The main advantage of profiled metal sheet over other metal roof types is the ability of the material to span economically up to around 3.5 metres between primary structural supports. This self-supporting ability of the material, combined with its weather resistant, painted coating applied during manufacture, allows for it to be used as both a substrate material for a finish in a different material set onto it, or as a single layer structural and weatherproof material. Where standing seam roofing, with its high projecting folds, is suited to long, straight, or gently curving spans, profiled metal sheet can both span between supports and form complex geometries. It is this flexibility of being both structural deck and waterproofing layer that has an advantage where the interior finish is designed to be in a different material, such as dry lining or decorative boarding. In recent years roof pitches have greatly reduced to make the roof as flat as possible, usually for visual reasons. Most profiled sheet is laid to a minimum pitch of around 4°. Standing seam roofs can go down to a 1° pitch, depending on the geometry of the roof.

When used as a substrate, profiled metal sheet can be cut to form complex geometries, typically supported by a steel frame to create a three dimensional form. Profiled sheet with an overall depth of 50mm is used typically, but much deeper sections are used for spans above 3.5 metres to around 6.0 metres, with a depth up to around 200mm. The deep sections are also used in composite roof decks when filled with concrete. For a steel profile, sheets of 0.7mm thick are used for the outer skin; for aluminium a 0.9mm thick sheet is used. Steel is galvanised and coated, while aluminium is mill finished or coated.

**Profiled metal decks as substrates**

Where profiled metal is used as a deck rather than as a roofing material, a lightweight build-up is usually applied, since the metal decking is chosen where a lightweight roof is required. The lightweight finishes used are typically an additional layer of profiled sheet, metal standing seam (discussed in the previous section), membranes (mainly elastomers) and light planted roofs. A typical build-up is of closed cell insulation set onto the profiled metal deck, rigid enough to span across the peaks of the profile without deflecting significantly when it is walked upon for maintenance access, which would otherwise stretch the joints in the membrane. A single layer membrane is then set onto this insulation, usually an elastomeric membrane that can be left exposed to the effects of the sun without damage. Sometimes a thin layer of smooth pebbles is laid on top to keep the sun off the membrane and allow maintenance access without risk of puncturing the membrane. The closed cells of the material ensure that any water vapour trapped in the construction is not absorbed by the insulation which would otherwise cause its deterioration.

**Profiled metal roof sheeting**

When used as a finish material, called ‘roof sheeting’, profiled metal sheet provides a continuous weatherproof skin with the ability to be curved in one direction. A limitation of the material is that openings for rooflights, edges, and junctions with other materials are not easily integrated into the profile of the
Details
1. Outer profiled metal sheet
2. Inner lining sheet
3. Fibre quilt thermal insulation
4. Vapour barrier
5. Purlin or structural beam
6. Profiled metal structural deck
7. Folded metal gutter
8. Folded metal drip
9. Metal fascia panel
10. External wall
11. Outer sheet fixing bracket
12. Curved eaves sheet
13. Structural frame
14. Ridge piece
15. Metal flashing
16. Rooflight
17. Pipe or duct penetration
18. Parapet flashing
19. Vented filler piece

Vertical section 1:10. Profiled metal sheet roof with parapet

Vertical section 1:10. Edge detail