ARCHLine.XP® 2021

Windows

ARCHITECTURAL

TUTORIAL

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Contents

What is ARCHLine.XP®?

ARCHLine.XP is a large-scale 3D BIM software for architecture, rendering, site design, interior design and decoration projects.
ARCHLine.XP is an architectural design software equipped with a fully integrated Open BIM interface, providing the tools to create coordinated and computable building models. Every component, such as floor plans, sections, and elevations are in one comprehensive model. Your BIM projects are fully coordinated and they don't require any manual updates to keep them synchronized.

Working with ARCHLine.XP architectural design software you can create: floor plan views, section views, elevation views, perspective views, construction details, printing layouts, schedules, Excel reports, renderings, photo inserts, and even animations.

ARCHLine.XP is specifically designed for residential and commercial design professionals. It allows you to easily and efficiently produce 3D models and construction documents.

Description

The aim of this tutorial is to guide you through the planning of a residential building, step by step.
This tutorial consists of 3 main parts:

1. Building design
2. Documentation
3. Visual design

During this tutorial we look through how we can import a situation plan and an architectural floor plan into ARCHLine.XP, then create a 3D architectural model on that basis.

To get the most out of this tutorial it is best to run ARCHLine.XP® and YouTube with the appropriate video, so that you can get experiment with the concepts that are mentioned in the tutorial.

1. Part: Building design

1.1. Getting started

Open the YouTube video:
https://youtu.be/L0BMyvcXiQ0

1.1.1. Creating a new project

When ARCHLine.XP starts, the Welcome dialog appears, allowing you to choose how you want to start working with the program.

Click **NEW PROJECT** to create a new, blank project.

In this tutorial we will convert CAD lines on the floor plan into 3D architectural walls and other BIM elements.

It is also possible to start from scratch and work on an empty project by drawing walls directly.

1.1.2. How do I correct any mistake during work?

Let's pause for a second and talk about fixing mistakes that might accidentally happen.

It is human nature that sometimes we make mistakes while following a tutorial or we work on our projects. **If this happens to you, relax and just have a look at the following pieces of advice**.

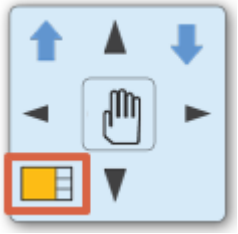
- If you select a wrong tool press **ESC** and just select the proper one.
- If you create or modify a wrong item, press **ESC** and click on the **UNDO** button.
- If you delete anything unintentionally, press **ESC** and click on the **UNDO** button.
- If you open a dialog unintentionally or enter wrong values, press **Cancel**.

1.1.3. Interface and navigation fundamentals

Navigation in ARCHLine.XP is very simple and straightforward, especially when you already have design experience with any other 2D or 3D design software. Let's summarize how we can handle drawing content and navigate around the interface of ARCHLine.XP before we jump in to start this tutorial.

Managing the content layout

To manage multiple drawings with one click simply use the **Enlarge active drawing** button of the Navibar. This will always enlarge the currently active drawing content.



Zoom

Scroll up or down to zoom in and out on a 2D content and in a 3D view.

Pan

Hold down the mouse wheel and move the mouse at the same time. This moves the current content to the desired direction. Release the mouse wheel to stop panning.

Orbit

To orbit around the model **keep holding the mouse wheel + SHIFT key and move the mouse**. To finish orbiting around the model simply release the mouse wheel and the SHIFT key.

Look around

When you already have a perspective view (this topic is covered later by the tutorial) you can **hold the right mouse button and move the mouse** around to look around in the model.

Selecting one item

When you would like to select an item, you should simply **click on the item** and it gets selected. You will see that the item gets recolored with the selection color and the selected item's properties appear on the left-hand side. To deselect an item simply hit ESC on your keyboard or click on another item.

Selecting multiple items

If you would like to select multiple items you can either:

- add a new item to the selection by **holding down the Ctrl key on the keyboard while clicking on another item**
  or
- you can click and drag the mouse over the drawing to **draw a selection rectangle** and click again in the end to select items under the selection rectangle. When you draw a selection rectangle from left to right all items that are completely under the selection rectangle will be selected. When you draw a selection rectangle from right to left, all items that are completely under and also those that are only "touching" the selection rectangle, will be selected.

Selection list

When you click on an item and see the selection list, that means there are multiple items which can be selected at the same click-point. You can use the left and right arrows on it to navigate to the previous or the following selection. To cycle through the possible items, you can also use the TAB key on your keyboard. You can also use the selection jump-list by clicking on the arrow pointing down and selecting the desired item.

User interface

To make sure you work with the default software interface – which this tutorial is based on – use the **Ribbon bar / View / User interface / Reset interface to factory default** command.

These are the most fundamental things about the interface and the navigation tools. All the rest of the interface, the location and management of tools and the commands will be taught as you progress through this tutorial.

1.2. Working with external files

If you are using ARCHLine.XP you can import, link or export CAD files, in DWG or DXF file formats.

Before you import a file containing the floor plan, it's helpful to know which formats are supported:

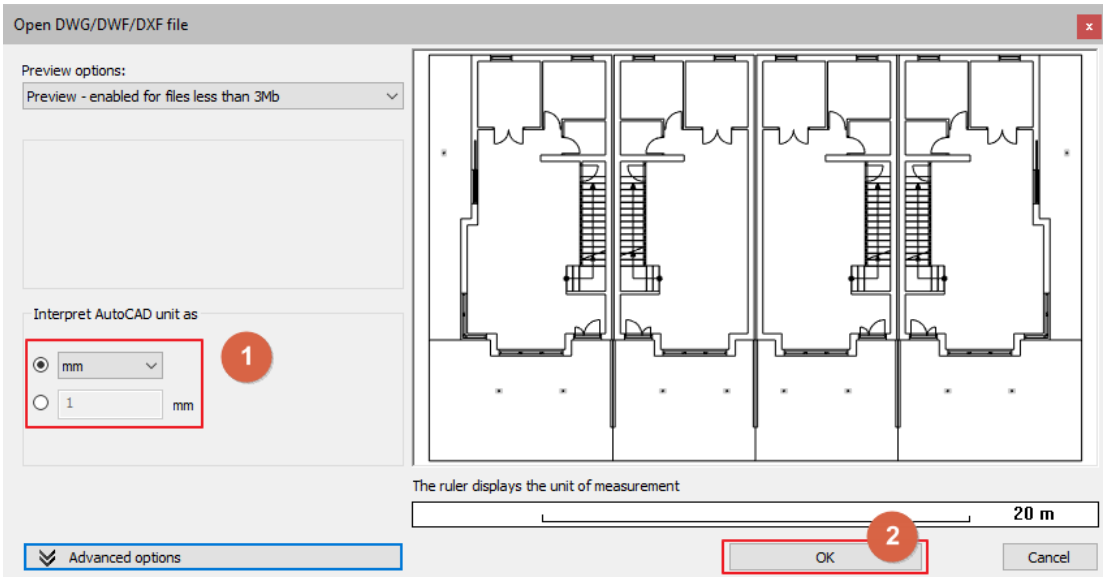
- raster images in JPG and PNG format
- PDF files as raster images
- PDF files as vector drawings
- DWG/DXF drawing
- IFC model

Importing a DWG drawing means a geometry import, so as a result, we get a drawing with precise units of measure. It may contain points, lines, polylines, arcs, circles, ellipses, notes, hatches, dimensions, raster images.

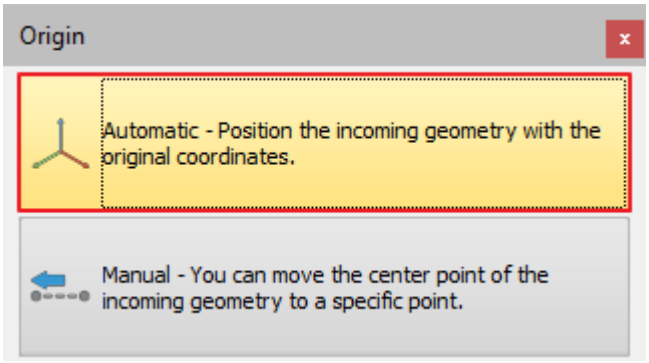
Let's start working!

1.2.1. Importing DWG drawings

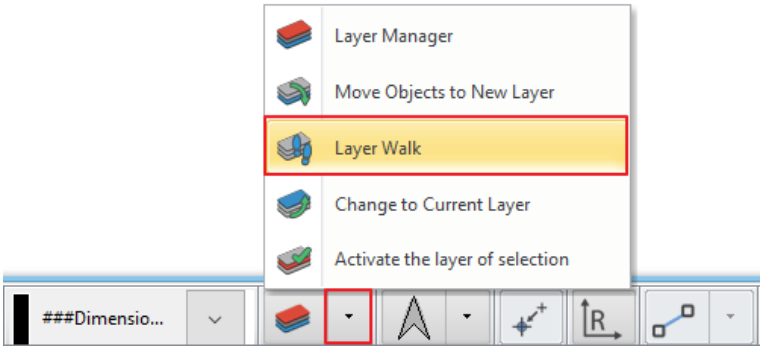
- Select the **File menu / Link / Link Cad** command.
- Browse to the *…\Documents\ARCHlineXP DRAW\2021\Architectural_Course\DWG* folder with the following file: **elata_nova_START-Ground floor**.dwg
- Click on the "Open" button and the following dialog appears:



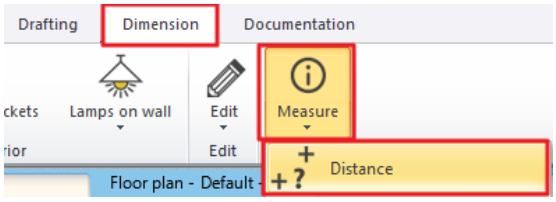
- The unit is automatically recognized, and you can also select another unit of measurement from the drop-down list. Selecting the correct unit ensures that your imported drawing is accurately measured. Make sure "mm" is selected.
- Import the file by pressing "OK".
- In the appearing dialog select the *Automatic – Position the incoming geometry with the original coordinates* option, the drawing is imported to the same location where it was drawn in the original application.



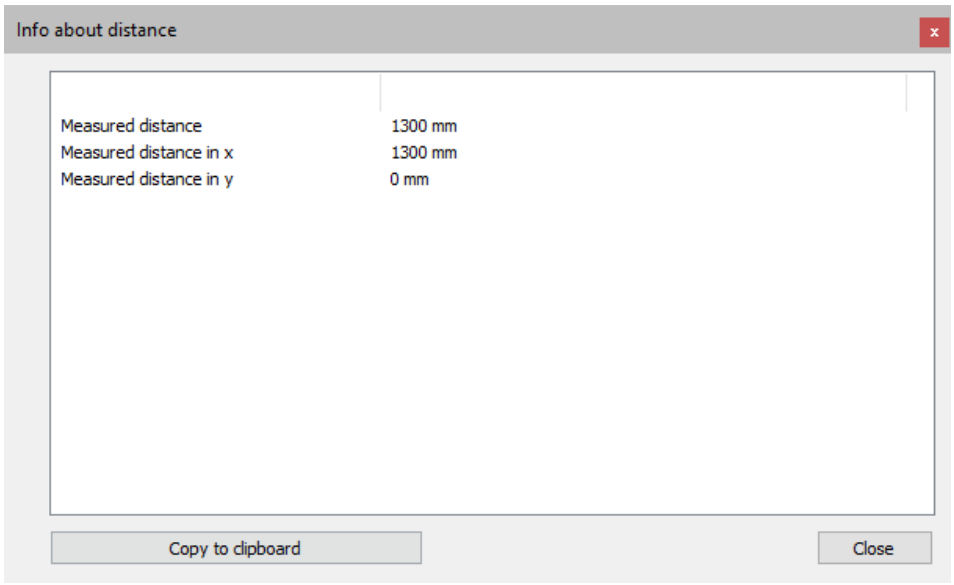
- The layer structure of the DWG file is also imported. You can easily activate and deactivate layers' visibility with the Layer Walk command.



- Check if geometry is imported at the correct scale.
- To do this, choose the **Ribbon bar / Dimension / Measure / Distance** command.



- Measure the front door, which should be 1300 mm.



The scale unit is correct.

If you accidentally selected a wrong unit and the drawing is having a wrong scaling don't worry. You can either undo the import/link and repeat it with the correct scaling or actually there is a Scale command in the Ribbon bar at the **Edit menu / Move / Scale**.

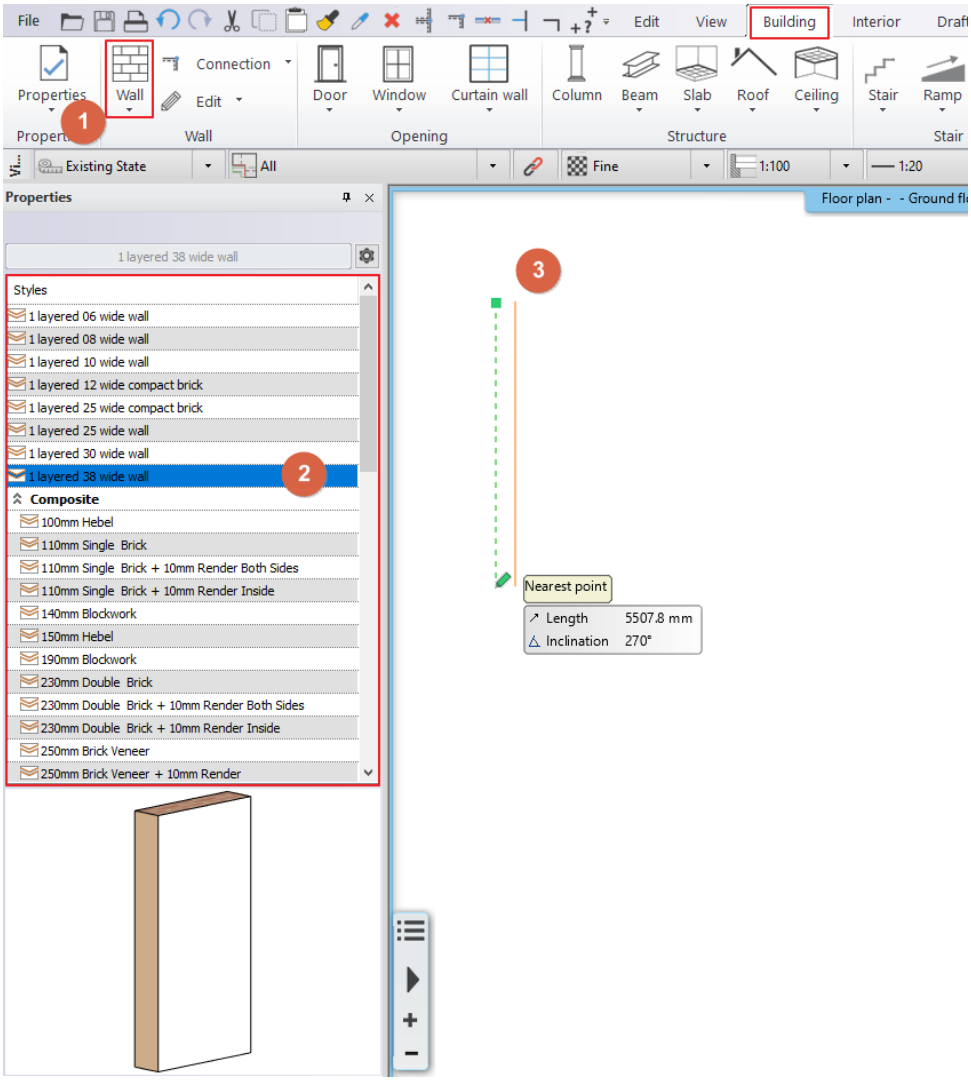
Importing a DWG drawing you get a good quality situation plan or floor plan. Imported CAD items can be selected and edited just like any 2D items that were created in ARCHLine.XP. When importing a DWG file, the program automatically recognizes the dimensions and notes. These can also be easily adjusted or removed from the floor plan.

1.3. Creating walls on DWG drawings

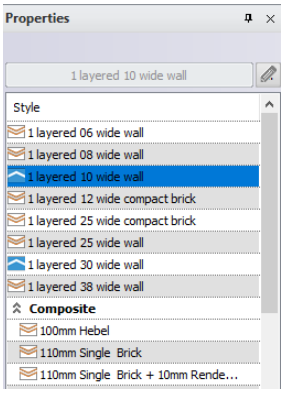
In this part, we create a residential building based on the imported drawing. ARCHLine.XP generates the 3D BIM model parallel as you work on the floor plan.

1.3.1. Selecting wall styles

You can also work with the wall styles that appear on the left side after starting the wall command.
The tiny wall preview at the bottom of the list keeps you informed about the wall characteristic you are working with.



When you start an element creating command (e.g.: walls, door, window etc.) the Properties panel on the left side displays all the styles of that element.



Styles can be classified as:

- Factory (built-in) styles
- Styles in project only
- My styles
- Company styles

Factory (built-in) styles: Factory (built-in) styles come with the installation of the software. These styles are read-only so you cannot change them. These built-in styles are represented by an orange-tinted envelope icon.

Styles in Project only: Styles created and saved in a project only are included in this category. Please note that these styles are not available in other projects. These styles are represented by a blue upside-down envelope icon.

My styles: You can store your favourite styles here in order to make those available in every project. These styles are represented by a human shape icon.

Company styles: You can deploy styles within your organization if you define the organizational style package with name and shared network location (Path). Styles relocated to company package are accessible to all users on shared network. Implementing organizational standards and rules allow users to become more proficient.
Company styles are represented by a folder shape icon.
In this tutorial we do not work with Company styles.

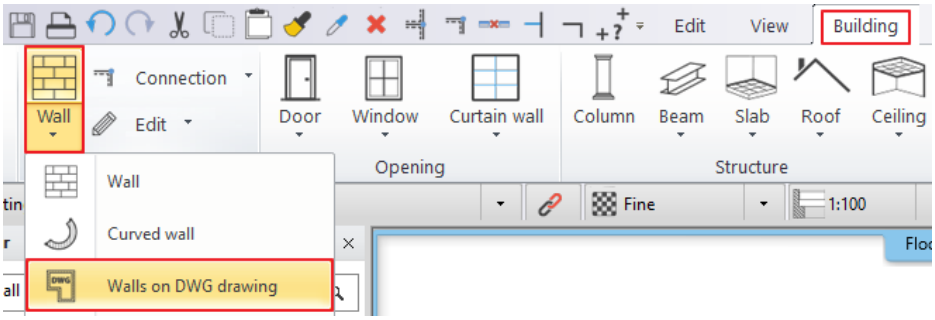
1.3.2. Drawing walls on DWG floor plan

Walls can be created many ways either from scratch or based on an existing drawing content. When working from scratch you can draw walls with the following tools:

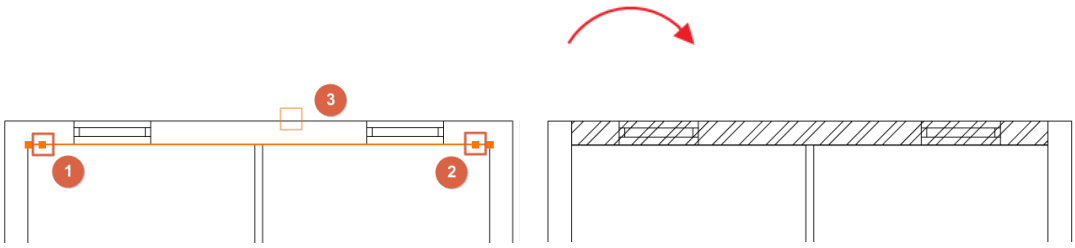
- ❖ straight wall
- ❖ curved wall
- ❖ rectangle wall
- ❖ spline wall

This time we will use the DWG file to turn its 2D shapes into real BIM walls. The **Walls on DWG drawing** command can be used to convert CAD lines on the floor plan into 3D architectural walls.

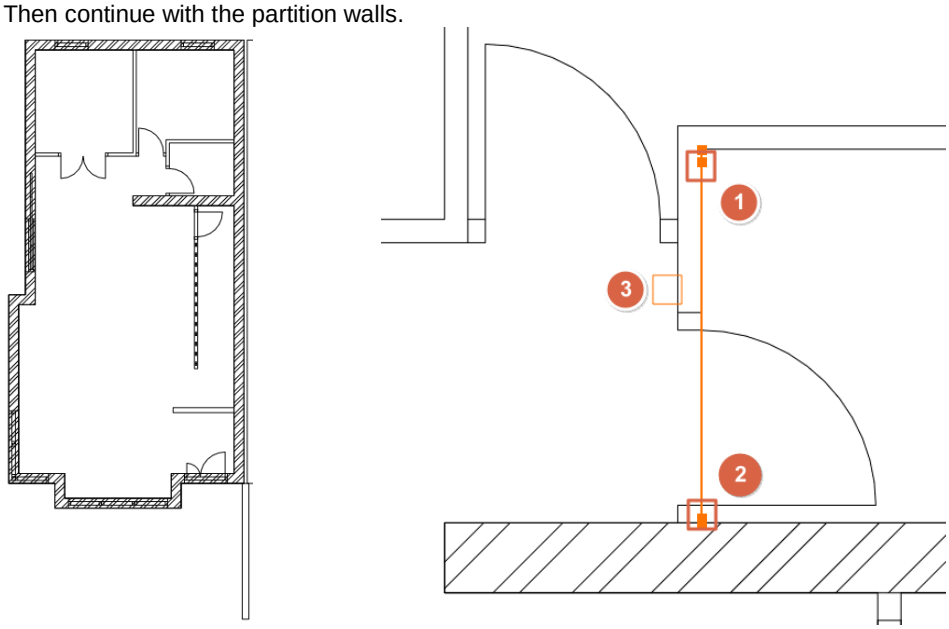
- Select **Building / Wall / Walls on DWG drawing** tool.



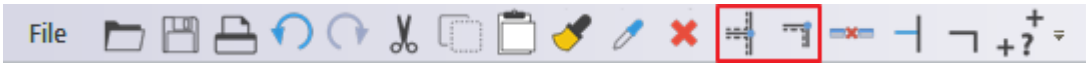
- Click near to the wall starting (1) and end point (2), then on the opposite side of the wall (3). The wall appears in the 3D view.



- Use this method to draw all the main walls.
- Then continue with the partition walls.



If the wall joints in the 3D model are incomplete, choose the **L or T wall connection** options from the toolbar appearing at the top of the ARCHLine.XP application window, and join the walls properly.

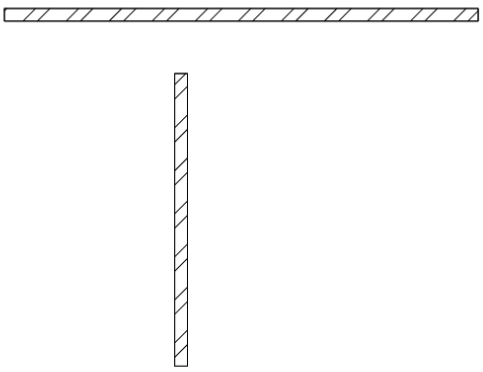


T connection

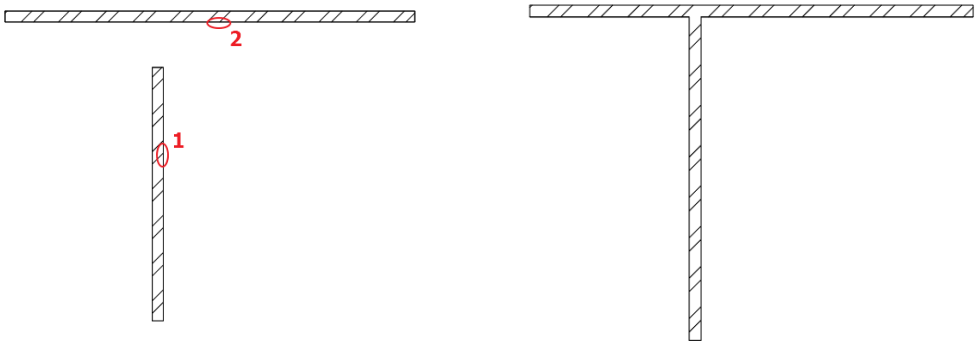
The T connection removes the unwanted walls or adjusts missing wall segment of the first selected item relative to the intersection with the second item. The wall, which is selected secondly will not be modified.

Now let's see the case when the T connection adjusts the missing wall segment relative to the intersection with the second wall.

Draw two walls as it is show below:



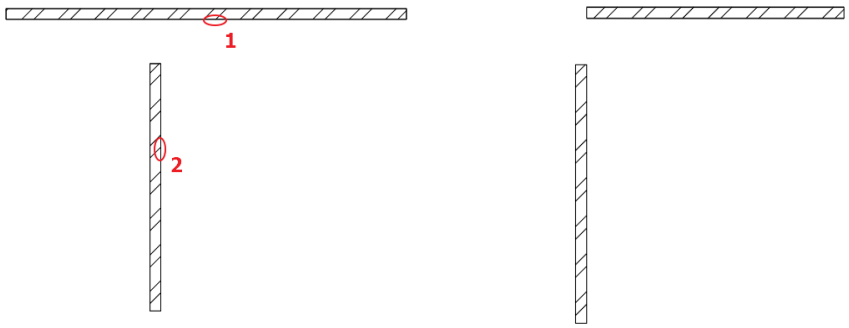
- Click on the  icon (representing T connection) on Toolbar then select with a single click the wall to be adjusted (1), then the second wall (2).



The short wall with the missing part was lengthened.

- Undo this action by pressing the  icon.

Now see the case when the T connection command shortens the first wall relative to the intersection with the second wall.



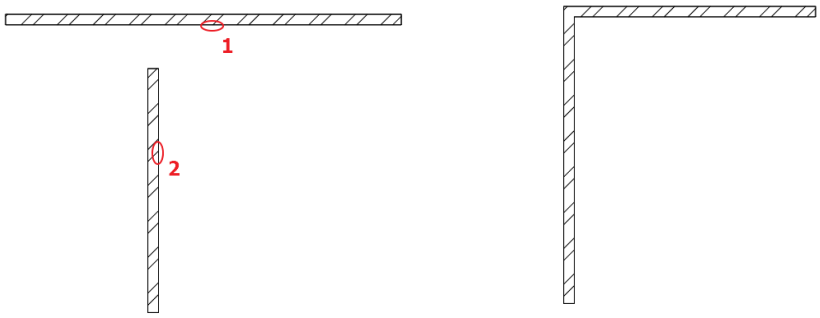
The wall segment, which extends over the intersection was modified.

- Undo this action by pressing  icon.

L connection

The L connection aligns the items to each other; shortens or extends walls, so selected points closer to the end points coincide.

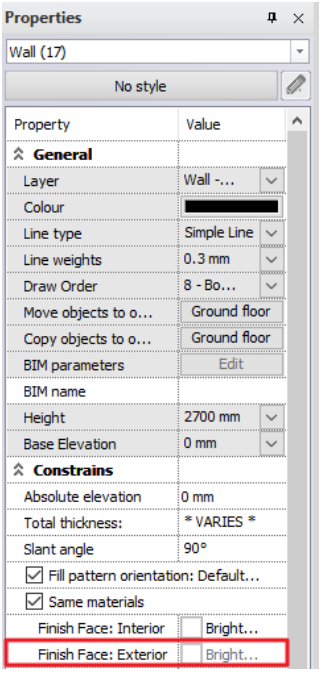
- Click on the  icon (representing L connection) on the Toolbar then, select the first wall with a single-click, then select the second wall.

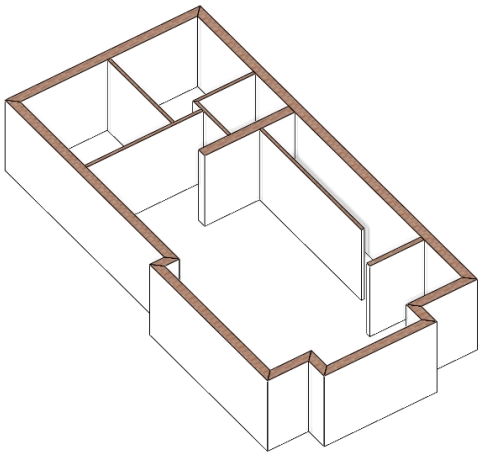


L connection is created between walls.

- Finally, select “Bright White” as exterior side material of the walls. Select the whole floor plan with the selection rectangle, then in the left side Properties, set the “Finish Face: Exterior” to “Bright White”.

  At this point your 3D model should look like this image below.

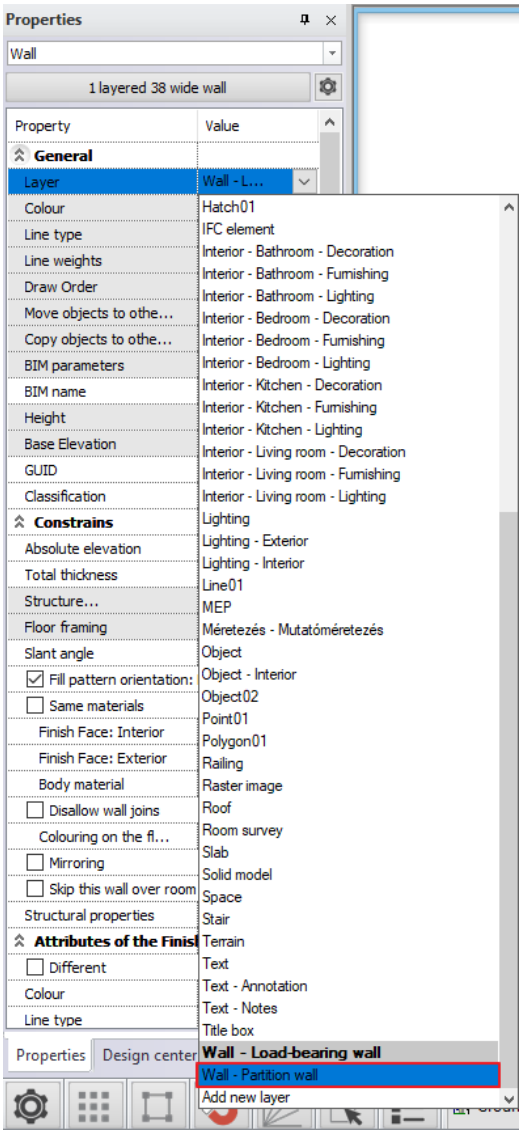




1.3.1. Change the layer settings of walls

Every element in the project is placed on a layer. New layers can be created at any point of the designing process, however when you open a new project, there will be default layers that can be used.

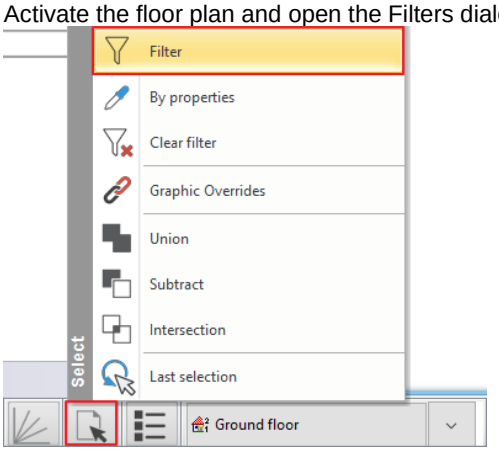
- Select a partition wall on the floor plan and change its layer to Wall – Partition wall in the property grid.



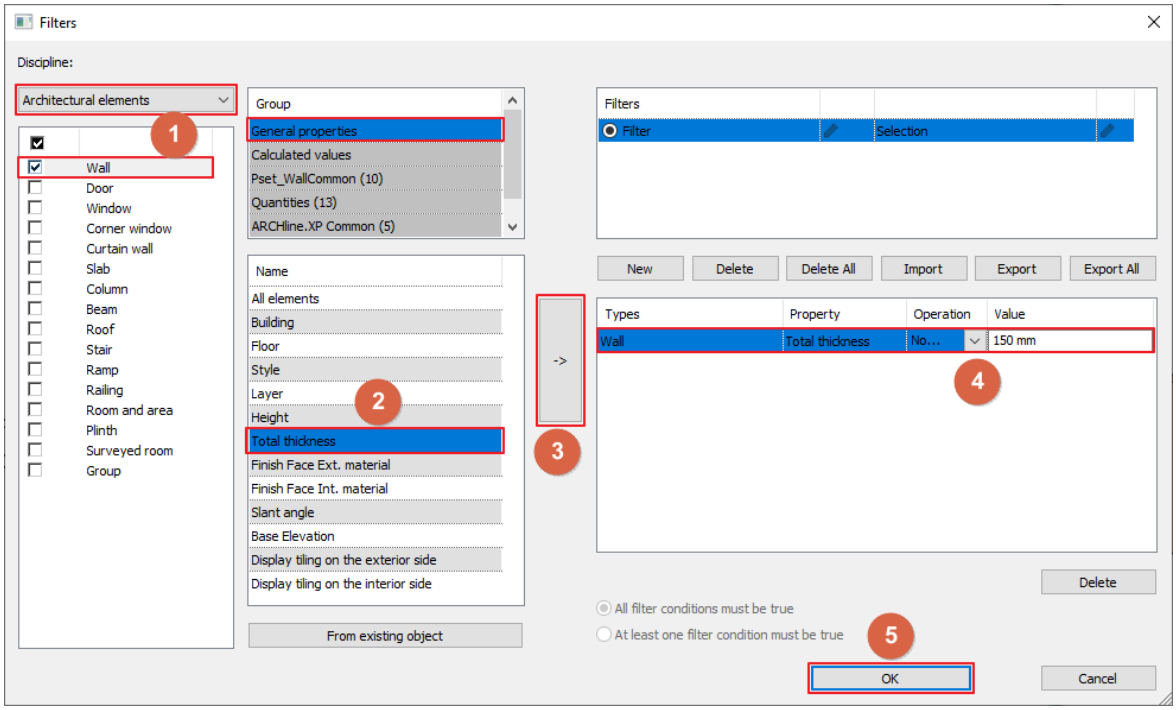
Rule-based filters

To select all partition walls in one simple step, we are going to use filters. Filters can be used for multiple things: rule-based graphic override, rule-based selection and rule-based visibility.

- Activate the floor plan and open the Filters dialog.

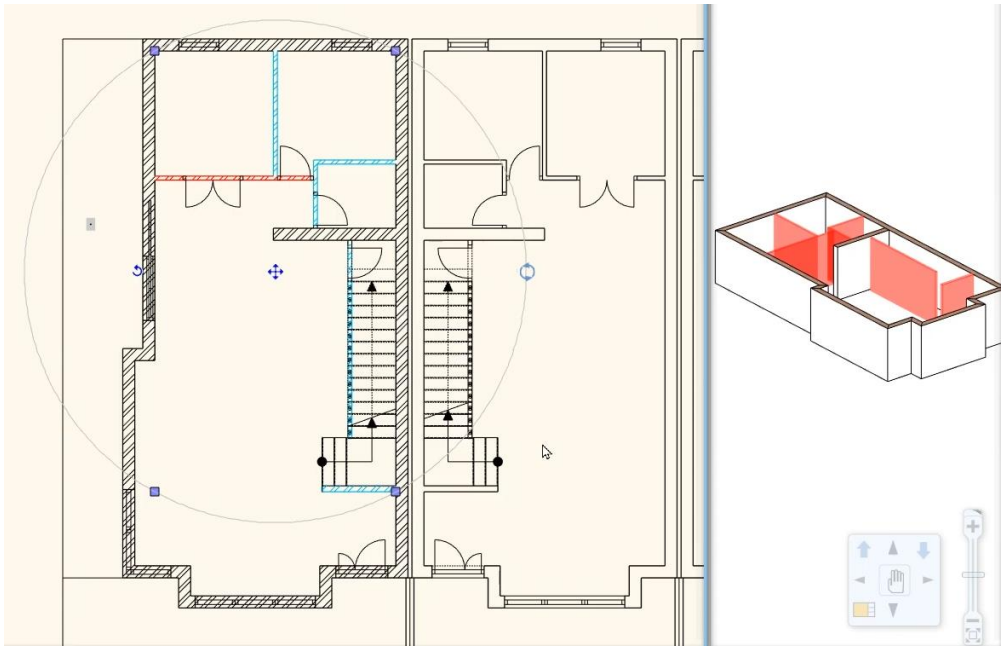


- Filter the walls based on their thickness. The load-bearing walls are thicker than the partition walls, thus we can create a rule to sort the thinner walls.
- In the first column of the dialog select the Architectural elements from the drop-down menu and activate walls.
- Select the Total thickness option in the middle column and click on the arrow to add it to the filter.
- In the right side of the dialog now you can see that a new row is added to the list. Here you can set the specifications of the filter. Set the Operation to *No more than* and set the value to 150 mm.
- Click OK to activate the filter.



Now all partition walls are selected on the floor plan.

- Change their layer to Wall – Partition wall in the Property grid like previously.



1.4. Openings: Doors and windows

This section covers the essentials to place doors / windows into the walls created so far.

The creation method of openings is the same for doors, windows, voids or recesses.

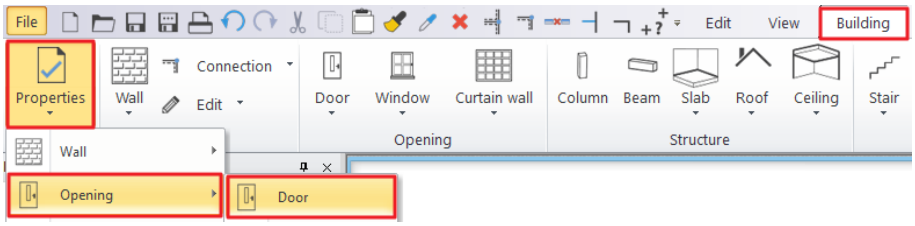
There is a strong connection between wall and openings. An opening (with a few exceptions) is always hosted in a wall: if you move a wall its openings move together with the wall.

1.4.1. Doors

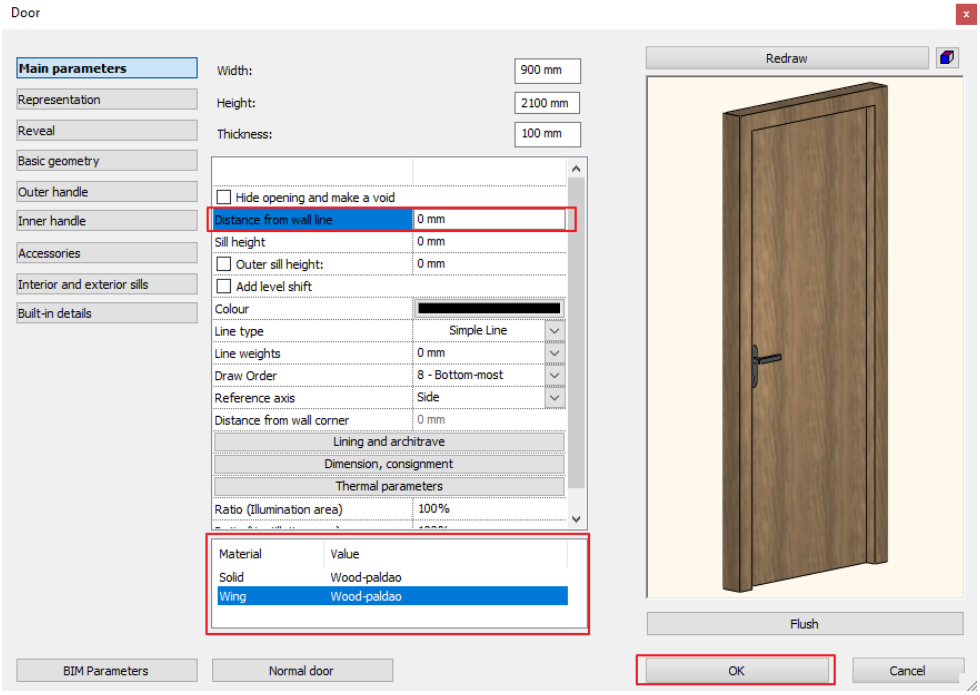
Place doors according to the DWG drawing, so the door width will be defined by the DWG drawing. The doors are all 2100 mm high, except the front door which is 2400 mm high.

You can set the door properties by selecting its properties on the Ribbon bar or using pre-defined doors from the styles that appear on the left after the command has been started.

- Now select **Ribbon bar / Building / Properties / Opening / Door** command.



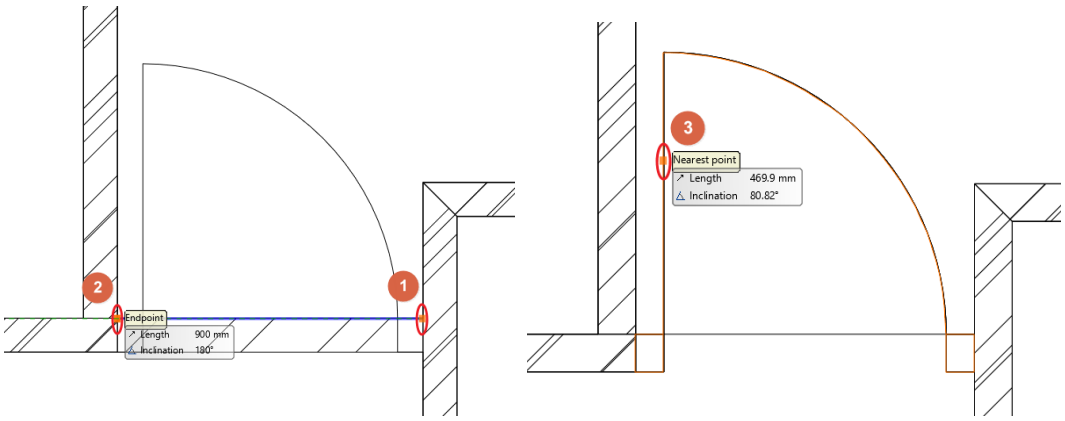
- In this case modify the "**Distance from wall line**" to "**0**" because these doors will be inserted into 100 mm wide partition walls.



- Modify the material of the door. Choose the "**Wood–paldao**" material from the material libraries.
- Close the dialog by pressing "**OK**".

Let's draw the doors based on the original content of the DWG drawing.

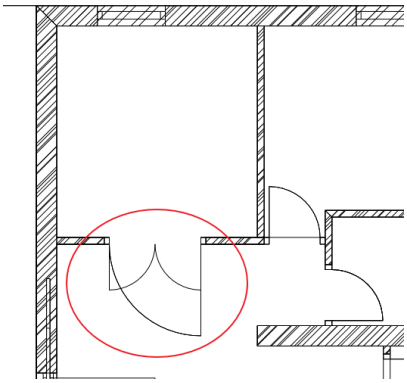
- Select the **Ribbon bar / Building / Door / Door by two points** command.
- Now define the first and second point of the door with two clicks one after the other.
- Then, move the mouse to find the opening direction and click to set it.



- Use this method to insert other doors.

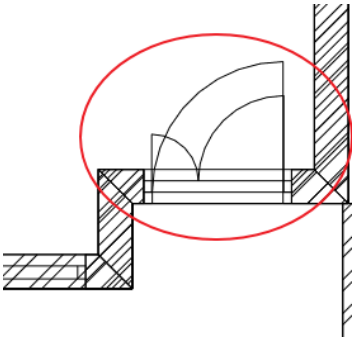
  Let's switch the front door and one of the other doors with a double door.

Double door



- To modify an already placed door, select it and from the Pop-up menu, select the pencil icon to open its properties.
- Open the library by clicking on the button with the name of the door type on it, below the preview window.
- Select a double door "**Flush internal double**" and close the library with the "**OK**" button.
- Now the program asks whether we want to keep the already set dimensions of the doors. In this case, select "**Yes**", because we have followed the dimensions given by the DWG drawing.
- Change the **Thickness** value to **100** mm and click **OK** to close the dialog.

Front door

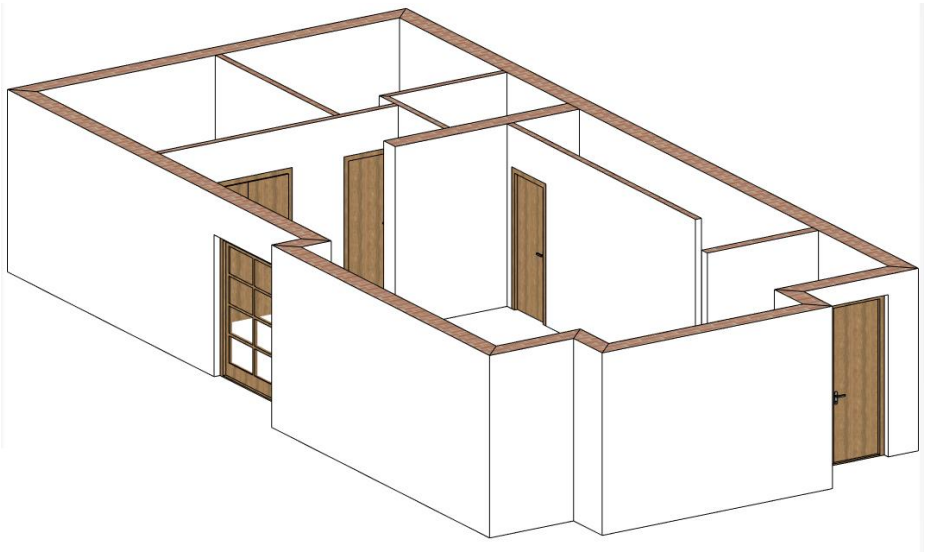


- Select the front door and from the Pop-up menu, and select the pencil icon to open its properties.
- Open the library by clicking on the button with the door type on it, below the preview window.
- Select a double outdoor "**Flush one side fixed**" and close the library with the "**OK**" button.
- Now the program asks, whether we want to keep the already set dimensions of the doors. In this case, select yes, because we have followed the dimensions given by the DWG drawing.
- Modify the **Distance from the wall line** to **100** mm and the **Height** to **2400** mm.

Sliding door

Finally, place the last door which is a sliding door.

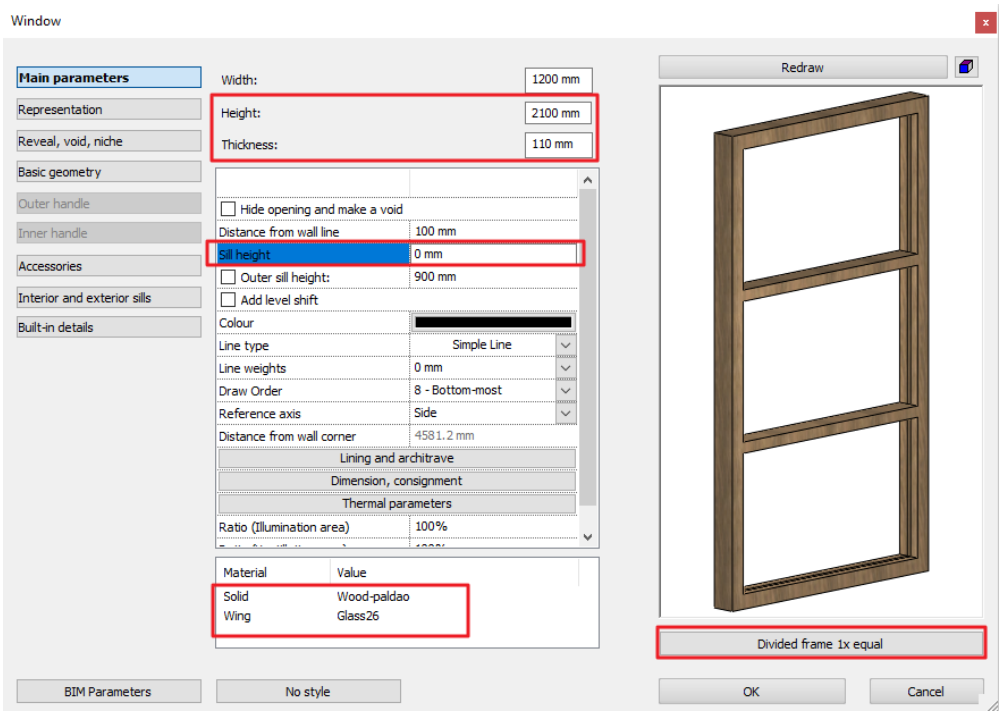
- Select the **Ribbon bar / Building / Properties / Opening / Door** command.
- Open the library, by clicking on the button with the door type on it, below the preview window.
- Select a sliding door "**Glass sliding in 1**" and close the library with the "**OK**" button.
- Modify the **Distance from the wall line** to **50** mm.
- Close the dialog window with **OK**.
- Finally place the door on the inner side of the wall using the **Ribbon bar / Building / Door / Door by two points** command.



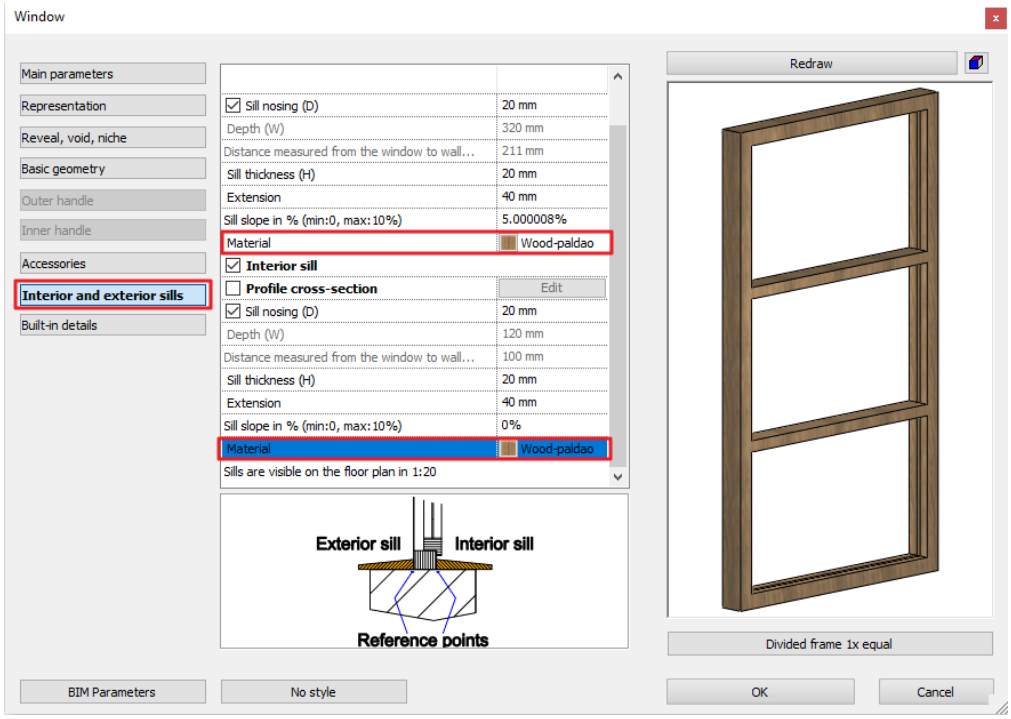
1.4.2. Windows

Let's place windows. First set the properties of the windows.

- Select the **Ribbon bar / Building / Properties / Opening / Window** command.
- From the window default properties dialog window open the library and select a window which has 3 vertically divided glass parts: "**Divided frame 1x equal**".
- Set its **Thickness** to **110** mm, its **Height** to **2100** mm and its **Sill height** to **0** mm.
- Choose another solid material (same with the doors) "**Wood–paldao**".



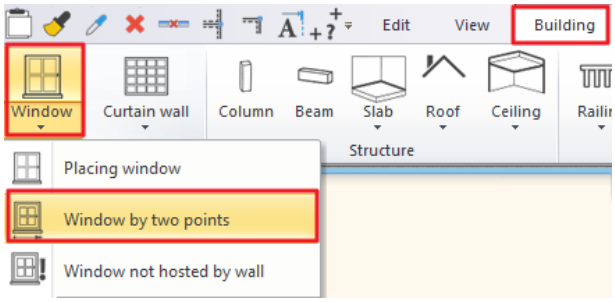
- Finally set this material to both sides of the sills on the **Interior and exterior sills** tab.



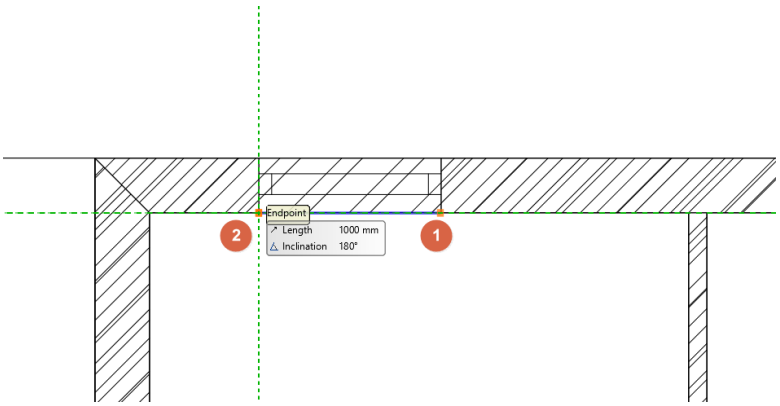
- Close the dialog window with **OK**.

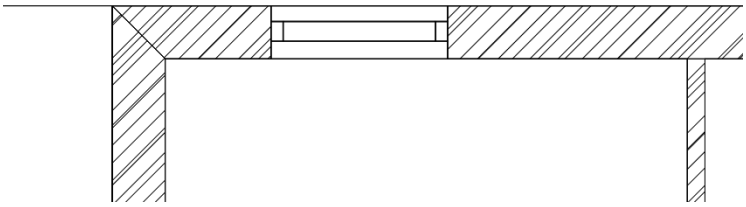
  Now you can draw the windows on the DWG with the right properties.

- Select the **Ribbon bar / Window / Window by two points** command.



- Select two corner points of the window by clicking on the inner side of the wall.

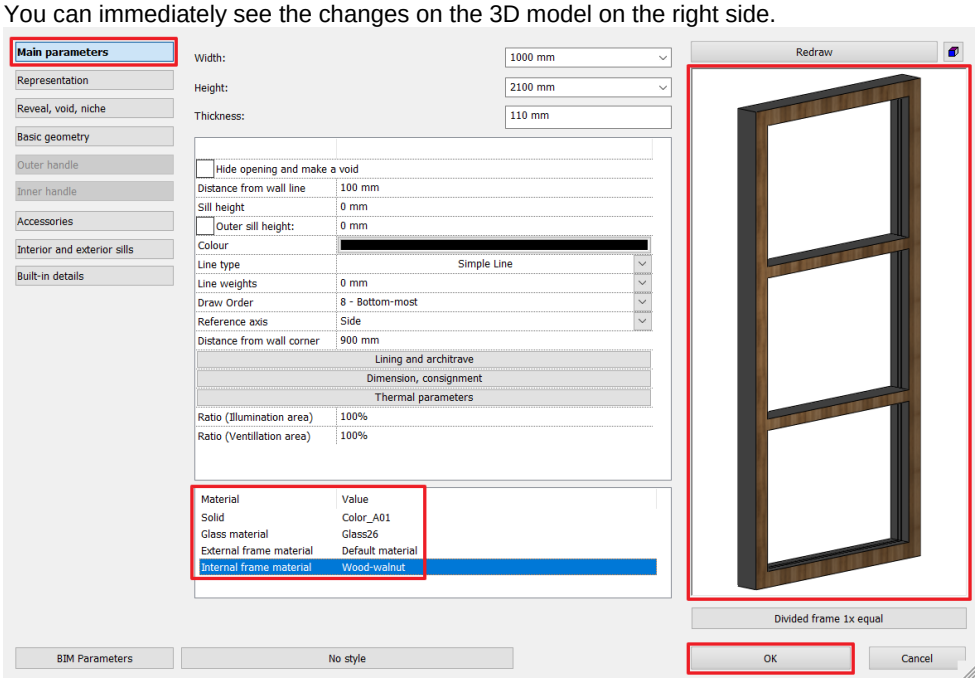




- Place all other windows following these steps.

Good to know: You can change the interior and exterior material of the window separately.

- Select any window in the house.
- You can now change the material settings in the **Window settings / Main parameters / Material** option.
- Select the “Wood-walnutciaro” material as Internal frame material.
- You can immediately see the changes on the 3D model on the right side.

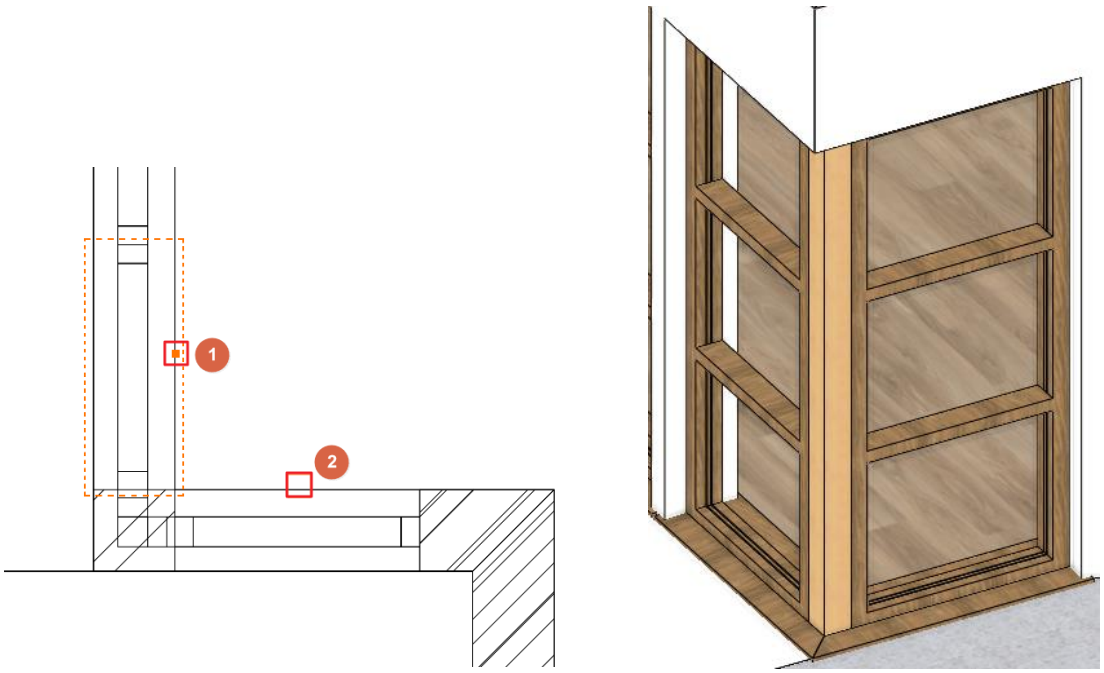


1.4.3. Place two windows as corner window

Any combination of standard windows can be joined in a corner window.

To create a corner window place two windows on each side of a corner where two walls form a corner.

Using the **Join two openings on wall corner** command from the **Ribbon bar / Building / Window / Windows on wall corner** menu then select the first and second window with one click.

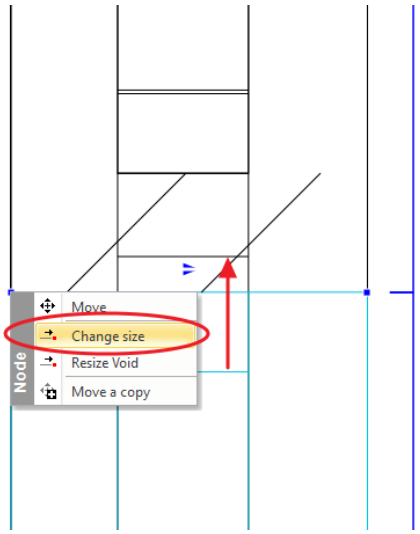


ARCHLine.XP automatically creates the corner post between two windows.

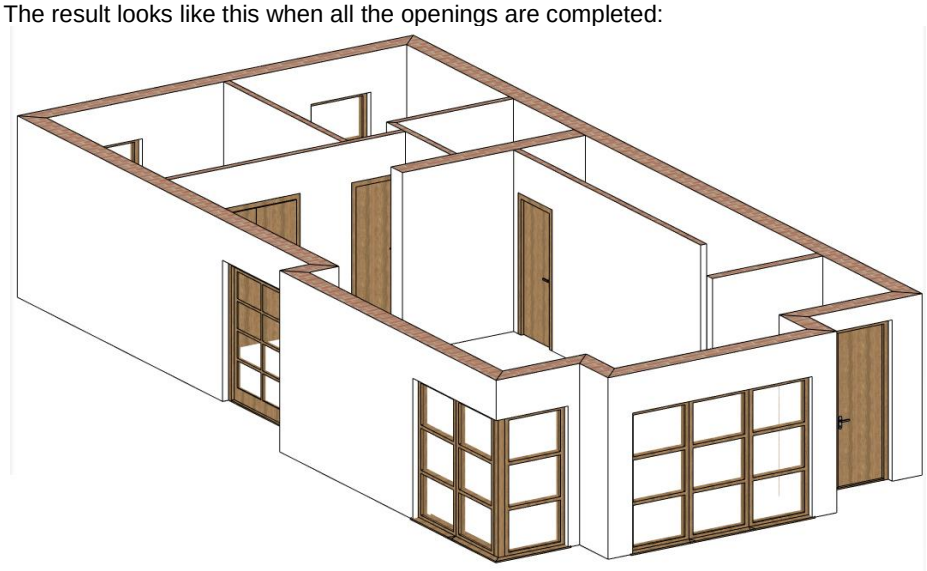
- Change its material "**Wood-paldao**": Go to the properties, **Built-in details** tab and modify the **Body material**.

Finally, modify the width of the two joining corner windows to match the original drawing.

- Select one of the windows.
- Click on the blue dot corner marker and select the **Change size** command.
- Adjust size and snap it to the original drawing content.
- Repeat these with the other window.



The result looks like this when all the openings are completed:



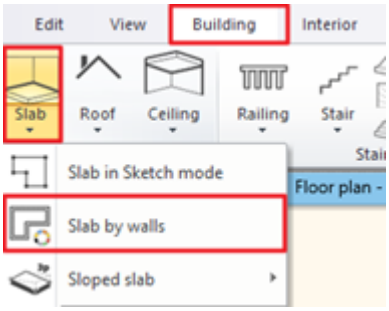
1.4.4. Slab tool - Creating the flooring

When we have finished drawing walls, let's continue the work with placing a slab. First, we need to set up the settings we will work with.

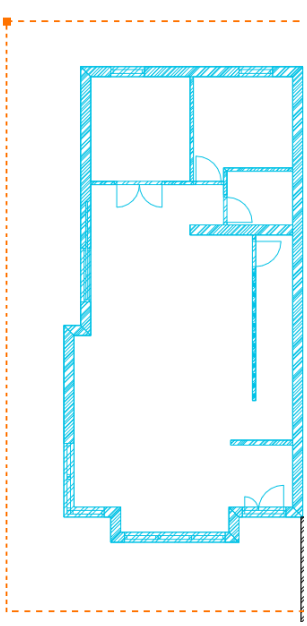
- Before we create the slab, go to the **Ribbon Bar / Building / Properties / Structure / Slab** tool, and here we can find all the settings of the slab.
- We need to modify the material of the slab. Choose a new material as the top material of the slab by clicking on the first material button.
- In the appearing dialog, you can see the material library with the current project materials (used in this project until now) and you can also access all the materials on this computer. Click on the **Home** button and find the "**Parquet / Strips**" material category. Find a material, for example "parquet_rovere_03", click on it and click OK to select it.
- The second material button is defining the side material of the slab. Click on it to change.
- Click on the **Home** button in the material library and type "**bright**" in the search field and hit Enter.
- Select the "**Bright_white**" material and click OK.
- Close the slab properties dialog window also with OK.

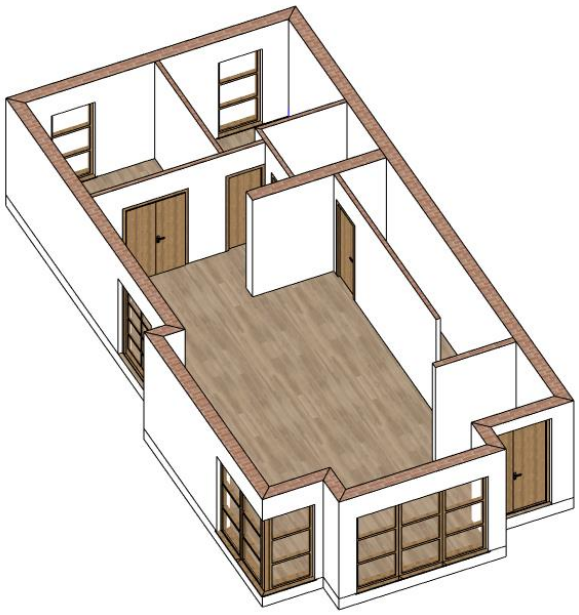
Now that the settings are okay, we can start creating the slab.

- Activate the floor plan window.
- Select the **Ribbon Bar / Building / Slab / Slab by walls** command.



- Select the floor plan with the selection rectangle.
- Press Enter and the slab is ready.

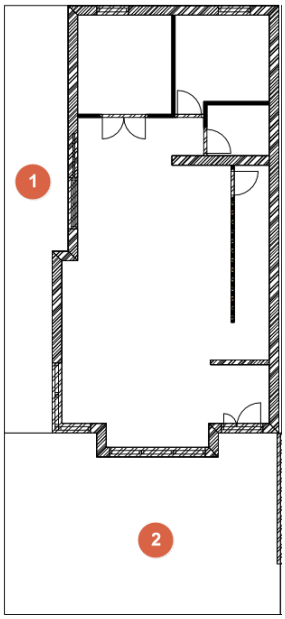


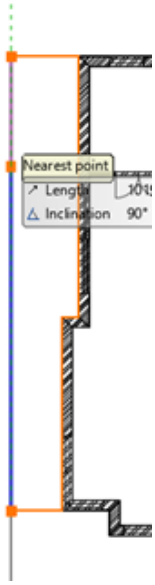


1.4.5. Slab tool - Creating a terrace

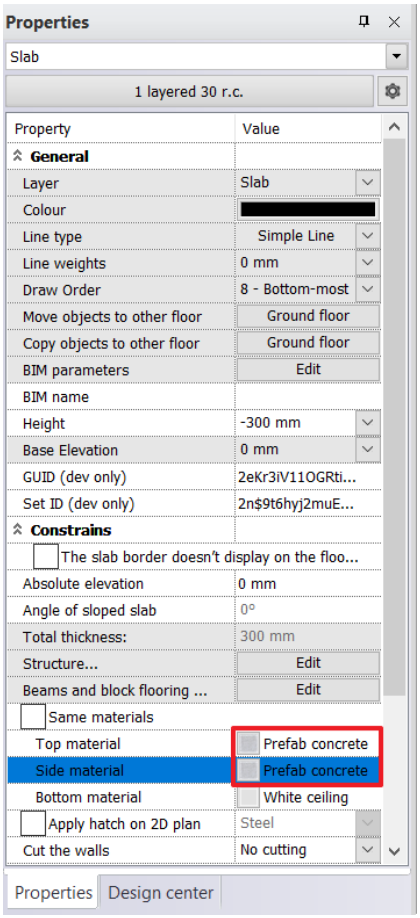
In the next step we will create a terrace with the slab tool.

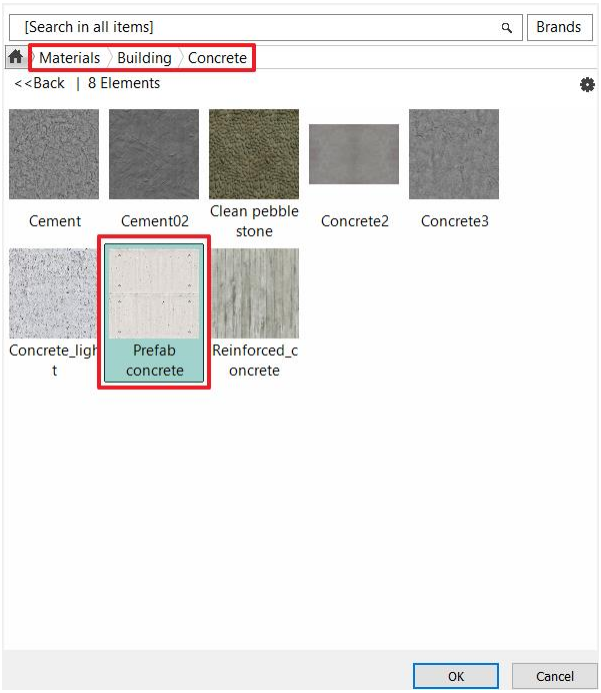
- First of all, enter the **Layer manager** dialog window and activate the "**Slab(1)**" layer. Now we see the line of the terrace on the left side (1) and the ramp in front of the entrance (2).
- Draw a slab on the left side with the **Ribbon bar / Building / Slab / Slab in Sketch mode** command.





- Choose the created slab by clicking on it.
- Find the Properties at the left side and select "**Prefab concrete**" as the new top and side material of the slab and "**White ceiling**" as the bottom material.

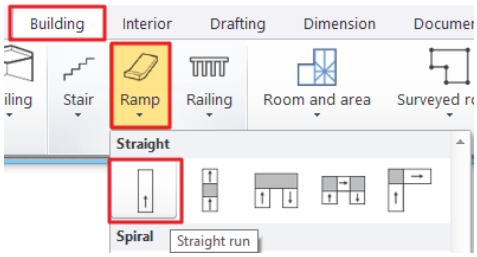




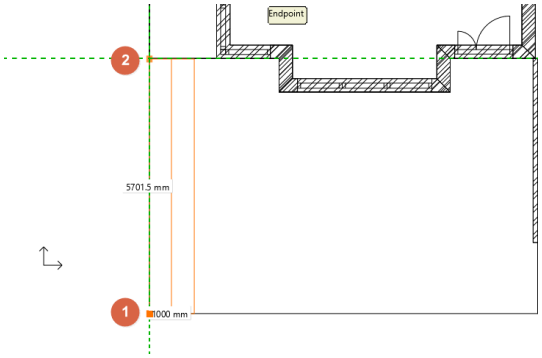
1.4.6. Creating a ramp

We create a ramp in front of the entrance by using the dedicated Ramp tool.

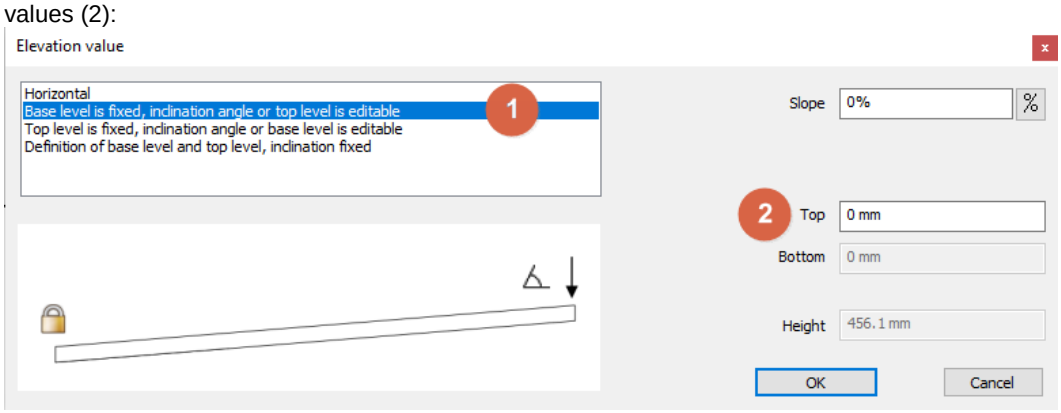
- Using the Ramp command from the **Ribbon bar / Building / Ramp** command list, then choose "**Straight run**" from the Straight category.



- Place the ramp by specifying the bottom (1) and top (2) points.



- Click on the ramp, then choose the marker in the middle near to the Move marker. The Elevation value window is appearing.
- We know the top and the bottom values: the top value is 0 mm, this is the ground floor and the bottom value is **-300 mm**. First set the 2nd option: "**Base level is fixed, inclination angle or top level is editable**" option (1), then add the top values (2):

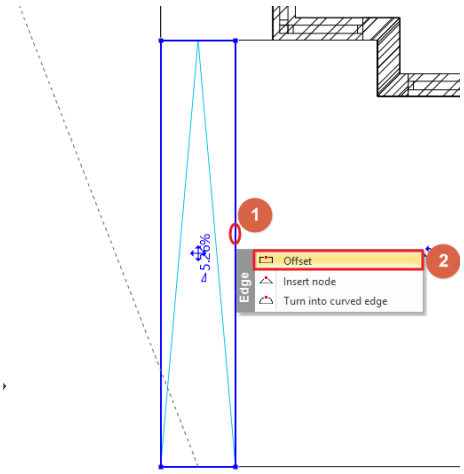


- Next set the 3rd option: "**Top level is fixed, inclination angle or top level is editable**" option (3), then add the bottom values (4):

- Close the dialog window with **OK**.

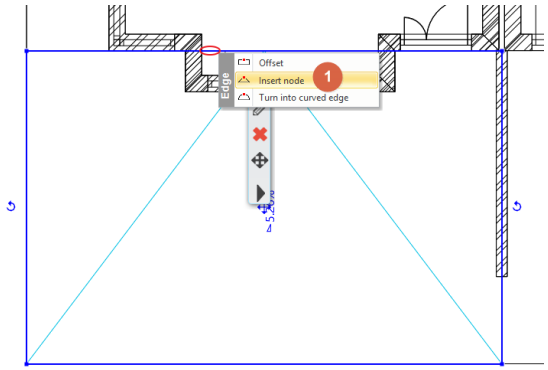
Now modify the width of the ramp.

- Click on the ramp in the floor plan window and select the Offset command to place it to the right place.

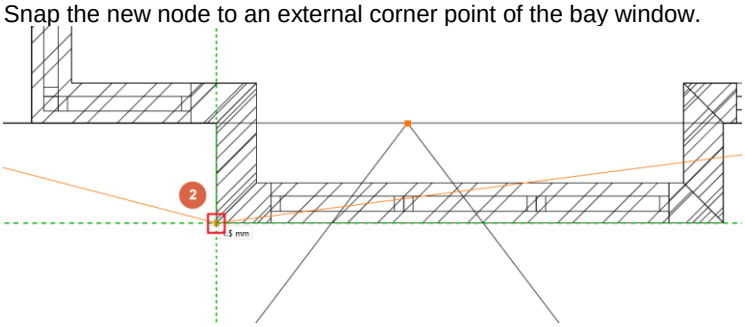


Insert four additional nodes into the top contour of the ramp and snap them to the corners of the bay window.

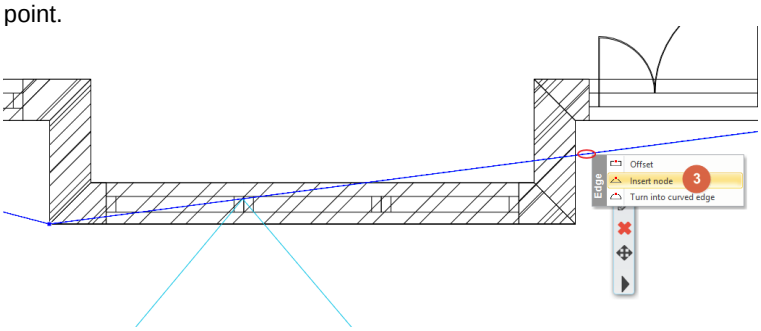
- Click on the top edge of the selected ramp and select the **Insert node** command.



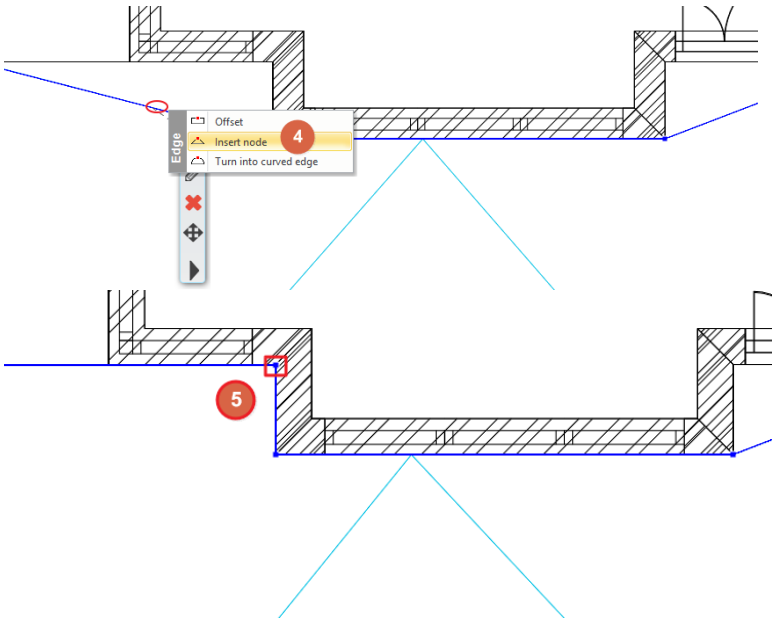
- Snap the new node to an external corner point of the bay window.



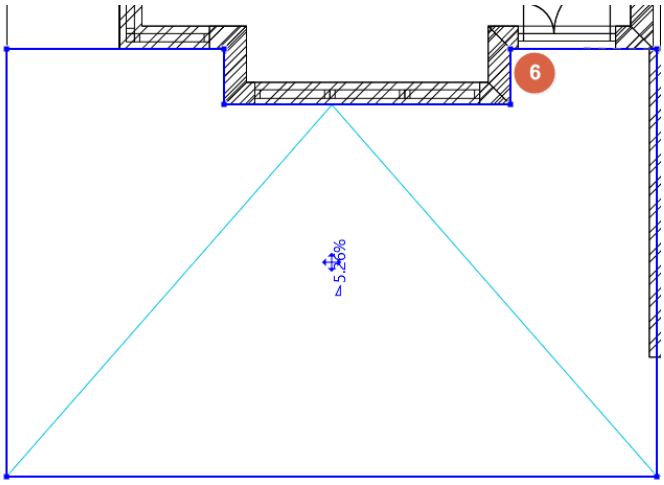
- Repeat the same method on the other side. Click on the edge and select **Insert node**, then snap it to the following corner point.



- Add the 3rd node.

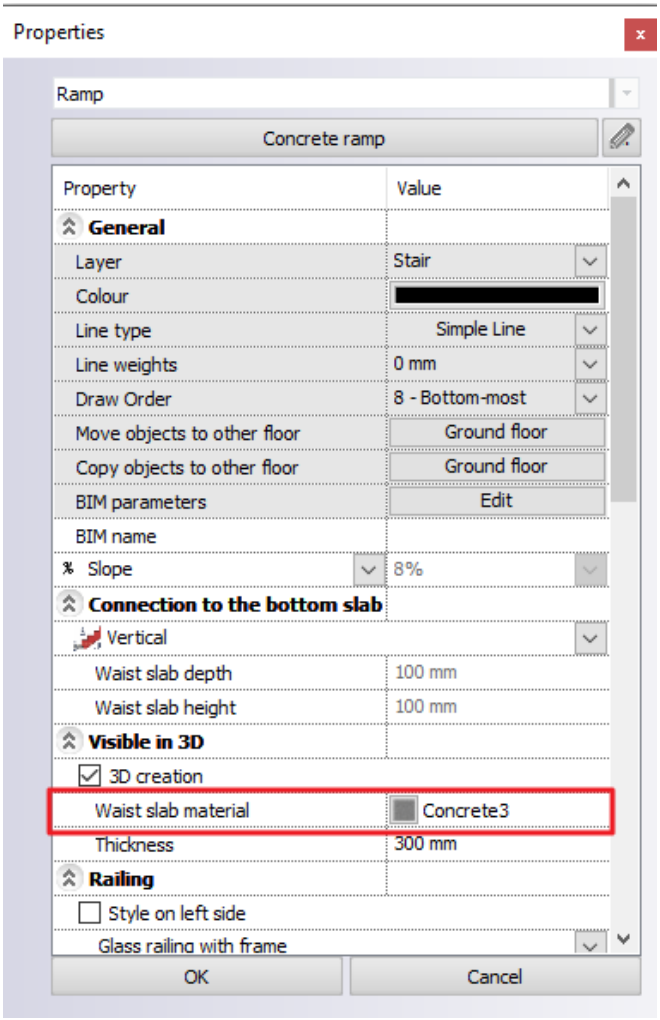


- Repeat this method on the other side too, in order to add the 4th node.

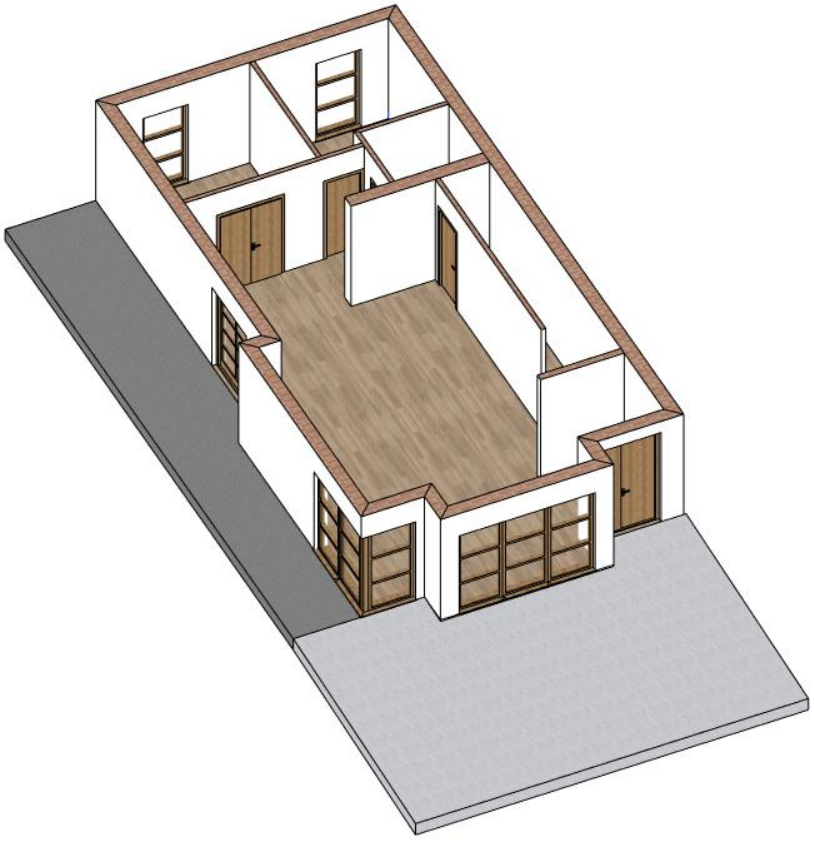


Finally, modify the material of the ramp from the material library.

- Click on the ramp, and choose the pencil icon from the appearing menu.
- In the Properties dialog window modify the "**Waist slab material**" to "**Concrete3**".


Properties
Ramp
Concrete ramp
Property
Value
General
Layer
Stair
Colour
Line type
Simple Line
Line weights
0 mm
Draw Order
8 - Bottom-most
Move objects to other floor
Ground floor
Copy objects to other floor
Ground floor
BIM parameters
Edit
BIM name
Slope
8%
Connection to the bottom slab
Vertical
Waist slab depth
100 mm
Waist slab height
100 mm
Visible in 3D
3D creation
Waist slab material
Concrete3
Thickness
300 mm
Railing
Style on left side
Glass railing with frame
OK
Cancel

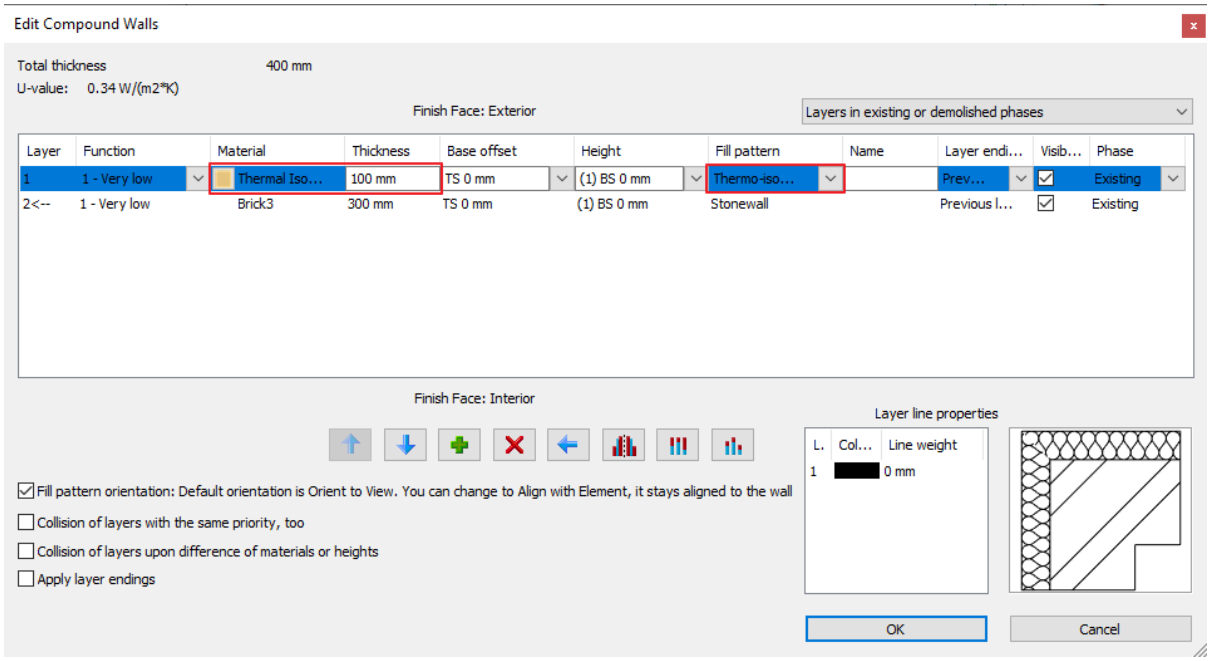
The result:

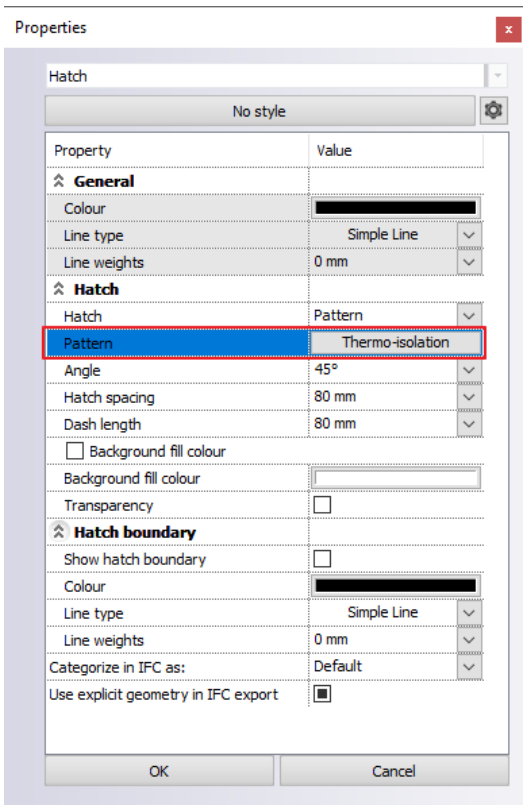


1.5. Multi-layer walls

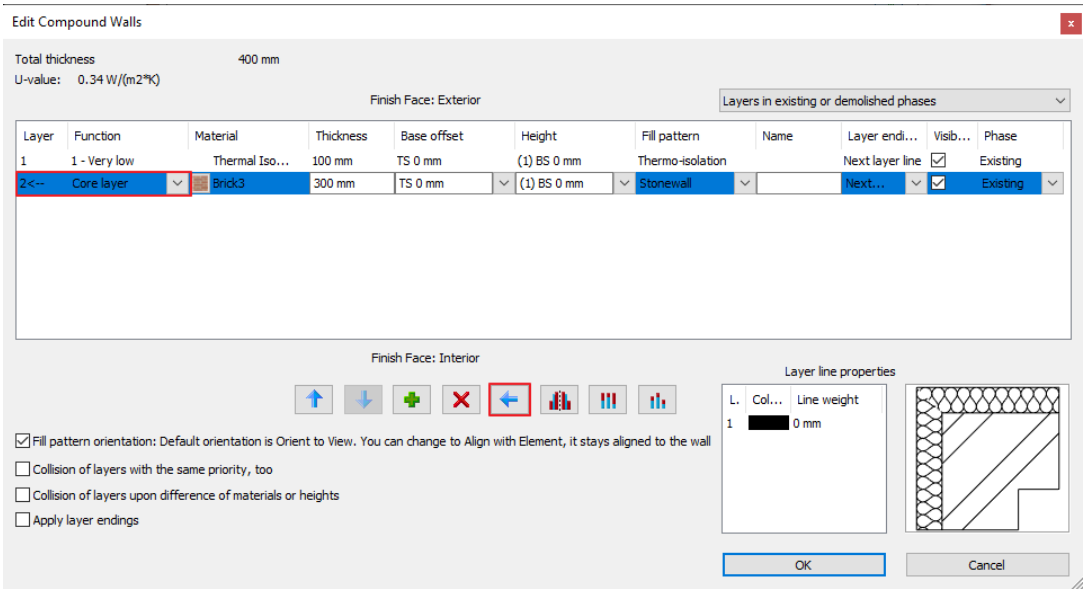
In ARCHLine.XP you can create multi-layer walls. Let's add a thermal insulation layer to the existing walls.

- Select an external wall. Enter its properties and click on the Edit Compound Walls button.
- In the appearing dialog you can edit the layers of the wall.
- Add a new layer by clicking on the green plus icon. 
- Change the top layer's thickness to 100 mm and its material to Thermal isolation.
- Click on the name of the fill pattern and select the edit option to change the pattern. In the appearing dialog click on the pattern's name and select Thermo-isolation. Click OK to accept the settings.

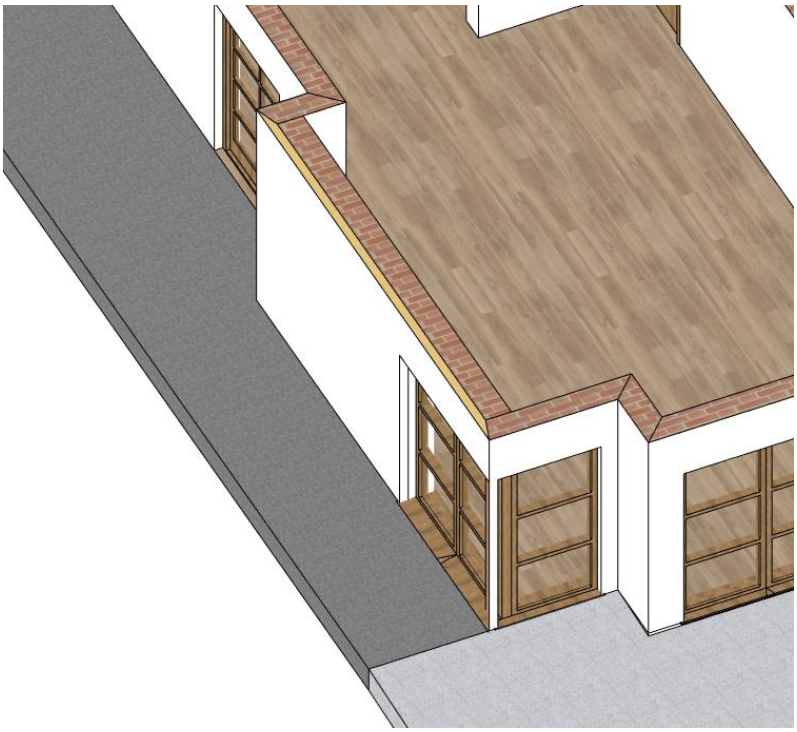




- Select the bottom layer, change its function to Core layer and click on the Displayed layer button.

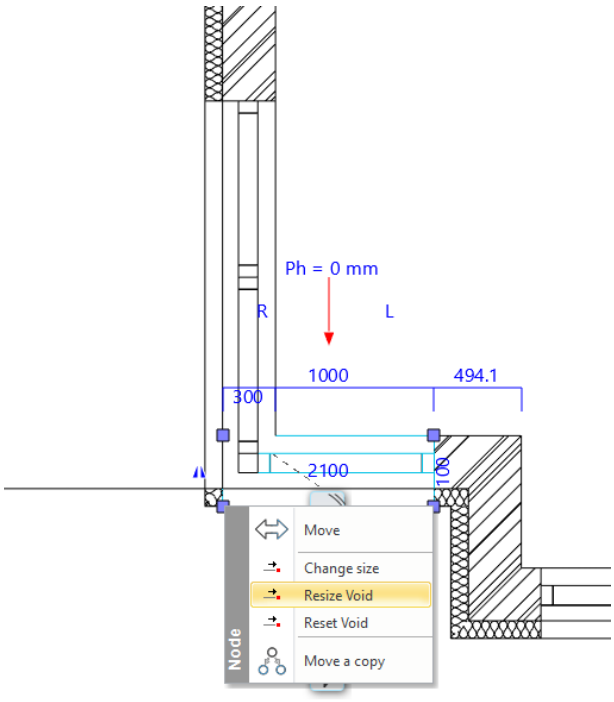


- Exit all dialogs by clicking on OK.

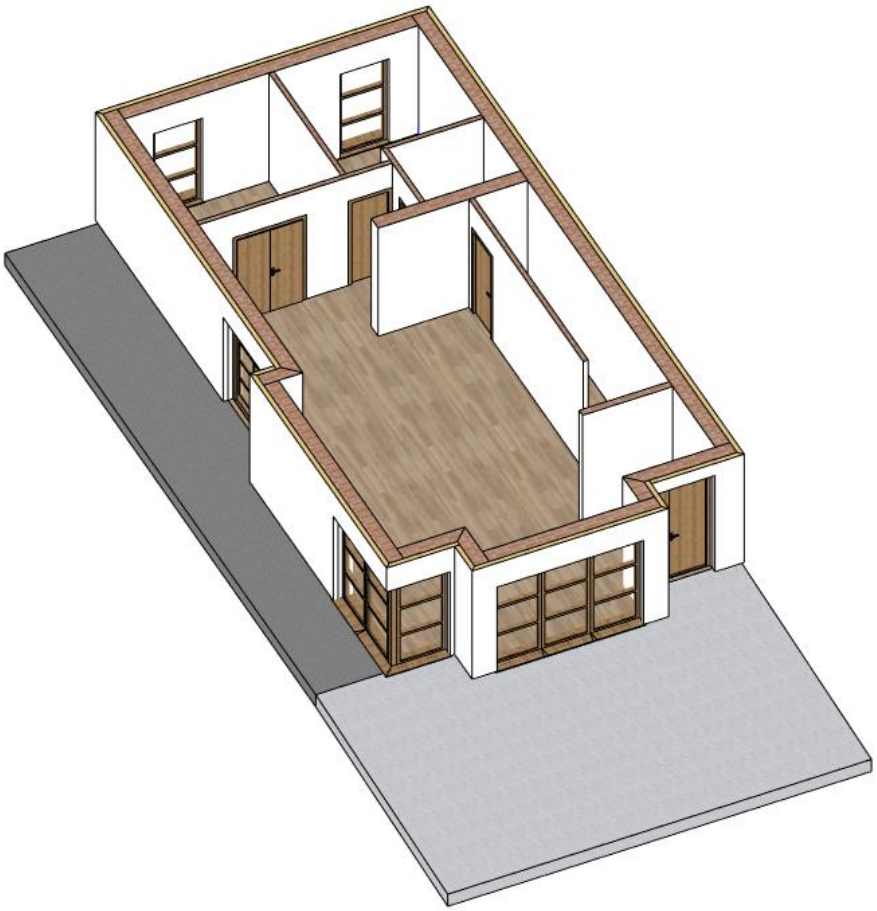


- Select the wall and copy its settings to all external walls with the Copy properties button. In the appearing window select all properties, then select all the external walls on the floor plan.

- Resize the void of the corner windows to make the wall disappear from the corner. Repeat this step on both corner windows.

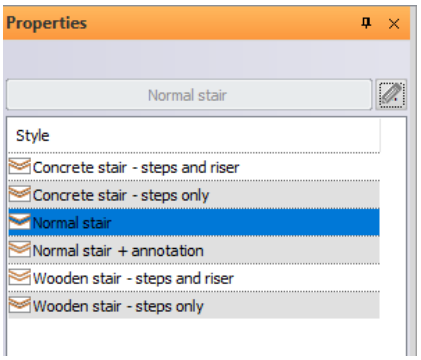


The result is the following:



1.6. Stairs

1.6.1. Placing stairs

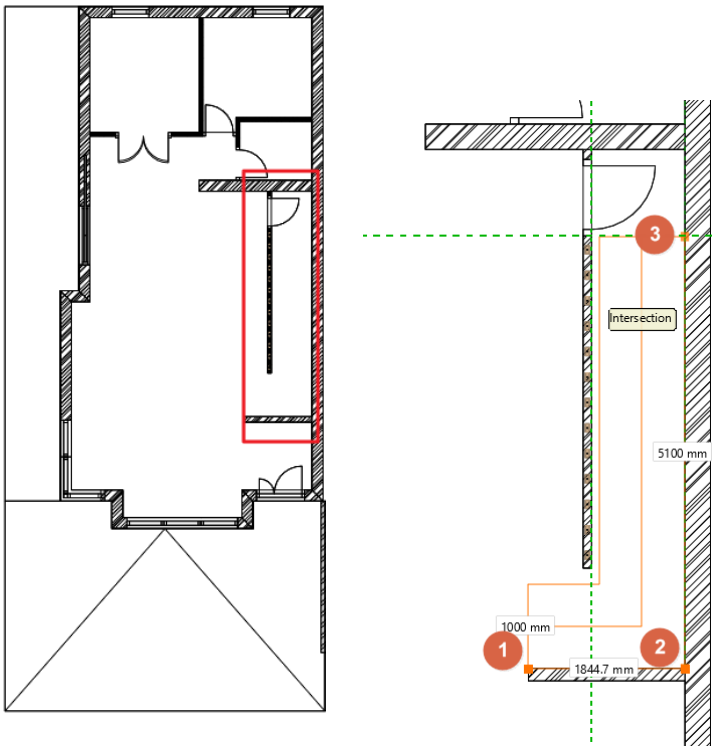


- Activate the floor plan window, and make sure that the Ground floor is active.

  We will design a staircase on this floor:

- Open the **Ribbon bar / Building / Stair** command list. Here you can find tools for creating and editing stairs.
- Start the **Building / Stair / L form + Landing** command.

  When you start the command, the Properties panel on the left displays all the previously saved styles. You can use these styles too.

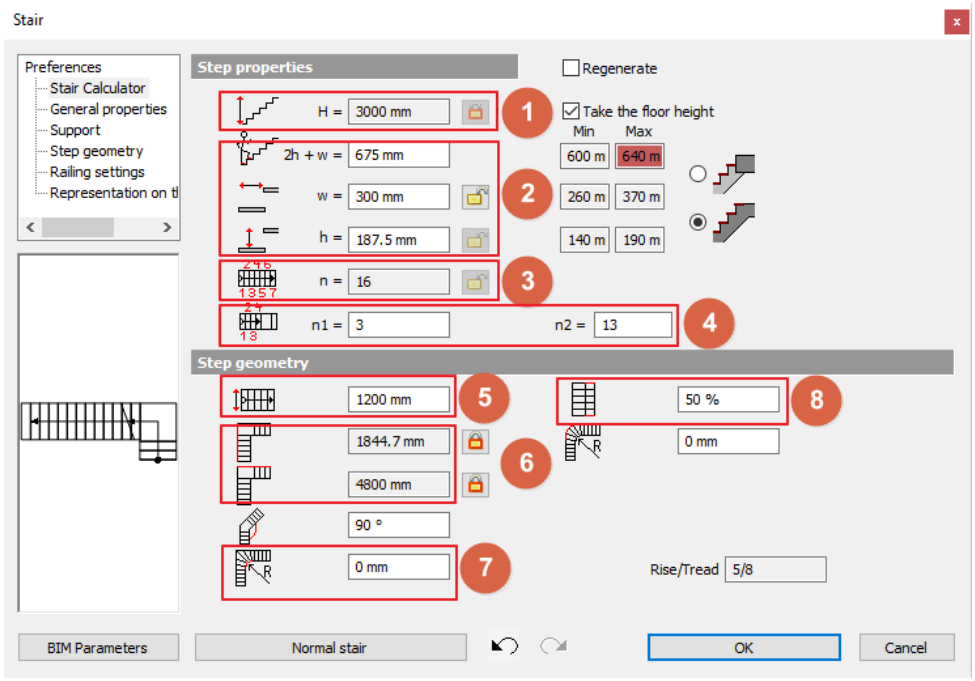


- Before placing the stair, choose the "**Right side**" option from the appearing option list on the right-hand side to place the stair with a reference line on the right side.
- Place the staircase with 3 corner points.

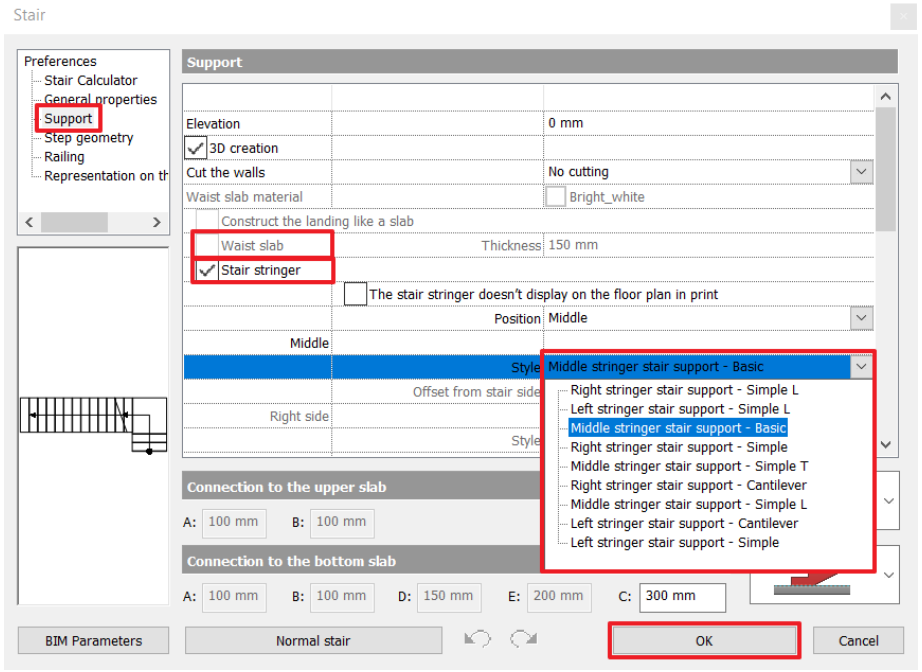
1.6.2. Modifying properties of the previously placed staircase

When you have placed the staircase, modify its properties. To do this, click on any points of it, and select the pencil icon from the floating menu.

- Now the Stair dialog window will appear. Set the following values on the Stair Calculator tab:



- And set the following values on the Support tab:



- **Floor height (1):** Activate the **Take the floor height** option and this value will be automatically overwritten as per the project to **3000** mm.

Ergonomic settings (2)

These values are not to be changed now - they are automatically calculated based on the height and the number of steps of the staircase. The staircase is considered ergonomic when these values are falling within the right side, indicated minimum and maximum standard values. If a value exceeds the limits, the software indicates that with a red highlight. However, even in case of a non-ergonomic stair the software allows the placement and leaves the decision to the designer whether it is to be changed or not.

Number of the steps (3)

The number of steps are calculated based on the values of n1 and n 2.

- **n1, n2 (4):** In case of a winded stair, the values of n1, n2 define the number of non-winded steps on the straight side. **n1 is 3 and n2 is 13**.
- **Width** (5): use **1200 mm**.

Side parameters (6)

These two values show the length on each sides of the staircase.

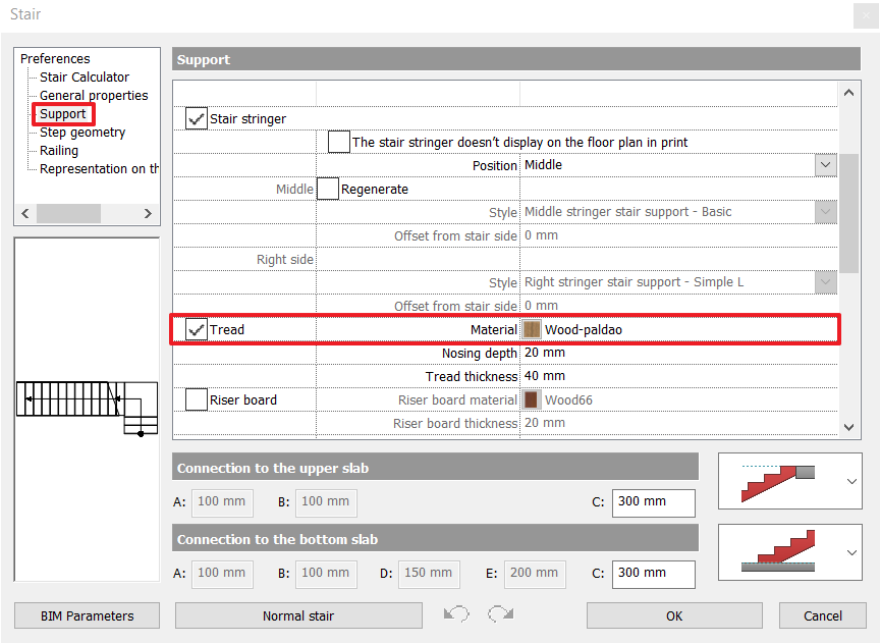
Rounding radius (7)

This can be found at the bottom. We do not change it this time and it results in a sharp corner with no rounding.

Walking line

Now it is 50%, which is in the middle of the staircase.

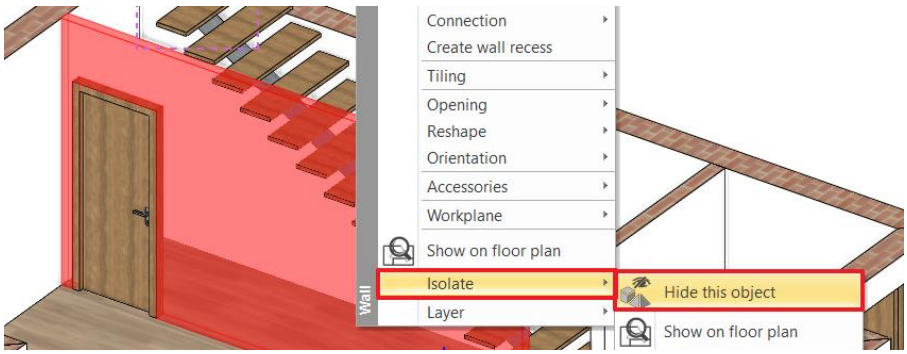
- Select the **Support tab** and modify the **Cut the walls** option to "**Own floor**". This way the stair will cut the wall below it.

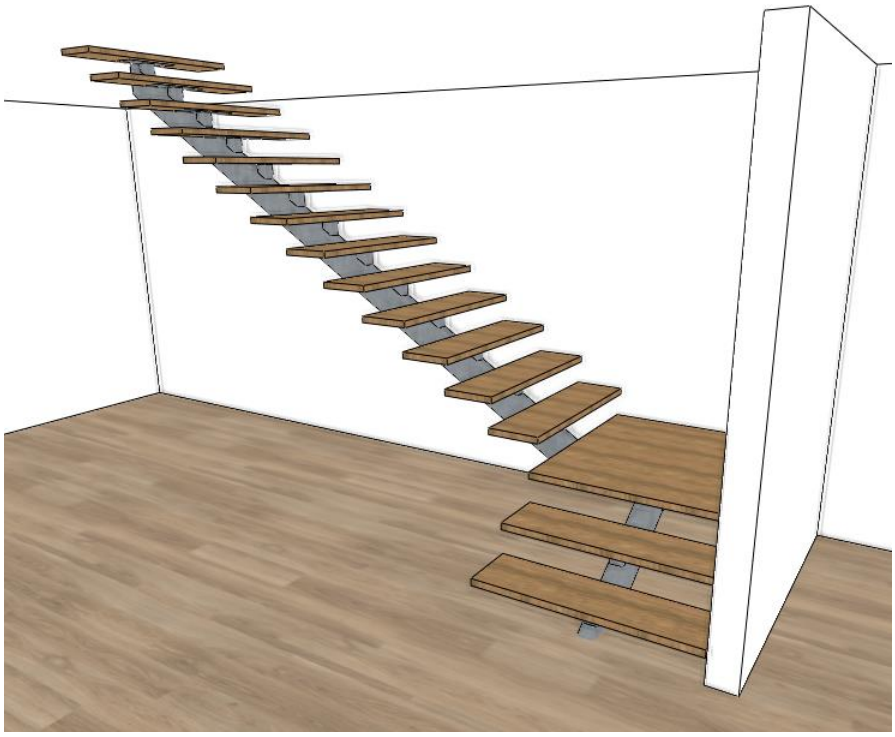


- Finally, scroll down in the support tab to modify the material of the **Tread**. Choose the same material that you used for the door: "**Wood–paldao**".

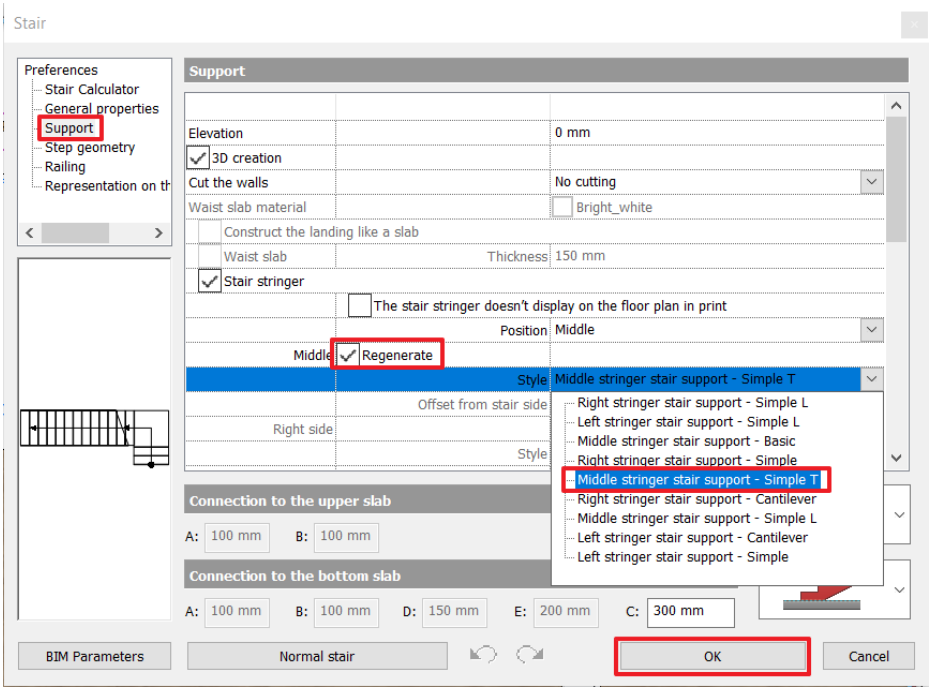
- When you finished the settings, close the dialog window by pressing **OK**. Now the program creates the staircase with the modified parameters.

- Change to the 3D window, right click on the wall next to the stairs and choose the **Isolate / Hide this object** option. Repeat this step with the door too.

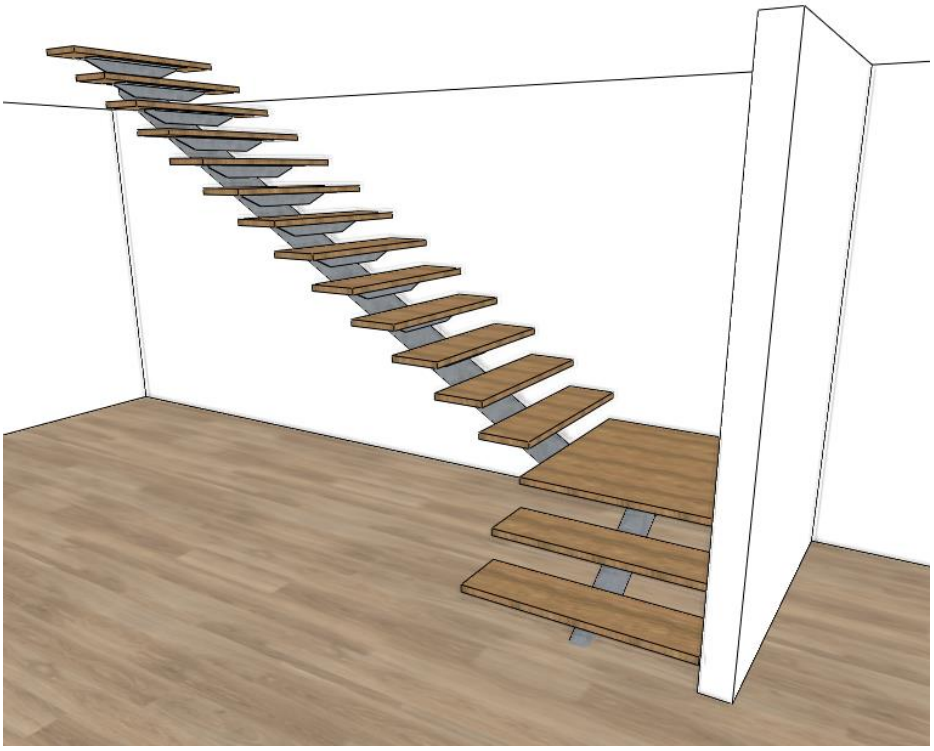




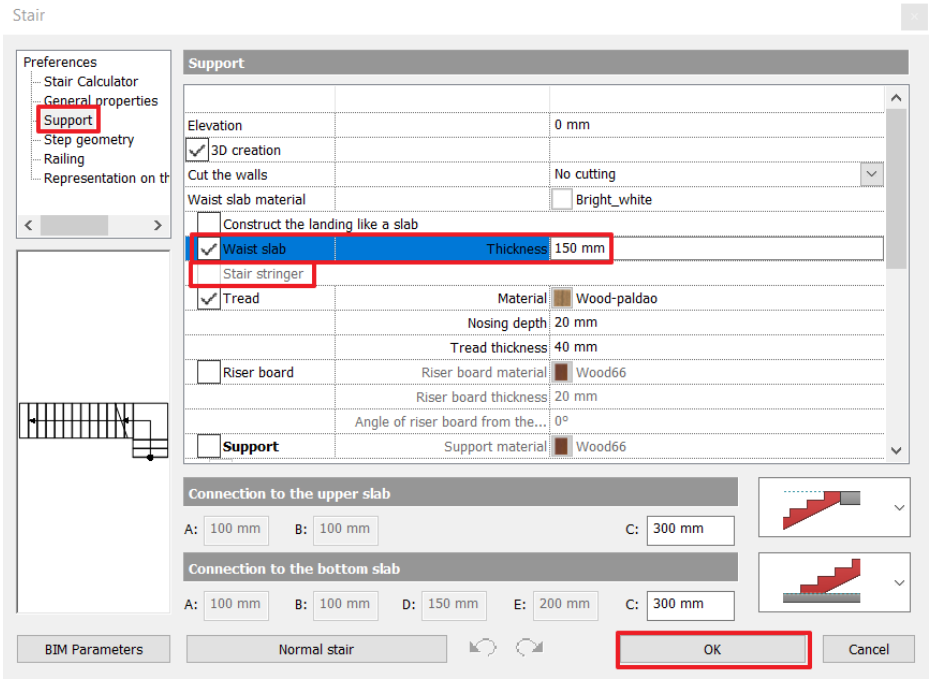
- You can create stairs with several types of support. To change the support click on the regenerate button and choose the “Middle stringer stair support – Simple T”. Now click on “OK”.

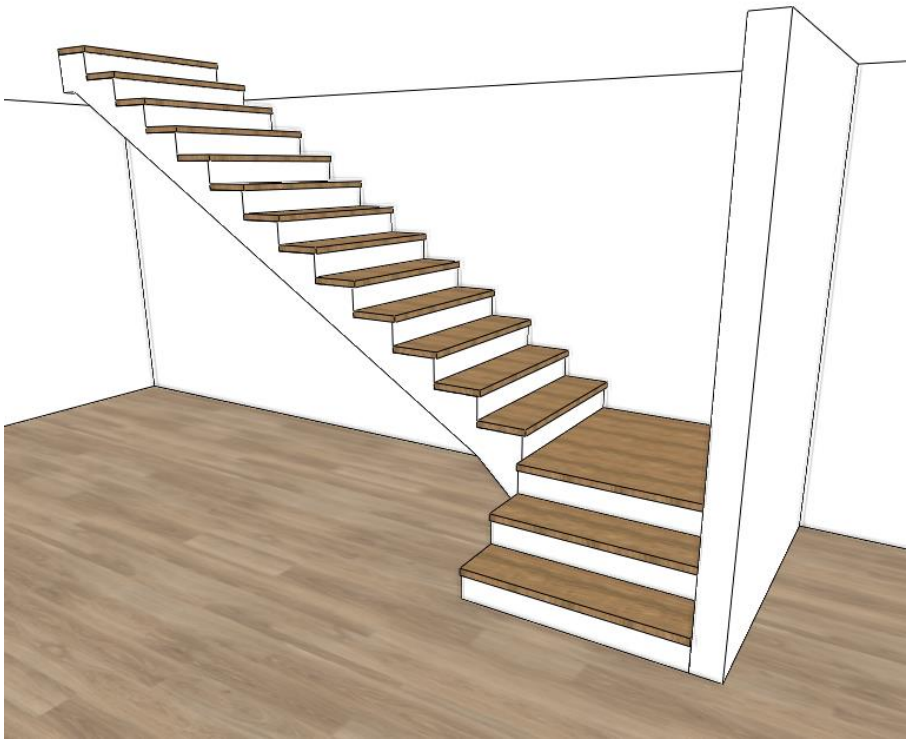


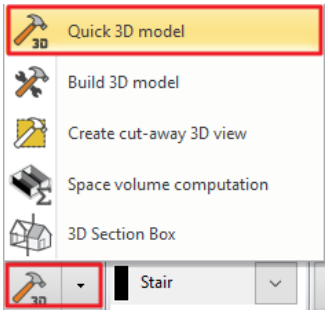
As a result, the support of the stairs changes:



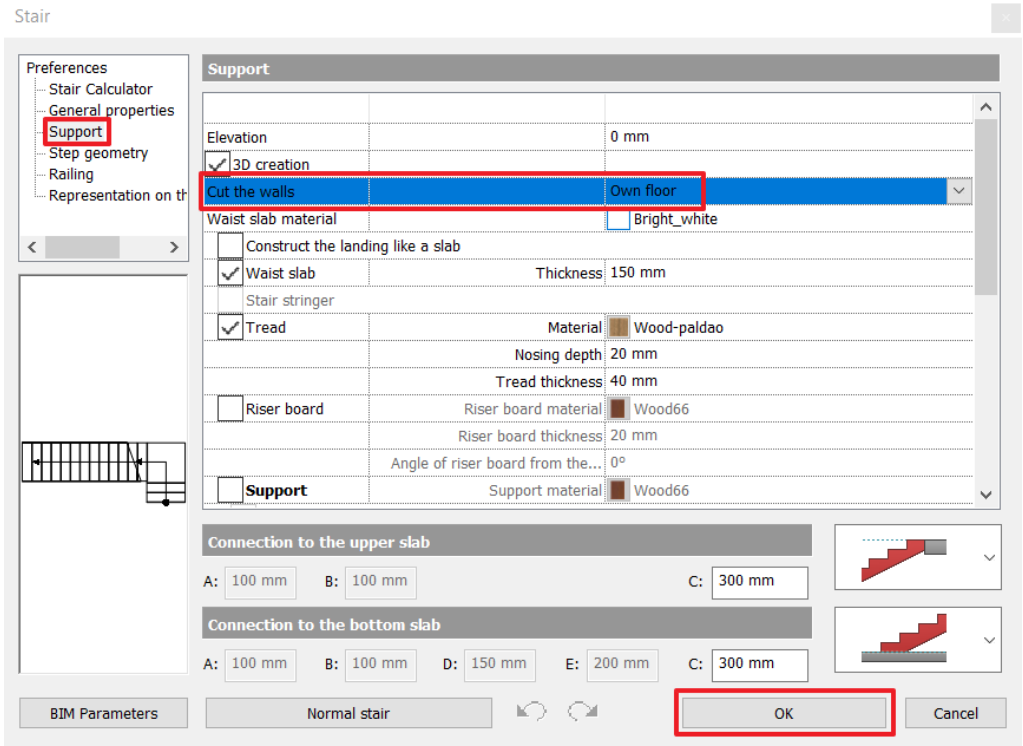
- Now select the following options in the support tab:





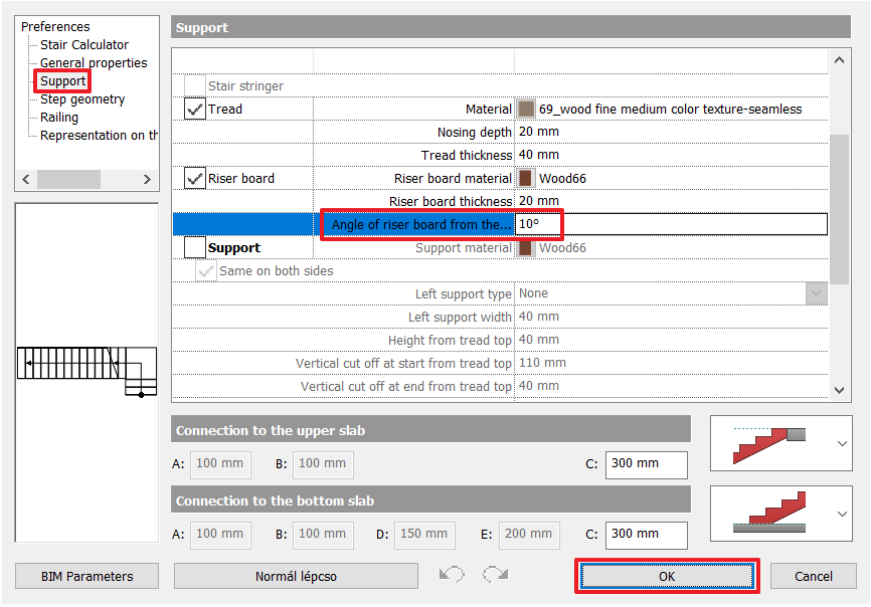


- Click on the "**Quick 3D model**" hammer to update the wall-stair connection.
- Now select the support tab again and select the **Cut the walls / Own floor** option and click on the **hammer sign** again.



Good to know: You can change the tilt of the riser board.

- In the stairs settings select the support tab and activate the riser board option.
- Change the Angle of riser board from the vertical degree to the desired value.



1.7. Working on an additional floor

ARCHLine.XP automatically creates several floors when the project is first created. You can create or import content on any of these floors. These floors are ready-made for you to use and of course you can fully customize, rename or erase them and you can add as many floors as necessary to create your building structure.

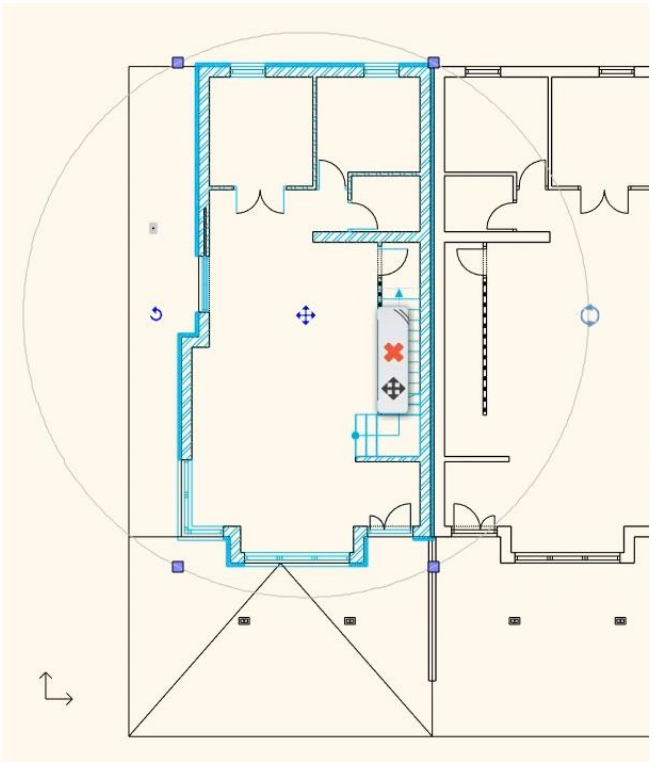
In our project we need to draw another floorplan, too. We will follow these 2 tasks to create the 1st floor's content:

- Copy content from the Ground floor to the 1st floor.
- Customize the architectural items of the 1st floor to match the desired floorplan.

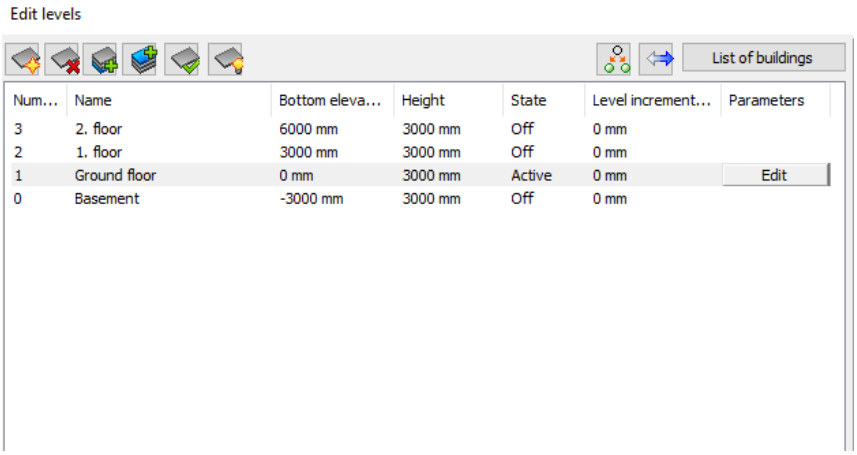
1.7.1. Copy content from one floor to the other

To speed up your work, it is very useful to know that you can easily copy or move things onto other floors.

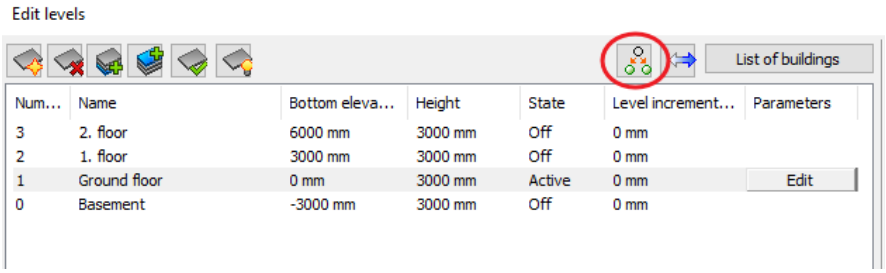
- Use the floor navigator buttons at the bottom of the screen to navigate to the "**Ground floor**". (Alternatively, you can use the **Page Up** and **Page Down** keys too.).
- Select the entire floor plan in the Ground floor then open the **Edit levels** dialog window by with clicking on the **Ground floor** button at the bottom of the screen.



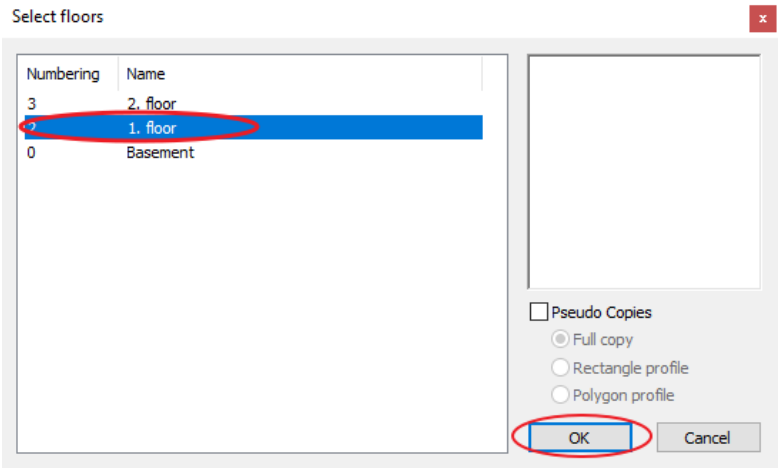
In the list there are 4 floors now. The currently active floor is the Ground floor. These floors are automatically created by the software by default, every time you start a new project.



- Click on "**Copy objects to other floor**" icon.



- In the appearing dialog window, select the **First floor**. Press the **OK** to copy the selected items.



In the 3D window you can see that the full content of the ground floor is copied to the upper floor as well.

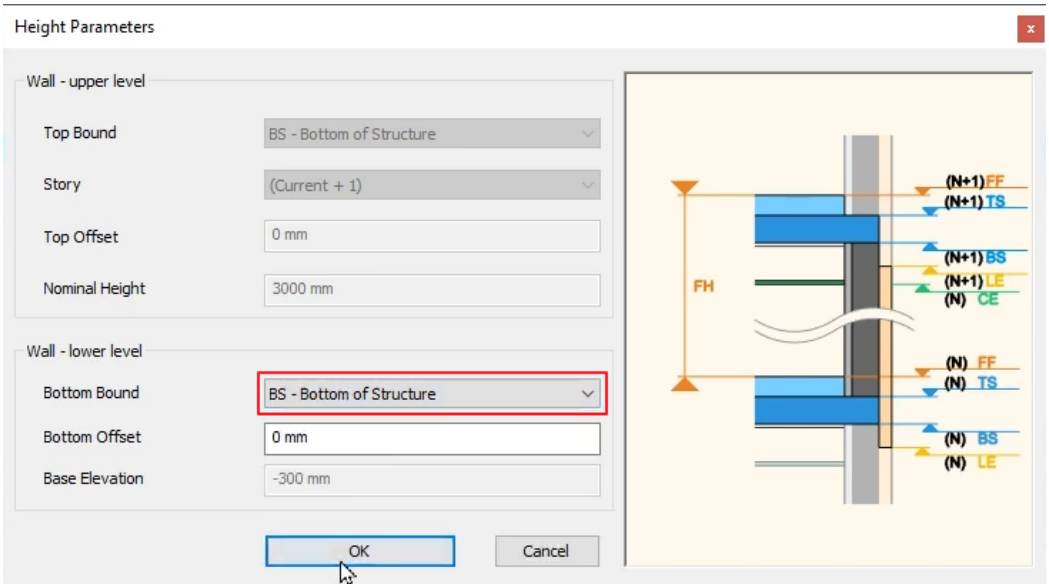
1.7.2. Customizing the content of the 1. floor

Now we will customize the **content of the 1. floor** by removing unnecessary partition walls and openings and create new ones.

- Select and **erase the partition walls, the entrance door and the stair** from the First floor's content.

Activate the 3D view and check the connection of the two floors. The insulation layers have a gap in the place of the slab. Let's select a wall on the first floor and edit the insulation layer's base height.

- Click on the pencil icon after selecting the wall then click on the Edit Compound Walls button. Now you can edit the layers individually.
- Select the Thermal isolation layer and click on the **Base offset / Edit** button.
- In the appearing dialog change the settings to BS- Bottom of Structure

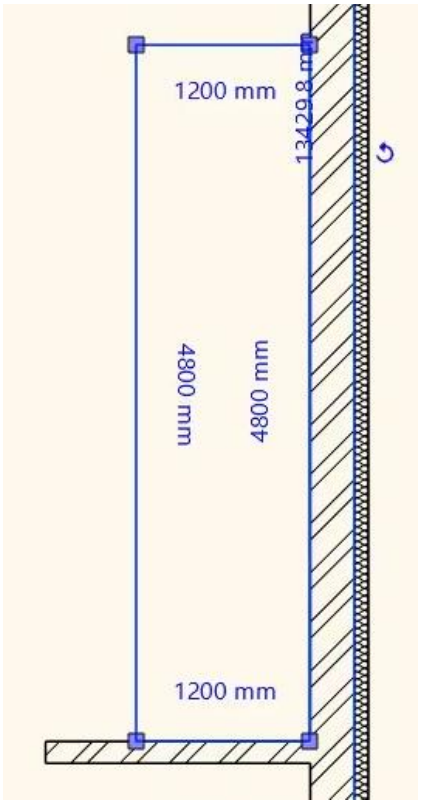


- Copy this wall's settings to all external walls on the first floor.

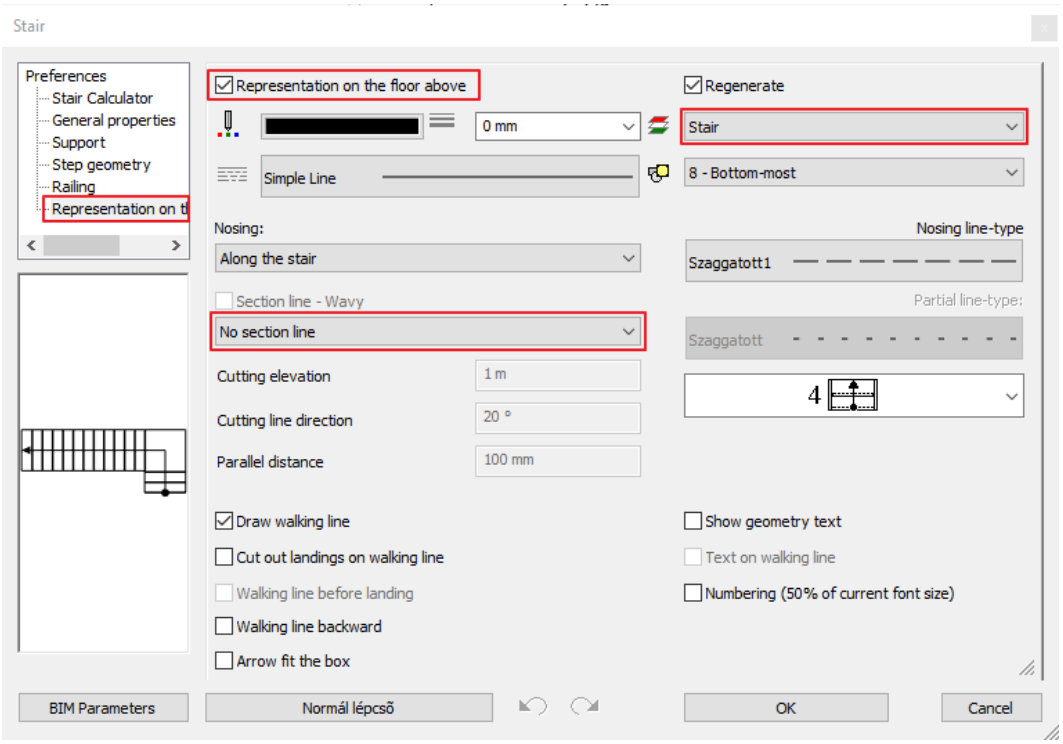
Setting up the correct display of the staircase

In order to show the staircase properly on both the floor plan and on the 3D, we have to modify the 2D symbol. This is how we do it:

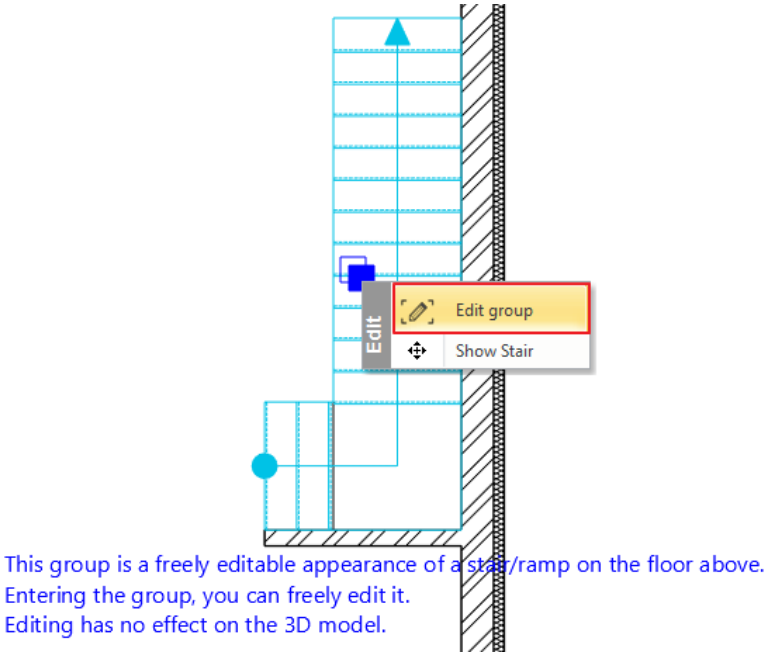
- Create the stair symbol on the first floor. Go to the ground floor and right click on the stair.
- Select the Cut slabs above the stair command. In the 3D view you can see that the slab has been cut above the stair.
- Go to the first floor and adjust the contour of the cut by clicking on the contour line.
- Select the offset option and create a rectangle shape from the original cut. Delete the extra node on the rectangle.



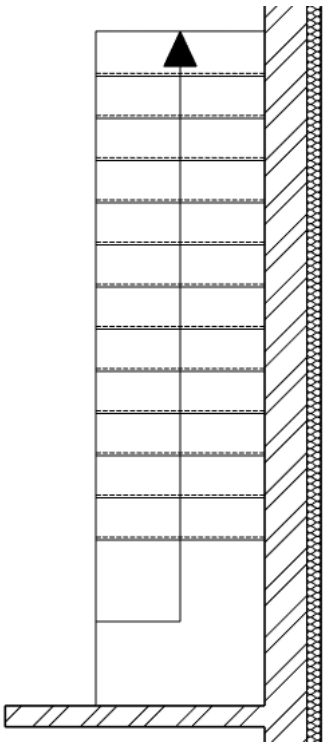
- Go to the ground floor and in the stair's properties go to the Representation on the floor above tab and activate the Representation on the floor above option. Set the section line to No section line and change the layer to Stair.



- Go to the first floor and edit the 2D symbol of the stair's first floor representation.
- Click on the blue rectangle icon and select the Edit group option.



- Delete the parts of the stair symbol that should not be visible.
- To exit the editor, right click on any of the lines and select the Close group option.



Good to know

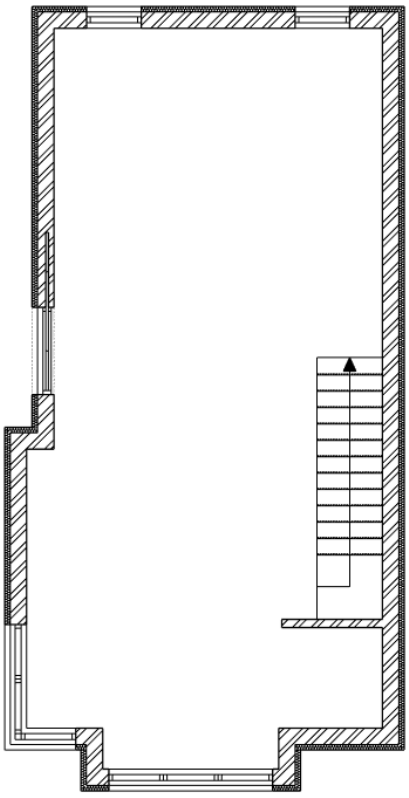
You can create the upstairs stair symbol by the following steps too.

- Copy the stair from the ground floor.
- Go in the properties of this stair and on the Support tab disable the 3D creation option and set the cut the walls to No cutting.
- On the General properties tab set the drop down menu to No section line.
- Now edit the floor plan symbol the same way as described above.

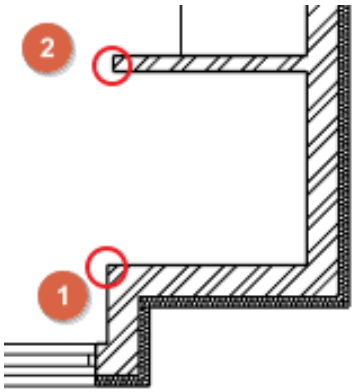
Drawing the partition walls on the first floor

Now we will draw the partition walls on the 1. floor. To do this, you will find the description below.

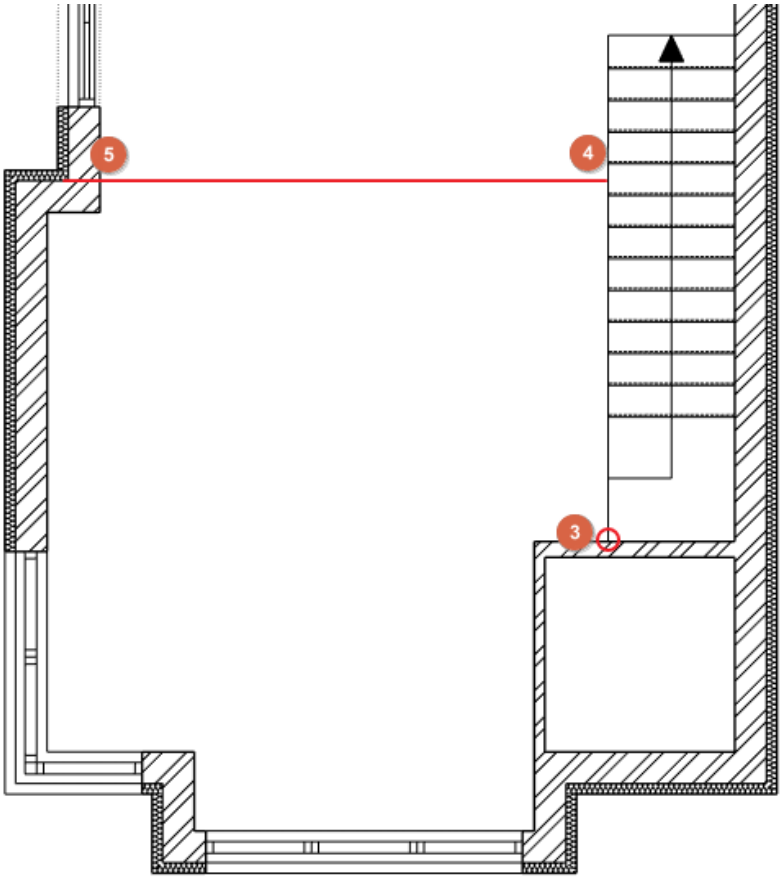
- The floor plan should look like this now:

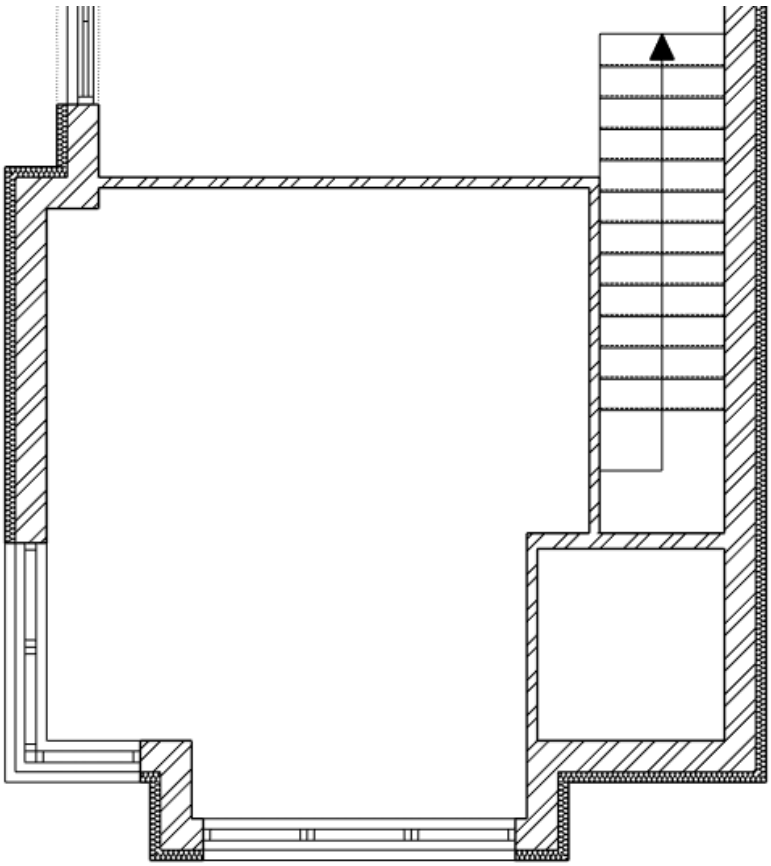


- Let’s start from the bottom, create the bedroom and the bathroom above the entrance.
- Click on the Building / Wall command and select the 1 layered 10 wide wall style on the left side of the screen.
- First, connect Points 1 and 2. When you start drawing the wall, change the reference line to the left side on the ribbon bar.
- Press SHIFT to align the wall to the other wall.



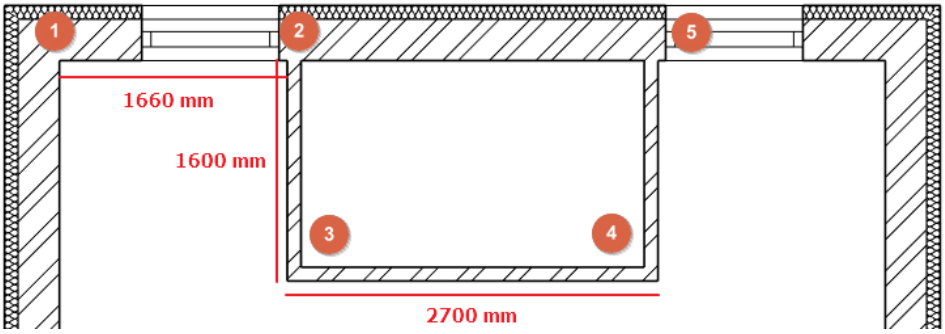
- When you are ready with it, connect points 3 and 4 the same way as before. Make sure to change back the reference line to the right side of the wall. Finally, connect the wall to point 5.



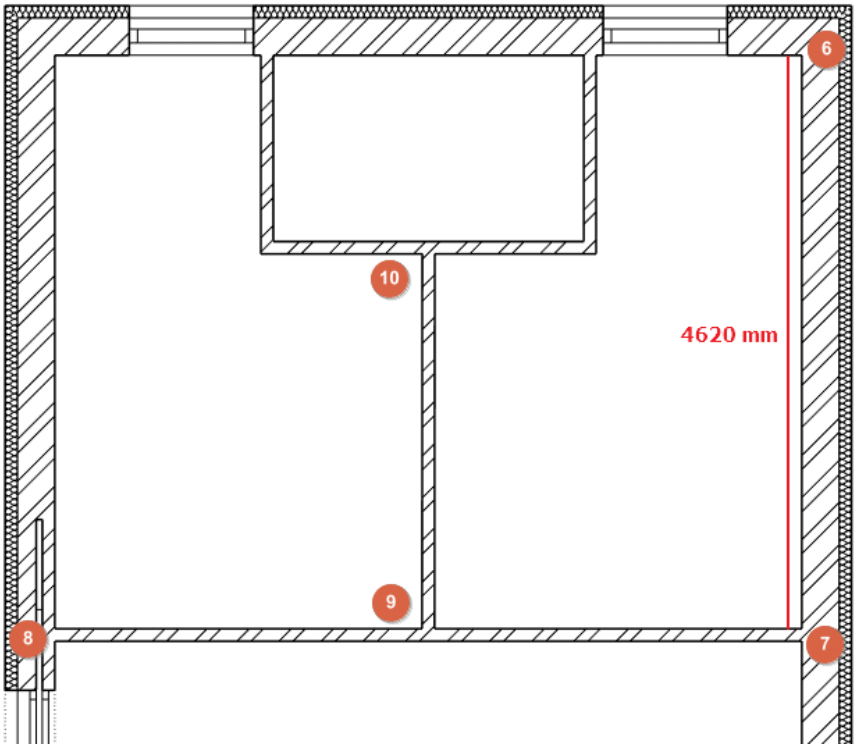


- Right click and select the Last command option. Now the wall drawing command is active again.
- Let's start from the top left corner of the building. Before you start drawing the wall, click on the Reference point button in the bottom of the screen.

- Click in the top left corner of the wall and start moving the mouse to the right. Type in 1660 mm and hit Enter. Now start drawing the wall downward, type in 1600 mm to get the right length. Continue drawing the wall to the right, type in 2700 mm and then connect it to the exterior wall next to the window.



- Activate the Wall command and then the Reference point command. Click in the top right corner of the building (Point 6) and move the mouse South 4620 mm (Point 7). Draw the wall to the opposite side (Point 8).
- Click in the middle of this new wall (Point 9) and change the reference line to be in the center. Connect it to the wall on the opposite side (Point 10).



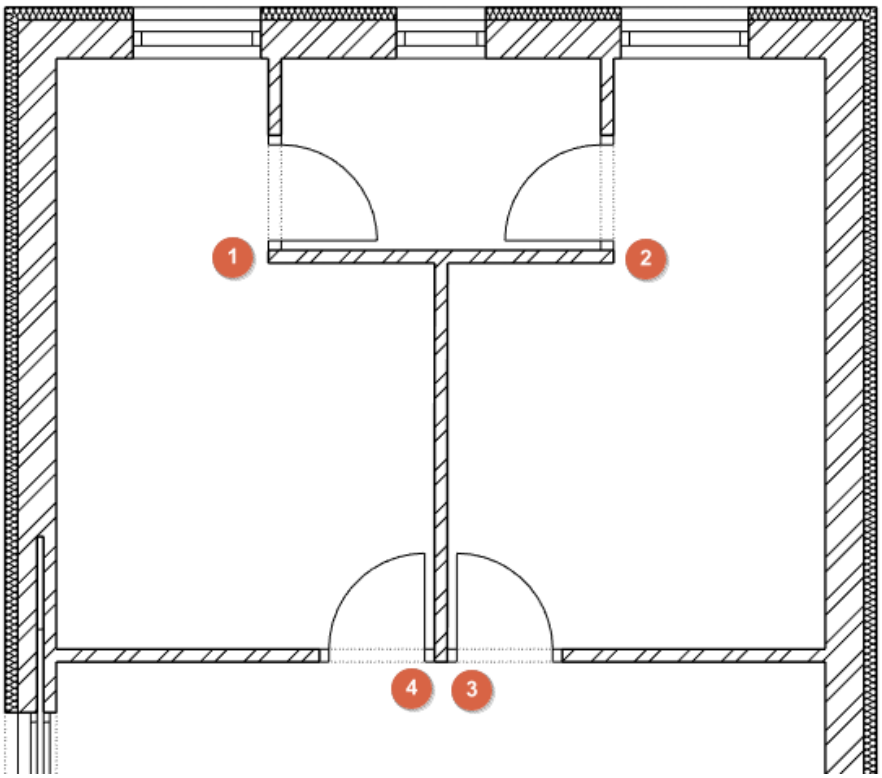
Adding doors to the building

The walls are ready, it is time to place the doors on the 1. floor. Let's have a look at how:

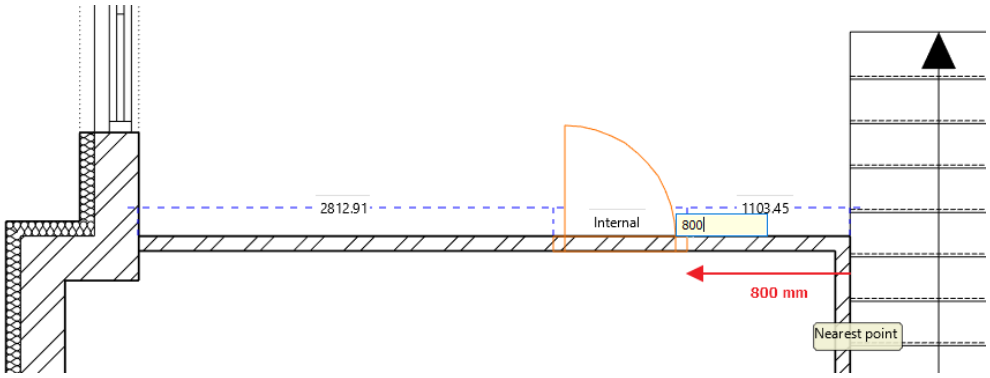
- Go to the Ribbon bar / Building / Properties / Opening / Door command to open the Door dialog.
- Click on the name of the door under the preview and search the "Flush" door.
- Change the Distance from wall line to 0 mm. Click OK to close the dialog.

Now all properties are set, let's place the doors:

- Activate the floor plan and click on the Ribbon bar / Building / Door / Placing door command.
- Move the mouse over a wall and you will instantly see how the door will be placed.
- Place the doors as shown in the picture below:



- Now place the doors in the other bedroom.
- Place one door 800 mm from the top right corner. To do this, move the mouse over the wall, the door will appear in orange, then type in 800 mm and the door will be placed exactly at the right place.



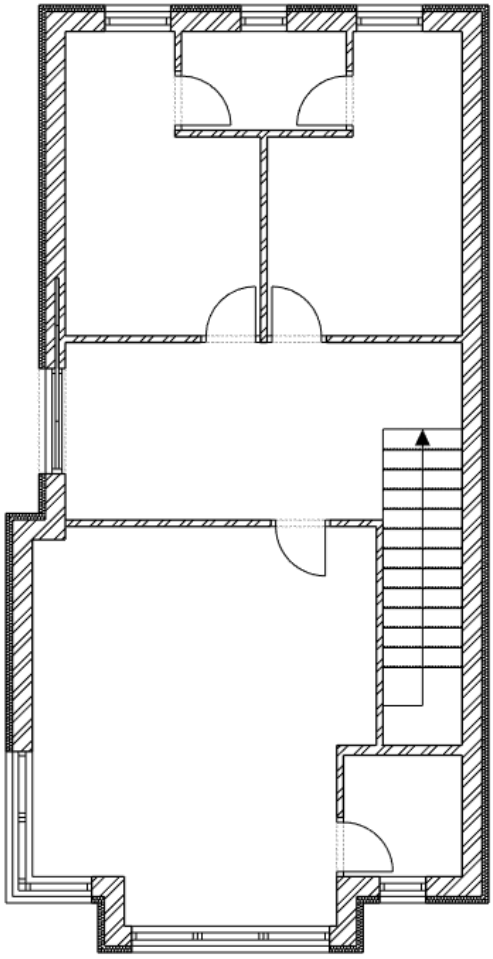
- Place the last door on the master bedroom's bathroom wall in the corner.

Modifying windows

There are two extra windows on this floor, sharing the same design with the rest of the windows except with different sizes. They will be placed in the two bathrooms. Let's learn a new method to create a new window based on an existing one with the Create similar command.

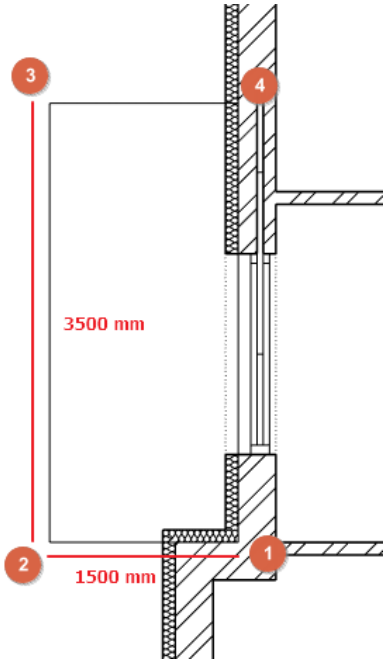
- Select one of the windows on the North side of the house and click on one of the blue dots. Select the Move a copy command. On the Ribbon bar click on the Next reference point button to move the reference point in the middle of the window. Move the window on this wall until it snaps to the middle of the wall and place it.
- Go in the properties of the window and change the width to 700 mm, the height to 1200 mm and the sill height to 900 mm. Click OK to accept the changes.
- Select the window again and click on the Create similar command from the context menu by clicking on the black arrowhead in the appearing floating menu. Place the window in the middle of the other bathroom's wall.

This is how the 1. floor should look like at this point:



Making flat roofs and balconies

Let's create a balcony with the **Slab in Sketch mode** command.

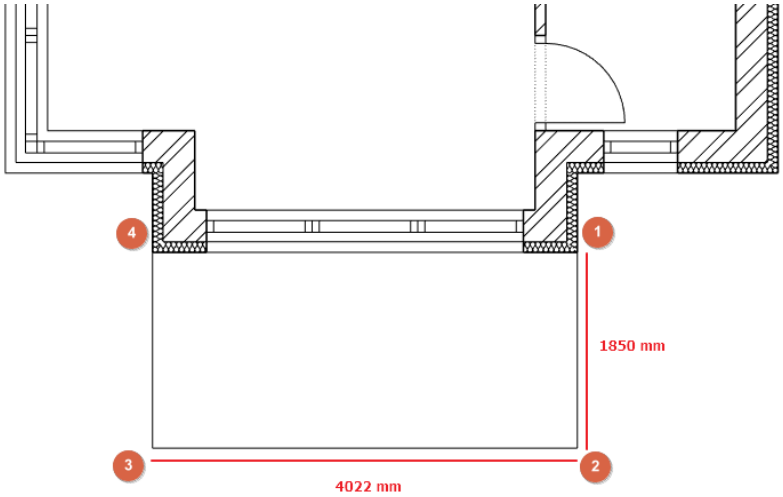


- Go to the Ribbon bar / Building / Properties / Structure / Slab menu.
- In the Slab dialog change the material to "Bright_white" and then chain all 3 materials together. Click OK to accept the changes.

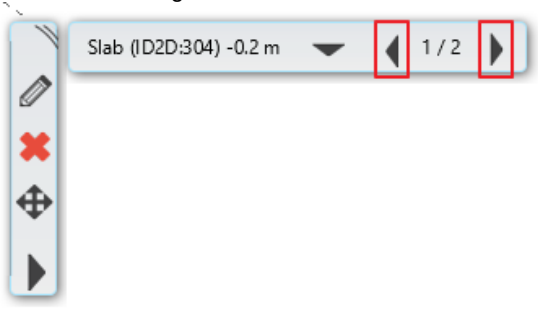
- After starting the command, draw the contour of the left balcony using **Slab in Sketch mode** command. Start it from the corner, its width is 1500 mm, its length is 3500 mm.
- Hit Enter to finish the balcony.

Let's create the flat roof above the driveway.

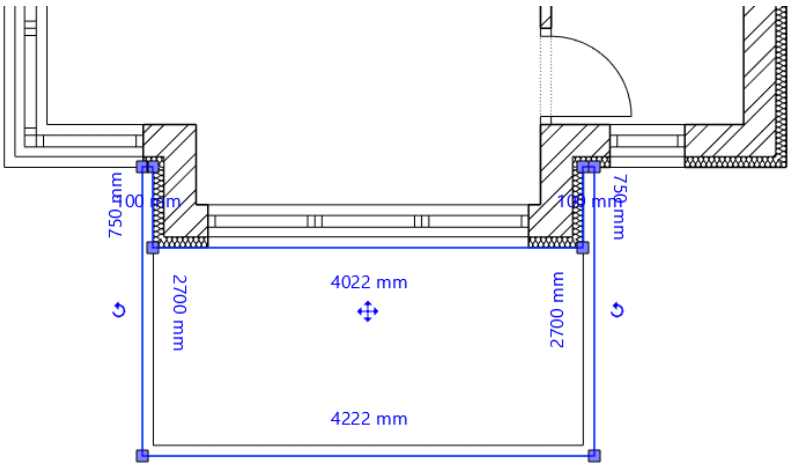
- Go in the Ribbon bar / Building / Properties / Structure / Slab command.
- In the **Slab properties dialog** modify its Material to "**Concrete3**", its **Base Elevation** to **-300 mm** and its **Height** to **-100 mm**.
- Start the Slab in Sketch mode command and start drawing the flat roof. Its depth is 1850 mm, its width is 4022 mm.

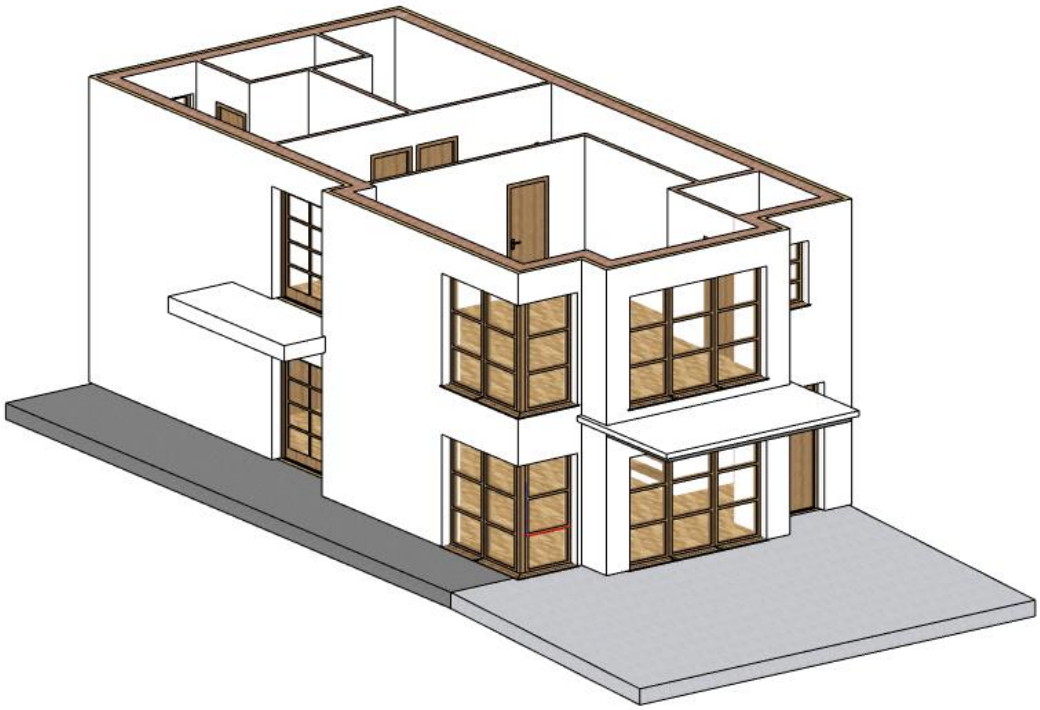


- Enter the Slab properties dialog again and change the Base offset from the floor to -200 mm and the material to "Bright_white".
- Start the Slab in Sketch mode command and draw the second layer of the flat roof in the same place as before.
- Select the slab on the floor plan, but make sure to select the right one. Change between the items in the floating menu with the left and right arrows.



- Click on the side of the selected slab and select the Offset option and offset 3 sides with 100 mm.
- On the top side insert new nodes on both sides of the slab to the wall corner.
- With the offset command move the edges upwards till it hits the wall.

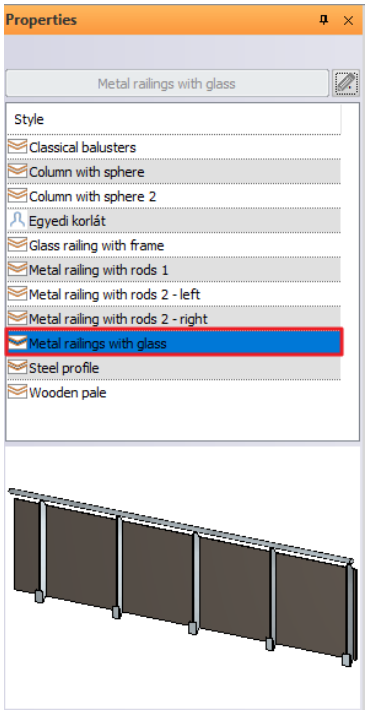




1.8. Creating railings

On the first floor we have a terrace on the left side. We will create a railing here.
Before we place the railing select a railing style.

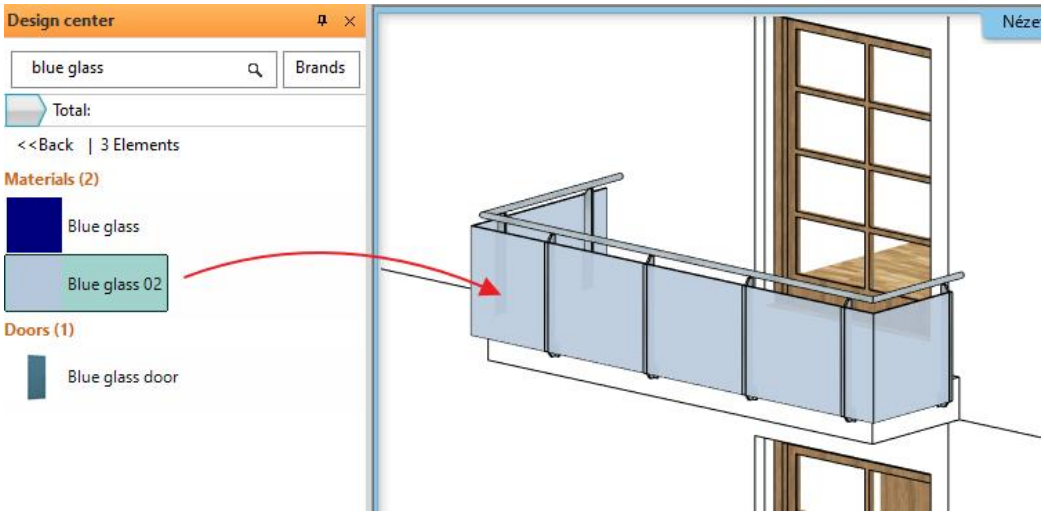
- Click on the **Ribbon bar / Building / Railing / Railing** command.
- In the left-hand side, activate the “Metal railings with glass – left” style.



- Trace the contour of the slab.
- When you are done, press the **Enter** key on the keyboard **twice**.
- Activate the 3D window.
- **Click on the railing** and raise its position by 800 mm: **Click on the blue arrowhead**, select the **Move command** and **move** the content **upwards**. **Type in 800** and hit the **Enter** key on the keyboard.

Finally, modify the glass material on the railing – this time we learn a new method.

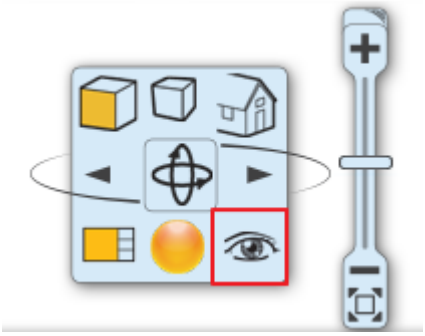
- Make sure nothing is selected on the drawing and click in the Design center search bar and type in “**Blue glass**”.
- Select a glass material (for example “**Blue glass 02**” and click and drag it into the model.
- Release the mouse button over the glass of the railing and choose the “**Replacing one material with another on this object**” command.
- Click on the glass surface of the railing to change it to “Blue glass 02”.
- Hit **ESC** to close the material replacement command.



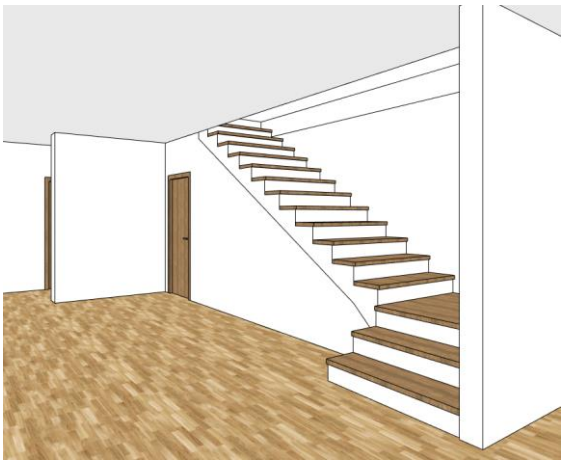
The railing is done on the balcony.

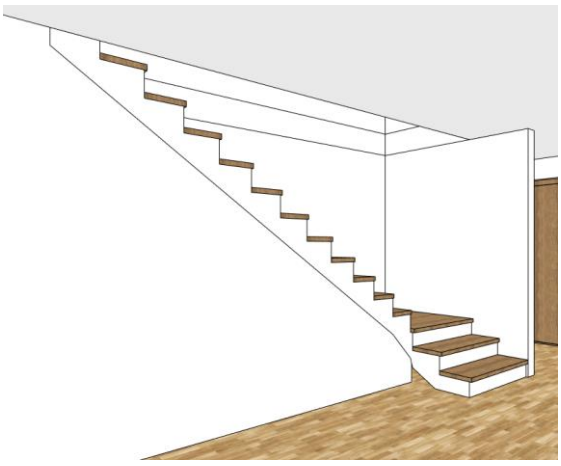
Let’s create now the stair’s railing. This time we will use columns as railing. To do this we need to create saved views.

- Activate the 3D view and click on the Eye icon on the Navibar.

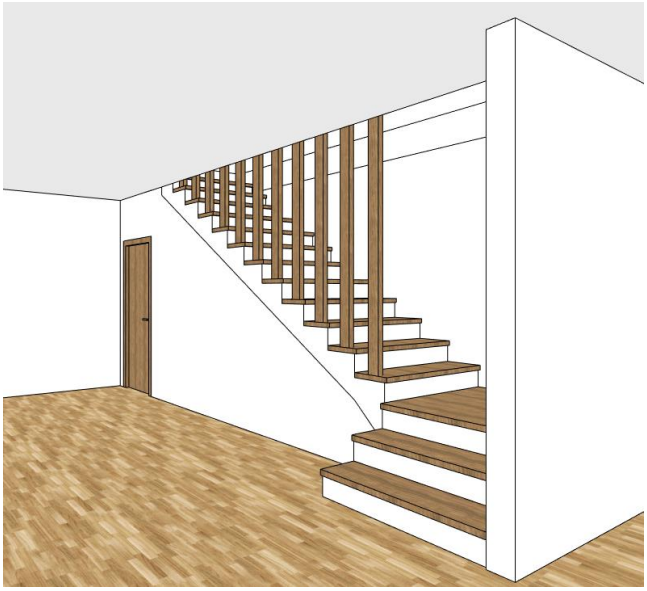


- In the appearing dialog you can set the views you need. Create one view that looks at the stair from the front, and one that looks from the back. Save the views with the  icon. Double click on the name to rename them “Livingroom_01” and “Livingroom_02”.

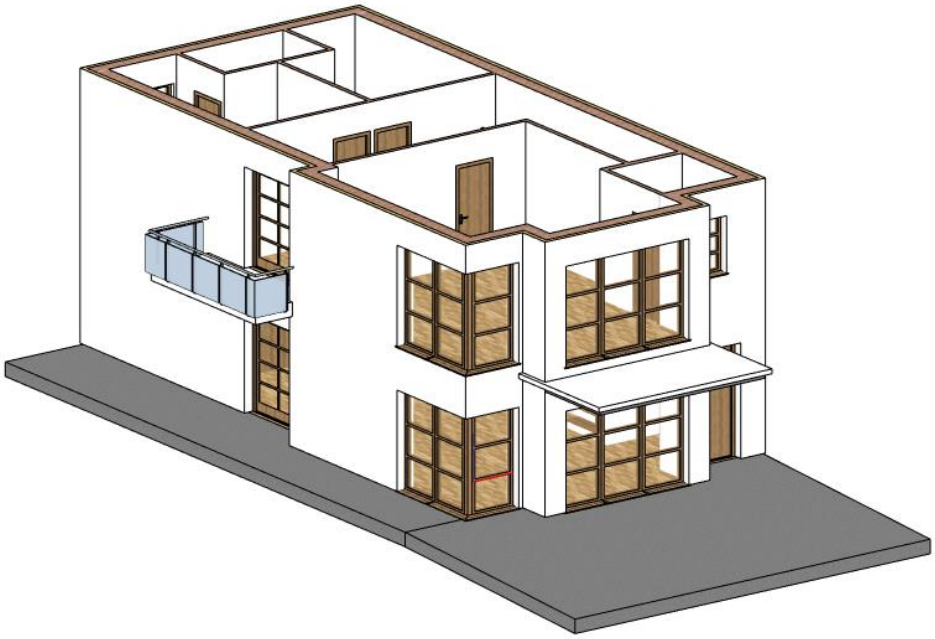




- Go to the Gorund floor view and click on the Ribbon bar / Building / Properties / Structure / Column command.
- In the dialog set the width to 50 mm, the height to 100 mm, the materials to “Wood-paldao”, the height of the column to 5100 mm, the base offset from the floor to 675 mm. Disable the Slab-roof cutting option.
- Place one column in the marked position.
- Select the column and click on the move button on the floating menu. Now select the Multiply command.
- In the appearing dialog set 12 copies and click OK.
- Set the reference point of the column, which should be the bottom left corner.
- Move the mouse to the last column mark and place the copies in the appropriate place.



Let's change the material of the ramp in front of the house the same way as we changed the material of the railing glass.



1.9. Roof

The ARCHLine.XP Roof toolset offers powerful solutions to design roof structures on a professional level should it be a simple conceptual or a highly detailed plan. The type of structure is not limited as you can design archaic, modern wooden or even steel structure. Everything you design is parametric and flexible, allowing designers to shape these complex items all through the design process just as the current status of project demands.

In this paragraph, we will create a simple conceptual roof. Through this example you will learn and understand the following concepts:

- Designing a roof
- Reshape an existing roof
- Working with roof planes and editing roof pitch
- Setting up roof materials and simple details
- Making connections to other architectural items

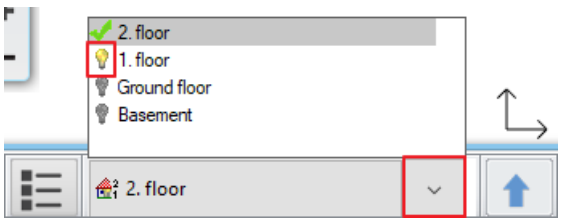
1.9.1. Creating the loft floor

Before we actually create the roof structure itself, let's create a closing slab structure above the 1st Floor. There are many ways to create slabs; this time we will copy and change an existing one.

- Activate the floor named "**1. floor**".
- Select the floor slab following the outer contour of the floor plan.
- Click on the "**1. floor**" button of the "**Copy objects to other floor**" row in the Properties panel.
- Select "**2. floor**" in the appearing floor list and click OK.
- Click on the hole contour of the newly created slab on the 2nd floor and select the "**Hole / Delete hole**" command in the context menu.
- Change the top material of the slab to "Bright_white".
- Offset all sides of the slab with 100 mm to cover the insulation layer too.

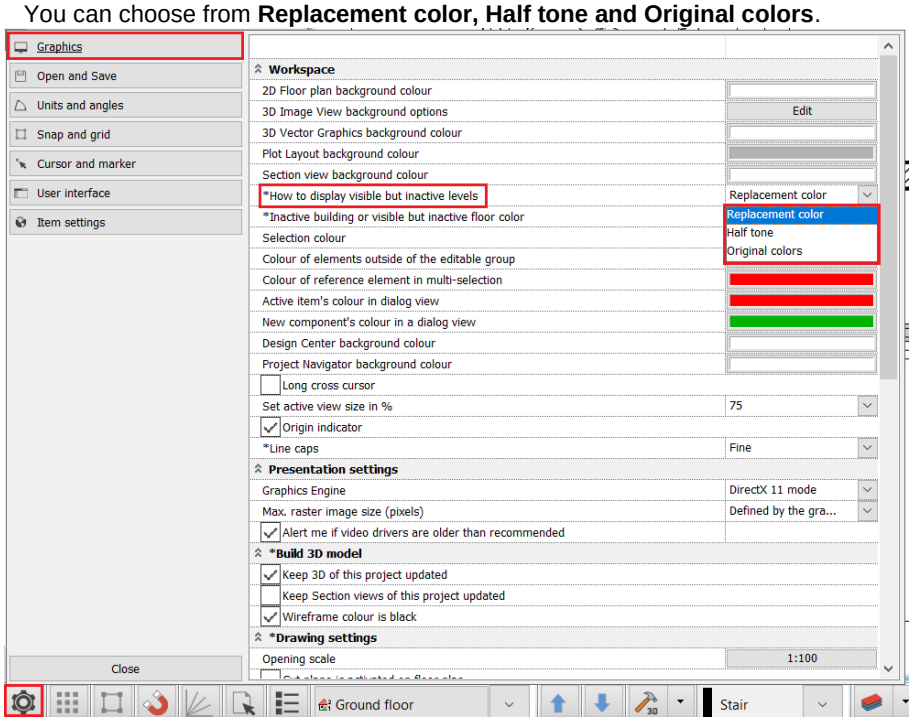
Good to know: You can make other floors visible on the floor plan

- Click on the arrow next to the floor's name on the bottom bar.
- Now the floor structure of the project appears.
- Click on the light bulb icon next to the 1. floor to activate the visibility of the 1. floor.
- This way you can offset the sides without having to measure the thickness of the thermal insulation.



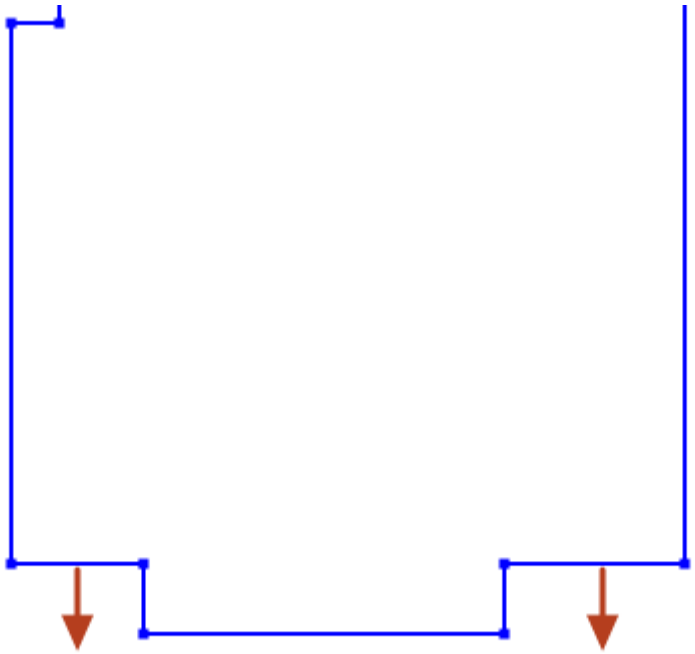
To change the appearance of the inactive floor do the following:

- In the bottom left corner click on the settings icon and select **Graphics / How to display visible but inactive floors** option.
- You can choose from **Replacement color, Half tone and Original colors**.

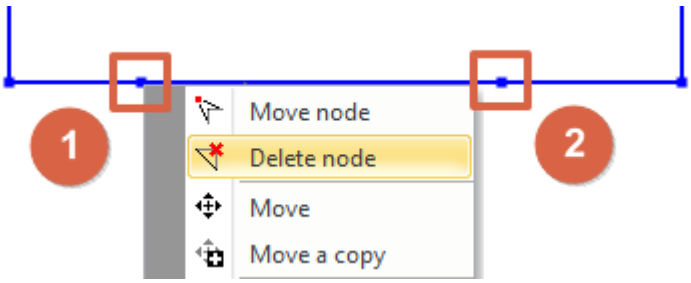


Now that the closing slab structure is set up and done, we also need to change its contour to get the final shape.

- Select the slab.
- Click on the short horizontal contour line at the bottom of the slab drawing and select the "**Offset**" command in the appearing marker menu.
- Move it **750 mm downwards** to snap to the lowest horizontal edge.
- Use the same solution to move the right side short horizontal edge to perfectly snap to the lowest horizontal edge.



- Use the marker menu to erase the remaining 2 corner points on the newly created horizontal slab edge.



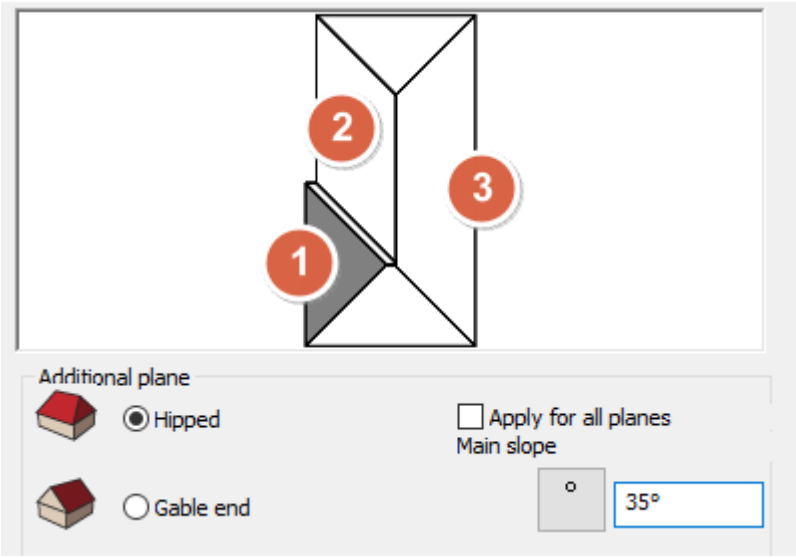
1.9.2. Designing the roof

ARCHLine.XP provides tools to create a roof structure either by selecting walls of an existing building to recognize its outer contour or you can also draw this contour by yourself. Either way, the roof can be reshaped, changed and redesigned completely at any time to add more details. This time we are creating a conceptual roof following the contour of the existing slab with only a few settings changed to understand the basics of the roof design process.

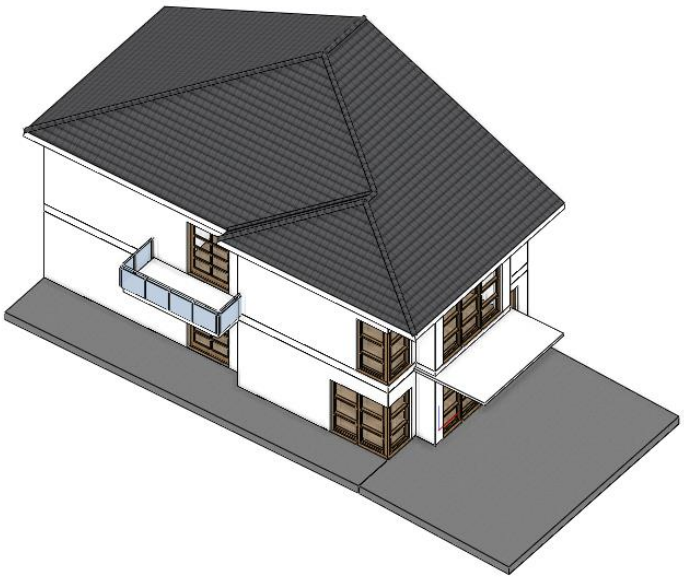
- Start the **Ribbon bar / Building / Roof / Roof in sketch mode** tool.
- Select the "Simple roof" style appearing on the left-hand side.
- By default, this tool is waiting for walls to be selected to recognize their outer contour. Now click on the **Polygon** option on the ribbon bar to switch to the manual contour design mode.
- Draw a polygon contour by clicking into each corner of the slab.

When you are finished drawing the closed contour, the roof property dialog appears. Let's make changes.

- Change both the bottom plane and side plane materials from **Natural_pine** to **Bright_white**.
- Change the Value "**C**" in the Reference point for roof elevation list to **-300 mm**.
- Go to the "**Pitch and shape**" page of the roof properties dialog window and enable the "**Apply for all planes**" option, then modify the pitch value from 42 degrees to **25 degrees**. Click on the "**Update**" button on the right side above the 3D preview to see the changes.
- Click on the **roof plane marked nr.1**. on the following image and change its pitch to **35 degrees** and then click "**Update**" to see the changes.



- Use the same method to change the pitch of the **plane marked nr.2** to **35 degrees**.
- Click on **plane marked nr.3**. and tick the **Gable end** button to turn it into a gable end then the click "**Update**" to see the changes.
- Go to the "**Roof tiles**" page and under the "**Basic**" tiling page click on the paint bucket icon to change the current roof material from "Roof brown" to "**Roof_Blind_Coal**". If you cannot see this material in the list, just click on the button with the blue cross on it to get access to the Design center with all the materials.
- Click on the "**Ridge**" tiling page too and change the current material from "Roof brown" to "**Roof_Blind_Coal**".
- On the "**Valley**" tiling page select the "**PANTONE-S325-3**" material.
- Click **OK** to close the properties dialog and see the roof on the 2D layout and in the 3D view.



1.9.3. Changing the roof contour

All roof shapes created with the Automatic roof tool can be changed in shape and details when needed. This time we will move 2 edges to make space for a fire-wall separating our building from the rest of the building block.

- Select the roof in the 2D view.
- Click on the right-side edge and select the Offset command from the appearing marker menu.
- Move the edge to the left to perfectly snap to the wall's inner side.
- Do the same with the 2nd vertical edge of the roof on the right side.
- Hit **ESC** to deselect the roof.

Let's align the contour of the slab to the roof to finish the roof-slab connection.

- Select the slab.
- Click on an edge and select the "**Offset**" command in the appearing marker menu.
- Move the edge to snap to the roof edge.
- Repeat this all the slab edges not aligned with the roof outer contour.

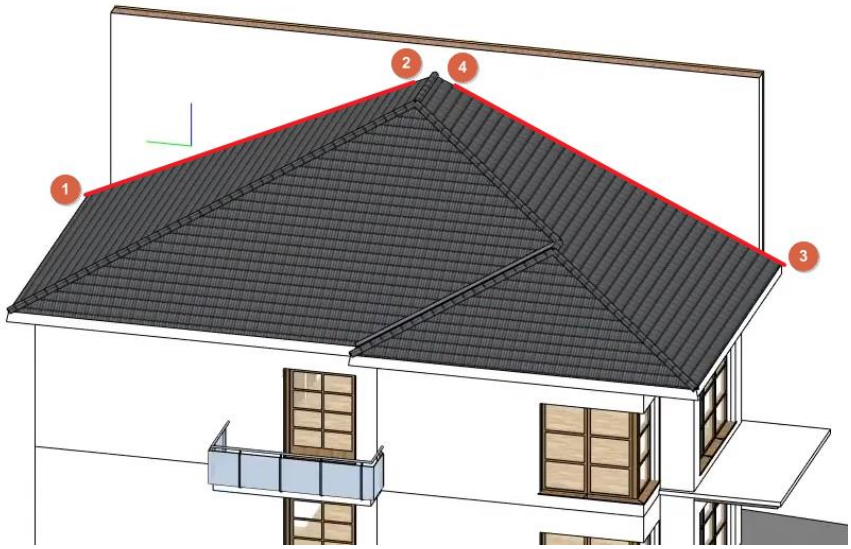
1.9.4. Designing the fire-wall

Let's create the wall separating the two buildings. For this we will now copy an existing wall and change its properties and then we will redesign its shape to match the roof.

- Switch to the floor named "**1. floor**".
- Select the right-side wall of our building.
- Click on the "**1. floor**" button of the "**Copy objects to other floor**" row in the Properties panel.
- Select "**2. floor**" in the appearing floor list and click **OK**.
- Select the new wall on the 2nd floor and change its **Height** to **4500 mm** and its **Base elevation to -300 mm**.
- Click on the endpoint marker of the wall and select the "**Change length**" command to snap it to the corner point of the slab.

The fire-wall is now just a regular wall with a straight horizontal top. Let's redesign its shape (the so-called frontal profile) to have a wall top that's following the pitch of the roof. First, we will take the current shape of the wall in context with the roof to use it as a basis to the design.

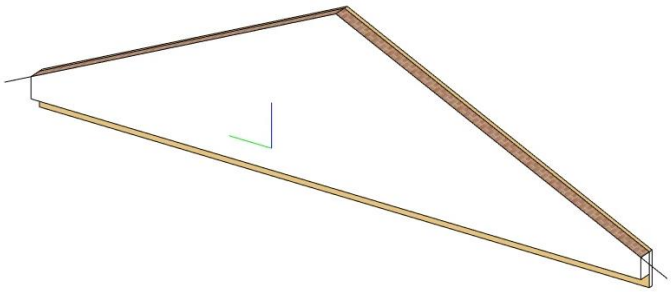
- Activate the 3D window.
- Click on the Ribbon bar / Drafting / Line command and select the surface of the wall on the roof's side.
- Click on the lower corner of the roof next to the fire-wall (1) and create the second point of the line close to the top of the roof (2). Repeat it on the other side of the roof (3, 4). Hit Enter to finish the line.



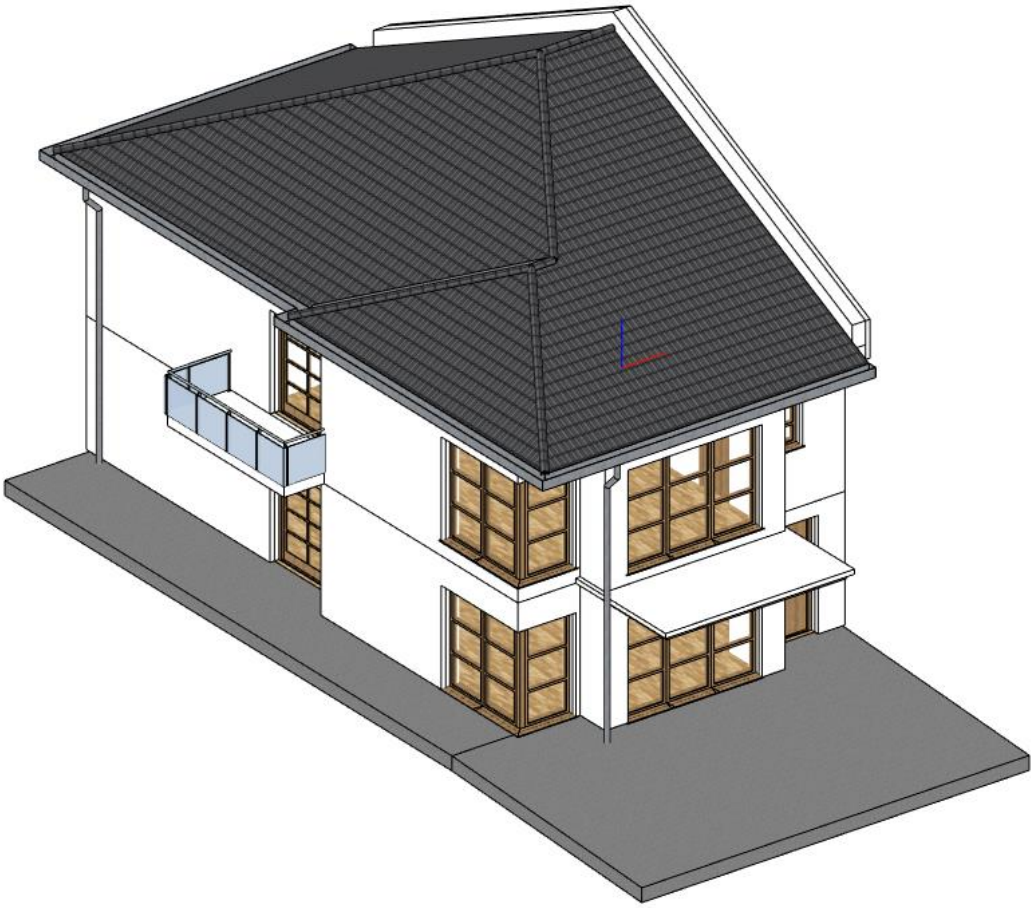
- Select the fire-wall and click on the 3D hammer icon to refresh the 3D view. Now only the wall and the lines are visible.

- Start the Ribbon bar / Drafting / Offset command and offset the lines upwards with the value of 300 mm.
- Connect the lines with the L connection command shown in the picture below. Delete the original lines that are not needed anymore.

- Start the Ribbon bar / Drafting / Push/Pull command and click on the wall over the line. By moving the mouse, you can now extend the selected part of the wall. Move it towards the outer side of the wall and click. Now the unnecessary part of the wall is deleted.



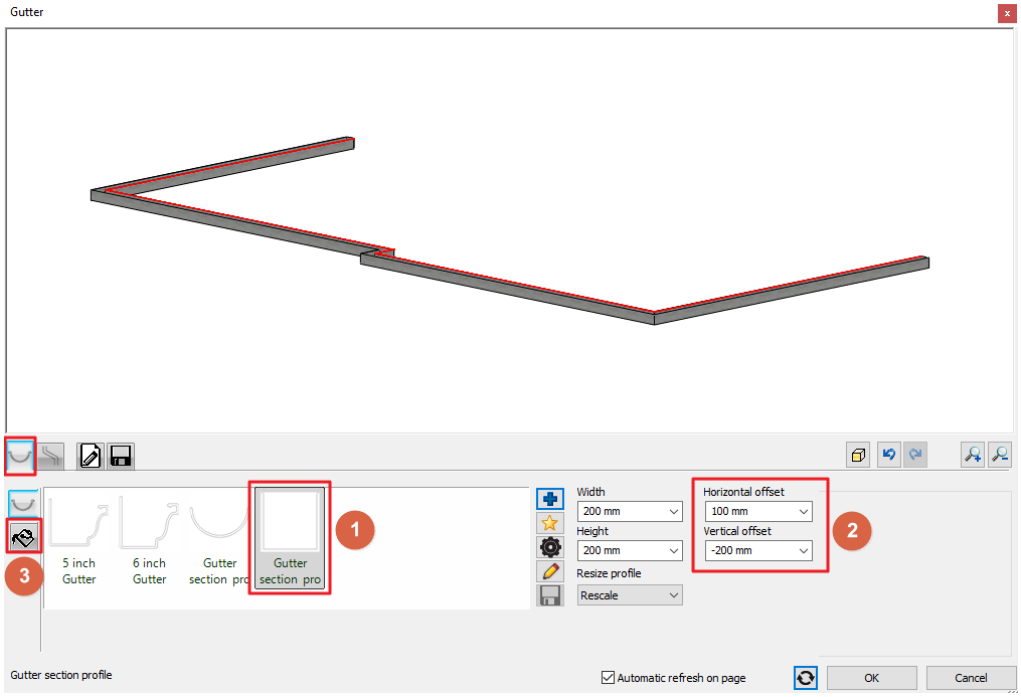
- Delete the lines from the 3D view.
- Right click on the white part of the wall and select the Find material option. Drag and drop the material on the wall and select the Replacing one material with another on this object option. Replace the brick and insulation materials on the top of the wall.
- To see the whole 3D model again, activate the floor plan, make sure nothing is selected and click on the 3D hammer button.



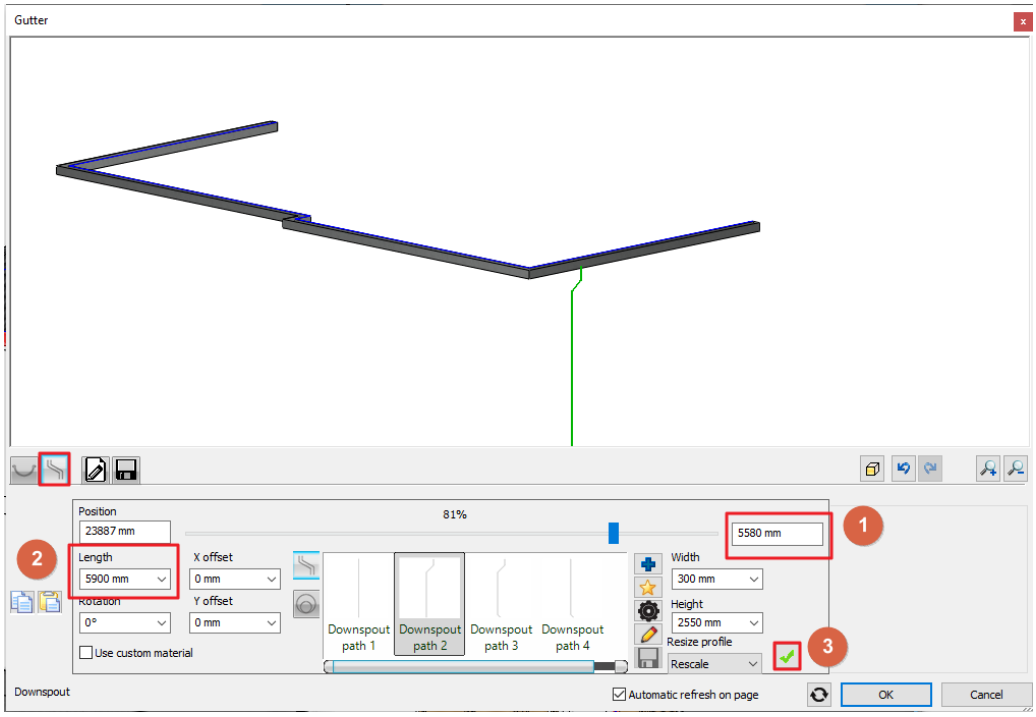
1.9.5. Designing the roof gutter

To create the gutter of a roof you can use the dedicated gutter tool.

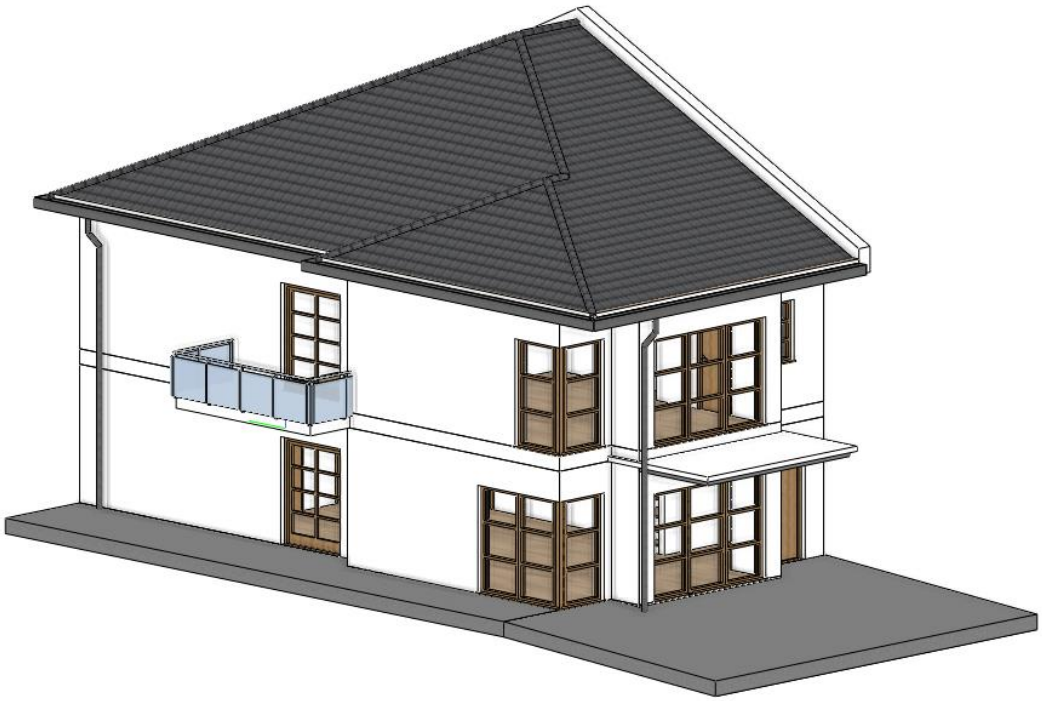
- Start the **Ribbon bar / Building / Roof / Gutter** tool.
- Click on the left edge of the roof on the 2D drawing.
- In the appearing properties dialog window make sure the cross-section profile named "**Gutter section profile 2**" is selected.
- Change the **Horizontal offset** to **100 mm** and the **Vertical offset** to **-200 mm**. These are matching the height of the selected gutter profile and half the width of it.
- Click on the paint bucket icon to change the **material** to **Steel**.



- Select the 2nd page named **Downspout**.
- Change **Length** to **5900 mm**.
- Change the **Position** value appearing **on the right side** of the position slider to **5700 mm**.
- Click on the **Green tick** to add the downspout.



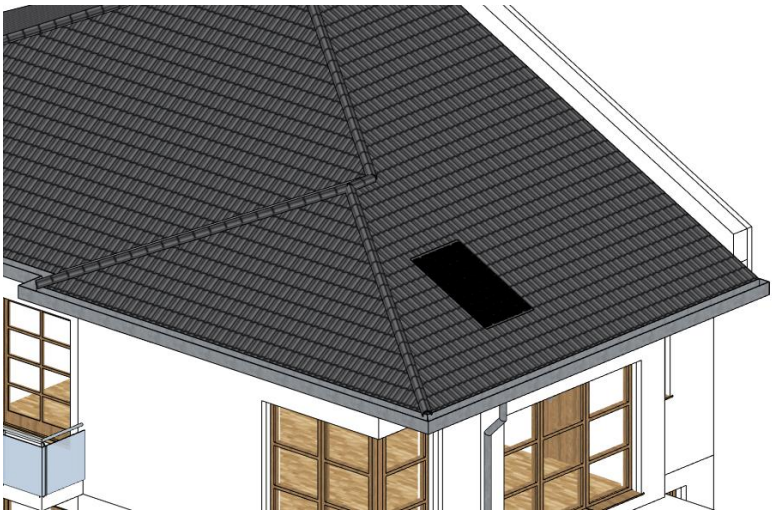
- Add a 2nd downspout using the **Green plus** icon, this time using **7800 mm** measured **from the left** side.
- Click **OK** to create.



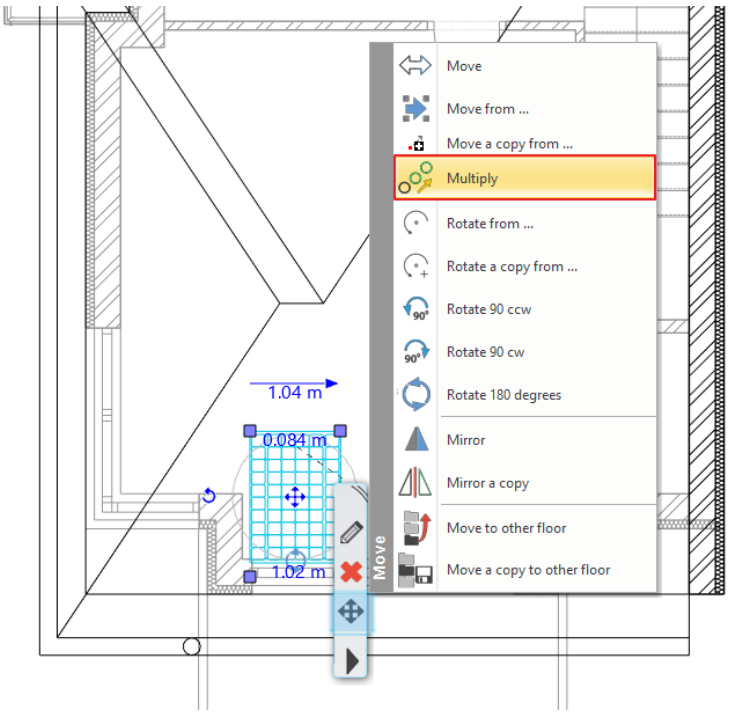
1.10. Importing objects - Solar panels

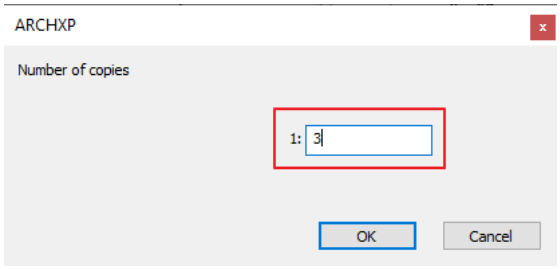
You can place solar panels on the roof by the new MEP function of the ARCHLine.XP.

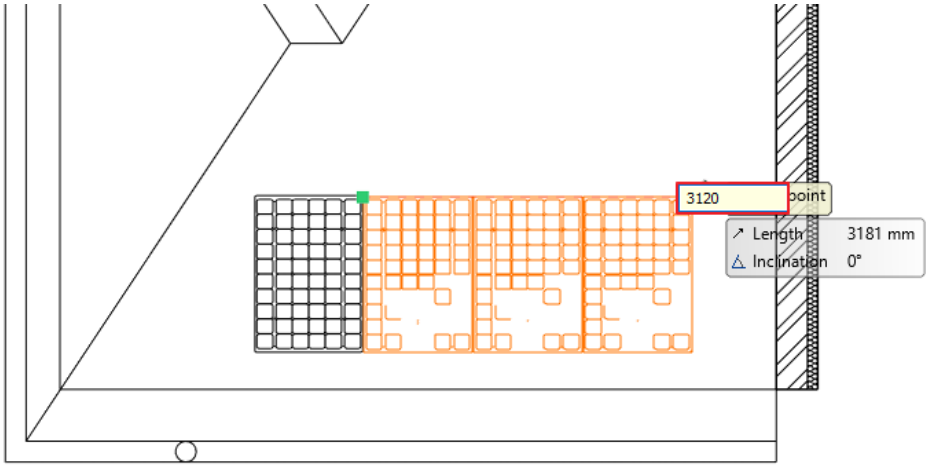
- Activate the 3D view.
- Click on the Ribbon bar / Interior / 3D warehouse / Direct download command. A browser window appears where you can search and download elements from the store. You have to sign into your account to be able to download.
- Type “Dynamic Model: LSX Solar Module System w/LSX Rail SD in Landscape” and download the object into the project. Select the 2021 model.
- Click on the roof plane over the driveway to place the solar panel.
- Now set the tilt of the solar panel to 25° to fit the roof completely.

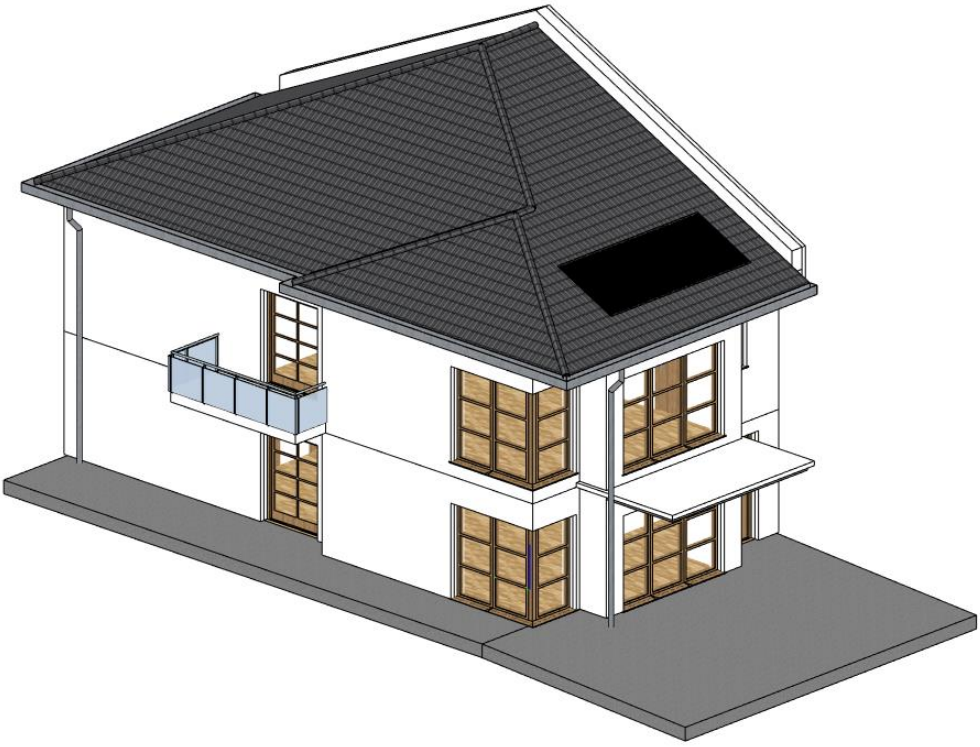


- Select the solar panel in the 2D window, click on the move button and select the multiply option. Type in 3, click on OK then move the cursor to the side and type in 3120.


Move
Move from ...
Move a copy from ...
Multiply
Rotate from ...
Rotate a copy from ...
Rotate 90 ccw
Rotate 90 cw
Rotate 180 degrees
Mirror
Mirror a copy
Move to other floor
Move a copy to other floor
1.04 m
0.084 m
1.02 m
Move


ARCHXP
Number of copies
1: 3
OK
Cancel


3120
Length 3181 mm
Inclination 0°



1.11. Columns

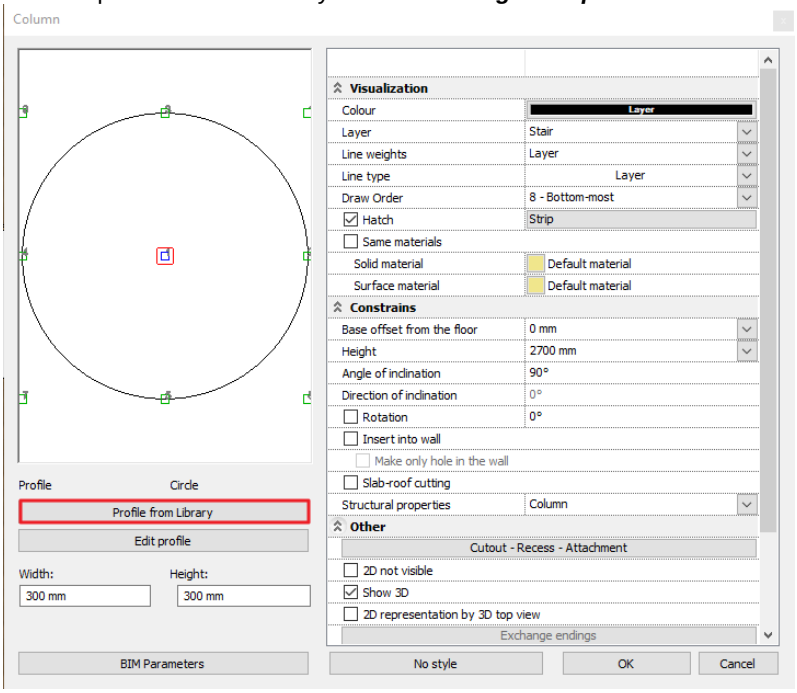
In this project, columns are used for two different reasons. You can use columns to design the railing built from wooden columns next to the stairs, and you can also use this method for structural columns too.

1.11.1. Place structural columns outside

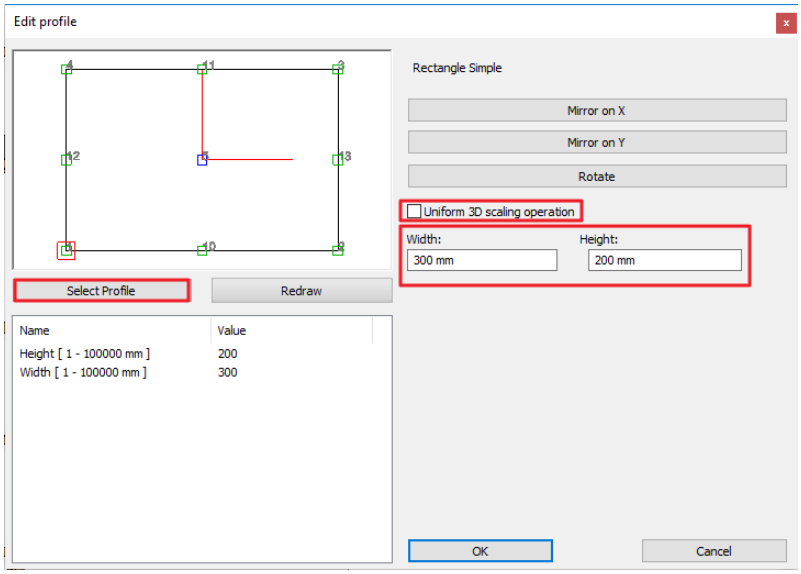
First of all, activate the column layers. Our exterior columns are made up of two parts.

Before you place the columns, go to the **Ribbon Bar / Building / Properties / Structure / Column** tool, and here you can find the all settings of the column.

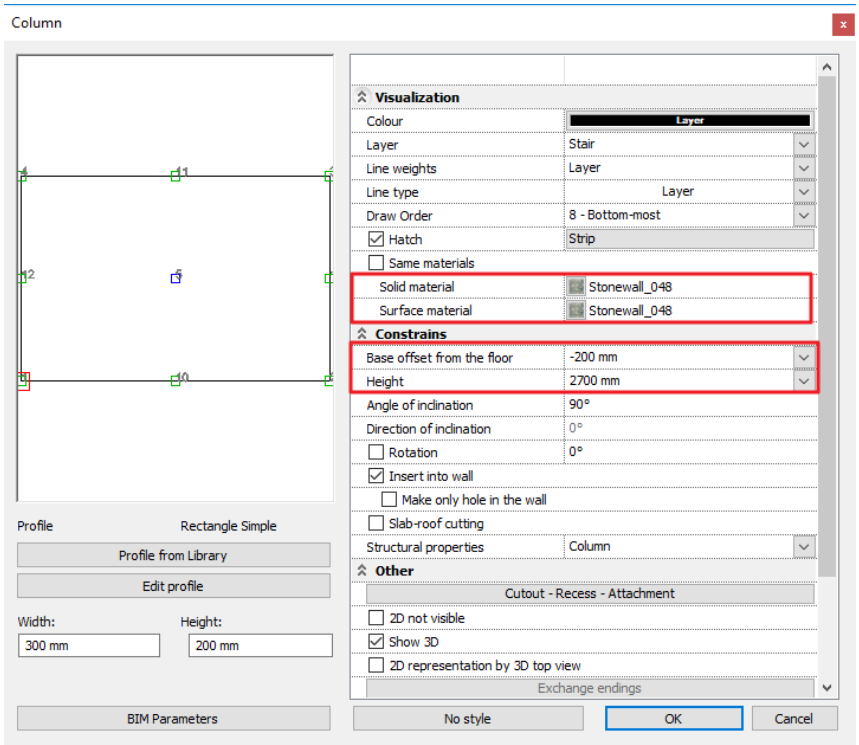
- Select a profile from the library named ***Rectangle Simple***.



- **Disable** the "**Uniform 3D scaling operation**" option and set **Width** to **300 mm** and **Height** to **200 mm**.



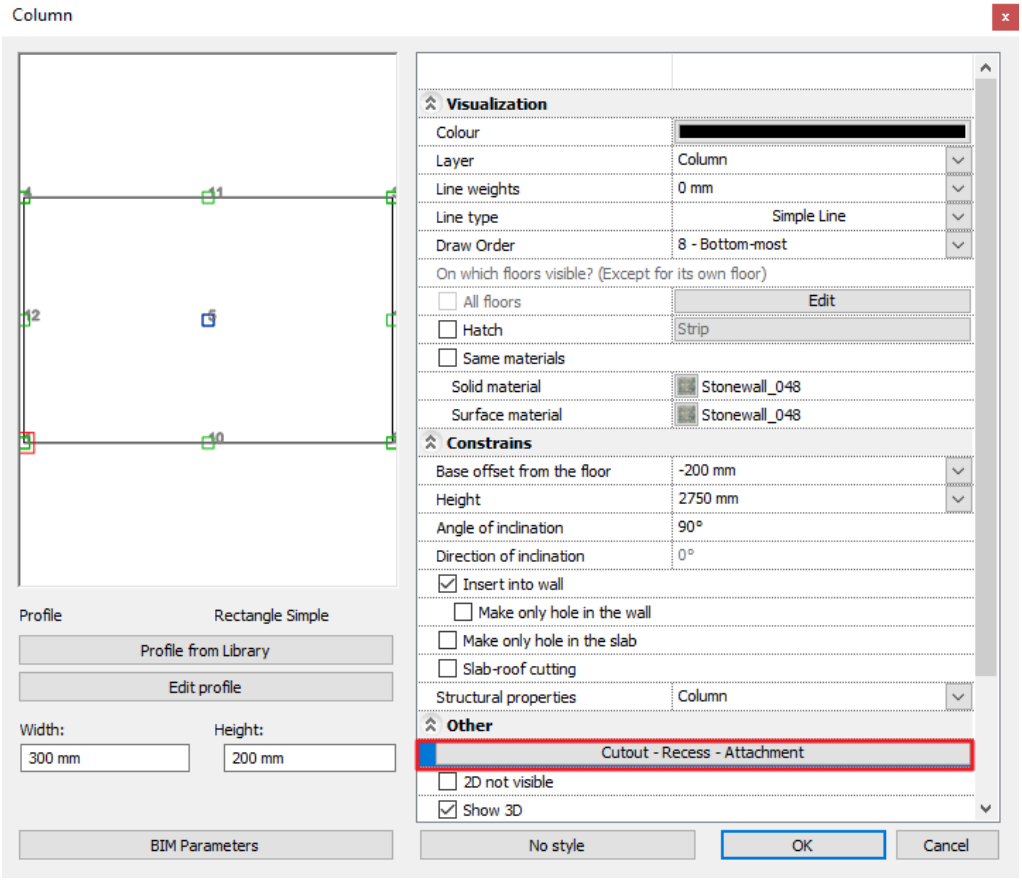
- Set the **Height** of the column to **2700 mm** and its **Base offset from floor** to **-200 mm**.
- Select ***Stonewall_048*** as the material of the column.



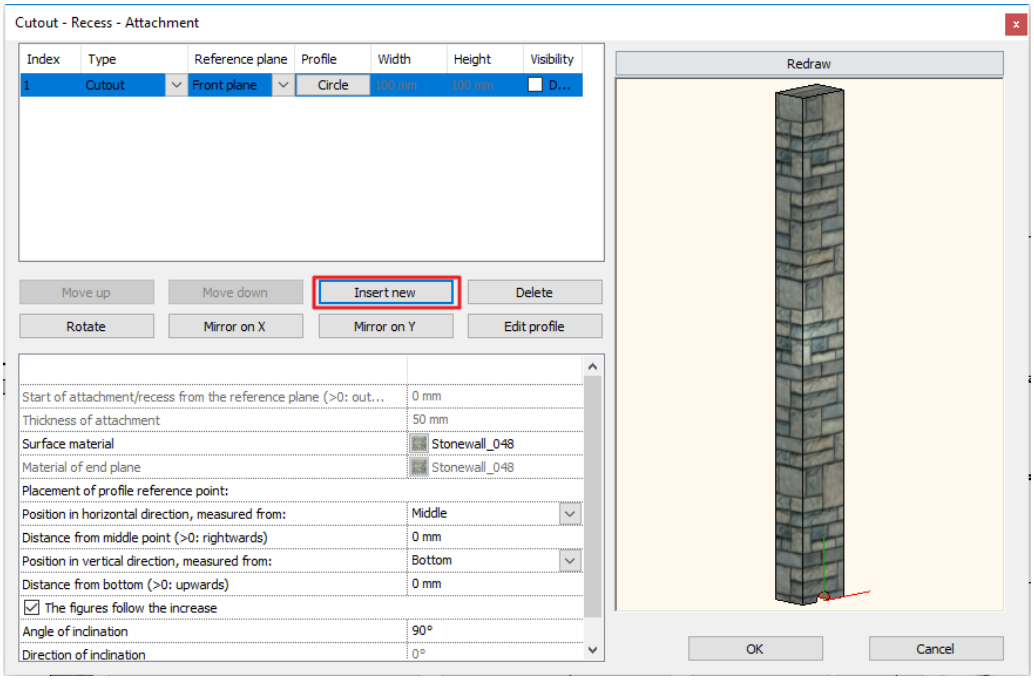
1.11.2. Column cutout, recess, attachment

Let's add an attachment to the top of the column.

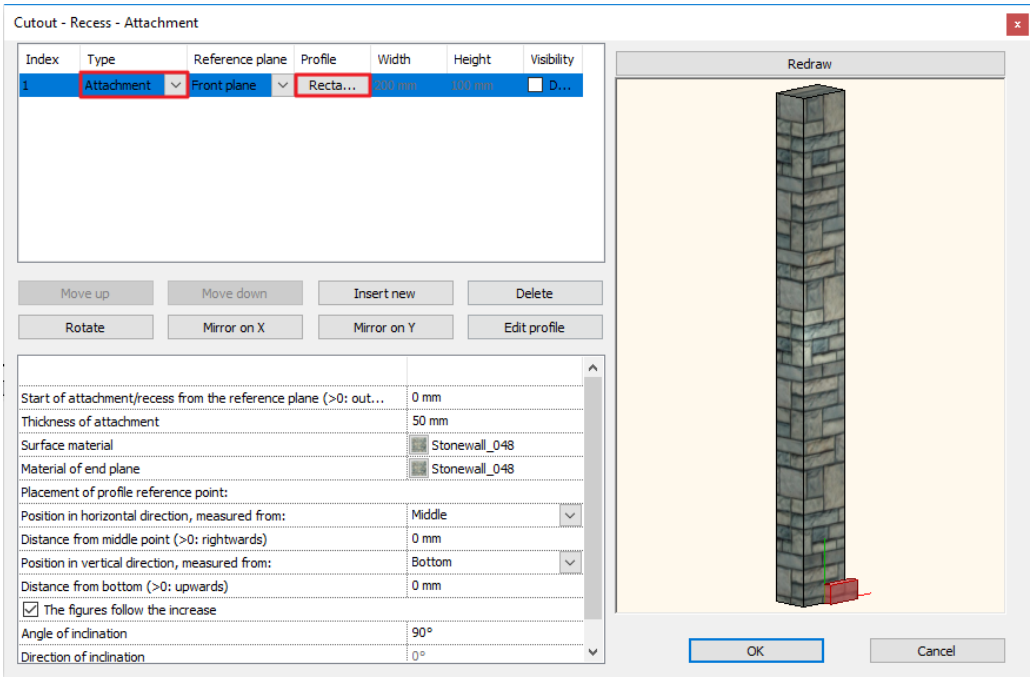
- Click on the **Cutout – Recess – Attachment** button in the Column dialog.



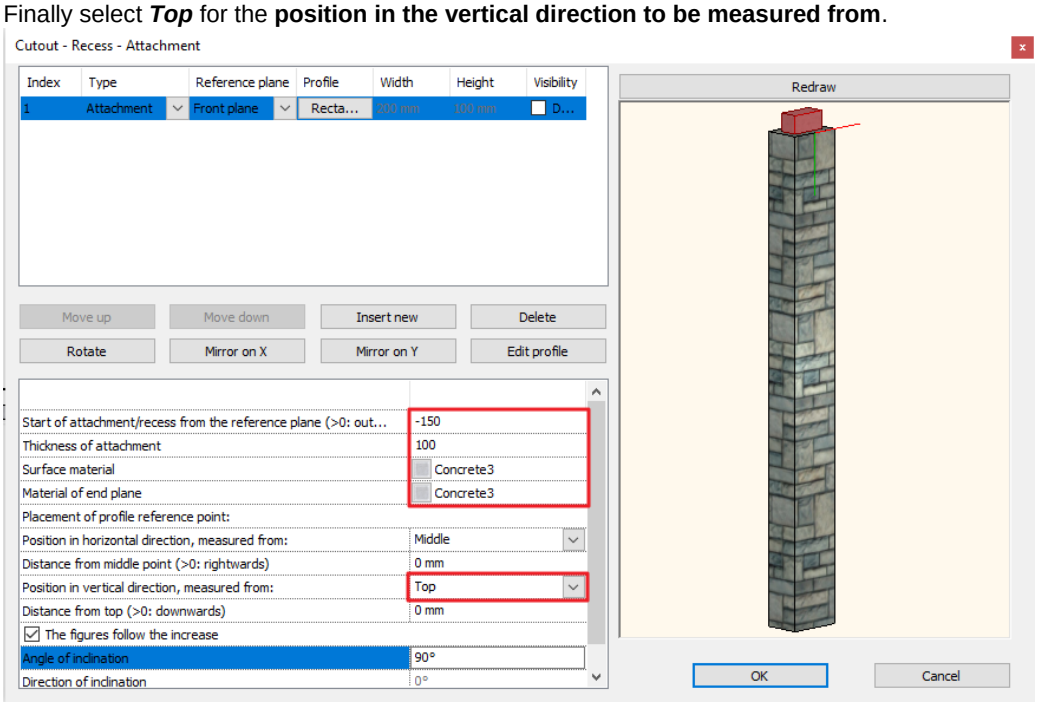
- Insert a new item by clicking on the **Insert new** button.



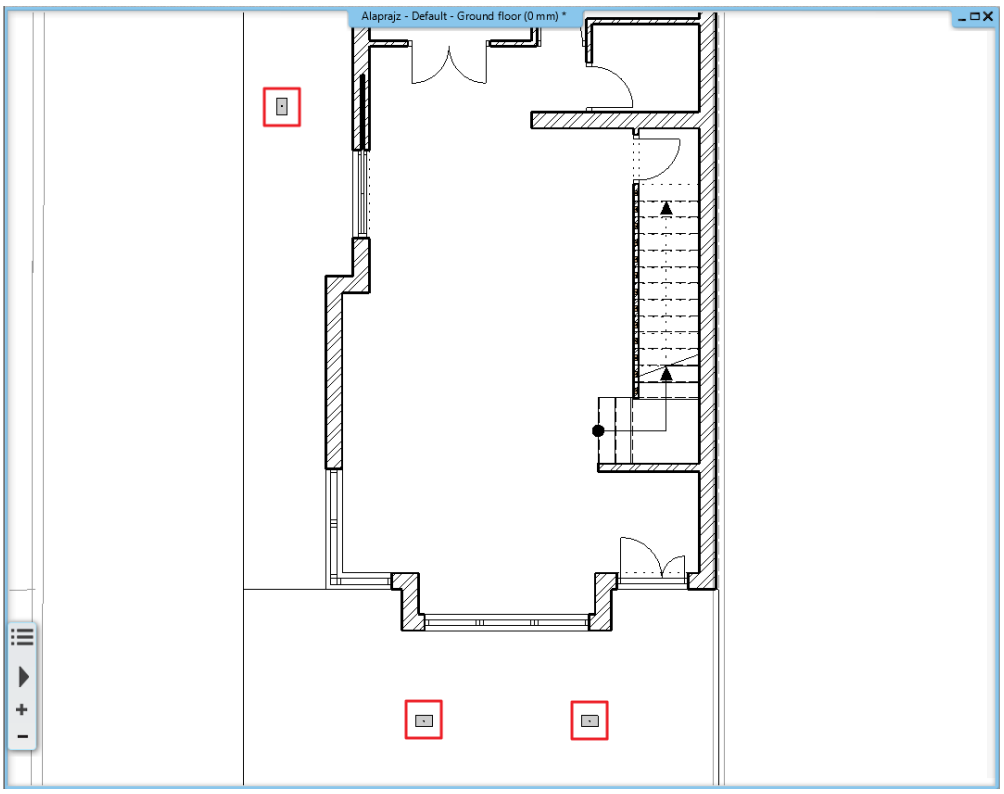
- Select ***Rectangle Simple*** from the profile library and select the middle bottom reference point of the profile.
- Modify the type to ***Attachment***.



- Set the start of the attachment from the reference plane to **-150 mm** and its **thickness** to **100 mm**.
- Select "***Concrete3***" as the material of the attachment.
- Finally select ***Top*** for the **position in the vertical direction to be measured from**.



- Close the dialogs.
- Activate the "**Column(1)" layer** then place three columns as seen on the DWG drawing.


Alaprajz - Default - Ground floor (0 mm) *

2. Part: Documentation

Open the YouTube video:
https://youtu.be/rQ2h75RlnXc

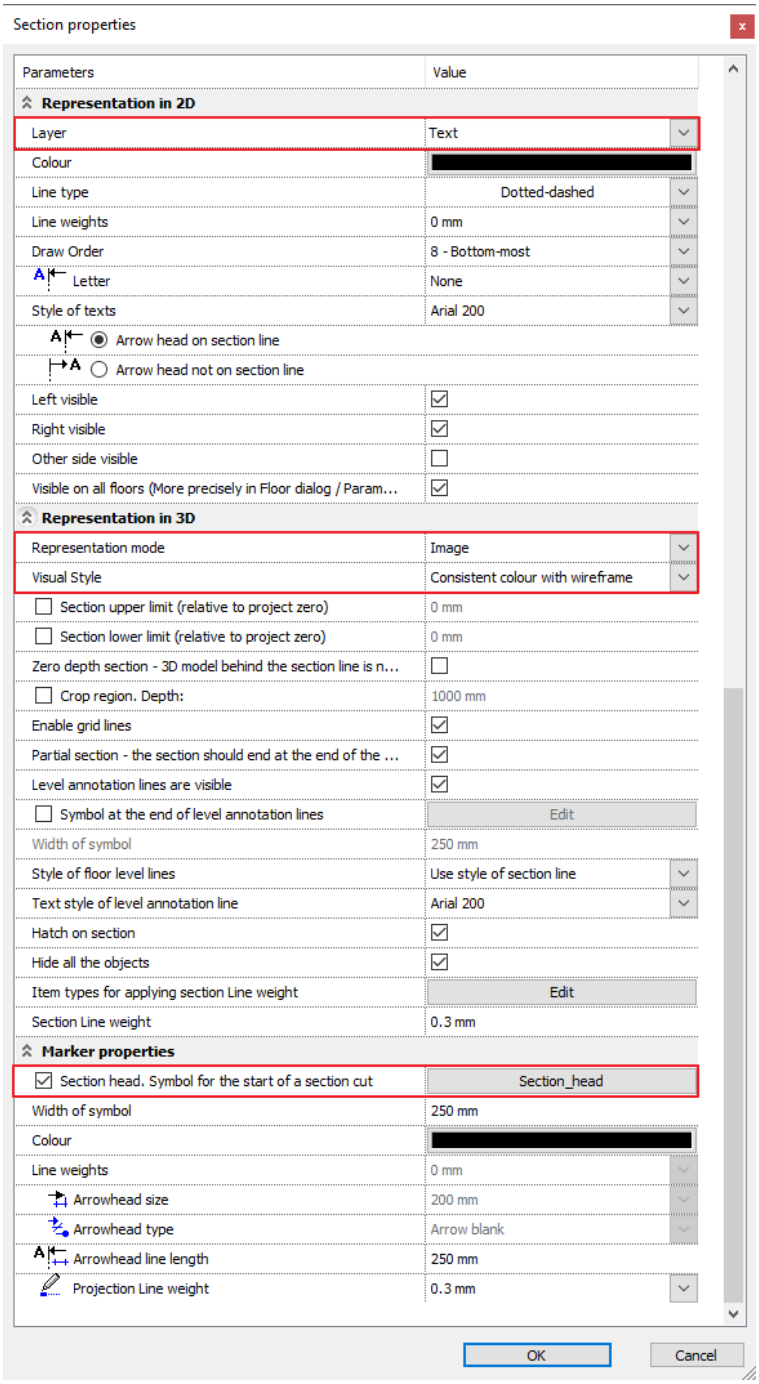
2.1. Sections, elevations and views

Sections and elevations are all fundamental dynamic drawings. A dynamic drawing is linked to the building; thus it is able to respond to changes in your design. All the floorplans are dynamic drawings too, actually.

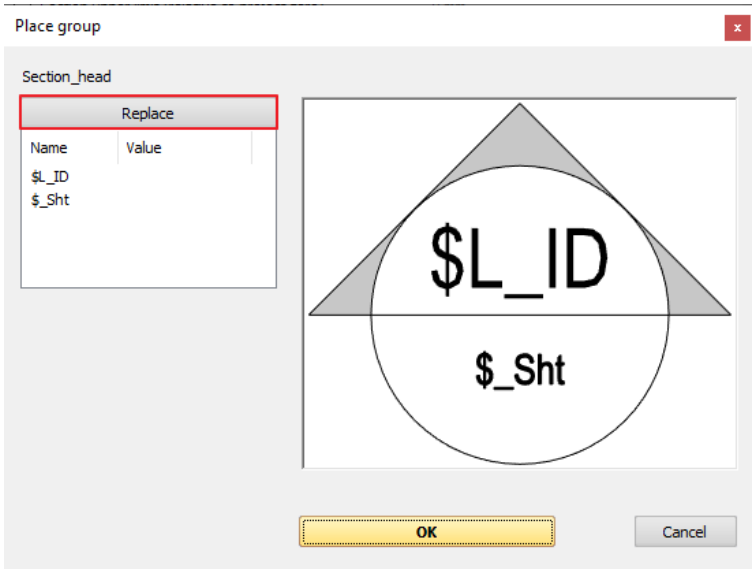
2.1.1. Sections

To define a section, start the **Ribbon bar / Documentation / Section / Section settings** command. A dialog appears in which you can specify the properties of the representation of the section in 2D and in 3D and the properties of the marker.

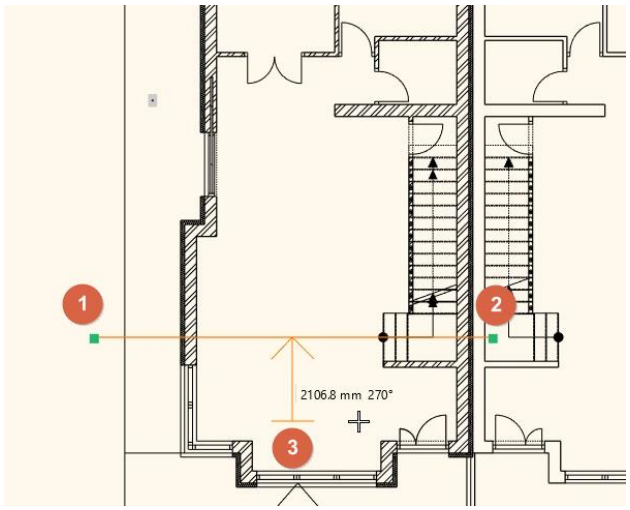
- Change the layer to Text, the representation mode to Image, the visual style to Consistent colour with wireframe and activate the section head.

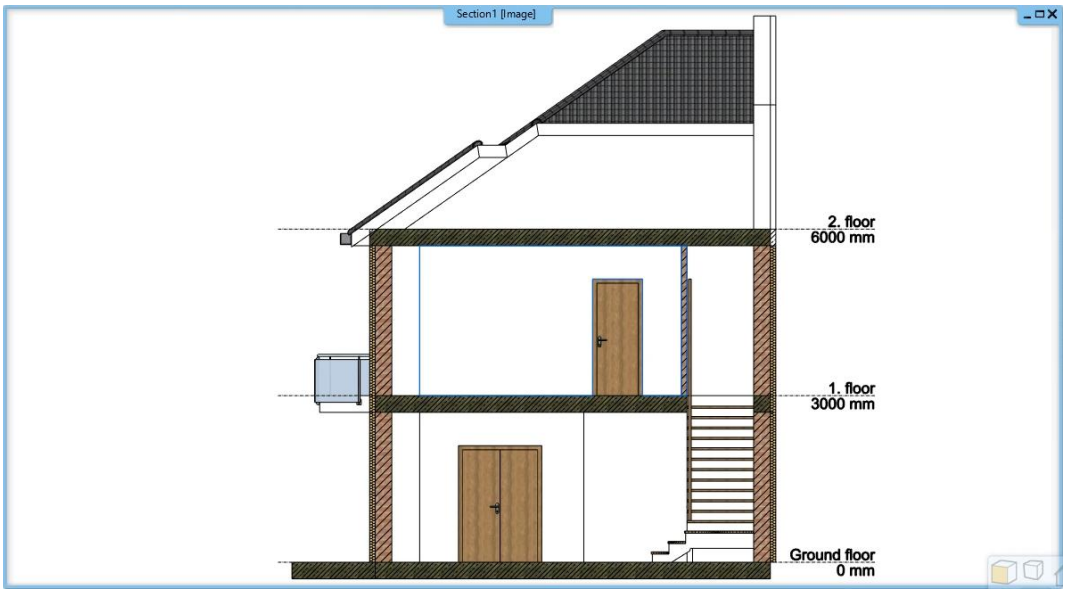


- You can select a different section head by clicking on its name and in the appearing dialog selecting the Replace option. We are using the default one in this project.

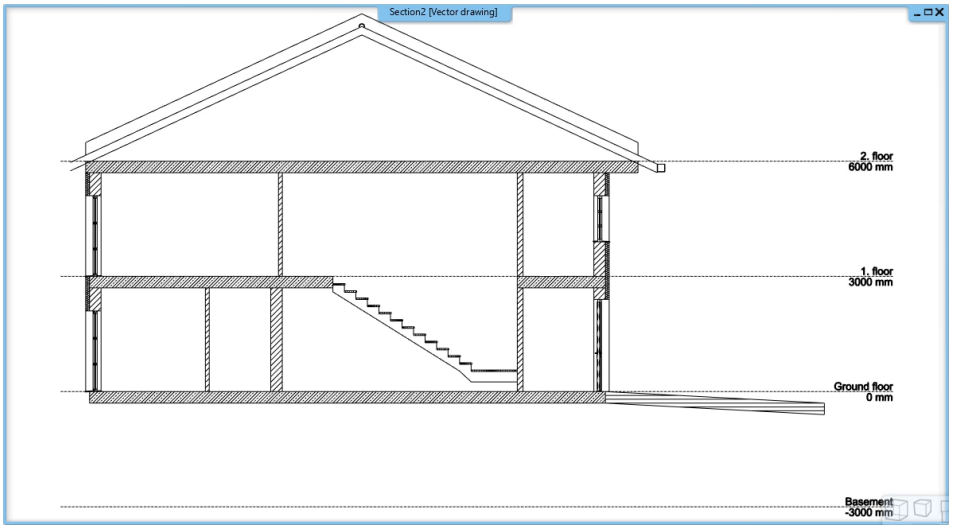


- Close the dialog with the **OK** button and draw the section line on the floor plan with **one click at the starting point and one another at the endpoint**.
- Move your mouse and set the view direction arrow to point to the top and click to accept and the section will be created in a separate window from vectors and lines.

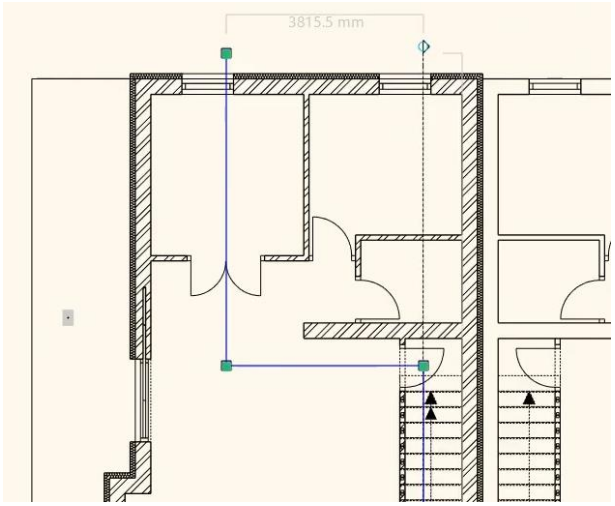




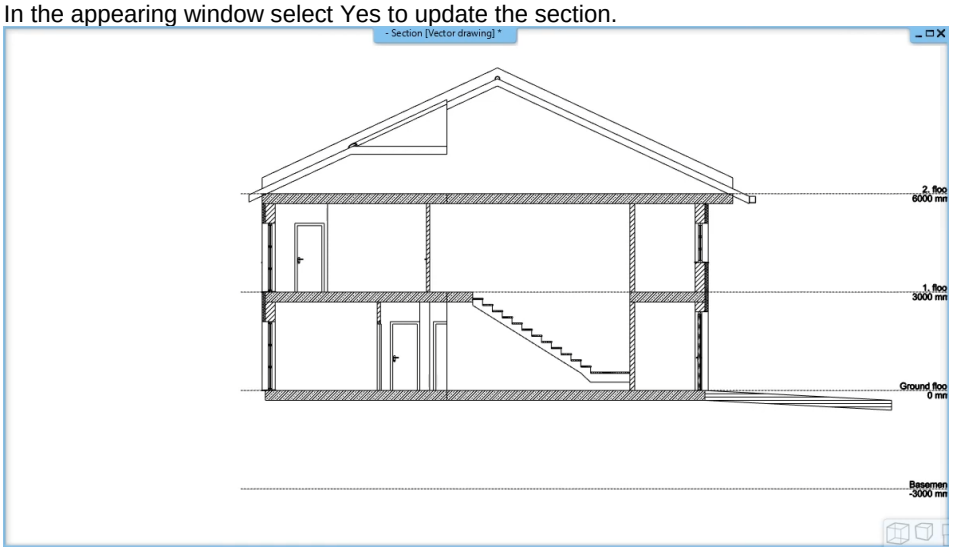
- Open the Section settings dialog and change the representation mode to Vector drawing and the visual style to Hidden line. Click OK to accept the changes.
- Place a section line perpendicular to the previous one that goes through the stair and set the direction arrow to point to the right.



- Now select this section line and click on the blue line. In the appearing menu select the Insert node option.
- Add a node to the section in the place of the door under the stair.
- Click on the top part of the section line and select the Offset option.
- Now offset the section line to the middle of the double door. Hit Enter to accept the changes.



- In the appearing window select Yes to update the section.



2.1.2. Hatch patterns on sections

There may be cases when you want to modify wall, slab or other hatches of an intersected item on the section. These items all have materials inside, which define how the item looks like on a visual, a section or also on an elevation drawing. To be able to represent an intersected surface with a different hatch pattern you can

- either change the inner material to another one, with another hatch pattern
- or you can actually modify the current material's properties to define another hatch representation of it.

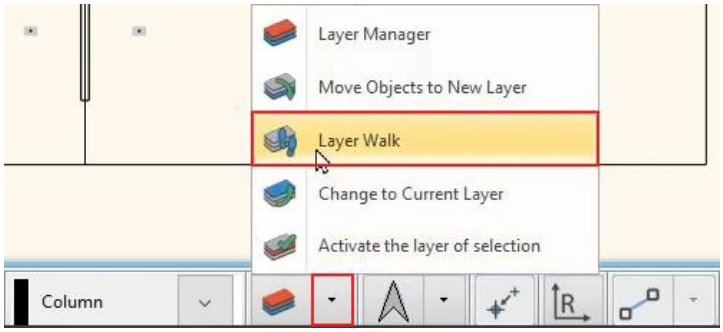
Let's have a look and change the material properties of the slab of this concept design.

- **Select the slab and** click on the "**Modify**" button to open its properties.
- Click on the "**Slab layers**" button to open the slab layer list.
- Click on the material named "**Reinforced_concrete**". This opens the material list where you can either choose another material or edit the properties of this material.
- Click on the small **cogwheel** at the right top corner of the material list and select "**Edit material**".
- Find and click on the "**Hatch on section**" button.
- Click on the button "**Hatch 67**". This is the name of the current hatch pattern and now we are going to change it.
- Select the "**Preferred**" category on the left-hand side in the appearing dialog and select the "**Reinforced concrete ISO**" pattern and click **OK**.
- Change the **Hatch spacing** and the **Dash length** to **300 mm**.
- Close all the dialog windows with an OK.
- Find the 2D symbol of the section line and right click on it (this is a shortcut to the context menu).
- Select the Create / Refresh section command.

2.1.3. Project location and North direction

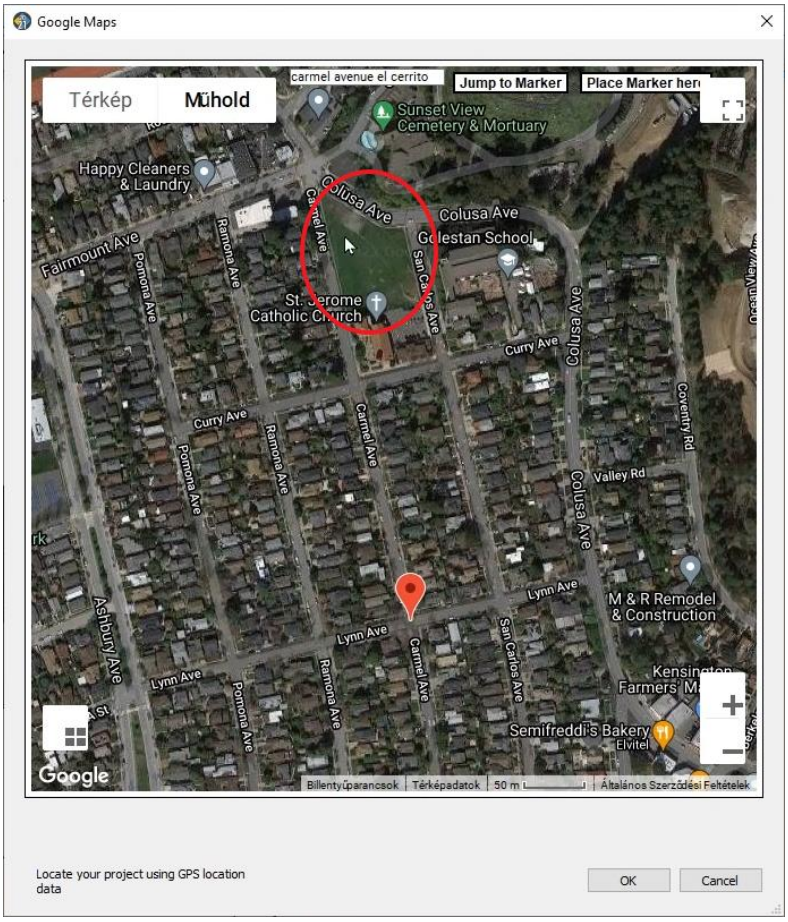
Before setting the location and the north direction, first let's switch off the layers that we don't need currently.

- We don't need the linked 2D drawing at this point, so we can switch off the visibility of the layers these elements are placed on.
- Click on the arrow next to the Layer Manager icon and select the Layer Walk option.



- Press the CTRL key and click on all the layers that have Elata_Nova in their names.
- Click OK to accept the changes.

- Now go to File / BIM / Project parameters and click on the Project location.
- Select the Project location by Google Maps option.
- In the appearing dialog you can find the Google Maps, where you can set the exact location of the building.
- Type in the search bar "Carmel Avenue El Cerrito".
- Switch to Earth mode and move the map a bit to find the plot.



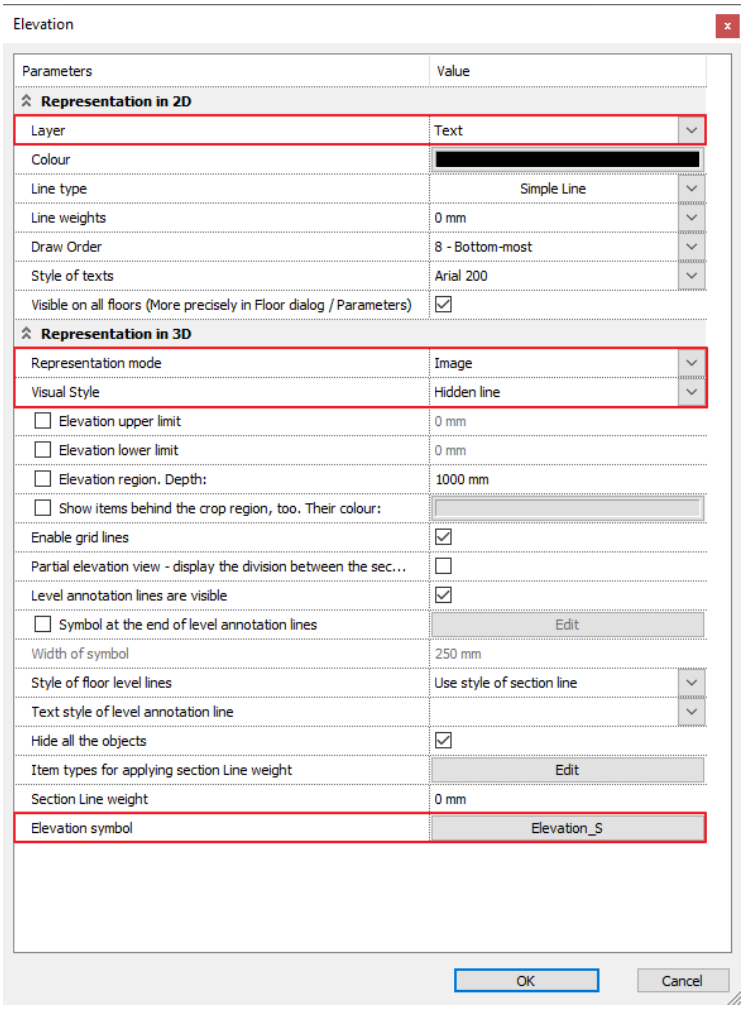
- Click on the pin sign and move it to the marked area.
- Click on the Arrow sign on the bottom bar and set the value to 42°.

2.1.4. Elevations

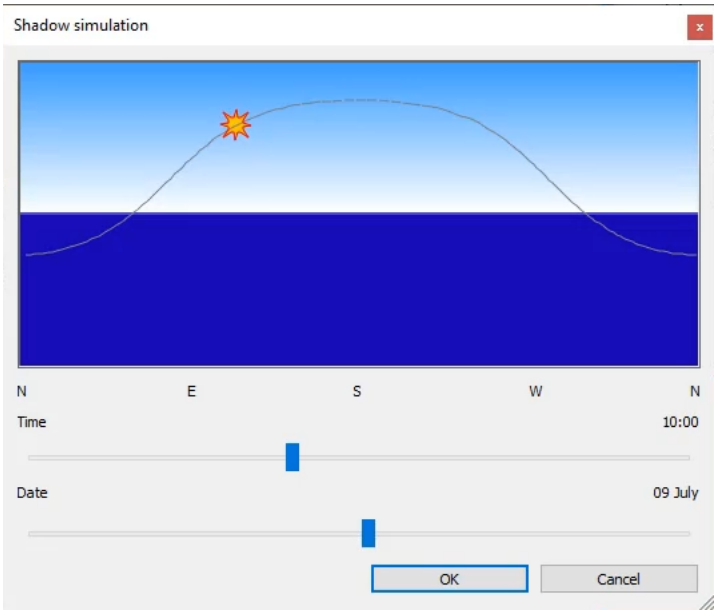
To create elevations, first we need to set the right parameters, then just select one from the list.

2.1.4.1. Placing elevations

- Click on the Ribbon bar / Documentation / Elevation / Elevation settings command to open the Elevation dialog.
- Change the layer to Text. You can modify the Elevation symbol if you want to.



- When you are ready with the settings, click on the elevation names to create them.
- Now select the West elevation and click on the pencil icon to enter its properties.
- Change the Visual style to “Consistent colour with wireframe”.
- Hit OK, then in the appearing dialog click Yes. This will refresh the elevation view.
- In order to display hatches and technical shadow on the elevation, go to the **Ribbon Bar / View / Shadow** group and start the **Shadow on/off** command. The shadows instantly appear on the buliding.
- Select the **Ribbon bar / View / Shadow simulation** command.



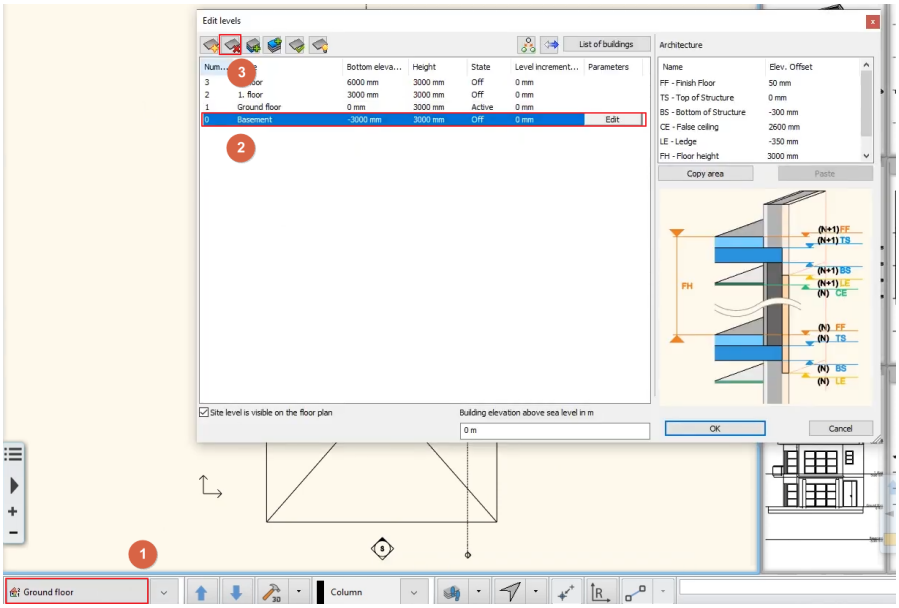
- You can click and drag the Sun symbol or the Time and the Date slider to study the shadows cast by the sunlight.

Besides this real-time tool there is also a **Shadow animation** tool to record the result into a video file and a **Solar access** tool to generate a color coded shadow-phase drawing for documentation purposes. Both commands are in the **Ribbon bar / View / Shadow** command list.

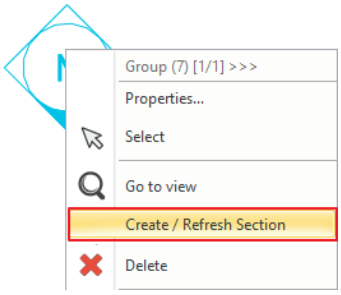
2.1.4.2. Refreshing elevations

In some cases elevations need to be manually refreshed. Let's see an example for this now.

- Activate the floor plan and open the Floor manager to delete the Basement from the project.



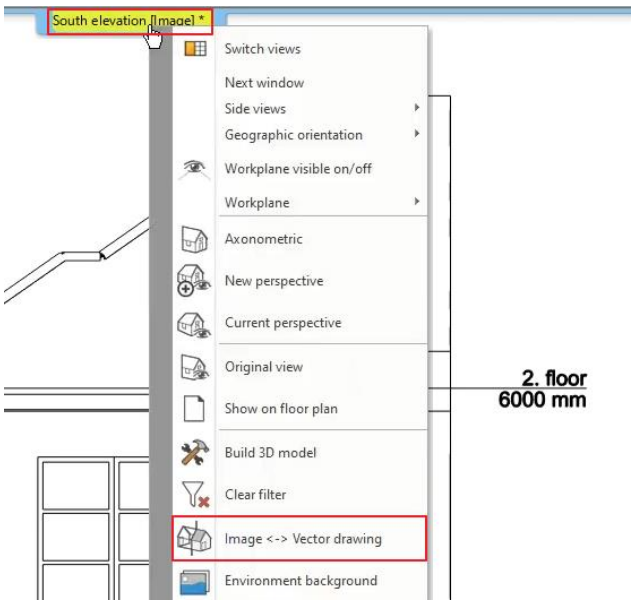
- Now activate the Northern elevation and click on its header.
- In the appearing menu select the Show on floor plan option.
- The program automatically zooms to the elevation sign.
- Right click on it and select the Create / Refresh Section option.



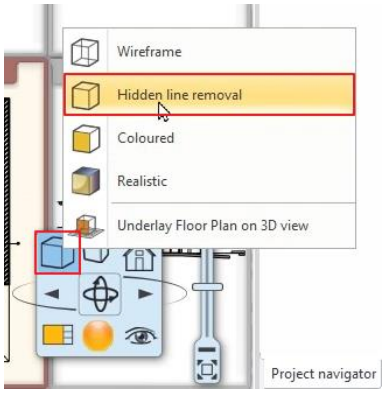
- Now the selected elevation is updated, the extra annotation line disappeared.
- Repeat these steps on the other elevations too.

2.1.4.3. Shadows on elevations

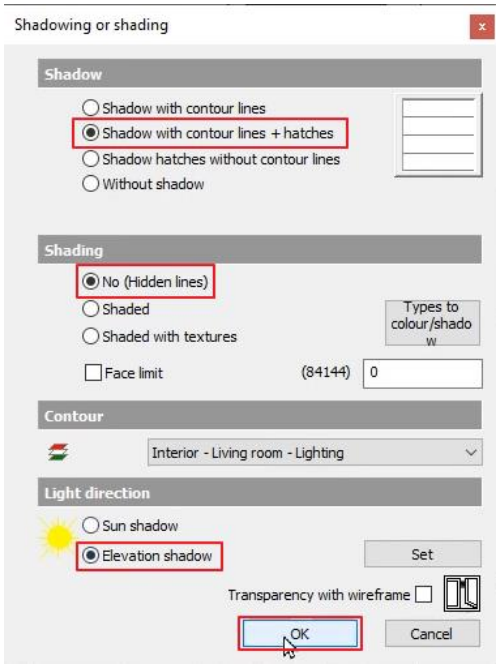
- Activate the South elevation view.
- Click on the header and select the Image <-> Vector drawing.



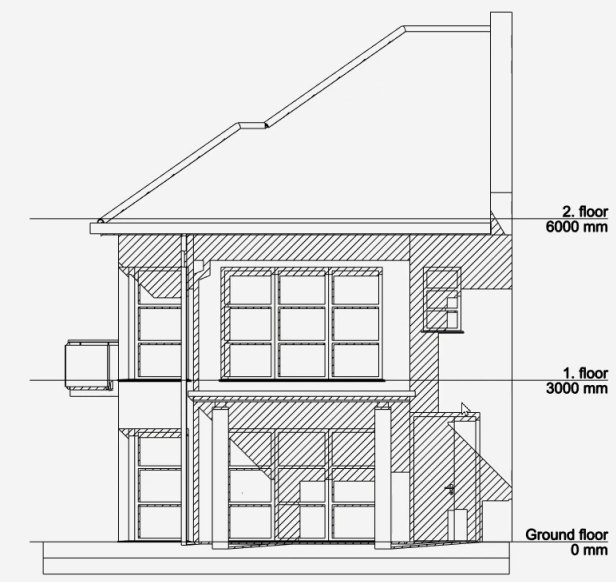
- Change the Representation mode to Hidden line removal on the Navibar.



- On the Navibar click on the middle icon in the top row, which activates the shadow settings.
- In the appearing dialog set the shadow representation to **Shadow with contour lines + hatches**, the shading to **Shaded with texture** and the light direction to **Elevation shadow**.
- Make sure that the "**Shadow on selected surfaces only**" option is **disabled**.



- Now click **OK** and wait until the elevation will be regenerated with the new settings.



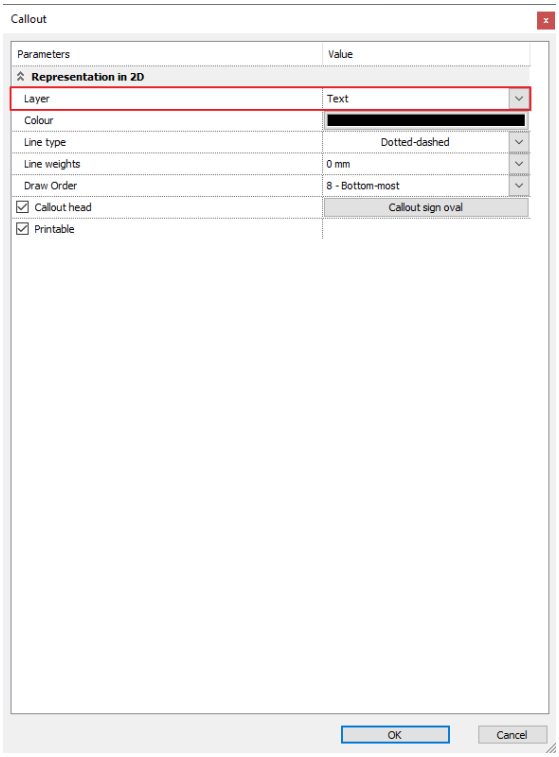
2.2. Documentation

Documentation is just as essential as the design process itself. This is when you can add annotations, dimensions, descriptions to your drawing and extract data using schedules or quantity take-offs in Microsoft Excel files.
In the end you will publish your drawing either by using your physical printer or by generating digital PDF files with your drawings.
ARCHLine.XP supports both direct printing and the assembly of so-called plot layouts providing the professional functionality to organize content on virtual pages and to generate even multi page PDF files.
Let's start making the documentation!

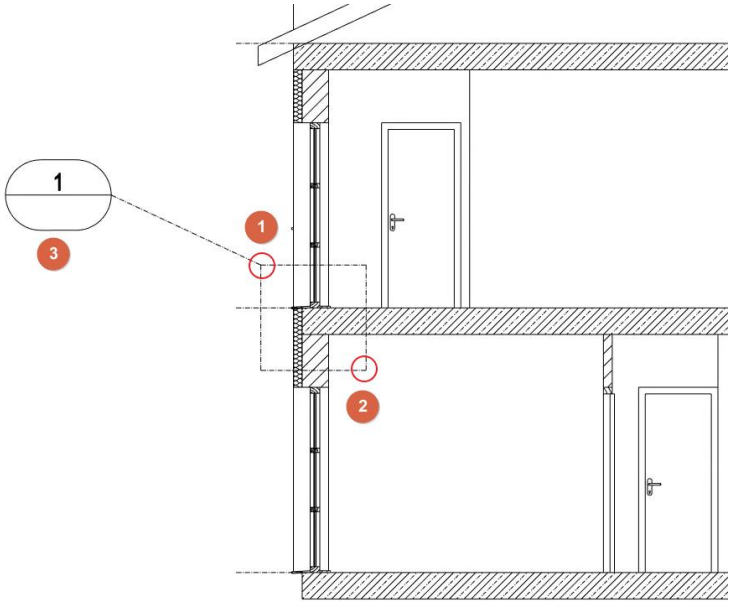
2.2.1. Callouts

To extract detailed drawings from parts of the building, use callouts.

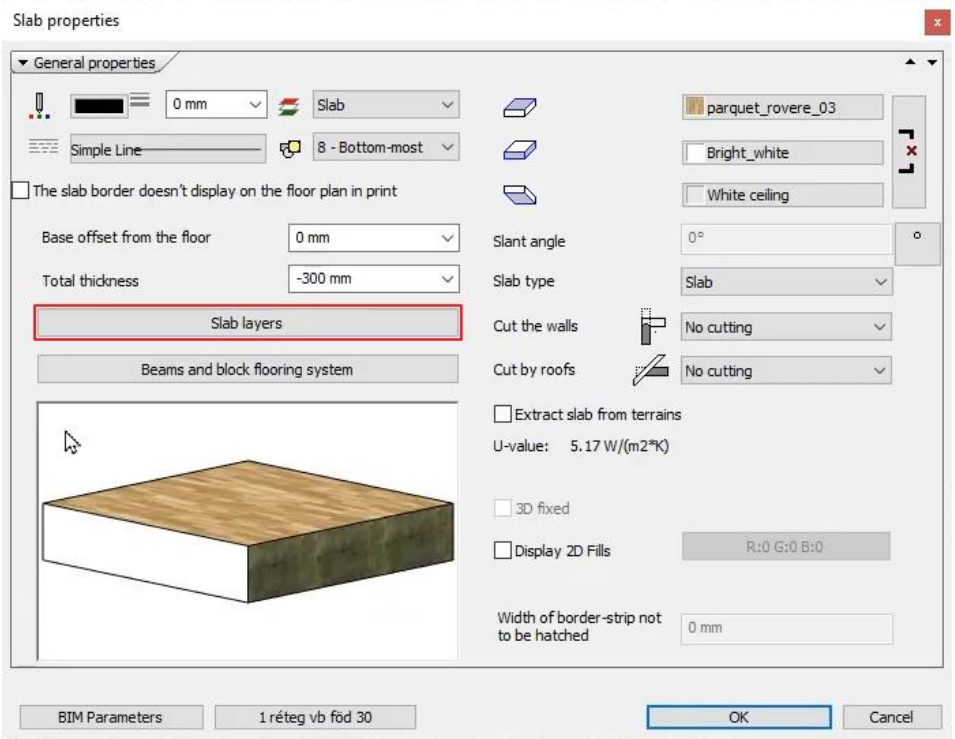
- Activate the second section's view.
- Click ont he Ribbon bar / Documentation / Callout / Settings option to open the properties dialog.
- Change the layer to "Text".
- You can change the Callout head if you want to by clicking no its name.
- Click OK to accept changes.



- Click on the Ribbon bar / Documentation / Callout / Rectangle command to draw the area of the callout.
- Click on the floor plan to set the first corner of the area, then click again to set its opposite corner.
- The last task is to set the place of the callout sign.



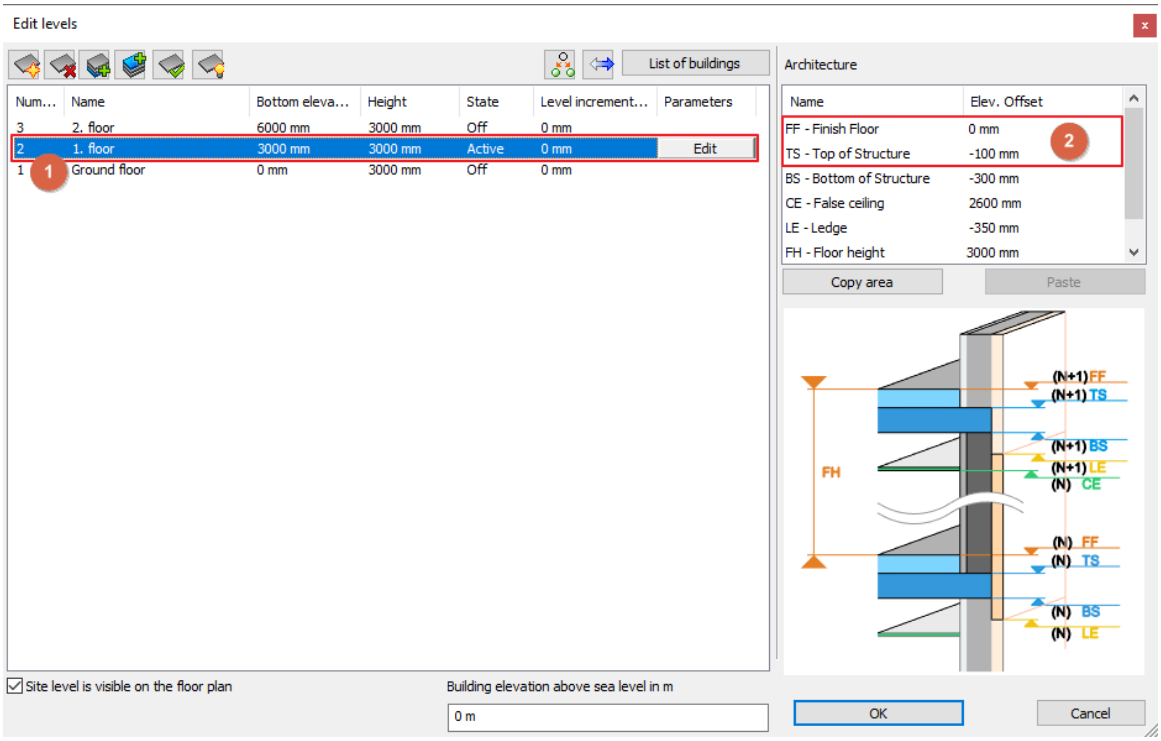
- A new view is automatically created, where you can edit the callout.
- In the Section view select the slab and click on the pencil icon to enter its properties.
- In the Slab properties dialog click on the Slab layers button.



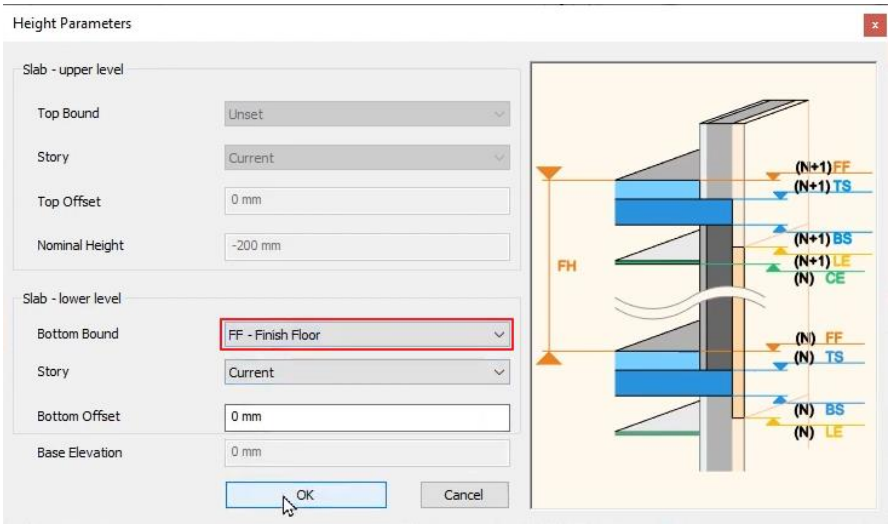
- Click on the green plus icon to add a new layer.
- Change the new layers' thickness to -100 mm, and the other one to -200 mm.
- Click on the material of the top layer and search for "Prefab concrete".
- Select the material and click on the gear icon in the top right corner.
- In the appearing dialog go to the Hatch on section tab and change the Hatch pattern to Concrete ISO, the Hatch spacing to 300 mm and the Dash length to 300 mm.
- Click OK to accept the changes, then hit again to set it as the material of the top layer.
- Close all dialogs by clicking OK.
- Click on the 3D hammer icon to refresh the model.

The walls and the structural layer of the slab now don't meet. Let's set the right values for the floor height, so everything will align. Walls and slabs are level bounded elements, which means the base and height of these elements allow you to define and update them automatically.

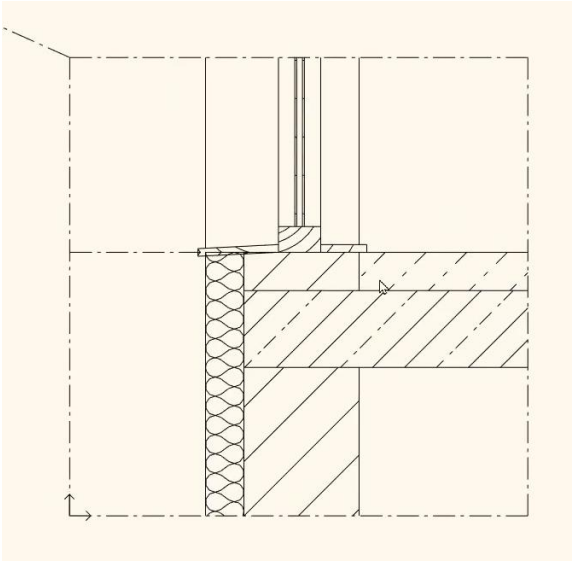
- Activate the floor plan and open the Edit levels dialog by clicking on the floor's name on the bottom bar.
- Select the 1. floor from the list and change the FF – Finish Floor to 0 mm and the TS – Top of Structure to -100 mm.



- Now the bottom of the walls is at the right height, but the slab needs to be adjusted.
- Enter the slab's properties and next to the Base offset from the floor value click on the arrow and select the Edit option. This way you can not only set a value for its base offset, but you can bound it to a certain point of the structure.
- In the Height Parameters dialog set the Bottom bound to FF – Finish Floor.



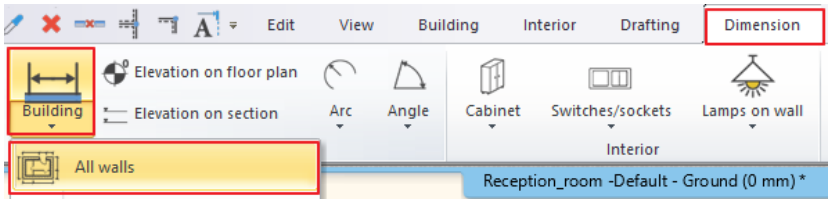
- Refresh the 3D model to see the changes in the section view.
- Activate the callout and right click on it. Select the Update Callout option to refresh it too.



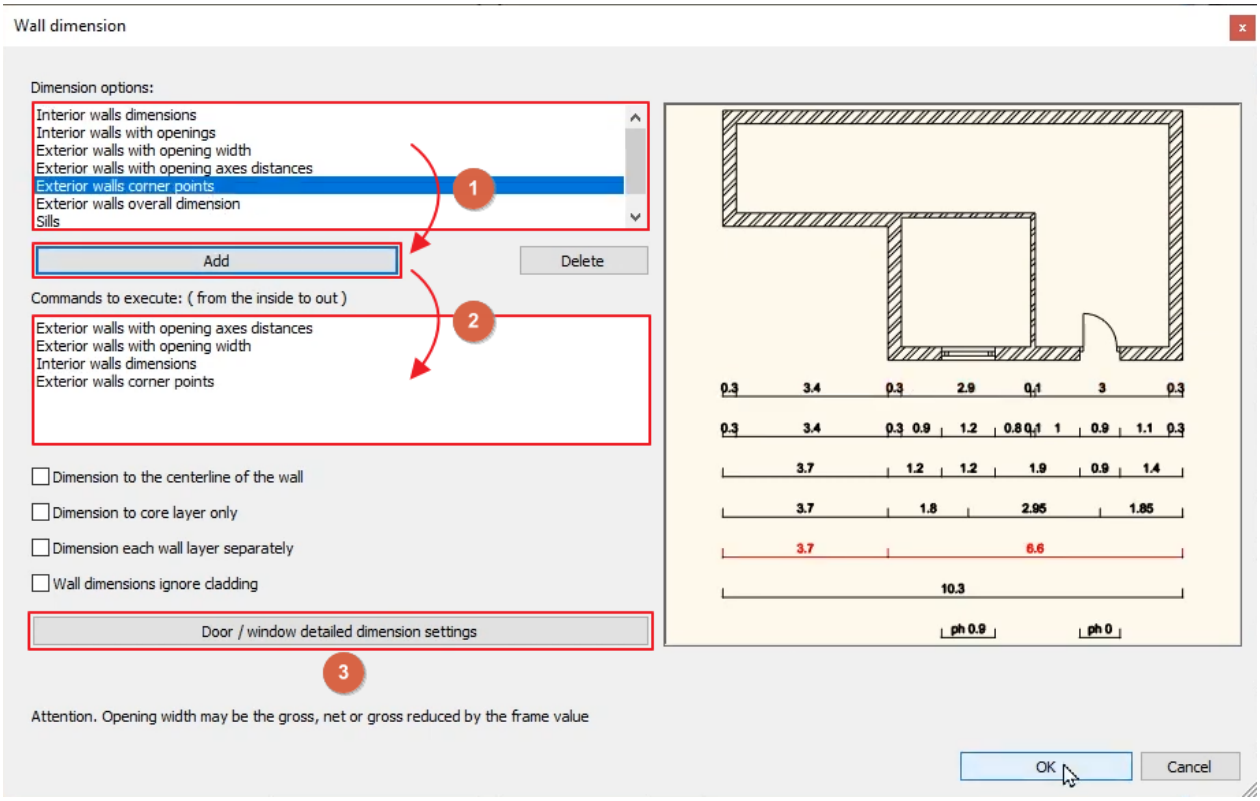
2.2.2. Dimensioning

Let's add wall and opening dimensions around the whole plan.

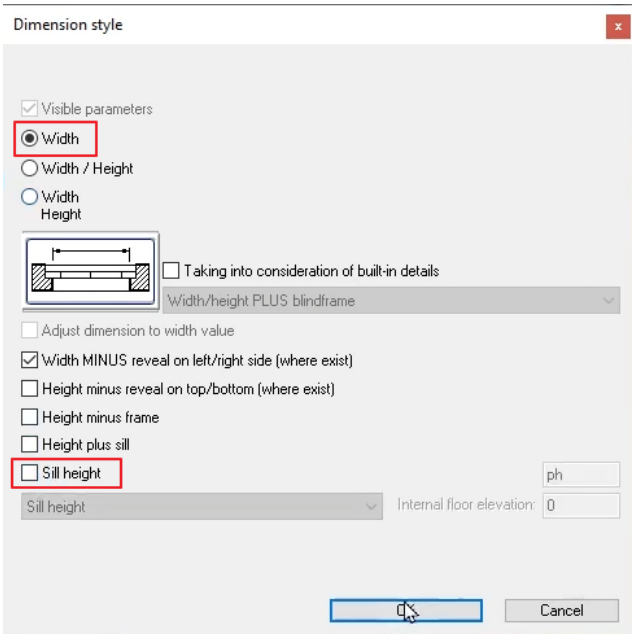
- First, we need to set the parameters of the dimension lines.
- Open the Ribbon bar / Dimension / Properties / Length command.
- In the appearing dialog you can change all parameters of the dimension lines. You can also save and use styles so you can always use the exact same dimensions in all projects. Now click OK to quit this dialog.
- Select the **Ribbon bar / Dimension / Building / All walls** command.



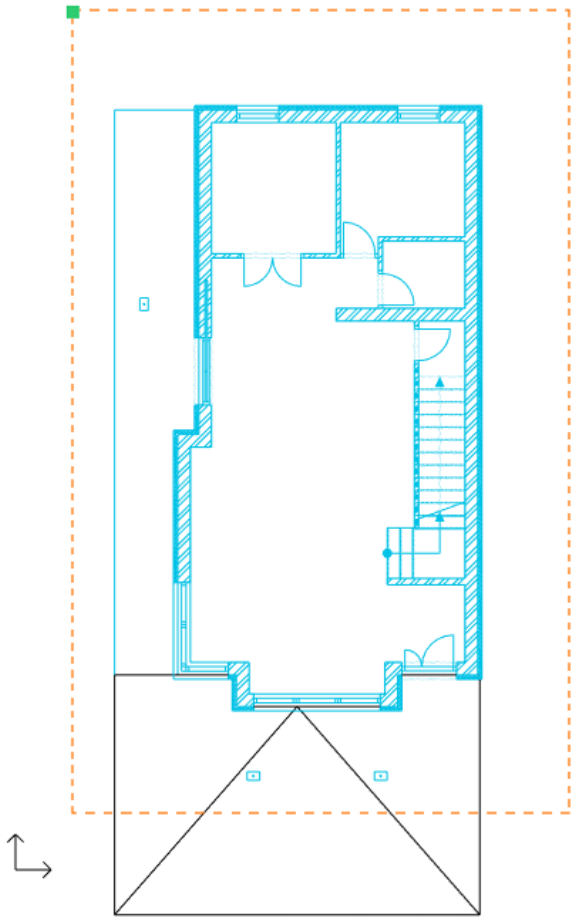
- Select the one from the Dimension options and add the desired dimensions to assemble a list as shown on the picture.



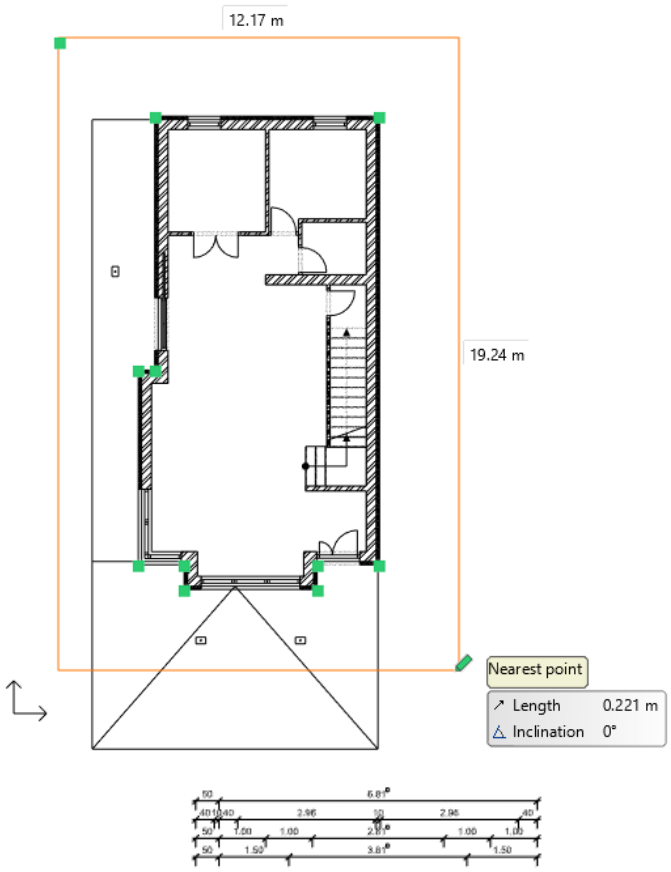
- When you added all dimension options to the list, click on the Door / window detailed dimension settings. Switch the opening dimension to Width and switch off the Sill height option.

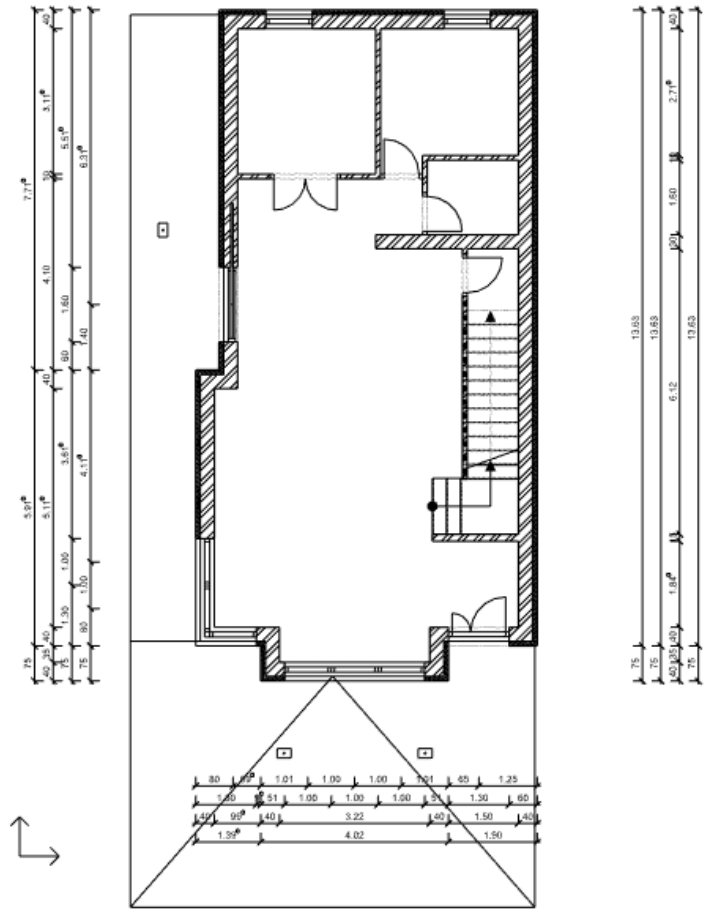


- After closing both windows, you can select the floorplan by drawing a rectangle from the right bottom corner to the top left corner – selecting the whole drawing.



- Press **ENTER** and the contour of the building is recognized automatically.
- Move the mouse to the desired position of the first dimension line and click.



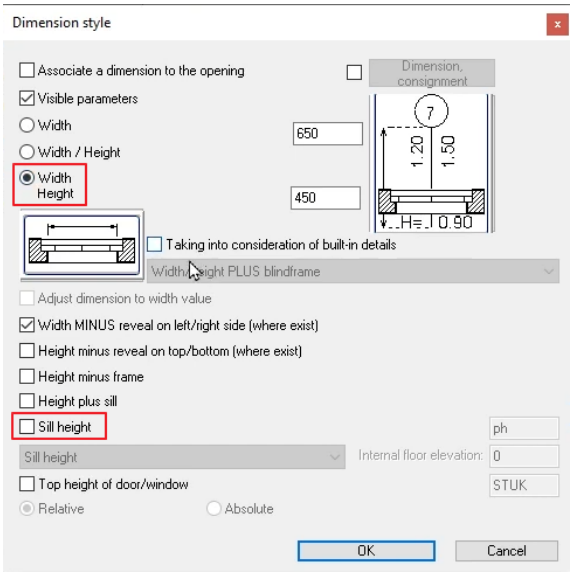


- Go to the 1. floor and repeat the previous steps to place the same dimension.

The dimensions will follow the changes of the drawing. You can add new ones to the current dimensions or delete existing ones. You can also move dimensions in groups later, in case the position of dimensions should be refined.

Now let's dimension doors and windows on both floors.

- Open the Ribbon bar / Building / Properties / Opening / Door command.
- On the Main parameters tab select the Dimension, consignment button.
- In the appearing dialog set the last option of the Visible parameters and switch off the Sill height.



- Enter the window properties the same way and set it to the same Visible parameter, but now switch the Sill height on.
- Select the Ribbon bar / Dimension / Building / Window / All command to activate all window dimensions on the Ground floor.
- Repeat the steps to activate the Door dimensions by clicking on the Door / All command.
- Repeat both procedures on the 1. floor too.

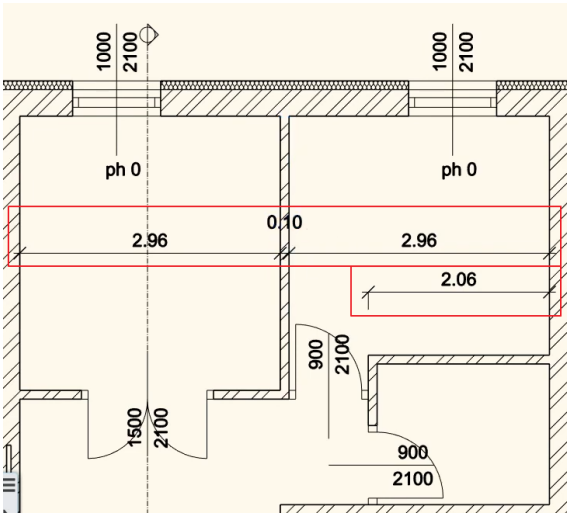
In case some dimensions are overlapping each other, click on the Door / Select command. Click on the external or internal side of the door to flip the dimension.

Let's measure the length of a wall.

- Click on the Ribbon bar / Dimension / Length / Aligned command.
- Select the starting point of the wall, then click on the ending point.
- Now set the place of the dimension.

You can also create a series of dimensions along a horizontal/vertical line.

- Click on the Ribbon bar / Dimension / Serial in horizontal command.
- Select the first point and the end point of the dimension line, then set its place.
- The program automatically continues the dimensioning, you just have to add the end points of the next dimension lines.
- When the dimension line is shorter than the value, you can move the value to a different place.



2.2.3. Room and area

You can visualize important information about the rooms of a floor plan by using the Room and area tool. The name of the room and the size of the room area will be represented by default. However, the look and content of the room stamp can be fully customized.

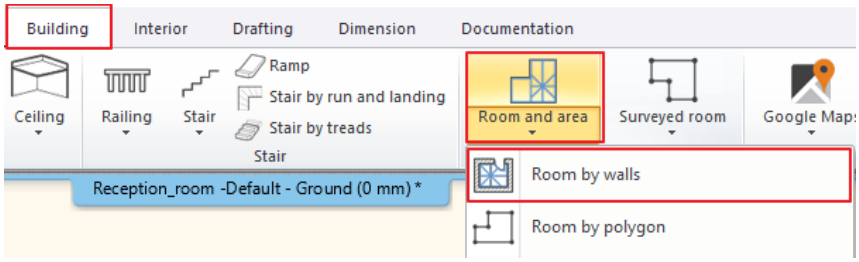
There are basically two ways to define the area of the room on the floor plan.

- ❖ By clicking inside a closed boundary of walls
  or
- ❖ by drawing a polygon contour manually.

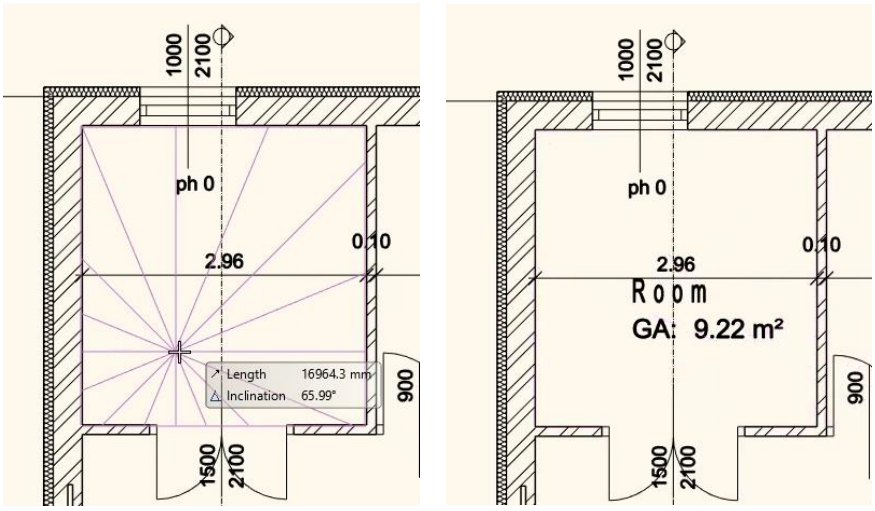
Room by walls

In case the room is surrounded by walls, we recommend using the **Room by Walls** command. It has the advantage that clicking inside of the room automatically creates a room stamp based on the closed contour by walls. There is no need to draw the contour of the room. This means that the room stamp is connected to the walls, changes on the walls are followed by the calculations.

- Click on the Ribbon bar / Building / Properties / Room / Room and area command to set its properties.
- You can select the type of the measurement on the Norms and rules tab, select DIN277.
- On the Upper Limit tab, you can set the values of the attic space. But now we don't need this on the ground floor.
- In the Calculated area set the Room name to Room.
- Now select the **Ribbon bar / Building / Room and area / Room by walls** command to place the stamp on the floor plan.



- Click inside a room that is surrounded by walls. The room stamp is placed in the room.



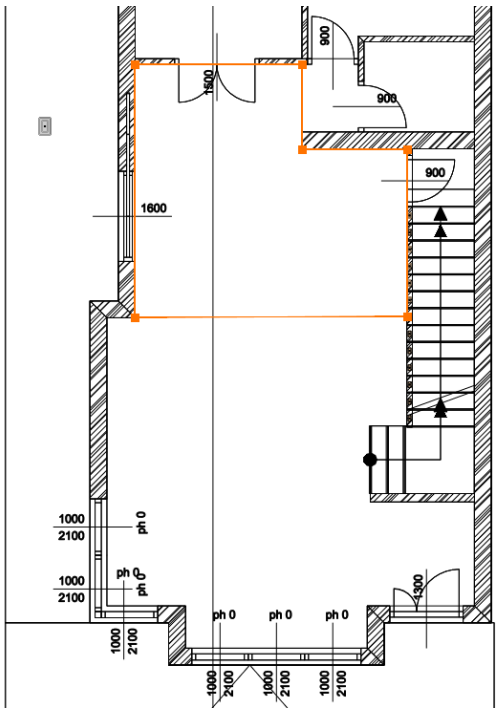
You can change the appearing content of the room stamp in its properties dialog if you want to further configure it.

- You can move the stamp by clicking on the move icon after selecting it.

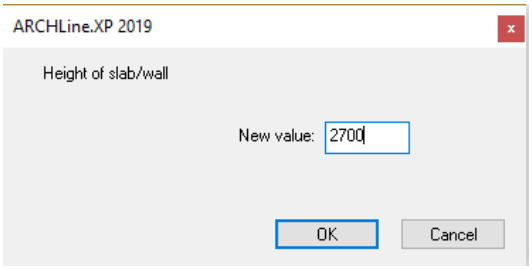
Room by polygon

This function is used when a physical space is divided into more than one functions (e.g., a living-dining room) or when we would like to measure areas not surrounded by walls (for example: terraces, balconies, gardens).

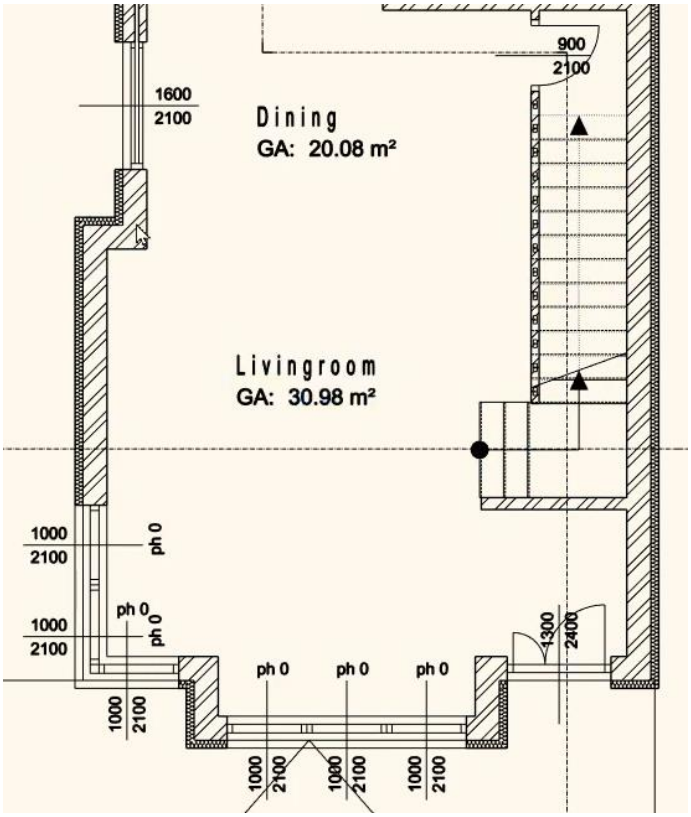
- Select the **Ribbon Bar / Building / Room and area** / **Room by polygon** command.
- Draw the shape of the room by following the inner side.



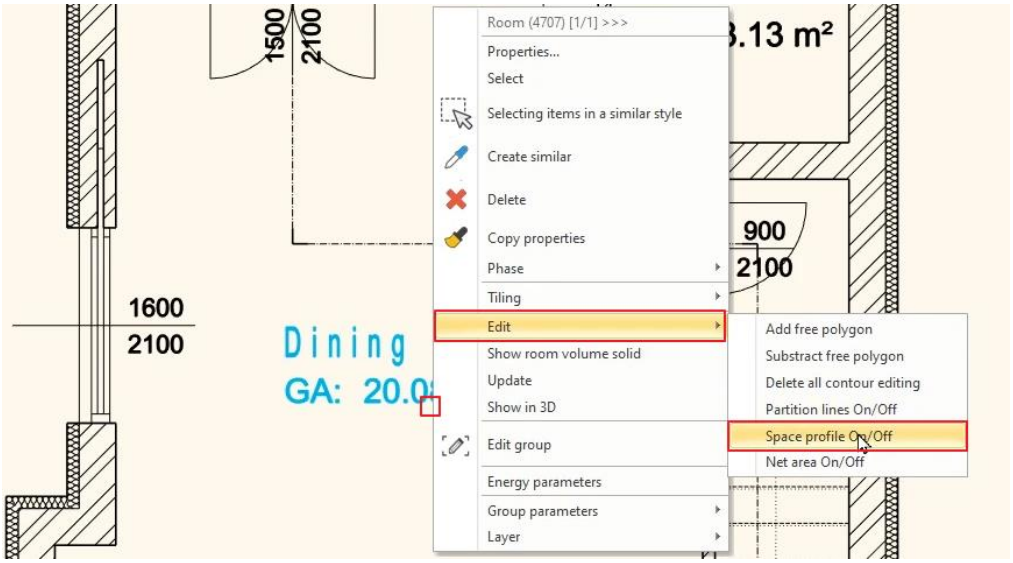
- Type the wall / ceiling height in the dialog box that appears.

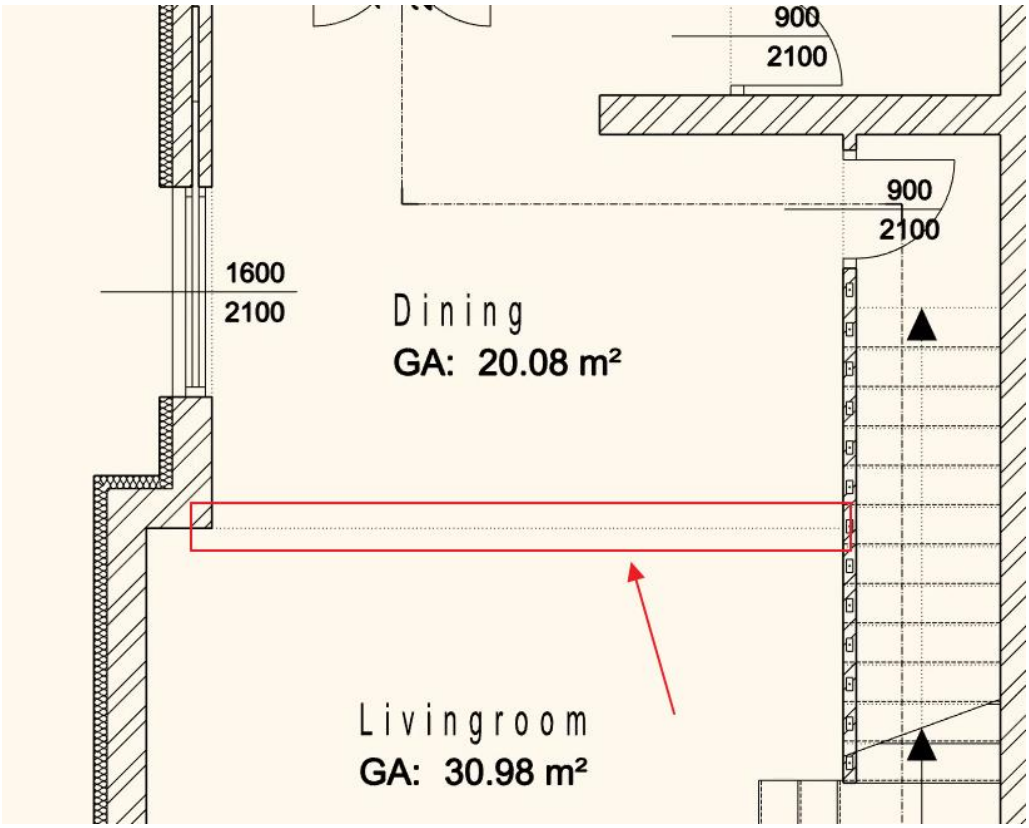


- The room stamp is ready, you can modify it afterwards as described above.
- Draw the area of the Livingroom too, so now the ground floor has all the Room and area stamps created.



- Let's activate the border line between these two stamps.
- In the properties of the Dining stamp on the Profile and area properties tab set the line type to Dotted.
- Right click on the stamp and select the Edit / Space profile On/Off command.
- The program automatically shows on the floor plan the border of the selected stamp.

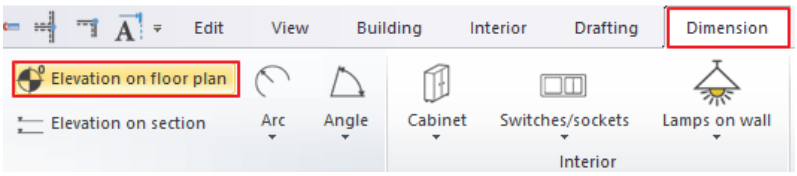


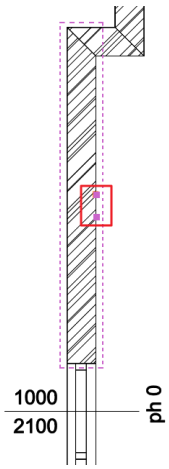


2.2.4. Elevation on floor plan

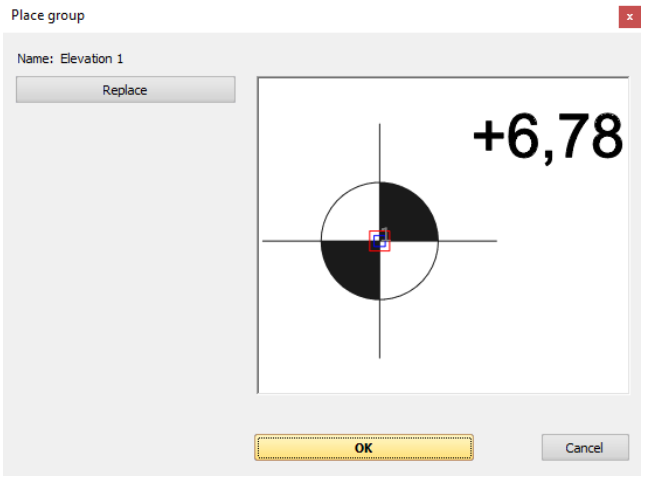
You can place a dimension symbol of an elevation on the floor plan.

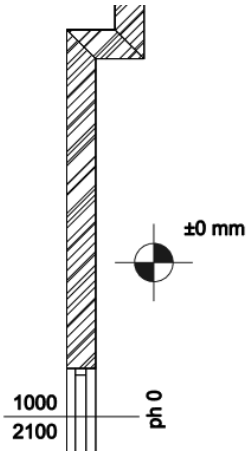
Select the **Ribbon bar / Dimension / Elevation on floor plan** command.





- First you need to select an element. Select one of the external walls. Then click on the inner line of it. This is where you will measure the elevation.
- In the top right corner of the screen you need to choose the proper keyword to set the elevation point to measure. Now choose the "**Bottom**" option.
- A dialog box appears with the starting height which can be changed if it is needed. Click OK without changing the value
- Click **OK** to continue.
- In the appearing dialog window, you can change the desired symbol. Let's keep it for now.





- Place the symbol on the floor plan with one click.

Good to know: Editing groups

When you place a group on the floor plan, it is closed, it cannot be edited. Let's see how you can edit a group on the floor plan.

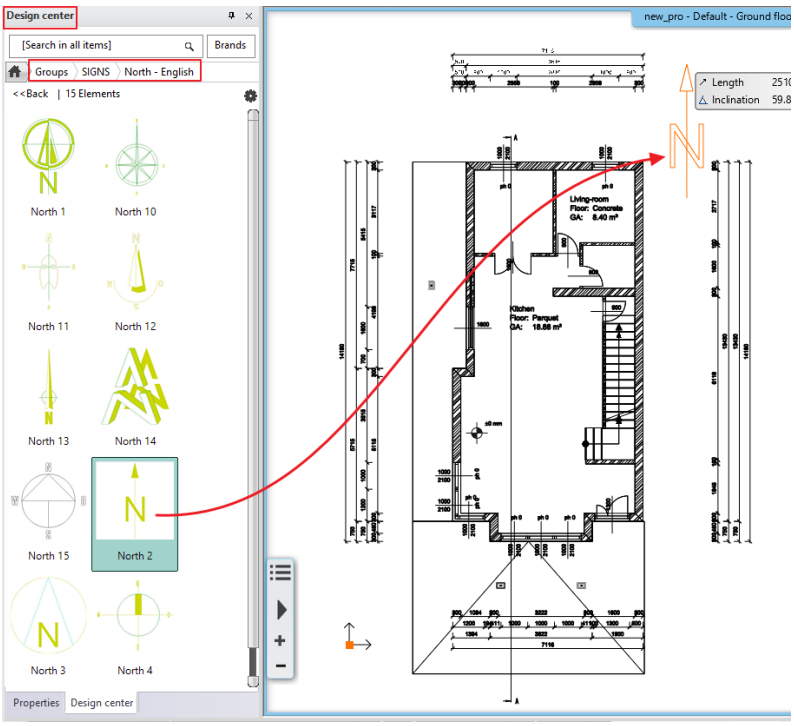
- Right click on the group and select the Edit group command.
- Now the editor mode is active, the group can be edited, everything else is grayed out.
- Select and modify the elements that you want to edit.
- When you are ready editing the group, right click on any of the elements in it and select the Close group command.

2.2.5. Symbols

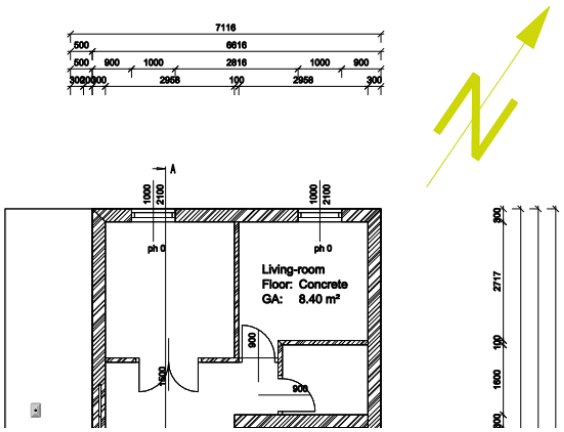
There are other symbols that may be needed on a floor plan during design, such as the symbol that marks the entrance or the North direction symbol. Most symbols can be found under the **Design center / Building / Groups / Signs** category. To position them on the floor plan just drag and drop them onto the drawing.

North direction sign

- Find the **Design center / Building / Group / Signs / North - English** category and select a north sign that suits you and simply click and drag it onto the floor plan and release the mouse button. Click once to place it.



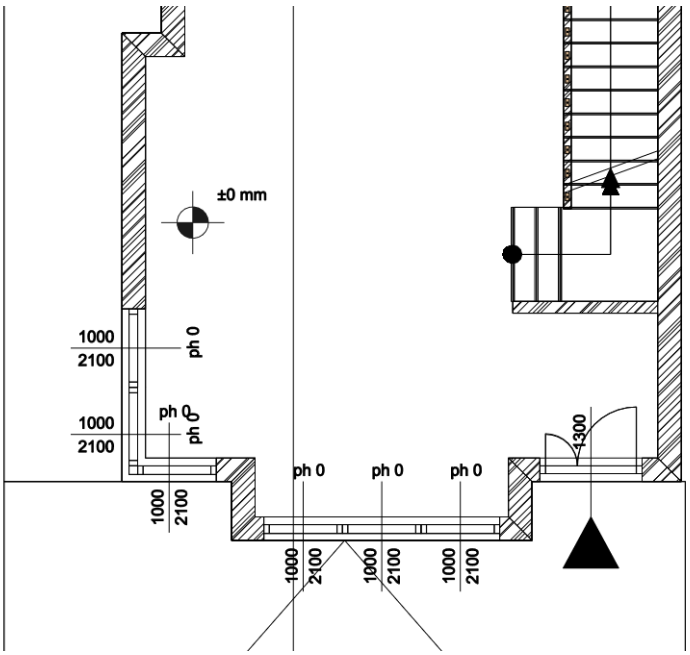
- The North symbol will be automatically aligned with the previously set North direction of the project.



- Select the symbol and in the property grid activate the Force colour option. This will force the layer's color setting on the symbol.
- Change the width of the symbol to 2000 mm in the property grid while the Maintain aspect ratio is activated.

Entrance symbol

- Select an arrow in the **Design center / Group / Signs / Arrows** category and place it in front of the entrance.

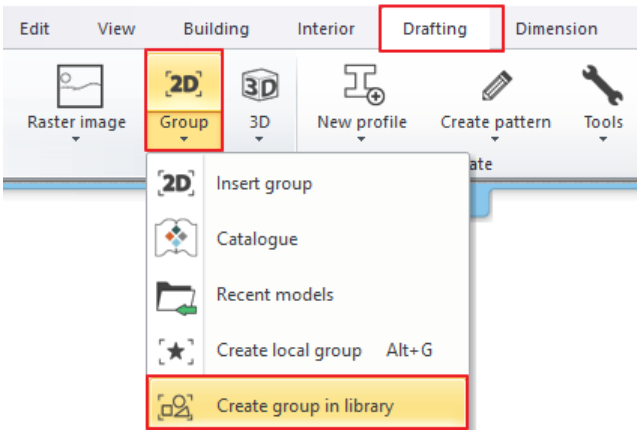


The previously mentioned modifications (resizing, positioning) can be performed in the same way as in the previous example.

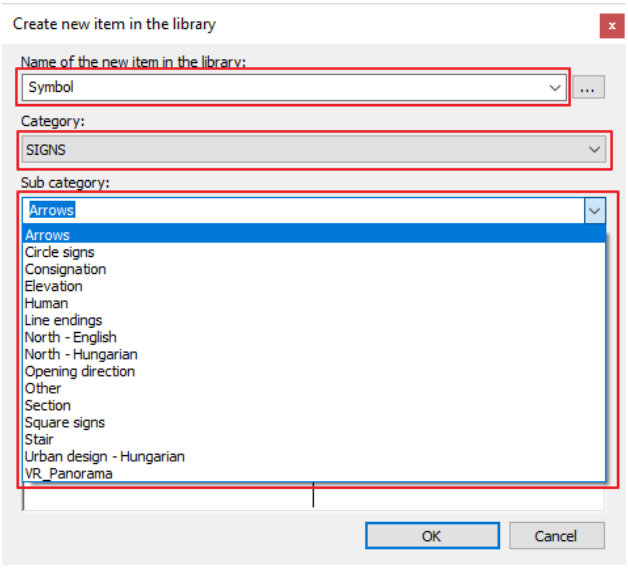
Good to know: How to create new symbols?

In this tutorial we do not create a new symbol but for future references you can use the following short summary in case you would like to create custom symbols for your design.

- Draw the new symbol in the 2D window using lines, rectangles, polylines and text using the **Ribbon Bar / Drafting** tools.
- Select the **Ribbon Bar / Drafting / Group / Create group in library** command. This command allows you to save and access your new symbol when working on other projects too.

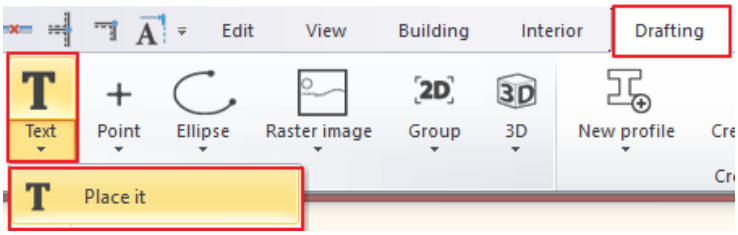


- Select all the elements of the new symbol and hit **Enter**.
- Click to set up a reference point for the symbol. You can define as many reference points that you want. Hit **Enter** to finish adding reference points.
- Name the new symbol and categorize it. For a subcategory you can select from the list or just type in a new name.



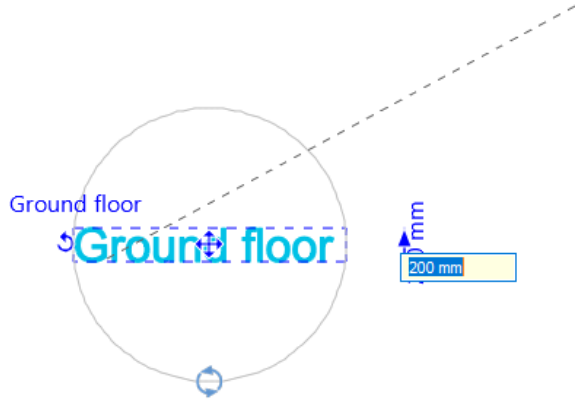
2.2.6. Placing a text

- Place a text on the architectural floor plan by using the **Ribbon bar / Drafting / Text / Place it** command.
- In the appearing "Text actuals" dialog window, type the text to place (for example, “Ground floor"), and then click **OK**.



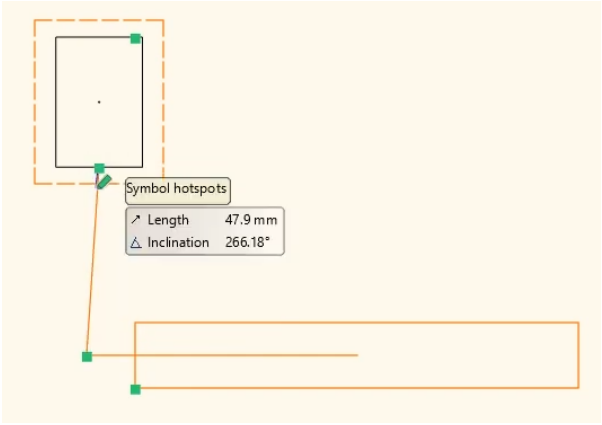
- The orange contour of the text appears, one of the corners is grabbed by the cursor. With this corner point, you can place the text on the drawing sheet anywhere you like.
- Now the text is placed, the text input window re-appears. Close the window by clicking on the **Cancel** button.
  The default text height is 200 mm, which is ideal for displaying designs at a 1:50 or 1:100 scale compared to drawing content.

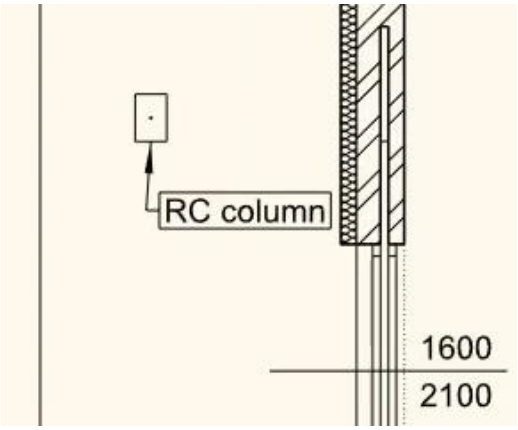
The height of the selected text can be edited by clicking on the height and typing a new value.



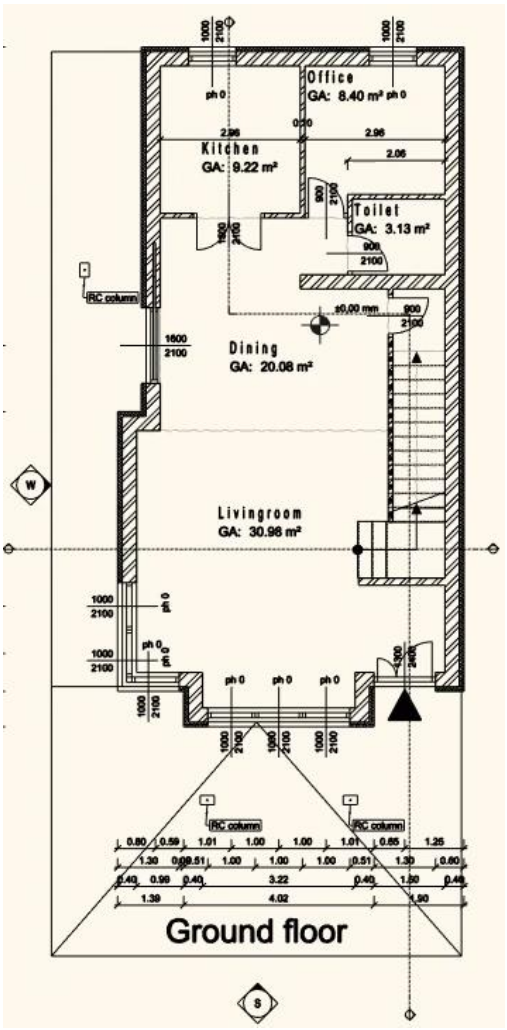
Text with pointer line

- Click on the Ribbon bar / Drafting / Text / Text with pointer command.
- Create the text “RC Column” and click OK.
- Select the column on the left side of the building.
- Now the orange rectangle appears that shows the size of the text. Place it under the column.
- Set the pointer line’s breaking point and connect it to the column.





- Select the text and click on the move icon on the floating menu.
- Click on the Move a copy from command and set the reference point to the end of the pointer line.
- Place the copies to the other two columns in front of the building.



2.2.7. Lengths dimensioning

Let’s add dimensions to the West elevation view. We will dimension the distances of the openings and the main building parts.

Lengths dimensioning

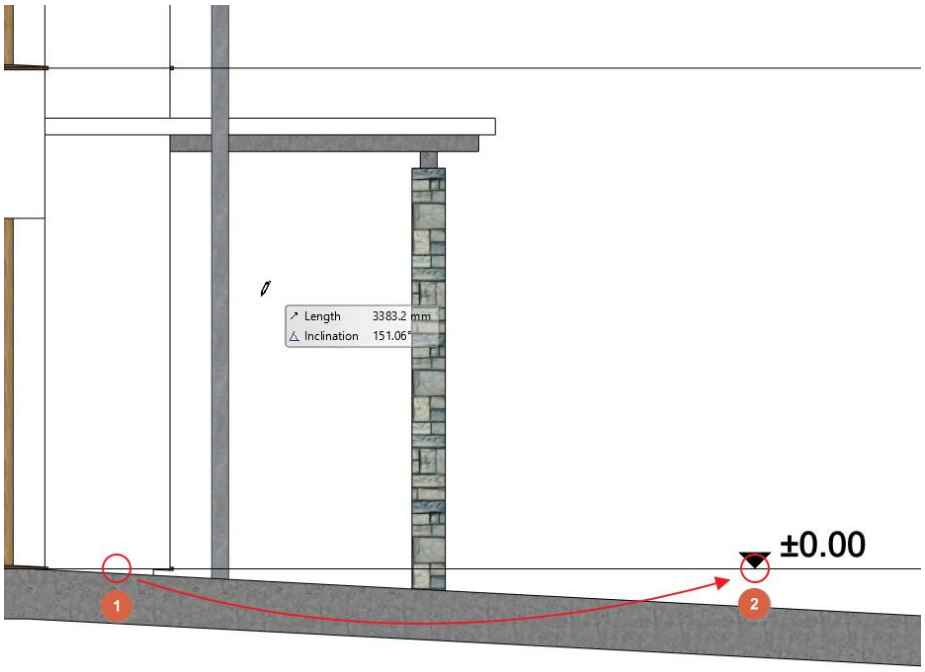
- Activate the West elevation view.
- Select the **Ribbon bar / Dimension / Serial in horizontal** command.

- Click on the starting point of the dimension at the left edge of the building, then click on the left side of the sliding door.
- Now position the dimension line below the building.
- Continue measuring the openings of the building.
- Now dimension the corners of the building like in the picture below.

2.2.8. Elevation on section

The **Elevation on section** command is located on the **Ribbon bar / Dimension** tab.
The dimensioning process is the following:

- Open the command from the above-mentioned path, then mark the starting height on the wall elevation view by clicking on the connection between the slab and wall. This will be the origin of measurement.
- To measure the value 0, then determine the position of the dimensioning next to the wall elevation view. Click on the preferred position, so the first height value of 0.00 will appear next to the wall elevation view at the desired location.



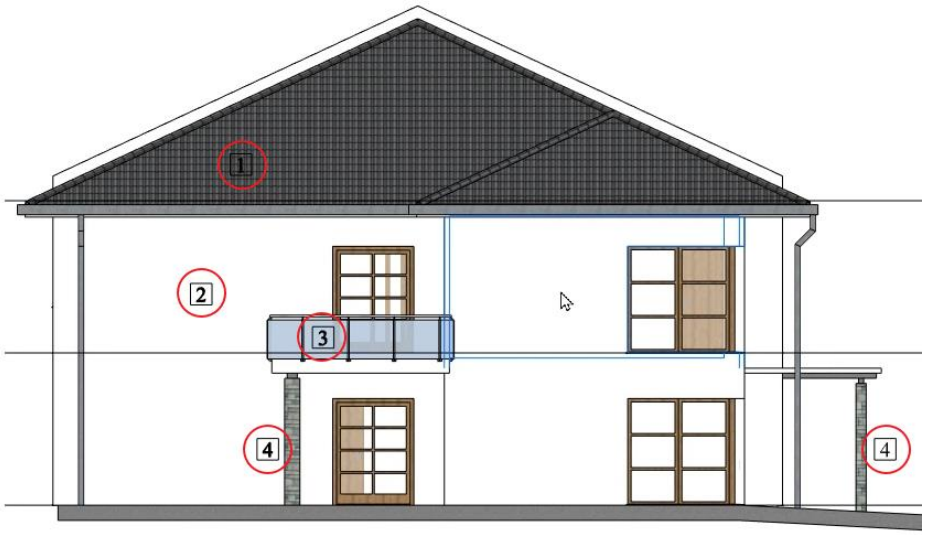
- Additional points should be determined with just one click and the height value for that distance will be displayed immediately next to the wall elevation view.

- When the dimensions are all placed, press **ENTER**.
- Add the “West Elevation” text to the drawing.

2.2.9. Material markers

In the documentation we will identify the different materials. For this we need to place markers to ID the appearing materials.

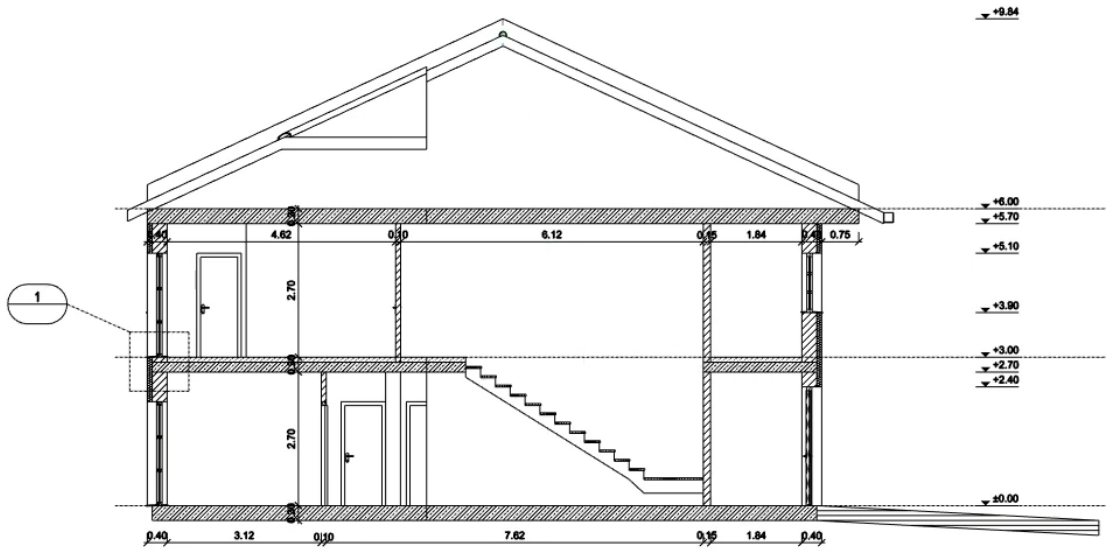
- Search the markers in the Design Center / Groups / Signs / Square signs folder.
- Drag and drop markers to the different materials of the elevation as in the picture below.



Repeat steps 2.2.7 and 2.2.8 on the South elevation. If the shadows disappeared, you can activate them again the same way as we did it in step 2.1.4.3.

2.2.10. Serial in vertical

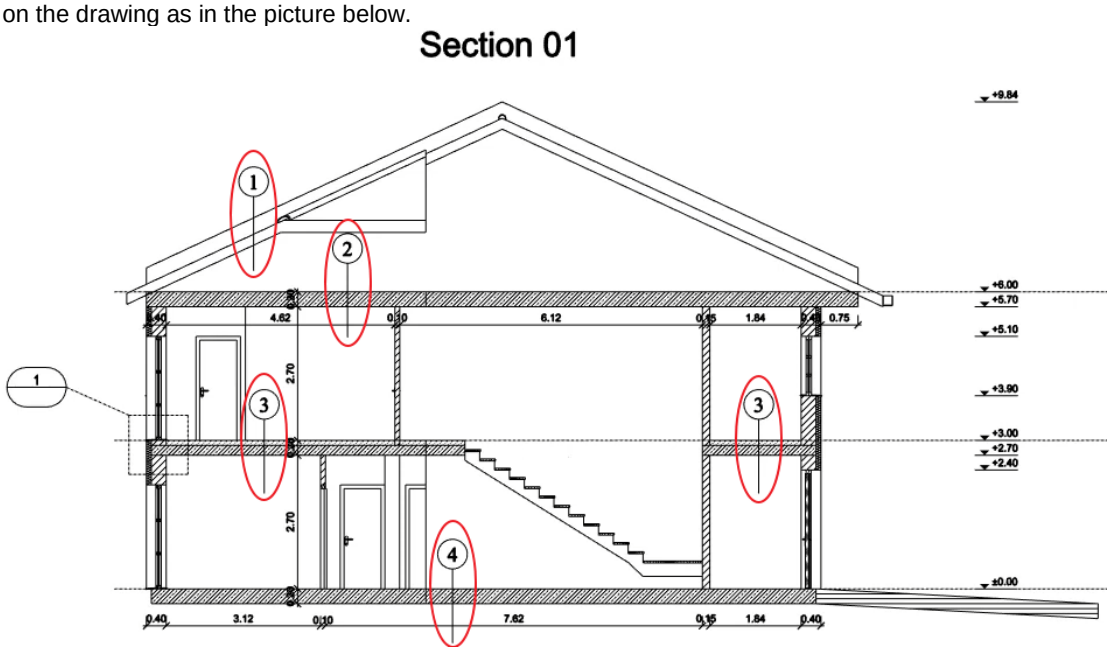
- Activate the vector drawing section and dimension the ground floor and the first floor as we did it in steps 2.2.7. and 2.2.8.
- Click on the Ribbon bar / Dimension / Serial in vertical command.
- Measure the height of the structural elements as in the picture below.
- Place the text “Section 01” on the drawing.



2.2.11. Layer markers

To identify the layered structures in the building when creating the final documentation, we'll place markers on these elements.

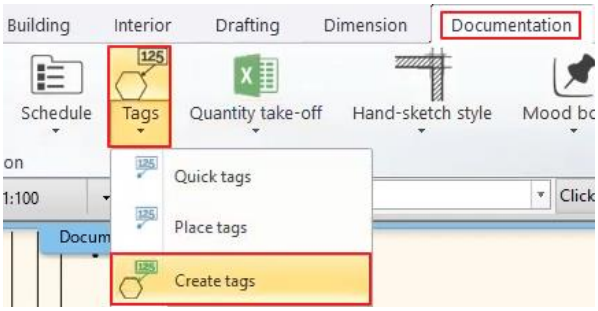
- In the Design Center / Groups / Signs / Circle signs folder search the Vertical_simple_circle_sign elements and place them on the drawing as in the picture below.



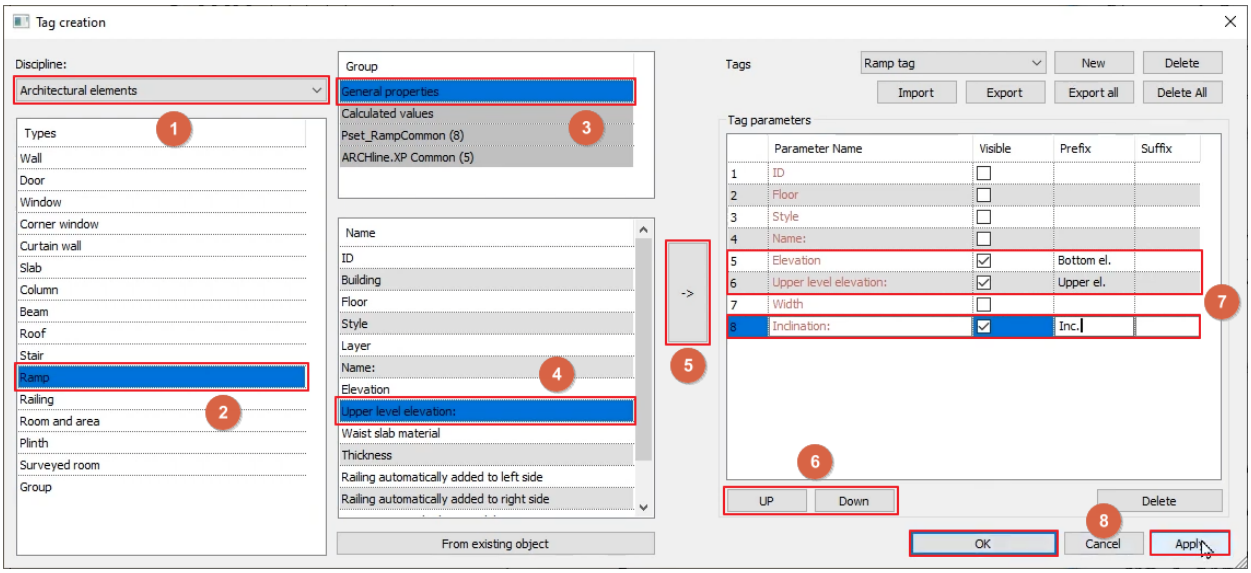
2.2.12. Tags

Tags display the properties of the element they are connected to. The displayed data is automatically updated if you change the properties of the elements or you can change the properties of the elements directly from the tags.
We will create a tag for the ramp in front of the house.

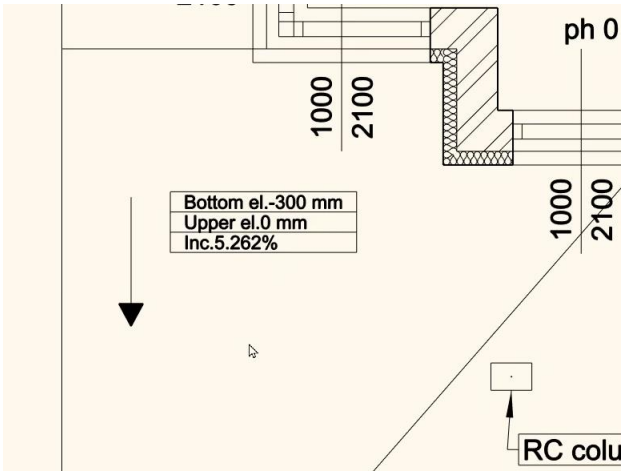
- First, start the Ribbon bar / Drafting / Line command and select the Simple line + arrowhead style on the left side.
- Place an arrow that shows the inclination of the ramp.
- Tags use the text style set in the text properties. Change the Font size to 100 mm in the text properties dialog.
- Open the Ribbon bar / Documentation / Tag / Create tags command.



- In the appearing dialog you can set the properties of the tag.
- On the left side select the Architectural elements from the drop down menu (1).
- Select the element type: Ramp (2).
- Select the group you want to add information from (3).
- Select the information you want to add to the tag (4).
- Click on the arrow (5) to add it to the tag.
- With the Up and Down buttons (6) you can modify the order of the properties. Set the same order as in the picture below.
- Switch off the visibility of everything but the Elevation, Upper level elevation and Inclination cells (7).
- Add the prefixes to the visible elements as in the picture below.
- Click Apply and OK (8) to accept the changes.



- Click on the Ribbon bar / Documentation / Tags / Place tags command.
- The software automatically shows the type you previously set.
- Click OK.
- In the appearing dialog you have the option to change the visual settings of the tag.
- Click OK without changing anything.
- Select the ramp on the floor plan and place the tag next to the arrow.
- Select the pointer line of the tag and delete it. This step won't terminate the connection between the ramp and the tag.



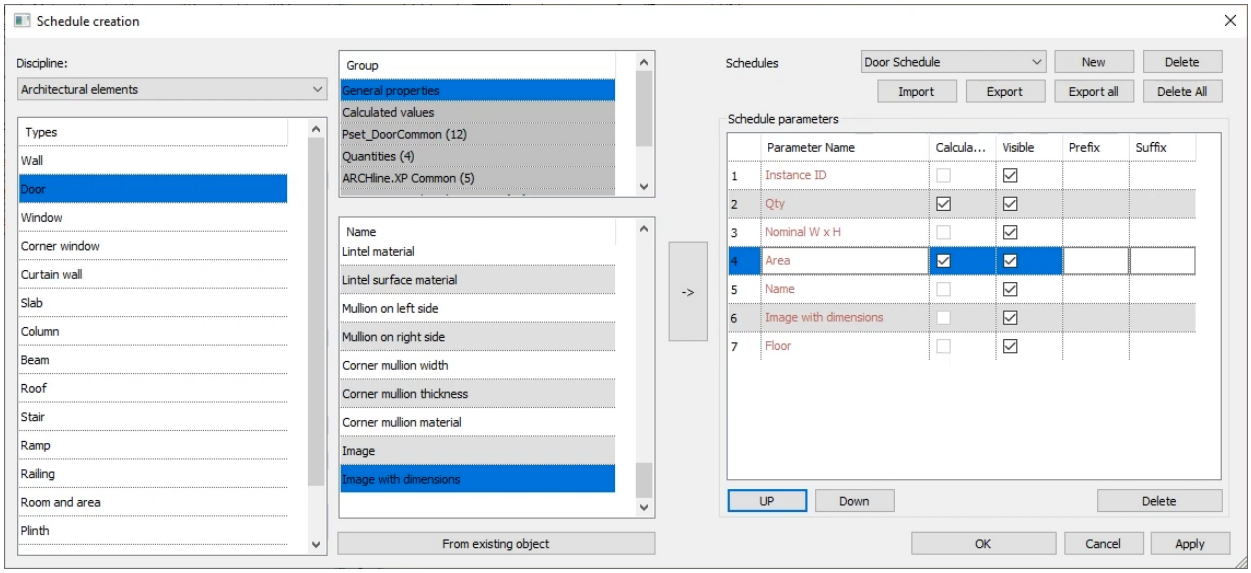
2.2.13. Schedules

Schedules are dynamic lists of building parts, generated based on the project content. Schedules are in bi-directional connection with the drawing, which means that changes of the projects are reflected in the schedules and changing values of the schedule tables will have an effect on the corresponding items of the drawing, too. Let's see how that works.

- Activate the Ground floor.
- Click on the **Documentation / Schedule / Placing Schedule** command on the **Ribbon bar**.
- Select the "**Window**" schedule in the left-hand side list of the appearing dialog window, then press **OK**.
- Let's keep the default setting in the "Formatting schedule" window and click **OK**.
- Place the schedule next to the drawing on the Ground floor with one click.

You can see that all the windows are grouped into one row, because they have the same parameters. Let's place a schedule for doors too. This time we'll customize its content.

- Click on the **Documentation / Schedule / Define Schedule** command on the **Ribbon bar**.
- The appearing dialog is similar to the one we used for defining the tag previously.
- Select the Architectural elements, Door, General properties and add the Image with dimensions option to the schedule by pressing the right arrow in the middle.
- With the up and down arrows organize the door schedule's content to the same order as the window schedule.
- Click Apply and OK to accept the changes.



- Place the door schedule the same way as before.
- Select the All floors option in the top to extend the schedule to the whole building.
- Click OK to accept the changes and place the door schedule under the window schedule.

Finding and changing items of a schedule

Items of a schedule can be easily found on the drawing, by selecting the content.

- Select the previously placed schedule and find one of the **Flush** doors of the Ground floor in the list.
- Click on the small "**Finder**" magnifying glass icon at the left side of the row and the software will draw an arrow pointing to the item on the drawing.
- Find the width value in the schedule for this very door and click on the blue value.
- Type a slightly smaller or larger value (for example 1000 mm or 850 mm) and hit **Enter**.
  The software changes the width of the door on the drawing.

Saving schedules into Excel tables

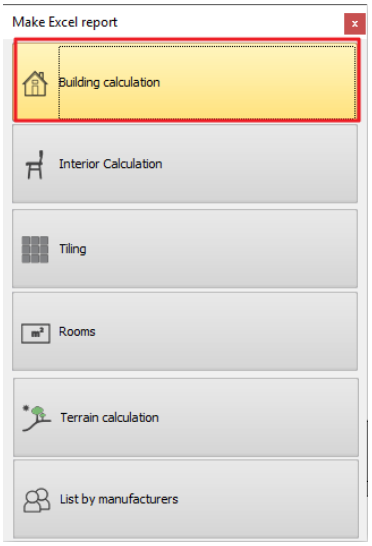
If you want to save a separate table of the schedule, you can do it easily.

- Right click on the schedule and select the Save to Excel command.

2.2.14. Quantity take-off

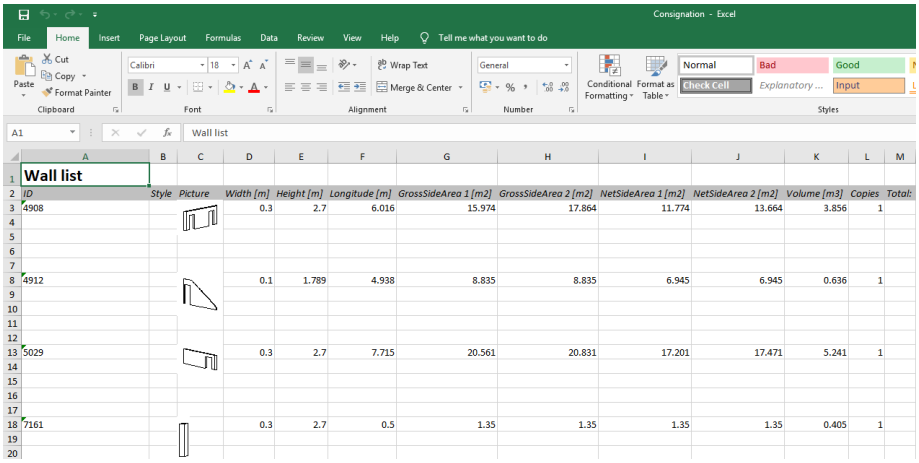
Quantity take-off is a great set of commands that you can use when you would like to extract data from your design into Microsoft Excel files to use them for calculations.

Let's extract a Building calculation and a Room summary list.



Building calculation list:

- Use the **Ribbon bar / Documentation / Quantity take-off / Excel list** command.
- Select the **Building calculation** option.
- Leave all options enabled and turn off **"Export BIM parameters"** and click **OK**.
- Set up the file name "**Building_calculation.xlsx**" and click Save to save the file.
- Microsoft Excel automatically opens the file if you have it installed on your computer.



Wall list

ID	Style	Picture	Width [m]	Height [m]	Longitude [m]	GrossSideArea 1 [m2]	GrossSideArea 2 [m2]	NetSideArea 1 [m2]	NetSideArea 2 [m2]	Volume [m3]	Copies	Total:
4908			0.3	2.7	6.016	15.974	17.864	11.774	13.664	3.856	1	
4912			0.1	1.789	4.938	8.835	8.835	6.945	6.945	0.636	1	
5029			0.3	2.7	7.715	20.561	20.831	17.201	17.471	5.241	1	
7161			0.3	2.7	0.5	1.35	1.35	1.35	1.35	0.405	1	

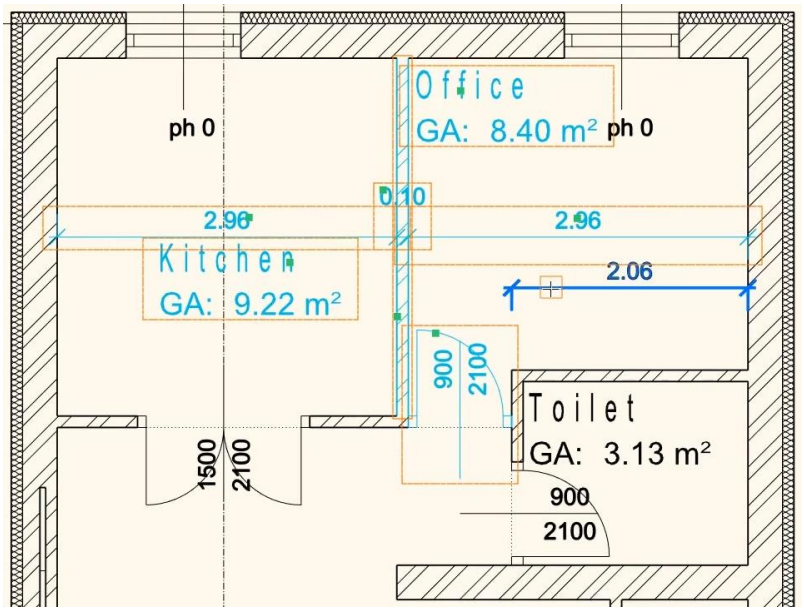
Room summary list:

- Use the **Ribbon bar / Documentation / Quantity take off / Excel list** command.
- Select the Rooms option.
- Click on "**Yes**" to update all rooms and areas in your project to reflect the latest status.
- Set up the file name "**Room_summary.xlsx**" and click "**Save**" to save the file.
- Microsoft Excel automatically opens the file if you have it installed on your computer.

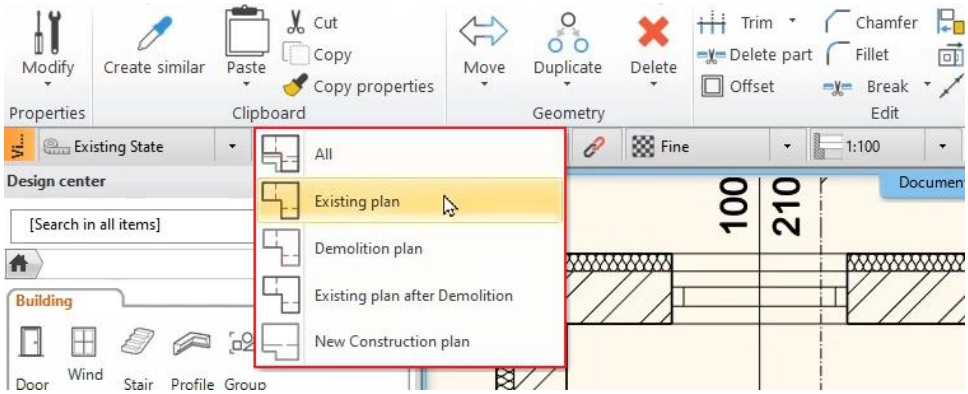
2.2.15. Design phases

When you want to show multiple instances of the same building, you can assign different elements to different phases. If you use phases instead of deleting parts of the building, you will be able to refer back to the original plan in the documentation.

- Turn the Kitchen and the Office into one room by changing the phases of the partition wall and the smaller door.
- Select the Ribbon bar / Edit / Phases / Change to Demolish command.
- Select the partition wall, the single door, the area stamps and the dimensions and hit Enter.



- In the top Taskbar under the Ribbon bar you can find the Phase filter selector.
- Here you can define which phase the program should show.

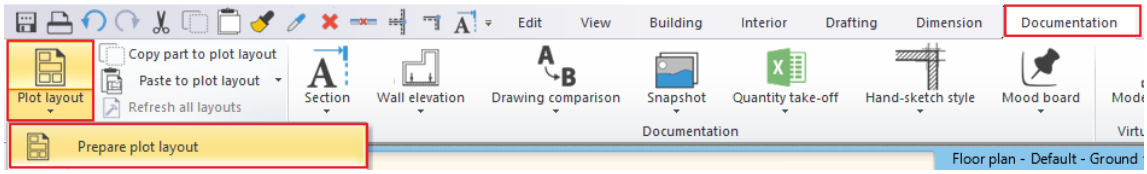


- Select the Existing plan to see the original version of the building.
- Select the Demolition plan and the program will automatically mark the parts that are connected to this phase.
- Select the Existing plan after Demolition to see the building after demolition.
- Select the New construction plan to see the parts that were added after the unnecessary parts were demolished.

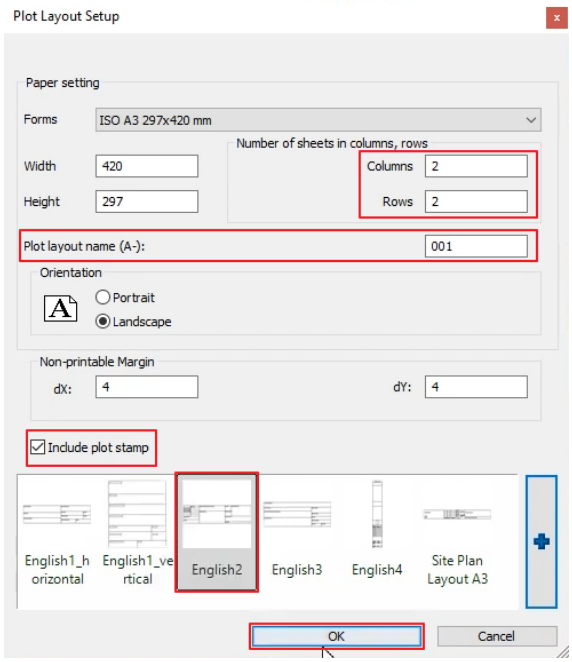
2.2.16. Plot layout

In order to record differently scaled plans to the corresponding project it is beneficial to create plot layouts. It is also recommended to use them as they provide neat, precise look.

- The **Prepare plot layout** command is available under the **Ribbon bar / Documentation / Plot layout** group.



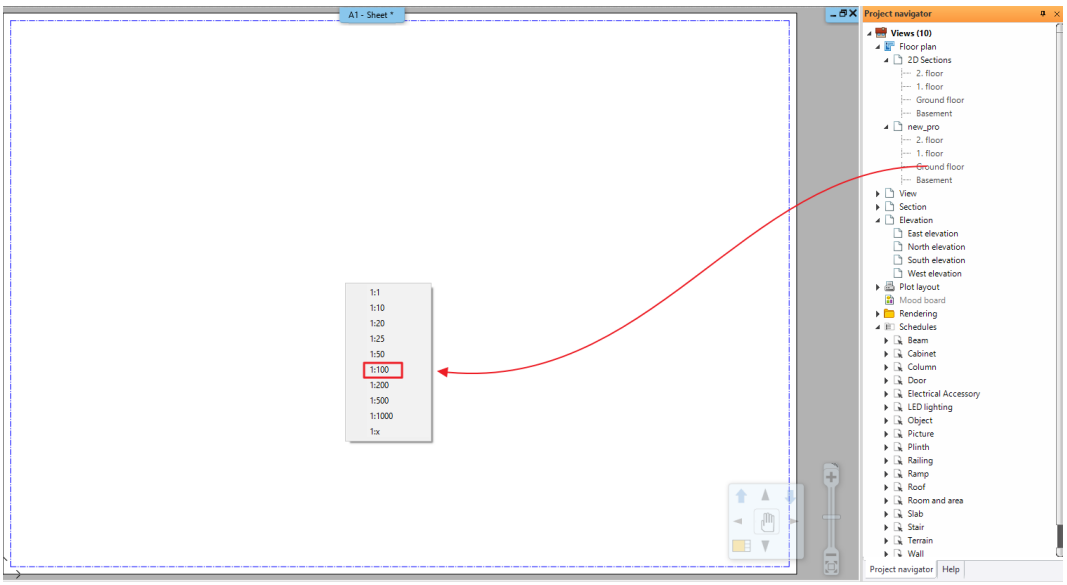
- First, you need to set the paper size, the number of pages, the name of the layout and the orientation in the appearing dialog window.
- You also need to select the plot stamp, which is named “English2”.
- Click OK to accept the settings and to create the plot layout.



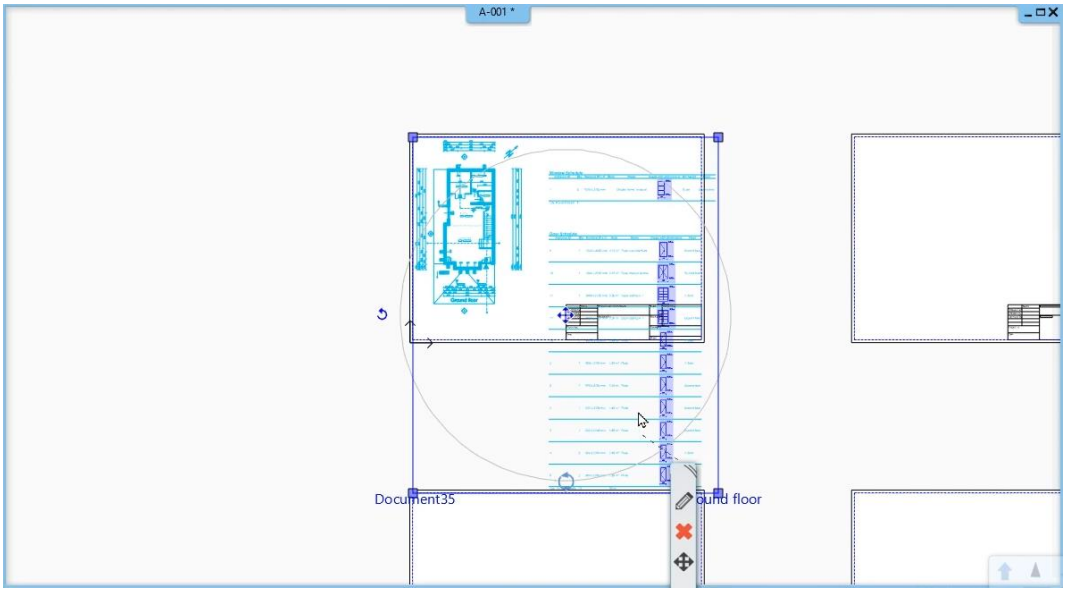
2.2.16.1. Floor plans on the plot layout

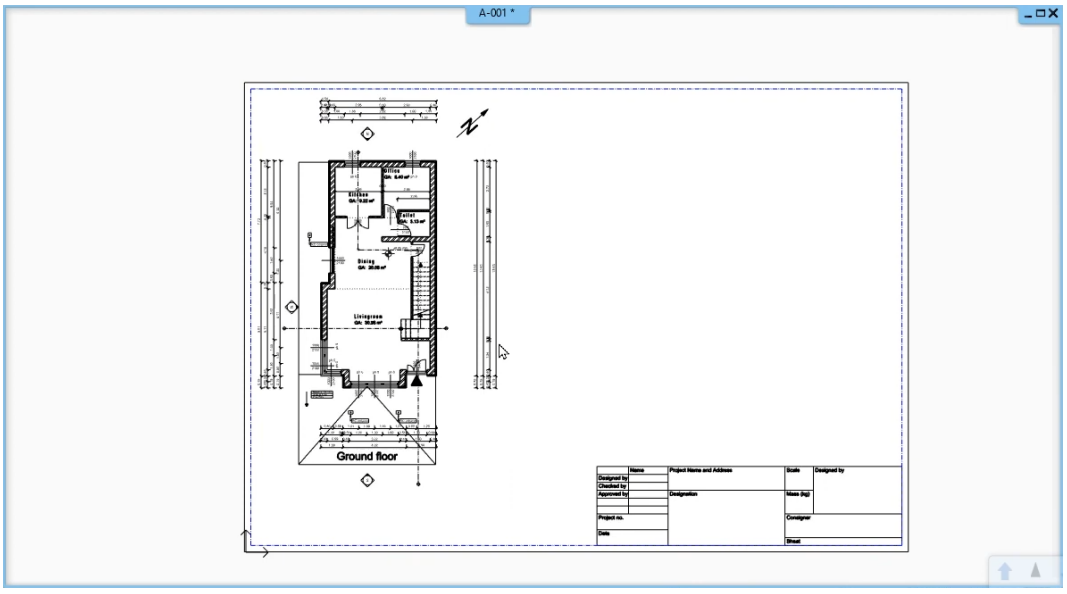
From the Project Navigator on the right-hand side drag and drop the Ground floor drawing on the sheet.

- “Drag and drop” the **Ground floor** plan onto the page and select the **1:100** scale factor.



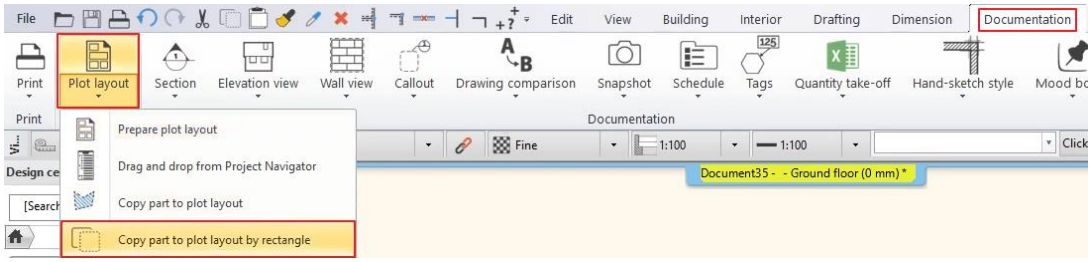
- Place the content to an empty area of the plot layout. This way it is possible to place different drawings on a plot layout with different scaling.
- Click on the blue border line to offset the right side and the bottom side, so only the floor plan will be visible.



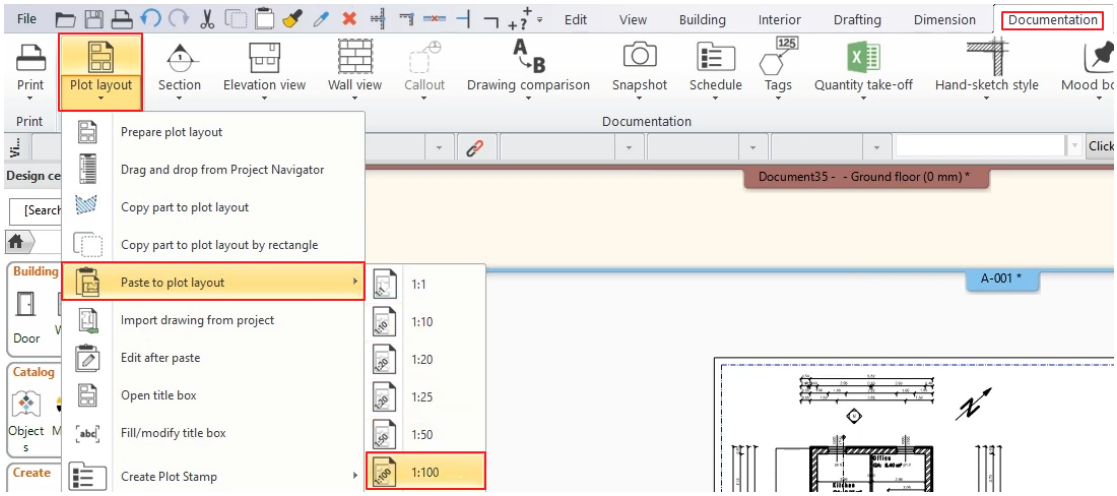


Now let's create the demolition plan for the documentation. We only need the top part of the floor plan for this.

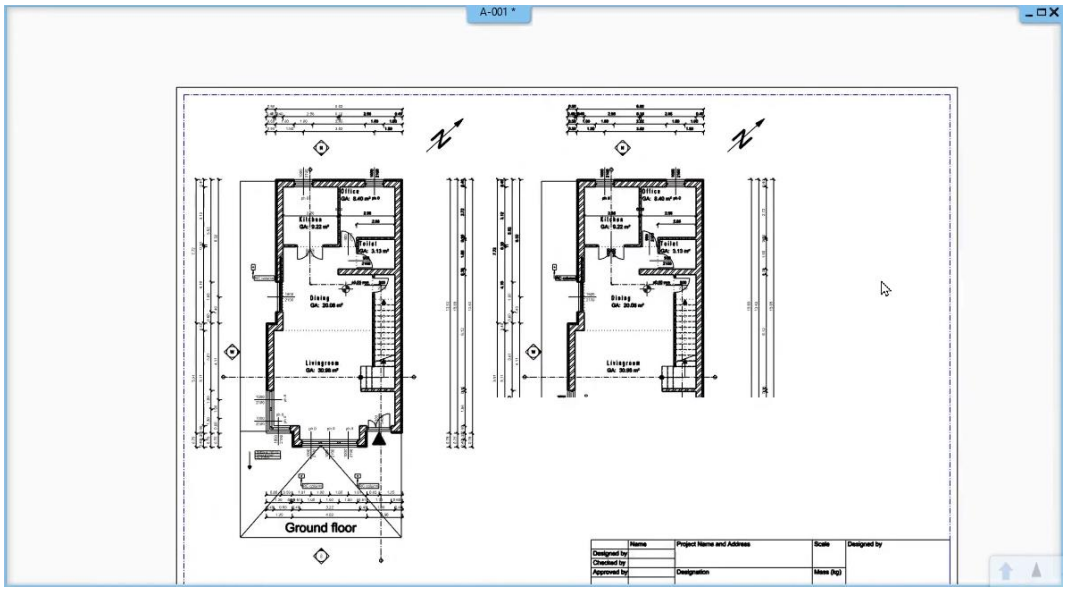
- Activate the Ground floor and click on the Ribbon bar / Documentation / Plot layout / Copy part to plot layout by rectangle command.



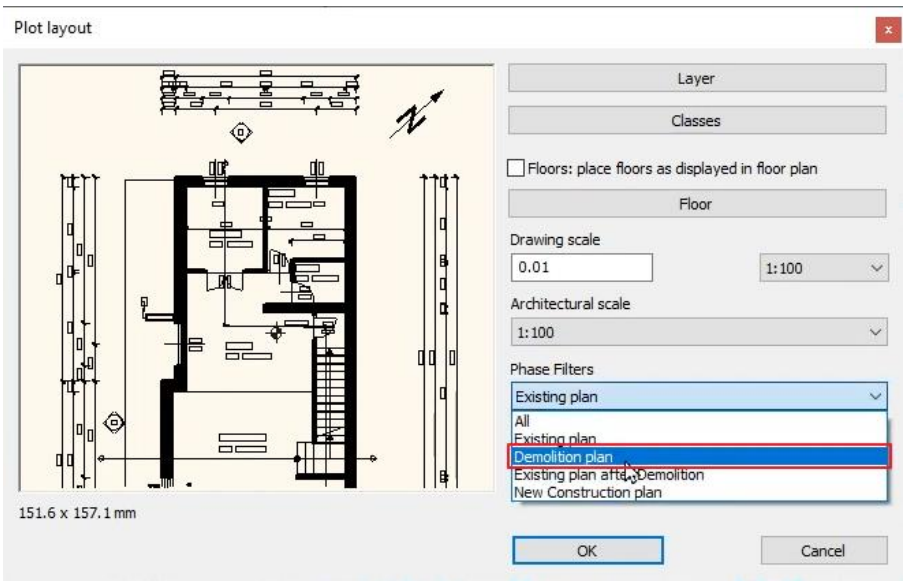
- Select the area of the floor plan, then set the reference point.
- Activate the plot layout and click on the Ribbon bar / Documentation / Plot layout / Paste plot layout / 1:100 command.



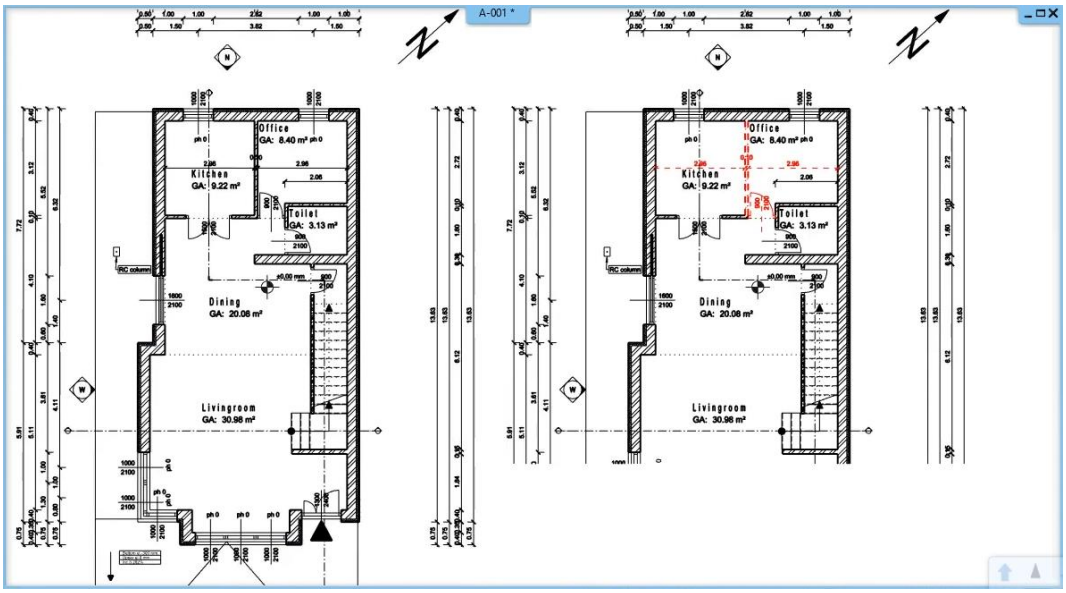
- Place the drawing on the plot layout.
- Select it again and click on the move icon. Select the Move from … command and click on the top left corner of the building.
- align the drawing to the other floor plan.



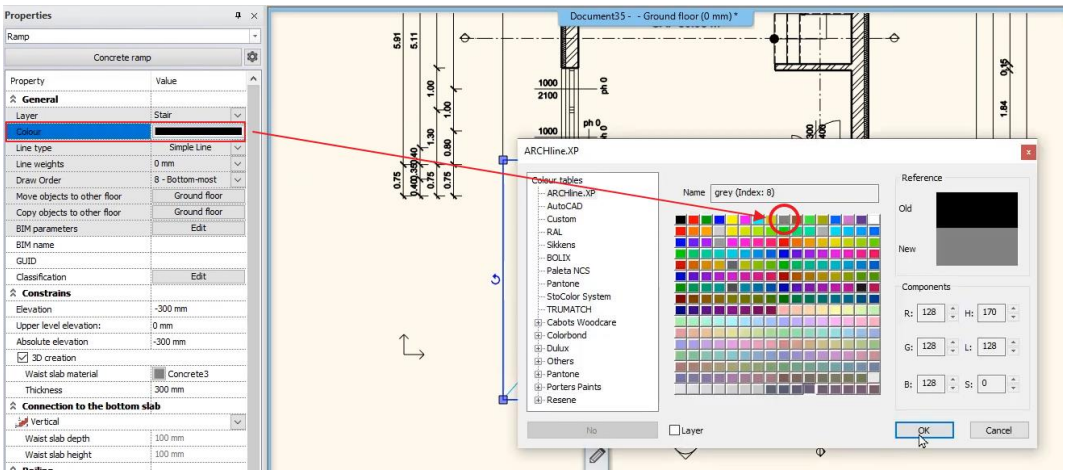
- Select the second floor plan and click on the pencil icon to open its properties dialog.
- Change the Phase Filter to Demolition plan.



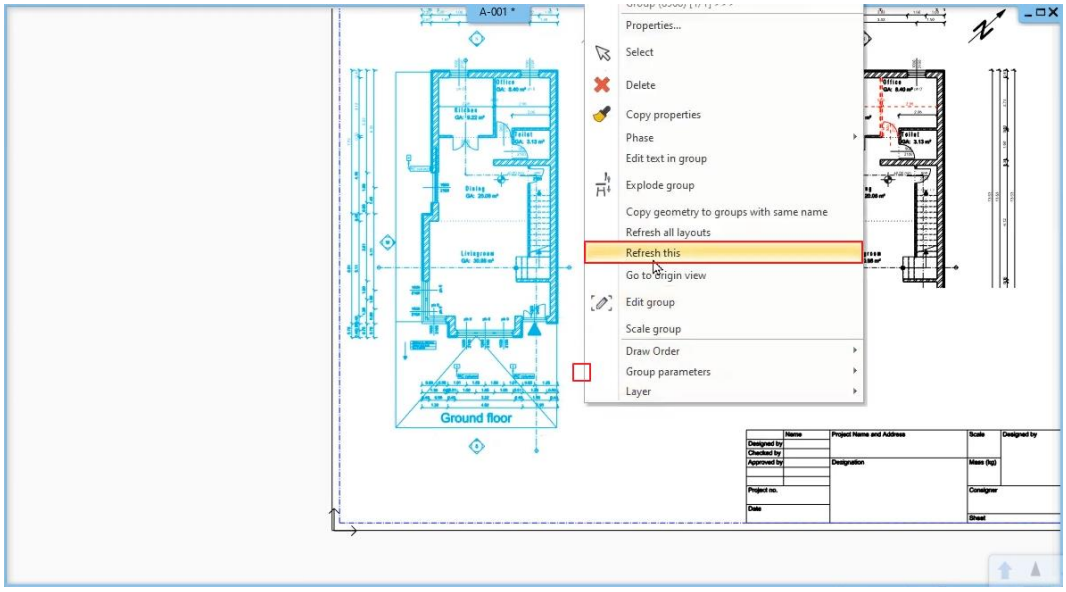
- The program automatically calculates the changes and shows it on the plot layout.



- Go back to the floor plan view and change the ramp's color in the property grid to grey.



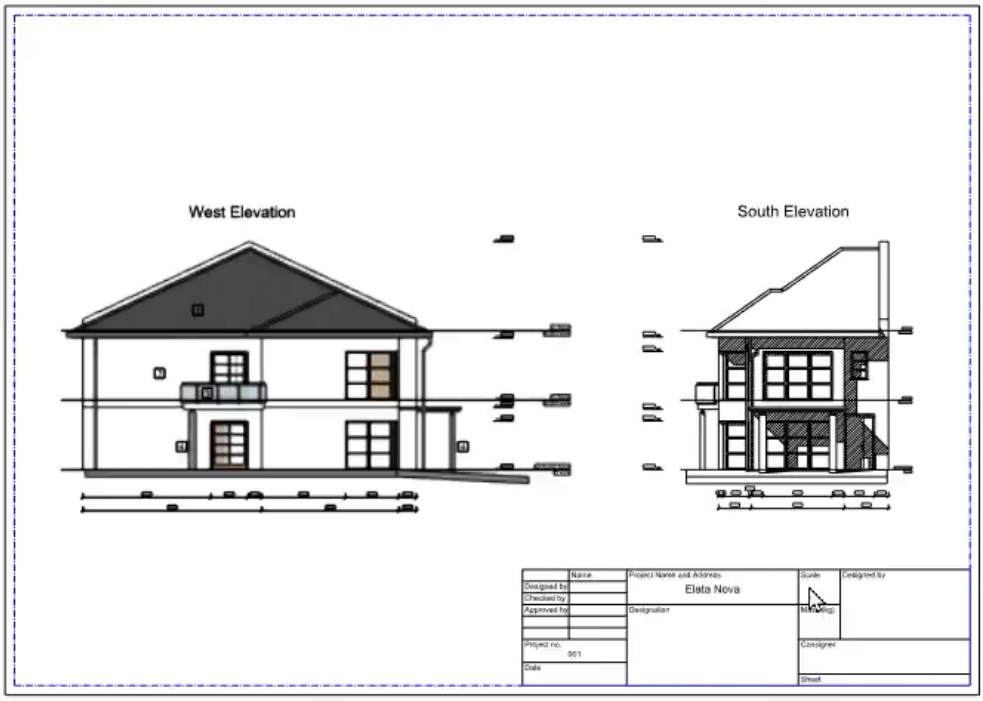
- Go back to the plot layout. You'll see that this change is not visible yet.
- Right click on the first plan and select the Refresh this command.



- Now the program will recalculate this drawing and show the changes on the plot layout too.

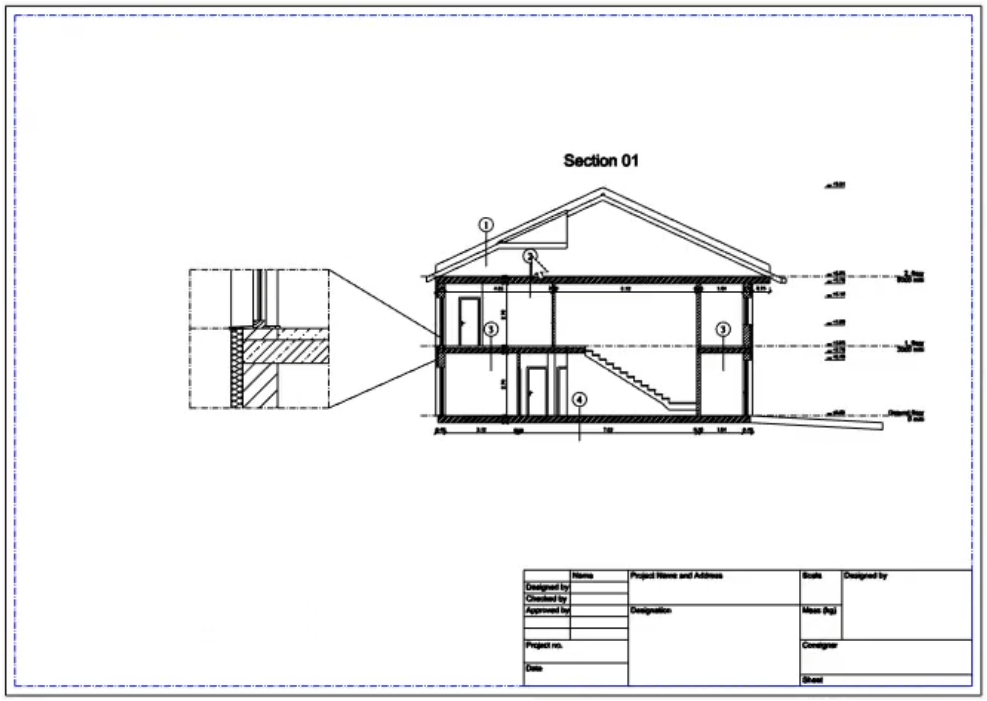
2.2.16.2. Elevations on the plot layout

- Drag and drop the West elevation on the second sheet and select the 1:100 ratio.
- Activate the South elevation and reactivate the shadows on the drawing.
- Place it on the sheet next to the West elevation.
- Align it to the West elevation.



2.2.16.3. Sections on the plot layout

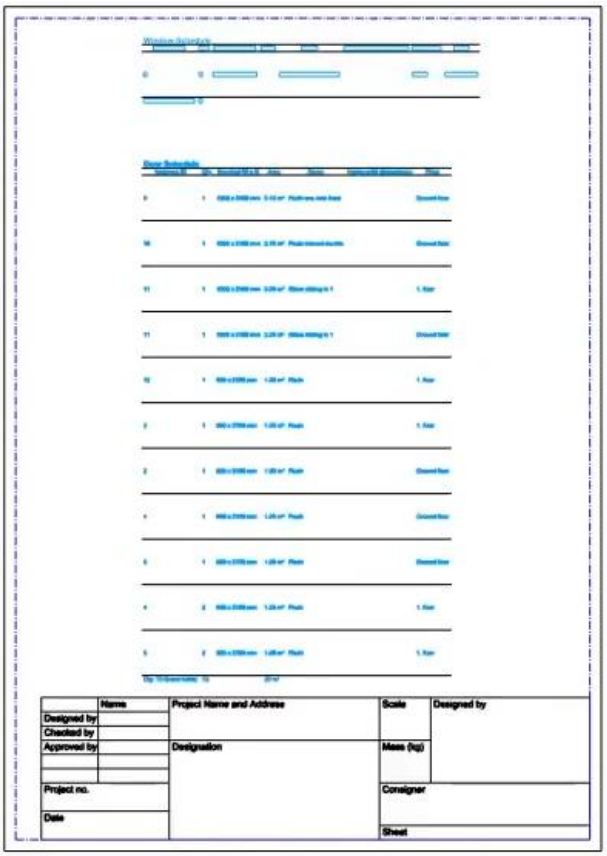
- Drag and drop the Vector section on the third sheet.
- Activate the callout and select its area with the Ribbon bar / Documentation / Plot layout / Copy part to plot layout by rectangle command. Set the reference point too.
- Place the callout on the plot layout in 1:20 ratio next to the section.
- Connect the section and the callout with lines as in the picture below.



2.2.16.4. Lists on the plot layout

We need an A4 page in portrait mode for the list to fit the paper best. We need to delete the fourth page and add a new one to the plot layout.

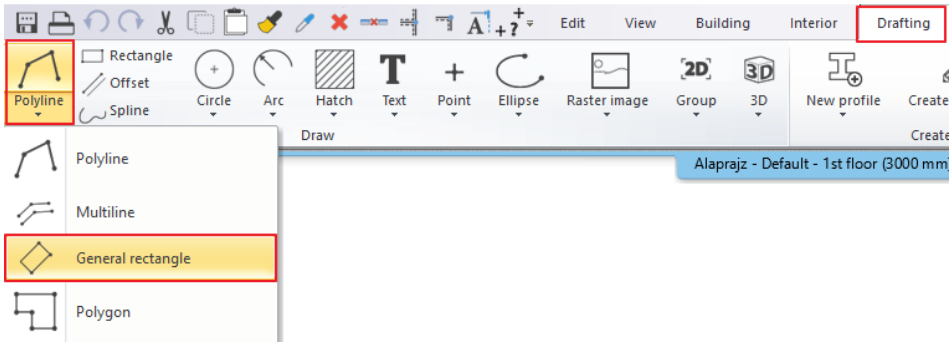
- Select the fourth page and the plot stamp and delete them.
- Click on the Ribbon bar / Documentation / Plot layout / Prepare plot layout command to add a new paper to the other ones.
- Select the A4 size from the drop-down menu, change the columns and rows to 1 and set the orientation to portrait.
- Click OK to accept the settings.
- In the appearing dialog click on No to add this paper to the layout.
- Copy the lists from the floor plan to the plot layout by any of the previously mentioned methods in 1:200 ratio.



Good to know: How to create plot stamps?

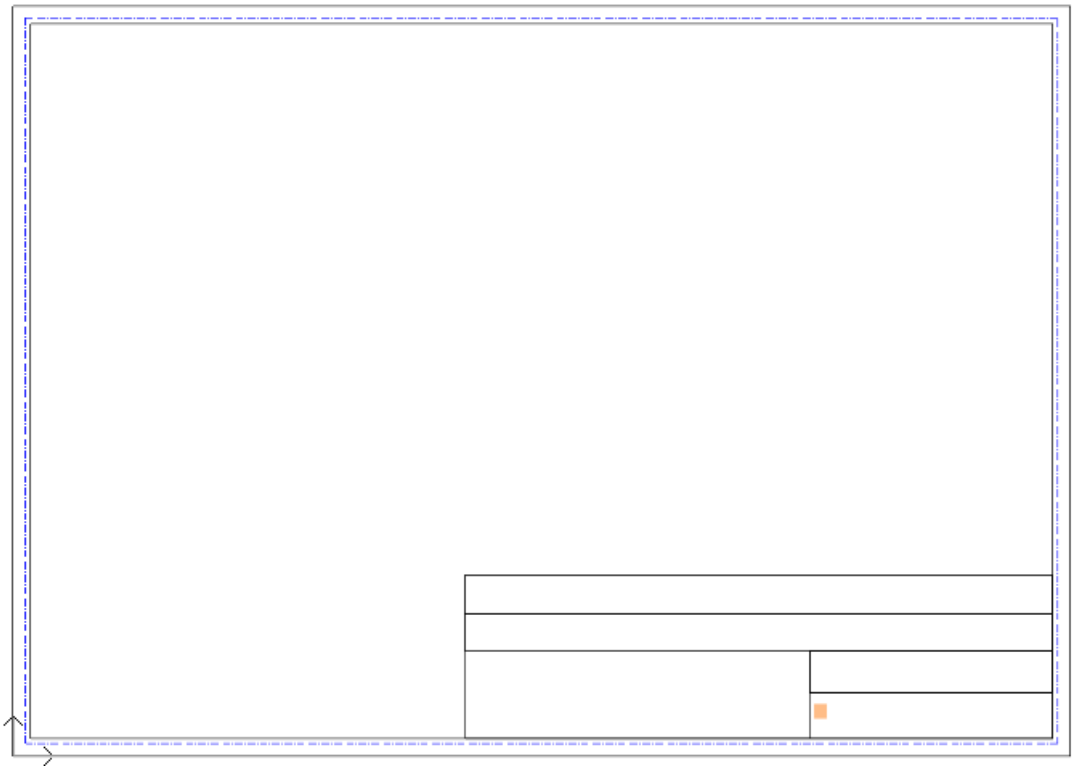
Documentation can be formally unified with the use of the plot stamp, which provides a suitable framework for the presented plans. It is possible to create a plot stamp that can be saved later on the plot layout. It is desirable to draw a plot stamp in different sizes (A3, A4), as well as in portrait and landscape positions, which you can use afterwards.

- Create a new plot layout following as described above.
- Create the plot stamp frame. The simplest way is to draw a border line along the print range (blue dotted line) by using **the Ribbon bar / Drafting / Polyline / General rectangle** command.
- After placement, select Offset All command from the Local menu and move by 2 mm towards the center of the plot layout.

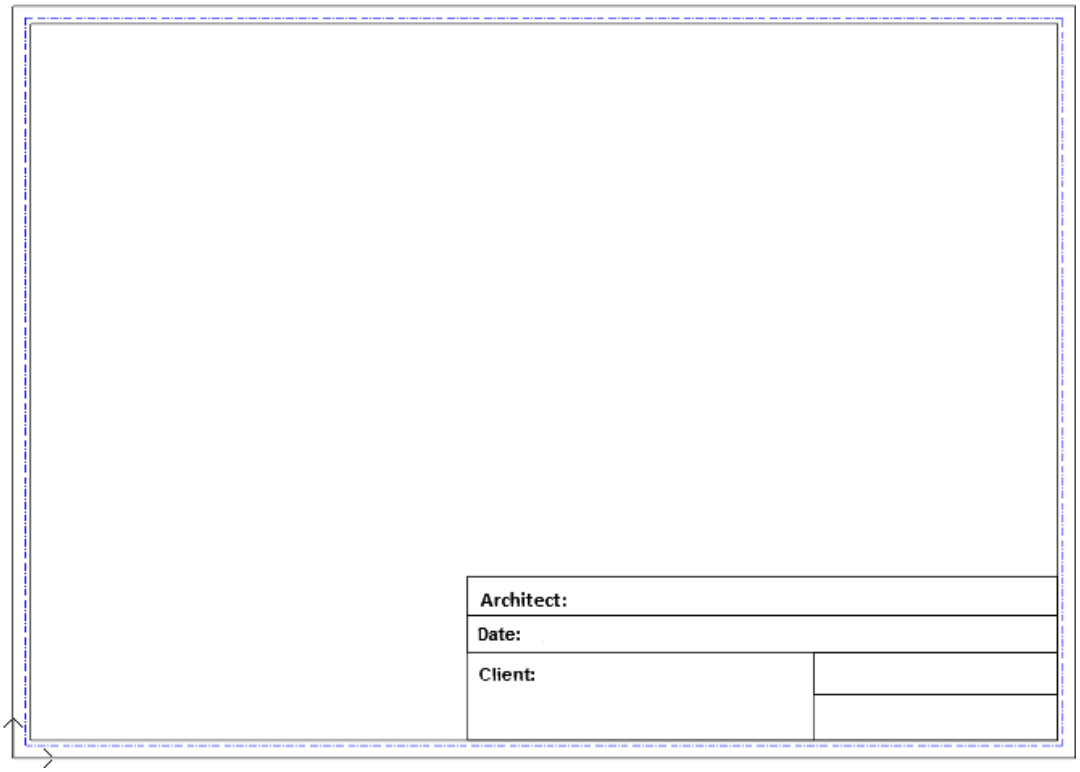


The offset is needed in case the contour of the plot stamp and the border line of the printing area are overlapping each other; therefore, it won't be visible in printing.

- Drawing additional rectangles in the plot layout, you can create the final layout of the stamp as it is shown below:

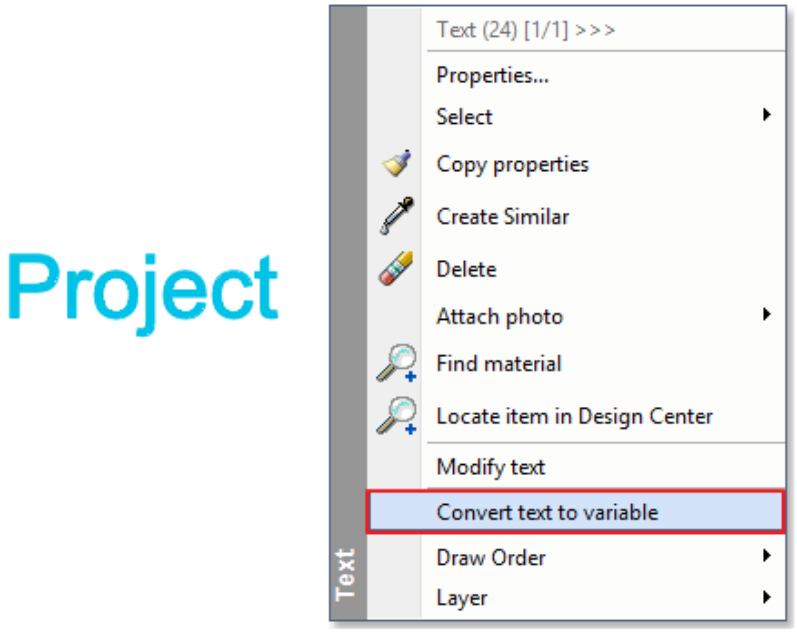


- Insert a label (e.g., customer, designer, name of plan, scale, date, logo, etc.) by using the **Ribbon bar / Drafting / Text / Place it** command in the plot stamp.
- Depending on the most recently used settings, change the text size to 5-10 mm to fit in the columns.



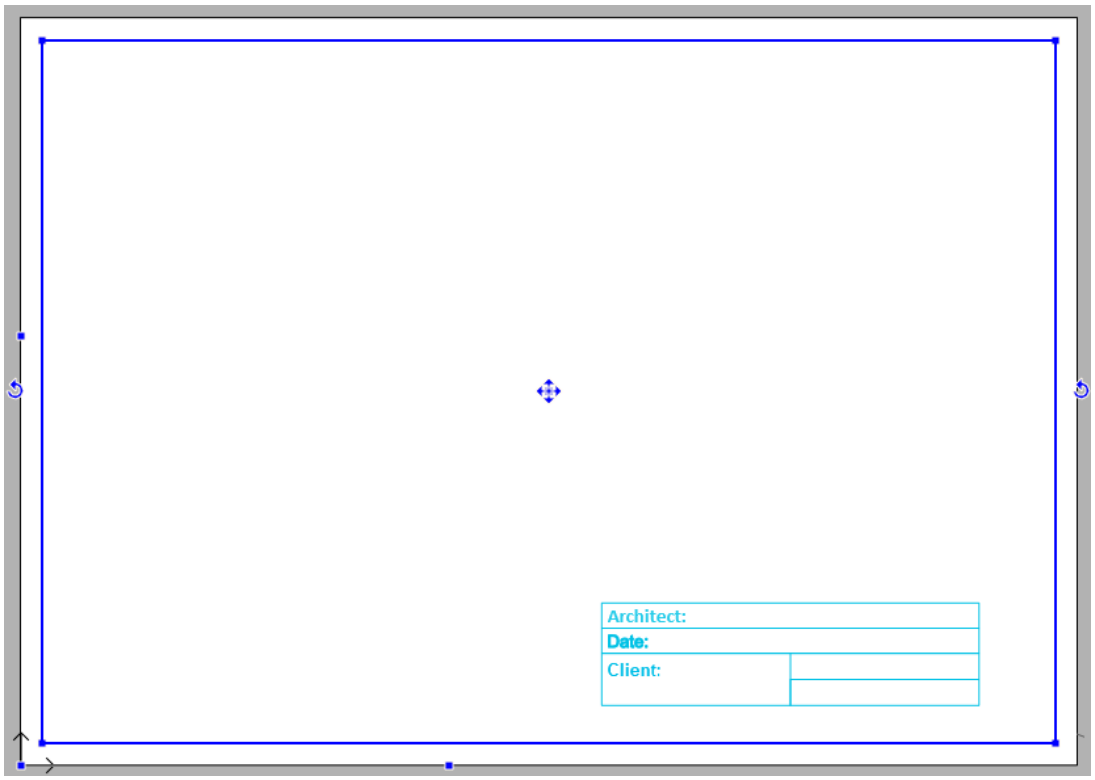
You can place a logo / image in the plot stamp with the **Ribbon bar / Documentation / Mood board / Raster image** command.
After that, fill in the plot stamp with additional texts and convert these into variables in order to be able to rewrite them after each placement.

- Place text from the **Ribbon bar / Drafting / Text** group.
- Adjust the height of the text to the correct size, then right click and select the „**Convert text to variable**" option.

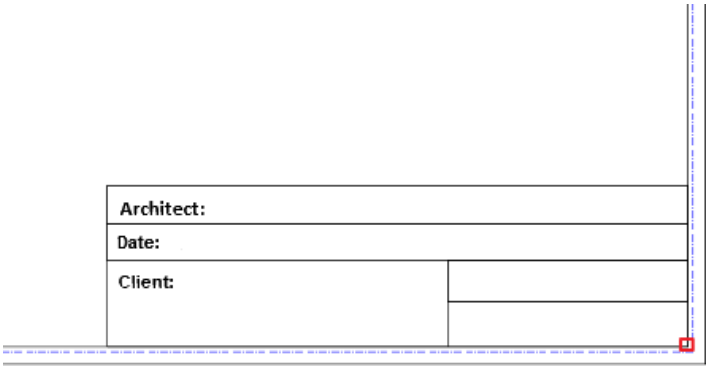


When you have finished setting up the content, it is recommended to save the plot stamp. This way it will be available later.

- Select all elements of the plot stamp, but make sure that the plot layout itself is not included. The simplest way to do this is to select the entire page and its contents with a rectangle. Then hold SHIFT down and click on the border edge of the page, now its color will change to black, while the contents of the stamp remain blue.

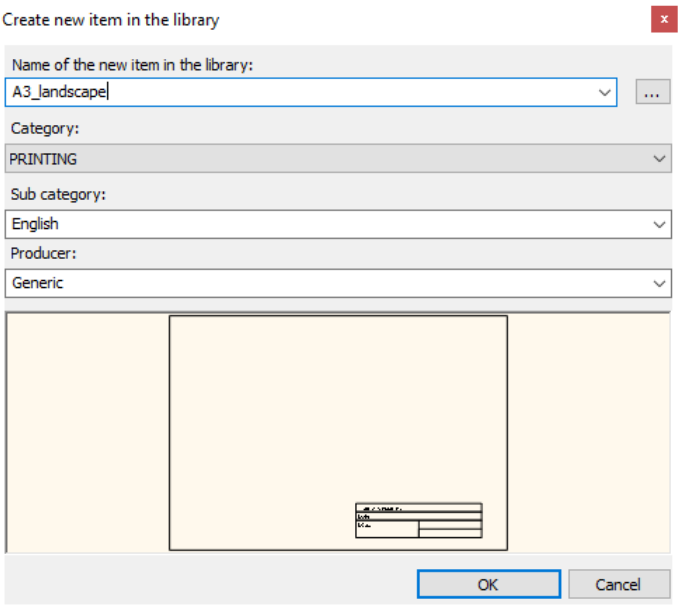


- Select the **Ribbon bar / Drafting / Group / Create group in library** command.
- Specify the reference points of the plot stamp; these will be used for placing it later.



As a reference point, it is useful to select the corners of the printing area. This way when you place it later, the plot stamp will always be within the print range.

- Press ENTER and the "**Create new item in the library**" window appears.
- Type the name of the library element (e.g. A3_landscape).
- Define the category and subcategory of the item (e.g. PRINTING / English), and then click **OK**.

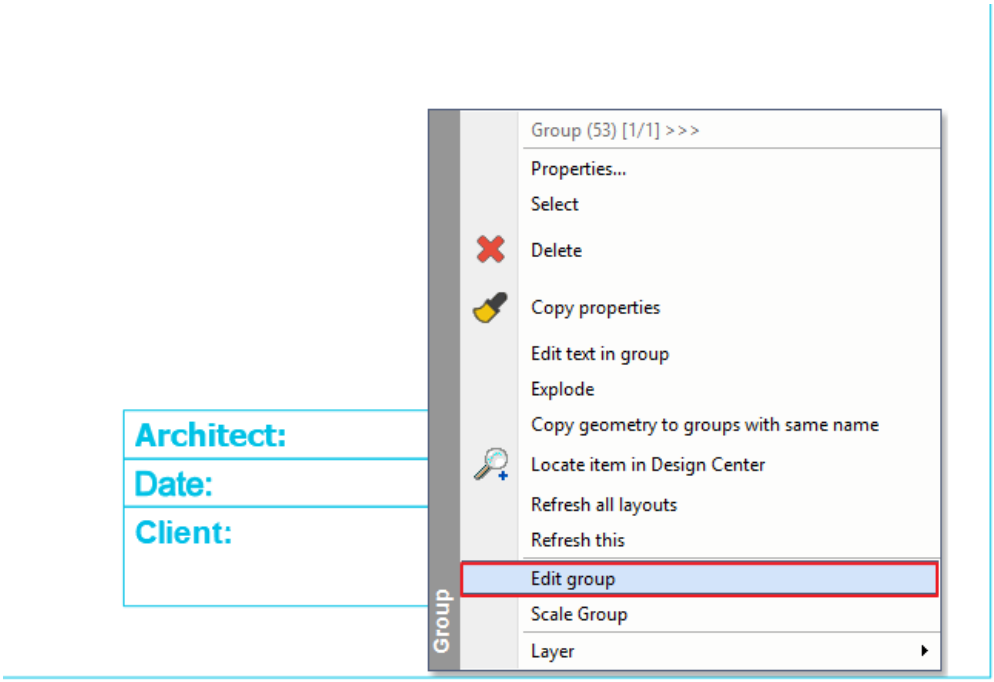


After saving, the plot stamp will be available to be placed from the Design center.

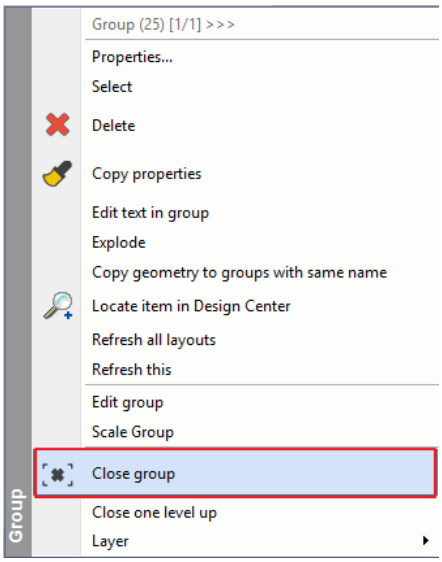
- Simply find the Groups in the Design center and use the “drag and drop” method to place it on an empty plot layout in the bottom left corner, for example.
- To fill the plot stamp, right-click on the edge of the plot stamp, then select the „**Edit text in group**” command or left click with your mouse button to change directly the data in the plot stamp.

Other parts of the previously placed plot stamp can also be modified after placing it:

- Select the plot stamp and choose Edit group from the Local menu, the contents of the plot layout turn grey.



- Then you can modify the elements of group (text, lines).
- After making the changes, make sure to close the group by using the **Close group** command in the Local menu.



Good to know: Layer visibility on plot layout

How is it possible, that everything is visible on the plot layout but after printing, some elements are missing from the document? This is the result of the incorrect layer visibility settings. Let's see how to set up the correct layer visibility of a drawing.

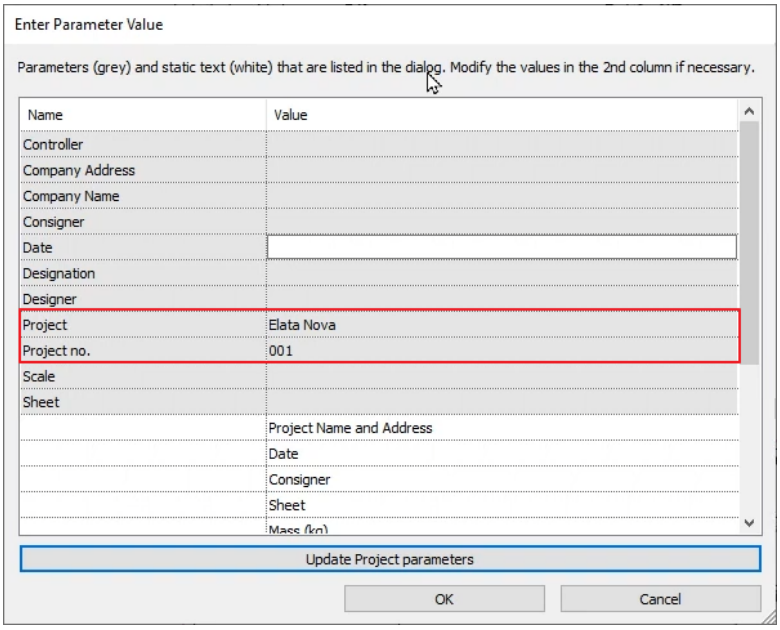
- Select a drawing on the plot layout and click on the pencil icon.
- Click on the Layer button and check which of the layers are visible on the drawing.
- When all the needed layers are visible in this setting, close the dialog by clicking OK.
- Activate the original drawing and click on the Layer Properties Management button on the bottom bar.
- In the appearing dialog check the Printable column and make all needed layers printable.

2.2.16.5. BIM parameters and plot stamps

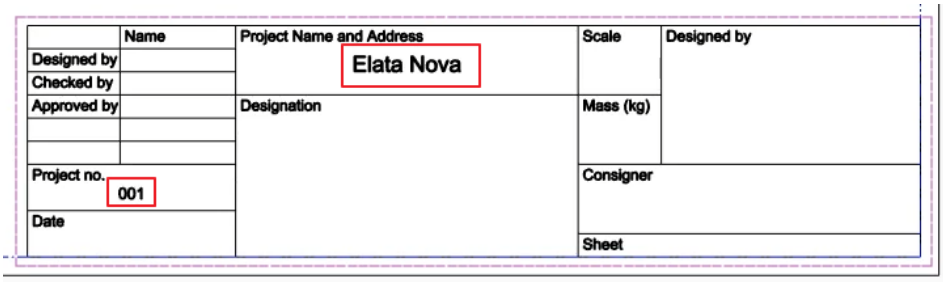
When you have variable texts in the plot stamp, you can easily add and change parameters of the stamp by modifying the BIM parameters.

- Go to File / BIM / Project parameters and add the wanted information to the correct row in the appearing dialog.
- Add "Elata Nova" to the Project name, "001" to the Project version number and your name to the Architect name.

- You can also add new rows with custom information to this list by clicking on the Add button.
- Click OK to accept all changes.
- Right click on the stamp and select the Edit text in group command.
- In the appearing dialog click on the Update Project parameters button. This will update the variable texts in the stamp.



- Click OK to accept the changes and now the stamp is automatically filled with the added BIM parameters.



- To do this in bulk, you have to go to the Ribbon bar / Documentation / Plot layout / Update Project Parameters command.
- Clicking on this command opens the Project properties dialog, in which you can further customize the content.
- Click OK to accept all changes, and the program will update all stamps automatically.

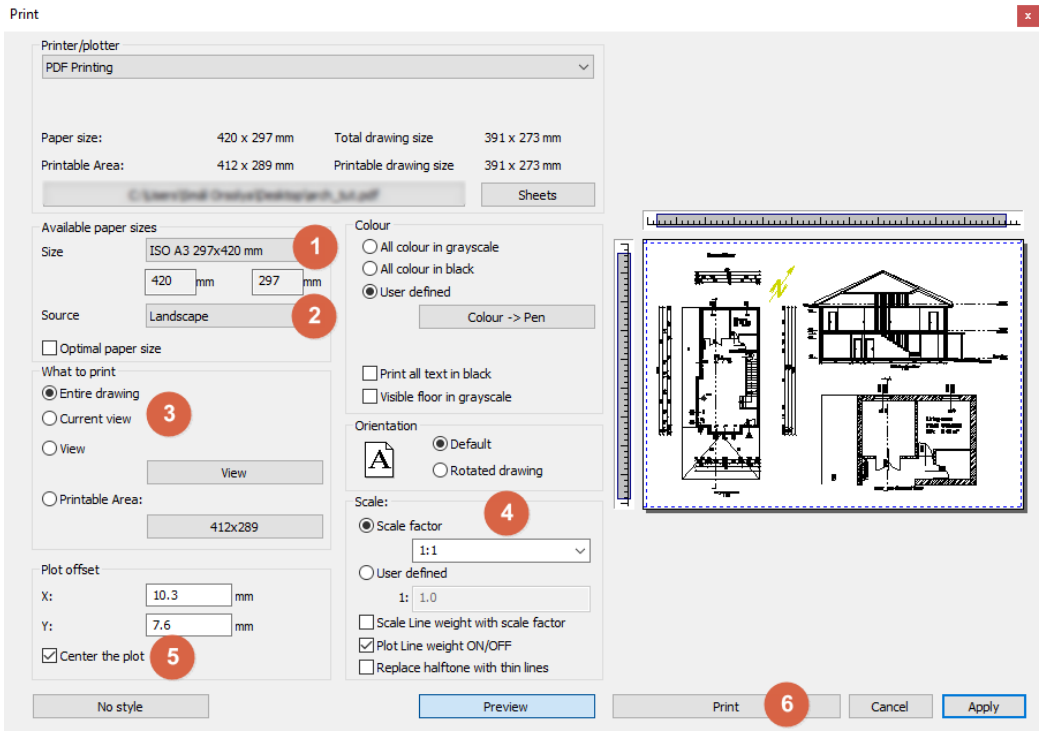
2.3. Printing

It is essential to be able to publish your previously created drawings in a project. You can either:

- ❖ print the current single drawing or
- ❖ print the current plot layout assembled from many other drawings.

The result can be a hard copy or a PDF file, depending on what you need to provide for your clients.

Make sure you have the plot layout activated and start the **Ribbon bar / Documentation / Print** command.
Let's see a quick guide to the Print dialog, before we start:



Printer/Plotter

All available PDF options and printers are in this list. You can choose any of the available options at your preference.

Paper size (1)

Here you can set the paper size, orientation, and the number of copies.
Based on these settings, the paper and printable size information will be automatically set in Print dialog.

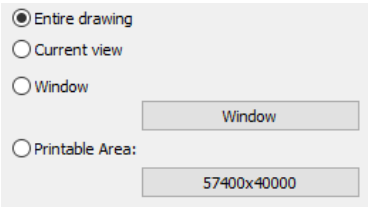
Orientation (2)

Specifies the drawing orientation. You can select Default or Rotated drawing option.

Don't confuse the Orientation with paper orientation. The former refers to the drawing and the latter to the paper sheet.

Content to print (3)

Specifies the area of the drawing to be printed.



Scale factor (4)

You can choose a predefined scale factor: e.g.: 1:100
The Scale to Fit calculates the best scale to fit the current paper size.

You need to set the scale 1:1 in case of publishing a plot layout, because the layout is a real-world size virtual paper and does not need to be further scaled.

Center the plot (5)

It moves the drawing center point into the paper center point.

Printing (6)

The Print button starts printing the content based on the settings of the Print dialog. The result can be a hard copy or a PDF file based on the selected Printer.

2.3.1. PDF printing / Publishing a PDF file

This time we will publish a PDF file out of the previously assembled Plot layout.

- Make sure you have the plot layout activated and start the **Ribbon bar / Documentation / PDF print** command.
- Click on the file path button in the appearing dialog and browse for a file location and type a filename and click on the "**Save**" button.

- Set up the paper size to **A3 landscape**.
- Set the scale factor to **1:1** – remember the plot layout is a virtual paper in real-world size.
- Make sure that the "**Entire drawing**" option is enabled and click on the "**Center the plot**" option to align the content.
- Start publishing the PDF file by clicking on the **Print** button.

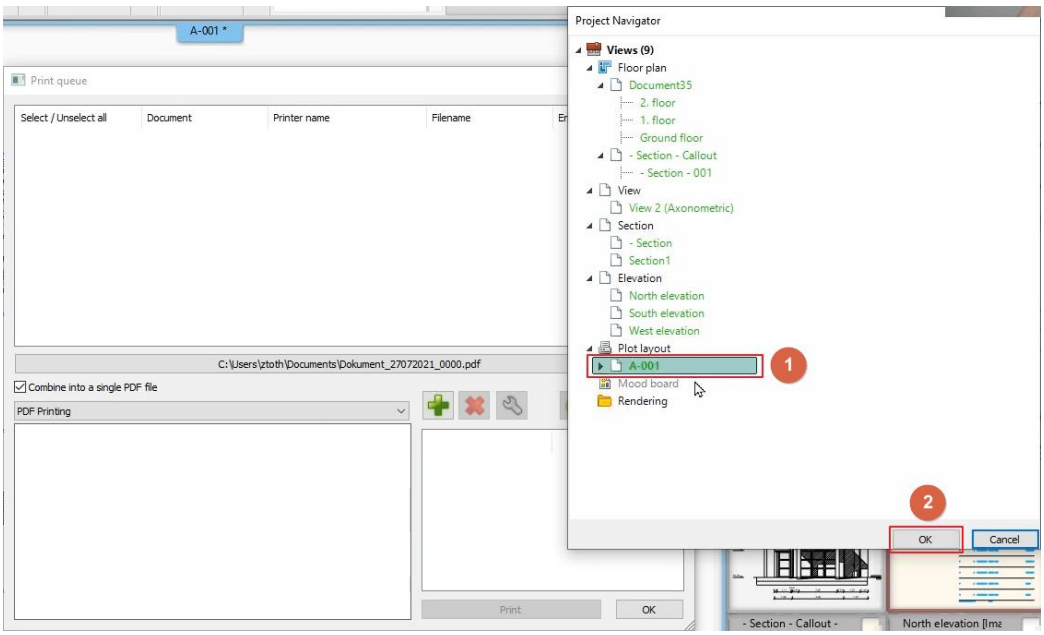
The PDF file is created in the predefined folder under the specified name.

2.3.2. Print queue

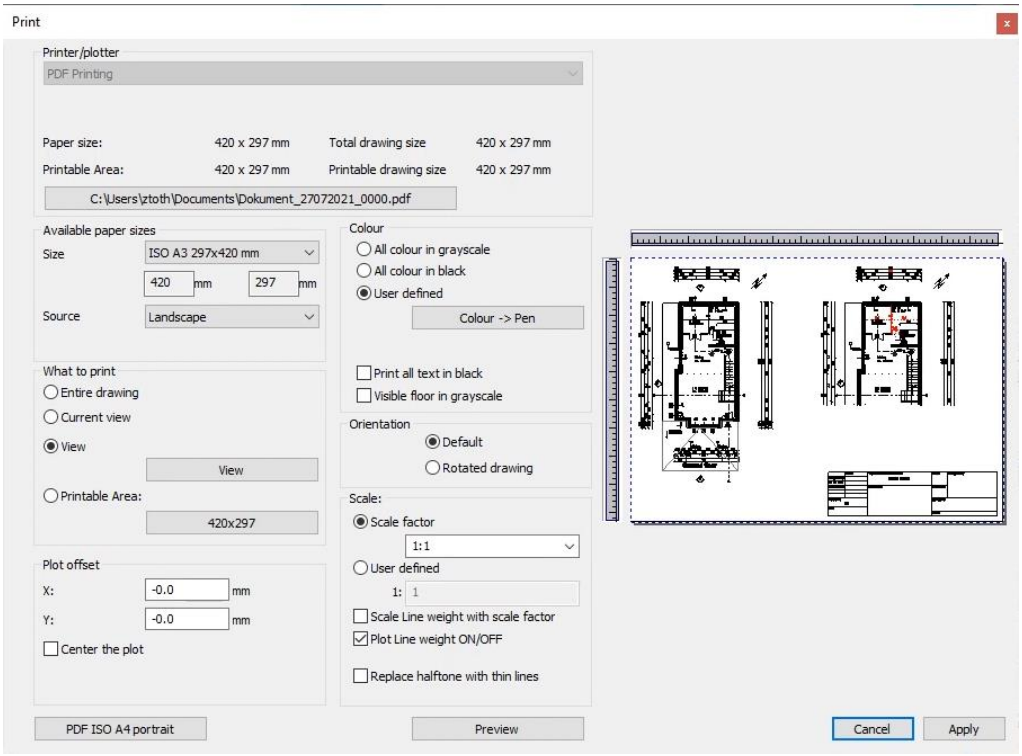
A print queue is a print/publish job-list that you can assemble and save with the project. It is extremely helpful when you need to publish your drawings over and over again, because it stores all the publishing settings for each and every content added to the print queue. This feature might not be available in all versions of the software, so please double check the availability of the command before you proceed.

Putting together the Printing Queue is simple:

- Start the **File menu / Print queue** command.
- Click on the **green plus**, and select the view/drawing/layout to be added to the Printing Queue from the Project Navigator.
- Click on the A-001 group name to select all plot layouts in it and click on OK.

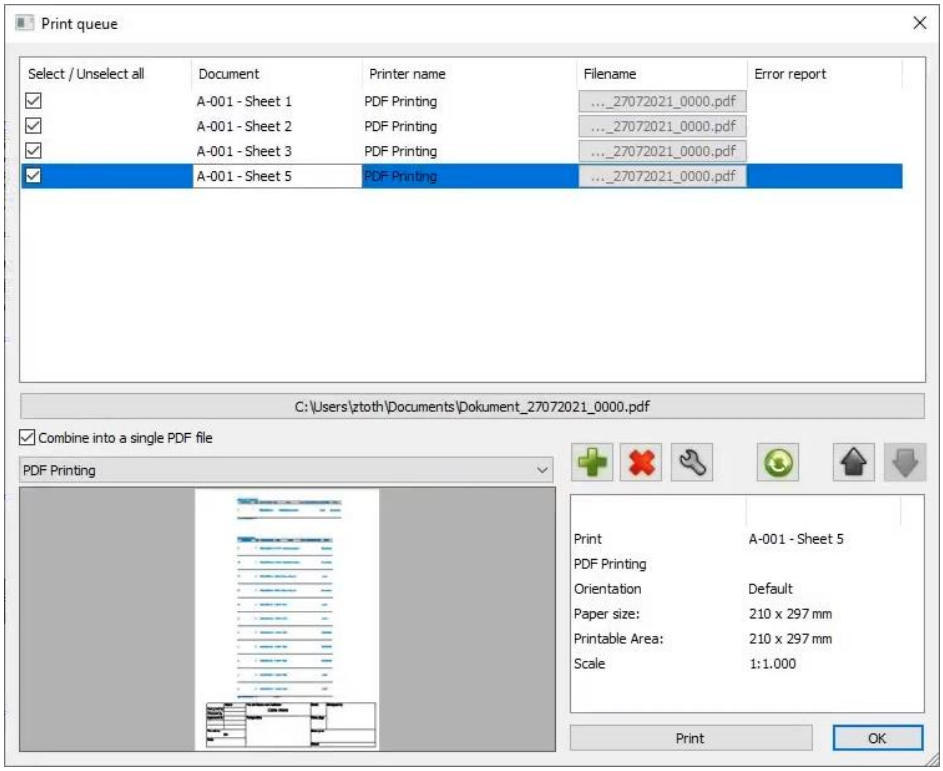


- Set up the printing properties in the appearing dialog and the close it with the "Apply" button.

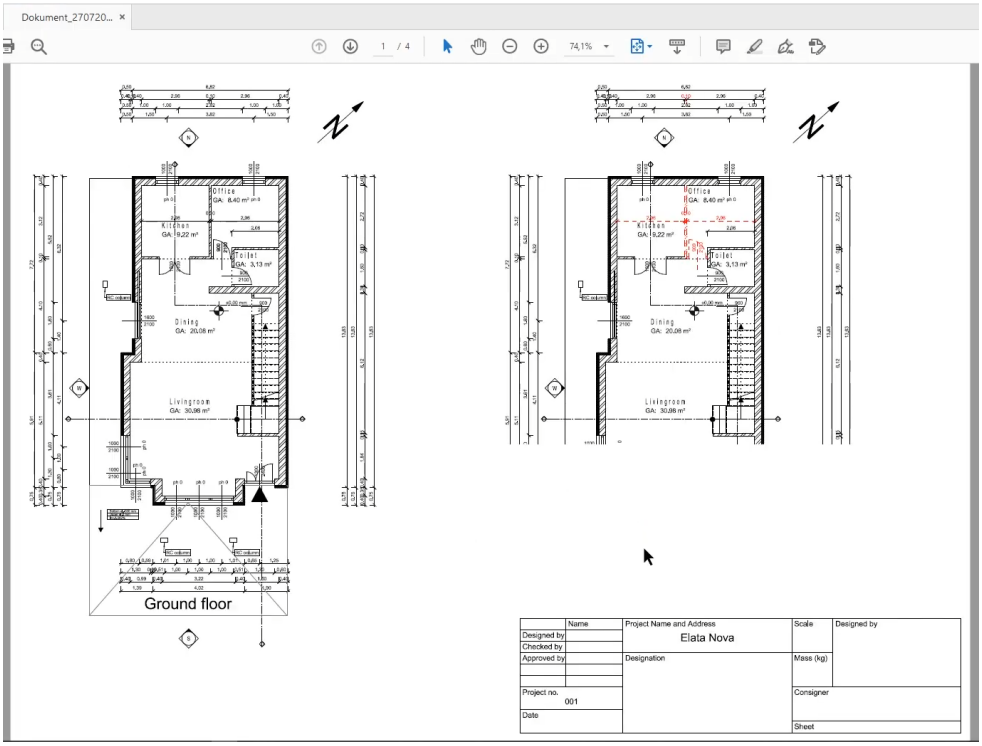


- Keep adding as many tasks to the list as you need.

  You can add, modify and cancel documents before starting to print. You can print the documents into one PDF file with multiple pages if you use the same file name or you can print the content directly to the selected printer.



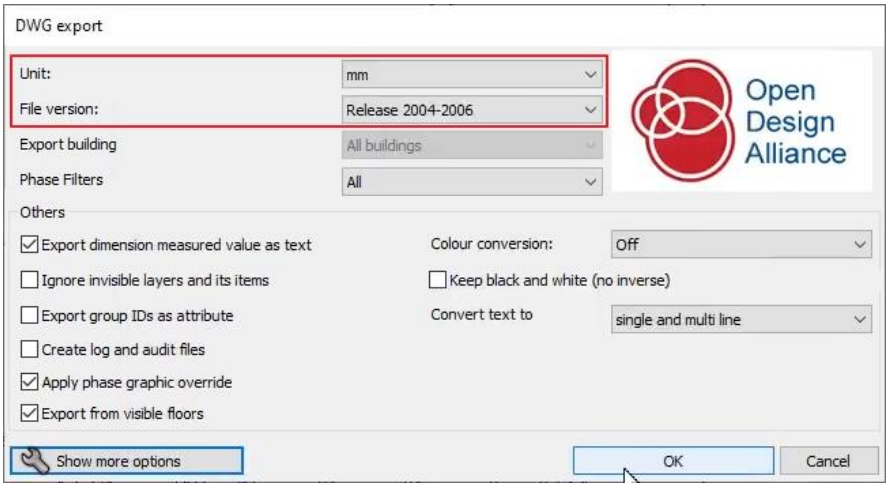
- Click Print to print out the sheets into one PDF file. It will be saved in the selected folder.



2.3.3. Exporting DWG files

Exporting DWG files from ARCHLine.XP® helps the communication with other CAD software. You can export 2D and 3D content from your project to DWG files.

- Activate the South Elevation view.
- Start the File / Export / DWG command.
- Define the path of the file where you want it to be saved and change the name to “Elata_South_Elevation.dwg”. Click on Save.
- In the appearing dialog define the File version and the Units too.



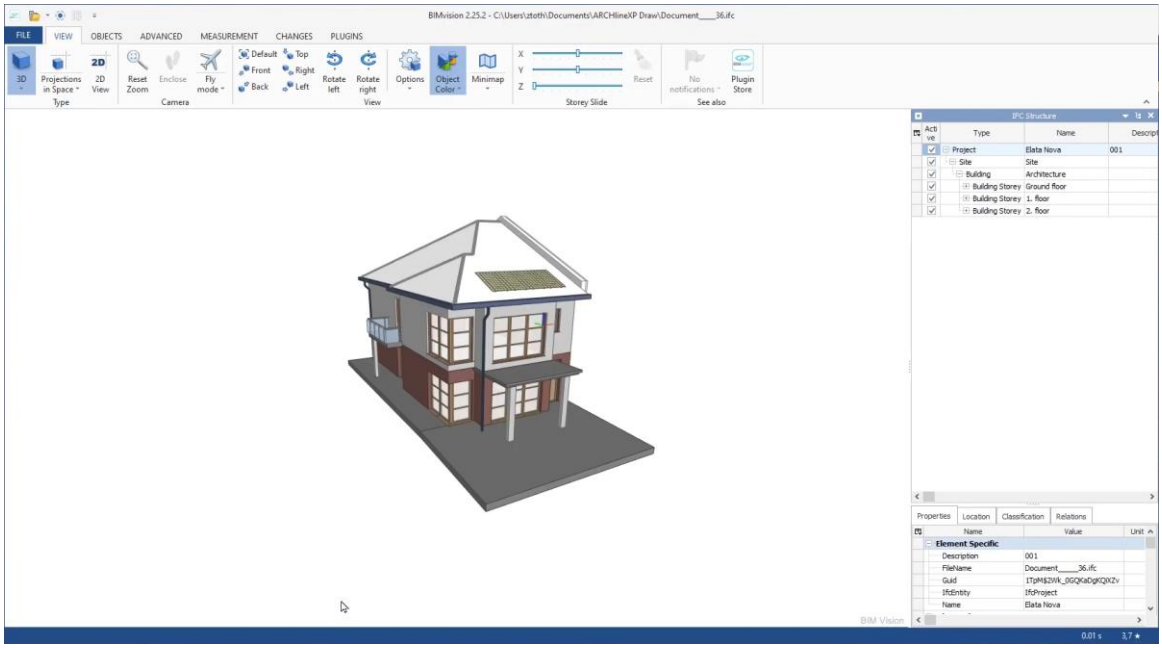
- Click on OK to accept the settings and start the export.

2.3.4. Exporting IFC files

Exporting the 3D model into an IFC file helps architects and designers to communicate with each other in an efficient way.

- Start the File / Export / IFC command.
- Define the path of the file where you want it to be saved and change the name to “Elata_Nova_BIM.ifc”. Click on Save.
- In the appearing dialog define the elements you want to export into the IFC file.
- You can also change the LOG settings here.
- Without any changes click on the OK button to start the export.

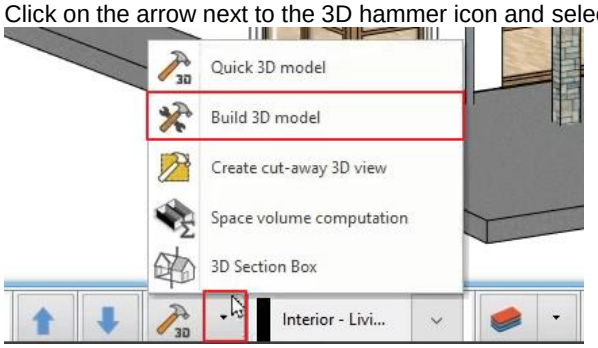
- You can check the exported file in any IFC compatible viewer.



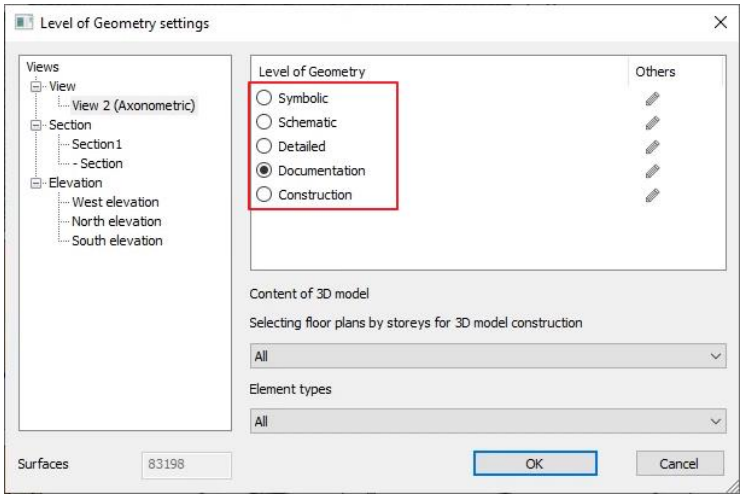
Good to know: LOG settings

You can set different Level of Geometry settings for the 3D model, which will change the complexity of the 3D model.

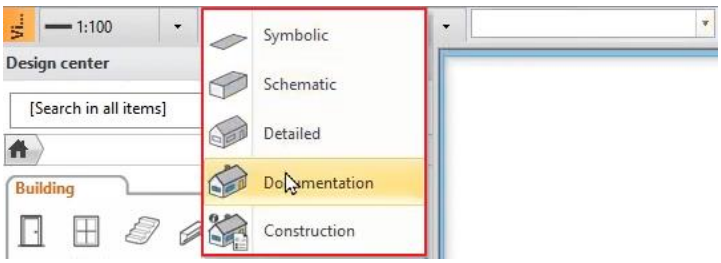
- Click on the arrow next to the 3D hammer icon and select the Build 3D model option.



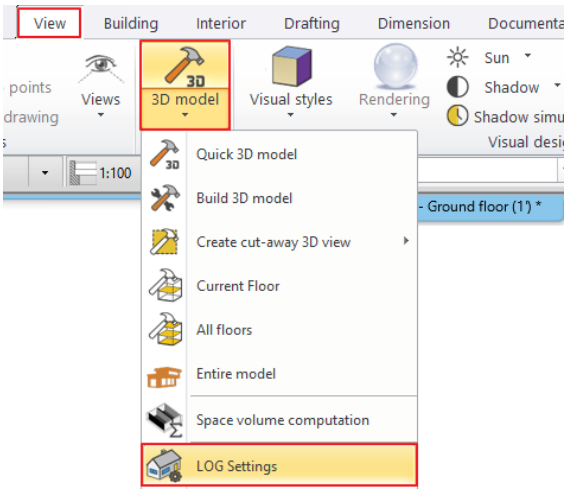
- In the appearing dialog you can select from the available LOG settings and change the 3D model parameters.

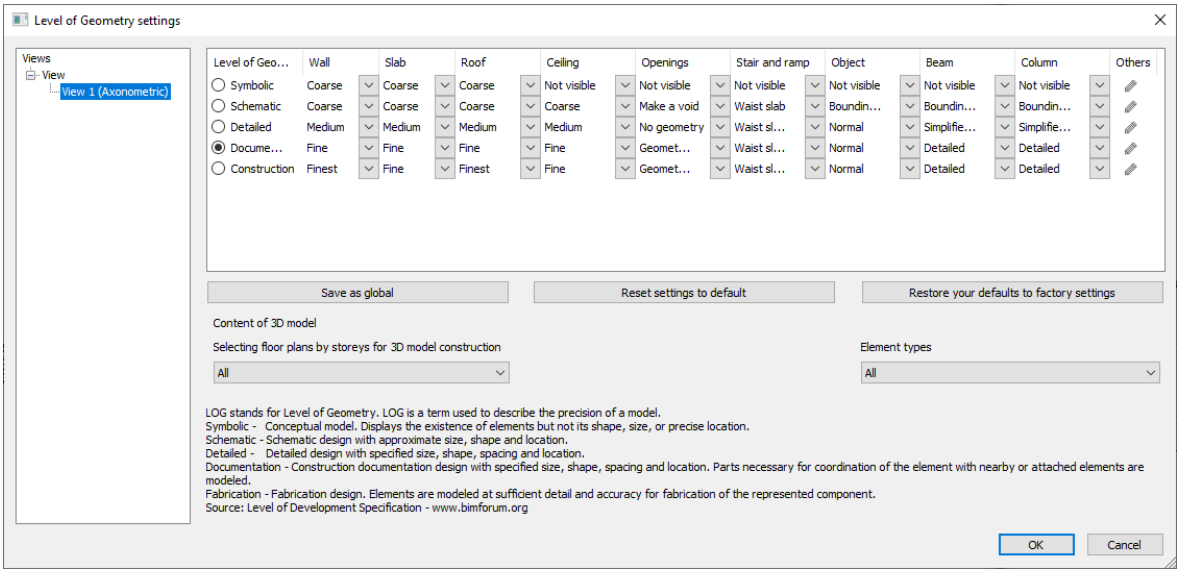


- You can also easily change between the LOG settings from the Ribbon bar.



- You can also customize the LOG settings of each representation mode for each 3D view separately.





3. Part: Visual design

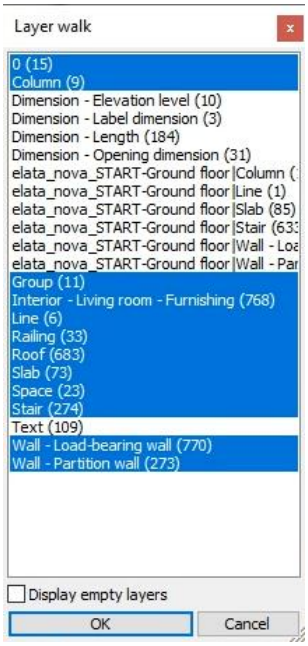
3.1. Preparing the model

Previously, we have created several plot layouts, sections, elevations and other content. For the rest of this tutorial, we only need the 2D floorplan and the 3D content.

- Find and close the drawing windows and keep only the 2D and 3D drawing.
- When prompted to save the content you are about to close, choose "**Yes**".

There is a Schedule next to our drawing and we would like to turn off its visibility. To do that please follow these steps:

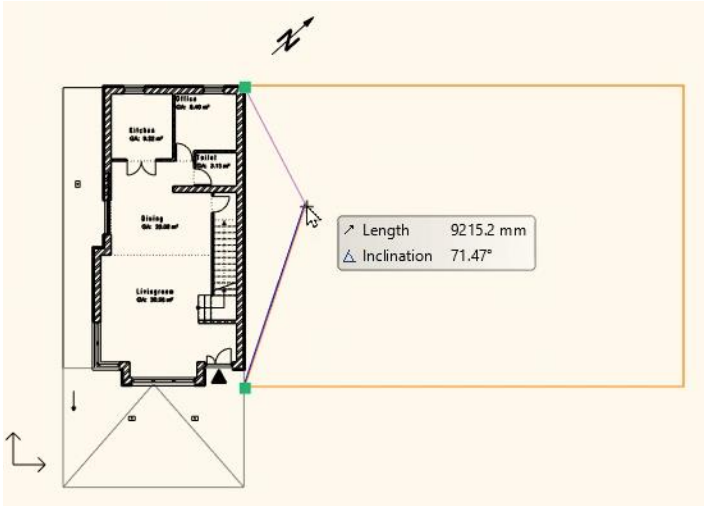
- Open the Layer walk dialog and while pressing the CTRL key, switch off the visibility of the layers like in the picture below.
- Click on the **3D hammer** to rebuild the 3D content based on the layer properties of the 2D content.



3.1.1. Creating a simple sketch of the neighbouring building

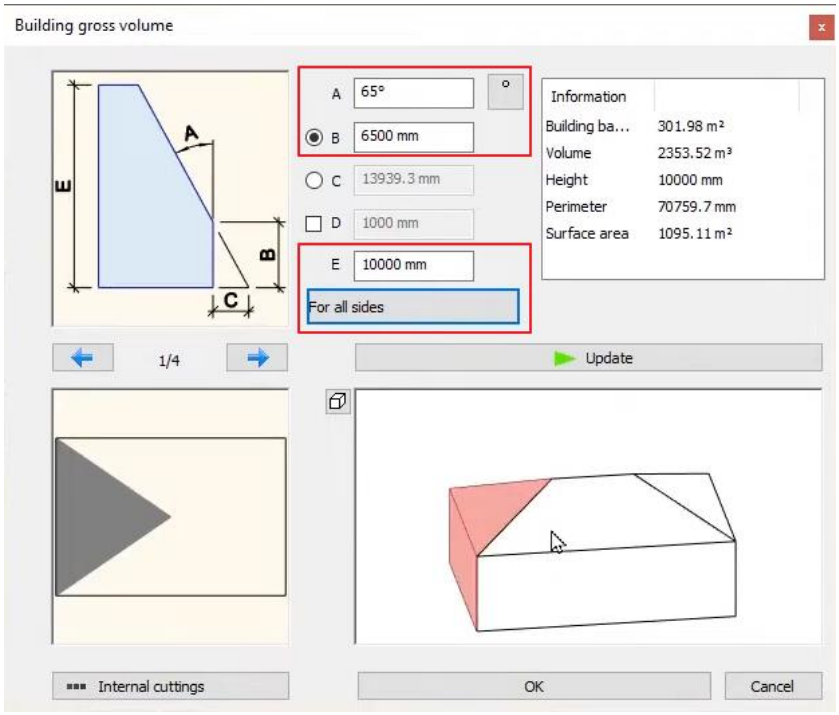
Previously we created a few other building blocks. Now we will create a simplified sketch of the remaining buildings of this particular building block by enabling the proper 2D DWG content and sketching a building volume based on the contour of it.

- Start the Conceptual building model command from the Ribbon bar / Building / Masses option.
- The path editing mode is activated and you can start drawing the contour line of the mass.
- Start it from the top right corner of the building and draw a 21000 mm long line to the right, then snap the next corner to the bottom of the building and add the last corner too.
- Hit Enter to finish drawing and open the Building gross volume dialog.

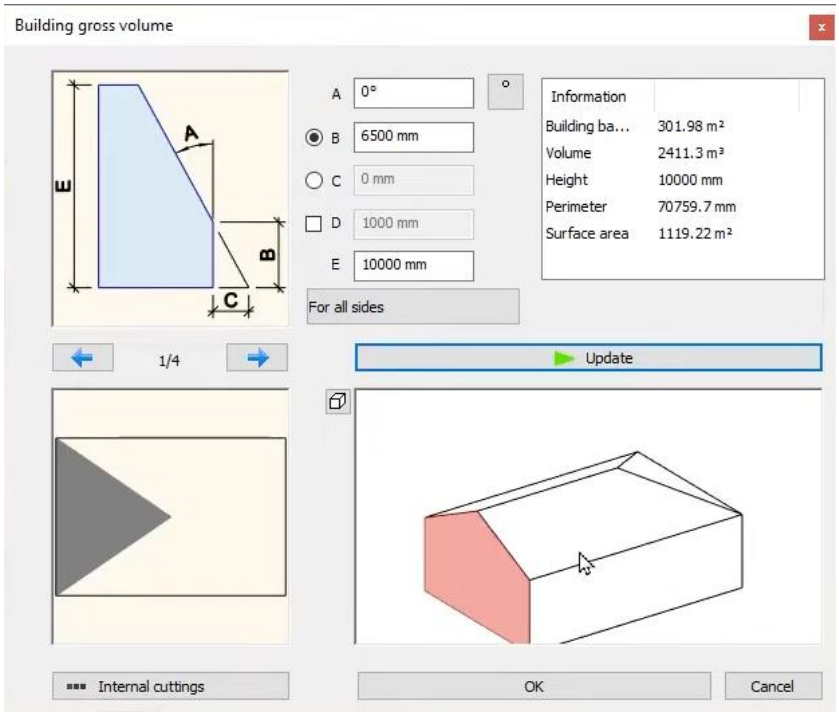


Let's set up the settings of the Building Volume:

- **Value A** is to be set to **65 degrees**. Click on the "**For all sides**" button to make this value available on all the sides of the shape.
- Set **value B** to **6.500 mm** for all sides. This is the front vertical elevation of the shape.
- Set value **E** to **10.000 mm**. This is the maximum height of the volume.



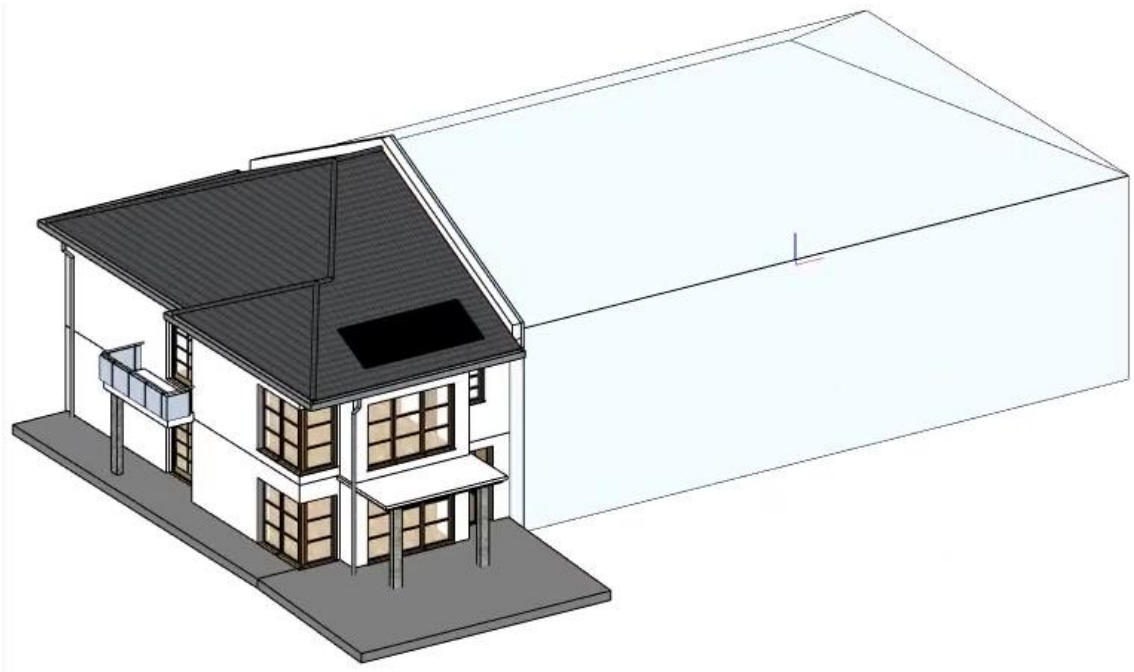
- Click on **the left side** and set it to a gable end by typing **0 degrees** to **value A**.



- Click on **the right side** and set it to **55 degrees** changing **value A**.
- Close the window by clicking on **OK**.

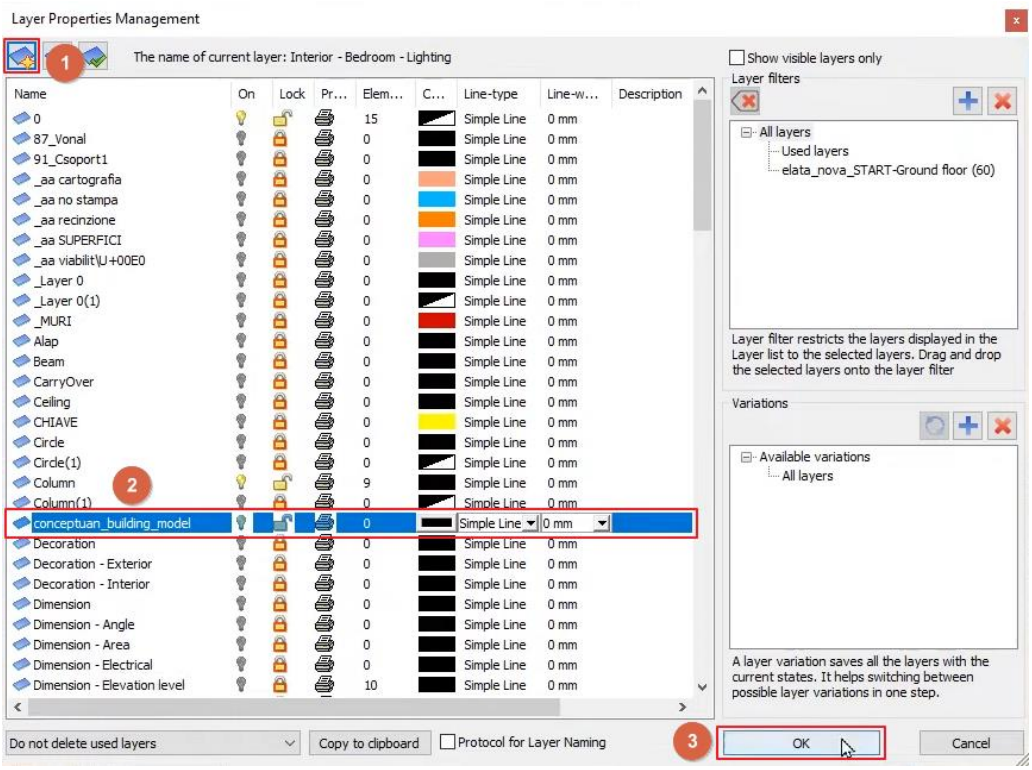
This creates the building volume at the default height and with a default material. Let's customize that.

- Find the **Base elevation** value on the left-hand side and change it to **-200 mm**.

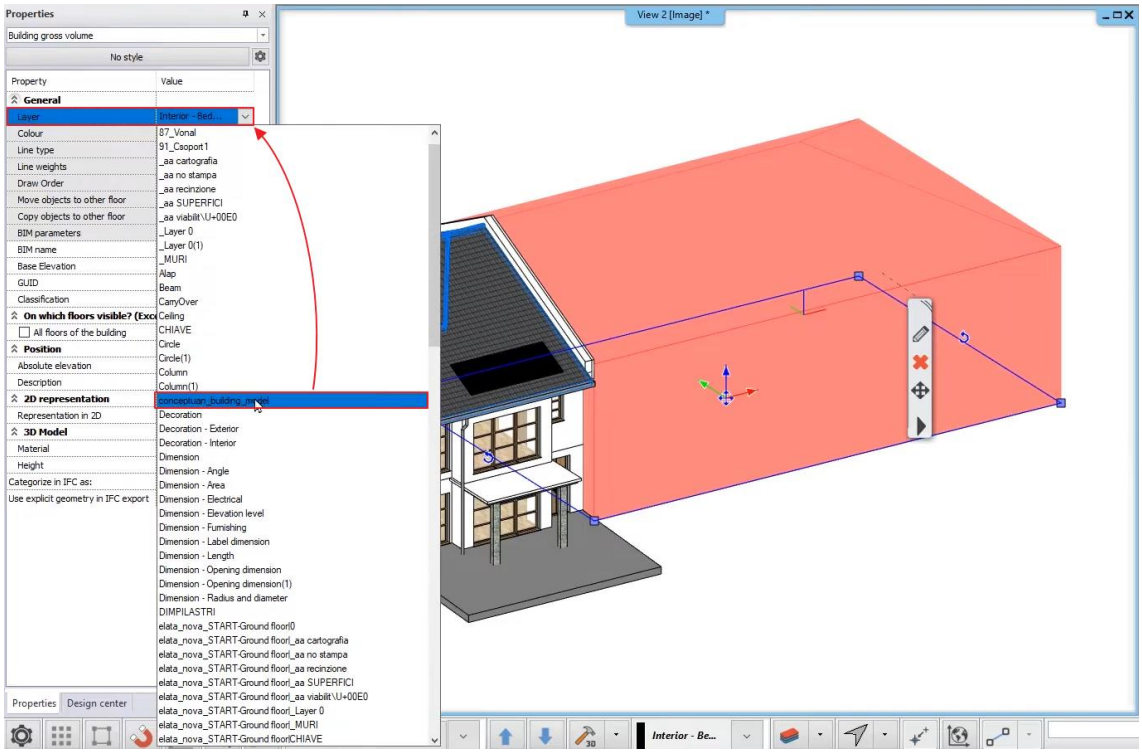


Now that we are done with the sketch of the neighbouring building, we can place it on another layer.

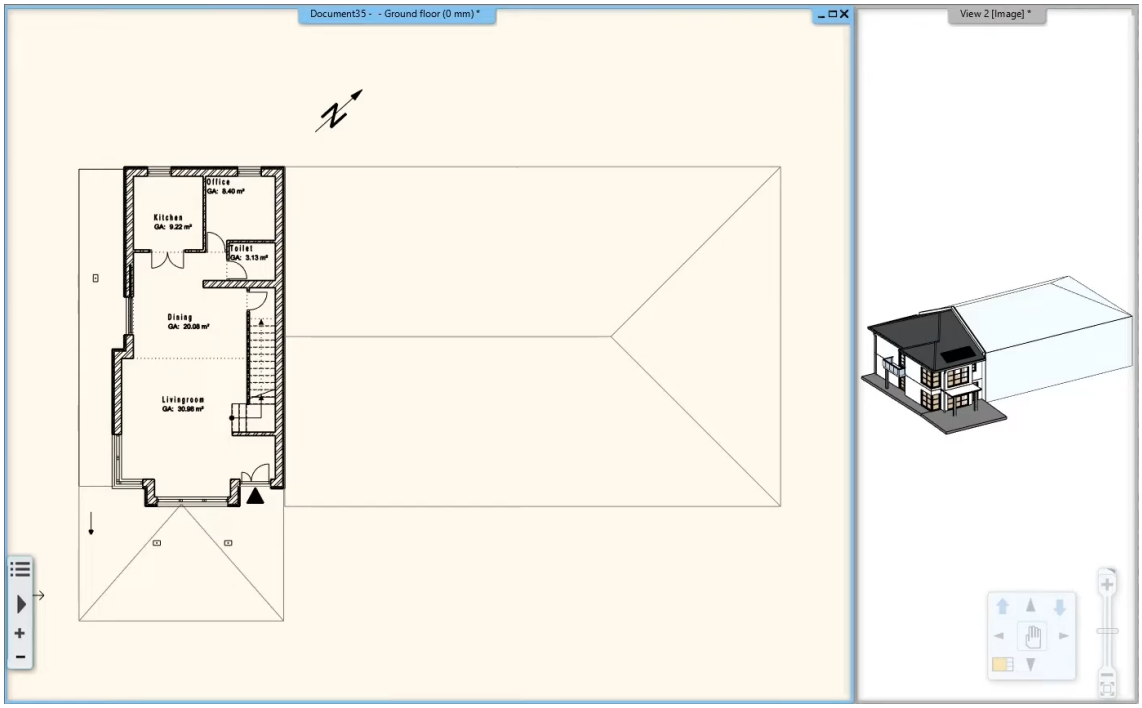
- Open the **Layer manager**.
- Create a new layer by clicking on the  icon.
- Double click on its name and change it to “conceptual_building_model”.
- Click OK to accept the changes and close the window.



- Select the conceptional building model and change the layer in the property grid to the one you just created.



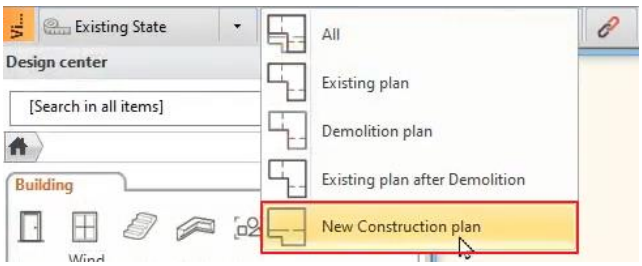
- While it is selected, change the representation color to grey.



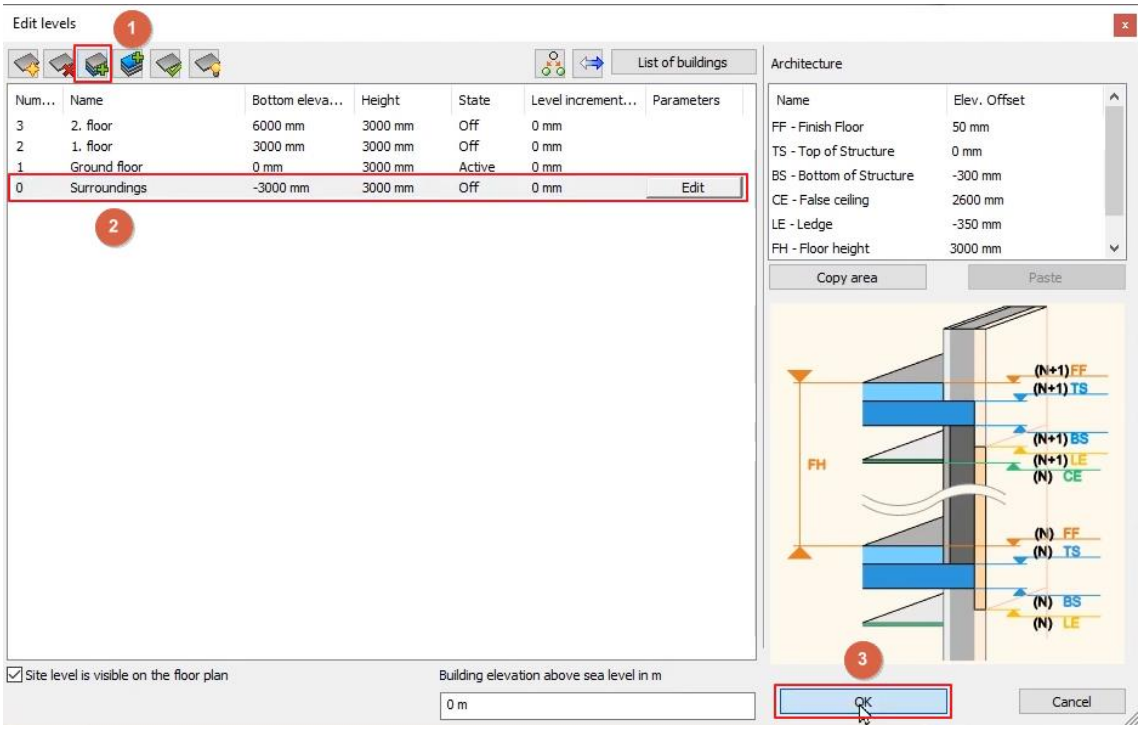
3.1.2. Linking terrain and buildings

Let's say that we are working together with other Civil Engineers and Architects, who created the rest of the building and the terrain around the building, thus we don't need to create these elements, only link them to the project.
Find the projects in the external_projects folder in the install set.

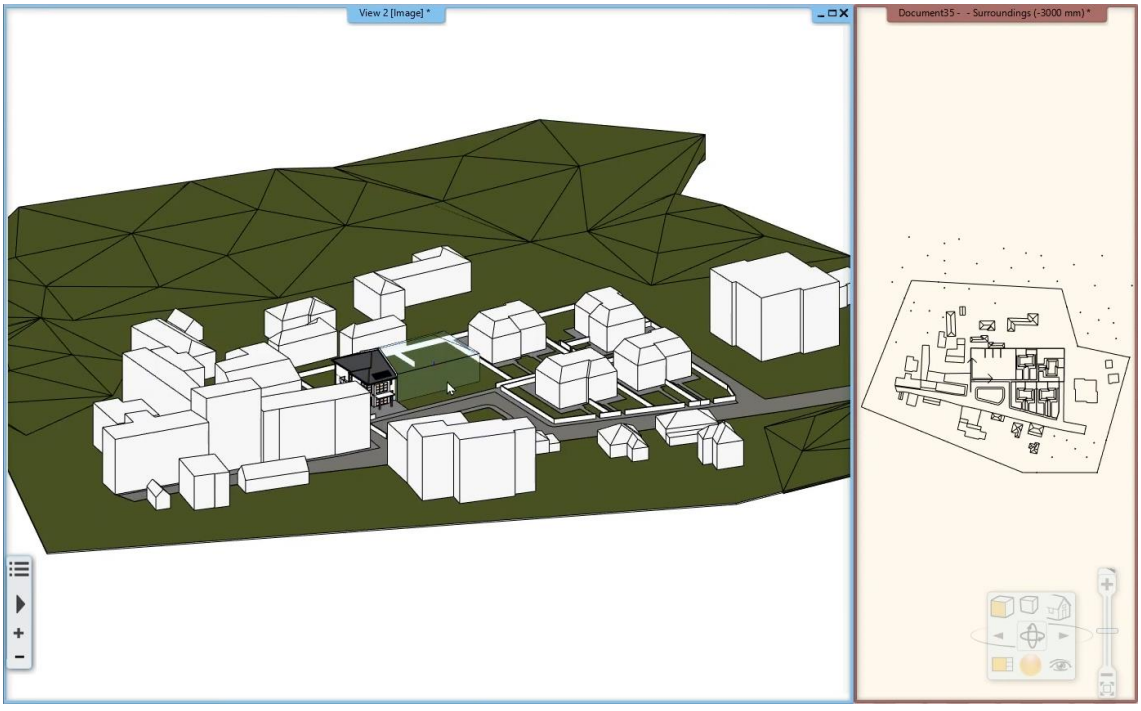
- Activate the floor plan and change the Phase filter to New Construction plan.



- Open the Edit levels dialog and add a new floor to the building: Surroundings.

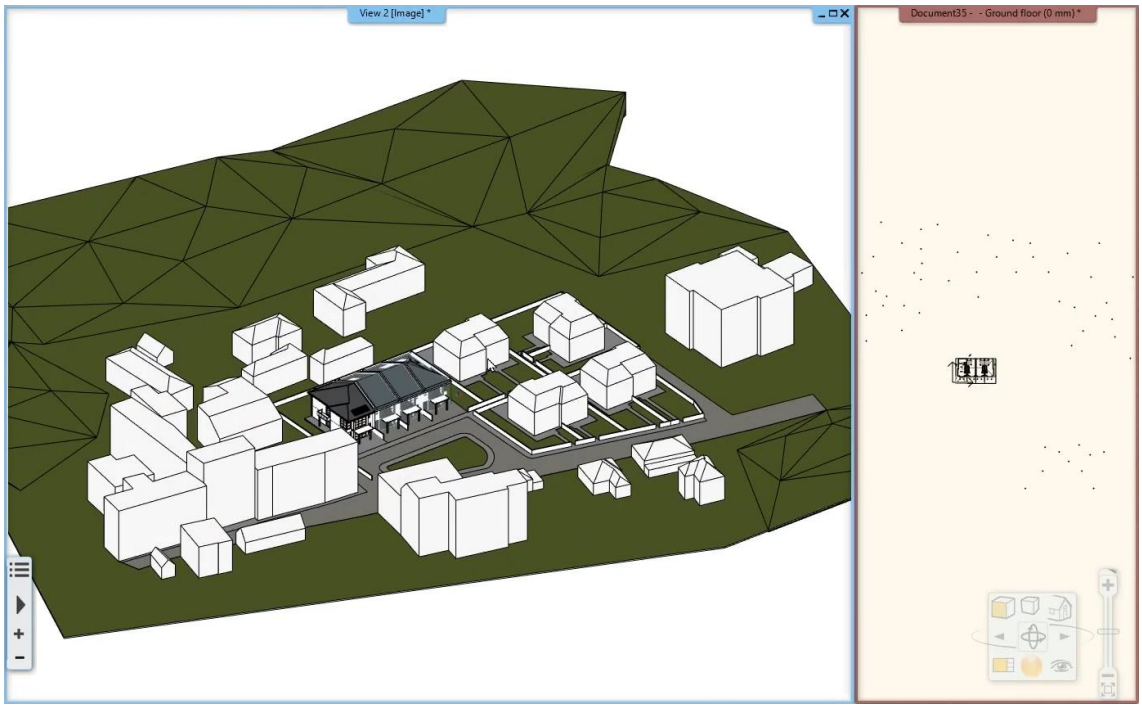


- Now go to File / Link and start the Link Project command.
- Select the elata_nova_JL_surroundings.pro file and select the Document2.asc (Tutorial_01) file on the right side.
- Click Open to link it to the project and click OK in the appearing dialog.
- Activate the Surroundings floor and rebuild the 3D model with the 3D hammer.



Now that we have the surrounding linked to the project, it is time to link the rest of the building to the project.

- Link the elata_nova_TS_buildings.pro file the same way as we did previously.
- Rebuild the 3D model to see the changes.

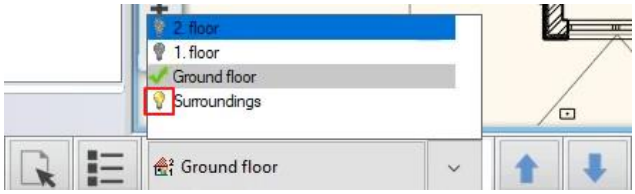


- Activate the floor plan and switch off the conceptual_building_model layer in the Layer Walk.
- Refresh the 3D model again to see the changes.

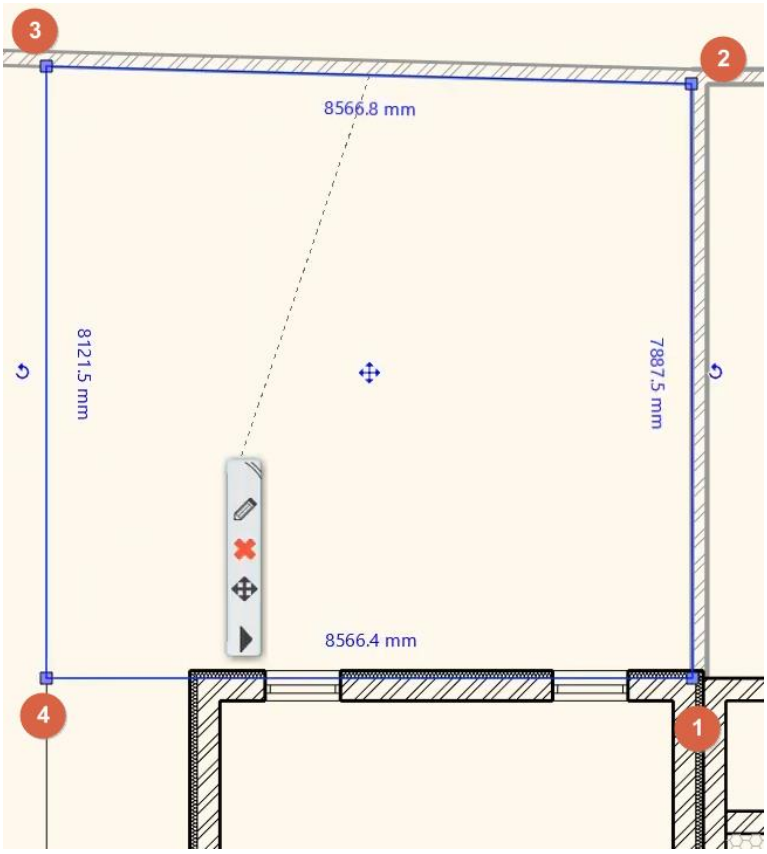
3.1.3. Drawing a swimming pool

As the terrace is more of a visual item and not a detailed part of the documentation, we will create a very simple representation of the terrace by using the slab tool.

- Activate the floor plan and click on the arrow next to the floor's name on the lower toolbar.
- Click on the light bulb icon next to the Surroundings floor and hit enter.



- Start the **Ribbon bar / Building / Properties / Structure / Slab** tool.
- Change the Total thickness to -300 mm.
- Unlink the materials, find the "**Top material**" and change it to **Deck_wood_11** for now.
- Click on OK to accept the changes.
- Activate the Ribbon bar / Building / Slab / Slab in Sketch mode.
- Trace the contours of the fence and the back of the building to create the four-sided shape of the backyard terrace.

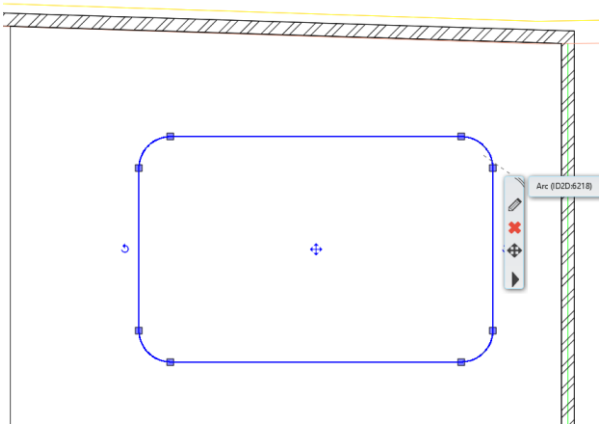


3.1.4. Drilling a hole into the terrace for the pool

Previously disabled layers might automatically re-appear during work. This happens mostly when the selected tool uses a layer that was disabled. In this case the software automatically enables the layer to be able to draft the item. Use the Layerwalk or the Layer manager to disable these layers any time again.

Before we start creating the actual hole in the slab let's design its shape using classic Drafting tools.

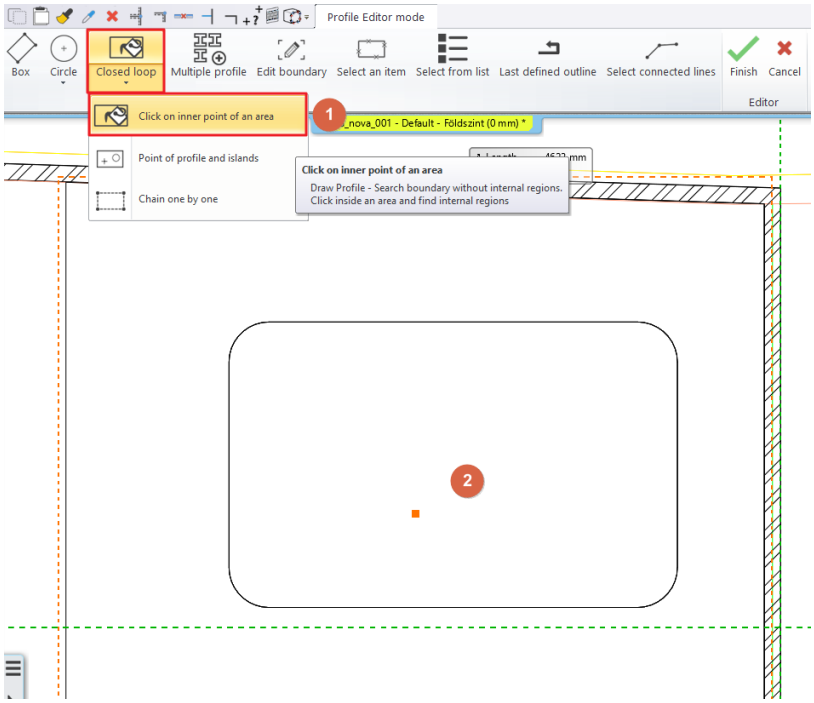
- Select the **Ribbon bar / Drafting / Rectangle** tool.
- Place the first point of the rectangle with a click and move your mouse to the right. Press TAB and type **5500 mm** for X spacing then hit **Enter**. This will be the width of the rectangle.
- Move your mouse up or down, type **3500 mm** and hit **Enter**. This will be the height of the rectangle.
- Select the rectangle and click on the move icon. Select the Move from command and align it to the corner of the house.
- Select the rectangle and click on the blue dot marker, representing its corner point.
- Select the "**Fillet all**" command and move your mouse to find the best visual result and click to round off the corners.



Creating a 2D draft of a 3D shape has a few advantages. It can be repositioned, modified and used for visual thinking before creating the real result, and it can also be re-used later at any time. Now let's create a real cut through the actual terrace slab based on the previously designed pool shape.

- Click on the slab contour and use the context menu to find the **Hole / Create a hole** command.
- Find the "**Closed loop**" keyword at the top of the screen and click on it.

- Click into the previously drafted rectangle shape to make its shape recognized by the software.



3.1.5. Creating the pool water using the slab tool

Now there is a hole in the slab and we need to fill it up with water.

- Start the **Ribbon bar / Building / Properties / Structure / Slab** tool.
- Change the Base offset to -100 mm and the Total thickness to -200 mm.
- Find the "**Top material**" and change it to **Water_1**.
- Click OK to accept the changes.
- Start the **Slab in Sketch mode** command and click on the Closed loop command.
- Click in the pool's area to create the water.

3.1.6. Importing objects

ARCHLine.XP comes with a built-in library of objects which you can use at any time, but its biggest power is in the many other tools and file formats you can use and import to find the latest possible products. These products you can find online either as free or commercial models.

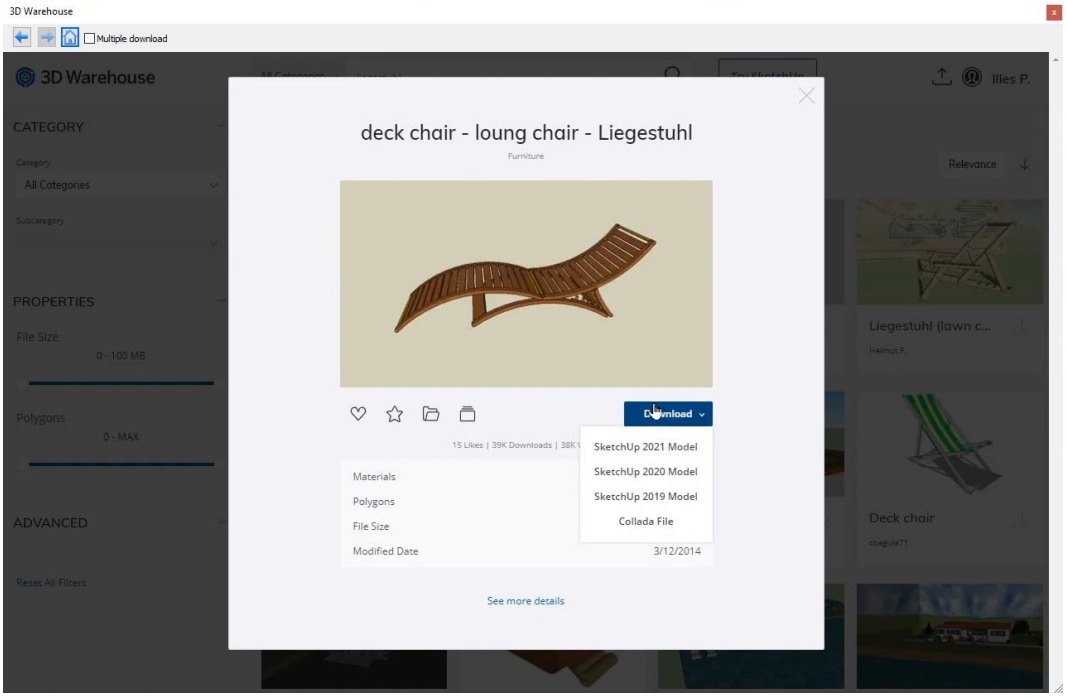
Let's start with a built-in parametric object: a parasol.

- Find and start the **Ribbon bar / Interior / Soft Furnishing / Parasol** tool.
- Place it on the drawing with a click and refine its position if necessary.

Many built-in objects are parametric in ARCHLine.XP. This means that not only their materials and size can be changed, but also other parameters of them can be modified. In case of a parasol you can change how many sides the parasol has, for example.

There are popular platforms that you can get access to right from within the software. Let's see what we can do using the free 3D Warehouse platform, provided by Trimble®.

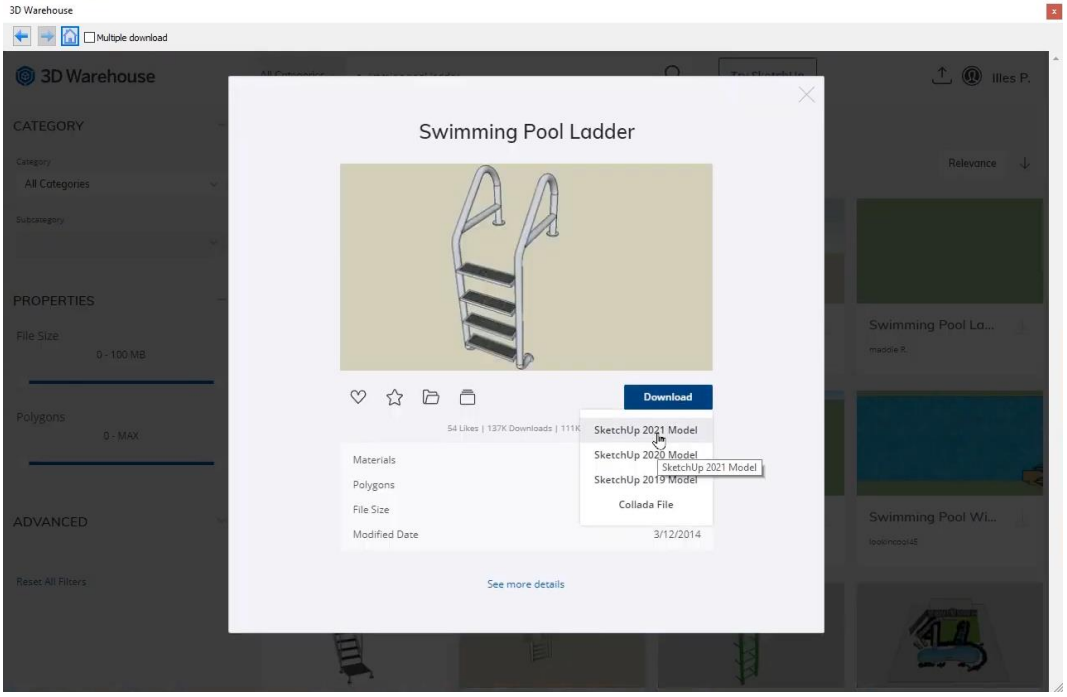
- Start the **Ribbon bar / Interior / Warehouse** tool.
- Search for deck chairs. Use the keyword "**liegestuhl**" to find the one we used in this tutorial.
- Click on its thumbnail to enlarge the image and download the model into the design.



- Place it on the drawing in 2 copies and rotate and move the copies to create an arrangement on the terrace.

The pool also needs a ladder. Let's use the 3D Warehouse again.

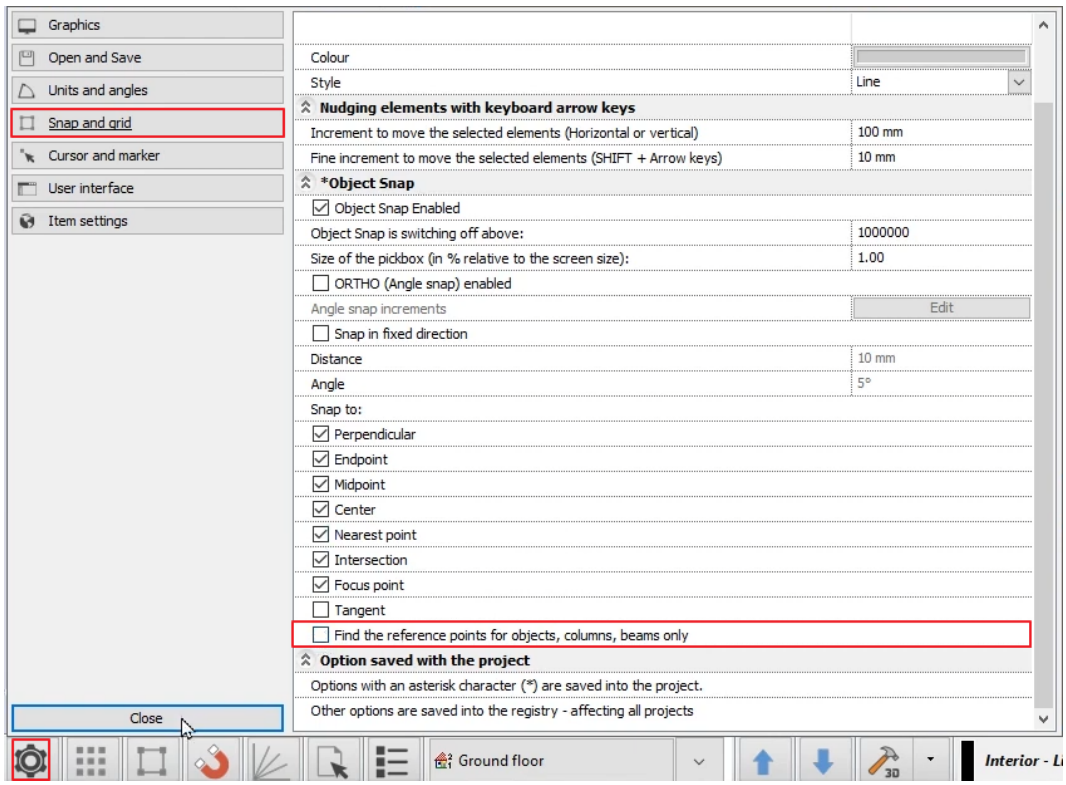
- Open Warehouse and find the "**Swimming Pool Ladder**" object.
- Click on it and download.



- Place it on the drawing and rotate if necessary.

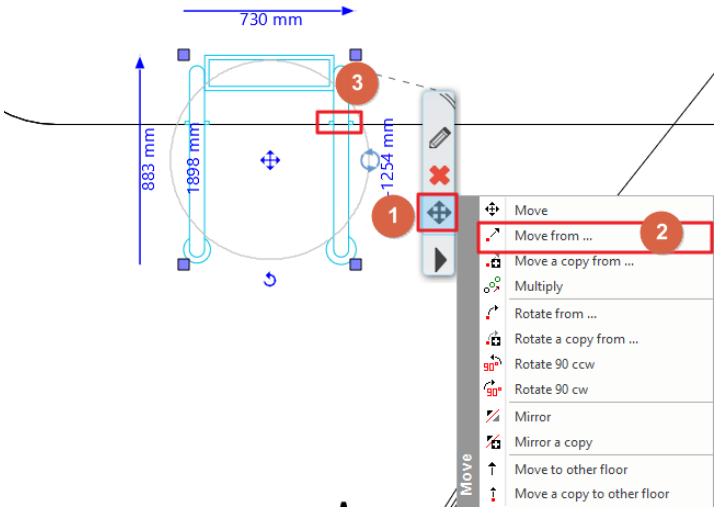
Snapping is now only available for hotspots of objects. In order to be able to snap to any point of the objects, we need to deactivate the following option in the settings:

- Click on the gear icon in the bottom left corner and click on the Snap and grid tab.
- Deactivate the Find the reference points for objects, columns, beams only option.

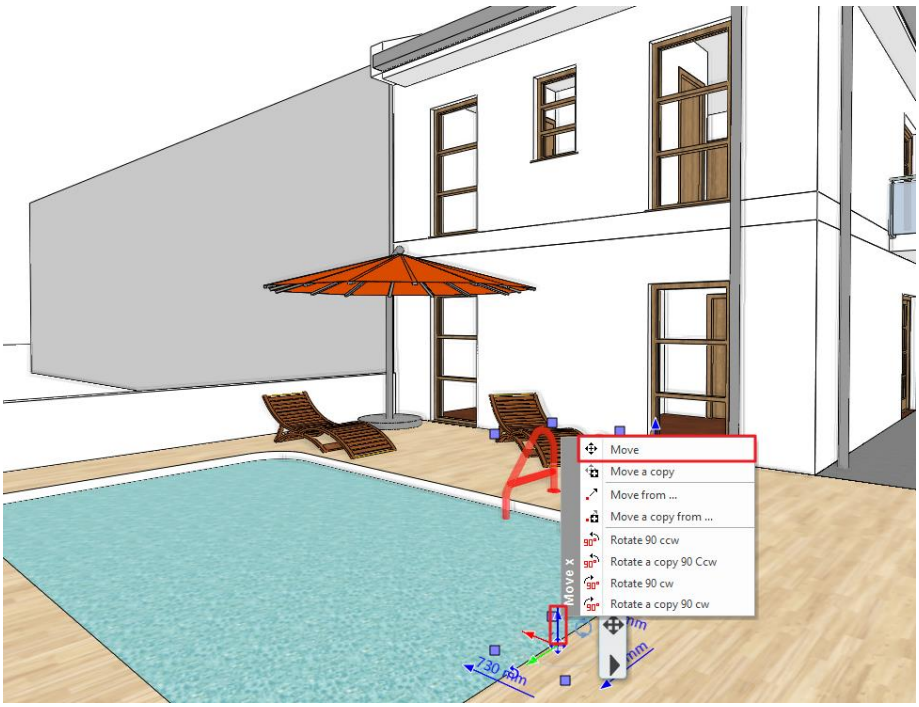


The top view helps properly matching the swimming pool ladder object to the side of the pool.

- Use the **Move from…** command and click on the 2D symbol of the ladder object to define the reference point.
- Move your mouse and snap it to the side of the pool and click to place it.



- Select it on the 3D and click on the vertical blue arrowhead.
- Choose “**Move**” and move it vertically until you find the proper position and click to place it there.



If during the creation of the previous content any layer turned on, it is because the tools you have used had a setting referencing an invisible layer. In such cases the software automatically turns on the visibility of such layers and unlocks them for editing. To make any of these layers invisible again, please simply turn their visibility off.

- Open the **Layer manager**.
- Find and click on the **elata_nova_START-Ground floor** filter.
- Select all the layers of this filter and **turn off their visibility**.

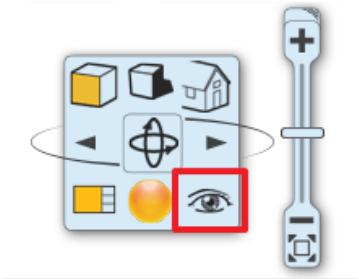
3.1.7. Perspective views

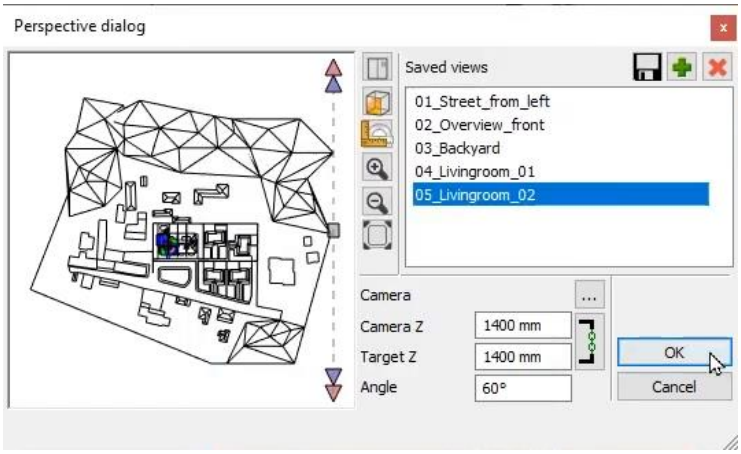
One of the essential parts of the project organization is setting the views properly for a well-ordered project. If you consistently follow the same logic, to set perspectives in the 3D window and name them appropriately, it will be easier to navigate through them.

In case of multilevel buildings, it can be useful to use numbering before the name of the perspective views. This way we can easily distinguish views of the first level from the view of ground floor for example. On the ground floor you can use “0_bathroom_ view_01” and on the first floor “1_bathroom_view_01”. Let’s try this in practice.

- Please activate a 3D window now.
- Select the right bottom “**Perspective dialog**” icon of the Navibar.
- Set up a perspective view: you need to click and drag the blue marker to find the location for the viewer or camera. Drag it to the left bottom corner of your drawing outside the building.
- You also need to set up the target viewpoint. Click and drag the grey dot marker and move it above the center of the building.
- To add a view, you need to click on the green cross.
- You can name your view by double clicking on it.
- Repeat these steps to add a few more views and finally close the dialog window with the OK button.

The program is automatically sorting all views in an alphabetical order. This is also why it is good practice to put a number before the name of the consecutive perspective views to control their order.





When in a 3D view, you can use either the up and down buttons at the status bar of ARCHLine.XP to navigate from one view to another. Alternatively, you can also use the **Page Up** and **Page Down** keys on your keyboard to do the same.

Defining a perspective directly on the floor plan

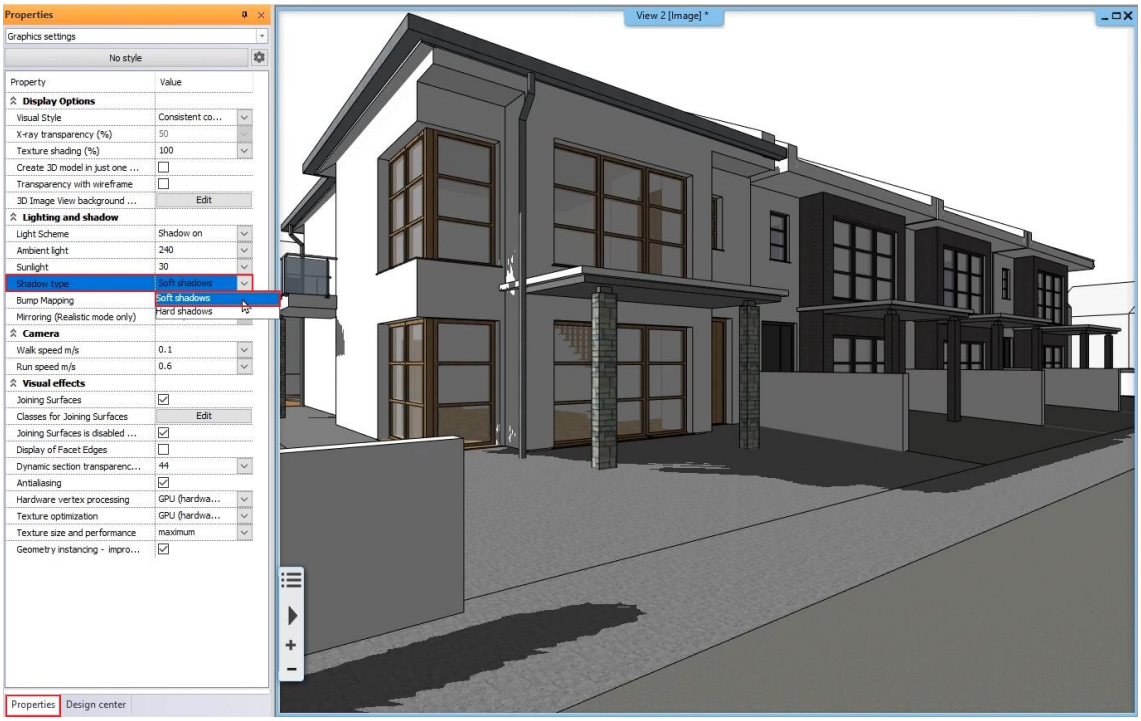
There is a special blue perspective symbol on the 2D drawing which you can use to see the current perspective view's position over the plan and to set up a different perspective or to navigate in the 3D model.
You can:

- ❖ click and drag the center of the symbol to move it around,
- ❖ or click and drag the tiny arrow to refine the view direction and pull the camera like a cart.

3.1.8. Adding shadows

Activate shadows to make the 3D view more realistic.

- Activate the shadows with the Ribbon bar / View / Shadow / Shadows on/off command.
- The shadows now appear in the 3D view.
- To finetune the shadows, activate the Property grid on the left side and change between Soft shadows and Hard shadows in the shadow type row.
- Select Soft shadows for the project.



Soft shadows create a simplified version of the shadow in the fastest way, while hard shadows create the correct shadows but it is slower and needs more processing power.

3.1.9. Sun light

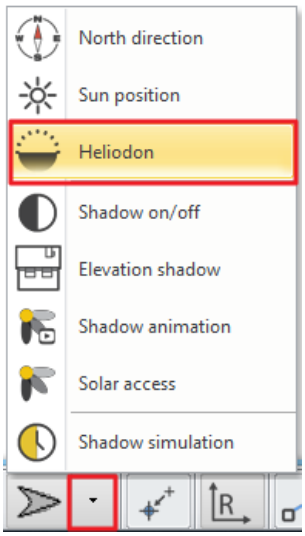
After setting the materials right, the other key to realistic rendering is the sunlight settings. In the following we will see a few examples of displaying and setting lights.

It is important in both interior design and architectural plans how the sunlight illuminates the interior and exterior surfaces of the model. We can set the direction of sunlight two ways:

- Heliodon based artistic lighting and
- Geo-location based realistic lighting.

Heliodon based lighting

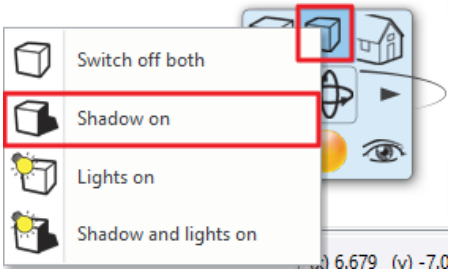
This is a good solution when we want to put the model in an artistic / advantageous lighting and we are not eager to know more about the real light effects. This tool can be found at different places in the software. Let's see how this tool works:



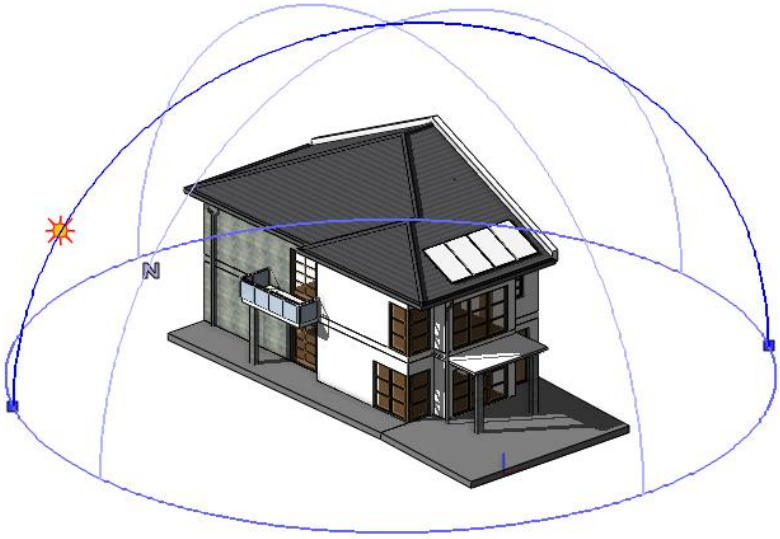
- Click on the tiny arrow on the bottom toolbar next to the "North direction" icon and start the "**Heliodon**" tool.

Heliodon is a simplified model of a hemisphere above our model. We can see the line of the horizon and the vertical axis of a simplified sun path.

- To turn on the visibility of Sun shadows you need to click on the Shadow icon of the Navibar and select the "**Shadow on**" option.



- You may need to zoom out and rotate the model slightly to see the Heliodon from above.



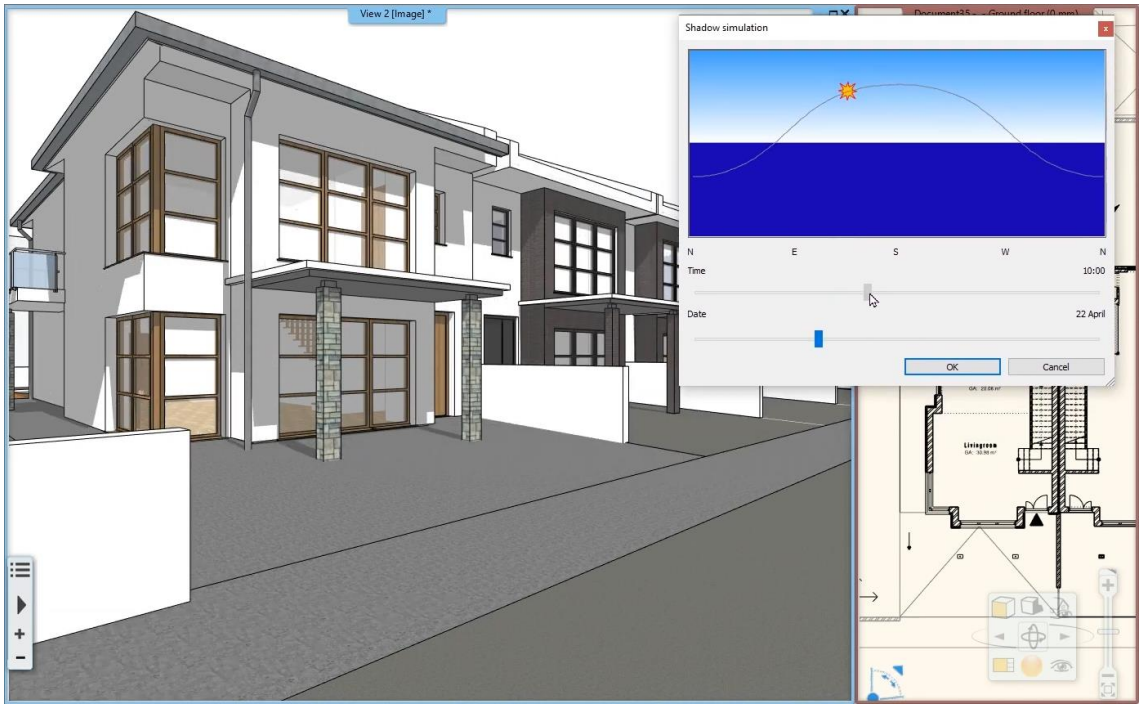
Heliodon is always represented with clearly visible markers while using it inside or outside. Let's make a change:

- Click on one of the blue dot markers at the bottom horizon line and move it around to find another direction for the main axis. Click to define.
- Click on the Sun icon appearing on the main axis and move it around to find the best position and click to finish.
- When you are completely finished with the settings, close Heliodon by pressing ESC.

3.1.10. Shadow simulation

Shadow simulation offers a real-time tool to study how the sunlight affects your building, based on the previously set sun settings, location and the North direction.

- Select the **Ribbon bar / View / Shadow simulation** command.



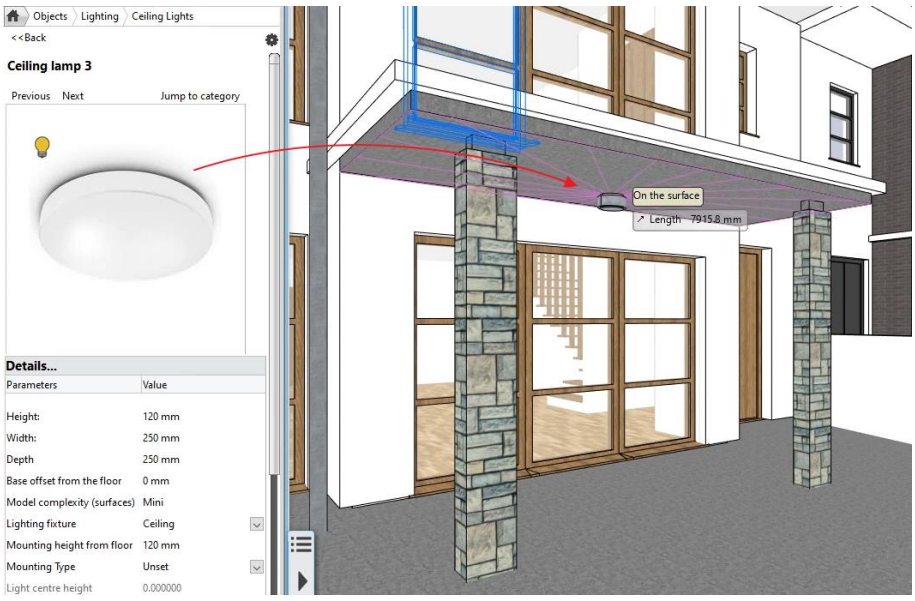
- You can click and drag the Sun symbol or the Time and the Date slider to study the shadows cast by the sunlight.

3.1.11. Working with lamps

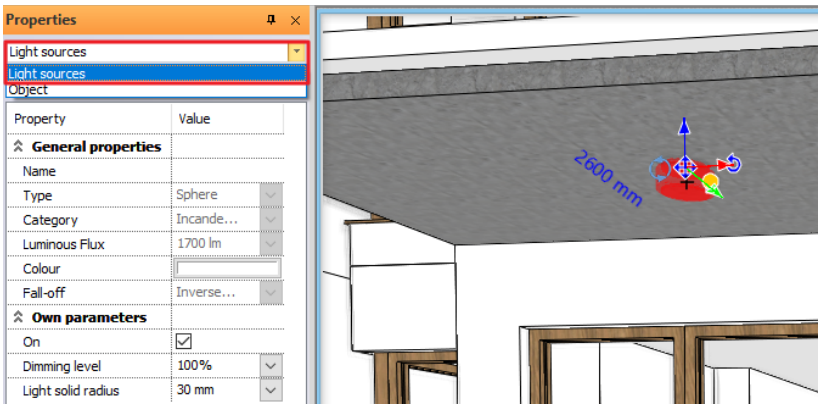
ARCHLine.XP has a built-in library of lamps and you can also create your lamps for interior or exterior models. A lamp is basically a composite of an object and at least one light source. You can turn lamps on or off and you can also change the color or intensity of their light sources. These topics are not covered in this tutorial, but feel free to find our detailed tutorials and learn more about lamps when you need.

Let's see how to find and place a lamp.

- Open the Design Center and find the "**Objects / Lighting / Ceiling lights**" category.
- Click and drag the "**Ceiling lamp 3**" into the 3D surface under the porch ceiling of the entrance.



- To change the light settings of a lamp select it and switch to the “Light sources” component of it at the left top of the properties list, by clicking on “**Object**” and selecting “**Light sources**”.
- Here you can turn it on or off and manage the Dimming level of the light.



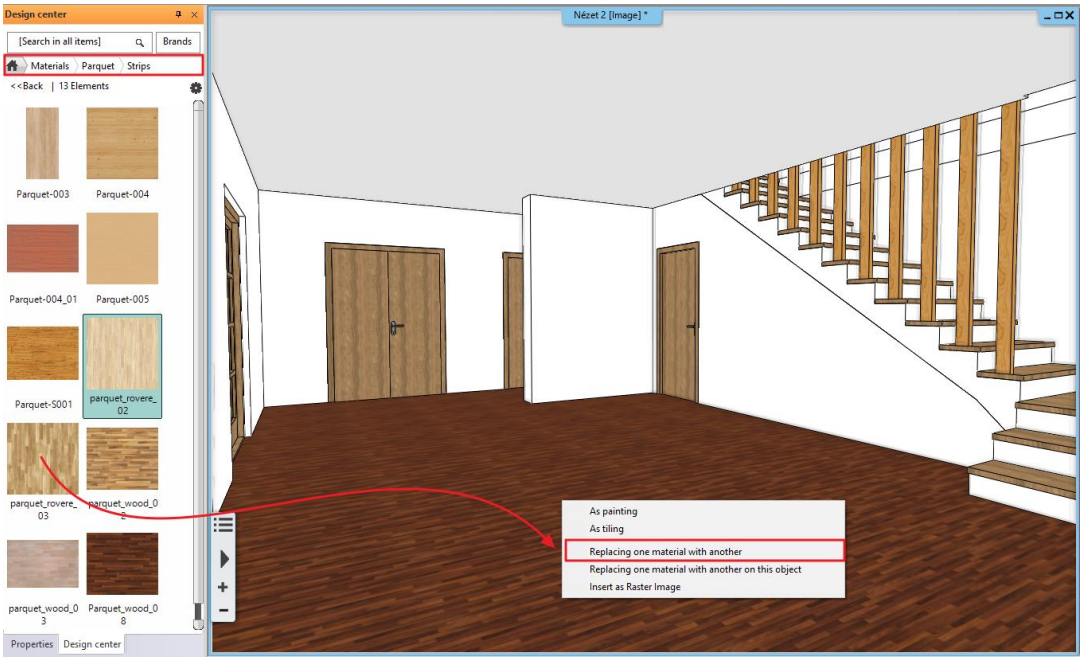
You can select a lamp and find the context menu “Lighting add/edit light source” command to add or remove light sources of a lamp. IES light profile files are also supported when adding light sources.

3.1.12. Taking snapshots

3.1.13. Working with materials

The software has a built-in material library where you can find materials using the Design Center in the materials catalogue.

- Open the Design Center and find a material in the **Materials / Parquet / Strips** category.
- Click and drag the material to the 3D surface of the internal floor and select the “**Replacing one material with another**” command. This changes the material here and also on the following floors – everywhere in the model.

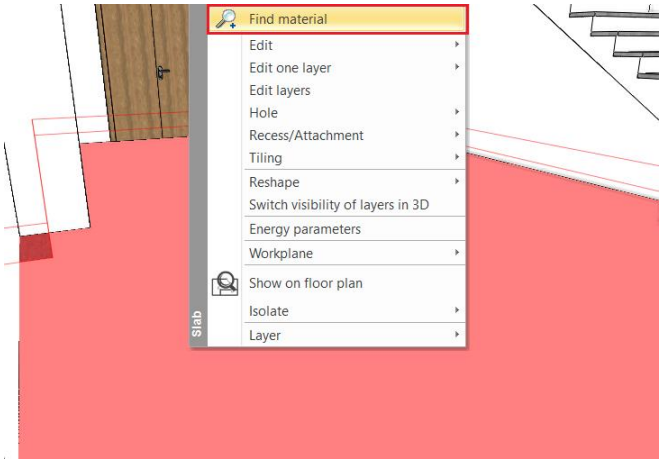


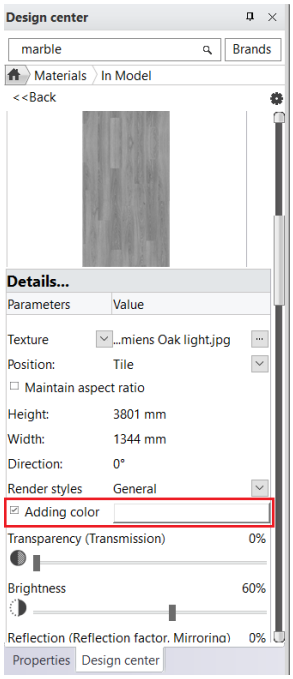
- Find the “**parquet_rovere_02**” material in the “**Materials / Parquet / Strips**” category.
- Click and drag the material to the 3D surface of the external terrace floor and select the “**Replacing one material with another on this object**” command. This changes the material only on this surface.
- Find the “**Stonewall_48**” material in the Materials catalogue.
- Click and drag the material to the longest external 3D wall surface of the building facing west and select the “**As painting**” command. This overpaints the material on this surface of the wall. Repeat this on both floors and the matching side of the slab.

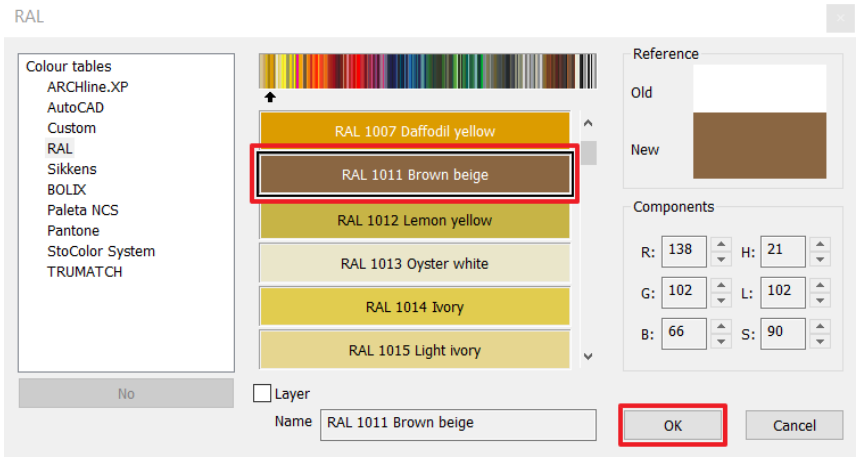
3.1.14. Coloring materials and textures

Keep in mind, that the pattern of the floor doesn't change, this command overwrites only the color of the surface.

- To change the color of the floor select the floor, and click on the "**Find material**" in its menu.
- On the left side of the screen in the properties select the "**Adding color**" option.
- Now select the "**RAL 1011 Brown beige**" color of the floor.

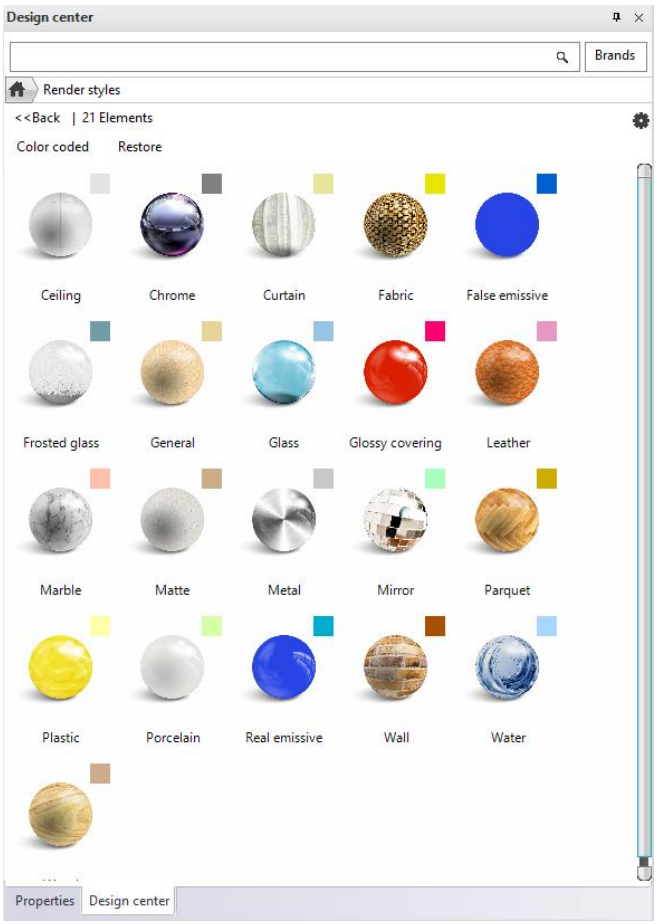




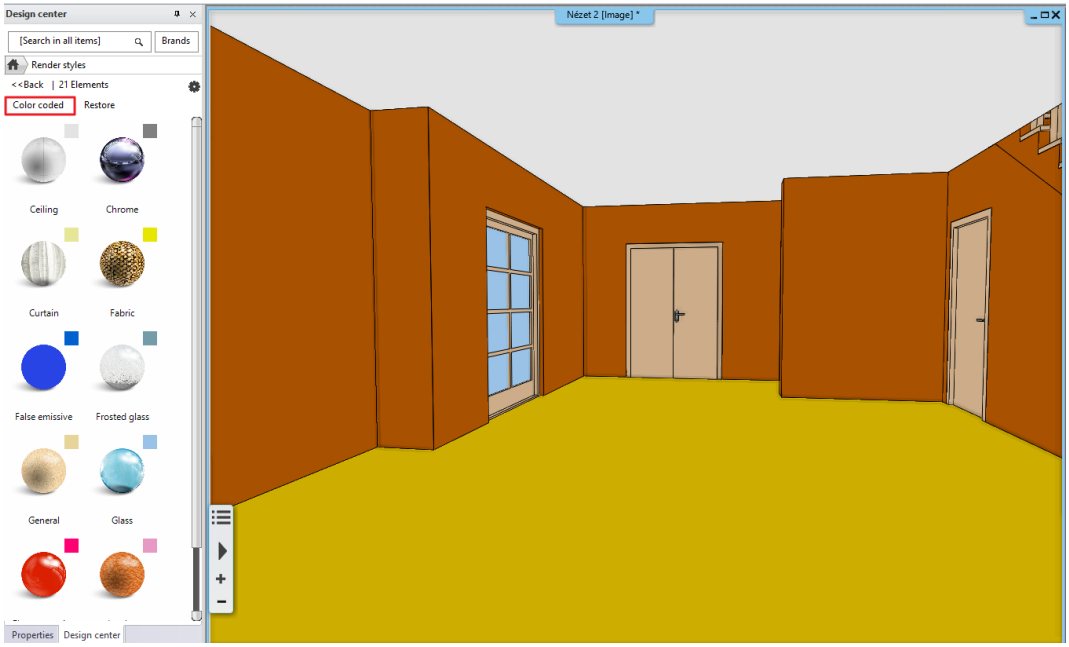


3.1.15. Render styles

Render styles are quick settings to help you set up the most commonly used material types in your model. A render style defines the main characteristic of a material from transparency through brightness till bump mapping, automatically. It is a very good starting point when setting up materials. These settings can be later fully customized.



- Find and click on the "**Render styles**" option in the Design Center.
- Click and drag the "**Wall**" render style to the bright white wall surface and click on it. This makes the bright white material a wall material all around the project wherever it was already used.
- Do the same with the rest of the model to define wooden surfaces, metal surfaces, glass surfaces and so on.
- To check whether there is anything left use the "**Color coded**" switch.

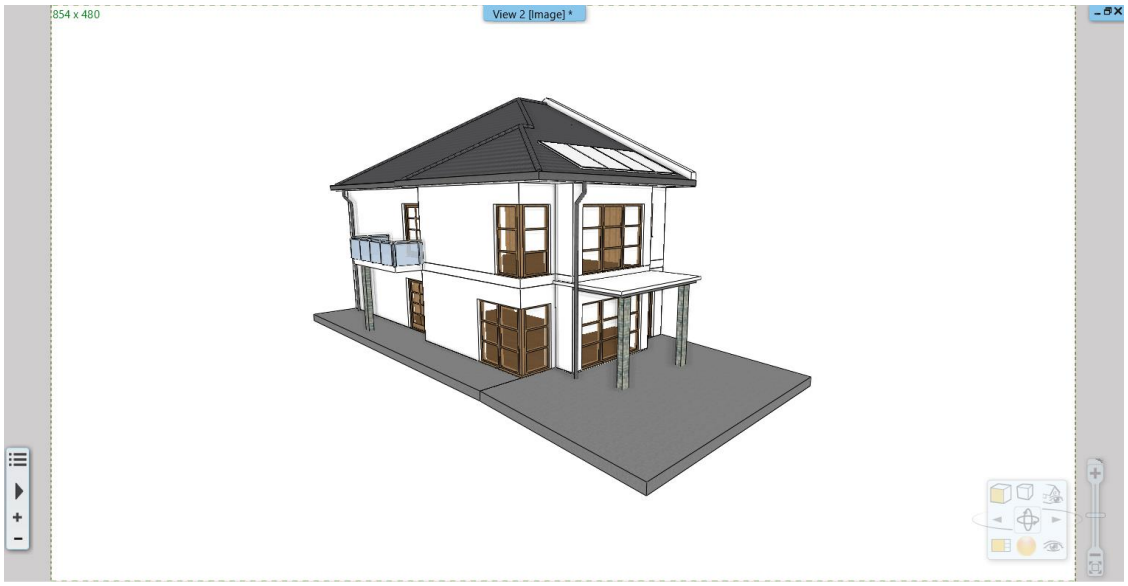


This visualizes the model re-colored by the color-codes of the material render styles applied to their surfaces. You can easily find all glass or metal surfaces for example and if a surface has a different color code than the tiny color swatch at the left top corner of a render style you can click and drag the proper one onto that surface to change it.

3.1.16. Real-time render

Real-time render helps adjusting lights and material settings to find the best setting prior the final renders. Real-time rendered images are created very quickly based on the settings.

- Set up a small wide screen resolution for rendering. Click on the "**Ribbon menu / View / Rendering / Standalone rendering – realtime draft**" command. Close the appearing explanation and find the Resolution option to change it to "**854x480**" resolution.
- Click on the "**Rendered frame on / off**" button at the bottom of the dialog. This will set up the visibility of the borders of the final render in the model view. You might need to stretch the width of the 3D Image window to be able to see the borders represented with dashed lines.



This function is useful to set the perspectives precisely, because you can define exactly what will be visible in the final render.

- Now start the "**Standalone rendering – realtime draft**" command again and start rendering by clicking on the "Start rendering" button.

Realtime rendering appears soon in a new window and as soon as you make changes in the model or modify the view for example, you will see those changes automatically updated to the realtime rendered image too.

- Make sure you add a parquet material from the Design Center to the terrace surface,
- and do not forget to add "**Water**" style to the pool water in the backyard.
- Add a "**Translucent glass**" render style to the glass surfaces of the balcony.
- Once you finished you can go back to the normal model view, by clicking on the "**Restore**" option next to the "Color coded" option in the Design Center.

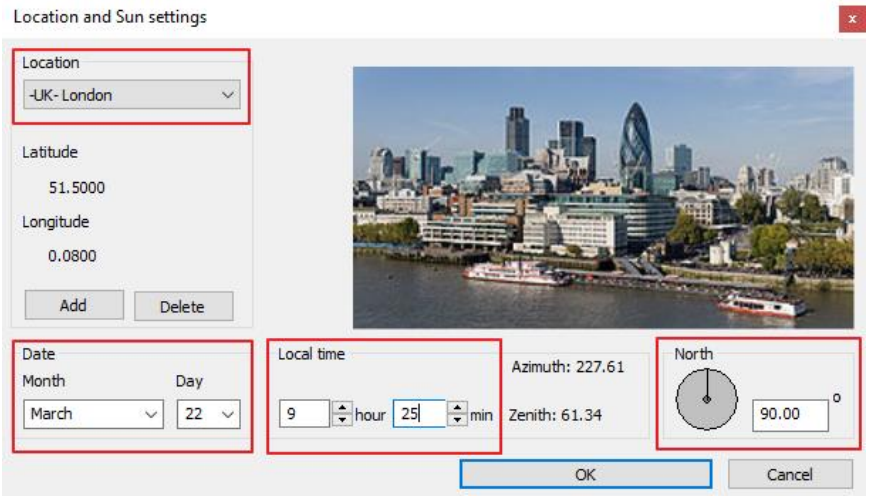
Realtime render is performance demanding and you can close it at any time you need. To open it again, you only need to start the "**Standalone rendering – realtime draft**" command.

Geolocation-based lighting

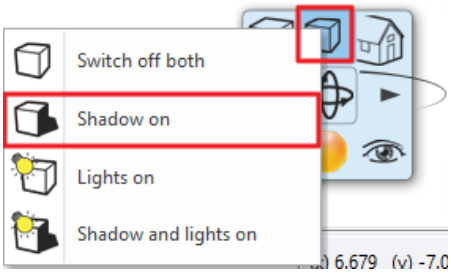
Based on orientation and geo-location we can determine the location and the exact time when the sunlight effects the model. This can be easily set on **Ribbon menu / File / BIM / "Project Parameters"** option. In the appearing dialog we can enter all the requested data. This is useful when we want to know exactly how sunlight effects the model at a given time and we want to make a shadow analysis.

.

- First, open the Sun setting dialog by using the **Ribbon bar / View / Sun / Sun position** command.
- The shadow will be accurately represented after setting up the location, the date, the time and the north direction and closing the dialog window by clicking on the OK button.



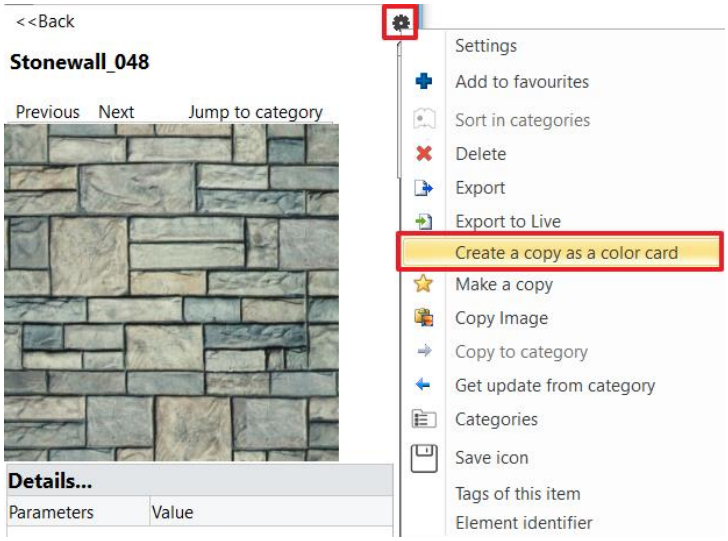
- Make sure that the shadow representation is turned on to see the result by using the shadow icon of the Navibar and selecting the "**Shadow on**" option.



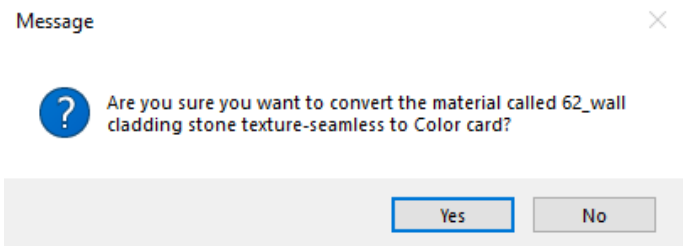
3.1.17. Working with Color cards

The Color cards tool is for creating a collection of predefined lists of materials (colored or textured) to be able to replace a material with another material of choice on the entire 3D model in a second. This predefined list of materials helps you better representing your model to your clients in several combinations of materials in a matter of seconds.

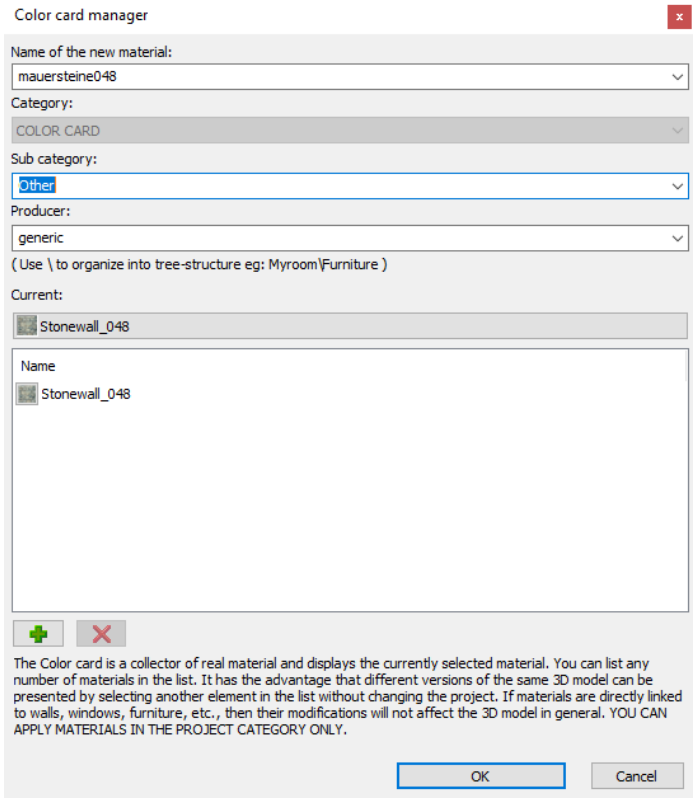
- Select the "**Material**" panel and the "**In Model**" category in the Design Center.
- Click on a material you are going to convert.
- Click on the Options button and select the "**Create a copy as a Color card**" command.



- When asked to make a copy as a color card, please click on the "**Yes**" button.



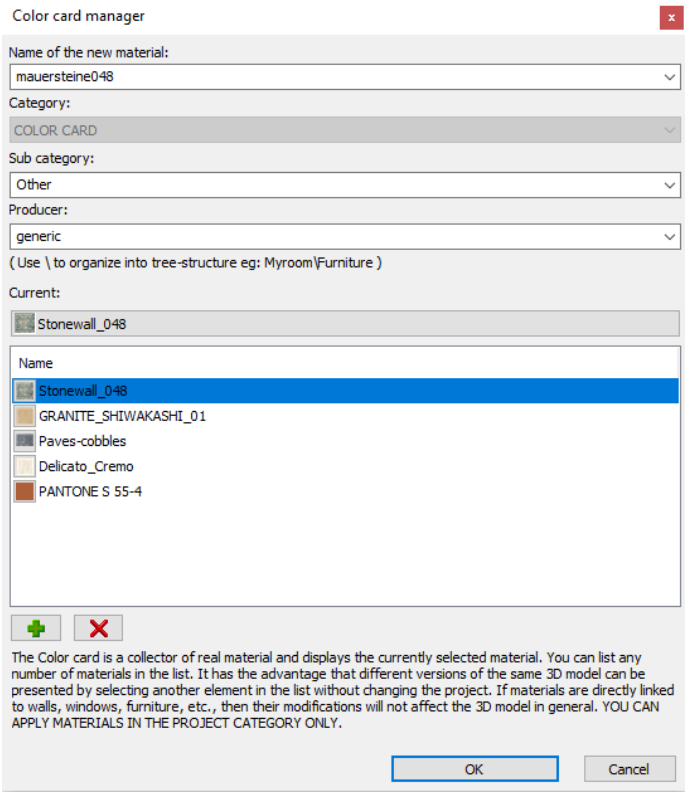
In the appearing dialog you can collect new materials and add them to the color card.



You can also remove one from the collection or change which material is the current one. When you close the dialog with OK, the program replaces the original material with the previously selected "**Current**" material.

- Click on the "**Add new**" button (represented with a green plus symbol) and select a new replacement material to the collection.

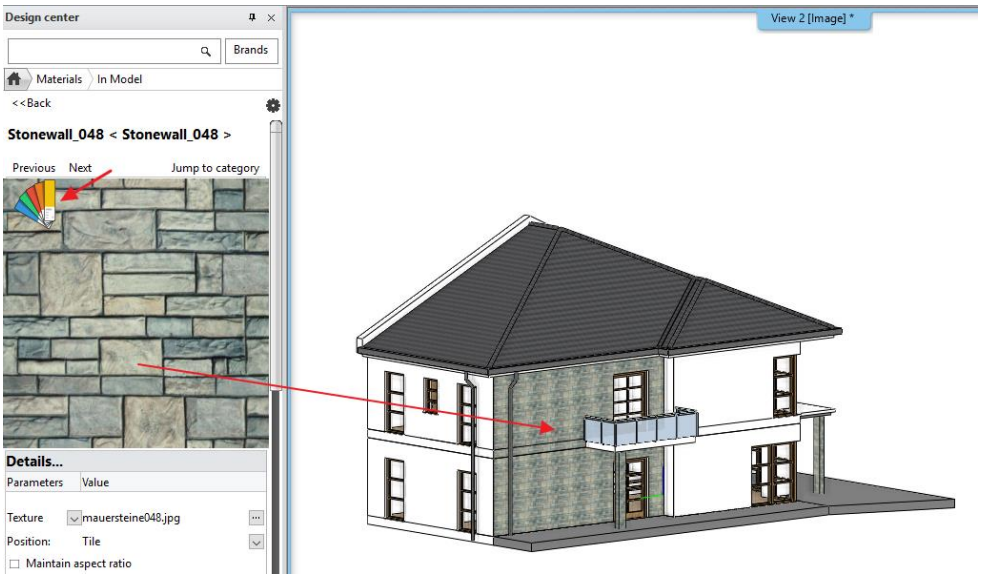
- Keep adding a few more to have at least 5-6 alternative representations for the material.
- Click “**OK**” to close the dialog window.



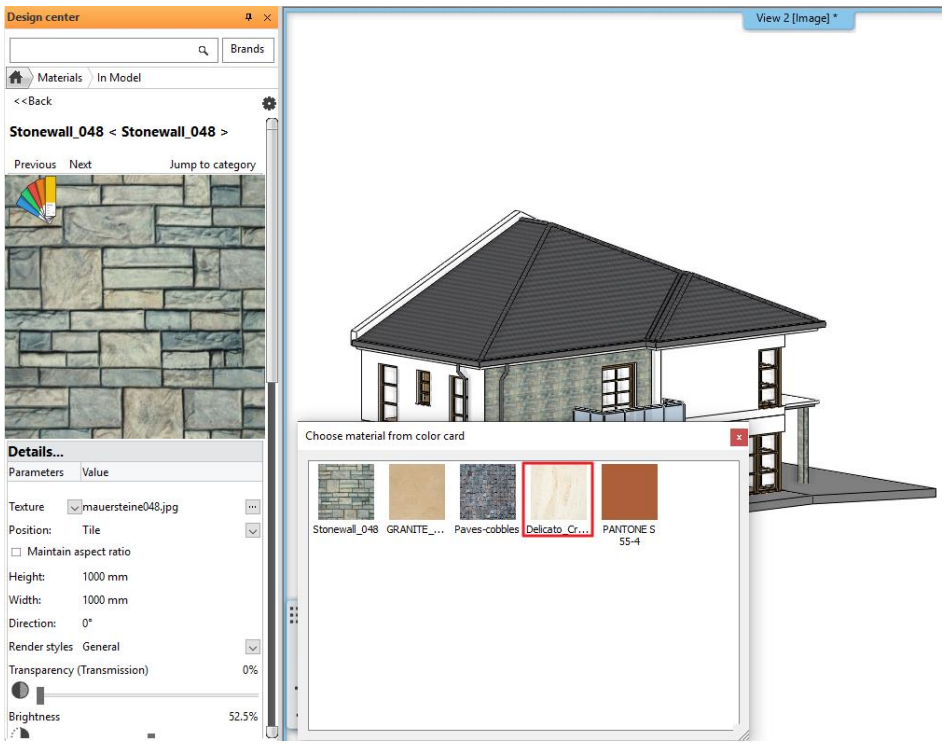
Keep in mind that the color card does not change its name when another material is selected to be the “Current” one. If you want to find the color card during work even easier, you can change its name (originated from the name of the first material converted) to a more descriptive name like “Elevation color card”.

You can change the current material at any time.

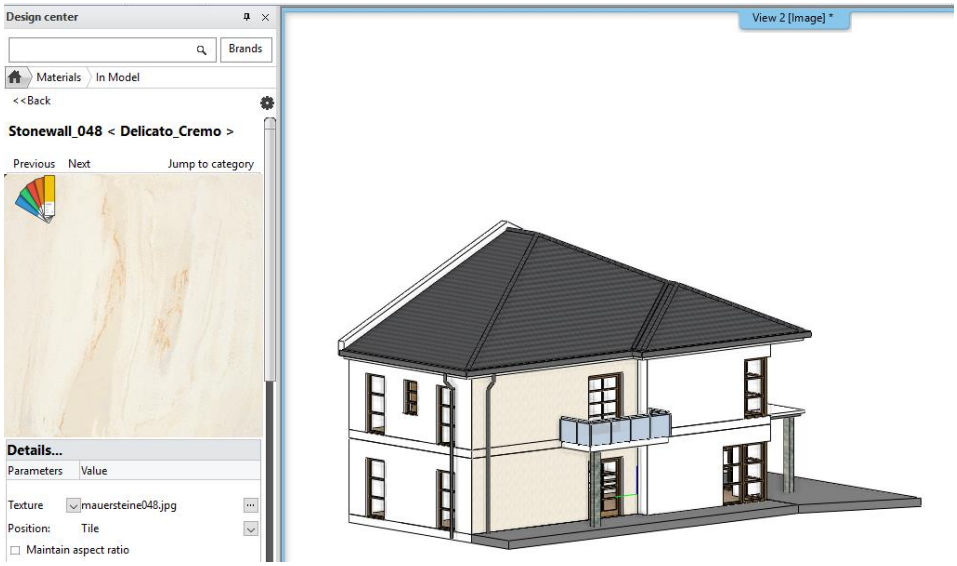
- Find and click on the color card in the Design Center and click on the “**Color card**” icon at the left top corner of the image.



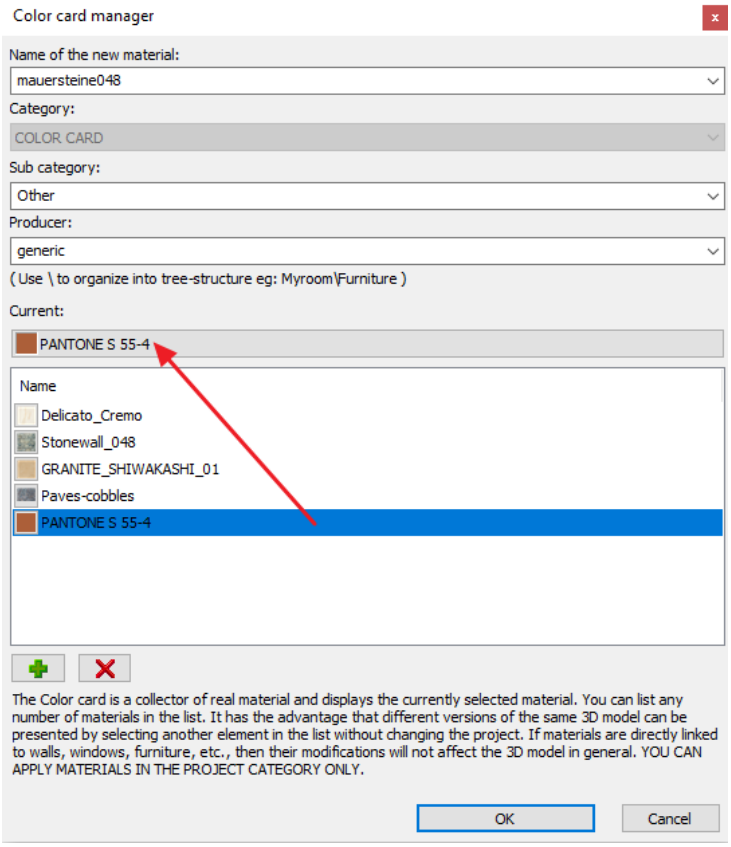
- Select a new “**Current**” material in the appearing dialog.



- The result is automatically represented. Close the color card list.



Alternatively, you can also choose a new “Current” material using the Settings command under the “Options” menu (small cogwheel icon). This is also where you can manage the color card content.



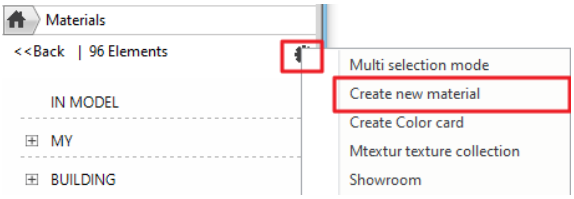
3.1.18. Creating a new material

ARCHLine.XP is shipped with a built-in material library. We have used them previously in this project, but it is essential to be able to create new materials for your projects either based on colors or textures of surface patterns. Let's see how to create a material based on an image search, using your web browser.

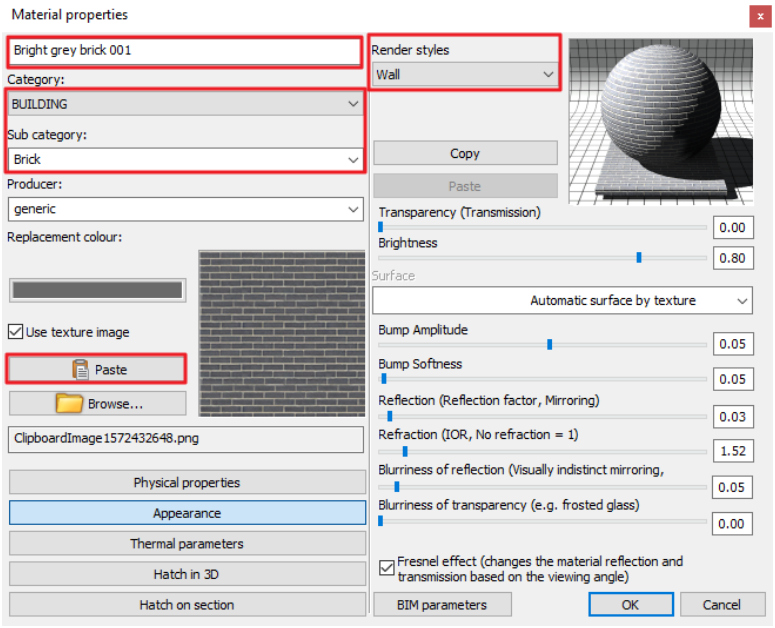
- Open your web browser and find a seamless image online. Use the following keywords for example: "grey brick seamless texture".
- Right click on the image in your browser and select "**Copy image**".

Note that based on which specific browser you are using this command might be simply "Copy" or "Copy to clipboard". The important thing here is that we do not want to save the image file on our computer now, we only want to copy it and later paste it into ARCHLine.XP.

- Go back to ARCHLine.XP, find the Design Center and open the "**Material**" catalogue.
- Use the "**Create new material**" command by clicking on the "**Options**" menu at the right top corner.



- Select the "**Building**" category and the "**Brick**" sub-category.
- Click on the "**Paste**" button to insert the previously copied image. This will be the texture of the new material.
- Make sure that the "**Physical properties**" page is activated and set width and height to **1000 mm x 1000 mm**. (Based on the result you found online you can use other values too.)
- Find the "**Appearance**" page and change the render style to "**Wall**".
- Click in the name field at the left top corner and change its name to "**Bright grey brick 001**".
- Close the dialog with the "**OK**" button.



Now you can use the new material on any surface you want. It will be available for all of your projects on this computer. Let's see how it looks like on a surface of this building.

- Change the material on any surface to see the result.
- Undo the change to the original material.

3.2. Visualization

Visualization and especially realistic visualization are very important when you would like to show the result of your design to a client. ARCHLine.XP offers a built-in renderer and supports also many 3D formats to be able to export your design and create visuals using external third-party rendering software packages as well. This following part discusses how you can use the built-in rendering abilities of ARCHLine.XP.

Note that not all versions of ARCHLine.XP offer the built-in renderer.

3.2.1. Architectural render settings

There are several factors that define the speed and quality of the final result of a photorealistic rendered visual. Generally speaking, the higher the details and settings are the longer the calculation will take. Let's see these key factors:

Which factors affect the render time?

1. The computer you are working on (processor speed, memory size).
2. Project size (number of surfaces).
3. The complexity of the materials.
4. The complexity of the lights.
5. The render settings.

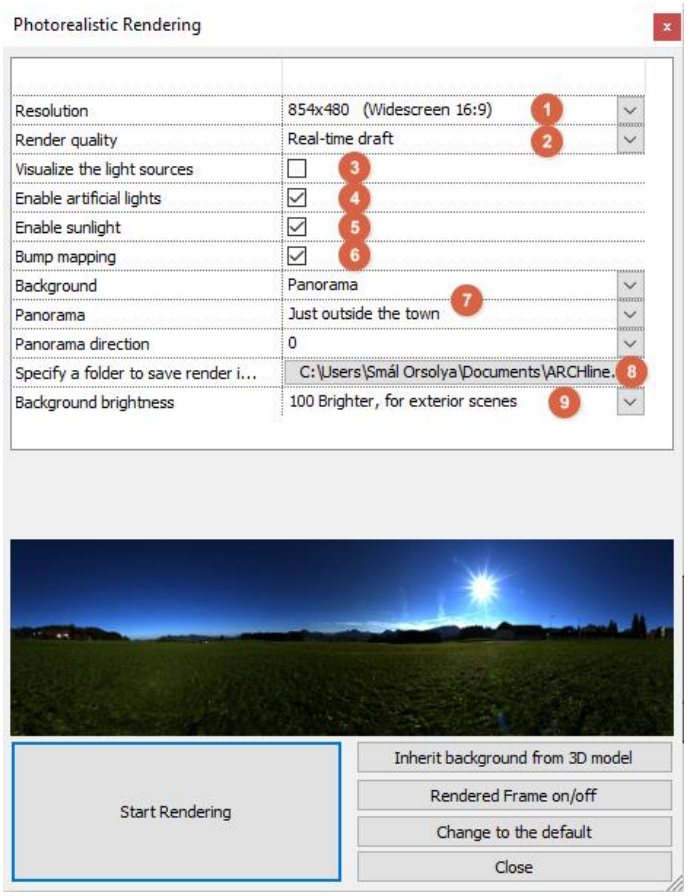
When rendering, it is recommended to turn off all the details of other rooms, except for the room currently being rendered. This will save you a considerable amount of render time, as the program does not need to calculate items that are not displayed in the final result anyway.

Rendering settings

To start rendering, open the **Ribbon bar / View / Rendering** menu. You have two main choices: you can start a standalone or an integrated rendering.

- The **Integrated rendering** appears as a drawing in the project and you can handle it as the drawing windows.
- The **Standalone rendering** opens an application which is in close connection with the program but runs separately.

- Start the "**Ribbon bar / View / Rendering / Standalone render – Real-time draft**" command and the following settings window appears.



- Let's set up the "**Resolution**" **(1)** first. Select 854x480 for now. This is a low-resolution for work and the reason we choose this is that lower resolutions render faster. Later, you can choose higher resolutions for the final renders for the client.
- The next setting is the "**Render quality**" **(2)**. Let's keep it at "**Real-time draft**". This mode will give a quick but not final result. It is good enough to determine what to fine-tune. Later we will change this to a higher quality.

You have the following options to create final visuals for the client:

- **Exterior – Quick render**: For exteriors and well-lit interiors.
- **Interior – Quick render**: For images that are not clear enough using the "Exterior – Quick render" quality setting. (Most probably when there is not enough direct light).
- **High detail render**: More details are displayed; the result will be clearer and noiseless but it will take more time.

Note that simply always going with the highest possible rendering quality might result in a good final render, but often the time you would invest into rendering like this will not lead to a considerable quality increase. Lower quality rendering settings may end up quite similar in many cases. The "Exterior – Quick render" for example can perform very well in well-lit interiors, too. In such cases increasing the quality to "Interior – Quick render" will take longer and sometimes will have no clearly visible difference. Test your scene with a lower quality setting first and if the result is not grainy you are good to go and use it for the final renders too.

- Leave the "**Visualize the light sources**" **(3)** option turned off. Using this option, you can turn on a simulation which visualize the light sources of the project as light bulbs. Usually this option is disabled because the source of the light is very well visible without it too.
- Enable the "**Enable artificial light**" **(4)** option. This option toggles the lights of the lamps in the project.
- Keep the "**Enable sunlight**" **(5)** option enabled. This toggles the direct sunlight. Note that turning off the sunlight does not mean that we will have a night time render. If this option is turned off, the result will resemble to a cloudy day outside.
- Keep "**Bump mapping**" **(6)** enabled. Materials have a bump map effect based on the selected render style or the custom settings made by the user. Bump map can increase realism and it is not too costly regarding rendering time, so it should be kept enabled.
- Select "**Panorama**" and the "**Just outside the town**" background for the render **(7)**. Panoramic backgrounds completely surround the model. You can also choose a color or color gradient or an image as background. Feel free to select backgrounds from the pre-defined ones or browse for custom background images.
- We are not changing the "**Specify a folder to save render images**" **(8)** for now. This is basically a back-up location, where the program creates a back-up of the latest state of each image.

- Leave the "**Background brightness**" **(9)** option on default. The brightness of backgrounds from different sources are not the same. You can adjust it here if necessary. In case of rendering exterior scenes the background brightness value should be set higher to better match the outdoor lighting conditions.
- Click on the "**Start Rendering**" button.

  Once the rendering process is started you will see an image appearing in a matter of seconds, however, depending on your computer's speed it can take a while. In the appearing dialog window, you will see the rendering "Effects" on the left-hand side.
- Set up the **Exposure** first. Try to find a good balance between lit and shaded areas, not allowing the image to become too bright washed out or too dark. Exposure for exteriors is usually kept on default or even lowered a bit.

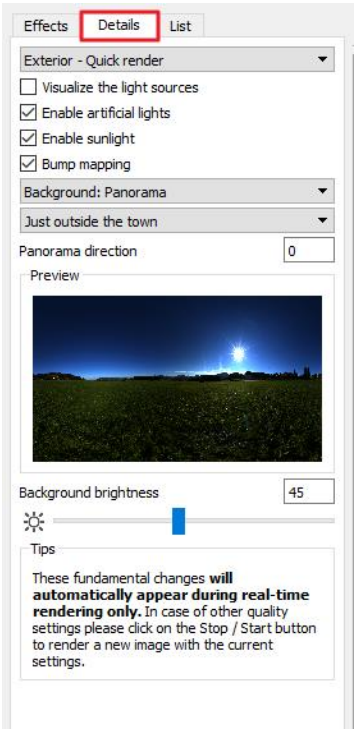
  You can use the real-time draft render to find materials that need further attention. Pay extra attention to the wall surfaces, metals, wooden frames, glass surfaces and the roads too. Make sure you use the proper "Render styles" we discussed in an earlier paragraph of this tutorial.

When you have enough artificial lights inside and outside your model, you can also create night time renders. For this, you simply need to

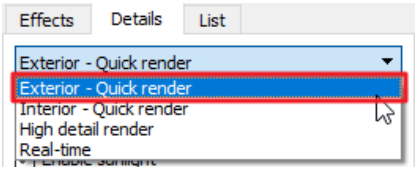
- ❖ use the "Shadow simulation" command to find a time at night
- ❖ disable the "**Enable sunlight**" option and
- ❖ make sure the lamps are turned on and the "**Enable artificial light**" option is enabled.

3.2.2. Creating the final renders

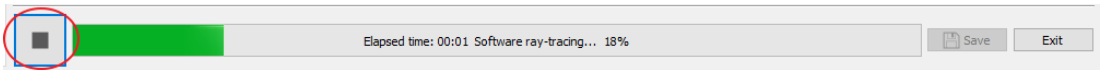
If you want to create a final image from a rendering started as a real-time draft, you have to do the following:



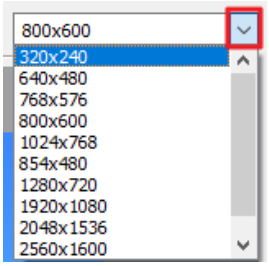
- Activate the render window.
- Go to the **Details** tab. Here you can find the settings with which you have originally started the work.
- Select the "**Exterior – Quick render**" quality from the options and the program automatically changes to normal render. In this case it will take a bit longer to complete the render.

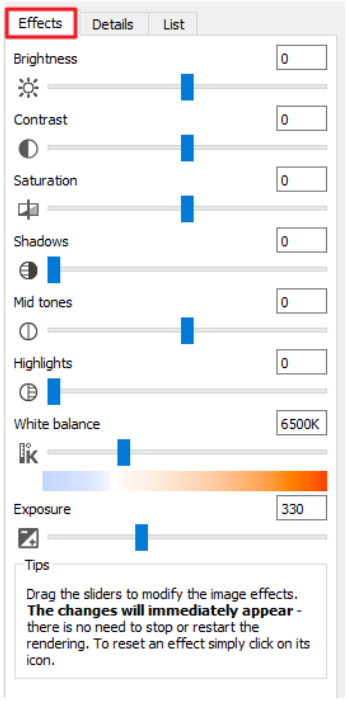


- The rendering can be stopped anytime with the Stop button seen at the bottom of the rendering dialog window. Later it can be re-started again using the start rendering button.



- To modify the resolution, click on the Stop button. Modify the resolution in the top right corner, then restart the render.





- While the program is working on the visuals, all the “Effects” can be modified on the fly. These settings can be modified on the final result as well.

Tip: It is recommended to set the **Exposure** first, so that the white colors are right. This modification is visible immediately.

If you want to get back to the default value at any of the settings, you just have to click on the icon of the setting next to the slider.

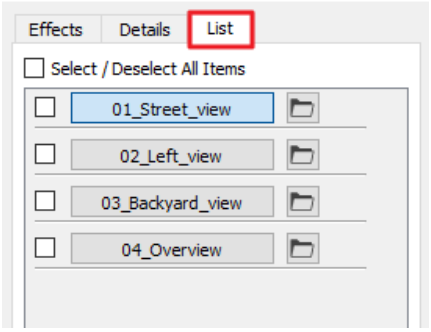
If you want to reset all the effects, click on the **Reset all** button at the bottom of the tab.

- Wait until the image is processed and save the final image by clicking on the “**Save**” button.
- Save multiple versions of your render, by making changes on the “**Effects**” page and saving each and every version into a new file. It is recommended to choose JPG if you want to send it to your client.

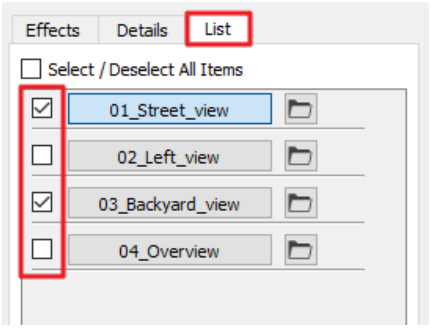
3.2.3. Render list

There is a third tab in the render window for the “**Render list**”. Creating the final images is a long process per image, and it is time consuming to save images and to switch to new ones, then launching a new rendering. Essentially, this process is automated by the rendering list.

- Click on the “**List**” tab and the previously saved perspective views appear here.



In the Render list you can select multiple views. You just have to tick the square before the name of the view, then click on the “**Start**” button below.



(The selected images are rendered with the settings and resolution previously selected at each image).

Tip: It is recommended to leave the computer “alone” after starting the final render list. No other programs should run during the rendering because it will increase the render time.

Congratulations!

You have done an excellent job by meeting a serious and very useful milestone, you have completed the architectural tutorial of ARCHLine.XP!

With the help of this tutorial material you made yourself familiar with the methods of the accurate and precise architectural design.

With the knowledge you have acquired so far, you will be able to process complex floor plans, sections and elevations, all in one comprehensive model.