

**TABLE 2308.7.3.1
RAFTER TIE CONNECTIONS^g**

| RAFTER SLOPE | TIE SPACING (inches) | NO SNOW LOAD | | | | GROUND SNOW LOAD (pound per square foot) | | | | | | | |
|--------------|----------------------|---|----|----|----|--|----|----|----|---------------------------|----|----|----|
| | | | | | | 30 pounds per square foot | | | | 50 pounds per square foot | | | |
| | | Roof span (feet) | | | | | | | | | | | |
| | | 12 | 20 | 28 | 36 | 12 | 20 | 28 | 36 | 12 | 20 | 28 | 36 |
| | | Required number of 16d common (3 ¹ / ₂ " x 0.162") nails ^{a, b} per connection ^{c, d, e, f} | | | | | | | | | | | |
| 3:12 | 12 | 4 | 6 | 8 | 10 | 4 | 6 | 8 | 11 | 5 | 8 | 12 | 15 |
| | 16 | 5 | 7 | 10 | 13 | 5 | 8 | 11 | 14 | 6 | 11 | 15 | 20 |
| | 24 | 7 | 11 | 15 | 19 | 7 | 11 | 16 | 21 | 9 | 16 | 23 | 30 |
| | 32 | 10 | 14 | 19 | 25 | 10 | 16 | 22 | 28 | 12 | 27 | 30 | 40 |
| | 48 | 14 | 21 | 29 | 37 | 14 | 32 | 36 | 42 | 18 | 32 | 46 | 60 |
| 4:12 | 12 | 3 | 4 | 5 | 6 | 3 | 5 | 6 | 8 | 4 | 6 | 9 | 11 |
| | 16 | 3 | 5 | 7 | 8 | 4 | 6 | 8 | 11 | 5 | 8 | 12 | 15 |
| | 24 | 4 | 7 | 10 | 12 | 5 | 9 | 12 | 16 | 7 | 12 | 17 | 22 |
| | 32 | 6 | 9 | 13 | 16 | 8 | 12 | 16 | 22 | 10 | 16 | 24 | 30 |
| | 48 | 8 | 14 | 19 | 24 | 10 | 18 | 24 | 32 | 14 | 24 | 34 | 44 |
| 5:12 | 12 | 3 | 3 | 4 | 5 | 3 | 4 | 5 | 7 | 3 | 5 | 7 | 9 |
| | 16 | 3 | 4 | 5 | 7 | 3 | 5 | 7 | 9 | 4 | 7 | 9 | 12 |
| | 24 | 4 | 6 | 8 | 10 | 4 | 7 | 10 | 13 | 6 | 10 | 14 | 18 |
| | 32 | 5 | 8 | 10 | 13 | 6 | 10 | 14 | 18 | 8 | 14 | 18 | 24 |
| | 48 | 7 | 11 | 15 | 20 | 8 | 14 | 20 | 26 | 12 | 20 | 28 | 36 |
| 7:12 | 12 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 5 | 3 | 4 | 5 | 7 |
| | 16 | 3 | 3 | 4 | 5 | 3 | 4 | 5 | 6 | 3 | 5 | 7 | 9 |
| | 24 | 3 | 4 | 6 | 7 | 3 | 5 | 7 | 9 | 4 | 7 | 10 | 13 |
| | 32 | 4 | 6 | 8 | 10 | 4 | 8 | 10 | 12 | 6 | 10 | 14 | 18 |
| | 48 | 5 | 8 | 11 | 14 | 6 | 10 | 14 | 18 | 9 | 14 | 20 | 26 |
| 9:12 | 12 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 5 |
| | 16 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 5 | 3 | 4 | 5 | 7 |
| | 24 | 3 | 3 | 5 | 6 | 3 | 4 | 6 | 7 | 3 | 6 | 8 | 10 |
| | 32 | 3 | 4 | 6 | 8 | 4 | 6 | 8 | 10 | 5 | 8 | 10 | 14 |
| | 48 | 4 | 6 | 9 | 11 | 5 | 8 | 12 | 14 | 7 | 12 | 16 | 20 |
| 12:12 | 12 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 |
| | 16 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 5 |
| | 24 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 6 | 3 | 4 | 6 | 8 |
| | 32 | 3 | 3 | 4 | 5 | 3 | 5 | 6 | 8 | 4 | 6 | 8 | 10 |
| | 48 | 3 | 4 | 6 | 7 | 4 | 7 | 8 | 12 | 6 | 8 | 12 | 16 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 47.8 N/m².

a. 40d box (5" x 0.162") or 16d sinker (3¹/₄" x 0.148") nails are permitted to be substituted for 16d common (3¹/₂" x 0.16") nails.

b. Nailing requirements are permitted to be reduced 25 percent if nails are clinched.

c. Rafter tie heel joint connections are not required where the ridge is supported by a load-bearing wall, header or ridge beam.

d. Where intermediate support of the rafter is provided by vertical struts or purlins to a load-bearing wall, the tabulated heel joint connection requirements are permitted to be reduced proportionally to the reduction in span.

e. Equivalent nailing patterns are required for ceiling joist to ceiling joist lap splices.

f. Connected members shall be of sufficient size to prevent splitting due to nailing.

g. For snow loads less than 30 pounds per square foot, the required number of nails is permitted to be reduced by multiplying by the ratio of actual snow load plus 10 divided by 40, but not less than the number required for no snow load.