CHAPTER 5

FLOORS

User note:

About this chapter: *Chapter 5 provides the requirements for the design and construction of floor systems that will be capable of supporting minimum required design loads. This chapter covers wood floor framing, wood floors on the ground, cold-formed steel floor framing and concrete slabs on the ground. Allowable span tables are provided that greatly simplify the determination of joist, girder and sheathing sizes for raised floor systems of wood framing and cold-formed steel framing. This chapter also contains prescriptive requirements for wood-framed exterior decks and their attachment to the main building.*

SECTION R501
GENERAL

R501.1 Application. The provisions of this chapter shall control the design and construction of the floors for buildings, including the floors of attic spaces used to house mechanical or plumbing fixtures and *equipment*.

R501.2 Requirements. Floor construction shall be capable of accommodating all loads in accordance with Section R301 and of transmitting the resulting loads to the supporting structural elements.

SECTION R502
WOOD FLOOR FRAMING

R502.1 General. Wood and wood-based products used for load-supporting purposes shall conform to the applicable provisions of this section.

R502.1.1 Sawn lumber. Sawn lumber shall be identified by a grade *mark* of an accredited lumber grading or inspection agency and have design values certified by an accreditation body that complies with DOC PS 20. In lieu of a grade *mark*, a certificate of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted.

R502.1.1.1 Preservative-treated lumber. Preservative treated dimension lumber shall be identified as required by Section R317.2.

R502.1.1.2 End-jointed lumber. *Approved* end-jointed lumber identified by a grade *mark* conforming to Section R502.1.1 shall be permitted to be used interchangeably with solid-sawn members of the same species and grade. End-jointed lumber used in an assembly required elsewhere in this code to have a fire-resistance rating shall have the designation "Heat-Resistant Adhesive" or "HRA" included in its grade *mark*.

R502.1.2 Prefabricated wood I-joists. Structural capacities and design provisions for prefabricated wood I-joists shall be established and monitored in accordance with ASTM D5055.

R502.1.3 Structural glued laminated timbers. Glued laminated timbers shall be manufactured and identified as required in ANSI A190.1, ANSI 117 and ASTM D3737.

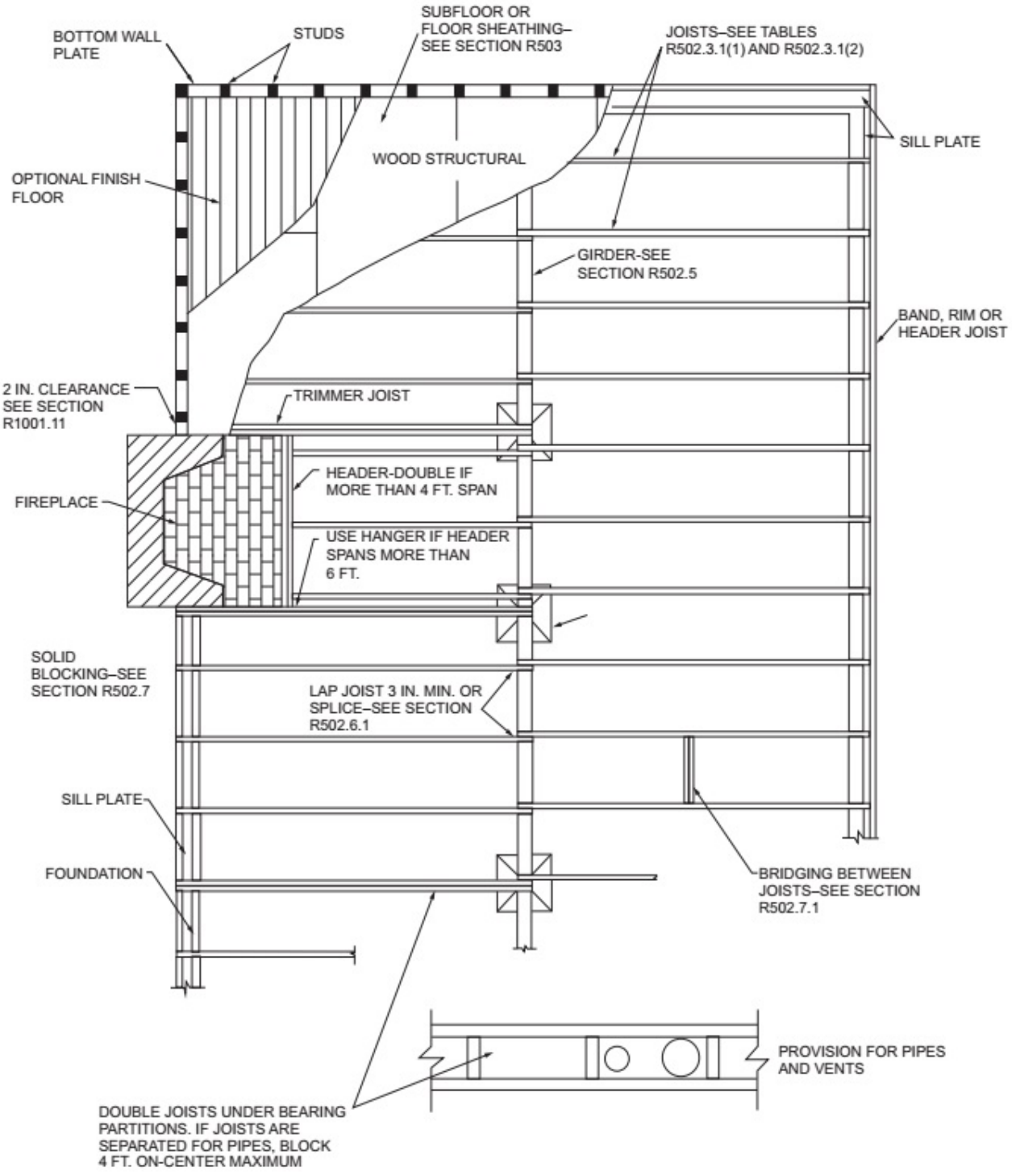
R502.1.4 Structural log members. Structural log members shall comply with the provisions of ICC 400.

R502.1.5 Structural composite lumber. Structural capacities for *structural composite lumber* shall be established and monitored in accordance with ASTM D5456.

R502.1.6 Cross-laminated timber. Cross-laminated timber shall be manufactured and identified as required by ANSI/APA PRG 320.

R502.1.7 Engineered wood rim board. Engineered wood rim boards shall conform to ANSI/APA PRR 410 or shall be evaluated in accordance with ASTM D7672. Structural capacities shall be in accordance with ANSI/APA PRR 410 or established in accordance with ASTM D7672. Rim boards conforming to ANSI/APA PRR 410 shall be marked in accordance with that standard.

R502.2 Design and construction. Floors shall be designed and constructed in accordance with the provisions of this chapter, Figure R502.2 and Sections R317 and R318 or in accordance with ANSI AWC NDS.



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

FIGURE R502.2
FLOOR CONSTRUCTION

R502.2.1 Framing at braced wall lines. A load path for lateral forces shall be provided between floor framing and *braced wall panels* located above or below a floor, as specified in Section R602.10.8.

R502.2.2 Blocking and subflooring. Blocking for fastening panel edges or fixtures shall be not less than utility grade lumber. Subflooring shall be not less than utility grade lumber, No. 4 common grade boards or *wood structural panels* as specified in Section R503.2. Fireblocking shall be of any grade lumber.

R502.3 Allowable joist spans. Spans for floor joists shall be in accordance with Tables R502.3.1(1) and R502.3.1(2). For other grades and species and for other loading conditions, refer to the AWC STJR.

R502.3.1 Sleeping areas and attic joists. Table R502.3.1(1) shall be used to determine the maximum allowable span of floor joists that support sleeping areas and *attics* that are accessed by means of a fixed *stairway* in accordance with Section R311.7 provided that the design *live load* does not exceed 30 pounds per square foot (1.44 kPa) and the design dead load does not exceed 20 pounds per square foot (0.96 kPa). The allowable span of ceiling joists that support *attics* used for limited storage or no storage shall be determined in accordance with Section R802.5.

R502.3.2 Other floor joists. Table R502.3.1(2) shall be used to determine the maximum allowable span of floor joists that support other areas of the building, other than sleeping areas and *attics*, provided that the design *live load* does not exceed 40 pounds per square foot (1.92 kPa) and the design dead load does not exceed 20 pounds per square foot (0.96 kPa).

TABLE R502.3.1(1)
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES (Residential sleeping areas, live load = 30 psf, L/Δ = 360)[a]

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
			(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
	Douglas fir-larch	#1	12-0	15-10	20-3	24-8	12-0	15-7	19-0	22-0
	Douglas fir-larch	#2	11-10	15-7	19-10	23-4	11-8	14-9	18-0	20-11
	Douglas fir-larch	#3	9-11	12-7	15-5	17-10	8-11	11-3	13-9	16-0
	Hem-fir	SS	11-10	15-7	19-10	24-2	11-10	15-7	19-10	24-2
	Hem-fir	#1	11-7	15-3	19-5	23-7	11-7	15-3	18-9	21-9
	Hem-fir	#2	11-0	14-6	18-6	22-6	11-0	14-4	17-6	20-4
	Hem-fir	#3	9-8	12-4	15-0	17-5	8-8	11-0	13-5	15-7
	Southern pine	SS	12-3	16-2	20-8	25-1	12-3	16-2	20-8	25-1
	Southern pine	#1	11-10	15-7	19-10	24-2	11-10	15-7	18-7	22-0
	Southern pine	#2	11-3	14-11	18-1	21-4	10-9	13-8	16-2	19-1
	Southern pine	#3	9-2	11-6	14-0	16-6	8-2	10-3	12-6	14-9
	Spruce-pine-fir	SS	11-7	15-3	19-5	23-7	11-7	15-3	19-5	23-7
	Spruce-pine-fir	#1	11-3	14-11	19-0	23-0	11-3	14-7	17-9	20-7
	Spruce-pine-fir	#2	11-3	14-11	19-0	23-0	11-3	14-7	17-9	20-7
	Spruce-pine-fir	#3	9-8	12-4	15-0	17-5	8-8	11-0	13-5	15-7
16	Douglas fir-larch	SS	11-4	15-0	19-1	23-3	11-4	15-0	19-1	23-3
	Douglas fir-larch	#1	10-11	14-5	18-5	21-4	10-8	13-6	16-5	19-1
	Douglas fir-larch	#2	10-9	14-2	17-5	20-3	10-1	12-9	15-7	18-1
	Douglas fir-larch	#3	8-7	10-11	13-4	15-5	7-8	9-9	11-11	13-10
	Hem-fir	SS	10-9	14-2	18-0	21-11	10-9	14-2	18-0	21-11
	Hem-fir	#1	10-6	13-10	17-8	21-1	10-6	13-4	16-3	18-10
	Hem-fir	#2	10-0	13-2	16-10	19-8	9-10	12-5	15-2	17-7
	Hem-fir	#3	8-5	10-8	13-0	15-1	7-6	9-6	11-8	13-6
	Southern pine	SS	11-2	14-8	18-9	22-10	11-2	14-8	18-9	22-10
	Southern pine	#1	10-9	14-2	18-0	21-4	10-9	13-9	16-1	19-1
	Southern pine	#2	10-3	13-3	15-8	18-6	9-4	11-10	14-0	16-6
	Southern pine	#3	7-11	10-0	11-1	14-4	7-1	8-11	10-10	12-10
	Spruce-pine-fir	SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-4
	Spruce-pine-fir	#1	10-3	13-6	17-2	19-11	9-11	12-7	15-5	17-10
	Spruce-pine-fir	#2	10-3	13-6	17-2	19-11	9-11	12-7	15-5	17-10
	Spruce-pine-fir	#3	8-5	10-8	13-0	15-1	7-6	9-6	11-8	13-6

TABLE R502.3.1(1)—continued
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES (Residential sleeping areas, live load = 30 psf, L/Δ = 360)[a]

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
			(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)
19.2	Douglas fir-larch	SS	10-8	14-1	18-0	21-10	10-8	14-1	18-0	21-4
	Douglas fir-larch	#1	10-4	13-7	16-9	19-6	9-8	12-4	15-0	17-5
	Douglas fir-larch	#2	10-1	13-0	15-11	18-6	9-3	11-8	14-3	16-6
	Douglas fir-larch	#3	7-10	10-0	12-2	14-1	7-0	8-11	10-11	12-7
	Hem-fir	SS	10-1	13-4	17-0	20-8	10-1	13-4	17-0	20-7
	Hem-fir	#1	9-10	13-0	16-7	19-3	9-7	12-2	14-10	17-2
	Hem-fir	#2	9-5	12-5	15-6	17-1	8-11	11-4	13-10	16-1
	Hem-fir	#3	7-8	9-9	11-10	13-9	6-10	8-8	10-7	12-4
	Southern pine	SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-6
	Southern pine	#1	10-1	13-4	16-5	19-6	9-11	12-7	14-8	17-5
	Southern pine	#2	9-6	12-1	14-4	16-10	8-6	10-10	12-10	15-1
	Southern pine	#3	7-3	9-1	11-0	13-1	6-5	8-2	9-10	11-8
	Spruce-pine-fir	SS	9-10	13-0	16-7	20-2	9-10	13-0	16-7	19-6
	Spruce-pine-fir	#1	9-8	12-9	15-8	18-3	9-1	11-6	14-1	16-3
	Spruce-pine-fir	#2	9-8	12-9	15-8	18-3	9-1	11-6	14-1	16-3
	Spruce-pine-fir	#3	7-8	9-9	11-10	13-9	6-10	8-8	10-7	12-4
24	Douglas fir-larch	SS	9-11	13-1	16-8	20-3	9-11	13-1	16-5	19-1
	Douglas fir-larch	#1	9-7	12-4	15-0	17-5	8-8	11-0	13-5	15-7
	Douglas fir-larch	#2	9-3	11-8	14-3	16-6	8-3	10-5	12-9	14-9
	Douglas fir-larch	#3	7-0	8-11	10-11	12-7	6-3	8-0	9-9	11-3
	Hem-fir	SS	9-4	12-4	15-9	19-2	9-4	12-4	15-9	18-5
	Hem-fir	#1	9-2	12-1	14-10	17-2	8-7	10-10	13-3	15-5
	Hem-fir	#2	8-9	11-4	13-10	16-1	8-0	10-2	12-5	14-4
	Hem-fir	#3	6-10	8-8	10-7	12-4	6-2	7-9	9-6	11-0
	Southern pine	SS	9-9	12-10	16-5	19-11	9-9	12-10	16-5	19-8
	Southern pine	#1	9-4	12-4	14-8	17-5	8-10	11-3	13-1	15-7
	Southern pine	#2	8-6	10-10	12-10	15-1	7-7	9-8	11-5	13-6
	Southern pine	#3	6-5	8-2	9-10	11-8	5-9	7-3	8-10	10-5
	Spruce-pine-fir	SS	9-2	12-1	15-5	18-9	9-2	12-1	15-0	17-5
	Spruce-pine-fir	#1	8-11	11-6	14-1	16-3	8-1	10-3	12-7	14-7
	Spruce-pine-fir	#2	8-11	11-6	14-1	16-3	8-1	10-3	12-7	14-7
	Spruce-pine-fir	#3	6-10	8-8	10-7	12-4	6-2	7-9	9-6	11-0

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

Note: Check sources for availability of lumber in lengths greater than 20 feet.

a. Dead load limits for townhouses in Seismic Design Category C and all structures in Seismic Design Categories D_0, D_1 and D_2 shall be determined in accordance with Section R301.2.2.2.

TABLE R502.3.1(2)
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES (Residential living areas, live load = 40 psf, L/Δ = 360)[b]

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
			(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)
12	Douglas fir-larch	SS	11-4	15-0	19-1	23-3	11-4	15-0	19-1	23-3
	Douglas fir-larch	#1	10-11	14-5	18-5	22-0	10-11	14-2	17-4	20-1
	Douglas fir-larch	#2	10-9	14-2	18-0	20-11	10-8	13-6	16-5	19-1
	Douglas fir-larch	#3	8-11	11-3	13-9	16-0	8-1	10-3	12-7	14-7
	Hem-fir	SS	10-9	14-2	18-0	21-11	10-9	14-2	18-0	21-11
	Hem-fir	#1	10-6	13-10	17-8	21-6	10-6	13-10	17-1	19-10
	Hem-fir	#2	10-0	13-2	16-10	20-4	10-0	13-1	16-0	18-6
	Hem-fir	#3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Southern pine	SS	11-2	14-8	18-9	22-10	11-2	14-8	18-9	22-10
	Southern pine	#1	10-9	14-2	18-0	21-11	10-9	14-2	16-11	20-1
	Southern pine	#2	10-3	13-6	16-2	19-1	9-10	12-6	14-9	17-5
	Southern pine	#3	8-2	10-3	12-6	14-9	7-5	9-5	11-5	13-6
	Spruce-pine-fir	SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-6
	Spruce-pine-fir	#1	10-3	13-6	17-3	20-7	10-3	13-3	16-3	18-10
	Spruce-pine-fir	#2	10-3	13-6	17-3	20-7	10-3	13-3	16-3	18-10
	Spruce-pine-fir	#3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
16	Douglas fir-larch	SS	10-4	13-7	17-4	21-1	10-4	13-7	17-4	21-1
	Douglas fir-larch	#1	9-11	13-1	16-5	19-1	9-8	12-4	15-0	17-5
	Douglas fir-larch	#2	9-9	12-9	15-7	18-1	9-3	11-8	14-3	16-6
	Douglas fir-larch	#3	7-8	9-9	11-11	13-10	7-0	8-11	10-11	12-7
	Hem-fir	SS	9-9	12-10	16-5	19-11	9-9	12-10	16-5	19-11
	Hem-fir	#1	9-6	12-7	16-0	18-10	9-6	12-2	14-10	17-2
	Hem-fir	#2	9-1	12-0	15-2	17-7	8-11	11-4	13-10	16-1
	Hem-fir	#3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4
	Southern pine	SS	10-2	13-4	17-0	20-9	10-2	13-4	17-0	20-9
	Southern pine	#1	9-9	12-10	16-1	19-1	9-9	12-7	14-8	17-5
	Southern pine	#2	9-4	11-10	14-0	16-6	8-6	10-10	12-10	15-1
	Southern pine	#3	7-1	8-11	10-10	12-10	6-5	8-2	9-10	11-8
	Spruce-pine-fir	SS	9-6	12-7	16-0	19-6	9-6	12-7	16-0	19-6
	Spruce-pine-fir	#1	9-4	12-3	15-5	17-10	9-1	11-6	14-1	16-3
	Spruce-pine-fir	#2	9-4	12-3	15-5	17-10	9-1	11-6	14-1	16-3
	Spruce-pine-fir	#3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4

TABLE R502.3.1(2)—continued
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES (Residential living areas, live load = 40 psf, L/Δ = 360)[b]

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
			(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)	(ft-in)
19.2	Douglas fir-larch	SS	9-8	12-10	16-4	19-10	9-8	12-10	16-4	19-6
	Douglas fir-larch	#1	9-4	12-4	15-0	17-5	8-10	11-3	13-8	15-11
	Douglas fir-larch	#2	9-2	11-8	14-3	16-6	8-5	10-8	13-0	15-1
	Douglas fir-larch	#3	7-0	8-11	10-11	12-7	6-5	8-2	9-11	11-6
	Hem-fir	SS	9-2	12-1	15-5	18-9	9-2	12-1	15-5	18-9
	Hem-fir	#1	9-0	11-10	14-10	17-2	8-9	11-1	13-6	15-8
	Hem-fir	#2	8-7	11-3	13-10	16-1	8-2	10-4	12-8	14-8
	Hem-fir	#3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
	Southern pine	SS	9-6	12-7	16-0	19-6	9-6	12-7	16-0	19-6
	Southern pine	#1	9-2	12-1	14-8	17-5	9-0	11-5	13-5	15-11
	Southern pine	#2	8-6	10-10	12-10	15-1	7-9	9-10	11-8	13-9
	Southern pine	#3	6-5	8-2	9-10	11-8	5-11	7-5	9-0	10-8
	Spruce-pine-fir	SS	9-0	11-10	15-1	18-4	9-0	11-10	15-1	17-9
	Spruce-pine-fir	#1	8-9	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Spruce-pine-fir	#2	8-9	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Spruce-pine-fir	#3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
24	Douglas fir-larch	SS	9-0	11-11	15-2	18-5	9-0	11-11	15-0	17-5
	Douglas fir-larch	#1	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Douglas fir-larch	#2	8-3	10-5	12-9	14-9	7-6	9-6	11-8	13-6
	Douglas fir-larch	#3	6-3	8-0	9-9	11-3	5-9	7-3	8-11	10-4
	Hem-fir	SS	8-6	11-3	14-4	17-5	8-6	11-3	14-4	16-10[a]
	Hem-fir	#1	8-4	10-10	13-3	15-5	7-10	9-11	12-1	14-0
	Hem-fir	#2	7-11	10-2	12-5	14-4	7-4	9-3	11-4	13-1
	Hem-fir	#3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1
	Southern pine	SS	8-10	11-8	14-11	18-1	8-10	11-8	14-11	18-0
	Southern pine	#1	8-6	11-3	13-1	15-7	8-1	10-3	12-0	14-3
	Southern pine	#2	7-7	9-8	11-5	13-6	7-0	8-10	10-5	12-4
	Southern pine	#3	5-9	7-3	8-10	10-5	5-3	6-8	8-1	9-6
	Spruce-pine-fir	SS	8-4	11-0	14-0	17-0	8-4	11-0	13-8	15-11
	Spruce-pine-fir	#1	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Spruce-pine-fir	#2	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Spruce-pine-fir	#3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

Note: Check sources for availability of lumber in lengths greater than 20 feet.

a. End bearing length shall be increased to 2 inches.

b. Dead load limits for townhouses in Seismic Design Category C and all structures in Seismic Design Categories D_0, D_1, and D_2 shall be determined in accordance with Section R301.2.2.2.

R502.3.3 Floor cantilevers. Floor cantilever spans shall not exceed the nominal depth of the wood floor joist. Floor cantilevers constructed in accordance with Table R502.3.3(1) shall be permitted where supporting a light-frame bearing wall and roof only. Floor cantilevers supporting an exterior balcony are permitted to be constructed in accordance with Table R502.3.3(2).

TABLE R502.3.3(1)
CANTILEVER SPANS FOR FLOOR JOISTS SUPPORTING LIGHT-FRAME EXTERIOR BEARING WALL AND ROOF ONLY[a, b, c, f, g, h]
(Floor live load ≤ 40 psf, roof live load ≤ 20 psf)

MEMBER & SPACING	MAXIMUM CANTILEVER SPAN (uplift force at backspan support in lb)[d, e]											
	Ground Snow Load											
	≤ 20 psf			30 psf			50 psf			70 psf		
	Roof Width			Roof Width			Roof Width			Roof Width		
	24 ft	32 ft	40 ft	24 ft	32 ft	40 ft	24 ft	32 ft	40 ft	24 ft	32 ft	40 ft
2 × 8 @ 12″	20″ (177)	15″ (227)	—	18″ (209)	—	—	—	—	—	—	—	—
2 × 10 @ 16″	29″ (228)	21″ (297)	16″ (364)	26″ (271)	18″ (354)	—	20″ (375)	—	—	—	—	—
2 × 10 @ 12″	36″ (166)	26″ (219)	20″ (270)	34″ (198)	22″ (263)	16″ (324)	26″ (277)	—	—	19″ (356)	—	—
2 × 12 @ 16″	—	32″ (287)	25″ (356)	36″ (263)	29″ (345)	21″ (428)	29″ (367)	20″ (484)	—	23″ (471)	—	—
2 × 12 @ 12″	—	42″ (209)	31″ (263)	—	37″ (253)	27″ (317)	36″ (271)	27″ (358)	17″ (447)	31″ (348)	19″ (462)	—
2 × 12 @ 8″	—	48″ (136)	45″ (169)	—	48″ (164)	38″ (206)	—	40″ (233)	26″ (294)	36″ (230)	29″ (304)	18″ (379)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. Tabulated values are for clear-span roof supported solely by exterior bearing walls.

b. Spans are based on No. 2 Grade lumber of Douglas fir-larch, Southern pine, hem-fir and spruce-pine-fir for repetitive (three or more) members.

c. Ratio of backspan to cantilever span shall be not less than 3:1.

d. Connections capable of resisting the indicated uplift force shall be provided at the backspan support.

e. Uplift force is for a backspan to cantilever span ratio of 3:1. Tabulated uplift values are permitted to be reduced by multiplying by a factor equal to 3 divided by the actual backspan ratio provided (3/backspan ratio).

f. See Section R301.2.2.6, Item 1, for additional limitations on cantilevered floor joists for detached one- and two-family dwellings in Seismic Design Category D_0, D_1 or D_2 and townhouses in Seismic Design Category C, D_0, D_1 or D_2.

g. A full-depth rim joist shall be provided at the unsupported end of the cantilever joists. Solid blocking shall be provided at the supported end. Where the cantilever length is 24 inches or less and the building is assigned to Seismic Design Category A, B or C, solid blocking at the support for the cantilever shall not be required.

h. Linear interpolation shall be permitted for building widths and ground snow loads other than shown.

TABLE R502.3.3(2)
CANTILEVER SPANS FOR FLOOR JOISTS SUPPORTING EXTERIOR BALCONY[a, b, e, f]

MEMBER SIZE	SPACING	MAXIMUM CANTILEVER SPAN (uplift force at backspan support in lb)[c, d]		
		Ground Snow Load		
		≤ 30 psf	50 psf	70 psf
2 × 8	12″	42″ (139)	39″ (156)	34″ (165)
2 × 8	16″	36″ (151)	34″ (171)	29″ (180)
2 × 10	12″	61″ (164)	57″ (189)	49″ (201)
2 × 10	16″	53″ (180)	49″ (208)	42″ (220)
2 × 10	24″	43″ (212)	40″ (241)	34″ (255)
2 × 12	16″	72″ (228)	67″ (260)	57″ (268)
2 × 12	24″	58″ (279)	54″ (319)	47″ (330)

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. Spans are based on No. 2 Grade lumber of Douglas fir-larch, Southern pine, hem-fir, and spruce-pine-fir for repetitive (three or more) members.

b. Ratio of backspan to cantilever span shall be not less than 2:1.

c. Connections capable of resisting the indicated uplift force shall be provided at the backspan support.

d. Uplift force is for a backspan to cantilever span ratio of 2:1. Tabulated uplift values are permitted to be reduced by multiplying by a factor equal to 2 divided by the actual backspan ratio provided (2/backspan ratio).

e. A full-depth rim joist shall be provided at the unsupported end of the cantilever joists. Solid blocking shall be provided at the supported end. Where the cantilever length is 24 inches or less and the building is assigned to Seismic Design Category A, B or C, solid blocking at the support for the cantilever shall not be required.

f. Linear interpolation shall be permitted for ground snow loads other than shown.

R502.4 Joists under bearing partitions. Joists under parallel bearing partitions shall be of adequate size to support the load. Double joists, sized to adequately support the load, that are separated to permit the installation of piping or vents shall be full-depth solid blocked with lumber not less than 2 inches (51 mm) in nominal thickness spaced not more than 4 feet (1219 mm)

on center. Bearing partitions perpendicular to joists shall not be offset from supporting girders, walls or partitions more than the joist depth unless such joists are of sufficient size to carry the additional load.

R502.5 Allowable girder and header spans. The allowable spans of girders and headers fabricated of dimension lumber shall not exceed the values set forth in Tables R602.7(1), R602.7(2) and R602.7(3).

R502.6 Bearing. The ends of each joist, beam or girder shall have not less than 1-1/2 inches (38 mm) of bearing on wood or metal, have not less than 3 inches of bearing (76 mm) on masonry or concrete or be supported by *approved* joist hangers. Alternatively, the ends of joists shall be supported on a 1-inch by 4-inch (25 mm by 102 mm) ribbon strip and shall be nailed to the adjacent stud. The bearing on masonry or concrete shall be direct, or a sill plate of 2-inch-minimum (51 mm) nominal thickness shall be provided under the joist, beam or girder. The sill plate shall provide a minimum nominal bearing area of 48 square inches (30 865 mm^2).

R502.6.1 Floor systems. Joists framing from opposite sides over a bearing support shall lap not less than 3 inches (76 mm) and shall be nailed together with a minimum three 10d face nails. A wood or metal splice with strength equal to or greater than that provided by the nailed lap is permitted.

R502.6.2 Joist framing. Joists framing into the side of a wood girder shall be supported by *approved* framing anchors or on ledger strips not less than nominal 2 inches by 2 inches (51 mm by 51 mm).

R502.7 Lateral restraint at supports. Joists shall be supported laterally at the ends by full-depth solid blocking not less than 2 inches (51 mm) nominal in thickness; or by attachment to a full-depth header, band or rim joist, or to an adjoining stud or shall be otherwise provided with lateral support to prevent rotation.

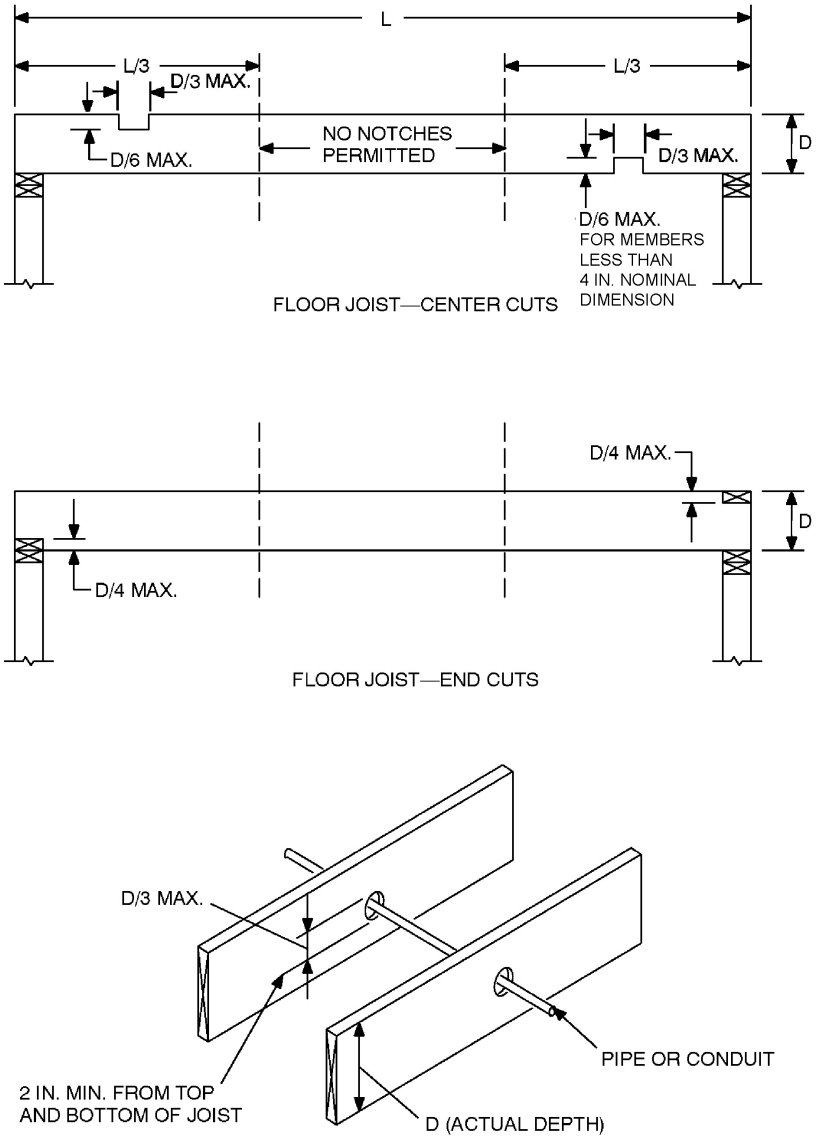
Exceptions:

1. Trusses, *structural composite lumber*, structural glued-laminated members and I-joists shall be supported laterally as required by the manufacturer's recommendations.
2. In *Seismic Design Categories* D_0, D_1 and D_2, lateral restraint shall be provided at each intermediate support.

R502.7.1 Bridging. Joists exceeding a nominal 2 inches by 12 inches (51 mm by 305 mm) shall be supported laterally by solid blocking, diagonal bridging (wood or metal), or a continuous 1-inch by 3-inch (25 mm by 76 mm) strip nailed across the bottom of joists perpendicular to joists at intervals not exceeding 8 feet (2438 mm).

Exception: Trusses, *structural composite lumber*, structural glued-laminated members and I-joists shall be supported laterally as required by the manufacturer's recommendations.

R502.8 Cutting, drilling and notching. Structural floor members shall not be cut, bored or notched in excess of the limitations specified in this section. See Figure R502.8.



For SI: 1 inch = 25.4 mm.

FIGURE R502.8
CUTTING, NOTCHING AND DRILLING

R502.8.1 Sawn lumber. Notches in solid lumber joists, rafters and beams shall not exceed one-sixth of the depth of the member, shall not be longer than one-third of the depth of the member and shall not be located in the middle one-third of the span. Notches at the ends of the member shall not exceed one-fourth the depth of the member. The tension side of members 4 inches (102 mm) or greater in nominal thickness shall not be notched except at the ends of the members. The diameter of holes bored or cut into members shall not exceed one-third the depth of the member. Holes shall not be closer than 2 inches (51 mm) to the top or bottom of the member, or to any other hole located in the member. Where the member is notched, the hole shall not be closer than 2 inches (51 mm) to the notch.

R502.8.2 Engineered wood products. Cuts, notches and holes bored in trusses, *structural composite lumber*, structural glue-laminated members, cross-laminated timber members or I-joists are prohibited except where permitted by the manufacturer's recommendations or where the effects of such alterations are specifically considered in the design of the member by a *registered design professional*.

R502.9 Fastening. Floor framing shall be nailed in accordance with Table R602.3(1). Where posts and beam or girder construction is used to support floor framing, positive connections shall be provided to ensure against uplift and lateral displacement.

R502.10 Framing of openings. Openings in floor framing shall be framed with header and trimmer joists. Where the header joist span does not exceed 4 feet (1219 mm), the header joist shall be a single member the same size as the floor joist. Single trimmer joists shall be used to carry a single header joist that is located within 3 feet (914 mm) of the trimmer joist bearing. Where the header joist span exceeds 4 feet (1219 mm), the trimmer joists and the header joist shall be doubled and of sufficient cross section to support the floor joists framing into the header.

R502.11 Wood trusses.

R502.11.1 Design. Wood trusses shall be designed in accordance with *approved* engineering practice. The design and manufacture of metal-plate-connected wood trusses shall comply with ANSI/TPI 1. The *truss design drawings* shall be prepared by a *registered design professional* where required by the statutes of the *jurisdiction* in which the project is to be constructed in accordance with Section R106.1.

R502.11.2 Bracing. Trusses shall be braced to prevent rotation and provide lateral stability in accordance with the requirements specified in the *construction documents* for the building and on the individual *truss design drawings*. In the absence of specific bracing requirements, trusses shall be braced in accordance with accepted industry practices, such as the SBCA *Building Component Safety Information (BCSI) Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses.*

R502.11.3 Alterations to trusses. Truss members and components shall not be cut, notched, spliced or otherwise altered in any way without the approval of a *registered design professional*. *Alterations* resulting in the addition of load that exceeds the design load for the truss, shall not be permitted without verification that the truss is capable of supporting the additional loading.

R502.11.4 Truss design drawings. *Truss design drawings*, prepared in compliance with Section R502.11.1, shall be submitted to the *building official* and *approved* prior to installation. *Truss design drawings* shall be provided with the shipment of trusses delivered to the job site. *Truss design drawings* shall include, at a minimum, the information specified as follows:

1. Slope or depth, span and spacing.
2. Location of all joints.
3. Required bearing widths.
4. Design loads as applicable:
    4.1. Top chord *live load*.
    4.2. Top chord dead load.
    4.3. Bottom chord *live load*.
    4.4. Bottom chord dead load.
    4.5. Concentrated loads and their points of application.
    4.6. Controlling wind and earthquake loads.
5. Adjustments to lumber and joint connector design values for conditions of use.
6. Each reaction force and direction.
7. Joint connector type and description, such as size, thickness or gage, and the dimensioned location of each joint connector except where symmetrically located relative to the joint interface.
8. Lumber size, species and grade for each member.
9. Connection requirements for:
    9.1. Truss-to-girder-truss.
    9.2. Truss ply-to-ply.
    9.3. Field splices.
10. Calculated deflection ratio, maximum description for live and total load, or both.
11. Maximum axial compression forces in the truss members to enable the building designer to design the size, connections and anchorage of the permanent continuous lateral bracing. Forces shall be shown on the truss drawing or on supplemental documents.
12. Required permanent truss member bracing location.

R502.12 Draftstopping required. Draftstopping shall be provided in accordance with Section R302.12.

R502.13 Fireblocking required. Fireblocking shall be provided in accordance with Section R302.11.

SECTION R503
FLOOR SHEATHING

R503.1 Lumber sheathing. Maximum allowable spans for lumber used as floor sheathing shall conform to Tables R503.1, R503.2.1.1(1) and R503.2.1.1(2).

TABLE R503.1
MINIMUM THICKNESS OF LUMBER FLOOR SHEATHING

JOIST OR BEAM SPACING (inches)	MINIMUM NET THICKNESS	
	Perpendicular to joist	Diagonal to joist
24	11/16	3/4
16	5/8	5/8
48[a]	1-1/2 T & G	N/A
54[b]		
60[c]		

For SI: 1 inch = 25.4 mm, 1 pound per square inch = 6.895 kPa.
N/A = Not Applicable.
a. For this support spacing, lumber sheathing shall have a minimum F_b of 675 and minimum E of 1,100,000 (see ANSI AWC NDS).
b. For this support spacing, lumber sheathing shall have a minimum F_b of 765 and minimum E of 1,400,000 (see ANSI AWC NDS).
c. For this support spacing, lumber sheathing shall have a minimum F_b of 855 and minimum E of 1,700,000 (see ANSI AWC NDS).

R503.1.1 End joints. End joints in lumber used as subflooring shall occur over supports unless end-matched lumber is used, in which case each piece shall bear on not less than two joists. Subflooring shall be permitted to be omitted where joist spacing does not exceed 16 inches (406 mm) and a 1-inch (25 mm) nominal tongue-and-groove wood strip flooring is applied perpendicular to the joists.

R503.2 Wood structural panel sheathing.

R503.2.1 Identification and grade. *Wood structural panel* sheathing used for structural purposes shall conform to CSA O325, CSA O437 DOC PS 1 or DOC PS 2. Panels shall be identified for grade, bond classification and Performance Category by a grade *mark* or certificate of inspection issued by an *approved* agency. The Performance Category value shall be used as the "nominal *panel thickness*" or "*panel thickness*" wherever referenced in this code.

R503.2.1.1 Subfloor and combined subfloor underlayment. Where used as subflooring or combination subfloor underlayment, *wood structural panels* shall be of one of the grades specified in Table R503.2.1.1(1). Where sanded plywood is used as combination subfloor underlayment, the grade, bond classification, and Performance Category shall be as specified in Table R503.2.1.1(2).

TABLE R503.2.1.1(1)
ALLOWABLE SPANS AND LOADS FOR WOOD STRUCTURAL PANELS FOR ROOF AND SUBFLOOR SHEATHING AND COMBINATION SUBFLOOR UNDERLAYMENT[a, b, c]

SPAN RATING	MINIMUM NOMINAL PANEL THICKNESS (inch)	ALLOWABLE LIVE LOAD (psf)[h, l]		MAXIMUM SPAN (inches)		LOAD (pounds per square foot, at maximum span)		MAXIMUM SPAN (inches)
		SPAN @ 16″ o.c.	SPAN @ 24″ o.c.	With edge support[d]	Without edge support	Total load	Live load	
Sheathing[e]				Roof[f]				Subfloor[j]
16/0	3/8	30	—	16	16	40	30	0
20/0	3/8	50	—	20	20	40	30	0
24/0	3/8	100	30	24	20[g]	40	30	0
24/16	7/16	100	40	24	24	50	40	16
32/16	15/32, 1/2	180	70	32	28	40	30	16[h]
40/20	19/32, 5/8	305	130	40	32	40	30	20[h, i]
48/24	23/32, 3/4	—	175	48	36	45	35	24
60/32	7/8	—	305	60	48	45	35	32
Underlayment, C-C plugged, single floor[e]				Roof[f]				Combination subfloor underlayment[k]
16 o.c.	19/32, 5/8	100	40	24	24	50	40	16[i]
20 o.c.	19/32, 5/8	150	60	32	32	40	30	20[i, j]
24 o.c.	23/32, 3/4	240	100	48	36	35	25	24
32 o.c.	7/8	—	185	48	40	50	40	32
48 o.c.	1-3/32, 1-1/8	—	290	60	48	50	40	48

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. The allowable total loads were determined using a dead load of 10 psf. If the dead load exceeds 10 psf, then the live load shall be reduced accordingly.

b. Panels continuous over two or more spans with long dimension (strength axis) perpendicular to supports. Spans shall be limited to values shown because of possible effect of concentrated loads.

c. Applies to panels 24 inches or wider.

d. Lumber blocking, panel edge clips (one midway between each support, except two equally spaced between supports where span is 48 inches), tongue-and-groove panel edges, or other approved type of edge support.

e. Includes Structural I panels in these grades.

f. Uniform load deflection limitation: 1/180 of span under live load plus dead load, 1/240 of span under live load only.

g. Maximum span 24 inches for 15/32- and 1/2-inch panels.

h. Maximum span 24 inches where 3/4-inch wood finish flooring is installed at right angles to joists.

i. Maximum span 24 inches where 1.5 inches of lightweight concrete or approved cellular concrete is placed over the subfloor.

j. Unsupported edges shall have tongue-and-groove joints or shall be supported with blocking unless minimum nominal 1/4-inch-thick wood panel-type underlayment, fiber-cement underlayment with end and edge joints offset not less than 2 inches or 1-1/2 inches of lightweight concrete or approved cellular concrete is placed over the subfloor, or 3/4-inch wood finish flooring is installed at right angles to the supports. Fiber-cement underlayment shall comply with ASTM C1288 or ISO 8336 Category C. Allowable uniform live load at maximum span, based on deflection of 1/360 of span, is 100 psf.

k. Unsupported edges shall have tongue-and-groove joints or shall be supported by blocking unless nominal 1/4-inch-thick wood panel-type underlayment, fiber-cement underlayment with end and edge joints offset not less than 2 inches or 3/4-inch wood finish flooring is installed at right angles to the supports. Fiber-cement underlayment shall comply with ASTM C1288 or ISO 8336 Category C. Allowable uniform live load at maximum span, based on deflection of 1/360 of span, is 100 psf, except panels with a span rating of 48 on center are limited to 65 psf total uniform load at maximum span.

l. Allowable live load values at spans of 16 inches on center and 24 inches on center taken from referenced standard APA E30, *APA Engineered Wood Construction Guide*. Refer to referenced standard for allowable spans not listed in the table.

TABLE R503.2.1.1(2)
ALLOWABLE SPANS FOR SANDED PLYWOOD COMBINATION SUBFLOOR UNDERLAYMENT[a]

IDENTIFICATION	SPACING OF JOISTS (inches)		
	16	20	24
Species group[b]	—	—	—
1	1/2	5/8	3/4
2, 3	5/8	3/4	7/8
4	3/4	7/8	1

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. Plywood continuous over two or more spans and face grain perpendicular to supports. Unsupported edges shall be tongue-and-groove or blocked except where nominal 1/4-inch-thick wood panel-type underlayment, fiber-cement underlayment or 3/4-inch wood finish floor is used. Fiber-cement underlayment shall comply with ASTM C1288 or ISO 8336 Category C. Allowable uniform live load at maximum span based on deflection of 1/360 of span is 100 psf.

b. Applicable to all grades of sanded exterior-type plywood.

R503.2.2 Allowable spans. The maximum allowable span for *wood structural panels* used as subfloor or combination subfloor underlayment shall be as set forth in Table R503.2.1.1(1), or APA E30. The maximum span for sanded plywood combination subfloor underlayment shall be as set forth in Table R503.2.1.1(2).

R503.2.3 Installation. *Wood structural panels* used as subfloor or combination subfloor underlayment shall be attached to wood framing in accordance with Table R602.3(1) and shall be attached to cold-formed steel framing in accordance with Table R505.3.1(2).

R503.3 Particleboard.

R503.3.1 Identification and grade. Particleboard shall conform to ANSI A208.1 and shall be so identified by a grade *mark* or certificate of inspection issued by an *approved agency*.

R503.3.2 Floor underlayment. Particleboard floor underlayment shall conform to Type PBU and shall be not less than 1/4 inch (6.4 mm) in thickness.

R503.3.3 Installation. Particleboard underlayment shall be installed in accordance with the recommendations of the manufacturer and attached to framing in accordance with Table R602.3(1).

SECTION R504
PRESSURE PRESERVATIVE-TREATED WOOD FLOORS (ON GROUND)

R504.1 General. Pressure preservative-treated wood *basement* floors and floors on ground shall be designed to withstand axial forces and bending moments resulting from lateral soil pressures at the base of the exterior walls and floor live and dead loads. Floor framing shall be designed to meet joist deflection requirements in accordance with Section R301.

R504.1.1 Unbalanced soil loads. Unless special provision is made to resist sliding caused by unbalanced lateral soil loads, wood *basement* floors shall be limited to applications where the differential depth of fill on opposite exterior foundation walls is 2 feet (610 mm) or less.

R504.1.2 Construction. Joists in wood *basement* floors shall bear tightly against the narrow face of studs in the foundation wall or directly against a band joist that bears on the studs. Plywood subfloor shall be continuous over lapped joists or over butt joints between in-line joists. Sufficient blocking shall be provided between joists to transfer lateral forces at the base of the end walls into the floor system.

R504.1.3 Uplift and buckling. Where required, resistance to uplift or restraint against buckling shall be provided by interior bearing walls or properly designed stub walls anchored in the supporting soil below.

R504.2 Site preparation. The area within the foundation walls shall have all vegetation, topsoil and foreign material removed, and any fill material that is added shall be free of vegetation and foreign material. The fill shall be compacted to ensure uniform support of the pressure preservative-treated wood floor sleepers.

R504.2.1 Base. A minimum 4-inch-thick (102 mm) granular base of gravel having a maximum size of 3/4 inch (19.1 mm) or crushed stone having a maximum size of 1/2 inch (12.7 mm) shall be placed over the compacted earth.

R504.2.2 Moisture barrier. Polyethylene sheeting of minimum 6-mil (0.15 mm) thickness shall be placed over the granular base. Joints shall be lapped 6 inches (152 mm) and left unsealed. The polyethylene membrane shall be placed over the pressure preservative-treated wood sleepers and shall not extend beneath the footing plates of the exterior walls.

R504.3 Materials. Framing materials, including sleepers, joists, blocking and plywood subflooring, shall be pressure-preservative treated and dried after treatment in accordance with AWPA U1 (Commodity Specification A, Special Requirement 4.2), and shall bear the *label* of an accredited agency.

SECTION R505
COLD-FORMED STEEL FLOOR FRAMING

R505.1 Cold-formed steel floor framing. Elements shall be straight and free of any defects that would significantly affect structural performance. Cold-formed steel floor framing members shall be in accordance with the requirements of this section.

R505.1.1 Applicability limits. The provisions of this section shall control the construction of cold-formed steel floor framing for buildings not greater than 60 feet (18 288 mm) in length perpendicular to the joist span, not greater than 40 feet (12 192 mm) in width parallel to the joist span and less than or equal to three *stories* above *grade plane*. Cold-formed steel floor framing constructed in accordance with the provisions of this section shall be limited to sites where the ultimate design wind speed is less than 140 miles per hour (63 m/s), Exposure Category B or C, and the ground snow load is less than or equal to 70 pounds per square foot (3.35 kPa).

R505.1.1.1 Alternate applications. Cold-formed steel floor framing for buildings exceeding the applicability limits of Section R505.1.1 is permitted to be designed and constructed in accordance with AISI S230, subject to the limits therein.

R505.1.2 In-line framing. Where supported by cold-formed steel-framed walls in accordance with Section R603, cold-formed steel floor framing shall be constructed with floor joists located in-line with load-bearing studs located below the joists in accordance with the tolerances specified in AISI S240, Section B1.2.3.

R505.1.3 Floor trusses. Cold-formed steel trusses shall be designed, braced and installed in accordance with AISI S230, Section D8. In the absence of specific bracing requirements, trusses shall be braced in accordance with accepted industry practices, such as the SBCA *Cold-Formed Steel Building Component Safety Information (CFSBCSI), Guide to Good Practice for Handling, Installing & Bracing of Cold-Formed Steel Trusses.* Truss members shall not be notched, cut or altered in any manner without an *approved* design.

R505.2 Structural framing. Load-bearing cold-formed steel floor framing members shall be in accordance with this section.

R505.2.1 Material. Load-bearing cold-formed steel framing members shall be cold formed to shape from structural quality sheet steel complying with the requirements of AISI S240, Section A3.

R505.2.2 Corrosion protection. Load-bearing cold-formed steel framing shall have a metallic coating complying with AISI S240, Section A4.

R505.2.3 Dimension, thickness and material grade. Load-bearing cold-formed steel floor framing members shall comply with AISI S230, Section A4.3 and material grade requirements as specified in AISI S230, Section A4.4.

R505.2.4 Identification. Load-bearing cold-formed steel framing members shall meet the product identification requirements of AISI S240, Section A5.5.

R505.2.5 Fastening. Screws for steel-to-steel connections shall be installed with a minimum edge distance and center-to-center spacing of 1/2 inch (12.7 mm), shall be self-drilling tapping, and shall conform to ASTM C1513. Floor sheathing shall be attached to cold-formed steel joists with minimum No. 8 self-drilling tapping screws that conform to ASTM C1513. Screws attaching floor sheathing to cold-formed steel joists shall have a minimum head diameter of 0.292 inch (7.4 mm) with countersunk heads and shall be installed with a minimum edge distance of 3/8 inch (9.5 mm). Gypsum board ceilings shall be attached to cold-formed steel joists with minimum No. 6 screws conforming to ASTM C954 or ASTM C1513 with a bugle-head style and shall be installed in accordance with Section R702. For all connections, screws shall extend through the steel not fewer than three exposed threads. Fasteners shall have a rust-inhibitive coating suitable for the installation in which they are being used, or be manufactured from material not susceptible to corrosion.

R505.2.6 Web holes, web hole reinforcing and web hole patching. Web holes in floor framing members shall comply with the conditions as prescribed in AISI S230, Section A4.5. Web holes not in compliance with the conditions as prescribed in AISI S230, Section A4.5 shall be reinforced in accordance with the provisions of AISI S230, Section A4.6 or patched in accordance with the provisions of AISI S230, Section A4.7.

R505.3 Floor construction. Cold-formed steel floors shall be constructed in accordance with this section.

R505.3.1 Floor-to-foundation or load-bearing wall connections. Cold-formed steel-framed floors shall be anchored to foundations, wood sills or *load-bearing walls* in accordance with Table R505.3.1(1) and Figure R505.3.1(1), R505.3.1(2), R505.3.1(3), R505.3.1(4), R505.3.1(5) or R505.3.1(6). Anchor bolts shall be located not more than 12 inches (305 mm) from corners or the termination of bottom tracks. Continuous cold-formed steel joists supported by interior *load-bearing walls* shall be constructed in accordance with Figure R505.3.1(7). Lapped cold-formed steel joists shall be constructed in accordance with Figure R505.3.1(8). End floor joists constructed on foundation walls parallel to the joist span shall be doubled unless a C-shaped bearing stiffener, sized in accordance with Section R505.3.4, is installed web-to-web with the floor joist beneath each supported wall stud, as shown in Figure R505.3.1(9). Fastening of cold-formed steel joists to other framing members shall be in accordance with Section R505.2.5 and Table R505.3.1(2).

TABLE R505.3.1(1)
FLOOR-TO-FOUNDATION OR BEARING WALL CONNECTION REQUIREMENTS[a, b]

FRAMING CONDITION	BASIC ULTIMATE WIND SPEED (mph) AND EXPOSURE	
	110 mph Exposure Category C or less than 139 mph Exposure Category B	Less than 139 mph Exposure Category C
Floor joist to wall track of exterior wall in accordance with Figure R505.3.1(1)	2-No. 8 screws	3-No. 8 screws
Rim track or end joist to load-bearing wall top track in accordance with Figure R505.3.1(1)	1-No. 8 screw at 24 inches o.c.	1-No. 8 screw at 24 inches o.c.
Rim track or end joist to wood sill in accordance with Figure R505.3.1(2)	Steel plate spaced at 4 feet o.c. with 4-No. 8 screws and 4-10d or 6-8d common nails	Steel plate spaced at 2 feet o.c. with 4-No. 8 screws and 4-10d or 6-8d common nails
Rim track or end joist to foundation in accordance with Figure R505.3.1(3)	1/2-inch minimum diameter anchor bolt and clip angle spaced at 6 feet o.c. with 8-No. 8 screws	1/2-inch minimum diameter anchor bolt and clip angle spaced at 4 feet o.c. with 8-No. 8 screws
Cantilevered joist to foundation in accordance with Figure R505.3.1(4)	1/2-inch minimum diameter anchor bolt and clip angle spaced at 6 feet o.c. with 8-No. 8 screws	1/2-inch minimum diameter anchor bolt and clip angle spaced at 4 feet o.c. with 8-No. 8 screws
Cantilevered joist to wood sill in accordance with Figure R505.3.1(5)	Steel plate spaced at 4 feet o.c. with 4-No. 8 screws and 4-10d or 6-8d common nails	Steel plate spaced at 2 feet o.c. with 4-No. 8 screws and 4-10d or 6-8d common nails
Cantilevered joist to exterior load-bearing wall track in accordance with Figure R505.3.1(6)	2-No. 8 screws	3-No. 8 screws

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

a. Anchor bolts are to be located not more than 12 inches from corners or the termination of bottom tracks such as at door openings or corners. Bolts extend not less than 15 inches into masonry or 7 inches into concrete. Anchor bolts connecting cold-formed steel framing to the foundation structure are to be installed so that the distance from the center of the bolt hole to the edge of the connected member is not less than one and one-half bolt diameters.

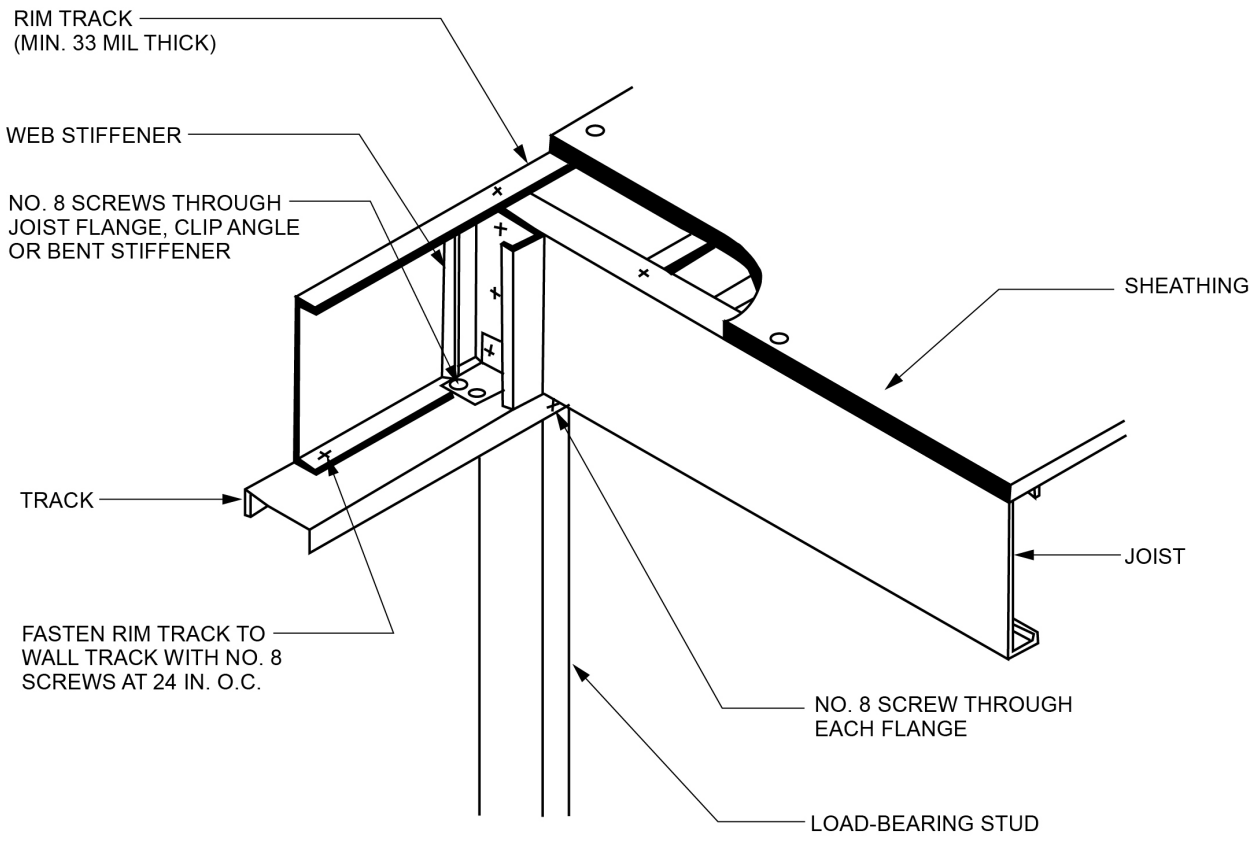
b. All screw sizes shown are minimum.

TABLE R505.3.1(2)
FLOOR FASTENING SCHEDULE[a]

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND SIZE OF FASTENERS	SPACING OF FASTENERS
Floor joist to track of an interior load-bearing wall in accordance with Figures R505.3.1(7) and R505.3.1(8)	2-No. 8 screws	Each joist
Floor joist to track at end of joist	2-No. 8 screws	One per flange or two per bearing stiffener
Subfloor to floor joists	No. 8 screws	6 in. o.c. on edges and 12 in. o.c. at intermediate supports

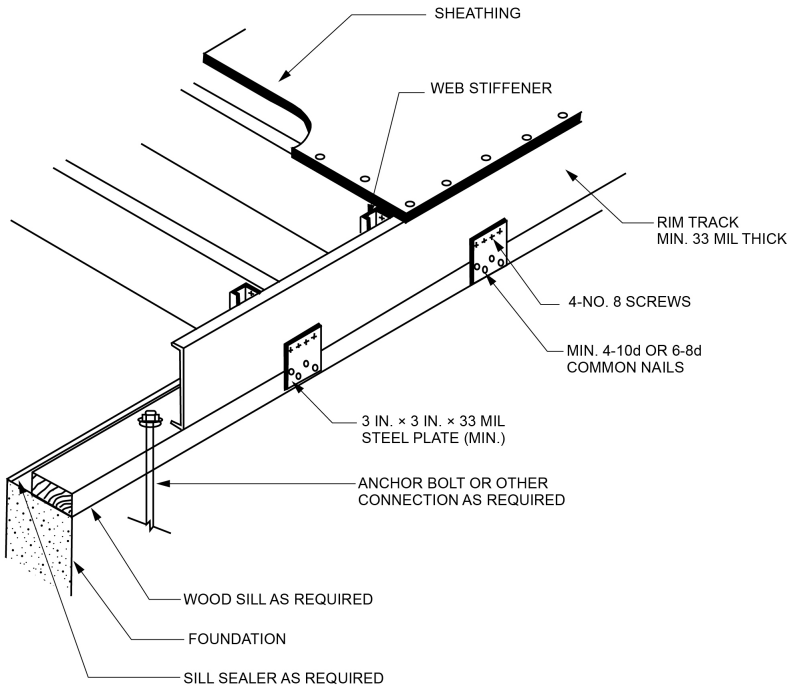
For SI: 1 inch = 25.4 mm.

a. All screw sizes shown are minimum.



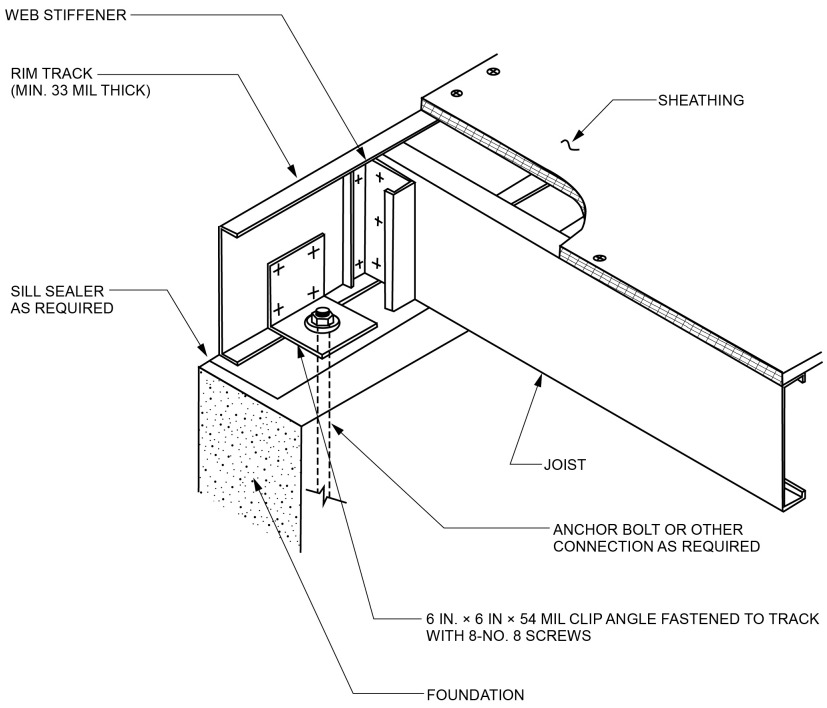
For SI: 1 mil = 0.0254 mm, 1 inch = 25.4 mm.

FIGURE R505.3.1(1)
FLOOR-TO-EXTERIOR LOAD-BEARING WALL STUD CONNECTION



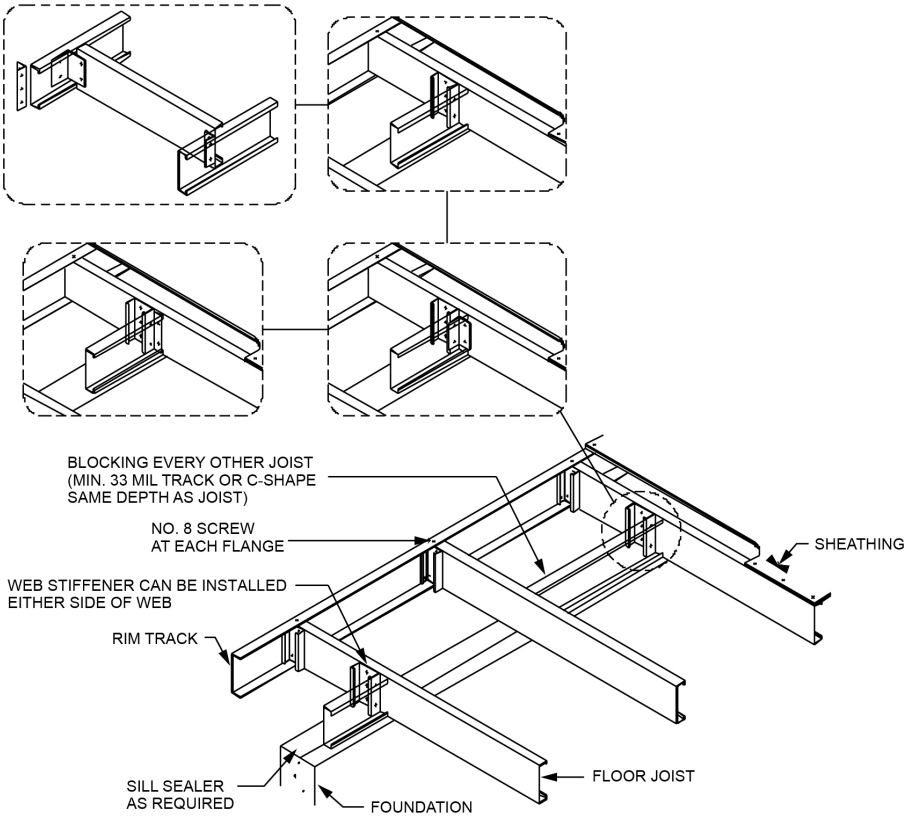
For SI: 1 mil = 0.0254 mm, 1 inch = 25.4 mm.

FIGURE R505.3.1(2)
FLOOR-TO-WOOD-SILL CONNECTION



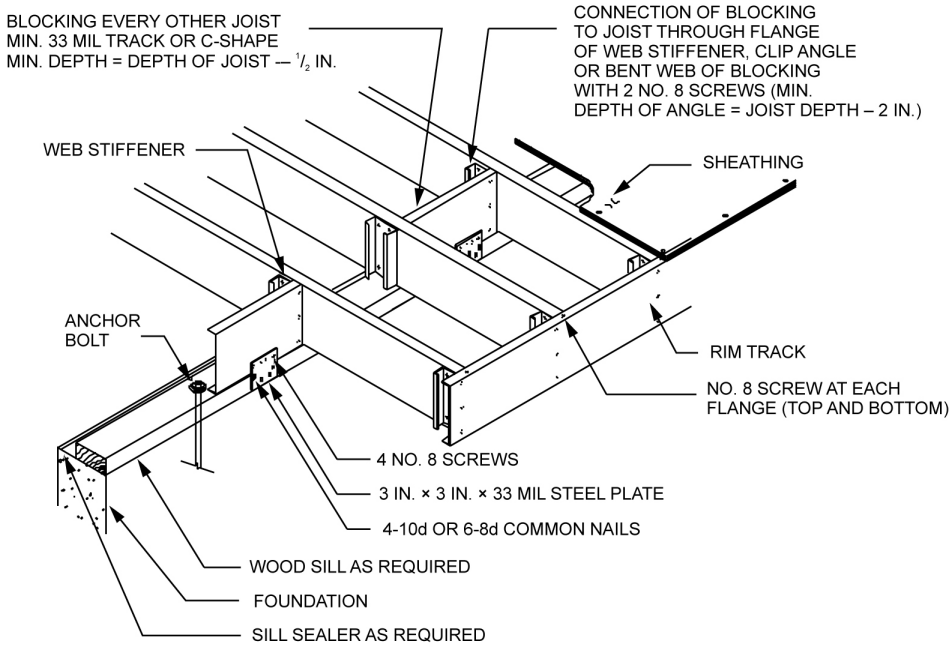
For SI: 1 mil = 0.0254 mm, 1 inch = 25.4 mm.

FIGURE R505.3.1(3)
FLOOR-TO-FOUNDATION CONNECTION



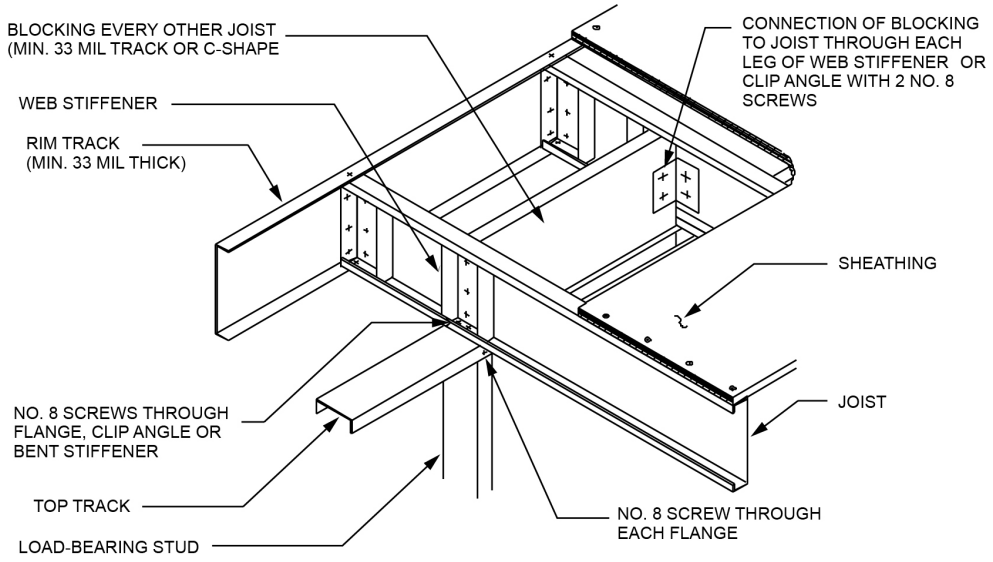
For SI: 1 mil = 0.0254 mm.

FIGURE R505.3.1(4)
CANTILEVERED FLOOR-TO-FOUNDATION CONNECTION



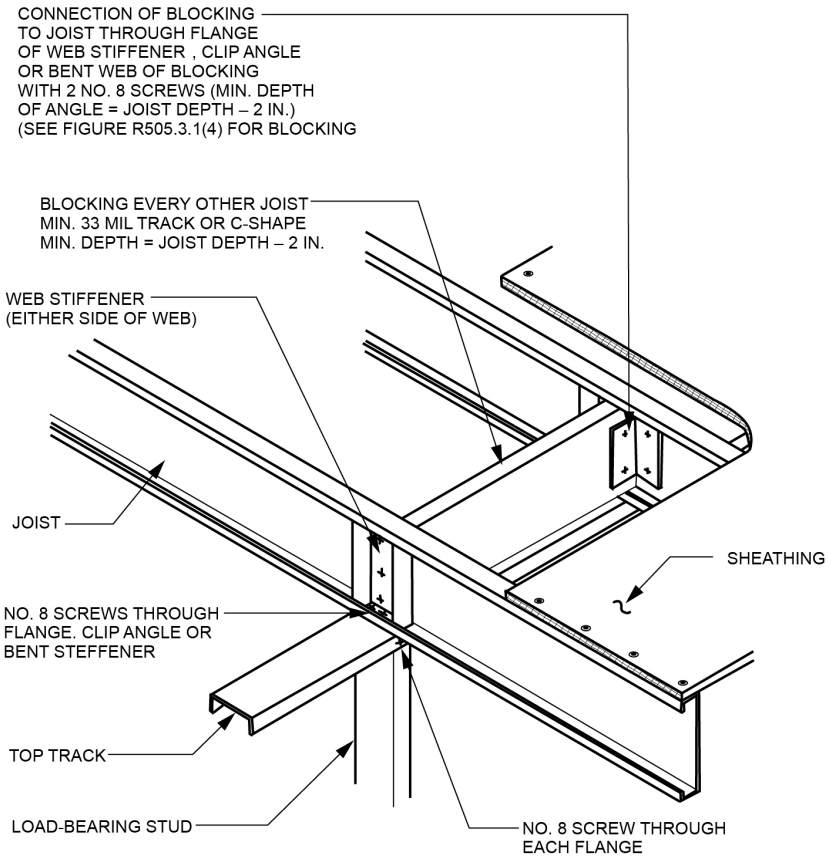
For SI: 1 mil = 0.0254 mm, 1 inch = 25.4 mm.

FIGURE R505.3.1(5)
CANTILEVERED FLOOR-TO-WOOD-SILL CONNECTION



For SI: 1 mil = 0.0254 mm, 1 inch = 25.4 mm.

FIGURE R505.3.1(6)
CANTILEVERED FLOOR TO EXTERIOR LOAD-BEARING WALL CONNECTION



For SI: 1 mil = 0.0254 mm, 1 inch = 25.4 mm.

FIGURE R505.3.1(7)
CONTINUOUS SPAN JOIST SUPPORTED ON INTERIOR LOAD-BEARING WALL

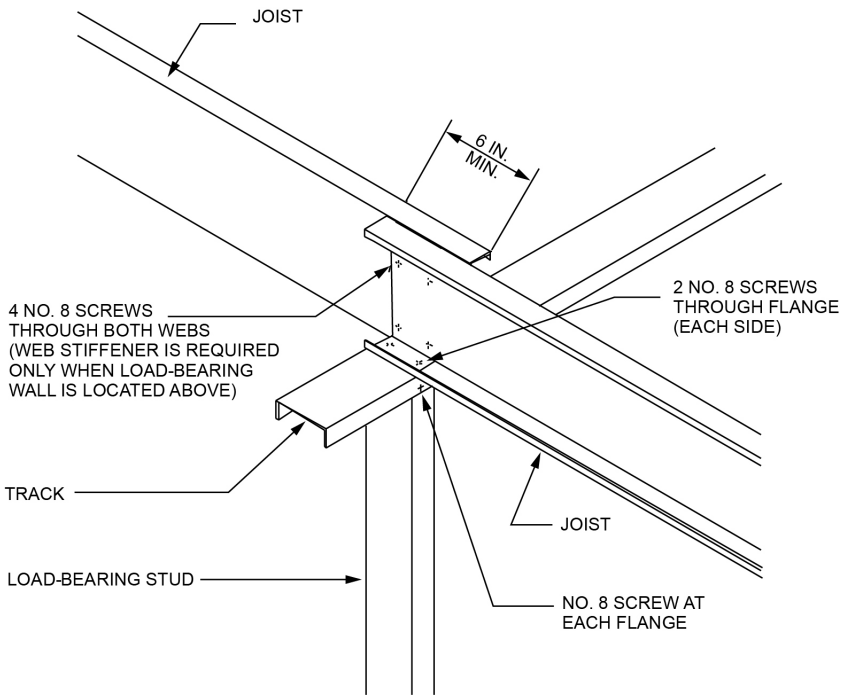


FIGURE R505.3.1(8)
LAPPED JOISTS SUPPORTED ON INTERIOR LOAD-BEARING WALL

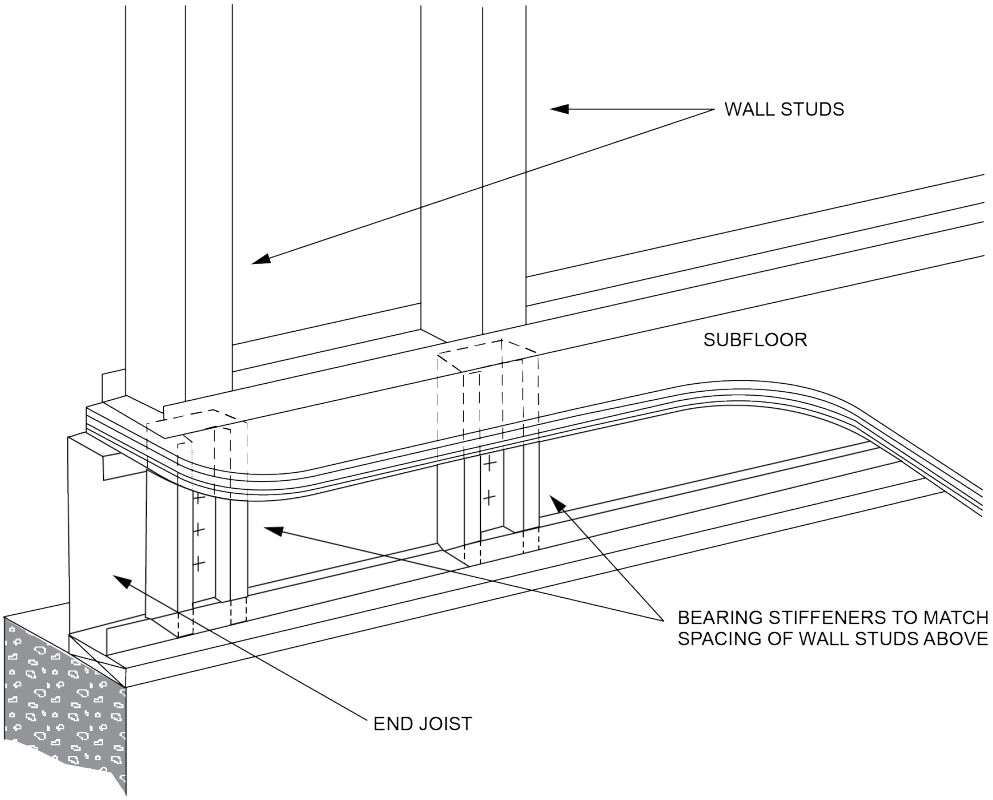


FIGURE R505.3.1(9)
BEARING STIFFENERS FOR END JOISTS

R505.3.2 Minimum floor joist sizes. Floor joist size and thickness shall be determined in accordance with the limits set forth in Table R505.3.2 for single or continuous spans. Where continuous joist members are used, the interior bearing

supports shall be located within 2 feet (610 mm) of midspan of the cold-formed steel joists, and the individual spans shall not exceed the spans in Table R505.3.2. Floor joists shall have a bearing support length of not less than 1-1/2 inches (38 mm) for exterior wall supports and 3-1/2 inches (89 mm) for interior wall supports. Tracks shall be not less than 33 mils (0.84 mm) thick except where used as part of a floor header or trimmer in accordance with Section R505.3.8. Bearing stiffeners shall be installed in accordance with Section R505.3.4.

TABLE R505.3.2
ALLOWABLE SPANS FOR COLD-FORMED STEEL JOISTS—SINGLE OR CONTINUOUS SPANS[a, b, c, d, e, f]

JOIST DESIGNATION	30 PSF LIVE LOAD				40 PSF LIVE LOAD			
	Spacing (inches)				Spacing (inches)			
	12	16	19.2	24	12	16	19.2	24
550S162-33	11′-8″	10′-4″	9′-5″	8′-5″	10′-7″	9′-2″	8′-5″	7′-6″
550S162-43	12′-8″	11′-6″	10′-8″	10′-5″	11′-6″	10′-4″	9′-10″	9′-3″
550S162-54	13′-7″	12′-4″	11′-7″	10′-9″	12′-4″	11′-3″	10′-7″	9′-10″
550S162-68	14′-7″	13′-3″	12′-6″	11′-7″	13′-3″	12′-0″	11′-4″	10′-6″
800S162-33	14′-6″	12′-6″	11′-5″	10′-3″	12′-10″	11′-1″	10′-2″	9′-1″
800S162-43	17′-0″	15′-1″	13′-9″	12′-4″	15′-5″	13′-5″	12′-3″	10′-11″
800S162-54	18′-3″	16′-7″	15′-8″	14′-6″	16′-7″	15′-1″	14′-2″	13′-2″
800S162-68	19′-9″	17′-11″	16′-11″	15′-8″	17′-11″	16′-3″	15′-4″	14′-3″
1000S162-43	19′-4″	16′-9″	15′-3″	13′-8″	17′-2″	14′-10″	13′-7″	12′-2″
1000S162-54	21′-9″	19′-9″	18′-7″	17′-3″	19′-9″	18′-0″	16′-11″	15′-8″
1000S162-68	23′-7″	21′-5″	20′-2″	18′-9″	21′-5″	19′-6″	18′-4″	17′-0″
1200S162-54	25′-1″	22′-10″	21′-6″	19′-9″	22′-10″	20′-9″	19′-6″	17′-6″
1200S162-68	27′-3″	24′-9″	23′-4″	21′-8″	24′-9″	22′-6″	21′-2″	19′-8″

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 mil = 0.0254 mm.

a. Deflection criteria: *L*/480 for live loads, *L*/240 for total loads.

b. Floor dead load = 10 psf.

c. Table provides the maximum clear span in feet and inches.

d. Bearing stiffeners are to be installed at all support points and concentrated loads.

e. Minimum Grade 33 ksi steel shall be used for 33 mil and 43 mil thickness. Minimum Grade 50 ksi steel shall be used for 54 and 68 mil thickness.

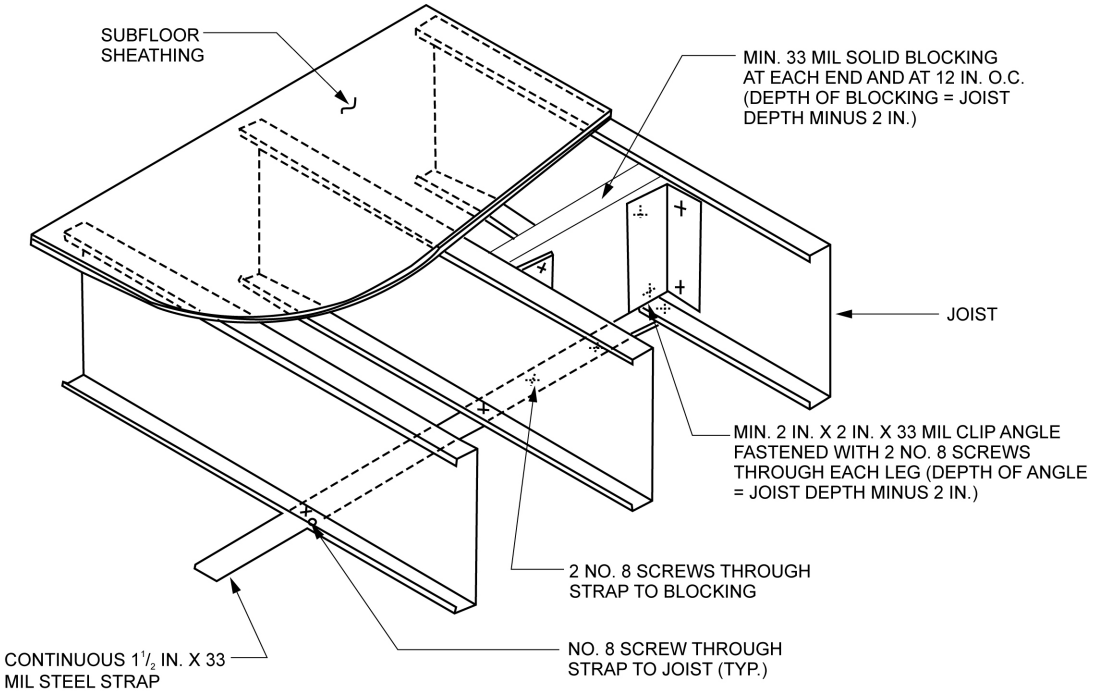
f. Table R505.3.2 is not applicable for 800S162-33 and 1000S162-43 continuous joist members.

R505.3.3 Joist bracing and blocking. Joist bracing and blocking shall be in accordance with this section.

R505.3.3.1 Joist top flange bracing. The top flanges of cold-formed steel joists shall be laterally braced by the application of floor sheathing fastened to the joists in accordance with Section R505.2.5 and Table R505.3.1(2).

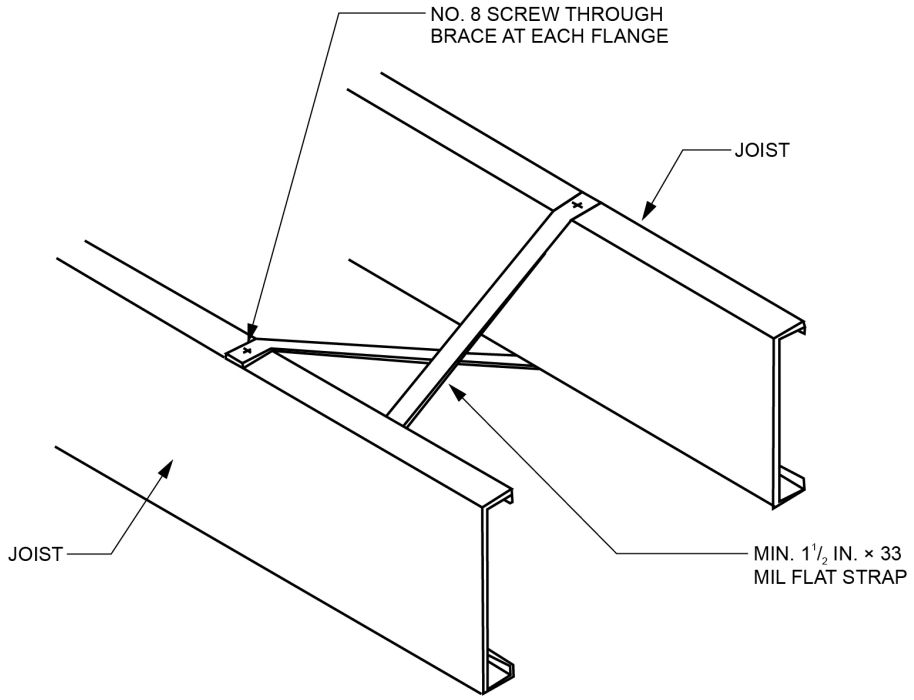
R505.3.3.2 Joist bottom flange bracing/blocking. Floor joists with spans that exceed 12 feet (3658 mm) shall have the bottom flanges laterally braced in accordance with one of the following:

1. Gypsum board installed with minimum No. 6 screws in accordance with Section R702.
2. Continuous steel straps installed in accordance with Figure R505.3.3.2(1). Steel straps shall be spaced at not greater than 12 feet (3658 mm) on center and shall be not less than 1-1/2 inches (38 mm) in width and 33 mils (0.84 mm) in thickness. Straps shall be fastened to the bottom flange of each joist with one No. 8 screw, fastened to blocking with two No. 8 screws, and fastened at each end (of strap) with two No. 8 screws. Blocking in accordance with Figure R505.3.3.2(1) or R505.3.3.2(2) shall be installed between joists at each end of the continuous strapping and at a maximum spacing of 12 feet (3658 mm) measured along the continuous strapping (perpendicular to the joist run). Blocking shall also be located at the termination of all straps. As an alternative to blocking at the ends, anchoring the strap to a stable building component with two No. 8 screws shall be permitted.



For SI: 1 mil = 0.0254 mm, 1 inch = 25.4 mm.

FIGURE R505.3.3.2(1)
JOIST BLOCKING (SOLID)



For SI: 1 mil = 0.0254 mm, 1 inch = 25.4 mm.

FIGURE R505.3.3.2(2)
JOIST BLOCKING (STRAP)

R505.3.3.3 Blocking at interior bearing supports. Blocking is not required for continuous back-to-back floor joists at bearing supports. Blocking shall be installed between every other joist for single continuous floor joists across bearing

supports in accordance with Figure R505.3.1(7). Blocking shall consist of C-shaped or track section with a minimum thickness of 33 mils (0.84 mm). Blocking shall be fastened to each adjacent joist through a 33-mil (0.84 mm) clip angle, bent web of blocking or flanges of web stiffeners with two No. 8 screws on each side. The minimum depth of the blocking shall be equal to the depth of the joist minus 2 inches (51 mm). The minimum length of the angle shall be equal to the depth of the joist minus 2 inches (51 mm).

R505.3.3.4 Blocking at cantilevers. Blocking shall be installed between every other joist over cantilever bearing supports in accordance with Figure R505.3.1(4), R505.3.1(5) or R505.3.1(6). Blocking shall consist of C-shaped or track section with minimum thickness of 33 mils (0.84 mm). Blocking shall be fastened to each adjacent joist through bent web of blocking, 33 mil clip angle or flange of web stiffener with two No. 8 screws at each end. The depth of the blocking shall be equal to the depth of the joist. The minimum length of the angle shall be equal to the depth of the joist minus 2 inches (51 mm). Blocking shall be fastened through the floor sheathing and to the support with three No. 8 screws (top and bottom).

R505.3.4 Bearing stiffeners. Bearing stiffeners shall be installed at each joist bearing location in accordance with this section, except for joists lapped over an interior support not carrying a *load-bearing wall* above. Floor joists supporting jamb studs with multiple members shall have two bearing stiffeners in accordance with Figure R505.3.4(1). Bearing stiffeners shall be fabricated from a C-shaped, track or clip angle member in accordance with one of the following:

1. C-shaped bearing stiffeners:
    1.1. Where the joist is not carrying a *load-bearing wall* above, the bearing stiffener shall be a minimum 33 mil (0.84 mm) thickness.
    1.2. Where the joist is carrying a *load-bearing wall* above, the bearing stiffener shall be not less than the same designation thickness as the wall stud above.
2. Track bearing stiffeners:
    2.1. Where the joist is not carrying a *load-bearing wall* above, the bearing stiffener shall be a minimum 43 mil (1.09 mm) thickness.
    2.2. Where the joist is carrying a *load-bearing wall* above, the bearing stiffener shall be not less than one designation thickness greater than the wall stud above.

The minimum length of a bearing stiffener shall be the depth of member being stiffened minus 3/8 inch (9.5 mm). Each bearing stiffener shall be fastened to the web of the member it is stiffening as shown in Figure R505.3.4(2).

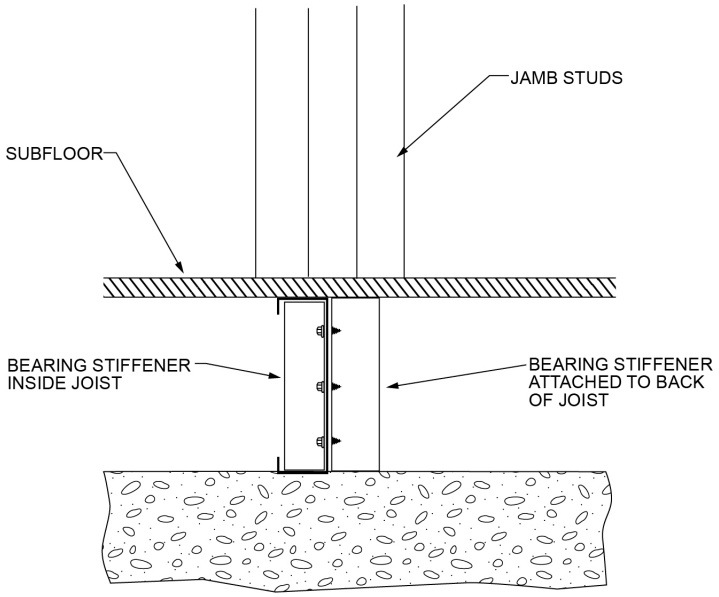
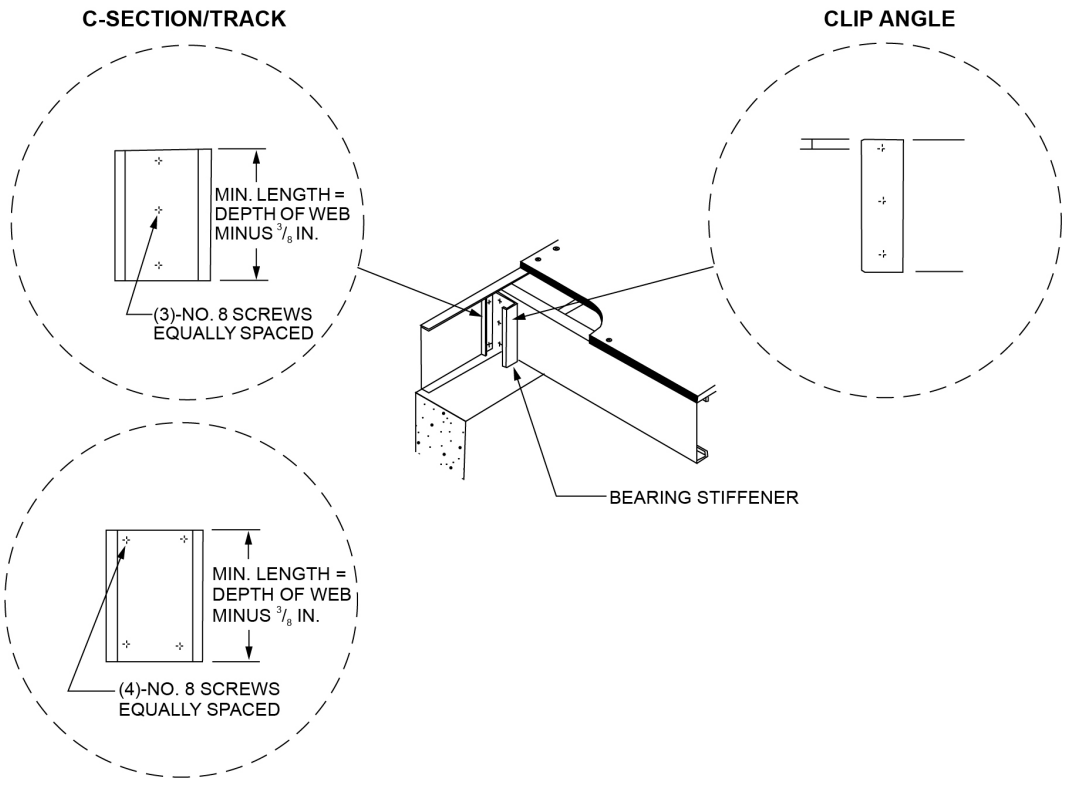


FIGURE R505.3.4(1)
BEARING STIFFENERS UNDER JAMB STUDS



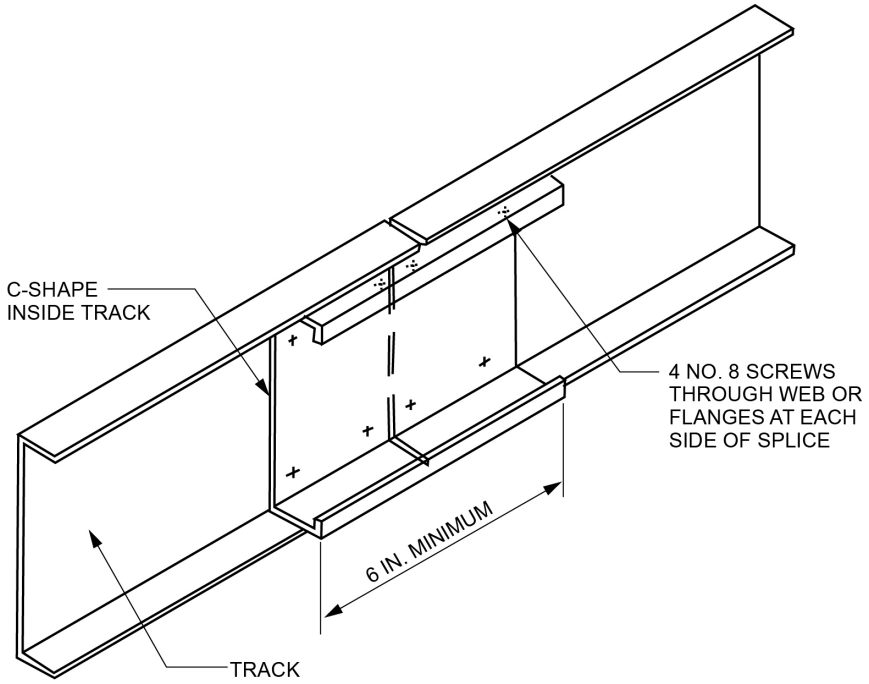
For SI: 1 inch = 25.4 mm.

FIGURE R505.3.4(2)
BEARING STIFFENER

R505.3.5 Cutting and notching. Flanges and lips of load-bearing cold-formed steel floor framing members shall not be cut or notched.

R505.3.6 Floor cantilevers. Floor cantilevers for the top floor of a two- or three-story building or the first floor of a one-story building shall not exceed 24 inches (610 mm). Cantilevers, not exceeding 24 inches (610 mm) and supporting two stories and roof (first floor of a two-story building), shall be permitted provided that all cantilevered joists are doubled (nested or back-to-back). The doubled cantilevered joists shall extend not less than 6 feet (1829 mm) toward the inside and shall be fastened with not less than two No. 8 screws spaced at 24 inches (610 mm) on center through the webs (for back-to-back) or flanges (for nested joists).

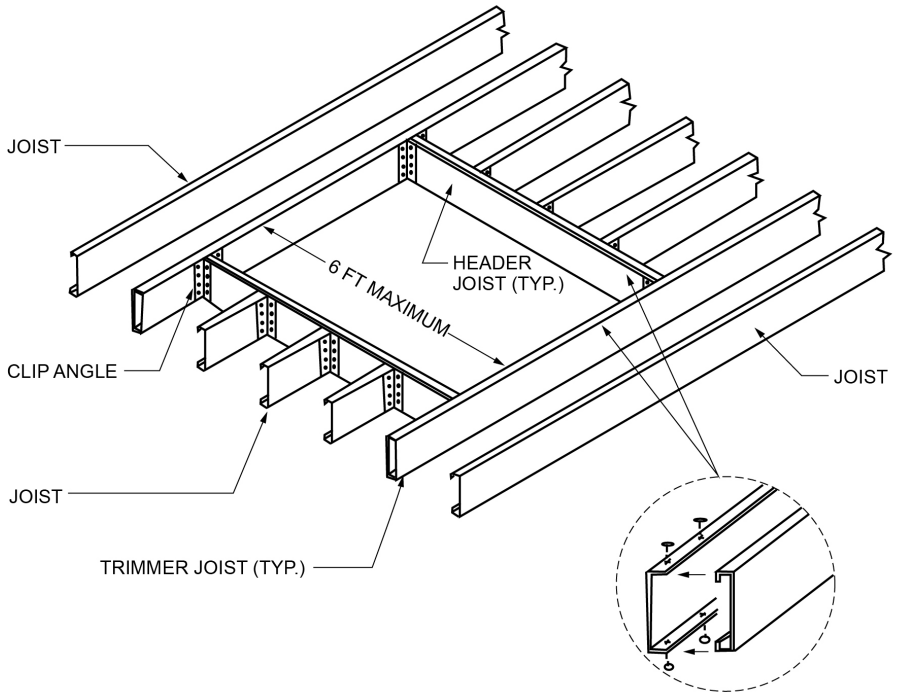
R505.3.7 Splicing. Joists and other structural members shall not be spliced without an *approved* design. Splicing of tracks shall conform to Figure R505.3.7.



For SI: 1 inch = 25.4 mm.

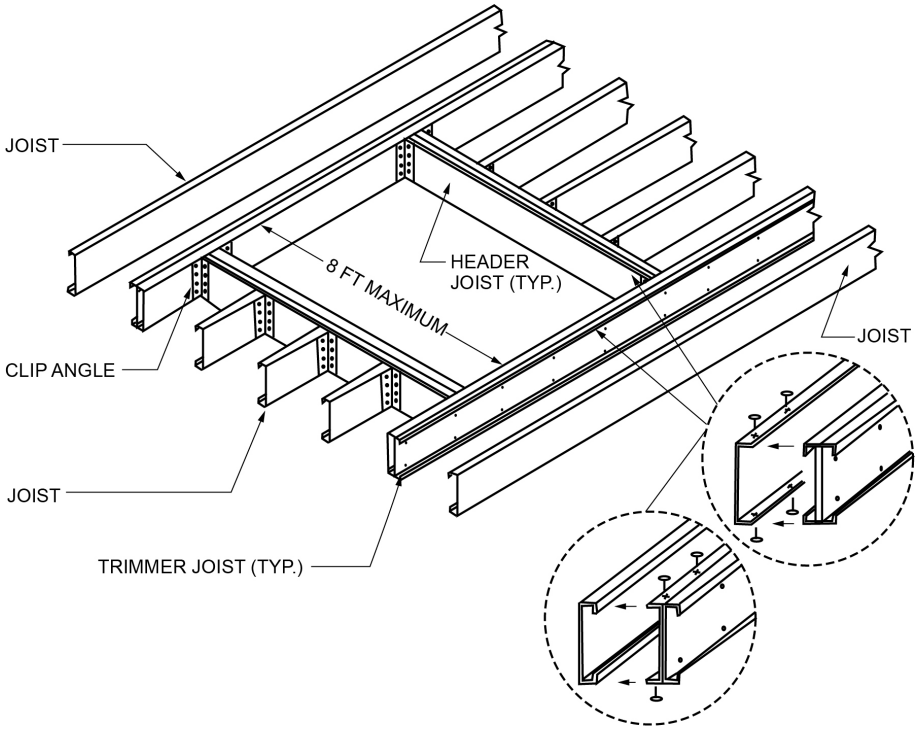
FIGURE R505.3.7
TRACK SPLICE

R505.3.8 Framing of floor openings. Openings in floors shall be framed with header and trimmer joists. Header joist spans shall not exceed 6 feet (1829 mm) or 8 feet (2438 mm) in length in accordance with Figure R505.3.8(1) or R505.3.8(2), respectively. Header and trimmer joists shall be fabricated from joist and track members, having a minimum size and thickness at least equivalent to the adjacent floor joists, and shall be installed in accordance with Figures R505.3.8(1), R505.3.8(2), R505.3.8(3) and R505.3.8(4). Each header joist shall be connected to trimmer joists with four 2-inch by 2-inch (51-mm by 51-mm) clip angles. Each clip angle shall be fastened to both the header and trimmer joists with four No. 8 screws, evenly spaced, through each leg of the clip angle. The clip angles shall have a thickness not less than that of the floor joist. Each track section for a built-up header or trimmer joist shall extend the full length of the joist (continuous).



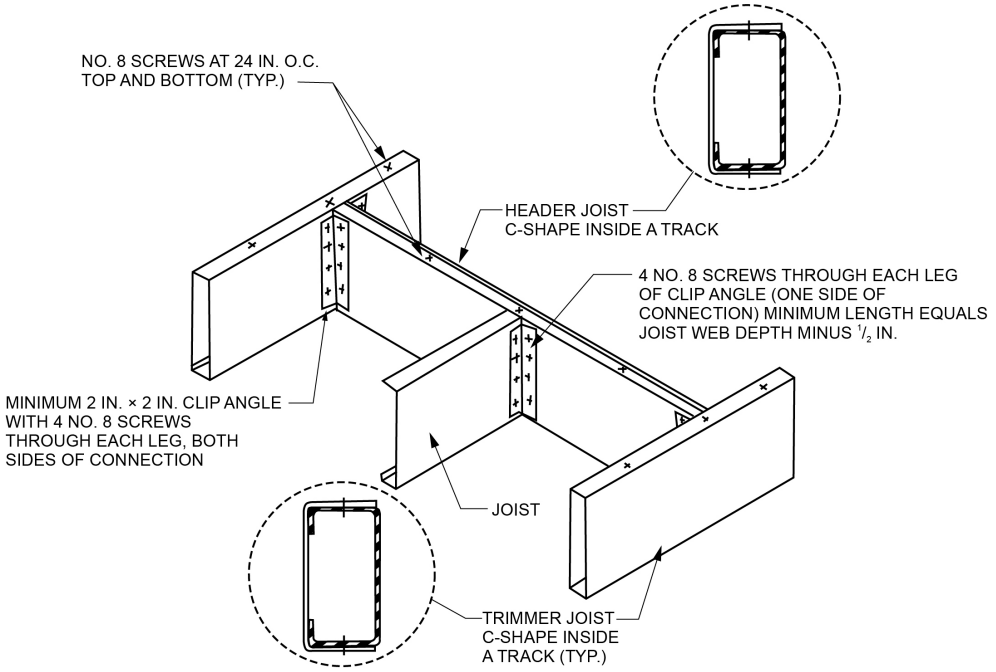
For SI: 1 foot = 304.8 mm.

FIGURE R505.3.8(1)
COLD-FORMED STEEL FLOOR CONSTRUCTION—6-FOOT FLOOR OPENING



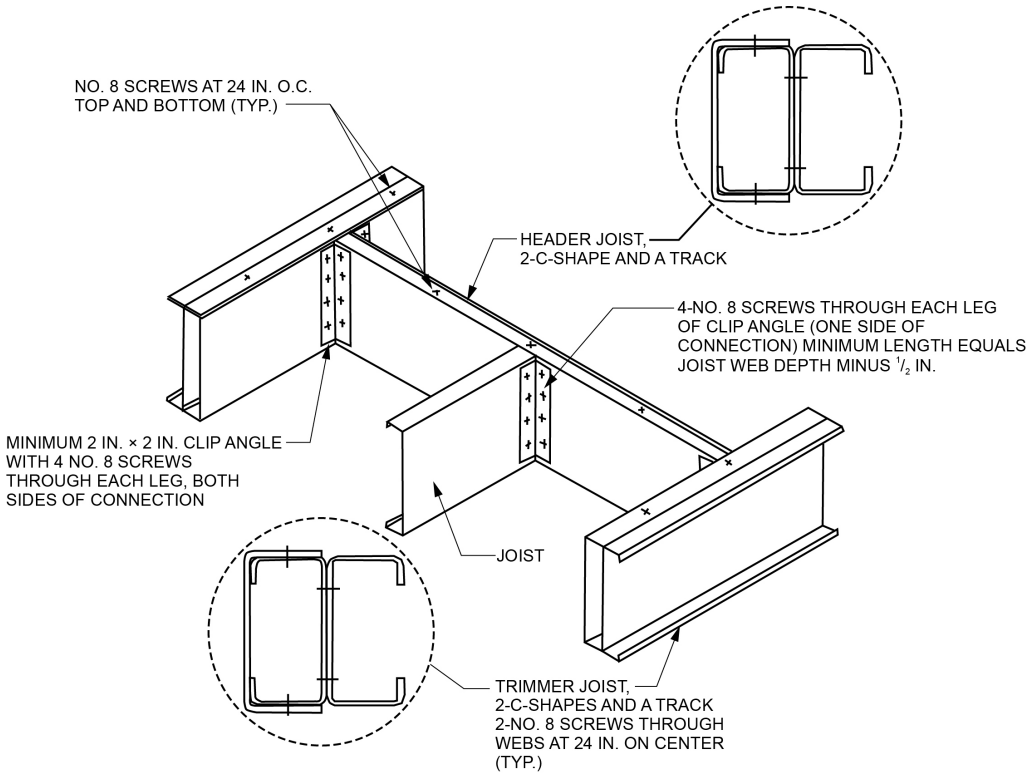
For SI: 1 foot = 304.8 mm.

FIGURE R505.3.8(2)
COLD-FORMED STEEL FLOOR CONSTRUCTION—8-FOOT FLOOR OPENING



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

FIGURE R505.3.8(3)
COLD-FORMED STEEL FLOOR CONSTRUCTION: FLOOR HEADER TO TRIMMER CONNECTION—6-FOOT OPENING



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

FIGURE R505.3.8(4)
COLD-FORMED STEEL FLOOR CONSTRUCTION: FLOOR HEADER TO TRIMMER CONNECTION—8-FOOT OPENING

SECTION R506
CONCRETE FLOORS (ON GROUND)

R506.1 General. Concrete slab-on-ground floors shall be designed and constructed in accordance with the provisions of this section or ACI 332. Floors shall be a minimum 3-1/2 inches (89 mm) thick (for *expansive soils*, see Section R403.1.8). The specified compressive strength of concrete shall be as set forth in Section R402.2.

R506.2 Site preparation. The area within the foundation walls shall have all vegetation, top soil and foreign material removed.

R506.2.1 Fill. Fill material shall be free of vegetation and foreign material. The fill shall be compacted to ensure uniform support of the slab, and except where *approved*, the fill depths shall not exceed 24 inches (610 mm) for clean sand or gravel and 8 inches (203 mm) for earth.

R506.2.2 Base. A 4-inch-thick (102 mm) base course consisting of clean graded sand, gravel, crushed stone, crushed concrete or crushed blast-furnace slag passing a 2-inch (51 mm) sieve shall be placed on the prepared subgrade where the slab is below *grade*.

Exception: A base course is not required where the concrete slab is installed on well-drained or sand-gravel mixture soils classified as Group I according to the United Soil Classification System in accordance with Table R405.1.

R506.2.3 Vapor retarder. A minimum 10-mil (0.010 inch; 0.254 mm) vapor retarder conforming to ASTM E1745 Class A requirements with joints lapped not less than 6 inches (152 mm) shall be placed between the concrete floor slab and the base course or the prepared subgrade where a base course does not exist.

Exception: The vapor retarder is not required for the following:

1. Garages, utility buildings and other unheated *accessory structures*.
2. For unheated storage rooms having an area of less than 70 square feet (6.5 m^2) and carports.
3. Driveways, walks, patios and other flatwork not likely to be enclosed and heated at a later date.
4. Where *approved* by the *building official*, based on local site conditions.

R506.2.4 Reinforcement support. Where provided in slabs-on-ground, reinforcement shall be supported to remain in place from the center to upper one-third of the slab for the duration of the concrete placement.

SECTION R507
EXTERIOR DECKS

R507.1 Decks. Wood-framed decks shall be in accordance with this section. Decks shall be designed for the *live load* required in Section R301.5 or the ground snow load indicated in Table R301.2, whichever is greater. For decks using materials and conditions not prescribed in this section, refer to Section R301.

R507.2 Materials. Materials used for the construction of decks shall comply with this section.

R507.2.1 Wood materials. Wood materials shall be No. 2 grade or better lumber, preservative-treated in accordance with Section R317, or *approved*, naturally durable lumber, and termite protected where required in accordance with Section R318. Where design in accordance with Section R301 is provided, wood structural members shall be designed using the wet service factor defined in AWC NDS. Cuts, notches and drilled holes of preservative-treated wood members shall be treated in accordance with Section R317.1.1. All preservative-treated wood products in contact with the ground shall be *labeled* for such usage.

R507.2.1.1 Engineered wood products. Engineered wood products shall be in accordance with Section R502.

R507.2.2 Plastic composite deck boards, stair treads, guards or handrails. *Plastic composite* exterior deck boards, stair treads, *guards* and *handrails* shall comply with the requirements of ASTM D7032 and this section.

R507.2.2.1 Labeling. *Plastic composite* deck boards and stair treads, or their packaging, shall bear a *label* that indicates compliance with ASTM D7032 and includes the allowable load and maximum allowable span determined in accordance with ASTM D7032. Plastic or composite *handrails* and *guards*, or their packaging, shall bear a *label* that indicates compliance with ASTM D7032 and includes the maximum allowable span determined in accordance with ASTM D7032.

R507.2.2.2 Flame spread index. *Plastic composite* deck boards, stair treads, *guards*, and *handrails* shall exhibit a flame spread index not exceeding 200 when tested in accordance with ASTM E84 or UL 723 with the test specimen remaining in place during the test.

Exception: *Plastic composites* determined to be noncombustible.

R507.2.2.3 Decay resistance. *Plastic composite* deck boards, stair treads, *guards* and *handrails* containing wood, cellulosic or other biodegradable materials shall be decay resistant in accordance with ASTM D7032.

R507.2.2.4 Termite resistance. Where required by Section 318, *plastic composite* deck boards, stair treads, *guards* and *handrails* containing wood, cellulosic or other biodegradable materials shall be termite resistant in accordance with ASTM D7032.

R507.2.2.5 Installation of plastic composites. *Plastic composite* deck boards, stair treads, *guards* and *handrails* shall be installed in accordance with this code and the manufacturer's instructions.

R507.2.3 Fasteners and connectors. Metal fasteners and connectors used for all decks shall be in accordance with Section R317.3 and Table R507.2.3.

TABLE R507.2.3
FASTENER AND CONNECTOR SPECIFICATIONS FOR DECKS[a, b]

ITEM	MATERIAL	MINIMUM FINISH/COATING	ALTERNATE FINISH/COATING[e]
Nails and glulam rivets	In accordance with ASTM F1667	Hot-dipped galvanized per ASTM A153, Class D for 3/8-inch diameter and less	Stainless steel, silicon bronze or copper
Bolts[c]	In accordance with ASTM A307 (bolts), ASTM A563 (nuts), ASTM F844 (washers)	Hot-dipped galvanized per ASTM A153, Class C (Class D for 3/8-inch diameter and less) or mechanically galvanized per ASTM B695, Class 55 or 410 stainless steel	Stainless steel, silicon bronze or copper
Lag screws[d] (including nuts and washers)			
Metal connectors	Per manufacturer's specification	ASTM A653 type G185 zinc-coated galvanized steel or post hot-dipped galvanized per ASTM A123 providing a minimum average coating weight of 2.0 oz./ft^2 (total both sides)	Stainless steel

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

a. Equivalent materials, coatings and finishes shall be permitted.

b. Fasteners and connectors exposed to salt water or located within 300 feet of a salt water shoreline shall be stainless steel.

c. Holes for bolts shall be drilled a minimum 1/32 inch and a maximum 1/16 inch larger than the bolt.

d. Lag screws 1/2 inch and larger shall be predrilled to avoid wood splitting per the *National Design Specification (NDS) for Wood Construction*.

e. Stainless-steel-driven fasteners shall be in accordance with ASTM F1667.

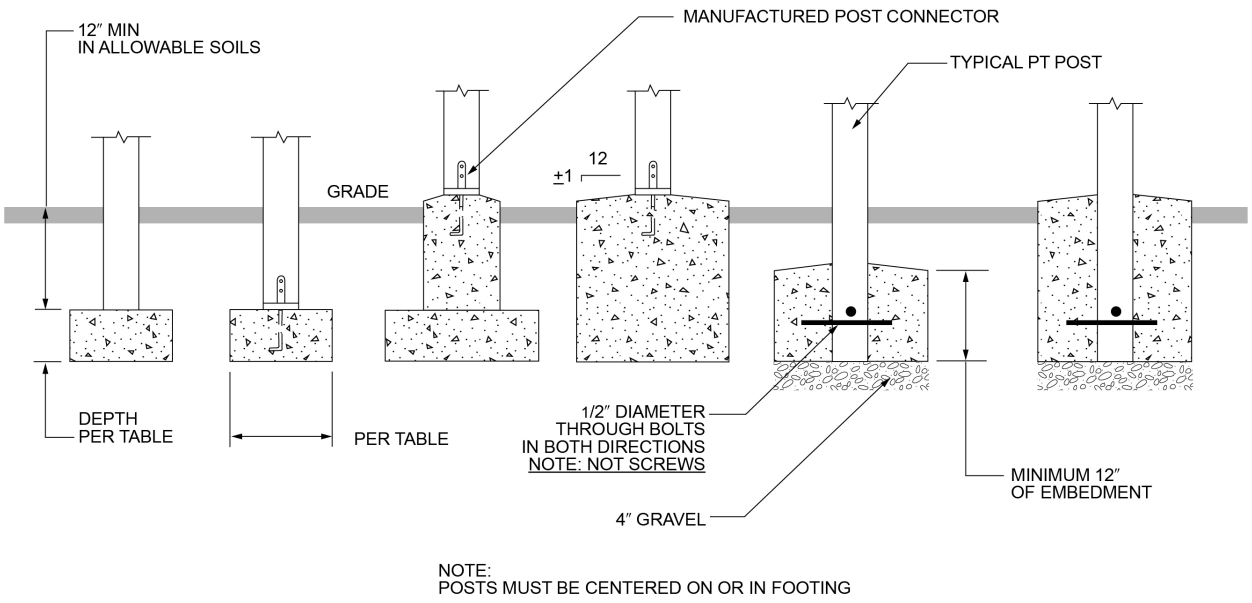
R507.2.4 Flashing. Flashing shall be corrosion-resistant metal of nominal thickness not less than 0.019 inch (0.48 mm) or *approved* nonmetallic material that is compatible with the substrate of the structure and the decking materials.

R507.2.5 Alternate materials. Alternative materials, including glass and metals, shall be permitted.

R507.3 Footings. Decks shall be supported on concrete footings or other *approved* structural systems designed to accommodate all loads in accordance with Section R301. Deck footings shall be sized to carry the imposed loads from the deck structure to the ground as shown in Figure R507.3.

Exceptions:

1. Footings shall not be required for free-standing decks consisting of joists directly supported on grade over their entire length.
2. Footings shall not be required for free-standing decks that meet all of the following criteria:
   2.1. The joists bear directly on *precast concrete* pier blocks at grade without support by beams or posts.
   2.2. The area of the deck does not exceed 200 square feet (18.6 m^2).
   2.3. The walking surface is not more than 20 inches (508 mm) above grade at any point within 36 inches (914 mm) measured horizontally from the edge.



For SI: 1 inch = 25.4 mm.

FIGURE R507.3
DECK POSTS TO DECK FOOTING CONNECTION

R507.3.1 Minimum size. The minimum size of concrete footings shall be in accordance with Table R507.3.1, based on the tributary area and allowable soil-bearing pressure in accordance with Table R401.4.1.

[W] ((~~TABLE R507.3.1~~
~~MINIMUM FOOTING SIZE FOR DECKS~~

~~LIVE OR GROUND SNOW LOAD[b] (psf)~~	~~TRIBUTARY AREA (ft^2)~~	~~LOAD-BEARING VALUE OF SOILS[a, c, d] (psf)~~								
		~~1,500[e]~~			~~2,000[e]~~			~~≥ 3,000[e]~~		
		~~Side of a square footing (inches)~~	~~Diameter of a round footing (inches)~~	~~Thickness (inches)[f]~~	~~Side of a square footing (inches)~~	~~Diameter of a round footing (inches)~~	~~Thickness (inches)[f]~~	~~Side of a square footing (inches)~~	~~Diameter of a round footing (inches)~~	~~Thickness (inches)[f]~~
~~40~~	~~5~~	~~7~~	~~8~~	~~6~~	~~7~~	~~8~~	~~6~~	~~7~~	~~8~~	~~6~~
	~~20~~	~~10~~	~~12~~	~~6~~	~~9~~	~~9~~	~~6~~	~~7~~	~~8~~	~~6~~
	~~40~~	~~14~~	~~16~~	~~6~~	~~12~~	~~14~~	~~6~~	~~10~~	~~12~~	~~6~~
	~~60~~	~~17~~	~~19~~	~~6~~	~~15~~	~~17~~	~~6~~	~~12~~	~~14~~	~~6~~
	~~80~~	~~20~~	~~22~~	~~7~~	~~17~~	~~19~~	~~6~~	~~14~~	~~16~~	~~6~~
	~~100~~	~~22~~	~~25~~	~~8~~	~~19~~	~~21~~	~~6~~	~~15~~	~~17~~	~~6~~
	~~120~~	~~24~~	~~27~~	~~9~~	~~21~~	~~23~~	~~7~~	~~17~~	~~19~~	~~6~~
	~~140~~	~~26~~	~~29~~	~~10~~	~~22~~	~~25~~	~~8~~	~~18~~	~~21~~	~~6~~
	~~160~~	~~28~~	~~31~~	~~11~~	~~24~~	~~27~~	~~9~~	~~20~~	~~22~~	~~7~~
~~50~~	~~5~~	~~7~~	~~8~~	~~6~~	~~7~~	~~8~~	~~6~~	~~7~~	~~8~~	~~6~~
	~~20~~	~~11~~	~~13~~	~~6~~	~~10~~	~~11~~	~~6~~	~~8~~	~~9~~	~~6~~
	~~40~~	~~15~~	~~17~~	~~6~~	~~13~~	~~15~~	~~6~~	~~11~~	~~13~~	~~6~~
	~~60~~	~~19~~	~~21~~	~~6~~	~~16~~	~~18~~	~~6~~	~~13~~	~~15~~	~~6~~
	~~80~~	~~21~~	~~24~~	~~8~~	~~19~~	~~21~~	~~6~~	~~15~~	~~17~~	~~6~~
	~~100~~	~~24~~	~~27~~	~~9~~	~~21~~	~~23~~	~~7~~	~~17~~	~~19~~	~~6~~
	~~120~~	~~26~~	~~30~~	~~10~~	~~23~~	~~26~~	~~8~~	~~19~~	~~21~~	~~6~~
	~~140~~	~~28~~	~~32~~	~~11~~	~~25~~	~~28~~	~~9~~	~~20~~	~~23~~	~~7~~
	~~160~~	~~30~~	~~34~~	~~12~~	~~26~~	~~30~~	~~10~~	~~21~~	~~24~~	~~8~~

[W] ((~~TABLE R507.3.1—continued~~
~~MINIMUM FOOTING SIZE FOR DECKS~~

~~LIVE OR GROUND SNOW LOAD[b] (psf)~~	~~TRIBUTARY AREA (ft^2)~~	~~LOAD-BEARING VALUE OF SOILS[a, c, d] (psf)~~								
		~~1,500[e]~~			~~2,000[e]~~			~~≥ 3,000[e]~~		
		~~Side of a square footing (inches)~~	~~Diameter of a round footing (inches)~~	~~Thickness (inches)[f]~~	~~Side of a square footing (inches)~~	~~Diameter of a round footing (inches)~~	~~Thickness (inches)[f]~~	~~Side of a square footing (inches)~~	~~Diameter of a round footing (inches)~~	~~Thickness (inches)[f]~~
~~60~~	~~5~~	~~7~~	~~8~~	~~6~~	~~7~~	~~8~~	~~6~~	~~7~~	~~8~~	~~6~~
	~~20~~	~~12~~	~~14~~	~~6~~	~~11~~	~~12~~	~~6~~	~~9~~	~~10~~	~~6~~
	~~40~~	~~16~~	~~19~~	~~6~~	~~14~~	~~16~~	~~8~~	~~12~~	~~14~~	~~6~~
	~~60~~	~~20~~	~~23~~	~~7~~	~~17~~	~~20~~	~~6~~	~~14~~	~~16~~	~~6~~
	~~80~~	~~23~~	~~26~~	~~9~~	~~20~~	~~23~~	~~7~~	~~16~~	~~19~~	~~6~~
	~~100~~	~~26~~	~~29~~	~~10~~	~~22~~	~~25~~	~~8~~	~~18~~	~~21~~	~~6~~
	~~120~~	~~28~~	~~32~~	~~11~~	~~25~~	~~28~~	~~9~~	~~20~~	~~23~~	~~7~~
	~~140~~	~~31~~	~~35~~	~~12~~	~~27~~	~~30~~	~~10~~	~~22~~	~~24~~	~~8~~
	~~160~~	~~33~~	~~37~~	~~13~~	~~28~~	~~32~~	~~11~~	~~23~~	~~26~~	~~9~~
~~70~~	~~5~~	~~7~~	~~8~~	~~6~~	~~7~~	~~8~~	~~6~~	~~7~~	~~8~~	~~6~~
	~~20~~	~~12~~	~~14~~	~~6~~	~~11~~	~~13~~	~~6~~	~~9~~	~~10~~	~~6~~
	~~40~~	~~18~~	~~20~~	~~6~~	~~15~~	~~17~~	~~6~~	~~12~~	~~14~~	~~6~~
	~~60~~	~~21~~	~~24~~	~~8~~	~~19~~	~~21~~	~~6~~	~~15~~	~~17~~	~~6~~
	~~80~~	~~25~~	~~28~~	~~9~~	~~21~~	~~24~~	~~8~~	~~18~~	~~20~~	~~6~~
	~~100~~	~~28~~	~~31~~	~~11~~	~~24~~	~~27~~	~~9~~	~~20~~	~~22~~	~~7~~
	~~120~~	~~30~~	~~34~~	~~12~~	~~26~~	~~30~~	~~10~~	~~21~~	~~24~~	~~8~~
	~~140~~	~~33~~	~~37~~	~~13~~	~~28~~	~~32~~	~~11~~	~~23~~	~~26~~	~~9~~
	~~160~~	~~35~~	~~40~~	~~15~~	~~30~~	~~34~~	~~12~~	~~25~~	~~28~~	~~9~~

~~For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m^2, 1 pound per square foot = 0.0479 kPa.~~

~~a. Interpolation permitted, extrapolation not permitted.~~

~~b. Based on highest load case: Dead + Live or Dead + Snow.~~

~~c. Footing dimensions shall allow complete bearing of the post.~~

~~d. If the support is a brick or CMU pier, the footing shall have a minimum 2-inch projection on all sides.~~

~~e. Area, in square feet, of deck surface supported by post and footings.~~

~~f. Minimum thickness shall only apply to plain concrete footings.~~))

[W] TABLE R507.3.1
MINIMUM FOOTING SIZE FOR DECKS

LIVE OR GROUND SNOW LOAD (psf)	TRIBUTARY AREA[a] (sq. ft.)	SOIL BEARING CAPACITY[a, c, d]								
		1500 psf			2000 psf			≥ 3000 psf		
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness[f] (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness[f] (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness[f] (inches)
60 live load or 70 ground snow load	5	7	8	6	7	8	6	7	8	6
	20	12	14	6	11	13	6	9	10	6
	40	18	20	6	15	17	6	12	14	6
	60	21	24	8	19	21	6	15	17	6
	80	25	28	9	21	24	8	18	20	6
	100	28	31	11	24	27	9	20	22	7
	120	30	34	12	26	30	10	21	24	8
	140	33	37	13	28	32	11	23	26	9
	160	35	40	15	30	34	12	25	28	9

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m^2, 1 pound per square foot = 0.0479 kPa.

a. Interpolation permitted, extrapolation not permitted.

b. Reserved.

c. Footing dimensions shall allow complete bearing of the post.

d. If the support is a brick or CMU pier, the footing shall have a minimum 2-inch projection on all sides.

e. Area, in square feet, of deck surface supported by post and footings.

f. Minimum thickness shall only apply to plain concrete footings.

R507.3.2 Minimum depth. Deck footings shall be placed not less than 12 inches (305 mm) below the undisturbed ground surface.

R507.3.3 Frost protection. Where decks are attached to a frost-protected structure, deck footings shall be protected from frost by one or more of the following methods:

1. Extending below the frost line specified in Table R301.2.
2. Erecting on solid rock.
3. Other *approved* methods of frost protection.

R507.4 Deck posts. For single-level decks, wood post size shall be in accordance with Table R507.4.

R507.4.1 Deck post to deck footing connection. Where posts bear on concrete footings in accordance with Section R403 and Figure R507.3, lateral restraint shall be provided by manufactured connectors or a minimum post embedment of 12 inches (305 mm) in surrounding soils or concrete piers. Other footing systems shall be permitted.

Exception: Where expansive, compressible, shifting or other questionable soils are present, surrounding soils shall not be relied on for lateral support.

[W] ((~~TABLE R507.4~~
~~DECK POST HEIGHT~~

~~LOADS (psf)[b]~~	~~POST SPECIES[c]~~	~~POST SIZE[d]~~	~~TRIBUTARY AREA (ft²)[g, h]~~							
			~~20~~	~~40~~	~~60~~	~~80~~	~~100~~	~~120~~	~~140~~	~~160~~
			~~MAXIMUM DECK POST HEIGHT[a] (feet inches)~~							
~~40 live load~~	~~Southern pine~~	~~4 × 4~~	~~14 0~~	~~13 8~~	~~11 0~~	~~9 5~~	~~8 4~~	~~7 5~~	~~6 9~~	~~6 2~~
		~~4× 6~~	~~14 0~~	~~14 0~~	~~13 11~~	~~12 0~~	~~10 8~~	~~9 8~~	~~8 10~~	~~8 2~~
		~~6 × 6~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~
		~~8 × 8~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~
	~~Douglas fir[e]~~ ~~Hem fir[e]~~ ~~Spruce pine fir[e]~~	~~4 × 4~~	~~14 0~~	~~13 6~~	~~10 10~~	~~9 3~~	~~8 0~~	~~7 0~~	~~6 2~~	~~5 3~~
		~~4 × 6~~	~~14 0~~	~~14 0~~	~~13 10~~	~~11 10~~	~~10 6~~	~~9 5~~	~~8 7~~	~~7 10~~
		~~6 × 6~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~
		~~8 × 8~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~
	~~Redwood[f]~~ ~~Western cedars[f]~~ ~~Ponderosa pine[f]~~ ~~Red pine[f]~~	~~4 × 4~~	~~14 0~~	~~13 2~~	~~10 3~~	~~8 1~~	~~5 8~~	~~NP~~	~~NP~~	~~NP~~
		~~4 × 6~~	~~14 0~~	~~14 0~~	~~13 6~~	~~11 4~~	~~9 9~~	~~8 4~~	~~6 9~~	~~4 7~~
		~~6 × 6~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~13 7~~	~~9 7~~
		~~8 × 8~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~
~~50 ground snow load~~	~~Southern pine~~	~~4 × 4~~	~~14 0~~	~~12 2~~	~~9 10~~	~~8 5~~	~~7 5~~	~~6 7~~	~~5 11~~	~~5 4~~
		~~4 × 6~~	~~14 0~~	~~14 0~~	~~12 6~~	~~10 9~~	~~9 6~~	~~8 7~~	~~7 10~~	~~7 3~~
		~~6 × 6~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~13 4~~
		~~8 × 8~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~
	~~Douglas fir[e]~~ ~~Hem fir[e]~~ ~~Spruce pine fir[e]~~	~~4 × 4~~	~~14 0~~	~~12 1~~	~~9 8~~	~~8 2~~	~~7 1~~	~~6 2~~	~~5 3~~	~~4 2~~
		~~4 × 6~~	~~14 0~~	~~14 0~~	~~12 4~~	~~10 7~~	~~9 4~~	~~8 4~~	~~7 7~~	~~6 11~~
		~~6 × 6~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~12 10~~
		~~8 × 8~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~
	~~Redwood[f]~~ ~~Western cedars[f]~~ ~~Ponderosa pine[f]~~ ~~Red pine[f]~~	~~4 × 4~~	~~14 0~~	~~11 8~~	~~9 0~~	~~6 10~~	~~3 7~~	~~NP~~	~~NP~~	~~NP~~
		~~4 × 6~~	~~14 0~~	~~14 0~~	~~12 0~~	~~10 0~~	~~8 6~~	~~7 0~~	~~5 3~~	~~NP~~
		~~6 × 6~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~10 8~~	~~2 4~~
		~~8 × 8~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~	~~14 0~~

[W] ((~~TABLE R507.4—continued~~
~~DECK POST HEIGHT~~

~~LOADS (psf)[b]~~	~~POST SPECIES[c]~~	~~POST SIZE[d]~~	~~TRIBUTARY AREA (ft²)[g, h]~~							
			~~20~~	~~40~~	~~60~~	~~80~~	~~100~~	~~120~~	~~140~~	~~160~~
			~~MAXIMUM DECK POST HEIGHT[a] (feet-inches)~~							
~~60 ground snow load~~	~~Southern pine~~	~~4 × 4~~	~~14-0~~	~~11-1~~	~~8-11~~	~~7-7~~	~~6-7~~	~~5-10~~	~~5-2~~	~~4-6~~
		~~4 × 6~~	~~14-0~~	~~14-0~~	~~11-4~~	~~9-9~~	~~8-7~~	~~7-9~~	~~7-1~~	~~6-6~~
		~~6 × 6~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~12-9~~	~~11-2~~
		~~8 × 8~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~
	~~Douglas fir[e]~~ ~~Hem-fir[e]~~ ~~Spruce-pine-fir[e]~~	~~4 × 4~~	~~14-0~~	~~10-11~~	~~8-8~~	~~7-3~~	~~6-2~~	~~5-0~~	~~3-7~~	~~NP~~
		~~4 × 6~~	~~14-0~~	~~13-11~~	~~11-2~~	~~9-7~~	~~8-4~~	~~7-5~~	~~6-8~~	~~5-11~~
		~~6 × 6~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~12-2~~	~~10-2~~
		~~8 × 8~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~
	~~Redwood[f]~~ ~~Western cedars[f]~~ ~~Ponderosa pine[f]~~ ~~Red pine[f]~~	~~4 × 4~~	~~14-0~~	~~10-6~~	~~7-9~~	~~4-7~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~
		~~4 × 6~~	~~14-0~~	~~13-7~~	~~10-9~~	~~8-9~~	~~7-0~~	~~4-9~~	~~NP~~	~~NP~~
		~~6 × 6~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~9-9~~	~~NP~~	~~NP~~
		~~8 × 8~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~
~~70 ground snow load~~	~~Southern pine~~	~~4 × 4~~	~~14-0~~	~~10-2~~	~~8-2~~	~~6-11~~	~~5-11~~	~~5-2~~	~~4-4~~	~~3-4~~
		~~4 × 6~~	~~14-0~~	~~12-11~~	~~10-5~~	~~8-11~~	~~7-10~~	~~7-1~~	~~6-5~~	~~5-10~~
		~~6 × 6~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~12-9~~	~~10-11~~	~~8-7~~
		~~8 × 8~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~
	~~Douglas fir[e]~~ ~~Hem-fir[e]~~ ~~Spruce-pine-fir[e]~~	~~4 × 4~~	~~14-0~~	~~10-1~~	~~7-11~~	~~6-6~~	~~5-3~~	~~3-7~~	~~NP~~	~~NP~~
		~~4 × 6~~	~~14-0~~	~~12-10~~	~~10-3~~	~~8-9~~	~~7-7~~	~~6-8~~	~~5-10~~	~~4-11~~
		~~6 × 6~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~12-2~~	~~9-9~~	~~5-9~~
		~~8 × 8~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~
	~~Redwood[f]~~ ~~Western cedars[f]~~ ~~Ponderosa pine[f]~~ ~~Red pine[f]~~	~~4 × 4~~	~~14-0~~	~~9-5~~	~~6-5~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~
		~~4 × 6~~	~~14-0~~	~~12-6~~	~~9-8~~	~~7-7~~	~~5-3~~	~~NP~~	~~NP~~	~~NP~~
		~~6 × 6~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~10-8~~	~~NP~~	~~NP~~	~~NP~~
		~~8 × 8~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~	~~14-0~~

~~For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.~~

~~NP = Not Permitted.~~

~~a. Measured from the underside of the beam to the top of footing or pier.~~

~~b. 10 psf dead load. Snow load not assumed to be concurrent with live load.~~

~~c. No. 2 grade, wet service factor included.~~

~~d. Notched deck posts shall be sized to accommodate beam size in accordance with Section R507.5.2.~~

~~e. Includes incising factor.~~

~~f. Incising factor not included.~~

~~g. Area, in square feet, of deck surface supported by post and footings.~~

~~h. Interpolation permitted. Extrapolation not permitted.~~))

[W] TABLE R507.4
DECK POST HEIGHT

LOADS[b] (psf)	POST SPECIES[c]	POST SIZE[d]	MAXIMUM DECK POST HEIGHT[a] (feet-inches)							
			TRIBUTARY AREA[g, h] (sq ft)							
			20	40	60	80	100	120	140	160
60 Live Load, ≤ 60 Ground Snow Load	Douglas Fir[e], Hem-fir[e], SPF[e]	4 × 4	14-0	10-10	8-7	7-0	5-8	4-1	NP	NP
		4 × 6	14-0	13-10	11-1	9-5	8-2	7-3	6-4	5-4
		6 × 6	14-0	14-0	14-0	14-0	14-0	13-3	10-9	6-11
		8 × 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Redwood[f], Western Cedars[f], Ponderosa Pine[f], Red Pine[f]	4 × 4	14-0	10-3	7-0	NP	NP	NP	NP	NP
		4 × 6	14-0	13-6	10-6	8-4	5-10	NP	NP	NP
		6 × 6	14-0	14-0	14-0	14-0	11-11	NP	NP	NP
		8 × 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0

[W] TABLE R507.4—continued
DECK POST HEIGHT

LOADS[b] (psf)	POST SPECIES[c]	POST SIZE[d]	MAXIMUM DECK POST HEIGHT[a] (feet-inches)							
			TRIBUTARY AREA[a, h] (sq ft)							
			20	40	60	80	100	120	140	160
70 Ground Snow Load	Douglas Fir[e], Hem-fir[e], SPF[e]	4 × 4	14-0	10-1	7-11	6-6	5-3	3-7	NP	NP
		4 × 6	14-0	12-10	10-3	8-9	7-7	6-8	5-10	4-11
		6 × 6	14-0	14-0	14-0	14-0	14-0	12-2	9-9	5-9
		8 × 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Redwood[f], Western Cedars[f], Ponderosa Pine[f], Red Pine[f]	4 × 4	14-0	9-5	6-5	NP	NP	NP	NP	NP
		4 × 6	14-0	12-6	9-8	7-7	5-3	NP	NP	NP
		6 × 6	14-0	14-0	14-0	14-0	10-8	NP	NP	NP
		8 × 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m^2, 1 psf = 0.0479 kPa. NP = Not Permitted

a. Measured from the underside of the beam to top of footing or pier.
b. Ten psf dead load. Snow load not assumed to be concurrent with live load.
c. No. 2 grade, wet service factor included.
d. Notched deck posts shall be sized to accommodate beam size in accordance with Section R507.5.2.
e. Includes incising factor.
f. Incising factor not included.
g. Area, in square feet, of deck surface supported by post and footings.
h. Interpolation permitted. Extrapolation is not permitted.

[W] R507.5 Deck beams. Maximum allowable spans for wood deck beams, as shown in Figure R507.5, shall be in accordance with ((~~Tables R507.5(1) through R507.5(4)~~)) Table R507.5. Beam plies shall be fastened together with two rows of 10d (3-inch × 0.128-inch) nails minimum at 16 inches (406 mm) on center along each edge. Beams shall be permitted to cantilever at each end up to one-fourth of the actual beam span. Deck beams of other materials shall be permitted where designed in accordance with accepted engineering practices.

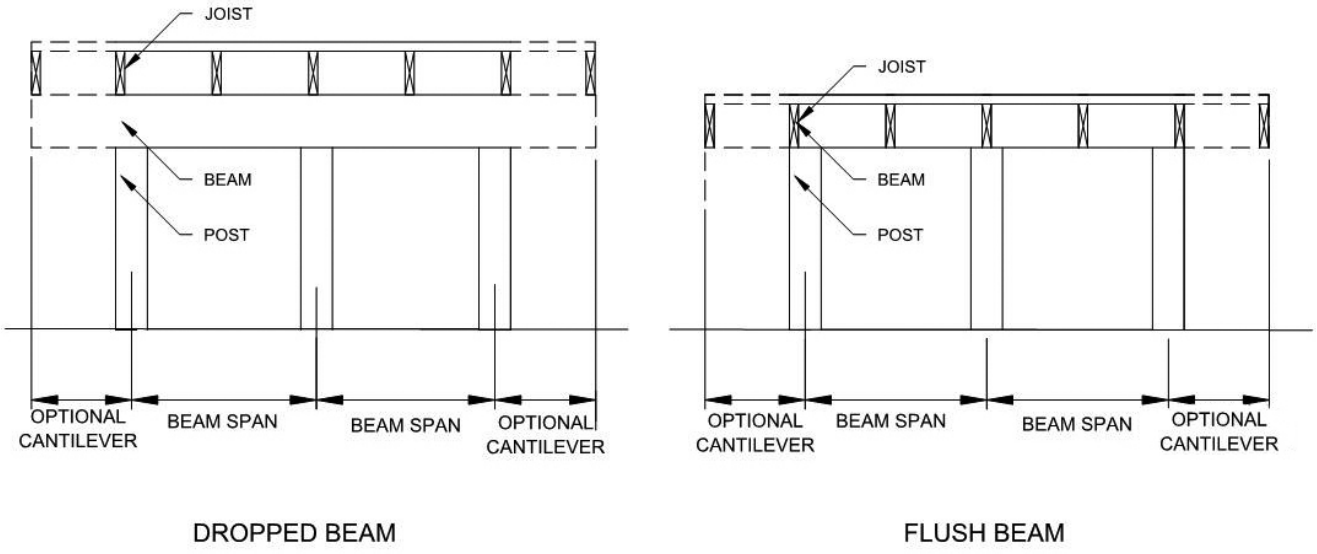


FIGURE R507.5
TYPICAL DECK ((~~JOIST~~)) BEAM SPANS

[W] ((~~TABLE R507.5(1)~~
~~MAXIMUM DECK BEAM SPAN—40 PSF LIVE LOAD[c]~~

~~BEAM SPECIES[d]~~	~~BEAM SIZE[e]~~	~~EFFECTIVE DECK JOIST SPAN LENGTH[a, i, j] (feet)~~						
		~~6~~	~~8~~	~~10~~	~~12~~	~~14~~	~~16~~	~~18~~
		~~MAXIMUM DECK BEAM SPAN LENGTH (feet-inches)[a, b, f]~~						
~~Southern pine~~	~~1 – 2 × 6~~	~~4-7~~	~~4-0~~	~~3-7~~	~~3-3~~	~~3-0~~	~~2-10~~	~~2-8~~
	~~1 – 2 × 8~~	~~5-11~~	~~5-1~~	~~4-7~~	~~4-2~~	~~3-10~~	~~3-7~~	~~3-5~~
	~~1 – 2 × 10~~	~~7-0~~	~~6-0~~	~~5-5~~	~~4-11~~	~~4-7~~	~~4-3~~	~~4-0~~
	~~1 – 2 × 12~~	~~8-3~~	~~7-1~~	~~6-4~~	~~5-10~~	~~5-5~~	~~5-0~~	~~4-9~~
	~~2 – 2 × 6~~	~~6-11~~	~~5-11~~	~~5-4~~	~~4-10~~	~~4-6~~	~~4-3~~	~~4-0~~
	~~2 – 2 × 8~~	~~8-9~~	~~7-7~~	~~6-9~~	~~6-2~~	~~5-9~~	~~5-4~~	~~5-0~~
	~~2 – 2 × 10~~	~~10-4~~	~~9-0~~	~~8-0~~	~~7-4~~	~~6-9~~	~~6-4~~	~~6-0~~
	~~2 – 2 × 12~~	~~12-2~~	~~10-7~~	~~9-5~~	~~8-7~~	~~8-0~~	~~7-5~~	~~7-0~~
	~~3 – 2 × 6~~	~~8-6~~	~~7-5~~	~~6-8~~	~~6-1~~	~~5-8~~	~~5-3~~	~~4-11~~
	~~3 – 2 × 8~~	~~10-11~~	~~9-6~~	~~8-6~~	~~7-9~~	~~7-2~~	~~6-8~~	~~6-4~~
	~~3 – 2 × 10~~	~~13-0~~	~~11-2~~	~~10-0~~	~~9-2~~	~~8-6~~	~~7-11~~	~~7-6~~
	~~3 – 2 × 12~~	~~15-3~~	~~13-3~~	~~11-10~~	~~10-9~~	~~10-0~~	~~9-4~~	~~8-10~~
~~Douglas fir-larch[g]~~ ~~Hem-fir[g]~~ ~~Spruce-pine-fir~~	~~1 – 2 × 6~~	~~4-1~~	~~3-6~~	~~3-0~~	~~2-8~~	~~2-5~~	~~2-3~~	~~2-1~~
	~~1 – 2 × 8~~	~~5-6~~	~~4-8~~	~~4-0~~	~~3-6~~	~~3-2~~	~~2-11~~	~~2-9~~
	~~1 – 2 × 10~~	~~6-8~~	~~5-10~~	~~5-1~~	~~4-6~~	~~4-1~~	~~3-9~~	~~3-6~~
	~~1 – 2 × 12~~	~~7-9~~	~~6-9~~	~~6-0~~	~~5-6~~	~~5-0~~	~~3-9~~	~~3-6~~
	~~2 – 2 × 6~~	~~6-1~~	~~5-3~~	~~4-9~~	~~4-4~~	~~3-11~~	~~3-7~~	~~3-3~~
	~~2 – 2 × 8~~	~~8-2~~	~~7-1~~	~~6-4~~	~~5-9~~	~~5-2~~	~~4-8~~	~~4-4~~
	~~2 – 2 × 10~~	~~10-0~~	~~8-7~~	~~7-9~~	~~7-0~~	~~6-6~~	~~6-0~~	~~5-6~~
	~~2 – 2 × 12~~	~~11-7~~	~~10-0~~	~~8-11~~	~~8-2~~	~~7-7~~	~~7-1~~	~~6-8~~
	~~3 – 2 × 6~~	~~7-8~~	~~6-8~~	~~6-0~~	~~5-6~~	~~5-1~~	~~4-9~~	~~4-6~~
	~~3 – 2 × 8~~	~~10-3~~	~~8-10~~	~~7-11~~	~~7-3~~	~~6-8~~	~~6-3~~	~~5-11~~
	~~3 – 2 × 10~~	~~12-6~~	~~10-10~~	~~9-8~~	~~8-10~~	~~8-2~~	~~7-8~~	~~7-2~~
	~~3 – 2 × 12~~	~~14-6~~	~~12-7~~	~~11-3~~	~~10-3~~	~~9-6~~	~~8-11~~	~~8-5~~
~~Redwood[h]~~ ~~Western cedars[h]~~ ~~Ponderosa pine[h]~~ ~~Red pine[h]~~	~~1 – 2 × 6~~	~~4-2~~	~~3-7~~	~~3-1~~	~~2-9~~	~~2-6~~	~~2-3~~	~~2-2~~
	~~1 – 2 × 8~~	~~5-4~~	~~4-7~~	~~4-1~~	~~3-7~~	~~3-3~~	~~3-0~~	~~2-10~~
	~~1 – 2 × 10~~	~~6-6~~	~~5-7~~	~~5-0~~	~~4-7~~	~~4-2~~	~~3-10~~	~~3-7~~
	~~1 – 2 × 12~~	~~7-6~~	~~6-6~~	~~5-10~~	~~5-4~~	~~4-11~~	~~4-7~~	~~4-4~~
	~~2 – 2 × 6~~	~~6-2~~	~~5-4~~	~~4-10~~	~~4-5~~	~~4-0~~	~~3-8~~	~~3-4~~
	~~2 – 2 × 8~~	~~7-10~~	~~6-10~~	~~6-1~~	~~5-7~~	~~5-2~~	~~4-10~~	~~4-5~~
	~~2 – 2 × 10~~	~~9-7~~	~~8-4~~	~~7-5~~	~~6-9~~	~~6-3~~	~~5-10~~	~~5-6~~
	~~2 – 2 × 12~~	~~11-1~~	~~9-8~~	~~8-7~~	~~7-10~~	~~7-3~~	~~6-10~~	~~6-5~~
	~~3 – 2 × 6~~	~~7-8~~	~~6-9~~	~~6-0~~	~~5-6~~	~~5-1~~	~~4-9~~	~~4-6~~
	~~3 – 2 × 8~~	~~9-10~~	~~8-6~~	~~7-7~~	~~6-11~~	~~6-5~~	~~6-0~~	~~5-8~~
	~~3 – 2 × 10~~	~~12-0~~	~~10-5~~	~~9-4~~	~~8-6~~	~~7-10~~	~~7-4~~	~~6-11~~
	~~3 – 2 × 12~~	~~13-11~~	~~12-1~~	~~10-9~~	~~9-10~~	~~9-1~~	~~8-6~~	~~8-1~~

~~For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.~~

~~a. Interpolation permitted. Extrapolation not permitted.~~

~~b. Beams supporting a single span of joists with or without cantilever.~~

~~c. Dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever. Snow load is not assumed to be concurrent with live load.~~

~~d. No. 2 grade, wet service factor included.~~

~~e. Beam depth shall be equal to or greater than the depth of intersecting joist for a flush beam connection.~~

~~f. Beam cantilevers are limited to the adjacent beam's span divided by 4.~~

~~g. Includes incising factor.~~

~~h. Incising factor not included.~~

~~i. Deck joist span as shown in Figure R507.5.~~

~~j. For calculation of effective deck joist span, the actual joist span length shall be multiplied by the joist span factor in accordance with Table R507.5(5).~~))

[W] ((~~TABLE R507.5(2)~~
~~MAXIMUM DECK BEAM SPAN—50 PSF GROUND SNOW LOAD~~[c]

~~BEAM SPECIES~~[d]	~~BEAM SIZE~~[e]	~~EFFECTIVE DECK JOIST SPAN LENGTH (feet)~~[a, i, j]						
		~~6~~	~~8~~	~~10~~	~~12~~	~~14~~	~~16~~	~~18~~
		~~MAXIMUM DECK BEAM SPAN LENGTH (feet-inches)~~[a, b, f]						
~~Southern pine~~	~~1—2 × 6~~	~~4-6~~	~~3-11~~	~~3-6~~	~~3-2~~	~~2-11~~	~~2-9~~	~~2-7~~
	~~1—2 × 8~~	~~5-9~~	~~4-11~~	~~4-5~~	~~4-0~~	~~3-9~~	~~3-6~~	~~3-3~~
	~~1—2 × 10~~	~~6-9~~	~~5-10~~	~~5-3~~	~~4-9~~	~~4-5~~	~~4-2~~	~~3-11~~
	~~1—2 × 12~~	~~8-0~~	~~6-11~~	~~6-2~~	~~5-8~~	~~5-3~~	~~4-11~~	~~4-7~~
	~~2—2 × 6~~	~~6-8~~	~~5-9~~	~~5-2~~	~~4-9~~	~~4-4~~	~~4-1~~	~~3-10~~
	~~2—2 × 8~~	~~8-6~~	~~7-4~~	~~6-7~~	~~6-0~~	~~5-7~~	~~5-2~~	~~4-11~~
	~~2—2 × 10~~	~~10-1~~	~~8-9~~	~~7-10~~	~~7-1~~	~~6-7~~	~~6-2~~	~~5-10~~
	~~2—2 × 12~~	~~11-11~~	~~10-3~~	~~9-2~~	~~8-5~~	~~7-9~~	~~7-3~~	~~6-10~~
	~~3—2 × 6~~	~~7-11~~	~~7-2~~	~~6-6~~	~~5-11~~	~~5-6~~	~~5-1~~	~~4-10~~
	~~3—2 × 8~~	~~10-5~~	~~9-3~~	~~8-3~~	~~7-6~~	~~6-11~~	~~6-6~~	~~6-2~~
	~~3—2 × 10~~	~~12-8~~	~~10-11~~	~~9-9~~	~~8-11~~	~~8-3~~	~~7-9~~	~~7-3~~
	~~3—2 × 12~~	~~14-11~~	~~12-11~~	~~11-6~~	~~10-6~~	~~9-9~~	~~9-1~~	~~8-7~~
~~Douglas fir-larch~~[g] ~~Hem-fir~~[g] ~~Spruce-pine-fir~~[g]	~~1—2 × 6~~	~~4-0~~	~~3-5~~	~~2-11~~	~~2-7~~	~~2-4~~	~~2-2~~	~~2-0~~
	~~1—2 × 8~~	~~5-4~~	~~4-7~~	~~3-11~~	~~3-5~~	~~3-1~~	~~2-10~~	~~2-8~~
	~~1—2 × 10~~	~~6-7~~	~~5-8~~	~~4-11~~	~~4-5~~	~~4-0~~	~~3-8~~	~~3-5~~
	~~1—2 × 12~~	~~7-7~~	~~6-7~~	~~5-11~~	~~5-4~~	~~4-10~~	~~4-6~~	~~4-2~~
	~~2—2 × 6~~	~~6-0~~	~~5-2~~	~~4-7~~	~~4-2~~	~~3-10~~	~~3-5~~	~~3-2~~
	~~2—2 × 8~~	~~8-0~~	~~6-11~~	~~6-2~~	~~5-8~~	~~5-0~~	~~4-7~~	~~4-2~~
	~~2—2 × 10~~	~~9-9~~	~~8-5~~	~~7-7~~	~~6-11~~	~~6-4~~	~~5-10~~	~~5-4~~
	~~2—2 × 12~~	~~11-4~~	~~9-10~~	~~8-9~~	~~8-0~~	~~7-5~~	~~6-11~~	~~6-6~~
	~~3—2 × 6~~	~~7-6~~	~~6-6~~	~~5-9~~	~~5-3~~	~~4-11~~	~~4-7~~	~~4-4~~
	~~3—2 × 8~~	~~10-0~~	~~8-8~~	~~7-9~~	~~7-1~~	~~6-6~~	~~6-1~~	~~5-8~~
	~~3—2 × 10~~	~~12-3~~	~~10-7~~	~~9-6~~	~~8-8~~	~~8-0~~	~~7-6~~	~~7-0~~
	~~3—2 × 12~~	~~14-3~~	~~12-4~~	~~11-0~~	~~10-1~~	~~9-4~~	~~8-9~~	~~8-3~~
~~Redwood~~[h] ~~Western cedars~~[h] ~~Ponderosa pine~~[h] ~~Red pine~~[h]	~~1—2 × 6~~	~~4-1~~	~~3-6~~	~~3-0~~	~~2-8~~	~~2-5~~	~~2-3~~	~~2-1~~
	~~1—2 × 8~~	~~5-2~~	~~4-6~~	~~4-0~~	~~3-6~~	~~3-2~~	~~2-11~~	~~2-9~~
	~~1—2 × 10~~	~~6-4~~	~~5-6~~	~~4-11~~	~~4-6~~	~~4-1~~	~~3-9~~	~~3-6~~
	~~1—2 × 12~~	~~7-4~~	~~6-4~~	~~5-8~~	~~5-2~~	~~4-10~~	~~4-6~~	~~4-3~~
	~~2—2 × 6~~	~~6-1~~	~~5-3~~	~~4-8~~	~~4-4~~	~~3-11~~	~~3-6~~	~~3-3~~
	~~2—2 × 8~~	~~7-8~~	~~6-8~~	~~5-11~~	~~5-5~~	~~5-0~~	~~4-8~~	~~4-3~~
	~~2—2 × 10~~	~~9-5~~	~~8-2~~	~~7-3~~	~~6-8~~	~~6-2~~	~~5-9~~	~~5-5~~
	~~2—2 × 12~~	~~10-11~~	~~9-5~~	~~8-5~~	~~7-8~~	~~7-2~~	~~6-8~~	~~6-3~~
	~~3—2 × 6~~	~~7-1~~	~~6-5~~	~~5-11~~	~~5-5~~	~~5-0~~	~~4-8~~	~~4-5~~
	~~3—2 × 8~~	~~9-4~~	~~8-4~~	~~7-5~~	~~6-10~~	~~604~~	~~5-11~~	~~5-7~~
	~~3—2 × 10~~	~~11-9~~	~~10-2~~	~~9-1~~	~~8-4~~	~~7-8~~	~~7-2~~	~~6-9~~
	~~3—2 × 12~~	~~13-8~~	~~11-10~~	~~10-7~~	~~9-8~~	~~8-11~~	~~8-4~~	~~7-10~~

~~For SI: 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.~~

~~a. Interpolation allowed. Extrapolation is not allowed.~~

~~b. Beams supporting a single span of joists with or without cantilever.~~

~~c. Dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.~~

~~d. No. 2 grade, wet service factor included.~~

~~e. Beam depth shall be equal to or greater than the depth of intersecting joist for a flush beam connection.~~

~~f. Beam cantilevers are limited to the adjacent beam's span divided by 4.~~

~~g. Includes incising factor.~~

~~h. Incising factor not included.~~

~~i. Deck joist span as shown in Figure R507.5.~~

~~j. For calculation of effective deck joist span, the actual joist span length shall be multiplied by the joist span factor in accordance with Table R507.5(5).~~))

[W] ((~~TABLE R507.5(3)~~
~~MAXIMUM DECK BEAM SPAN—60 PSF GROUND SNOW LOAD~~[c]

~~BEAM SPECIES~~[d]	~~BEAM SIZE~~[e]	~~EFFECTIVE DECK JOIST SPAN LENGTH~~[a, i, j] ~~(feet)~~						
		~~6~~	~~8~~	~~10~~	~~12~~	~~14~~	~~16~~	~~18~~
		~~MAXIMUM DECK BEAM SPAN LENGTH (feet inches)~~[a, b, f]						
~~Southern pine~~	~~1—2 × 6~~	~~4-2~~	~~3-7~~	~~3-3~~	~~2-11~~	~~2-9~~	~~2-6~~	~~2-5~~
	~~1—2 × 8~~	~~5-3~~	~~4-7~~	~~4-1~~	~~3-9~~	~~3-5~~	~~3-3~~	~~3-0~~
	~~1—2 × 10~~	~~6-3~~	~~5-5~~	~~4-10~~	~~4-5~~	~~4-1~~	~~3-10~~	~~3-7~~
	~~1—2 × 12~~	~~7-5~~	~~6-5~~	~~5-9~~	~~5-3~~	~~4-10~~	~~4-6~~	~~4-3~~
	~~2—2 × 6~~	~~6-2~~	~~5-4~~	~~4-9~~	~~4-4~~	~~4-0~~	~~3-9~~	~~3-7~~
	~~2—2 × 8~~	~~7-10~~	~~6-10~~	~~6-1~~	~~5-7~~	~~5-2~~	~~4-10~~	~~4-6~~
	~~2—2 × 10~~	~~9-4~~	~~8-1~~	~~7-3~~	~~6-7~~	~~6-1~~	~~5-8~~	~~5-4~~
	~~2—2 × 12~~	~~11-0~~	~~9-6~~	~~8-6~~	~~7-9~~	~~7-2~~	~~6-9~~	~~6-4~~
	~~3—2 × 6~~	~~7-5~~	~~6-9~~	~~6-0~~	~~5-6~~	~~5-1~~	~~4-9~~	~~4-6~~
	~~3—2 × 8~~	~~9-9~~	~~8-6~~	~~7-8~~	~~6-11~~	~~6-5~~	~~6-0~~	~~5-8~~
	~~3—2 × 10~~	~~11-8~~	~~10-2~~	~~9-1~~	~~8-3~~	~~7-8~~	~~7-2~~	~~6-9~~
	~~3—2 × 12~~	~~13-9~~	~~11-11~~	~~10-8~~	~~9-9~~	~~9-0~~	~~8-5~~	~~7-11~~
~~Douglas fir-larch~~[g] ~~Hem-fir~~[g] ~~Spruce-pine-fir~~[g]	~~1—2 × 6~~	~~3-8~~	~~3-1~~	~~2-8~~	~~2-4~~	~~2-2~~	~~2-0~~	~~1-10~~
	~~1—2 × 8~~	~~5-0~~	~~4-1~~	~~3-6~~	~~3-1~~	~~2-10~~	~~2-7~~	~~2-5~~
	~~1—2 × 10~~	~~6-1~~	~~5-2~~	~~4-6~~	~~4-0~~	~~3-7~~	~~3-4~~	~~3-2~~
	~~1—2 × 12~~	~~7-1~~	~~6-1~~	~~5-5~~	~~4-10~~	~~4-5~~	~~4-1~~	~~3-10~~
	~~2—2 × 6~~	~~5-6~~	~~4-9~~	~~4-3~~	~~3-10~~	~~3-5~~	~~3-1~~	~~2-10~~
	~~2—2 × 8~~	~~7-5~~	~~6-5~~	~~5-9~~	~~5-0~~	~~4-6~~	~~4-1~~	~~3-9~~
	~~2—2 × 10~~	~~9-0~~	~~7-10~~	~~7-0~~	~~6-4~~	~~5-9~~	~~5-2~~	~~4-10~~
	~~2—2 × 12~~	~~10-6~~	~~9-1~~	~~8-1~~	~~7-5~~	~~6-10~~	~~6-4~~	~~5-10~~
	~~3—2 × 6~~	~~6-11~~	~~6-0~~	~~5-4~~	~~4-11~~	~~4-6~~	~~4-2~~	~~3-10~~
	~~3—2 × 8~~	~~9-3~~	~~8-0~~	~~7-2~~	~~6-6~~	~~6-1~~	~~5-6~~	~~5-0~~
	~~3—2 × 10~~	~~11-4~~	~~9-10~~	~~8-9~~	~~8-0~~	~~7-5~~	~~6-11~~	~~6-5~~
	~~3—2 × 12~~	~~13-2~~	~~11-5~~	~~10-2~~	~~9-4~~	~~8-7~~	~~8-1~~	~~7-7~~
~~Redwood~~[h] ~~Western cedars~~[h] ~~Ponderosa pine~~[h] ~~Red pine~~[h]	~~1—2 × 6~~	~~3-9~~	~~3-2~~	~~2-9~~	~~2-5~~	~~2-2~~	~~2-0~~	~~1-11~~
	~~1—2 × 8~~	~~4-10~~	~~4-2~~	~~3-7~~	~~3-2~~	~~2-11~~	~~2-8~~	~~2-6~~
	~~1—2 × 10~~	~~5-10~~	~~5-1~~	~~4-6~~	~~4-1~~	~~3-8~~	~~3-5~~	~~3-3~~
	~~1—2 × 12~~	~~6-10~~	~~5-11~~	~~5-3~~	~~4-10~~	~~4-5~~	~~4-2~~	~~3-11~~
	~~2—2 × 6~~	~~5-7~~	~~4-10~~	~~4-4~~	~~3-11~~	~~3-6~~	~~3-2~~	~~2-11~~
	~~2—2 × 8~~	~~7-1~~	~~6-2~~	~~5-6~~	~~5-0~~	~~4-7~~	~~4-2~~	~~3-10~~
	~~2—2 × 10~~	~~8-8~~	~~7-6~~	~~6-9~~	~~6-2~~	~~5-8~~	~~5-4~~	~~4-11~~
	~~2—2 × 12~~	~~10-1~~	~~8-9~~	~~7-10~~	~~7-2~~	~~6-7~~	~~6-2~~	~~5-10~~
	~~3—2 × 6~~	~~6-8~~	~~6-1~~	~~5-5~~	~~5-0~~	~~4-7~~	~~4-3~~	~~3-11~~
	~~3—2 × 8~~	~~8-9~~	~~7-9~~	~~6-22~~	~~6-4~~	~~5-20~~	~~5-5~~	~~5-3~~
	~~3—2 × 10~~	~~10-11~~	~~9-5~~	~~8-5~~	~~7-8~~	~~7-3~~	~~6-8~~	~~6-3~~
	~~3—2 × 12~~	~~12-8~~	~~10-11~~	~~9-9~~	~~8-11~~	~~8-3~~	~~7-9~~	~~7-3~~

~~For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.~~

~~a. Interpolation allowed. Extrapolation is not allowed.~~

~~b. Beams supporting a single span of joists with or without cantilever.~~

~~c. Dead load = 10 psf, $L/\Delta = 360$ at main span, $L/\Delta = 180$ at cantilever. Snow load not assumed to be concurrent with live load.~~

~~d. No. 2 grade, wet service factor included.~~

~~e. Beam depth shall be equal to or greater than the depth of interseeting joist for a flush beam connection.~~

~~f. Beam cantilevers are limited to the adjacent beam's span divided by 4.~~

~~g. Includes incising factor.~~

~~h. Incising factor not included.~~

~~i. Deck joist span as shown in Figure R507.5.~~

~~j. For calculation of effective deck joist span, the actual joist span length shall be multiplied by the joist span factor in accordance with Table R507.5(5).~~))

[W] ((~~TABLE R507.5(4)~~
~~MAXIMUM DECK BEAM SPAN—70 PSF GROUND SNOW LOAD[c]~~

~~BEAM SPECIES[d]~~	~~BEAM SIZE[e]~~	~~EFFECTIVE DECK JOIST SPAN LENGTH (feet)[a, i, j]~~						
		~~6~~	~~8~~	~~10~~	~~12~~	~~14~~	~~16~~	~~18~~
		~~MAXIMUM DECK BEAM SPAN LENGTH (feet-inches)[a, b, f]~~						
~~Southern pine~~	~~1—2 × 6~~	~~3-11~~	~~3-4~~	~~3-0~~	~~2-9~~	~~2-6~~	~~2-4~~	~~2-3~~
	~~1—2 × 8~~	~~4-11~~	~~4-3~~	~~3-10~~	~~3-6~~	~~3-3~~	~~3-0~~	~~2-10~~
	~~1—2 × 10~~	~~5-10~~	~~5-1~~	~~4-6~~	~~4-2~~	~~3-10~~	~~3-7~~	~~3-4~~
	~~1—2 × 12~~	~~6-11~~	~~6-0~~	~~5-4~~	~~4-11~~	~~4-6~~	~~4-3~~	~~4-0~~
	~~2—2 × 6~~	~~5-9~~	~~5-0~~	~~4-6~~	~~4-1~~	~~3-9~~	~~3-6~~	~~3-4~~
	~~2—2 × 8~~	~~7-4~~	~~6-4~~	~~5-8~~	~~5-2~~	~~4-10~~	~~4-6~~	~~4-3~~
	~~2—2 × 10~~	~~8-9~~	~~7-7~~	~~6-9~~	~~6-2~~	~~5-8~~	~~5-4~~	~~5-0~~
	~~2—2 × 12~~	~~10-3~~	~~8-11~~	~~8-0~~	~~7-3~~	~~6-9~~	~~6-3~~	~~5-11~~
	~~3—2 × 6~~	~~7-0~~	~~6-3~~	~~5-7~~	~~5-1~~	~~4-9~~	~~4-5~~	~~4-2~~
	~~3—2 × 8~~	~~9-3~~	~~8-0~~	~~7-2~~	~~6-6~~	~~6-0~~	~~5-8~~	~~5-4~~
	~~3—2 × 10~~	~~10-11~~	~~9-6~~	~~8-6~~	~~7-9~~	~~7-2~~	~~6-8~~	~~6-4~~
	~~3—2 × 12~~	~~12-11~~	~~11-2~~	~~10-0~~	~~9-1~~	~~8-5~~	~~7-11~~	~~7-5~~
~~Douglas fir-larch[g]~~ ~~Hem-fir[g]~~ ~~Spruce-pine-fir[g]~~	~~1—2 × 6~~	~~3-5~~	~~2-10~~	~~2-5~~	~~2-2~~	~~2-0~~	~~1-10~~	~~1-9~~
	~~1—2 × 8~~	~~4-7~~	~~3-8~~	~~3-2~~	~~2-10~~	~~2-7~~	~~2-5~~	~~2-4~~
	~~1—2 × 10~~	~~5-8~~	~~4-9~~	~~4-1~~	~~3-8~~	~~3-4~~	~~3-1~~	~~2-11~~
	~~1—2 × 12~~	~~6-7~~	~~5-8~~	~~5-0~~	~~4-6~~	~~4-1~~	~~3-10~~	~~3-7~~
	~~2—2 × 6~~	~~5-2~~	~~4-6~~	~~4-0~~	~~3-5~~	~~3-1~~	~~2-10~~	~~2-7~~
	~~2—2 × 8~~	~~6-11~~	~~6-0~~	~~5-3~~	~~4-7~~	~~4-1~~	~~3-8~~	~~3-5~~
	~~2—2 × 10~~	~~8-5~~	~~7-4~~	~~6-6~~	~~5-10~~	~~5-2~~	~~4-9~~	~~4-5~~
	~~2—2 × 12~~	~~9-10~~	~~8-6~~	~~7-7~~	~~6-11~~	~~6-4~~	~~5-9~~	~~5-4~~
	~~3—2 × 6~~	~~6-6~~	~~5-7~~	~~5-0~~	~~4-7~~	~~4-2~~	~~3-9~~	~~3-5~~
	~~3—2 × 8~~	~~8-8~~	~~7-6~~	~~6-8~~	~~6-1~~	~~5-6~~	~~5-0~~	~~4-7~~
	~~3—2 × 10~~	~~10-7~~	~~9-2~~	~~8-2~~	~~7-6~~	~~6-11~~	~~6-4~~	~~5-10~~
	~~3—2 × 12~~	~~12-4~~	~~10-8~~	~~9-7~~	~~8-9~~	~~8-1~~	~~7-7~~	~~7-1~~
~~Redwood[h]~~ ~~Western cedars[h]~~ ~~Ponderosa pine[h]~~ ~~Red pine[h]~~	~~1—2 × 6~~	~~3-6~~	~~2-11~~	~~2-6~~	~~2-3~~	~~2-0~~	~~1-11~~	~~1-9~~
	~~1—2 × 8~~	~~4-6~~	~~3-10~~	~~3-3~~	~~2-11~~	~~2-8~~	~~2-6~~	~~2-4~~
	~~1—2 × 10~~	~~5-6~~	~~4-9~~	~~4-2~~	~~3-9~~	~~3-5~~	~~3-2~~	~~3-0~~
	~~1—2 × 12~~	~~6-4~~	~~5-6~~	~~4-11~~	~~4-6~~	~~4-2~~	~~3-11~~	~~3-8~~
	~~2—2 × 6~~	~~5-3~~	~~4-7~~	~~4-1~~	~~3-6~~	~~3-2~~	~~2-11~~	~~2-8~~
	~~2—2 × 8~~	~~6-8~~	~~5-9~~	~~5-2~~	~~4-8~~	~~4-2~~	~~3-10~~	~~3-6~~
	~~2—2 × 10~~	~~8-2~~	~~7-1~~	~~6-4~~	~~5-9~~	~~5-4~~	~~4-10~~	~~4-6~~
	~~2—2 × 12~~	~~9-5~~	~~8-2~~	~~7-4~~	~~6-8~~	~~6-2~~	~~5-9~~	~~5-5~~
	~~3—2 × 6~~	~~6-4~~	~~5-8~~	~~5-1~~	~~4-8~~	~~4-3~~	~~3-10~~	~~3-6~~
	~~3—2 × 8~~	~~8-4~~	~~7-3~~	~~6-5~~	~~5-11~~	~~5-5~~	~~5-1~~	~~4-8~~
	~~3—2 × 10~~	~~10-2~~	~~8-10~~	~~7-11~~	~~7-2~~	~~6-8~~	~~6-3~~	~~5-11~~
	~~3—2 × 12~~	~~11-10~~	~~10-3~~	~~9-2~~	~~8-4~~	~~7-9~~	~~7-3~~	~~6-10~~

~~For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.~~

~~a. Interpolation allowed. Extrapolation is not allowed.~~

~~b. Beams supporting a single span of joists with or without cantilever.~~

~~c. Dead load = 10 psf, $L/\Delta = 360$ at main span, $L/\Delta = 180$ at cantilever. Snow load not assumed to be concurrent with live load.~~

~~d. No. 2 grade, wet service factor included.~~

~~e. Beam depth shall be equal to or greater than the depth of intersecting joist for a flush beam connection.~~

~~f. Beam cantilevers are limited to the adjacent beam's span divided by 4.~~

~~g. Includes incising factor.~~

~~h. Incising factor not included.~~

~~i. Deck joist span as shown in Figure R507.5.~~

~~j. For calculation of effective deck joist span, the actual joist span length shall be multiplied by the joist span factor in accordance with Table R507.5(5).~~))

~~[W] ((TABLE R507.5(5)~~
~~JOIST SPAN FACTORS FOR CALCULATING EFFECTIVE DECK JOIST SPAN~~
~~[for use with Note j in Tables R507.5(1), R507.5(2), R507.5(3) and R507.5(4)]~~

~~C/J[a]~~	~~JOIST SPAN FACTOR~~
~~0 (no cantilever)~~	~~0.66~~
~~1/12 (0.87)~~	~~0.72~~
~~1/10 (0.10)~~	~~0.80~~
~~1/8 (0.125)~~	~~0.84~~
~~1/6 (0.167)~~	~~0.90~~
~~1/4 (0.250)~~	~~1.00~~

~~For SI: 1 foot = 304.8 mm.~~

~~a. C = actual joist cantilever length (feet); J = actual joist span length (feet).~~))

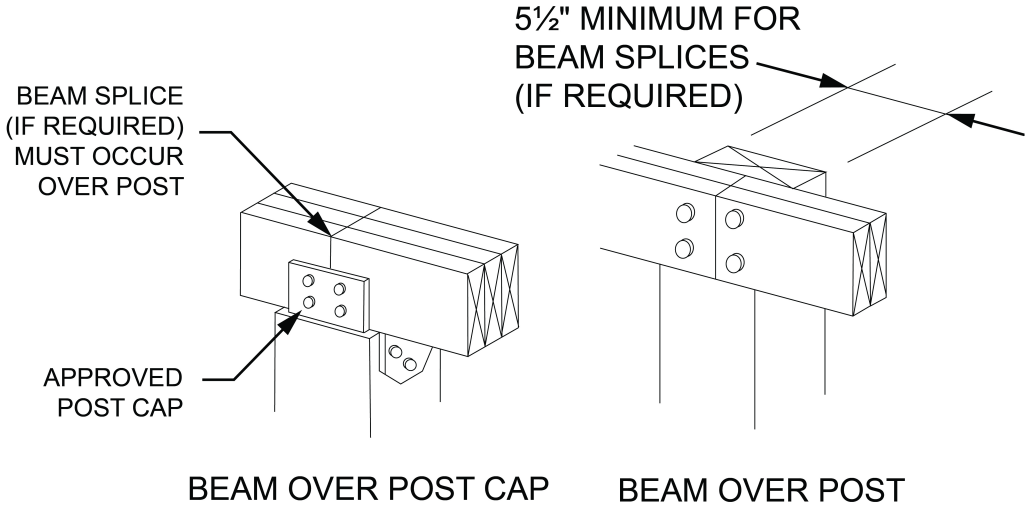
[W] TABLE R507.5
MAXIMUM DECK BEAM SPAN – 60 PSF LIVE LOAD or 70 PSF GROUND SNOW LOAD[c]

BEAM SPECIES[d]	BEAM SIZE[e]	EFFECTIVE DECK JOIST SPAN[a, j] (feet)						
		6	8	10	12	14	16	18
		MAXIMUM DECK BEAM SPAN LENGTH[a, b, f] (feet-inches)						
Douglas fir-larch[g], Hem-fir[g], Spruce-pine-fir[g]	1-2x6	3-5	2-10	2-5	2-2	2-0	1-10	1-9
	1-2x8	4-7	3-8	3-2	2-10	2-7	2-5	2-4
	1-2x10	5-8	4-9	4-1	3-8	3-4	3-1	2-11
	1-2x12	6-7	5-8	5-0	4-6	4-1	3-10	3-7
	2-2x6	5-2	4-6	4-0	3-5	3-1	2-10	2-7
	2-2x8	6-11	6-0	5-3	4-7	4-1	3-8	3-5
	2-2x10	8-5	7-4	6-6	5-10	5-2	4-9	4-5
	2-2x12	9-10	8-6	7-7	6-11	6-4	5-9	5-4
	3-2x6	6-6	5-7	5-0	4-7	4-2	3-9	3-5
	3-2x8	8-8	7-6	6-8	6-1	5-6	5-0	4-7
	3-2x10	10-7	9-2	8-2	7-6	6-11	6-4	5-10
	3-2x12	12-4	10-8	9-7	8-9	8-1	7-7	7-1
Redwood[h], Western Cedars[h], Ponderosa Pine[h], Red Pine[h]	1-2x6	3-6	2-11	2-6	2-3	2-0	1-11	1-9
	1-2x8	4-6	3-10	3-3	2-11	2-8	2-6	2-4
	1-2x10	5-6	4-9	4-2	3-9	3-5	3-2	3-0
	1-2x12	6-4	5-6	4-11	4-6	4-2	3-11	3-8
	2-2x6	5-3	4-7	4-1	3-6	3-2	2-11	2-8
	2-2x8	6-8	5-9	5-2	4-8	4-2	3-10	3-6
	2-2x10	8-2	7-1	6-4	5-9	5-4	4-10	4-6
	2-2x12	9-5	8-2	7-4	6-8	6-2	5-9	5-5
	3-2x6	6-4	5-8	5-1	4-8	4-3	3-10	3-6
	3-2x8	8-4	7-3	6-5	5-11	5-5	5-1	4-8
	3-2x10	10-2	8-10	7-11	7-2	6-8	6-3	5-11
	3-2x12	11-10	10-3	9-2	8-4	7-9	7-3	6-10

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

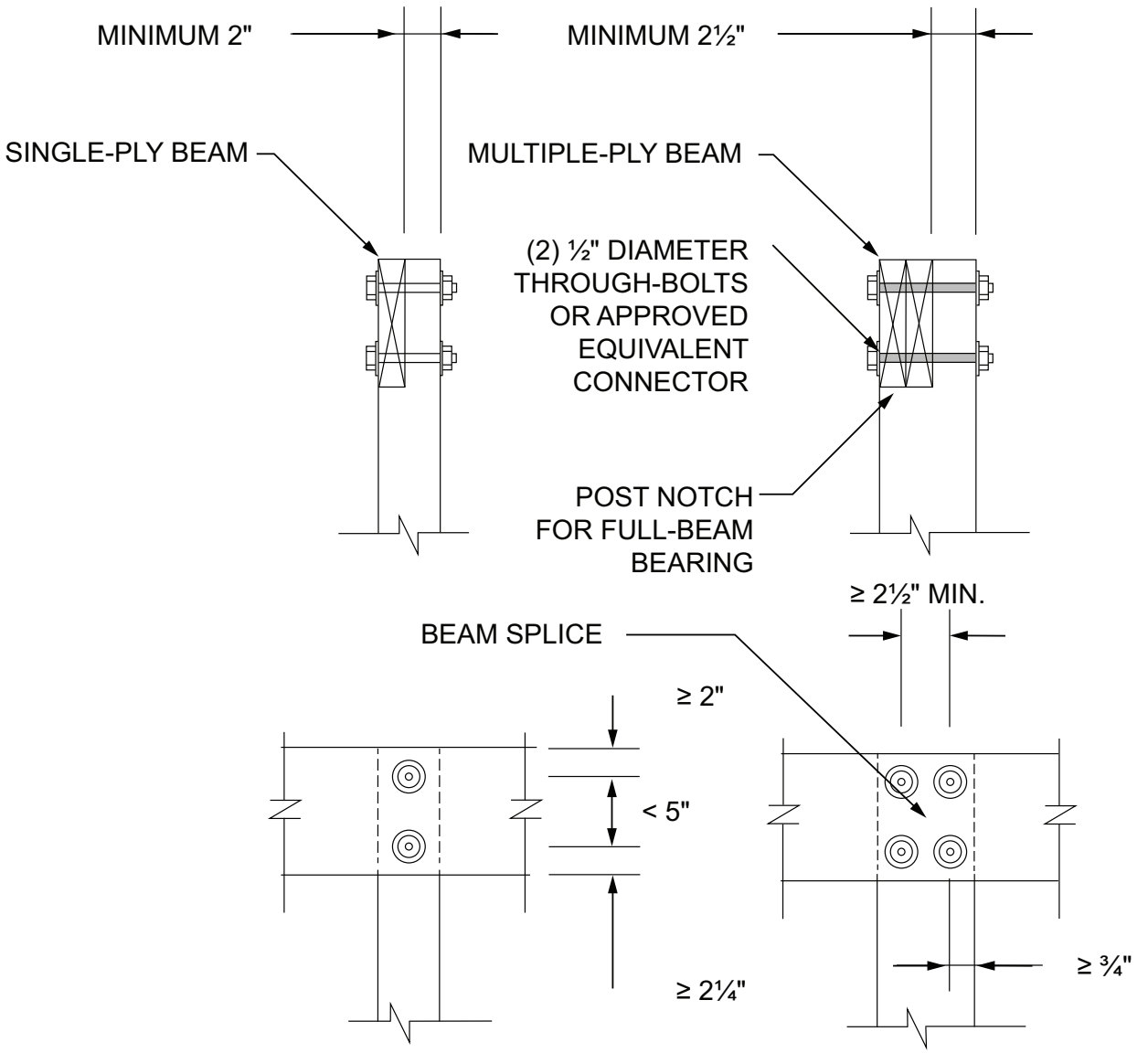
a. Interpolation allowed. Extrapolation is not allowed.
b. Beams supporting a single span of joists with or without cantilever.
c. Dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.
d. No. 2 grade, wet service factor included.
e. Beam depth shall be equal to or greater than the depth of intersecting joist for a flush beam connection.
f. Beam cantilevers are limited to the adjacent beam's span divided by 4.
g. Includes incising factor.
h. Incising factor not included.
i. Deck joist span as shown in Figure R507.5.
j. For calculation of effective joist span, the actual joist span length shall be multiplied by the joist span factor in accordance with Table R507.6.

R507.5.1 Deck beam bearing. The ends of beams shall have not less than 1-1/2 inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) of bearing on concrete or masonry for the entire width of the beam. Where multiple-span beams bear on intermediate posts, each ply must have full bearing on the post in accordance with Figures R507.5.1(1) and R507.5.1(2).



For SI: 1 inch = 25.4 mm.

FIGURE R507.5.1(1)
DECK BEAM TO DECK POST



For SI: 1 inch = 25.4 mm.

FIGURE R507.5.1(2)
NOTCHED POST-TO-BEAM CONNECTION

R507.5.2 Deck beam connection to supports. Deck beams shall be attached to supports in a manner capable of transferring vertical loads and resisting horizontal displacement. Deck beam connections to wood posts shall be in accordance with Figures R507.5.1(1) and R507.5.1(2). Manufactured post-to-beam connectors shall be sized for the post and beam sizes. Bolts shall have washers under the head and nut.

R507.6 Deck joists. Maximum allowable spans for wood deck joists, as shown in Figure R507.6, shall be in accordance with Table R507.6. The maximum joist spacing shall be limited by the decking materials in accordance with Table R507.7.

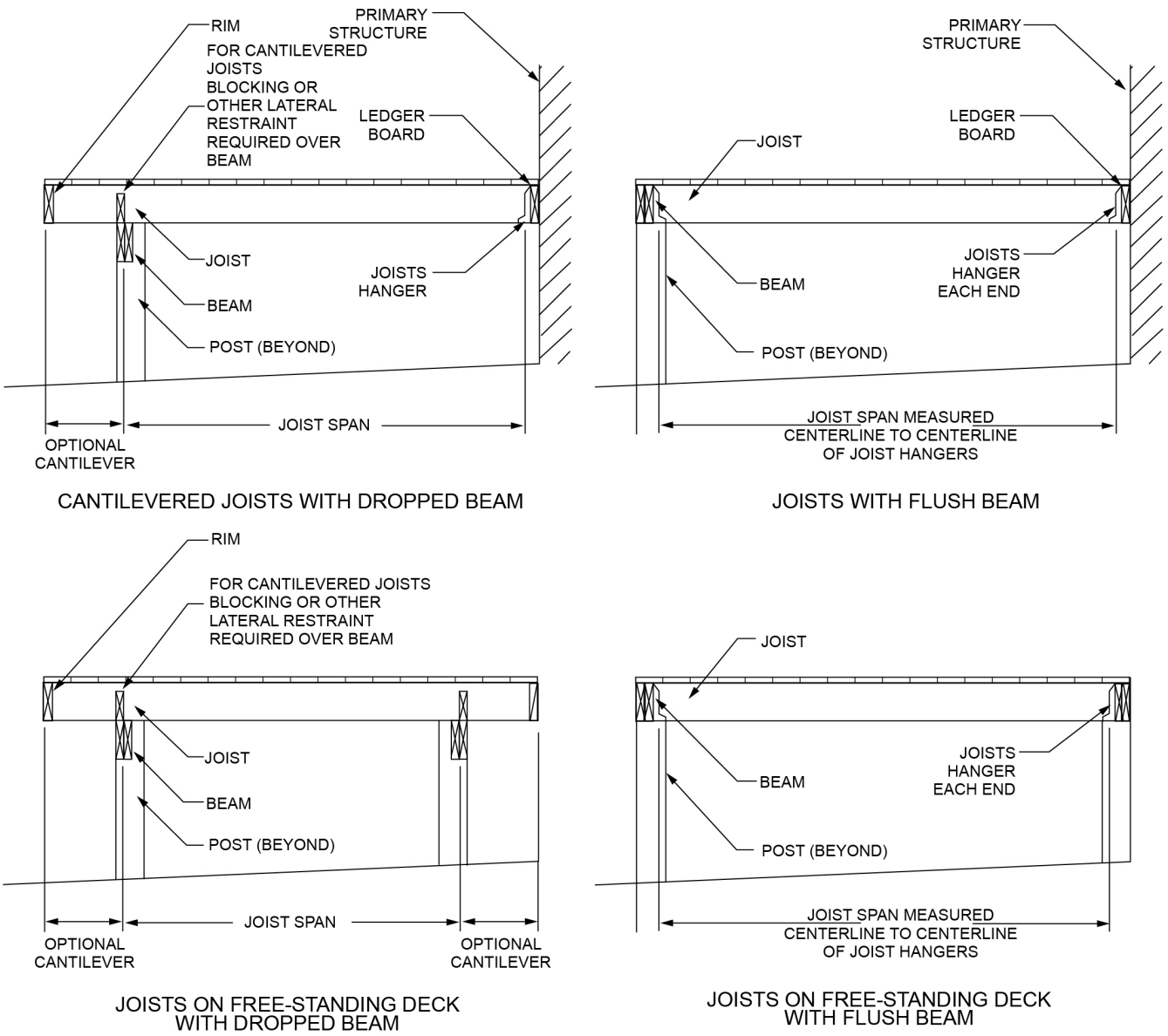


FIGURE R507.6
TYPICAL DECK JOIST SPANS

[W] ((TABLE R507.6
MAXIMUM DECK JOIST SPANS

LOAD[a] (psf)	JOIST SPECIES[b]	JOIST SIZE	ALLOWABLE JOIST SPAN[b,c] (feet inches)			MAXIMUM CANTILEVER[d,f] (feet inches)							
			Joist spacing (inches)			Joist back span[g] (feet)							
			12	16	24	4	6	8	10	12	14	16	18
40 live load	Southern pine	2 × 6	9-11	9-0	7-7	1-0	1-6	1-5	NP	NP	NP	NP	NP
		2 × 8	13-1	11-10	9-8	1-0	1-6	2-0	2-6	2-3	NP	NP	NP
		2 × 10	16-2	14-0	11-5	1-0	1-6	2-0	2-6	3-0	3-4	3-4	NP
		2 × 12	18-0	16-6	13-6	1-0	1-6	2-0	2-6	3-0	3-6	4-0	4-1
	Douglas fir-larch[e] Hem-fir[e] Spruce-pine-fir[e]	2 × 6	9-6	8-4	6-10	1-0	1-6	1-4	NP	NP	NP	NP	NP
		2 × 8	12-6	11-1	9-1	1-0	1-6	2-0	2-3	2-0	NP	NP	NP
		2 × 10	15-8	13-7	11-1	1-0	1-6	2-0	2-6	3-0	3-3	NP	NP
		2 × 12	18-0	15-9	12-10	1-0	1-6	2-0	2-6	3-0	3-6	3-11	3-11
	Redwood[f] Western cedars[f] Ponderosa pine[f] Red pine[f]	2 × 6	8-10	8-0	6-10	1-0	1-4	1-1	NP	NP	NP	NP	NP
		2 × 8	11-8	10-7	8-8	1-0	1-6	2-0	1-11	NP	NP	NP	NP
		2 × 10	14-11	13-0	10-7	1-0	1-6	2-0	2-6	3-0	2-9	NP	NP
		2 × 12	17-5	15-1	12-4	1-0	1-6	2-0	2-6	3-0	3-6	3-8	NP
50 ground snow load	Southern pine	2 × 6	9-2	8-4	7-4	1-0	1-6	1-5	NP	NP	NP	NP	NP
		2 × 8	12-1	11-0	9-5	1-0	1-6	2-0	2-5	2-3	NP	NP	NP
		2 × 10	15-5	13-9	11-3	1-0	1-6	2-0	2-6	3-0	3-1	NP	NP
		2 × 12	18-0	16-2	13-2	1-0	1-6	2-0	2-6	3-0	3-6	3-10	3-10
	Douglas fir-larch[e] Hem-fir[e] Spruce-pine-fir[e]	2 × 6	8-10	8-0	6-8	1-0	1-6	1-4	NP	NP	NP	NP	NP
		2 × 8	11-7	10-7	8-11	1-0	1-6	2-0	2-3	NP	NP	NP	NP
		2 × 10	14-10	13-3	10-10	1-0	1-6	2-0	2-6	3-0	3-0	NP	NP
		2 × 12	17-9	15-5	12-7	1-0	1-6	2-0	2-6	3-0	3-6	3-8	NP
	Redwood[f] Western cedars[f] Ponderosa pine[f] Red pine[f]	2 × 6	8-3	7-6	6-6	1-0	1-4	1-1	NP	NP	NP	NP	NP
		2 × 8	10-10	9-10	8-6	1-0	1-6	2-0	1-11	NP	NP	NP	NP
		2 × 10	13-10	12-7	10-5	1-0	1-6	2-0	2-6	2-9	NP	NP	NP
		2 × 12	16-10	14-9	12-1	1-0	1-6	2-0	2-6	3-0	3-5	3-5	NP
60 ground snow load	Southern pine	2 × 6	8-8	7-10	6-10	1-0	1-6	1-5	NP	NP	NP	NP	NP
		2 × 8	11-5	10-4	8-9	1-0	1-6	2-0	2-4	NP	NP	NP	NP
		2 × 10	14-7	12-9	10-5	1-0	1-6	2-0	2-6	2-11	2-11	NP	NP
		2 × 12	17-3	15-0	12-3	1-0	1-6	2-0	2-6	3-0	3-6	3-7	NP
	Douglas fir-larch[e] Hem-fir[e] Spruce-pine-fir[e]	2 × 6	8-4	7-6	6-2	1-0	1-6	1-4	NP	NP	NP	NP	NP
		2 × 8	10-11	9-11	8-3	1-0	1-6	2-0	2-2	NP	NP	NP	NP
		2 × 10	13-11	12-4	10-0	1-0	1-6	2-0	2-6	2-10	NP	NP	NP
		2 × 12	16-6	14-3	11-8	1-0	1-6	2-0	2-6	3-0	3-5	3-5	NP
	Redwood[f] Western cedars[f] Ponderosa pine[f] Red pine[f]	2 × 6	7-9	7-0	6-2	1-0	1-4	NP	NP	NP	NP	NP	NP
		2 × 8	10-2	9-3	7-11	1-0	1-6	2-0	1-11	NP	NP	NP	NP
		2 × 10	13-0	11-9	9-7	1-0	1-6	2-0	2-6	2-7	NP	NP	NP
		2 × 12	15-9	13-8	11-2	1-0	1-6	2-0	2-6	3-0	3-2	NP	NP

[W] ((~~TABLE R507.6—~~continued
~~MAXIMUM DECK JOIST SPANS~~

~~LOAD[a] (psf)~~	~~JOIST SPECIES[b]~~	~~JOIST SIZE~~	~~ALLOWABLE JOIST SPAN[b, c] (feet-inches)~~			~~MAXIMUM CANTILEVER[d, f] (feet-inches)~~							
			~~Joist spacing (inches)~~			~~Joist back span[g] (feet)~~							
			~~12~~	~~16~~	~~24~~	~~4~~	~~6~~	~~8~~	~~10~~	~~12~~	~~14~~	~~16~~	~~18~~
~~70 ground snow load~~	~~Southern pine~~	~~2 × 6~~	~~8-3~~	~~7-6~~	~~6-5~~	~~1-0~~	~~1-6~~	~~1-5~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~
		~~2 × 8~~	~~10-10~~	~~9-10~~	~~8-2~~	~~1-0~~	~~1-6~~	~~2-0~~	~~2-2~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~
		~~2 × 10~~	~~13-9~~	~~11-11~~	~~9-9~~	~~1-0~~	~~1-6~~	~~2-0~~	~~2-6~~	~~2-9~~	~~NP~~	~~NP~~	~~NP~~
		~~2 × 12~~	~~16-2~~	~~14-0~~	~~11-5~~	~~1-0~~	~~1-6~~	~~2-0~~	~~2-6~~	~~3-0~~	~~3-5~~	~~3-5~~	~~NP~~
	~~Douglas fir-larch[e]~~ ~~Hem-fir[e]~~ ~~Spruce-pine-fir[e]~~	~~2 × 6~~	~~7-11~~	~~7-1~~	~~5-9~~	~~1-0~~	~~1-6~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~
		~~2 × 8~~	~~10-5~~	~~9-5~~	~~7-8~~	~~1-0~~	~~1-6~~	~~2-0~~	~~2-1~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~
		~~2 × 10~~	~~13-3~~	~~11-6~~	~~9-5~~	~~1-0~~	~~1-6~~	~~2-0~~	~~2-6~~	~~2-8~~	~~NP~~	~~NP~~	~~NP~~
		~~2 × 12~~	~~15-5~~	~~13-4~~	~~10-11~~	~~1-0~~	~~1-6~~	~~2-0~~	~~2-6~~	~~3-0~~	~~3-3~~	~~NP~~	~~NP~~
	~~Redwood[f]~~ ~~Western cedars[f]~~ ~~Ponderosa pine[f]~~ ~~Red pine[f]~~	~~2 × 6~~	~~7-4~~	~~6-8~~	~~5-10~~	~~1-0~~	~~1-4~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~
		~~2 × 8~~	~~9-8~~	~~8-10~~	~~7-4~~	~~1-0~~	~~1-6~~	~~1-11~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~	~~NP~~
		~~2 × 10~~	~~12-4~~	~~11-0~~	~~9-0~~	~~1-0~~	~~1-6~~	~~2-0~~	~~2-6~~	~~2-6~~	~~NP~~	~~NP~~	~~NP~~
		~~2 × 12~~	~~14-9~~	~~12-9~~	~~10-5~~	~~1-0~~	~~1-6~~	~~2-0~~	~~2-6~~	~~3-0~~	~~3-0~~	~~NP~~	~~NP~~

~~For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.~~
~~NP = Not Permitted.~~
~~a. Dead load = 10 psf. Snow load not assumed to be concurrent with live load.~~
~~b. No. 2 grade, wet service factor included.~~
~~c. L/Δ = 360 at main span.~~
~~d. L/Δ = 180 at cantilever with a 220-pound point load applied to end.~~
~~e. Includes incising factor.~~
~~f. Incising factor not included.~~
~~g. Interpolation allowed. Extrapolation is not allowed.~~))

[W] TABLE 507.6
MAXIMUM DECK JOIST SPANS

LOAD[a] (psf)	JOIST SPECIES[b]	JOIST SIZE	ALLOWABLE JOIST SPAN[b, c] (feet-inches)			MAXIMUM CANTILEVER[f, g] (feet-inches)							
			Joist Spacing (inches)			Adjacent Joist Back Span[g] (feet)							
			12	16	24	4	6	8	10	12	14	16	18
60 live load or 70 ground snow load	Douglas fir-larch[e], Hem-fir[e], Spruce-pine-fir[e]	2 × 6	7-11	7-1	5-9	1-0	1-6	NP	NP	NP	NP	NP	NP
		2 × 8	10-5	9-5	7-8	1-0	1-6	2-0	2-1	NP	NP	NP	NP
		2 × 10	13-3	11-6	9-5	1-0	1-6	2-0	2-6	2-8	NP	NP	NP
		2 × 12	15-5	13-4	10-11	1-0	1-6	2-0	2-6	3-0	3-3	NP	NP
	Redwood[f], Western Cedars[f], Ponderosa Pine[f], Red Pine[f]	2 × 6	7-4	6-8	5-10	1-0	1-4	NP	NP	NP	NP	NP	NP
		2 × 8	9-8	8-10	7-4	1-0	1-6	1-11	NP	NP	NP	NP	NP
		2 × 10	12-4	11-0	9-0	1-0	1-6	2-0	2-6	2-6	NP	NP	NP
		2 × 12	14-9	12-9	10-5	1-0	1-6	2-0	2-6	3-0	3-0	NP	NP

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg. NP = Not Permitted
a. Dead load = 10 psf. Snow load not assumed to be concurrent with live load.
b. No. 2 grade, wet service factor included.
c. L/Δ = 360 at main span.
d. L/Δ = 180 at cantilever with 220-pound point load applied to end.
e. Includes incising factor.
f. Incising factor not included.
g. Interpolation permitted. Extrapolation is not permitted.

R507.6.1 Deck joist bearing. The ends of joists shall have not less than 1-1/2 inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) of bearing on concrete or masonry over its entire width. Joists bearing on top of a multiple-ply beam or ledger shall be fastened in accordance with Table R602.3(1). Joists bearing on top of a single-ply beam or ledger shall be attached by a mechanical connector. Joist framing into the side of a beam or ledger board shall be supported by *approved* joist hangers.

R507.6.2 Deck joist lateral restraint. Joist ends and bearing locations shall be provided with lateral resistance to prevent rotation. Where lateral restraint is provided by joist hangers or blocking between joists, their depth shall equal not less than 60 percent of the joist depth. Where lateral restraint is provided by rim joists, they shall be secured to the end of each joist with not fewer than three 10d (3-inch by 0.128-inch) (76 mm by 3.3 mm) nails or three No. 10 x 3-inch-long (76 mm) wood screws.

R507.7 Decking. Maximum allowable spacing for joists supporting wood decking, excluding *stairways*, shall be in accordance with Table R507.7. Wood decking shall be attached to each supporting member with not less than two 8d threaded nails or two No. 8 wood screws. Maximum allowable spacing for joists supporting *plastic composite* decking shall be in accordance with Section R507.2. Other *approved* decking or fastener systems shall be installed in accordance with the manufacturer's installation requirements.

TABLE R507.7
MAXIMUM JOIST SPACING FOR WOOD DECKING

DECKING MATERIAL TYPE AND NOMINAL SIZE	DECKING PERPENDICULAR TO JOIST		DECKING DIAGONAL TO JOIST[a]	
	Single span[c]	Multiple span[c]	Single span[c]	Multiple span[c]
	Maximum on-center joist spacing (inches)			
1-1/4-inch-thick wood[b]	12	16	8	12
2-inch-thick wood	24	24	18	24

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 degree = 0.01745 rad.

a. Maximum angle of 45 degrees from perpendicular for wood deck boards.

b. Other maximum span provided by an accredited lumber grading or inspection agency also allowed.

c. Individual wood deck boards supported by two joists shall be considered single span and three or more joists shall be considered multiple span.

R507.8 Vertical and lateral supports. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. For decks with cantilevered framing members, connection to exterior walls or other framing members shall be designed and constructed to resist uplift resulting from the full *live load* specified in Table R301.5 acting on the cantilevered portion of the deck. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting.

R507.9 Vertical and lateral supports at band joist. Vertical and lateral supports for decks shall comply with this section.

R507.9.1 Vertical supports. Vertical loads shall be transferred to band joists with ledgers in accordance with this section.

R507.9.1.1 Ledger details. Deck ledgers shall be a minimum 2-inch by 8-inch (51 mm by 203 mm) nominal, pressure-preservative-treated Southern pine, incised pressure-preservative-treated hem-fir, or *approved*, naturally durable, No. 2 grade or better lumber. Deck ledgers shall not support concentrated loads from beams or girders. Deck ledgers shall not be supported on stone or masonry veneer.

R507.9.1.2 Band joist details. Band joists supporting a ledger shall be a minimum 2-inch-nominal (51 mm), solid-sawn, spruce-pine-fir or better lumber or a minimum 1-inch (25 mm) nominal engineered wood rim boards in accordance with Section R502.1.7. Band joists shall bear fully on the primary structure capable of supporting all required loads.

R507.9.1.3 Ledger to band joist details. Fasteners used in deck ledger connections in accordance with Table R507.9.1.3(1) shall be hot-dipped galvanized or stainless steel and shall be installed in accordance with Table R507.9.1.3(2) and Figures R507.9.1.3(1) and R507.9.1.3(2).

[W] TABLE R507.9.1.3(1)
DECK LEDGER CONNECTION TO BAND JOIST

LOAD[c] (psf)	JOIST SPAN[a] (feet)	ON-CENTER SPACING OF FASTENERS[b] (inches)		
		1/2-inch diameter lag screw with 1/2-inch maximum sheathing[d, e]	1/2-inch diameter bolt with 1/2-inch maximum sheathing[e]	1/2-inch diameter bolt with 1-inch maximum sheathing[f]
((~~40 live load~~	~~6~~	~~30~~	~~36~~	~~36~~
	~~8~~	~~23~~	~~36~~	~~36~~
	~~10~~	~~18~~	~~34~~	~~29~~
	~~12~~	~~15~~	~~29~~	~~24~~
	~~14~~	~~13~~	~~24~~	~~21~~
	~~16~~	~~11~~	~~21~~	~~18~~
	~~18~~	~~10~~	~~19~~	~~16~~

[W] TABLE R507.9.1.3(1)—continued
DECK LEDGER CONNECTION TO BAND JOIST

~~50 ground snow load~~	~~6~~	~~29~~	~~36~~	~~36~~
	~~8~~	~~22~~	~~36~~	~~35~~
	~~10~~	~~17~~	~~33~~	~~28~~
	~~12~~	~~14~~	~~27~~	~~23~~
	~~14~~	~~12~~	~~23~~	~~20~~
	~~16~~	~~11~~	~~20~~	~~17~~
	~~18~~	~~9~~	~~18~~	~~15~~
~~60 ground snow load~~	~~6~~	~~25~~	~~36~~	~~36~~
	~~8~~	~~18~~	~~35~~	~~30~~
	~~10~~	~~15~~	~~28~~	~~24~~
	~~12~~	~~12~~	~~23~~	~~20~~
	~~14~~	~~10~~	~~20~~	~~17~~
	~~16~~	~~9~~	~~17~~	~~15~~
	~~18~~	~~8~~	~~15~~	~~13~~))
60 live load or 70 ground snow load	6	22	36	35
	8	16	31	26
	10	13	25	21
	12	11	20	17
	14	9	17	15
	16	8	15	13
	18	7	13	11

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

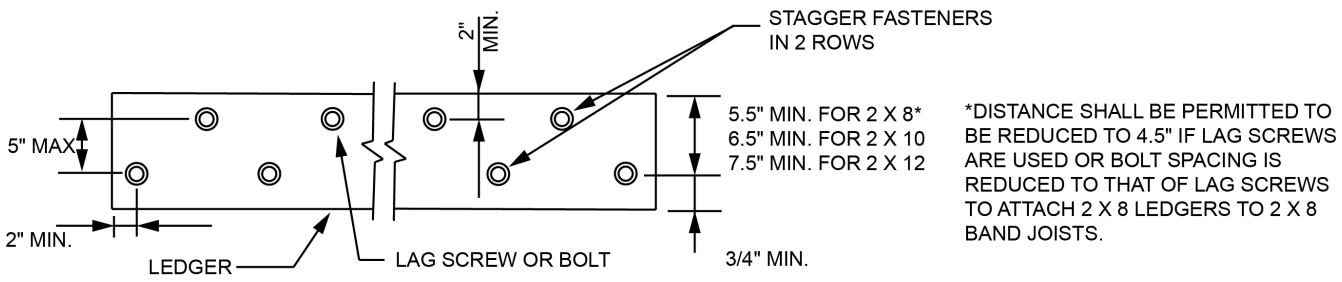
a. Interpolation permitted. Extrapolation is not permitted.
b. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.
c. Dead Load = 10 psf. Snow load shall not be assumed to act concurrently with live load.
d. The tip of the lag screw shall fully extend beyond the inside face of the band joist.
e. Sheathing shall be wood structural panel or solid sawn lumber.
f. Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to 1/2-inch thickness of stacked washers shall be permitted to substitute for up to 1/2 inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

[W] TABLE R507.9.1.3(2)
PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS

MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS				
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
Ledger[a]	2 inches[d]	3/4 inch	2 inches[b]	1-5/8 inches[b]
Band Joist[c]	3/4 inch	2 inches	2 inches[b]	1-5/8 inches[b]

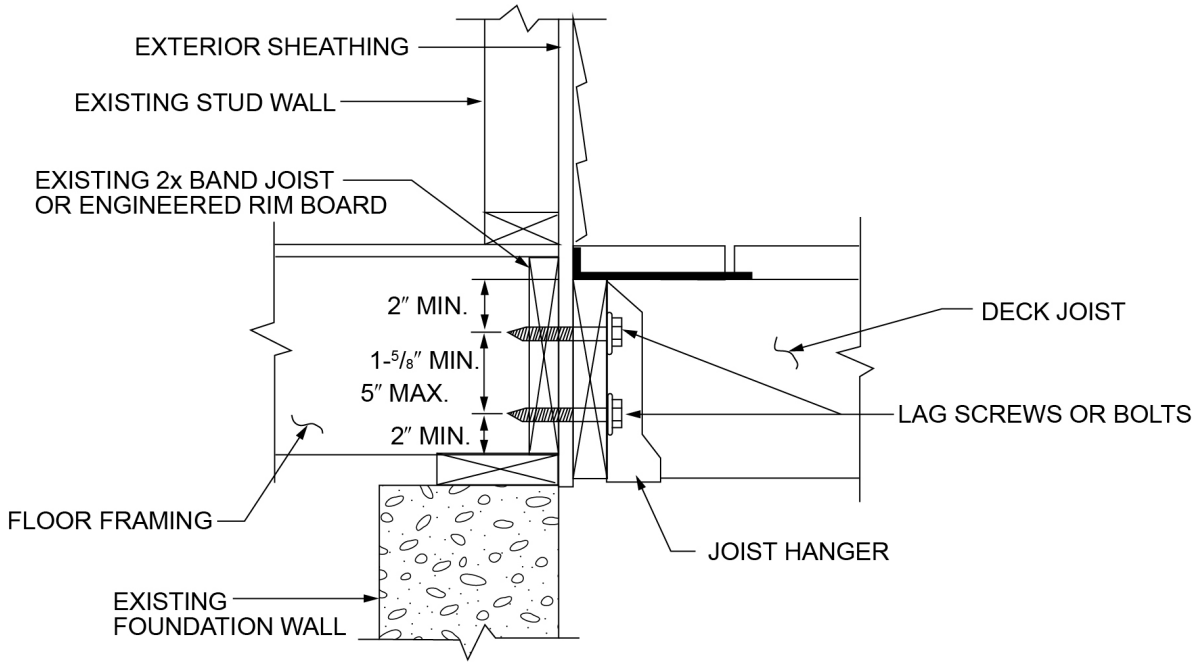
For SI: 1 inch = 25.4 mm.

a. Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.9.1.3(1).
b. Maximum 5 inches.
c. For engineered rim joists, the manufacturer's recommendations shall govern.
d. The minimum distance from bottom row of lag screws ((~~or bolts~~)) to the top edge of the ledger shall be in accordance with Figure R507.9.1.3(1).
e. The 2 inches may be reduced to 3/4 inch when the band joist is directly supported by a mudsill, a header or by double top wall plates.



For SI: 1 inch = 25.4 mm.

FIGURE R507.9.1.3(1)
PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS



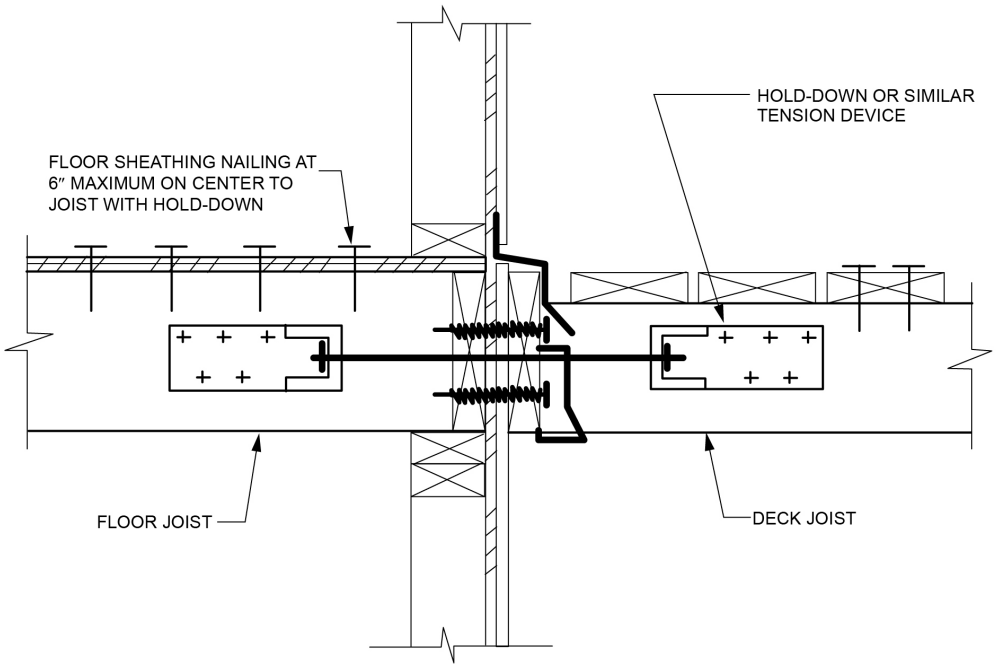
For SI: 1 inch = 25.4 mm.

FIGURE R507.9.1.3(2)
PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOISTS

R507.9.1.4 Alternate ledger details. Alternate framing configurations supporting a ledger constructed to meet the load requirements of Section R301.5 shall be permitted.

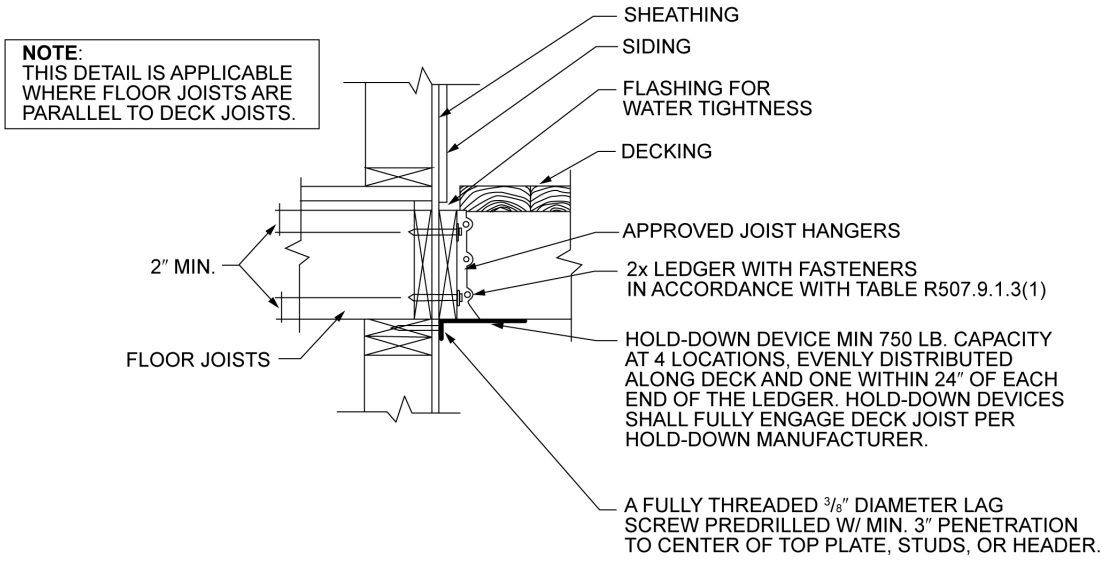
[W] R507.9.2 ((~~Lateral~~)) Deck lateral load connection. Lateral loads shall be transferred to the ground or to a structure capable of transmitting them to the ground. Where the lateral load connection is provided in accordance with Figure R507.9.2(1), hold-down tension devices shall be installed in not less than two locations per deck, within 24 inches (610 mm) of each end of the deck. Each device shall have an allowable stress design capacity of not less than 1,500 pounds (6672 N). Where the lateral load connections are provided in accordance with Figure R507.9.2(2), the hold-down tension devices shall be installed in not less than four locations per deck, and each device shall have an allowable stress design capacity of not less than 750 pounds (3336 N).

Exception: Decks not more than 30 inches above grade at any point may be unattached.



For SI: 1 inch = 25.4 mm.

FIGURE R507.9.2(1)
DECK ATTACHMENT FOR LATERAL LOADS



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

FIGURE R507.9.2(2)
DECK ATTACHMENT FOR LATERAL LOADS

R507.10 Exterior guards. *Guards* shall be constructed to meet the requirements of Sections R301.5 and R312, and this section.

R507.10.1 Support of guards. Where *guards* are supported on deck framing, *guard* loads shall be transferred to the deck framing with a continuous load path to the deck joists.

R507.10.1.1 Guards supported by side of deck framing. Where *guards* are connected to the interior or exterior side of a deck joist or beam, the joist or beam shall be connected to the adjacent joists to prevent rotation of the joist or beam. Connections relying only on fasteners in end grain withdrawal are not permitted.

R507.10.1.2 Guards supported on top of deck framing. Where *guards* are mounted on top of the decking, the *guards* shall be connected to the deck framing or blocking and installed in accordance with manufacturer's instructions to transfer the *guard* loads to the adjacent joists.

R507.10.2 Wood posts at deck guards. Where 4-inch by 4-inch (102 mm by 102 mm) wood posts support guard loads applied to the top of the guard, such posts shall not be notched at the connection to the supporting structure.

R507.10.3 Plastic composite guards. *Plastic composite guards* shall comply with the provisions of Section R507.2.2.

R507.10.4 Other guards. Other *guards* shall be in accordance with either manufacturer's instructions or accepted engineering principles.