GERARD
Roofing Designed to Endure

New Zealand Installation Manual

MAN0003 v2.3
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Gerard Roofs installation manual

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1.0 Roofing tools

1.1 Gerard roofs specialised tools

Available from your Gerard roofs distributor.

Guillotine		Long and short tile bending attachment		Short tile bender	

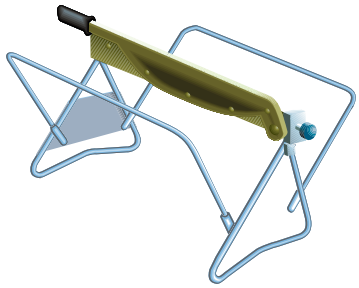
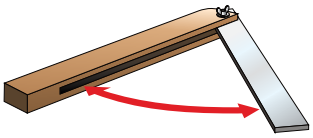
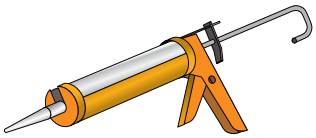
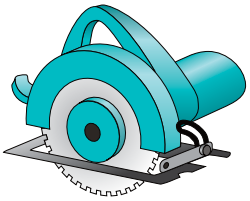
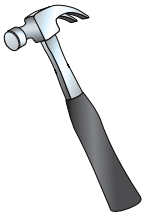
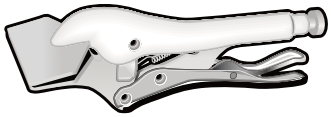
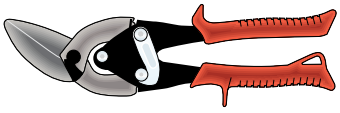
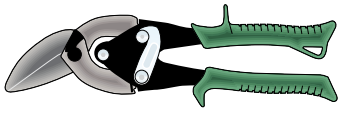
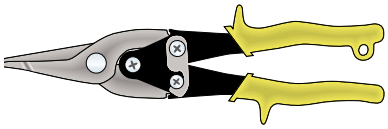
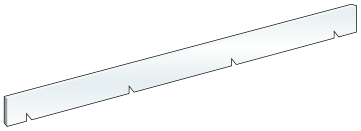



Figure 1.11		*Figure 1.12*		*Figure 1.13*	
Base	630 mm x 1200 mm	**Base**	1050 mm x 1660 mm	**Base**	840 mm x 760 mm
Height	620 mm	**Height**	1030 mm	**Height**	530 mm
Weight	36kg	**Weight**	36kg	**Weight**	32kg
The legs are detachable for ease of transportation. The blade is manufactured from heavy-duty spring steel.					

1.2 Personal tools and hand tools

Bevel	Caulking Gun	Circular Saw
		
Ear Muffs	**Hammer**	**Duck Bills**
		
Aviation Snips (Left)	**Aviation Snips (Right)**	**Aviation Snips (Straight)**
		
Pinout Rod	**Nail Puller**	**Nail Gun CNP 65**
		

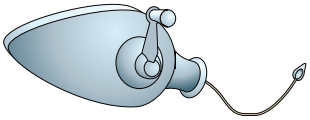
1.0 Roofing tools

Nailgun Paslode IM 350

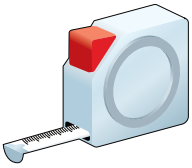
Pencil (non-graphite)

Soft-Soled Shoes

String Line



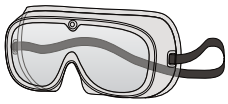
Tape Measure



Hard Hat (if required)

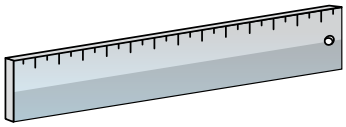
High Vis (if required)

Safety Glasses



Safety Site Sign

Ruler



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2.0 Checklists

2.1 Health and safety

This is a simplified version of our Health and Safety on-site. For full Health and Safety documentation (i.e. Safe installation guidelines) please contact your GCR or Gerard Area Manager.

2.1.1 General safety

- Work should be supervised by an experienced supervisor or Gerard Area Manager to ensure it is done safely.
- Take all practicable safety precautions.
- All work should comply with Work Safe NZ "Guidelines for safe working at heights for residential and light commercial roofing".
- Temporary work (e.g. scaffolding/edge fall protection) is suitable, strong and meets Work Safe NZ requirements.
- Only experienced and trained contractors are to use guillotines, cutters and benders, or any power tools unless supervised by experienced contractors.
- Only competent and experienced contractors are to get onto the roof unless they are under supervision of experienced contractors or Gerard staff inspecting roofs.
- Other site workers, and members of public must be kept safe from site works e.g. footpaths must be kept safe from falling debris. "Danger Roofing Work in Progress" signs must be used on all sites.

2.1.2 Roofers

Roofers must be adequately trained in the safe use of the equipment in the place of work, including protective clothing and equipment.

Roofers should use sunglasses and hats, particularly during the time of highest exposure (11a.m. – 2p.m.) to ultraviolet radiation to avoid damage to skin and eyes.

2.1.3 Building site

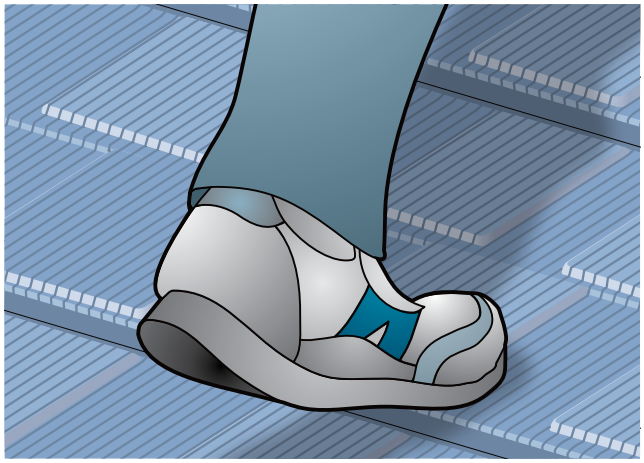
Before any work is commenced, in all cases there is a requirement that the roofing contractor will have had sufficient safety training and education, that site hazard identification has been undertaken, and that a contractors safety policy is in place.

2.1.4 Roof traffic

Use the correct footwear and technique.

Technique

Place your weight over the battens. Avoid walking on the roof when it is wet.



Footwear

Soft soled shoes, such as tennis shoes or old runners.

Check	Hazard identified	E	I	M	Action to be taken
	Brittle roofing (skylights, translucent, fibrecement or corroded sheets)				Not to be walked or stood on, risk of falling through
	Ceiling panels and battens				Not to be walked or stood on, risk of falling through.
	Slippery roof surfaces resulting from paint finishes, moss or lichen or dew and rain				
	Roof pitches above 35°				
	Roof projections such as pipework and flashing				
	Overhead power lines				Be aware of lines and have power turned off if necessary.
	Any roof penetration larger than 600 mm by 600 mm				
	Steeply sloping building sites				
	Wet or muddy ground conditions				Wear clean shoes on roof only
	Untidy site				Ensure no dangerous materials under work area
	Open foundations or drains				Put board over for access
	Within 2 m of any roof edge				
	Unsafe and/or inappropriate safety fall protection systems (choose from bump rail, safety mesh, edge protection, travel restriction and fall arrest devices)				Must meet OSH requirements
	Fall risk				Comply with Roofing Association of NZ (RANZ) guidelines for safe working at height. This is compulsory
	Rotten timber frame				Take extra care when walking on framing
	Loose accessories or loose tiles that have not been securely fastened must not be walked on				
	Valley boards not supported insufficiently to hold roofer's weight				Do not use valley boards for support when walking on the roof
	Fire damaged elements				
	Plant and equipment				
	Reinforcing starter bars				
	Asbestos check on existing material				
	Other Hazards noted				

Table 2.1.3.1 Site hazards checklist example

E = Eliminate I = Isolate M = Minimise

2.2 Estimating building materials

Estimating the nails you need			
Use	**Size**	**Description**	**Packaging**
Tile installation	50 x 2.8 mm	Galvanised painted straight shank flathead	Box of 25kg *or* 5kg
Accessory installation	50 x 2.8 mm	Galvanised painted straight shank flathead	Box of 25kg
Batten installation – new roofing (refer 4.0 Batten installation for specific details)			
50 x 40 mm *or* 50 x 50 mm Battens (square cut)	90 x 3.15 mm *or* 80 mm 10 gauge screws	Galvanised	Box of 25kg

Roof estimating and quoting from Gerard Roofs

Builders or contractors only need to pass the building plan to Gerard Roofs and we will sort out the roof estimating for a small charge.

Table 2.2.0 Nail schedule

Estimating tiles for a straight gable roof

I. Determine the rafter length (**Figure 2.2.1**) and calculate the number of courses of tiles using formula **1** or from **Table 2.2.1**.

Always ensure that fractional tiles are counted as whole tile as these will have to be cut at ridge board.

II. Determine the overall length of the roof (**Figure 2.2.2**) and calculate the number of tiles using formula **2** or from **Table 2.2.1**.

Ensure that fractional tiles are counted as whole tiles.

III. Multiply tiles (I) x tiles (II)

IV. Multiply result (III) x 2 when estimating for both sides of the roof.

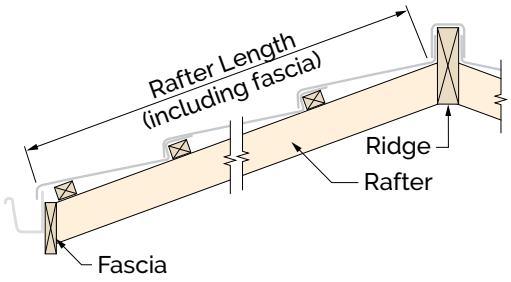


Figure 2.2.1

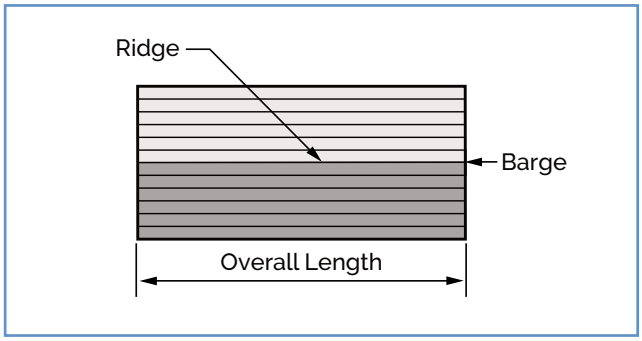


Figure 2.2.2

Estimating tiles for hip and valley roofs

Extra tiles are required to compensate for wastage when cutting tiles for hips and valleys.

I. Hip roofs: (**Figure 2.2.3**).

Treat the roof initially as a straight gable. Calculate the number of tiles required for coverage using formula **1** and formula **2** for the body of the roof (or use **Table 2.2.1** to calculate the number of tiles.)

Multiply again by two to calculate tiles for both sides of the roof.

Find the total hip length and using formula **3** calculate the additional tiles required for hips.

Add this to the tiles required for the body of the roof.

II. Hip and valley roofs: (**Figure 2.2.4**).

First take the section with longest rafters (Section (**A**) **Figure 2.2.4**). Treat this section of the roof initially as a straight gable. Calculate the number of tiles required for coverage using formula **1** and formula **2** (or use **Table 2.2.1** to calculate the number of tiles.)

Multiply again by two when calculating tiles for both sides of the roof section.

Repeat the calculations for each section of the roof (Section (**B**)(**C**) **Figure 2.2.4**).

Find the total length of hips and valleys and using formula **3** calculate the additional tiles required for hips and valleys.

Add together the tiles for each section (**A**,**B**,**C**) and the additional tiles for hips and valleys to obtain the total tile requirement.

All dimensions converted to metres.

Formula 1:
Number of courses up rafter length
(RL-ES+WC)/WC
Where
RL – Rafter length
ES – Eave course spacing (0.33 m)
WC – Profile specified width of cover – refer to **3.0 Products**.

Formula 2:
Number of rows of tiles in overall length of roof
(OL-1.250* + LC)/LC
Where
OL – Overall length
LC – Length of cover of profile – refer to **3.0 Products**
**Change to 1.215 for Milano profile*

Formula 3:
Additional tiles = total hip and or valley length in linear metres x 1.32 (wastage factor).

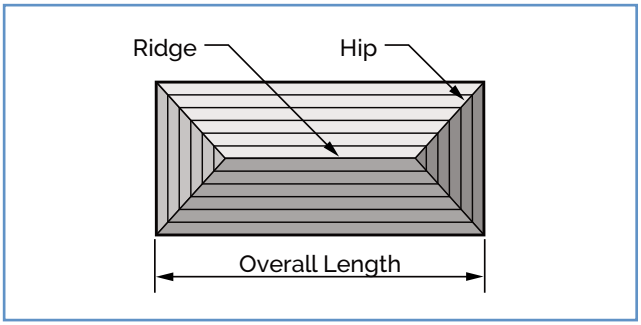


Figure 2.2.3

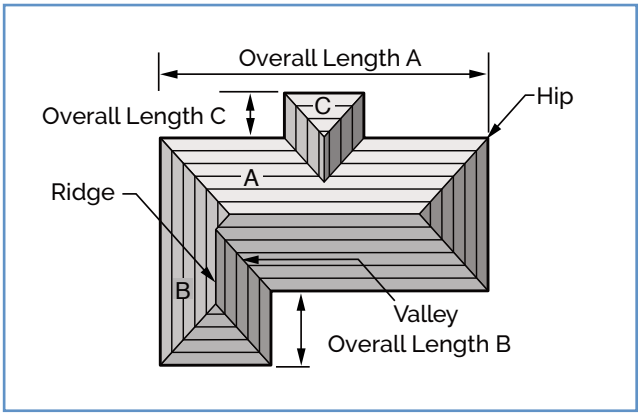


Figure 2.2.4

Rafter length*		Overall length	
To suit full course of tiles	No. of barge courses	Roof length	No. of tiles
0.330 m	1	1.365 m	1
0.700 m	2	2.615 m	2
1.070 m	3	3.865 m	3
1.440 m	4	5.115 m	4
1.810 m	5	6.365 m	5
2.180 m	6	7.615 m	6
2.550 m	7	8.865 m	7
2.920 m	8	10.115 m	8
3.290 m	9	11.365 m	9
3.660 m	10	12.615 m	10
4.030 m	11	13.865 m	11
4.400 m	12	15.115 m	12
4.770 m	13	16.365 m	13
5.140 m	14	17.615 m	14
5.510 m	15	18.865 m	15
5.880 m	16	20.115 m	16
6.250 m	17	21.365 m	17
6.620 m	18	22.615 m	18
6.990 m	19	23.865 m	19
7.360 m	20	25.115 m	20
7.730 m	21	26.365 m	21
8.100 m	22	27.615 m	22
8.470 m	23	28.865 m	23
8.840 m	24	30.115 m	24
9.210 m	25	31.365 m	25
9.580 m	26	32.615 m	26
9.950 m	27	33.865 m	27
10.320 m	28	35.115 m	28
10.690 m	29	36.365 m	29
11.060 m	30	37.615 m	30

Table 2.2.1

Estimating accessories

When calculating accessory requirements a small allowance should be included to compensate for wastage.

I. **Ridge/hip caps** (RHC): Determine the length of ridges and/or hips. Divide by the linear coverage per cap (i.e. 1900 mm) to calculate the number of units required.

II. **Box barge cover** (BBC): Determine the length of barge boards. Divide by the linear coverage per box barge cover unit (i.e. 1900 mm) to calculate the number of units required.

III. **Wall flashings, side flashings, step and pitch flashings, apron flashings:** Determine the overall length of flashings required (m). Divide the linear coverage by 1.9 to calculate the number of flashing units required.

IV. **Barrel accessory:** Determine the total length of ridges, hips and barge boards to be covered. Divide by the linear cover of each unit (i.e. 370 mm) to calculate the number of barrel accessories required.

Estimating battens for new roofing (standard accessories)

Provide 3 linear metres of battens per square metre of roof. 3.2 linear meters of batten per square metre where barrel accessories used.

Estimating battens for overlay roofing

Provide 5 linear metres of battens per square metre of roof area.

Estimating batten nail quantities

Refer to **4.0 Batten installation**

Estimating tile nail quantities

Provide 1 kilogram of nails per 22 square metres of roof.

Estimating accessory nail quantities

Refer to **8.0 Installing hips, ridges & gables**

2.3 Packaging

Tiles and accessories are stored on wooden pallets and protected by a plastic cover. A pallet consists of between 250 and 350 textured tiles which represent a roofing area of between 115 and 160 m², or 500 maximum satin tiles which represent a maximum roofing area of 230 m². Base dimension of tile pallets is 1400 x 1100 mm. The maximum height of a pallet is 1000 mm. Tiles are stacked on each pallet with a maximum weight of 1150 kg.

2.4 Identification

Each batch is identified individually; this identification can be found on the labels attached to the cardboards and on the back of the tiles. Product traceability is ensured from manufacturing to the installation site. The labels can be kept and filed.

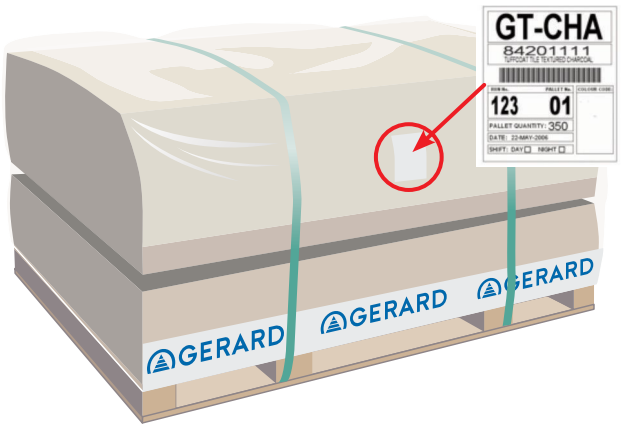


Figure 2.4.1 Label on the pallet

Figure 2.4.2 Label on the back of the tile

2.5 Storage and handling

Tiles and accessories must be kept dry, covered and protected from damage while stored on the site. They should be stacked in a sheltered position preferably near areas of the building where they are to be installed. Tiles and accessories must be covered with a loose tarpaulin allowing air to circulate.

Once packs are opened and laying of the roof commences, a continual visual check should be made to ensure surface of the roofs and accessories are free of any noticeable defect or damage.

Where minor damage does occur, the touch up kit should be used to repair the surface.

2.6 Non-standard elements

When installing non-standard elements or gutters above the level of the roof, it is strongly recommended NOT to use materials that could cause corrosion (e.g. Cu, stainless steel etc.)

2.7 Conditions of strong wind-driven rain or snow

In areas prone to hurricane or strong wind-driven rain or snow, it is recommended that initial technical advice be sought from Gerard Roofs.

2.8 Installation in extreme cold conditions

Many installations have been completed in areas which are subject to lengthy periods of extreme cold. No detrimental effect has been noted on the surface coating of tiles, but special care is needed during installation to prevent chipping of the surface, and punching of the final 5 mm of the installation nail is recommended. In addition tiles should be warmed before either cutting or bending.

2.9 Responsibility

It is the responsibility of architects, builders and roof installers to ensure that local standards, by-laws and requirements are satisfied.

Care should be taken to ensure:

- All live electrical cables are well clear of any nailing positions
- Nailing is done in the position and manner specified by this manual
- Nails or fasteners are used according to specification

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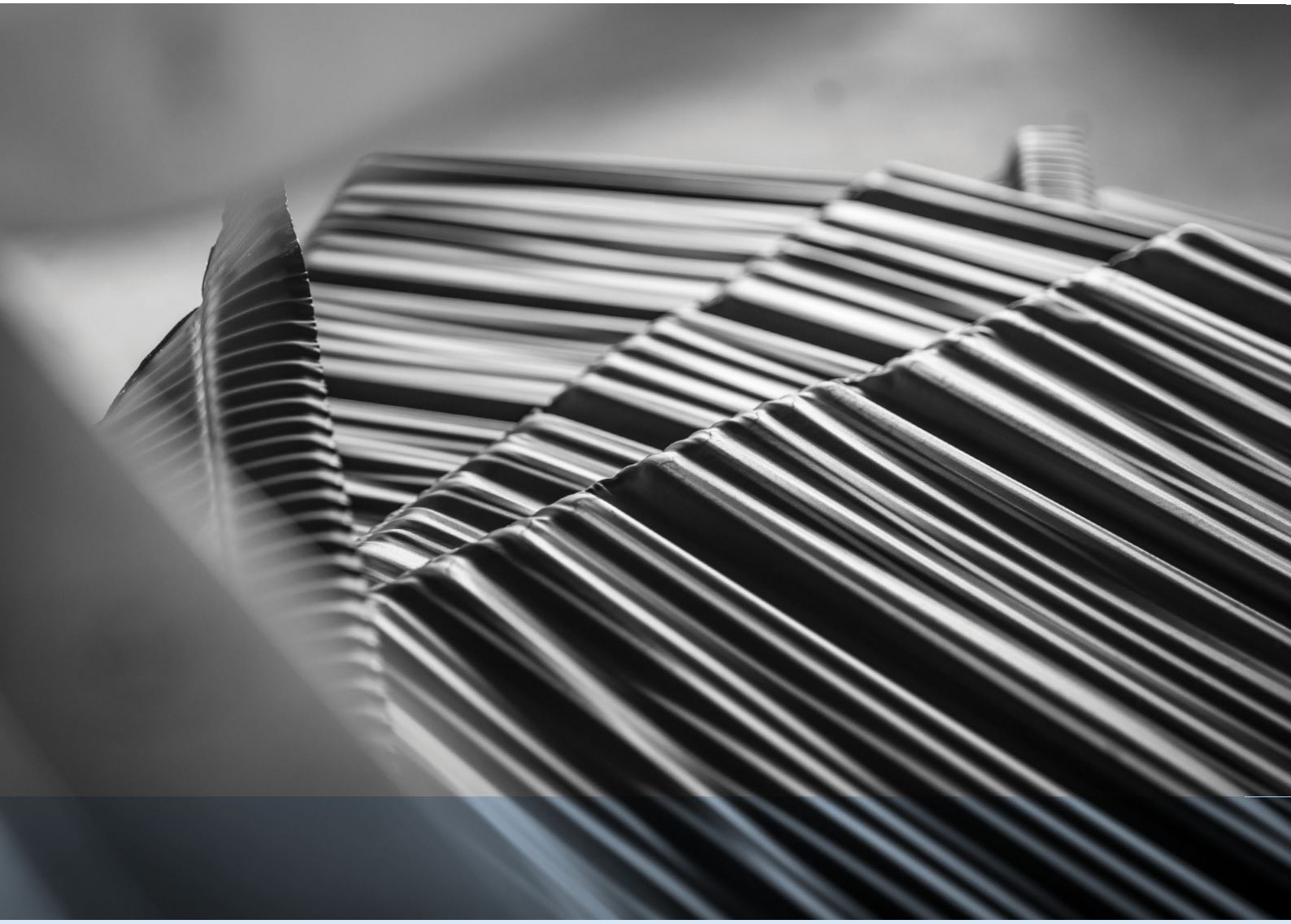
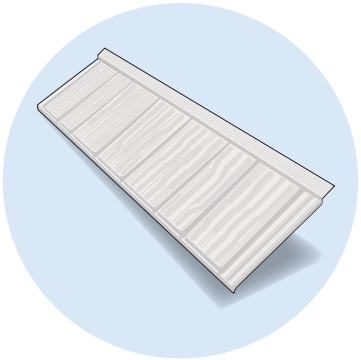


3.0 Products

3.1 Roof profiles

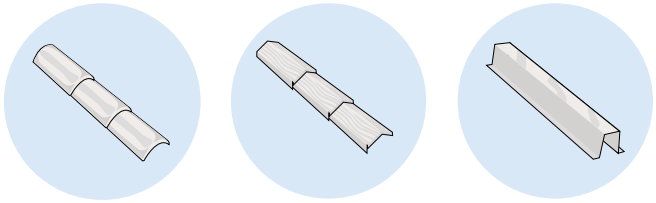
Shake

Combining a flat plane with continuous but irregular grooves gives Shake a recurring but slightly organic pattern that works with many styles of home.



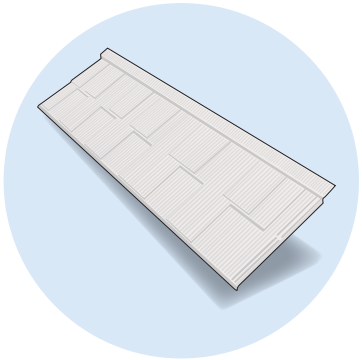
Pitch – min./max.	15-60°
Overall length	1310 mm
Length of cover	1250 mm
Width of cover	368 mm
Upstand	27 mm
Roof cover/panel	0.46 m²
Panels/m²	2.2
Weight/panel Textured	2.9 kg
Weight/panel Satin	2.1 kg
Weight/m² Textured	6.6 kg
Weight/m² Satin	4.7 kg

Shake is compatible with all three Gerard trims – **Barrel, Angle** and **Box**.



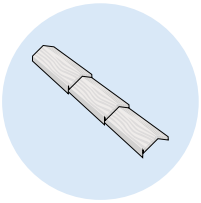
Senator

A profile with a modern look and subtle raised detailing. Senator is known for the simplicity and uniformity it brings to contemporary and traditional homes.



Pitch – min./max.	15-60°
Overall length	1320 mm
Length of cover	1250 mm
Width of cover	368 mm
Upstand	16 mm
Roof cover/panel	0.46 m²
Panels/m²	2.2
Weight/panel Textured	2.9 kg
Weight/panel Satin	NA
Weight/m² Textured	6.4 kg
Weight/m² Satin	NA

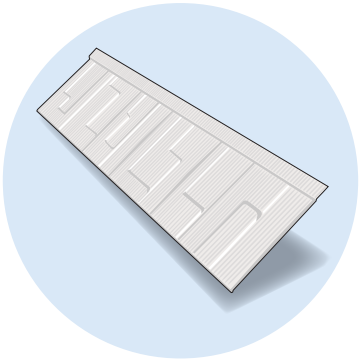
Senator is compatible with **Angle** trim.



Dimensions and weights given are nominal.

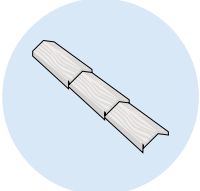
Rockport

Among Gerard's flattest profiles, Rockport lends your roof a sleek, linear look and is often used on clean, simple architecture with a modern bias.



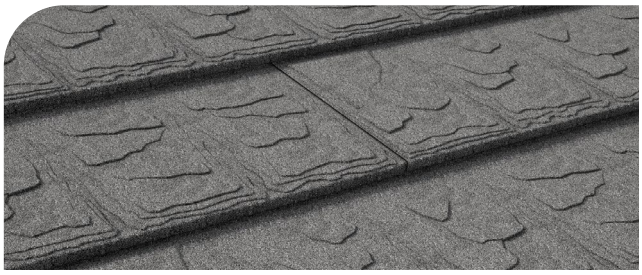
Pitch – min./max.	15-60°
Overall length	1330 mm
Length of cover	1250 mm
Width of cover	368 mm
Upstand	20 mm
Roof cover/panel	0.46 m²
Panels/m²	2.2
Weight/panel Textured	2.9 kg
Weight/panel Satin	NA
Weight/m² Textured	6.4 kg
Weight/m² Satin	NA

Rockport is compatible with **Angle** trim.



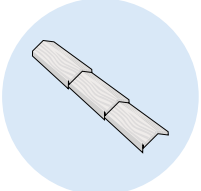
Alpine

Inspired by the look of Welsh slate the Alpine profile lends a smooth, sleek linear look while surface detailing adds a slightly rustic overtone.



Pitch – min./max.	15-60°
Overall length	1330 mm
Length of cover	1250 mm
Width of cover	368 mm
Upstand	20 mm
Roof cover/panel	0.46 m²
Panels/m²	2.2
Weight/panel Textured	2.9 kg
Weight/panel Satin	NA
Weight/m² Textured	6.4 kg
Weight/m² Satin	NA

Alpine is compatible with **Angle** trim.

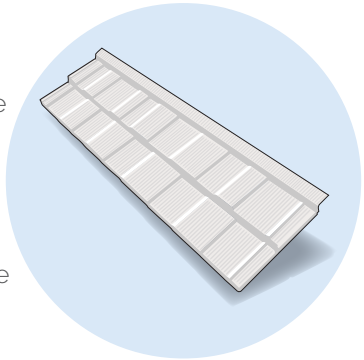


Dimensions and weights given are nominal.

3.1 Roof profiles

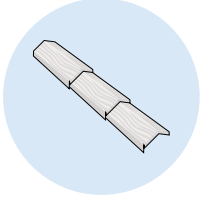
Oberon

The depth and dimension of Oberon make it most responsive to changes in light. It is often seen on substantial homes alongside dressed stone and natural timbers.



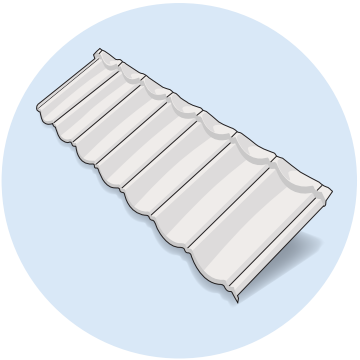
Pitch – min./max.	20-60°
Overall length	1310 mm
Length of cover	1230 mm
Width of cover	320 mm
Upstand	20 mm
Roof cover/panel	0.39 m²
Panel/m²	2.54
Weight/panel Textured	2.8 kg
Weight/panel Satin	NA
Weight/m² Texture	7.1 kg
Weight/m² Satin	NA

Oberon is compatible with **Angle** trim.



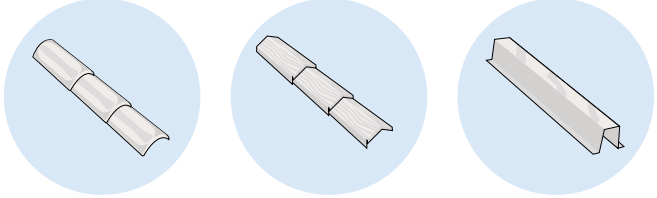
Bond

The scalloped shapes of this profile bring a look that's similar to heavyweight tiles. The advantages of pressed steel mean this profile is often chosen as a substitute.



Pitch – min./max.	12-60°
Overall length	1325 mm
Length of cover	1265 mm
Width of cover	368 mm
Upstand	25 mm
Roof cover/panel	0.47 m²
Panels/m²	2.15
Weight/panel Textured	3.0 kg
Weight/panel Satin	2.1 kg
Weight/m² Textured	6.4 kg
Weight/m² Satin	4.5 kg

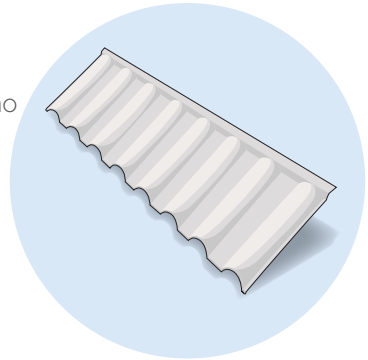
Bond is compatible with all three Gerard trims – **Barrel, Angle** and **Box**.



Dimensions and weights given are nominal.

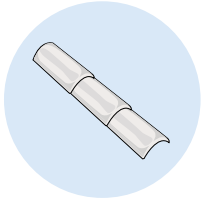
Milano

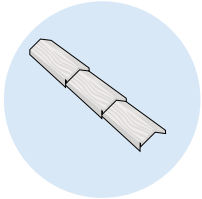
With balanced arches and flats found in traditional design, Milano is a timeless profile that creates clean, elegant and classical looking roofs.



Pitch – min./max.	12-60°
Overall length	1330 mm
Length of cover	1210 mm
Width of cover	368 mm
Upstand	25 mm
Roof cover/panel	0.45 m²
Panels/m²	2.2
Weight/panel Textured	2.9 kg
Weight/panel Satin	NA
Weight/m² Textured	6.4 kg
Weight/m² Satin	NA

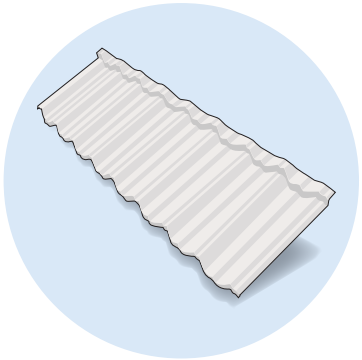
Milano is compatible with **Barrel** and **Angle** trims.





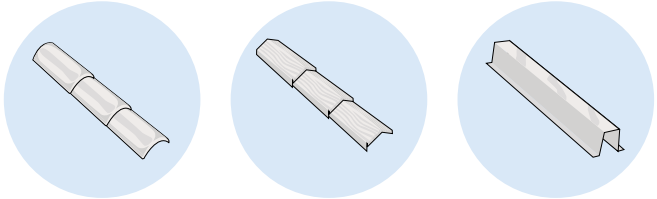
Classic

Classic is a geometric profile with shapes and angles that accentuate light and shadow to emphasise its corrugations and create a look of strength and definition.



Pitch – min./max.	12-60°
Overall length	1325 mm
Length of cover	1262 mm
Width of cover	368 mm
Upstand	26 mm
Roof cover/panel	0.46 m²
Panels/m²	2.15
Weight/panel Textured	3.0 kg
Weight/panel Satin	2.1 kg
Weight/m² Textured	6.5 kg
Weight/m² Satin	4.5 kg

Classic is compatible with all three Gerard trims – **Barrel, Angle** and **Box**.

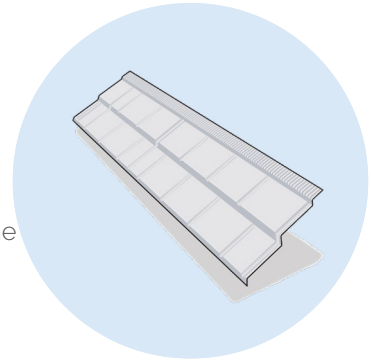


Dimensions and weights given are nominal.

3.1 Roof profiles

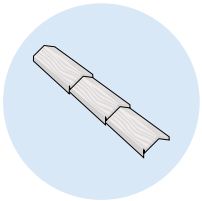
Aspen

Aspen's slate-like appearance creates a beautiful textured aesthetic. It is often used in projects alongside dressed stone and natural timbers.



Pitch – min./max.	15-60°
Overall length	1320 mm
Length of cover	1165 mm
Width of cover	368 mm
Upstand	18 mm
Roof cover/panel	0.43 m²
Panel/m²	2.3
Weight/panel Textured	2.9 kg
Weight/panel Satin	2.1 kg
Weight/m² Texture	6.67 kg
Weight/m² Satin	4.8 kg

Aspen is compatible with **Angle** trim.

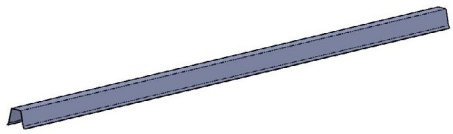


Dimensions and weights given are nominal.

3.2 Accessories

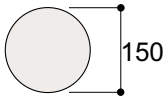
3.2.1 General

146 Box Trim



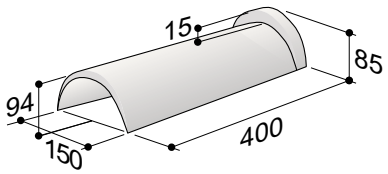
Overall length	2000 mm
Length of cover	1900 mm
Downturn - Satin	66 mm
Width - Satin	45 mm
Downturn - Textured	62.3 mm
Width - Textured	40 - 34 mm tapered

Barrel Trim End



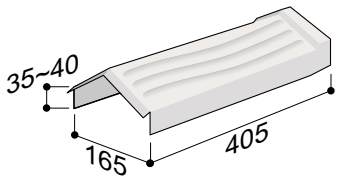
Diameter	150 mm
Weight/unit Texture	0.1 kg
Weight/unit Satin	0.1 kg

131 Barrel Trim



Overall length	400 mm
Length of cover	370 mm
Weight/unit Texture	0.6 kg
Weight/unit Satin	0.4 kg

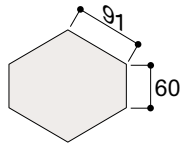
142 Angle Trim



Overall length	405 mm
Length of cover	370 mm
Width	165 mm
Weight/unit	0.5 kg

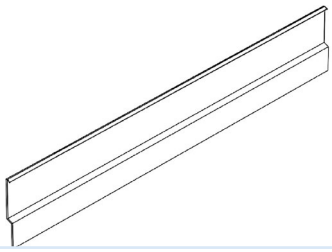
Dimensions and weights given are nominal.

Angle Trim End



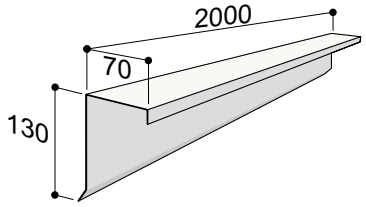
Weight/unit	0.1 kg
Width	157 mm
Height	150 mm

104 Side Flashing



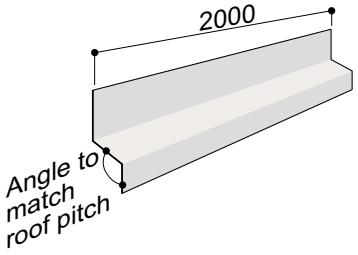
Overall length	2000 mm
Length of cover	1850 mm
Upturn	10 mm
Width	15 mm
Downturn	55 mm
Weight/unit Texture	1.8 kg
Weight/unit Satin	1.2 kg

147 Box Barge



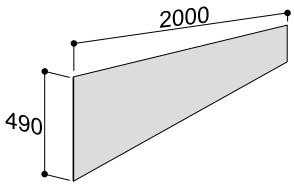
Overall length	2000 mm
Length of cover	1900 mm
Downturn	130 mm
Width	70 mm
Weight/unit Texture	2.5 kg
Weight/unit Satin	1.6 kg

151 Step Flashing 22-27 Degrees



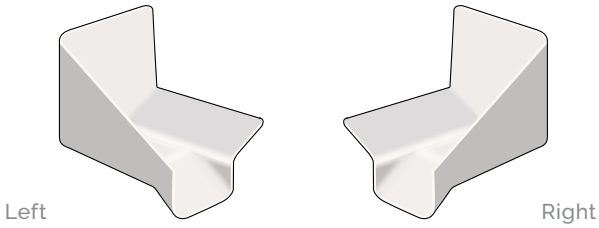
Overall length	2000 mm
Length of cover	1900 mm
Upturn	113 mm
Width	66 mm
Downturn	66 mm
Weight/unit Texture	2.3 kg
Weight/unit Satin	1.6 kg

Flat Sheet 490



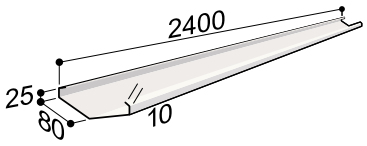
Overall length	2000 mm
Width	490 mm
Weight/unit Texture	4.8 kg
Weight/unit Satin	3.2 kg

Stop End left & right



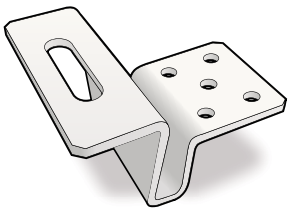
Material	PVC
Colour	White
Weight/unit	0.2 kg

145 Valley



Overall length	2400 mm
Lap	150 mm
Width	160 mm
Weight/unit	2.1 kg

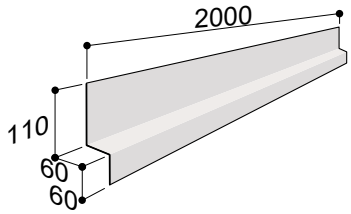
Solar Brackets



Weight/unit Senator	0.18 kg
Weight/unit HMCC	0.23 kg

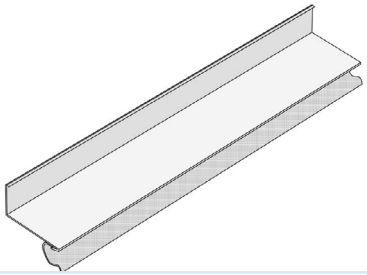
Note: Stop Ends and Solar Brackets are not covered by BRANZ Appraisal no. 1096.

150 Step Flashing 90 Degrees



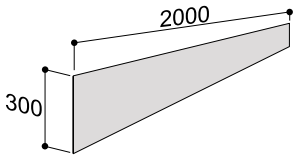
Overall length	2000 mm
Length of cover	1900 mm
Upturn	110 mm
Width	60 mm
Downturn	60 mm
Weight/unit Texture	2.3 kg
Weight/unit Satin	1.6 kg

112 Apron Flashing



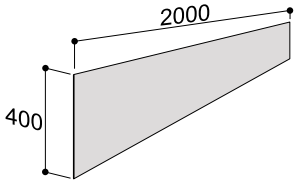
Overall length	2000 mm
Width	150 mm
Weight/unit Texture	3.5 kg

Flat Sheet 300



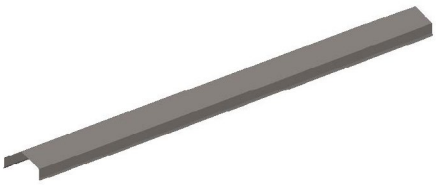
Overall length	2000 mm
Width	300 mm
Weight/unit Texture	2.9 kg
Weight/unit Satin	2.0 kg

Flat Sheet 400



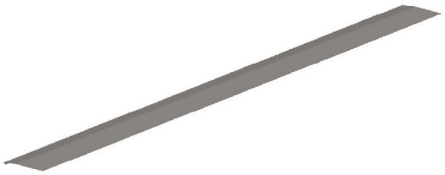
Overall length	2000 mm
Width	490 mm
Weight/unit Texture	4.8 kg
Weight/unit Satin	3.2 kg

144 Long Angle Trim



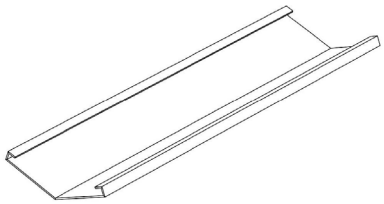
Overall length	2000 mm
Length of cover	1900 mm
Downturn	92 - 90 mm tapered

155 Eaves Flashing



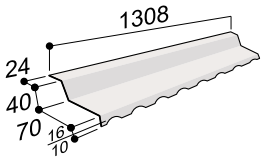
Overall Length	2000 mm
Width	150 mm

116 Wide Valley



Overall length	2400 mm
Length of cover	2250 mm
Weight/unit Painted	3.3 kg

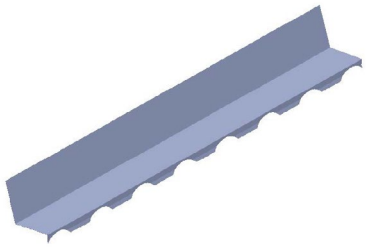
Milano Ridge Flashing



Overall length	1308 mm
Length of cover	1215 mm
Weight/unit	1.0 kg

Note: Milano Ridge Flashings are not covered by BRANZ Appraisal no. 1096.

Milano Wall Flashing



Overall length	1308 mm
Length of cover	1215 mm
Weight/unit	1.4 kg

Note: Milano Wall Flashings are not covered by BRANZ Appraisal no. 1096.

4.0 Batten installation

4.0 Batten installation

4.1 Batten sizing

Rafters or roof trusses can be set at various centres depending on the type of construction.

The following batten sizes are recommended:

Truss spacing (mm)	Batten size (mm)	Situation
900	40 x 50	Standard
1200	50 x 50	Occasional
1500	50 x 65 on edge	Unusual
1800	50 x 75 on edge	Unusual

Table 4.1.1 Batten size

Cost savings may be obtained if rafter lengths are designed to accommodate an exact number of tile courses. Where this is not possible, the tiles in the top course will need to be cut and bent.

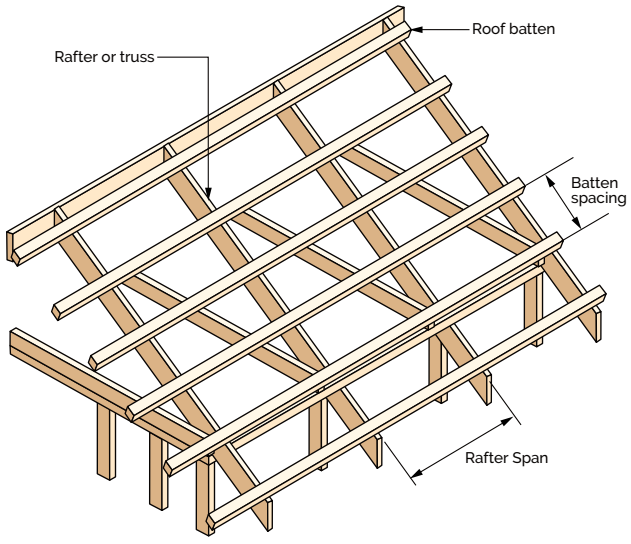


Figure 4.1.1 Roof battens

4.2 Batten selection

Battens meeting NZ3604 must be used for all roofing.

Timber treatment grade, Pinus Radiata – H1.2, Douglas Fir – H1.2.

Length must be longer than 3 rafter spans.

Installer must visually grade battens on site using the following criteria:

Minimum finish – cut-of-log (COL) sawn timber.

- Must be free from defects, knots and splitting.
- No twisting and batten must be straight between rafters once fixed.
- Sizing as listed in the batten size: **Table 4.1.1** batten size.

Battens meeting these criteria are then classed as No.1 framing grade.

**A batten must be able to hold a load of 100 kg (1 kN) at centre span. You are selecting battens which you can safely work on.*

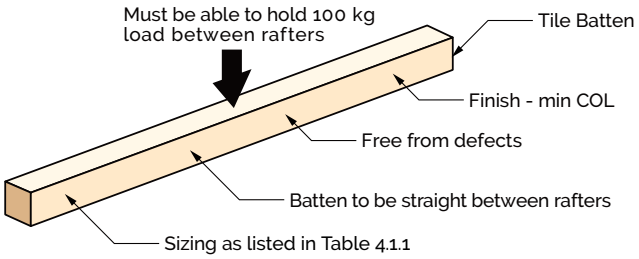


Figure 4.2.1 Roof battens

Battens are required by NZS 3604 to be No. 1 framing grade and able to support a load of 100 kg at mid-span. It has been agreed with the Department of Building and Housing (DBH) that this can be achieved by visual grading and selection by the fixer from standard battens, which are rough sawn "cut-of-log", so as to ensure battens which are straight in both directions, and safe to stand on at mid-span. It is the fixer's responsibility to make sure that the battens used are safe and suitable for good tile installation.

4.3 Batten fastening

Battens are attached to rafters using fasteners designed to hold the battens onto the rafters under various wind uplift loads.

Fastener type is selected based on the **wind zone**.

Generally, with batten size 40 x 50 mm and span 900 mm, 2 gun nails suit for all wind zones, up to and including very high wind zone, for domestic buildings. If in doubt contact the Gerard Roofs Technical Service Division.

Gerard Roofs require that the battens are fastened with the fasteners described in **Table 4.3.1** or a fastener equivalent to, or greater than, the kN pullout max load for each batten rafter junction of the roof.

Fastener	Size	Quantity	Fixing type	kN pullout max
Gun nail	90 x 3.15	2	S	0.8
Purlin screw c/s head	80 mm x 10g	1	T	2.4
Type 17 screw	14g x 100	1	U	5.5

Table 4.3.1 Batten fastener type

Fixing type – designation and kN pullout loads from NZS3604:2011.

Wind zone	900 rafter 50x40 mm	1200 rafter 50x50 mm
Low 32m/s	**S**	**S**
Medium 37m/s	**S**	**S**
High 44m/s	**S**	T
Very high 50m/s	**S**	T
Extra high 55m/s	T	T
SED +55m/s*	Contact GR	Contact GR

Table 4.3.2 Fasteners for panel battens - wind zones – NZS3604.

S = 2 x 90 mm x 3.15 mm nails (0.8kN)
T = 80 mm x 10g screw (2.4kN)

**In SED Specific design situations refer to Gerard Roofs Technical Notes on installation in SED wind areas.*

When tiles are used for roofs of domestic buildings or other buildings with lined roofs (370 batten spacing), fastener types are determined as required for the higher uplift loads at the periphery of the roof based on local pressure factors in AS/NZS1170.2.

Note: Use of a nail gun for tile installation is not covered by BRANZ Appraisal no. 1096.

4.4 Batten installation procedure

4.4.1 Batten setting out

The most critical factor in the laying out of the tiles is accurate setting out of the battens. If this is not adhered to, the tiles will not fit correctly.

All measurements should be made from the front of battens (face closest to eave). This is the surface where tiles will be fixed to the batten.

Use the following table to identify the batten spacing for the tile you are installing:

Tile profile	Batten spacing		
	Textured	Satin	Product requiring centre batten
Shake	368 mm	370 mm	
Senator*	368 mm		Refer Figure 4.4.1.3 below
Rockport	368 mm		
Alpine	368 mm		
Oberon^	320 mm		Refer Figure 4.4.1.2 below
Bond	368 mm	370 mm	
Milano	368 mm		
Classic	368 mm	370 mm	
Aspen	368 mm	370mm	Refer Figure 4.4.1.3 below

Table 4.4.1.1 Batten spacing

**Centre batten 185 mm, second batten from eave not installed, ^Centre batten 160 mm, second batten from eave not installed.*

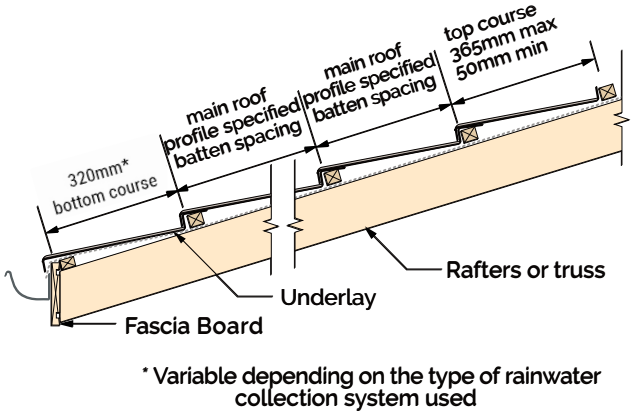


Figure 4.4.1.1 Rafter truss end-on view, batten spacing

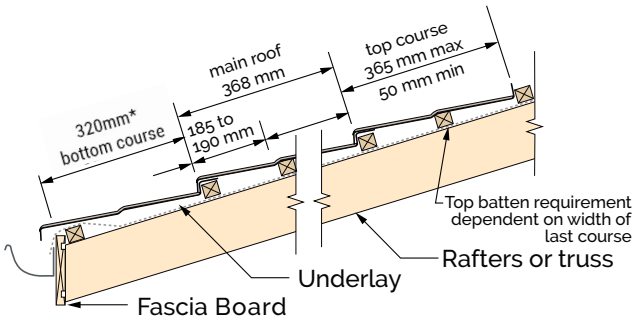


Figure 4.4.1.3 Senator and Aspen setout, centre batten

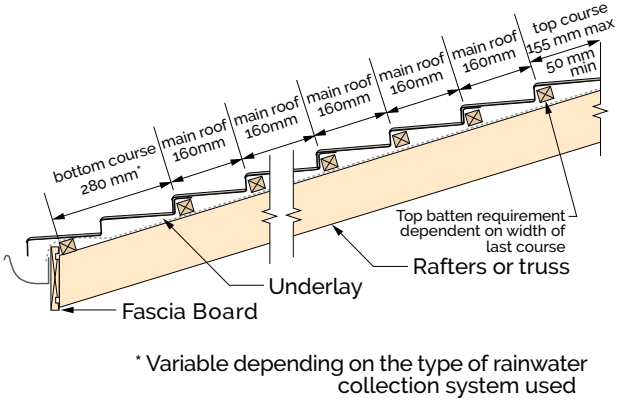


Figure 4.4.1.2 Oberon setout, centre batten

4.4.2 Pin out

Measure up a rafter from the outside of the fascia board 320 mm* to establish the position of the second batten, tack in a nail at this position. Repeat at the other end of the section of roof, then run a string line between the points. On each remaining rafter tack a nail at the string line.

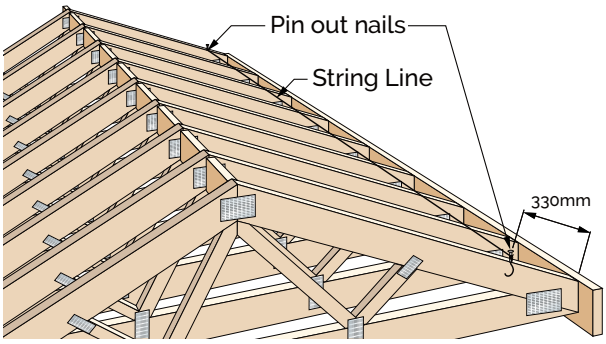


Figure 4.4.2.1 Pin out nail installation

In the event that the top course tile is too short or the rain water collection system conflicts with the tile nose, this dimension may be changed within -40 mm to +15 mm tolerance.

Roofing underlay is installed after pin out but before the tile battens are fastened. Refer to 5.0 Roofing underlays, to ensure that you have installed it correctly.

Using a measuring rod (pre-notched at the specific tile batten spacing) hook it over the nail so that it lays up the rafter. Tack a nail in each slot as markers for the battens.

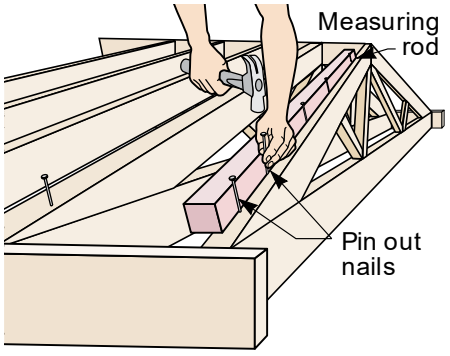


Figure 4.4.2.2

4.4.3 Pin out around obstacles in a roof plane

When you encounter an obstacle in the roof. Sections where a valley results in a short eave, take a set of pin out nails to the ridge line (**Figure 4.4.3.1** Step **1**). Measure the distance from the last pin out nail to the ridge apex and transfer this to the opposite end of the ridge (**Figure 4.4.3.1** Step **2**) and then work down the rafters using the measuring rod to locate the pin out nail positions (**Figure 4.4.3.2** Step **3**).

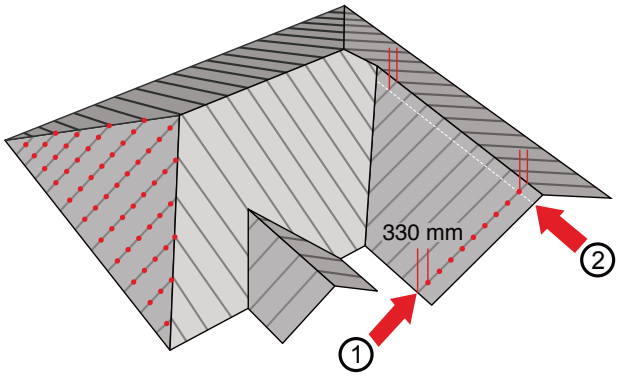


Figure 4.4.3.1

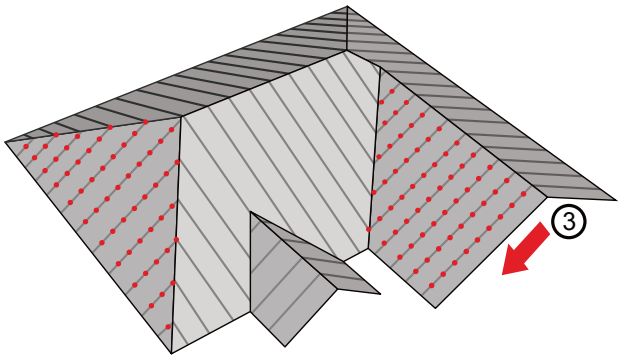


Figure 4.4.3.2

When you come across a dormer window, first of all, check if the fascia is of the same distance from the ridge. If the fascia is levelled, follow **Figure 4.4.3.3.** Step **1, 2** and **Figure 4.4.3.4.** Step **3** to provide pin out nails from eave to ridge, project a string line over the dormer using pin out nails on one side as a guide (**Figure 4.4.3.4** Step **4**), work up and down the other side with the measuring rod (**Figure 4.4.3.5** Step **5**). If the fascia is not levelled, a short eave course may be required – Refer **12.0 Unusual situations & circumstances**.

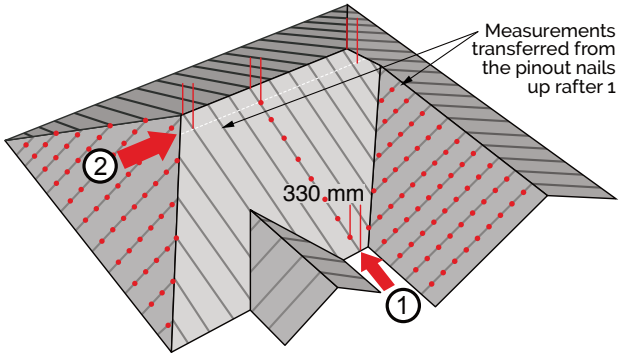


Figure 4.4.3.3

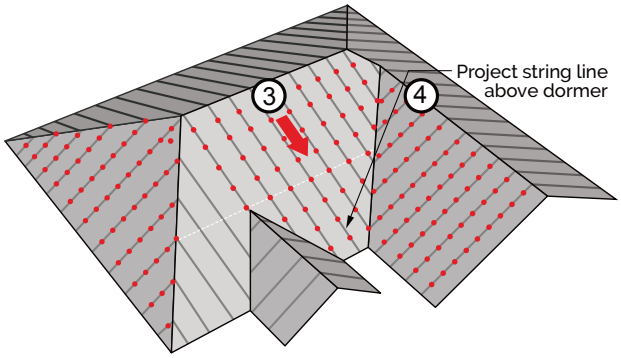


Figure 4.4.3.4

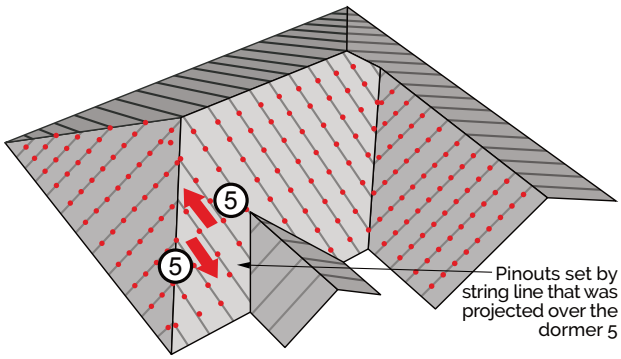


Figure 4.4.3.5

4.5 Batten location and fastening

Position eave batten just behind the fascia board. Eave batten must close gap between fascia and rafter to prevent vermin and bird access.

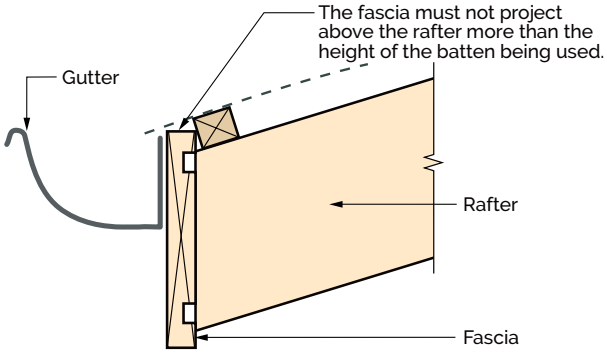


Figure 4.5.1

Pin out marker nails help hold the underlay in place, battens laid every third course but not fixed can be used to roll out the underlay. Batten joints are to be staggered and cut to length so that they butt together on top of a rafter. Battens must be fixed towards 3 rafters. Hold the battens firmly against the marking nail and fasten through the batten into the rafter. Once the battens are fastened remove the pin out nails.

Fasten battens over each length of underlay starting from the eave. Minimum overlap of a lower section of underlay is 75 mm (Refer to **5.0 Roofing underlays**).

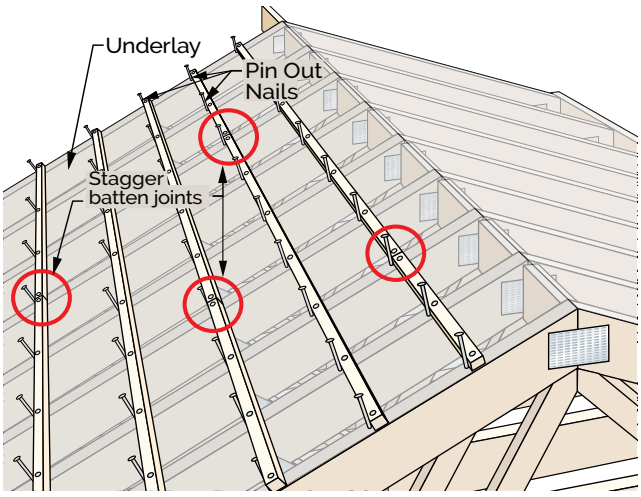


Figure 4.5.2

4.6 Accessory batten installation

Ridges, hips, gables, valleys

There are several ridge configurations that may be used when constructing a roof:

Truss type (commonly used on new construction) and rafter/ridge board (**Figure 4.6.1**).

Battens need to be installed to accommodate the different accessories.

Accessory battens are fastened using the same size and number of fasteners as used for the tile battens – refer **Table 4.3.1**.

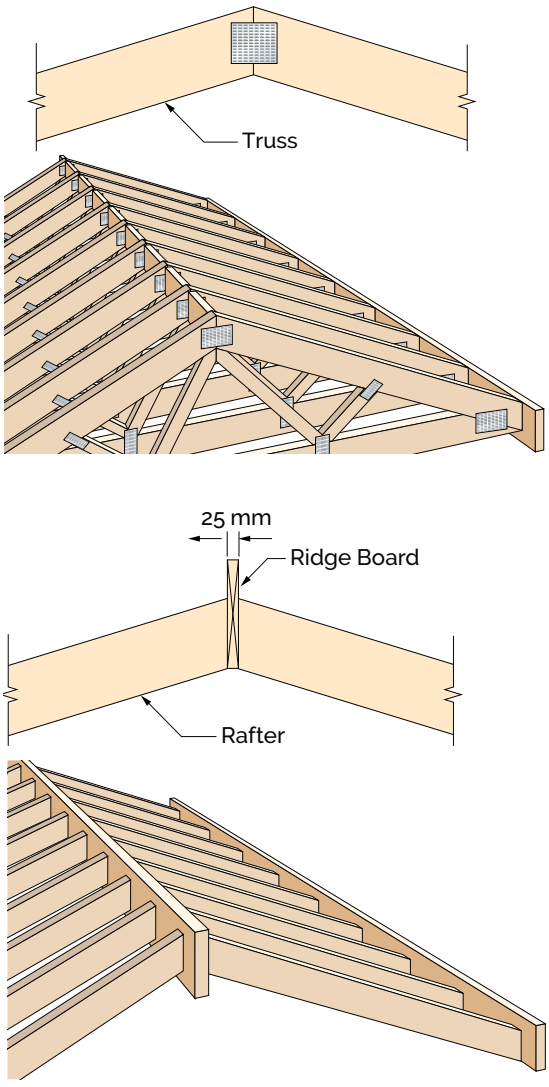
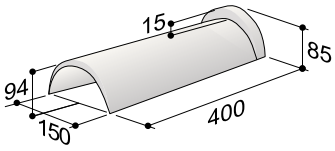
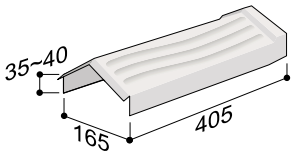


Figure 4.6.1

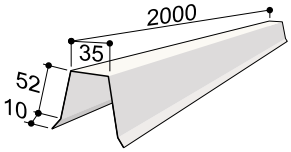
There are three accessories that are communally used on **ridges and hips:** Barrel trim, Angle trim and Box trim; **gable ends** may be finished with: Barrel trim, Angle trim or Box barge.



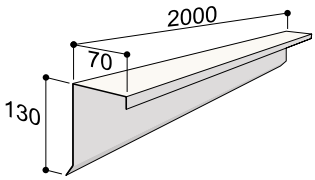
Barrel 150



Angle trim



Box trims



Box barge

4.6.1 Ridge batten installation

Barrel trim and Angle trims

Set out of the battens is dependant on the pitch of the roof. Battens are usually positioned so that they are spaced apart evenly either side of the ridges apex. On steeper pitch roofs the battens need to be located closer together so the Barrels/Angle trims can be installed snugly against the turned up tile. **Table 4.6.1.1** provides a guide to the width of battens at various pitches. It is good practice to use a string line to set battens for ridge/hips.

Two battens each side provide a base support for the back of the tile and for fastening the Barrels/ Angle trims.

Barrel trim

Typical ridge battens for Barrel trims are spaced at 140 mm – check **Table 4.6.1.1**.

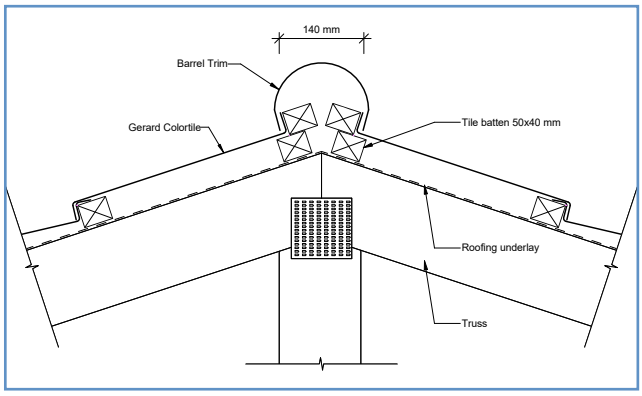


Figure 4.6.1.1.1 Barrel 150 trim on truss ridge

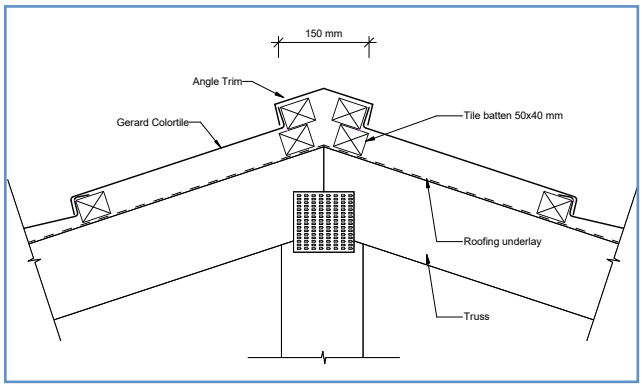


Figure 4.6.1.1.2 Angle trim on truss ridge

Box trims

Box trims require a 25 mm wide board that stands 90 – 100 mm above the apex of the ridge.

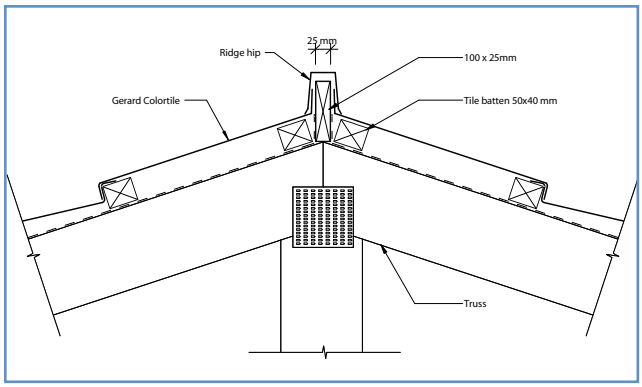


Figure 4.6.1.2.1 Box trim on truss ridge

4.6.2 Hip batten installation

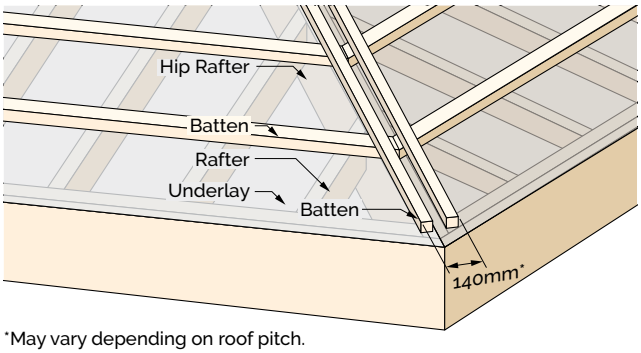
Barrel trim and Angle trim

Set out of the battens is dependent on the pitch of the roof. Battens are usually positioned so that they are spaced apart evenly either side of the hips apex. On steeper pitch roofs the battens need to be located closer together so the barrels/angle trim can be installed tightly against the turned up tile. **Table 4.6.1.1** provides a guide to the width of battens at various pitches.

The battens each side are for supporting the turned up tiles and for fastening the Barrel trim/Angle trim.

Barrel trim

Typical hip battens for Barrel trim installed on top of the tile battens at spacing of 140 mm – refer to **Table 4.6.1.1**.



*May vary depending on roof pitch.

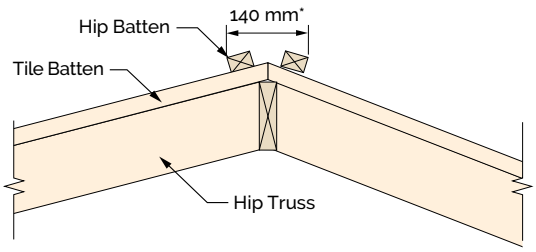


Figure 4.6.2.1.1

Ridge accessory	mm*			
		Roof pitch		
	Profile width	15-20˚	20-35˚	35-50˚
Barrel trim	150 mm	145 mm	140 mm	125 mm
Angle trim	160 mm	155 mm	150 mm	135 mm
Box trim	25 mm	25 mm	25 mm	25 mm

Table 4.6.1.1 Ridge accessory batten spacing

Always use an Angle trim/Barrel to check set out and allow for tiles turn up.

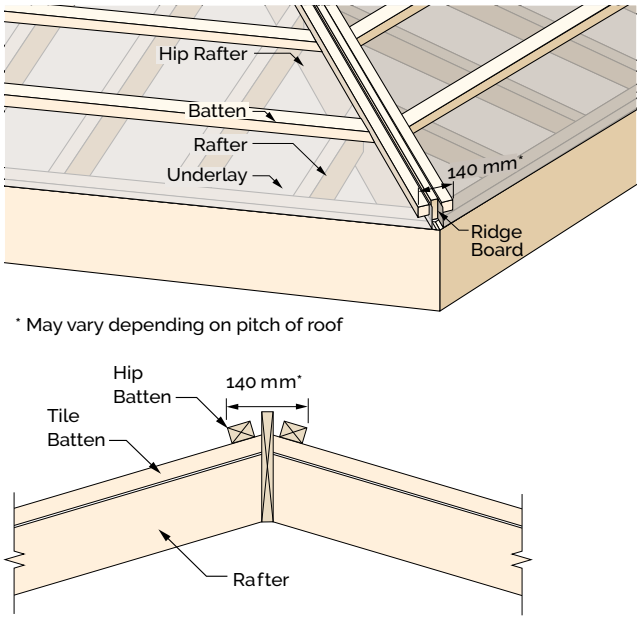


Figure 4.6.2.1.2

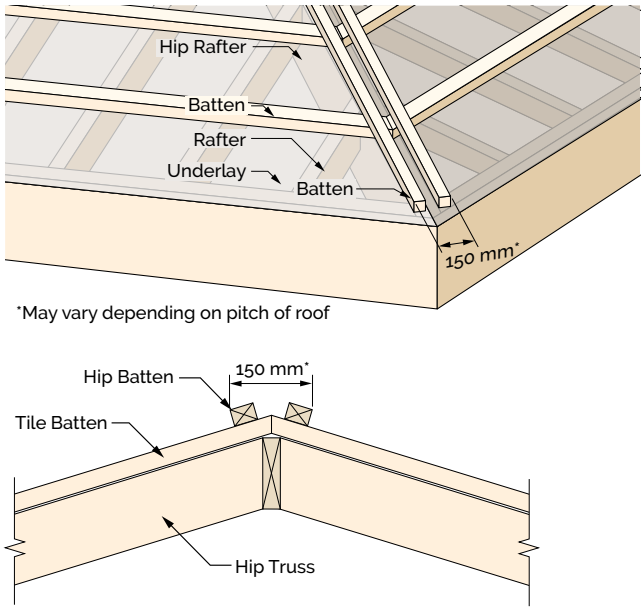


Figure 4.6.2.1.3

Angle trims

Typical hip battens for Angle trims installed on top of the tile battens at spacing of 150 mm – refer to **Table 4.6.1.1**.

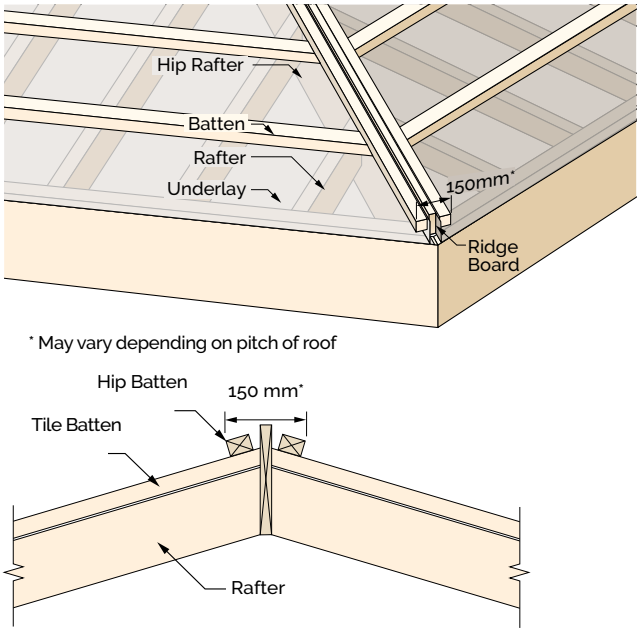


Figure 4.6.2.1.4

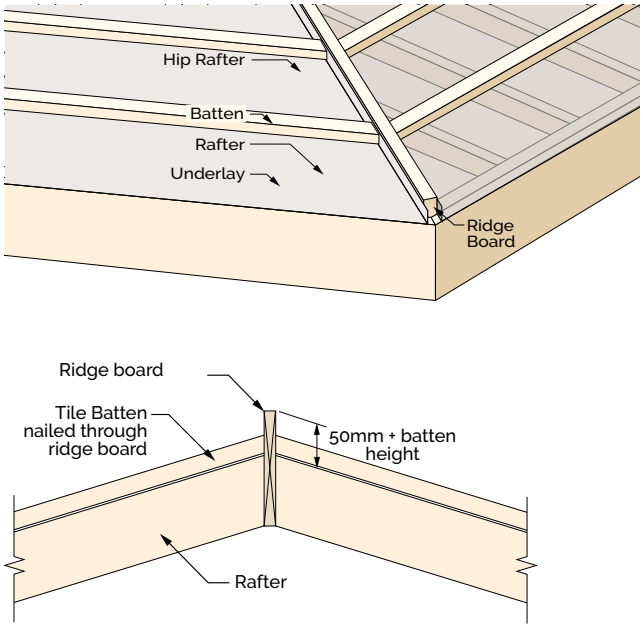


Figure 4.6.2.2.2

Box trims

Box trims require a 25 mm wide board that stands 90 – 100 mm above the apex of the hip. This results in a 25 mm board projecting 40 – 50 mm above the tile battens.

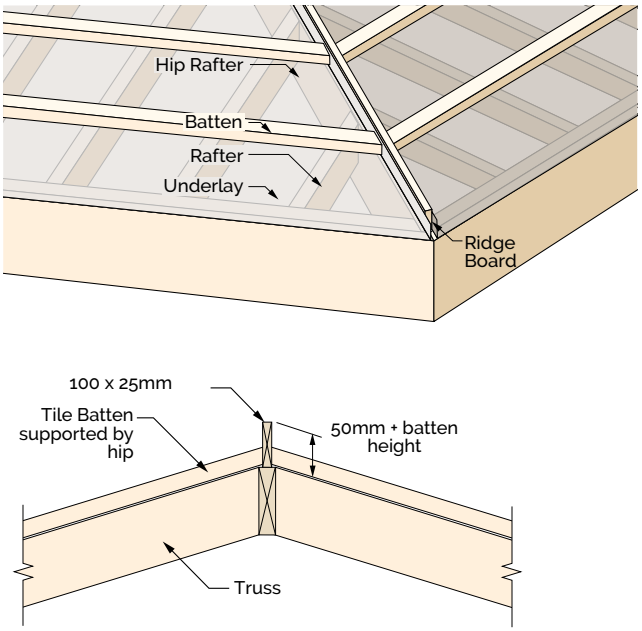


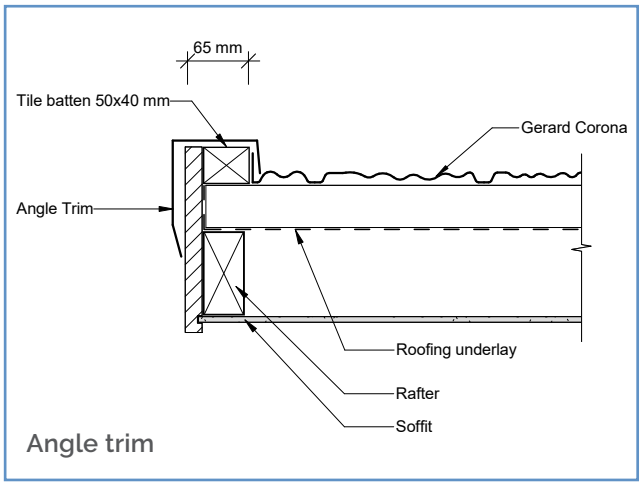
Figure 4.6.2.2.1

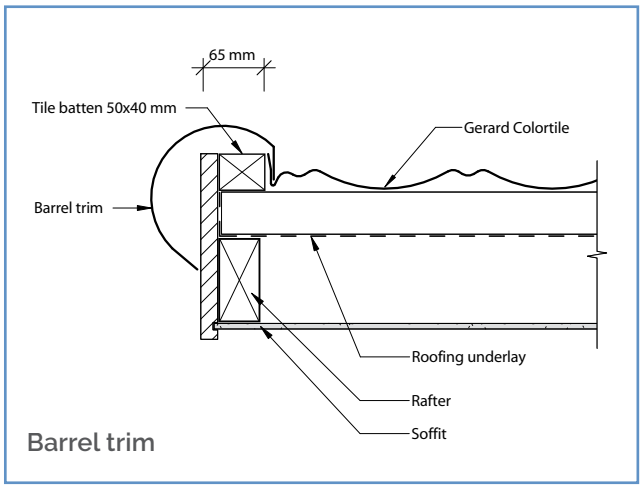
4.6.3 Gable end batten installation

A barge board should be installed before commencing batten installation.

The barge board should be installed 40 mm above the rafter. Tolerances of a minimum of 25 mm and a maximum of 60 mm above the rafter are permitted.

The measurement to locate the accessory batten is taken from the outside of the barge board





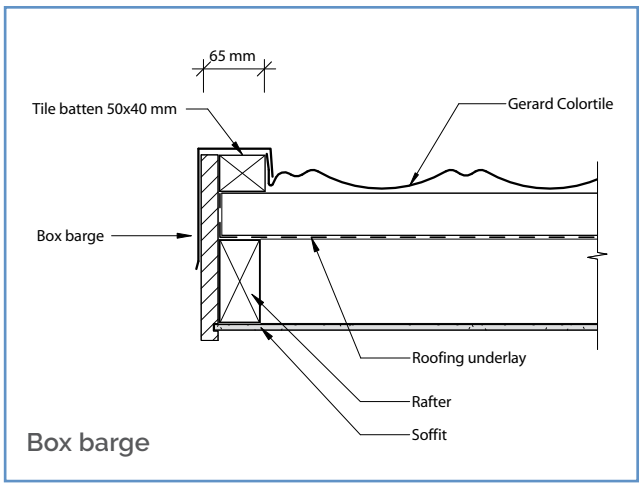


Figure 4.6.3.1

Gable accessory	Profile width as a gable accessory	Batten position for all roof pitches (from outside of barge board to inside of accessory batten)
Barrel trim	70 mm	65 mm
Angle trim	90 mm	65 mm
Box barge	70 mm	65 mm

Table 4.6.3.2

4.6.4 Valley board installation

Valley boards should be installed by the builder prior to the roof fixer starting batten installation. Timber should be treated to H3.

Valley boards are required to be set a minimum of 150 mm from the centre of the valley if Gerard Roofs

Combination valleys are used. These are required to support the valley, to attach the tile battens and they have to be able to support a load of 1.1 kN (110 kg).

Valley boards 150 x 25 mm are cut and installed between the trusses so that they can be nailed flush with the top of the rafter.

Valley boards 100 x 50 mm may be installed however these must be installed so that there is 25 mm clearance outside of where the valley sits so that tile battens have sufficient support and nailing width.

Roofing underlay is to be installed over the valley boards and under the tile battens. Refer to **5.0 Roofing underlays**.

Wide valley

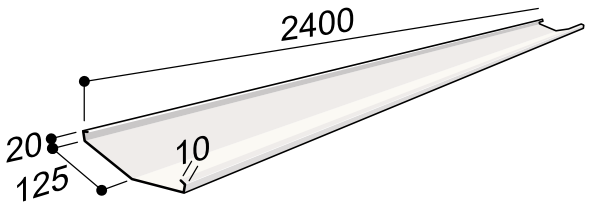
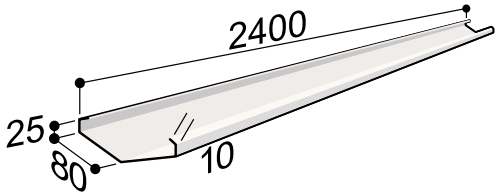


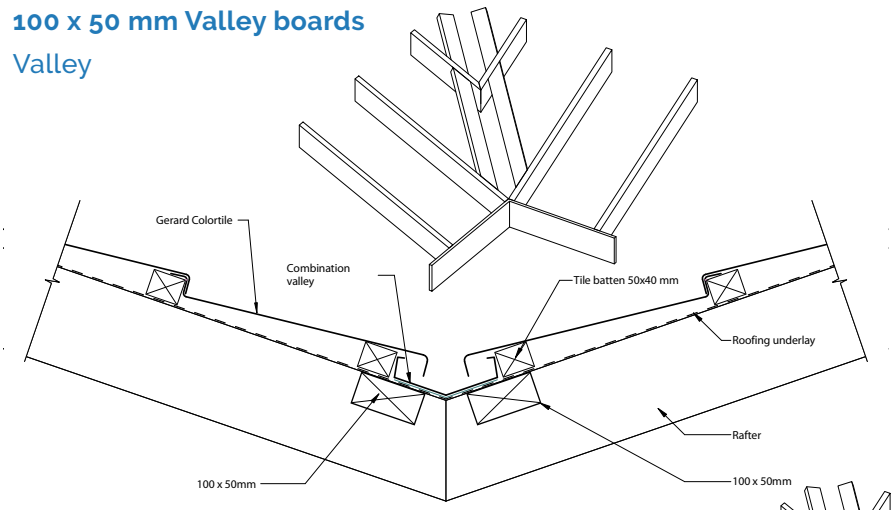
Figure 4.6.4.1

Valley



100 x 50 mm Valley boards

Valley



Wide Valley

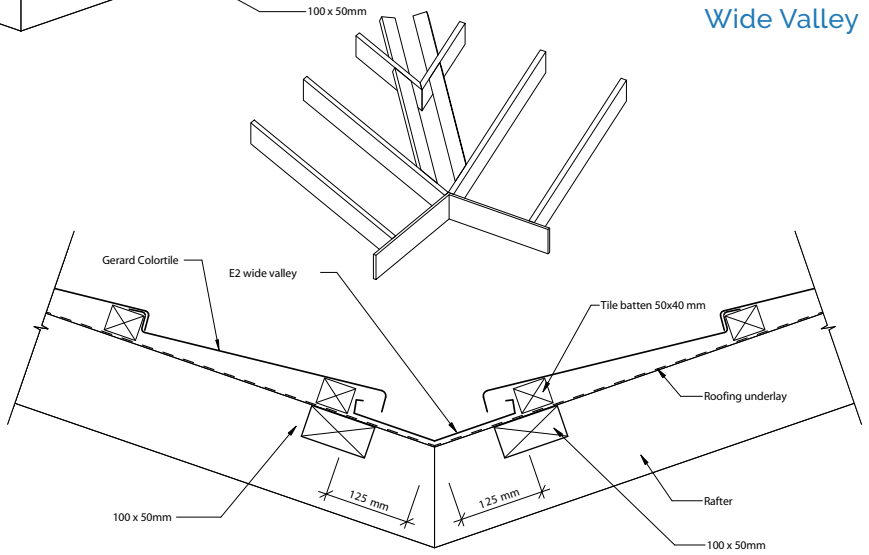
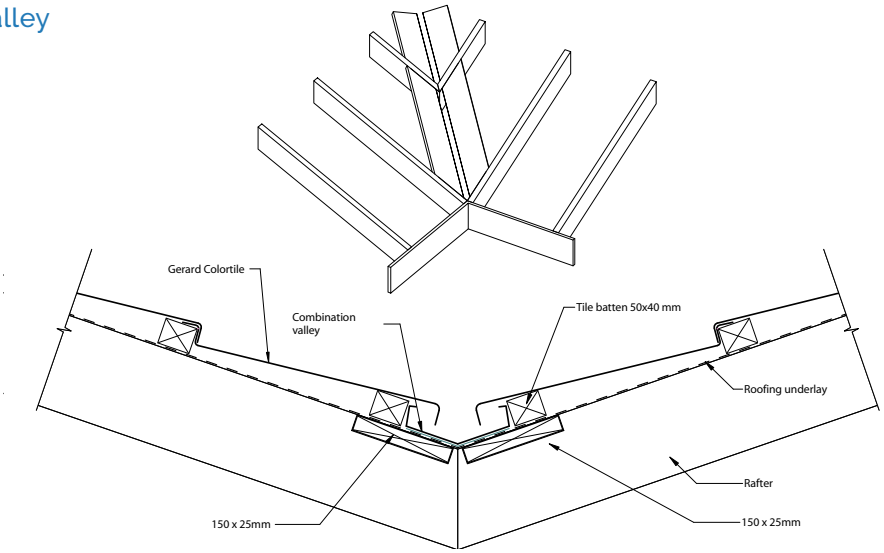


Figure 4.6.4.2 (continues on following page)

150 x 25 mm Valley boards

Valley



Wide valley

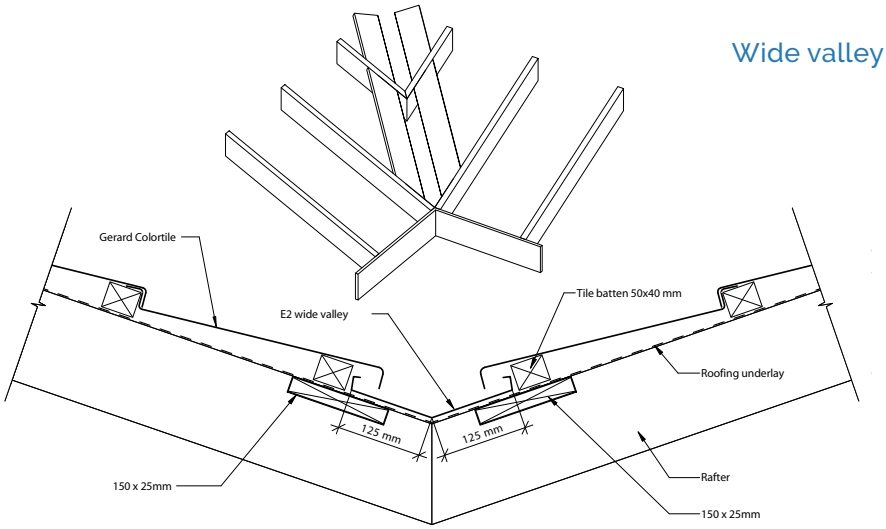
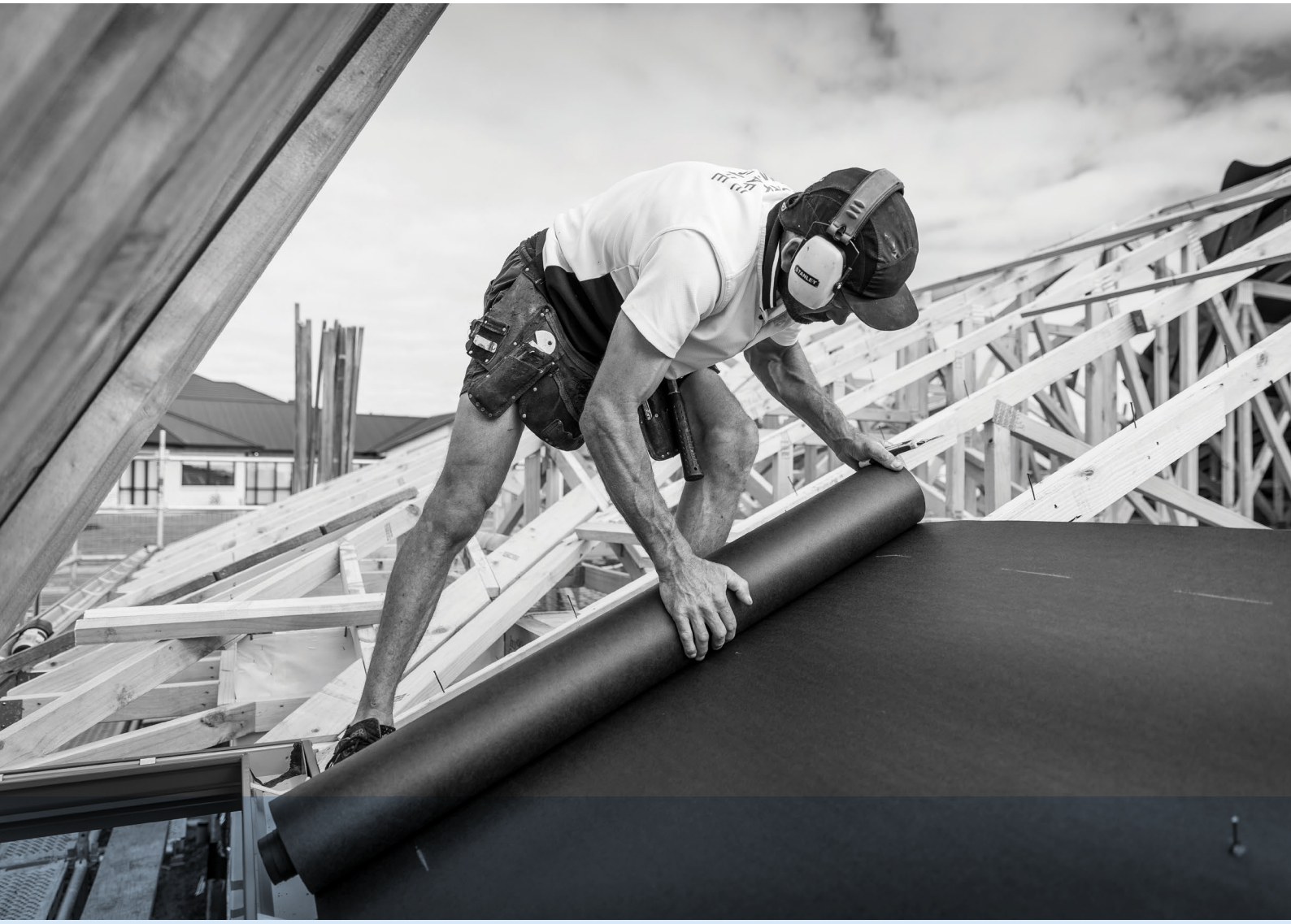


Figure 4.6.4.2

GERARD
Roofing Designed to Endure



5.0 Roofing underlays

5.0 Roofing underlays

5.1 Types of underlay

A self supporting roofing underlay or mesh supported underlay is required under all metal roofing. Must comply with standard NZS 2295 - Pliable and Permeable Building Underlays.

Type	Maximum
Bitumen Impregnated Kraft – self supporting	1200 mm
Fire Retardant Kraft – self supporting	1200 mm
Synthetic Roofing Underlay – self supporting	1200 mm
The above roofing underlays	>1200 mm to be wire mesh supported

Table 5.1.1 Roofing underlays

Roofing underlay should be installed so that any flow of moisture ultimately ends up in the eave gutter.

Follow the manufacturer's instruction on exposure to the elements. Take note of wet weather and UV exposure guidelines.

5.2 Roofing underlay installation

The roofing underlay is installed horizontally from the eave of the roof up to the ridge or hip, with a minimum edge overlap of 75 mm, ensuring that each higher length overlaps the lengths below. We recommend vertical laps must be a minimum of 150 mm and be over a rafter so that both ends are held in place by battens, however, follow the manufacturer's instructions.

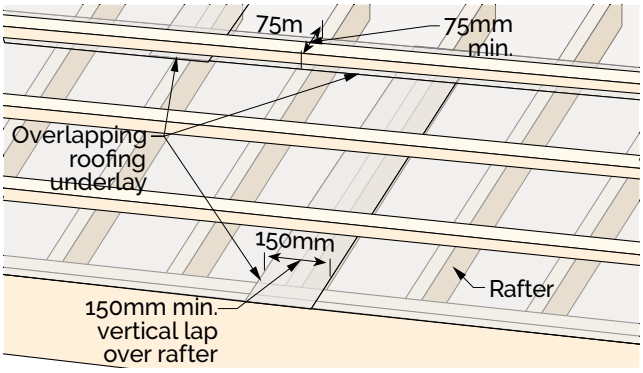


Figure 5.2.1

5.3 Eave roofing underlay

Install the first length so that the lower edge of the roofing underlay hangs 40 mm over the edge of the fascia board and into the gutter.

Roofing underlay at the eaves must be pulled tight so that it does not sag between the second batten and eave batten. Staple in place. Install an antiponding board if required.

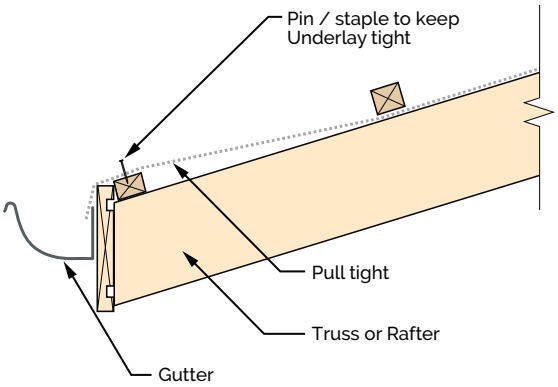


Figure 5.3.1

Use the eave batten and another batten laid horizontally to support the roll as it is rolled out. Push the roofing underlay down so that the pinout nails pierce the roofing underlay. This helps hold the roofing underlay in place. Place the tile battens on top of the roofing underlay and nail them in place, ensuring they are held

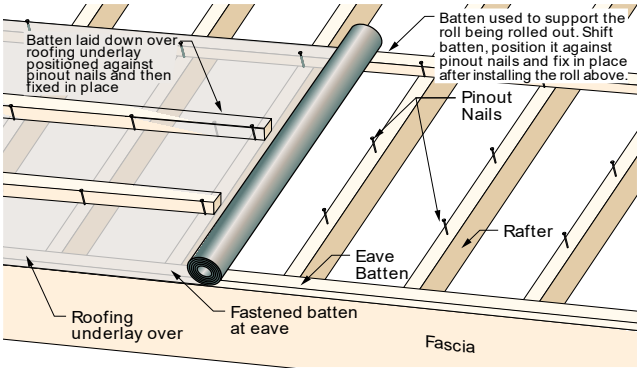
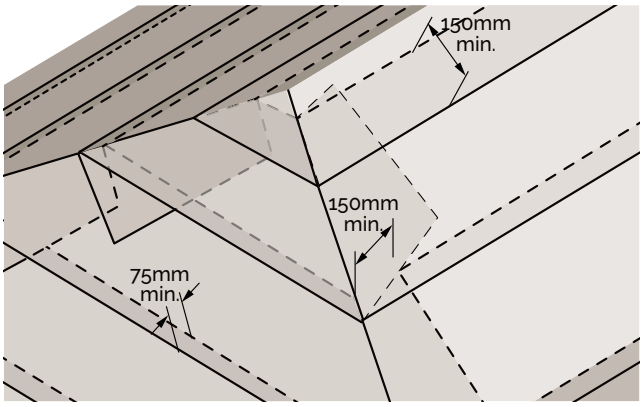


Figure 5.3.2

Note: Pinout nails have to be perpendicular to the rafters.

5.4 Ridges and hips

Roofing underlay must be lapped over ridges and hips so that the edges are held in place by battens on the opposite section of roof.



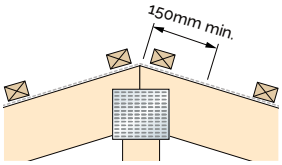


Figure 5.4.1

5.5 Valleys

Option 1

A single length of roofing underlay laid down the valley section may be used - optional but not required (See **1** in **Figure 5.5.1**).

Roofing underlay must be lapped across valley sections so that the edges are held in place by battens on the opposite section of roof (See **2** and **3** in **Figure 5.5.1**).

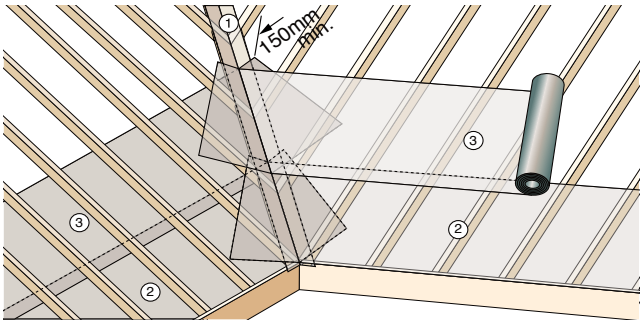


Figure 5.5.1

Option 2

Lay down the valley section with a 400 mm strip underlay (See **1** in **Figure 5.5.2**). This allows Combination valleys to be put in position firstly (See **2** in **Figure 5.5.2**) for cutting tile battens up against them. Then lay roofing underlay from eave up. (See **3** and **4** in **Figure 5.5.2**).

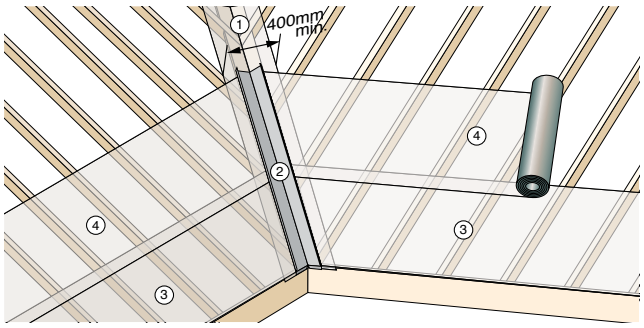
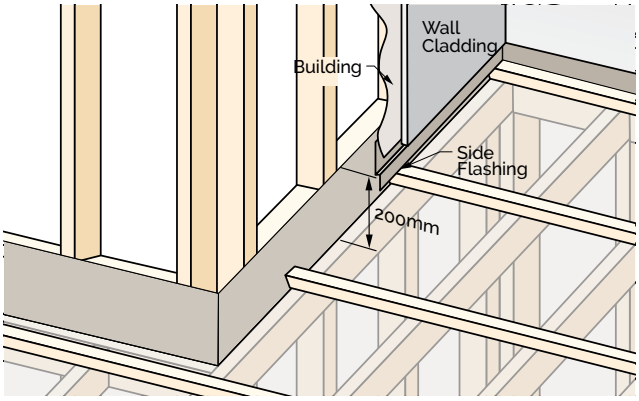


Figure 5.5.2

5.6 Wall Junctions

The roofing underlay must be turned up against the wall behind the building wrap so that it extends higher than any flashing.



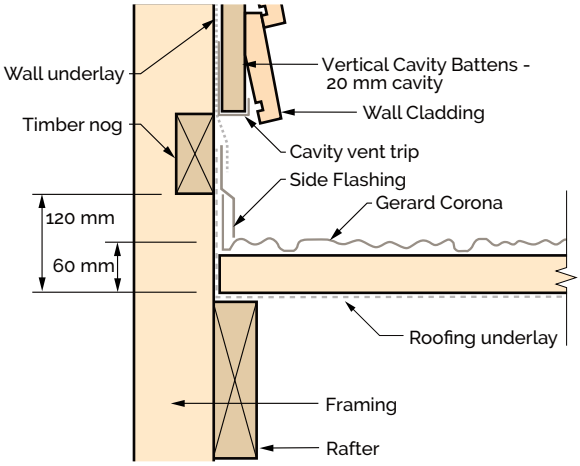
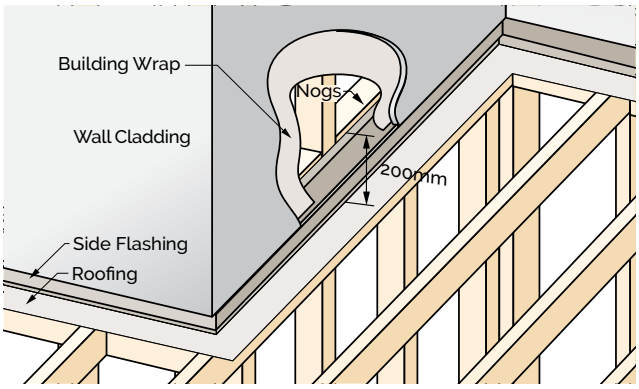


Figure 5.6.1

In situations where the roofing is not installed until after the wall cladding has been completed then a short section of roofing underlay is to be preinstalled at the roof wall junction. The width must be sufficient so that it overlaps the roofing underlay edge when it is installed. Roofing underlay must be turned up behind the lower sections of the side flashing as far as possible.



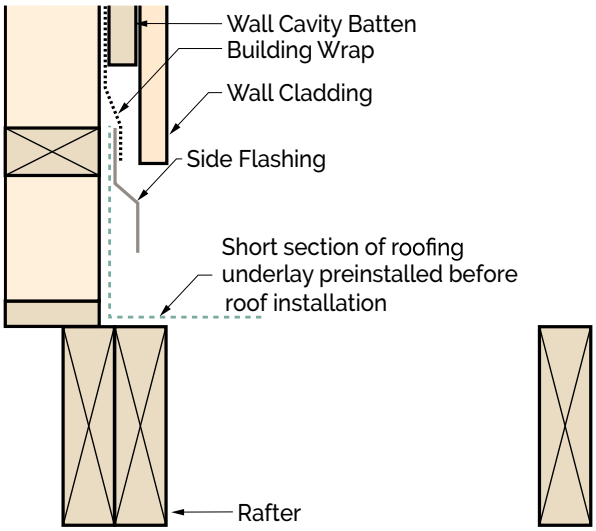


Figure 5.6.2

5.7 Repairs to roofing underlay

Follow the manufacturer's instructions on repairs to roofing underlay.

5.8 Penetrations through the roofing underlay

Cut outs off the roofing underlay and the tile should be minimised matching the size and shape of the penetration. The penetrations should be flashed and the flashing should be dressed to the tile profile (see **11.0 Penetrations** for aquaseal flashing installation for pipe penetrations).

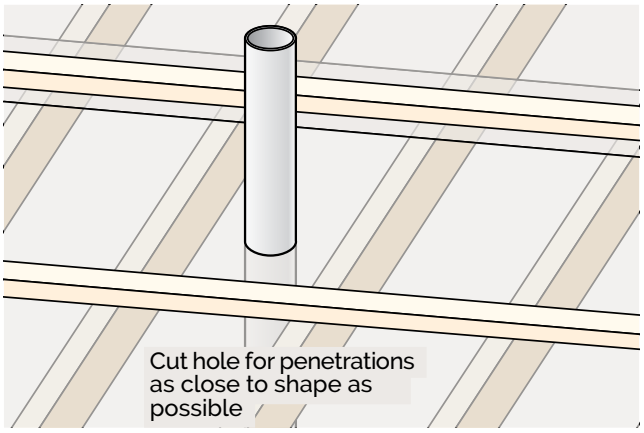


Figure 5.8.1

Sections above large penetrations such as skylight windows should be treated as an eave. A separate sheet of roofing underlay the width of the penetration should be installed so that the roofing underlay ends up on top of the penetration's flashing.

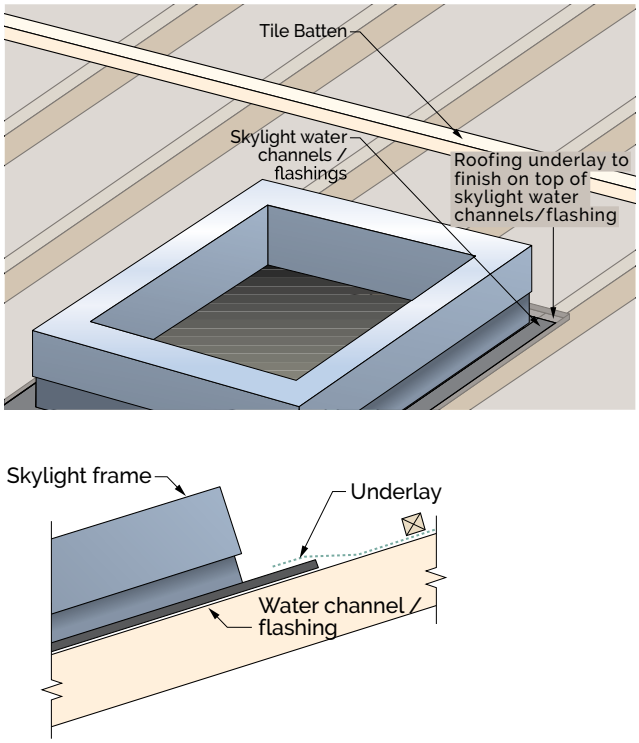


Figure 5.8.2

GERARD
Roofing Designed to Endure

6.0 Cutting & installing

6.1 Site safety

Safety signs and edge protection, if required, should be in place before installation starts.

6.1.1 Preparatory work

Underlay, tile and accessory battens, wall flashings, valleys and fascia boards should be in place before laying tiles.

6.1.2 Tile selection - colour coding

The roof installer should check that the tiles are of the correct colour and are in good condition. Gerard Roofs provides a colour code on each pallet (A - M).

Different colour coded tiles should NOT be installed on the same roof.

Tiles with surface defects should NOT be installed on the roof.

6.1.3 Walking on tiles

Soft soled shoes capable of providing secure footing should be worn.

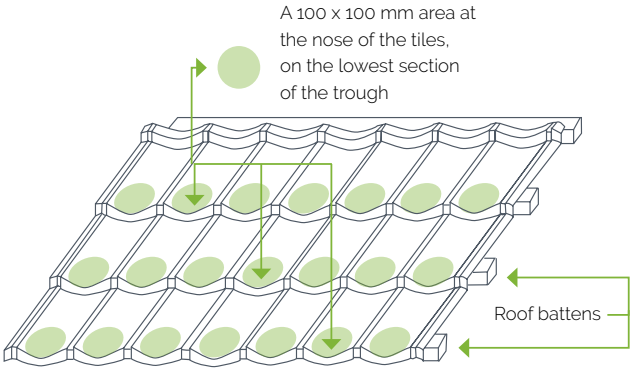
Extreme care is required when walking on wet tiles and this should be avoided if possible. Satin finish tiles can be very slippery and should NOT be worked on while wet.

The surface coating of the textured finish tiles may be damaged when they are wet, and damage increases as the pitch increases.

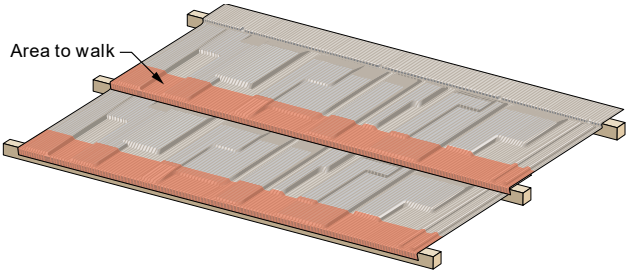
When walking on the tiles weight must be concentrated directly above the batten for Shake, Senator, Rockport, Oberon, Aspen and Alpine and in the pan (lower section) of tiles above the batten.

Tile damage will occur if installer weight is applied to tile ridges or mid sections of Shake, Senator, Rockport, Oberon, Aspen and Alpine.

For Bond, Milano and Classic



For Shake, Senator, Rockport, Oberon, Aspen and Alpine



6.1.4 Damaged tiles

Tiles damaged during installation should be removed and replaced.

6.1.5 Sub-trade damage

If substantial work is to be carried out above a section of roof, such as installation of walls, tiles should generally be installed after this work has been completed. Tiles may be installed prior however protection for the tiles and their surface coatings needs to be installed before the wall cladding is installed. This may involve drop sheets and/or a plywood covering. At this point it should be made clear to the building supervisor who is responsible for damaged tiles by sub-trades.

6.1.6 Work interruption

If work is interrupted for any reason, or at the end of a workday, all loose tiles, accessories and incomplete

sections must be secured against possible movement by wind.

Tile and accessories must be left clean and dry and securely covered to protect against the weather.

6.1.7 Clean up

The building site should be left clean of any roofing materials. All batten and tile off cuts, nails and packaging must be removed from the site. The roof should be cleaned to remove any debris left by the installation process.

6.1.8 Sign off

Obtain sign off for the roof as soon as possible after completion of the clean up.

6.2 Tile laying

For Shake, Senator, Rockport, Oberon, Aspen and Alpine tiles only, to prevent lines of tile joins showing down the roof make sure to randomly stagger the tiles (Refer to **7.0 Product-specific installation** for each tile profile laying pattern).

All tiles interlock. Depending on the tile profile they may be interlocked in both directions or only in one direction (Refer to **7.0 Product-specific installation** for each tile profile laying pattern).

Lay tile laps facing away from prevailing winds. Where possible the tiles should be laid with the laps facing away from the line of normal sight.

6.2.1 Laying tiles

Tiles are installed from the top of the roof to the eave. Install the second to top course tiles (usually the first full width tile), hold them in place by nailing through the flat of the back edge of the tile which sits on the batten (Step **1** in **Figure 6.2.1.1**). Lower courses of tiles may then be laid without having to fasten each tile.

Subsequent tiles are laid by lifting both tiles in the course above and sliding the next course under the nose of the tiles already in place (Steps **2** and **3** in **Figure 6.2.1.1**). Tiles should be staggered so that side laps do not line up down the roof.

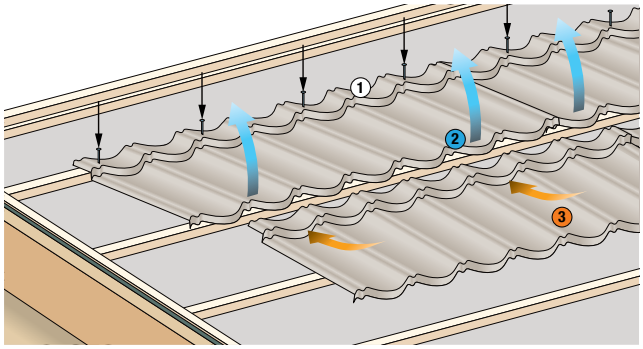


Figure 6.2.1.1

On lower pitched roofs all full tiles can be laid to cover the entire area without fastening. On higher pitch roofs, over 30˚, tiles should be fastened two courses above the tiles being laid.

All tiles should be fastened in place before leaving the job site for any reason.

6.2.2 Tile fastening

Tiles in the body of the roof are fastened using 4 tile nails per tile (spacing 360 mm approx.) through the front downturn (tile nose) so that the nail penetrates the front face of the tile batten (see **Figure 6.2.2.1**). Nails should be placed 60 mm from the lowest section of a pan on tiles and not in the hidden water channels on Shake, Senator, Rockport, Oberon, Aspen and Alpine (Refer to **7.0 Product-specific installation** for each tile profile). Fasteners should be installed a minimum of 10 mm from the edge of the nose or half the width of the nose.

Eave tiles are fastened through the tops of the tiles using 4 fasteners, not in the pans or water channels.

Cover the nail with basecoat and stone chips from the finish kit (texture finish).

Satin finish (painted) tile requires a rubber washer under the head of the eave nail.

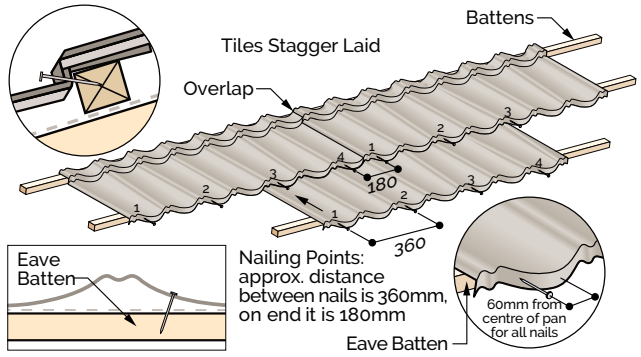


Figure 6.2.2.1 Nailing positions on Bond

6.2.3 Nailing fastening technique

The person nailing the tiles should stand on the tile being fastened facing the eave and nailing as shown.

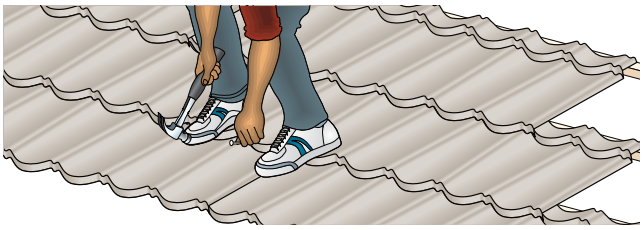
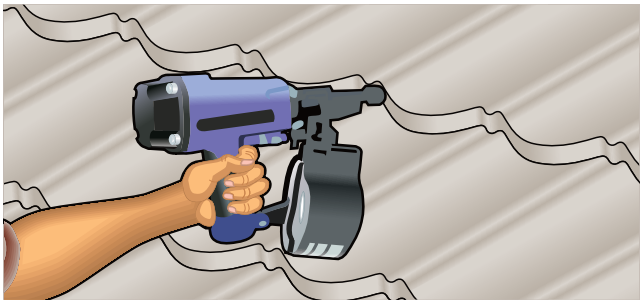


Figure 6.2.3.1

Gun Nailers using Gerard Roofs specified nails can also be used to secure tiles (Refer to **6.3 Nail guns and Nails**).



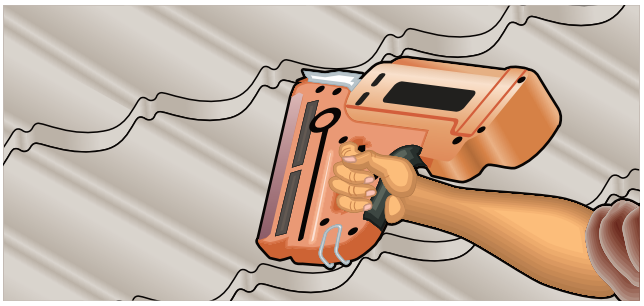


Figure 6.2.3.2

6.2.4 Gable roof

Tiles are turned up against the gable end accessory batten a minimum of 40 mm.

The end of the first tile is bent up 40 mm, this tile is then positioned against the accessory batten and second to top course tile batten, full tiles are then laid the length of the gable. These are held in place by tacking in place on the flat at the back of the tile.

Starting from the course already laid, lay the tiles two courses at a time end to end. The tile laps must be staggered down the roof. The staggered laying will result in gaps at either end of the gable. Tiles need to be measured, cut and bent to suit. When laying these cut and bent tiles make sure that the laps are laid the same way as the rest of the roof.

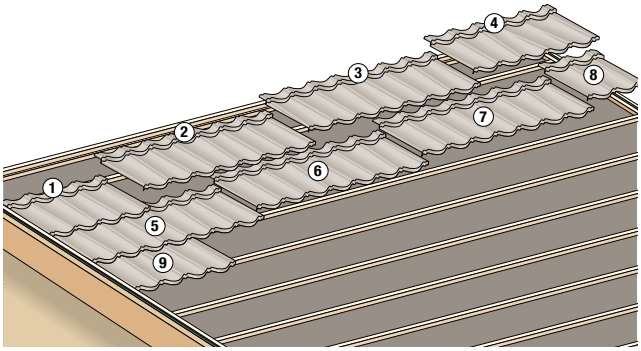


Figure 6.2.4.1 Stagger the tile laps down the roof, using part tiles at the gable end

Randomly stagger the laps of Shake, Alpine, Senator, Rockport, Aspen and Oberon.

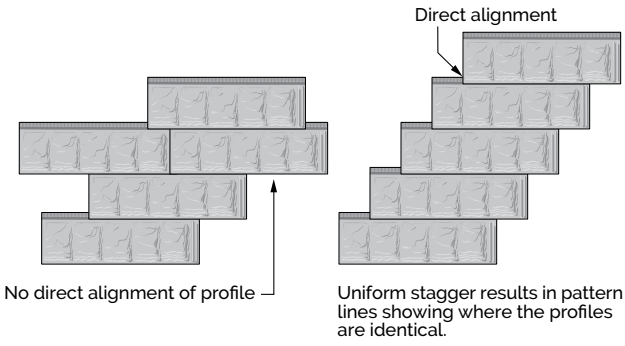


Figure 6.2.4.2 Random stagger

Measuring, cutting and bending gable end tiles

Measurements for cutting and bending tiles are taken on the roof. The measurements are then transferred on to tiles on the ground where they are **cut**, **bent** and **stacked** in order.

For Bond, Classic and Milano; the measurement is taken from the centre of the water channel of the tile, along the front face of the tile batten on the roof to the inside of the gable end accessory batten, this is the bend line. Add 40 mm for the turn up of the tile, this is the cut line. (Refer to **6.4 Use of fixing tools – guillotine and bender**).

For Shake, Senator, Rockport, Oberon, Aspen and Alpine; the measurement is taken from the edge of the side lap of the tile, along the front face of the tile batten on the roof to the inside of the gable end accessory batten, this is the bend line. Add 40 mm for the turn up of the tile, this is the cut line. (Refer to **6.4 Use of fixing tools - guillotine and bender**).

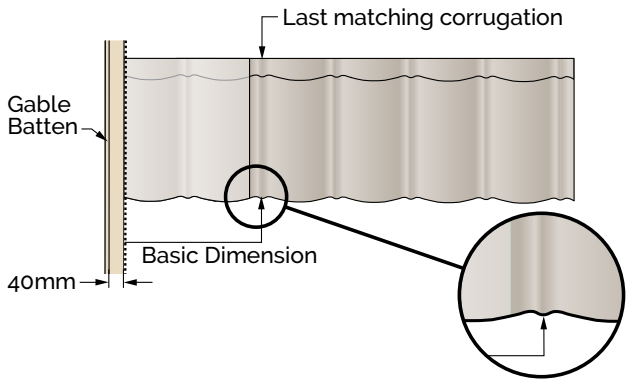


Figure 6.2.4.3

Figure 6.2.4.4 Gable end tile

If the gable is 90˚ then the bend can be made straight across the width of the tile. If it is an angled gable, treat the measurements the same way as a hip roof (Refer **6.2.5 Hip roof**).

Gable end tiles are installed from the eave up ensuring lapping is correct. Tiles are nailed in place through the front down turn and into the accessory batten through the turn up.

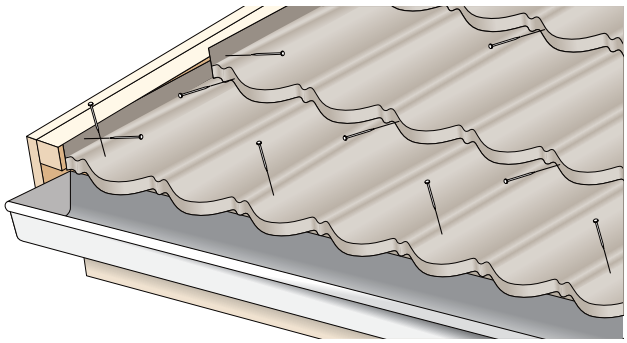


Figure 6.2.4.5

6.2.5 Hip roof

Tiles are turned up against the hip accessory batten a minimum of 40 mm.

Lay the first full tile at the second to top course (if it doesn't fit, lay from the third to top course) so that the back of the tile is a minimum of 150 mm from the inside edge of the hip accessory batten (see **Figure 6.2.5.1**). This allows a full module to be used for the cut and bent hip tile.

Stagger and lay full tiles across the length of the roof until the last full tile. If the hip tile for the end section cannot be cut and bent out of a full tile it will be necessary to insert a part tile before the end of the hip. Bond, Milano and Classic can be cut in modular length, whereas Shake, Senator, Rockport, Oberon, Aspen and Alpine have specific points where to cut (Refer to **7.0 Product-specific installation** for each tile profile).

Lay the remaining full tiles down the roof leaving gaps at each end where hip tiles will need to be inserted.

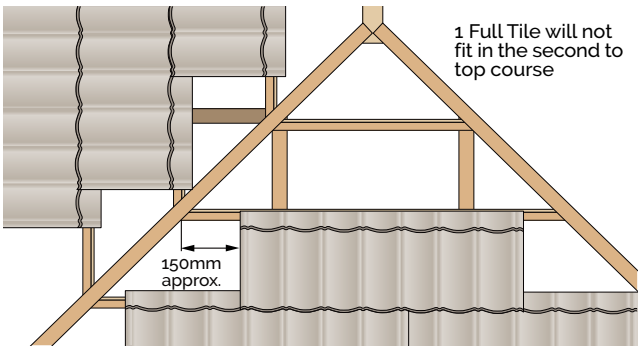


Figure 6.2.5.1

Measuring, cutting and bending hip tiles

Measurements for cutting and bending tiles are taken on the roof. The measurements are then transferred on to tiles on the ground where they are **cut**, **bent** and **stacked** in order.

For Bond, Classic and Milano; the measurement is taken from the centre of the water channel of the tile, along the front face of the tile batten on the roof to the inside of the hip accessory batten, this is the bend line. Add 40 mm for the turn up of the tile, this is the cut line. (Refer to **6.4 Use of fixing tools – guillotine and bender**).

For Shake, Senator, Rockport, Oberon, Aspen and Alpine; the measurement is taken from the edge of the side lap of the tile, along the front face of the tile batten on the roof to the inside of the hip accessory batten, this is the bend line. Add 40 mm for the turn up of the tile, this is the cut line. (Refer to **6.4 Use of fixing tools - guillotine and bender**).

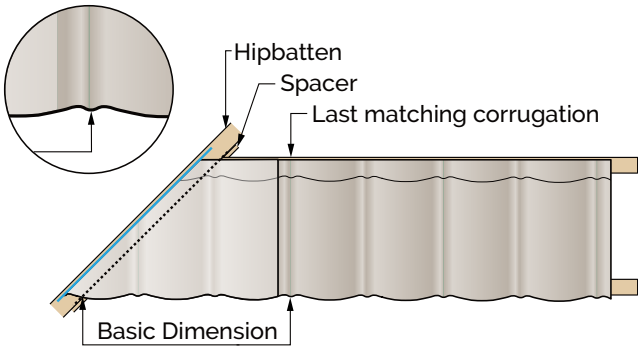


Figure 6.2.5.2

Fig 6.2.5.3 Hip tile being cut then bent

A bevel set to the angle of the hip may then be used to mark the required angle for the hip tile. Alternatively measurements of the front and back of the tile along the front face of the tile batten may be used to provide the angle.

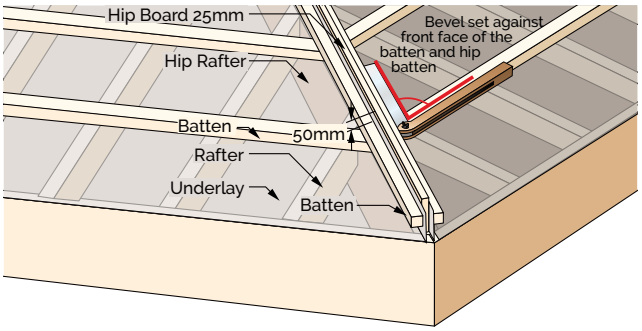


Figure 6.2.5.4 Transfer hip angle to the tile to be cut

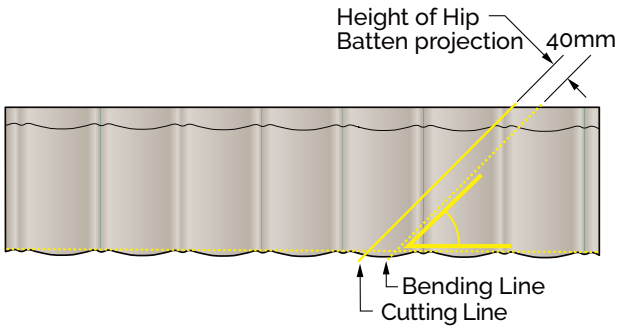


Figure 6.2.5.5

Hip tiles are then laid to fill the gaps from the eave up, nailing through the front downturn and through the turn up into the hip accessory batten.

Bond, Milano and Classic need to be laid as described above as they are modular and require significant care in ensuring the modules line up down the roof.

Shake, Senator, Rockport, Oberon, Aspen and Alpine may be installed by pre-cutting and bending them for the starting end of a hip. The angle of the hip tile is taken from the roof using a bevel; this is then transferred onto the tile on the ground. Shake, Senator, Rockport, Oberon, Aspen and Alpine should be made slightly different length so that when the roof is completed it will have a random pattern on the roof. This results in only having to measure the end hip tile gaps.

Each tile should supply two cut sections leaving a minimum wastage.

Careful cut tile selection and use of cut tiles for hips and valleys also reduces waste.

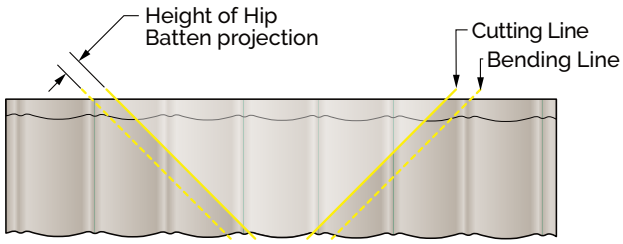


Figure 6.2.5.6

6.2.6 Ridge tiles

Measurements for bending and cutting tiles are taken on the roof. Ridge tiles are **bent** before **cutting.**

All measurements need to be taken along the front face of the batten as this is where the tiles are fastened. Tiles need to be marked along a line where the batten will eventually be positioned.

The measurement is taken from the front of the headlap of the tile to the front of the ridge tile batten A in **Figure 6.2.6.1** & **6.2.6.2** this is the bend line. Add 40 mm for the turn up of the tile, this is the cut line. (Refer to **6.4 Use of fixing tools – guillotine and bender**).

Measurements along the ridge are required to ensure that the cut tiles are correct (do NOT assume that the ridge is exactly straight unless you have measured).

The measurements are transferred to tiles on the ground. The tiles are **bent, cut** and **stacked** in order as they will be laid on the roof.

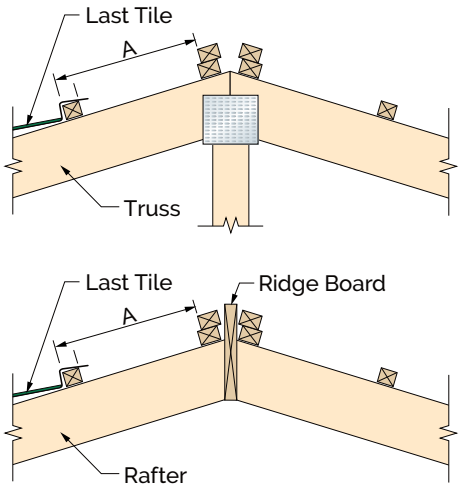


Figure 6.2.6.1 Standard ridge/hip setup

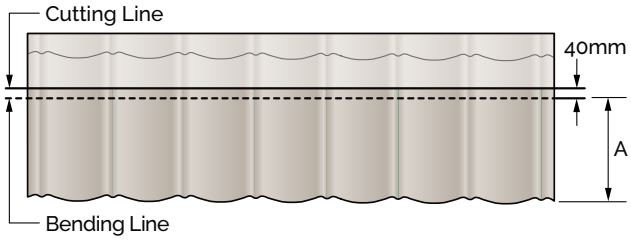


Figure 6.2.6.2

Figure 6.2.6.3 Ridge tile being bent then cut

Installing ridge tiles

Fasten the ends of the front of the tile first (Steps **1** and **2** in **Figure 6.2.6.4**), then fasten the outside ends of the back of the tile so that the modules line up with other tiles on the roof, also nail the back so that the pitch of the top course tile is the same as the roof (Steps **3** and **4** in **Figure 6.2.6.4**). By nailing each end the back of the tile will bow up (due to the distortion created when bending) (see **Figure 6.2.6.4**); push the centre of the tile down and nail the upturn to the ridge batten in several places (see **Figure 6.2.6.5**).

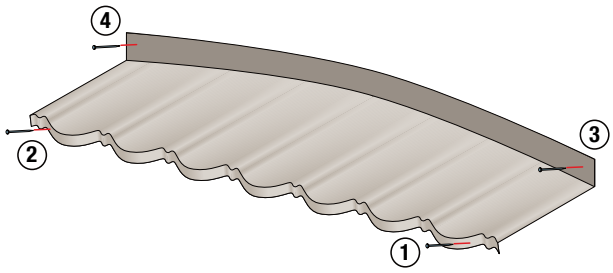


Figure 6.2.6.4

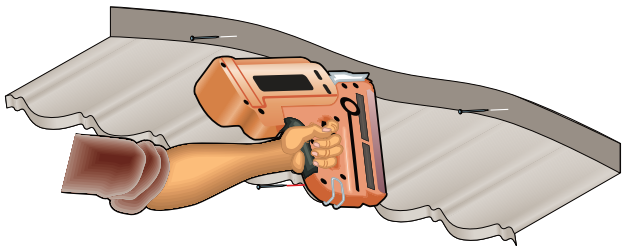


Figure 6.2.6.5

6.2.7 Valley tiles

Measurements for cutting and bending tiles are taken on the roof.

All measurements need to be taken along the front face of the batten as this is where the tiles are fastened. Tiles need to be marked along a line where the batten will eventually be positioned. Failure to follow this procedure will result in bends being incorrect on the modular tiles.

The measurements are then transferred on to tiles on the ground where they are **cut**, **bent** and **stacked** in order.

For Bond, Classic and Milano; the measurement is taken from the centre of the water channel of the tile, along the front face of the tile batten on the roof to 30 mm past the edge of the valley. The turn down is not parallel to the bend line, add 40 mm at the front (nose) of the tile and 30 mm to the back of the tile, this is the cut line (see **Figure 6.2.7.1**). (Refer to **6.4 Use of fixing tools – guillotine and bender**).

For Shake, Senator, Rockport, Oberon, Aspen and Alpine; the measurement is taken from the edge of the side lap of the tile, along the front face of the tile batten on the roof to 30 mm past the edge of the valley. The turn down is not parallel to the bend line, add 40 mm at the front (nose) of the tile and 30 mm to the back of the tile, this is the cut line (see **Figure 6.2.7.1**). (Refer to **6.4 Use of fixing tools – guillotine and bender**).

The slope on the cut made on valley tiles is required to make sure that the bottom edge of the valley tile appears straight in the valley.

The gap between tiles in a valley must be a minimum of 50 mm.

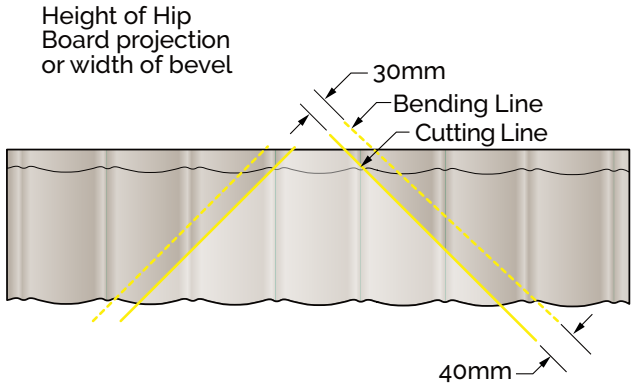


Figure 6.2.7.1

Figure 6.2.7.2 Valley tile being cut then bent

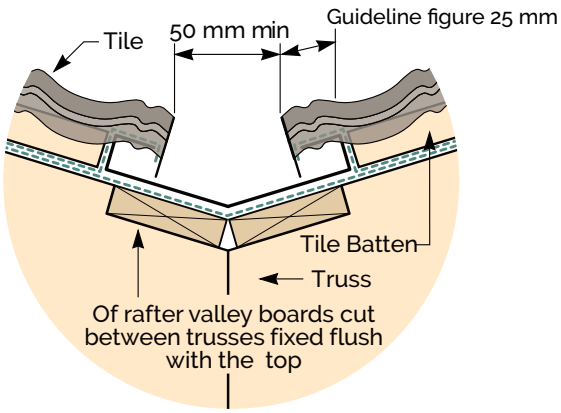


Figure 6.2.7.3

Cut and bend the tiles at the valley as straight as possible to obtain a straight line. Lay the valley tiles from the eave up fastening them through the front downturn. Never nail into a valley.

6.2.8 Laying tiles next to a wall

The tile turn up against a wall must be a minimum of 40 mm.

All measurements need to be taken along the front face of the batten as this is where the tiles are fastened. Tiles need to be marked along a line where the batten will eventually be positioned. Failure to follow this procedure will result in bends being incorrect on Bond, Milano and Classic.

The measurements are then transferred onto tiles on the ground where they are **cut, bent** and **stacked** in order.

The measurement is taken from the water channel of Bond, Milano and Classic (or centre of the side lap on Shake, Senator, Rockport, Oberon, Aspen and Alpine) then along the front face of the tile batten on the roof to the surface of the wall framing, note that the bent up tile should install neatly behind the wall flashing accessory (usually a side flashing). If the flashings are already in place carefully insert the tiles under the flashing by tilting the tile up and sliding the bent section under the flashing. If the flashing has not been installed lay the tiles and install the flashing soon after.

Lay the wall tiles from the eave up fastening them through the front down turn but do not nail the tile to the wall framing.

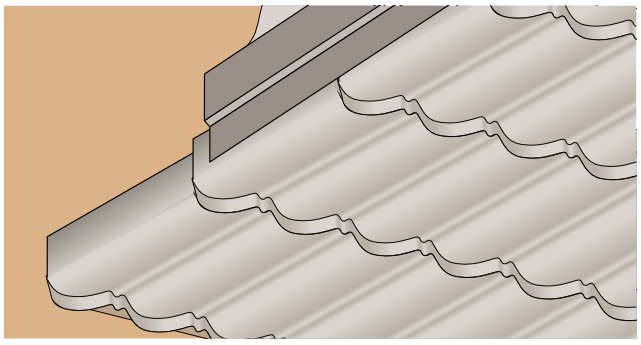


Figure 6.2.8.1

6.3 Nail guns and nails

There are two types of gun nails approved for fastening Gerard Roofs tiles. Each nail gun uses a different nail type.

No other nails are to be used for fastening tiles.

Nails may be painted before installation using a high quality spray paint suitable for touch up on metal roofing should a better colour match be required.

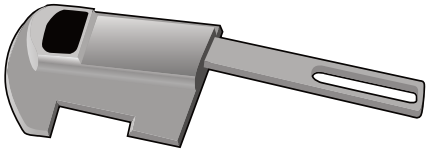
Standard Gerard Roofs tile nails

These are hammer driven nails supplied in boxes of 5 or 25 kg.

IM350 Nail framing gun

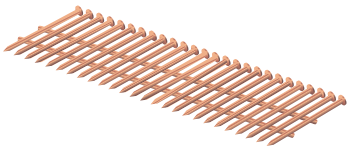
When fastening tiles with this nail gun a tile nose attachment must be installed. This nail gun is also popular for fastening tile battens with 90 mm nails.

IM350 Nailer



Nailer Nose

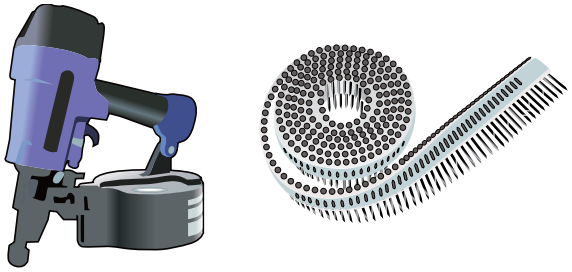
The nails used in this nail gun are 50 mm Paslode Round Head Hot Dip Galvanised nails supplied in a stick of 40 nails.



Stick Nails For IM350

Duofast CNP-65 pneumatic nail gun

Nails used with this nail gun are 50 mm Paslode Round Head Hot Dip Galvanised nails supplied in a coil of 325 nails.

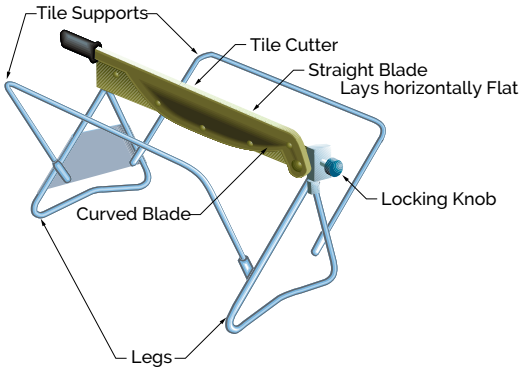


CNP65 Nail Gun

6.4 Use of fixing tools

Guillotine

The guillotine can be used to cut tiles or accessories as required.



Gable, hip and valley tiles

Flattening the nose and headlap before cutting the tile will make cutting easier.

Figure 6.4.1

Cut along the marked line, a quick single motion down while pulling the guillotine blade towards yourself (to the left) will keep the blades together and usually ensure that a cut is made in one operation. If more than one cut is required move the tile closer to where the blades intersect as this is where the guillotines cutting power is greatest.

Hold the tile so that the largest side is held in the left hand, this gives you greater control over the tile being cut.

Cutting a tile

Figure 6.4.2

Bending a tile

Figure 6.4.3

Ridge tiles

These are bent in the long tile bender before cutting to help reduce tile distortion (splay).

Figure 6.4.4

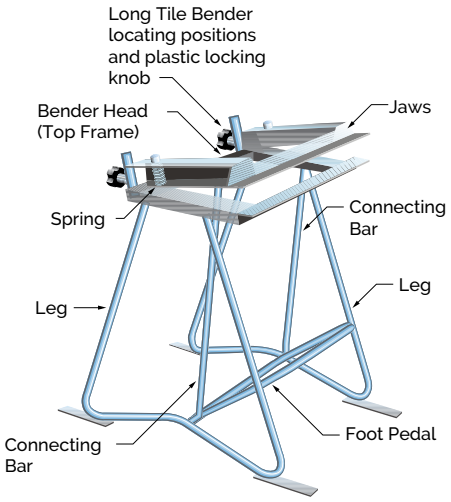
These tiles are cut along the length of the tile, so it will take several cuts to complete a ridge tile.

Start with the tile headlap to the right of the guillotine blade, make short cuts along the cut line pushing the tile into the first 1/3 of the cutting area of the guillotine. Continue the sequence until the tile is cut.

Figure 6.4.5

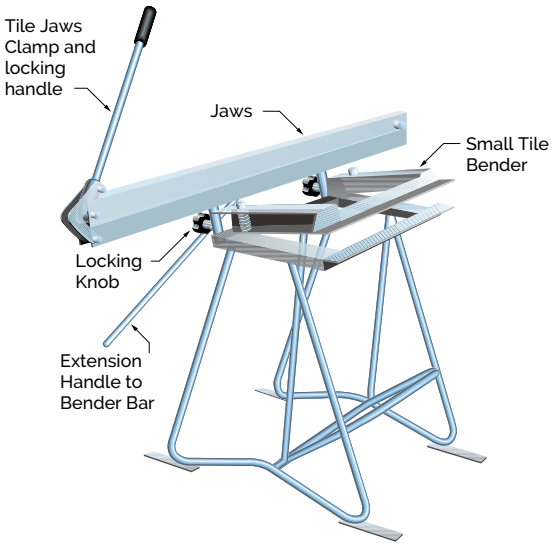
Short tile bender

The short tile bender is used for folding the turn-ups required for gable and hip and wall tiles and for the turndown into valleys. It clamps and flattens the tile turn-ups so that the tiles can be installed under accessories.



Long tile bender

This folder attaches to the back of the short tile bender. It can be used for folding ridge tiles and if necessary gable, hip or valley tiles.



GERARD
Roofing Designed to Endure

7.0 Product-specific installation

7.1 Shake

Pitch – min./max.	15-60°
Overall length	1310 mm
Length of cover	1250 mm
Width of cover	368 mm
Upstand	27 mm
Roof cover/panel	0.46 m²
Panels/m²	2.2
Weight/panel Textured	2.9 kg
Weight/panel Satin	2.1 kg
Weight/m² Textured	6.6 kg
Weight/m² Satin	4.7 kg

Batten spacing

Shake textured (chipped) 368 mm.
Shake satin (painted) 370 mm.

Tile batten sizes

40 x 50 mm on 900 mm spaced rafter.

50 x 50 mm on 1200 mm spaced rafters.

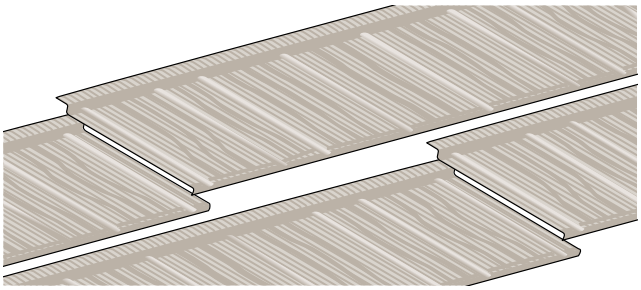
Tile batten fastening

Refer to **Section 4.0 – Tables 4.3.1 and 4.3.2**

900 mm rafter spacing. Minimum 2 x 90 x 3.15 mm nails for low, medium, high and very high wind zones.

1 x 80 mm x 10 gauge batten screw for extra high wind zone.

Laying direction



Left over right or right over left
Lay laps away from line of sight.
Lay away from prevailing winds.
Lay laps away from discharging rainwater pipes or roof valleys.

Laying pattern

Stagger lay Shake down the roof to create a random pattern. Laps of tile above or below should not be closer than 200 mm.

Fastening

Refer: **Tile installation – nailing position for Shake.**

4 x 50 mm tile nails. Nail spacing ~320 mm, up to and including Extra High wind zones.

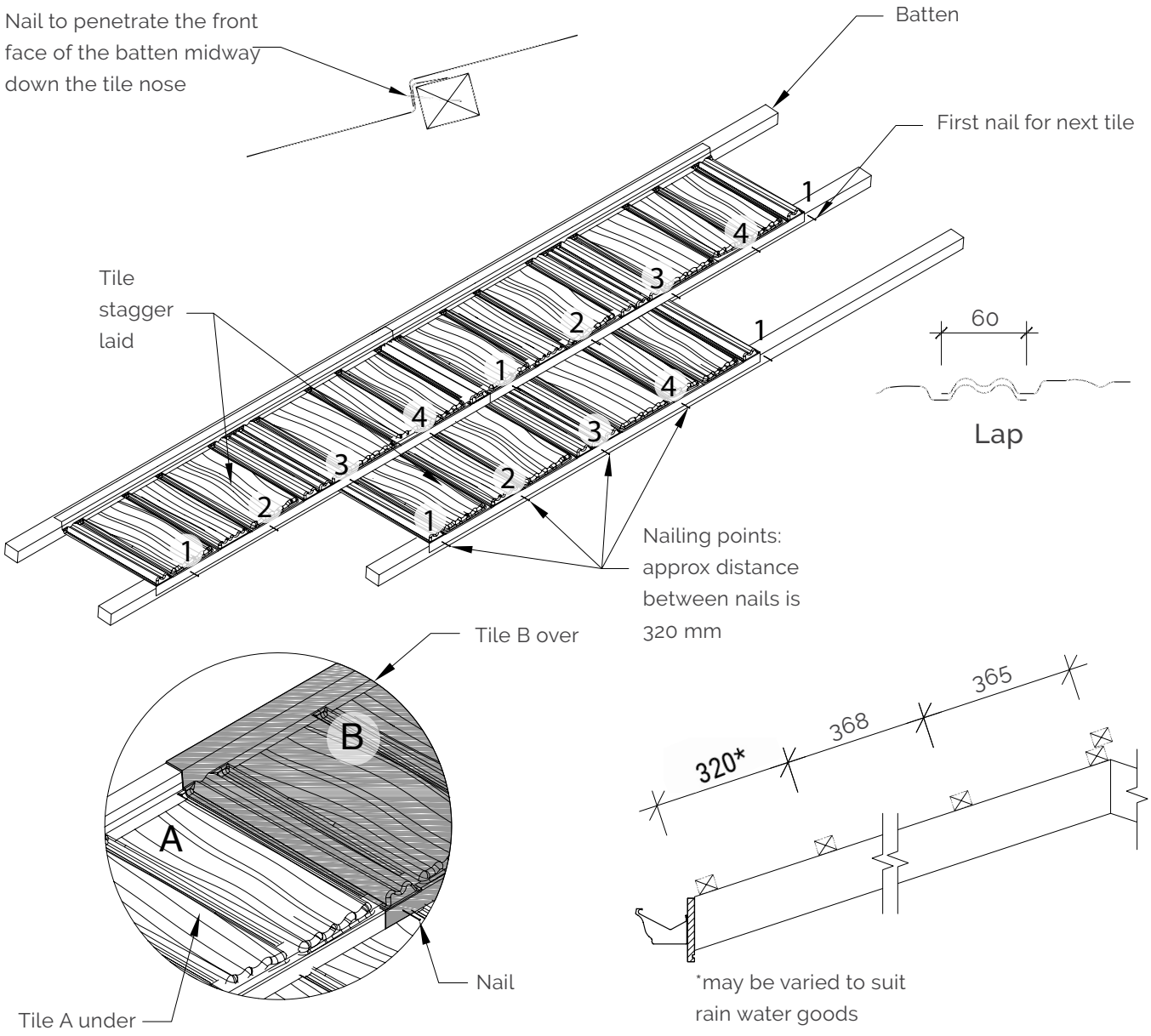
7 x 50 mm tile nails for Specific Engineering Design above 5.2 kPa design load.

Only use tile nails approved by Gerard Roofs.

Part tile

The centre section of a Shake is profiled so that a half tile can be cut 660 mm from either end of the tile.

Tile installation – nailing position for Shake



Dimensions and weights given are nominal.

7.2 Senator

Pitch – min./max.	15-60°
Overall length	1320 mm
Length of cover	1250 mm
Width of cover	368 mm
Upstand	16 mm
Roof cover/panel	0.46 m²
Panels/m²	2.2
Weight/panel Textured	2.9 kg
Weight/panel Satin	NA
Weight/m² Textured	6.4 kg
Weight/m² Satin	NA

Batten spacing

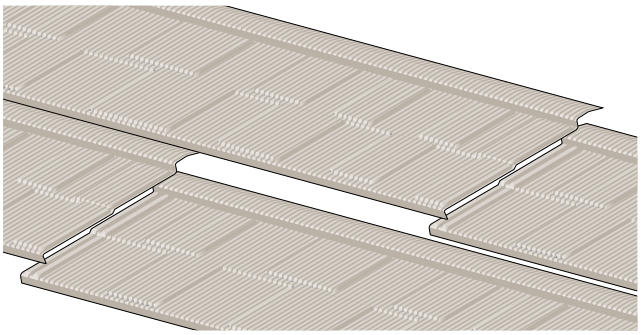
Senator textured (chipped) 368 mm.

Tile batten sizes

40 x 50 mm on 900 mm spaced rafter.

50 x 50 mm on 1200 mm spaced rafters.

Laying direction



One way lay – right to left

Tile batten fastening

Refer to **Section 4.0 – Tables 4.3.1 and 4.3.2.**

900 mm rafter spacing. Minimum 2 x 90 x 3.15 mm nails for low, medium, high and very high wind zones.

1 x 80 mm x 10 gauge batten screw for extra high wind zone.

Laying pattern

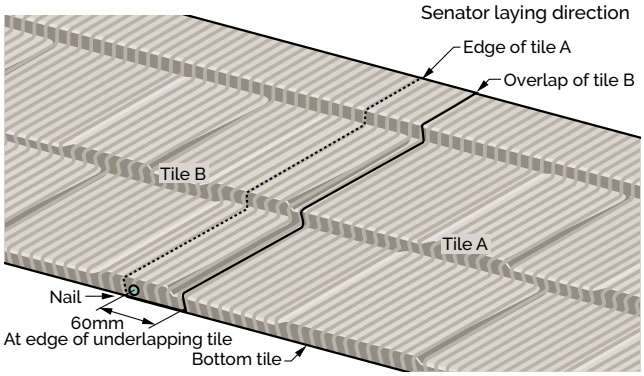
Stagger lay Senator down the roof to create a random pattern. Laps of tile above or below should not be closer than 200 mm.

Fastening

Refer: **Tile installation – nailing position for Senator.**

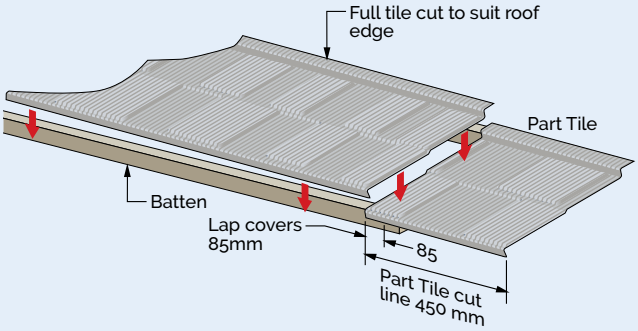
4 x 50 mm tile nails. Nail spacing ~320 mm, up to and including Extra High wind zones.

7 x 50 mm tile nails for Specific Engineering Design above 5.2 kPa design load.

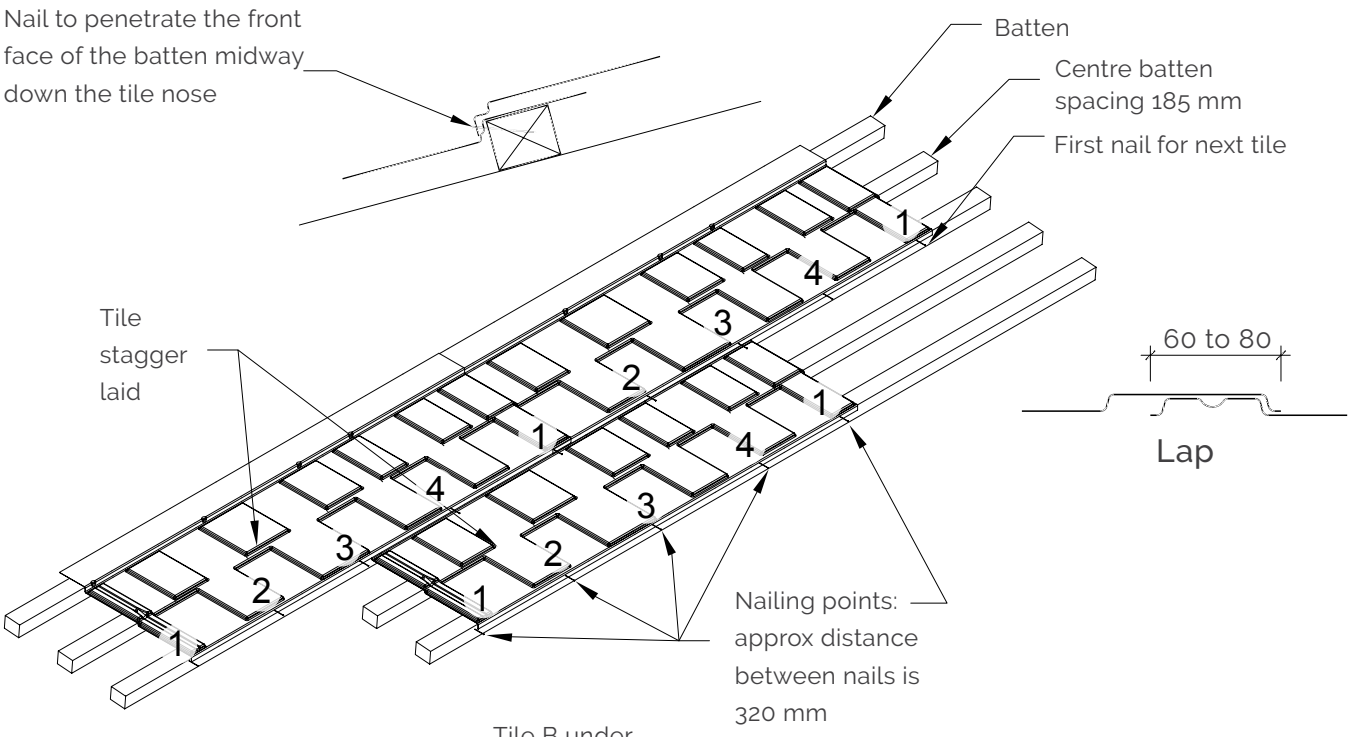


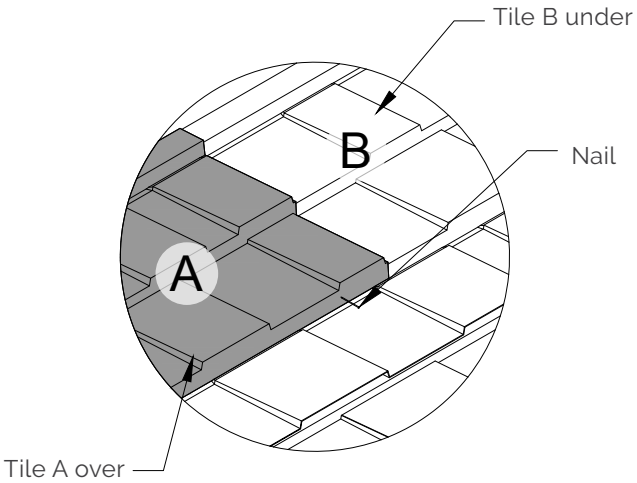
Part tile

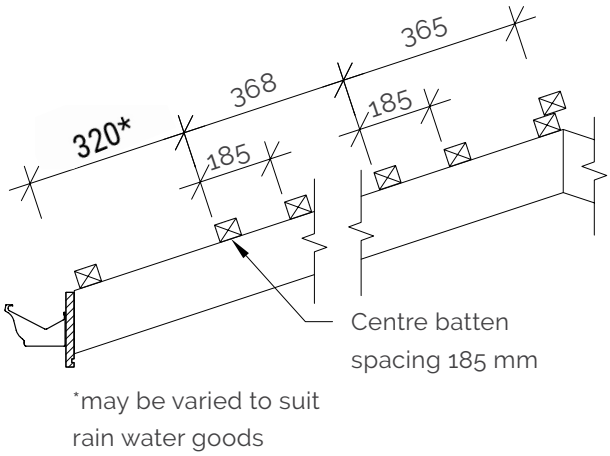
There is only one specific point where a part Senator can be created. This is 450 mm from the right hand end of the tile. The right hand end of the part tile is always overlapped by a full tile. Lap using the maximum coverage of the lap (80 mm).



Tile installation – nailing position for Senator







Batten setout

Dimensions and weights given are nominal.

7.3 Rockport

Pitch – min./max.	15-60°
Overall length	1330 mm
Length of cover	1250 mm
Width of cover	368 mm
Upstand	20 mm
Roof cover/panel	0.46 m²
Panels/m²	2.2
Weight/panel Textured	2.9 kg
Weight/panel Satin	NA
Weight/ m² Textured	6.4 kg
Weight/ m² Satin	NA

Batten spacing

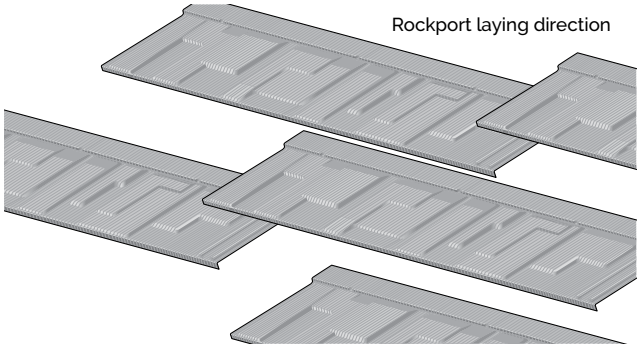
Rockport textured (chipped) 368 mm.

Tile batten sizes

40 x 50 mm on 900 mm spaced rafter.

50 x 50 mm on 1200 mm spaced rafters.

Laying direction



One way lay – right to left

Tile batten fastening

Refer to **Section 4.0 – Tables 4.3.1 and 4.3.2.**

900 mm rafter spacing. Minimum 2 x 90 x 3.15 mm nails for low, medium, high and very high wind zones. 1 x 80 mm x 10 gauge batten screw for extra high wind zone.

Laying pattern

Stagger lay Rockport down the roof to create a random pattern. Laps of tile above or below should not be closer than 200 mm.

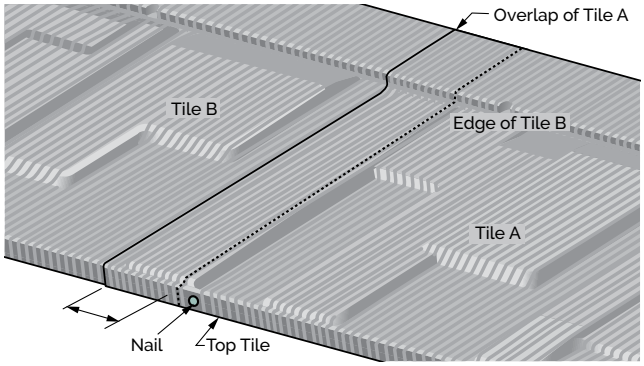
Fastening

Refer: **Tile Installation – nailing position for Rockport.**

4 x 50 mm tile nails. Nail spacing ~320 mm, up to and including Extra High wind zones.

7 x 50 mm tile nails for Specific Engineering Design above 5.2 kPa design load.

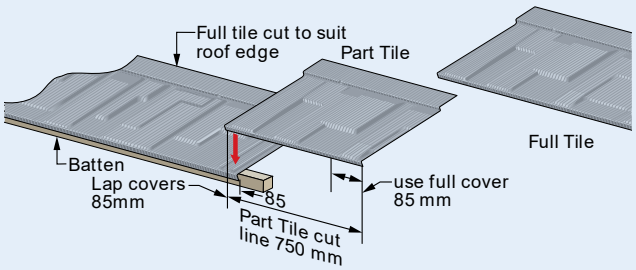
Only use tile nails approved by Gerard Roofs.



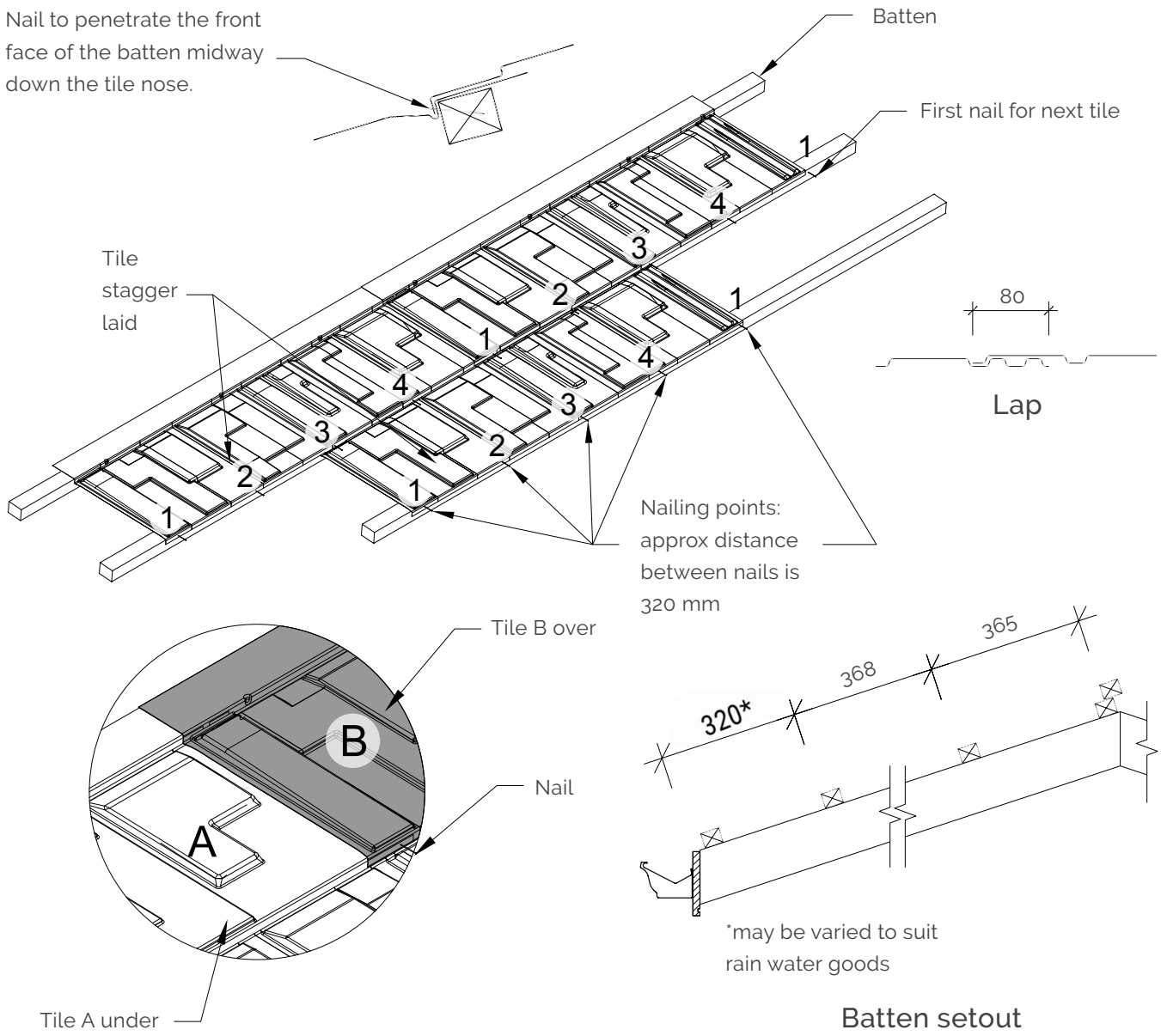
Part tile

There is only one specific point where a part Rockport can be created. This is 750 mm from the left hand end of the tile. The right hand end of the part tile is always overlapped by a full tile. Lap using the maximum coverage of the lap (85 mm).

Rockport part tile



Tile installation – nailing position for Rockport



Dimensions and weights given are nominal.

7.4 Alpine

Pitch – min./max.	15-60°
Overall length	1330 mm
Length of cover	1250 mm
Width of cover	368 mm
Upstand	20 mm
Roof cover/panel	0.46 m²
Panels/ m²	2.2
Weight/panel Textured	2.9 kg
Weight/panel Satin	NA
Weight/ m² Textured	6.4 kg
Weight/ m² Satin	NA

Batten spacing

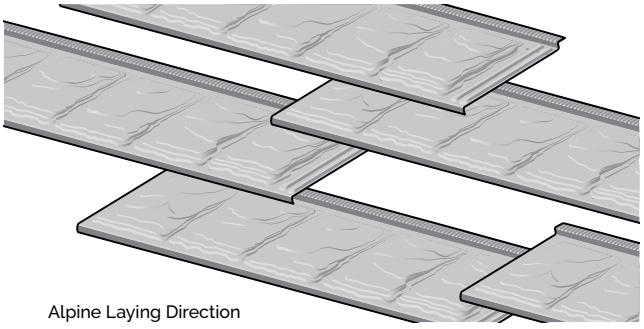
Alpine textured (chipped) 368 mm.

Tile batten sizes

40 x 50 mm on 900 mm spaced rafter.

50 x 50 mm on 1200 mm spaced rafters.

Laying direction



One way lay – left to right

Tile batten fastening

Refer to **Section 4.0 – Tables 4.3.1 and 4.3.2.**

900 mm rafter spacing. Minimum 2 x 90 x 3.15 mm nails for low, medium, high and very high wind zones. 1 x 80 mm x 10 gauge batten screw for extra high wind zone.

Laying pattern

Stagger lay Alpine down the roof to create a random pattern. Laps of Alpine above or below should not be closer than 200 mm.

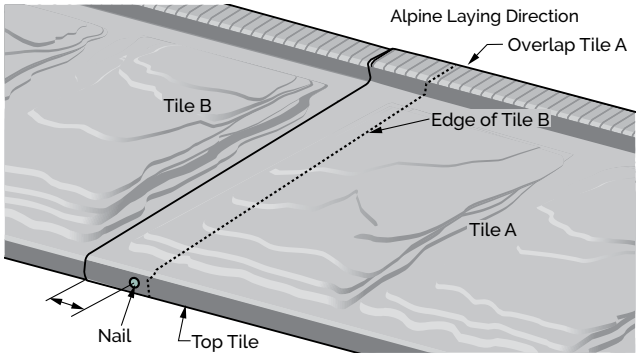
Fastening

Refer: **Tile Installation – nailing position for Alpine.**

4 x 50 mm tile nails. Nail spacing ~320 mm, up to and including Extra High wind zones.

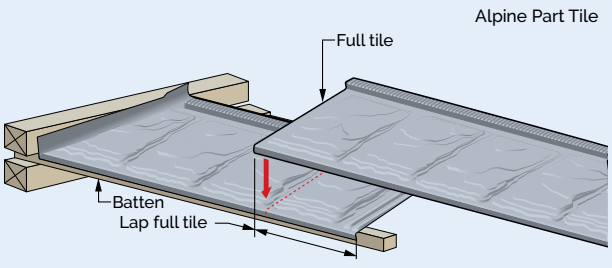
7 x 50 mm tile nails for Specific Engineering Design above 5.2 kPa design load.

Only use tile nails approved by Gerard Roofs.

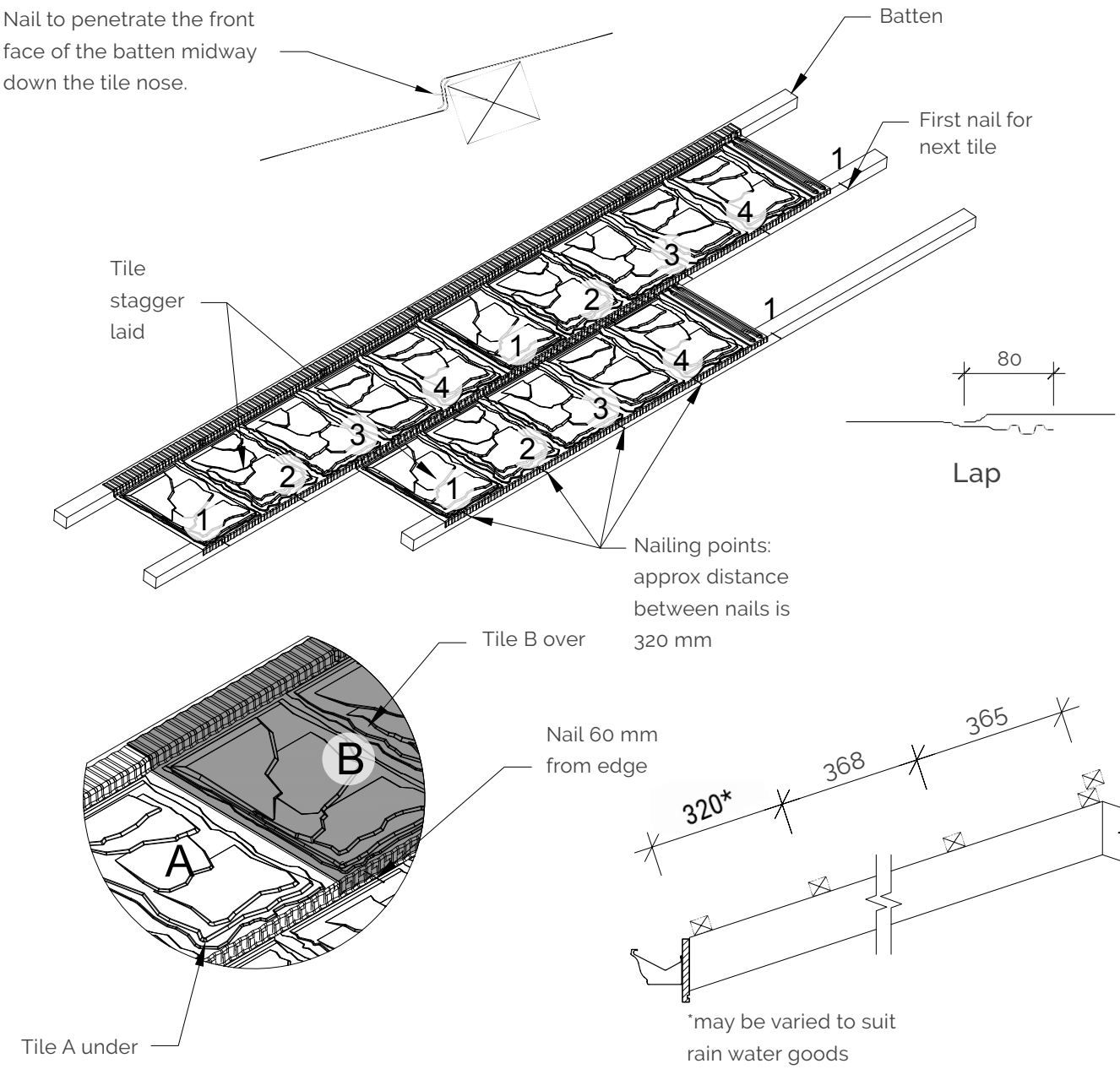


Part tile

If a small part Alpine (less than a course width) is required then it will be necessary to lap the adjacent full Alpine by a module which will then allow a full Alpine to be cut and bent to suit. Lay the part Alpine one full tile from the end of the roof – this helps hide the module lap.



Tile installation – nailing position for Alpine



Dimensions and weights given are nominal.

7.5 Bond

Pitch – min./max.	12-60°
Overall length	1325 mm
Length of cover	1265 mm
Width of cover	368 mm
Upstand	25 mm
Roof cover/panel	0.47 m²
Panels/m²	2.15
Weight/panel Textured	3.0 kg
Weight/panel Satin	2.1 kg
Weight/m² Textured	6.4 kg
Weight/m² Satin	4.5 kg

Batten spacing

Bond textured (chipped) 368 mm.
Bond satin (painted) 370 mm.

Tile batten sizes

40 x 50 mm on 900 mm spaced rafter.

50 x 50 mm on 1200 mm spaced rafters.

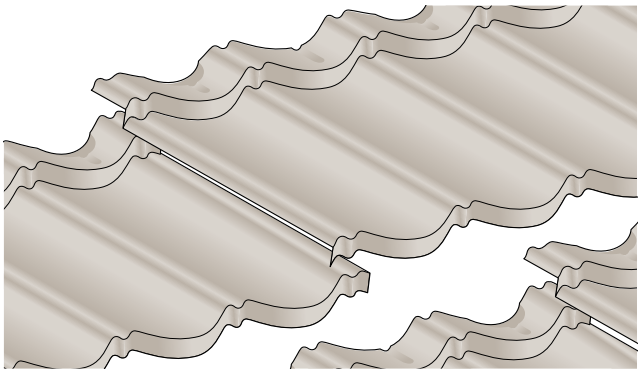
Tile batten fastening

Refer to **Section 4.0 – Tables 4.3.1 and 4.3.2.**

900 mm rafter spacing. Minimum 2 x 90 x 3.15 mm nails for Low, medium, high and very high wind zones.

1 x 80 mm x 10 gauge batten screw for extra high wind zone.

Laying direction



Left over right or right over left
Lay laps away from line of sight.
Lay away from prevailing winds.
Lay laps away from discharging rainwater pipes or roof valleys.

Laying pattern

Stagger lay tiles laps 2 or more modules apart down the roof.

Tile fastening

Refer: **Tile installation – nailing position for Bond**

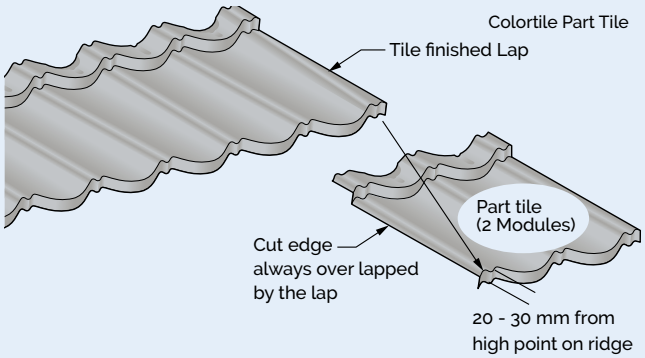
4 x 50 mm tile nails. Nail spacing 360 mm and 180 mm to hold at lap, every second module, up to and including Extra High wind zone.

7 x 50 mm tile nails – every module – for Specific Engineering Design above 3.8 kPa design load.

Only use tile nails approved by Gerard Roofs.

Part tile

Tiles may be cut down to modular size;
Cut edges should be overlapped by tile finish laps.



Tile installation – nailing position for Bond

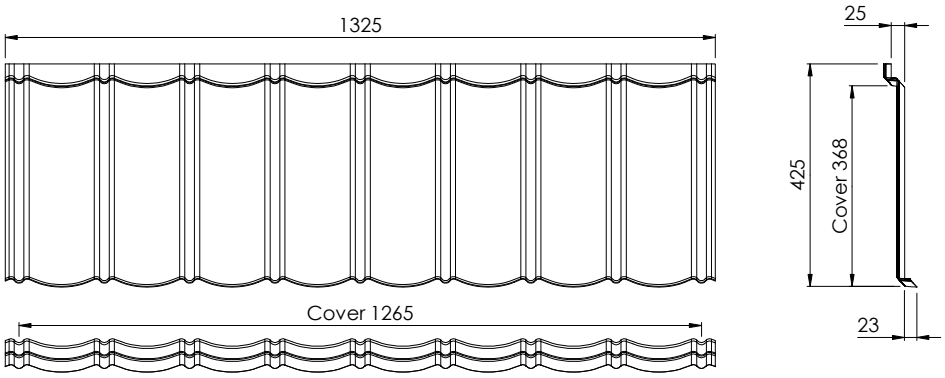


Figure 1.1 Tile Dimensions

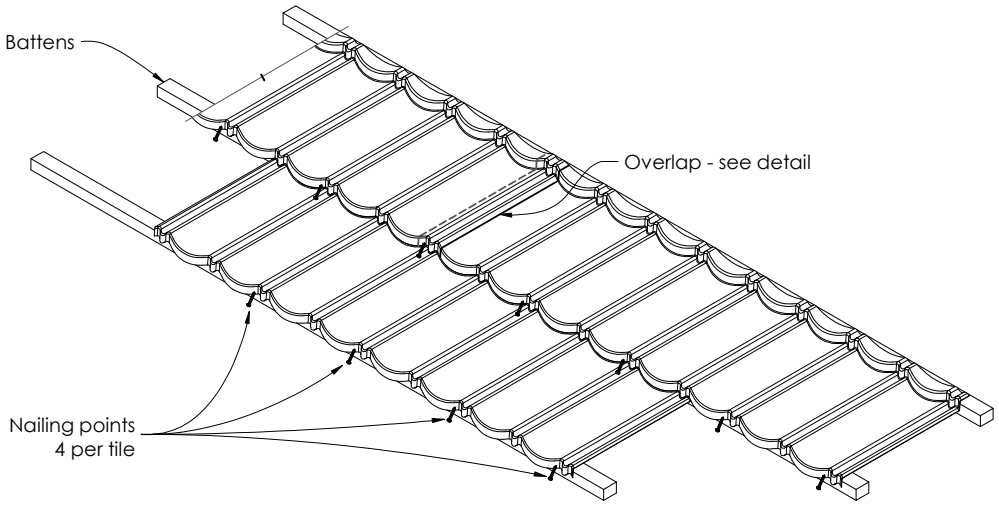


Figure 1.2 Nailing Detail

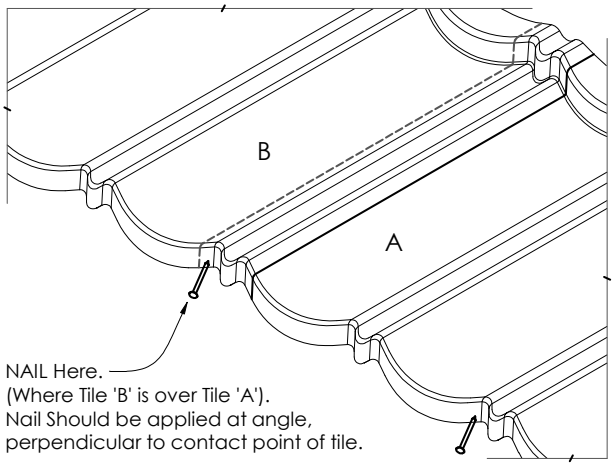


Figure 1.3 Overlap Detail

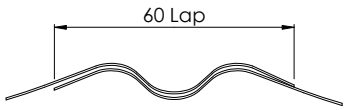


Figure 1.4 Lap Section

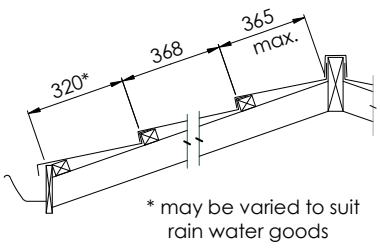


Figure 1.5 Batten Layout

Dimensions and weights given are nominal.

7.6 Milano

Pitch – min./max.	12-60°
Overall length	1330 mm
Length of cover	1210 mm
Width of cover	368 mm
Upstand	25 mm
Roof cover/panel	0.45 m²
Panels/m²	2.2
Weight/panel Textured	2.9 kg
Weight/panel Satin	NA
Weight/m² Textured	6.4 kg
Weight/m² Satin	NA

Batten spacing

Milano textured (chipped) 368 mm.

Tile batten sizes

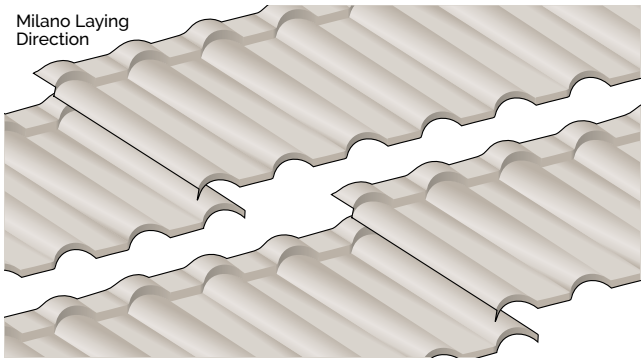
40 x 50 mm on 900 mm spaced rafter.
50 x 50 mm on 1200 mm spaced rafters.

Tile batten fastening

Refer to **Section 4.0 – Tables 4.3.1 and 4.3.2.**

900 mm rafter spacing. Minimum 2 x 90 x 3.15 mm nails for low, medium, high and very high wind zones. 1 x 80 mm x 10 gauge batten screw for extra high wind zone.

Laying direction



Left over right or right over left
Lay laps away from line of sight.
Lay away from prevailing winds.
Lay laps away from discharging rainwater pipes or roof valleys.

Laying pattern

Stagger lay tiles laps 2 or more modules apart down the roof.

Tile fastening

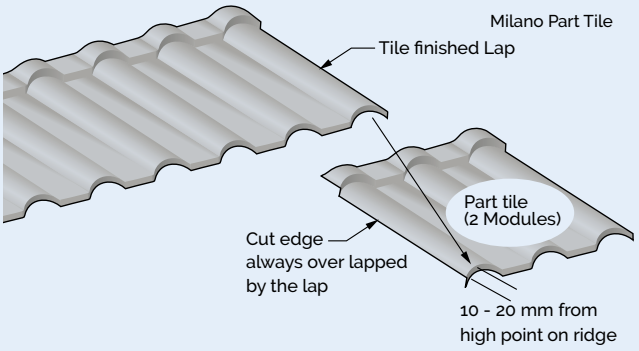
Refer: **Tile installation – nailing position for Milano** back and front of laps are to be nailed.

4 x 50 mm tile nails. Nail spacing 360 mm and 180 mm to hold at lap, up to and including Extra High wind zone.

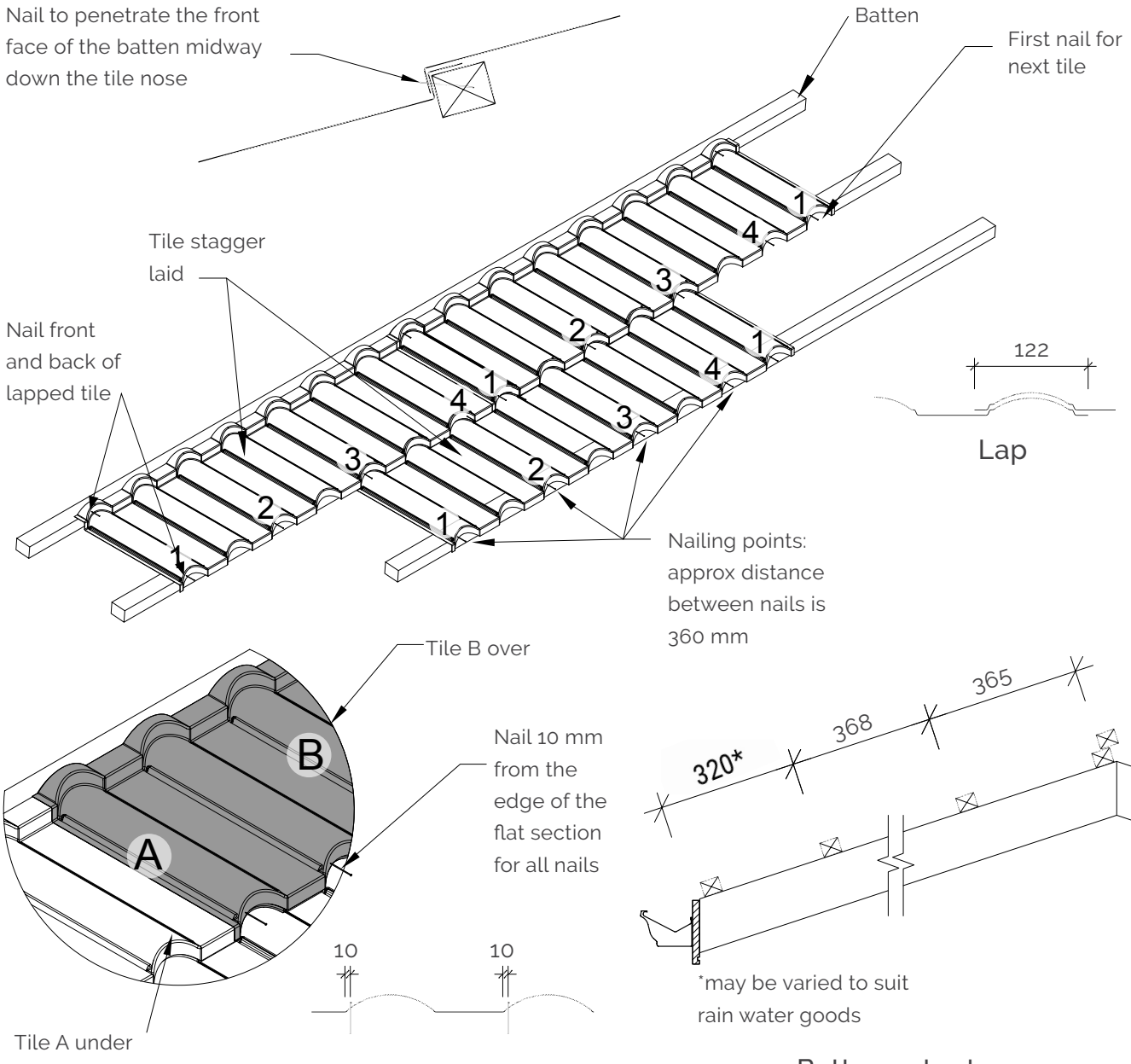
7 x 50 mm tile nails for Specific Engineering Design above 5.2 kPa design load.**Only use tile nails approved by Gerard Roofs.**

Part tile

Tiles may be cut down to modular size; Cut edges should be overlapped by tile finish laps.



Tile installation – nailing position for Milano



Dimensions and weights given are nominal.

7.7 Classic

Pitch – min./max.	12-60°
Overall length	1325 mm
Length of cover	1262 mm
Width of cover	368 mm
Upstand	26 mm
Roof cover/panel	0.46 m²
Panels/m²	2.15
Weight/panel Textured	3.0 kg
Weight/panel Satin	2.1 kg
Weight/m² Textured	6.5 kg
Weight/m² Satin	4.5 kg

Batten spacing

Classic textured (chipped) 368 mm.
Classic satin (painted) 370 mm.

Tile batten sizes

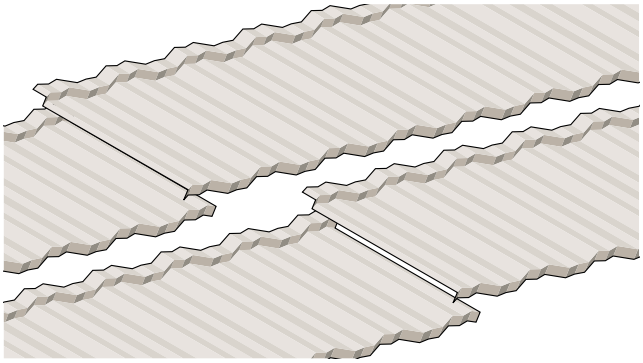
40 x 50 mm on 900 mm spaced rafter
50 x 50 mm on 1200 mm spaced rafters

Tile batten fastening

Refer to **Section 4.0 – Tables 4.3.1 and 4.3.2.**

900 mm rafter spacing minimum 2 x 90 x 3.15 mm nails for low, medium, high and very high wind zones. 1 x 80 mm x 10 gauge batten screw for Extra High Wind Zone.

Laying direction



Left over right or right over left
Lay laps away from line of sight.
Lay away from prevailing winds.
Lay laps away from discharging rainwater pipes or roof valleys.

Laying pattern

Stagger lay tiles laps 2 or more modules apart down the roof.

Tile fastening

Refer: **Tile installation – nailing position for Classic**

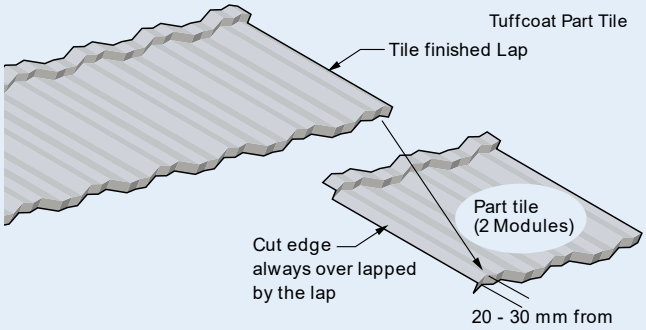
4 x 50 mm tile nails. Nail spacing 320 mm, every second module up to and including Extra High wind zones.

8 x 50 mm tile nails for Specific Engineering Design above 3.8 kPa design load.

Only use tile nails approved by Gerard Roofs.

Part tile

Tiles may be cut down to modular size;
Cut edges should be overlapped by tile finish laps.



Tile installation – nailing position for Classic

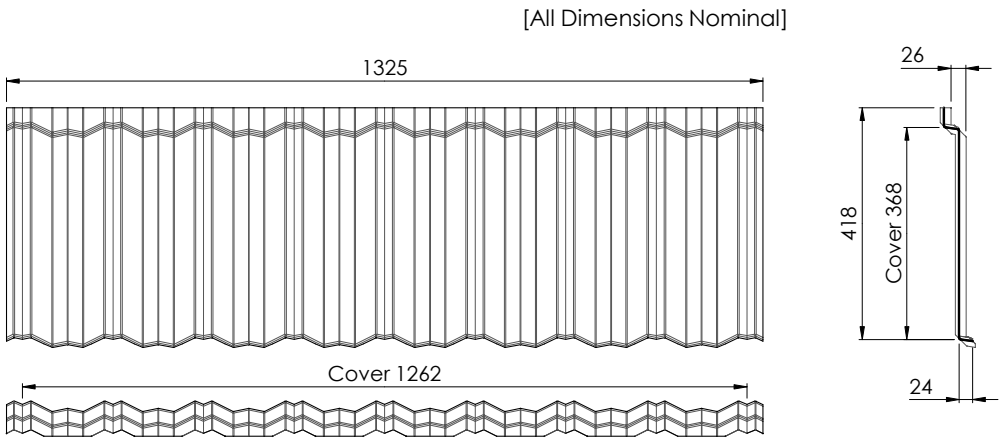


Figure 4.1 Tile Dimensions

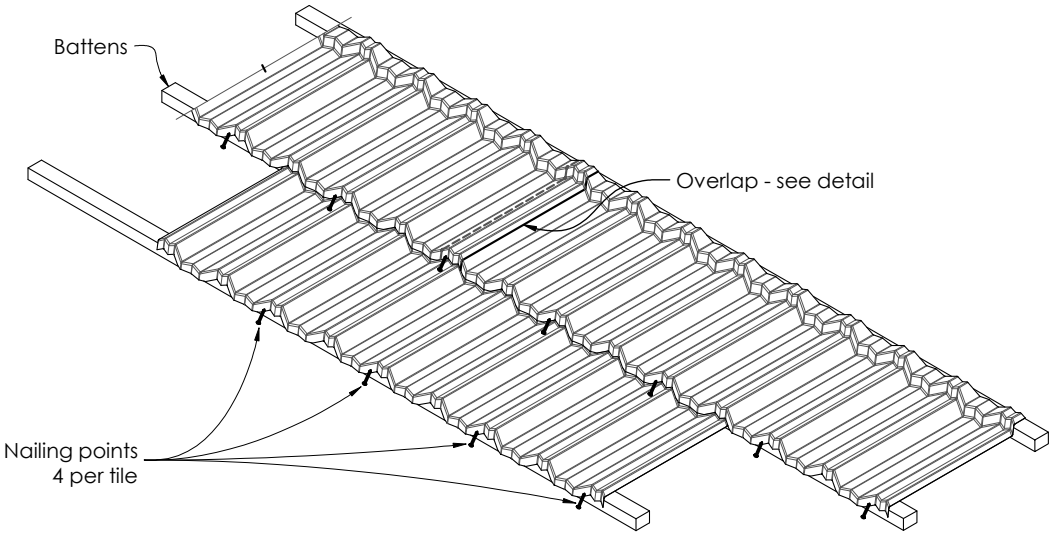


Figure 4.2 Nailing Detail

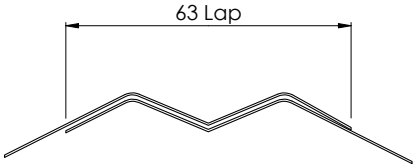


Figure 4.4 Lap Section

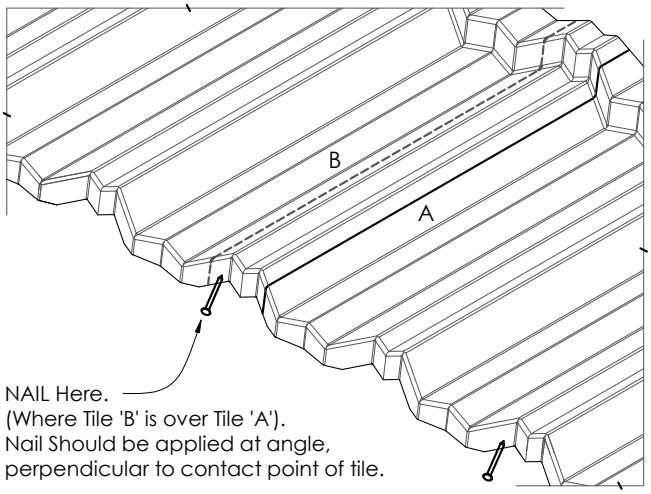


Figure 4.3 Overlap Detail

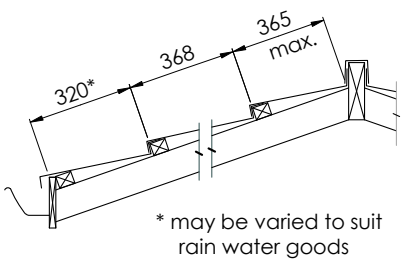


Figure 4.5 Batten Layout

Dimensions and weights given are nominal.

7.8 Aspen

Pitch – min./max.	15-60°
Overall length	1320 mm
Length of cover	1165 mm
Width of cover	368 mm
Upstand	18 mm
Roof cover/panel	0.43 m²
Panels/m²	2.3
Weight/panel Textured	2.9 kg
Weight/panel Satin	2.1 kg
Weight/m² Textured	6.67 kg
Weight/m² Satin	4.8 kg

Batten spacing

Aspen textured (chipped) 368 mm.
Aspen satin (painted) 370 mm.

Tile batten sizes

40 x 50 mm on 900 mm spaced rafter
50 x 50 mm on 1200 mm spaced rafters

Tile batten fastening

Refer to **Section 4.0 – Tables 4.3.1 and 4.3.2.**

900 mm rafter spacing minimum 2 x 90 x 3.15 mm nails for low, medium, high and very high wind zones. 1 x 80 mm x 10 gauge batten screw for Extra High Wind Zone.

Laying pattern

Stagger lay Aspen down the roof to create a random pattern. Laps of Aspen above or below should not be closer than 200 mm.

Fastening

Refer: **Tile Installation – nailing position for Aspen.**

4 x 50 mm tile nails. Nail spacing ~320 mm, up to and including Extra High wind zones.

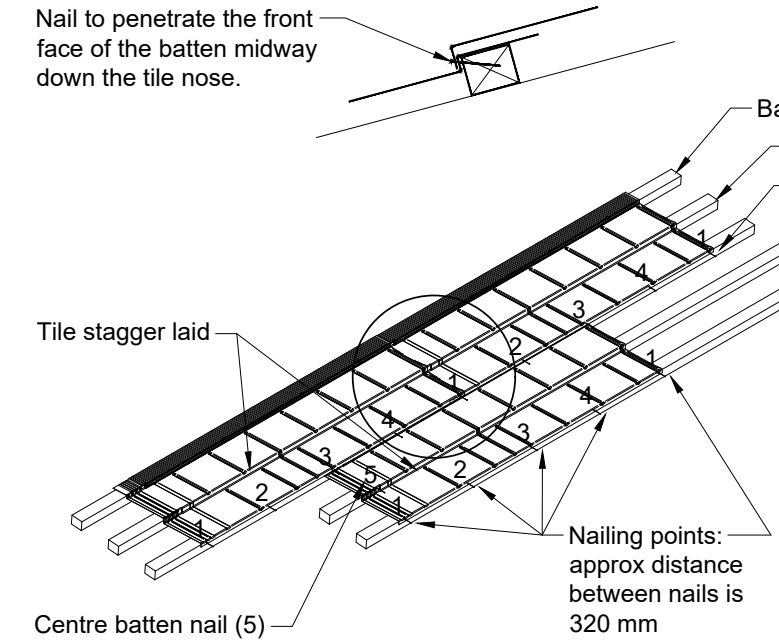
7 x 50 mm tile nails for Specific Engineering Design above 5.2 kPa design load.

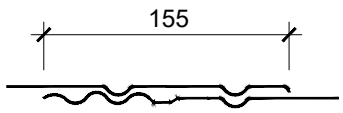
Only use tile nails approved by Gerard Roofs.

Part tile

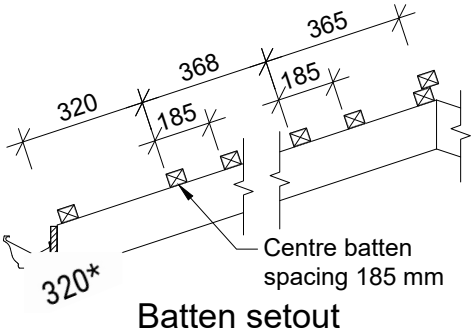
Tiles may be cut down to modular size;
Cut edges should be overlapped
by tile finish laps.

Tile installation – nailing position for Aspen

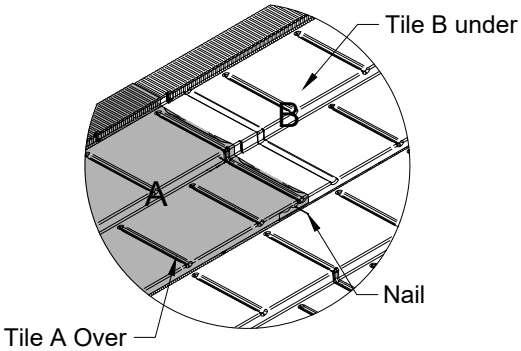


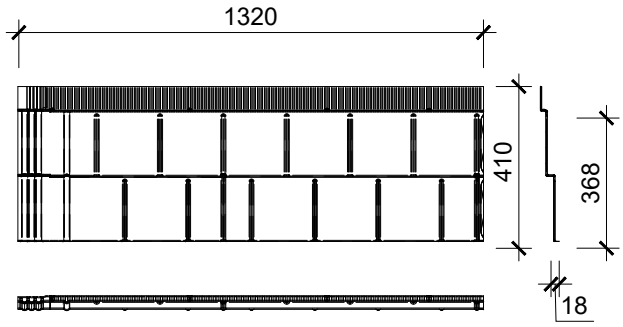


Lap



Batten setout





Tile dimensions

Dimensions and weights given are nominal.

7.9 Oberon

Pitch – min./max.	20-60°
Overall length	1310 mm
Length of cover	1230 mm
Width of cover	320 mm
Upstand	20 mm
Roof cover/panel	0.39 m²
Panel/m²	2.54
Weight/panel Textured	2.8 kg
Weight/panel Satin	NA
Weight/ m² Texture	7.1 kg
Weight/ m² Satin	NA

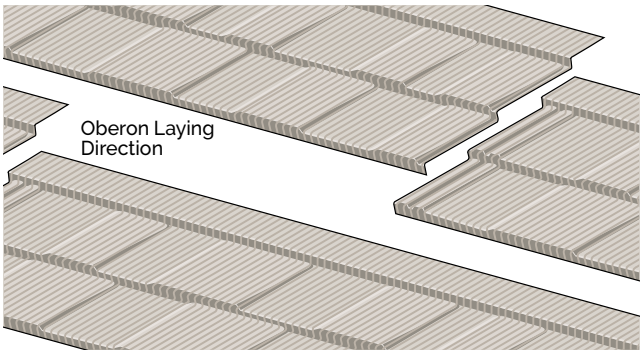
Batten spacing

Oberon textured (chipped) 320 mm.

Tile batten sizes

40 x 50 mm on 900 mm spaced rafter.
50 x 50 mm on 1200 mm spaced rafters.

Laying direction



One way lay – right to left

Tile batten fastening

Refer to **Section 4.0 – Tables 4.3.1 and 4.3.2**

900 mm after spacing. Minimum 2 x 90 x 3.15 mm nails for low, medium, high and very high wind zones.

1 x 80 mm x 10 gauge batten screw for extra high wind zone.

Laying pattern

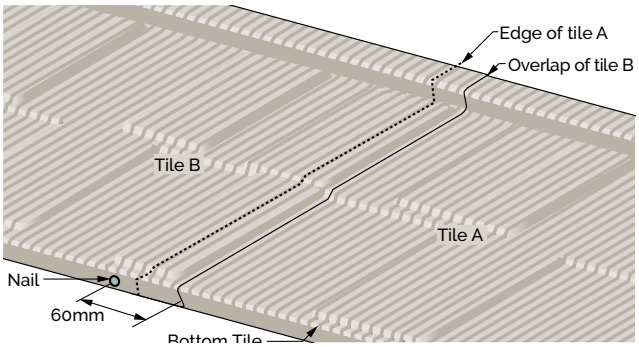
Stagger lay Oberon down the roof to create a random pattern. Laps of tile above or below should not be closer than 200 mm.

Tile fastening

Refer: **Tile installation – nailing position for Oberon**
4 x 50 mm tile nails. Nail spacing ~320 mm, up to and including Extra High Wind Zone

7 x 50 mm tile nails for Specific Engineering Design up to 5.2 kPa design load.

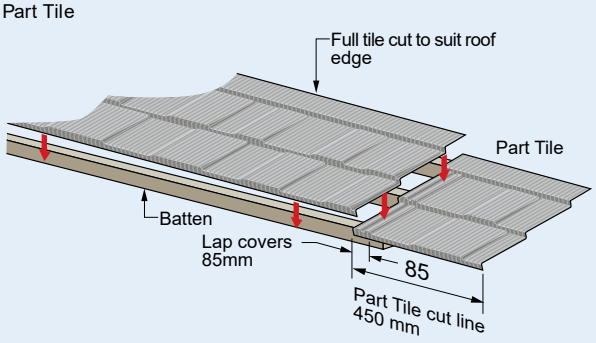
Only use tile nails approved by Gerard Roofs.



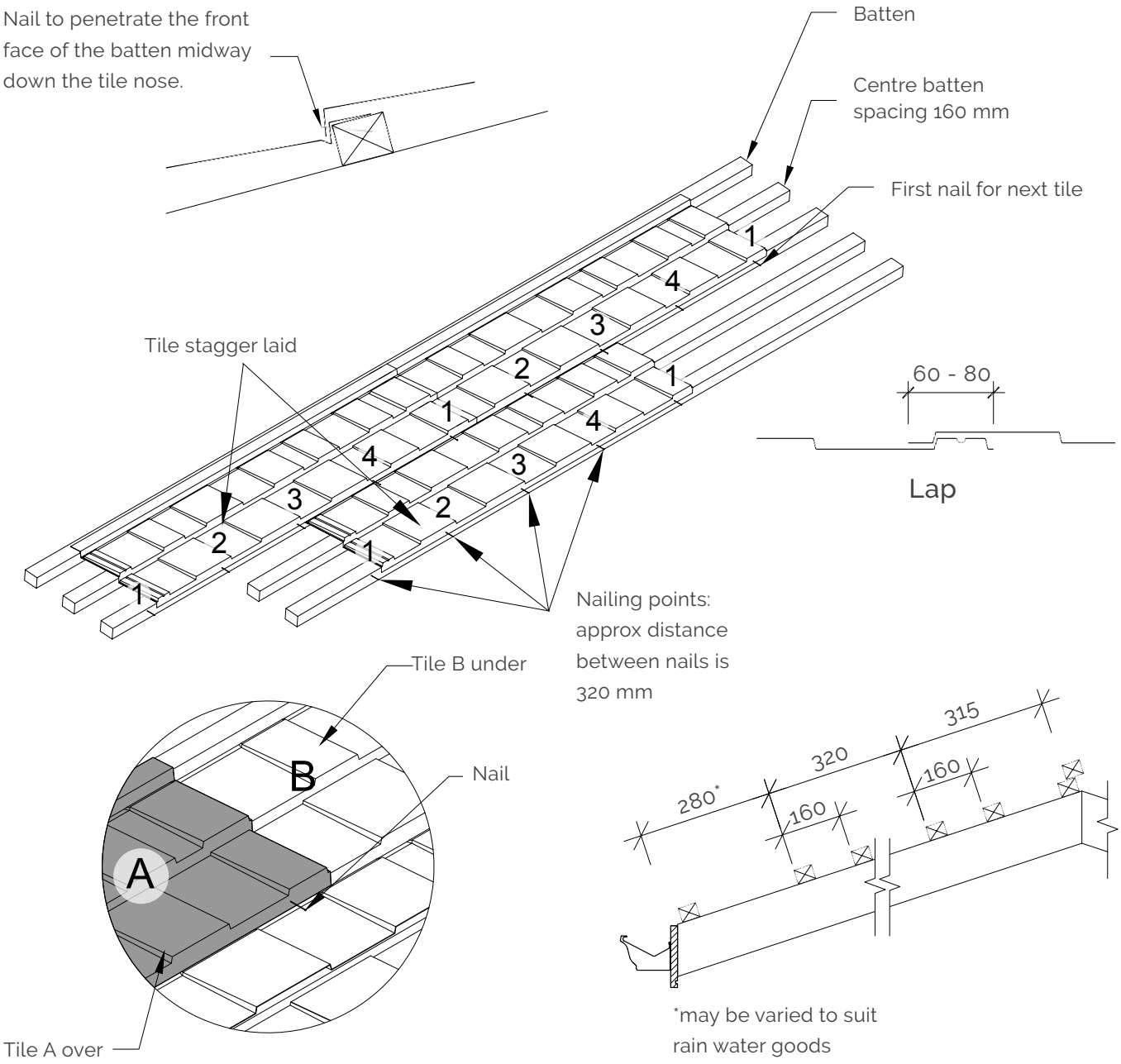
Part tile

There is only one specific point where a part Oberon can be created. This is 450 mm from the right hand end of the tile. The right hand end of the part tile is always overlapped by a full tile. Lap using the maximum coverage of the lap (80 mm).

Oberon Part Tile



Tile installation – nailing position for Oberon

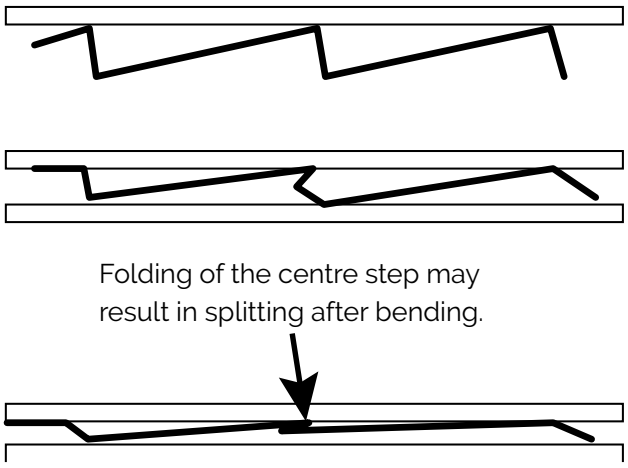


Dimensions and weights given are nominal.

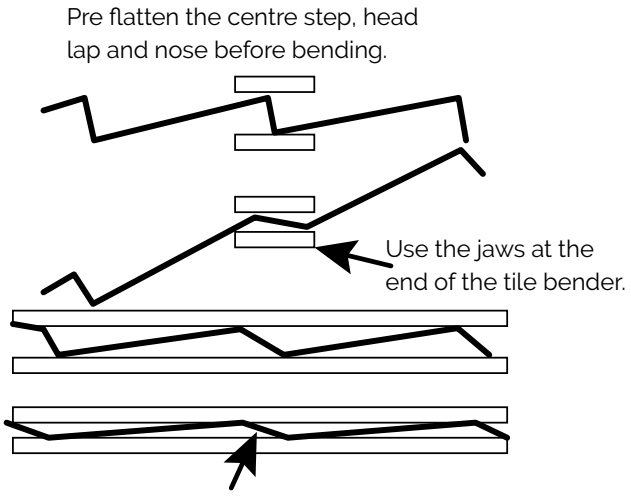
Tile bending – Oberon

Flattening the centre step, head lap and nose of the Oberon will reduce the chances of splitting the tile during bending where the steel and coatings fold over each other. This is critical where bends are made on hips or gables where the height between the front and back sections is the largest.

Cause



Solution



A flat single layer of Oberon is unlikely to split.

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Roofing Designed to Endure

8.0 Installing hips, ridges & gables

8.1 Barge installation (gable end)

Box barge, Angle trim and Barrel trim are installed over the turned up tile and fascia board. The accessories must cover the turned up sections of the tiles by a minimum of 25 mm.

8.1.1 Box barge

Box barges are laid from the eave to ridge.

The box barge cover at the eave must be cut and bent to cover the lower end of the barge board which usually projects about 150 mm beyond the fascia. The cutting and folding are done on site to suit the barge board.

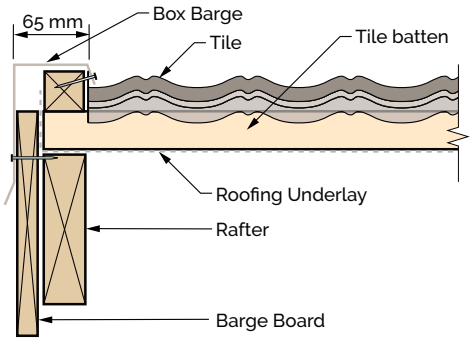


Figure 8.1.1.1 Accessory batten layout for box barge

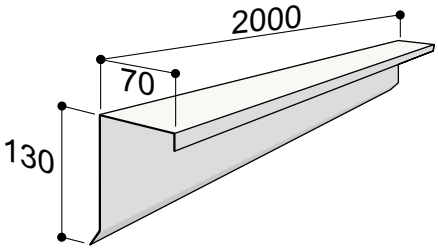


Figure 8.1.1.2 Box barge

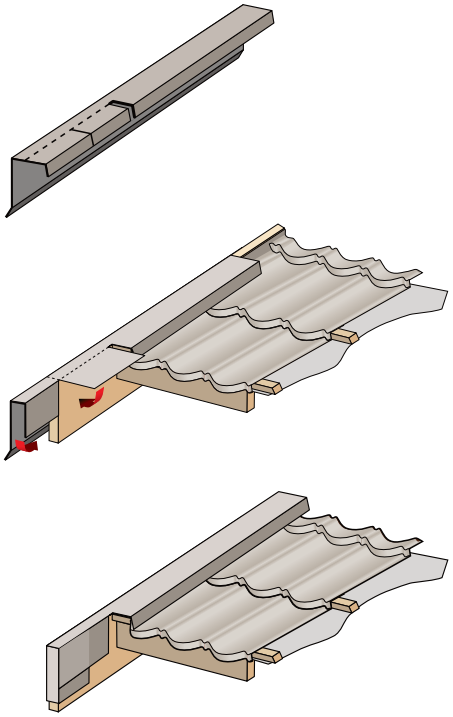


Figure 8.1.1.3

The Box barge accessories are tacked in place and checked for straightness before complete nailing. The nails are positioned near the bottom edge on the fascia side and mid way on the tile side of the box barge, nails are spaced approximately 600 mm apart or where holes are located on painted product. The nails are driven in so that the heads just make contact with the metal. Over driving them will crease the straight edge.

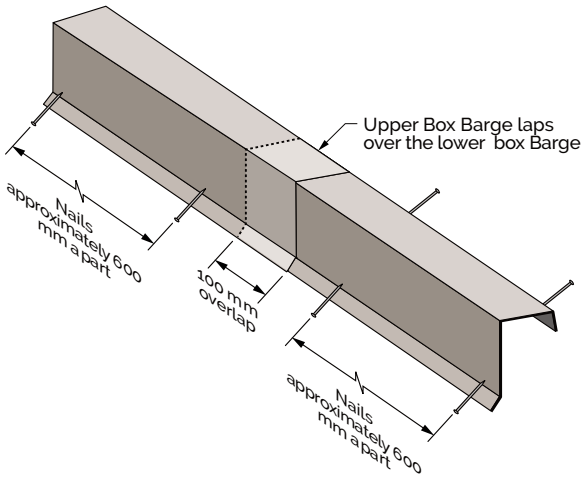


Figure 8.1.1.4

8.1.2 Angle trim

Angle trims are laid from the eave to ridge.

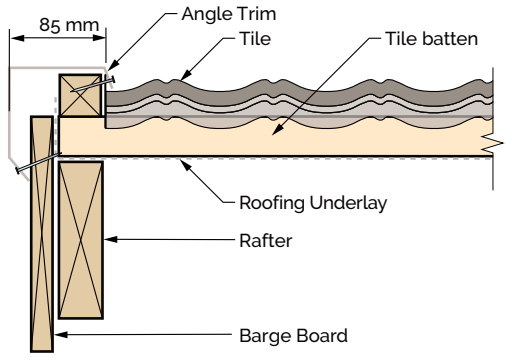


Figure 8.1.2.1 Accessory batten layout for angle trim

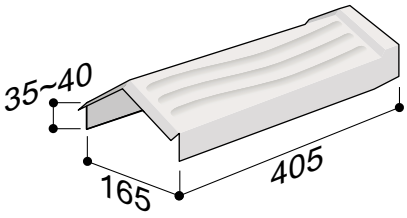


Figure 8.1.2.2 Angle trim

Angle trims are bent on site to a 90 degree angle and the edge that is to overlap the tiles is also bent to 90 degrees.

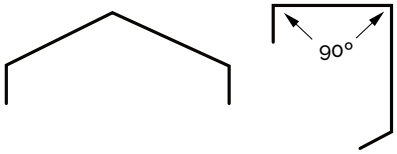


Figure 8.1.2.3

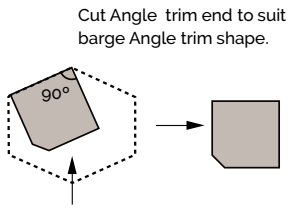


Fig 8.1.2.4 Angle trim end

The eave angle trim is created by fastening a trimmed Angle trim end to an angle trim with pop rivets.

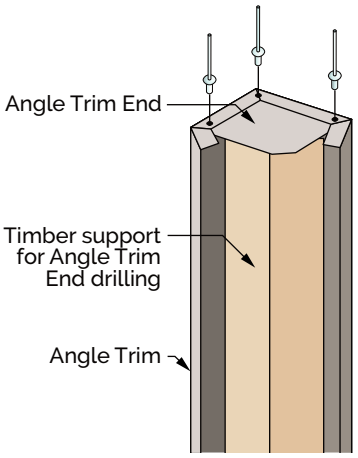


Figure 8.1.2.5

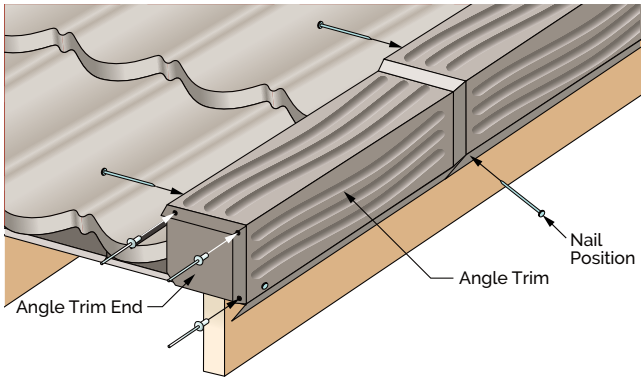


Figure 8.1.2.6

Angle trims are installed from the eave up overlapping so that the upper angle trim covers and fits neatly over the step of the lower angle trim.

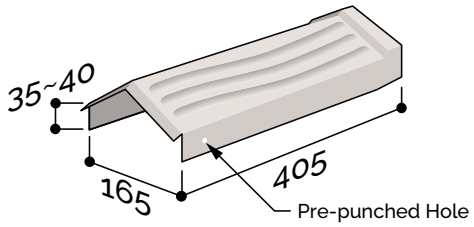


Figure 8.1.2.7

Pre-punched holes for fastening the Angle trims are located close to the front of the trim where it will overlap lower trim.

Line the Angle trims up the gable and then tack them in place, adjust heights if required and then finish nailing.

Drive the nails in sufficiently to bring the heads of the nails in contact with the Angle trims, do not over drive them as it will distort the Angle trim shape.

8.1.3 Barrel trim

Barrel trims are laid from the eave to ridge.

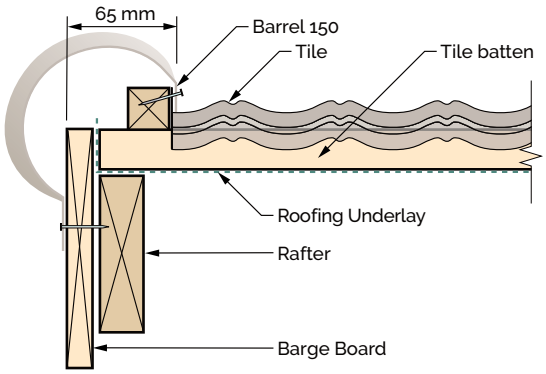


Figure 8.1.3.1 Accessory batten layout for Barrel trim

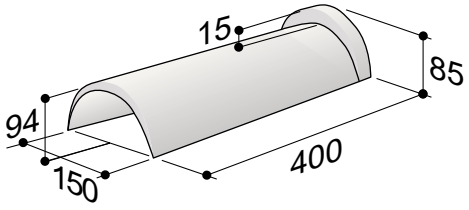


Figure 8.1.3.2 Barrel trim

Barrels are bent on site so that there is a vertical edge that will cover the bent up section tiles at the barge.

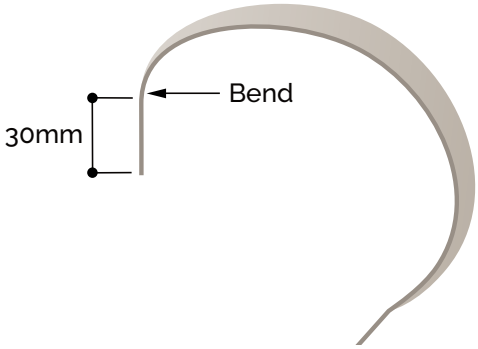


Figure 8.1.3.3

Barrel end disc

Cut and shape to suit eave barrel.

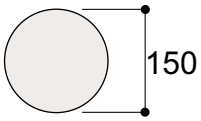


Figure 8.1.3.4

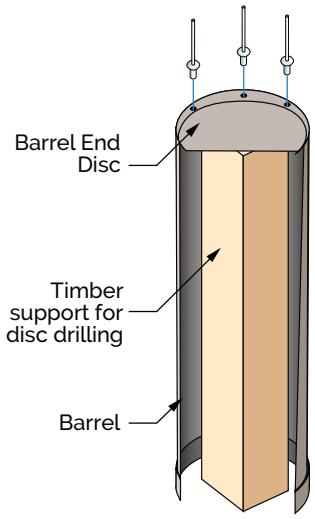


Figure 8.1.3.5

The eave barrel is created by shaping and fastening a barrel end disc to a barrel with pop rivets.

Barrels are installed from the eave up overlapping so that the upper barrel covers and fits neatly over the step of the lower barrel. Line the barrels up the gable and then tack them in place, adjust heights if required and then finish nailing.

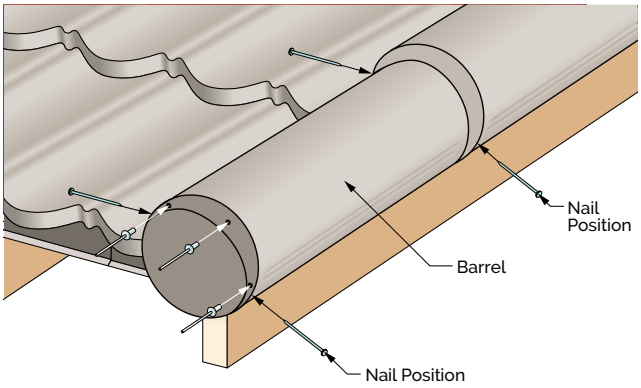


Figure 8.1.3.6

Pre-punched holes for fastening the barrels are located close to the front where it will overlap lower barrels.

Drive the nails in sufficiently to bring the heads of the nails in contact with the Barrels, do not over drive them as it will distort the Barrel shape.

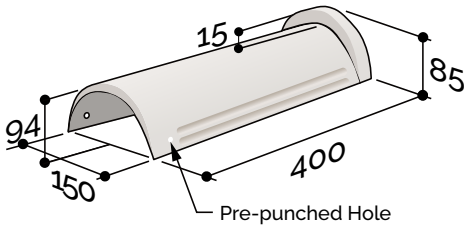


Figure 8.1.3.7

8.2 Hip installation

Box trim, Angle trim and Barrel trim are installed over tiles that have been turned up against hip battens. The accessories must cover the turned up sections of the tiles by a minimum of 35 mm.

8.2.1 Box trim over a hip

Textured Box trims are tapered. The wider end of one cap fits neatly over the narrow end of the other.

Satin Box trims are straight and have holes punched for nailing every 630 mm.

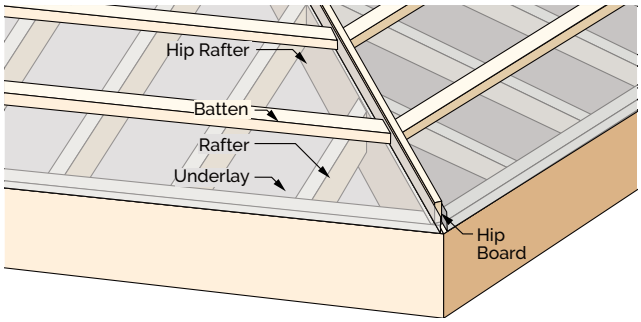


Figure 8.2.1.1 Accessory batten layout for Box trim

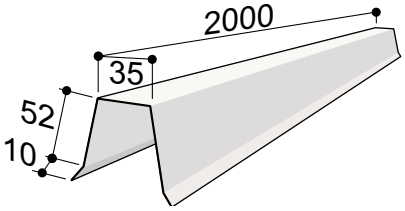


Figure 8.2.1.2 Box trim

The Box trim cap at the eave must be cut and bent to cover the lower end of the hip board. The cutting and folding are done on site to suit the hip. Cut the wide end in the case of the textured Box trim. (Steps shown in **Figure 8.2.1.3**).

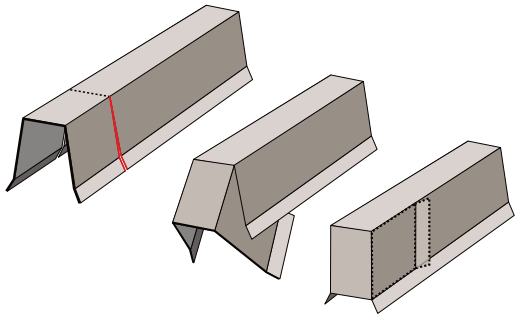


Figure 8.2.1.3

Box trims are laid from the eave up the hip lapping the lower Box trim by 100 mm (**Figure 8.2.1.4**). The Box trim accessories are tacked in place using 30 mm accessory nails and checked for straightness before complete nailing. The nails are positioned near the bottom edge just above the 10 mm crease on the sides, nails are spaced approximately 600 mm apart or where holes are located on painted product. The nails are driven in so that the heads just make contact with the metal. Over driving them will crease the straight lines of the accessory.

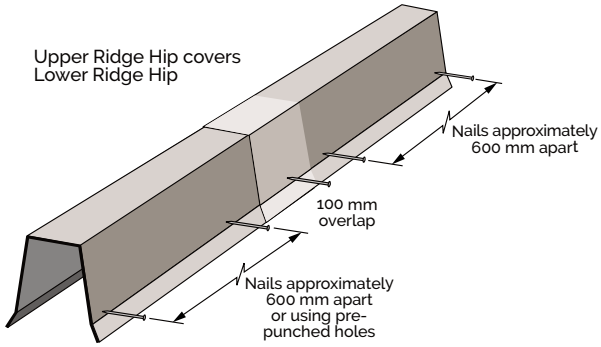


Figure 8.2.1.4

8.2.2 Angle trim over a hip

Angle trims are laid from eave to ridge.

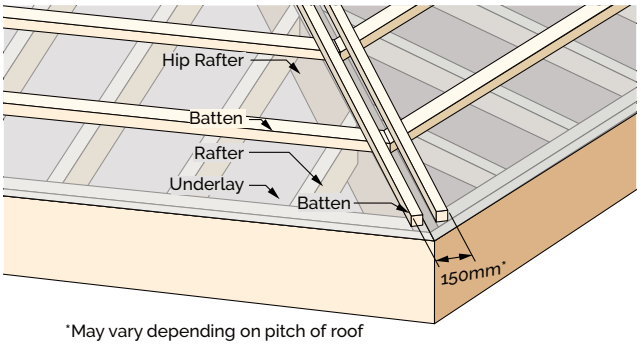


Figure 8.2.2.1 Accessory batten layout for hips – Angle trim

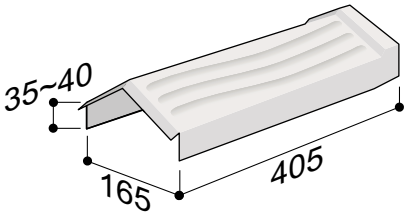


Figure 8.2.2.2 Angle trim

The eave Angle trim is created by fastening an Angle trim end (**Figure 8.2.2.4**) to an Angle trim with pop rivets.

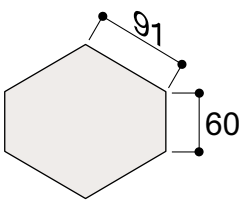


Figure 8.2.2.4 Angle trim end

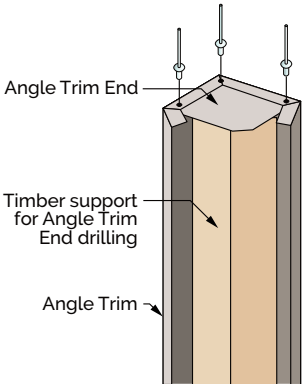


Figure 8.2.2.3

Angle trims are installed from the eave up overlapping so that the upper Angle trim covers and fits neatly over the step of the lower Angle trim (**Figure 8.2.2.5** and **Figure 8.2.2.6**).

Line the Angle trims up the hip and then tack them in place, adjust heights if required and then finish nailing. Drive 50 mm tile nails in sufficiently to bring the heads of the nails in contact with the Angle trims, do not over drive them as it will distort the Angle trim shape.

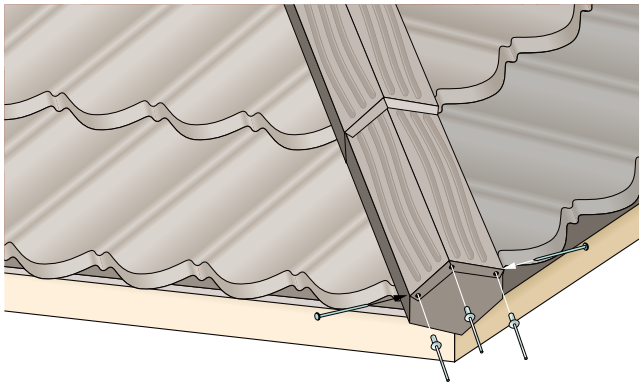


Figure 8.2.2.5

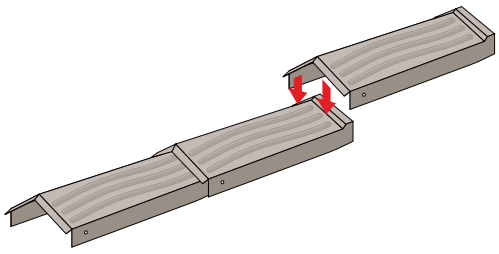


Figure 8.2.2.6

Pre-punched holes for fastening the Angle trim are located close to the front of the trim where it will overlap lower trim (**Figure 8.2.2.7**).

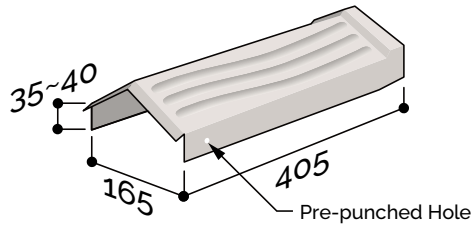


Figure 8.2.2.7

8.2.3 Barrel over a hip

Barrels are laid from eave to ridge.

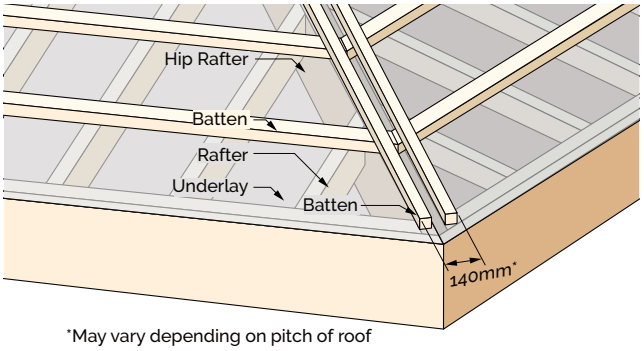


Figure 8.2.3.1 Accessory batten layout for Barrel 150

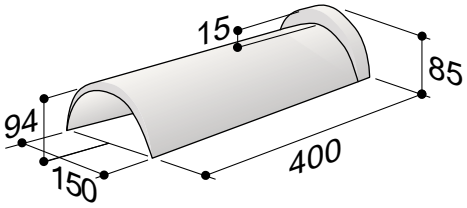


Figure 8.2.3.2 Barrel 150

Barrels are bent on site so that there is a vertical edge either side of the Barrel that will cover the bent up section of the tiles up the hip (**Figure 8.2.3.3**). This can be done in a short tile bender or in-between 2 tile battens fastened 5 mm apart.

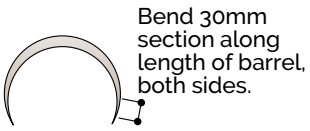


Figure 8.2.3.3

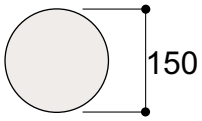


Figure 8.2.3.4

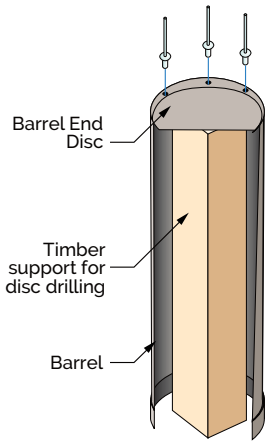


Figure 8.2.3.5

The eave Barrel is created by fastening a Barrel end disc to a Barrel with pop rivets (**Figure 8.2.3.5**).

Barrels are installed from the eave up overlapping so that the upper barrel covers and fits neatly over the step of the lower barrel (**Figure 8.2.3.6** and **Figure 8.2.3.7**)

Line the Barrels up the hip and then tack them in place using 50 mm tile nails, adjust heights if required and then finish nailing.

Drive the nails in sufficiently to bring the heads of the nails in contact with the Barrels, do not over drive them as it will distort the Barrel shape.

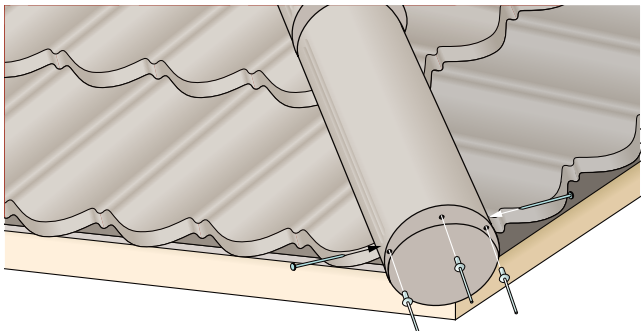


Figure 8.2.3.6

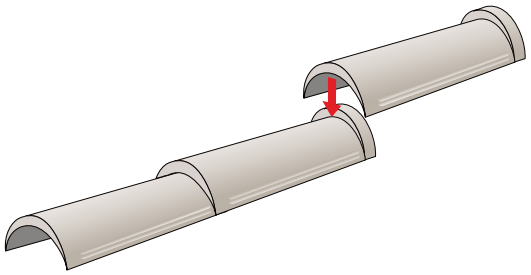


Figure 8.2.3.7

Pre-punched holes for fastening the barrels are located close to the front where it will overlap lower barrels (**Figure 8.2.3.8**).

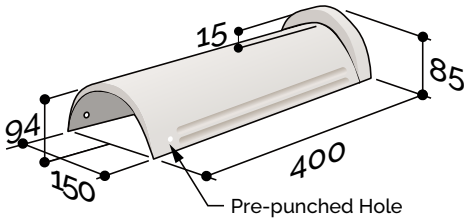


Figure 8.2.3.8

8.3 Ridge accessory installation

Box trim, angle trim and Barrel trim are installed along the ridges.

Special profiled ridge accessories are used on Milano tiles instead of bending tiles up against the ridge battens. On all the other profiles the accessories are installed directly over the turned up tiles.

The accessories must cover the turned up sections of the tiles by a minimum of 35 mm.

8.3.1 Box trim along a ridge

Textured Box trims are tapered. The wider end of one cap fits neatly over the narrow end of the other.

Satin Box trims are straight and have holes punched for nailing every 630 mm.

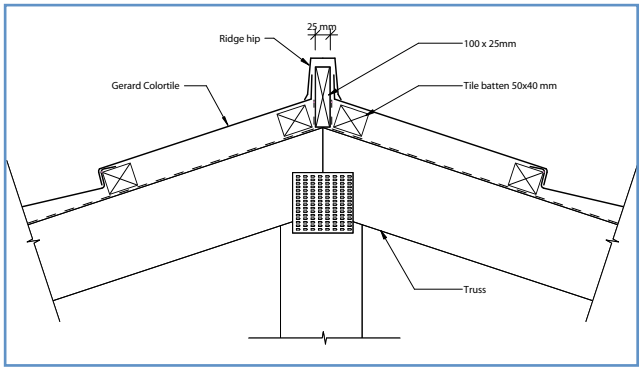


Figure 8.3.1.1 Accessory batten layout for Box trim along a ridge

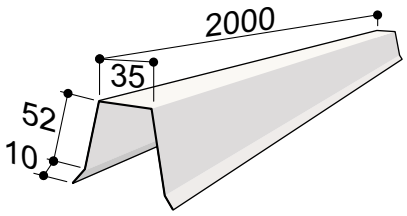


Figure 8.3.1.2

The Box trim may need to be installed at a hip or barge junction. The cutting and folding methods for these are covered in **10.0 Roof junctions**. Box trims are laid from one end of the ridge to the other lapping them by 100 mm (**Figure 8.3.1.3**).

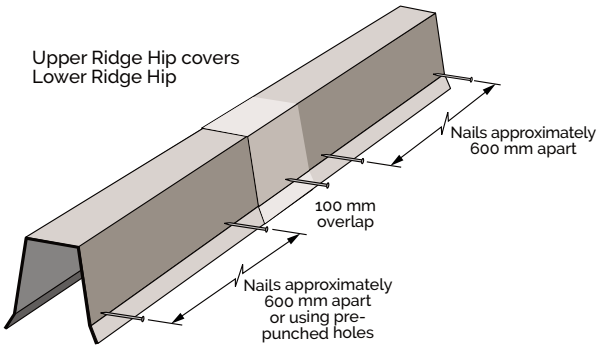


Figure 8.3.1.3

The Box trim accessories are tacked in place using 30 mm accessory nails and checked for straightness before complete nailing.

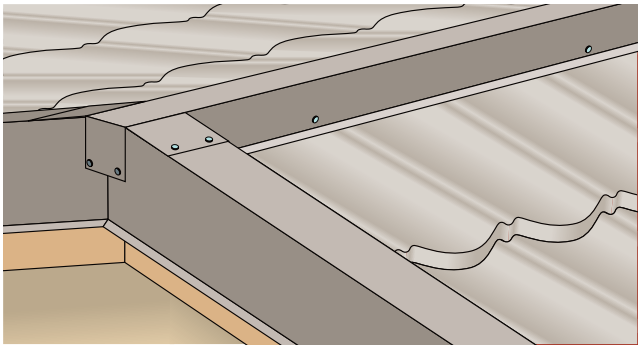


Figure 8.3.1.4

The nails are positioned near the bottom edge just above the 10 mm crease on the sides, nails are spaced approximately 600 mm apart or where holes are located on painted product. The nails are driven in so that the heads just make contact with the metal. Over driving them will crease the straight lines of the accessory.

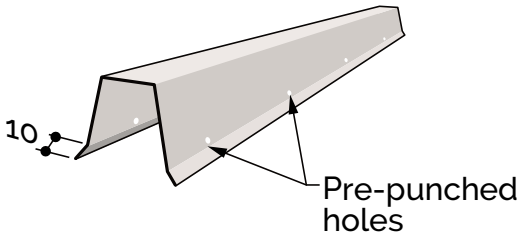


Figure 8.3.1.5

8.3.2 Angle trim along a ridge

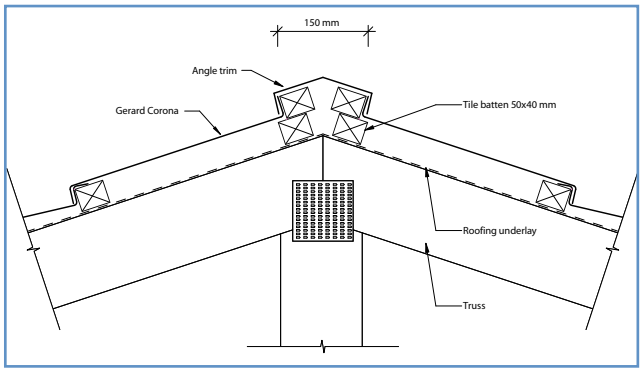


Figure 8.3.2.1 Accessory batten layout for Angle trim along a ridge

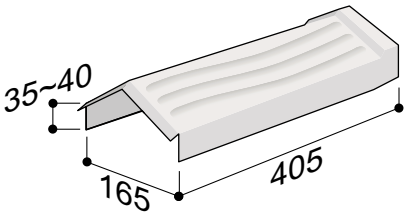


Figure 8.3.2.2 Angle trim

The angle trim may need to be installed at a hip or barge junction. The cutting and folding methods for these are covered in **10.0 Roof junctions**.

Angle trims are laid from one end of the ridge to the other overlapping them so that the over lapping angle trim sits neatly over the step (**Figure 8.3.2.3**).

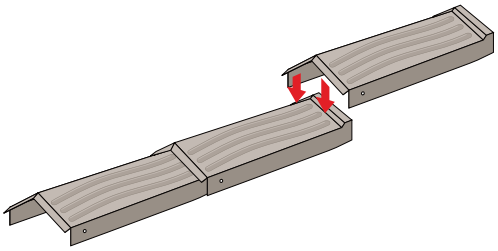


Figure 8.3.2.3 Angle trim overlap

Line the angle trims along the ridge and then tack them in place, adjust heights if required and then finish nailing.

Drive 50 mm tile nails in sufficiently to bring the heads of the nails in contact with the angle trims, do not over drive them as it will distort the angle trim shape.

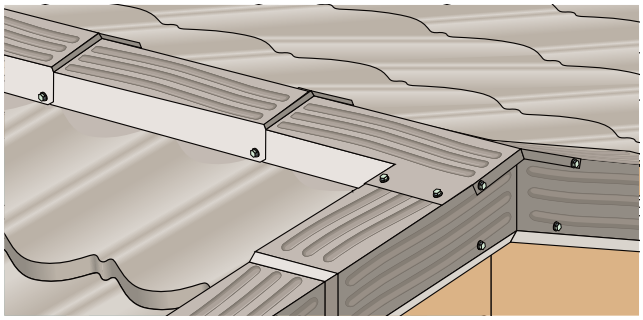


Figure 8.3.2.4

Pre-punched holes for fastening the angle trims are located close to the front of the trim where it will overlap lower trim (**Figure 8.3.2.5**).

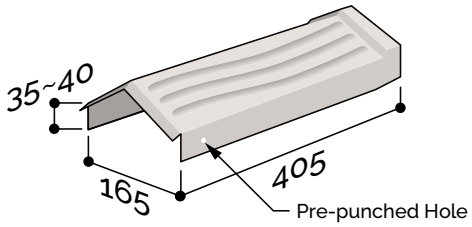


Figure 8.3.2.5

8.3.3 Barrel along a ridge

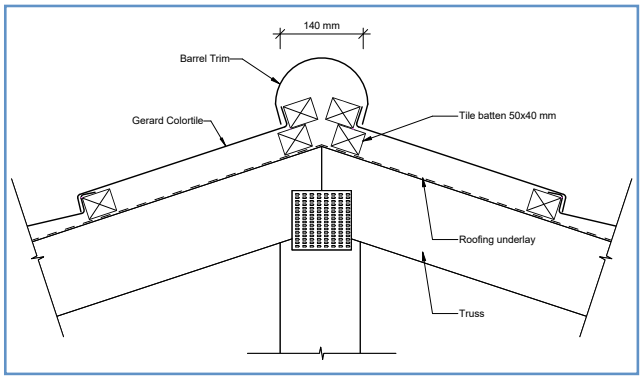


Figure 8.3.3.1 Accessory batten layout for barrel trim along a ridge

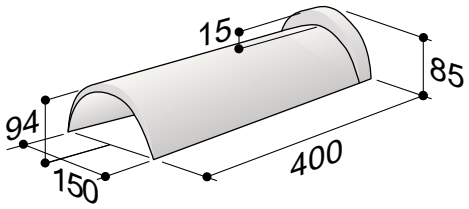


Figure 8.3.3.2 Barrel trim

Barrels are bent on site so that there is a vertical edge either side of the barrel that will cover the bent up section of the tiles that have been laid along the ridge (**Figure 8.3.3.3**). This can be done in a short tile bender or in-between 2 tile battens fastened 5 mm apart.

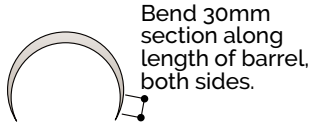


Figure 8.3.3.3

Barrels are installed along the ridge overlapping so that the upper barrel covers and fits neatly over the step of the lower barrel (**Figure 8.3.3.4** and **Figure 8.3.3.5**).

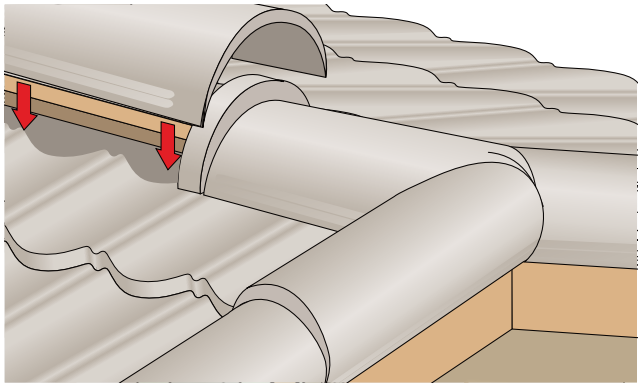


Figure 8.3.3.4

Line the barrels along the ridge and then tack them in place using 50 mm tile nails, adjust heights if required and then finish nailing.

Drive the nails in sufficiently to bring the heads of the nails in contact with the barrels, do not over drive them as it will distort the barrel shape.

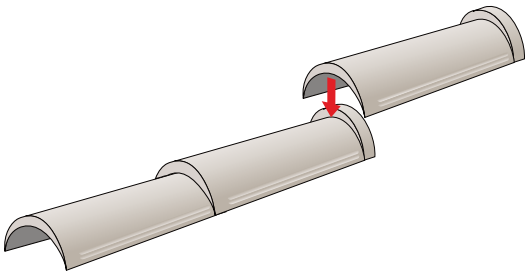


Figure 8.3.3.5

Pre-punched holes for fastening the barrels are located close to the front where it will overlap lower barrels (**Figure 8.3.3.6**).

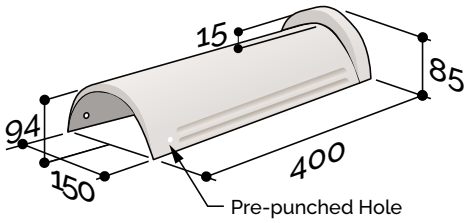


Figure 8.3.3.6

8.3.4 Milano ridge flashing A installation

There are two options in finishing a ridge where a Milano tile is used.

Milano tiles are usually turned up 40 mm against the ridge batten and covered with an accessory. This method is used for the other profiles as described in sections within **8.3 Ridge accessory installation**.

An alternative Milano ridge flashing A is available. This accessory is profiled to the shape of the Milano top surface. It provides a clean step just before the covering accessory. The Milano tile has to have the flat sections at the top of the tile turned up 10–25 mm, this reshapes the profile and provides a barrier to windblown moisture.

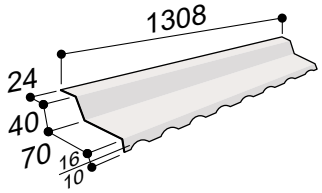


Figure 8.3.4.1 Milano ridge flashing A installed along each side of the ridge

Lay the Milano ridge flashing A along the ridge line and tack them in place at the ends so that they stay in place while installing the barrels.

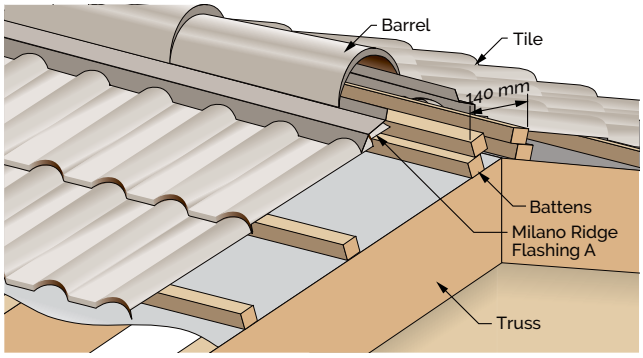


Figure 8.3.4.2

GERARD
Roofing Designed to Endure

9.0 Valleys & wall flashings

9.1 Valley installation

Valleys are installed from the eave up to the point at which it terminates.

No fasteners should penetrate inside the valleys.

Valleys may be made in full lengths from prepainted 0.55 mm Aluminium Zinc coated steel or from Gerard Roofs Valleys and Wide valley that are 2400 mm. The cross section shown is suitable for a roof area of 70 m^2 in a 200 mm (rainfall area). This is the minimum cross section size of any valley made for a Gerard Roof.

All valleys must be installed to E2/AS1.

Valley

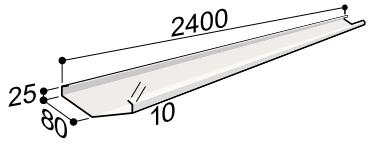


Figure 9.1.1

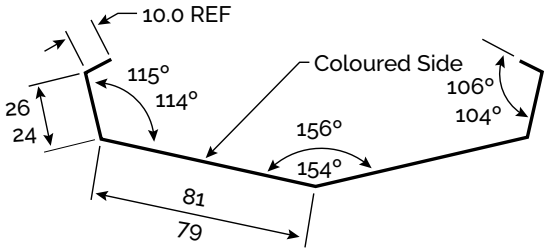


Figure 9.1.2

Wide valley

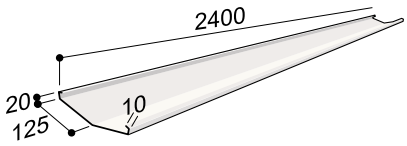


Figure 9.1.3

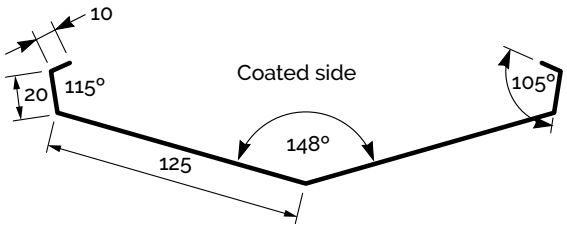
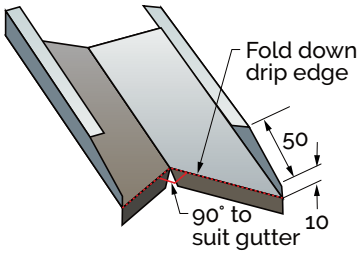


Figure 9.1.4

9.1.1 Valley at an eave

Cut a **V** out of the valley where the valley laps in to the gutter.



Cut down top edge of valley wall. 10mm at eave up 50mm

Figure 9.1.1.1

If the edge of the valley is below the edge of the gutter the valley should be "sprung up" to the discharge level and not cut, to permit water to flow into the gutter.

9.1.2 Joining lengths of valleys

Overlap minimum 150 mm. Notch valleys to stop thermal movement of lengths. Each valley joint must have a notched section.

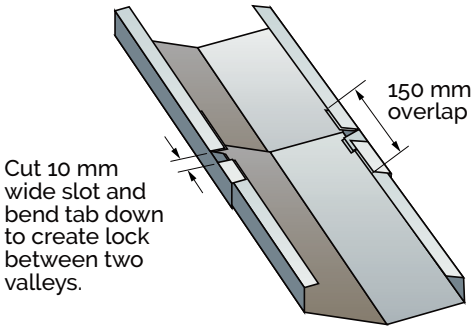


Figure 9.1.2.1

9.1.3 Fastening valley to the roof

Valleys are held in place with a clip. Do not nail inside the valley.

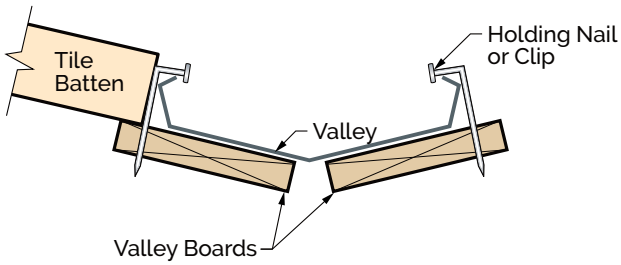


Figure 9.1.3.1

9.1.4 Closing valley top

Cut valley to create section for turning up. Turn up should be sufficient to reach top of the ridge battens. This provides no open sections where water could be blown over the top of the valley.

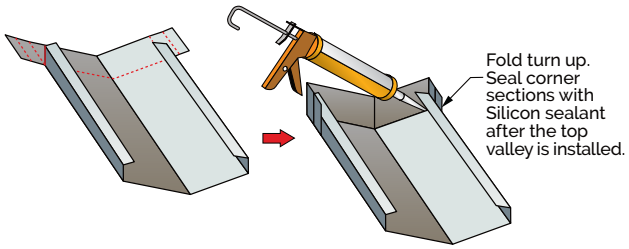


Figure 9.1.4.1

9.1.5 Valley junction on the top of a dormer

Cut valley to suit pitch of roof above the dormer, leave a minimum of 50 mm turn over edge to seal and rivet to join sections firmly together.

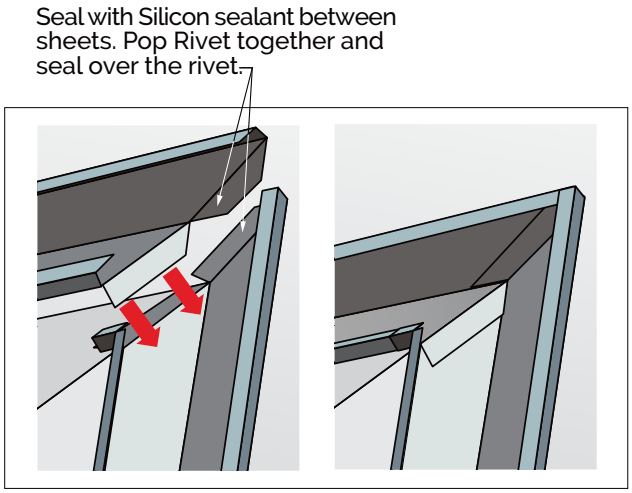


Figure 9.1.5.1

9.2 Wall flashings for pitched roofs

There are many approved wall cladding systems used on buildings that all need to be flashed when installing Gerard Roofs.

These flashings will provide adequate weather security through the width of cover or turn up of the tiles and will have sufficient height to be covered by the wall cladding so providing weather security (also meeting the requirements of E2AS1)

9.2.1 Side flashings

Side flashings are installed on to the wall framing before the cladding is installed. Noggins are optional. They do, however, provide support to the flashing. In some areas noggin may be required to support the flashing – change in slope or support for claddings. Noggins are to be installed so that the bottom edge is

120 mm above the top of the rafter. This will give full support for the side flashing (**Figure 9.2.1.1**).

The side flashing is installed so that the lower edge is positioned 55-60 mm above the top of the rafter. This allows sufficient room for the tile batten and the turn up of the tile.

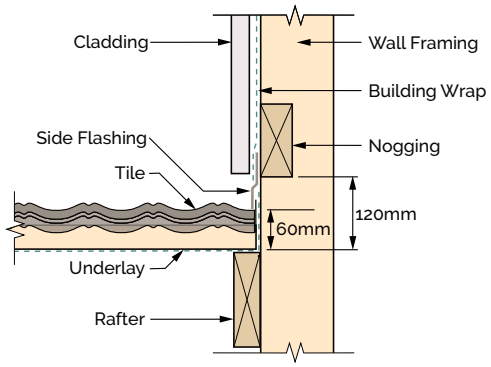


Figure 9.2.1.1 Positioning of side flashing lap for installation

Side flashings are installed from the lower section of the roof with an overlap of 100 mm. They are nailed in place so that the nails will be hidden under the wall cladding; nails are spaced approximately 600 mm apart (**Figure 9.2.1.3**).

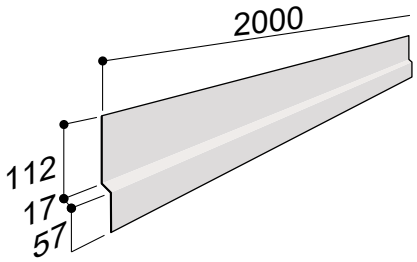


Figure 9.2.1.2 Side flashing

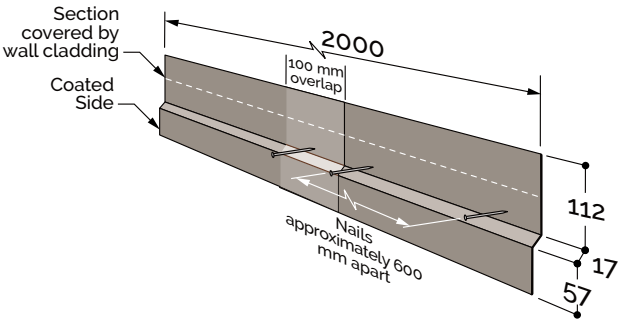


Figure 9.2.1.3

9.2.2 Side flashings - secret gutter

Side flashings are installed on to the wall framing before the cladding is installed. Noggins are optional. They do, however, provide support to the flashing.

In some areas noggin may be required to support the flashing – change in slope or support for claddings. Noggins are to be installed so that the bottom edge is 80 mm above the floor of the secret gutter. This will give full support for the side flashing (**Figure 9.2.2.1**).

The side flashing is installed so that the lower edge is positioned 20 mm above the top of base of the secret gutter. This allows sufficient room behind the side flashing for the turn up of the secret gutter.

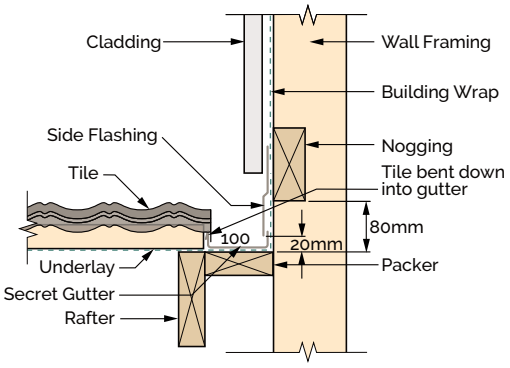


Figure 9.2.2.1 Side flashing installation over a secret gutter

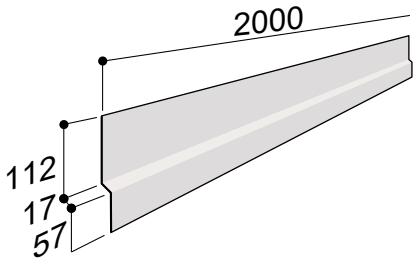


Figure 9.2.2.2 Side flashing

Note: The secret gutter must comply with the NZ Metal Roof and Wall Cladding Code of Practice.

In brief: the valley must be a minimum of 100 mm wide and have a minimum depth of 20 mm and be made of a non ferrous metal as it is required to last 50 years as it cannot be easily replaced.

Side flashings are installed from the lower section of the roof with an overlap of 100 mm. They are nailed in place so that the nails will be hidden under the wall cladding; nails are spaced approximately 600 mm apart (**Figure 9.2.2.3**)

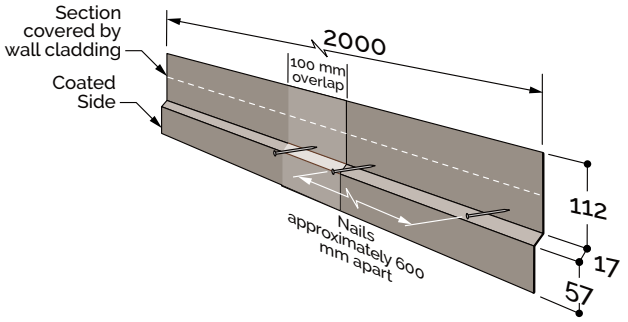


Figure 9.2.2.3

9.2.3 Apron flashings

Apron flashings are installed on to the wall framing before the cladding is installed. Noggins are optional. They do, however, provide support to the flashing. In some areas noggin may be required to support the flashing – change in slope or support for claddings. Noggins are to be installed so that the bottom edge is 120 mm above the top of the rafter. This will give full support for the apron flashing (**Figure 9.2.3.1**).

The apron flashing is installed so that the lower edge is positioned 60 mm above the top of the rafter. This allows sufficient room for the tile batten and the turn up of the tile. The soft edge of the apron flashing is dressed down on to the surface of the tile.

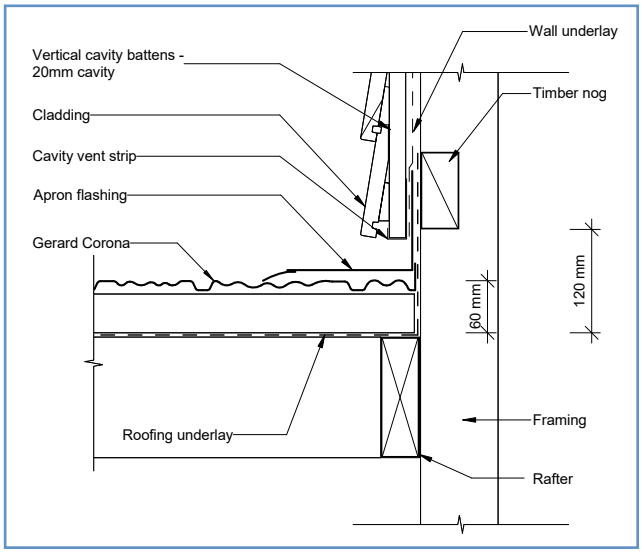


Figure 9.2.3.1 Positioning of apron flashing lap for installation

Apron flashings are installed from the lower section of the roof with an overlap of 100 mm (**Figure 9.2.3.3**). They are nailed in place so that the nails will be hidden under the wall cladding; nails are spaced approximately 600 mm apart.

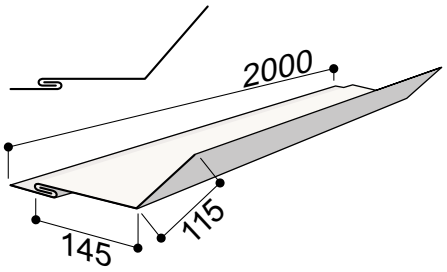


Figure 9.2.3.2 Apron flashing

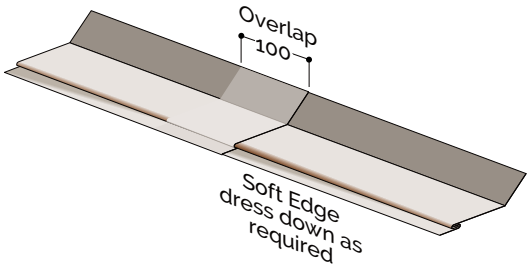


Figure 9.2.3.3

9.2.4 Pitch flashings for brick veneer or cavity cladding systems

Pitch flashings or purpose made flashings perform the same function as side flashings however they have a step which brings them out close to the line of the wall. The purpose is to allow turned up tiles to be inserted under the flashings. They require support at the wall as well as at the point where the tiles turn up under them.

Critical elements are the length of the section that is attached to the wall and that it's covered by the wall cladding. It must be sufficiently long to provide a minimum of 75 mm wall cover while still leaving a minimum gap of 10 mm between the cladding and the top of the flashing. Gerard Roofs usually recommends a minimum height of 86 mm.

The width of the step is dependent on the cladding width. The length of the section covering the turned up tile should be a minimum of 50 mm.

Noggins are optional. They do, however, provide support to the flashing. In some areas noggin may be required to support the flashing – change in slope or support for claddings. Noggins are to be installed so that the bottom edge is 120 mm above the top of the rafter. This will give full support to the pitch flashing (**Figure 9.2.4.1**).

The pitch flashing is installed so that the lower edge is positioned 55-60 mm above the top of the rafter. This allows sufficient room for the tile batten and turn up of the tile while providing coverage for the turn up. A counter batten is installed down the roof section on top of the tile battens 5 mm shorter than the width of the pitch flashing away from the wall studs.

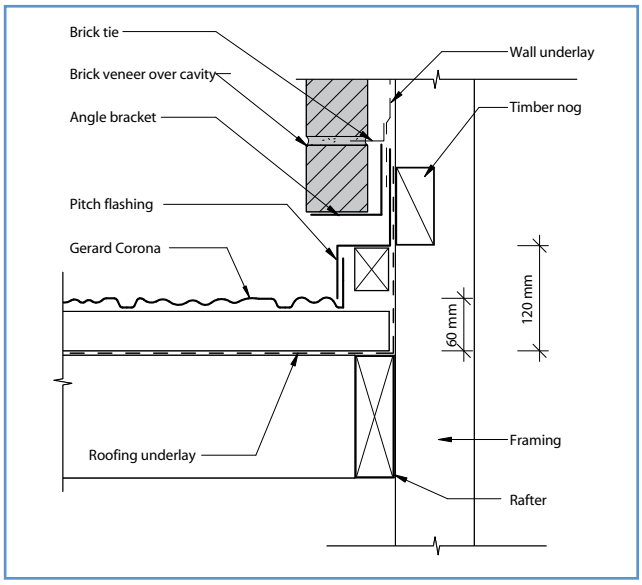


Figure 9.2.4.1 Nogging and positioning of pitch flashing for installation

Pitch flashings are installed from the lower section of the roof with an overlap of 100 mm. They are nailed in place so that the nails will be hidden under the wall cladding; nails are spaced approximately 600 mm apart (**Figure 9.2.4.3**).

There is no need to nail the pitch flashing edge against the turned up tile.

Note: Pitch flashings are used along the wall where the tiles are laid down the roof. There are various angled step flashings used for across horizontal sections. The two accessories pitch and step flashings meet neatly at corners where they are joined with rivets and sealant. Refer to **9.3.3 Step flashings** and **10.0 Roof junctions**.

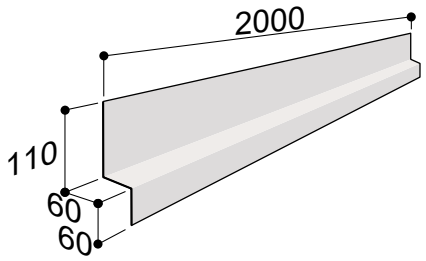


Figure 9.2.4.2 Pitch flashing

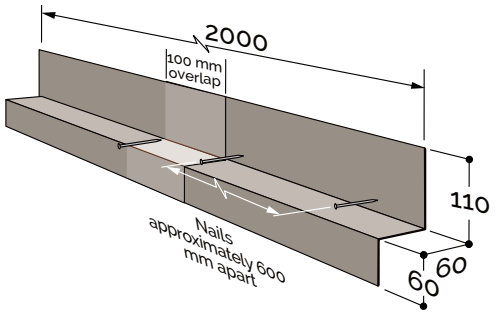


Figure 9.2.4.3

9.3 Transverse wall flashings

Where the roof wall junction runs horizontal the tiles are bent up a minimum of 40 mm except in the case of Milano where a profiled flashing is used. The bent up tiles are covered with a side flashing, apron flashing or a purpose made step flashing.

9.3.1 Side flashings

Side flashings are installed on to the wall framing before the cladding is installed. Noggins are optional. They do, however, provide support to the flashing. In some areas noggin may be required to support the flashing – change in slope or support for claddings. Noggins are to be installed so that the bottom edge is 120 mm above the top of the rafter. This will give full support for the side flashing (**Figure 9.3.1.1**).

The side flashing is installed so that the lower edge lines up with the lower edge of the side flashing installed down the pitched roof section. This allows sufficient room for the turn up of the tile. This should leave an (approx) 5 mm gap between the tile and the lower edge of the flashing.

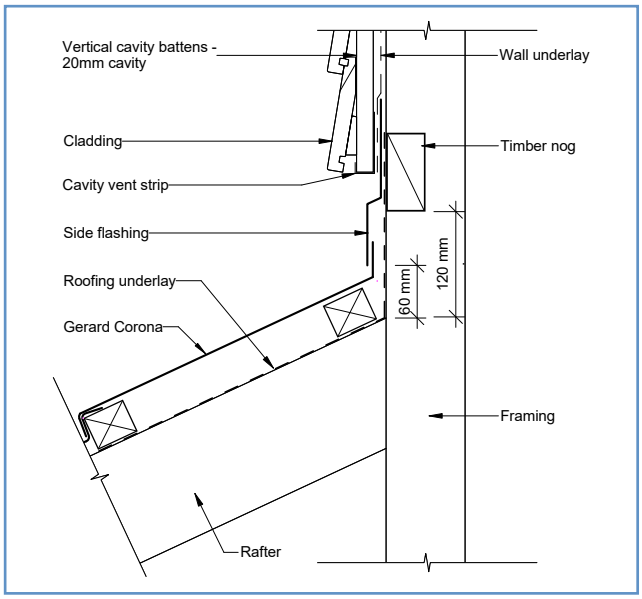


Figure 9.3.1.1 Position of side flashing

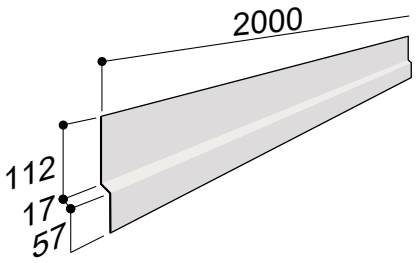


Figure 9.3.1.2 Side flashing

Side flashings are installed from the lower section of the roof with an overlap of 100 mm. They are nailed in place so that the nails will be hidden under the wall cladding; nails are spaced approximately 600 mm apart (**Figure 9.3.1.3**).

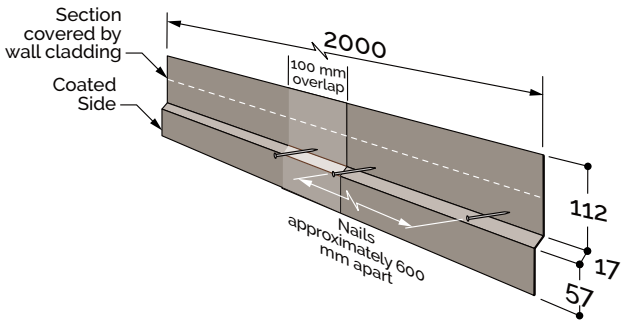


Figure 9.3.1.3

9.3.2 Apron flashings

Apron flashings are installed on to the wall framing before the cladding is installed. Noggins are optional. They do, however, provide support to the flashing. In some areas noggin may be required to support the flashing – change in slope or support for claddings. Noggins are to be installed so that the bottom edge is 120 mm above the top of the rafter. This will give full support for the apron flashing (**Figure 9.3.2.1**).

The apron flashing is installed so that the lower edge is positioned level with the surface of the tile and the apron flashing installed down the pitched section. The soft edge of the apron flashing is dressed down on to the surface of the tile.

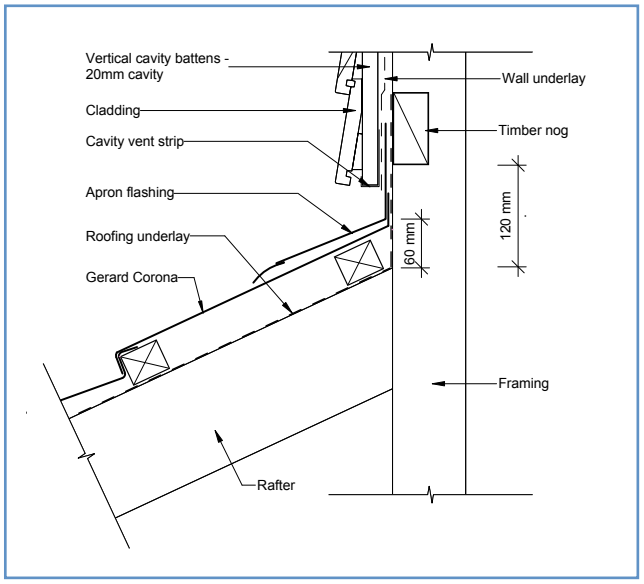


Figure 9.3.2.1 Nogging and position of apron flashing

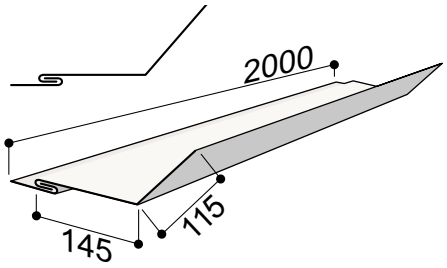


Figure 9.3.2.2 Apron flashing

Apron flashings are installed across the roof section with an overlap of 100 mm (**Figure 9.3.2.3**). They are nailed in place so that the nails will be hidden under the wall cladding; nails are spaced approximately 600 mm apart.

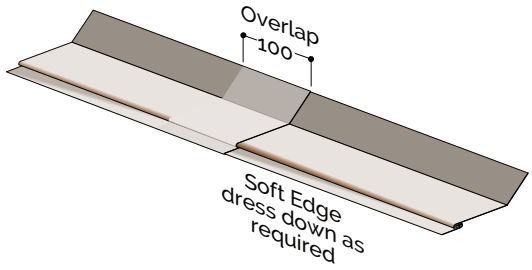


Figure 9.3.2.3

9.3.3 Step flashings for brick veneer or cavity cladding systems

The angle of the slope in the step flashing should closely match the roof pitch (**Figure 9.3.3.2**). This provides a neater finish at corners where a step flashing meets a pitch flashing.

Step flashings are installed on to the wall framing before the cladding is installed. Noggins are optional. They do, however, provide support to the flashing. In some areas noggin may be required to support the flashing – change in slope or support for claddings. Noggins are to be installed so that the bottom edge is 120 mm above the top of the rafter. This will give full support for the step flashing (**Figure 9.3.3.1**).

The step flashing is installed so that the lower edge

lines up with the lower edge of the pitch flashing installed down the pitched roof section. This allows sufficient room for the turn up of the tile. This should leave an (approx) 5 mm gap between the tile and the lower edge of the flashing.

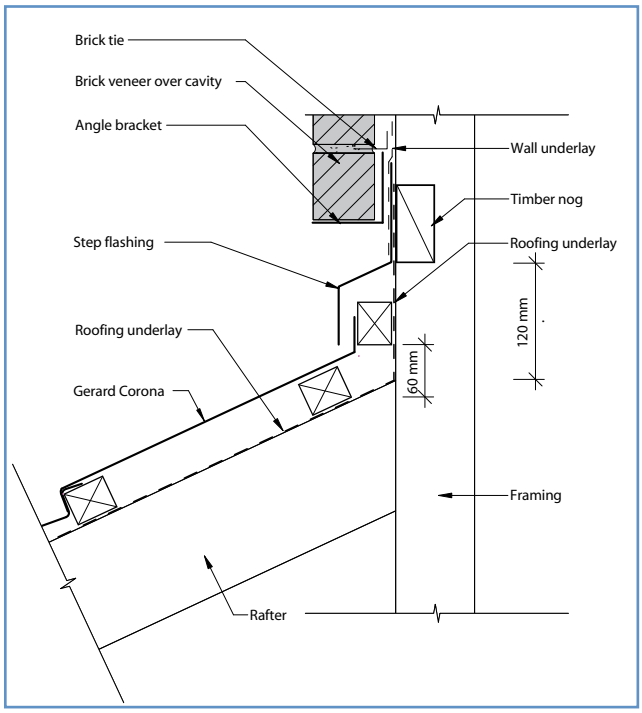


Figure 9.3.3.1 Batten and step flashing positioning

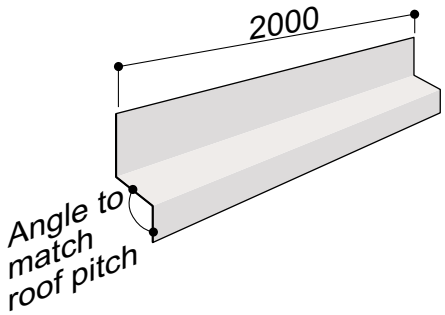
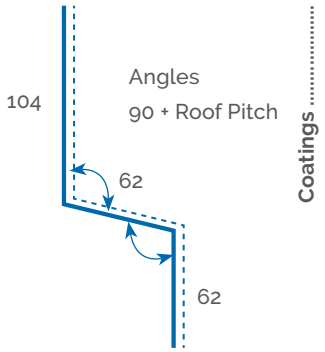


Figure 9.3.3.2 Step flashing

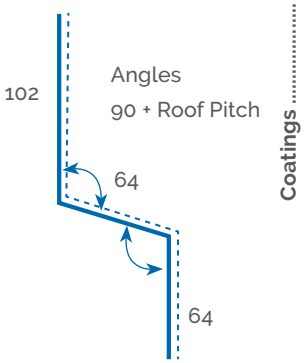
Standard item

Roof pitch 12.0° - 16.0°	
Angle required	
Items required	



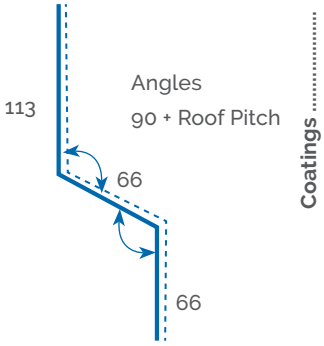
Substrate 230 x 2000 mm APS

Roof pitch 16.1° - 22.0°	
Angle required	
Items required	



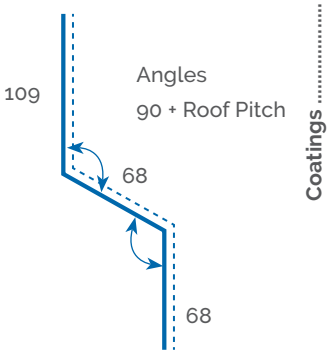
Substrate 230 x 2000 mm APS

Roof pitch 22.1° - 27.0°	
Angle required	
Items required	



Substrate 245 x 2000 mm APS

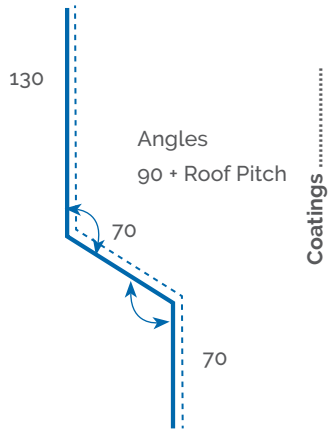
Roof pitch 27.1° - 29.0°	
Angle required	
Items required	



Substrate 245 x 2000 mm APS

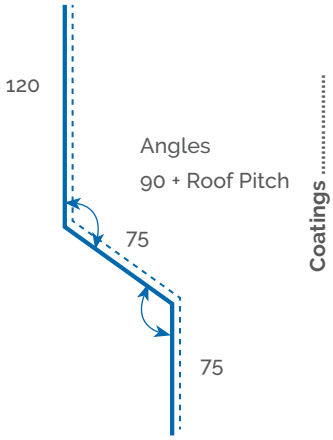
Figure 9.3.3.3 (continued on next page)

Roof pitch 29.1° - 32.0°	
Angle required	
Items required	



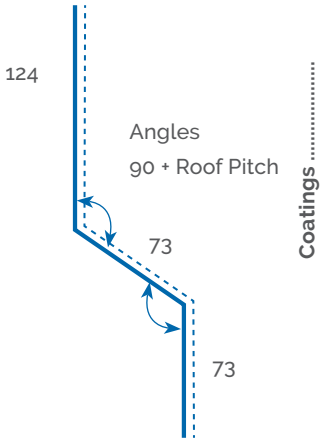
Substrate 270 x 2000 mm APS

Roof pitch 35.1° - 38.0°	
Angle required	
Items required	



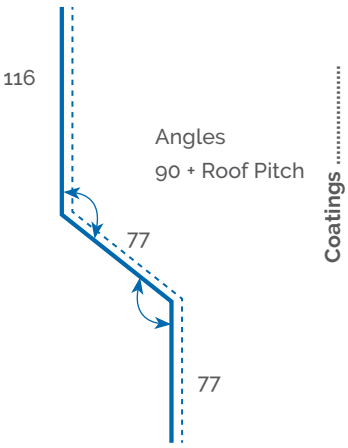
Substrate 270 x 2000 mm APS

Roof pitch 32.1° - 35.0°	
Angle required	
Items required	



Substrate 270 x 2000 mm APS

Roof pitch 38.1° - 40.0°	
Angle required	
Items required	



Substrate 270 x 2000 mm APS

Figure 9.3.3.3

Step flashings are installed along the wall overlapping by 100 mm. They are nailed in place so that the nails will be hidden under the wall cladding; nails are spaced approximately 600 mm apart (**Figure 9.3.3.4**).

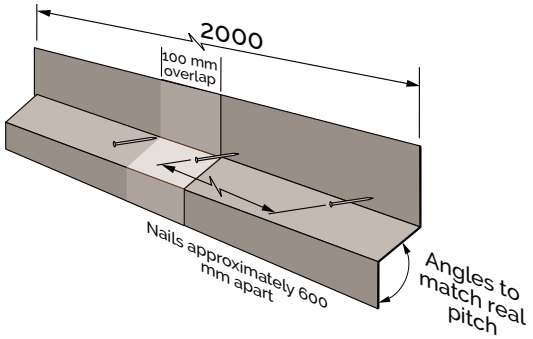


Figure 9.3.3.4

GERARD
Roofing Designed to Endure

10.0 Roof junctions

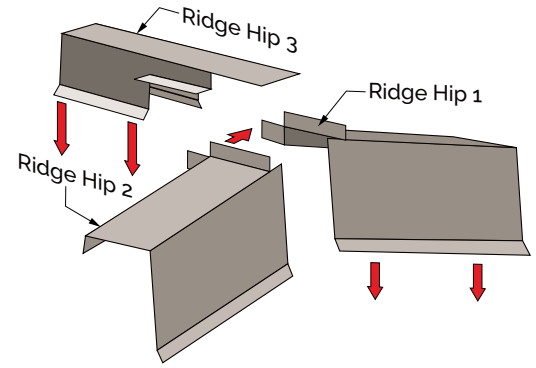
Gerard Roofs recommends sealant MS Sealants for general use with our products. However, this product requires slightly higher application temperature (5°C), and resists only up to 70°C (darker roofing material may reach temperatures up to 80°C in direct sunlight in the height of summer). Sealant must always be used in conjunction with mechanical fastening and be applied between the two sheets to be lapped before they are fixed together. The excess sealant extruded from the lap must be removed. Rivets should be at 50 mm centres.

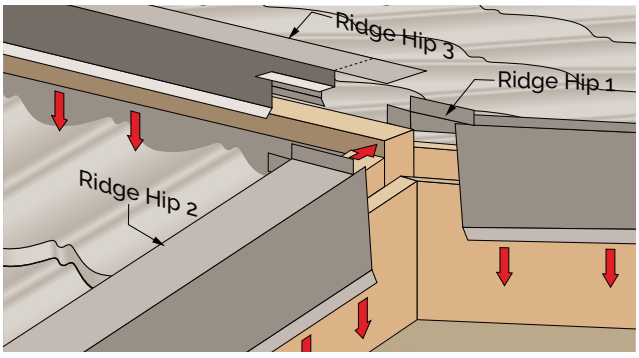
10.1 Gable end junction

10.1.1 External

Box trim over Box barges

Method 1





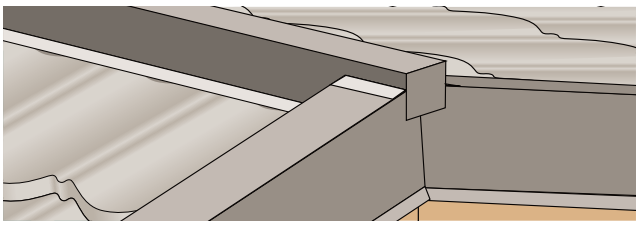
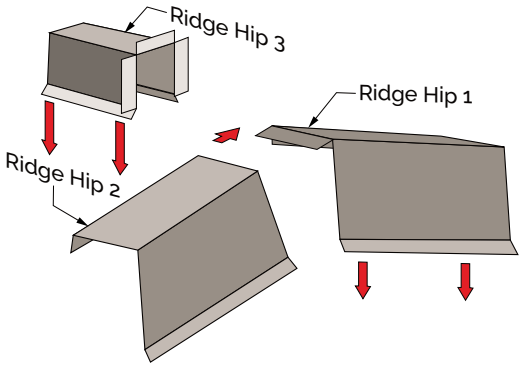
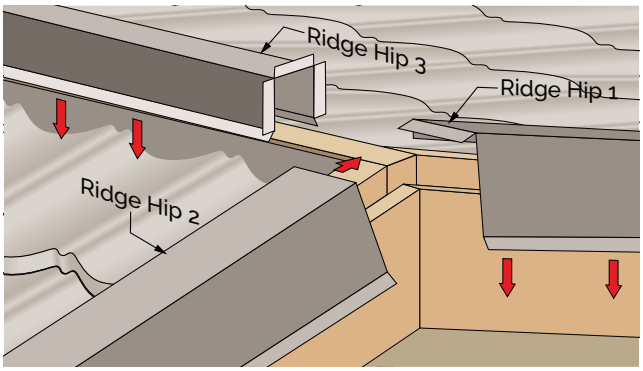


Figure 10.1.1.1.1

Note: sealants must always be applied on tags and between the two surfaces to be lapped. After that all the accessory joints must be riveted together. The excess sealant extruded from the lap must be removed.

Method 2





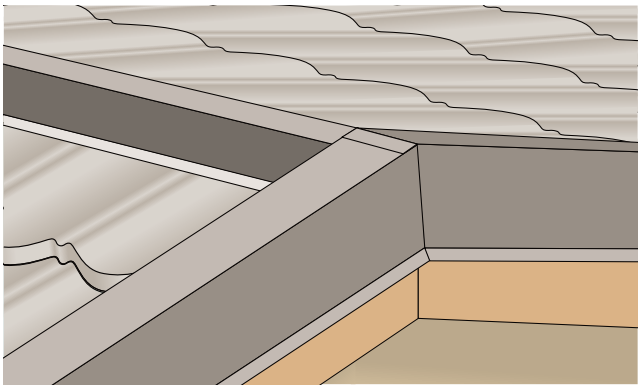
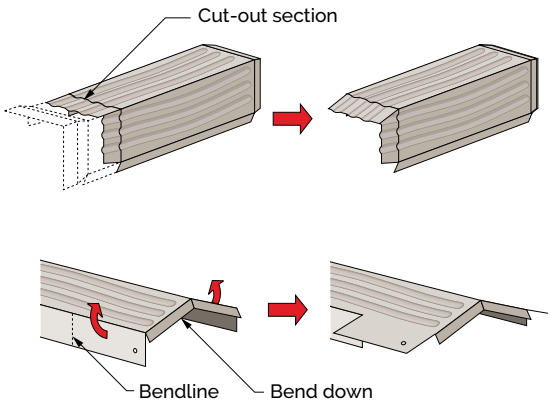


Figure 10.1.1.1.2

Note: sealants must always be applied on tags and between the two surfaces to be lapped. After that all the accessory joints must be riveted together. The excess sealant extruded from the lap must be removed.

Angle trims



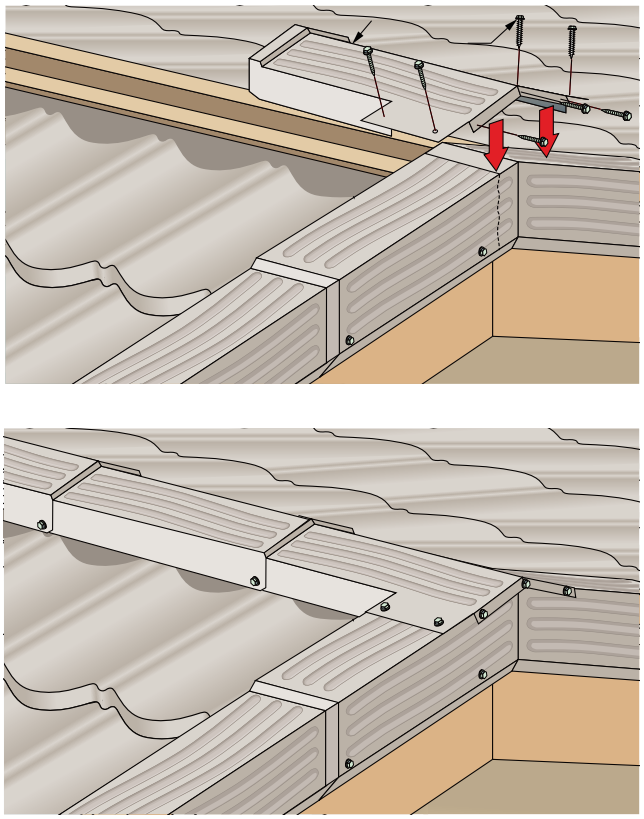
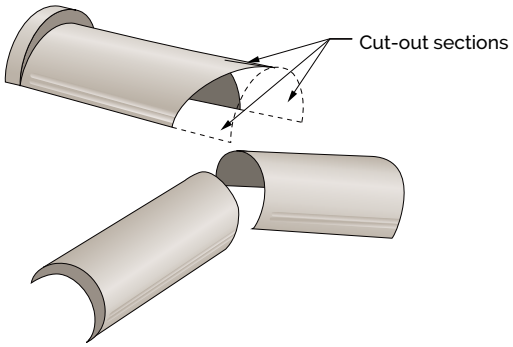


Figure 10.1.1.2.1

Note: sealants must always be applied on tags and between the two surfaces to be lapped. After that all the accessory joints must be riveted together. The excess sealant extruded from the lap must be removed.

Barrel trims



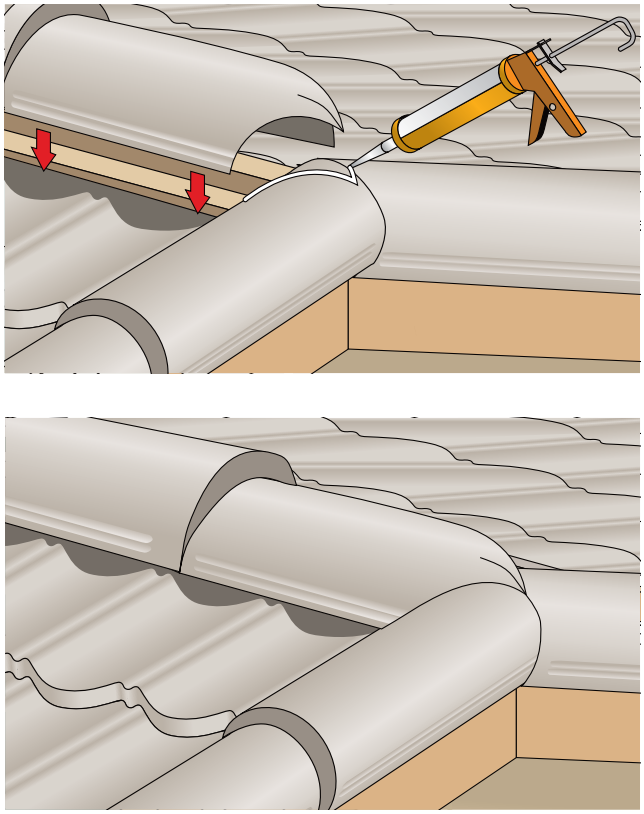


Figure 10.1.1.3.1

Note: sealants must always be applied on tags and between the two surfaces to be lapped. After that all the accessory joints must be riveted together. The excess sealant extruded from the lap must be removed.

10.1.2 Internal

Box barge over box trim

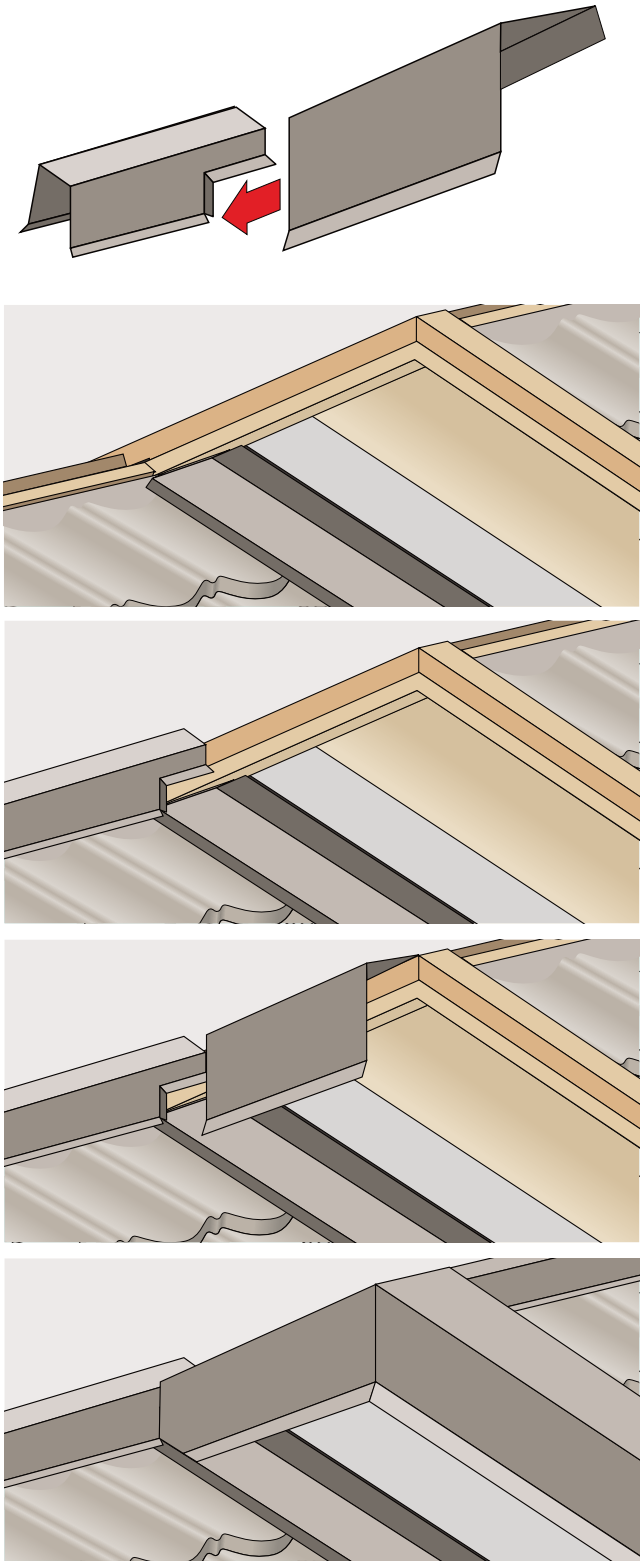


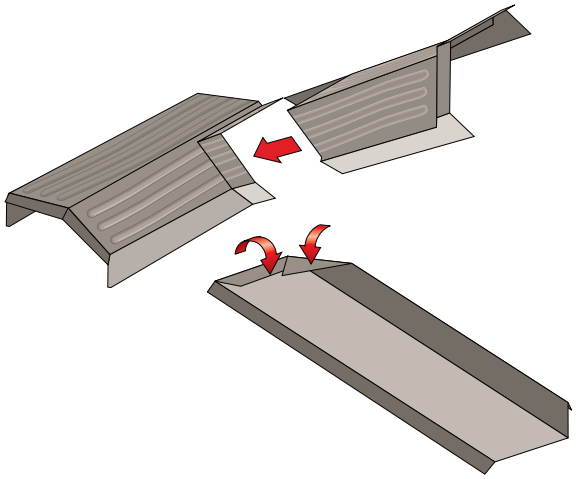
Figure 10.1.2.1.1

Side flashing can be installed instead of apron flashing. One end must be bent to fit under box trim and to stop water running sideways.

In most cases the apron flashing or the side flashing will be found to be in behind the metal fascia.

Note: sealants must always be applied on tags and between the two surfaces to be lapped. After that all the accessory joints must be riveted together. The excess sealant extruded from the lap must be removed.

Angle trims



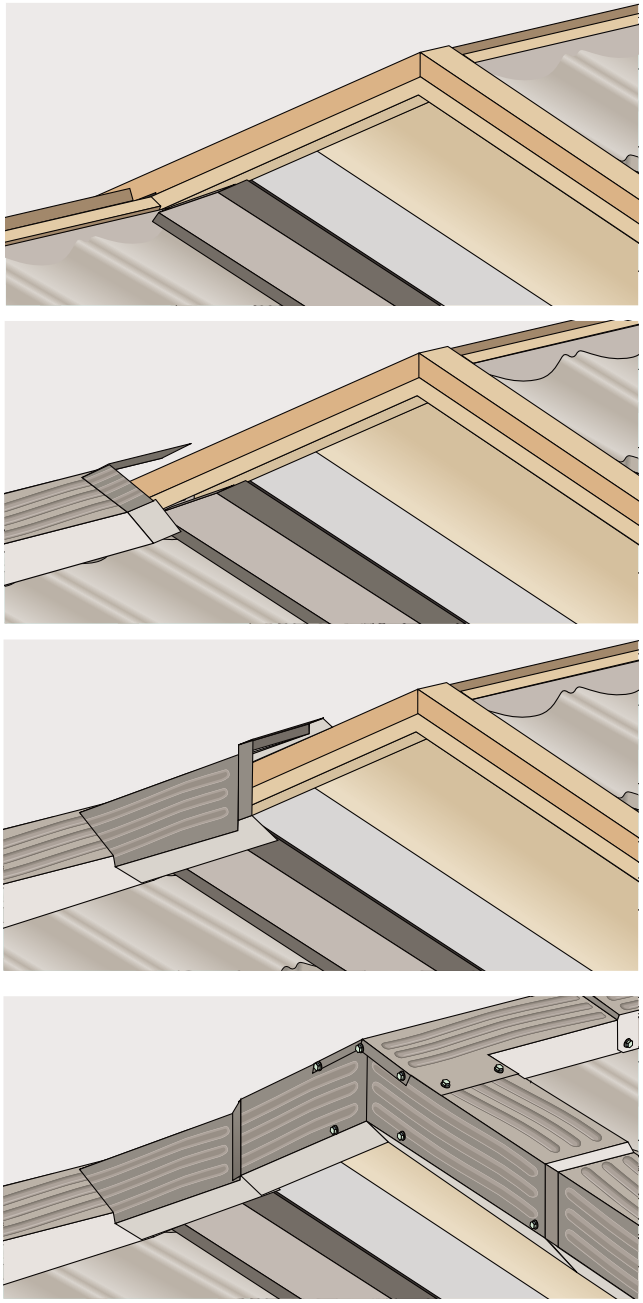


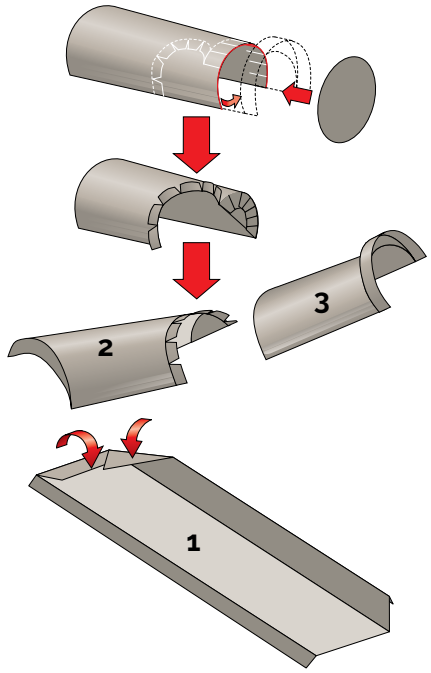
Figure 10.1.2.2.1

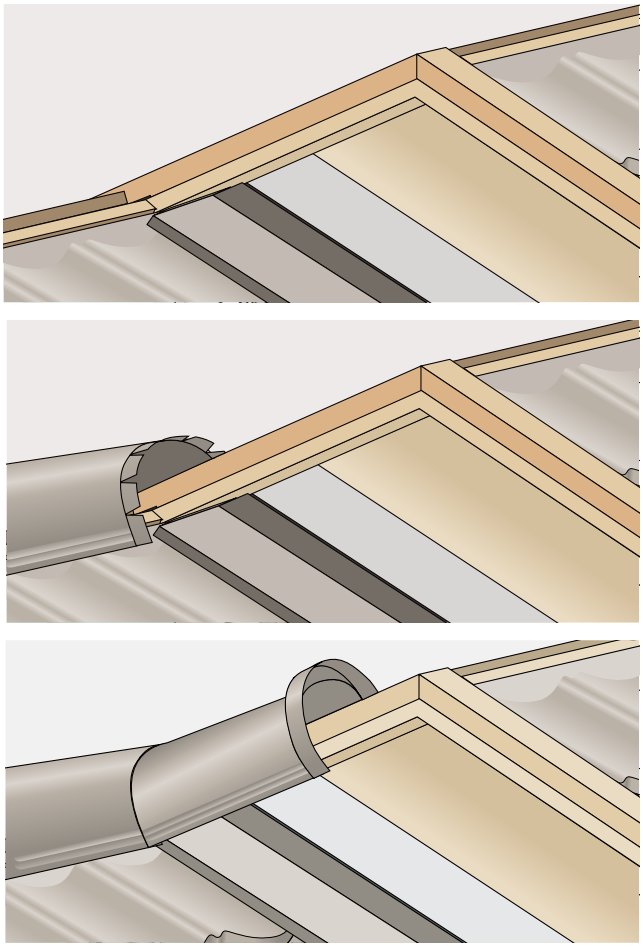
Side flashing can be installed instead of apron flashing. One end must be bent to fit under angle trim and to stop water running sideways.

In most cases the apron flashing or the side flashing will be found to be in behind the metal fascia.

Note: sealants must always be applied on tags and between the two surfaces to be lapped. After that all the accessory joints must be riveted together. The excess sealant extruded from the lap must be removed.

Barrel trim





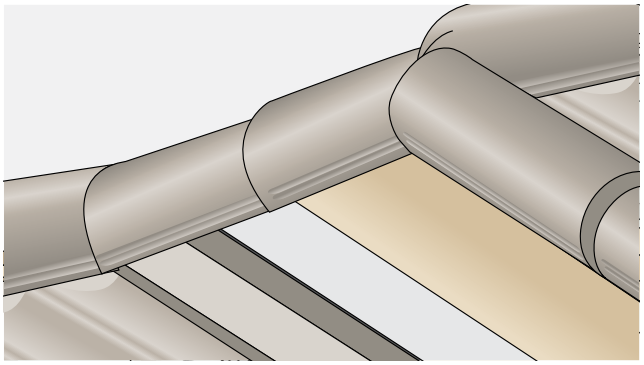


Figure 10.1.2.3.1

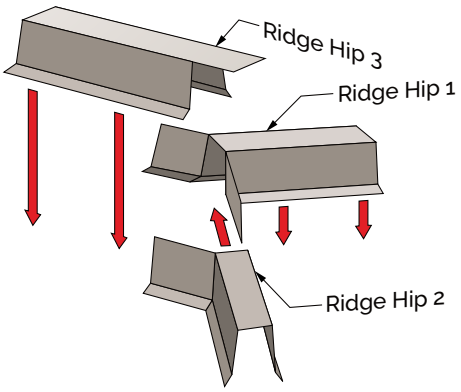
Side flashing can be installed instead of apron flashing. One end must be bent to fit under Barrel 150 and to stop water running sideways.

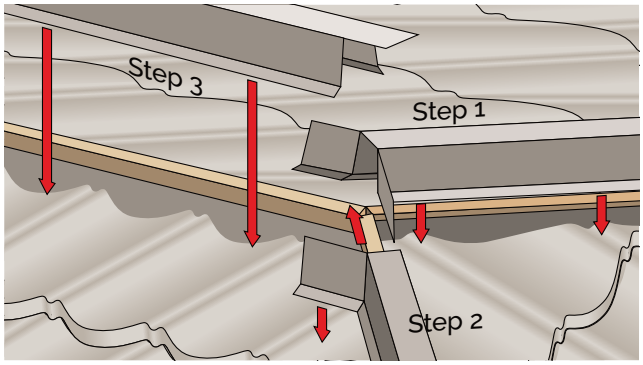
In most cases the apron flashing or the side flashing will be found to be in behind the metal fascia.

Note: sealants must always be applied on tags and between the two surfaces to be lapped. After that all the accessory joints must be riveted together. The excess sealant extruded from the lap must be removed.

10.2 Hip ridge junction

10.2.1 Box trim





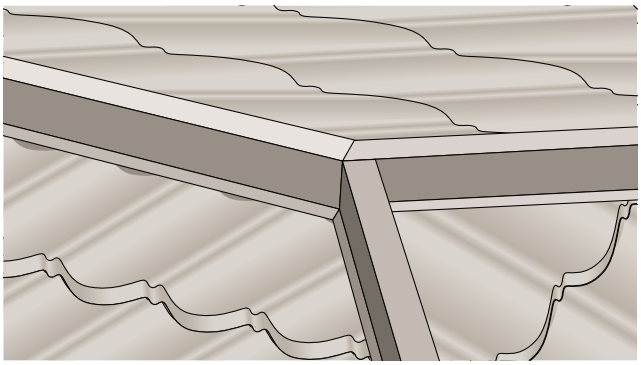


Figure 10.2.1.1

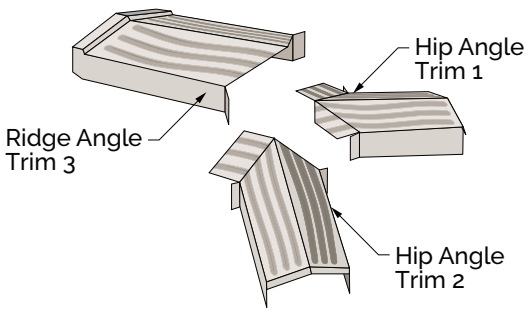
Box trims are laid from the eave to ridge.

Step 1: cut box trim 1 to correct angle
Step 2: align and cut box trim 2 to correct angle and seal with silicone on tags
Step 3: cut and lay box trim 3 over the box trims 1 and 2 and seal with silicone on tags

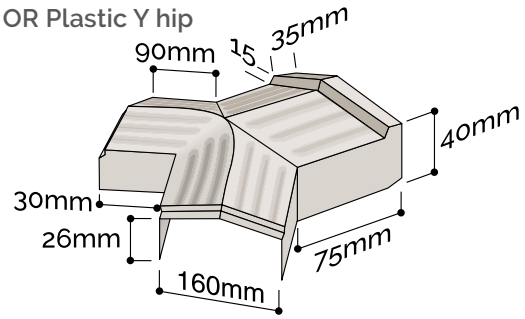
Continue installing box trims along the ridge.

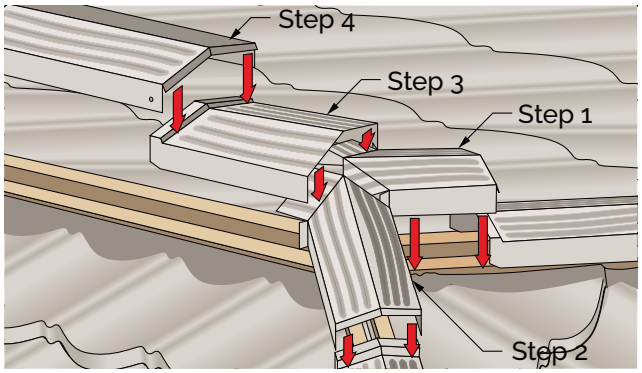
Note: sealants must always be applied on tags and between the two surfaces to be lapped. After that all the accessory joints must be riveted together. The excess sealant extruded from the lap must be removed.

10.2.2 Angle trim



OR Plastic Y hip





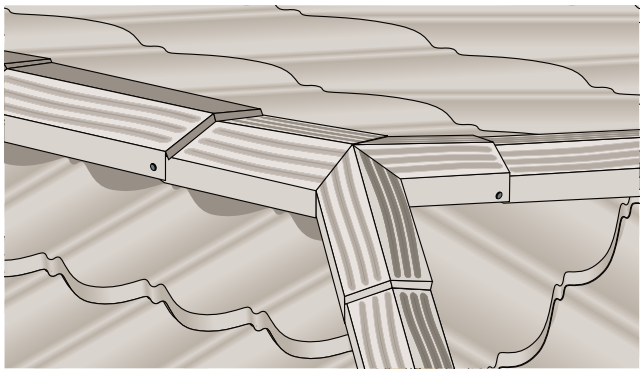


Figure 10.2.2.1

Angle trims are laid from the eave to ridge.

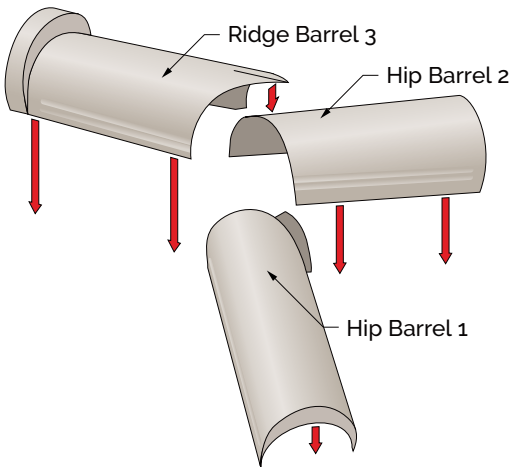
Step 1: cut first hip angle trim to correct angle
Step 2: align and cut second hip angle trim to correct angle and seal with silicone on tags
Step 3: cut and lay ridge angle trim over the hip angle trims and seal with silicone on tags

Or you can use a Gerard Roofs Angle trim plastic Y hip.

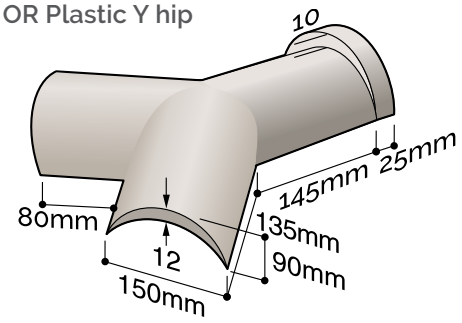
Continue installing angle trims along the ridge.

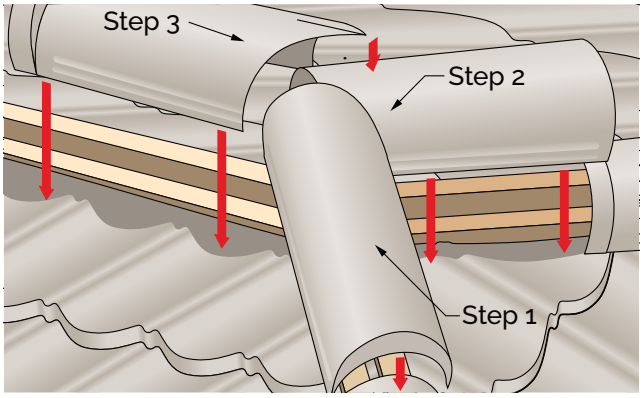
Note: sealants must always be applied on tags and between the two surfaces to be lapped. After that all the accessory joints must be riveted together. The excess sealant extruded from the lap must be removed.

10.2.3 Barrel 150 trim



OR Plastic Y hip





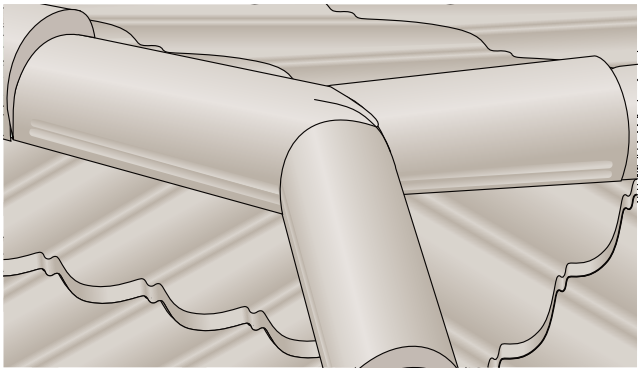


Figure 10.2.3.1

Barrel trims are laid from the eave to ridge.

Step 1: cut first hip barrel trim to correct angle
Step 2: align and cut second hip barrel trim to correct angle and seal with silicone on tags
Step 3: cut and lay ridge barrel trim over the hip barrel trims and seal with silicone on tags

Or you can use a Gerard Roofs Barrel trim plastic Y hip.

Continue installing barrel trims along the ridge.

Note: sealants must always be applied on tags and between the two surfaces to be lapped. After that all the accessory joints must be riveted together. The excess sealant extruded from the lap must be removed.

10.3 Internal barge fascia junction

The internal barge is created by flashing the eave tile over the accessory. Sealant is to be applied between the tile and accessory before riveting the junction.

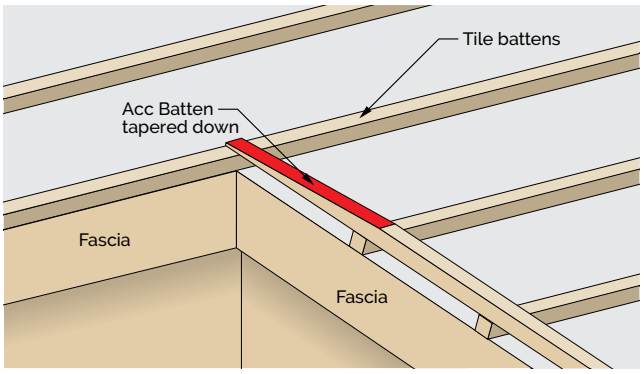


Figure 10.3.1

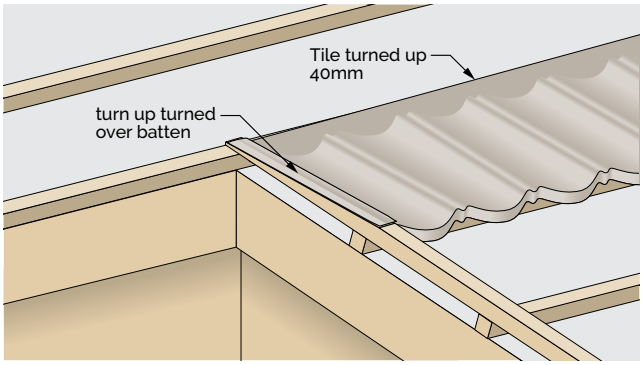


Figure 10.3.2

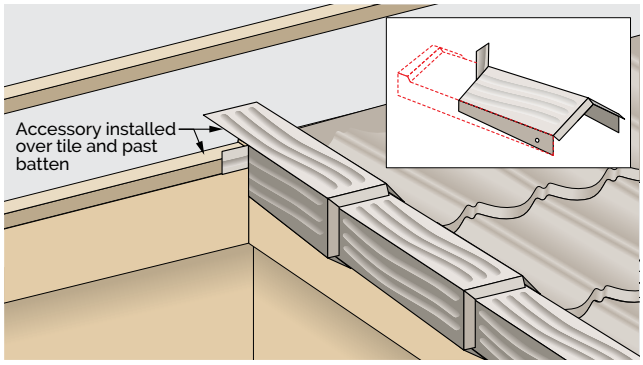


Figure 10.3.3

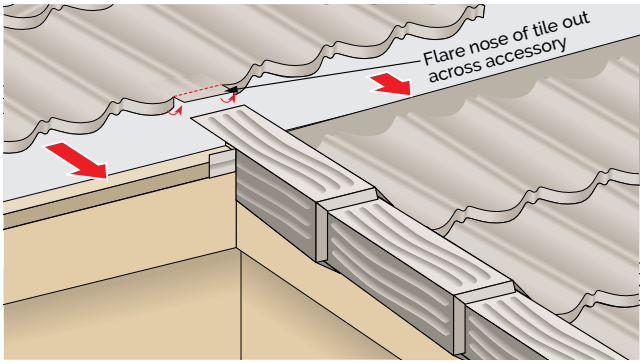


Figure 10.3.4

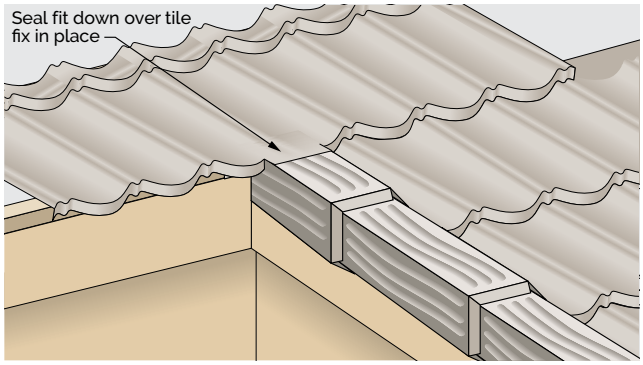


Figure 10.3.5

10.4 Valley junction

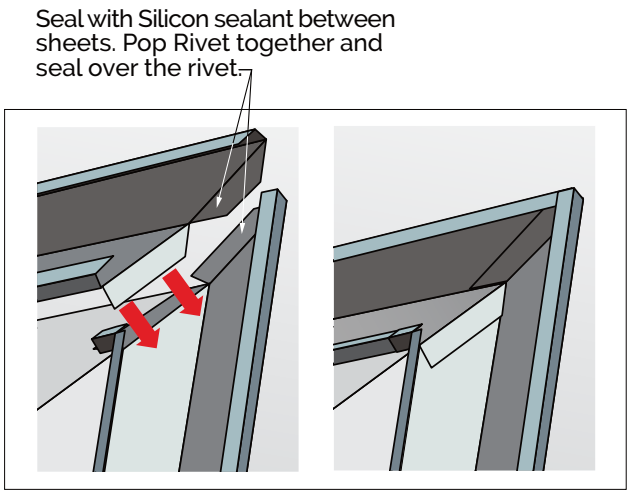


Figure 10.4.1

Cut valley to create section for turning up. Turn up should be sufficient to reach top of the ridge battens. This provides no open sections where water could be blown over the top of the valley.

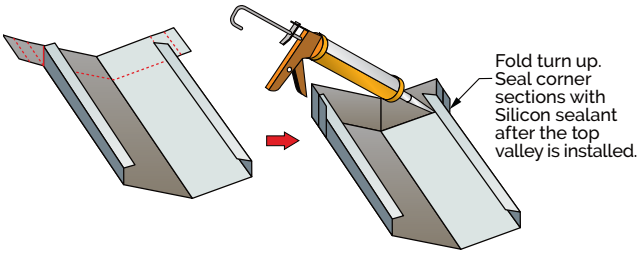


Figure 10.4.2

10.5 Valley split

10.5.1 Box trim

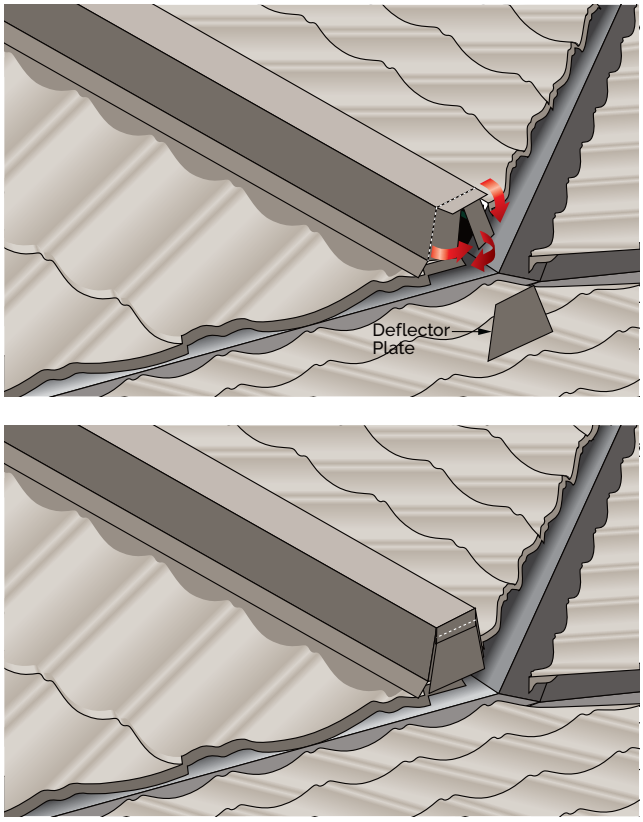


Figure 10.5.1.1

Note: sealants must always be applied on tags before the end cap and the tags are riveted together. The excess sealant extruded from the lap must be removed. The deflector plate must be cut down to the surface of the valleys.

10.5.2 Angle trim

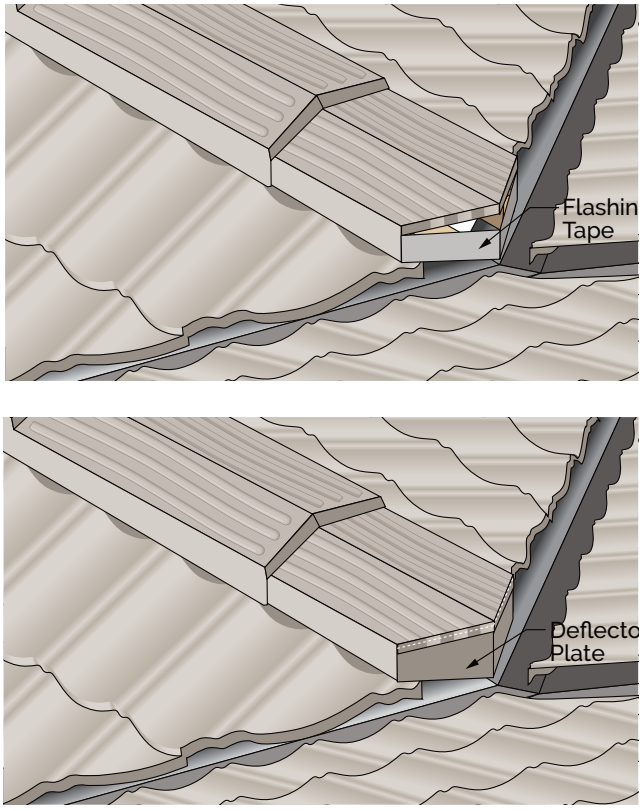
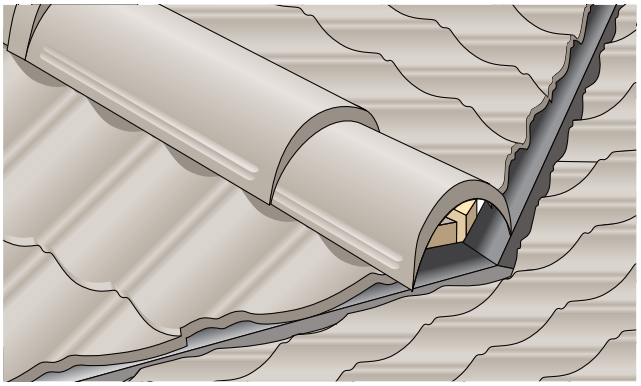


Figure 10.5.2.1

Note: sealants must be applied on nose of the angle trim before the angle trim and the deflector plate are riveted together. The excess sealant extruded from the lap must be removed. The deflector plate must be cut down to the surface of the valleys.

10.5.3 Barrel trim



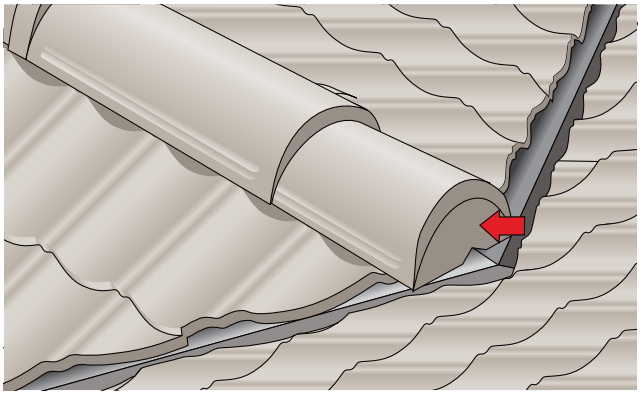


Figure 10.5.3.1

Step 1: cut the barrel end disc to fit valley junction
Step 2: fasten the barrel end disc to the barrel with pop rivet.

Note: the barrel end disc must be cut down to the surface of the valleys.

10.6 Hip/ridge to wall

10.6.1 Install lower roof after wall cladding

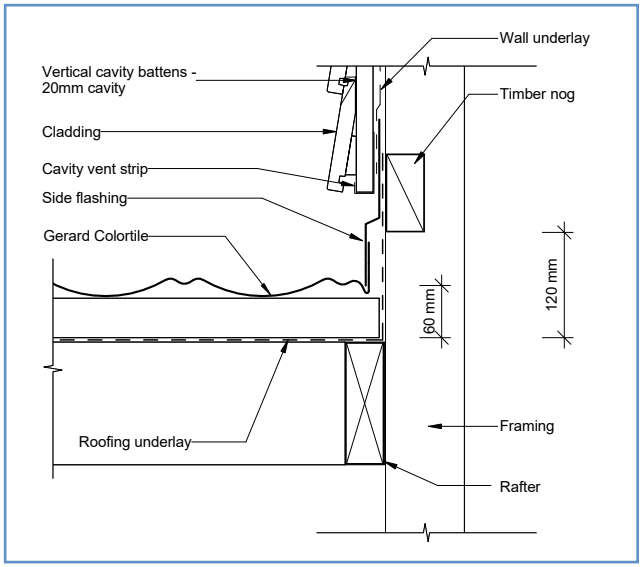
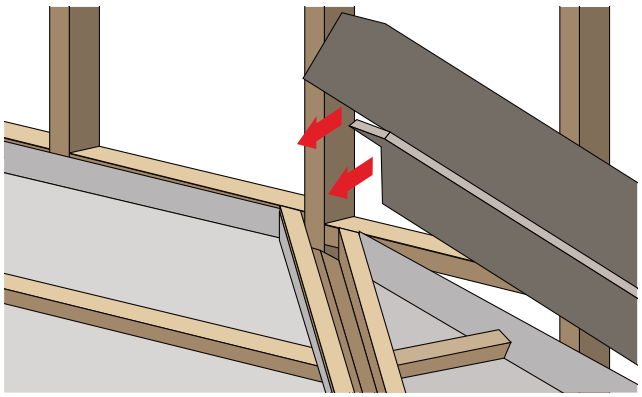
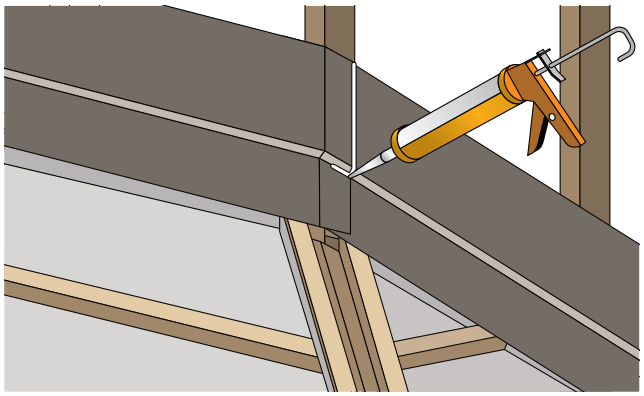
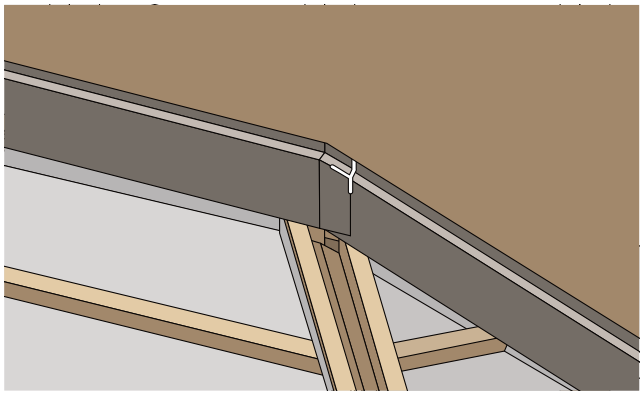


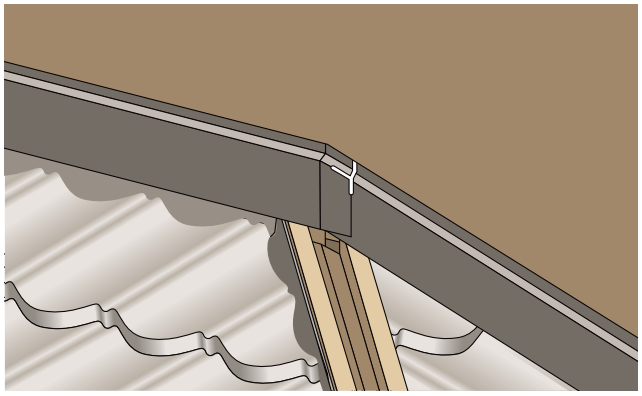
Figure 10.6.1.1

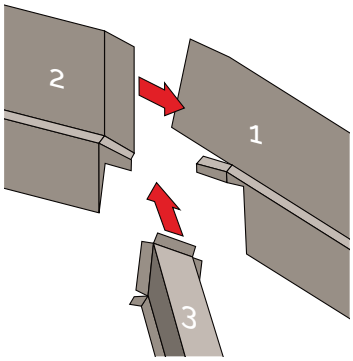
Box trim

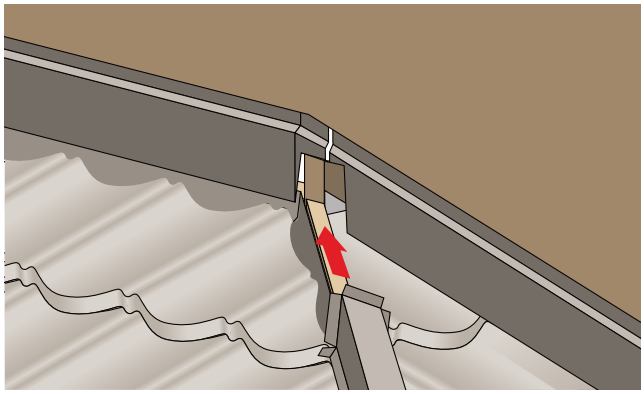












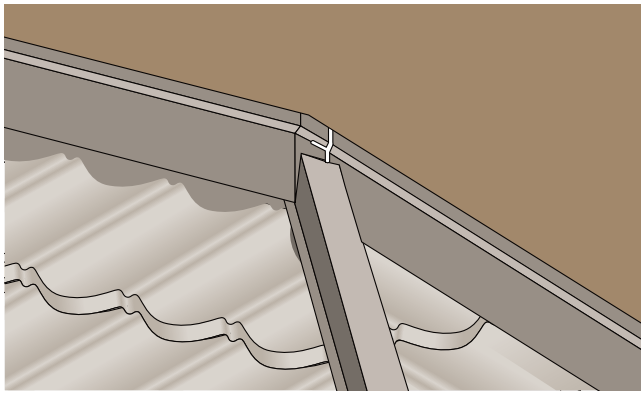
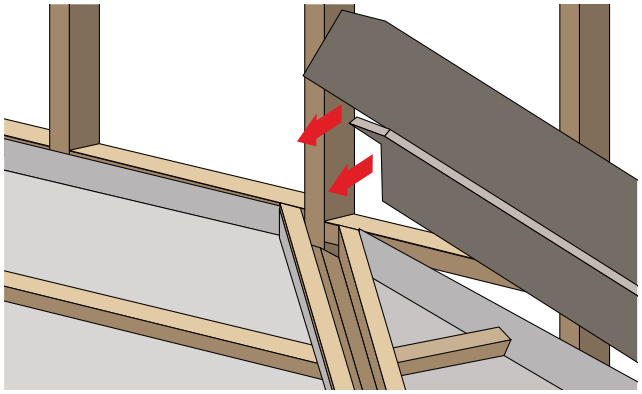
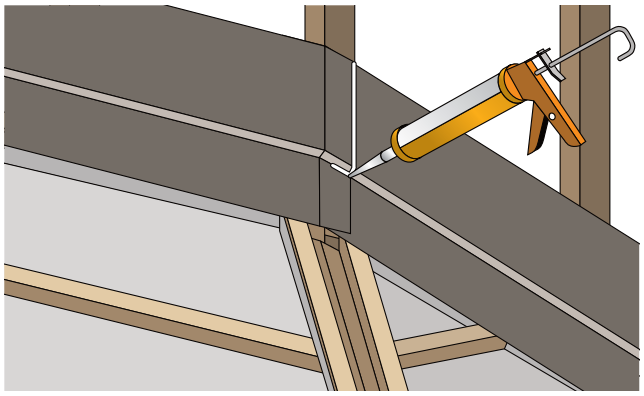


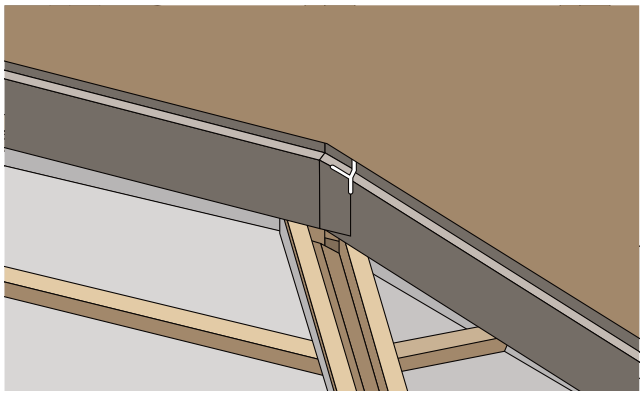
Figure 10.6.1.1.1

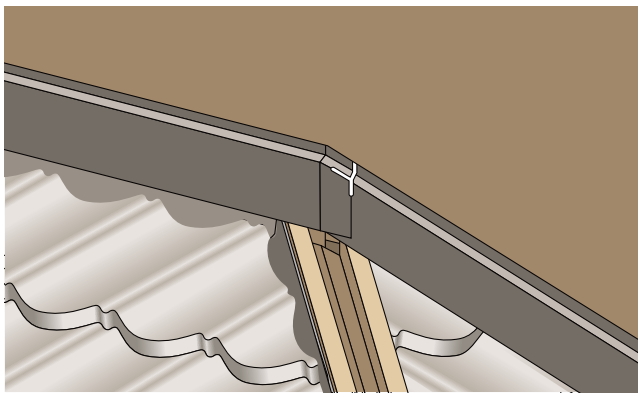
Note: sealants must be applied on tags and between the two surfaces to be lapped except for the lower sections of the side flashings where the box trim will be inserted behind. Rivet all the joints afterwards.

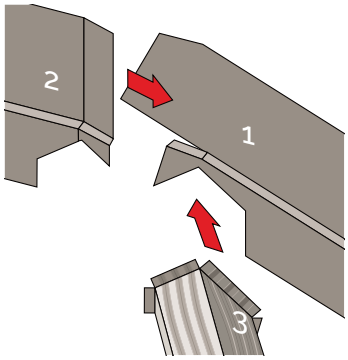
Angle trim

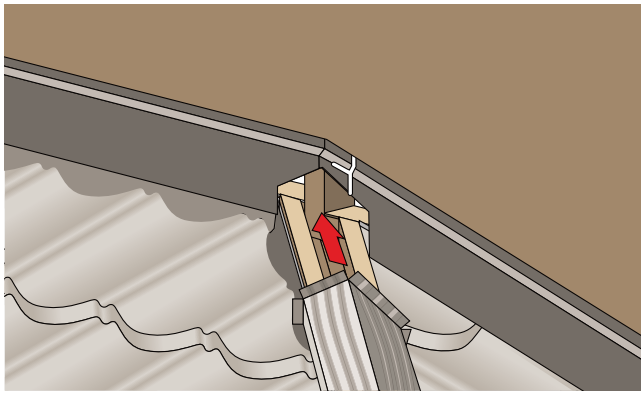












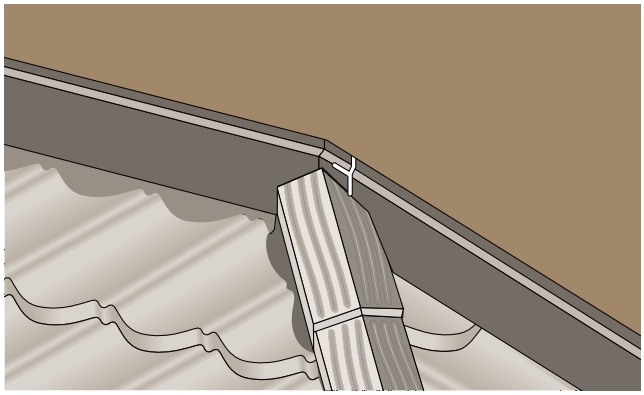
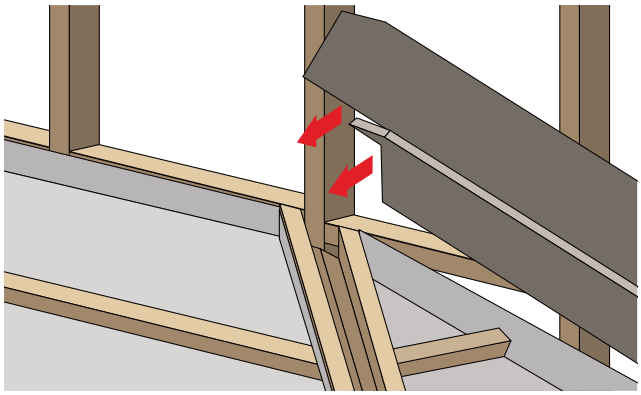
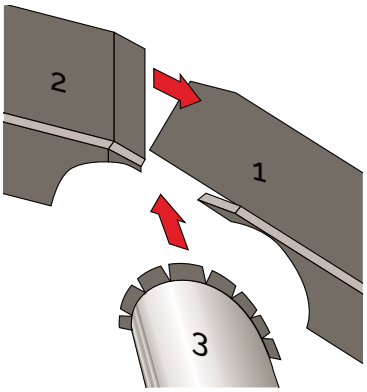


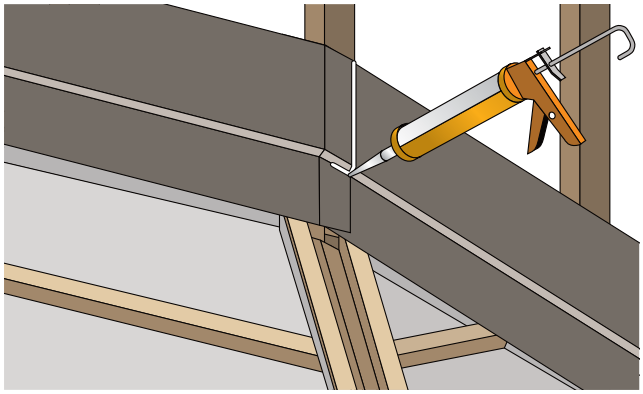
Figure 10.6.1.2.1

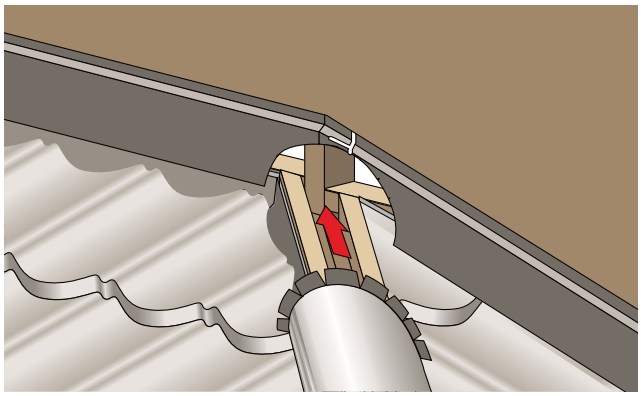
Note: sealants must be applied on tags and between the two surfaces to be lapped except for the lower sections of the side flashings where the angle trim will be inserted behind. Rivet all the joints afterwards.

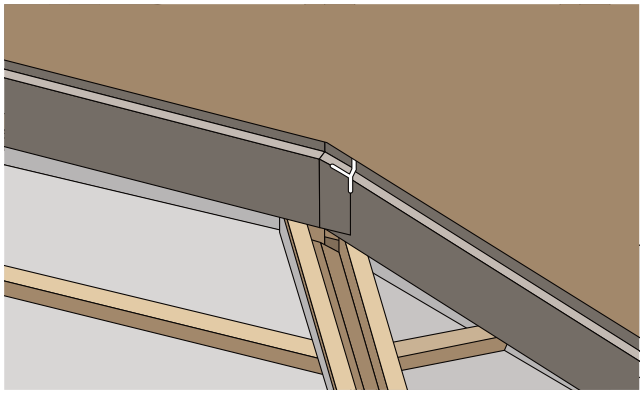
Barrel 150

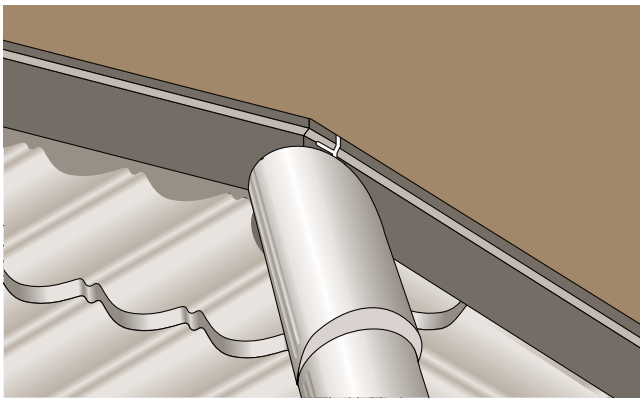












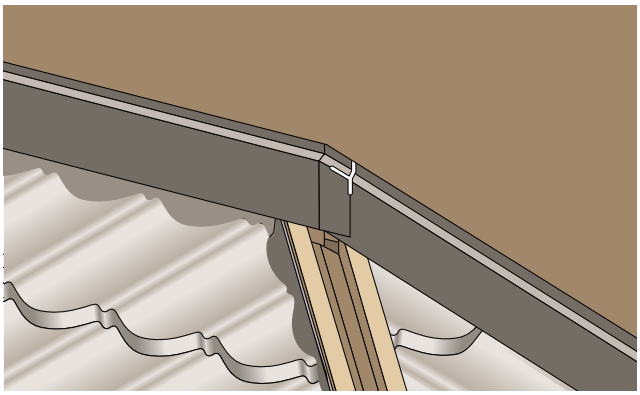


Figure 10.6.1.3.1

Note: sealants must be applied on tags and between the two surfaces to be lapped except for the lower sections of the side flashings where the barrel 150 will be inserted behind. Rivet all the joints afterwards.

10.6.2 Install lower roof before wall cladding

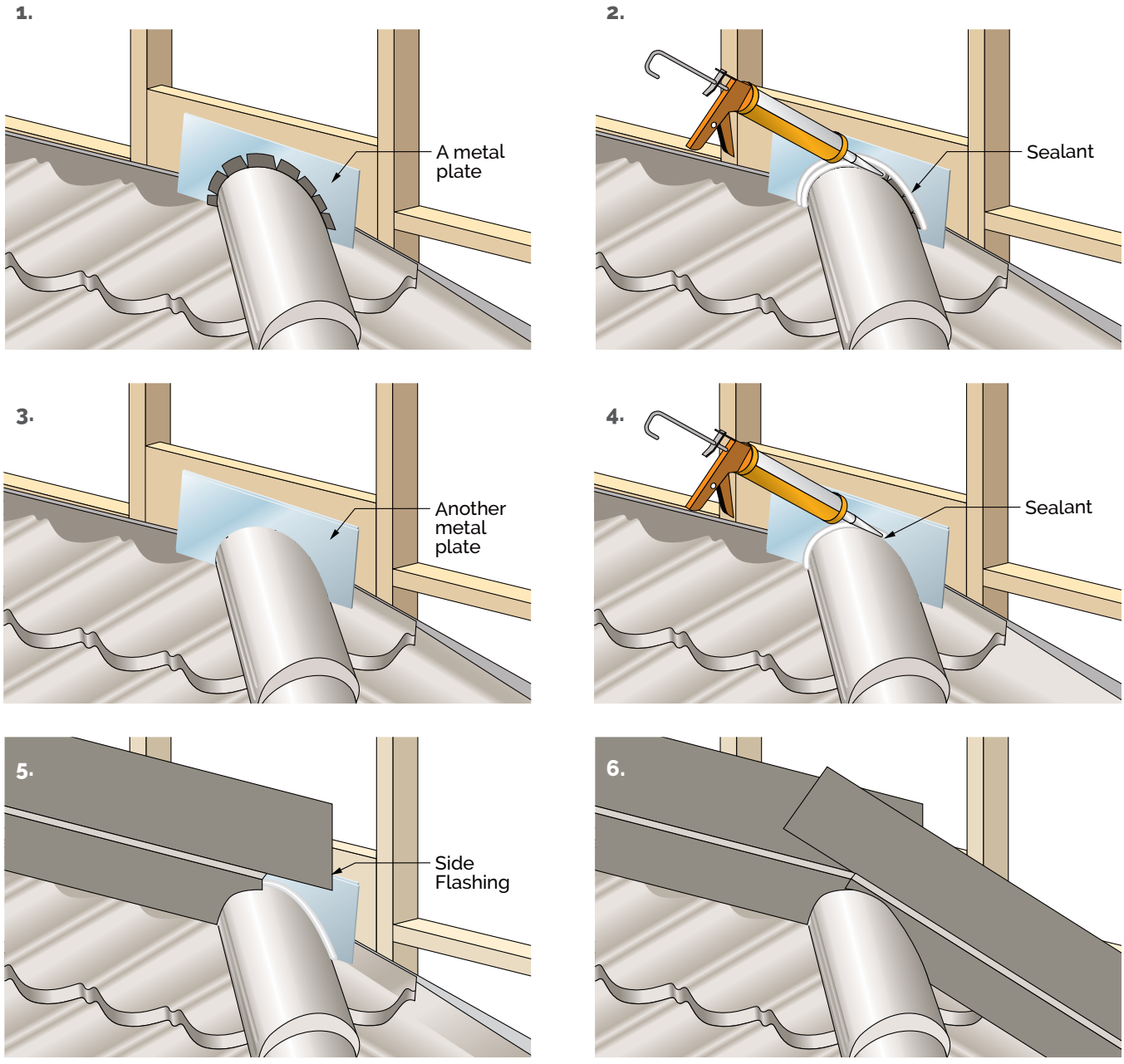


Figure 10.6.2.1

The roof underlay should be carried up behind the side flashing. It is omitted in **Figure 10.6.2.1** for clarity.

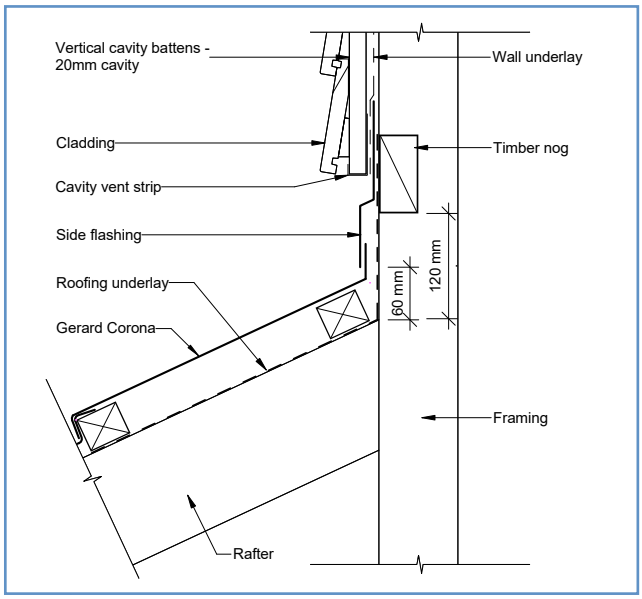


Figure 10.6.2.2

Box trim or Angle trim installation follows the same approach.

10.7 Roof to wall stop end

10.7.1 External gutter system

Stop end installation with a fascia board. An external gutter will be installed after the wall has been completed.

The stop end is positioned so that the angled edge is installed vertical, a 10 mm gap is left between the fascia board and that it contacts the top of the batten mid point.

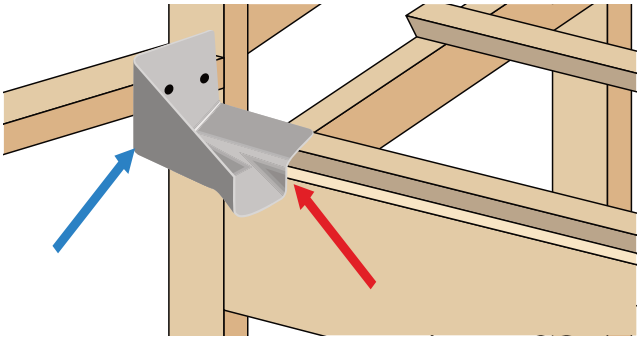


Figure 10.7.1.1

Underlay over the last batten and into the stop end.

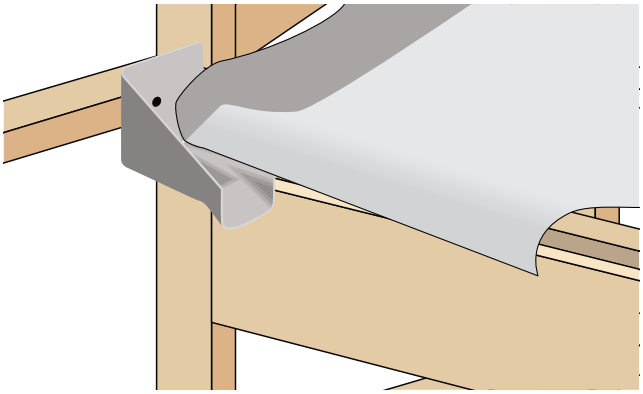


Figure 10.7.1.2

Roofing may be installed before or after wall system.

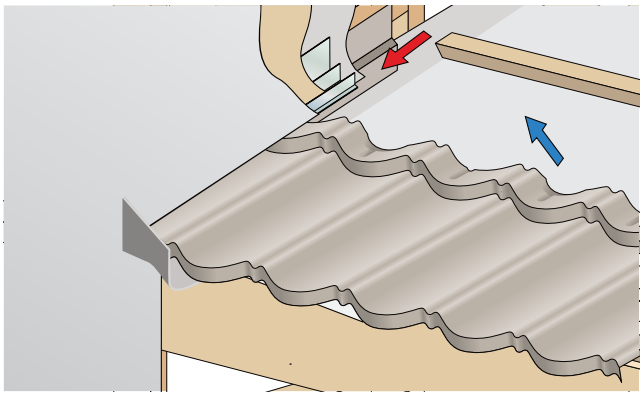


Figure 10.7.1.3

Once the wall system has been finished the gutter can be installed up close to the wall surface.

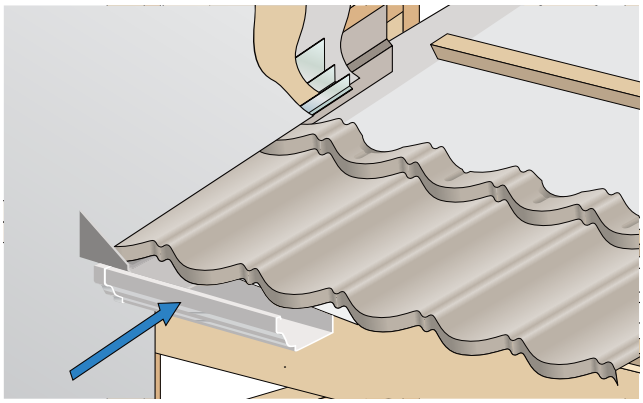


Figure 10.7.1.4

The stop end may be painted to match` wall, gutter or roof, with preference being given to the lightest colour.

10.8 Dormers

It is the designer or the roof contractor's responsibility to ascertain that the capacity of the valley profile chosen is adequate for the catchment area.

10.8.1 Detail A - Ridge to wall junction

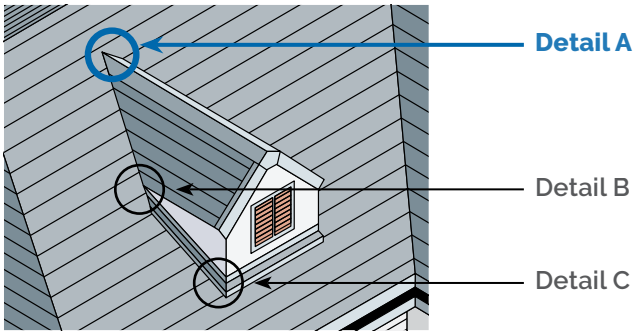


Figure 10.8.1.1

Box trim

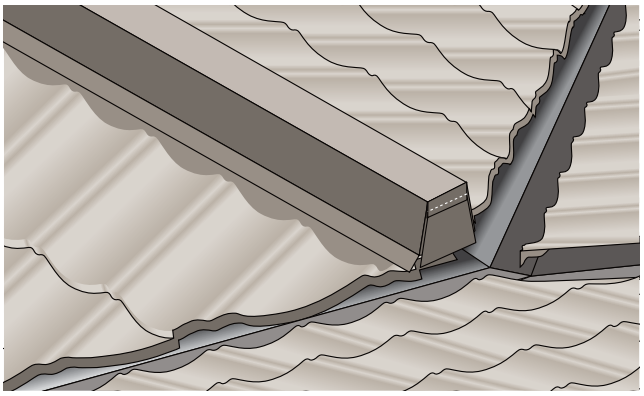
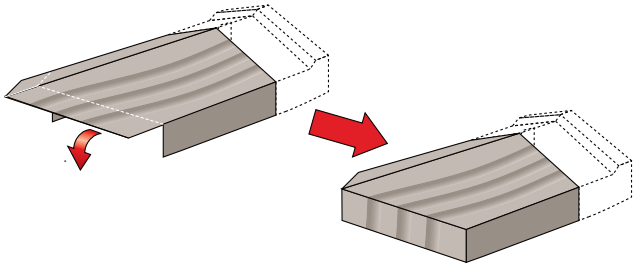


Figure 10.8.1.2

Angle trim



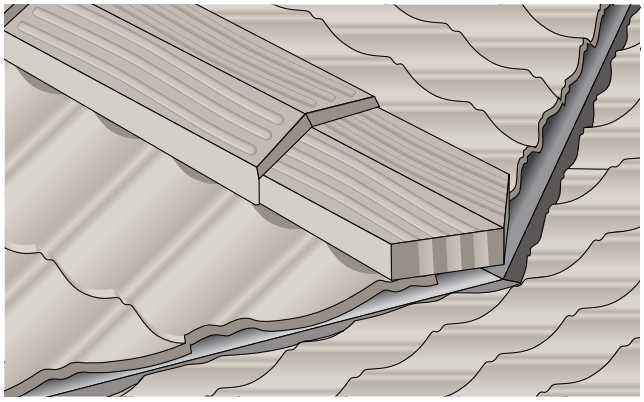
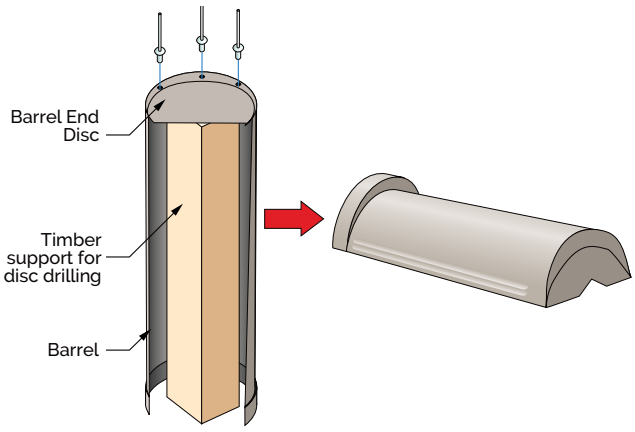


Figure 10.8.1.3

Barrel trim

Method 1



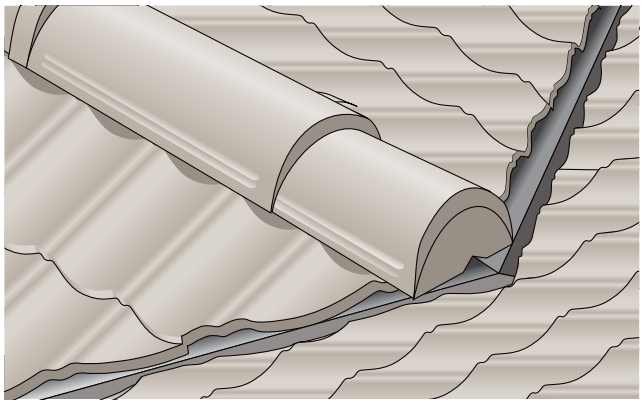
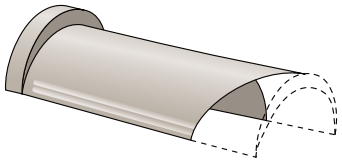


Figure 10.8.1.4

Method 2

Mitre cut and sealant under the barrel at the junction. By carrying through to tile the barrel will act as diverter.



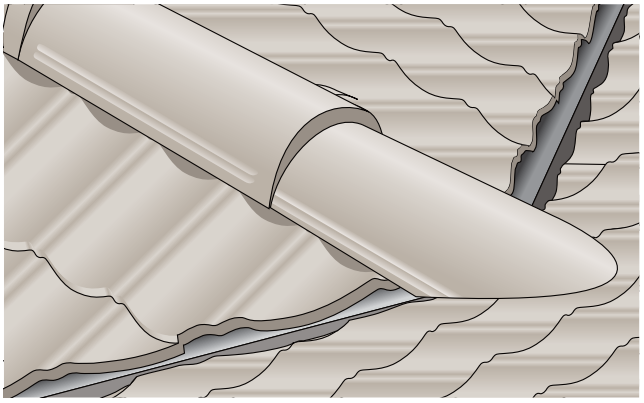


Figure 10.8.1.5

10.8.2 Detail B – Valley to roof

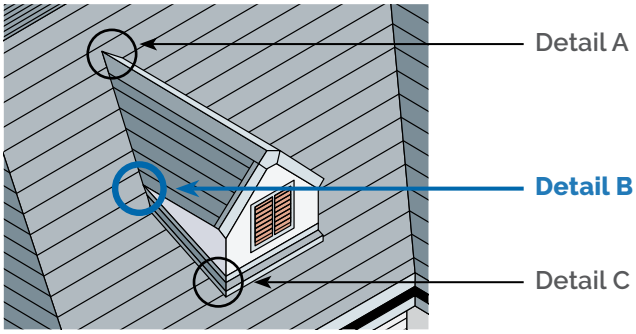


Figure 10.8.2.1

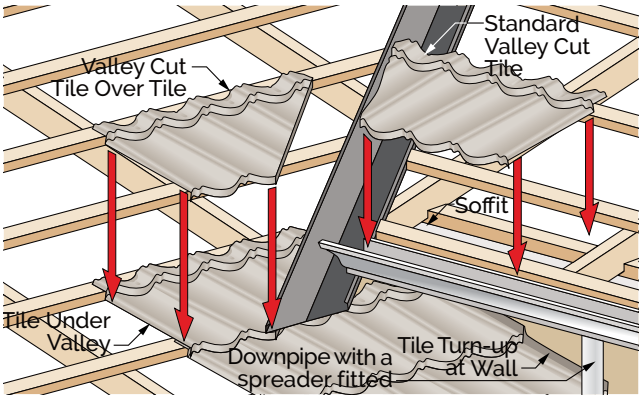


Figure 10.8.2.2

An extra valley cut tile is installed onto an existing panel so that the valley is concealed and held firmly in place.

Keep the valley cut tiles tight against the valley side walls so that the extra valley cut tiles do not impede the water flow.

Fold down drip edge to direct water flow onto the lower roof.

Tile turn-ups against wall should be inserted behind side flashings or apron flashings, which are omitted here for clarity (**Refer 9.2 Wall flashings for pitched roofs**).

10.8.3 Detail C – Side/Apron flashing junctions

Refer **10.9** and **10.9.1 External corner**.

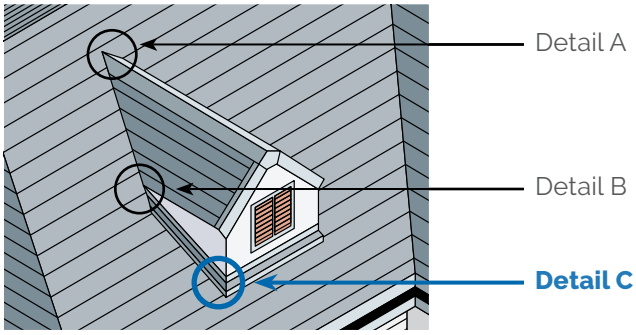


Figure 10.8.3.1

10.9 Side flashing junctions

10.9.1 External corner

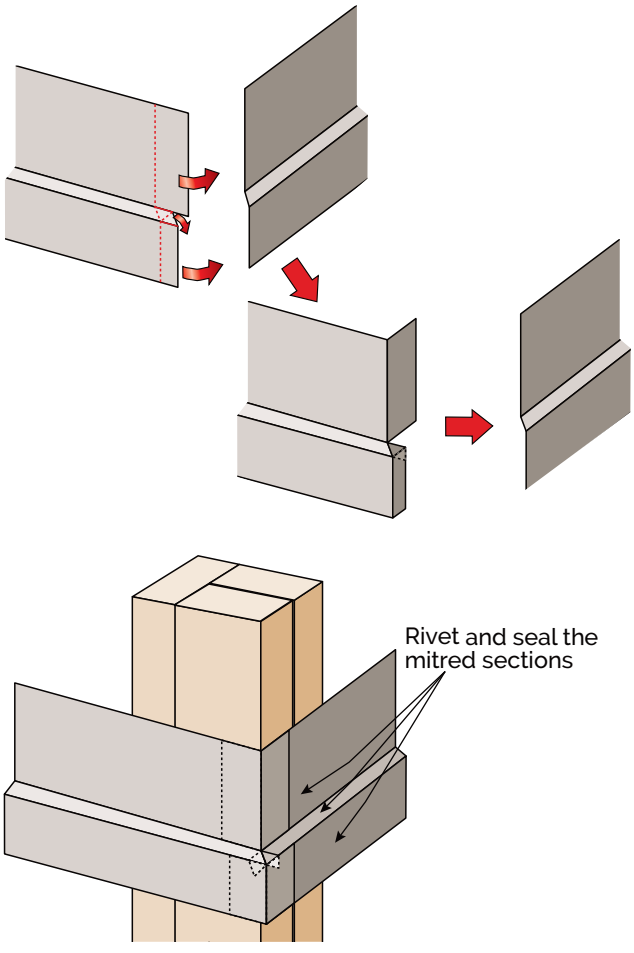
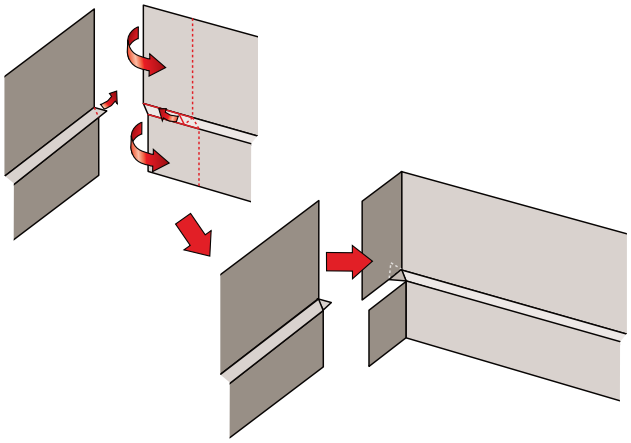


Figure 10.9.1.1

10.9.2 Internal corner



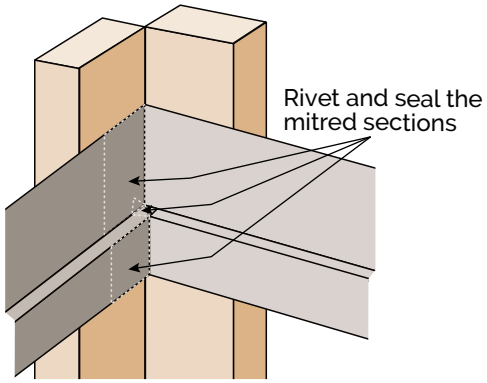


Figure 10.9.2.1

10.10 Side flashing and step flashing junction

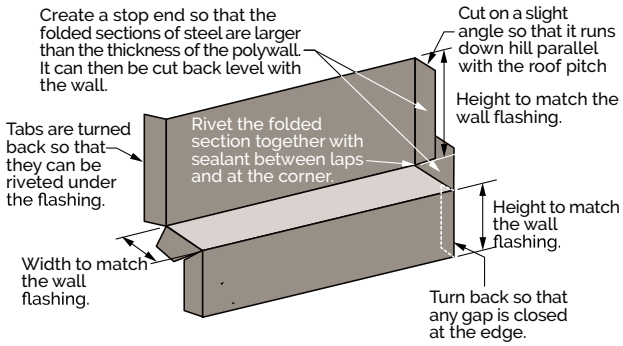


Figure 10.10.1

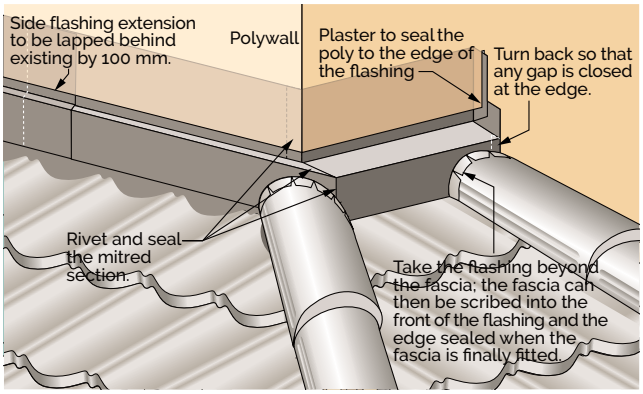


Figure 10.10.2

10.11 Corner tiles

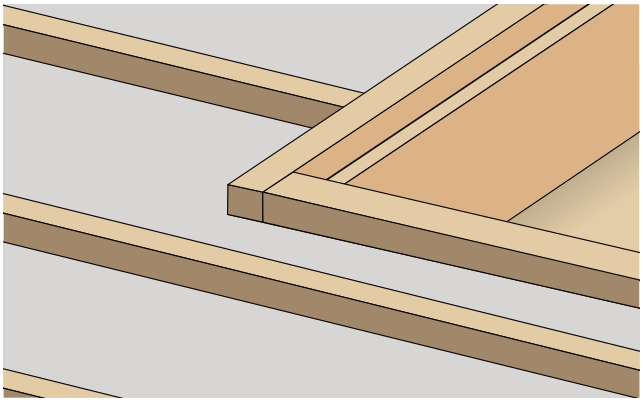
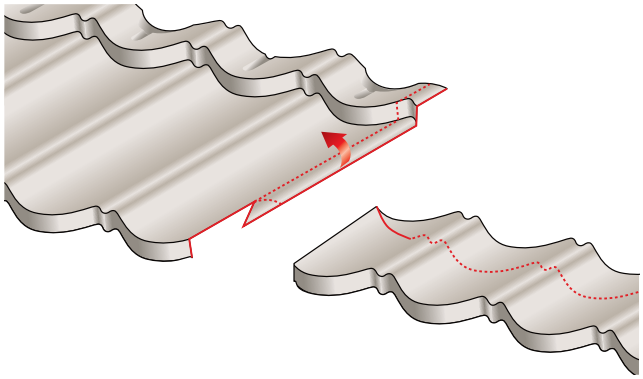
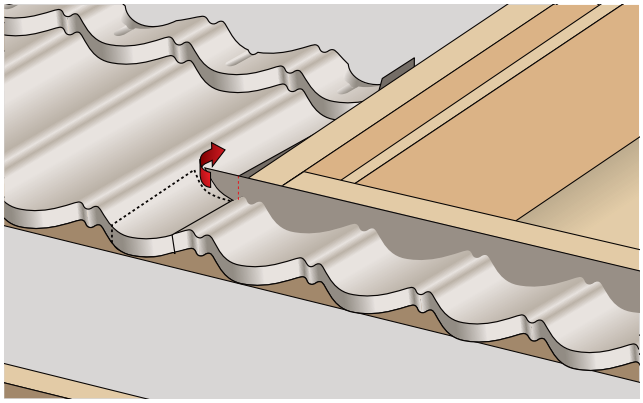


Figure 10.11.1

10.11.1 Installation





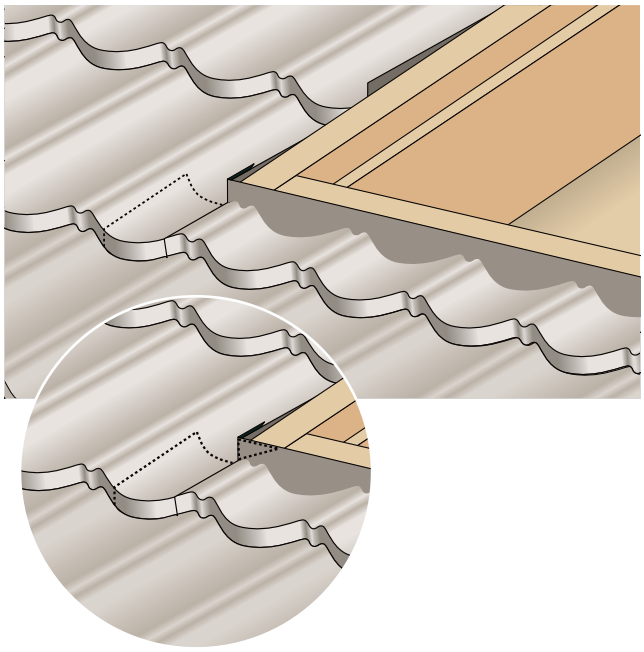


Figure 10.11.1.1

10.12 Gable end wall top junction

A stop end needs to be made to ensure water does not penetrate the wall cavity. A flat vertical surface that projects out further than the wall cladding is created to allow the wall cladding to be sealed either side of the kick out.

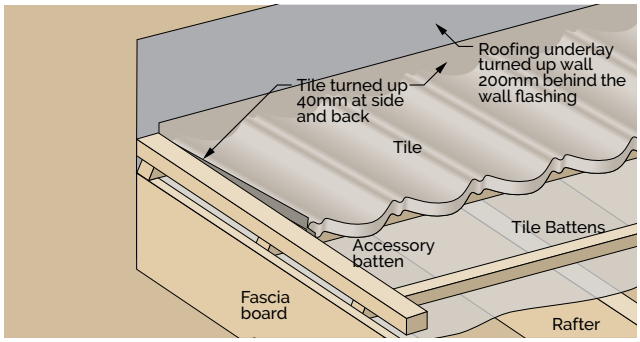


Figure 10.12.1

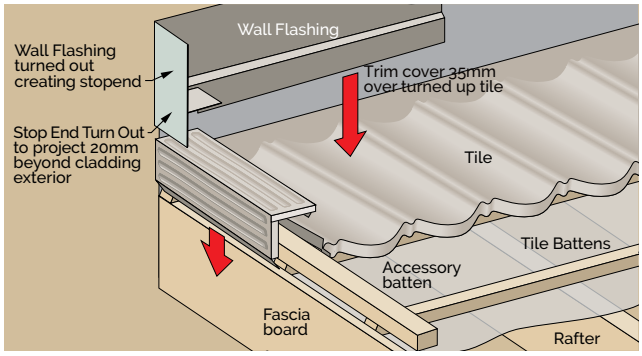


Figure 10.12.2

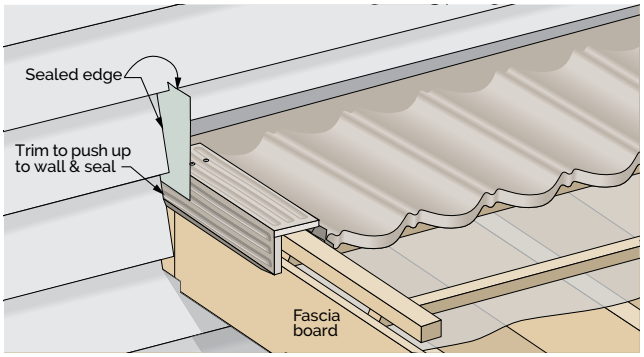
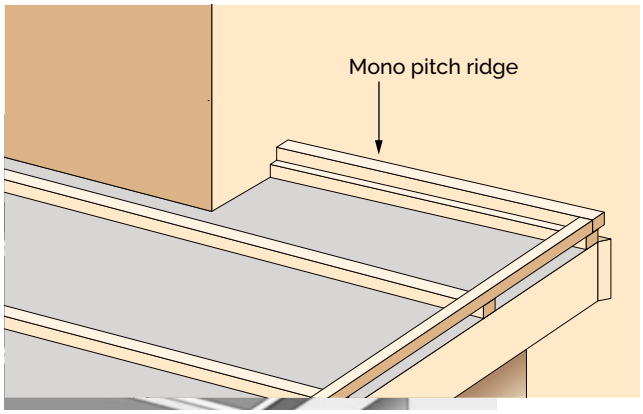
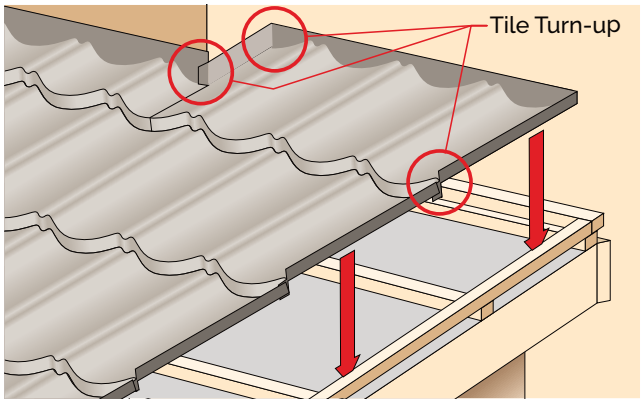


Figure 10.12.3

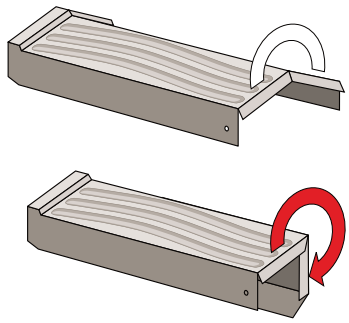
10.13 Mono pitch ridge & wall junction

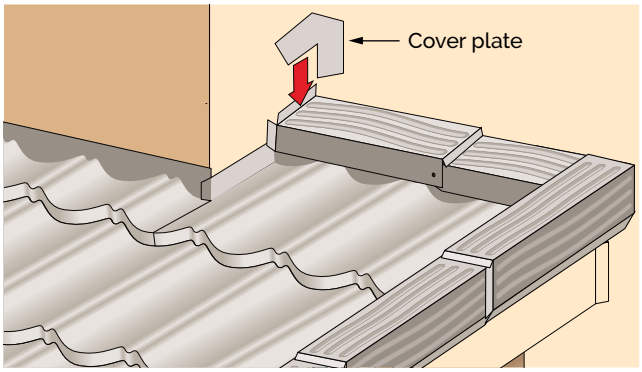


Install tile and accessory battens to the mono ridge and gable to suit ridge and gable accessories.



Install tiles with a 40mm turn up against the accessory battens and walls.





Prebend the accessories to match the angle of the mono pitch at the ridge and for the gable end. Where the accessory butts against the wall turn the ends up a minimum of 25 mm and cut a cover plate to flash over the bent up ends. Seal the cover plate over the ends to ensure weather security.

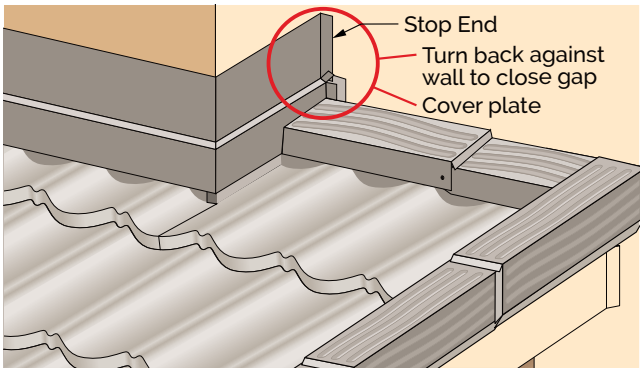
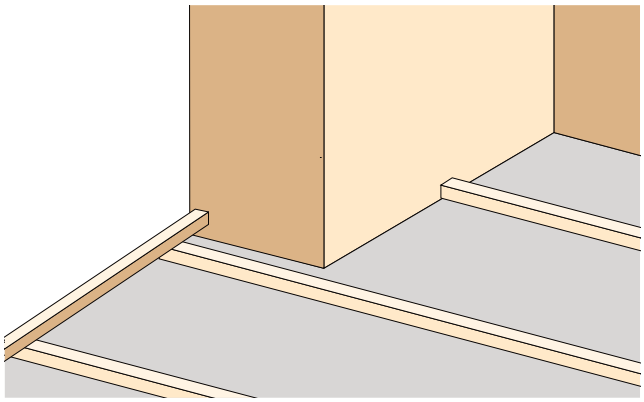


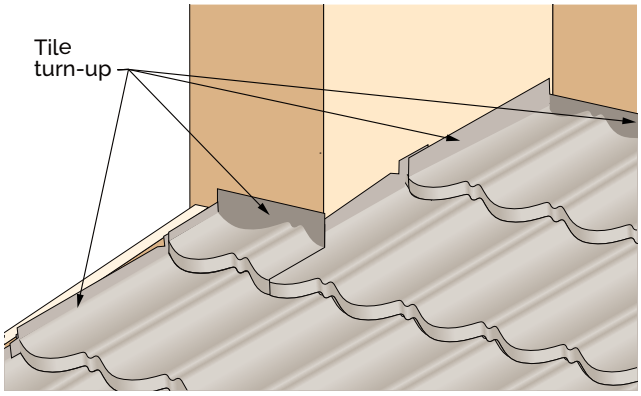
Figure 10.13.1

Scribe the side flashing over the accessory at the wall. Turn the outer section of the side flashing on the vertical side of the mono ridge in against the wall, closing the gap.

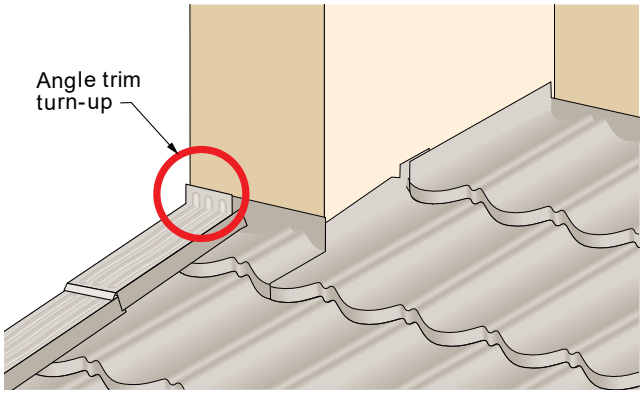
10.14 Gable end and wall junction



Install battens down the gable end.



Install tiles with a 40mm turn up against the gable end batten and walls.



Scribe the side flashing over the accessory at the wall. Turn the outer section of the side flashing out by 20 mm to create a stop end.

Wall wrap should lap over the side flashings.

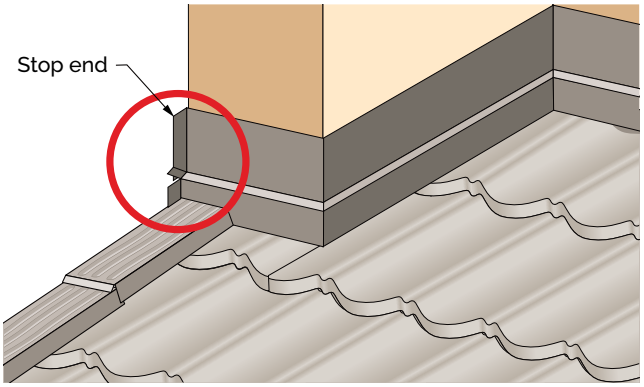
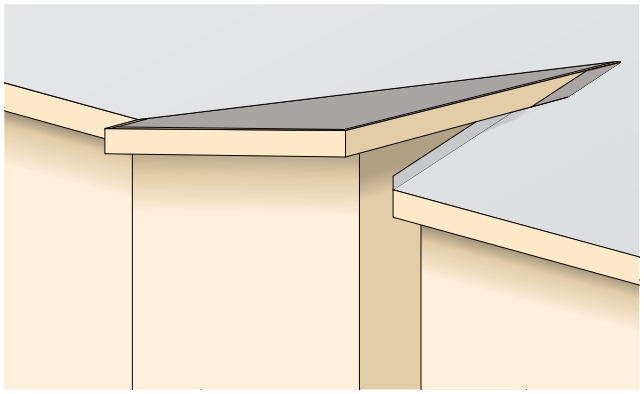
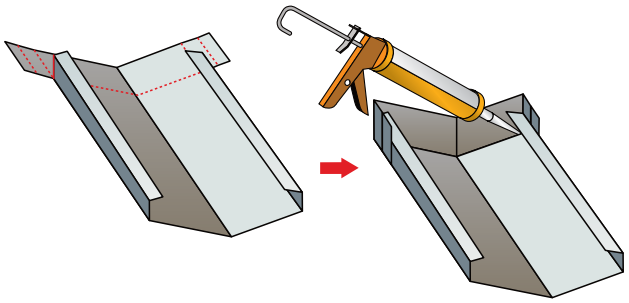


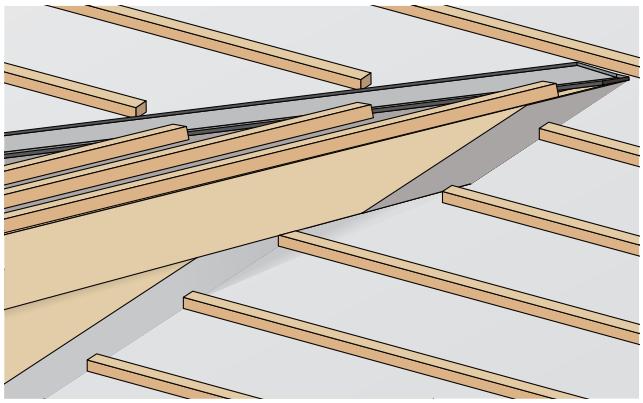
Figure 10.14.1

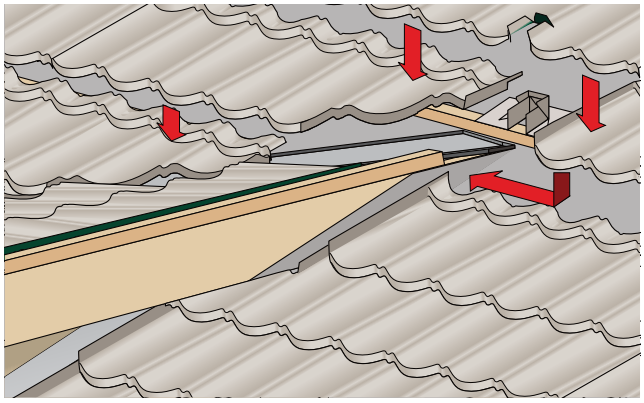
10.15 Ridge valley roof junction

Install roofing under battens over the rafters. Install the valley up to the highest point, turn up the top end of the valley sealing corner sections (refer **Figure 10.4.2** for more info).

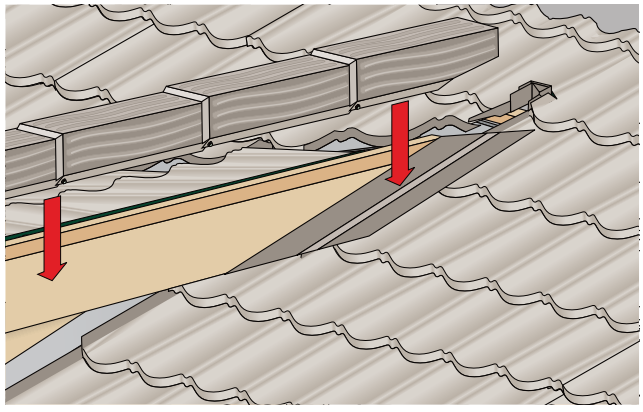




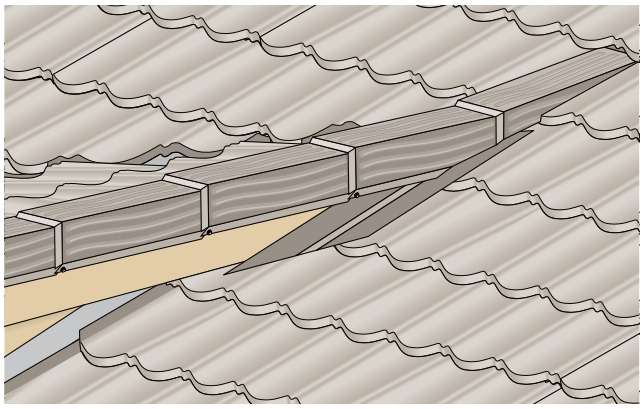




Install tiles into valley and up against the fascia board.



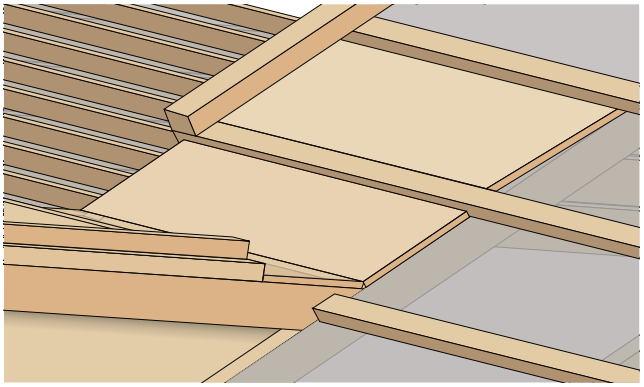
Install side flashing down fascia and accessory along the ridge.



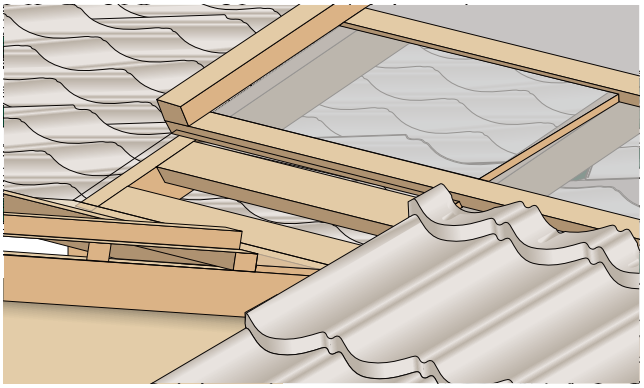
Install end accessory under nose of tile above the ridge and valley ensuring the junction is weather secure.

Figure 10.15.1

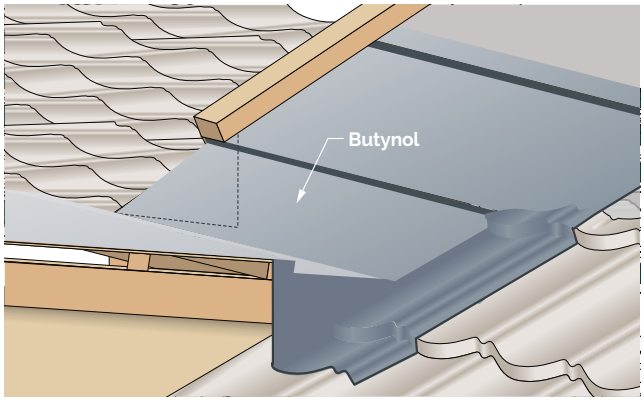
10.16 Butyl valley at roof cross over junction



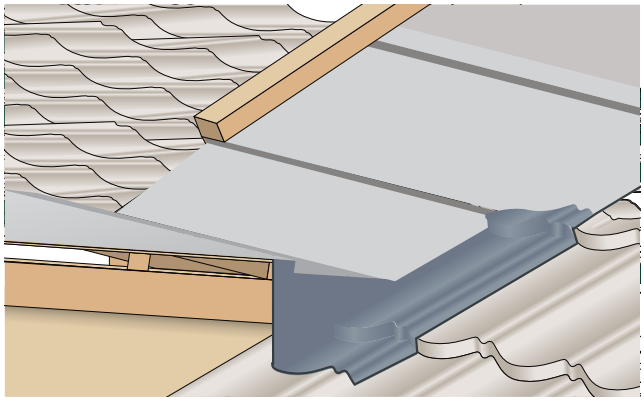
Install 12 mm plywood support boards for the valley. Install them between battens.

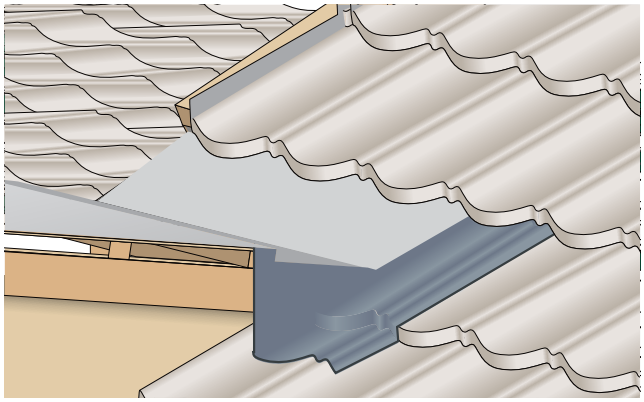


Lay tiles up to the valley.

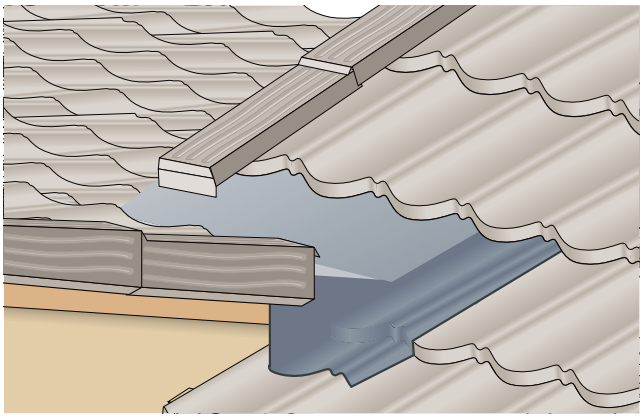


Install butyl valley over the plywood support and on to the tile surface. Install a layer of underlay over the butyl.





Install tiles with a 40 mm turn up against the gable end batten.



Lay tiles and accessories up the remaining section of the roof.

Figure 10.16.1

11.0 Penetrations

11.0 Penetrations

General

Tiles cut for penetrations through the roof must be provided with up-stands and over-flashed to provide drainage from above without restricting the water flow.

All penetration flashings upstands should have a 10 mm minimum clearance from the finished wall cladding of the penetration structure.

Where roof penetrations are required for large openings such as skylights and chimneys:

The edge of roofing penetrations over 200 mm wide should be supported in either direction with additional framing as shown in **Figure 11.1**

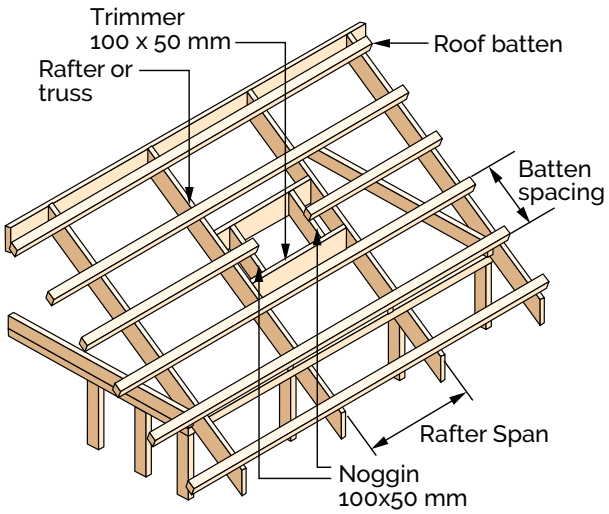


Figure 11.1

11.1 Chimneys

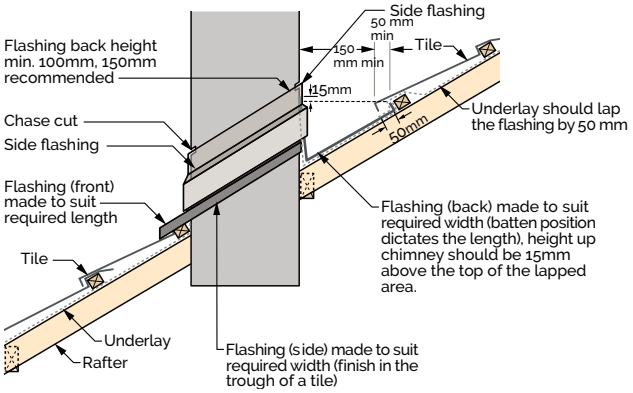


Figure 11.1.1 Elevation

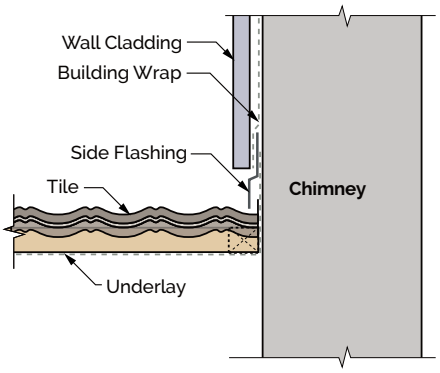


Figure 11.1.2 Section

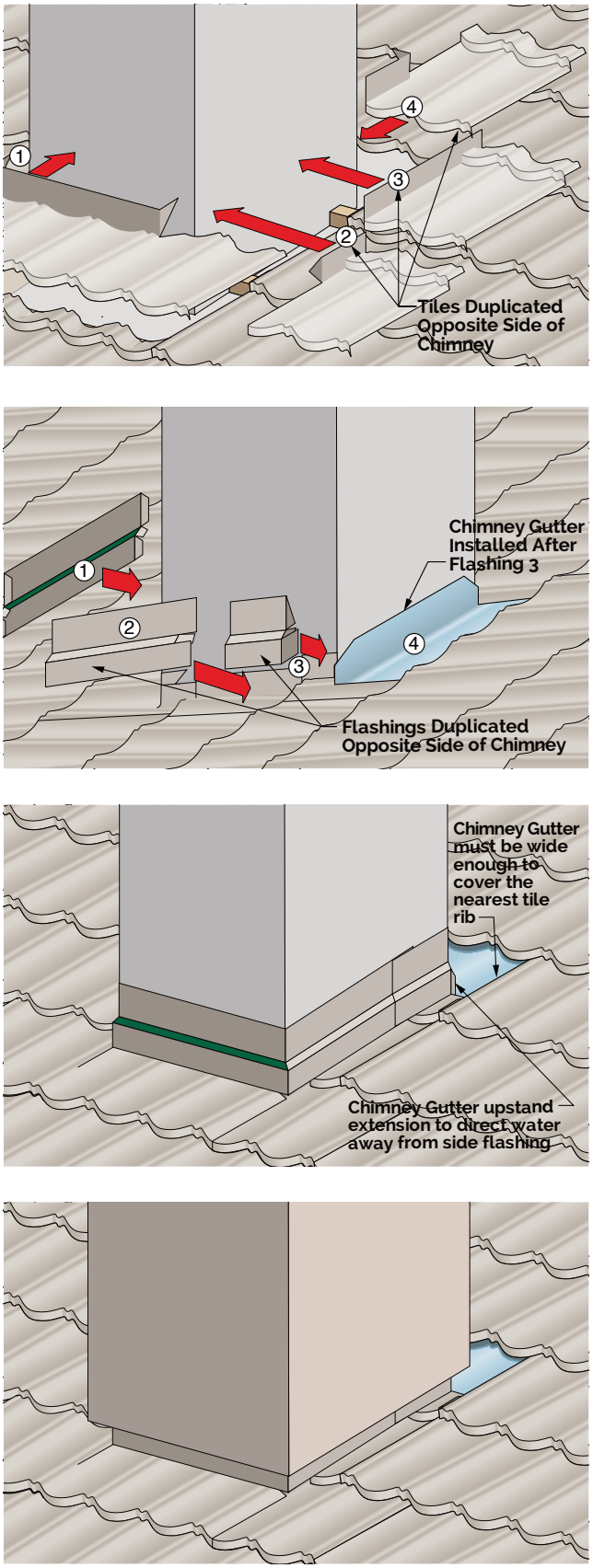


Figure 11.1.3 Installation

Where the use of sheet metal is not the most pragmatic method to flash a penetration, butyl rubber with a minimum thickness of 1.0 mm is the preferred alternative providing that they are compatible and comply with the design requirements and conditions outlined in ASTM D6134.

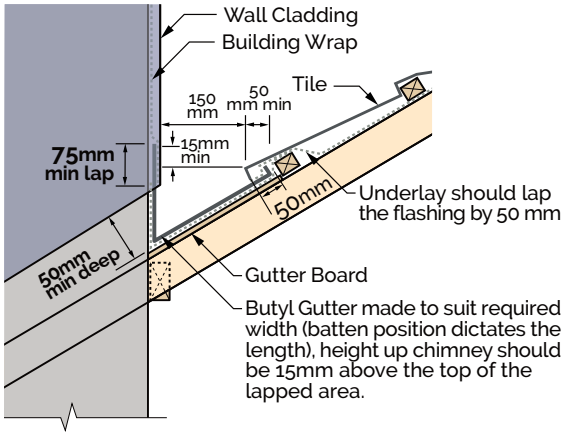


Figure 11.1.4 Elevation – Butyl gutter

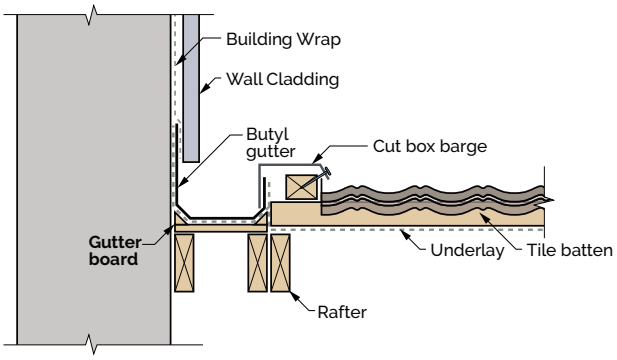


Figure 11.1.5 Section – Butyl gutter

Install the gutter board so that it hangs over the fascia board and into the gutter but avoid contact with the gutter. Glue the butyl rubber extension on the stop end.

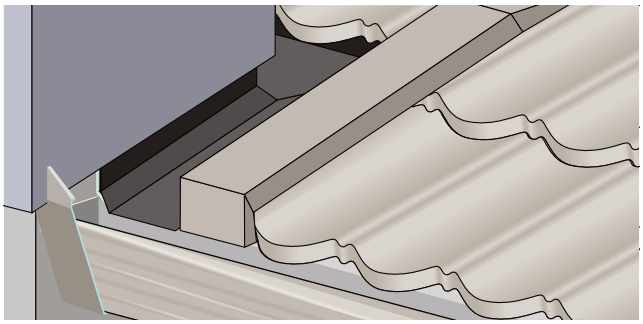


Figure 11.1.6 Chimney at eave – Butyl gutter

When the chimney construction is solid masonry or brickwork, and flashings cannot be installed under the wall cladding, a chase must be cut and an over flashing installed in the chase to provide weather protection.

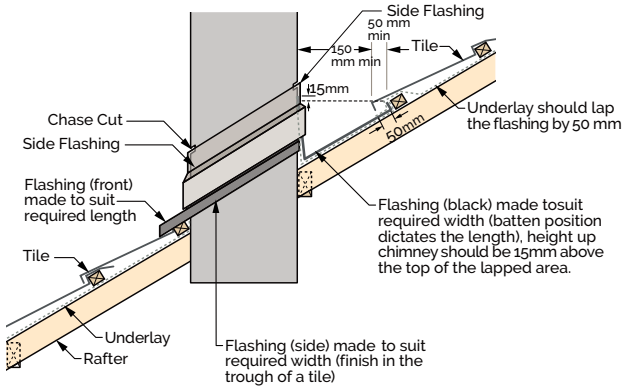


Figure 11.1.7 Elevation

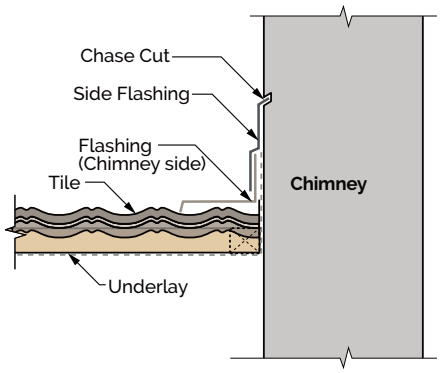


Figure 11.1.8 Section

11.2 Skylights

11.2.1 Velux skylights

An extra trimmer at both sides of the frame and two extra trimmers above the frame are installed to provide support to the tile battens. The trimmers are 40 x 50 mm (h x w).

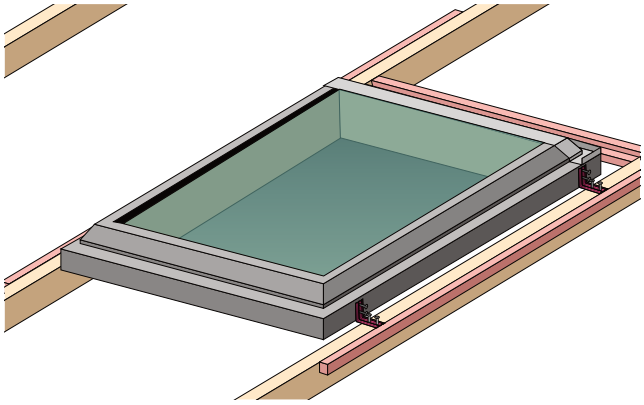


Figure 11.2.2.1 Frame support

Dress roofing underlay up around all four sides of the frame. Roofing underlay at bottom frame must not exceed groove.

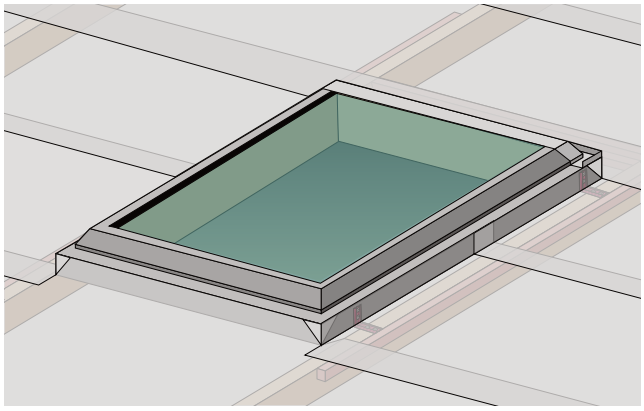


Figure 11.2.2.2 Underlay installation

Cut a groove (25 mm deep and 140 wide) in the tile battens at both sides and above the frame.

Install the tile batten below the frame so that the distance from its front edge to the bottom frame must be 140 mm.

Position an extra batten 30 mm below the frame to support the bottom flashing. The supporting batten to be positioned at a level 10 mm lower than that of remaining battens.

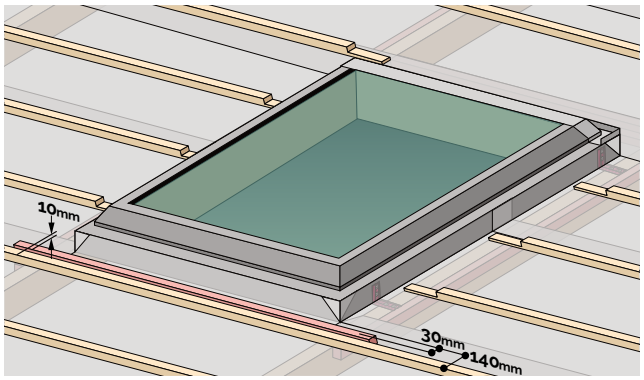


Figure 11.2.2.3 Batten set up

Install bottom, side and top flashings supplied by VELUX following VELUX Skylight Installation Instructions.

Note: NEVER nail/fasten the VELUX bottom flashing through the top of the tiles.

For VELUX Skylight Installation Instructions check on:

http://www.velux.co.nz/professionals/installation-instructions

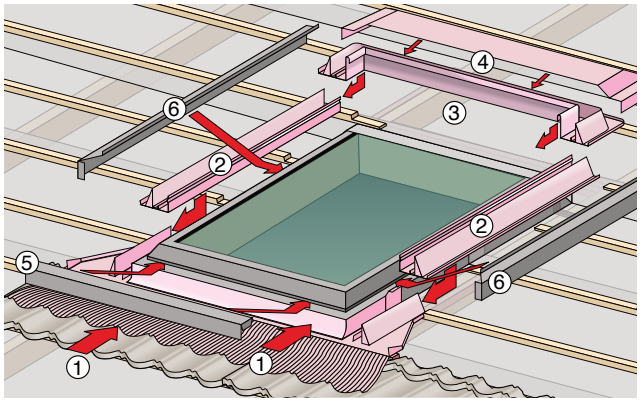


Figure 11.2.2.4 Flashings installation

11.3 Sky tube base installation

Mark the centre of hole to be cut in the roof based on the location of hole that will be cut in the ceiling below.

Mark where the hole in the roof is to be cut using chalk.

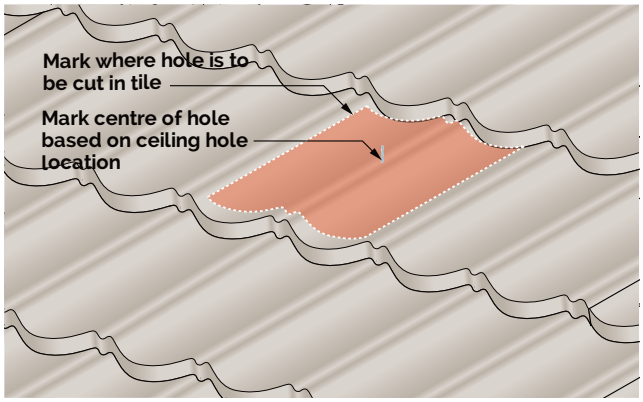


Figure 11.3.1

Position base above the hole and mark the side of the base where it is to be cut to suit the tile profile.

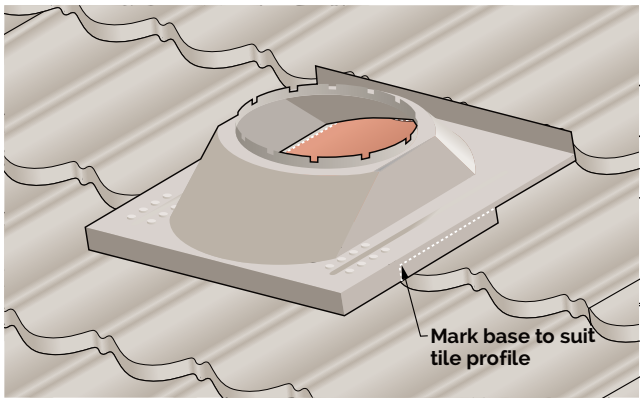


Figure 11.3.2

Remove the nails of the tile above the hole so that you can lift the nose of the tile.

Cut the hole with hacking knife or snips along pre-marked chalk line (Refer **Figure 11.3.1**).

Snip the hole ends 15 mm wider (horizontal) than the hole in preparation for turning back the sides of the hole. Cut roofing underlay so it can be dressed up around the four sides of the hole.

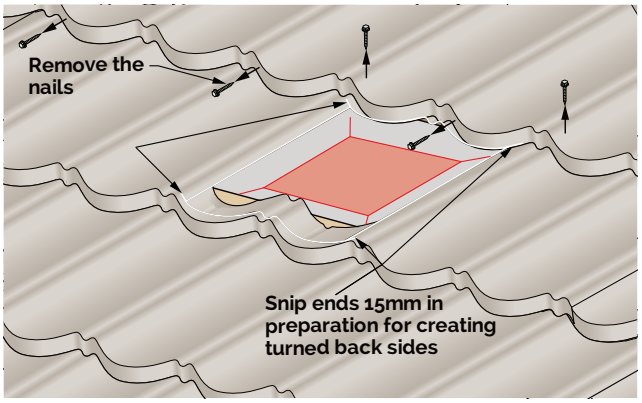


Figure 11.3.3

Turn the sides of the hole over (almost 180˚) 15 mm using hand benders.

This provides weather security down the sides of the hole.

Cut the back out of the batten as shown in **Figure 11.3.4** so that the gap between the batten above and the cut batten is large enough to allow the solar tube to fit between the battens, usually cutting the batten back to the back of the tile is sufficient. **DO NOT** fully remove the batten as support is required for the tile and the base.

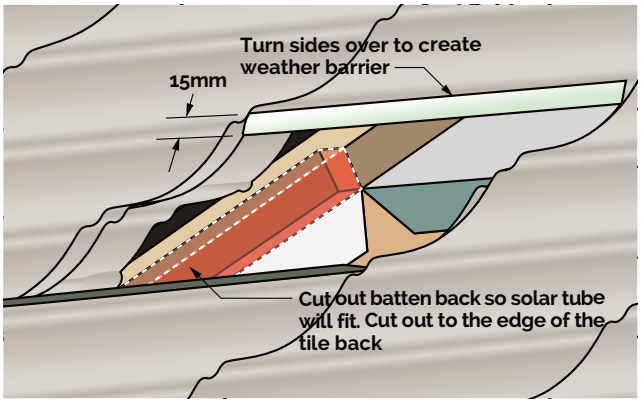


Figure 11.3.4

Lift up the tile above (and the remaining back of the cut tile) and turn up and staple the roofing underlay to the front face of the batten above.

Fold up and staple the roofing underlay to the back of the batten below.

Tape the roofing underlay to the two turned-over sides.

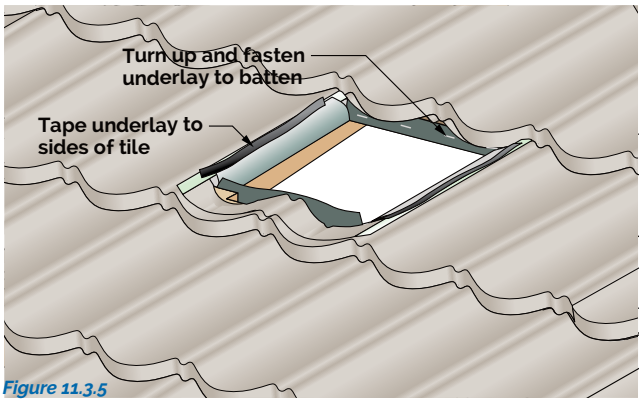


Figure 11.3.5

Seal the back edges of the folded sides using a suitable sealant.

Cut the base where it was marked earlier.

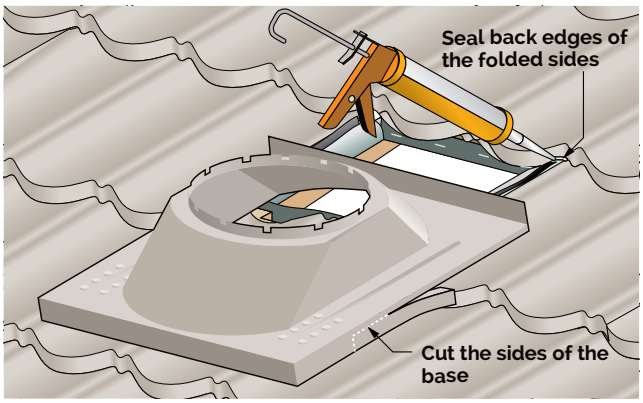


Figure 11.3.6

Place the base so that the nose of the tile below sits over the back turn up of the base. Refasten the tiles above; pre-drill if nailing through base, press the tile nose down onto the base as tight as possible whilst nailing.

Tek screw (supplied) the base to the tile batten. Pre-drill the hole in the base, the tek screw will cut through the tile surface and in to the tile batten.

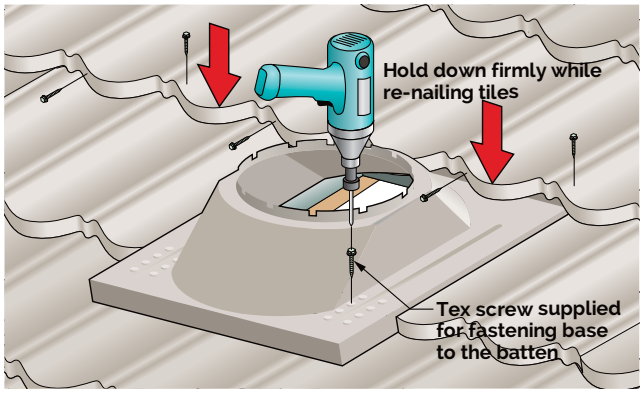


Figure 11.3.7

11.4 Pipe vents

Measure and cut the tile when it intersects with a vent pipe as per **Figure 11.4.1** and **Figure 11.4.2**.

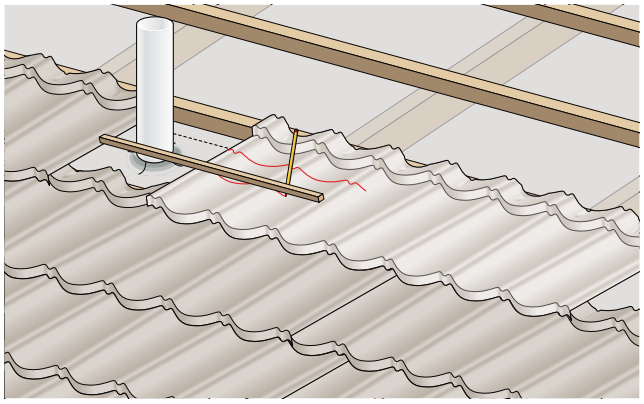


Figure 11.4.1

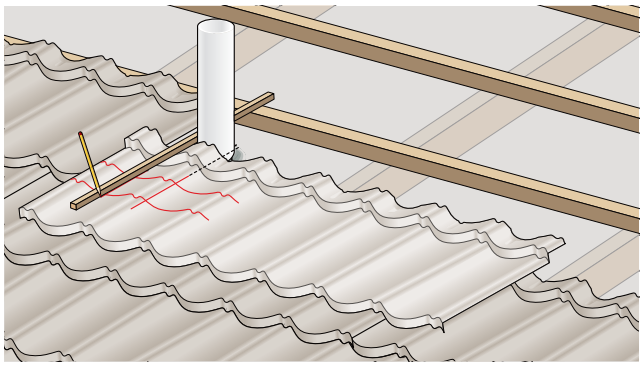


Figure 11.4.2

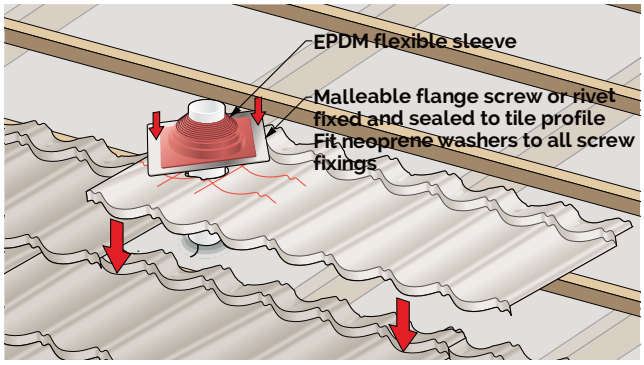


Figure 11.4.3

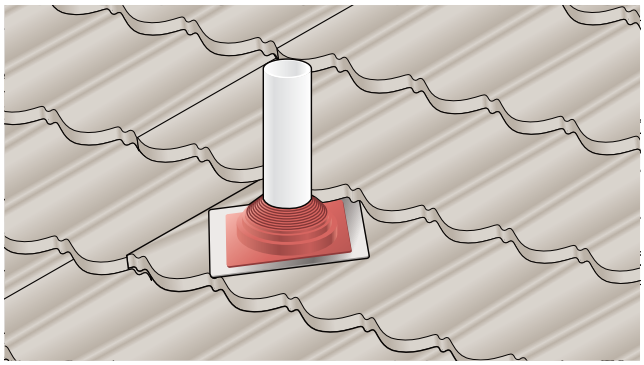


Figure 11.4.4

Pipe penetration should be flashed using an EPDM aquaseal pipe flashing or a butyl rubber pipe flashing as shown in **Figure 11.4.3**.

Hole cut out through the rib if possible and square base must be fixed diagonally to minimise holding of discharge water. Gerard Roofs recommends the MS sealant or Neutral Silicone to use with EPDM based through-roof fittings.

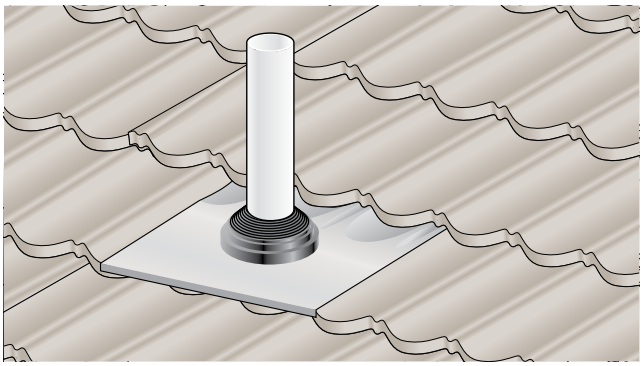


Figure 11.4.5

11.5 Ventilation

Gerard Roofs have been supplying passive flow roof vents for Gerard Roof tile profiles for over 30 years.

These profiles are still available however a new range from our European plant is available for use.

A passive/ducted vent LV200 and Sanitary Vents are available in a range of profiles.

11.5.1 LV200

Matched to each of the tile profiles it is easily installed in to the roof at the correct place.

This low profile 20,000 mm² vent provides a vent for both passive and mechanically vented spaces.

This vent provides a 160 mm diameter vent and can be provided with a reducer down to 80 mm so it can be connected up as a ducted vent for bathroom, kitchen or laundry extraction systems. It can also be used as a passive vent to allow moist or hot air from the space below the roof.

Installation

Determine the location of the vent, position the vent and remove and cut a circular hole in the roofing underlay for connection of the extraction system or for passive ventilation.

The vent tiles are overlapped by the above and side tiles, this interlocks them in place. Fasteners installed next to the laps but not through the vents complete the installation.

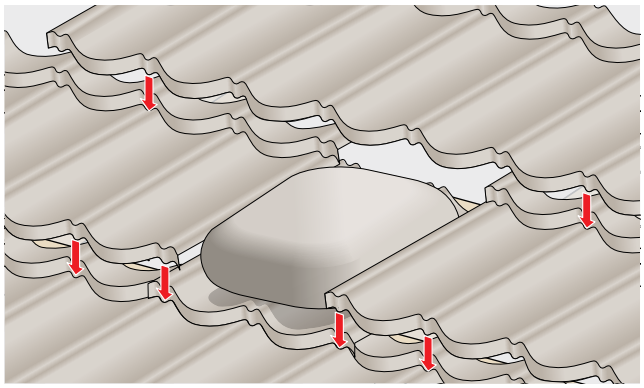


Figure 11.5.1.1

11.5.2 Sanitary vent

These vents are provided with a flexible duct pipe that can be connected to sanitary pipes or a ducted extraction system.

Installation

Check with the plumber where the vents are to be installed. Connect the flexible pipe to the base of the vent, cut a round hole in the roofing underlay and feed the flexi pipe through.

The sanitation vent tiles are overlapped by the above and side tiles, this interlocks them in place. Fasteners installed next to the laps but not through the vents bases complete the installation.

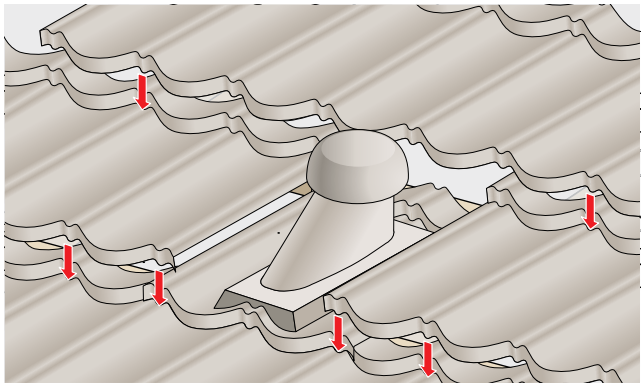


Figure 11.5.2.1

11.6 Solar brackets

Gerard Roofs solar brackets. These may be used for PV or Solar hot water systems.

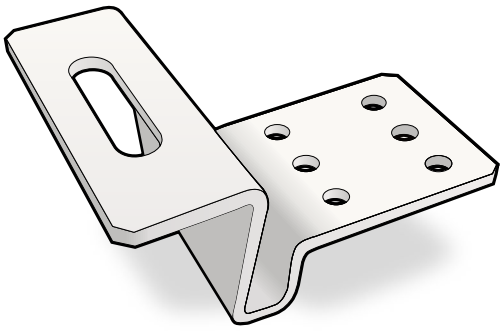


Figure 11.6.1 Senator solar bracket

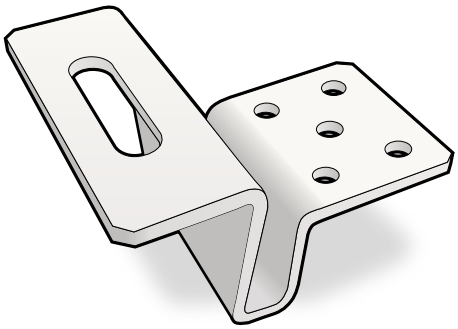


Figure 11.6.2 HMCC solar bracket

11.6.1 Before installation

Consult local authorities for regulations and solar panel manufacturers for installation and maintenance instructions.

11.6.2 Solar bracket installation

Solar brackets are best installed at the time a new roof is being installed. This ensures that every batten rafter junction is screw fastened in the solar area and that the brackets are installed in the best location/position.

Solar brackets are fastened with 2 x 80 mm 10 g screws or fixing equivalent to 2.4 kN.

When installing solar brackets on a Shake, Senator, Rockport, Oberon, Aspen or Alpine profile ensure that the brackets are screw fastened directly over a rafter.

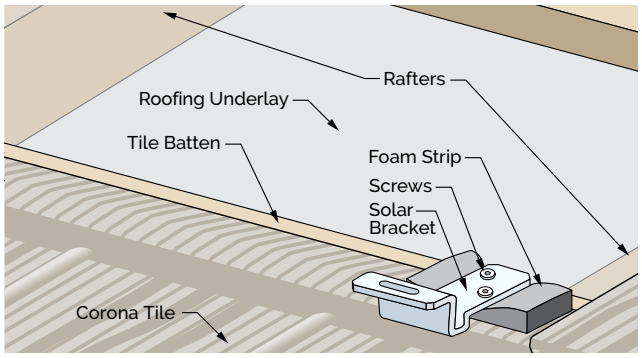


Figure 11.6.2.1 2 x 80 mm 10g screws through batten into rafter

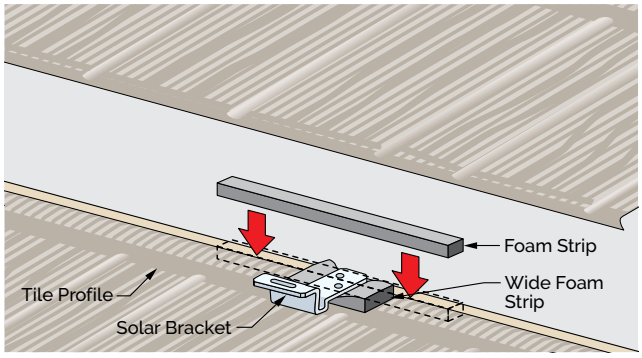


Figure 11.6.2.2 Solar brackets weather security strips

Note: Solar brackets are not covered by BRANZ Appraisal no. 1096.

When a Bond, Milano or Classic profile is used the brackets are always to be installed within 100 mm of a rafter. The rafter junction must always be screw fastened.

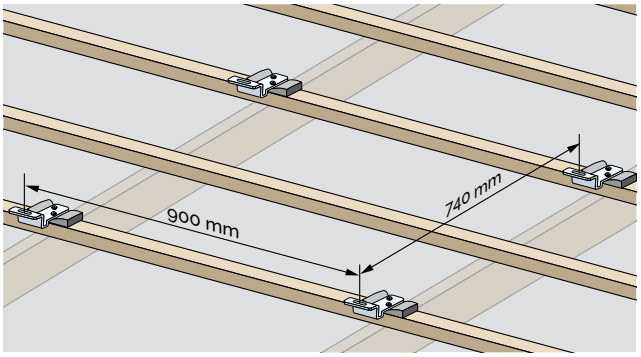


Figure 11.6.2.3 2 x 80 mm 10g screws through batten into rafter

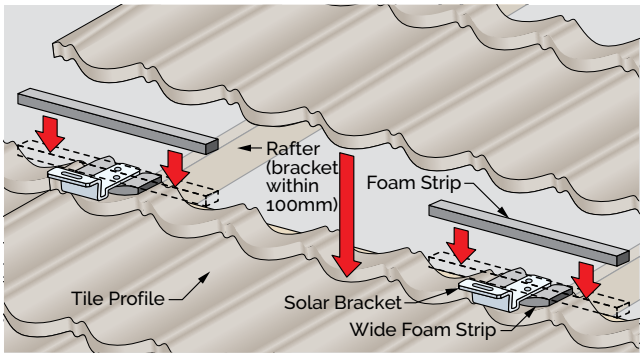


Figure 11.6.2.4 Solar bracket weather security strips

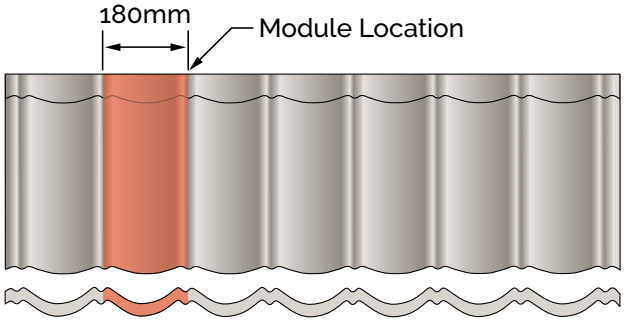


Figure 11.6.2.5 Module position

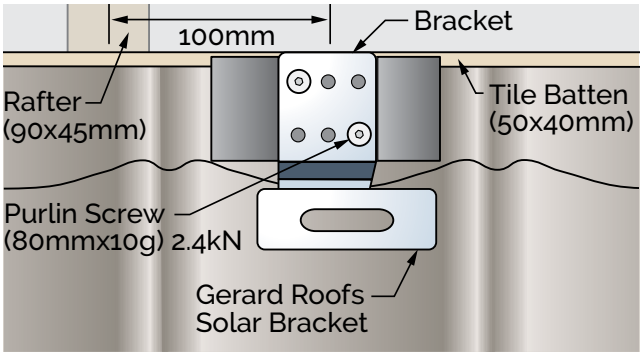


Figure 11.6.2.6 Solar bracket installation

The spacing between the brackets should not exceed 900 mm horizontally. Brackets installed up the roof should be spaced as per, **Figure 11.6.2.7**.

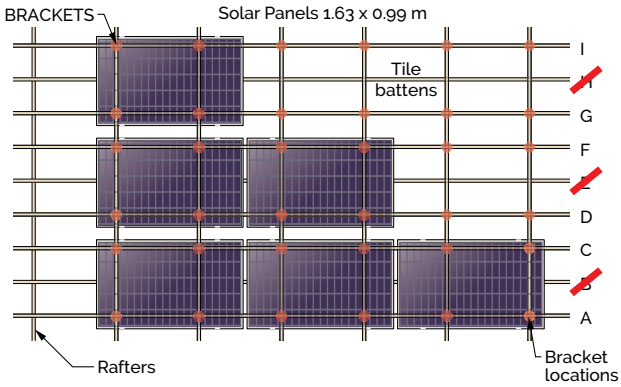


Figure 11.6.2.7 Solar bracket positions

Consult solar panel manufacturer's installer/supplier guide regarding pane sizes to be used and widths of panels. Ask them to provide a plan of bracket locations. Rails are connected to the solar brackets, these will support solar panels. It's important that the brackets are located in the correct place.

Retrofitting of solar brackets is possible however this involves removing tile fasteners from tiles where the brackets are to be installed. The tile nose is lifted and the brackets fastened in place.

Note: All batten rafter junctions are to also be fastened with a screw or 2.4 kN capacity fastener.

Note: Solar brackets are not covered by BRANZ Appraisal no. 1096.

11.6.3 Walking on tiles

Soft soled shoes capable of providing secure footing should be worn.

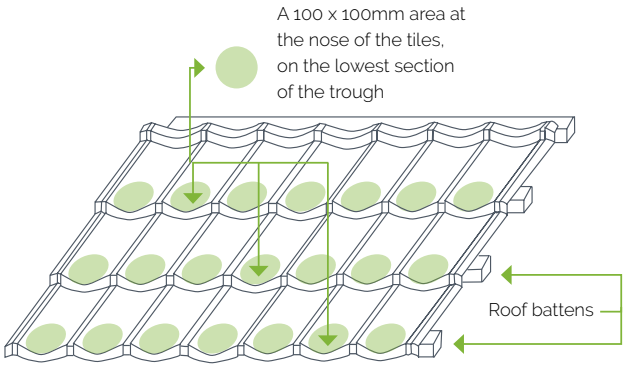
Extreme care is required when walking on wet tiles and this should be avoided if possible. Satin finish tiles can be very slippery and should NOT be worked on while wet.

The surface coating of the textured finish tiles may be damaged when they are wet, and damage increases as the pitch increases.

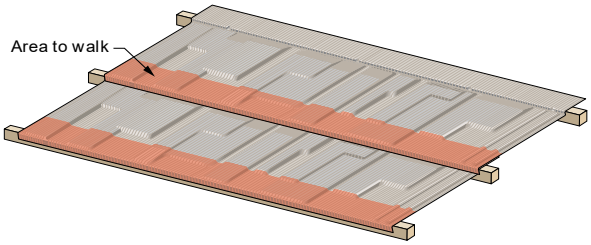
When walking on the tiles weight must be concentrated directly above the batten for Shake, Senator, Rockport, Oberon, Aspen and Alpine and in the pan (lower section) of tiles above the batten.

Tile damage will occur if installer weight is applied to tile ridges or mid sections of Shake, Senator, Rockport, Oberon, Aspen and Alpine.

For Bond, Milano and Classic



For Shake, Senator, Rockport, Oberon and Alpine



11.6.4 Solar panel installation

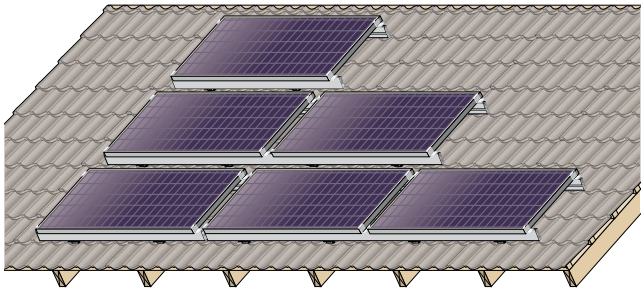


Figure 11.6.4.1

Rail spacing's are to suit each panel manufacturer's recommendations. They should not be spaced more than 0.9 m apart.

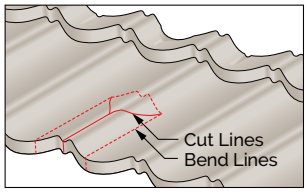
Photovoltaic (PV) solar panels

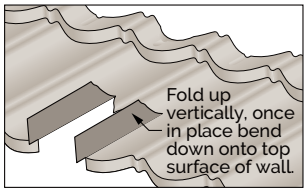
The final step is to run the conduit to connect the panels to the inverter. The electricity wiring enters the internal from the metal roof which must be properly flashed.

Solar water heating panels

The relief valve drains and water pipes which enter the internal from the metal roof must be properly flashed. The heated water pipes must be properly insulated to last for no less than 5 years.

11.7 Parapets





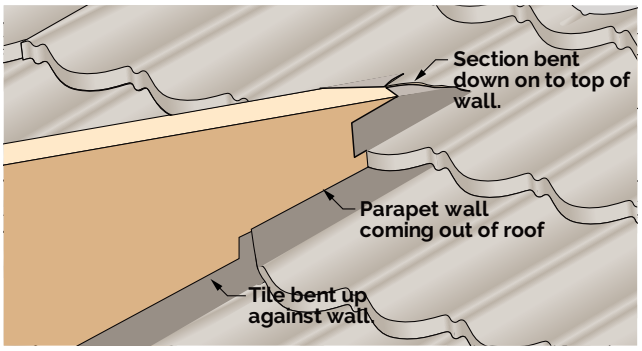


Figure 11.7.1 Install tiles

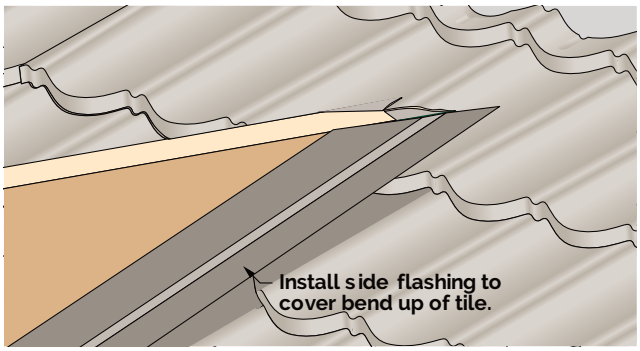


Figure 11.7.2 Install side flashing

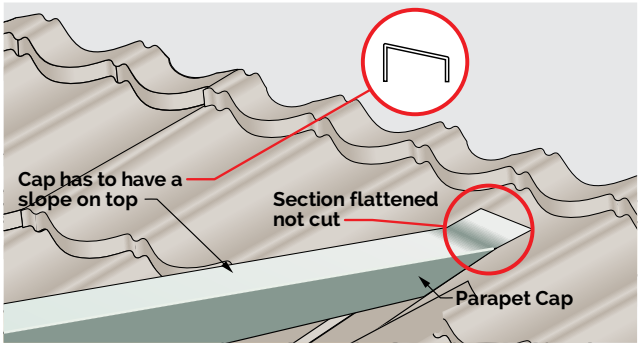
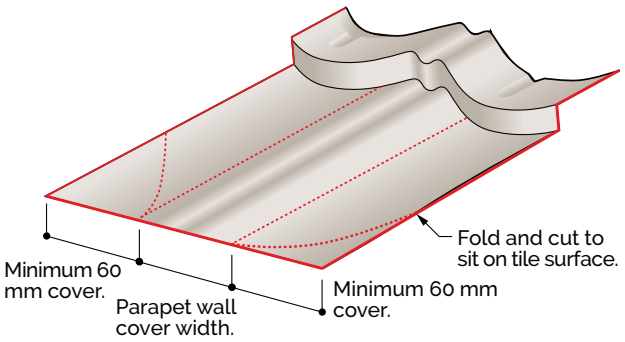
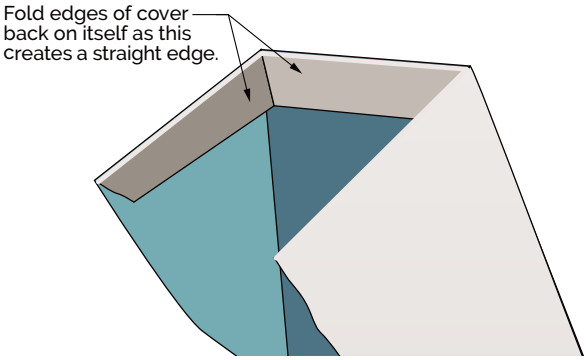
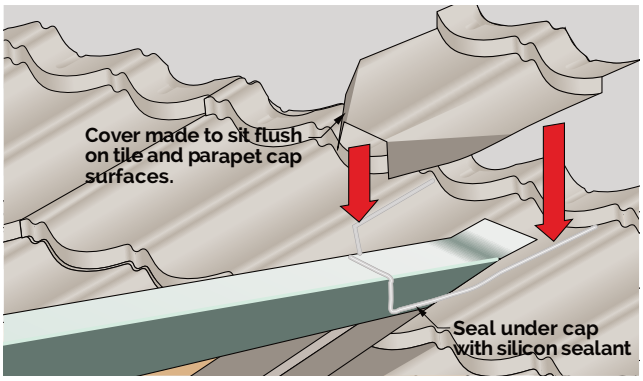


Figure 11.7.3 Install parapet cap







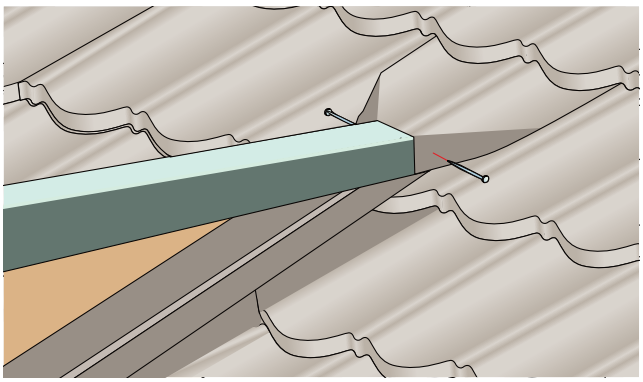


Figure 11.7.4 Install cover pan

11.8 Back wall cricket

Where the back wall or chimney is greater than 600 mm a cricket may be required to ensure water drainage.

Where the use of sheet metal is not the most pragmatic method to flash a penetration, butyl rubber with a minimum thickness of 1.0 mm is the preferred.

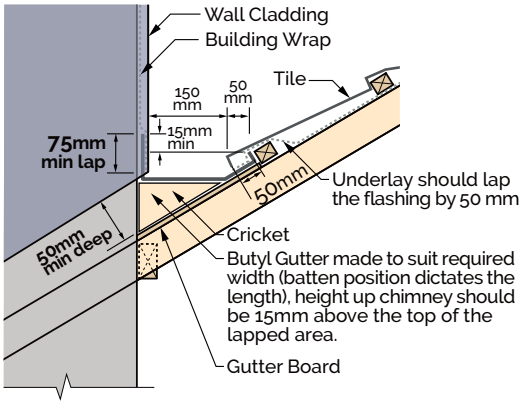


Figure 11.8.1 Elevation – Butyl gutter with cricket

Install the butyl gutter down the side of the chimney to the eave.

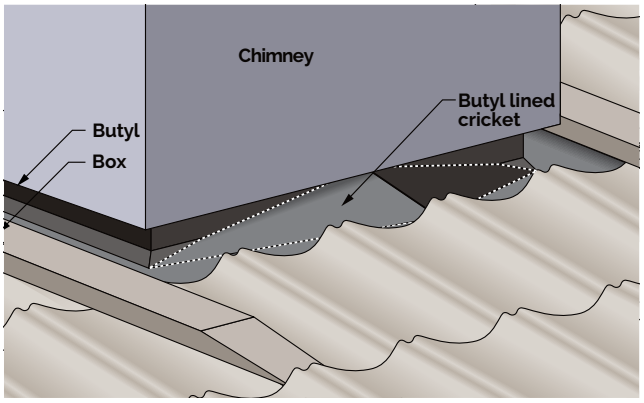


Figure 11.8.2 Butyl gutter with cricket

Install the gutter board so that it hangs over the fascia board and into the gutter but avoid contact with the gutter. Glue the butyl rubber extension on the stop end and the gutter board edge at the eave.

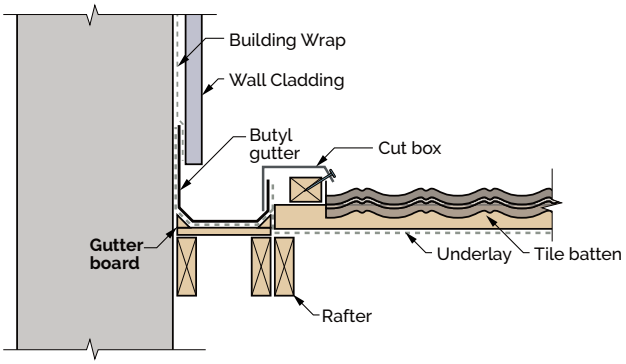


Figure 11.8.3 Elevation – Butyl gutter

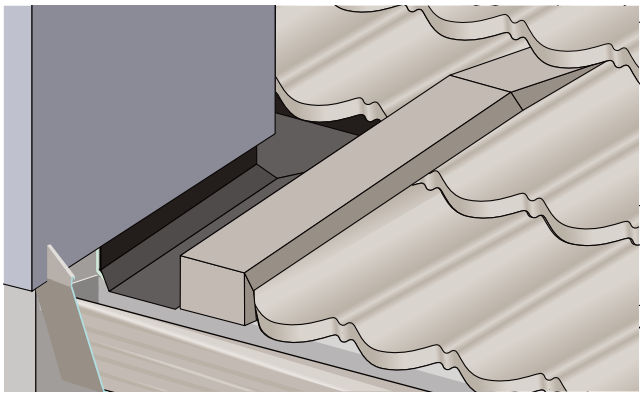


Figure 11.8.4 Chimney at eave – Butyl gutter

11.0 Penetrations

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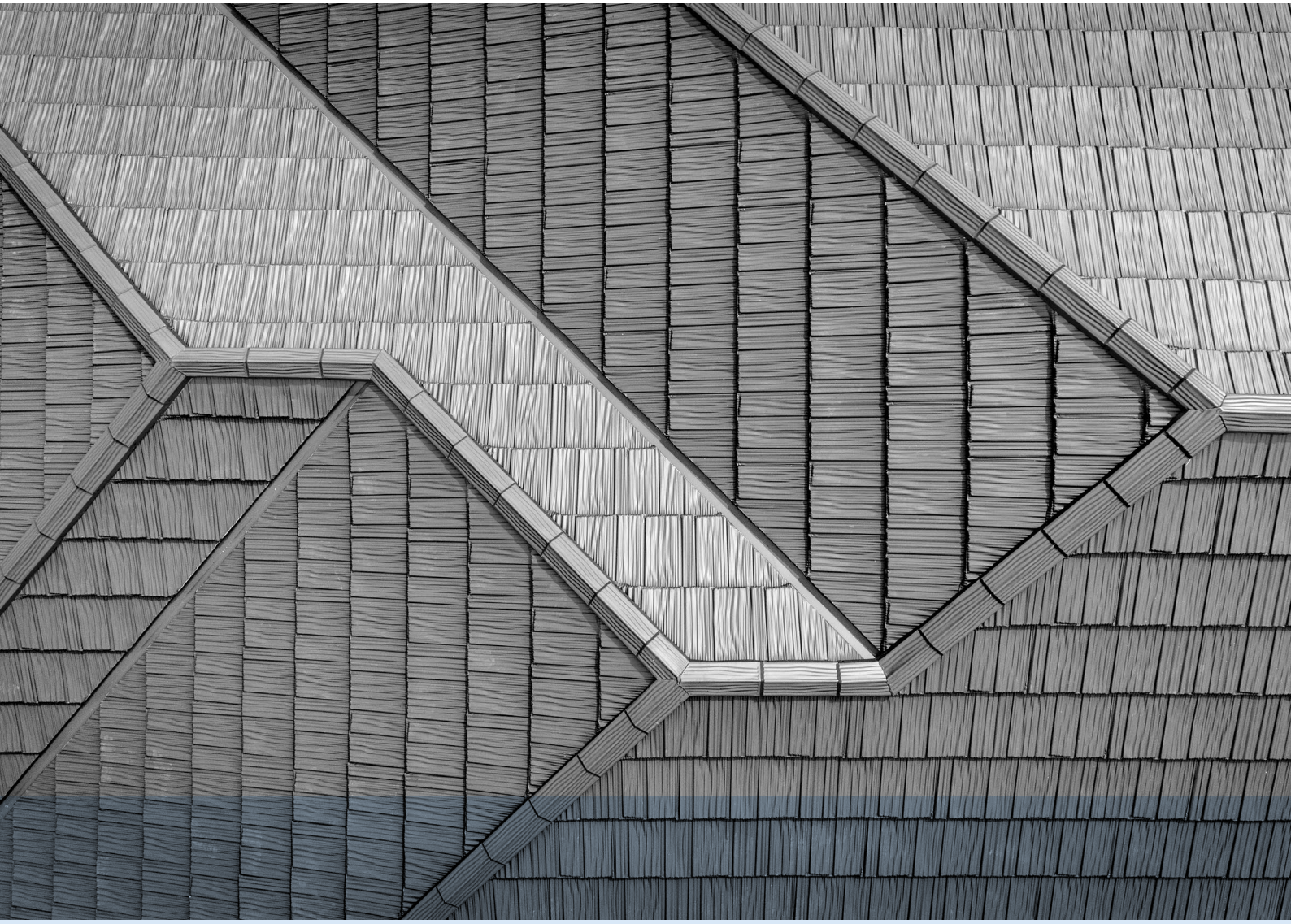
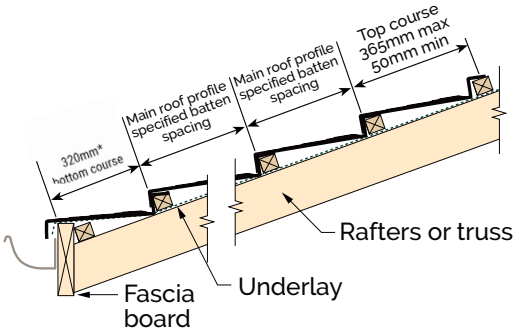


12.0 Unusual situations & circumstances

12.1 Top course too short or too long



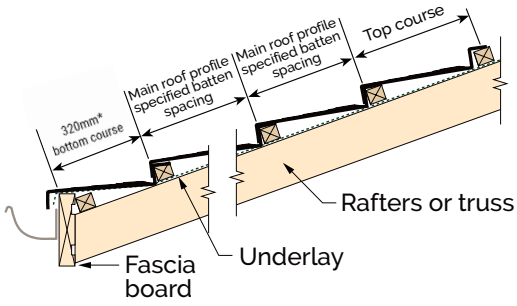
* Variable depending on the type of rainwater collectionsystem used

Figure 12.1.1 Batten set out general rule

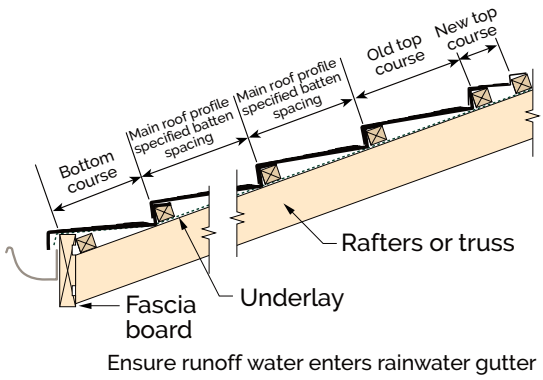
12.1.1 Bond, Classic, and Rockport

When the top course batten spacing is found out to be too short (less than 50 mm) or too long after pin out (more than 365 mm and less than 420 mm), the bottom course dimension may be changed to between 290 mm and 328 mm to solve the problem.

Example 1 reduce bottom course spacing

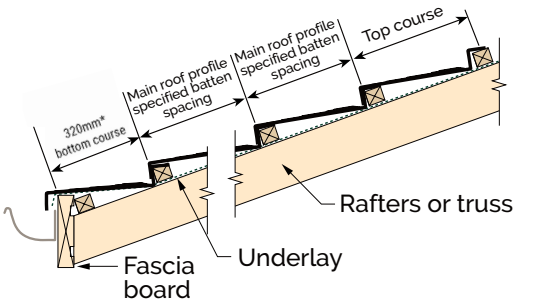


* Variable depending on the type of rainwater collectionsystem used

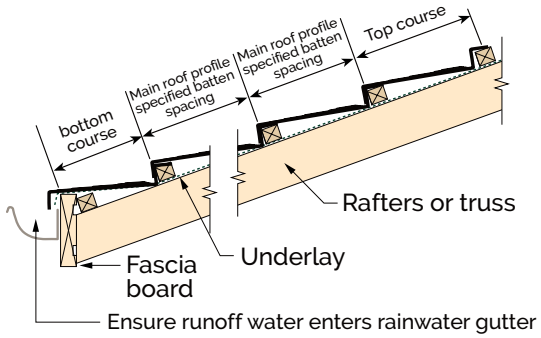


Ensure runoff water enters rainwater gutter

Example 2 increase bottom course spacing



* Variable depending on the type of rainwater collectionsystem used



Ensure runoff water enters rainwater gutter

Figure 12.1.1.1

12.1.2 Shake, Senator, Aspen, and Alpine

When the top course batten spacing is outside the range between 50 mm and 365 mm, the natural upstand of the Shake, Senator and Alpine remains and the front downturn can be created by bending the tile down before cutting.

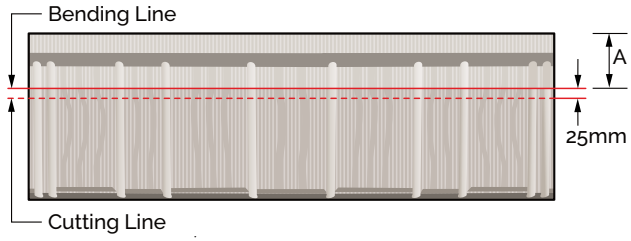


Figure 12.1.2.1

12.2 Short valleys

This situation occurs when a valley exits onto the roof surface well above the fascia. Cut end of the valley to protrude 50 mm and do not use cover pans. Fold down drip edge to ease water to flow down the roof.

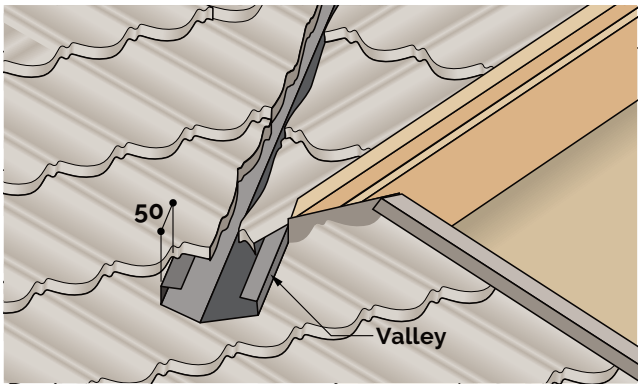


Figure 12.2.1

12.3 Low pitched roof (>8°)

If a side flashing is used against the wall, seal the small section of wall wrap over the butynol using a sealant tape and also use a foam closure.

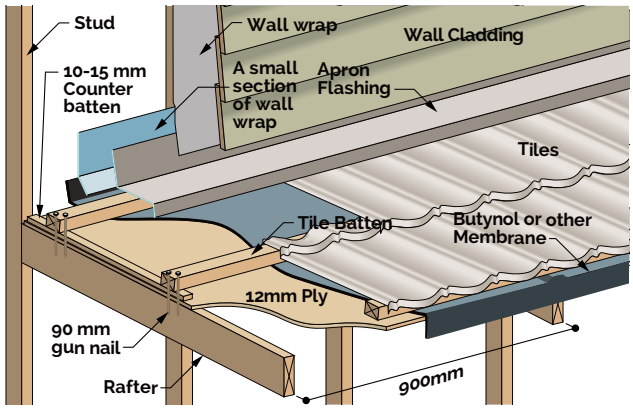


Figure 12.3.1

Use two 90 mm gun nails to compensate for the loss of ply plus counter batten plus membrane thickness.

The counter battens are to allow drainage if the tiles leak as is possible at pitch smaller than 15°.

At roof pitch lower than 8° a membrane roof or profiled steel roof is recommended.

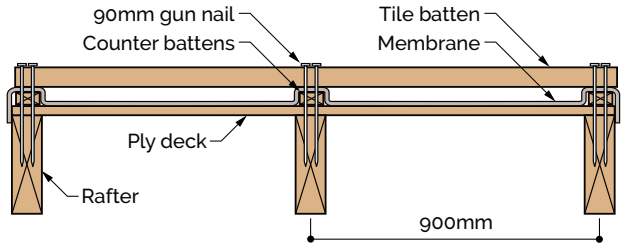


Figure 12.3.2

12.4 Butynol deck – Tile interface

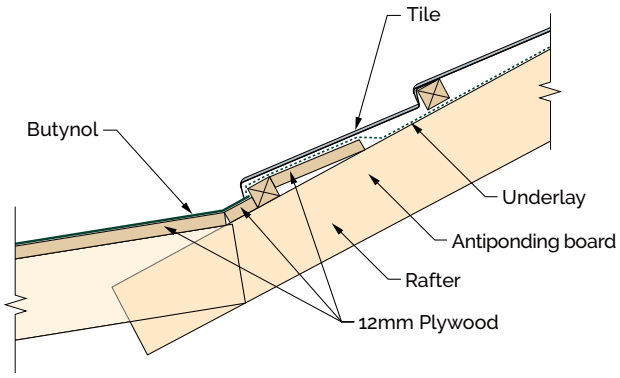


Figure 12.4.1

Note: Low pitched roof installation is not covered by BRANZ Appraisal no. 1096.

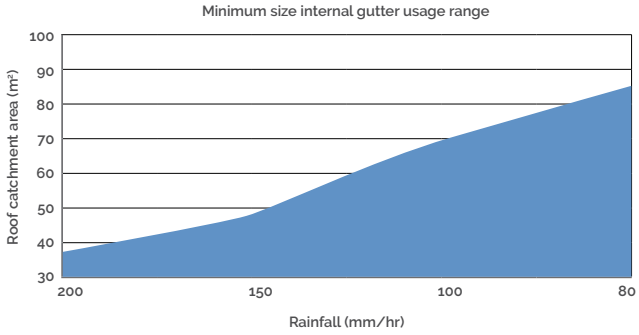
12.5 Over length mono-pitched roof

If a mono-pitch roof exceeds 12 m at its minimum roof pitch, the roof pitch should be increased by 1° per additional 0.5 m.

12.6 Internal gutters

Only either 5000 series aluminium to AS/NZS 1734 temper O, with a minimum thickness of 1.2 mm and a minimum fall of 1: 200, or butyl rubber, with a minimum thickness of 1.0 mm, should be used to form internal gutter.

The minimum size internal gutter suits for the roof catchment area as in **Graph 12.6.**



Graph 12.6

Bigger internal gutter should be used for larger roof area. A freeboard allowance of 20 mm should be added to the net capacity calculation to increase the maximum depth of flow in the gutter.

Angled internal gutter for the back wall should be installed using the details shown in **Figure 12.6.2**. The same principles of installation apply to the back flashing/gutter of dormers. The capacity calculations of angled internal gutters are more complicated than those of box internal gutters (**Figure 12.6.1**). The roof pitch has to be taken into account.

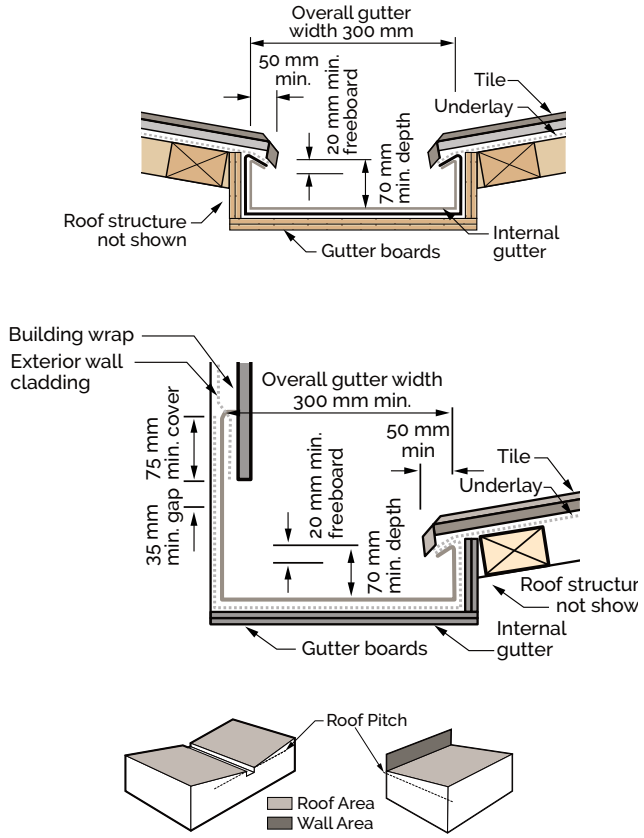


Figure 12.6.1

Catchment area = ▭ x

Vertical wall/s adjacent to roof slope	
Factor	Pitches
1.1	10°-25°
1.2	25°-35°
1.3	35°-45°
1.4	45°-55°
1.5	55°-65°

+ 0.5 x ▭

Catchment area = ▭ x

Sloped roofs only	
Factor	Pitches
1.1	10°-25°
1.2	25°-35°
1.3	35°-45°
1.4	45°-55°
1.5	55°-65°

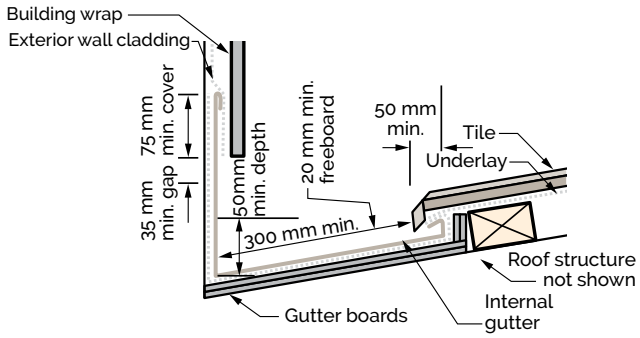


Figure 12.6.2

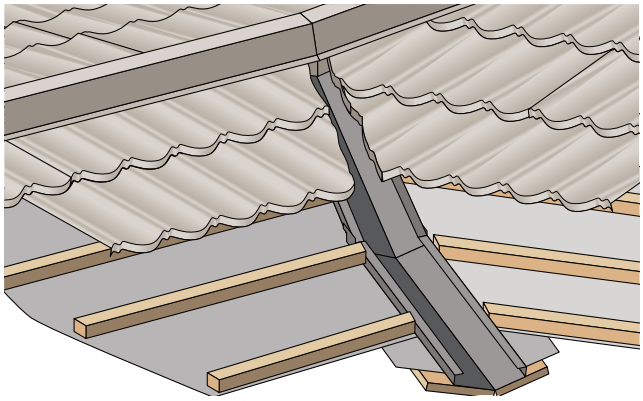
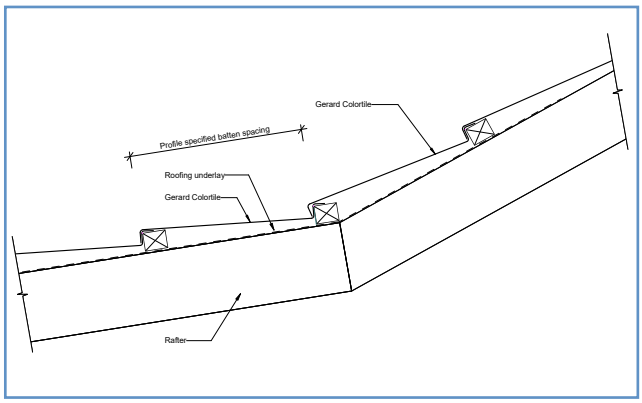


Figure 12.7.1.2 Valley installation

12.7 Change in pitch

12.7.1 High pitch to low pitch



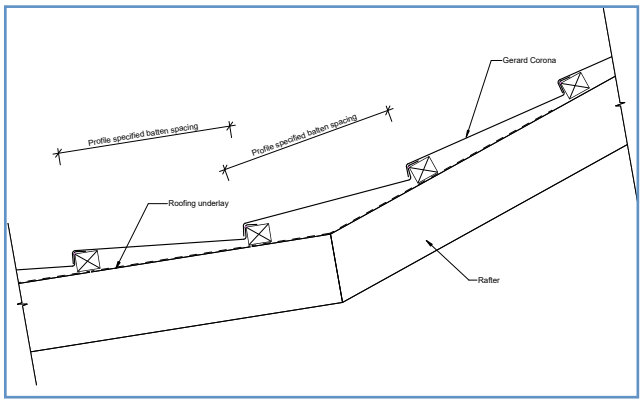


Figure 12.7.1.1 High pitch to low pitch

Gerard Roofs recommends sealant Silaflex MS for general use with our products. However, this product requires slightly higher application temperature (5°C), and resists only up to 70°C (darker roofing materialmay reach temperature up to 80°C in direct sunlight in the height of summer). Where operating temperature may be an issue, it may be preferable to use the Soudal MS Fix All 220. Sealant must always be used in conjunction with mechanical fastening and be applied between the two sheets to be lapped before they are fixed together.

The excess sealant extruded from the lap must be removed. Rivets should be at 50 mm centres.

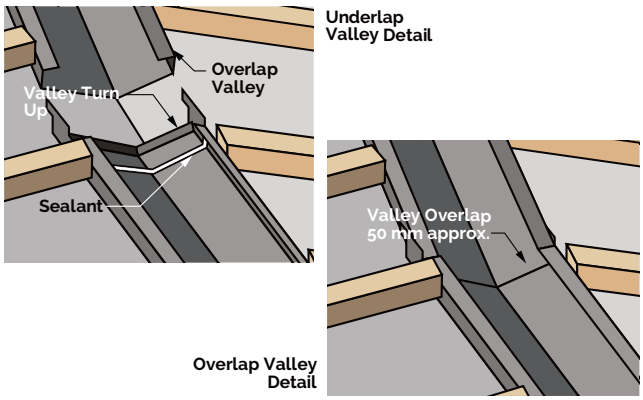


Figure 12.7.1.3 Low pitch to high pitch

12.7.2 Low pitch to high pitch

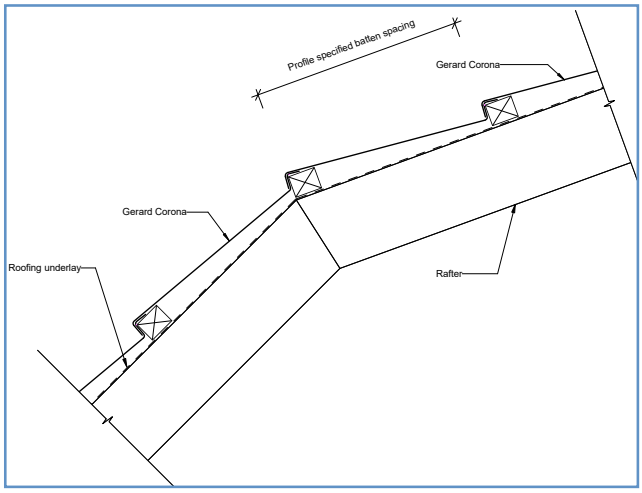


Figure 12.7.2.1 Low pitch to high pitch

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13.0 Re-roofing

Assessment of existing corrugated steel roof

This must be carried out by the sales representative who visits the roof and uses the re-roof check sheet supplied by Gerard Roofs.

The use of **direct overlay or counter** batten method requires the corrugated steel to be in a reasonable condition.

Repairs to corrugated steel

Areas where corrosion has been found may be covered using sound (good condition) corrugated steel. The covering steel must be fixed to the roof purlins in the same way as the rest of the roof or to the roof purlins with the tek screws supplied for fastening the tiles.

13.1 Metal roof overlay with counter battens

The use of this method is not suitable for concrete or clay tiles and requires the roof to be in a reasonable condition.

13.1.1 Set out

Fascia

Existing roof cladding must be cut back inside fascia and preferably removed to behind the bottom eave batten.

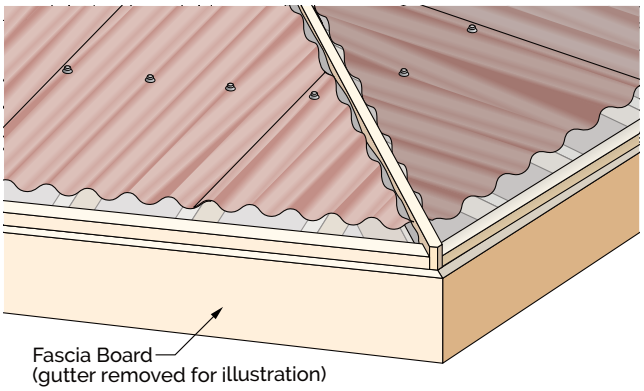

Figure 13.1.1.1.1

A tile batten should be installed immediately behind the fascia as a fixing point for the eaves course of tiles. In some cases the fascia board may need raising. Install the second tile batten 320 mm* up from the outside of the fascia board.

** In the event that the top course tile is too short or the rain water collection system conflicts with the tile nose, this dimension may be changed within -40 mm to +15 mm tolerance.*

Counter battens

Counter battens are installed parallel (preferred directly above the rafter) to the rafter. They are usually the same size as the tile battens; 50 mm x 25 mm for most re-roofing applications. The maximum spacing for counter battens in various parts of the roof should be as set in **Table 13.1.1.2**.

Counter battens should be fixed in the troughs of the existing corrugated steel and nailed at every crossing of the purlins with suitable nails e.g. two 90 mm gun nails.

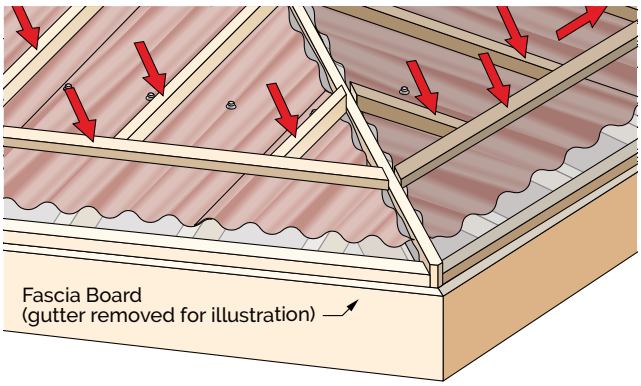

Figure 13.1.1.2.1

Wind areas	Spacing of purlins (mm)			
	≤750	750-900	≤750	300-900
	General roof area (no edge)		Roof edge zone within 1.2 m of eave, ridge, gable or hip	
Low & med	600	600	600	600
High	600	600	300	300
Very high	600	450	300	300
Extra high	Replace roof. Ensure correct batten rafter connections are used.			

Table 13.1.1.2 Spacing of 50 x 25 mm counter battens

Note: Additional short counter battens are required round edge zones between the normal counter battens to provide additional batten nailing points in high wind areas. Use batten fasteners outlined in **Tables 4.3.1** and **4.3.2**.

Tile battens

Fix tile battens to counter battens at each crossing.

Batten set out will be as for a new roof (Refer **4.0 Batten installation**).

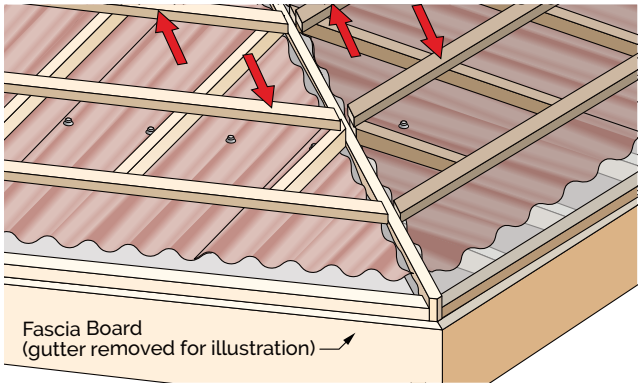

Figure 13.1.1.3.1

Ridge/hip

Remove all existing ridge and hip caps starting a waste pile on the ground.

Roll out underlay on hips and ridges. This is optional to protect the structure during installation.

Hip and ridge boards/battens should be built up at least 50 mm above the tile batten height (approximately 100 mm above existing roof) as in new roofing.

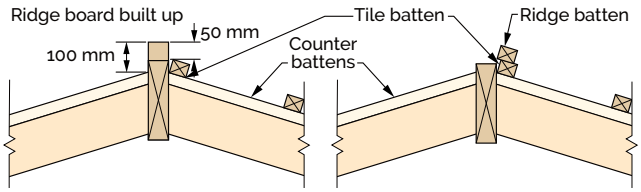

Figure 13.1.1.4.1 Ridge board/battens

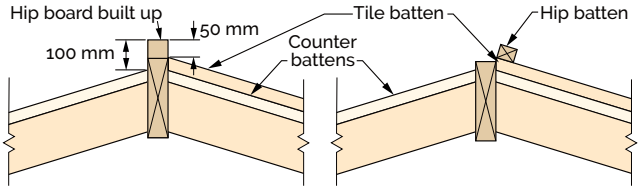

Figure 13.1.1.4.2 Hip board/battens

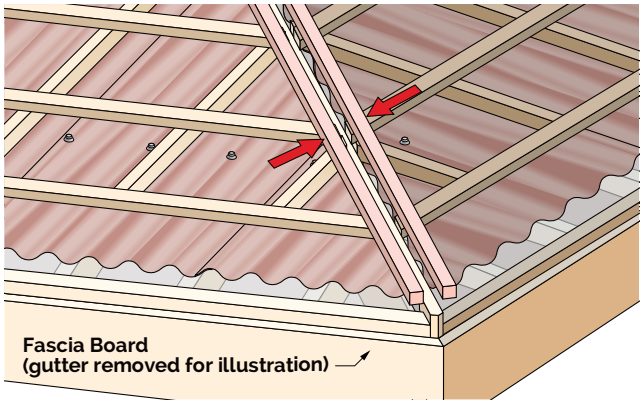

Figure 13.1.1.4.3 Hip battens installed above the tile battens

Valleys

Where the steel has been cut back to behind the bottom eave batten (**Figure 13.1.1.1.1**) then it should also be cut back to the valley batten for the first 750 mm measured up from the fascia.

Valley support battens approx 50 mm x 25 mm are laid over the existing roof and held by 90 mm x 3.15 mm nails into the old battens or sheathing. The spacing between the two support battens depends on the valley accessories to be used.

Replacement valleys are placed between the valley support battens and held securely.

Note: Capacity of valleys will depend on prevailing environmental conditions and roof size. Refer **9.1 Valleys & wall flashings.**

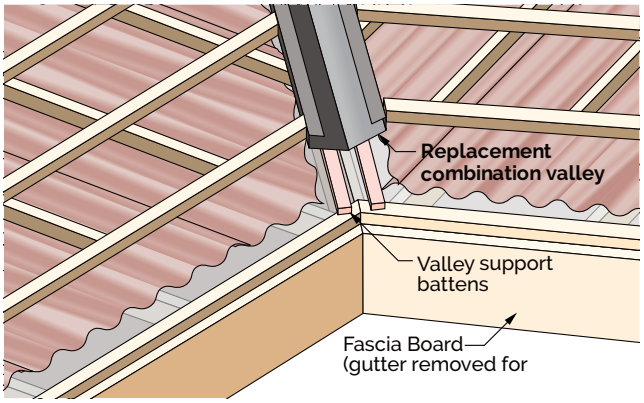

Figure 13.1.1.5.1

13.1.2 Tile and accessory installation

Roll out underlay on eaves where the steel has been cut back.

Tile and accessories will be laid and fitted as for a new roof (Refer **6.0 Cutting & installing the roof, 7.0 Product specific installation & 8.0 Installing hips, ridges & gables**). All roof flashing should be renewed except those in good order and of sufficient height to be re-used.

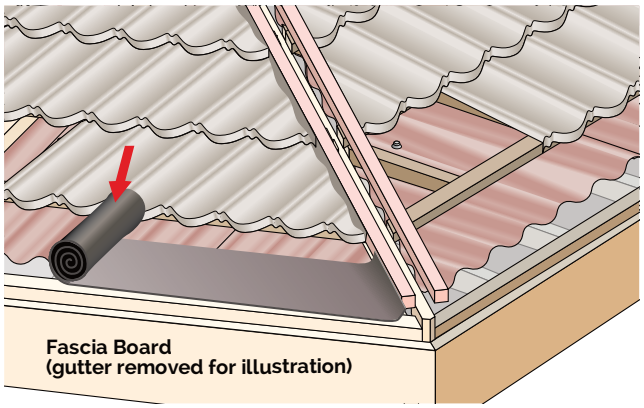

Figure 13.1.2.1

13.2 Direct overlay method

The use of this method requires the longrun or the corrugated steel roof to be in a reasonable condition.

This method, originally conceived for re-roofing using Senator, should also be suitable for Shake and Rockport.

This method is not suitable for extra high wind zones. Replace existing roof with new if roof is located in an extra high wind zone.

13.2.1 Preparation

Renailing existing roof

Remove lead head nails and renail the original roof to the battens close to the troughs in the corrugations with 90 mm nails, ensure the nail heads do not pierce the steel by using the correct settings if a nail gun is used. Nails are to be located every second corrugation. Install at least the same number as nails removed. Always nail where sheets of corrugated steel overlap.

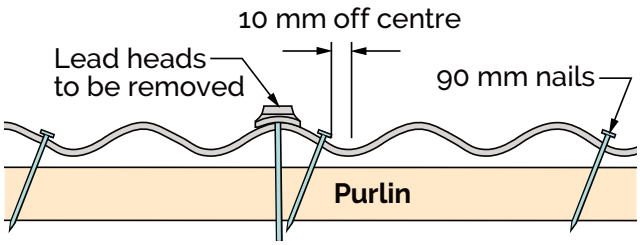

Figure 13.2.1.1

13.2.2 Set-out

Barge

Remove the existing barge covers.

Install a 50 x 40 mm batten up the gable spaced to suit accessory. Fasten with 90 mm nails at 600 mm centres to the rafter under the steel.

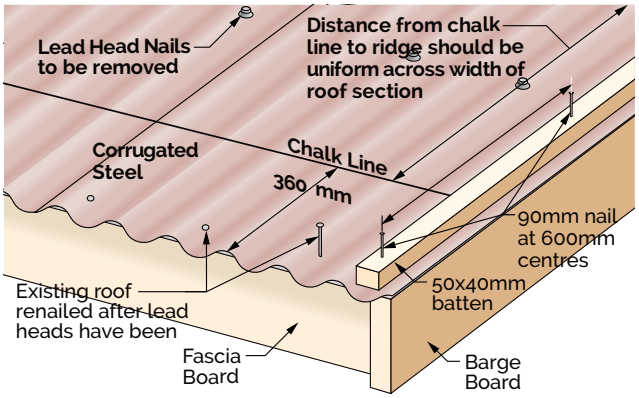

Figure 13.2.2.1.1

Hip

Remove the existing hip.

Identify where the battens attach to the hip rafter.

Attach 50 x 40 mm batten(s) to the battens and/or the hip rafter with 90 mm nails at the required spacing for the selected accessories.

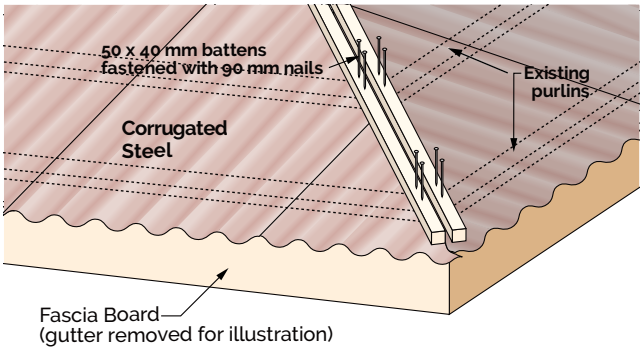

Figure 13.2.2.2.1

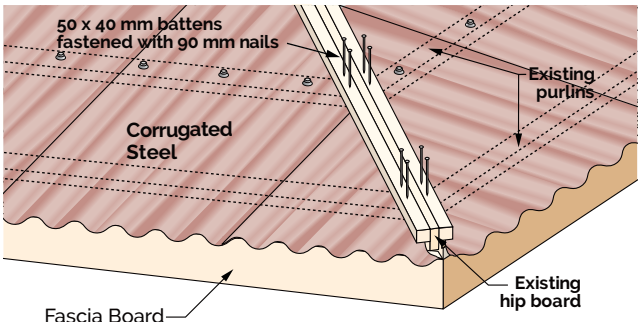

Figure 13.2.2.2.2

Ridge

Remove existing ridge capping.

Identify where the top purlin is located under the existing roof.

Produce (if required, see below) profiled counter battens long enough to span the distance from the top purlin to the peak of the ridge.

Install the profiled counter battens at a minimum of 600 mm centres using 2 x 90 mm nails to attach them to the purlins.

Install 50 x 40 mm batten(s) along the ridge line. If two battens are installed, set them to the width required for the accessory to be used.

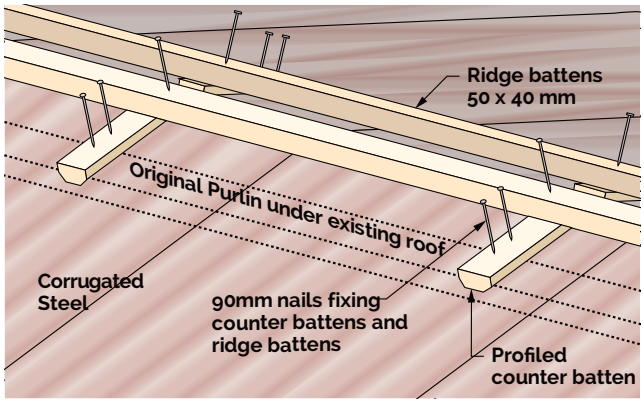

Figure 13.2.2.3.1

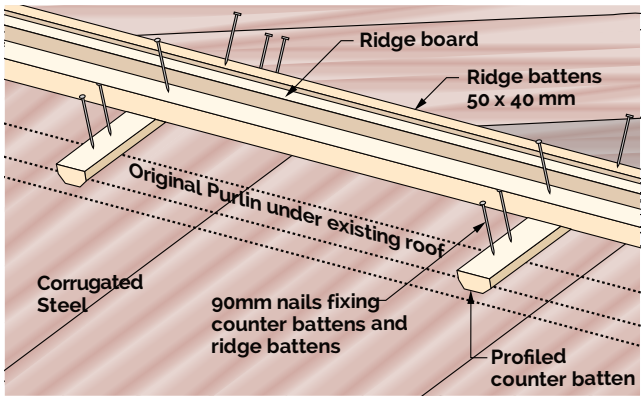

Figure 13.2.2.3.2

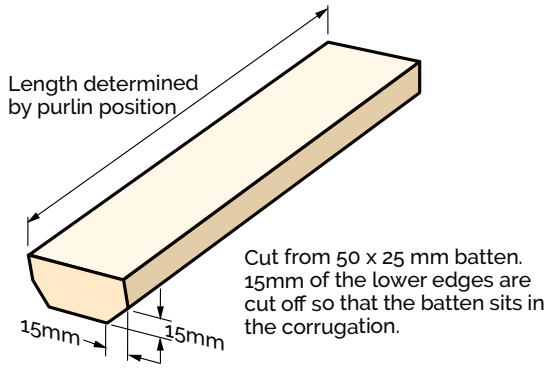

Figure 13.2.2.3.3 Profiled counter batten

Valley

Valleys may be installed over the existing valley if the original is in good condition. Valleys with any signs of red rust should be removed.

If required, cut back the corrugated steel along the valley line so that a combination valley can be inserted over the existing valley. Insert the valley and fix it in place (with a nail bent over the edge) without penetrating the valley.

Modify the valley end if required (see **Figure 13.2.2.4.1** and **13.2.2.4.2**).

At the top of any valley it must be turned up as high as possible to eliminate any wind blown rain getting into the roof cavity.

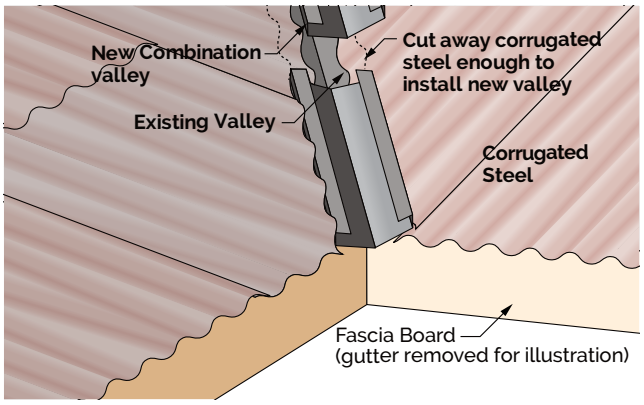

Figure 13.2.2.4.1

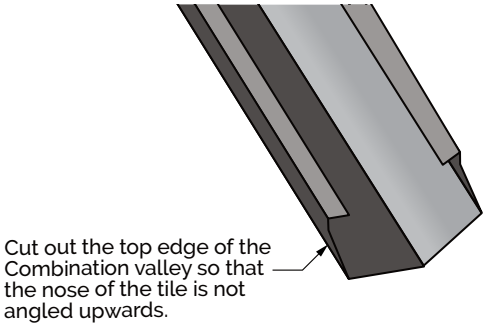

Figure 13.2.2.4.2

13.2.3 Tile and accessory installation

Screw fasteners supplied by Gerard Roofs should be used to fasten tiles to the corrugated steel that is structurally sound.

Mark using chalk, a line 360 mm up from the eaves of roof. Measure from the ridge down to ensure that the distance from the ridge is constant across the roof. If the eaves line is not parallel with the ridge line, make adjustments to the chalk line. Allow a minimum of 5 mm over-hang of the tile over the edge of the corrugated steel.

The back upturns of the eave tiles are aligned along the chalk line. The eaves tiles are then fastened along the back. Fasteners at the eaves are located approximately 50 mm up from the front nose. It is also important to place the fastener on a high point of the surface and NOT into the drainage channel that is over-lapped. Subsequent courses of tiles are held in place with fasteners through the nose and back upstand of the tile. Ensure that the noses of the tiles are hard against the back upstand before fastening to the corrugated steel.

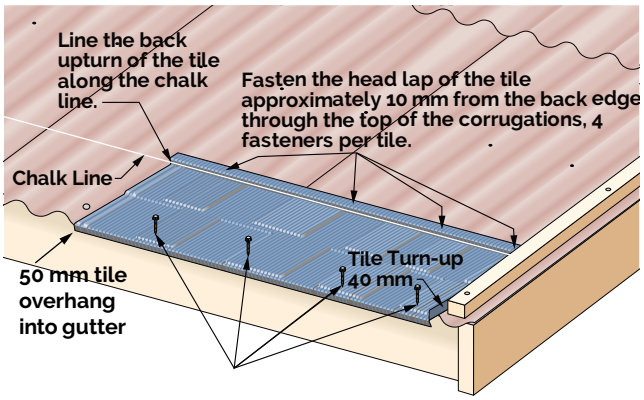

Figure 13.2.3.1

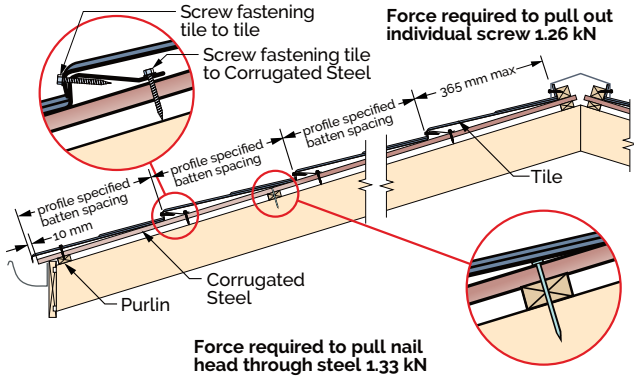

Figure 13.2.3.2

Tiles are fastened with 4 screws evenly spaced along the head lap. Care should be taken to ensure that the fasteners are located at the top of the corrugations of the underlying steel. This can be achieved by locating corrugation with the fingers under the nose of the tile or by noting the corrugation up the roof above the head lap of the tile. Fasteners should be installed where the corrugated steel overlaps, this results in the fastener penetrating 2 sheets of steel which provides greater pullout strength.

The fronts of the tiles are held in place with 4 horizontally installed fasteners. Care needs to be taken to ensure that the screws do not ride over the back of the head lap of the tiles.

Fasteners must not be installed in the drain channel at the side lap of tiles.

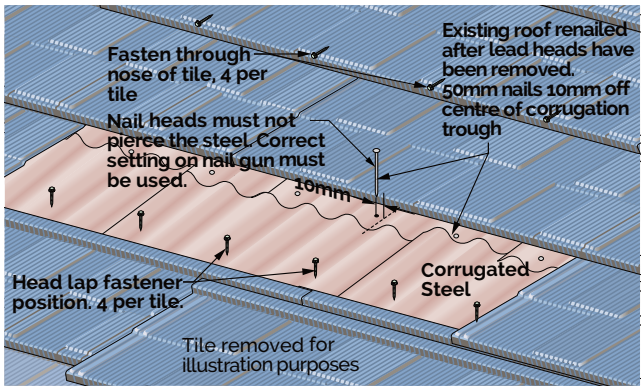

Figure 13.2.3.3

Tile and accessories will be laid and fitted as for a new roof (Refer **6.0 Cutting & installing the roof, 7.0 Product specific installation & 8.0 Installing hips, ridges & gables**). All roof flashings should be renewed except those in good order and of sufficient height to be re-used.

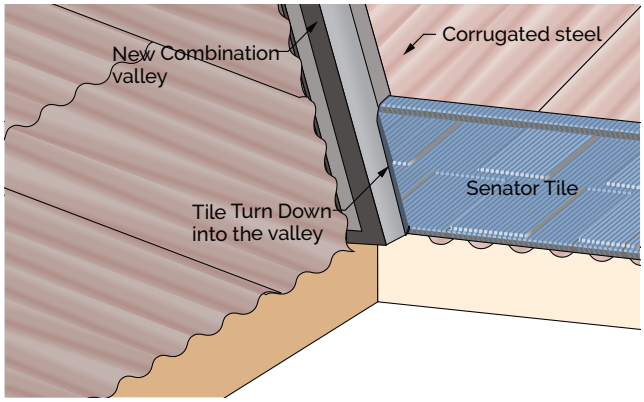

Figure 13.2.3.4 Valley detail

13.3 Full roof strip and replacement

Prior to beginning re-roof work, evaluate whether a test for traces of asbestos is appropriate.

Remove old roofing material (steel, shakes, shingle, pressed metal tile, concrete or clay tiles, etc). Lift nails, flashings and battens. Follow with a thorough examination of the roof structure for decay and damage. Replace all unsound or suspect timber.

Hip and ridge boards must be built up to extend at least 50 mm above tile batten height as in new roofing.

Any fascia repairs or replacement must be completed before re-roofing commences.

All old valley trays should be replaced.

Batten set out, tile and accessory laying proceeds as for new roof (Refer **4.0 Batten installation, 5.0 Roofing underlays, 6.0 Cutting & installing the roof, 7.0 Product specific installation & 8.0 Installing hips, ridges & gables**).

GERARD
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14.0 Roof installation on steel battens

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

14.1 Batten setting out

Battens set out should proceed in a similar manner as for houses with wooden framing.

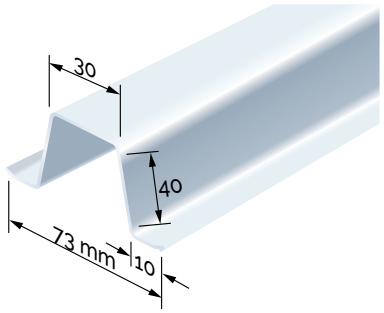


Figure 14.1.1 Steel batten

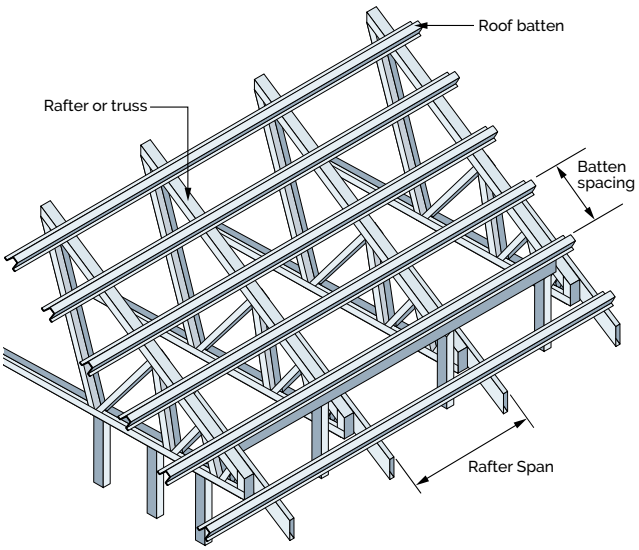
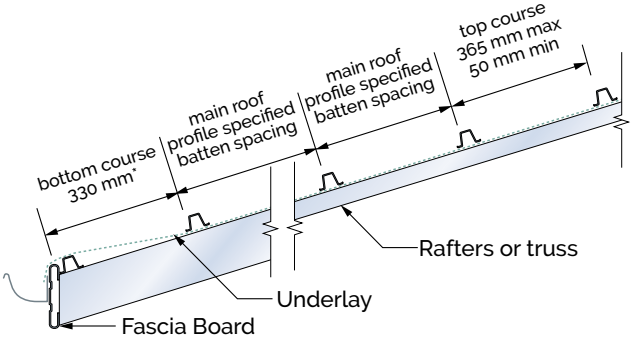


Figure 14.1.2 Steel framing

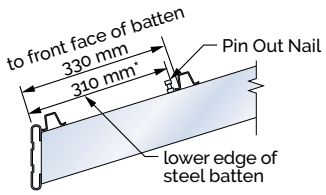
Steel battens are supplied by the steel frame supplier. These will be engineered to span up to 1200 mm however they may be used at narrower spacings.

Battens must be secured every second rafter with at least one tek screw before walking on them during the installation process. Once the section of roof has been covered with battens and underlay the battens must be fastened with the acceptable method as outlined in **section 14.3** before moving on to other sections or laying tiles.



* Variable depending on the type of rainwater collection system used

Figure 14.1.3 Rafter truss end on view, batten spacing



* Variable depending on the type of rainwater collection system used

Figure 14.1.4 Eave and first batten location/spacing

14.2 Installing battens and roofing underlay

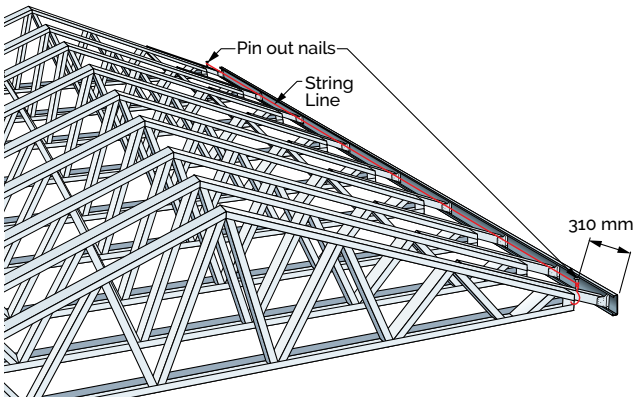


Figure 14.2.1 Batten pin-out

Mark/set out and fixing of the battens should be done sequentially throughout the batten installation process. The first batten is to be fixed behind facia.

Pin-out the second row to the recommended spacing to ensure that the eave tile is far enough into the gutter (40 mm). Then place the batten on the pin-out

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

nail/screw, this will be used to support the first run of roofing underlay as rolled out across the roof.

The roofing underlay can then be rolled out placing a magnet strip on every second rafter to hold the roofing underlay in place.

14.2.1 Install a RU Eave Flashing

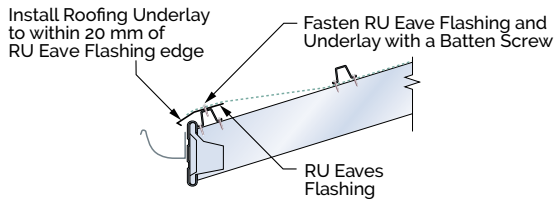


Figure 14.2.1.1

The RU Eave Flashing supports the roofing underlay at the edge and reduces or eliminates underlay vibration that can occur in high winds.

Lay the roofing underlay to within 20 mm of the edge of the RU Eave Flashing, the RU Eave Flashing overhangs the gutter by approximately 40 mm and the underlay is pinned by the batten screws so that any condensation will run into the gutter should it occur.

Minimum overlap of a lower section of under lap is 75 mm.

14.2.2 Underlay installation

Do not get on to the roof or top plate to roll out the roofing underlay, this is to be done from the working platform (**Figure 14.2.2.1**).

Once the roofing underlay is in place lift the second batten out from under the roofing underlay and fasten it in place against the pin-out nail/screw (**Figure 14.2.2.2**).

Roll out roofing underlay from the platform.

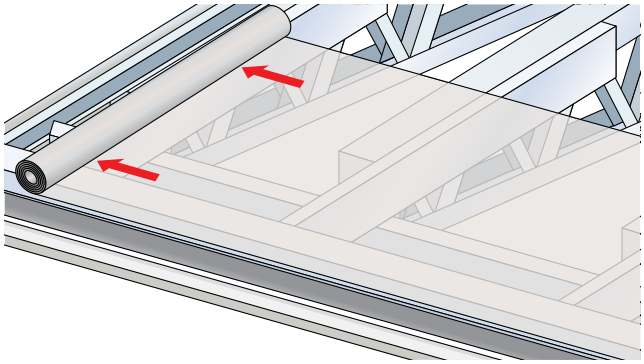


Figure 14.2.2.1

Fasten the second batten.

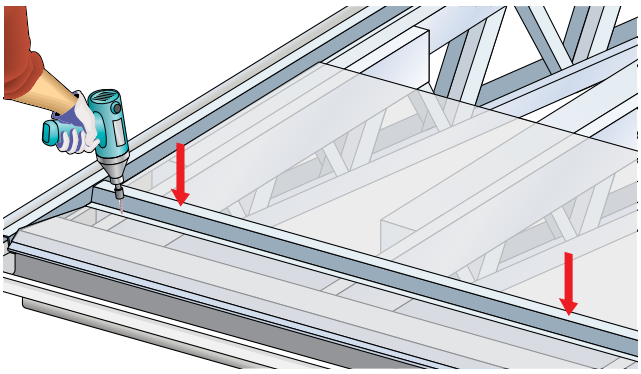


Figure 14.2.2.2

Space battens using batten spacers.

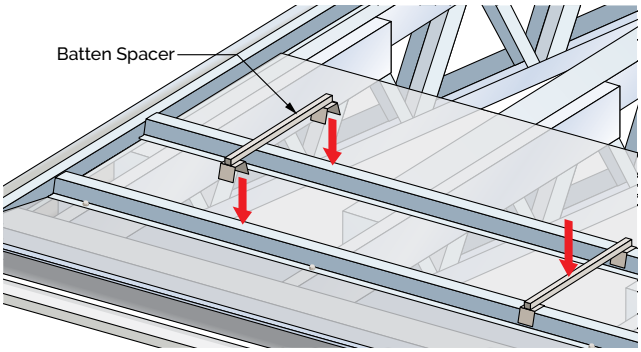


Figure 14.2.2.3

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

Fasten only the bottom/lower edge of the batten at the top edge of the roofing underlay.

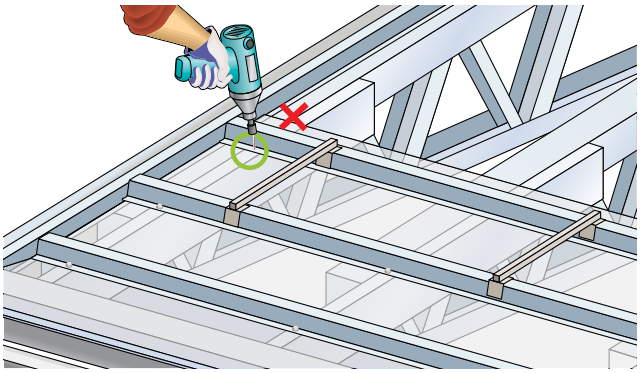


Figure 14.2.2.4

The batten at the top of the roofing underlay is to be screwed at the bottom only so it can be tilted up to enable the lap of the next run of roofing underlay to slide underneath. (**Figure 14.2.2.4**)

Place the next batten with the batten spacer off the top batten to support the next run of paper as in **Figure 14.2.2.5**.

Place supporting batten for second run of roofing underlay then roll out roofing underlay.

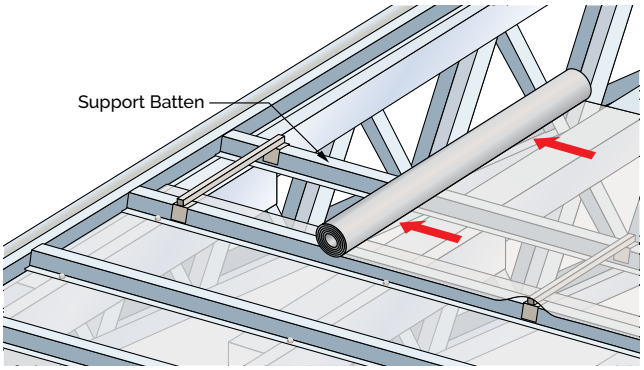


Figure 14.2.2.5

Roll out the next run of roofing underlay along the battens placing a magnet strip every second rafter.

Do not reach over open rafters to attach fixings to top of paper to hold in place.

Once the roofing underlay has been rolled out remove the batten spacer (**Figure 14.2.2.6**) allowing the batten under the roofing underlay to slide down. Place the batten on top of the roofing underlay using the batten spacer to locate it (**Figure 14.2.2.7**), fasten this batten. The lower edge of the roofing underlay is then tucked under the top edge of the batten below. (**Figure 14.2.2.8 & Figure 14.2.2.9**)

Remove batten spacer and remove batten from under the roofing underlay.

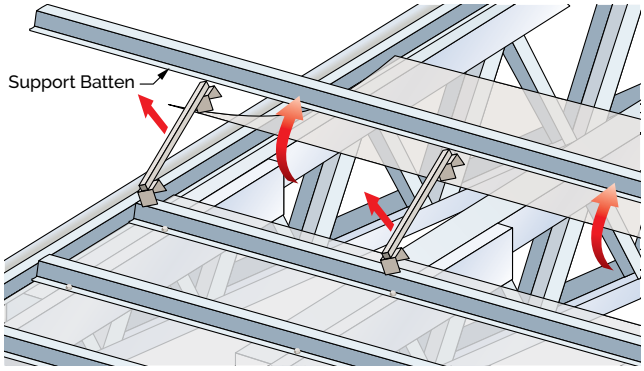


Figure 14.2.2.6

Place batten on top of the roofing underlay and fasten it in place.

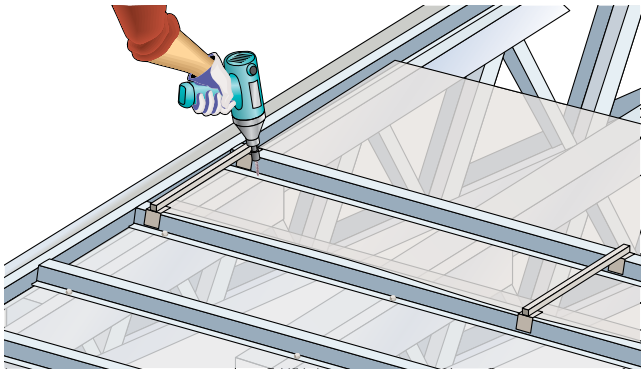


Figure 14.2.2.7

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

Tuck the roofing underlay under the top most batten of the rolled out underlay below.

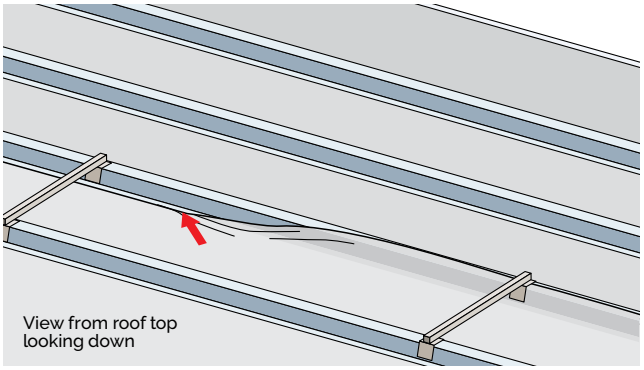


Figure 14.2.2.8

Tuck the underlay under the batten, then fasten the top edge of the batten.

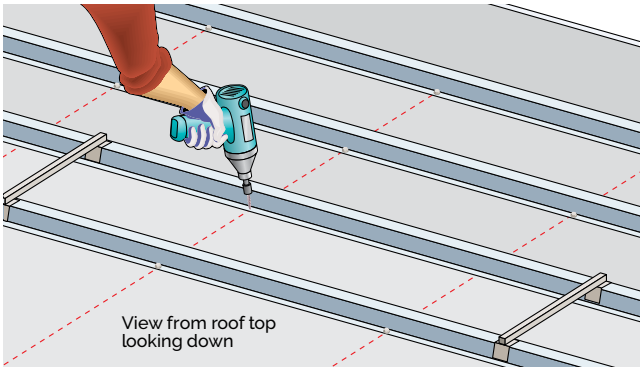
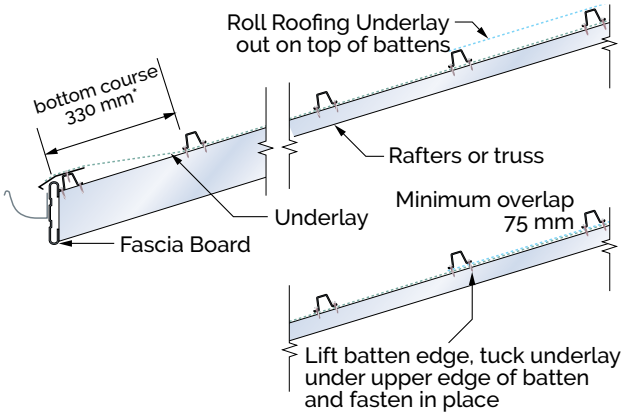


Figure 14.2.2.9



* Variable depending on the type of rainwater collection system used

Figure 14.2.2.10 Installation and overlap of roofing underlay

14.3 Batten fastening

Batten joints are to be cut to length so that they lap together on top of a rafter.

Fasten through the batten into the rafter using the approved fastening technique of:

2 x 16 mm 10 gauge drill point screws or 2 x 12 gauge tile fasteners one each side of the batten.

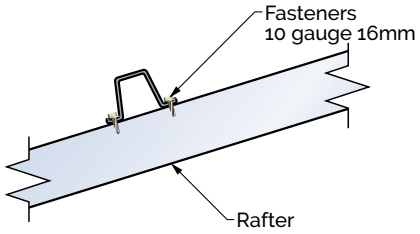


Figure 14.3.1

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

14.4 Accessory batten installation

14.4.1 Ridge installation

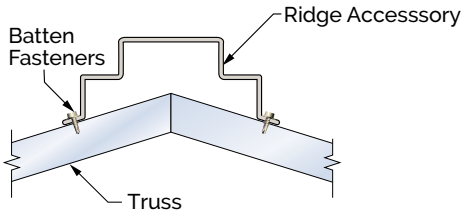


Figure 14.4.1.1 Ridge batten installation

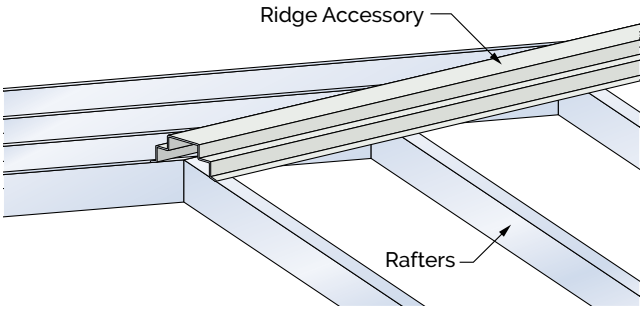


Figure 14.4.1.2

14.4.2 Hip installation

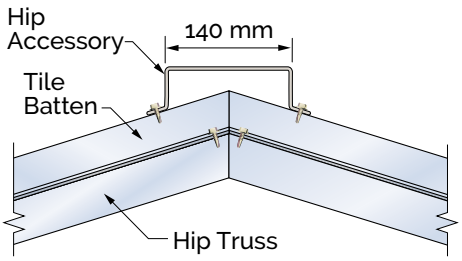


Figure 14.4.2.1 Hip batten installation

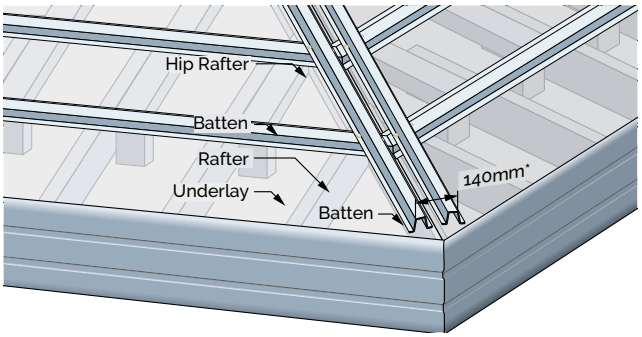


Figure 14.4.2.3 Hip batten installation alternative

14.4.3 Ridge hip accessory junction

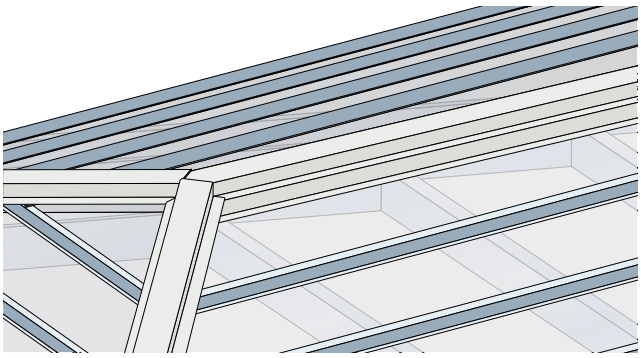


Figure 14.4.3.1

14.4.4 Gable installation

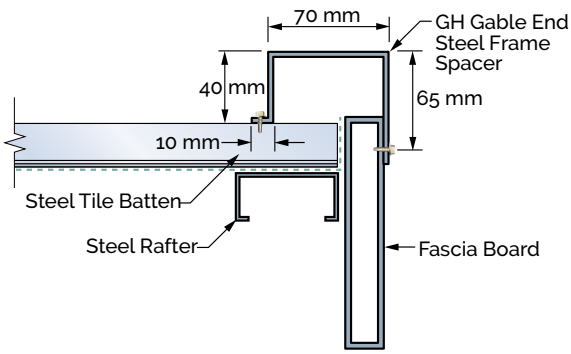


Figure 14.4.4.1 Gable batten installation Angle trim with steel frame gable end spacer

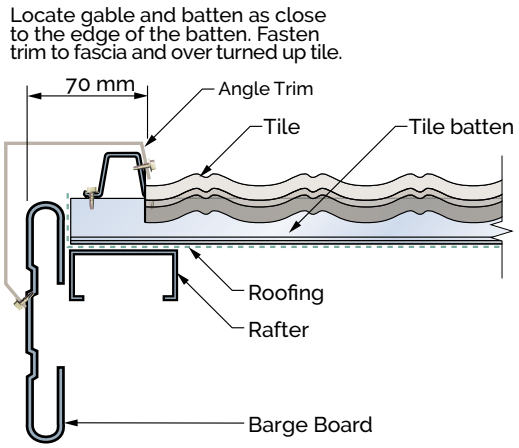


Figure 14.4.4.2 Gable batten installation Angle trim

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

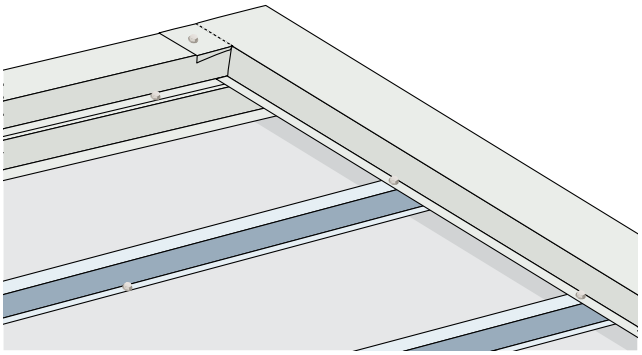


Figure 14.4.4.3

14.5 Valley batten installation

Steel valley boards should be installed by the builder prior to the roof fixers starting batten installation.

Roofing underlay is to be installed over the valley boards and under the tile battens.

Valleys may be held in place by clipping the top section of the valley and fastening it to the valley board. Valleys should be overlapped a minimum of 150 mm.

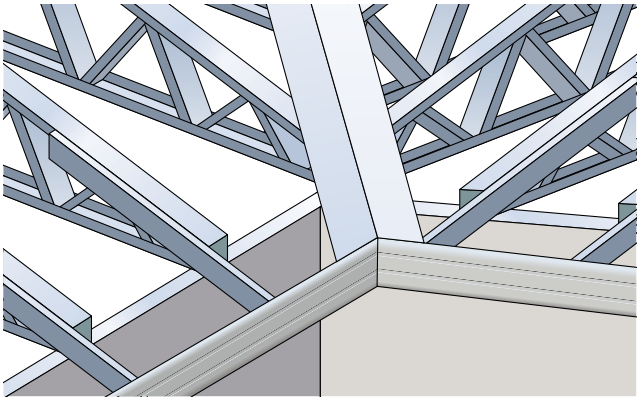


Figure 14.5.1 Two steel pieces riveted together

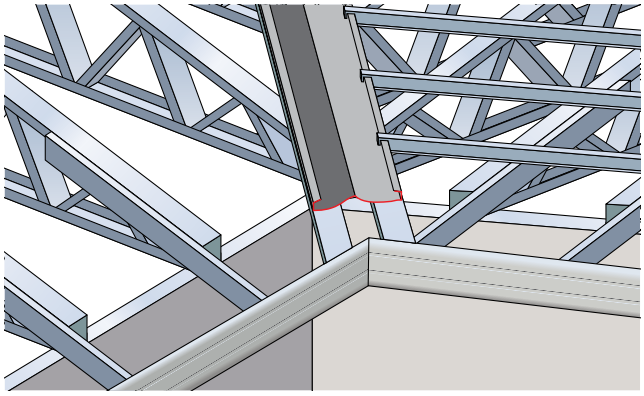


Figure 14.5.2 Two 'C' section steels

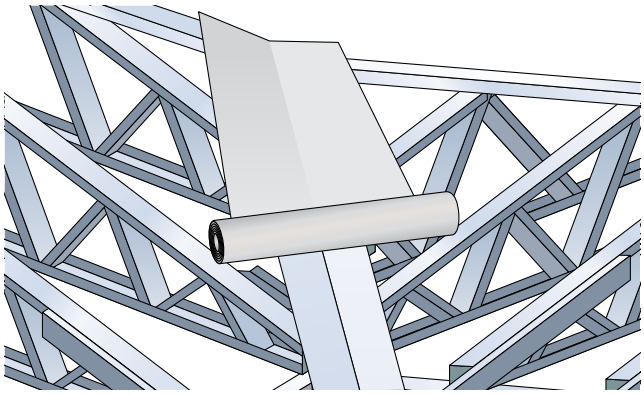


Figure 14.5.3 Installing the underlay from the top valley, note approach is from a fully battened section of roof

14.6 Tile installation over steel battens

14.6.1 General

Safety signs and edge protection, if required, should be in place before installation starts.

14.6.2 Preparatory work

Underlay, tile and accessory battens, wall flashings, valleys and fascia boards should be in place before laying tiles.

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

14.6.3 Tile selection - colour coding

The roof installer should check that the tiles are of the correct colour and are in good condition. Gerard Roofs provides a colour code on each pallet (A - M).

Different colour coded tiles should NOT be installed on the same roof.

Tiles with surface defects should NOT be installed on the roof.

14.6.4 Walking on tiles

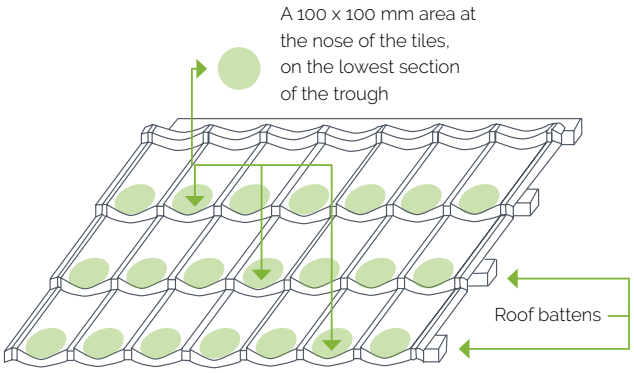
Soft soled shoes capable of providing secure footing should be worn. Extreme care is required when walking on wet tiles and this should be avoided if possible. Satin finish tiles can be very slippery and should NOT be worked on while wet.

The surface coating of the textured finish tiles may be damaged when they are wet, and damage increases as the pitch increases.

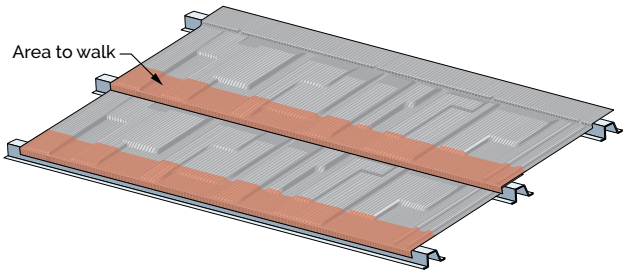
When walking on the tiles weight must be concentrated directly above the batten for Shake, Senator, Rockport, Oberon, Aspen and Alpine and in the pan (lower section) of tiles above the batten.

Tile damage will occur if installer weight is applied to tile ridges or mid sections of Shake, Senator, Rockport, Oberon, Aspen and Alpine.

For Classic, Bond and Milano



For Shake, Senator, Rockport, Oberon and Alpine



14.6.5 Damaged tiles

Tiles damaged during installation should be removed and replaced.

14.6.6 Sub-trade damage

If substantial work is to be carried out above a section of roof, such as installation of walls, tiles should generally be installed after this work has been completed. Tiles may be installed prior however protection for the tiles and their surface coatings needs to be installed before the wall cladding is installed. This may involve drop sheets and/or a plywood covering. At this point it should be made clear to the building supervisor who is responsible for damaged tiles by sub-trades.

14.6.7 Work interruption

If work is interrupted for any reason, or at the end of a workday, all loose tiles, accessories and incomplete sections must be secured against possible movement by wind.

Tile and accessories must be left clean and dry and securely covered to protect against the weather.

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

14.6.8 Clean up

The building site should be left clean of any roofing materials. All batten and tile off cuts, nails and packaging must be removed from the site. The roof should be cleaned to remove any debris left by the installation process.

14.6.9 Sign off

Obtain sign off for the roof as soon as possible after completion of the clean up.

14.7 Tile laying

For Shake, Senator, Rockport, Oberon, Aspen and Alpine tiles only, to prevent lines of tile joins showing down the roof make sure to random stagger the tiles (Refer to **7.0 Product-specific installation** for each tile profile laying pattern).

All tiles interlock. Depending on the tile profile they may be interlocked in both directions or only in one direction (Refer to **7.0 Product-specific installation** for each tile profile laying pattern).

Lay tile laps facing away from prevailing winds. Where possible the tiles should be laid with the laps facing away from the line of normal sight.

14.7.1 Laying tiles

Tiles are installed from the top of the roof to the eave. Install the second to top course tiles (usually the first full width tile), hold them in place by fastening through the flat of the back edge of the tile which sits on the batten (Step **1** in **Figure 14.7.1.1**). Lower courses of tiles may then be laid without having to fasten each tile.

Subsequent tiles are laid by lifting both tiles in the course above and sliding the next course under the nose of the tiles already in place (Steps **2** and **3** in **Figure 14.7.1.1**). Tiles should be staggered so that side laps do not line up down the roof.

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

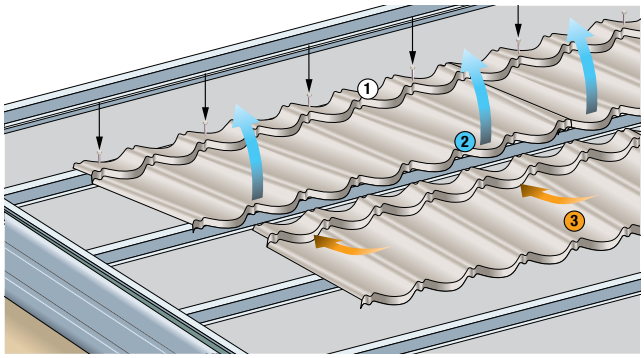


Figure 14.7.1.1

On lower pitched roofs all full tiles can be laid to cover the entire area without fastening. On higher pitch roofs, over 30˚, tiles should be fastened two courses above the tiles being laid.

All tiles should be fastened in place before leaving the job site for any reason.

14.7.2 Tile fastening

Tiles in the body of the roof are fastened using 4 tile fasteners per tile (spacing 420 mm approx.) through the front downturn (tile nose) so that the fastener penetrates the front face of the steel tile batten (see **Figures 14.7.2.1 & 14.7.2.2**). Fasteners need to be placed 60 mm from the lowest section of a pan on tiles and not in the hidden water channels on Shake, Senator, Rockport, Oberon, Aspen and Alpine tiles.

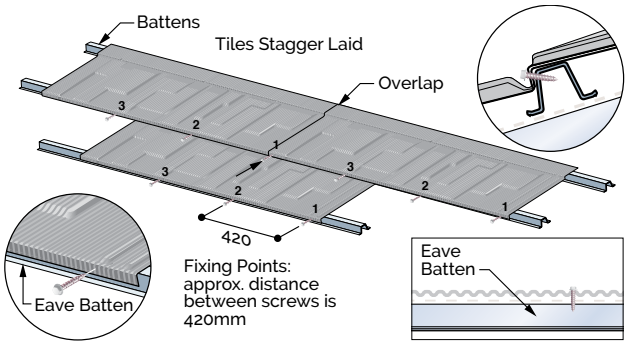


Figure 14.7.2.1

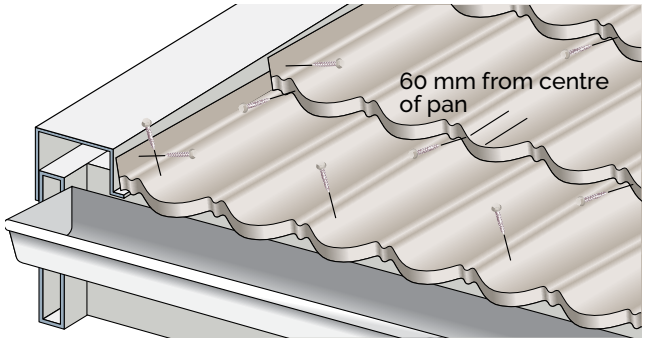


Figure 14.7.2.2

Fasteners should be installed a minimum of 10 mm from the edge of the nose or half the width of the nose.

Eave tiles are fastened through the tops of the tiles using 4 fasteners, not in the pans or water channels.

To ensure weather proofing - satin finish (painted) tile requires a rubber washer under the head of the eave fastener.

14.7.3 Fastening technique

The person fastening the tiles should stand on the tiles below, push down on the tile just above the location to be fastened. Push on the drill to drive the fastener into the nose and through the steel batten.

Clean any swarf that may fall on to the tile surface.

Figure 14.7.3.1

14.7.4 Gable roof

Tiles are turned up against the gable end accessory batten a minimum of 40 mm.

The end of the first tile is bent up 40 mm, this tile is then positioned against the accessory batten and second to top course tile batten, full tiles are then laid the length of the gable.

Starting from the course already laid; lay the tiles two courses at a time end to end. The tile laps must be staggered down the roof. The staggered laying will result in gaps at either end of the gable. Tiles need to be measured, cut and bent to suit. When laying these cut and bent tiles make sure that the laps are laid the same way as the rest of the roof.

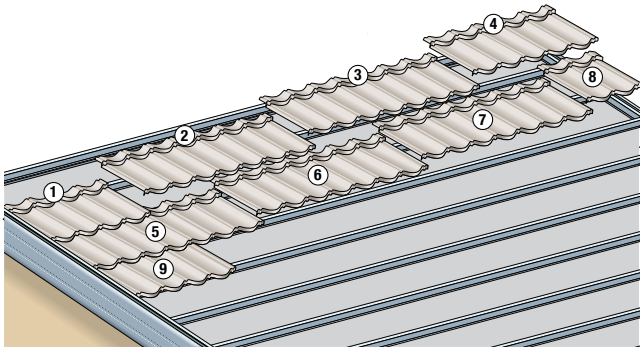


Figure 14.7.4.1 Stagger the tile laps down the roof, using part tiles at the gable end

Measuring, cutting and bending gable end tiles

Measurements for cutting and bending tiles are taken on the roof. The measurements are then transferred on to tiles on the ground where they are **cut**, **bent** and **stacked** in order.

For Bond, Classic and Milano: the measurement is taken from the centre of the water channel of the tile, along the front face of the tile batten on the roof to the inside of the gable end accessory batten, this is the bend line. Add 40 mm for the turn up of the tile, this is the cut line. (Refer to **6.4 Use of fixing tools – guillotine and bender**).

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

For Shake, Senator, Rockport, Oberon, Aspen & Alpine: the measurement is taken from the edge of the side lap of the tile, along the front face of the tile batten on the roof to the inside of the gable end accessory batten, this is the bend line. Add 40 mm for the turn up of the tile, this is the cut line. (Refer to **6.4 Use of fixing tools – guillotine and bender**).

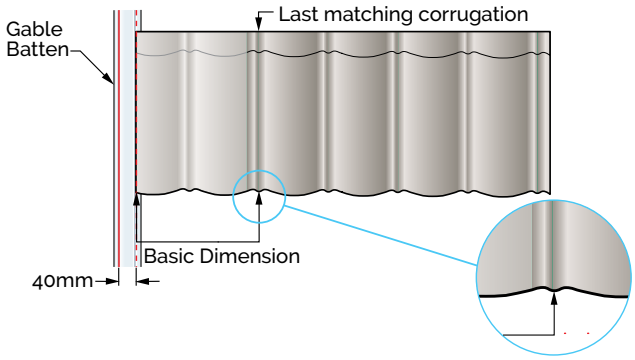


Figure 14.7.4.2 Gable end tile being cut then bent

If the gable is 90˚ then the bend can be made straight across the width of the tile. If it is an angled gable, treat the measurements the same way as a hip roof (Refer **14.7.5 Hip roof**).

Gable end, end tiles are installed from the eave up ensuring lapping is correct. Tiles are nailed in place through the front down turn and into the accessory batten through the turn up.

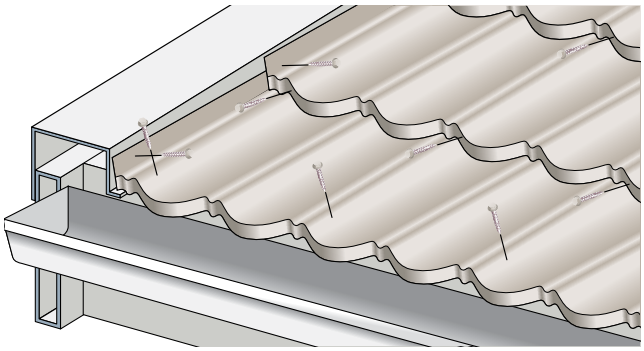


Figure 14.7.4.3 Fastener locations

Note the cut edge of a tile must be covered by accessories or other tiles on the roof to protect against weather.

14.7.5 Hip roof

Tiles are turned up against the hip accessory batten a minimum of 40 mm.

Lay the first full tile at the second to top course (if it doesn't fit, lay from the third to top course) so that the back of the tile is a minimum of 150 mm from the inside edge of the hip accessory batten (see **Figure 14.7.5.1**). This allows a full module to be used for the cut and bent hip tile.

Stagger and lay full tiles across the length of the roof until the last full tile. If the hip tile for the end section cannot be cut and bent out of a full tile it will be necessary to insert a part tile before the end of the hip. Bond, Milano and Classic can be cut in modular length, Shake, Senator, Rockport, Oberon, Aspen and Alpine have specific points where to cut (Refer to **7.0 Product-specific installation details** for each tile profile).

Lay the remaining full tiles down the roof leaving gaps at each end where hip tiles will need to be inserted.

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

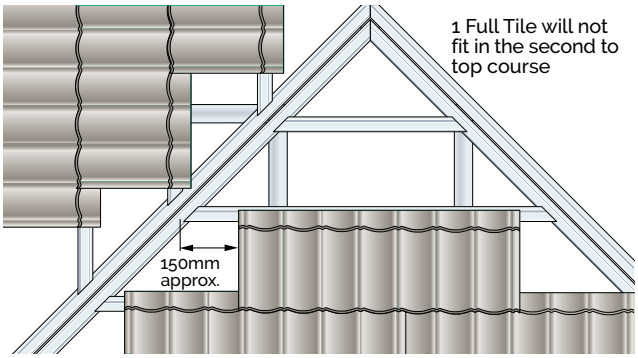


Figure 14.7.5.1 Laying tiles on a hip

Measuring, cutting and bending hip tiles

Measurements for cutting and bending tiles are taken on the roof.

All measurements need to be taken along the front face of the batten as this is where the tiles are fastened. Tiles need to be marked along a line where the batten will eventually be positioned. Failure to follow this procedure will result in bends being incorrect on the modular tiles.

The measurements are then transferred on to tiles on the ground where they are **cut**, **bent** and **stacked** in order.

For Bond, Classic and Milano: the measurement is taken from the centre of the water channel of the tile, along the front face of the tile batten on the roof to the inside of the hip accessory batten, this is the bend line. Add 40 mm for the turn up of the tile, this is the cut line. (Refer to section **6.4 Use of Fixing tools – guillotine and benders**).

For Shake, Senator, Rockport, Oberon, Aspen and Alpine: the measurement is taken from the edge of the side lap of the tile, along the front face of the tile batten on the roof to the inside of the hip accessory batten, this is the bend line. Add 40 mm for the turn up of the tile, this is the cut line. (Refer to section **6.4 Use of Fixing tools – guillotine and benders**).

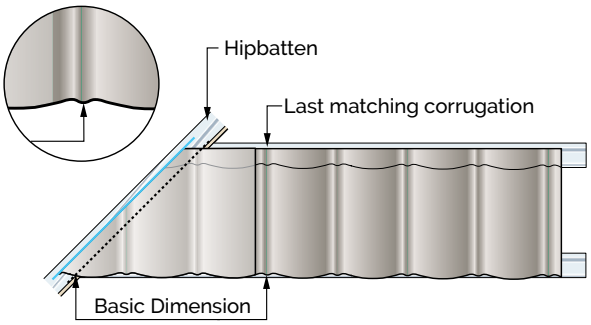
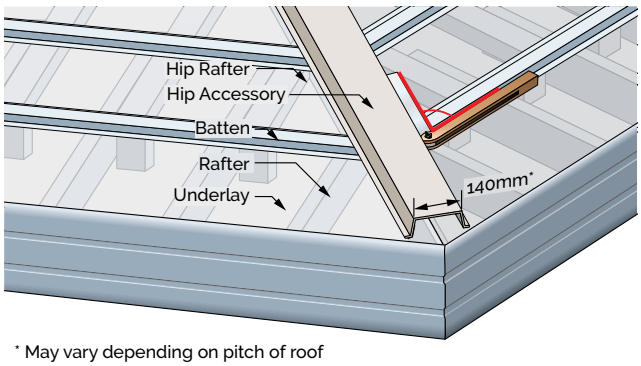


Figure 14.7.5.2 Cutting and bending a hip tile

A bevel set to the angle of the hip may then be used to mark the required angle for the hip tile. Alternatively measurements of the front and back of the tile along the front face of the tile batten may be used to provide the angle.



* May vary depending on pitch of roof

Figure 14.7.5.3 Tile bevel hip angle measurement

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

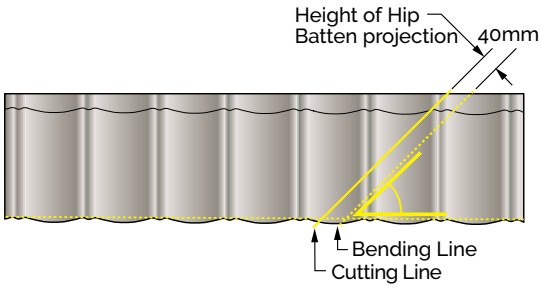


Figure 14.7.5.4 Transfer hip angle to the tile to be cut

Hip tiles are then laid to fill the gaps from the eave up, nailing through the front downturn and through the turn up into the hip accessory batten.

Bond, Milano and Classic need to be laid as described above as they are modular and require significant care in ensuring the modules line up down the roof.

Shake, Senator, Rockport, Oberon, Aspen and Alpine may be installed by pre-cutting and bending for the starting end of a hip. The angle of the hip tile is taken from the roof using a bevel; this is then transferred onto the tile on the ground. Each tile should be made a slightly different length so that when the roof is completed it will have a random pattern on the roof. This results in only having to measure the end hip tile gaps.

Each tile should supply two cut sections leaving a minimum wastage.

Careful cut tile selection and use of cut tiles for hips and valleys also reduces waste.

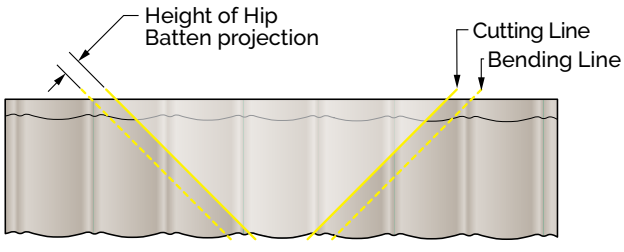


Figure 14.7.5.5 Hip cuts out of a tile

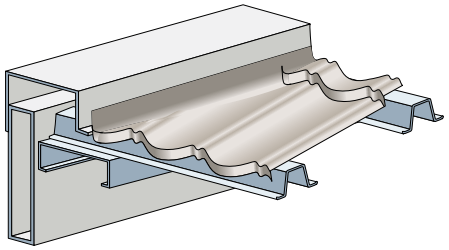


Figure 14.7.5.6 Hip cut against a batten

Note: the cut edge of a tile must be covered by accessories or other tiles on the roof to protect against weather.

14.7.6 Ridge tiles

Measurements for bending and cutting tiles are taken on the roof. Ridge tiles are **bent** before **cutting**.

All measurements need to be taken along the front face of the batten as this is where the tiles are fastened. Tiles need to be marked along a line where the batten will eventually be positioned.

The measurement is taken from the front of the headlap of the tile to the front of the ridge tile batten (A), this is the bend line. Add 40 mm for the turn up of the tile, this is the cut line. (Refer to **6.4 Use of fixing tools – guillotine and benders**).

Measurements along the ridge are required to ensure that the cut tiles are correct (do NOT assume that the ridge is exactly straight unless you have measured).

The measurements are transferred to tiles on the ground. The tiles are **bent**, **cut** and **stacked** in order as they will be laid on the roof.

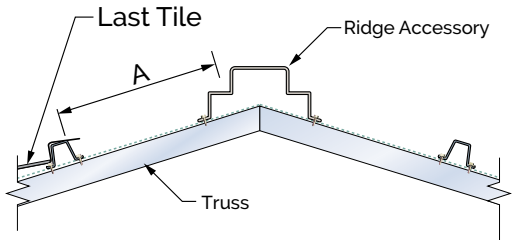


Figure 14.7.6.1 Standard ridge/hip setup

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

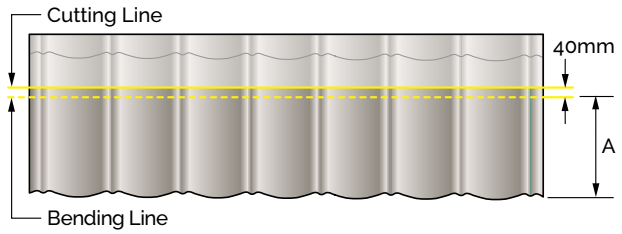


Figure 14.7.6.2 Standard ridge/hip cut and bend lines

Figure 14.7.6.3 Ridge tile being bent then cut

Bend the tile before cutting, if you cut and then bend the tile will bow excessively.

Installing ridge tiles

Fasten the ends of the front of the tile first (Steps **1** and **2** in **Figure 14.7.6.4**), then fasten the outside ends of the back of the tile so that the modules line up with other tiles on the roof, also fasten the back so that the pitch of the top course tile is the same as the roof (Steps **3** and **4** in **Figure 14.7.6.4**). By fastening each end the back of the tile will bow up (due to the distortion created when bending) (see **Figure 14.7.6.4**); push the centre of the tile down and nail the upturn to the ridge batten in several places (see **Figure 14.7.6.5**).

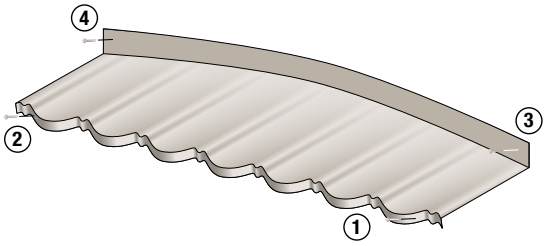


Figure 14.7.6.4

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

Figure 14.7.6.5

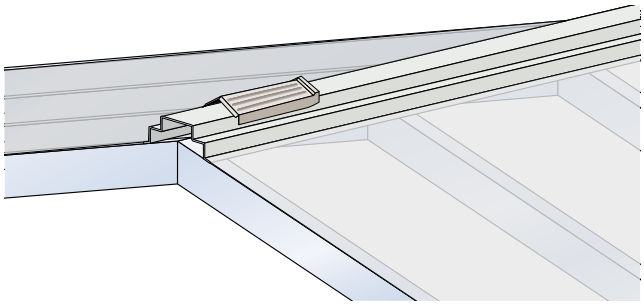


Figure 14.7.6.6 Ridge hip tile and Angle trim installed over a ridge accessory

Note: the cut edge of a tile must be covered by accessories or other tiles on the roof to protect against weather.

14.7.7 Valley tiles

Measurements for cutting and bending tiles are taken on the roof.

All measurements need to be taken along the front face of the batten as this is where the tiles are fastened. Tiles need to be marked along a line where the batten will eventually be positioned. Failure to follow this procedure will result in bends being incorrect on the modular tiles.

The measurements are then transferred on to tiles on the ground where they are **cut**, **bent** and **stacked** in order.

For Bond, Classic and Milano: the measurement is taken from the centre of the water channel of the tile, along the front face of the tile batten on the roof to 30 mm past the edge of the valley. The turn down is not parallel to the bend line, add 40 mm at the front (nose) of the tile and 30 mm to the back of the tile, this is the cut line (see **Figure 14.7.7.1**). (Refer to **6.4 Use of fixing tools – guillotine and benders**).

For Shake, Senator, Rockport, Oberon, Aspen and Alpine: the measurement is taken from the edge of the side lap of the tile, along the front face of the tile batten on the roof to 30 mm past the edge of the valley. The turn down is not parallel to the bend line, add 40 mm at the front (nose) of the tile and 30 mm to the back of the tile, this is the cut line (see **Figure 14.7.7.1**). (Refer to **6.4 Use of fixing tools – guillotine and benders**).

The slope on the cut made on valley tiles is required to make sure that the bottom edge of the valley tile appears straight in the valley.

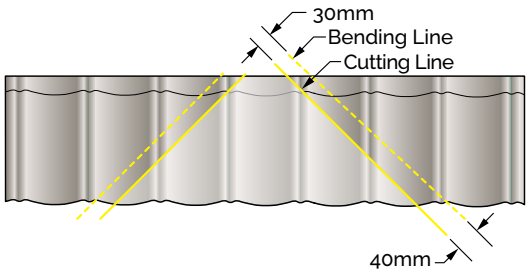


Figure 14.7.7.1 Cut and bend lines of a valley tile

Figure 14.7.7.2 Valley tile being cut then bent

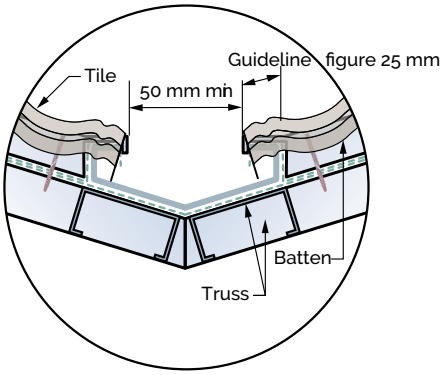


Figure 14.7.7.3

Cut and bend the tiles at the valley as straight as possible to obtain a straight line. Lay the valley tiles from the eave up. Never fasten into a valley.

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

14.8 Use of fixing tools

Guillotine

The guillotine can be used to cut tiles or accessories as required.

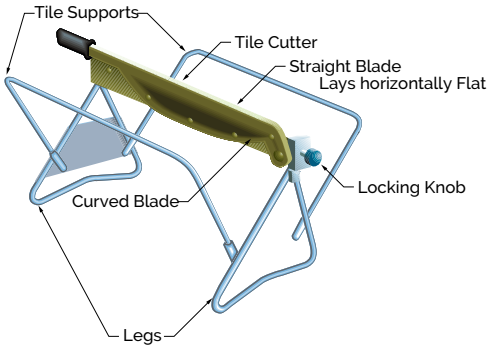


Figure 14.8.1

14.8.1 Gable, hip and valley tiles

Flattening the nose and headlap before cutting the tile will make cutting easier.

Figure 14.8.1.1

Cut along the marked line, a quick single motion down while pulling the guillotine blade towards yourself (to the left) will keep the blades together and usually ensure that a cut is made in one operation. If more than one cut is required move the tile closer to where the blades intersect as this is where the guillotines cutting power is greatest.

Hold the tile so that the largest side is held in the left hand, this gives you greater control over the tile being cut.

Cutting a tile

Figure 14.8.1.2

Bending a tile

Figure 14.8.1.3

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

14.8.2 Ridge tiles

These are bent in the long tile bender before cutting to help reduce tile distortion (splay).

Figure 14.8.2.1

These tiles are cut along the length of the tile, so it will take several cuts to complete a ridge tile.

Start with the tile headlap to the right of the guillotine blade, make short cuts along the cut line pushing the tile into the first 1/3 of the cutting area of the guillotine. Continue the sequence until the tile is cut.

Figure 14.8.2.2

14.8.3 Short tile bender

The short tile bender is used for folding turn-ups required for gable, hip and wall tiles and for the turndowns into valleys. It clamps and flattens the tile turn-ups so that the tiles can be installed under accessories.

Short tile bender

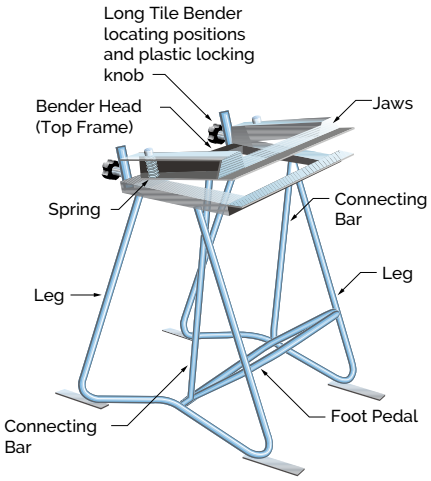


Figure 14.8.3.1

14.8.4 Long tile bender

This folder attaches to the back of the short tile bender. It can be used for folding ridge tiles and if necessary gable, hip or valley tiles.

Long tile bender

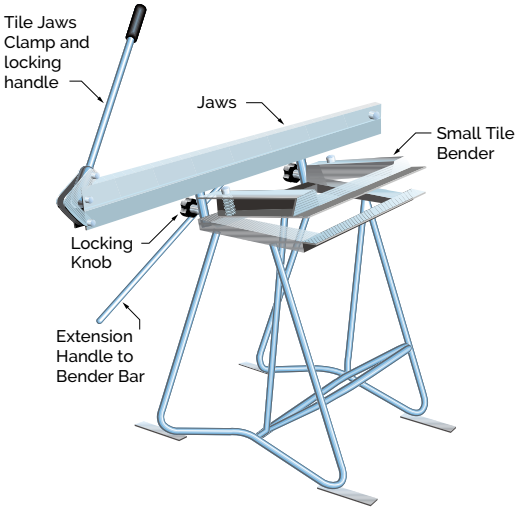


Figure 14.8.4.1

Note: Installation on steel battens is not covered by BRANZ Appraisal no. 1096.

Important information about this material

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