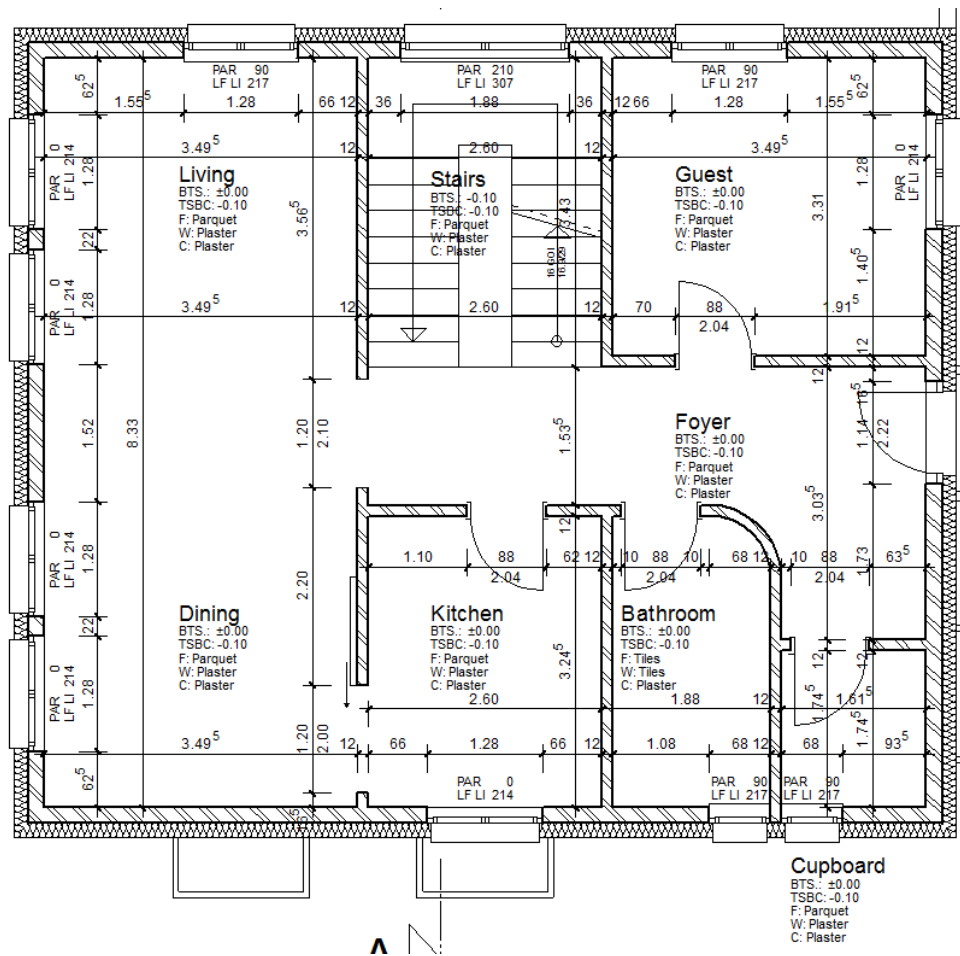


# COURSE UNIT 5



## Work Drawings

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# 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

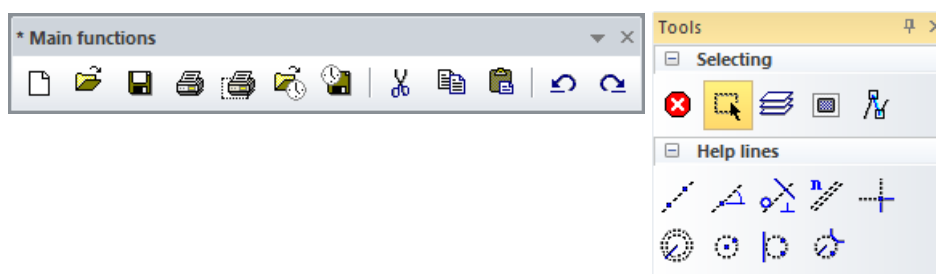
### WORKSHOP END

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

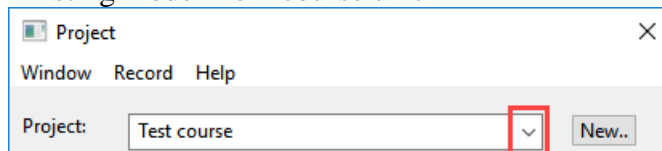
## ▼ ▼ ▼ ▼ WORKSHOP

In this course unit we start with the project status that you created in course unit 4 or you use our example supplied (CAD\_Object4). First, load the project.

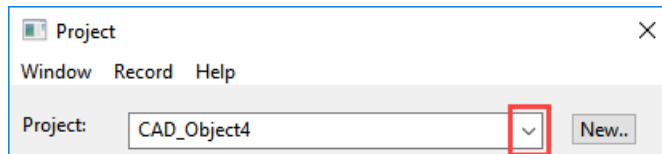
1. Open the project settings.



Existing model from course unit 4



Without model from course unit 4

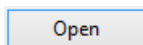


Select the relevant project and confirm with OK.

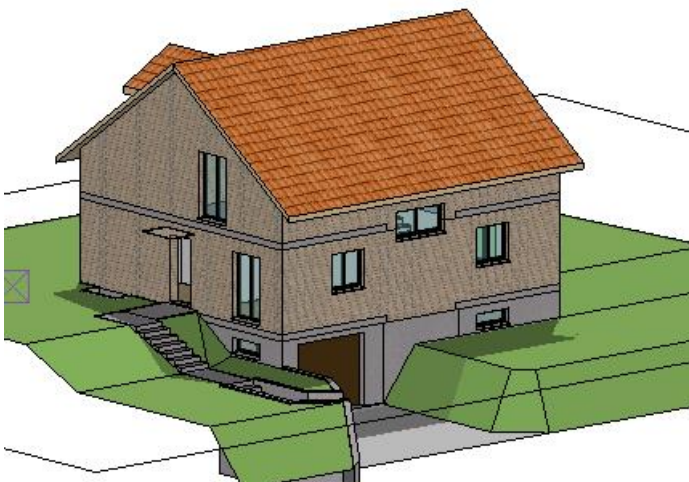
2. Load the corresponding model file with the menu FILE > OPEN.



Select the model and open it.



The opened model should have this status.

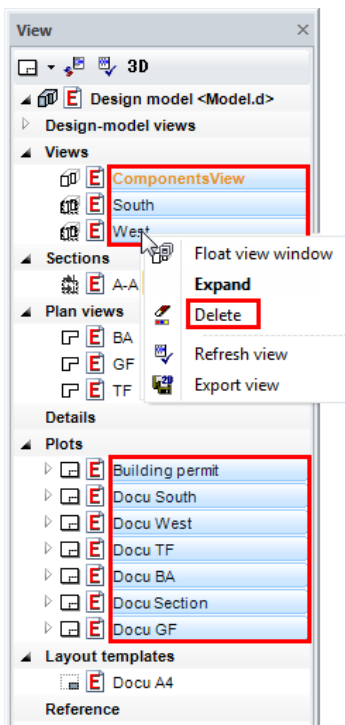


**EXPLANATION**

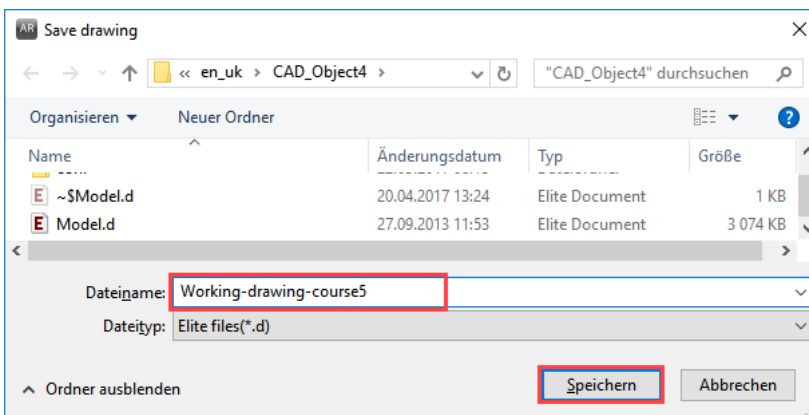
The changeover to the representation mode "work drawing" also changes the scale of the model and of the views. As a result, the plot compilations can no longer be used.

Make sure that you save the "input model" with its views and plots as an independent file. Use the SAVE AS function in the FILE menu to save a model and all its plans under a new name. A back-up copy of the entire file can also be created in the same way.

3. In views management delete all plots and views. Select the views and delete them using the context menu.  
[Ctrl] key = multiple selection; [Shift] key = "from-to" selection

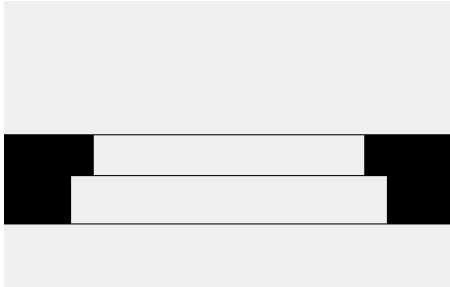


4. From the FILE menu select SAVE AS and save the file under the new name **Working-drawing-course 5.d**.

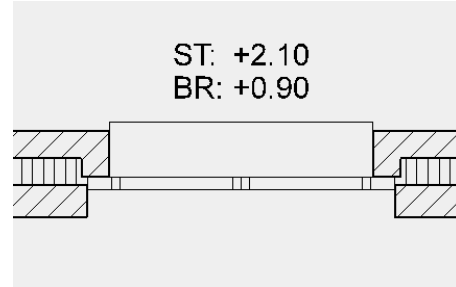


## SWITCH REPRESENTATION MODE

To be able to plan efficiently, the modifiability of the representation mode is decisive. The construction objects are drawn once and can be displayed in different ways. The imaging depth does not depend on the scale of the drawing.



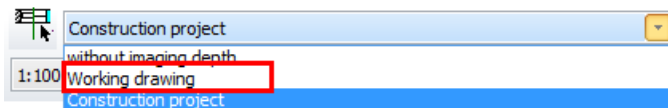
Construction project



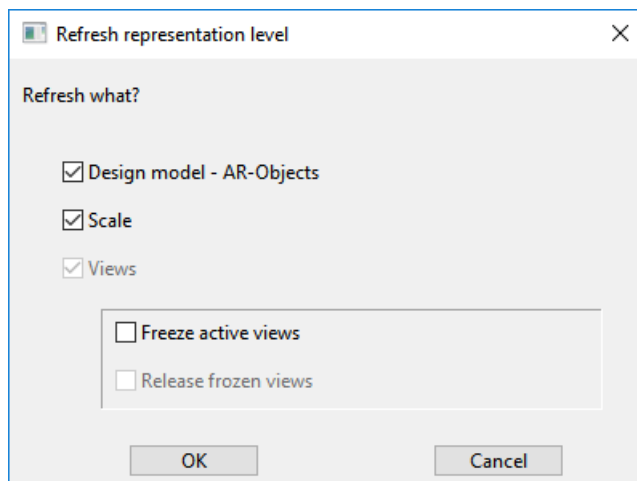
Working drawing

### ▼ ▼ ▼ ▼ WORKSHOP

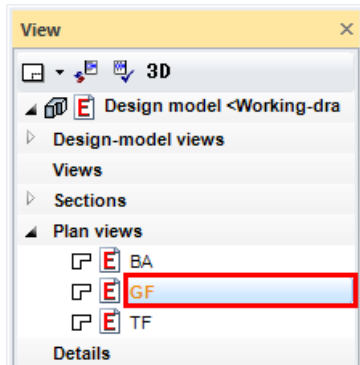
1. Switch the imaging depth from construction project to work drawings. Ensure that you are in the model.



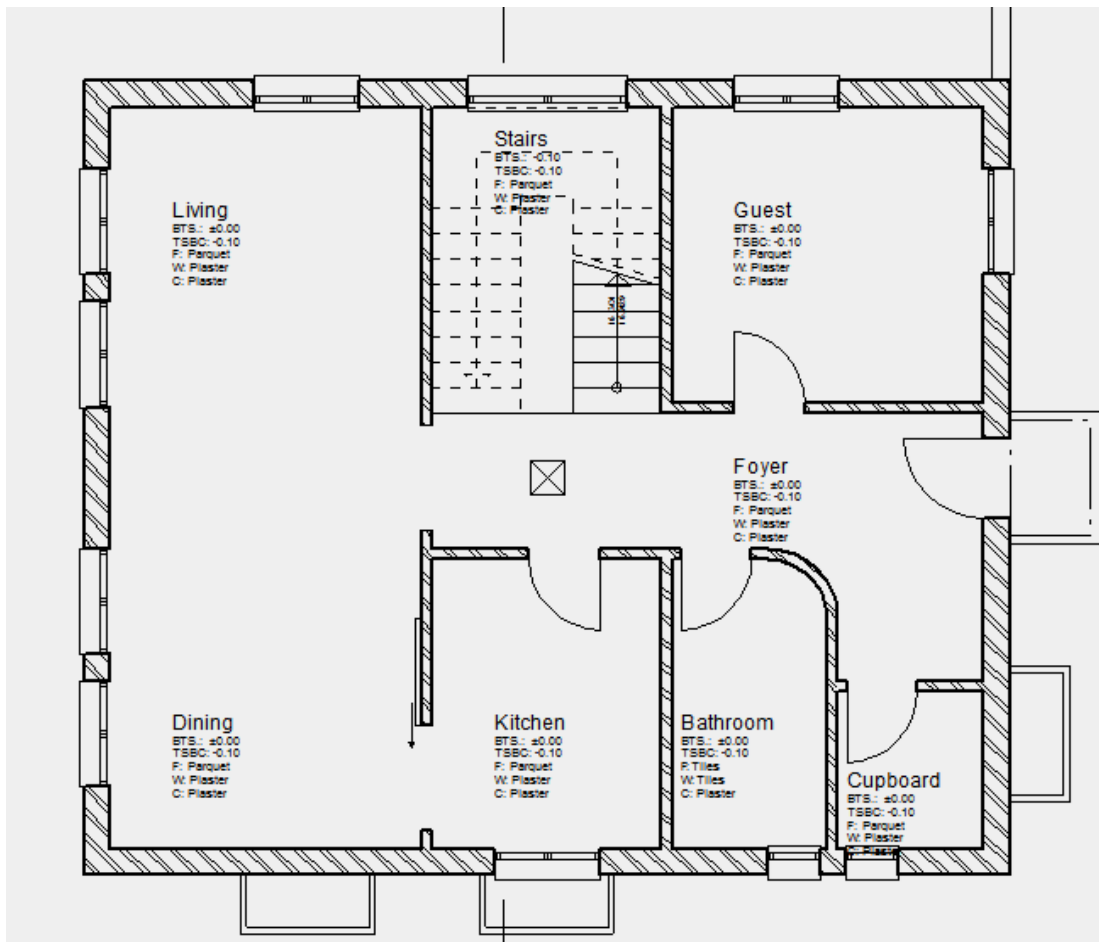
2. The model and the MST must be updated.



3. In views management, switch to the GF.



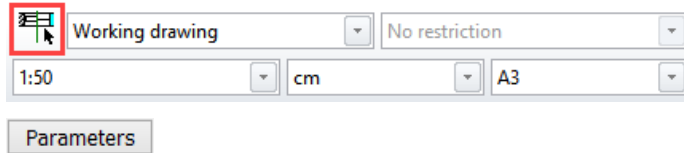
4. The walls have changed the hatches; the windows, doors and room labels have adjusted the level of detail.



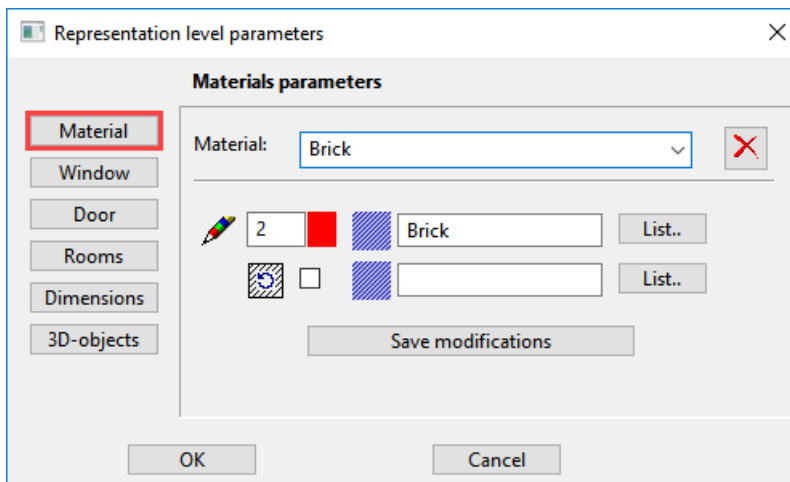
**WORKSHOP END**

# PARAMETER REPRESENTATION MODE

The way in which the AR objects are displayed in the different imaging depths can be set in the parameter mask.

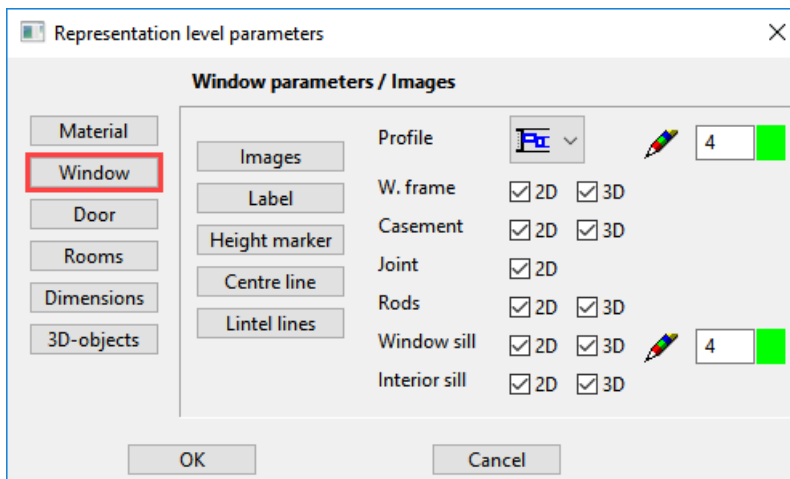


## Materials



In materials management, the line width and hatch parameters are defined which are used to display the materials of components in the floor plan view and/or section view.

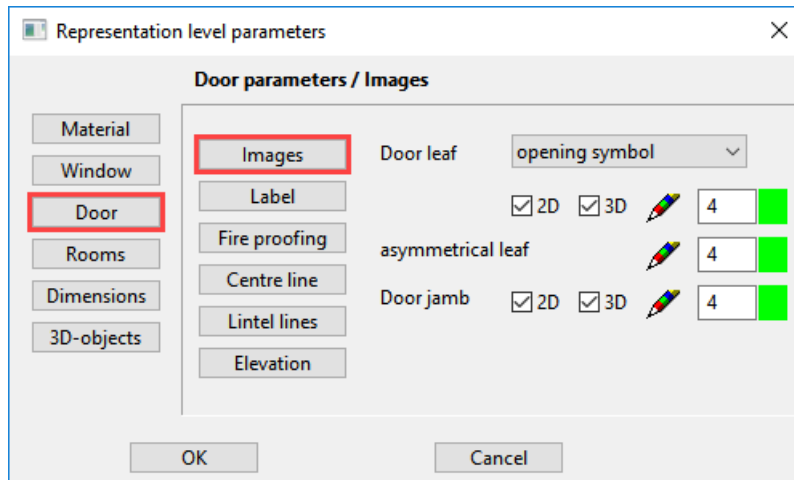
## Windows



In the window parameters, the display of windows in 2D and 3D can be defined. In addition, you can modify the type of label and the text parameters to be used, the settings of the height markers, the length and the pen for the centre line and the line types for the lintel lines.

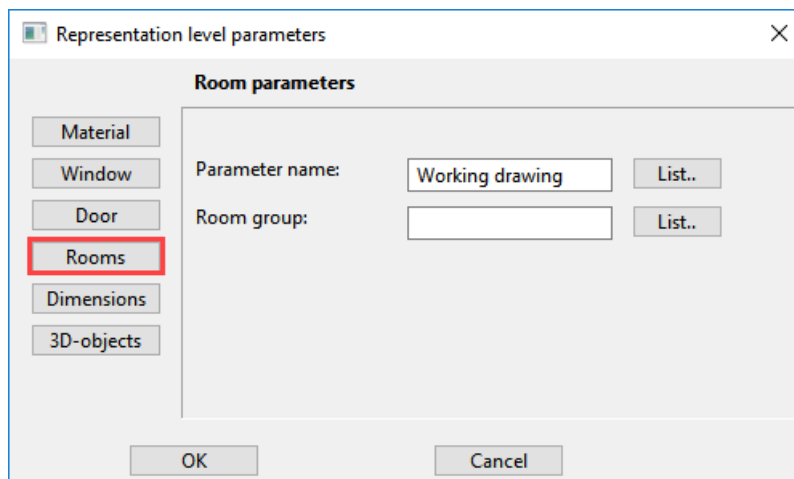


### Doors



In the door parameters, you can define the display of doors in 2D and 3D. In addition, you can modify the type of label and the text parameters to be used, the length and the pen for the centre line and the pens and line types for the lintel lines.

### Rooms



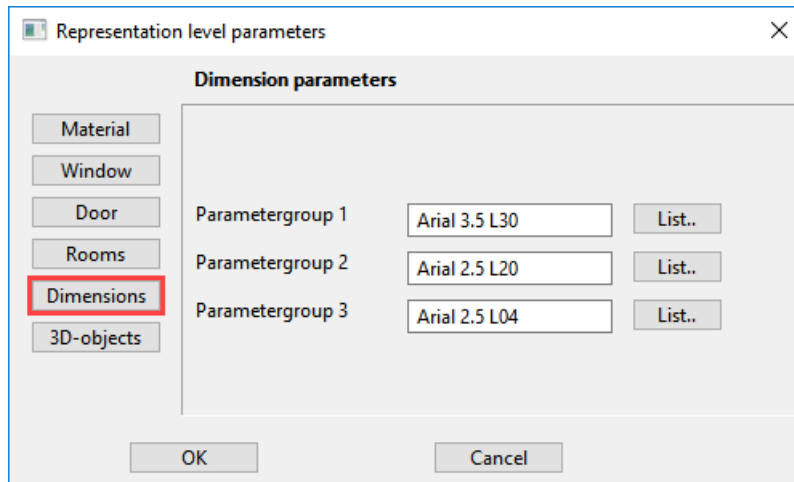
In the room parameters you can select the data record for the room label and room group used.

### TIP

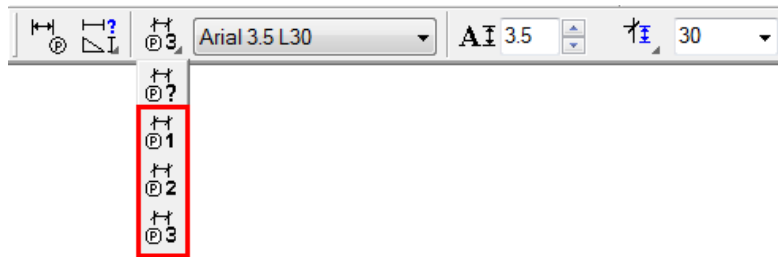
The construction parts are adjusted when the imaging depth is changed or when the settings for this imaging depth are updated, even when different settings were applied on the parameter screens of the relevant construction parts. To prevent this with individual construction parts, each construction part has the option to be frozen when edited. If this option is set, this construction part is ignored when the imaging depth is updated.



### Dimensions

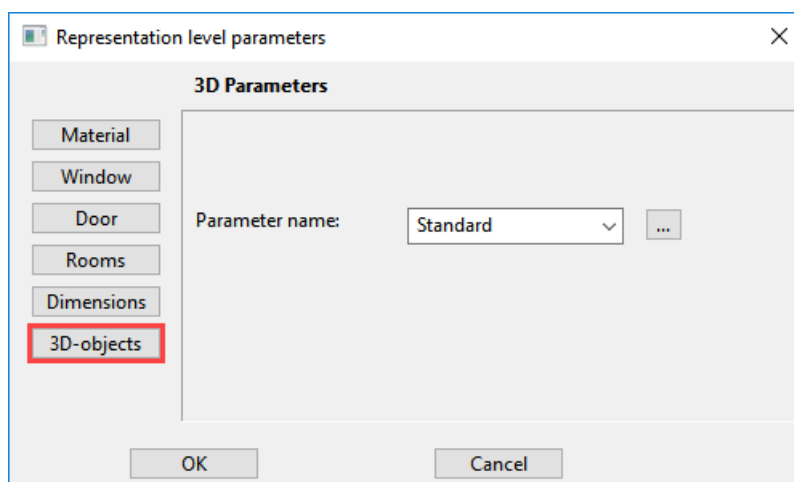


On this screen you specify the dimension parameters for the "parameter groups 1–3" to be used during architectural dimensioning.



The dimension parameter must be selected from "List...", i.e. from a list of all of the settings created under the function "Dimension parameters". The selection of an imaging depth automatically converts the current dimension parameter.

### 3D objects




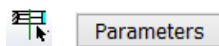
In the 3D parameters, the data record can be selected which is to be used as a standard for 3D objects (plane, box, rotation bodies, free forms, etc.).

# CHANGE IMAGING DEPTH

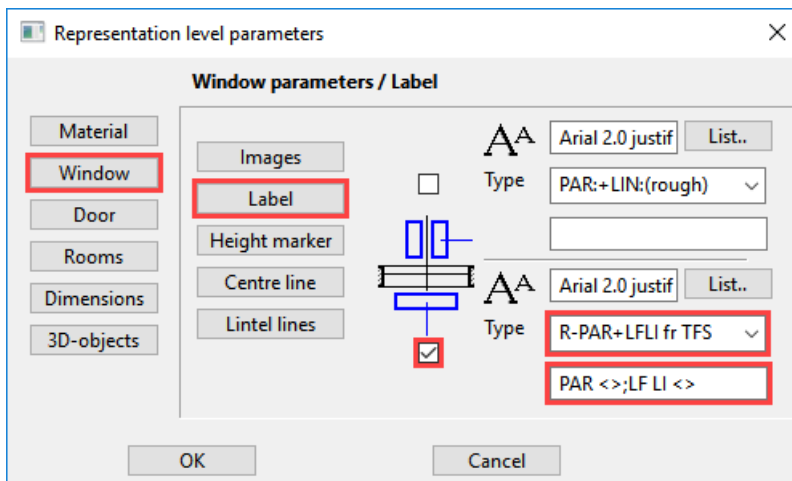
After the imaging depth has been changed, all objects are updated (with the exception of objects on locked layers). Everything must be set up before the imaging depth is changed.

## ▼ ▼ ▼ ▼ WORKSHOP

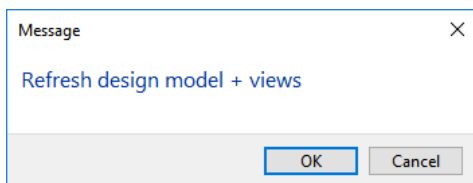
1. Switch to the model and set everything up. 
2. Open the imaging depth settings and switch to the window parameters.



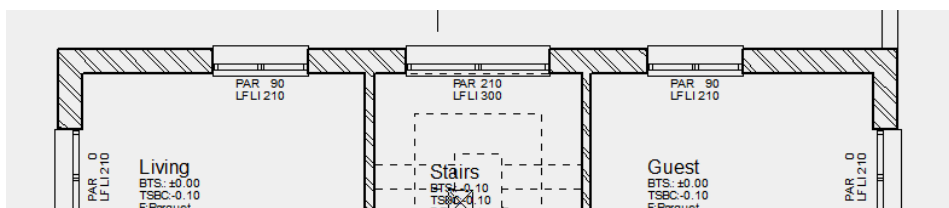
3. Switch to label. Activate the inner label and change the type to “R PAR+LF LI fr TFS” (raw parapet and lower face Lintel from top face slab). Complete the formatting text and confirm with OK.



4. Update the model.



5. The windows now have a label.



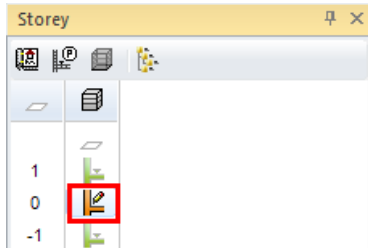
## WORKSHOP END

# MODIFY EXTERNAL WALL

The walls from the building permit are single-layered and must be adjusted in accordance with the construction.

## ▼ ▼ ▼ ▼ WORKSHOP

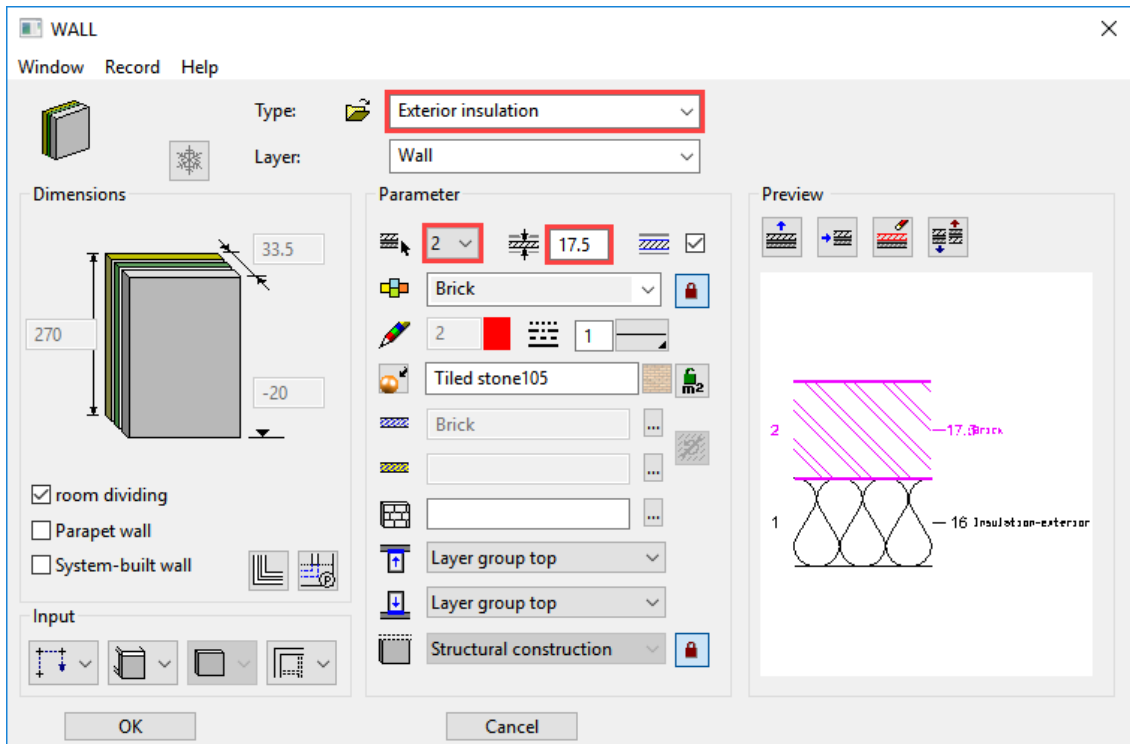
1. Switch the "GF" floor to visible *alone* on the screen.



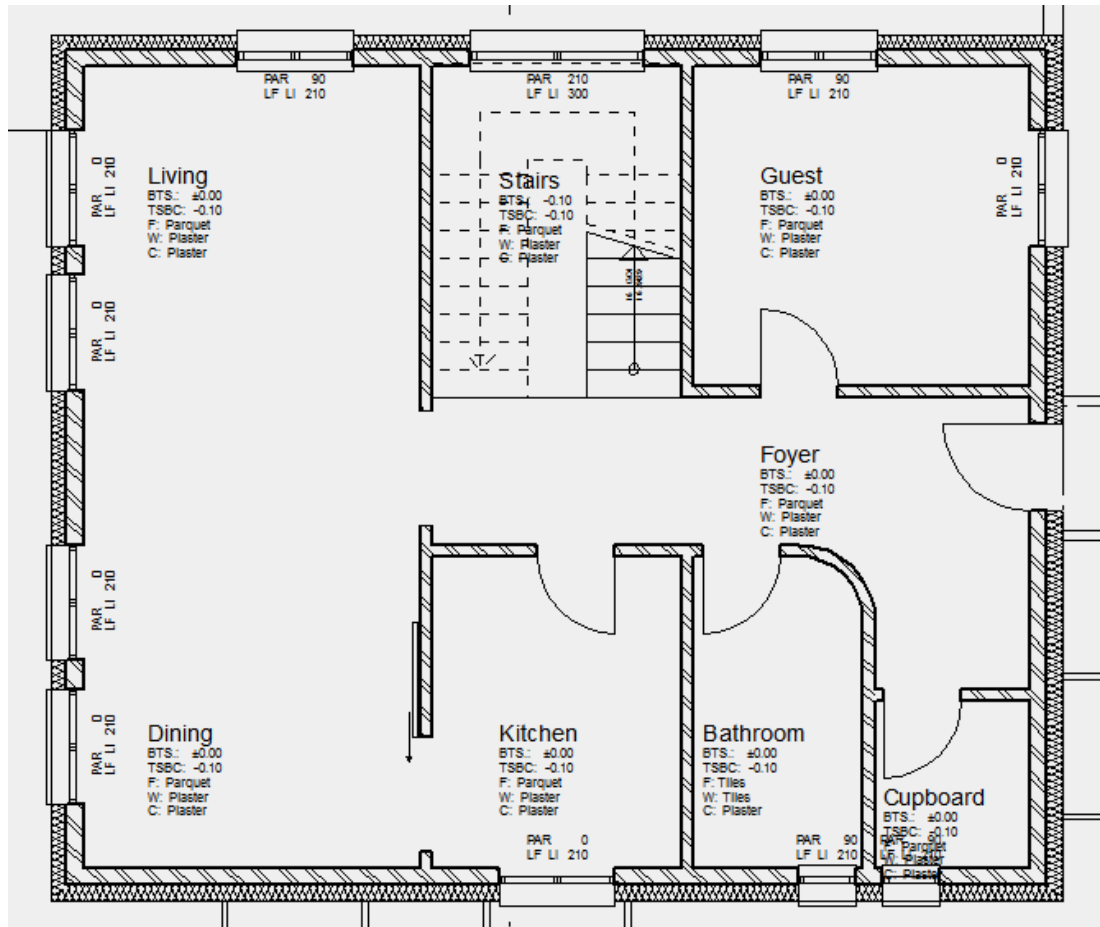
2. Select the outer wall and switch to the parameter screen.



3. Select *Exterior insulation* as type and change the thickness of the brick to **17.5**.



4. The room labels may need to be updated. From the menu select LAY-OUT > REFRESH ROOMS and confirm with OK.



**WORKSHOP END**

## EXPLANATION

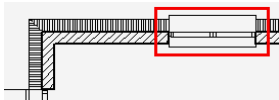
If the wall thickness is changed, the wall connections adjust themselves automatically. Library parts, stairs, own 2D elements, etc. must be adjusted manually to the new ratios.

# MODIFY WINDOW STOP

The window stops must be adjusted to the new wall construction.

## ▼ ▼ ▼ ▼ WORKSHOP

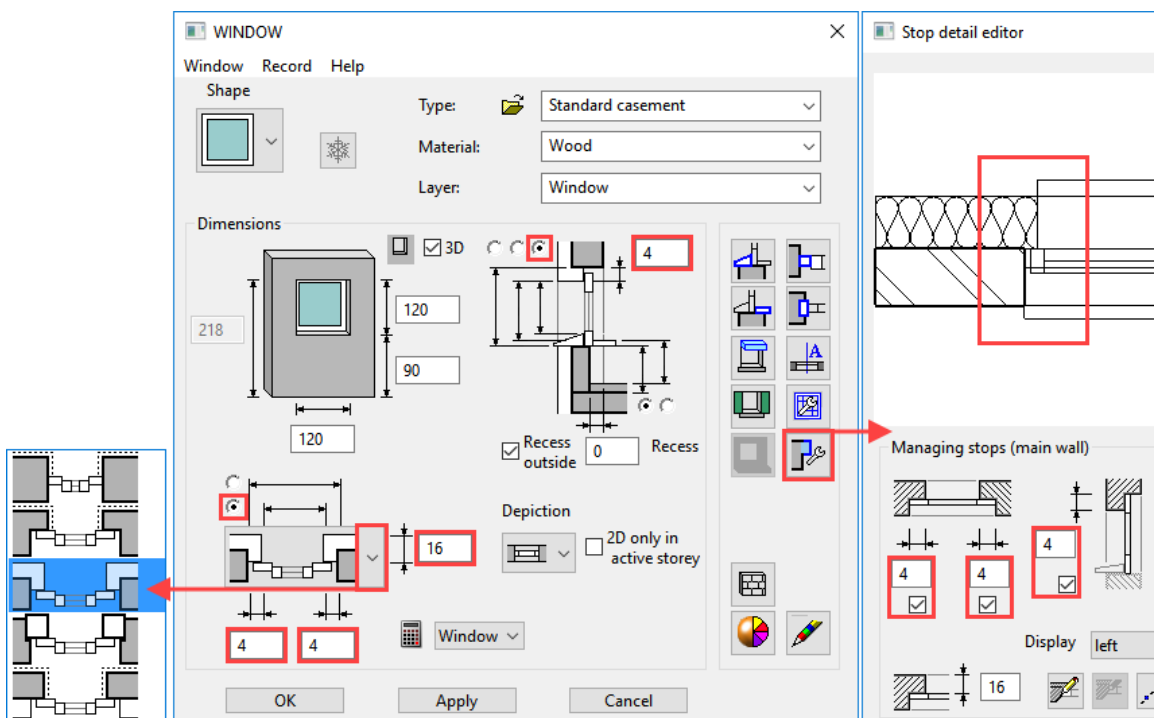
1. Edit the window in the *Living* room at the top left.



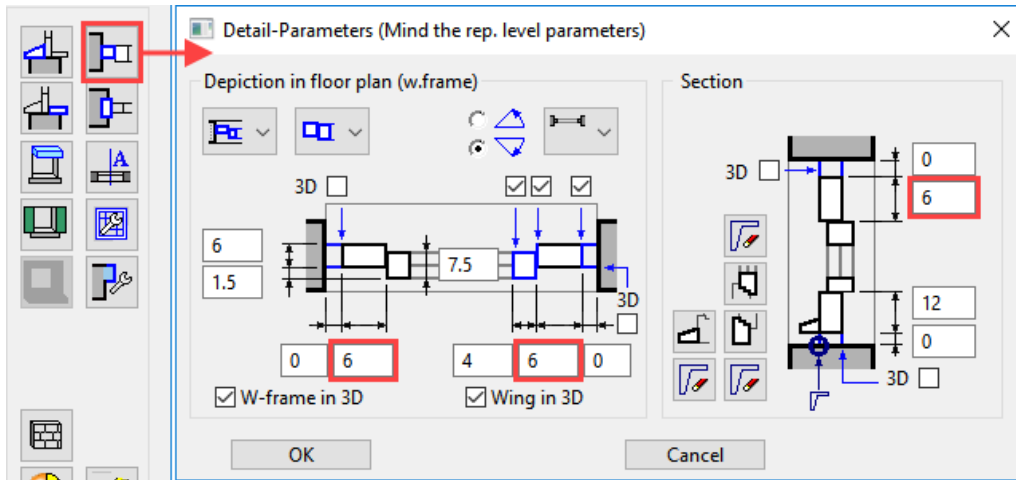
2. In the properties bar switch to the large parameter screen.



3. Give the window a stop, set the width to **4** and the depth to **16** and change the "Enter size" to finished clearance, then switch to the "Stop detail editor" and activate all stops. Close the "Stop detail editor" with *Apply*.

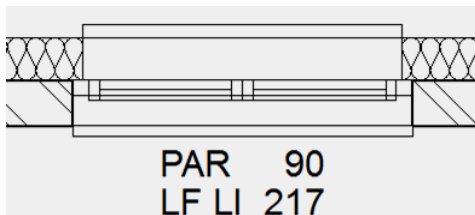


4. Open the frame parameters and change the frame strength at the side and top to 6 cm. Confirm with OK.

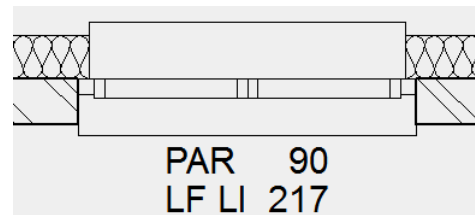


The floor plan and geometry lines are shown in the model. The cleared display of the floor plan can be checked in the plan view in print mode.

Model



Floor plan



WORKSHOP END

# MODIFY DOOR STOP

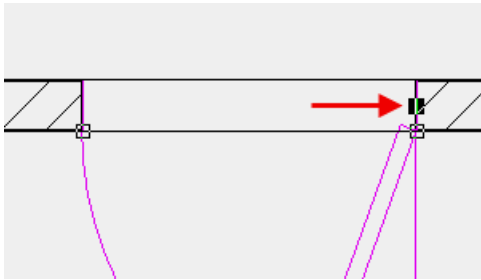
## ▼ ▼ ▼ ▼ WORKSHOP

1. Select the kitchen doors.

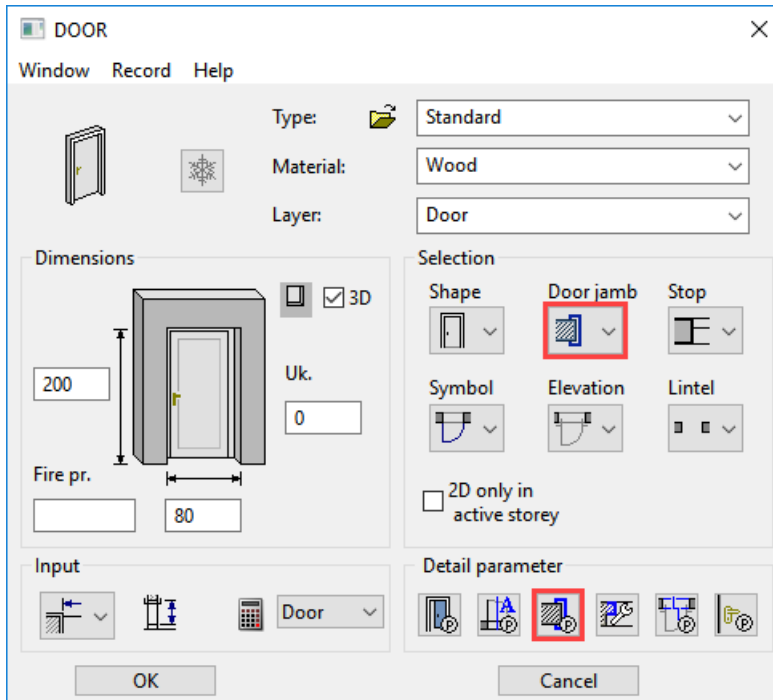


2. Check whether the "fixed point" is in the correct place.

Following selection, the "fixed point" is indicated by a handle and can if necessary be dragged to the correct position.

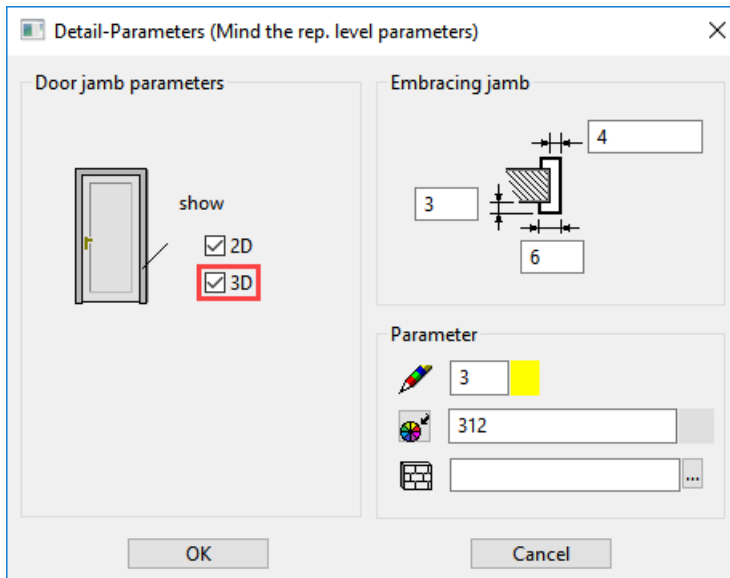


3. Change the door jamb type to "Embracing jamb" and then open the "Door jamb parameters".



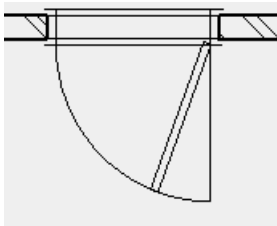


4. Change the settings for the "Embracing jamb" as shown and close both door masks.

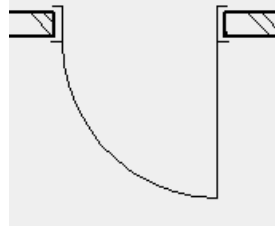


For display of doors, the same applies as for windows. The display in the model is not purged.

Model



Floor plan



---

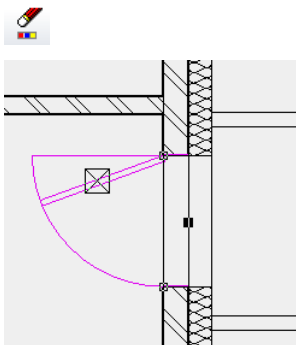
**WORKSHOP END**

# SET DOORS WITH STOP

Since, in the work drawing, the outside doors also have a stop, they are best reinserted again.

## ▼ ▼ ▼ ▼ WORKSHOP

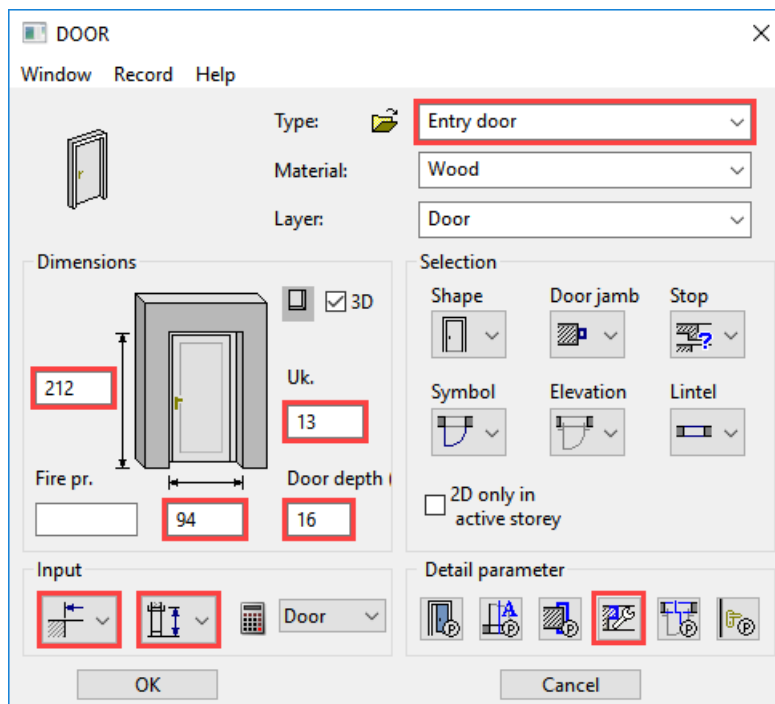
1. The outside door must first be deleted.  
Select the door, which is most easily done by selecting the door leaf, and delete it by using the function DELETE or by pressing the [Delete] key.



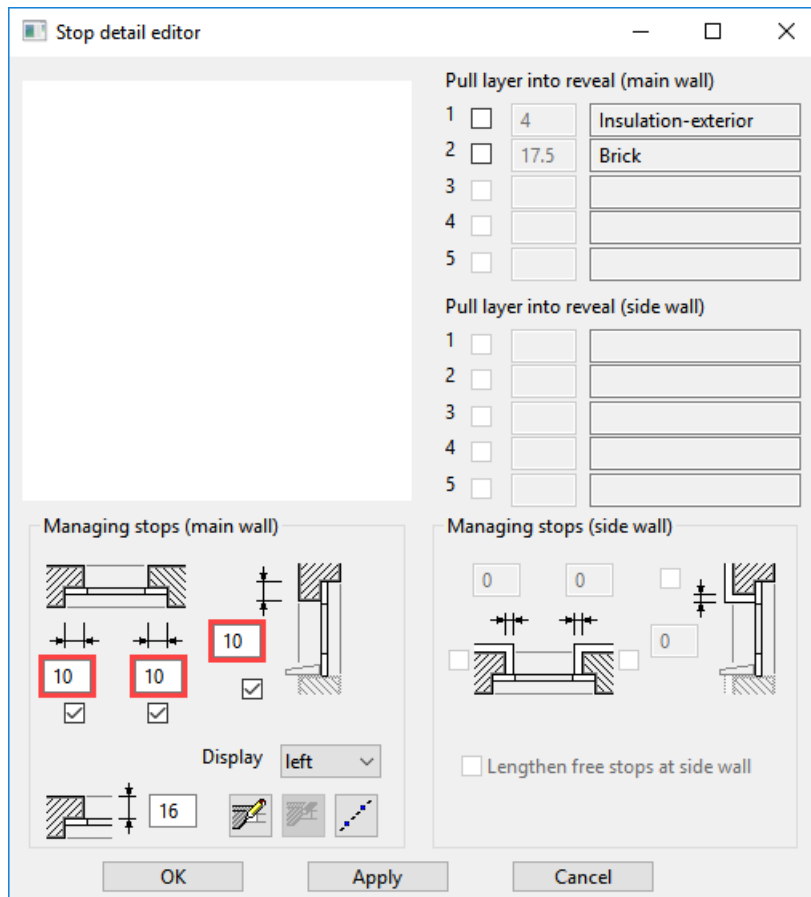
2. Start the function CREATE DOORS and open the parameter mask from the properties bar.



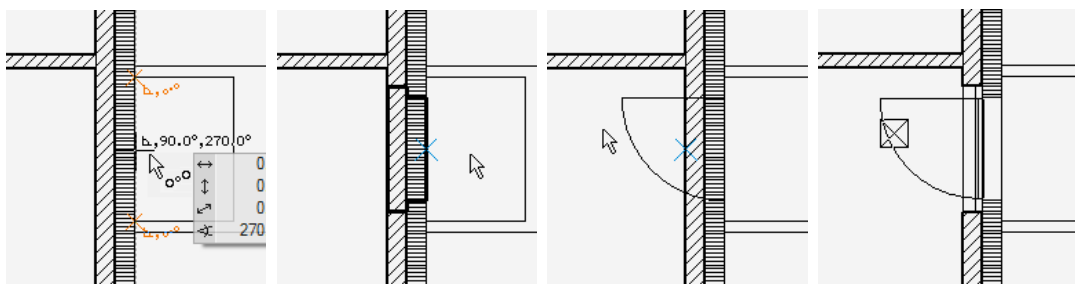
3. Select the type *Entry door* and change the rest of the values. Switch to the stop editor of the doors.



4. Set the stop to one side and above at **10** cm. No preview will be displayed because the wall function is not yet known.



5. Set the doors into the middle of the exterior wall. Click again to determine whether the door opens inwards or outwards.



WORKSHOP END

# TRANSFER THE PARAMETERS OF THE DOORS

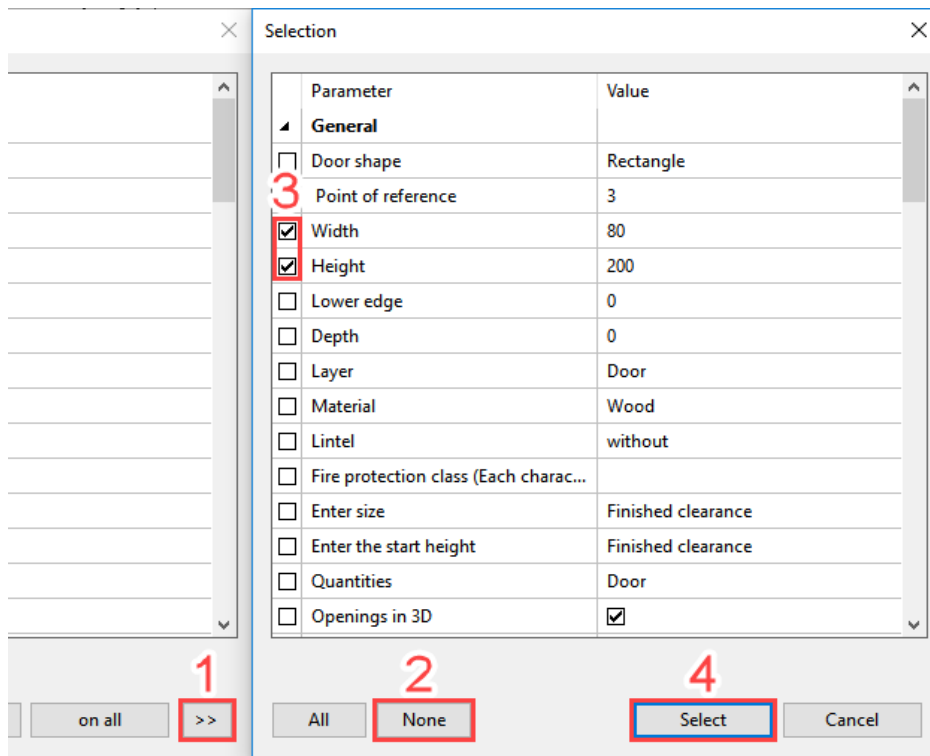
The parameter settings of the modified components can now be transferred globally to all others.

## WORKSHOP

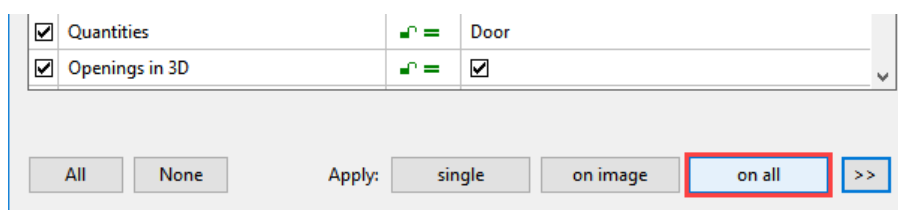
1. Select the function TRANSFER PARAMETERS.



2. Click on the kitchen door you created earlier and from which the parameters are to be transferred. The parameters cannot be transferred to all doors (outside door, garage door, sliding door) meaning that you have to make a selection. The parameters may only be transferred to doors that are 80 cm wide and 200 cm high.



3. Thanks to the selection the parameters can now be transferred *to all*. Compared to *on image* this also includes the doors of the basement and of the top floor not displayed.



# TRANSFERRING THE PARAMETERS OF THE WINDOWS

## WORKSHOP

1. Make the top floor visible as well.
2. Select the function TRANSFER PARAMETERS.



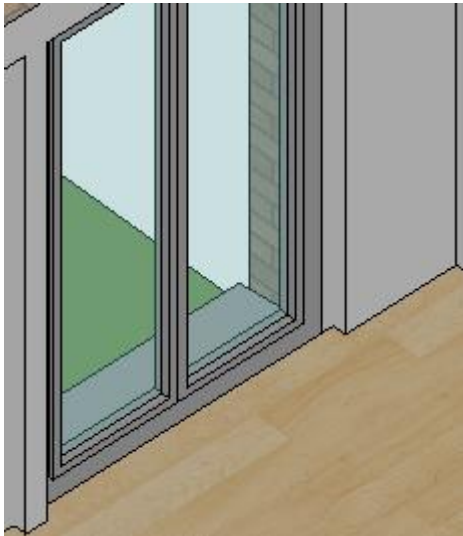
3. Click on the window in the living area modified previously. Not all values may be transferred because the windows differ in size or are divided in different ways. Activate the window depth, input of sizes, the values of the frame (except frame width below) and the stop parameter. Transfer the values *to the image* (to all visible objects) > the basement windows must not be affected.

Parameter	Value
<b>General</b>	
<input type="checkbox"/> Window shape	Rectangle
<input type="checkbox"/> Width	120
<input type="checkbox"/> Height	120
<input type="checkbox"/> Parapet height	90
<input checked="" type="checkbox"/> Depth	16
<input type="checkbox"/> Recess for radiator	0
<input type="checkbox"/> Outside recess	<input checked="" type="checkbox"/>
<input type="checkbox"/> Layer	Window
<input type="checkbox"/> Material	Wood
<input type="checkbox"/> Casement/muntin division	*
<input type="checkbox"/> Glass composition	*
<input type="checkbox"/> Lintel	contiguous
<input checked="" type="checkbox"/> Enter size	Net finished dim. from exterior sill
<input type="checkbox"/> Enter the start height	from rough floor level
<input type="checkbox"/> Rough/finished lintel	0
<input type="checkbox"/> Side plaster thickness	0
<input type="checkbox"/> Quantities	Window
<b>W. frame</b>	
<input type="checkbox"/> Floor plan depiction	W.frame and casement separated
<input type="checkbox"/> Normal frame/ Block frame	Normal frame
<input type="checkbox"/> Inward/Outward	open inward
<input type="checkbox"/> Casement thickness	7.5
<input type="checkbox"/> Casement offset	1.5
<input type="checkbox"/> Window frame thickness	6
<input type="checkbox"/> Casement	<input checked="" type="checkbox"/>
<input type="checkbox"/> Casement frame width	4
<input type="checkbox"/> W. frame	<input checked="" type="checkbox"/>
<input type="checkbox"/> Dummy f.	<input checked="" type="checkbox"/>
<input type="checkbox"/> Sub-frame width	0
<input type="checkbox"/> W-frame in 3D	<input checked="" type="checkbox"/>
<input type="checkbox"/> Wing in 3D	<input checked="" type="checkbox"/>

<input checked="" type="checkbox"/> Window width up	6
<input type="checkbox"/> Window width below	12
<input checked="" type="checkbox"/> Window width left	6
<input checked="" type="checkbox"/> Window width right	6
<input type="checkbox"/> Top joint width	0
<input type="checkbox"/> Joint width below	0
<input type="checkbox"/> Top joint in 3D	<input type="checkbox"/>
<input type="checkbox"/> Bottom joint in 3D	<input type="checkbox"/>
<input type="checkbox"/> Left joint in 3D	<input type="checkbox"/>
<input type="checkbox"/> Right joint in 3D	<input type="checkbox"/>
<input type="checkbox"/> Frame contour	*
<input type="checkbox"/> Bottom window frame sill jamb	*
<input type="checkbox"/> Pen	4
<input type="checkbox"/> Line type	1
<input type="checkbox"/> 3D frame depiction	320
<input type="checkbox"/> Frame 3D hatching	<input type="checkbox"/>
<input type="checkbox"/> 3D casement depiction	320
<input type="checkbox"/> Leaf 3D hatching	<input type="checkbox"/>
<b>Label</b>	
<b>Muntins and pane</b>	
<b>Walling</b>	
<b>Exterior sill</b>	
<b>Interior sill</b>	
<b>Roller blind</b>	
<b>Venetian/vertical blind</b>	
<b>Symbols</b>	
<b>Assembly frame / Padding</b>	
<b>Stop</b>	
<input checked="" type="checkbox"/> Stop parameters	*
<b>Recess for radiator</b>	
<b>Opening</b>	
<b>Properties</b>	

All   None   Apply:            >>

4. The recess depth of the window doors no longer matches the new wall construction. Change the recess depth to 11.5 cm, the lintel depiction to without, and transfer these values to all window doors.



You can select the window doors according to their height and width.

Window parameters copy

Parameter	Value
<b>General</b>	
<input type="checkbox"/> Window shape	Rectangle
<input type="checkbox"/> Width	120
<input type="checkbox"/> Height	210
<input type="checkbox"/> Parapet height	0
<input type="checkbox"/> Depth	16
<input checked="" type="checkbox"/> Recess for radiator	11.5
<input type="checkbox"/> Outside recess	<input checked="" type="checkbox"/>
<input type="checkbox"/> Layer	Window
<input type="checkbox"/> Material	Wood
<input type="checkbox"/> Casement/muntin division	*
<input type="checkbox"/> Glass composition	*
<input type="checkbox"/> Lintel	contiguous
<input type="checkbox"/> Enter size	Net finished dim. from exterior sill
<input type="checkbox"/> Enter the start height	from rough floor level

Apply:

Selection

Parameter	Value
<b>General</b>	
<input type="checkbox"/> Window shape	Rectangle
<input checked="" type="checkbox"/> Width	120
<input checked="" type="checkbox"/> Height	210
<input type="checkbox"/> Parapet height	0
<input type="checkbox"/> Depth	16
<input type="checkbox"/> Recess for radiator	11.5
<input type="checkbox"/> Outside recess	<input checked="" type="checkbox"/>
<input type="checkbox"/> Layer	Window
<input type="checkbox"/> Material	Wood
<input type="checkbox"/> Casement/muntin division	*
<input type="checkbox"/> Glass composition	*
<input type="checkbox"/> Lintel	contiguous
<input type="checkbox"/> Enter size	Net finished dim. from
<input type="checkbox"/> Enter the start height	from rough floor level

WORKSHOP END

# MOVE WINDOWS

The addition of the stop for the windows causes the position of the windows to be changed. To move an object you can use either the manipulation function MOVE SELECTION or the handles. View the advantages and disadvantages in the workshop.

## ▼ ▼ ▼ ▼ WORKSHOP

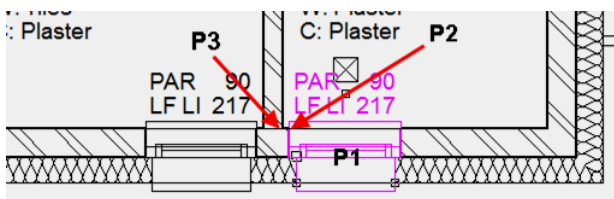
1. Switch to the plan view *GF*.



2. The two windows in the rooms *Bathroom* and *Cupboard* must be corrected. Select the window in the *Cupboard* with mouse **P1** and start the function MOVE SELECTION.

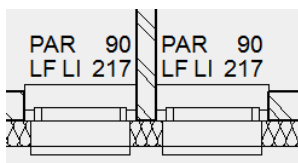


3. The function allows you to use a freely selectable reference point. Click on the point **P2** and drop the window at point **P3**. End the function.



4. Also move the window in the room *Bathroom* so that the window reveal is flush with the interior wall.

1. Select window
2. Function MOVE SELECTION
3. Reference point
4. New position
5. Cancel function



5. The function (Re)Draw walls recalculates all wall connections and removes superfluous lines. If 2 walls with the same material meet each other, the dividing line is removed.



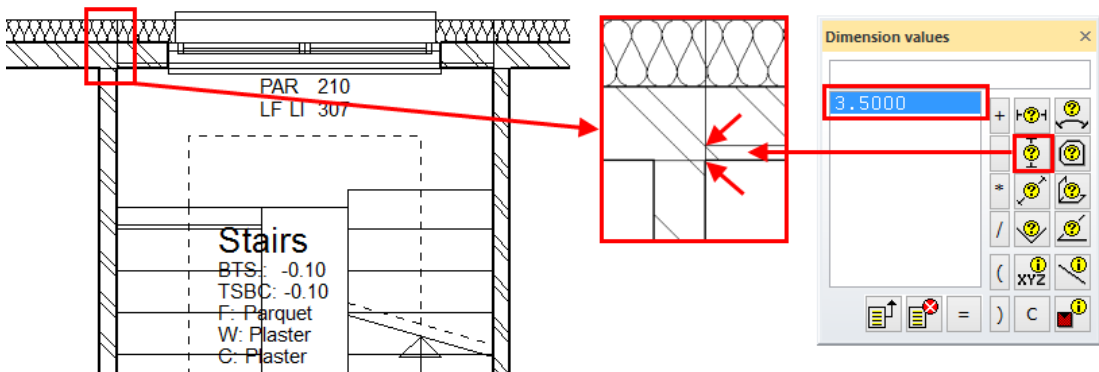
WORKSHOP END

# CORRECT STAIR

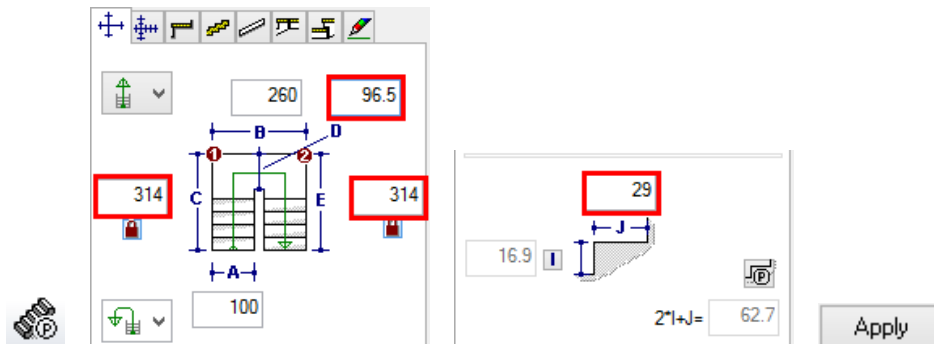
The stair landing must be adjusted to the new wall construction.

## WORKSHOP

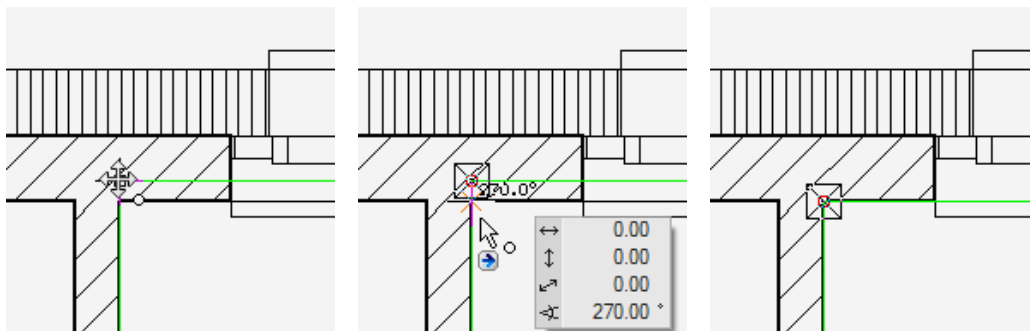
1. The staircase protrudes into the wall. Measure the value. To do so, open the measurement functions (context menu "Measure") and use the MEASURE VERTICAL function to measure the distance between the landing and the wall corner.



2. The last step must be shortened by 3.5 cm. Select the stair and open the parameter mask of the staircase. Shorten the length of the flight of stairs and the length of the landing by 3.5 cm, change the rise width to 29 cm and assign the values.



3. Select the stairs and move them with the handle to the corner of the wall.



## WORKSHOP END



# EXTERNAL DIMENSIONS

The floor plan can now be measured using the different options for architectural measurement. It does not matter whether you measure in the model or in the plan view. The correct floor must be active in the model. Like construction parts, measurements can be copied to the current floor.

## ▼ ▼ ▼ ▼ WORKSHOP

1. Prepare the position of the external dimensioning using help lines.

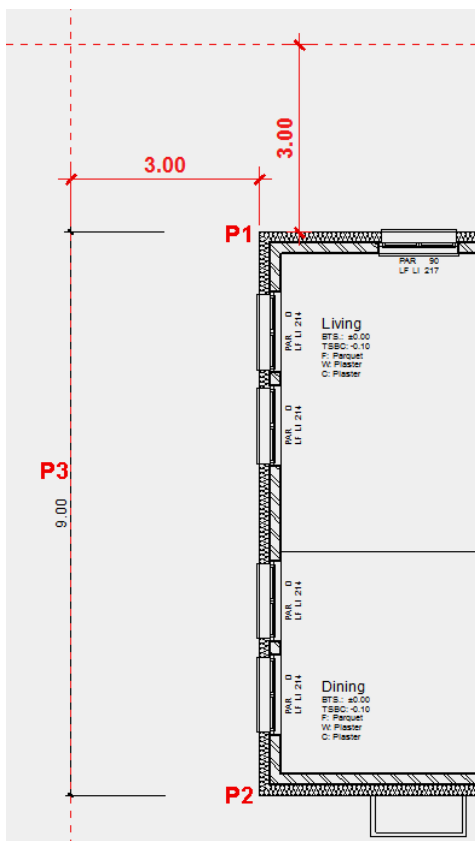
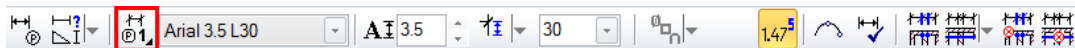


Create help lines with a distance of **300** cm to the walls.

2. Click on the function CHAIN DIMENSION.



Switch to the parameter 1.

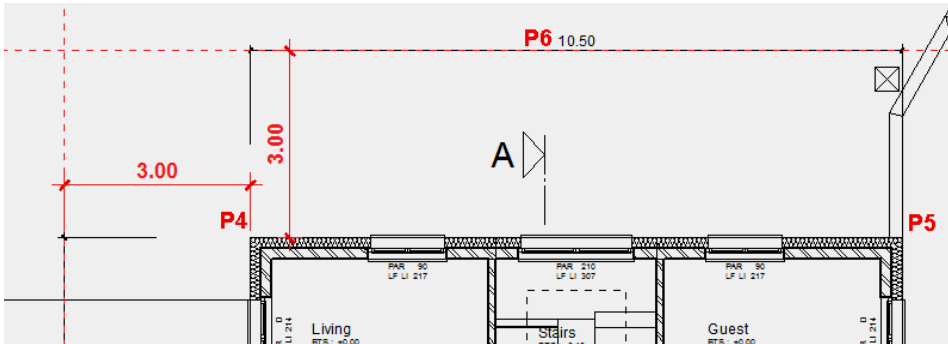


3. Create the vertical main dimension. Set the two dimension points **P1** and **P2**, set the position of the dimension chain **P3**.

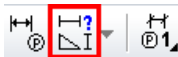
4. To start a new dimension chain you either need to restart the function CHAIN DIMENSION or you select the function AUTOMATIC on the properties bar.



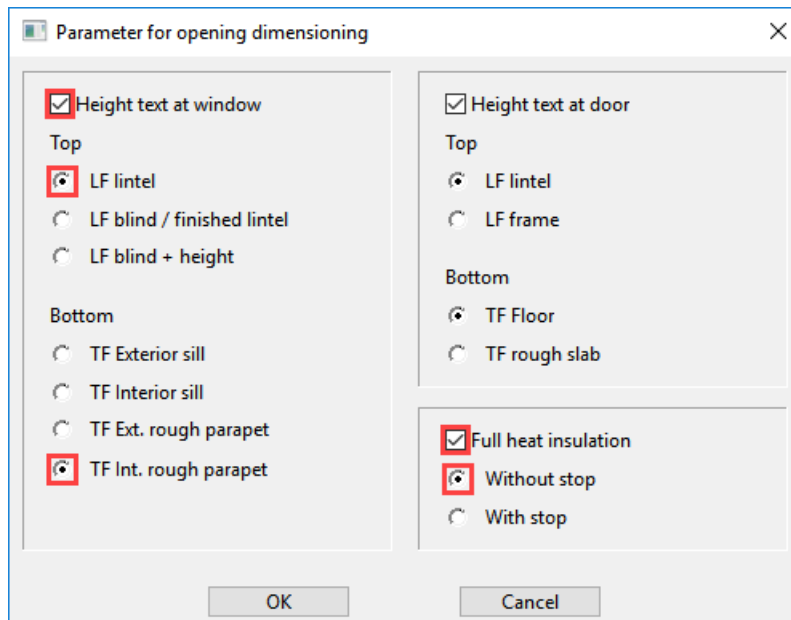
5. Create the horizontal main dimension. Set the two dimension points **P4** and **P5**, set the position of the dimension chain **P6**.



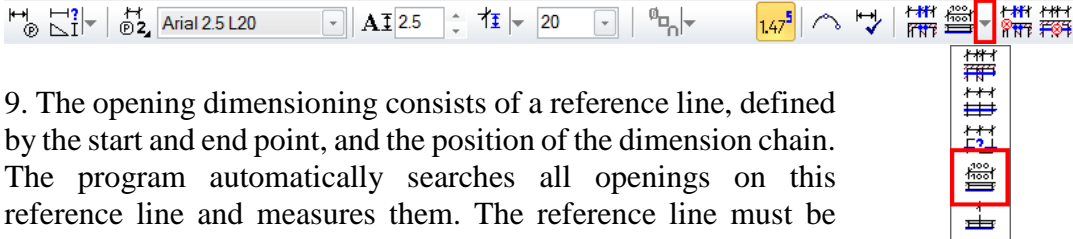
6. Start a new dimension chain.



7. Switch to the PARAMETER GROUP 2. In the additional functions open the PARAMETER FOR OPENING DIMENSIONING. In the settings you can determine the desired options for the points to be measured.



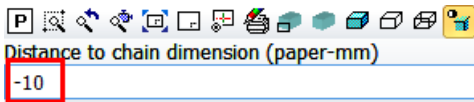
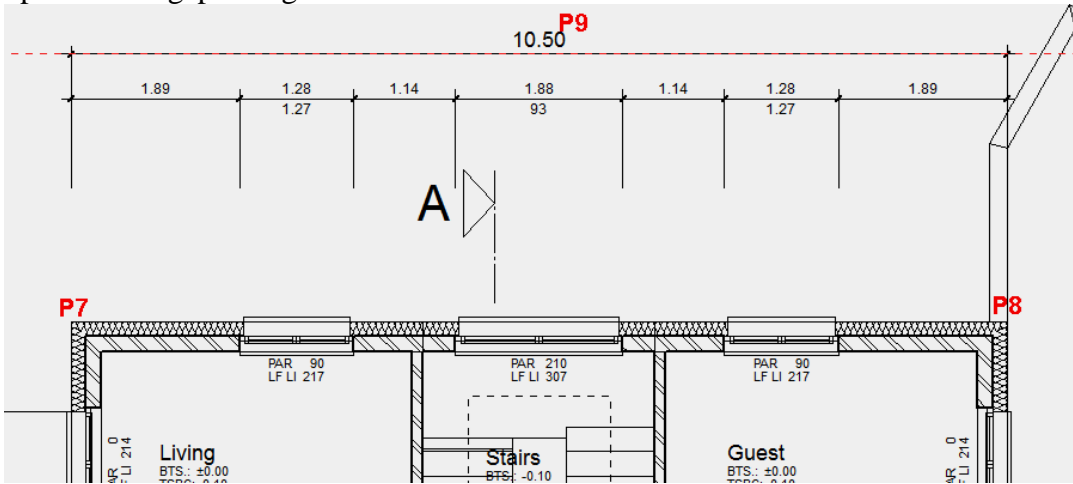
8. Under additional functions, select the OPENING DIMENSION.



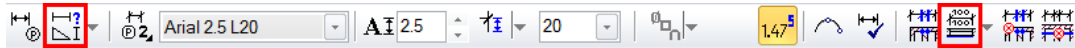
9. The opening dimensioning consists of a reference line, defined by the start and end point, and the position of the dimension chain. The program automatically searches all openings on this reference line and measures them. The reference line must be located on the outside or inside of the wall, but not necessarily on the end points. The result will vary depending on the position and window type (stop).

Specify the points **P11** and **P12** for the reference line and click for the position on the text of the primary dimension **P13**.

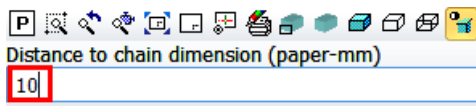
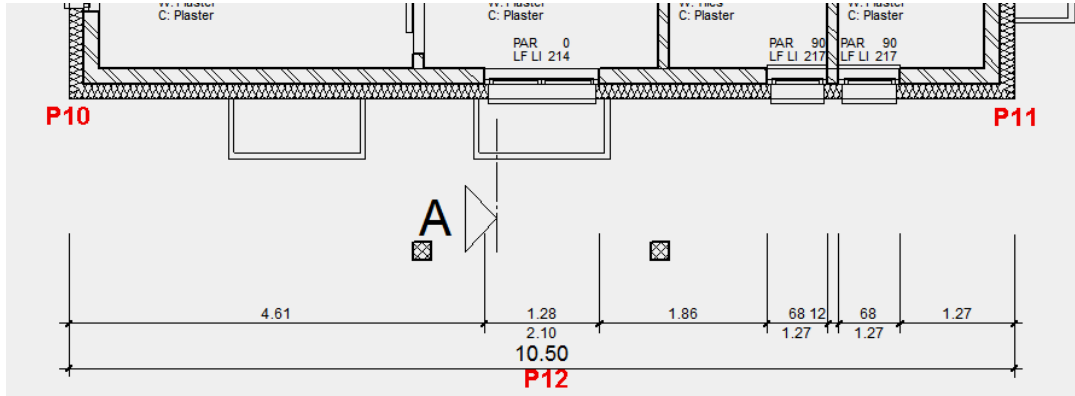
In the input line specify the distance to the primary dimension. Downwards and upwards the gap is negative.



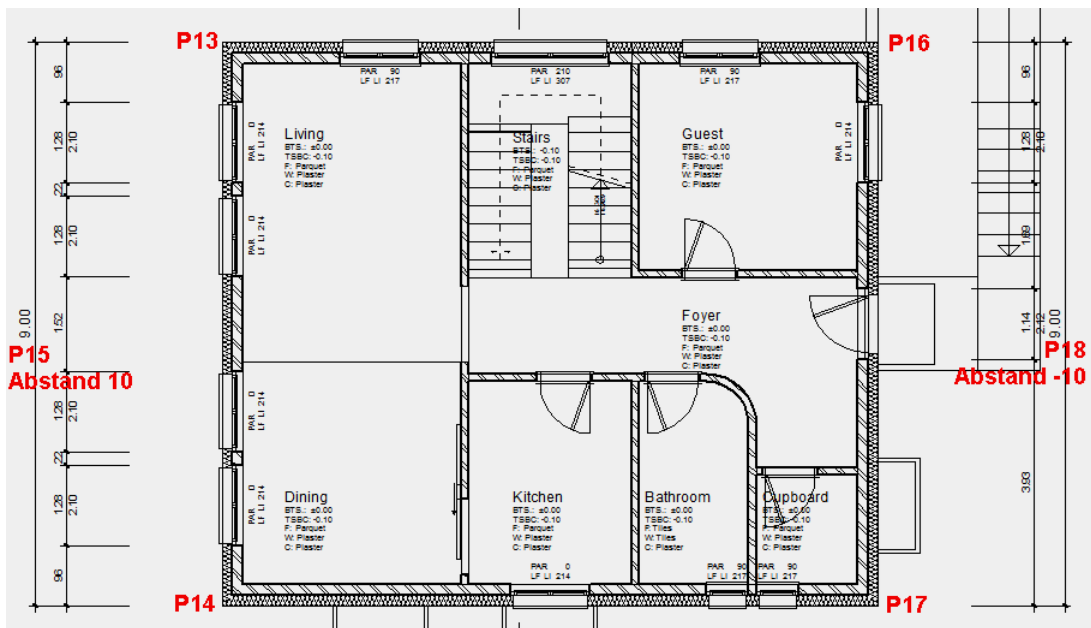
10. Start a new dimension chain and select the opening dimension again. The additional functions must be reselected for every dimension chain.



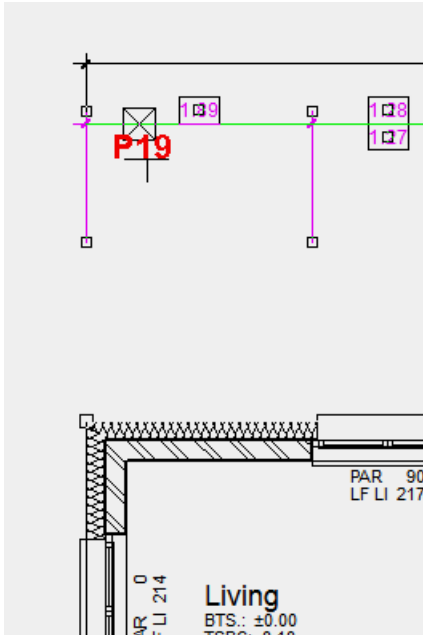
11. Specify the points **P10** and **P11** for the reference line. For the position, click on the text of the primary dimension **P12** and enter the distance **10**.



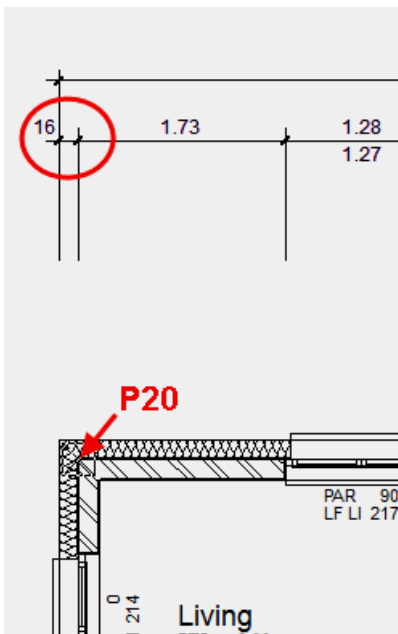
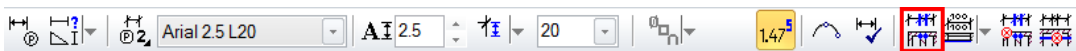
12. Generate the secondary dimension for the two vertical primary dimensions.



13. Add the dimension points for the brick wall. Edit the dimension **P19**.



14. Select the function “Define measuring point”. Add the dimension point **P20**.

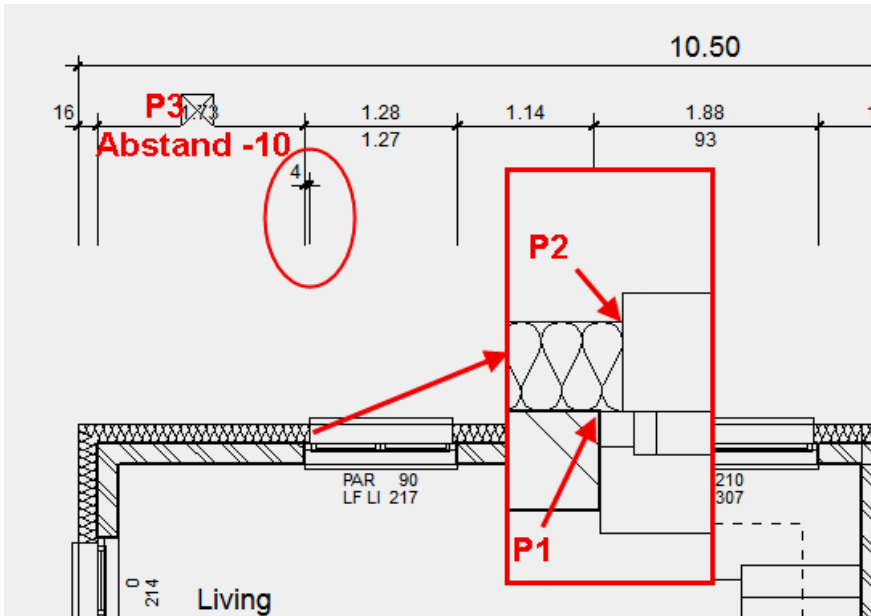


15. Cancel the function.  
[Esc]

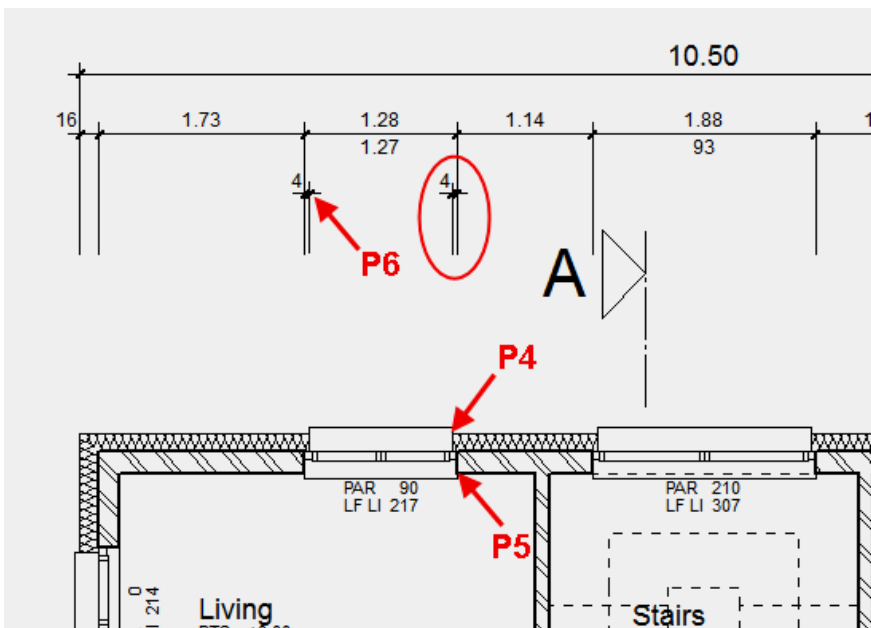
16. Complete the dimensioning with a single dimension for the window's stop. Start a new dimension line.



17. Change the length of the help line to 10. Define the two dimension points P1 for the rough reveal P2 for the finished reveal. Set the position of the dimension line P3, to distance -10.



18. Start a new dimension chain. Indicate the two points to be measured, P4 and P5. It is not necessary to set a distance for the position, just click on the snap point of the previously created dimension, P6.





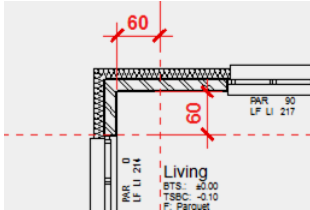
# INTERNAL DIMENSIONS

## ▼ ▼ ▼ ▼ WORKSHOP

1. Prepare the positions of the internal dimensions with help lines.



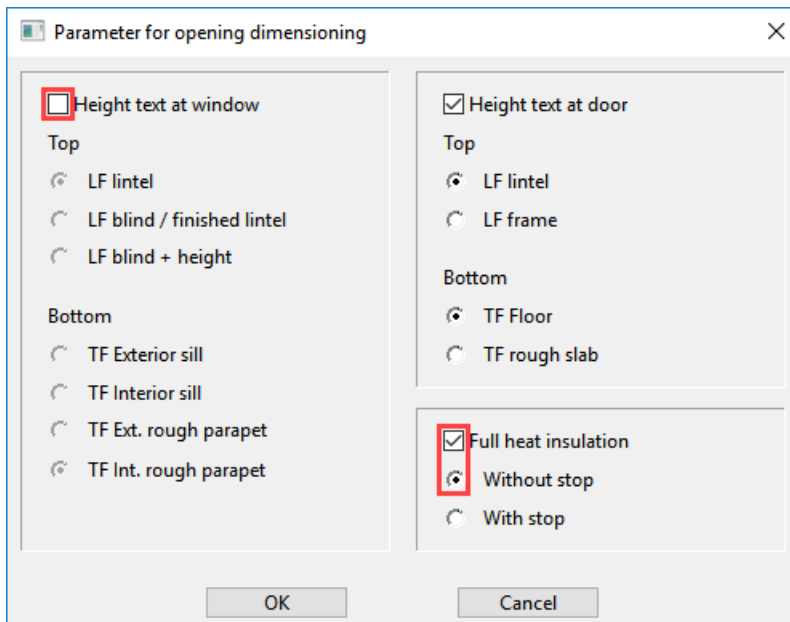
Create help lines with a distance of **60 cm** to the outer wall.



2. Start the function CHAIN DIMENSION.



3. Switch to the **PARAMETER GROUP 3**. In the additional functions open the **PARAMETER FOR OPENING DIMENSIONING**. Change the options as shown below and confirm with OK.



## EXPLANATION

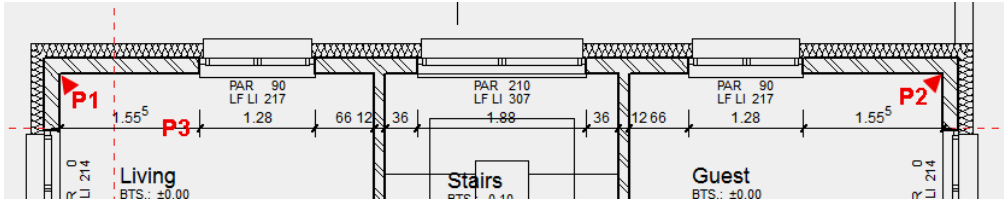
In the "Parameters for Opening Dimension" different options can be selected as to which heights need to be measured for the opening dimension for the window and door opening. If changes were made in this mask, the dimension and the additional function must be accessed again.



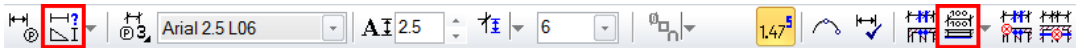
4. Under additional functions, select the OPENING DIMENSION.



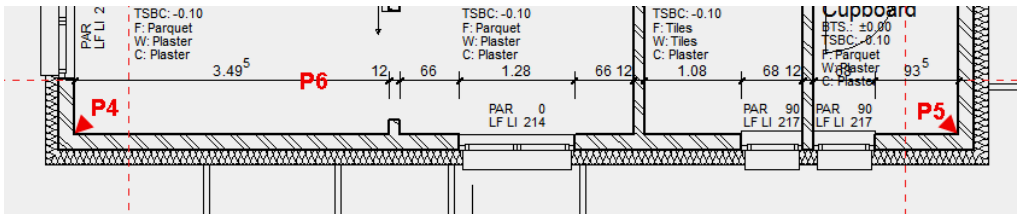
Specify the points **P1** and **P2** for the reference line and specify the position of the chain dimension **P3**.



5. Start a new dimension chain and select the OPENING DIMENSION in the additional functions.



Specify the points **P4** and **P5** for the reference line and specify the position of the chain dimension **P6**.

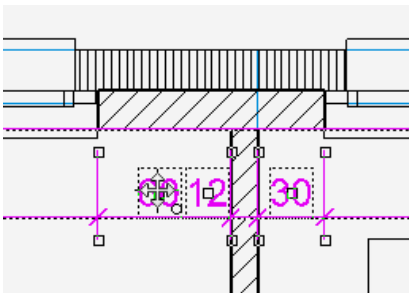


**TIP**

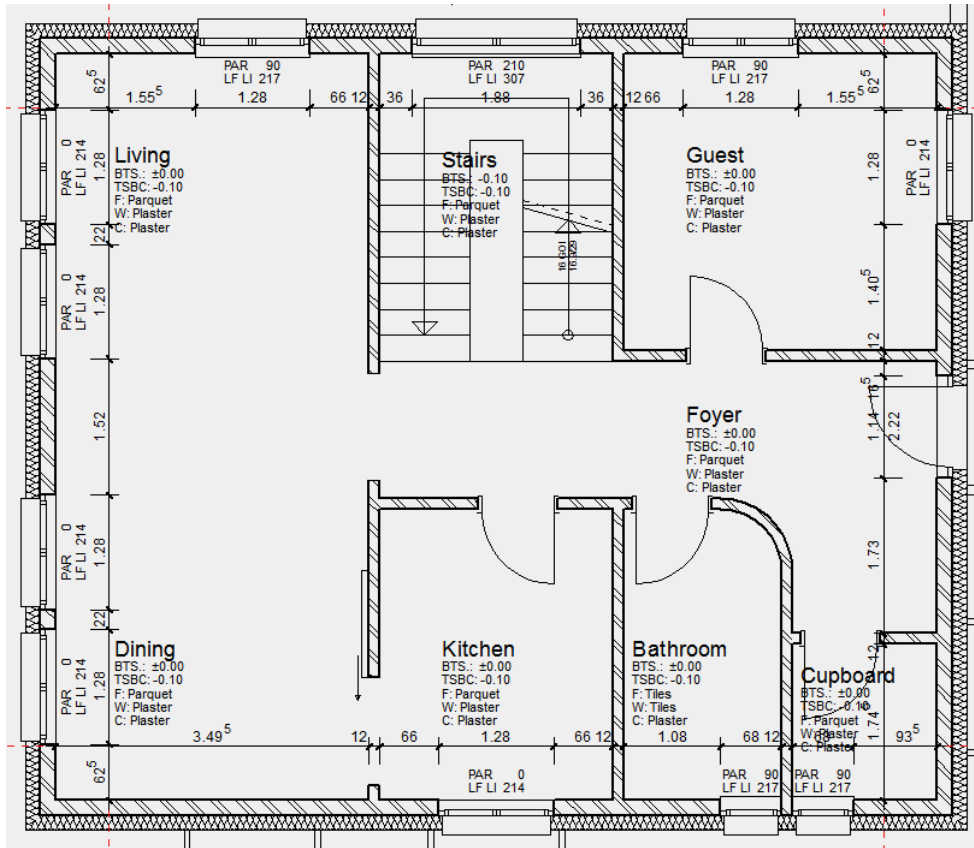
Room labels can simply be moved. Select the room label and move it to the new position.

**TIP**

Dimension texts can be moved. If the dimension text is selected, the dimension texts can be moved by their handles.



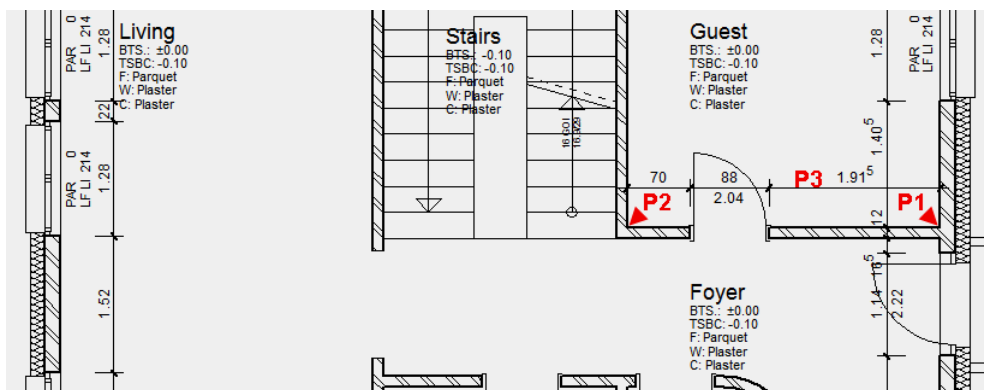
6. Now add the remaining dimensions.



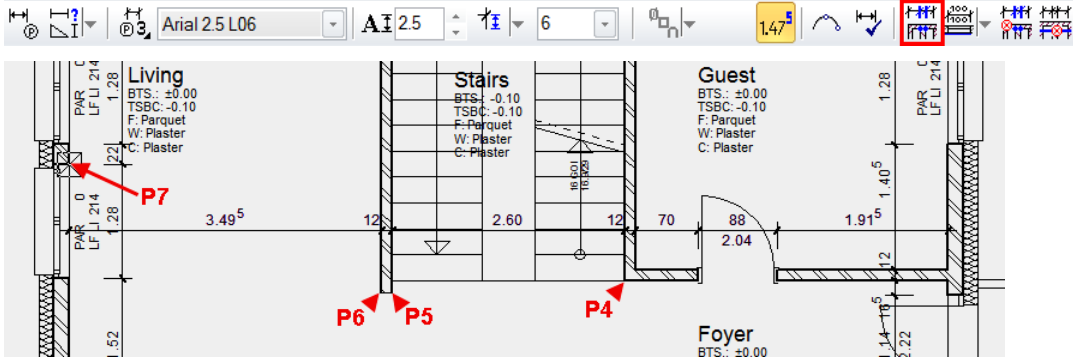
7. The opening dimension can also be combined with the normal point entry. Start a new dimension chain and select the **OPENING DIMENSION**.



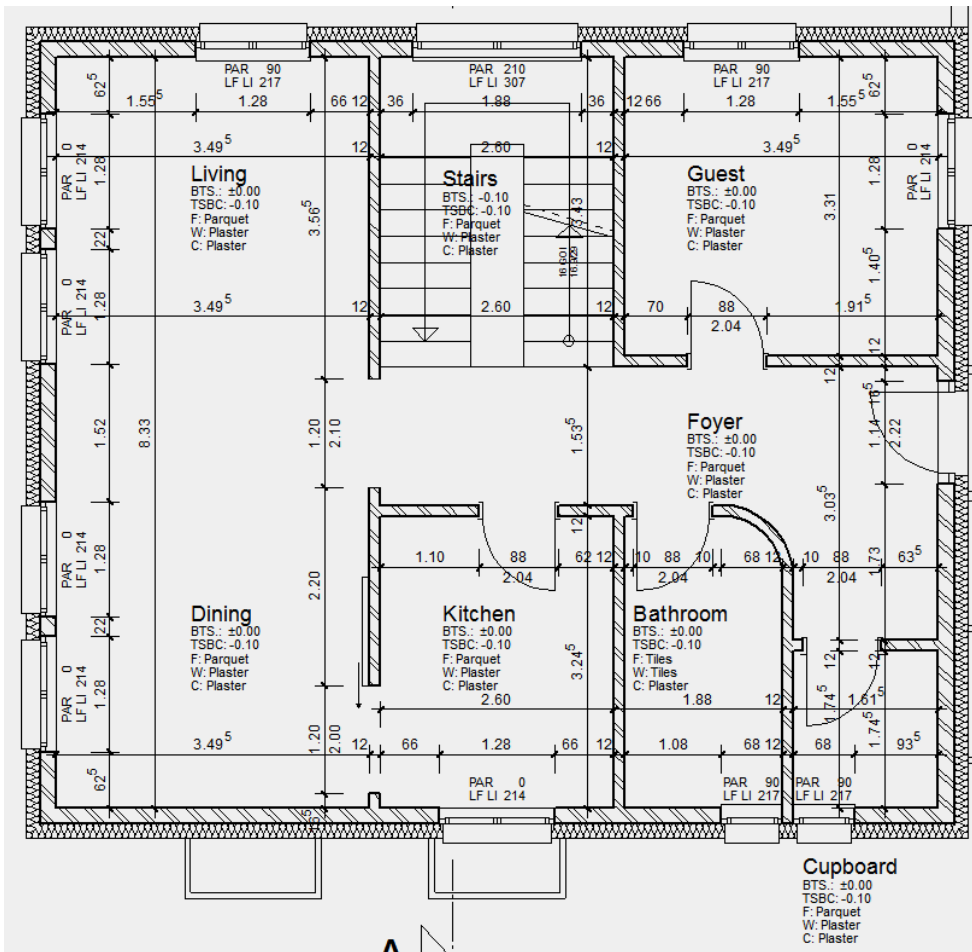
8. Specify the points **P1** and **P2** for the reference line of the opening dimension and locate the dimension chain **P3**.



9. In the properties bar now switch to the point entry and specify the other points.



10. Now try to continue to add to the floor plan with the dimension options.



**TIP**

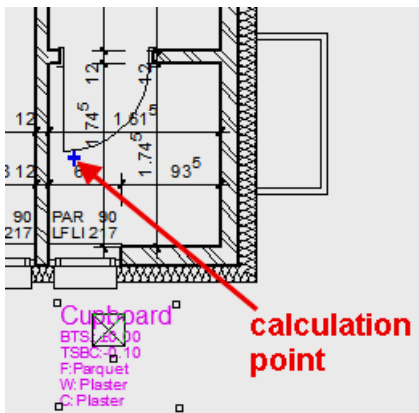
If an incorrect dimension point was selected, you can simply click in the properties bar on DELETE DIMENSIONING POINT and the point can be deleted again by left-clicking on it.

To continue with dimensioning, select the function DEFINE DIMENSIONING POINT and continue dimensioning.



**TIP**

A room label can be moved outside the room using its handles. The calculation point (blue cross) must always remain in the room.

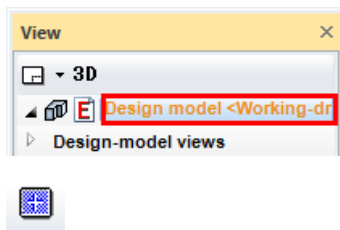


**WORKSHOP END**

**SAVE**

**WORKSHOP**

1. Switch to the model and set up all data.



2. Save the file using the SAVE function from the FILE menu.

**WORKSHOP END**