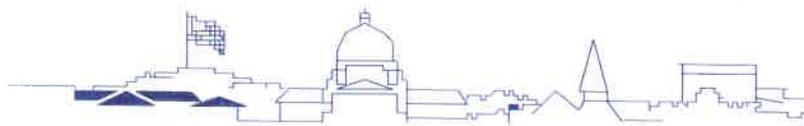
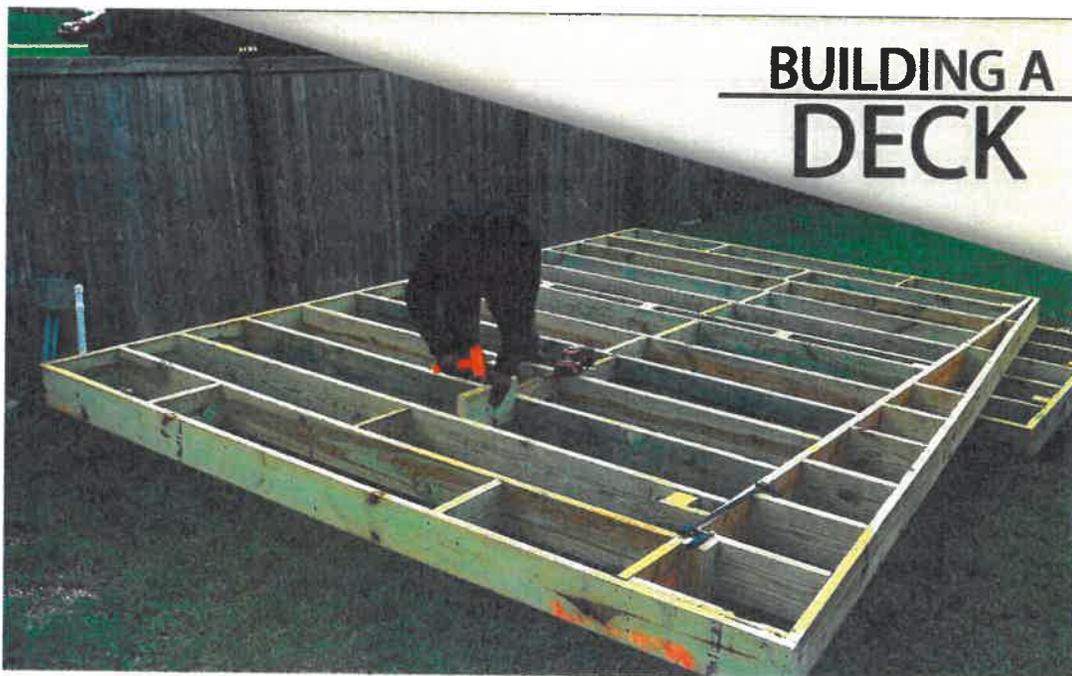


CITY OF ALTOONA



DEPARTMENT OF CODES AND INSPECTIONS



DECK SPECIFICATIONS

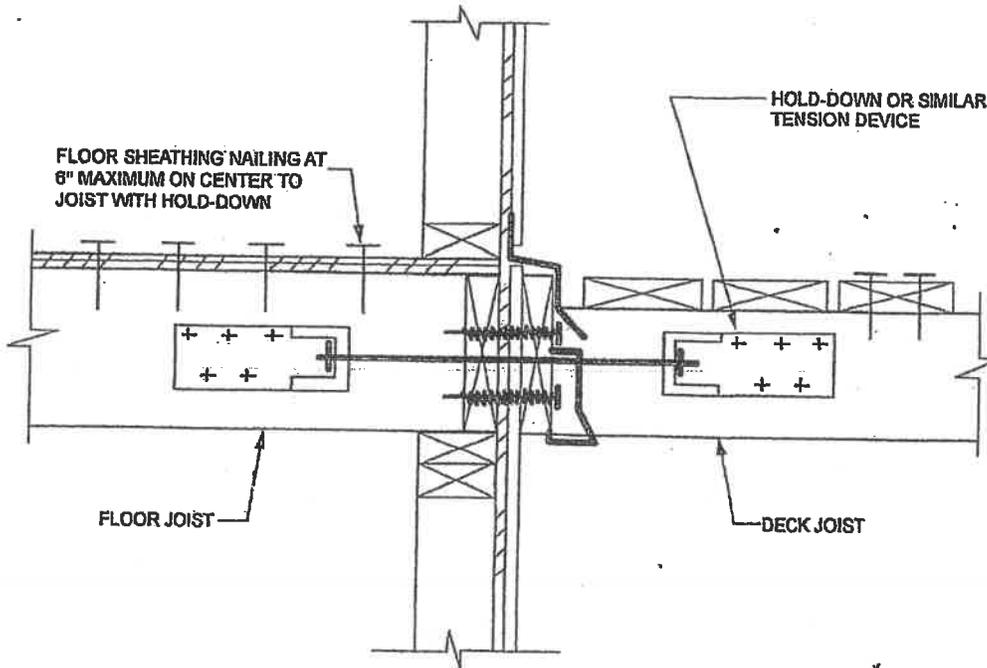
Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. For decks with cantilevered framing members connections to exterior walls 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.

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.

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).

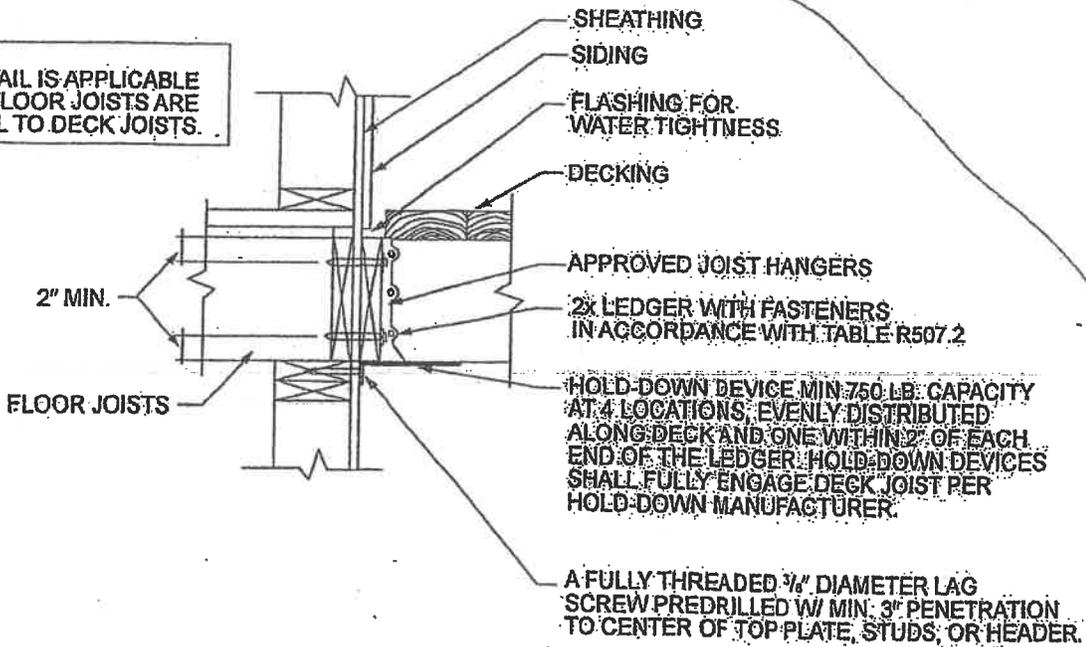
FLOORS



For SI: 1 inch = 25.4 mm.

FIGURE 507.2.3(1)
DECK ATTACHMENT FOR LATERAL LOADS

NOTE:
THIS DETAIL IS APPLICABLE
WHERE FLOOR JOISTS ARE
PARALLEL TO DECK JOISTS.



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 x 0.128-inch) nails or (3) No. 10 x 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 ^a
1 1/2-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^a (ft. - in.)**

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

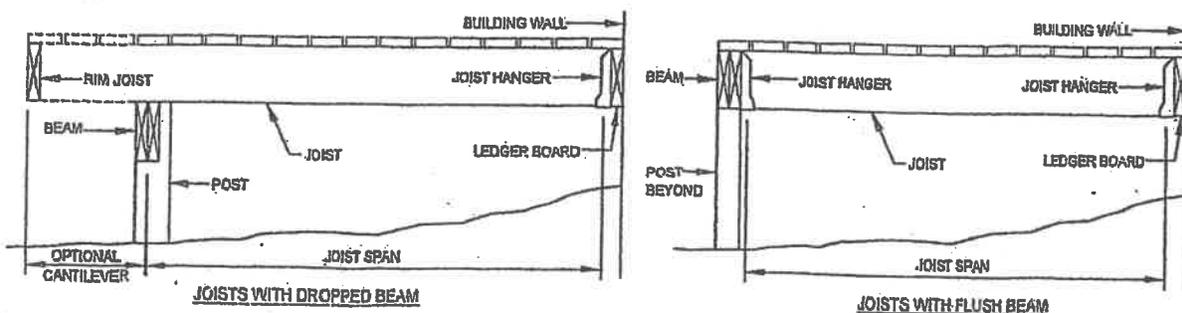
b. Ground snow load, live load = 40 psf, dead load = 10 psf, L/A = 360

c. Ground snow load, live load = 40 psf, dead load = 10 psf, L/A = 360 at main span, L/A = 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 normal depth of the joist are permitted.



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

FLOORS

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 multispans 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^{a,b} (ft., -in.)

SPECIES ^c	SIZE ^d	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
	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 × 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.

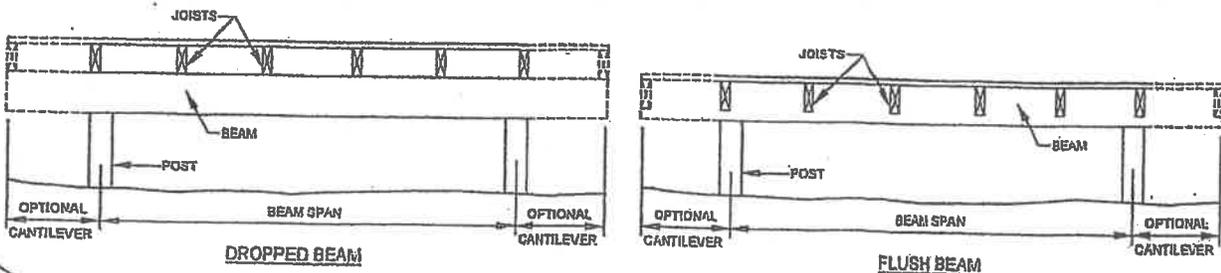


FIGURE R507.6
TYPICAL DECK BEAM SPANS

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.

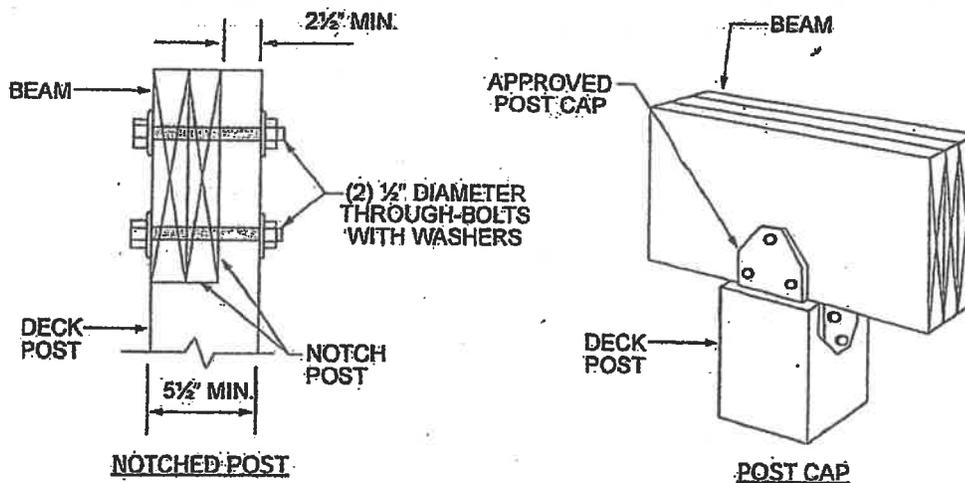
**TABLE R507.8
DECK POST HEIGHT***

DECK POST SIZE	MAXIMUM HEIGHT*
4 x 4	8'
4 x 6	8'
6 x 6	14'

For SI 1 foot = 304.8 mm.

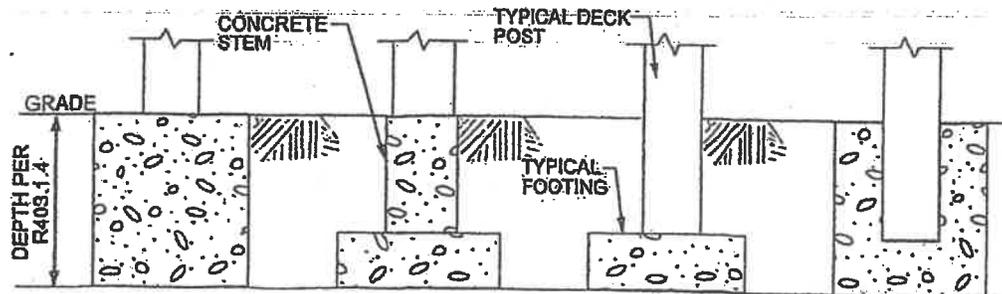
a. Measured to the underside of the beam

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.



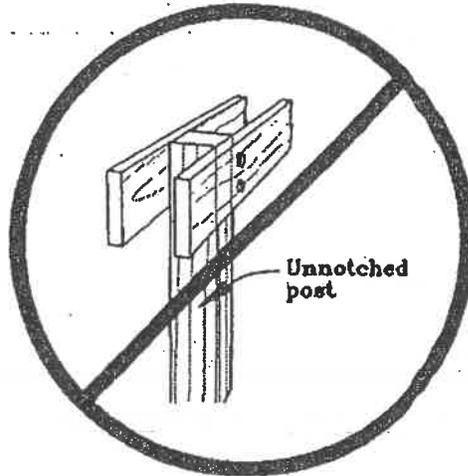
For SI 1 inch = 25.4 mm

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

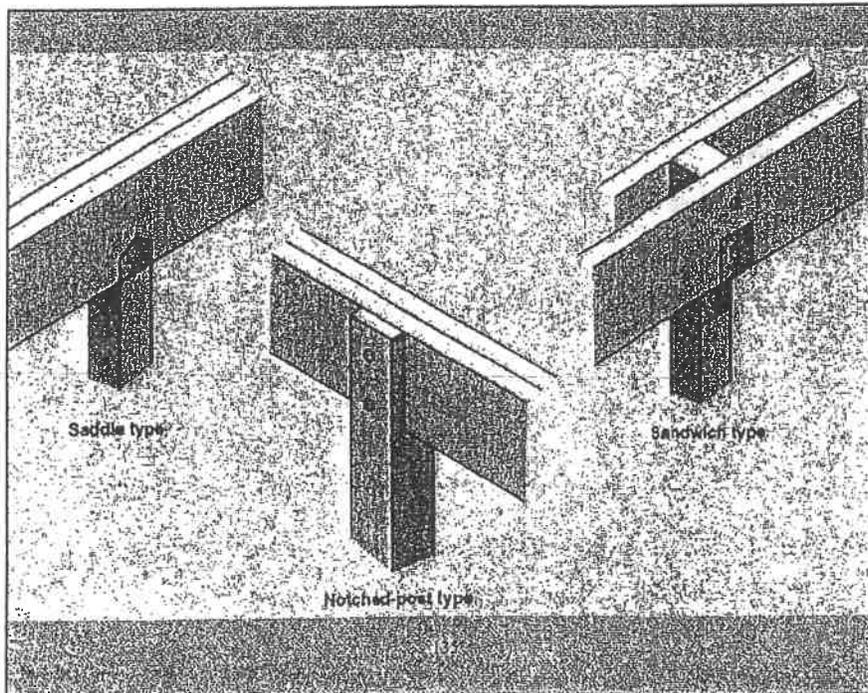


**FIGURE R507.8.1
TYPICAL DECK POSTS TO DECK FOOTINGS**

Bolt connection has limited capacity and does not meet bearing requirement of the IRC

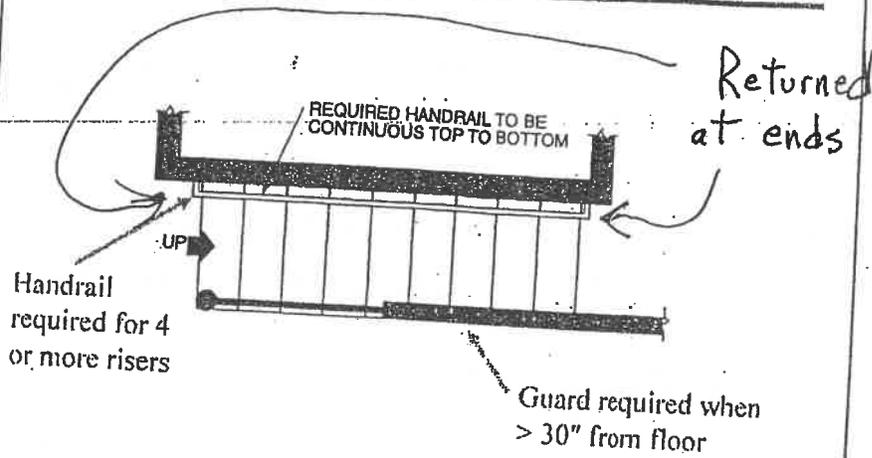


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Handrails and guards

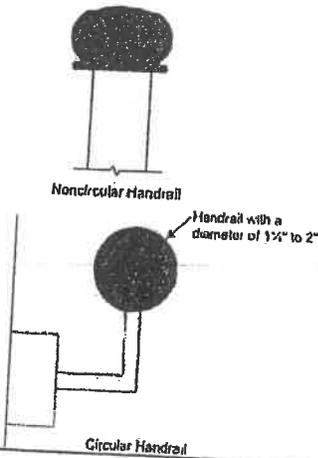
IRC: R311.7.7.2



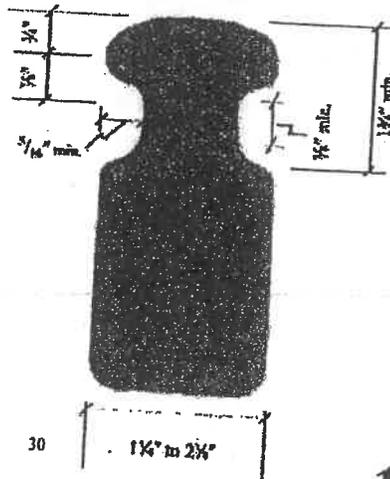
Handrails and guards

IRC: R311.5.6.3

Type 1
 Non-circular handrail shall have a perimeter dimension 4" to 6 1/4" and a maximum cross-sectional dimension of 2 1/4".

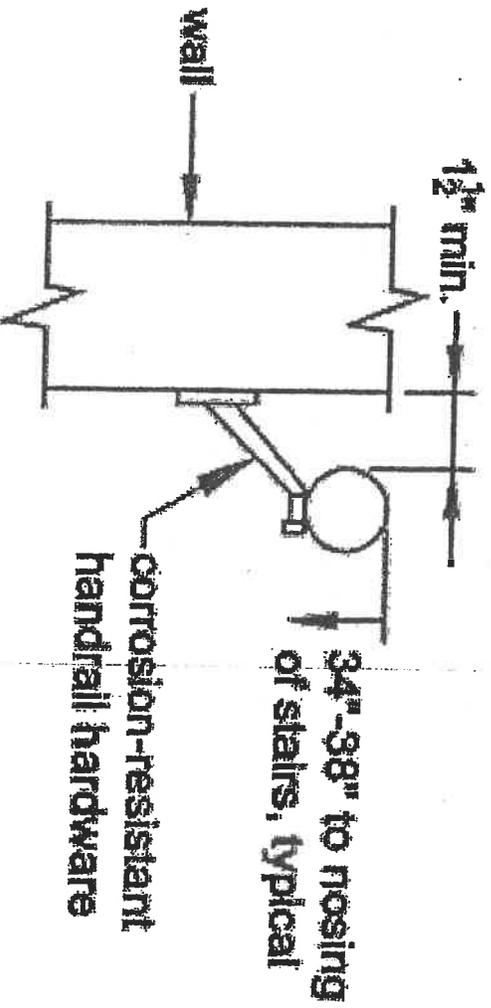
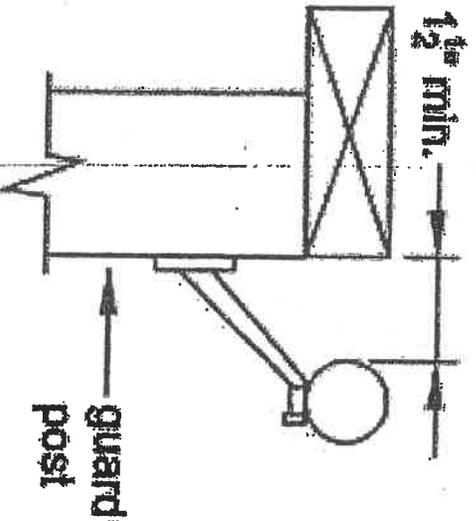
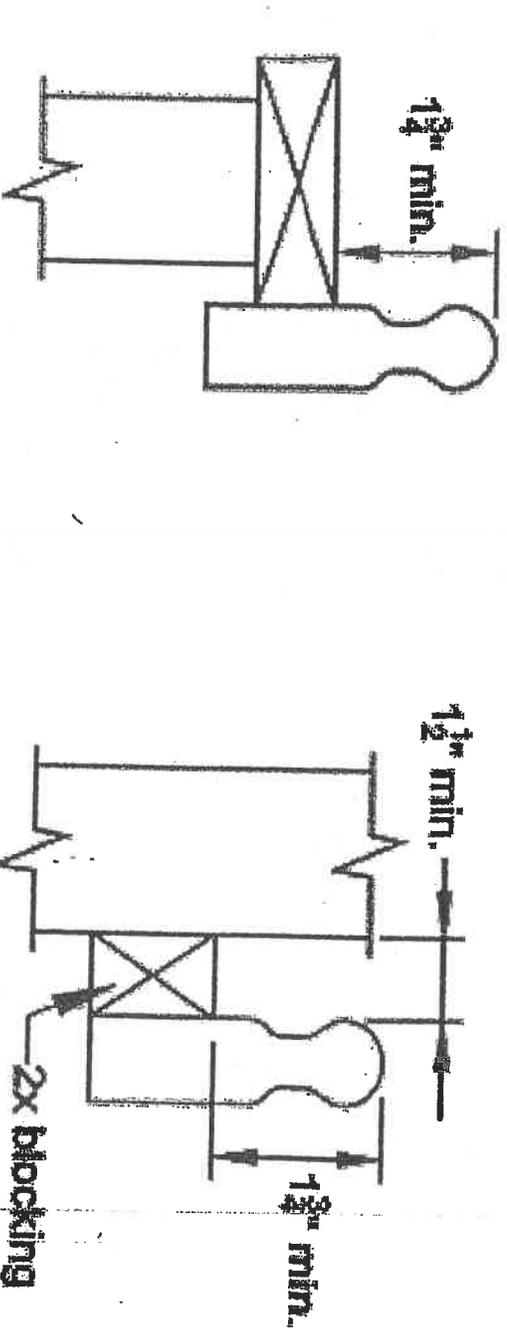


Type 2
 For handrails with a perimeter > 6 1/4"



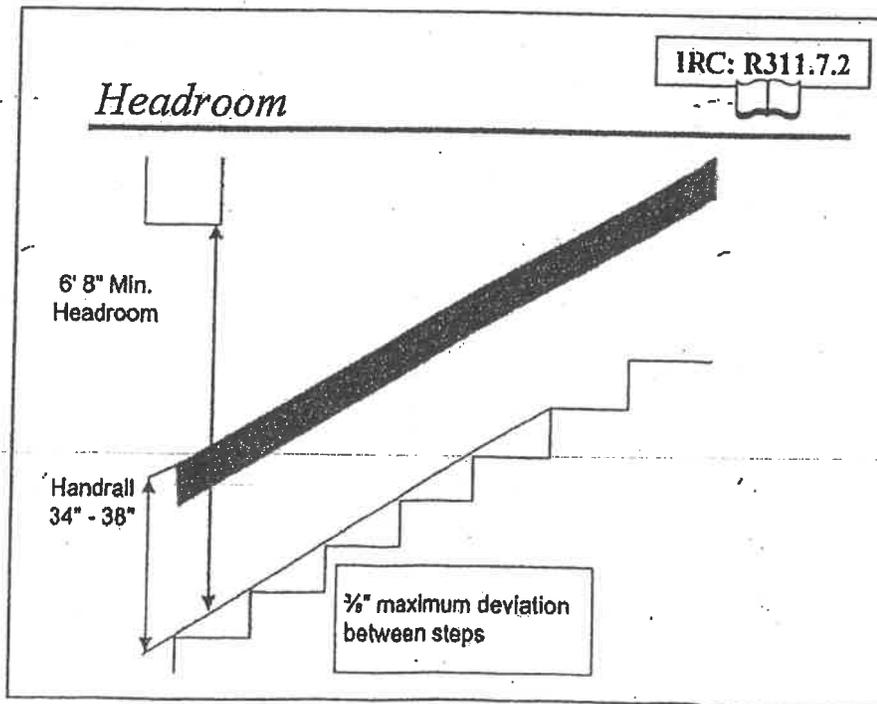
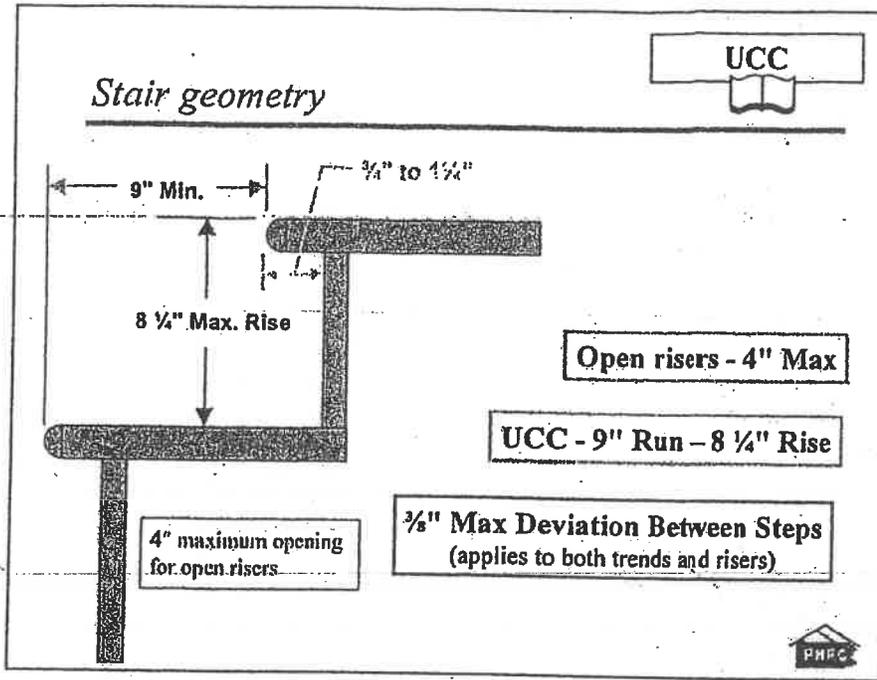
Handrail Mounting Examples

Fasten handrails per manufacturer recommendations



MOUNTED TO GUARD

MOUNTED TO WALL



Guardrail detail

Handrail - Required on one side of stairs with 4 or more treads $3\frac{1}{2}$ " - 38" above stair nosing

4 3/8"

Cannot pass 4" sphere between balusters or the bottom rail and nosing

Guardrail - Min. 42" height where deck floor exceeds 4' above grade

Concrete landing

Cannot pass 6" sphere through triangle formed by nosing, tread and bottom rail

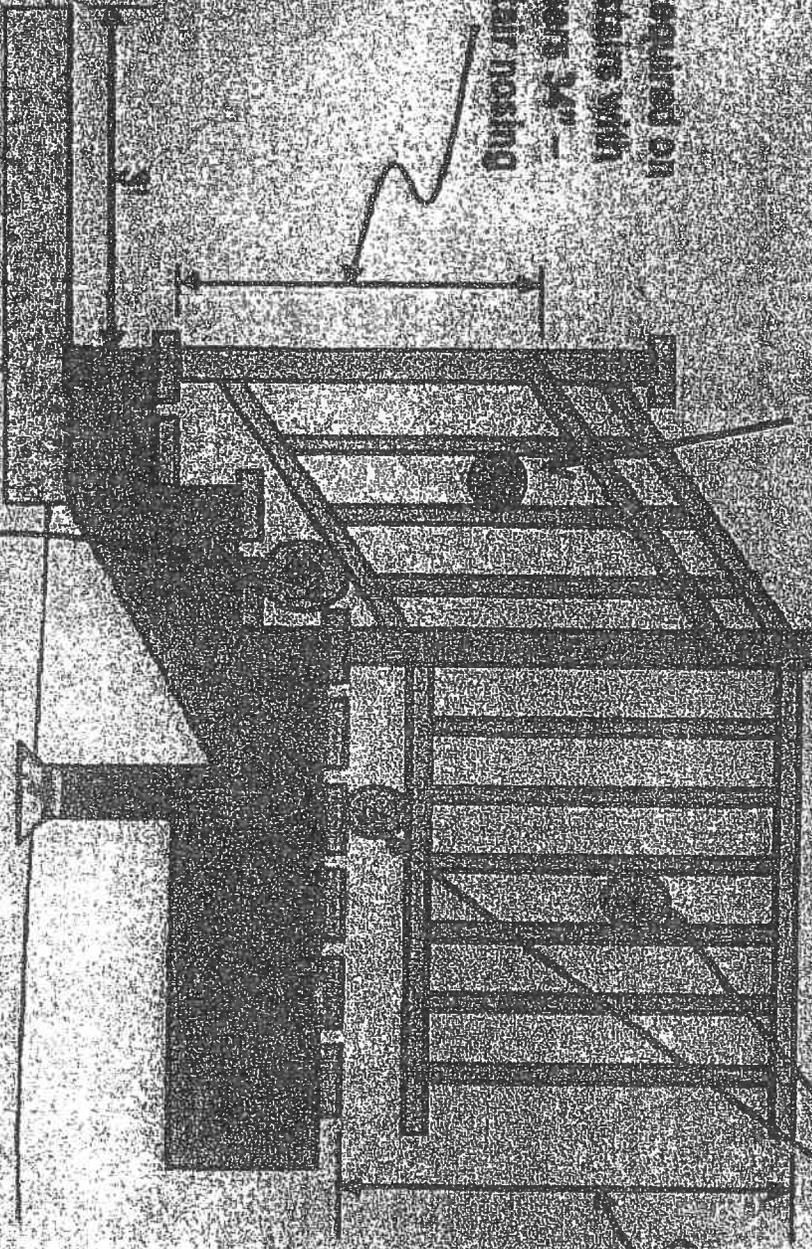
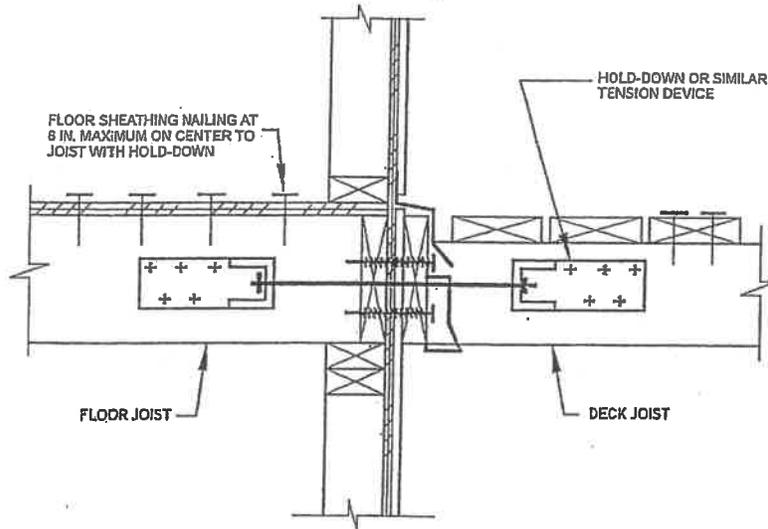


TABLE R502.2.2.1
FASTENER SPACING FOR A SOUTHERN PINE OR HEM-FIR DECK LEDGER
AND A 2-INCH NOMINAL SOLID-SAWN SPRUCE-PINE-FIR BAND JOIST^{1,2}
 (Deck live load = 40 psf, deck dead load = 10 psf)

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'
Connection details	On-center spacing of fasteners ^{d, e}						
1/2 inch diameter lag screw with 15/32 inch maximum sheathing ^a	30	23	18	15	13	11	10
1/2 inch diameter bolt with 15/32 inch maximum sheathing	36	36	34	29	24	21	19
1/2 inch diameter bolt with 15/32 inch maximum sheathing and 1/2 inch stacked washers ^{b, h}	36	36	29	24	21	18	16

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

- The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- The maximum gap between the face of the ledger board and face of the wall sheathing shall be 1/2".
- Ledgers shall be flashed to prevent water from contacting the house band joist.
- Lag screws and bolts shall be staggered in accordance with Section R502.2.2.1.1.
- Deck ledger shall be minimum 2x8 pressure-preservative-treated No. 2 grade lumber, or other approved materials as established by standard engineering practice.
- When solid-sawn pressure-preservative-treated deck ledgers are attached to a minimum 1 inch thick engineered wood product (structural composite lumber, laminated veneer lumber or wood structural panel band joist), the ledger attachment shall be designed in accordance with accepted engineering practice.
- A minimum 1 x 9/2 Douglas Fir laminated veneer lumber rimboard shall be permitted in lieu of the 2-inch nominal band joist.
- Wood structural panel sheathing, gypsum board sheathing or foam sheathing not exceeding 1 inch in thickness shall be permitted. The maximum distance between the face of the ledger board and the face of the band joist shall be 1 inch.



For SI: 1 inch = 25.4 mm.

FIGURE 502.2.2.3
DECK ATTACHMENT FOR LATERAL LOADS

