

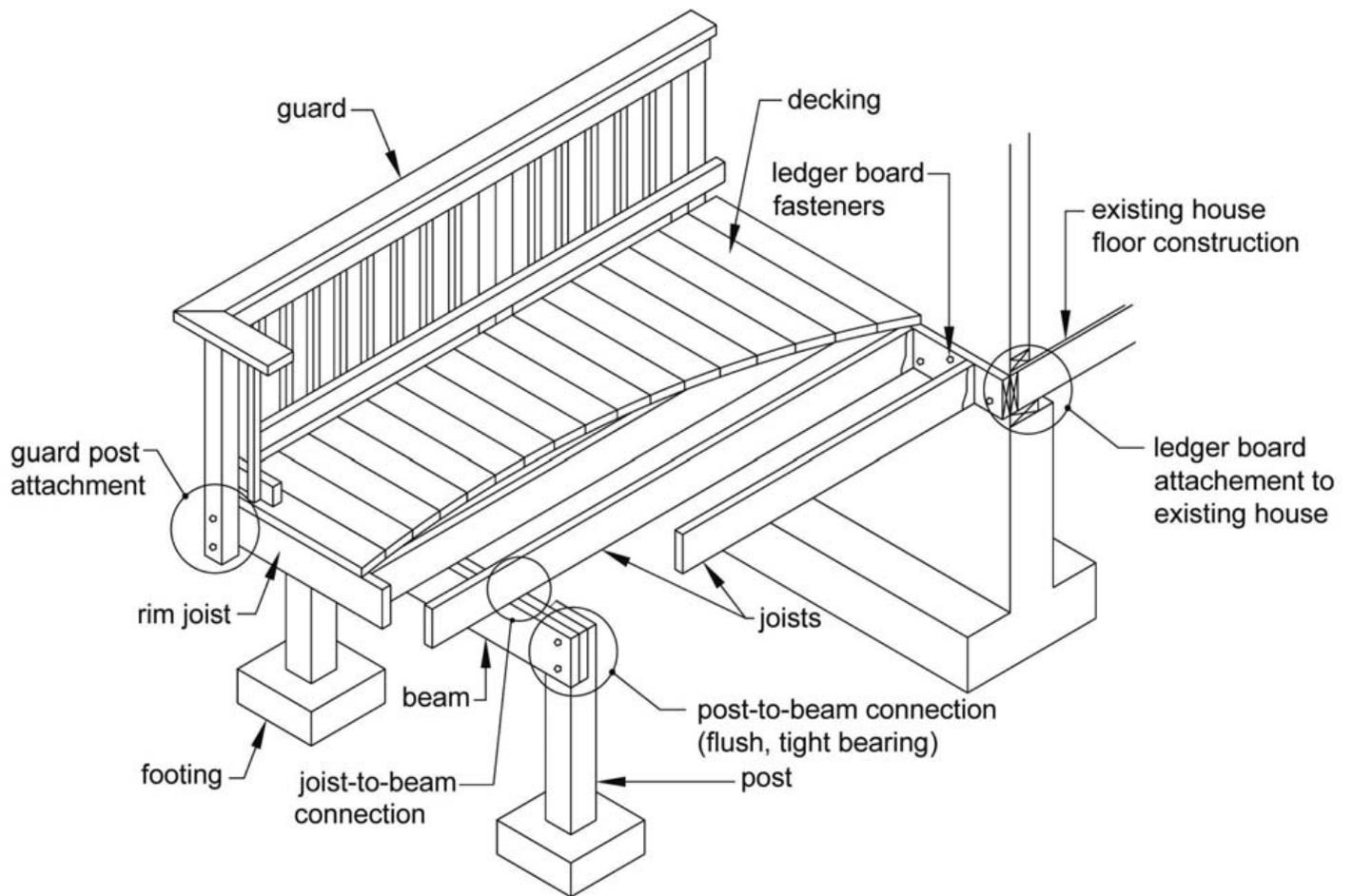


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Residential Wood Deck Construction Guide

For Deck Permit submittal, please include the following:

- Completed **Deck Permit & Zoning Certificate** Application
- 2 Sets of Plans/Drawings
- Scope of Work - materials used, size, height, railing, stairs tread/riser, footer, whether attached or detached
- Site Map with setbacks marked - distance from deck to sides and rear of property
- Page two (2) and three (3) of this guide, with all boxes filled in



PROJECT ADDRESS:

CHECK LIST

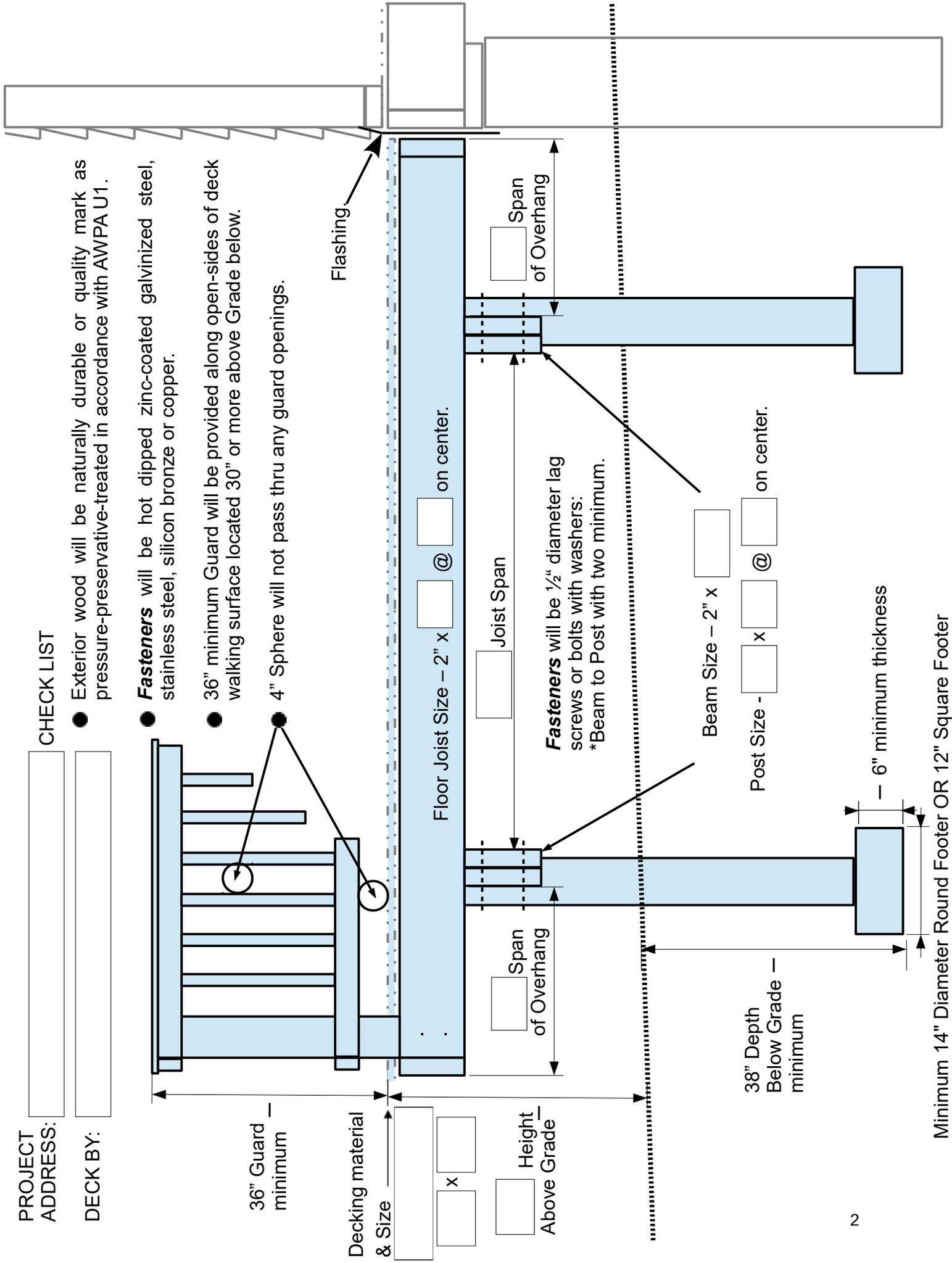
- Exterior wood will be naturally durable or quality mark as pressure-preservative-treated in accordance with AWPA U1.
- **Fasteners** will be hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.
- 36" minimum Guard will be provided along open-sides of deck walking surface located 30" or more above Grade below.
- 4" Sphere will not pass thru any guard openings.

36" Guard - minimum

Decking material & Size

 x

Height Above Grade



38" Depth Below Grade - minimum

Beam Size - 2" x

Post Size - x @ on center.

- 6" minimum thickness

Minimum 14" Diameter Round Footer OR 12" Square Footer

Attached Deck

Owners Name

Address

Beam Size

Post Size

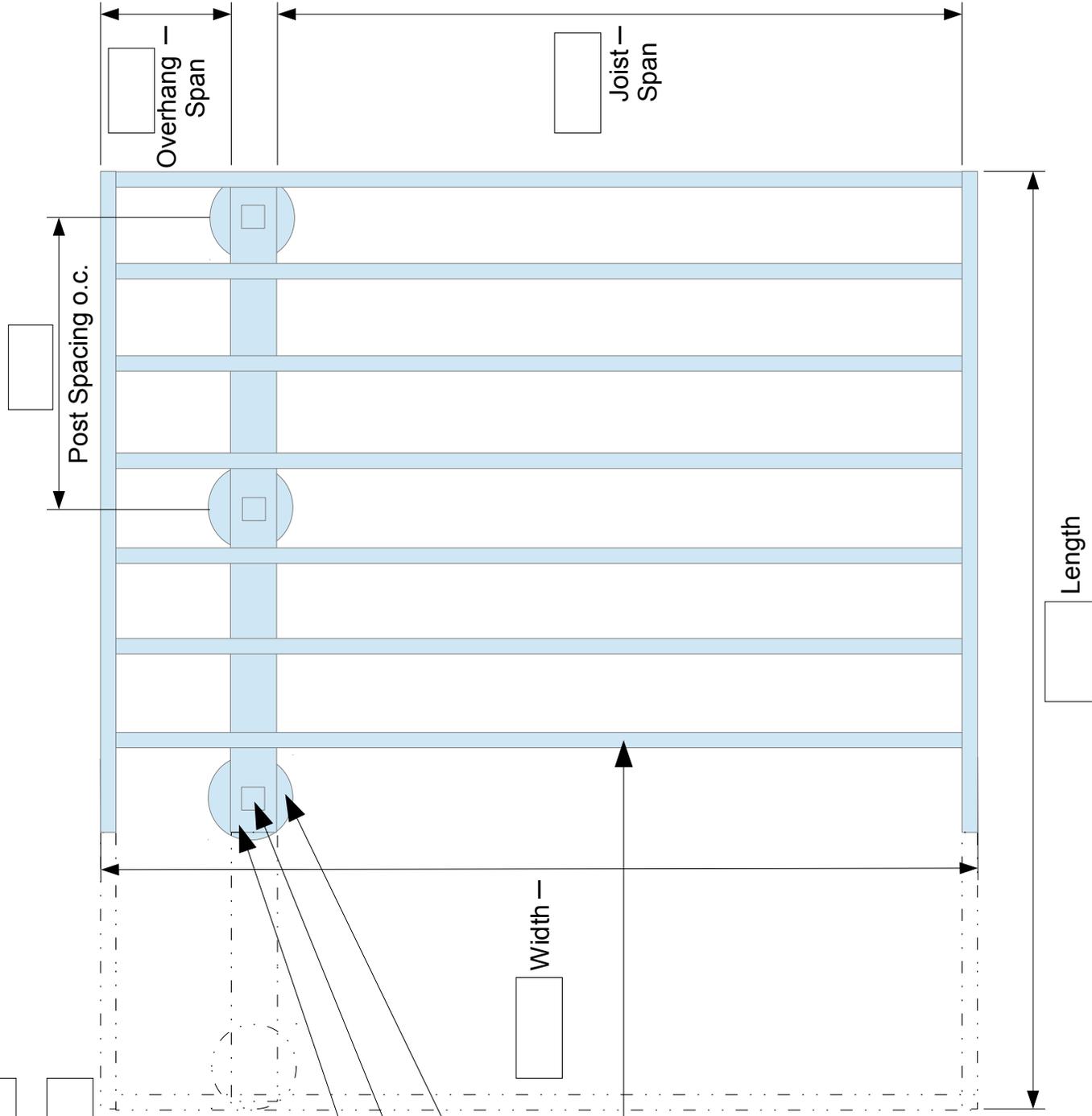
Footer Size

Joist Size @

o.c.

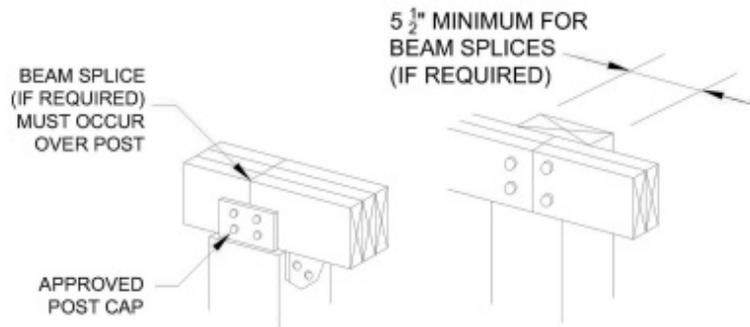
Finish Drawing by providing:

- House Location
- Stairway Location
- Lumber Dimensions
- Deck Dimensions
- Deck Shape & Offsets



Beams

FIGURE 507.5.1(1)
DECK BEAM TO DECK POST

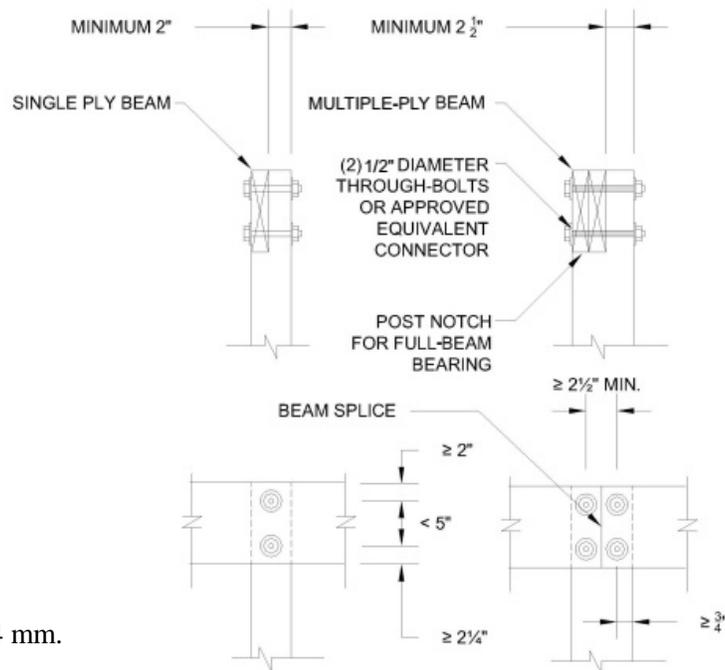


For SI: 1 inch = 25.4 mm.

BEAM OVER POST CAP

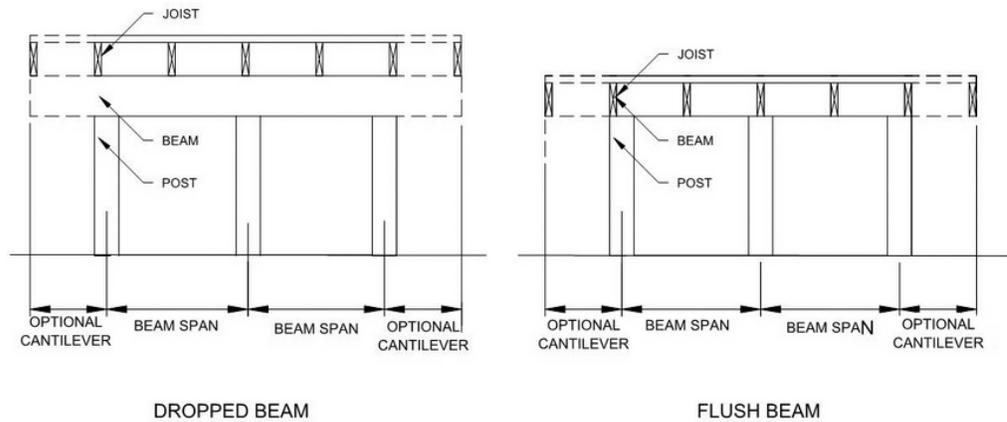
BEAM OVER POST

FIGURE 507.5.1(2)
NOTCHED POST-TO-BEAM CONNECTION

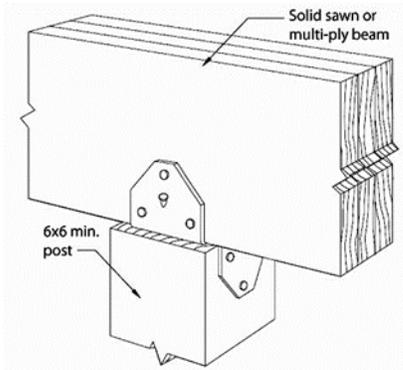


For SI: 1 inch = 25.4 mm.

FIGURE R507.5
TYPICAL BEAM SPANS



Beams



Prohibited Connection

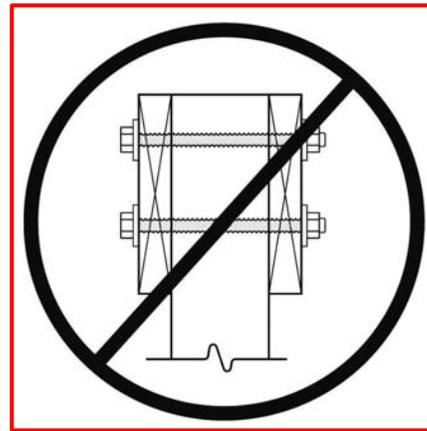


TABLE R507.5
DECK BEAM SPAN LENGTHS^{a,b,g} (feet-inches)

SPECIES ^c	SIZE ^d	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
		6	8	10	12	14	16	18
Southern pine	1 – 2 x 6	4-11	4-0	3-7	3-3	3-0	2-10	2-8
	1 – 2 x 8	5-11	5-1	4-7	4-2	2-10	3-7	3-5
	1 – 2 x 10	7-0	6-0	5-5	4-11	4-7	4-3	4-0
	1 – 2 x 12	8-3	7-1	6-4	5-10	5-5	5-0	4-9
	2 – 2 x 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0
	2 – 2 x 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0
	2 – 2 x 10	10-4	9-0	8-0	7-4	6-9	6-4	6-0
	2 – 2 x 12	12-2	10-7	9-5	8-7	8-0	7-6	7-0
	3 – 2 x 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
	3 – 2 x 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
3 – 2 x 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6	
3 – 2 x 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 x 6 or 2 – 2 x 6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	3 x 8 or 2 – 2 x 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3 x 10 or 2 – 2 x 10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3 x 12 or 2 – 2 x 12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4 x 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4 x 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4 x 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4 x 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3 – 2 x 6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3 – 2 x 8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	3 – 2 x 10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3 – 2 x 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.

- 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 at the end.
- Beams supporting deck joists from one side only.
- No. 2 grade, wet service factor.
- Beam depth shall be greater than or equal to depth of joists with a flush beam condition.
- Includes incising factor.
- Northern species. Incising factor not included
- Beam cantilevers are limited to the adjacent beam's span divided by 4.

Ledger

TABLE 507.9.1.3(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						
½-inch diameter lag screw with ½-inch maximum sheathing ^{c,d}	30	23	18	15	13	11	10
½-inch diameter bolt with ½-inch maximum sheathing ^d	36	36	34	29	24	21	19
½-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.

- Ledgers shall be flashed in accordance with Section 703.4 to prevent water from contacting the house band joist.
- Snow load shall not be assumed to act concurrently with live load.
- The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- Sheathing shall be wood structural panel or solid sawn lumber.
- Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to ½-inch thickness of stacked washers shall be permitted to substitute for up to ½-inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

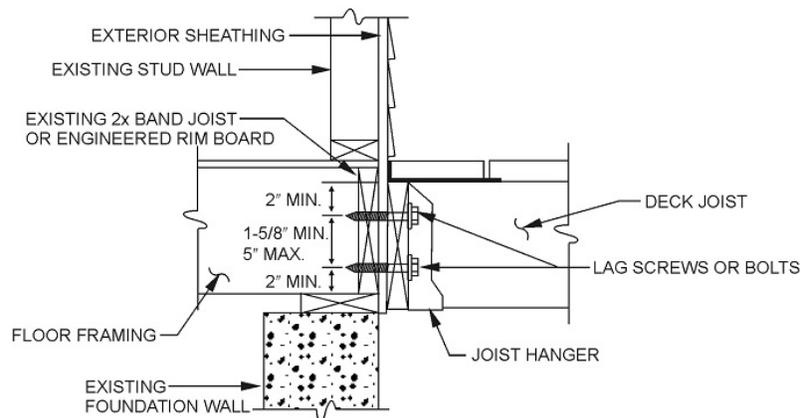
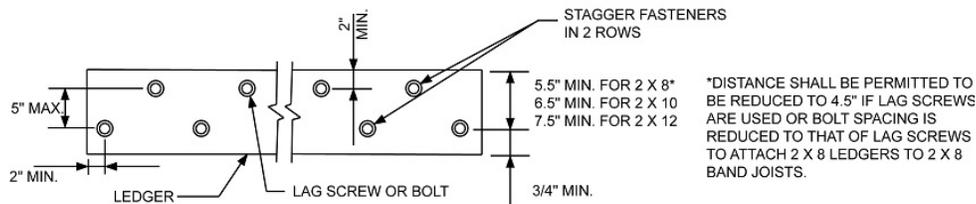
Table R507.9.1.3(2)

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	¾-inch	2 inches ^b	1 ½ inches ^b
Band Joist ^c	¾-inch	2 inches	2 inches ^b	1 ½ inches ^b

For SI: 1 inch = 25.4 mm.

- 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).
- Maximum 5 inches.
- For engineered rim joists, the manufacturer's recommendations shall govern.
- 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).

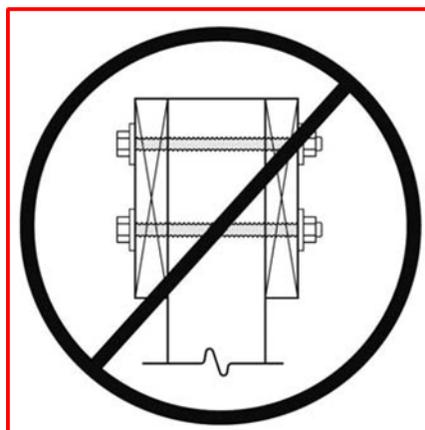


Connections

Ledger Board Connections

1. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure.
2. Ledger boards shall be equal to or greater than the joist depth.
3. Ledger boards shall not be attached to veneers – brick, stone, masonry; or to cantilevered floors or windows.
4. Exterior finish (siding) shall be removed prior to the placement of a ledger board.
5. Continuous flashing is required when the ledger board is attached to wood-framed construction.
6. Type of Fasteners:
 - A. Lag Screws: Lag screws shall be hot-dipped galvanized or stainless steel with a ½ inch minimum diameter and installed with washers.
 - B. Expansion Anchors: Expansion anchors, ½ inch diameter bolt or threaded rod minimum, equipped with washers installed according to the manufacturer’s installation instructions.
 - C. Adhesive Anchors: Adhesive anchors (Hilti-HY-70; Red Head – Epcon A7) minimum ½ inch threaded rod with washers shall be used for concrete, solid or hollow masonry. **Adhesive cartridges must remain on jobsite for inspector verification.**
 - D. Wood Screws: Wood screws (FastenMaster – Ledgerlok; SimpsonStrong Tie-Strong-Drive Screws (SDS, SDW) with a minimum ¼ inch diameter may be used to attach to wood frame construction.

Prohibited Connection



Joists

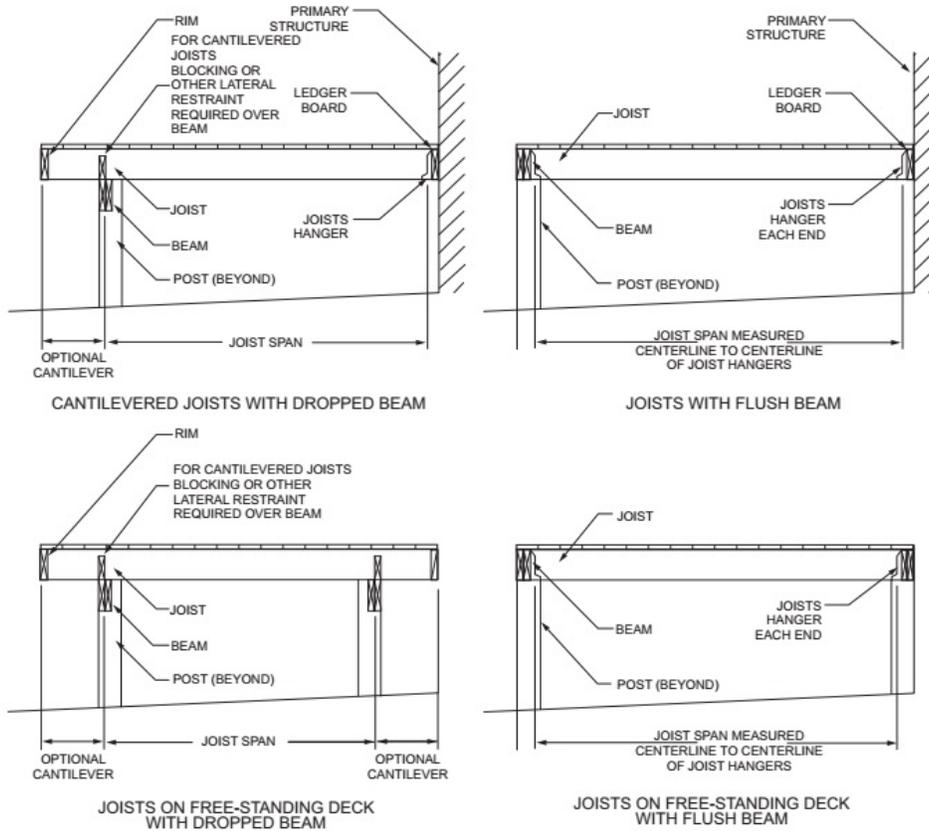


Table R507.6
DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft. – in.)

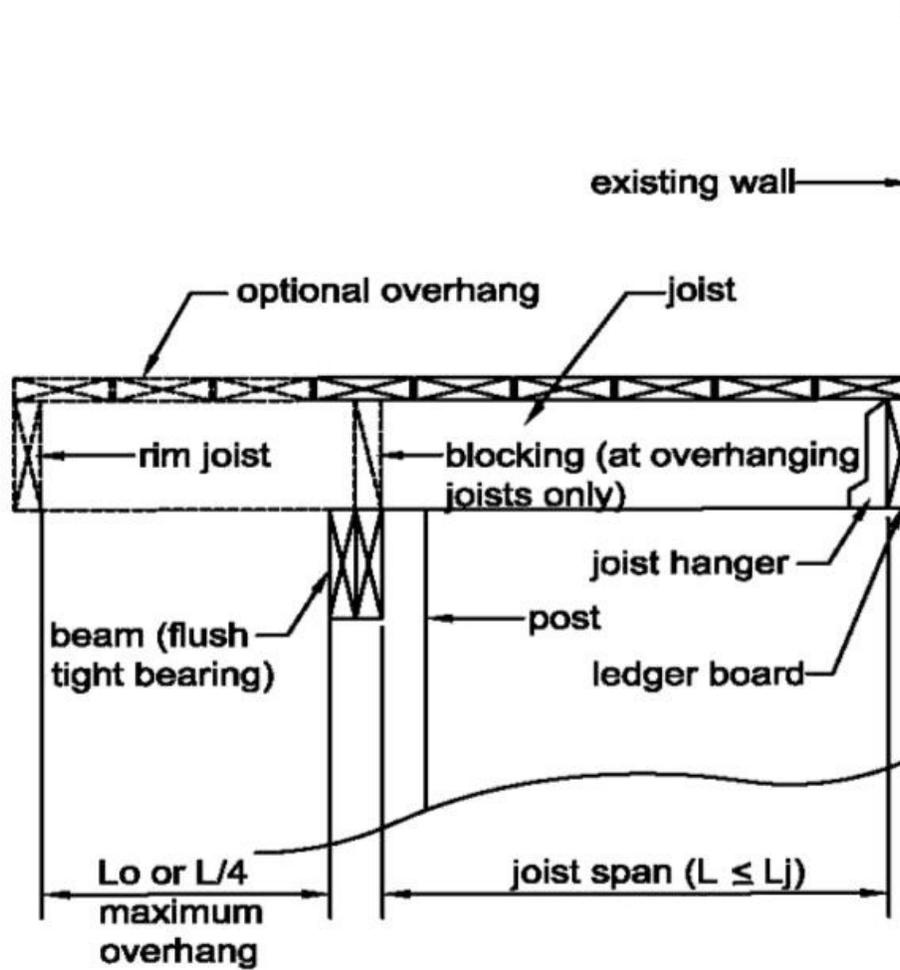
SPECIES ^a	SIZE	ALLOWABLE JOIST SPAN ^b			MAXIMUM CANTILEVER ^{c,f}		
		SPACING OF DECK JOISTS (inches)			SPACING OF DECK JOISTS WITH CANTILEVERS ^e (inches)		
		12	16	24	12	16	24
Southern pine	2 x 6	9-11	9-0	7-7	1-3	1-4	1-6
	2 x 8	13-1	11-10	9-8	2-1	2-3	2-5
	2 x 10	16-2	14-0	11-5	3-4	3-6	2-10
	2 x 12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

- No. 2 grade with wet service factor.
- Ground snow load, live load = 40 psf, dead load = 10 psf, $L/\Delta = 360$.
- 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.
- Includes incising factor.
- Northern species with no incising factor.
- Cantilevered spans not exceeding the nominal depth of the joist are permitted.

Joists

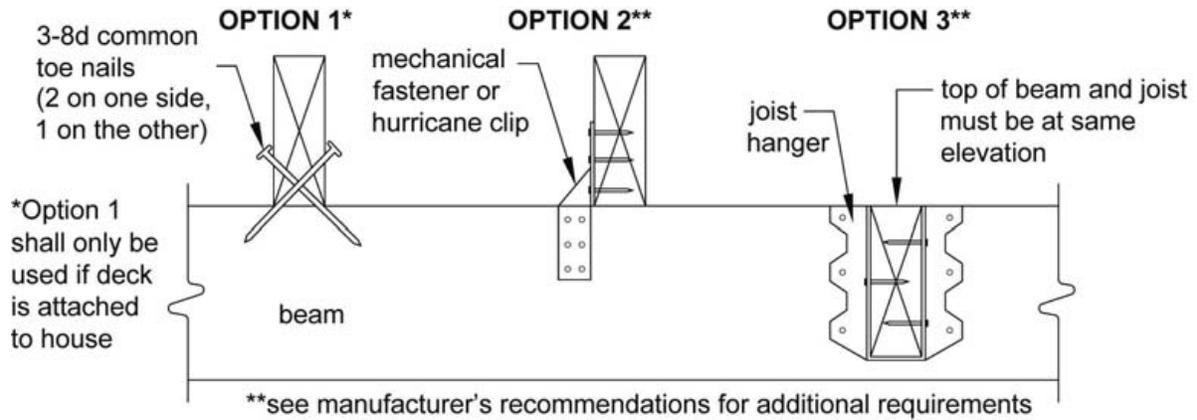
Joist Span – Joist Attached at House and Bearing over Beam



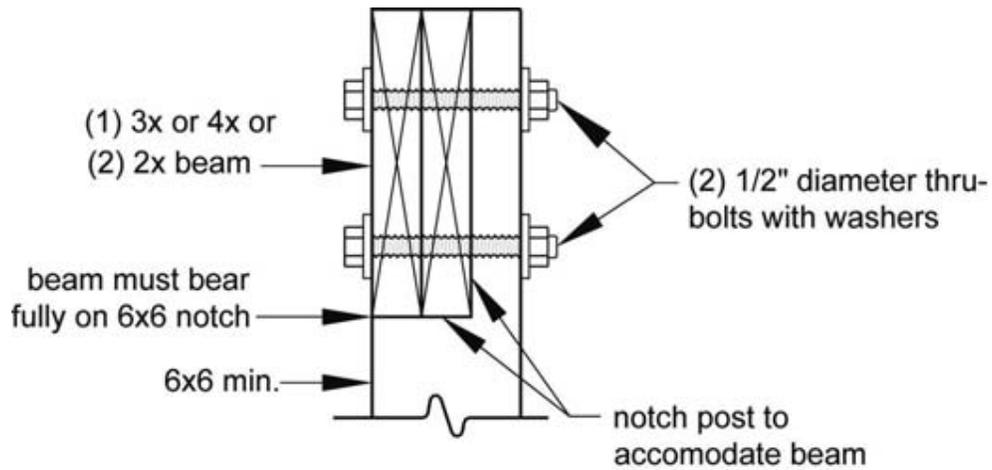
The joist span is the distance between the two points supporting the joist (i.e. ledger to beam, beam to beam) and does not include any overhang. Allowable cantilever is joist span = $(L)/4$.

Connections

Joist to Beam Detail



Post to Beam Connections



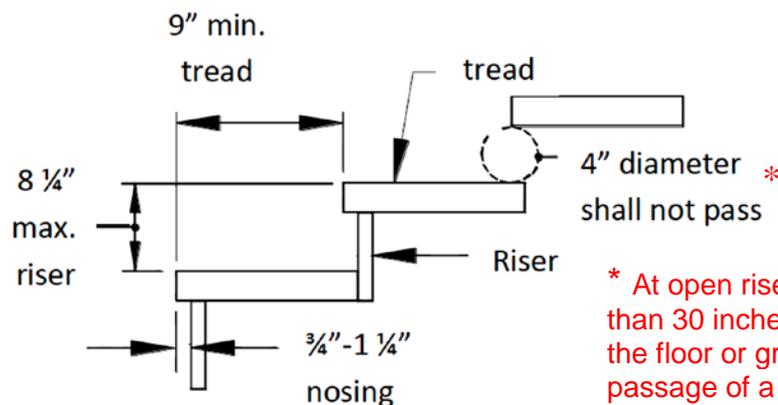
Notched post

Guards

1. A Guard is required when a deck is greater than 30" above grade measured vertically at any point within 36" measured horizontally along the deck edge. (2019 RCO 312.1.1)
2. The height of the guard shall be not less than 36" measured vertically above the walking surface. (2019 RCO 312.1.2)
3. Required guards shall not have openings from the walking surface to the required guard height which allow the passage of a sphere 4" in diameter. (2019 RCO 312.1.3)

Stairs

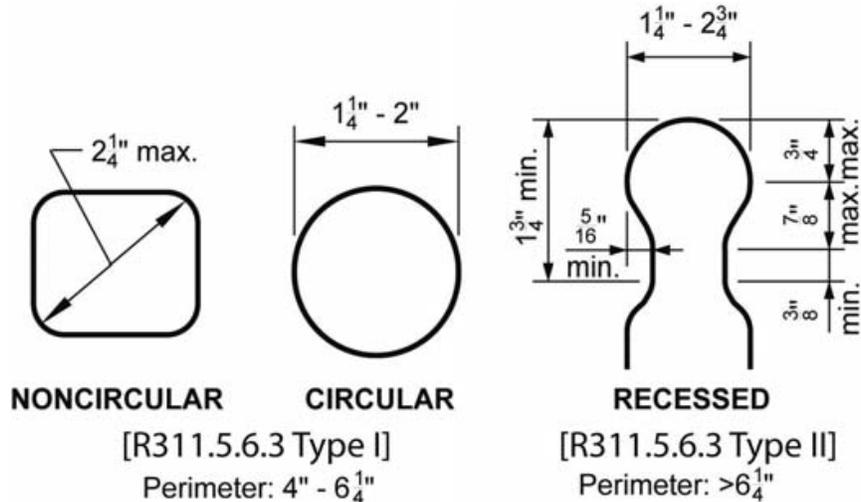
1. Stairs shall have a minimum clear width 36". (2019 RCO 311.7.1)
2. The maximum riser height shall be 8 ¼". (2019 RCO 311.7.5.1)
3. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8". (2019 RCO 311.7.5.1)
4. The minimum tread depth shall be 9". (2019 RCO 311.7.5.2)
5. Wood-plastic composites used shall bear a label indicating the required performance levels and demonstrating compliance with the provisions of ASTM D 7032 (2019 RCO 507.2.2).
6. Flight of stairs shall not have a vertical rise larger than 148 ½" between floor levels or landings. (2019 RCO 311.7.3)



* At open risers, openings located more than 30 inches, as measured vertically, to the floor or grade below shall not permit the passage of a 4-inch-diameter sphere.

Stair Handrails

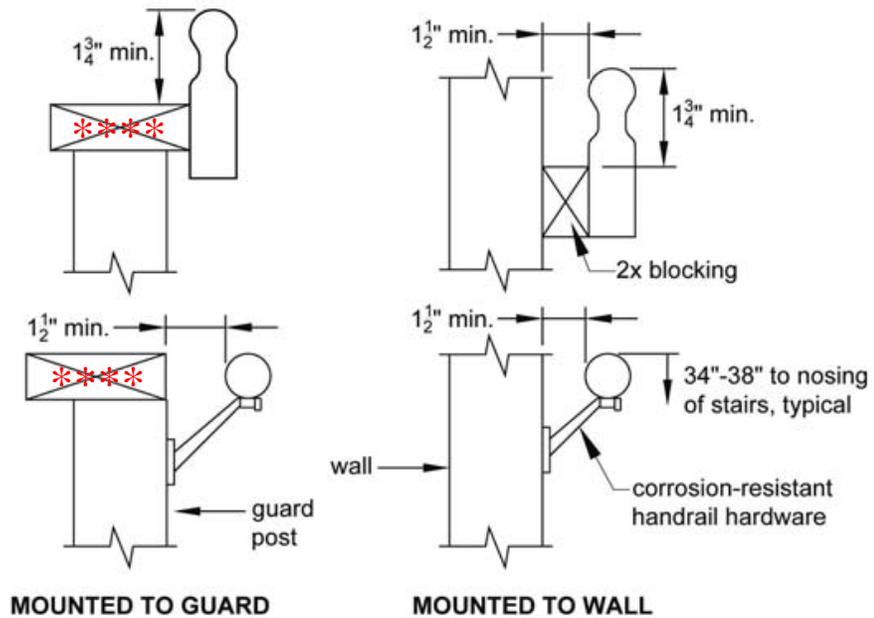
1. Handrails shall be provided on at least one side of each continuous run of treads or flight with four (4) or more risers. (2019 RCO 311.7.8)
2. Handrail height, measured vertically from the tread nosing shall not be less than 34" and not more than 38". (2019 RCO 311.7.8.1)
3. Handrails shall be continuous for the full length of the flight. (2019 RCO 311.7.8.4)
4. Handrails shall be provided with graspability as illustrated below. (2019 RCO 311.7.8.5)



Stair Handrails

Mounting Examples

Fasten handrails per manufacturer recommendations



****Decking or lumber on top of posts is not an approved railing per the Handrail Standards in the 2019 RCO – Section 311.7.8.****