

DESIGN CONSIDERATIONS FOR STEEL ROOFING AND CLADDING IN VERY SEVERE ENVIRONMENTS



The very severe marine zone is that area where salt spray (or salt laden sea air) creates a very corrosive environment. When building in this area, the building design should seek to minimise areas that are not regularly washed by rainwater, (this area is commonly referred to as unwashed). Onshore winds will always bring salt with them. When combined with rain, in close proximity to the sea, salt-water rain is formed. Normally rain will remove air born salt from the top exposed surfaces only when it comes via offshore winds or no wind at all.

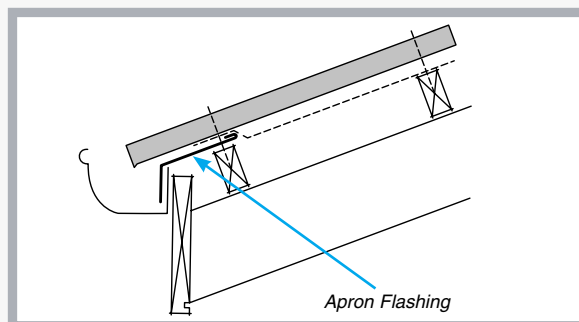
The increasing use of coated profiled steel for cladding, means that both design and installation must be appropriate for the environment and location. This is particularly important where the cladding is not regularly washed by rain, typically under the eaves.

When the roofing profile is specified, the roofing manufacturer will have a fastener and placement recommendation. Each profile has a designated fixing type, be they penetrating fasteners (nails or self drilling screws) or clip type fastening. The most appropriate product should be selected for the local environment.

NZ Steel currently recommends the use of coated steel fasteners manufactured to Class 4 AS 3566.2 2002 in this very severe marine environment. The life of the fastener, like the coated steel roofing is directly related to the level of washing. Fasteners which are subject

to a build up of salt and not washed, will have a reduced life. Stainless steel fasteners are not compatible with zinc/aluminium coated steel based products.

Clips (typically galvanised) used for clip fastened profiles are likewise subject to the build up of salt and atmospheric dust. To reduce the impact of airborne salt the use of preformed profiled closed cell foam sealers are essential to prevent salt from entering the roof cavity. The galvanised clips, especially those nearest to the gutter line, should have additional protection by applying a primer and a marine paint topcoat. The positioning of the fascia and gutter will also influence the amount of air entering the roof cavity and should be installed using an apron flashing as shown in the NZMRM Code of Practice 5.3.5.4.



The roof pitch, orientation to the prevailing wind, and the type and positioning of gutters will all impact on the life of the roof.

Steel cladding is gaining higher levels of acceptance in both urban and rural environments and its use in very severe marine environments is also increasing. Minimising areas that are unwashed therefore becomes more important.

Regular and thorough maintenance by washing down is an essential requirement where metal roof and wall cladding is used close to the sea. The use of alternative cladding materials in areas not washed by rain should be seriously considered, especially where maintenance is infrequent.

Refer to New Zealand Steel's Environmental Categories Guide for recommendations on the correct products and maintenance requirements for this environment.



The building design should give consideration to the following:

- Location and orientation of the building, relative to the prevailing wind and the sea.
- Steel Roofing material
 - Product specified
 - Profile
 - Fastener specified
 - Positioning of the gutter
- Steel Cladding
 - Cladding material
 - Fastener specified
 - Flashing designs for windows and doors
- Ease of maintenance
 - Extent of overhang
 - Areas not washed by rain
 - Soffit material and ability to access for cleaning

Details of product maintenance requirements are in the Environmental Categories Guide.

Additional Information:

New Zealand Metal Roof and Cladding Code of Practice; NZ Metal Roofing Manufacturers Inc, Installers Guide, Specifiers and Builders Guide, Environmental Categories Guide.

FURTHER INFORMATION

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