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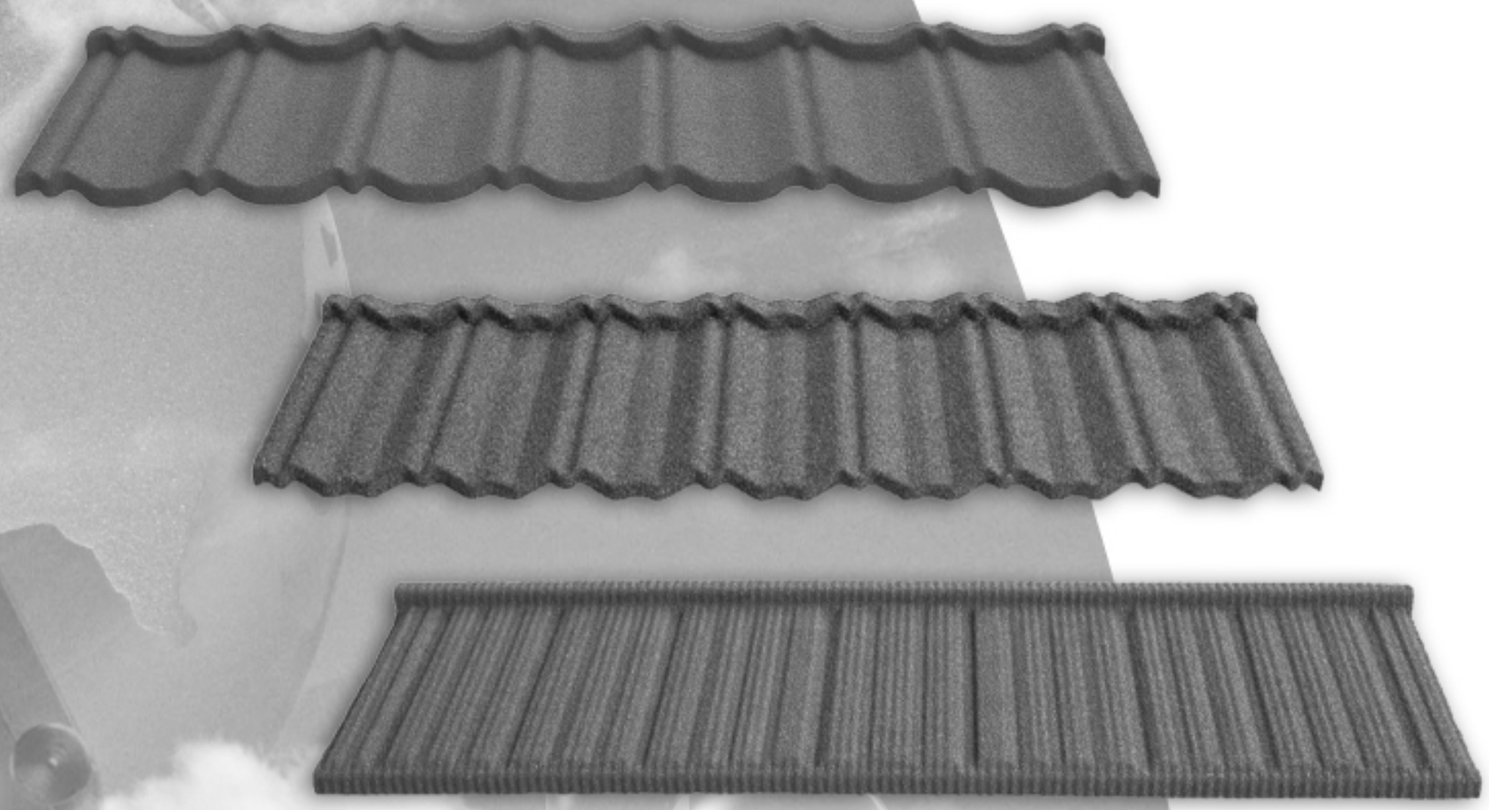
KAB
(KAB-QC-30)

JASCO
STEEL ROOF TILE
INSTALLATION GUIDE



유한회사 중앙강재
JUNG ANG STEEL CO., INC.

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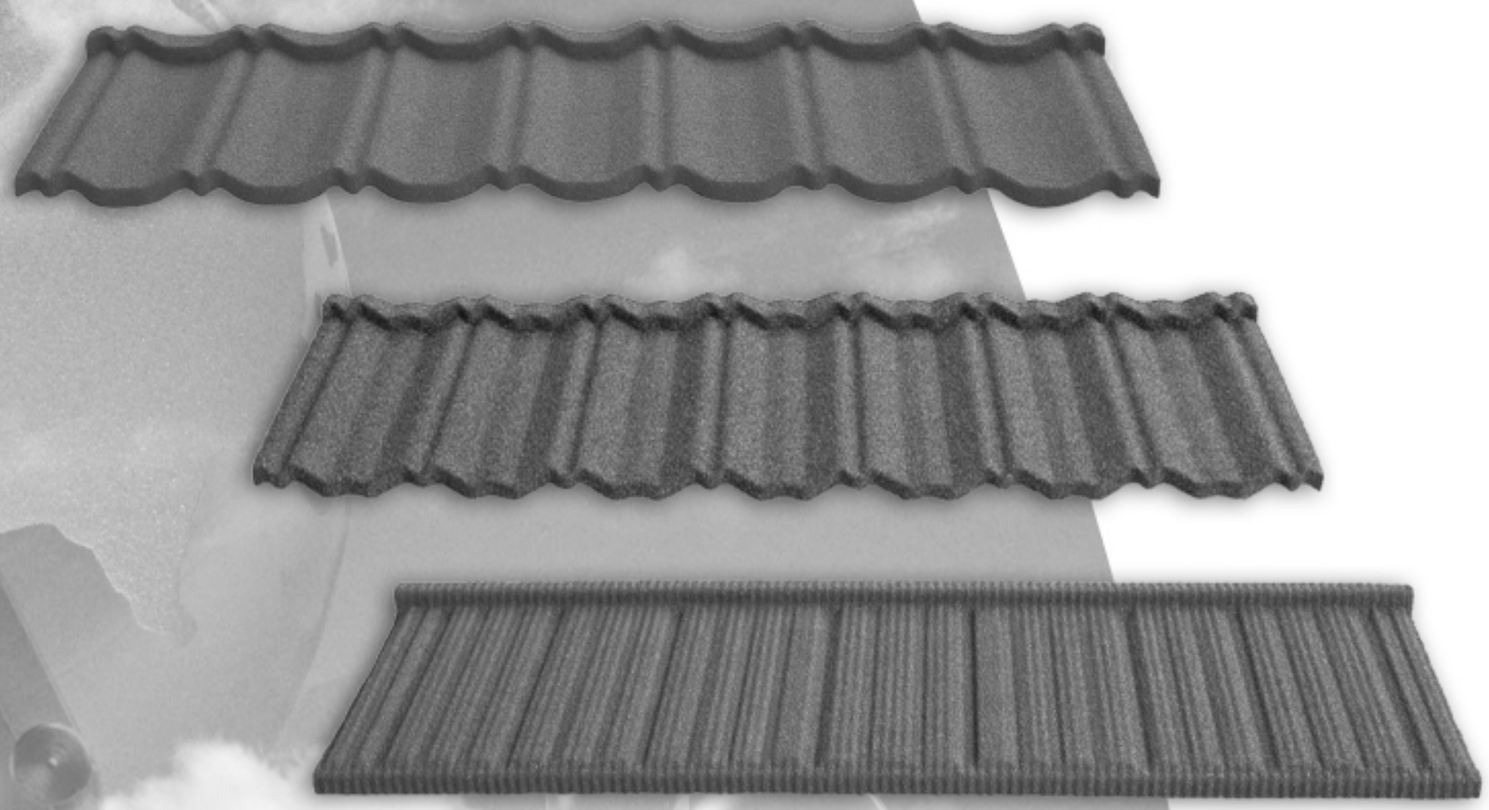

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JUNG ANG STEEL CO., INC.

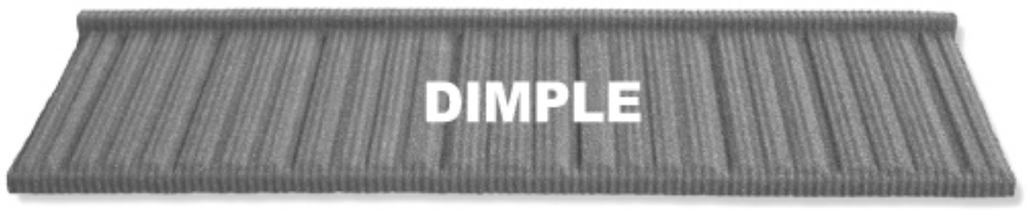
STANDARD PROFILE 표준기와

STAR-BOND

Overall Length	1335mm (4′4 3/5″)	Roof Cover/Tile	0.47m²(5ft²)
Length of Cover	1260mm (4′1 5/8″)	Tiles/m²	2.15
Width of Cover	370mm (1′2 4/7″)	Weight/Tile	2.8kg(6.17lbs)
UpStand	25.4mm (1″)		

HILLOCK

Overall Length	1335mm (4′4 3/5″)	Roof Cover/Tile	0.47m²(5ft²)
Length of Cover	1260mm (4′1 5/8″)	Tiles/m²	2.15
Width of Cover	370mm (1′2 4/7″)	Weight/Tile	2.8kg(6.17lbs)
UpStand	25.4mm (1″)		



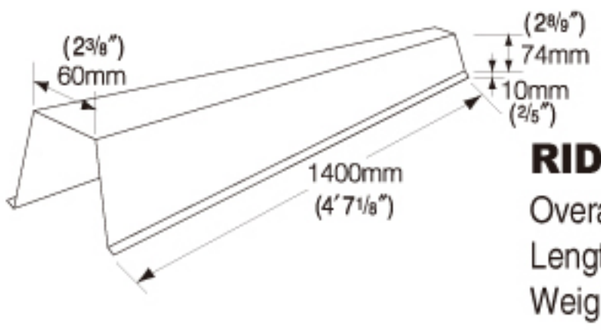
DIMPLE

Overall Length	1325mm (4′4 1/6″)	Roof Cover/Tile	0.46m²(4.95ft²)
Length of Cover	1255mm (4′1 3/7″)	Tiles/m²	2.17
Width of Cover	370mm (1′2 4/7″)	Weight/Tile	2.9kg(6.39lbs)
UpStand	28mm (1 1/8″)		

STAR-COLOR

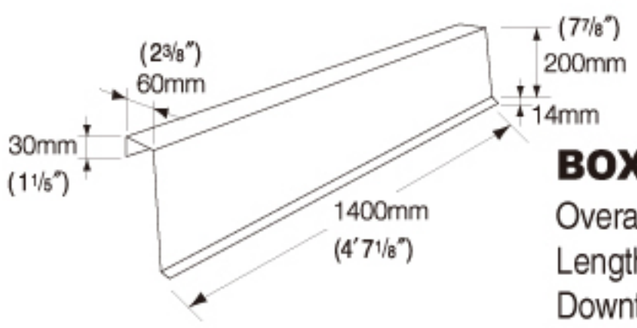
Overall Length	1335mm (4′4 3/5″)	Roof Cover/Tile	0.47m²(5ft²)
Length of Cover	1260mm (4′1 5/8″)	Tiles/m²	2.15
Width of Cover	370mm (1′2 4/7″)	Weight/Tile	2.0kg(4.41lbs)
UpStand	25.4mm (1″)		

STANDARD ACCESSORIES 표준부속



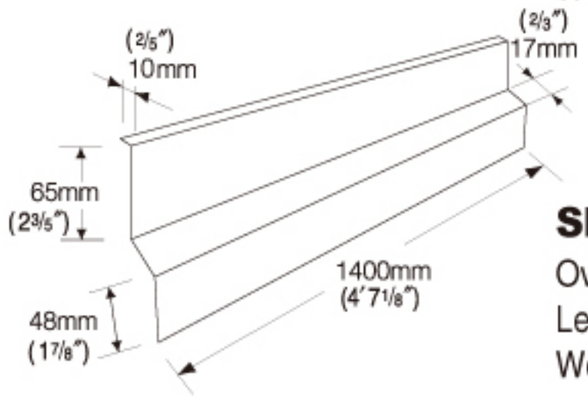
RIDGE/HIP CAP

Overall Length	1400mm (4′7 1/8″)
Length of Cover	1300mm (4′3 1/5″)
Weight / Unit	1.5kg (3.31lbs)



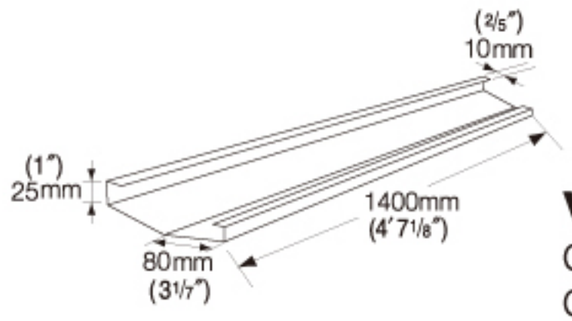
BOX BARGE COVER

Overall Length	1400mm (4′7 1/8″)
Length of Cover	1300mm (4′3 1/5″)
Downturn	214mm (8 2/5″)
Width	60mm (2 3/8″)
Weight / Unit	2.1kg (4.63lbs)



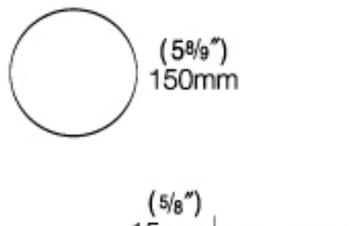
SIDE FLASHING

Overall Length	1400mm (4′7 1/8″)
Length of Cover	1300mm (4′3 1/5″)
Weight / Unit	0.9kg (1.98lbs)



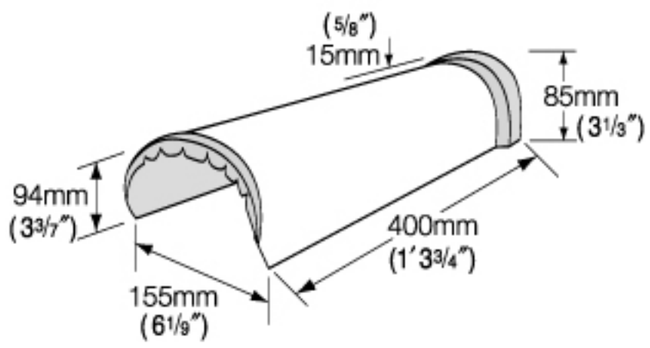
VALLY GUTTER

Overall Length	1400mm (4′7 1/8″)
Overall Width	1300mm (4′3 1/5″)
Weight / Unit	1.5kg (3.31lbs)



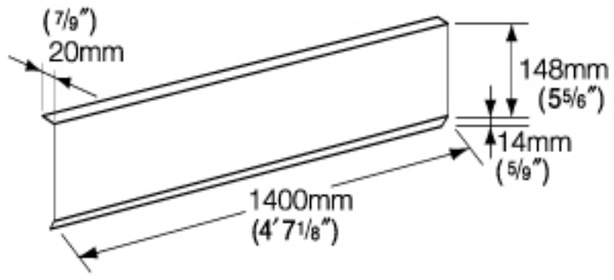
BARREL END CAP DISC

Diameter	150mm (5 7/8″)
Weight / Unit	0.1kg (0.22lbs)



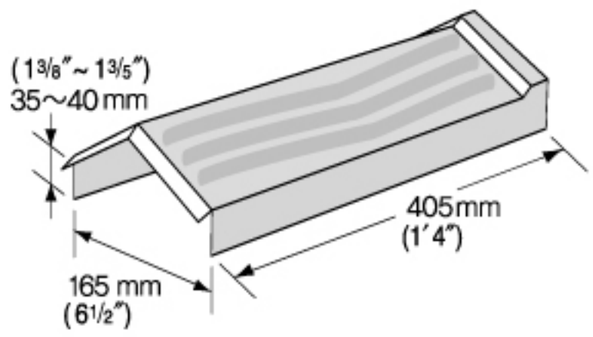
BARREL CAP

Overall Length	400mm (1′3 3/4″)
Length of Cover	370mm (1′2 4/7″)
Weight / Unit	0.5kg (1.1lbs)



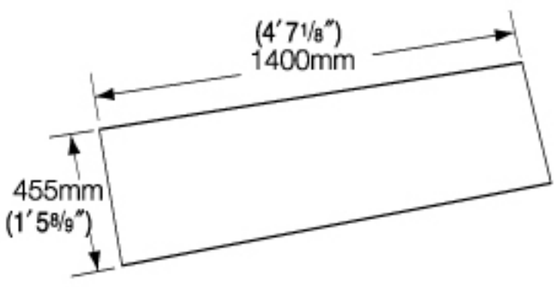
TEXAS FLASHING

Overall Length	1400mm (4′7 1/8″)
Length of Cover	1300mm (4′3 1/5″)
Into Wall	20mm (7/9″)
Downturn	148mm (5 5/6″)
Weight / Unit	1.2kg (2.65lbs)



ANGLE TRIM

Overall Length	405mm (1′4″)
Length of Cover	370mm (1′2 4/7″)
Weight / Unit	0.5kg (1.10lbs)



FLAT SHEET

Overall Length	1400mm (4′7 1/8″)
Overall Width	455mm (1′5 8/9″)
Weight / Unit	3.0kg (6.61lbs)

NOTE : SPECIAL SIZED FLASHINGS CAN BE PRODUCED TO ORDER IN A MAXIMUM LENGTH 0F 1.4 LINEAL METERS (4′7 1/8″)

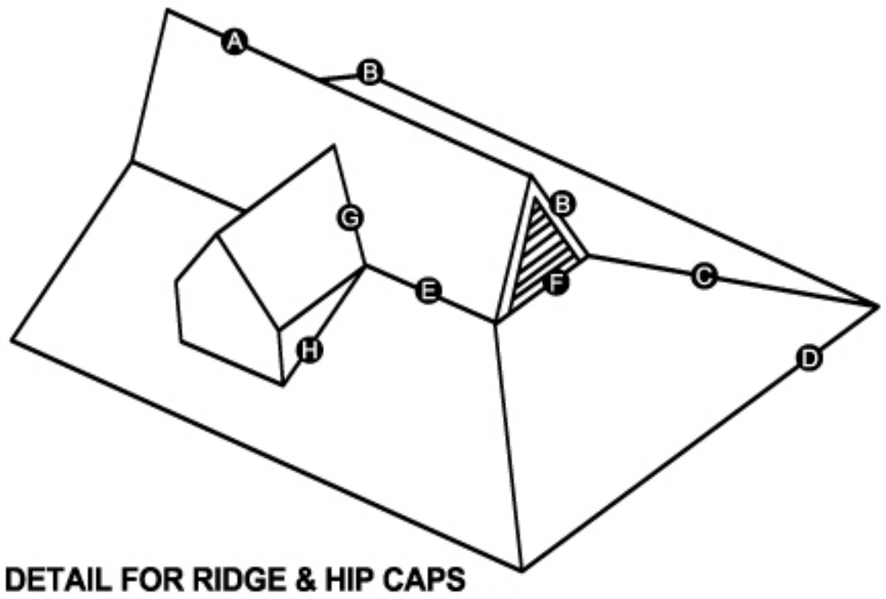
PACKING

Tiles are stacked on wooden pallets to the below measurements.

Products	Per pallet	Max weight	Size L x W x H	m³/ft³
JASCO STEEL ROOF TILE	400	1050kg(2310lbs)	1.4x1.1x0.9(4′6″x3′6″x3′)	1.38/49.28

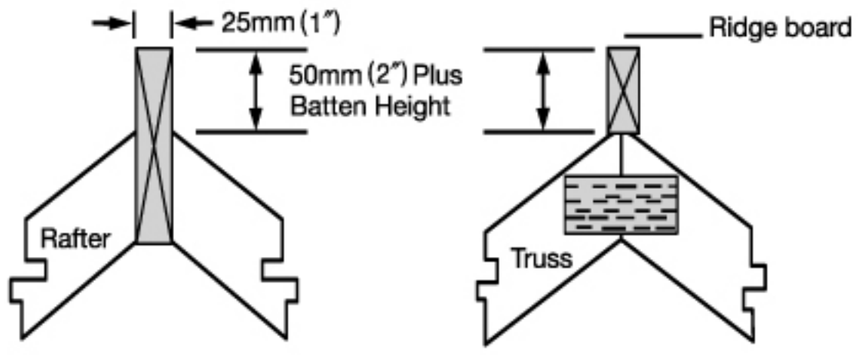
Export: 16 pallets plus sufficient roofing accessories can be packed into a standard 20ft container. Special packing can be offered on request to conform to the importing countries' requirements. This equates to 3200m²(34400ft²) of roofing area.

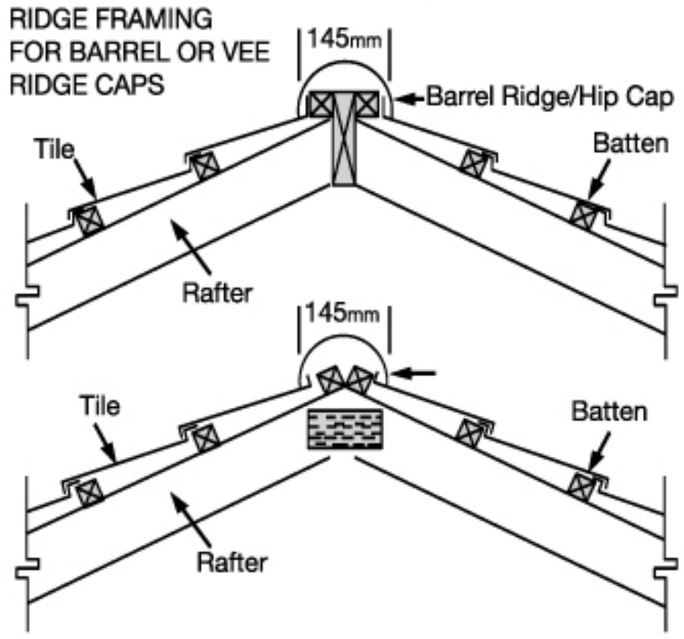
INSTALLATION GUIDE



A RIDGE DETAIL FOR RIDGE & HIP CAPS

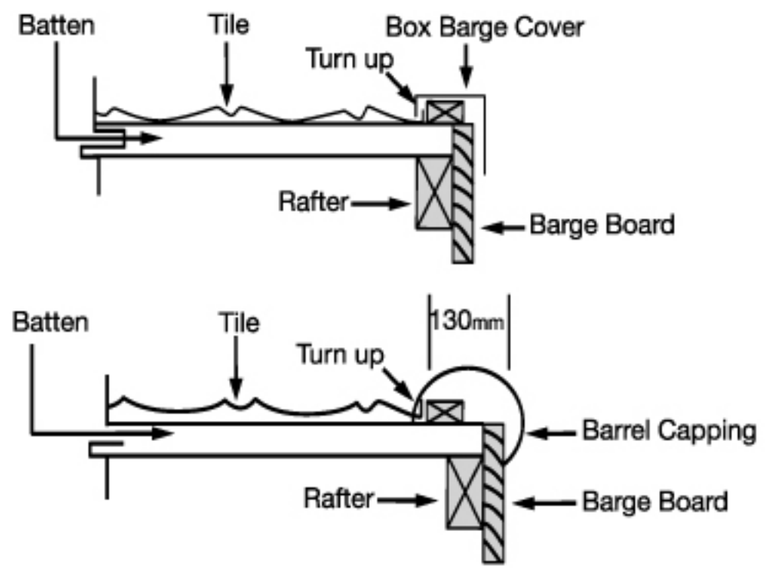
Should project 50 mm(2") plus batten height above rafters, and be formed from 25mm(1") thick timber.





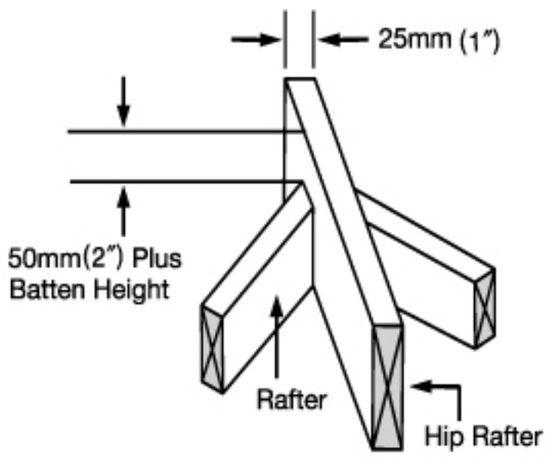
B BARGEBOARDS

Barge Boards must project to the top of the batten.
Note : tile ends MUST be turned up.



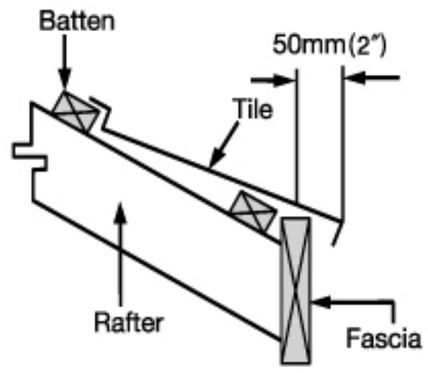
C HIP FINISH - FOR STANDARD RIDGE

Should be installed 50mm(2") plus batten height above rafters, and be formed from 25mm(1") thick timber. Note : Metrotrim of Vee-Ridge installations do not require a hip board.



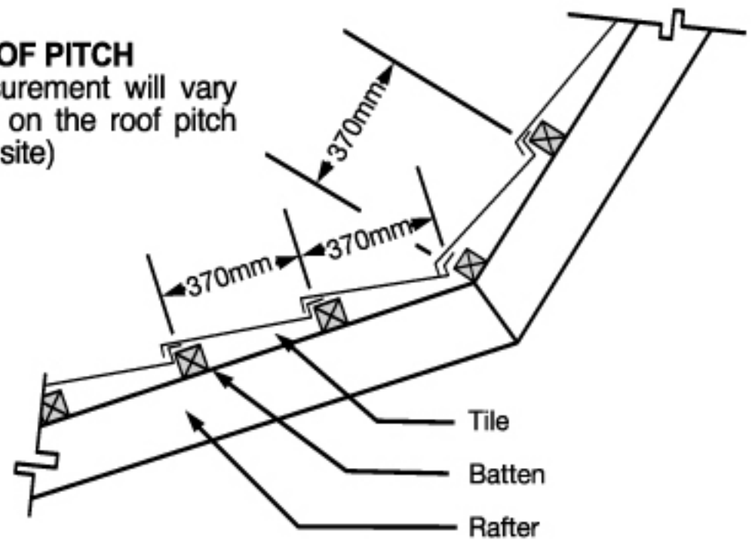
D FASCIA

The fascia must not project above the rafter more than the height of the batten being used.
When a rainwater collection system is required, the tiles will overhang the fascia by 50mm(2")



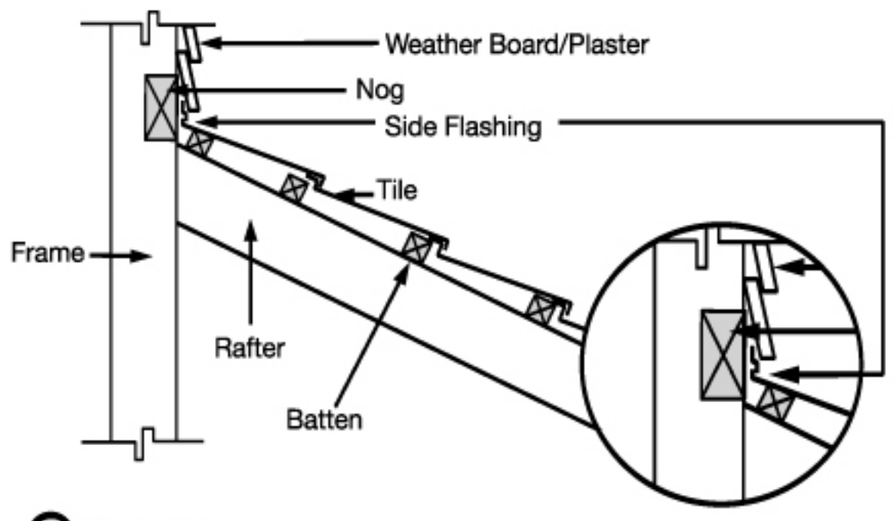
E CHANGE OF PITCH

This measurement will vary depending on the roof pitch (Check on site)



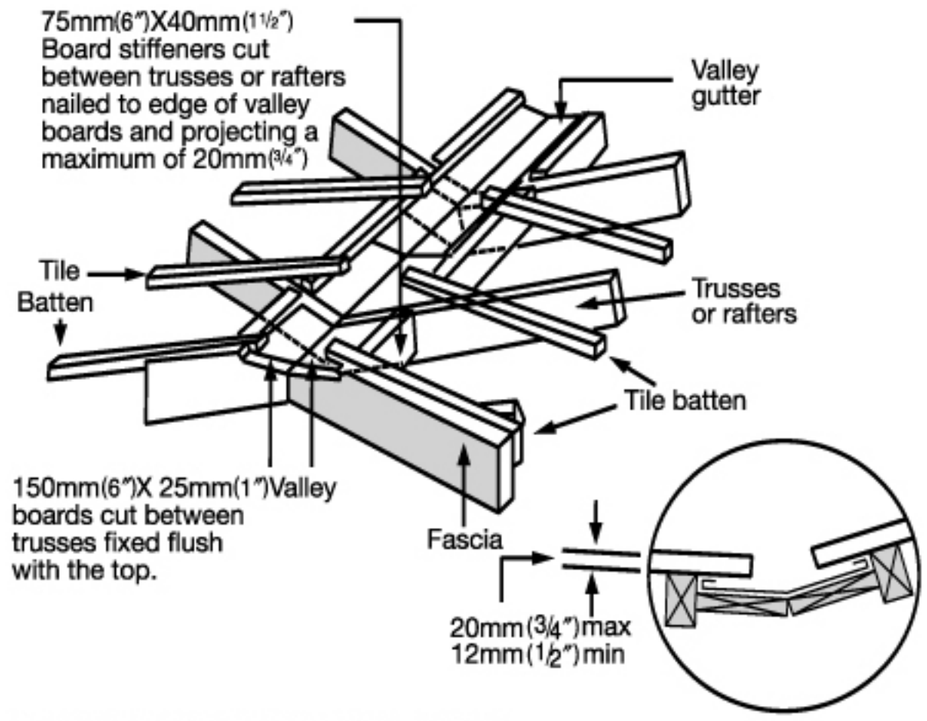
F DUTCH GABLES

When vertical junctions occur, the tiles are bent up and flattened to provide a turn-up under the dutch gable lining and side flashing used.

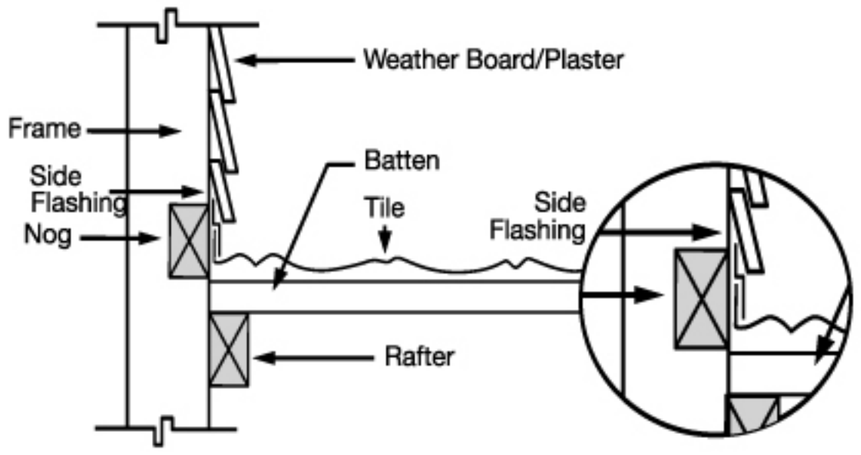


G VALLEYS

The accompanying details suggest some of the ways valley gutters may be fitted. Local accepted practise, building regulations and site conditions will dictate the final method. The valley gutter is formed from galvanised sheet metal strip, the size being determined in accordance with local conditions.



H JUNCTIONS WITH VERTICAL FACES



TILE INSTALLATION

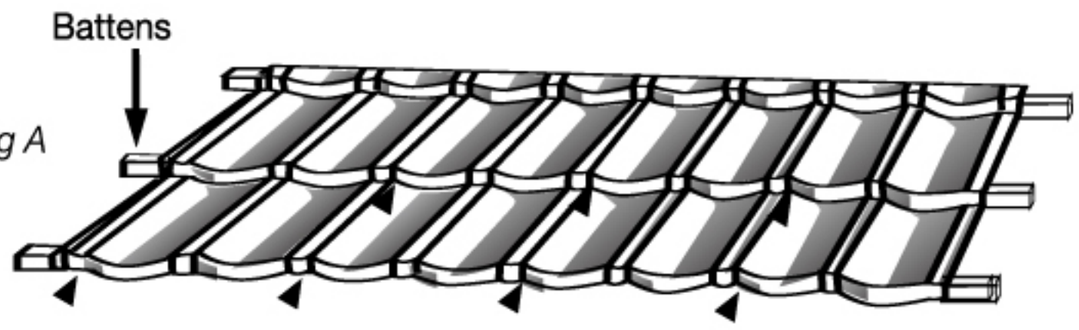
❖ NAILING

The correct position for nailing tiles to battens is shown in(Fig. A.) Tiles are secured by nailing through the front downturned flange into the side of the batten.

Nails should be approximately 60mm(2½″)to the side of the centre of the pan of the tile(fig. B): and close to the bottom of the downturned flange. This ensures good holding of the tile and ample penetration of the batten at the same time restricting nail penetration to a maximum of three thickness.

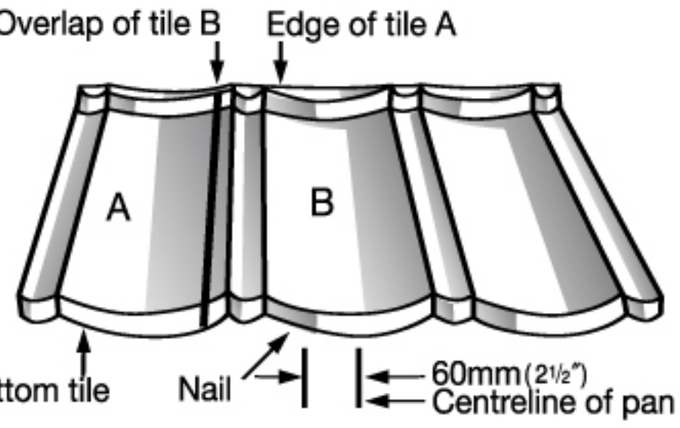
NOTE: In areas prone to cyclones and hurricanes, installation must meet local standards and bylaws. Low wind zones nailing should be at 8 points per tile for the top two courses and bottom two courses of tiles and also within one tile length from hips, valley and barges.

Fig A



Nailing points 4 per tile

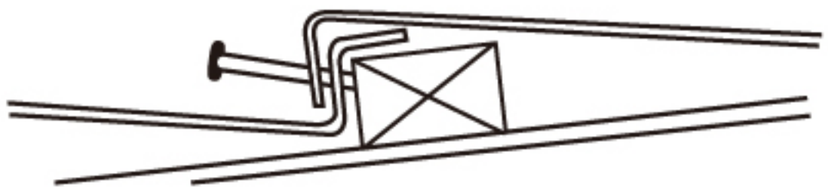
Fig B

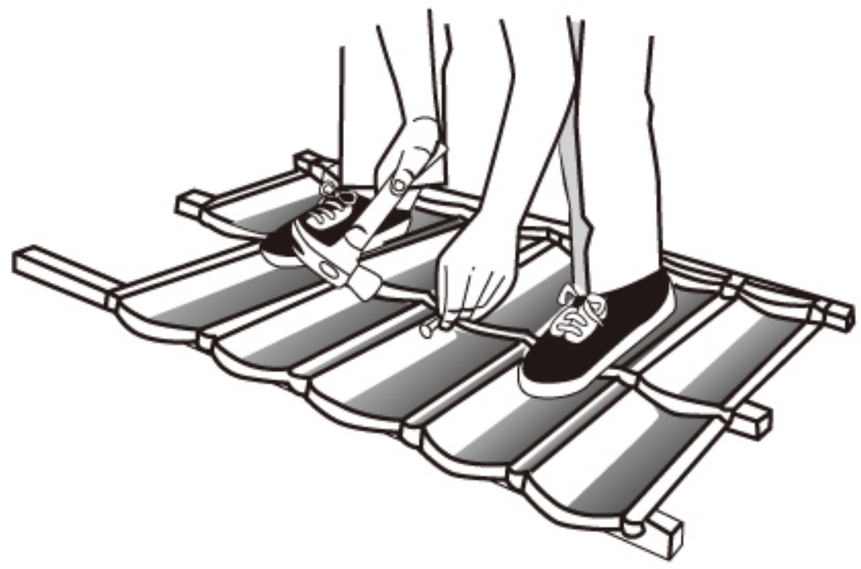


4 nails per tile positioned out of water course.

❖ NAILING TECHNIQUE

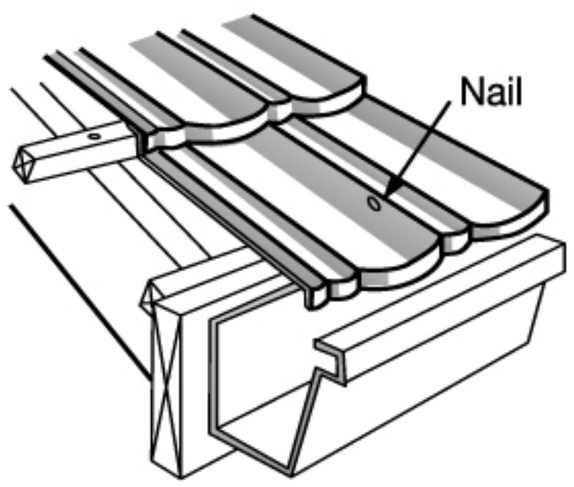
The person nailing should stand on the tile being installed facing the faxcia and nailing as shown.





❖ EAVES/FASCIA

At eaves, tiles are fixed through the top surface of the tiles into the batten immediately behind the fascia. The nail should be close to the high point of the tile profile. To ensure weatherproofing, the nail must be sealed. Shake nail positions must be out of the water course.



❖ TILE LAYING

Tiles can be interlocked either right over left or left over right but should be laid with the laps facing away from prevailing winds or from discharging rain water pipes or valleys.

Where possible the tiles shoulld also be laid with the laps facing away from the normal line of sight.(Fig. 1.1)

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(Fig. 1.2)

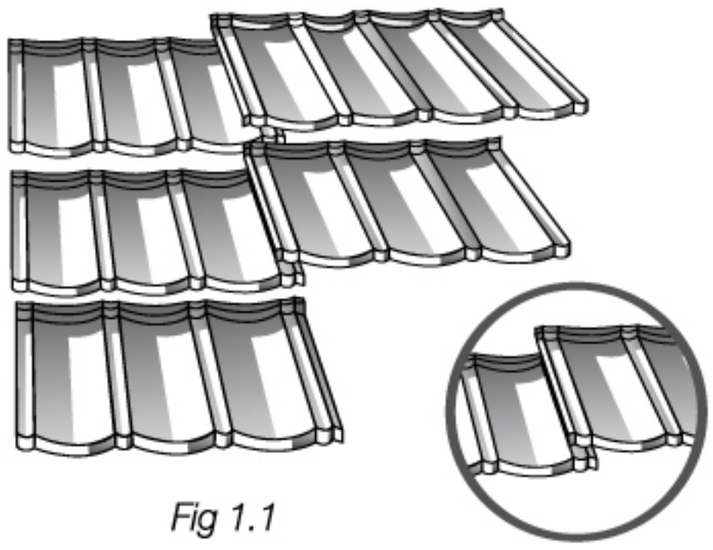
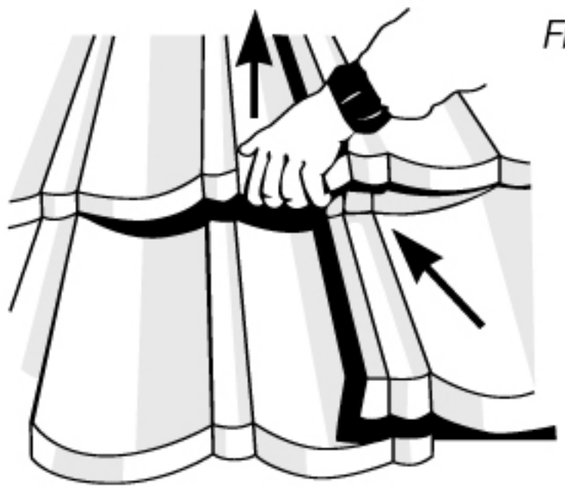


Fig 1.1

Fig 1.2



INSTALLATION GUIDE

❖ TILE INSTALLATION PROCEDURE - HIP ROOF

General instructions for tile laying as described above.

On the second to top course, lay the top corner of the first tile 150mm(6") form the hip board. Continue to lay tiles towards the other hip until the last full tile will fit.

Secure these tiles by tacking through the back flange. Lay subsequent courses two at a time, both starting about the same distance from the hip board(Fig. 1.3)

Care should be taken to line up the corrugations. To reduce waste, use part tiles to complete rows within approximately 150mm(6") of hip board. This allows each end of a full tile to be cut and bent to fill the gaps.

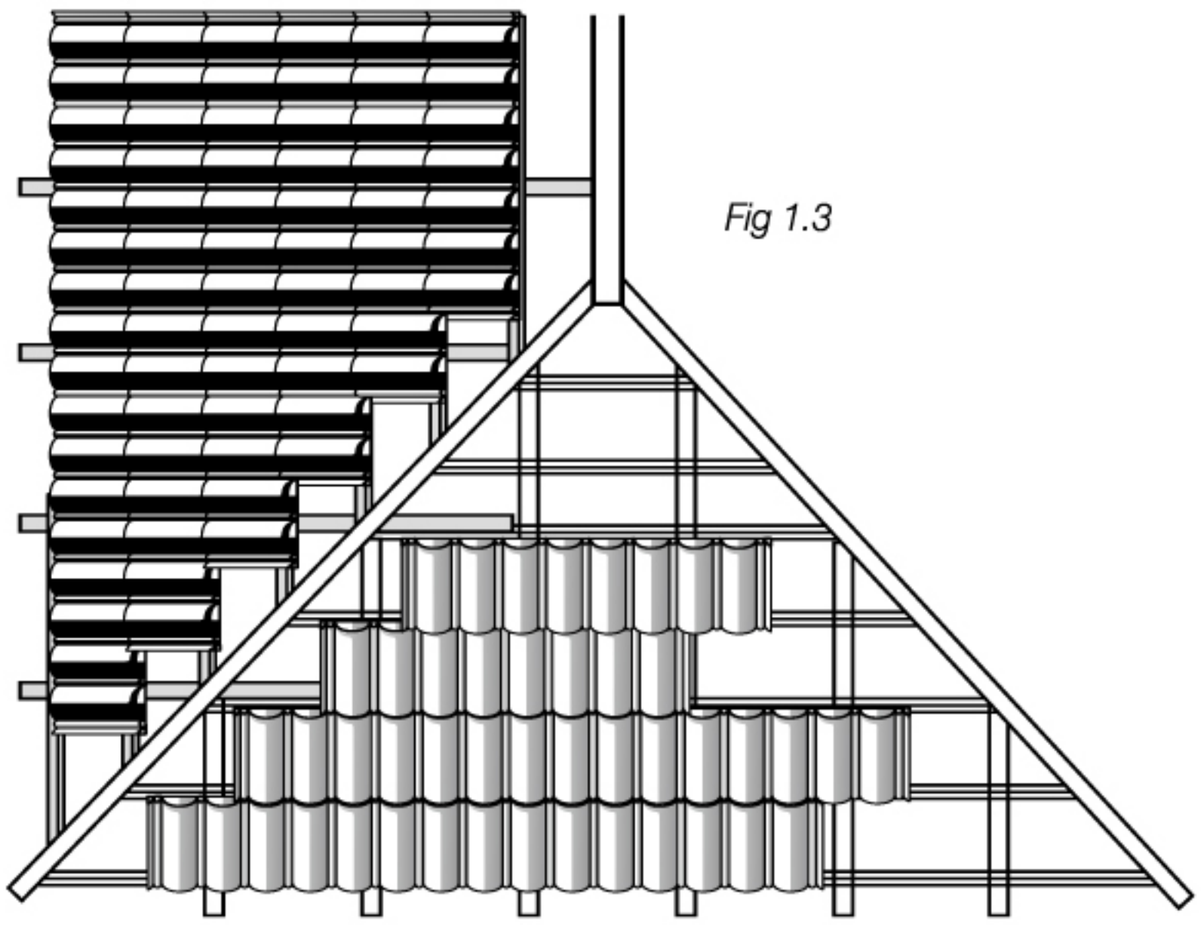


Fig 1.3

❖ MEASUREMENTS AND MARKING

Measurements are made on the roof, but tiles are normally marked, cut, bent and stacked on the ground.

To save time marking, cutting and bending each tile, it is best done by both installers - one to measure and the other to enter the measurements on a board or piece of paper as shown(Fig. 1.4). To avoid confusion, cut, bend and stack tiles in strict order. Note the following steps:

(i) The basic measurement (recorded on paper or board) is taken from the last corrugation on the bottom corner of the last full tile, to the hip board, along the front edge of the batten(Fig. 1.5).

(ii) Measure and mark on the tiles with chalk or similar, the required measurements taken from the roof, ensuring the MATCHING corrugation of the overlapping tile to be cut, is taken as the measure starting point(Fig. 1.5). This forms the BENDING line(Fig. 1.6).

Add to the bending line measurement the height of the ridge board projection above the tile line. Mark on the tiles with chalk or similar. This forms the cutting line(Fig. 1.6).

ALTERNATIVELY-Set a bevel to the angle formed by the hip board and tile batten. Place the bevel on the tile so that the measuring mark on the front of the tile lines up with the inside of the bevel to form the CUTTING line.

Each tile should supply two cut pieces leaving a minimum of wastage(Fig. 1.6).

NOTE : As measurements are taken from the face edge of the batten, measurement markings of the title should be along this line also.

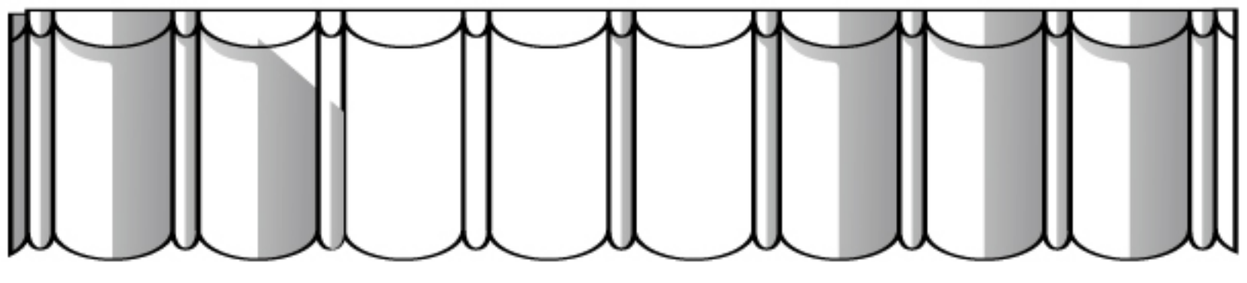
Left- Hand Side

Top	475mm(18¾")
Bottom	845mm(33½")
Top	560mm(22")
Bottom	930mm(36¾")
Top	342mm(13½")
Bottom	712mm(28")

Right- Hand Side

Top	530mm(21")
Bottom	900mm(36")
Top	600mm(23½")
Bottom	970mm(38¾")
Top	380mm(15")
Bottom	750mm(30")

Fig 1.4



TILE INSTALLATION

HIPS

❖ CUTTING

Use the guillotine the scissors to cut along the pre-marked cutting lines.

❖ BENDING

Place the tile in the bender and line up the marks showing the bend line. Operate the foot controlled vice mechanism to hold the tile firmly, and bend the tile upwards.
Each cut tile will vary slightly in size, and as cutting and bending are done on the ground, it is very important not to mix up the individually cut tiles. Stack them in the sequence that they will be used(Fig. 2.1).

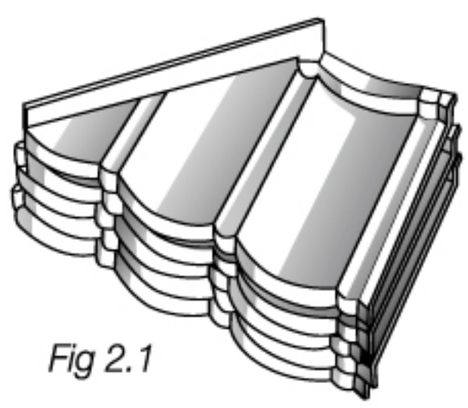


Fig 2.1

❖ INSTALLATION OF CUT TILES

Install all cut tiles by nailing through the turn-up into the hip board, and one or more nails through the front edge into the battens(Fig. 2.2), starting from the bottom course.

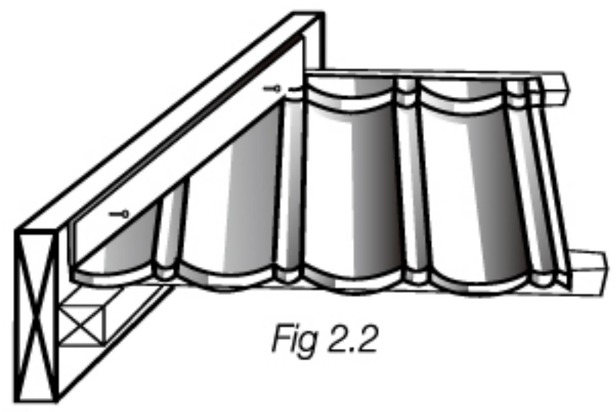


Fig 2.2

VALLEYS

❖ TILE MEASURING, CUTTING AND BENDING

Tile measuring, cutting and bending for valleys is carried out as for hips, except that the bends are downwards.
Measure the distance from the last corrugation of the installed tile to the desired finished tile line in the valley(approximately 40mm(1⅝″) to each side of the valley centre line(Fig. 2.3). This measurement is done at the top and bottom of the installed tile. This is the BEND line. To this measurement add the depth or the valley from the FINISHED TILE line minus 10mm(⅜″) which is the amount the tile will drop into the valley. This is the CUTTING line(Fig. 2.4) and will result in a tapered downturn.
Cut with the guillotion and bend down the tile at the bend line (Fig. 2.5). Install in the normal manner, endeavouring to place one nail close to the valley. DO NOT nail in the valley itself.

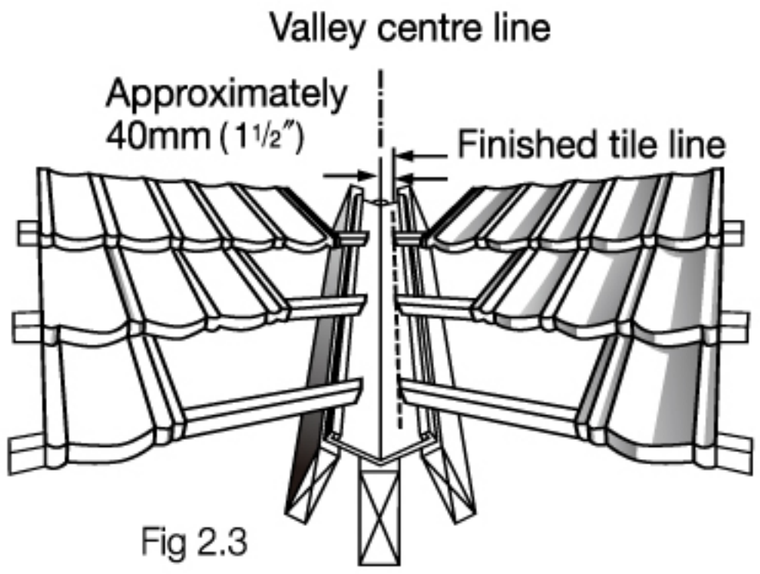


Fig 2.3

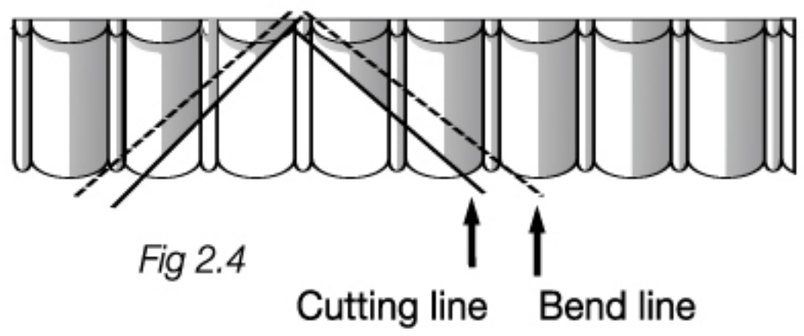


Fig 2.4

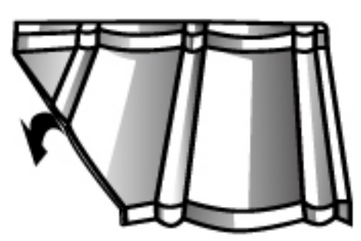


Fig 2.5

RIDGES

LAYING THE TOP COURSE OF TILES WHEN RAFTER LENGTH SUITS A FULL TILE COURSE.
The back edge of the tile must be straightened out. This is usually done in the bender.
LAYING THE TOP COURSE OF TILES WHEN RAFTER LENGTH DOES NOT SUIT A FULL TILE COURSE.

❖ PROCEDURE

Measure the distance (A) form the last tile to the ridge board (Fig. 2.6). Add 50mm(2") to the measurement (turn up allowance) and mark the tile to be cut(Fig. 2.7).

Fig 2.6

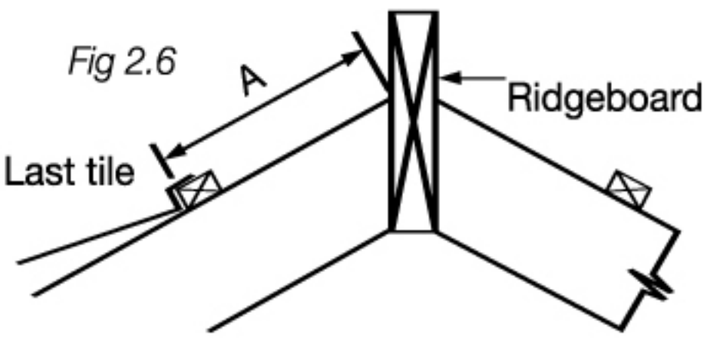
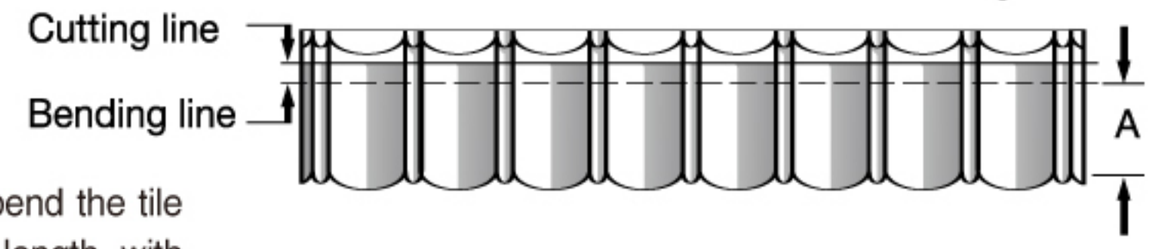


Fig 2.7



❖ BENDING AND CUTTING

Place the full-tile in the full-tile bending attachment which can be bolted to the bender. Line up the marks showing the bend line and bend the tile upwards. Tiles can be bent in ether the bender or, depending on the length, with the full-tile bending attachment. Finally cut along the marked cutting line using the guillotine or hand shears. It is essential to bend the tile before cutting to avoid tile distortion.

❖ INSTALLING THE TOP COURSE OF TILES

Install the top course of tiles to the ridge board by nailing each tile through the up stand to the ridge board in 4 places and nailing the bottom edge as previously described. Ensure that the top course of tiles follows the same pitch as the other courses (Fig. 2.8)

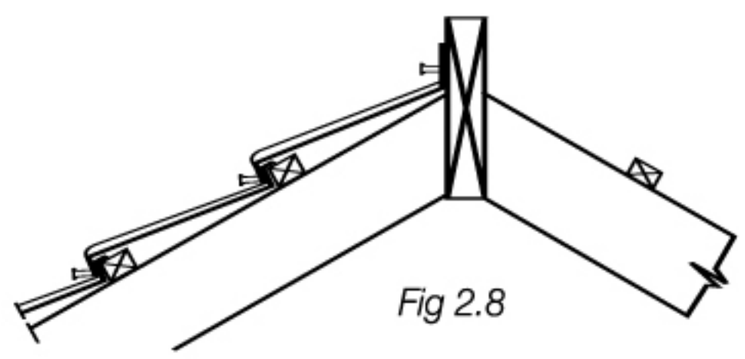


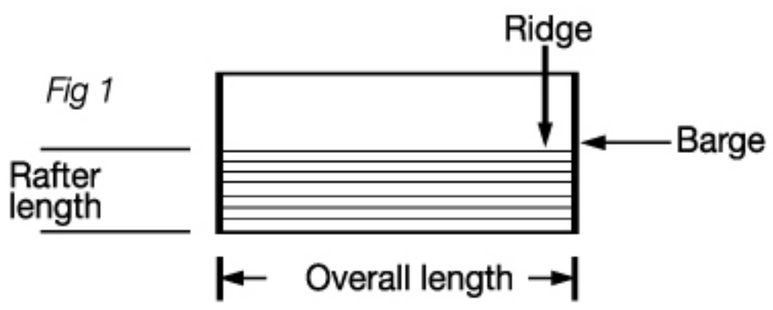
Fig 2.8

ESTIMATING DATA

ESTIMATING TILES FOR A STRAIGHT GABLE ROOF

(a) Determine the rafter length (Fig.1) and calculate the number of courses of tiles from the Tile Coverage Table. Always ensure that fractional tiles are counted as whole tiles as these will have to be cut at the ridge board.
(b) Determine the overall length of the roof (Fig. 1) and refer to the Tile coverage Table for the number of tiles required. Ensure that fractional tiles are counted as whole tiles.
(c) Multiply tiles (a) by tiles (b).
(d) Multiply the result by two when estimating for both sides of the roof.

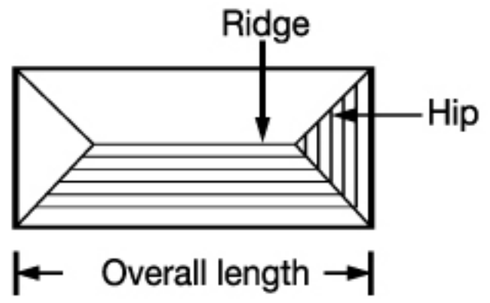
Fig 1



ESTIMATING TILES FOR HIP ROOFS

Treat the roof initially as a straight gable. Find the over - all length(Fig. 2) and refer to the Tile coverage Table to calculate the number of tiles required for coverage. Multiply the result by the number of courses of tiles needed to cover the rafter length. Multiply again by two when calculating for both sides of the roof. Find the hip length and using one of the formulae outlined (top of next column), calculate the extra tiles required for hips. Add this to the tiles required for the body of the roof.

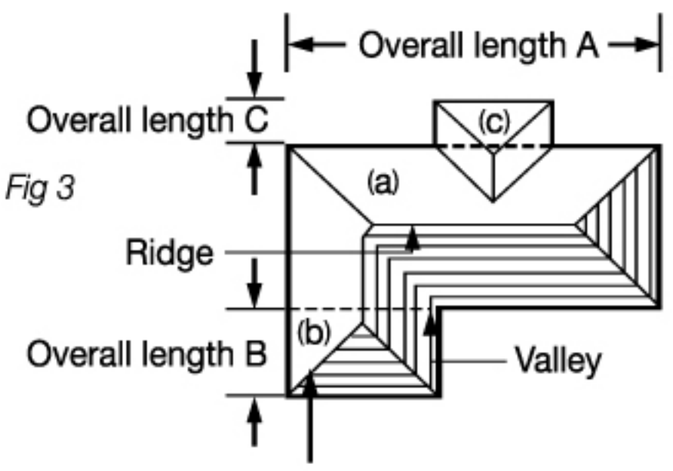
Fig 2



ESTIMATING TILES FOR HIP AND VALLEY ROOFS

First take the section with the longest rafters (section (a) of Fig. 3).
From the Tile Coverage Table calculate the requirements for that section and then for the remaining section(b)(c) of (Fig. 3).
[(a)+(b)+(c)] x 2 for both sides. Find the total length of hips and valleys, and using one of the formulae outlined (top of next column), calculate the additional tiles required for hips and valleys Add together the tiles for each section and the tiles for hips and valleys, to obtain the total tile requirement.

Fig 3



ESTIMATING ADDITIONAL TILES

Additional tiles for hips and valleys may be estimated using one of the following formulae:
Additional tiles = Total hip and valley length in linear meters x wastage factor 0.6 x 2.2 (tiles per square metre) OR
Additional tiles = Total hip and valley length in linear feet x 2 and divided by 5 (square feet per tile)

ESTIMATING ACCESSORIES

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

(a) RIDGE / HIP CAPS : Determine the length of ridges and/or hips. Divide by the liner coverage per cap(i.e 1.9m-6'3")to calculate the number of units required.

(b) BARGE COVER : Determine the length of barge boards. Divide by the linear coverage per Box Barge cover unit(i.e 1.9m-6'3")to calculate the number of units required.

(c) BARREL CAP / V-RIDGE : Determine the total length of ridges, hips and barge boards to be covered. Divide by the linear cover per unit(i.e 370mm-1'2½")to calculate number of Barrel Cap/V-Ridge required.

ESTIMATING BATTENS FOR NEW ROOFING

Provide 3 linear meters of battens per square metre of roof.

OR

Provide 100 linear feet of battens per 100 square feet of roof.

ESTIMATING BATTENS FOR OVERLAY RE-ROOFING

Provide 5 linear meters of battens per square metre of roof area.
OR

Provide 150 linear feet of battens per 100 square feet of roof area.

SIMPLIFIED METHODS FOR QUICK ESTIMATION

Some simplified methods for estimating quantities are outlined below. These may be useful as a quick checking method to prove estimating calculation:

(a) HIP ROOFS : calculate as for a straight gable roof, and add a half tile per course for each hip and valley to allow for wastage.

(b) BARGE : one length per five courses of tiles.

(c) BATTENS:
  (i) Number of tiles pule 50% equals linear meters of battens required.
  (ii) Number of tiles multiplied by 5 equals linear feet of batten required.

(d) UNDERLAY:
  (i) 50% of the tile quantity equals square meters of underlay required.
  (ii) Number of tiles multiplied by 5 equals square feet of underlay required.

TILE CALCULATION CHART

Rafter Length	*Tile Courses*	*Overall Roof Length*	*No. of Tiles*
0.345m (1'1 1/2")	1	1.410m (4'7 1/2")	1
0.710m (2'4")	2	2.660m (8'8 3/4")	2
1.080m (3'6 1/2")	3	3.920m (12'10 3/8")	3
1.450m (4'9")	4	5.180m (16'11 3/4")	4
1.820m (5'11 1/2")	5	6.440m (21'1 1/4")	5
2.190m (7'2")	6	7.690m (25'2 3/4")	6
2.560m (8'4 1/2")	7	8.950m (29'4 1/4")	7
2.930m (9'7")	8	10.200m (33'5 3/4")	8
3.300m (10'9 1/2")	9	11.470m (37'7 1/4")	9
3.670m (12 1/2")	10	12.720m (41'8 3/4")	10
4.040m (13'3")	11	13.980m (45'10 1/4")	11
4.410m (14'5 5/8")	12	15.240m (49'11 3/4")	12

Rafter Length	*Tile Courses*	*Overall Roof Length*	*No. of Tiles*
4.780m (15'8")	13	16.490m (54'1 1/4")	13
5.150m (16'10 1/4")	14	17.750m (58'2 3/4")	14
5.520m (18'1 3/4")	15	19.000m (62'4 1/4")	15
5.890m (19'3 7/8")	16	20.260m (66'5 3/4")	16
6.260m (20'6 1/2")	17	21.520m (70'7 1/4")	17
6.630m (21'9")	18	22.780m (74'8 3/4")	18
7.000m (22'11 1/2")	19	24.040m (78'10 1/4")	19
7.370m (24'2 1/8")	20	25.290m 82'11 3/4")	20
7.740m (25'4 3/4")	21	26.550m (87'1 1/4")	21
8.110m (26'7 1/4")	22	27.800m (91'2 3/4")	22
8.480m (27'9 3/4")	23	29.060m (95'4 1/4")	23
8.850m (29'3/8")	24	30.320m (99'5 3/4")	24

STANDARD PACKING FOR EXPORT

- **STAR BOND :** 400tiles per pallet can be stacked with a maximum weight of 1250kg
- **HILLOCK :** 16 standard pallets plus sufficient roofing accessories can be packed
- **DIMPLE** : into a standard 20 ft (6.10m) container. Special packing can be offered on request to conform to importing countries' reqirements.
  Note : Base Dimension of wooden pallets-1400mm × 1100mm
- **Handing and storage :** If stored outside, a cover should be placed over the tiles to prevent damage and to keep them dry. Care should be taken when handing tiles to avoid damage to the surface. Where minor damage does occur, the finishing-kit should be used to repair damage.

NOTE :
All dimensions and weights given are nominal.
Flat - sheets and finishing kit are available upon request.
Galvanized Black Nails or stainless nails should be used for all installation and is available from your regular distributor(50mm(2″) × 1600 pcs(box))

The information contained herein is subject to change without prior notice.

Finishing kit

Adhesive
(Freezing below 0℃)

Stone chip
(Natural Stone)

INSTRUCTION

1) Examine the tiles after installation for totch up
2) Apply the base coat to damaged area and immediately cover with stone chip
3) If damage is excessive, Consult JASCO Roofing for recommended action

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