

DECK PLAN SUBMITTAL GUIDE



**BARRY
ISETT &
associates INC**

For decks accessory to one- and two-family dwellings

Based on the PA UCC and the 2018 IRC | Updated August 2022

NOTE | This is intended to be a deck permit application submittal guide; this is not a complete list of deck code requirements.

CHECKLIST:

Y N N/A

Building Permit Application Does your application include a completed building permit application?	☐	☐	☐
Site Plan Do you have a site plan? Does it show the size and location of the deck and existing structures on the site and the distance from lot lines to the deck per PA UCC §403.62a.(e)?	☐	☐	☐
Construction Plans Do you have construction plans which detail the size, span, and spacing of all building materials, and the means and methods of critical connections?	☐	☐	☐
Height Do the plans indicate the height of the deck?	☐	☐	☐
Footing Depth Do the plans show the depth of the footings below the frost depth per R507.3.2?	☐	☐	☐
Footing Size Do the plans show the footing sizes in compliance with <i>Table R507.3.1</i> ?  <i>See Note #1</i>	☐	☐	☐
Post Size Do the plans show the post size in compliance with <i>Table R507.4</i> ?  <i>See Note #2</i>	☐	☐	☐
Post-to-Footing Do the plans show the post-to-footing connection in compliance with <i>Figure R507.3</i> ?  <i>See Note #3</i>	☐	☐	☐
Beam-to-Post Do the plans show the beam-to-post connection in compliance with <i>Figure R507.5.1(1)</i> and <i>Figure R507.5.1(2)</i> ?  <i>See Note #4</i>	☐	☐	☐
Joists Do the plans show the joist size, span, and spacing in compliance with <i>Table R507.6</i> ?  <i>See Note #5</i>	☐	☐	☐
Joist Cantilever Do the plans show that the joist cantilever does not exceed $\frac{1}{4}$ th the adjacent joist span per IRC R507.6 or the maximum cantilever span in <i>Table R507.6</i> ? Whichever is less.  <i>See Note #5</i>	☐	☐	☐
Beam(s) Do the plans show the beam(s) size and span in compliance with <i>Table R507.5</i> ?  <i>See Note #6</i>	☐	☐	☐
Beam Cantilever Do the plans show that the beam cantilever does not exceed $\frac{1}{4}$ th the allowable beam span per IRC R507.5?	☐	☐	☐
Ledger Flashing Do the plans show ledger flashing per R703.4.5?	☐	☐	☐
Ledger Connection to Wood Band Joist Do the plans show the ledger connection in compliance with R507.9.1.3? <i>Note: For LedgerLoks, use the technical evaluation report found on the manufacturer's website.</i>  <i>See Note #7</i>	☐	☐	☐
Joist-to-Ledger Do the plans show joist hangers per R507.6.1?	☐	☐	☐
Joist Lateral Restraint Do the plans show the joists with a means to prevent rotation on both ends, such as blocking, or a connection to a rim joist per R502.7?	☐	☐	☐
Lateral Load Protection Where supported by attachment to an exterior wall, does the deck have lateral load protection in compliance with R507.9.2?  <i>See Note #8</i>	☐	☐	☐
Guardrail Height Do the plans show the guardrail height of at least 36" for any location where the deck floor height to grade is more than 30" at any point within 36" per R312.1.2?	☐	☐	☐
Guardrail Openings Do the plans show the guardrail openings of less than 4" per R312.1.3?	☐	☐	☐
Guardrail Post Connection Do the plans show how the guardrail posts are connected to comply with the load requirements of a 200psf minimum?  <i>See Note #9</i>	☐	☐	☐
Stairs Do the plans show tread depth and riser height in compliance with PA UCC §403.21(7)?  <i>See Note #10</i>	☐	☐	☐
Handrail If there are four or more stair risers, do the plans show a graspable handrail per R311.7.8?  <i>See Note #11</i>	☐	☐	☐

NOTES:

#1

Footing Size | Do the plans show the footing sizes in compliance with Table R507.3.1?

The footings must not be smaller than listed in *Table R507.3.1*—the most relevant section of which is copied below. Consult the IRC for additional ground snow loads or soil bearing capacities.

LOAD-BEARING VALUE OF SOILS ^{*a, c, d} : 1,500 PSF ^{*e}				
Live or Ground Snow Load (psf) ^{*b}	Tributary Area (sq. ft.)	Side of Square Footing (in.)	Diameter of Round Footing (in.)	Footing Thickness (in.) ^{*f}
40	20	12	14	6
	40	14	16	6
	60	17	19	6
	80	20	22	7
	100	22	25	8
	120	24	27	9
	140	26	29	10
	160	28	31	11

a) Interpolation permitted. Extrapolation not permitted. b) Based on highest load case: Dead + Live or Dead + Snow. c) Footing dimensions shall allow complete bearing of the post.
d) If the support is a brick or CMU pier, the footing shall have a minimum 2-inch projection on all sides. e) Area, in square feet, of deck surface supported by post and footings.
f) Minimum thickness shall only apply to plain concrete footings.

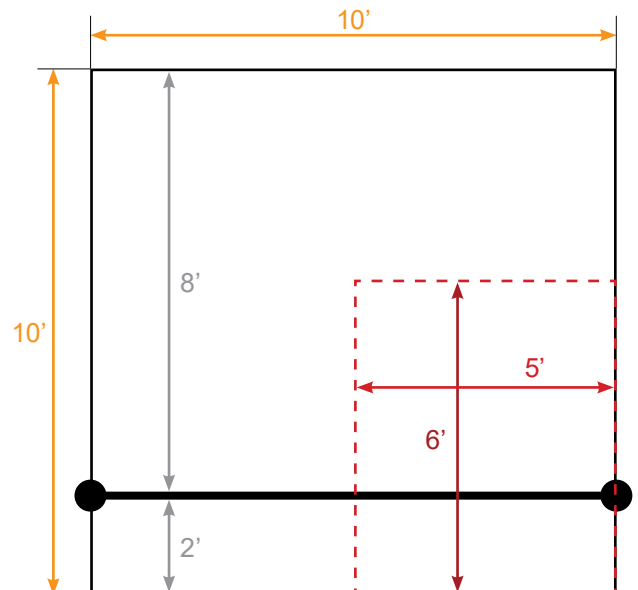
TRIBUTARY AREA | The tributary area is the portion of the deck surface area that bears its mass on top of an individual footing. To calculate the tributary area of an individual footing, find the midway point between the footing and the nearest bearing point on each side (typically another footing or ledger). In the case of a cantilever, include the entire cantilever area.

EXAMPLE:

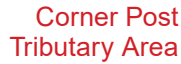
For a 10' x 10' deck with two footings and a 2' joist cantilever, the tributary area for each footing is 5' x 6' = 30ft²

5' is half the distance between the footings: $[10' \div 2 = 5']$

6' is half the distance between the beam and the ledger, plus the entire cantilever: $[(8' \div 2) + 2' = 6']$



Reference diagram for Table R507.3.1 and Table R507.4



Interior Post Tributary Area

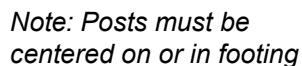
#2 *Post Size | Do the plans show the post size in compliance with Table R507.4?*

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

a) Measured to the underside of the beam. b) Based on 40 psf live load. c) The maximum permitted height is 8 feet for one-ply and two-ply beams. The maximum permitted height for three-ply beams on post cap is 6 feet 9 inches.

#3 *Post-to-Footing | Do the plans show the post-to-footing connection in compliance with Figure R507.3?*

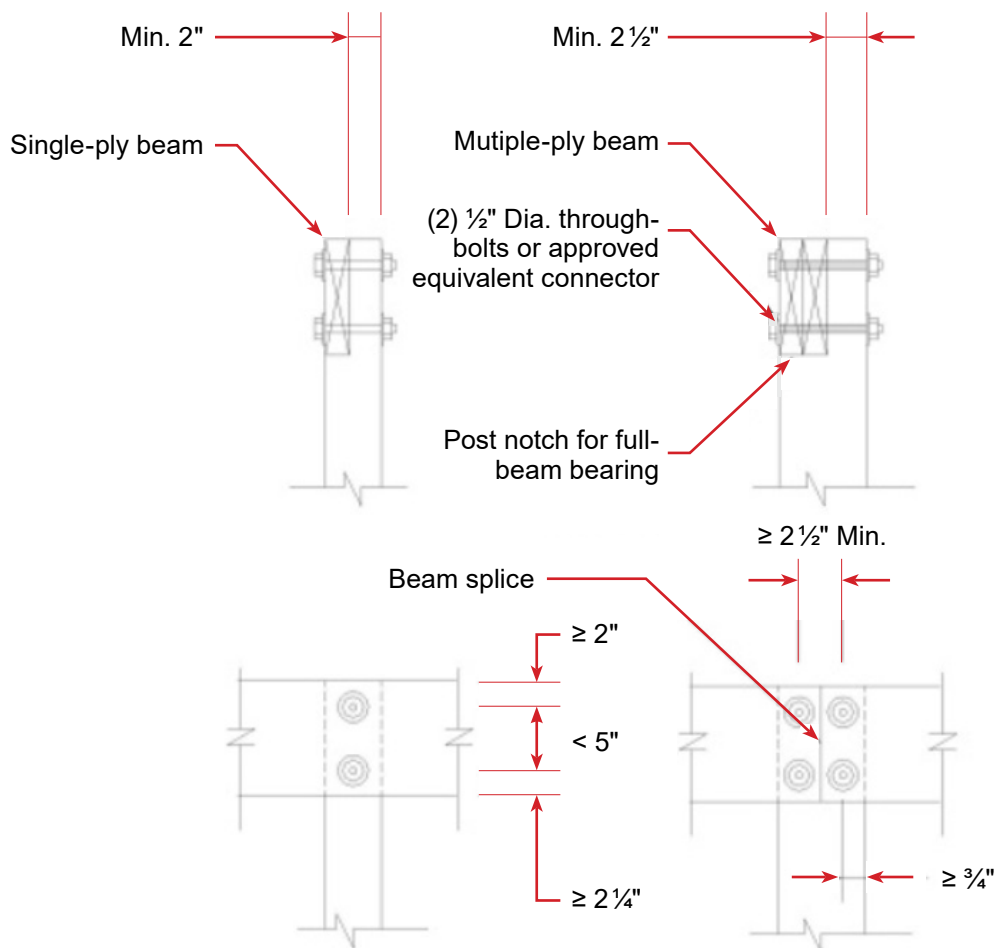
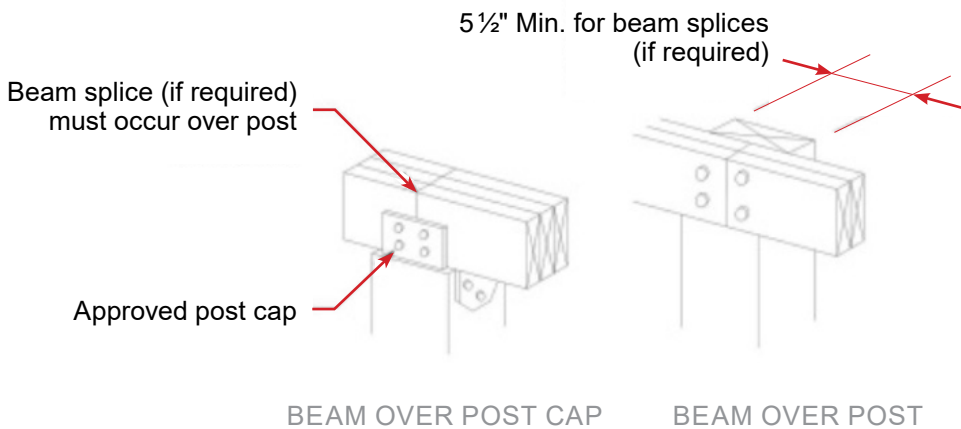
The post-to-footing connection must comply with one of the six examples in *Figure R507.3 Deck Posts to Deck Footing Connection*—which is copied below.



Beam-to-Post | Do the plans show the beam-to-post connection in compliance with Figure R507.5.1(1) and Figure R507.5.1(2)?

The deck-to-beam connection must comply with one of the examples shown in *Figure R507.1(1) Deck Beam to Deck Post* and *Figure R507.5.1(2) Notched Post-to-Beam Connection*—copied below, respectively.

For SI: 1 inch = 25.4 mm



Joists | Do the plans show the joist size, span, and spacing in compliance with Table R507.6?

The joist size, spacing, and span must comply with *Table R507.6 Deck Joist Spans for Common Lumber Species (ft.-in.)*—the most relevant section of which is copied below. Consult the IRC for additional snow loads and lumber species.

Species ^a	Size	ALLOWABLE JOIST SPAN ^b			MAXIMUM CANTILEVER ^{c,f}		
		Spacing of Deck Joists (in.)			Spacing of Deck Joists with Cantilevers ^c (in.)		
		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

a) Ground snow load—live load = 40 psf, dead load = 10 psf, $L/\Delta = 360$ at main span, $L/\Delta = 180$ at cantilever with 220-pound point load applied at the end. b) Beams supporting deck joists from one side only. c) No. 2 grade—wet service factor included. d) Beam depth shall be greater than or equal to depth of joists with 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.

Beam(s) | Do the plans show the beam(s) size and span in compliance with Table R507.5?

The size of all beams must comply with *Table R507.5*—the section for Southern Pine lumber is shown below. For other lumber species, consult the IRC. It is important to note footnote *b*: *Table R507.5* can only be used to size beams with joists on one side of the beam. If utilizing an engineered wood product for the beam—such as LVL, PSL, Glulam, Paralam, etc.—loading data must be provided to show the beam is appropriately sized. The lumber company may be able to provide this information.

Species ^c	Size ^d	DECK JOIST SPAN LESS THAN OR EQUAL TO (FT.)						
		6	8	10	12	14	16	18
Southern Pine	1—2x6	4-11	4-0	3-7	3-3	3-0	2-10	2-8
	1—2x8	5-11	5-1	4-7	4-2	3-10	3-7	3-5
	1—2x10	7-0	6-0	5-5	4-11	4-7	4-3	4-0
	1—2x12	8-3	7-1	6-4	5-10	5-5	5-0	4-9
	2—2x6	6-11	5-11	5-4	4-10	4-6	4-3	4-0
	2—2x8	8-9	7-7	6-9	6-2	5-9	5-4	5-0
	2—2x10	10-4	9-0	8-0	7-4	6-9	6-4	6-0
	2—2x12	12-2	10-7	9-5	8-7	8-0	7-6	7-0
	3—2x6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
	3—2x8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
	3—2x10	13-0	11-3	10-0	9-2	8-6	7-11	7-6
	3—2x12	15-3	13-3	11-10	10-9	10-0	9-4	8-10

a) Ground snow load—live load = 40 psf, dead load = 10 psf, $L/\Delta = 360$ at main span, $L/\Delta = 180$ at cantilever with 220-pound point load applied at the end. b) Beams supporting deck joists from one side only. c) No. 2 grade—wet service factor included. d) Beam depth shall be greater than or equal to depth of joists with 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.

Ledger Connection to Wood Band Joist | Do the plans show the ledger connection in compliance with R507.9.1.3?

Use Table R507.9.1.3(1) Deck Ledger Connection to Band Joist for lag screw (AKA: lag bolt) and through-bolt spacings. Use Table R507.9.1.3(2) Placement of Lag Screws and Bolts in Deck Ledgers and Band Joists for lag screw or through-bolt placement. Do not use this table for proprietary screws, such as FastenMaster LedgerLoks, or Simson Strong-Tie SDS screws. Consult the **manufacturers' installation instructions*** for the spacing between LedgerLoks and SDS screws. Both LedgerLoks and SDS screws require more screws and closer spacing than is shown in Table R507.9.1.3(1) for the ½-inch diameter lag screws. *Note: Ledger connections to masonry require different fasteners and may require an engineered design, depending on the specifics of the masonry.*

Table R507.9.1.3(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" diameter lag screw with ½" maximum sheathing ^{c,d}	30	23	18	15	13	11	10
½" diameter bolt with ½" maximum sheathing ^d	36	36	34	29	24	21	19
½" diameter bolt with 1" maximum sheathing ^e	36	36	29	24	21	18	16

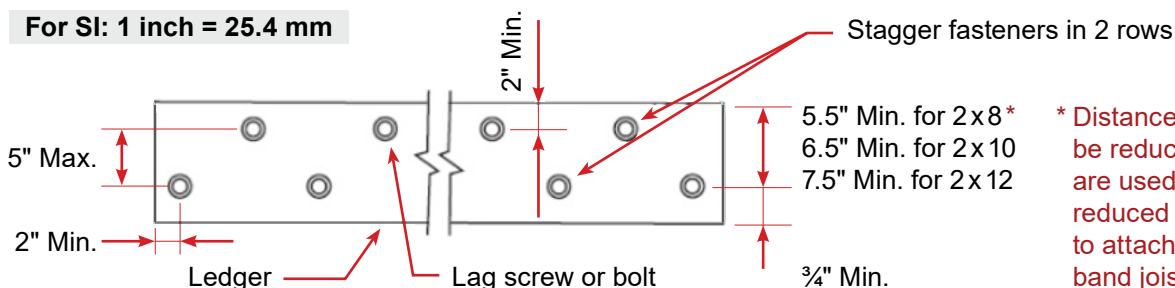
a) Ledgers shall be flashed in accordance with R703.4 to prevent water from contacting the house band joist. b) Snow load shall not be assumed to act concurrently with live load. c) The tip of the lag screw shall fully extend beyond the inside face of the band joist. d) Sheathing shall be wood structural panel or solid sawn lumber. e) Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber, or foam sheathing. Up to ½-inch thickness of stacked washers shall be permitted to substitute for 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" ^d	¾"	2" ^b	1 ⅝" ^b
Band Joist ^c	¾"	2"	2" ^b	1 ⅝" ^b

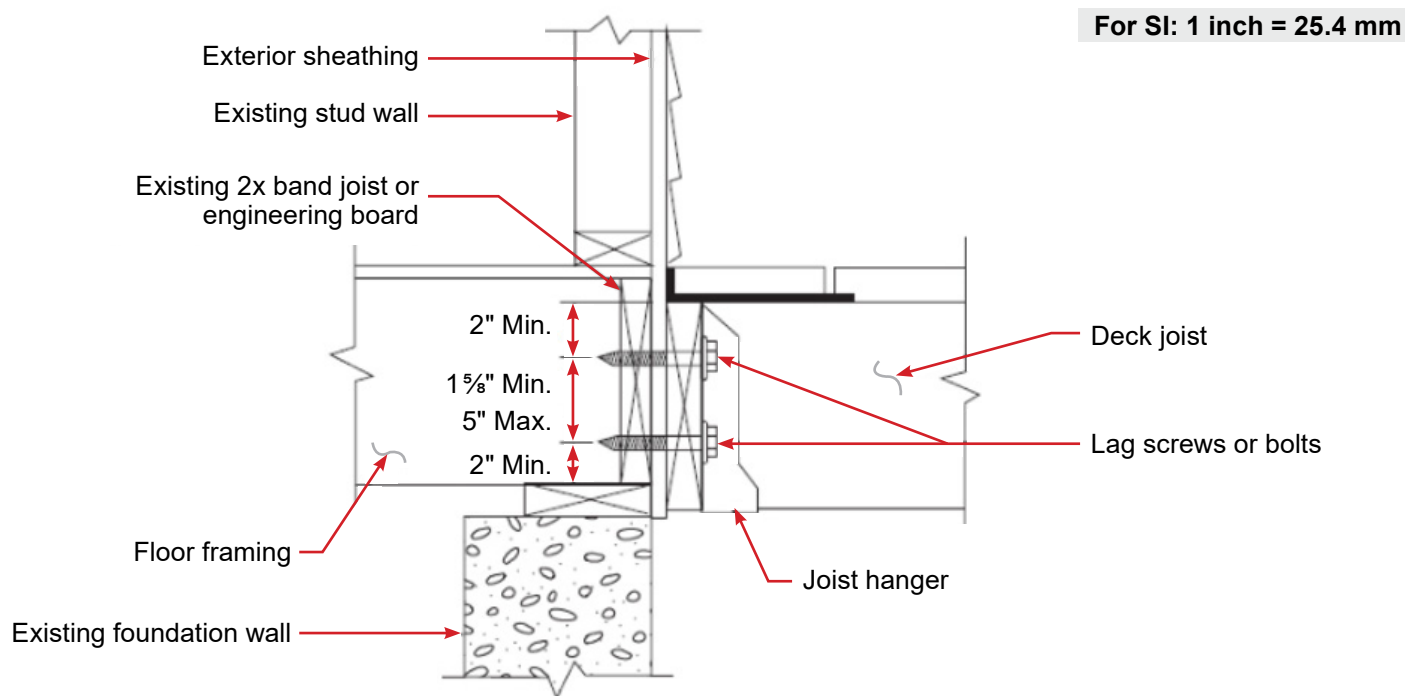
a) Lag screws or bolts shall be staggered from top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.9.1.3(1). b) Maximum 5 inches. c) For engineered rim joists, the manufacturer's recommendations shall govern. d) The minimum distance from bottom row of lag screws or bolts to the top edge of the ledger shall be in accordance with Figure R507.9.1.3(1).

Figure R507.9.1.3(1) Placement of Lag Screws and Bolts in Ledgers



* Distance shall be permitted to be reduced to 4.5" if lag screws are used or bolt spacing is reduced to that of lag screws to attach 2x8 ledgers to 2x8 band joists.

Figure R507.9.1.3(2) Placement of Lag Screws and Bolts in Band Joists



FastenMaster LedgerLok:

<https://d3g5z6m6vcoqo2.cloudfront.net/resources/LL1-LedgerLOK-Deck-Ledger-to-Rim-Board.pdf>

LIVE LOAD	LEADER MATERIAL	RIB BOARD TYPE	SPACING BETWEEN FASTENERS (IN) BY MAXIMUM OPEN JOIST SPAN					
			6:1	8:1	12:1	16:1	18:1	
40	D FR S FINE	ZKLLWRN	24	18	14	12	10	8
		EW RNM	25	19	15	12	10	9
	HEM FR SFF	ZKLLWRN	20	15	12	10	8	7
		EW RNM	25	19	15	12	10	9
60	D FR S FINE	ZKLLWRN	17	13	10	9	7	6
		EW RNM	18	13	10	9	7	6
	HEM FR SFF	ZKLLWRN	14	11	9	7	6	5
		EW RNM	18	13	10	9	7	6

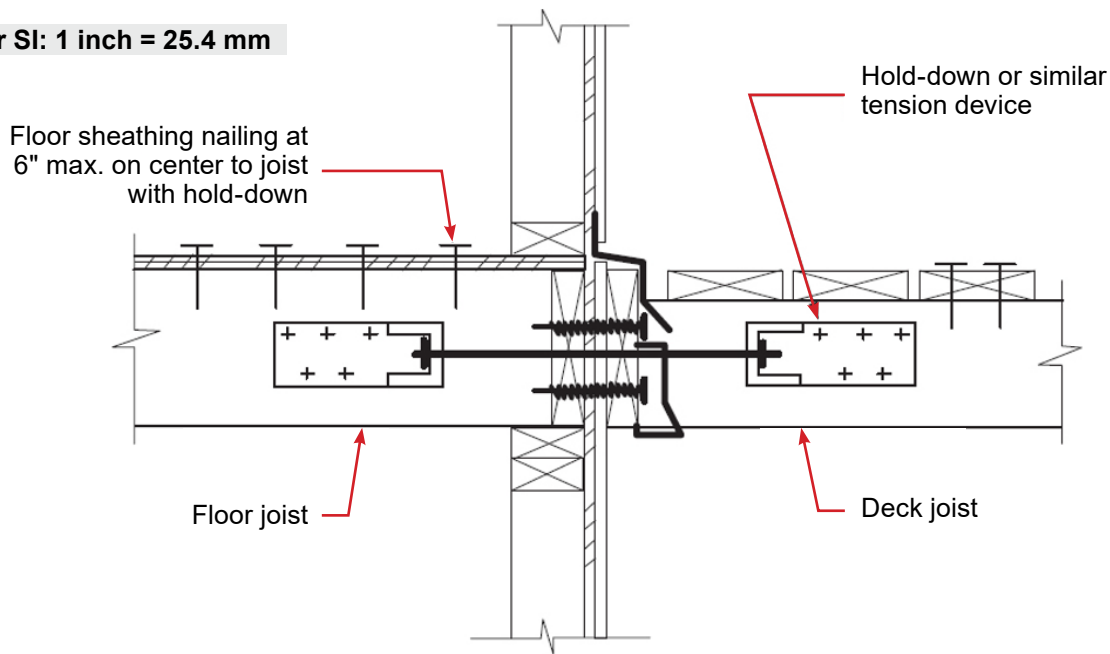
Simpson Strong-Tie SDS:

https://www.strongtie.com/strongdrive_exteriorwoodscrews/sds_screw/p/strong-drive-sds-heavy-duty-connector-screw

Lateral Load Protection | Where supported by attachment to an exterior wall, does the deck have lateral load protection in compliance with R507.9.2?

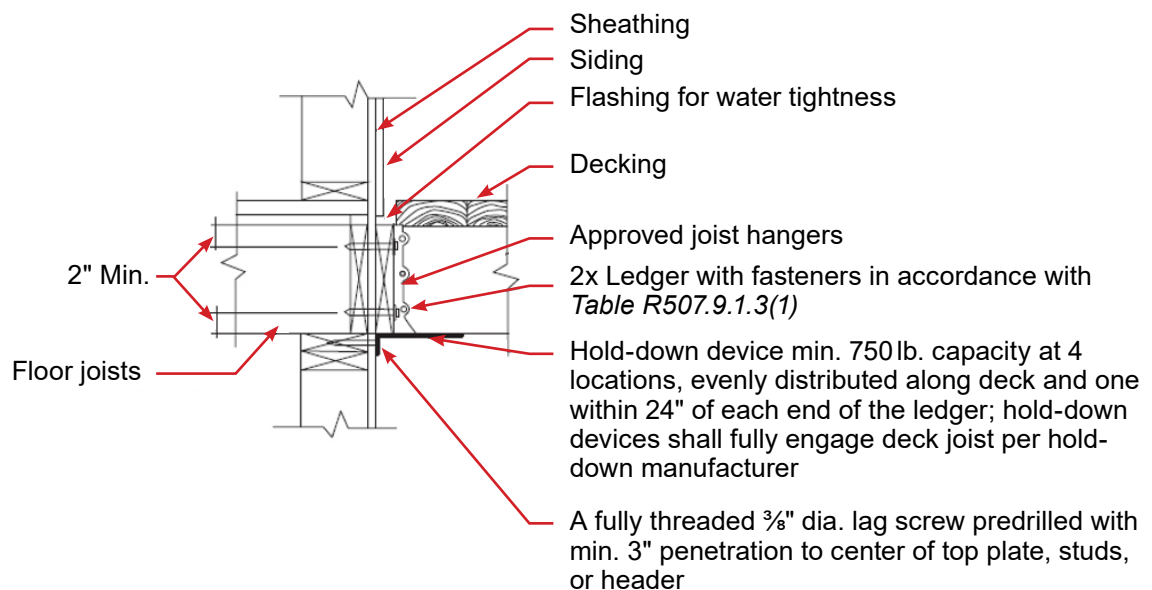
The code requires decks that are supported by attachment to an exterior wall to be positively anchored to the floor framing of the primary structure. The code provides two prescriptive attachment methods in *Figure R507.9.2(1) Deck Attachment for Lateral Loads* and *Figure R507.9.2(2) Deck Attachment for Lateral Loads*, respectively. Where utilizing *Figure R507.9.2(1)* to provide the required lateral load protection, hold-down tension devices must be installed in not less than two locations per deck, within 24 inches of each end of the deck. Where utilizing *Figure R507.9.2(2)* to provide the required lateral load protection, hold-down tension devices must be installed in not less than four locations per deck. Where not utilizing *Figure R507.9.2(1)* or *Figure R507.9.2(2)*, the deck plans must be signed and sealed.

For SI: 1 inch = 25.4 mm



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

Note: This detail is applicable where floor joists are parallel to deck joists.



#9

Guardrail Post Connection | Do the plans show how the guardrail posts are connected to comply with the load requirements of a 200 psf minimum?

Guardrail posts may not be notched. Where guardrail posts are connected to the interior or exterior side of a deck joist or beam, the joist or beam must be connected to the adjacent joists to prevent rotation of the joist or beam. Where guardrail posts are mounted on top of the decking, the guardrail posts must be connected to the deck framing or blocking and installed in accordance with the manufacturer's installation instructions to transfer the guardrail loads to the adjacent joists.

#10

Stairs | Do the plans show tread depth and riser height in compliance with PA UCC §403.21(7)?

The maximum riser height is 8 1/4". The riser height is to be measured vertically between leading edges of the adjacent treads—there may be no more than a 3/8" variation in riser height within a flight of stairs. The minimum tread depth is 9" measured from tread nosing to tread nosing—the greatest tread depth within any flight of stairs may not exceed the smallest by more than 3/8". Treads may have a uniform projection of not more than 1 1/2" when solid risers are used.



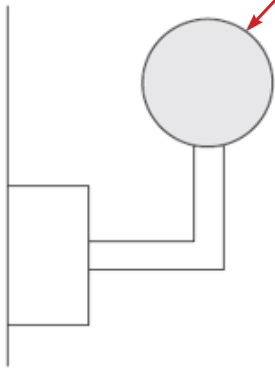
Stair flights of four or more risers require a handrail on at least one side of the entire flight of stairs. Handrail grips must comply with one of the three figures below.

Figure R311.7.8.3(1) Type I Handrail

For SI: 1 inch = 25.4 mm

CIRCULAR HANDRAIL

Handrail with circular 1 ¼" min. / 2" max. dia.



NONCIRCULAR HANDRAIL

Handrail that is not circular must have a perimeter of 4" min. / 6 ¼" max. with a max. cross section dimension of 2 ¼"

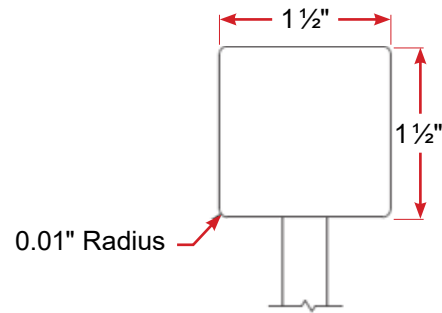
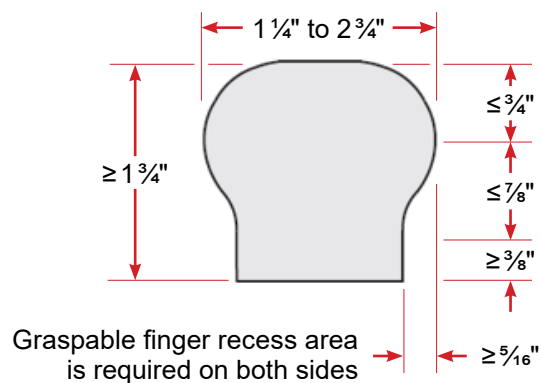


Figure R311.7.8.3(2) Type II Handrail

For SI: 1 inch = 25.4 mm

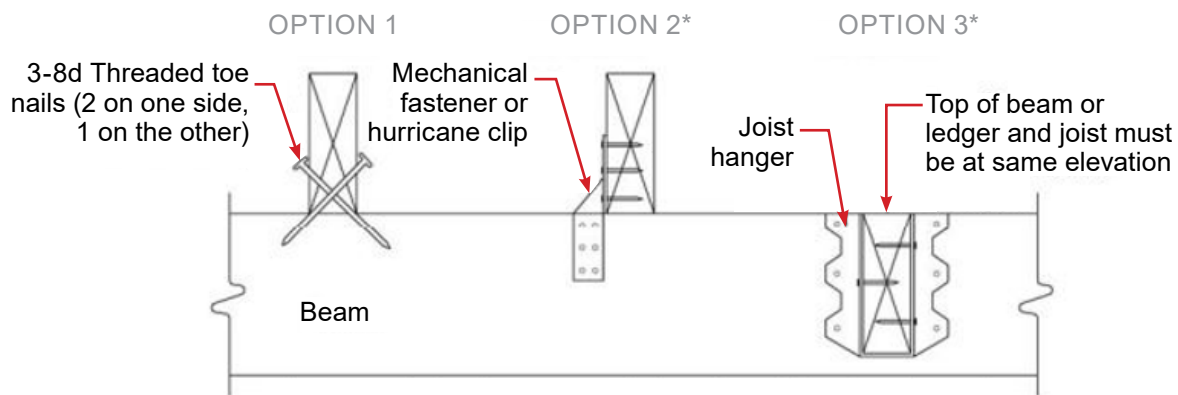
Handrail perimeter > 6 ¼"



BEST PRACTICES AS DEFINED BY THE 2015 AWC DECK GUIDE:

Joist-to-Beam Connection

Does your joist-to-beam connection follow one of the methods listed in *Figure 6 Joist-to-Beam Detail*?



*See manufacturer's recommendations for additional requirements

Prohibited Connections

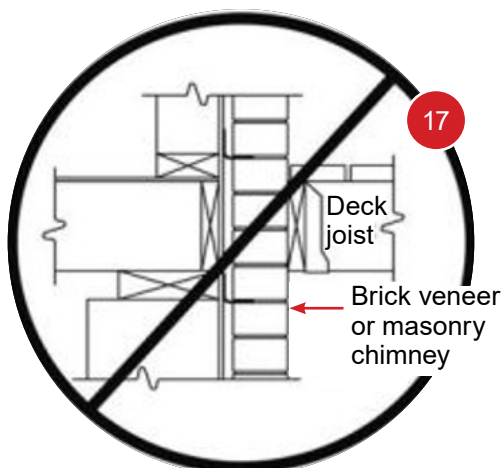
Does your deck construction take into account the prohibited connections as defined in *Figure 17 No Attachment to or Through Exterior Veneers (Brick, Masonry, Stone)* and *Figure 18 No Attachment to House Overhang with Ledger*?

Prescriptive Residential Wood Deck Construction Guide

15

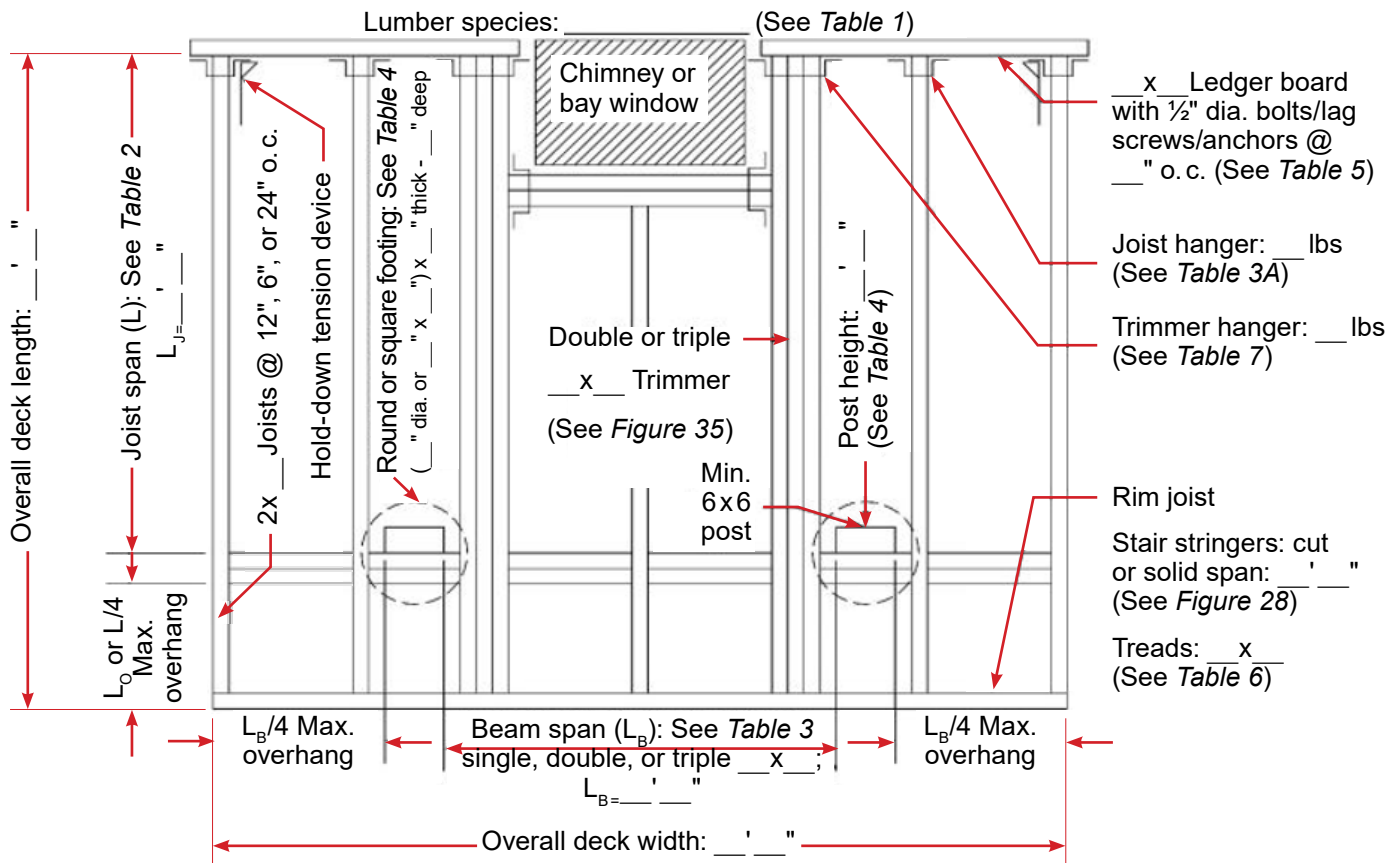
Prohibited Ledger Attachments

Attachments to exterior veneers (brick, masonry, stone), hollow masonry, and to cantilevered floor overhangs or bay windows are prohibited (see *Figures 17 and 18*). In such cases, the non-ledger deck is required (see NON-LEDGER DECKS).



Framing Around Chimneys and Bay Windows

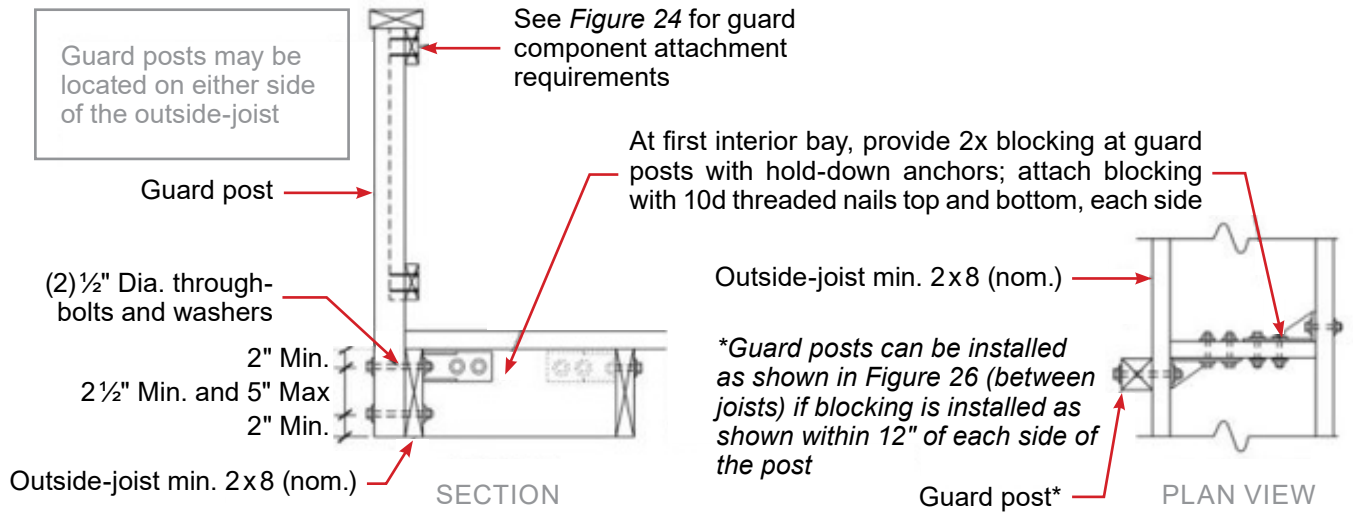
Does your deck construction around chimneys and bay windows follow the method in *Figure 5 Typical Deck Framing Plan*?



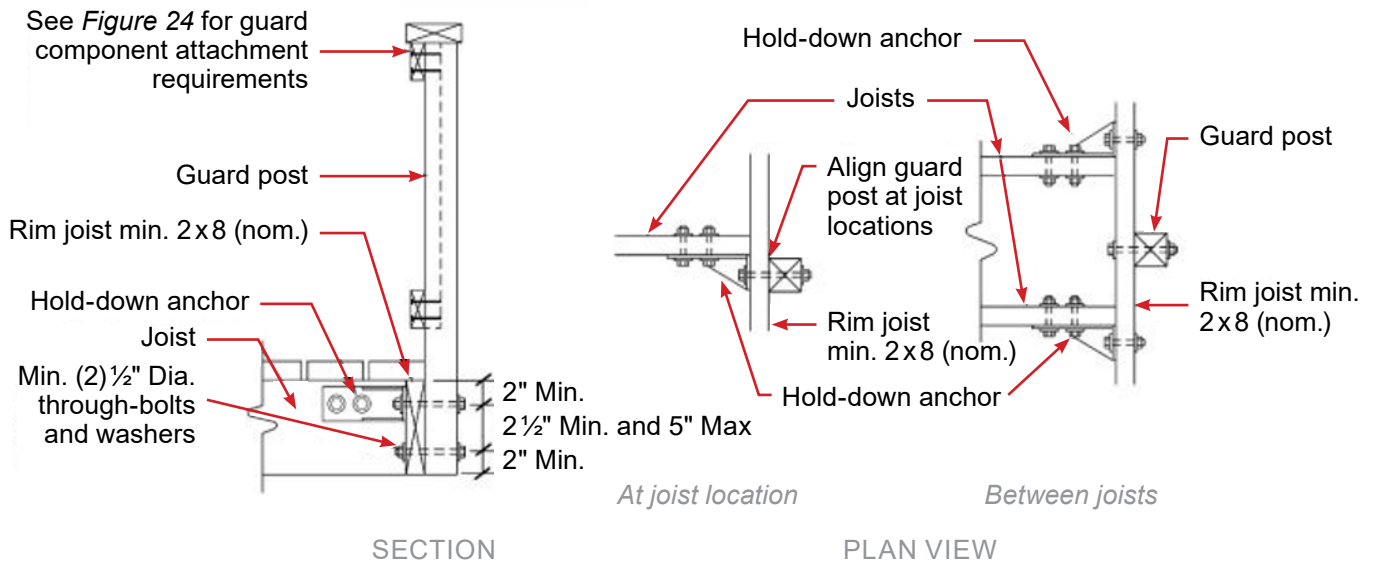
AMERICAN WOOD COUNCIL

Guard Posts

Do your guard posts connect to the joist system as defined in *Figure 25 Guard Post to Outside-Joist Example (top)* or *Figure 26 Guard Post to Rim Joist Example (bottom)*?

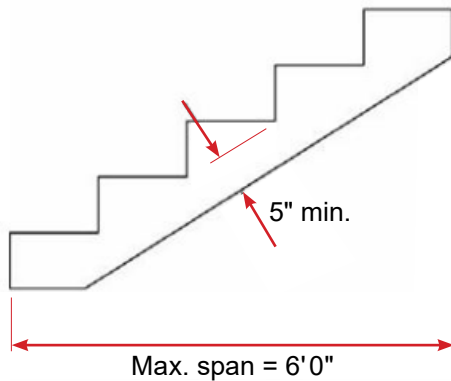


Alternate attachment of hold-down anchors to framing members possible per manufacturer's instructions

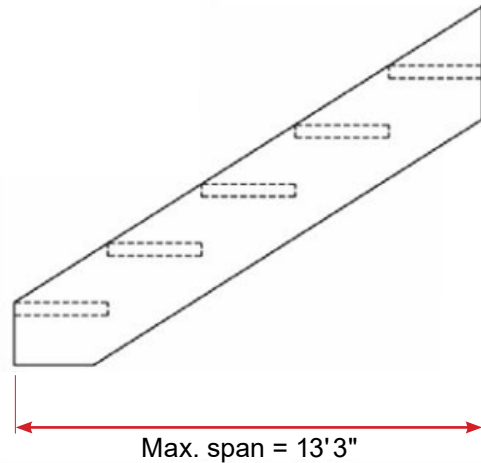


Stringers

Does your stringer design follow one of the following methods as displayed in *Figure 28 Stair Stringer Requirements*?



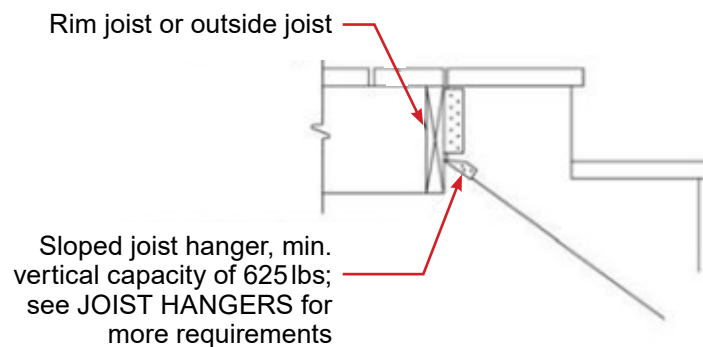
CUT STRINGER



SOLID STRINGER

Stringer Attachment

Does your stringer attach to the rim joist as shown in *Figure 31 Stair Stringer Attachment Detail*?



ATTACHMENT WITH HANGERS

Tread Connection

Do your treads connect to the stringers as shown in *Figure 29 Tread Connection Requirements*?

Attachment per tread at each stringer or ledger:

2x_ or 5/4 treads | (2) 8d threaded nails or (2) #8 screws $\geq 2\frac{1}{2}$ " long

3x_ treads | (2) 16d threaded nails or (2) #8 screws $\geq 3\frac{1}{2}$ " long

