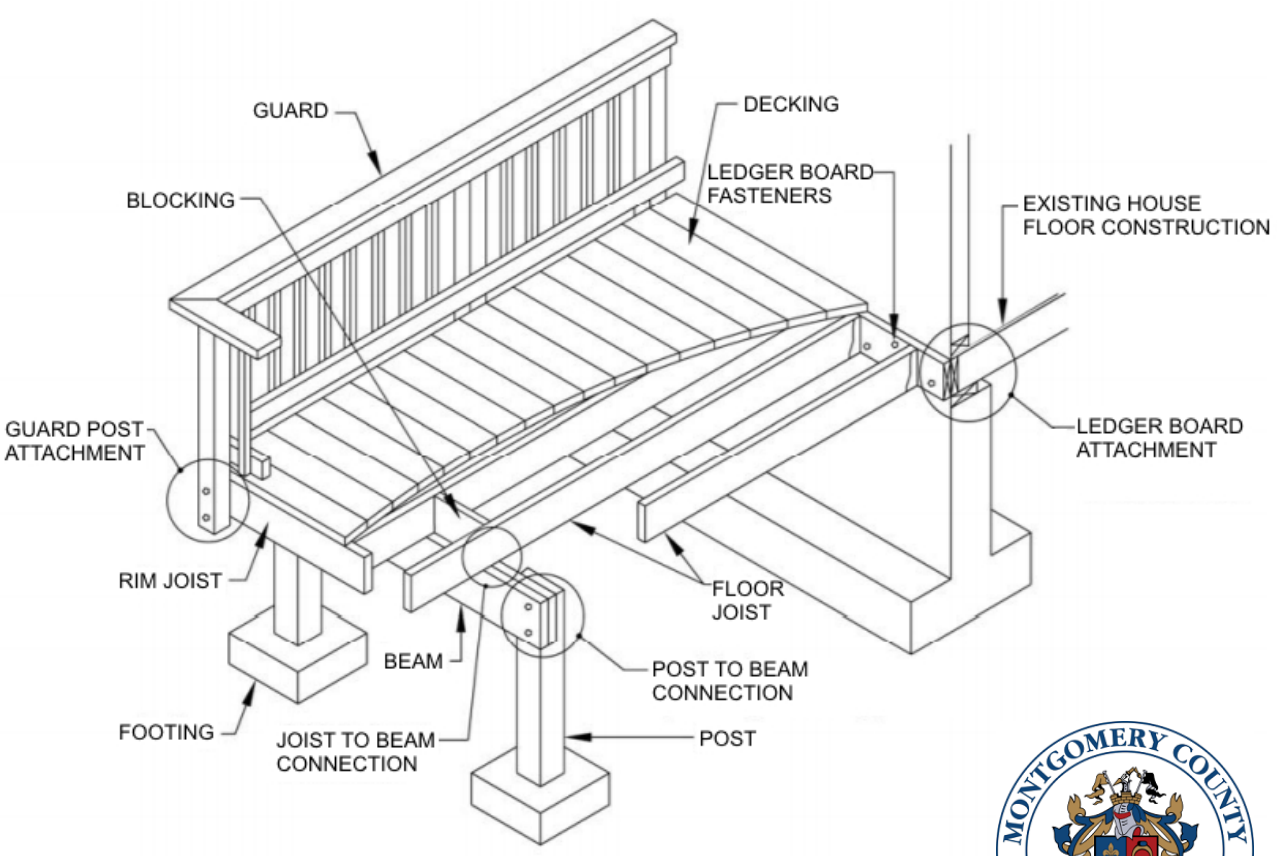
DPS | Montgomery County Department of Permitting Services
YOUR PROJECT PARTNER

2425 Reedie Drive, 7th floor
Wheaton, MD 20902
240-777-0311
montgomerycountymd.gov/dps

MONTGOMERY COUNTY RESIDENTIAL TYPICAL DECK DETAILS

Based on the 2021 International Residential Code



CONTENTS

1. General Requirements and Limitations……. 2
2. Framing Plans and Sections ……..4
3. Footings ……..…….... 6
4. Posts ……..... 6
5. Beam ……..…….7
6. Post to Beam Connection……. 7
7. Joist ……..…….. 9
8. Floor Joist to Beam Connection……..... 9
9. Ledger Attachment ……... 10
10. Ledger Board Fasteners……12
11. Deck Lateral Loads …….. 13
12. Framing at Chimney or Bay Window...14
13. Decking ……..…….... 14
14. Guardrail …….. 15
15. Stairway ……..…….. 17
16. Deck Worksheet ……..20

1. GENERAL REQUIREMENTS

1. This document can be used in lieu of construction plans and it applies to single level – single span rectangular decks only. The overall deck length shall be equal to or less than the overall deck width. (Figures 1 or 2, page 4)

2. Band joists supporting attached decks shall be capable of supporting the new deck. If the condition can't be verified a free-standing deck or full plan submission will be required.

3. A copy of this document is required to be on the jobsite and available for inspection.

4. Deck joists shall be parallel to the house joists. When house joists are perpendicular to the deck joists a free-standing deck or full plan submission will be required.

5. Decks constructed according to these guidelines are not approved for future hot tub, porch roofs or any future installations or modifications.

6. Decks shall not be attached to house overhangs, bay windows, or chimneys.

7. Deck shall not be loaded with more than 50 psf (pounds per square foot) total load. Soil bearing capacity shall be minimum 2000 psf and the minimum compressive strength of concrete shall be 3000 psi (pounds per square inch).

8. All deck lumber shall be #2 Southern Pine or better. All lumber shall be pressure-treated – with an approved process and preservative in accordance with the American Wood Protection Association standard. All lumber in contact with the ground shall be approved preservative treated wood suitable for ground contact.

9. Deck post size and maximum post height shall be in accordance with Table 1, page 5.

10. All screws, bolts, washers, nuts and nails shall be hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Hot-dipped galvanized fasteners shall meet the requirements of ASTM A 153. Class D for fasteners 3/8" diameter and smaller or Class C for fasteners with diameters over 3/8". Stainless steel driven fasteners shall be in accordance with the material requirements of ASTM F 1667. Fasteners other than nails and timber rivets shall be permitted to be of mechanically deposited zinc-coated steel with coatings and weights in accordance with ASTM B695, Class 55, minimum.

11. All connectors (joist hangers, cast-in-place post anchors, etc.) shall be galvanized or shall be stainless steel. Hardware to be hot-dipped galvanized prior to fabrication shall meet ASTM A653, type G-185 zinc coating. Hardware to be hot-dipped galvanized after fabrication shall meet ASTM A123.

12. Screws, spirally grooved and ring shanked nails shall be used for the deck surface and only manufacturer-specified fasteners shall be used to attach the connectors. Do not mix galvanized and stainless-steel connectors.

13. Decks 30 inches or less above grade are not required to have a guardrail. Grade measurement is at any point within 36" horizontally.

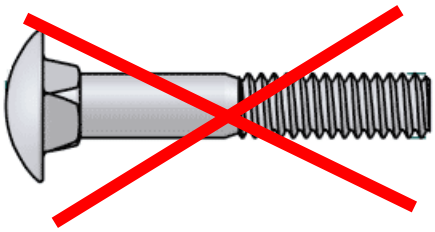
14. All decks that are accessible from the inside of the dwelling shall have at least one receptacle outlet accessible from the deck. (NEC 210.52(e)3).

15. **Before you dig call MISS UTILITY 1-800-257-7777 (2-day notice is required**). Please note that the Maryland High Voltage Line Act prohibits any person or object from getting closer than 10 feet to high voltage power lines.

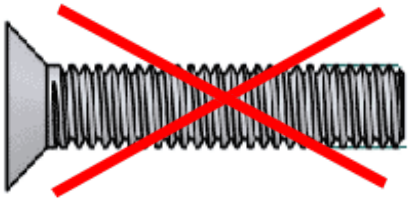
DECK TYPES

Attached Deck: a deck structure that is physically attached to and supported by the house with a ledger board.
Note: Not all decks are permitted to be attached to the house. Ledger Board attachment to brick veneer, stone or cultured stone, house cantilever, bay windows or chimneys, and web floor trusses are not permitted. Band joists supporting attached decks shall be capable of supporting the new deck. Deck joists shall be parallel to the house joists. If the condition can't be verified a free-standing deck or full plan submission will be required

Free-Standing Deck: a self-supporting deck structure built independently from the house, requires not more than two support beams.

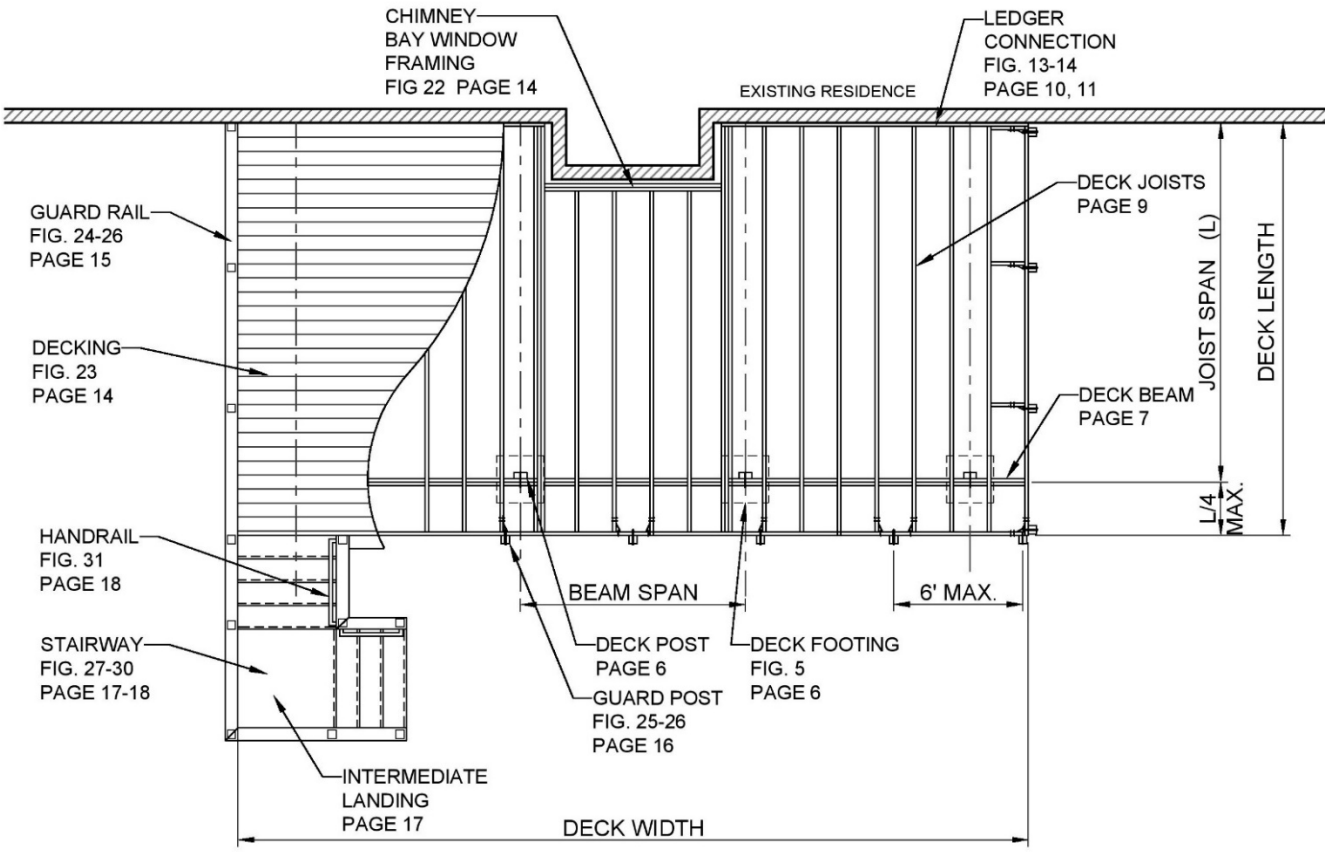


Carriage Bolts are not Permitted



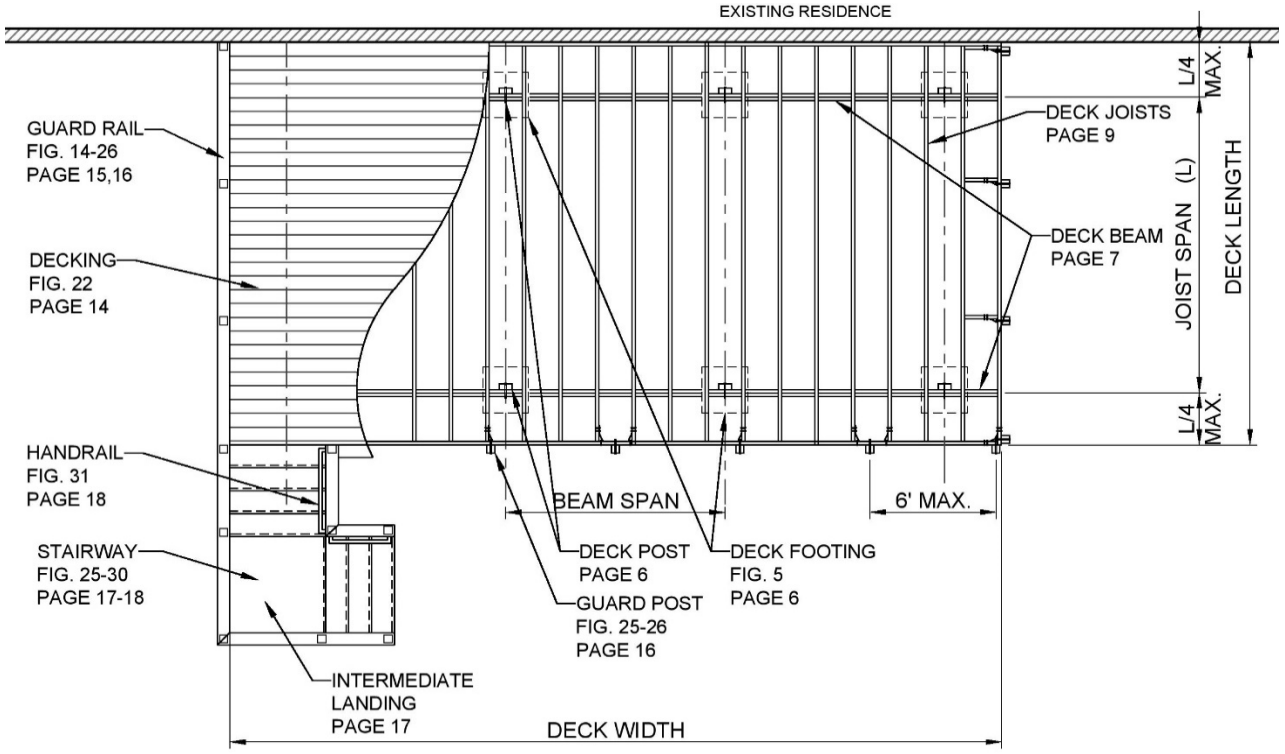
Countersunk bolts are not Permitted

2. DECK FRAMING PLANS AND SECTIONS



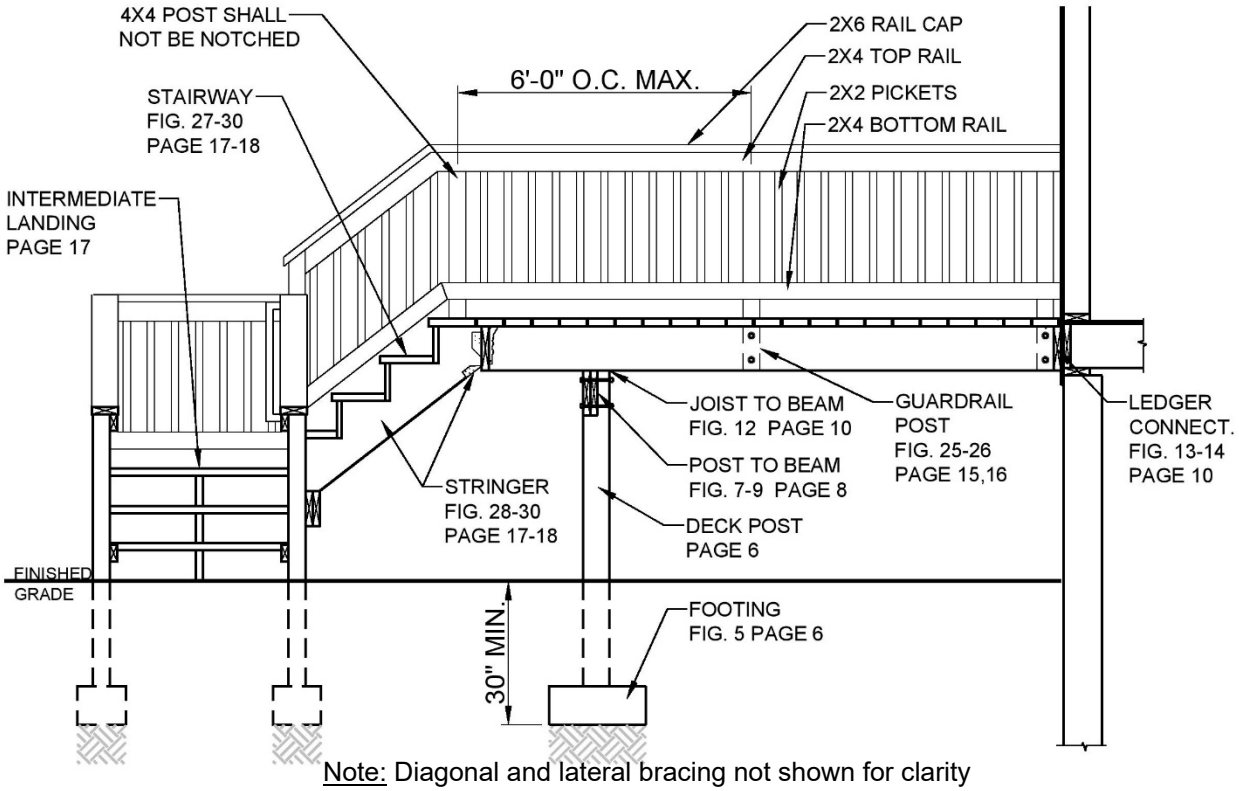
ATTACHED DECK

Figure 1



FREE STADING DECK

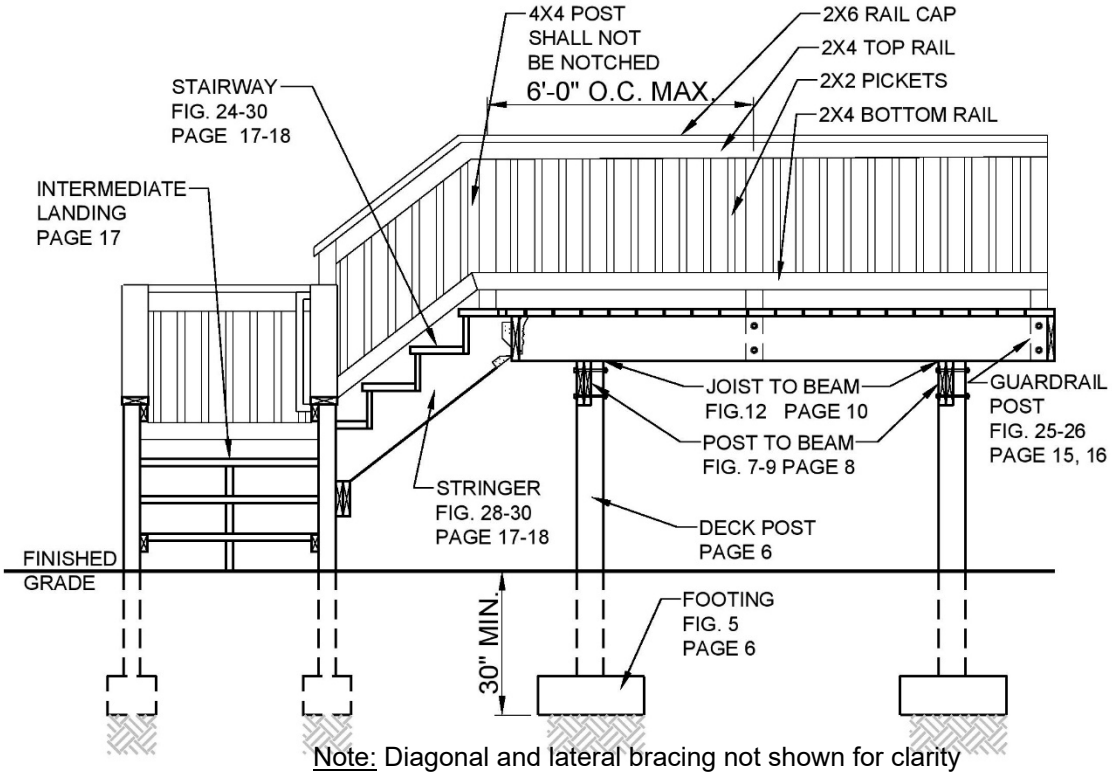
Figure 2



Note: Diagonal and lateral bracing not shown for clarity

ATTACHED DECK

Figure 3



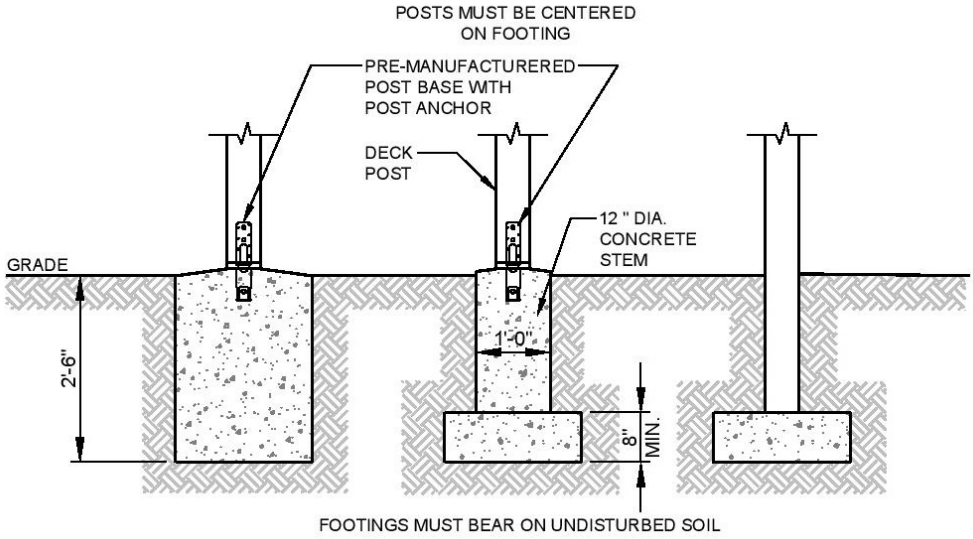
Note: Diagonal and lateral bracing not shown for clarity

FREE STANDING DECK

Figure 4

3. DECK FOOTINGS

Footings shall be minimum 20 inches square or 22 inches diameter. Bottom of footings shall be a minimum of 30 inches below grade and shall bear on undisturbed soil. **Deck footings closer than 5'-0" to an exterior house foundation wall must bear at the same elevation as the existing house foundation. New footings cannot be placed on top of the existing house foundation.** Distances to the edges of the footing and connector's embedment must be in accordance with the manufacturer's recommendations.



DECK FOOTINGS

Figure 5

a. Posts shall be restrained to prevent lateral displacement at the bottom support by manufacturer connectors or by a minimum of 12" in surrounding soils or concrete piers. Where expansible, compressible, shifting or other questionable soils are present, soils shall not be relied on for lateral support.
b. Cut ends of posts shall be field treated with an approved preservative.

4. DECK POSTS

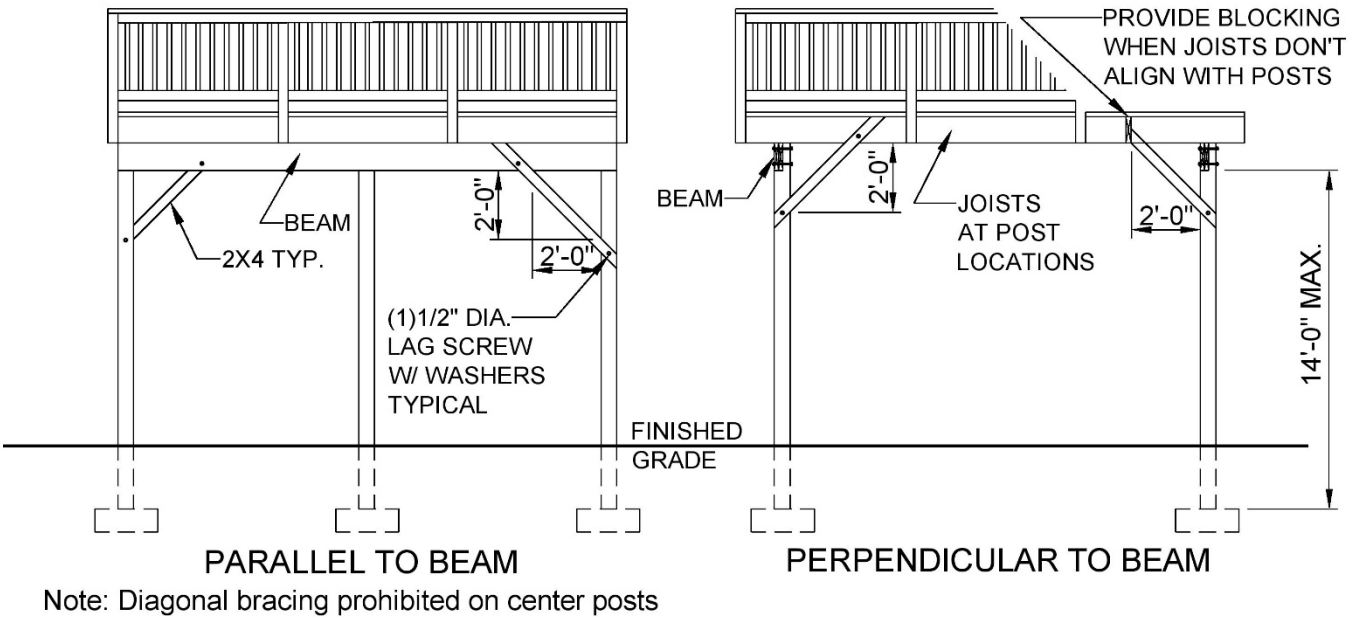
Deck post size shall be in accordance with Table 1. The height of the post is measured from grade or top of foundation (whichever is higher) to the underside of the beam. Post shall be centered on the footing. Cut ends and notches of post shall be field treated with an approved preservative. The post shall be attached to the beam by notching as shown in Figure 7 or by providing an approved post cap to connect the post to the beam as shown in Figure 7. Where post bear on concrete footings lateral restrain shall be provided by manufactured connectors or a minimum post embedment of 12 inches in surrounding soils of concrete piers.

Provide diagonal bracing at each post greater than 2 feet in height (grade to bottom of beam) as shown in Figure 6. Diagonal bracing is prohibited on center posts. Bracing shall be fastened to the post at one end with ½" dia. Lag screws. One set of diagonal bracing shall be located between posts and beams or parallel to the house. Another set of diagonal bracing shall be located perpendicular to beams and house in the end spans. This bracing shall be bolted to the post and joist above the post location. If the joist spacing is such that a joist does not align over a post location an extra joist shall be added to facilitate connection of the diagonal bracing. For free standing decks (see Figure 4) diagonal bracing may be omitted at the beam and posts adjacent to the house.

DECK POST SIZE	MAXIMUM HEIGHT [a,b] (feet and inches)
4x4	6'-2"
6x6	14'-0"

a. Measured to the underside of the beam
b. Based on 40 psf live load

Table 1



Note: Diagonal bracing prohibited on center posts

Figure 6

5. DECK BEAM

Maximum allowable spans for deck beams to be as per Table 2. Beam plies shall be fastened with two rows of 10d (3 in x 0.128 in) nails minimum at 16" o.c. along each edge. Beams shall be permitted to cantilever up to 2 feet or up to one-fourth of the actual beam span, whichever is less. The ends of beams shall have a minimum of 1 ½" inches of bearing.

MAXIMUM DECK BEAM SPANS [a,b,]

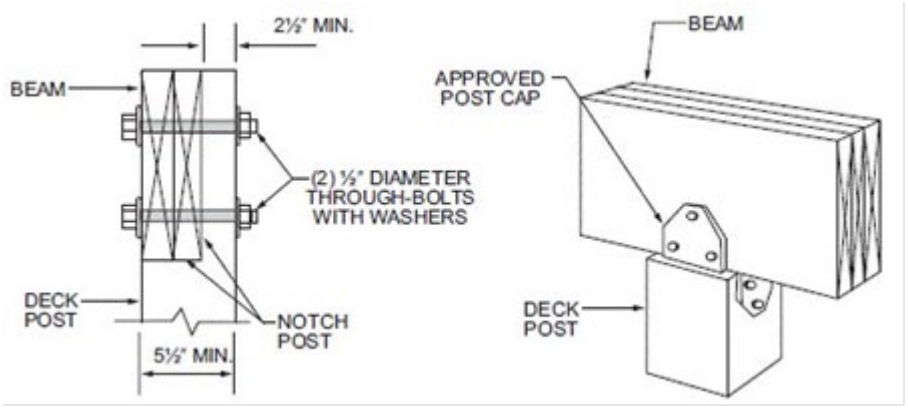
	Size	EFFECTIVE DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
		6	8	10	12	14	16	18
Southern Pine No. 2	(2) 2x6	6'-11"	5'-11"	5'-4"	4'-10"	4'-6"	4'-3"	4'-0"
	(2) 2x8	8'-9"	7'-7"	6'-9"	6'-2"	5'-9"	5'-4"	5'-0"
	(2) 2x10	10'-4"	9'-0"	8'-0"	7'-4"	6'-9"	6'-4"	6'-0"
	(2) 2x12	12'-2"	10'-7"	9'-5"	8'-7"	8'-0"	7'-5"	7'-0"
	(3) 2x6	8'-6"	7'-5"	6'-8"	6'-1"	5'-8"	5'-3"	4'-11"
	(3) 2x8	10'-11"	9'-6"	8'-6"	7'-9"	7'-2"	6'-8"	6'-4"
	(3) 2x10	13'-0"	11'-2"	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"

a. Beam depth shall be greater than or equal to the depth of the floor joist with a flush beam condition.
b. Beams shall be permitted to cantilever at each end 2 feet or up to one-fourth of the actual beam span, whichever is less.

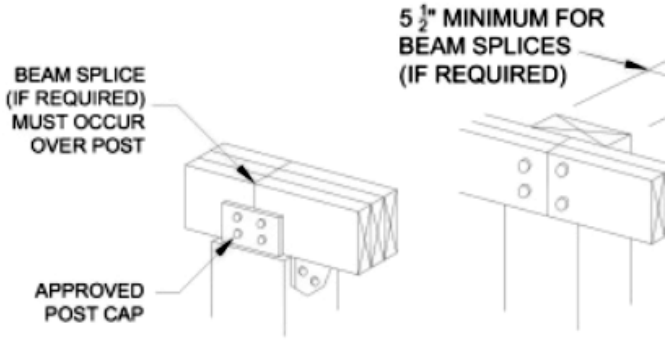
Table 2

6. POST TO BEAM CONNECTION

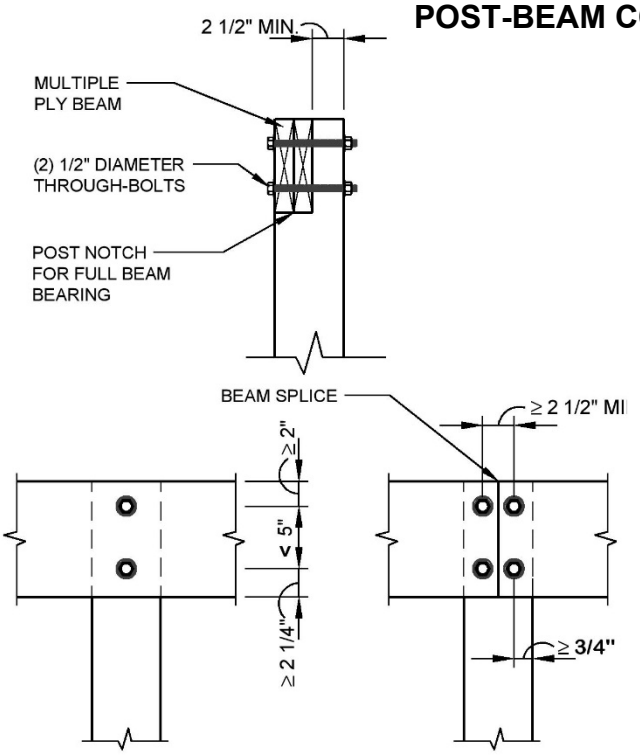
Deck beams shall be attached to deck post in a manner capable of transferring vertical loads and resisting horizontal displacement. Where multiple span beams bear on intermediate posts each ply must have full bearing on the post as shown on Figures 7, 8 and 9 Connections shall be as per Figures 7,8 and 9. Manufactured post to beam connectors shall be sized for the post and beam sizes. Bolts shall have washers under the head and nut.
Beam to post connection with fasteners only is prohibited, see Figure 10. Built-up beams shall be assembled in accordance with Figure 11. For triple member beams, provide the nailing pattern shown to the outside member on each side; however staggered rows shall be offset so as not to occur in the same location.



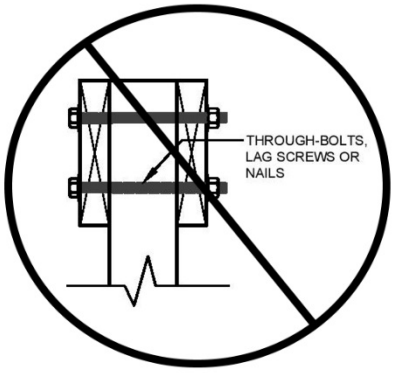
POST-BEAM CONNECTION
Figure 7



POST-BEAM CONNECTION AT SPLICE
Figure 8

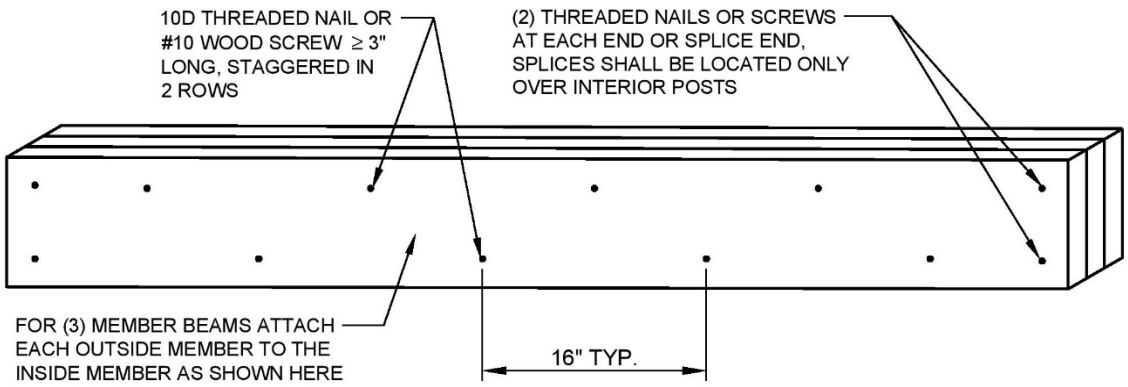


NOTCHED POST TO BEAM CONNECTION
Figure 9



POST TO BEAM PROHIBITED CONNECTION
Figure 10

Note:
a.Beams must span continuously between posts and shall be spliced at interior post locations only.
b.Spans are measured between the centerline of bearings or supports.



BUILT-UP BEAM CONNECTION
Figure 11

7. DECK JOIST

Maximum allowable span for deck joists to be as per Table 3. The maximum cantilever shall be limited to one-fourth of the actual adjacent joist span or the maximum cantilevered length shown on table 3. Whichever is less. The ends of joists shall have not less than 1 ½" bearing on wood or metal. Joist framing into the side of a beam or ledger shall be supported by approved joists hangers. Joist ends and bearings shall be provided with lateral resistance to prevent rotation by joists hangers or blocking and their depth shall not be less than 60% of the joist depth. Rim joists shall be secure to the end of each joist with no less than three 10d (3-in x 0.128in) nails or three No. 10 x 3-in long wood screws.

SPECIES	SIZE	ALLOWABLE JOIST SPAN (feet and inches) SPACING OF DECK JOISTS (inches)			MAXIMUM CANTILEVER (feet and inches) JOIST BACK SPAN (feet)							
Southern		12	16	24	4	6	8	10	12	14	16	18
Pine No. 2	2x6	9'-11"	9'-0"	7'-7"	1'-0"	1'-6"	1'-5"	NP	NP	NP	NP	NP
	2x8	13'-1"	11'-10"	9'-8"	1'-0"	1'-6"	2'-0"	2'-6"	2'-3"	NP	NP	NP
	2x10	16'-2"	14'-0"	11'-5"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-4"	3'-4"	NP
	2x12	18'-0"	16'-6"	13'-6"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	3'-4"	4'-1"

Table 3

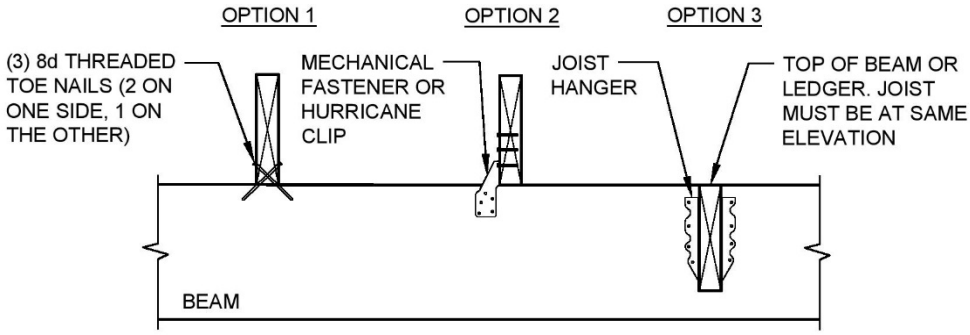
8. JOIST TO BEAM CONNECTION

Each joist shall be attached to the beam as shown on Figure 12. Joist may bear on an overhang past the beam face when Option 1 or Option 2 is used, and blocking is provided between joists at beam bearing. Option 2 mechanical fasteners of hurricane clips must have a minimum uplift and lateral load capacity of 100 lbs in both uplift and lateral load directions. Joists may also be attached to the side of the beam with joist hangers per Option 3. Joists shall not frame in from opposite sides of the beam. Joist hangers shall be at least 60% of the ledger of beam depth. See Table 4 for minimum joist hanger capacity. Inside flange hangers can be used at edge conditions. Clip angles or brackets to support deck joists are prohibited.

F

JOIST SIZE	MIN. CAPACITY
2x6	400 lbs
2x8	500 lbs
2x10	600 lbs
2x12	700 lbs

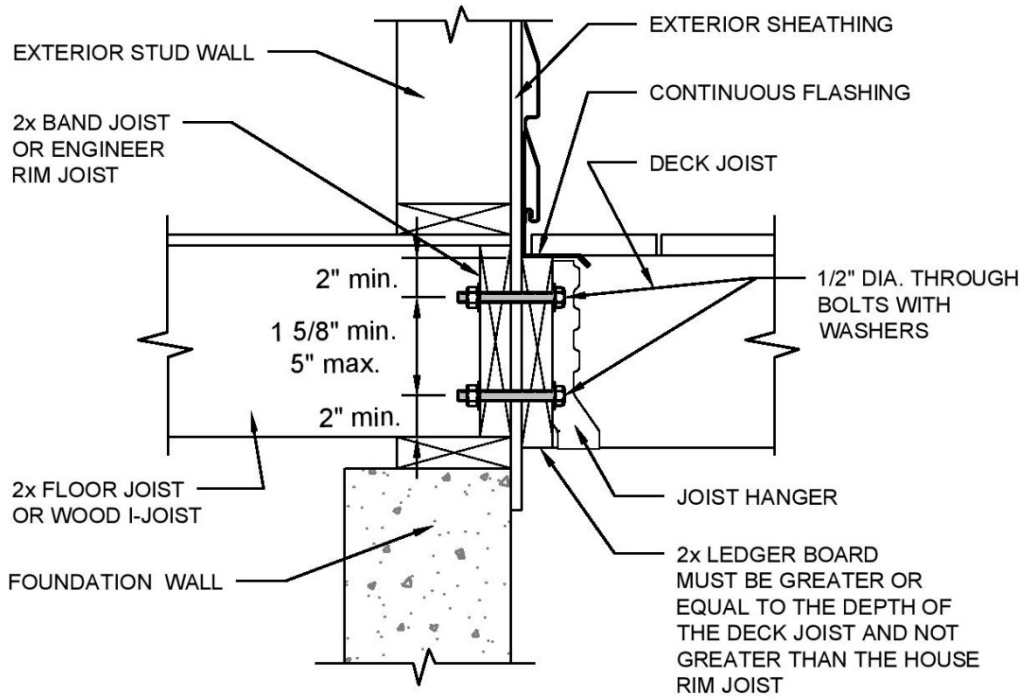
JOIST HANGER VERTICAL CAPACITY
Table 4



JOIST TO BEAM CONNECTION
Figure 12

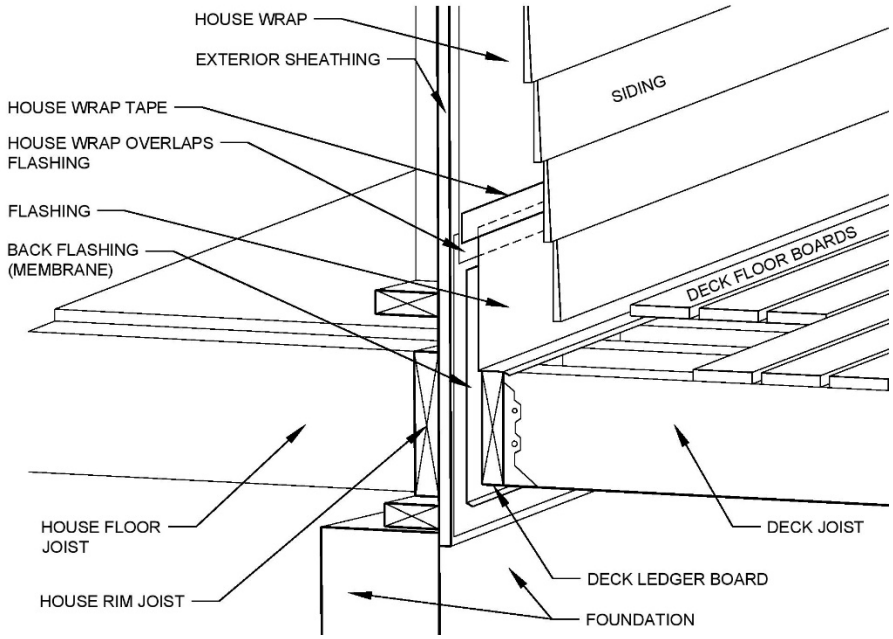
9. LEDGER DECK ATTACHMENT

The ledger board shall be equal to or greater than the deck joist depth but equal or less than the house band or rim joist. Ledger board attachments to the exterior wall shall be constructed as indicated in Figure 13. The ledger shall be a minimum nominal 2x8. When attachments are made to the house band joist the connection shall be to a 2" nominal lumber band joist or LVL rim joist bearing on a sill plate or wall plate and it shall be constructed with ½" through bolts with washers and nuts. 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, a free-standing deck or full plan submission will be required. Prohibited ledger board attachments are attachment to or through exterior veneers (Brick, Masonry, Stone) Figure 16, cantilever floor overhangs Figure 16, open web trusses Figure 16, as they are not intended or designed to support a new deck.



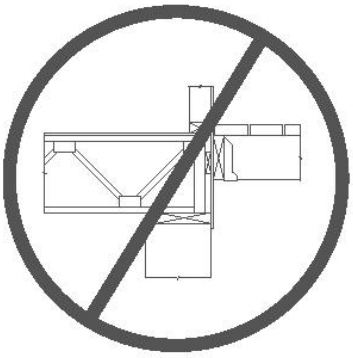
Note: Flashing is not shown for clarity

LEDGER BOARD TO RIM JOIST ATTACHMENT
Figure 13

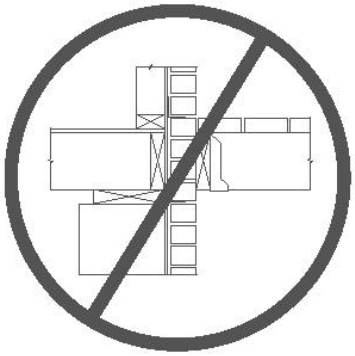


ATTACHED DECK FLASHING DETAIL

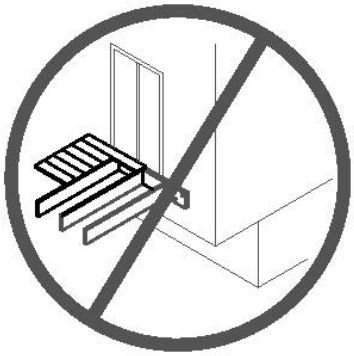
Figure 15



Attachment to Open Web Trusses



Attachment to Brick, Masonry or Stone Veneers

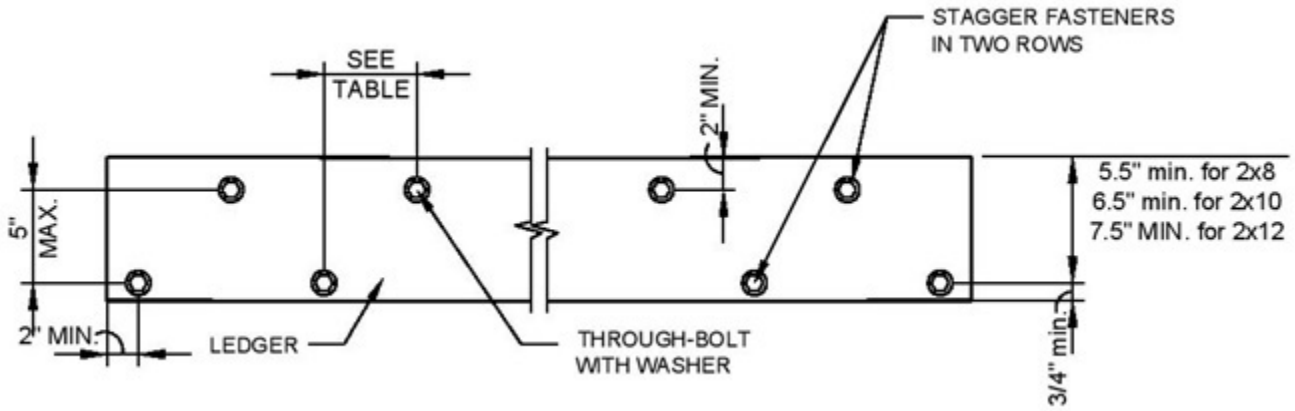


Attachment to House Overhang or Chimney

PROHIBITED LEDGER ATTACHMENTS

Figure16

10. LEDGER BOARD FASTENERS



LEDGER FASTENER SPACING AND CLEARANCES
Figure 17

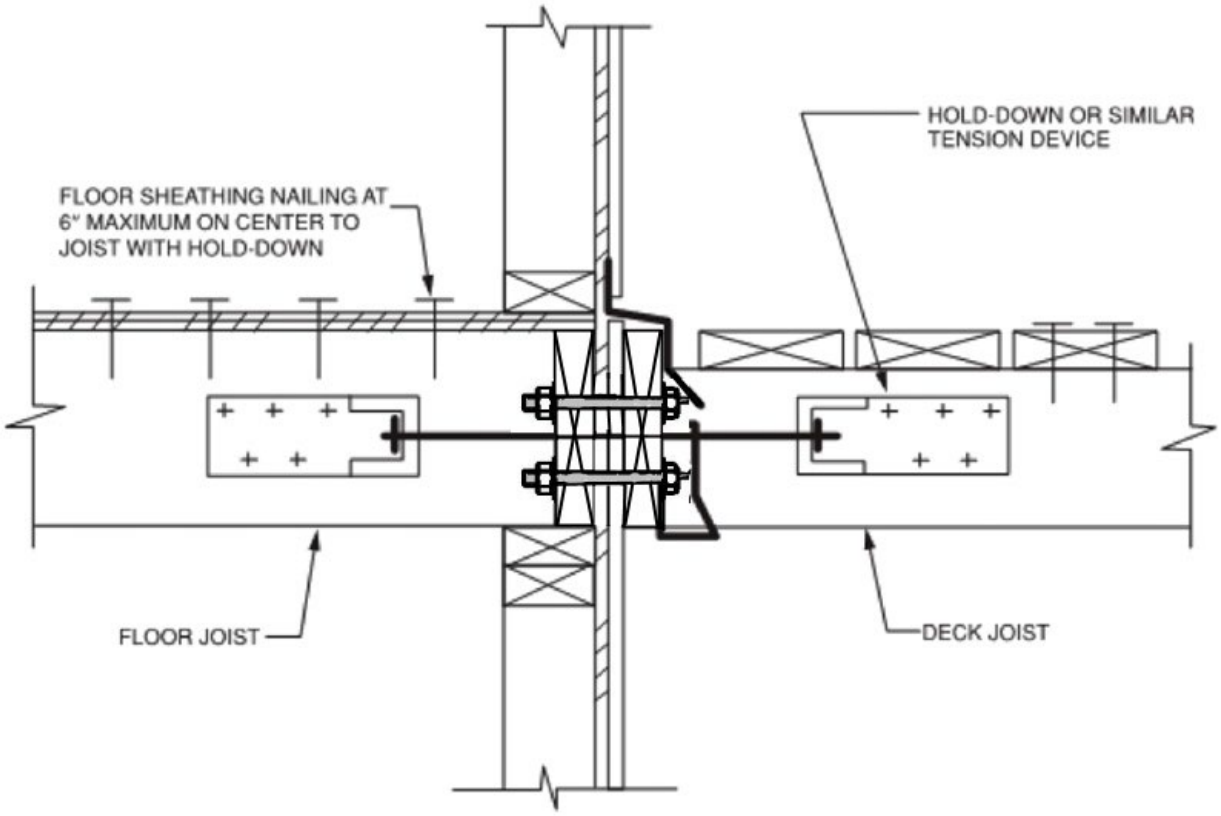
Connection	On-Center Spacing of Fasteners						
Max. Joists Span	6'-0"	8'-0"	10'-0"	12'-0"	14'-0"	16'-0"	18'-0"
½" dia. bolt	24"	18"	14"	12"	10"	9"	8"

FASTENER SPACING
Table 5

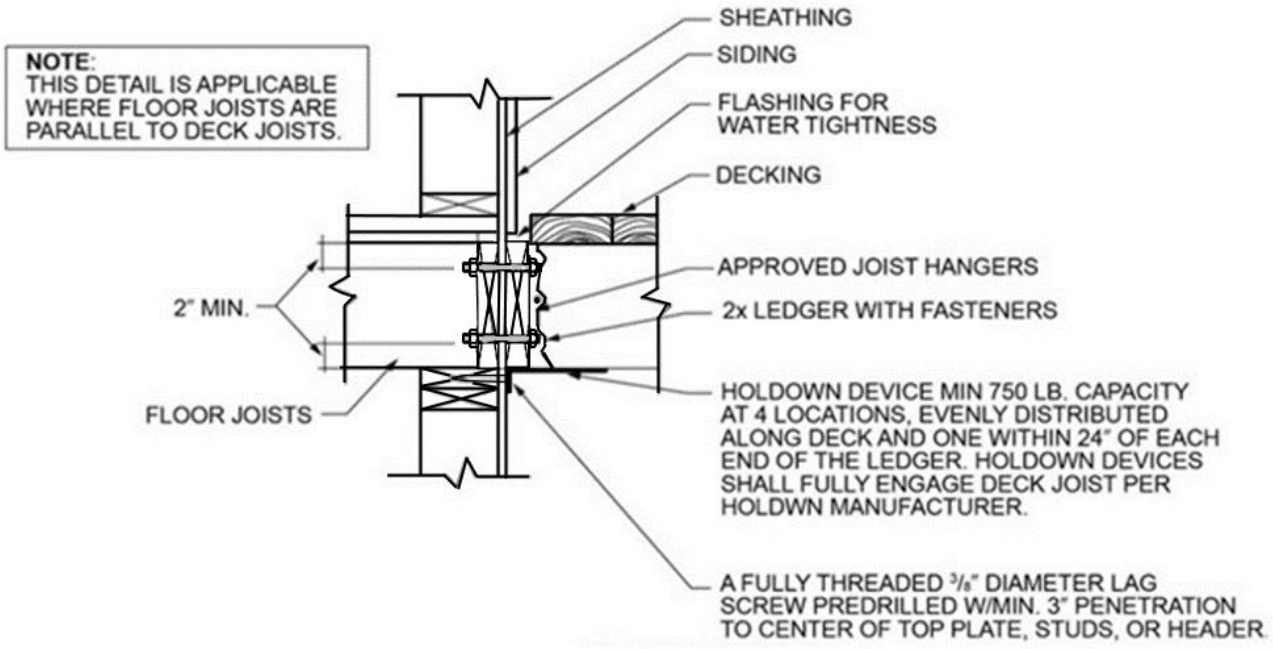
Through-Bolts
Through-Bolts shall have a diameter of ½". Pilot holes for through-bolts shall be 17/32" to 9/16" in diameter. Through-Bolts require washers at the bolt head and nut.

11. DECK LATERAL LOAD CONNECTION

Decks shall be positively anchored to the primary structure. The lateral connection shall be permitted in accordance with Figures 19 and 20. For conditions where the house joists are parallel to the deck joists hold-down devices shall be provided not less than two locations within two feet of the edge of the deck and shall have an allowable design capacity of not less than 1,500lbs (Figure 19); or hold down devices shall be connected to the base of the deck to house structure at not less than 4 locations, evenly distributed along deck and within 2 ft of each end and shall have an allowable design capacity of not less than 750 lbs each (figure 20).



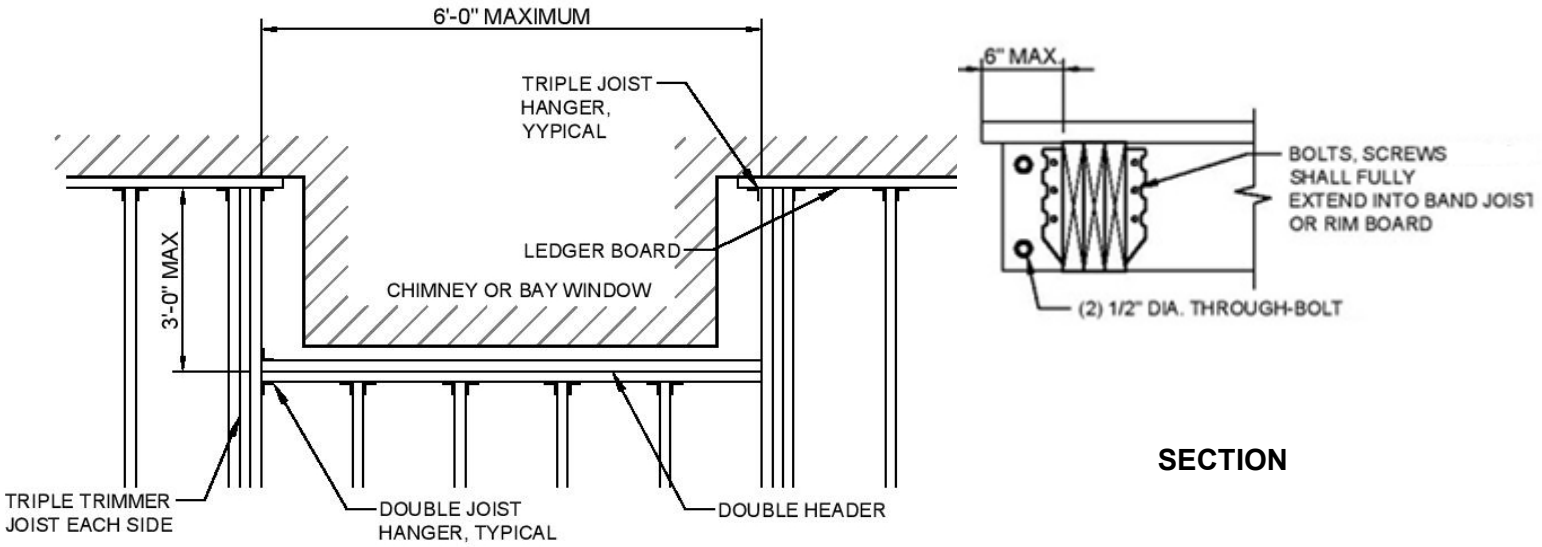
LATERAL LOAD CONNECTION
DECK JOISTS PARALLEL TO HOUSE JOISTS
Figure 19



LATERAL LOAD CONNECTION
DECK JOISTS PARALLEL TO HOUSE JOISTS
Figure 20

12. DECK FRAMING AT CHIMNEY OR BAY WINDOW

All members at chimneys or bay windows shall be framed in accordance with Figure 22. Header may span a maximum of 6’-0”. When a chimney or bay window is wider than 6’-0”, one or more 6x6 post 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 shall be located no more than 3’-0” from the end of the trimmer joist. Triple trimmer joists are required on each side of the header. Joist hangers shall each have a minimum vertical capacity in accordance with Table 4. Bolts, screws, 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 LVL rim joist. Otherwise, a free-standing deck is required.

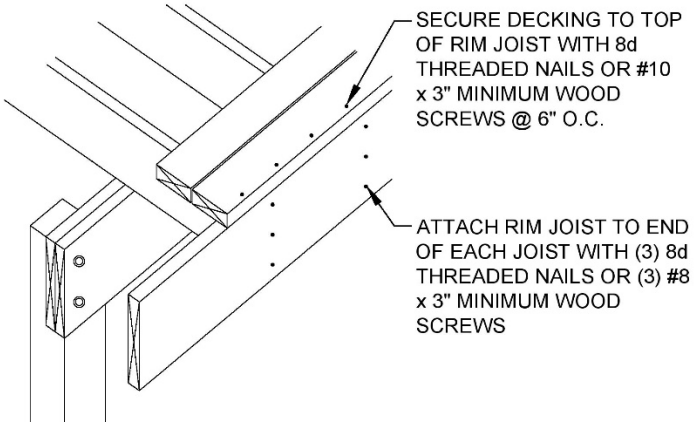


FRAMING AROUND CHIMNEY OR BAY WINDOW
Figure 22

13. DECKING

Decking laid perpendicular to joists may consist of 2x6 structural lumber supported by joists spaced at 24” o.c. maximum or 1 ¼ inch thick wood decking supported by joists spaced 16” o.c. maximum. Attach decking to each joist with 2-8d threated nails of 2-#10 screws. Space decking boards approximately 1/8” apart. See figure 23 for decking connection requirements to rim joist. Decking placement may range from an angle perpendicular to the joist to an angle of 45 degrees to the joist. Each segment of decking must bear on a minimum of 3 joist.

Plastic composite deck boards and stair treads will be accepted if they are labeled to indicate compliance with ASTM D7032. A complete current code evaluation report for the manufactured decking system that includes the maximum allowable load and span must be provided to the building inspector at the time of framing inspection. Manufactured decking systems must be installed in accordance with the code evaluation report and manufacturer’s specifications.

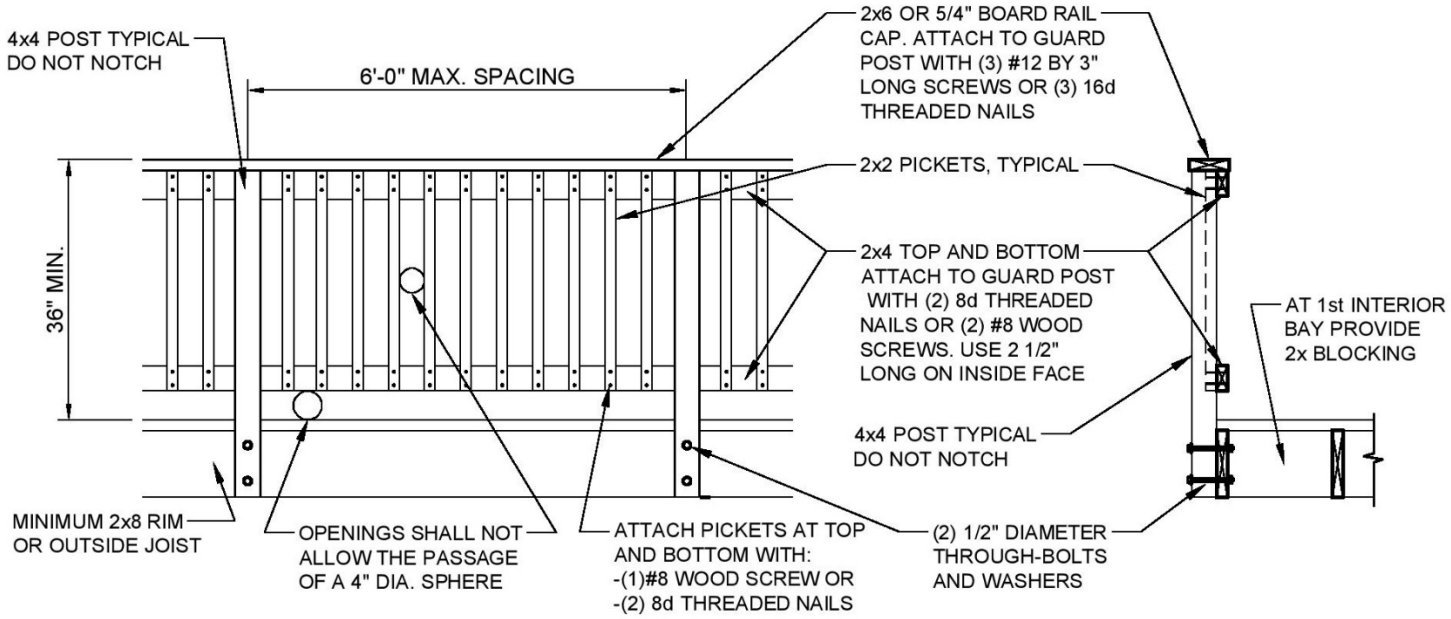


RIM JOIST CONNECTION DETAIL
Figure 23

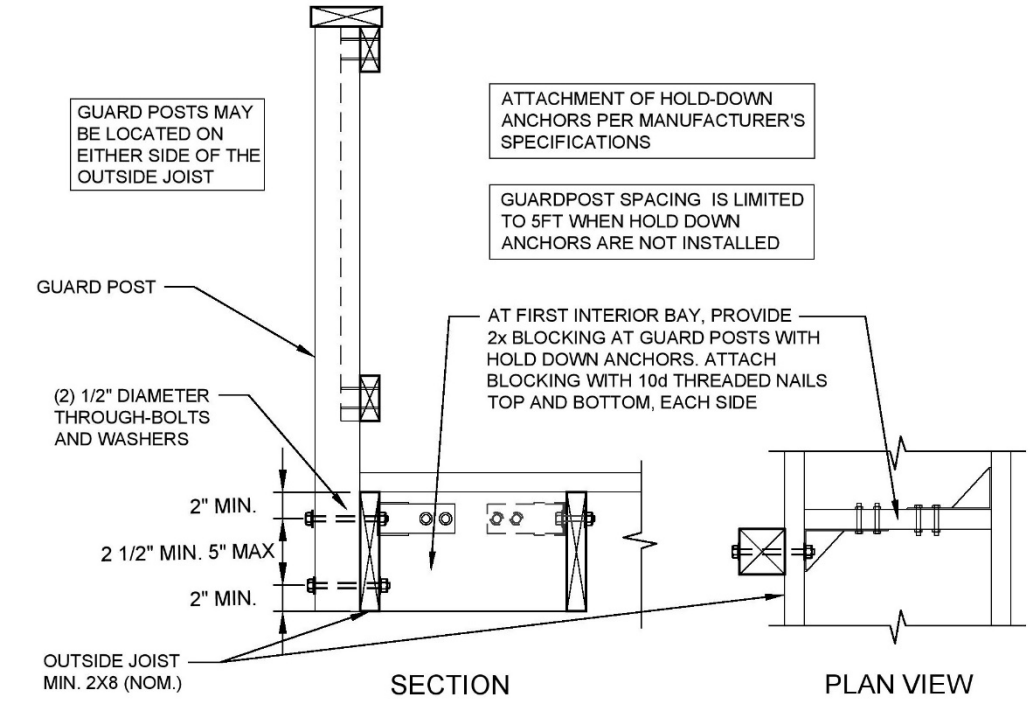
14. DECK GUARDRAIL

All decks greater than 30” above grade are required to have a guard constructed as shown in Figure 24. Deck guard posts shall be a minimum 4x4 (nominal). Joists and rim joists to which guards post are attached shall be a minimum of 2x8 (nominal). Guard post which run parallel to the deck joist shall be attached to the outside joist as per figure 25. Guard post that run perpendicular to the deck joists shall be attached to the rim joist in accordance with Figure 26. Hold down anchors shall have a minimum allowable tension load of 1,800 lbs for a 36” maximum guard height and shall be installed in accordance with manufacturer’s instructions.

Manufactured railing systems will be accepted only if they are labeled to indicate compliance with ASTM D7032 and listed by an approved code agency in a current code evaluation report. A complete current code evaluation report for the manufactured railing system to be installed must be provided to the building inspector at the time of framing inspection. Manufactured railing systems must be installed in accordance with the report and manufacturer’s specifications. Wood post spacing and connections, if used for supporting manufactured rails, balusters or pickets, must follow the conditions specified by the code evaluation report.

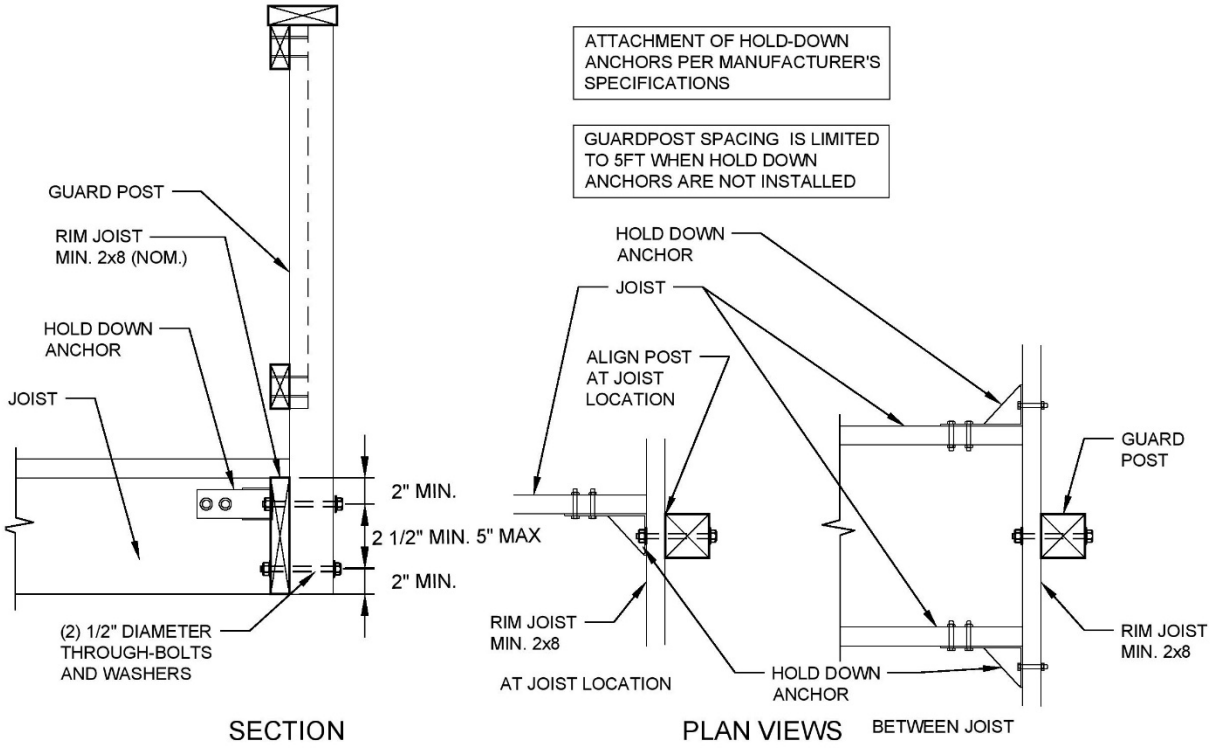


DECK GUARD DETAIL
Figure 24



GUARD POST TO OUTSIDE JOIST

Figure 25



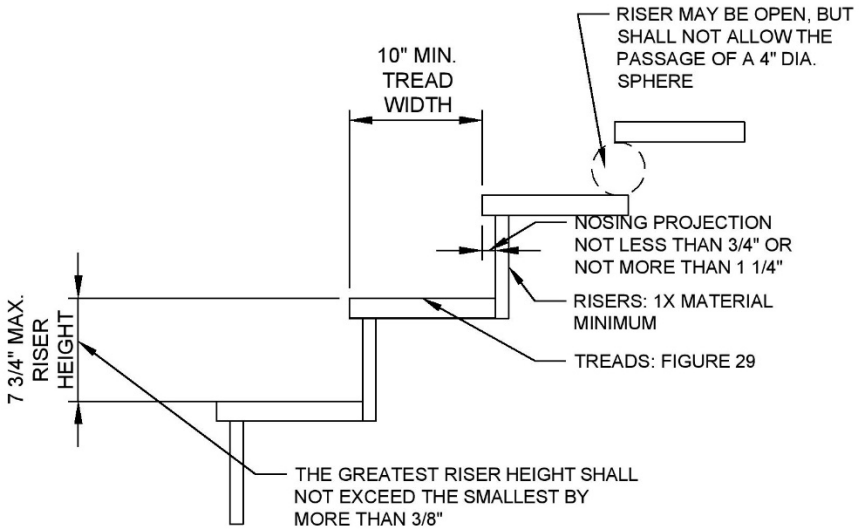
GUARD POST TO RIM JOIST

Figure 26

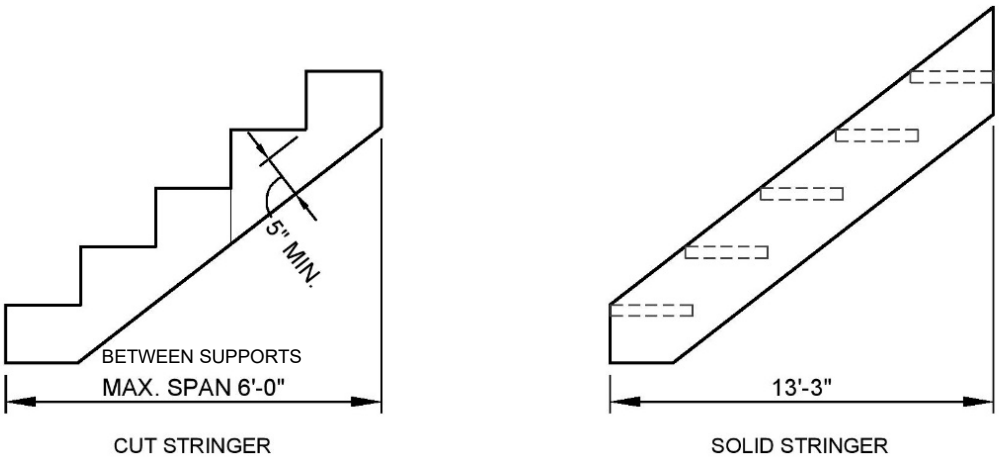
15. STAIR REQUIREMENTS

Stair, stair stringers, and guards shall meet the requirements shown in Figure 27 through Figure 34. All stringers shall be a minimum of 2x12. Stair stringers shall not span more than the dimensions shown on Figure 28. An intermediate landing may also be provided to shorten the stringer span. If the total vertical height for a stairway exceeds 12’-0” and intermediate landing will be required. Stair stringers over 6 feet in length require support at mid span.

All **intermediate stair landings** must be constructed as a non-ledger deck using the details in this document. Stair shall be a minimum of 36” in width. If only cut stringers are used, a minimum of 3 stringers 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). Stair stringers must be fully supported or connected to the deck structure (see Figures 30 and 33) The width of each landing shall not be less than the width of the stairway served. Every rectangular landing shall have a minimum dimension of 36” measured in the direction of travel and not less than the width of the stair served.

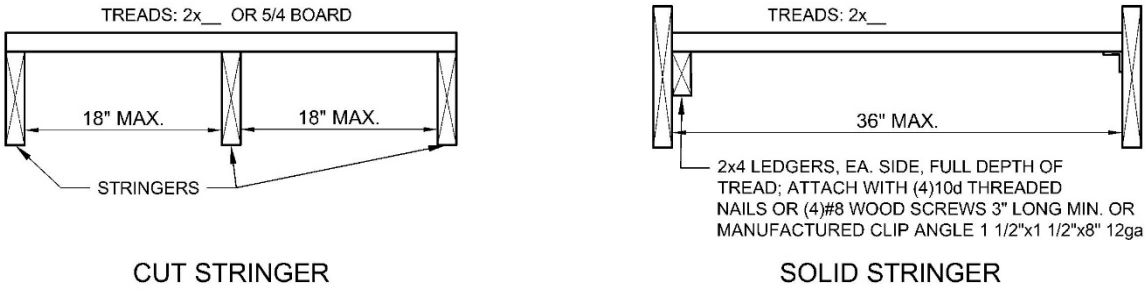


TREAD AND RISER DETAIL
Figure 27



STAIR STRINGER REQUIREMENTS
Figure 28

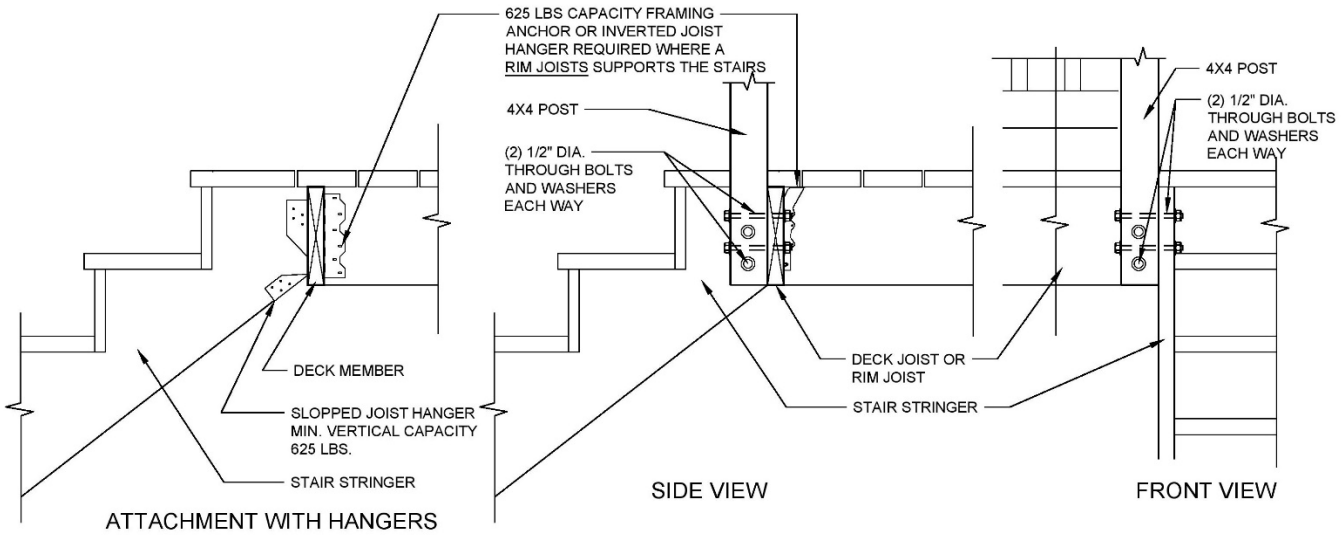
ATTACHMENT PER TREAD AT EACH STRINGER OR LEDGER:
2x__ OR 5/4" TREADS - (2)8d THREADED NAILS OR (2)#8 SCREWS 2 1/2" LONG MIN.
3x__ TREADS - (2) 16D THREADED NAILS OR (2)#8 SCREWS 3 1/2" LONG MIN.



CUT STRINGER SOLID STRINGER

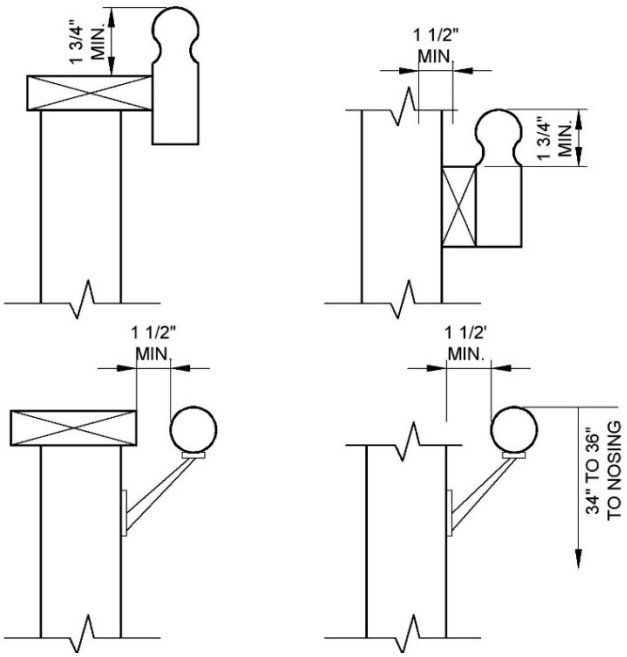
TREAD CONNECTION REQUIREMENTS

Figure 29

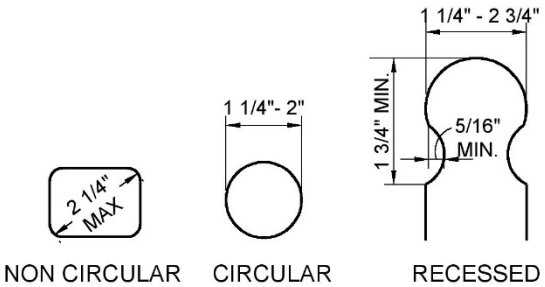


STAIR STRINGER ATTACHMENT

Figure 30



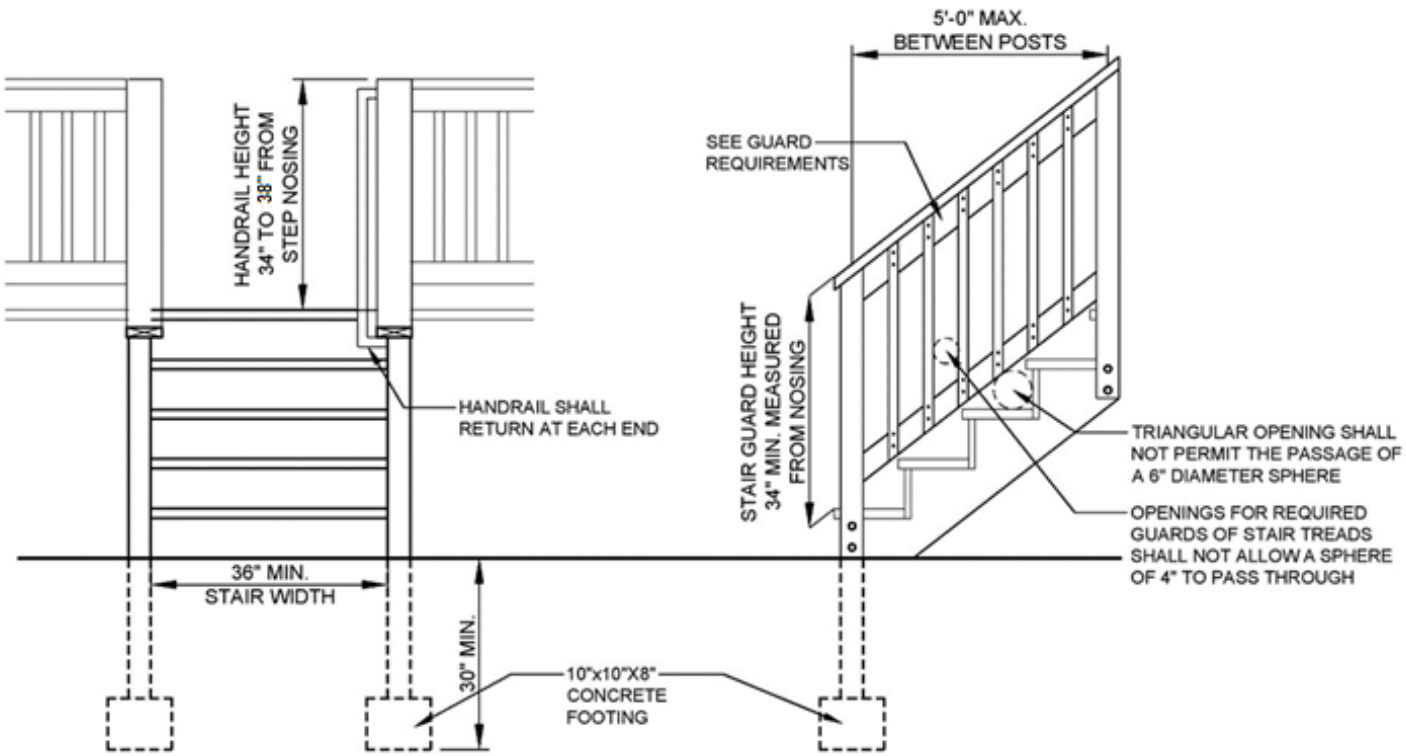
HANDRAIL MOUNTING EXAMPLES



HANDRAIL GRIP SIZE

Figure 32

Figure 31



STAIR AND GUARDRAIL REQUIREMENTS

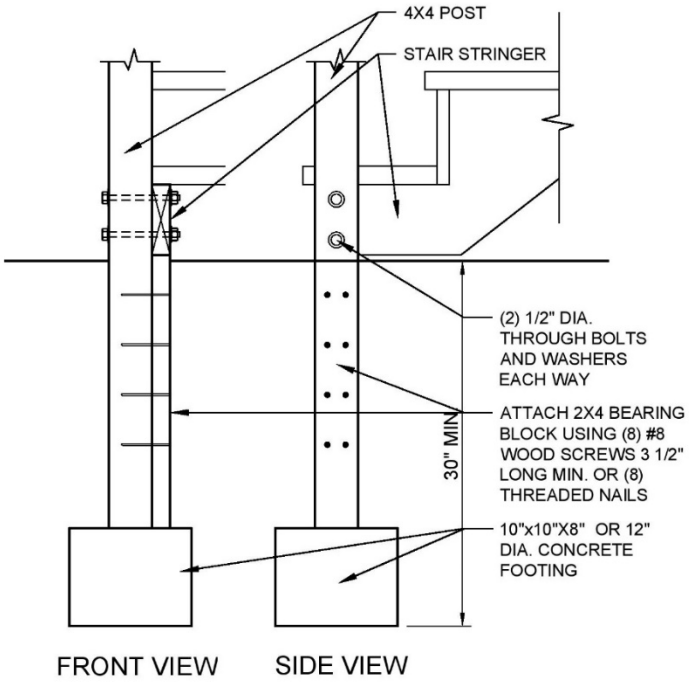
Figure 33

STAIR FOOTING REQUIREMENTS

Where the stair meets the grade, attach the stringers to the stair guard post as shown of Figure 33. Post shall bear on footings. All footing shall bear on solid ground at least 30” below grade. Stringers shall bear on 2x4 bearing block attached to the post as shown.

STAIR LIGHTING REQUIREMENTS

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 the inside of the house. Motion detected or timed switches, solar powered or low voltage lighting are acceptable.



STAIR FOOTING DETAIL

Figure 34

16. DECK WORKSHEET

This worksheet is provided to help you determine compliance with the requirements of the Montgomery County Residential Typical Deck Details and It should not be submitted when applying for deck permits using deck details.

1. Attached Deck ☐ or Free-Standing ☐ Deck
2. Deck Dimensions (L): _____ x (W)_____ x Height _____
3. Footing Size: _____ Total #:_____ (including stairs)
4. Post Spacing: _____
5. Beam Size ( ) _____ x _____
6. Post Base/Cap Connectors: ☐ YES ☐ NO
7. Ledger Size: _____ x _____ w/ ½" dia. Bolts
8. Joists _____ x _____ @ _____ o.c.
9. Deck Boards: ☐ Wood ☐ Composite*

   (*Provide current Code Evaluation Report @ Framing Inspection)
10. Guardrails: ☐ Wood or ☐ Composite*

    (*Provide current Code Evaluation Report @ Framing Inspection)