

In a series of articles on interlocking concrete roof tiles, experts from the **Concrete Tile Manufacturers Association** have pooled their knowledge. This Construction Note discusses top edge abutments.

### Top edge abutment

A top edge abutment occurs where the top of a roof slope meets a wall that rises above it. The top edge abutment will normally be horizontal. If it is not horizontal it should be considered as a raking side abutment. Rainwater should always flow away from a top edge abutment.

Top edge abutments should always be formed with a flashing, without any form of mortar bedding. The elimination of mortar helps to accommodate differential movement between the timber or steel roof structure and the solid wall.

### The building structure

The wall construction should be built up to 75mm above the highest point of the tiles/ventilation system and a cavity tray (A) or similar device installed in the wall to discharge over the top edge abutment flashing. For some solid wall materials a horizontal chase is cut into the wall to receive a horizontal damp proof course (DPC), especially where a solid wall is rendered. The cavity tray should be installed to allow the lead cover flashing to be inserted directly below the cavity tray to a depth of at least 25mm. The wall can therefore be completed prior to the roof being constructed.

### High level ventilation

Where a roof needs to be ventilated to comply with BS 5250 and Approved Document F2 of the Building Regulations, it will be necessary to install a continuous ventilation grill or regularly-spaced tile vents to provide 5000 square millimetres per metre run at the top edge abutment.

### Continuous ventilation systems

Continuous ventilation systems (C) at a top edge are all proprietary, but fall into two broad classifications: -

1. Where the grill is positioned between the tile/slate and the flashing.
2. Where the grill is positioned between the flashing and the wall.

The installation methods for both types are as follows: -

1. Where the grill is positioned between the tile/slate and the flashing the grill is shaped to the tile profile, allowing the flashing to be flat. This saves having to dress or cut and weld the lead to the shape of the tile profiles. With this arrangement the lead is dressed into a support carrier, which is a set width regardless of the true pitch of the tiles. The quantity of visible lead is therefore reduced and the leading edge of the lead can be secured to the carrier to resist wind uplift.
2. Where the grill is positioned between the flashing and the wall dressing the flashing onto the tiles will accommodate the profile of the tiles. Because the grill is positioned at the top of the flashing the air path will be between the wall and the flashing the flashing must be spaced away from the wall. The installation instructions should always be carefully followed.

Regardless of which proprietary system is used a clear 10mm air path (D) should be maintained between the wall and the tiles/slates and the underlay. To ensure that the sag in the underlay does not interfere with the air path it is advisable to turn the underlay over

the top batten. This will also close off the head of the batten cavity. With profiled tiles it is also advisable to close off the ends of the tile corrugations to prevent insects in the batten cavity gaining access to the roof void.

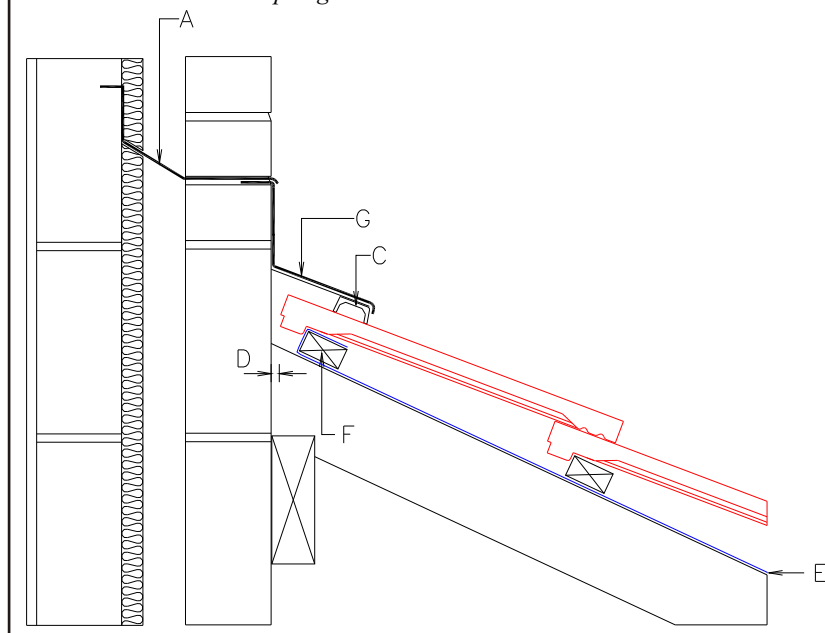
### Ventilation tiles

When using ventilation tiles (B), where the insulation is positioned between the rafters, one vent tile spaced between each pair of rafters will be needed. The free vent area of each vent tile needed will depend upon the rafter spacing rafters at 450mm centres will require a vent tile providing no less than 2250mm<sup>2</sup>. Rafters at 600mm centres will require a vent tile providing no less than 3000mm<sup>2</sup>.

Alternatively, where the insulation is laid horizontally between the ceiling joists the total vent capacity needs to be the equivalent to 5000mm<sup>2</sup>/metre run. Regardless of the position of the insulation the vent tiles should be positioned on the second course of tiles down from the top edge abutment to ensure that the vent cap or grill does not interfere with the flashing.

Where the insulation is positioned between the rafters and the vent tiles incorporate an integral pipe/duct which passes through the

FIGURE 1: Ventilated top edge abutment



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underlay, the pipe length may need reducing to ensure that it does not make contact with the insulation and so close off the air path.

Vent tiles with no integral pipe/duct rely upon a hole in the underlay positioned directly below the vent tile. Precautions should be taken to prevent insects gaining access from the batten cavity into the roof space. In all other respects the construction will be the same as without ventilation.

The arrangement of the batten fixings, when using vent tiles, will be the same as described in the 'without ventilation' section that follows.

## Without ventilation

Where there is no requirement to provide ventilation, for example where part of the building is exempt, such as an open porch roof, the construction is more conventional and common to all rafter pitches.

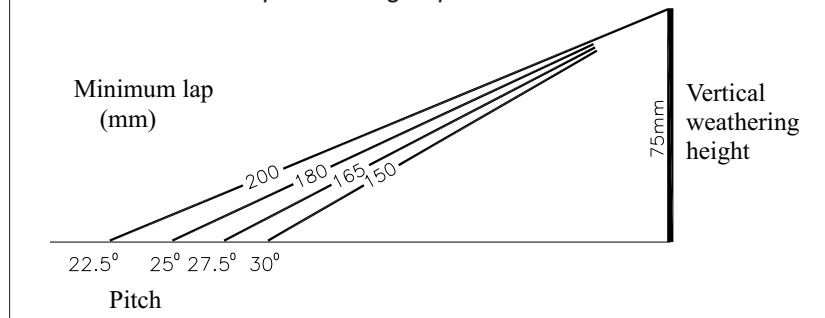
## Underlay/battens/tiles

The underlay (E) should be laid to finish 50mm up the wall. The top batten (F) should be positioned to allow the top course of tiles to finish as close to the wall as possible. Cutting tiles in their length to fit the top course should be avoided wherever possible.

## Fixings

BS 5534: *British Standard Code of Practice for Slating and Tiling* requires all perimeter tiles to be mechanically fixed. The tiles on the top course should be head nailed and/or tail clipped, whichever is appropriate, having carried out wind uplift calculations in accordance with BS 5534.

Table 1: Minimum lap according to pitch



## Flashings

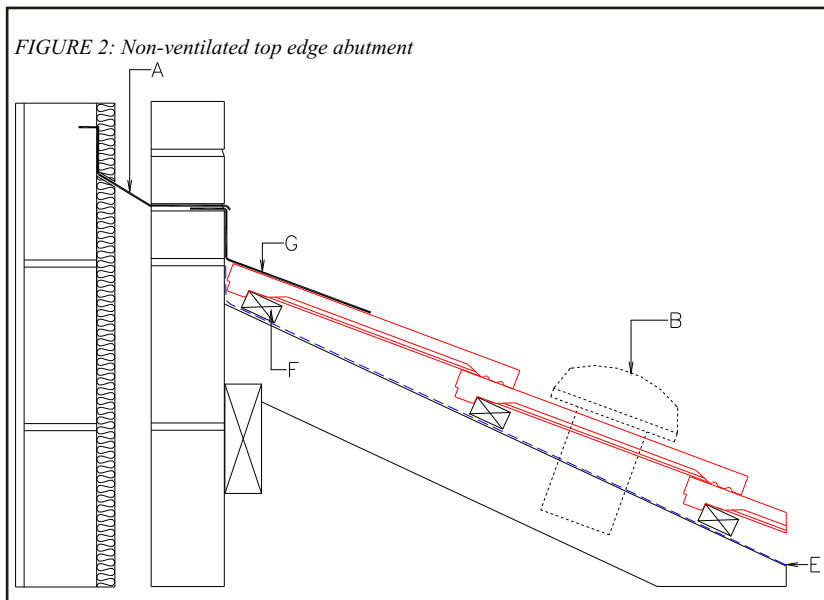
The lead cover flashing (G) should be laid in lengths not greater than 1.5 metres, but for other metals this dimension may differ. The width of the flashing can vary from 250 to 500mm depending upon the rafter pitch, the tile profile and the distance from the roof covering to the cavity tray in the wall.

The flashing will need to be cut, folded and dressed to turn in under the cavity tray to a depth of at least 25mm. The flashing should turn down the wall by a minimum of 75mm onto the top surface of the tiles. The distance by which the flashing needs to cover the head of the tile/slate will depend upon the true pitch of the tile/slate and can vary between 150 and 390mm (see Table 1). A tile will always lay at between 3 and 5 degrees shallower than the rafter onto which it is fixed, depending upon its design, length and thickness. The flashing should be dressed down onto the top surface of the tiles/slates to follow their contour as closely as possible. Each horizontal section of flashing should lap with the adjacent section of flashing by a minimum of 100mm. The leading edge of the flashing

may need to be secured to prevent it lifting during high winds. The clipping of the leading edge can be achieved using thin copper or stainless steel devices which are shaped to pass through the side interlock of an interlocking tile. The clip is fixed to the tile batten at one end and is folded around the leading edge of the flashing at the other end. Clips formed from straight lengths of copper or stainless steel will be stiffer than lead but should be secured as close to the leading edge of the flashing as possible to increase its strength. The spacing of the clips along the leading edge of the flashing will depend upon the exposure of the flashing and can vary from 300 to 500mm centres. At the ends of the top edge abutment flashing, where it meets a side abutment, verge, valley, hip or ridge, the appropriate design of saddle, in the same material, will be needed to lap over and integrate with the top abutment flashing.

## Summary

- Top edge ventilation should achieve 5000mm<sup>2</sup> per metre run of top edge abutment.
- Continuous ventilation grille systems require less plumbing skill when installing the flashing with profiled tiles.
- The flashing should be lapped directly under the cavity tray or DPC.
- The size and spacing of ventilation tiles should be appropriate to the location of the insulation.



CTMA members are:

Cemex  
Forticrete  
Lafarge  
Marley Eternit  
Sandtoft