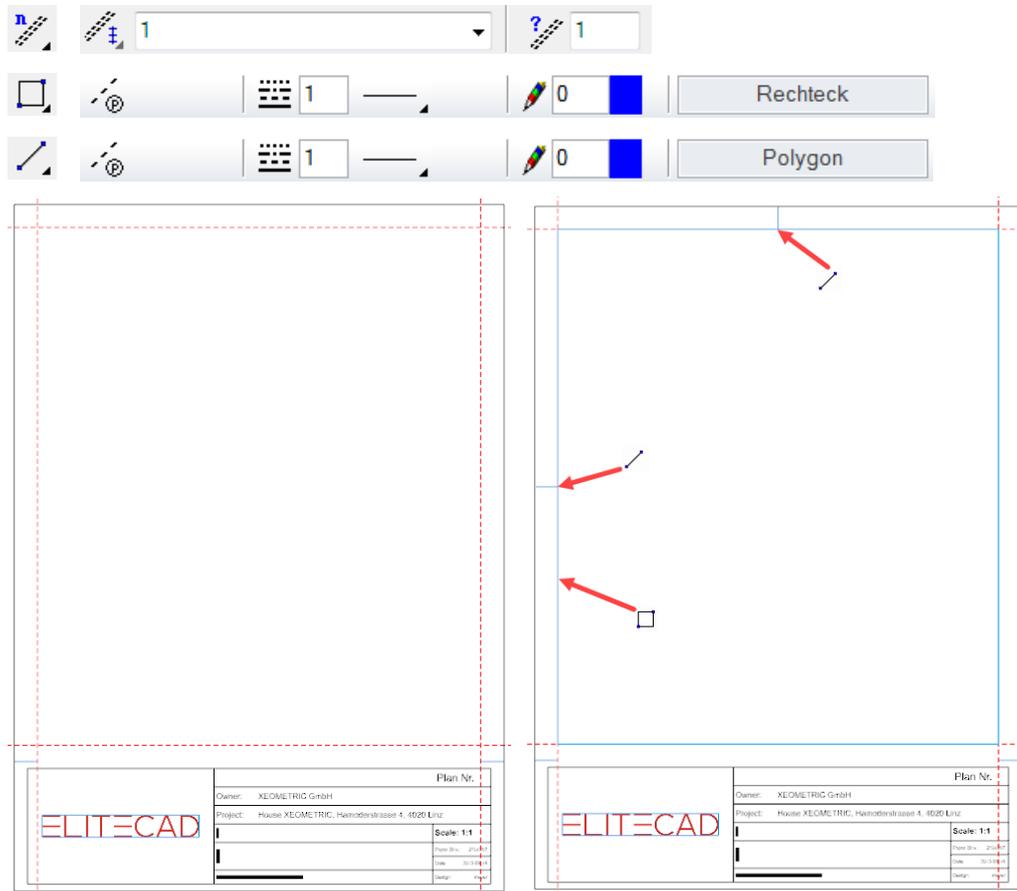
12. Delete the help lines.

WORKSHOP END

DEFINE PLOT

In the plot view, all defined views, floor plans and sections can be merged into one plot. The individual views, floor plans and sections are linked with the originals. If you change the original, the copy in the plot view also changes.

▼ ▼ ▼ ▼ WORKSHOP

1. In views management, generate a new plot by right-clicking on the title Plots.
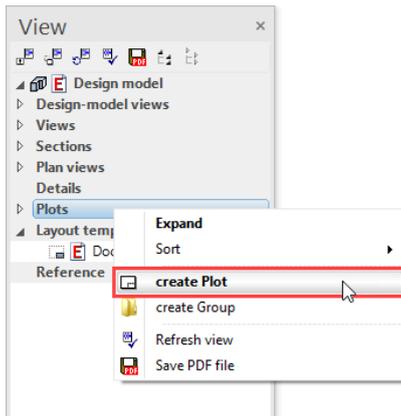
2. Enter a name for the plot and select the layout template just created, *Docu A4*, as basis.
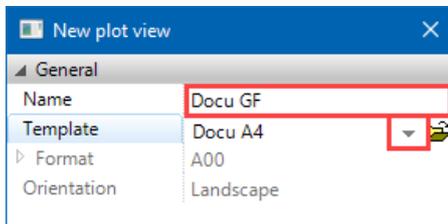
3. The new plot view appears with the layout template on screen. In the header line of views management, select the function INSERT VIEW and select the *GF* from the list.
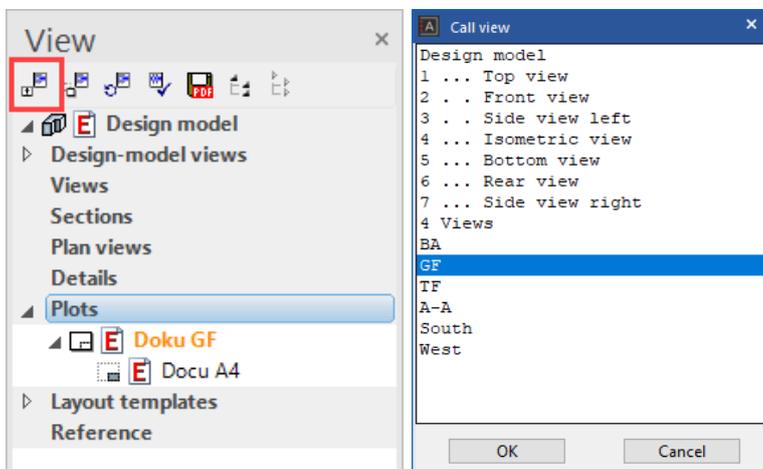
4. Insert the ground floor into the plot.

5. Using the function MOVE VIEW, move the plan from the header line of views management into the centre.
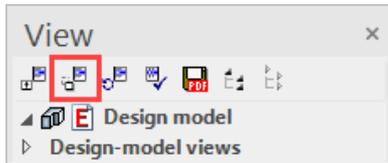
Start the function MOVE VIEW. Determine the centre of the plan using the snap mode MIDDLE OF 2 POINTS.
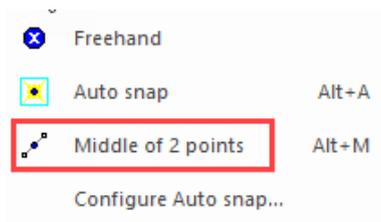
The centre in the plot can be determined with two temporary reference points from the auxiliary drawing with help lines of the layout template.
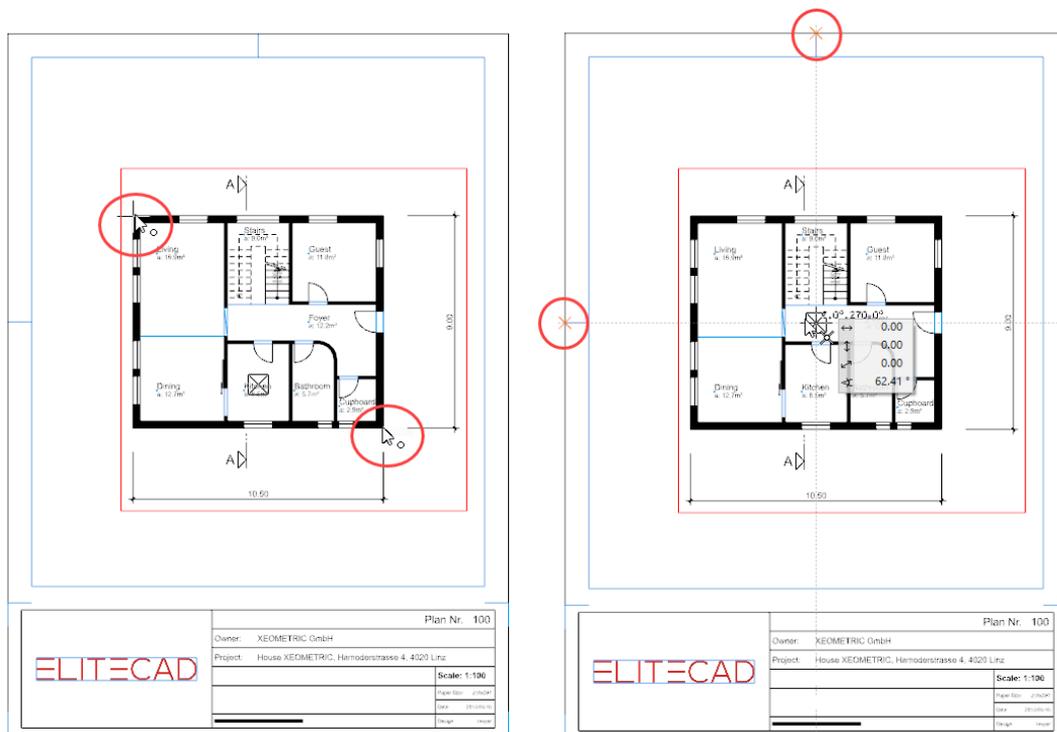
6. Add the missing labels to the title block.
Menu LAY-OUT > COMPLETE TITLE BLOCK.
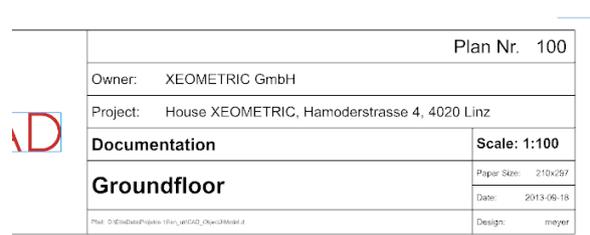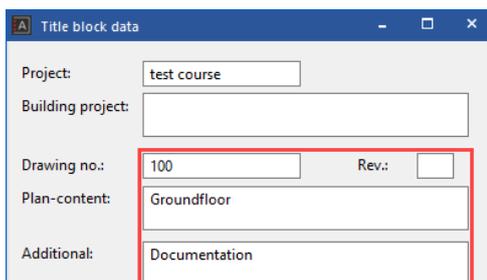
7. Generate the rest of the documentation yourself.

In the views, the tree protrudes out of the page format. A cut-out can be defined in a view.

To be able to change a view in the plot, you must double-click on the frame. Right-click to access the function DEFINE CUT OUT.

Create a new frame.
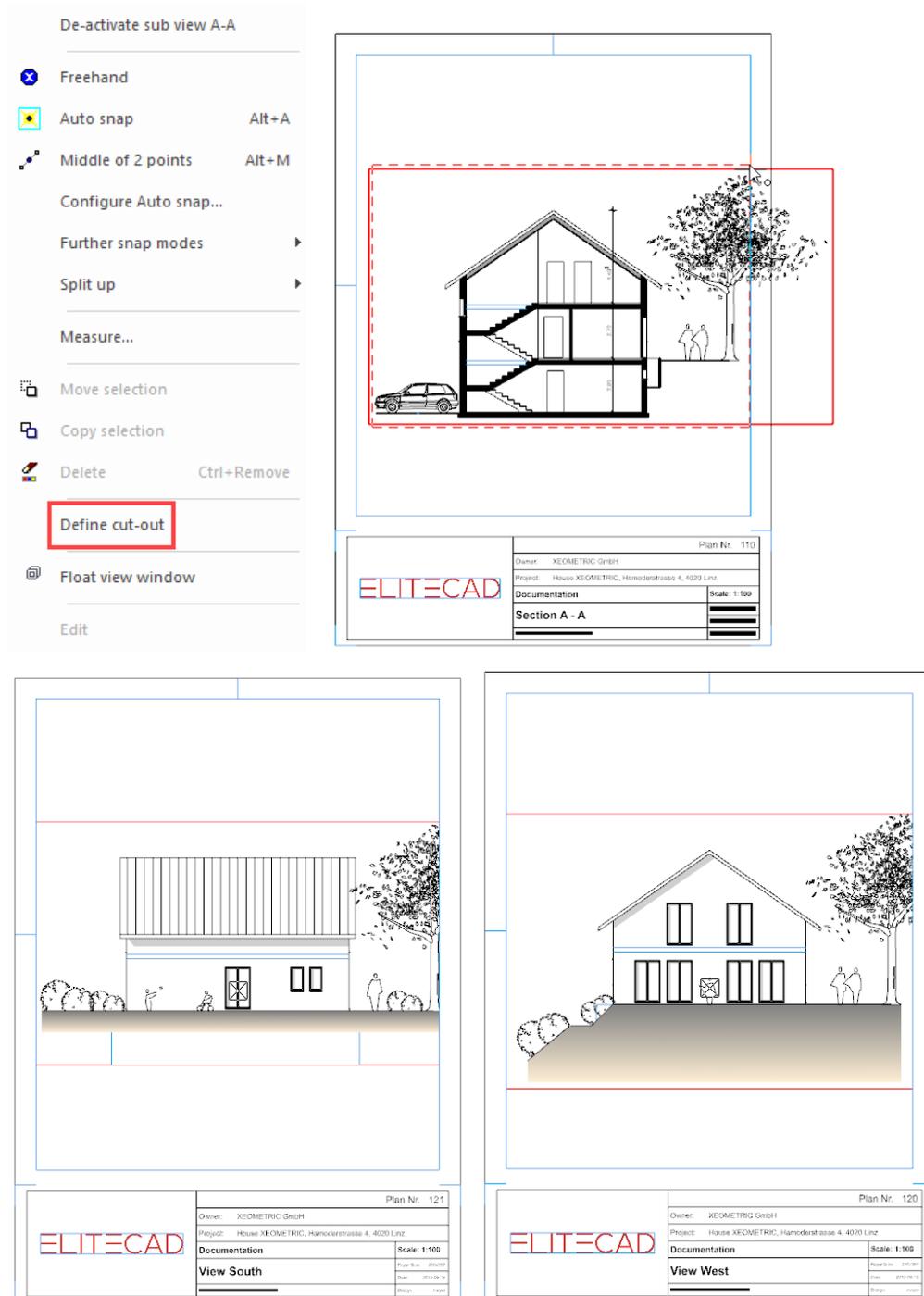
TIPP

The view can also be inserted into the plot using drag and drop.
Activate the plot into which the views are 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.
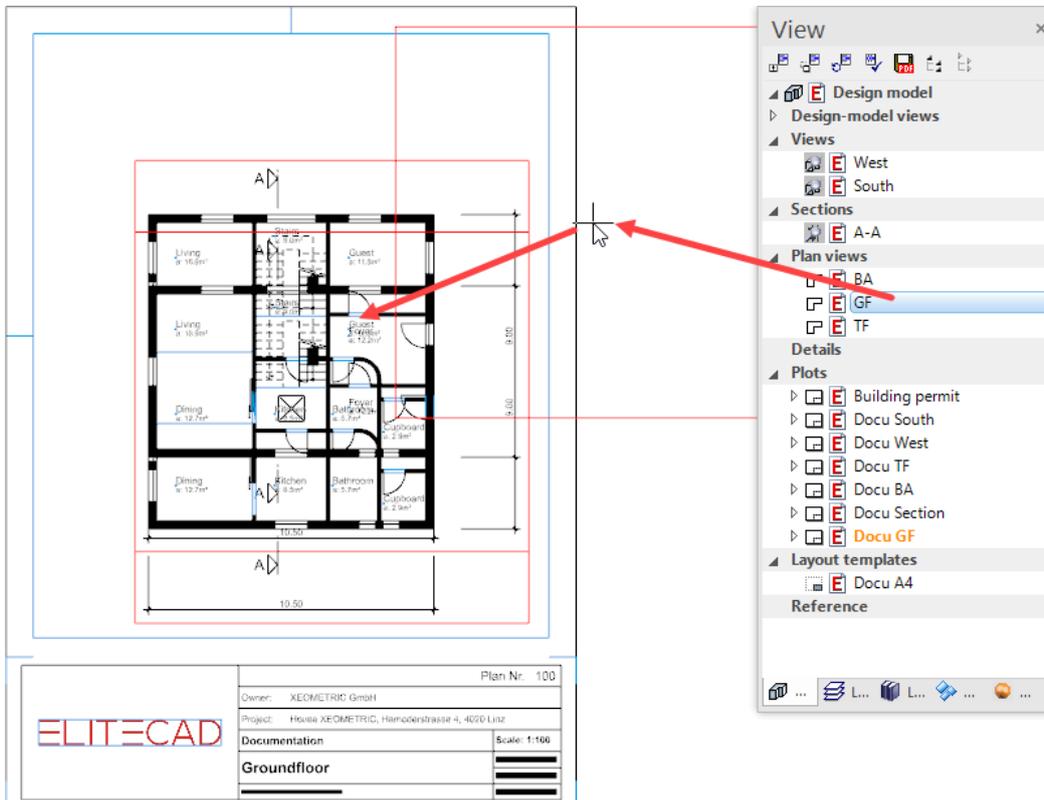
WORKSHOP END

PLOT WITH MULTIPLE VIEWS

1. In views management, generate a new plot by right-clicking on the title Plots.

2. Enter the name **building permit** and select an **A3 landscape format**.
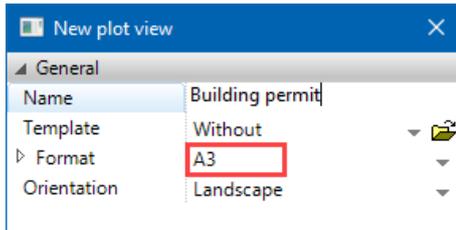
3. Add a frame to the plot.
Menu LAY-OUT > FORMAT FRAME
Confirm the A3 format by entering a **3** in the input line.
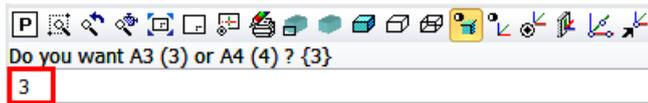
4. Fill the plot with the plans: GF, section A-A, view West and South.
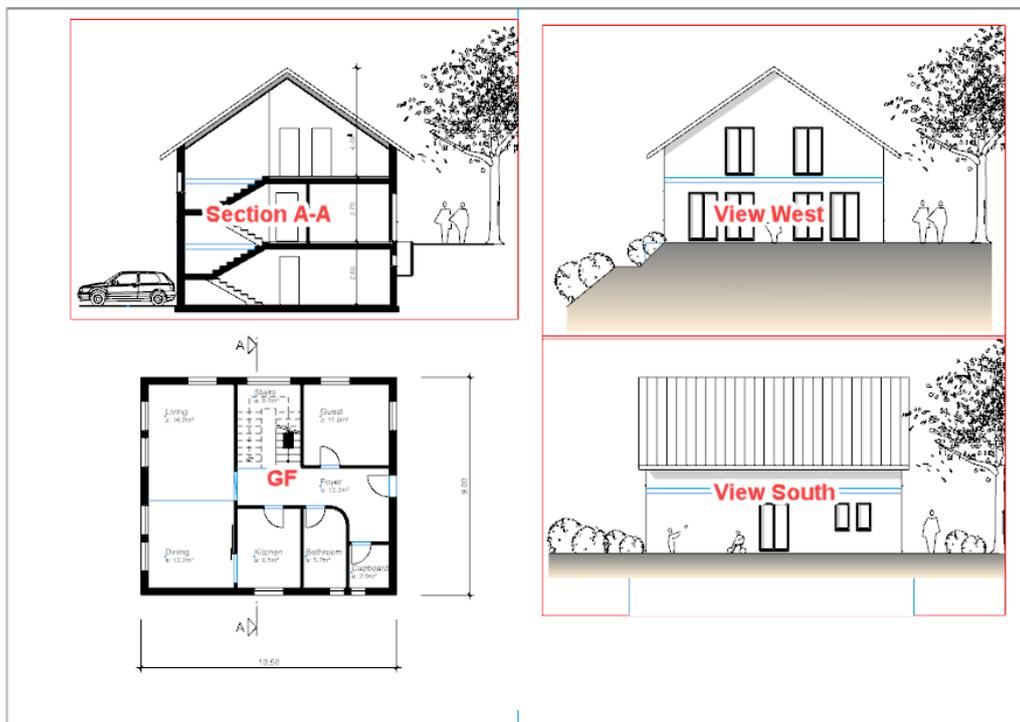
5. The title block could be included in the plot via the menu LAY-OUT > PLACE TITLE BLOCK. However, since you already added a title block in the layout template, with information on the client and construction project, it is quicker to copy it.
Switch to the layout template *Docu A4*.
Since the title block is combined in one group, you can select it with a single click.

6. Select the COPY function and place the reference point at the bottom right.
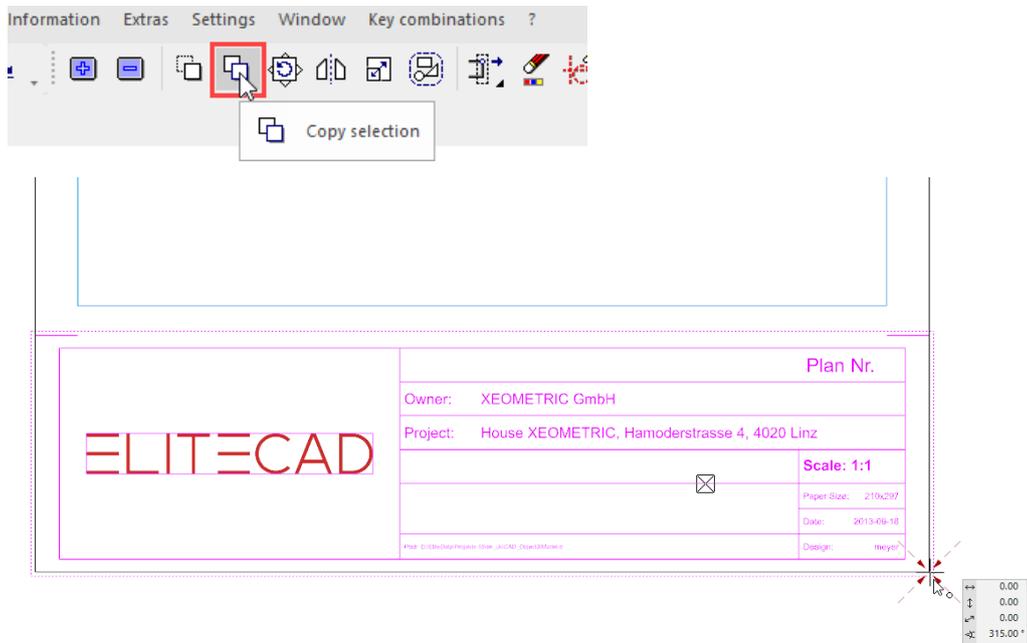
The title block is now in the clipboard.

EXPLANATION

If a selection is copied from the current view, the function Copy selection must be used.

If a selection needs to be copied to a different view or a different file, it must be copied from the clipboard. The COPY function adds a selection to the clipboard.

The PASTE function pastes the selection from the clipboard.

7. Switch back to the plot *Building permit*.

8. Insert the title block into the lower right corner using the function ABSOLUTE PASTE from the EDIT menu.
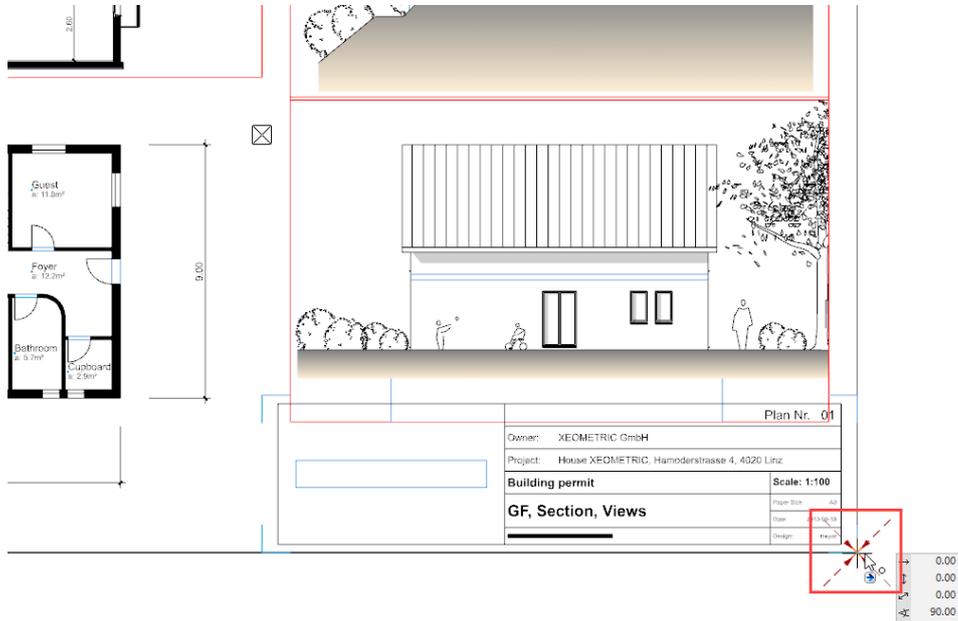
9. In the menu select LAY-OUT > COMPLETE TITLE BLOCK and add the missing information to the title block.
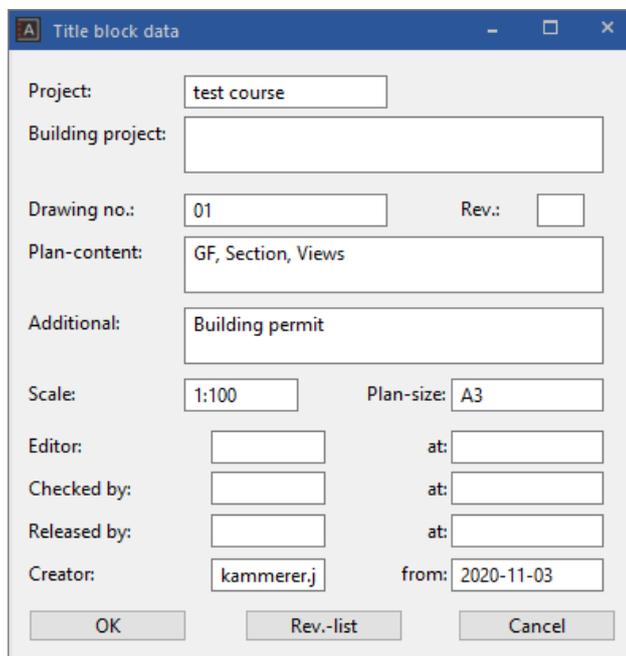
10. From the header line of views management, use the function MOVE VIEW to align the views.

You can create help lines or work with the temporary reference points.
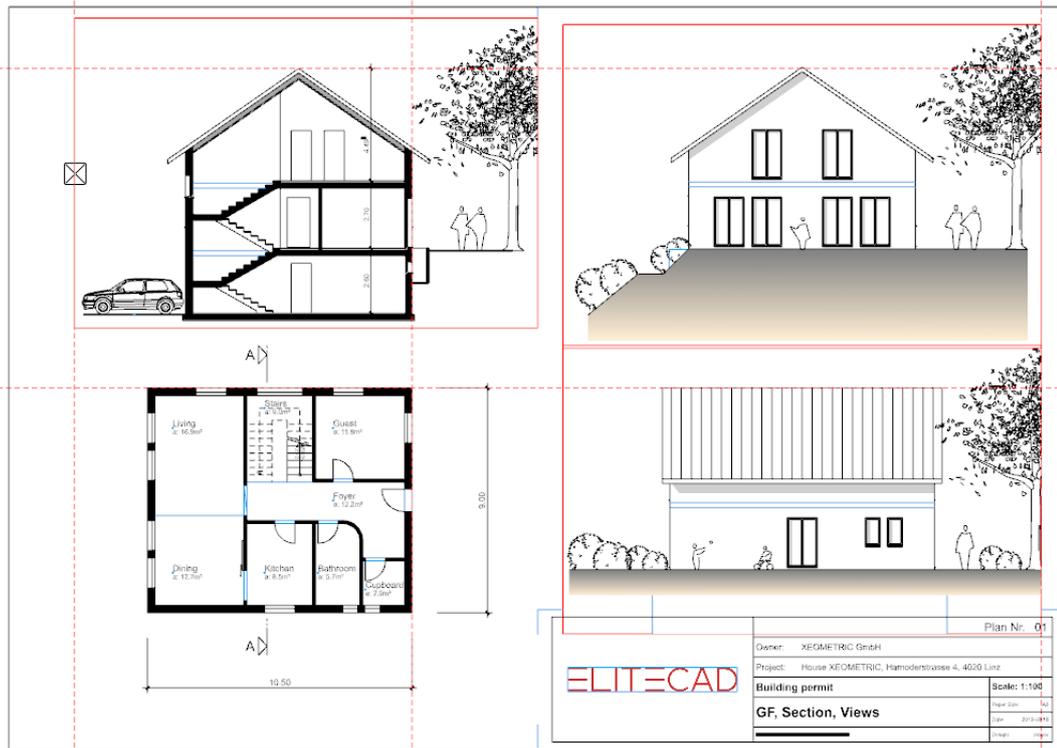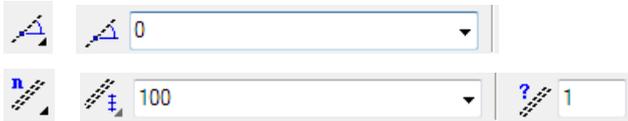
11. Remove help lines where applicable.

WORKSHOP END

PRINT

Now you need only transfer the plan to paper.

▼ ▼ ▼ ▼ WORKSHOP ——————————————————————

1. Click on the PRINT symbol.
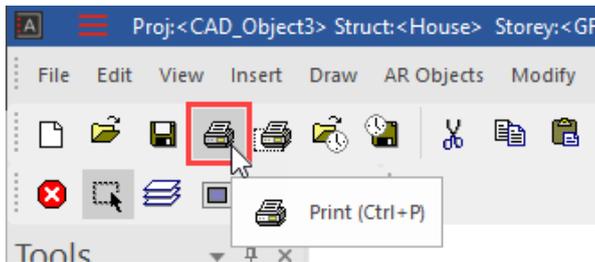
2. Select your printer from the list and open printer properties.
The installed Windows printer will be detected and loaded with the standard settings.
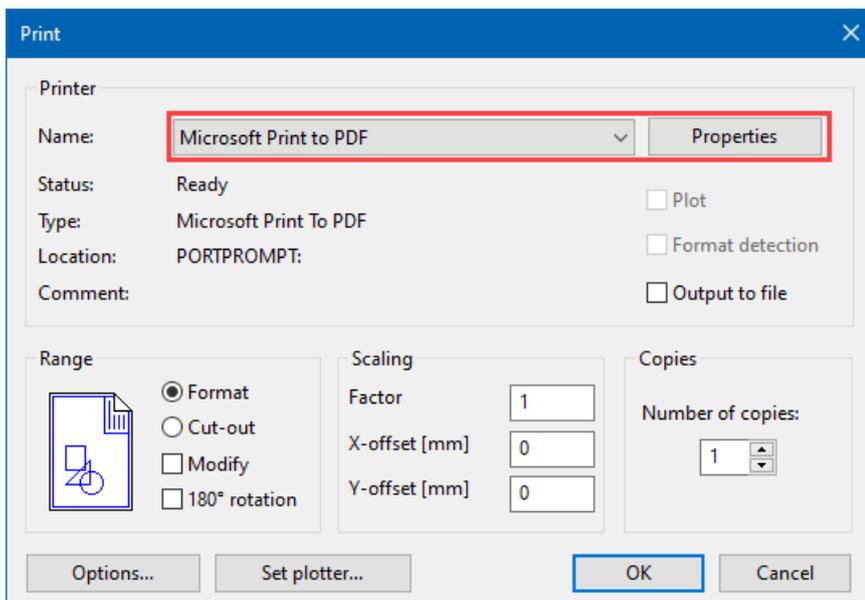
3. The appearance of the properties will differ depending on the printer.
Select an A3 landscape format.

4. Confirm both screens with OK.
The plan is printed out on the printer or generated as a PDF.

WORKSHOP END

EXPLANATION

Plot:

The *Plot* option uses the printer language hpgl2 and is mainly used for CAD large-format printers (plotters). This option is not active until the selected printer is configured with the function SET PLOTTER. Plans with pixel images can only be printed, not plotted.

Format detection:

This check box is only available in connection with plotting. If the check box is ticked, the current drawing format is used.

Options:
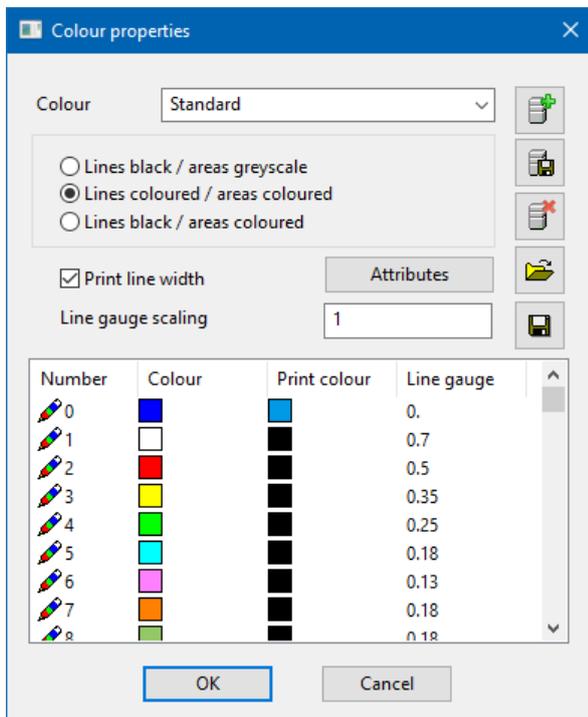
The same screen can also be accessed via the menu SETTINGS > COLOUR PROPERTIES. The print colour and line width of the individual pens can be modified.

Plan graphic:

If a large number of pixel images, colour gradient hatches or transparent hatches were used in the plan or such images and hatches were large, in the menu SETTINGS > OPTIONS the option *Print in highest quality* must be activated.
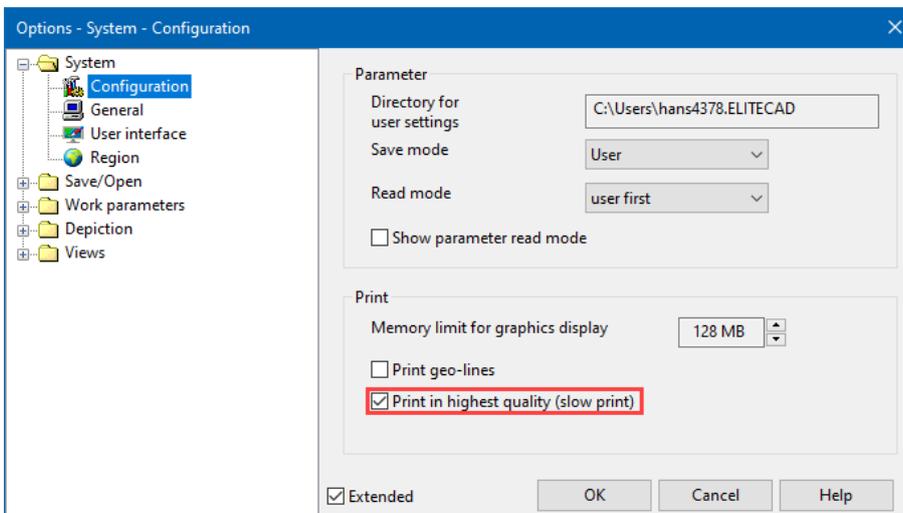
SAVE

▼ ▼ ▼ ▼ **WORKSHOP** ————————————————————

The next course unit builds on the current project level. Save the model.

1. Switch to the model view.
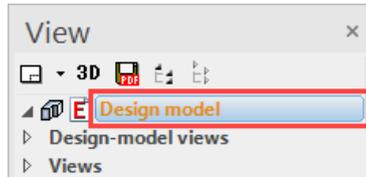
2. Set up everything.

3. Menu FILE > SAVE AS
Enter the name **Model-course3.d** for the model and save it.
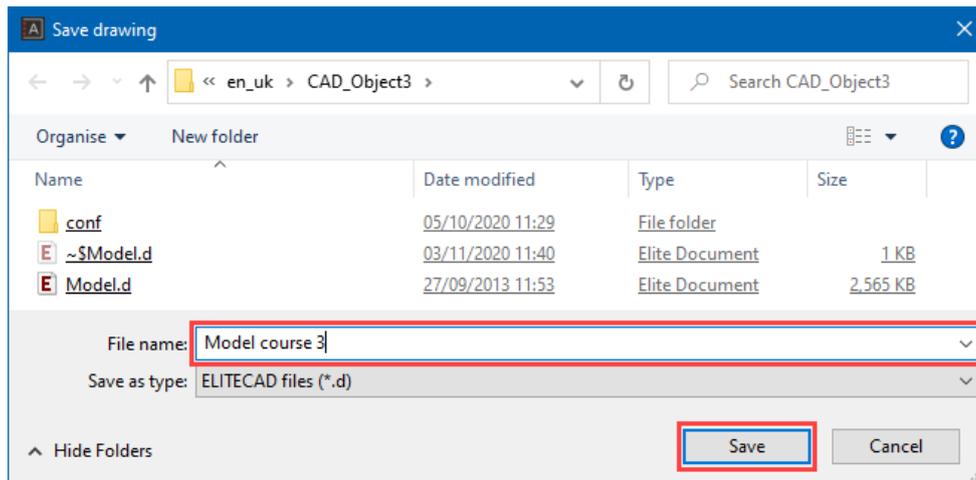
———————————————— **WORKSHOP END**

You can now continue directly with the course unit 4.

APPENDIX (OWN TITLE BLOCK)

▼ ▼ ▼ ▼ WORKSHOP ─────────────────────────────

Open a 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
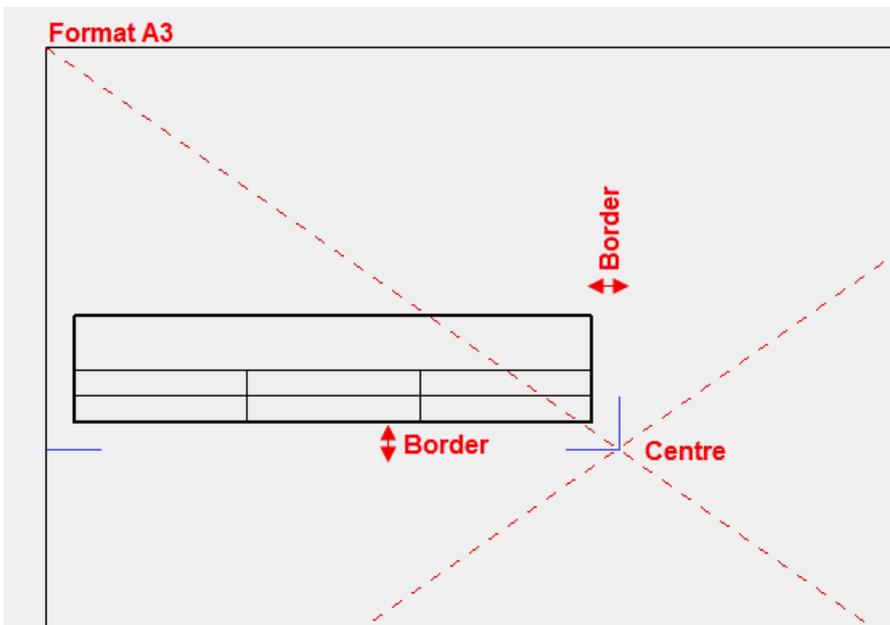
3. Add texts. To enable a text to be created vertically in the centre of a field, the text reference point must be set to *Centre left*.
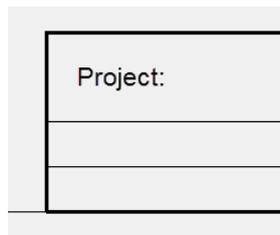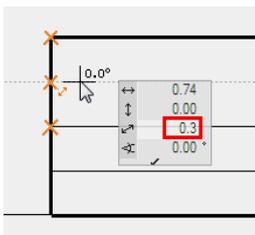
4. Auto text can be added to the title block by right-click. There is auto text that is filled out directly by the program (project, MST, file name, etc.) and auto text that is determined via the screen *Complete title block* (plan content, building project, etc.).
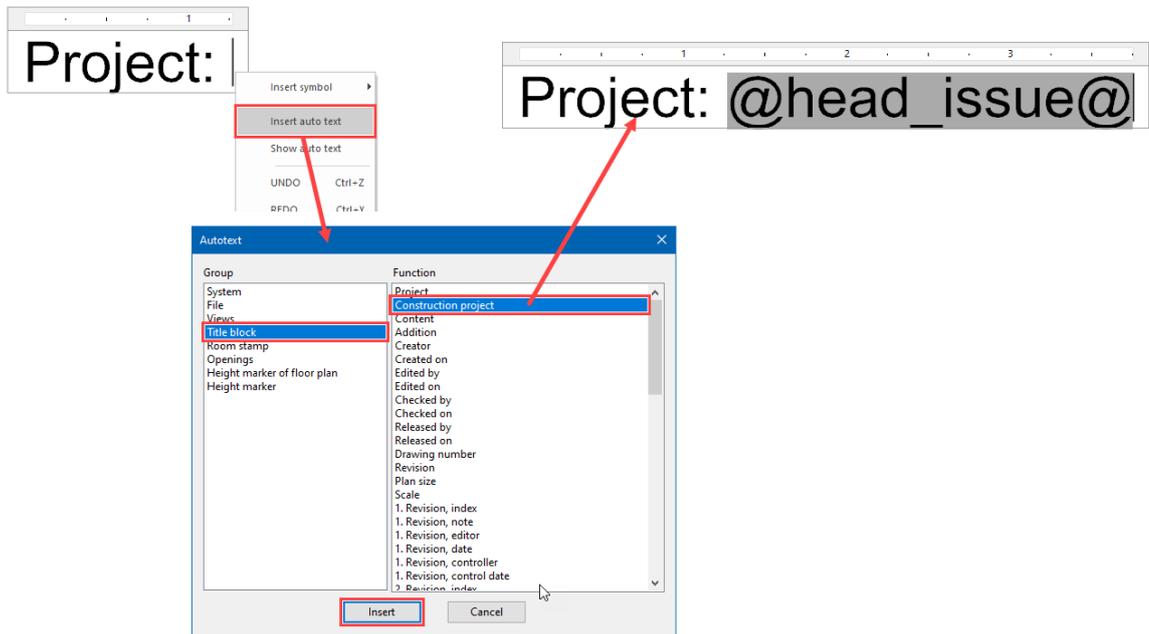
5. As a test, the title block can be filled out:
Menu LAY-OUT > COMPLETE TITLE BLOCK.
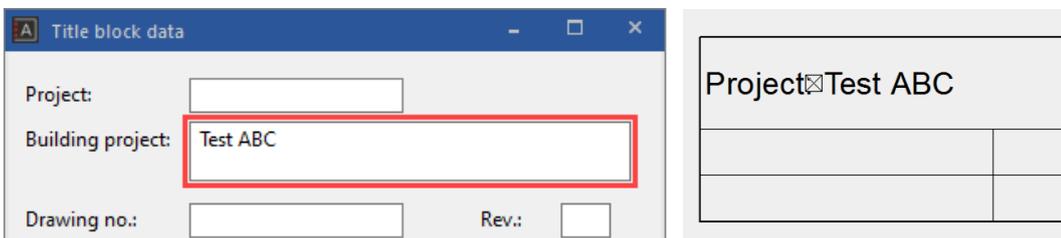
6. To enable the title block to be selected with a single click, it must be grouped together. Select the title block and from the context menu select GROUP SELECTION.
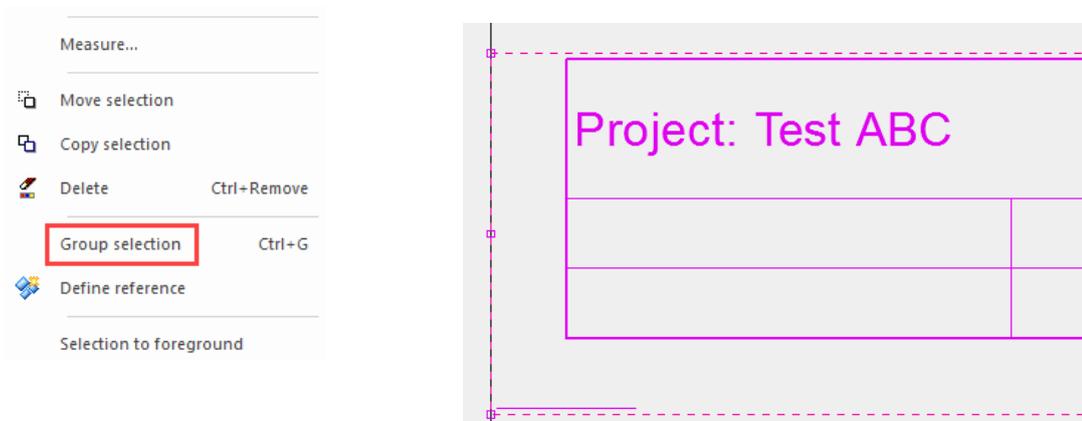
7. Move the title block in such a way that the point of the title block is located in the middle of the page; later on the title block will be attached to this point when you locate it using your cursor.
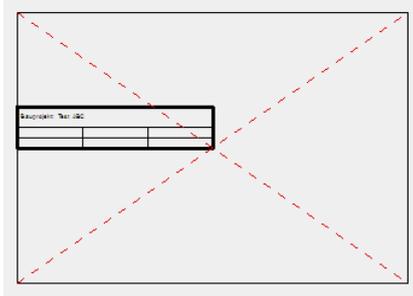
8. Save the title block to your library.
Menu FILE > SAVE AS

WORKSHOP END