TERRÁN

OTTHON A JÖVŐBEN

Terrán ArchiCAD AddOn

Roof Tiling User Manual

eptar

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Terrán Roof Tiler (Archicad 23/24/25/26/27/28/29) User Manual

Terrán Roof Tiler (Archicad 23/29) program

The Terrán Roof Tiler (Archicad 23/24/25/26/27/28/29) program

Trademarks:

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1. Chapter: Installation and Starting the Program

1.1. Installing the Terrán Program

Download the Terrán 6.5 roof tiling add-on and run the installer.
The installer automatically copies the necessary files to your computer.

There is no need to uninstall previous Terrán versions before installation, even if a Terrán solution was already installed on your computer.

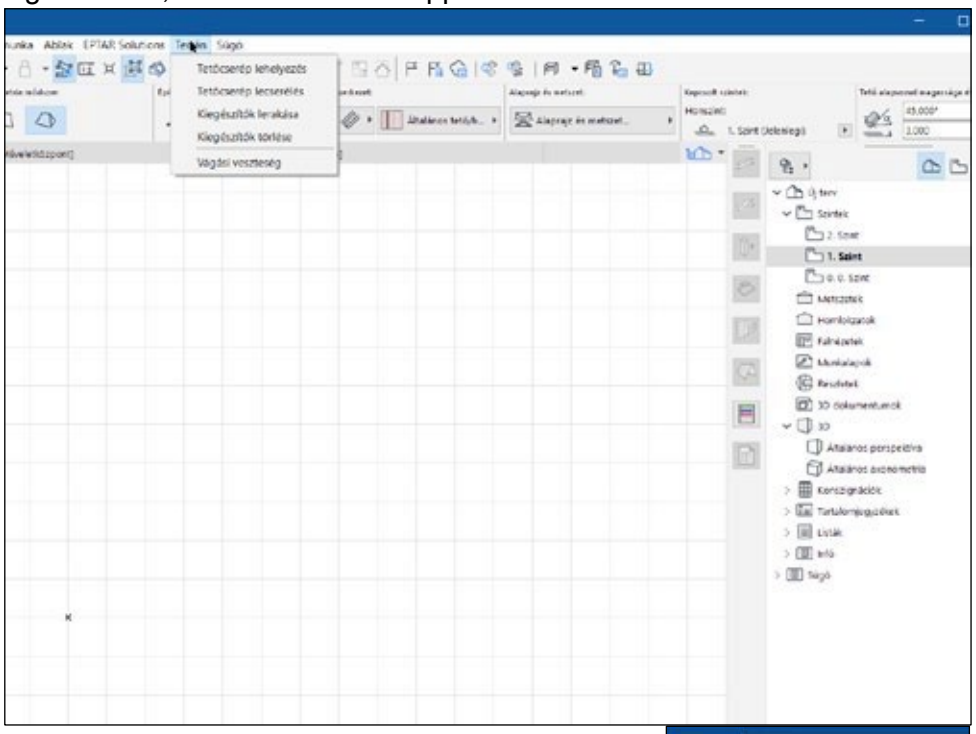
After installation, the Terrán application automatically loads the necessary libraries on first use.

Note: the current version of the Terrán program can only be used with Archicad 23/29!

If you previously installed an earlier version of the Terrán (Mediterrán) roof tiler, the installer will overwrite it during installation.

1.2. The Terrán Program

After launching Archicad, a new menu item appears in the menu bar: “Terrán”.



The various functions can be accessed from its submenus.

1.3. General Structure of the Terrán Program

The Terrán Roof Tiler consists of two parts: the add-on program running under ArchiCAD (Terrán API) and the library (TerranTmp.lib).

The program places polygons corresponding to the various roof surfaces on the floor plan above the Archicad roofs. Accessory elements (e.g. snow guards, antenna outlets, roof hatches, etc.) can be placed on these surfaces. The tiles appear as textures on the polygons. The accessory elements are visible both in the floor plan and in 3D view. Ridge tiles are displayed schematically in 3D. The TerranTmp.lib library contains, among other things, the files needed for textures and listing. The library elements corresponding to the tile and ridge elements are placed after installation in the Add-

ons folder in the Terran/TerranTmp.lib library. (This library is automatically loaded by the program.) These are placed on the floor plan with parameters set by the Terrán API.

1.4. Using the Terrán Program with Plans Created with the Earlier Mediterrán Program

If you previously installed an earlier version of the Mediterrán roof tiler, the installer will overwrite it during installation.

If you want to open a previously created plan that contains roof surfaces made with the earlier Mediterrán roof tiler, the program will not automatically find the tile surfaces. This is because the TerranTmp.lib library is only loaded when tiling begins. If you select a roof surface and issue the Terrán/Tile Roof command, the library loads automatically and displays the old roof surfaces as well, even if you do not complete the tiling and click Cancel in the dialog.

2. Chapter: Using the Program

2.1. The Basics

In the Archicad plan, polygons imitating tile surfaces are placed on roofs at the same level. After placing the parameterized library elements, the roof and the tile surface polygon are grouped together; of course this group can be suspended or dissolved using the relevant commands in the Tools menu. There is no other automatic connection between the roof and the placed library element! Thus, modifications to the roof (changing pitch angle, thickness, etc.) are not followed by the placed tile surface element. Moving, mirroring, or rotating the roof is only followed by the polygon if group management has not been suspended. Deleting the roof has no effect on the placed tile surface polygon.

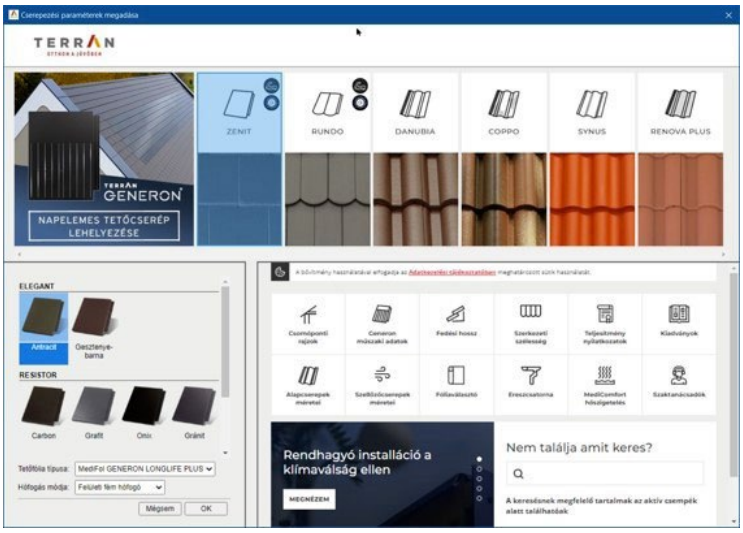
Important! It is recommended to use the Terrán program when the roof is already in its “final state”, i.e. when the other related structures (e.g. chimneys, skylights, etc.) have already been placed.

Before using the Terrán program, the necessary roof elements must be created in Archicad using the Roof tool and edited together. The Terrán program works with a tolerance of a few cm, which can filter out minor inaccuracies. After completing the roofs, the Terrán program can be applied. This consists of tiling and assigning accessories.

The program only deals with roof, wall and fill type elements selected simultaneously. After geometrical analysis of these, it places the necessary library elements. During the analysis, it determines the relationship between the roofs, walls and fills. This reveals where the ridge needs to be placed, which section of the roof contour will be the eave, the valley, where a verge tile can be placed, etc. Wall and chimney flashings are created on the edges or sections of edges shared by walls and fills with the roof.

2.2. Tile Placement

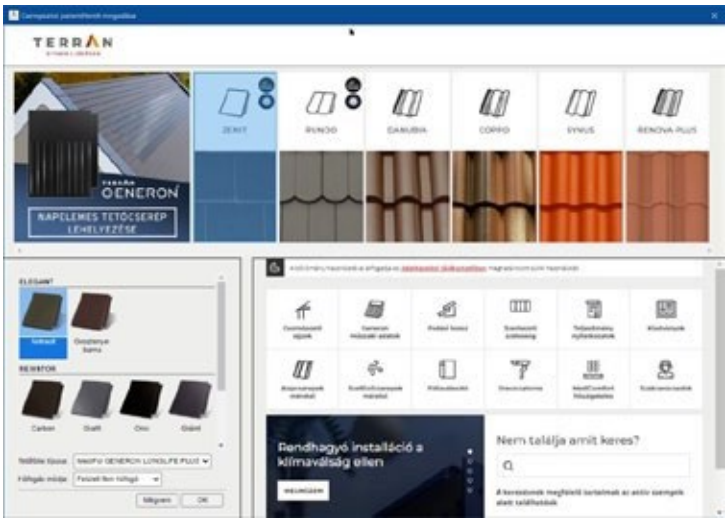
After jointly selecting the roof, wall and fill type elements forming a roof structure, we define the tiling properties in the settings window of the “Roof Tile Laying” menu item in the Terrán menu. This interface has been significantly revamped.
By selecting the tile type and colour, the program automatically determines the shape and colour of the ridge tile, and the colour of accessory elements and structures.

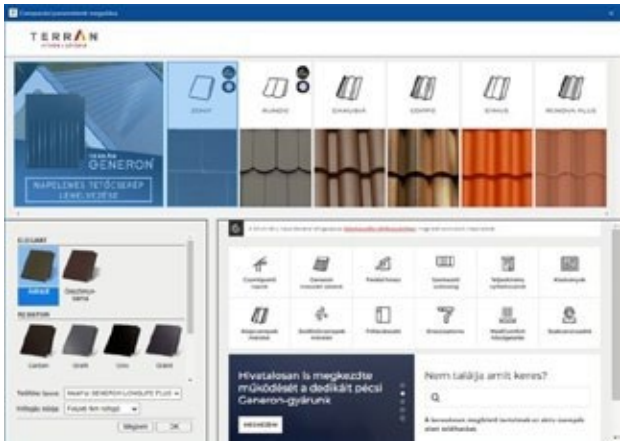


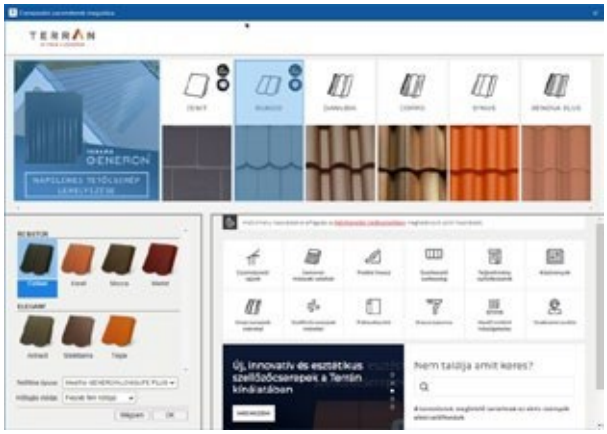
2.3. Placing GENERON Tiles

GENERON tile placement: the program treats the GENERON tile as an option
meaning it can be activated when ZENIT or RUNDO tiles are placed on roof surfaces. It is not applicable to other tile types; when these tiles are selected in the program, the GENERON option is not available.

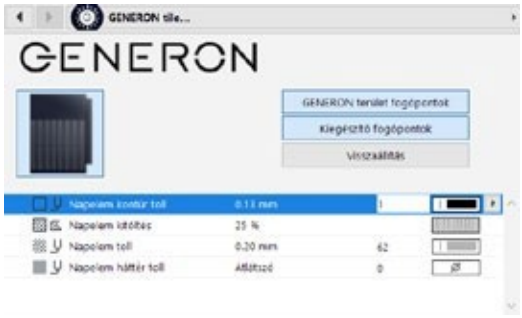
The GENERON option can be activated by clicking on the “GENERON” image in the upper left corner of the interface.

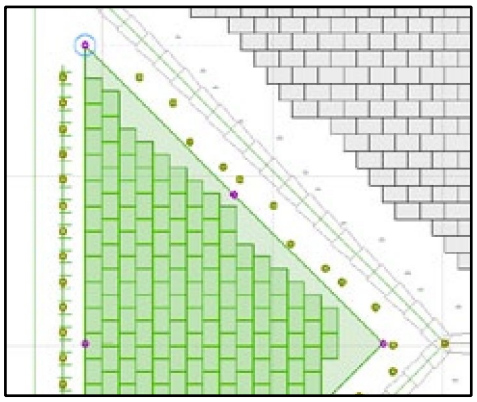






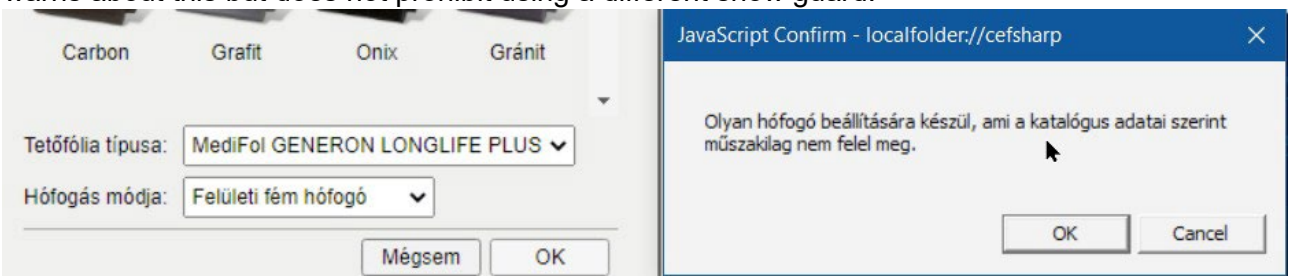
When placing GENERON tiles, solar panel elements are placed on the roof surface in accordance with GENERON regulations. Of course, the program places the solar panel elements on the largest usable surface, but this surface can be modified afterwards. To do this, the tile GDL element placed on the roof surface must be selected, then opening the Object Selection Settings window, the “GENERON area handles” switch on the GENERON tab can be activated; clicking OK then displays the polygon for the maximum number of GENERONs determined by the add-on on the roof surface. The corner points of the polygon are marked in red and can be grabbed to modify the shape and size of the area. When the modification is complete, the modification points can be turned off on the settings tab mentioned above. On the same settings page, the “Reset” switch can be used to restore the area originally calculated by the add-on.

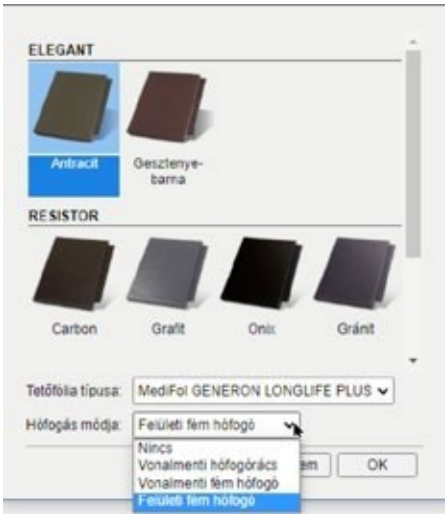




A new feature of the program's new version is the choice of roof membrane and snow guard. The designer can select which Terrán roof membrane and what type of snow guard (surface or linear metal snow guard or snow guard grid) to apply to the given roof.

Snow guarding with GENERON: according to the technical description, only a linear snow guard grid can be used with the GENERON tile. If a different option is selected during placement, the program warns about this but does not prohibit using a different snow guard.



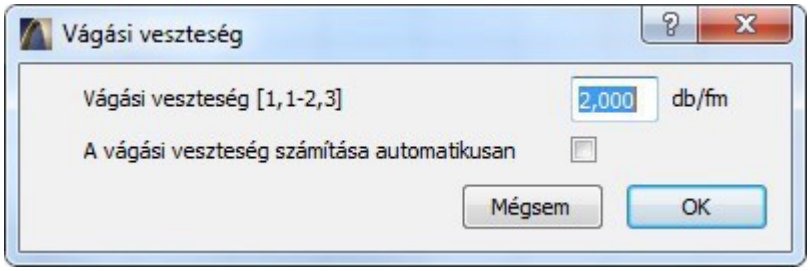


The selected snow guard type automatically appears on the tile surface with the appropriate distribution. The quantity of snow guards and membrane naturally appears in the Terrán list.

The quantity of base tiles for the roof is first determined based on the maximum batten spacing applicable to the given roof pitch. If the construction is realised with a smaller batten spacing, this must be taken into account in the base tile quantity (inverse proportionality). On buildings with

complex roof geometry, the actual base tile requirement differs from the demand calculated based on the surface area. Due to cut tiles that necessarily form along the edges, there is an additional demand for base tiles compared to the quantity calculated based on the surface area.

This additional demand shows a near linear relationship with the length of the cutting edges (valley, edge, hip ridge, etc.), so the most accurate estimate for the additional base tiles can be given based on the length of the edges. The setting of the cutting loss value can be found under the **"Terrán"** menu item under the **"Cut Loss"** command in the window that appears. The set default value is 2.0 pcs/lm/side (for valleys and edges both sides are counted, so there it is actually 4 pcs/lm). The user can deviate from the set default within the specified limits (1.1 – 2.3).



Depending on the tile type, the program determines the quantity of various accessory tiles (verge, half-hip, ventilation tiles, etc.). The program does not account for half-tiles. After selecting the tile in the settings window, clicking the OK button causes the program to place the necessary elements.

The layer and pen used in Archicad for elements to be placed is also determined here.

The quantity of base tiles for the roof is set at the default value; this may need to be increased depending on the geometric configuration of the roof structure. Depending on the tile type and the selected snow guarding method, the program determines the quantity of various accessory tiles (ventilation, snow guard tiles, etc.). The program does not account for half-tiles and calculates the cutting loss based on the roof surface and geometry. After selecting the tile in the settings window and clicking OK, the program performs the roof analysis and places an edge-setting element on the surface.

Checking and Adjusting Roof Edges

The roof edges are automatically determined by the program. For more complex roofs, it may happen that the add-on assigns the wrong edge type to certain roof sections based on the algorithm. The Terrán roof tiling solution has therefore been extended with a new step compared to previous versions, so that the roof edges can be precisely and easily adjusted if needed, and the designer can correct an incorrectly assigned edge.

Important! After setting the tiles, the roof tiler places an edge-setting GDL element on the roof. This element only appears temporarily in the plan and disappears after the tiling is finalized. Please do not move this element or place it on another layer, otherwise the roof tiling add-on will not work.

When the edge-setting element appears, an icon appears on every edge of the roof, showing the edge type set for each roof edge.

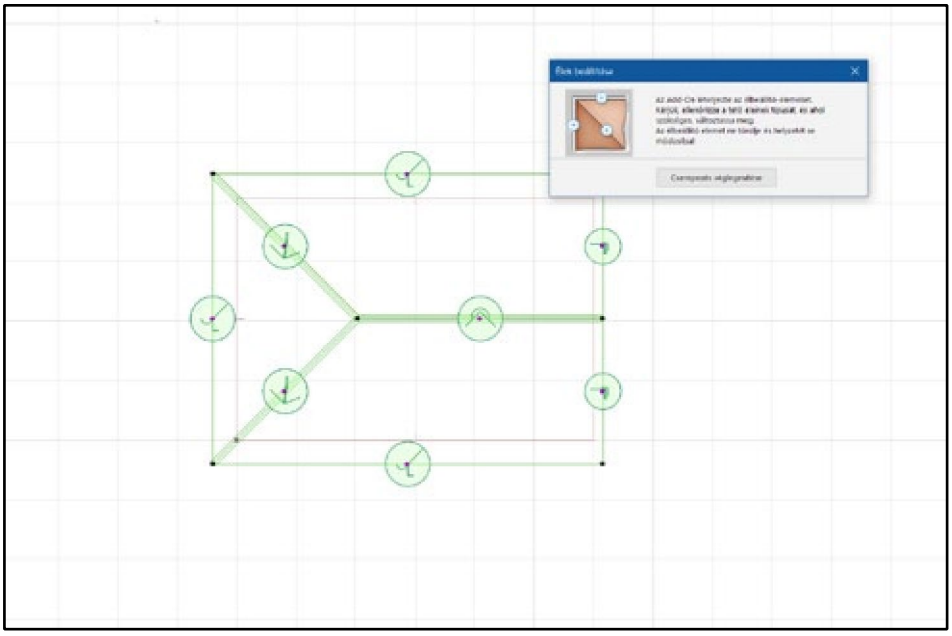
If the automatically set edge types are correct or you do not wish to set the edges, press the **"Finalize Tiling"** button in the dialog.

If the edge types are incorrect and you wish to change them, this can be done in two ways.

1) Setting Edge Type on the Floor Plan:
Grab the purple hotspot in the centre of the icon and move it upward. The edge types that can be set for the given edge will then appear; find the type that suits you and drag the purple hotspot onto it.

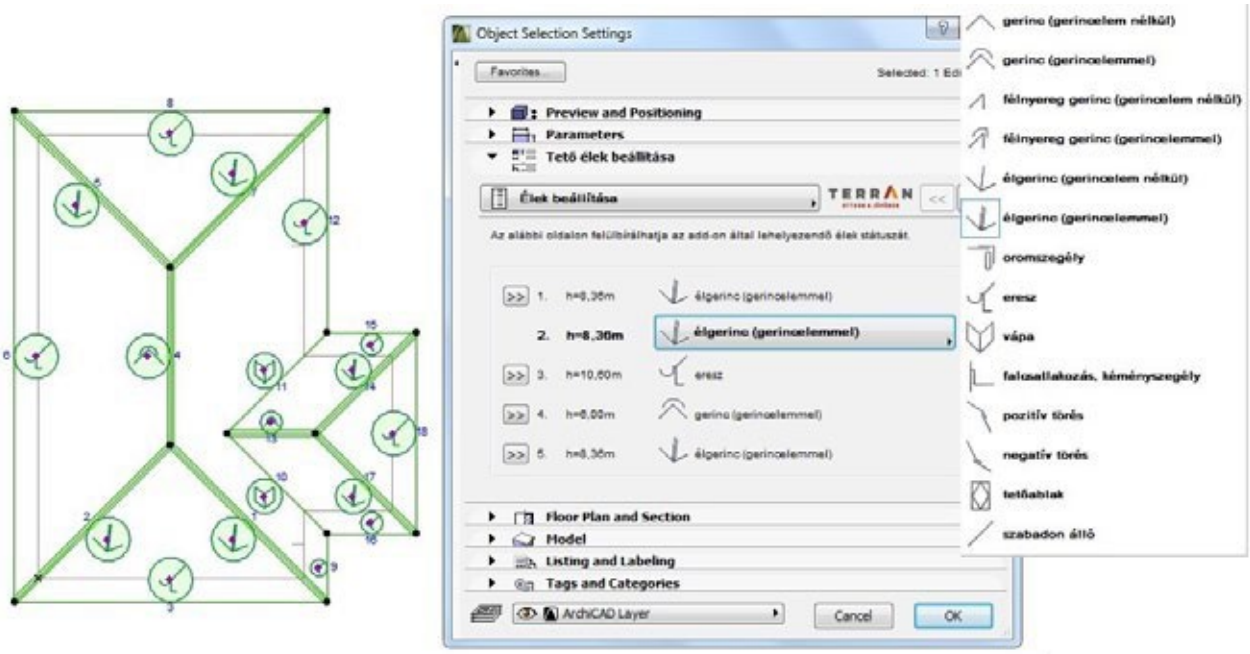
To move the purple hotspots, always use the **"Move Node"** function on the floating palette. The edge separator icons appear when the hotspot is moved upward.

The icon of the edge type originally assigned by the add-on is always located above the circular icon. If you want to restore the original edge type but cannot remember which it was, drag the hotspot to this icon.



2) Setting Edge Type in the Object Selection Settings:

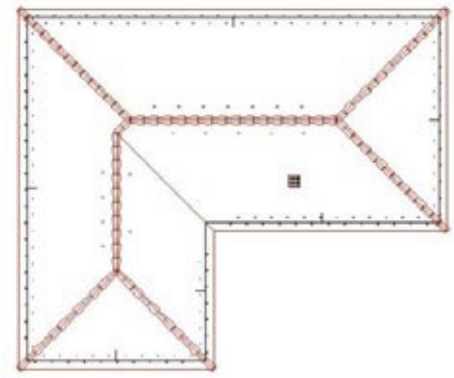
Open the “Object Selection Settings” window from the Info Panel or using the Ctrl+T shortcut, then on the “Attributes” page of the Set Roof Edges tab, activate the “Show edge labels” switch. This turns on edge numbering on the object. Then, on the “Set Edges” page, change the edges with the appropriate sequence numbers in the list according to the numbering.



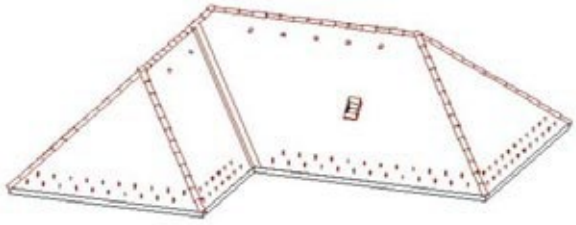
The edges can be as follows:

- ridge (without ridge element)
- eave ridge (with ridge element)
- valley
- half-hip ridge (without ridge element)
- wall connection, chimney flashing
- half-hip ridge (with ridge element)positive
- break hip ridge (without ridge element)negative break hip ridge (with ridge element)
- skylight
- gable trim
- freestanding

You can use either of the two options above to adjust the edges. Once you have finished the settings, press the “Finalize Tiling” button; the program will place the necessary elements:



floor plan



3D hidden line drawing

3D coloured rendering

rendering

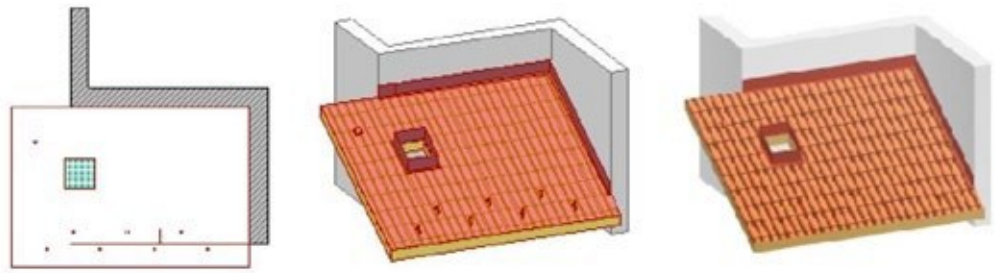
2.4. Properties of the Terrán 6.5 Program

1. Valley Solutions:

The valleys appear in 3D and in the list in a colour that harmonises with the tile colour, and the quantity of tiles they “occupy” is deducted.

2. Handling Wall and Chimney Connections:

If when placing the tiles, not only the roof but also wall(s) and fill(s) are selected, and they have a shared edge with the roof on the floor plan, the program can handle them as wall or chimney connections. So it is not enough to pierce the roof with the chimney wall; the roof must also be pierced at the same location. If the chimney is not made of wall, the fill placed at the same location plays a role.



Important! The program does not examine the relationship between walls and roofs in 3D space; they only need to have a shared edge on the floor plan. The program does not deal with unselected elements during analysis!

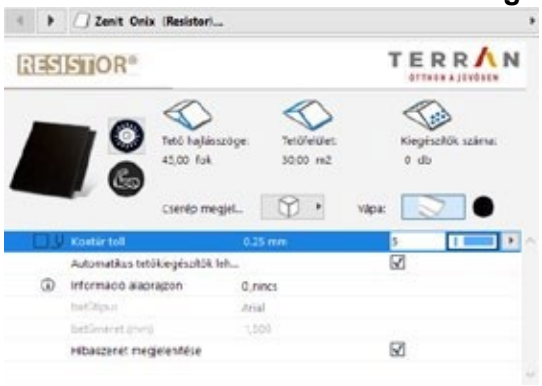
3. Observing Pitch Angle Limits:

If we want to place tiles on a roof with a pitch angle below 10 degrees, a (red) strikethrough and an alert text appear on the floor plan view. In all other cases (3D, listing), the tiles are displayed. This function draws the designer's attention to the fact that the roof pitch angle needs to be increased.
Under the tile cladding, depending on the roof pitch and other circumstances, an underlay covering or underlay insulation must be installed. The detailed specifications for underlay covering, underlay insulation and their substrate are contained in the currently valid Terrán® Application Guide. If tiles are to be placed on a roof with a pitch angle more than 6 degrees lower than the prescribed pitch angle, the designer's attention is drawn by a (non-strikethrough, red) label to the fact that underlay insulation must be planned under the cladding.

4. Listing:

This version of the program can only list product quantities. Listing information is covered in Chapter 3.

5. Custom User Interface for Tile and Ridge Elements:



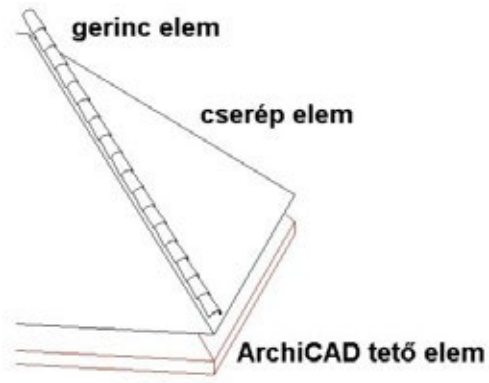
tile element

ridge element

The data displayed here is partly for reference only, as e.g. for setting the tile type and colour, the “Terrán” menu item must be used, but some things can also be set individually. (E.g. placing valley or accessories, using 3D tiles, floor plan information, etc.)

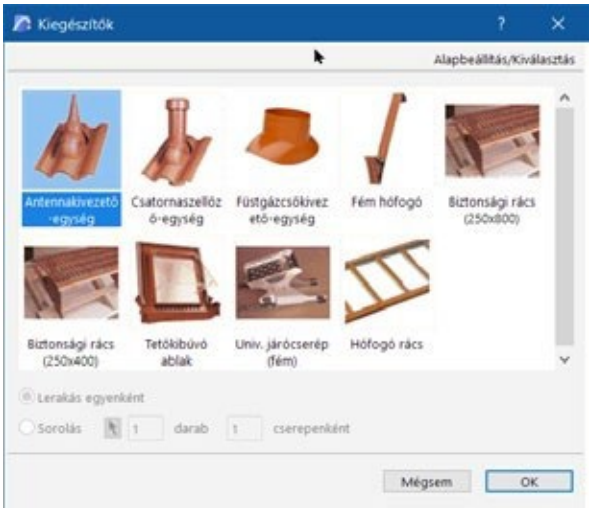
2.5.Assigning Accessories

The program automatically assigns some accessories to the roof surface depending on the surface geometry. These can include ventilation tiles and metal snow guards. Their quantity depends on the tile type.
However, there are accessories that the user can assign to the tile element according to their needs. For example, antenna outlets, gutter ventilators, metal snow guards, roof hatches, etc. can be specified individually.

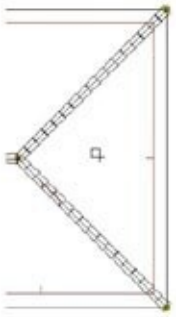


To define these, a tile surface element must be selected. (If multiple such elements are selected, an error message will appear or nothing will happen. A message also appears if no tile element has been selected.)

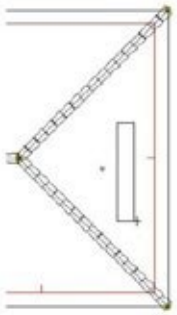
A “Terrán” menü **“Place Accessories”** menu item window, specify the type of accessory and the placement method.



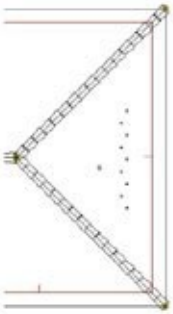
For individual placement, after closing the dialog box, the element can be placed on the selected tile surface using the mouse.
When using row placement, an exact quantity can be specified if the “arrow” button is not pressed. The density of elements to be placed can also be defined per tile. Checkerboard placement is also available.



individual placement (e.g. antenna outlet)



row placement (e.g. metal snow guard)

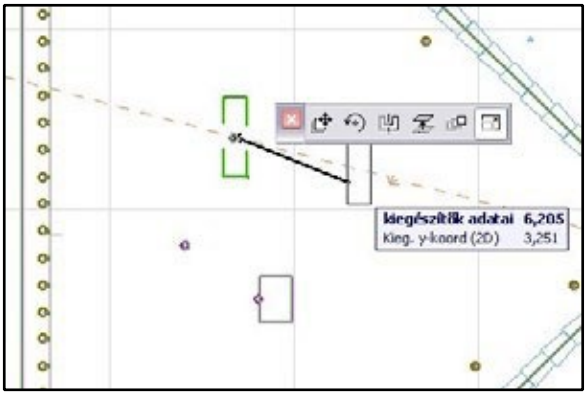


placed elements

Using this method, accessory elements can be assigned to multiple tile surfaces in sequence. Every accessory element appears on the floor plan, schematically in 3D, and naturally in the listing as well.

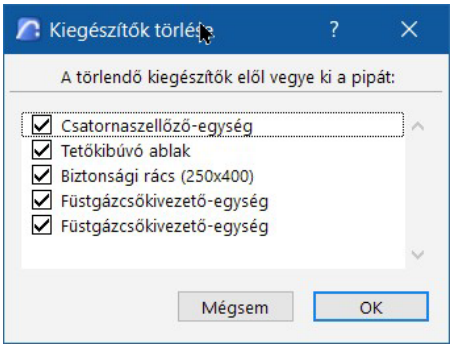
2.6. Modifying and Deleting Accessory/Accessories

Accessory elements placed on roof surfaces can be moved after placement. By selecting the roof surface element, movable handles (green, hollow diamonds) appear on the floor plan; clicking on them and selecting the “Stretch” button in the modification dialog allows you to move the accessory. In the case of linear accessory elements (snow guard grid, metal snow guard), several handles appear, allowing the length of the accessory to be modified as well.



Szintén a “Terrán” menü **Delete Accessories** menu item can be used to delete one or more previously placed elements.

By unchecking the checkbox before the items, these elements will be deleted after closing the window. So the checkbox must be present before the elements that are to remain.

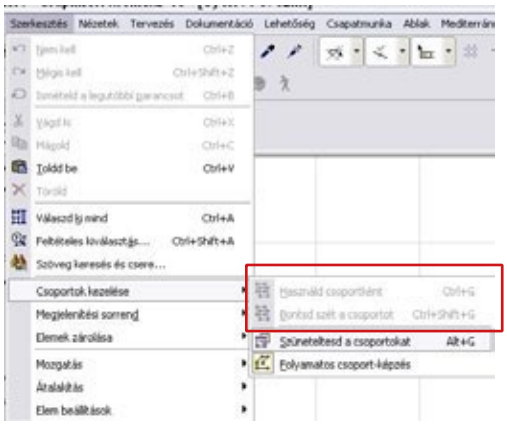


2.7. Modifying and Deleting Tile Covering

When placing tile surfaces, the solution groups them with the Archicad roof elements. This is a great help if we want to move, rotate or raise the roof. However, it can cause problems when changing the tile covering pattern or when deleting the covering.

Deleting Roof Elements:

To be able to delete the tile covering without deleting the roof element, you must dissolve or suspend the grouping. To ungroup, select the roof surface and issue the “Edit / Manage Groups / Ungroup” command. To suspend grouping, use the “Edit / Manage Groups / Suspend Groups” command.

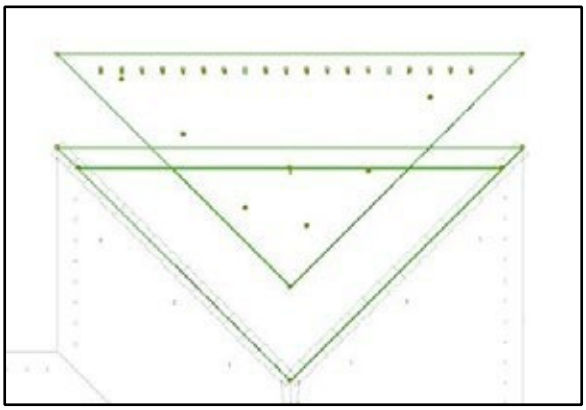


To delete the base tiles for each roof surface, select the roof tile element and delete it using the “Edit / Delete” command. To delete ridge tiles, select the ridge tile and delete it.

Note:
Deleting the field tiles also deletes the accessories belonging to the given surface; this must be taken into account during listing. The elements deleted in this case are: the roof membrane, valley element

at half the valley length, snow guards, eave ventilation element, condensation drip plate, ventilation strip.

Modifying Field Tiles:

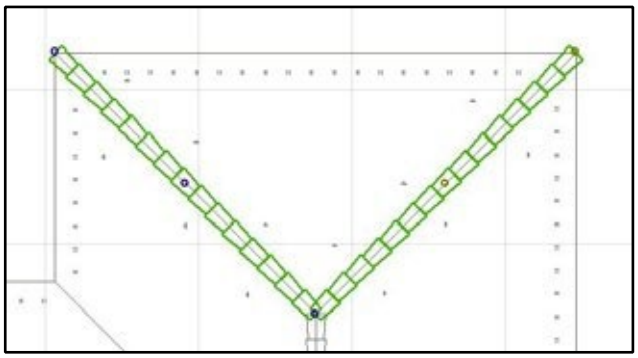


To modify field tiles, the “grouping” command must also be turned off (see above). However, for modifications, both the roof element and the field tile element (terran_cserep) must be selected on the floor plan. After selecting the roof surface to be modified and the field tile element on it, launch the “Terrán/Roof Tile Replacement” command. Select the type of new tiling, then press the OK button. The application automatically deletes the field tile element and places the new one.

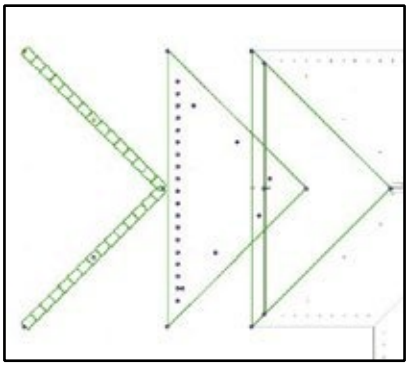
Warning! If the field tile element is not also selected before modification, the application will not delete it and will place the new field tile element on top of the existing one. This may mean that the two textures mix in the visualisation and the number of tiles on the given surface doubles in the schedule.

We recommend deleting the old field tile before modifying the field tile.

Modifying Ridge Tiles:



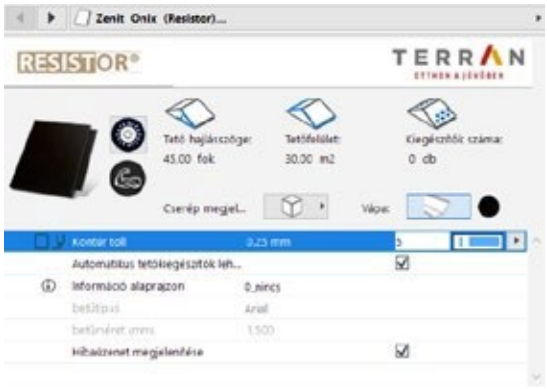
Turn off the “grouping” command (see above). Select the wedge-shaped or ridge element to be modified, launch “Terrán/Roof Tile Replacement”, then select the new tile colour and type. The solution automatically deletes the old element and places the new one.



If you want to modify both field tiles and ridge tiles, select the field tile, its associated roof surface and the ridge tiles, then select the new colour in the “Terrán/Roof Tile Replacement” menu item.

2.8. Additional Properties of Elements

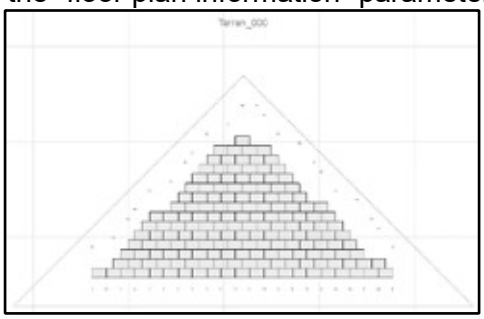
The placed library elements have several additional useful properties through their parameters. The product data assigned to the tile surface or ridge can be viewed. (Data such as colour, tile type, etc. cannot be changed on the user interface, only using the Terrán Roof Tiler program as described in section 2.6!)



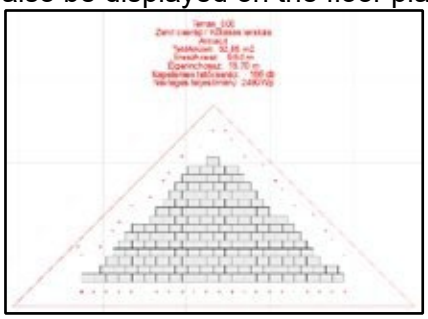
tile element parameters

ridge tile element parameters

Using the “floor plan information” parameter, some data can also be displayed on the floor plan:



“1_only ID”

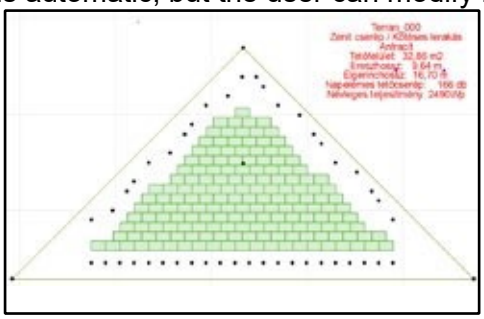


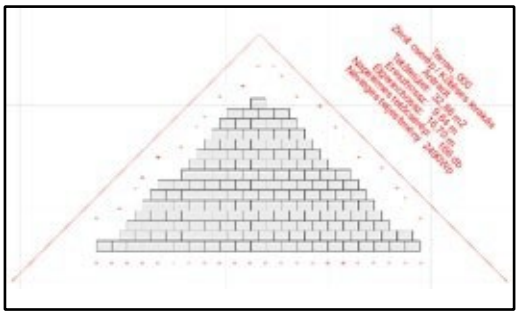
“2_detailed”

“1_only ID”

“2_detailed”

This information can help us identify the surfaces listed in the schedules. (See Chapter 3) This parameter also includes the option to set the font type and font size. The positioning of the displayed texts is automatic, but the user can modify it: the text box can be moved or rotated.



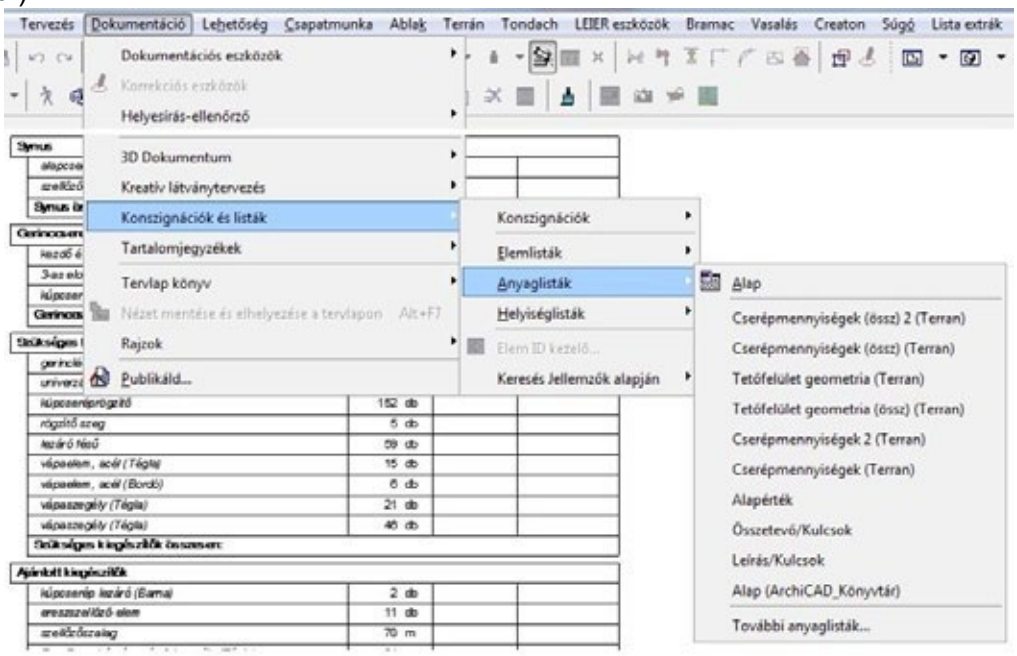


In addition to these, the floor plan pen of the placed elements (see section 2.2) and the floor plan fill of the tile element can be changed.

3. Chapter: Listing

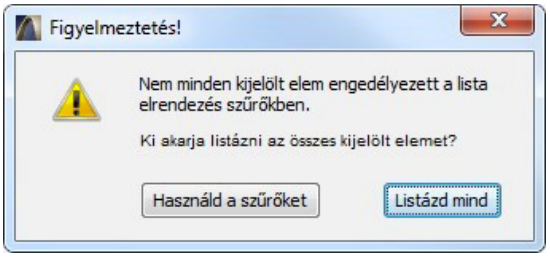
3.1. Listing Terrán Elements

The placed library elements have several additional useful properties through their parameters. The product data assigned to the tile surface or ridge can be viewed. (Data such as colour, tile type, etc. cannot be changed on the user interface, only using the Terrán Roof Tiler program as described in section 2.6!)



Terrán elements are listed as components.

Important! The listing automatically filters the listable elements. If we narrow down the group of elements in the schedule by selection, it may happen that among the selected elements there is also one that does not meet the listing criteria. In this case, a warning window appears:



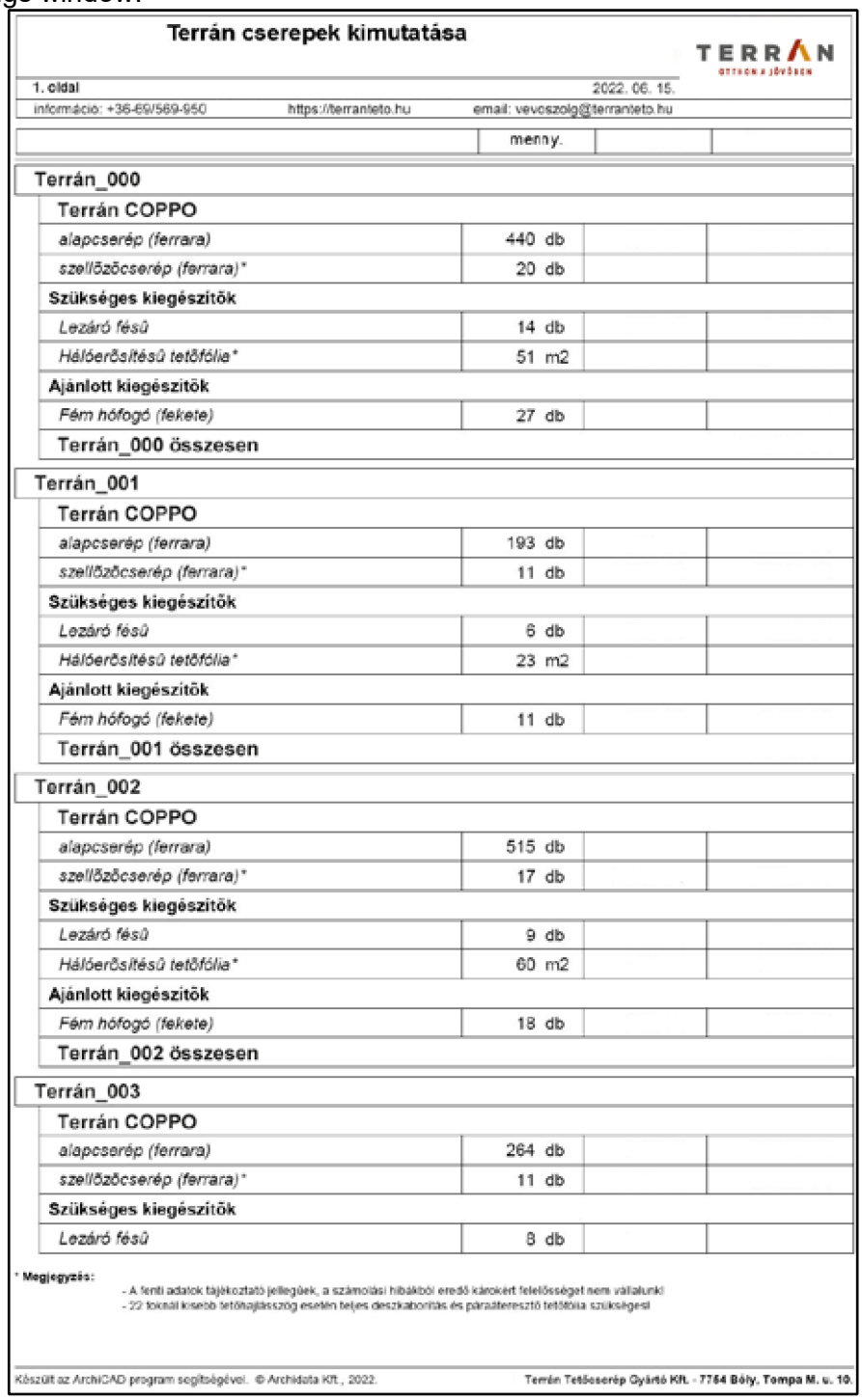
We recommend using the “Use Filters” button.

3.2. Presenting List Templates

In the following, we present the main properties of the listing options.

Tile Detection and Tile Detection 2*:

The list provides a per-roof-surface listing of the placed tiles. The surfaces are distinguished based on the listing identifier (user ID). Therefore, we do not recommend changing this in the library element settings window!



Terrán cserepek kimutatása

TERRÁN OTTHON A JÖVŐBEN

1. oldal — 2022. 06. 15.

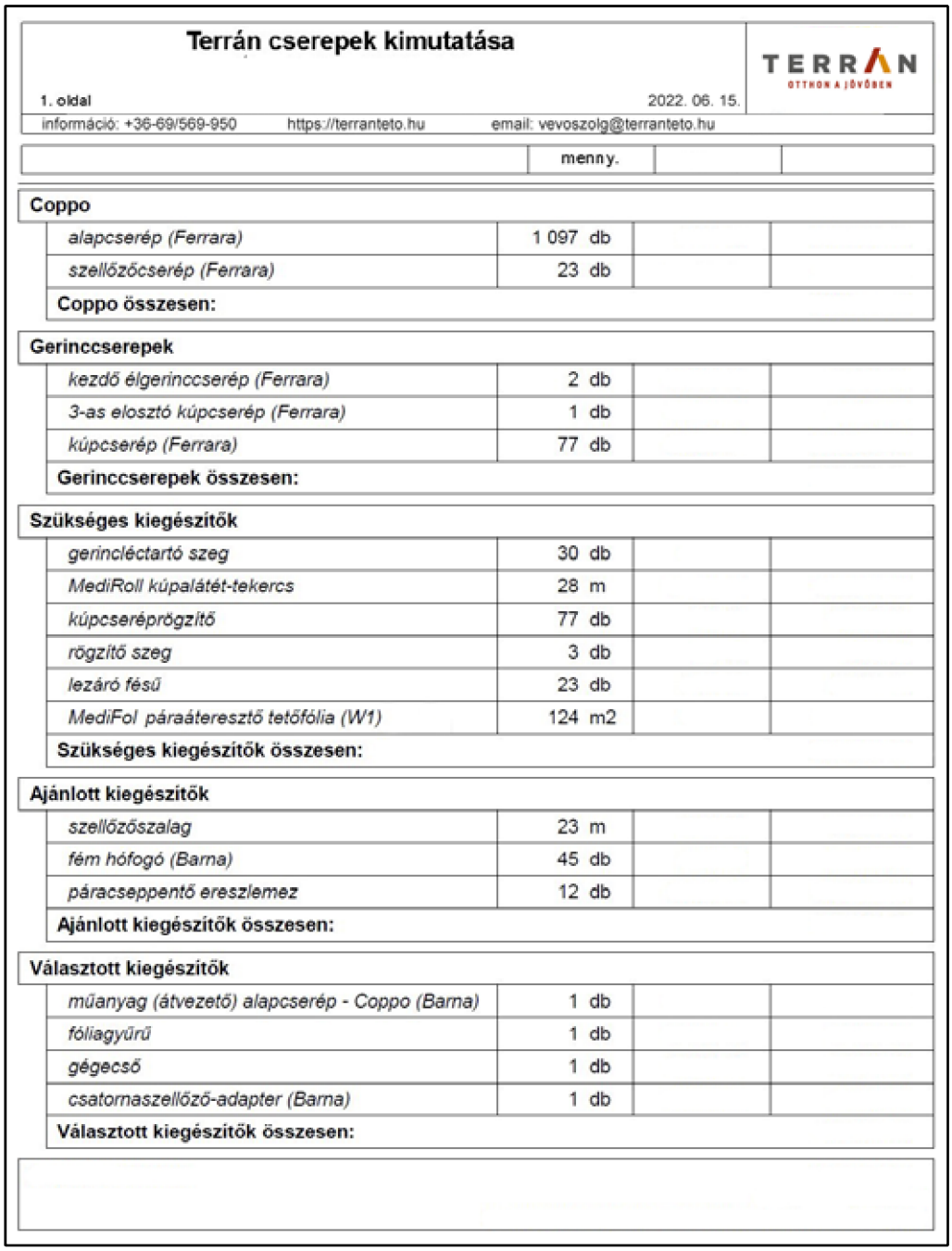
információ: +36-69/569-950 https://terranteto.hu email: vevoszolg@terranteto.hu

	menny.		
Terrán_000			
Terrán COPPO			
alapcserép (ferrara)	440 db		
*szellőzőcserép (ferrara)**	20 db		
Szükséges kiegészítők			
Lezáró fésű	14 db		
*Hálóerősítésű tetőfólia**	51 m2		
Ajánlott kiegészítők			
Fém hófogó (fekete)	27 db		
Terrán_000 összesen			
Terrán_001			
Terrán COPPO			
alapcserép (ferrara)	193 db		
*szellőzőcserép (ferrara)**	11 db		
Szükséges kiegészítők			
Lezáró fésű	6 db		
*Hálóerősítésű tetőfólia**	23 m2		
Ajánlott kiegészítők			
Fém hófogó (fekete)	11 db		
Terrán_001 összesen			
Terrán_002			
Terrán COPPO			
alapcserép (ferrara)	515 db		
*szellőzőcserép (ferrara)**	17 db		
Szükséges kiegészítők			
Lezáró fésű	9 db		
*Hálóerősítésű tetőfólia**	60 m2		
Ajánlott kiegészítők			
Fém hófogó (fekete)	18 db		
Terrán_002 összesen			
Terrán_003			
Terrán COPPO			
alapcserép (ferrara)	264 db		
*szellőzőcserép (ferrara)**	11 db		
Szükséges kiegészítők			
Lezáró fésű	8 db		

* **Megjegyzés:**
- A fenti adatok tájékoztató jellegűek, a számolási hibákból eredő károkért felelősséget nem vállalunk!
- 22 foknál kisebb tetőhajlásszög esetén teljes deszkaborítás és páraáteresztő tetőfólia szükséges!

Készült az ArchiCAD program segítségével. © Archidata Kft., 2022. Terrán Tetőcserép Gyártó Kft. - 7754 Bóly, Tompa M. u. 10.

Tile Detection (Total) and Tile Detection (Total) 2*:



Terrán cserepek kimutatása

1. oldal 2022. 06. 15.

információ: +36-69/569-950 https://terranteto.hu email: vevoszolg@terranteto.hu

	menny.		
Coppo			
alapcserép (Ferrara)	1 097 db		
szellőzőcserép (Ferrara)	23 db		
Coppo összesen:			
Gerinccserepek			
kezdő élgerinccserép (Ferrara)	2 db		
3-as elosztó kúpcserép (Ferrara)	1 db		
kúpcserép (Ferrara)	77 db		
Gerinccserepek összesen:			
Szükséges kiegészítők			
gerincléctartó szeg	30 db		
MediRoll kúpalátét-tekercs	28 m		
kúpcseréprögzítő	77 db		
rögzítő szeg	3 db		
lezáró fésű	23 db		
MediFol páraáteresztő tetőfólia (W1)	124 m2		
Szükséges kiegészítők összesen:			
Ajánlott kiegészítők			
szellőzőszalag	23 m		
fém hófogó (Barna)	45 db		
páracseppentő ereszlemez	12 db		
Ajánlott kiegészítők összesen:			
Választott kiegészítők			
műanyag (átvezető) alapcserép - Coppo (Barna)	1 db		
fóliagyűrű	1 db		
gégecső	1 db		
csatornaszellőző-adapter (Barna)	1 db		
Választott kiegészítők összesen:			

The list provides a consolidated listing of the placed tiles.

Roof Surface Geometry:

The list provides the geometric data of the placed surface elements.

Terrán cserepek kimutatása

1. oldal 2022. 06. 15.

információ: +36-69/569-950 https://terranteto.hu email: vevoszolg@terranteto.hu

Terrán_000			
hajlásszög:	36,00 fok		
tetőfelület:	44,00 m2		
ereszhossz:	13,53 m		
taréjgerinchossz:	6,37 m		
élgerinchossz:	11,38 m		
Terrán_001			
hajlásszög:	36,00 fok		
tetőfelület:	19,24 m2		
ereszhossz:	5,38 m		
taréjgerinchossz:	4,16 m		
élgerinchossz:	6,66 m		
vápahossz:	4,72 m		
Terrán_002			
hajlásszög:	36,00 fok		
tetőfelület:	51,45 m2		
ereszhossz:	8,77 m		
taréjgerinchossz:	2,53 m		
élgerinchossz:	14,01 m		

Roof Surface Geometry (Total):

The list provides a consolidated summary of the geometric data of the placed surface elements.

Terrán cserepek kimutatása

1. oldal 2022. 06. 15.

információ: +36-69/569-950 https://terranteto.hu email: vevoszolg@terranteto.hu

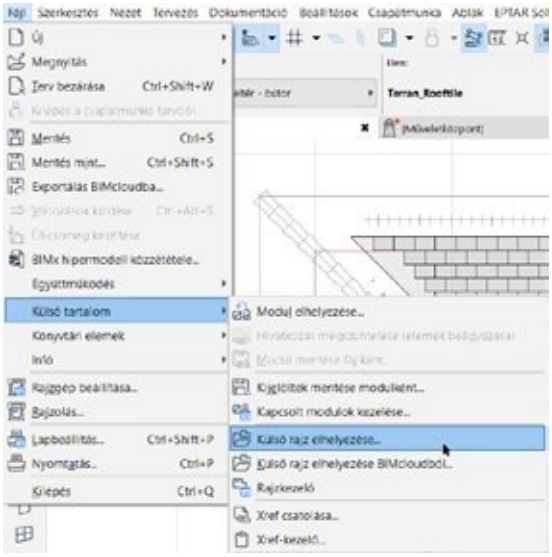
tetőfelület:	201,07 m2		
ereszhossz:	61,93 m		
taréjgerinchossz:	12,23 m		
élgerinchossz:	38,76 m		
vápahossz:	8,97 m		

4. Chapter: Using Detail Drawings

4.1. Inserting Detail Drawings

The detail drawing library contains all the detail solutions needed for Terrán roof tiling. The library is available online at http://www.terranteto.hu/szakembereknek/csomoponti-rajzok under the “Download GDL folder as ZIP” menu item. The library can be downloaded in full or in parts.

Unzip the library and place it in a folder on your computer. Individual drawings can be inserted into your designs using the “File / External Content / Place External Drawing” command.



The drawings appear at the origin, from where you can immediately push them to the appropriate location.

The drawings are optimised for a 1:10 scale. If you insert them into a drawing sheet of a different scale, you may get the following result.

If you do not want to change the drawing sheet to 1:10 scale, see section 4.2 for how to modify the text sizes to the appropriate size.

In many cases, the detail nodes contain multiple solutions; in this case, select the one that suits you best and delete the rest.

4.2. Modifying Detail Drawings

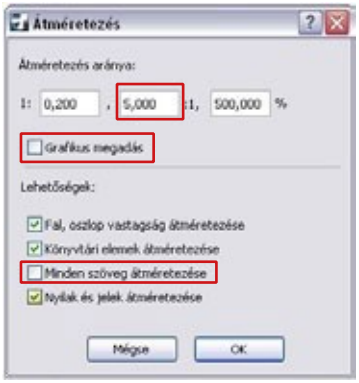
The drawing appears at the wrong scale, the font sizes are too large/small.

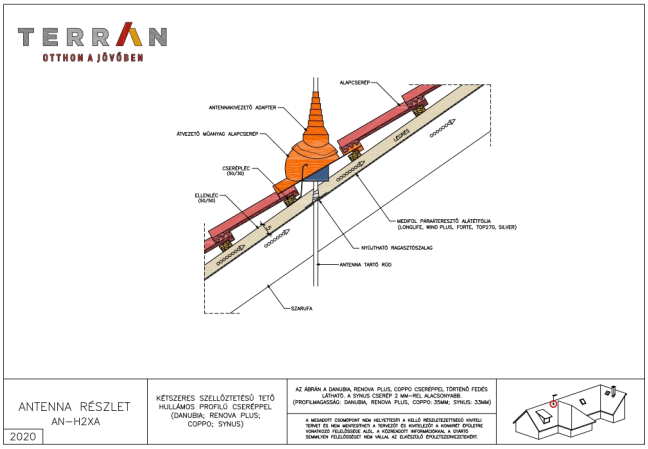
1. Change the scale to 1:10, as the drawings are optimised for 1:10 scale.

2. If you do not want to change the scale: select all elements of the detail drawings with the checkbox and select the “Edit / Transform / Resize” command.

Enter the ratio between the desired scale and 1:10 in the upper section (turn off the “Graphic Input” option).
This can be achieved at 1:50 scale with the number 5 written in the second box (desired scale/10).

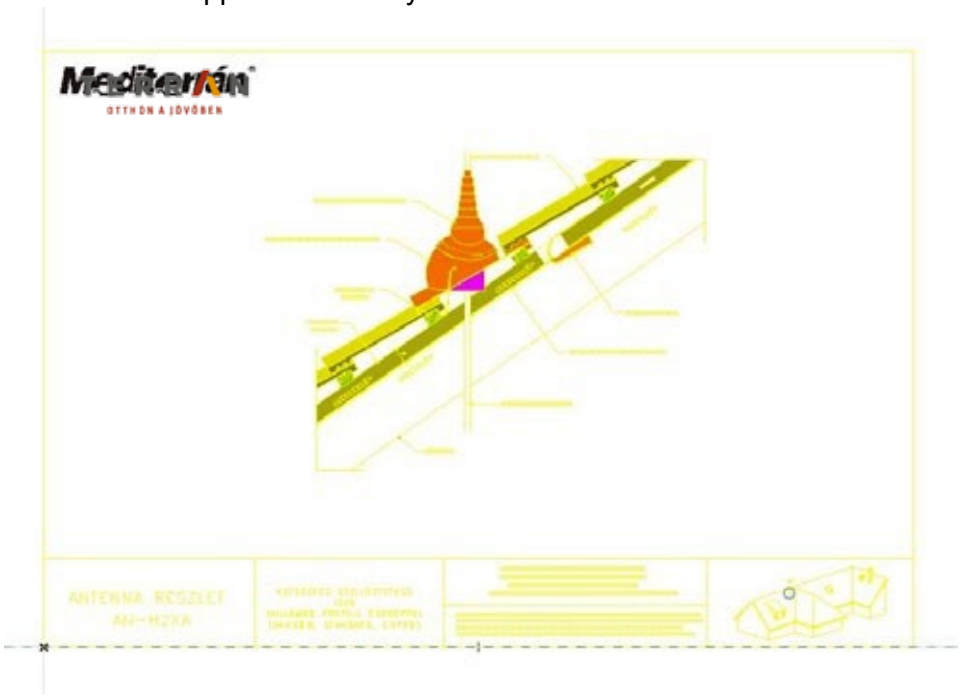
Warning! To prevent text from being resized, turn off the “Resize All Text” checkbox!





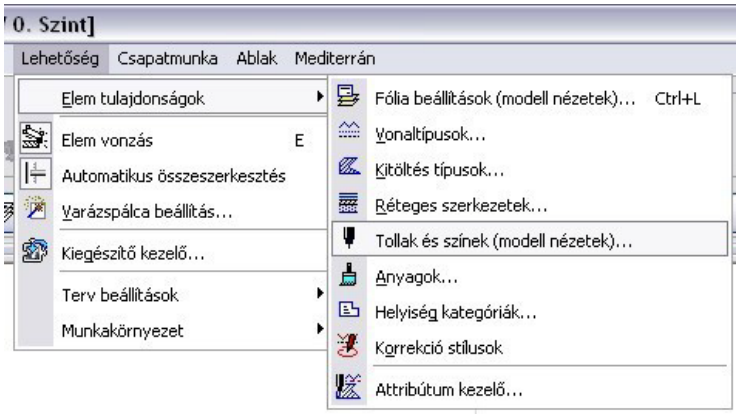
The drawing appears with incorrect colours.

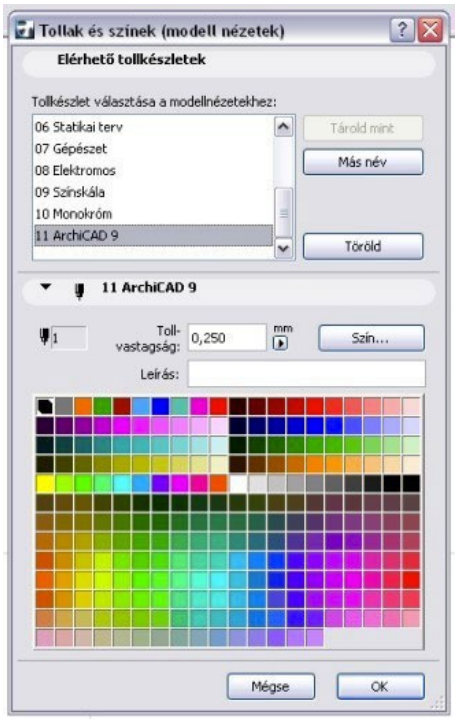
The drawings were adapted to the colour palette of Archicad 8.1 and 9 programs, so in the Archicad 10 program certain colours appear incorrectly.



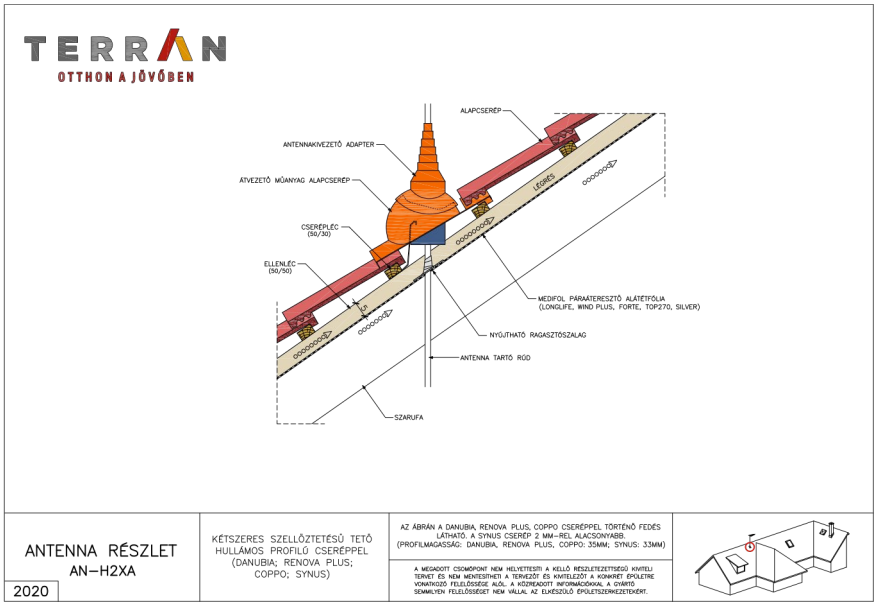
Solution:

1. change the colour palette to the ArchiCAD 25 colour palette under “Options / Element Properties / Pens and Colours” by selecting the “Archicad 25” pen settings.





2. Modify the following pen colours as desired:
   - 100 – black (contour pens)
   - 93 - grey (timber structure visible surface)
   - 13 - red (tile visible surface)
   - 17 - maroon (tile sections)
   - 74 - brown (timber structures)
   - 92 - grey (visible steel structures)
   - 44 - blue (flexible plastic components)
   - 43 - dark blue (plastic components)
   - 34 - blue (membrane channel)
   - 3 - red (plastic roof elements)



5. Chapter: Technical Support and Bug Reporting

5.1 Technical Support and Bug Reporting

The Terrán solution was developed by ÉPTÁR Kft. For any bug reports or comments, please contact us at the following:

ÉPTÁR Kft.
1145 Budapest, Szugló utca 61-63.
Tel.: 1 / 225 73 55
info@eptar.hu

Budapest, 9 June 2026.