



Performance
Chemicals

NEW ZEALAND

Technical Note: Fasteners for Treated Timber



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INTRODUCTION

The fasteners used to fix treated wood need to be selected with care to ensure the expected service life can be achieved. The corrosion risk for fasteners depends on the service conditions (wood moisture content, exposure to condensation, rain or salt spray etc) and the inherent corrosivity of the treated timber product.

NZS 3604:2011 Timber-Framed Buildings notes the specific requirements for structural fasteners used in New Zealand construction; this Technical Note is based upon Section 4 of this Standard. Compliance with NZS 3604 is required when following the Acceptable Solution for B2 Durability (B2/AS1).

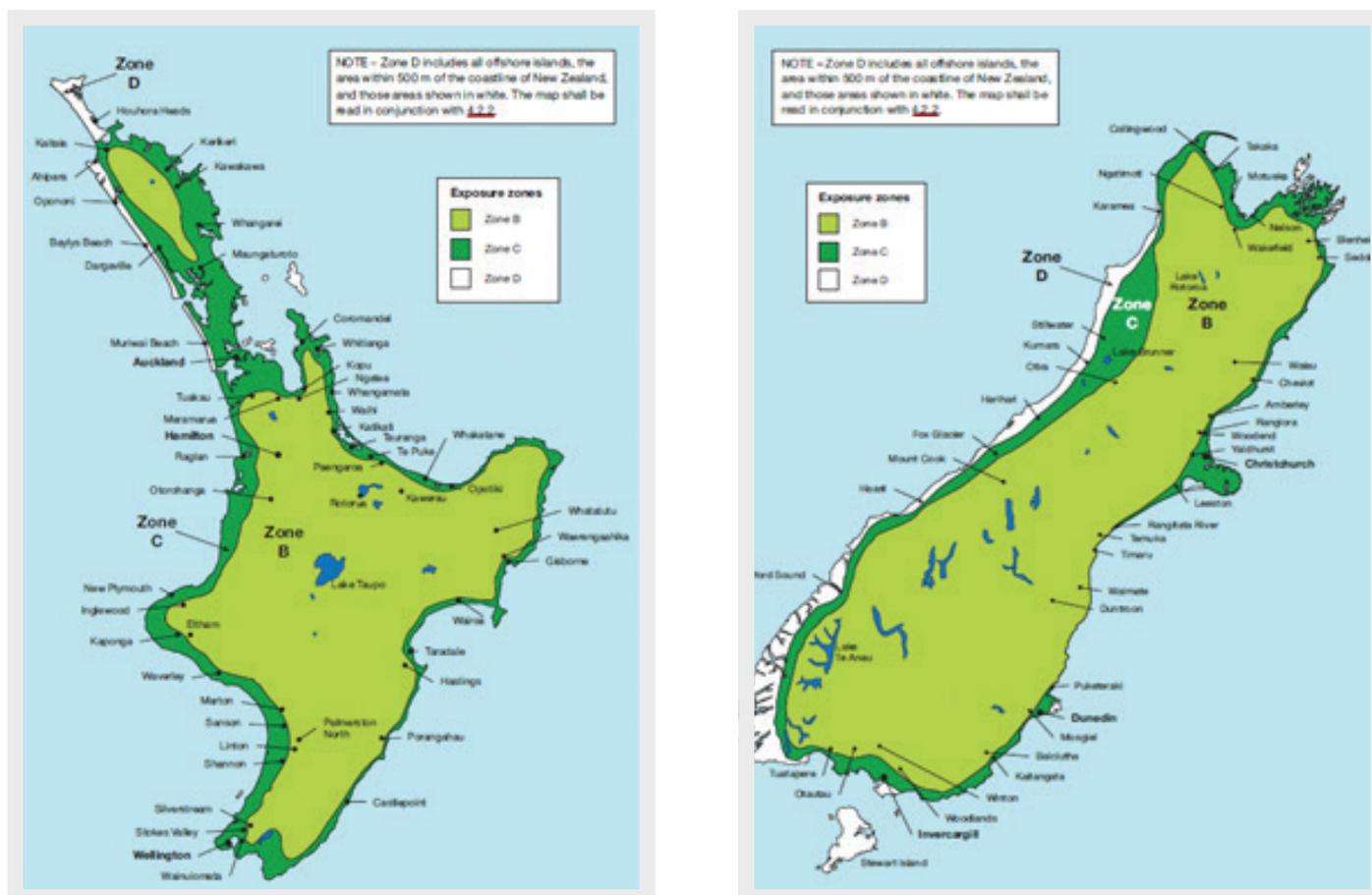
EXPOSURE ZONES

NZS 3604 Section 4.2 has maps showing NZ divided into different Exposure Zones that broadly classify the corrosion risk into B (Low), C (Medium) and D (High) classifications.

Most of NZ's densely populated areas are in Exposure Zones C and D, and Zone D includes the highest salt spray areas and includes all locations with 500m of the coastline. These zones then require specific fastener types to meet the environmental corrosion risk.

Some localised regions in NZ are exposed to microclimatic conditions that are subject to specific design and as such are beyond the scope of this Technical Note.

Figure 1. Extract of Figure 4.2 Exposure Zone Maps, NZS 3604

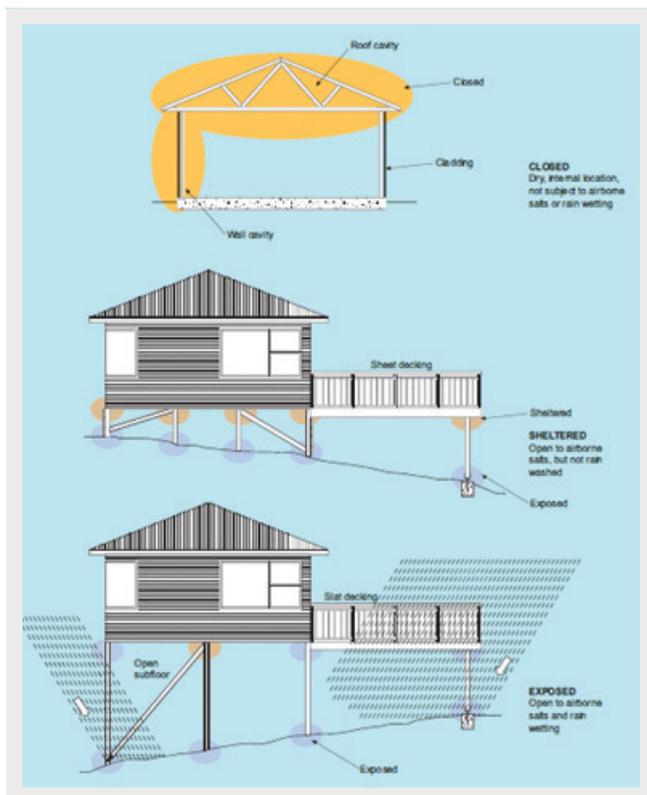


EXPOSURE POSITIONS

The position within the building is then considered:

- "Closed" situations include all internal framing not subject to airborne salts or rain wetting
- "Sheltered" is where the wood is exposed to airborne salts and condensation but not direct rain washing
- "Exposed" is where rain washing is expected – refer Figure 2

Figure 2. Extract of Figure 4.3(b) Exposure Definitions, NZS 3604



EFFECTS OF TIMBER TREATMENTS

NZS 3604 Clause 4.4.4 specifies that all fasteners in contact with wood treated with a copper-based wood preservative will require corrosion protection in all situations (minimum hot-dip galvanised).

In addition, Clause 4.4.4 (a) identifies that wood treated with Copper Azole (CuAz) or ACQ is expected to be more corrosive and will require fasteners to be a minimum of Type 304 stainless steel when used in Sheltered or Exposed situations. Micronized Copper Azole (known in market by its acronym, MCA) is by the current definition a Copper Azole preservative and therefore requires stainless steel fasteners in accordance with NZS 3604, part of the NZBC Acceptable Solution for Durability, B2/AS1.

FASTENERS FOR H1.2 AND H3/H3.1 TREATED TIMBER

Wood treated with preservatives that do not contain copper (i.e. H1.2 boron and H3/H3.1 Azole LOSP) does not require any specific corrosion-resistant fasteners. Mild steel may be used in all Closed spaces, and H3/H3.1 may be fixed with galvanized fasteners in Sheltered and Exposed positions unless the wood is Exposed and in Zone D, where 304 Stainless may be required for 50-year performance.

FASTENERS FOR H3.2 AND ABOVE

Fasteners in wood treated with CCA and used in Closed spaces must be a minimum of hot-dipped galvanized, and this also applies to fasteners used in Exposed or Sheltered positions, except in Zone D where fasteners in exposed situations must be 304 Stainless Steel to comply with Acceptable Solution B2/AS1.

Fasteners in wood treated with **Copper Azole (including MCA) or ACQ** may be galvanized for Closed situations but must otherwise be 304 Stainless for all Sheltered and Exposed positions in all Zones.

Fasteners must also be compatible with other fixings e.g. nail plates and brackets, and any nails or screws within 600mm of ground level must in all cases be a minimum of 304 Stainless. Nails or screws used in contact with stainless steel fixings, flashings, etc. must also be stainless to avoid galvanic corrosion.

IDENTIFICATION OF TIMBER TREATMENT TYPE

Treated wood will carry a brand identifying the treatment plant, the preservative type and the Hazard Class it is intended for, for example "**667 01 H3.2**". The two digit code in the centre (01 in this example) specifies the preservative chemical that has been used, as per NZS3640:2003 5.1.3.

Common codes are given below:

Code	Preservative
01	CCA
11	Boron
58	Copper Azole (as emulsion)
64	Azoles (Tebuconazole, Propiconazole and Permethrin)
88	Micronized Copper Azole
90	Alkaline Copper Quaternary (ACQ)

SUMMARY

NZBC Acceptable Solution B2/AS1 provides NZS 3604 as a pathway for fastener selection relative to exposure zones, exposure situations and the specific treatment types of wood products.

The requirements for durability of steel items such as nails and screws for framing and cladding are summarised in the following table:

Situation	Treatment Type				
	Boron	Azole	CCA	Copper Azole*	ACQ
Closed (all zones)	Mild	Mild	Galv	Galv	Galv
Sheltered (all zones)	Galv	Galv	Galv	SS	SS
Exposed Zone C	—	Galv	Galv	SS	SS
Exposed Zone D framing and cladding that is bracing	—	SS	SS	SS	SS
Exposed Zone D non-structural cladding	—	Galv	Galv	SS	SS
Into timber piles within 600mm	—	—	SS	SS	SS

* Including Micronized Copper Azole (MCA)

REFERENCES

1. Acceptable Solution "B2/AS1 - Durability"
2. NZS 3604:2011 "Timber Framed Buildings"
3. NZS 3640:2003 "Chemical Preservation of Round and Sawn Timber"