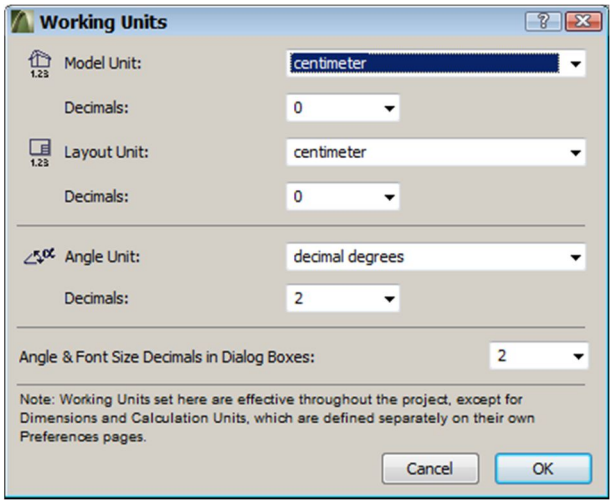
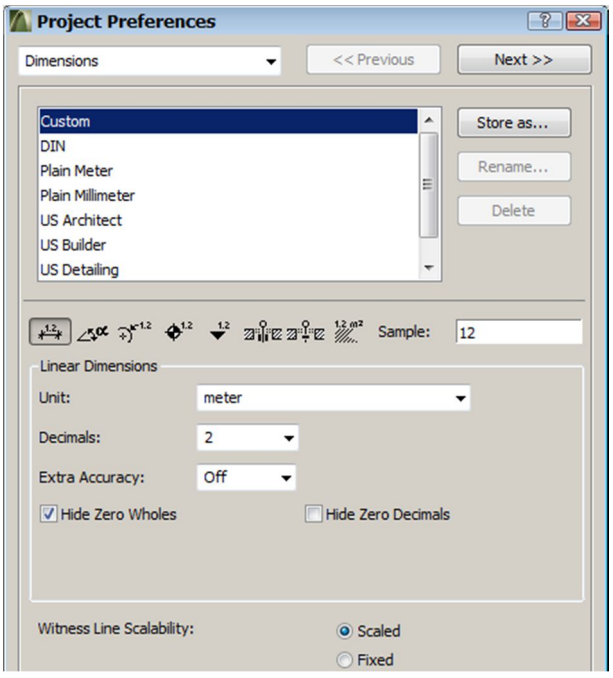
Roof-maker

GENERAL SETTINGS



Set the project units (centimeters - **OPTIONS» PROJECT PREFERENCES »WORKING UNITS**).

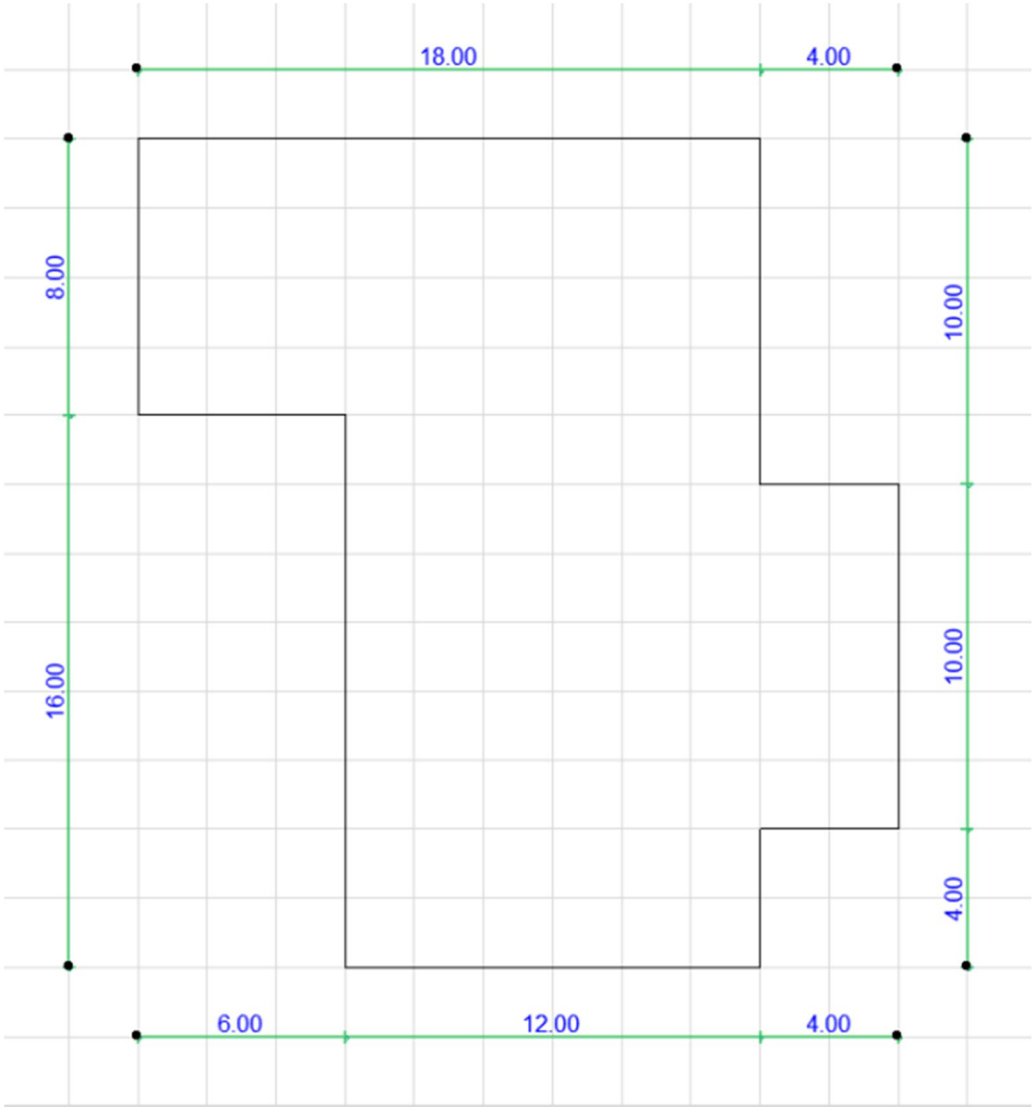


In this tutorial you will study how to:

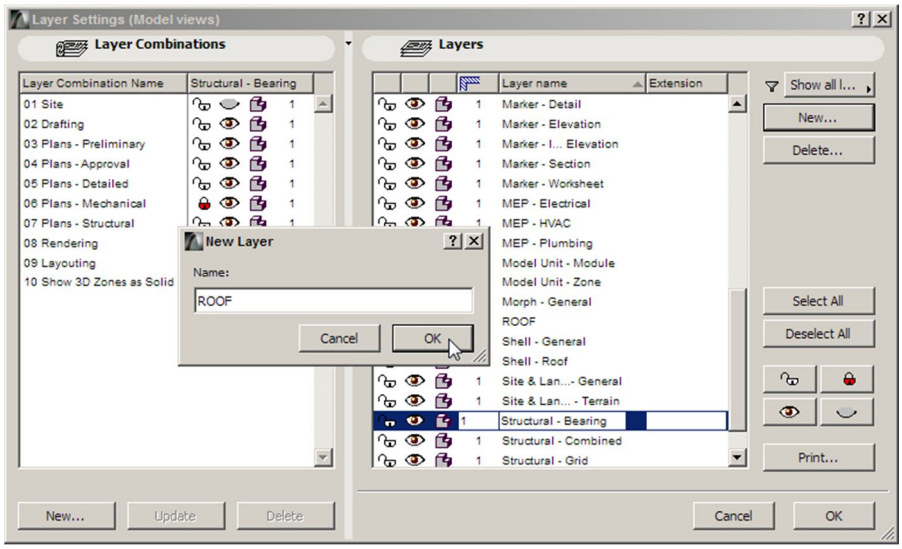
- create composite materials
- automatically create multiplane roofs using a contour line.
- **Use RoofMaker**
  - automatically generate a hip roof structure
  - draw individual structural elements for the roof
- place and edit roof windows

In the **OPTIONS»PROJECT PREFERENCES»DIMENSIONS** menu, set the dimension units to meters with 2 decimals and check the **HIDE ZERO WHOLES** in order to show sub unitary dimensions in centimeters.

Using Polyline, create on the first floor the next closed contour:



Open the layer manager (CTRL+L) and create a new layer, naming it ROOF.

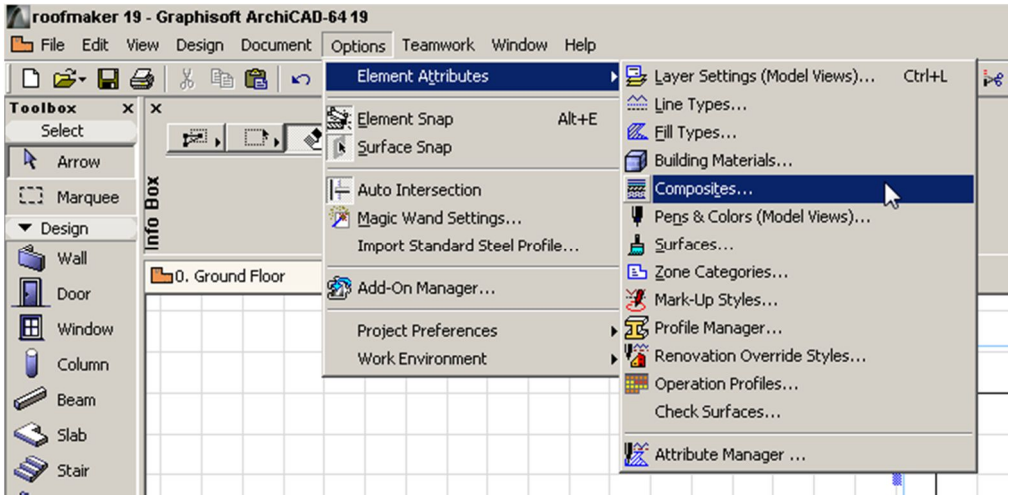


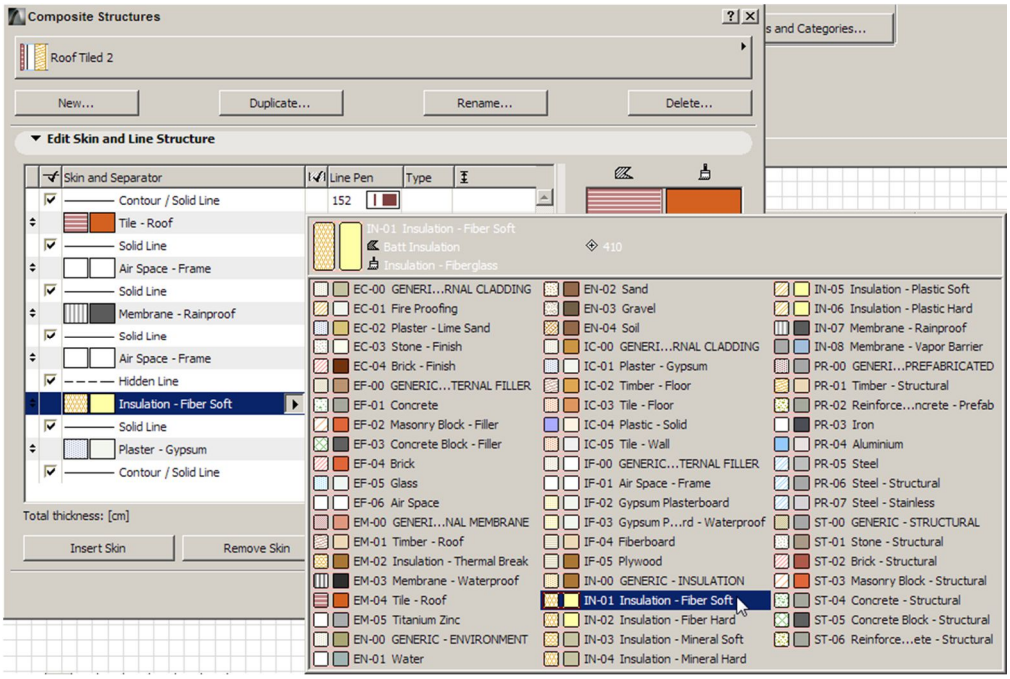
CREATING A COMPOSITE STRUCTURE FOR THE ROOF

Create a new composite material for the roof **OPTIONS » ELEMENT ATRIBUTES » COMPOSITES**.

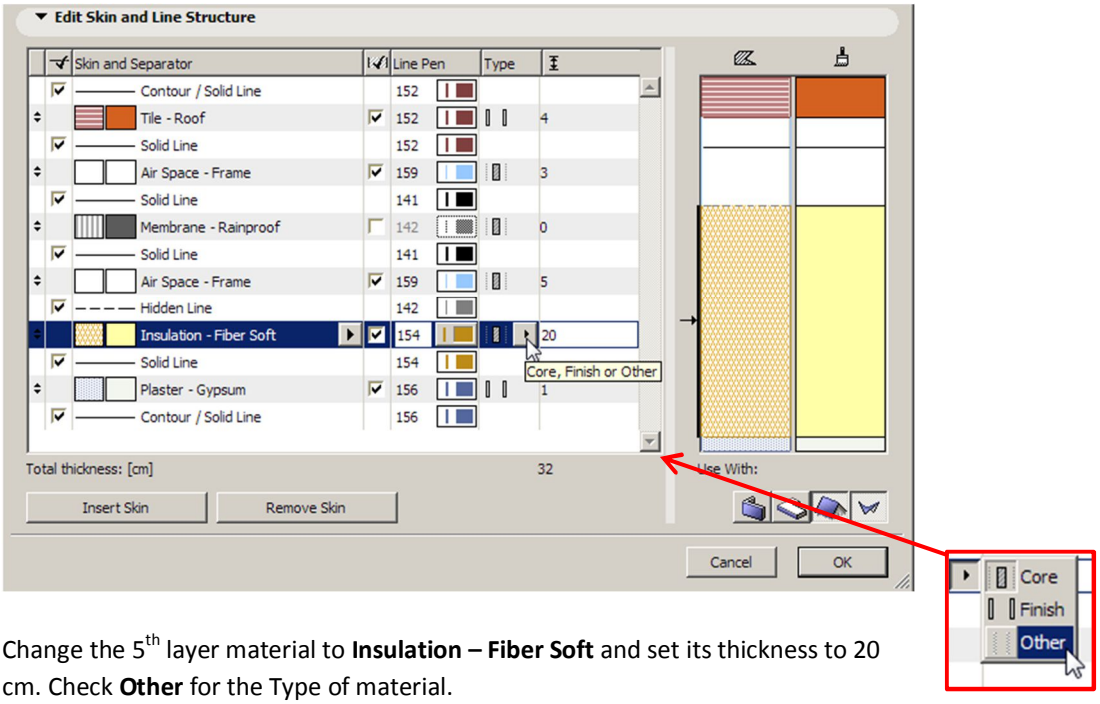
Select **ROOF TILED** from the composite material list, and press **DUPLICATE** to make a copy of the material and edit it. Name the new material **ROOF TILED 2.**

Keep the first four layers **(TILE ROOF, AIR SPACE-FRAME, MEMBRANE-RAINPROOF & AIR SPACE-FRAME)**. The first air space layer will represent the battens and the second the decking.





The **CORE** type of this layers will prevent the intersection with the finishing layers of other elements using composite structure materials.

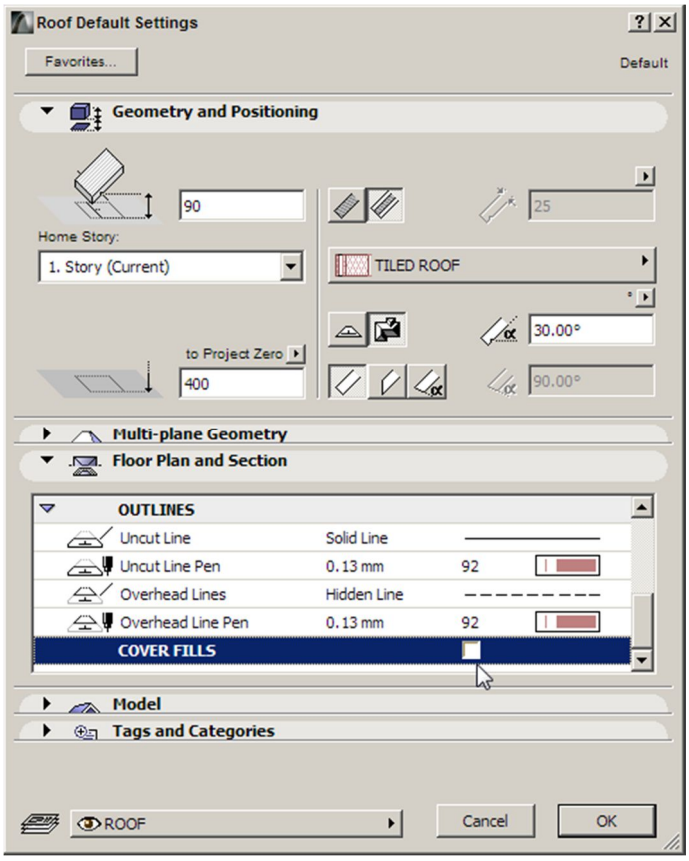


Change the 5th layer material to **Insulation – Fiber Soft** and set its thickness to 20 cm. Check **Other** for the Type of material.

CREATING A MULTI-PLANE ROOF USING A PREDEFINED CONTOUR

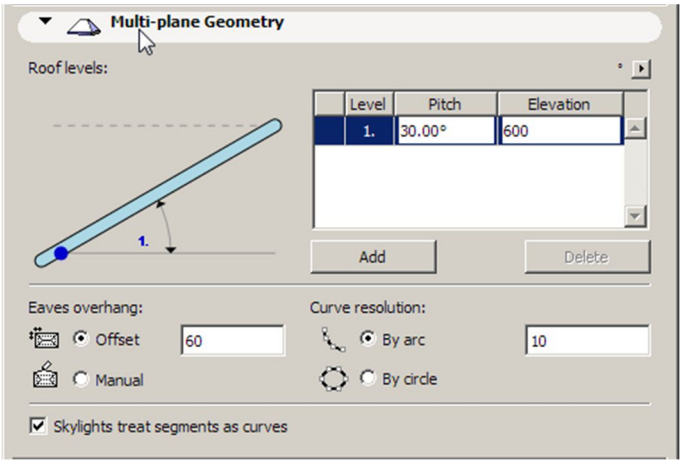
The roof will be generated on the first floor level, using the **MULTI-PLANE** geometric method of the **ROOF** command.

Enter the settings area of the ROOF command and make the following changes:



In the **GEOMETRY AND POSITIONING** section set Pivot Line height to 90 cm relative to the first floor level. In the **FLOOR PLAN AND SECTION» STRUCTURE** section choose the composite material created before (**TILED ROOF**). In the **FLOOR PLAN AND SECTION,** deactivate the roof texture. (Uncheck **COVER FILLS)**

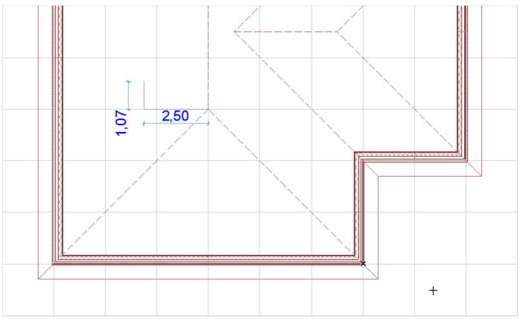
Place the roof on the **ROOF** Layer.

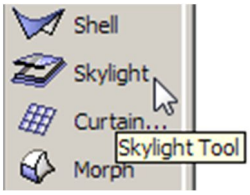


In the **MULTI-PLANE GEOMETRY** section, set the angle to 30 degrees, elevation to 600, and the offset to 60 cm.

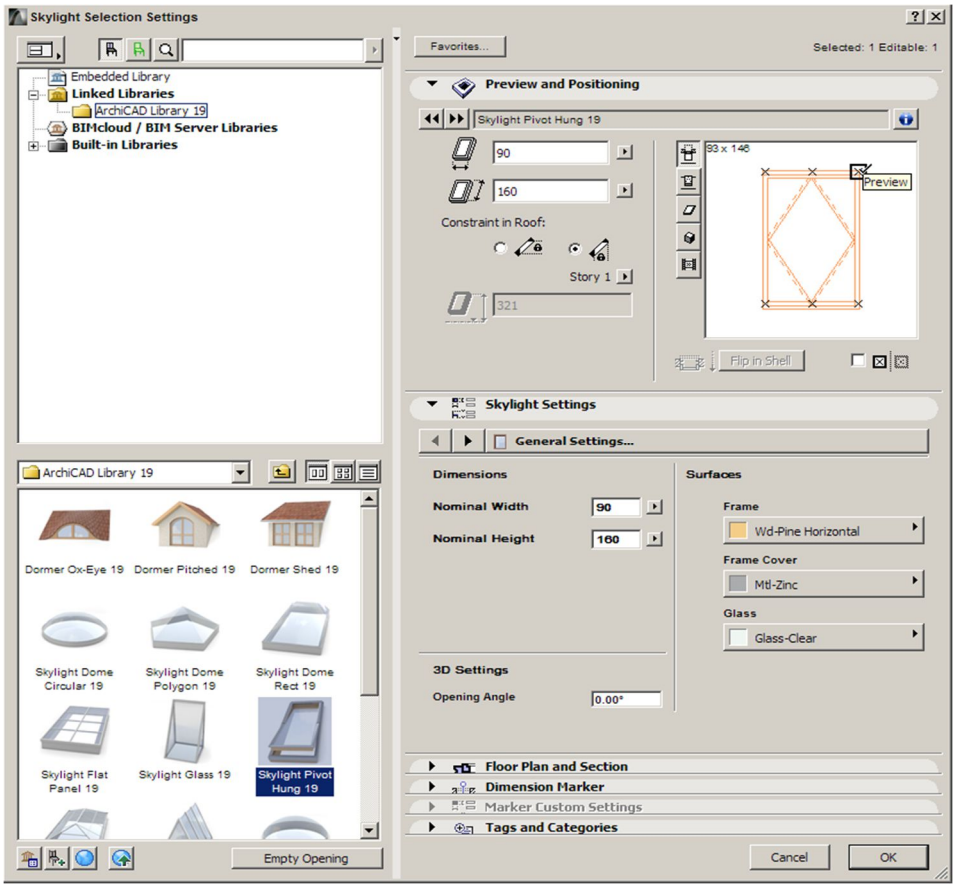
Generate the roof using the Magic Wand (**SPACE & CLICK** on the polyline contour).

On the first floor plan will be placed the skylights. Draw a polyline like in the figure below (2,50m on the X coordinate to the left, and 1,07m on the Y coordinate upwards).



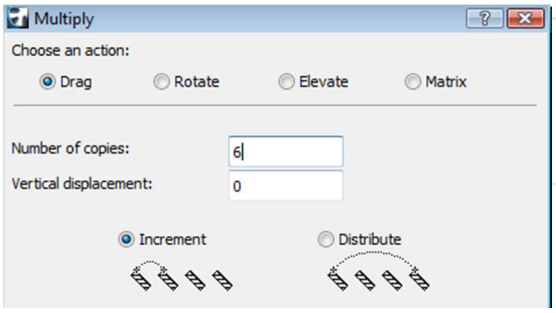


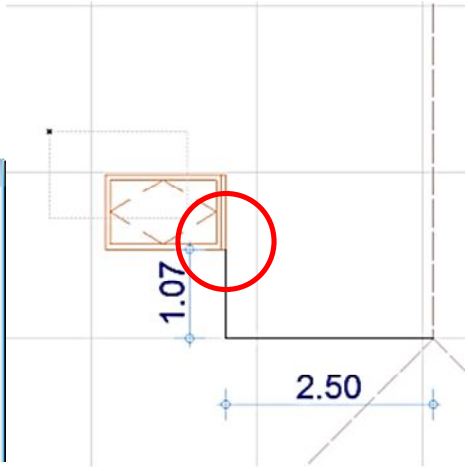
Double click the Skylight tool in Toolbox to access its settings and select from ArchiCAD library **SUNLIGHT PIVOT HUNG 19**.



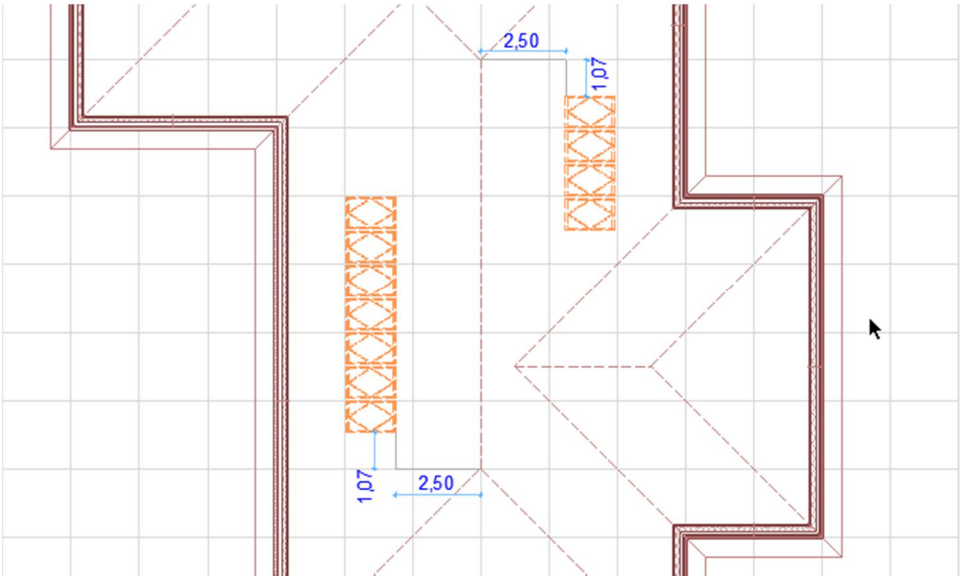
In the **PREVIEW AND POSITIONING** section, change the skylights dimension to 90 x160cm, and in the preview window set the insertion point in the right upper corner.

Place the skylight at the end of the polyline drawn previously.



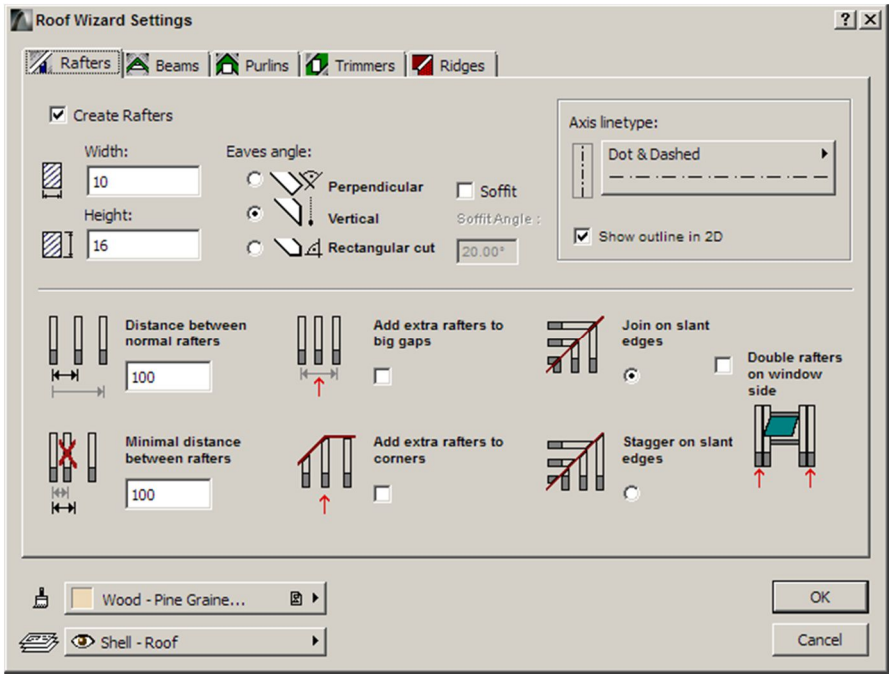


Select the skylight and press CTRL+U (Multiply) –Drag Action, Increment Method, number of copies – 6.
To enter the reference point (Drag Reference Point), click anywhere in the plan. By holding the SHIFT key in order to snap to the orthogonal directions, press R to access the incremental distance and set it to 100cm.
Using the editing options (DRAG A COPY, MIRROR and MULTIPLY), place 4 identical skylights starting from the upper end of the main ridge of the roof.



GENERATING THE ROOF STRUCTURE

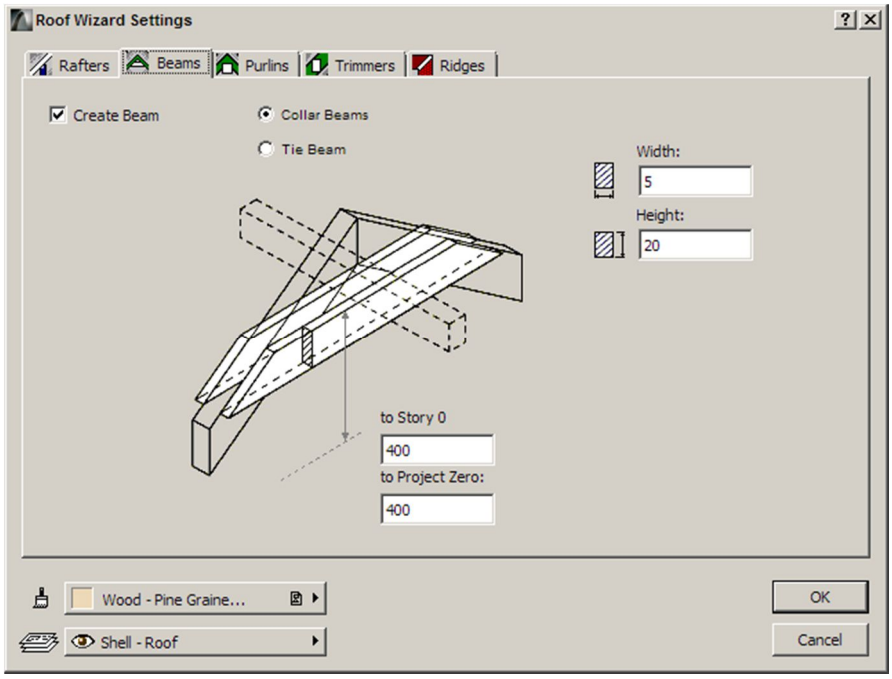
To enter the Roof Maker menu, access **DESIGN»ROOF EXTRAS»ROOFMAKER»SHOW ROOFMAKER TOOLBOX.**
Select the roof and press the Roof Wizard button in order to automatically generate the roof structure.



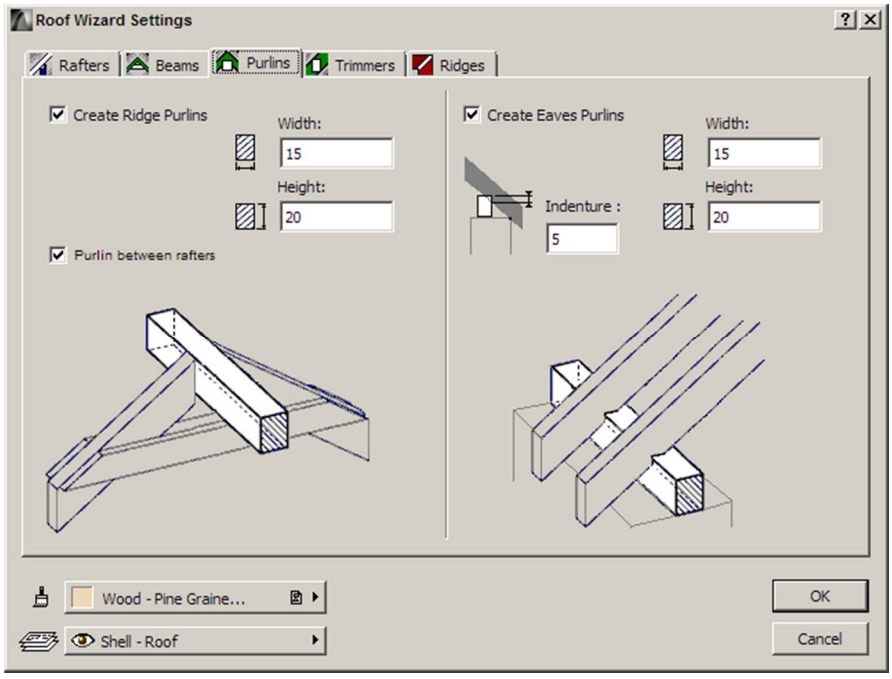
In the **RAFTERS** section :
Rafter section dimensions – 10x16 cm
Distance between normal rafters – 100 cm
Minimal distance between rafters – 100 cm

Check the **JOINT ON SLANT EDGES** option to have a simmetrical positioning of the rafters on the adjacent planes of the roof

In the **BEAMS** section :
Beam section dimensions – 5x20 cm
Height to project 0 – 655 cm.

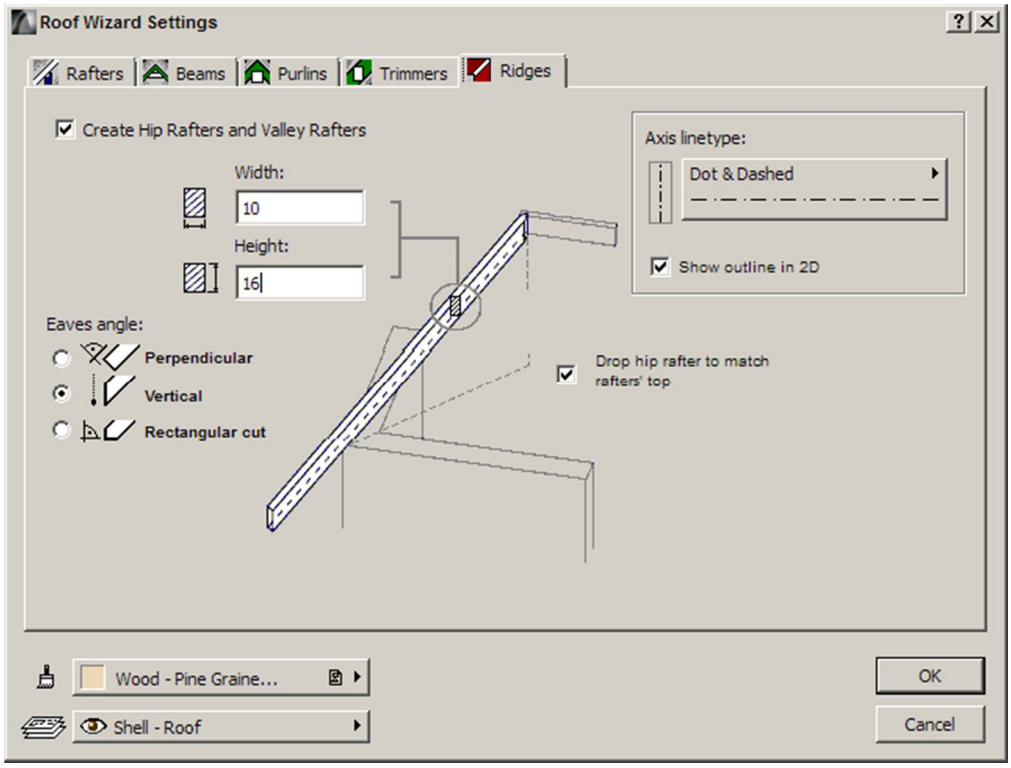


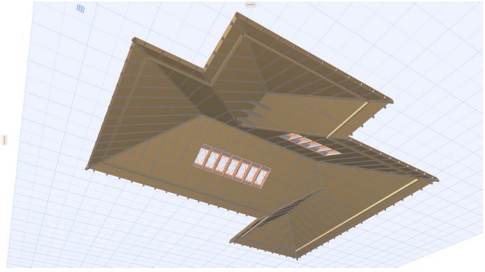
In the **PURLINS** section set the section dimensions of the ridge and eaves purlins to 15x20 cm.

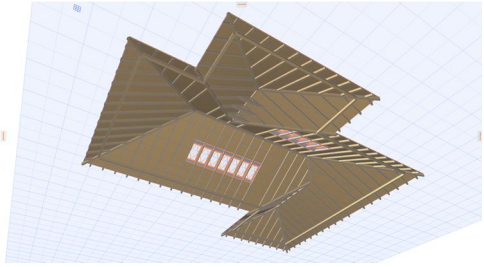


In the **TRIMMERS** section, uncheck the CREATE TRIMMERS option.

Set the **RIDGES** dimensions to 10x16, and press ok to generate the roof structure



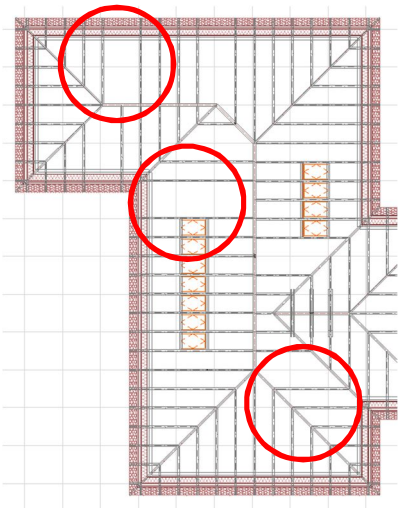




! In the 3D view the roof structure will be hidden in the roof layers. In order to inspect it, check the **CORE ONLY** option from **DOCUMENT>PARTIAL STRUCTURE DISPLAY** menu. This will show in the 3D window only the **CORE** elements of the COMPOSITE STRUCTURE MATERIAL (check the Creating a Composite Structure for the Roof section of this tutorial).

MANUAL ADJUSTMENTS

Using Roof Wizard for complex roofs may require manual adjusments to correct errors and omissions of the module.

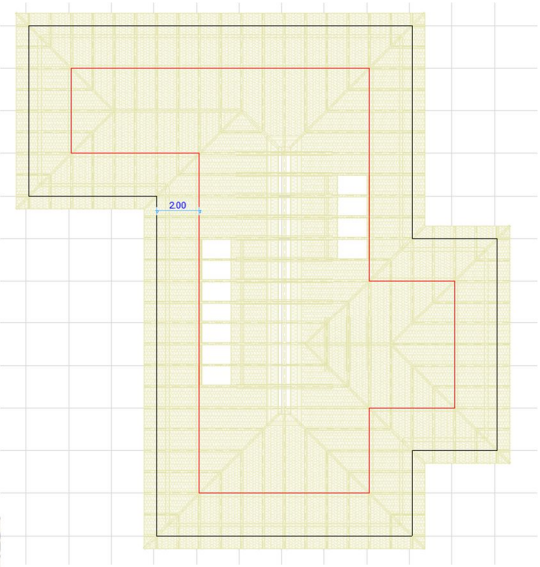


The missing rafters can be placed with the usual editing tools MIRROR A COPY and DRAG A COPY or by individually defining them using the specific tools of the ROOFMAKER Toolbox.

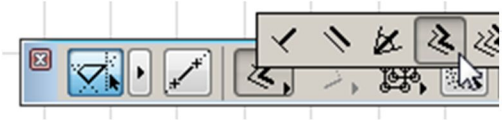
With the last method, the **CREATE RAFTER** button will enquire the selection of the roof and the dimensions of the element section. Clicking on the insertion point of the ridgr will finally place the rafter.

There may be errors in the Beams, which will not be generated if the adjacent rafters are not symmetric relative to the ridge.

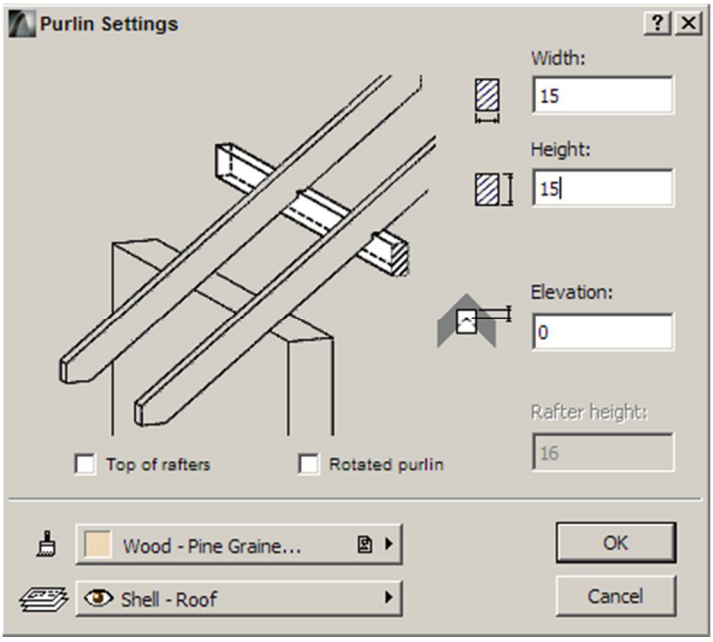
After adjusting them to be symmetric, select them and press **CREATE COLLAR BEAMS** in the ROOFMAKER Toolbox.
Like in the case of the rafters, there will be an enquiery for the dimensions before generating them.



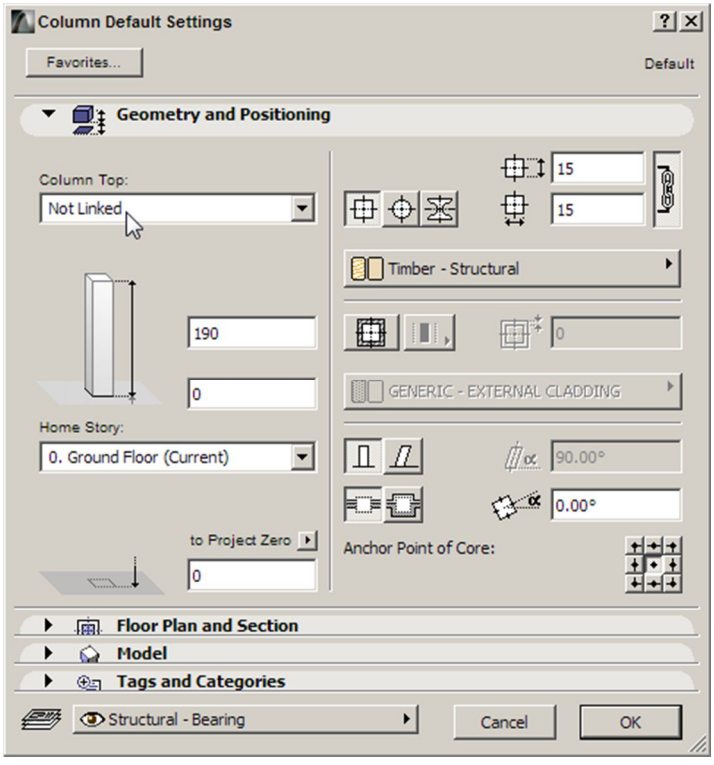
Open the CONTROL BOX from WINDOW»PALETTES menu.
In the ground floor select the polyline, press **OFFSET POLYLINE** in the **CONTROL BOX** and holding SPACE key, generate a similar poligon 200cm towards the interior.

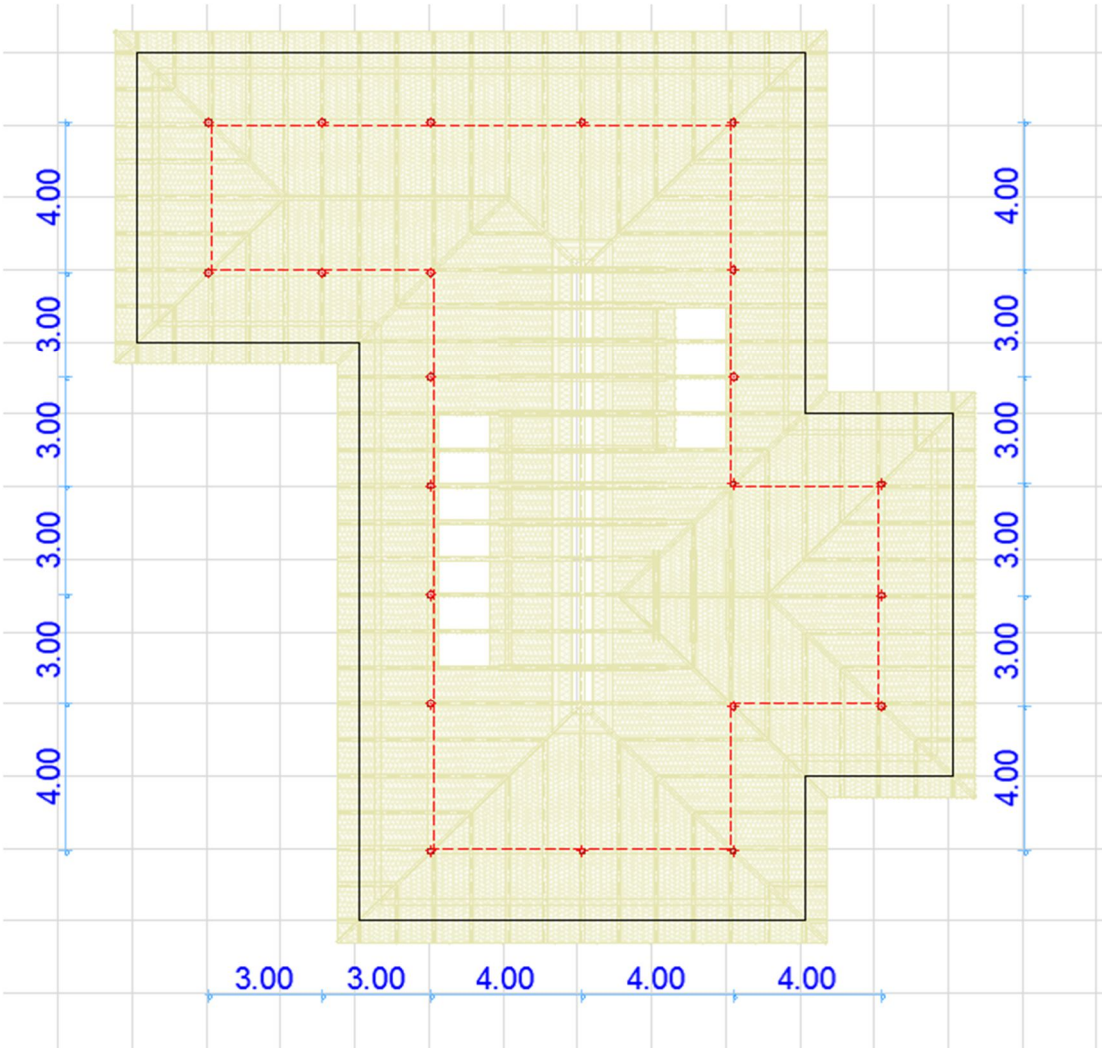


Copy the new polyline on the first floor plan. This will be the contour line for creating PURLINS for the roof. Press the **CREATE A PURLIN** button in the ROOFMAKER Toolbox. You will be prompted to select the roof plane which will be affected. After setting the dimensions (section dimensions – 15x15 cm, elevation – 5cm), click on the segment of the polyline created above on that roof. In order to place the purlins you have to perform this action for each roof plane.



On the purlin contour place studs using the COLUMN tool, with the following dimensions: section - 15x15cm
Height – 190cm.
Set **NOT LINKED** optiom for the **Column Top** type.

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