

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

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER ^{a,b,c}	SPACING OF FASTENERS
Joist to sill or girder, toe nail	3-8d (2-1/2" x 0.113")	—
1" x 6" subfloor or less to each joist, face nail	2-8d (2-1/2" x 0.113") 2 staples, 1-3/4"	— —
2" subfloor to joist or girder, blind and face nail	2-16d (3-1/2" x 0.135")	—
Sole plate to joist or blocking, face nail	16d (3-1/2" x 0.135")	16" o.c.
Top or sole plate to stud, end nail	2-16d (3-1/2" x 0.135")	—
Stud to sole plate, toe nail	3-8d (2-1/2" x 0.113") or 2-16d (3-1/2" x 0.135")	—
Double studs, face nail	10d (3" x 0.128")	24" o.c.
Double top plates, face nail	10d (3" x 0.128")	24" o.c.
Sole plate to joist or blocking at braced wall panels	3-16d (3-1/2" x 0.135")	16" o.c.
Double top plates, minimum 24-inch offset of end joints, face nail in lapped area	8-16d (3-1/2" x 0.135")	—
Blocking between joists or rafters to top plate, toe nail	3-8d (2-1/2" x 0.113")	—
Rim joist to top plate, toe nail	8d (2-1/2" x 0.113")	6" o.c.
Top plates, laps at corners and intersections, face nail	2-10d (3" x 0.128")	—
Built-up header, two pieces with 1/2" spacer	16d (3-1/2" x 0.135")	16" o.c. along each edge
Continued header, two pieces	16d (3-1/2" x 0.135")	16" o.c. along each edge
Ceiling joists to plate, toe nail	3-8d (2-1/2" x 0.113")	—
Continuous header to stud, toe nail	4-8d (2-1/2" x 0.113")	—
Ceiling joist, laps over partitions, face nail	3-10d (3" x 0.128")	—
Ceiling joist to parallel rafters, face nail	3-10d (3" x 0.128")	—
Rafter to plate, toe nail	2-16d (3-1/2" x 0.135")	—
1" brace to each stud and plate, face nail	2-8d (2-1/2" x 0.113") 2 staples, 1-3/4"	— —
1" x 6" sheathing to each bearing, face nail	2-8d (2-1/2" x 0.113") 2 staples, 1-3/4"	— —
1" x 8" sheathing to each bearing, face nail	2-8d (2-1/2" x 0.113") 3 staples, 1-3/4"	— —
Wider than 1" x 8" sheathing to each bearing, face nail	3-8d (2-1/2" x 0.113") 4 staples, 1-3/4"	— —
Built-up corner studs	10d (3" x 0.128")	24" o.c.
Built-up girders and beams, 2-inch lumber layers	10d (3" x 0.128")	Nail each layer as follows: 32" o.c. at top and bottom and staggered. Two nails at ends and at each splice.
2" planks	2-16d (3-1/2" x 0.135")	At each bearing
Roof rafters to ridge, valley or hip rafters: toe nail	4-16d (3-1/2" x 0.135")	—
face nail	3-16d (3-1/2" x 0.135")	—
Rafter ties to rafters, face nail	3-8d (2-1/2" x 0.113")	—
Collar tie to rafter, face nail, or 1-1/4" x 20 gage ridge strap	3-10d (3" x 0.128")	—

(continued)

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

DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER ^{b, c, e}	SPACING OF FASTENERS	
		Edges (inches) ⁱ	Intermediate supports ^{c, e} (Inches)
Wood structural panels, subfloor, roof and wall sheathing to framing, and particleboard wall sheathing to framing			
$\frac{3}{16}$ "- $\frac{1}{2}$ "	6d common (2" x 0.113") nail (subfloor, wall) 8d common ($2\frac{1}{2}$ " x 0.131") nail (roof) ^f	6	12 ^g
$\frac{19}{32}$ "-1"	8d common nail ($2\frac{1}{2}$ " x 0.131")	6	12 ^g
$1\frac{1}{8}$ "- $1\frac{1}{4}$ "	10d common (3" x 0.148") nail or 8d ($2\frac{1}{2}$ " x 0.131") deformed nail	6	12
Other wall sheathing^h			
$\frac{1}{2}$ " structural cellulosic fiberboard sheathing	$1\frac{1}{2}$ " galvanized roofing nail 8d common ($2\frac{1}{2}$ " x 0.131") nail; staple 16 ga., $1\frac{1}{2}$ " long	3	6
$\frac{25}{32}$ " structural cellulosic fiberboard sheathing	$1\frac{3}{4}$ " galvanized roofing nail 8d common ($2\frac{1}{2}$ " x 0.131") nail; staple 16 ga., $1\frac{3}{4}$ " long	3	6
$\frac{1}{2}$ " gypsum sheathing ^d	$1\frac{1}{2}$ " galvanized roofing nail; 6d common (2" x 0.131") nail; staple galvanized $1\frac{1}{2}$ " long; $1\frac{1}{4}$ " screws, Type W or S	4	8
$\frac{5}{8}$ " gypsum sheathing ^d	$1\frac{3}{4}$ " galvanized roofing nail; 8d common ($2\frac{1}{2}$ " x 0.131") nail; staple galvanized $1\frac{5}{8}$ " long; $1\frac{5}{8}$ " screws, Type W or S	4	8
Wood structural panels, combination subfloor underlayment to framing			
$\frac{3}{4}$ " and less	6d deformed (2" x 0.120") nail or 8d common ($2\frac{1}{2}$ " x 0.131") nail	6	12
$\frac{7}{8}$ "-1"	8d common ($2\frac{1}{2}$ " x 0.131") nail or 8d deformed ($2\frac{1}{2}$ " x 0.120") nail	6	12
$1\frac{1}{8}$ "- $1\frac{1}{4}$ "	10d common (3" x 0.148") nail or 8d deformed ($2\frac{1}{2}$ " 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. All 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 $\frac{7}{16}$ -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. For regions having basic wind speed of 110 mph or greater, 8d deformed ($2\frac{1}{2}$ " x 0.120) nails shall be used for attaching plywood and wood structural panel roof sheathing to framing within minimum 48-inch distance from gable end walls, if mean roof height is more than 25 feet, up to 35 feet maximum.
- g. For regions having basic wind speed of 100 mph or less, nails for attaching wood structural panel roof sheathing to gable end wall framing shall be spaced 6 inches on center. When basic wind speed is greater than 100 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.
- h. Gypsum sheathing shall conform to ASTM C 79 and shall be installed in accordance with GA 253. Fiberboard sheathing shall conform to ASTM C 208.
- i. Spacing of fasteners on floor sheathing panel edges applies to panel edges supported by framing members and required blocking and at all 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 or 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.

TABLE
R602.3.1.1

TABLE R602.3(2)
ALTERNATE ATTACHMENTS

NOMINAL MATERIAL THICKNESS (inches)	DESCRIPTION ^{a,b} OF FASTENER AND LENGTH (inches)	SPACING ^c OF FASTENERS	
		Edges (inches)	Intermediate supports (inches)
Wood structural panels subfloor, roof and wall sheathing to framing and particleboard wall sheathing to framing^f			
up to 1/2	Staple 15 ga. 1 3/4	4	8
	0.097 - 0.099 Nail 2 1/4	3	6
	Staple 16 ga. 1 3/4	3	6
19/32 and 5/8	0.113 Nail 2	3	6
	Staple 15 and 16 ga. 2	4	8
	0.097 - 0.099 Nail 2 1/4	4	8
23/32 and 3/4	Staple 14 ga. 2	4	8
	Staple 15 ga. 1 3/4	3	6
	0.097 - 0.099 Nail 2 1/4	4	8
	Staple 16 ga. 2	4	8
1	Staple 14 ga. 2 1/4	4	8
	0.113 Nail 2 1/4	3	6
	Staple 15 ga. 2 1/4	4	8
	0.097 - 0.099 Nail 2 1/2	4	8
NOMINAL MATERIAL THICKNESS (inches)	DESCRIPTION ^{a,b} OF FASTENER AND LENGTH (inches)	SPACING ^c OF FASTENERS	
		Edges (inches)	Body of panel ^d (inches)
Floor underlayment; plywood-hardboard-particleboard^f			
Plywood			
1/4 and 5/16	1 1/4 ring or screw shank nail—minimum 12 1/2 ga. (0.099") shank diameter	3	6
	Staple 18 ga., 7/8, 3/16 crown width	2	5
11/32, 3/8, 15/32, 1/2 and 19/32	1 1/4 ring or screw shank nail—minimum 12 1/2 ga. (0.099") shank diameter	6	8 ^e
5/8, 23/32 and 3/4	1 1/2 ring or screw shank nail—minimum 12 1/2 ga. (0.099") shank diameter	6	8
	Staple 16 ga. 1 1/2	6	8
Hardboard^f			
0.200	1 1/2 long ring-grooved underlayment nail	6	6
	4d cement-coated sinker nail	6	6
	Staple 18 ga., 7/8 long (plastic coated)	3	6
Particleboard			
1/4	4d ring-grooved underlayment nail	3	6
	Staple 18 ga., 7/8 long, 3/16 crown	3	6
3/8	6d ring-grooved underlayment nail	6	10
	Staple 16 ga., 1 1/8 long, 3/8 crown	3	6
1/2, 5/8	6d ring-grooved underlayment nail	6	10
	Staple 16 ga., 1 5/8 long, 3/8 crown	3	6

For SI: 1 inch = 25.4 mm.

a. Nail is a general description and may be T-head, modified round head or round head.

b. Staples shall have a minimum crown width of 7/16-inch on diameter except as noted.

c. Nails or staples shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater. Nails or staples shall be spaced at not more than 12 inches on center at intermediate supports for floors.

d. Fasteners shall be placed in a grid pattern throughout the body of the panel.

e. For 5-ply panels, intermediate nails shall be spaced not more than 12 inches on center each way.

f. Hardboard underlayment shall conform to ANSI/AHA A135.4.

SCHED FASTENER
 CONST JAW
 FRMG FLR
 STEEL
 2S2L
 FLR
 SPAN2
 FLO

TABLE R602.3(3)
WOOD STRUCTURAL PANEL WALL SHEATHING

PANEL SPAN RATING	PANEL NOMINAL THICKNESS (inch)	MAXIMUM STUD SPACING (inches)	
		Siding nailed to: ^a	
		Stud	Sheathing
12/0, 16/0, 20/0, or wall—16 o.c.	$\frac{5}{16}$, $\frac{3}{8}$	16	16 ^b
24/0, 24/16, 32/16 or wall—24 o.c.	$\frac{3}{8}$, $\frac{7}{16}$, $\frac{15}{32}$, $\frac{1}{2}$	24	24 ^c

For SI: 1 inch = 25.4 mm.

- a. Blocking of horizontal joints shall not be required.
- b. Plywood sheathing $\frac{3}{8}$ -inch thick or less shall be applied with long dimension across studs.
- c. Three-ply plywood panels shall be applied with long dimension across studs.

TABLE R602.3(4)
ALLOWABLE SPANS FOR PARTICLEBOARD WALL SHEATHING^a

THICKNESS (inch)	GRADE	STUD SPACING (inches)	
		When siding is nailed to studs	When siding is nailed to sheathing
$\frac{3}{8}$	M-1 Exterior glue	16	—
$\frac{1}{2}$	M-2 Exterior glue	16	16

For SI: 1 inch = 25.4 mm.

- a. Wall sheathing not exposed to the weather. If the panels are applied horizontally, the end joints of the panel shall be offset so that four panels corners will not meet. All panel edges must be supported. Leave a $\frac{1}{16}$ -inch gap between panels and nail no closer than $\frac{3}{8}$ inch from panel edges.

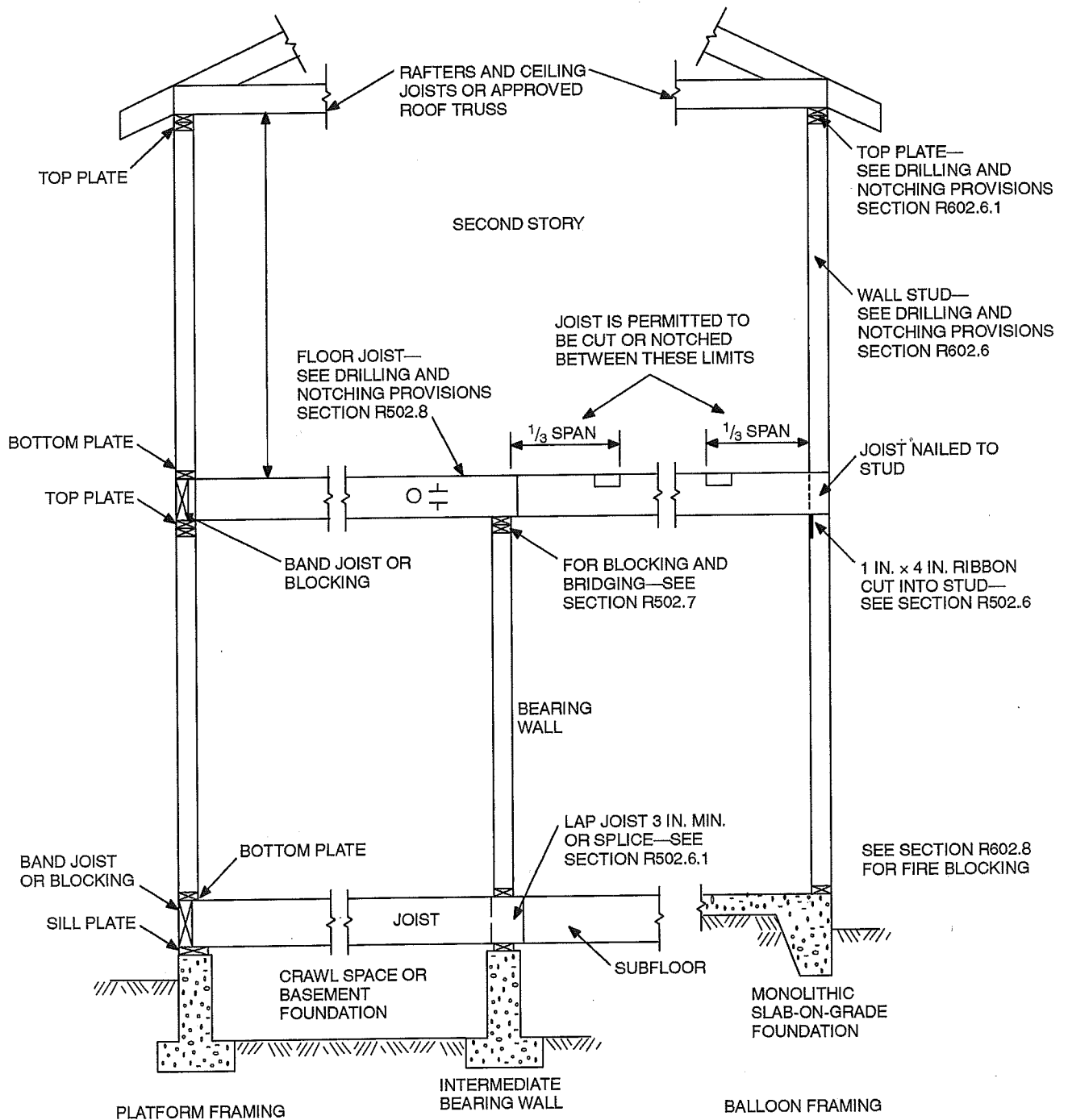
TABLE R602.3(5)
SIZE, HEIGHT AND SPACING OF WOOD STUDS^a

STUD SIZE (inches)	BEARING WALLS				NONBEARING WALLS		
	Laterally unsupported stud height ^a (feet)	Maximum spacing when supporting roof and ceiling only (inches)	Maximum spacing when supporting one floor, roof and ceiling (inches)	Maximum spacing when supporting two floors, roof and ceiling (inches)	Maximum spacing when supporting one floor only (inches)	Laterally unsupported stud height ^a (feet)	Maximum spacing (inches)
2 × 3 ^b	—	—	—	—	—	10	16
2 × 4	10	24	16	—	24	14	24
3 × 4	10	24	24	16	24	14	24
2 × 5	10	24	24	—	24	16	24
2 × 6	10	24	24	16	24	20	24

For SI: 1 inch = 25.4 mm.

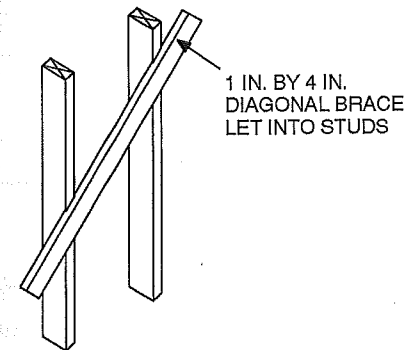
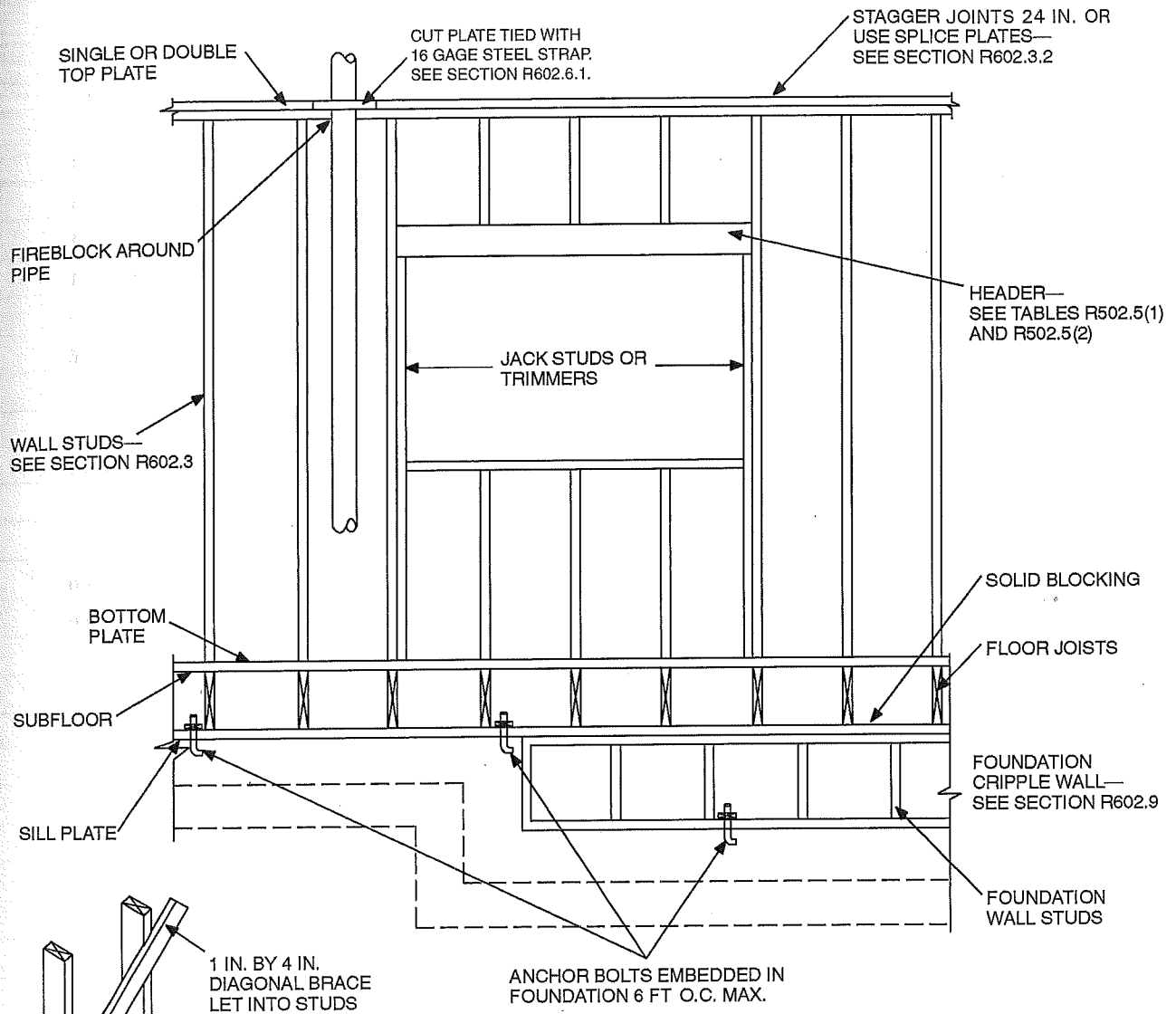
- a. Listed heights are distances between points of lateral support placed perpendicular to the plane of the wall. Increases in unsupported height are permitted where justified by analysis.
- b. Shall not be used in exterior walls.

WALL CONSTRUCTION



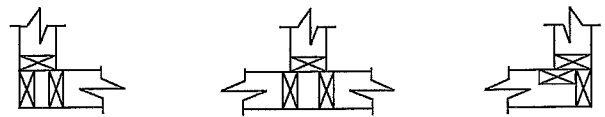
For SI: 1 inch = 25.4 mm.

FIGURE R602.3(1)
TYPICAL WALL, FLOOR AND ROOF FRAMING



APPLY APPROVED SHEATHING OR BRACE EXTERIOR WALLS WITH 1 IN. BY 4 IN. BRACES LET INTO STUDS AND PLATES AND EXTENDING FROM BOTTOM PLATE TO TOP PLATE, OR OTHER APPROVED METAL STRAP DEVICES INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. SEE SECTION R602.10.

CORNER AND PARTITION POSTS



NOTE: A THIRD STUD AND/OR PARTITION INTERSECTION BACKING STUDS SHALL BE PERMITTED TO BE OMITTED THROUGH THE USE OF WOOD BACKUP CLEATS, METAL DRYWALL CLIPS OR OTHER APPROVED DEVICES THAT WILL SERVE AS ADEQUATE BACKING FOR THE FACING MATERIALS.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

FIGURE R602.3(2)
FRAMING DETAILS

WALL CONSTRUCTION

TABLE R602.3.1
 MAXIMUM ALLOWABLE LENGTH OF WOOD WALL STUDS EXPOSED TO WIND SPEEDS OF 100 mph OR LESS
 IN SEISMIC DESIGN CATEGORIES A, B, C and D₀, D₁ AND D₂^{b,c}

HEIGHT (feet)	ON-CENTER SPACING (inches)			
	24	16	12	8
Supporting a roof only				
>10	2 × 4	2 × 4	2 × 4	2 × 4
12	2 × 6	2 × 4	2 × 4	2 × 4
14	2 × 6	2 × 6	2 × 6	2 × 4
16	2 × 6	2 × 6	2 × 6	2 × 4
18	NA ^a	2 × 6	2 × 6	2 × 6
20	NA ^a	NA ^a	2 × 6	2 × 6
24	NA ^a	NA ^a	NA ^a	2 × 6
Supporting one floor and a roof				
>10	2 × 6	2 × 4	2 × 4	2 × 4
12	2 × 6	2 × 6	2 × 6	2 × 4
14	2 × 6	2 × 6	2 × 6	2 × 6
16	NA ^a	2 × 6	2 × 6	2 × 6
18	NA ^a	2 × 6	2 × 6	2 × 6
20	NA ^a	NA ^a	2 × 6	2 × 6
24	NA ^a	NA ^a	NA ^a	2 × 6
Supporting two floors and a roof				
>10	2 × 6	2 × 6	2 × 4	2 × 4
12	2 × 6	2 × 6	2 × 6	2 × 6
14	2 × 6	2 × 6	2 × 6	2 × 6
16	NA ^a	NA ^a	2 × 6	2 × 6
18	NA ^a	NA ^a	2 × 6	2 × 6
20	NA ^a	NA ^a	NA ^a	2 × 6
22	NA ^a	NA ^a	NA ^a	NA ^a
24	NA ^a	NA ^a	NA ^a	NA ^a

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa,
 1 pound per square inch = 6.895 kPa, 1 mile per hour = 0.447 m/s.

- a. Design required.
- b. Applicability of this table assumes the following: Snow load not exceeding 25 psf, f_b not less than 1310 psi determined by multiplying the AF&PA NDS tabular base design value by the repetitive use factor, and by the size factor for all species except southern pine, E not less than 1.6×10^6 psi, tributary dimensions for floors and roofs not exceeding 6 feet, maximum span for floors and roof not exceeding 12 feet, eaves not over 2 feet in dimension and exterior sheathing. Where the conditions are not within these parameters, design is required.
- c. Utility, standard, stud and No. 3 grade lumber of any species are not permitted.

(continued)

TABLE R602.3.1—continued
 MAXIMUM ALLOWABLE LENGTH OF WOOD WALL STUDS EXPOSED TO WIND SPEEDS OF 100 mph OR LESS
 IN SEISMIC DESIGN CATEGORIES A, B, C, D₀, D₁ and D₂

