# Guideline

July 2017

Welcome to this update on technical and informative advice for the building and construction industry on issues relating to building controls and good construction practices.

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## Top plate connections

Tying it all together

To ensure loads are transferred through the framing, NZS 3604:2011 *Timber-framed buildings* has specific fixing requirements where top plates are jointed or intersect with another wall.

For walls not containing bracing top plates, joints can be:

- halved (over support) and nailed with three 75 mm x 3.15 mm nails
- butted over blocking and fixed with two 100 mm x 3.75 mm nails each side of the joint
- joined with a fixing that has a capacity in tension and compression of 3 kN.

For single-storey buildings, the top plates of walls containing bracing shall have end-to-end joints that are:

- for walls containing up to 100 bracing units, a fixing that has a capacity in tension and compression of 3 kN along the plate
- for walls with a bracing capacity of greater than 100 bracing units, a fixing that has a capacity in tension and compression of 6 kN along the plate
- for walls that have an attached ceiling diaphragm, a fixing that has a capacity in tension and compression of 6 kN along the plate.

The required capacity of top plate connections of internal walls that contain one or more bracing elements to an external wall depends on the amount of bracing being provided by the wall. These are the rules:

- For walls containing up to 125 bracing units – one 6 kN fixing connected to at least one external wall.
- For walls containing 126–250 bracing units – 6 kN fixings connected to at least two external walls.
- For walls where the bracing exceeds 250 bracing units – a capacity of 2.4 kN every 100 bracing units connected to at least two external walls. For a wall with 400 bracing units, the required connection capacity would be 9.6 kN at each external wall connection.

Where a required fixing capacity is outside the scope of NZS 3604:2011 or appears to be unachievable, specific engineering design will be required.

For proprietary systems, always follow the installation instructions to ensure the required capacity will be achieved.

## High levels of internal moisture in new houses

Ventilation is a must

Unacceptably high levels of moisture observed as condensation on windows and walls are becoming more common in many new dwellings. There are a number of reasons why this is occurring:

- Installed home ventilation systems and extract systems in bathrooms and kitchens are not being used or windows are not being opened to remove moisture generated by occupants.
- Occupants have moved from an older air leaky house where actively ventilating the house to remove moisture was not needed. As houses have become more airtight, the importance of providing ventilation to remove moisture increases.
- The house has been constructed quickly, and there is still a significant amount of moisture contained in building materials that needs to evaporate.
- A lack of heating – even a well insulated house will typically require some heating (unless passive design principles have been incorporated).
- Clothes being dried inside the building and the use of unvented clothes driers.

The key is ensuring your clients are made aware of the need to ventilate modern houses. Ventilation is no longer something to take for granted.

## Low-level decks

Exploring options

Where timber pile, framed and slat decks are constructed close to the ground, NZS 3604:2011 requires that all ends and cuts to piles that are within 150 mm of the ground be site treated with zinc naphthenate.

Other foundation options that could be considered include using H4 treated bearers and:

- using concrete instead of timber piles
- supporting the bearers off hot-dip galvanised or stainless steel brackets set into concrete footing pads.

Where decks are close to the ground and access is difficult:

- always slope the ground away from the building – standing water under the deck will increase the risk of cupping in the decking timber
- cover the ground with a weed mat to prevent vegetation regrowth.

## Exposure (corrosion) zones

Rust never sleeps

A number of standards are referenced for determining the exposure (corrosion) zone of a particular site. The typical reference is NZS 3604:2011, which classifies exposure zones as follows:

- Zone B (low) – inland areas with little risk of wind-blown sea-spray salt deposits.
- Zone C (medium) – inland coastal areas with medium risk of wind-blown sea-spray salt deposits. This zone covers mainly coastal areas with relatively low salinity. The extent of the area varies significantly with factors such as wind, topography and vegetation.
- Zone D (high) (including E2/AS1 zone E) – coastal areas with high risk of wind-blown sea-spray salt deposits. This is defined as within 500 m of the sea, including harbours, or 100 m from tidal estuaries and sheltered inlets and otherwise shown in NZS 3604:2011 Figure 4.2. The coastal area also includes all offshore islands including Waiheke Island, Great Barrier Island, Stewart Island, the Chatham Islands and the areas shown in white in NZS 3604:2011 Figure 4.2.

Other documents referencing corrosion zones:

- E2/AS1, which follows NZS 3604:2011 except that it includes an additional exposure zone E (C5 of ISO 9223 and E in AS/NZS 2728:2013), defined as "Severe marine classified as breaking surf beach beaches".
- ISO 9223:2012 *Corrosion of metals and alloys – Corrosivity of atmosphere – Classification, determination and estimation*.
- AS/NZS 2312:2014 *Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings*.
- AS/NZS 2728:2013 *Prefinished/prepainted sheet metal products for interior/exterior building applications – Performance requirements, which is applied to the selection and finish of metal roofing*.

ISO 9223:2012 introduced a new corrosivity category CX, which refers to specific marine/industrial environments. In New Zealand, this category is applicable to geothermal environments. This category is included in AS/NZS 2312:2014 but not referenced elsewhere.

A comparison of the different zones is given in *Build* 136 page 43.

BRANZ's online tool BRANZ Maps can be used to identify the overarching NZS 3604:2011 exposure zones for a specific site.