

Deck Tip Sheet

This tip sheet reflects code requirements of the 2021 International Residential Code (IRC) with Washington State Amendments.

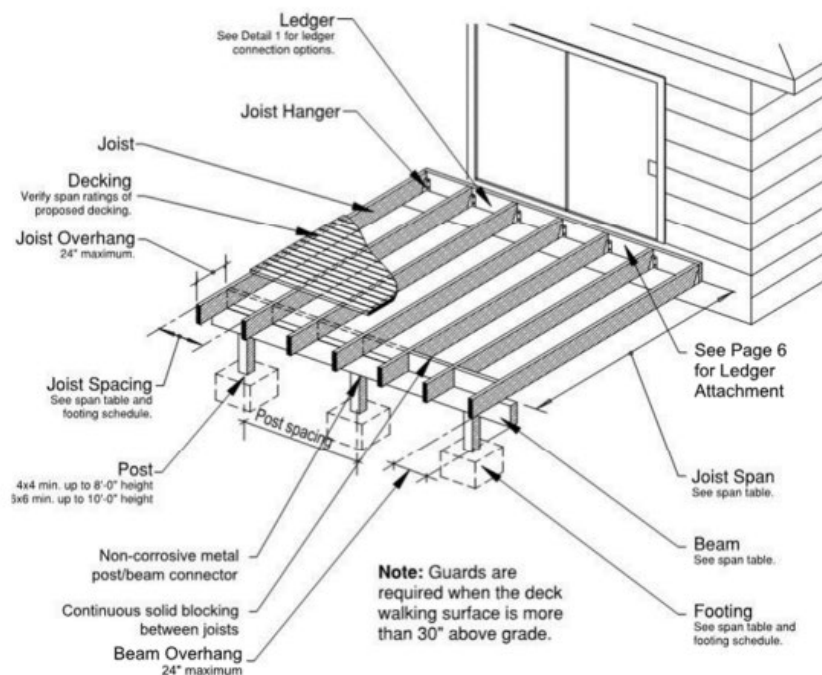
Deck Permit Requirements Pursuant to 2021 IRC R105.1

- Deck meets or exceeds 200 Square Feet in size.
- Deck meets or exceeds 30 inches in height above grade at any point.
- Attached directly to the dwelling or structure.
- Serves as the exit door required by 2021 IRC Section R311.4.

Typical Deck

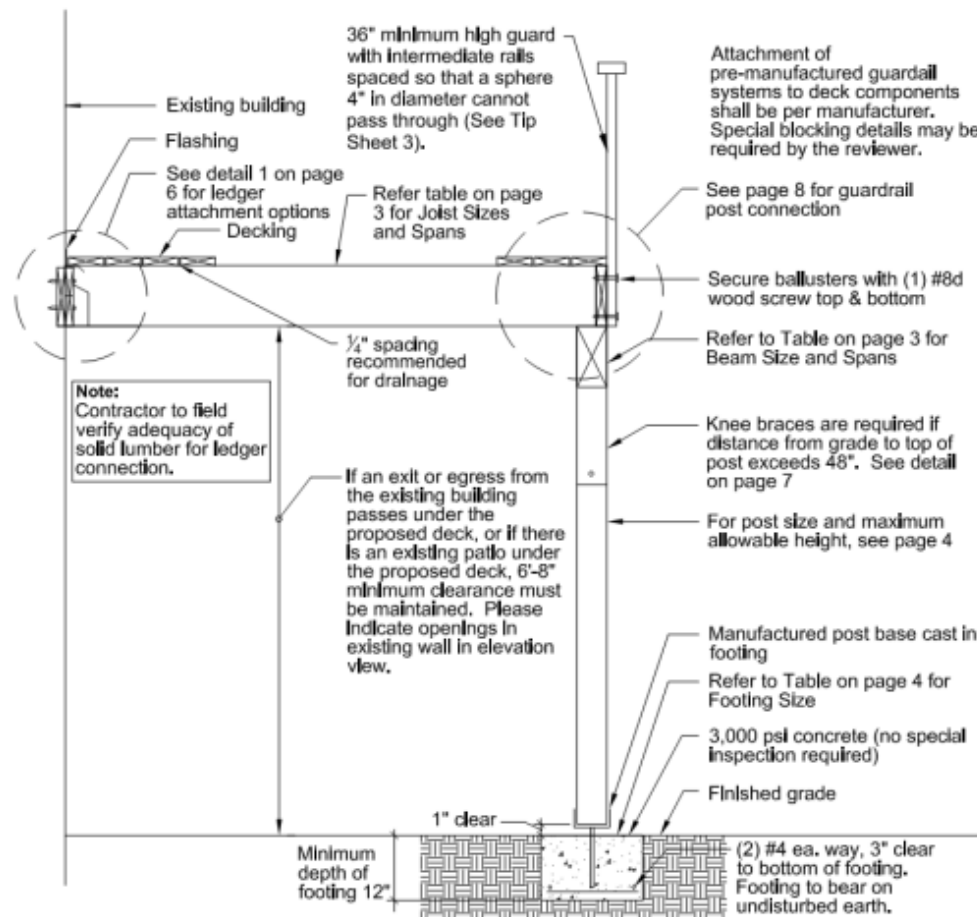
This document provides building code information applicable to prescriptive residential wood deck design. You may need to hire a licensed architect or engineer to design a deck where any of the following conditions apply:

- The deck serves other than a one or two-family dwelling.
- The deck design includes more than one level.
- The deck will support a hot tub, spa, or other heavy object (Heavy Decking or Pavers)
- The walking surface is more than 14 feet above grade.
- The deck ledger is attached to the house overhangs bay windows, bricks, stone, or a vertical concrete block wall.
- The deck is self-supporting (not attached to exterior wall).



Deck Construction Notes

- Design loads for decks is based on 60 pounds per square feet (PSF) live load, 10 PSF dead load, and 1500 PSF soil-bearing capacity.
- All wood must be pressure treated or naturally resistant to decay. Treat cuts, holes, and notches with end cut solution.
- Fasteners, hangers, nails, etc., must be stainless steel, hot dipped galvanized, or as specifically required for the specified wood preservative used. The coating weights for zinc coated fasteners are to be in accordance with ASTM A 153.
- You may modify any components of this Tip Sheet using accepted engineering practices. Any modifications must be reviewed prior to permit issuance and all attachments must be per manufacture's installation instructions.





Sizing of Structural Elements

When using the tables below, interpolation is allowed, extrapolation is not allowed.

Maximum Deck Joist Span ^{a,c}											
Joist Size	Joist Spacing ^b (inches)			Joist Back Span							
	12	16	24	4	6	8	10	12	14	16	18
	Allowable Joist Span			Maximum Cantilever (feet-inches)				Adjacent Joist Span (feet)			
2x6	7-11	7-1	5-9	1-0	1-6	NP	NP	NP	NP	NP	NP
2x8	10-5	9-5	7-8	1-0	1-6	2-0	2-1	NP	NP	NP	NP
2x10	13-3	11-6	9-5	1-0	1-6	2-0	2-6	2-8	NP	NP	NP
2x12	15-5	13-4	10-11	1-0	1-6	2-0	2-6	3-0	3-3	NP	NP

a. Includes Incising Factor.

b. When using composite decking, refer to manufacturer's installation instructions for maximum spacing of joists.

c. Spans based on Doug Fir-Larch, Hem Fir and Spruce-Pine-Fir, No. 2 grade, wet service factor.

Minimum Beam Size							
Beam Size ^{c,d,e}	Deck Joist Span (feet)						
	6	8	10	12	14	16	18
	Maximum Beam Span ^{a,b,d} (feet-inches)						
4x6	5-2	4-6	4-0	3-5	3-1	2-10	2-7
4x8	6-11	6-0	5-3	4-7	4-1	3-8	3-5
4x10	8-5	7-4	6-6	5-10	5-2	4-9	4-5
4x12	9-10	8-6	7-7	6-11	6-4	5-9	5-4
6x6	6-6	5-7	5-0	4-7	4-2	3-9	3-5
6x8	8-8	7-6	6-8	6-1	5-6	5-0	4-7
6x10	10-7	9-2	8-2	7-6	6-11	6-4	5-10
6x12	12-4	10-8	9-7	8-9	8-1	7-7	7-1

a. Spans based on Doug Fir-Larch, Hem Fir and Spruce-Pine-Fir, No. 2 grade, wet service factor.

b. If 2x built up beams to make 4x or 6x beams, they shall be fastened with two rows of 10d (3-inch × 0.128-inch) nails minimum at 16 inches on center along each edge (507.5)

c. Beam depth shall be equal to or greater than the depth of intersecting joist for a flush beam connection.

d. Beam cantilevers are limited to the adjacent beam's span divided by 4.

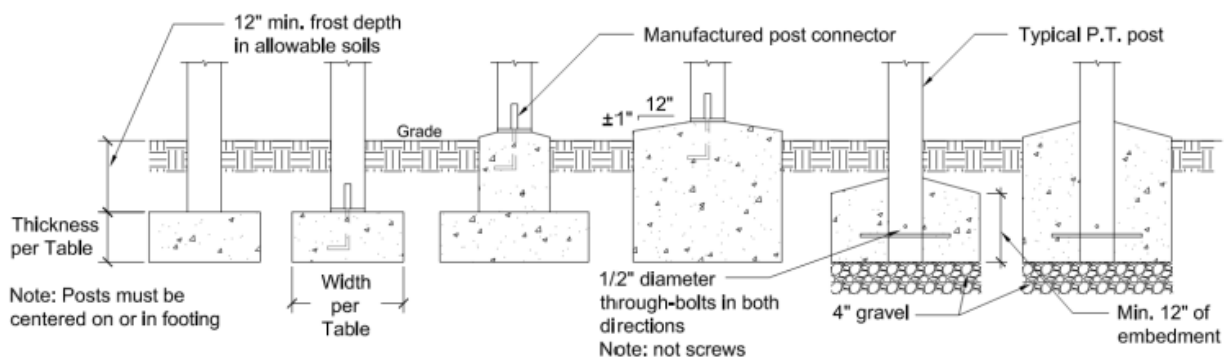
e. Includes incising factor.

Post Size b, c	Maximum Deck Post Height							
	Tributary Area ^d							
	20	40	60	80	100	120	140	160
	Maximum Deck Post Height ^{a, e} (feet-inches)							
4x4	10-0	10-0	8-7	7-0	5-8	4-1	NP	NP
4x6	14-0	13-10	11-1	9-5	8-2	7-3	6-4	5-4
6x6	14-0	14-0	14-0	14-0	14-0	13-3	10-9	6-11
8x8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0

- a. Measured from the underside of the beam to top of footing.
b. Based on Doug Fir, Hem Fir and Spruce-Pine-Fir, Number 2 grade, wet service factor.
c. Includes incising factor.
d. Area, in square feet, of deck surface supported by post and footing.
e. For fire-retardant-treated wood (exterior grade), follow the manufacturer's height specifications.

Footing Size ^a			
Tributary Area ^b	Side of Square Footing (inches)	Diameter of Round Footing (inches)	Thickness (inches)
5	7	8	6
20	12	14	6
40	18	20	6
60	21	24	8
80	25	28	9
100	28	31	11
120	30	34	12
140	33	37	13
160	35	40	15

- a. Footing dimensions shall allow complete bearing of the post.
b. Area, in square feet, of deck surface supported by post and footings.





Deck Ledger and Connections

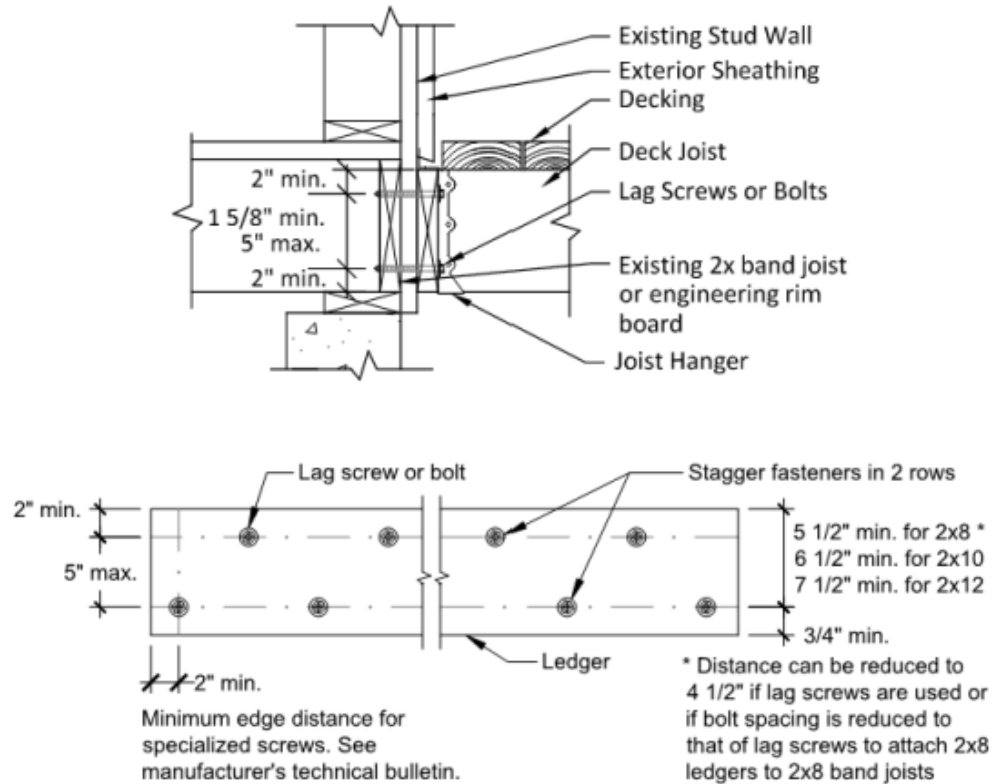
Deck Ledger Connection to Band Joist			
Joist Span ^c (feet)	On-Center Spacing of Fasteners (inches)		
	½-inch diameter lag screw with ½-inch maximum sheathing ^{b,c,e}	½-inch diameter bolt with ½-inch maximum sheathing ^c	½-inch diameter bolt screw with 1-inch maximum sheathing ^d
6	22	36	35
8	16	31	26
10	13	25	21
12	11	20	17
14	9	17	15
16	8	15	13
18	7	13	11

- a. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.
- b. The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- c. Sheathing shall be wood structural panel or solid sawn lumber.
- d. 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.
- e. For on-center spacing of specialized fasteners refer to the manufacturer's installation instructions.

Placement of Lag Screws and Bolts in Ledgers and Band Joists

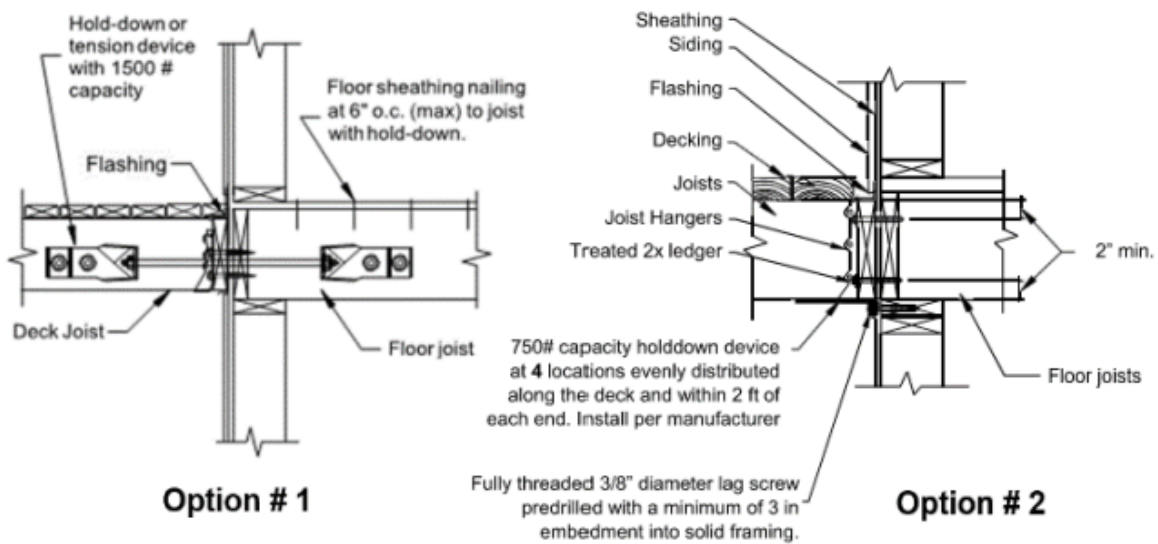
Minimum End and Edge Distance and Spacing Between Rows				
	Top Edge	Bottom Edge	Ends	Row Spacing
Ledger ^a	2 inches ^d	¾ inch	2 inches ^b	1-5/8 inches ^b
Band joist ^c	¾ inch	2 inches ^e	2 inches ^b	1-5/8 inches ^b

- a. Lag screws or bolts must be staggered from the top and bottom along the horizontal run. See figure below.
- b. Maximum 5 inches.
- c. For engineered rim joists, the manufacturer's recommendations govern.
- d. The minimum distance from the bottom row to the top edge of the ledger must be in accordance with figure below.
- e. 2 inches may be reduced to ¾-inch when the band joist is directly supported by a mudsill, header, or by double top wall plates.



Detail 1 – Ledger Attachment for Lateral Loads

(Knee braces are required on posts greater than 4 feet in height.)



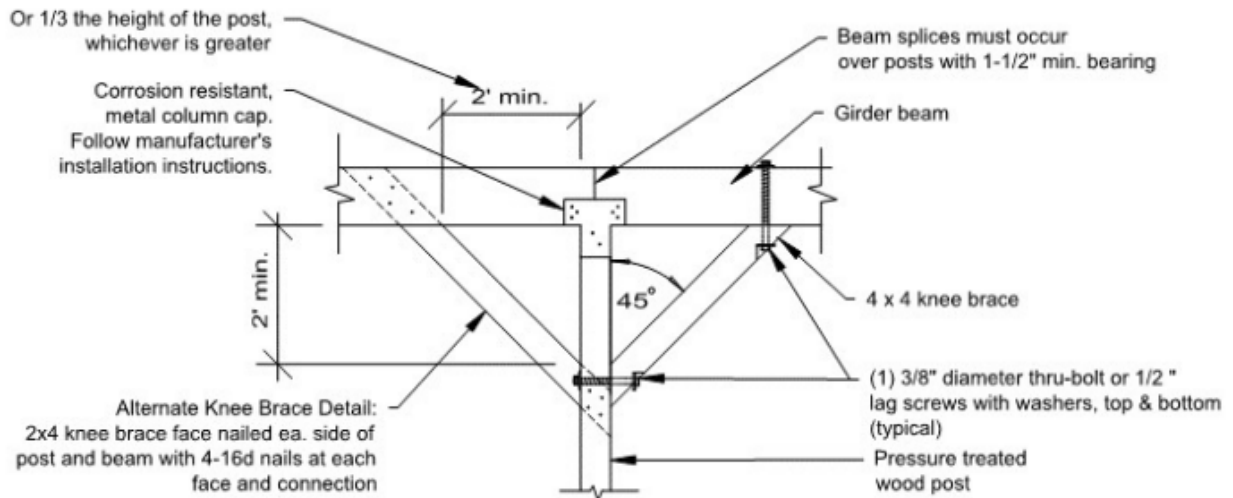
Connections and Fasteners

All fasteners, nails, bolts, screws, and connectors shall be corrosion resistant.

Type of Connection:	Notes:
Manufactured Connectors	Follow manufacturer's instructions
Post to Footing	Post base is required
Post to Footing (High Winds)	Consult with jurisdiction about additional uplift loads where wind exposure is greater than Risk Category B
Post to Beam	Connector is required
Ledger to House Framing	See information on Sheet 5 and Sheet 6
Joist to Beam or Girder	(3) 8d – Toe nailed
Blocking or Bridging to Joist	(2) 10d – Toe nailed at each end
Wooden Deck Boards	(2) 8d threaded nails <u>OR</u> (2) No. 8 screws
Composite Decking	Follow manufacturer's instructions

Post to Beam Connection with Knee Brace

(Knee braces are required on posts greater than 4 feet in height.)



Guards and Attachment

Guards are required when the deck is more than 30 inches measured vertically to the floor or grade below at any point within 36" horizontally to the edge of the open side.

