



BRANZ gets quite a few calls about the requirements around fixing top plates that support roof members to wall studs or lintels. Here is a quick guide.

The connections between roof and wall framing require straps in many areas. The framing here is subject to uplift in strong winds and is therefore the most vulnerable part of the structure. Where a roof is supported over an opening such as a window, it is critical that the load is properly transferred around the opening and ultimately down to the ground.

NZS 3604:2011 *Timber-framed buildings* Table 2.2 is a guide for fixing requirements and describes the types and capacity of fixings. Five of the fixing types include galvanised mild-steel strapping.

Lintels

NZS 3604:2011 paragraphs 8.6.1.7 and 8.6.1.8 require that, where a lintel supports a rafter or truss, and depending on wind zone, lintel span and loaded dimension, the lintel must be fixed against uplift according to Table 8.14. This includes using

25 × 1 mm galvanised steel straps meeting the capacity requirements in clause 8.6.1.8 to secure the lintel to the trimming stud and the trimming stud to a floor joist or solid blocking (Figure 8.12). Each strap must be fixed by six 30 × 2.5 mm nails into both the lintel and the trimming stud.

Table 8.18 in the standard sets the requirements for top plates that support roofs:

- 900 mm is the maximum roof member spacing for heavy roofs
- the nailing specified is satisfactory for studs up to 2.7 m long, but for longer studs, BRANZ recommends 3/90 × 3.15 mm end nails, not 2 (see Note 3 of Table 8.19)
- where nailing plus wire dogs is specified, nailing plus straps may be a better option as wire dogs can split jack studs when they are installed. ➤

Tying down is also required at 600 centres between:

- top plate and lintel
- top plate and jack studs
- jack studs and lintel
- trimming studs to top plate.

An alternative 4.7 kN connection (in tension) may also be used when a type B fixing is required.

Trimming studs

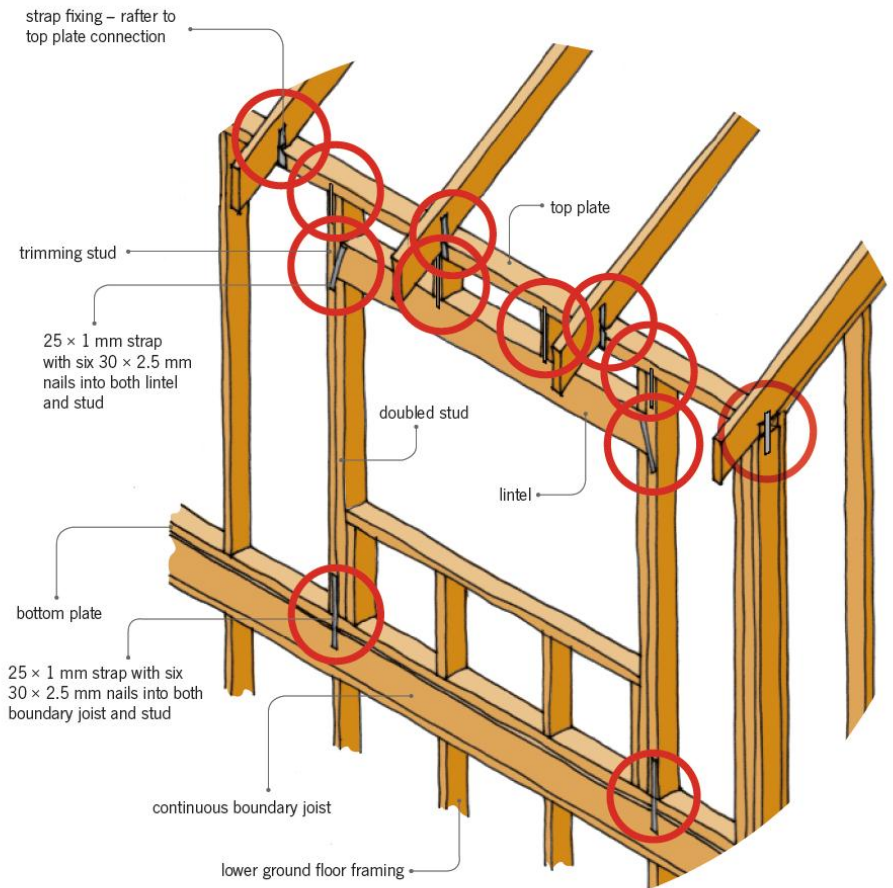
Fixing the trimming stud to the floor joist for timber-framed floors applies to a single-storey building or to upper floor framing to the intermediate floor.

Where ground floor framing is on a concrete floor slab, the strapping is folded under the bottom plate and fixed to each side of the stud using six 30×2.5 mm nails. A proprietary anchor that is tested to and meets the requirements of NZS 3604:2011 7.5.12.3 or cast-in bolt must fix the bottom plate to the slab within 150 mm of the stud.

Other straps

Other locations where strapping of roofs is required are shown in Figure 1 and include:

- rafter to top plate connections
- truss to top plate connections – may be straps and/or wire dogs
- over adjacent rafters supported by a ridge beam and when they support the ceiling lining
- dummy rafters over sarking or ceiling lining and supporting purlins.



Note: Circles indicate strap fixing locations to resist uplift.

Figure 1. Framing locations requiring strap fixing.

Items recently found to be a bit of a problem.



This photo shows lintel / top plate fixings for a property in a high wind zone. Connections are not as per the approved consent drawings, nor do they comply with the requirements for a high wind zone.



This photo depicts the lintel studs for the above photo; no straps have been fitted at the bottom of the lintel studs. NZS3604 requires straps to be fitted to the bottom of all studs if lintel straps are required. The plan also clearly indicated this.

