

# Installation Guide for single lap concrete tiles

## Introduction

The following installation instructions are recommended minimum requirements for Sandtoft single lap concrete tiles. The designer and fixer should ensure that tiles are installed in accordance with BS 5534: 2003; The British Standard Code of Practice for Slating and tiling. Also, local conditions and current good practice should be considered.

All work on site should be carried out in accordance with BS 8000: Part 6: 1990: The British Standard Code of Practice for Workmanship on building sites.

## Storage

Sandtoft single lap concrete tiles are supplied shrink wrapped on wooden pallets and should be stored on firm, level ground.

## Ventilation and Dry Systems

Guidance on the installation of eaves, ridge, top abutment and tile ventilation systems is given in the Sandtoft *Roof Ventilation* brochure. Information on the installation of dry systems is given in the Sandtoft *Dry Roofing* series of brochures and also the Sandtoft *Profile Ridge*, *RollRidge*, *Roll Hip*, *Profile Mono Ridge* and *Multiverge* installation guides.

## Underlay and Tile battens

Guidance on the installation of underlay and tile battens is given in the Sandtoft *Underlay and Battens* installation guides.

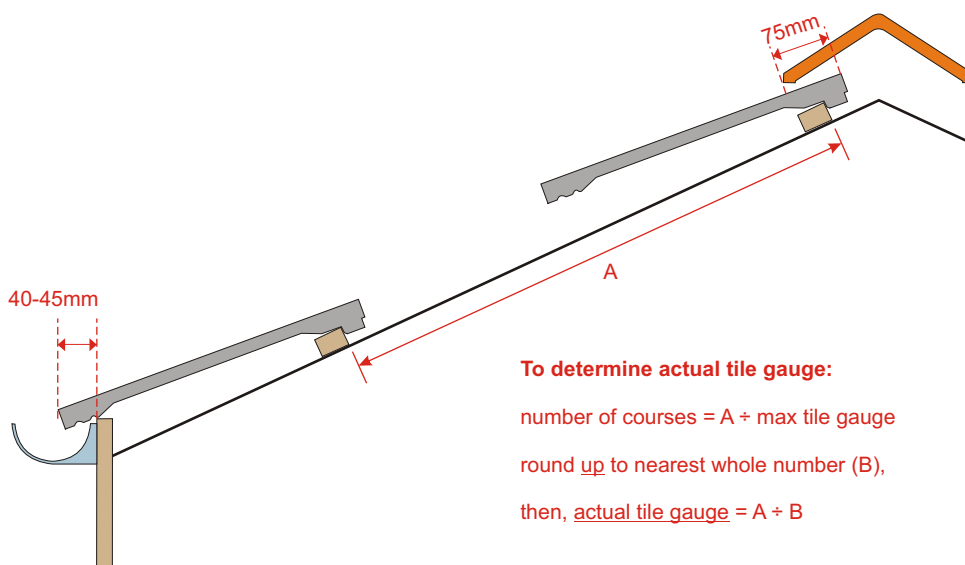
## Tile Gauge

Set the battens out at the maximum spacing specified in the technical data to ensure a minimum 75mm headlap. The gauge can be reduced if necessary to avoid a cut course at eaves or ridge.

## Setting Out up the roof (Gauge)

Set the first batten at eaves to allow the tails of the eaves course tiles to overhang the fascia by 40 to 45mm, ie; just short of the centre of the gutter.

Set the last batten at the ridge so that the ridge tiles will overlap the top course of tiles by at least 75mm. See drawing below.



Measure the distance (A) from the first, eaves course batten to the top course batten. Divide this distance by the maximum tile gauge. Round the answer up to the nearest whole number (B) this gives the number of tile courses required. Divide A by B to determine the actual batten gauge. Fix the remaining battens at this gauge.

Alternatively, it is technically possible to set out most of the roof at maximum gauge and then reduce the gauge of the last few courses to avoid having a cut course at the ridge. But this will distort diagonal lines and so may not be aesthetically acceptable.

### Linear Coverage

Check the cover width in the technical data. There is a 3 to 4mm adjustment (shunt) built into the side interlocks to aid setting out across the roof.

### Setting out across the roof

Lay a course of tiles along the eaves, setting the tiles at the average cover width. At this stage, some adjustment in shunt could be made, if necessary, to allow a 38 to 50mm overhang at verges. Ensure verge overhang is equal at left and right ends. Mark the position along the eaves and top battens of every third tile.

Alternatively, take a gauge rod (ie a short length of tile batten) and mark the position of three tiles with their sidelocks fully closed, then mark the position of the three tiles fully 'open'. Set the average coverage by making a third mark midway between the previous 2 marks on the rod. Use this third position to mark out along the eaves and top battens.

Strike a chalk line from eaves to ridge at each mark. Tiles can be laid to these marks to ensure perpendicular lines remain straight.

### Tile Fixing Generally

Load out all sides of the roof uniformly, randomly mixing tiles from different pallets.

Profile tiles are laid 'straight' bond and flat tiles are laid 'cross' or 'broken' bond, starting at the right hand side of the roof plane and working towards the left.

Make sure that every third tile is positioned to the chalk line.

Secure each tile using aluminium clout head nails and clips as specified in the Zonal Method or use Sandtoft 'Fixing SPEC' service to determine appropriate fixings for each project. Contact Sandtoft *Technical Support* for further information. Drive nails fully home and ensure clips are correctly fitted.

### Eaves

Position the fascia board or tilt fillet so that the eaves course tiles lie at the same pitch as the tiles above. If using an over fascia ventilator then adjust the height of the fascia or tilt fillet accordingly. Contact Sandtoft *Technical Support* for further information.

Where eaves clips are used these should be nailed into the fascia using 25mm long aluminium clout head nails. Where bird comb filler is required nail onto the fascia board using 25mm long nails. If using an over fascia ventilator then carefully locate the clip and bird comb nails through the slots provided in the ventilator. Depending upon the depth of the ventilator use an appropriate length of nail that gives adequate penetration into the fascia or tilt fillet.

Fit and secure the eaves course tiles. Where using bird comb filler set the tiles such that the combs are facing outwards. This will prevent access to birds and rodents.

### Verges - Generally

Finish the gable wall level with the tops of the rafters. Generally, the outer skin of the wall will be stone or brickwork, or there may be a timber bargeboard. An alternative construction sometimes adopted is a gable ladder, to extend the roofing out beyond the gable wall.

For straight bond tiles fit standard tiles at the right hand verge. For cross bond tiles fit standard tiles and right hand half tiles in alternate courses. For straight bond tiles fit left hand verge tiles (if available) at the left hand verge. For cross bond tiles fit left verge tiles and left hand verge half tiles in alternate courses.

## **Multiverge**

Carry the underlay 40mm over the edge and turn down the wall. Terminate the tile battens 40mm beyond outer edge of wall or bargeboard.

Position a tile on the eaves course at the left/right hand verge with the correct overhang over the eaves and verge. Locate the eaves closure unit under this tile and then screw to the wall or bargeboard through suitable holes in the eaves closure bracket.

Fit a batten bracket to the end of each tile batten (see table in the *Multiverge installation guide* for correct orientation).

Locate the first verge unit over the eaves closure and batten bracket and click into position (see table in the *Multiverge installation guide* for correct batten bracket slot). Continue to fit verge units on each course up to the ridge.

Once the batten brackets have been fixed to the battens the verge units can be installed as the tiling progresses or all at once after the tiles have been laid.

Install a ridge closure comb at the ridge to prevent access into the roof space by birds or rodents.

Start/terminate the ridge with a block end ridge tiles to cover the ends of the verge units.

(See the *Multiverge installation guide* for further information).

## **Bedded Verge**

Terminate the underlay midway across outer leaf of brickwork or masonry. Bed a 6mm thick fibre cement undercloak on to the wall above the underlay and below the battens, projecting about 38 to 50mm beyond the outer wall face. Do not allow the undercloak to tilt inwards, towards the roof. Either lay the undercloak level or with a slight tilt outwards.

Carry the tiling battens over the undercloak and finish them 100mm from the outer edge of the undercloak. If using verge clips fix each clip to a tile batten with its outer edge aligned with the outer edge of the undercloak.

Lay a 75mm wide bed of underlay onto the undercloak. Avoid contact between the mortar and the ends of the battens. Bed the verge tiles onto the mortar. Nail every verge tile and also secure the tails of the tiles in the verge clips.

Neatly point up the joint as the mortar starts to 'go off'.

## **Ridge - Generally**

Ideally, tiling should finish with a full course at the ridge. It is easy avoid having a cut course by reducing the gauge if necessary.

Ensure all top course tiles are secured to Zonal Method or Sandtoft Fixing SPEC recommendations.

## **Dry Ridge**

Terminate the underlay 30mm from the ridge apex. Fix a timber batten along the ridge apex, securing with ridge batten straps provided. The timber height will depend upon the pitch of the roof - use tile battens to make up to the appropriate height of ridge batten, ensuring that the drive screws penetrate by at least 25mm. Lay the top courses of tiles ensuring each tile is secured to Zonal Method or Sandtoft Fixing SPEC recommendations.

There are two dry ridge systems available to suit Sandtoft single lap concrete tiles, as follows:

**RollRidge:** Lay the ridge roll along the centre line of the apex and tack to the ridge batten. Remove the paper backing from each side of the ridge roll and press the edges of the ridge roll onto the tile surface or profiles.

Fit and secure the ridge tiles over the ridge roll with ridge unions using the stainless steel drive screws, sealing washers, plates and plugs provided.

**Profile Ridge:** Insert profile fillers (for profile tiles only) into ventilation units then place and connect on top course of tiles to each side of the ridge. Fit and secure the ridge tiles onto the ventilation units with ridge unions using the stainless steel drive screws, sealing washers and plates provided.

Fit block end ridge tiles at gables.

### **Bedded Ridge**

Lay a continuous bed of mortar along the top course of tiles at each side of the ridge. Joints between each ridge and at the gable end should be 'solid bedded' by placing a tile slip to 'straddle' across the tops of the top courses of tiles to support the mortar. Place a full bed of mortar onto the tile slip. To prevent cracking, reduce the amount of mortar by inserting additional tile slips into mortar. Use dentil slips where the tile profile depth is 25mm or more.

Place each ridge onto the mortar bed and tap down to give no more than a 10mm deep mortar bed between the ridge and the tile rolls. A string line can be used to ensure the ridge line is straight and true.

Neatly point up the joint as the mortar starts to 'go off'.

To comply with BS 5534 ridge tiles must be mechanically fixed for a distance of 900mm at gables, abutments and where the ridge passes over a masonry wall. Also, all ridges must be mechanically fixed in areas of high exposure, on industrial buildings and where the ridge height is over 15 metres.

Sandtoft recommends that all bedded ridges be mechanically fixed. This can be achieved by fitting security ridge tiles (ie ridges with holes) and securing into an additional ridge batten using stainless steel drive screws and sealing washers. The height of the ridge batten will depend upon the pitch of the roof - use tile battens to make up the height of hip batten to allow at least 25mm penetration of the ridge-fixing screws.

### **Hips - Generally**

Cut the general tiles closely to the hip timber and at the same relative angle. All tiles at the hip should be secured to Zonal Method or Sandtoft Fixing SPEC recommendations. Ensure small cut pieces are secured by drilling or notching the cut tiles to facilitate nailing. Fix additional battens if necessary. Hip clips are also available to secure cut tiles.

### **Dry Hip**

Fix an additional timber batten along the hip, securing with hip batten straps provided. The timber height will depend upon the pitch of the roof - use tile battens to make up to the appropriate height of hip batten.

Lay tiles as described earlier. Lay the hip roll along centre line of hip and tack to hip batten. Remove paper backing from each side of the hip roll and then press and dress edge of hip roll neatly into the tile profiles.

Cut the first length of the hip tray to fit the corner at the eaves. Nail the hip tray to the hip batten with its under-lap section facing towards roof apex. Continue fixing subsequent hip trays, each overlapping the previous one.

Place a dry hip starter ridge directly over the hip tray, close against the eaves tiles, and secure to the hip timber using a drive screw. Fit a hip union under the open end of the dry hip starter ridge and then locate the next hip ridge over the union. Secure using a drive screw with sealing washer and plate. Continue fixing subsequent hip ridges to the ridge apex.

### **Bedded Hip**

Nail or screw a hip iron to the lower end of the hip timber. This will prevent the hip ridge tiles from sliding down the hip as they are bedded.

Cut the first hip ridge to the shape of the eaves at the corner. Lay a continuous bed of mortar along the tiles at each side of the hip. Joints between each hip ridge and at the eaves end should be 'solid bedded' by placing a tile slip to 'straddle' across the tiles at either side of the hip to support the mortar. Place a full bed of mortar onto the tile slip. To prevent cracking, reduce the amount of mortar by inserting additional tile slips into mortar.

Place each hip ridge onto the mortar bed and tap down to give no more than a 10mm deep mortar bed between the hip ridge and the tile rolls. A string line can be used to ensure the hip line is straight and true.

Neatly point up the joint as the mortar starts to 'go off'.

To comply with BS 5534 hip ridge tiles must be mechanically fixed for a distance of 900mm at abutments and where the hip passes over a masonry wall. Also, all hip ridges must be mechanically fixed in areas of high exposure, on industrial buildings and where the ridge height is over 15 metres.

Sandtoft recommends that all bedded hip ridges be mechanically fixed. This can be achieved by fitting security hip ridge tiles (ie hip ridges with holes) and securing into the hip timber using stainless steel drive screws and sealing washers. The height of the hip timber can be built up if necessary, using tile battens, to allow at least 25mm penetration of the hip ridge fixing screws.

### **Ridge/Hip Junctions**

Where the hip meets the ridge a lead saddle is required to weather the junction. See *Lead Sheet Association Manual* for details.

Cut the ridge and hip ridge tiles to finish closely together with no more than a 10mm joint at the butt joint. The end hip ridge should finish level with the top of the ridge line.

### **Valleys**

Fit support timbers to the rafter sides to enable the top surface of the valley boards to be set level with the tops of the rafters. Fix tile battens to act as tilting fillets to each side of the valley, at least 150mm from the valley centre.

Lead should be Code 4 or 5, at least 450mm wide and each piece should be no longer than 1.5 metres.

Start the first strip of lead at the eaves overhanging the gutter and dress closely onto the valley boards, over the tilt fillets and finish each side in a welt. The overlap between subsequent pieces will depend upon the pitch of the roof. (Further guidance on the widths and minimum overlaps of lead can be obtained from the *Lead Sheet Association*). At the top of the valley, where it meets another valley or ridge, etc, a lead saddle is required to weather the junction. See *Lead Sheet Association Manual* for details.

Provide an undercloak of slate or fibre cement board, etc, for the mortar bed at each side of the valley. Do not lay the mortar directly onto the lead. Lay the mortar onto the undercloak, ensuring that there is a clear channel between the mortar and the tilt fillet.

Neatly cut the tiles into the valley at a rake to provide a minimum 125mm wide channel. Lay the cut tiles onto the mortar and point neatly. Avoid blocking the tile interlocks with mortar. Secure small cuts by drilling or notching the cut tiles to facilitate nailing. Fix additional battens if necessary.

### **Top Edge Abutments**

Where the tiling meets a wall (abutment) at the top edge turn the underlay 50mm vertically up the wall. If ventilating the roof space then terminate the underlay 30mm from the wall. Fix the top course tile batten close to the wall, allowing for a minimum 5mm air gap and the nibs of the tiles. Complete the tiling.

Chase out, or otherwise make a cut 25mm deep in the wall to receive the lead flashing. The distance from the tiles to where the lead turns into the wall (ie the upstand), should be at least 75mm. The lead should dress over the top course of tiles and Rollvent top abutment ventilator by at least 150mm (200mm for low roof pitches and/or exposed conditions). Each piece of lead should not be longer than 1.5 metres and should overlap the next piece by at least 100mm. The front edge of the lead should be secured using clips (these are provided with the Rollvent) and the top edge should be secured into the wall using wedges.

### **Side Abutments Generally**

For profile tiles side abutments can be weathered using a cover flashing. For flat tiles a secret gutter should be used in addition to a cover flashing.

If a cover flashing is not used then verge clips can be used to secure the edge tiles.

If possible the tiling should be set out to fit full standard tiles at left and right hand abutments. If this is not possible then the tiles must be cut to fit, ensuring that the cut tiles are large enough to be adequately mechanically secured.

### **Side Abutment Secret Gutter**

Fix a 75mm wide timber between the last rafter and the wall, level with the top of the rafter, to support the lead. Fix a 25mm deep timber counterbatten over the last rafter, 75mm away from the wall.

Extend the lead lining up the wall by at least 65mm above the top edge of the tiling. It should neatly line the gutter and finish with a welt over the counterbatten. Each piece of lead should not be longer than 1.5 metres. The overlap between subsequent pieces will depend upon the pitch of the roof. (Further guidance on the widths and minimum overlaps of lead can be obtained from the *Lead Sheet Association*).

Where the secret gutter discharges into the gutter at the eaves splay out the lead to prevent overflow.

Finish the tiling as close to the wall as possible, with a gap no greater than 15mm wide, cutting neatly as necessary.

### **Side Abutment Cover Flashing**

Chase out or otherwise make a cut 25mm deep in the wall to receive the lead flashing. In the case of a stepped flashing, the minimum distance from the tiles to where the lead turns into the wall should be at least 65mm. The total distance the lead flashing extends up the wall should be at least 150mm. Dress the cover flashing closely over the tiles by at least 150 mm, but wider if necessary to fully cover one full tile corrugation. If using separate single step and cover flashings then the step flashing should cover the upstand of the cover flashing by at least 65mm.

Each piece of lead should not be longer than 1.5 metres and should overlap the next piece by at least 100mm. Secure the front edge of the lead using clips and secure the top edge into the wall using wedges.

Sandtoft Technical Support: 0870 145 2019