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decades of guaranteed

WECKMAN

quality

**Shaped sheets
Installation
instructions**

The structural solutions presented in these instructions are indicative and actual structures may differ from those described here. Any deviating structural solutions must be approved by the structural engineer and contractor, and they must comply with the regulations of the National Building Code of Finland. If these instructions differ from the original installation instructions delivered with products that Weckman supplies as a subcontractor, the product's original instructions must always be followed.

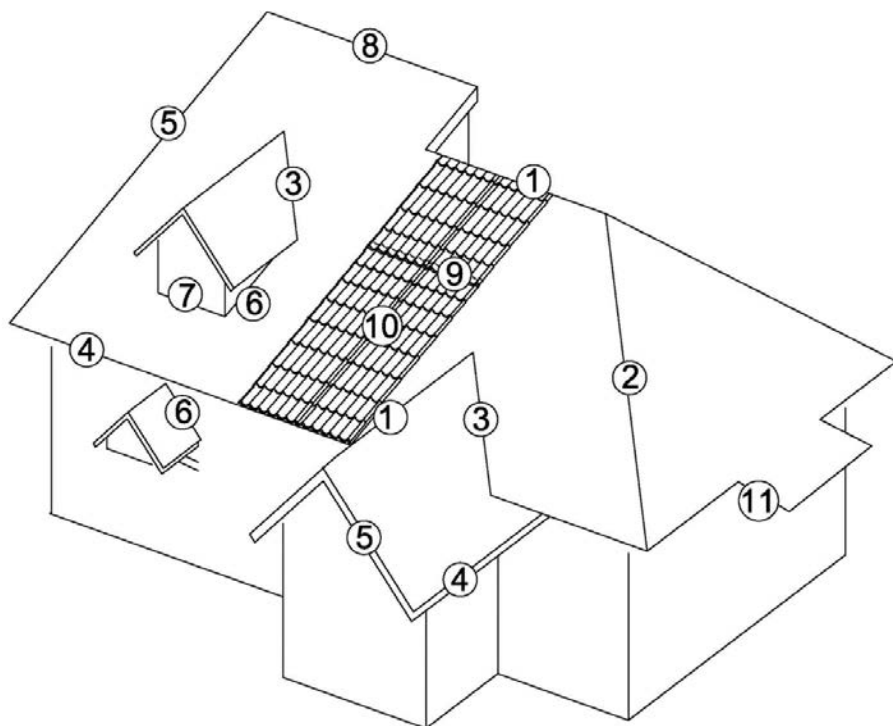
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Further information on installation:

Tel. +358 44 783 7225 and +358 44 783 7224, Mon–Fri from 7:30 am to 4:00 pm

ROOF PARTS



ROOF PART:

1. Ridge/ridge capping
2. Hip/hip capping
3. Mitre/inner capping
4. Bottom eaves
5. Overhang gable
6. Longitudinal roof-to-wall junction
7. Crosswise roof-to-wall junction
8. Upper eaves
9. End overlap
10. Side overlap
11. Overhang gable

REQUIRED ROOF ACCESSORY/FLASHING:

- Ridge capping (formed/smooth) + ridge seal
- Ridge capping (formed/smooth) + hip seal
- Mitre plate + mitre seal
- Eaves flashing + (small seal)
- Gable flashing
- End wall flashing
- End wall flashing + shaped seal
- Gable overhang + ridge seal
- (Sealing tape on a gently sloping roof)
- (Sealing tape on a gently sloping roof)
- Base flashing

1. Handling

1.1. Reception of materials

Check that all the **items specified in the covering letter are included**. **Notify the seller or the factory of any errors or damage** apparent at the time of delivery without delay by **entering the information in the bill of lading**. **Do not use a faulty product**. Notifications regarding the delivery should be given within 8 days. The supplier will not be responsible for any costs incurred from replacing products installed contrary to the instructions provide in this guide.

Please note: Any lifting slings included in the delivery must not be used after the unloading of the delivery by the driver.

1.2. Work safety

Avoid handling the sheets in windy conditions. Sheet edges and corners are sharp and there may be rough and sharp burrs after processing. Wear work gloves and protective clothing. Corrugated sheets are slippery even when dry, wet and icy sheets are extremely slippery. Always use a safety rope and soft-soled shoes when working on the roof. When moving a sheet bundle, make sure the lifting gear is properly secured and its capacity is sufficient for the (see the end of section 1.1). Make sure no one goes under a suspended bundle or sheet. Valid safety regulations must be observed while working.

1.3. Handling

The bundle will be unloaded from the truck onto an even surface provided by the customer. Supports, such as supporting timbers, must be placed under the bundle. The supports must be a maximum of one metre apart (at the transverse bends) so that the bundle will be approximately 20 cm above the ground. Unpack the sheets from the bundle by lifting, **not by pulling**, because otherwise the sharp end of the sheet may damage the coating of the next sheet in the bundle (Figure 1).

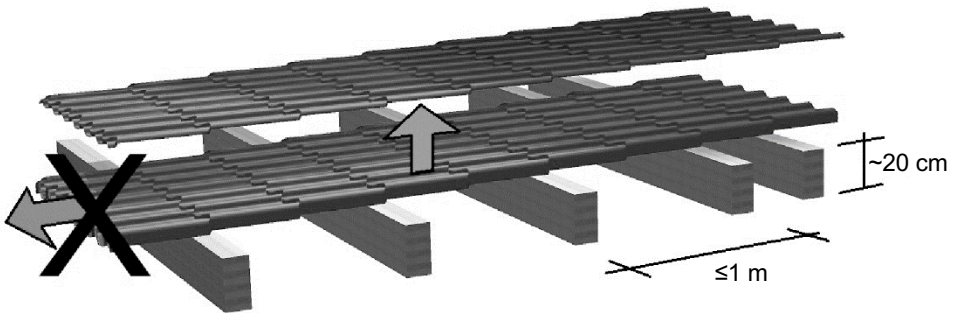


Figure 1. Lifting the shaped sheets from the bundle

Process the sheets properly and according to the instructions to prevent them from being dented or otherwise damaged. **Never lift the shaped sheets from the ends** (Figure 2). If a brick-patterned shaped sheet is bended during lifting, the transverse bend will straighten out, which will cause alignment problems with the side seam (Figure 3). The correct way to lift a shaped sheet is to grab it at the edge on the capillary groove side, at the transverse bend (Figure 4).

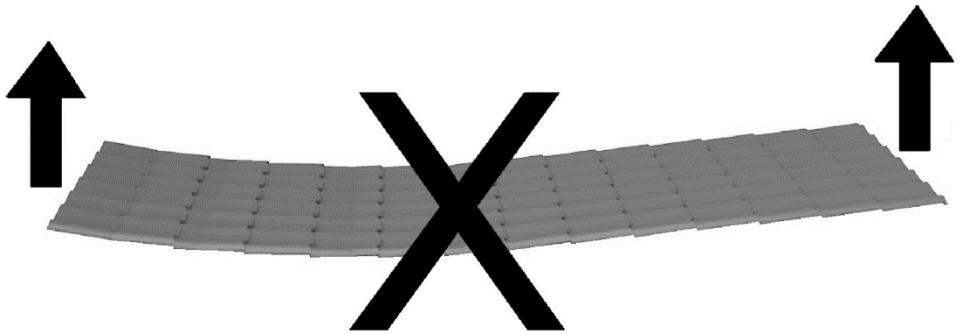


Figure 2. The wrong way of lifting and carrying a shaped sheet

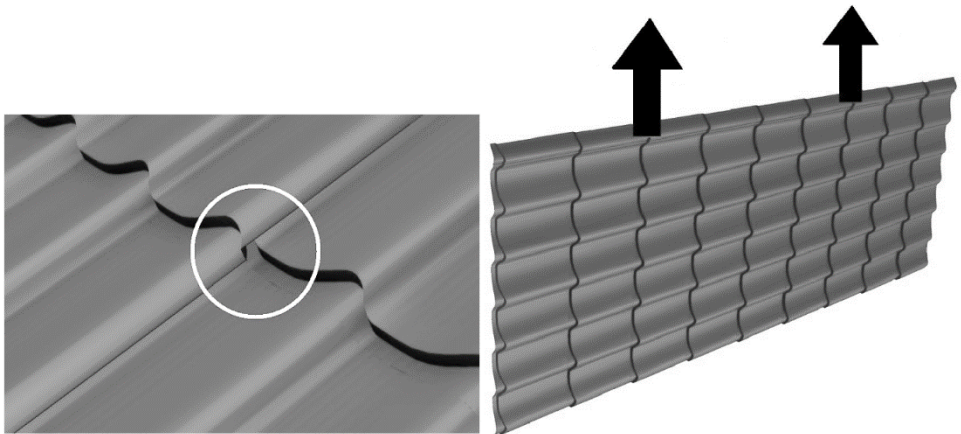


Figure 3. Overlapping a shaped sheet that has been handled in the wrong way.

Figure 4. The correct way of carrying a shaped sheet

Lift the sheets onto the roof along strong ramps or similar structures that run from the eaves to the ground (Figure 5).

If a shaped sheet gets bent during lifting to the roof as illustrated by Fig. 2, there will be problems with the alignment of the brick pattern.

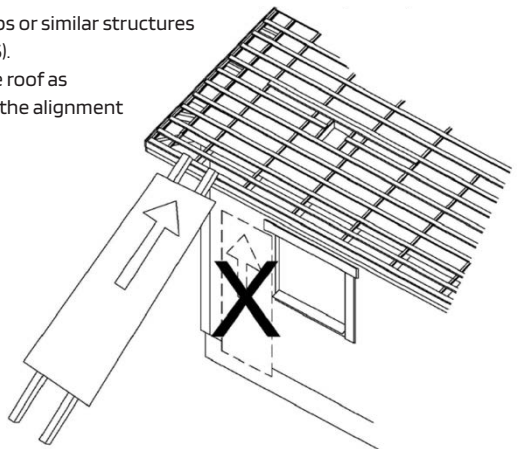


Figure 5. Lifting sheets onto the roof

1.4. Storage

In normal conditions, **coated** sheets can be stored either in their transport package or without packaging for a maximum of two weeks. If storing them for a longer period of time, cover the sheets and bundle them on a sloping surface, allowing any moisture accumulating between them to run off and evaporate. Secure the sheets against damage caused by wind by tying them down or placing an adequate weight on top of the bundle.

1.5. Preparations for installation and processing of sheets

Before installation, check the cross-measure of the pane of the roof (Figure 6) or the desired geometrical shape.

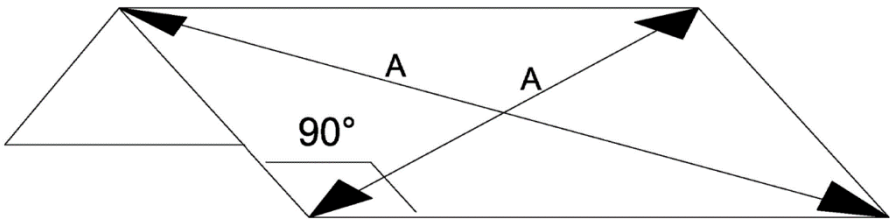


Figure 6. Cross-measure of the pane of the roof

Sheets used for roof cladding can be cut using a cordless circular saw (with a blade suitable for steel sheet), a nibbler, a jigsaw or tin snips. Always use safety goggles, hearing protectors and the necessary protective clothing. **Do not cut or grind the sheets with an angle grinder**, as the heat and hot splashes generated during cutting or grinding will damage the coating. Avoid cutting and any other hot work which might generate hot splashes within ten metres of the sheets. Protect the areas surrounding the processing site carefully as hot chips (e.g. from drilling) may damage the sheet surface. Remove any cutting and drilling chips carefully. Any rusting chips, scale and leftover rivet mandrels remaining on the surface may cause damage to it.

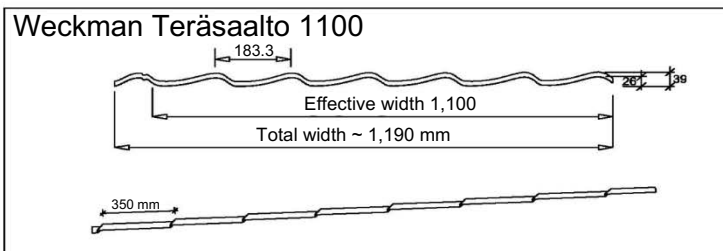
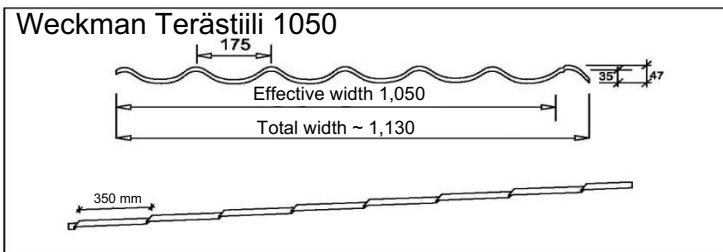
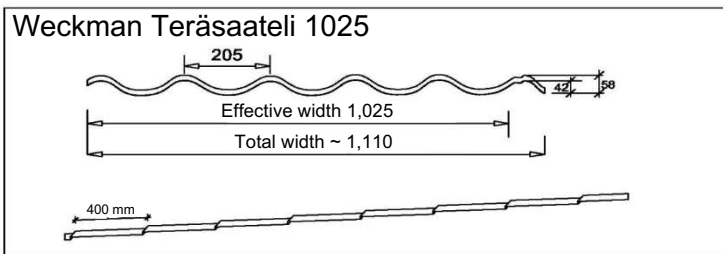
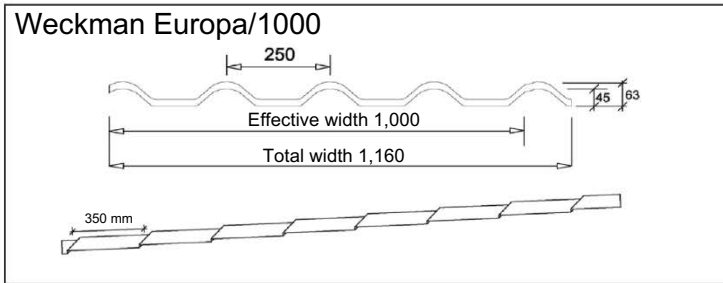
Once the sheets are installed, we recommend treating any cut edges or scratches as well as the edges of eaves with touch-up paint or paint intended for repair painting.

Stains on the sheets can be removed with a mild detergent.

Use scaffolding that is sufficiently high, set up at an appropriate distance from the roof and equipped with railings that comply with regulations.

2. Installing shaped sheets

Dimensions in accordance with SFS EN-508-1



2.1. Dimensioning of sheets

The sheet length is usually equal to the length of the upper frame beam + fascia board(s). The following must be taken into account in the case of shaped sheets (= brick-pattern sheets): If sheets of different lengths will be placed at the pane of the roof (such as the roof of a patio), the length of the eaves overhang C must be a multiple of the length of the brick pattern (Europa Terästiili and Teräsaalto: 350 mm or Teräsaateli: 400 mm), because otherwise the brick patterns will not align (Figure 7).

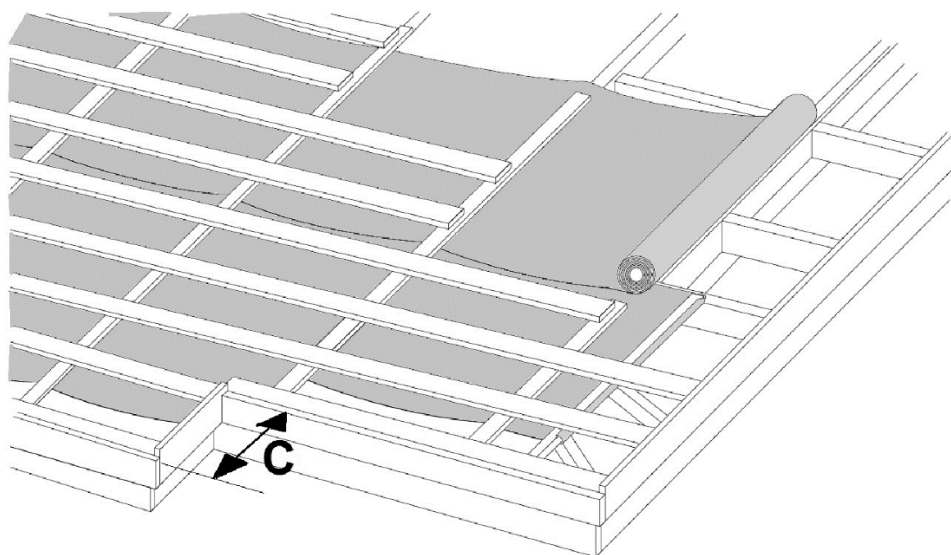


Figure 7. Underlay structure

If the overhang cannot be made as a multiple of the brick pattern, the eaves must be extended or the extra length must be cut from the bottom edge of the sheet on site. The multiplicity of the brick pattern and sheet lengths must also be taken into account in the dimensioning of sheets at the mitre if the valley ends at the pane of the roof.

The recommended maximum lengths of shaped sheets are listed in Table I.

| | Nominal effective width mm | Total width mm | Recommended maximum length mm | Minimum length mm |
|------------------|----------------------------------|-------------------|-------------------------------------|----------------------|
| Teräsaateli 1025 | 1,025 | 1,110 | 7,000 | 530 |
| Terästiili 1050 | 1,050 | 1,130 | 7,000 | 450 |
| Teräsaalto 1100 | 1,100 | 1,190 | 7,000 | 450 |
| Europa 1000 | 1,000 | 1,160 | 7,000 | 450 |

Table I. Dimensions of shaped sheets

Dimensions in accordance with SFS EN-508-1

If the pane of the roof is constructed from two or more sections, the overlap must be 130 mm. There must always be a batten at the overlap point. Any deviating overlap requirements must be indicated when placing an order. In certain lengths of Teräsaateli, there is an extra transverse bend at the ridge end to facilitate installation and prevent the top edge of the sheet from spreading out. This must be taken into account when placing an order for several lengths of Teräsaateli for the same pane.

2.2. Sheet quantity

The required sheet quantity can be calculated by dividing the ridge length with the sheet's effective width and rounding the resulting figure up (if sheets are required for two roof panes, this figure must be multiplied by two). Effective width of the outmost sheet on the pane = the total width. The (nominal) widths of shaped sheets are listed in Table 1. When dimensioning a hip roof, it must be noted that shaped sheets cannot be placed crosswise to the other side of the roof in the same way as corrugated sheets. Our dimensioning service calculates the number of sheets required for a hip roof. Mitre cuts required for hip and valley roofs must be made on site.

2.3. Underlay and ventilation battens

A waterproof underlay must be placed under the roofing sheets to prevent condensing water from entering the structures. Install the underlay so that it runs parallel to the ridge, starting from the bottom eaves. Fix the underlay to the rafters with a stapler gun, for example. The underlay strips must overlap by at least 150 mm. Do not pull the underlay too tight between the rafters but allow it sag by 20...30 mm (Figure 7). We recommend installing the underlay at the ridge in the manner illustrated by Figures 8a and 8b. Terminate the underlay approximately 100 mm before the ridge to allow air to flow from the space below the roof to the space below the ridge. Attach four battens to each other at the ridge (two battens per pane) and install a strip of underlay that is the correct size on top of the four topmost battens. This strip of underlay ensures that any melting water entering the space below the ridge will remain on top of the actual underlay.

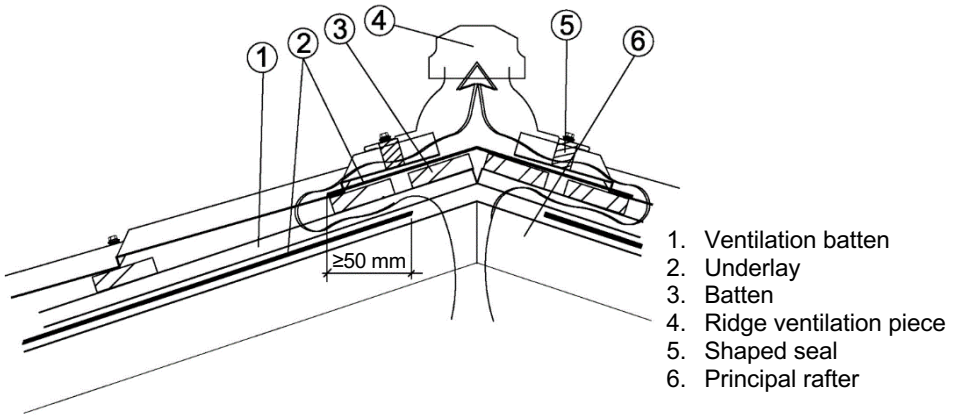


Figure 8a. Ventilated ridge

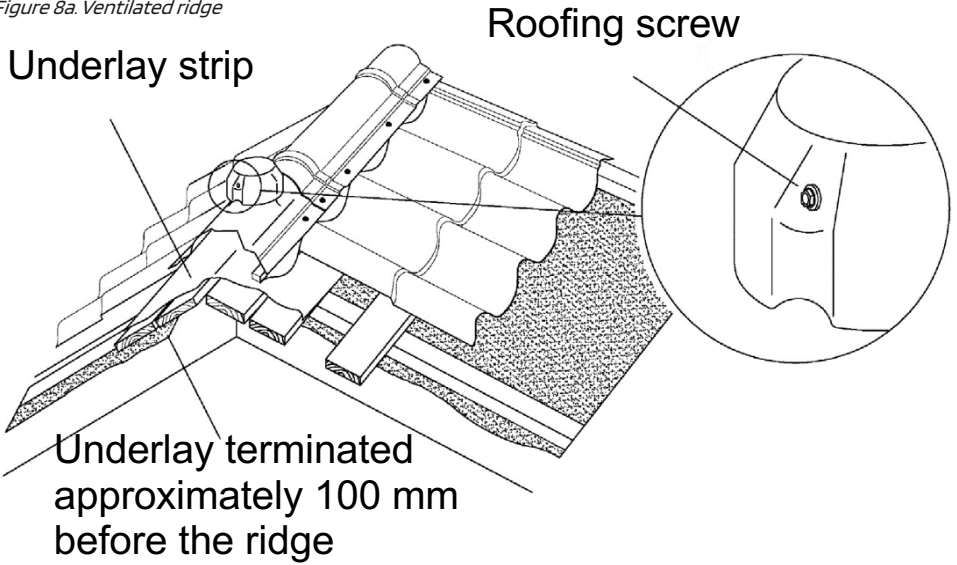


Figure 8b. Ventilated ridge

Install the underlay far enough at the eaves to prevent condensing water from entering the wall structures but so as to allow air to circulate above the underlay (Figure 9). At the overhang gable, the underlay should extend at least 200 mm over the outermost point of the wall (Figure 10).

Fix battens with nails on top of the underlay (25 x 50 mm or 32 x 50 mm; Fig. 7).

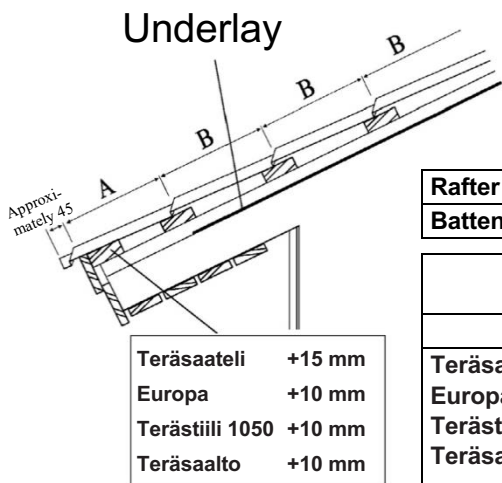


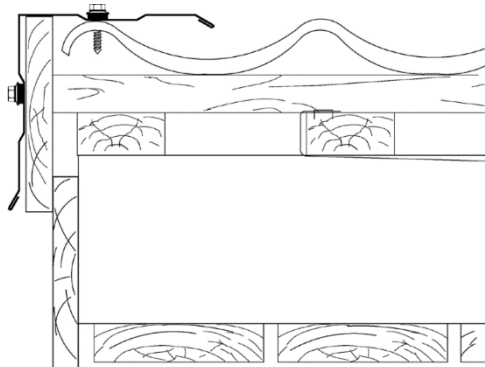
Figure 9. Dimensioning of battens

| | | |
|-----------------------|-----------------|-----------------------|
| Rafter spacing | 900 mm | 900–1,200 mm |
| Batten size | 25 x 100 | 32 x 75–100 mm |

| | Fixing at the bottom | Fixing at the ridge | |
|-------------|----------------------|---------------------|-----|
| | A | A | B |
| Teräsaateli | 350 | 390 | 400 |
| Europa | 300 | 330 | 350 |
| Terästiili | 300 | 330 | 350 |
| Teräsaalto | 300 | 330 | 350 |

Please note: The dimension A is from the outer edge of the fascia board to the middle of the second batten.

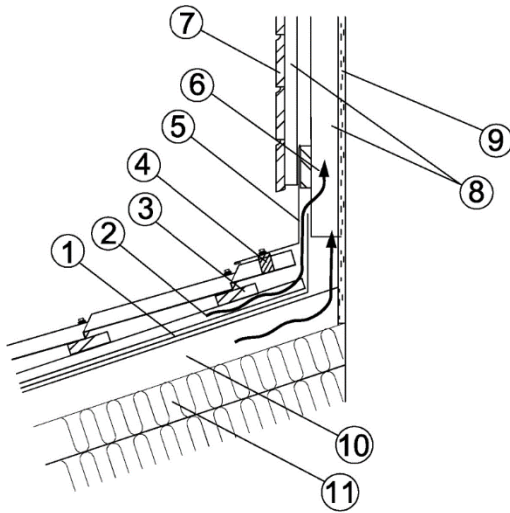
Figure 10. Overhang gable



2.4. Ventilation

2.4.1. Ventilation for battens

An elevation batten must be fixed with nails on top of the underlay at the rafters, and the eaves must be designed so that air will be able to circulate from the eaves to the space between the underlay and the roofing sheets. At the ridge, air is directed out via a ventilation piece or, in the case of a short ridge (max. 10 m), via the ends of the shaped ridge capping. In the case of a hip roof, air is directed out at the ridge via ridge ventilation pieces. A junction between the pane of a pitched roof and a wall can be constructed in the manner illustrated by Fig. 11, for example.

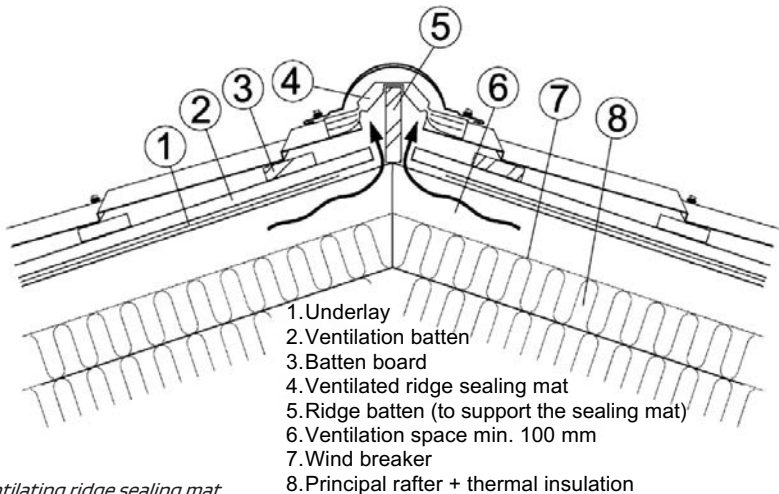


1. Underlay
2. Ventilation batten
3. Batten board
4. Shaped seal
5. End wall flashing
6. Wall studwork
7. Cladding
8. Vertical studwork + ventilation space
9. Wind breaker
10. Elevation piece + ventilation space min. 100 mm
11. Principal rafter + thermal insulation

Figure 11. Roof-to-wall junction

2.4.2. Ventilation underneath the underlay

The eaves structure must be constructed so as to allow air to circulate unimpeded from the eaves to the ventilation space underneath the underlay. From there, air is directed out via ventilation grilles in the end wall. In the case of roofs that have insulation material running along the pane of the roof all the way to the ridge, the underlay must be left open at the ridge (approximately 100 mm). Water must be prevented from entering the structure with either a ventilating ridge sealing mat (Figure 12) or a structure as illustrated in Fig. 8a/8b, in which case air is removed via a ridge ventilation piece. The ventilation of hip roofs and the ventilation of each fire compartment section in a terraced house can also be arranged in this manner. The ventilation space underneath the underlay must be at least 100 mm across the entire roof.



1. Underlay
2. Ventilation batten
3. Batten board
4. Ventilating ridge sealing mat
5. Ridge batten (to support the sealing mat)
6. Ventilation space min. 100 mm
7. Wind breaker
8. Principal rafter + thermal insulation

Figure 12. A ventilating ridge sealing mat

2.5. Battens

When selecting the thickness of the battens, the length of the fasteners and the height of the sheet's bends must be taken into account (if the sheets are fixed at the bends). The batten size is 25 x 100/32 x 75/32 x 100 mm. The bottom batten must be thicker than the other battens. (Terästiili 1050, Teräsaalto and Europa: approx. 10 mm, Teräsaateli and Terästiili 1125: approx. 15 mm). (Figure 9). Use 2.8 x 75 mm galvanised nails hammered in at a slant to fix the battens to the rafter (2 nails per crossing). Place two battens at the ridge close to each other so that they will support the underlay strip.

If necessary, place an additional batten above and below penetrations (such as a roof hatch, sewer ventilation pipe or chimney) and support the ends of the battens with beams (Figures 13 and 14). If the pane of the roof is made from two or more sheets, there must be a batten below the overlap point.

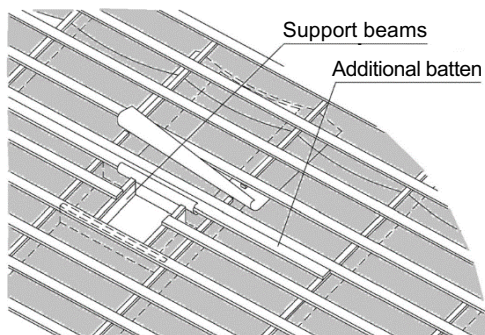


Figure 13. Supporting a penetration

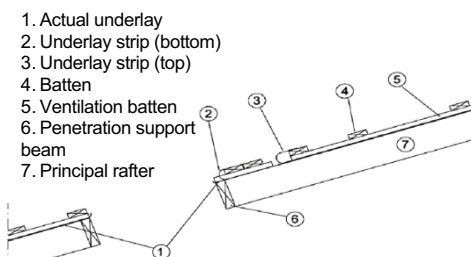


Figure 14. Cross section of a supported penetration

2.6. Installation of sheets

During installation, be careful when walking on the sheets as they are susceptible to cracking under concentrated loads! When walking on shaped sheets, always step on a batten, either at the bottom of a bend or on top of several bends.

The installation can be done from right to left or vice versa (as seen from the ground). When installing Terästiili and Teräsaateli from right to left, the edge of the sheet must be pushed under the previous sheet. This will facilitate installation, as the sheet is supported by the transverse bends of the previous sheet which prevents the sheet from sliding downwards. In the case of Teräsaalto, the easiest installation direction is left to right. Leave the capillary groove **at the bottom** when overlapping the sheets.

Install the sheets according to **the bottom eaves** instead of according to the gable end. Place the first roofing sheet so that its bottom edge extends approximately 45 mm over the fascia board (Figure 15). Fix the roofing sheet at the top edge in the middle of the sheet and at the bottom of the bend with one roofing screw onto the batten as indicated by Fig. 16.

Figure 15. Edge of the sheet overhanging the eaves

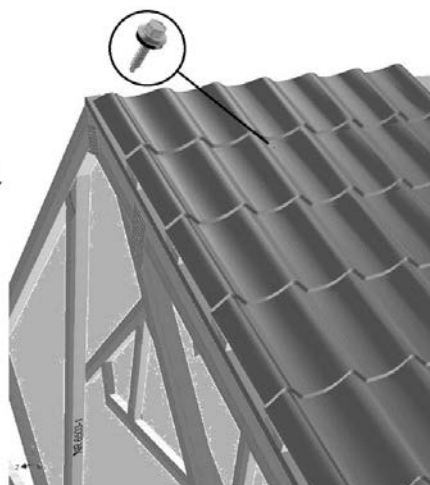
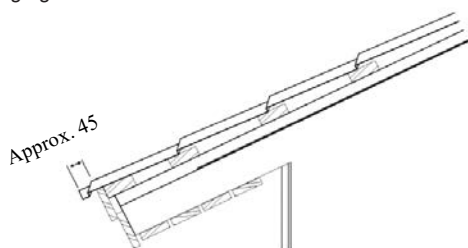


Figure 16. Fixing the first sheet

Fix the second roofing sheet onto the first sheet at the bottom edge of the side seam with a roofing screw. Make sure that the transverse bends of the sheets lie tightly against each other. (The transverse overlap influences the alignment of the bends; see Figures 17a and 17b.)

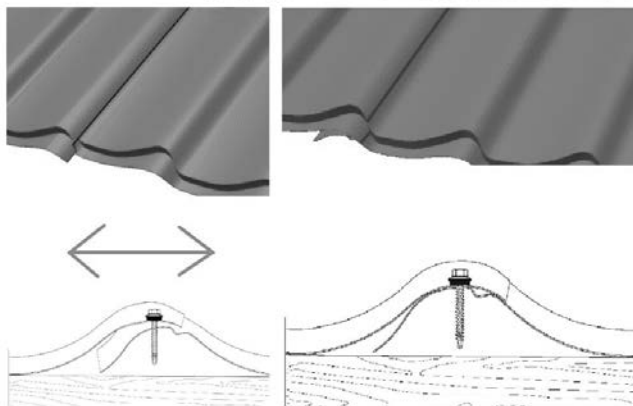


Figure 17a. Incorrectly overlapping sheets

Figure 17b. Correctly overlapping sheets

Fix the sheets onto each other below the transverse pattern on top of the bend, starting at the eaves and moving towards the ridge, with 4.8 x 28 mm roofing screws (Figure 18).

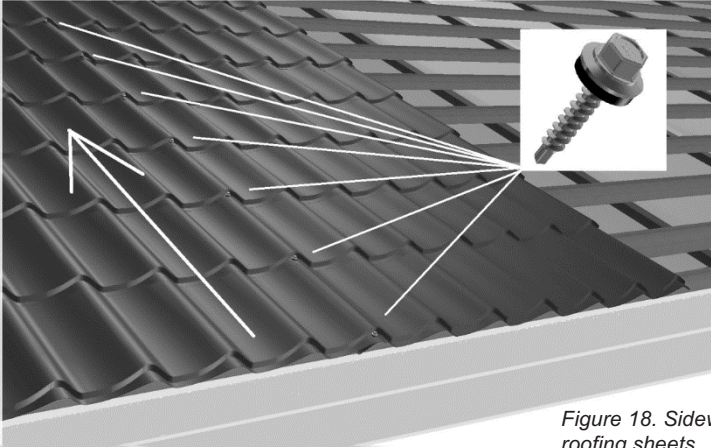


Figure 18. Sideways overlap of roofing sheets

Fix the third sheet in the same manner onto the second one, align the sheets according to the eaves and lock them by fixing the third sheet with a screw at the bottom edge and at the bottom of the bend onto the batten (Figure 19).

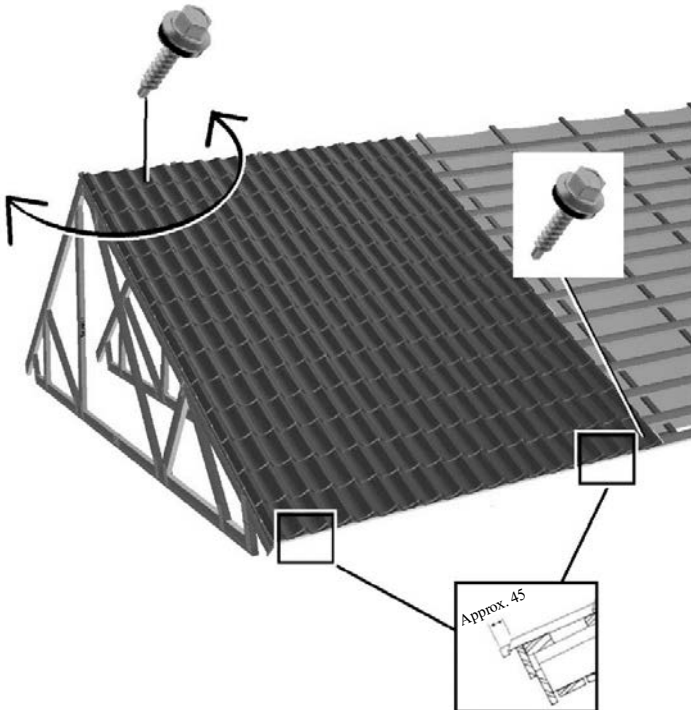


Figure 19. Aligning the sheets and locking them in the correct position

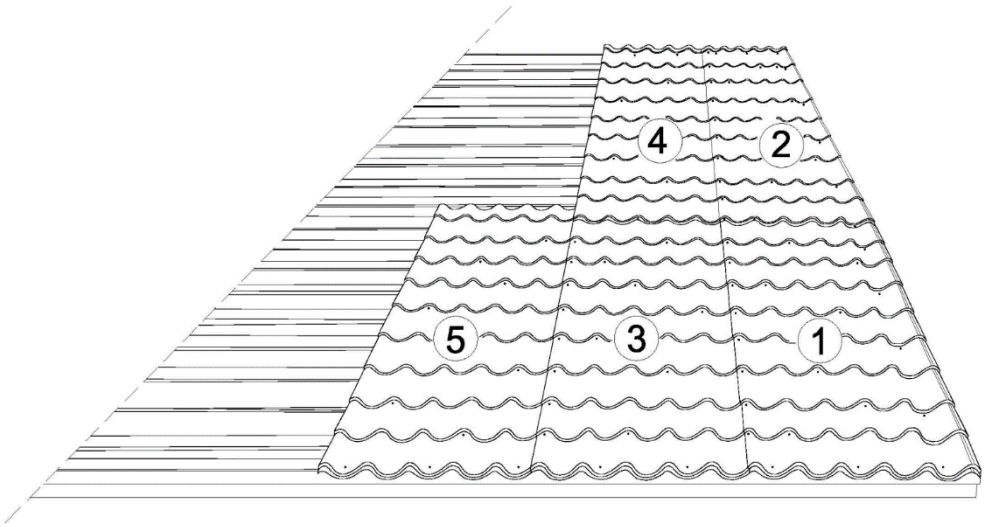


Figure 20. Installation order and fastener division

You can use an alignment wire or a floating rule as an aid in the alignment. Continue the installation by fixing the sheet first onto the previous sheet and then onto the battens. If end overlaps are to be added on the pane of the roof, the installation order in Figure 20 must be used.

If there is an uneven number of sheets on a ridged roof with two panes, one of the sheets must be cut in half. In such a case, start the second pane with the cut sheet. If a Weckman roof ladder is to be added to the roof, install the sheets on the ladder-side pane first. Then fix the ladder with the top fasteners onto the frame structure of the opposite pane and finally install the roofing sheets of the second pane.

2.7. Fixing of sheets

Roofing sheets can be fixed either at the bottom of a bend (screw size 4.8 x 28 mm; Fig. 21a) or at the top of a bend (screw size 4.8 x 50/65 mm; Fig. 21b). Europa sheets must always be fixed at the bottom of the bend with 4.8 x 28 mm roofing screws. At overlap points (Fig. 22), at the eaves, at the ridge and when fixing flashings, the screw size is 4.8 x 28 mm. The screws must be sealed (EPDM rubber) roofing screws. Do not overtighten the screws; the sheet must not become indented. Use a power drill/cordless screwdriver with mechanical depth adjustment.

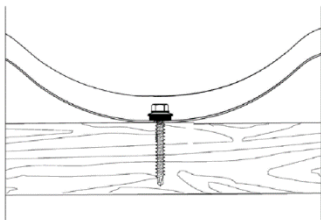


Figure 21a. Fixing at the bottom of a bend

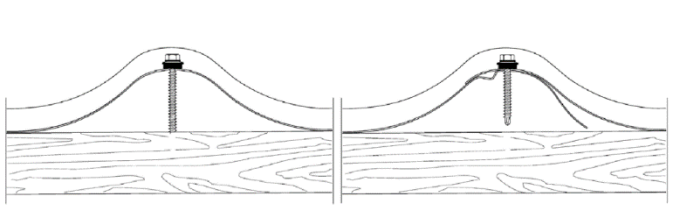


Figure 21b. Fixing at the top of a bend Figure 22. Side overlap

Fastener spacing (Fig. 20):

- At the bottom eaves: At the bottom of every other bend onto the batten
- Side overlaps: Below each transverse bend onto another sheet
- At overhang gable: Below every other transverse bend onto the batten
- End overlaps: Below every other bend, below transverse bend onto another sheet
- At the ridge/upper eaves: At the bottom of every other bend onto the batten
- In the middle of the roof: Even spacing

Approximately 6–7 screws per square metre are required for the entire roof.

2.8. Special considerations

2.8.1.1. Inner mitre

An example of a valley using a V flashing is given in Figure 23. To begin with, install a full-width underlayment strip so that it runs in the same direction as the valley all the way to the principal rafter. Next, install the underlay in the other areas of the roof in the manner specified in Section 2.3. Attach ventilation battens (e.g. 32 x 50 mm) along the entire upper frame beam, starting approx. 50 mm from the bottom of the valley. Install mitre sheathing in the area required by the mitre plate using timber that is the same thickness as the battens, starting 50 mm above the bottom of the valley. Fix the sheathing on top of the ventilation battens in accordance with the sheet profile's batten distribution all the way to the baseboards. Fix the section of the mitre plate that will remain below the roof sheets onto the battens with a couple of screws, starting at the eaves. Position the mitre plates so that they overlap by at least 200 mm and apply elastic sealing paste that is suitable for outdoor use between the plates. Fix the shaped sheets onto the battens and install a mitre seal (Figure 24) in between the shaped sheet and the mitre plate. The free width of the inner mitre (horizontal gap between the sheets) is about 200 mm.

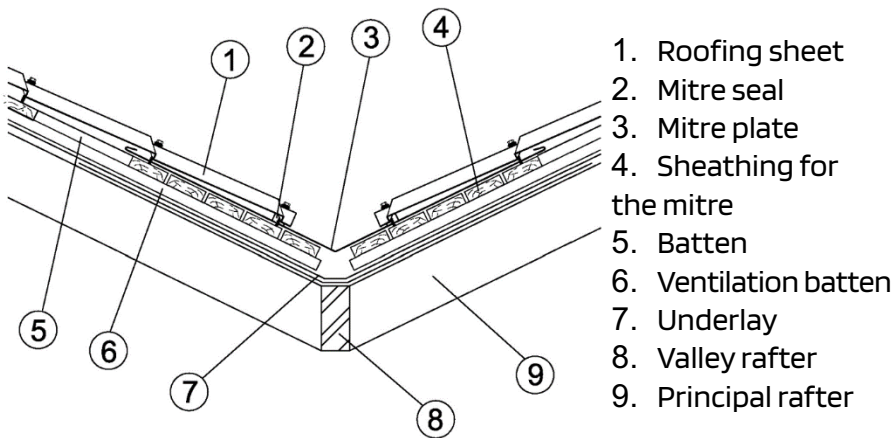


Figure 23. Structure of an inner mitre

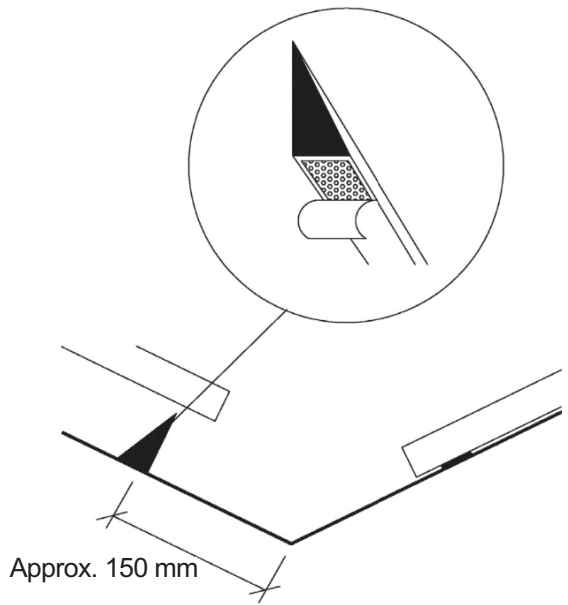


Figure 24. Installing a mitre seal

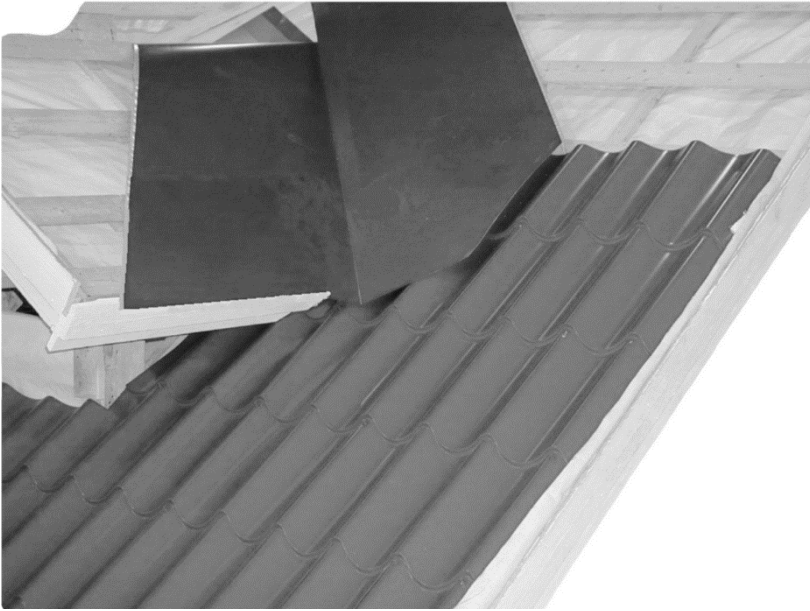
2.8.1.2. Inner mitre ending at the pane of the roof

An example of a valley ending on the pane of the roof is shown in Figures 25 a–c.

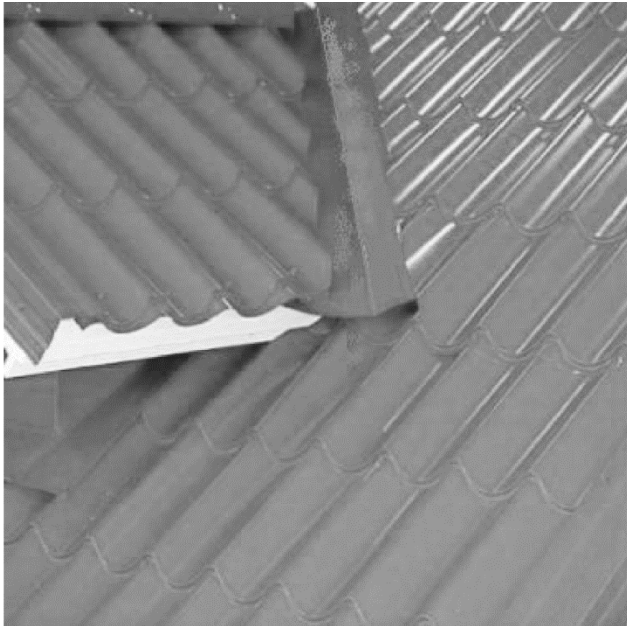
The inner mitre shown in the picture is constructed as described in section 2.8.1.1 but in the following order:



25a. Install a shaped sheet at the eaves so that it extends at least 400 mm above the end point of the mitre along the pane of the roof.



25b. Fix a mitre plate that has been cut to align with the shape of the eaves of the side roof onto the battens with a couple of roofing screws placed in the area that will remain under the roofing sheet.



25c. Install a shaped sheet cut to fit the shape of the valley and the sheets of the side roof at the ridge.

2.8.2. Penetrations

We recommend placing all penetrations as close to the ridge/upper eaves as possible.

Battens coming close to a trap door, ventilation pipe or chimney must be supported with beams and additional battens must be installed as necessary. (Figures 13 and 14). All joints must be sealed with care. The trap door and ventilation pipe must overlap with the roofing sheet by as much as in the case of roofing sheet overlap. Trap doors must be fixed with roofing screws onto the roofing sheet and the joints must be sealed with weather-proof, permanently elastic butyl sealing compound.

In Terästiili 1125 and Europa sheets, trap doors must be of the SK Uniroof type that is installed at the ridge or in the middle of the pane of the roof with a sheet metal collar. Fixing in accordance with the provided installation instructions.

The accessories for penetration elements (roof extractor, sewer ventilation pipe, ventilation system pipe) include an underlay sealing flange and an EPDM rubber sealing unit (detailed installation instructions are included in product packages). Ventilation pipes and ventilation units must be supported by the roof structures, not by the penetration element. Heavy snow loads must be removed from areas above the inlet. If the inlet is located more than a metre from the ridge, a snow breaker should be installed above it.

2.8.3. Snow breaker

Using a tubular snow breaker is recommended at least at locations where people will walk near or under the eaves or there are plants on the ground that might be damaged by falling snow. The tubular snow breaker must be installed on the roof in an area where snow piles up over a load-bearing wall. Fix the bases of the snow breaker (four bases per set) onto the bottom of a roofing sheet bend parallel to a transverse bend (place a sealing strip of 3 x 30 mm in between the base and the roofing sheet) with 8 mm coach screws or (if possible) with a bolt and nut. Push the oval tubes (2) in place and insert 8 x 35 mm bolts through the holes at their ends to prevent the tubes from sliding out sideways (Figure 26).

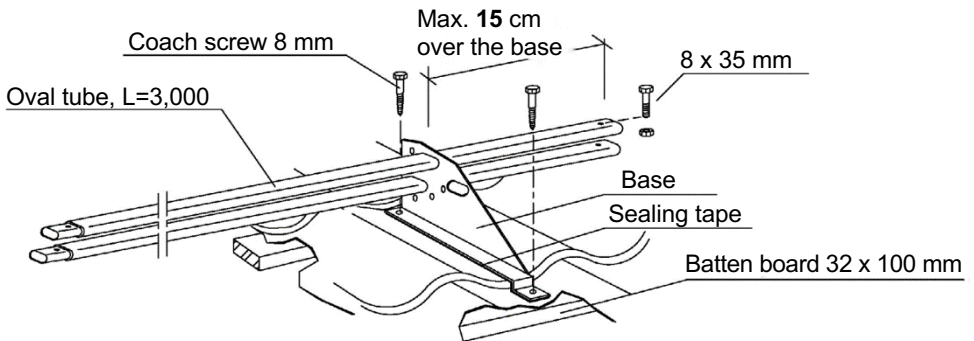


Figure 26. Fixing a snow breaker

Please note: We recommend that snow is cleared off the roof if the accumulated snow load exceeds the roof's rated bearing capacity (further information is available on the website of the Finnish Environmental Administration at www.ymparisto.fi).

If the pane of the roof is long, more than one row of snow breakers may have to be installed over the length of the pane. Table 2 indicates the allowed maximum roof pane length at different snow loads when the roof has a single row of snow breakers.

| Roof slope | Snow load kN/m ² | | | | | |
|------------|-----------------------------|-----|-----|-----|-----|-----|
| | 1 | 1.5 | 2 | 2.5 | 3 | 4 |
| 6° | 60 | 40 | 30 | 24 | 20 | 15 |
| 10° | 36 | 24 | 18 | 15 | 12 | 9.1 |
| 14° | 27 | 18 | 13 | 11 | 8.9 | 6.7 |
| 18° | 19 | 13 | 9.7 | 7.7 | 6.4 | 4.8 |
| 23° | 14 | 9.1 | 6.9 | 5.5 | 4.6 | 3.4 |
| 27° | 11 | 7.4 | 5.5 | 4.4 | 3.7 | 2.8 |
| 33° | 10 | 6.8 | 5.1 | 4.1 | 3.4 | 2.5 |
| 38° | 12 | 7.8 | 5.9 | 4.7 | 3.9 | 2.9 |
| 42° | 14 | 9.3 | 7.0 | 5.6 | 4.7 | 3.5 |
| 45° | 17 | 11 | 8.3 | 6.7 | 5.6 | 4.2 |
| 50° | 25 | 17 | 13 | 10 | 8.5 | 6.3 |
| 55° | 53 | 36 | 27 | 21 | 18 | 13 |

Table 2. Maximum pane length (m) with one row of snow breakers.

2.9. Sealing

The minimum slope of shaped sheets is 1:4 (Figure 27). The manufacturer cannot guarantee the functionality of shaped sheet roofs with a lower slope.

If you wish to install shaped Weckman sheets on a roof with a slope of less than 1:4, we recommend sealing sideways overlaps.

Minimum slopes:

Shaped sheets min. 1:4

Corrugated sheets and Eleganti min. 1:7

Proganti min. 1:8

Machine joint roof min. 1:10

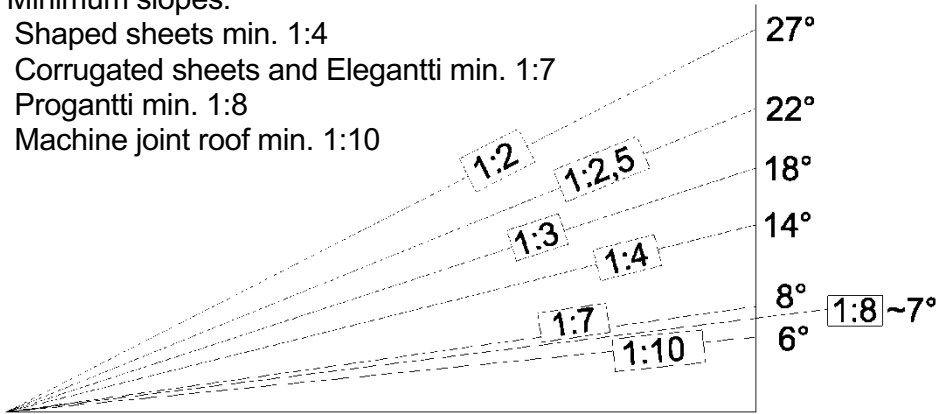


Figure 27. Minimum slopes for various roofing types

A moulding seal is used to seal hip capping. The adhesive seal is attached onto the edges of the ridge capping (Figure 28).

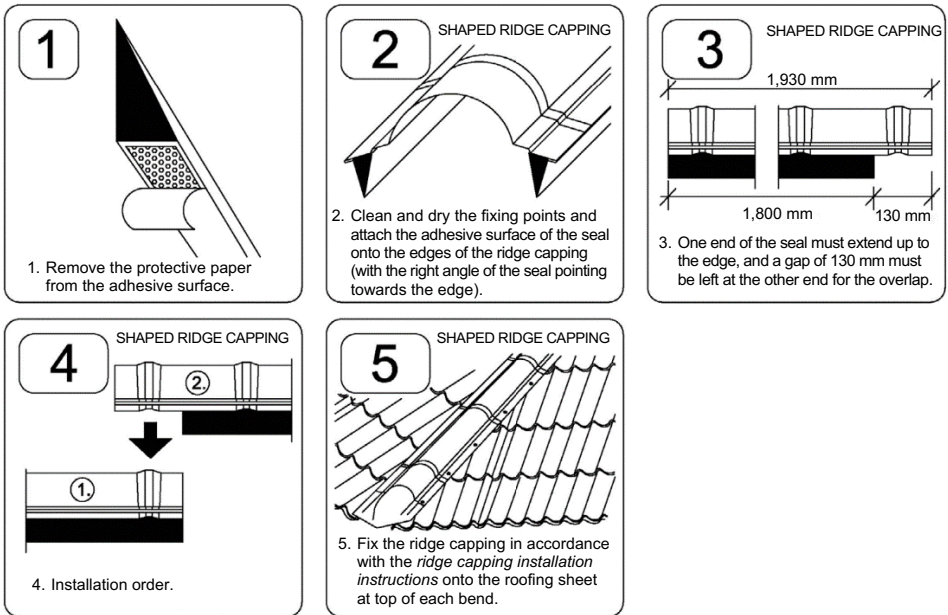


Figure 28. Sealing hip capping

2.10. Gable flashing

Fix gable flashing onto the fascia from the side and onto the roofing sheet at the top (at the highest point of a bend) with roofing screws (Figure 10). Support spacing must be 800–1,000 mm. Flashings must overlap by about 100 mm.

2.11. Lower eaves flashing

At the eaves, in overhang areas, it is possible that water enters the space under the gable flashing and causes the gable board and the eave's sheathing and structures to get wet (Figure 29).

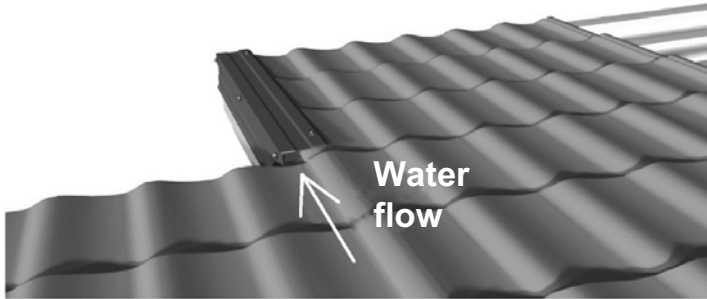


Figure 29. Overhang

In such a case, a lower eaves flashing should be installed under the gable flashing to direct rainwater to the gutter. With this structure, it is essential that the top edge of the fascia remains level with the batten. The lower eaves flashing (Figure 30) is 2 m long and it must be installed at the same level with the fascia. At the eaves, it must extend approx. 20 mm above the fascia. There is a specific lower eaves flashing size for each brick pattern roofing sheet. The flashings must overlap longitudinally by about 100 mm. The top edge of the flashing must be cut to size and its turned edge must be cut off as necessary so that the flat part of the flashing extends about 200 mm under the topmost roofing sheet. Fixing to every other batten with roofing screws with sealing (Figure 31).

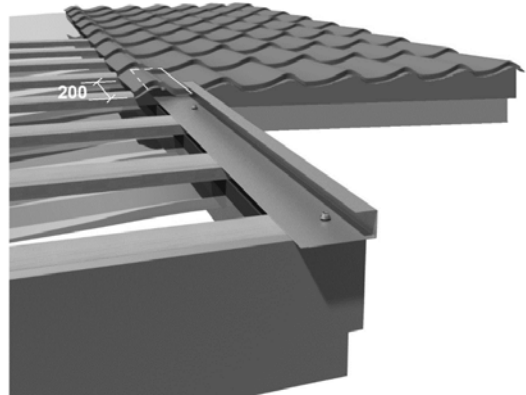


Figure 31. Installing the lower eaves flashing

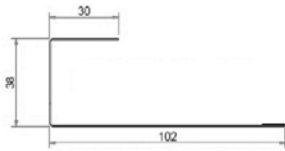


Figure 30. Dimensions of the lower eaves flashing (Teräsaalto 1100)

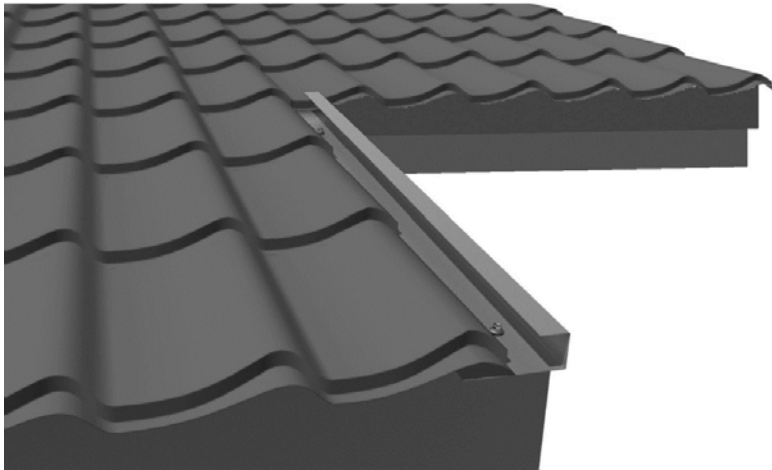


Figure 32. Eaves structure before the installation of gable flashing

The gable flashing must be installed tightly against the lower eaves flashing and fixed in place through the lower eaves flashing with screws at approximately 500 mm intervals and onto the roofing sheet at approximately 800 mm intervals (Figure 35).

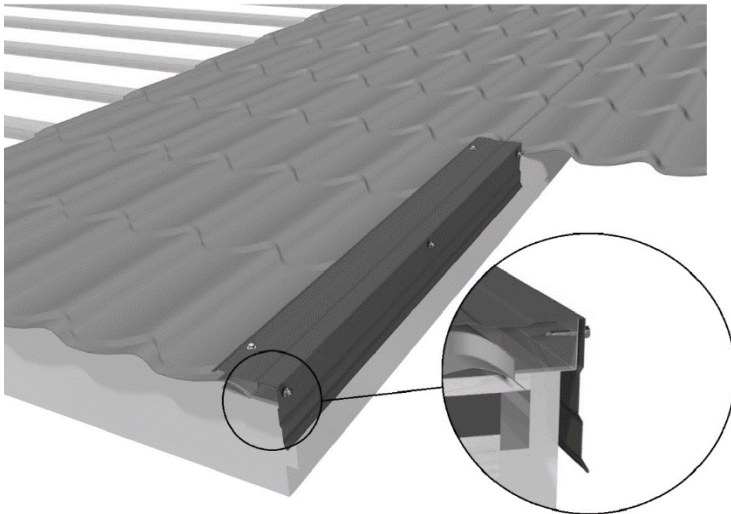


Figure 33. Installing the gable flashing on top of the lower eaves flashing

2.12. Ridge capping

Fix two to five pieces of ridge capping with 4.8 x 28 mm roofing screws onto each other at the bottom edge and align them with the ridge. Shaped ridge capping must overlap by 130 mm (with reinforcements aligned) and smooth ridge capping must overlap by at least 100 mm. Place a ridge seal in between the ridge capping and the roofing sheet (Figure 8b) and fix the ridge capping with roofing screws through the seal onto the roofing sheets at the top of each bend. If the ridge of a side roof "collides" with the pane of the roof, cut the end of the ridge capping according to the pane and install it as far below the main pane's roofing sheets as possible.

You can also use a ridge sealing mat with shaped ridge capping. Before installing the sealing mat, fix a longitudinal ridge board on top of the rafters with nails or screws. Make sure that its top edge remains above the roofing sheets (the ridge board is only installed to keep the middle part of the sealing mat elevated: the ridge capping will not be fixed onto it). Roll the ridge sealing mat on top of the ridge board so that the middle part of the mat is supported by the board.

Then attach the middle of the ridge sealing mat onto the ridge board with a stapler gun, for example. Clean and dry the top ends of the roofing sheets. Remove the protective paper from the adhesive surfaces and fix the mat in place by pressing the adhesive surfaces firmly onto the roofing sheets in accordance with the shape of the sheets (Figure 12). End, Y, T and hip end pieces are available for shaped ridge capping. The bottom of the pieces must be attached onto the ridge capping with roofing screws.

2.13. End wall flashing

At a crosswise wall-roof junction, bend the end wall flashing so that its angle corresponds with the slope of the roof and fix it with roofing screws to the sheets at the middle of each roofing sheet. During installation, place a shaped seal in between the end wall flashing and the roofing sheet. Leave the top edge under the wall coating (in the case of a stone wall, place the top edge in a groove cut into the wall and seal it with sealing compound). Ensure ventilation of the roof and wall structures (Figure 11). At lengthwise wall-roof junctions, fix the end wall flashing onto the roofing sheet at the top of every other transverse bend. The flashings must overlap by at least 100 mm and be sealed with sealing compound.

2.14. Eaves flashing

You can use an eaves flashing at the bottom eaves to prevent the fascia from getting wet. Fix the overhang onto the lowermost batten with flat-headed galvanised nails before installing the roofing sheets. Overhangs must overlap by approximately 20 mm. You can use a shaped seal in between the eaves flashing and the roofing sheet to prevent damage caused by birds, for example (see also Section 2.4).

2.15. Edge trim

An edge trim is used at the bends of a gambrel roof's panes (Figure 34) and at points where the slope of the roof changes (becomes less steep; Figure 35). Start by installing the sheets of the lower slope. Fix the edge trim and install a ridge seal in between the trim and the roofing sheet. Then install roofing sheets on the top slope as usual. You can use a seal in between the top roofing sheet and the trim if you expect billowing snow to be a problem.

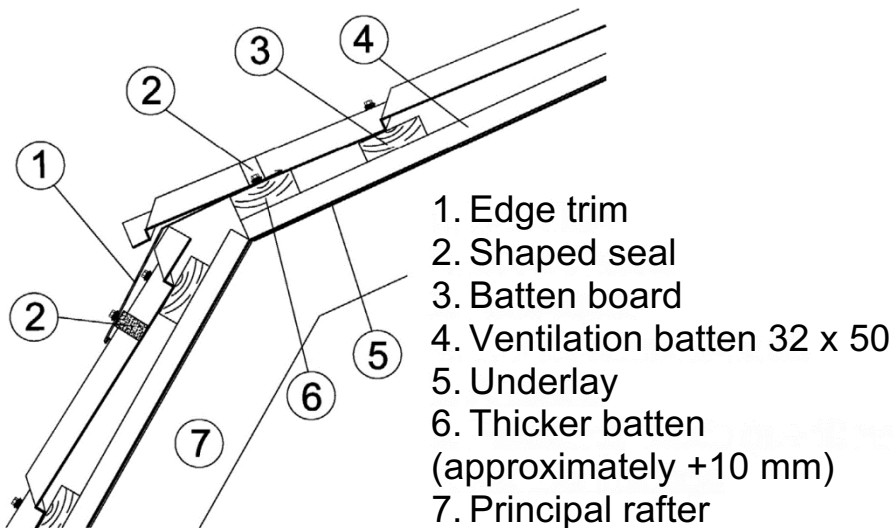


Figure 34. Gambrel roof edge

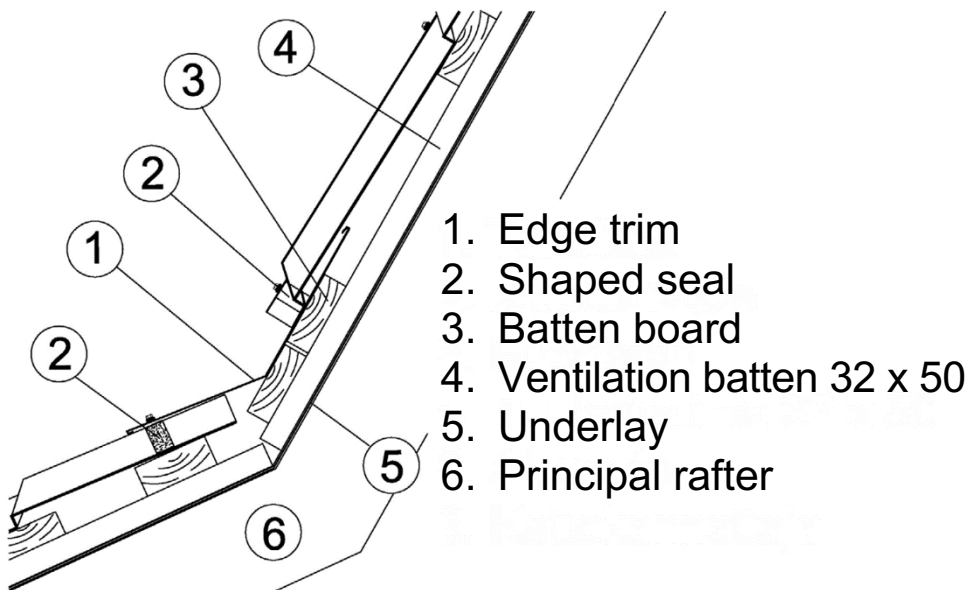
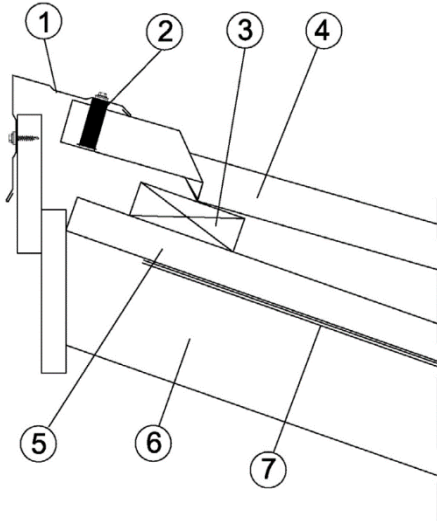


Figure 35. Roof slope (becoming less steep)

2.16. Upper eaves flashing

You can use a standard gable flashing at the top edge of single pitch roofs. It must be bent to suit the slope of the roof. Place profile seals at the top edge of the roofing sheet and fix the flashing onto the roofing sheet at the top of a bend and onto the fascia every metre or so with sealed roofing screws. The flashings must overlap by about 100 mm. (Figure 36).



1. Upper eaves flashing (gable flashing)
2. Ridge seal
3. Batten board
4. Roofing sheet
5. Ventilation batten
6. Principal rafter
7. Underlay

Figure 36. Upper eaves

ANNUAL INSPECTION OF STEEL ROOFING

CHECK

1. Condition of the paint, chalking, any colour alterations or cracking, particularly at overlaps
2. Cleanliness of gutters. Any blockages will increase corrosion and may lead to water entering the structures
3. Cleanliness of roofing sheets. Tree leaves and needles piling up on the roof increase corrosion because they keep the roof permanently damp.
4. Any damage or indentations in the paint coat
5. Any loose fasteners or their parts, such as rivet mandrels or drilling chips have been left on the roof, as they may cause corrosion
6. Any faulty or erroneously attached fasteners left on the roof as they may cause leaks.
7. Any corrosion on cut sheet edges.

ACTION

Assess the situation and decide whether washing, cleaning, treating of the corroded edge or repainting is required.

Remove any leaves and needles from the gutters as they absorb water and possibly corrosive substances.

Clean the roofing sheets with water or a soft brush from the ridge towards the eaves. You may also use a mild detergent.

Decide whether repair painting, repainting or replacing the sheets is required, depending on the nature and extent of the damage.

Remove any metal objects and chips and paint over any scratches.

Replace any faulty fasteners. If the thread has become damaged or the screw cannot be tightened properly, replace the fastener with a thicker one.

Remove any loose paint and rust, treat the corroded area with primer and repaint it.

Table 3. Annual steel roof inspection

3. Maintenance of coated sheets

Inspect the coating annually, preferably in the spring (Table 3). Remove any debris on the roof, and when necessary wash the roof with a mildly alkaline detergent. If the coating is damaged or peeling, remove all the flaky or loose coating. In the area requiring repair, remove any rust, dirt and other impurities by brushing the surface lightly with a steel brush or by scraping. Use paints developed by paint factories in collaboration with steel manufacturers to repaint the damaged areas. Leading paint suppliers can provide additional information on such paints.

4. Basic instructions for installing Weckman roofing on an old roof:

The following matters must be taken into account in renovation projects:

If the old roof has suffered from major ventilation problems or moisture problems, it should be removed and new roofing sheets and sheathing should be installed. (For example, instructions for shaped sheets can be found starting from section 2.3). In addition, the municipal building inspection authorities should be contacted to find out whether a permit is required for changing the roof structure (i.e. changing roofing colour or material). If any old asbestos material is removed, the work must be carried out by a professional.

Weckman recommends that roofing sheets are always installed by one of Weckman's contractors, whose contact details are available on our website at <http://www.weckmansteel.fi>.

The old roofing sheets can be left underneath the new ones when:

- Sufficient ventilation is arranged at both the eaves and the ridge. The ridge of the old roofing must often be opened up and a new eaves structure constructed so that ventilation spaces of 20 mm are left throughout the eaves. Ventilation must also be arranged for chimneys and other inlets. When converting a flat roof into a pitched roof, the old bitumen roofing must be removed and new roofing sheets installed in accordance with the instructions (starting from section 2.1). In addition, all wooden structures under the old roofing must be inspected. If they are in a poor condition, it is safer to remove the old roofing material, including the old battens, and install a new roofing, studs and battens.

Old profiled sheet roof

1. Leave the old profiled sheets in place
2. Install upright studs that are the same height as the profiles (min. 32 mm) with nails over the rafters
3. Install new battens with the spacing required by the roofing sheets
4. Fix the new sheets to the battens
5. Install seals and flashings

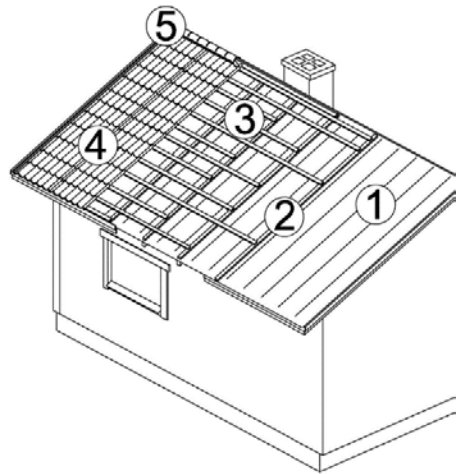


Figure 37. Renovating an old metal profile roof.

Old angle fillet roof

1. Leave the old angle fillet roofing in place
2. Install upright studs that are at least the same height as the angle fillet over the rafters with nails
3. Install new battens with the spacing required by the roofing sheets
4. Fix the new sheets to the battens
5. Install seals and flashings

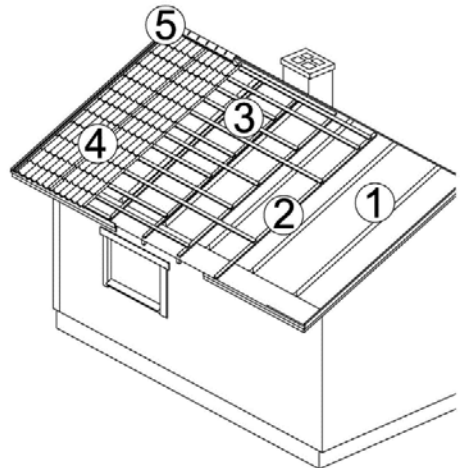


Figure 38. Renovating an old angle fillet roof.

Old smooth felt roof

1. Leave the old felt roofing in place
2. Install upright studs (min. 32 x 50 mm) over the rafters with nails
3. Install new battens with the spacing required by the roofing sheets
4. Fix the new sheets to the battens
5. Install seals and flashings

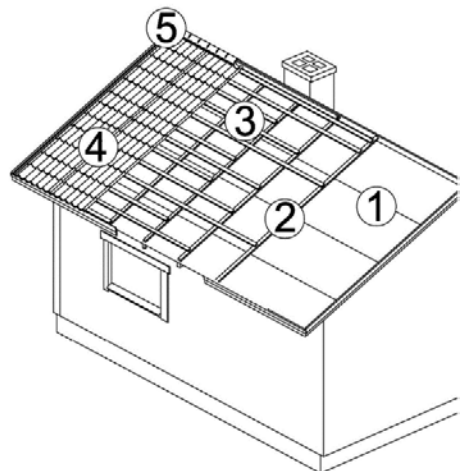


Figure 39. Renovating an old smooth felt roof.

Old asbestos tile roof

1. After removing the old roofing, including the battens, install an underlay if the roof does not already include one
2. Install upright studs (min. 32 x 50 mm) over the rafters with nails
3. Install new battens with the spacing required by the roofing sheets
4. Fix the new sheets to the battens
5. Install seals and flashings

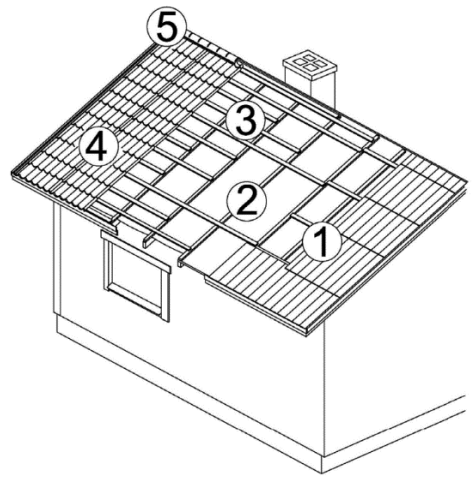


Figure 40. Renovating an old asbestos tile roof.

Old tile roof

1. After removing the old roofing, including the battens, install an underlay if the roof does not already include one
2. Install upright studs (min. 32 x 50 mm) over the rafters with nails
3. Install new battens with the spacing required by the roofing sheets
4. Fix the new sheets to the battens
5. Install seals and flashings

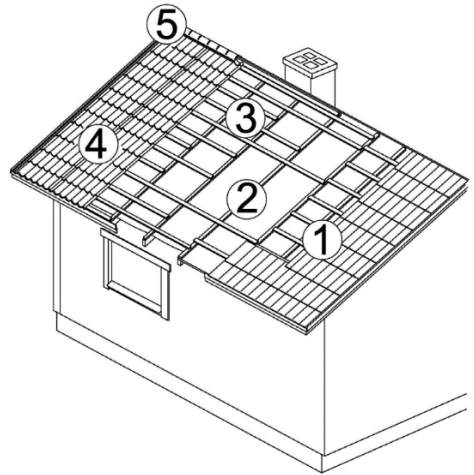


Figure 41. Renovating an old tile roof.

Old jointed metal roof

1. Leave the old roofing in place
2. Install upright studs the same height as the joints (min. 32 mm) over the rafters with nails
3. Install new battens with the spacing required by
4. Fix the new sheets to the battens
5. Install seals and flashings

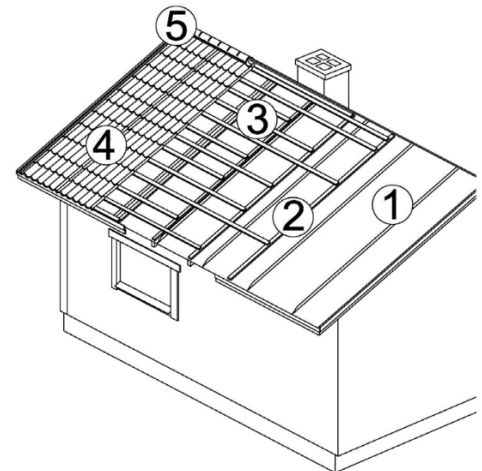


Figure 42. Renovating an old jointed metal roof.

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