

WOOD DECKS

EXCESS FILL OR SPOIL FROM EXCAVATING DECK MUST BE REMOVED FROM PROPERTY. IF USED MUST ACCOMPANY FILL PERMIT.

Note: Some deck codes may vary if drawn and stamped by a design professional.

BUILDING PERMIT APPLICATION

To apply for the building permit, the following items shall be submitted to the Building Department.

1. **Completed permit application**
2. **Plat of survey showing proposed location of deck/above grade/grade level**
3. **Construction drawings showing the following:**
 - a. **size, length, and spacing of all floor joists**
 - b. **size, length, and spacing of any beams and their support (posts)**
 - c. **how deck and framing members are to be supported at the house**
 - d. **size and location of post holes**
 - e. **size of decking material (what you will be walking on)**
 - f. **Guard rail design**
 - g. **Stairs and hand rail design**
 - h. **Complete deck construction – checklist attached**
 - i. **Post hole spacing. Post holes will not be more than 8' (eight feet) apart parallel to house.**
4. **Tax index number and a copy of the signed contract**
5. **Contractor listed will need to be licensed and insured with the Village.**

DEPTH OF SUPPORT POSTS AND SPACING

The holes for support posts for a wood deck shall be dug no less than forty-two inches (42") below grade and six inch by six inch (6"x6") posts may not be spaced more than eight feet (8') apart. The pier diameter shall be a minimum of twelve inches (12") of concrete. If a post is placed in a pier, sixteen inch (16") diameter concrete pier is required. Lumber spans for decks shall be a minimum of forty-pound (40 lb.) live loads. For above grade decks 30" and above lumber spans shall be a minimum of 40 pound live load.

Ledger

A minimum ½ inch diameter lag screws with washers must be hot-dipped galvanized or stainless steel only. 1-1/2" inch shank and must extend through existing house band board and beyond band board a minimum of ½". Stagger fasteners in 2 rows. Ledgers may not be attached to hollow masonry or brick.

(See attached)

Beam to post connection.

(See attached.)

Diagonal Bracing

Decks greater than 2' (two feet) above shall be provided with diagonal bracing.

(See attached.)

GUARD RAILS

A guard rail not less than thirty-six (36) inches high shall be required for any deck over thirty (30) inches above finished grade. In addition, the baluster spacing must not allow a four inch diameter object to pass. Hold-down anchors are required at all guard post corners and lengths over 8 feet.

STAIRS

Stairs shall be required for any wood decks over eight inches (8") in height and eight inches (8") above finished grade. The maximum rise shall be 7 3/4 inches and the minimum tread depth shall be 10 inches. 1.5" clearance between wall and handrail. Open risers are permitted, provided that the openings between treads does not permit the passage of a 4" diameter sphere.

(See attached for stair details.)

HAND RAILS

Hand rails shall be required for any set of stairs thirty (30) inches or more above finished grade. 34" minimum height, 38" maximum height measured from the nose of the tread.

LOCATION

No part of an accessory structure shall be located closer than five (5) feet to the rear lot line or the side lot lines abutting such required rear yard except in the SR-4 Zoning District where an accessory structure may be located within three (3) feet of a lot line. No structure (deck) is permitted to encroach into any easement. Note: Decks cannot cover electric services, gas meters, escape windows or vents.

BUILDING PERMIT REQUIRED

No building or structure shall be erected, constructed, built, replaced, enlarged, repaired, altered, or moved, nor shall any repair or maintenance work be done which affects the structural, fire protection, or health protection qualities of a building without having first obtained a building permit.

DECKS

Decks that have a roof or sun shield over the deck are required to have a continuous trench footing or footing under the deck. The plans shall be signed and sealed by a licensed architect.

Building permits expire one year from the date of the permit. However, if work has not started within six months of the date of the permit, the building permit is void.

VEGETATION

All vegetation shall be removed under deck, vegetation barrier and stone in place.

BUILDING PERMIT FEE

The building permit fee for a wood deck shall be based on the estimated cost of the project; refer to B.B.C. 9-3-4.

INSPECTIONS REQUIRED

The Building Inspector shall inspect all buildings and structures that are being erected, constructed, built, enlarged, repaired, altered, replaced, or moved. Inspections shall be requested by telephone or in writing to the Building Department at least twenty-four (24) hours in advance. There are two inspections. The first is a post hole inspection before the concrete is poured. The second would be the final deck inspection.

CONTRACTOR LICENSE REQUIRED

It shall be unlawful to engage in business in the Village of Bartlett as a building contractor without first having obtained a building contractor license.

A homeowner is not required to be licensed as a subcontractor or general contractor to construct, demolish, rehabilitate, alter, or repair his or her own home.

LICENSED CONTRACTOR

All names of licensed subcontractors and general contractors are on file, listed alphabetically, in the Building Department and the Village Main Office.

1. No decks are permitted in any required front, corner side, or side yard.
2. Decks 18 inches or less in height above the average ground elevation, measured immediately adjacent to the deck, are permitted within the required rear yard but in no instance shall any deck be within 5 feet of any lot line.
3. Decks more than 18 inches in height above the average ground elevation, measured immediately adjacent to the deck, are permitted to extend 10 feet into the required rear yard.
4. Decks with roofs must meet all required yard setbacks. (A deck with a roof is considered a building addition and shall comply with all applicable building and zoning codes.)
5. All solid overhead coverings or structures shall be considered roofs.
6. No decks are permitted on or over any easement.
7. Patios are permitted within all required yards (e.g. up to the property line).

8. Detached gazebos and decks are permitted in the required rear yard, but in no instance shall they be nearer to any lot line than the distance equal to the required side yard in the zoning district in which such use is located.
9. The height of all decks shall be measured from the immediately adjacent ground level to the floor of the deck.
10. Wooden structures which are attached to a house shall be considered decks if they have poles for support and access to the ground. Structures without poles or ground access shall be considered balconies.

Deck Construction Checklist

All the codes below have attached drawings for your convenience.

Address: _____

Size of Holes (Minimum)
Dia. 12" x 42" Deep _____

Post Size 6x6 min. Yes _____
Post Spacing 8' (feet) on center parallel to house

Beam Size _____
Beams must be bolted to posts using 1/2" nuts and bolts.

Ledger Size _____
Ledgers must be lagged to house using 1/2" lags.

Diagonal bracing required for decks over 24" above grade Yes _____ No _____
Size of Deck Sections:

1: _____

2: _____

3: _____

Is deck 18" or more above grade? _____
What is the highest point from grade? _____

Joist Size _____

Railing Height, 36" min. _____

Railing Baluster Spacing _____
(So a 4" sphere cannot pass through)

Stair Rise (7 3/4" max) _____

Stair Tread (10" nose to nose) _____

Deck Material _____

NOTE:

1. If deck is 30" above grade or more the deck must have stairs _____, railing _____, and baluster _____.
2. Do not cover holes before inspection.
3. Holes must be dry.
4. All decks must be drawn to scale on Plat of Survey.
5. Provide lumber species and grade of lumber.
6. Submit all span charts for beams, ledger, posts, and joist sizes.
7. Submit CAD drawings from supplier (must show dimensions).

COMPLETED FORM REQUIRED WITH APPLICATION

Figure 1A. Joist Span – Deck Attached at House and Bearing Over Beam

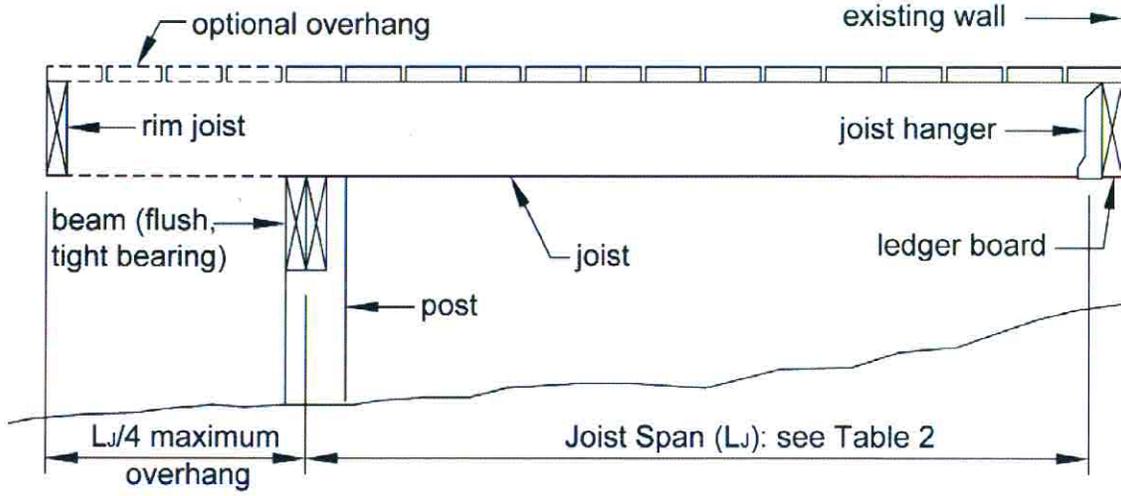


Figure 1B. Joist Span – Joists Attached at House and to Side of Beam

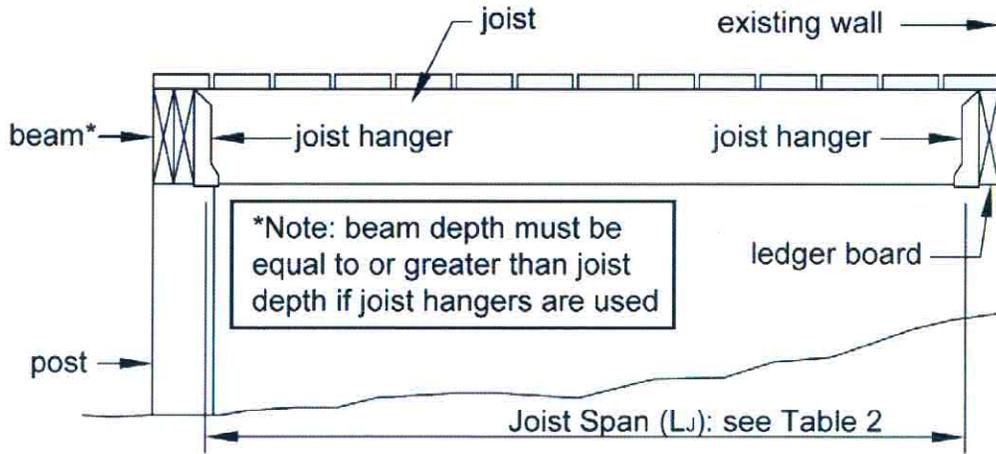


Figure 2. Joist Span – Free Standing Deck

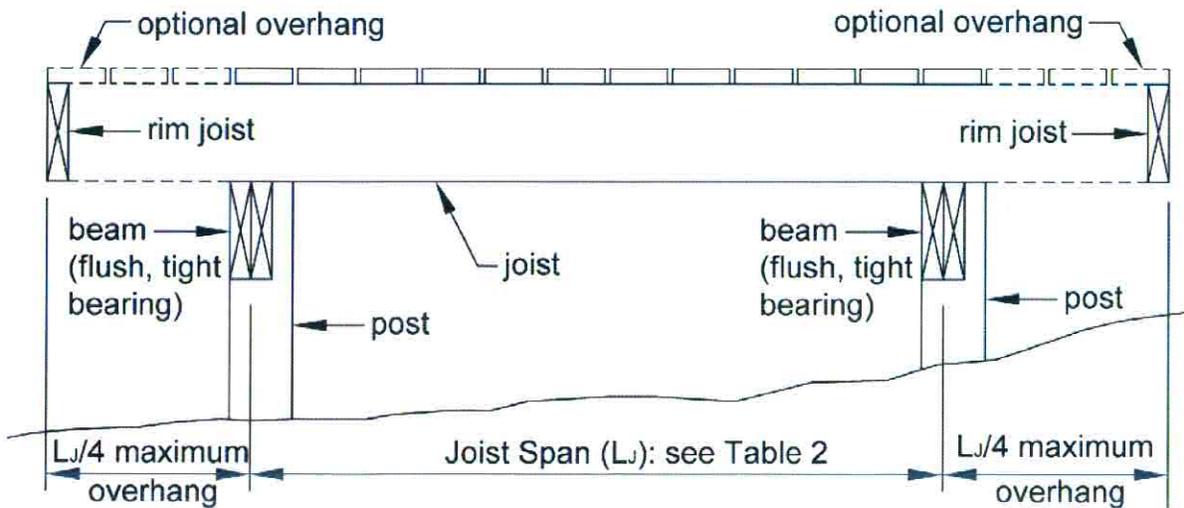
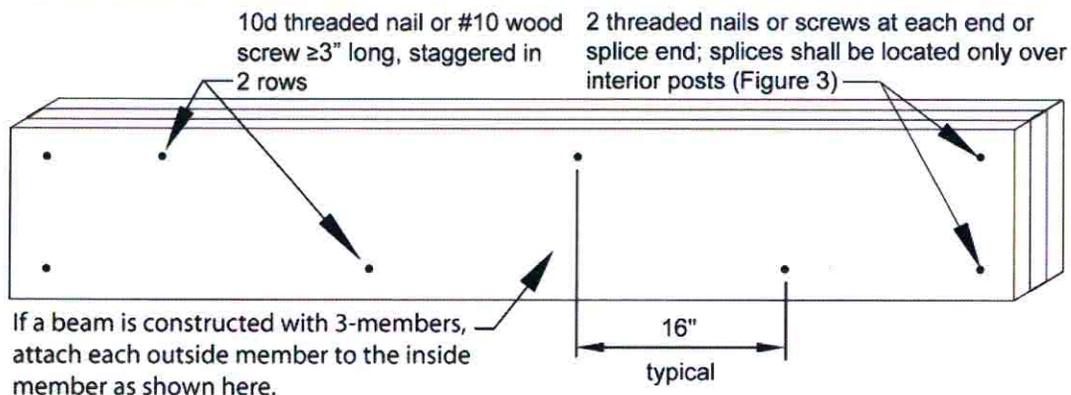


Figure 4. Beam Assembly Details



DECK FRAMING PLAN

A framing plan shows the joist and beam layout; the location of the ledger board, posts, and footings, and the type, size, and spacing of the ledger board fasteners. See Figure 5 for an example of a typical deck framing plan.

Figure 5. Typical Deck Framing Plan

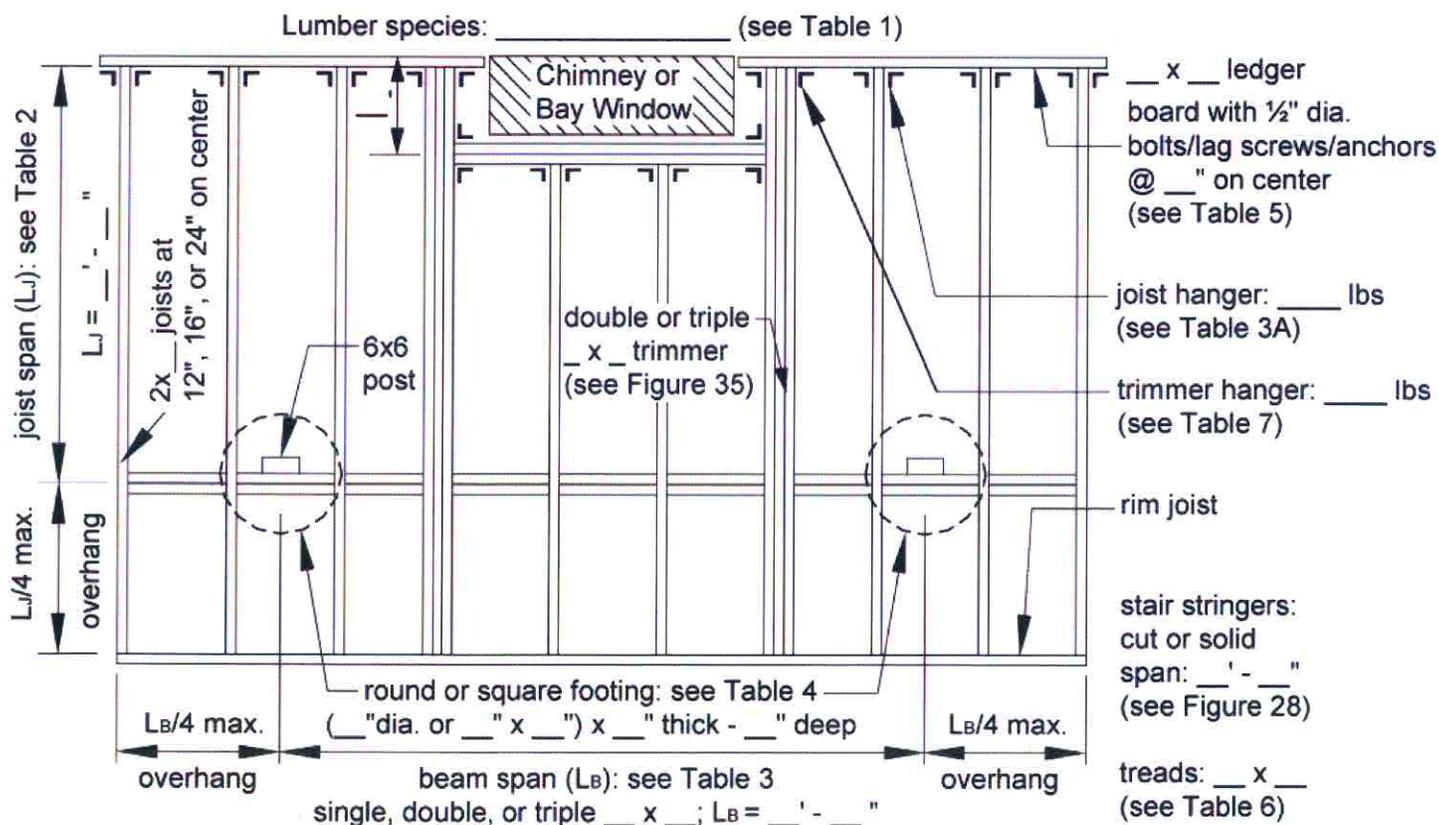


Figure 8. Post-to-Beam Attachment Requirements

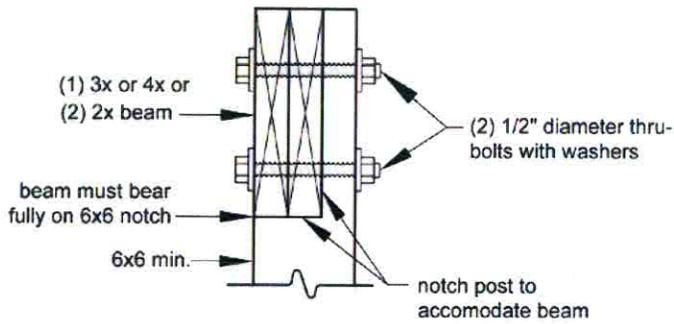
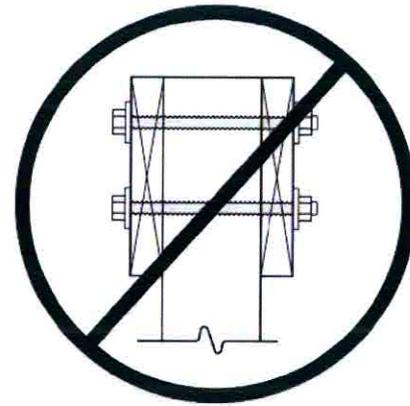


Figure 9. Prohibited Post-to-Beam Attachment Condition



RIM JOIST REQUIREMENTS

Attach a continuous rim joist to the ends of joists as shown in Figure 11. Attach decking to the rim joist as shown in Figure 11. For more decking attachment requirements, see DECKING REQUIREMENTS.

Figure 10. Alternate Approved Post-to-Beam Post Cap Attachment

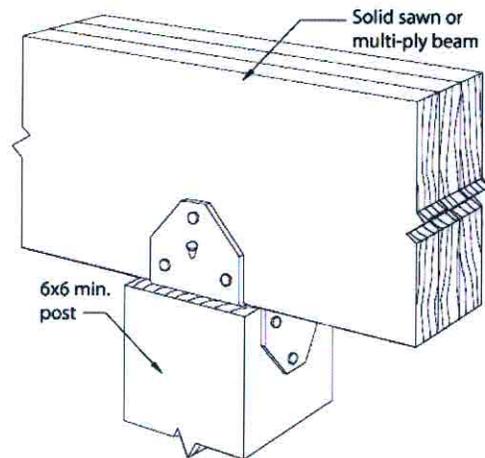


Figure 11. Rim Joist Connection Details

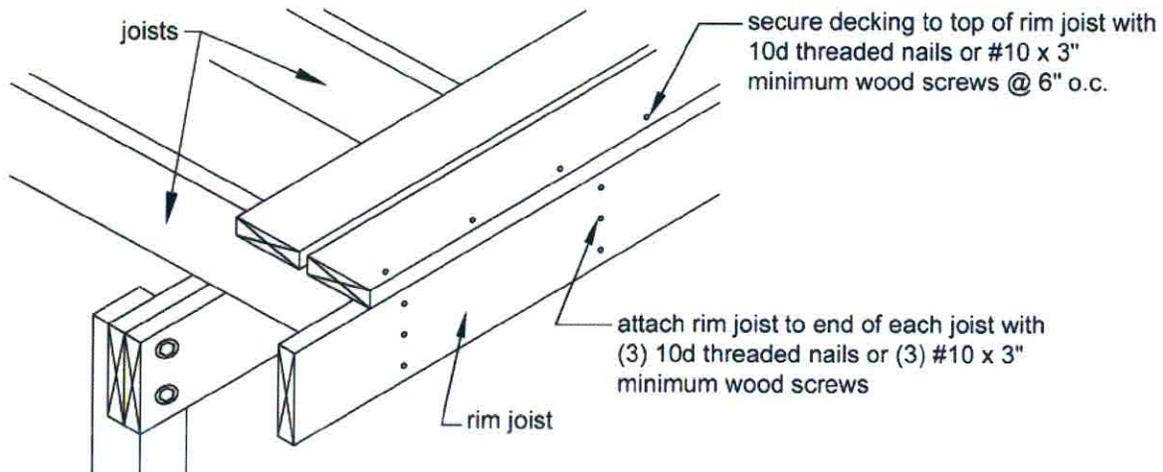


Figure 14. General Attachment of Ledger Board to Band Joist or Rim Board

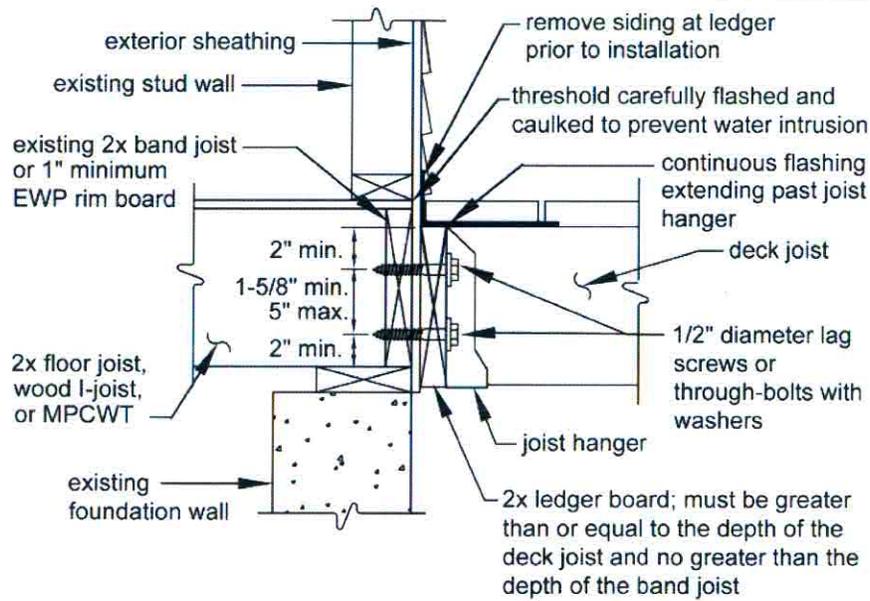


Figure 15. Attachment of Ledger Board to Foundation Wall (Concrete or Solid Masonry)

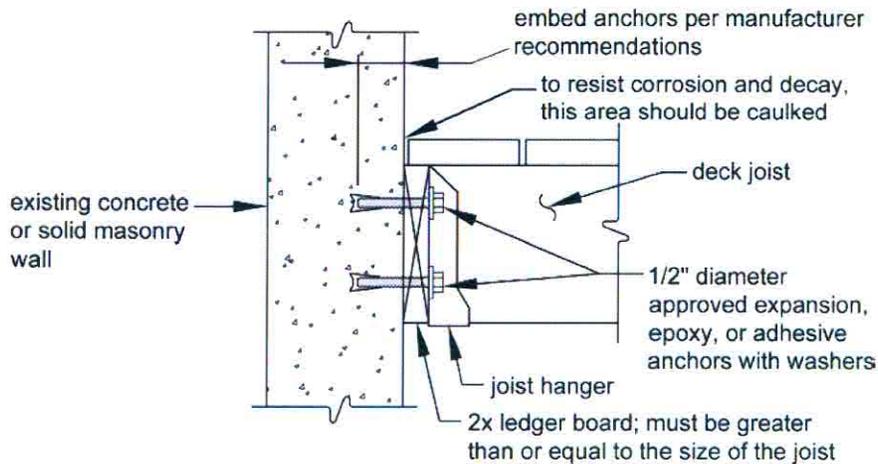
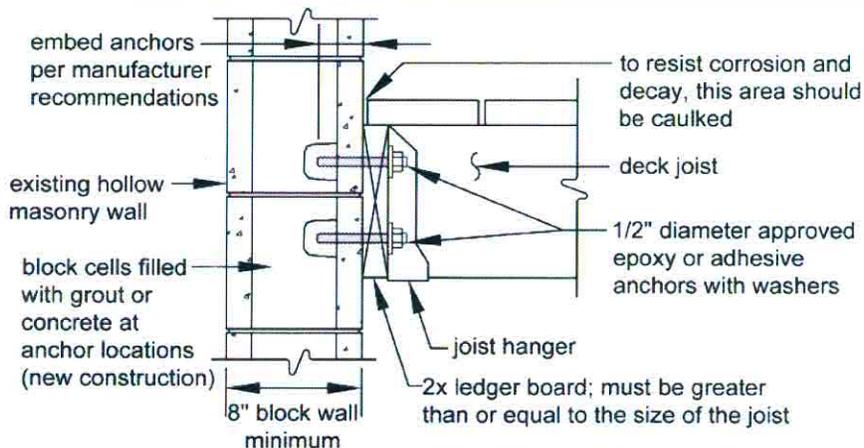


Figure 16. Attachment of Ledger Board to Foundation Wall (Hollow Masonry)

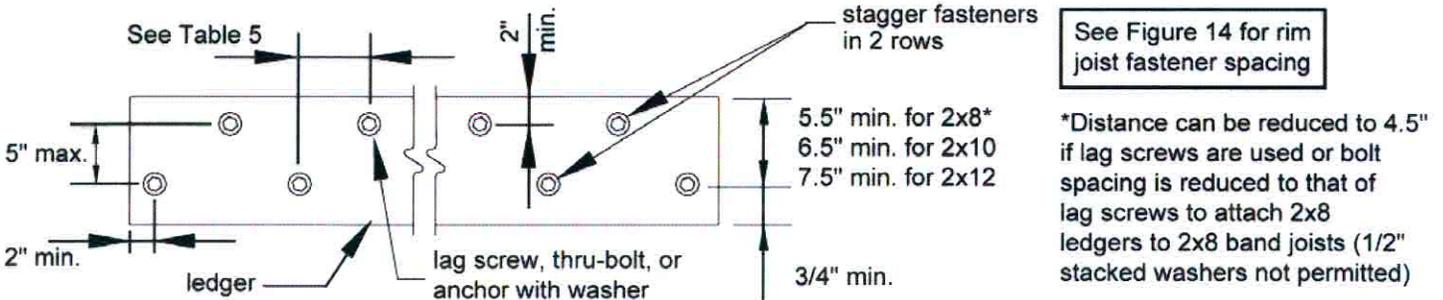


Placement of lag screws or bolts in deck ledgers

The lag screws or bolts shall be placed as shown in Figure 19. The lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of

the deck ledger (see Figure 19). Proper installation of lag screws or bolts shall be verified by the authority having jurisdiction.

Figure 19: Ledger Board Fastener Spacing and Clearances



Thru-Bolts

Thru-bolts shall have a diameter of 1/2". Pilot holes for thru-bolts shall be 17/32" to 9/16" in diameter. Thru-bolts require washers at the bolt head and nut.

Expansion and Adhesive Anchors

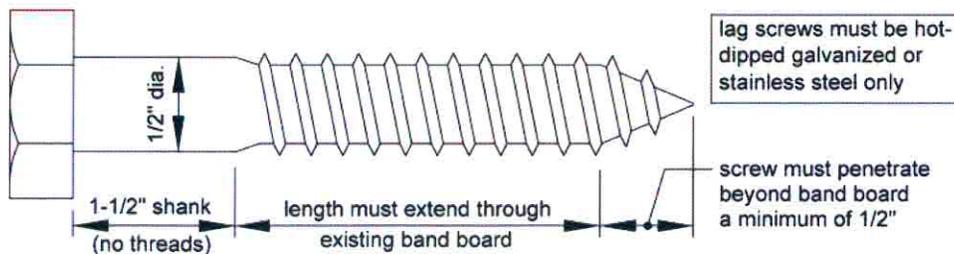
Use approved expansion or adhesive anchors when attaching a ledger board to a concrete or solid masonry wall as shown in Figure 15 or a hollow masonry wall with a grouted cell as shown in Figure 16. Expansion and adhesive anchor bolts shall have a diameter of 1/2".

Minimum spacing and embedment length shall be per the manufacturer's recommendations. All anchors must have washers.

Lag Screws

Lag screws shall have a diameter of 1/2" (see MINIMUM REQUIREMENTS). Lag screws may be used only when the field conditions conform to those shown in Figure 14. See Figure 20 for lag screw length and shank requirements. All lag screws shall be installed with washers.

Figure 20: Lag Screw Requirements



Lag screw installation requirements: Each lag screw shall have pilot holes drilled as follows: 1) Drill a 1/2" diameter hole in the ledger board, 2) Drill a 5/16" diameter hole into the band board of the existing house. **DO NOT DRILL A 1/2" DIAMETER HOLE INTO THE BAND BOARD.**

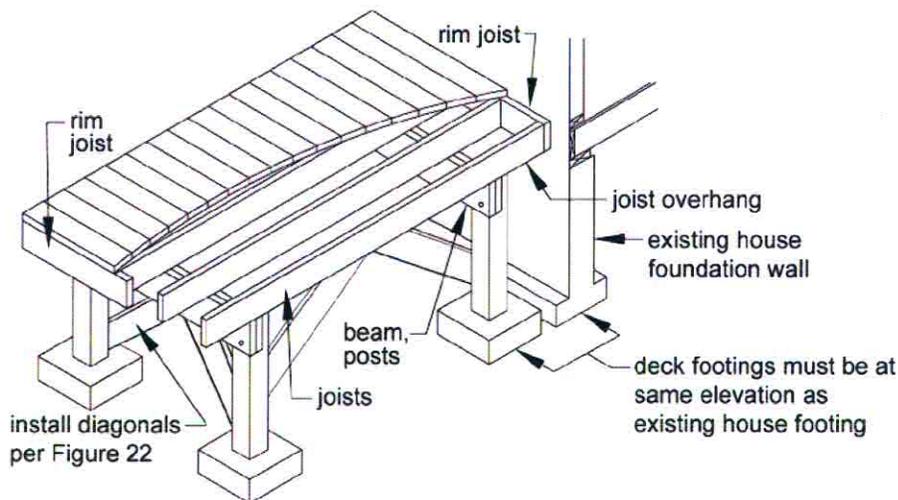
The threaded portion of the lag screw shall be inserted into the pilot hole by turning. **DO NOT DRIVE LAG SCREWS WITH A HAMMER.** Use soap or a wood-compatible lubricant as required to facilitate tightening. Each lag screw shall be thoroughly tightened (snug but not over-tightened to avoid wood damage).

FREE-STANDING DECKS

Decks which are free-standing do not utilize the exterior wall of the existing house to support vertical loads (see Figure 21); instead, an additional beam with posts is provided at or within L/4 of the existing house. THE ASSOCIATED DECK POST FOOTINGS SHALL BE PLACED AT THE SAME ELEVATION AS THE

EXISTING HOUSE FOOTING IF LOCATED CLOSER THAN 5'-0" TO AN EXISTING HOUSE WALL (see Figure 2 and Figure 12). For houses with basements, a cylindrical footing (caisson) is recommended to minimize required excavation at the basement wall. Beam size is determined by Table 3.

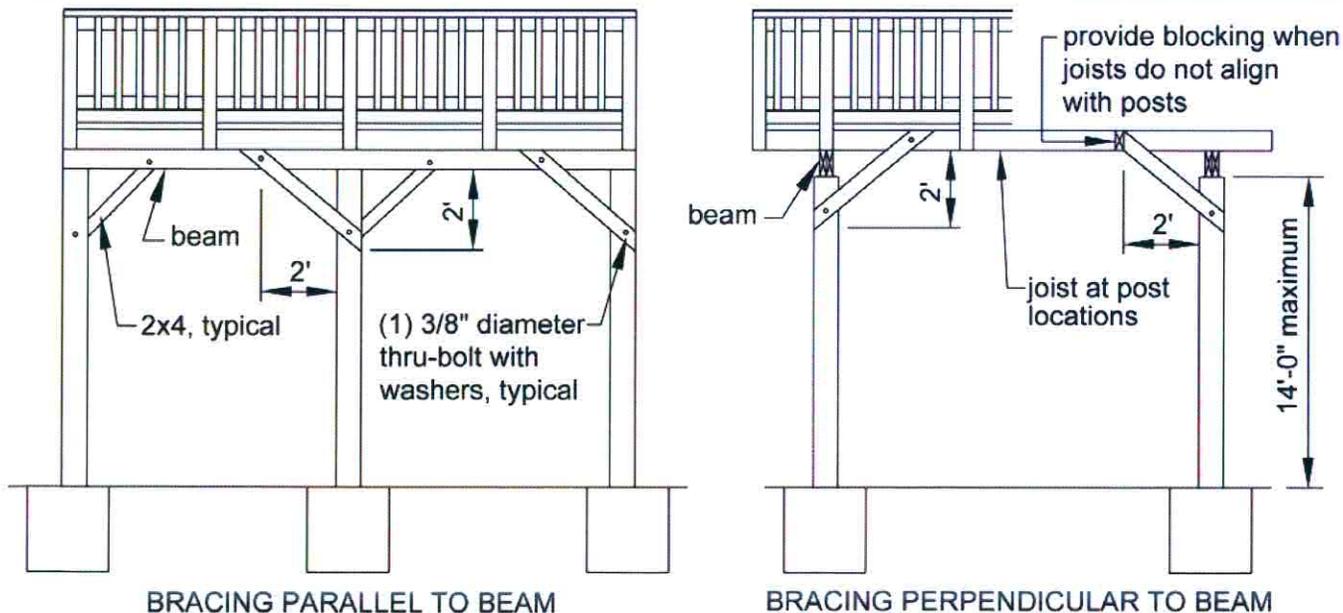
Figure 21. Free-Standing Deck



DECK STABILITY

Decks greater than 2 feet above grade shall be provided with diagonal bracing.

Figure 22. Diagonal Bracing Requirements



Diagonal Bracing: Provide diagonal bracing both parallel and perpendicular to the beam at each post as shown in Figure 22. When parallel to the beam, the bracing shall be bolted to the post at one end and beam at the other. When perpendicular to the beam, the bracing shall be bolted to the post at one end and a joist or blocking between joists at the other. When a joist does not align with the bracing location, provide blocking between the adjacent joists. Decks attached to the house as shown in Figure 23A do not require diagonal bracing perpendicular to the house. Diagonal bracing parallel to the house may be omitted at the beam adjacent to the house for a free-standing deck attached as shown in Figure 23.

Free-standing Deck - Attachment to House: Attach the deck rim joist to the existing house exterior wall as shown in Figure 23 for a free-standing deck. The wall must be sheathed with minimum $\frac{3}{8}$ " wood structural panel sheathing. Use lag screws or thru-bolts when fastening to an existing band joist or wall stud; use expansion anchors or epoxy anchors when fastening to

concrete or masonry. DO NOT ATTACH TO BRICK VENEERS. VERIFY THIS CONDITION IN THE FIELD PRIOR TO UTILIZING THIS METHOD. Fasteners shall be 16" on center and staggered in 2 rows for free-standing decks. Flashing over the rim joist is required and must be installed in accordance with the flashing provisions in the LEDGER ATTACHMENT REQUIREMENTS.

Deck Supported by Ledger - Attachment to House: Where supported by attachment to an exterior wall (Figures 14, 15, or 16), decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable [R502.2.2]. The lateral load connection required shall be permitted to be in accordance with Figure 23A. Hold down tension devices shall be provided in not less than two locations per deck, and each device shall have an allowable stress design capacity of not less than 1,500 lb [R502.2.2.3]. See the *Commentary* to this document for additional information on applicability of this provision.

Figure 23. Attachment of Free-Standing Deck to House for Deck Stability

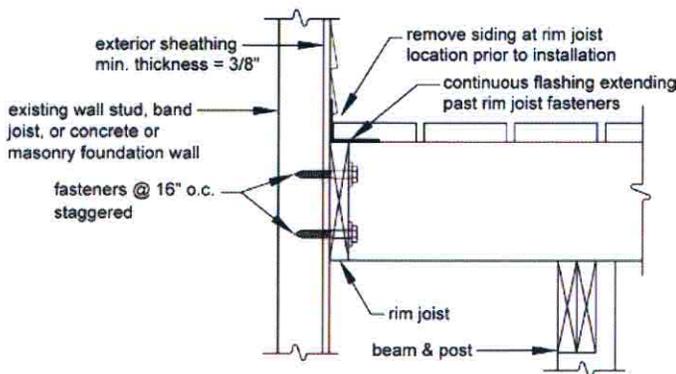
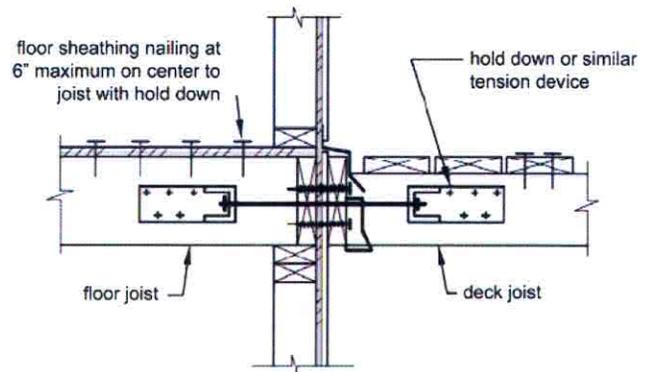


Figure 23A. Example of a Lateral Load Device for a Deck Attached to a House with a Ledger

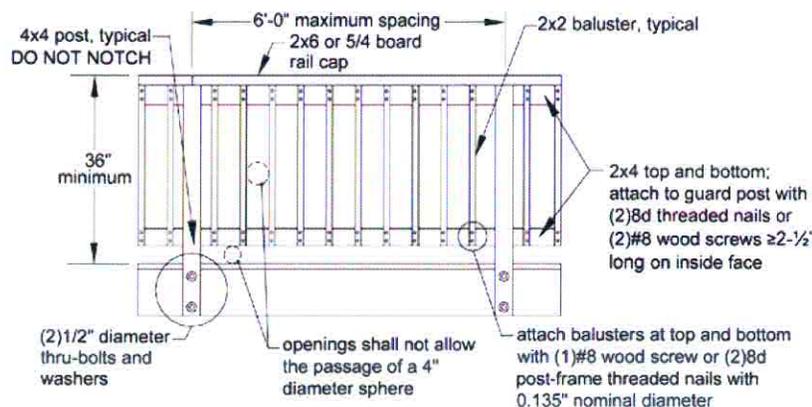


GUARD REQUIREMENTS

All decks greater than 30" above grade are required to have a guard [R312.1] - one example is shown in Figure

24. Other methods and materials may be used for guard construction when approved by the authority having jurisdiction.

Figure 24. Example Guard Detail



GUARD POST ATTACHMENTS

Deck guard posts shall be a minimum 4x4 (nominal) with an adjusted bending design value not less than 1,100 psi.

Guard posts for guards which run parallel to the deck joists shall be attached to the outside joist per Figure 25. Guard posts for guards that run perpendicular to the deck

joists shall be attached to the rim joist in accordance with Figure 26. Only hold down anchor models meeting these minimum requirements shall be used. Hold down anchors shall have a minimum allowable tension load of 1,800 pounds for a 36" maximum rail height and be installed in accordance with the manufacturer's instructions.

Figure 25. Guard Post to Outside Joist Example

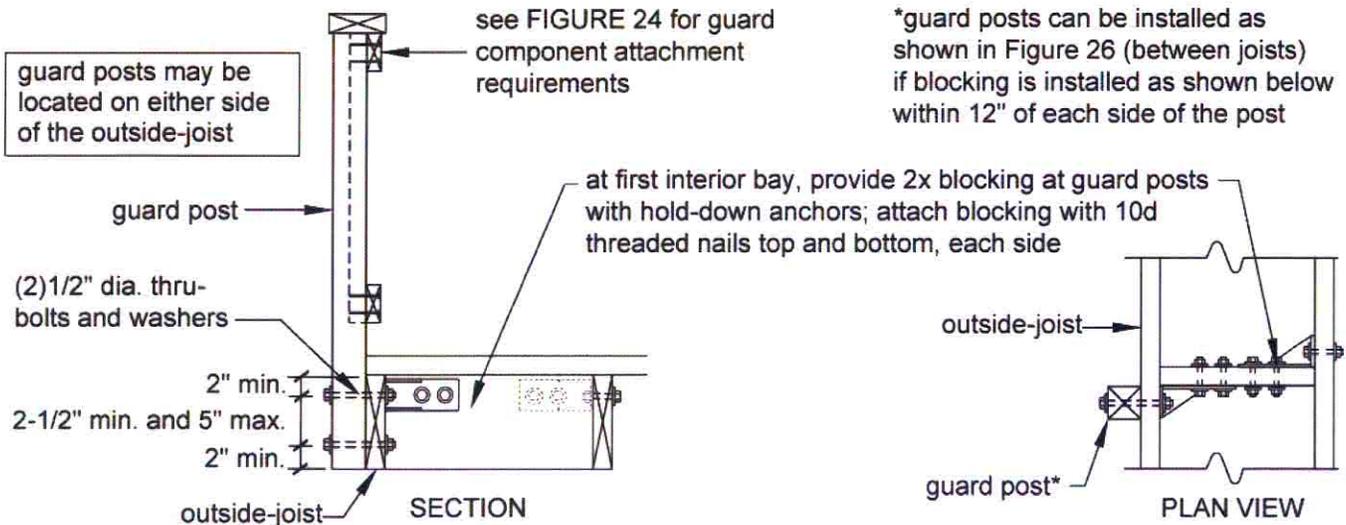
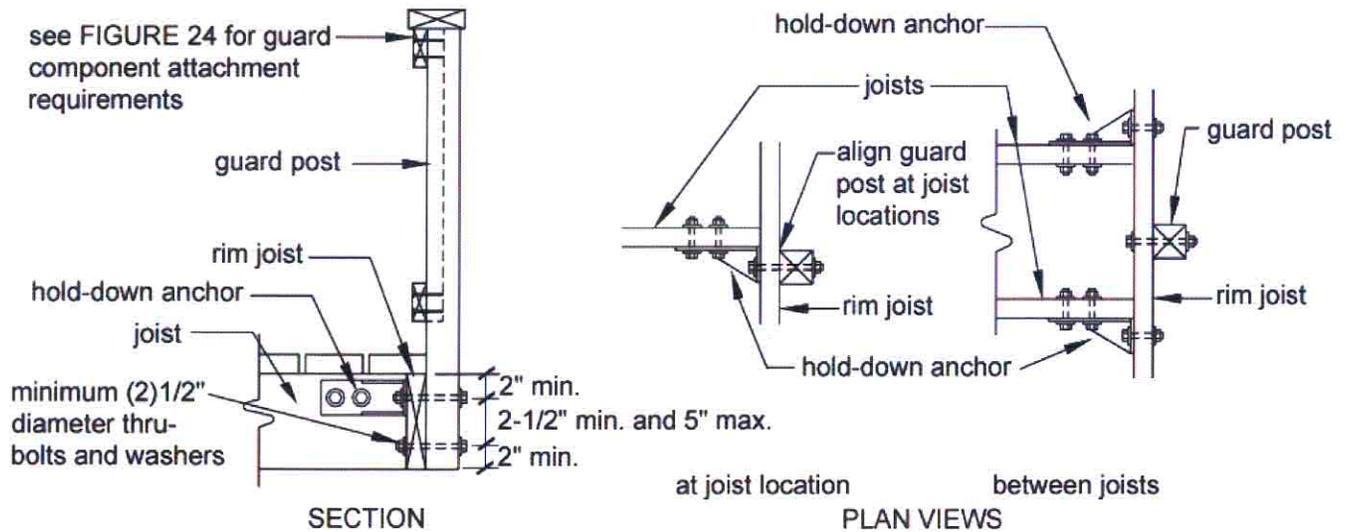


Figure 26. Guard Post to Rim Joist Example



STAIR REQUIREMENTS

Stairs, stair stringers, and stair guards shall meet the requirements shown in Figure 27 through Figure 34 and Table 6 except where amended by the local jurisdiction. All stringers shall be a minimum of 2x12. Stair stringers shall not span more than the dimensions shown in Figure 28. If the stringer span exceeds these dimensions, then a 4x4 post may be provided to support the stringer and shorten its span length. The 4x4 post shall be notched and bolted to the stringer with (2) 1/2" diameter through-bolts with washers per Figure 8. The post shall be centered on a 12" diameter or 10" square, 6" thick footing. The footing shall be constructed as shown in Figure 34 and attached to the post as shown in Figure 12. An intermediate landing may also be provided to shorten

the stringer span (see provisions below). If the total vertical height of a stairway exceeds 12'-0", then an intermediate landing shall be required. All intermediate stair landings must be designed and constructed as a free-standing deck using the details in this document. Stairs shall be a minimum of 36" in width as shown in Figure 33 [R311.7]. If only cut stringers are used, a minimum of three are required. For stairs greater than 36" in width, a combination of cut and solid stringers can be used, but shall be placed at a maximum spacing of 18" on center (see Figure 29). The width of each landing shall not be less than the width of the stairway served. Every landing shall have a minimum dimension of 36" measured in the direction of travel and no less than the width of the stairway served [R311.7].

Figure 27. Tread and Riser Detail

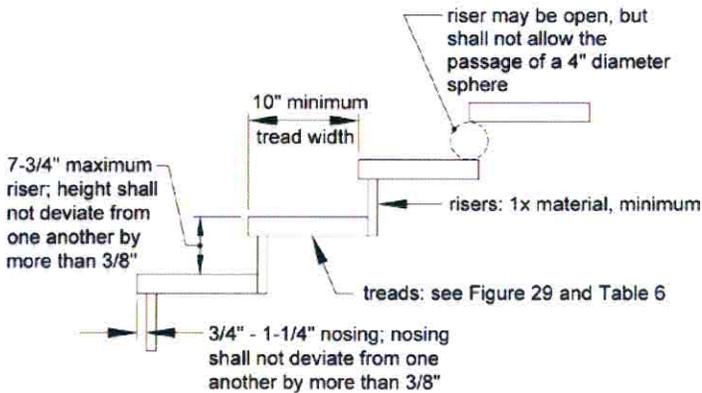


Figure 28. Stair Stringer Requirements

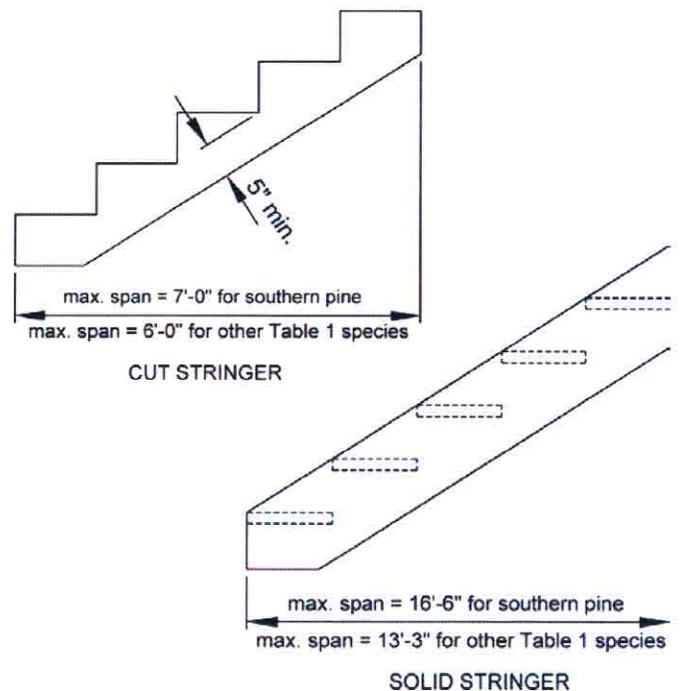


Figure 29. Tread Connection Requirements

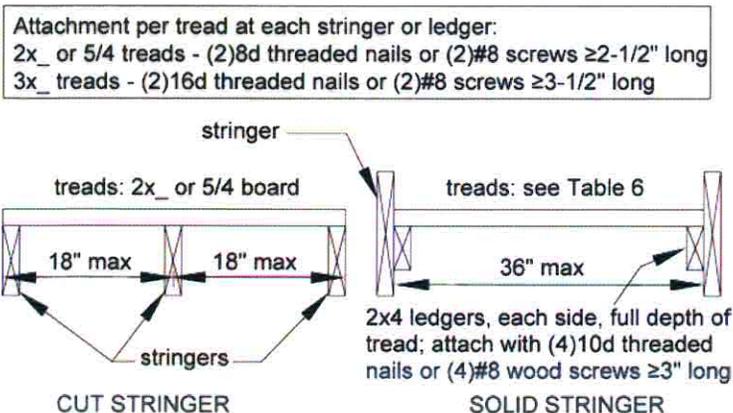


Table 6. Minimum Tread Size for Cut and Solid Stringers¹

Species	Cut Stringer	Solid Stringer
Southern Pine	2x4 or 5/4	2x6
Douglas Fir Larch, Hem-Fir, SPF ²	2x4 or 5/4	2x8 or 3x4
Redwood, Western Cedars, Ponderosa Pine ³ , Red Pine ³	2x4 or 5/4	2x10 or 3x4

1. Assumes 300 lb concentrated load, L/288 deflection limit, No. 2 grade, and wet service conditions.
 2. Incising assumed for refractory species including Douglas fir-larch, hem-fir, and spruce-pine-fir.
 3. Design values based on northern species with no incising assumed.

Figure 30. Stair Guard Requirements

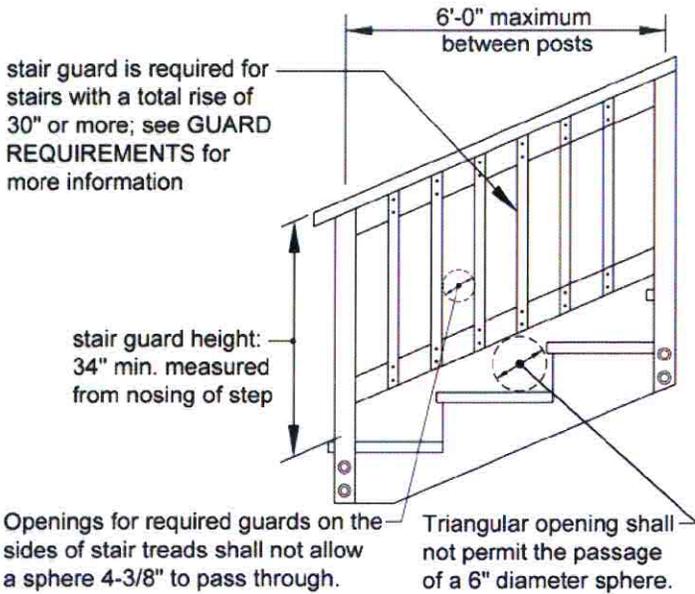
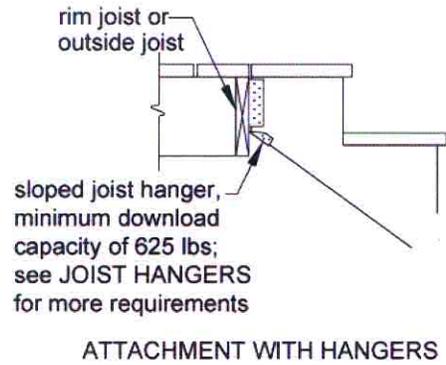


Figure 31. Stair Stringer Attachment Detail



STAIR HANDRAIL REQUIREMENTS

All stairs with 4 or more risers shall have a handrail on at least one side (see Figure 32A) [R311.7.7]. The handrail height measured vertically from the sloped plane adjoining the tread nosing shall be not less than 34 inches and not more than 38 inches (see Figure 30) [R311.7.7.1]. Handrails shall be graspable and shall be composed of decay-resistant and/or corrosion resistant material. Handrails shall be Type I, Type II, or provide equivalent graspability (see Figure 32B). Type I shall have a perimeter dimension of at least 4" and not greater

than 6-1/4". Type II rails with a perimeter greater than 6-1/4" shall provide a graspable finger recess area on both sides of the profile [R311.7.7.3]. All shapes shall have a smooth surface with no sharp corners. Handrails shall run continuously from a point directly over the lowest riser to a point directly over the highest riser and shall return to the guard at each end (see Figure 33). Handrails may be interrupted by guard posts at a turn in the stair [R311.7.7.2].

Figure 32A. Handrail Mounting Examples

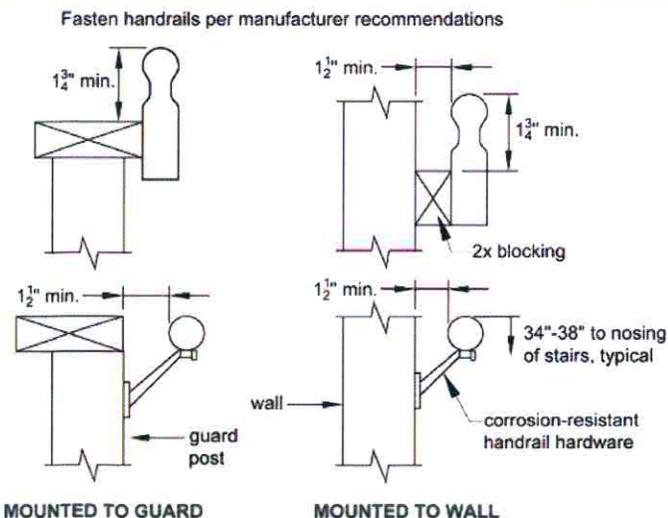
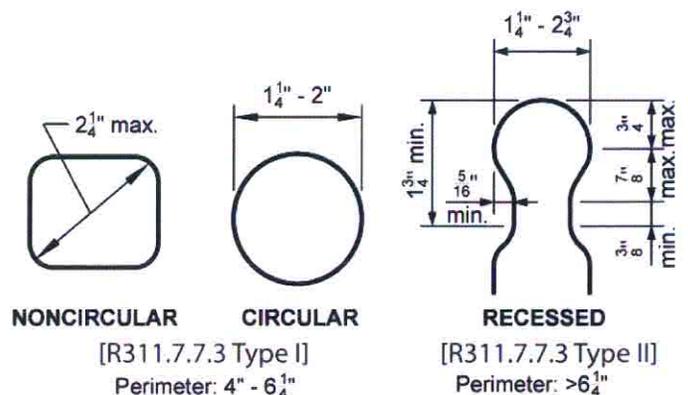


Figure 32B. Handrail Grip Size



STAIR FOOTING REQUIREMENTS [R403]

Where the stairway meets grade, attach the stringers to the stair guard posts as shown in Figure 34. Posts shall bear on footings. All footings shall bear on solid ground and shall be placed at least 12 inches below the undisturbed ground surface or below the frost line, whichever is deeper (see Figure 34). Stringers shall bear on a 2x4 bearing block attached to the post as shown. Stringers shall not bear on new or existing concrete pads or patios that are not founded below this depth. When guards are not required (see GUARD

REQUIREMENTS), posts may terminate below the bottom tread elevation. Bolts are only required if a guard post is required.

STAIR LIGHTING REQUIREMENTS [R303.6]

Stairways shall have a light source located at the top landing such that all stairs and landings are illuminated. The light switch shall be operated from inside the house. However, motion detected or timed switches are acceptable.

Figure 33. Miscellaneous Stair Requirements

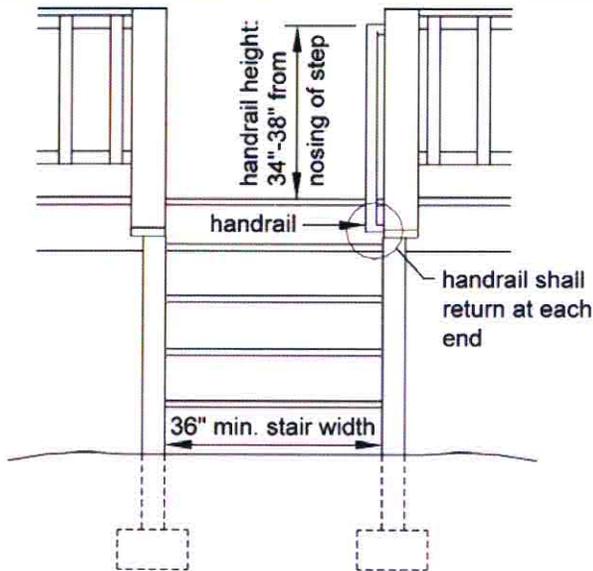
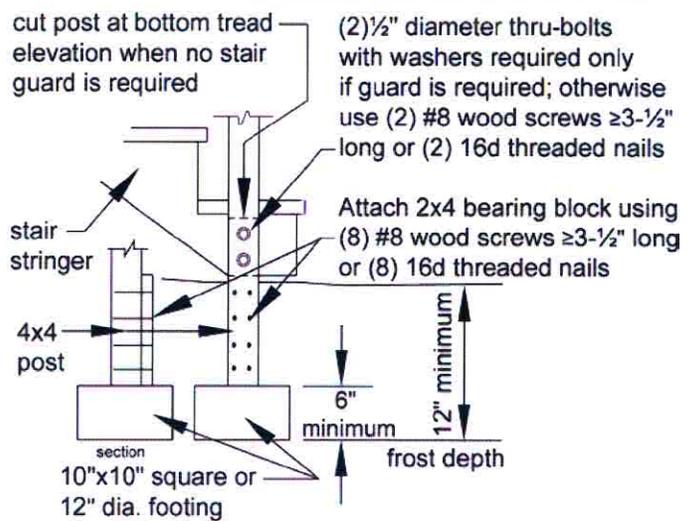


Figure 34. Stair Footing Detail



FRAMING AT CHIMNEY OR BAY WINDOW

All members at a chimney or bay window shall be framed in accordance with Figure 35. Headers may span a maximum of 6'-0". When a chimney or bay window is wider than 6'-0", one or more 6x6 posts may be added to reduce header spans to less than 6'-0". In such cases, the post footing must meet the requirements in the FOOTINGS section. Headers with a span length greater than 6'-0" require a plan submission. Headers shall be located no more than 3'-0" from the end of the trimmer joist.

1B. Joist hangers shall each have a minimum download capacity in accordance with Table 7. Bolts or lag screws used to attach the hanger to the ledger shall fully extend through the ledger into the 2-inch nominal lumber band joist (1-1/2" actual) or EWP rim board. Otherwise a freestanding deck is required.

Triple trimmer joists are required on each side of the header if joist spacing is 12" or 16" o.c. or if the trimmer joist span exceeds 8'-6"; otherwise, double trimmer joists are permitted. Trimmer joists may bear on the beam and extend past the beam centerline up to $L_j/4$ as shown in Figures 1A and 2, or the trimmer joist may attach to the side of the beam with joist hangers as shown in Figure

Table 7. Trimmer Joist Hanger Download Capacity

Joist Size	Minimum Capacity, lbs
2x8	1050
2x10	1380
2x12	1500

Figure 28: Stair Stringer Requirements

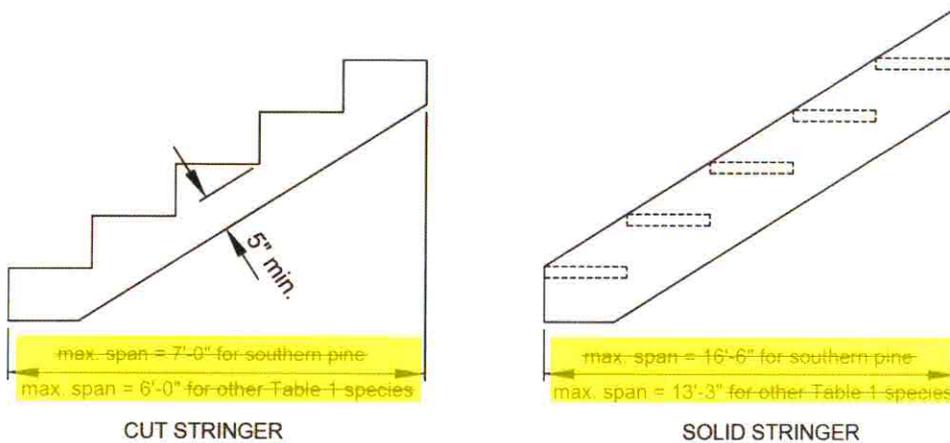


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1. Assumes 300 lb concentrated load, L/288 deflection limit, No. 2 grade, and wet service conditions.
2. Incising assumed for refractory species including Douglas fir-larch, hem-fir, and spruce-pine-fir.
3. Design values based on northern species with no incising assumed.

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JOIST HANGERS

The loads listed in the Table 3A are derived from the worst case condition for each joist size based on Table 2 (508 lbs, 654 lbs, and 771 lbs 483 lbs, 570 lbs, and 675 lbs for southern pine at 24" o.c. for 2x8, 2x10, and 2x12, respectively). For simple span applications without overhangs, as shown in Table 2, note that spans are identical to those shown in Table 2 with overhangs for southern pine joists at 24" o.c., therefore the same joist hanger capacities as shown in Table 3A will work for spans with or without overhangs.

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POST REQUIREMENTS

Assuming that identical species will be used for joists and beams, an analysis of Table 3 reveals that a maximum tributary area of approximately 84.71 ft² will result if southern pine is used (see calculations under FOOTINGS for L_J = 18'-0" and L_B = 8'-0" 7'-0" for 2-2x12). This results in a load on the post of 4,064 3,562 lbs. A 4x4 southern pine No. 2 post 10' in height would work in this situation (assuming pinned end fixity). Similarly, for other Table 3 species, assuming joists and beams are the same species, a maximum