

Residential Deck Application Requirements

Deck permits are required for **all decks** *except those that are detached from a structure AND under 200 square feet AND more than 36" away from a residence or an accessory structure.*

Application for a deck construction permit must include the following. **Use this as a checklist to make sure your application and plans are complete.**

- **Building permit application** completed in full detail.
- **Site plan** showing the location of all existing structures and the location of the proposed deck. This plan must be approved by the Planning/Zoning administrator prior to building department review. (Refer to the City's checklist for residential site plans)
- **Deck framing plan that shows the following (see example plan):**
 - Overall layout showing length and width of the structure. Show the location of the house structure and any doors leading to the deck.
 - Side view of the deck that shows the height of the deck above the finished grade at its highest point. Show also the distance(s) from the bottom of the beam(s) to finished grade.
 - Footing detail. The footing pad ("cookie") shall be a minimum of 12" (w) x 6" (h). The bottom of the footing pad shall be no less than 42" below finished grade.
 - Post size and locations (show distance between middle of posts).
 - Ledger size and attachment to the house, if applicable.
 - Beam size (number and size of members), locations and distance between beams
 - Joist size, spacing and spans between bearing points. Describe how the joists are attached to the beams.
 - Stair locations (if any).
 - Decking materials.

General Code Requirements:

- Deck and stair guards are required if the floor/tread surface is 30" or more above the grade at the grade line extended out 36" from the edge of the deck.
- Stairways shall not be less than 36" in clear width, positively attached to the deck and bear on proper footings at the termination at grade.
 - Maximum riser height is 8.25"
 - Minimum tread depth is 9"
- Handrails are required on all stairways that consist of four or more risers
 - Shall be graspable
 - The ends shall be returned to a wall or post
- Deck beam to post attachment shall be in accordance with R507.7.1. and the ends of each member shall bear directly on 1.5" of wood or metal.
- Deck ledger attachment to the band joist shall be in accordance with section R507.2

A deck construction package is available to assist you. None of the pages may be used as part of your plans. These are to be used merely as a guideline for your plans.

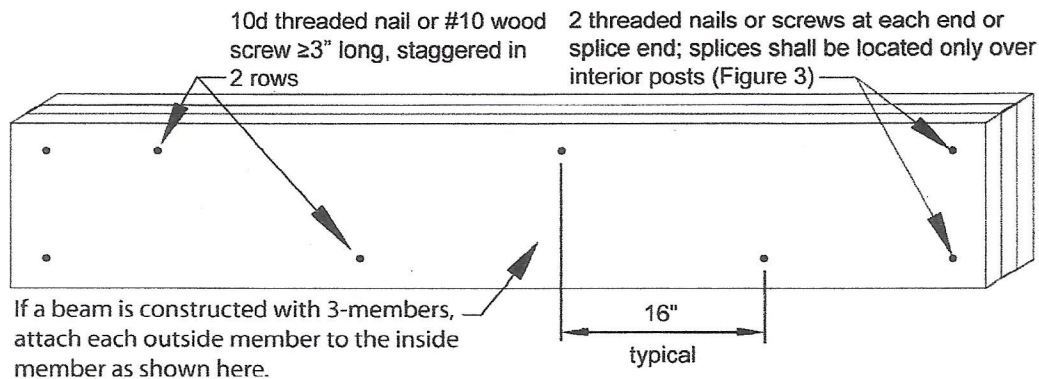
Residential Deck Construction Guide

Deck permits are required for **all decks** *except those that are detached from a structure AND under 200 square feet AND more than 36" away from a residence or an accessory structure.*

The attached pages are meant to assist you in planning your deck. They are to be used as guidelines for both construction drawings and the construction of the deck. Do not use any of these pages in your submittal, as they will be rejected

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- Deck beam to post attachment shall be in accordance with R507.7.1. and the ends of each member shall bear directly on 1.5" of wood or metal. (see enclosed)
- Deck ledger attachment to the band joist shall be in accordance with section R507.2 (see enclosed)

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.

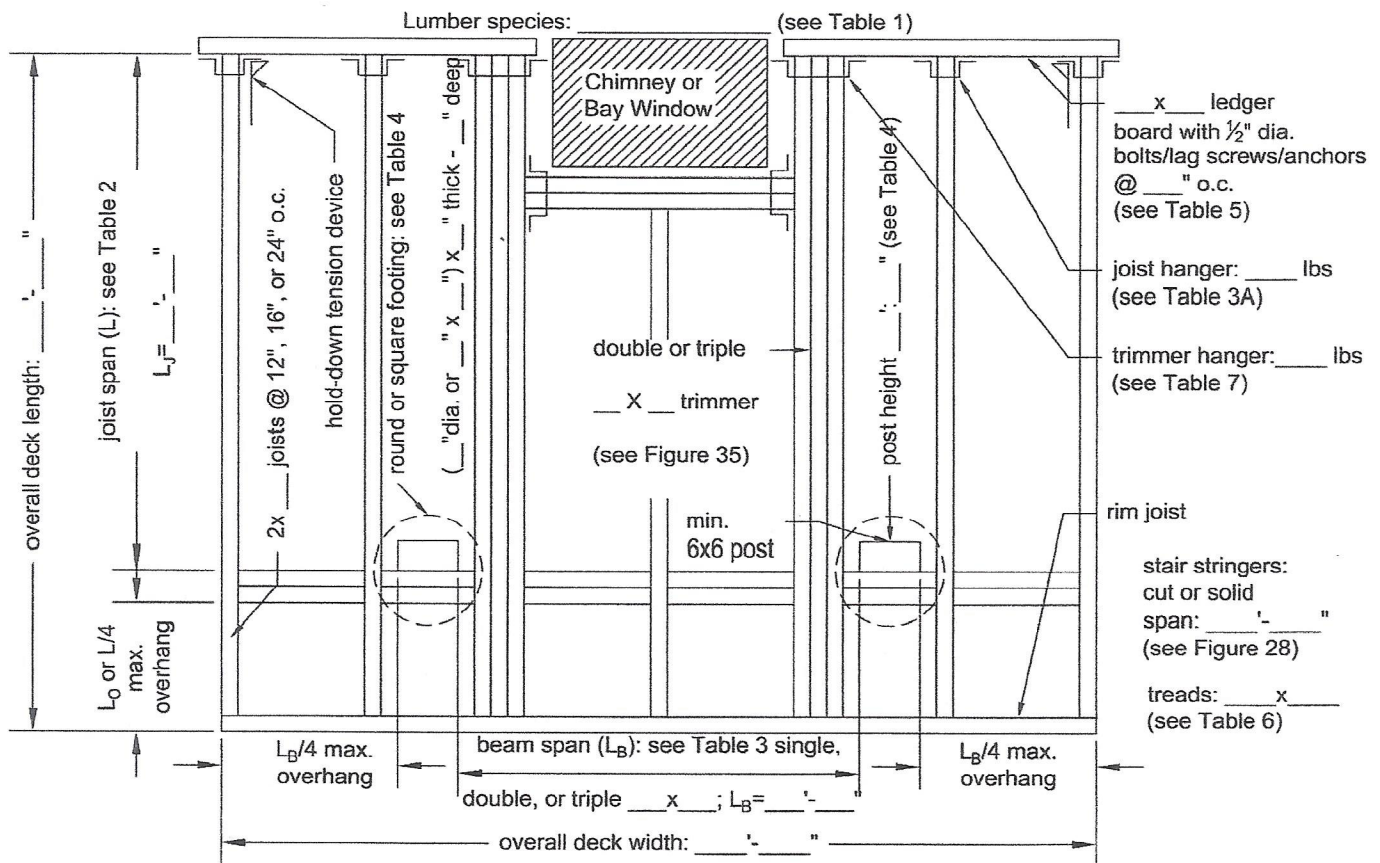
Figure 5. Typical Deck Framing Plan.

TABLE R507.6
DECK BEAM SPAN LENGTHS^{a, b} (ft. - in.)

SIZE ^d	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
	6	8	10	12	14	16	18
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
3 × 6 or 2-2 × 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

^a Joist depth = 24 in. 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

^b 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 at the end.

^c Supporting deck joists from one side only.

^d Allowable service factor.

^e Joist depth shall be greater than or equal to depth of joists with a flush beam condition.

^f Allowable service factor.

^g Incising factor not included.

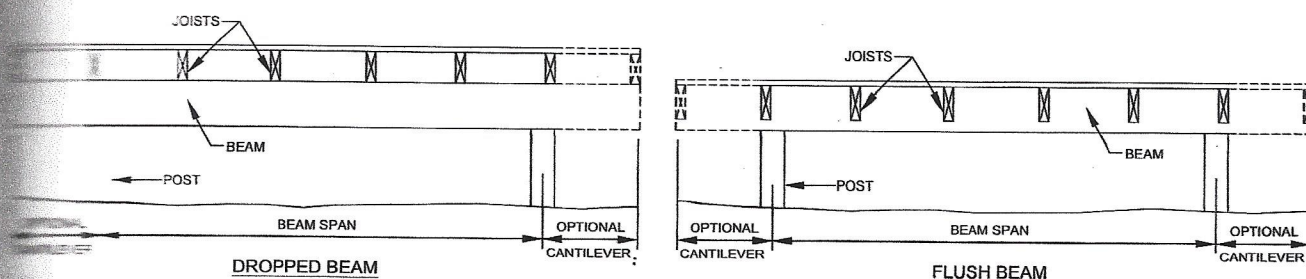
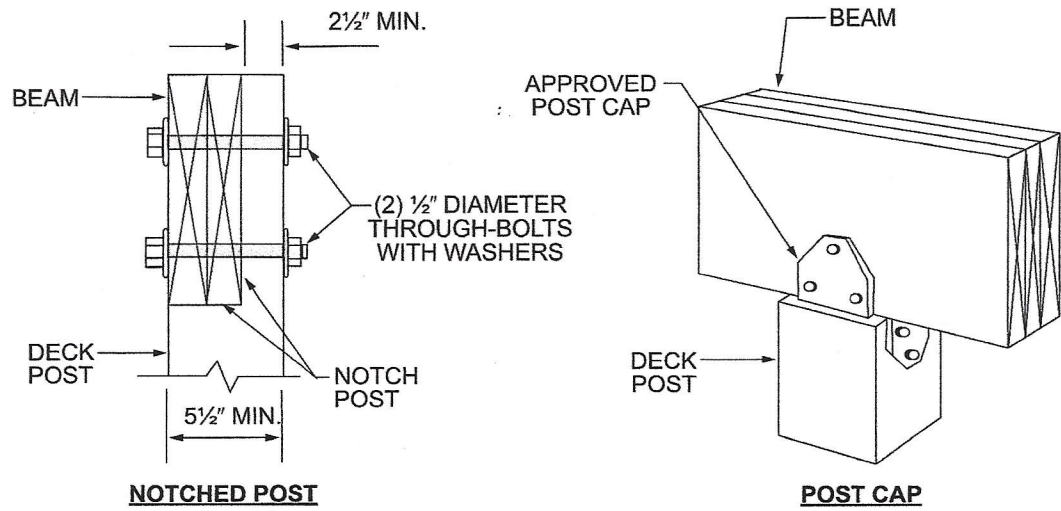


FIGURE R507.6
TYPICAL DECK BEAM SPANS



For SI: 1 inch = 25.4 mm.

FIGURE R507.7.1
DECK BEAM TO DECK POST

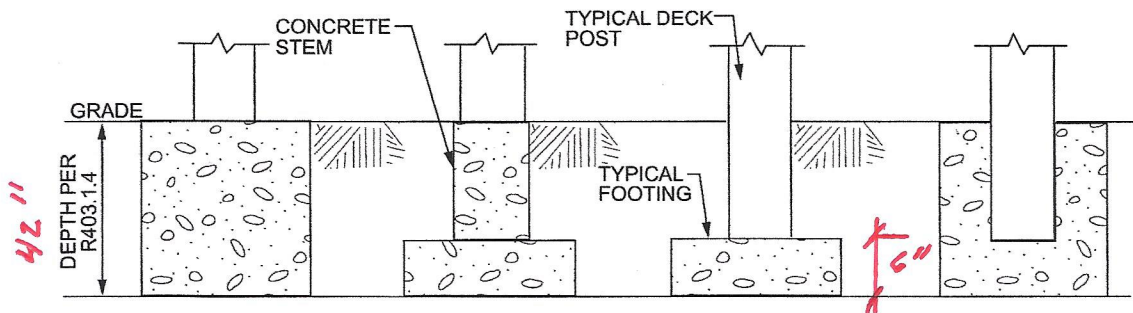


FIGURE R507.8.1
TYPICAL DECK POSTS TO DECK FOOTINGS

12" MIN

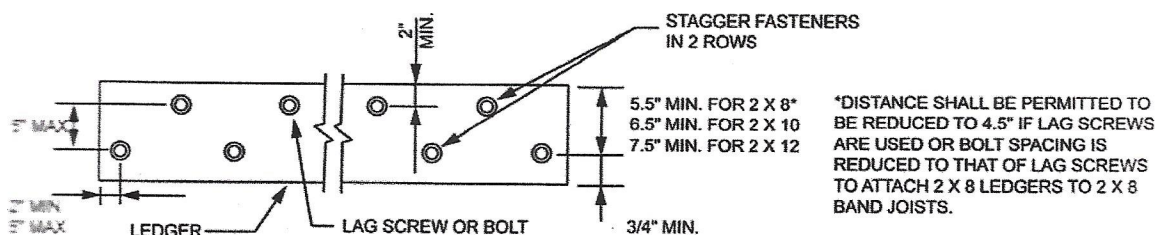


FIGURE R507.2.1(1)
PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS

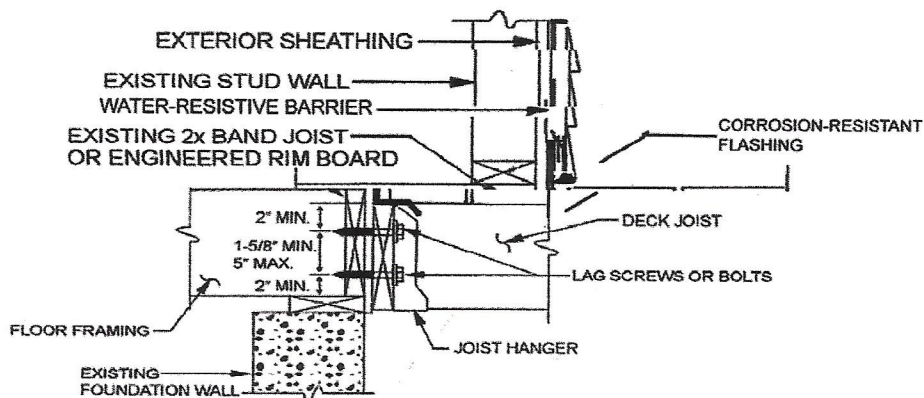


FIGURE R507.2.1(2)
PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOISTS

R507.7 Deck joist and deck beam bearing. The ends of deck joist and beam shall have not less than 1½ inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on concrete or masonry for the entire width of the beam. Joist framing into the side of a ledger board or beam shall be supported by approved joist hangers. Joists bearing on beams shall be connected to the beam to resist lateral displacement.

R507.7.1 Deck post to deck beam. Deck beams shall be attached to deck posts in accordance with Figure R507.7.1 or by other equivalent means capable to resist lateral displacement. Manufactured post-to-beam connectors shall be used for the post and beam sizes. All bolts shall have washers under the head and nut.

Exception: Where deck beams bear directly on footings in accordance with Section R507.8.1.

R507.8 Deck posts. For single-level wood-framed decks with beams sized in accordance with Table R507.6, deck post size shall be in accordance with Table R507.8.

TABLE R507.8
DECK POST HEIGHT^a

DECK POST SIZE	MAXIMUM HEIGHT ^a
4 × 4	8'
4 × 6	8'
6 × 6	14'

For SI: 1 foot = 304.8 mm.

a. Measured to the underside of the beam.

R507.8.1 Deck post to deck footing. Posts shall bear on footings in accordance with Section R403 and Figure R507.8.1. Posts shall be restrained to prevent lateral displacement at the bottom support. Such lateral restraint

dance with ASTM E84 or UL 723 with the test specimen remaining in place during the test.

Exception: Plastic composites determined to be non-combustible.

R507.3.3 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.

R507.3.4 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.

507.3.5 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.

R507.4 Decking. Maximum allowable spacing for joists supporting decking shall be in accordance with Table R507.4. Wood decking shall be attached to each supporting member with not less than (2) 8d threaded nails or (2) No. 8 wood screws.

R507.5 Deck joists. Maximum allowable spans for wood deck joists, as shown in Figure R507.5, shall be in accordance with Table R507.5. Deck joists shall be permitted to cantilever no greater than one-fourth of the actual, adjacent joist span.

R507.5.1 Lateral restraint at supports. Joist ends and bearing locations shall be provided with lateral restraint to prevent rotation. Where lateral restraint is provided by joist hangers or blocking between joists, their depth shall be 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 less than (3) 10d (3-inch × 0.128-inch) nails or (3) No. 10 × 3-inch (76 mm) long wood screws.

R507.6 Deck Beams. Maximum allowable spans for wood deck beams, as shown in Figure R507.6, shall be in accordance with Table R507.6. 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 actual beam span. Splices of multispan beams shall be located at interior post locations.

TABLE R507.2
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 R703.8 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 507.2.1
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 R507.2.1(1).

b. Maximum 5 inches.

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

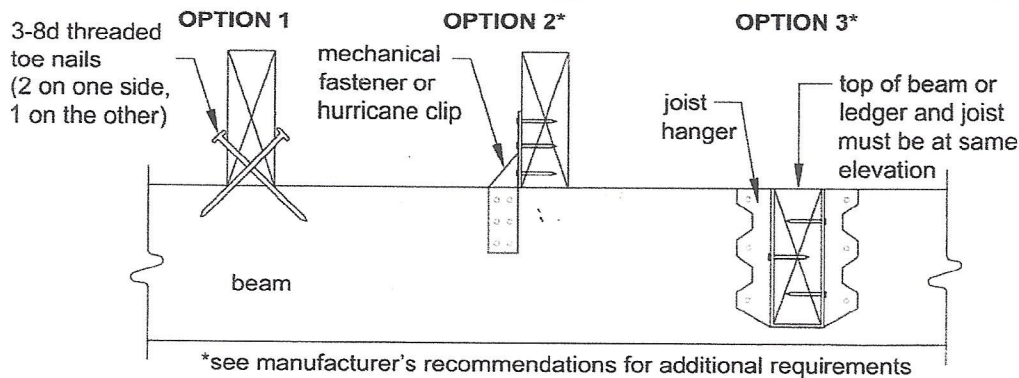
d. The minimum distance from bottom row of lag screws or bolts to the top edge of the ledger shall be in accordance with Figure R507.2.1(1).

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_0 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.**

Figure 7. Typical Joist Hangers.

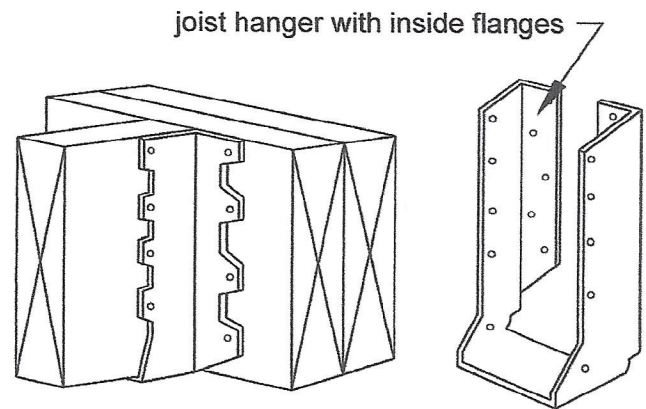


Table 3A. Joist Hanger Vertical Capacity.

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

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.

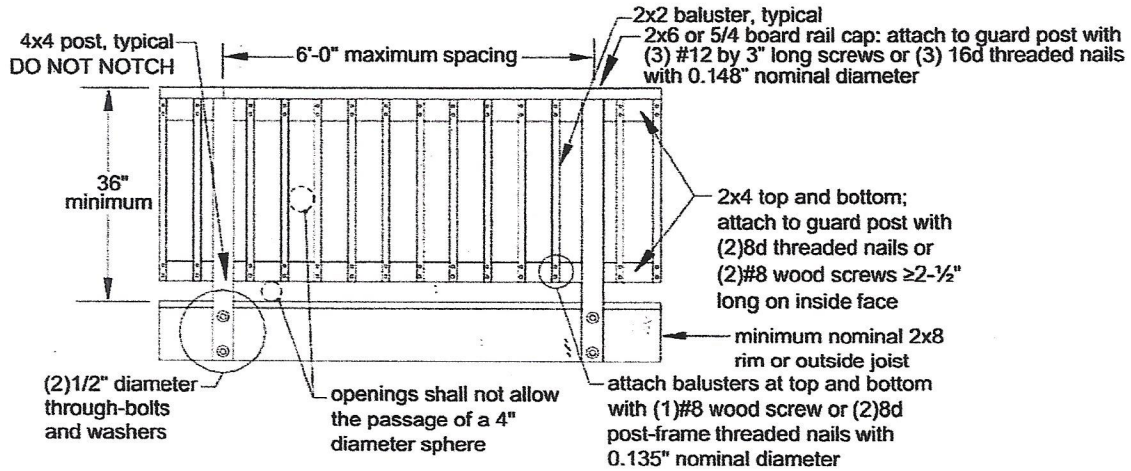


Figure 28. Stair Stringer Requirements.

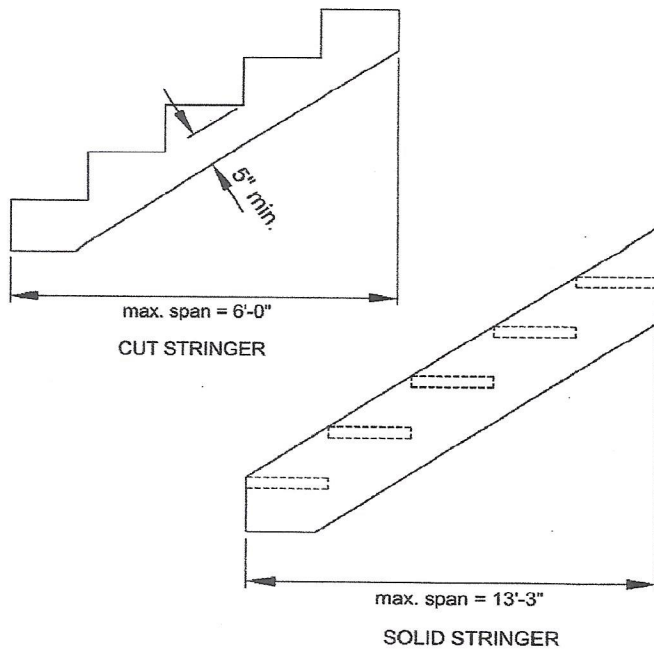


Figure 30. Stair Guard Requirements.

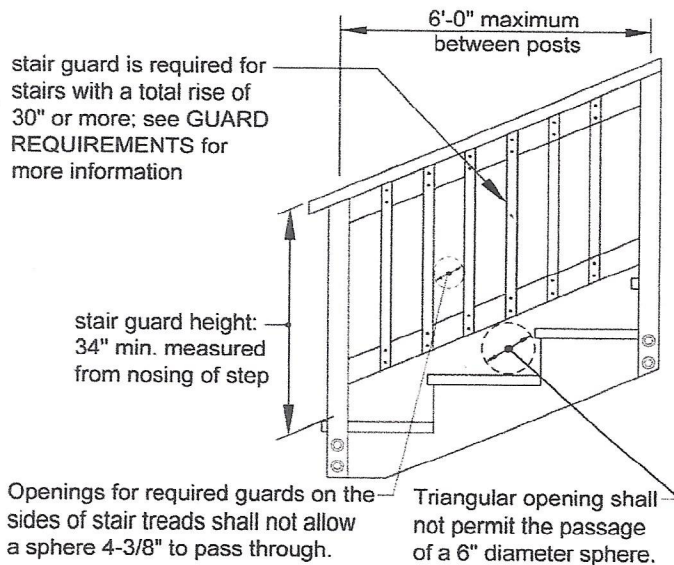


Figure 29. Tread Connection Requirements.

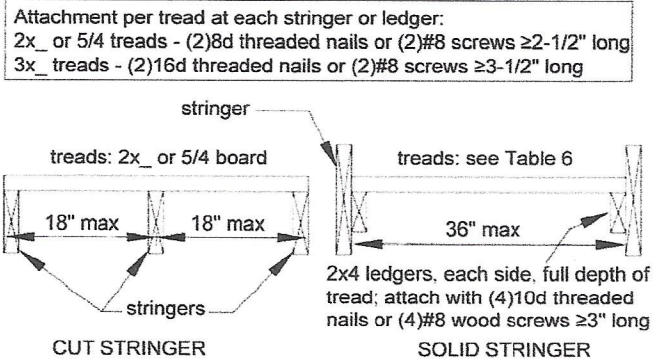


Figure 31. Stair Stringer Attachment Detail.

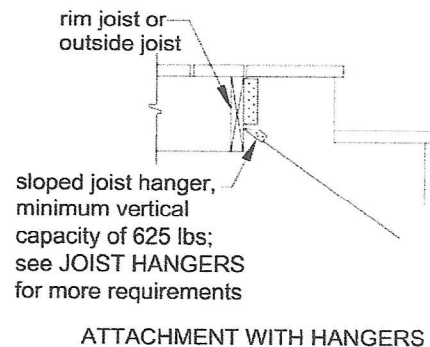


Table 6. Minimum Tread Size for Cut and Solid Stringers.¹

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.