BALEXMETAL

ELEGANT 2.0

INSTALLATION MANUAL

CONTENTS

EN-2022-10-05

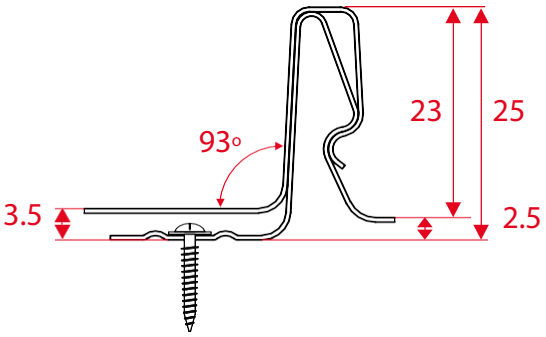
ELEGANT 2.0

Version 2.0 of the upright seam panel is a roofing material with an almost unparalleled, timeless look and feel.

The ELEGANT 2.0 panel is designed with the concept of an iconic classic that never fades away and will continue to inspire the architects of today.

TECHNICAL PARAMETERS

Name	ELEGANT 2.0 upright seam panel with concealed fasteners	
Panel effective width [mm]	300	510
Lock profile height [mm]	24	
Min. length [mm]	400	
Max. length [mm]	10,000	
End undercut [mm]	2 mm; 35 mm	
Eaves undercut bend	optional at 35 mm; 10°	
Seam closing flap	YES	
Sheet thickness [mm]	0.50 / 0.60 / 0.70	
Steel grade	S250GD-S280GD + Z275 (Polyester + Z225)	
Coatings	SP Polyester 25 µm, SP Polyester Mat Pearl 35 µm, CESAR 55	
Profiling	Plain, micro-wave, double wide lining, double grooved	
Weight [kg/m²]	ca. 4.5 kg/m²	
Technical requirements	CE per PN-EN 14782:2008	
Minimum roof slope	8° (14%)	
Batten spacing [mm]	250 mm max. or use blind boarding	

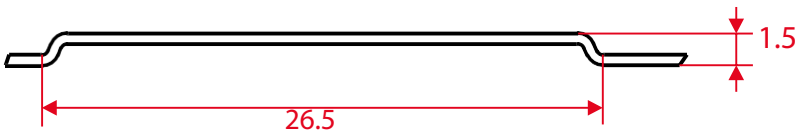


The special lock shape conceals the fastening of the sheet to the roof structure

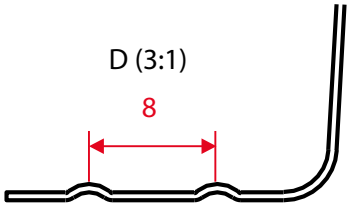
A (4:1)

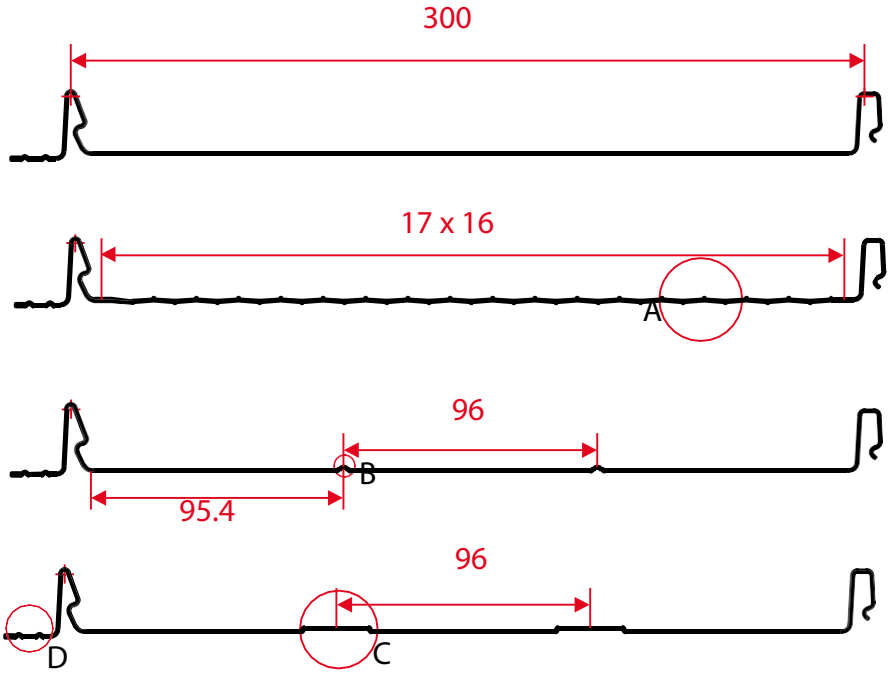
B (4:1)

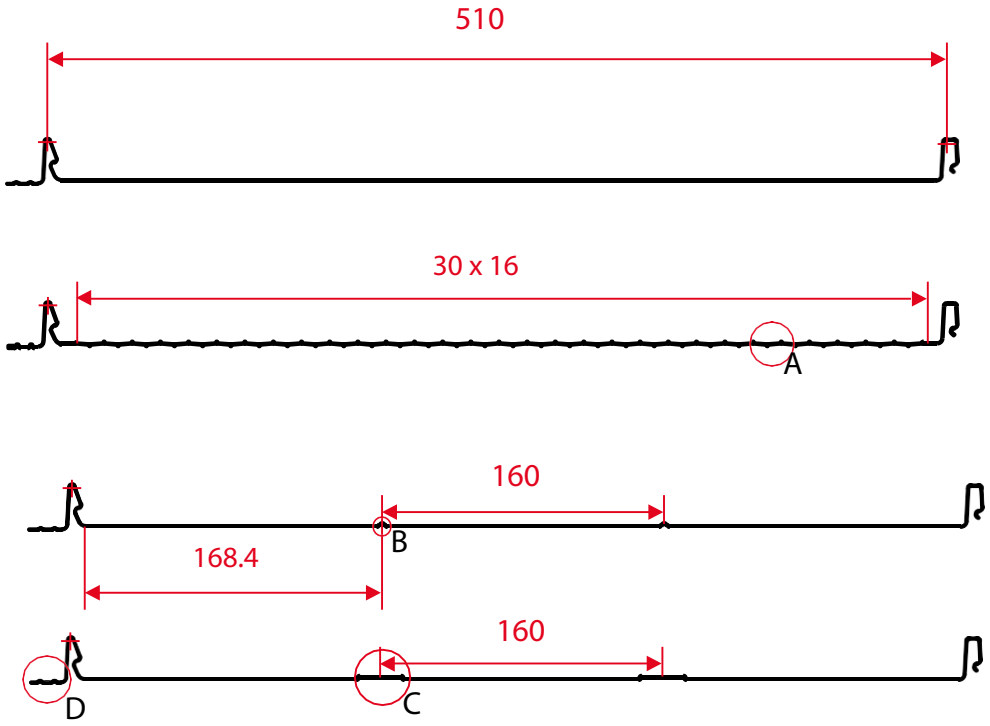
C (4:1)



D (3:1)







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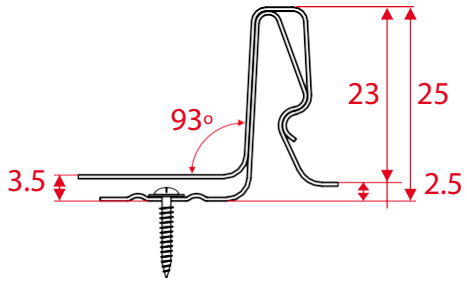
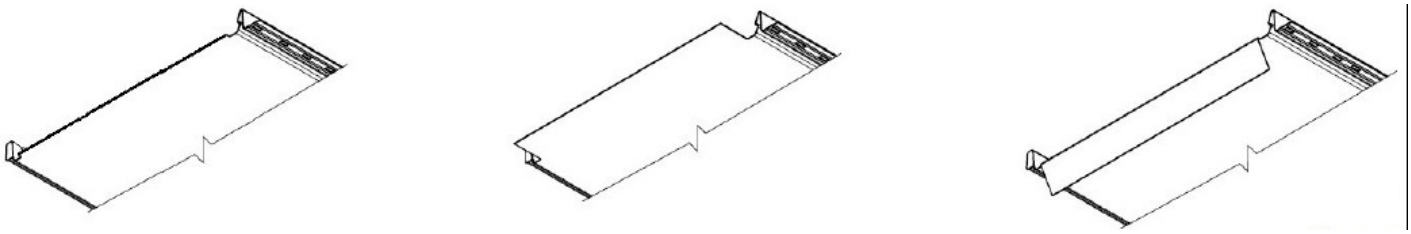
GEOMETRICAL FEATURES

A safe lock that resists deformation from walking loads



Eaves undercut (optional): 2 mm, 35 mm, 35 mm with a 10° downturn



Ridge undercut (optional): 2 mm, 35 mm

Double-sided lock closing flap

Sliding joint slots

GENERAL

PACKAGING

The ELEGANT 2.0 upright seam panels are packed either upright or stacked flat in crates, depending on the package contents.

Depending on the roof panel option, one crate contains:

- Panel width > 0.50 m, length ≤ 4 m – 70 panels
- Panel width > 0.50 m, length > 4 m – 50 panels
- The panels less than 0.50 m wide are in unit packaging.

To secure the shipments with a number of sheets less than the maximum, the package is filled with a safety padding.
For longer sheets, the shipment is centred in relation to the crate length.

FIG. 3. ROOF PANEL CRATE

TRANSPORT

The primary mode of shipment are trucks with closed or open bodies which can be loaded from both sides.

The following technical conditions are recommended for carrier vehicles that transport the panels:

- Curtain side load body
- The whole length of the load body shall be supported
- The lashing straps to secure the shipment shall touch the crate supports (the lashing tension shall not deform the panels).

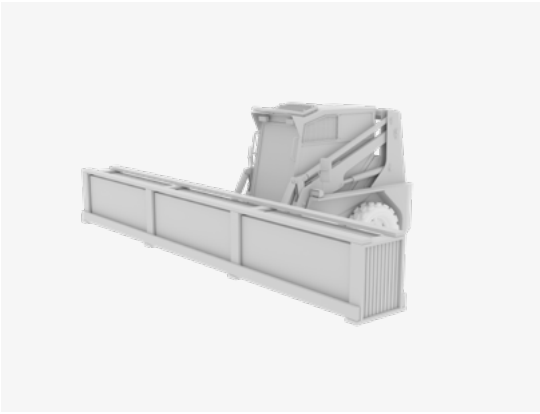


FIG. 4. TRANSPORTING THE ROOF PANELS

UNLOADING

To avoid damage to the panels, use a spreader boom or a forklift truck to handle the shipment from the delivery truck.

If handling with a spreader boom, the straps shall touch the crate supports.

If unloading manually, do not slide the panels directly over other panels or the ground. Otherwise the panel's organic coating will be irreversibly damaged and the roofing aesthetics will suffer.

Use protective gloves when unloading manually.

It is recommended to manually unload with one person handling every 2.50 of panel length. This will avoid the risk of bending and damage of the panels.

FIG. 5. UNLOADING THE ROOF PANELS

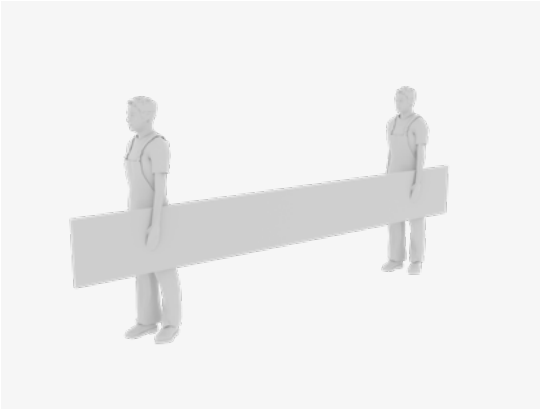


FIG. 6. UNLOADING THE PANELS

STORING ROOF PANELS

It is recommended to store the panels indoors with a good ventilation and away from fertilizers, acids, alkali, salts and other corrosives. Do not store the panels without any shelter. Place the panels on spacers not lower than 250 mm above the ground or store in the original packaging with the plastic sheet removed. The maximum stacking height is two packaging units, each positioned with a slight downgrade to facilitate drainage of water.

If storage is required outdoors and under a tarpaulin cover (do not exceed two weeks of this storage), provide a free flow of air around the products. If the panels need to be stored for more than two weeks, keep them indoors, well-ventilated, and uncovered to enable free ventilation of all layers in the stacks. Failure to comply may result in discolouration of the finish coating, or *white rust*, which will void the warranty.

Do not walk over the panels in storage or load the panel packaging with any objects.

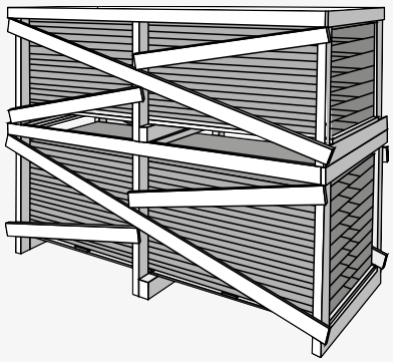


FIG. 7. STORING ROOF PANELS

CAUTION!

Remove the protective film from the panel surfaces no later than 3 weeks after the production date shown on the bulk packaging. Otherwise the film may permanently stick to the panel surface.

INSTALLATION INSTRUCTIONS

The specified installation methods are examples only and may require modification depending on the actual roof conditions. All questions should be addressed by the project design engineer or the sales consultant.

WORK SAFETY

Follow the essential safety practices for working on roofs.

WALKING ON ROOF PANELS

If the panels need to be walked over, step on the panel valleys only. Do not step on the profiles! Walk over the panels in soft-sole shoes only; wipe the soles carefully to remove debris (especially metal filings) each time before stepping on a panel. The installation method must minimise the need to walk over the roof panels.

MEASURING THE ROOF ON YOUR OWN

Roof structures are often complex and Balex Metal recommends installation of the product by qualified contractors. If the customer decides to measure the roof and install the roofing themselves, they should have basic technical knowledge of the process and consult a professional.

To determine the quantity of panels and roof deck boarding needed, measure the roof plane as shown in Fig. 9.

1. Determine the length of the roof plane, L, corresponding to the length of roof panels and counter battens needed.
2. Determine the width of the roof plane, W. This will indicate the length of the battens and, if divided by the coverage width of a single panel, the number of ELEGANT 2.0 seam roof panels required.

Measurements should be taken over the dimensions of the finished roof truss system, the roof structure dimensions usually differ from the design dimensions. If you want to install the roofing yourself, it will be helpful to have ready-made flashing units ordered from Balex Metal.

The size of the battens will depend on their spacing and that of the rafters. The greater the spacing is, the greater the required batten cross-section is (Table 2). The recommended batten spacing is 250 mm.

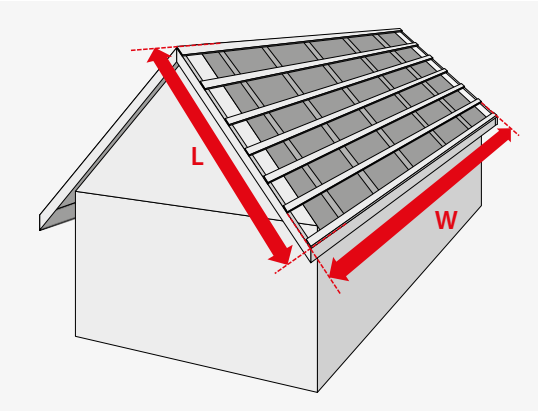


FIG. 9. ROOF MEASUREMENT

L roof plane length
W roof plane width

BATTEN SPACING (THK. 0.5 mm) [mm]	RAFTER C.O.C. SPACING [mm]	BATTEN SIZE [mm]
250	600	30 × 50
	900	35 × 50
	1200	40 × 50

TABLE 2.

SCREW

Use flat head screws to install the ELEGANT 2.0 seam roof panels (Fig. 10A and Fig. 10B). These fasteners allows thermal expansion and contraction as the ambient temperature changes.

Overlapping joints and the joining of panels together are best made with pop rivets with seals.

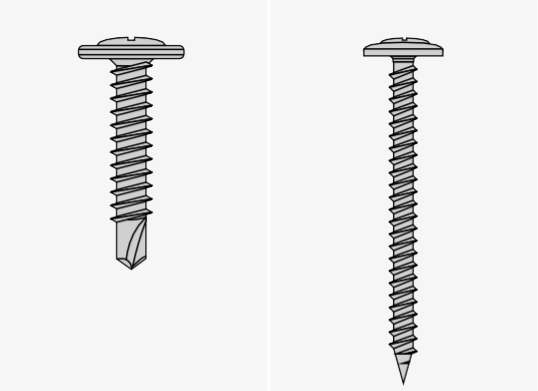


FIG. 10 SCREWS

CUTTING

The ELEGANT 2.0 upright seam panels supplied by Balex Metal are manufactured to the required length, taking into account undercuts and possible undercuts. When installing the roofing, some of the panels must be trimmed to size and fit in certain locations, like corners, roof valleys, ventilation penetrations, and roof windows.

Cut the panel sheets with automatic nibblers (Fig. 11A); use hand shears to process the flashing (Fig. 11B). Do not use angle grinders or other power tools that generate high temperatures on the workpiece; otherwise, the anti-corrosive coating can be damaged.

Before attempting the installation work, protect the panels against damage from sharp metal filings; after every drilling and cutting operation, carefully remove all metal debris and filings that might discolour the cladding. All paint coat damage caused during the installation process must be represerved with touch-up paint.

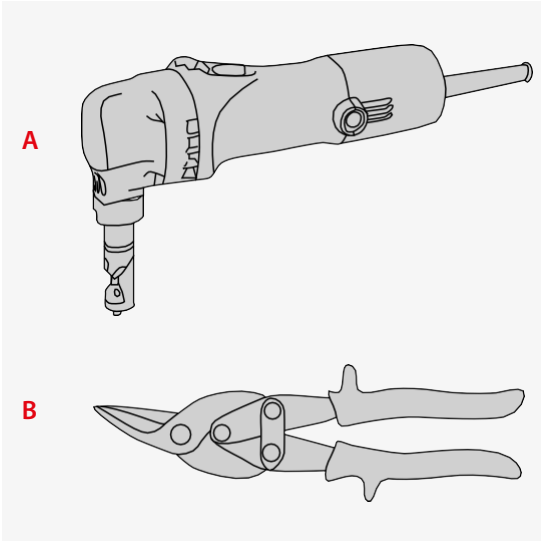


FIG. 11. INSTALLATION TOOLS FOR THE ELEGANT 2.0 ROOF PANELS

A. Nibbler
B. Hand shears

ROOF PLANE VENTILATION

Before attempting the installation work, the roofing ventilation design must be reviewed to ascertain if it is correct. The ventilation air should flow freely from the eaves to the ridge and remove moisture. Insufficient ventilation might damage the underside of the panels. Proper ventilation during hot weather prevents the roof, and indirectly the attic rooms, from overheating. Therefore, always use counter-battens no less than 25 mm thick and use roof vents to air the roof plane.

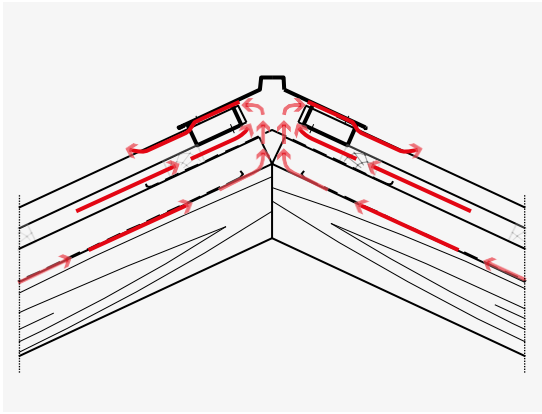


FIG. 12. ROOF PLANE VENTILATION

ROOFING MEMBRANES

With the ELEGANT 2.0 upright seam roof panels, two windproofing solutions are possible. The first solution, specifically developed for flat metal sheet roofing, is the AQMetal structural membrane. The membrane consists of a backing layer and a textured mat with a 8 mm high texture. Apart from the primary function of vapour permeability, the mat provides clearance between the roof skin and the drainage layer and allows the roofing to shift when the steel sheet expands and contracts with ambient temperature variations. The membrane is applied to blind boarding. The second solution is a traditional roofing membrane, Aspira Plus or Aspira Max.

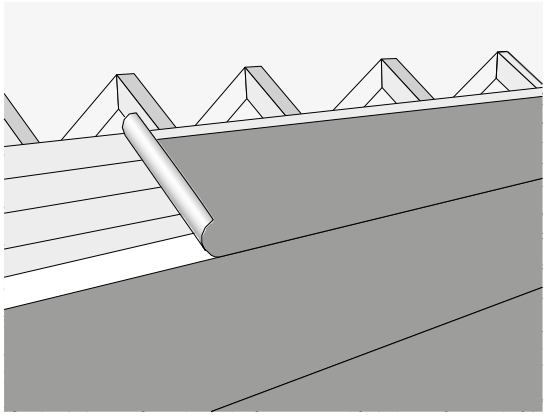


FIG. 13. INSTALLING THE TEXTURE MEMBRANE ON THE BOARDING

INSTALLATION SEQUENCE OF THE ELEGANT 2.0 UPRIGHT SEAM PANELS

The ELEGANT 2.0 upright seam panels can be installed in any direction. It is best to determine the panel direction by considering the predominant wind direction on site. To ensure maximum tightness of the roofing, install the panels in the direction opposite to the direction of wind. (Fig. 14)

Direction (sequence) of panel installation

Direction of wind

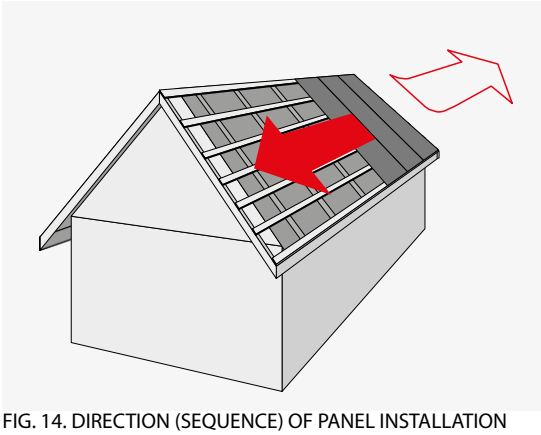
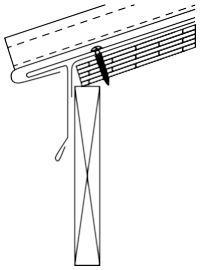


FIG. 14. DIRECTION (SEQUENCE) OF PANEL INSTALLATION

INSTALLING THE GUTTER FLASHING

The roofing installation begins by installing the eaves flashing. The gutter flashing is installed straight and aligned with the eaves edge, and first fastened to the first batten with galvanized nails/flat head screws. Next, verify the level, and screw down the whole flashing.

When designing the eaves flashing, note that the ELEGANT 2.0. panels are available with an undercut and a downturn; the panel geometry can be used to provide a continuous joint with the eaves flashing as illustrated in this example.



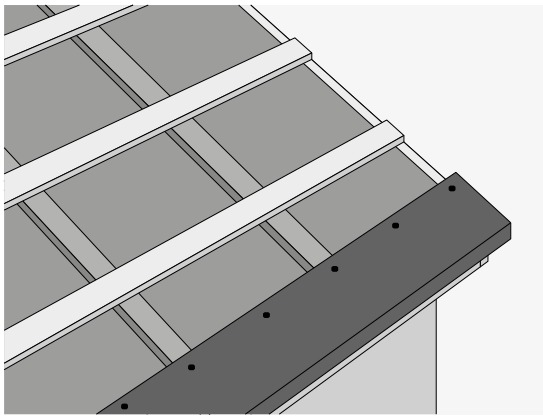


FIG. 15. INSTALLING THE GUTTER FLASHING

If the roof plane needs more than gutter flashing length, have the flashing pieces overlap when meeting one another. If the battens are steel, use the PES soundproofing tape between the battens and each panel to reduce the noise from rain and wind.

FIG. 16. LAYING THE ROOF PANELS

INSTALLING THE ROOF PANELS

Always install the roof panel sheets perpendicular in length to the eaves edge. Position the first panel with its bottom edge flush to the eaves flashing downturn (the gutter flashing); use one flat head screw to fasten a bottom corner of the panel to the first batten.

When installing the first panel, carefully position it square to the eaves flashing. This will make it easier to install the other panels correctly.

The right angle (90°) can be set out with a right angle gauge.

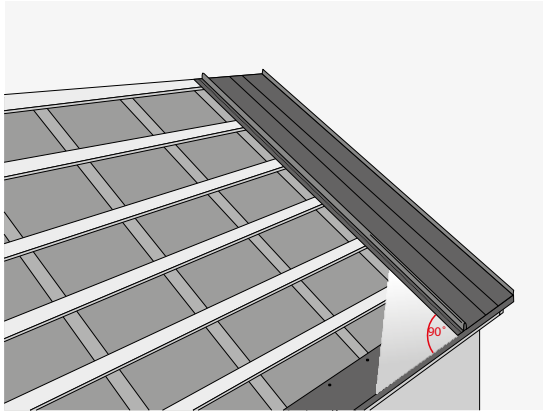


FIG. 17. SETTING THE RIGHT ANGLE ON THE ROOF PLANE

With the right angle set out, fasten the inner part of the panel to every batten with screws. Fasten the edge side relative to the roof side when fitting the wind brace to size. Before this step, leave the panel fastened so it will not be moved by gusts of wind etc.

FIG. 18. FIXING THE PANEL TO THE ROOF PLANE

FASTENING THE ELEGANT 2.0 UPRIGHT SEAM PANELS

Fasten the panels by driving each screw into the centre of the slot. The screws on the gutter flashing will ensure proper alignment of the flashing pieces. Tighten the screws enough to permit the panel to expand and contract as the ambient temperature changes. The best way to achieve this is to tighten each screw to stop and release it back by 90-180 degrees (1/4 to 1/2 of turn).

Fasten the panels to the battens as follows (Fig. 20):

- The first and the last two untrimmed panels are to be fastened to every batten along the panel's fastening edge.
- The panels in between are to be fastened to the upper batten, to the three lowest battens, and to every other batten in between.

These installation rules apply to buildings located at ground level with the shortest horizontal dimension of no more than 12 m and a building height of no more than 15 m. In other cases, consult a design engineer to determine the batten spacing and the fastening spacing.

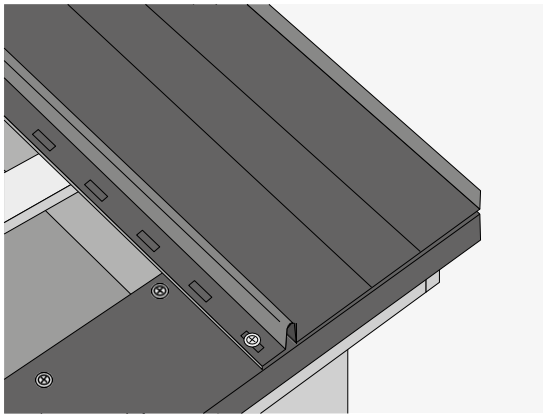


FIG. 19. FASTENING THE ROOF PANEL AT THE EAVES

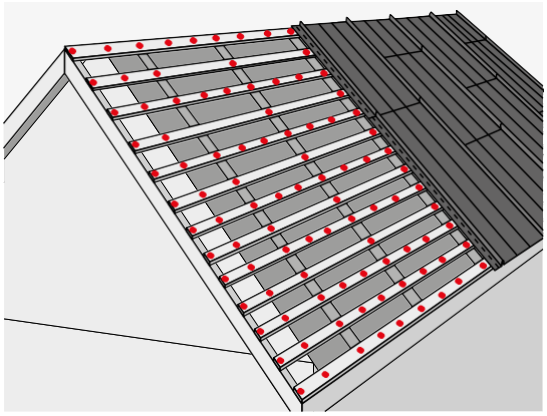


FIG. 20. FASTENING THE PANELS TO THE ROOF PLANE

Install the next panels by pressing the panel into the lock profile, from the eaves to the ridge.

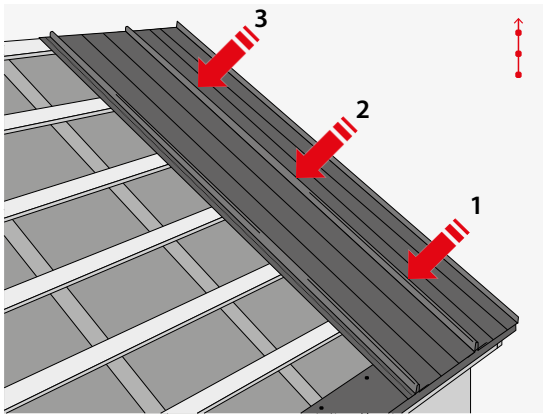


FIG. 21. INSTALLING THE NEXT PANELS

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With the lock profile fully engaged between the panels, carefully slide the panel sheets so that their bottom edges are aligned. Use a rubber mallet or a similar soft tool.

Fasten the panels to the battens as specified above and continue installing the other panels at the designated locations.

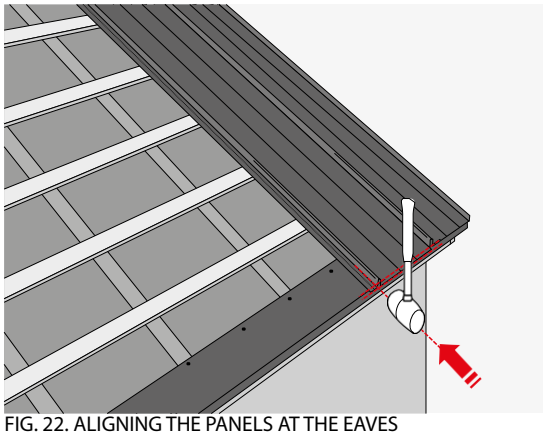

FIG. 22. ALIGNING THE PANELS AT THE EAVES

FASTENING THE PANELS LENGTHWISE

When the roof plane is longer than the permitted roof panel length of 7 m, the panels must be joined lengthwise.

The overlap width between the panels (dimension B in Fig. 23.) needs to be determined by the roof slope and be at least. 200 mm for slopes above 15° and at least 400 mm for slopes between 8-14°.

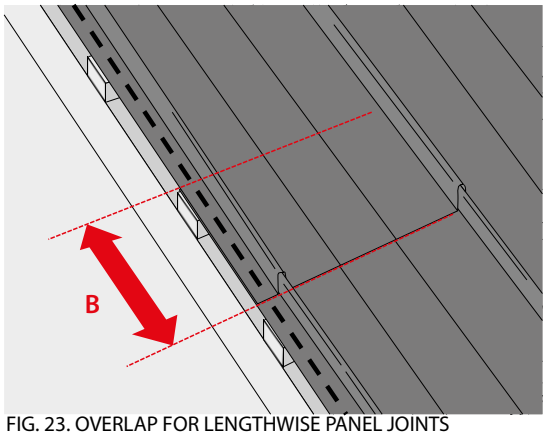

FIG. 23. OVERLAP FOR LENGTHWISE PANEL JOINTS

If more than one overlap must be made lengthwise, the overlaps are best made staggered in the sequence shown in Fig. 24. The minimum joint spacing shall be 700 mm.

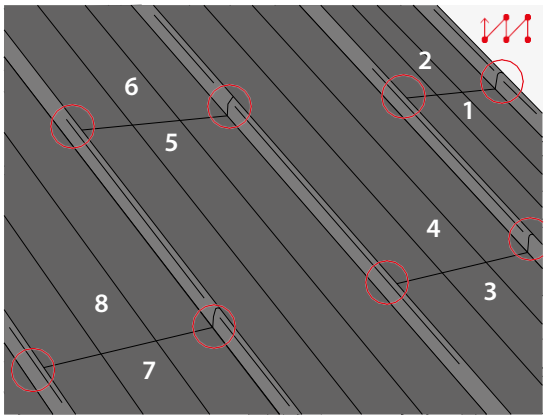

FIG. 24. LAYOUT OF PANEL JOINTS ON THE ROOF

Remove the lock profiles at the lower panel where the joints are between the panels (Fig. 26). Remove the lock profile by excising the outer part of both ridges of the panel being extended, along a length equal to the overlap length.

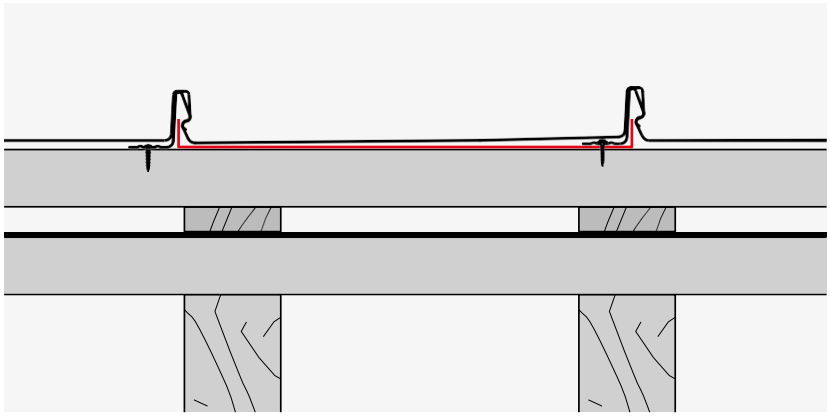

FIG. 25. OVERLAPPING PANEL JOINT CROSS-SECTIONAL VIEW

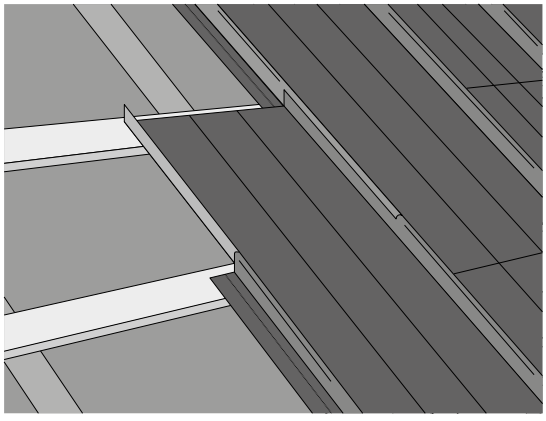

FIG. 26. LOWER PANEL WITH REMOVED LOCK PROFILES

When laying the next panel, its lock is engaged over the lock of the last fastened panel. It is recommended to seal the locks with a roof cement or butyl tape (with at least two tape strips on roof slopes less than 30°).

FIG. 27. LAYING THE NEXT PANEL OVERLAPPED

Tap the panel-to-panel joints for a full fit with a wooden mallet (Fig. 28).

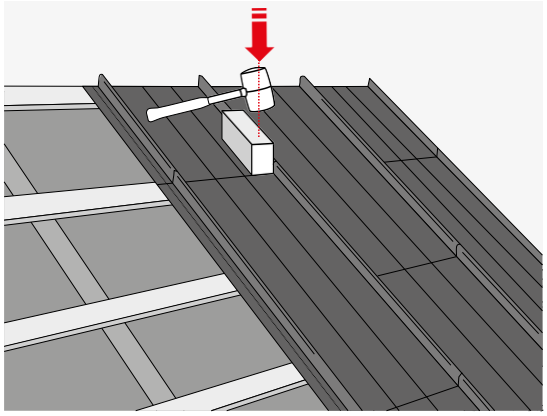

FIG. 28. LAYING THE NEXT PANEL OVERLAPPED

The lock at the joint can be secured additionally with a hand crimping tool (roofing pliers). Next, fasten the panels to the battens.

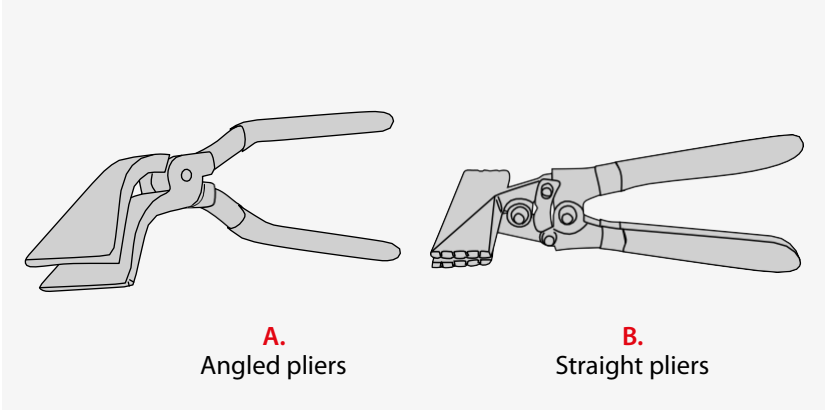

FIG. 29. TOOLS FOR PANEL LOCK CRIMPING

FIG. 30. CRIMPING THE PANEL LOCKS ALONG OVERLAPS

MODULAR PANELS

As a rule, the Elegant 2.0 modular panels are installed as specified so far for the joining of standard Elegant 2.0 panel. The difference for the modular panels, which are designed to be joined lengthwise, is that the lock profile is specifically designed to ensure a sealed joint with the overlap depth limited to the factory-made 35 mm undercut.

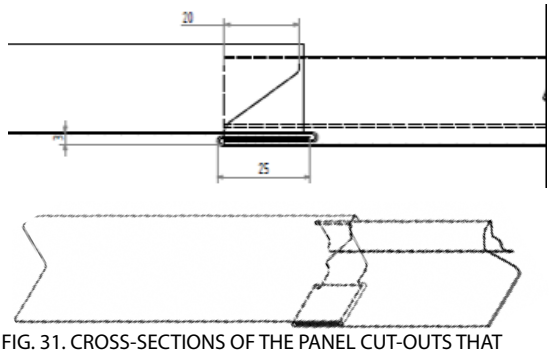

FIG. 31. CROSS-SECTIONS OF THE PANEL CUT-OUTS THAT SEAL THE SHORT JOINTS

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The modular panels are provided with modified 35 mm undercuts on both ends and a 10 deg. downturn on one end. The other downturn needs to be bent upward at a rather sharp angle (ca. 10 deg.) by hand (with a crimping tool) to allow the "upper" panel to snag on the "lower" panel.

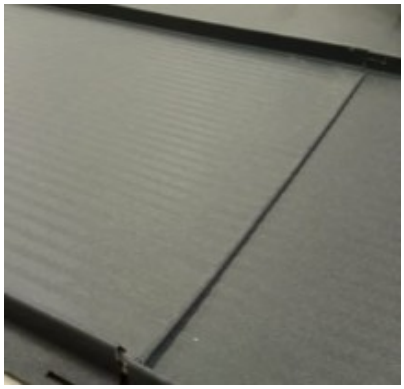


FIG. 22. JOINING THE PANELS

The joint orientation should follow the downgrade to prevent the rain water from penetrating the panel joints; it should run down freely.

FIG. 23. OVERLAP FOR LENGTHWISE PANEL JOINTS

The joint also needs to be sealed by applying a roof cement or another permanently plastic caulk into the upper panel bend. The joint made so needs to be levelled out by tapping down with a wooden block.

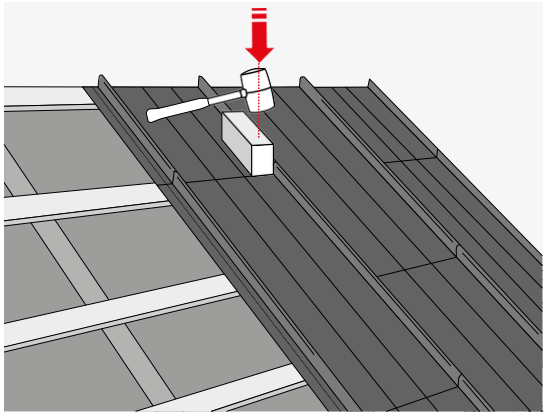


FIG. 24. LAYOUT OF PANEL JOINTS ON THE ROOF

The batten layout (max. spacing 250 mm) needs to be arranged so that all modular panel joints are over the battens. The rigidity of the panel arrangement at the joints is reduced and requires a firm, permanent support.

The Elegant 2.0 modular panels are like the standard panels and need to be staggered to prevent overlapping 4 panel sheets on one another.

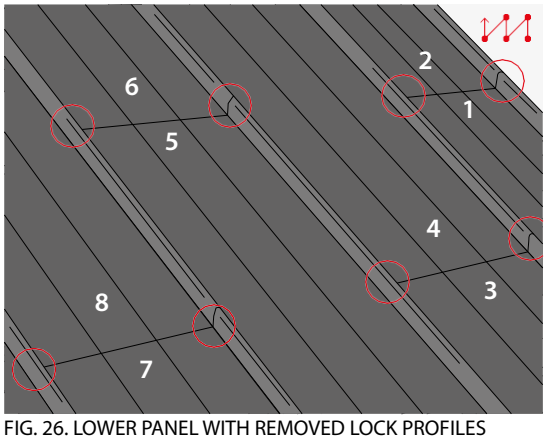


FIG. 26. LOWER PANEL WITH REMOVED LOCK PROFILES

VALLEY GUTTERS

Bend the valley gutter to fit and install it before laying the panels.

When joining the panels lengthwise, do this with an overlap of 200 mm and seal the overlap with a caulk. Draw the lines on the bent valley gutter to help align the panels within the roof valley.

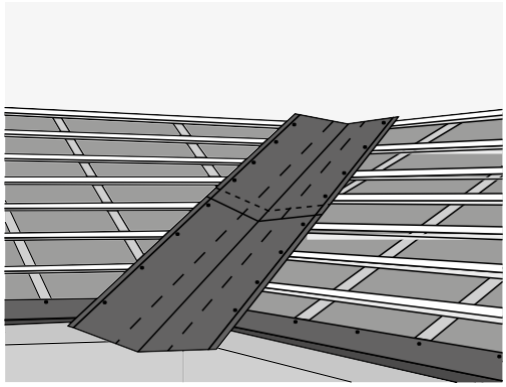


FIG. 31. INSTALLING THE VALLEY GUTTER

To seal the joints between the valley gutter and the upright seam roof panels, tap down the edges along 2 cm (Fig. 33).
This will prevent entrainment of rain water and snow by wind under the sheets and the roof slope durability will be prolonged.

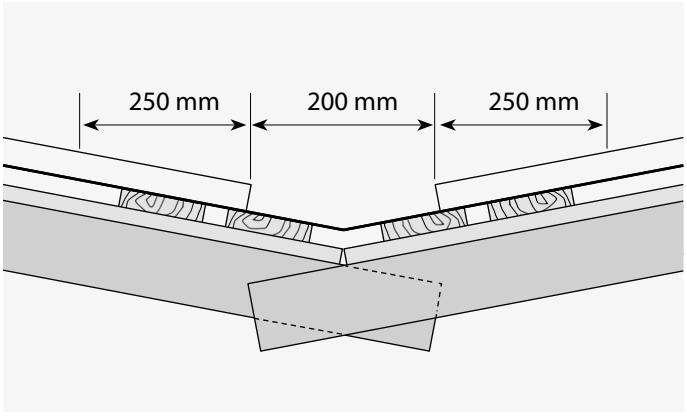


FIG. 32. ALIGNING THE PANELS WITHIN THE VALLEY GUTTER

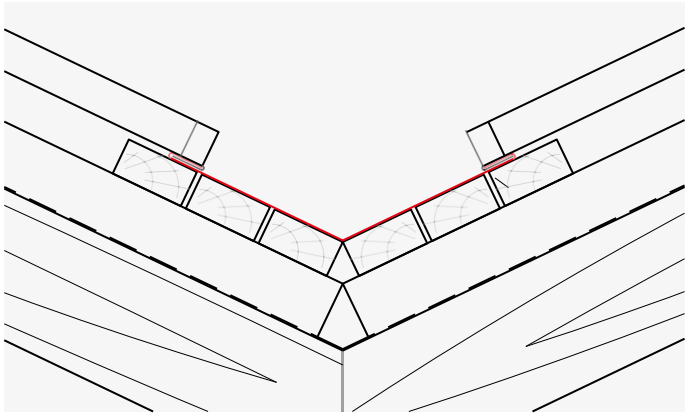


FIG. 33. TAPPING THE UPRIGHT SEAM PANEL DOWN TO THE VALLEY GUTTER

The angle of trimming the panels within the valley gutter can be set out with a square triangle gauge. Determine the correct angle and transfer it onto the other panels, and trim them to the angle.

The trimmed panels are to be fastened at the top of the valley. Seal the joints between the panel overlap on the valley with a rubber caulk or butyl tape.

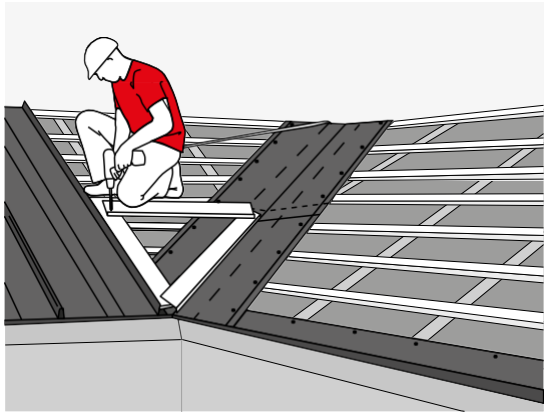


FIG. 34. DETERMINING THE ROOF PANEL TRIM ANGLE AT THE VALLEY GUTTER

During the installation process, make sure that the valley gutter bend angle follows the drawn lines. If necessary, adjust the shape of the square triangle gauge.

Fasten the panels within the roof valley with self-drilling screws. Fasten each panels with two 4.8 × 20 self-drilling screws, spaced equidistant at one third of the panel width on each end.

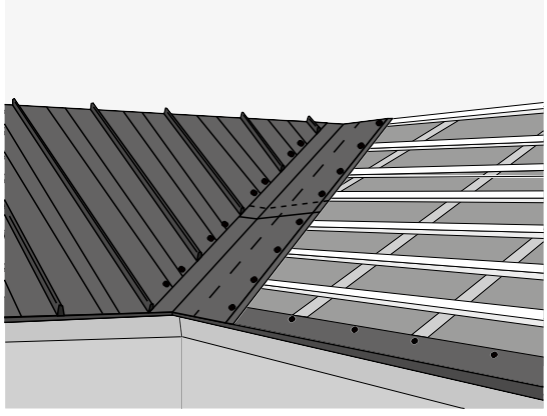


FIG. 35. PANELS INSTALLED AT THE VALLEY

BUILDING GABLE

Trim the the last (topmost) panel of the roof plane to size as follows:

Draw a line at the roof plane end and cut the panel to leave 30 mm of the panel over the plane edge (Fig. 36). Use power or hand shears. (Fig. 11)

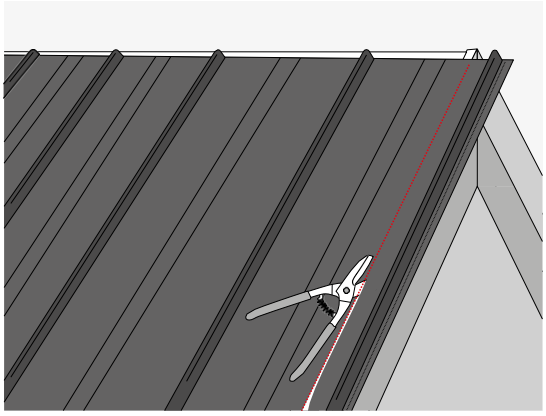


FIG. 36. CUTTING THE PANELS AT THE BUILDING GABLE

Trim the excess sheet from the top to form an upright seam. Next, fasten the panel is the barge board with screws driven into previously drilled holes with a diameter more than 3 mm.

Install the wind brace to the barge board with 4.8 × 20 self-drilling screws. Install the wind brace on the other roof plane end in the same way.

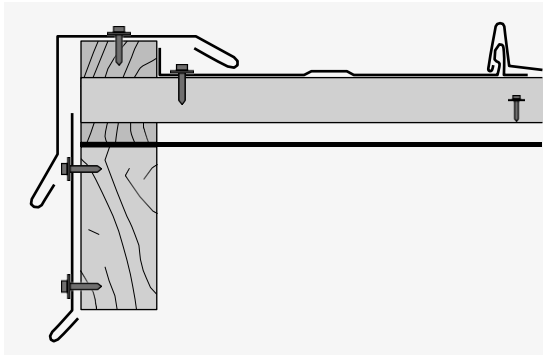


FIG. 37. CROSS-SECTION OF THE ROOF SKINNED WITH THE ROOF PANELS

RIDGE TILING

The roof ridge and the edges where the two roof planes meet at a convex angle is sheltered with the ridge tiles. The ridge fastening solution must permit free flow of air through one or two air gaps. This is solved with among others, PDG ridge tile flashings dedicated to the ELEGANT 2.0 upright seam roof panels.

To determine the installation locations, place the ridge tile at the gable and mark out the locations of ridge tile edges. The PDG ridge flashings for the ELEGANT 2.0 upright seam panels are to be installed 20 mm above the drawn lines so that they are covered by the ridge tiles. Fasten the PDG ridge flashings to the roofing made of the upright seam panels (do not fasten to the battens), use two sheet metal screws for each flashing piece.

Fasten the ridge tiles to the ridge flashings with self-drilling screws spaced no more than 500 mm apart. The ridge flashing overlap must be at least 100 mm.

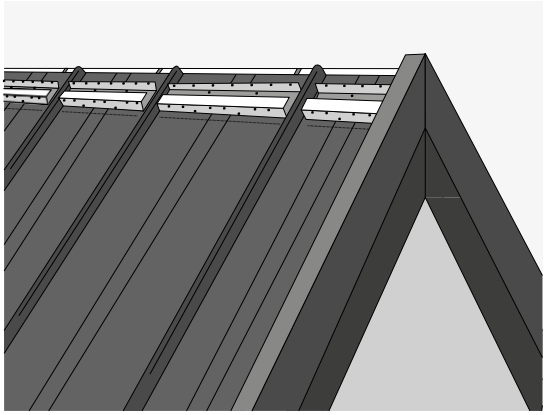


FIG. 38. ROOF RIDGE: RIDGE FLASHINS FOR THE UPRIGHT SEAM PANELS

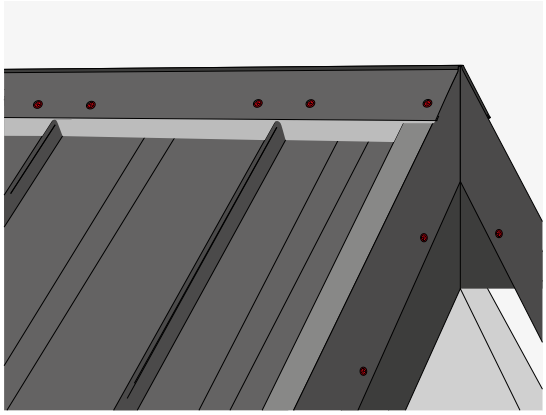


FIG. 39. RIDGE: RIDGE TILE SHOWN INSTALLED

With the every roof plane installation complete, use a soft brush to clean the surface of all metal filings from cutting and drilling. If necessary, represerve minor scratches with touch-up paint.

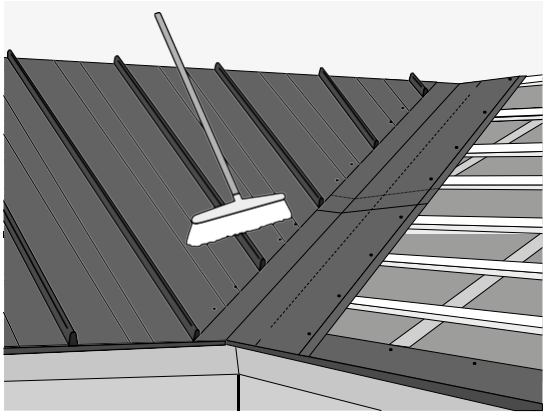
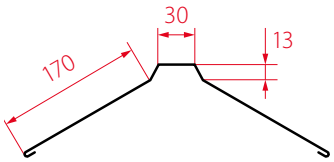


FIG. 40. CLEANING THE ROOF SURFACE

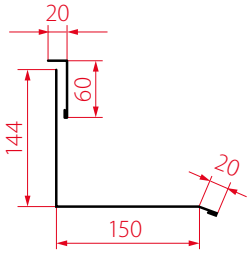
DEDICATED FLASHING

Ridge tile

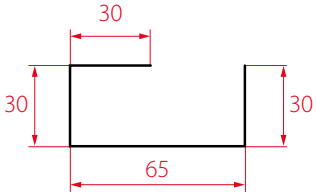


Roof vent

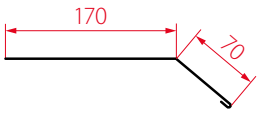
Chimney flashing



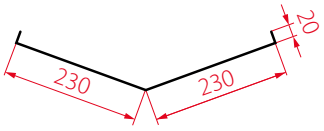
Ridge tile flashing



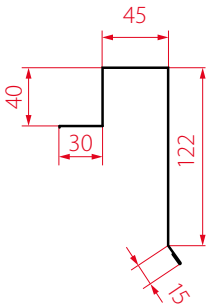
Gutter flashing



Valley gutter



Wind brace



DETAILED SOLUTIONS

FIG. 42. ROOF CROSS-SECTION ACROSS THE EAVES

1. Gutter
2. Gutter hook
3. Gutter gully
4. Down pipe bend
5. Down pipe
6. ELEGANT 2.0 upright seam panel
7. Batten
8. Counter batten
9. Windproofing
10. Rafter

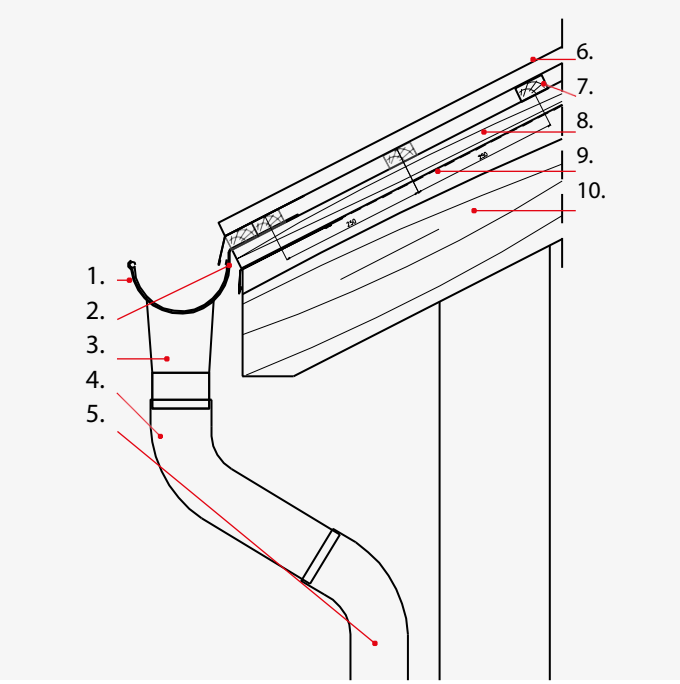


FIG. 42. ROOF CROSS-SECTION ACROSS THE EAVES

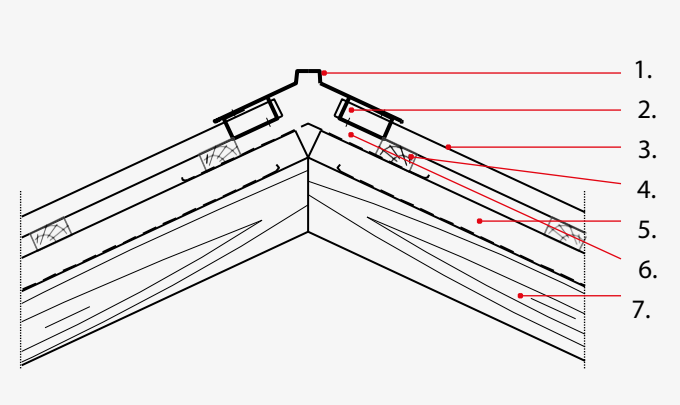


FIG. 43. ROOF CROSS-SECTION ACROSS THE RIDGE

1. Ridge tile
2. Ridge tile flashing
3. ELEGANT 2.0 upright seam panel
4. Battens
5. BALEX ASPIRA roof membrane
6. Counter battens (e.g. 25 × 50)
7. Rafters

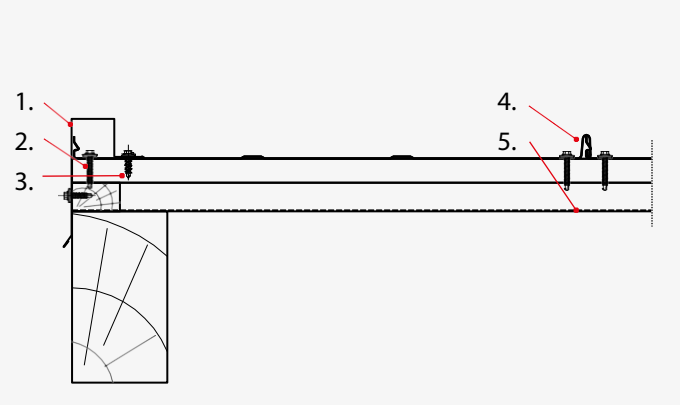


FIG. 44. ROOF GABLE SOLUTION

1. Wind brace
2. 4.6 × 35 screw
3. 4.8 × 35 screw
4. ELEGANT 2.0 upright seam panel with exposed fasteners
5. BALEX ASPIRA roof membrane

FIG. 45. JOINING TWO ADJACENT ROOF PLANES WITH DIFFERENT SLOPES

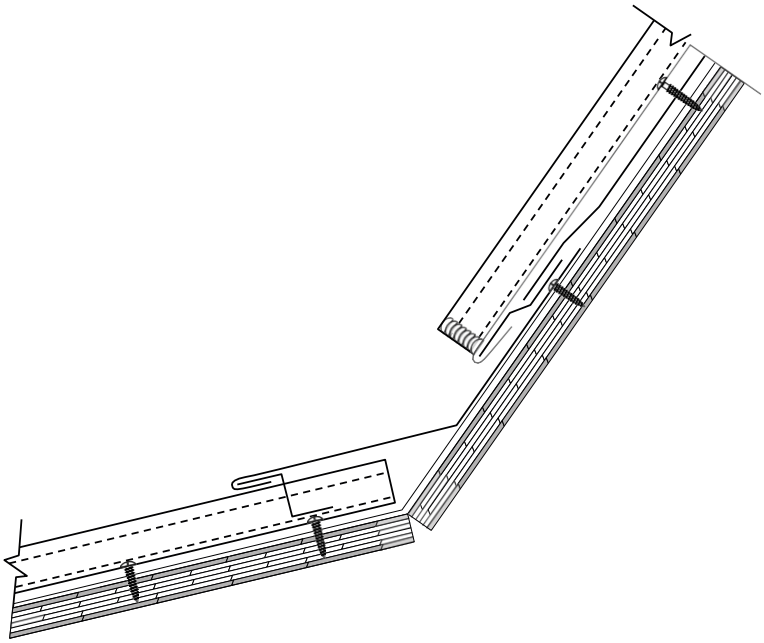
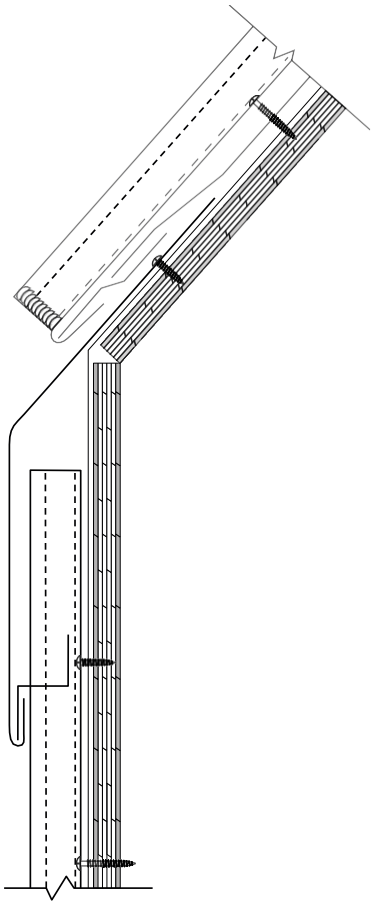


FIG. 46. JOINING THE ROOF PANEL WITH THE FAÇADE PANEL



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