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Sitework Guide

Concrete tile and interlocking slate fixing guide

Contents

This sitework guide

This publication contains detailed guidance to good site practice to comply with the requirements of the Building Regulations and relevant British Standards. It contains both traditional installation details and instructions for the installation of a range of Marley Roofing products including ventilation and dry fix components.

For detailed information concerning the range of Marley Roofing products, including design guidance, fixing requirements, performance and properties, please contact the Technical Advisory Service.

This guide should be read in conjunction with all relevant British Standards and Health and Safety Regulations.

The Information contained in this guide is intended for general applications, but where non-standard situations occur users must satisfy themselves as to the suitability of the recommendations given. Further advice can be obtained from the Technical Advisory Service.

Further information:

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Safety and general precautions

Storage, safety and access

Storage and handling

Provision should be made for proper storage and handling of materials to avoid deterioration in quality and appearance, to avoid breakage or distortion, and to minimise wastage.

Safety regulations

The Construction Regulations made under the Factories Act 1961 comprise :

The Health and Safety at Work Act 1974

The Construction (Design and Management) (Amendment) Regulations 2000

The Management of Health and Safety at Work Regulations 1999

Construction (Health, Safety and Welfare) Regulations 1996

Work at Height Regulations 2005

Health and Safety Commission

Control of lead at work – Control of Lead at Work Regulations 1998 Management of Health and Safety at Work Regulations 1992 – Workplace (Health, Safety and Welfare) Regulations 1992 – Approved code of practice, regulations and guidance.

Access

Any roof or vertical work in slating or tiling should be treated as fragile. An adequate number of roof ladders should be used. Crawling boards and ladders should be used for gaining access over completed areas of roof tiling, and should be designed for the purpose, be of good construction, strong enough to enable planned work to be carried out. The boards or ladders should also be properly supported on the sloping part of the roof by means of a ridge hook placed over the ridge (not bearing on the ridge tiles). (See Fig 1).

The Regulations also require precautions to be taken when access ladders are used. (See Fig 2). Full requirements are given in 'HSG33'.

Ladders used to gain access to working platforms or to the eaves of the roof should be in good sound condition, fully secured with the feet resting on a solid flat surface. The length should extend above the level of the landing by 1m with an angle of slope of 1:4 (1m out for every 4m height).

The requirements to secure ladders should be particularly noted.

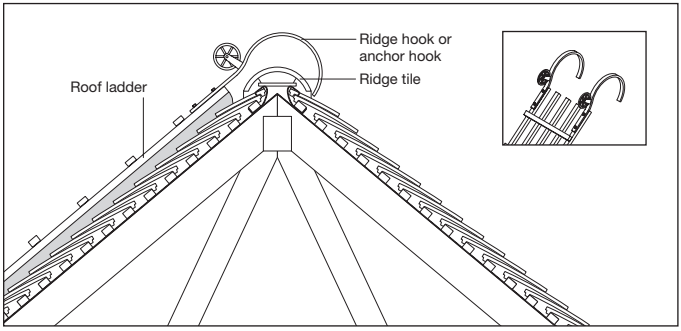

Fig 1 – Use of crawling boards

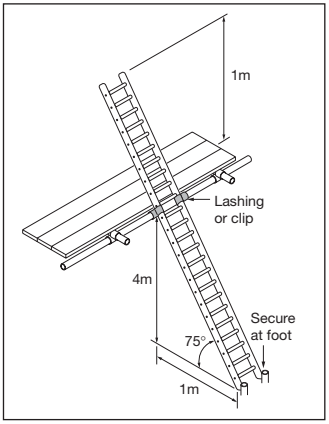

Fig 2 – Use of ladders

Work on roofs

On traditional pitched roofs, most injuries occur as a result of one of the following; a fall from the eaves; slipping down the slope of the roof and over the eaves; falling through the roof trusses; falling from the gable end. Unless work is only for a very short duration, full edge protection must be provided on all elevations of the roof where access is needed.

Strip and re-tile

An independent tied scaffold is required. Guidance to the scaffold specification is given in BS 5973 'Code of practice for access and working scaffolds and special scaffold structures in steel'.

Other work

Where a person can fall from the lower edge of a sloping roof, a catch barrier should be provided at the edge (scaffolding as shown in Figs 3 and 4 is ideal).

The platform should comply with BS 5973.

Where sloping roof edge protection takes the form of a working platform below the eaves, the platform should:

- be 305mm below eaves
- project at least three boards beyond the edge of the roof
- be fitted with both an intermediate rail and guard rail
- have a 150mm high toe-board (Fig 3)

The top lift of a scaffold providing sloping edge protection should be dimensioned as follows (see Fig 4):

i) working platform minimum width 600mm
ii) minimum 910mm
iii) maximum gap 470mm
iv) to rise to the line of the roof slope with a minimum height of 150mm
v) gap between rails no more than 470mm

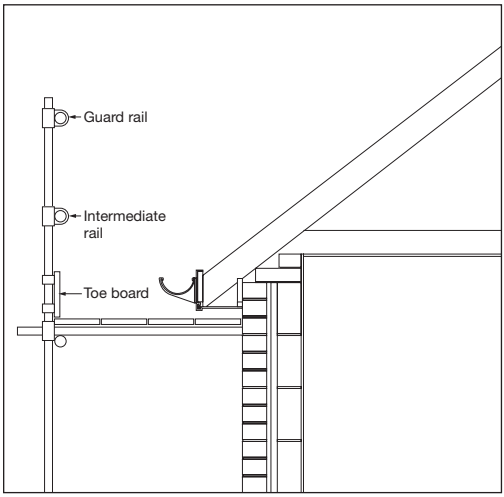

Fig 3 – Sloping roof edge protection

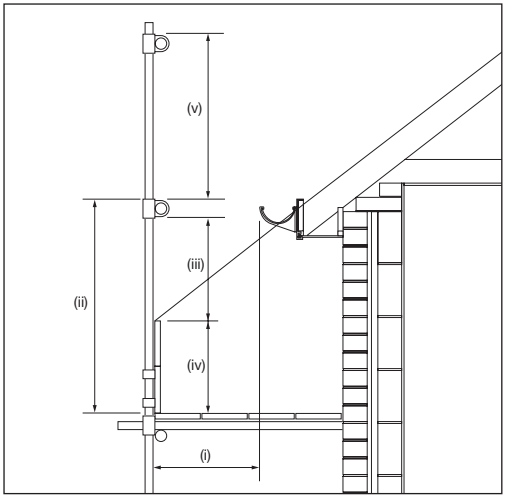

Fig 4 – Top lift of scaffold providing working platform

Precautions

- Do not rest ladders used for access at eaves level against gutter.
- Block ladders out to clear gutter and make secure.
- Access ladders should extend to project not less than 1.07m above landing position.
- Take care when working near metal or open valleys so as not to damage side coverings.
- Take great care when fixing eaves gutters, immediately below valleys. Valley troughs are vulnerable to breakage, and should not be eased or levered.
- Provide some form of packing between roof ladders and covering materials, e.g. straw-stuffed sacks, thick sheet, rubber etc., to prevent breakage of tiles and slates. This is important where lightweight tiles or slates are used.
- Materials and tools should not be drawn or dragged over the roof.

Safety and general precautions check points

- Ensure that all legal safety requirements are met by reference to the following:

  The Health and Safety at Work Act 1974

  The Construction (Design and Management) (Amendment) Regulations 2000

  The Management of Health and Safety at Work Regulations 1999

  The Construction (Health Safety and Welfare) Regulations 1996

  Health and Safety in Roofwork HSG33: 1999

  The Work at Height Regulations 2005
- Ensure all scaffolds and ladders are properly secured.
- Provide guardrails and toe-boards on scaffolds.
- Avoid trafficking over completed tiled and slated roofs.
- Use a roof ladder for access, maintenance and repair.
- Cured tiles are inert but edges and surfaces can be sharp and abrasive.
- Machine cutting of cured tiles can create dust which may contain quartz. If inhaled, in excessive quantities over long periods, respirable dust containing quartz can constitute a health hazard. Exposure should not exceed published health standards. (For current standards, see Guidance Note EH40 issued by the Health and Safety Executive).

Good tiling practice

Introduction

Good tiling practice is the result of many years experience in the practical application of roof tiles to all pitched roofs. This guide is based on Marley Roofing's long experience in roof tiling and incorporates the latest recommendations of BS 5534 : Code of Practice for slating and tiling (including shingles) and BS 8000: Code of Practice for Workmanship on Building Sites Part 6 : Slating and Tiling.

Handling and storage

- All Marley Roofing products are provided palletised, banded and shrink wrapped by a fleet of modern transport with mechanical off-loading facilities.
- Store on a smooth and level base capable of supporting the weight of the pallets.
- Do not stack tiles more than 3 pallets high in stockyards or 2 high on site.
- Transport pallets using appropriate lifting machinery i.e. forklift truck or mechanical grab.
- Unload and handle tiles and fittings with care to avoid damage, soiling or breakage.
- Avoid loading pallets onto scaffolding unless a safe access platform has been provided.

Materials

- Store roof underlays on end on a firm, clean base protected from direct sunlight.
- Store battens and counterbattens on sufficient bearers to prevent sagging or twisting.
- Protect from water saturation when stored in bales or bundles horizontally.
- Store accessories in a safe, weatherproof store.
- Load tiles and fittings out on roof safely, support by battens to avoid slippage and distribute evenly to prevent overloading of roof structure (Figs 5 and 6).
- For variegated and granular faced tiles, it is recommended that, to enhance appearance, pallet loads are mixed whilst roof is being loaded.

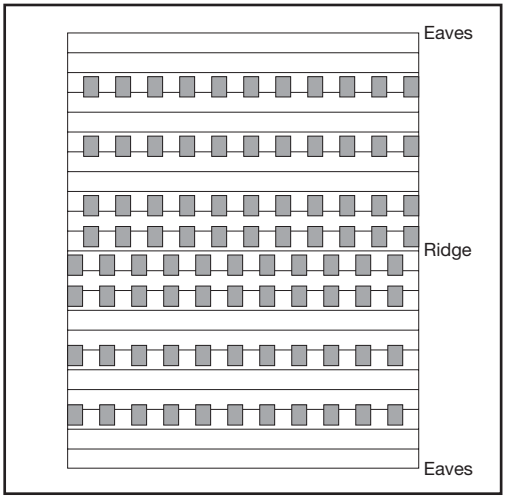

Fig 5 – Loading roof

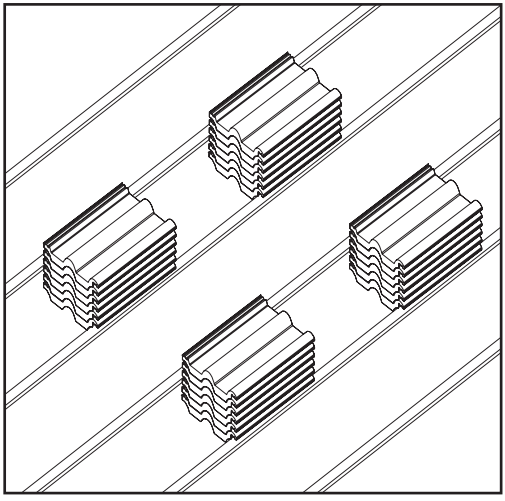
Fig 6 – Stacks of interlocking tiles (6 No. max.)

Roof groundwork

Before commencing work check:-

- Roof trusses are to a true line and adequately braced as specified.
- Roof structure is to an acceptable squareness, tolerance and to specified pitch.
- Flashings and secret gutters, covered by the slating or tiling, are positioned and secured to specification.
- Fascia boards and gutters are positioned and secured to specification.
- Gable brickwork has been levelled to be below rafter truss.
- Fascia boards or tilting fillets are positioned to allow eaves course of tiles or slates to be in same plane as main roof, i.e. not drooped or elevated.

Underlays

- Usually, roofing underlay is laid across rafters or counter battens and fixed using the smallest number of clout nails.
- Approved types of underlays are detailed in BS 747 'Reinforced bitumen sheets for roofing-Specification'.

a) Fully supported on boarding or rigid sarking: 1B Bitumen (Fibre base)*.

b) Not fully supported e.g. over rafters: 1F Reinforced Bitumen or 5U polyester reinforced bitumen.

c) Other approved underlays (with Third Party Certification) e.g. vapour permeable.

*Note: Where underlay is fully supported on boarding, it should have a vapour permeability of not less than 36g/m² per 24h at 25°C and 75% relative humidity tested to BS 7374.

Underlays

Laying recommendations

- Lay specified roofing underlay parallel to eaves or ridge with horizontal overlaps as specified in Table 1. Vertical side laps should be 100mm (min).
- Minimise gap at laps resulting from different tautness between underlay courses. Drape in underlay between supports to be no less than 6mm and no greater than 25mm.
- Fix underlay with fixings specified, keeping number of perforations to a minimum.
- Handle and fix underlay with care to ensure no tears or punctures. Repair any tears or punctures prior to tiling.
- Ensure that underlay does not obstruct flow of air through ventilators located at eaves, ridge or in main roof.
- Avoid contact between underlay and underside of tiles.
- To prevent wind uplift, fix additional battens or timber strips where laps occur between tiling battens.
- For recommendations on types of underlay, refer to BS 5534 (see page 11).

Table 1 – Minimum horizontal lap for underlays

Rafter pitch	Not fully supported (mm)	Fully supported (mm)
15° to 34°	150	100
35° and above	100	75

Eaves

- Lay 300mm wide strip of high performance underlay (BS 747 Type 5u or similar) or proprietary eaves protection strip at eaves, allowing 50mm overhang into gutter.
- Lap main roof underlay onto eaves strip by 150mm.
- Underlay should allow drainage of water and should extend over tilting piece or fascia board.
- Avoid water-traps behind the fascia board (Fig 7).

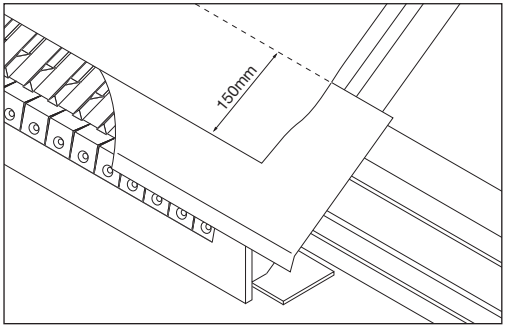

Fig 7 – Ensure water drainage at eaves

Underlays

Duo ridge

- Lay top courses of underlay over apex and fix in an overlapping manner to rafters (Fig 8).

Mono ridge

- Lay or cut top course of underlay (about 100mm) over top of fascia board and fix to same.

Hips

- Continue underlay over hip and fix in an overlapping manner.
- Ensure that a minimum lap of 150mm is maintained (Fig 9).

Note: An additional strip 600mm wide may be laid over the main roof underlay taking care to avoid excessive thickness.

Valleys

- Lay underlay parallel to eaves and extend beyond centre-line of valley by not less than 300mm from each direction to give a double thickness of underlay in valley of not less than 600mm wide.
- Fix underlay not less than 100mm from centre-line of valley.
- Where underlay is cut to centre-line of valley, lay a continuous strip of underlay not less than 600mm wide for the full length of valley beneath main courses of underlay (Fig 10).
- Where layboards are provided for continuously supported metal valleys, underlay should be cut back to rake so as to lap over metal valley tilting fillets.
- Do not lay metal and plastic valley materials and units directly onto an underlay where there is any risk of adhesion.

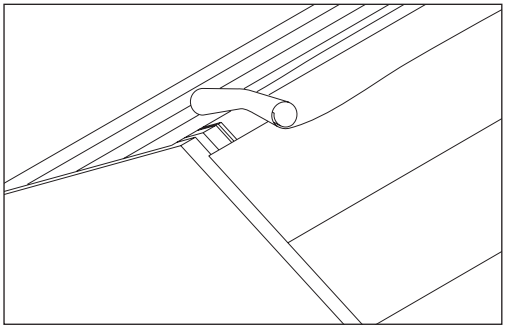

Fig 8 – Underlay at Duo ridge

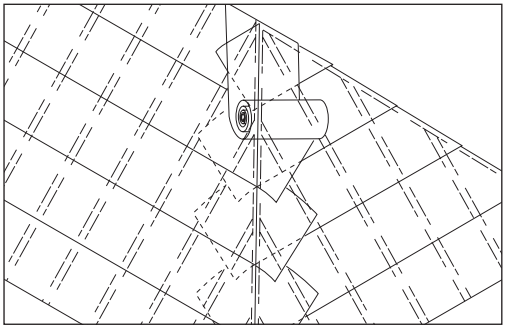

Fig 9 – Underlay at hip

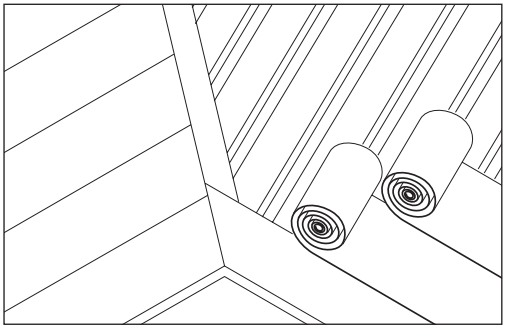

Fig 10 – Underlay at valley

Underlays

Verges

- At verges, underlay should be carried across wall cavity and laid beneath the undercloak.

Side/front abutments

- Turn and neatly cut underlay to not less than 50mm up abutment which will be covered by flashings.

Back abutment

- Dress or cut underlay neatly to provide not less than a 100mm to 150mm overhang into back gutter.

Underlay penetrations

- Accurately locate and mark position for opening using pipe etc. as a template.
- Neatly cut an 'X' shaped hole and turn up flaps around sides of pipe to minimise risk of any water leakage.

Vertical laps

- Vertical laps should be not less than 100mm. Fix each end securely over rafters. Edge distance of fixings should be not less than 50mm.

Horizontal laps

- Horizontal lap should be not less than that given in Table 1 on page 12.
- For underlays not fully supported, horizontal laps should be under a batten with at least 25mm of underlay projecting beyond each edge of a batten.
- Where a lap occurs between battens, hold it down with an extra batten in order to prevent lap from opening under wind uplift.
- Alternatively, fasten thin timber plywood strips of not less than half thickness of a batten directly over rafters between battens at which a lap occurs, but strips should be clear of any nibs on underside of tiles (Fig 11).

Fixing

- Fix underlay with extra large head felt nails of copper, aluminium alloy or hot dip galvanised steel of 3.00mm diameter.

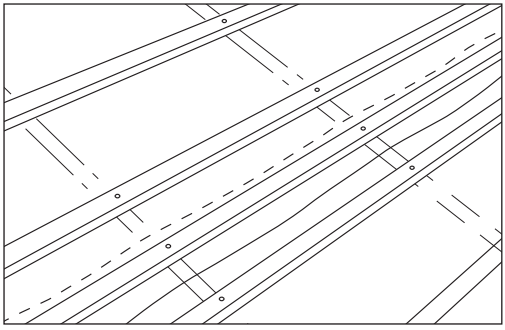

Fig 11 – Horizontal lap in underlay (sharing extra battens)

Battens

- Battens and counterbattens should meet requirements as recommended in BS 5534 in respect to timber species, permissible characteristics and defects and preservative treatment.
- Battens should be at least 1200mm in length and supported at each end and intermediately by a total of at least three rafters, trusses or walls.
- Stagger butt joints over intermediate supports.
- Splay nail each batten end and nail battens to each rafter.
- On trussed rafter roofs for interlocking tiles, allow not more than one joint in any four consecutive battens on same support.
- On trussed rafter roofs for Plain tiles, allow not more than three joints together in any twelve consecutive battens on same support.
- Batten sizes given in Table 2 should be taken as minimum dimensional requirements.
- Take care that nails used to secure tiles do not penetrate underside of battens or underlay.

Table 2 – Recommended batten sizes for pitched roofs and vertical work (BS 5534).

Tile type	Basic minimum sizes			
Rafters/supports	450mm span		600mm span	
	width	depth	width	depth
Plain Pitched/vertical	38	25	38	25
Single Lap Interlocking	38	25	50	25

All dimensions subject to re-sawing allowance: width ± 3mm depth - 0 or + 3mm based on measurement at a reference moisture content of 20%.

Roof battens

- Fix specified battens up roof slope on top of rafters ensuring minimum 40mm nail penetration into rafters (smooth shank).
- Nail counter battens vertically up roof slope where boarding is used to coincide with line of rafters. Maximum 300mm centres.

Wall

- Fix specified battens to boarding/sheathing/ sarking in line with vertical supports, or to masonry wall as specified.
- Secure counterbattens to masonry walls by fixing cut nails into built-in timber pads in mortar joints or by plugs and screws.

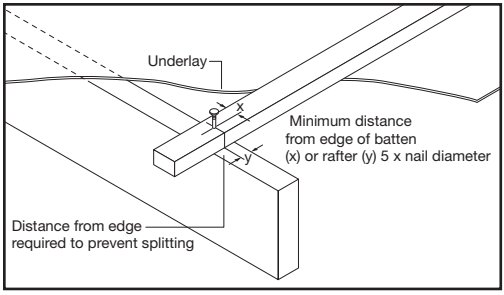

Fig 12 – Batten nailing position

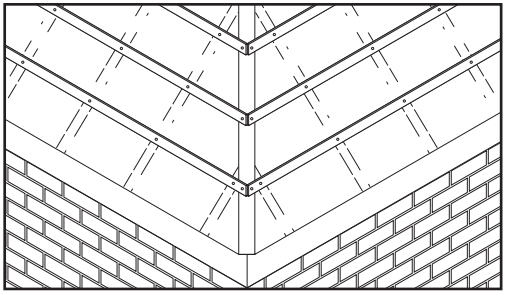

Fig 13 – Fixing battens at hip

Setting out the roof

It is important that the tiler should set out the roof prior to fixing. This will help to save time and avoid unequal overhangs at verges and expensive labour costs in cutting tiles at abutments (Fig 14).

Position of top and bottom battens

- Batten gauge required must be worked out on site. Fix eaves course batten first and position using one of the following methods:-
- Tack a short length of batten into position and locate tile over fascia so it hangs the correct amount into centre of gutter (45 to 55mm for a 100mm gutter) (Fig 15).

  Or
- Position eaves batten and measure distance from top edge to outside edge of fascia. This distance should equal length of tile less nib depth and gutter overhang e.g. (Bold Roll length 420mm, nib depth 20mm, overhang 50mm hence = 420mm - 20mm - 50mm = 350mm).
- For Plain tiles, position an additional eaves top tile batten below/above first full plain tile batten.
- Fix top course batten so that ridge tile provides a minimum 75mm cover to top course tile (Fig 16).

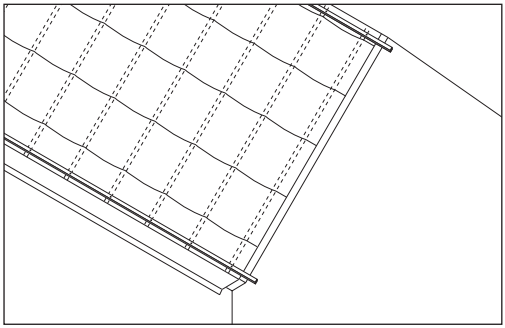

Fig 14 – Setting out

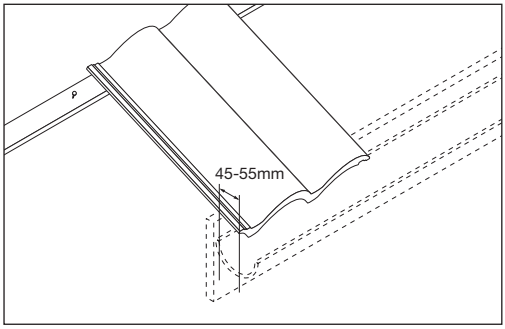

Fig 15 – Measuring gutter overhang

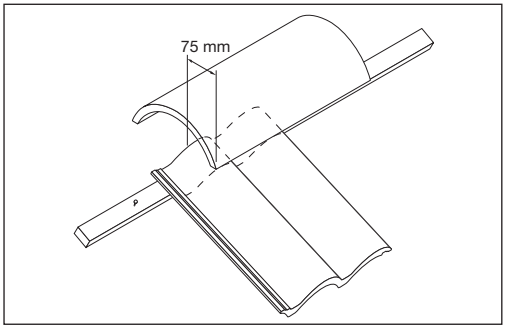

Fig 16 – Fixing top (ridge) course

Setting out the roof

Calculating the batten gauge

- Measure distance between top of eaves batten and top of ridge batten.
- Divide distance by maximum gauge of tile being used. For Plain tiles, gauge is determined by length of tile less required headlap divided by two, i.e. $\frac{267 - 65}{2}$ = 101mm (100mm)
- Round figure up to give number of courses up slope as a whole number.
- Divide measured distance by number of courses to give batten gauge.
- The practice of adjusting gauge over last few courses at eaves or ridge is technically acceptable, provided maximum gauge for tile is not exceeded.
- It is important, with deeply profiled tiles, to maintain a fixed gauge up roof to avoid a 'dog leg' diagonal.
- If necessary, tiles should only be cut in ridge course, drilled and nailed.

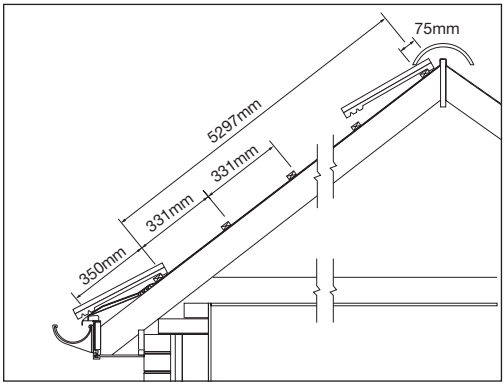

Fig 17 – Calculating batten gauge

Table 3 – Example (Fig 17)	
Distance eaves to ridge batten:	5297mm
Max. gauge for Bold Roll tiles:	345mm
No. of courses (5297 ÷ 345) = 15.35 15.35 rounded up:	16
Batten gauge (5927 ÷ 16):	331mm

Notes

i) The above applies only to a roof pitch with no features such as dormers, chimneys etc. Batten gauges between all such fixed points should be calculated individually.

ii) Where two roof slopes of varying pitch intersect, batten gauge should be set to lower or longer rafter pitch.

Setting out the roof

Horizontal alignment

There are several ways of achieving true horizontal alignment:-

- Strike a chalk/ochre line at 90° to perpendicular line (Fig 18).
- Measure two pieces of timber, each length of batten gauge minus width of one batten (advantageous for vertical tile hanging).
- Drive nails through a length of timber the distance of batten gauge apart and protruding approximately 5mm. Scribe required gauge onto underlay.

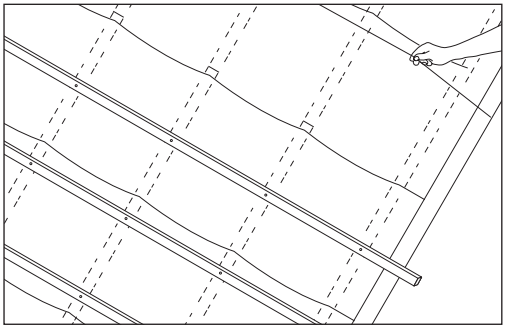

Fig 18 – Striking chalk lines

Perpendicular alignment

- Set out roof along eaves starting with correct overhang at right-hand verge.
- Correct overhang on left-hand verge can be achieved using full tiles by opening or closing side lap between tiles.
- Marley interlocking tiles allow a tolerance ('shunt') of approximately 3mm in side lock for adjustment (Fig 19).
- Allow a 3mm gap between adjacent Plain tiles.
- Overhang at verges should not be more than 50mm.
- On a short eaves, tiles may require cutting. Cut tiles at verges should be at least half width of a full tile. Half tiles are available for Bold Roll, Modern, Mendip and Double Roman tiles to assist setting out.
- Strike perpendicular chalk or ochre lines over eaves to ridge at three tile intervals to coincide with edges of tiles.
- A gauge rod the width of three tiles can be used as an alternative to actual tiles.

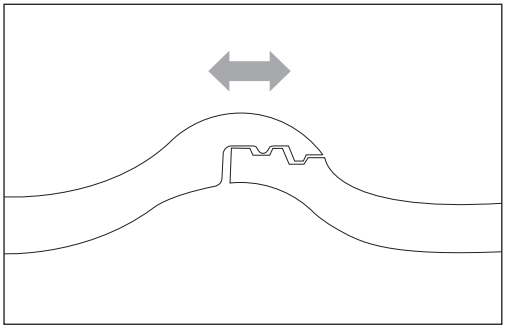

Fig 19 – Interlocking tile 3mm 'shunt'

Setting out the roof

Completion of tiling

- Load out all tiles on the roof evenly before commencing tiling (see page 10).
- Work from right to left (Fig 20). Depending on fixing specifications, you may leave out third and fourth tiles from left-hand verge and make use of tile battens as a ladder enabling upper part of roof to be reached for fixing ridges.
- On a hipped roof, cut tiles so that end tiles of each course align with rake of hip.

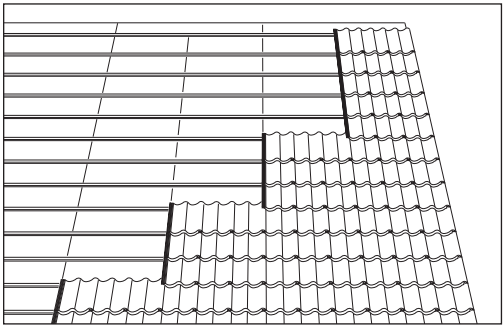

Fig 20 – Completion of tiling

Good tiling practice check points

- Never exceed maximum gauge for tile used at recommended pitch.
- Avoid cutting tiles wherever possible.
- Never cut bottom edge of a tile.
- Vertical cuts should never be less than half a tile width.
- On adjacent roof slopes of varying pitch, set batten gauge to the lower roof pitch to ensure alignment at intersections.
- Ensure ridge tiles provide a minimum 75mm cover to top course tiles.
- Eaves tiles should lie over the centre line of the gutter.

Fixing materials

Nails

Most tile profiles are suitable for nail fixing.

- Ensure that nails used are durable under expected conditions of exposure.
- The following types can be used, but for further details refer to BS 5534.
  - Aluminium
  - Silicon-Bronze
  - Stainless Steel
  - Copper

Clips

- The presence of nail holes reduces effective lap of some patterns of roof tiles. Accordingly, tile profiles for low pitches may be designed for fixing by clips only.
- Marley Roofing tile clips are available in aluminium alloy or stainless steel, which meet the requirements of BS 5534.

Mortar

Mixes

- Mortar should typically consist of the following mixes:

a) cement and fine aggregate (sand): one part cement and three parts fine aggregate (type S) by volume.

b) cement and fine aggregate (sand): one part cement to four parts fine aggregate (type G).

c) adapted site mortar: 8 parts mortar (1:1:6 cement/hydrated lime/fine aggregate) to 1 part cement.

- Plasticizing admixtures may be added in accordance with manufacturers' recommendations.

Notes

If use of other mixes is being considered, attention should be given to workability of mix and possible application problems, e.g. need to avoid unsatisfactory bedding on steep pitches.

Mortar mixes stronger than mix described above could lead to excessive shrinkage and lower values of tensile adhesion strength when tested in accordance with method given in Annex J of BS 5534.

Preparation

- Prepare mortar as recommended in BS 8000 : Part 3. Mix by machine to obtain uniform consistency and colour, and use within 2 hours.
- Avoid pointing with a separate mix of mortar to that used for bedding. If this is not possible, apply bedding allowing for enough insertion of mortar for finishing and pointing.
- Dampen mortar prior to pointing.
- Mortar may be coloured to match tile colour but pigment should not exceed 1 part in 60 to total mix.
- Avoid unsightly rainwater run off from fresh mortar.

Fire stopping

Party wall junction with roof

Use of a mortar bedding trowelled onto the wall under and between the battens is not recommended, as gaps are often left under the tiles. Additionally, if differential settlement occurs, this will lead to hogging or humping of the roof tiling above the separating wall.

It is recommended that a glass fibre or similar compressible material is selected.

The following points should be adopted to ensure a satisfactory detail:-

- When trimmed to roof slope, ensure that party wall is 25mm below top edge of adjacent rafters. Mortar if necessary to achieve a fair line.
- Select fire-stopping material of rock wool, slag wool or glass fibre quilt, resilient enough to fill irregular spaces but not so resilient to lift or dislodge tiles.
- Before felting and battening, ensure quilt is laid on top of wall with edges tucked between faces of wall and adjoining rafters.
- After felting and battening, ensure lengths of quilt are laid between battens as tiling proceeds or fixed by spot sticking in place before tiling.

Eaves

- Check eaves void is filled and correct material is chosen to achieve a tight fit.
- Filling must be securely fixed without support from the soffit board (Fig 21). The following materials can be useful for this purpose:

  Wire reinforced mineral wool 50mm thick.

  Mineral wool, wired to expanded metal lath.

  Semi-rigid mineral wool batt, spiked or wedged in place.

  Compressed mineral board cut to close fit.

  Plywood min. 19mm thick treated with flame retardant.

  Sand-cement (pre-mixed vermiculite cement) render on expanded metal lath.

Note: It is advised that the Local Authority Building Control Officer is consulted prior to undertaking this work.

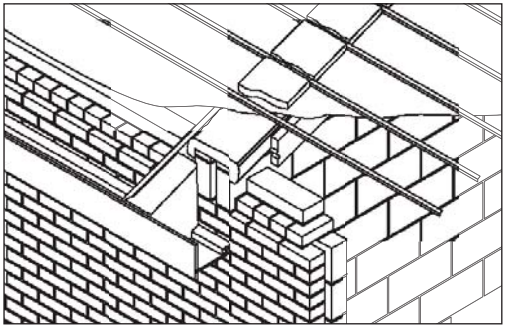

Fig 21 – Party wall fire stopping.

Scottish practice

Roofing practice in Scotland differs from elsewhere in the British Isles by the addition of rigid or semi-rigid boarding (or sarking) fixed directly above the rafters.

- When completing groundwork on roof, first lay underlay onto the sarking lapped 100mm horizontally and vertically.
- Fix counterbattens through sarking into rafters by at least 40mm.
- Nail tiling battens above counterbattens at required tiling gauge (Figs 22 & 23).
- Allow for extra thickness of counterbattens and sarking at eaves when fixing fascia or tilting fillet, and at verge, by building up outer layer of brickwork.
- Cut the rigid sarking back at inner leaf of brickwork.
- Lap underlay at ridge over apex and finish sarking and counterbattens 15mm short of this apex.
- Where Marley Roofing ventilated dry fix ridge system is used, cut sarking and underlay back to provide ventilation. Due to high wind speeds and exposure of many sites in Scotland it may be necessary to mechanically fix ridge and hip tiles as well as bedding them in mortar.

The fixing of all tiles should comply with BS 5534.

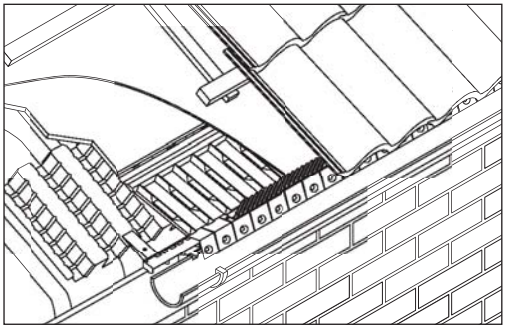

Fig 22 – Tiling battens and counter battens at eaves

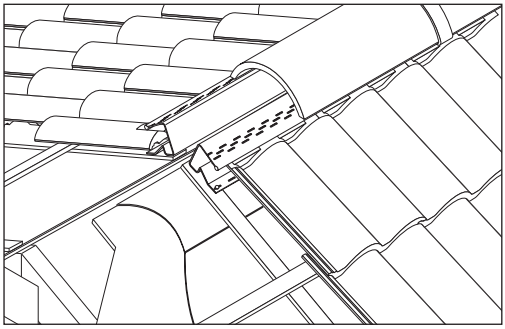

Fig 23 – Tiling battens and counter battens at ridge (with Marley ventilated dry ridge system)

Repair and replacement of broken tiles and slates

Introduction

Any broken or defective tiles should be replaced with a sound matching unit and not covered over superficially with any other material or coating.
If extensive repairs are required, sectional or complete re-tiling should be considered.
The use of surface coatings to weatherproof roofs externally or internally is not recommended.

Interlocking tiles

- To remove a broken tile, first ease up slightly to slide out with nibs clearing batten. Replace tile by applying this method in reverse.
- For a nailed tile, neighbouring tiles above should be lifted first to expose nail, which should be extracted carefully. Tile can then be replaced as described above.
- If all courses are nailed, a slate ripper can be used to remove tile nails and replacement should follow normal procedure.
- If all tiles are clipped, strip back roof to nearest verge or valley/hip and re-fix tiles as necessary.
- Isolated tiles can also be replaced and re-fixed using an epoxy-resin adhesive applied along interlock of the replacement tile and at overlap (see Care, Maintenance and Repair Datasheet for list of suitable adhesives).
- This method is only suitable where all adjacent tiles are mechanically fixed.
- Alternatively, replacement tiles can be mechanically fixed using procedure as recommended for Monarch/Marquess/Duo Marquess/Dalestone interlocking slates using an appropriately sized stainless steel screw and sealing washer.

Repair and replacement of broken tiles and slates

Monarch/Marquess/Duo Marquess/Dalestone interlocking slates

- Remove broken slates using a hacksaw blade to cut nail if necessary.
- Isolated damaged slates can be suitably repaired using an epoxy resin adhesive applied along the interlock of replacement slate and at overlap.
- Alternatively, and particularly where several slates are broken, the following procedure should be followed:
  - Remove broken slates
  - Chamfer nibs of replacement slate
  - Mark batten centre on its bottom edge and locate under course above
  - Drill a no. 8 hole 50mm from L/H edge and fix slate with no. 9 counter sunk, stainless steel woodscrew and sealing washer
  - Repeat at batten gauge through R/H slate in next course above (see Fig 24).

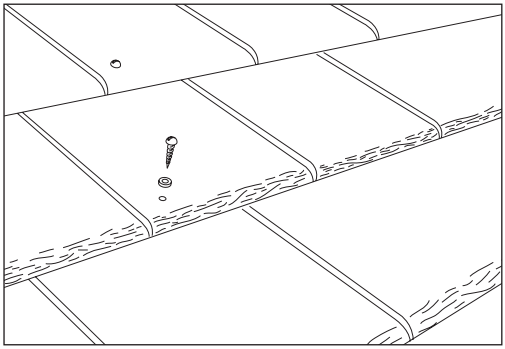

Fig 24 – Replacing Monarch/Marquess/Duo Marquess/Dalestone interlocking slates

Melbourn interlocking slates

Marley Melbourn reconstituted slates are interlocking slates which are normally fixed with one (occasionally two) stainless steel ring-shanked nails, into softwood battens.

Because each stainless steel fixing is concealed and protected from the elements by an overlapping adjacent slate, replacement of a damaged slate must be carried out with care, and in accordance with the following procedure

- At bottom left hand corner of damaged slate, immediately adjacent to neighbouring slate, insert a hacksaw blade and cut through shank of fixing nail (Fig 25).
- This releases lower edge of damaged slate and allows it to be broken gently into smaller pieces, and removed, all except for head or upper portion of the slate (Fig 26).

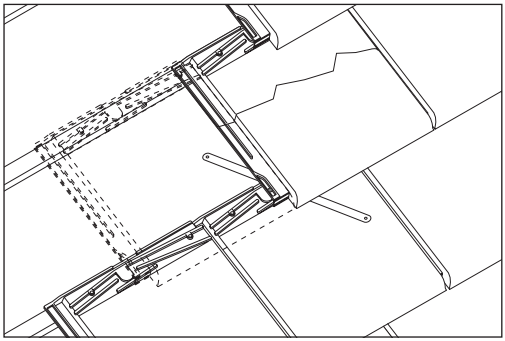

Fig 25 – Cut fixing nail

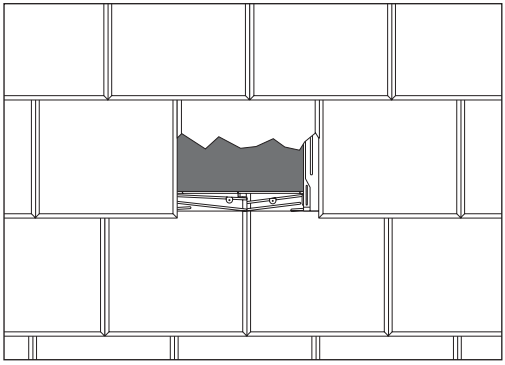

Fig 26 – Removal of lower part of slate

Repair and replacement of broken tiles and slates

- With a larger opening, it is now possible to cut head off nail that retains slate directly above damaged slate.
- The remaining portion of damaged slate can now be pushed upwards over batten and removed.
- If resistance is felt, cut second nail fixing in remaining head portion in a similar manner (Fig 27).
- Pliers or a saw may be used to remove any lengths of nail left in battens, so that replacement slate may be fitted without obstruction.
- On new slate, batten nibs at positions 'A' and 'B' should be carefully removed (Fig 28).
- In addition, top upstand 'X' should be slightly reduced in height to allow easy insertion of new slate (Fig 28).
- Slip modified slate into position by carefully lifting surrounding slates. Hook onto batten with remaining nib and align with adjacent slates.
- Fix replacement slate through slate immediately to left of new slate. To position fixing, measure 280mm up from tails of slates on course below, and mark a light parallel line on adjacent slate. Then mark a vertical line on same slate 25mm in from right hand edge of slate. At intersection of two lines on adjacent slate, carefully drill a 3mm-diameter hole through the two thicknesses of slate (Fig 29).
- Screw through drilled hole and both layers of slate into batten below using No. 9 countersunk stainless steel screw with washer sealing as Monarch/Marquess slates (see Fig 24, page 24).
- Use same procedure to secure tail of slate above replacement slate.

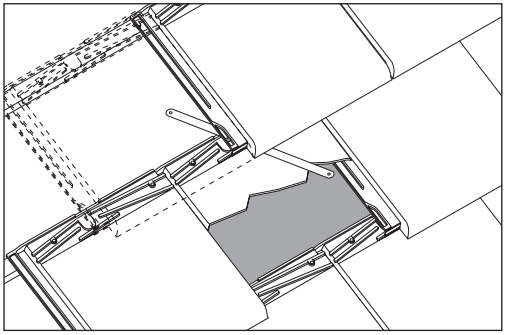

Fig 27 – Removal of further fixings

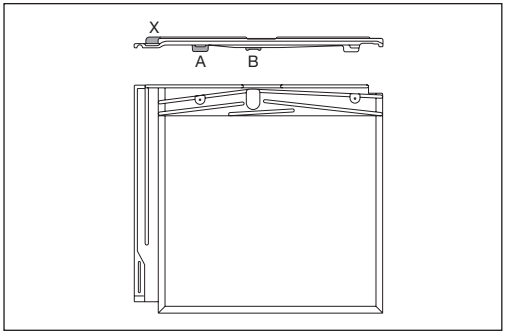

Fig 28 – Removal of nibs

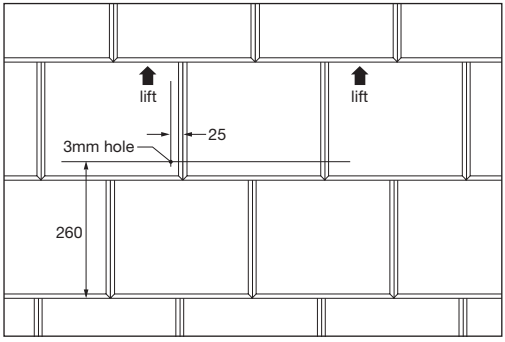

Fig 29 – Position new slate

Repair and replacement of broken tiles and slates

Plain tiles

The Marley Plain tile repair clip (code 30360 for 19mm thick tile battens and code 30359 for 25mm thick tile battens) has been developed to assist the replacement of a tile that requires mechanical fixing. It can be used on roofs in exposed areas or with vertical cladding.

- Remove damaged tile with neighbouring tiles blocked up with 25 x 38mm batten. Care should be taken not to break adjacent tiles (Fig 30).
- Insert clip into tile firmly and attach tool to clip (Fig 31).
- Push up into gap so clip attaches to batten and nibs fall over top of batten (Fig 32).
- Where tiling battens have been nailed directly to blockwork, prise batten away by approximately 5mm and insert a small wedge so that clip will go into position.
- Remove tool and blocks from panel allowing tiles to be eased into position and adjusted to seat properly.

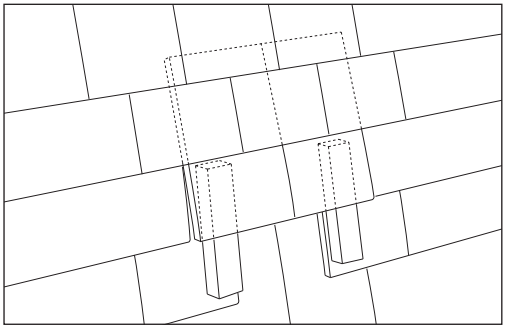

Fig 30 – Block tiles with battens

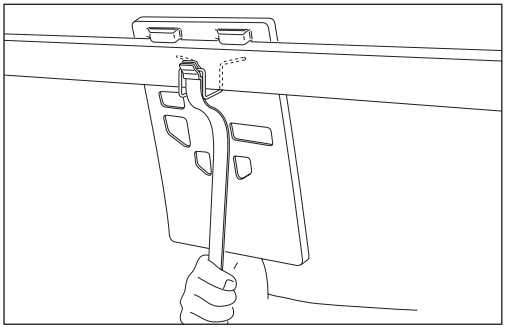

Fig 31 – Attach tool to clip

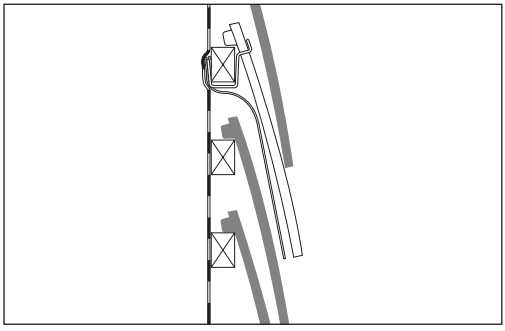

Fig 32 – Attach clip to batten

General tile fixing

General tile fixing

Before commencing the installation of the tiles, ensure the following is carried out:

Roof structure

- All rafters/trusses are perpendicular, fully braced and secured to wall plates.
- If re-roofing an existing property, make sure structure meets current Building Regulations requirements.
- Check to see if roof needs to be strengthened to take weight of replacement tiles

Roof pitch

- Check rafter pitch is adequate for selected tile profile.

Note: If a tile is laid below the minimum recommended lap, there is a risk that wind will drive rain under the headlap and onto the underlay. Some profiles benefit from an increased headlap to 100mm but this is no substitute for an increased pitch.

Fixing

- Tiles are mechanically fixed to meet BS 5534 and Marley Roofing requirements.
- (All perimeter tiles must be either nailed or clipped with fixing of additional areas dependent on size, of roof exposure category, wind speed etc.)

Note: Detailed, fixing specifications can be obtained from the Technical Advisory Service:

Tel: 08705 626400
Fax: 08705 626450
Email: tas-rooftile@marleyeternit.co.uk

Table 4 – Minimum fixing specifications

Plain tiles	
Roof pitch 35˚-59˚	Two courses of tiles at eaves and top courses nailed. In addition, all perimeter (verges/abutments) tiles and every fifth course twice nailed.
Roof pitch 60˚ and above	All tiles twice nailed.
Monarch/Marquess/Duo Marquess/Dalestone slates	
Roof pitch 22.5˚ - 69˚	(Height to ridge below 10m) All slates clipped and once head nailed.
Roof pitch 22.5˚ - 69˚	(Height to ridge above 10m) All slates clipped and twice head nailed.
Roof pitch 70˚ - 90˚	All slates clipped and twice head nailed.
Melbourn slates	
Roof pitch 15˚-24˚	All slates twice nailed.
Roof pitch 25˚ - 90˚	All slates once nailed.
Interlocking tiles and slates	
Roof pitch 15˚ - 22˚	All perimeter tiles clipped (eaves/verge/top course/abutments)
Roof pitch 22.5˚ - 44˚	All perimeter tiles clipped or nailed depending on exposure (eaves/verge/top course/abutments).
Roof pitch 45˚ - 54˚	All tiles fixed with at least one nail.
Roof pitch 55˚ and above	All tiles nailed and clipped.

* Modern/Duo Modern/Edgemere/Duo Edgemere slates and Wessex interlocking tiles 25° minimum pitch for nailing. Tiles without nail holes must be used below 25°. All other concrete tiles and slates are supplied with nail holes.

Note: The recommendations above should be followed for general security and are the minimum expected for any roof. The recommendations for wind uplift resistance or general security should also be followed; in many cases the fixing recommendations for wind loads exceed the minimum recommendations for general security. Fixing recommendations for wind loads can be determined by the Technical Advisory Service.

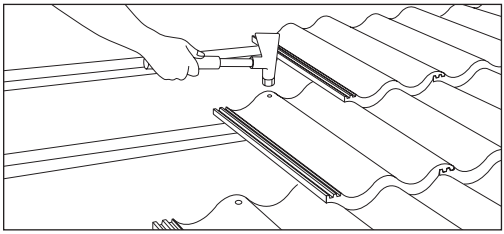

Fig 33 – Ensure pitch and headlap are sufficient

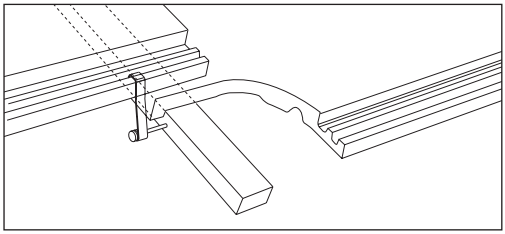

Fig 34 – Tile clip (modern)

Sitework

- Check correct mortar mix for bedding tiles and fittings.

The following is good practice:

- Wet all products prior to bedding.
- Ensure all bedding surfaces are clean and free from harmful matter.
- Tiles for hips and flashings may be cut using a hammer or pincers.
- Tiles cut to rake or mitre in open details, e.g. valleys, external angles, should be trimmed with a disc cutter (Fig 35) or scribed (Fig 36) and cut using hammer/pincers, (Fig 37) to ensure neat finish.
- Avoid dust inhalation by using cutting equipment which has dust extraction or suppression where practiced.
- Always wear appropriate personal protective equipment (goggles/protective clothing/ear defenders/and approved P3 respirator) when mechanically cutting tiles.

For current guidance see Marley Roofing's Health and Safety product data sheets available from the Technical Advisory Service.
Tel: 08705 626400

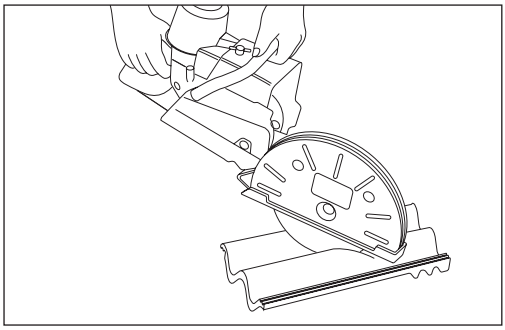

Fig 35 – Use a disc cutter for mitring or cutting tiles to rake

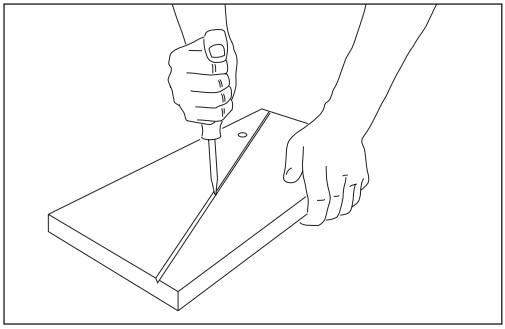

Fig 36 – Scribing tile to be cut

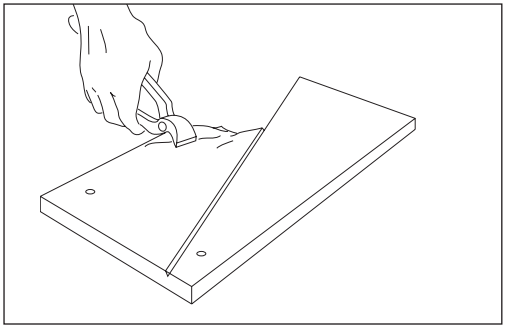

Fig 37 – Cutting tile using pincers

Eaves

Interlocking tiles

- Lay out full course of eaves tiles.
- Tiles must overhang fascia board so that water discharges into centre of gutter (Fig 38).
- If gutter is not fixed, an overhang of min. 50mm should be allowed.

  Note: Fascia heights shown in Table 5 on page 32 and Tables 9 and 10 on pages 71-72 assume the 50mm distance is measured between bottom right corner of tile and fascia board, that is bottom corner of overlock.
- Fit underlay protector or draw underlay taut over tilting fillet and front edge of fascia board before fixing.
- Fix eaves course tiles with nail or purpose-made eaves clip nailed to top of fascia board (Fig 39).
- If fascia board has been fixed at right height, eaves course will automatically be at correct pitch.

  Note: Sprockets are not recommended with interlocking tiles.
- Eaves ventilation should be provided for all new projects.
- For deep profile tiles, nail comb filler to top of fascia board (Fig 40).

  Note: Eaves ventilation can be achieved unobtrusively by using Marley Universal eaves ventilation systems (10mm and 25mm).

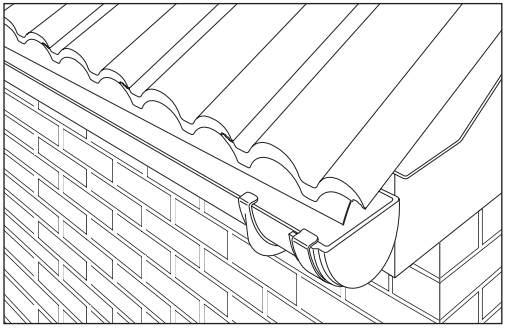

Fig 38 – Overhanging tiles ensuring water discharges into the gutter

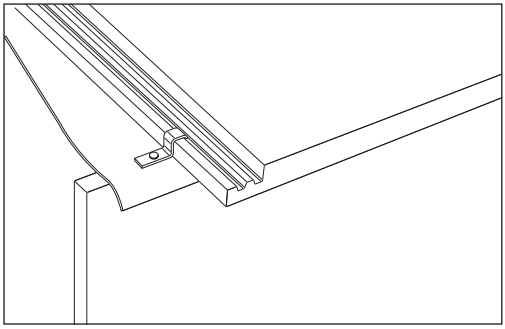

Fig 39 – Eaves clip

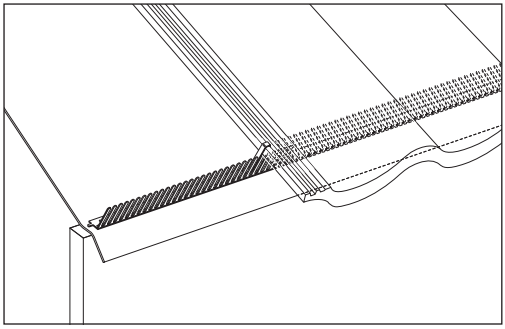

Fig 40 – Eave clip and comb fillers for deep profile tiles

Eaves

Plain tiles

Eaves have a double course throughout their length using purpose-made eaves tiles for the undercourse.

- Twice nail both courses.
- Eaves course to overhang fascia board so that water discharges into centre of the gutter.
- If gutter is not fixed, an overhang of 50mm should be allowed (Fig 41).
- A sprocketed eaves detail may be used, provided it is not below 35˚ pitch.

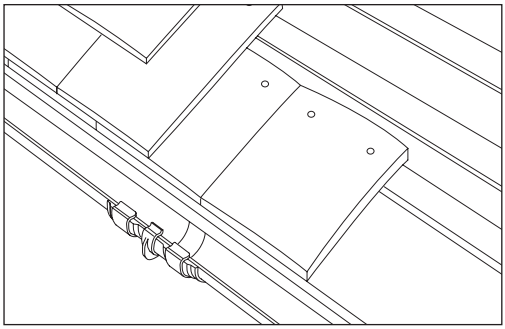

Fig 41 – Ensure sufficient overhang into gutter

Eaves check points

- Nail or clip all eaves tiles.
- Make sure eaves course does not tilt backwards.
- Where appropriate, fit correct eaves comb filler unit.
- New projects may use Marley Roofing Eaves Ventilation Systems (10mm or 25mm continuous ventilation above 15° pitch).
- If above is not used, a tilting fillet must take its place.
- Ensure bottom courses overhang into gutter approx. 50mm.

Eaves – fascia heights

The eaves course of tiles must be in the same plane as the remainder of roof.

- For comprehensive tabulated reference for vertical measurement of eaves fascia above rafter, see below. For measurements using the Marley Universal 10mm and 25mm Eaves ventilation systems, please refer to Tables 9 and 10 on pages 71-72.

Table 5 – Fascia height settings (mm) 'x' **without** over fascia ventilation system

Pitch	20°	30°	40°	50°	60°	70°
Anglia Plus	–	34	34	38	72	95
Ashmore	–	44	44.6	50	–	–
Bold Roll	34	34	35	37	43	55
Double Roman	–	31	32	34	38	49
Duo Marquess/Marquess/ Monarch/Dalestone	–	35	36	37	44	56
Edgemere/ Duo Edgemere	40	40	41	44	52	68
Ludlow Major	–	35	36	39	45	58
Ludlow Plus	–	33	35	55	65	84
Malvern	44	44	45	50	59	77
Melbourn	38	37	35	35	38	43
Mendip	–	33	33	36	42	53
Modern/ Duo Modern	47	48	51	58	71	98
Plain	–	–	45	50	58	76
Wessex	44	47	52	57	62	71

Note: Tables calculated using a 19mm thick timber fascia board with tile projecting 50mm beyond the front plane of the fascia. Heights shown will be affected where rigid sarking and counterbattens (Scottish practice) are used or where there is variation in batten thickness, tile overhang, fascia thickness or pitch.

The nominal dimensions given in this table should be adjusted to suit site requirements by ensuring that the eaves course of tiles is laid at the same pitch as the main body of the roof.

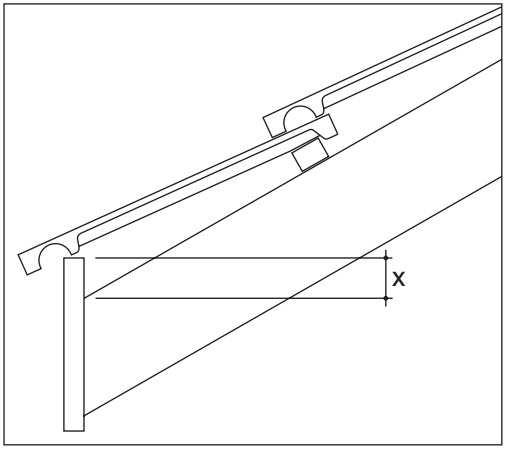

Fig 42 – 'x' = Fascia height setting

Verges

Interlocking tiles

- Form verges by bedding tiles onto undercloak of fibre cement strip (1200mm x 150mm).
- Lay undercloak rough side upwards, closely butted together, with a slight tilt outwards to provide drip at outside edge.
- Level off irregularities in brickwork by laying undercloak onto a buttering of mortar, bringing height up to adjacent rafter.
- Carry roofing underlay over cavity wall and cover by inside edge of undercloak.
- When laid on boarding, nail each length of undercloak at maximum of 300mm centres.

Tiling battens

- Tiling battens should finish 100mm from edge of brickwork or bargeboard.
- Place undercloak below battens, overhanging by maximum of 50mm (Fig 43).
- Provide about 50mm of mortar width.
- Ensure that batten ends remain clear.
- Bed all verge tiles and fix either by nailing or clipping.

External clipping

- When required, nail verge clips to top of battens with upstand level with extreme edge of undercloak (Fig 44).
- Under normal conditions, set roof out to avoid cutting. Where not possible, ensure that cut tiles are symmetrical at both verges.
- Remove interlocks where necessary to facilitate the fixing of external verge clips.
- Strike all mortar bedding off flush and neatly point.

Note: It is recommended that tiles are not swept up at verges (Fig 50).

Verge at eaves

- Verges at eaves should overhang by same amount as rest of tiling.
- Remove a small piece of undercloak to prevent first tile from riding up.

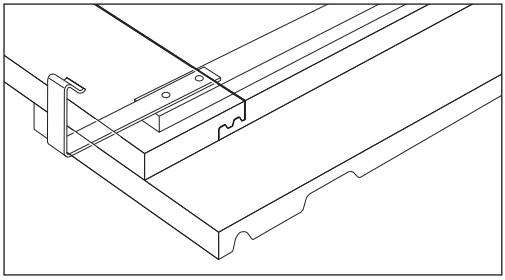

Fig 44 – Verge clip

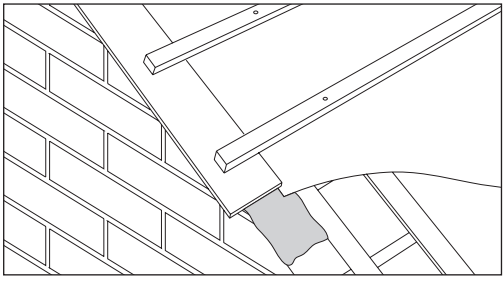

Fig 43 – Fibre cement undercloak fitted over tiling batten

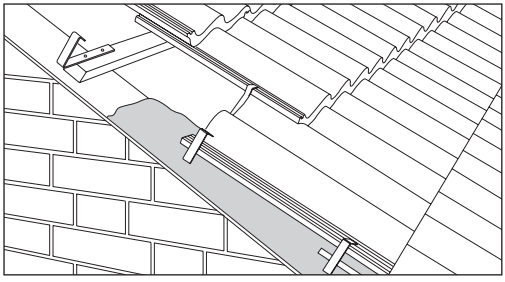

Fig 45 – Clip all verge tiles

Verges

Plain tiles

- A plain tile undercloak can be used in place of a fibre cement strip.
- Lay face down with tail edge facing outwards (Fig 46).

  Note: Do not use Plain tiles as an undercloak below 30° pitch.
- Lay verges broken-bond with full tiles and tile-and-a-half in alternate courses.
- Bed tiles projecting approximately 50mm over the gable walls or bargeboard.
- Strike off bedding mortar and neatly point in one operation (see Fig 46).
- Alternatively, bed tiles in mortar onto a fibre cement undercloak.
- When laid on brickwork or masonry, bed undercloak in mortar and strike off flush with external face of wall, leaving top surface finished smooth and straight; bed tiles forming verge on this undercloak.
- When laid on boarding, nail each undercloak with at least two nails at centres of not more than 300mm.

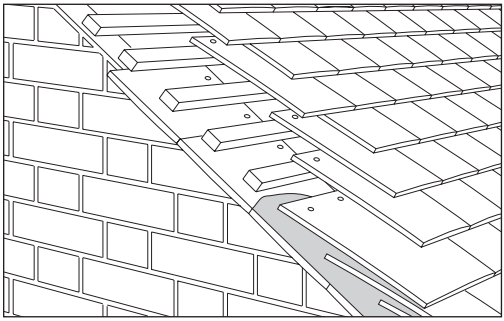

Fig 46– Undercloak using Plain tiles

Verge check points

- Nail or clip all verge tiles.
- Always continue underlay across wall cavity and below undercloak (where appropriate).
- Mortared verges should have an overhang of 38 to 50mm.
- Undercloak should have an outward tilt on mortared verges.
- Avoid pointing with a separate mix of mortar.

Ridges

Duo-pitch ridges

Ridges should be covered using ridge tiles of complementary colour or contrasting and texture to that of main roof tiles. Always check that the ridge tile design suits the pitch and type of roof tile being used. (See Marley Roofing Product Catalogue).

- Edge-bed ridge tiles onto the top course tiles with solid bedding at butt joints (Fig 47).
- Support mortar at these butt joints using pieces of tile.
- A minimum of 75mm cover should be provided over top course tiles.
- Exposed mortar should be neatly pointed.

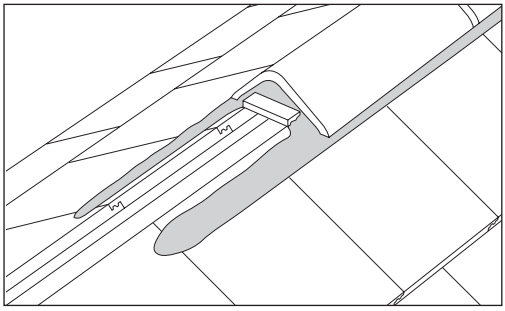

Fig 47 – Bedded ridge with tile slips to support mortar at butt joints

Ridges at gable ends

- Allow for mechanically fixing of two ridge tiles at gable ends, abutments, above separating walls, or for a minimum distance of 900mm.
- For trussed rafter roofs, fix a length of batten approximately 2m long at the apex of wall and adjacent trusses.
- Drive a nail into batten and attach a Security Ridge tile to it using the galvanised wire provided in tile (Fig 48).
- Fill fair ends of ridges with mortar inset with pieces of Plain tile and neatly point.

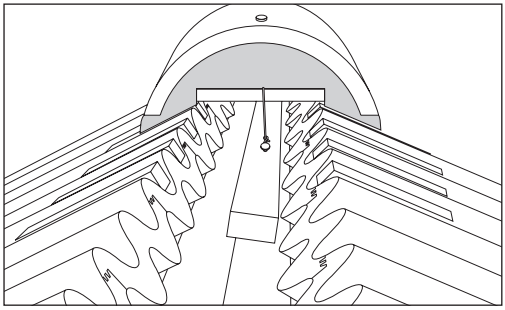

Fig 48 – Security Ridge fixing at gable ends

Dentil slips

- For Mendip, Wessex, Anglia Plus, Malvern, Bold Roll or Double Roman (optional) tiles, lay dentil slips into pans of top courses.
- A mortar bed approx 10mm thick should be provided to bed the dentil onto (Fig 49).

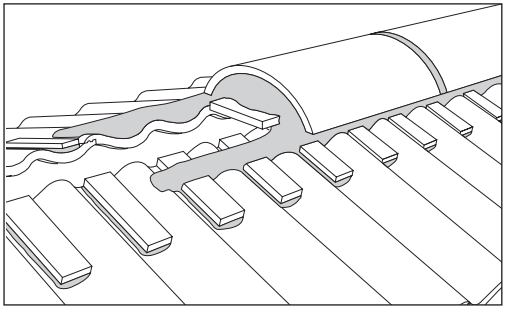

Fig 49 – Mortar bedded ridge using dentil slips for deep profiled tiles

Ridges

Mono-ridge

- Carry roofing underlay over ridge and cut below vertical leg of mono-ridge tile.
- Lay mono-ridge tiles for Plain and Interlocking profiles as standard ridge tiles and mechanically fix each by using 2 No. 50mm x 10g stainless steel screws (supplied) to timber fascia behind vertical leg (Fig 50).

Top courses when using Plain tiles

- Use a single course with 200mm long eaves/top tile mechanically fixed with special stainless steel spring clip (Fig 51). (Code 30332).

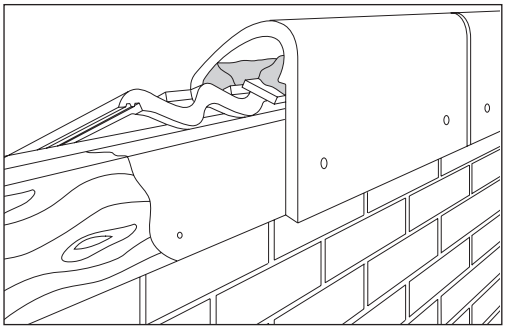

Fig 50 – Bedded mono-ridge with 2 mechanical fixings

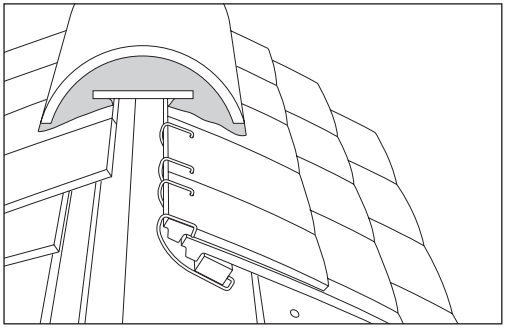

Fig 51 – Mechanical fixing of top course plain tiles using spring clips

Ridge check points

- Nail and/or clip all top course tiles either side of ridge.
- Bed dentil slips in mortar in pans of high profile tiles.
- Overlap ridge underlay by minimum 150mm.
- Ensure minimum 75mm cover by ridge tile over top course.
- Keep ridge tiles set in a true line.
- Do not over-tighten screws.

Hips

Interlocking tiles

Hips should be weathered by covering the junction of the tiles, often achieved by securing hip tiles along the length of hip.

- Mitre tiling battens and fix to continuous structural member.
- Fix a galvanised hip iron minimum 5mm thick at base of hip tree with two 5mm diameter nails, or suitable screws.
- Cut tiles closely to rake of hip.
- Edge-bed, with solid bedding at butt joints, onto adjacent roof tiles.
- Shape first hip tile at foot to line of tiling at eaves and fill fair end with mortar inset with pieces of tile. Neatly point.
- Edge and solid bed hip tiles continuing along length of hip (Fig 52).

Hip/ridge junction

- Mitre junction of hip and ridge using a standard three-way mitre and solid bed (Fig 53).
- In exposed situations, it is recommended that a lead saddle Code 4 is used beneath the apex junction.
- For Mendip, Wessex, Bold Roll, Malvern and Anglia Plus, lay a course of dentil slips into pans and bed in mortar.
- Where a bedded hip tile meets a dry ridge line, height of bedding should be same as that of profiled filler units so that ridge height is even and line continuous.
- Use Security Hip tiles for a distance of 900mm from face of rigid masonry supports, abutments, or separating walls (see Fig 48, page 35).

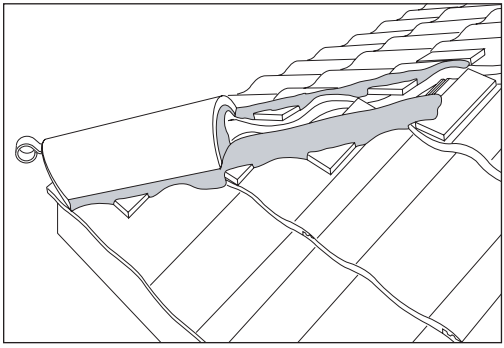

Fig 52 – First hip tile bedded and supported with tile slips

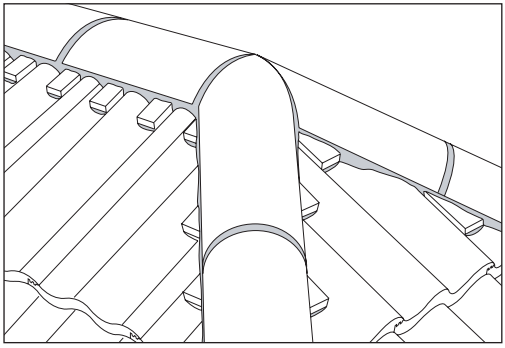

Fig 53 – At ridge hip junction, cut tiles with three-way mitre to ensure continuous line

Hips

Plain tiles and Third Round Hip tiles

- Edge-bed Third Round Hip tiles onto close mitred tiles with a solid bedding at butt joints.
- Fix a galvanised hip iron at foot of hip as support.

Plain tiles and Bonnet Hip tiles

- Bed in mortar during fixing. Strike bedding off smoothly at lower edges of hip tiles or keep slightly back and point.
- At eaves, solidly bed bonnet hip and fill with dentil or tile slips where possible.
- Straight cut tiles adjacent to each side of bonnet hip to maintain bond and fix with 70mm x 3.35mm aluminium nails (Fig 54).

Close-fitting Arris Hip and purpose-made tiles

- Fix close-fitting hip tiles with 65mm x 3.35mm aluminium nails penetrating at least 25mm into hip rafter or supplementary batten.
- Bed top of hip tiles to provide seating in mortar.
- Lay and fix bottom hip tile in line with under eaves course.
- Where roof pitches on either side of hip vary, the steeper pitch should be battened to a closer gauge to maintain same number of courses on either side.

Mitred hips

- Where tiling does not meet at right angles on plan, cut tiles or tile-and-a-half to a close rake to hip line.
- Cut Code 3 lead soakers to extend a min. 100mm either side of hip and fix as required.

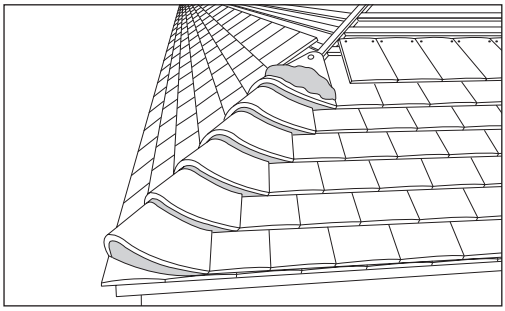

Fig 54 – Bedded bonnet hip tiles

Hip check points

- Fix a suitable hip iron to the base of rafter.
- Close mitre roof tiles where they meet hip and ensure each tile is nailed or clipped.
- Bed and fix all small pieces of tile.
- Mitre hip tiles at ridge junctions ensuring that the end tile does not ride up.
- Cut bottom hip tile to align with eaves.

Valleys

Trough valley tiles (for interlocking tiles)

Marley concrete trough valley tiles (for interlocking tiles) are available in two types, Standard design for roof pitches of 35° to 45° and Type 30 - 23 design for use on roof pitches of 22.5° to 34°.

Groundwork

- Trough valley tiles should be adequately supported by a valley tree.
- In trussed rafter construction, use timber layboards up centre of valley to provide support and lay flush with top of rafters.
- Cut away fascia board with two mitred cuts level with rafters for a distance of 200mm on each side of valley rafter.
- Fit a galvanised valley iron to base of valley rafter with two 2.65mm diameter screws, or nails, to make foot of valley in line with overhang of tiling into gutter (Fig 55).

Underlay

- Place a strip of underlay at least 600mm wide vertically up length of the valley and overlap on each side with the main roof underlay.

Laying procedure

- Lay a full trough valley tile at foot and at head of valley with centres over valley board or rafter and side parallel to it.
- Use these tiles as guides for two 38 x 25mm counterbattens laid parallel to edges of tiles and closely adjacent to them.
- Bring tiling battens over counterbattens, cut off flush and nail through (Fig 56).
- At eaves, notch first trough valley tile so that each side of it carries line of eaves to a point at which tiling covers the valley tile. Centre should rest firmly against valley iron.
- Ensure that subsequent trough valley tiles sit firmly on one beneath.

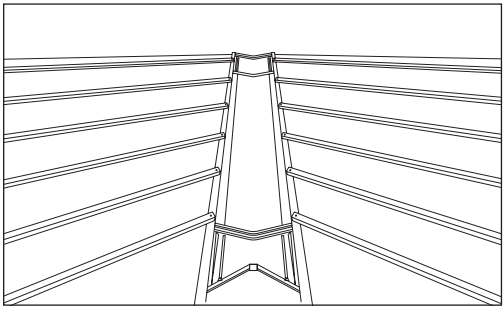

Fig 55 – Position and fix head and foot valley tiles first with valley iron at eaves.

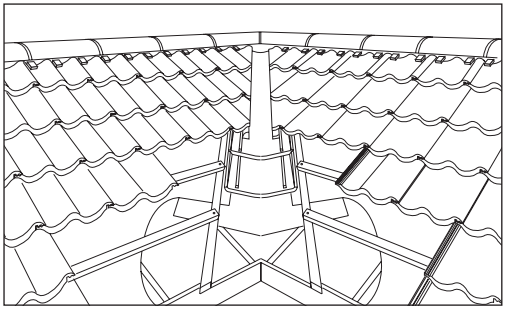

Fig 56 – Timber construction through valley

Valleys

Laying procedure (continued)

- Lay trough valley tiles up the valley inside two counterbattens.
- Ensure that each tile is lapped correctly and that there is no sideways movement (Fig 57).
- Provide support by laying a length of 125mm x 50mm timber up centre of trough valley tiles, held in position by short lengths of batten.
- Timber support ensures 125mm open width of valley and also acts as a support to bedding mortar until it is set.
- Timber also provides correct scribing line for mitred cutting of tiles adjacent to valley (Fig 58).
- Once cut, bed tiles on trough valley tiles, ensuring that mortar is kept inside two tapered bars down each side of tile.
- Compact mortar against edge of timber, completing each side of valley separately (Fig 59).
- Once the mortar has set, remove timber and smooth any rough edges with a trowel.
- Remove loose mortar and tile chippings.

Note: Only use trough valley tiles where angle of intersecting walls of building are 90° and where adjacent roof pitches have a pitch difference of 5° or less.

In order to ensure a full tile is used at top course, increase lap on first two or three courses by cutting down side ribs near top of tile.

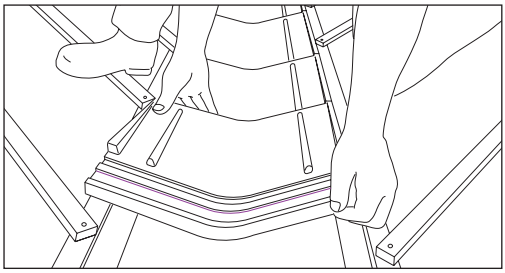

Fig 57 – Ensure correct lap and no sideways movement

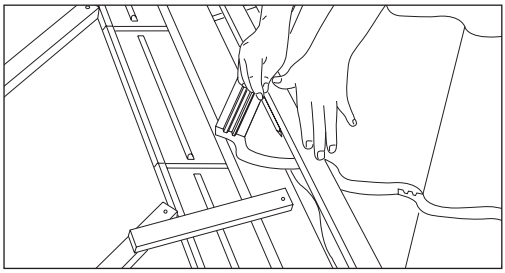

Fig 58 – Scribe roof tiles to cut in use with valley

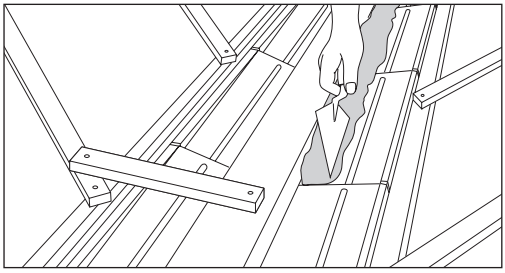

Fig 59 – Keep mortar within the two tapered bars on trough valley tiles

Valleys

Plain tiles

Form valleys with purpose-made valley tiles or open construction, using metal lined valleys. Traditional laced or swept valleys may be used, but involve a great deal of cutting. Refer to the Technical Advisory Service for details.

- For trussed rafter roofs, support tiling battens at valley where roof slopes intersect.
- Fix timber valley boards between rafters to provide support for tiling battens and valley tiles.
- Lay a strip of underlay at least 600mm wide up length of valley.
- Overlap on each side with main roofing underlay.

Plain valley tiles

Lay valley tiles without nailing or bedding to main roof tiling (Fig 60).

- Lay bottom valley tile first and butt adjacent eaves tile to it.
- Keep a true line between valley tiles and main roof tiles.
- Avoid small cut pieces of tile adjacent to valley tile by using tile-and-a-half tiles.

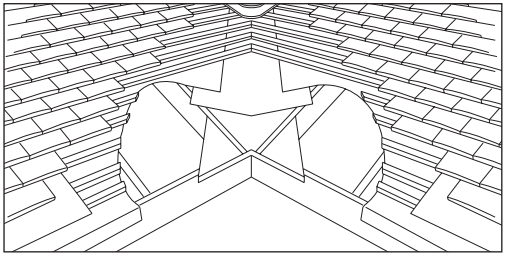

Fig 60 – Laying valley tiles

Table 6 – Minimum widths of valley gutter for different roof pitches and plan areas

Roof pitch	Design rainfall rate 225mm/h		Design rainfall rate 150mm/h		Design rainfall rate 75mm/h	
Degrees (°)	25m² and less on plan (mm)	over 25m² up to 100m² on plan (mm)	25m² and less on plan (mm)	over 25m² up to 100m² on plan (mm)	25m² and less on plan (mm)	over 25m² up to 100m² on plan (mm)
15° - 17°	150	250	125	200	125	150
17.5° - 22°	125	200	125	150	100	125
22.5° - 29.5°	100	150	100	125	100	100
30° - 34.5°	100	125	100	100	100	100
> 35°	100	100	100	100	100	100

Table 7 – Minimum width of lead to line valley gutters for different roof pitches and plan areas

Roof pitch degrees (°)	Area to be drained 25m² and less on plan (mm)	Area to be drained over 25m² up to 100m² on plan (mm)
15° to 17°	550	650
17.5° to 22°	525	600
22.5° to 29°	500	550
29.5° to 34°	500	525
> 35°	500	500

Valleys

Metal valleys for interlocking tiles

Sheet metal valleys can be used at all roof pitches, and are especially useful where a valley forms junction between slopes of different pitch.

Metal used to form the valley should be not less than 500mm wide, and should extend a minimum of 250mm up each side of the valley. (See Table 7, page 41 and Fig 61).

Valley widths

A traditional valley gutter width of 125mm is satisfactory for most gutter lengths. For pitches below 35°, or valley lengths exceeding 5 metres, valley width may require increasing to cope with the additional flow experienced during storm conditions. (See BS 5534 and Table 7, page 41).

Support for metal valley linings

- Support all metal linings adequately along their entire length.
- Valley boards for valleys below 30° pitch may be inset into suitably housed traditional rafters, or fitted between trussed rafters.
- Lay a 4mm thick ply lining board over valley boards to provide a smooth surface for metal lining.
- If roof pitch is 35° or more, valley boards may be laid on top of the rafters and the tiling battens swept up to valley by packing them with timber firring pieces. (This detail is not recommended for small valleys, such as at dormers, where sweep of tile courses will be clearly visible.)

Lead sheet valleys

Where lead is used, use minimum Code 4, preferably Code 5. To avoid staining, the Lead Sheet Association recommends an application of patination oil immediately after the lead is fixed.

- Dress metal lining down tightly onto lay boards and fix in lengths not exceeding 1500mm with copper nails across the top of each piece.
- Laps should be a min. 150mm although below 30°, this increases to 290mm min. at 15° valley pitch (see LSA recommendations).
- Dress metal lining over tilting fillets at each side of valley and tack to form a welt.
- Restrict any fixings down sides to top third of each piece of gutter lining.
- Cut roofing underlay so that it laps over tilting fillets.
- Cut roof tiles to a rake and bed with mortar onto a suitable undercloak laid onto lead lining. Ensure that tile interlocks are kept free and a gap is maintained between tilting fillets and mortar bedding.
- Never lay mortar directly onto lead as there is a risk of differential movement causing mortar to crack and lead to split.
- Nail or clip all tiles adjacent to valley and ensure small tile cuts are well bedded in mortar.

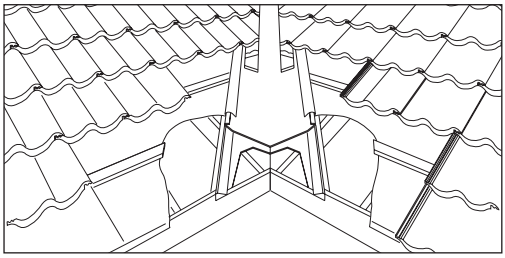

Fig 61 – Metal valley construction for interlocking tiles

Valleys

Metal valleys for plain tiles

Metal valleys may also be used with Plain tiles. Exposed raking cut tiles should not be bedded in mortar. If concealed mortar is used within the tiling, it should not block head or side laps.

- Use tile-and-a-half tiles where possible to minimise use of small tile sections at valley.
- Mechanically fix all tiles and pieces adjacent to valley (Fig 62). For details refer to 'Metal valleys' for interlocking tiles on Page 42 .

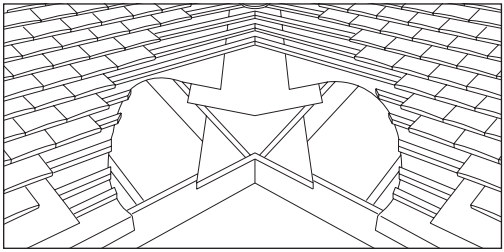

Fig 62 – Metal valley construction for plain tiles

GRP valley for interlocking tiles

Always fit GRP preformed valley troughs over timber valley boards to (BS 5534, Clause 4.11). These should be of sufficient width to provide end support for the slating/tiling battens, outside counter battens.

Where rafters are at centres up to 600mm, valley boards should be either a minimum of 19mm softwood (or 12mm ply) lay boards set between the rafters supported on timber noggins, or 6mm continuous ply boards laid over the rafters.

- Lay a single strip of roofing underlay to BS 747 (or suitable breather membrane to BS 5534, Clause 4.10.3), full width of valley boards, up centre of valley, directly on top of valley boards.
- Counter battens (BS 5534, Clause 4.12 and Table 1) should be same depth as slating/tiling battens and be fitted onto valley boards, (over valley underlay), and nailed through these into main rafter/truss.
- Where battens are deeper than 25mm, provide packing above valley boards, between counter battens, to provide correct support for GRP Valley Trough whilst accommodating standard 25mm upstand.
- Firmly locate batten ends onto valley boards with ends supported on lip of GRP Valley Trough.
- Main roofing underlay can be laid either under or over GRP valley trough. Cut out fascia to allow GRP preformed valley trough to pass through and discharge into gutter without flattening out.
- Trim end of GRP Valley Trough using a fine toothed hacksaw to the centreline of gutter – which normally entails a 'V shape' cut.

  Note: Where design does not permit cutting to fascia board, a saddle of minimum Code 4 lead should be fitted and dressed into gutter.
- Fit GRP Valley Trough to ensure centre is located firmly into trough between valley boards, and nail sides into counter battens at maximum 500mm centres, using 25mm clout nails.
- Lap any additional lengths of valley by a minimum 150mm (300mm minimum at 22.5° rafter pitch – see NFRC Technical Bulletin 28 'Inclined Preformed GRP valley troughs). Secure overlap with 2 No. nails on each side.

Valleys

Bedded tiles

- Where tiles require bedding, lay them dry, mark desired cut line, then remove and cut away from the roof.
- Re-lay tiles, mechanically fix and bed onto sanded strip on GRP valley trough with correct mortar mix and point off.
- At head of valley, fix a saddle of minimum Code 4 lead. Length of lap of saddle over GRP Valley Trough should be the same as required by the lap of two GRP valley trough units at same pitch.
- Where ridge intersects a roof slope, step the ridge back where it meets head of intersecting GRP Valley Troughs; dress a saddle of minimum Code 4 lead under adjacent tiling, and over both valley troughs.
- When a valley discharges onto a roof slope (e.g. at dormers), a lead saddle will be required at base of GRP valley trough to dress onto adjacent tiling.

Note: Use of tile slips in mortar bedding is generally recommended to reduce this problem and to reduce mortar slumping away from tiles.

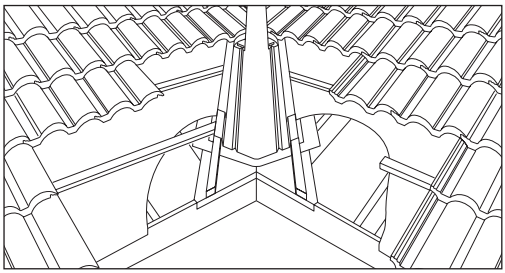

Fig 63 – Bedded valley

Valley check points

- Keep an open channel between cut edges of roof tiles (125mm minimum).
- Don't block interlock laps for tiles with mortar since this may cause damming.
- Don't lay underlay directly beneath a lead valley; heat causes underlay to expand. This may split lead.
- Don't apply mortar direct to lead.
- Mechanically fix all tiles either side of valley.

Flashings and weatherings

Interlocking and Plain tile details

At all abutments where the tiling meets walls or chimneys use an adequate flashing material to weather junction.

Where Plain tiling meets a side abutment, use tile-and-a-half tiles in alternate courses to provide broken bond.

Top edge abutment

- Turn roofing underlay 50mm up abutment.
- Fix top tiling batten as close as possible to abutment.
- Complete tiling in the usual way.
- Chase abutment and insert lengths of Code 4 lead, not more than 1.5m long and wedge in with small pieces of lead not less than 450mm apart .
- Lead should be wide enough to give at least 150mm cover to top course of tiles (below 30° this increases to 290mm at 15° rafter pitch).
- Vertical upstand should be 75-100mm.
- Lap each length of lead by not less than 100mm.
- Dress lead to profile of tiles (Fig 64).
- Secure lead flashings with copper or stainless steel clips with frequency dependent on exposure (see Lead Sheet Association recommendations).

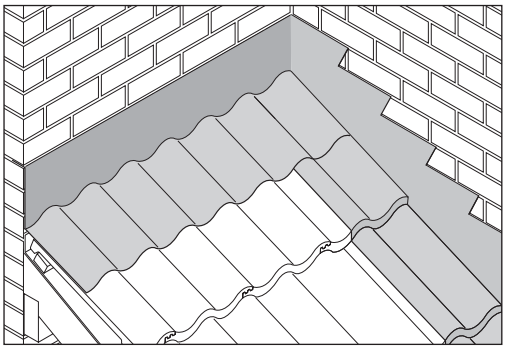

Fig 64 – Top edge abutment

Side abutments

There are two common ways of weathering a side abutment with interlocking tiles:

- Stepped cover flashings
- Secret gutters

Flashings and weatherings

Stepped cover flashing

- Turn roofing underlay 50mm up abutment.
- Finish tiling battens as close to abutment as possible.
- Lay tiles to butt as close as possible to wall.
- Cut a piece of Code 4 lead as shown to form a combined step and cover flashing.
- Flashing should not exceed 1.5m in length and should be 150 - 200mm width or wide enough to cover the first roll, whichever gives the greater cover.
- Chase out brickwork mortar joints and push folds of flashing into chases and wedge in with small pieces of lead.
- Dress cover flashing as tightly as possible to tile profile (Figs 65 and 66).
- Repoint brickwork.
- In areas of high exposure or when dressing lead over flat tiles, use clips to hold cover flashing in place. When using this type of flashing with flat tiles below 25°, increase cover of flashing over tile to 200mm.

Abutment with soakers and step flashings

Soakers are used where double-lap Plain tiles abut a wall.

1 Turn underlay 50mm up abutment and cut tiling battens as close as possible.

2 Lay tiles close to abutment with a soaker fitted between each tile.

3 Form Code 3 lead soakers with an upstand of 75mm to place against abutment. They should be 175mm wide and 190mm long allowing a 25mm downturn over back of tile (Fig 67).

After all tiles and soakers have been fixed, insert a stepped flashing into abutment wall and dress down over upturned edges of soakers (Fig 68).

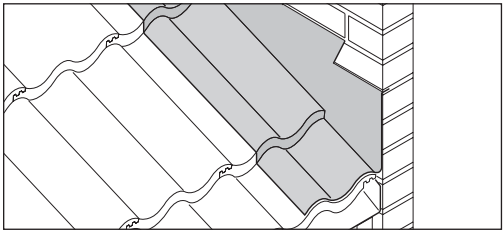

Fig 65 – Stepped flashing with profiled interlocking tiles

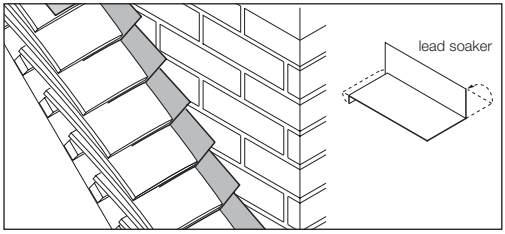

Fig 67 – Lead soakers

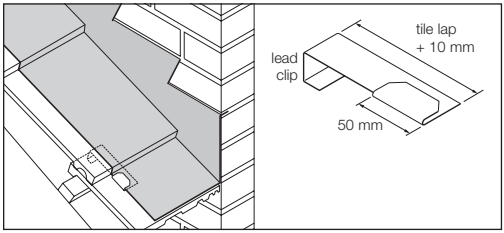

Fig 66 – Stepped cover flashing with interlocking slates

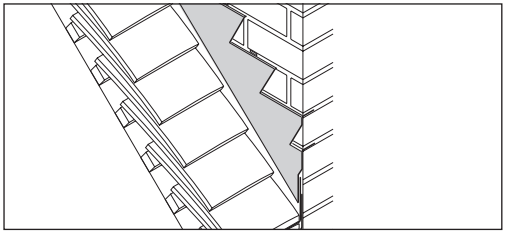

Fig 68 – Stepped flashing

Flashings and weatherings

Secret gutter

- Form secret gutters before starting tiling.
- Fix a support between last rafter and abutment. This should be a minimum of 75mm wide and run full length of abutment.
- Fix a splayed timber fillet at discharge point to raise lead lining to the right height. Avoid backward falls (Fig 69).
- Fix a counterbatten along outer edge of rafter.
- Line gutter with Code 4 or 5 lead, in lengths of not more than 1.5m.
- Lap each strip offered over the lower one by a minimum 150mm and fix with copper nails at head.
- Turn up lead welts to exclude birds and vermin from entering tile batten space.
- Gutter should be a minimum of 25mm deep and have a vertical upstand of at least100mm against abutment.
- Fit a stepped flashing, chased into brickwork as before and dressed over vertical upstand.
- Turn roofing underlay up side of counter battens and butt tiling battens up to counter batten.
- Lay tiles to leave a gap of 15mm by the side of abutment (Fig 70).
- A lead cover flashing above secret gutter is advisable for interlocking tiles and slates, particularly in areas of high exposure or on roofs under trees, where risk of blockage is high. If this is done, width of secret gutter may be reduced to 50mm (Fig 71).

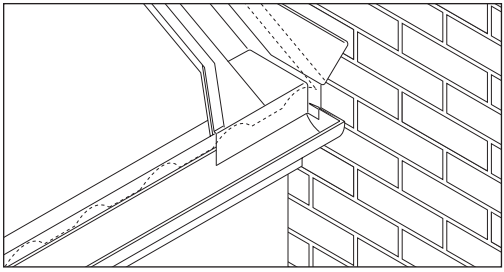

Fig 69 – Secret gutter

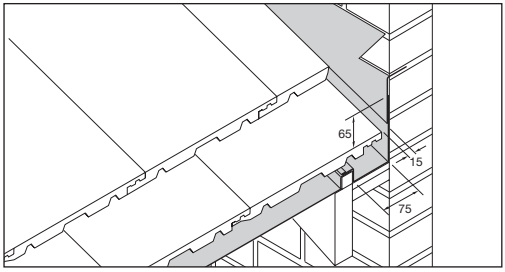

Fig 70 – Secret gutter

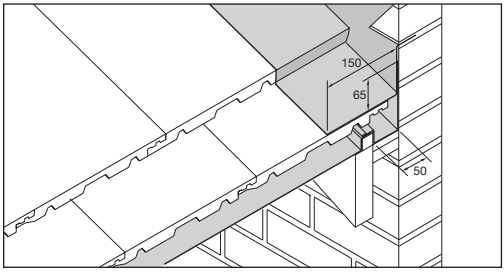

Fig 71 – Reduced width secret gutter with cover flashing

Flashings and weatherings

Dormers

Treat tiled dormer roofs in a similar way to the main roof work. However, single lap tiling is less suitable for small covered areas and for a dormer, it is generally preferable to adopt an alternative form of covering.

- When dormer cheeks are tile hung, close cut vertical tiles to rake of roof over a flashing fixed to side of dormer and dress well into the adjacent tiles. Formation of a secret gutter is not recommended.

Back gutters

A gutter should be formed where the bottom edge of tiling meets an abutment. Form the gutter before tiling, but after felting and battening is complete.

- Fix a layboard to support lead lining, with a tilting fillet, close to abutment to flatten pitch of lead.
- Dress a sheet of Code 5 lead (width of abutment plus 450mm) into position with a vertical upstand of at least 100mm up abutment.
- Dress extra width of lead around corner of abutment after any side abutment weathering has been fitted.
- Dress upper edge of lead over tilting fillet and turn it back to form a welt (Fig 72).
- Chase abutment, insert a cover flashing of Code 4 lead and dress it over vertical upstand of gutter.

Roof protrusions

The treatment of tiling against chimney stacks, skylights and other similar projections through the roof surface should be similar to that described for abutments where appropriate (Fig 73).

- Make perforations for pipes, chimney stays, supports for ladders etc. weathertight by dressing over and under tiling, with a lead or copper slate to which a sleeve is burned or soldered.
- Boss sleeve around pipe or stay, and seal at top by a collar.

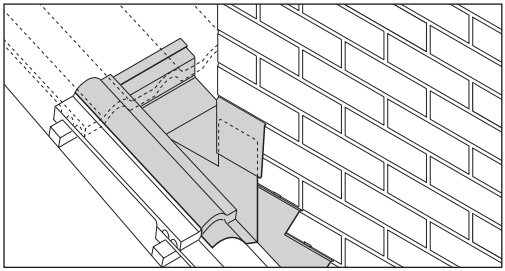

Fig 72 – Back gutter

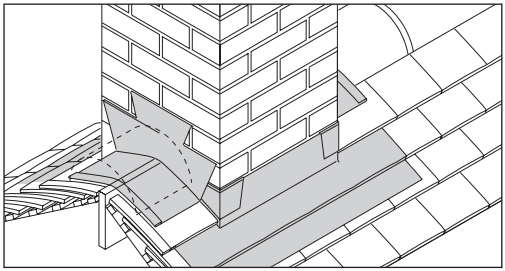

Fig 73 – Roof chimney at ridge line

Flashings and weatherings

Saddles

The following details can apply to any type of valley or hip/ridge intersection.

- Use Code 4 lead not less than 450mm square and large enough to give a lap of at least 150mm over gutter lining on each side.
- Saddles should be capable of being readily dressed down when in position (Figs 74 and 75).

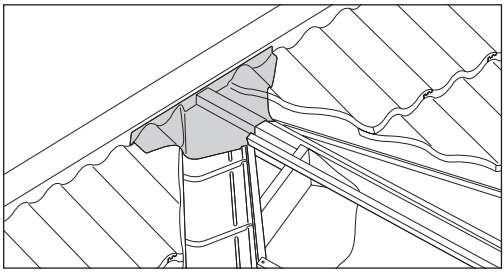

Fig 74 – Saddle at ridge/roof/valley intersection (interlocking tiles)

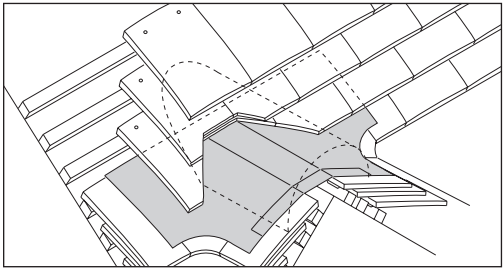

Fig 75 – Saddle at ridge/roof/intersection with Plain tiles valley

Flashing and weathering check points

- Lead can be difficult to work, particularly heavier codes. In cold weather take care not to split or puncture it whilst working.
- Always use proper lead working tools. Hammers are not recommended for dressing lead.
- Nail and/or clip all tiles next to an abutment.
- Fillets of mortar are not recommended at abutments because cracking of mortar brings high risk of failure.
- Place a length of cloth beneath lead before dressing down onto lightweight slates to avoid breakage.

Note: Full details on fixing and use of lead flashings and weatherings can be obtained from the Lead Sheet Association.

Vertical tiling

It is possible (but rare) to use interlocking tiles in vertical applications provided every tile is nailed or, preferably, screwed and clipped. Special consideration must be given to the fixing of battens to the groundwork to ensure they are able to sustain the additional loadings imposed.

The following details apply to Plain and Feature tiles.

Battens

- Provide a moisture barrier for vertical applications. With brick and blockwork, roofing underlay is generally used.
- Lap underlay 75mm horizontally and 150mm vertically and secure with clout nails. Distance of fixing at edge must exceed 50mm from edge of tiles.
- On timber frame constructions, fix battens to a maximum gauge of 115mm and secure with wire nails to timber studding. Battens to be at least 1.2m in length, sufficient to be supported at each end and intermediately by at least three studs or walls.
- Stagger butt joints over intermediate supports so that not more than three battens are joined in any twelve consecutive supports. Batten ends must be sawn.
- On masonry construction, fix Plain and Feature tiles either direct to battens or to battens and counterbattens, securely fixed to the wall with cut nails. (If dense concrete blocks are encountered, seek advice on fixings from block manufacturer). Use of counterbattens reduces amount of direct nailing to plugs or timber plates embedded in the wall. Counterbattens also increase ventilation around tiling battens. (Fig 76).

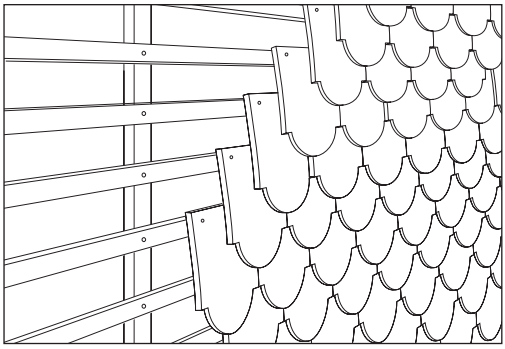

Fig 76 – Feature tiles laid over battens and counter-battens

Vertical tiling

Fixing

- Lay Marley vertical Plain and Feature tiles to a minimum lap of 35mm, maximum gauge 115mm.
- Fix each tile with 2 No. 38mm x 2.65mm aluminium nails.

Eaves

- Lay a double course of tiles at eaves. Form by laying a first course of eaves tiles 20mm long, with a course of full tiles laid broken bond on top.
- Tilt eaves tile a minimum of 65mm from face of groundwork by using a timber fillet.
- Twice nail both eaves courses using 38mm x 2.65mm aluminium nails.

Top courses

- For top tiles, use a course of eaves/tops tiles 200mm long, nail each tile as before.
- Where a top course is formed under a window sill, dress a lead flashing (supplied by a plumber) down over top course tiles for at least 100mm, cut level or to an approved finish.

Angles

- Use purpose-made internal or external angle tiles at all corners.
- Left and right hand angles of 90° are available to provide a broken bond with main tiling, to be twice nailed (Figs 77 and 78).
- For impractical situations i.e. sprocketed tiling, close mitre tiles at corner(s) and weather with lead soakers.

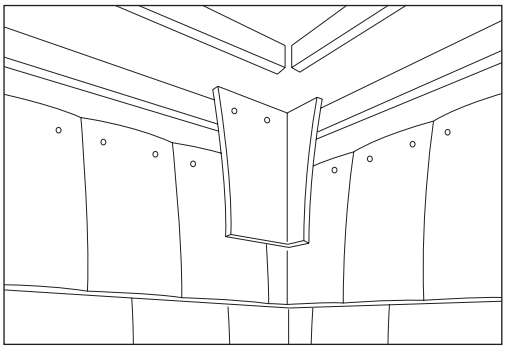

Fig 77 – Internal angle with Internal Angle tiles

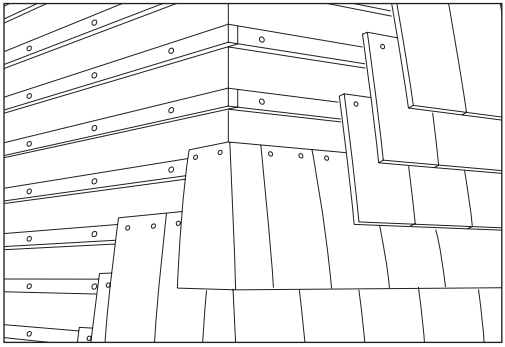

Fig 78 – External angle with External Angle tiles

Vertical tiling

Gables: 'Winchester' cut

This technique avoids the use of small triangular pieces of tile and ensures the secure fixing of the last tile against the main roof verge, by the use of a tile-and-a-half at the end of each course.

'Winchester' cutting is best suited for gable ends where the roof pitch is 40° or more. For lower pitches, the tiling gauge may need to be reduced to 100mm or 90mm in order to avoid too great a splayed cut.

It is likely that two-tile-and-a-half tiles adjacent to one another will be needed to overcome this.

- Leave battening short of rake of verge. This allows fixing of a batten parallel to, but below rake line. This batten must be at the same angle as tiling battens so that tiles do not tilt up (Fig 79).
- Cut tile-and-a-half tiles to angle of rake for each vertical course, keeping cut edge parallel to and below rake (Fig 80).
- Once tile-and-a-half tiles are positioned, cut adjacent tile to fit. All tile-and-a-half tiles should be twice nailed. This may mean drilling an extra hole after cutting to shape.
- At apex of gable, use a tile-and-a-half tile turned through 45° and cut to shape to finish (Fig 81).

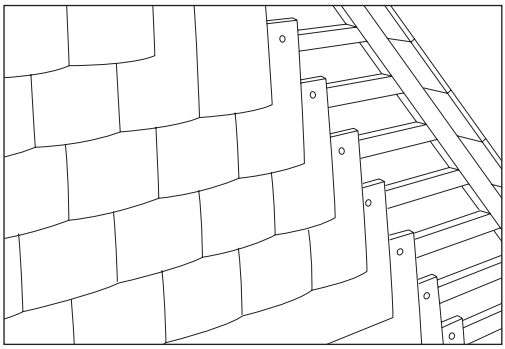

Fig 79 – Fix battens parallel

Fig 80 – Cut tile-and-a-half tile

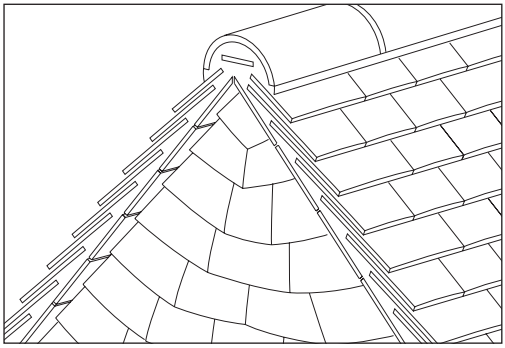

Fig 81 – Apex of gable

Vertical tiling

Gables: Soldier Course

This method is used for low pitched roofs where 'Winchester' cutting is impractical.

- After felting, fix two additional battens parallel to rake of verge on top of existing battens.
- Cut vertical tiles to meet raking battens using tile-and-a-half tiles at end of each course. (Fig 82).
- Fix courses of standard Plain tiles to lower of two raked battens, then fix course of eaves tiles to remaining (top) raked batten (Fig 83).

It is not recommended that Feature tiles are used for gable ends. If they are, however, use Plain tile-and-a-half tiles to complete course beneath rake of the verge.

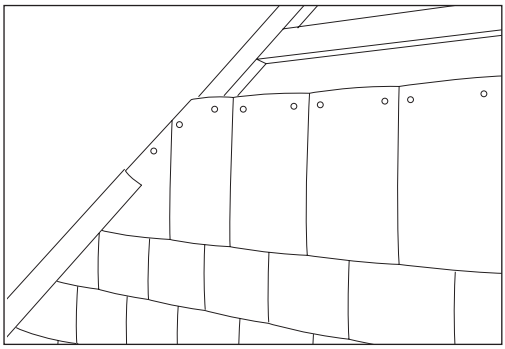

Fig 82 – Cut tile to meet rake of verge

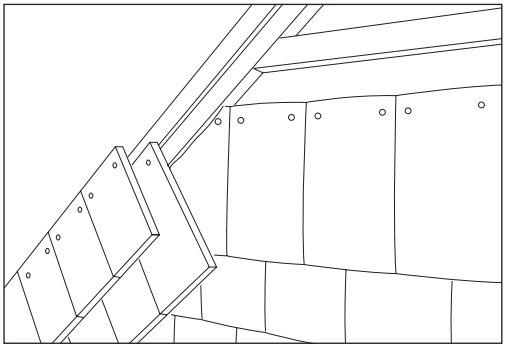

Fig 83 – Fixing tiles to raked batten

Vertical tiling

Gables: Sussex cutting

- Fix an additional batten onto face of vertical tiling battens and parallel to the verge to allow fixing of cut tiles.
- Form raking cuts using tile-and-a-half tiles as necessary (Fig 84).
- Fix edge tile close to undercloak/soffit, securing by spot bedding and double nailing into raking batten (Fig 85).

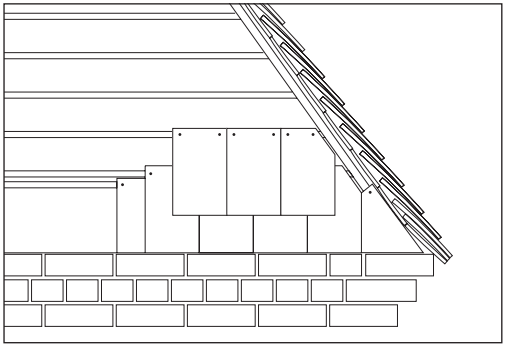

Fig 84 – Cut tile to meet rake of verge

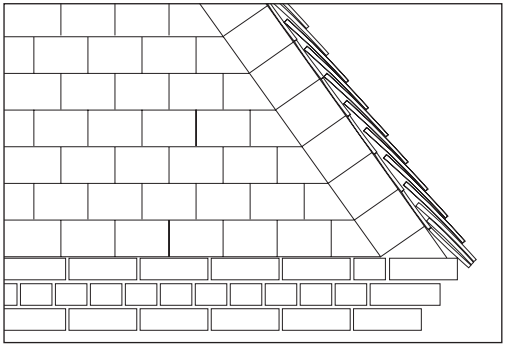

Fig 85 – Fixing tiles to raked batten

Vertical tiling

Abutments

Where the tiling meets an abutment, use tile-and-a-half tiles in alternate courses to provide a broken bond.

- When tiling meets a brickwork wall, fix tiles to within 50mm of return.
- A Code 4 lead sheet can be taken a minimum of 75mm behind tiles and turned in a single welt on a vertical counterbatten.
- Lead is taken around corner and top edge taken into brickwork mortar joints (Fig 86).
- If lead soakers are used, slot them between tiles and turn along abutment wall.
- Turn and dress the stepped flashing over soakers.
- When meeting timber cladding or a window jamb, turn flashing behind cladding or return into the jamb (Fig 87).

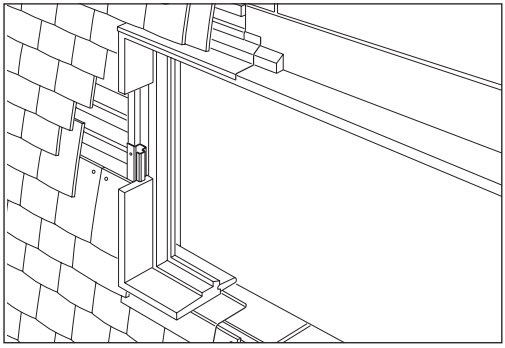

Fig 86 – Abutment to window

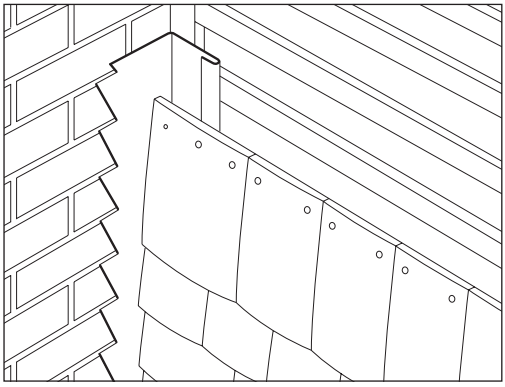

Fig 87 – Abutment to wall, with flashing

Vertical tiling check points

- Ensure each Plain and Feature tile is twice nailed on vertical tiling.
- Use double course of tiles at eaves and top edges
- Always use tile-and-a-half tiles at raking cut abutments.
- Maintain broken bond in all cases.
- Avoid using Feature tiles on pitches below 70° unless adequate weathering is provided by additional groundwork.
- Ensure battens are securely fixed to groundwork with suitable fixings.

Monarch, Marquess, Duo Marquess and Dalestone interlocking slates

Slates should be laid single lap with a broken bond, utilising slate and a half-slates in alternate courses at verges. Double-slates are available for use at hips and valleys to avoid small cut pieces.

All slates must be mechanically fixed to resist wind uplift using the recommended fixing materials (stainless steel ring shank nails and clips, Fig 88).

Broken bond laying for 'Duo' Products (Duo Marquess/Duo Modern/Duo Edgemere)
Duo Marquess, Duo Modern and Duo Edgemere should be laid broken bond. The required broken bond pattern is created by the introduction of three-quarter width tiles, cut from standard tiles on site to form verge tiles in alternate courses.

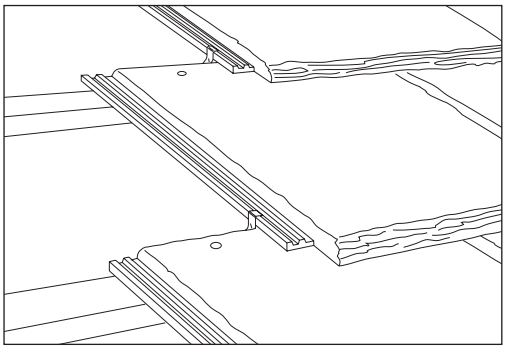

Fig 88 – Clipped interlocking slates

Monarch, Marquess, Duo Marquess and Dalestone interlocking slates

Setting out

- Fix Eaves course batten first by positioning it and measuring distance from top edge to outside edge of fascia. This should equal length of slate, less nib and overhang to centre line of gutter depth i.e. 325mm less 50mm (overhang) less 12mm = 263mm from outside of fascia.
- Fix top course batten so that ridge tile provides 75mm cover over top course slates.
- Measure distance between top of eaves batten and top course of ridge batten.
- Divide distance by 250mm, the maximum gauge of slates. Round this figure up to give number of courses up slope as a whole number. Divide the measured distance of courses to give batten gauge.

  Note: Batten gauges between fixed points should be calculated individually.
- Where two roof slopes of varying pitch intersect, batten gauge should be set to lower or longer rafter pitch.

Adjusting gauge

The practice of adjusting the gauge over the last few courses at eaves or ridge is technically acceptable provided the max. gauge is not exceeded. Slates should only be cut at the top, and drilled, nailed and clipped.

- Check horizontal alignment by striking a chalk/ochre line at 90° to vertical line.
- Check perpendicular alignment by setting out roof along eaves starting with correct overhang at right-hand verge.
- Overhang on the left-hand verge can be achieved using full slates by opening or closing side lock (max. verge overhang 50mm).
- Cut slates at verge should be at least half width of a full slate.
- Strike perpendicular chalk or ochre lines over eaves to ridge at three slate intervals to coincide with edges of slates.

Monarch, Marquess, Duo Marquess and Dalestone interlocking slates

Fixing

Before slating the roof, ensure the correct fixing specification is being used:

The slates should be mechanically fixed in the following manner:-

- Head nail each slate once through the right hand nail hole using a 35mm x 2.65mm stainless steel ring shank nail (on roof pitches above 70° and for ridge heights of 10m and above, twice nail each slate).
- Clip each slate using a stainless steel clip located firmly and accurately over side-lock of slate (Fig 89).
- Nail with a 50mm x 2.65mm stainless steel ring shank nail to top edge of batten course below.
- Care is required to ensure that nails are not overdriven. Nails should be tapped rather than driven home (Fig 90).

Eaves

- Fix eaves course slates with purpose-made eaves clips nailed to fascia with each slate nailed at head.
- Lay eaves course at same pitch as remainder of roof. The vertical measurement of fascia above rafter varies according to roof pitch.

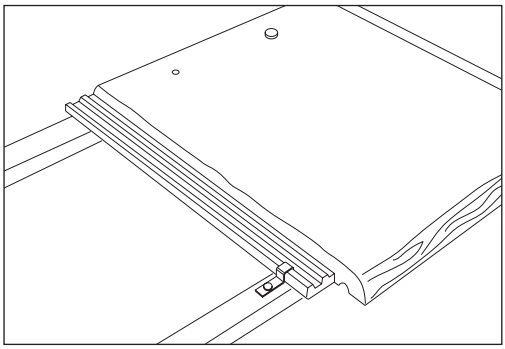

Fig 89 – Clipping eaves course slates

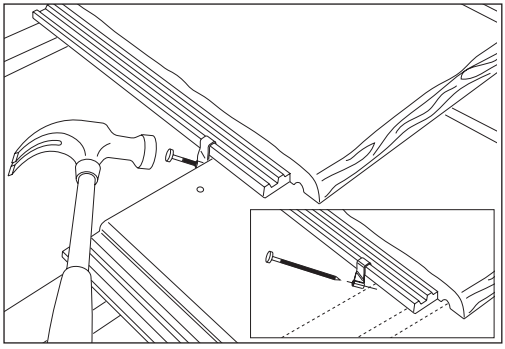

Fig 90 – Nailing clips to batten slate

Monarch, Marquess, Duo Marquess and Dalestone interlocking slates

Verges

Form verges with slates and slate and a half-slates in alternate courses. All slates on left-hand verges should have the sidelock removed.

- Bed slates onto an undercloak of fibre reinforced cement strip (1200mm x 150mm).
- Lay undercloak rough side up, closely butted together. Tilt outwards slightly to provide drip edge. Max. 50mm overhang from brickwork or bargeboard.
- Provide approx. 65mm mortar width, bed all verge slates and fix by nailing and clipping.
- Verge clips should be twice nailed to battens with upstand level with edge of undercloak (Fig 91).
- Strike all mortar bedding off flush and neatly point.

Note: For details of the Marley Roofing Slate Dry Verge system refer to pages 104 - 108.

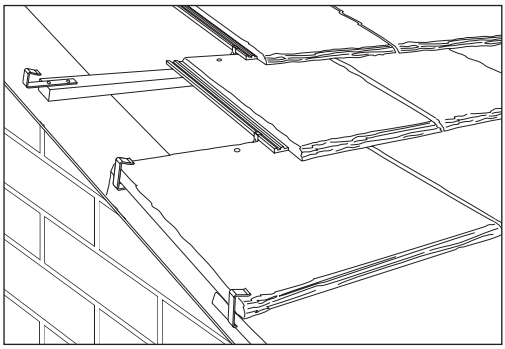

Fig 91 – Twice-nailed verge clips

Ridges

Cover ridges using Modern or Segmental ridge tiles of complementary colour to main roof slates.

- Edge-bed ridge tiles onto top course slates with solid bedding at butt joints.
- Support mortar at butt joints using pieces of tile.
- A minimum of 75mm cover should be provided over top course slates and exposed mortar should be neatly pointed.
- Provision must be made to mechanically fix two ridge tiles at gable ends.
- Wire a security ridge tile to a nail driven into a ridge board or supplementary batten (Fig 92).

Note: For details of the Marley Roofing Ventilated Dry Ridge System and Universal RidgeFast System, refer to pages 94-108.

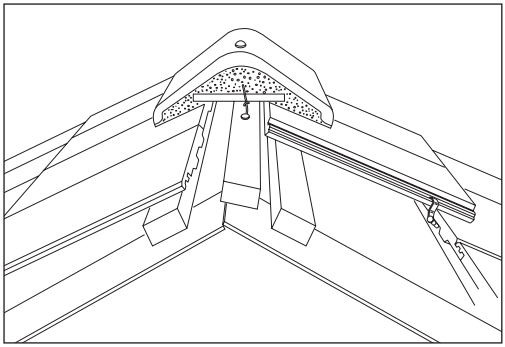

Fig 92 – Security ridge

Monarch, Marquess, Duo Marquess and Dalestone interlocking slates

Hips

- Form hips using double-slates, each slate mechanically fixed.
- Cut slates to rake of hip and cover with hip tiles edge-bedded, with solid bedding at butt joints, onto adjacent slates.
- Fix hip iron at base of hip tree and shape first hip tile at front line of tiling at eaves.
- Mitre junction of hip and ridge.

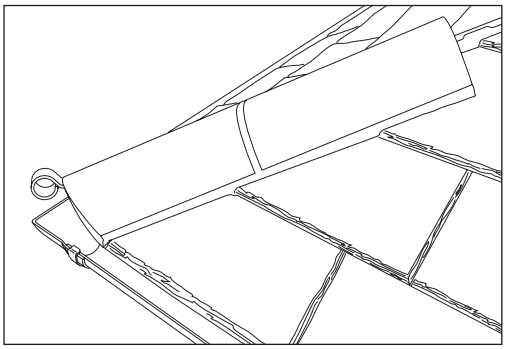

Fig 93 – Hip iron at base of hip tree

Valleys

- Form valleys using double-slates, each slate twice nailed and clipped using valley clips.
- Cut slates to rake leaving a clear channel approx. 125mm wide.
- Form valley with metal (min. Code 4 Lead Sheet) not less then 500mm wide.
- For roof pitches under 30°, or valley lengths exceeding 6m, valley width may need to be increased (See LSA recommendations).

Note: For details of the Marley Roofing slate GRP valley trough refer to the relevant fixing instructions leaflet.

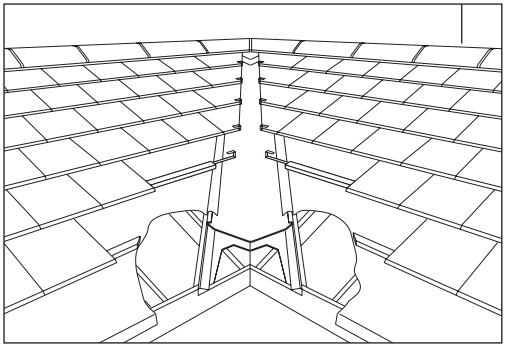

Fig 94 – Metal valley

Monarch, Marquess, Duo Marquess and Dalestone interlocking slates

Abutments

- Roof slates should be brought up close to the wall, cutting if necessary, and underlay returned up wall.

  Alternative flashing details are as below:

a) *Abutment step and cover flashing.* Code 4 lead sheet 150 - 200mm wide, dressed down over clip slates, to be used on roof pitches above 30°. Free edges of lead to prevent wind uplift.

b) *Abutment flashing with secret gutter.* Alternative to (a) with secret side gutter formed on supporting board with timber fillet weathered by separate stepped cover flashing. Use verge clips in exposed locations.

c) *Abutment step and cover flashing combined with secret gutter for roof pitches under 30°.* Construct back gutters on boarding ensuring metal lining is carried over a tilting fillet to be covered with roof slates. Extend top course apron flashing down over the top slates 150-200mm. Clip cover flashings in exposed situations.

Further information can be obtained from the Lead Sheet Association.

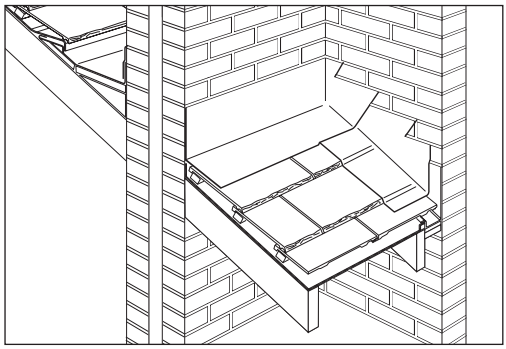

Fig 95 – Typical abutment details

Ashmore tiles

Ashmore single lap interlocking roof tiles have a 'mock bond' joint to give the appearance of two traditional double-lap plain tiles when laid on the roof. Tiles are laid single lap with a broken bond, utilising left hand and right hand ¾ tiles for use in alternate courses at verges and abutments. Tile and a half tiles are also available to assist with setting out to hips and valleys to avoid small cut sections of tile.

Tiles requiring fixing are either once or twice nailed using 45mm x 3.35mm aluminium or stainless steel nails with a self fixing stainless steel wire tile clip which is additionally used for exposed locations or roofs with pitches of 55° and above.

Setting out

- Position eaves course batten first and measure distance from top of outer edge of fascia. This should be equal to length of tile, less nib and tile overhang to centre line of gutter width, i.e. 267mm less 50mm (overhang) less 28mm (nib width and indent) = 189mm from outer edge of fascia or tilting fillet. Top course batten should be fixed so that ridge tile provides a minimum 75mm cover over top course tiles.
- Measure distance between the top of eaves batten and top of ridge course batten. Divide distance by 190mm, maximum gauge of Ashmore tile. Round this figure up to give number of courses up roof slope as a whole number.

  Divide measured distance of courses to give required batten gauge.

  Note: Batten gauges between fixed points should be calculated individually.
- Where two roof slopes of varying pitch intersect, set batten gauge to the lower or longer rafter pitch.
- The practice of adjusting gauge over last few courses at eaves or ridge is technically acceptable, provided maximum gauge is not exceeded. Tiles should only be cut at top, and drilled, nailed.
- Horizontal alignment can be checked by striking a chalk/ochre line at 90° to vertical line.
- Check perpendicular alignment by setting out roof along eaves starting with correct overhang at the right hand verge. Overhang at left hand verge can be achieved using full and ¾ tiles by opening or closing side lock shunt (max. verge overhang 50mm).
- Cut tiles at verge should never be less than ¾ the width of a standard tile, unless cut from a tile and a half tile.

Ashmore tiles

Fixing

Before commencing to tile the roof, check to ensure the correct fixing specification is being used.

Ashmore tiles should be mechanically fixed in the following manner:

Step A - Tiles requiring once nailing should be nailed through right hand nail hole using a 45mm x 3.35mm aluminium or stainless steel nail. For roof pitches over 45°, all tiles should be at least twice nailed.

Step B - Tiles requiring clipping should be nailed through the left-hand nail hole using a 45mm x 3.35mm aluminium or stainless steel nail and clipped using Ashmore stainless steel wire clip, which is located over side lock of tile with tail push fitted under back edge of the nailed course of tiles beneath.

For exposed sites and for roof pitches over 55°, each tile should be twice nailed and clipped.

Eaves

- The eaves course of tiles may be fixed by either nailing or clipping or both.
- Purpose made eaves clips are nailed to fascia board and located over side lock of the eaves course tile.
- Eaves course must be laid at same pitch as remainder of roof.
- Care should be taken to adjust height of fascia or tilting fillet to accommodate any eaves vent strips (see pages 71 and 72, Tables 9 and 10).

Verges

- Verges should be formed using standard tiles with left hand or right hand verge tiles in alternate courses. Tiles on left hand verges will require the sidelock to be removed.
- Form verges by mortar bedding tiles onto an undercloak of fibre reinforced cement strip (1200mm x 150mm).
- Lay undercloak rough side up and closely butted together with a slight tilt outwards to provide a drip edge with a maximum 50mm overhang from brickwork gable or bargeboard.
- Provide 65mm width of mortar to bed all verge tiles and fix each verge tile by twice nailing and clipping.
- Use purpose made verge clips on both left hand and right hand verges and twice nailed to battens with upstand level with edge of the undercloak.
- Strike all mortar bedding off flush and neatly point.

Ridges

- Ridges may be covered using Marley Segmental ridge tiles or any other ridge tile design suitable for the pitch of the roof (see Marley Roofing Product Catalogue).
- Edge bed all mortar bedded ridge tiles onto top course of tiles with solid bedding at butt joints.
- Support mortar at butt joints with pieces of cut tile.

Ashmore tiles

- Ensure that a minimum 75mm cover is provided by ridge tile over top course of tiles with any exposed mortar neatly pointed.
- Provide two Security Ridge tiles at each end ridge, which should be mechanically fixed to a ridge board or supplementary batten.

Note: For details of Marley Roofing dry ridge systems refer to pages 94-108.

Hips

Hips should be formed using Tile and a half tiles, each tile being nailed or nailed and clipped.

- Cut tiles to rake of hip and cover with Third Round Hip tiles or alternative suitable hip tiles, edge bedded, with solid bedding at butt joints, onto adjacent tiles.
- Support mortar at butt joints with pieces of cut tile.
- Ensure that a minimum 75mm cover is provided by hip tile over adjacent courses of tiles with any exposed mortar neatly pointed.
- Fix a hip iron at base of hip rafter and shape first hip tile at front to align with tiling at the eaves.
- Mitre junction of hip and ridge, using a concealed lead saddle in exposed locations.

Note: For details of Marley Roofing dry hip systems refer to pages 126-138.

Valleys

Valleys should be formed using Tile and a Half tiles, each tile being nailed and clipped.

- Cut tiles to rake of valley trough, leaving a clear channel of minimum 125mm wide.
- Form valley with either a metal lining (Code 4 lead sheet) of not less than 500mm wide (see LSA recommendations) or with a Marley GRP Standard Valley Trough.
- Bed raking cut tiles at edges of valley using mortar, ensuring that there is adequate space kept clear behind mortar to avoid water capillarity.

Note: For details of Marley Roofing GRP Std Valley Trough refer to pages 143-145.

Ventilation Tiles and Contour Vent Terminals

Ashmore Ventilation tiles and Contour Vent Terminals should be installed in accordance with the instructions contained in the ‘Ventilation Systems’ section, pages 78-87.

Melbourn interlocking slates

Before commencing the installation of the slates, ensure the following is carried out:

Battens

- The batten gauge is 250mm maximum, and recommended softwood batten size is 50 x 25mm, in accordance with BS 5534.
- Position eaves batten so that eaves course overhangs fascia by a maximum of 50mm.
- Fix subsequent battens at a maximum gauge of 250mm (minimum 235mm) up to ridge, where top batten spacing may be less than 250mm to suit ridge detail (Fig 96)

Fixing

- Melbourn slates are designed to be fixed with one nail per slate, at bottom left hand corner, at roof pitches of 25° and over, but nail penetrates through head of slate below.
- Correct alignment of slates is essential (see Figs 97-98).

Note: Two nails per slate are needed at eaves, verges, ridges, hips, valleys and on roof pitches of between 15° and 24°.

(When using a 25mm eaves ventilator, a special Melbourn stainless steel nail and clip are required as shown above)

It is essential that Melbourn nails are used throughout to fix the Melbourn roofing system.

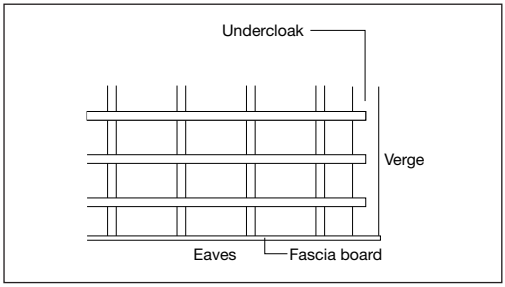

Fig 96 – Batten configuration at eaves

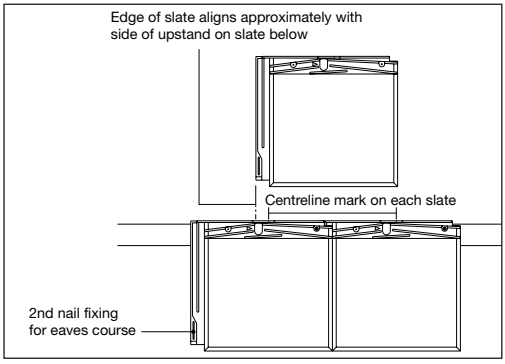

Fig 97 – Standard eaves

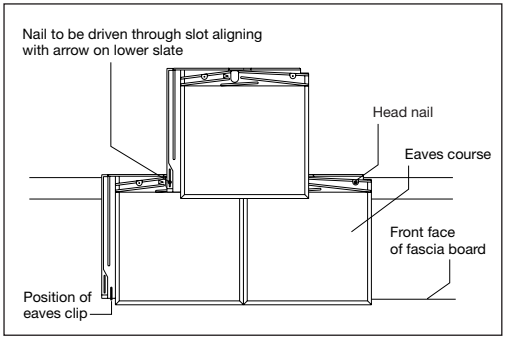

Fig 98 – Eaves with 25mm Eaves ventilator strip

Melbourn interlocking slates

Fixing sequence

- Fix eaves course first, always working from right to left, ensuring that eaves course overhangs fascia by 50mm maximum. Draw perpendiculars up roof to ensure good lines are maintained (Fig 99).
- Begin second course at right hand verge with a slate-and-a-half slate, then continue with standard slates (Fig 100).
- Use mid point mark at head of each slate to aid accurate setting out.
- Lay subsequent courses, working up roof, beginning each course from right hand verge with alternating slates and slate-and-a half slates (Fig 101).
- Where slates abut a structure within the roof, use double slates to ensure adequate fixings.

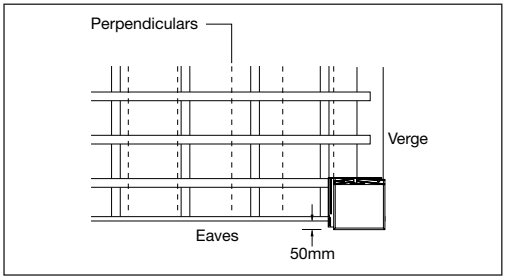

Fig 99 – Fixing eaves course

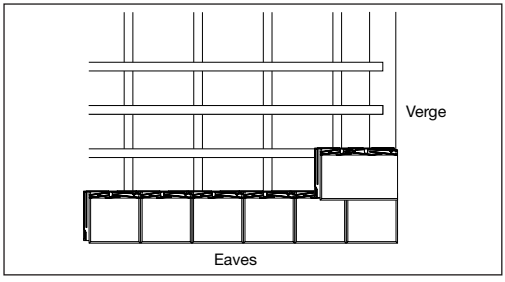

Fig 100 – Fixing second course

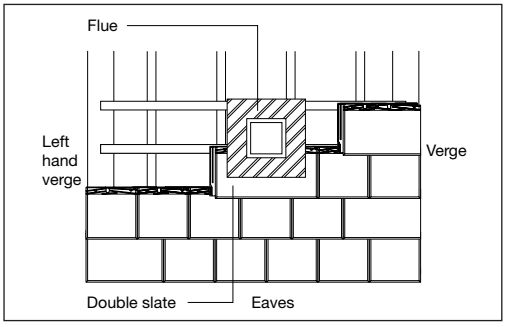

Fig 101 – Fixing subsequent courses

Melbourn interlocking slates

Nailing positions

These fixing recommendations apply to wind suction loadings up to 2kN/m²; for greater loadings contact the Technical Advisory Service.

- Each slate is generally nailed once, but additional nail fixings are required around perimeter of roof and at pitches shallower than 25°.
- Special clip fixings are also required for some details.
- For body of roof, single slates are generally nailed at point A only, but for roof pitches below 25° or above 65° a second fixing is required at position C.
- For single slates, slate-and-a-half slates and double slates, additional fixings at positions B, D and E may be required, (see Table 8, below).

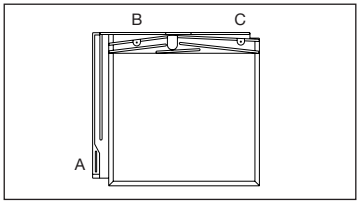

Fig 102 – Single slate

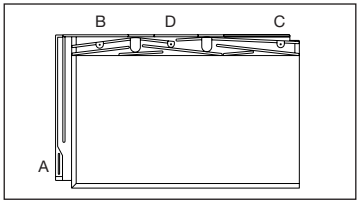

Fig 103 – Slate and a half slate

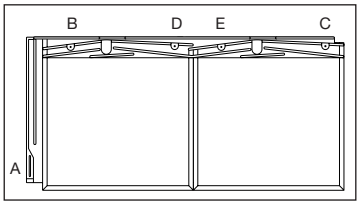

Fig 104 – Double slate

Table 8 – Use of different nailing positions at roof perimeters

	Eaves	Ridge	Verge/valley/hip/ abutment Right-hand	Left-hand
Single slate	A,C	A,C	A, B	C
Slate-and-a-half	–	–	A, D, B	D, C
Double slate	–	–	A, B & E (or D)	C, D or E