

Bottom plate fixings to slab-on-ground floors – general fixing requirements

There are two separate criteria for the fixing of bottom plates to slab-on-ground floors:

1. For fixing down timber plates as required by NZS 3604 7.5.12.
2. As hold-down fixings for bottom plates for proprietary bracing systems.

Bottom plate fixings to slab-on-ground floors – bottom plates generally

In the first criteria, where proprietary fasteners are used, these must be tested to provide minimum capacity loads. These are:

- Internal walls:
 - a) In the plane of the wall 4 kN.
 - b) Out of the plane of the wall 3 kN.
- External walls:
 - a) Horizontal loads in the plane of the wall 5 kN.
 - b) Horizontal loads out of the plane of the wall 4 kN.
 - c) Vertical loads in axial tension of the fastener 8 kN.

The fasteners must be within 150 mm of each end of the plate and at no more than 900 mm centres. It is still possible to use proprietary fasteners that have been tested and shown to have lower capacities than above by closing up the fastener centres.

Bottom plate fixings to slab-on-ground floors – proprietary bracing systems

In the second situation, the fasteners are for holding down both ends of bracing elements.

The need in these situations is for a much higher vertical characteristic tensile strength, which is specified by the proprietor of the bracing system. Typically this is 15 kN for 150 bracing units per metre. Some fasteners are rated at less than 15 kN, e.g. 11 kN for 120 bracing units per metre. Where fasteners have been additionally tested, they can be used also for the horizontal loads of NZS 3604 as above.

For high-strength proprietary bracing systems where hold-downs are specified, fasteners that are only tested to NZS 3604 7.5.12 cannot be used as bracing system hold-downs.

Proprietary fasteners for either situation must be tested for the particular slab edge detail, i.e. formed concrete or concrete masonry header block.

In NZS 3604 Sea Spray Zone where there are 90 mm wide bottom plates, there is insufficient concrete cover to fasteners unless they are stainless steel. The options in Sea Spray Zone are therefore 140 mm

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timber framing, a formed concrete foundation or stainless steel fasteners.

Bottom plate fixings for internal walls

Proprietary fasteners require a minimum concrete slab thickness. Most fastener suppliers require the hole to be drilled 10 mm deeper than the fastener embedment length. BRANZ recommends an additional 10 mm minimum of concrete below the hole. This means that a fastener with up to 80 mm embedment length can be used in a standard 100 mm slab-on-ground provided there is a DPM under the slab. Where fasteners have a greater embedment length, there must be a slab thickening. Drill depth guide stops must be used when drilling holes in slabs.

Barrier and handrail fixings

While you may not consider it the most aesthetic solution, B1/AS1 gives one design option as a deemed-to-comply solution for the design and fixing requirements for a timber handrail/barrier to a deck. Where a glass, aluminium or other barrier solution is proposed, it will need to be specifically engineered to meet the loadings given in AS/NZS 1170 for barriers. Specific design will be required for the structural connections of the barrier to the deck and adjacent walls. Where the barrier provides protection against falling from a waterproof deck, such fixings must be designed to ensure the

performance requirements of clause E2 *External moisture* will be met (although no details are provided in E2/AS1).

Slip resistance and private dwellings

The health and other costs associated with slips and falls in and around the home are well documented. Many of the walk-on surfaces we specify are slippery even when dry (much worse when wet), and care needs to be exercised in the selection of these finishes to make them as safe as possible.

Under Building Code clause D1, there is a requirement to meet minimum slip resistances for the usual path of travel between the public street and the main entry to the dwelling. There are no other mandatory requirements for slip resistance within and around stand-alone dwellings. BRANZ believes safety is important, and walk-on surfaces in wet areas (bathrooms, laundries), decks and around pools should have sufficient grip so that they are not dangerous to walk on when wet.

Deck piles and jack studs

The design standard for design and construction of support framing (piles and jack studs) to decks is Section 6 of NZS 3604. Timber piles/jack studs supporting a deck must be either 125 mm square or 140 mm diameter round, treated to H5.

The pile/jack stud size requirement applies regardless of the height of the deck off the ground.

ALF 3.2

There are two requirements for minimum levels of insulation in the Building Code – clauses E3 and H1. When using ALF, you must not reduce the insulation value of a wall or roof below that required by E3/AS1 even though the design may allow you to achieve the required BPI of no greater than 1.55.

Horizontal weatherboard fixing centres

NZS 3604 clause 11.5.2.2 specifies that horizontal weatherboards are to be fixed to framing at not more than 600 mm centres. E2/AS1 has no specific fixing centre requirement but does limit framing spacing to 600 mm and specify nail lengths for given head types and minimum framing penetration in Table 24.

Some weatherboard manufacturers specify, in their installation instructions, fixing to all studs.

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