

SOLARSTONE

Solar Tiled Roof™ BIM

Quick Start Guide

Version: 1.1 (EN)
Release date: 19.05.2026

**Roof.
Design.
Power.**



Table of Contents

Introduction	3
Files to Download	3
1. Project Setup in Revit.....	4
1.1. Families Loaded.....	4
1.2. Solar Roof Schedule.....	6
2. Preparing the Roof.....	7
2.1. Model the architectural roof.....	7
2.2. Create the Elevation Gap for the Solar Roof Base	7
3. Convert Roof to Tile Base.....	9
3.1. Tile Base Behaviour & Grid Logic	9
3.2. Assign Roof Tiles and Resolve Edge Conditions	11
4. Defining the Active Solar Area	12
4.1. Outline the BIPV Zone.....	12
4.2. Create the Solar Tiled Roof Base	12
4.3. Alignment and Module Check	13
4.4. Select and Assign BIPV Modules	14
5. Fascia Boards, Ridge Flashing & Gutters	15
5.1. Fascia Board.....	15
5.2. Ridge Flashing.....	15
5.3. Gutters	16
6. Advanced options	17
6.1. Broken Bond (Flat Tiles Only).....	17
6.2. Filler modules	18
7. Final Check & Visualization Options	19
7.1. Schedule Review.....	19
7.2. Visualization	19
Workflow Summary.....	20
Version.....	21

Introduction

Designing a solar roof shouldn't slow you down. The process should fit naturally into an architectural workflow – clear steps, predictable results, and tools that behave the way you expect.

This guide shows how to turn a standard Revit roof into a SOLARSTONE Solar Tiled Roof using the same setup we use our internal coordination models.

Rather than relying on manual grid sketches or repurposed curtain-panel tricks, you'll work with a purpose-built system designed for roofs, not workarounds. You focus on the geometry; the solar layout and data stay in sync automatically.

A complete Solar Tiled Roof setup includes:

- Predefined roof grids matched to SOLARSTONE Solar Tiled Roof model
- Compatibility with four different roof tile types
- Dedicated filler modules where tile coverage width does not divide evenly into the module width
- Supports broken bond layouts for flat tile applications
- Automatic calculations for area, effective area, and estimated power
- Lightweight BIM that still reads well in views and renderings

For more product information and support:

- Website: solarstone.com
- support@solarstone.com

Files to Download

Our BIM library is available from the SOLARSTONE Architect Toolbox under *Tools & Resources* on our [Website](https://solarstone.com).

You can download:

1. Revit Project Showcase Model (Recommended)

A ready-to-open Revit model containing:

- All families preloaded
- Demonstration roof assemblies including roof base types, ridge flashing mullion, fascia boards, gutters and four widely used roof tile types integrated into the model.
Note: Displayed tile types are indicative – actual products may vary slightly from the geometry shown in the model. Special tiles (ridge tiles, verge tiles and other custom elements) are not included and should be modeled separately or specified based on manufacturer data.

Always start with this model – especially the first time you use it – to explore fully coordinated Solar Tiled Roof workflow and copy ready-made solutions.

2. Individual Revit Family files

- a. Solarstone Solar Tiled Roof BIPV module
- b. Solarstone Solar Tiled Roof Filler module

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1. Project Setup in Revit

Always begin by opening the SOLARSTONE Showcase Model downloaded from the SOLARSTONE Architect Toolbox. After opening the Showcase Model:

→ **copy one demonstration roof into your own project (Paste Aligned).**

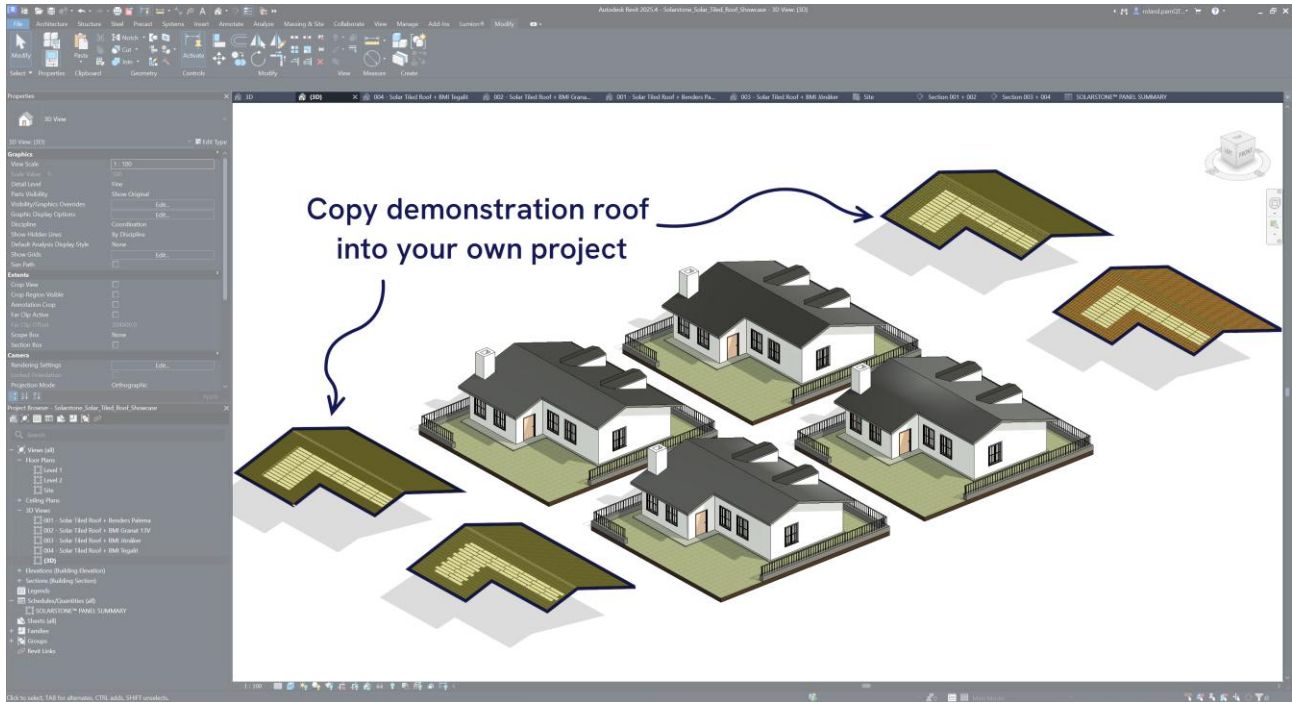


Figure 1 - Copying the demonstration roof from the Showcase Model into your project to load all SOLARSTONE families.

This action will load the families included in the system into your project.

1.1. Families Loaded

After copying the demo roof into your project, confirm the following items appear under Project Browser → Families:

Curtain Panels

- Empty System Panel
 - Empty
- Solarstone_Solar_Tiled_Roof_BIPV_module
 - Standard
- Solarstone_Solar_Tiled_Roof_Filler_module
 - Standard
- Roof_Tile
 - Benders_Palema
 - BMI_Jönåker
 - BMI_Granat_13V
 - BMI_Tegalit

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- System Panel
 - Solar_Roof_Finishing
 - Solid

Curtain Wall Mullions

- L Corner Mullion
 - Solarstone_Roof_Ridge

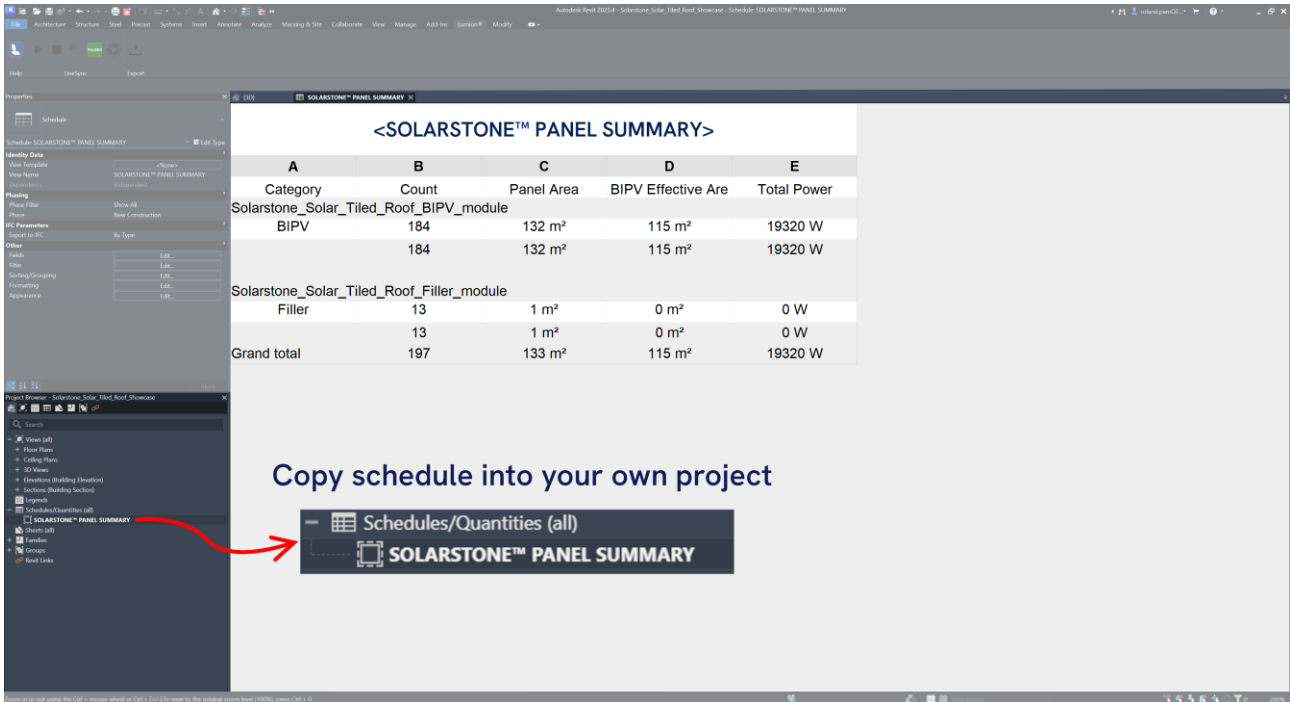
Roofs

- Fascia
 - Solarstone_Border_Plate
- Sloped Glazing
 - Solar_Tiled_Roof_Base
 - Roof_Tile_Benders_Palema_Base
 - Roof_Tile_BMI_Jönåker_Base
 - Roof_Tile_BMI_Granat13V_Base
 - Roof_Tile_BMI_Tegalit_Base

1.2. Solar Roof Schedule

The Showcase Model includes a prebuilt schedule named:

SOLARSTONE™ PANEL SUMMARY



Copy schedule into your own project

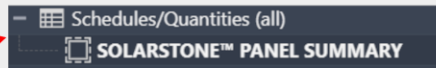


Figure 2 – Copying SOLARSTONE PANEL SUMMARY Schedule into your project.

You may copy this schedule into any project. It will function correctly as long as you imported the demo roof first. The schedule auto-populates once BIPV and Filler modules are placed, showing:

- Panel Type & Count
- Panel Area
- Effective Active Area
- Total Installed Power (BIPV modules only)

SOLARSTONE™ PANEL SUMMARY				
Category	Count	Panel Area	BIPV Effective Area	Total Power
Solarstone_Solar_Tiled_Roof_BIPV_module				
BIPV	184	132 m ²	115 m ²	19320 W
	184	132 m ²	115 m ²	19320 W
Solarstone_Solar_Tiled_Roof_Filler_module				
Filler	13	1 m ²	0 m ²	0 W
	13	1 m ²	0 m ²	0 W
Grand total	197	133 m ²	115 m ²	19320 W

Table 1 - Example of outputs from the SOLARSTONE panel summary schedule.

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Solar Tiled Roof™ BIM Quick Start Guide

Version: 1.1 (EN) | Release date: 19.05.2026

2. Preparing the Roof

The Solar Tiled Roof sits above the sub-roof, supported either by explicit batten layers or by a fixed geometric offset. This spacing is structurally required and also ensures the Solar Roof Base grid aligns correctly with the system.

You can prepare the roof in two equivalent ways, depending on the required level of detail.

2.1. Model the architectural roof

Start by modeling the project's roof up to structural layer where battens would normally begin, including:

- Structural deck / sheathing
- Membranes / insulation, if present
- Support layers up to the battens

This element will function as the sub-roof beneath the Solar Roof Base.

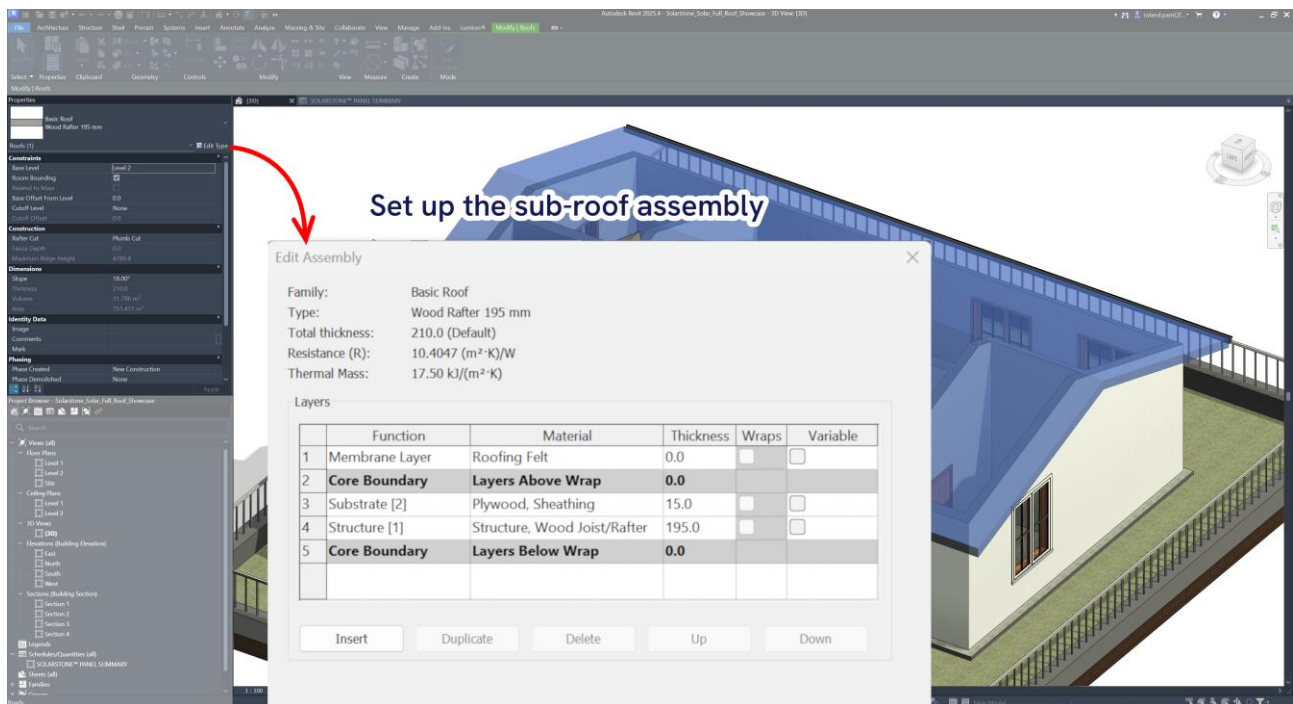


Figure 3 - Example of a sub-roof assembly up to the underlay layer before adding the Solar Roof Base.

2.2. Create the Elevation Gap for the Solar Roof Base

To position the Solar Roof Base correctly, the system typically requires a 90 mm vertical separation between the sub-roof and solar layer. If project-specific ventilation requirements differ, this spacing should be adjusted accordingly.

This 90 mm corresponds to:

- 45 mm ventilation batten (vertical)
- 45 mm counter batten (horizontal)

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The spacing is mandatory for correct installation height and to ensure proper ventilation beneath the solar roofing surface.

You can achieve this spacing using either workflow below:

Option A – Add batten layers directly into the roof assembly

For projects requiring construction-accurate build up, simply add 45 mm ventilation batten and 45 mm counter batten layer directly inside the roof structure.

In this method, you do not apply any manual offset. Solar Roof Base can be copied directly on top of the architectural roof. The assembly itself already includes the correct 90 mm elevation.

Best for: Construction-accurate models and detail-level drawings.

Option B – Duplicate the sub-roof upward by 90 mm

For a simpler BIM workflow:

1. Select the architectural roof
2. Copy it upward by 45 mm + 45 mm = 90 mm

This creates the correct installation height for the Solar Roof Base. This method produces the same functional spacing but without modeling batten layers inside the roof type.

Best for: Fast modeling, concept stages, simplified BIM.

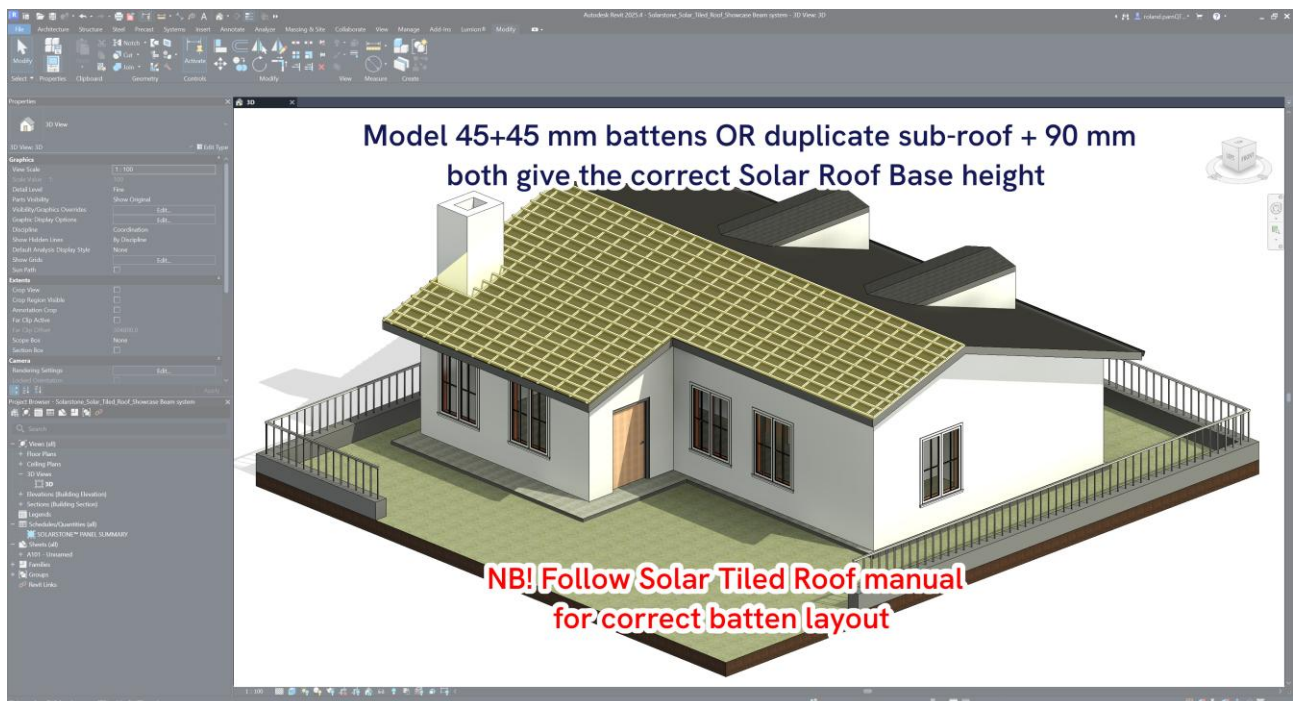


Figure 4 - Example of how to set the Solar Roof Base elevation using modeled battens or a +90 mm offset.

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3. Convert Roof to Tile Base

The Solar Tiled Roof system is always used together with a specific roof tile type, so start by selecting a compatible tile and applying the correct Roof Tile Base.

Refer to the SOLARSTONE Solar Tiled Roof manual to confirm tile compatibility. If the required tile type is not available in the model, create or add it before proceeding.

Select the duplicated upper roof and change its Type to the appropriate Roof Tile Base:

- Roof_Tile_Benders_Palema_Base
- Roof_Tile_BMI_Jönåker_Base
- Roof_Tile_BMI_Granat13V_Base
- Roof_Tile_BMI_Tegalit_Base

3.1. Tile Base Behaviour & Grid Logic

Each Roof Tile Base contains a predefined curtain grid that configuration derived from the selected roof tile geometry and installation pattern. This grid defines how tiles are distributed across the roof surface.

Editable Grid Controls

- Grid 1 → Spacing: Fixed by tile coverage width (*do not edit*)
- Grid 2 → Spacing: Batten step (*editable per Table 2*)
- Grid 1/2 → Alignment: Beginning / Center / End

Note: The Solar Tiled Roof system supports a module batten step range of 325-375 mm, with 330-350 mm typically providing the best results.

Refer to Table 2 to confirm compatible batten steps and minimum roof slopes for each tile type. While some tiles allow lower pitches, a slope of 20-25° is generally recommended by tile manufacturers and aligns well with the Solar Tiled Roof system.

Batten Step Compatibility Table			
Roof Tile Model	Compatible batten step for		
	Tile (mm)	Solar Tiled Roof module batten step (mm)	Tile minimum installation pitch (°) ¹
BMI Monier			
Evo	312-340	325-340	19°
Teviva	312-340	325-340	19°
Tegalit Minster	312-340	325-340	14°
Minster Aerlox	312-340	325-340	15°
Turmalin Turmalin DE	355-380	355-375	14°
	350-380	350-375	
Granat 13V	330-360	330-360	14°
Jönåker	310-370	325-370	14°
Zanda	310-370	325-370	15°

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Wienerberger			
Actua 10	340-385	340-375	15°
Planoton 11 (Figaro 11)	350-385	350-375	20°
Benders			
Carisma	310-350	325-350	18°
Mecklenburger	310-375	325-375	14°
Palema	310-375	325-375	14°
IBF			
Funkis	310-370	325-370	15°
Double S	310-370	325-370	15°
Meyer-Holsen			
Piano	330-345	330-345	10°
Skarpnes			
Flat	315-370	325-375	15°
Creaton			
Kapstadt	310-340	325-340	15°

¹ Installations under 20° degree, SOLARSTONE advises using waterproof membranes

Table 2 - Batten step and Solar Tiled Roof™ compatibility table

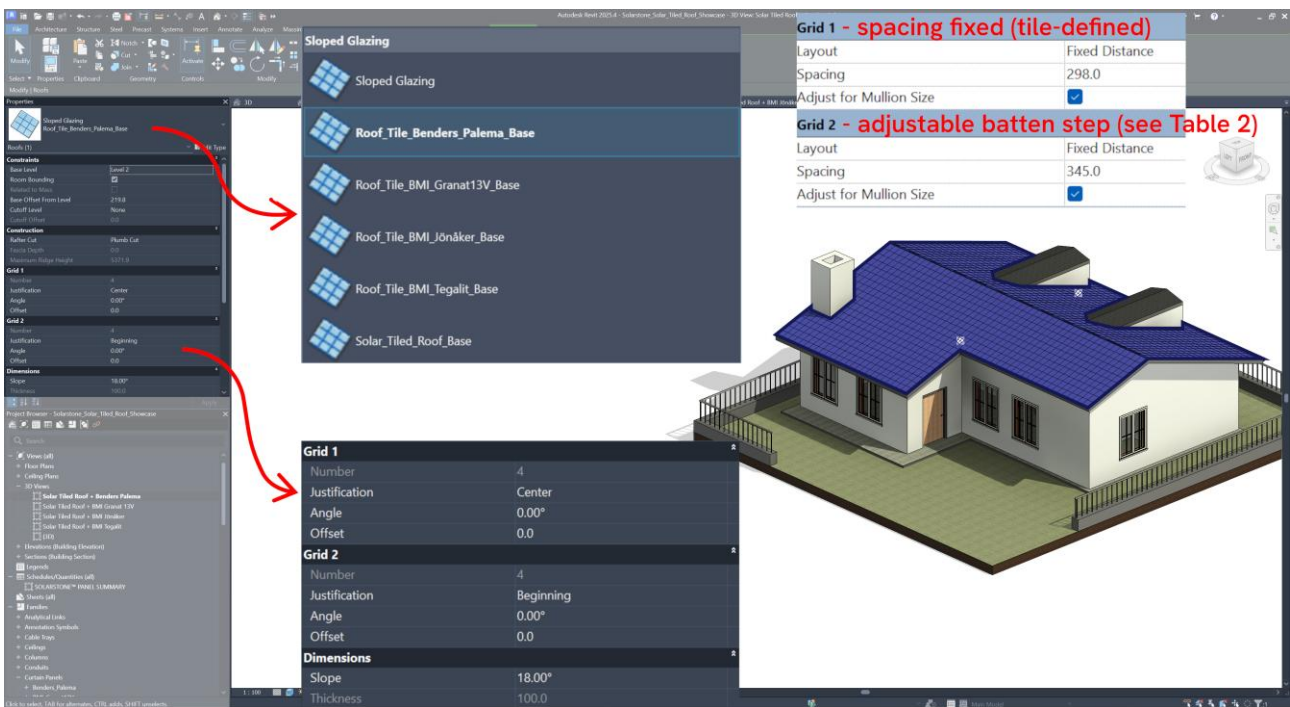


Figure 5 - Selecting the correct Roof Tile Base and adjusting grid alignment.

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3.2. Assign Roof Tiles and Resolve Edge Conditions

Once the Roof Tile Base is set, assign the correct **Roof_Tile** curtain panel type to the roof.

The selected Roof_Tile type must correspond to the chosen Roof Tile Base (e.g., Roof_Tile_Benders_Palema_Base → Benders_Palema tile), otherwise the tile layout will not match the defined grid.

Select one cell, then use Select All Panels on Face / Host, and choose the appropriate Roof_Tile type. Revit will replace the panel grid with the selected roof tiles.

Common Adjustments

- Ridge row
Revit may generate an extra row at the ridge.
→ Select that row and assign **Empty**.
- Gable edges
Tiles may extend beyond the roof footprint.
→ Use Edge_Mode on the edge tiles:
 - Edge_Mode = 1 → Left edge
 - Edge_Mode = 2 → Right edge

Apply Edge_Mode by selecting the full edge column and setting the parameter once.

Note: Edge_Mode trimming is intended for left/right gable edges only. For valleys or hip roofs, use either void cuts or alternative curtain panel solutions to resolve local edge conditions.

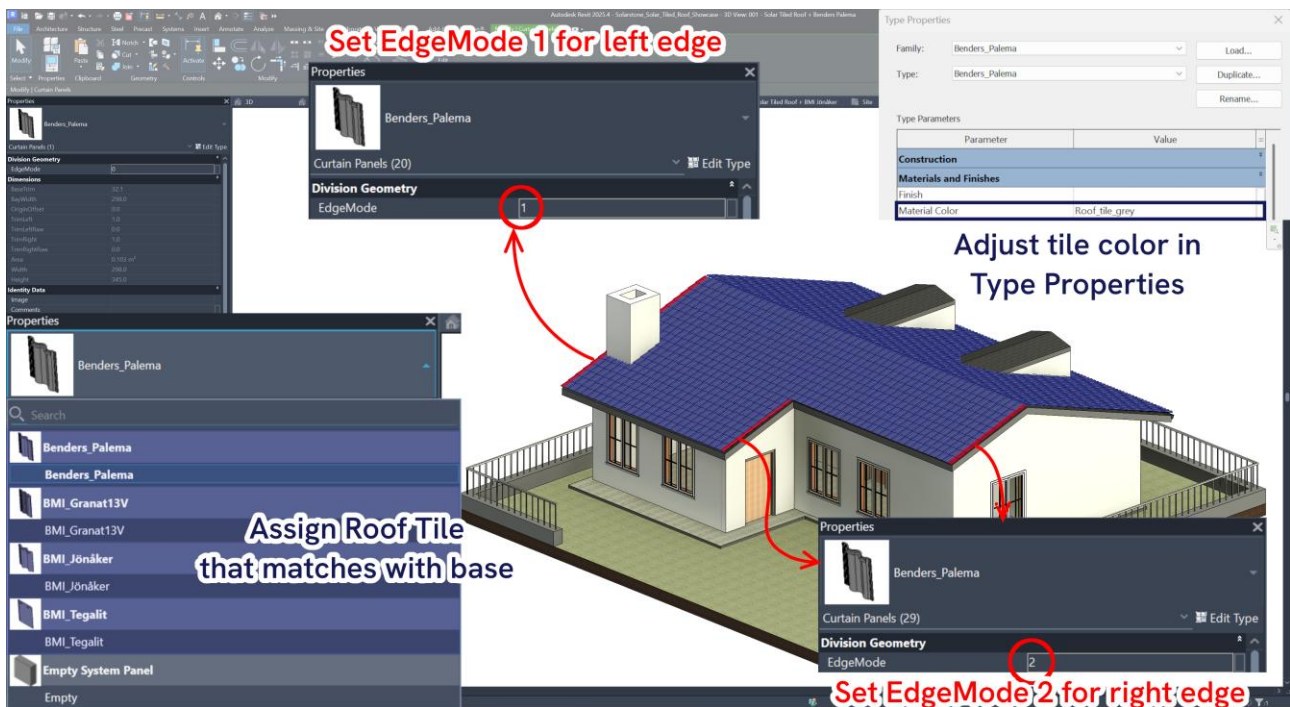


Figure 6 - Assigning Roof Tiles that match selected base and setting edge conditions using Edge_Mode.

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4. Defining the Active Solar Area

The active Solar Tiled Roof area is defined by creating a precise cutout in the existing Roof Tile Base footprint. This ensures a clean boundary, predictable grid behaviour, and correct module sizing.

4.1. Outline the BIPV Zone

At this stage, the roof should already be assigned with the selected roof tiles. Edit the Roof Tile Base footprint and define the intended solar area as opening.

For the most accurate result, use **Pick Lines** to trace the boundary along the existing grid lines. This ensures the solar area aligns directly with the tile layout and prevents irregular or misaligned geometry.

The cutout should be defined so that it matches full module widths. For example, when using a tile with a 298 mm coverage width, one module corresponds to 6 tiles. Based on this, the solar area should be sized in full module

Use **Trim/Extend to Corner** to close and clean the boundary, then finish the footprint edit. You should now see an empty opening in the tiled roof where the solar base will be placed.

Note: Maintain required clearances from eaves, ridge, and penetrations according to the Solar Tiled Roof manual.

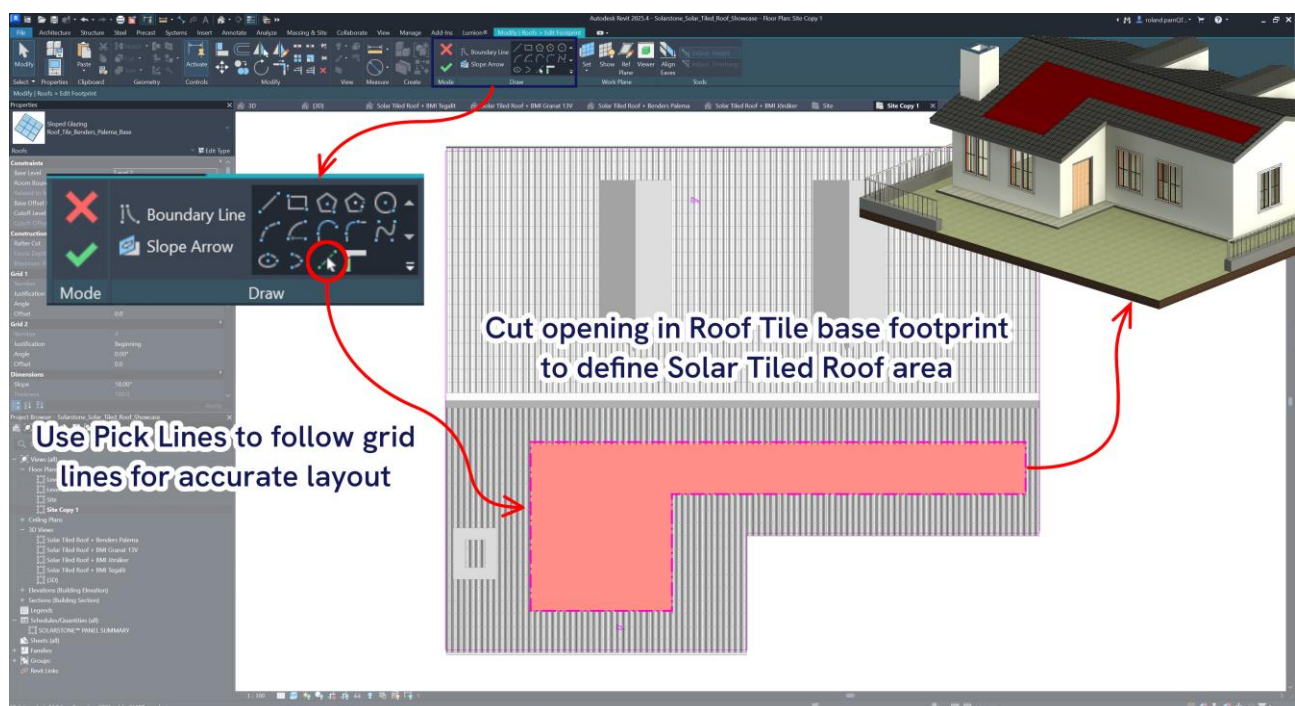


Figure 7 – Solar Tiled Roof area defined within the Roof Tile Base footprint.

4.2. Create the Solar Tiled Roof Base

Create the solar base by copying the existing Roof Tile Base and keeping only the defined cutout area.

Edit the copied footprint and remove all unnecessary segments, leaving only the solar area. Apply the same slope as the original Roof Tile Base.

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After creating the new roof element, use a section or elevation view to position it correctly. Move the Solar_Tiled_Roof_Base vertically so it sits at the required installation height above sub-roof (matching the batten build-up defined earlier).

Copy the roof, edit the copied footprint, and remove everything except the cutout boundary. Apply the same slope as the Roof Tile Base.

Because roof behaviour and offsets can resolve differently when the footprint changes, the copied base may not land exactly at the intended height. Use a section/elevation view to locate the new solar base and move it vertically so it sits at the correct installation level above the sub-roof (i.e., accounting for the batten build-up / elevation gap defined earlier).

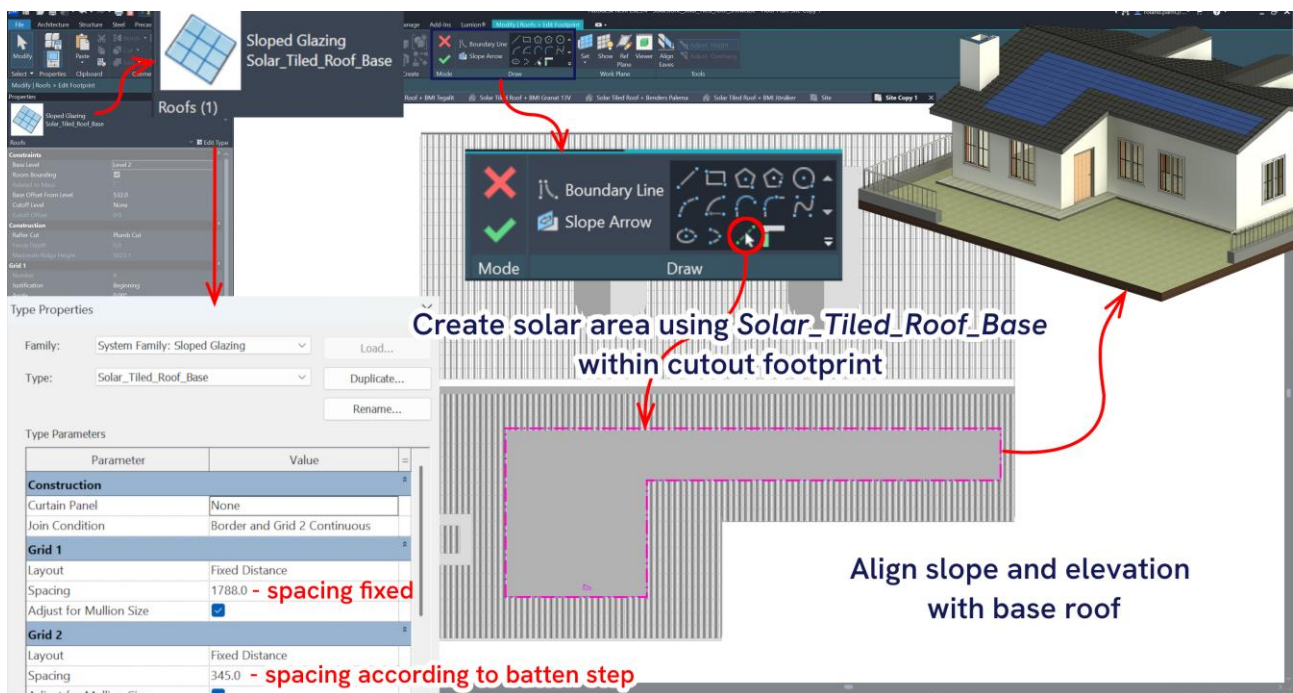


Figure 8 – Solar_Tiled_Roof_Base created from the cutout area and positioned to match the base roof geometry.

4.3. Alignment and Module Check

Before assigning modules, ensure that the grid resolves correctly.

A reliable default setting is:

- Grid 2 → Justification = Beginning

This prevents Revit from distributing the remainder across both sides, which would result in incomplete modules at both edges.

Check the resulting layout: all areas intended for BIPV must resolve as full-width modules. If shorter modules appear, adjust the cutout boundary or grid alignment until the layout resolves correctly.

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4.4. Select and Assign BIPV Modules

Select panels within the defined Solar Tiled Roof Base area and assign:

- Solarstone_Solar_Tiled_Roof_BIPV_module → Standard

The selected areas become active BIPV modules, while the surrounding roof remains defined by the Roof_Tile system.

BIPV modules must remain full-size. Areas that do not match the required modules dimensions must not be assigned as active panel.

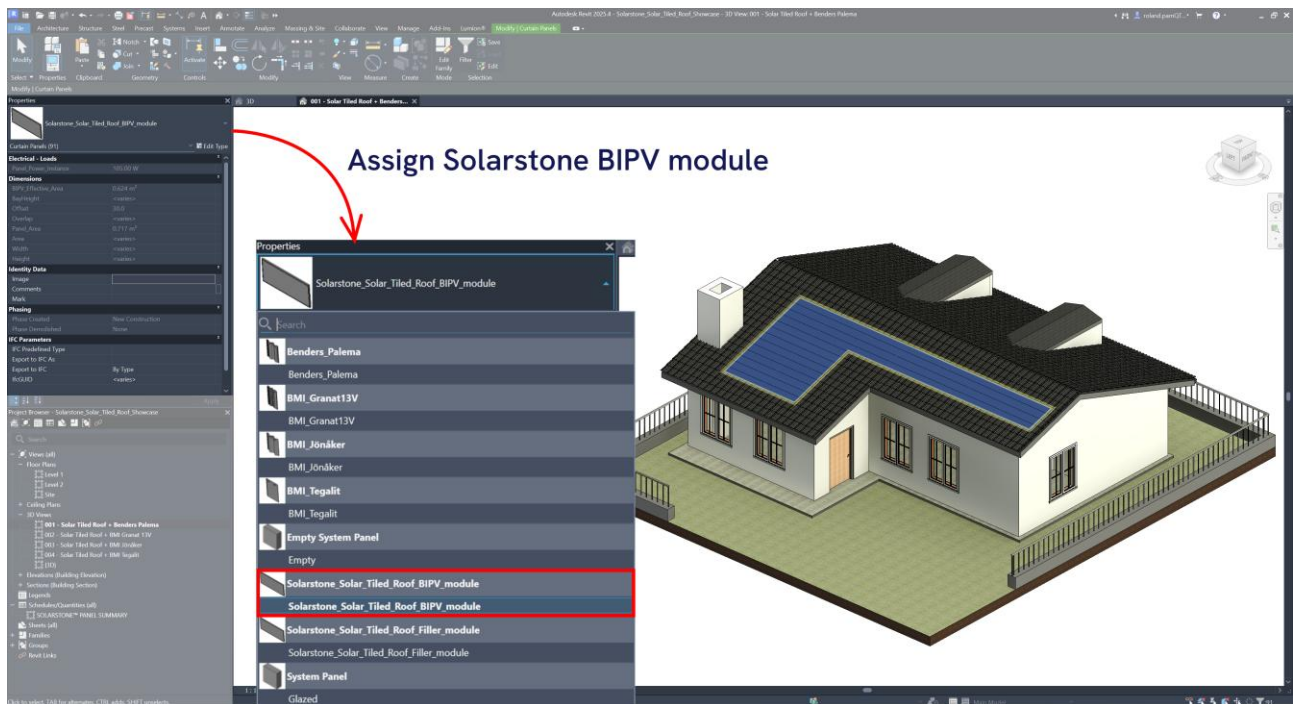


Figure 9 – BIPV modules assigned within the defined Solar Tiled Roof area.

Note: All openings and penetrations should be located outside the Solar Tiled Roof area and resolved within the surrounding tiled roof.

5. Fascia Boards, Ridge Flashing & Gutters

Adding fascia boards, ridge flashings, and gutters helps finalize the roof visually and coordinate it with the architectural roof design.

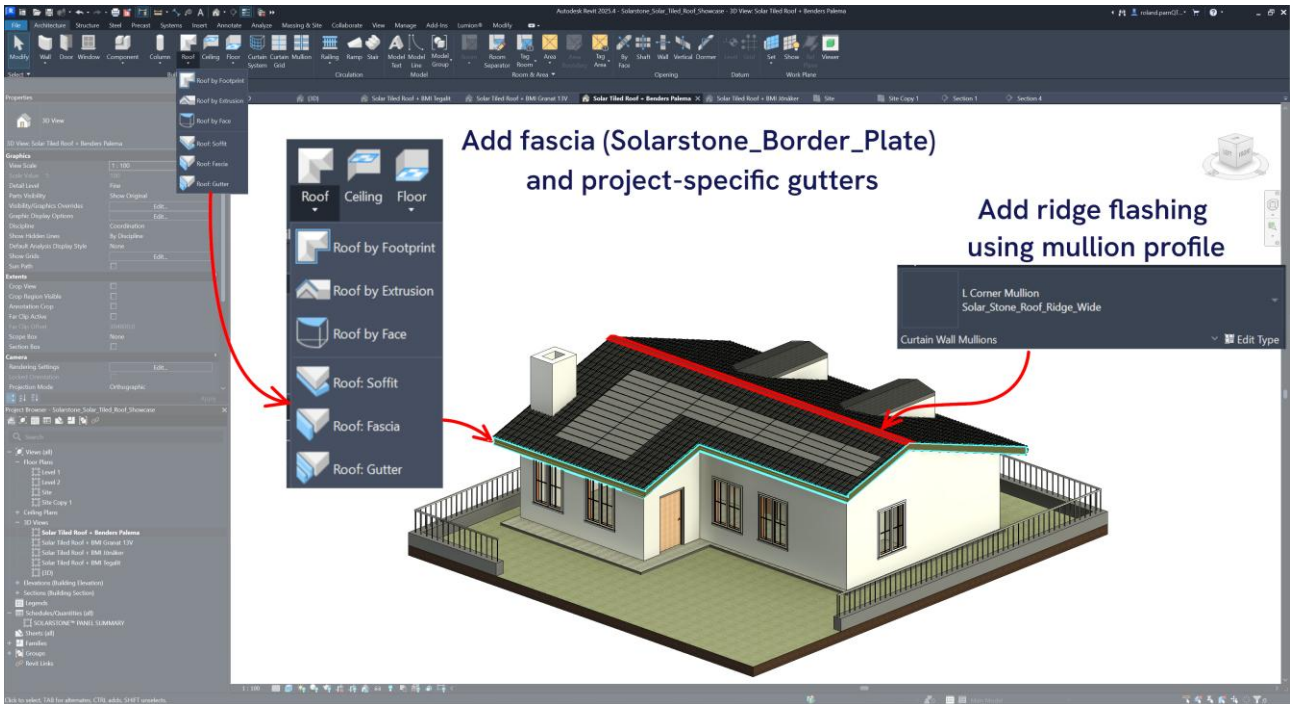


Figure 10 - Adding roof fascia, ridge flashing and project-specific gutters to complete the roof's architectural appearance.

5.1. Fascia Board

Apply the fascia from:

Architecture → Roof → Fascia → Solarstone_Border_Plate

Use this mainly for visualization of an edge finishing. Adjust the vertical offset so that the fascia plate covers the exposed sides of the modules for a clean appearance.

5.2. Ridge Flashing

Ridge flashing can be modeled using the Solarstone_Roof_Ridge mullion.

The mullion approach allows you to control the ridge flashing visually through the mullion parameters, including:

- Vertical offset
- Thickness and material
- Profile widths on both sides

Note: Project-specific ridge solutions or manufacturer-specific ridge details require alternative families or custom modeling, depending on architectural and regulatory requirements.

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5.3. Gutters

Gutters are not provided as SOLARSTONE families and should be selected based on the project's architectural style, drainage design, and regulatory requirements.

Use any suitable gutter family and adjust the vertical offset so it aligns with modules in the bottom row and with the intended eave detail of the project.

Note: In real Solar Full Roof installations, the eaves, ridges, and verges are finished with specialized sheet metal flashings designed for the system. These components are not modeled in SOLARSTONE BIM model to keep project lightweight and easy to work with.

6. Advanced options

This chapter introduces additional options used in specific situations, beyond the standard Solar Tiled Roof workflow. These include broken bond layouts (flat tile types only) and filler modules for tile-to-module width mismatches.

6.1. Broken Bond (Flat Tiles Only)

Broken bond is a layout where adjacent rows of BIPV modules are offset relative to each other. This approach is applicable only to flat tile types (such as BMI Tegalit and BMI Granat 13V) and is not intended for profiled or irregular tiles.

By default, the curtain panel grid resolves the module field as a continuous layout. When rows are shifted, Revit attempts to maintain continuity, which can result in unintended panel joints or disorted panel areas. To achieve a correct broken bond pattern, the grid must be adjusted manually at the locations where module edges shift.

To create a clean broken bond pattern:

- Add grid lines where module joints need to occur
- Use Add/Remove Segments to activate only the required grid segments
- Remove unnecessary grid segments so the layout resolves without unwanted splits

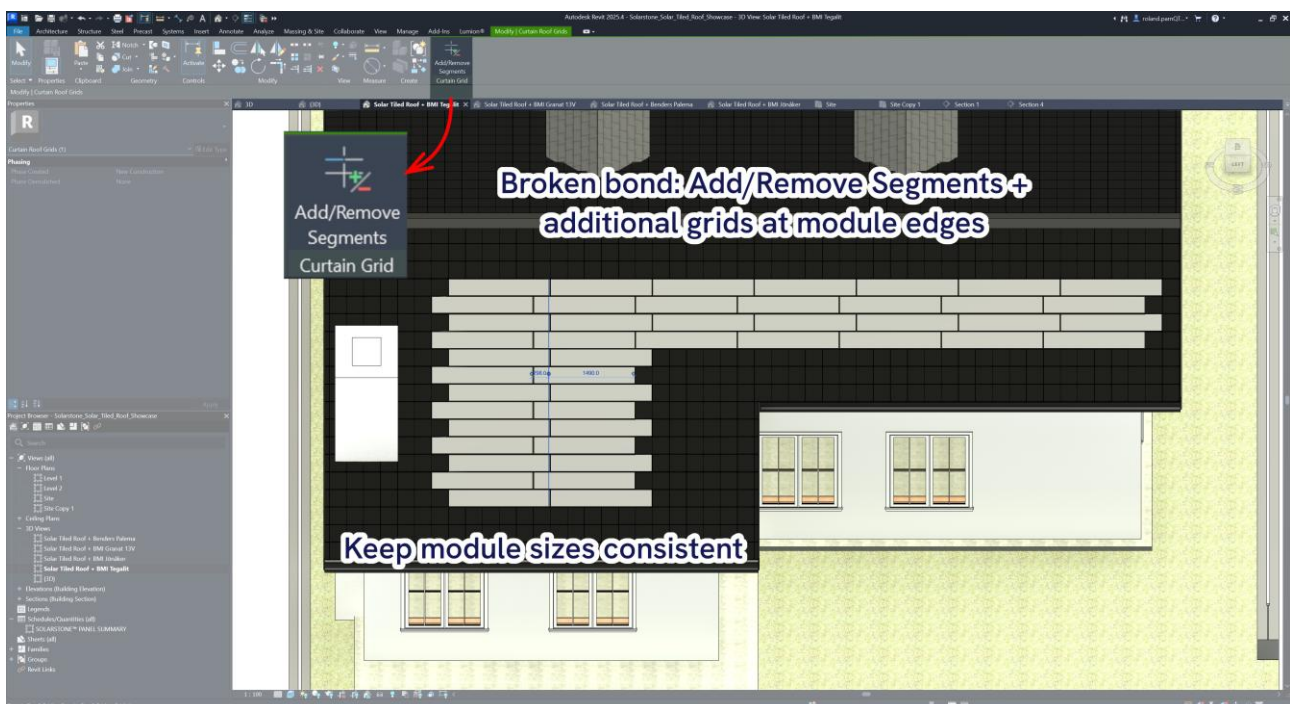


Figure 11 – Broken bond layout with shifted module rows controlled through grid segmentation.

Note: Broken bond is easiest to manage when the cutout boundary and grid are traced consistently and when the layout is kept module-clean.

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6.2. Filler modules

Filler modules are used when the selected roof tile does not resolve cleanly into full-width BIPV modules. This occurs when the tile coverage width does not divide evenly into the module layout, resulting in a remaining area that does not match the standard module width.

In these situations, the remaining area must be assigned as a filler module rather than forcing it into a BIPV module.

For example, with BMI Granat 13V, the tile coverage width is 213 mm and it does not divide evenly into the module width. In such cases, the remaining boundary area should be assigned as:

- Solarstone_Solar_Tiled_Roof_Filler_module → Standard

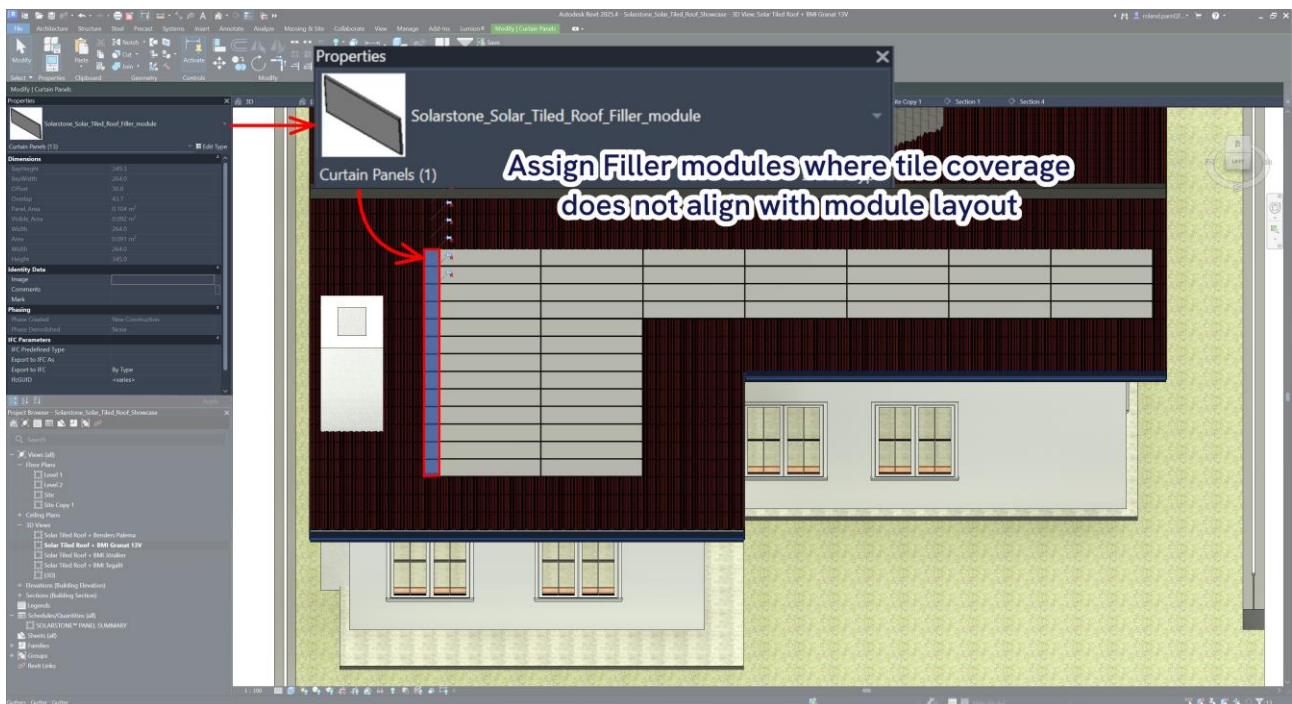


Figure 12 – Filler module applied at the boundary where tile coverage does not align with module width.

Note: Available filler module variants and their placement logic depend on the selected tile type. Refer to the Solar Tiled Roof manual to confirm the appropriate solution for each case.

7. Final Check & Visualization Options

After completing the SOLARSTONE Solar Tiled Roof setup, you can review the outputs and prepare visual materials for clients or internal presentations.

7.1. Schedule Review

Open the **SOLARSTONE™ PANEL SUMMARY** schedule.

It will now display:

- Active BIPV modules
- Filler modules (if used)
- Total installed area
- Total effective area
- Total power output

All values update automatically whenever you modify the roof layout.

7.2. Visualization

You can export or live-sync the completed Solar Tiled Roof to any visualization platform used in your office.

For example:

- Lumion
- Enscape
- Twinmotion
- V-Ray
- Other rendering tools that support Revit models

This allows you to generate:

- Realistic exterior renderings
- Quick client-ready visuals
- Smooth concept-design iterations
- Consistent presentation views across the project



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Workflow Summary

1. Open the SOLARSTONE Showcase Model

Load all required families by copying a demonstration roof into your project.

2. Verify Families in Project Browser

Ensure Roof Tile, BIPV module, Filler module, and base types are present.

3. Model the Architectural Roof (Sub-roof)

Up to battens or structural layers that will sit under the solar layer.

4. Create the Solar Roof Base elevation

Add 45 + 45 mm batten layers or duplicate the roof +90 mm upward.

5. Convert the roof to a Roof Tile Base

Select compatible tile type, assign corresponding Tile Base and set spacing according to the batten step.

6. Apply roof tiles

Assign the Roof_Tile panel type matching the selected base and adjust boundary conditions if needed.

7. Define the Solar Tiled Roof area

Create a cutout in the Roof Tile Base footprint, aligned with the tile grid and module dimensions.

8. Create the Solar Tiled Roof base

Copy the roof, keep only the cutout area, assign Solar_Tiled_Roof_Base, and align the installation height.

9. Check grid alignment

Ensure the layout resolves into full-width BIPV modules and adjust justification if required.

10. Assign BIPV modules

Apply Solarstone_Solar_Tiled_Roof_BIPV_module → Standard to the defined solar area.

11. Resolve coverage mismatches (if required)

Use Solarstone_Solar_Tiled_Roof_Filler_module where tile coverage does not align with module width.

12. Add Fascia, Ridge Flashing & Gutters (project specific)

Apply Solarstone_Border_Plate, Solarstone_Roof_Ridge and project specific gutters.

13. Apply broken bond layout (if required)

Control grid segments to achieve shifted module rows for flat tile systems.

14. Final Checks & Visualization options

Review the Solar Roof Schedule; export or sync to any visualization tool as needed.

Version

No	Date	Description	Made by	Approved by
V1.1	19.05.2026	Version published	R.Pärn	R.Roosalu