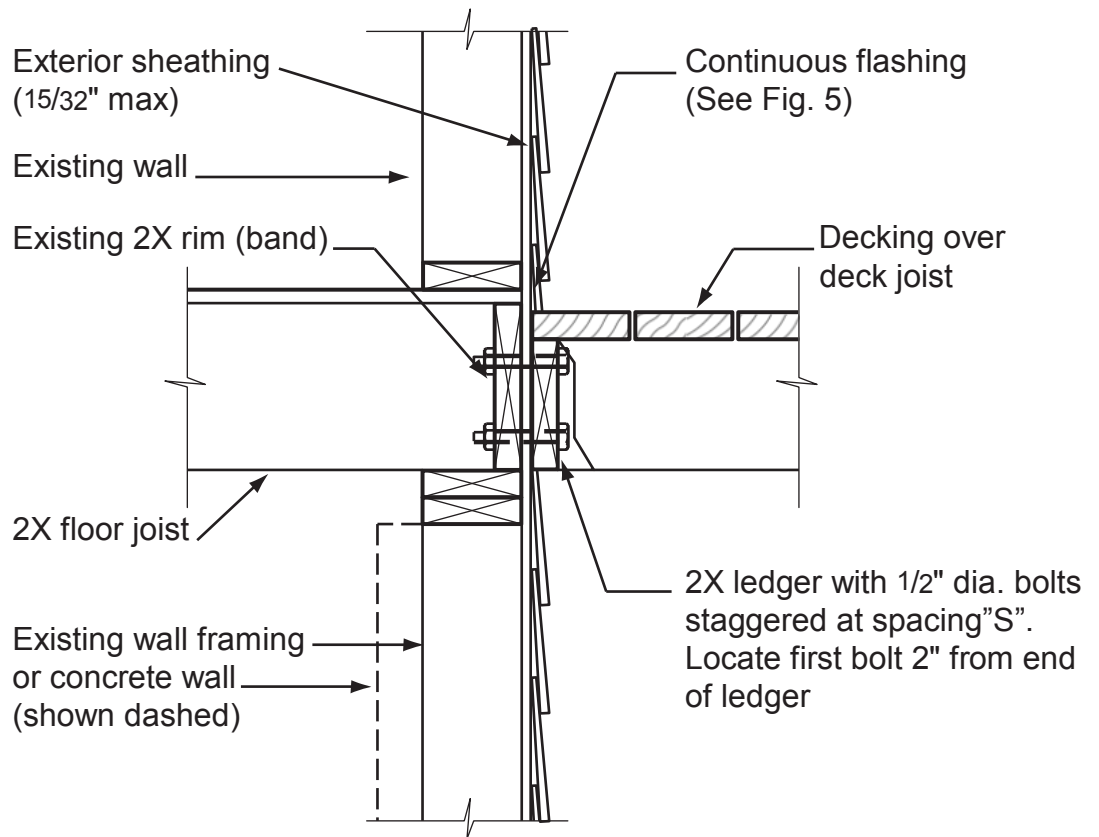
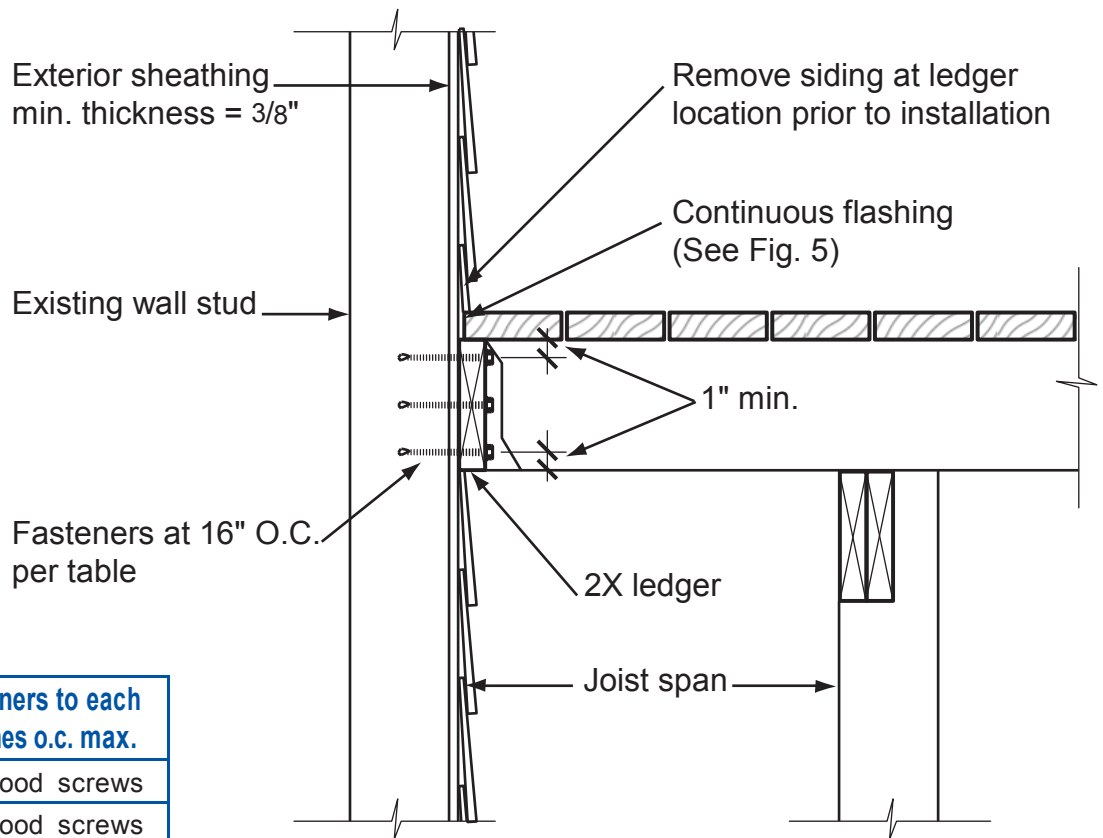


Joist Span	Spacing "S"
0 < span ≤ 8'	36"
8' < span ≤ 10'	34"
10' < span ≤ 14'	24"
14' < span ≤ 16'	21"

From table R502.2.2.1 of 2011 ORSC.

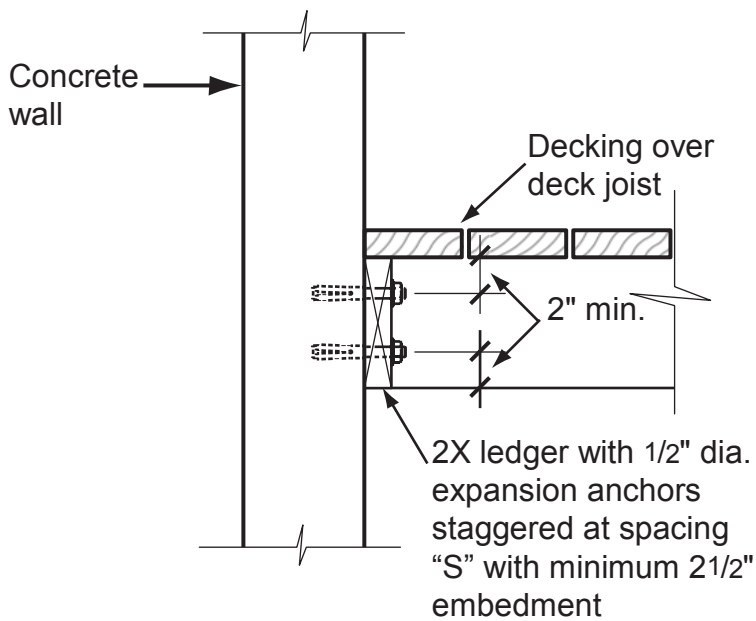


▲ Fig. 6: Attachment of Ledger Board to Band Board with Thru-Bolts (See Fig. 12 for spacing and clearances)



Joist Span	Required fasteners to each stud or 16 inches o.c. max.
0 < span ≤ 8'	(3) #10 x 5" wood screws
8' < span ≤ 10'	(4) #10 x 5" wood screws
10' < span ≤ 14'	(5) #10 x 5" wood screws
14' < span ≤ 16'	(6) #10 x 5" wood screws

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



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).

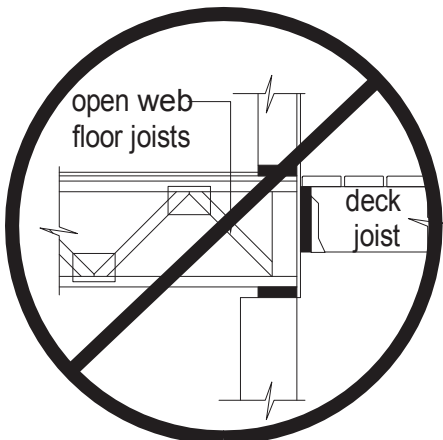


Fig. 9: No attachment to open web trusses

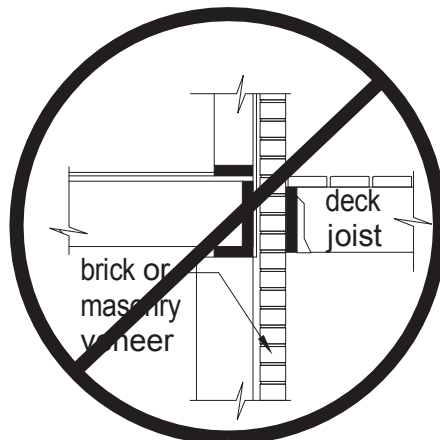
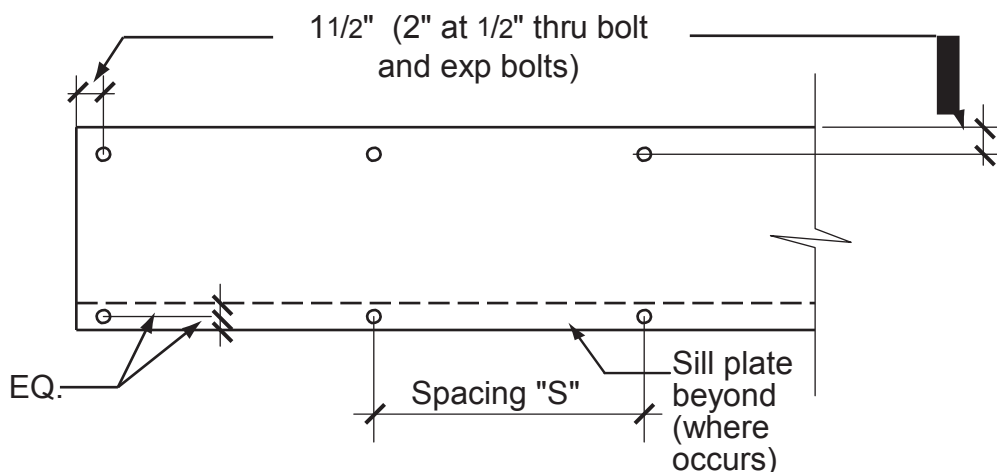


Fig. 10: No attachment to brick veneer



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 $\frac{3}{8}$ " 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.

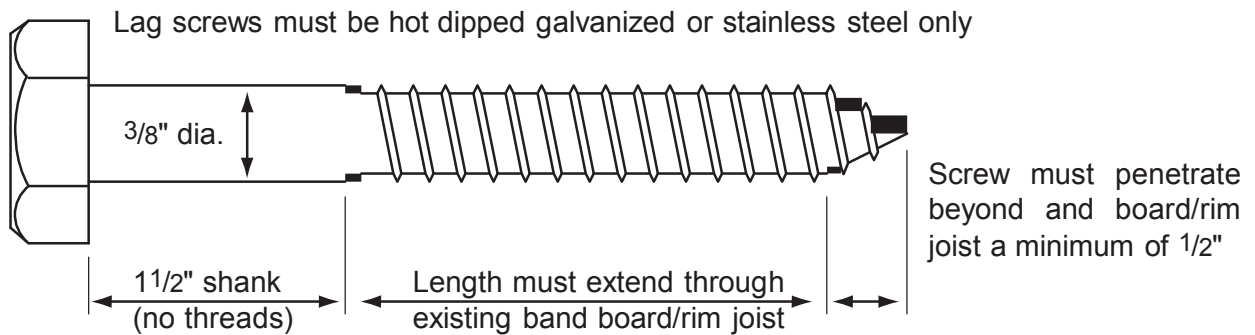


Fig 13: Lag screw requirements

Lag Screw Installation Requirements: Each lag screw shall have lead (pilot) holes drilled as follows: 1) drill a $\frac{3}{8}$ " diameter hole in the ledger board, 2) drill a $\frac{3}{16}$ " diameter hole into the solid connection material of the existing house. **DO NOT DRILL A $\frac{3}{8}$ " 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.

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 at any depth 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.

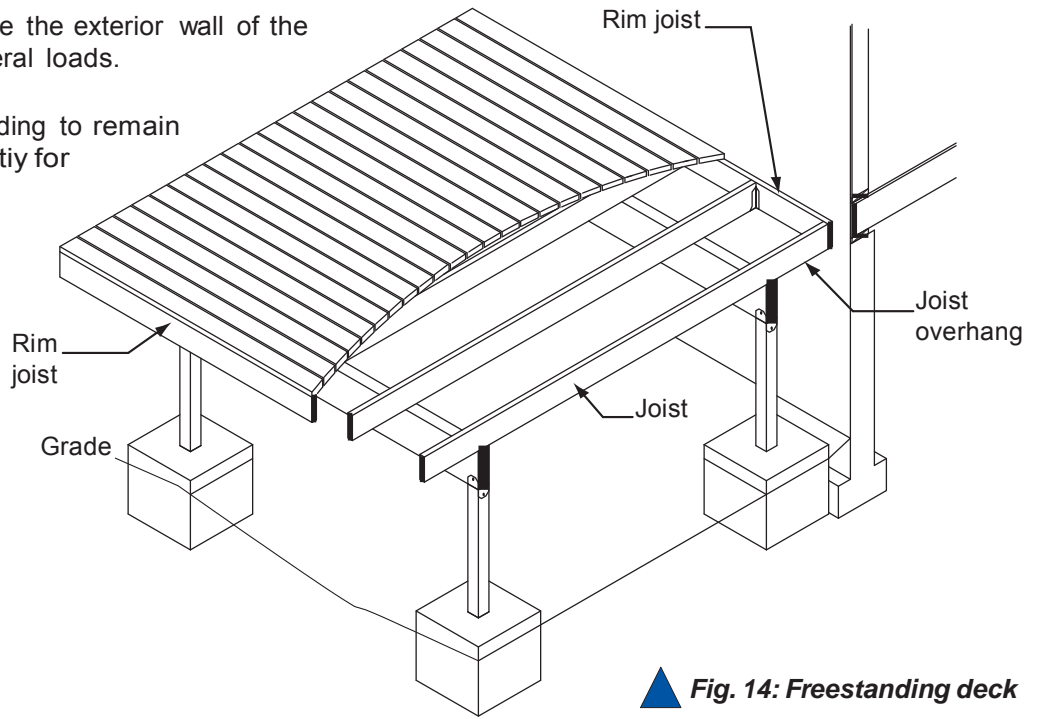


Fig. 14: Freestanding deck

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. If the deck is free-standing, diagonal bracing must be provided on all the posts and in both directions. 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.

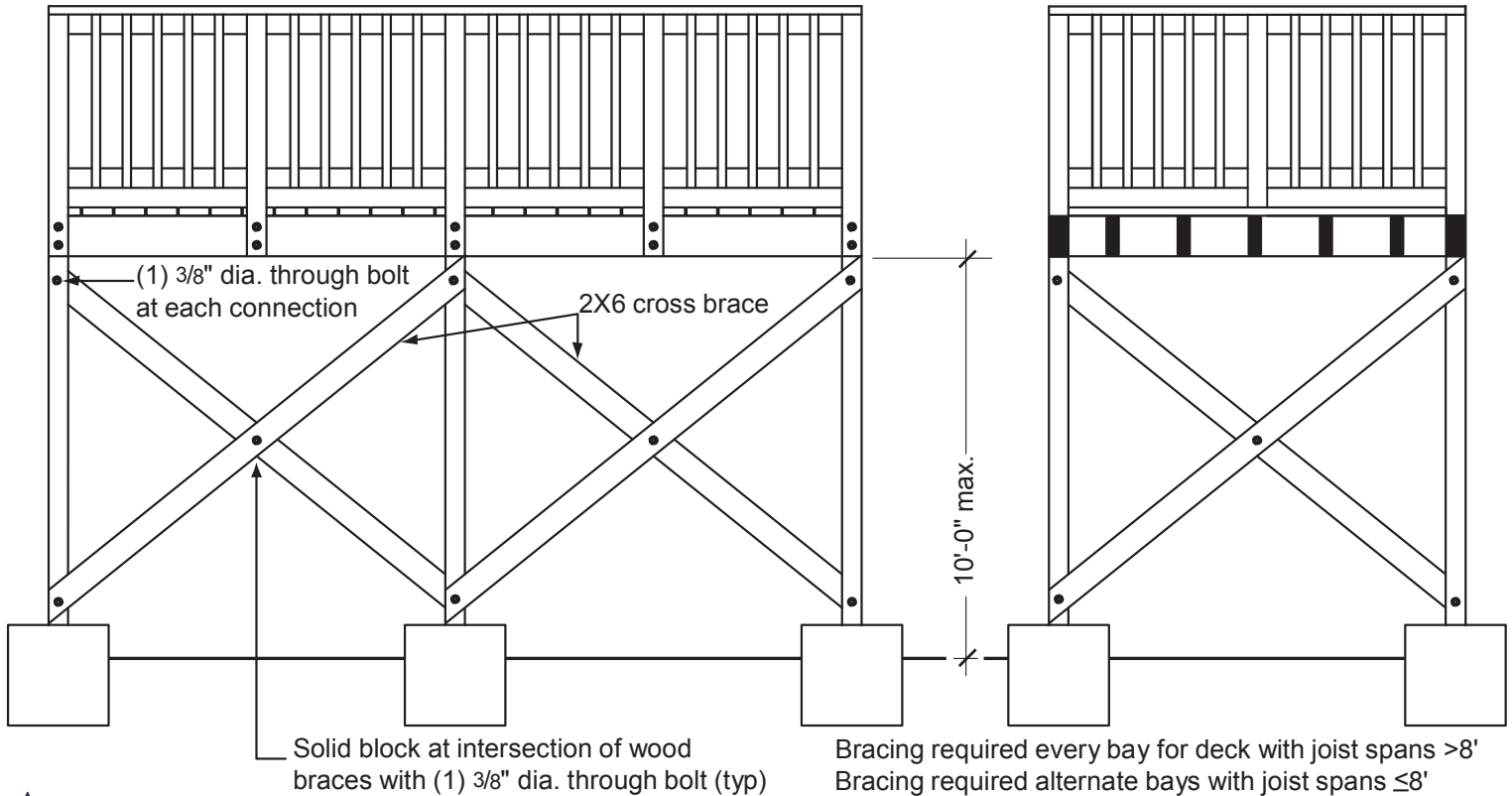


Fig. 15: Diagonal bracing

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.

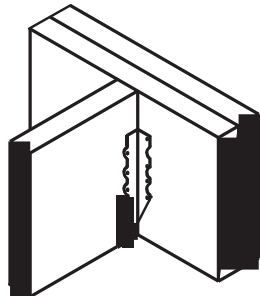


Fig. 16: Typical joist hangers

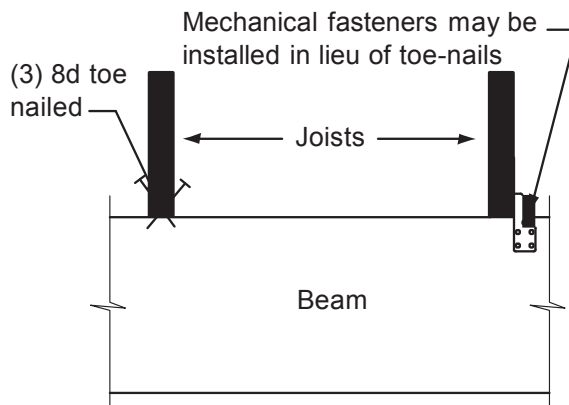


Fig. 17: Joist-to-beam detail

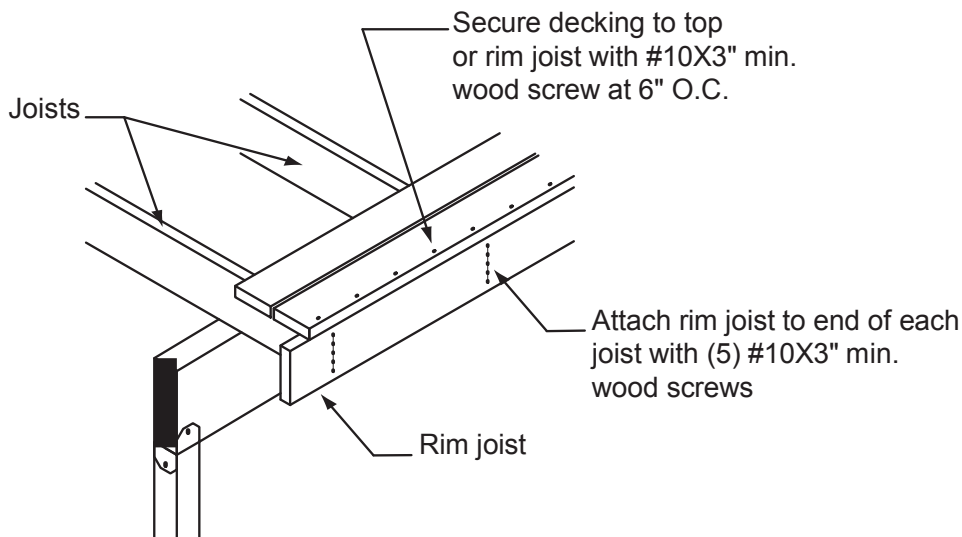


Fig. 18: Rim joist connection

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.

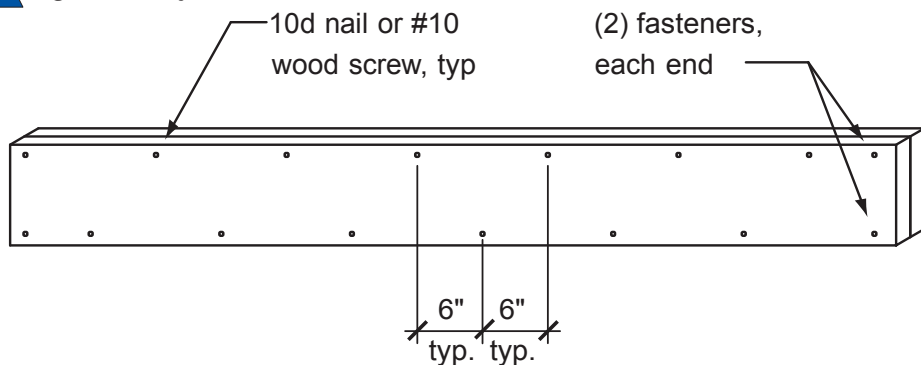


Fig. 19: Built-up-beam

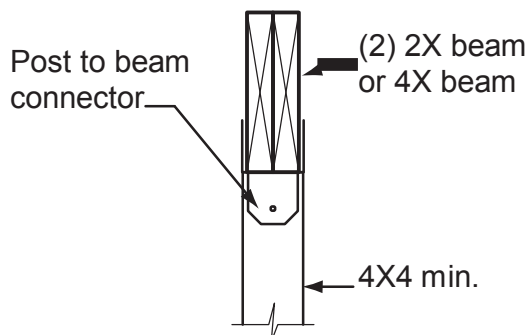


Fig. 20 - Post-to-beam connection

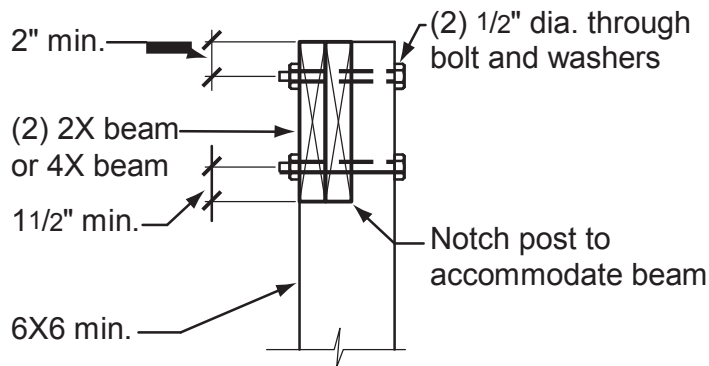


Fig. 21 - Post-to-beam connection

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.

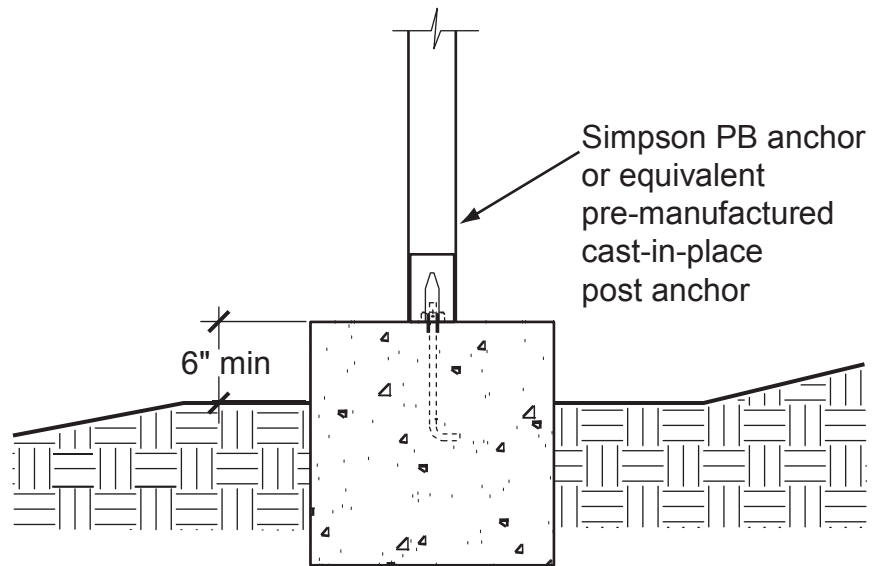


Fig. 22: Typical footing detail

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

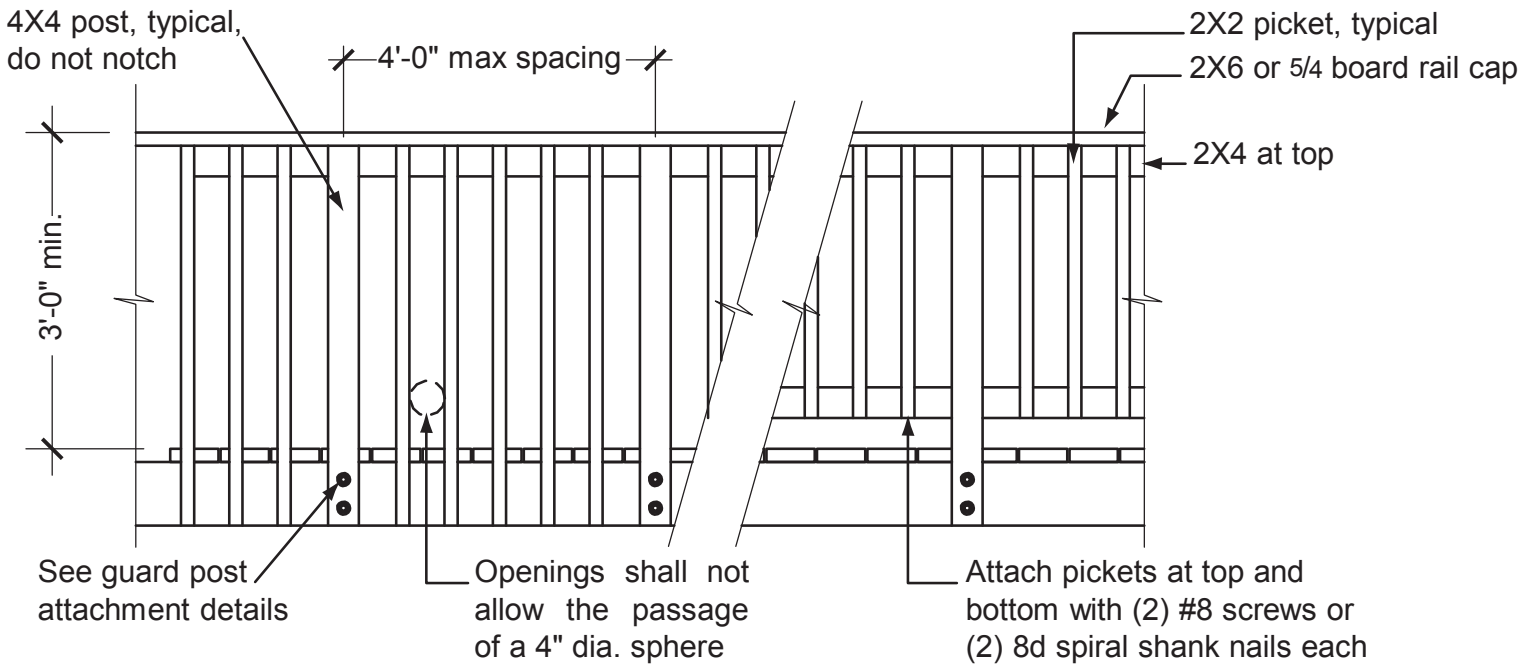
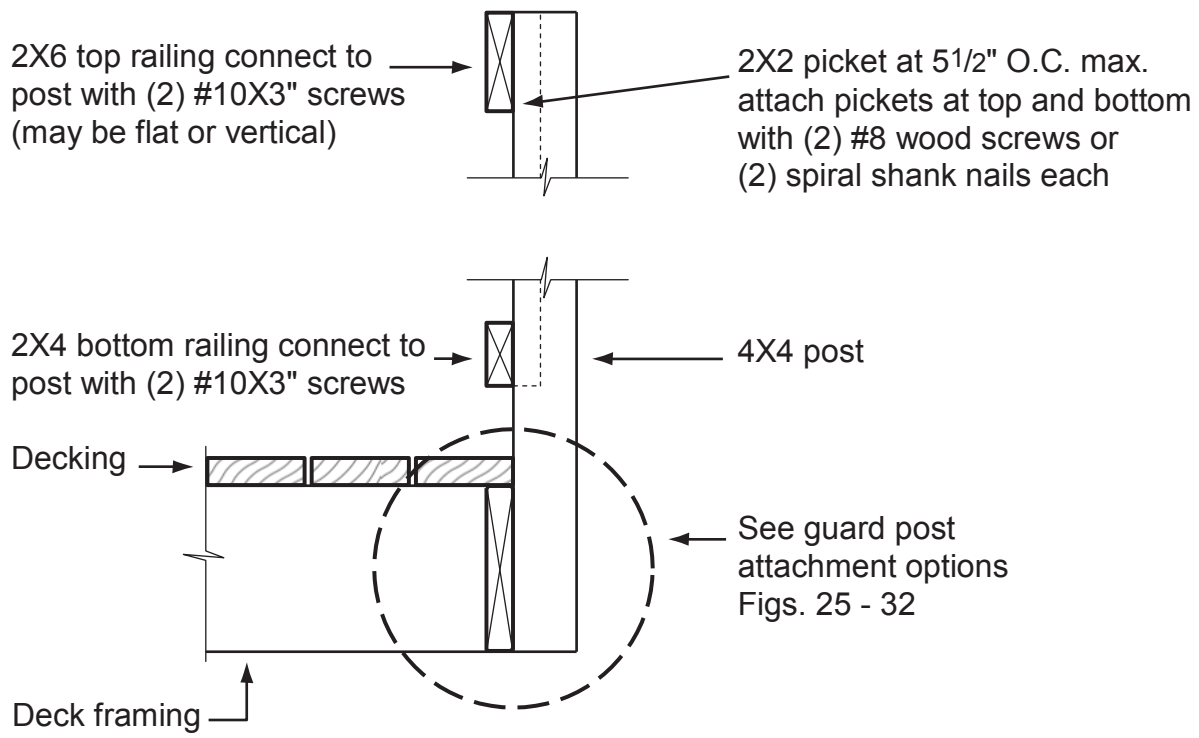


Fig. 23: Typical guardrail detail

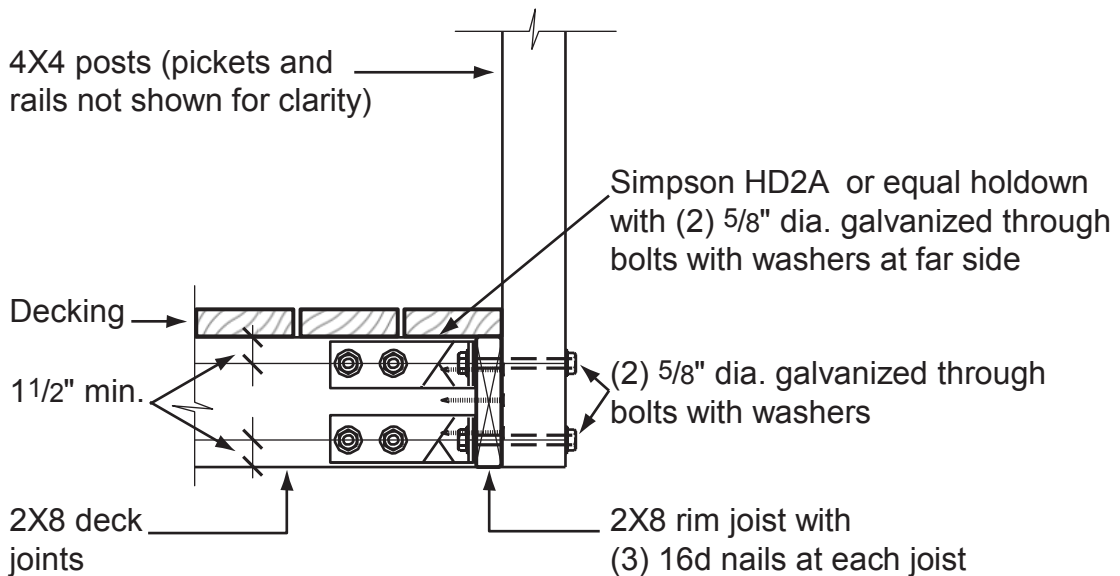


▲ Fig. 24: Guardrail railing and picket detail

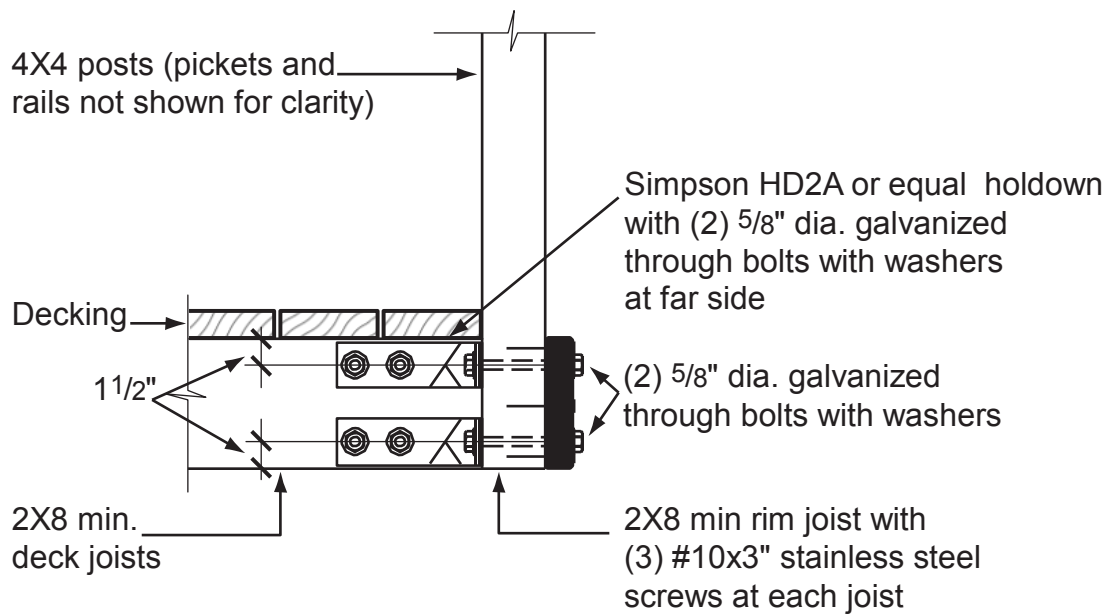
Guardrail Post Attachment

Here are five options for guardrail post attachment; you may use one of these, or you may submit a different design for review and approval. Guardrail posts shall be spaced per **Figure 23** and attached per **Figures 25 through 32**.

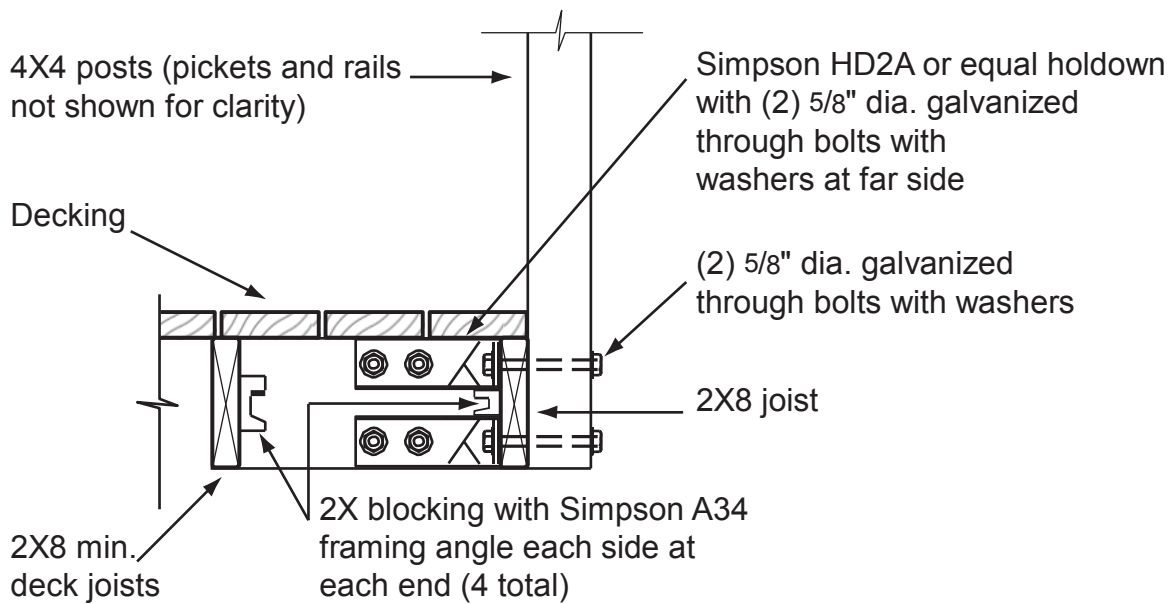
Note: 2x8 minimum joists are required for Figures 25, 26, 27, 30, and 31, and minimum 2x10 joists for Figures 28 and 29.



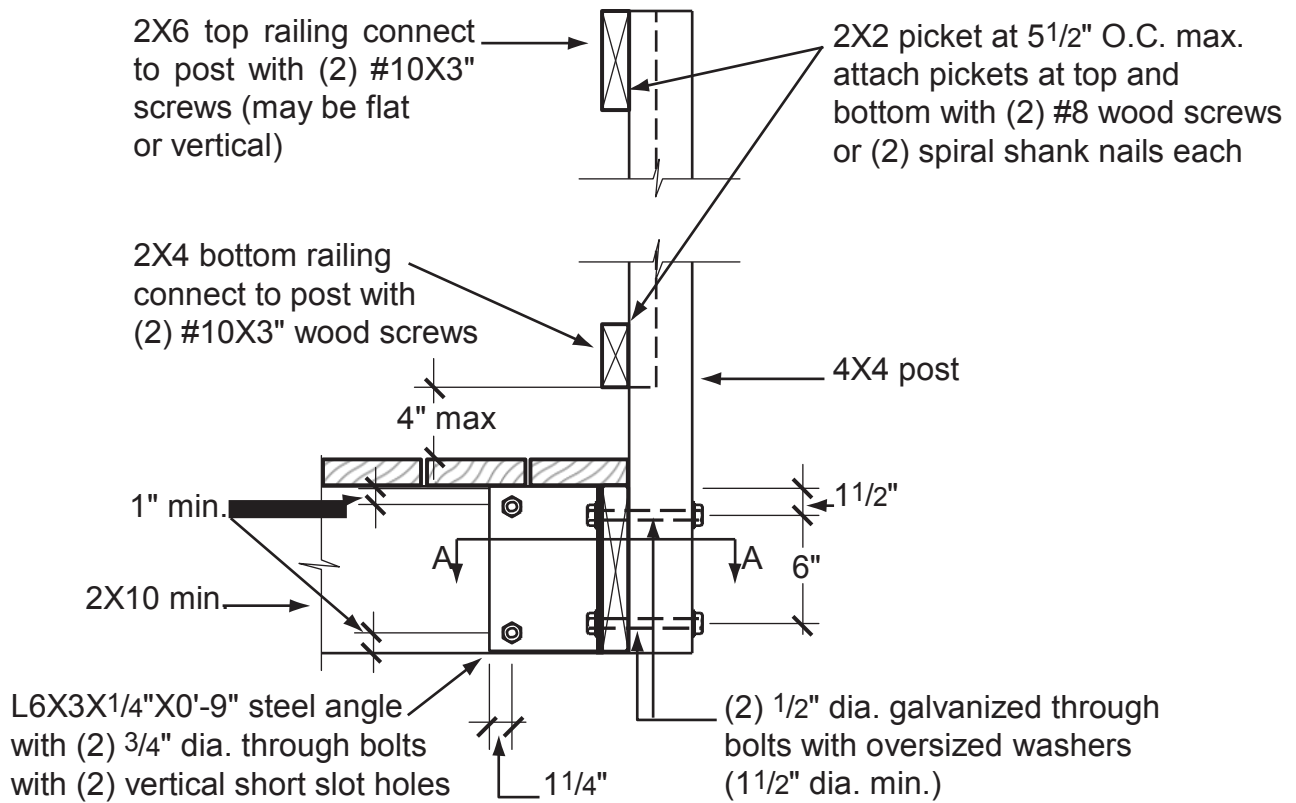
▲ Fig. 25: Guardrail attachment option 1 – Deck joists perpendicular, post on outside, manufactured connectors



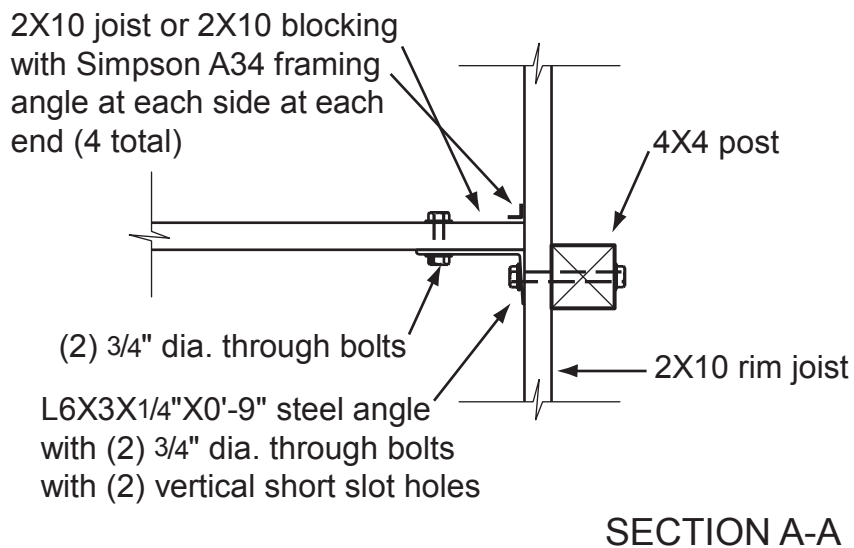
▲ **Fig. 26: Guardrail attachment option 2 - Deck joists perpendicular, rim joist on outside, manufactured connectors**



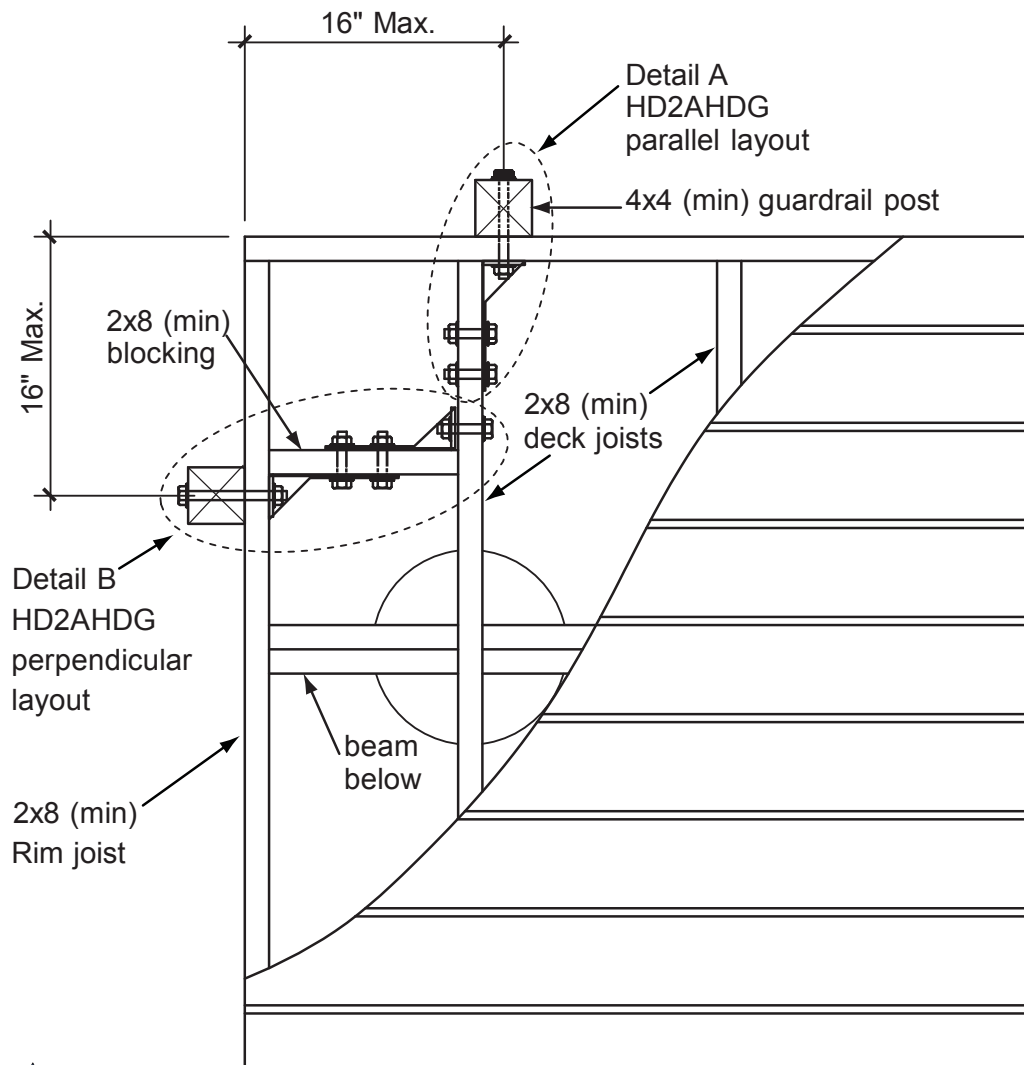
▲ **Fig. 27: Guardrail attachment option 3 - Deck joists parallel, post on outside, manufactured connectors**



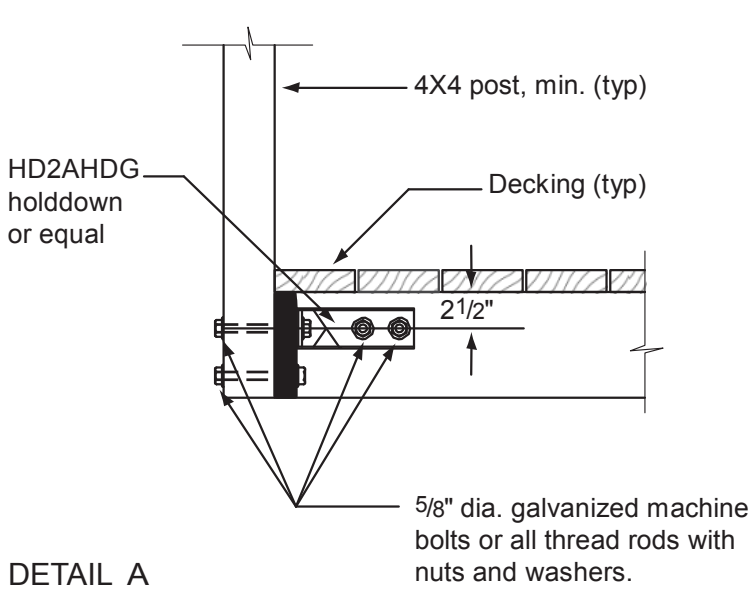
▲ Fig. 28: Guardrail attachment option 4 - Deck joists perpendicular, post on outside, custom-fabricated connectors



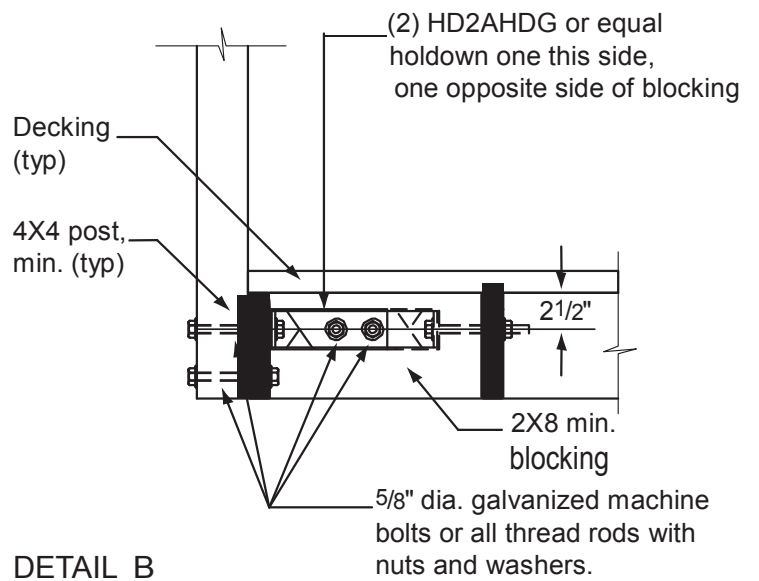
▲ Fig. 29: Guardrail attachment section for option 4



▲ **Figure 30: Guardrail attachment option 5 plan view**



DETAIL A



DETAIL B

▲ **Fig. 31: Guardrail attachment option 5 parallel layout**

▲ **Fig. 32: Guardrail attachment option 5 perpendicular layout**

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.

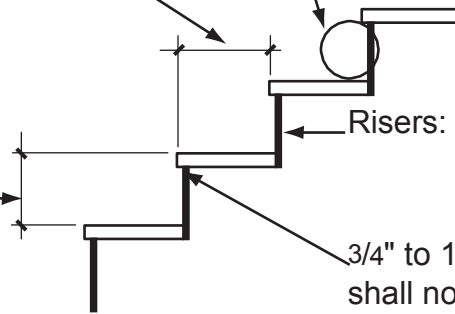
9" min. tread width shall not deviate from one another by more than 3/8"

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

Risers may be open but shall not allow the passage of a 4" sphere

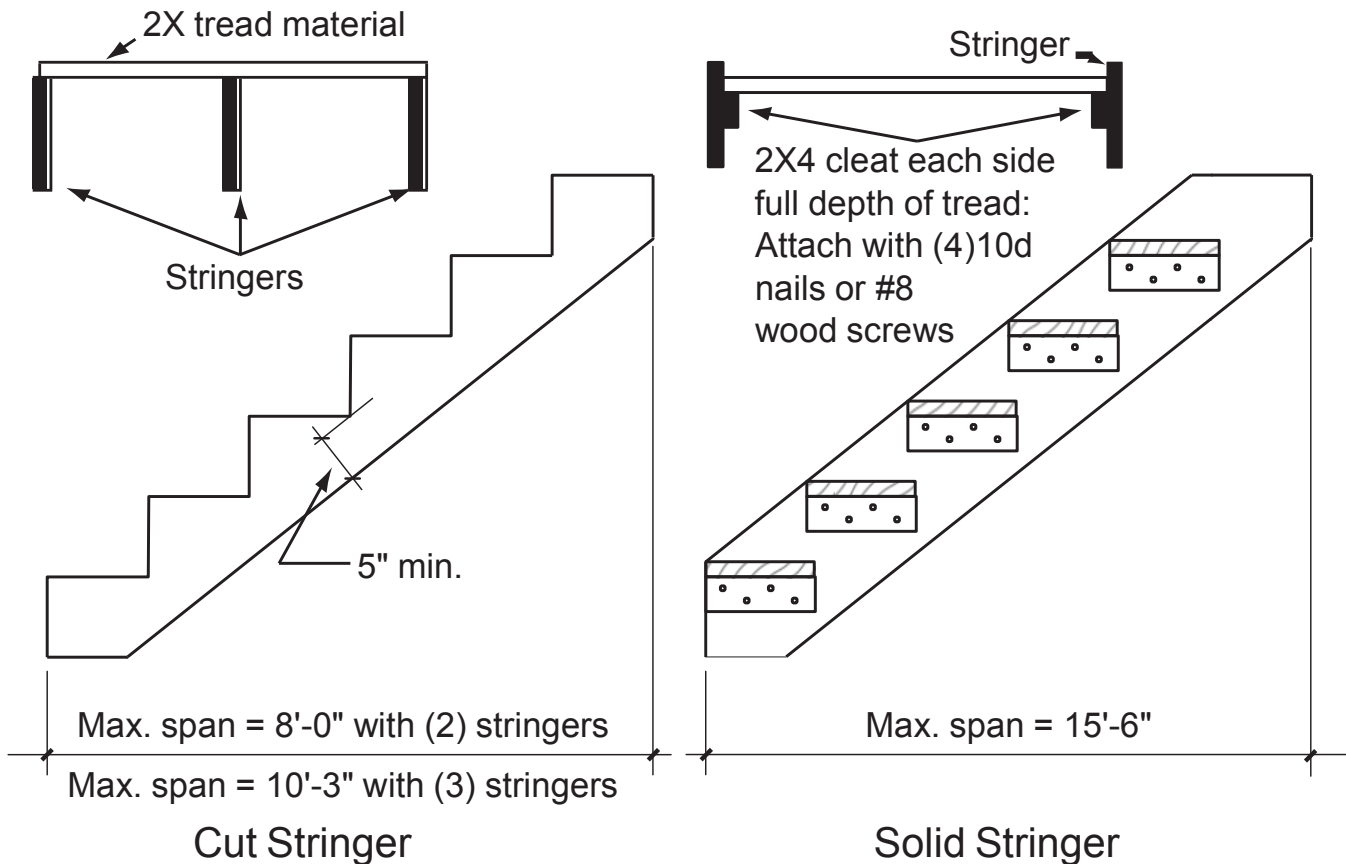
Risers: 1X material min.

3/4" to 1 1/2" nosing shall not deviate from one another by more than 3/8"

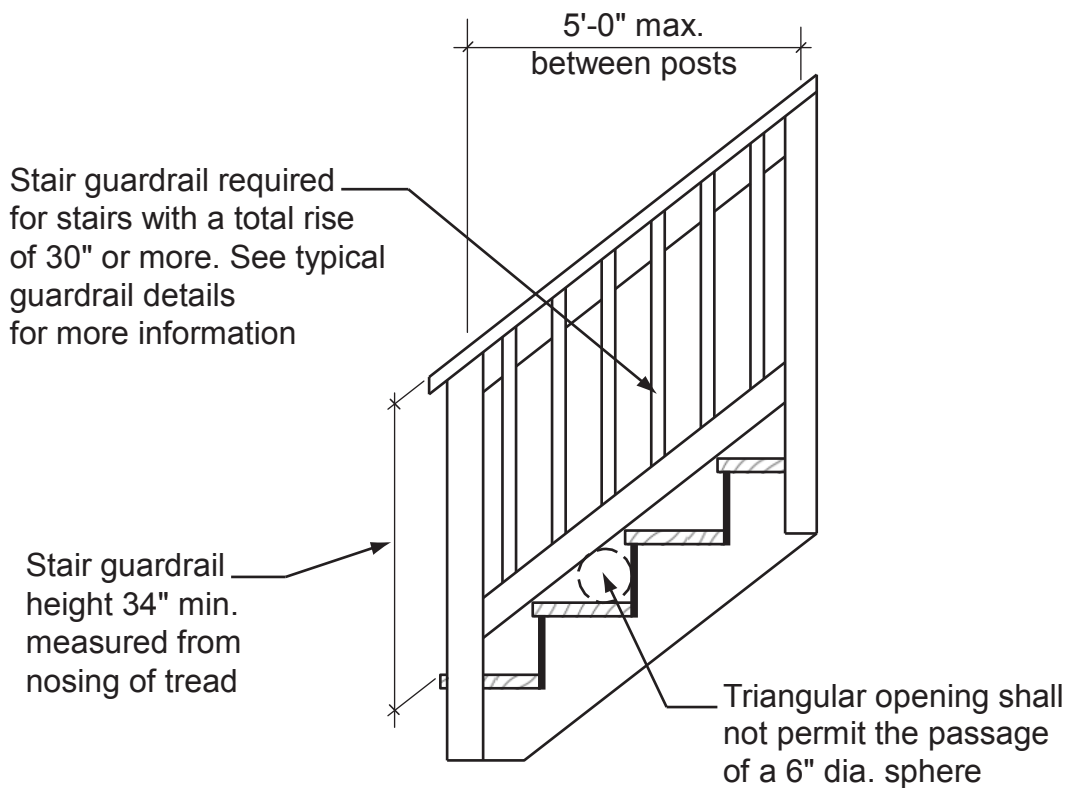


▲ Fig. 33: Tread and riser detail

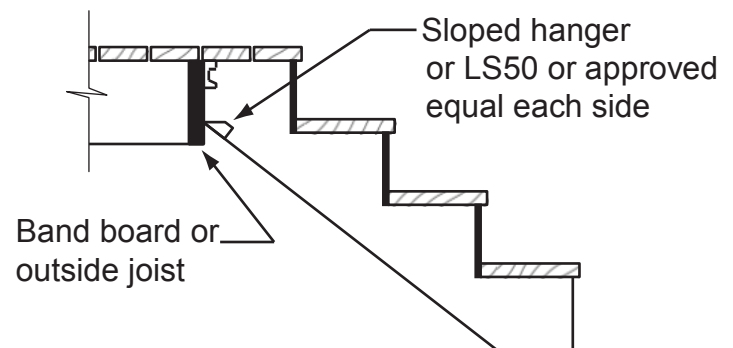
Attach 2X tread material to stringers or cleats with (2) #8 screws or (2) 8d nails per board at each stringer or cleat



▲ Fig. 34: Stair stringers and tread connections



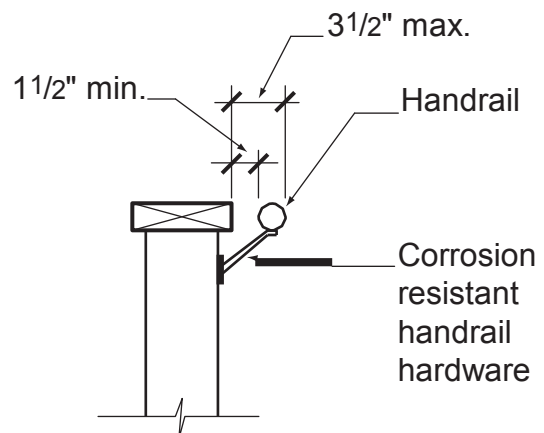
▲ Fig. 35: Stair guard requirements



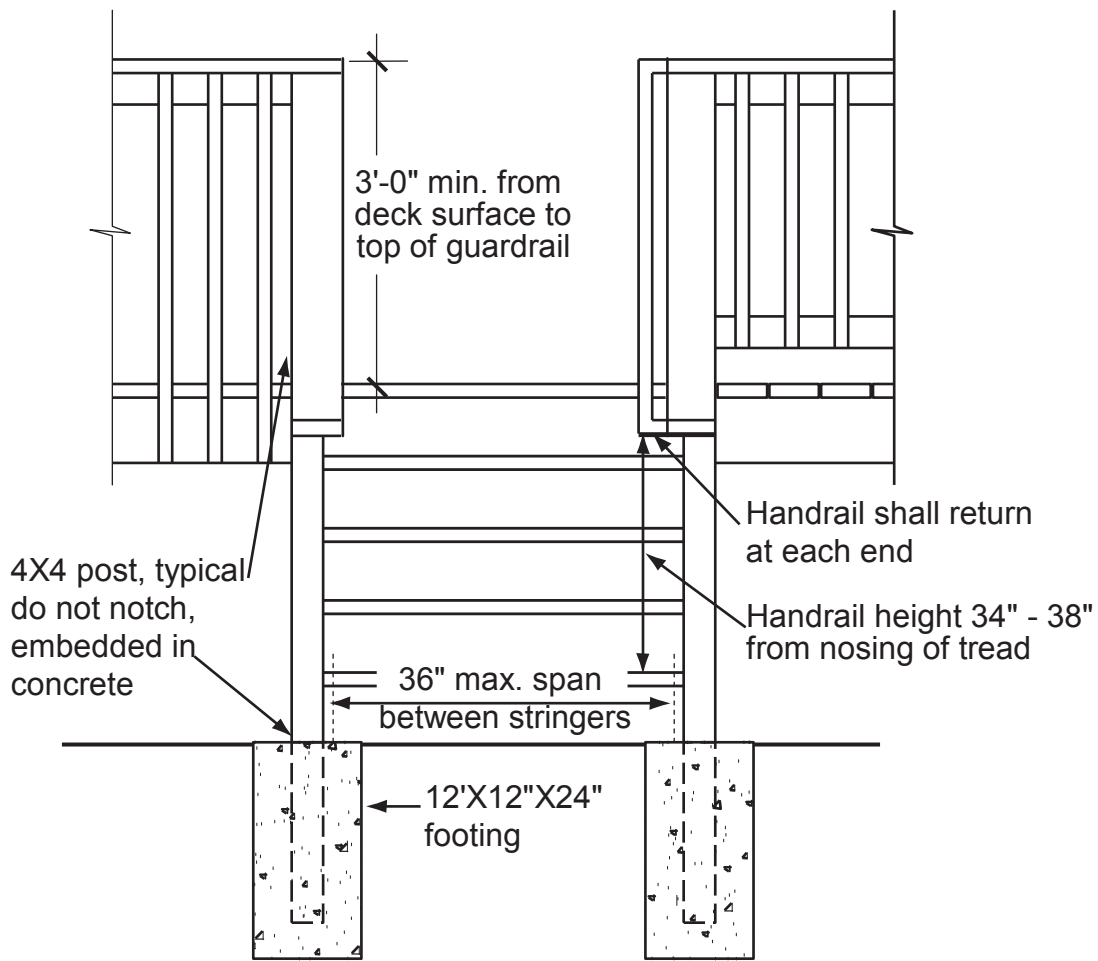
▲ Fig. 36: Stair stringer connection detail

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 1¼" and 2" in cross section. Shapes other than circular shall have a perimeter dimension between 4" and not greater than 6¼" with a maximum cross sectional dimension of 2¼". 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.



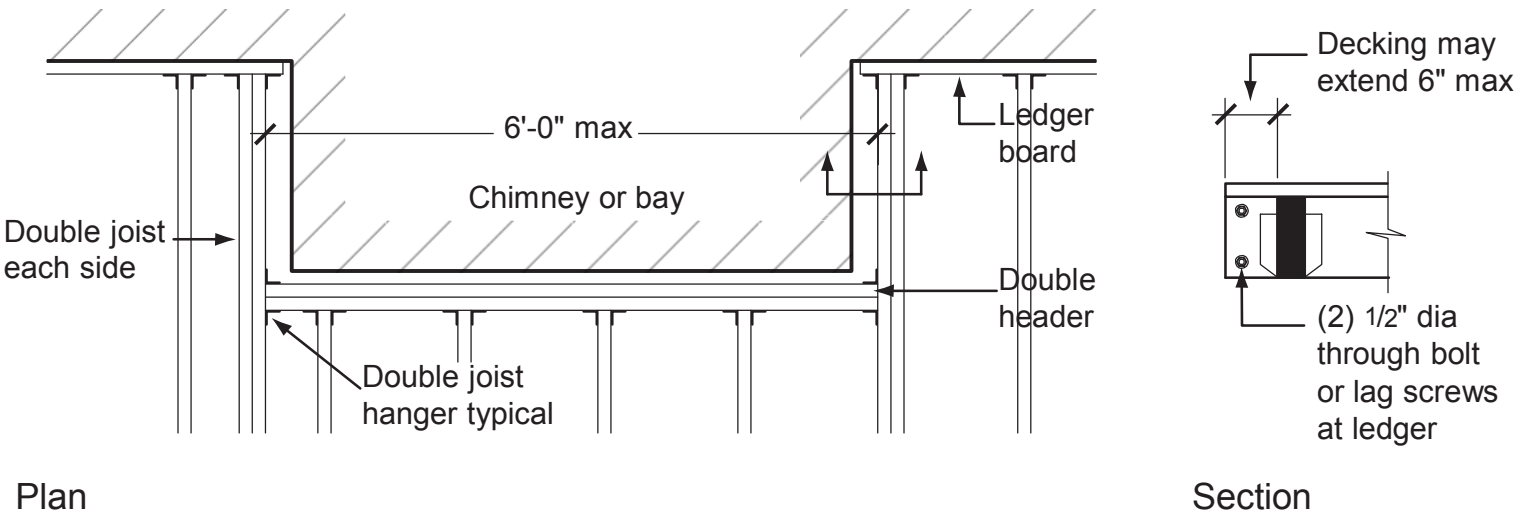
▲ Fig. 37: Handrail requirements



▲ Fig. 38: Miscellaneous stair requirements

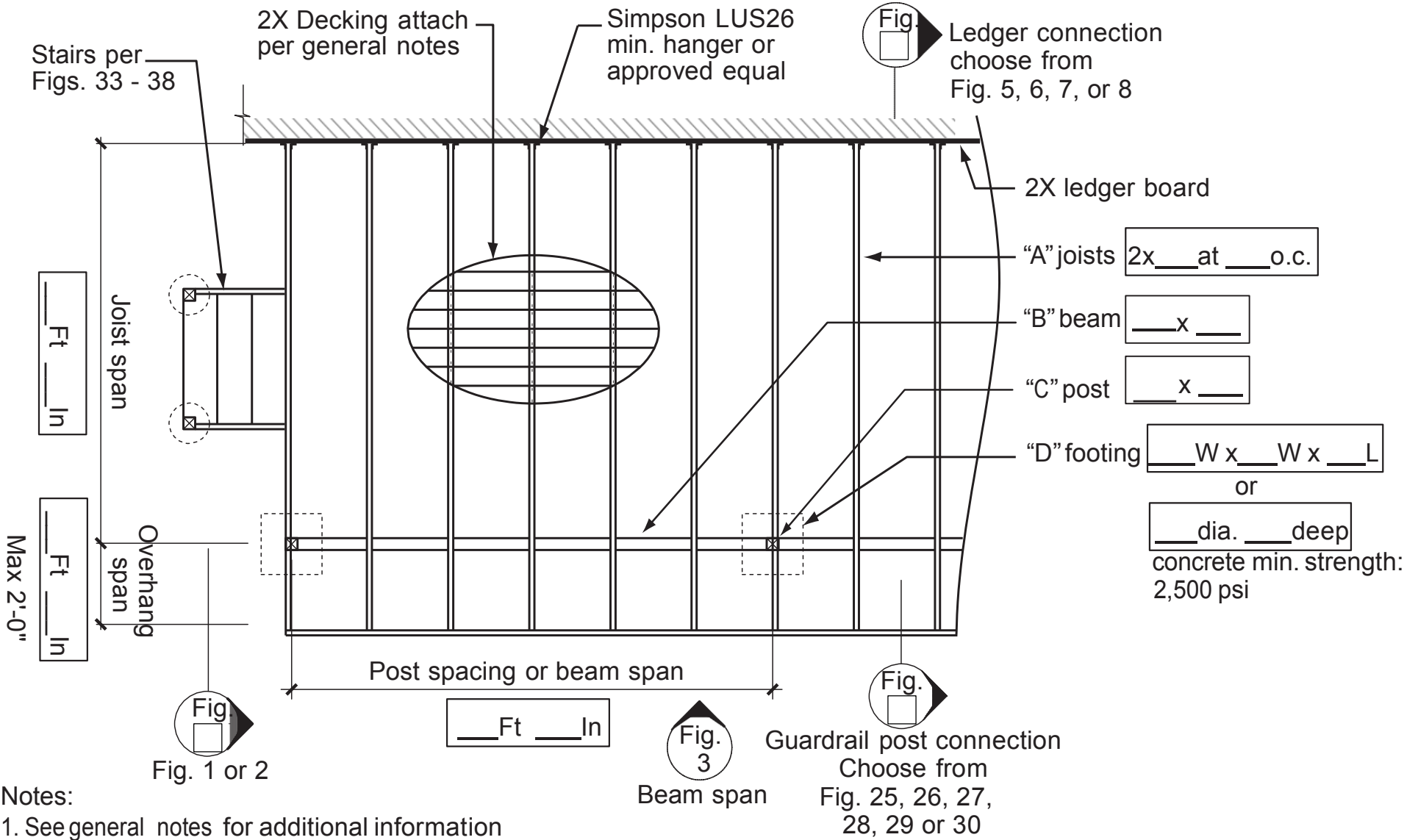
Framing at a Chimney or Bay Window

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.

