



Dragon ties revisited



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While the use of dragon ties in New Zealand residential construction has decreased over recent decades, they remain a simple and cost-effective method to provide bracing solutions to larger rooms. However, BRANZ helpline queries suggest there is still some confusion around when they should be used.

DRAGON TIES are described in paragraph 8.3.3 of NZS 3604:2011 *Timber-framed buildings* and are still an Acceptable Solution.

Initially a hip rafter support

Dragon ties first appeared several hundred years ago as a reinforcing system for the exterior corners of walls to support hip rafters. This was in the days when timber framing consisted of heavy timber sections with carpenter type interlocking joints made without nails (see Figure 1).

Years later, New Zealand residential timber construction went down the path of light timber stick framing adapted to suit our New Zealand timber resource with details based on North American building practice.



Figure 1 Traditional dragon tie arrangement in heavy roof construction.

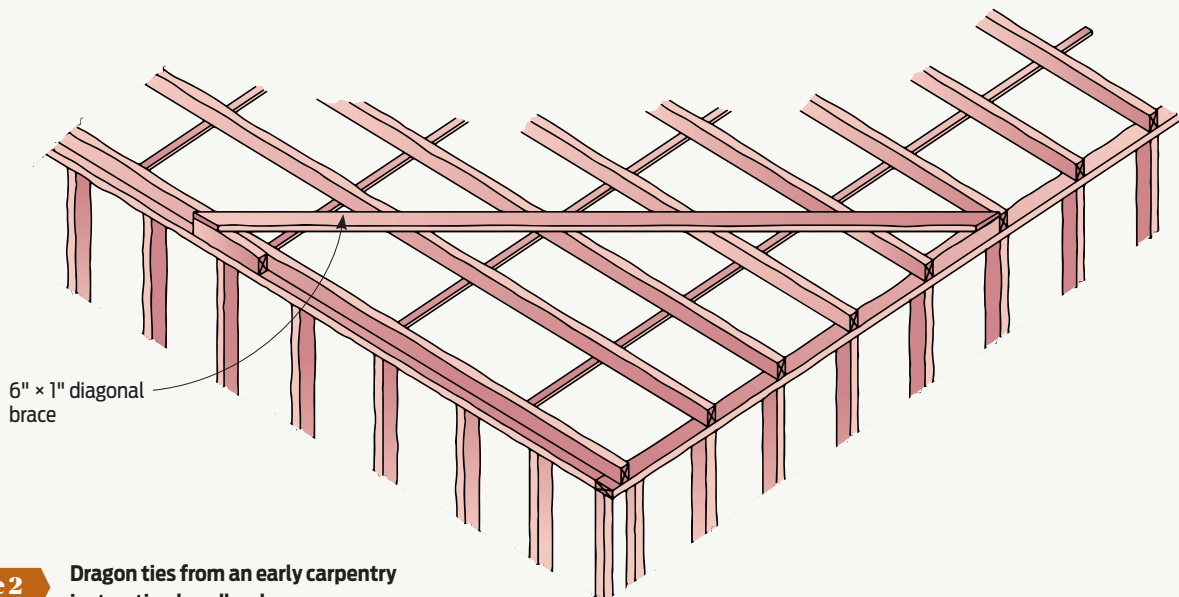


Figure 2 Dragon ties from an early carpentry instruction handbook.

However, as late as the 1950s, a New Zealand building dictionary still described dragon ties as the hip rafter support system seen in Figure 2.

New function to stiffen longer unsupported top plates

The dragon tie's first mention in NZS 3604 was in the early 1980s, although it was in common use before then (often in an unlined garage roof) as a stiffener for wall top plates and installed across an external corner (see Figure 2).

The 1981 version of NZS 3604 utilised a pair of dragon ties installed over the ceiling framing to extend the spacing of bracing lines from 6 m up to 7.5 m before a structural ceiling diaphragm is required. This was a new function for the dragon tie and is quite different to its earlier function as a hip rafter support. The effect of the new provisions is shown in Figure 3.

The increase in brace line spacing can only apply in the direction indicated on Figure 3 because the dragon ties help to stiffen the longer unsupported top plates.

The BRANZ helpline is sometimes asked if the principle applies for both directions. It would be a fairly unlikely plan layout where this would be possible.

With the current almost universal use of plasterboard ceiling linings with paper reinforced joints, the necessity of dragon ties used in this way is rather reduced.

Dragon tie or roof plane brace?

An article in *Build* 169, *Sloped dragon ties*, focused on the role of sloping dragon ties. This rather

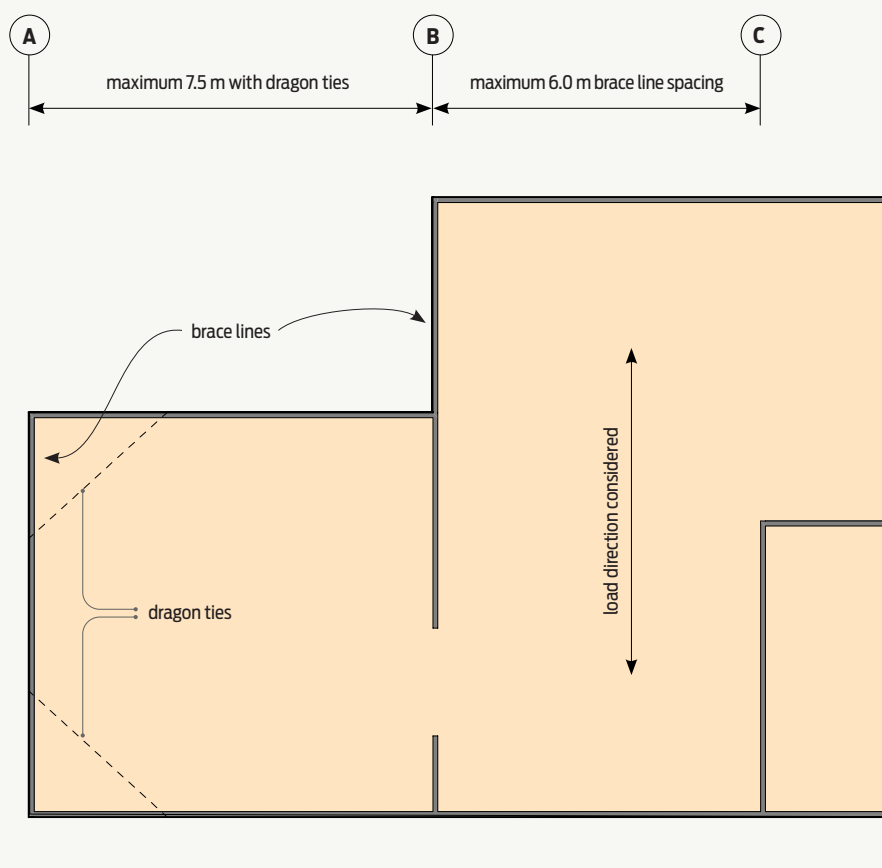


Figure 3 Basic function of dragon ties from NZS 3604.

liberally interpreted the word 'rafters' in Figure 8.1 of NZS 3604:2011, which was intended to provide for low-pitched monoslope roofs rather than gable-shaped roofs.

A bracing member in that roof situation is best considered as a roof plane brace rather than a dragon tie. ◀