

Slating & Tiling

TIPS 59

open inclined valleys 2 – installation

Having explained the design principles for an open inclined valley in part 1, part 2 will deal with the issues of installing the valley.

Support boards

Support boards should be used under all open valleys formed with metal and GRP valley liners. They should be thick enough to support the weight of a man standing on the valley and be set between the rafters, or counter battens, on noggins. They should be wide enough to extend beyond the edge of the valley lining material, and under the ends of the battens by at least 50mm, to allow the batten ends to be nailed to the support boards.

Underlay

The type of underlay used will determine whether it can be laid under the valley or not. On the main roof slopes, it should not directly lap under the valley, as water will be able to drain under the valley liner. By lapping the underlay over the welt on the edges of the valley construction, most of the water on the underlay will drain down between the welt and the batten ends, and exit at the eaves.

With a lead valley, special fleece materials should be laid under the valley to allow the lead to expand and contract without abrasion or adhesion during hot summer temperatures. Bitumen underlay should never be laid under a lead valley, as it will act like an adhesive between the lead and the support boards. With other types of underlay, you should consult the manufacturer.

Three lines of defence

A good open valley design should have three lines of defence: the mortar bedding to define the sides of the open channel; the tilt fillets – raised sections that discourage water from tracking sideways; and the welt, which stops any water that may reach the edge of the valley from dripping off the edge.

Each of these features should be separated to work effectively. Therefore, mortar should never come in contact with the tilt fillet or the welt, as water will wick through between the mortar and the feature.

The welt should not be incorporated into the tilt fillet, as the underlay should finish between the two and never extend over the tilt fillet into the bedding mortar, as again it can create a wick path.

The edge of the open channel to the outer edge of the welt should be about 200mm. Therefore, the total valley width should be twice that distance under the tiles/slates, plus the open channel width. The metal liner will be wider to dress over the tilt fillet and form a welt.

Tilt fillet

The tilt fillet should be positioned approximately 75mm from the edge of the open valley channel line to ensure there is sufficient space for the mortar bedding. If no mortar is being used, it will be the first line of defence and can be closer to the cut edge of the slates.

The tilt fillet should not be higher than the tile battens or it will cause the roof covering to kick up. If the support boards are between the rafters, there will be room for a batten cut on the diagonal. Without a tilt fillet – especially on a slate roof with no mortar bedding – the valley will leak during heavy rainfall.

Valley liners

Most open valleys are formed using ductile metals such as lead, zinc or copper, although GRP valley troughs are also used.

Lead is the most popular metal for forming open valleys due to its long life expectancy and its ability to be bossed or cut and welded to form the flashings at the head and base of a valley. Generally, copper valleys are more expensive and zinc valleys are cheaper, but the principles of forming the valley should be the same. The maximum sheet lengths will vary with the materials and the thicknesses.

Welt

The welt is the edge of the metal liner turned back on itself, with a 4mm gap between. Lead, which is unable to support its own weight, often collapses and closes the gap, so it is better to turn the lead up to form a vertical wall level with the top of the battens/tilt fillet.



Mortar bedding

The mortar bedding should form the edges of the open channel. This is essential with most interlocking tiles to locate the small cut pieces of tile, especially on the left-hand side of the valley, where without mortar they would not lie at the right angle and may not be fixed to a batten.

With double-lap slates, there may be no need to use mortar bedding. With plain tiles, the thickness of the tiles can allow insects, birds and rodents to enter the batten cavity if there is no mortar bedding.

When mortar bedding is used, it should be laid on a slip plane – normally a piece of undercloak – which is laid on the metal valley liner. The mortar is placed on the slip plane before the cut edges of the tiles are placed. The reason for not placing the mortar directly on the metal valley liner is to allow the liner to expand and contract freely, so that it does not fracture along the side of the open channel.

Mortar should not be used between the laps of the tiles as this will restrict the self-draining effect of the headlap or the side interlocks. The mortar mix should be one part cement to three parts sand, placed during dry weather only.

Eaves detail

Where a valley reaches an eave, the true pitch of the valley should be maintained. If the valley forms a horizontal shelf where it passes over

the fascia board, the capacity of the valley will be decreased, as in heavy rainfall water can slow and back up. It is better to cut down the fascia board for the width of the open channel and the tilt fillets, to allow the true valley pitch to run through. The tiles/slates on either side of the valley should also lie correctly.

Ridge detail

Where two open valleys meet at a ridge, such as above a dormer, the valleys should run through and be covered with a saddle. The ridge tiles should be cut in line with the edges of the open channel and should not cross the valley, as this will restrict the water flow off the main roof slope, creating a wick path. Where the head of a valley meets a hip or other feature, again a lead saddle should be installed, and the hips and ridge tiles should be mitred and fixed over the saddle.

Tips

- Do not allow bedding mortar to come into contact with tilt fillet.
- With metal valleys, always place mortar on a slip plane to allow the metal liner to expand and contract freely.
- The underlay should never lap over the tilt fillet, or make contact with the bedding mortar.

Compiled by Chris Thomas
The Tiled Roofing Consultancy
2 Ridlands Grove, Limpsfield Chart,
Oxted, Surrey, RH8 0ST
tel: 01883 724 774

Email:
chris.thomas@thetiledroofingconsultancy.com

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