

# CARROLL COUNTY BUREAU OF PERMITS AND INSPECTIONS

## RESIDENTIAL CODE COMPLIANCE GUIDE FOR

# DECKS

Code Reference: Chapter 170, Code of Public Local Laws and Ordinances of Carroll County and The International Residential Code as adopted

The following list of Code requirements is intended to assist you in complying with the Carroll County Building Code as adopted by Chapter 170, Code of Public Law and Ordinances of Carroll County, but does not encompass the entire Code. Failure to comply with all applicable Code requirements will result in a Notice of Violation and/or Stop Work Order until such violations are corrected. The approved set of building plans and the permit must be made available at the site for all required inspections. Decks shall not be used or occupied until final inspection and approval is obtained. Should you have any questions regarding these requirements, please call 410-386-2674 or 1-888-302-8978.

**Note: Please be aware that these guidelines are minimum requirements for inspection approval only**

Applicant must fill out a Building Permit Application and submit along with three copies of plot plan, with the proposed deck drawn on, the distance from the deck to the property lines and well and septic locations (if applicable) and two complete sets of building plans.

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## SECTION 1: GENERAL REQUIREMENTS:

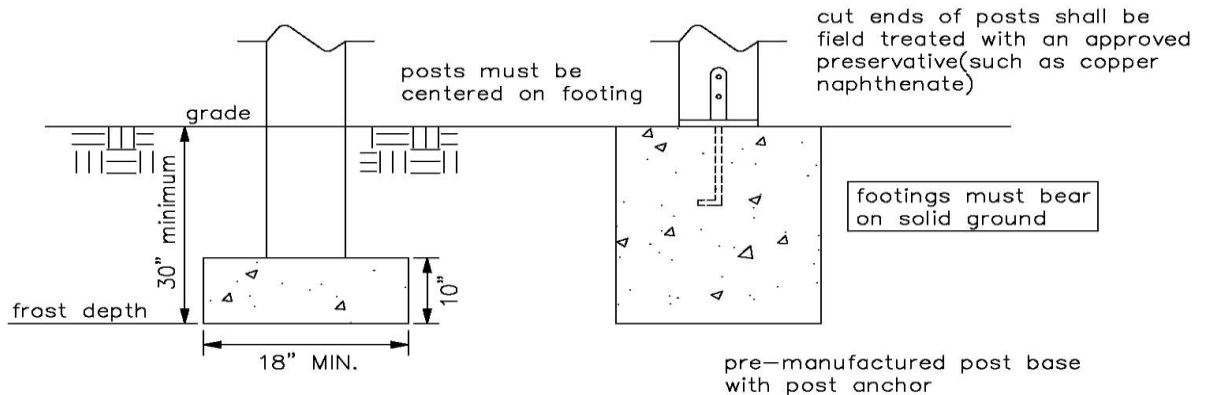
- a. All lumber shall be identified as southern pine, grade #2 or better and shall be pressure-treated with an approved process and preservative in accordance with American Wood Protection Association standards. **All lumber in contact with the ground shall be approved preservative treated wood suitable for “ground- contact”.**
- b. Chemicals used in pressure treatment methods will prematurely corrode standard fasteners, hardware, and flashing when in contact with lumber. To combat corrosion, the following is required.
  - All screw and nails shall be hot-dipped galvanized or stainless steel.
  - All hardware (joist hangers, 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.
  - All fasteners and hardware used must meet the minimum load requirements for its intended use.
- c. All manufactured products shall be installed in accordance with the manufacturer’s instructions. This includes connectors and span restrictions.
- d. Decks constructed according to this handout are **not approved** for future hot tub installations.
- e. Decks around or next to an above ground pool shall also comply with the pool barrier guidelines.
- f. It is the responsibility of the permit holder or the permit holder’s representative to notify the county when the stages of construction are reached that requires an inspection.
- g. Plastic composite or PVC deck boards, stair treads, guards, or handrails shall have a valid evaluation report from an accredited listing agency and shall comply with the requirements of ASTM D 7032. Products shall exhibit a flame spread index not exceeding 200 when tested in accordance with ASTM E 84 or UL 723 with the test specimen remaining in place during the test, except for plastic composites determined to be non-combustible.
- h. Enclosing perimeter below deck: All framing members for attachment of lattice or solid type panels shall maintain a two inch clearance from finish grade to allow for ground heaving from frost.

### Required Inspections:

- A footing, framing, and final inspection are required on all decks.
- Footing inspections required **PRIOR** to the placement of concrete.
- Framing inspection after all structure members are installed.
- Final inspection when deck is complete.
- A framing and final inspection can be combined provided the deck is at least 48” above grade at all points.
- Inspections are required by law. Failure to receive any and all inspections can result in the issuance of violations, in accordance with the Code of Public Local Laws and Ordinances of Carroll County.

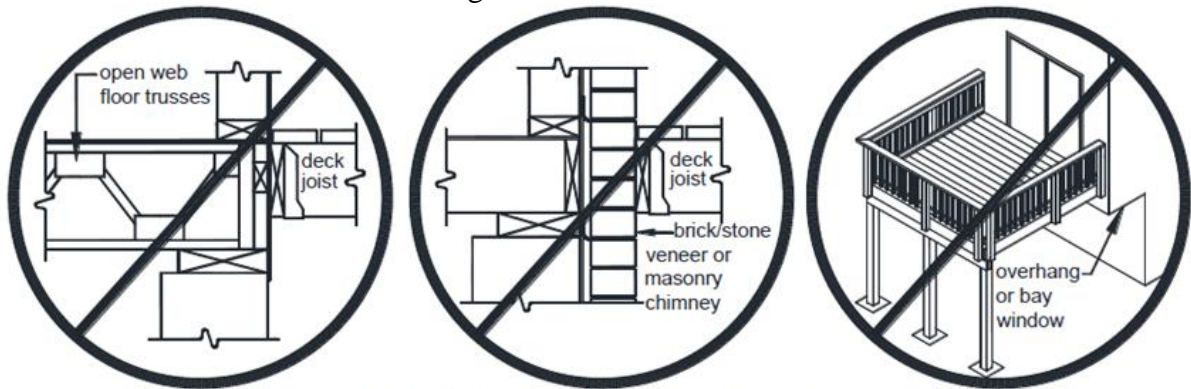
## SECTION 2: FOOTERS:

- a. Minimum depth from finished grade to bottom of all footings shall be 30" or extend to solid bearing, whichever is greater.
- b. Deck footings 3'-0" or less from an existing exterior house wall shall bear at the same elevation as the footing of the existing house foundation.
- c. Size- 4x4 and 6x6 post require minimum 18" diameter footer. All footers require a minimum of 10" concrete after the required inspection. **Note: Decks with roofs or rooms may require footers to be sized to carry the additional load.**
- d. All footings shall bear on solid ground. Bearing conditions shall be verified in the field by the building inspector.
- e. Concrete shall have a minimum compressive strength of 3,000 pounds per square inch.
- f. Do not construct footings over utility lines, septic lines, drainage lines or any type of underground tank. Be sure to contact **Miss Utility (1-800-257-7777) before digging.**
- g. All post anchors shall be galvanized.



### SECTION 3: LEDGER ATTACHMENT REQUIREMENTS:

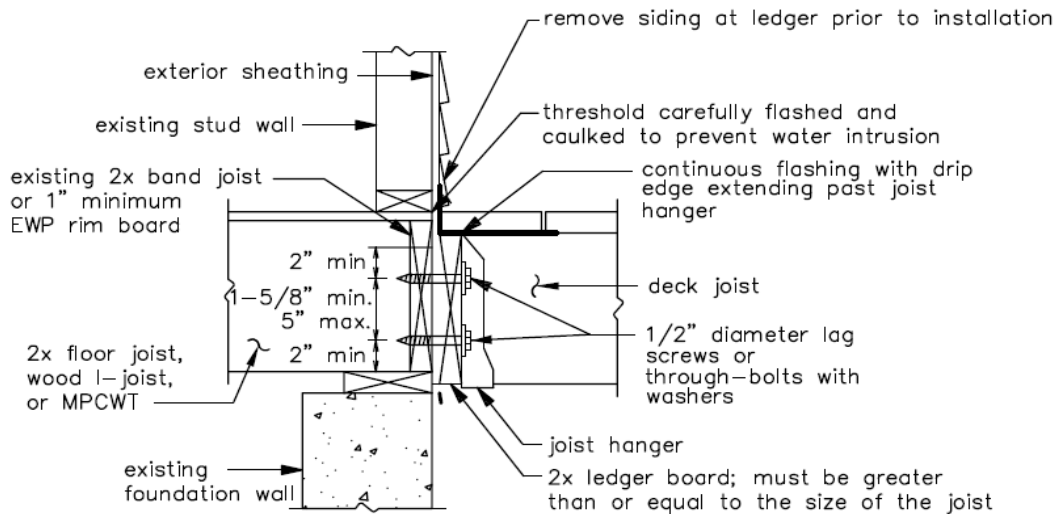
- a. Ledger shall be the same size or greater than the deck joist depth with a minimum of 2"x 8".
- b. When attachment is made to the existing house band joist, the band joist shall be capable of supporting the new deck. If this cannot be verified or conditions at the house differ from the details herein, then a free-standing deck will be required.
- c. Siding and flashing: Flashing shall be installed in accordance with the requirements below.
  - The exterior finish, i.e., house siding, must be removed prior to the installation of the ledger board.
  - Continuous flashing with drip edge, as shown on next page, is required at the ledger board when attached to wood-framed construction.
  - Flashing shall be copper (attached using copper nails only), stainless steel, UV resistant plastic, rubber or galvanized steel coated with 1.85 ounces of zinc per square foot (G-185 coating).
  - Flashing at a door threshold shall be installed to prevent water intrusion from rain or melting snow.
- d. Ledger shall not be connected to house overhang/cantilever or brick veneer for structural purposes. In such cases the deck shall be free-standing.



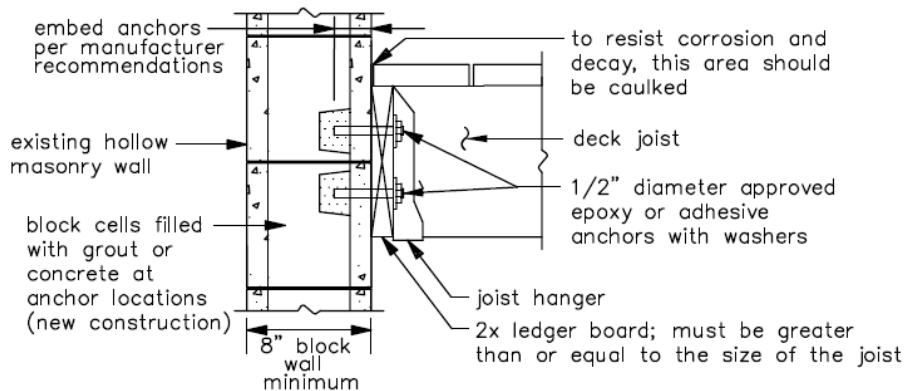
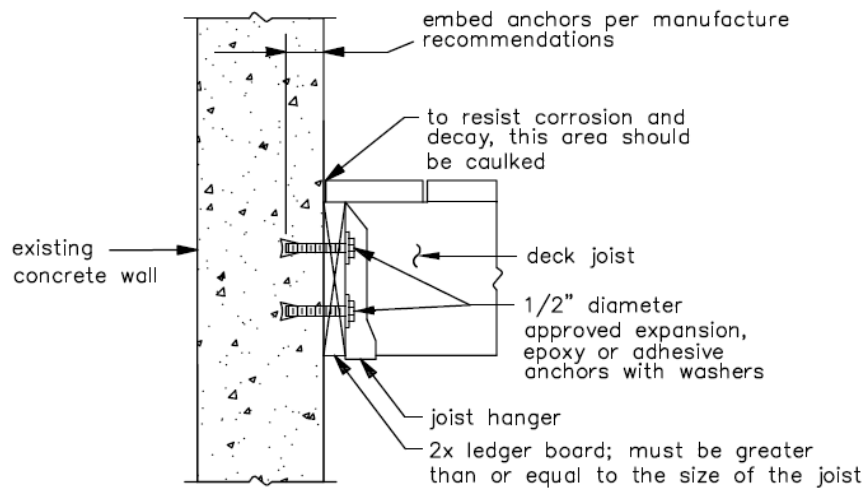
**PROHIBITED LEDGER ATTACHMENTS**

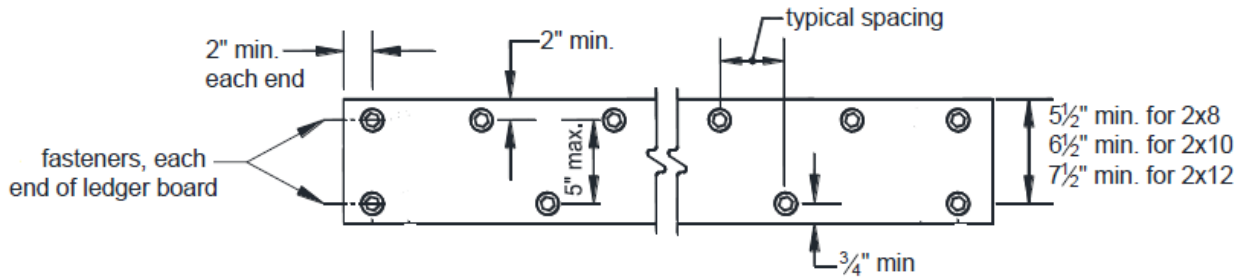
- e. Ledger shall not be connected to engineered wood products of less than 1" in thickness. Contractor shall verify house bandboard attachment before attaching deck ledger. Attachment to any engineered product must be installed per manufacturer's instructions if not covered in these guidelines or be installed as free standing.
- f. Ledger Board Fastener Requirements
  - Bolts and Lags shall be 1/2" diameter with washers.  
For joist spans up to 12'-0" install @ 16" oc.  
For joist spans exceeding 12'-0" install @ 10" oc.
  - Lag Screws: Hot-dipped galvanized or stainless steel - 1/2 inch diameter with washers shall be used only with sheathing of wood structural panels or solid sawn lumber.
  - Bolts: 1/2 inch diameter with washers shall be permitted with sheathing of wood structural panel, gypsum board, fiberboard, lumber or foam sheathing up to one inch in thickness.
  - For other ICC approved attachment fasteners, it is imperative that the fastener be used and installed per the manufacturer's specifications. Manufacturer's specifications must be on site at the time of inspection. (Size, Location and spacing requirements)
  - All fasteners shall be staggered from top to the bottom along the horizontal run

- Lead anchors are prohibited



## PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOIST



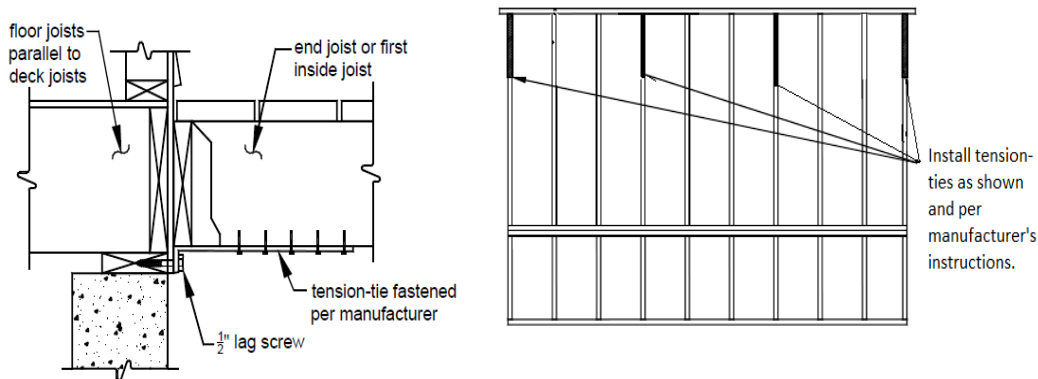


**LEDGER BOARD FASTENER SPACING AND CLEARANCES**

g. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable.

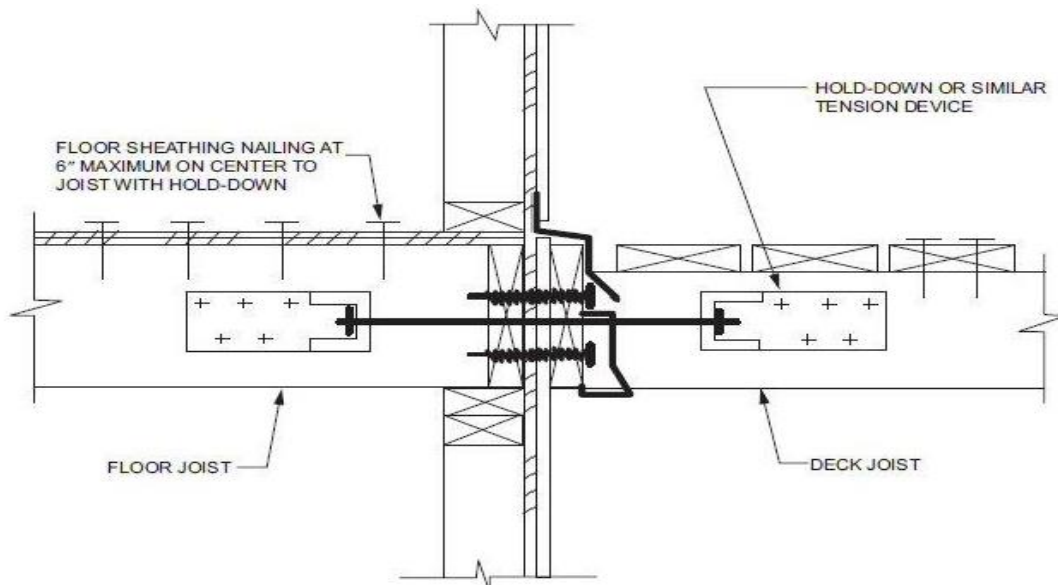
**Lateral load connection may use one of the following methods: SEE DETAILS BELOW**

- Install (2) two 1500 pound capacity connectors within 24 inches of each end of the deck
- Install (4) four 750 pound capacity connectors in (4) four locations (two at each end)
- Provide diagonal bracing with 2x members at all post
- Alternative method and products with prior approval from the Code Official



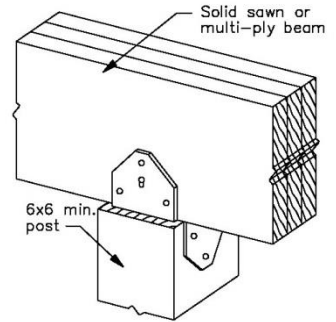
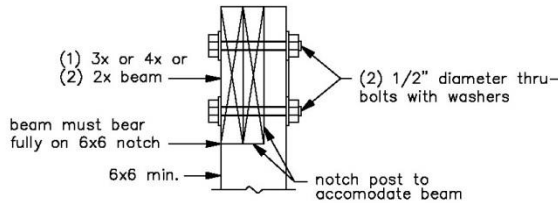
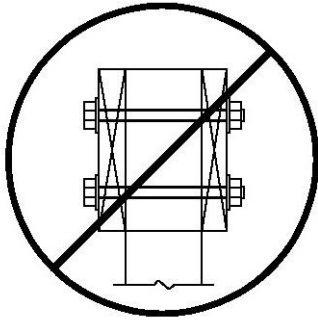
**TENSION-TIE CONNECTION JOISTS**

**TENSION TIE LOCATIONS ON UNDERSIDE OF DECK**

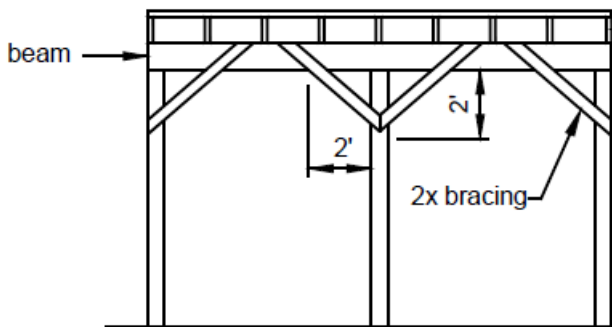


## SECTION 4: POSTS

- a. Post/columns shall be a minimum of 4x4's, 4x6's or equivalent for heights up to 8'-0", and 6x6's or equivalent for heights over 8'-0". Maximum 14'-0" in height.
- b. When post is not buried, secure post to footer with an approved pre-manufactured post base with anchor.
- c. See "Beam Size and Maximum Spacing Between posts for Beams" on next page.
- d. Cut ends of posts shall be field treated with a wood preservative containing copper naphthenate.

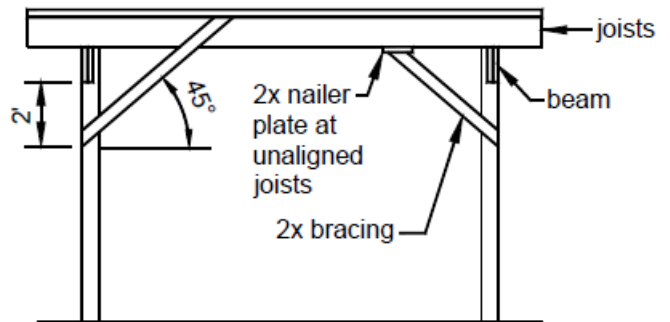


- e. Diagonal bracing shall be provide when one or more of the following apply:
  - Free standing deck
  - Deck supporting a roof or room
  - Decking material is installed with hidden fasteners
  - Post height exceeds 8'-0" from finish grade to underside of beam



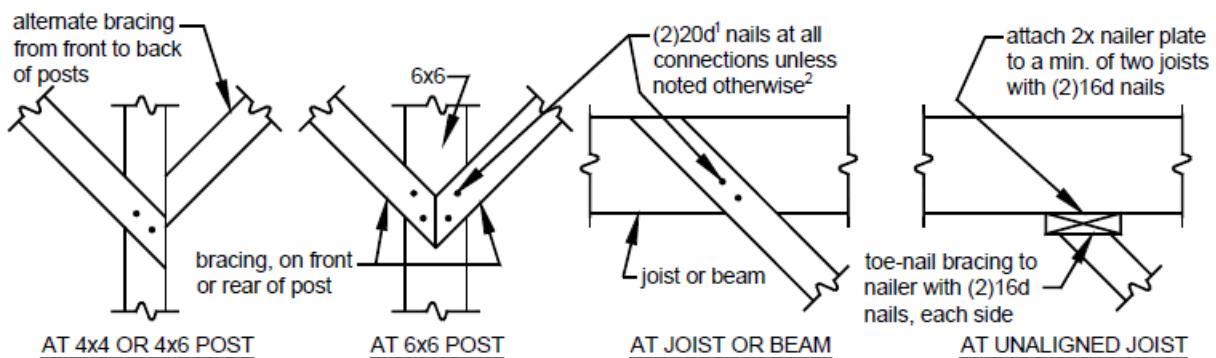
2x BRACING

- Place 2x bracing at all beam-post locations.



2x BRACING

- Place 2x bracing at all joist-post locations.



AT 4x4 OR 4x6 POST

AT 6x6 POST

AT JOIST OR BEAM

AT UNALIGNED JOIST

<sup>1</sup> Nails maybe be substituted with an equal number of the approved wood screws

<sup>2</sup> Nails shall have a distance of 3/4 inches to all edges and 1/4 inches to the end of the bracing member.

## SECTION 5: BEAMS

- a. Post to beam connection shall be secured by the following methods:
  - 4x4 post to beam-use approved column/post cap.
  - 4x6 and 6x6 post to beam-notch post and secure to post with 2-1/2" diameter bolts.

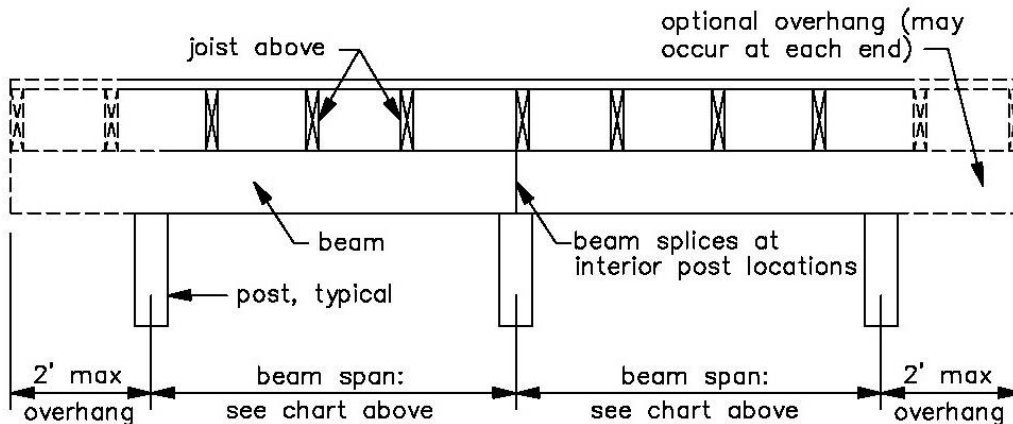
**Attachment of beam to side of post is prohibited. See page 7 for detail.**
- b. **All beam splices shall be centered on top of bearing post. Splices between posts are PROHIBITED.**
- c. Beam cantilever measured to center of post:
  - a. 2x6 beam – prohibited
  - b. 2x8 beam – 2' maximum
  - c. 2x10 beam – 2' maximum
  - d. 2x12 beam – 2' maximum
- d. All headers and beams shall be fastened together at 16" oc. with 16d nails along the top and bottom horizontal run.
- e. See beam chart below for required beam size and post spacing.

For joist framing from one side only. Beams in center span of deck requires additional calculation.

Deck Beam Spans		Total Joist Length (L <sub>J</sub> ) Less Than or Equal To: <sup>1</sup> (Includes cantilever)						
Species	Size <sup>4</sup>	6'	8'	10'	12'	14'	16'	18'
Southern Pine	2-2x6	6'-11"	5'-11"	5'-4"	4'-10"	4'-6"	4'-3"	4'-0"
	2-2x8	8'-9"	7'-7"	6'-9"	6'-2"	5'-9"	5'-4"	5'-0"
	2-2x10	10'-4"	9'-0"	8'-0"	7'-4"	6'-9"	6'-4"	6'-0"
	2-2x12	12'-2"	10'-7"	9'-5"	8'-7"	8'-0"	7'-6"	7'-0"
	3-2x6	8'-2"	7'-5"	6'-8"	6'-1"	5'-8"	5'-3"	5'-0"
	3-2x8	10'-10"	9'-6"	8'-6"	7'-9"	7'-2"	6'-8"	6'-4"
	3-2x10	13'-0"	11'-3"	10'-0"	9'-2"	8'-6"	7'-11"	7'-6"
	3-2x12	15'-3"	13'-3"	11'-10"	10'-9"	10'-0"	9'-4"	8'-10"

<sup>1</sup> Spans are based on 40 PSF live load, 10 PSF dead load, southern pine #2, normal loading duration, wet service conditions and deflections of  $L/\Delta = 360$  for main span and  $L/\Delta = 180$  for overhang with a 220lb. point load.

<sup>4</sup> Beam depth must be equal to or greater than joist depth if joist hangers are used.



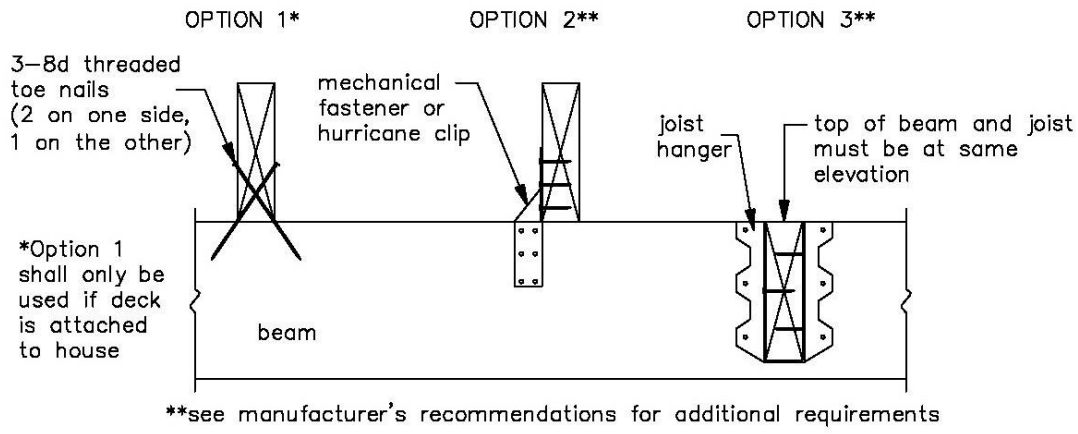


## SECTION 6: FLOOR JOIST

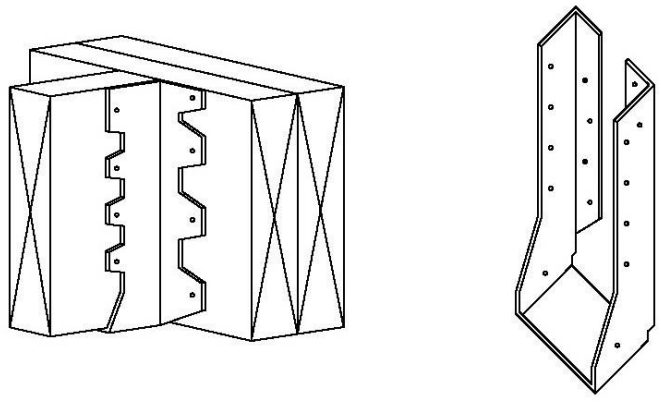
- a. See span table below for treated lumber, southern yellow pine, 40 psf live load, 10 psf dead load and deflection of  $L\Delta/360$  minimum.
- b. Joist may overhang past the center of the beam up to one-fourth of the actual joist span.
- c. Provide full-depth 2x blocking between overhanging joist above beam locations; toe-nails with (3)10d nails at each end. Exception: blocking may be omitted if the overhang is less than or equal to two feet.
- d. See detail next page for framing at chimneys or bay window.
- e. See chart below for allowable joist spans.

Joist Spacing (on center)	Joist Size	Without <sup>1</sup> Overhang	With Overhang
12"	2x6	9'-11"	6'-8"
	2x8	13'-1"	10'-1"
	2x10	16'-2"	14'-6"
	2x12	19'-1"	18'-0"
16"	2x6	9'-0"	6'-8"
	2x8	11'-10"	10'-1"
	2x10	14'-0"	14'-0"
	2x12	16'-6"	16'-6"
24"	2x6	7'-7"	6'-8"
	2x8	9'-8"	9'-8"
	2x10	11'-5"	11'-5"
	2x12	13'-6"	13'-6"

<sup>1</sup>Cantilevered spans not exceeding the nominal depth of the joists are permitted. Dimension shall be included in the overall span of the joist.

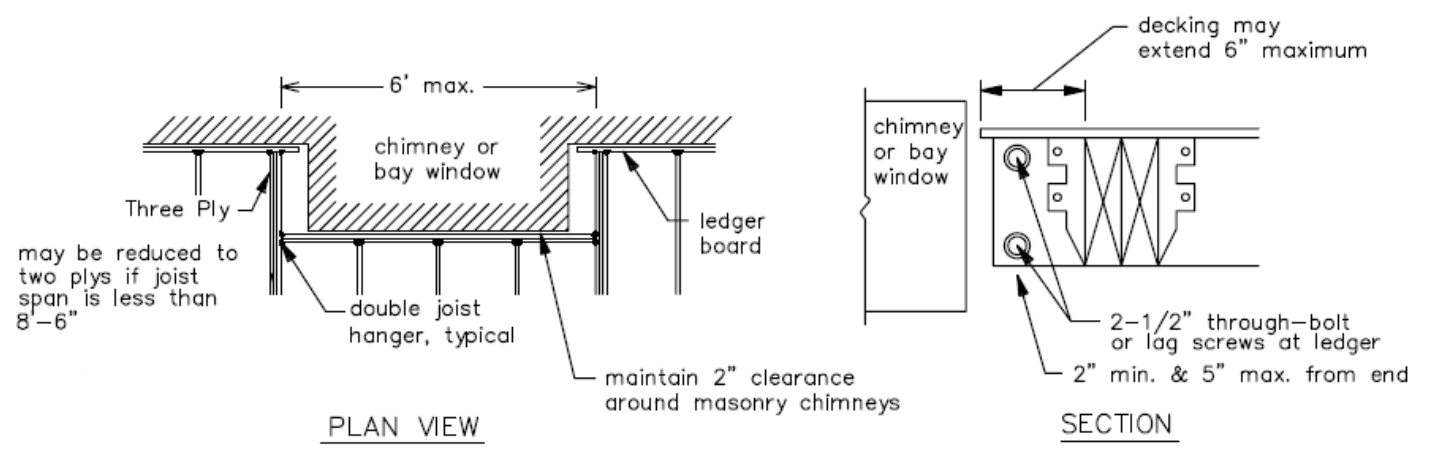


Note: see manufacturer of hanger for download capacity



Use joist hangers with inside flanges when clearances to the edge of the beam or ledger board are limited.

**DO NOT USE CLIP ANGLES OR BRACKETS TO SUPPORT JOIST**



## SECTION 7: DECKING BOARDS

- a. All decking material shall be composed of dimension lumber (2" nominal thickness) or span rated decking in accordance with the American Lumber Standards. In either case, the use of decking boards wider than 6 inches is not recommended because of the "cup", a form of warp that can become a problem. See chart below for allowable spans.

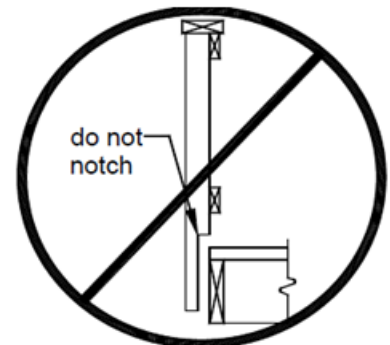
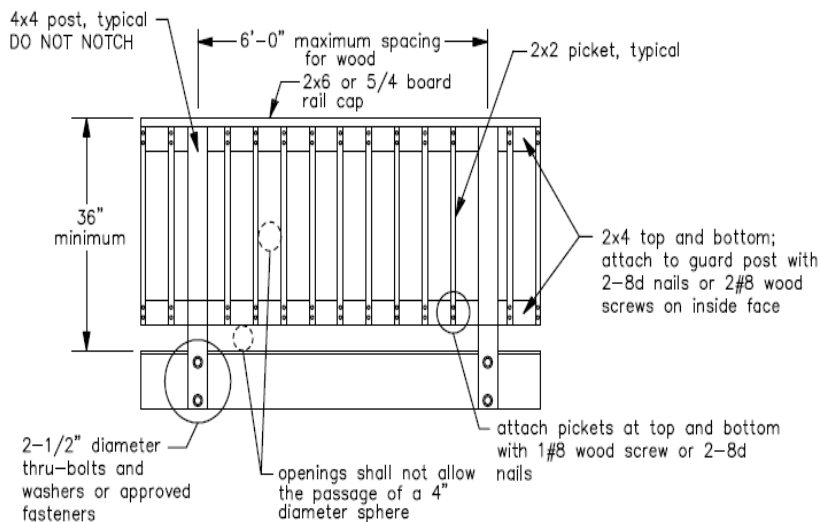
**Note: Reduce the allowable decking spans if the decking is applied diagonally by installing the floor joist closer together, e.g.: 24" to 16" oc., and 16" to 12" oc. All composite decking shall be installed per manufacturer's requirements.**

Material Type and Nominal Size	Maximum Joist Spacing (inches)	
	Angular	Perpendicular
Wood "five-quarter" board	12	16
Wood 2x4 or 2x6	16	24
Plastic composites, PVC	per manufacturer	per manufacturer

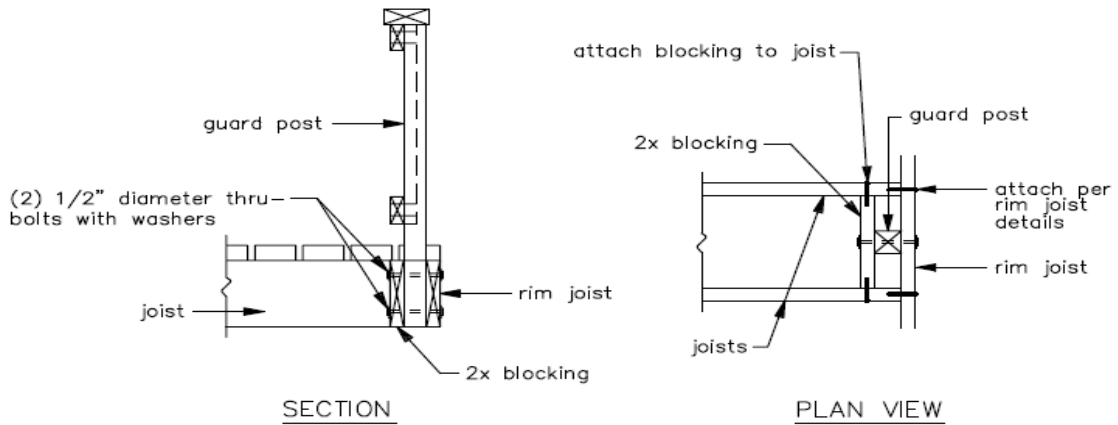
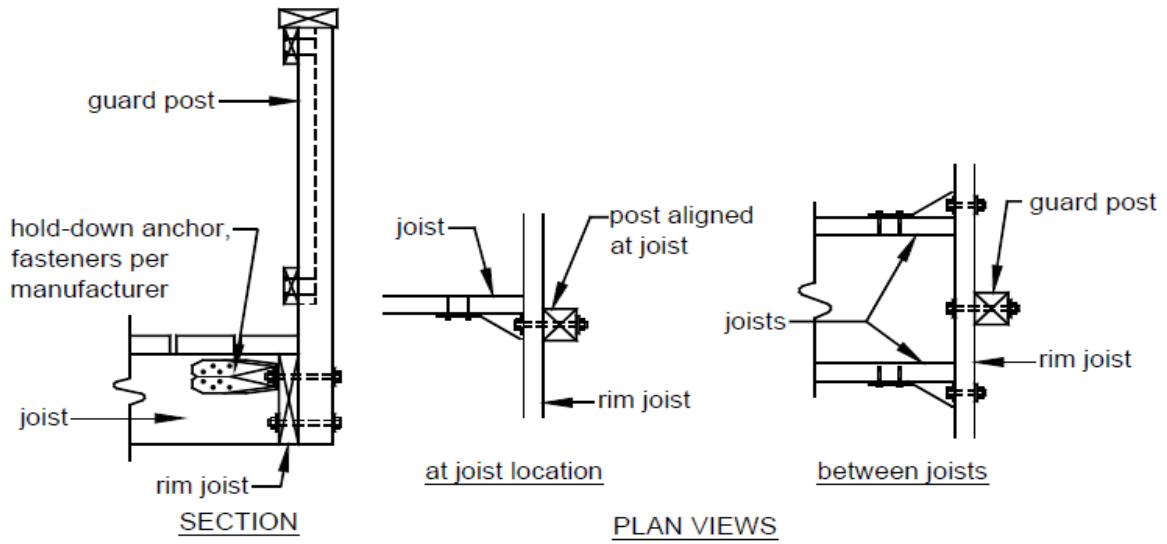
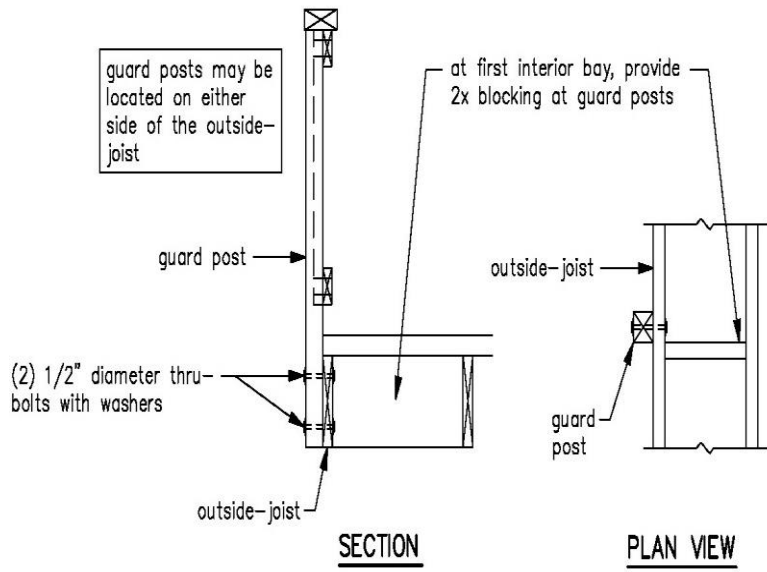
◆Remember to reduce joist spacing if decking is applied diagonally◆  
24" to 16" and 16" to 12"

## SECTION 8: GUARD POST

- a. The guardrail posts can be attached to the exterior of the rim joist, or the interior of the rim joist. (see details on next page)
- b. Maximum post spacing for wood shall be 6'-0". (see details below)
- c. **NOTCHING OF POST NOT ALLOWED.**
- d. Post shall be installed with a minimum of two (2) half inch bolts or ICC approved fasteners installed per manufacturer's instructions.

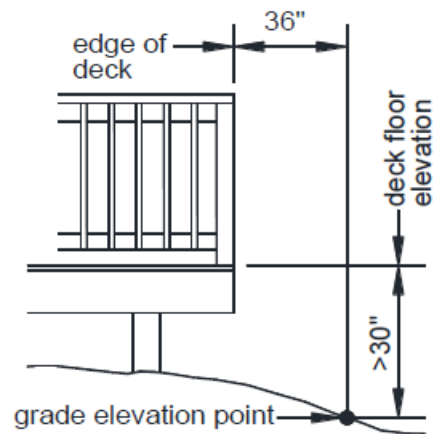


**POST NOTCHES PROHIBITED**



## SECTION 9: GUARDRAILS

- a. Guardrails for porches, decks, balconies, or raised floor surfaces more than 30" above floor grade shall be 36" high. Guards which are not required, but are nevertheless provided, must also comply with these requirements. • See details below on guardrail height measurement.
- b. Open sides of stairs with total rise of more than 30" above floor or grade shall have guardrails not less than 34" high measured vertically from nose of tread.
- c. Horizontal spacing between vertical members in required guardrails shall be a maximum of 4 inches. Stairway guard spacing is 4-3/8" maximum.
- d. Triangular openings formed by riser, tread, and bottom rail of guardrails on stairways shall not allow a sphere 6" in diameter to pass through.
- e. Installation of wood/plastic composites shall be installed in accordance with the manufacturer's instructions.



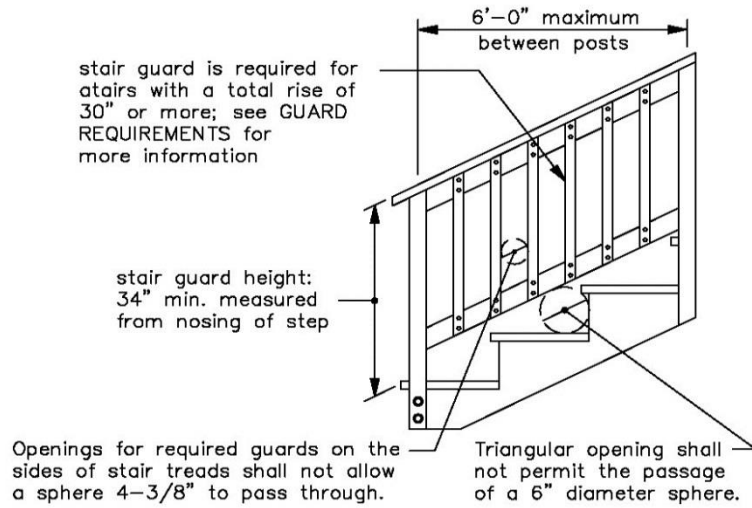
**WHEN A GUARD IS REQUIRED**

## SECTION 10: STAIRS AND HANDRAILS

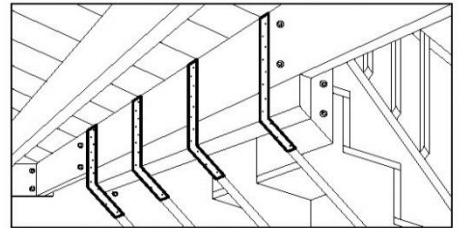
- a. Minimum 3 feet net clear width.
- b. Maximum riser height shall be 7  $\frac{3}{4}$  ”.
- c. Minimum tread width shall be 10” (**measure from edge of nose to edge of nose**).
- d. A nosing not less than  $\frac{3}{4}$ ” but not more than 1  $\frac{3}{4}$ ” shall be provided unless tread width is 11” or greater.
- e. Riser and tread shall be consistent to within a tolerance of  $\frac{3}{8}$ ” throughout the flight.
- f. Risers shall not permit the passage of a 4” sphere.
- g. All stringers shall be a minimum of 2x12 material.
- h. Maximum stringer span for southern pine is **6’-0”**.
  - If stringer span exceeds 6’-0”, midpoint support with frost footers shall be provided.
  - Post will require a 12” diameter footer.
  - Stringer shall be bolted to post with two  $\frac{1}{2}$ ” bolts with washers.
  - If the total vertical height of the stairway exceeds 12’-3”, then an intermediate landing shall be required. All intermediate stair landings must be designed and constructed as a free-standing deck with required frost footers and diagonal bracing.
  - Stairs shall be solidly attached to landings and deck. The cut for stair stringers or stair carriages shall be solidly attached for the entire height of the cut. **See detail on next page for stringer attachment.**
- i. The maximum allowable spacing of stair stringers or stair carriages shall be determined by the maximum allowable span of the tread material or decking used.
  - If cut stringers are used, a minimum of (3) three are required for 36” width stairs.
  - Check manufacturer of decking for additional stringer requirements.
- j. Stair guard height shall be a minimum of 34” measured vertically from the nosing of step.
- k. Openings on required stair guards on the sides shall not allow a sphere of 4- $\frac{3}{8}$ ” to pass.
- l. Triangular openings formed by riser, tread, and bottom rail of guardrails on stairways shall not allow a sphere of 6” to pass.
- m. All stairs with 4 or more risers shall have a graspable handrail on at least one side.
  - **Handrails shall be installed at 34”-38” measured vertically from the nosing.**
  - All 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 post at each end.**
  - The minimum clearance from guards and post to handrail shall be 1- $\frac{1}{2}$ ”.
  - **Handrails shall be graspable and be composed of decay-resistant and/or corrosion resistant material. Maximum cross dimension shall be 2- $\frac{3}{4}$ ”.**
- n. Where the stairway meets the grade, the stringers shall bear on solid material such as concrete or patio blocks to provide support and protection of the stair stringers.
  - All material in contact of ground must be ground contact approved.

**SEE NEXT PAGE FOR STAIRS AND HANDRAIL DETAILS**

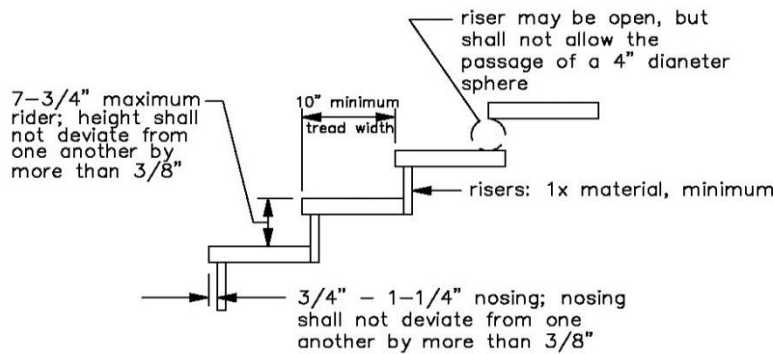
**Stair Guard Requirements**



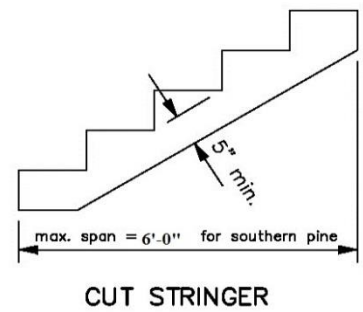
**Stair Stringer Attachment Detail**



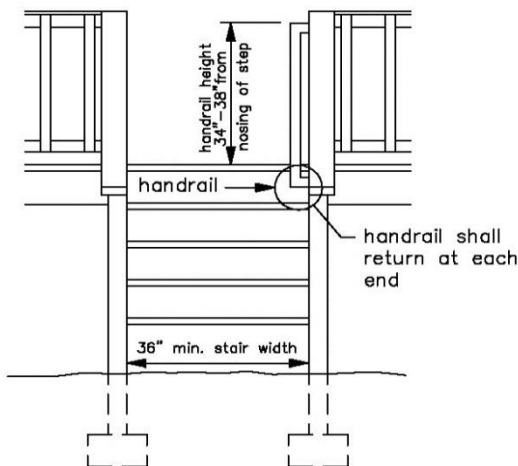
**Tread and Riser Detail**



**Stair Stringer Requirements**



**Miscellaneous Stair Requirements**



**Handrail Mounting Examples**

Fasten handrails per manufacturer recommendations

