

# Decks

The construction of a deck requires a zoning/building permit prior to starting construction.

**Applications for a Deck Permit must include the following:**

- 1. A completed Zoning/Building Permit application & associated fee**
- 2. Required information for contractor:**
  - a. An affidavit of assurances, pursuant to KRS 198B.060(10)
  - b. Occupational license number for the city/county work is being performed
  - c. Proof of Kentucky Workers Compensation coverage & liability insurance
- 3. Three complete sets of construction drawings including site plans:**

**Construction drawings including:**

- a. Size of deck(s)
- b. Footing information (show size and indicate depth below grade-frost line is 30")
- c. Decking span or joist spacing
- d. Joist span or beam spacing
- e. Beam span or post spacing
- f. Joist, column, beam, and decking size(s)
- g. Spacing, size, and number of anchors for attachment to building
- h. Guardrails required if deck is greater than 30 inches above finished grade at any point-guardrails to be a minimum of 36 inches high
- i. All lumber to be pressure treated
- j. Lumber size, type, and grade

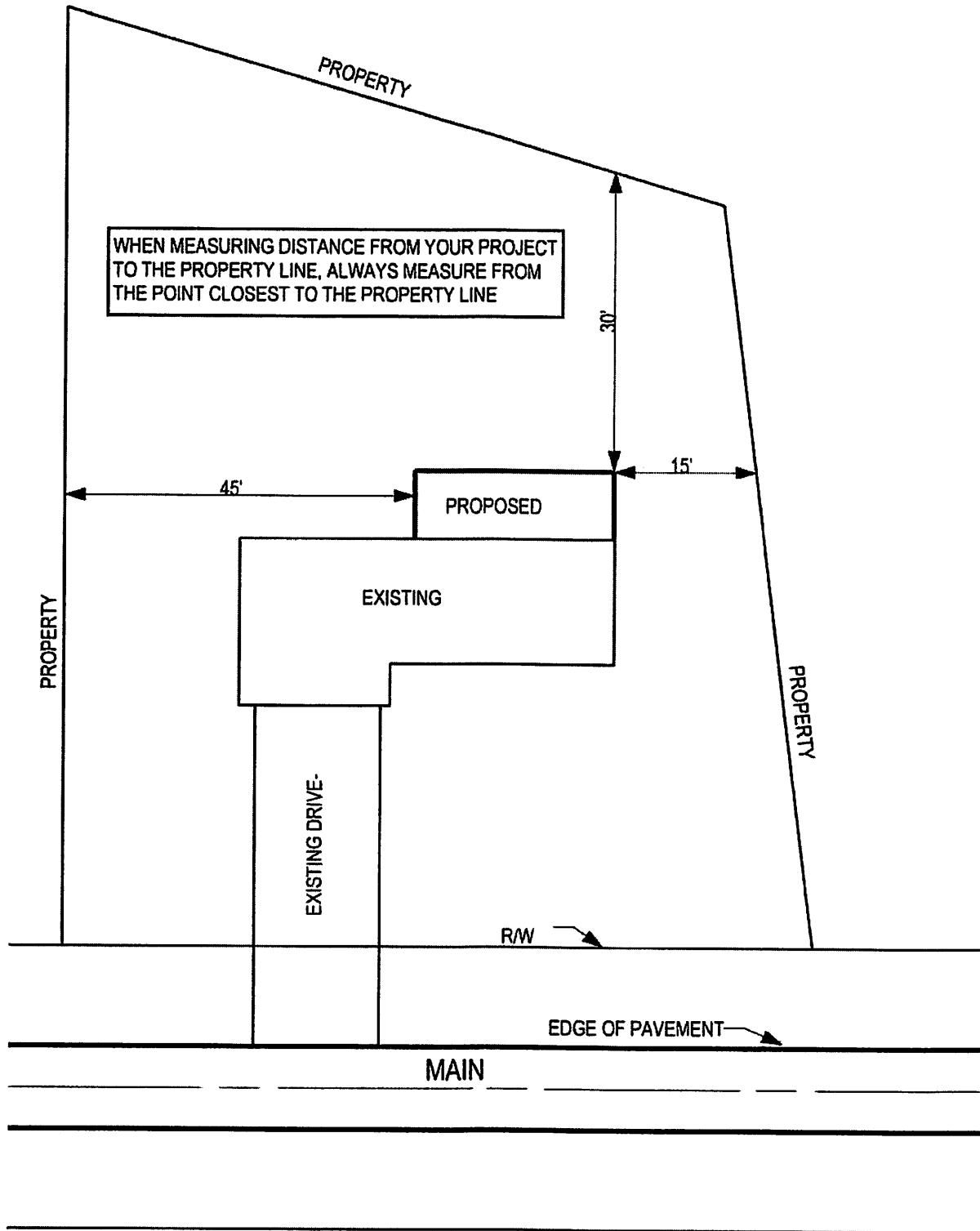
If applicable, the following items must be shown:

- Stair riser height shall be a maximum of 8.25 inches and tread depth shall be a minimum of 9 inches
- The greatest riser height within any flights of steps (stairs) shall not exceed the smallest by more than 3/8 inch
- Handrails shall be a minimum of 34 inches and a maximum of 38 inches
- All handrail grip portions shall not exceed 2'-5/8" in cross sectional dimension
- All handrails shall be continuous without interruption for the entire length of stairways and ends shall be returned to a wall or post
- Intermediate rails of guardrails on any deck, landing, or stair shall be spaced such that a four inch sphere will not pass through.

**Site plan indicating:**

- a. Location of all existing and proposed easements
- b. Identification of any street adjacent to the property
- c. Proposed or existing septic tank, leach field, or other septic system shall be shown to scale
- d. Property lines with bearing and dimensions
- e. Location of existing and proposed building(s) and uses. The distance from the existing and proposed building to the front and/or right of way lines, side and rear lines
- f. Location of driveway, sidewalks, and other off street parking areas as well as type of surfacing used
- g. Provisions for erosion control, hillside slippage, and sedimentation indicating the temporary and permanent control practices and measures which will be implemented during all phases of clearing, grading, and construction
- h. Water drainage and grading lines
- i. The existing and proposed topography, shown by contours with intervals not to exceed five feet.

# SITE PLAN



Draw Floor Joist Layout Here:  
Show joists, beam(s), posts and stairs (if applicable) and show all dimensions

*All lumber exposed to weather must be pressure treated and  
all nails, bolts, screws and joist hangers must be approved for the type of lumber being used.*

Deck Size: \_\_\_\_\_ Floor Joist size(s) \_\_\_\_\_ span(s) \_\_\_\_\_

spacing (inches on center): \_\_\_\_\_ Floor Joist Cantilever (extension past beam): \_\_\_\_\_

Beam Size & No. of members: (example 2-2 x 10) \_\_\_\_\_ Beam Span (distance between posts): \_\_\_\_\_

Post Size \_\_\_\_\_ Post Height \_\_\_\_\_ Footing Size \_\_\_\_\_ Footing Depth \_\_\_\_\_

Band Board size: \_\_\_\_\_ Band Board Bolt size \_\_\_\_\_ Bolt spacing: \_\_\_\_\_

*Band board must be THROUGH bolted to the primary structure! Sleeve type anchors may only be used in concrete walls.*

Will this deck have a hot tub or any other special feature: \_\_\_\_\_

***I have read this document in its entirety and agree to construct this deck according to these specifications***

\_\_\_\_\_  
Title: \_\_\_\_\_

## SECTION R507 EXTERIOR DECKS

**R507.2.2 Alternate deck ledger connections.** Deck ledger connections not conforming to Table R507.2 shall be designed in accordance with accepted engineering practice. Girders supporting deck joists shall not be supported on deck ledgers or band joists. Deck ledgers shall not be supported on stone or masonry veneer unless specifically designed by a design professional, or supported by an approved listed and labeled fastening method.

## SECTION R507 EXTERIOR DECKS

**R507.1 Decks.** Wood-framed decks shall be in accordance with this section or Section R301 for materials and conditions not prescribed herein. 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. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. For decks with cantilevered framing members connections 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.

**R507.2 Deck ledger connection to band joist.** Deck ledger connections to band joists shall be in accordance with this section, Tables R507.2 and R507.2.1, and Figures R507.2.1(1) and R507.2.1(2). For other grades, species, connection details and loading conditions, deck ledger connections shall be designed in accordance with Section R301.

**R507.2.1 Ledger details.** Deck ledgers installed in accordance with Section R507.2 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 installed in accordance with Section R507.2 shall not support concentrated loads from beams or girders. Deck ledgers shall not be supported on stone or masonry veneer.

**R507.2.2 Band joist details.** Band joists attached by a ledger in accordance with Section R507.2 shall be a minimum 2-inch-nominal (51 mm), solid-sawn, spruce-pine-fir lumber or a minimum 1-inch by 9 $\frac{1}{2}$ -inch (25 mm  $\times$  241 mm) dimensional, Douglas fir, laminated veneer lumber. Band joists attached by a ledger in accordance with Section R507.2 shall be fully supported by a wall or sill plate below.

**R507.2.3 Ledger to band joist fastener details.** Fasteners used in deck ledger connections in accordance with Table R507.2 shall be hot-dipped galvanized or stainless steel and shall be installed in accordance with Table R507.2.1 and Figures R507.2.1(1) and R507.2.1(2).

**R507.2.4 Deck lateral load connection.** The lateral load connection required by Section R507.1 shall be permitted to be in accordance with Figure R507.2.3(1) or R507.2.3(2). Where the lateral load connection is provided in accordance with Figure R507.2.3(1), hold-down tension devices shall be installed in not less than two locations per deck, within 24 inches 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 R507.2.3(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).

**R507.3 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 D 7032 and the requirements of Section 507.3.

**R507.3.1 Labeling.** Plastic composite deck boards and stair treads, or their packaging, shall bear a label that indicates compliance to ASTM D 7032 and includes the allowable load and maximum allowable span determined

FLOORS

in accordance with ASTM D 7032. Plastic or composite handrails and guards, or their packaging, shall bear a label that indicates compliance to ASTM D 7032 and includes the maximum allowable span determined in accordance with ASTM D 7032.

**R507.3.2 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 E 84 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 D 7032.

**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 D 7032.

**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.

**TABLE R507.2**  
**DECK LEDGER CONNECTION TO BAND JOIST<sup>a, b</sup>**  
(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 <sup>c, d</sup>	30	23	18	15	13	11	10
1/2-inch diameter bolt with 1/2-inch maximum sheathing <sup>d</sup>	36	36	34	29	24	21	19
1/2-inch diameter bolt with 1-inch maximum sheathing <sup>e</sup>	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.

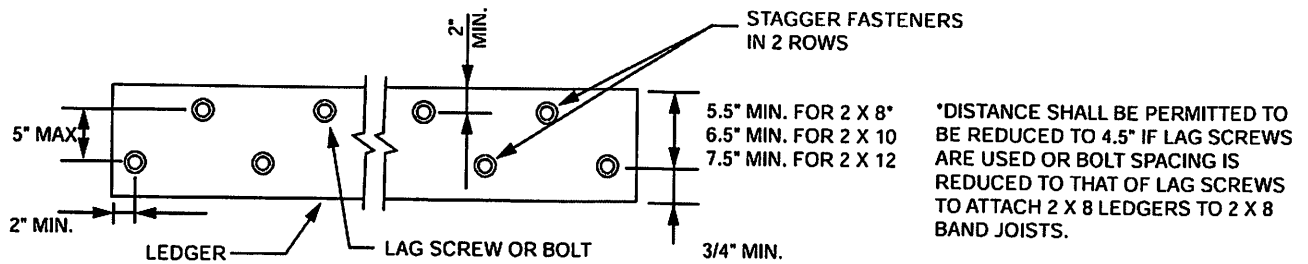
- a. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.
- b. Snow load shall not be assumed to act concurrently with live load.
- c. The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- d. Sheathing shall 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 R507.2.1**  
**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 <sup>a</sup>	2 inches <sup>d</sup>	3/4 inch	2 inches <sup>b</sup>	1 5/8 inches <sup>b</sup>
Band Joist <sup>c</sup>	3/4 inch	2 inches	2 inches <sup>b</sup>	1 5/8 inches <sup>b</sup>

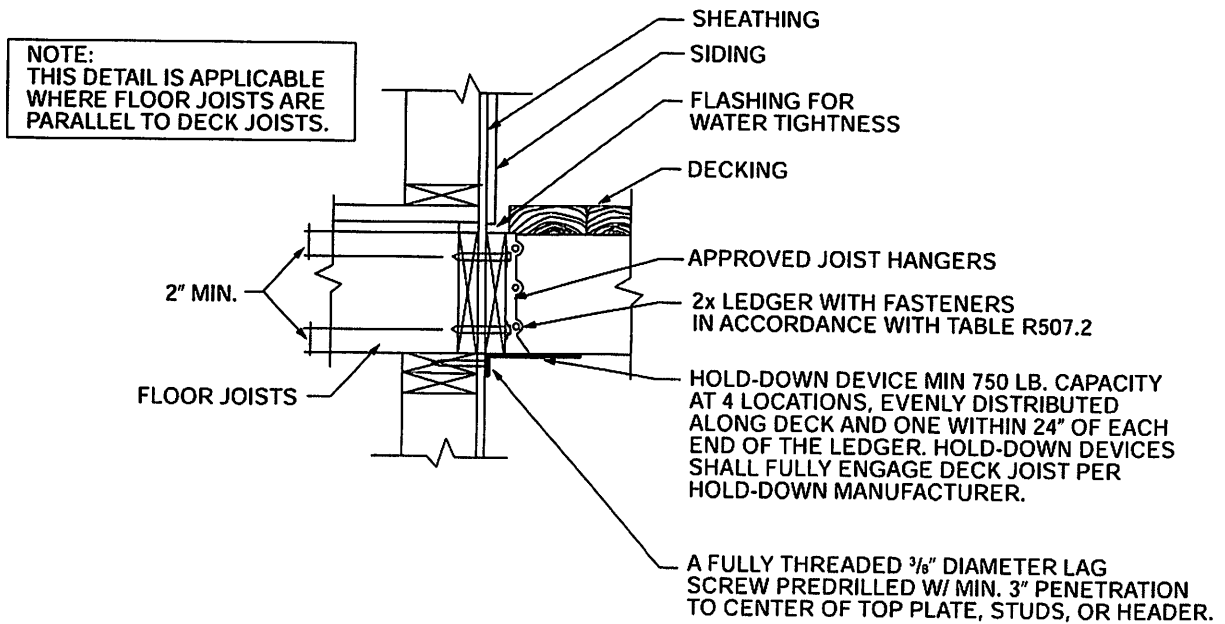
For SI: 1 inch = 25.4 mm.

- 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).



For SI: 1 inch = 25.4 mm.

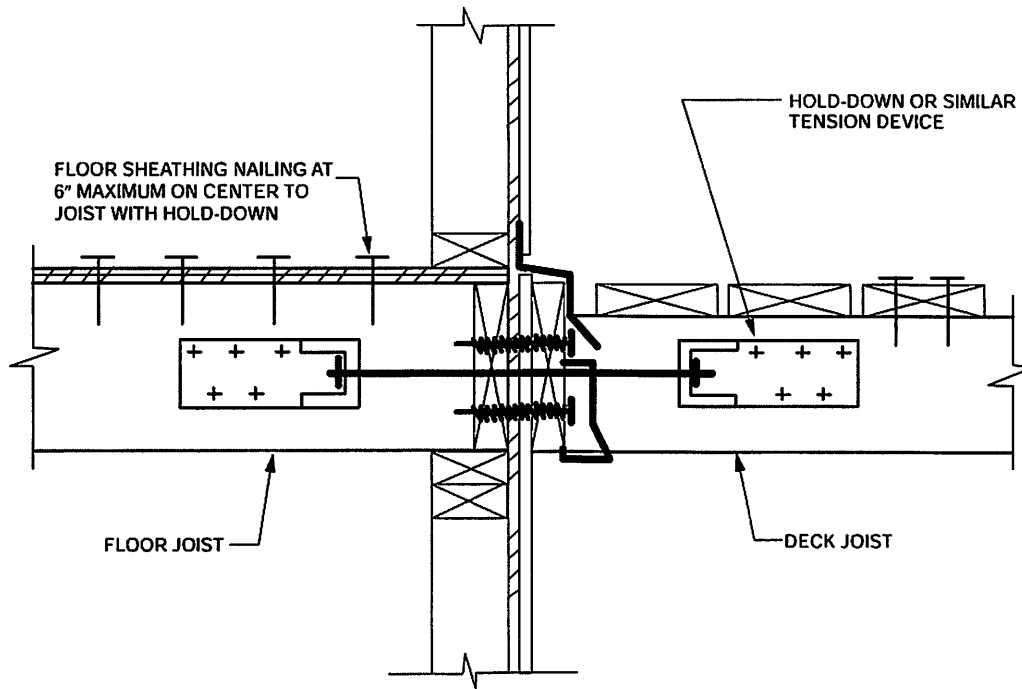
FIGURE R507.2.1(1)  
PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS



For SI: 1 inch = 25.4 mm.

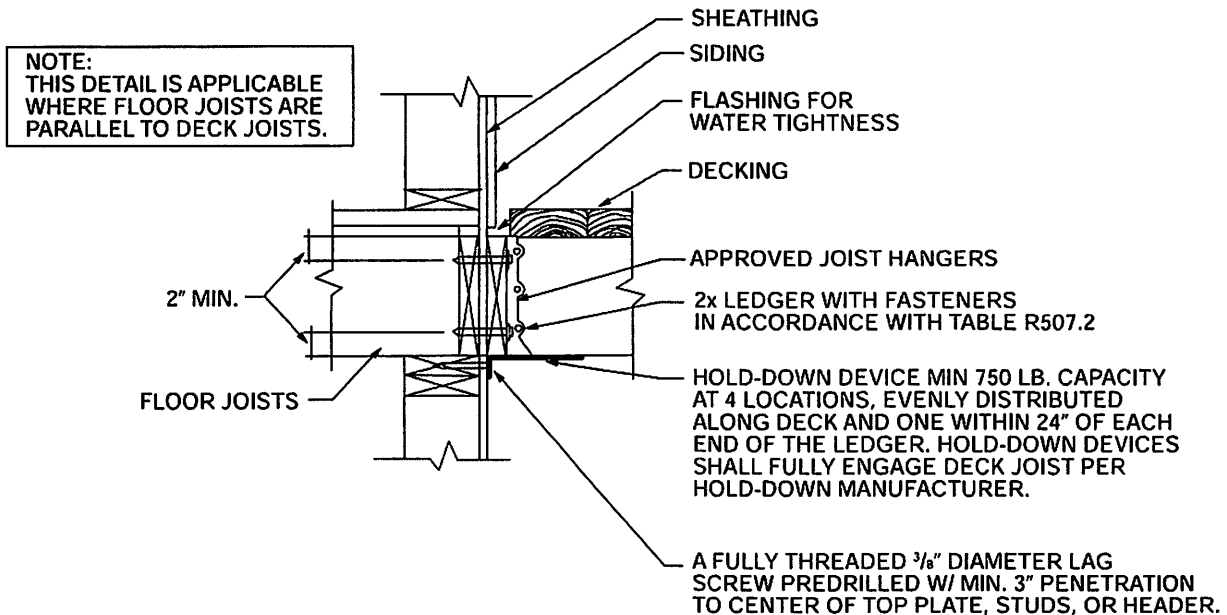
FIGURE R507.2.1(2)  
PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOISTS

FLOORS



For SI: 1 inch = 25.4 mm.

**FIGURE 507.2.3(1)**  
**DECK ATTACHMENT FOR LATERAL LOADS**



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

**FIGURE R507.2.3(2)**  
**DECK ATTACHMENT FOR LATERAL LOADS**

**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 not 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 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.

**TABLE R507.4  
MAXIMUM JOIST SPACING**

MATERIAL TYPE AND NOMINAL SIZE	MAXIMUM ON-CENTER JOIST SPACING	
	Perpendicular to joist	Diagonal to joist <sup>a</sup>
1 1/4-inch-thick wood	16 inches	12 inches
2-inch-thick wood	24 inches	16 inches
Plastic composite	In accordance with Section R507.3	In accordance with Section R507.3

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 R507.5  
DECK JOIST SPANS FOR COMMON LUMBER SPECIES<sup>f</sup> (ft. - in.)**

SPECIES <sup>a</sup>	SIZE	SPACING OF DECK JOISTS WITH NO CANTILEVER <sup>b</sup> (inches)			SPACING OF DECK JOISTS WITH CANTILEVERS <sup>c</sup> (inches)		
		12	16	24	12	16	24
Southern pine	2 × 6	9-11	9-0	7-7	6-8	6-8	6-8
	2 × 8	13-1	11-10	9-8	10-1	10-1	9-8
	2 × 10	16-2	14-0	11-5	14-6	14-0	11-5
	2 × 12	18-0	16-6	13-6	18-0	16-6	13-6
Douglas fir-larch <sup>d</sup> , hem-fir <sup>d</sup> , spruce-pine-fir <sup>d</sup>	2 × 6	9-6	8-8	7-2	6-3	6-3	6-3
	2 × 8	12-6	11-1	9-1	9-5	9-5	9-1
	2 × 10	15-8	13-7	11-1	13-7	13-7	11-1
	2 × 12	18-0	15-9	12-10	18-0	15-9	12-10
Redwood, western cedars, ponderosa pine <sup>e</sup> , red pine <sup>e</sup>	2 × 6	8-10	8-0	7-0	5-7	5-7	5-7
	2 × 8	11-8	10-7	8-8	8-6	8-6	8-6
	2 × 10	14-11	13-0	10-7	12-3	12-3	10-7
	2 × 12	17-5	15-1	12-4	16-5	15-1	12-4

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.

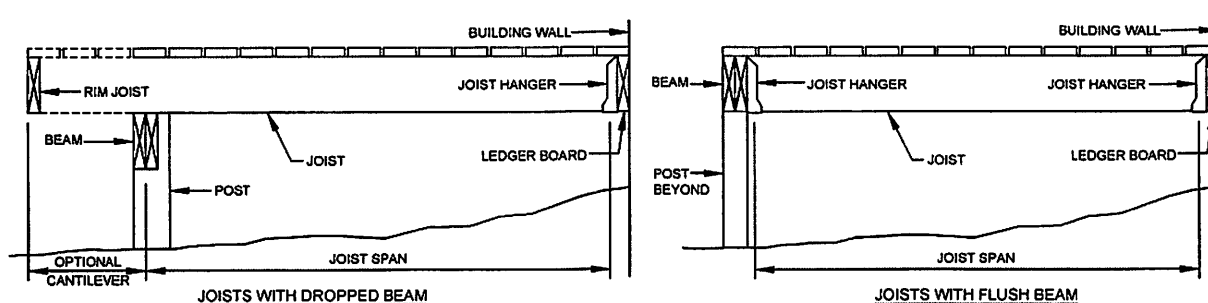
b. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360.

c. 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 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.



**FIGURE R507.5  
TYPICAL DECK JOIST SPANS**



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**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.

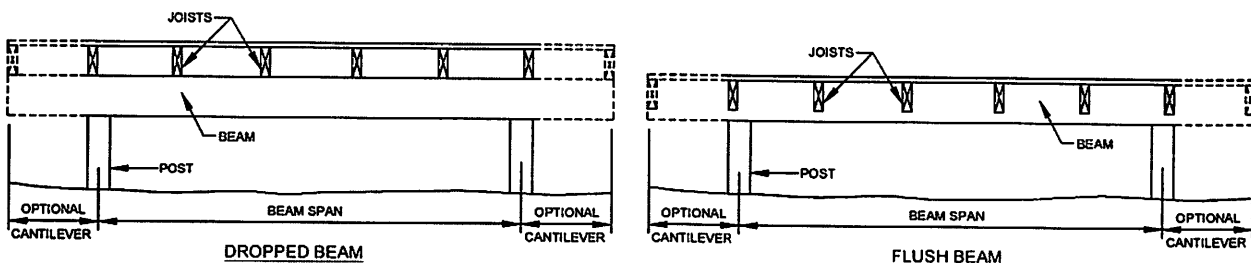
**R507.7 Deck joist and deck beam bearing.** The ends of each joist and beam shall have not less than 1½ inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on concrete or masonry for the entire width of the beam. Joist framing into the side of a ledger board or beam shall be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

**TABLE R507.6**  
**DECK BEAM SPAN LENGTHS<sup>a, b</sup> (ft. - in.)**

SPECIES <sup>c</sup>	SIZE <sup>d</sup>	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
		6	8	10	12	14	16	18
Southern pine	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
Douglas fir-larch <sup>e</sup> , hem-fir <sup>e</sup> , spruce-pine-fir <sup>e</sup> , redwood, western cedars, ponderosa pine <sup>f</sup> , red pine <sup>f</sup>	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

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.



**FIGURE R507.6**  
**TYPICAL DECK BEAM SPANS**

**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 sized 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.

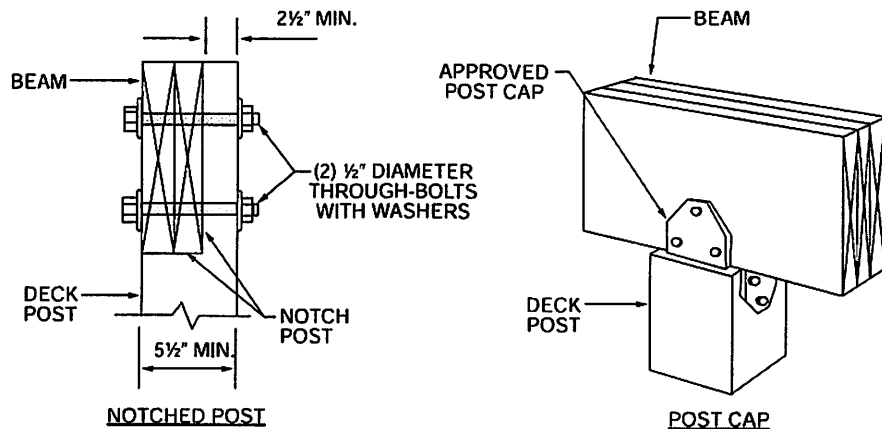
**TABLE R507.8  
DECK POST HEIGHT<sup>a</sup>**

DECK POST SIZE	MAXIMUM HEIGHT <sup>a</sup>
4 × 4	8'
4 × 6	8'
6 × 6	14'

For SI: 1 foot = 304.8 mm.

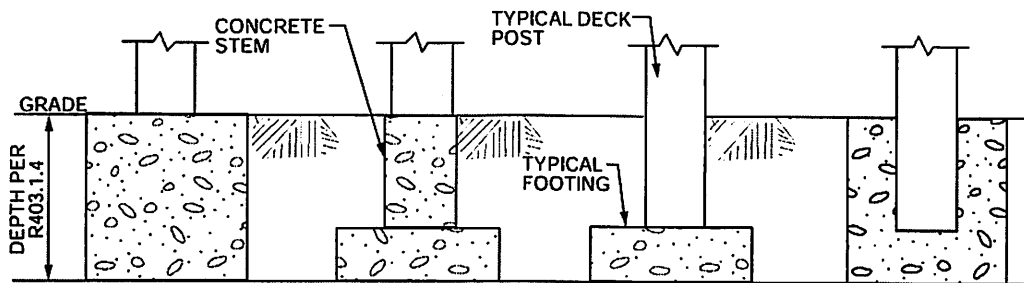
a. Measured to the underside of the beam.

**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 shall be provided by manufactured connectors installed in accordance with Section R507 and the manufacturers' instructions or a minimum post embedment of 12 inches (305 mm) in surrounding soils or concrete piers.



For SI: 1 inch = 25.4 mm.

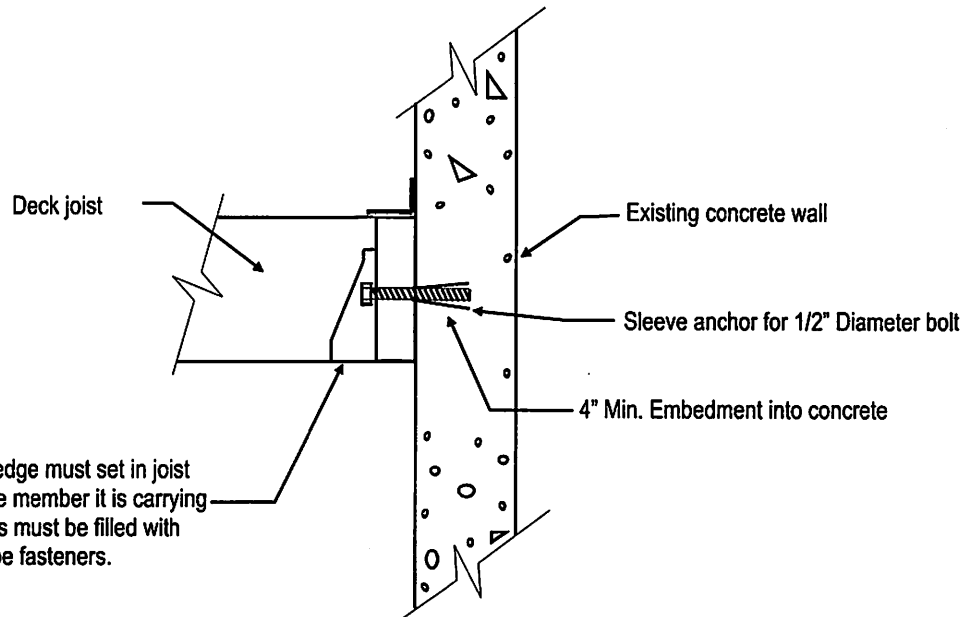
**FIGURE R507.7.1  
DECK BEAM TO DECK POST**



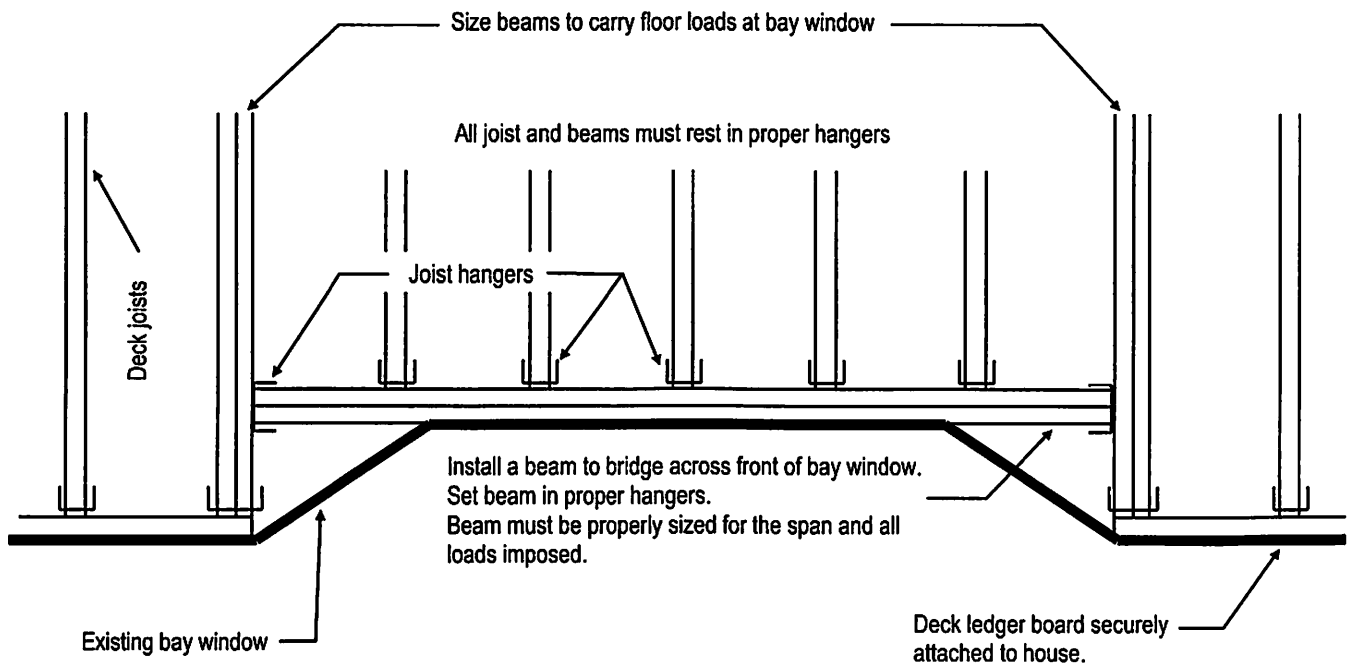
**FIGURE R507.8.1  
TYPICAL DECK POSTS TO DECK FOOTINGS**

## ATTACHING BAND BOARD TO CONCRETE OR SOLID MASONRY WALL

Instead of bolting through concrete walls you may attach deck ledger board by a sleeve anchor made for a 1/2" diameter bolt and set a minimum 4" into the concrete wall.



## ATTACHING DECK TO A BAY WINDOW



## DECK STAIR DETAILS

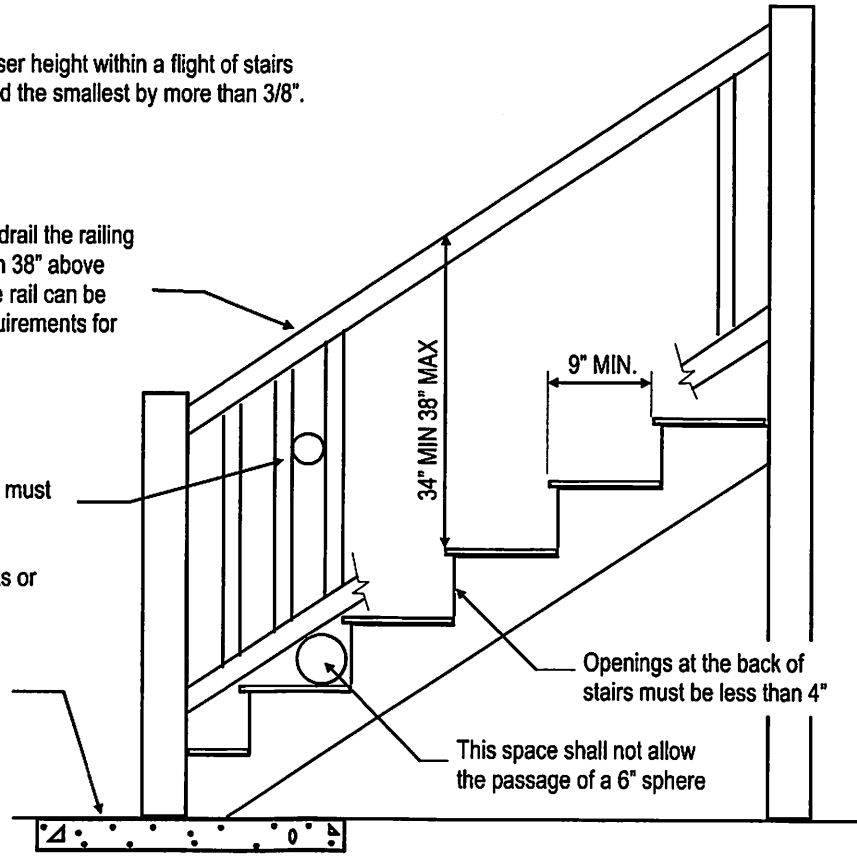
The greatest riser height within a flight of stairs shall not exceed the smallest by more than  $\frac{3}{8}$ ".

If using the top of the guardrail for handrail the railing must be set a min. 34" and a maximum 38" above the leading edge of the stair tread. The rail can be no wider than  $2\frac{5}{8}$ " and meet the requirements for handrails.

All openings on stair guard rail must be less than  $4\frac{3}{8}$ ".

Openings in guard rail on decks or platforms must be less than 4"

Bottom of stair riser must rest on solid material or post in footing



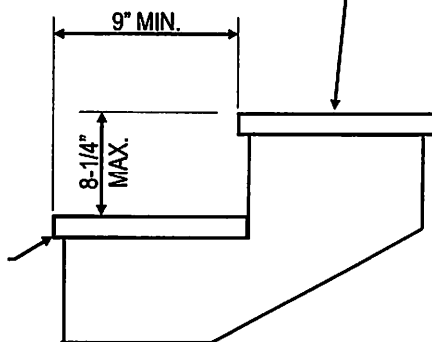
Openings at the back of stairs must be less than 4"

This space shall not allow the passage of a 6" sphere

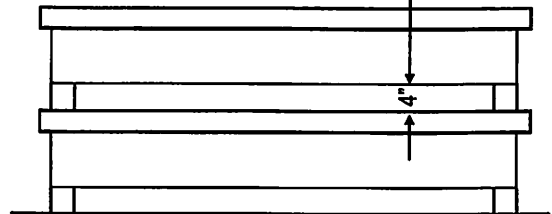
## STAIR TREADS AND RISERS

The greatest tread depth within any flight of stairs shall not exceed the smallest by more than  $\frac{3}{8}$ "

All stairs must overhang a MIN.  $\frac{3}{4}$ " and a MAX.  $1\frac{1}{4}$ "



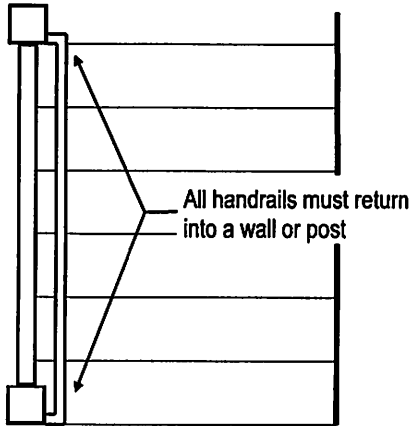
The openings at the back of the stairs must be less than 4"



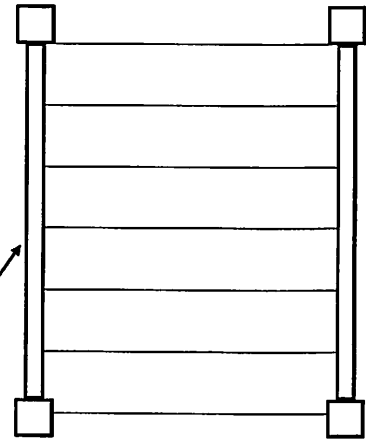
## STAIR AND HANDRAIL DETAILS

Handrails are required on all stairs with 4 or more risers

Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight.



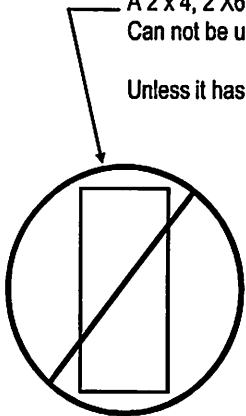
If using the top of the guardrail as the required handrail it must be no wider than 2-5/8" and graspable.



## GRASPABLE HANDRAILS

A 2 x 4, 2 X6 or 2 X 8 stood on edge  
Can not be used as a handrail

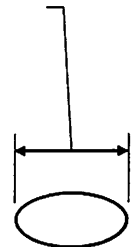
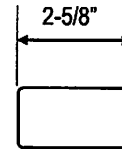
Unless it has been altered to be graspable



Grooves routed into top railing to make graspable



Maximum handrail width for any type handrail is 2-5/8"



Corners of handrails must have a minimum 1/8" radius