DESIGN RIGHT

Internal gutters and flow capacity

BY ALIDE ELKINK,
FREELANCE TECHNICAL WRITER, WELLINGTON

If an internal gutter that provides drainage from a metal roof overflows, the only place the water can go is into the building below. This is not only inconvenient but can cause damage. How can these problems be avoided?

THE BEST WAY to prevent problems with internal gutters is to avoid them. However, this is not always possible, so where required, internal gutters must be designed and built with care.

Building Code compliance

There are three Building Code clauses relevant to internal gutter design:

- Clause B2 *Durability* requires that internal gutters have a minimum 15-year durability (with normal maintenance) along with the rest of the building elements that make up the building envelope.
- Clause E1 *Surface water* requires that drainage systems must be able to convey surface water to an appropriate outfall or outlet for disposal.
- Clause E2 *External moisture* requires that roofs must shed precipitated moisture such as rain and snow and prevent water penetration into buildings.

Designs can follow the Acceptable Solutions in E1/AS1 and E2/AS1 or be alternative methods.

Some alternative methods available

Alternative methods of sizing gutters are provided in the *NZ Metal Roof and Wall Cladding Code of Practice v3.0*.

This provides a more up-to-date method of calculating internal gutter sizes than E1/AS1 and E2/AS1. It incorporates more factors including the effect of wind and adjacent walls as well as rainfall intensity and roof area and pitch.

Specific requirements of E2/AS1

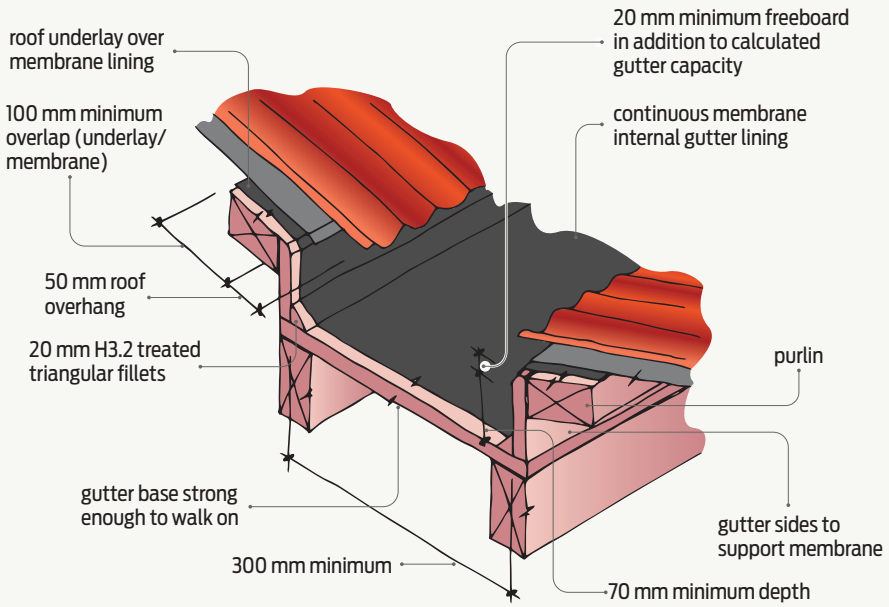
E2/AS1 sets out specific design requirements for internal gutters. They must be lined with a fully supported continuous butyl or EPDM membrane or sheet metal with joints that are welded.

The metals specified include aluminium, copper, stainless steel or zinc. Internal gutters must have a minimum fall of 1:100 and be constructed to at least the dimensions given in E2/AS1 Figure 52 (see Figure 1).

Figure 52 of E2/AS1 gives a minimum width of 300 mm and a minimum depth of 70 mm, but note (2) states that internal gutters must be sized to suit the catchment area and references Acceptable Solution E1/AS1 to calculate the gutter capacity. Where E1/AS1 is used to calculate capacity, an additional freeboard depth of 20 mm minimum must be provided.

Internal gutters with roof claddings other than a membrane must discharge into:

- a rainwater head or
- an internal outlet with overflows provided by a second outlet to a rainwater head or to another



Note: Internal gutters must be sized to suit roof catchment area.

Figure 1 **Minimum dimensions for internal gutter (from E2/AS1 Figure 52).**