



# Deck Design Guide



## One and Two Family Residential Dwellings

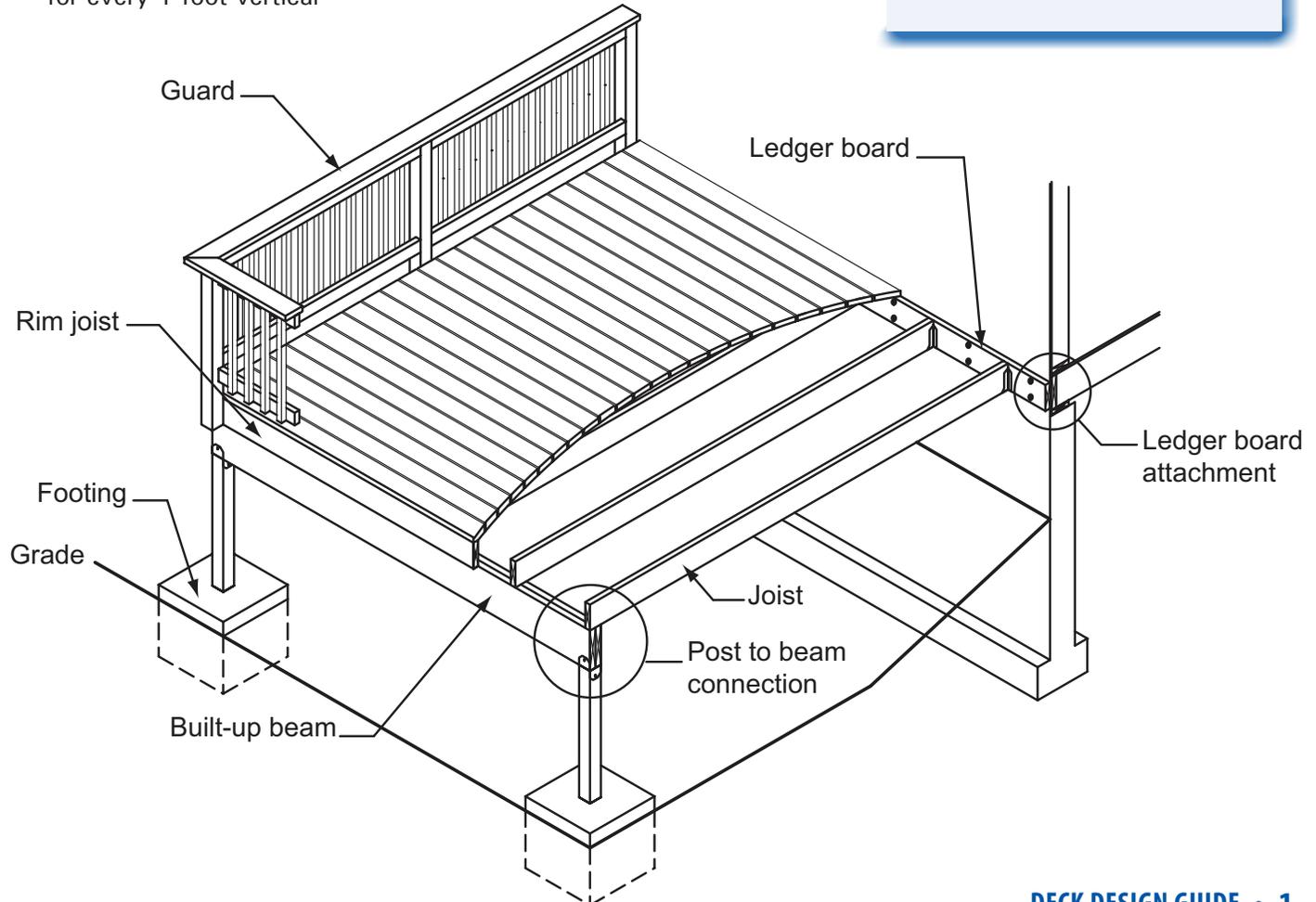
The Bureau of Development Services (BDS) is providing this information to help you design your deck, obtain a building permit and pass inspections. The standards and details in this Guide will help you determine how large the footings, beams, joists, posts, and ledgers need to be; how to build lateral bracing, stairs, and railings; and how to fasten all of the pieces together. This Guide does not take into account conditions which may affect your deck design such as drainage conditions, slope conditions, or decks supporting loads in excess of the standard uniform loads. Depending on your specific situation, you may need to hire a licensed architect or structural engineer prior to approval.

You may include all, or part of the pre-approved design standards and details in this guide with your building permit plans for decks that are:

- For one- and two-family dwellings
- Single-span
- All on one level
- Not supporting a hot tub or spa
- Not attached to house overhangs, bay windows, brick, stone or concrete block
- Not more than 10 feet above the ground
- Not bearing on ground with a slope greater than 2 feet horizontal for every 1 foot vertical

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# Introduction

## Do I Need A Permit For My Deck?

A building permit is required for all decks that are more than 30 inches above the ground at any point. See **Brochure 3 , Fences, Decks and Outdoor Projects**.

## Setbacks and Other Regulations?

For information on setbacks (how close a deck is to a property line) and other regulations that may apply to your deck project, even when a building permit is not required, see **Brochure 3**. Call Planning and Zoning at 503-823-7526 to find out what zoning requirements apply to your specific property.

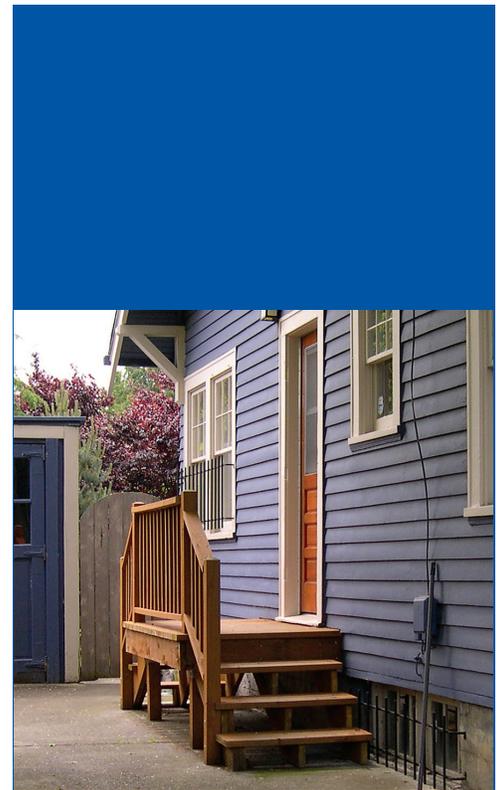
## How Do I Get A Building Permit?

See BDS handout, **Brochure 1, Guide to Permits and Inspections**. This handout describes the building permit process from application to final inspection.

## What Plans Do I Need?

You may draw all your own plans and details without using this Guide, or you may use the pre-approved standards and details in this Guide to supplement your plans. Refer to **Brochure 6, What Plans Do I Need for a Building Permit?** for descriptions and examples of the plans needed to obtain a building permit for a typical residential construction project. Since a deck can be a relatively simple project, you will only be required to provide the plans listed below if you use this Guide:

- **Site Plan** - You will need to draw a site plan. The Site Plan must show the property lines, outlines of all existing and proposed buildings, paved areas and decks on the lot, and the distances from your proposed deck to the nearest property lines. See Brochure 6 for Site Plan requirements and a sample Site Plan.
- **Elevation View** - You will also need to draw an Elevation View, which is a front or side view of your house and the proposed deck and the level of the ground adjacent to the deck (see Brochure 6).
- **Framing and Foundation Plan** - You can draw your own Framing and Foundation Plans (see Brochure 6) or you can complete the Worksheet and Typical Deck Plan at the end of this Guide.
- **Cross Section and Details** - You can draw your own Cross Section and Details (see Brochure 6) or you can use the details in this Guide. Your plans must include details of the following parts of your deck:
  - Ledger board attachment
  - Joist-to-beam connection
  - Rim joist connection
  - Post-to-beam connection
  - Lateral support method
  - Guardrail height and openings
  - Guardrail post attachment
  - Stair and stair handrail details
  - Post-to-footing connection



# General Notes



1. All lumber shall be grade #2 Douglas-Fir, Hem-Fir, or better and shall be pressure treated (to resist insect and dry rot) in accordance with American Wood-Preservers' Association Standards (Category). Deck surface and trim material of redwood, cedar, or other wood with a natural resistance to decay does not require pressure treatment. The level of treatment depends on the use as follows:
  - a. Decking material, railings, joists, and beams must be treated to a Category UC3B (or must be other wood with a natural resistance to decay).
  - b. Posts and other woods located on, in, or in contact with the ground must be a Category UC4B.
  - c. Any wood less than six inches above the ground or in contact with concrete must be a Category UC4A.

The level of preservative treatment is noted on the tags on the ends of the wood members. Remember, any time you make a cut, treat the cut end of the wood with a paint-on preservative. Cut ends expose the inner untreated wood to potential moisture and insect damage.

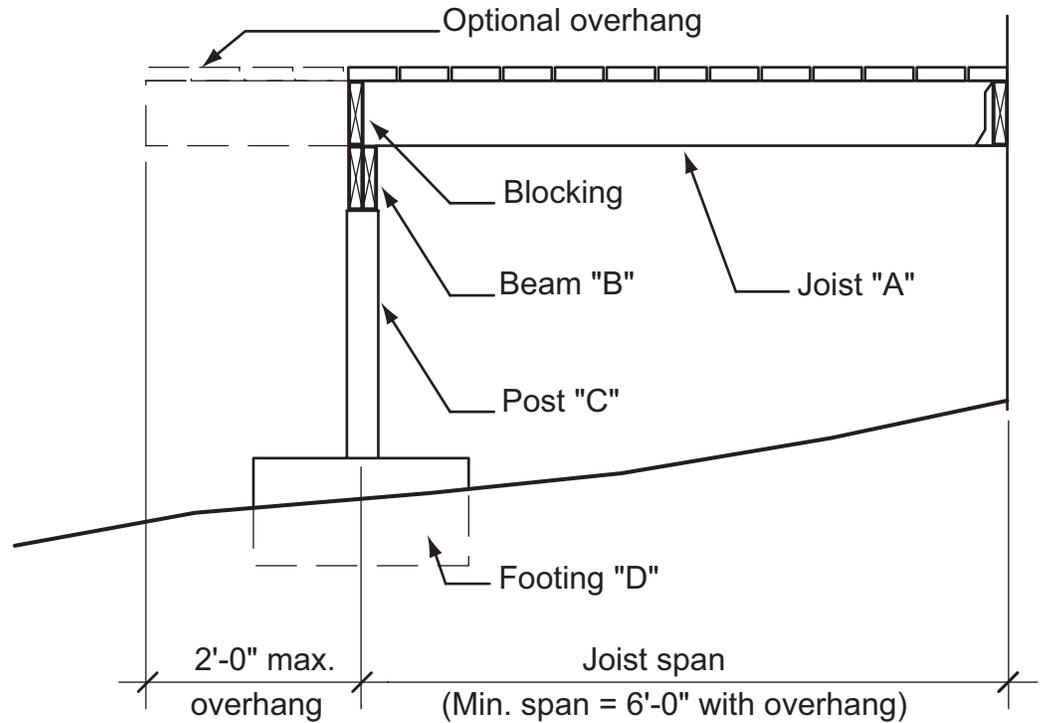
Hardwood and plastic or composite decking products may be substituted for conventional wood decking, but installation and span lengths of the substituted material must be in strict conformance with the product listing and the manufacturer's installation instructions. Copies of the manufacturer's installation instructions must be submitted with the building permit application.

2. All nails shall be *common* or *box* galvanized. It is recommended that *common* nails be used. They have a thicker shank and are stronger than *box* nails.
3. New pressure treatment methods use chemicals that will prematurely corrode standard fasteners, hardware, and flashing when in contact with pressure treated lumber; and as a result, fastener and hardware requirements have changed. Note the following:
  - a. All screws and nails shall be hot-dipped galvanized or stainless steel.
  - b. All hardware (bolts, nuts and washers, joist hangers, mechanical fasteners, holdowns, tie plates cast-in-place post anchors, etc.) shall be galvanized with 1.85 oz/sf of zinc (G-185 coating) or shall be stainless steel. Look for products such as "Zmax" from Simpson Strong-Tie or "Triple Zinc" from USP.
4. All decking material shall be 2x4, 2x6, or five quarter (5/4") boards. Attach decking to each joist with two 10d nails or two #8 screws. Decking may be placed from an angle perpendicular to the joists to an angle of 45 degrees to the joists. Decking must have a span length such that each board bears on a minimum of two joists.
5. Headers over existing doors, windows or openings greater than six feet in width that are located below a deck that will be attached to the house must be checked to verify that those headers can support the additional load added by the deck.
6. The bottom of all footings for decks that are attached to a house are to be placed a minimum of 18 inches below the surface of the finished grade and must bear on firm, undisturbed native soil. The bottom of footings for free-standing decks may be at any depth on undisturbed native soil. Footings adjacent to the top of a retaining wall must be set back from the wall a distance equal to the height of the wall, or be extend below grade an amount equal to the height of the retaining wall.

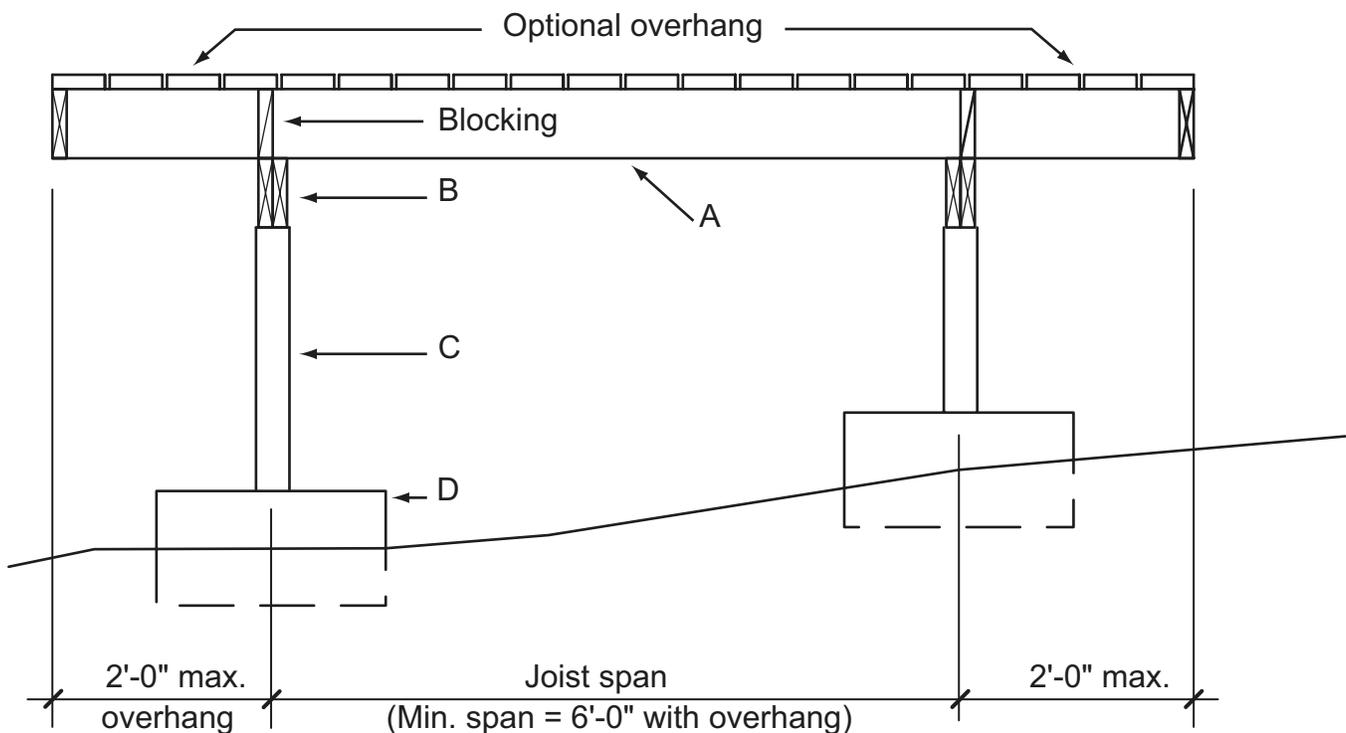
# Footings, Beams, Joists, and Posts

First, decide how long and wide you want your deck. (Note: The drawings in this Guide indicate square or rectangular configurations, however, decks can be any shape as long as the longest joist and beam spans are used to determine the beam, joist, and footing sizes.) Your deck can have up to a two-foot maximum joist and/or beam overhang. See **Figures 1, 2, and 3**. Beams must be supported on each end by a post and cannot be supported with beam hangers off the house. Use **Table 1** to find the minimum beam, joist and footing sizes. Joists are identified as "A", beams as "B", posts as "C," and footings as "D." It is recommended that you first determine the joist span, and then note what beam and footing sizes you will need.

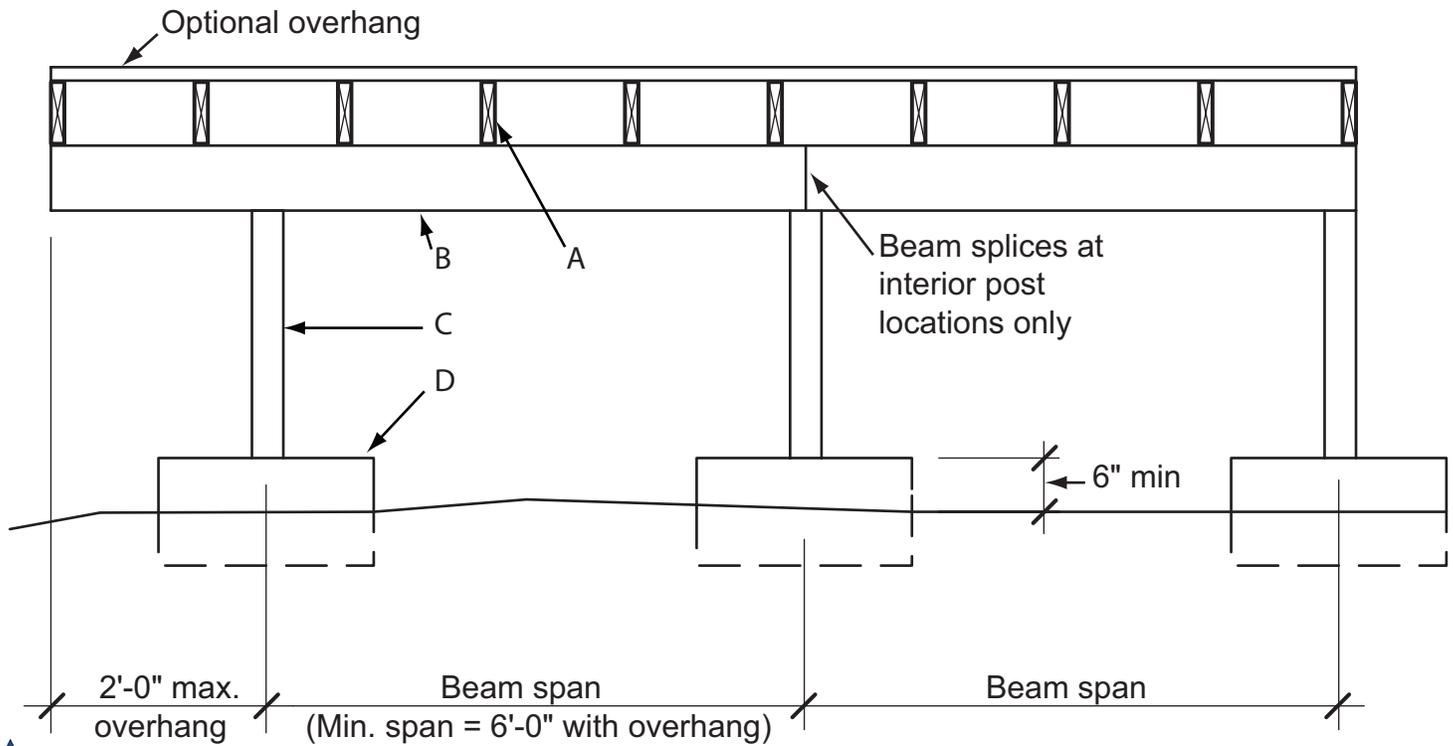
The span of a joist is measured from the centerline of bearing at one end of the joist to the centerline of bearing at the other and does not include overhangs. Maximum joist span lengths are noted in Table 1. See Figures 1 and 2 for joist span types.



**▲ Fig. 1: Joist span, deck attached at house**



**▲ Fig. 2: Joist span, freestanding deck**



**Fig. 3: Beam span**

**Table 1** provides you with the information to determine the minimum sizes of the footings, beams, and joists. The sizes will depend on how big the deck will be and how many footings and posts are going to be used; how far the beam(s) will span from post to post, or post to ledger; and how far the joist will span from beam to beam, or beam to ledger.

Note: The sizes, spans and spacing of the joists in Table 1 are the minimum/maximum allowed by code. If you want your deck to be stiffer, increase the size, reduce the span, or reduce the spacing of your joists.

Note: The footings must bear on native soil. The footing details require a footing that is a minimum of 24 inches in height so the bottom can be located a minimum of 18 inches below the finished grade and extend six inches above the finished grade. If you have fill material that is greater than 18 inches deep, your footing will need to extend through the fill to native soil. Footings for freestanding decks (those not attached to the house) are not required to be located 18 inches below the finished grade and can have a minimum thickness of eight inches.

Post sizes are 4x4 minimum for decks six feet or less above the ground and 4x6 for decks over six feet above the ground. Use a minimum 4x6 post under all beam splices.

Mark the sizes, spacing and spans for the footings, beams, joists, and posts from Table 1 in the space provided below:

- A.** Joist Size: \_\_\_\_\_ x \_\_\_\_\_, spaced \_\_\_\_\_ apart.
- B.** Beam Size: \_\_\_\_\_ x \_\_\_\_\_.
- C.** Post Size: \_\_\_\_\_ x \_\_\_\_\_, spaced \_\_\_\_\_ apart.
- D.** Footing Size: \_\_\_\_\_ x \_\_\_\_\_ x \_\_\_\_\_.

Transfer your footings, beams, joists, and posts information above into the **Deck Framing Plan** at the end of this Guide

**TABLE 1**

If you have a beam "B" that is:	and you have posts "C" supporting the beam spaced:	then you can only span the joists:	and the minimum size joist you can use is:	and they can be spaced a maximum of:	and the footings "D" supporting the posts must be a minimum size of (WxWxH):
4x8 or (2) 2x8	6'-0" apart	6'-0"	2x6*	24" apart	13"x13"x24" deep or 14" diameter x 24" deep
4x10 or (2) 2x10	8'-6" apart	6'-0"	2x6*	24" apart	15x15"x24" or 17" diameter x 24" deep
4x12 or (2) 2x12	10'-6" apart	6'-0"	2x6*	24" apart	16"x16"x24" or 18" diameter x 24" deep
4x12	11'-9" apart	6'-0"	2x6*	24" apart	18"x18"x24" or 20" diameter x 24" deep
4x8 or (2) 2x8	6'-0" apart	8'-0"	2x6* or 2x8	16" apart or 24" apart	14x14"x24" or 16" diameter x 24" deep
4x10 or (2) 2x10	8'-0" apart	8'-0"	2x6* or 2x8	16" apart or 24" apart	16"x16"x24" or 18" diameter x 24" deep
4x12 or (2) 2x12	9'-6" apart	8'-0"	2x6* or 2x8	16" apart or 24" apart	18"x18"x24" or 20" diameter x 24" deep
4x12	10'-9" apart	8'-0"	2x6* or 2x8	16" apart or 24" apart	18"x18"x24" or 20" diameter x 24" deep
4x8 or (2) 2x8	5'-6" apart	10'-0"	2x8 or 2x10	16" apart or 24" apart	14"x14"x24" or 16" diameter x 24" deep
4x10 or (2) 2x10	7'-6" apart	10'-0"	2x8 or 2x10	16" apart or 24" apart	16"x16"x24" or 18" diameter x 24" deep
4x12 or (2) 2x12	9'-0" apart	10'-0"	2x8 or 2x10	16" apart or 24" apart	18"x18"x24" or 20" diameter x 24" deep
4x12	10'-3" apart	10'-0"	2x8 or 2x10	16" apart or 24" apart	20"x20"x24" or 23" diameter x 24" deep
4x6 or (2) 2x8	5'-0"	12'-0"	2x10 or 2x12	16" apart or 24" apart	14"x14"x24" or 16" diameter x 24" deep
4x8 or (2) 2x10	6'-6"	12'-0"	2x10 or 2x12	16" apart or 24" apart	16"x16"x24" or 18" diameter x 24" deep
4x12 or (2) 2x12	8'-6"	12'-0"	2x10 or 2x12	16" apart or 24" apart	18"x18"x24" or 20" diameter x 24" deep
4x12	9'-6"	12'-0"	2x10 or 2x12	16" apart or 24" apart	20"x20"x24" or 22" diameter x 24" deep
4x6 or (2) 2x8	4'-6"	16'-0"	2x12	16" apart	15"x15"x24" or 17" diameter x 24" deep
4x8 or (2) 2x10	6'-0"	16'-0"	2x12	16" apart	18"x18"x24" or 20" diameter x 24" deep
4x10 or (2) 2x12	7'-6"	16'-0"	2x12	16" apart	20"x20"x24" or 23" diameter x 24" deep
4x12	9'-0"	16'-0"	2x12	16" apart	22"x22"x24" or 25" diameter x 24" deep

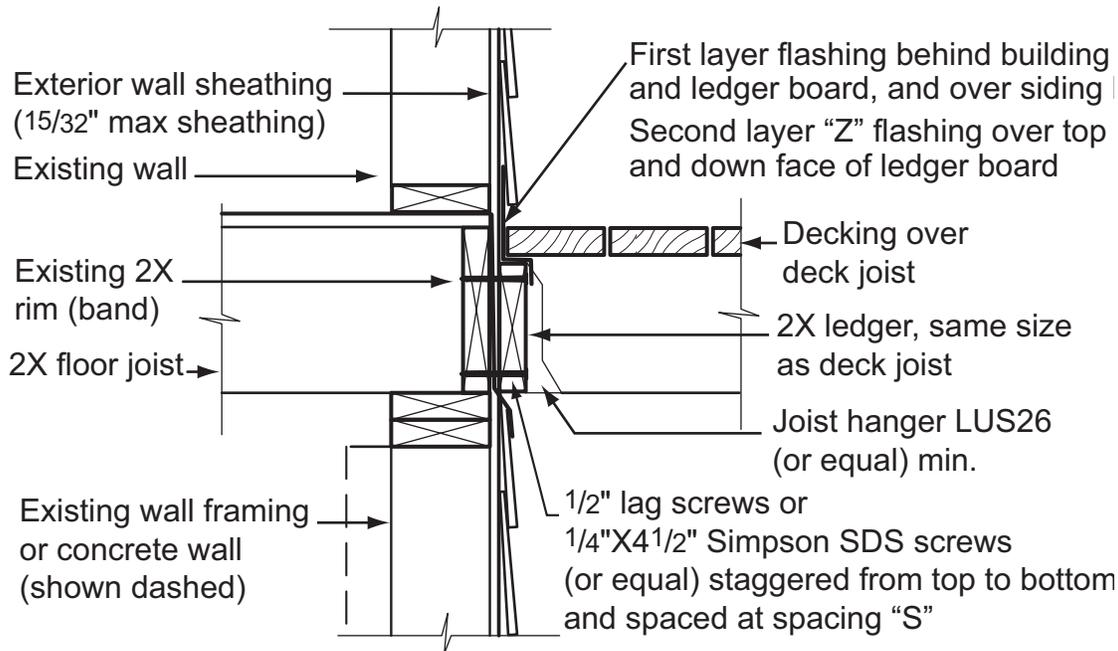
\* 2x6 joists cannot be used where a guardrail is required.

# The Ledger Board

Decks that are attached to a house require a ledger board to be fastened to the house structure, and the deck joists are fastened to the ledger. If your deck will be free-standing and not attached to the house, skip this section and proceed to **Free-Standing Decks**.

There are several methods for attaching the ledger to the house, depending on how the house was built and how high the deck will be located relative to the house's existing floor framing. The ledger can be fastened to the house band board (or rim joist) (**Figure 5 or 6**), the wall studs (**Figure 7**) or a concrete wall (**Figure 8**). You will need to verify the existing conditions before you apply for a building permit. If you can't verify the existing conditions or if they are different from Figures 5, 6, 7 or 8 then a free-standing deck is required (see Free-Standing Decks).

**Siding and Flashings:** The siding or exterior finish system must be removed to install the ledger board against the wall sheathing. Two layers of continuous flashing must be properly installed to prevent water from getting into the wall where the siding has been removed. **See Figure 5.** The flashing material may be copper (using copper nails), stainless steel, galvanized steel coated with 1.85 oz/sf of zinc (G-185 coating), UV-resistant plastic, or self-sealing bituminous (tar) "peel-and-stick" flashing. The first layer is attached directly to the exterior wall sheathing starting behind and above the bottom edge of the building paper and siding, continuing straight down the face of the wall behind the ledger board (before it is installed) and ending on the



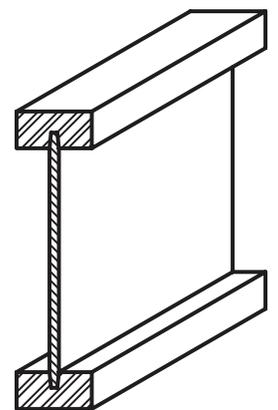
outer face of the exterior wall siding or foundation below the bottom of the ledger board. Self-sealing bituminous peel-and-stick flashing is ideal for the first layer. Pre-formed Z-shaped metal flashing is ideal for the outer, second layer of flashing. It is installed after the ledger board and before the joists, starting behind and above the bottom edge of the building paper and siding, continuing down vertically to the top of the ledger board, bending horizontally to the outer face of the ledger board, and bending again vertically down the face of the ledger board at least 1/2".

**▲ Fig. 5: Attachment of Ledger Board to Band Board with Lag or Wood Screws**  
(See Fig. 12 for spacing and clearances)

Spacing "S"		
Joist Span	1/2" dia. lag screws* !	Simpson SDS 1/4" X 4 1/2"
0 < span ≤ 8'	23"	14"
8' < span ≤ 10'	18"	12"
10' < span ≤ 14'	13"	8"
14' < span ≤ 16'	11"	6"

\*The tip of lag screw shall fully extend beyond inside face of rim joist! From table R502.2.2.1 of 2011 ORSC.

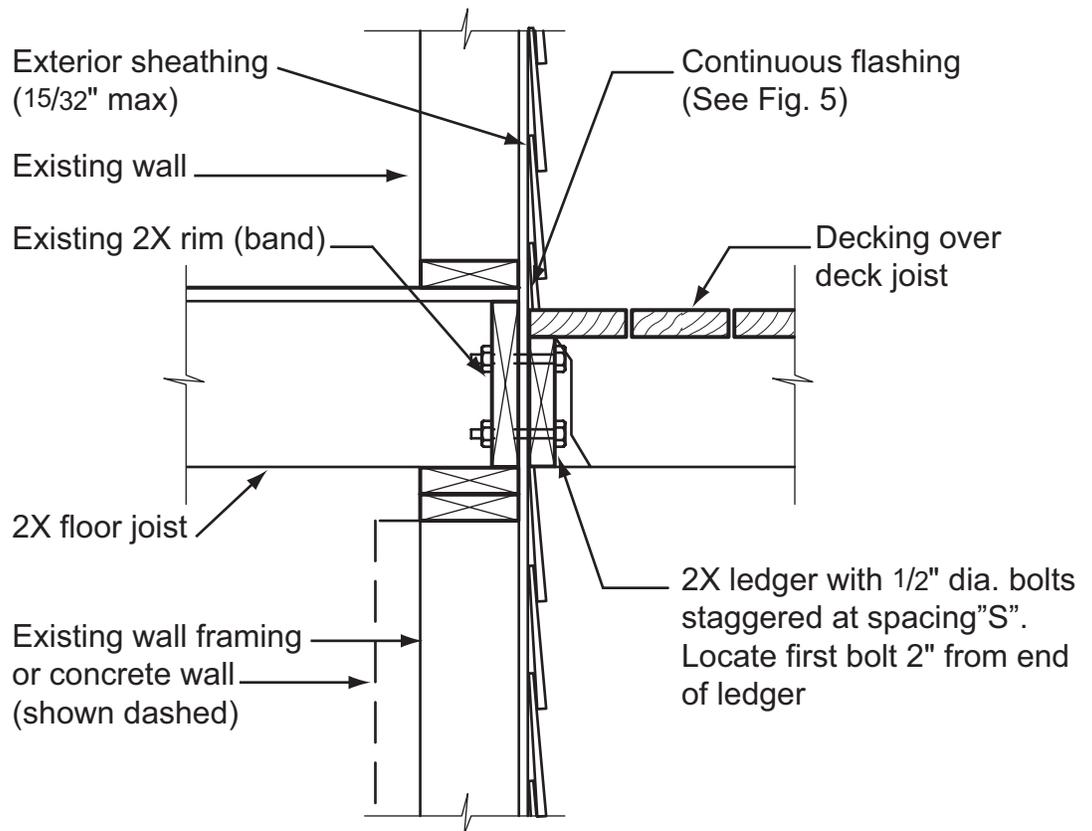
**Manufactured Wood Joists (MWJs):** If the existing house floor joists are MWJs, and not solid-sawn lumber, you will need to submit a ledger attachment detail that is approved by the MWJ manufacturer or a licensed engineer. Examples of MJWs are TJI, GPI and LPI. See Figure 4. Older homes constructed with MWJs may have a plywood band board, while some newer homes may have 1 1/4-inch manufactured wood rim joists.



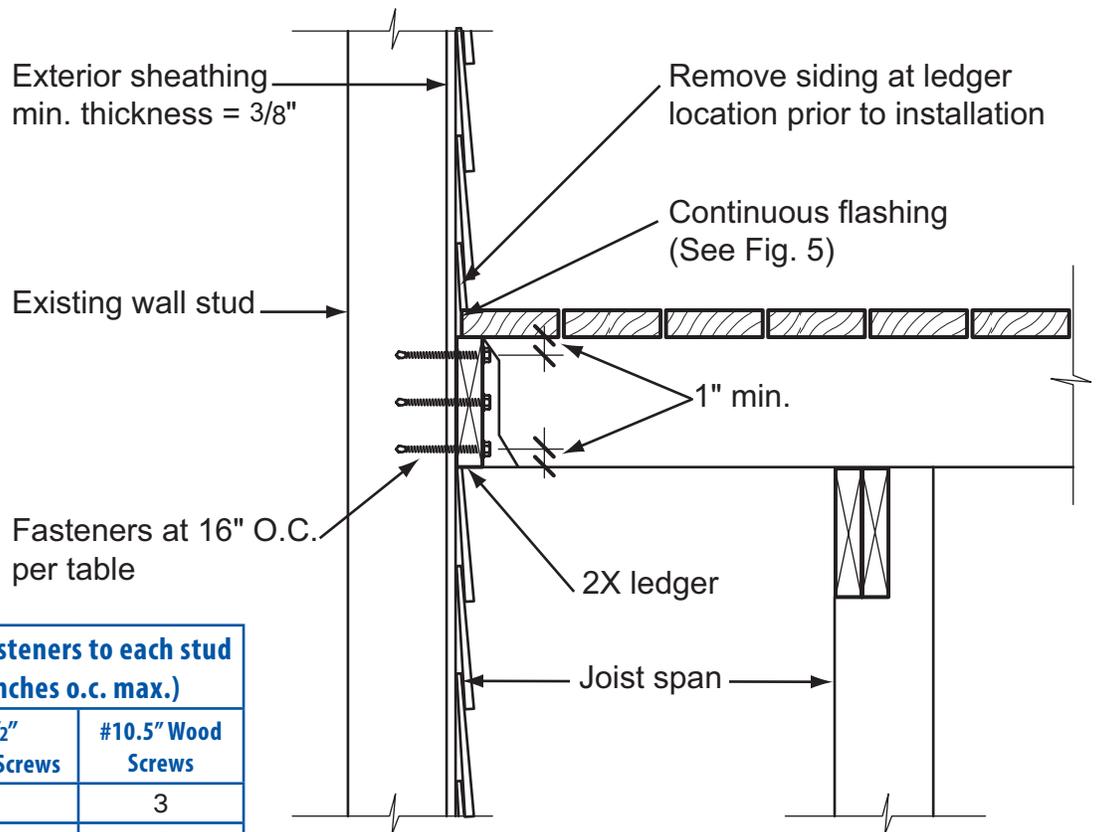
**▲ Fig. 4: MWJ profile**

Joist Span	Spacing "S"
0 < span ≤ 8'	36"
8' < span ≤ 10'	34"
10' < span ≤ 14'	24"
14' < span ≤ 16'	21"

From table R502.2.2.1 of 2011 ORSC.

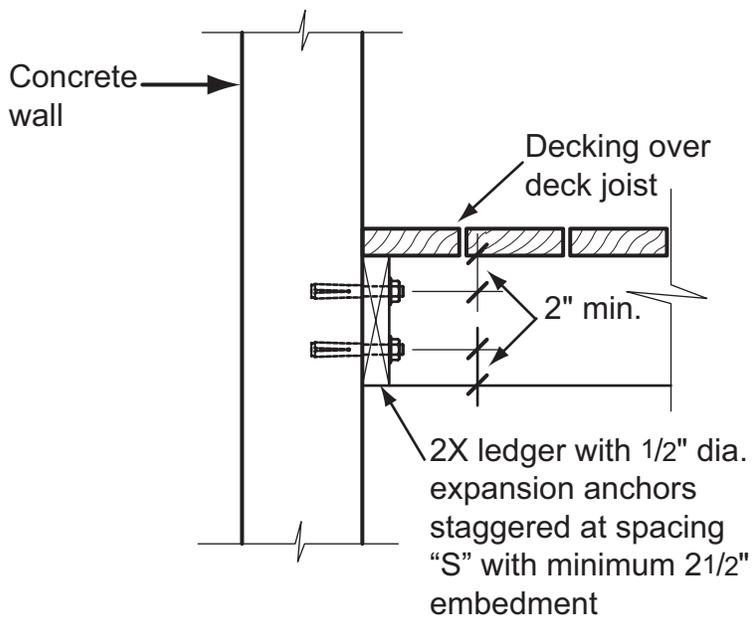


▲ Fig. 6: Attachment of Ledger Board to Band Board with Thru-Bolts (See Fig. 12 for spacing and clearances)



▲ Fig. 7: Attachment of Ledger Board to Wall Studs with Screws

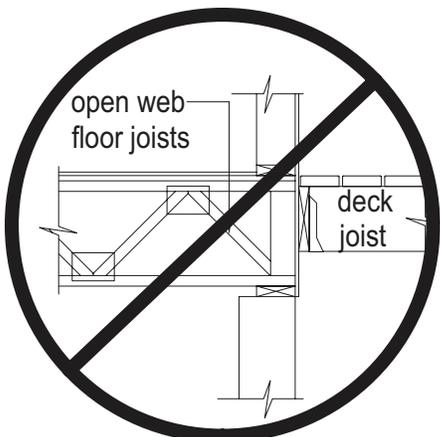
Joist Span	Required fasteners to each stud or (16 inches o.c. max.)	
	1/4" X 4 1/2" Simpson SDS Screws	#10.5" Wood Screws
0 < span ≤ 8'	2	3
8' < span ≤ 10'	2	4
10' < span ≤ 14'	2	5
14' < span ≤ 16'	2	6



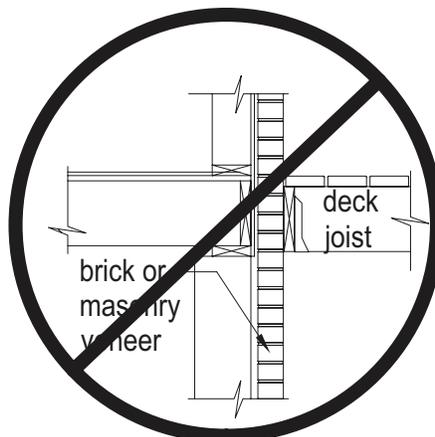
Joist Span	Spacing "S"
0 < span ≤ 8'	18"
8' < span ≤ 10'	15"
10' < span ≤ 14'	10"
14' < span ≤ 16'	9"

**▲ Fig. 8: Attachment of Ledger Board to Concrete Wall**  
(See Fig. 12 for spacing and clearances)

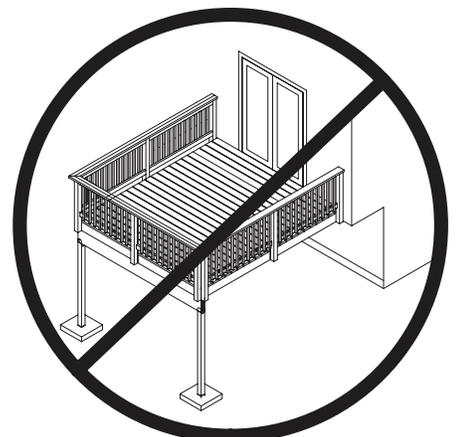
**Prohibited Ledger Attachments:** Attachments to the ends of premanufactured open web joists, to brick veneers, and to house overhang/bay windows are not allowed when using this Guide (see Figures 9, 10 and 11). In such cases the decks shall be free-standing (see Free-Standing Decks).



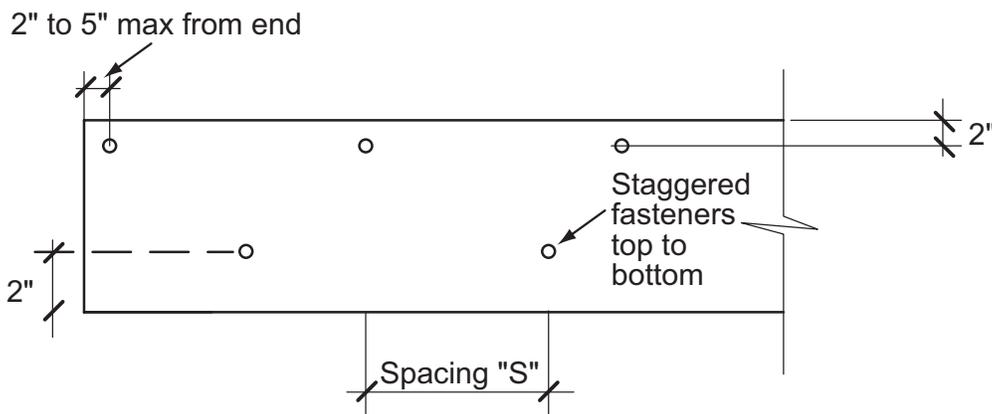
**Fig. 9: No attachment to open web trusses**



**Fig. 10: No attachment to brick veneer**



**Fig. 11: No attachment to house overhang**



**▲ Fig. 12: Ledger Board Fastener Spacing and Clearances**

# Ledger Board Fasteners

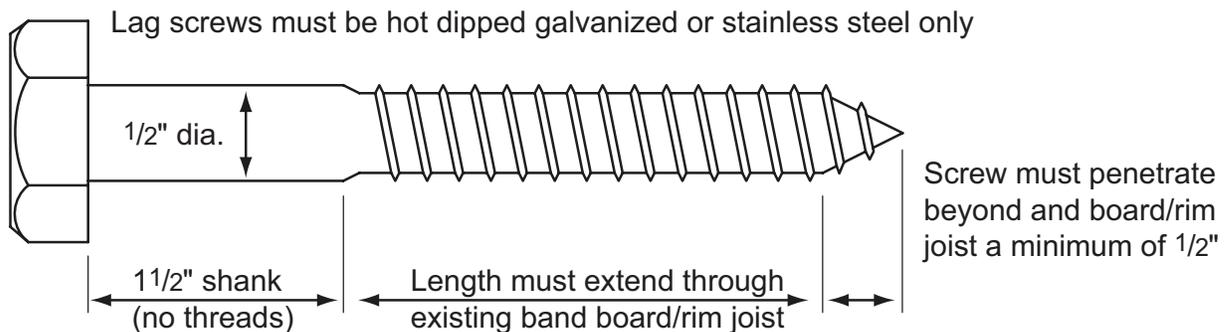
All fasteners shall be spaced per the tables provided with **Figures 5, 6, 7 and 8** and shall be installed per **Figure 12**. All fasteners shall be installed with washers and thoroughly tightened.

**Thru-bolts:** Thru-bolts are those where a hole is drilled all the way through the wood members and a nut and washer are attached to complete the connection. Thru-bolts shall have a minimum diameter of  $\frac{1}{2}$ ". Lead (pilot) holes for thru-bolts shall be  $\frac{17}{32}$ " to  $\frac{9}{16}$ " in diameter. Thru-bolts must be equipped with washers at the bolt head as well as the nut.

**Expansion (Wedge) Anchors:** Use expansion anchors when attaching a ledger board to a concrete wall as shown in **Figure 8**. Bolt diameters of the anchors shall be a minimum of  $\frac{1}{2}$ "; in some cases, this may require an anchor size of  $\frac{5}{8}$ ". Minimum embedment length shall be  $2\frac{1}{2}$ ". Expansion anchors must have washers. Expansion anchors must be installed as required by the manufacturer's instructions. This may include cleaning the holes drilled in the concrete to ensure they are free of dirt, debris, and moisture. Improper installation of the anchors can result in catastrophic failure and collapse of the deck.

**Adhesive Anchors:** Adhesive anchors may be used with a design by a licensed structural engineer. Special inspections are required for expansion anchors and adhesive anchors. They are performed by third-party inspectors that are hired by the project owner. The special inspector verifies that the expansion or adhesive fasteners are installed correctly and submits a report to the owner and the City.

**Lag Screws:** Lag screws shall have a diameter of  $\frac{1}{2}$ " and shall be hot-dipped galvanized or stainless steel. Lag screws may be used only when the field conditions match those shown in **Figure 5**. See **Figure 13** for lag screw length and shank requirements. All lag screws shall be installed with washers.



**Fig 13: Lag screw requirements**

**Lag Screw Installation Requirements:** Each lag screw shall have lead (pilot) holes drilled as follows: 1) drill a  $\frac{1}{2}$ " diameter hole in the ledger board, 2) drill a  $\frac{5}{16}$ " diameter hole into the solid connection material of the existing house. **DO NOT DRILL A  $\frac{1}{2}$ " DIAMETER HOLE INTO THE SOLID CONNECTION MATERIAL.**

The threaded portion of the lag screw shall be inserted into the lead hole by turning. **DO NOT DRIVE WITH A HAMMER.** Use soap or a wood-compatible lubricant as required to help facilitate tightening. Each lag screw shall be thoroughly tightened.

**Simpson SDS Screws or Equivalent:** Install per manufacturer's instructions.

Mark the size of the ledger board and the fastener type, size, and spacing in the spaces below:

Ledger Size: \_\_\_\_\_ x \_\_\_\_\_, fastened with \_\_\_\_\_, spaced \_\_\_\_\_ apart.

Transfer your ledger information above into the Typical Deck Plan at the end of this Guide.

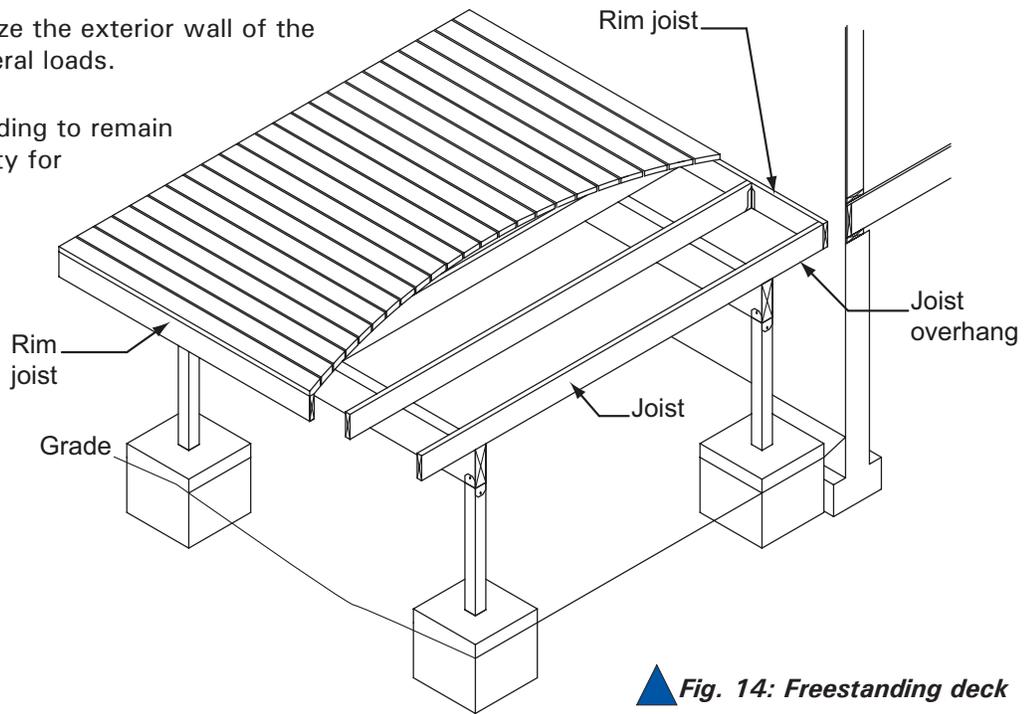
# Freestanding Decks

Decks that are free-standing do not utilize the exterior wall of the existing house to support vertical or lateral loads.

Freestanding decks allow the exterior siding to remain on the house, so there is less opportunity for water to get into the wall structure.

Freestanding decks may use precast footing pads set 12" below the surface of the ground on firm, undisturbed native soil.

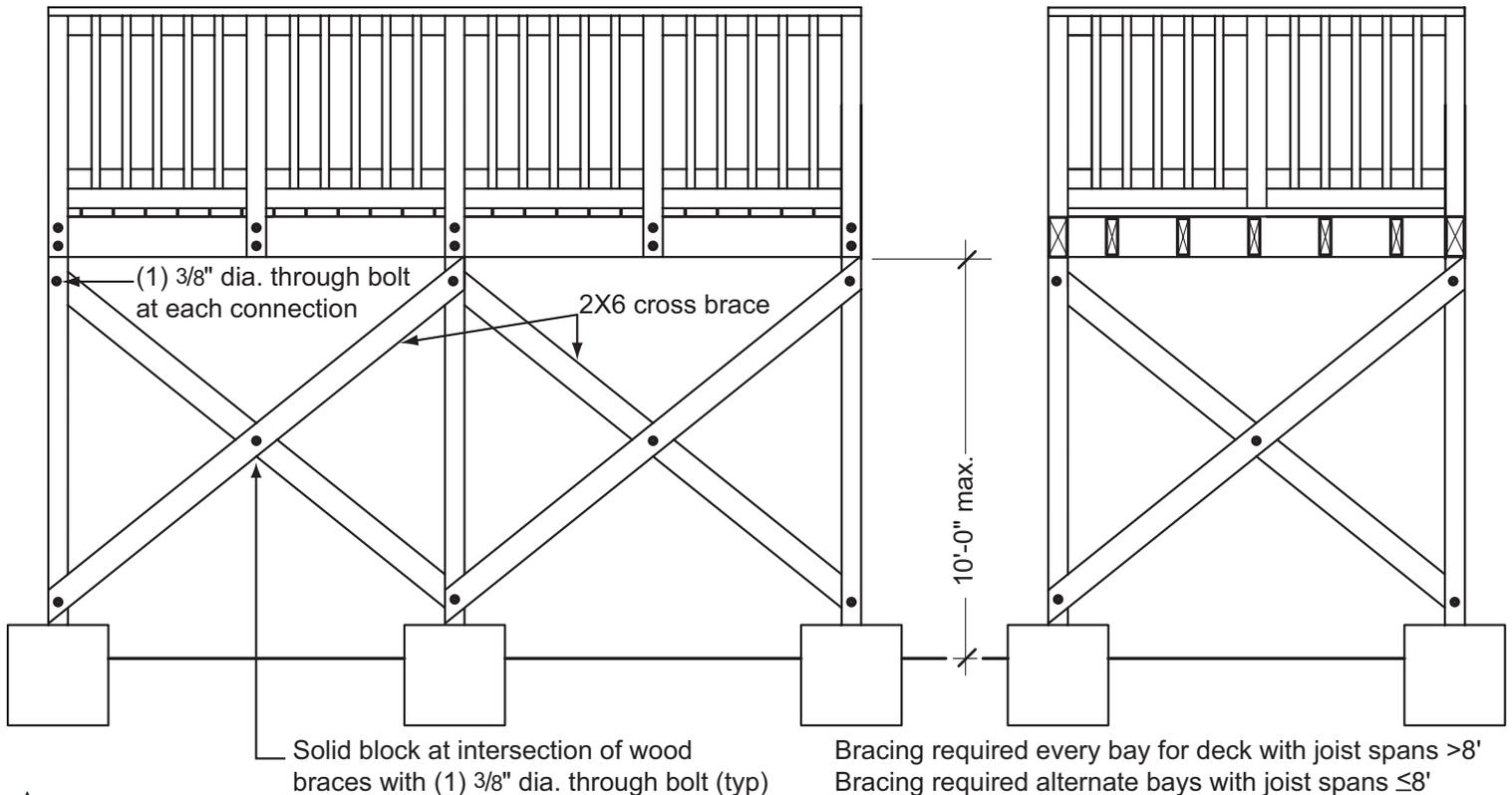
Freestanding decks require an additional beam, posts and footings, instead of a ledger board attached to the house.



**Fig. 14: Freestanding deck**

# Lateral Support

Decks more than 30 inches above grade must resist lateral forces (wind and earthquake) with diagonal cross bracing as shown in Figure 15. Bracing shall be located between posts parallel to beams and bolted with a 3/8" diameter through-bolt at each end to the posts as shown. Diagonal bracing shall also be located perpendicular to beams. Bracing is required in every other bay between posts for decks with joist spans up to 8 feet, and in every bay for decks with joist spans greater than 8 feet. If the deck is free-standing, diagonal bracing must be provided on all the posts and in both directions.

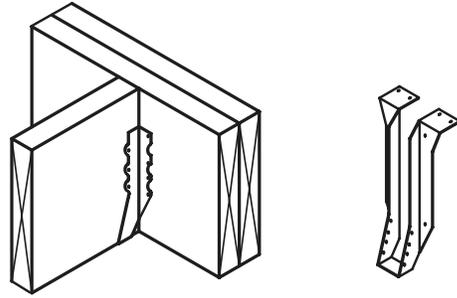


**Fig. 15: Diagonal bracing**

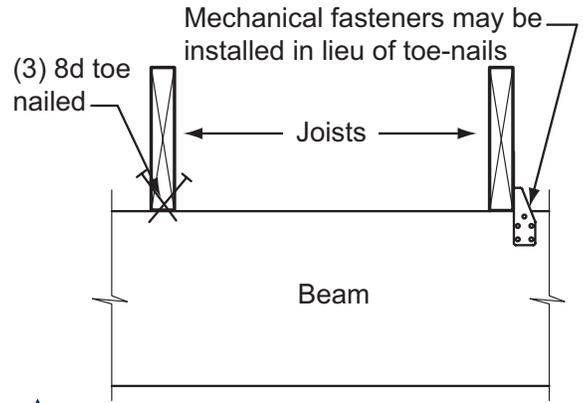
# Framing Connections

**Joist Hangers:** Joist hangers (see Fig. 16) shall have a minimum capacity of 1,000 pounds. Joist hangers used shall be manufactured for their intended lumber size.

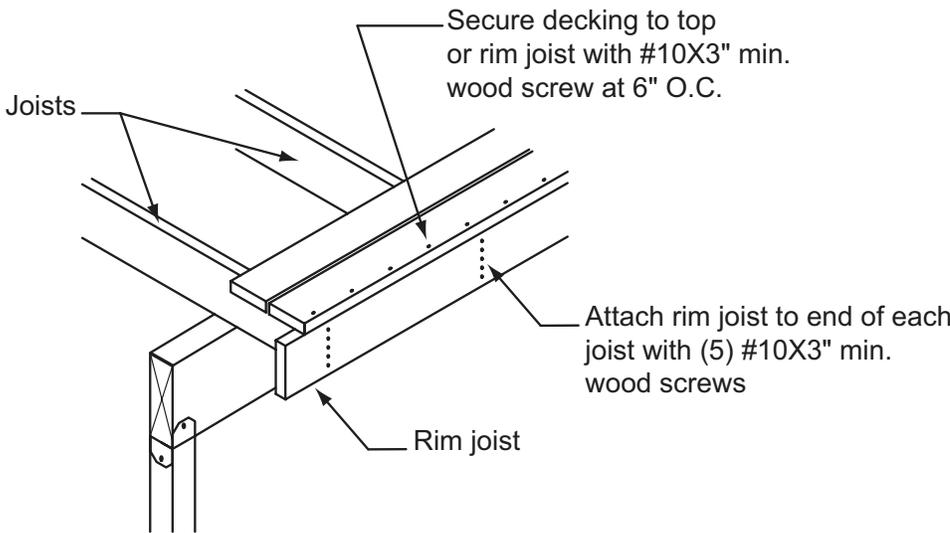
**Joist-to-Beam Connection:** Each joist shall be attached to the beam as shown in Fig. 16 or 17.



**Fig. 16: Typical joist hangers**



**Fig. 17: Joist-to-beam detail**

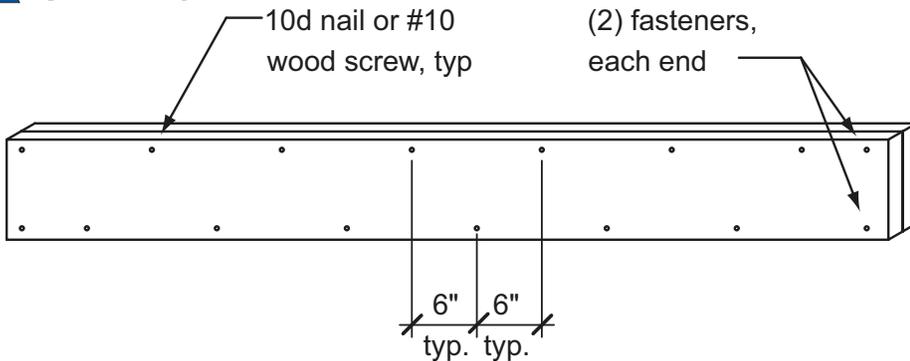


**Fig. 18: Rim joist connection**

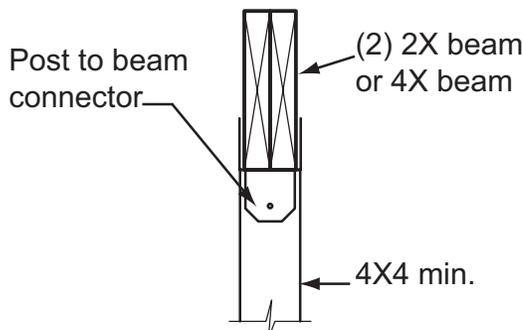
**Rim Joists:** Attach a continuous rim joist to the ends of joists as shown in Figure 18. Note that the rim joists are required at both ends of joists in free-standing decks. Minimum rim joist dimensions shall be equal to the dimensions of the joist.

**Built-up Beams:** Built-up beams shall be assembled in accordance with Figure 19. The nailing pattern shall be staggered as shown.

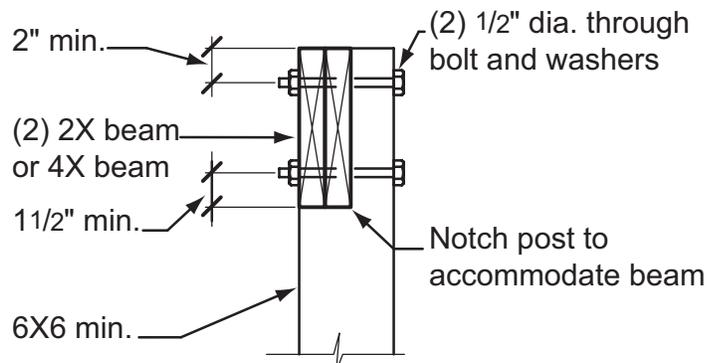
**Post-To-Beam Connection:** The post-to-beam connection shall be made with premanufactured mechanical connectors as shown in Figure 20. Post-to-beam connections may also be accomplished using a minimum 6x6 post notched for a 4x beam as shown in Figure 21. All thru-bolts shall have washers at the bolt head and nut.



**Fig. 19: Built-up-beam**



**Fig. 20 - Post-to-beam connection**

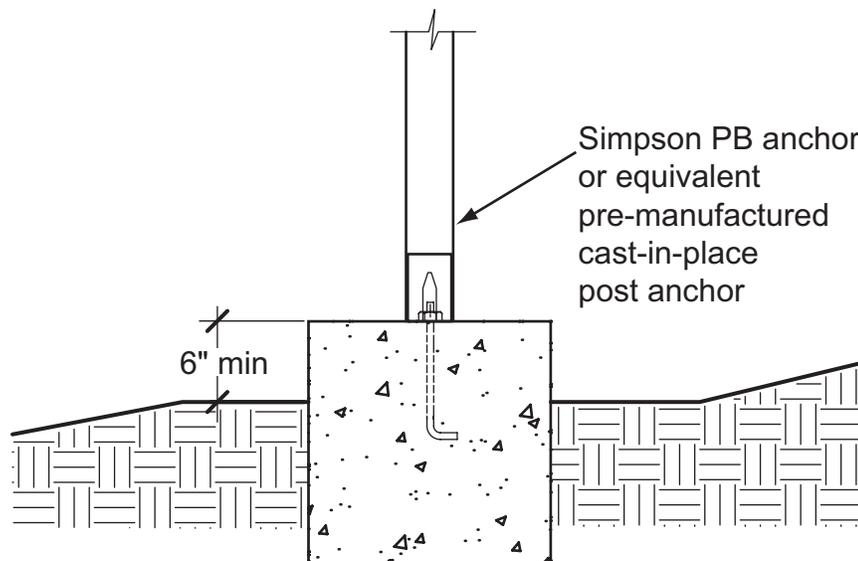


**Fig. 21 - Post-to-beam connection**

# Footings

See **Table 1** for footing size and footing thickness and **Figure 22** for post attachment requirements. The bottom of footings must extend 18 inches below grade and must bear on solid, native soil. Bearing conditions must be verified in the field during the footing inspection, prior to placement of concrete. Footings closer than 3'-0" to the existing exterior house wall must bear at the same elevation as the existing wall footing. **Do not construct footings over utility lines or enclosed meters. Call 1-800-332-2344 before you dig.**

**Post Anchors:** Premanufactured post anchors shall be capable of supporting a minimum of 3,000 pounds. Where diagonal bracing is required by Figure 15, the post anchors must be rated for horizontal (seismic) forces.

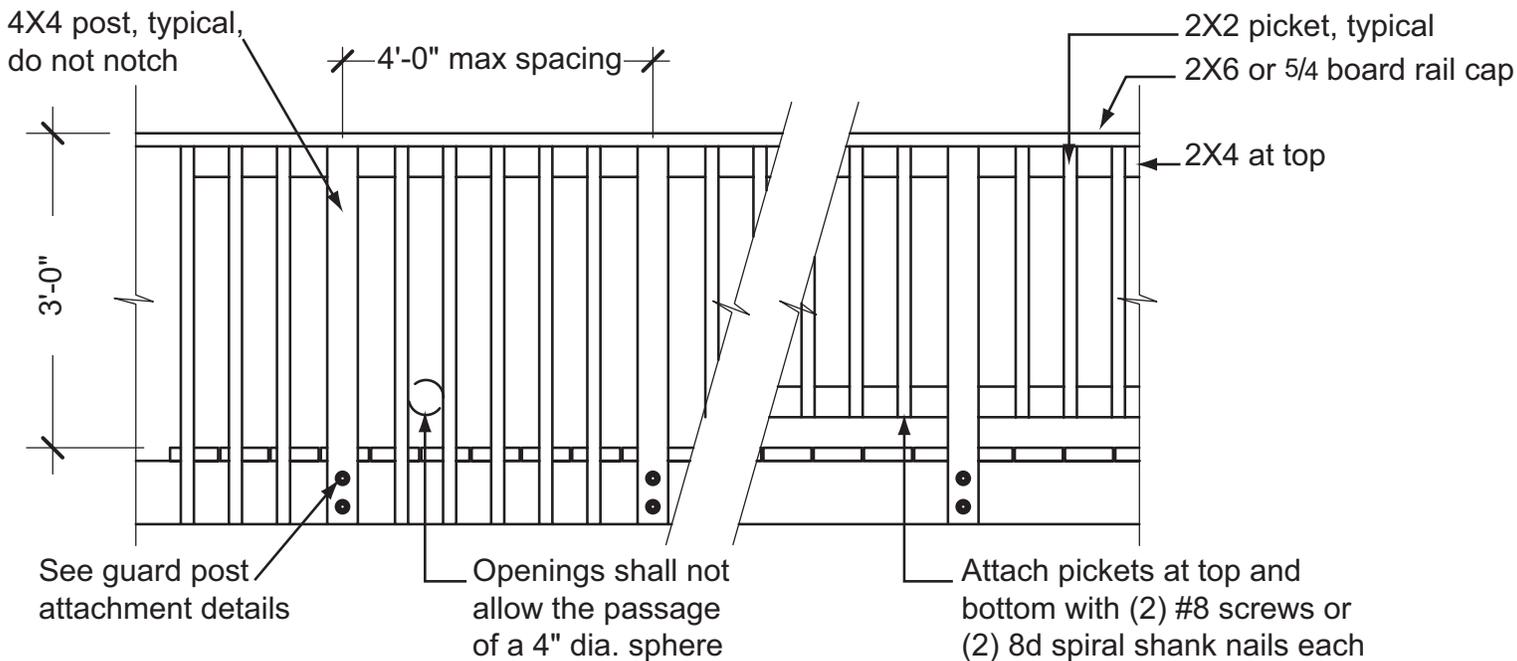


**Fig. 22: Typical footing detail**

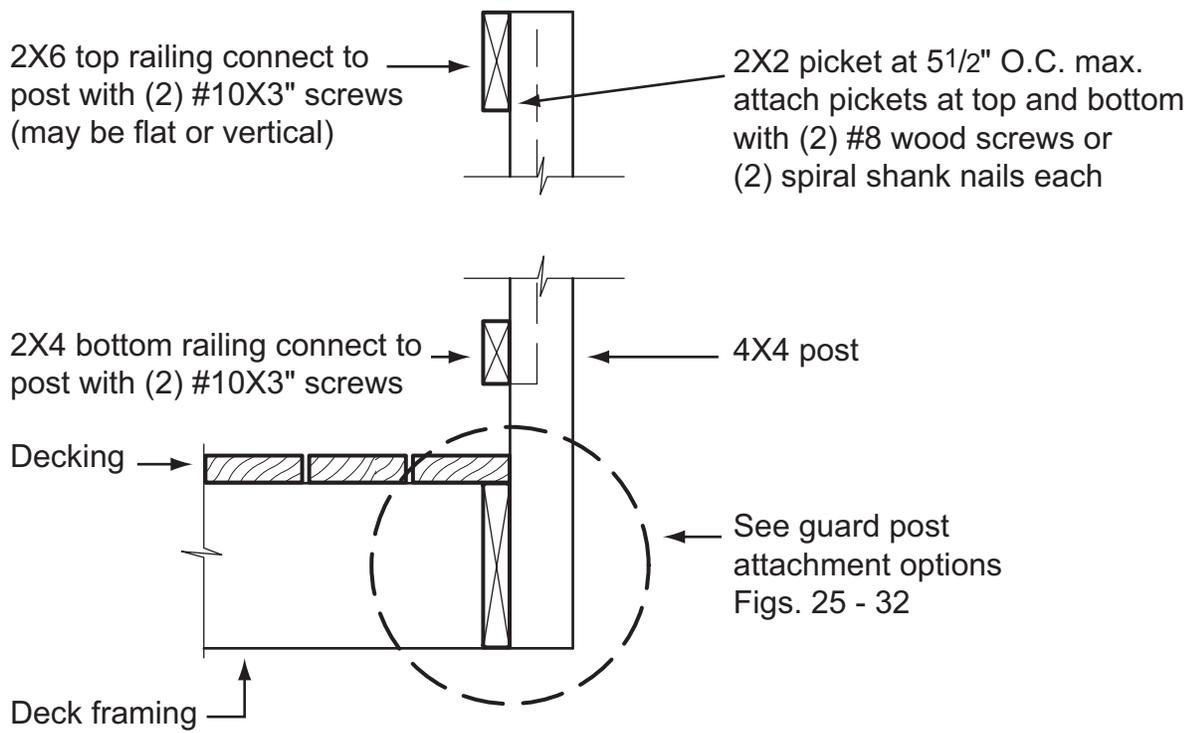
# Guardrails

Decks and stairways more than 30 inches above the adjacent grade must have guardrails. The guardrail must be designed to withstand a concentrated load of 200 pounds, in any direction anywhere along its length, and the infill area must withstand a load of 50 pounds per square foot area.

Guardrails using aluminum, composite wood, plastic, or other pre-manufactured systems must be designed by a structural engineer licensed in the state of Oregon.



**Fig. 23: Typical guardrail detail**

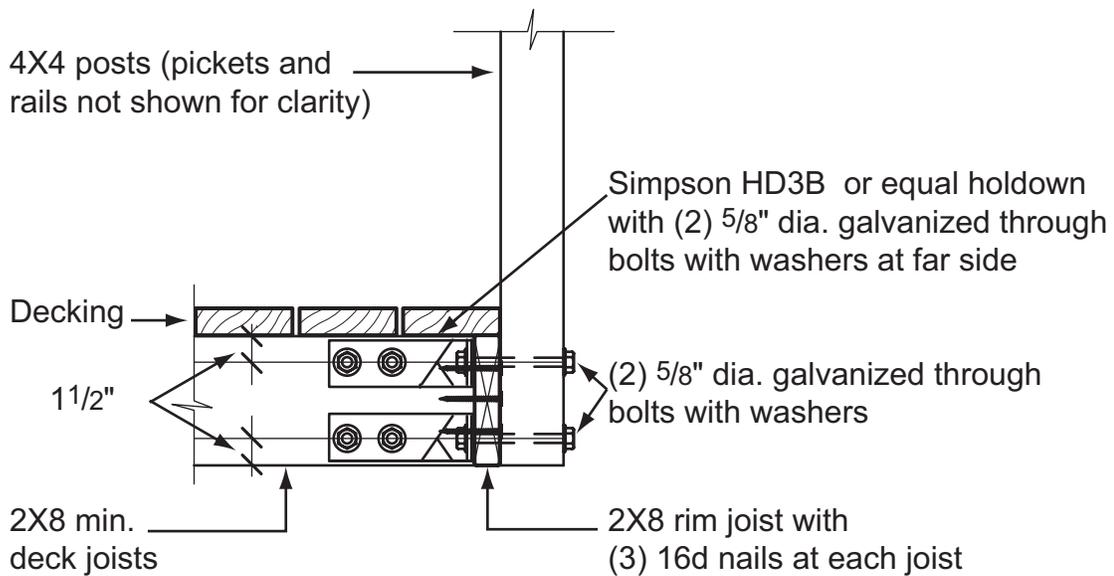


**▲ Fig. 24: Guardrail railing and picket detail**

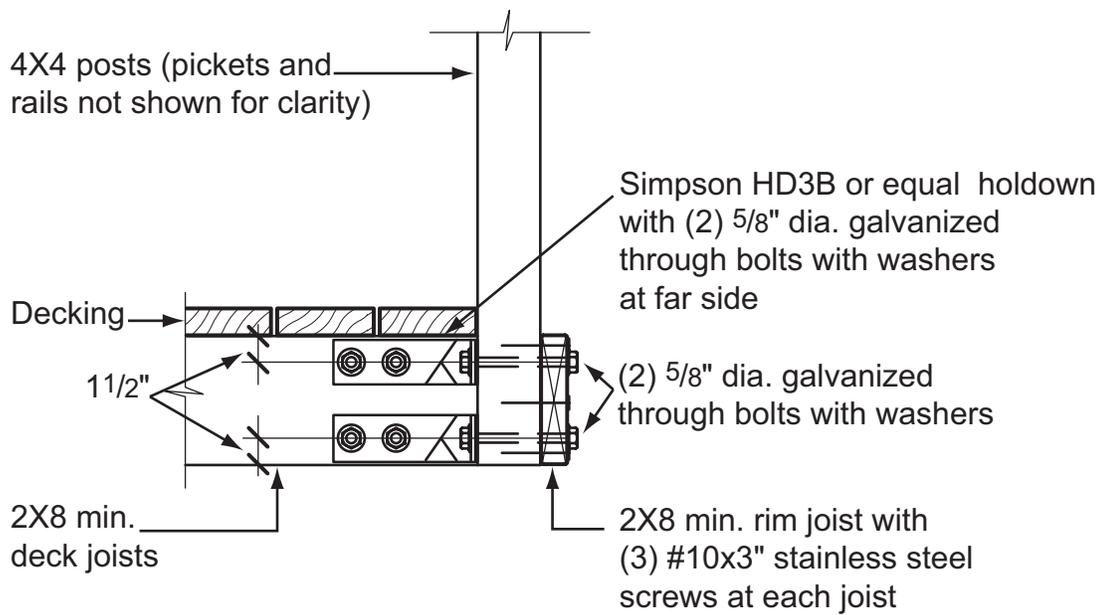
## Guardrail Post Attachment

Here are three options for guardrail post attachment; You may use one of these options or may submit a different design with drawings and calculations prepared by a professional engineer licensed in the State of Oregon.

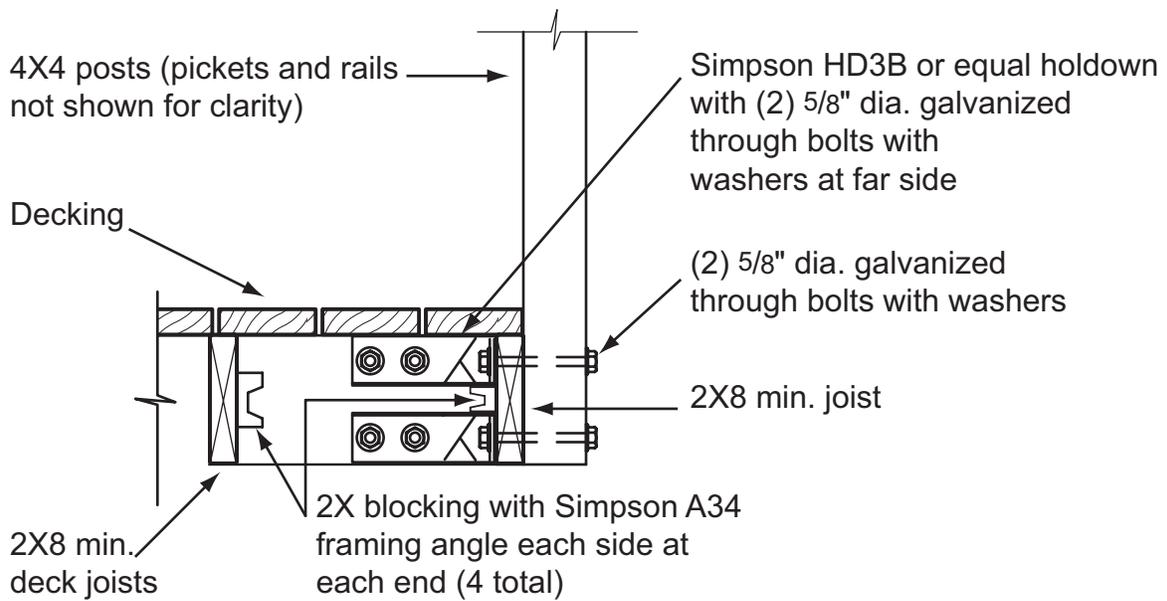
Guardrail posts shall be spaced per **Figure 23** and attached per **Figures 25 through 32**. Note: 2x8 minimum joists are required for Figures 25, 26, 27, 30, and 31, and minimum 2x10 joists for Figures 28 and 29. You may use one of these options.



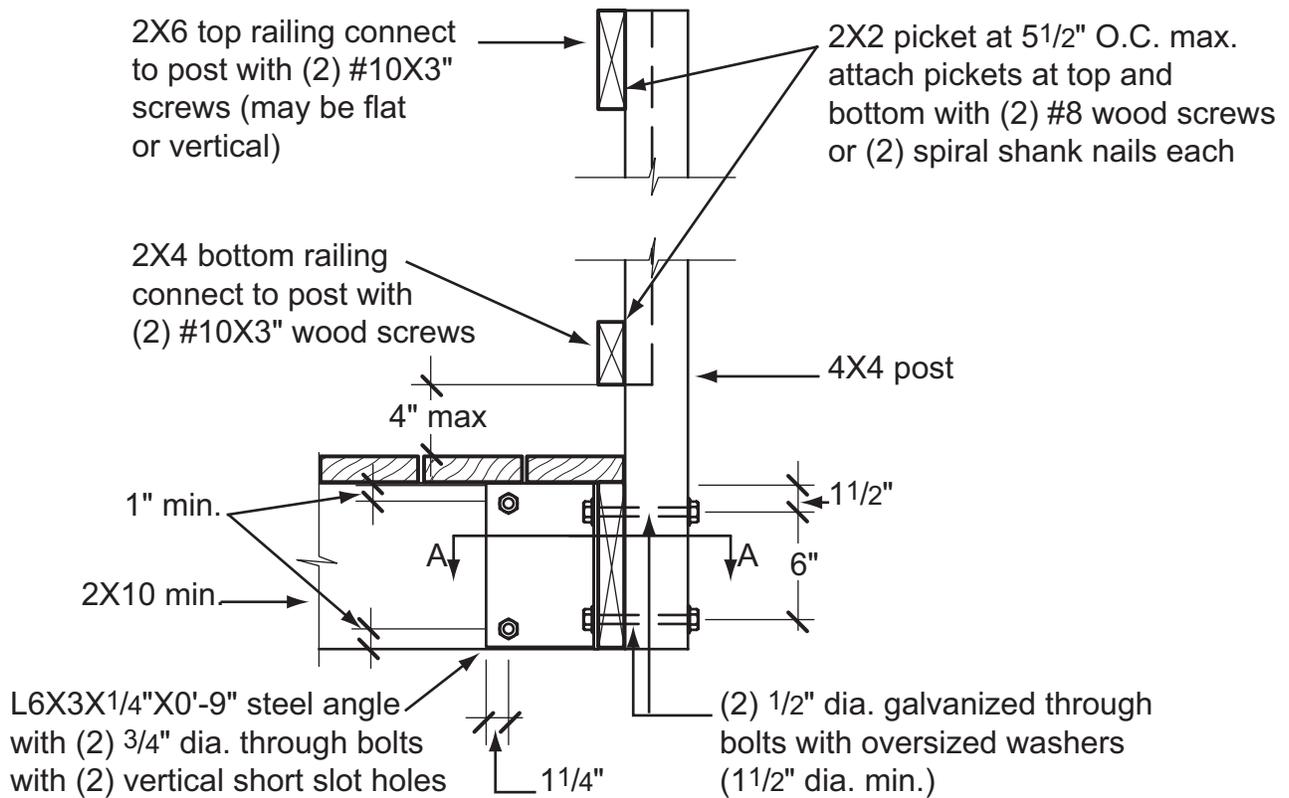
**▲ Fig. 25: Guardrail attachment OPTION 1 – Deck joists perpendicular to guardrail, post on outside, manufactured connectors**



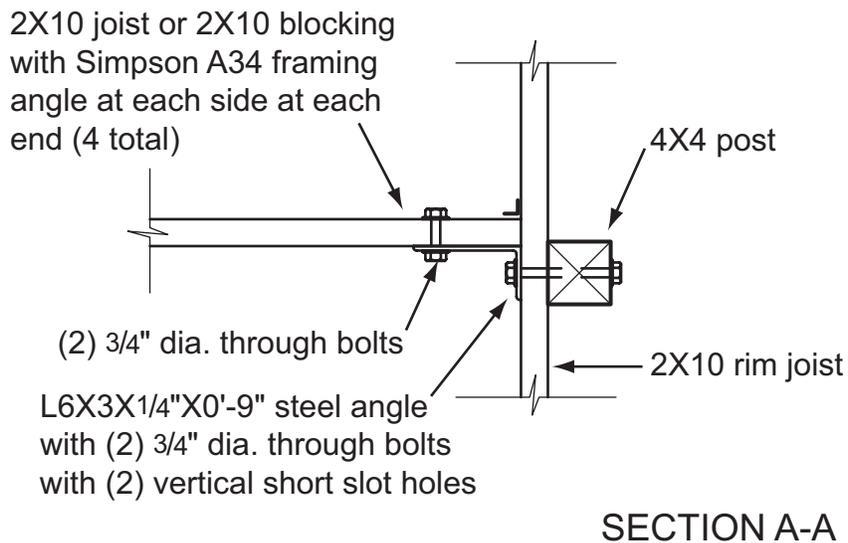
▲ **Fig. 26: Guardrail attachment OPTION 1A - Deck joists perpendicular to guardrail, rim joist on outside, manufactured connectors**



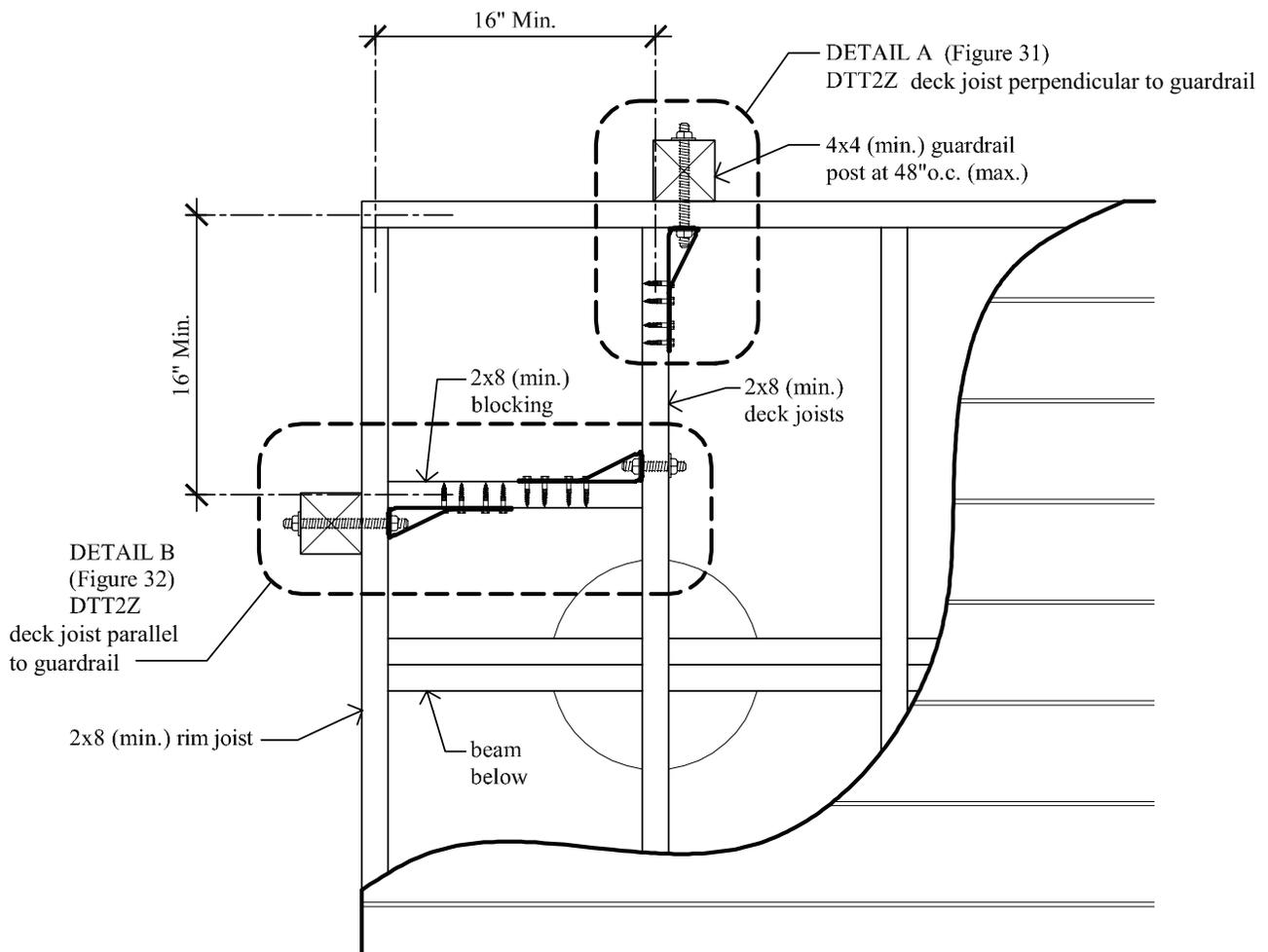
▲ **Fig. 27: Guardrail attachment for OPTION 1 and 1A - Deck joists parallel to guardrail, post on outside, manufactured connectors**



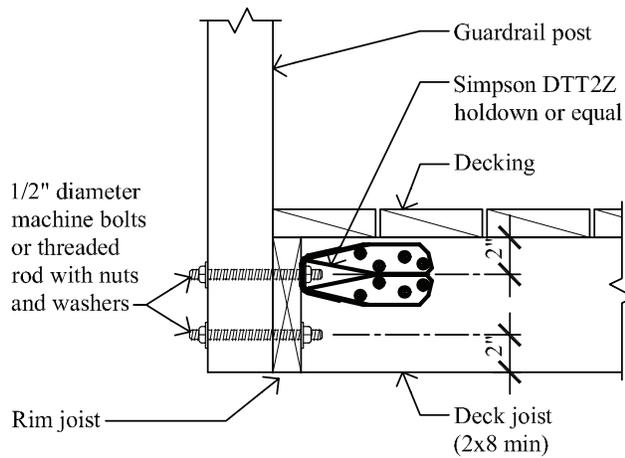
**▲ Fig. 28: Guardrail attachment OPTION 2 - Deck joists perpendicular to guardrail, post on outside, custom-fabricated connectors**



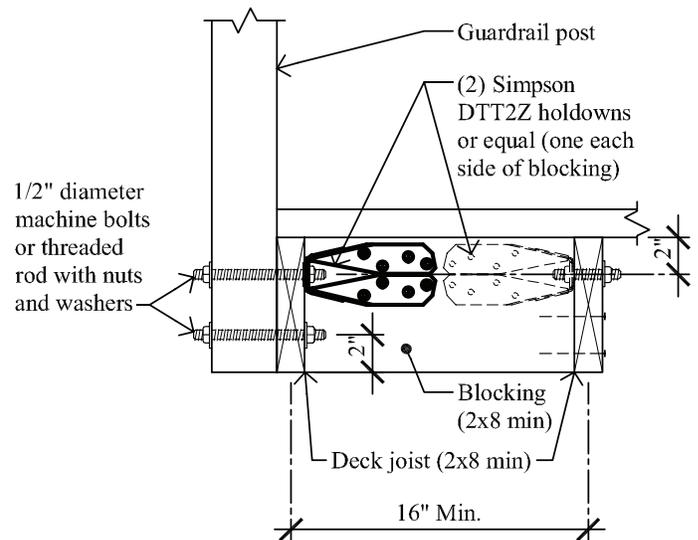
**▲ Fig. 29: Guardrail attachment section for OPTION 2**



▲ **Figure 30: Guardrail attachment OPTION 3 plan view**



**Detail A**



**Detail B**

▲ **Fig. 31: Guardrail attachment OPTION 3 perpendicular to guardrail**

▲ **Fig. 32: Guardrail attachment OPTION 3 parallel to guardrail**

# Stairs

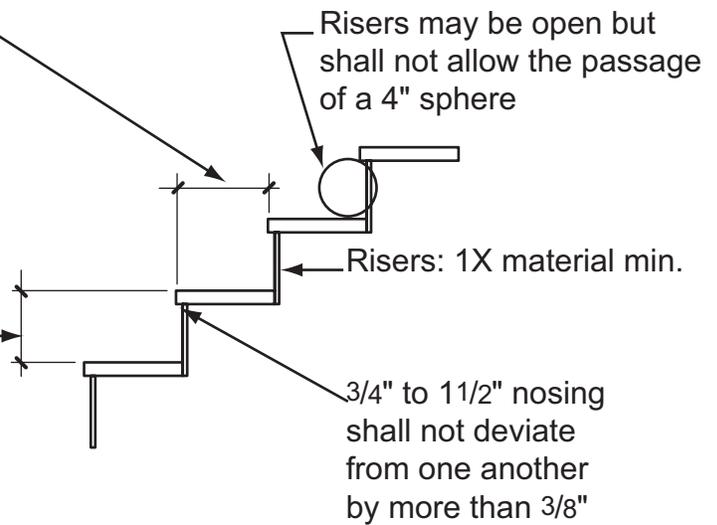
Stairways, stringers, handrails and guardrails shall meet the requirements shown in **Figures 33 through 36**. All stringers shall be minimum 2x12. A level landing minimum 3 feet by 3 feet is required at the top (usually this is the deck) and at the bottom of the stairway (usually a concrete pad, or the ground).

Note: This stair detail is for a three-foot wide maximum stairway with minimum 2x tread material. Plastic or composite decking products may be used for stair treads; however, they may require additional stair stringers for bracing. Check with the manufacturer's requirements.

See **Brochure # 8** for additional stair information.

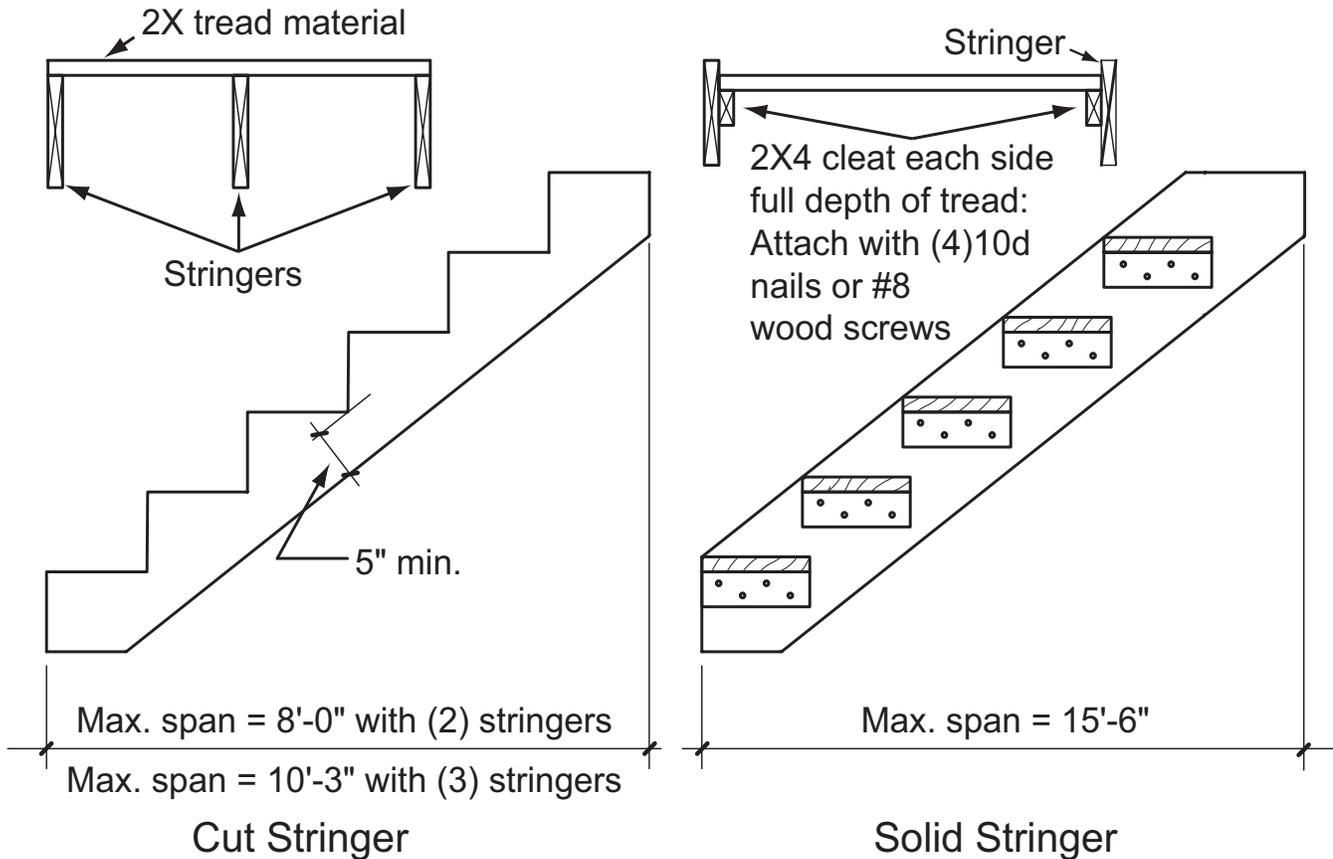
9" min. tread width shall not deviate from one another by more than 3/8"

8" max. riser height shall not deviate from one another by more than 3/8"

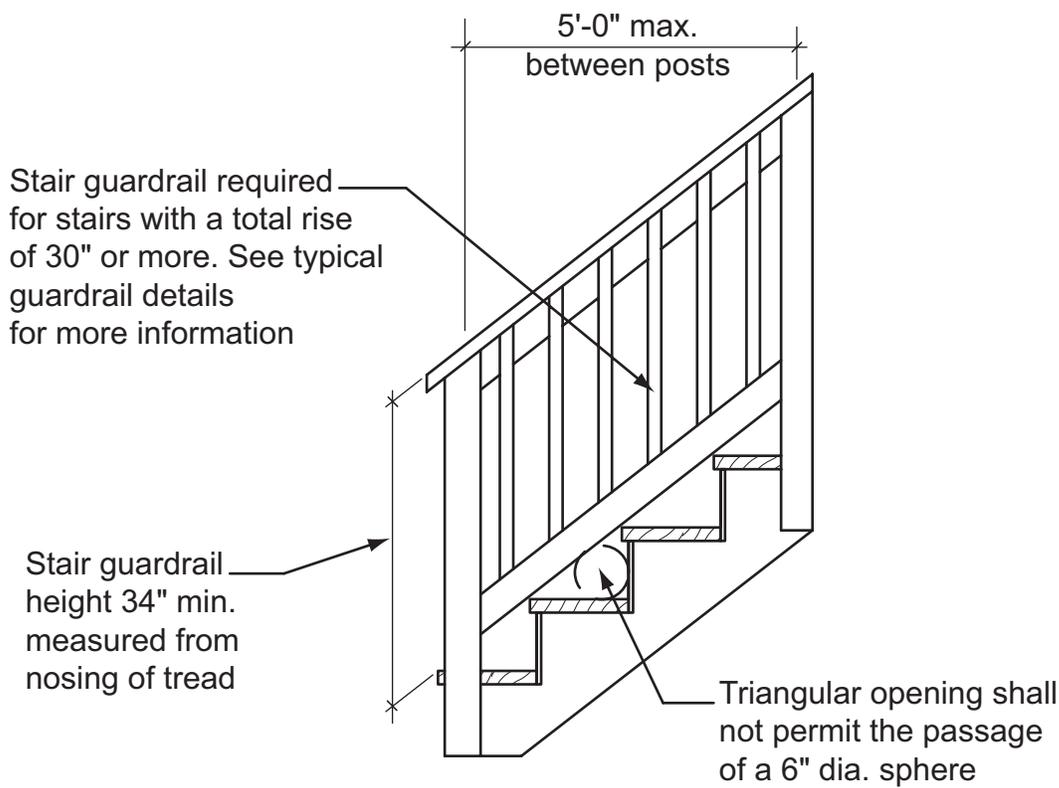


**▲ Fig. 33: Tread and riser detail**

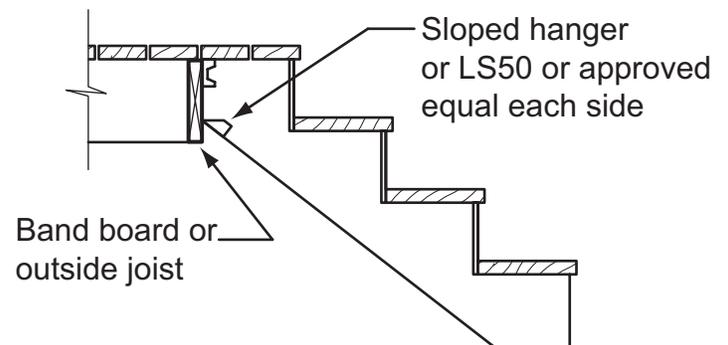
Attach 2X tread material to stringers or cleats with (2) #8 screws or (2) 8d nails per board at each stringer or cleat



**▲ Fig. 34: Stair stringers and tread connections**



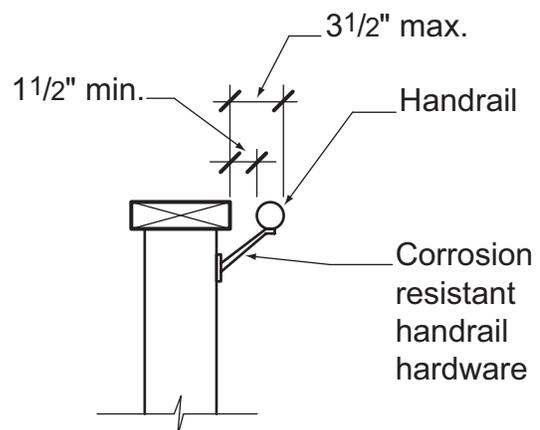
▲ **Fig. 35: Stair guard requirements**



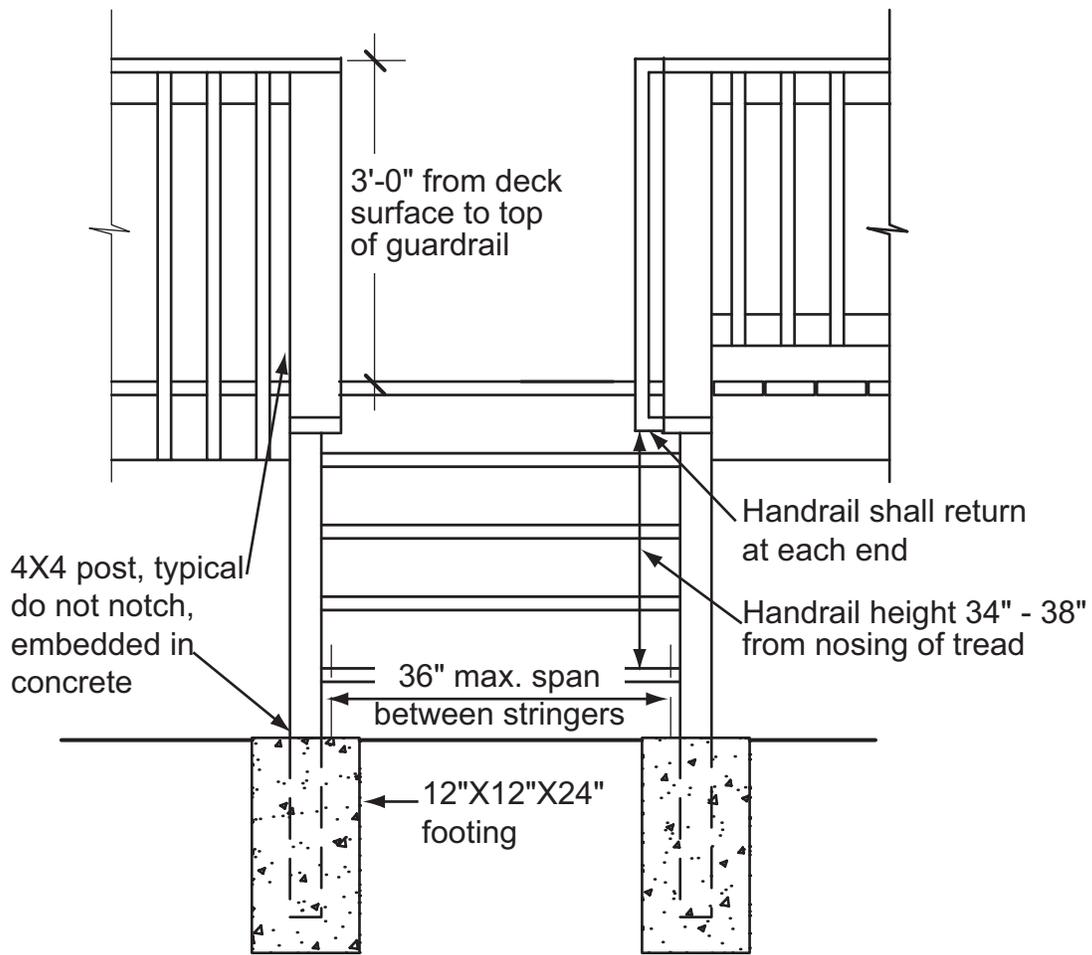
▲ **Fig. 36: Stair stringer connection detail**

## Stair Handrails

Stairs with four or more risers must have a handrail on at least one side. Handrails shall be graspable and shall be of decay-resistant and/or corrosion-resistant material. **See Figure 37.** The hand grip portion, if circular, shall be between 1 1/4" and 2" in cross section. Shapes other than circular shall have a perimeter dimension between 4" and not greater than 6 1/4" with a maximum cross sectional dimension of 2 1/4". All shapes must have a smooth surface with no sharp corners. Handrails shall run continuously from a point directly above the lowest riser to a point directly above the highest riser and shall return to the guard at each end. **See Figure 38.** Handrails may be interrupted at guardrail posts only at a turn in the stair.



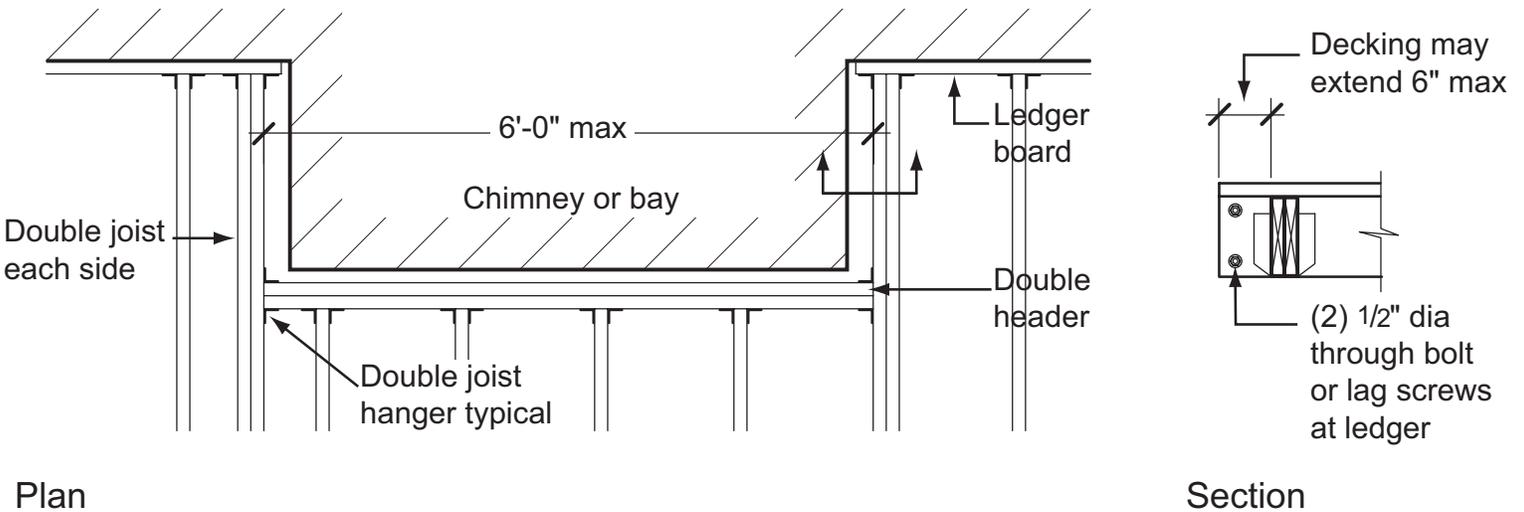
▲ **Fig. 37: Handrail requirements**



**▲ Fig. 38: Miscellaneous stair requirements**

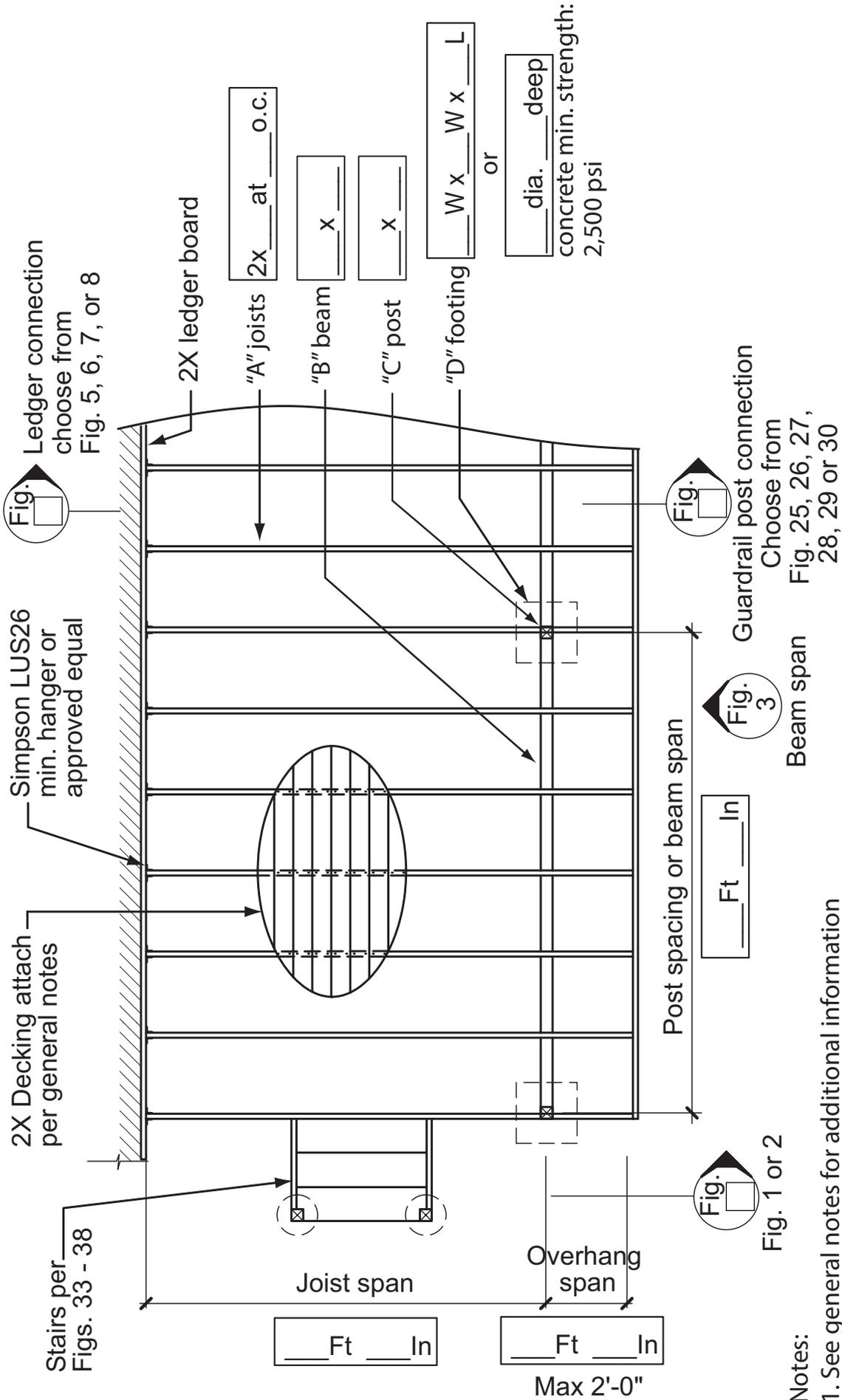
## Framing at a Chimney or Bay Window

Decks abutting a chimney or bay window shall be framed in accordance with Figure 39. Headers with a span length greater than 6'-0" require a calculation.



**▲ Fig. 39: Requirements for framing at chimney or bay window**

# DECK FRAMING PLAN



**Notes:**

1. See general notes for additional information
2. See Figure 15 for diagonal bracing requirements
3. See Figures 20, 21 for post to beam connection and figure 18 for rim joist connection
4. See Figure 23 for typical guardrail elevation

# Helpful Information

## Bureau of Development Services

City of Portland, Oregon  
1900 SW 4th Avenue, Portland, OR 97201  
[www.portlandoregon.gov/bds](http://www.portlandoregon.gov/bds)

## General Office Hours:

Monday through Friday, 8:00 am to 5:00 pm  
BDS main number: 503-823-7300

## Permit Information is available at the following location:

Development Services Center (First Floor)  
For Hours Call 503-823-7310  
or visit [www.portlandoregon.gov/bds](http://www.portlandoregon.gov/bds)

Permitting Services (Second Floor)

For Hours Call 503-823-7310  
or visit [www.portlandoregon.gov/bds](http://www.portlandoregon.gov/bds)

# Important Telephone Numbers

BDS main number .....	503-823-7300
DSC automated information line .....	503-823-7310
Building code information .....	503-823-1456
Zoning code information .....	503-823-7526
Permit information for electrical, mechanical, plumbing, sewer and sign .....	503-823-7363
Permitting process and fees .....	503-823-7357
Permit resources and records .....	503-823-7660
BDS 24 hour inspection request line requires IVR number and three digit type of inspection code .....	503-823-7000
Residential information for one and two family dwellings .....	503-823-7388
Environmental Soils .....	503-823-7790
Portland Bureau of Transportation .....	503-823-7002
City of Portland TTY .....	503-823-6868
Call before you dig .....	503-246-6699
Tree Hotline .....	503-823-8733

For more detailed information regarding the bureau's hours of operation and available services;

Visit our Web site  
[www.portlandoregon.gov/bds](http://www.portlandoregon.gov/bds)

**Note:** All information in this brochure is subject to change.

# Scheduling an inspection

- Call 503-823-7000, the BDS 24 hour inspection request line
- Enter your IVR or permit number
- Enter the three-digit inspection code for the type of inspection you are requesting
- Enter a phone number where you can be reached during weekdays and if you want the inspection in the morning or afternoon
- There must be an adult over age 18 to allow the inspector entry

- ✓ To be safe, remember to call before you dig, and have your underground utility lines located.
- ✓ Check with PDOT regarding the width of the right-of-way if you are building in your front yard.
- ✓ Depending on your location and the specifications of your project, building and/or zoning permits may be required.
- ✓ Some zones have special requirements which could affect your outdoor project.
- ✓ If you have any questions or concerns about your project, check with staff in the DSC about zoning and building issues.