



Rafter fixings



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PITCHED ROOFS CONSTRUCTED WITH TIMBER RAFTERS ARE DESCRIBED IN NZS 3604:2011 *TIMBER-FRAMED BUILDINGS* AS EITHER COUPLE-CLOSE OR SKILLION ROOFS. WHAT ARE THE RAFTER FIXING REQUIREMENTS?

FINDING FIXING REQUIREMENTS for rafters in couple-close roof construction is fairly straightforward in NZS 3604:2011 Section 10 Roof framing.

However, finding the requirements for rafter fixings in skillion roofs, or for hip and valley rafters, is a little more circuitous.

Figures 1–5 show the fixing requirements for the various roof framing elements.

From NZS 3604:2011

When considering the fixings required (see Table 1), NZS 3604:2011 uses:

- fixing types E (or 4.7 kN equivalent) and F (or 7 kN equivalent) depending on the span and size of rafters (rafter spans may be increased by 10% where continuous over two or more spans)
- a default wind zone of extra high (EH) – a note within NZS 3604:2011 Table 10.1 indicates that rafter span lengths may be adjusted for other wind zones by multiplying factors of 1.3 for low and medium and 1.1 for high and very high wind zones.

Important connections

Connections that need to be considered are rafter (or jack rafter) to:

- ridge board for a couple-close roof (Figure 1a)
- top plate for a couple-close roof (Figure 1b)
- top plate for a skillion roof (Figures 2 and 3)
- ridge beam for a skillion roof (Figure 4).

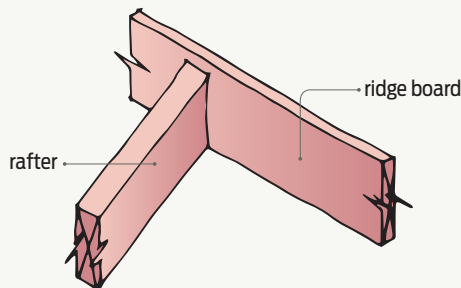
Figure 5 covers the connection of the hip rafter to the top plate where the hip rafters brace the roof. ◀

Table 1

NZS 3604:2011 FIXING TYPES

FIXING TYPE	DESCRIPTION	ALTERNATIVE FIXING CAPACITY
Type E	2/90 × 3.15 mm skew nails + 2 wire dogs	4.7 kN
Type F	2/90 × 3.15 mm skew nails + 2 strap fixings	7.0 kN

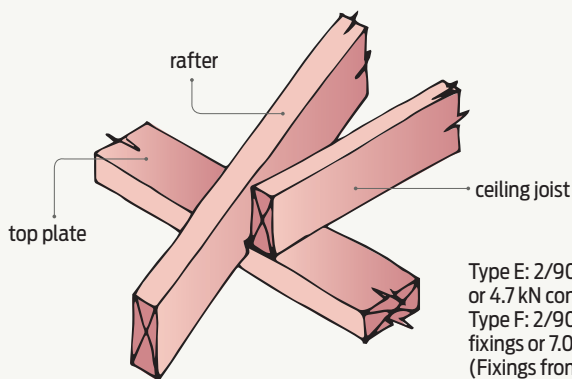
(a) Rafter to ridge board



No connections are given in NZS 3604:2011, use:

- 4/75 × 3.15 mm skew nails or
- 2/100 × 3.75 mm end nails

(b) Rafter to top plate



Type E: 2/90 × 3.15 mm skew nails + 2 wire dogs or 4.7 kN connectors
 Type F: 2/90 × 3.15 mm skew nails + 2 strap fixings or 7.0 kN connectors
 (Fixings from NZS 3604:2011, Table 10.1)

Figure 1 Couple-close roof.

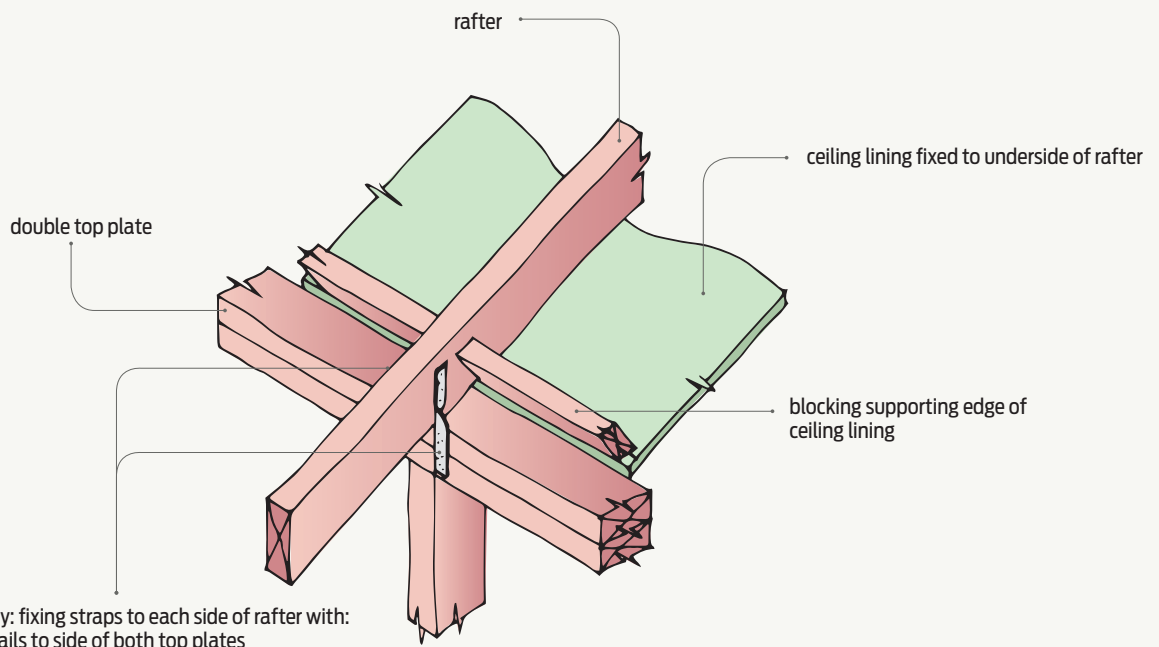


Figure 2 Rafter to double top plate fixing – skillion roof.

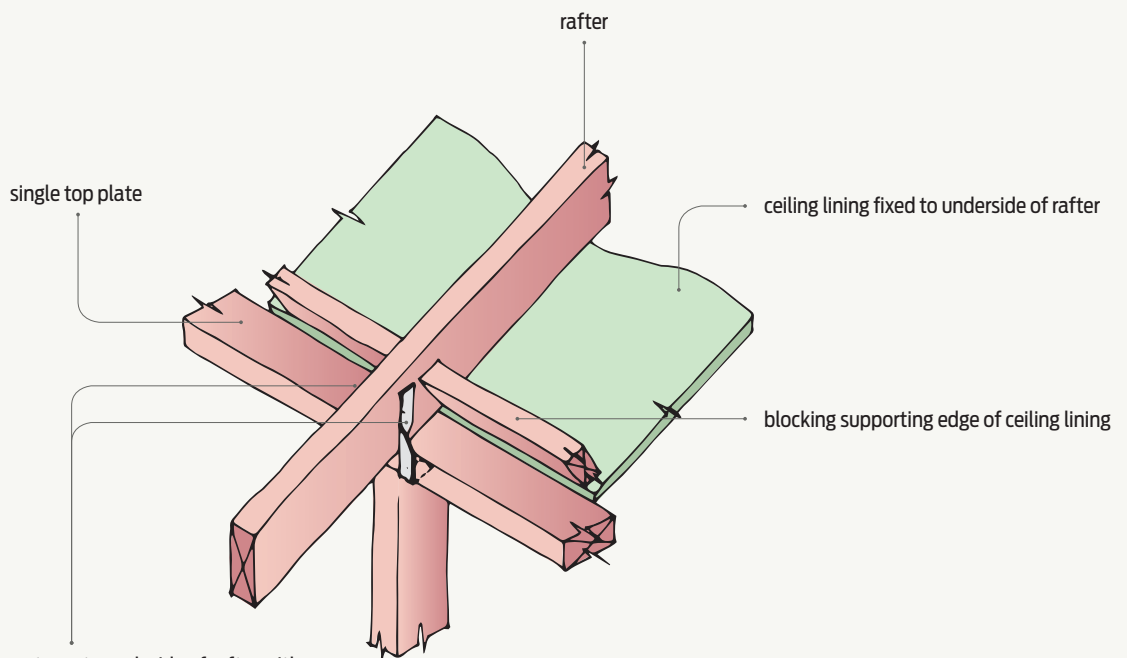


Figure 3 Rafter to single top plate fixing – skillion roof.

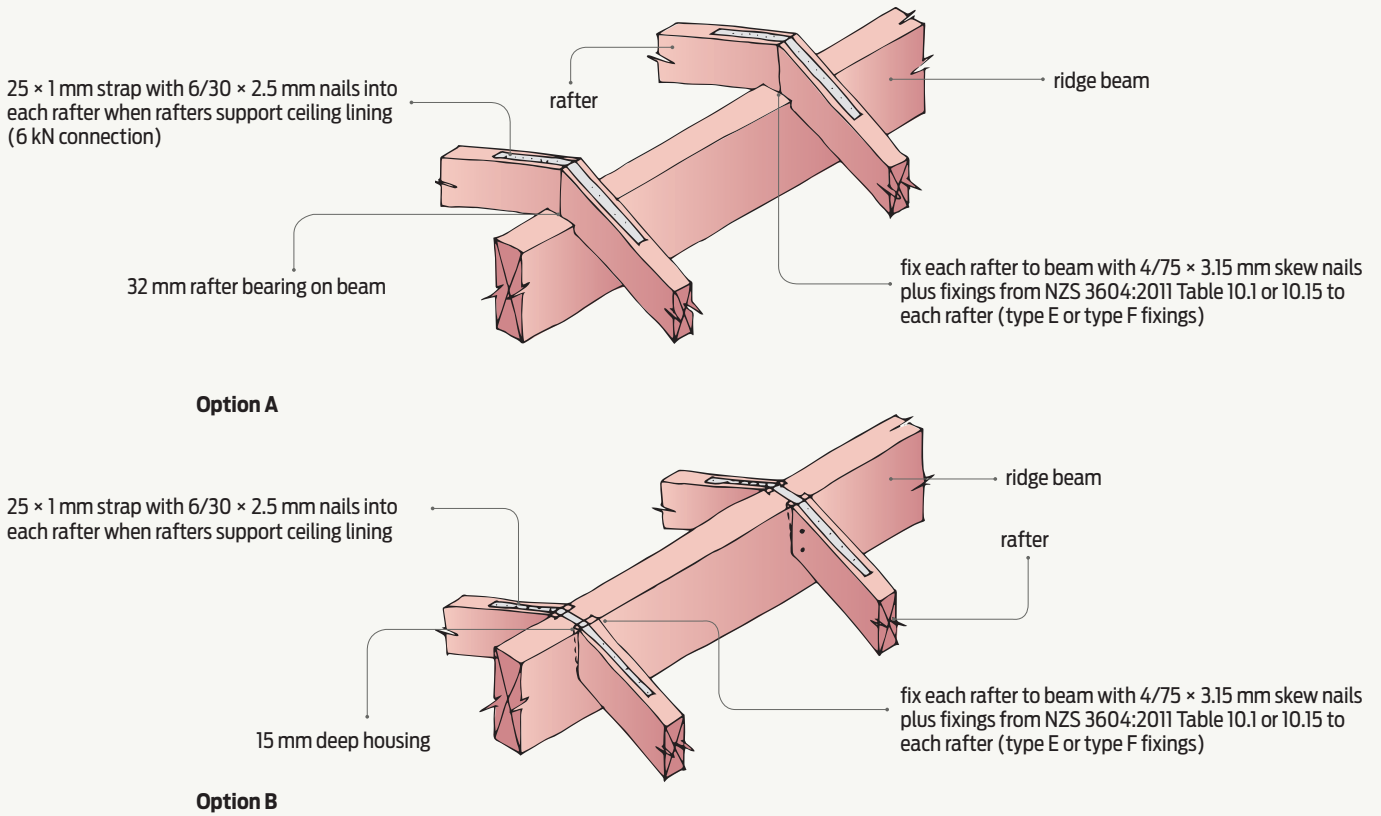


Figure 4 Rafter to ridge beam – skillion roof.

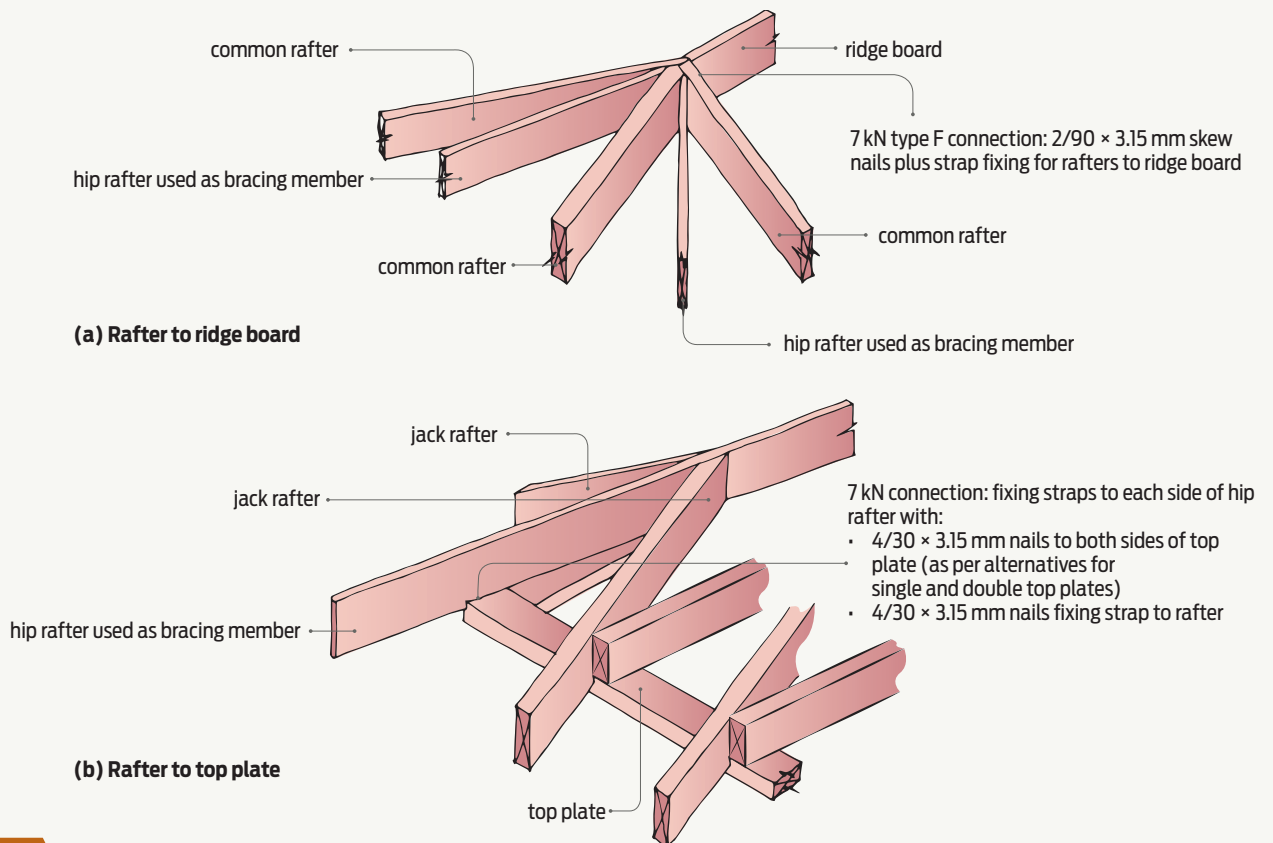


Figure 5 Hip rafter as bracing member.