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quality

Corrugated roof 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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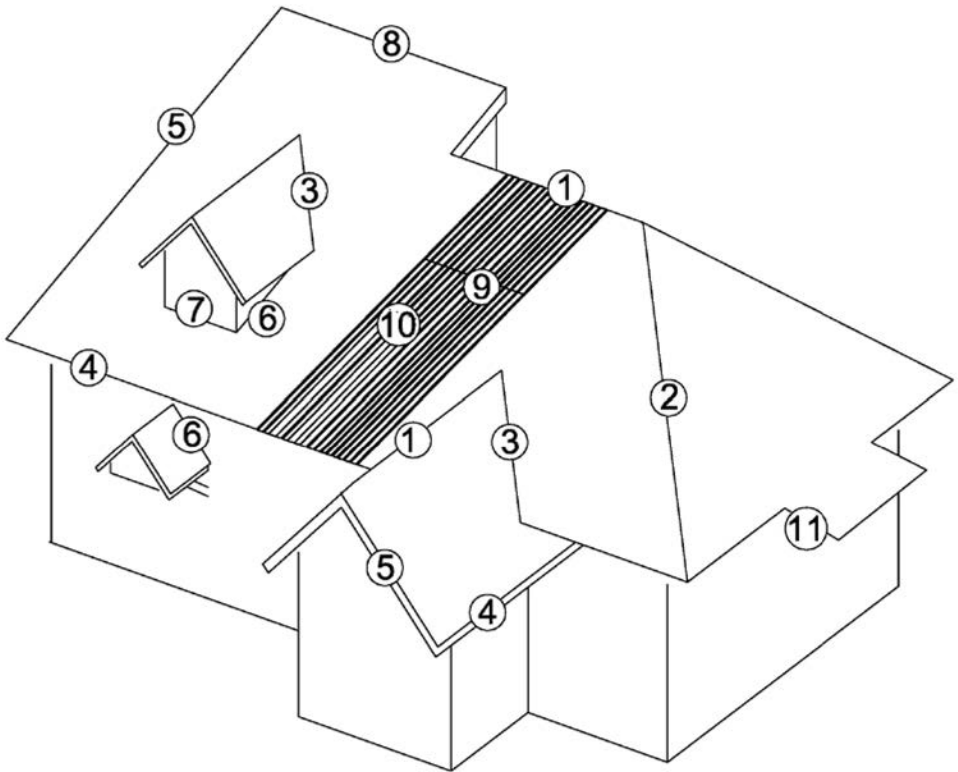
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Further information on installation:

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

ROOF PARTS



ROOF PART:

1. Ridge/ridge capping
2. Hip/outer bend
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 smooth + ridge seal
Ridge capping 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
(Sealing tape on a gently sloping roof)
Lower eaves 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 bundles will be unloaded from the truck onto an even surface provided by the customer. They must be stored approximately 20 cm off the ground. Transverse supports must be placed at a maximum of one meter intervals. Transverse supports must be placed at a maximum of one meter apart (Figure 1).

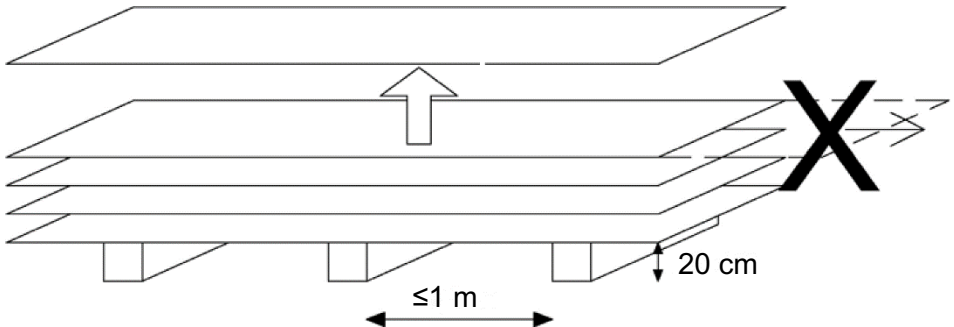


Figure 1. Handling of sheets

Unpack the sheets from the bundles by lifting, **not by pulling**, because otherwise the sharp end of the sheet may damage the coating of the next sheet in the bundle. As thin metal sheets are highly susceptible to denting and bending, always handle them with care. Stains on the sheets can be removed with a mild detergent.

1.4. Storage

To avoid white rust, do not store **galvanised** sheets in tight bundles. The supplier will not be responsible for any damage caused by incorrect storage. Cover the sheets and bundle them on a sloping surface, allowing any moisture accumulating between them to run off and evaporate.

In normal conditions, **coated** sheets can be stored either in their transport package or without packaging for a maximum of two weeks. If stored for a longer period of time, store as galvanised sheets. Secure the sheets against damage caused by wind by tying them down or placing an adequate weight on top of the bundle.

Protect corrugated sheets with an anti-condensation coating with care from moisture, dirt and mechanical damage. Store them indoors in dry conditions. If this is not possible and the sheets must be temporarily stored outside, ensure sufficient protection and ventilation to prevent moisture from reaching the materials.

1.5. Preparations for installation and processing of sheets

Before installation, check the cross-measure of the pane of the roof (Figure 2) or the desired geometrical shape. Ensure that the eaves edge is straight and that the sheet lies on an even surface, and straighten out any indentations.

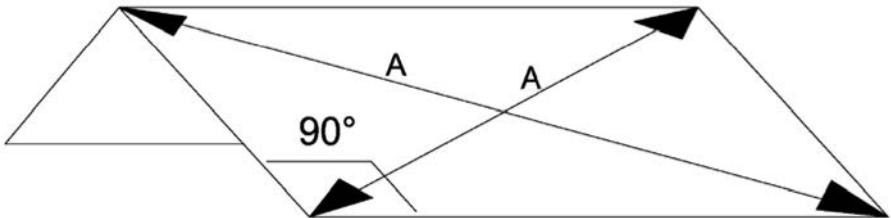


Figure 2. Cross-measure of the pane of the roof

Before installing the roofing sheets, install any additional battens and support beams required for roof security products (roof ladder, catwalk, snow breaker) or penetrations (e.g. roof hatch). Lift the sheets onto the roof along strong ramps or similar structures that run from the eaves to the ground (Figure 3).

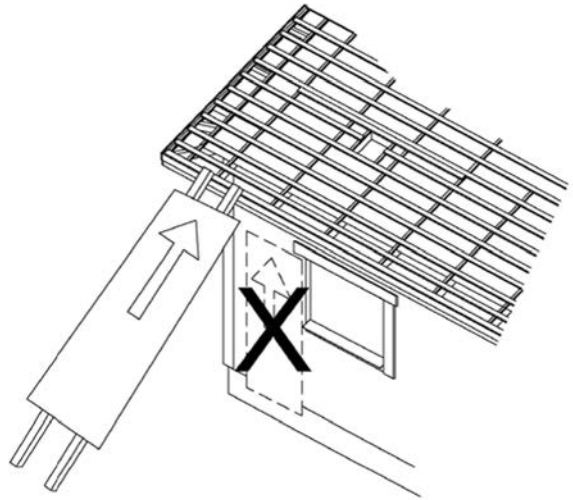


Figure 3. Lifting sheets onto the roof

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.

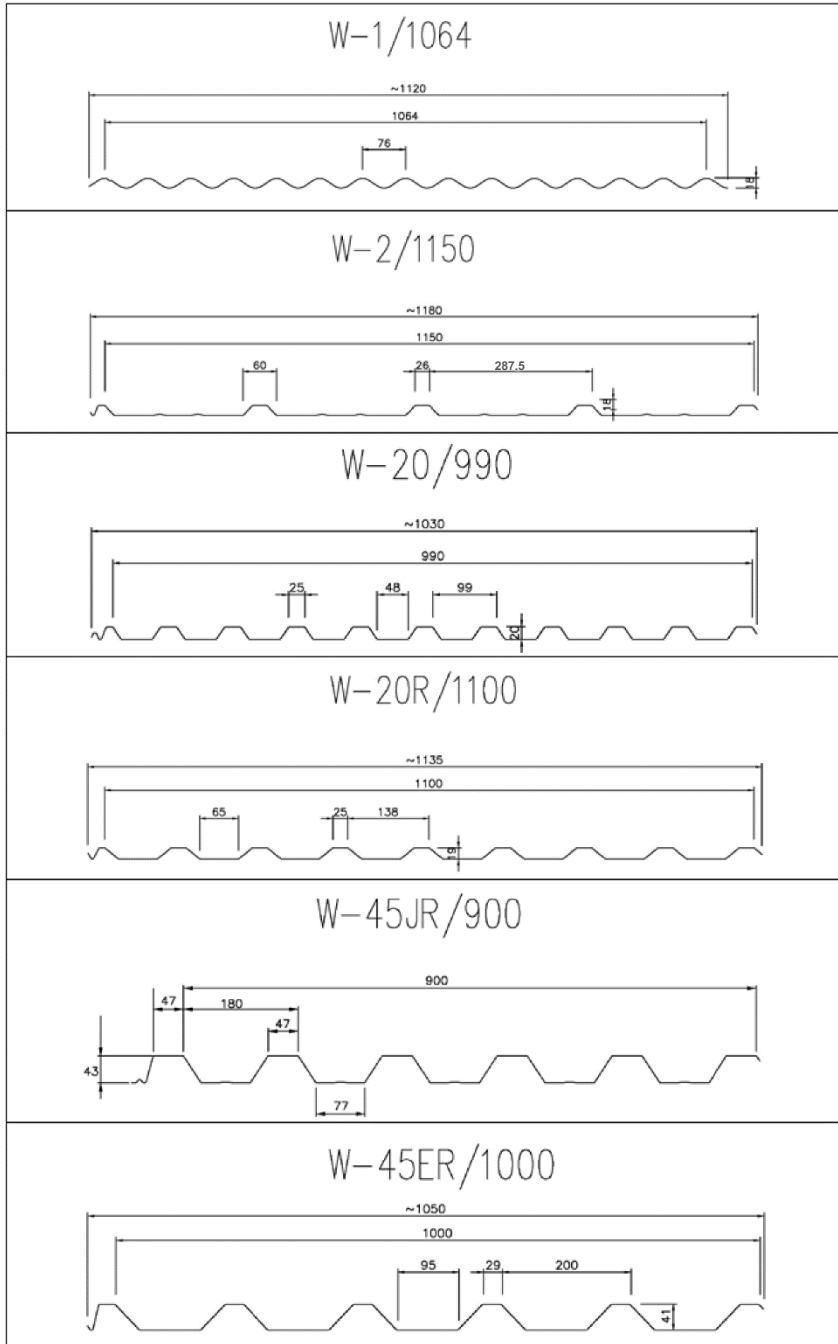
Once the sheets are installed, we recommend treating any cut edges or scratches as well as the edges of eaves with touch-up paint or paint intended for repair painting.

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. Installation of corrugated sheets (W-1, W-2, W-20 and W-45)

Dimensions according to the tolerances of 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). Sheet lengths must be taken into account in the dimensioning of sheets at the mitre if the valley ends at the pane of the roof (Figure 16). The recommended maximum lengths of corrugated sheets are listed in Table 1. If the pane of the roof is constructed from two or more sections, the end overlap must be a minimum of 200 mm. A sealing strip must be used in the end overlap. There must always be a batten at the overlap point. Any deviating overlap requirements must be indicated when placing an order.

	Nominal effective width mm	Total width mm	Recommended maximum length mm	Minimum length mm
W-1/1064	1,064	1,120	8,000	400
W-2/1150	1,150	1,180	6,000	400
W-20R/1100	1,100	1,135	8,000	400
W-20/990	990	1,030	8,000	400
W-45ER/1000	1,000	1,050	10,000	400
W-45JR/900	900	980	10,000	400

Dimensions according to the tolerances of SFS EN-508-1.

Table 1. Dimensions of corrugated sheets

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 corrugated sheets are listed in Table 1. In the case of a hip roof, any "excess pieces" can be used crosswise on the other side of the roof (please note that in such a case the water/capillary groove will be at the other edge). 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. 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. We recommend installing the underlay at the ridge in the manner illustrated by Figure 6. 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. Install the underlay far enough at the bottom eaves to prevent condensing water from entering the wall structures but so as to allow air to circulate above the underlay. The underlay should extend at least 200 mm over the outermost point of the wall at the overhang gable.

Fix battens with nails on top of the underlay (min. 32 x 50 mm; Fig. 4).

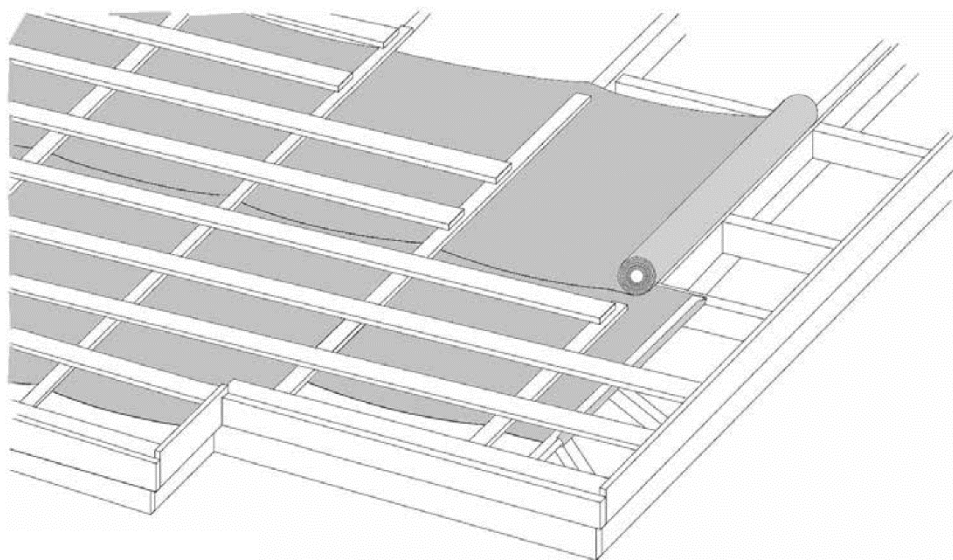


Figure 4. Underlay structure

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 ridge ventilation piece. In the case of a hip roof, air is directed out at the ridge via a ridge ventilation piece. A junction between the pane of a pitched roof and a wall can be constructed in the manner illustrated by Fig. 5, for example.

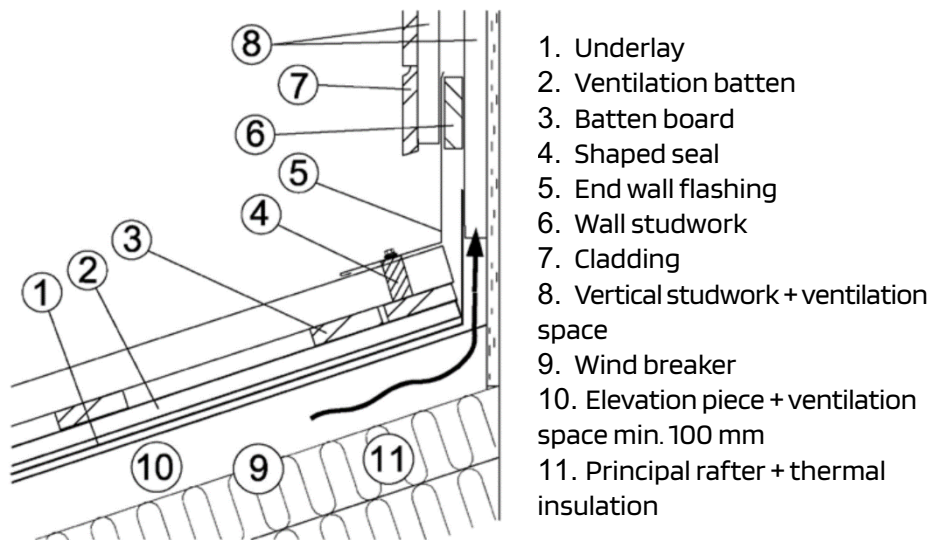


Figure 5. Roof-to-wall junction

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. The ventilation of hip roofs and the ventilation of each fire compartment section in a terraced house can also be arranged in the manner illustrated by Fig. 6. The ventilation space underneath the underlay must be at least 100 mm across the entire roof.

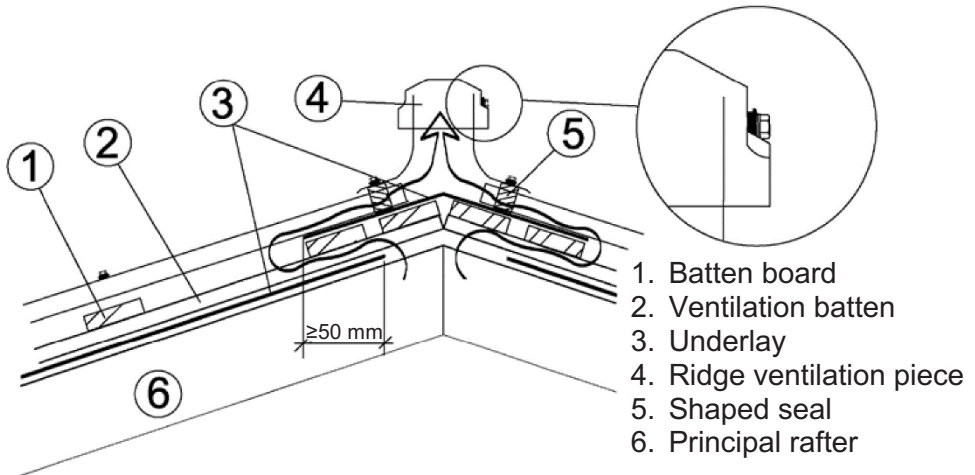


Figure 6. Ridge ventilation piece

2.5. Battens

The batten thickness and the distance between battens depend on the carrying capacity of the corrugated sheet, the load and the slope of the roof. Minimum batten size is 22 x 100 mm. Indicative batten thicknesses and batten spacings for corrugated sheets are listed in Table 3. The dimensioning factor in the case of W-2/1150 in the table is the carrying capacity of the **corrugated sheet** itself. In the case of other sheets, the dimensioning factor is the durability of the sheets.

If any roof security products are to be installed (such as a catwalk or snow breaker), using battens of 32 x 100 mm is recommended to ensure proper fixing. Use 2.8 x 75 mm galvanised nails hammered in at a slant to fix the battens to the rafter (2 nails per crossing). 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 (Figure 8). If the pane of the roof is made from two or more sheets, there must be a batten below the overlap point.

Sheet	Rafter spacing	Batten board	Roof slope		
			1:3 or less	1:1.5	1:1
BATTEN SPACING (k)					
W-2/1150	900 mm	25 x 100 mm	300 (*)	400 (*)	600 (*)
	1,200 mm	32 x 100 mm	300 (*)	400 (*)	600 (*)
	1,200 mm	50 x 100 mm	300 (*)	400 (*)	600 (*)

* The dimensioning factor is the carrying capacity of the **corrugated sheet**

W-1/1064	900 mm	25 x 100 mm	300 (**)	400 (**)	600 (**)
	900 mm	32 x 100 mm	400 (**)	600 (**)	900 (**)
W-20	900 mm	38 x 100 mm	600 (**)	900 (**)	1,200 (**)
W-45	1,200 mm	38 x 100 mm	400 (**)	600 (**)	900 (**)
	1,200 mm	50 x 100 mm	750 (**)	900 (**)	1,200 (**)

** The dimensioning factor is the carrying capacity of the **batten**

Table 3. Indicative batten spacing

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 corrugated 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). The water/ capillary groove will remain at the **bottom** on the right-hand or left-hand side. Install the sheets according to **the bottom eaves** instead of according to the gable end. The sheet must extend approximately 45 mm above the eaves. Start the installation by fixing the first sheet at the top and at the bottom of a bend with one screw onto the batten. Then fix the next sheet onto the first one at the bottom edge of the side seam. Fix the sheets onto each other from the bottom eaves to the ridge every 500 mm (every 300 mm if a sealing strip is used) at the top of the bends with 4.8 x 28 mm roofing screws. In the case of W-1/1064, you can use 4.8 x 50 mm roofing screws.

Align the sheets with the bottom eaves every three to four sheets. You can use an alignment wire or a floating rule as an aid in the alignment. Fix the sheets onto the battens. Continue the installation by fixing the sheet first onto the previous sheet and then onto the batten.

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 installed, fix the ladder supports onto the structures of the opposite pane before fixing the sheets on that pane.

2.7. Fixing of sheets

W-1/1064 must be attached onto the battens at the top of the bends, in which case the screw size is usually 4.8 x 50 mm. W-2/1150, W-20/990 and W-20R/1100 must be attached onto the battens at the top or bottom of the bends. When fixing sheets at the bottom of the bend, the screw size is 4.8 x 28 mm. W-45ER/1000 and W-45JR/900 must be fixed onto the battens at the bottom of the bends with 4.8 x 28 mm screws. The same screw size must be used at the eaves, in side overlaps and when fixing flashings. The screws must be sealed (EPDM rubber) roofing screws.

Fastener spacing:

- At the bottom eaves: At a maximum every 400 mm on the batten/beam.
- Side overlaps: At a maximum every 500 mm or, if a sealing strip is used, every 300 mm onto each other.
- At the overhang gable: At a maximum every 500 mm on the batten/beam or on every batten if the batten spacing is >500 mm.
- End overlaps: At a maximum every 400 mm at the bottom of the bend on the batten/beam.
- At the ridge/upper eaves: At a maximum every 400 mm at the bottom of the bend on the batten/beam.
- In the middle of the roof: Even spacing

The total quantity of screws required is about 6 screws per square metre.

2.8. Inner mitre

An example of an inner mitre using a V flashing is given in Figure 7.

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.

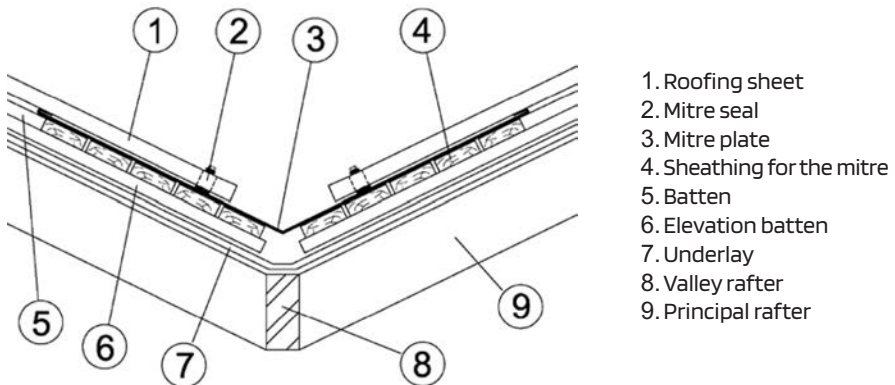


Figure 7. Inner mitre

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 bottom 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 corrugated sheets onto the battens and install a mitre seal in between the corrugated sheet and the mitre plate. Make sure that the seal remains in place by either putting a roofing screw through the seal or by using sealing compound. The free width of the inner mitre (horizontal gap between the sheets) is about 200 mm.

2.8.1. Inner mitre ending at the pane of the roof

An inner mitre ending at the pane is to be constructed as described in Section 2.8. but in the following order:

1. Install a corrugated 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.
2. 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.
3. Install a corrugated sheet cut to fit the shape of the valley at the ridge. If the side seam of the corrugated sheets is close to the end of the valley, fix the sheets onto each other with roofing screws approximately every 200 mm.

2.9. Penetrations.

We recommend placing all penetrations as close to the ridge/upper eaves as possible. Battens coming close to a chimney must be supported with beams and additional battens must be installed as necessary (Figure 8). All joints must be sealed with care.

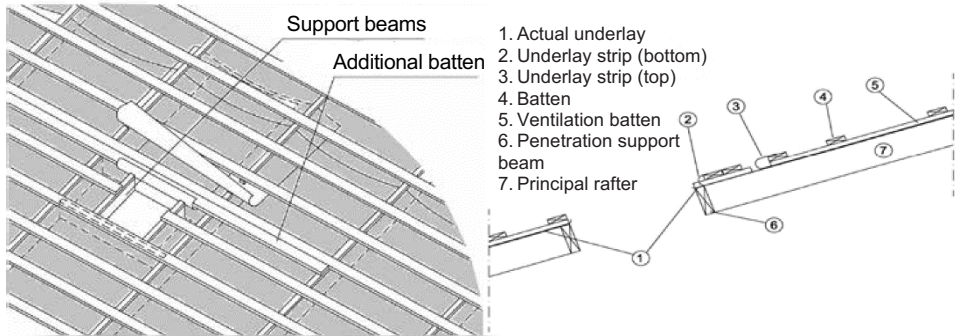


Figure 8. Cross section

Figure 9. Penetration structures

The accessories for penetration elements (roof extractor, sewer ventilation pipe, ventilation system pipe, antenna penetration) include an underlay sealing flange, an EPDM rubber sealing flange and an EPDM rubber sealing unit (detailed installation instructions are included in product packages). We recommend using an Eleganti penetration as the penetration in corrugated sheets. It is fixed onto a smooth bottom plate with trimmed edges (Figure 10). 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.

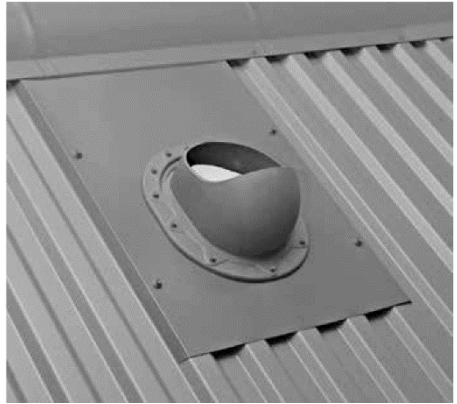


Figure 10. Penetration and bottom plate

2.10. 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. Place support beams parallel to the pane of the roof at the base of the snow breaker before installing the roofing sheets (32 x 100 mm or similar). Fix the bases of the snow breaker (four bases per set) onto the bottom of a bend (place a sealing strip of 3 x 30 mm in between the base and the roofing sheet) with galvanised 8 mm coach screws or (if possible) with a bolt and nut.

Push the oval tubes (two pieces per set) in place and insert 8 x 35 mm bolts through the holes at their ends to prevent the tubes from sliding out sideways (Figure 11).

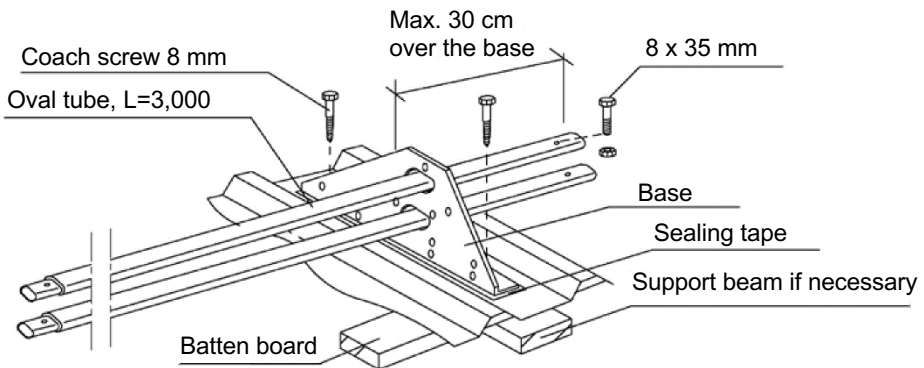


Figure 11. Snow breaker

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 4 indicates the allowed maximum roof pane length at different snow loads when the roof has a single row of snow breakers.

For example, with a roof slope of 1:3 = 18° and snow load of 2.0 kN/m², the maximum length of the pane with **one** row of snow breakers is 9.7 m.

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

2.11. Sealing

The minimum slope of corrugated sheets is 1:7 (Figure 12). The manufacturer cannot guarantee the functionality of corrugated sheet roofs with a lower slope. If you wish to install corrugated Weckman sheets on a roof with a slope of <1:7, we recommend sealing sideways overlaps with sealing strip, for example. End overlaps (min. 200 mm) must be sealed with a 3 x 10 mm adhesive sealing strip.

Minimum slopes:

Shaped sheets min. 1:4

Corrugated sheets and Elegantti min. 1:7

Progantti min. 1:8

Machine joint roof min. 1:10

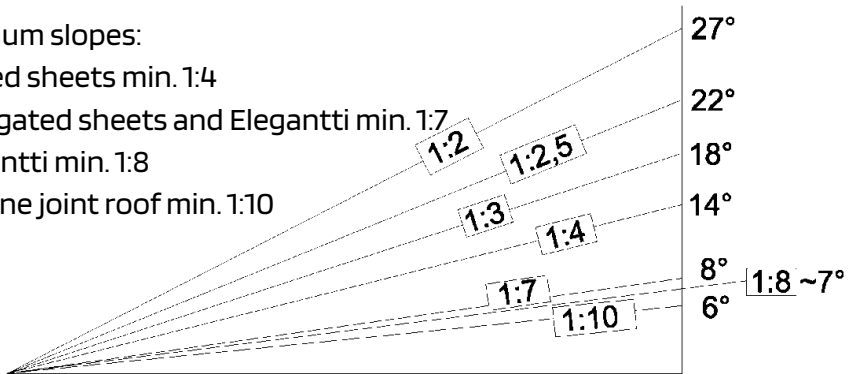


Figure 12. Minimum roof inclinations

2.12. Gable flashing

Fix gable flashing onto the fascia from the side and onto the roofing sheet at the top of a bend with roofing screws (Figure 13). Maximum screw spacing 800 mm. Flashing overlap approximately 100 mm.

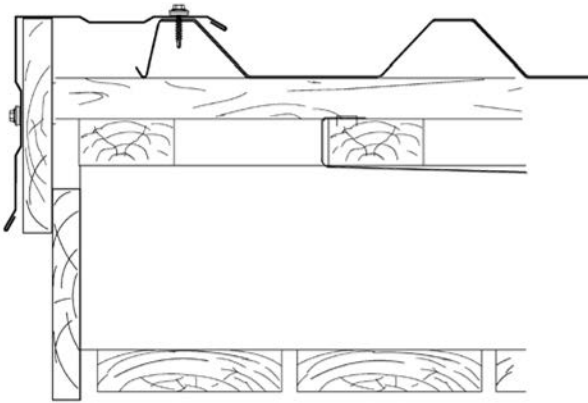


Figure 13. Installation of gable flashing

2.13. Lower eaves flashing

At the bottom 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 14).

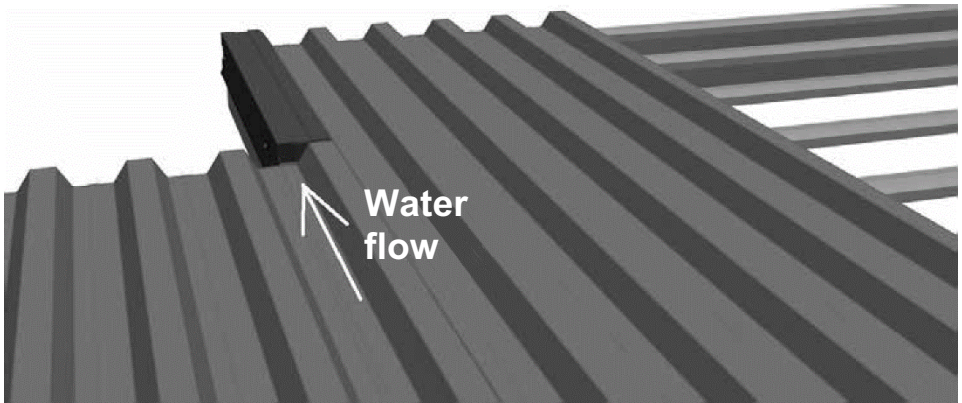


Figure 14. Overhang

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 bottom eaves flashing (Figure 16) 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. 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 15).

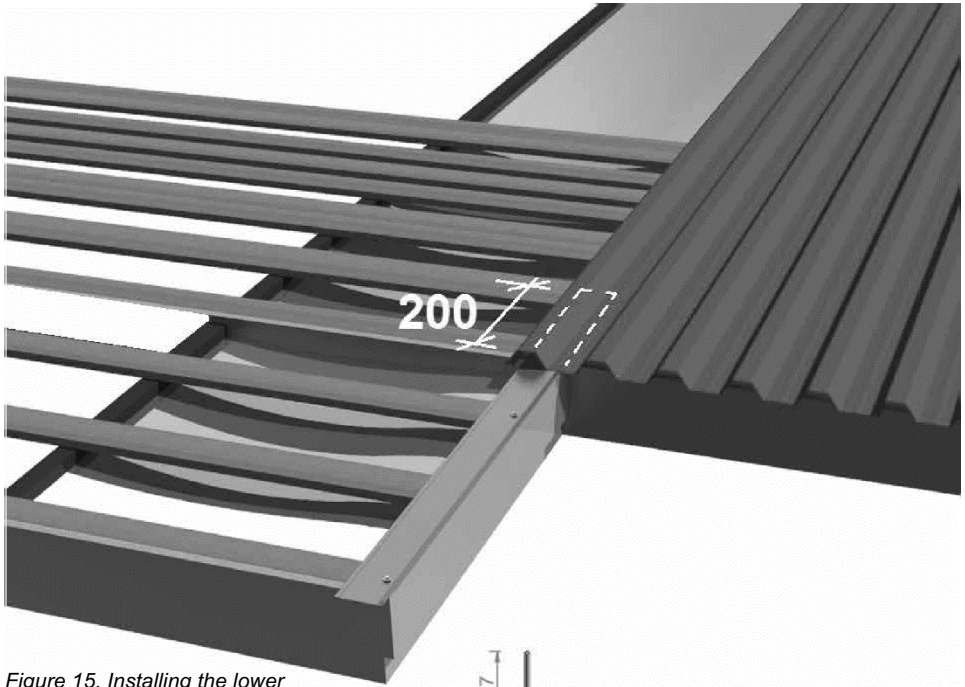


Figure 15. Installing the lower eaves flashing

Figure 16. Dimensions of the lower eaves flashing

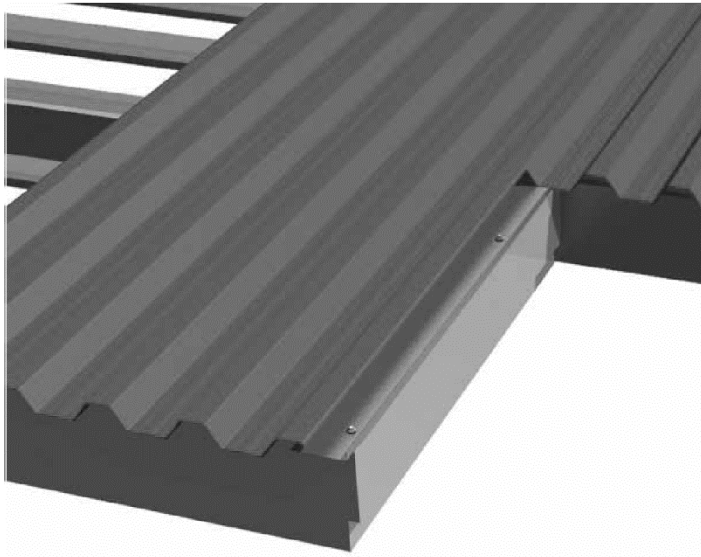
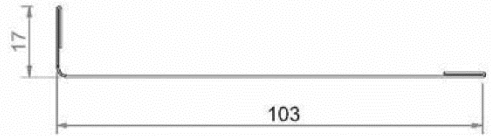


Figure 17. Overhang gable before the installation of gable flashing

The gable flashing must be installed tightly against the lower eaves flashing and fixed with roofing screws at the fascia approximately every 500 mm and on top of the batten every 800 mm onto the roofing sheet (Figure 18).



Figure 18. Installation of gable flashing

2.14. 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. In the case of smooth ridge capping, the minimum spacing is 100 mm. Install a ridge seal in between the ridge capping and the roofing, and fix the ridge capping with roofing screws through the seal at the top of the roofing sheet bend approximately every 400 mm. 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.

2.15. 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 sheet every 400 mm 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 5). At lengthwise wall-roof junctions, fix the end wall flashing at a maximum spacing of 400 mm onto the roofing sheet. The flashings must overlap by at least 100 mm and be sealed with sealing compound.

2.16. Eaves flashing

An eaves flashing is used at the bottom eaves to guide water into the gutter and 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).

2.17. Upper eaves

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 19).

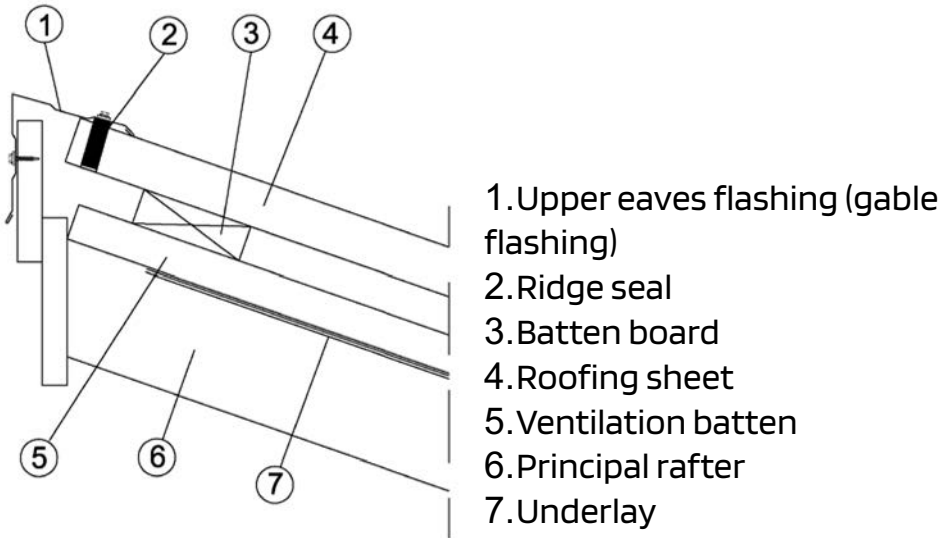


Figure 19. Upper eaves

3. Maintenance of coated sheets

Inspect the coating annually, preferably in the spring (Table 5). 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.

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 5. Annual roof inspection

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.

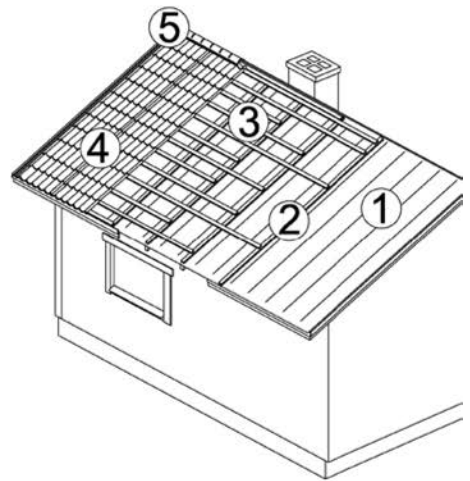
The old roofing sheets can be left underneath the new ones when:

- 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 ridged roof, the old bitumen roofing must be removed and new roofing installed in accordance with the instructions (starting from Section 2.3). 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

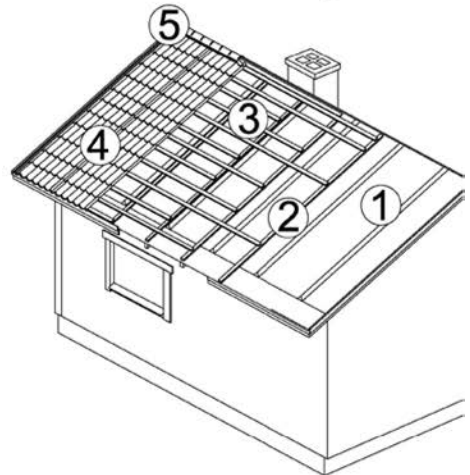
Figure 42. Renovating an old metal profile roof.



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

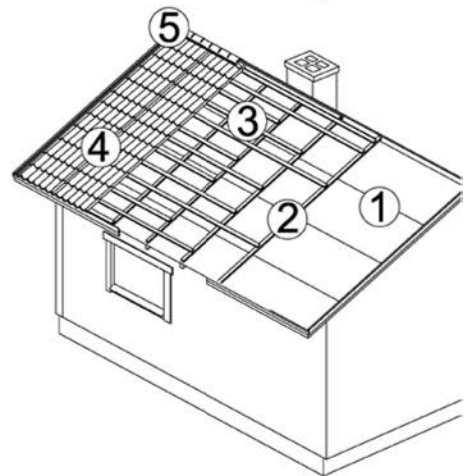
Figure 43. Renovating an old angle fillet roof.



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 44. Renovating an old smooth felt roof.



Old asbestos tile roof

1. Have the old asbestos sheets removed by an authorised asbestos removal company and then 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

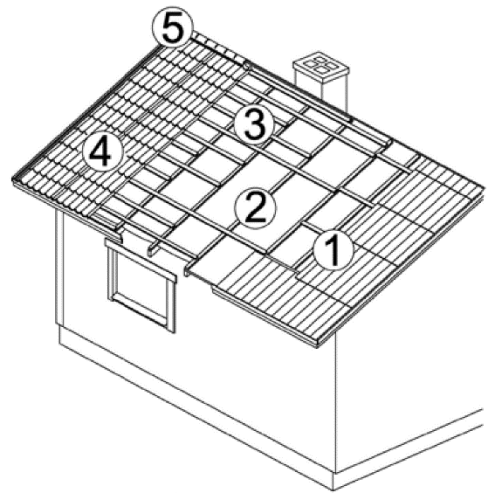


Figure 45. Renovating an old asbestos tile roof.

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

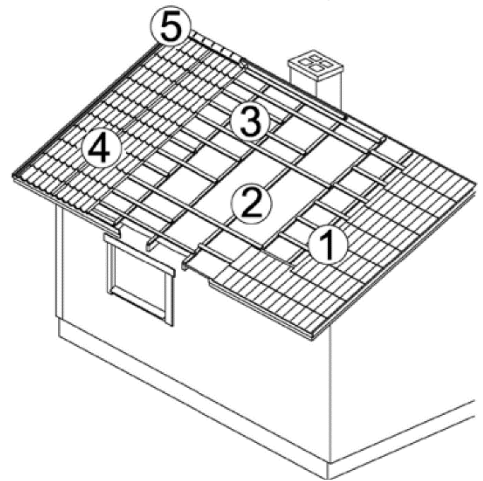


Figure 46. Renovating an old tile roof.

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 the roofing sheets
4. Fix the new sheets to the battens
5. Install seals and flashings

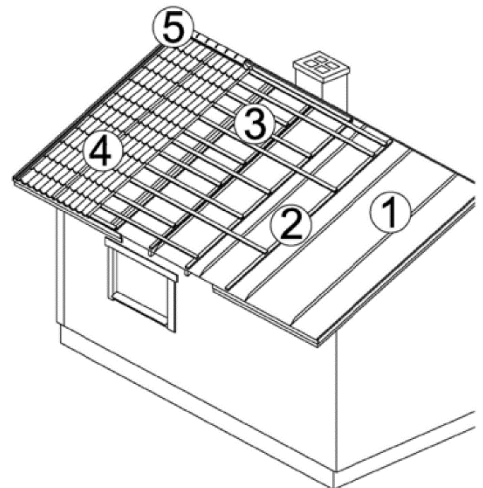


Figure 47. Renovating an old seamed roof.

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