KMEW

ROOGA Miyabi Steel Batten Method

Design/Installation Manual July 2025

KMEW Co., Ltd.

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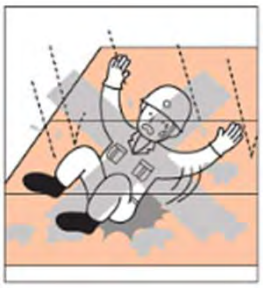
General Precautions

Safety precautions

Prohibited

Installation on wet roofing materials

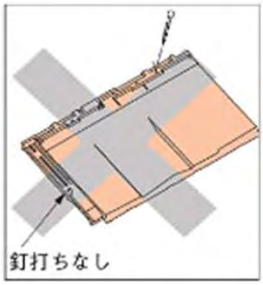


If working on wet roofing Materials can make them slippery and lead to falls and crashes. Please Avoid working on wet roofing materials/

Precautions to be taken to prevent shattering

Prohibited

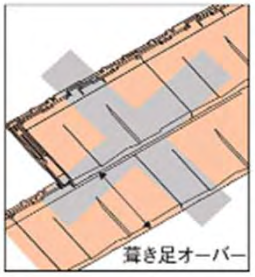
Roofing materials installed using improper fastening methods



If roofing materials are not installed using the specified fastening method, wind resistance performance will be reduced, causing shattering during high winds.

Prohibited

Exceed the exposed area of the panel



Exceeding the standard exposed area of the panel may leaking and shattering.

Prohibited

Insufficient nails or screws are used to fasten coping and trim.

If the required number of nails or screws are not installed, the wind resistance performance will be degraded, and the roof will be susceptible to scattering in high winds. Be sure to use the specified number of nails or screws to fasten the roofing material.

General Precautions

Precautions for prevention of rainwater leakage

Use for roof slopes below standard

Prohibited

Failure to maintain the specified overlap distance may cause leaks.

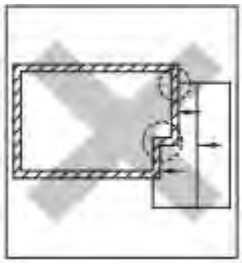
Use exceeding the maximum roof length within the standard.

Prohibited

If the roof length exceeds the maximum length standard, the amount of rainwater at the eaves will increase.,causing more water to flow around the backside of the panel,This can cause leaks.

Use on improper roof shape

Prohibited



Roof slopes toward the wall, etc., can cause leaks if the roof shape is not well designed for rain control.

Improperly installed Incidentals on the roof

Prohibited

If ancillary items such as top lights, chimneys, etc. are installed around valleys, ridges, and other parts of the building, they will not provide good rain control and may cause rain leakage.

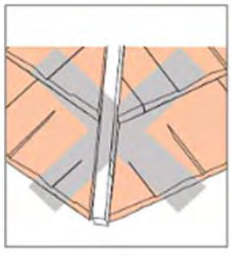
Diagonal use of roofing materials

Prohibited

If roofing materials are used at an angle to the direction of the eaves of the roof, water will run around the back of the roofing material and cause leaks.

Installation without edge cutting at the hip

Prohibited



Without edge cutting, rainwater will run into the inside of the hip and causing leaks.

Screws into the drainage part of the flashing.

Prohibited

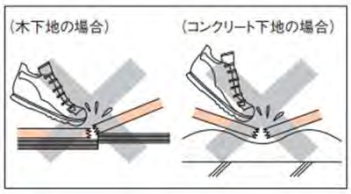
Screws into the drainage part of the flashing will allow rainwater to run around and cause leaks.

General Precautions

Precautions for prevention of cracks

Prohibited

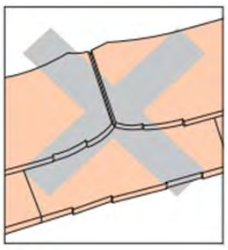
Installation of roofing materials on uneven or stopped substrates



Large steps, Protrusions, gaps, etc. can cause the roofing material to step on and lift at the tips.

Prohibited

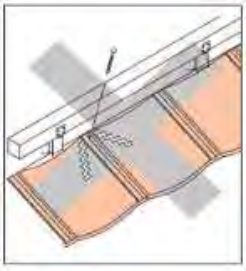
Installation of roofing materials tightly butted against each other.



If the roofing materials are attached by strongly sticking them against each other, it may cause warping of the roofing materials.

Prohibited

Screws directly into the roofing material



Nailing or screwing directly into the roofing material without first drilling holes when securing small widths of roofing material can cause cracking.

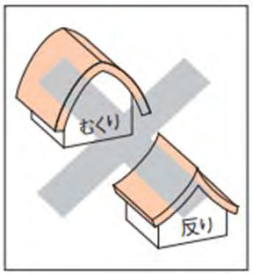
Prohibited

Too many screws driven in

Over-driving the screws can lift the tip of the roofing material and cause the tip to open or step cracks.

Prohibited

Use on curved shaped roofs



If roofing materials are installed on curved or circular shapes, they will not be able to accommodate the shape and may cause cracking.

Prohibited

Use on improper roof Substrate

Large deflection, unevenness, etc. of the substrate can cause the roofing material to step on and crack.

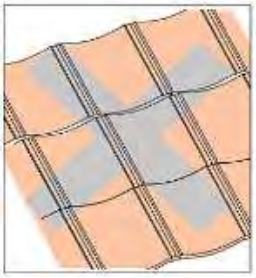
Prohibited

Installation on baseboards with insulation installed on top of the baseboards

Installation on a non-rigid substrate can cause the roofing material to step on and crack..

Prohibited

Installation with improper shifting.



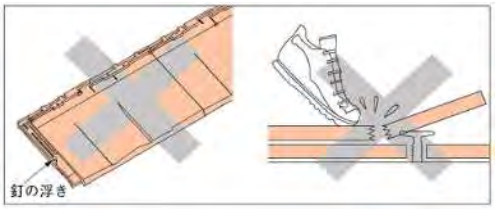
Incorrect installation of the roofing materials may cause unevenness, opening at the tips, and cracks.

General Precautions

Precautions for prevention of cracks

Prohibited

Insufficiently driven in screws



If the screws are installed with the screw heads floating, it may cause the roofing material to crack when walking after installed.

Prohibited

Screws too tight when fixing accessory tiles.

When fastening accessory tiles, over-tightening screws may cause cracking.

Prohibited

Walking around the area where the part was installed

Walking around the area where the member is attached under the roofing material will cause it to crack.

Prohibited

Walking of roofing material right and left joints.

Walking on the left-right joint may cause the roofing materials to

Precautions for prevention of dirt and stain

Prohibited

Walking on roof surfaces with dirty shoes

If you walk on the roof surface with the soles of your shoes soiled with mud or other contaminants, the mud will adhere to the roofing material and cannot be removed.

Prohibited

Wipe off stains on the ROOGA with thinner or other solvents

Wiping paint from panels with thinner or other solvents can cause discoloration.

If paint or other contaminants adhere to the ROOGA, repair them with touch-up paint. If the stain is extensive, replace the siding panels.

Prohibited

When painting walls and other surfaces, be sure to cover the roof surface with a sheet or similar material.

When painting walls and other surfaces, cover them with a sheet to prevent adhesion to roof surfaces and components. When covering, do not use adhesive tape or glue as it may peel off the surface coating of the roofing material when the cover is removed.

General Precautions

Health and safety

1. Warning about silica dust

WARNING: AVOID BREATHING SILICA DUST

KMEW ROOF panels contain silica. Inhalation of respirable silica dust can cause silicosis a potentially disabling lung disease. When drilling, cutting, or abrading cladding panels during installation or handling, (1) Work outdoors where feasible, otherwise use mechanical ventilation, (2) Wear a dust mask or, if dust may exceed the specific level defined by the local laws or regulations, use an appropriate respirator approved or recommended by the local authority, (3) Warn others in area. For further information, refer to material safety data sheet or consult employer.

FAILURE TO ADHERE TO WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY.

2. Handling and carrying

• One pallet weights approx. one ton.

• Take extra care to avoid hitting anything with the panels or dropping them, or the edges may be damaged.

• Don’t touch the panels with dirty hands.

<Transportation by vehicle>

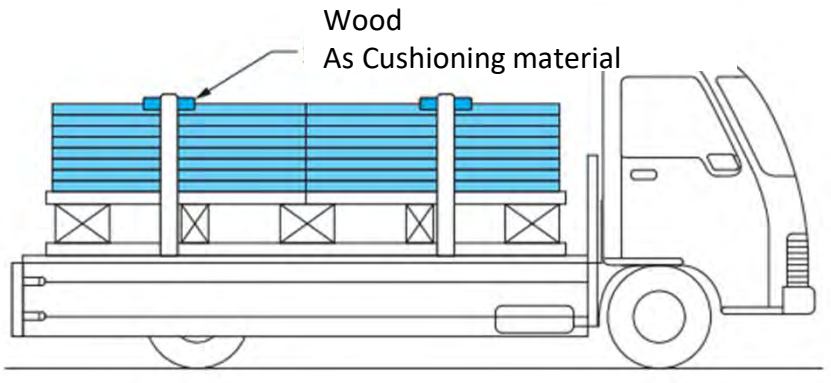
• When transporting the panels by vehicle, stack them flat.

• When loading panels onto a pallet, strap the panels down and use blocks to protect the panel edges.

• When loading/unloading panels, take extra care to avoid damaging them.

• When hoisting panels, put plates between the panels and ropes to avoid damaging the panels.

• Don't stack the pallet with more panels on top of the pallet with fewer panels.



General Precautions

Health and safety

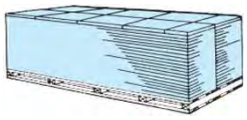
3. Handling and storage

- Store the panels flat and under cover. Keep the panels dry and off the ground prior to installation to avoid moisture conditions that could affect the quality of the work.
- Pallets should be loaded and unloaded with a forklift or sling. Taking care not to drop the pallet.
- Keep the panels clean when handling on site, and take care not to damage the edges.
- When necessary to stand panels on edge prior to installation, take care to avoid contact with rough and abrasive surfaces that could damage the factory-applied coating or sealer.
- The maximum number of the pallets to be stacked on a flat concrete floor in an indoor storage should be four.

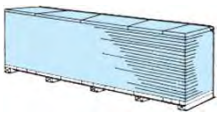
Temporary outdoor storage:

Indoor storage:

a) On a pallet



b) On spacers



●Do not place panels directly on the ground.

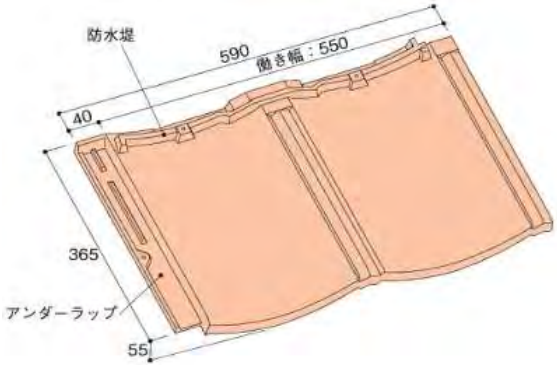
4. Health precautions

1) When cutting the panels, prolonged inhalation of a large amount of dust may be harmful to your health. Follow the instructions below:
   - Use a dustproof cutter equipped with an interlocked dust collector, or local exhaust equipment.
   - Wear a dustproof mask and dustproof glasses.
   - Work in a well-ventilated location.
   - Make sure to gargle and wash your hands.

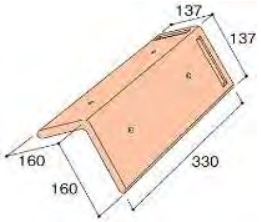
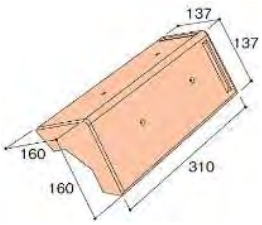
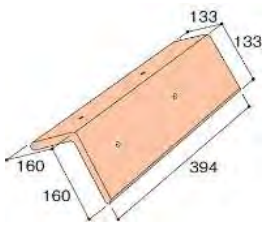
2) When using a solvent-based material, such as repair paint, waterproof sealer, caulking, and caulking primer, wear an appropriate mask and protective gloves, and work in a well-ventilated location.

Product specifications

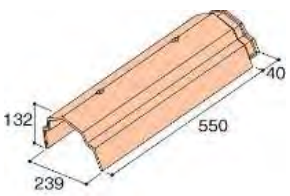
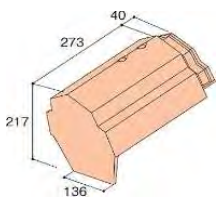
Product Specification

Product name	ROOGA Miyabi
Product No.	RJ4*U
Shape	
Applicable degree	16.7 ~ 45.0
Overall size [mm]	W590 × L365
Effective size [mm]	W550 × L250~300
Apparent height	55mm
Weight [kg/pc]	Approx. 3.4

■Verge tile

Product name	Verge tile	Verge starter	Verge end
Product No.	DRF4*U	DRG4*U	DRH4*U
Shape			
Applicable degree	16.7 ~ 45.0	16.7 ~ 45.0	16.7 ~ 45.0
Effective length [mm]	250~300	230~280	(Overall length 394)

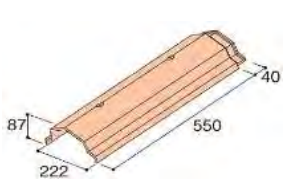
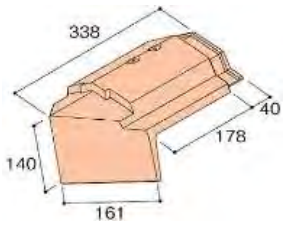
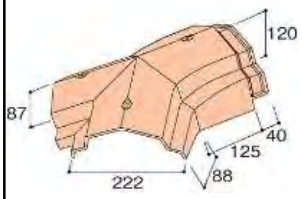
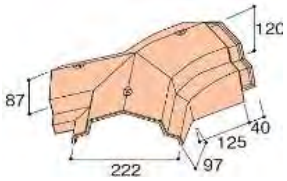
■Ridge tile

Product name	Ridge tile	Ridge starter	
Product No.	DRA4*U	DRB4*U	
Shape			
Applicable degree	16.7 ~ 45.0	16.7 ~ 45.0	
Effective length [mm]	550	273	

Product specifications

Product Specification

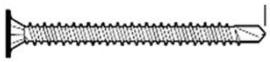
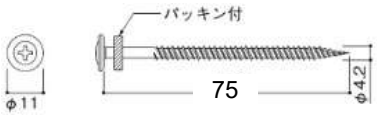
■Hip tile

Product name	Hip tile	Hip starter	Hip apex
Product No.	DRM4*U	DRD4*U	DRC4*U
Shape			
Applicable degree	16.7 ~ 38.7	16.7 ~ 45.0	21.8 ~ 31.0
Effective length [mm]	550	298	—
Product name	Hip apex (for low slope)		
Product No.	DRC4*BU		
Shape			
Applicable degree	16.7 ~ 21.8		
Effective length [mm]	—		

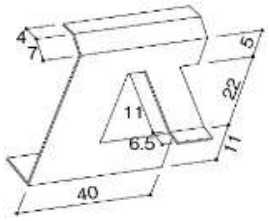
Product specifications

Product Specification

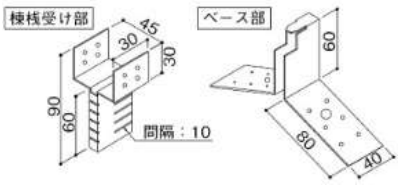
■Fastening screw

Area of use	Product Name	Product No	Shape	Specification
Fastener for ROOGA	ROOGA screw L50	KLWBR50		Stainless steel
Fastener for accessory tile	Accessory tile screw L75	DXWB175		Stainless steel

■Clip

Area of use	Product Name	Product No	Shape	Specification
Fastener for ROOGA	ROOGA Clip	DXQJ		Stainless steel

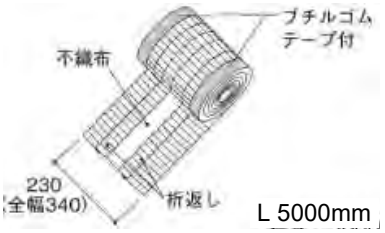
■Metal Fitting

Area of use	Product Name	Product No	Shape	Specification
Ridge Hip	Metal fitting H60-110	DXUH60		Hot-dip zinc-aluminum magnesium alloy coated steel

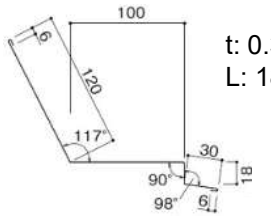
Product specifications

Product Specification

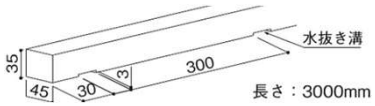
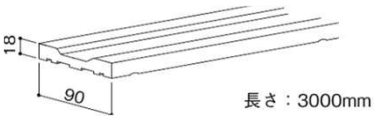
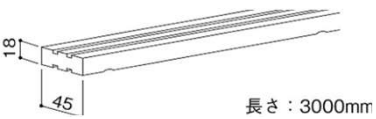
■Waterproof material

Area of use	Product Name	Product No	Shape	Specification
Ridge Hip Wall to roof	Waterproof sheet	DXTB1		Elastomer seat + Aluminum + Butyl tape

■Metal flashing

Area of use	Product Name	Product No	Shape	Specification
Wall to roof	Rain cover	DXZA*	 t: 0.35mm L: 1829m	Coated galvanized steel

■Furring for fixing

Area of use	Product Name	Product No	Shape	Specification
Ridge Hip	Ridgepole 35×45	DXBW35453		Polystyrene
Wall to roof	Coping 18×90	KLBW18903		Polystyrene
Wall to roof	Furring 18×45	KLBW18453		Polystyrene

Product specifications

Product Specification

■Use classification

Item	Product Name	Product No	Classification*1
Roof tile	ROOGA Miyabi	RJ4*U	●
Accessory tile	Verge tile	DRF4*U	●
	Verge starter	DRG4*U	●
	Verge end	DRH4*U	●
	Ridge tile	DRA4*U	●
	Ridge starter	DRB4*U	●
	Hip tile	DRM4*U	●
	Hip starter	DRD4*U	●
	Hip apex	DRC4*U	●
	Hip apex (low slope)	DRC4*BU	●
Fastening screw	ROOGA screw L50	KLWBR50	○
	Accessory tile screw L75	DXWB175	○
Clip	ROOGA Clip	DXQJ	●
Metal Fitting	Metal fitting H60-110	DXUH60	○
Waterproof material	Waterproof sheet	DXTB1	○
Metal flashing	Rain cover	DXZA*	○
Furring for fixing	Ridgepole 35×45	DXBW35453	○
	Coping 18×90	KLBW18903	○
	Furring 18×45	KLBW18453	○

*1 ●: Use genuine products, ○: Local procurement is acceptable.

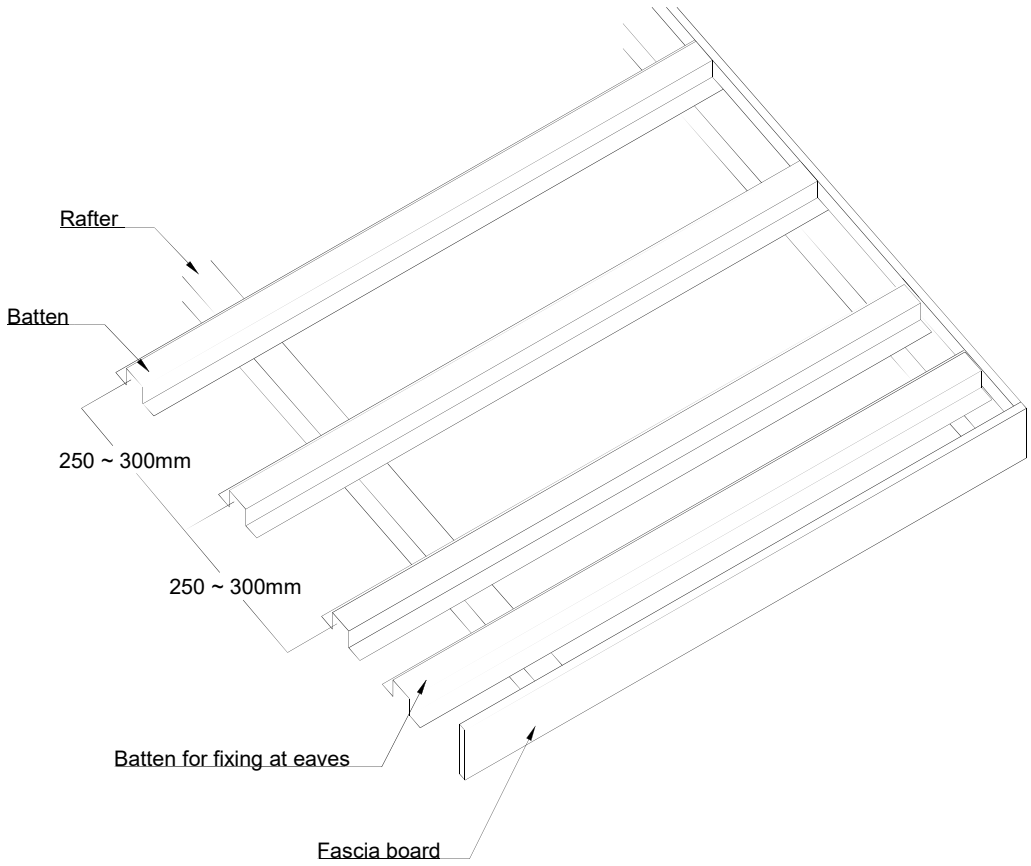
- Other parts required for installation that are not listed in the above table should be purchased locally.
- KMEW is not responsible for any problems caused by locally procured parts.

Design Criteria

Structural Requirement

1. Standard of substructure

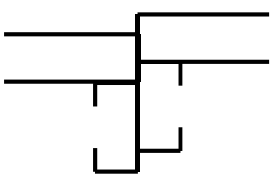
- Use a rigid material for the roof substrate. Large deflection, unevenness, etc. of the substrate can cause the roofing material to step on and crack. KMEW is not responsible for cracks in roofing materials caused by insufficient rigidity of the substrate.
- Install the battens at intervals of 250 to 300mm (same as the effective length of the ROOGA)
- Keep the spacing between rafters to 1200mm or less.



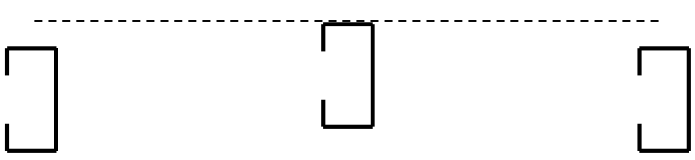
2. Structure unevenness

- The surface of the substructure should be smooth.

<Steps> 3mm or less
<Uneven> 3mm or less at 500mm intervals



Steps : 3mm or less



Unevenness : 3mm or less

Design Criteria

Structural Requirement

3. Applicable building

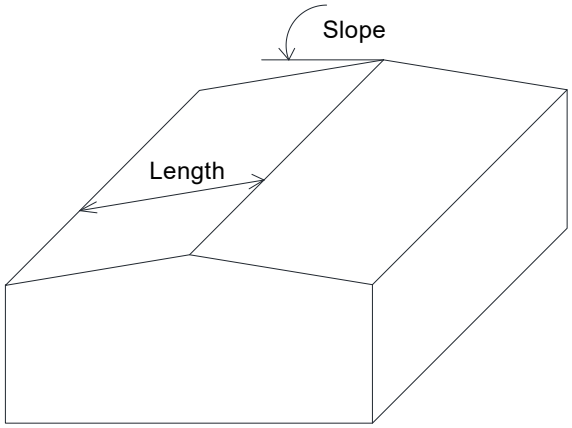
Item	Standard
Roof surface	Roof with a flat surface
Building height	31m or less

4. Applicable degrees

	Roof shape		
	Gable roof 	Shed roof 	Hip roof 
Applicable degrees	16.7~ 45.0	16.7~ 45.0	16.7~ 31.0

5. Slope and roof length

Slope	Length(max)
16.7° to 19.3° than less	10 m
19.3° to 21.8° than less	12 m
21.8° to 24.2° than less	14 m
24.2° to 26.6° than less	16 m
26.6° to 28.8° than less	18 m
28.8° to 31.0° than less	20 m
31.0° or more	20m

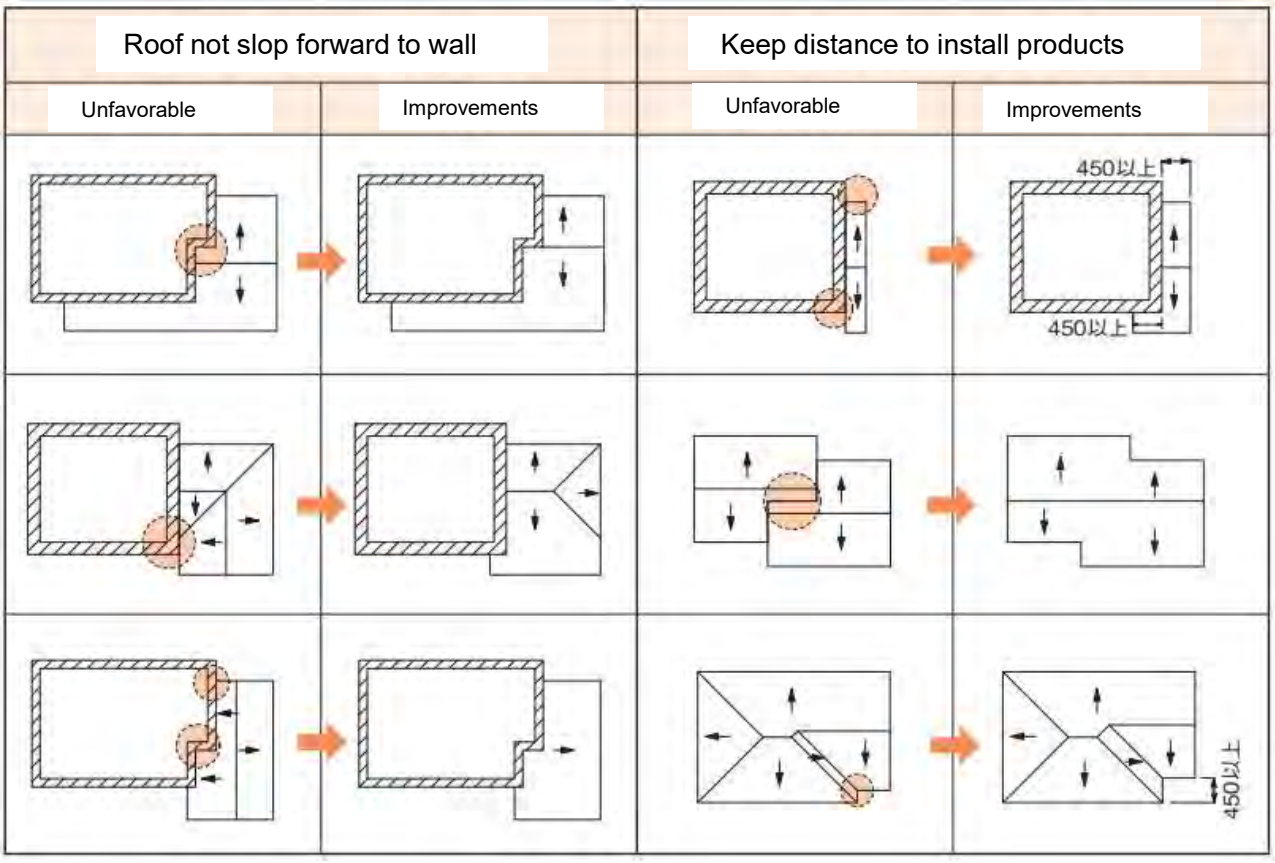


Design Criteria

Structural Requirement

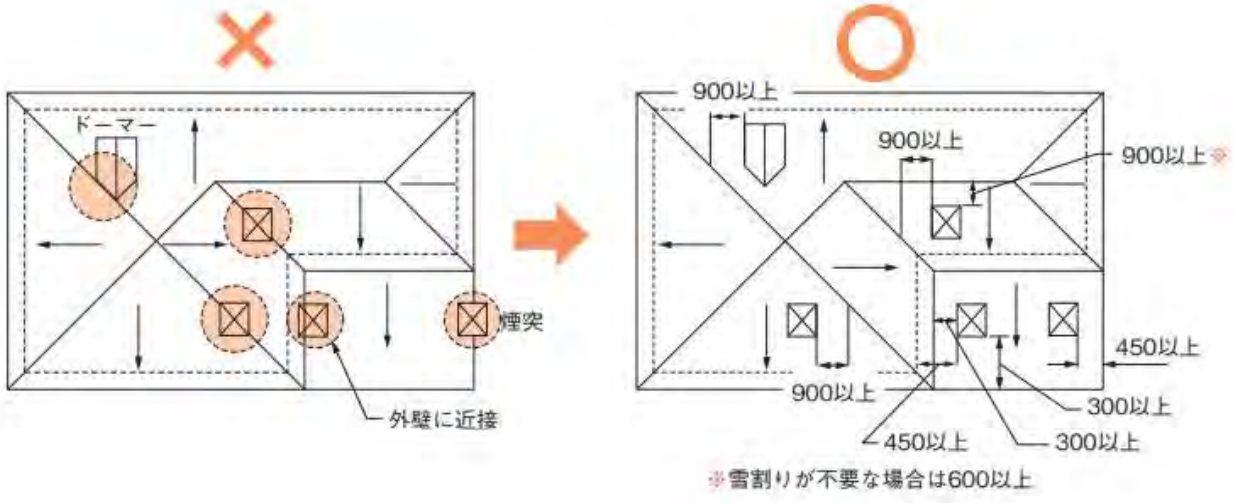
6. Roof Shape

- Avoid complicated shapes for waterproofing.
- Particular consideration should be given to waterproofing in areas where rainwater tends to collect.



7. Incidental items on the roof

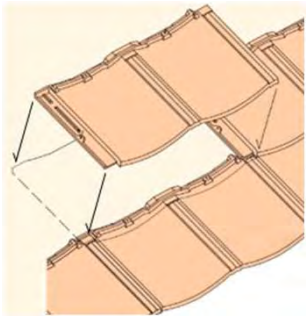
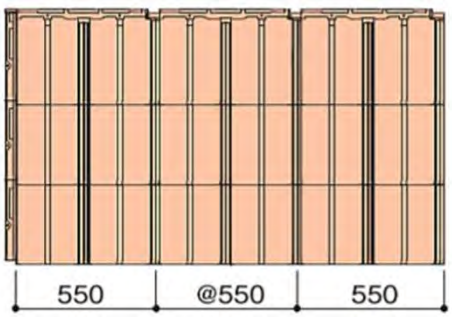
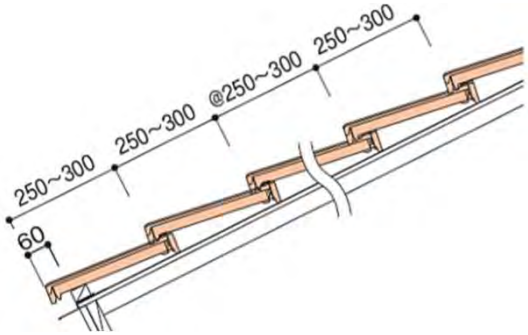
- Avoid complicated shapes for waterproofing.
- For the location of top lights, chimneys, dormers, etc., consider the distance from the valley, ridge, and other parts of the building.
- If the distance required for installation is not sufficient, there is a possibility of leakage.
- When the slope is loose or the roof surface is long in the direction of the eaves, consider the waterproofing around the appendages in particular.



Design Criteria

Installation criteria

1. Installation standards of roof tiles

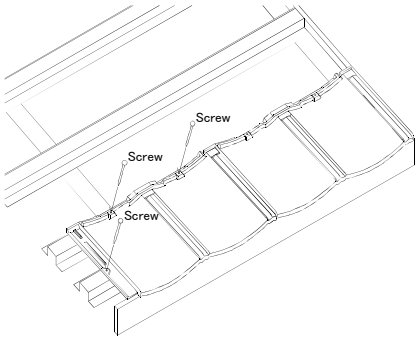
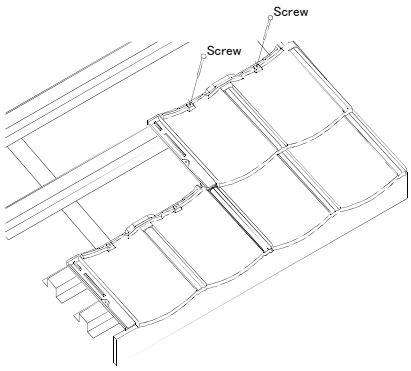
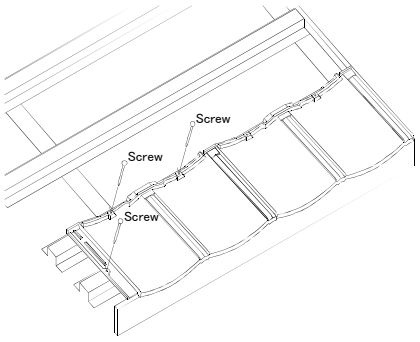
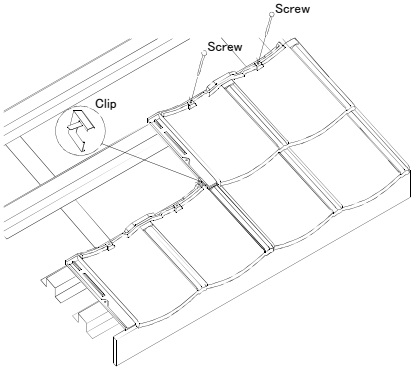
Item		Criteria
Hot to install		【Straight-line installation】 • Horizontal, Overlap the under-lap portion of the ROOGA • Vertical: Install the upper and lower ROOGA on the same line. 
Effective length	Digit direction	550mm 
	Slope direction	250~300mm 
Each part		• At the eave, should be about 60mm out from the eaves. • At the ridge, should be about 20mm set back from the ridge. • At the verge, should be allocated at the top of the ROOGA shape, avoiding valleys as much as possible. • At the wall junction, should be about 10mm set back from the wall. • At the hip, should be cut off the edge of ROOGA by about 30mm

Design Criteria

Installation criteria

2. Fastening method of roof tiles

- The fastening specifications for ROOGA are shown in the table below.

Method	Fastener		
		First tier	After second tier
Screw	Rear end	ROOGA screw L50	ROOGA screw L50
	Underlap	ROOGA screw L50	-
	Image		
Screw + clip (for high wind are)	Rear end	ROOGA screw L50	ROOGA screw L50
	Underlap	ROOGA screw L50	ROOGA Clip
	Image		

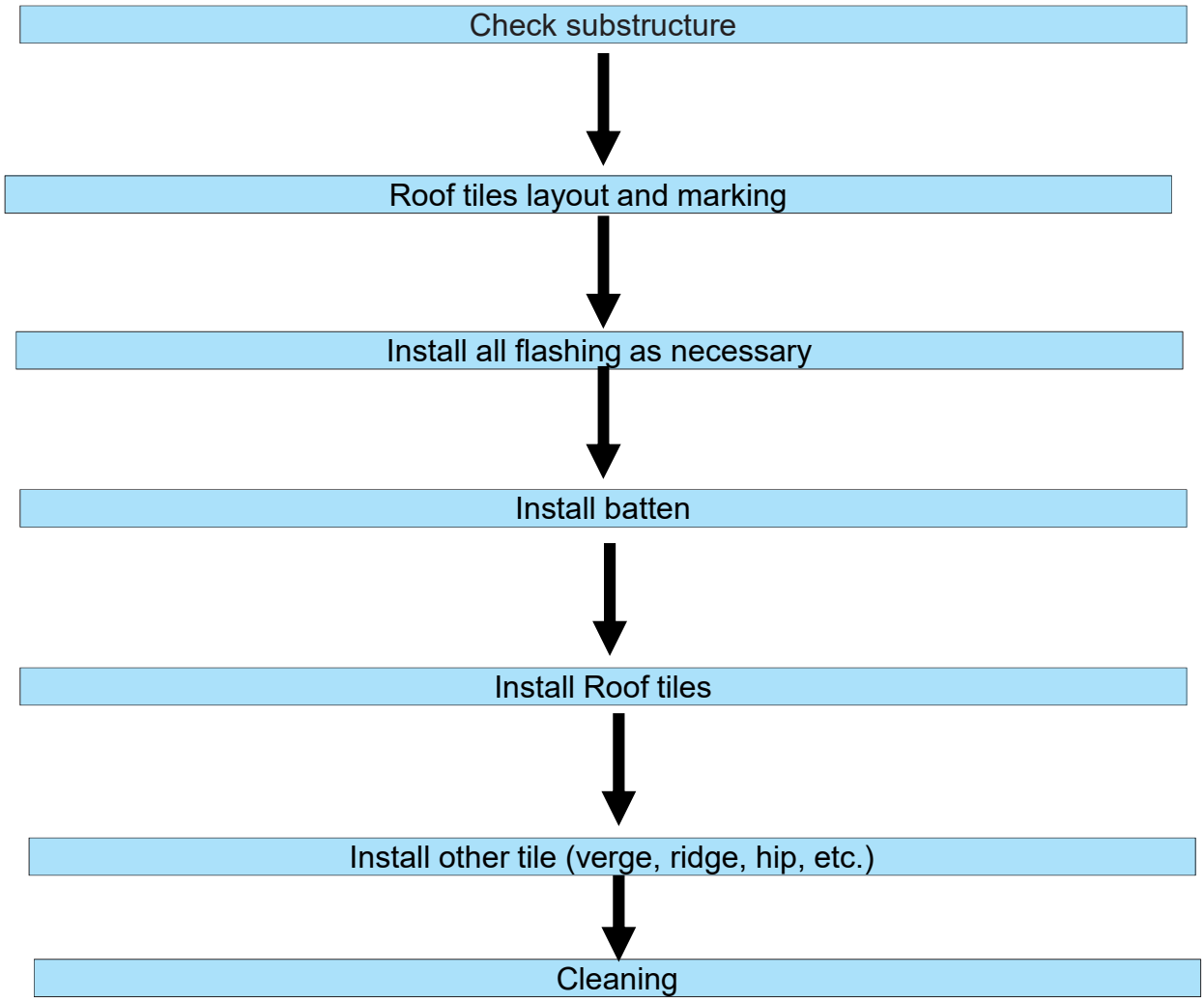
【Design wind resistance performance value】

- The design value of wind pressure resistance for above fastening specifications.
- The design wind pressure value is applicable when the design wind pressure is greater than the required wind pressure.
- The values are not taking into account a safety factor. If wind speeds are expected to increase due to terrain or building height, take appropriate measures such as considering safety factors.

Method	Design wind Pressure [Pa]
Screw	-1,530
Screw + Clip	-2,200

General Installation Instruction

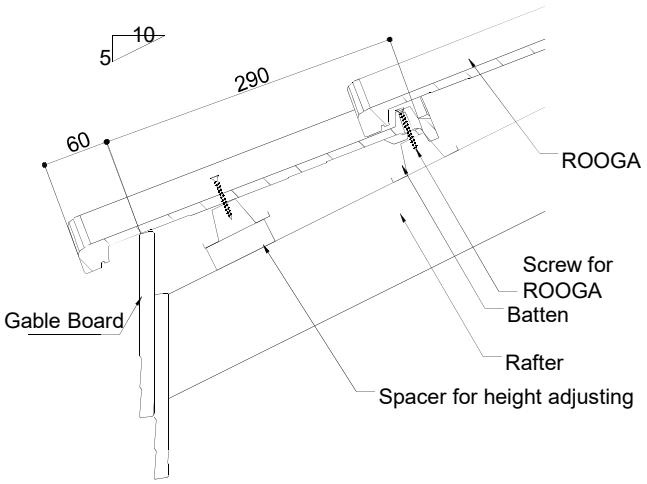
Installation Procedure



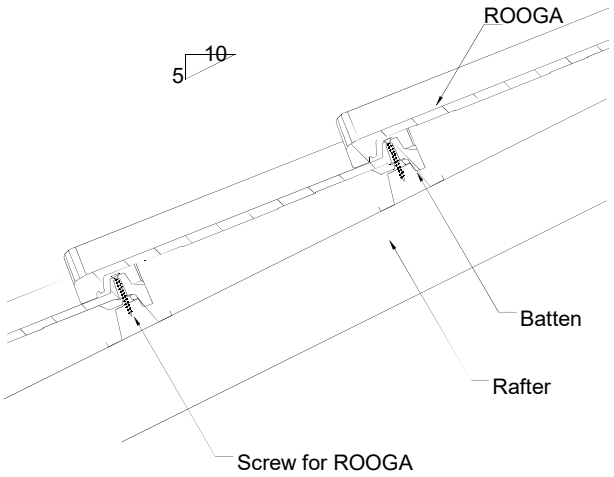
General Installation Instruction

Details

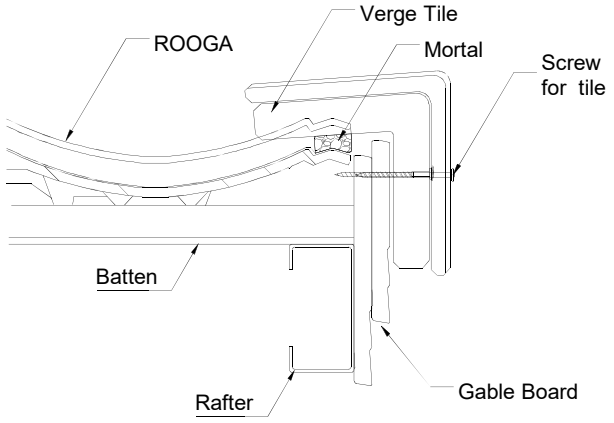
Eave



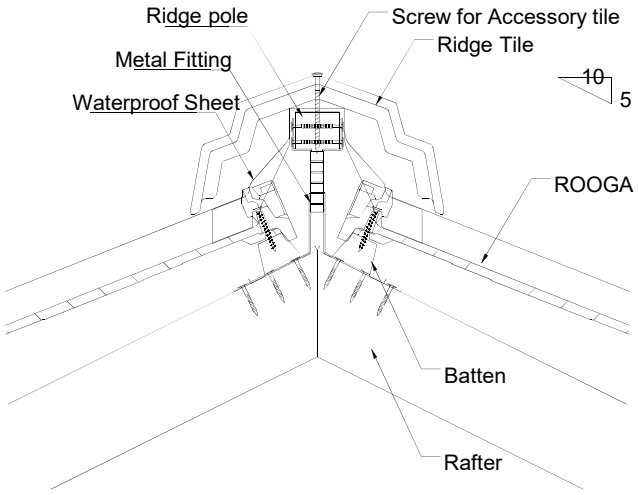
General



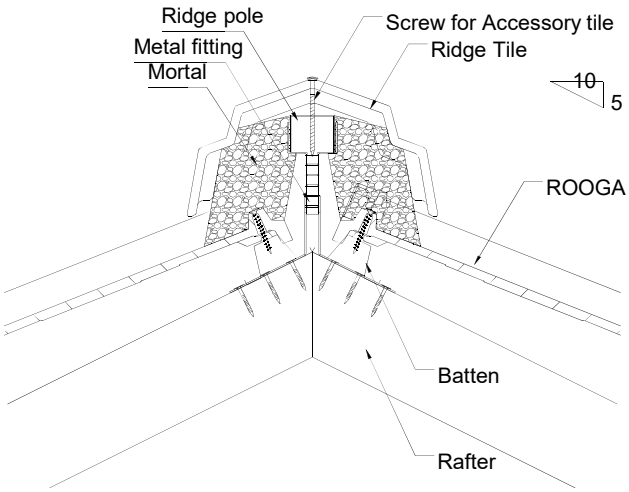
Verge



Ridge



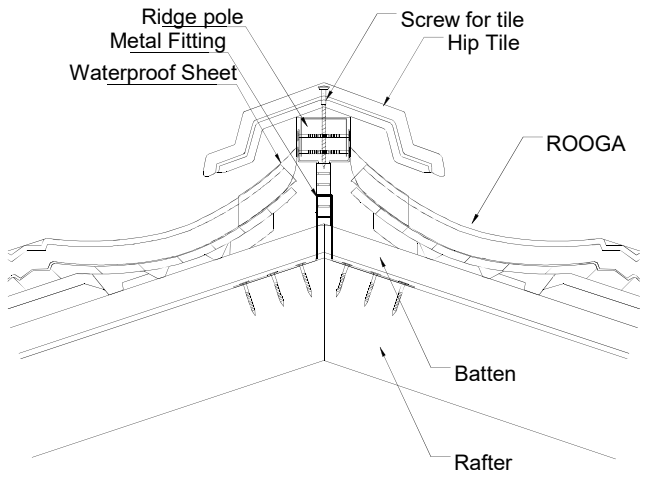
Ridge (Mortal)



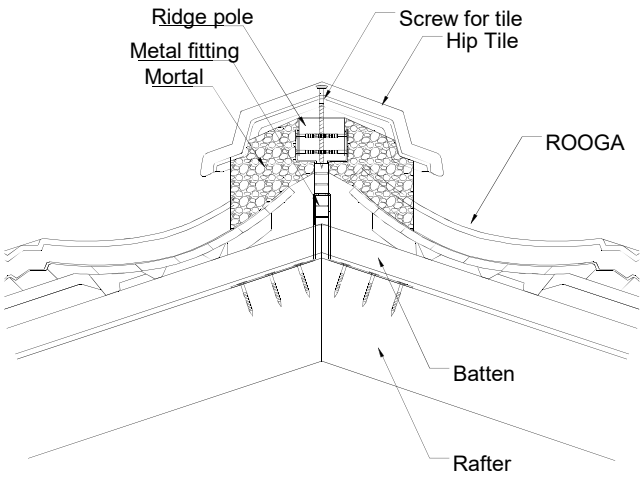
General Installation Instruction

Details

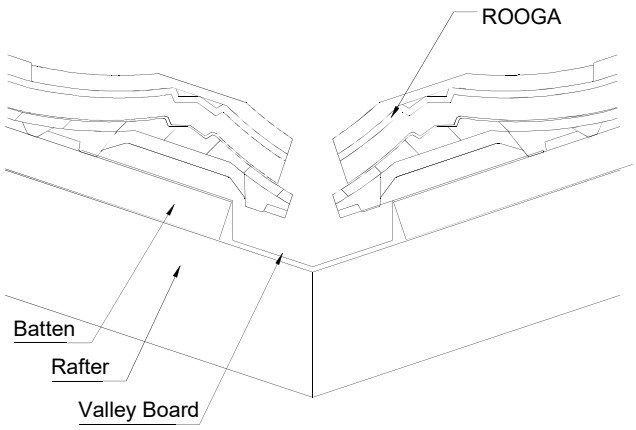
Hip



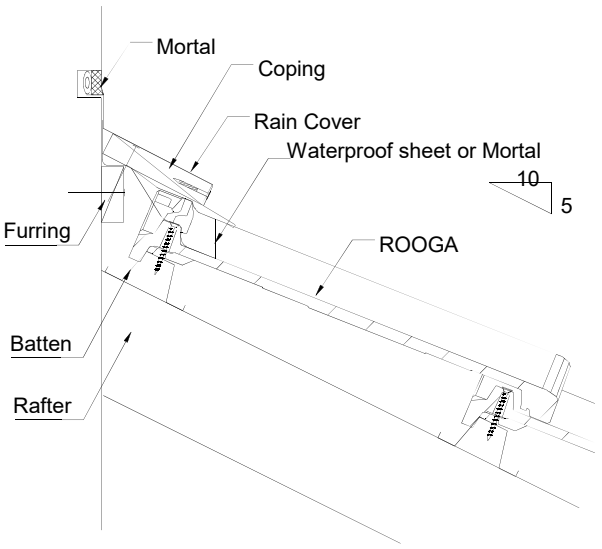
Hip (Mortal)



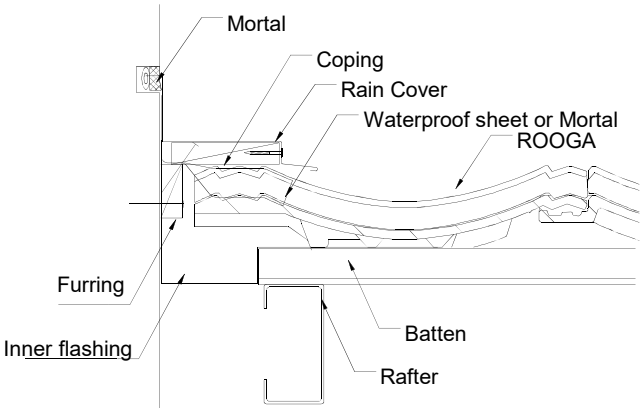
Valley



Wall to Roof (Horizontal)



Wall to Roof (Slope)



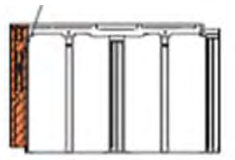
General Installation Instruction

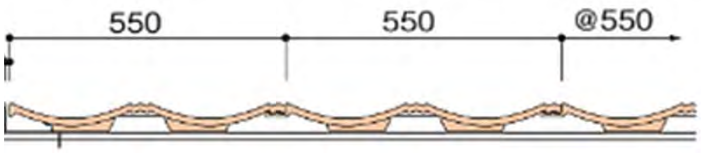
Roof tiles layout (digit direction)

Digit direction

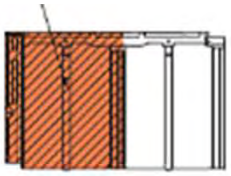
- Basically, it is allocated at 275 mm.
- Avoid small width tiles as much as possible and allocate them.
- MIYABI should be allocated at the top, avoiding valleys as much as possible.

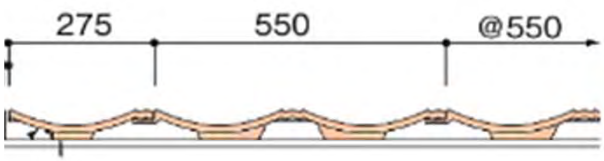
Cut

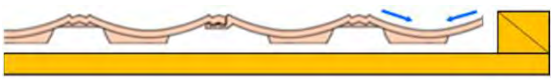




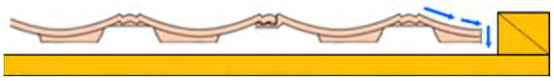
Cut







Avoid this as much as possible, as rainwater can easily penetrate.

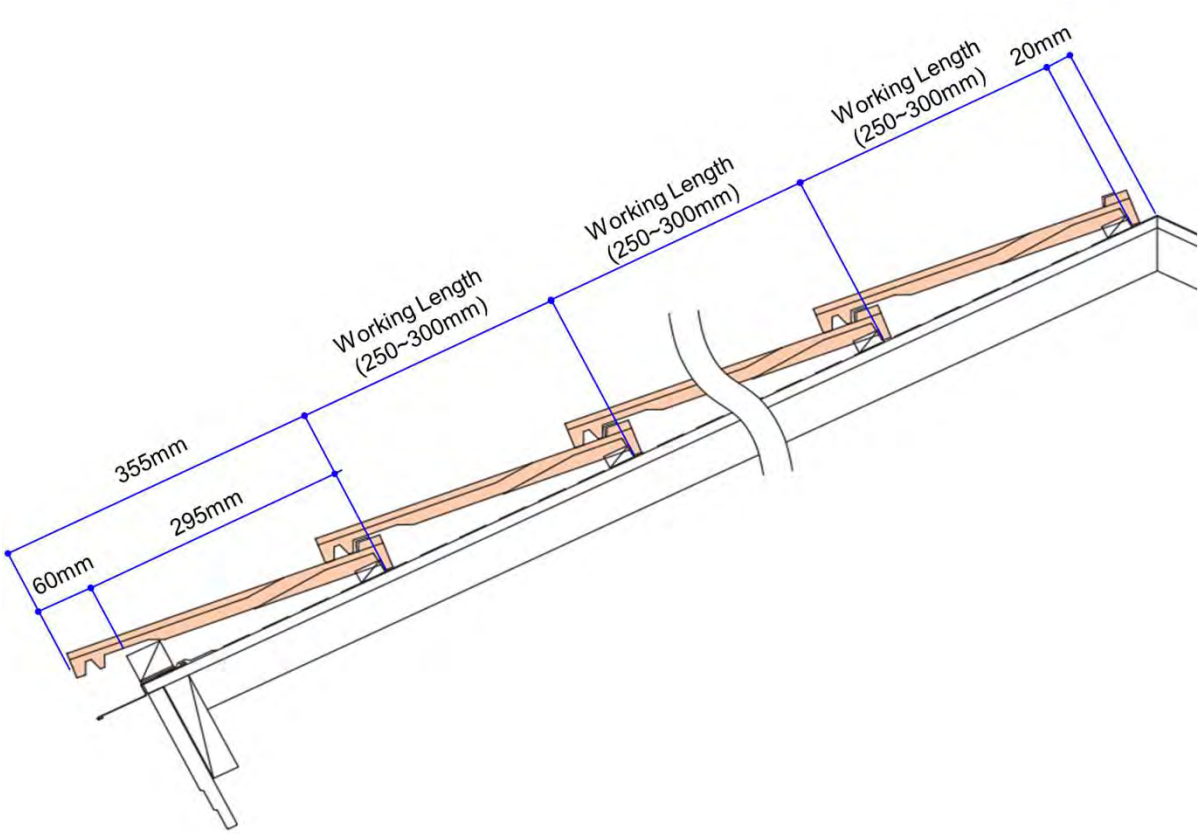


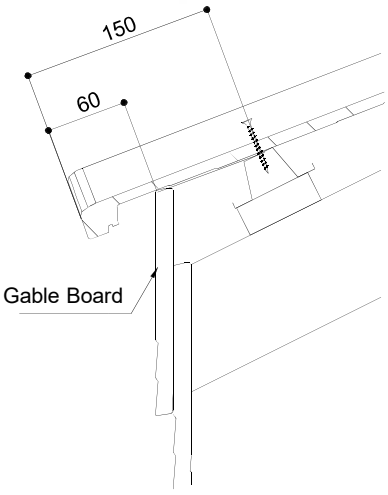
General Installation Instruction

Roof tiles layout (slope direction)

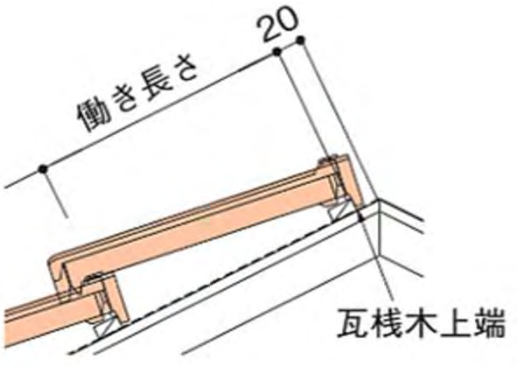
Slope direction

- Allocation is based on the top edge of the batten.
- The first tiles is allocated at 295mm from the tip of the furring for eaves.
- The first tiles should be about 60 mm out from the furring for eaves.
- Install an additional batten at the underlap fastening position of the first tiles (approximately 150 mm from the eaves)..
- The roof tiles at the top shall be 20 mm below the top of the ridge.
- Allocate the remaining length at 250mm to 300mm.





At the eaves



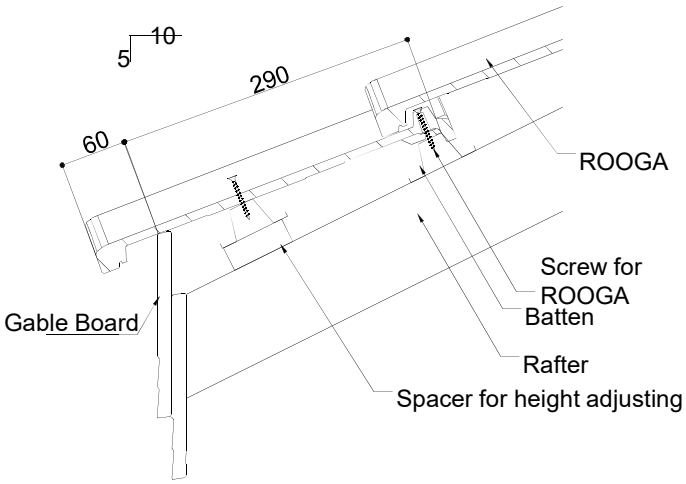
At the ridge

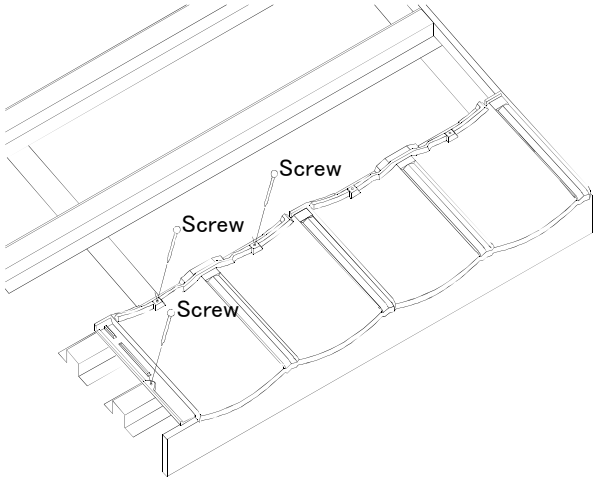
General Installation Instruction

Installation of roof tiles

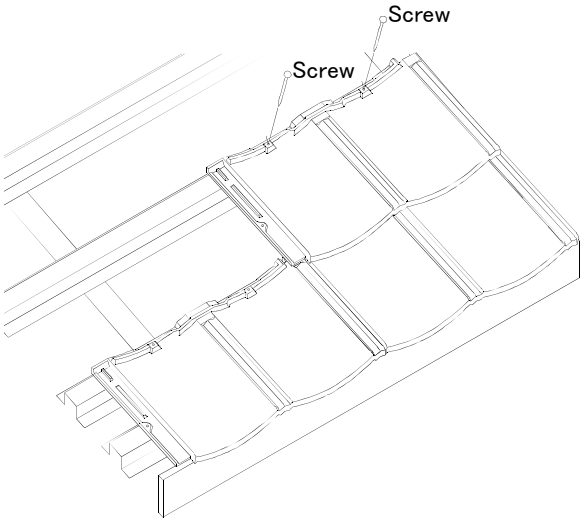
Installation of roof tiles

- Adjust the angle of the roof tiles at eaves with the gable board.
- The first tier roof tiles should be about 60 mm out from the furring for eaves.
- The first tier battens are allocated at 295mm from the tip of the furring for eaves.
- The first tier roof tiles are secured to the rear edge with two screws and screw to the underlap.





First step



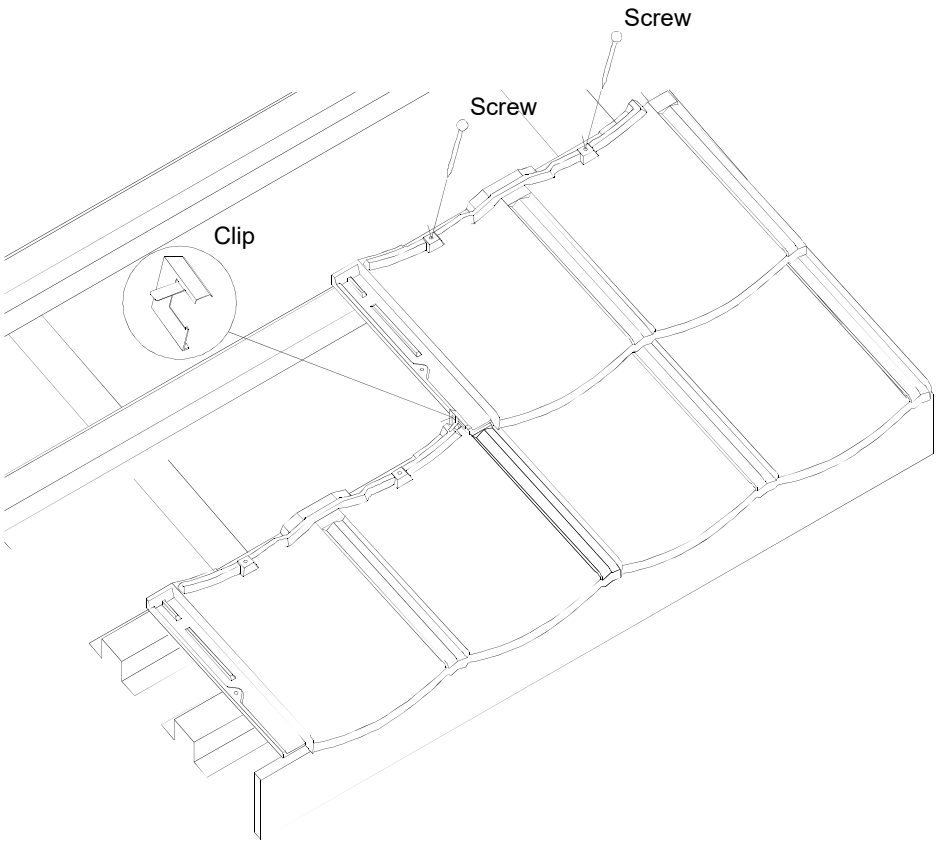
After second step

General Installation Instruction

Installation of roof tiles with clip (for areas with strong winds)

Installation of clips

- When reinforcement is necessary in areas with strong winds, after the second step of roof tiles are secured with two screws at the rear end and one clip at the underlap.

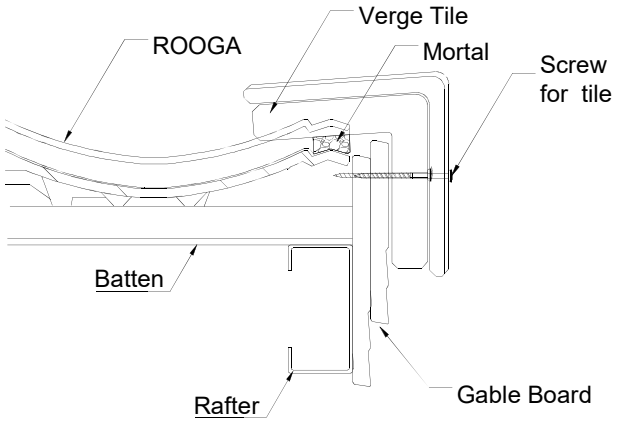


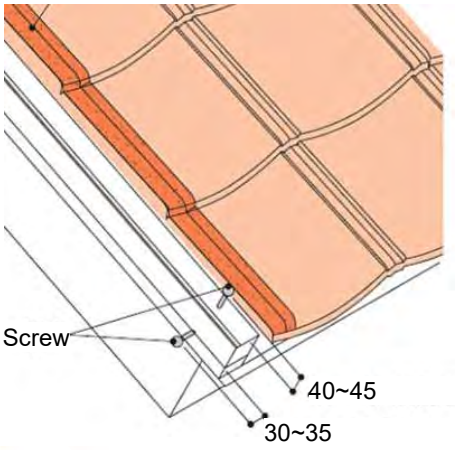
General Installation Instruction

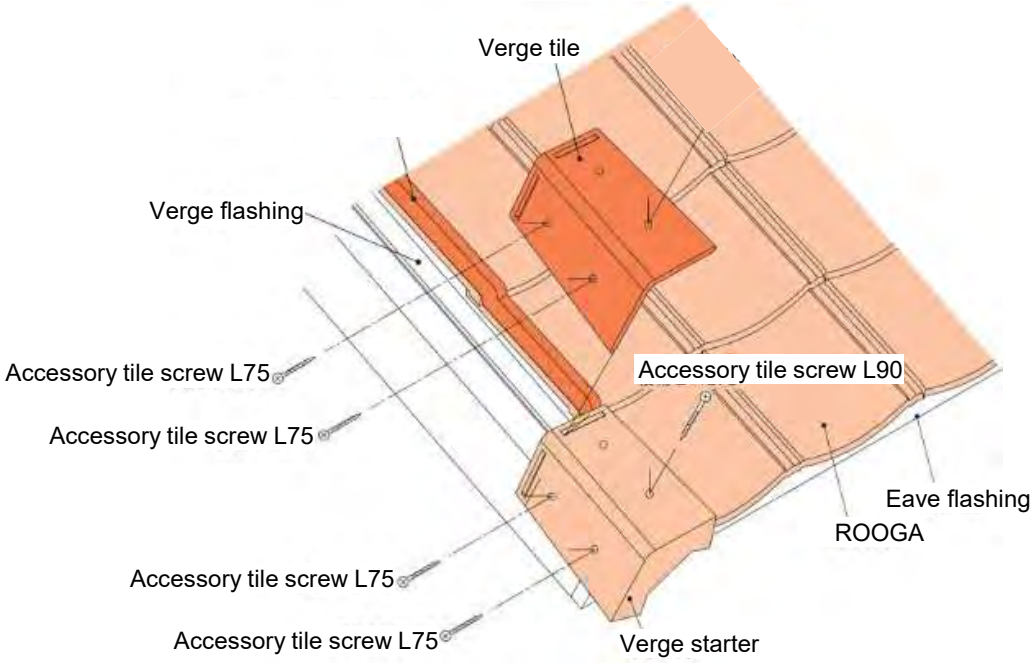
Installation of verge

Installation of verge tiles

- After roof tiles are installed, the verge tiles are installed.
- Adjust the angle of verge starter with screws.
- Mortal is installed to the gap between verge tiles and ROOGA.
- Verge tiles are secured with two side screws.







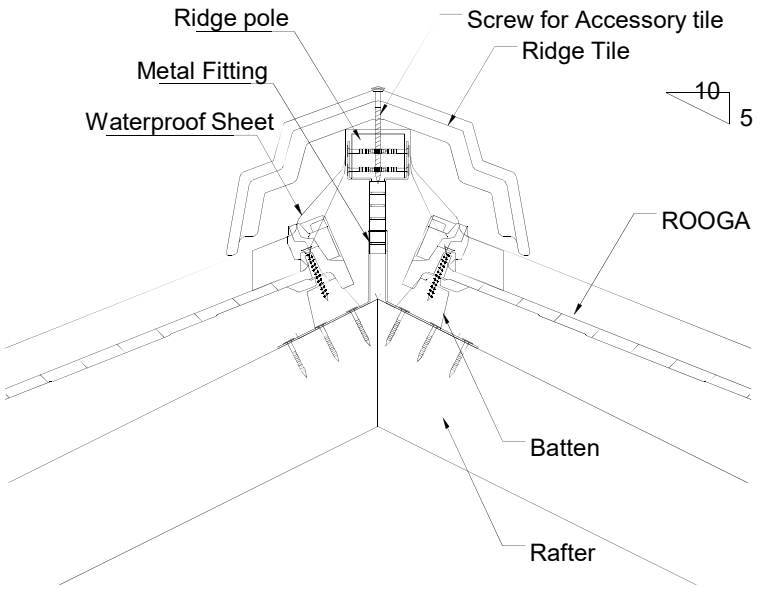
The verge tiles should be installed with a slight slope on the roof surface side. If it is sloped outward, rainwater may fall from the edge of the verge tiles.

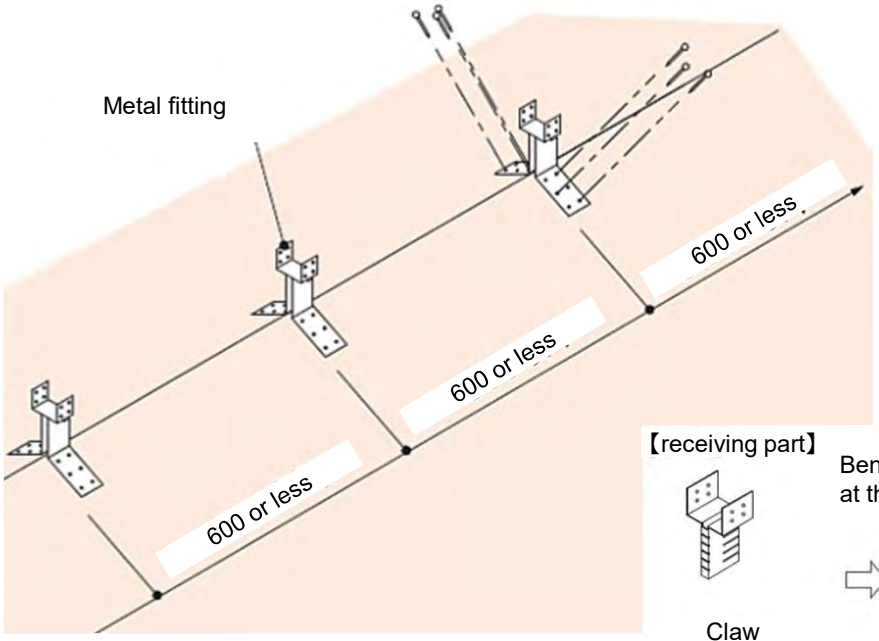
General Installation Instruction

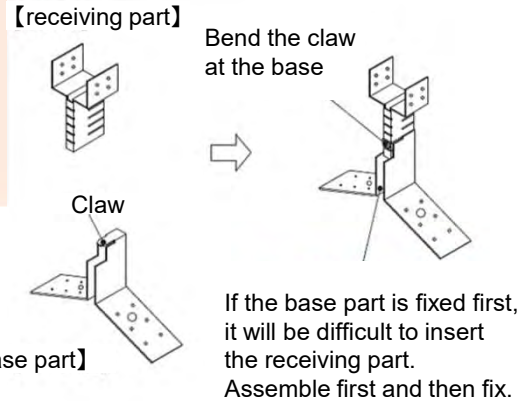
Installation of ridge

Installation of metal fittings

- Before installing the roof tiles, install the metal fittings at the ridge.
- The metal fittings are assembled by inserting the receiving part into the base part.
- Adjust the height according to the situation. (adjustable in 10mm increments)
- Install at intervals of 600 mm or less and secure with 3 screws on each side of the base section.





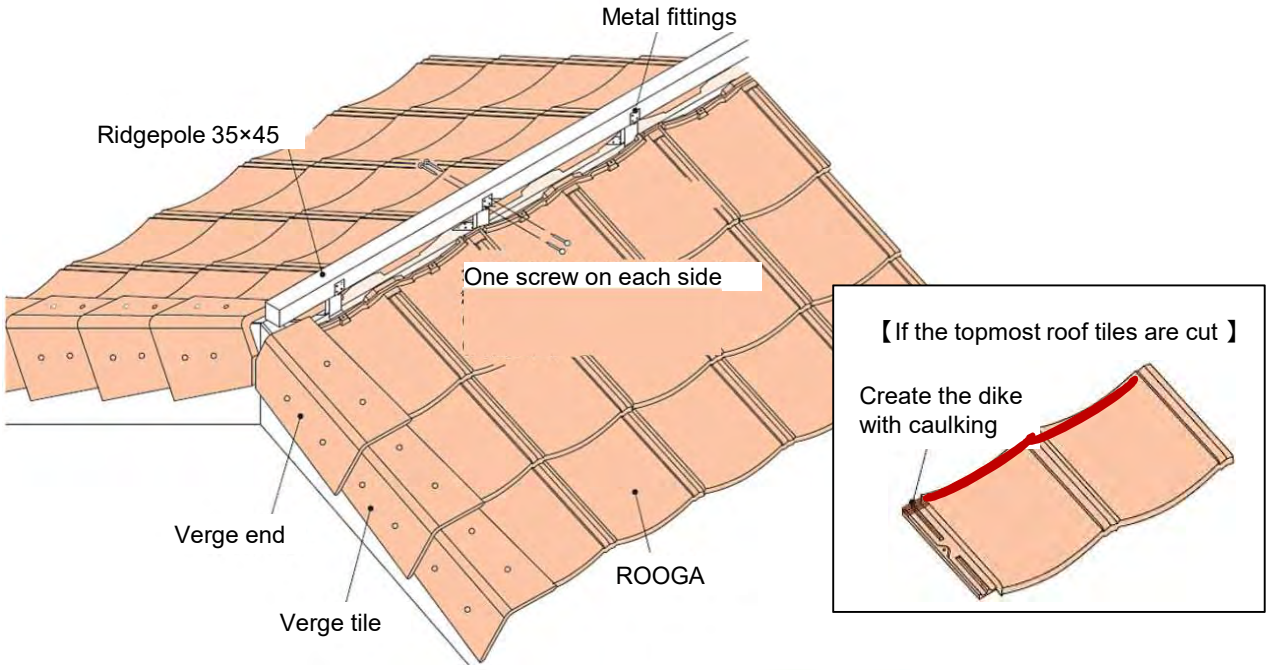


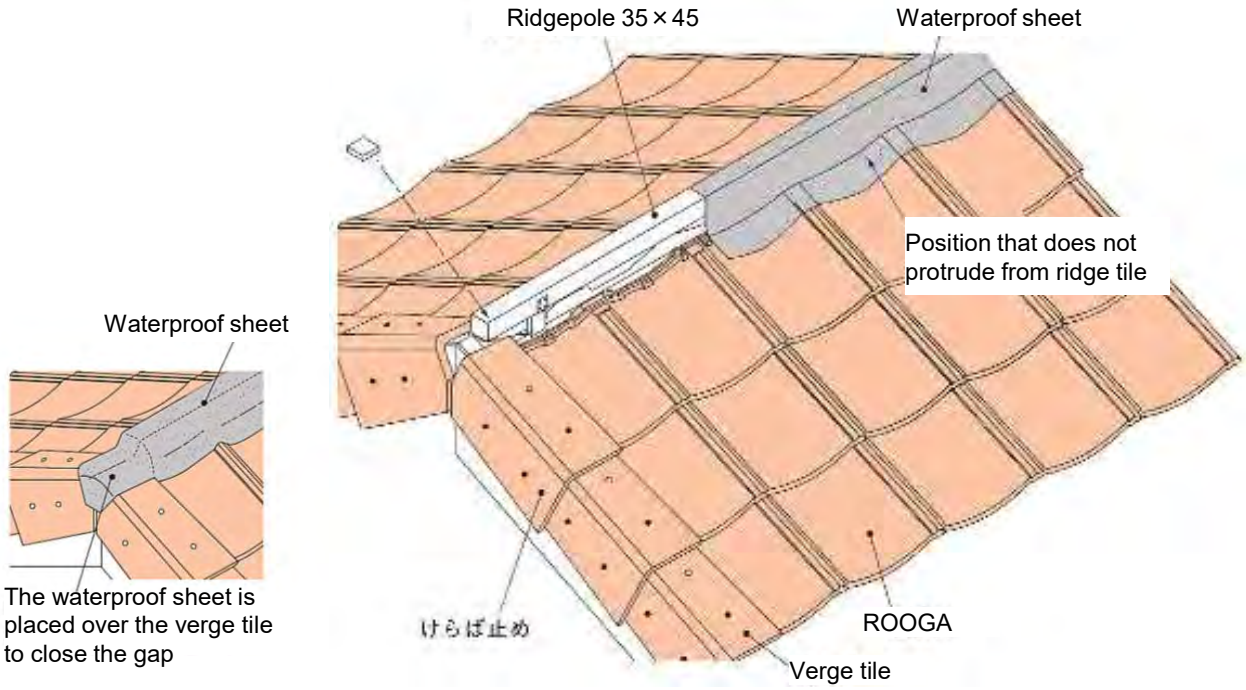
General Installation Instruction

Installation of ridge

Installation of ridgepole and waterproof sheet

- Attach the ridgepole 35✕45 on the metal fittings.
- The ridgepole is secured from the side of the metal fittings with one screw on each side.
- Place the waterproof sheet over the ridgepole, fitting it to the shape of the roof tiles so that there are no gaps.
- If the topmost roof tiles are cut and installed, adjust the height, drill pre-drilled holes in the surface of the roof tiles, and secure with screws. Also, create the waterproof dike with caulking or other materials on the rear end.
- Joints of waterproof sheet should be overlapped by at least 100 mm.
- At the edge of ridge, the waterproof sheet is placed over the verge tile to close the gap between the verge tiles.
- If mortar is used, the waterproof sheet is not required.



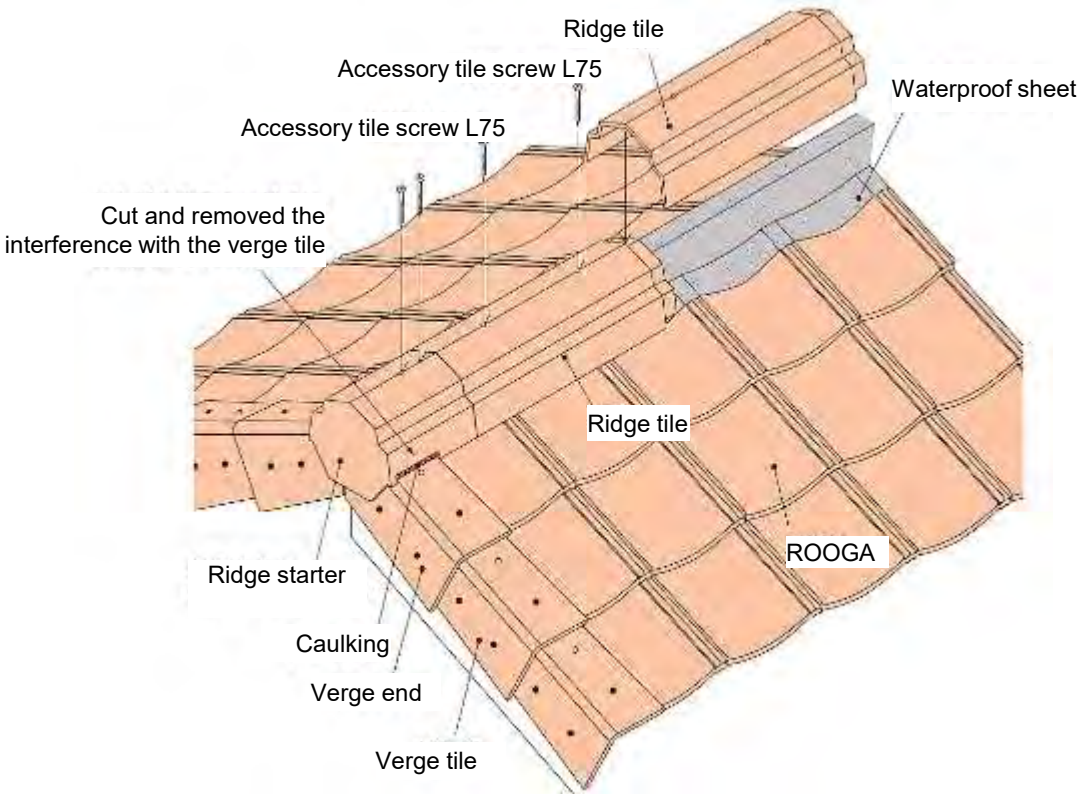


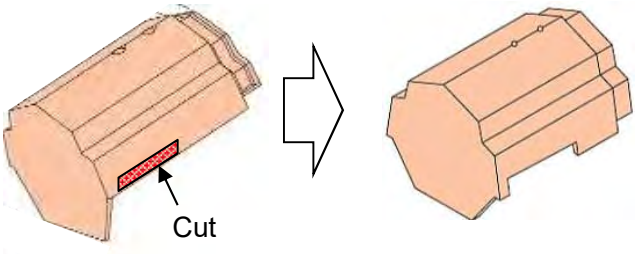
General Installation Instruction

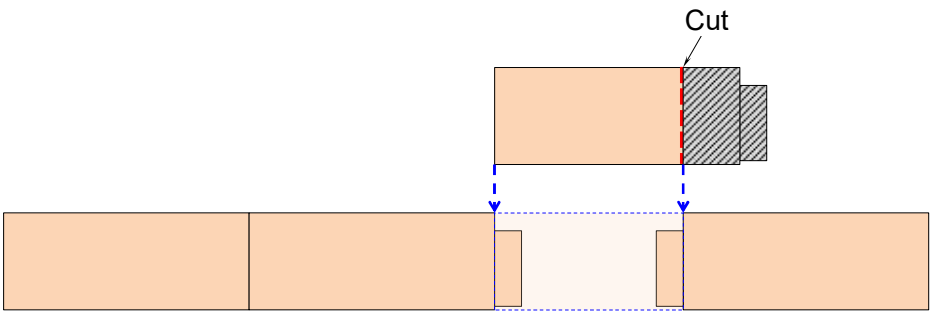
Installation of ridge

Installation of ridge tiles

- Install the ridge starter and ridge tiles and secure it to the ridgepole with two screws per tile.
- Ridge starter cut and removed the interference with the verge tiles and sealed the gap with caulking.







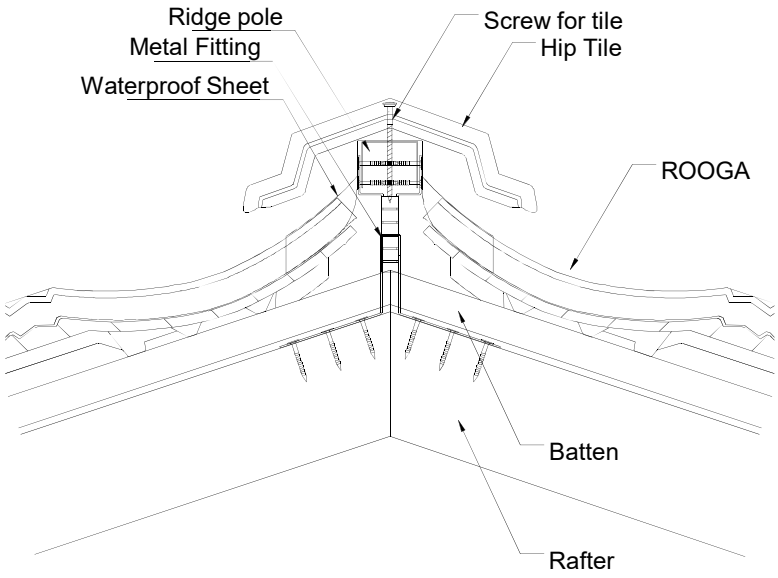
If the ridge tiles is installed from both sides, the underlap side of the last ridge tile should be cut and installed.

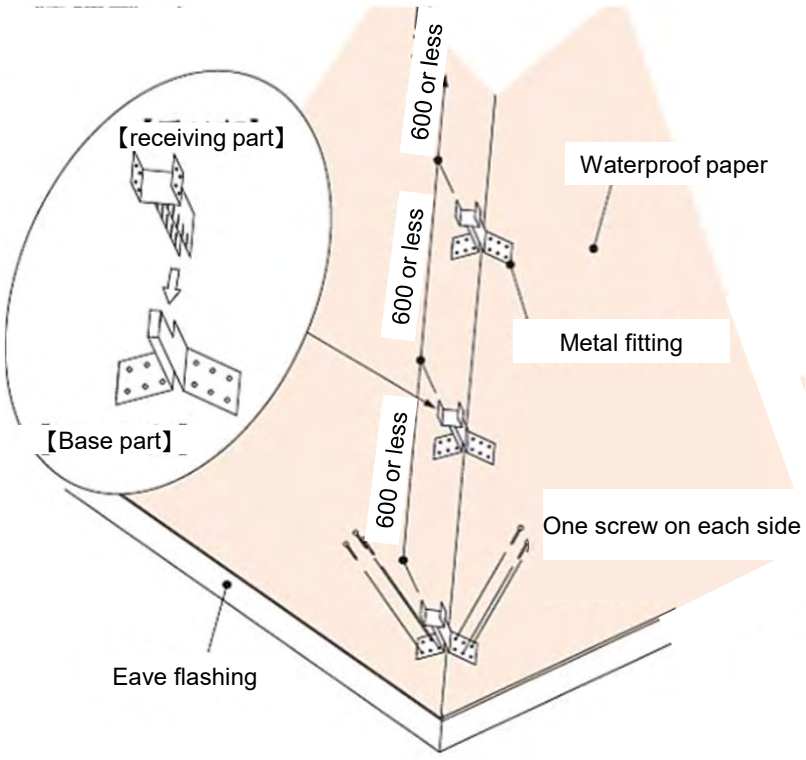
General Installation Instruction

Installation of hip

Installation of metal fittings

- Before installing the roof tiles, install the metal fittings at the ridge.
- The metal fittings are assembled by inserting the receiving part into the base part.
- The direction of attachment should be from the ridge side to the eave side.
- Adjust the height according to the situation. (adjustable in 10mm increments)
- Install at intervals of 600 mm or less and secure with 3 screws on each side of the base section.



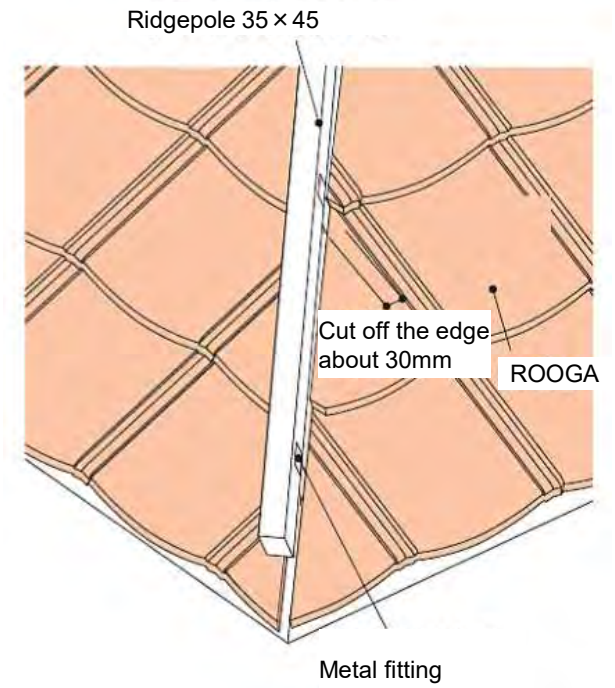


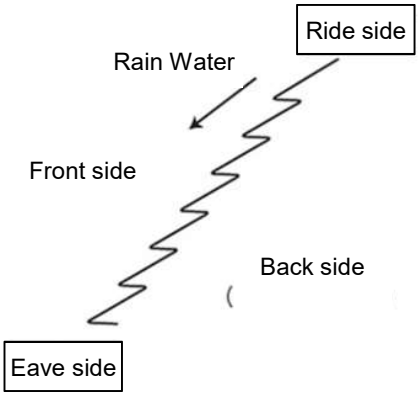
General Installation Instruction

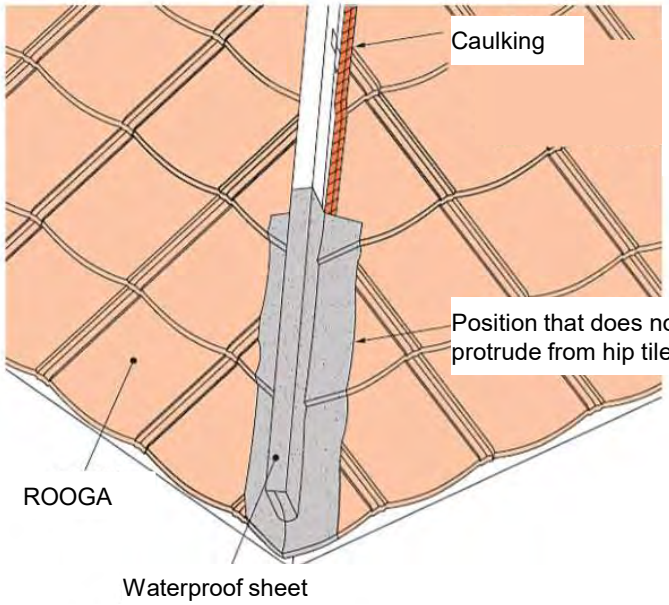
Installation of hip

Installation of ridgepole and waterproof seat

- Attach the ridgepole 35✕45 on the metal fittings.
- Cut off the edge of the roof tiles after second tier diagonally about 30mm wide.
- The ridgepole is secured from the side of the metal fittings with one screw on each side.
- Place the waterproof sheet over the ridgepole, fitting it to the shape of the roof tiles so that there are no gaps.
- The sheet should be installed in a direction that does not allow water to accumulate in the folded portion of the sheet.
- Joints of waterproof sheet should be overlapped by at least 100 mm.
- If mortar is used, the waterproof sheet is not required.





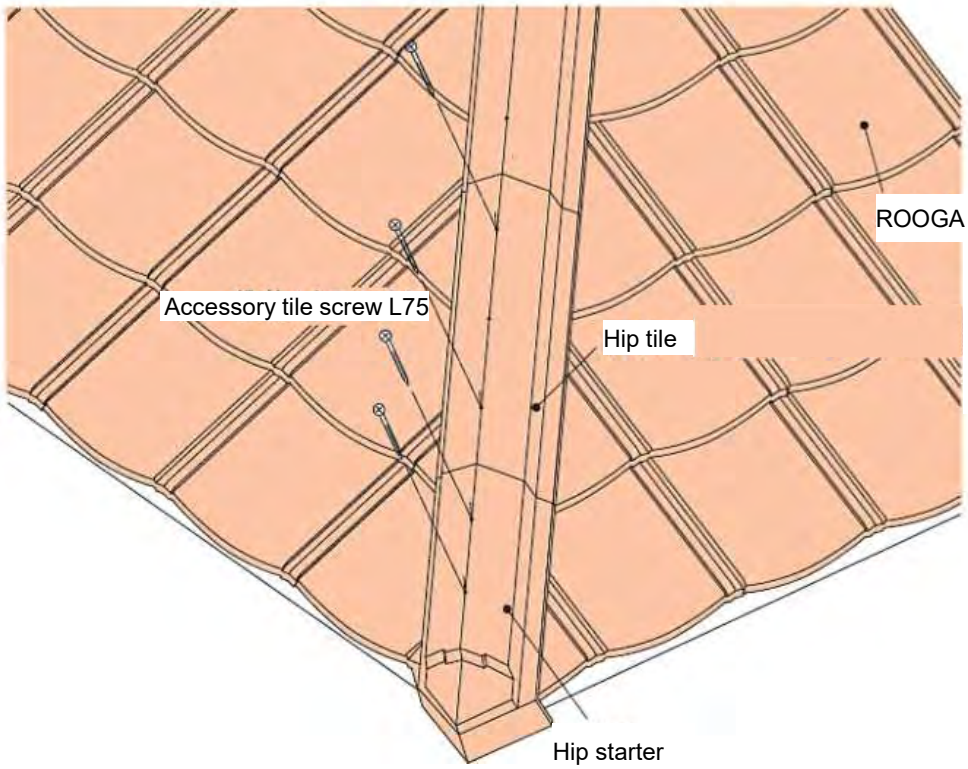


General Installation Instruction

Installation of hip

Installation of hip tiles

- Install the hip starter and hip tiles and secure it to the ridgepole with two screws per tile.

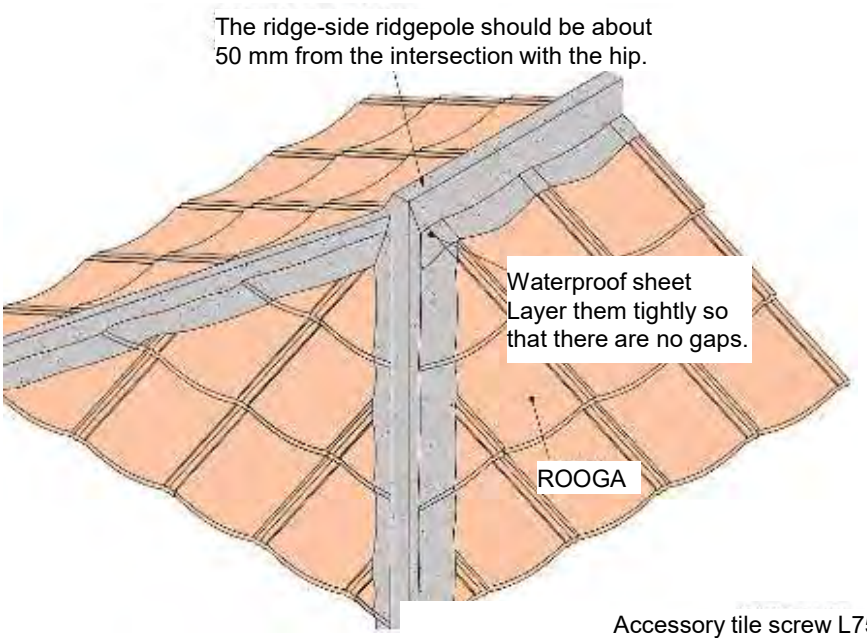


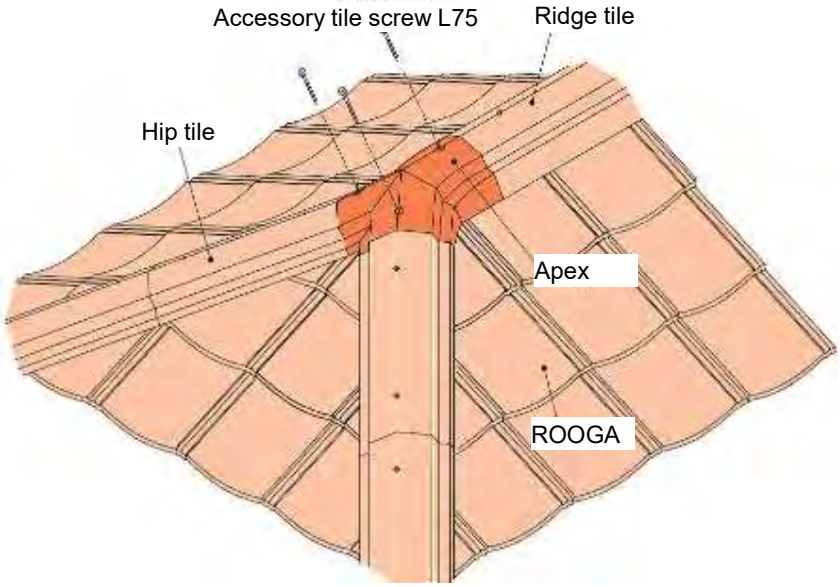
General Installation Instruction

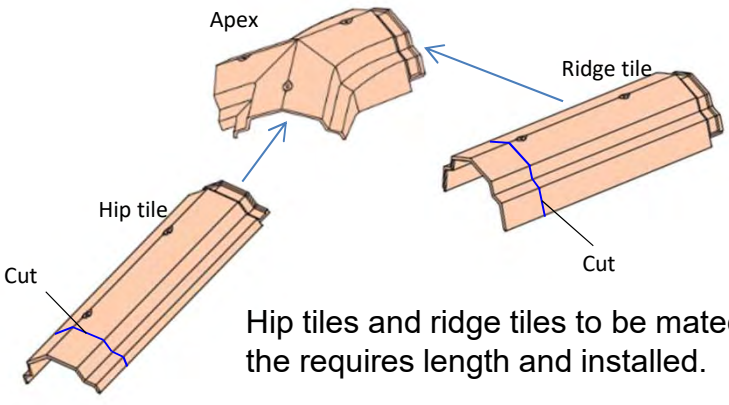
Installation of apex (intersection of ridge and hip)

Installation of hip tiles

- Cover the waterproof seat up to intersection of ridge and hip.
- Install the hip apex and secure it to the ridgepole with 3 screws.







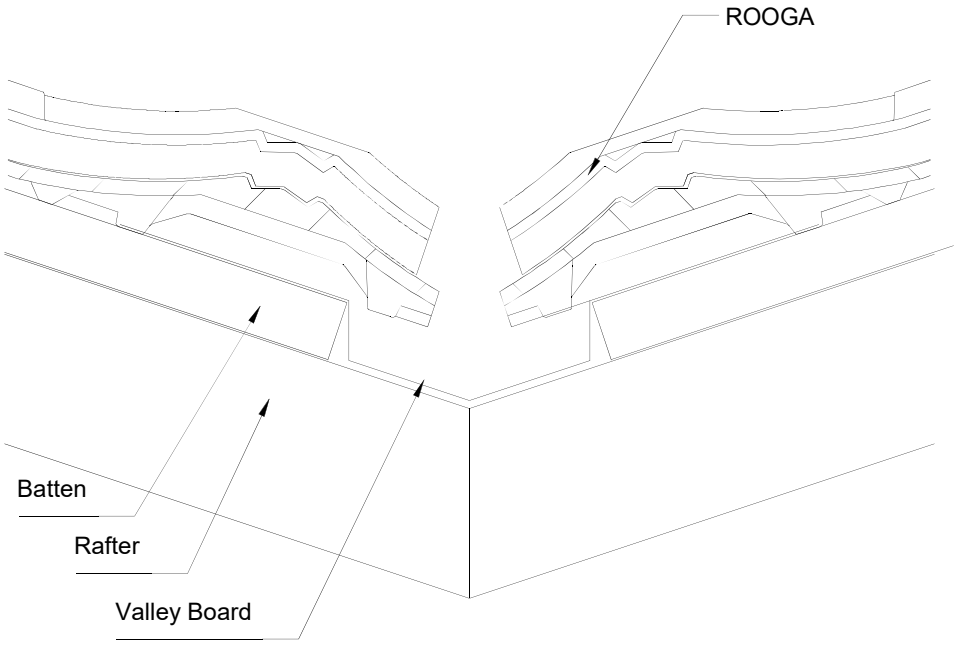
Hip tiles and ridge tiles to be mated with hip apexes are cut to the requires length and installed.

General Installation Instruction

Installation of valley

Installation of valley

- Install valley boards in the valley.
- Make sure there is proper space between the left and right roofing materials.

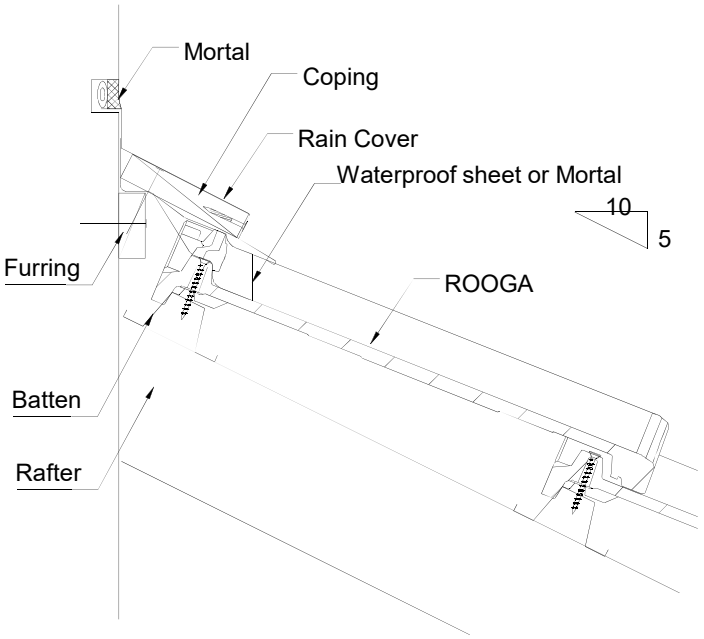


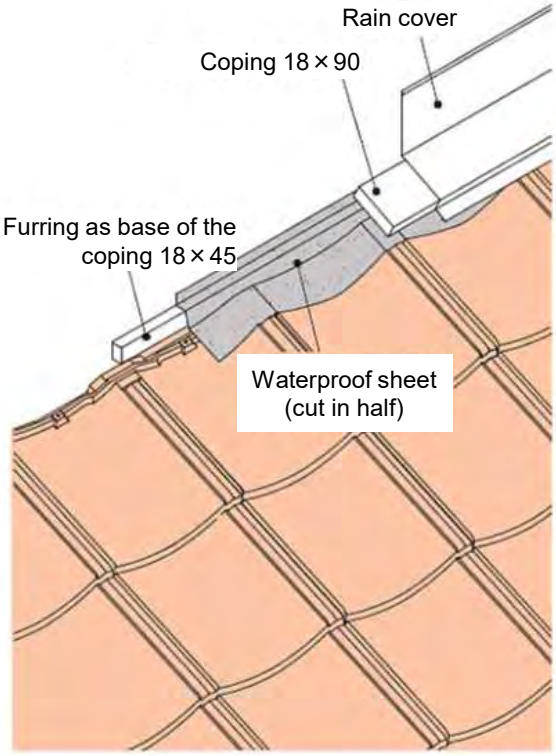
General Installation Instruction

Installation of wall junction (digit direction)

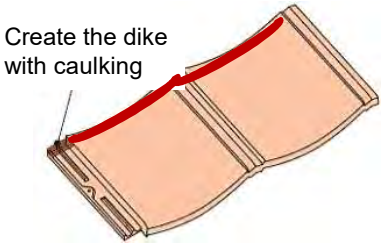
Installation of rain cover

- Attach the furring wood to the wall to serve as the base for the coping.
- After the roof tiles are installed, waterproof sheet cut in half is placed over the furring wood and installed so that there are no gaps in accordance with the shape of the tiles.
- If the topmost roof tiles are cut and installed, adjust the height, drill pre-drilled holes in the surface of the roof tiles, and secure with screws. Also, create the waterproof dike with caulking or other materials on the underlap.
- Fasten the copings to the furring wood with screws at intervals of 500 mm or less.
- Place the rain cover over the coping, and fasten it to the coping with screws at intervals of 455 mm or less.
- Joints of rain covers should be overlapped by at least 50 mm
- If mortar is used, the waterproof sheet is not required.





【If the topmost roof tiles are cut 】

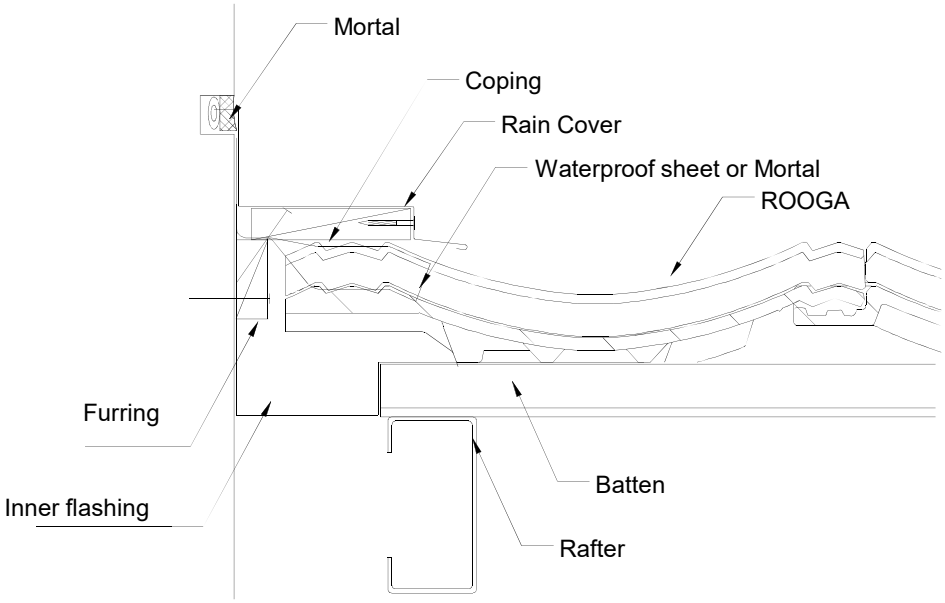


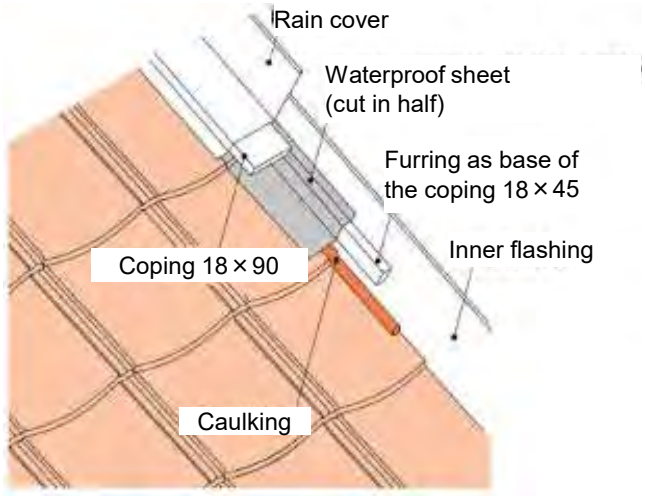
General Installation Instruction

Installation of wall junction (slope direction)

Installation of rain cover

- Attach the furring wood to the wall to serve as the base for the coping.
- After the roof tiles are installed, waterproof sheet cut in half is placed over the furring wood and installed so that there are no gaps in accordance with the shape of the tiles.
- Fasten the copings to the furring wood with screws at intervals of 500 mm or less.
- Place the rain cover over the coping, and fasten it to the coping with screws at intervals of 455 mm or less.
- Joints of rain covers should be overlapped by at least 50 mm
- If mortar is used, the waterproof sheet is not required.



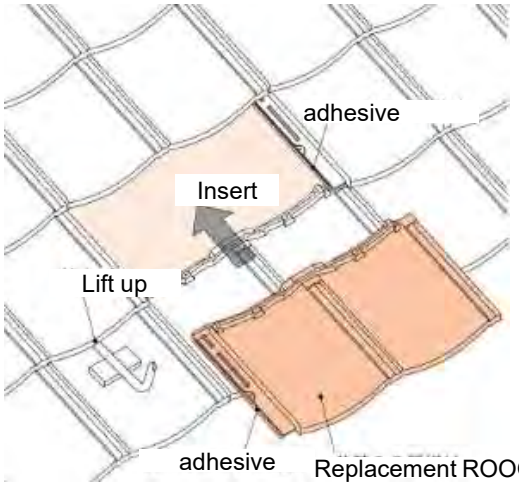


Repair

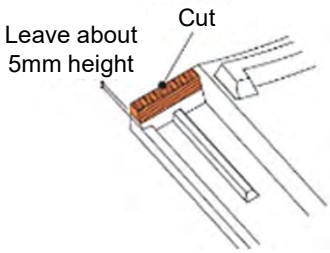
Replace

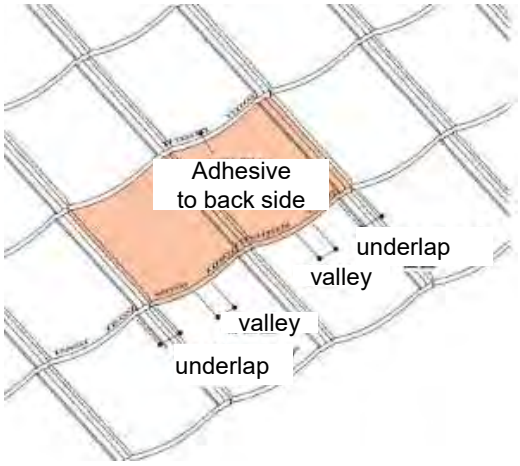
- Cut and remove ROOGA to be removed. It can be easily removed by cutting out squares with a grinder.

- Cut or pull out the screws that held in place.



- Cut the dike at the top of underlap of the replacement ROOGA. It is difficult to insert without cutting.
- Insert the replacement ROOGA while lifting the tip of the adjacent ROOGA.





- Apply adhesive to the back side and glue the top and bottom ROOGA.
- Do not apply adhesive to the valleys and underlap areas of the replaced ROOGA to ensure drainage.