

HANDBOOK

HANDLING AND INSTALLATION OF POLYURETHANE ROOF PANELS PROJECT - CLIENT

STEP 1: LOAD MATERIAL

The panels will be loaded on a platform (high table) with a minimum length of 40'. Once the load is placed the carrier will proceed to secure the bundles of panels with slings. Between the panels and the slings, the carrier shall place steel/wood corners or angles to protect the panels from the compression forces exerted by the slings. Otherwise the panels could be affected by deformations.



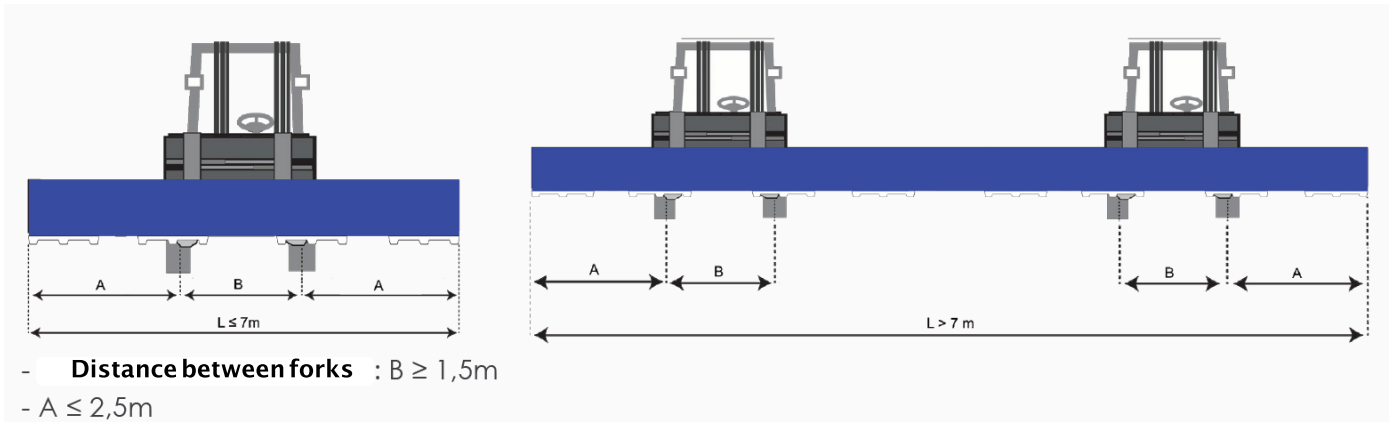
STEP 2: DOWNLOAD MATERIAL

The unloading and handling of the panels is the responsibility of the client and will be carried out with the appropriate means to limit the flexing of the panels. Before handling the packages, it should be checked that the stretch plastic that holds the panels is in good condition and maintains its consistency. The lower polystyrene protections allow to avoid the damage to panels during discharge.

It is the customer's responsibility to review each package with the referral of the same to verify quantity, dimensions, state of the panels, state of the packaging (to proceed with the handling of the packages without risks), etc. In case of existing any anomaly or damage to the material, it is necessary to notify it in the delivery agreement document together with the signature of the carrier.

Side handling and unloading by forklift:

The package must be lifted and/or transported using the polystyrene pallets as a base by means of the forklift shovels. The blades must have a minimum support surface of 10 cm wide and 120 cm long. The separation between supports must be at least 1.5m for packages less than 7m long. For longer lengths at 7m, extendable shovels or two forklifts must be used, leaving a maximum overhang of 2.5m between the last shovel and the panel end.



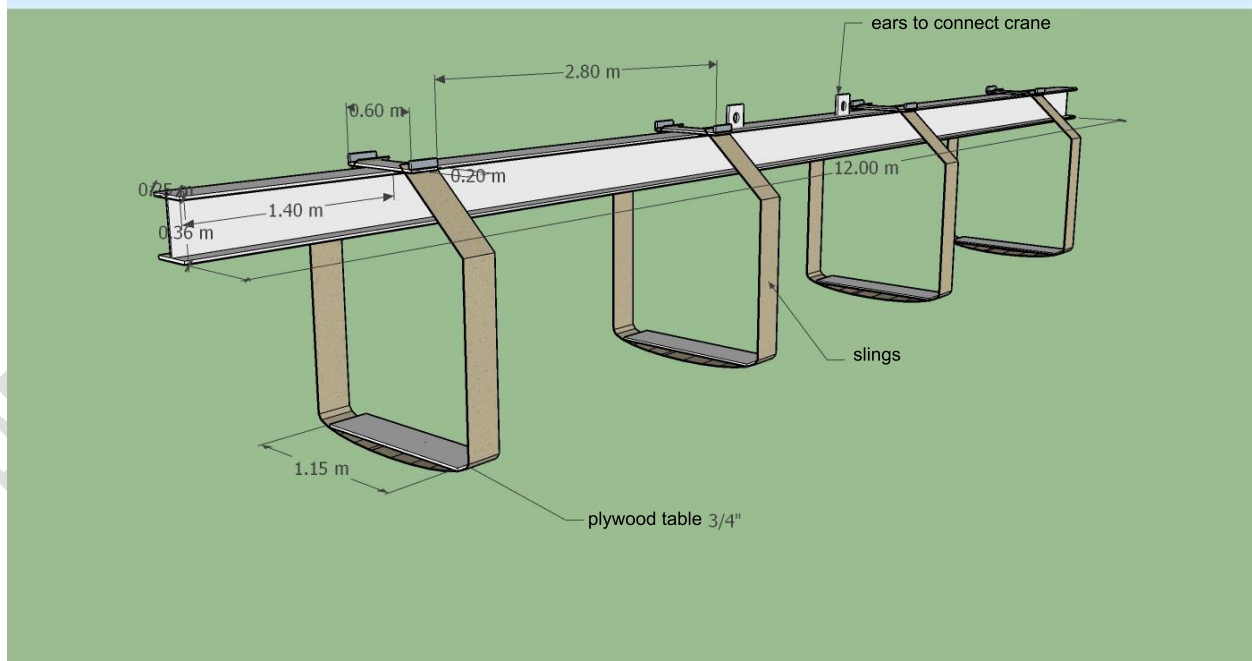
Unloading and handling by crane:

For lifting by bridge crane and slings, packages must be protected by separators to prevent the crushing forces of the slings lifting the package will damage the panel. These spacers should be placed in the base and the top of the panel, recommending the use of corner protectors to avoid scratches on the panel.

For panels of more than 6 meters, a rocker must be used so as not to damage the panel. The bands or support points recommended depending on the length of the panel are:

- Up to 6 meters: 2 bands
- From 6 to 9 meters: 3 bands
- From 9 to 12 meters: 4 bands
- From 12 to 15 meters: 5 bands

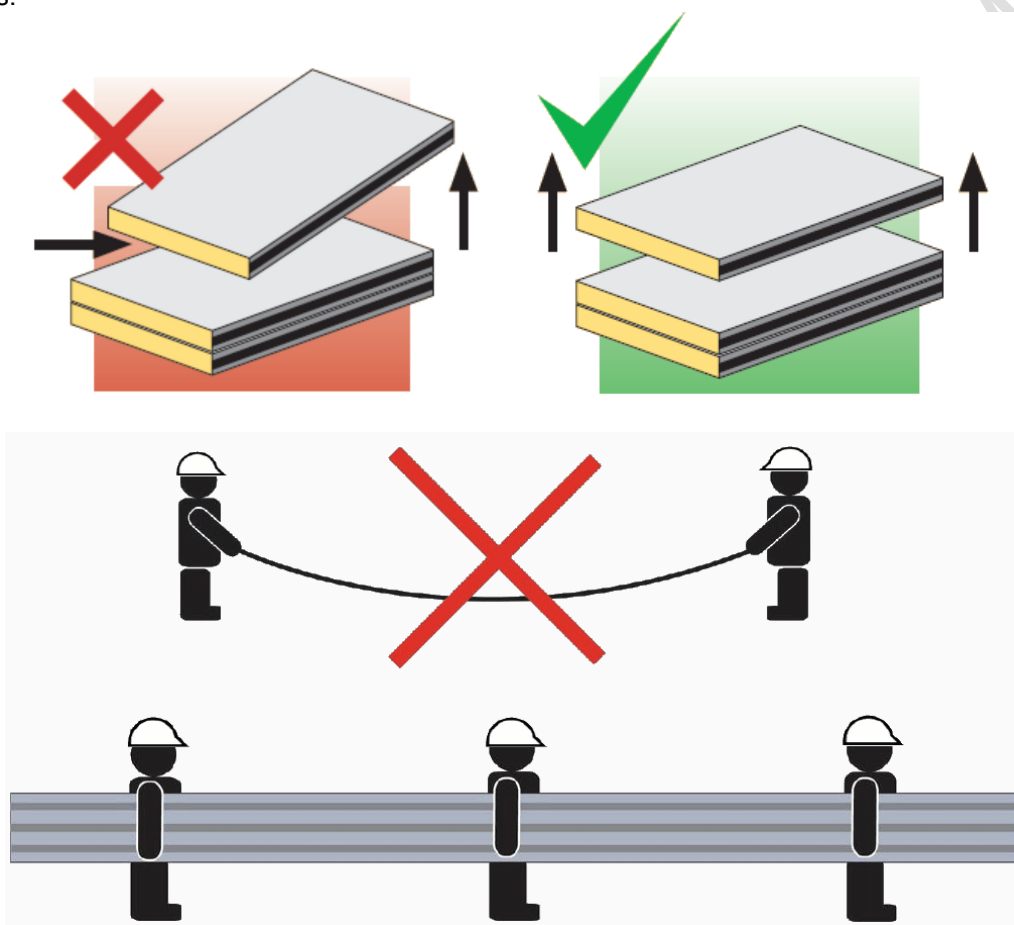
Rocker arm for unloading



Hand handling:

For the manual handling of the panels on site, the following must be taken into account:

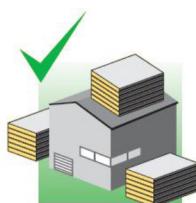
- do not slide the panels over each other to avoid damaging the paint
- hold the panel by placing a person every 3 meters transporting it perpendicular to the ground the bending of the panel can cause detachment of the core sheet causing air bubbles and anomalies in its flatness.

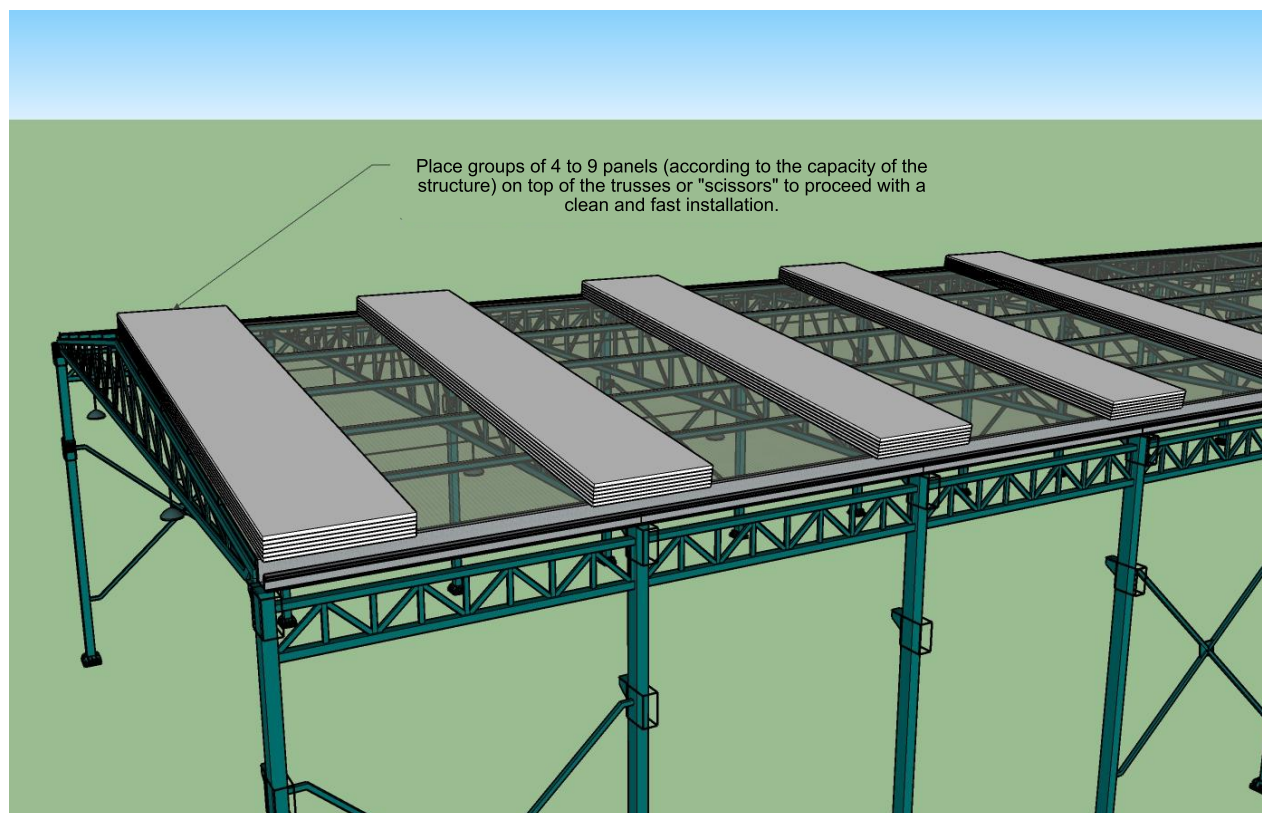


STEP 3: STORAGE

Limit the storage time on site to 2 months. Deposit the packages in a covered place. If it is not possible, protect them with non-transparent waterproof fabrics. If the panels have a protective film, this should not be exposed to sunlight to prevent it from thermosetting to the metal sheet.

Store the packages on the ground, away from metallic contaminating agents, or directly on the roof (panels of cover) on a ventilated and slightly inclined surface (between 1° and 5°) where the flow of an eventual condensation and thus avoid the stagnation of water. Do not exceed the number of packages stored overlapping to avoid deformations in the panels.

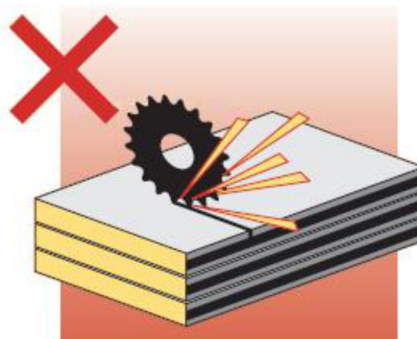
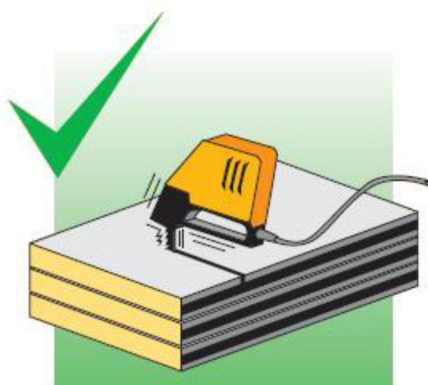




STEP 3: CUTS

Set the cutting site away from panel storage. A fine-tooth jigsaw or cold cutting disc, ensuring that its cutting plane is perpendicular to the panel sheets.

Protect the area adjacent to the cut section so as not to damage the coating of the plates. do not use tools cutting tools that produce hot sparks.



Cut path: - Determine and protect the surface where the cut is going to be made and place an adhesive tape or mask to best protect the finished surface of the panel. - Trace the line on the tape with a marker guide where the cut will be executed.

Making the cut: - Verify that the trace is correct and proceed to cut the panel with a vertical saw. if it goes to make a full thickness cut, ensure that the length of the saw blade cut is greater than the thickness of the panel. When cutting on one side only (required in overlaps or in special installations) verify that the sheet of the saw penetrate the insulating core to the desired depth.

Immediately after cutting, carefully clean the metal particles and residues that may remain on the edge and/or the surface of the panel, because over time they can generate oxidation points, damaging the paint. Use the vacuum cleaner, both in the workshop and in the assembly areas, guaranteeing at all times that the surfaces panel are clean and free of cutting debris and metal particles.**Finishing the cut:** - If necessary, file the edges of the panel until a perfect finish is obtained. Remove the tape surface and clean panel until ready for installation.**Cut with straight saw or jigsaw:** The cutting teeth of the saw should cut in an upward direction and the panel must be positioned with the outer face on the opposite side to the cutting surface, to prevent the cutting force of the tooth peel off the veneer from the foam. **Circular saw cutting:** The blade teeth must be short and prepared for cutting sheet metal (diamond or aluminum blade 140 teeth). The cut will be made supporting the machine on the outer face of the panel.

Hose down the panel liberally with 1000psi pressure to remove any chips and debris.
court.

STEP 4: INSTALLATION

Precautions:

To avoid scratches, dents and deformations during assembly, rubber shoes should be used, remove the chips after the cuts and not to place concentrated loads on the panels.

Bindings:

The screws must be. The tightening torque of the screwing machine must be the necessary to guarantee a good fixing, avoiding excessive torques that may cause superficial deformations in the outer sheet of the panel.

Protection film:

Verify that the panel protection film (if any) has been completely removed as the fixings are fixed. panels to the supporting structure.

Grounding:

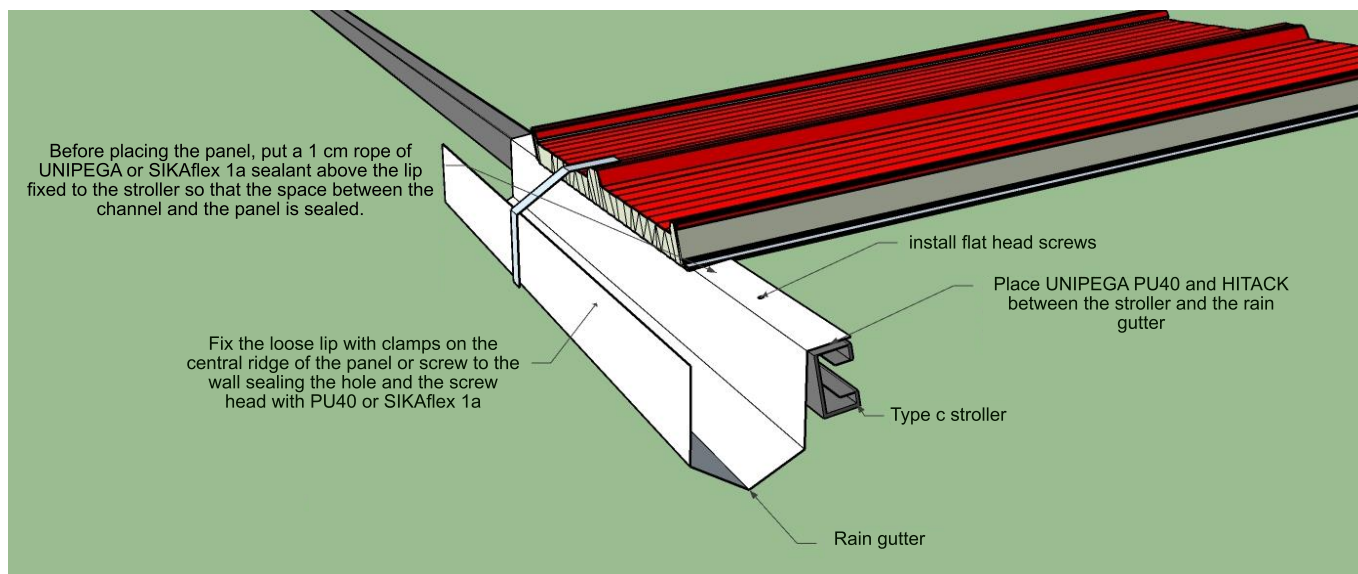
It is recommended to ground the panels and the load-bearing structure of the roof, in order to avoid the accumulation of static electricity.

Minimum roof slope: 4%

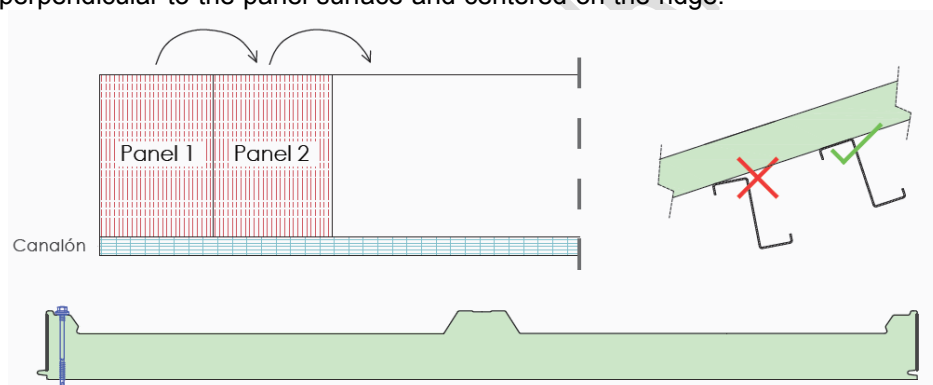
Assembly hand: The first panel will be installed at any of the lateral ends of the water, and its female edge pointing to the outside of the roof structure. As a consequence the male edge It will be pointing towards the inside of the roof structure.

Assembly sequence:

1. Remove the temporary protection film as the panels are installed (if applicable).
2. Place in the structure all those mounting accessories provided under the panel (for example, the channel of rain). (see image on next page).



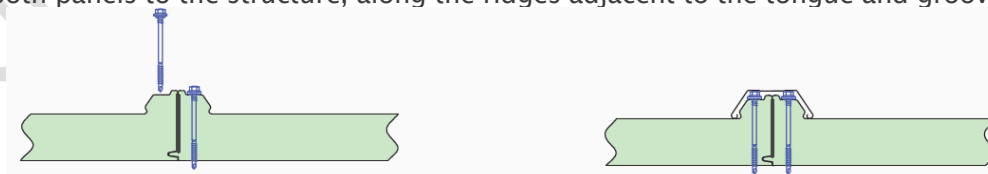
3. Fix the first panel to the structure. The panel must rest perfectly on the support. The screw must be attached perpendicular to the panel surface and centered on the ridge.



4. Place the second panel, respecting the tongue and groove. For an easier fit, the panel should be entered with a slight incline.



5. Screw both panels to the structure, along the ridges adjacent to the tongue and groove, and fit the flashing.

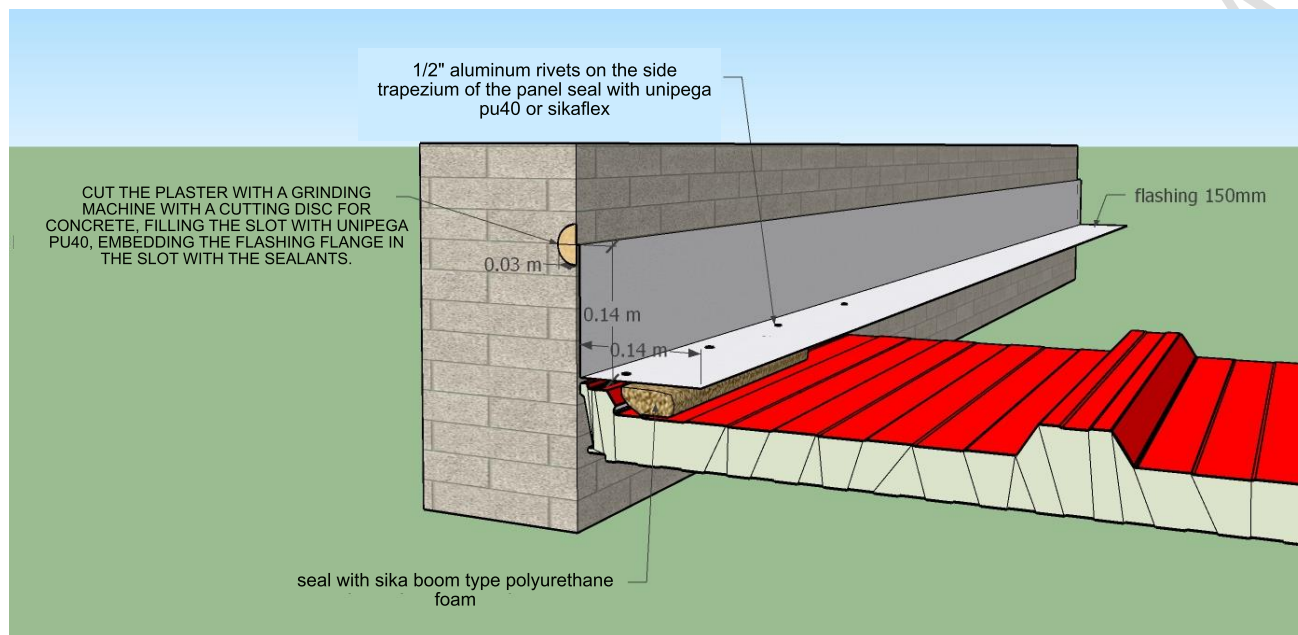


6. Proceed in the same way with the rest of the roof, checking at all times the alignment between panels and the alignment of the panels with the structure.

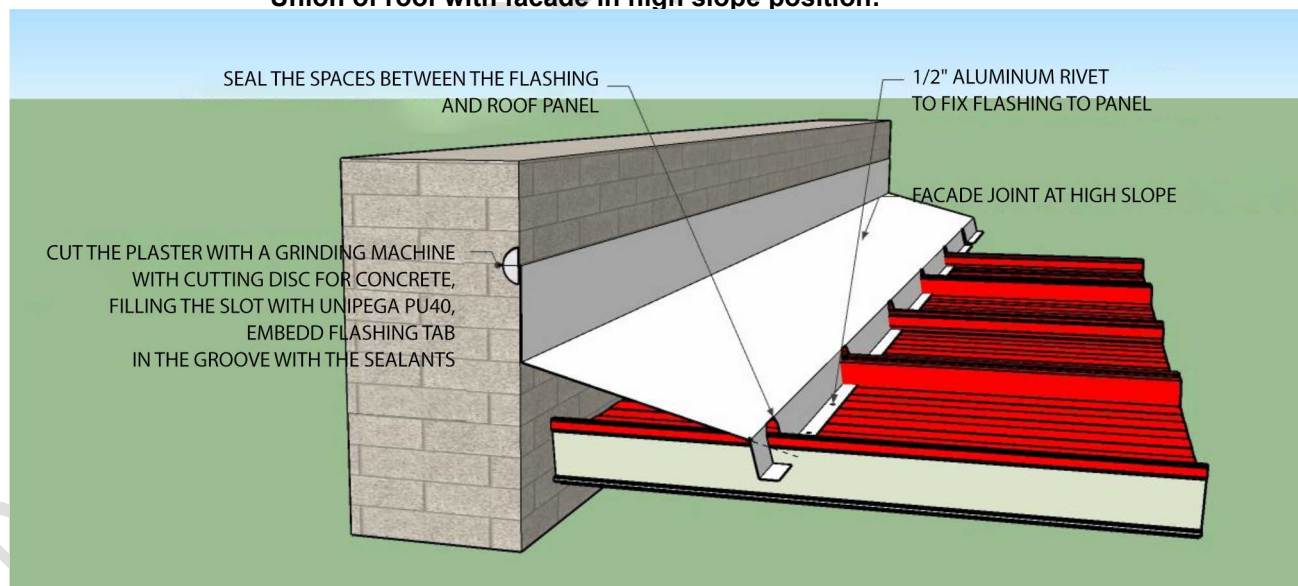
7. Once the cover is finished, cut the excess lateral part of the last panel with a jigsaw or disk cold cutting and remove any chips that may remain on the surface after cutting.

8. Assemble the rest of the roof elements (tutting, finishes, etc.).

Lateral joint against wall



Union of roof with facade in high slope position:



Hose the panel abundantly with a pressure of 1000psi to remove any chips and cutting debris when end of each working day.