Roofs

Installation instructions

Profiled sheets

A complete roof includes a lot more than just the roofing sheets. A combination of lead-ins, water removal systems, ladders, roof bridges and snow stops is also needed to make the roof safe and functional. All the components of roof packages manufactured by Ruukki are tested high-quality products that are compatible with one another. Steel roofs have an impressive and elegant appearance. They are watertight, light and durable, which ensures easy installation and use.

Product applications

- detached houses
- terraced houses
- residential multi-storey buildings
- recreational dwelling

Ruukki is a metal expert you can rely on all the way, whenever you need metal based materials, components, systems or total solutions. We constantly develop our product range and operating models to match your needs.

CFI 01.014 FI/11.2009

These instructions apply to the installation of profile sheets suitable for use as roofing material.

A complete roof includes a lot more than just the roofing sheets. A combination of lead-ins, water removal systems, ladders, roof bridges and snow stops is also needed to make the roof safe and functional. All the components of roof packages manufactured by Ruukki are tested high-quality products that are compatible with one another. Ruukki is the only roofing manufacturer in Finland to have a quality certificate issued by the Technical Research Centre of Finland (VTT) covering all parts of its roof packages.

The methods presented in the installation instructions are examples and can not be implemented as such for all roofs. When unsure about how to proceed, follow the structural designer's instructions or contact our technical support department.

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- **Reception of goods**
  Ensure that the goods delivery is as ordered and features all the goods listed on the dispatch note. Any deficiencies or errors in the delivery and any transportation damages must be written down on the consignment note and reported immediately to Ruukki or the retailer. Any objections regarding the delivery must be made within 8 days of the delivery. The company accepts no liability for any costs arising from the replacement of products installed in some other way than as described in these instructions.

- **Unloading and handling the delivery**
  The roofing sheets are unloaded from the truck to even ground. Place approx. 200 mm high supports underneath the sheet stack at one-metre distances. In normal conditions, roofing sheet stacks can be stored either packaged or unwrapped for about a month. For longer storage, the stacks must be protected and placed on a sloping surface to allow any water between them to evaporate or drain off. The roofing sheets can also be lifted onto the roof in stacks. If the sheet stacks are lifted onto the roof with lifting equipment, do not remove the sheets from their transport packages before lifting. When handling individual sheets, remember that long sheets must not be lifted by their ends nor allowed to rub against each other. The best way is to hang them from the edge seam. Individual sheets are lifted onto the roof along supports that run from the eaves to the ground. The sheets are lifted onto the roof to install along supports, and the lifting can be helped from the ground by pushing the sheets from their sides. Do not go under the sheets during lifting.

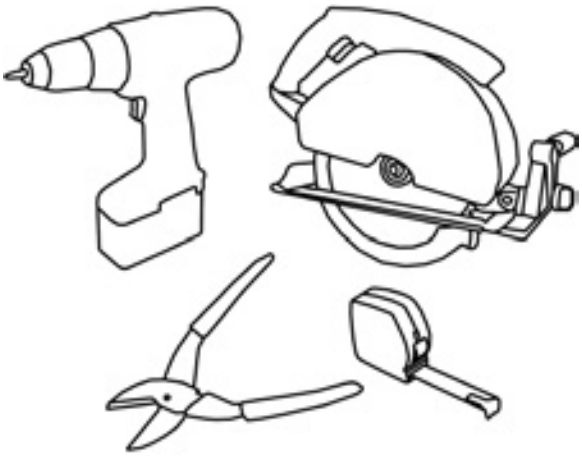
- **Dimensioning**
  Roofing sheets are delivered cut-to-size. But in roof valleys, hipped roofs and lead-ins, roofing sheets have to be cut on-site. Roofing sheets can be cut with a hand-held circular saw suitable for cutting steel sheets, with shears, a nibbling machine, jigsaw or any other device that does not produce heat when used.

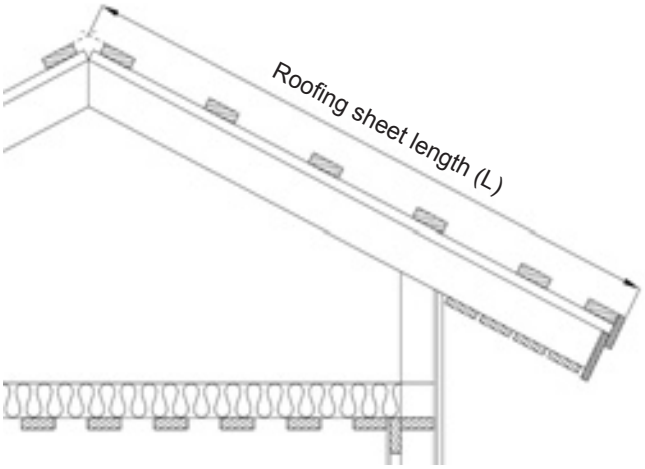
  The use of an angle grinder with a cut-off disc is strictly forbidden. Using an angle grinder with a cut-off disc to cut the sheets will automatically void the sheets' surface guarantee.

  In addition to hand-held circular saw with suitable blade and shears or a nibbling machine you need at least one screw gun and measuring tape.

  Protect the roofing sheet before commencing working, because the sharp chips may damage the surface. Any debris from drilling or cutting carried out during the installation must be thoroughly brushed off. It is recommended that any scratches on the coating and any visible cut surfaces are painted with suitable tou-chup paint.

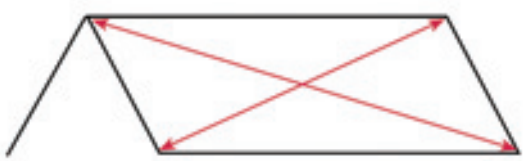
- **Work safety**
  Always use work gloves and protective clothing when working on the sheets. Be careful of the sharp edges and corners. Do not go under the sheets when they are moved. Ensure that the hoisting lines are in working order and suitable for the sheets' weight and that they are appropriately attached. Avoid handling the sheets during high winds. When on the roof, always move with great caution. Use a safety rope and soft-soled footwear. All effective safety regulations must be complied with while working.



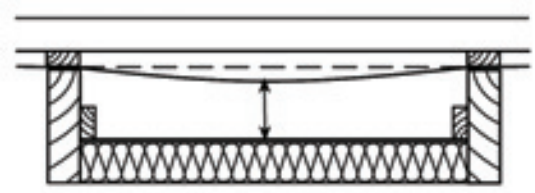


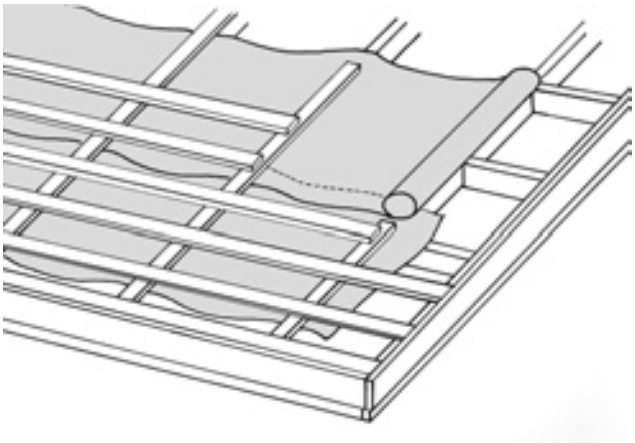
- **Ordering the roof**
  Ruukki delivers the roofing on the basis of measurements provided by the customer. These measurements can easily be found on structural drawings. You can also draw a simplified model drawing and include the most important measurements. A rule of thumb is that the length (L) of a roofing sheet is measured from the outer surface of the farthest facing board at the eaves to the middle of the ridge. In order to get the right measurements for the order, it is useful to check the measurements of all roof panes in different places.

  N.B. in case of ordering the roof for mansard-roofed house notice the height of the profile and roofs hip influences the length of the profile. More information is available from our technical support department (see the details on the back cover).



- **Measuring the roof and checking the measurements**
  Roofing sheets are installed at right angle (90 degrees) to the eaves. Before the installation, check how level the roof is, its cross-measure, and the straightness of the ridge and eaves. In problem situations, contact our technical support department.





- **Roofing underlay**
  Begin the installation of roofing underlay horizontally from the eaves on top of the roof trusses. The roofing underlay should extend at least 200 mm beyond the wall at the eaves and the verge. First staple the roofing underlay onto the roof trusses. The final fixing is accomplished by nailing wooden strips (needed to ensure ventilation) on top of the roofing underlay in the direction of the roof trusses. Leave the roofing underlay hanging loose between the roof trusses. At the ridge, the roofing underlay is installed according to the installation instructions specified in the detailed drawings (p.13). In problem situations contact the structural designer regarding the specific ridge solution. The roofing underlay layers are supposed to overlap by about 150 mm at the horizontal joint. If the roofing underlay must be extended lengthways, this must be done at the roof trusses with a minimum of 100 mm overlap.

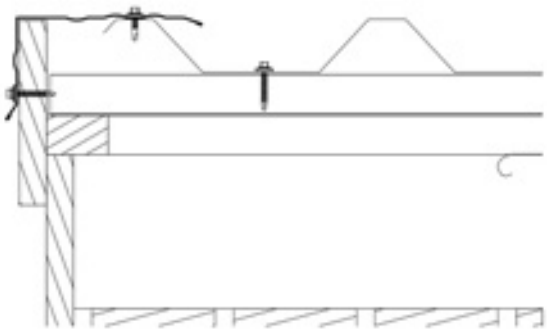
Battening

32 x 100 mm timber or self-ventilating steel battens (RA5453700) with truss spacing of 900 or 1200 mm can be used for profile roofing sheets. Fix self-ventilating steel battens with galvanised nails or self-drilling screws. You can consult your structural engineer to check the correct thickness of the boarding battens.

The values given in the table below are minimum values. Under snow stops and areas where snow may accumulate, such as foldings, a smaller spacing must be used between the boarding battens.

Battening table

		Roof pitch 1:1		Roof pitch 1:1,5		Roof pitch 1:3 or less	
		Roof truss interval 900 mm	Roof truss interval1200 mm	Roof truss interval 900 mm	Roof truss interval 1200 mm	Roof truss interval 900 mm	Roof truss interval 1200 mm
Battening spacing	250 mm	22x100	25x100	22x100	25x100	22x100	32x100
	300 mm	22x100	25x100	22x100	32x100	25x100	32x100
	400 mm	22x100	32x100	22x100	32x100	25x100	38x100
	450 mm	22x100	32x100	25x100	32x100	32x100	38x100
	600 mm	25x100	32x100	25x100	32x100	32x100	38x100
	750 mm	32x100	38x100	32x100	38x100	32x100	50x100
	900 mm	32x100	38x100	32x100	38x100	38x100	50x100
	1200 mm	32x100	50x100	32x100	50x100	38x100	50x100
	1500 mm	50x100	50x100	50x100	50x100	50x100	50x100



The outermost fascia board is installed higher than the boarding batten so that there is a distance equal to the height of the roofing sheet between them.

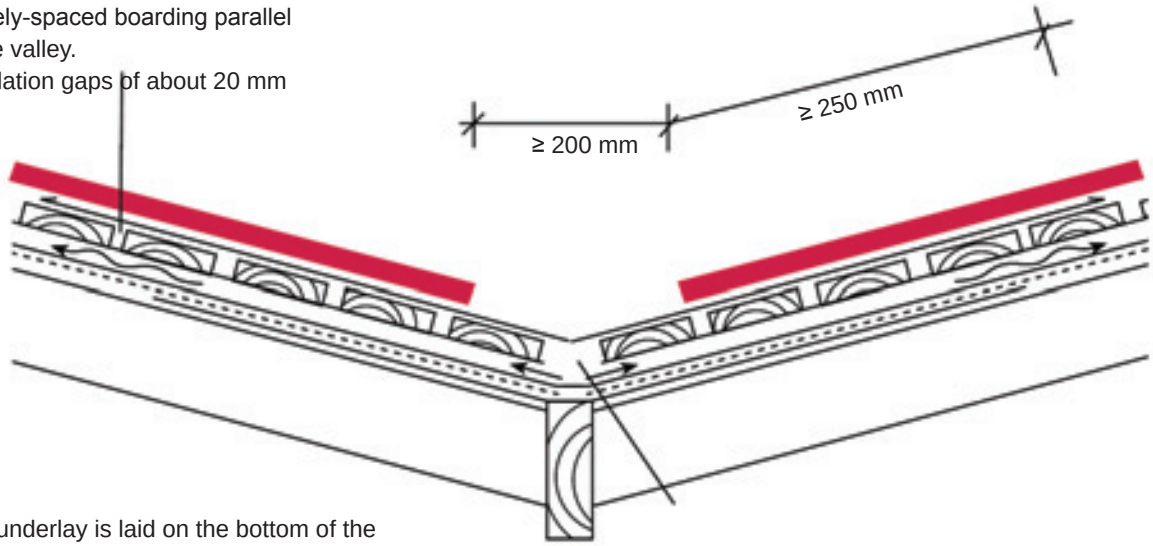
- **Installation of fascia boards**
  With profile roofing sheets, the outermost fascia board is raised or elevated with a batten by the height of a tile profile roofing sheet above the roofing battens. The verge trims will be fixed to this fascia board.

- **Building roof valley**
  Build the bottom of the roof valley at the same level as the roof pane battening and at the width of one sheet (approx. 0.5 m per roof pane). Leave ventilation gaps of approx. 20 mm between roof valley boards. To guarantee adequate ventilation the gap in the middle should be 50–80 mm.

  The roof valley sheet extensions should overlap by at least 200 mm. On shallow-pitch roofs, the use of a sealing compound to seal the overlap is recommended. The sheet is first fixed on loosely with nails on the outer edge and properly in connection with the roofing sheets.

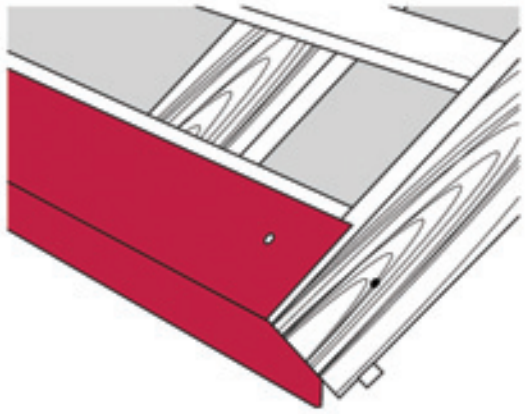
  Cut and shape the bottom end of the roof valley sheet according to the alignment of the eaves. The roof valley ridge can be bent over the ridge edge or be puttied. The roof valley sheet must extend at least 250 mm under the roofing sheet. We recommend a distance of at least 200 mm between roofing sheets. A sealing strip that has the same shape as the profile is used between the roof valley sheet and roofing sheet.

Closely-spaced boarding parallel to the valley.
Ventilation gaps of about 20 mm



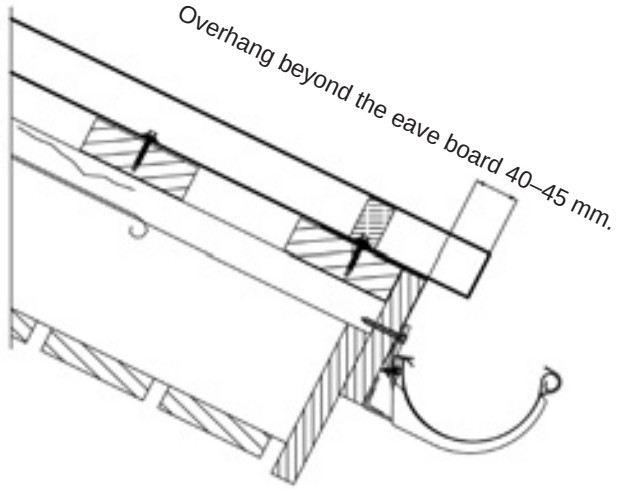
The underlay is laid on the bottom of the valley in a direction parallel to the valley (continuous line) and the underlay to be installed on the pane (dashed line) is installed on top of it.

Open space parallel to the valley for ventilation.
Width 50–80 mm.



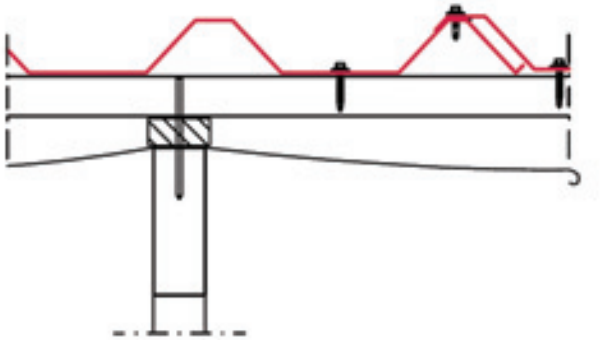
- **Installing the roof**

Before installing roofing sheets, install the eaves flashings where possible. The eaves flashing is installed aligned straight and first fixed with galvanised nails or self-drilling screws to the first battening board. You can ensure the correct alignment of the eaves flashing by, for example, marking a straight line along the eaves using an alignment wire. A sealing strip that has the same shape as the profile can be used between the eaves flashing and roofing sheet, but ventilation air access under the roofing must be provided somewhere else.



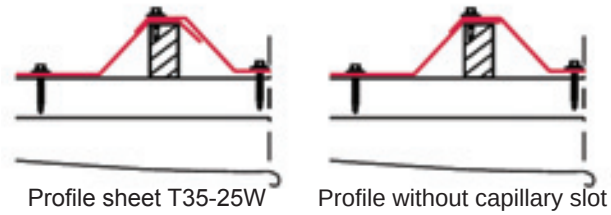
With pitched roofs, the installation of profile roofing sheets is usually started at the gable, and with hipped roofs always at the hip. The sheets are aligned with the eaves, not the gable. The sheets can be installed starting from the right or from the left side.

The overhang of the roofing sheet beyond the eave board must be 40– 45 mm.



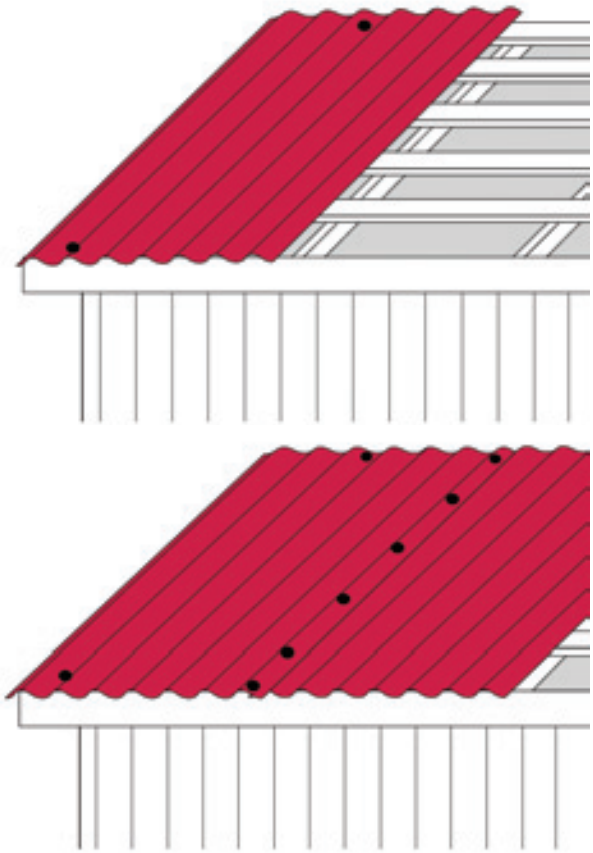
The profile roofing sheet is fixed to the battening with screws at the lowest point of the profile. Fixing is effected with self-drilling screws 4.8 x 28 mm (wooden battening). For steel battening self-drilling screws 4.8 x 20 mm are used.

The left overlapping edge of tile profile roofing sheets has a capillary slot, which is to be installed on the underside. In the overlap joint, the sheets are fixed onto each other with self-drilling screws (4.8 x 20 mm) at the highest point of the profile, below each of the lateral patterns. max. k500 mm. To improve tightness, sealants can be used In the overlapping joint, or the sheets additional sealing is done by overlapping the sheets sideways according to the wave pattern.



Profile sheet T35-25W Profile without capillary slot

For profile sheet T35-25W and all roofing sheets without capillary slot, use a wood batten in the overlapping joint.

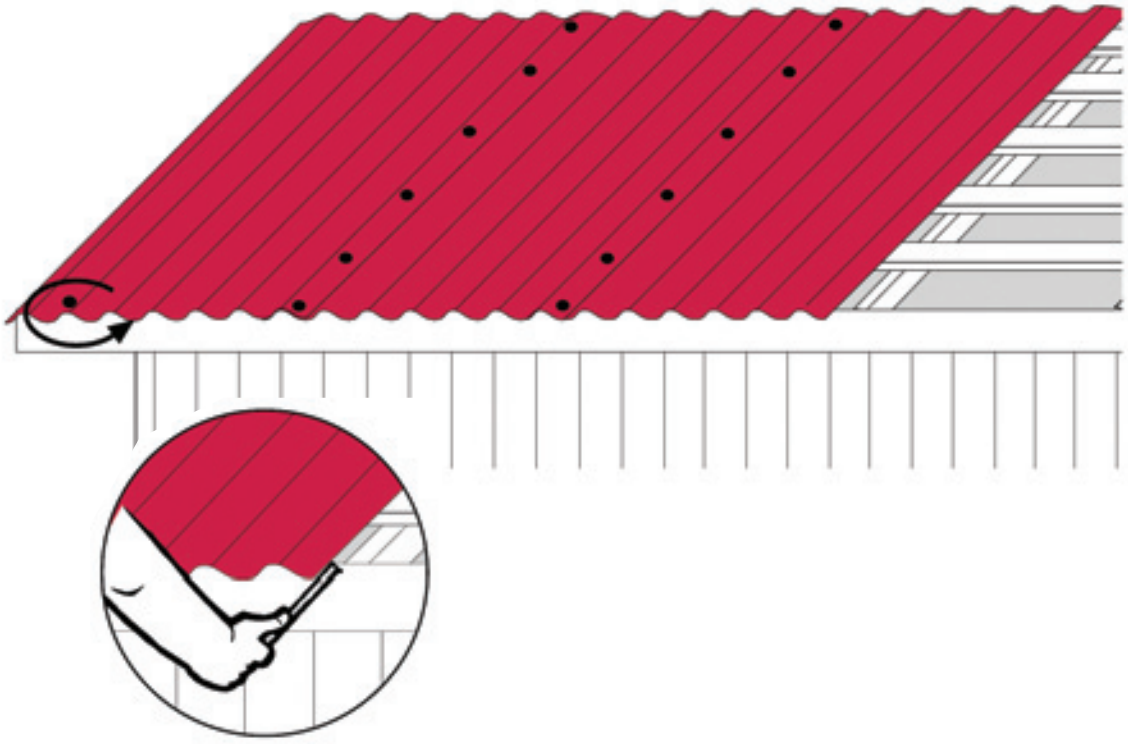


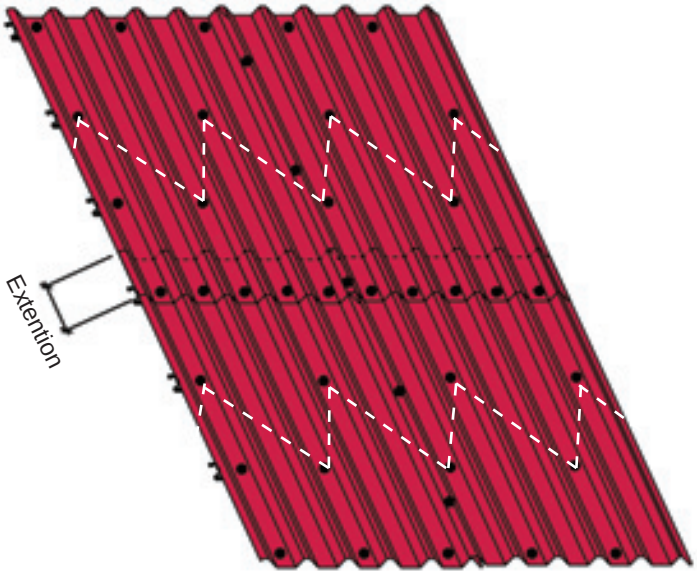
- **Laying out the sheets**
  Fix the first sheet on the side where you are starting with an appropriate length over the eaves (approx. 40–45 mm). Fix the sheet at the eaves into the battening and temporarily on the ridge with one screw.

  Align the following sheet by the side joint with the bottom edge of the first sheet.

  Fix the next sheets by the side joint at the top of the wave, below each of the lateral patterns. The fixing spacing is max. 500 mm centre to centre. Progress from the eaves to the ridge.

  Install three or four sheets in this manner. Remove the screws from the ridge and align the sheets with the eaves.





- **Fixing the set of sheets**
  The installation instructions for the sheets have been prepared considering the wind uplift force on the edges of the sheets caused by wind, thermal movement in the central areas, and the tightness and appearance of the sheet joints.

  Fix the sheets at the eaves into the battening at every other wave.

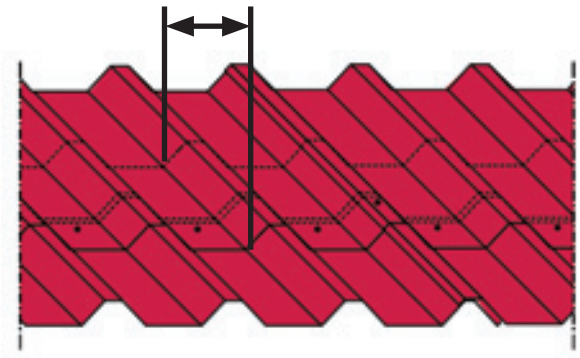
  At the gable, fix the sheet at the bottom of each profile into the battening.

  At the ridge fix the sheet at the bottom of every other profile into the battening (2–3 screws per sheet).

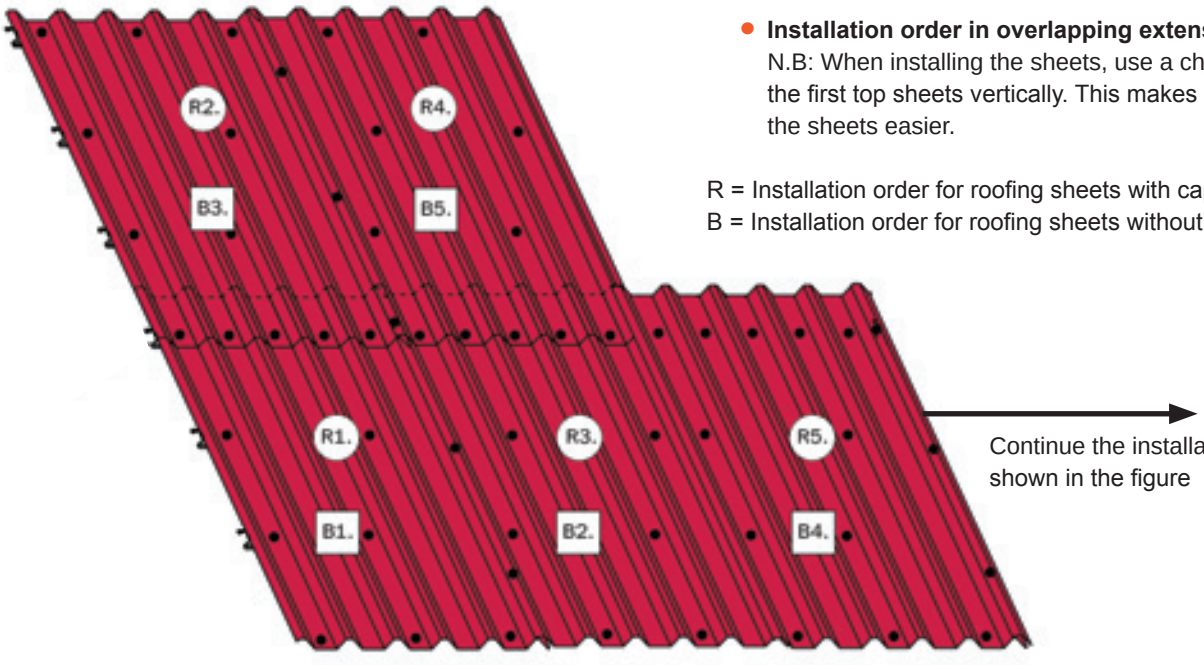
  In the middle zone, use 4–5 screws/m², placed in a zigzag pattern as shown in the figure.

  Fix the extension (if any) from the bottom of each wave on the boarding.

Overlapping at least 200 mm

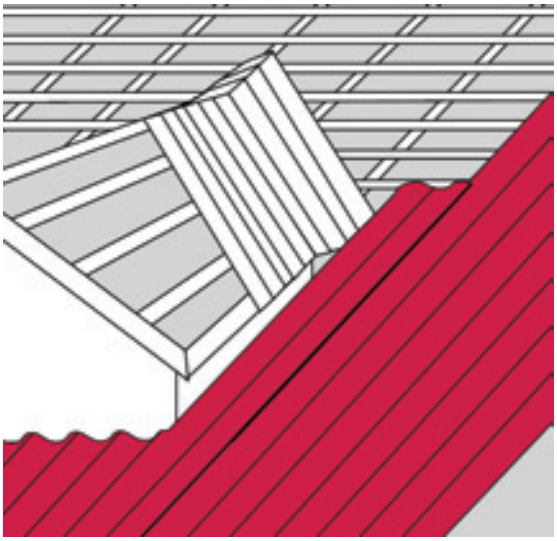


- **Overlapping extension**
  In extension joints, the profile sheet is overlapped at least 200 mm at the horizontal pattern. Fix the extension from the bottom of each wave on the boarding.



- **Installation order in overlapping extensions**
  N.B: When installing the sheets, use a chalk line to align the first top sheets vertically. This makes the laying of the sheets easier.

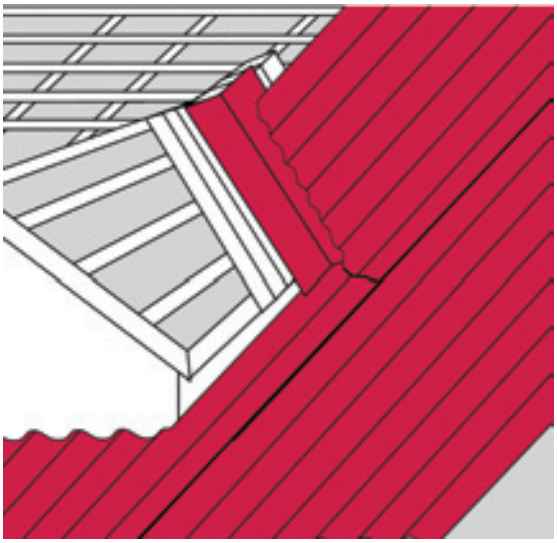
R = Installation order for roofing sheets with capillary slot
B = Installation order for roofing sheets without capillary slot



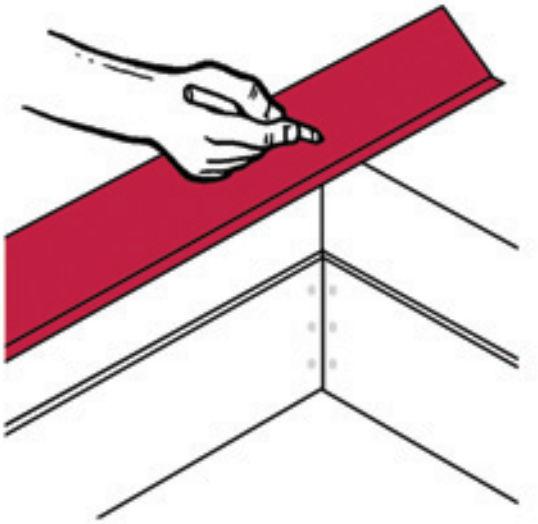
- **Building roof valleys that ends within the roof pane**
  At the dormer, the installation of roofing sheets is two-fold: from the eaves to the roof valley and from the roof valley to the ridge. This has to be taken into consideration when dimensioning the sheets.

1. First make the bottom sheet into the right shape and fix it on.

2. Then make the roof valley sheet into the right shape and fix it on.



3. Make the top roofing sheet into the right shape and fix it on.



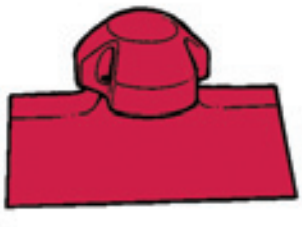
- **Verge trim**
  Install the verge trims from the eaves upwards, and cut any extra off at the ridge. The trims are fixed with self-drilling screws at about every 1000 mm into the fascia board, and from the top into the roofing sheet. The verge trim must be overlapped by a minimum of 100 mm.

  The verge trim must extend over the first profile of the roofing sheet. If verge trim is too short a lower verge flashing should be used (see p.13).

- **Ridge capping**
  Apply universal filler to the ridge capping before fixing the capping to the roof. Remove the cover tape from the universal filler and apply the filler under the ridge capping about 50 mm from the edge in the ridge direction.

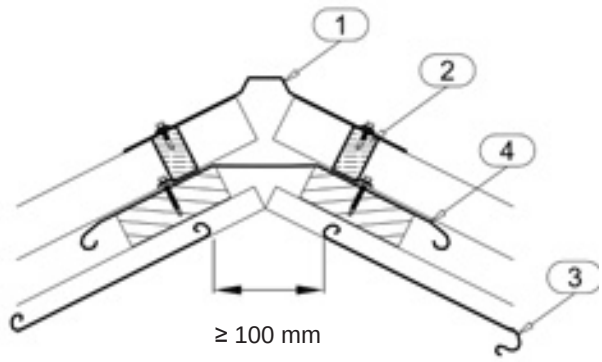
  N.B. It is not recommended to fix the screws through the filler.

  Fix the ridge capping to the roofing sheets at every other wave with self-drilling screws. The ridge cap overlap must be at least 100 mm.



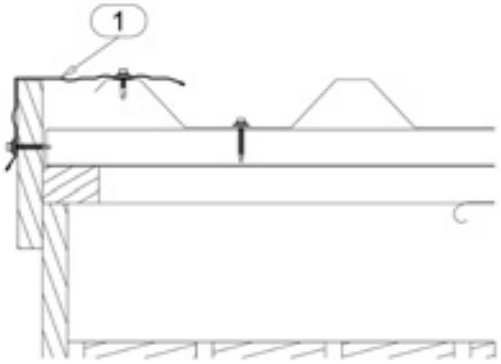
Ventilation between the roof underlay and roofing sheets can be improved by installing ventilation ducts on top of the ridge capping at approx. 5-6 metre intervals.

Detailed drawings



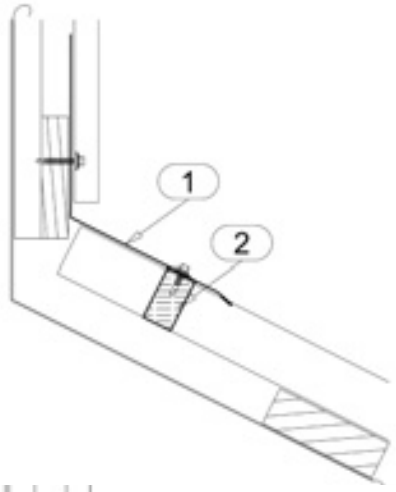
Ridge, vertical detail

1. Ridge capping flat RA1BRF
2. Filler
3. Roofing underlay (ventilation gap ≥ 100 mm)
4. Roofing underlay strip



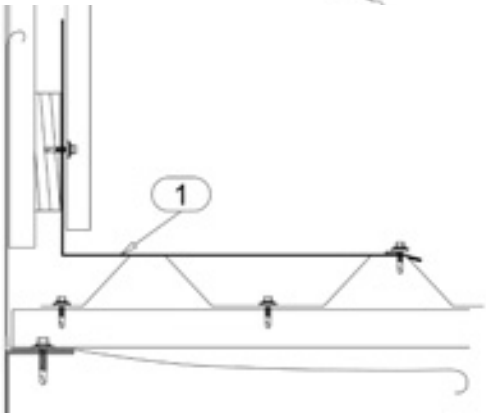
Verge, vertical detail

1. Verge trim RA1BG



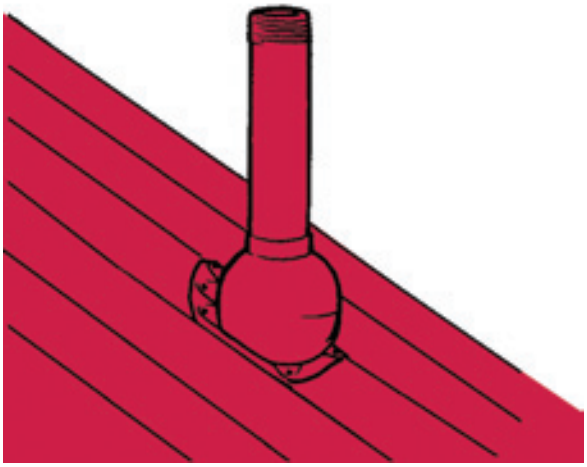
Roof-to-wall intersection, end wall, vertical detail

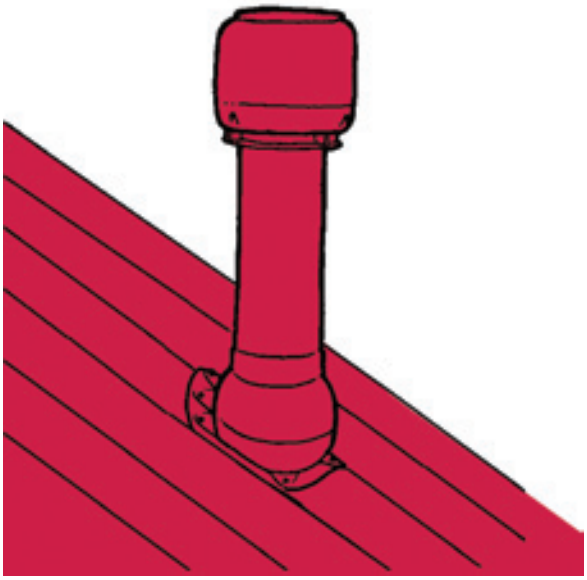
1. Joint flashing RA1BJ - K
   (K=according to roof slope)
2. Filler

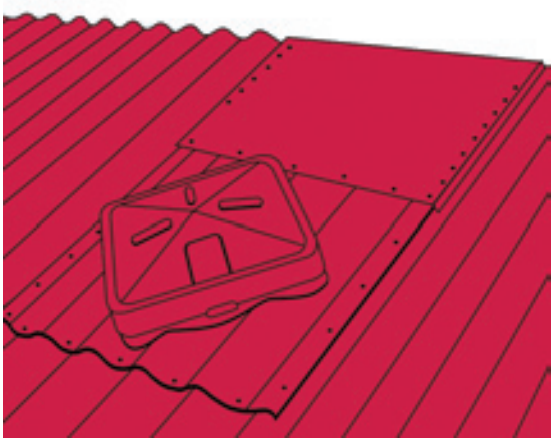


Roof-to-wall intersection, sidewall, vertical detail

1. Joint flashing RA1BJ







- **Lead-ins**
  With profile sheets make a lead-in with a bottom plate that can be made into the desired shape. Lead-in pipes should be installed as close to the ridge or access routes as possible. If a lead-in must be installed lower on the roof pane, we recommend that you put a snow stop above it.

  A 110 mm lead-in pipe without a cap is used for sewer ventilation. Lead-in packages include an adapter for the ventilation pipe. The same ventilation pipe can be used with a cap for radon ventilation. We do not recommend that you combine ventilation pipes with air conditioning.

  The outlet pipe of the central vacuum cleaning system is an insulated 75 mm pipe with a cap. It includes an adapter for the commonest central vacuum cleaning systems.

  Insulated lead-in pipes equipped with caps are used for ventilation. The inner diameter is usually 125 or 160 mm. Also bigger diameters are available. Check the appropriate pipe diameter in the ventilation designs.

  The roof extraction fan is used as a cooker hood or ventilation fan that can be connected to the stepless adjustment of the cooker hood.

  The bases of round pipes, aerials etc. that are led through the roof are sealed with rubber soakers (Ø 40–350 mm). For renovations, a lead-through soaker are available for later installation (Ø 12–102 mm). The soakers are equipped with an aluminium/lead collar that can be bent into the same shape as the profile. Putty the gap between the soaker and roofing sheet and fix with screws.

  Accurate installation instructions for each type of lead-ins are included in the lead-in packages.

- **Fire hatches**
  A fire hatch is installed as near the ridge as possible, entirely over a roofing sheet. The upper side of the fire hatch is covered with a steel sheet that extends under the ridge capping. Fire hatch is fixed with self-drilling screws.

- **Chimney flashings**
  Chimney flashings are installed by cutting an appropriate hole in the profile sheets. N.B. if the chimney flashings are installed after the roofing sheets, the sheets must be covered well up to the eaves for the duration of the work. The chimney is equipped with a flashing either only in its base or all over, followed by a steel sheet installed on the top part of the chimney's side, extending from over the flashing to under the ridge capping.

- **Check the following annually:**

The ventilation of roof structures still works
Condition and fixings of rainwater systems
Condition and fixings of roof safety products
Condition, tightness and fixings of lead-ins
Condition of seals
Condition and fixing of self-drilling screws
Condition of paintwork on roofing sheets and flashing

- **When necessary:**

Clean the roof
Remove snow
Remove leaves, twigs etc.

- **Roof maintenance**

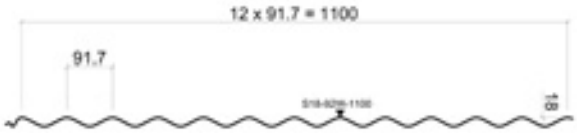
Annual maintenance
To ensure optimal condition and long service life the roof should be inspected regularly.

Removal of leaves, etc.
Usually rainwater is enough to keep the paint surface clean. But fallen leaves, twigs etc. are not always washed away by rainwater and should be cleaned annually. Roof valleys and rainwater systems also need to be cleaned annually.

Cleaning
Dirty or stained areas can be washed with a soft brush and water. Pressure washers (up to 50 bar) may also be used. More persistent dirt can be cleaned with detergent intended for cleaning painted surfaces. Follow the detergent's usage instructions or contact the product manufacturer to find out more about its suitability. A difficult localised stain can be rubbed off with a cloth dipped in white spirit. The paint coating should be rinsed from the top down to get all the detergent off. Finally the rainwater systems must be rinsed with water.

Removal of snow
Snow usually falls from painted roofs, and the snow that remains does not exceed the roof's structural load capacity. However, if the snow load needs to be reduced, a layer of snow (~100 mm) should be left on the roof to protect the coating.

Profile S18-92W-1100
Effective width 1100 mm
Material thickness 0.45 - 0.6 mm

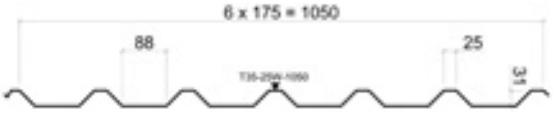


Profile T19-20W-1150
Effective width 1150 mm
Material thickness 0.45 - 0.6 mm

Profile T20-30W-1090
Effective width 1090 mm
Material thickness 0.45 - 0.8 mm

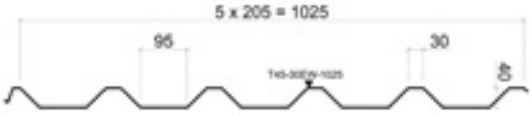
Profile T20-39SW-1000
Effective width 1000 mm
Material thickness 0.45 - 0.7 mm

Profile T35-25W-1050
Effective width 1050 mm
Material thickness 0.45 - 0.9 mm



Profile T45-30W-905
Effective width 905 mm
Material thickness 0.45 - 1.0 mm

Profile T45-30EW-1025
Effective width 1025 mm
Material thickness 0.5 - 1.0 mm



Contact information

Technical support department (more information) Tel. +358 20 59 127 Fax +358 20 592 7700

Rautaruukki Oyj www.ruukki.com