

2303.7 Shrinkage. Consideration shall be given in design to the possible effect of cross-grain dimensional changes considered vertically which may occur in lumber fabricated in a green condition.

SECTION 2304

GENERAL CONSTRUCTION REQUIREMENTS

2304.1 General. The provisions of this section apply to design methods specified in Section 2301.2.

2304.2 Size of structural members. Computations to determine the required sizes of members shall be based on the net dimensions (actual sizes) and not nominal sizes.

2304.3 Wall framing. The framing of exterior and interior walls shall be in accordance with the provisions specified in Section 2308 unless a specific design is furnished.

2304.3.1 Bottom plates. Studs shall have full bearing on a 2-inch-thick (actual 1½-inch, 38 mm) or larger plate or sill having a width at least equal to the width of the studs.

2304.3.2 Framing over openings. Headers, double joists, trusses or other approved assemblies that are of adequate size to transfer loads to the vertical members shall be provided over window and door openings in load-bearing walls and partitions.

2304.3.3 Shrinkage. Wood walls and bearing partitions shall not support more than two floors and a roof unless an analysis satisfactory to the building official shows that shrinkage of the wood framing will not have adverse effects on the structure or any plumbing, electrical or mechanical systems, or other equipment installed therein due to excessive shrinkage or differential movements caused by shrinkage. The analysis shall also show that the roof drainage system and the foregoing systems or equipment will not be adversely affected or, as an alternate, such systems shall be designed to accommodate the differential shrinkage or movements.

2304.4 Floor and roof framing. The framing of wood-joisted floors and wood framed roofs shall be in accordance with the provisions specified in Section 2308 unless a specific design is furnished.

2304.5 Framing around flues and chimneys. Combustible framing shall be a minimum of 2 inches (51 mm), but shall not

be less than the distance specified in Sections 2111 and 2113 and the *International Mechanical Code*, from flues, chimneys and fireplaces, and 6 inches (152 mm) away from flue openings.

2304.6 Wall sheathing. Except as provided for in Section 1405 for weatherboarding or where stucco construction that complies with Section 2510 is installed, enclosed buildings shall be sheathed with one of the materials of the nominal thickness specified in Table 2304.6 or any other approved material of equivalent strength or durability.

2304.6.1 Wood structural panel sheathing. Where wood structural panel sheathing is used as the exposed finish on the exterior of outside walls, it shall have an exterior exposure durability classification. Where wood structural panel sheathing is used on the exterior of outside walls but not as the exposed finish, it shall be of a type manufactured with exterior glue (Exposure 1 or Exterior). Where wood structural panel sheathing is used elsewhere, it shall be of a type manufactured with intermediate or exterior glue.

2304.6.2 Interior paneling. Softwood wood structural panels used for interior paneling shall conform with the provisions of Chapter 8 and shall be installed in accordance with Table 2304.9.1. Panels shall comply with DOC PS 1 or PS 2. Prefinished hardboard paneling shall meet the requirements of AHA A135.5. Hardwood plywood shall conform to HPVA HP-1.

2304.7 Floor and roof sheathing.

2304.7.1 Structural floor sheathing. Structural floor sheathing shall be designed in accordance with the general provisions of this code and the special provisions in this section.

Floor sheathing conforming to the provisions of Table 2304.7(1), 2304.7(2), 2304.7(3) or 2304.7(4) shall be deemed to meet the requirements of this section.

2304.7.2 Structural roof sheathing. Structural roof sheathing shall be designed in accordance with the general provisions of this code and the special provisions in this section.

Roof sheathing conforming to the provisions of Table 2304.7(1), 2304.7(2), 2304.7(3) or 2304.7(5) shall be deemed to meet the requirements of this section. Wood structural panel roof sheathing shall be bonded by exterior glue.

TABLE 2304.6
MINIMUM THICKNESS OF WALL SHEATHING

SHEATHING TYPE	MINIMUM THICKNESS	MAXIMUM WALL STUD SPACING
Wood boards	5/8 inch	24 inches on center
Fiberboard	1/2 inch	16 inches on center
Wood structural panel	In accordance with Tables 2308.9.3(2) and 2308.9.3(3)	—
M-S "Exterior Glue" and M-2 "Exterior Glue" Particleboard	In accordance with Tables 2306.4.3 and 2308.9.3(4)	—
Gypsum sheathing	1/2 inch	16 inches on center
Gypsum wallboard	1/2 inch	24 inches on center
Reinforced cement mortar	1 inch	24 inches on center

For SI: 1 inch = 25.4 mm.

TABLE 2308.8(1)
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES
 (Residential Sleeping Areas, Live Load = 30 psf, L/Δ = 360)

JOIST SPACING (Inches)	DEAD LOAD = 10 psf						DEAD LOAD = 20 psf					
	2x6	2x8	2x10	2x12	2x6	2x12	2x8	2x10	2x12	2x8	2x10	2x12
	Maximum floor joist spans (ft. - in.)											
SPECIES AND GRADE	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)
12	Douglas Fir-Larch SS	12-6	16-6	21-0	25-7	12-6	16-6	21-0	25-7	12-6	16-6	21-0
	Douglas Fir-Larch #1	12-0	15-10	20-3	24-8	12-0	15-7	19-0	22-0	12-0	15-7	19-0
	Douglas Fir-Larch #2	11-10	15-7	19-10	23-0	11-6	14-7	17-9	20-7	11-6	14-7	17-9
	Douglas Fir-Larch #3	9-8	12-4	15-0	17-5	8-8	11-0	13-5	15-7	8-8	11-0	13-5
	Hem-Fir SS	11-10	15-7	19-10	24-2	11-10	15-7	19-10	24-2	11-10	15-7	19-10
	Hem-Fir #1	11-7	15-3	19-5	23-7	11-7	15-2	18-6	21-6	11-7	15-2	18-6
	Hem-Fir #2	11-0	14-6	18-6	22-6	11-0	14-4	17-6	20-4	11-0	14-4	17-6
	Hem-Fir #3	9-8	12-4	15-0	17-5	8-8	11-0	13-5	15-7	8-8	11-0	13-5
	Southern Pine SS	12-3	16-2	20-8	25-1	12-3	16-2	20-8	25-1	12-3	16-2	20-8
	Southern Pine #1	12-0	15-10	20-3	24-8	12-0	15-10	20-3	24-8	12-0	15-10	20-3
	Southern Pine #2	11-10	15-7	19-10	24-2	11-10	15-7	18-7	21-9	11-10	15-7	18-7
	Southern Pine #3	10-5	13-3	15-8	18-8	9-4	11-11	14-0	16-8	9-4	11-11	14-0
16	Spruce-Pine-Fir SS	11-7	15-3	19-5	23-7	11-7	15-3	19-5	23-7	11-7	15-3	19-5
	Spruce-Pine-Fir #1	11-3	14-11	19-0	23-0	11-3	14-7	17-9	20-7	11-3	14-7	17-9
	Spruce-Pine-Fir #2	11-3	14-11	19-0	23-0	11-3	14-7	17-9	20-7	11-3	14-7	17-9
	Spruce-Pine-Fir #3	9-8	12-4	15-0	17-5	8-8	11-0	13-5	15-7	8-8	11-0	13-5
	Douglas Fir-Larch SS	11-4	15-0	19-1	23-3	11-4	15-0	19-1	23-0	11-4	15-0	19-1
	Douglas Fir-Larch #1	10-11	14-5	18-5	21-4	10-8	13-6	16-5	19-1	10-8	13-6	16-5
	Douglas Fir-Larch #2	10-9	14-1	17-2	19-11	9-11	12-7	15-5	17-10	9-11	12-7	15-5
	Douglas Fir-Larch #3	8-5	10-8	13-0	15-1	7-6	9-6	11-8	13-6	7-6	9-6	11-8
	Hem-Fir SS	10-9	14-2	18-0	21-11	10-9	14-2	18-0	21-11	10-9	14-2	18-0
	Hem-Fir #1	10-6	13-10	17-8	20-9	10-4	13-1	16-0	18-7	10-4	13-1	16-0
	Hem-Fir #2	10-0	13-2	16-10	19-8	9-10	12-5	15-2	17-7	9-10	12-5	15-2
	Hem-Fir #3	8-5	10-8	13-0	15-1	7-6	9-6	11-8	13-6	7-6	9-6	11-8
16	Southern Pine SS	11-2	14-8	18-9	22-10	11-2	14-8	18-9	22-10	11-2	14-8	18-9
	Southern Pine #1	10-11	14-5	18-5	22-5	10-11	14-5	17-11	21-4	10-11	14-5	17-11
	Southern Pine #2	10-9	14-2	18-0	21-1	10-5	13-6	16-1	18-10	10-5	13-6	16-1
	Southern Pine #3	9-0	11-6	13-7	16-2	8-1	10-3	12-2	14-6	8-1	10-3	12-2
	Spruce-Pine-Fir SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-4	10-6	13-10	17-8
	Spruce-Pine-Fir #1	10-3	13-6	17-2	19-11	9-11	12-7	15-5	17-10	9-11	12-7	15-5
	Spruce-Pine-Fir #2	10-3	13-6	17-2	19-11	9-11	12-7	15-5	17-10	9-11	12-7	15-5
	Spruce-Pine-Fir #3	8-5	10-8	13-0	15-1	7-6	9-6	11-8	13-6	7-6	9-6	11-8

(continued)

TABLE 2308.8(1)—continued
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES
 (Residential Sleeping Areas, Live Load = 30 psf, L/Δ = 360)

JOIST SPACING (inches)	DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
	2x6	2x8	2x10	2x12	2x6	2x8	2x10	2x12
	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)
	Maximum floor joist spans							
	Douglas Fir-Larch	14-1	18-0	21-10	10-8	14-1	18-0	21-0
	Douglas Fir-Larch	10-4	13-7	19-6	9-8	12-4	15-0	17-5
	Douglas Fir-Larch	10-1	12-10	18-3	9-1	11-6	14-1	16-3
	Douglas Fir-Larch	7-8	9-9	13-9	6-10	8-8	10-7	12-4
	Hem-Fir	10-1	13-4	20-8	10-1	13-4	17-0	20-7
	Hem-Fir	9-10	13-0	19-0	9-6	12-0	14-8	17-0
	Hem-Fir	9-5	12-5	17-1	8-11	11-4	13-10	16-1
	Hem-Fir	7-8	9-9	13-9	6-10	8-8	10-7	12-4
19.2	Southern Pine	10-6	13-10	21-6	10-6	13-10	17-8	21-6
	Southern Pine	10-4	13-7	21-1	10-4	13-7	16-4	19-6
	Southern Pine	10-1	13-4	19-3	9-6	12-4	14-8	17-2
	Southern Pine	8-3	10-6	14-9	7-4	9-5	11-1	13-2
	Spruce-Pine-Fir	9-10	13-0	20-2	9-10	13-0	16-7	19-6
	Spruce-Pine-Fir	9-8	12-9	18-3	9-1	11-6	14-1	16-3
	Spruce-Pine-Fir	9-8	12-9	18-3	9-1	11-6	14-1	16-3
	Spruce-Pine-Fir	7-8	9-9	13-9	6-10	8-8	10-7	12-4
	Douglas Fir-Larch	9-11	13-1	20-3	9-11	13-1	16-2	18-9
	Douglas Fir-Larch	9-7	12-4	17-5	8-8	11-0	13-5	15-7
	Douglas Fir-Larch	9-1	11-6	16-3	8-1	10-3	12-7	14-7
	Douglas Fir-Larch	6-10	8-8	12-4	6-2	7-9	9-6	11-0
	Hem-Fir	9-4	12-4	19-2	9-4	12-4	15-9	18-5
	Hem-Fir	9-2	12-0	17-0	8-6	10-9	13-1	15-2
	Hem-Fir	8-9	11-4	16-1	8-0	10-2	12-5	14-4
	Hem-Fir	6-10	8-8	12-4	6-2	7-9	9-6	11-0
24	Southern Pine	9-9	12-10	19-11	9-9	12-10	16-5	19-11
	Southern Pine	9-7	12-7	19-6	9-7	12-4	14-7	17-5
	Southern Pine	9-4	12-4	17-2	8-6	11-0	13-1	15-5
	Southern Pine	7-4	9-5	13-2	6-7	8-5	9-11	11-10
	Spruce-Pine-Fir	9-2	12-1	18-9	9-2	12-1	15-0	17-5
	Spruce-Pine-Fir	8-11	11-6	16-3	8-1	10-3	12-7	14-7
	Spruce-Pine-Fir	8-11	11-6	16-3	8-1	10-3	12-7	14-7
	Spruce-Pine-Fir	6-10	8-8	12-4	6-2	7-9	9-6	11-0

Check sources for availability of lumber in lengths greater than 20 feet.
 For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 47.8 N/m².

TABLE 2308.9.5
HEADER AND GIRDER SPANS^a FOR EXTERIOR BEARING WALLS
 (Maximum Spans for Douglas Fir-Larch, Hem-Fir, Southern Pine and Spruce-Pine-Fir^b and Required Number of Jack Studs)

HEADERS SUPPORTING	GROUND SNOW LOAD (psf) ^c											
	30						50					
	Building width ^c (feet)											
SIZE	20		28		36		20		28		36	
	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d
Roof & Ceiling	2-2 x 4	1	3-2	1	2-10	1	3-2	1	2-9	1	2-6	1
	2-2 x 6	1	4-8	1	4-2	1	4-8	1	4-1	1	3-8	2
	2-2 x 8	1	5-11	2	5-4	2	5-11	2	5-2	2	4-7	2
	2-2 x 10	2	7-3	2	6-6	2	7-3	2	6-3	2	5-7	2
	2-2 x 12	2	8-5	2	7-6	2	8-5	2	7-3	2	6-6	2
	3-2 x 8	1	7-5	1	6-8	1	7-5	1	6-5	2	5-9	2
	3-2 x 10	1	9-1	2	8-2	2	9-1	2	7-10	2	7-0	2
	3-2 x 12	2	10-7	2	9-5	2	10-7	2	9-2	2	8-2	2
	4-2 x 8	1	8-4	1	7-8	1	8-4	1	7-5	1	6-8	1
	4-2 x 10	1	10-6	1	9-5	2	10-6	1	9-1	2	8-2	2
	4-2 x 12	1	12-2	2	10-11	2	12-2	2	10-7	2	9-5	2
	2-2 x 4	1	2-9	1	2-5	1	2-9	1	2-5	1	2-2	1
	2-2 x 6	1	4-0	1	3-7	2	4-1	1	3-7	2	3-3	2
	2-2 x 8	2	5-0	2	4-6	2	5-2	2	4-6	2	4-1	2
	2-2 x 10	2	6-2	2	5-6	2	6-4	2	5-6	2	5-0	2
Roof, Ceiling & 1 Center-Bearing Floor	2-2 x 12	2	7-1	2	6-5	2	7-4	2	6-5	2	5-9	3
	3-2 x 8	1	6-3	2	5-8	2	6-5	2	5-8	2	5-1	2
	3-2 x 10	2	7-8	2	6-11	2	7-11	2	6-11	2	6-3	2
	3-2 x 12	2	8-11	2	8-0	2	9-2	2	8-0	2	7-3	2
	4-2 x 8	1	7-3	1	6-7	1	7-5	1	6-6	1	5-11	2
	4-2 x 10	1	8-10	2	8-0	2	9-1	2	8-0	2	7-2	2
	4-2 x 12	2	10-3	2	9-3	2	10-7	2	9-3	2	8-4	2
	2-2 x 4	1	2-4	1	2-1	1	2-7	1	2-3	1	2-0	1
	2-2 x 6	1	3-5	2	3-0	2	3-10	2	3-4	2	3-0	2
	2-2 x 8	2	4-4	2	3-10	2	4-10	2	4-2	2	3-9	2
	2-2 x 10	2	5-3	2	4-8	2	5-11	2	5-1	2	4-7	3
	2-2 x 12	2	6-1	3	5-5	3	6-10	2	5-11	3	5-4	3
	3-2 x 8	2	5-5	2	4-10	2	6-1	2	5-3	2	4-8	2
	3-2 x 10	2	6-7	2	5-11	2	7-5	2	6-5	2	5-9	2
	3-2 x 12	2	7-8	2	6-10	2	8-7	2	7-5	2	6-8	2
Roof, Ceiling & 1 Clear Span Floor	4-2 x 8	1	6-3	2	5-7	2	7-0	1	6-1	2	5-5	2
	4-2 x 10	2	7-7	2	6-10	2	8-7	2	7-5	2	6-7	2
	4-2 x 12	2	8-10	2	7-11	2	9-11	2	8-7	2	7-8	2

(continued)

TABLE 2308.9.6
HEADER AND GIRDER SPANS^a FOR INTERIOR BEARING WALLS

(Maximum Spans for Douglas Fir-Larch, Hem-Fir, Southern Pine and Spruce-Pine-Fir^b and Required Number of Jack Studs)

HEADERS AND GIRDERS SUPPORTING	SIZE	BUILDING WIDTH ^c (feet)					
		20		28		36	
		Span	NJ ^d	Span	NJ ^d	Span	NJ ^d
One Floor Only	2-2 × 4	3-1	1	2-8	1	2-5	1
	2-2 × 6	4-6	1	3-11	1	3-6	1
	2-2 × 8	5-9	1	5-0	2	4-5	2
	2-2 × 10	7-0	2	6-1	2	5-5	2
	2-2 × 12	8-1	2	7-0	2	6-3	2
	3-2 × 8	7-2	1	6-3	1	5-7	2
	3-2 × 10	8-9	1	7-7	2	6-9	2
	3-2 × 12	10-2	2	8-10	2	7-10	2
	4-2 × 8	9-0	1	7-8	1	6-9	1
	4-2 × 10	10-1	1	8-9	1	7-10	2
	4-2 × 12	11-9	1	10-2	2	9-1	2
Two Floors	2-2 × 4	2-2	1	1-10	1	1-7	1
	2-2 × 6	3-2	2	2-9	2	2-5	2
	2-2 × 8	4-1	2	3-6	2	3-2	2
	2-2 × 10	4-11	2	4-3	2	3-10	3
	2-2 × 12	5-9	2	5-0	3	4-5	3
	3-2 × 8	5-1	2	4-5	2	3-11	2
	3-2 × 10	6-2	2	5-4	2	4-10	2
	3-2 × 12	7-2	2	6-3	2	5-7	3
	4-2 × 8	6-1	1	5-3	2	4-8	2
	4-2 × 10	7-2	2	6-2	2	5-6	2
	4-2 × 12	8-4	2	7-2	2	6-5	2

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

a. Spans are given in feet and inches (ft-in).

b. Tabulated values are for No. 2 grade lumber.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the headers are permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

TABLE 2308.10.2(1)
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
 (Uninhabitable Attics Without Storage, Live Load = 10 pounds psf, $L/\Delta = 240$)
 DEAD LOAD = 5 pounds per square foot

CEILING JOIST SPACING (inches)	SPECIES AND GRADE	DEAD LOAD = 5 pounds per square foot		
		2 x 4	2 x 6	2 x 8
		(ft. - in.)	(ft. - in.)	(ft. - in.)
12	Douglas Fir-Larch SS	13-2	20-8	Note a
	Douglas Fir-Larch #1	12-8	19-11	Note a
	Douglas Fir-Larch #2	12-5	19-6	25-8
	Douglas Fir-Larch #3	10-10	15-10	20-1
	Hem-Fir SS	12-5	19-6	25-8
	Hem-Fir #1	12-2	19-1	25-2
	Hem-Fir #2	11-7	18-2	24-0
	Hem-Fir #3	10-10	15-10	20-1
	Southern Pine SS	12-11	20-3	Note a
	Southern Pine #1	12-8	19-11	Note a
	Southern Pine #2	12-5	19-6	25-8
	Southern Pine #3	11-6	17-0	21-8
16	Spruce-Pine-Fir SS	12-2	19-1	25-2
	Spruce-Pine-Fir #1	11-10	18-8	24-7
	Spruce-Pine-Fir #2	11-10	18-8	24-7
	Spruce-Pine-Fir #3	10-10	15-10	20-1
	Douglas Fir-Larch SS	11-11	18-9	24-8
	Douglas Fir-Larch #1	11-6	18-1	23-10
	Douglas Fir-Larch #2	11-3	17-8	23-0
	Douglas Fir-Larch #3	9-5	13-9	17-5
	Hem-Fir SS	11-3	17-8	23-4
	Hem-Fir #1	11-0	17-4	22-10
	Hem-Fir #2	10-6	16-6	21-9
	Hem-Fir #3	9-5	13-9	17-5
16	Southern Pine SS	11-9	18-5	24-3
	Southern Pine #1	11-6	18-1	23-1
	Southern Pine #2	11-3	17-8	23-4
	Southern Pine #3	10-0	14-9	18-9
	Spruce-Pine-Fir SS	11-0	17-4	22-10
	Spruce-Pine-Fir #1	10-9	16-11	22-4
	Spruce-Pine-Fir #2	10-9	16-11	22-4
	Spruce-Pine-Fir #3	9-5	13-9	17-5

(continued)

TABLE 2308.10.2(2)
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
 (Uninhabitable Attics With Limited Storage, Live Load = 20 pounds per square foot, $L/\Delta = 240$)

CEILING JOIST SPACING (inches)	SPECIES AND GRADE	DEAD LOAD = 10 pounds per square foot			
		2 x 4 (ft. - in.)	2 x 6 (ft. - in.)	2 x 8 (ft. - in.)	
12	Douglas Fir-Larch SS	10-5	16-4	21-7	
	Douglas Fir-Larch #1	10-0	15-9	20-1	
	Douglas Fir-Larch #2	9-10	14-10	18-9	
	Douglas Fir-Larch #3	7-8	11-2	14-2	
	Hem-Fir SS	9-10	15-6	20-5	
	Hem-Fir #1	9-8	15-2	19-7	
	Hem-Fir #2	9-2	14-5	18-6	
	Hem-Fir #3	7-8	11-2	14-2	
	Southern Pine SS	10-3	16-1	21-2	
	Southern Pine #1	10-0	15-9	20-10	
	Southern Pine #2	9-10	15-6	20-1	
	Southern Pine #3	8-2	12-0	15-4	
	Spruce-Pine-Fir SS	9-8	15-2	19-11	
	Spruce-Pine-Fir #1	9-5	14-9	18-9	
	Spruce-Pine-Fir #2	9-5	14-9	18-9	
	Spruce-Pine-Fir #3	7-8	11-2	14-2	
	16	Douglas Fir-Larch SS	9-6	14-11	19-7
		Douglas Fir-Larch #1	9-1	13-9	17-5
Douglas Fir-Larch #2		8-9	12-10	16-3	
Douglas Fir-Larch #3		6-8	9-8	12-4	
Hem-Fir SS		8-11	14-1	18-6	
Hem-Fir #1		8-9	13-5	16-10	
Hem-Fir #2		8-4	12-8	16-0	
Hem-Fir #3		6-8	9-8	12-4	
Southern Pine SS		9-4	14-7	19-3	
Southern Pine #1		9-1	14-4	18-11	
Southern Pine #2		8-11	13-6	17-5	
Southern Pine #3		7-1	10-5	13-3	
Spruce-Pine-Fir SS		8-9	13-9	18-1	
Spruce-Pine-Fir #1		8-7	12-10	16-3	
Spruce-Pine-Fir #2		8-7	12-10	16-3	
Spruce-Pine-Fir #3		6-8	9-8	12-4	

(continued)

TABLE 2308.10.3(3)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground Snow Load = 30 pounds per square foot, Ceiling Not Attached to Rafters, L/Δ = 180)

RAFTER SPACING (inches)	DEAD LOAD = 10 pounds per square foot										DEAD LOAD = 20 pounds per square foot									
	2 x 4		2 x 6		2 x 8		2 x 10		2 x 12		2 x 4		2 x 6		2 x 8		2 x 10		2 x 12	
	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)
	Maximum rafter spans																			
	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)
	10-0	15-9	20-9	Note a	Note a	10-0	15-9	20-1	24-6	Note a	10-0	15-9	20-1	24-6	Note a	10-0	15-9	20-1	24-6	Note a
	9-8	14-9	18-8	22-9	21-4	9-0	13-2	16-8	20-4	Note a	9-0	13-2	16-8	20-4	Note a	9-0	13-2	16-8	20-4	Note a
	9-5	13-9	17-5	21-4	16-1	8-5	12-4	15-7	19-1	24-8	8-5	12-4	15-7	19-1	22-1	8-5	12-4	15-7	19-1	22-1
	7-1	10-5	13-2	16-1	25-0	6-4	9-4	11-9	14-5	18-8	6-4	9-4	11-9	14-5	16-8	6-4	9-4	11-9	14-5	16-8
	9-6	14-10	19-7	25-0	22-2	9-6	14-10	19-7	24-1	Note a	9-6	14-10	19-7	24-1	Note a	9-6	14-10	19-7	24-1	Note a
	9-3	14-4	18-2	22-2	21-0	8-9	12-10	16-3	19-10	18-2	8-9	12-10	16-3	19-10	23-0	18-2	8-9	12-10	16-3	19-10
	8-10	13-7	17-2	21-0	16-1	8-4	12-2	15-4	18-9	17-2	8-4	12-2	15-4	18-9	21-9	17-2	8-4	12-2	15-4	18-9
	7-1	10-5	13-2	16-1	Note a	6-4	9-4	11-9	14-5	18-8	6-4	9-4	11-9	14-5	16-8	6-4	9-4	11-9	14-5	16-8
12	9-10	15-6	20-5	Note a	Note a	9-10	15-6	20-5	Note a	Note a	9-10	15-6	20-5	Note a	Note a	9-10	15-6	20-5	Note a	Note a
	9-8	15-2	20-0	24-9	22-3	9-8	14-10	18-8	22-2	Note a	9-8	14-10	18-8	22-2	Note a	9-8	14-10	18-8	22-2	Note a
	9-6	14-5	18-8	22-3	20-0	9-0	12-11	16-8	19-11	22-3	9-0	12-11	16-8	19-11	23-4	22-3	9-0	12-11	16-8	19-11
	7-7	11-2	14-3	16-10	24-6	6-9	10-0	12-9	15-1	16-10	6-9	10-0	12-9	15-1	17-11	16-10	6-9	10-0	12-9	15-1
	9-3	14-7	19-2	24-6	Note a	9-3	14-7	18-8	22-9	Note a	9-3	14-7	18-8	22-9	Note a	9-3	14-7	18-8	22-9	Note a
	9-1	13-9	17-5	21-4	21-4	8-5	12-4	15-7	19-1	17-5	8-5	12-4	15-7	19-1	22-1	17-5	8-5	12-4	15-7	19-1
	9-1	13-9	17-5	21-4	21-4	8-5	12-4	15-7	19-1	17-5	8-5	12-4	15-7	19-1	22-1	17-5	8-5	12-4	15-7	19-1
	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-1	6-4	9-4	11-9	14-5	16-8	6-4	9-4	11-9	14-5	16-8
	9-1	14-4	18-10	23-9	Note a	9-1	13-9	17-5	21-3	18-10	9-1	13-9	17-5	21-3	24-8	18-10	9-1	13-9	17-5	21-3
	8-9	12-9	16-2	19-9	22-10	7-10	11-5	14-5	17-8	16-2	7-10	11-5	14-5	17-8	20-5	16-2	7-10	11-5	14-5	17-8
	8-2	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	18-5	7-3	10-8	13-6	16-6	19-2	18-5	7-3	10-8	13-6	16-6
	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	13-11	5-6	8-1	10-3	12-6	14-6	13-11	5-6	8-1	10-3	12-6
	8-7	13-6	17-10	22-9	Note a	8-7	13-6	17-1	20-10	22-9	8-7	13-6	17-1	20-10	24-2	22-9	8-7	13-6	17-1	20-10
	8-5	12-5	15-9	19-3	22-3	7-7	11-1	14-1	17-2	19-3	7-7	11-1	14-1	17-2	19-11	19-3	7-7	11-1	14-1	17-2
	8-0	11-9	14-11	18-2	21-1	7-2	10-6	13-4	16-3	18-2	7-2	10-6	13-4	16-3	18-10	18-2	7-2	10-6	13-4	16-3
	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	13-11	5-6	8-1	10-3	12-6	14-6	13-11	5-6	8-1	10-3	12-6
	8-11	14-1	18-6	23-8	Note a	8-11	14-1	18-6	23-8	Note a	8-11	14-1	18-6	23-8	Note a	8-11	14-1	18-6	23-8	Note a
	8-9	13-9	18-1	21-5	25-7	8-8	12-10	16-2	19-2	18-1	8-8	12-10	16-2	19-2	22-10	18-1	8-8	12-10	16-2	19-2
	8-7	12-6	16-2	19-3	22-7	7-10	11-2	14-5	17-3	16-2	7-10	11-2	14-5	17-3	20-2	16-2	7-10	11-2	14-5	17-3
	6-7	9-8	12-4	14-7	17-4	5-10	8-8	11-0	13-0	12-4	5-10	8-8	11-0	13-0	15-6	12-4	5-10	8-8	11-0	13-0
	8-5	13-3	17-5	22-1	25-7	8-5	12-9	16-2	19-9	17-5	8-5	12-9	16-2	19-9	22-10	17-5	8-5	12-9	16-2	19-9
	8-2	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	18-5	7-3	10-8	13-6	16-6	19-2	18-5	7-3	10-8	13-6	16-6
	8-2	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	18-5	7-3	10-8	13-6	16-6	19-2	18-5	7-3	10-8	13-6	16-6
	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	13-11	5-6	8-1	10-3	12-6	14-6	13-11	5-6	8-1	10-3	12-6

(continued)

TABLE 2308.10.3(5)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground Snow Load = 30 pounds per square foot, Ceiling Attached to Rafters, $L/\Delta = 240$)

RAFTER SPACING (inches)	DEAD LOAD = 10 pounds per square foot										DEAD LOAD = 20 pounds per square foot									
	2 x 4		2 x 6		2 x 8		2 x 10		2 x 12		2 x 4		2 x 6		2 x 8		2 x 10		2 x 12	
	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)	(ft. - in.)
	SPECIES AND GRADE																			
	Douglas Fir-Larch	SS	9-1	14-4	18-10	24-1	24-1	24-1	24-1	24-1	24-1	24-1	24-1	24-1	24-1	24-1	24-1	24-1	24-1	24-1
	Douglas Fir-Larch	#1	8-9	13-9	18-2	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9
	Douglas Fir-Larch	#2	8-7	13-6	17-5	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4
	Douglas Fir-Larch	#3	7-1	10-5	13-2	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1
	Hem-Fir	SS	8-7	13-6	17-10	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9	22-9
	Hem-Fir	#1	8-5	13-3	17-5	22-2	22-2	22-2	22-2	22-2	22-2	22-2	22-2	22-2	22-2	22-2	22-2	22-2	22-2	22-2
	Hem-Fir	#2	8-0	12-7	16-7	21-0	21-0	21-0	21-0	21-0	21-0	21-0	21-0	21-0	21-0	21-0	21-0	21-0	21-0	21-0
	Hem-Fir	#3	7-1	10-5	13-2	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1
12	Southern Pine	SS	8-11	14-1	18-6	23-8	23-8	23-8	23-8	23-8	23-8	23-8	23-8	23-8	23-8	23-8	23-8	23-8	23-8	23-8
	Southern Pine	#1	8-9	13-9	18-2	23-2	23-2	23-2	23-2	23-2	23-2	23-2	23-2	23-2	23-2	23-2	23-2	23-2	23-2	23-2
	Southern Pine	#2	8-7	13-6	17-10	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3
	Southern Pine	#3	7-7	11-2	14-3	16-10	16-10	16-10	16-10	16-10	16-10	16-10	16-10	16-10	16-10	16-10	16-10	16-10	16-10	16-10
	Spruce-Pine-Fir	SS	8-5	13-3	17-5	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3	22-3
	Spruce-Pine-Fir	#1	8-3	12-11	17-0	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4
	Spruce-Pine-Fir	#2	8-3	12-11	17-0	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4	21-4
	Spruce-Pine-Fir	#3	7-1	10-5	13-2	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1	16-1
	Douglas Fir-Larch	SS	8-3	13-0	17-2	21-10	21-10	21-10	21-10	21-10	21-10	21-10	21-10	21-10	21-10	21-10	21-10	21-10	21-10	21-10
	Douglas Fir-Larch	#1	8-0	12-6	16-2	19-9	19-9	19-9	19-9	19-9	19-9	19-9	19-9	19-9	19-9	19-9	19-9	19-9	19-9	19-9
	Douglas Fir-Larch	#2	7-10	11-11	15-1	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5
	Douglas Fir-Larch	#3	6-2	9-0	11-5	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11
	Hem-Fir	SS	7-10	12-3	16-2	20-8	20-8	20-8	20-8	20-8	20-8	20-8	20-8	20-8	20-8	20-8	20-8	20-8	20-8	20-8
	Hem-Fir	#1	7-8	12-0	15-9	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3
	Hem-Fir	#2	7-3	11-5	14-11	18-2	18-2	18-2	18-2	18-2	18-2	18-2	18-2	18-2	18-2	18-2	18-2	18-2	18-2	18-2
	Hem-Fir	#3	6-2	9-0	11-5	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11
16	Southern Pine	SS	8-1	12-9	16-10	21-6	21-6	21-6	21-6	21-6	21-6	21-6	21-6	21-6	21-6	21-6	21-6	21-6	21-6	21-6
	Southern Pine	#1	8-0	12-6	16-6	21-1	21-1	21-1	21-1	21-1	21-1	21-1	21-1	21-1	21-1	21-1	21-1	21-1	21-1	21-1
	Southern Pine	#2	7-10	12-3	16-2	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3	19-3
	Southern Pine	#3	6-7	9-8	12-4	14-7	14-7	14-7	14-7	14-7	14-7	14-7	14-7	14-7	14-7	14-7	14-7	14-7	14-7	14-7
	Spruce-Pine-Fir	SS	7-8	12-0	15-10	20-2	20-2	20-2	20-2	20-2	20-2	20-2	20-2	20-2	20-2	20-2	20-2	20-2	20-2	20-2
	Spruce-Pine-Fir	#1	7-6	11-9	15-1	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5
	Spruce-Pine-Fir	#2	7-6	11-9	15-1	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5	18-5
	Spruce-Pine-Fir	#3	6-2	9-0	11-5	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11	13-11

(continued)