JEFFREY M. LANIGAN
Mayor

MARK DOMENICO
Director

DEPARTMENT OF CODE ENFORCEMENT

Decks, Porches and Steps

NOTE: Please pick up and use the "deck packets" for Code Compliant drawing details prior to filling out this application.

This information shall be provided by the applicant in order to process the permit application.

1. Address of the property _____
2. Property Owner: Name _____
   Address _____
   Phone # _____
   Email _____
3. Contractor: Name _____
   Address _____
   Phone # _____
   Email _____
4. Check which applies to applicant: Property Owner _____ Contractor _____ Tenant _____
5. Approximate cost of work being performed: $_____
6. Please note insurance requirement submitted: Workers' Comp _____ CE-200 _____ BP-1 _____

NOTE: If you are a tenant, a notarized letter approving the project is required from the property owner (Attach).

7. A diagram that illustrates the following information (attachment)
   a. A scaled site plan of the deck footprint and the dimensions from the edge of the structure to the property lines and location on front, rear or side of house.
   b. Scaled constructions drawings indicating: post size, depth, and type of footings and layout dimensions, beam locations, size and post to beam connection detail, floor framing lumber sizes, spans and spacing, type of decking, connectors and fasteners being used, stair and handrail locations, spindle spacing. **(SEE DECK PACKET AND DRAWING EXAMPLE).**
8. Is any portion of the deck floor greater than 30" above the finished grade? Yes ____ No ____

NOTE: Decks 30" above grade and higher are required to be a minimum of 10' from property lines and are limited to the rear or side yards without ZBA approval.

9. Will the deck have new lighting or receptacles? Yes ____ No ____
10. Will the deck have a stairway with more than three (3) risers? Yes ____ No ____
11. Is the deck connected to a swimming pool? Yes ____ No ____
12. Will the deck be connected to the house with a ledger board? Yes ____ No ____
13. Are the deck post supporters installed a minimum of 48" below finished grade? Yes ____ No ____
14. Is the deck intended to be covered with a new roof structure? Yes ____ No ____

Signature of Applicant: _____ **Date:** _____

For official Use Only:

Rome Zoning Board of Appeals approval required Yes ____ No ____
Rome Planning Board approval required Yes ____ No ____
Rome Historic District approval required Yes ____ No ____

Date Received: _____ **Initials:** _____ **Reviewed by:** _____

JEFFREY M LANIGAN
Mayor

MARK DOMENICO
Director

Deck Drawings Sheet

Address: _____

1. Will the deck be Attached _____ or detached _____ from the house?
2. Is the deck 30" or higher above grade measured within 3' of the edge? Yes _____ No _____ (See example)

Signature of Applicant: _____ **Date:** _____

For Office Use Only:
Date Received: _____ **Initials:** _____ **Reviewed by:** _____

JEFFREY M. LANIGAN
Mayor

MARK DOMENICO
Director

DEPARTMENT OF CODE ENFORCEMENT

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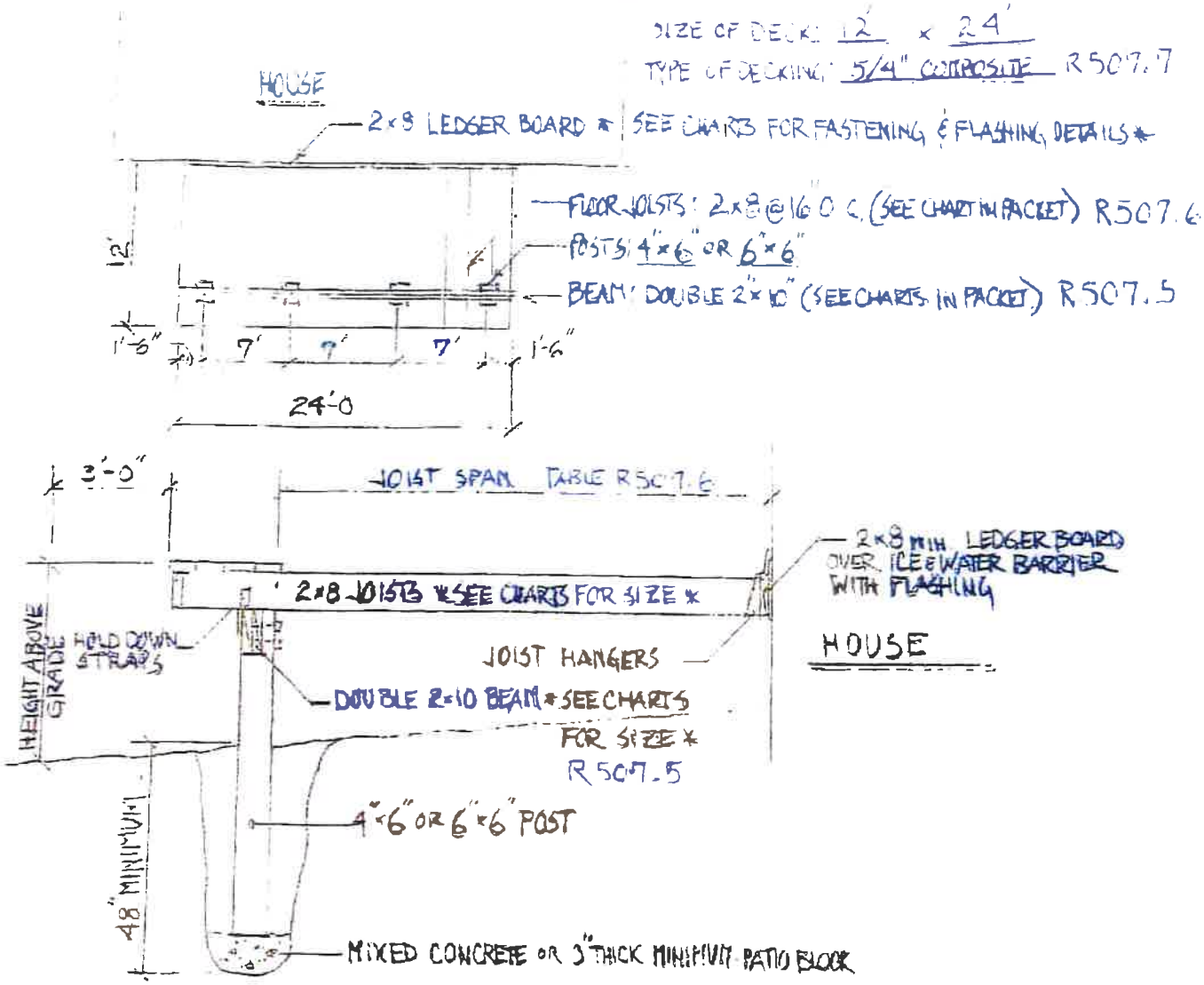
DEPARTMENT OF CODE ENFORCEMENT

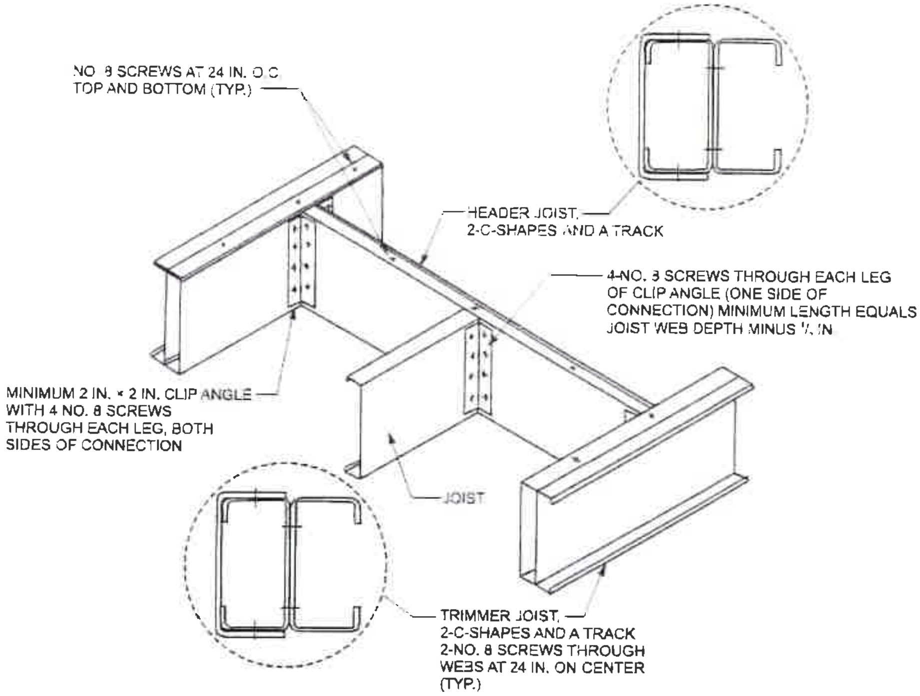
Deck Drawings Example



Signature of Applicant: _____ **Date:** _____

For Official Use Only:

Date Received: _____ ***Reviewed by:*** _____



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 6-mil (0.006 inch; 152 μm) polyethylene or *approved* vapor retarder 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 m²) 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. 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.

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. The footing depth shall be in accordance with Section R403.1.4.

Exception: Free-standing decks consisting of joists directly supported on grade over their entire length.

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.

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

ITEM	MATERIAL	MINIMUM FINISH/COATING	ALTERNATE FINISH/COATING[e]
Nails and timber rivets	In accordance with ASTM F1667	Hot-dipped galvanized per ASTM A153	Stainless steel, silicon bronze or copper
Bolts[c] Lag screws[d] (including nuts and washers)	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
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.

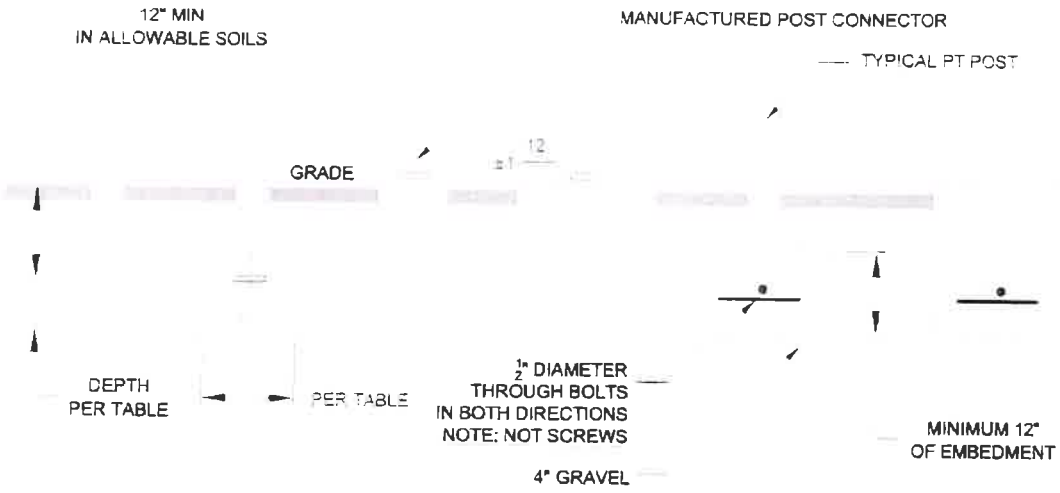
a. Equivalent materials, coatings and finishes shall be permitted.

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.



For SI: 1 inch = 25.4 mm.

FIGURE R507.3
DECK POSTS TO DECK FOOTING CONNECTION

R507.3.2 Minimum depth. Deck footings shall extend below the frost line specified in Table R301.2(1) in accordance with Section R403.1.4.1.

Exceptions:

1. Free-standing decks that meet all of the following criteria:
   1.1. The joists bear directly on precast concrete pier blocks at grade without support by beams or posts.
   1.2. The area of the deck does not exceed 200 square feet (18.9 m^2).
   1.3. The walking surface is not more than 20 inches (616 mm) above grade at any point within 36 inches (914 mm) measured horizontally from the edge.
2. Free-standing decks need not be provided with footings that extend below the frost line.

R507.4 Deck posts. For single-level wood-framed decks with beams sized in accordance with Table R507.5, deck post size shall be in accordance with Table R507.4.

TABLE R507.4
DECK POST HEIGHT[a]

DECK POST SIZE	MAXIMUM HEIGHT[a, b] (feet-inches)
4 × 4	6-9[c]
4 × 6	8
6 × 6	14
8 × 8	14

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

a. Measured to the underside of the beam.
b. Based on 40 psf live load.
c. The maximum permitted height is 8 feet for one-ply and two-ply beams. The maximum permitted height for three-ply beams on post cap is 6 feet 9 inches.

R507.4.1 Deck post to deck footing connection. Where posts bear on concrete footings in accordance with Section R403 and Figure R507.4.1, 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.

R507.5 Deck beams. Maximum allowable spans for wood deck beams, as shown in Figure R507.5, shall be in accordance with Table R507.5. Beam plies shall be fastened 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 allowable beam span. Deck beams of other materials shall be permitted where designed in accordance with accepted engineering practices.

TABLE R507.3.1
MINIMUM FOOTING SIZE FOR DECKS

LIVE OR GROUND SNOW LOAD[b] (psf)	TRIBUTARY AREA (sq. ft.)[e]	1500[a] Side of a square footing (inches)	1500[a] Diameter of a round footing (inches)	1500[a] Thickness (inches)	2000[a] Side of a square footing (inches)	2000[a] Diameter of a round footing (inches)	2000[a] Thickness (inches)	2500[a] Side of a square footing (inches)	2500[a] Diameter of a round footing (inches)	2500[a] Thickness (inches)	≥ 3000[a] Side of a square footing (inches)	≥ 3000[a] Diameter of a round footing (inches)	≥ 3000[a] Thickness (inches)
		LOAD BEARING VALUE OF SOILS[a,c,d] (psf)											
40	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	14	16	6	12	14	6	12	14	6	12	14	6
	60	17	19	6	15	17	6	13	15	6	12	14	6
	80	20	22	7	17	19	6	15	17	6	14	16	6
	100	22	25	8	19	21	6	17	19	6	15	17	6
	120	24	27	9	21	23	7	19	21	6	17	19	6
	140	26	29	10	22	25	8	20	23	7	18	21	6
	160	28	31	11	24	27	9	21	24	8	20	22	7
50	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	15	17	6	13	15	6	12	14	6	12	14	6
	60	19	21	6	16	18	6	14	16	6	13	15	6
	80	21	24	8	19	21	6	17	19	6	15	17	6
	100	24	27	9	21	23	7	19	21	6	17	19	6
	120	26	30	10	23	26	8	20	23	7	19	21	6
	140	28	32	11	25	28	9	22	25	8	20	23	7
	160	30	34	12	26	30	10	24	27	9	21	24	8
60	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	16	19	6	14	16	6	13	14	6	12	14	6
	60	20	23	7	17	20	6	16	18	6	14	16	6
	80	23	26	9	20	23	7	18	20	6	16	19	6
	100	26	29	10	22	25	8	20	23	7	18	21	6
	120	28	32	11	25	28	9	22	25	8	20	23	7
	140	31	35	12	27	30	10	24	27	9	22	24	8
	160	33	37	13	28	32	11	25	29	10	23	26	9
70	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	18	20	6	15	17	6	14	15	6	12	14	6
	60	21	24	8	19	21	6	17	19	6	15	17	6
	80	25	28	9	21	24	8	19	22	7	18	20	6
	100	28	31	11	24	27	9	21	24	8	20	22	7
	120	30	34	12	26	30	10	24	27	9	21	24	8
	140	33	37	13	28	32	11	25	29	10	23	26	9
	160	35	40	15	30	34	12	27	31	11	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. Assumes minimum square footing to be 12 inches x 12 inches x 6 inches for 6 x 6 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.

R507.5.1 Deck beam bearing. The ends of beams shall have not less than $1\frac{1}{2}$ 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).

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. The maximum joist cantilever shall be limited to one-fourth of the joist span or the maximum cantilever length specified in Table R507.6, whichever is less.

R507.6.1 Deck joist bearing. The ends of joists shall have not less than $1\frac{1}{2}$ 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. 10x 3-inch (76 mm) long wood screws.

R507.7 Decking. Maximum allowable spacing for joists supporting decking 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. Other approved decking or fastener systems shall be installed in accordance with the manufacturer's installation requirements.

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.

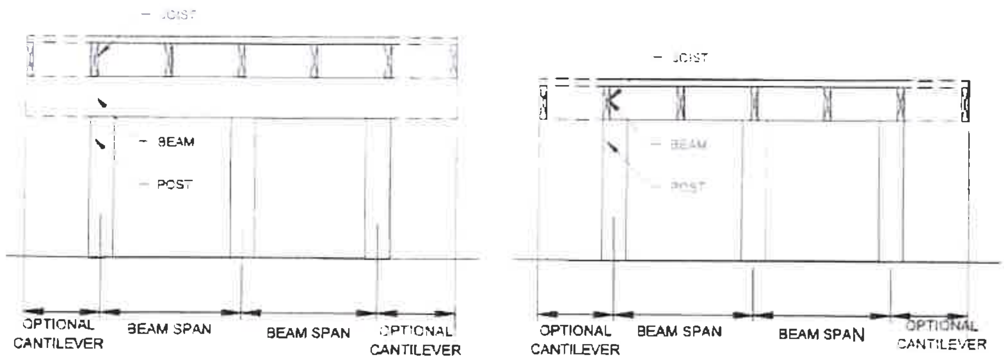
R507.9.1.1 Ledger details. Deck ledgers shall be a minimum 2-inch by 8-inch (51 mm by 203 mm) nominal, pressure-preservative-treated Southern pine, incised pressure-preservative-treated hem-fir, or approved, naturally durable, No. 2 grade or better lumber. Deck ledgers shall not support concentrated 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 by $9\frac{1}{2}$-inch (25 mm × 241 mm) dimensional, Douglas fir or better, laminated veneer lumber. 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).

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.

R507.9.2 Lateral 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).



DROPPED BEAM

FLUSH BEAM

FIGURE R507.5
TYPICAL DECK JOIST SPANS

TABLE R507.5
DECK BEAM SPAN LENGTHS[a, b, g] (feet - inches)

SPECIES[c]	SIZE[d]	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
		6	8	10	12	14	16	18
Southern pine	1 – 2 × 6	4-11	4-0	3-7	3-3	3-0	2-10	2-8
	1 – 2 × 8	5-11	5-1	4-7	4-2	2-10	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	7-6	7-0
	3 – 2 × 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
	3 – 2 × 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
	3 – 2 × 10	13-0	11-3	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[e], hem-fir[e], spruce-pine-fir[e], redwood, western cedars, ponderosa pine[f], red pine[f]	3 × 6 or 2 – 2 x 6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	3 × 8 or 2 – 2 × 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3 × 10 or 2 – 2 × 10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3 × 12 or 2 – 2 × 12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4 × 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4 × 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4 × 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4 × 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3 – 2 × 6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3 – 2 × 8	9-8	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. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220-pound point load applied at the end.

b. Beams supporting deck joists from one side only.

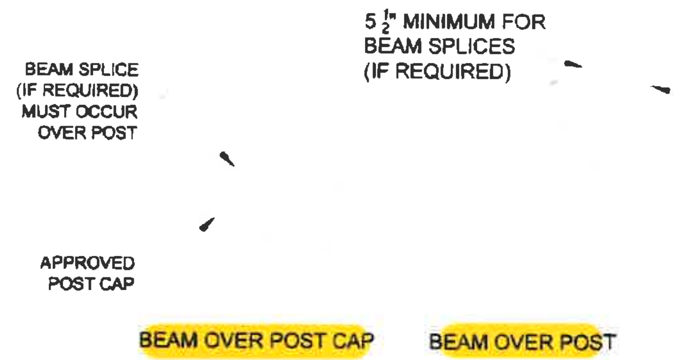
c. No. 2 grade, wet service factor.

d. Beam depth shall be greater than or equal to depth of joists with a flush beam condition.

e. Includes incising factor.

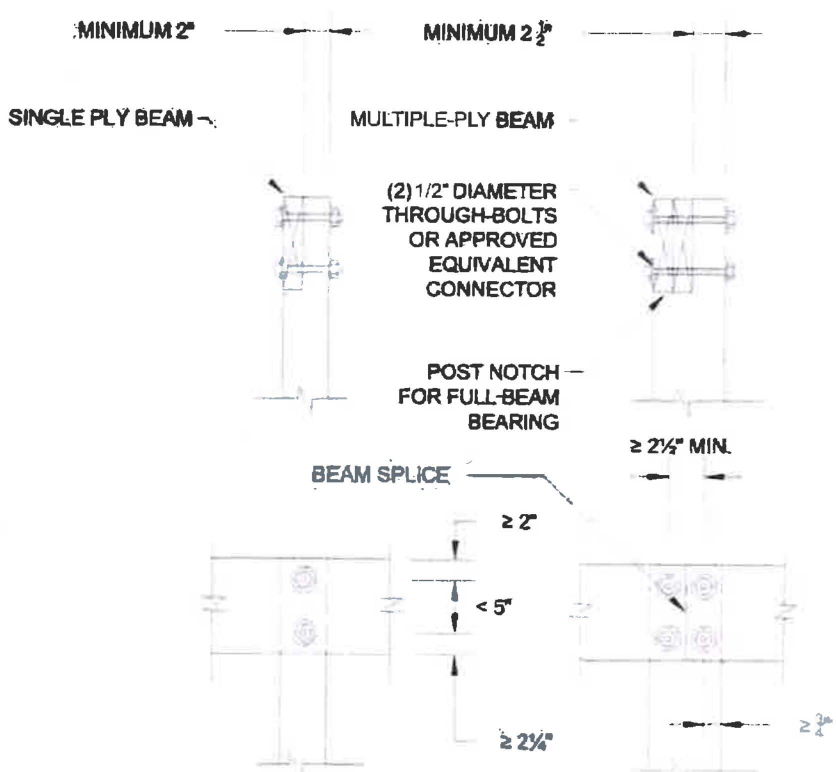
f. Northern species. Incising factor not included.

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



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

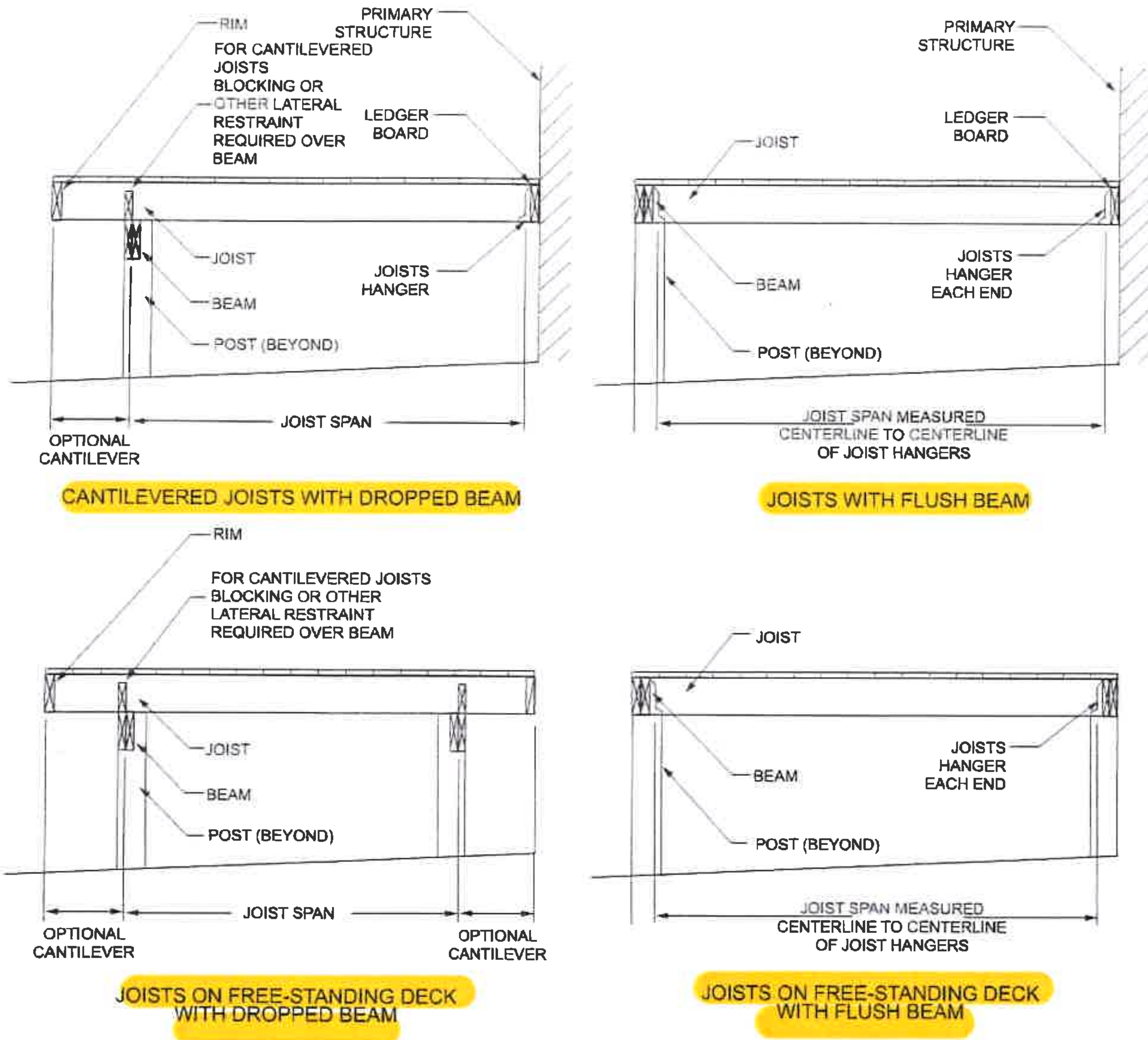


FIGURE R507.6
TYPICAL DECK JOIST SPANS

TABLE R507.6
DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft. - in.)

SPECIES[a]	SIZE	ALLOWABLE JOIST SPAN[b]			MAXIMUM CANTILEVER[c, f]		
		SPACING OF DECK JOISTS (inches)			SPACING OF DECK JOISTS WITH CANTILEVERS[c] (inches)		
		12	16	24	12	16	24
Southern pine	2 × 6	9-11	9-0	7-7	1-3	1-4	1-6
	2 × 8	13-1	11-10	9-8	2-1	2-3	2-5
	2 × 10	16-2	14-0	11-5	3-4	3-6	2-10
	2 × 12	18-0	16-6	13-6	4-6	4-2	3-4
Douglas fir-larch[d], hem-fir[d] spruce-pine-fir[d],	2 × 6	9-6	8-8	7-2	1-2	1-3	1-5
	2 × 8	12-6	11-1	9-1	1-11	2-1	2-3
	2 × 10	15-8	13-7	11-1	3-1	3-5	2-9
	2 × 12	18-0	15-9	12-10	4-6	3-11	3-3
Redwood, western cedars, ponderosa pine[e], red pine[e]	2 × 6	8-10	8-0	7-0	1-0	1-1	1-2
	2 × 8	11-8	10-7	8-8	1-8	1-10	2-0
	2 × 10	14-11	13-0	10-7	2-8	2-10	2-8
	2 × 12	17-5	15-1	12-4	3-10	3-9	3-1

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. No. 2 grade with wet service factor.

b. Ground snow load, live load = 40 psf, dead load = 10 psf, $L/\Delta = 360$.

c. Ground snow load, live load = 40 psf, dead load = 10 psf, $L/\Delta = 360$ at main span, $L/\Delta = 180$ at cantilever with a 220-pound point load applied to end.

d. Includes incising factor.

e. Northern species with no incising factor.

f. Cantilevered spans not exceeding the nominal depth of the joist are permitted.

TABLE R507.7
MAXIMUM JOIST SPACING FOR DECKING

DECKING MATERIAL TYPE AND NOMINAL SIZE	MAXIMUM ON-CENTER JOIST SPACING	
	Decking perpendicular to joist	Decking diagonal to joist[a]
$1^1/_4$-inch-thick wood	16 inches	12 inches
2-inch-thick wood	24 inches	16 inches
Plastic composite	In accordance with Section R507.2	In accordance with Section R507.2

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.

TABLE R507.9.1.3(1)
DECK LEDGER CONNECTION TO BAND JOIST[a, b]
(Deck live load = 40 psf, deck dead load = 10 psf, snow load ≤ 40 psf)

CONNECTION DETAILS	JOIST SPAN						
	6′ and less	6′1″ to 8′	8′1″ to 10′	10′1″ to 12′	12′1″ to 14′	14′1″ to 16′	16′1″ to 18′
	On-center spacing of fasteners						
$^1/_2$-inch diameter lag screw with $^1/_2$-inch maximum sheathing[c, d]	30	23	18	15	13	11	10
$^1/_2$-inch diameter bolt with $^1/_2$-inch maximum sheathing[d]	36	36	34	29	24	21	19
$^1/_2$-inch diameter bolt with 1-inch maximum sheathing[e]	36	36	29	24	21	18	16

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

a. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.

b. Snow load shall not be assumed to act concurrently with live load.

c. The tip of the lag screw shall fully extend beyond the inside face of the band joist.

d. Sheathing shall be wood structural panel or solid sawn lumber.

e. 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.

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]

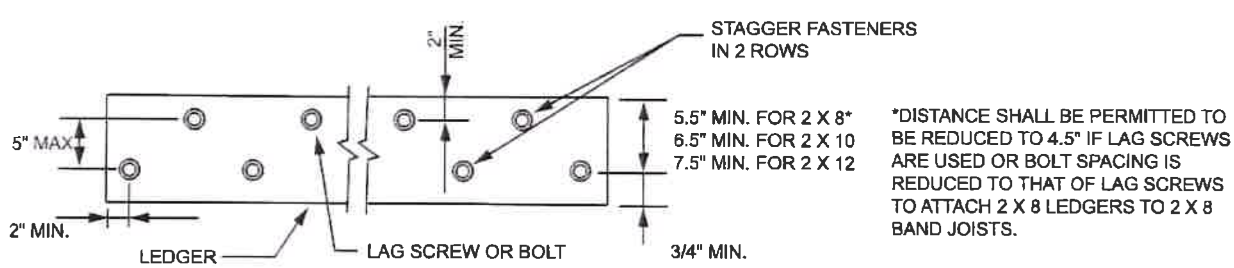
For SI: 1 inch = 25.4 mm.

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.

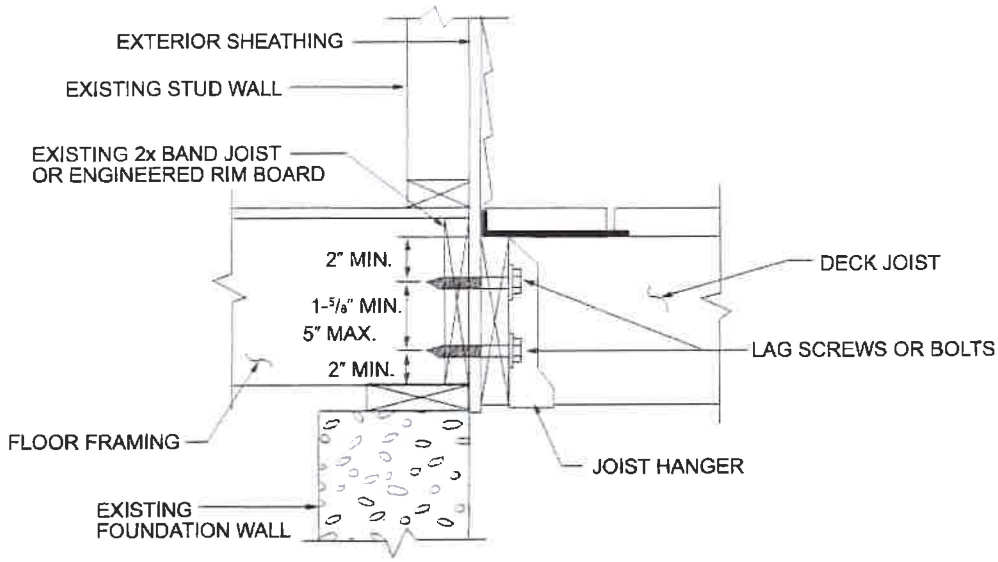
c. For engineered rim joists, the manufacturer's recommendations shall govern.

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).



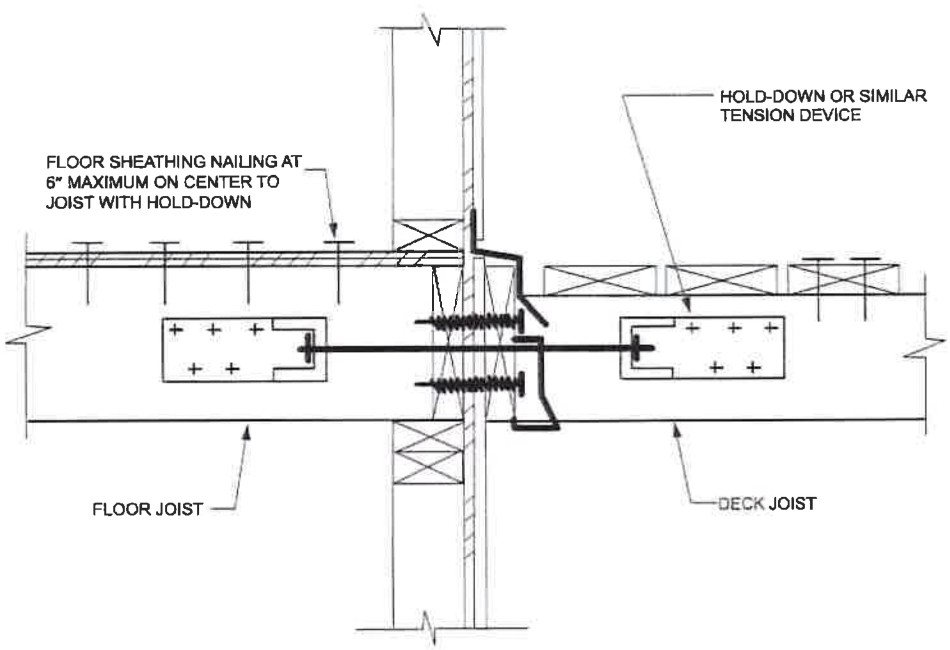
For SI: 1 inch = 25.4 mm.

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



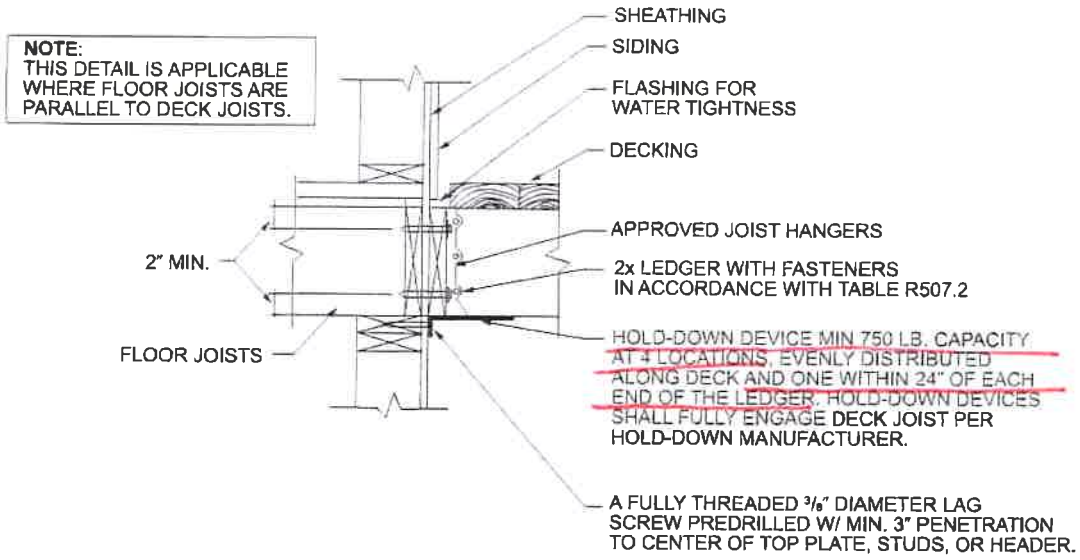
For SI: 1 inch = 25.4 mm.

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



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

CONTENTS

MINIMUM REQUIREMENTS & LIMITATIONS

1. This document applies to single level residential wood decks that are attached to the house to resist lateral forces. [R507.2.4]
2. Overall deck length shall be equal to or less than overall deck width. See DECK FRAMING PLAN for definition of deck length and width.
3. Minimum post size is 6x6 nominal and maximum post height shall be in accordance with Table 4.
4. All lumber shall be identified by the grade mark of, or certificate of inspection issued by, an *approved* lumber grading or inspection bureau or agency (www.alsc.org). All lumber and glued laminated timber shall be a naturally durable species (such as Redwood or Western Cedars where 90 percent or more of the width of each side is heartwood); or be preservatively treated with an *approved* process in accordance with American Wood Protection Association standards (Table 1) [R317 and R318]. All lumber in contact with the ground shall be *approved* preservative treated wood suitable for ground contact. [R317.1.2] All cuts shall be field treated with an *approved* preservative (such as copper naphthenate) [R402.1.2].
5. All nails shall meet the requirements of *ASTM F 1667*. Threaded nails as stated in this document include helical (spiral) and annular (ring-shank) nails. Wood screws shall meet the requirements of *ANSI/ASME B18.6.1*. Bolts and lag screws shall meet the requirements of *ANSI/ASME B18.2.1*.
6. Throughout this document, ½" diameter bolts and lag screws are specified for various connections. Edge distance and spacing requirements are based on ½" diameter fasteners. If larger (or smaller) fasteners are specified, edge distance and spacing shall be adjusted.
7. To resist corrosion, the following is required [R317.3]:
   - All screws, bolts, washers, nuts, and nails for use with preservative treated wood shall be hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze, or copper. Hot-dipped galvanized fasteners shall meet the requirements of *ASTM A 153*, Class D for fasteners $^{3}/_{8}$" diameter and smaller or Class C for fasteners with diameters over $^{3}/_{8}$". Stainless steel driven fasteners shall be in accordance with the material requirements of *ASTM F 1667*.
   - Fasteners other than nails and timber rivets shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with *ASTM B 695*, Class 55, minimum.
   - All connectors (joist hangers, cast-in-place post anchors, etc.) shall be galvanized or shall be stainless steel. Hardware to be hot-dipped prior to fabrication shall meet *ASTM A 653*, G-185 coating. Hardware to be hot-dipped galvanized after fabrication shall meet *ASTM A 123*.
   - Fasteners and connectors exposed to salt water or located within 300 feet of a salt water shoreline shall be stainless steel grade 304 or 316.
   - Fasteners and connectors shall be of the same corrosion-resistant material.
   - Other coated or non-ferrous fasteners or hardware shall be *approved* by the authority having jurisdiction.
8. Decks supporting large concentrated loads such as hot tubs are beyond the scope of this document.
9. This document does not apply to decks which will experience snow loads, snow drift loads, or sliding snow loads that exceed 40 psf.
10. Lateral load resistance is limited to the prescriptive provisions of R507.2.4 of the IRC. Alternative loads and detailing shall be *approved* by the authority having jurisdiction.

11. Flashing shall be corrosion-resistant metal [R703.8] of minimum nominal 0.019-inch thickness or *approved* non-metallic material. Aluminum should not be used in direct contact with lumber treated with preservatives that contain copper such as ACQ, Copper Azole, or ACZA.
12. Decks shall not be used or occupied until final inspection and approval is obtained.
13. This document is not intended to preclude the use of other construction methods or materials not described herein.

Table 1. Common Species and Use Categories for Decay Resistance.[1]

	Species	Above Ground	Ground Contact
Preservative-Treated[2]	Southern Pine	X	X
	Douglas Fir-Larch	X	X
	Hem-Fir	X	X
	SPF	X	
	Ponderosa Pine	X	X
	Red Pine	X	X
	Redwood	X	X
	Western Cedars	X	
Naturally Durable[3]	Redwood	X	
	Western Cedars	X	

1. Use categories listed in Table 1 are based on the American Wood Protection Association (AWPA) *Book of Standards*.
2. Above Ground – UC3B; Ground Contact – UC4A.
3. Naturally durable species with 90% heartwood in width on each side need not be treated per minimum requirements.

DECKING REQUIREMENTS

All decking material shall be composed of dimension lumber (2" nominal thickness) or span rated decking in accordance with the American Lumber Standard Committee *Policy for Evaluation of Recommended Spans for Span Rated Decking Products (November 5, 2004)*. Attach decking to each joist with 2-8d threaded nails or 2-#8 screws. Space decking boards approximately $^1/_8$" apart. See Figure 11 for decking connection requirements at the rim joist. Decking placement may range from an angle perpendicular to the joists to an angle of 45 degrees to the joists. Each segment of decking must bear on a minimum of 3 joists (or 3 supports).

Decking not meeting these requirements may be substituted when the product has been *approved* by the authority having jurisdiction; however, connections equivalent to those shown for lumber or span rated decking are assumed.

JOIST SIZE

The span of a joist, L, is measured from the face of support at one end of the joist to the face of support at the other end of the joist and does not include the length of the overhangs, L_O. Use Table 2 to determine allowable joist span, L_J, based on lumber size and joist spacing. Joist span, L, must be less than or equal to allowable joist span, L_J. Overhang length is the lesser of allowable overhang, L_O, or one fourth the joist span, L/4. See Figure 1 and Figure 2 for joist span types.

Table 2. Maximum Joist Spans and Overhangs.[1]

Species	Size	Joist Spacing (o.c.) 12"	16"	24"	12"	16"	24"
		Allowable Span[2] (L_J)			Allowable Overhang[3] (L_O)		
Southern Pine	2x6[6]	9' - 11"	9' - 0"	7' - 7"	1' - 0"	1' - 1"	1' - 3"
	2x8	13' - 1"	11' - 10"	9' - 8"	1' - 10"	2' - 0"	2' - 4"
	2x10	16' - 2"	14' - 0"	11' - 5"	3' - 1"	3' - 5"	2' - 10"
	2x12	18' - 0"[7]	16' - 6"	13' - 6"	4' - 6"	4' - 2"	3' - 4"
Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir[4]	2x6[6]	9' - 6"	8' - 4"	6' - 10"	0' - 11"	1' - 0"	1' - 2"
	2x8	12' - 6"	11' - 1"	9' - 1"	1' - 8"	1' - 10"	2' - 2"
	2x10	15' - 8"	13' - 7"	11' - 1"	2' - 10"	3' - 2"	2' - 9"
	2x12	18' - 0"[7]	15' - 9"	12' - 10"	4' - 4"	3' - 11"	3' - 3"
Redwood, Western Cedars, Ponderosa Pine[5], Red Pine[5]	2x6[6]	8' - 10"	8' - 0"	6' - 10"	0' - 9"	0' - 10"	0' - 11"
	2x8	11' - 8"	10' - 7"	8' - 8"	1' - 5"	1' - 7"	1' - 9"
	2x10	14' - 11"	13' - 0"	10' - 7"	2' - 5"	2' - 7"	2' - 8"
	2x12	17' - 5"	15' - 1"	12' - 4"	3' - 7"	3' - 9"	3' - 1"

1. Assumes 40 psf live load, 10 psf dead load, No. 2 grade, and wet service conditions.
2. Assumes L/360 deflection.
3. Maximum allowable overhang cannot exceed L/4 or ¼ of actual main span. Assumes cantilever length/180 deflection with 220 lb point load (See Figure 1A and Figure 2).
4. Incising assumed for Douglas Fir-Larch, Hem-Fir, and Spruce-Pine-Fir.
5. Design values based on northern species with no incising assumed.
6. Ledger shall be a minimum of 2x8 nominal. Joists and rim joists to which guard posts are attached shall be a minimum of 2x8 nominal.
7. Joist length prescriptively limited to 18'-0" for footing design.

Figure 1A. Joist Span – Joists Attached at House and Bearing Over Beam.

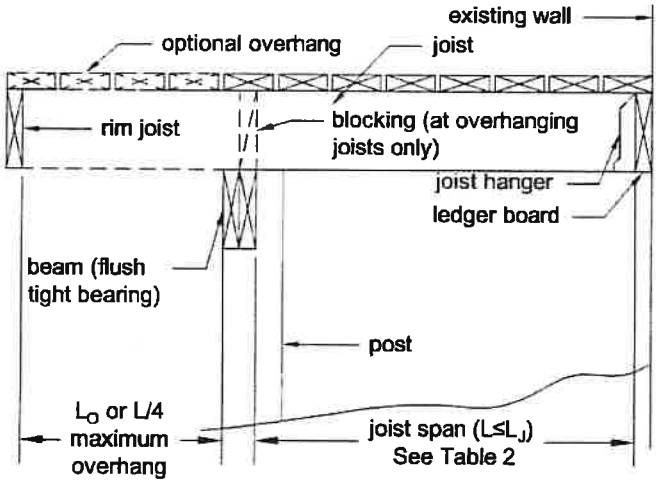


Figure 1B. Joist Span – Joists Attached at House and to Side of Beam.

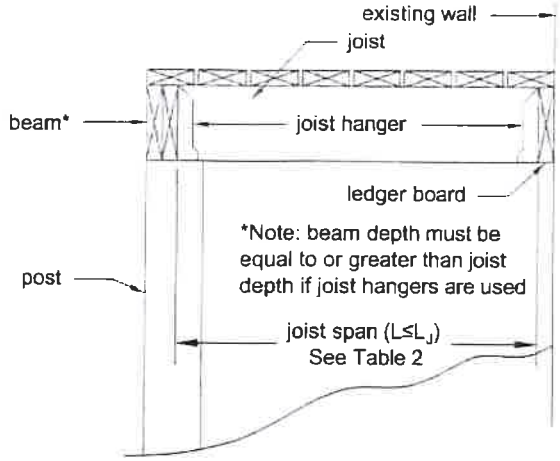
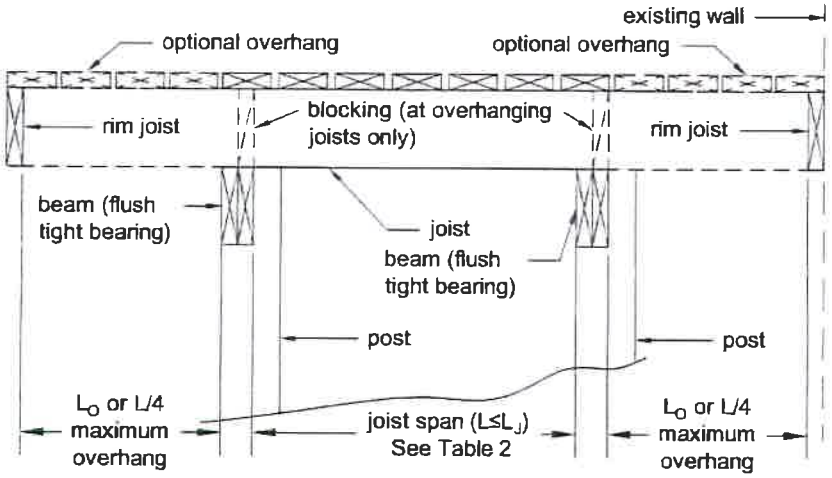


Figure 2. Joist Span – Non-Ledger Deck.



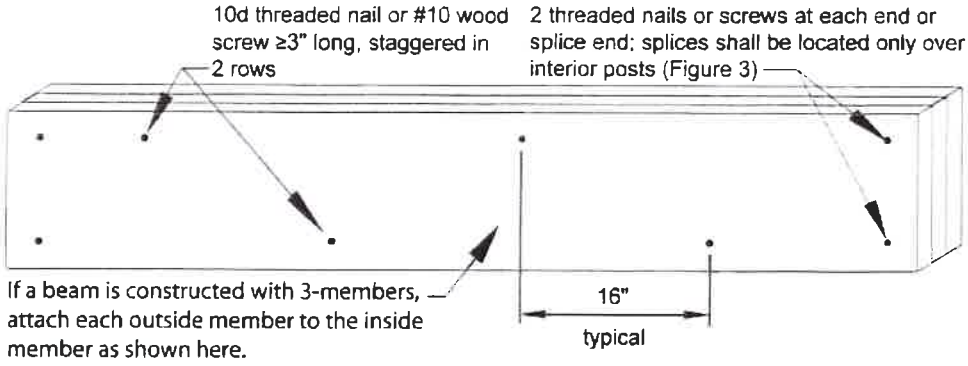
BEAM SIZE & ASSEMBLY REQUIREMENTS

Deck beam spans shall be in accordance with Table 3 and can extend past the post face up to $L_B/4$ as shown in Figure 3. Joists may bear on the beam and extend past the beam face up to the lesser of L_O or L/4 as shown in Figures 1A and 2, or the joists may attach to the side of the beam with joist hangers as shown in Figure 1B.

Joists shall not frame in from opposite sides of the same beam. See JOIST-TO-BEAM CONNECTION details, Figure 6.

Where multiple 2x members are used, the deck's beam is assembled by attaching the members identified in Table 3A in accordance with Figure 4 [Table R602.3(1)].

Figure 4. Beam Assembly Details.

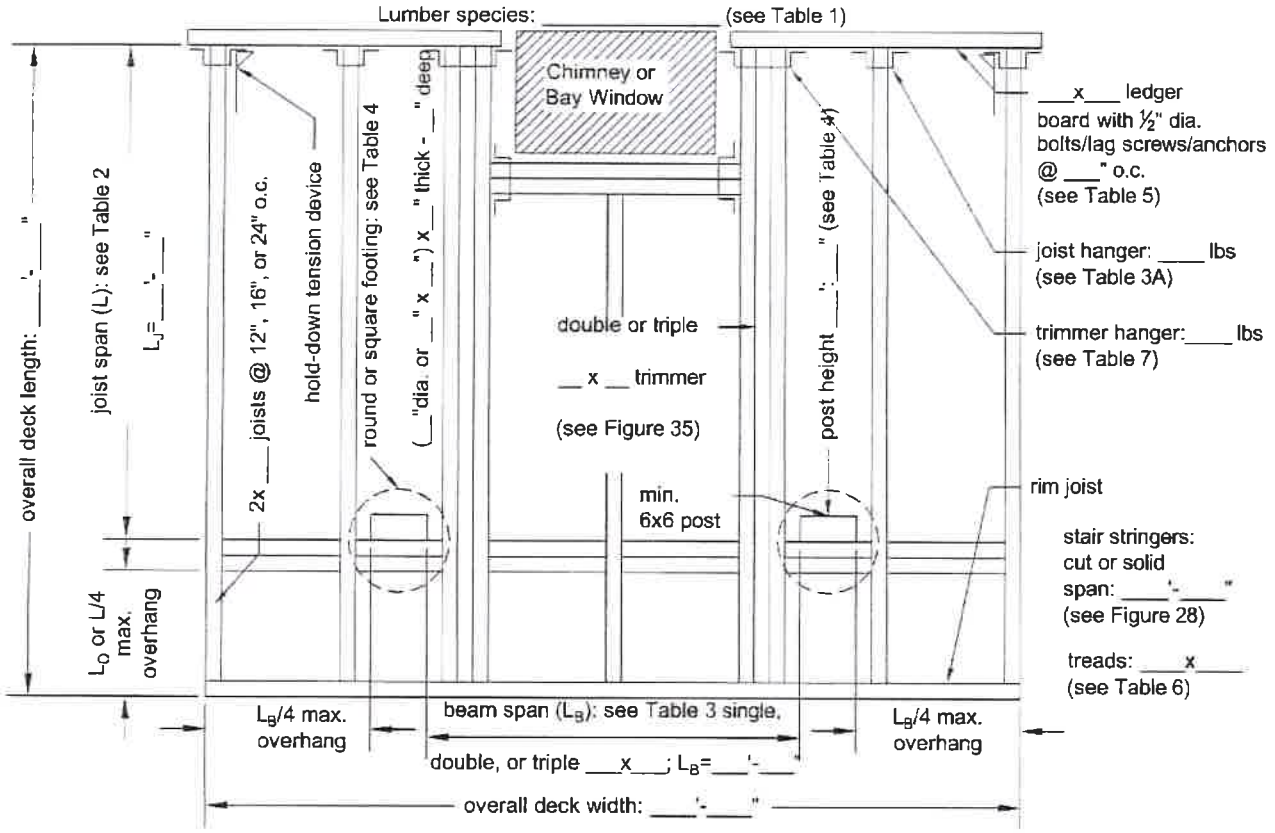


DECK FRAMING PLAN

A framing plan shows the width, length, joist and beam layout; the location of the ledger board, posts, and footings; and the type, size, and spacing of the ledger board fasteners.

The overall deck length shall be equal to or less than the overall deck width. Stairs and stair landings shall not be included in determining the overall deck length or width. See Figure 5 for an example of a typical deck framing plan.

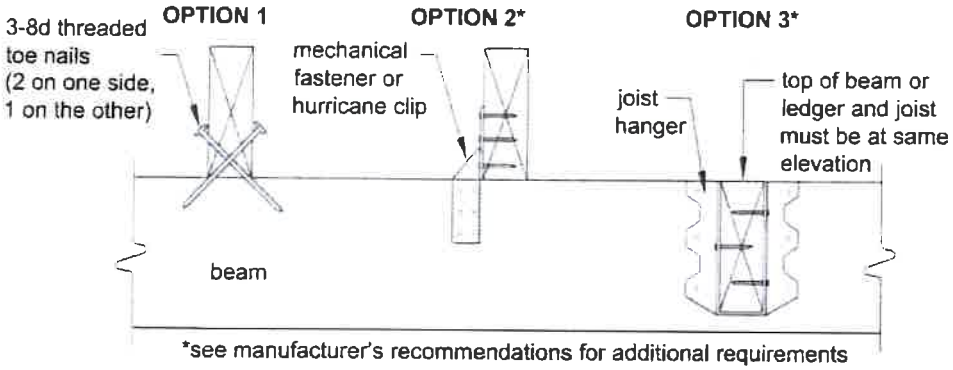
Figure 5. Typical Deck Framing Plan.



JOIST-TO-BEAM CONNECTION

Each joist shall be attached to the beam as shown in Figure 6. Joists may bear on and overhang past the beam face the lesser of L_O or L/4 when Option 1 or Option 2 is used to attach the joist to the beam and blocking is provided between joists at beam bearing. Mechanical fasteners or hurricane clips used, as shown in Option 2, must have a minimum capacity of 100 lbs in both uplift and lateral load directions. Joists may also attach to the side of the beam with joist hangers per Option 3. Joists shall not frame in from opposite sides of the same beam. See JOIST HANGERS for more information. Hangers, clips, and mechanical fasteners shall be galvanized or stainless steel (see MINIMUM REQUIREMENTS).

Figure 6. Joist-to-Beam Detail.



JOIST HANGERS

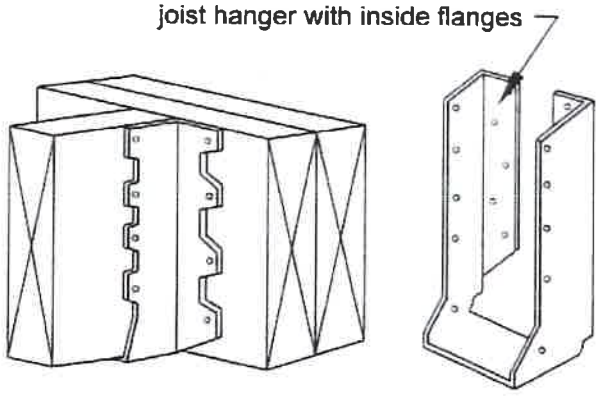
Joist hangers, as shown in Figure 7, shall have a depth of at least 60% of ledger or beam depth. Each hanger shall have a minimum vertical capacity in accordance with Table 3A. The joist hanger shall be selected from an *approved* manufacturer's product data based on the dimensions of the joist or header it is carrying. Joist hangers and fasteners shall be corrosion resistant (see MINIMUM REQUIREMENTS).

Use joist hangers with inside flanges when clearances to the edge of the beam or ledger board dictate. **Do not use clip angles or brackets to support joists.**

Table 3A. Joist Hanger Vertical Capacity.

Joist Size	Minimum Capacity, lbs
2x6	400
2x8	500
2x10	600
2x12	700

Figure 7. Typical Joist Hangers.



POST REQUIREMENTS

All deck post sizes shall be 6x6 (nominal) or larger, and the maximum height shall be in accordance with Table 4 and measured from grade or top of foundation, whichever is highest, to the underside of the beam. Under prescriptive limits of this document, 8x8 nominal posts can be substituted anywhere in Table 4 but are limited to a maximum height of 14'-0". Posts shall be centered on footings. Cut ends and notches of posts shall be field treated with an *approved* preservative (such as copper naphthenate) [R402.1.2]. The beam shall be attached to the post by notching as shown in Figure 8A or by providing an *approved* post cap to connect the beam and post as shown in Figure 8B. All 3-ply beams shall be connected to the post by a post cap. All through-bolts shall have washers under the bolt head and nut. Attachment of the beam to the side of the post without notching is prohibited (see Figure 9).

Provide diagonal bracing parallel to the beam at each corner post greater than 2'-0" in height as shown in Figure 10. Diagonal bracing is prohibited on center posts. Bracing shall be fastened to the post at one end and the beam at the other with ½" diameter lag screws. For non-ledger decks, (see Figure 21) diagonal bracing may be omitted at the beam and posts adjacent to the house.

Figure 8A. Post-to-Beam Attachment Requirements.

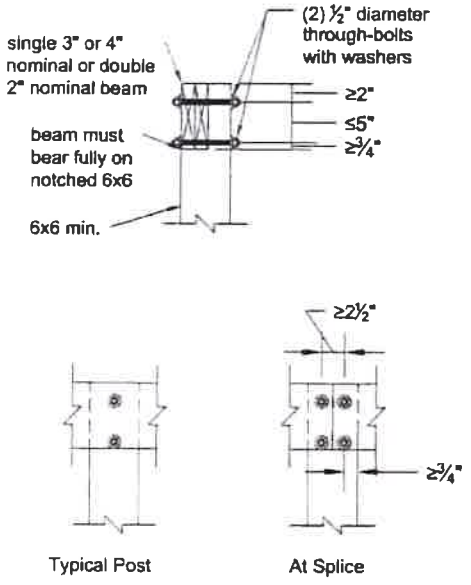


Figure 8B. Alternate *Approved* Post-to-Beam Post Cap Attachment.

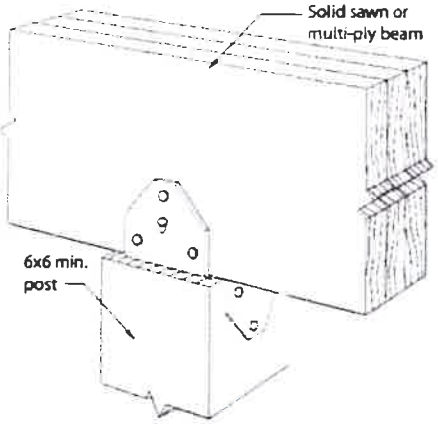


Figure 9. Prohibited Post-to-Beam Attachment Condition.

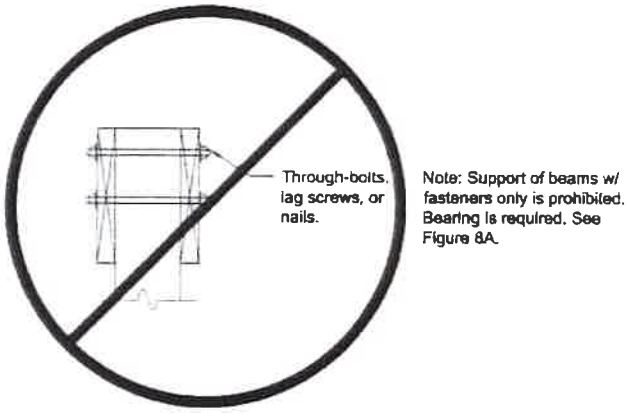
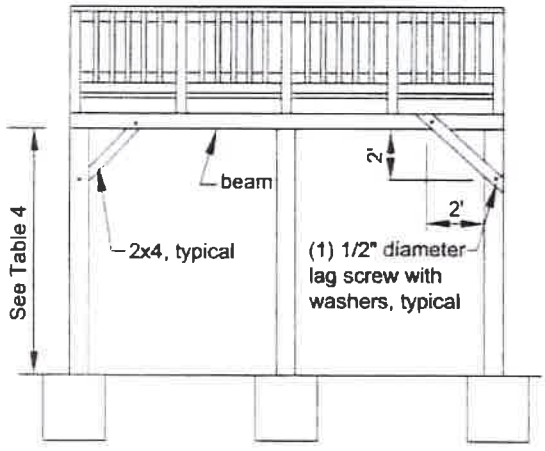


Figure 10. Diagonal Bracing.

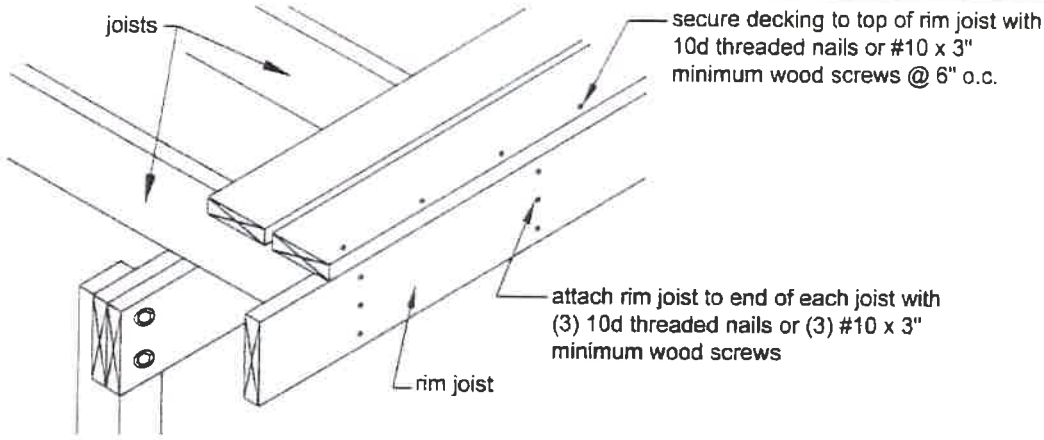


DIAGONAL BRACING PARALLEL TO BEAM
Note: Diagonal Bracing is prohibited on center posts.

RIM JOIST REQUIREMENTS

Attach a continuous rim joist to the ends of joists as shown in Figure 11. Attach decking to the rim joist as shown in Figure 11. For more decking attachment requirements, see DECKING REQUIREMENTS.

Figure 11. Rim Joist Connection Details.



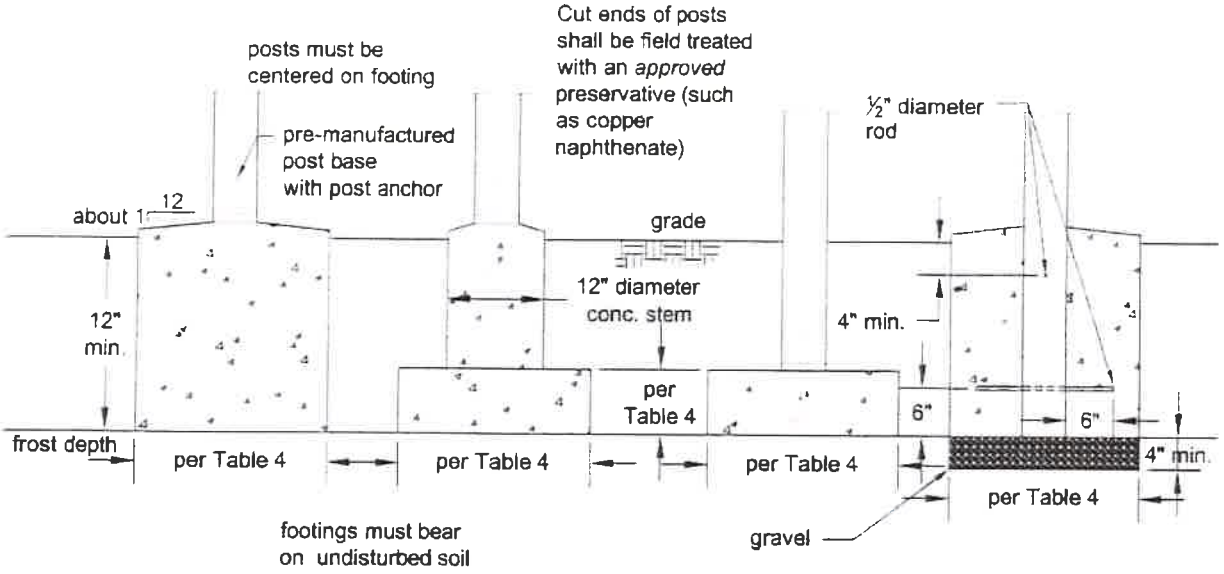
FOOTINGS [R403]

See Figure 12 and Table 4 for footing size, footing thickness, and post attachment options and requirements. All footings shall bear on undisturbed soil at least 12 inches below the undisturbed ground surface or below the frost line, whichever is deeper. Contact the authority having jurisdiction to determine the specified frost line. Bearing conditions shall be verified in the field by the building official prior to placement of concrete. Where the building official determines that in-place soils with an allowable bearing capacity of less than 1,500 psf are likely to be present at the site, the allowable bearing capacity shall be determined by a soils investigation. DECK FOOTINGS CLOSER THAN 5'-0" TO AN EXTERIOR HOUSE FOUNDATION WALL MUST BEAR AT THE SAME ELEVATION AS THE FOOTING OF THE HOUSE FOUNDATION.

Do not construct footings over septic systems or leach fields, utility lines, or enclosed meters. Contact local utilities (call 811) before digging.

Pre-manufactured post anchors shall be galvanized or stainless steel. See MINIMUM REQUIREMENTS.

Figure 12. Typical Footing Options.



LEDGER ATTACHMENT REQUIREMENTS [R507]

GENERAL: Attach the ledger board, which shall be equal to or greater than the deck joist depth but less than or equal to the house band or rim joist depth, to the house in accordance with Figures 14 and 15. The ledger shall be a minimum nominal 2x8. When attachments are made to the house band joist, the band joist shall be capable of supporting the new deck. If this cannot be verified or conditions at the house differ from the details herein, then either a non-ledger deck or full plan submission is required. See NON-LEDGER DECKS.

SIDING AND FLASHING: House siding or the exterior finish system must be removed prior to installation of the ledger board. *Approved* corrosion resistant flashing is required at any ledger board connection to a wall of wood framed construction (see MINIMUM REQUIREMENTS). See Figure 14 for continuous flashing with drip edge. The threshold shall be carefully flashed and caulked to prevent water intrusion due to splash from the deck or melting snow and ice.

MANUFACTURED WOOD I-JOIST: The term "I-Joist" denotes manufactured wood "I" joists (see Figure 13A). Many new homes constructed with wood I-joists include 1" or thicker laminated veneer lumber (LVLas band joists (or rim joists) that can support the attachment of a deck (see Figure 14). However, some older homes might be constructed with band boards that are too thin (less than 1") to support a deck. In such cases, a non-ledger deck or a full plan submission is required.

MANUFACTURED WOOD TRUSS: A metal plate connected wood truss (MPCWT) is an engineered, prefabricated structural component designed for each specific application. MPCWT's used in residential floors are often installed with a 2x4 lumber "ribbon" at the ends of the trusses (see Figure 13B) to tie the ends of the trusses together. The ribbon board, by itself, is not intended to support the deck ledger and deck. Installing residential decks when the floor system for the house uses MPCWT requires a standard detail provided by the truss designer, a non-ledger deck, or a full plan submission. Refer to the Technical Note – *Attachment of Residential Deck Ledger to Metal Plate Connected Wood Truss Floor System* for special blocking details and attachment requirements (www.sbcindustry.com).

Figure 13A. Wood I-Joist Profile.

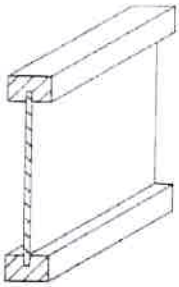


Figure 13B. Metal Plate Connected (MPC) Wood Floor Trusses with a 2x4 Lumber "Ribbon" at the Ends of the Trusses.

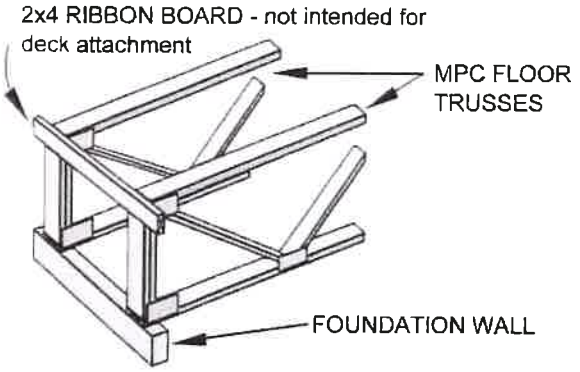


Figure 14. General Attachment of Ledger Board to Band Joist or Rim Joist.

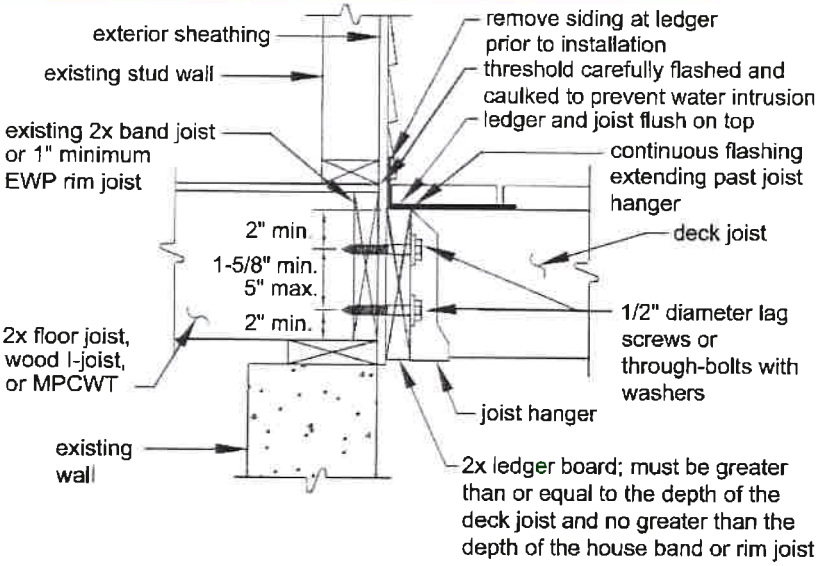
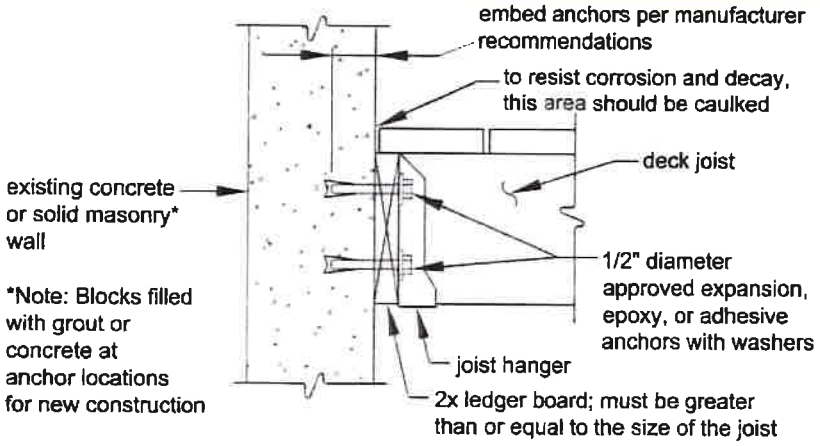


Figure 15. Attachment of Ledger Board to Foundation Wall (Concrete or Solid Masonry).



PROHIBITED LEDGER ATTACHMENTS

Attachments to exterior veneers (brick, masonry, stone), hollow masonry, and to cantilevered floor overhangs or bay windows are prohibited (see Figures 17 and 18). In such cases, the non-ledger deck is required (See NON-LEDGER DECKS).

Figure 17. No Attachment to or Through Exterior Veneers (Brick, Masonry, Stone).

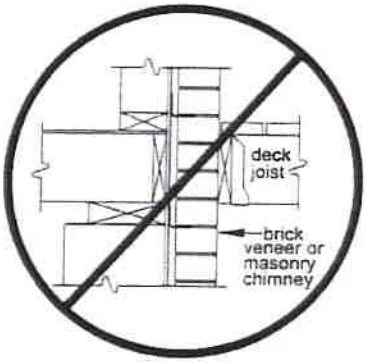


Figure 18. No Attachment to House Overhang with Ledger.

LEDGER BOARD FASTENERS

Only those fasteners noted below are permitted. LEAD ANCHORS ARE PROHIBITED.

Deck ledger connection to band joist or rim joist. The connection between a deck ledger and a 2-inch nominal lumber band joist (1-½" actual) or LVL rim joist bearing on a sill plate or wall plate shall be constructed with ½" lag screws or bolts with washers per Table 5 and Figure 19 (see MINIMUM REQUIREMENTS).

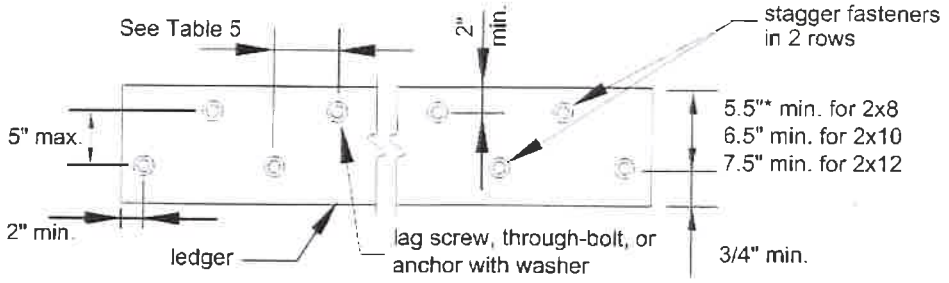
Table 5. Fastener Spacing for a Southern Pine, Douglas Fir-Larch, or Hem-Fir Deck Ledger or Band or Rim Joist and a 2-inch Nominal Solid-Sawn Spruce-Pine-Fir Band Joist or LVL Rim Joist.[3,4,5,6,8]
(Deck Live Load = 40 psf, Deck Dead Load = 10 psf)

		Joist Span						
Connection Details	Rim Joist or Band Joist	6'-0" and less	6'-1" to 8'-0"	8'-1" to 10'-0"	10'-1" to 12'-0"	12'-1" to 14'-0"	14'-1" to 16'-0"	16'-1" to 18'-0"
		On-Center Spacing of Fasteners						
½" diameter lag screw[1] with 15/32" maximum sheathing	1" LVL	24"	18"	14"	12"	10"	9"	8"
	1-1/8" LVL	28"	21"	16"	14"	12"	10"	9"
	1-½" Lumber	30"	23"	18"	15"	13"	11"	10"
½" diameter bolt with 15/32" maximum sheathing	1" LVL	24"	18"	14"	12"	10"	9"	8"
	1-1/8" LVL	28"	21"	16"	14"	12"	10"	9"
	1-½" Lumber	36"	36"	34"	29"	24"	21"	19"
½" diameter bolt with 15/32" maximum sheathing and ½" stacked washers[2,7]	1-½" Lumber	36"	36"	29"	24"	21"	18"	16"

1. The tip of the lag screw shall fully extend beyond the inside face of the band or rim joist.
2. The maximum gap between the face of the ledger board and face of the wall sheathing shall be ½".
3. Ledgers shall be flashed or caulked to prevent water from contacting the house band joist (see Figures 14 and 15).
4. Lag screws and bolts shall be staggered per Figure 19.
5. Deck ledgers shall be minimum 2x8 pressure-preservative-treated No.2 grade lumber, or other *approved* materials as established by standard engineering practice.
6. When solid-sawn pressure-preservative-treated deck ledgers are attached to engineered wood products (minimum 1" thick wood structural panel band joist or structural composite lumber including laminated veneer lumber), the ledger attachment shall be designed in accordance with accepted engineering practice. Tabulated values based on 300 lbs and 350 lbs for 1" and 1-1/8" LVL rim joist, respectively.
7. Wood structural panel sheathing, gypsum board sheathing, or foam sheathing shall be permitted between the band or rim joist and ledger. Stacked washers are permitted in combination with wood structural panel sheathing, but are not permitted in combination with gypsum board or foam sheathing. The maximum distance between the face of the ledger board and the face of the band joist shall be 1".
8. Fastener spacing also applies to Southern Pine, Douglas Fir-Larch, and Hem-Fir band or rim joists.

Placement of lag screws or bolts in deck ledgers
The lag screws or bolts shall be placed as shown in Figure 19. The lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger (see Figure 19). Proper installation of lag screws or bolts shall be verified by the authority having jurisdiction.

Figure 19. Ledger Board Fastener Spacing and Clearances.

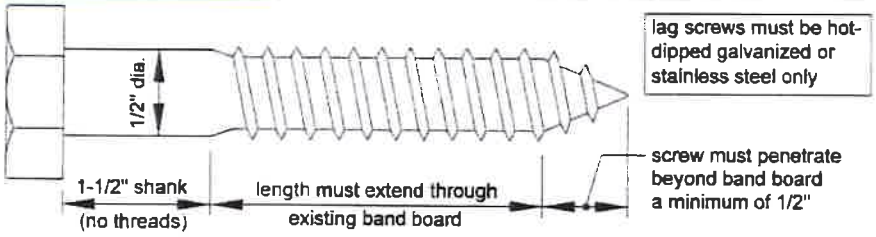


Through-Bolts
Through-bolts shall have a diameter of ½". Pilot holes for through-bolts shall be $^{17}/_{32}$" to $^{9}/_{16}$" in diameter. Through-bolts require washers at the bolt head and nut.

Expansion and Adhesive Anchors
Use *approved* expansion or adhesive anchors when attaching a ledger board to a concrete or solid masonry wall as shown in Figure 15. Expansion and adhesive anchor bolts shall have a diameter of ½". Minimum spacing and embedment length shall be per the manufacturer's recommendations. All anchors must have washers.

Lag Screws
Lag screws shall have a diameter of ½" (see MINIMUM REQUIREMENTS). Lag screws may be used only when the field conditions conform to those shown in Figure 14. See Figure 20 for lag screw length and shank requirements. All lag screws shall be installed with washers.

Figure 20. Lag Screw Requirements.

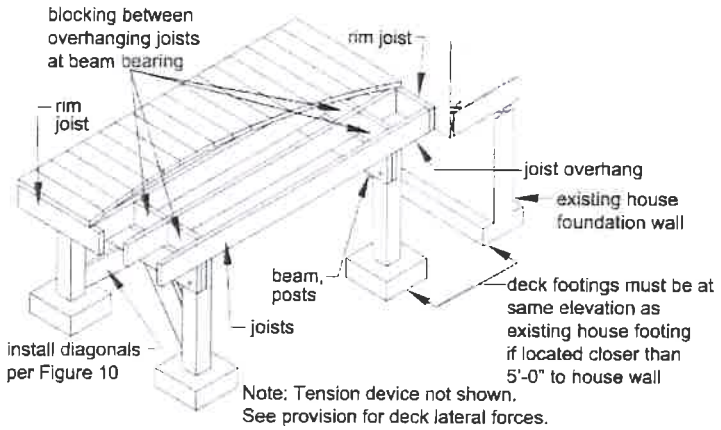


Lag screw installation requirements: Each lag screw shall have pilot holes drilled as follows: 1) Drill a ½" diameter hole in the ledger board, 2) Drill a $^{5}/_{16}$" diameter hole into the band board of the house. DO NOT DRILL A ½" DIAMETER HOLE INTO THE BAND JOIST.
The threaded portion of the lag screw shall be inserted into the pilot hole by turning. DO NOT DRIVE LAG SCREWS WITH A HAMMER. Use soap or a wood-compatible lubricant as required to facilitate tightening. Each lag screw shall be thoroughly tightened (snug but not over-tightened to avoid wood damage).

NON-LEDGER DECKS - FOR RESISTING VERTICAL LOADS

Non-ledger decks use the house for resisting lateral loads but do not utilize the exterior wall of the house to support vertical loads (see Figure 21). Rather than supporting the deck on a ledger, an additional beam with posts is provided at or within the lesser of L_O or L/4 of the house. THE ASSOCIATED DECK POST FOOTINGS SHALL BE PLACED AT THE SAME ELEVATION AS THE HOUSE FOOTING IF LOCATED CLOSER THAN 5'-0" TO A HOUSE WALL (see Figure 2 and Figure 12). For houses with basements, a cylindrical footing (caisson) is recommended to minimize required excavation at the basement wall. Beam size is determined by Table 3. Non-ledger decks shall be attached to the house per Table 5 and Figures 22 or 23 for lateral loads.

Figure 21. Non-Ledger Deck - For Resisting Vertical Loads.



DECK LATERAL LOADS

Attachment to House: Decks shall be positively anchored to the primary structure [R507.1]. The lateral connection required shall be permitted to be in accordance with Figure 22 or 23 for ledger and non-ledger decks. Hold-down tension devices shall be provided in not less than two locations within two feet of the edge of the deck, and shall have an allowable stress design capacity of not less than 1,500 lb [R507.2.4].

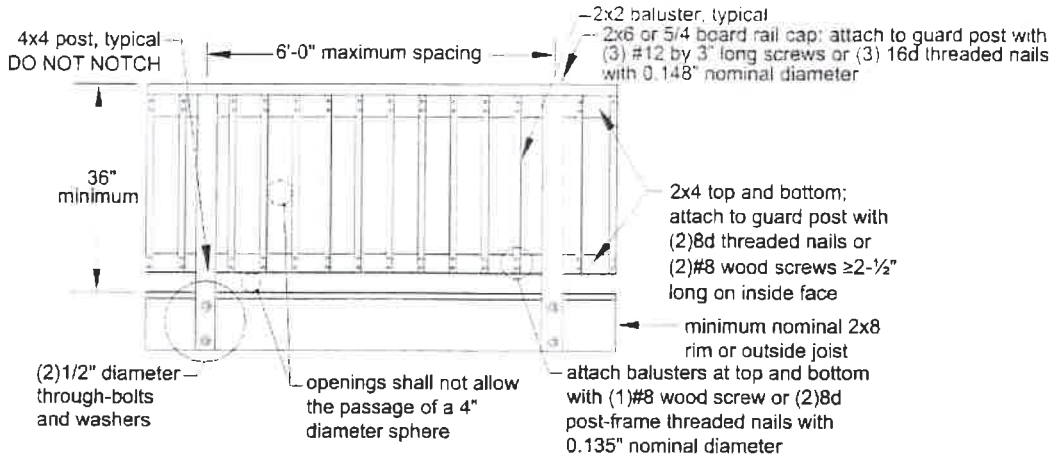
The wall must be sheathed with minimum $^3/_8$" wood structural panel sheathing. Use lag screws or through-bolts when fastening to a band joist; use expansion anchors or epoxy anchors when fastening to concrete or masonry. DO NOT ATTACH TO BRICK VENEERS. VERIFY THIS CONDITION IN THE FIELD PRIOR TO UTILIZING THIS METHOD. Fasteners shall penetrate beyond the house band board and be installed per Table 5.

For non-ledger decks, blocking or framing angles can be used in lieu of joist hangers and shall be provided on each side of each joist. Blocking shall be installed with 5-10d threaded nails into the rim joist or the framing angle shall have a lateral capacity of 600 lb. Flashing over the rim joist is required and must be installed in accordance with the flashing provisions in the LEDGER ATTACHMENT REQUIREMENTS.

GUARD REQUIREMENTS

All decks greater than 30" above grade are required to have a guard [R312.1] - one example is shown in Figure 24. Other methods and materials may be used for guard construction when *approved* by the authority having jurisdiction.

Figure 24. Example Guard Detail.



GUARD POST ATTACHMENTS FOR REQUIRED GUARDS

Deck guard posts for required guards shall be a minimum 4x4 (nominal) with an adjusted bending design value not less than 1,100 psi. Joists and rim joists to which guard posts are attached shall be a minimum of 2x8 (nominal).

Guard posts for required guards which run parallel to the deck joists shall be attached to the outside joist per Figure 25. Guard posts for required guards that run perpendicular to the deck joists shall be attached to the rim joist in accordance with Figure 26. Only hold-down anchor models meeting these minimum requirements shall be used. Hold-down anchors shall have a minimum allowable tension load of 1,800 pounds for a 36" maximum guard height and be installed in accordance with the manufacturer's instructions.

Figure 25. Guard Post to Outside-Joist Example.

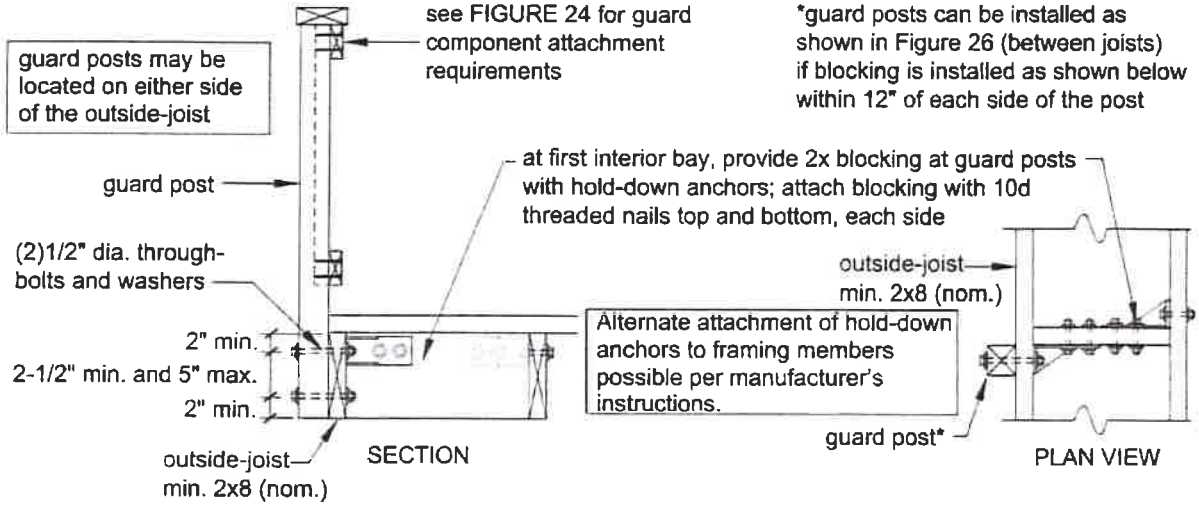
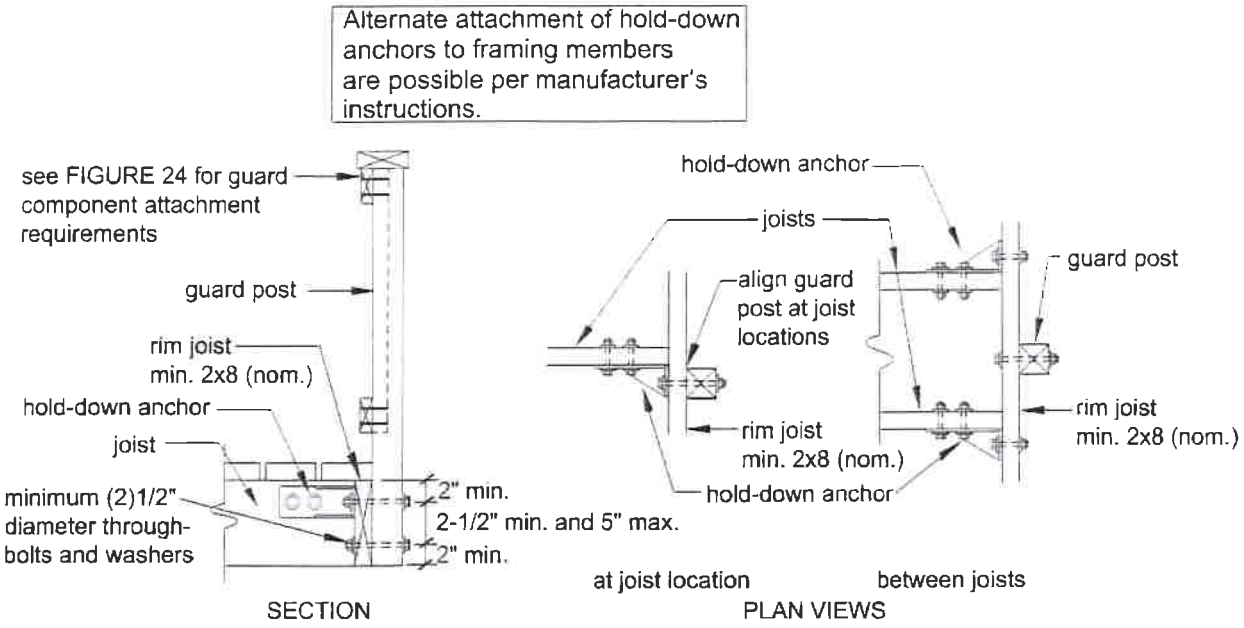


Figure 26. Guard Post to Rim Joist Example.



STAIR REQUIREMENTS

Stairs, stair stringers, and stair guards shall meet the requirements shown in Figure 27 through Figure 34 and Table 6 except where amended by the local jurisdiction. All stringers shall be a minimum of 2x12. Stair stringers shall not span more than the dimensions shown in Figure 28. If the stringer span exceeds these dimensions, then a 4x4 post may be provided to support the stringer and shorten its span length. The 4x4 post shall be notched and bolted to the stringer with (2) ½" diameter through-bolts with washers per Figure 8A. The post shall be centered on a 12" diameter or 10" square, 6" thick footing. The footing shall be constructed as shown in Figure 34 and attached to the post as shown in Figure 12. An intermediate landing may also be provided to shorten the stringer span (see provisions below). If the total vertical height of a stairway exceeds 12'-0", then an intermediate landing shall be required. All intermediate stair landings must be designed and constructed as a non-ledger deck using the details in this document. Stairs shall be a minimum of 36" in width as shown in Figure 33 [R311.7]. If only cut stringers are used, a minimum of three are required. For stairs greater than 36" in width, a combination of cut and solid stringers can be used, but shall be placed at a maximum spacing of 18" on center (see Figure 29). The width of each landing shall not be less than the width of the stairway served. Every rectangular landing shall have a minimum dimension of 36" measured in the direction of travel and no less than the width of the stairway served [R311.7].

Figure 27. Tread and Riser Detail.

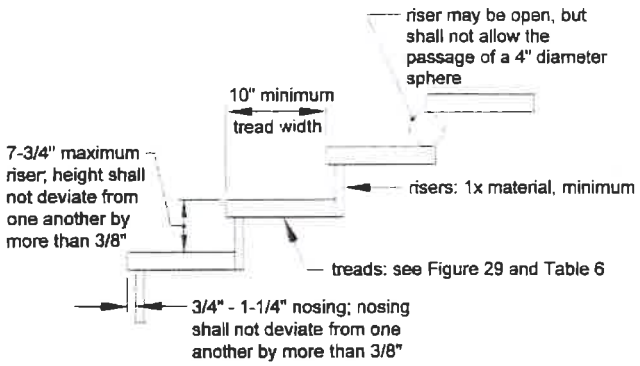


Figure 28. Stair Stringer Requirements.

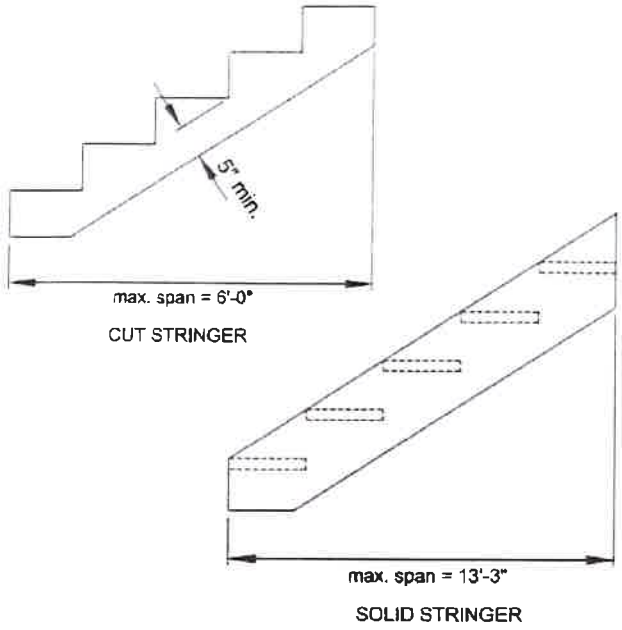


Figure 29. Tread Connection Requirements.

Attachment per tread at each stringer or ledger:
2x_ or 5/4 treads - (2)8d threaded nails or (2)#8 screws ≥2-1/2" long
3x_ treads - (2)16d threaded nails or (2)#8 screws ≥3-1/2" long

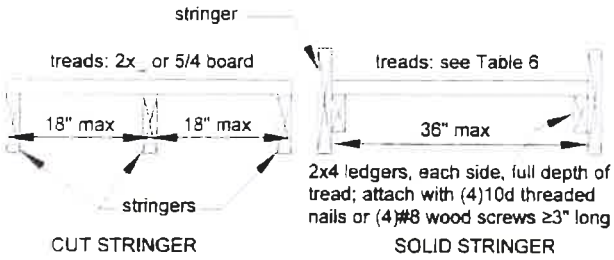


Figure 30. Stair Guard Requirements.

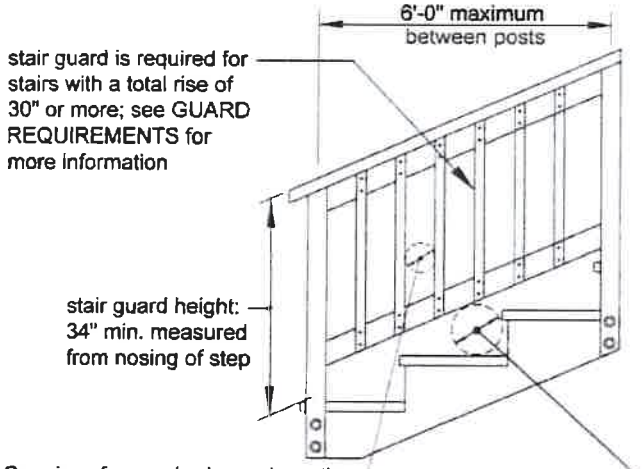


Figure 31. Stair Stringer Attachment Detail.

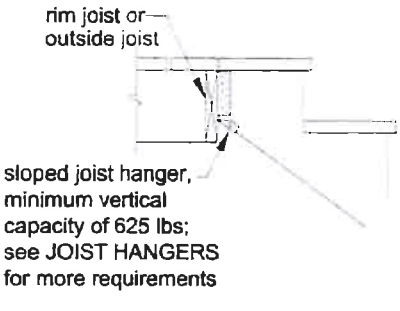


Table 6. Minimum Tread Size for Cut and Solid Stringers.[1]

Species	Cut Stringer	Solid Stringer
Southern Pine	2x4 or 5/4	2x8
Douglas Fir Larch, Hem-Fir, SPF[2]	2x4 or 5/4	2x8 or 3x4
Redwood, Western Cedars, Ponderosa Pine,[3] Red Pine[3]	2x4 or 5/4	2x10 or 3x4

1. Assumes 300 lb concentrated load, L/288 deflection limit, No. 2 stress grade, and wet service conditions.
2. Incising assumed for Douglas Fir-Larch, Hem-Fir, and Spruce-Pine-Fir.
3. Design values based on northern species with no incising assumed.

STAIR HANDRAIL REQUIREMENTS

All stairs with 4 or more risers shall have a handrail on at least one side (see Figure 32A) [R311.7.8]. The handrail height measured vertically from the sloped plane adjoining the tread nosing shall be not less than 34 inches and not more than 38 inches (see Figure 30) [R311.7.8.1]. Handrails shall be graspable and shall be composed of decay-resistant and/or corrosion resistant material. Handrails shall be Type I, Type II, or provide equivalent graspability (see Figure 32B). Type I shall have a perimeter dimension of at least 4" and not greater than 6-¼". Type II rails with a perimeter greater than 6-¼" shall provide a graspable finger recess area on both sides of the profile [R311.7.8.3]. All shapes shall have a smooth surface with no sharp corners. Handrails shall run continuously from a point directly over the lowest riser to a point directly over the highest riser and shall return to the guard at each end (see Figure 33). Handrails may be interrupted by guard posts at a turn in the stair [R311.7.8.2].

Figure 32A. Handrail Mounting Examples.

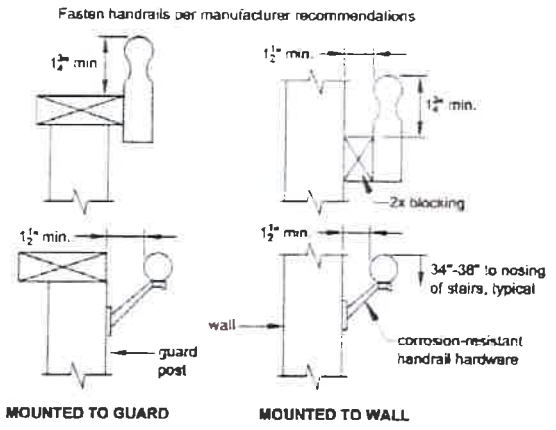
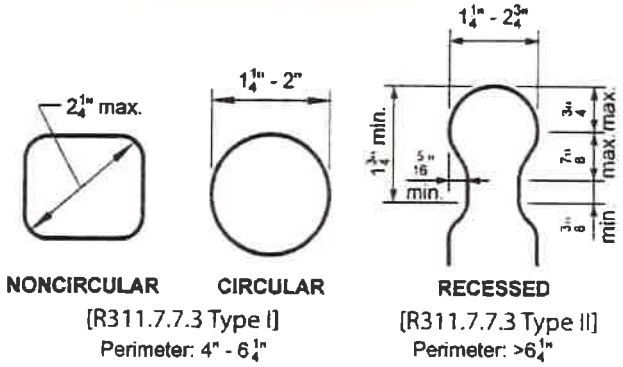


Figure 32B. Handrail Grip Size.



STAIR FOOTING REQUIREMENTS [R403]

Where the stairway meets grade, attach the stringers to the stair guard posts as shown in Figure 34. Posts shall bear on footings. All footings shall bear on solid ground and shall be placed at least 12 inches below the undisturbed ground surface or below the frost line, whichever is deeper (see Figure 34). Stringers shall bear on a 2x4 bearing block attached to the post as shown. Stringers shall not bear on new or existing concrete pads or patios that are not founded below this depth. When guards are not required (see GUARD REQUIREMENTS), posts may terminate below the bottom tread elevation. Bolts are only required if a guard post is required.

STAIR LIGHTING REQUIREMENTS [R303.7]

Stairways shall have a light source located at the top landing such that all stairs and landings are illuminated. The light switch shall be operated from inside the house. However, motion detected or timed switches are acceptable.

Figure 33. Miscellaneous Stair Requirements.

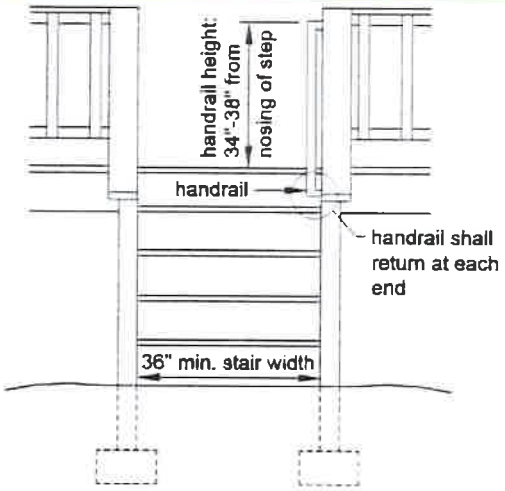
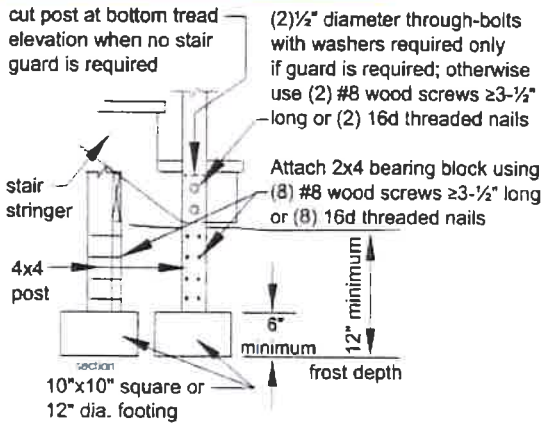


Figure 34. Stair Footing Detail.



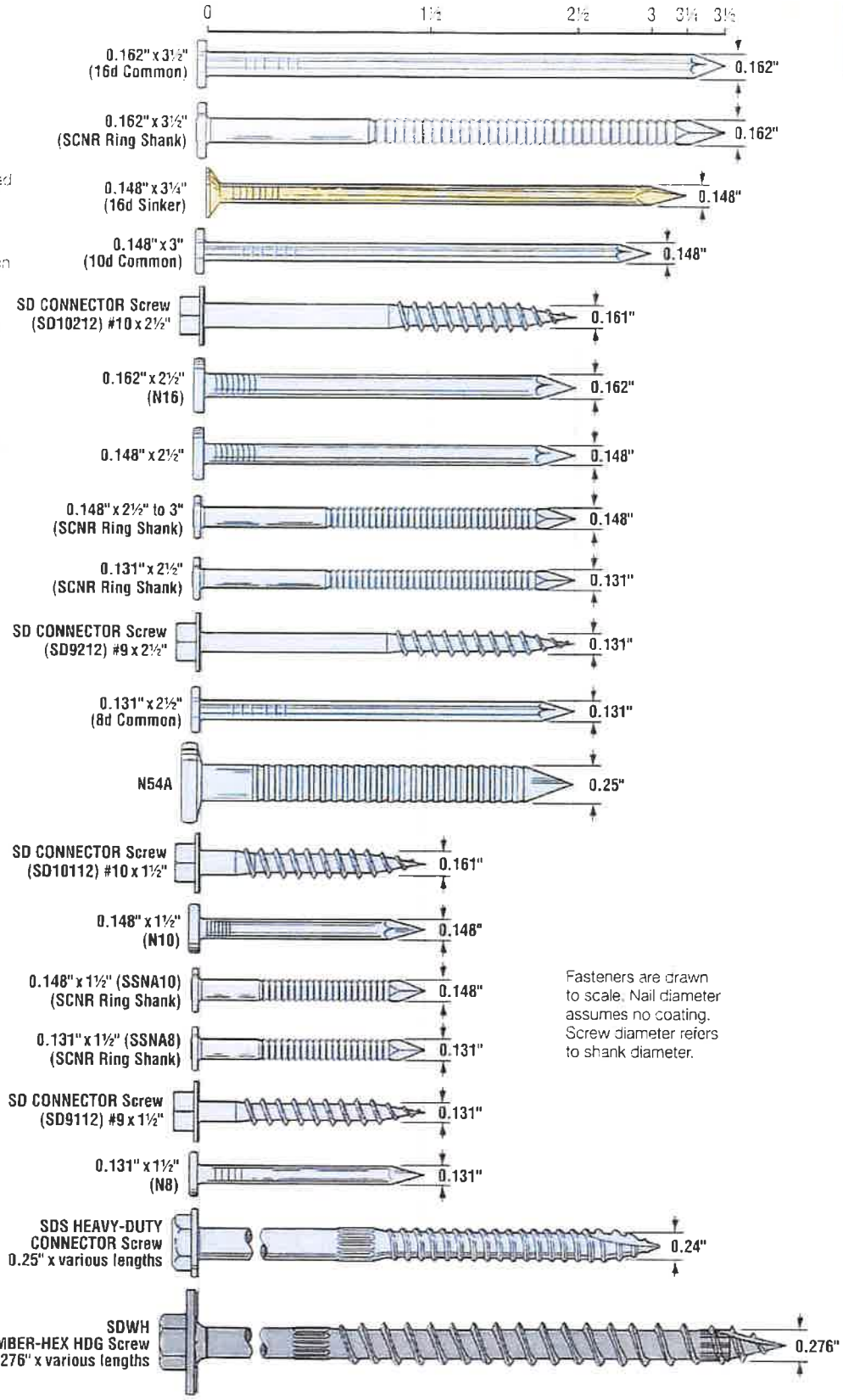
Connector Fastener Types

Many Simpson Strong-Tie connectors have been designed and tested for use with specific types and sizes of fasteners. The specified quantity, type and size of fastener must be installed in the correct holes on the connector to achieve published loads. Other factors such as fastener material and finish are also important. Incorrect fastener selection or installation can compromise connector performance and could lead to failure. For more information about fasteners, see our *Fastening Systems* catalog at **strongtie.com** or access our Fastener Finder software at **strongtie.com/software**.

The Simpson Strong-Tie® Strong-Drive® SD Connector screw is the only screw approved for use with our connectors. See pp. 348–352 for more information.

SS

The allowable loads of stainless-steel connectors match those of carbon-steel connectors when installed with Simpson Strong-Tie® stainless-steel, SCNR ring-shank nails. For more information, refer to engineering letter L-F-SSNAILS at **strongtie.com**.



Fasteners are drawn to scale. Nail diameter assumes no coating. Screw diameter refers to shank diameter.

ABA/ABU/ABW

Adjustable and Standoff Post Bases

Additional standoff bases are on p. 331.

The AB series of retrofit adjustable post bases provide a 1" standoff for the post, are slotted for adjustability and can be installed with nails, Strong-Drive® SD Connector screws or bolts (ABU). Depending on the application needs, these adjustable standoff post bases are designed for versatility, cost-effectiveness and maximum uplift performance.

Features:

- The slot in the base enables flexible positioning around the anchor bolt, making precise post placement easier
- The 1" standoff helps prevent rot at the end of the post and meets code requirements for structural posts installed in basements or exposed to weather or water splash

Material: Varies (see table)

Finish: ZMAX® and some in stainless steel; see Corrosion Information, pp. 12–15

Installation:

- Use all specified fasteners; see General Notes.
- See our *Anchoring, Fastening, Restoration and Strengthening Systems for Concrete and Masonry* catalog, or visit **strongtie.com** for retrofit anchor options, such as Titen HD®, Stainless-Steel Titen HD or SET-3G™.
- Post bases do not provide adequate resistance to prevent members from rotating about the base and therefore are not recommended for non-top-supported installations (such as fences or unbraced carports).
- Place the base, cut washer(s) or load transfer plate(s) and nut(s) on the anchor bolt(s). Make any necessary adjustments to post placement and tighten the nut securely on the anchor bolt.
- See **strongtie.com** for information on hollow column installation.

ABW

Place the standoff base and then the post in the ABW and fasten on three vertical sides, using nails or Strong-Drive SD Connector screws

– Bend up the fourth side of the ABW and fasten using the correct fasteners

ABU

Place the standoff base and then the post in the ABU

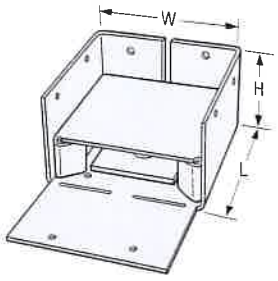
– Fasten using nails or Strong-Drive SD Connector screws or bolts (ABU88Z, ABU1010Z, ABU1212Z – SDS optional)

ABA

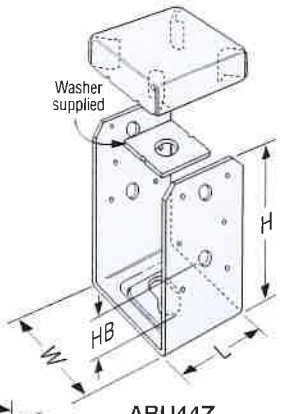
Place the post in the ABA

– Fasten using nails or Strong-Drive SD Connector screws

Codes: See p. 11 for Code Reference Key Chart



ABWZ



ABU44Z
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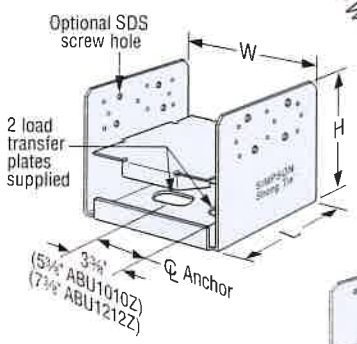

ABU88Z
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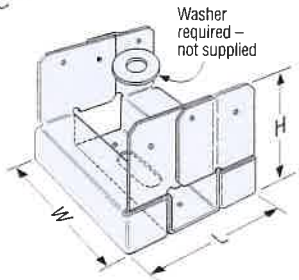
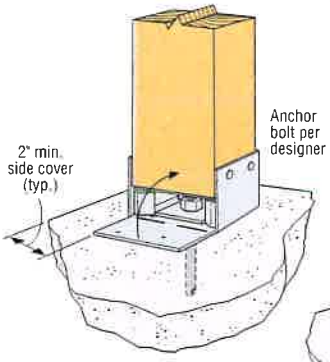
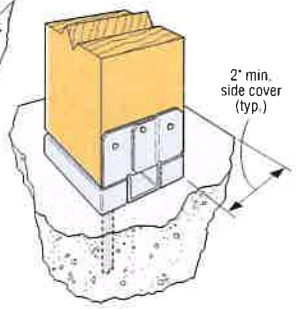


ABA44Z
(other sizes similar)



Typical ABWZ Installation

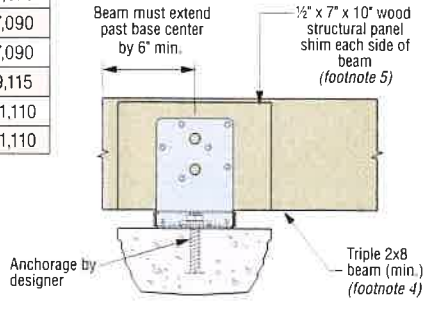


Typical ABA44Z Installation

Allowable Loads — Beam Installation

Model No.	Nominal Beam Size	Material (ga.)		Dimensions (in.)			Fasteners (in.)		DF/SP Allowable Loads		SPF/HF Allowable Loads	
		Base	Strap	W	L	H	Anchor Dia.	Nails	Uplift (160)	Down (100)	Uplift (160)	Down (100)
ABU46Z	Double 2x	12	12	3 3/16	5	7	5/8	(12) 0.162 x 3½	2,030	8,475	1,820	6,075
ABU46Z	4x	12	12	3 3/16	5	7	5/8	(12) 0.162 x 3½	2,155	9,890	1,850	7,090
ABU46RZ	Rough 4x	12	12	4	6	6¾	5/8	(12) 0.162 x 3½	2,155	9,890	1,850	7,090
ABU66Z	Triple 2x	12	10	5½	5	6 1/16	5/8	(12) 0.162 x 3½	1,405	12,715	1,165	9,115
ABU66Z	6x	12	10	5½	5	6 1/16	5/8	(12) 0.162 x 3½	1,905	12,920	1,640	11,110
ABU66RZ	Rough 6x	12	10	6	6	5 13/16	5/8	(12) 0.162 x 3½	1,905	12,920	1,640	11,110

1. Uplift loads have been increased for earthquake or wind loading with no further increase allowed. Reduce where other loads govern.
2. Downloads may not be increased for short-term loading.
3. Specifier is to design concrete and anchorage for uplift capacity.
4. Beam depth must be a minimum of 7¼".
5. Shims are required for double 2x (1 shim) and triple 2x (2 shims) installations as shown in the illustration. Additional fastening of shim to beam is not required.
6. **Fasteners:** Nail dimensions are listed diameter by length. See pp. 21–22 for fastener information.



ABU66Z Beam Installation

ABA/ABU/ABW

Adjustable and Standoff Post Bases (cont.)

These products are available with additional corrosion protection. For more information, see p. 14.

SS For stainless-steel fasteners, see p. 21.

SD Many of these products are approved for installation with Strong-Drive® SD Connector screws. See pp. 348–352 for more information.

Allowable Loads — Post Installation

Model No.	Nominal Post Size	Material (ga.)		Dimensions (in.)				Fasteners				Allowable Loads (DF/SP)			Code Ref.
		Base	Strap	W	L	H	HB	Anchor Dia. (in.)	Nails (in.)	Bolts Qty.	Bolts Dia. (in.)	Uplift Nails	Uplift Bolts	Down (100)	
ABA44Z	4x4	16	16	3 9/16	3 3/8	3 1/16	—	1/2	(6) 0.148 x 3	—	—	690	—	5,925	IBC, FL, LA
ABW44Z	4x4	16	16	3 9/16	3 9/16	2 1/4	—	1/2	(8) 0.148 x 3	—	—	1,005	—	7,180	
SS ABU44Z	4x4	16	12	3 9/16	3	5 1/2	1 3/4	5/8	(12) 0.162 x 3 1/2	2	1/2	1,900	2,300	7,570	
ABA44RZ	Rough 4x4	16	16	4 1/16	3 1/8	2 13/16	—	1/2	(6) 0.148 x 3	—	—	655	—	7,215	
ABW44RZ	Rough 4x4	16	16	4	4 1/16	1 15/16	—	1/2	(8) 0.148 x 3	—	—	835	—	7,180	
ABU44RZ	Rough 4x4	16	12	4 1/16	3	5 1/4	1 1/2	5/8	(12) 0.162 x 3 1/2	2	1/2	1,900	2,300	7,570	
ABA46Z	4x6	14	14	3 9/16	5 3/16	3 1/8	—	5/8	(8) 0.162 x 3 1/2	—	—	870	—	10,500	
ABW46Z	4x6	12	16	3 9/16	5 9/16	3	—	1/2	(10) 0.148 x 3	—	—	845	—	4,590	
SS ABU46Z	4x6	12	12	3 9/16	5	7	2 5/8	5/8	(12) 0.162 x 3 1/2	2	1/2	2,405	2,265	12,520	
ABA46RZ	Rough 4x6	14	14	4 1/16	5 3/16	2 7/8	—	5/8	(8) 0.162 x 3 1/2	—	—	870	—	10,695	
ABW46RZ	Rough 4x6	12	16	4	6	2 13/16	—	1/2	(10) 0.148 x 3	—	—	780	—	4,590	
ABU46RZ	Rough 4x6	12	12	4 1/16	5	6 3/4	2 3/8	5/8	(12) 0.162 x 3 1/2	2	1/2	2,405	2,265	12,520	
ABU5-5Z	5 1/8 x 5 1/8	12	10	5 1/4	5	6 1/16	1 3/4	5/8	(12) 0.162 x 3 1/2	2	1/2	2,235	2,235	10,570	
ABU5-6Z	5 1/8 x 6	12	10	6 1/8	5	6 1/16	1 3/4	5/8	(12) 0.162 x 3 1/2	2	1/2	2,235	2,235	10,570	
ABU65Z	5 1/8 x 5	12	10	5 1/2	5	6 1/16	1 3/4	5/8	(12) 0.162 x 3 1/2	—	—	2,475	—	10,960	
ABA66Z	6x6	14	14	5 1/2	5 3/8	3 1/8	—	5/8	(8) 0.162 x 3 1/2	—	—	850	—	10,245	
ABW66Z	6x6	12	14	5 1/2	5 9/16	3	—	1/2	(12) 0.148 x 3	—	—	1,190	—	12,935	
SS ABU66Z	6x6	12	10	5 1/2	5	6 1/16	1 3/4	5/8	(12) 0.162 x 3 1/2	2	1/2	2,475	2,190	18,205	
ABA66RZ	Rough 6x6	14	14	6	5 3/16	2 7/8	—	5/8	(8) 0.162 x 3 1/2	—	—	850	—	11,500	
ABW66RZ	Rough 6x6	12	14	6	6	2 13/16	—	1/2	(12) 0.148 x 3	—	—	1,190	—	12,935	
ABU66RZ	Rough 6x6	12	10	6 1/16	5	5 13/16	1 1/2	5/8	(12) 0.162 x 3 1/2	2	1/2	2,475	2,190	18,205	
ABW7-7Z	7 1/8 x 7 1/8	12	14	7 5/16	7 5/16	3	—	1/2	(12) 0.148 x 3	—	—	840	—	14,530	
SS ABU88Z	8x8	14	12	7 1/2	7	7	—	(2) 5/8	(18) 0.162 x 3 1/2	—	—	2,570	—	22,405	
ABU88RZ	Rough 8x8	14	12	8	7	7	—	(2) 5/8	(18) 0.162 x 3 1/2	—	—	2,450	—	19,870	
ABU1010Z	10x10	14	14	9 1/2	9	7 1/4	—	(2) 5/8	(22) 0.162 x 3 1/2	—	—	2,270	—	32,020	
ABU1010RZ	Rough 10x10	14	14	10	9	7	—	(2) 5/8	(22) 0.162 x 3 1/2	—	—	1,830	—	31,650	
ABU1212Z	12x12	12	12	11 1/2	11	7 1/4	—	(2) 5/8	(22) 0.162 x 3 1/2	—	—	3,000	—	34,745	
ABU1212RZ	Rough 12x12	12	12	12	11	7	—	(2) 5/8	(22) 0.162 x 3 1/2	—	—	3,000	—	34,745	

1. Uplift loads have been increased for earthquake or wind loading with no further increase allowed. Reduce where other loads govern.
2. Downloads may not be increased for short-term loading.
3. Specifier is to design concrete and anchorage for uplift loads.
4. ABU products may be installed with either bolts or nails (not both) to achieve table loads. ABU88Z, ABU88RZ, ABU1010Z, ABU1010RZ, and ABU1212Z/RZ may be installed with eight ¼" x 3" Strong-Drive SDS Heavy-Duty Connector screws (sold separately) for the same table load.
5. For higher downloads, pack grout solid under 1" standoff plate before installation. Base download on column or concrete, according to the code.
6. HB dimension is the distance from the bottom of the post up to the first bolt hole.
7. Structural composite lumber columns have sides that show either the wide face or the edges of the lumber strands/veneers. For SCL columns, the fasteners for these products should always be installed in the wide face. See technical bulletin T-C-SCLCLM at strongtie.com for more information.
8. Downloads shall be reduced where limited by allowable loads of the post.
9. **Fasteners:** Nail dimensions are listed diameter by length. See pp. 21–22 for fastener information.

BC/BCS

Post Caps

The BCS allows for the connection of (2) 2x's to a 4x post or (3) 2x's to a 6x post. Double-shear nailing between beam and post gives added strength. The BC series offers dual purpose post cap/base for light cap or base connections.

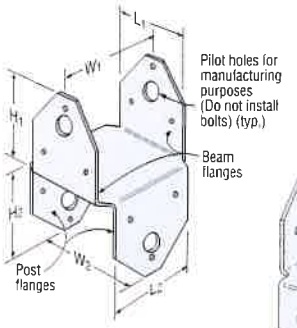
Material: 18 gauge

Finish: Galvanized. Some products available in ZMAX® coating. See Corrosion Information, pp. 12–15.

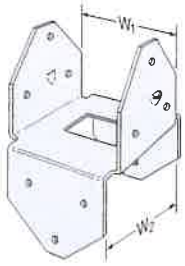
Installation:

- Use all specified fasteners; see General Notes
- Do not install bolts into pilot holes
- BCS — Install dome nails on beam; drive nails at an angle through the beam into the post below to achieve the table loads
- BC — Install with 0.162" x 3½" nails or 0.162" x 2½" nails
- Post bases do not provide adequate resistance to prevent members from rotating about the base and therefore are not recommended for non-top-supported installations (such as fences or unbraced carports)
- To tie multiple 2x members together, the designer must determine the fasteners required to join members to act as one unit without splitting the wood

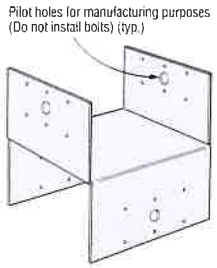
Codes: See p. 11 for Code Reference Key Chart



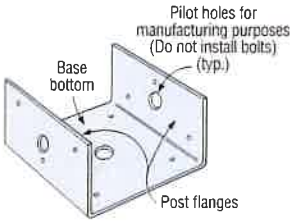
BC4 Cap/Base
(BC6 similar)



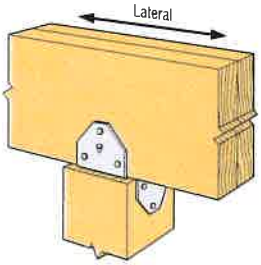
BCS2-2/4



BC8 Cap/Base



BC60 Half Base
(other similar)



Typical BCS Installation

These products are available with additional corrosion protection. For more information, see p. 14.

SS For stainless-steel fasteners, see p. 21.

SD Many of these products are approved for installation with Strong-Drive® SD Connector screws. See pp. 348–352 for more information.

	Model No.	Dimensions (in.)						Fasteners (in.)			Allowable Loads (DF/SP) (160)		Code Ref.
		W_1	W_2	L_1	L_2	H_1	H_2	Beam Flange	Post Flange	Base Bottom	Uplift	Lateral	
	Caps												
SS	BC4	3⁹⁄₁₆	3⁹⁄₁₆	2⅞	2⅞	3	3	(6) 0.162 x 3½	(6) 0.162 x 3½	—	605	1,000	IBC, FL, LA
	BC46	3⁹⁄₁₆	5½	4⅞	2⅞	3½	2½	(12) 0.162 x 3½	(6) 0.162 x 3½	—	945	1,000	
	BC4R	4	4	4	4	3	3	(12) 0.162 x 3½	(12) 0.162 x 3½	—	605	1,000	
SS	BC6	5½	5½	4⅜	4⅜	3⅜	3⅜	(12) 0.162 x 3½	(12) 0.162 x 3½	—	1,185	1,825	
	BC6R	6	6	6	6	3	3	(12) 0.162 x 3½	(12) 0.162 x 3½	—	1,185	1,825	
	BC8	7½	7½	7½	7½	4	4	(12) 0.162 x 3½	(12) 0.162 x 3½	—	1,660	1,825	
SS	BCS2-2/4	3⅛	3⁹⁄₁₆	2⅞	2⅞	2¹⁵⁄₁₆	2¹⁵⁄₁₆	(8) 0.148 x 3	(6) 0.148 x 3	—	895	890	
SS	BCS2-3/6	4⅝	5⁹⁄₁₆	4⅜	2⅞	3⁵⁄₁₆	2¹⁵⁄₁₆	(12) 0.162 x 3½	(6) 0.162 x 3½	—	895	1,330	
	Bases												
SS	BC40	3⁹⁄₁₆	—	3¼	—	2¼	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	510	735	—
	BC40R	4	—	4	—	3	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	510	735	
	BC460	5½	—	3⅜	—	3	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	450	735	
	BC60	5½	—	5½	—	3	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	450	735	
	BC60R	6	—	6	—	3	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	450	735	
	BC80	7½	—	7½	—	4	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	450	735	
	BC80R	8	—	8	—	4	—	—	(6) 0.162 x 3½	(4) 0.162 x 3½	450	735	

1. Allowable loads have been increased for wind or earthquake loading with no further increase allowed. Reduce where other loads govern.
2. Structural composite lumber columns have sides that show either the wide face or the edges of the lumber strands/veneers known as the narrow face. Values in the tables reflect installation into the wide face. See technical bulletin T-C-SCLCLM at **strongtie.com** for load reductions resulting from narrow-face installations.
3. Base allowable loads assume that nails have full penetration into the supporting member. Loads do not apply to end-grain post installations.
4. **Fasteners:** Nail dimensions are listed diameter by length. See pp. 21–22 for fastener information.

AC/LPCZ/LCE/RTC

Post Caps

The universal design of the LCE4 post cap provides high capacity while eliminating the need for rights and lefts. For use with 4x or 6x lumber. LPCZ — Adjustable design allows greater connection versatility.

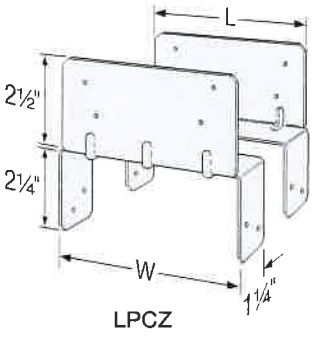
Material: LCE4 — 20 gauge;
AC, LPC4Z — 18 gauge;
LPC6Z — 16 gauge;
RTC — 14 gauge

Finish: Galvanized.
Some products available in ZMAX® coating and stainless steel.
See Corrosion Information, pp. 12–15.

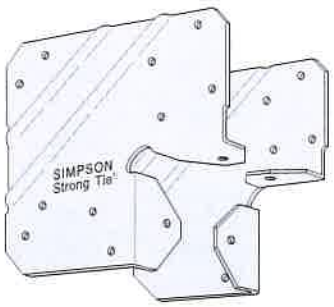
Installation:

- Use all specified fasteners; see General Notes
- Install all models in pairs, except RTC.
  LPCZ — 2½" beams may be used if 0.148" x 1½" nails are substituted for 0.148" x 3" nails

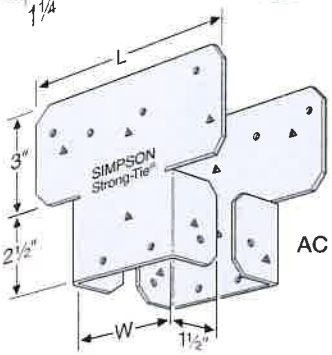
Codes: See p. 11 for Code Reference Key Chart



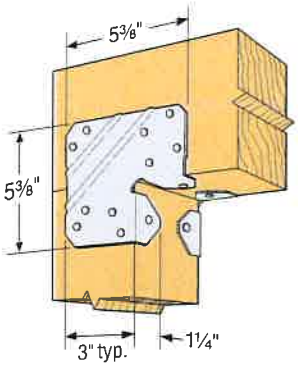
LPCZ



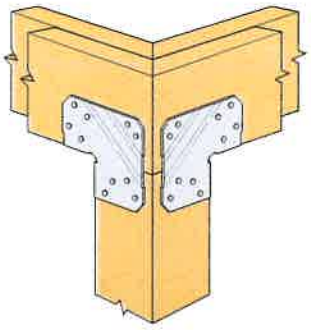
LCE4

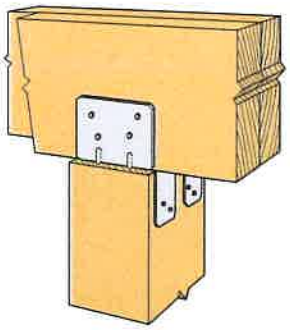


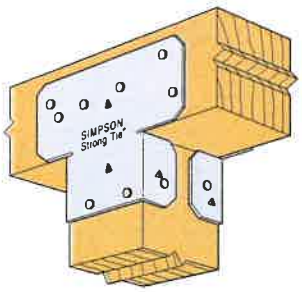
AC



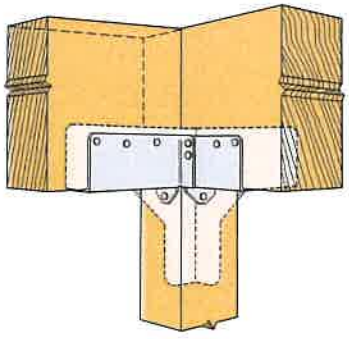
Typical LCE4 Installation
(for 4x or 6x lumber)

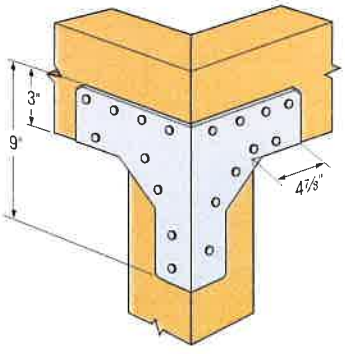

Typical LCE4 Corner Installation
(mitered corner)


Typical LPC4Z Installation
(mitered corner)



Typical AC4 Installation


RTC44 Installation
(square cut)



RTC44 Installation
(mitered corner)

LUC/LU/U/HU/HUC

Standard Face-Mount Joist Hangers

LUC — Concealed-flange hanger available for 2x6, 2x8, 2x10 and 2x12 lumber. Ideal for end of ledger/header or post conditions, the LUCZ also provides cleaner lines for exposed conditions such as overhead decks.

LU — Value engineered for strength and economy. Precision-formed — engineered for installation ease and design value.

U — The standard U hanger provides flexibility of joist to header installation. Versatile fastener selection with tested allowable loads.

HU/HUC — Most models have triangle and round holes. To achieve maximum loads, fill both round and triangle holes with common nails. These heavy-duty connectors are designed for additional strength, longevity and safety factors.

Material: See tables on pp. 104–114

Finish: Galvanized. Some products available in ZMAX® coating or stainless steel.

Installation:

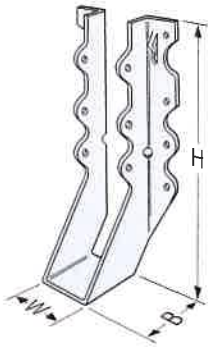
- Use all specified fasteners; see General Notes.
- HU/HUC — Can be installed filling round holes only, or filling round and triangle holes for maximum values.
- Joists sloped up to ¼:12 achieve table loads.
- For installations to masonry or concrete see pp. 243–245.
- HU/HUC hangers can be welded to a steel member. Allowable loads are the lesser of the values in the hanger tables on pp. 104–114 or the weld capacity — refer to technical bulletin T-C-HUHUC-W at **strongtie.com**.
- When nailing into solid sawn carrying member's end grain, the allowable load is adjusted by a factor of 0.67.

Allowable Loads:

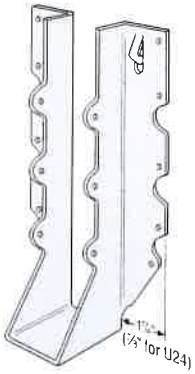
- See table on pp. 104–114 for loads.

Options:

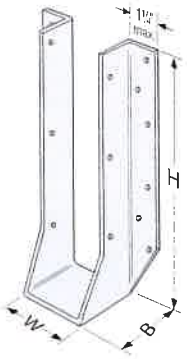
- For both flanges concealed, order HUC.
- When the HUC is skewed, the header flange opposite the skew direction is not concealed. See p. 101.
- For low-cost, code approved 45° skewed hangers, see SUR/SUL.
- For field-adjustable hangers, see LSSJ, LRUZ and LSSR on pp. 117–119.
- See modifications table for available options and associated load capacities for U and HU hangers.
- For ease of ordering, refer to technical bulletin T-C-U-HU-WS at **strongtie.com**.
- LU/LUC cannot be modified.



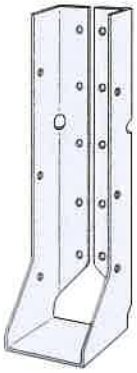
LU28
(except LU roughs)



U210



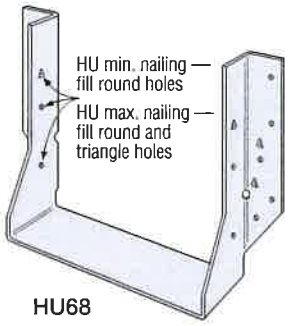
HU214
Projection seat on most models for maximum bearing and section economy.



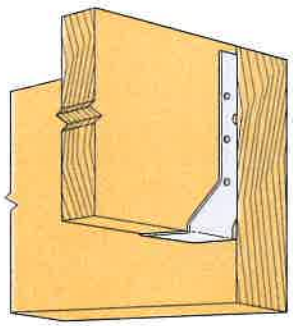
LUC210Z
(LUC26Z similar)

HUC412
Concealed flanges

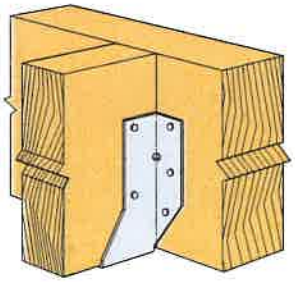
Model configurations may differ from those shown. Some HU models do not have triangle holes. Contact Simpson Strong-Tie.



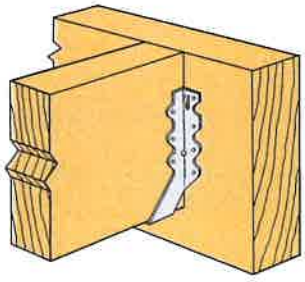
HU68



Typical LUCZ Installation



Typical HU Installation



Typical LU28 Installation

LTT/HTT

Tension Ties

Tension ties offer a solution for resisting tension loads that are fastened with nails or Strong-Drive® SD Connector screws. The new LTTP2 light tension tie, designed for wood joist attachments to concrete or masonry walls, features two separate nailing patterns: obround holes spaced 3" apart for I-joist purlins and square holes spaced to accommodate the narrow face of 2x solid-sawn purlins. LTTP2 may also be installed vertically on the wide face of a minimum 2x4 stud for holdown application. It features an extruded anchor bolt hole to accommodate ¼", ⅝" and ¾" bolt diameters.

The LTTI31 is designed for wood chord open-web truss attachments to concrete or masonry walls and may also be installed vertically on a minimum 2x6 stud.

The HTT4 and HTT5 tension ties feature an optimized nailing pattern which results in better performance with less deflection. HTT5KT is sold as a kit with the holdown, bearing plate washer and Strong-Drive SD Connector screws.

The HTT5-¾ is designed to use a ¾"-diameter anchor bolt.

When using LTT or HTT tension ties with unreinforced concrete masonry, ¾" post-installed anchor bolts are commonly used.

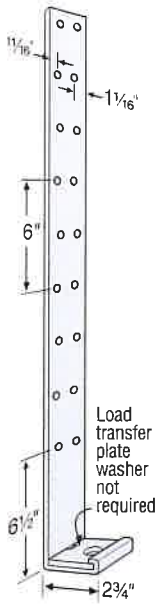
Material: See table

Finish: Galvanized. May be ordered HDG; contact Simpson Strong-Tie.

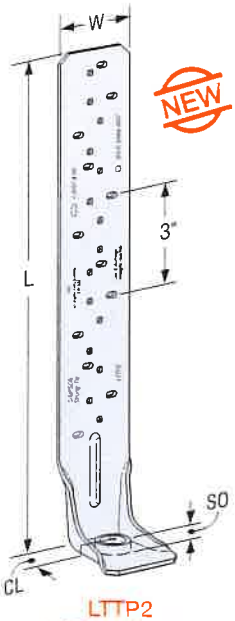
Installation:

- See Holdown and Tension Tie General Notes on pp. 49–50.
- LTTP2 – one standard cut-washer is required when using ⅝" and ¾" anchor bolts; and no additional washer is required for ¼" anchor bolts.
- LTTP2 – For installations on narrow edge of solid sawn (2x, 3x) joists use (1) square holes; for all other installations use (12) obround holes.
- For tension ties installed over wood structural panel sheathing, use a 2½"-long fastener minimum.
- For information about marriage strap at panelized roof applications, see **strongtie.com**.
- HTT5-KT requires BP 5/8-2 bearing plate and #10 x 2½" SD Strong-Drive screws (included in kit).

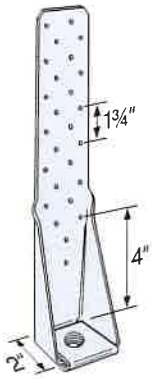
Codes: See p. 11 for Code Reference Key Chart



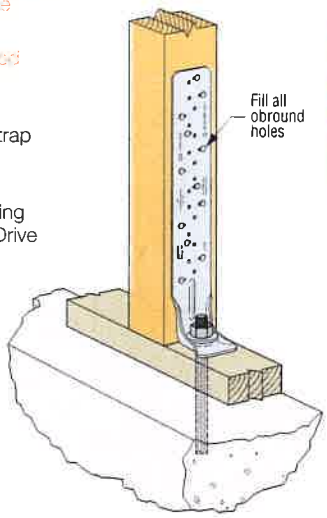
LTTI31



LTTP2
US Patent Pending

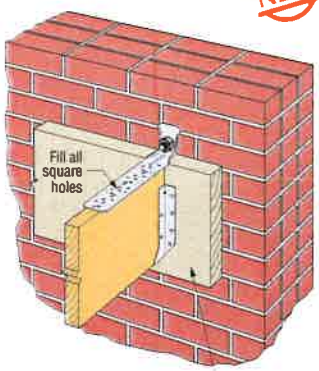


HTT5
(HTT4 similar)

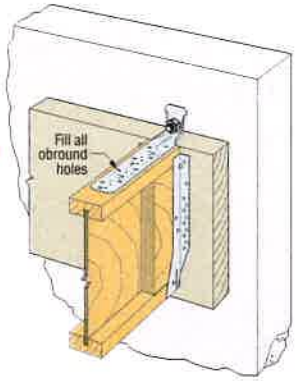


Typical LTTP2 Installation for Holdown Application

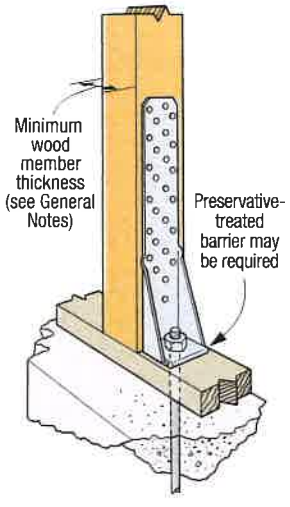
NEW



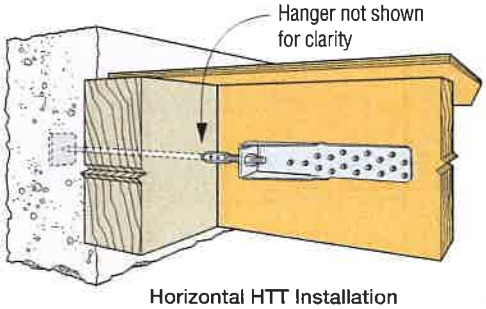
Typical LTTP2 Installation for Solid Sawn Joist



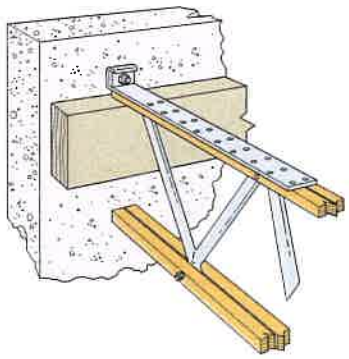
Typical LTTP2 Installation for I-joist



Vertical HTT5 Installation
(HTT4 similar)



Horizontal HTT Installation



Horizontal LTTI31 Installation

H/TSP

Seismic and Hurricane Ties

Simpson Strong-Tie hurricane ties provide a positive connection between truss/rafter and the wall of the structure to resist wind and seismic forces.

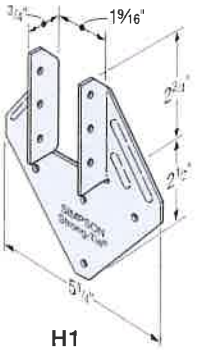
Material: See table

Finish: Galvanized. H1.81Z, H7Z and H11Z — ZMAX® coating. Some models available in stainless steel or ZMAX; see Corrosion Information, pp. 12–15 or visit **strongtie.com**.

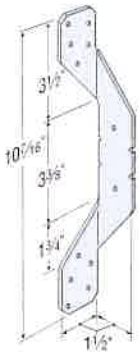
Installation:

- Use all specified fasteners; see General Notes.
- Hurricane ties can be installed with flanges facing inward or outward.
- H2.5T, H3 and H6 ties are shipped in equal quantities of right and left versions (right versions shown).
- Hurricane ties do not replace solid blocking.
- When installing ties on plated trusses (on the side opposite the truss plate) do not fasten through the truss plate from behind. This can force the truss plate off of the truss and compromise truss performance.
- H10A optional nailing to connect shear blocking, use 0.131" x 2½" nails. Slots allow maximum field bending up to a pitch of 6:12, use H10A sloped loads for field-bent installation.

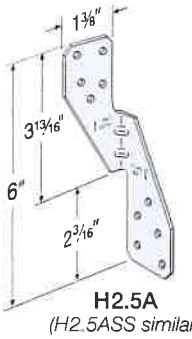
Codes: See p. 11 for Code Reference Key Chart



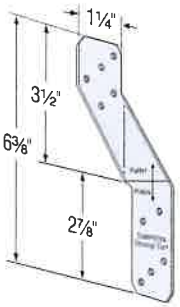
H1
(H1.81Z similar)



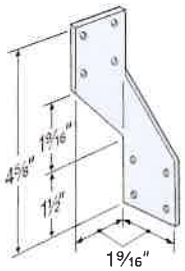
H2A
(H2ASS similar)



H2.5A
(H2.5ASS similar)

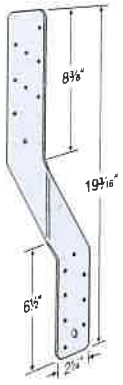


H2.5T

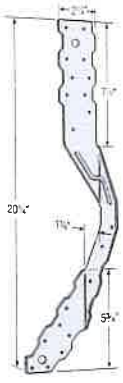


H3
(H3SS similar)

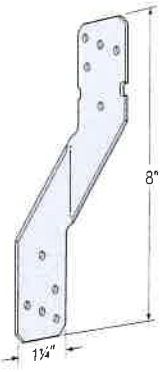
TSP



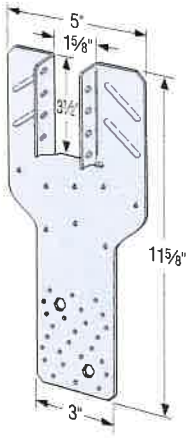
H6



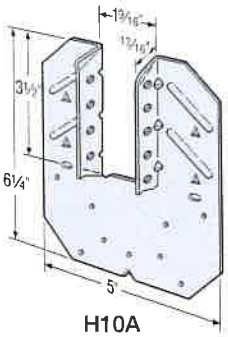
H7Z



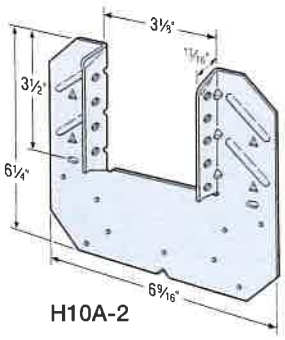
H8
(H8SS similar)



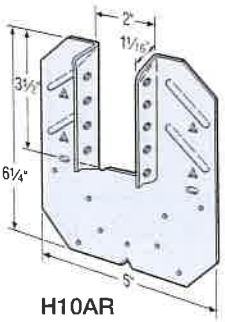
H10S



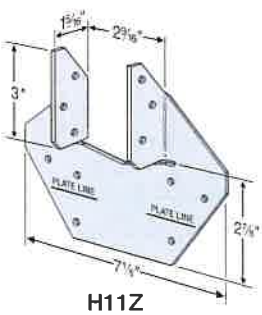
H10A
(H10ASS similar)



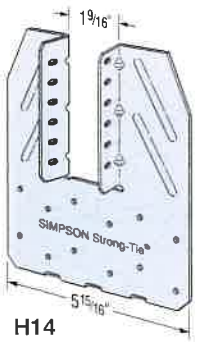
H10A-2



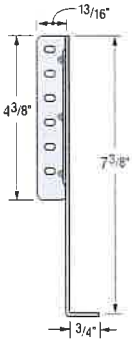
H10AR



H11Z



H14



H14 Profile

LSC

Adjustable Stringer Connector

The LSC adjustable stair-stringer connector offers a versatile, concealed connection between the stair stringer and the carrying header or rim board while replacing costly framing. Field slopeable to all common stair stringer pitches, the LSC connector is suitable for either solid or notched stringers.

Features:

- Replaces additional framing and toe-nailing.
- May be installed flush with the top of the carrying member (typically suitable for 2x10 or 2x12 header / rim board) or lower on the face (typically suitable for a 2x12 header / rim board).
- Interchangeable for left or right applications.
- LSCZ features a ZMAX® coating for additional corrosion protection. Suitable for interior and some exterior applications. LSCSS is made from stainless steel for higher exposure environment. See **strongtie.com/info** for more information.

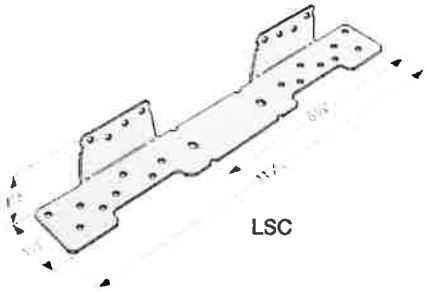
Material: 18 gauge

Finish: LSCZ — ZMAX® coating; LSCSS — stainless steel

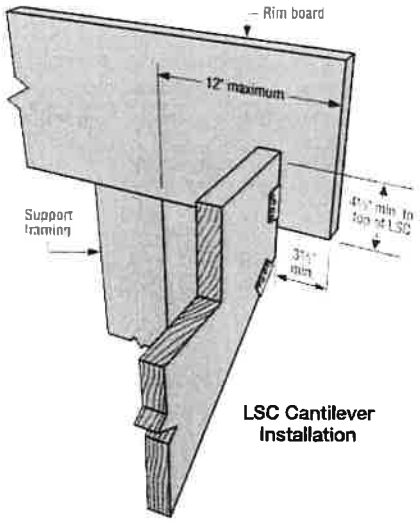
Installation:

- Use all specified fasteners, see table.
- Before fastening, position the stair stringer with the LSC on the carrying member to verify where the bend should be located.
- The fastener that is installed into the bottom edge of the stringer must go into the second-to-last hole.
- When installed on 1⅝" LVL or a 1¼" LSL stringer, additional items that will not affect the structural performance of the LSC, but should be considered, include the following:
  - LSC stringer flange will protrude ¼" from face of stringer. As such, it is recommended the LSC be installed with the tabs positioned to the outside of the stringer.
  - 1½" fasteners installed into 1¼" LSL stringer will protrude from the opposite side.

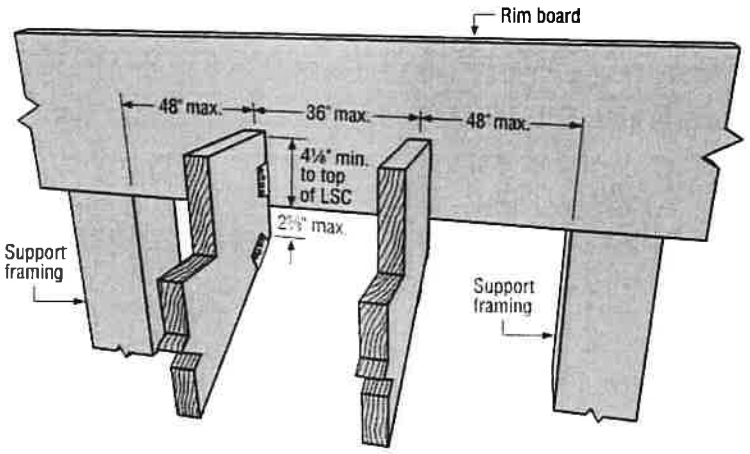
Codes: See p. 11 for Code Reference Key Chart



LSC



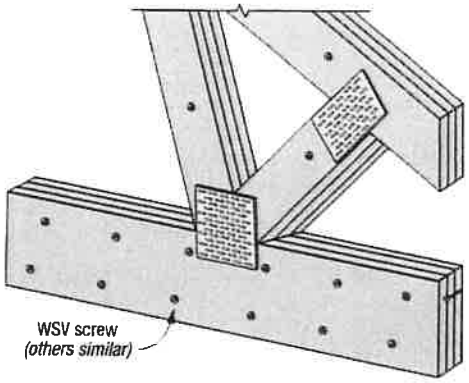
LSC Cantilever Installation



Standard LSC Installation

Fastener Application Guide

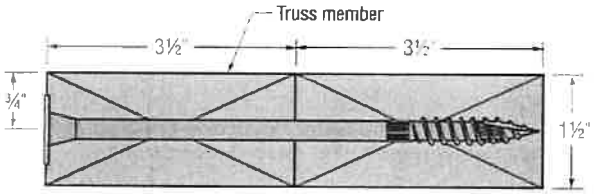
Multi-Ply Truss



Strong-Drive® WSV SUBFLOOR Screw
Size range: #9 x 1¾", 2", 2½", 3"

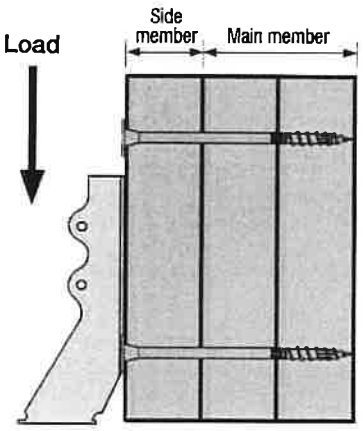
Strong-Drive SDW TRUSS-PLY and EWP-PLY Screws
Size range:
SDW Truss-Ply — 0.220" x 2⁹/₁₆", 3⅛", 4⅛", 5", 6⅜"
SDW EWP-Ply — 0.220" x 3¾", 5", 6¾"

Multi-Ply Floor Truss



Strong-Drive SDW TRUSS-PLY and EWP-PLY Screws
Size range:
SDW Truss-Ply — 0.220" x 2⁹/₁₆", 3⅛", 4⅛", 5", 6⅜"
SDW EWP-Ply — 0.220" x 3¾", 5", 6¾"

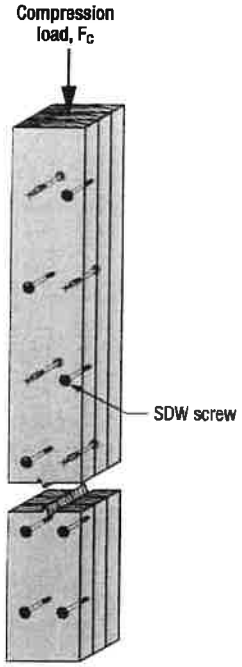
Multi-Ply Beam or Girder



Strong-Drive SDW TRUSS-PLY and EWP-PLY Screws
Size range:
SDW Truss-Ply — 0.220" x 2⁹/₁₆", 3⅛", 4⅛", 5", 6⅜"
SDW EWP-Ply — 0.220" x 3¾", 5", 6¾"

Fastener Application Guide

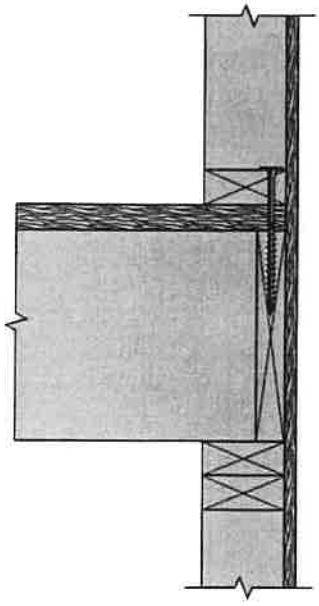
Built-Up Columns



Strong-Drive SDW TRUSS-PLY and EWP-PLY Screws

Size range:
SDW Truss-Ply – 0.220" x 2 15/16", 4 3/8", 4 5/8", 5", 6 3/8"
SDW EWP-Ply – 0.220" x 3 1/8", 5", 6 3/8"

Sole-to-Rim

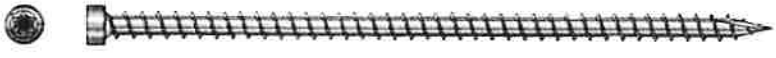


Strong-Drive SDS HEAVY-DUTY CONNECTOR Screw
Size range: Stainless steel – ¼" x 1½" – 3½"
Double barrier – ¼" x 1" – 8"

Strong-Drive SDWS TIMBER Screw (Interior Grade)
Size range: 0.195" x 6", 7½": 0.220 x 4" – 15"

Strong-Drive SDWV SOLE-TO-RIM Screw
Size: #10 x 4"

Strong-Drive SDWC TRUSS Screw (SDWC15450)
Size: 0.152" x 4½"



Strong-Drive SDWC TRUSS Screw (SDWC15600)
Size: 0.152" x 6"

LSC

Adjustable Stringer Connector

The LSC adjustable stair-stringer connector offers a versatile, concealed connection between the stair stringer and the carrying header or rim board while replacing costly framing. Field slopeable to all common stair stringer pitches, the LSC connector is suitable for either solid or notched stringers.

Features:

- Replaces additional framing and toe-nailing.
- May be installed flush with the top of the carrying member (typically suitable for 2x10 or 2x12 header / rim board) or lower on the face (typically suitable for a 2x12 header / rim board).
- Interchangeable for left or right applications.
- LSCZ features a ZMAX® coating for additional corrosion protection. Suitable for interior and some exterior applications. LSCSS is made from stainless steel for higher exposure environment. See **strongtie.com/info** for more information.

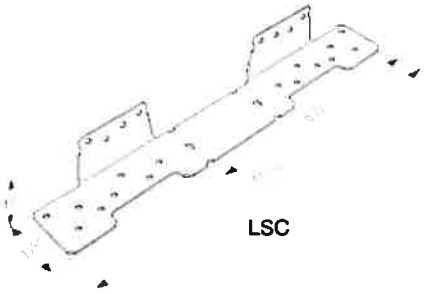
Material: 18 gauge

Finish: LSCZ — ZMAX® coating; LSCSS — stainless steel

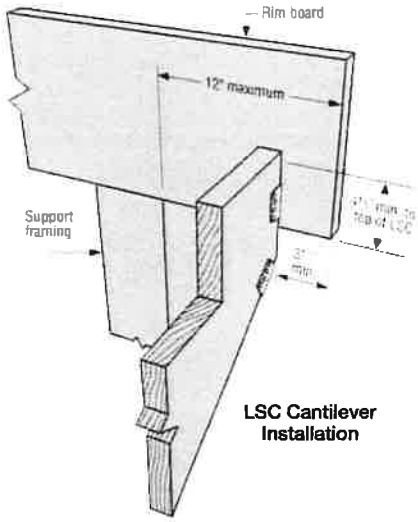
Installation:

- Use all specified fasteners, see table.
- Before fastening, position the stair stringer with the LSC on the carrying member to verify where the bend should be located.
- The fastener that is installed into the bottom edge of the stringer must go into the second-to-last hole.
- When installed on 1 9/16" LVL or a 1 1/4" LSL stringer, additional items that will not affect the structural performance of the LSC, but should be considered, include the following:
  - LSC stringer flange will protrude 1/4" from face of stringer. As such, it is recommended the LSC be installed with the tabs positioned to the outside of the stringer.
  - 1 1/2" fasteners installed into 1 1/4" LSL stringer will protrude from the opposite side.

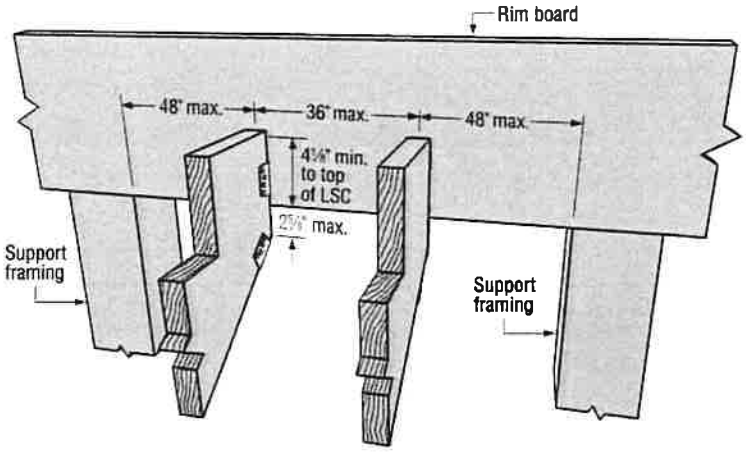
Codes: See p. 11 for Code Reference Key Chart



LSC



LSC Cantilever Installation



Standard LSC Installation

LSC

Adjustable Stringer Connector (cont.)

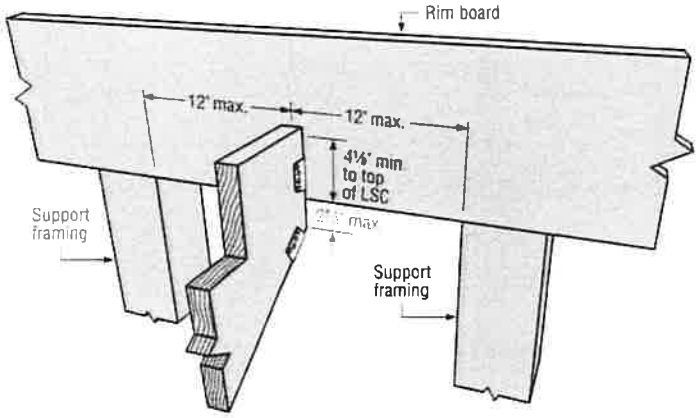
These products are available with additional corrosion protection. For more information, see p. 14.

SS For stainless-steel fasteners, see p. 21.

SD Many of these products are approved for installation with Strong-Drive® SD Connector screws. See pp. 348–352 for more information.

	Model No.	Rim Board Installation	Fastener Schedule			DF/SP Allowable Loads		SPF/HF Allowable Loads		Code Ref.
			Rim Board	Stringer Wide Face	Stringer Narrow Face	Floor (100)	Snow (115)	Floor (100)	Snow (115)	
	LSC2 LSC3	Supported	(8) 0.148 x 1 ½	(8) 0.148 x 1 ½	(1) 0.148 x 1 ½	945	960	815	825	IBC FL, LA
		Supported	(8) #9 x 1 ½" SD	(8) #9 x 1 ½" SD	—	865	865	670	670	
SS		Standard	(8) 0.148 x 1 ½	(8) 0.148 x 1 ½	(1) 0.148 x 1 ½	755	755	650	650	
		Standard	(8) #9 x 1 ½" SD	(8) #9 x 1 ½" SD	(1) #9 x 1 ½" SD	755	755	650	650	
		Cantilever	(8) 0.148 x 1 ½	(8) 0.148 x 1 ½	(1) 0.148 x 1 ½	460	460	395	395	
		Cantilever	(8) #9 x 1 ½" SD	(8) #9 x 1 ½" SD	—	545	545	445	445	

1. When installed on minimum 1 ¾" LVL or minimum 1 ¾" LSL stringers, allowable loads for DF/SP shall apply.
2. When cross-grain bending or cross-grain tension cannot be avoided in the members, mechanical reinforcement to resist such forces shall be considered by the designer.
3. #9 x 1 ½" Strong-Drive® SD Connector screws may be substituted for 0.148" x 1 ½" nails to achieve published nail values if the extra screw is installed in the narrow face of the stringer.
4. **Fasteners:** Nail dimensions are listed diameter by length. SD screws are Simpson Strong-Tie® Strong-Drive SD Connector screws. See pp. 21–22 for fastener information.



Supported LSC Installation

DPTZ

Deck Post Tie

The DPTZ deck post tie products are used to attach 2x4 (DPT5Z) or 4x4 (DPT7Z) vertical posts to the side of stringers, rims or other wood members.

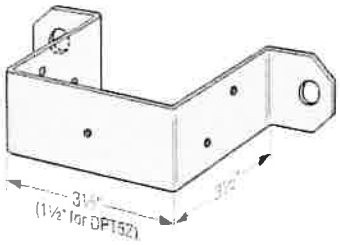
Material: 14 gauge

Finish: ZMAX® coating; see Corrosion Information, pp. 12–15

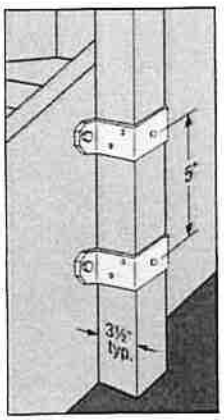
Installation:

- Use specified HDG fasteners; see General Notes
- Typically installed in pairs
- Install with two ⅜" through bolts into side member (lag screws not permitted) and (5) 0.148" x 1½" nails to post for DPT5Z or (5) 0.148" x 3" for DPT7Z

SD Many of these products are approved for installation with Strong-Drive® SD Connector screws. See pp. 348–352 for more information.



DPT7Z
(DPT5Z similar)



Typical DPT7Z Stairway Installation
(DPT5Z similar)