# SINGLE FAMILY RESIDENTIAL UNCOVERED DECKS AND PORCHES

## How to use this guide

Provide electronic plans and complete the following:

1. Complete this building guide
   a. Fill in the blanks on the bottom of this page and on page 13. Indicate which construction details will be used.
2. Provide electronic Auto-CAD plot plans in vector file format
   a. Please see sample site plan page 2. Show dimensions of your deck show its relationship to existing buildings or structures on the property and the distance to existing property lines, drawn to scale.
3. Fill out a building permit application
   a. The majority of permit applications are processed with little delay. The submitted documents will help determine if the project follows building safety codes, zoning codes and other applicable laws. Provide manufactures specifications for manufactured railings.



## Projections Allowed

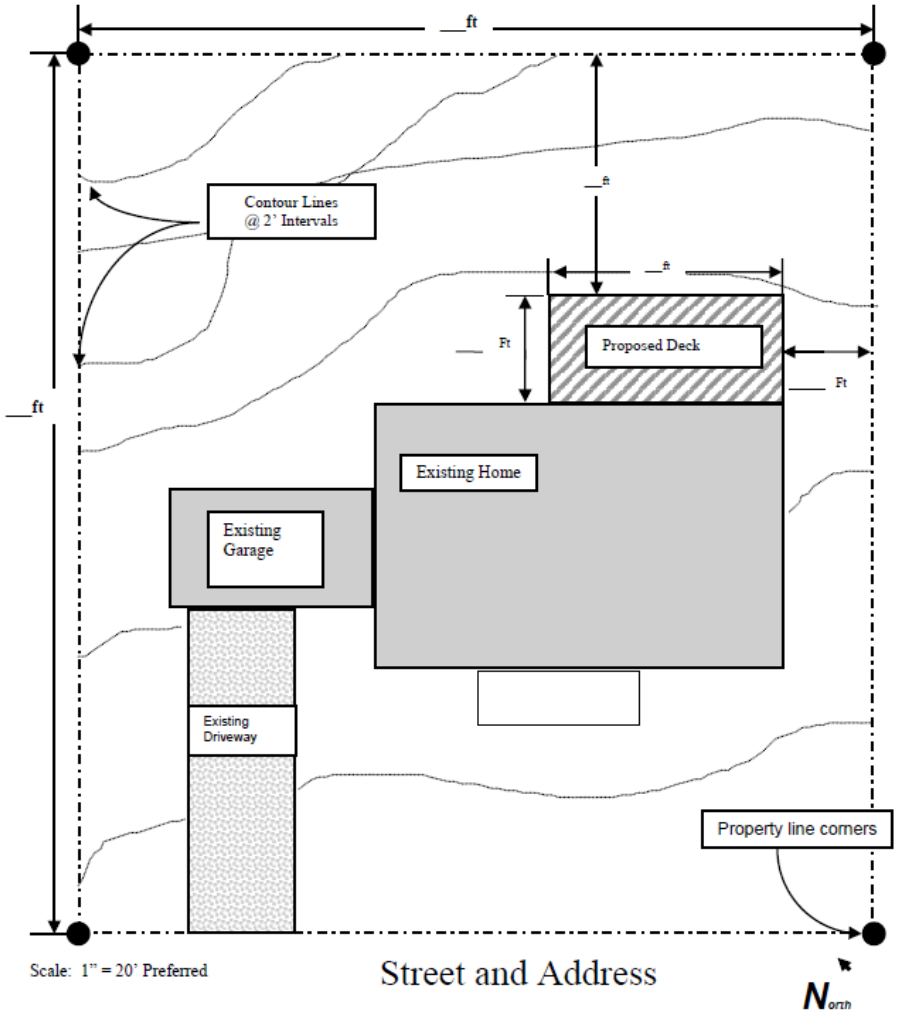
Projections may extend into required setbacks as follows:

1. Uncovered porches and decks which exceed 18 inches above the finished grade may project:
   a. Eighteen inches into interior setbacks
   b. Five feet into the front setback
   c. Five feet into the front setback
2. Uncovered porches and decks not exceeding 18 inches above the finished grade may project to the property line

## Affected Critical Areas:

☐ NONE ☐ WETLANDS ☐ STREAMS ☐ FLOOD HAZARD AREA ☐ CRITICAL AQUIFER RECHARGE AREA
☐ GEOLOGICALLY HAZARDOUS AREA ☐ FISH AND WILDLIFE CONSERVATION AREA

## Sample Site Plan



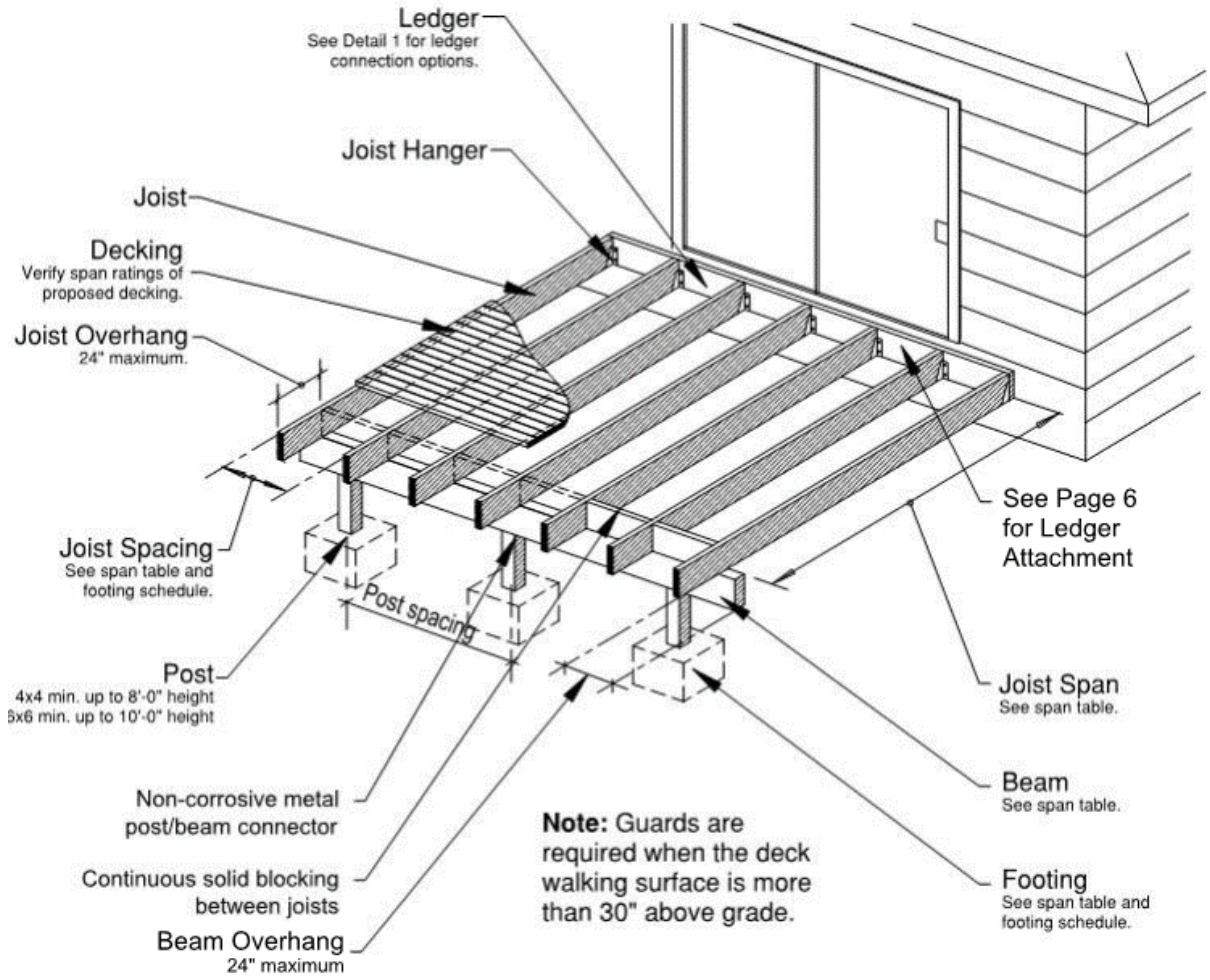
## Basic Deck

This tip sheet provides easy-to-follow deck design, compliant with the 2021 International Residential Code (IRC) with Washington State Amendments.

## 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, including heavy deck covering (such as pavers)
- The walking surface is more than 14 feet above grade
- The deck ledger is attached to house overhangs, bay windows, bricks, stone, or concrete block
- The deck is bearing on ground with a slope greater than 1 foot horizontal for every 1 foot vertical
- The deck is self-supporting (not attached to an exterior wall)

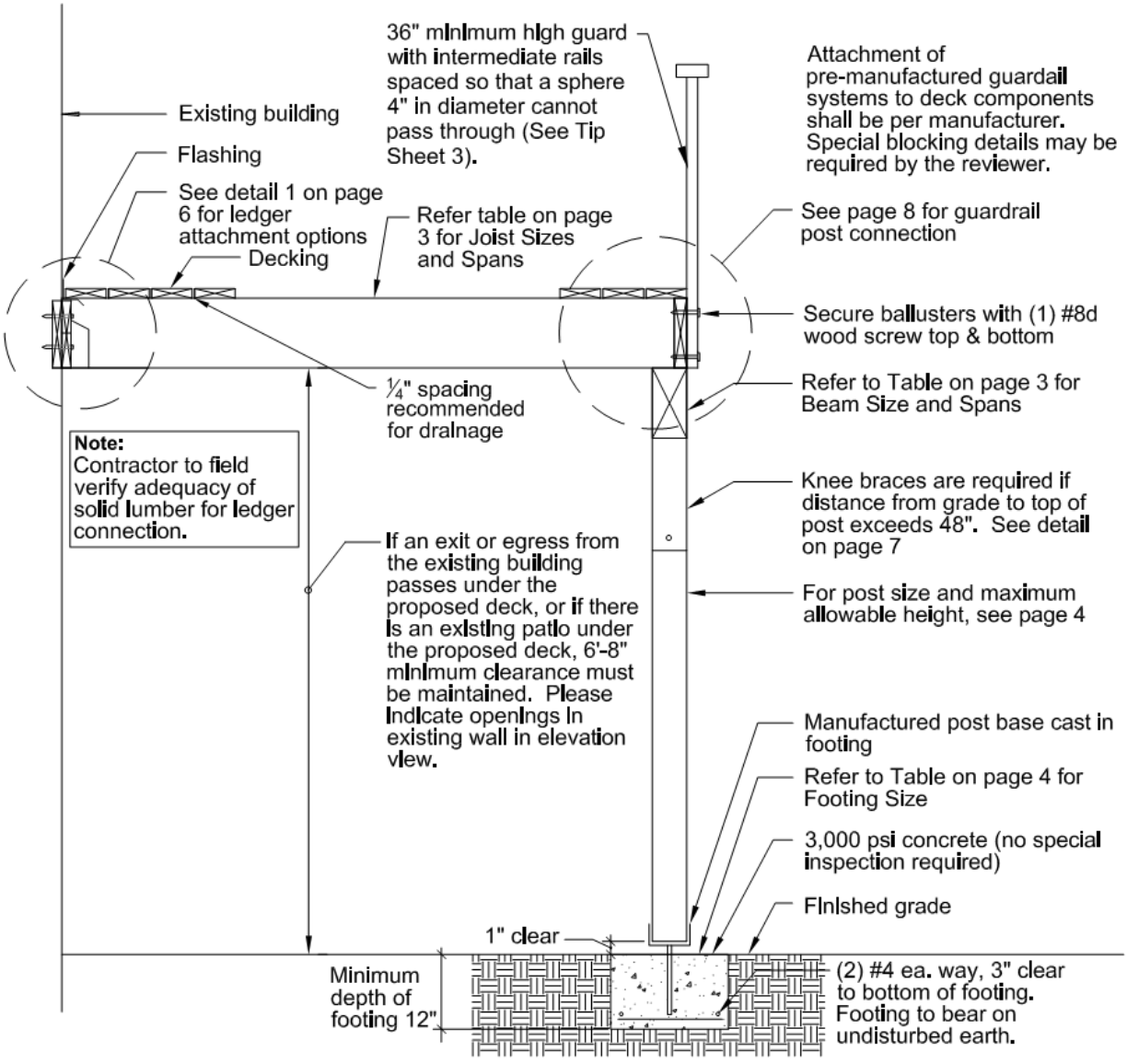





eCityGov.net
2005 © eCityGovAlliance

## Deck Construction Notes

- Design loading 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 (i.e. cedar, redwood, teak). Treat cuts, holes, and notches with end-cut solution. See Tip Sheet #11 for more information.
- 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 to be in accordance with ASTM A 153. Provide documentation to your inspector.
- You may modify any components of this tip sheet using accepted engineering practices. **Any modifications must be reviewed prior to permit issuance.**
- All attachments must be per manufacturer's installation instructions.






eCityGov.net
2005 © eCityGovAlliance

## Sizing of Structural Elements

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

| Maximum Deck Joist Span [a, c] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Joist Size | Joist Spacing (inches) [b] | | | Joist Back Span (feet) | | | | | | | |
| | 12 | 16 | 24 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| | Allowable Joist Span [d] | | | Maximum Cantilever (feet-inches) [d] | | | | | | | |
| 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 |

NP = Not Permitted
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, Number 2 grade, wet service factor.
d. For fire-retardant-treated wood (exterior grade), follow the manufacturer's span tables.

| Minimum Beam Size | | | | | | | |
|---|---|---|---|---|---|---|---|
| Beam Size [c, d, e, f] | Deck Joist Span (feet) | | | | | | |
| | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| | Maximum Beam Span [a, b, d, f] (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, Number 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 (R507.5).
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.
f. For fire-retardant-treated wood (exterior grade), follow the manufacturer's span tables.

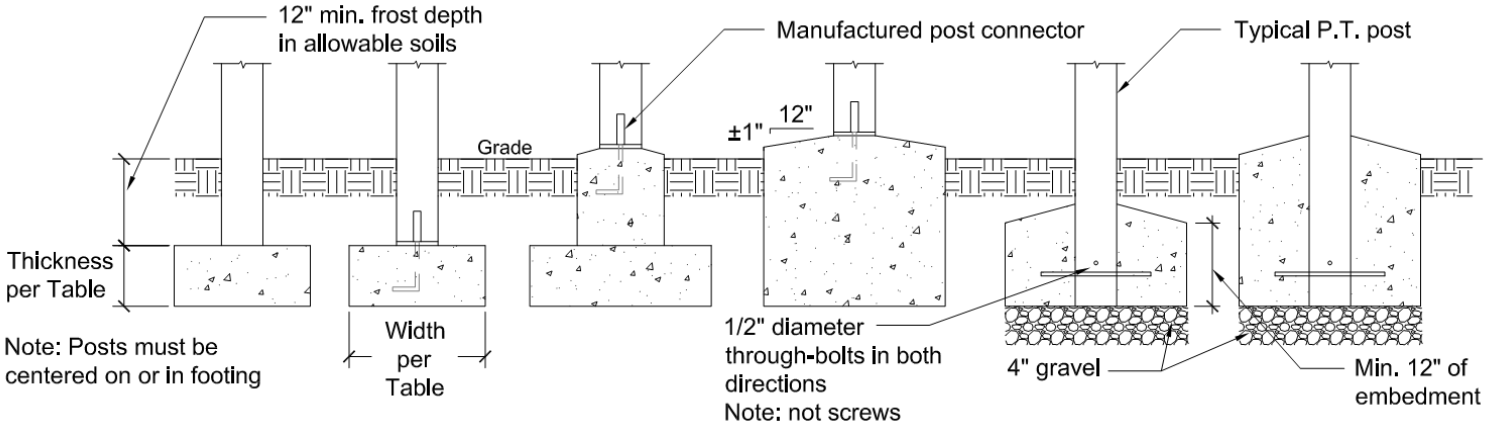

eCityGov.net
2005 © eCityGovAlliance

| 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.





eCityGov.net
2005 © eCityGovAlliance

## 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 |

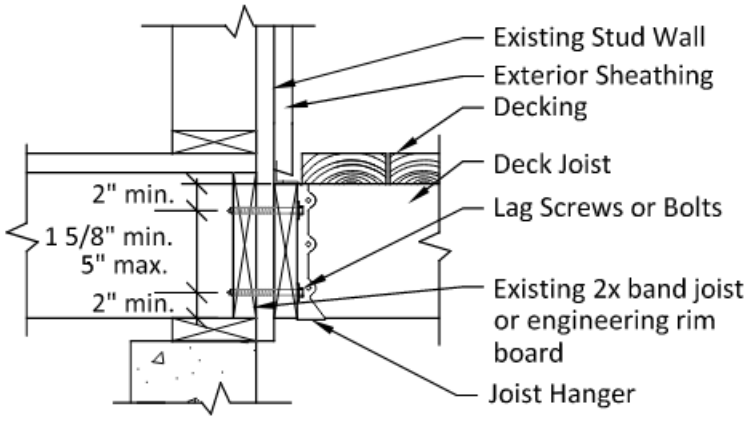
a. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.
b. The tip of the lag screw shall fully extend beyond the inside face of the band joist.
c. Sheathing shall be wood structural panel or solid sawn lumber.
d. Sheathing shall be permitted 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.

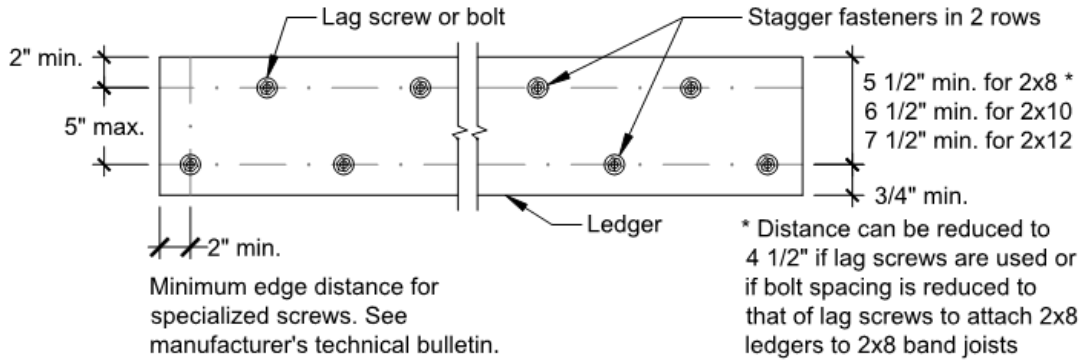
## Placement of Lag Screws and Bolts in Ledgers and Band Joists

| Minimum End and Edge Distance and Spacing Between Rows | | | | |
|---|---|---|---|---|
| | Top Edge | Bottom Edge | Ends | Row Spacing |
| Ledger [a] | 2 inches [d] | 3/4 inch | 2 inches [b] | 1-5/8 inches [b] |
| Band joist [c] | 3/4 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 3/4-inch when the band joist is directly supported by a mudsill, header, or by double top wall plates.

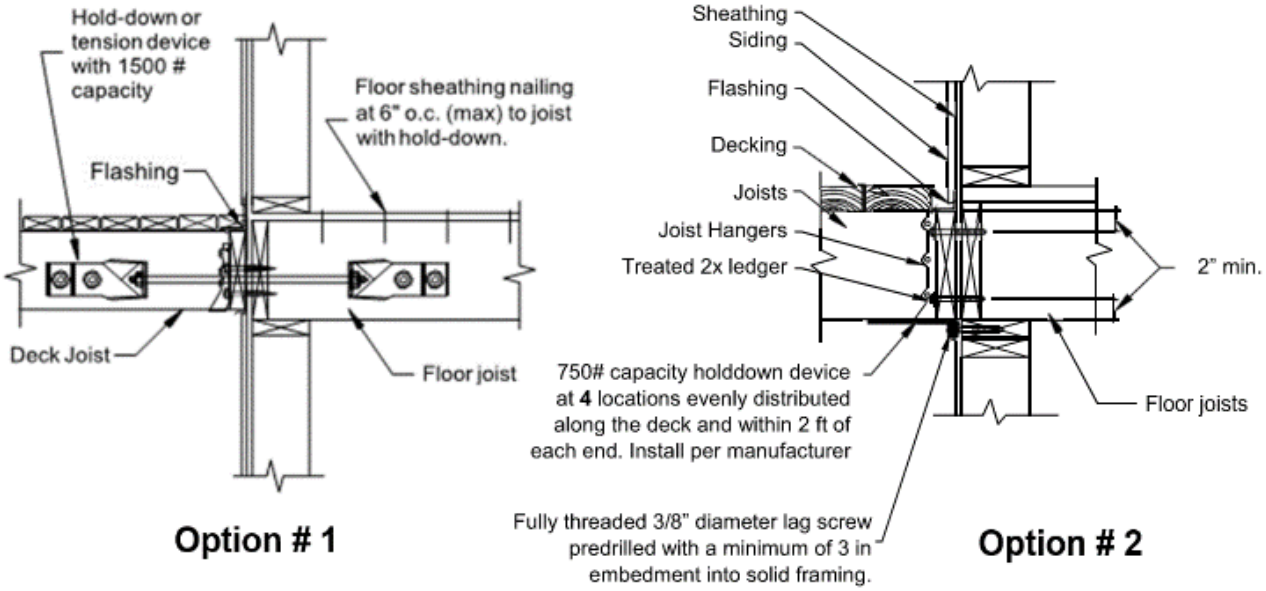

eCityGov.net
2005 © eCityGovAlliance




## Detail 1 – Ledger Attachment for Lateral Loads

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






eCityGov.net
2005 © eCityGovAlliance

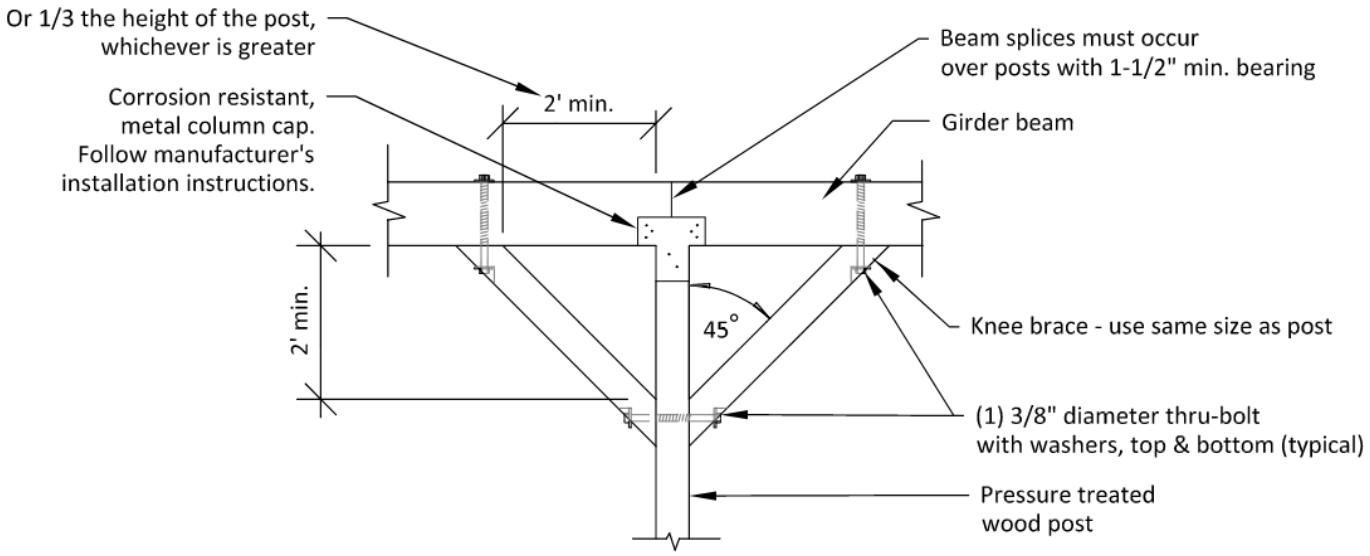
## Connections and Fasteners

All fasteners, nails, bolts, screws, and connectors must 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 OR (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.

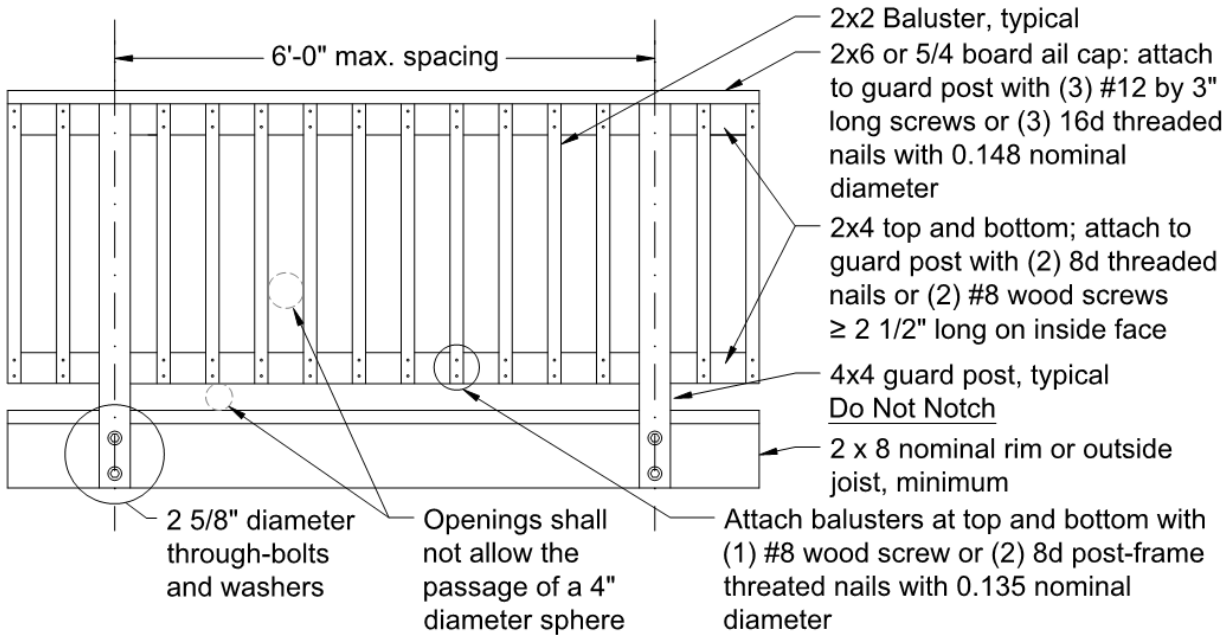


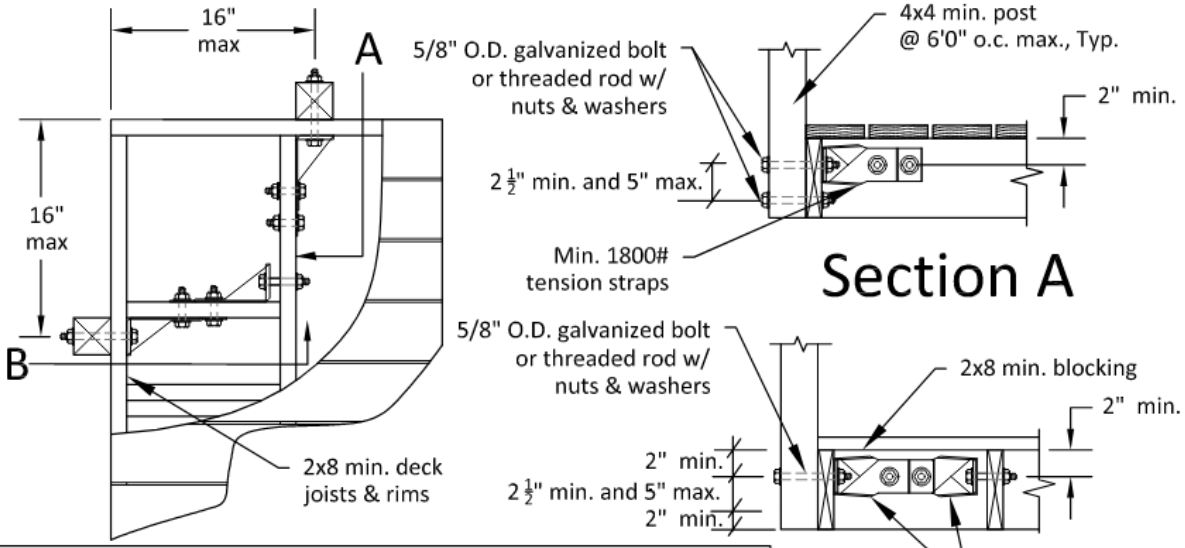



eCityGov.net
2005 © eCityGovAlliance

## Guards & Attachment

Guards are required when the deck is more than 30 inches above grade. See Tip Sheet #19 for safety glazing requirements for glass guards/infill panels.




**Note:**
Use above details for guard connections or provide engineered design that shows Guards can resist a single concentrated load of 200 lbs applied in any direction at any point along the top and have attachment devices and supporting structure to transfer this load to appropriate structural elements of the building per IBC sec 1607.9.1.1



eCityGov.net
2005 © eCityGovAlliance

# Residential Guards (Guardrails)

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

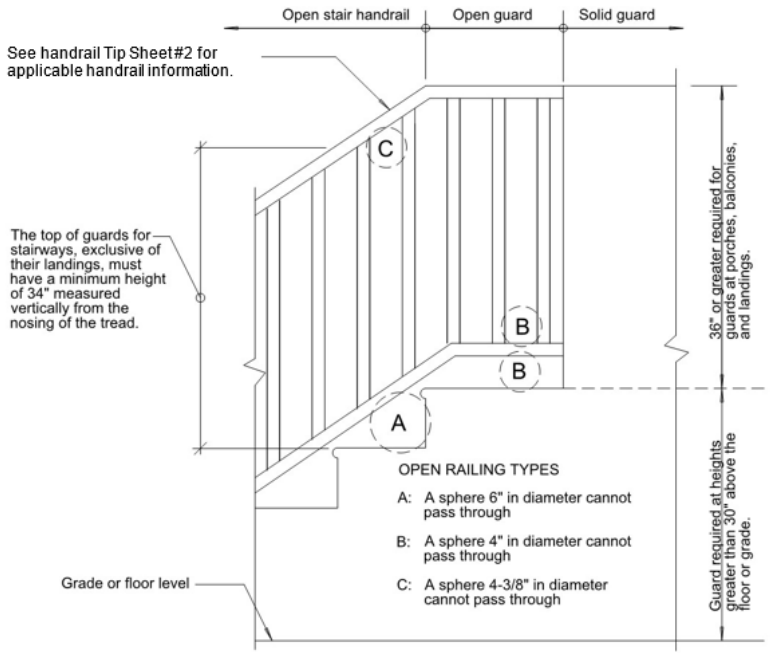



**Figure 1:** Guard Elevation (IRC R312)

## Requirements

☐ Guards are required when portions of open-sided walking surfaces, mezzanines, lofts, stairs, ramps and landings are located more than 30 inches above the floor or grade below at any point within 36 inches horizontally to the edge of the open side. (IRC 312.1.1) refer to Figure 1 for major requirements.

☐ Guards shall be structurally designed to comply with IRC Table R301.5 (i.e., designed for a 200-pound load in any direction along the top and a 50-pound point load elsewhere). See footnote h for glazing used in handrail assemblies and guards.

☐ For glass in guards or guards or railings, including structural baluster panels and nonstructural in-fill panels, they shall be considered to be a hazardous location. (IRC R308.4.4).

Guards in lofts with ceiling heights of 7 feet or less guards shall not be less than 36 inches in height or one-half of the clear height from the loft floor to the loft ceiling, whichever is less. See IRC 333 to determine if the space qualifies as a loft.



eCityGov.net
2005 © eCityGovAlliance

## Residential Handrails

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

### Where Required

Handrails are required on at least one side of each continuous run of treads or flight with four or more risers.

### Typical Details

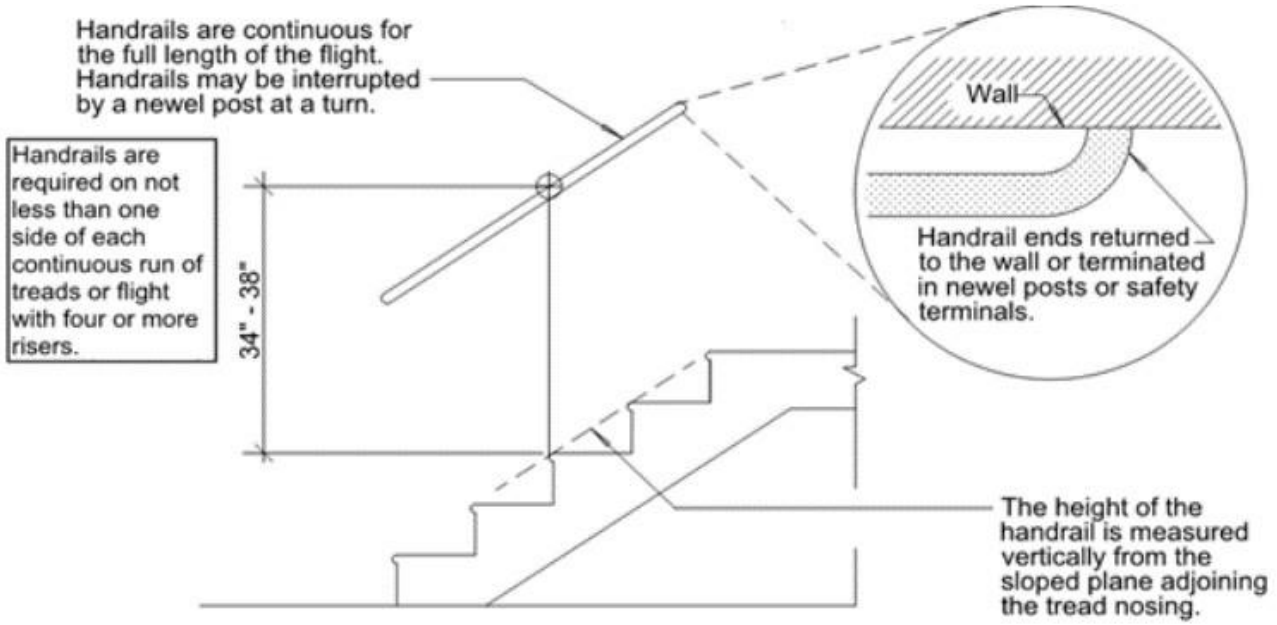



**Figure 1:** Typical Handrail Elevation (IRC R311.7.8)

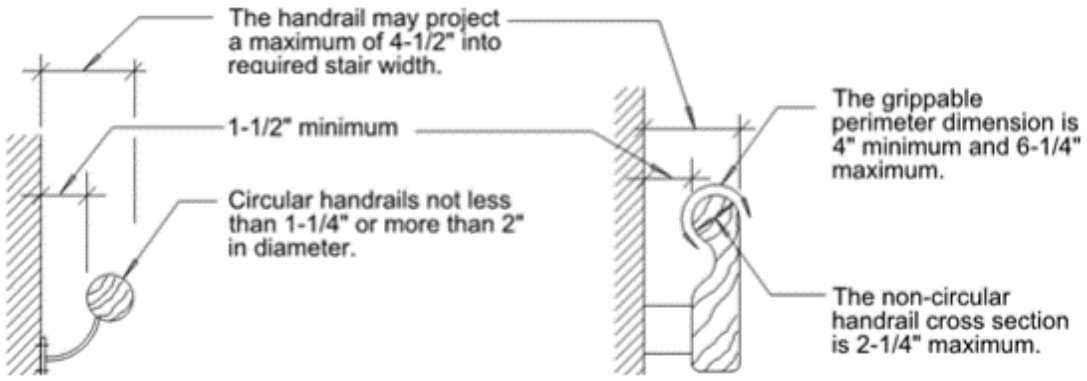



**Figure 2:** Type I Handrails (IRC R311.7.8.5)



eCityGov.net
2005 © eCityGovAlliance

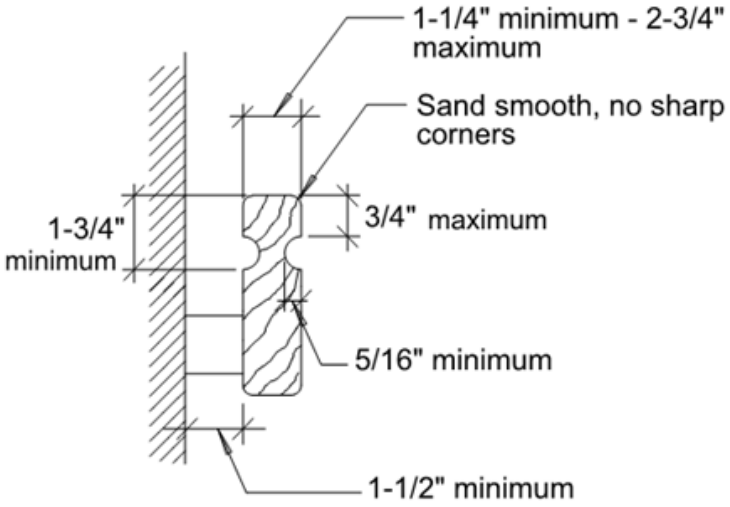



**Figure 3:** Type II Handrails (At handrails with a perimeter greater than 6-1/4 inches) (IRC R311.7.8.5)

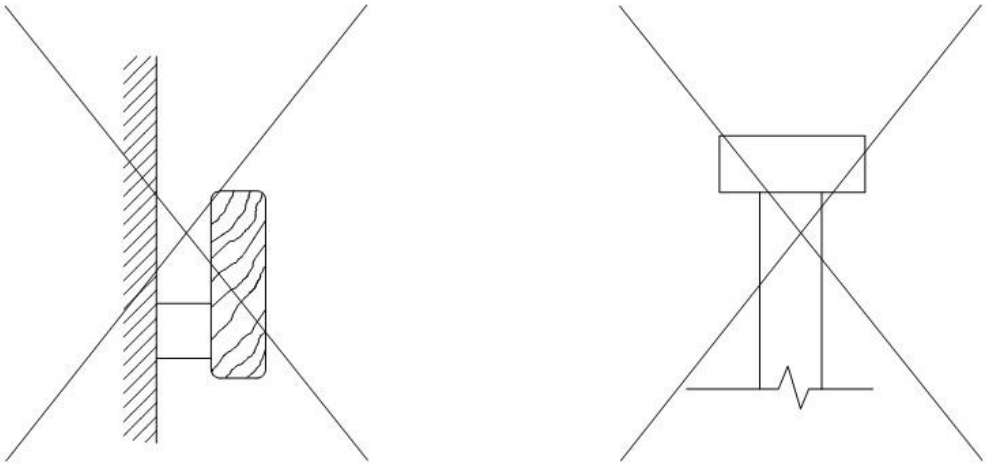


**Figure 4:** Unacceptable Handrails



eCityGov.net
2005 © eCityGovAlliance

Refer to page 7 for information location details. List your choices in the blank boxes on this sheet

