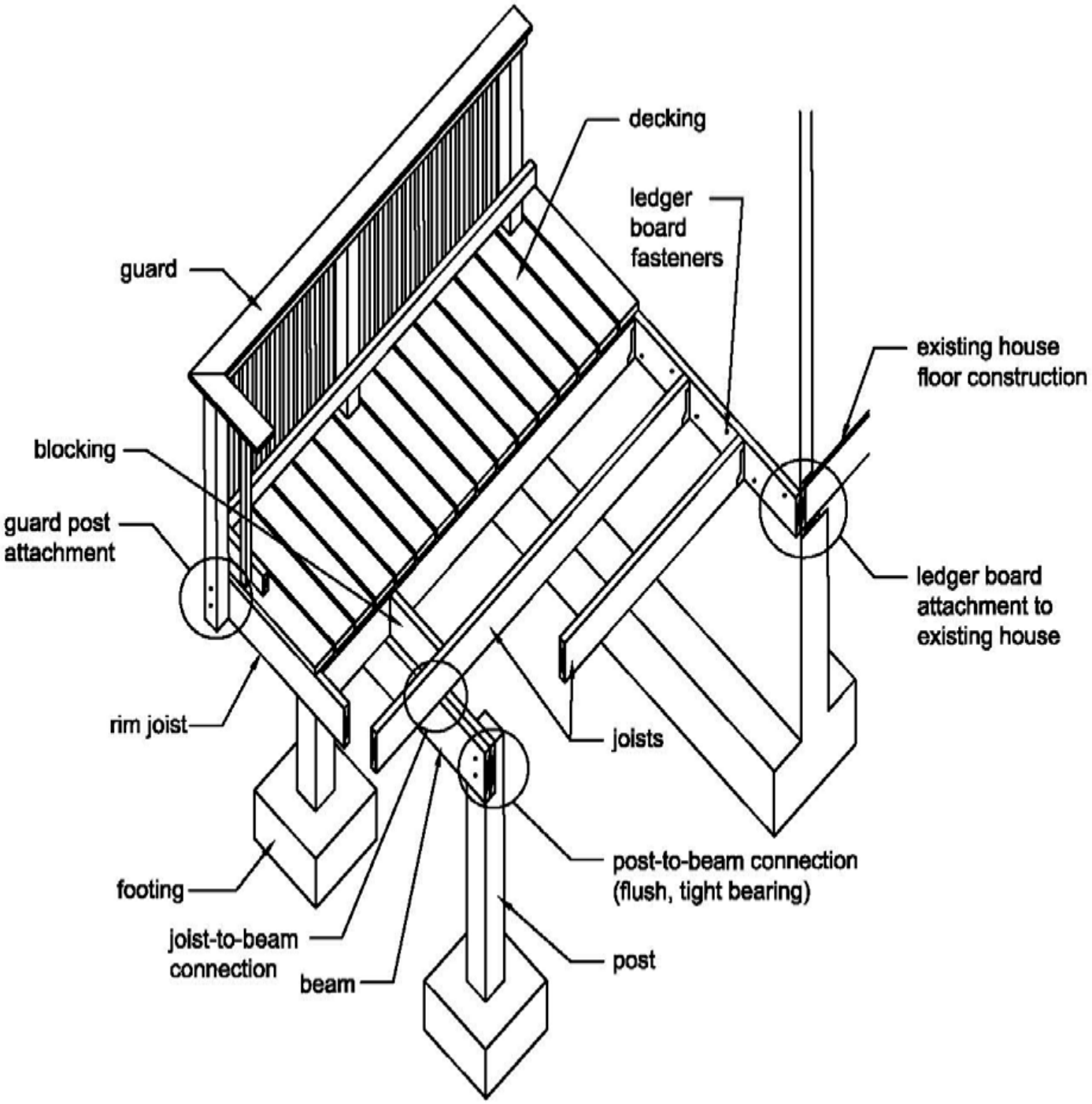
RESIDENTIAL WOOD DECKS CONSTRUCTION GUIDE

CITY OF STRONGSVILLE,OHIO

BUILDING DEPARTMENT

16099 FOLTZ PARKWAY

440-580-3105



Courtesy of American Wood Council—Leesburg, VA

GENERAL REQUIREMENTS

1. This document shall apply to single level decks only and in accordance with:

2019 Residential Code of Ohio (RCO) Section - 507 Exterior Decks.

*****SPECIAL REQUIREMENTS FOR DECKS AROUND SWIMMIMG POOLS*****

*****See our Swimming Pool Handout*****

Building Code and Codified Ordinance information available at:
www.strongsville.org

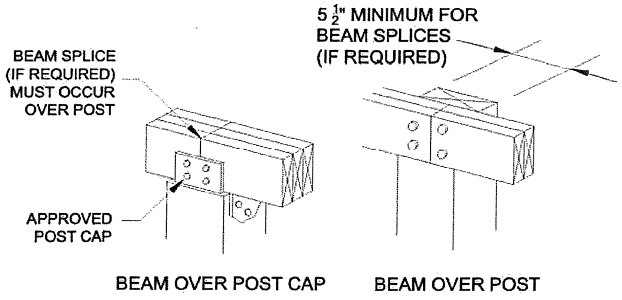
ZONING Requirements

1. Decks are not permitted to encroach into the side yard that has been established by the main dwelling. (Strongsville Codified Ordinance (SCO)1252.16).
2. An unenclosed deck may project fourteen (14') feet into the required rear yard setback. (SCO 1252.06)
3. A deck must be set back not less than five (5') feet from any rear lot line. (SCO) 1252.16)
4. Decks may not encroach into any easement. (SCO 1252.16)

BUILDING Requirements

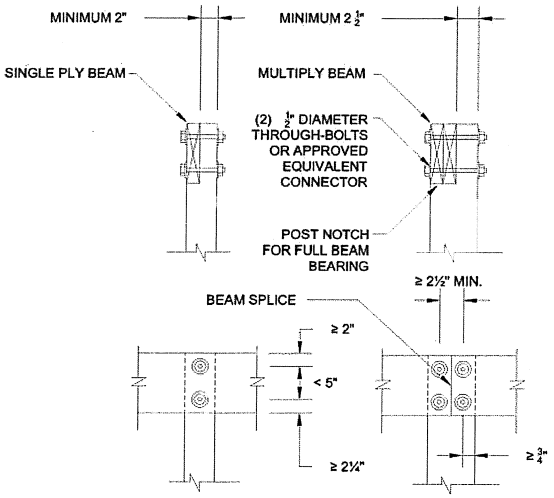
1. Frost line/Footer depth—**39". Post hole concrete footers - diameters and thickness based on tributary load.** (RCO 507.3.1)
2. All wood shall be pressure preservative treaded or equivalent. (RCO 507.2.1)
3. Decking shall be 2x4, 2x6, five quarter board, or Wood-Plastic Composite sizes per Manufacturer's specifications. Wood-Plastic Composite decking shall be installed per the Manufacturer's Installation Instructions.
4. All screws, nails, bolts, washers and nuts used with preservative treated wood shall be hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze, or copper. (RCO T507.2.3 & 317.3)
5. Decks supporting large concentrated loads (spa tubs, masonry fireplaces, etc.) are beyond the scope of this document and may require submission of professionally designed drawings.
6. THIS DOCUMENT IS NOT INTENDED TO PRECLUDE THE USE OF OTHER CONSTRUCTION METHODS OR MATERIALS NOT SHOWN HEREIN.

BEAMS



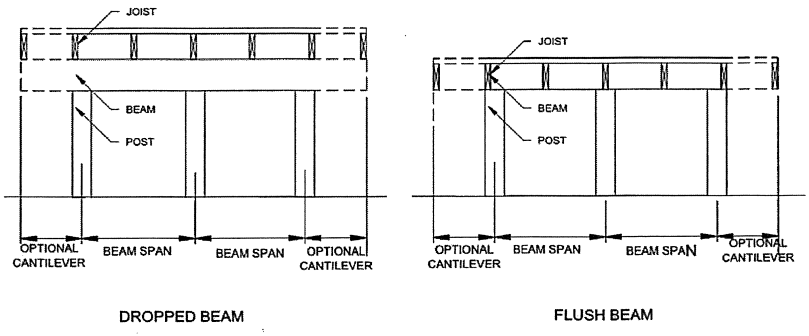
For SI: 1 inch = 25.4 mm.

FIGURE 507.5.1(1)
DECK BEAM TO DECK POST

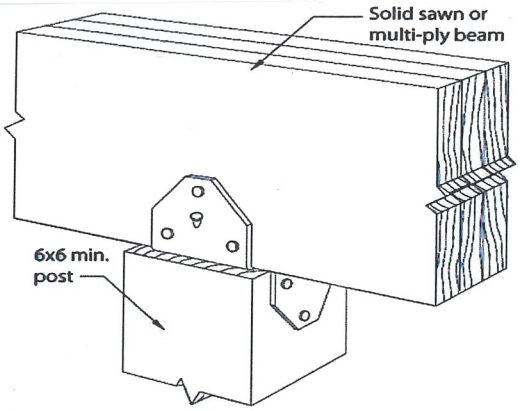


For SI: 1 inch = 25.4 mm.

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



BEAMS



PROHIBITED CONNECTION

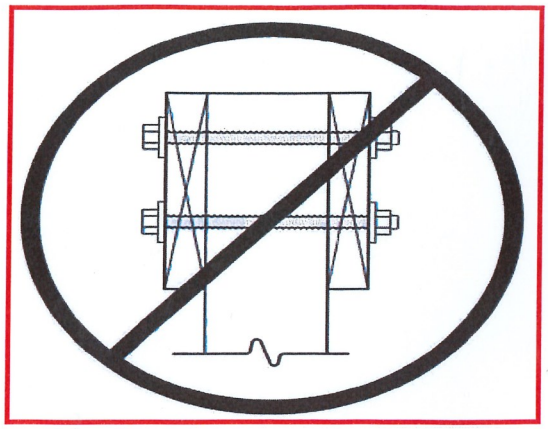


TABLE 507.5
DECK BEAM SPAN LENGTHS [a, b, g] (feet - inches)

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.

a. 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.
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.

Courtesy of American Wood Council - Leesburg, VA 5

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						
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.

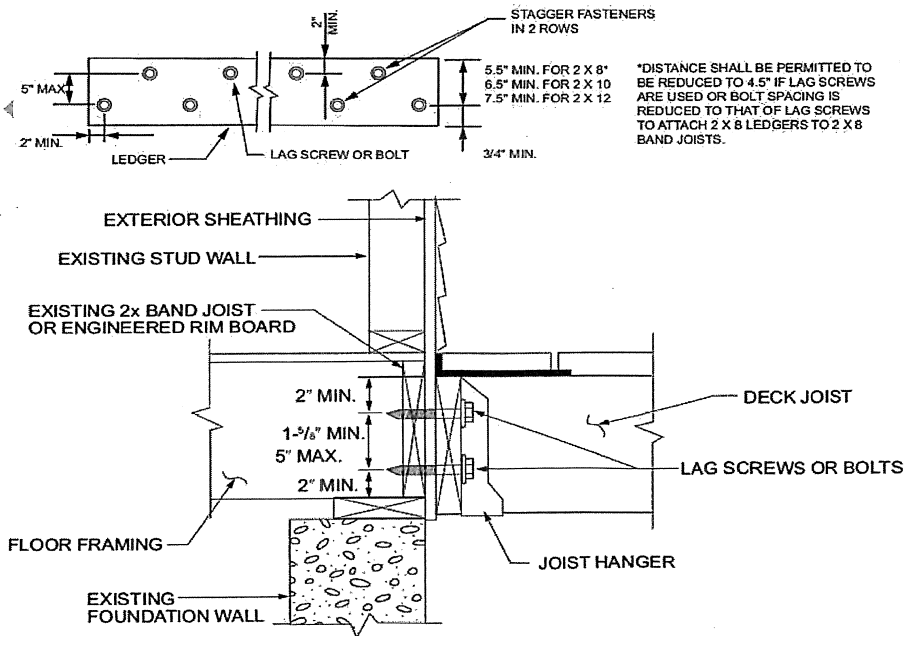
a. Ledgers shall be flashed in accordance with Section 703.4 to prevent water from contacting the house band joist.
b. Snow load shall not be assumed to act concurrently with live load.
c. The tip of the lag screw shall fully extend beyond the inside face of the band joist.
d. Sheathing shall be wood 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 507.9.1.3(2)
PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS

	MINIMUM END AND EDGE DISTANCES AND SPACING			
	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 507.9.1.3(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 507.9.1.3(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. TYPES OF FASTENERS:

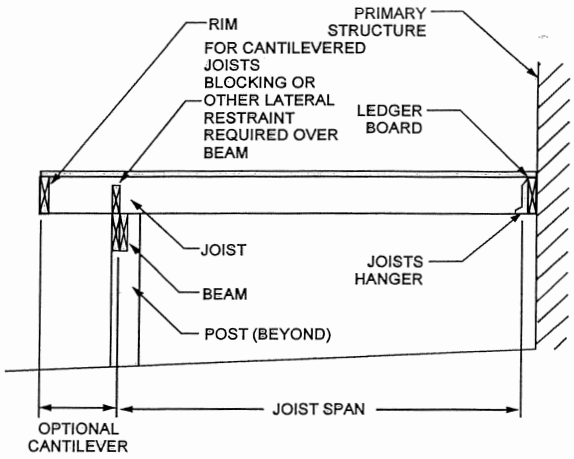
   A. LAG SCREWS: Lag Screws shall be hot-dipped galvanized or stainless steel with a 1/2 inch minimum diameter and installed with washers.

   B. EXPANSION ANCHORS: Expansion anchors, 1/2 inch diameter bolt or threaded rod minimum, equipped with washers installed according to the manufacturer's installation instructions.

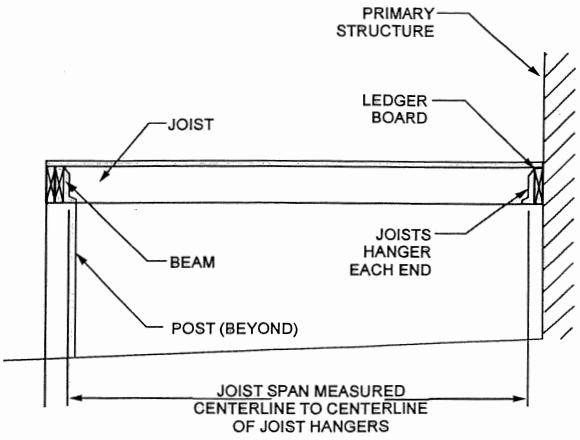
   C. ADHESIVE ANCHORS: Adhesive anchors (Hilti-HY-70; Red Head - Epcon A7) minimum 1/2 inch threaded rod with washers shall be used for concrete, solid or hollow masonry. Adhesive cartridges must remain on jobsite for inspector verification.

   D. WOOD SCREWS: Wood screws (FastenMaster—LedgerLok; Simpson Strong Tie-Strong-Drive Screws(SDS, SDW) with a mimimum 1/4 inch diameter may be used to attach to wood frame construction.

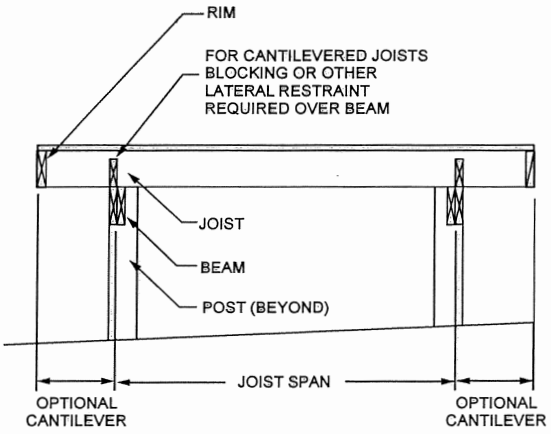
Joists



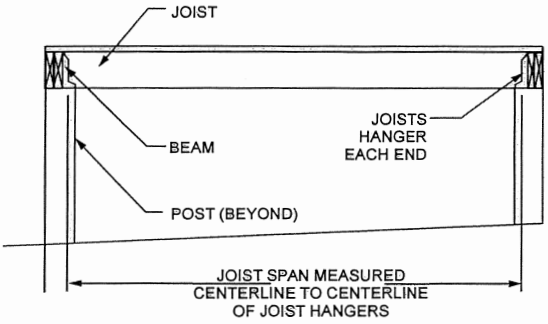
CANTILEVERED JOISTS WITH DROPPED BEAM



JOISTS WITH FLUSH BEAM



JOISTS ON FREE-STANDING DECK WITH DROPPED BEAM



JOISTS ON FREE-STANDING DECK WITH FLUSH BEAM

TABLE 507.6
DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft. - in.)

SPECIES[a]	SIZE	ALLOWABLE JOIST SPAN[b] SPACING OF DECK JOISTS (inches)			MAXIMUM CANTILEVER[c, f] SPACING OF DECK JOISTS WITH CANTILEVERS[c] (inches)		
		12	16	24	12	16	24
Southern pine	2x6	9-11	9-0	7-7	1-3	1-4	1-6
	2x8	13-1	11-10	9-8	2-1	2-3	2-5
	2x10	16-2	14-0	11-5	3-4	3-6	2-10
	2x12	18-0	16-6	13-6	4-6	4-2	3-4
Douglas fir-larch[d], hem-fir[d] spruce-pine-fir[d],	2x6	9-6	8-8	7-2	1-2	1-3	1-5
	2x8	12-6	11-1	9-1	1-11	2-1	2-3
	2x10	15-8	13-7	11-1	3-1	3-5	2-9
	2x12	18-0	15-9	12-10	4-6	3-11	3-3
Redwood, western cedars, ponderosa pine[e], red pine[e]	2x6	8-10	8-0	7-0	1-0	1-1	1-2
	2x8	11-8	10-7	8-8	1-8	1-10	2-0
	2x10	14-11	13-0	10-7	2-8	2-10	2-8
	2x12	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.

JOISTS

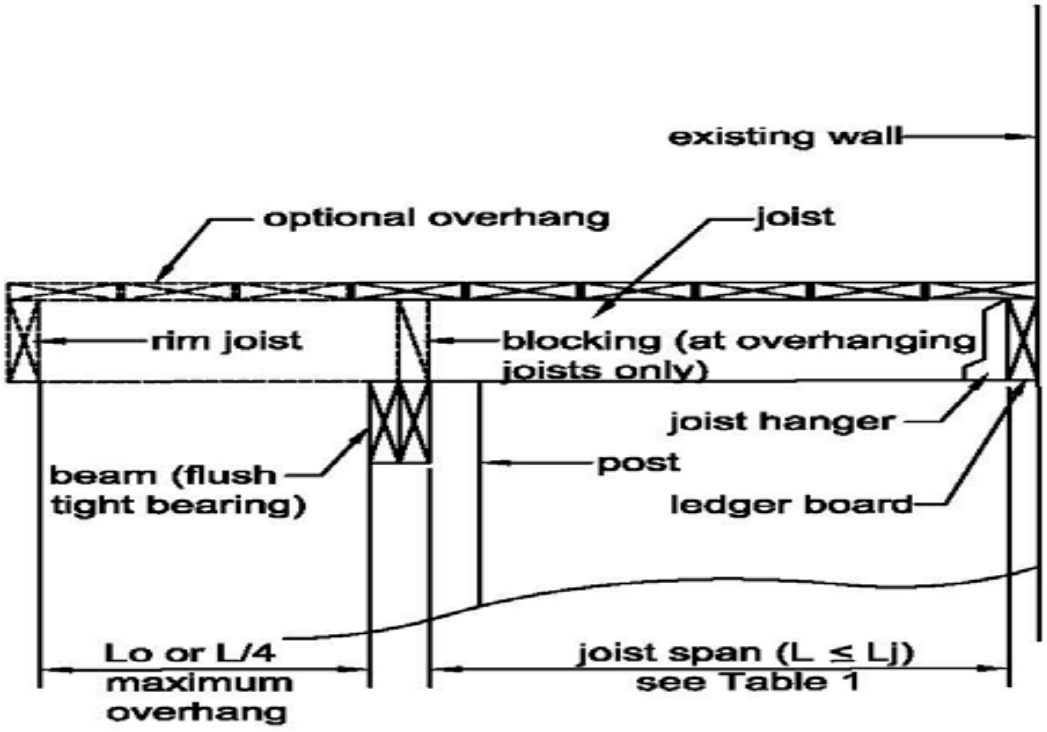


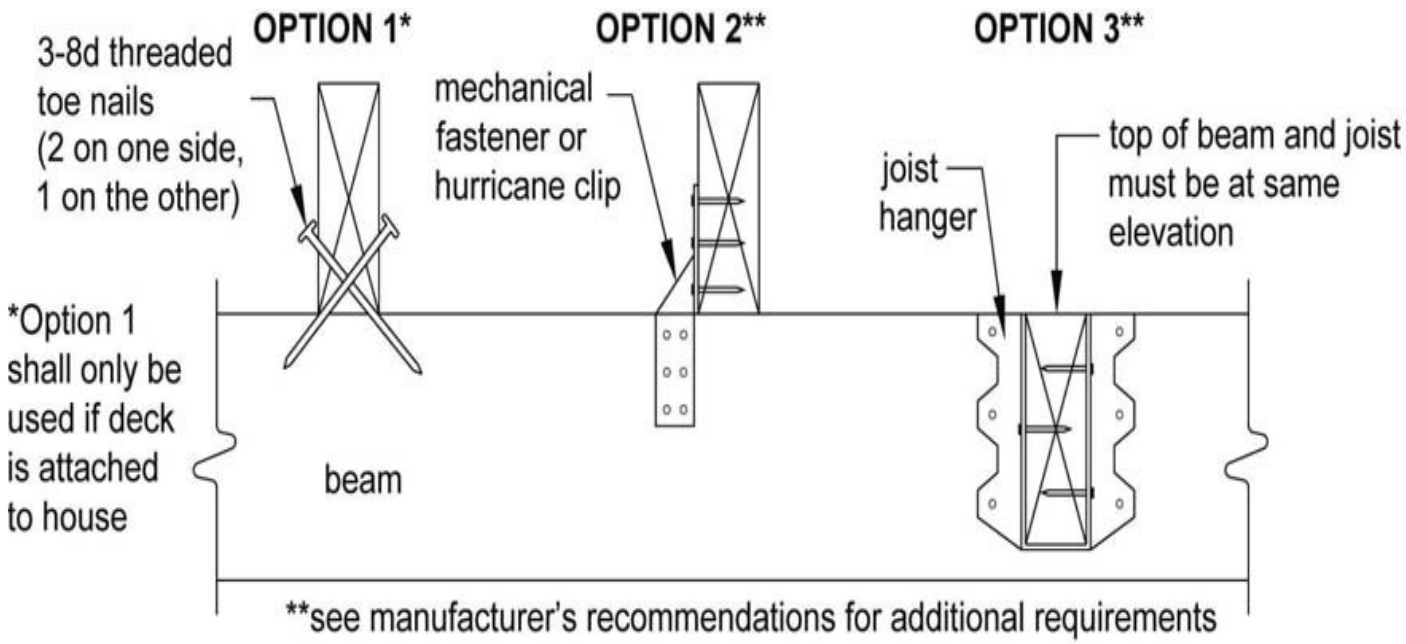
Figure 1. Joist Span – Joist Attached at House and Bearing over Beam

Courtesy of American Wood Council - Leesburg, VA

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



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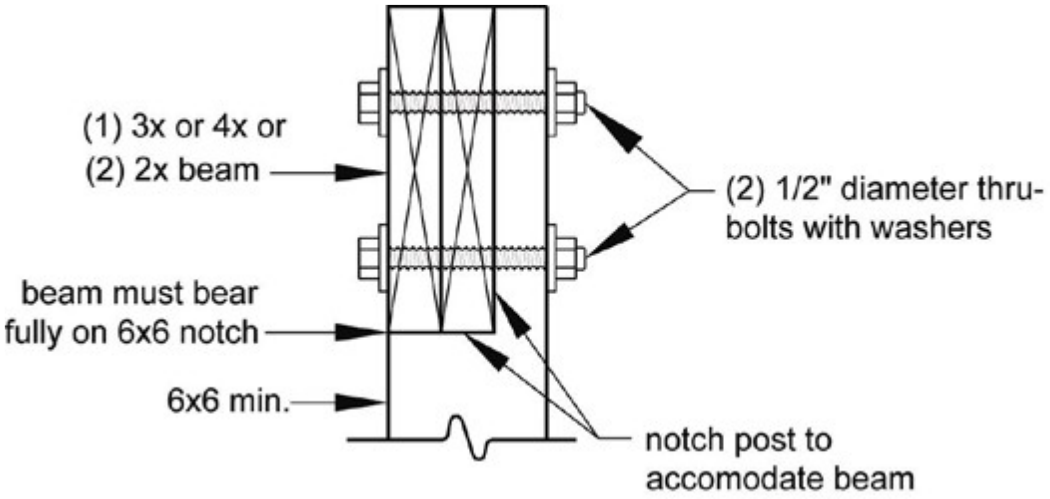
POST TO BEAM CONNECTIONS



NOTCHED POST

Courtesy of American Wood Council - Leesburg, VA

GUARDS

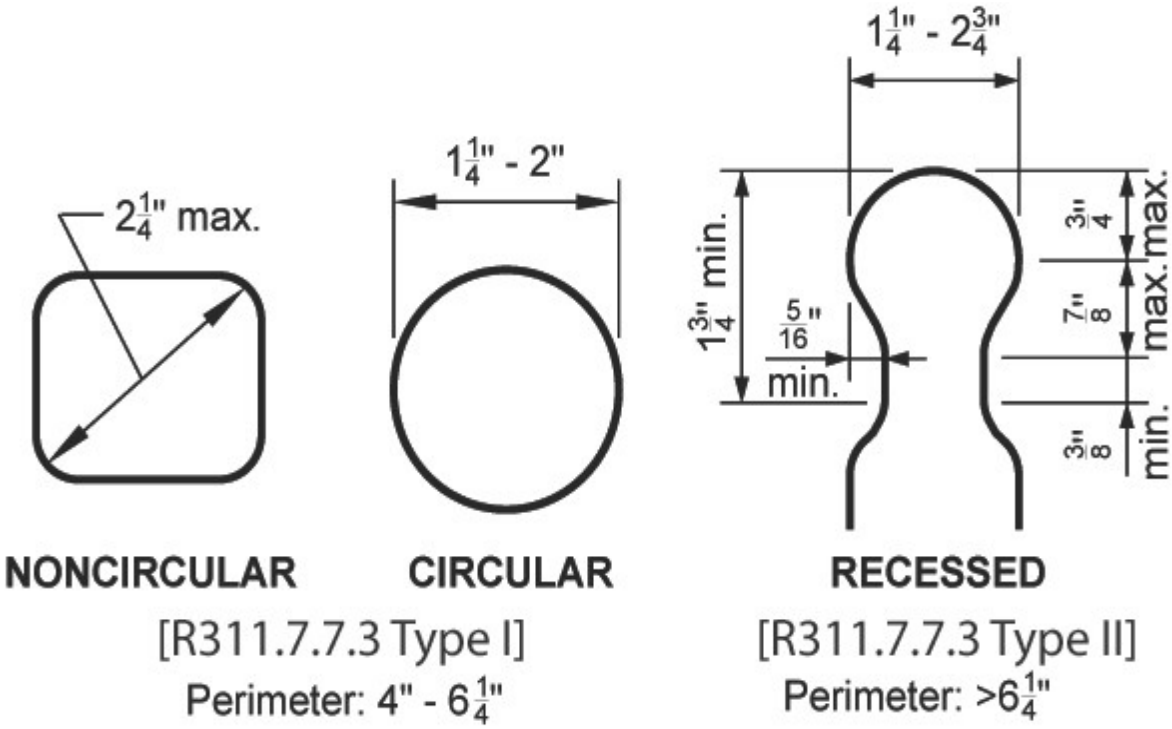
1. A guard is required when a deck is greater than 30” above grade measured vertically at any point within 36” measured horizontally along the deck edge. (2019 Residential Code of Ohio 312.1.1)
2. The height of the guard shall be not less than 36” measured vertically above the walking surface. (2019 Residential Code of Ohio 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 Residential Code 312.1.3)
4. Guard posts shall be 4x4 minimum.

STAIRS

1. Stairs shall have a minimum clear width 36”. (2013 RCO 311.7.1)
2. The maximum riser height shall be 8 1/4”. (2013 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.

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 311.8.5)



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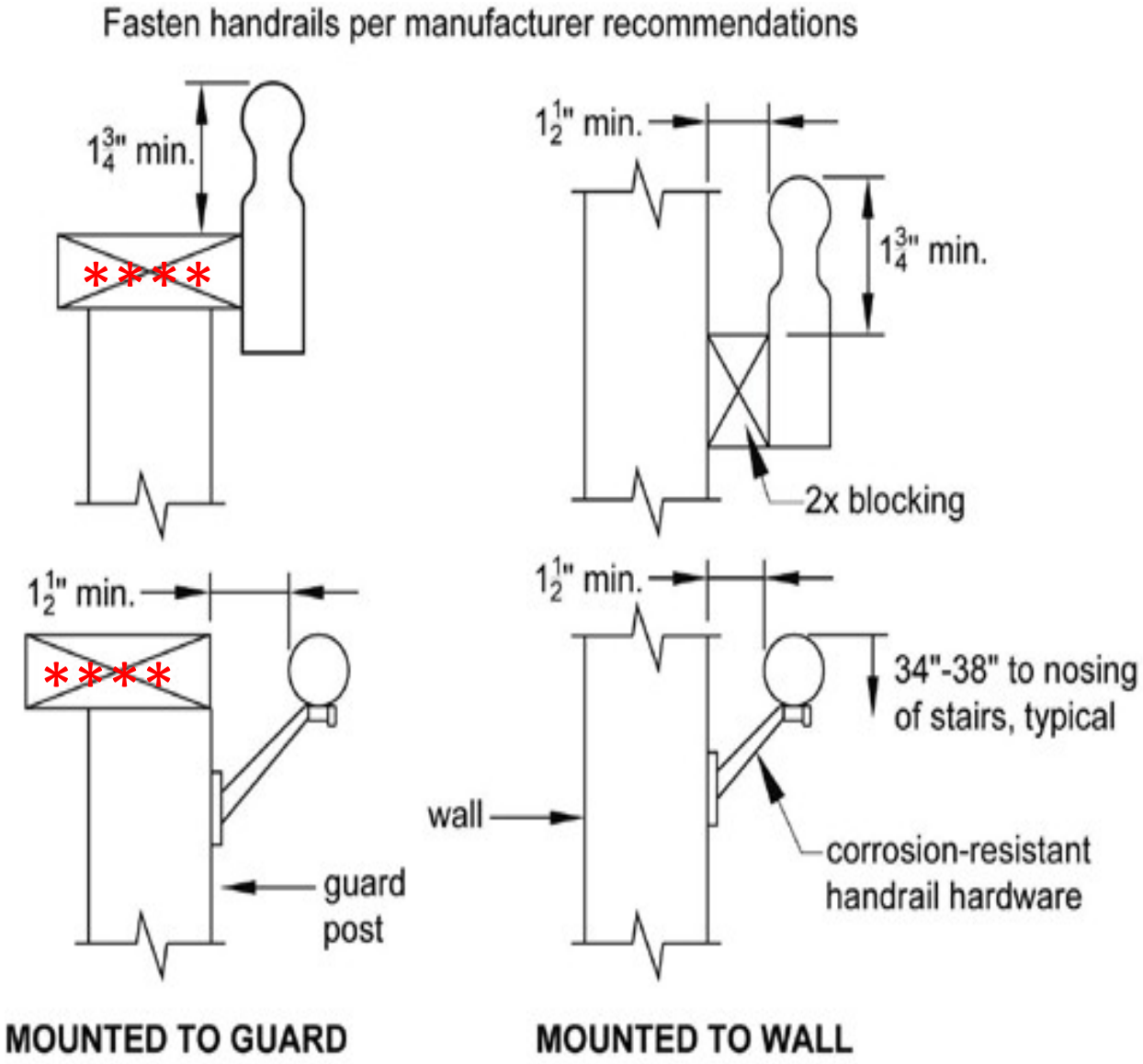
STAIR HANDRAILS

MOUNTING EXAMPLES



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

Courtesy of American Wood Council - Leesburg, VA

CITY OF STRONGSVILLE, OHIO

MINIMUM INFORMATION REQUIRED FOR DECK PERMIT