



Community Development Department BUILDING & SAFETY DIVISION

100 Civic Plaza, Dublin, CA 94568 • Ph: (925) 833-6620 • www.dublin.ca.gov

CLICK ANYWHERE ON THIS PAGE TO RETURN TO WOOD FRAME TOE NAILING INFORMATION at InspectApedia.com

RESIDENTIAL NAILING SCHEDULE

TABLE R602.3(1) FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER ^{a, b, c}	SPACING OF FASTENERS
Roof			
1	Blocking between joists or rafters to top plate, toe nail	4-8d box (2 ½ x 0.113")or 3-8d (2½" × 0.113"); or 3-10d box (3"x0.128");or 3-3"x0.131" nails	Toe nail
2	Ceiling joists to plate, toe nail	4-8d box (2 ½ x 0.113")or 3-8d (2½" × 0.113"); or 3-10d box (3"x0.128");or 3-3"x0.131" nails	Per joist, toe nail
3	Ceiling joists not attached to parallel rafter, laps over partitions, face (see Sections R802.3.2, R802.3.2 and Table R802.5.1(9))	4-10d box (3"x0.128");or 3-16d common (3 ½" x 0.162");or 4-3"x0.131" nails	Face nail
4	Ceiling joist attached to parallel rafter (heel joint) (see Sections R802.3.1 and R802.3.2 and Table R802.5.1(9))	Table R802.5.1(9)	Face nail
5	Collar tie to rafter, face nail or 1¼" × 20 gage ridge strap to rafter	4-10d box (3"x0.128"); or 3-10d common (3" × 0.148"); or 4-3"x0.131 nails	Face nail each rafter
6	Rafter or roof truss to plate	3-16d box nails (3½" × 0.135") or 3-10d common nails (3" × 0.148"); or 4-10d box (3"x0.128"); or 4-3"x0.131" nails	2 toe nails on one side and 1 toe nail on opposite side of each rafter or truss ⁱ
7	Roof rafters to ridge, valley or hip rafters or roof rafter to minimum 2" ridge beam	4-16d (3½" × 0.135"); or 3-10d common (3" × 0.148"); or 4-10d box (3"x0.128"); or 4-3" x 0.131 nails	Toe nail
		3-16d box (3½" × 0.135"); or 3-16d common (3½" × 0.148"); or 3-10d box (3"x0.128"); or 3-3" x 0.131 nails	End nails
Wall			
8	Stud to stud (not at braced wall panels)l	16d common (3 ½" × 0.162")	24" o. c. face nail
		10d box (3" x 0.128"); or 3"x 0.131" nails	16" o. c. face nail
9	Stud to stud and abutting studs at intersecting wall corners (at braced wall panels)	16d box (3½" × 0.135"); or 3" x 0.131" nails	12" o.c.
		16d common (3 ½" x 0.162")	16" o.c. face nail
10	Built-up header (2" to 2" header with ½" spacer	16d common (3½" × 0.162")	16" o.c. each edge face nail
		16d box (3 ½" x 0.135")	12" o.c. each edge face nail
11	Continuous header to stud	5-8d box (2½" × 0.113"); or 4-8d common (2 ½"x 0.131"); or 4-10d box (3" x 0.128")	Toe nail
12	Top plate to top plate	16d common (3 ½" x 0.162")	16" o.c. face nail
		10d box (3" × 0.128"); or 3" x 0.131" nails	12" o.c. face nail
13	Double top plate splice	8-16d common (3½" × 0.162"); or 12-16d box (3 ½" x 0.135"); or 12-10d box (3" x 0.128"); or 12-3" x 0.131 nails	Face nail on each side of end joist (minimum 24" lap splice length each side of end joint)
14	Bottom plate to joist, rim joist, band joist or blocking (not at braced wall panels)	16d common (3 ½" x 0.162")	16" o.c. face nail
		16d box (3 ½" x 0.135"); or 3" x 0.131" nails	12 " o.c. face nail

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER ^{a, b, c}	SPACING OF FASTENERS
15	Bottom plate to joist, rim joist, band joist or blocking (at braced wall panels)	3-16d box (3½" × 0.135"); or 2-16d common (3½" × 0.162"); or 4-3" x 0.131 nails	3 each 16" o.c. face nail 2 each 16" o.c. face nail 4 each 16" o.c. face nail
16	Top or bottom plate to stud	4-8d box (2 ½" x 0.113"); or 3-16d box (3½" × 0.135"); or 4-8d common (2½" × 0.131"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131 nails	Toe nail
		3-16d box (3 ½" x 0.135"); or 2-16d common (3 ½" x 0.162"); or 3-10d box (3"x 0.128"); or 3-3" x 0.131 nails	End nail
17	Top plates, laps at corners and intersections	3-10d box (3" x 0.128"); or 2 -16d common (3 ½" x 0.162"); or 3-3" x 0.131 nails	Face nail
18	1" brace to each stud and plate	3-8d box (2½" × 0.113"); or 2-8d common (2 ½"x 0.131"); or 2010d box (3" x 0.128"); or 2 staples 1 ¾" ×	Face nail
19	1" × 6" sheathing to each bearing	3-8d box (2½" × 0.113"); or 2-8d common (2 ½" x 0.131"); or 2-10d box (3" x 0.128"); or 2 staples, 1" crown, 16 ga., 1 ¾" long	Face nail
20	1" × 8" and wider sheathing to each bearing	3-8d box (2½" × 0.113"); or 3-8d common (2 ½" x 0.131"); or 3-10d box (3" x 0.128"); or 3 staples 1" crown, 16 ga., 1 ¾" long	Face nail
		Wider than 1" x 8" 4-8d box (2 ½" x 0.113"); or 3-8d common (2 ½" x 0.131"); or 3-10d common (3" x 0.128"); or 4 staples, 1" crown, 16 ga., 1¾" long	
Floor			
21	Joist to sill, top plate or girder	4-8d box (2½" × 0.113"); or 3-8d common (2 ½" x 0.131"); or 3-10d box (3" x 0.128"); or 3-3" x 0131" nails	Toe nail
22	Rim joist, band joist or blocking to sill or top plate (roof application also)	8d box (2½" × 0.113")	4" o.c. toe nail
		8d common (2 ½" x 0.131"); or 10d box (3" x 0.128"); or 3" x 0.131" nails	6" o.c. toe nail
23	1" × 6" subfloor or less to each joist	3-8d box (2½" × 0.113"); or 2-8d common (2 ½" x 0.131"); or 3-10d box (3" x 0.128"); or 2 staples, 1" crown, 16 ga., 1 ¾" long	Face nail
24	2" subfloor to joist or girder	3-16d box (3 ½" x 0.135") 2-16d common (3 ½" x 0.162")	Blind or face nail
25	2" planks (plank & beam - floor & roof)	3-16d box (3½" × 0.135"); or 2-16d common (3 ½" x 0.162")	At each bearing
26	Band or rim joist to joist	3-16d common (3 ½" x 0.162") 4-10 box (3" x 0.128"), or 4-3" x 0.131" nails, or 4-3" x 14 ga. staples, 7/16" crown	End nail
27	Built-up girders and beams, 2-inch lumber layers	20d common (4" x 0.192"); or	Nail each layer as follows: 32" o.c. at top and bottom and staggered.
		10d box (3" x 0.128"); or 3" x 0.131" nails	24" o.c. face nail at top and bottom staggered on opposite sides.
		And: 2-20d common (4" x 0.192⊕); or 3-10d box(3 ½" x 0.128"); or 3-3" x 0.131" nails	Face nail at ends and at each splice
28	Ledger strip supporting joists or rafters	4-16d box (3 ½" x 0.135"); or 3-16d common (3½" × 0.162"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131 nails	At each joist or rafter, face nail
29	Bridging to joist	2-10d (3" x 0.128"), or 2-8d common (2 ½" x 0.131"; or 2- 3" x 0.131") nails	Each end, toe nail
ITEM	DESCRIPTION OF BUILDING	DESCRIPTION OF FASTENER ^{b, c, e}	SPACING OF FASTENERS

	MATERIALS		Edges (inches) ⁱ	Intermediate supports ^{c, e} (inches)
Wood structural panels, subfloor, roof and interior wall sheathing to framing and particleboard wall sheathing to framing (see Table R602.3(3) for wood structural panel exterior wall sheathing to wall framing)				
30	$\frac{3}{8}$ " - $\frac{1}{2}$ "	6d common (2" x 0.113") nail (subfloor wall) ^j 8d common (2½" x 0.131") nail (roof) ^j or RSRS-01 (2⅝" x 0.113" nail (roof) ^j	6	12 ^f
31	$\frac{19}{32}$ " - 1"	8d common nail (2½" x 0.131"); or RSRS-01; (2⅝" x 0.113") nail (roof) ^j	6	12 ^f
32	1⅛" - 1¼"	10d common (3" x 0.148") nail or 8d (2½" x 0.131") deformed nail	6	12
Other wall sheathing^h				
33	½" structural cellulosic fiberboard sheathing	1½" galvanized roofing nail, ⅞" head diameter or 1¼" long 16 ga. Staple with 7/16" or 1" crown	3	6
34	$\frac{25}{32}$ " structural cellulosic fiberboard sheathing	1¾" galvanized roofing nail, ⅞" head diameter or 1½" long 16 ga. Staple with 7/16" or 1" crown	3	6
35	½" gypsum sheathing ^d	1½" galvanized roofing nail; staple galvanized, 1½" long; 1¼ screws, Type W or S	7	7
36	⅝" gypsum sheathing ^d	1¾" galvanized roofing nail; staple galvanized, 1⅝" long; 1 5/8" screws, Type W or S	7	7
Wood structural panels, combination subfloor underlayment to framing				
37	$\frac{3}{4}$ " and less	6d deformed (2" x 0.120") nail or 8d common (2½" x 0.131") nail	6	12
38	$\frac{7}{8}$ " - 1"	8d common (2½" x 0.131") nail or 8d deformed (2½" x 0.120") nail	6	12
39	1⅛" - 1¼"	10d common (3" x 0.148") nail or 8d deformed (2½" x 0.120") nail	6	12

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1 Ksi = 6.895 MPa.

a. Nails are smooth-common, box or deformed shanks except where otherwise stated. Nails used for framing and sheathing connections shall have minimum average bending yield strengths as shown: 80 ksi for shank diameter of 0.192 inch (20d common nail), 90 ksi for shank diameters larger than 0.142 inch but not larger than 0.177 inch, and 100 ksi for shank diameters of 0.142 inch or less.

b. Staples are 16 gage wire and have a minimum ⅞-inch on diameter crown width.

c. Nails shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater.

d. Four-foot by 8-foot or 4-foot by 9-foot panels shall be applied vertically.

e. Spacing of fasteners not included in this table shall be based on Table R602.3(2).

f. Where the ultimate design wind speed is 130 mph or less, nails for wood structural panel roof sheathing to gable end wall framing shall be space 6 inches on center. Where the ultimate wind speed is greater than 130 mph, nails for attaching panel roof sheathing to intermediate supports shall be spaced 6 inches on center for minimum 48-inch distance from ridges, eaves and gable end walls; and 4 inches on center to gable end wall framing.

g. Gypsum sheathing shall conform to ASTM C 1396 and shall be installed in accordance with GA 253. Fiberboard sheathing shall conform to ASTM C 208.

h. Spacing of fasteners on floor sheathing panel edges applies to panel edge supported by framing members and required blocking and at floor perimeters only. Spacing of fasteners on roof sheathing panel edges applies to panel edges supported by framing members and required blocking. Blocking of roof and floor sheathing panel edges perpendicular to the framing members need not be provided except as required by other provisions of this code. Floor perimeter shall be supported by framing members or solid blocking.

j. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule, provide two toe nails on one side of the rafter and toe nails from the ceiling joist to top plate in accordance with this schedule. The toe nail on the opposite side of the rafter shall not be required.

j. RSRS-01 is a Roof Sheathing Ring Shank nail meeting the specifications in ASTM F1667.

- ❖ **The fastener schedule provides minimum nailing requirements (i.e. size, spacing) for connecting building elements used in wood framed construction. For wood structural panels, both edge nailing and intermediate (field) nailing are specified. In addition to the nailing for wood structural panels, fasteners are specified for gypsum wall sheathing, cellulosic fiberboard wall sheathing and combination subfloor underlayment.**