



HOOK FIXING

HOOK FIXING SITEWORK

Storage on site

Slates should be stored in pallets whenever possible.

Slates should be stacked on their long edge on dry, level ground. Two battens should be placed under each row of slates.

Preparatory work

SORTING AND STACKING SLATES

Each slate should be inspected, and the thicker end selected for the tail. They should be stacked into at least three separate stacks, according to thickness (heavy, medium, thin).

Thick slates should be used on the lower roof (eaves), medium slates on the middle roof and thin slates on the upper roof (ridge) section.

CUTTING SLATE

When using a slate cutting machine for cuts to hips and valleys etc., proper adjustment and maintenance is required.

To maintain adequate laps and allow proper fixing, slates must not be cut too narrow. As a rule, no slate should be less than half a slate wide.

At hips and other angled surfaces, the slates must be cut on the rake using wider slates to maintain an adequate width of head of not less than 50 mm.

Hook fixing method

Full details of the labour saving hook fixing method are available on request from SSQ Technical Department.

Hook shaped stainless steel fixings are used instead of nails to support the slates, eliminating the need to hole individual slates.

Where slates are laid on battens, nail hooks must be used. Slates laid on fully boarded roofs are secured by nail hooks.

The length of hook should be at least 10mm longer than the minimum head lap required. Hooks are available from 60mm – 160mm in 10mm increments.

1. Fix underlay as specified.
2. Mark out the roof to the correct batten gauge.
3. Fix battens.
4. Check width of slates and add 3mm for the hook and mark out the slate joints and slate centres (perpends). It is generally necessary to mark out only two lines for every three slates on battens and every perpendicular when fixing to full boarded roofs.
5. Fix batten or nail hooks as appropriate on perpendicular lines and secure slates. Perimeter slates should be fixed with additional nail(s).

Hook fixing installation

With this system, straight lines must be maintained in the courses of slates and it is necessary to mark out these lines prior to fixing.

Hooks should conform to BS EN 10088:2004 stainless steel grade 316, 2.75 gauge.

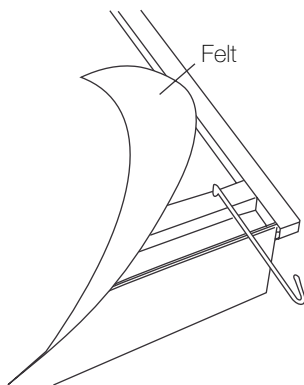
$$\text{Hook length} = \text{Head lap} + 10\text{mm}$$

FIXING

1. With hook fixing, only one under-course of slates is used at the eaves, with the felt being draped over battens (i) see fig 1.

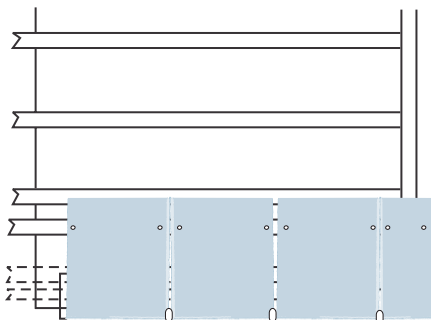
Consequently, the nail hooks in batten (i) must be fixed before the felt is laid over them (see fig 3). Fix a line of hooks into batten (i), lignin them up with previously made position marks. Lay the felt carefully into the hooks.

Fig 3.



2. Drill the under-eaves slates and fix a complete course by a Nailing them into batten (ii) in such a way that the hooks previously fixed into batten (i) fall into the gaps between the slates (see fig 4).

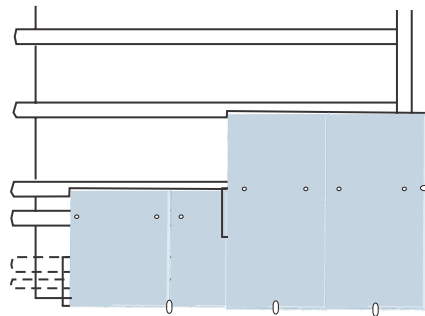
Fig 4.



3. Using the position markings, fix a second line of hooks into batten (iii), positioning them at the centre line of each under-eaves slate.

(See fig 5) Fix a complete course of eaves slates by sliding them centrally by the tail into those hooks fixed previously into batten (i). for security, nail the eaves slates into batten (iii).

Fig 5.



4. Continue slating up and across the roof, laying a triangular area from the verge/eaves corner.

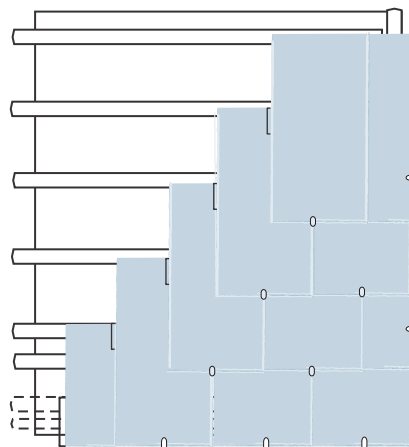
For extra security, each full and half width verge slate is drilled and fixed with three nails. If desired, even further security can be obtained by locating the verge slate edges into the hooks fixed horizontally along the battens at right angles to their normal position.

All other slates are secured at the tail, by the hook only and are not nailed into position (see fig 6).

Continue inserting nail hooks and laying slates in position up and across the roof.

The final slates at the apex and the opposite verge are nailed into position in the normal manner.

Fig 6.



ALTERNATIVE EAVES/VERGE FIXING

Nails are used to secure eaves and verge slates, the hook fixings being employed elsewhere

This enables a double eaves course and slate-and-a-half widths at verges to be fixed.

HIPS AND VALLEYS

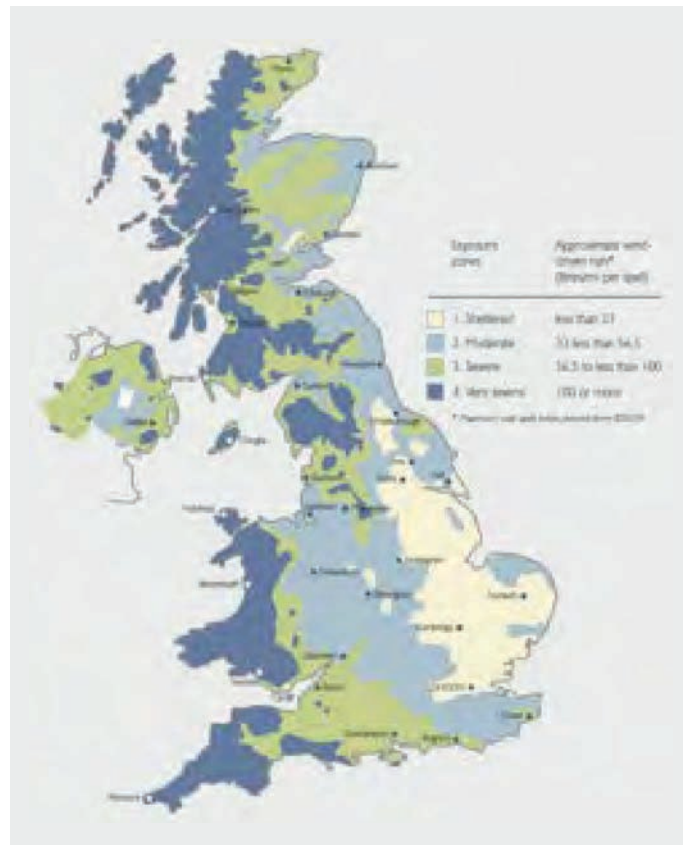
Where these details occur, it is essential to secure the skew cut slates with nails and hooks.

HOOK FIXING DESIGN WORK

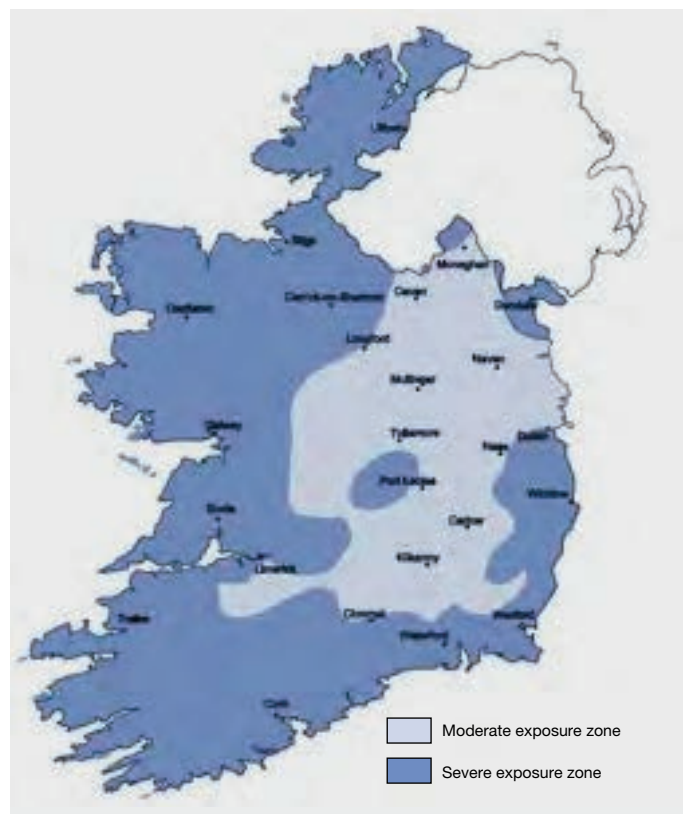
Head lap

The head lap is calculated by taking account of wind uplift, exposure to driving rain and the roof pitch. Table 3 gives the recommended minimum laps for various roof pitches and building exposures.

Map Based on BS 5534 Driving Rain Index.



Map Based on NSAI – S.R. 82:2017 Driving Rain Index



Design considerations

Effective designs of a slate roof must consider several inter-related factors including site exposure, the pitch of the roof, the type slae selected and the slate lap.

General guidance on the most important points to be considered is given below. Full application and sitework details are given on pages 28 to 44. Further information can be obtained from BS 5534:2014+A2:2018, Code of practice for slating and tiling.

Reference should be made also to BS 8000-6:2013, Workmanship on building sites series, Code of practice for sating and tiling of roofs and claddings.

Environmental conditions

RAIN EXPOSURE

The degree of driving rain exposure to a building determines the minimum lap which should be specified.

The anticipated degree of exposure is given in Figure 1 (taken from BS 5534:2014+A2:2018).

Localised factors such as high buildings, buildings on slopes or tops of hills and coastal sites, can increase the exposure grading which should be applied in a specific project. Table 3 on page 29 shows the recommended minimum lap for moderate and severe exposure sites.

For more detailed information on exposure to rain refer to BS 8104:1992.

WIND UPLIFT

Adequate resistance to wind load and wind uplift can be provided by following the application details shown on pages 28 to 44, taking into consideration the minimum lap recommendations given in Table 1.

Design calculations for wind load and wind uplift are given in BS5534:2014, BRE Digest 346: Parts 1 to 7 and BS EN 1991-1-4:2005.

Pitch of roof

In general, the lower the roof pitch, the greater the head lap should be. This longer lap will help to resist both capillary action and wind uplift.

On steeper pitches with free-flowing drainage, smaller slates may be used.

For exposed sites, wide slates with a greater lap should be used (see section 5.5 of BS 5534:2014).

In sheltered areas, roof pitches as low as 15° can be achieved using the SSQ hook fixing system.

Table 3

Minimum head lap for fixing slates with nails or hooks according to BS 5534:2014

Moderate exposure (less than 56.5 l/m)

Slate size (mm)	20°	22.5°	25°	27.5°	30°	35°	40°	45°	80°
600 x 300	130	120	95	85	80	70	60	55	50
500 x 300	130	120	95	85	80	70	60	55	50
500 x 250		150	120	100	80	70	60	55	50
450 x 300					80	70	60	55	50
450 x 220					80	70	60	55	50
400 x 300					80	70	60	55	50
400 x 250					80	70	60	55	50
400 x 220					80	70	60	55	50
400 x 200					80	70	60	55	50
350 x 250					80	70	60	55	50
350 x 200					80	70	60	55	50
320 x 220					80	70	60	55	50
300 x 200					80	70	60	55	50
270 x 180					80	70	65	55	50
250 x 150						70	65	55	50

Moderate exposure (less than 56.5 l/m)

Slate size (mm)	20°	22.5°	25°	27.5°	30°	35°	40°	45°	80°
600 x 300	150	140	130	120	100	90	80	70	65
500 x 300	150	140	130	120	100	90	80	70	65
500 x 250				130	100	90	80	70	65
450 x 300					100	90	80	70	65
450 x 220					130	120	100	90	65
400 x 300					100	90	80	70	65
400 x 250					100	90	80	70	65
400 x 220					100	90	80	70	65
400 x 200					120	110	105	100	65
350 x 250					100	90	80	70	65
350 x 200					100	90	80	70	65
320 x 220					100	90	80	70	65
300 x 200						90	80	70	65
270 x 180						90	80	70	65
250 x 150								70	65

Rafter Length Table

Sheltered Exposure - driving rain index less than 3m²/s

Length of Slope (m)

Roof Pitch	0 to 5.5	5.6 to 10.0	11.0 - 16.0
14°	145	155	
20°	120	130	140
25°	110	120	130
30°	100	105	115
35°	90	100	100
40°	80	90	100
45°	75	80	90
75°	60	60	70

Moderate Exposure - driving rain index between 3m²/s and 7m²/s

Length of Slope (m)

Roof Pitch	0 to 5.5	5.6 to 10.0	11.0 - 16.0
14°			
20°	135	145	155
25°	120	130	140
30°	110	120	125
35°	100	110	110
40°	90	100	110
45°	80	90	100
75°	65	70	75

Severe Exposure - driving rain index greater than 7m²/s

Length of Slope (m)

Roof Pitch	0 to 5.5	5.6 to 10.0	11.0 - 16.0
14°			
20°	150		
25°	135	145	155
30°	120	130	140
35°	105	110	120
40°	100	110	110
45°	90	100	100
75°	70	75	80

Battens

Recommended timber batten sizes for natural slate roofs are 50x25mm up to 600mm rafter spans according to BS 5534:2014.

Battens should be set out horizontally across the roof at a gauge calculated from the formula:

$$\text{Gauge} = (\text{Slate length} - \text{head lap}) / 2$$

Battens should be nailed at maximum 600mm centres, with the end of each length fully supported and be not less than 50mm wide by 25mm thick.

Note: If used, counter battens should be a minimum 38x25mm.

Underlay

Underlay should be selected to meet the requirements of section 4.9 of BS 5534:2014.

Ventilation

To comply with the Building Regulations F2:2010 and BS 5250:2011 Code of practice for control of condensation in buildings, 10mm continuous ventilation must be provided at all eaves for a cold roof construction and 25mm continuous ventilation for a warm roof construction.

Note: 25mm continuous eaves ventilation is required on roofs of 15° or less regardless of warm or cold roof construction.

Additional ventilation at or near the ridge equivalent to a 5mm continuous vent is required in the case of warm roofs and is also recommended for cold roofs with a greater pitch of 35° or if the span exceeds 10m.

Cold roofs are defined as being those where the insulation is at ceiling level and warm roofs where the insulation is at rafter level.

Fixing methods

All SSQ natural slates can be fixed by using either traditional holing and nailing (see pages 10 to 24) or hooks (see pages 30 to 44).

The hook fixing method offers considerable freedom in design and can save up to 25% on labour costs and eliminate waste from slate breakage.

With the hook fixing system, the slates are secured at the tail, thus providing stronger resistance to wind uplift.

Hooks

Hooks should be black stainless steel, conforming to BS EN 10088-3:2014 grade 316, 2.7mm gauge and at least 10mm longer than the minimum lap required. Where battens coincide with rafters, nails hooks must be used.

Pitches of 25° and less should use a stainless steel crossinuous hook.

Coverage of slates

See table 4 for coverage of all slate sizes at different head lap.

Total weight of slate roof

The total weight of slates on a roof can be calculated as follows:

Example:

Slate Type	Del Carmen
Slate Size	400mm x 250mm
Weight of Slates (per 1000)	1235kg
Exposure	Moderate
Roof Pitch	40°
Roof Area	150m ²
Length of Roof Slope	9.5m

The head lap can be found in Table 3 by reference to slate size, roof pitch and exposure = 65mm

The slate coverage per m² can be found in Table 4 =23.9

The total weight of slates for a roof project can be found using the following formula:

$$\text{Weight of slates (kg) / 1000} \times \text{Area of roof (m}^2\text{)} \times \text{Slate coverage}$$

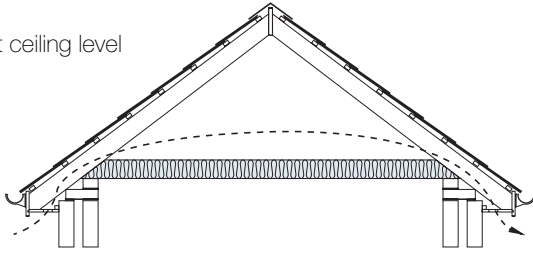
Therefore:

$$1235 / 1000 \times 150 \times 23.9 = 4427\text{kg Total weight}$$

Figure 2

Cold and Warm Roof Ventilation

Cold Roof:
Insulation at ceiling level



Warm Roof:
Insulation at rafter level

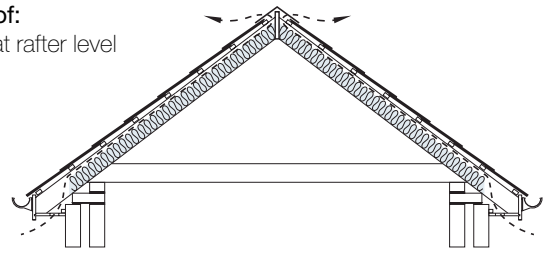


Table 4

Coverage of SSQ slates with hook fixing method

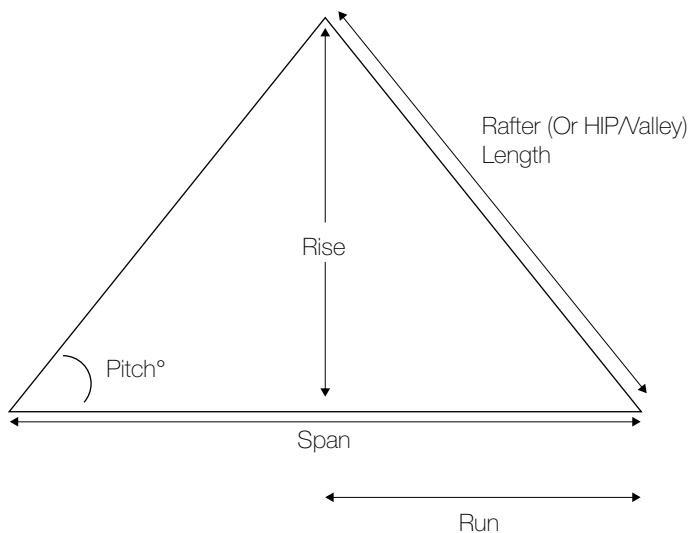
Head Lap (mm)

Slate size (mm)	60	65	75	80	90	100	110	115	120	130	140	150
600 x 300	12.1	12.5	12.7	12.8	13.1	13.3	13.6	13.7	13.9	14.2	14.5	14.8
500 x 300	14.8	15.3	15.7	15.9	16.3	16.7	17.1	17.3	17.5	18	18.5	19
500 x 250	17.8	18.4	18.8	19	19.5	20	20.5	20.8	21	21.6	22.2	
450 x 300	16.7	17.3	17.8	18	18.5	19	19.6	19.9	20.2	20.8	21.5	
450 x 220	20	20.8	21.3	21.6	22.2	22.9	23.5	23.9	24.2	25	25.8	
400 x 300	19	19.9	20.5	20.8	21.5	22.2	23	23.4	23.8			
400 x 250	22.9	23.9	24.6	25	25.8	26.7	27.6	28.1	28.6			
400 x 200	28.6	29.9	30.8	31.3	32.3	33.3	34.5	35.1	35.7			
350 x 250	26.7	28.1	29.1	29.6	30.8	32	33.3					
350 x 200	33.3	35.1	36.4	37	38.5	40	41.7					
320 x 220	33.7	35.7	37.1	37.9	39.5	41.3	43.3					
300 x 200	40	42.6	44.4	45.5	47.6	50						

NB: No allowance has been made for wastage

Rafter Constants and Equations

Pitch	Rise	Rafter	Hip/Valley
12.5	0.22	1.02	1.43
15	0.27	1.04	1.44
17.5	0.32	1.05	1.45
20	0.36	1.06	1.46
22.5	0.41	1.08	1.47
25	0.47	1.10	1.49
27.5	0.52	1.13	1.51
30	0.58	1.15	1.53
32.5	0.64	1.19	1.55
35	0.7	1.22	1.58
37.5	0.77	1.26	1.61
40	0.84	1.31	1.64
42.5	0.92	1.36	1.69
45	1.00	1.41	1.73
47.5	1.09	1.48	1.79
50	1.19	1.56	1.85



Measure the Pitch of the Roof

Measure the Length of the Run
(ie Half the Span)

Rafter Length = Run x Rafter Constant
(for Roof Pitch)

Hip/Valley Length = Run x Hip/Valley Constant
(for Roof Pitch)

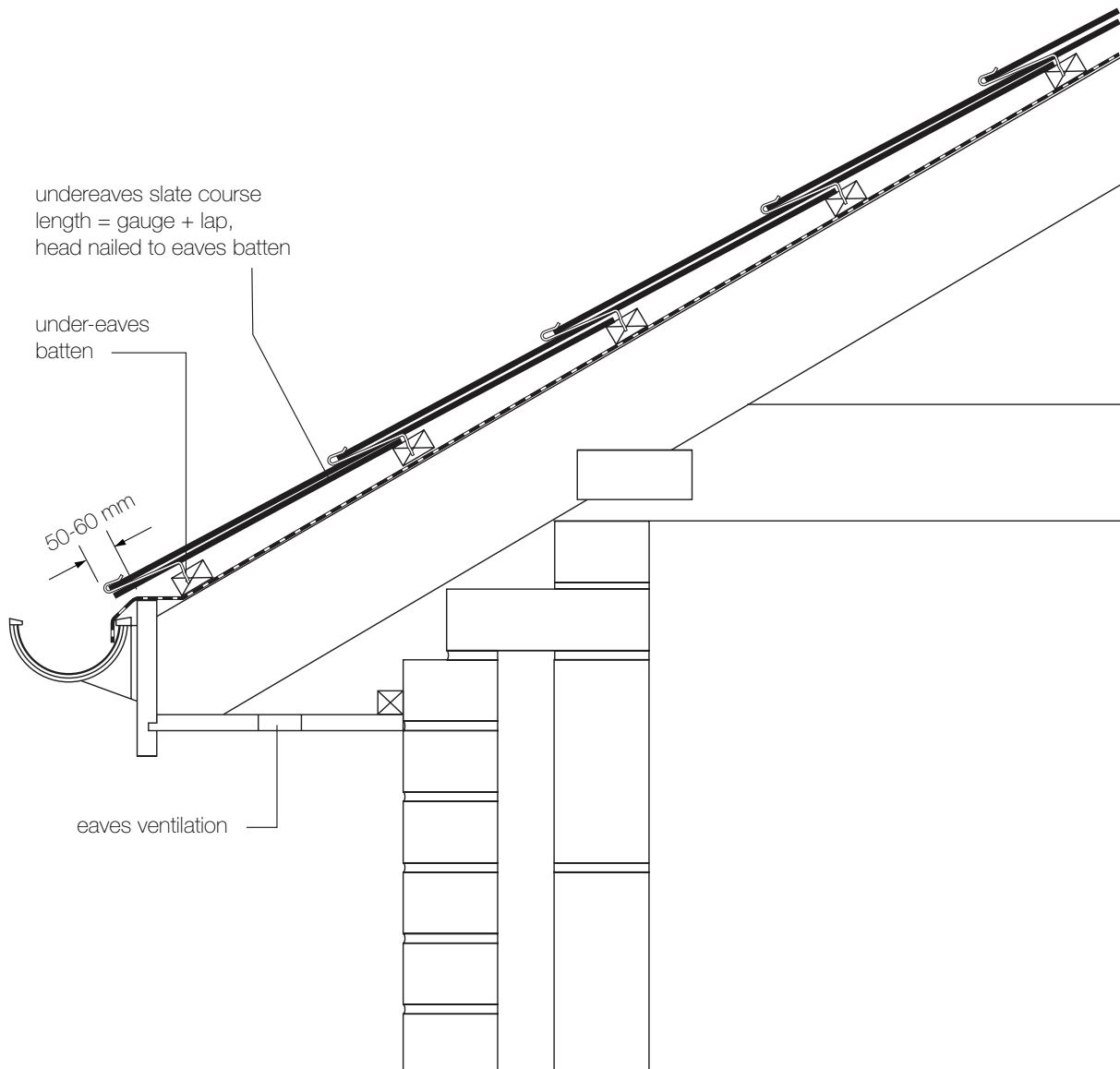
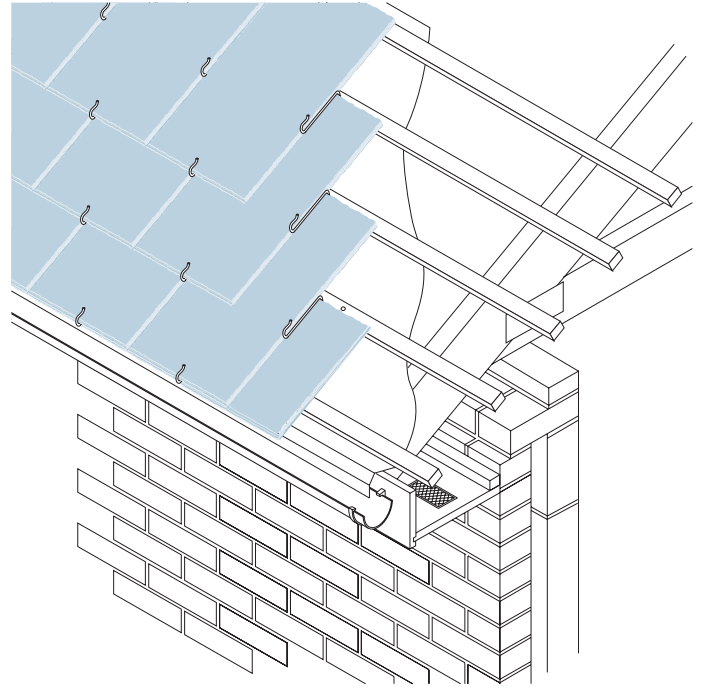
Eaves

At all eaves, a double course of slates is required, comprising a course of short slates over which the first course of full length of slates is fixed.

The length of the eaves slates should be gauge + lap.

FIXING SEQUENCE AT EAVES:

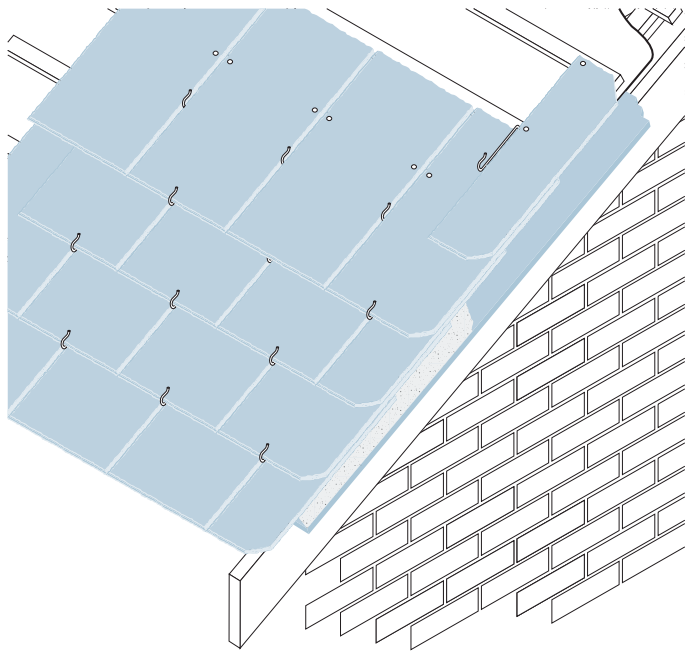
1. Fix the underlay to extend over the tilting fillet and fascia board into the gutter. The underlay should overhang the fascia board by 50mm.
2. Fix the first full course batten (the eaves batten) so that the tails of the slates in the eaves and the under-eaves courses align, ensuring that they will overhang 50 to 60mm into the gutter. Fix an under-eaves batten below the eaves batten at a position which corresponds with the hook length from the tail of the eaves course slates (see page 31 for minimum batten dimensions).
3. Lay the slates forming the under-course on their backs and head nail them to the eaves batten.
4. Fix the eaves course with the tails of the slates aligning with the tails of the slates in the under-course.
5. Commence hook fixing on second course of slates.



Verge

Where an undercloak is fixed it should consist of one or more courses of slates not less than 4.5mm thick, laid riven side up and closely butted.

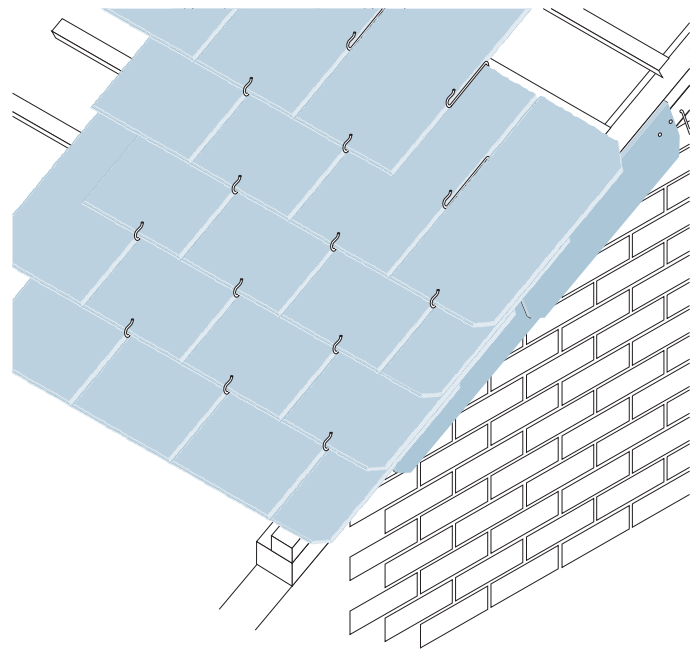
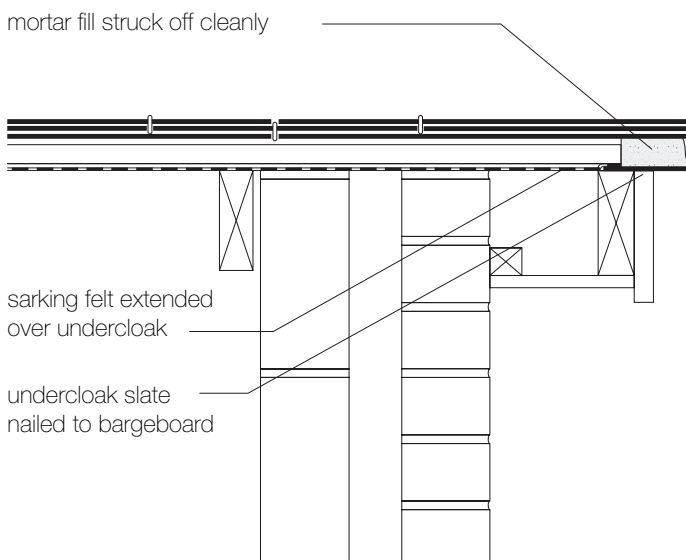
If more than one course is used, joints should be staggered.



FIXING SEQUENCE AT VERGE ON BARGEBOARD

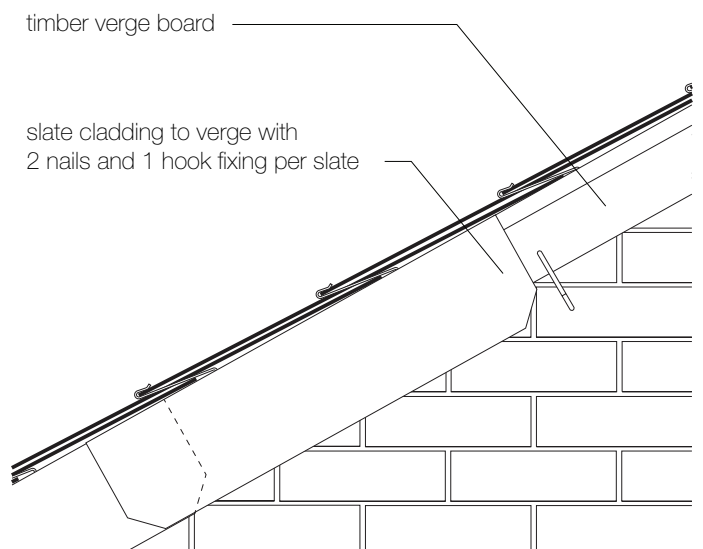
The verge should be finished with full slates in alternate courses, the full slate should be fixed with two nails in addition to the hook; the half slate should be fixed with two nails. Provision may be made for a slight inward tilt from the verge.

1. Fix the undercloak with nails so that it overhangs the face of the bargeboard by 40-50mm.
2. Fill the gap between the undercloak and slates with mortar and strike off smoothly to provide a flush joint.



FIXING SEQUENCE AT VERGE ON BRICKWORK

1. Fix one batten parallel to the verge.
2. The verge should be finished with full slates and half slates in alternate courses. The full slate should be fixed with one nail in addition to the hook; the half slate should be fixed with two nails. Provision may be made for slight inward tilt from the verge.
3. Clad timber with slates fixed with two nails and one hook. Slates must overhang the timber by at least 50mm and overlap one another by 75mm.



Ridges

The length and gauge of slate in the top courses at the ridge should be sufficient to ensure that the appropriate lap is maintained.

Shouldered slates should be used in the course below the top course to enable the short top course slates to be nailed directly to the batten.

FIXING SEQUENCE WITH TILED RIDGE

1. Fix underlay over the ridge so that it overlaps the main underlay by at least 150mm. When using a ventilated ridge, a gap of 50mm should be allowed between the top of the underlay of each pitch.
2. Fix the top course of slates to maintain gauge, using one nail in addition to the hook.
3. Lay ridge tiles true. Joint ridge tiles in mortar and firmly bed the edges along the roof slope in mortar. Where the ridge tiles meet, squeeze up the bedding to fill the joint and strike it off smoothly, no separate pointing necessary.

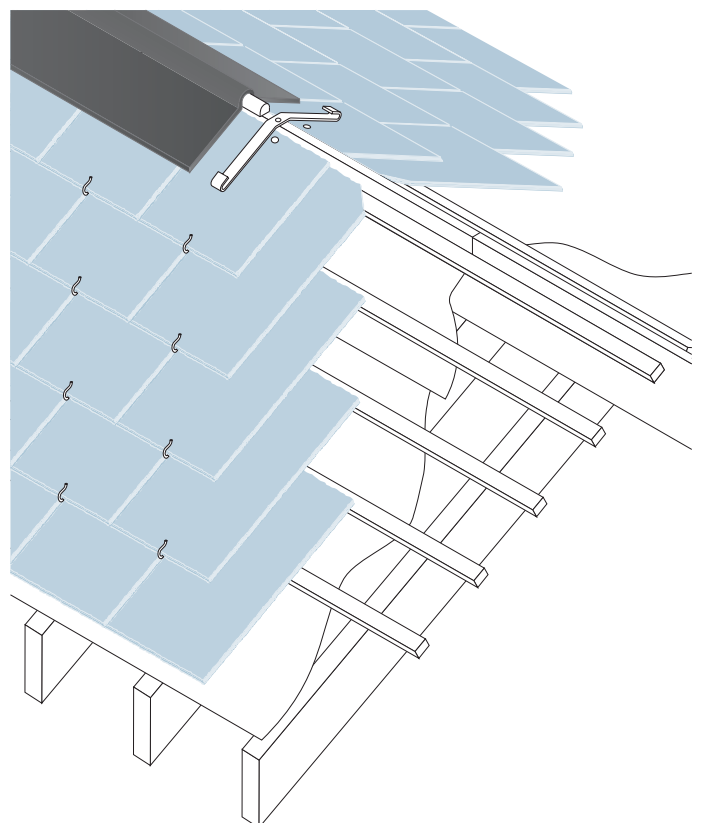
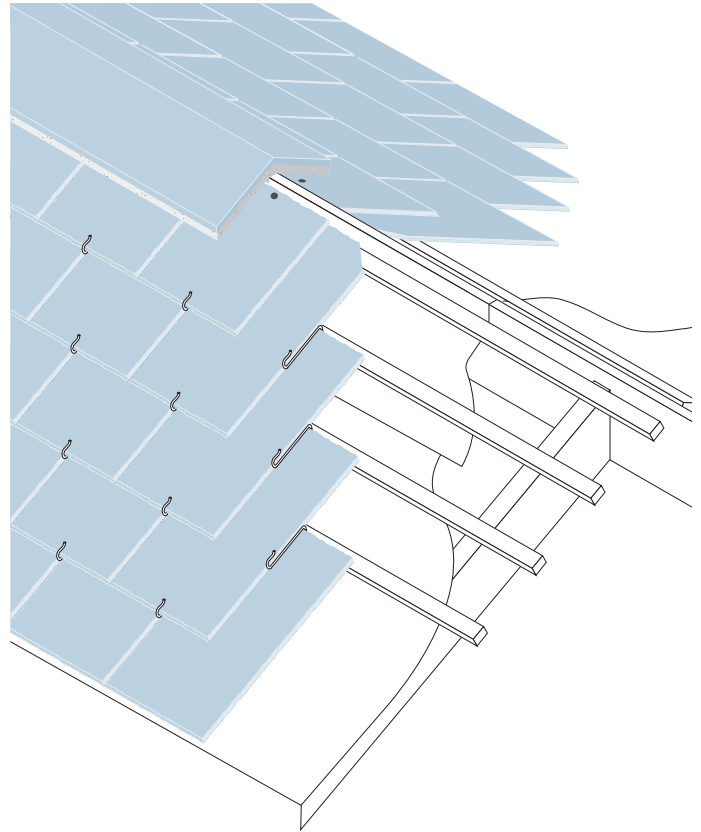
FIXING SEQUENCE WITH SHEET METAL RIDGE (NOT ILLUSTRATED)

1. Fix underlay over the ridge so that it overlaps the main underlay by at least 150mm. When using a ventilated ridge, a gap of 5mm should be allowed between the top of the underlay of each pitch.
2. Fix the top course of slates to maintain gauge, using one nail in addition to the hook.
3. Fix 50mm zinc clips at 450mm intervals.
4. Fix nail hooks in a position to secure the tail of the sheet metal ridge. Secure the sheet metal ridges in the hooks, overlapping each ridge piece by 100mm and nailing it with two clout nails on each pitch wherever and overlapping.

Note: To ensure resistance to wind pull-out, the length of the ridge should not exceed 1m.

FIXING SEQUENCE WITH LEAD ROLL RIDGE

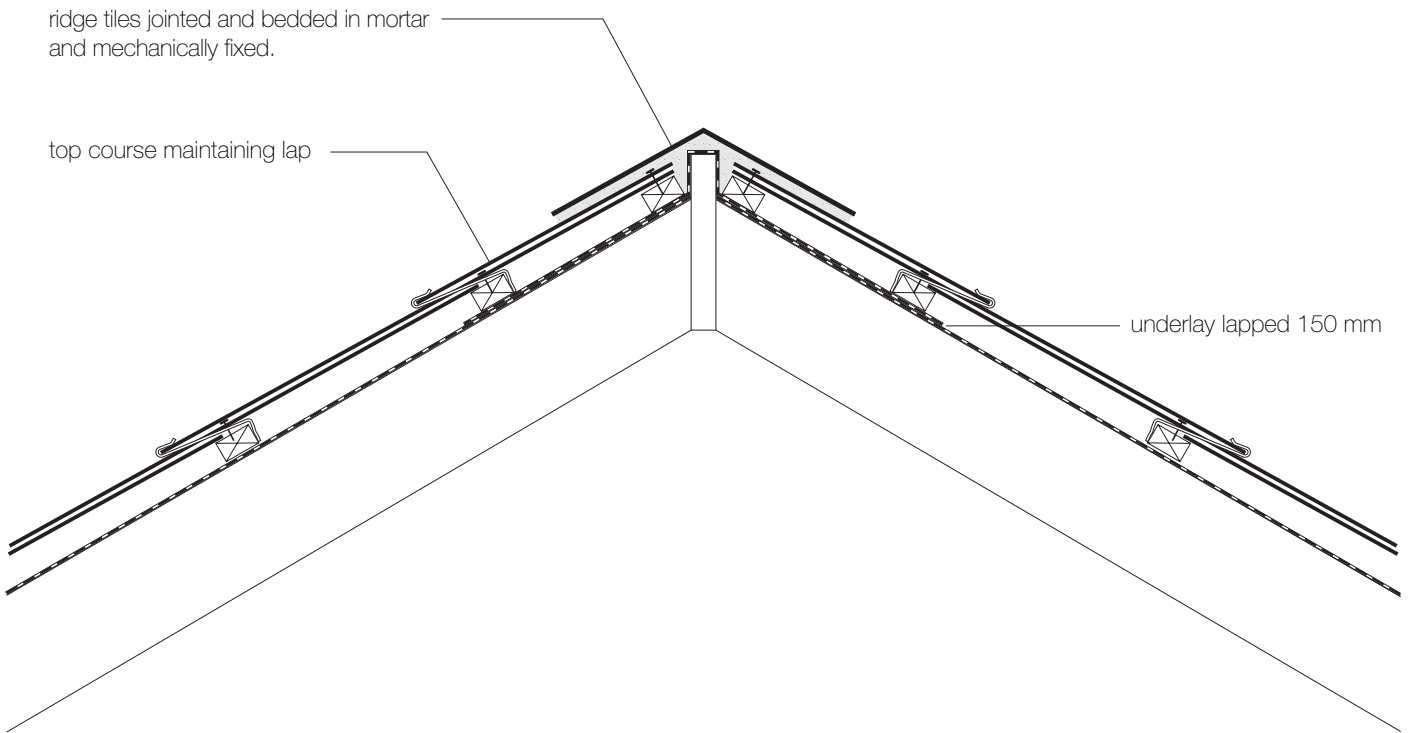
1. Fix underlay over the ridge so that it overlaps the main underlay by at least 150mm. when using the vent ridge, a gap of 5mm should be allowed between the top of the underlay of each pitch.
2. Fix top course of slates to maintain gauge, using one nail in addition to the hook.
3. Cover the timber roll with Code 6 lead strips 450mm to 500mm wide and 1.5m to 1.8m in length. Lap the strips 75mm at the joints, secure the lead with screws top sealed with a lead dot under the over-flap.
4. Fix 50mm clips at minimum 450mm intervals.



ridge tiles jointed and bedded in mortar and mechanically fixed.

top course maintaining lap

underlay lapped 150 mm

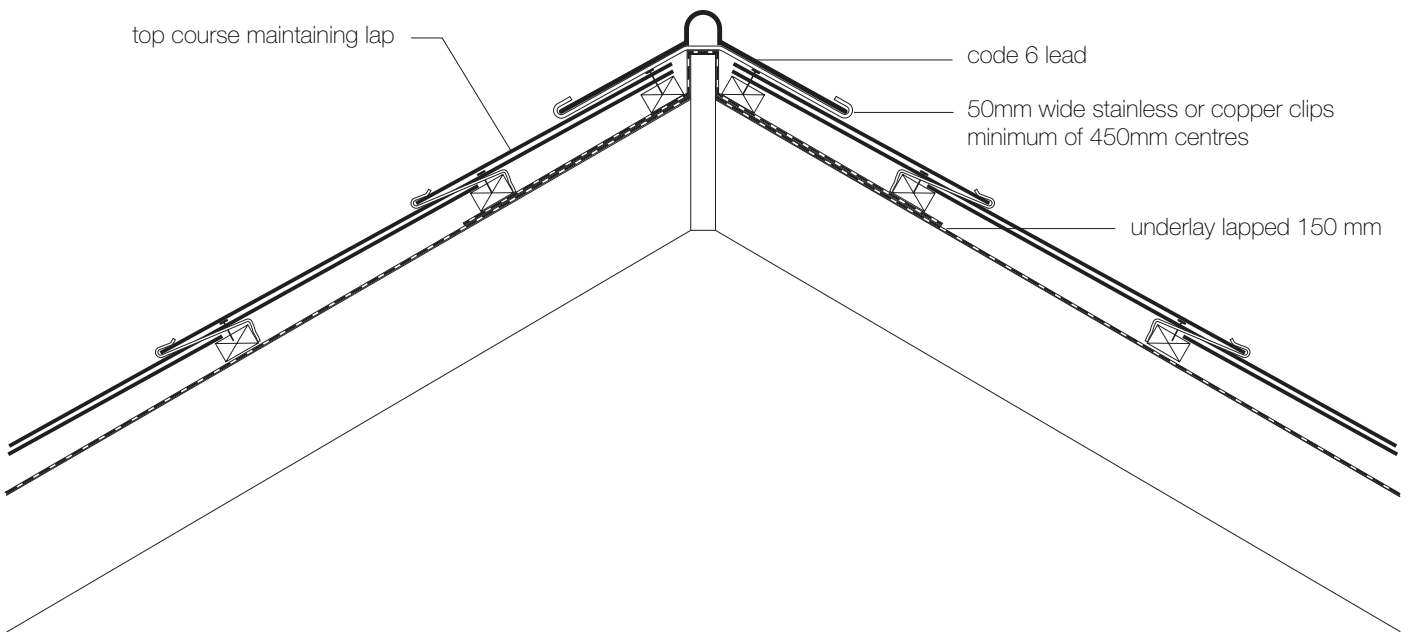


top course maintaining lap

code 6 lead

50mm wide stainless or copper clips
minimum of 450mm centres

underlay lapped 150 mm



Hips

In cutting slates for hips, care must be taken to preserve an adequate bond, using slate-and-a-half-slates.

Where pitches at hips are almost vertical, the hips can be treated the same way as verges.

FIXING SEQUENCE AT MITRED HIP

1. Fix 600mm wide underlay, overlapping the main underlay.
2. Cut slates carefully, ensuring that adequate width is maintained at the head. SSQ and BS 5534 do not recommend the fixing of mitred hips on roofs where the angle of the hip is 30° or less.
3. Hip slates must have an even size and shape at every course. The width of the tail of the hip slate must not be less than the width of a normal slate.
4. Using one hook and two nails, fix the hip slates interleaved with lead soakers, nailed to battens at the top edge to provide a weathertight close-mitred joint.
5. Cut slates of adequate width to connect with main roof slates and hip slates.

FIXING SEQUENCE WITH LEAD ROLL HIP

1. Fix 600mm wide underlay, overlapping the main underlay.
2. Cover the timber roll with Code 6 lead strips 450mm to 500mm wide and 1.5m to 1.8m in length. Lap the strips 75mm at the joints equal to the lap of the slates.
3. Fix 50mm lead tacks at 500mm intervals, under the timber roll.

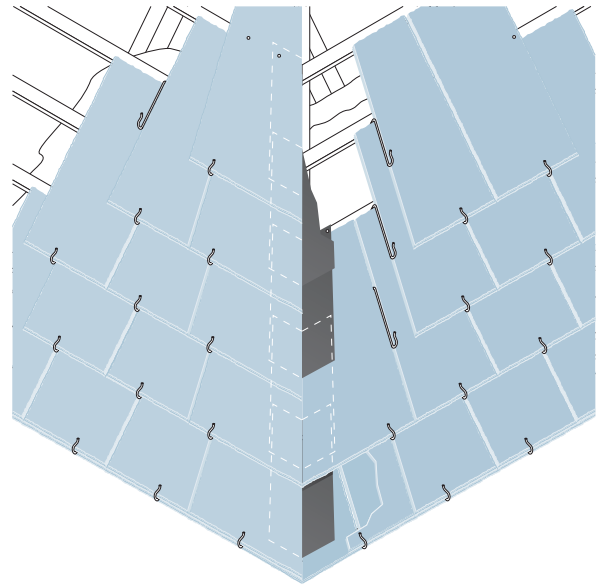
FIXING SEQUENCE WITH RIDGE TILED HIP

Mortar 1:3 cement/sand pigmented to approved colour.

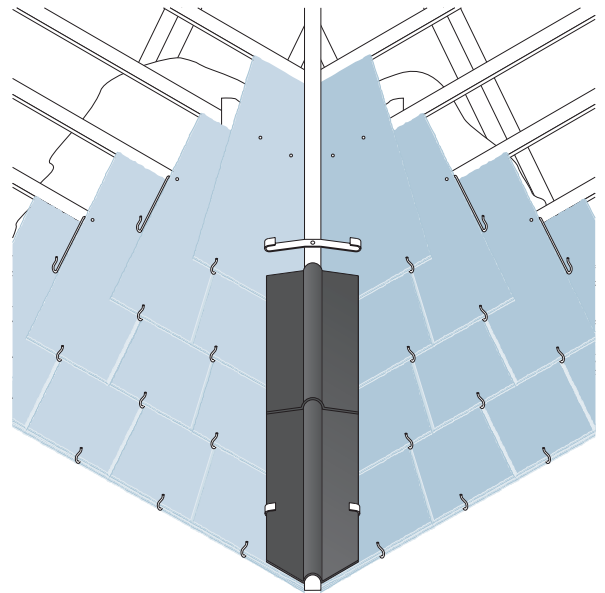
1. Fix 600mm wide underlay, overlapping the main underlay.
2. Fix hip iron (to BS 5534:2014) to hip rafter.
3. Cut slates to fit closely at junction.
4. Lay hip tiles true and bed edges and joints firmly in mortar, struck off smoothly to provide a flush finish.
5. Cut first tile to align with corner of eaves.
6. Fill end of hip with mortar and slips of slate finished flush.

Note: Ridge tiles hips to be twice mechanically fixed in line with BS 5534.

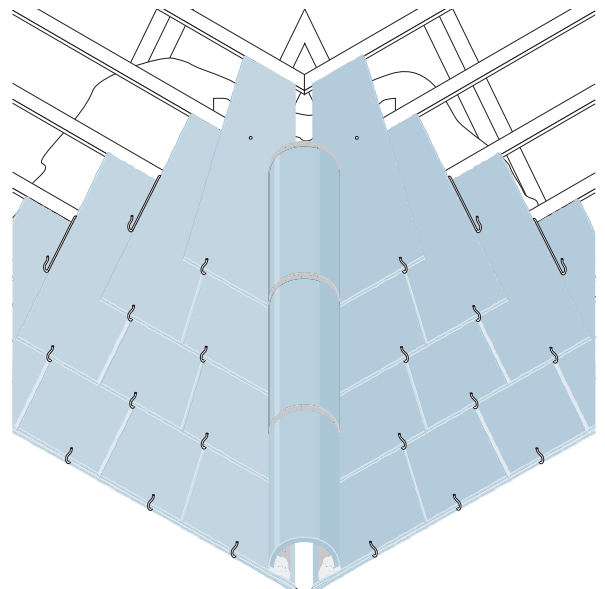
Mitred Hip



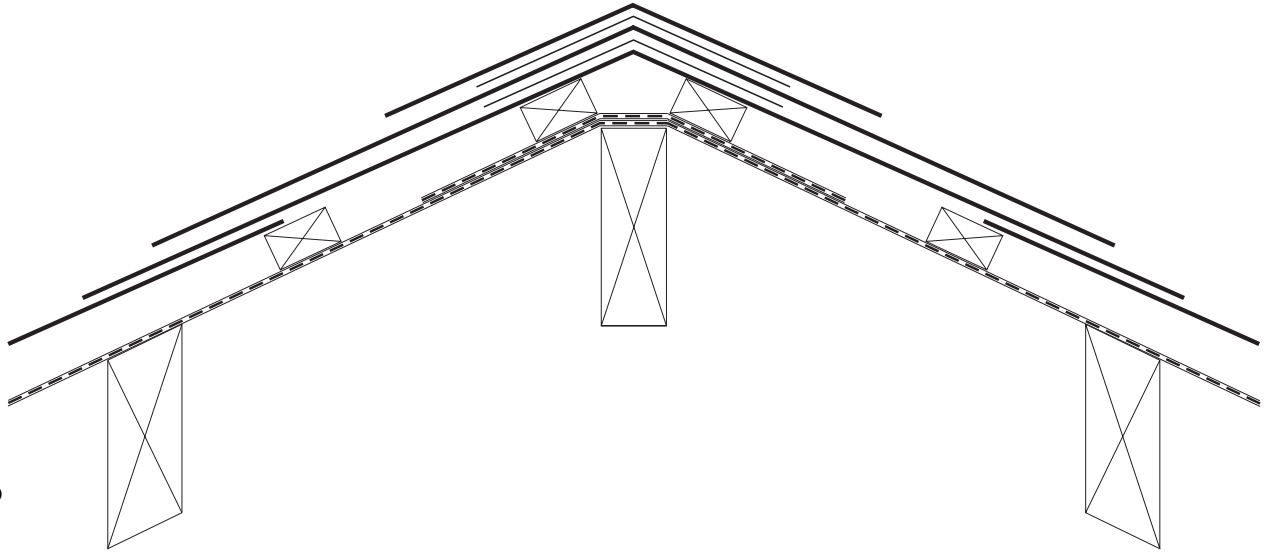
Lead Roll Hip



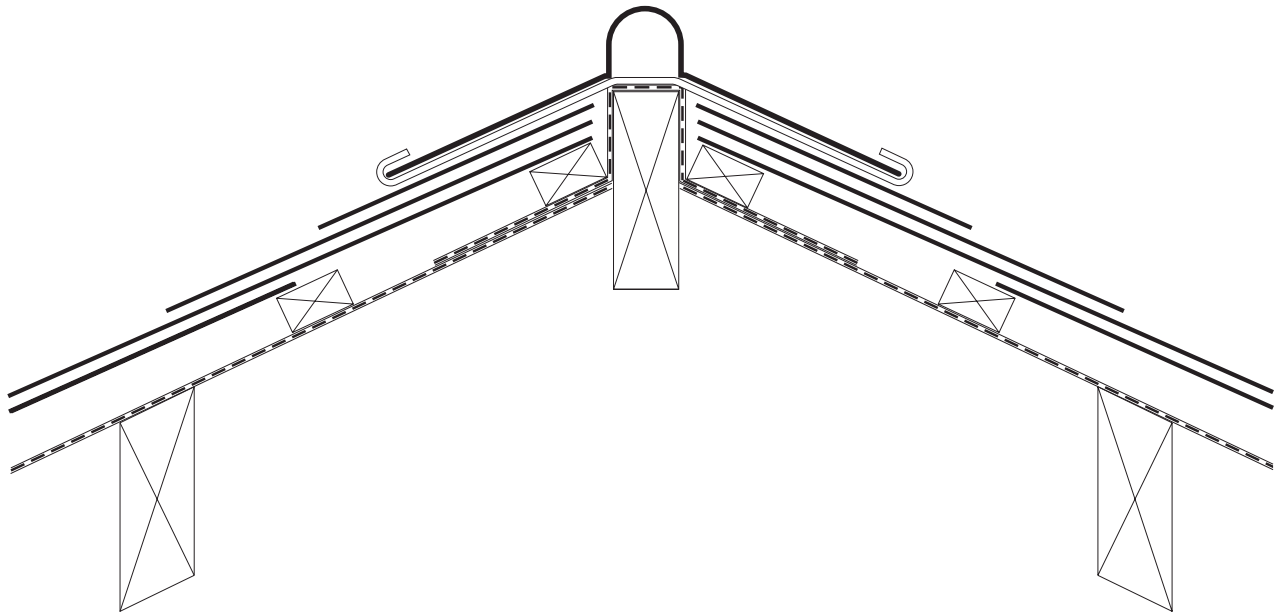
Ridge Tiled Hip



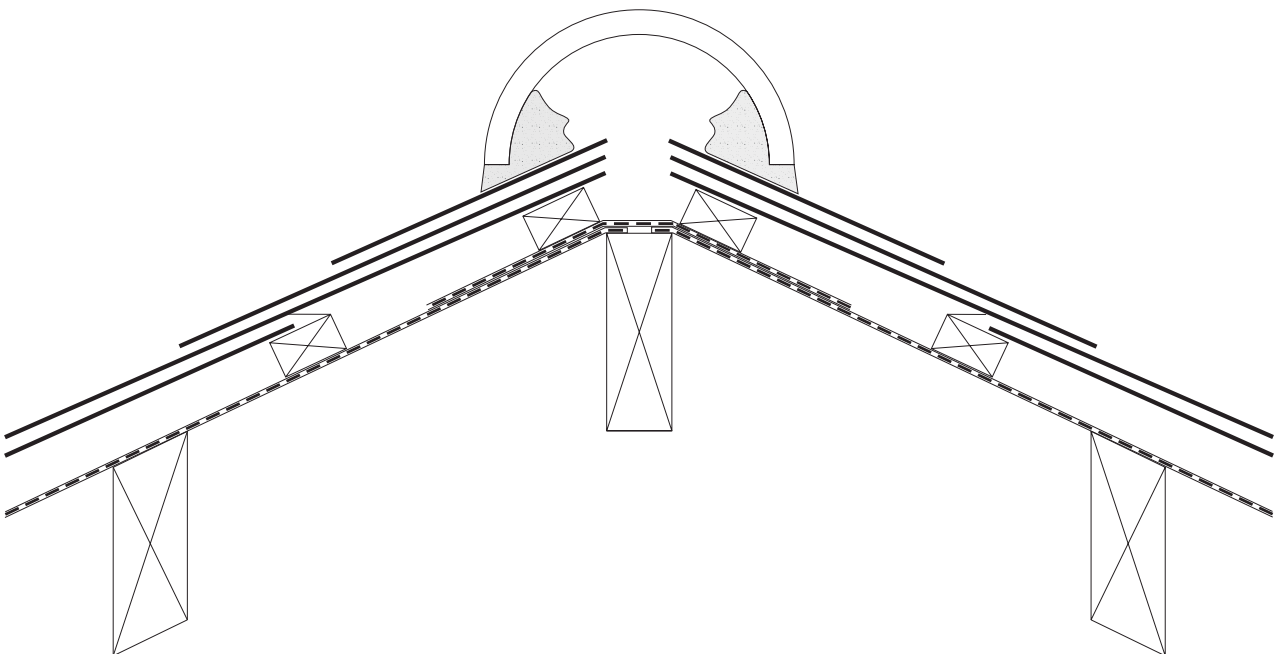
Mitred Hip



Lead Roll Hip



Ridge Tiled Hip

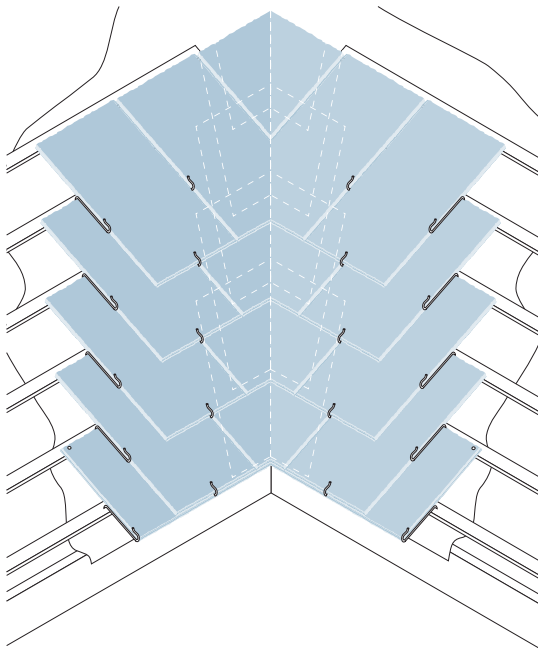


Open valleys

Special care should be taken to ensure that valleys feature a clear unobstructed channel, at least 100mm wide. Increased kerbing may be required to accommodate mass flow where the pitches on either side of the valley are unequal.

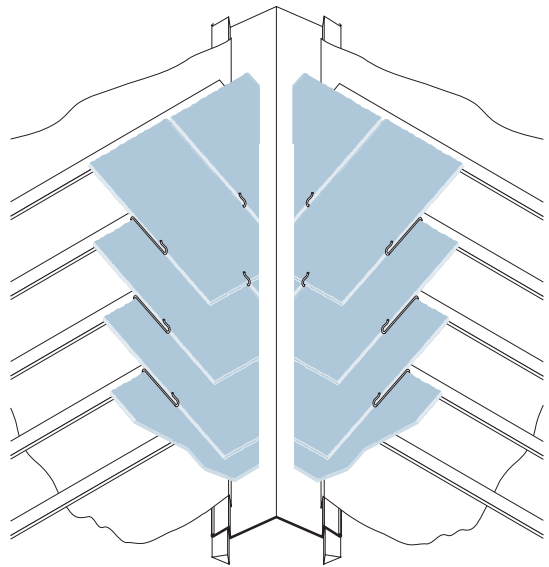
FIXING SEQUENCE AT OPEN VALLEY

1. Fix tilting fillets on either side of the valley board and dress underlay over these tilting fillets.
2. Lay pre-formed sheet metal or GRP gutter at least 400mm wide in the valley, overlapping each piece by at least 150mm and securing them with lips at the edges and at the top.
3. Cut slates accurately, ensuring sufficient width is retained at the head to pit nails in to overhang the tilting fillet but leave a minimum of 100mm clear width of valley.
4. Secure the edge slates with one nail in addition to the hook or use two nails if not using a hook.

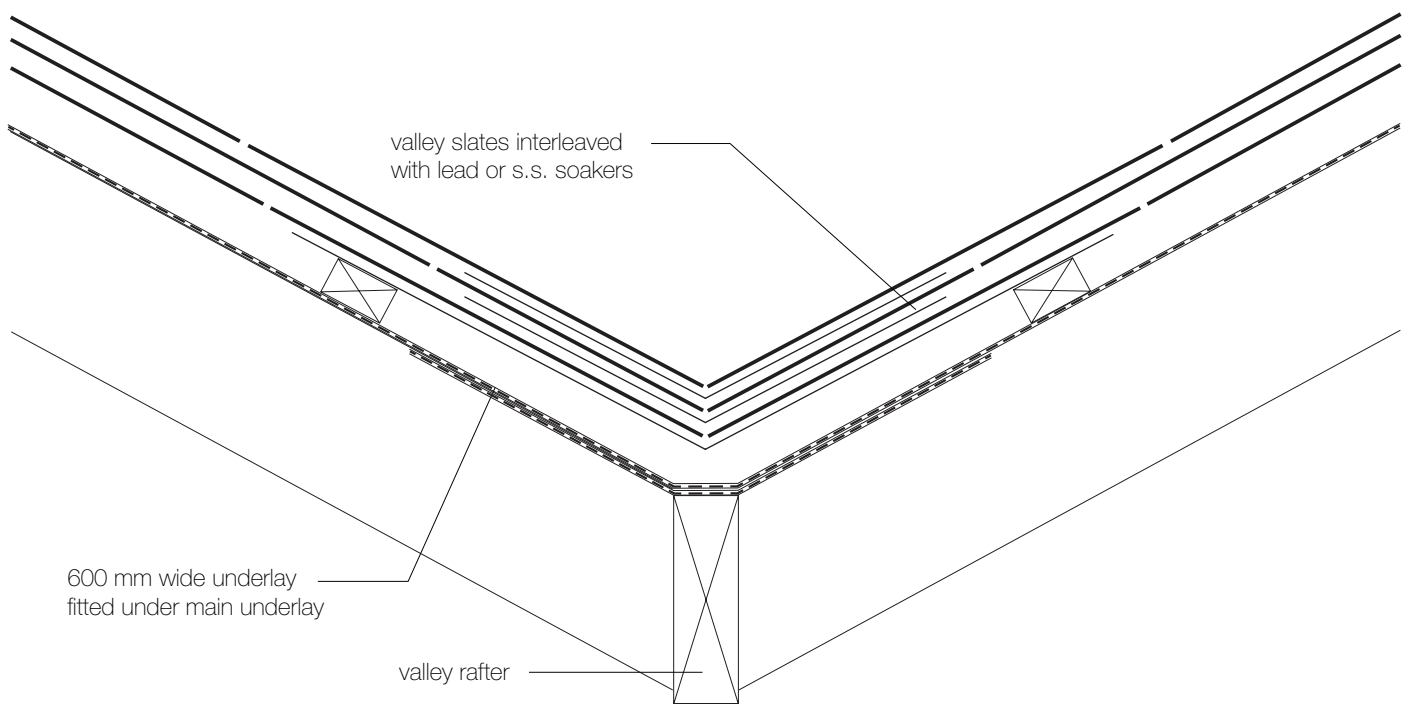
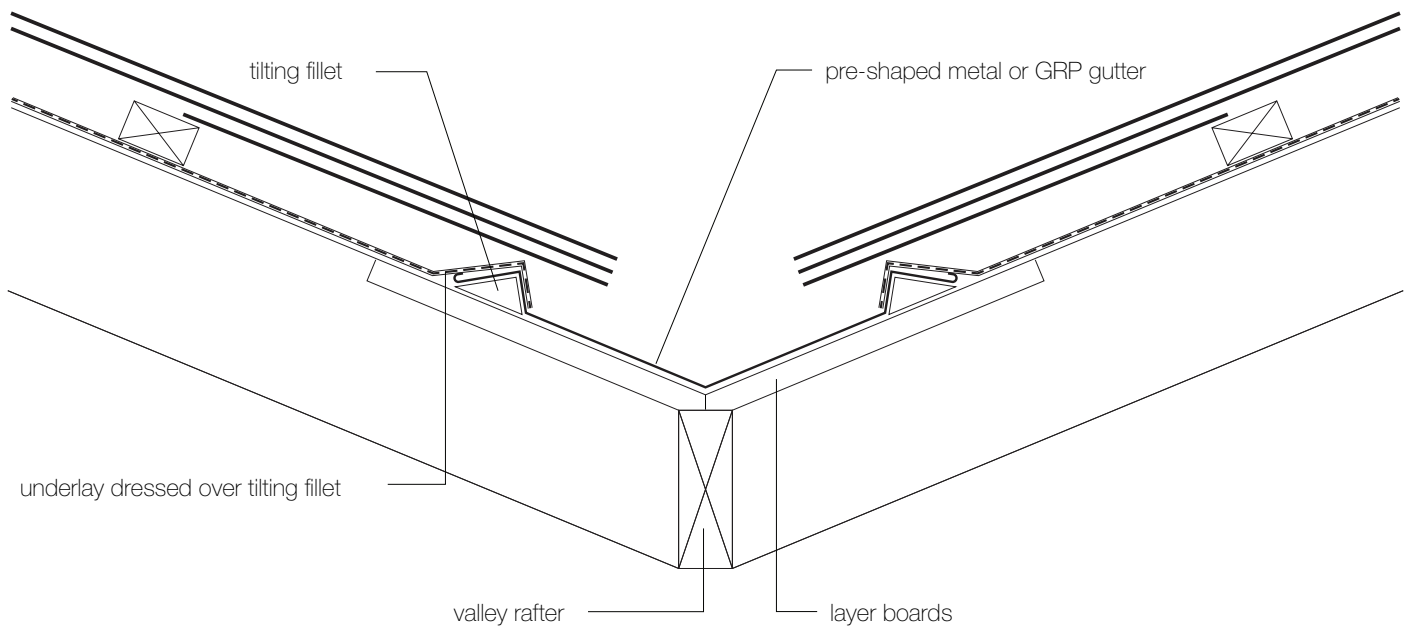


FIXING SEQUENCE AT MITRED VALLEY

1. Lay a strip of underlay 600mm wide over the valley underlapping the main underlay.
2. Cut slate accurately to match with the main roof.
3. Fix slates to interleave with Code 3 lead or stainless steel soakers, nailed to battens at the top edge, to provide a straight, weathertight close-mitred joint. The size of the soaker must be not less than one slate in length; in width, it should be at least half a slate on both sides at the top and at least a quarter of a slate on both sides at the tail.



For more information on open lead valleys, please contact the Lead Sheet Training Academy at:
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Branbridges Road
East Peckham
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TN12 5HP
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Or contact the SSQ Technical Department at
technical@ssq.co.uk



Abutments and parapets

SIDE ABUTMENT

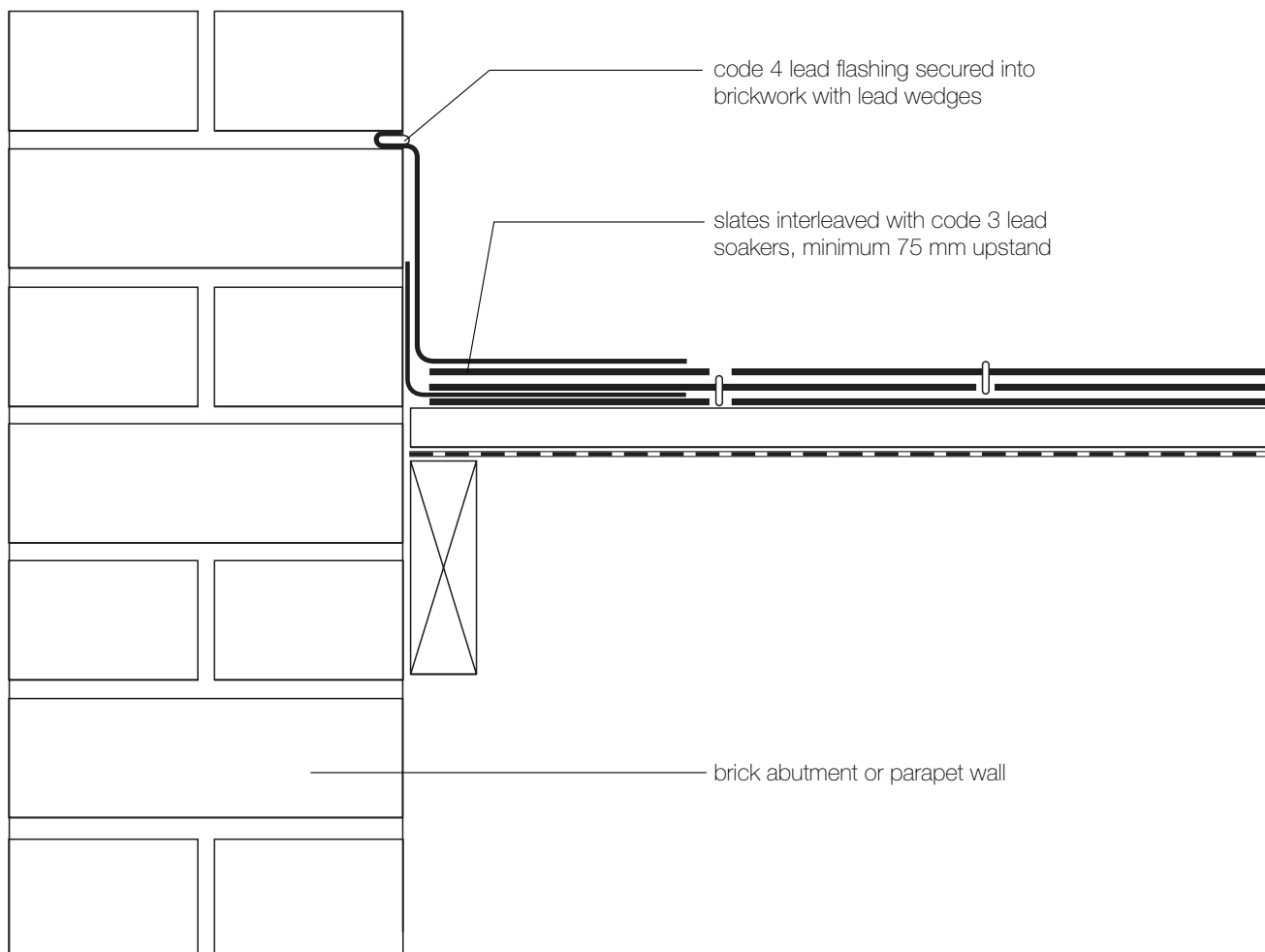
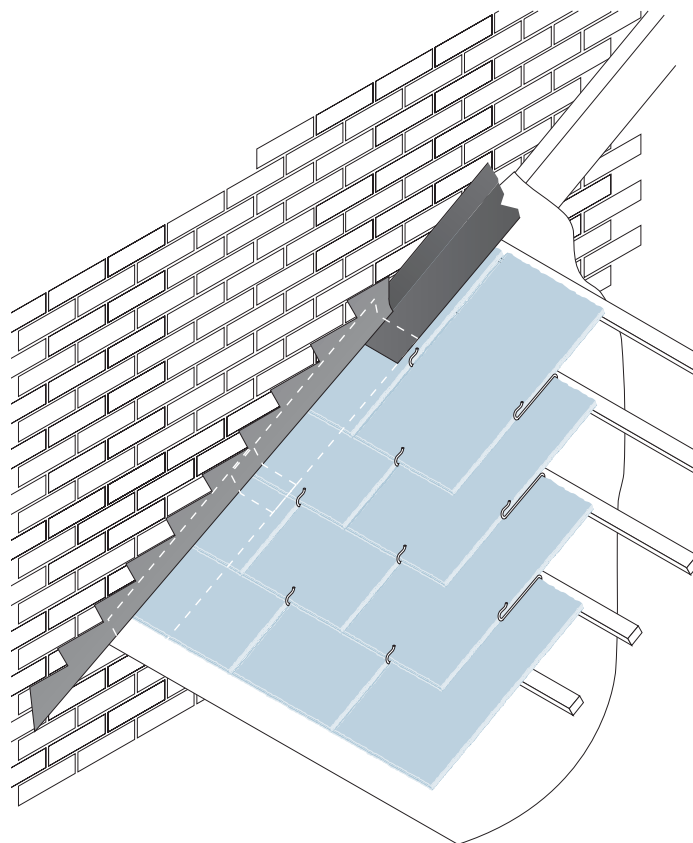
As nearly as possible, the abutment slates should be slate and slate-and-a-half in alternate courses.

Soakers should be equal to slate length plus 15mm. the width should be equal to half the standard slate width.

Note: To avoid staining when lead is used, a smear coat of patination oil should be applied to the surface of the lead as soon as practical after fixing.

FIXING SEQUENCE

1. Cut slates as required and interleave with Code 3 lead soakers, dressed to provide at least 75mm upstand to form a close, weathertight abutment.
2. Fix soakers into the battens with nails; soakers should be no shorter than the slate. Fix one soaker under full slate and none under the half slate.
3. Fix Code 4 (1.8kg) lead flashing or sheet metal flashing pre-formed to right width, to be secured in the top course of hooks and turned up against the abutment. Welt top edge, secure into the brickwork joints to a depth of at least 25mm, with lead wedges and point in mortar.

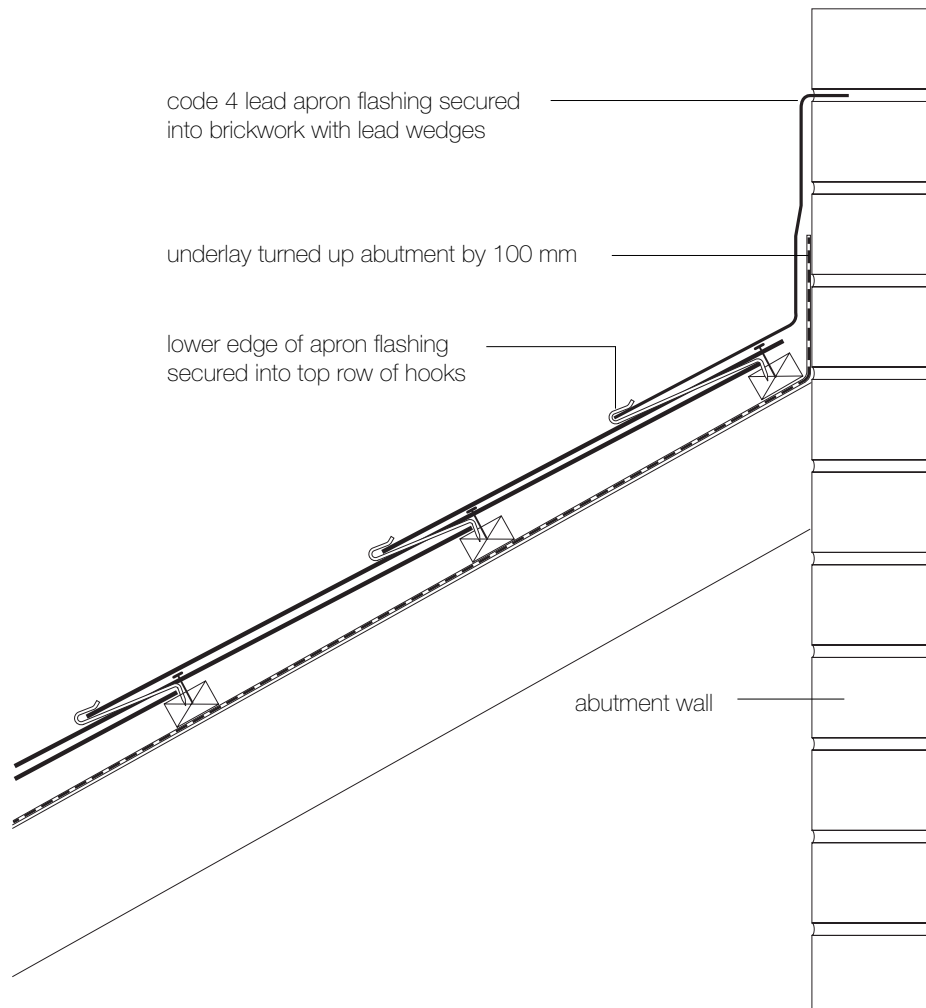
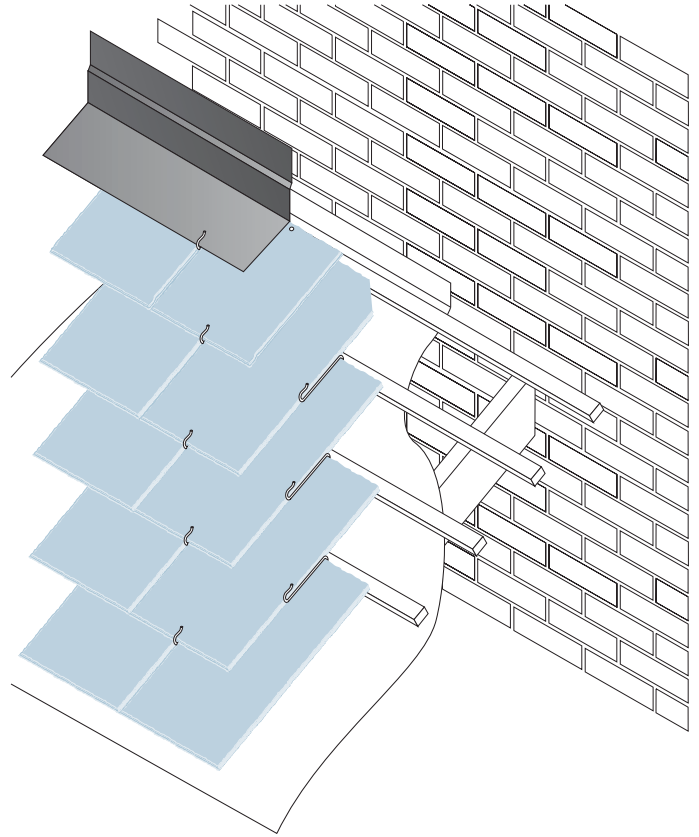


Abutments and parapets

TOP ABUTMENT

FIXING SEQUENCE

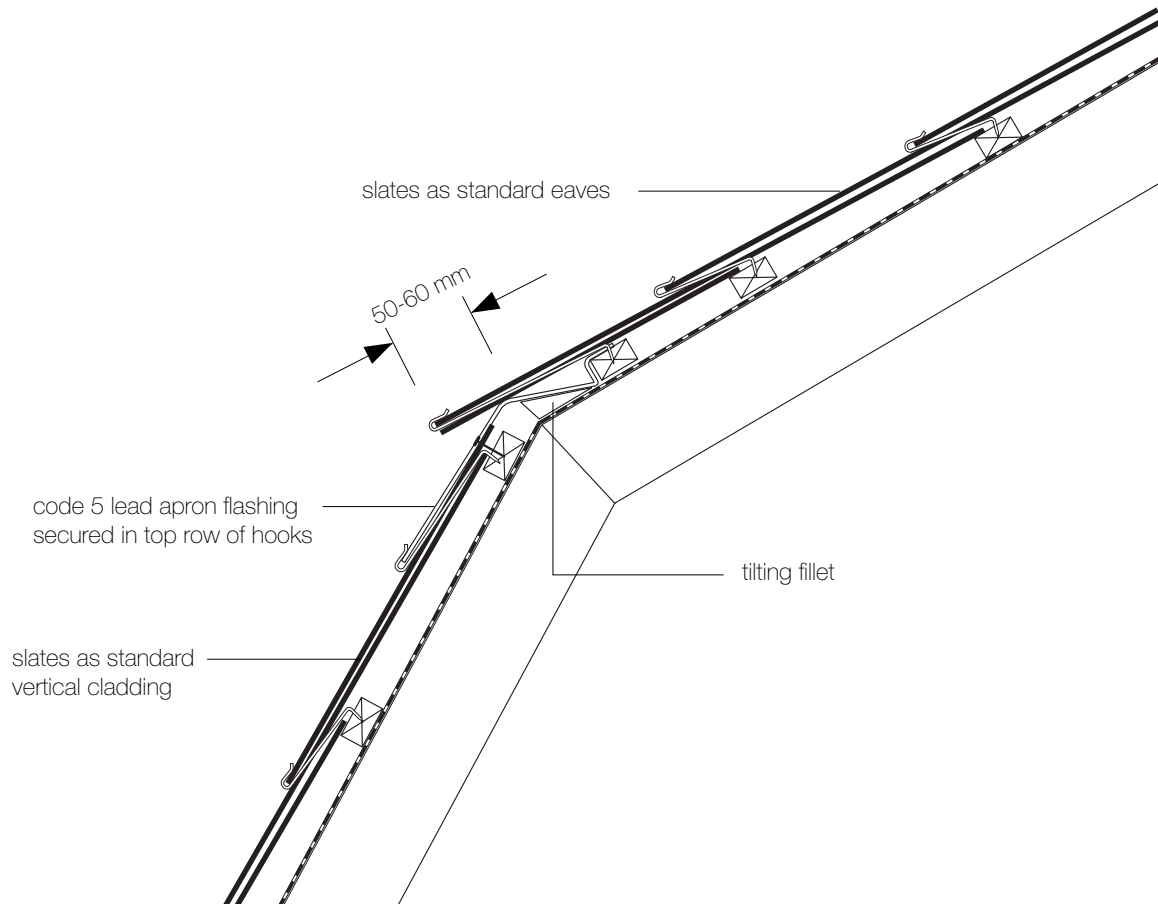
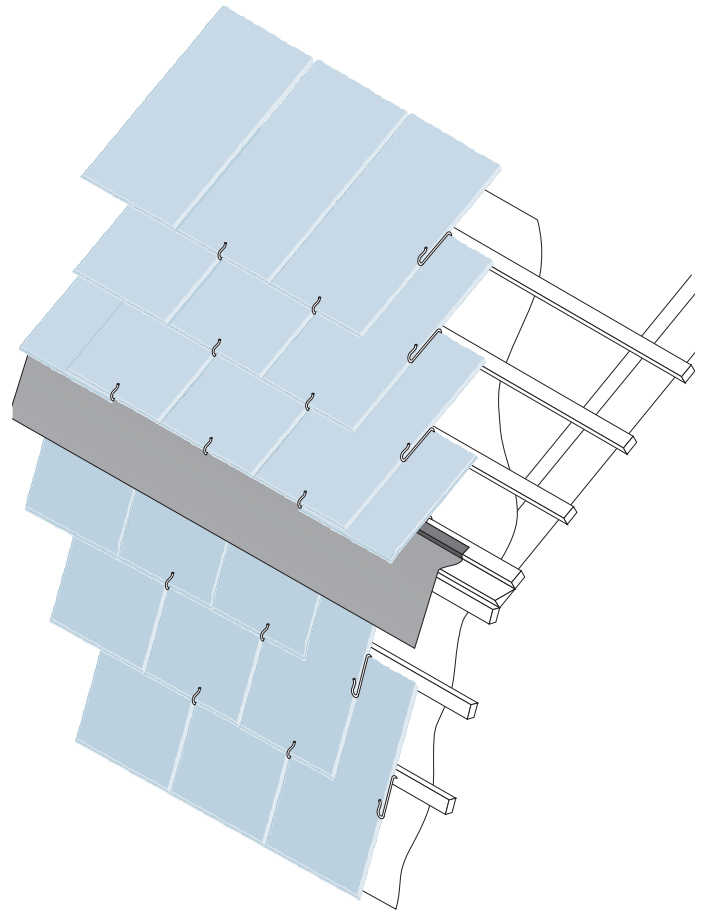
1. Turn underlay 100mm up abutment.
2. Fix short slates as the top course to maintain gauge.
3. Fic Code 4 lead flashing or sheet metal flashing pre-formed to the right width to be secured in the top course of hooks and turned up against the abutment. Welt top edge and secure into the brickwork joints to a depth of at least 25mm with lead wedges and point mortar.



Change of roof pitch

FIXING SEQUENCE TO MANSARD ROOF

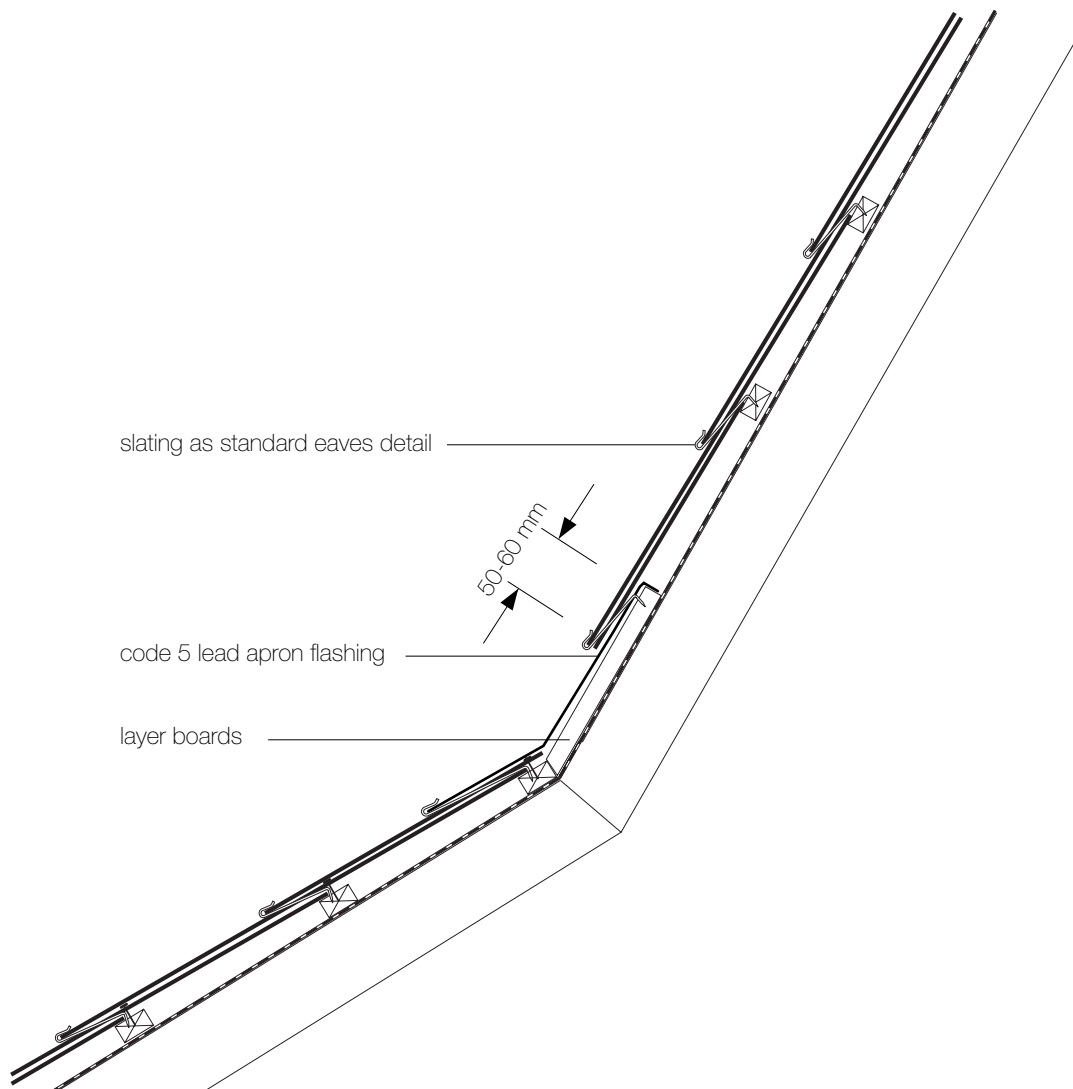
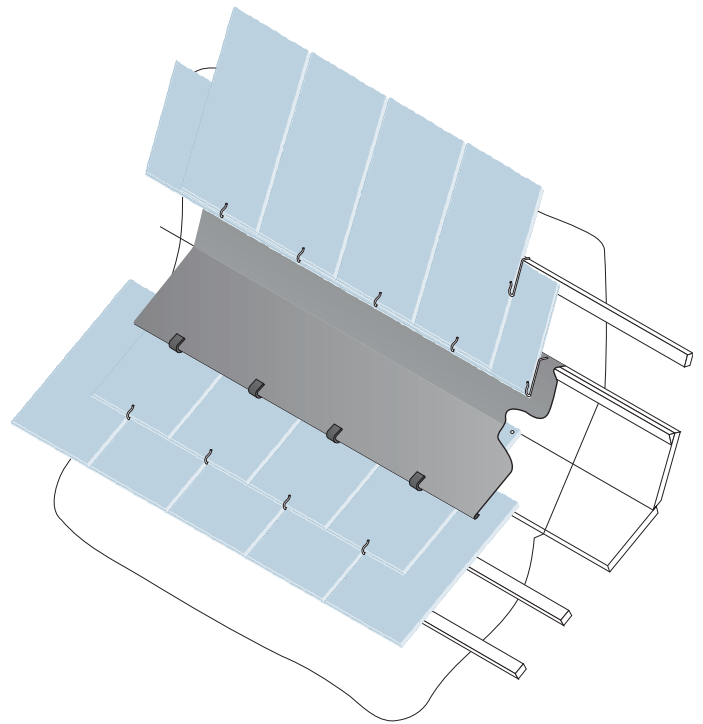
1. Slate lower slope as standard for vertical cladding.
2. Fix tilting fillet to lower edge of upper roof slope.
3. Fix Code 5 lead flashing over the under-eaves batten and fillet on the upper slope and dress down at least 150mm over the slates on the lower slope.
4. Slate the upper slope as standard eaves with the bottom edge of the upper slates overhanging the flashing by 50mm to 60mm.



Change of roof pitch

FIXING SEQUENCE TO SPROCKET ROOF

1. Complete slating the lower slope as for standard roof upper edge.
2. Fix layer board to the rafters at the bottom of the upper roof slope, equal in thickness to the battens. The top edge of the layer board should correspond in position to the usual under-eaves batten.
3. Fix tilting fillet to the upper edge of the layer board.
4. Fix Code 5 lead apron flashing over the tilting fillet and layer board and dress down over the heads of the slate below by at least 150mm.
5. Slate upper slope as standard eaves, with bottom course projecting below tilting fillet by 50mm to 60mm.



Vertical cladding

SSQ slates used for external wall cladding provide a highly aesthetic appearance as well being extremely functional.

A wide range of cladding patterns can be achieved, which can offer particular benefits of economy and weather resistance as well as allowing versatility in design.

FIXING SEQUENCE FOR VERTICAL CLADDING

1. General

Vertical slating or cladding may be fixed either directly to battens (or to battens and counterbattens), firmly fixed to the wall face (BS 5534:2014) minimum head-lap is 32mm.

2. At Lower Edge

Fix slates at lower edge of vertical work in the same way as roof slating.

External corners and abutments to openings should be treated as verges or mitred verges with soakers at every course.

3. At Top Edge

Finish top course with lead apron fixed on hooks.

4. At Abutments

Form abutments with full slates and half slates on alternate courses.

5. Abutments Adjacent to Openings

Fix full slates and half slates on alternate courses, interleaving with lead soakers. Fix flashings, suitable for the particular window installations, around all openings.

6. At Gable Ends

Splay cut slates at the ends of courses to fit closely under the verge, either by cutting wide slates to leave a 5mm gap adjacent to the abutment or cutting the last two slates at the end of every course so that the tail of the end slate is almost at right angles to the verge.

