Single Family Residential Uncovered Decks and Porches

How to use this guide
Provide two sets of plans and complete the following:

1. **Complete this building guide** by filling in the blanks on the bottom of this page and on page 4. Indicate which construction details will be used.
2. **Provide 2 plot plans** 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**
   The majority of permit applications are processed with little delay. The submitted documents will help determine if the project is in compliance with building safety codes, zoning codes and other applicable laws.

Projections allowed

Projections may extend into required setbacks as follows:

- Uncovered porches and decks which exceed 18 inches above the finished grade may project:
  A. Eighteen inches into interior setbacks; and
  B. Five feet into the front setback;
- 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 & Wildlife Conservation Area
Sample Site Plan

Contour Lines @ 2' Intervals

Existing Home

Proposed Deck

Existing Garage

Existing Driveway

Property line corners

Scale: 1" = 20' Preferred

Street and Address

N orth
Existing Building

Typical Landing, Stairs, and Railing

- 2x top rail handrail with grip grooves
- Vertical rails
- 1-1/4" to 2'
- 1-1/4" to 2'

* Landing and stair illumination is required per IRC303.6

- 36" high guardrail required when deck is over 30" above grade

- Minimum 3x3' landing at all exterior doors

- Minimum 36" wide stairway

- 1-1/2" min.

- Handrail- 1-1/4" to 2" diameter-return ends

- Less than 4" space between horizontal rails

- See IRC Section R311.6.3 for other handrail shapes permitted. Handrail ends shall be returned or terminated in newel posts or safety terminals. See IRC Section R311.5.6.2.

- Minimum.

- Quadrail spaces so that a 4" sphere cannot pass-R312.2 #2

- Exception: triangular space at steps so that a 6" sphere cannot pass.

- Quadrail spaces so that a 4-3/8" sphere cannot pass.

- If 4 or more nsers, handrail is required-R311.5.6

- 3/4" min. max. 1-1/4"

- 34" to 36" high handrail

- 7-3/4" max. nose

- 10" min. step

- 2% slope

- Opening between treads does not permit passage of 4" sphere. Not limited if total rise is less than 30 inches. R311.5.3.3

- Each as
Directions

1. Please see attached Prescriptive Residential Wood Deck Construction Guide. Use this guide to fill in the blanks with dimensions and materials which will be used to build the structure. Please print legibly. Approved naturally durable or pressure preservative treated wood is required.

Type of decking __x__ (Example: 1 x 4 Trex)

Size and amount of lags __x__ (Example: two 3/8 x 5" lags @ 16" o.c.) See page 5 joist spans for spacing of fasteners.

(_) x __ beam (Example: 4 x 10 see page 3)

2x___joists spaced___" apart
(Example: 2 x 10 spaced 24" apart)

span
(Example: 10’ – 2")

Approved joist hangers list size and type here.

Approved闪光 required

See Option 1 or 2 on page 4 for lateral ledger attachment options.

36" high guard with balusters spaced so that a 4" diameter sphere cannot pass through

36” high guard with balusters spaced so that a 4" diameter sphere cannot pass through

36” – 8” Minimum
(See note)

Existing Building

Approved flashing required

See Detail 2 page 4 for guard attachment

Knee braces are required if distance from grade to top of posts exceeds 48”. See detail on page 3. Braces installed

YES or NO

_x__posts spaced___" apart
(Example: 4 x 4 posts spaced 8’ apart) see page 3 for requirements.

Footing size
Type_{(example: “B”)}
See Footing Schedule
For Decks
(Footing type) Page 5

Existing Building

Note: If an exit or egress door from the existing building passes under proposed deck, or there is an existing patio, minimum clear headroom of not less than 6’ – 8” must be maintained under the beam.

Span

Finished grade

2 #4 rebar each way 3” clear to bottom of footing

Approved flashing required

See Option 1 or 2 on page 4 for lateral ledger attachment options.
This Tip Sheet reflects code requirements of the 2015 International Residential Code (IRC) with Washington State Amendments which update the live load to 60 p.s.f.

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

- The deck serves other than a one- or two-family dwelling building
- 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 10’ 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’ horizontal for every 1’ vertical
- The deck is self-supporting (not attached to an exterior wall)

**Typical Deck**

![Diagram of typical deck](image)

**Note:** Guards are required when the deck walking surface is more than 30’ above grade.

**GENERAL INFORMATION:**

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- Additional information can be obtained from your local participating jurisdiction.
Deck Construction Notes

- Please note that due to the new 60 psf loading, previous lumber spans and footing sizes have changed.
- The illustrations and information in this Tip Sheet may be used for decks whether or not they require a permit. See Tip Sheet 0 for when a permit is required.
- 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 to be in accordance with ASTM A 153. Provide documentation in the field showing the required fastener protection for the wood chosen for your deck.
- 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.
- This Tip Sheet is intended to represent good construction practices for deck construction and related IRC requirements. See related Tip Sheets: 1 for stairs, 2 for handrails, and 3 for guards.

**Typical Deck Section**

*Note:* Contractor to field verify adequacy of solid lumber for ledger connection.
**Post to Beam Connection w/ Knee Brace**

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

- Or 1/3 the height of the post, whichever is greater
- Beam splices must occur over posts with 1-1/2" min. bearing
- Pressure treated wood post
- Corrosion resistant, metal column cap
- Follow manufacturer's installation instructions
- Alternate Knee Brace Detail:
  - 2x4 knee brace face nailed ea. side of post and beam with 4-16d nails at each face and connection

**Guardrail Attachment**

Guardrails are required when the deck is more than 30 inches above grade.

- 5/8" O.D. galvanized bolt or threaded rod w/ nuts & washers
- 2x8 min. blocking
- 2x8 min. deck joists & rims
- 4x4 min. post @ 60" o.c. max., Typ
- Min. 1800# tension device
- Min. 1800# tension straps

**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 1607.7.1.1

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Detail 1 – Ledger Attachment for Lateral Loads
(Knee braces are required on posts greater than 4 feet in height.)

Option #1
(Required for New Construction)

Option #2
(Existing Construction Only)

Deck Connections
(All fasteners, nails, bolts, screws and connectors must be corrosion resistant.)

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

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Span Table and Footing Schedule for Decks

Spans and footings assume the maximum 24" cantilever using Hem-Fir/Doug Fir No. 2 or better framing lumber. Table uses 70 p.s.f. loading (10 p.s.f. dead load + 60 p.s.f. live load) and 2000 p.s.f. soil bearing pressure.

<table>
<thead>
<tr>
<th>Joist Size</th>
<th>Joist Spacing</th>
<th>Max. Joist Span</th>
<th>Girder Beam Size and Max. Span Between Support Posts / Footing Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2x6</td>
<td>12&quot; o.c.</td>
<td>7'-5&quot;</td>
<td>4x6 Footing 4x8 Footing 4x10 Footing 4x12 Footing 4x6 Footing 4x8 Footing 4x10 Footing 4x12 Footing</td>
</tr>
<tr>
<td></td>
<td>16&quot; o.c.</td>
<td>6'-9&quot;</td>
<td>5'-11&quot; 14x14 5'-9&quot; 16x16 9'-6&quot; 18x18 11'-1&quot; 18x18</td>
</tr>
<tr>
<td></td>
<td>24&quot; o.c.</td>
<td>5'-9&quot;</td>
<td>6'-3&quot; 14x14 8'-9&quot; 16x16 11'-0&quot; 18x18 12'-10&quot; 18x18</td>
</tr>
<tr>
<td>2x8</td>
<td>12&quot; o.c.</td>
<td>9'-7&quot;</td>
<td>4'-11&quot; 14x14 6'-6&quot; 16x16 8'-3&quot; 18x18 10'-0&quot; 20x20</td>
</tr>
<tr>
<td></td>
<td>16&quot; o.c.</td>
<td>8'-8&quot;</td>
<td>4'-11&quot; 14x14 6'-6&quot; 16x16 8'-3&quot; 18x18 10'-0&quot; 18x18</td>
</tr>
<tr>
<td></td>
<td>24&quot; o.c.</td>
<td>7'-7&quot;</td>
<td>5'-11&quot; 14x14 7'-9&quot; 16x16 9'-6&quot; 18x18 11'-1&quot; 18x18</td>
</tr>
<tr>
<td>2x10</td>
<td>12&quot; o.c.</td>
<td>13'-3&quot;</td>
<td>3'-6&quot; 14x14 4'-8&quot; 16x16 5'-11&quot; 18x18 7'-2&quot; 18x18</td>
</tr>
<tr>
<td></td>
<td>16&quot; o.c.</td>
<td>11'-6&quot;</td>
<td>4'-1&quot; 14x14 5'-5&quot; 16x16 6'-11&quot; 18x18 8'-5&quot; 20x20</td>
</tr>
<tr>
<td></td>
<td>24&quot; o.c.</td>
<td>9'-5&quot;</td>
<td>4'-11&quot; 14x14 6'-6&quot; 16x16 8'-3&quot; 18x18 10'-0&quot; 20x20</td>
</tr>
<tr>
<td>2x12</td>
<td>12&quot; o.c.</td>
<td>15'-5&quot;</td>
<td>3'-1&quot; 14x14 4'-1&quot; 16x16 5'-2&quot; 16x16 6'-3&quot; 18x18</td>
</tr>
<tr>
<td></td>
<td>16&quot; o.c.</td>
<td>13'-4&quot;</td>
<td>3'-6&quot; 14x14 4'-8&quot; 16x16 5'-11&quot; 18x18 7'-2&quot; 18x18</td>
</tr>
<tr>
<td></td>
<td>24&quot; o.c.</td>
<td>10'-11&quot;</td>
<td>4'-1&quot; 14x14 5'-5&quot; 16x16 6'-11&quot; 18x18 8'-5&quot; 18x18</td>
</tr>
</tbody>
</table>

Footings must have a minimum reinforcement of (2) #4 bars each way with a 3" clearance to the bottom of the footing.

Note: Footing sizes are based on decks designed with single span joists where there is no center bearing beam.

Deck Ledger Connection to Band Joist

(Reference IRC Table R507.2 - Deck live load = 60 psf, deck dead load = 10 psf, snow load ≤ 40 psf)

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

<table>
<thead>
<tr>
<th>Connection Details</th>
<th>Joist Span</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6’ and less</td>
</tr>
<tr>
<td></td>
<td>On-center spacing of fasteners</td>
</tr>
<tr>
<td>½ inch diameter lag screw with ½ inch maximum sheathing</td>
<td>22</td>
</tr>
<tr>
<td>½ inch diameter bolt with ½ inch maximum sheathing</td>
<td>30</td>
</tr>
<tr>
<td>½ inch diameter bolt with 1 inch maximum sheathing</td>
<td>26</td>
</tr>
</tbody>
</table>

a. Ledgers shall be flashed in accordance with Section 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 1/2-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.

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Placement of Lag Screws and Bolts in Ledgers and Band Joists

(Reference IRC Table 507.2.1)

<table>
<thead>
<tr>
<th>Minimum End and Edge Distance and Spacing Between Rows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Edge</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Ledger^a</td>
</tr>
<tr>
<td>Band joist^c</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4mm

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 munsill, header, or by double top wall plates.

Placement of Lag Screws and Bolts in Ledgers

(Reference IRC Figure 507.2.1(1))

Placement of Lag Screws and Bolts in Ledgers

(Reference IRC Figure 507.2.1(2))

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