

# Slating & Tiling

TIPS 33

## GRP valley trough support

It is generally accepted that lead-lined inclined open valleys need to be supported on substantial timber boards set between the rafters to support the weight of the lead. However, with GRP valley trough units, there has been conflicting recommendations regarding installation from different manufacturers and suppliers. In recent years recommendations have changed, but there are still some technical loose ends that need to be resolved.

### Deflection

GRP is light and rigid and does not require supporting, unlike lead which cannot support its own weight. However, the forces acting on the unit are more than just its self-weight.

Inclined valleys are always laid at a shallower pitch than the rafter pitch of the two adjacent slopes, by approximately 5°. This is the shallowest route from the eaves to the ridge and will inevitably be used as a safe way to reach the ridge, especially if the tiles or slates look fragile. While tradesmen on the roof may be discouraged from walking up the valley, they will still be used as walkways. Once a roof has been completed it is difficult to determine if the valley trough is adequately supported. However, once you stand on it and it deflects, it is too late. The weight of a tradesman standing on a valley trough spanning between rafters will cause the GRP to deflect sufficiently to stress-crack the material. Therefore, the construction needs to be capable of supporting the weight of a man without excess deflection.

### Mortar

Valley trough units, used for interlocking tiles, have a sanding strip along the edges of the open channel to allow the mortar bedding to adhere to the surface of the material. In theory this works well. However, if the valley trough unit deflects due to the point-load of a tradesman standing on the valley, the mortar will not be able to bond with the GRP, and will either

crack or pull away from the sanded strip. Neither option is desirable. The only way mortar bedding will remain in position is for the valley trough to be supported so that there is little or no deflection.

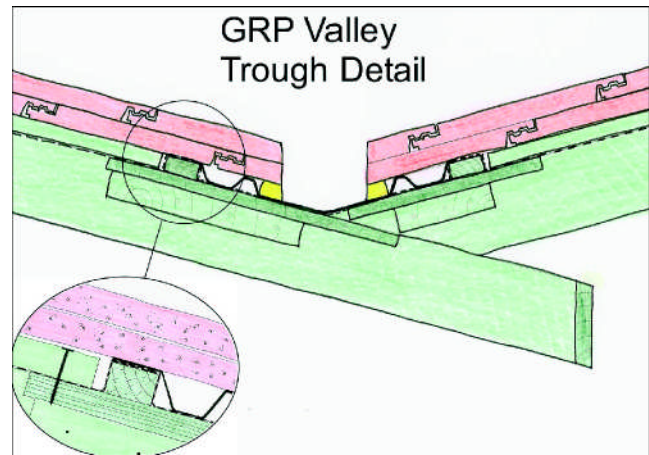
### Battens

At an open valley the tile or slate battens need to terminate short of the centre-line of the valley. This allows the valley trough to sit in the depth of the batten and not kick up the edge tiles or slates. This will result in some batten ends being unsupported, unless there is a board that is set between the rafters, or a valley batten to which to fix them. The end of every batten should be supported by being nailed to a timber support. In many instances the timber support boards, if wide enough, will serve as a suitable support.

The alternative method of mitre-cutting the end of the batten to the side of the valley batten, and then tosh-nailing up through thin edge of the tile batten into the valley batten, is not discouraged, but is clearly not as secure. Nailing through the thin edge of the batten so close to the end grain of the batten will inevitably split the batten when using a standard batten nail. This method of securing the ends of the battens also alters the detailing of the underlay.

### Underlay

If there are no support boards under the valley trough units the underlay will sag between the rafters. It will only come into contact with the valley trough units where the underlay passes over a rafter or down the valley rafter. If there is no valley rafter, as with trussed rafter roofs, the expansion and contraction of the valley trough units will eventually wear through the underlay on the edges of the timbers. If water on the roof underlay is allowed to drain under the valley it can drain through the holes worn in the underlay. Underlay that is laid on a relatively smooth support board is less likely to



~ Especially with timber trussed rafters GRP valley trough units need to be supported using timber boards between the rafters. Note how the underlay should lap over the valley batten.

wear through as the movement takes place over a much greater surface area. Similarly, bituminous underlay can become adhered to the underside of the valley trough after periods of hot weather.

The contraction of the GRP in cold weather can tear the underlay apart at the laps in the valley trough units. It is, therefore, ideal if the underlay under the valley is not bituminous and is laid over the valley battens along with the main roof slope underlay. This will prevent water on the main roof slope underlay from draining under the valley. A 10mm gap is needed between the end of the tile battens and the side of the valley batten. This will encourage water on the main roof slope underlay to drain down the side of the valley batten. This makes the nailing of the battens into the valley batten impossible.

### Valley trough profiles

There are three generic profiles of GRP valley trough, not including the proprietary dry valley designs. These are troughs that need a valley batten to support the outer edges, those that do not, those designed for interlocking tiles with mortar, and those designed for double lap slates with no mortar.

There are also two widths of trough. It is not clear when, or why, you would choose one design over another. The wider units provide a wider clear open channel down the centre, and in some instances, larger corrugations to channel any water that may get through the mortar bedding. It is also recognised that troughs that finish on the top of a valley batten are more weatherresistant at lower rafter pitches than those that finish at rafter

level and do not need a valley batten to support the edge.

The recommendation states that units that do not need a valley batten are designed for used with rigid sarking. Where a counter batten is used, I see no reason why valley trough units that need a valley batten should not be used with rigid sarking applications. It is also not clear as to which units are used for plain tiles. While they are double lapped like natural slates, the thickness of the tiles at approximately 13mm is large enough to allow insects into the batten cavity. Therefore, it would be better to mortar bed plain tiles at a valley.

### Conclusion

The suggestion that no support or partial support, with 6mm sheets of ply-wood, below GRP valley trough units is acceptable, is less than helpful as they will be liable to fail in the long term. Full support of the valley trough units using a 19mm timber, or a 15mm plywood support board, set between the rafters and wider than the valley, with a non-bitumen underlay under the valley, is the only safe option.

### Tips

- ~ The end 50mm of all battens should be supported and fixed to the valley support board
- ~ The underlay under the valley should ideally not be bituminous
- ~ Water on the main roof slope underlay should not be allowed to drain under a valley by lapping it over the valley battens

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