

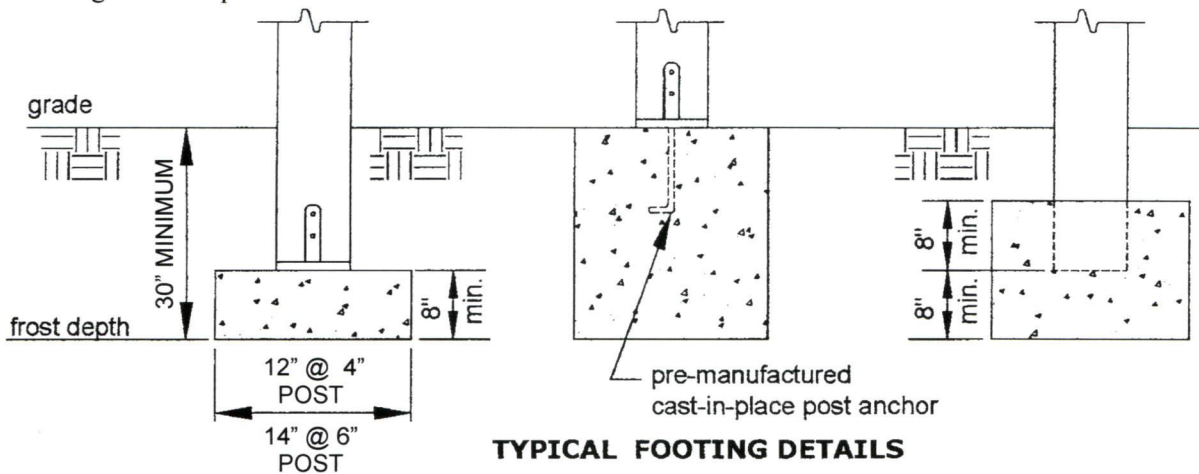
**RESIDENTIAL DECK GUIDE**

**GENERAL NOTES**

- Deck lumber is to be pressure-treated Southern Pine, grade #2 or better.
- Manufactured decking, railing and composite products (plastic, fiberglass, etc.) and approved fasteners (ThruLOK, etc.) are permitted if installed per the manufacturer's product specifications. These products must have an approved building code evaluation report. The manufacturer's instructions and evaluation report shall be provided on the job site.
- Chemicals used in pressure treated lumber will prematurely corrode standard fasteners, hardware and flashing. All screws and nails shall be hot-dipped galvanized or stainless steel. All hardware (joist hangers, cast-in-place post anchors, etc.) shall be galvanized or stainless steel.
- Decks constructed according to this handout are not approved for future hot tub installations. Deck loads exceeding the minimum 40 psf live load such as hot tubs, spas or other concentrated loads shall require a design certification from a Maryland licensed professional engineer.
- Two copies of plans are required and shall include post size and spacing, floor joist size and spacing and beam sizes. Two copies of the property site plan showing the proposed deck to scale with dimensions to the property lines are also required.

**FOOTINGS & POSTS**

- All footings shall bear on solid ground 30" below grade. Footings and posts located in the backfill area of the house shall bear on undisturbed solid ground beneath the backfill. Footings typically need to be at least 4'-0" away from the house foundation wall to avoid the backfill area.
- Posts shall be a minimum 4x4 lumber. Posts over 8'-0" tall require 6x6 lumber and may require that knee bracing be installed. Maximum height of 6x6 posts is 14'-0".



**TYPICAL FOOTING DETAILS**

**BEAMS**

- The required beam size is based on the joist span carried by the beam, and on the distance between support posts. Beams shall be permitted to cantilever at each end up to 2'-0" maximum.
- Splices of multispan beams shall be located at interior post locations.
- See page 4 for beam to post connection examples and additional information.

**MAXIMUM BEAM SPAN LENGTH<sup>1</sup>**

Joist Span	(number of plies) Beam Size							
	(2)2x6	(2)2x8	(2)2x10	(2)2x12	(3)2x6	(3)2x8	(3)2x10	(3)2x12
less than or equal to:								
6'	6'-11"	8'-9"	10'-4"	12'-2"	8'-2"	10'-10"	13'-0"	15'-3"
8'	5'-11"	7'-7"	9'-0"	10'-7"	7'-5"	9'-6"	11'-3"	13'-3"
10'	5'-4"	6'-9"	8'-0"	9'-5"	6'-8"	8'-6"	10'-0"	11'-10"
12'	4'-10"	6'-2"	7'-4"	8'-7"	6'-1"	7'-9"	9'-2"	10'-9"
14'	4'-6"	5'-9"	6'-9"	8'-0"	5'-8"	7'-2"	8'-6"	10'-0"
16'	4'-3"	5'-4"	6'-4"	7'-6"	5'-3"	6'-8"	7'-11"	9'-4"
18'	4'-0"	5'-0"	6'-0"	7'-0"	5'-0"	6'-4"	7'-6"	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  $\Delta = \ell/360$  for main span and  $\ell/180$  for overhang with a 220 lb. point load.

## JOISTS & DECKING

- Deck joists shall be permitted to cantilever not greater than one-fourth of the actual joist span.
- Joist ends and bearing locations shall be provided with lateral restraint to prevent rotation. Where lateral restraint is provided by joist hangers or blocking between joists, their depth shall equal not less than 60 percent of the joist depth. Where lateral restraint is provided by rim joists, they shall be secured to the end of each joist with not less than (3) 10d nails (3 inch) or (3) No.10 x 3 inch long wood screws.
- When using different species of lumber or composite material for decking, follow the manufacturer's recommendations.

### MAXIMUM JOIST SPACING

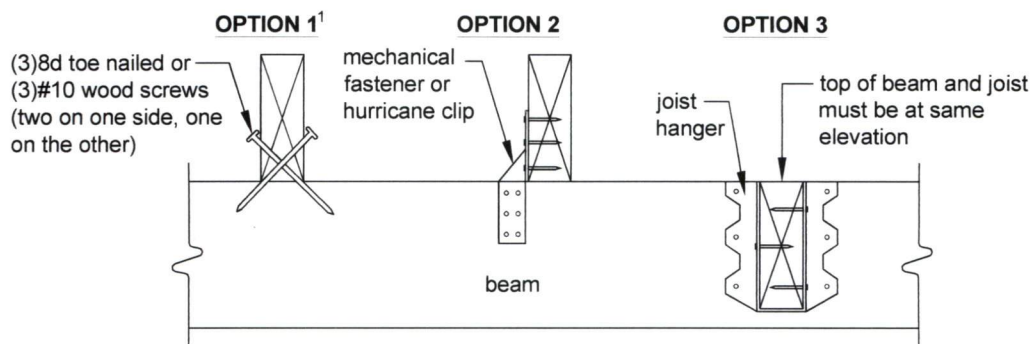
MATERIAL TYPE AND WITHOUT OVERHANG	MAXIMUM ON-CENTER JOIST SPACING	
	Perpendicular to joist	Diagonal to joist <sup>1</sup>
1 1/4 inch thick wood	16 inches	12 inches
2 inch thick wood	24 inches	16 inches
Plastic composite	Per the manufacturer's specs.	Per the manufacturer's specs.

<sup>1</sup>Maximum angle of 45 degrees from perpendicular for wood deck boards

### MAXIMUM JOIST SPAN LENGTH<sup>1</sup>

JOIST SPACING (on center)	JOIST SIZE	WITHOUT OVERHANG	WITH OVERHANGS
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>Spans are based on 40 PSF live load, 10 PSF dead load, southern pine #2, normal loading duration, wet service conditions and deflections of  $\Delta = \ell/360$  for main span and  $\ell/180$  for overhang with a 220 lbs. point load.



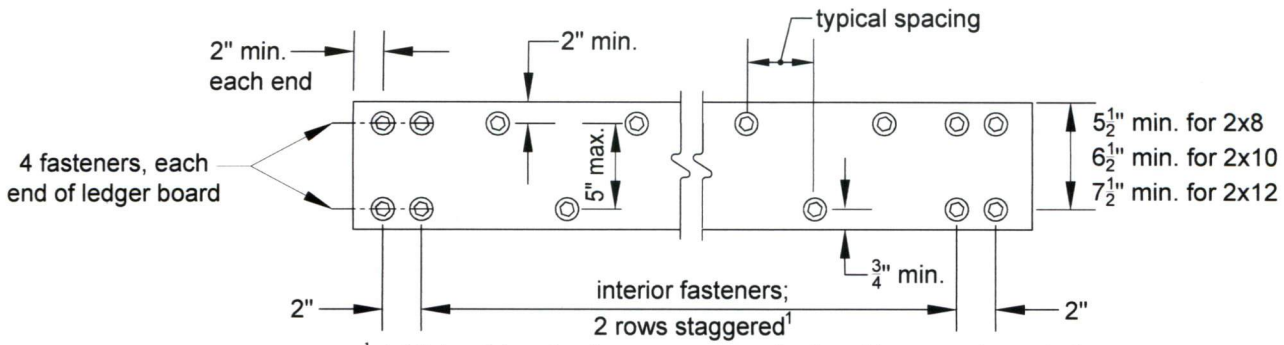
<sup>1</sup> Option 1 is prohibited on free-standing decks.

### JOIST-TO-BEAM CONNECTION

## LEDGER

- Ledger board size shall be equal to or greater than the joist size (2 x 8 minimum) and properly secured to solid structural material of the house. Nailing is not an acceptable method. See page 5 for examples.
- House siding must be removed prior to the installation of the ledger board. Flashing is required at any ledger board connection to a wall of wood framed construction. Flashing shall be composed of copper, stainless steel, UV resistant plastic or galvanized steel coated. Aluminum flashing will prematurely corrode due to the chemicals used in pressure treated lumber and shall not be used.
- Attachments to brick veneers, chimneys, house overhangs or bay windows are prohibited. In such cases the deck shall be free standing or shall be designed by a Maryland licensed professional engineer.

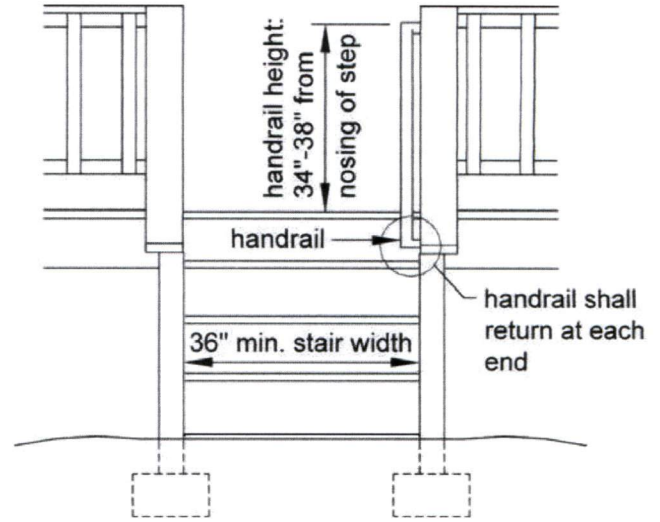




<sup>1</sup> Additional interior fasteners are required at chimney or bay window

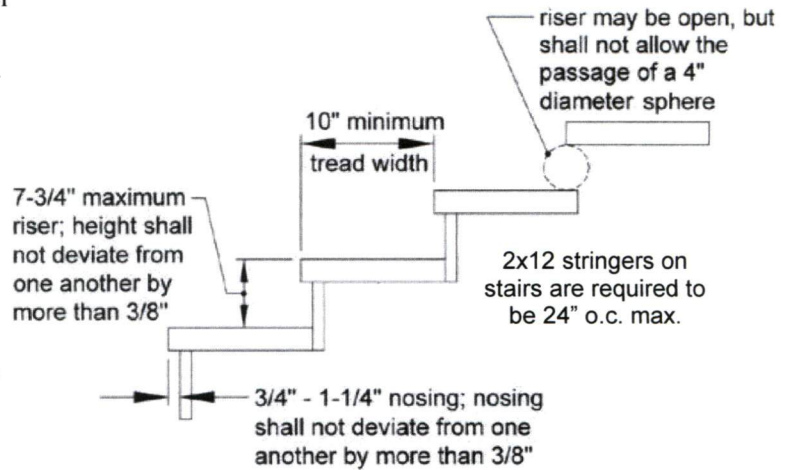
**LEDGER BOARD FASTENER SPACING AND CLEARANCES**

LEDGER BOARD FASTENER SPACING			
JOIST SPAN	FASTENER SPACING - ON CENTER		
	Lag Screws 1/2" Dia.	LedgerLok	1/2" Thru-bolts (washers both sides), Expansion Anchors, Epoxy Anchors
0 - 6'-0"	30"	16"	36"
6'-1" - 8'-0"	23"	12"	36"
8'-1" - 10'-0"	18"	10"	34"
10'-1" - 12'-0"	15"	8"	29"
12'-1" - 14'-0"	13"	7"	24"
14'-1" - 16'-0"	11"	6"	21"
16'-1" - 18'-0"	10"	5"	19"

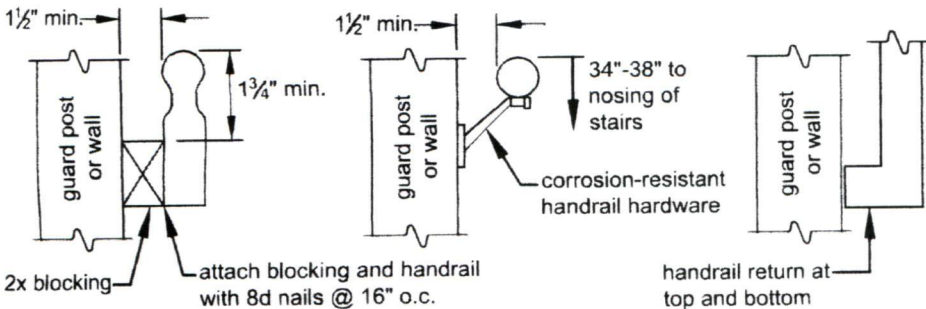


**STAIRS & GUARDRAILS**

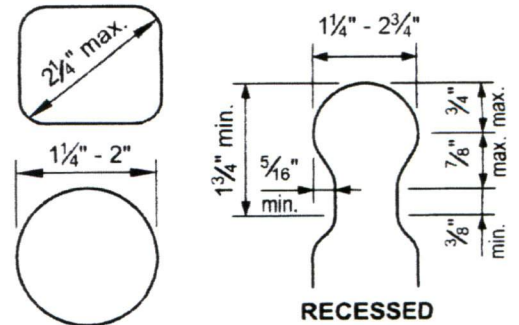
- Minimum stair width is 3'-0". 10" min. tread, 7 3/4" max. riser
- Minimum ceiling height above the tread nosing is 6'-8".
- Guardrails are required on decks over 30" above ground level. Minimum guardrail height is 36" above the decking. Railing system shall be able to resist a concentrated load of 200 lbs. at any point.
- Guardrails on stairs must be 34" min. height above the tread nosing.
- Guard opening limitations between members is 4" except at the triangular opening formed at stairs. A sphere 6" in diameter cannot pass through this area.
- Continuous graspable handrails on stairs shall be between 34" and 38" above the tread nosing and are required on stairs with 4 or more risers. Handrail ends shall be returned or terminate in newel post or safety terminals.



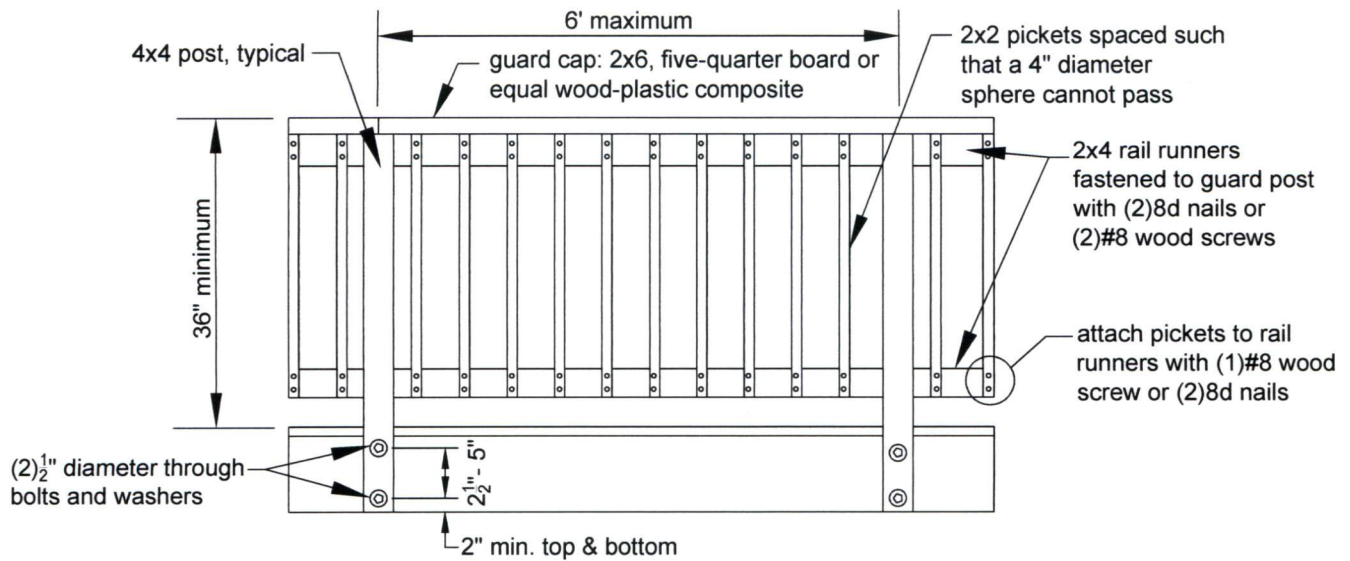
**TREAD AND RISER DETAIL**



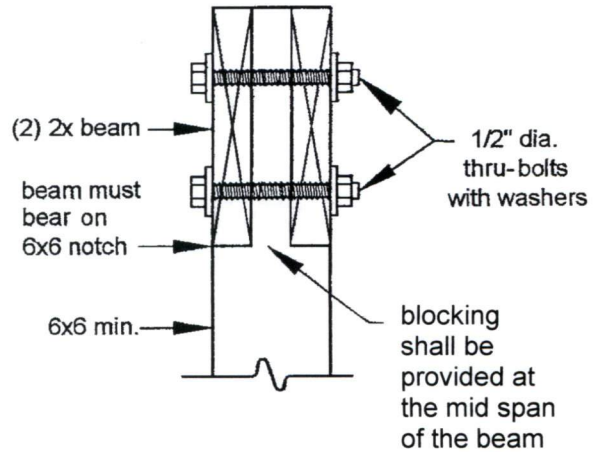
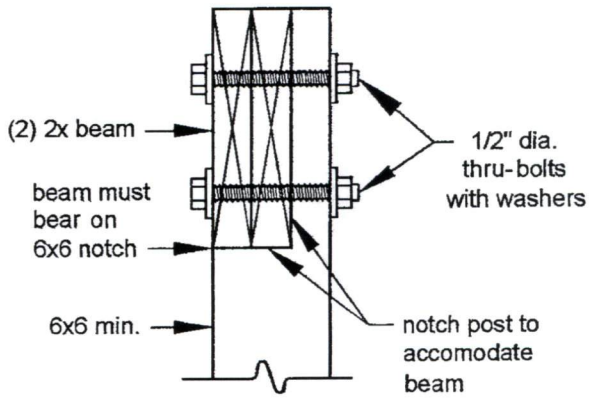
**HANDRAILS**



**HANDRAIL GRASPABILITY**

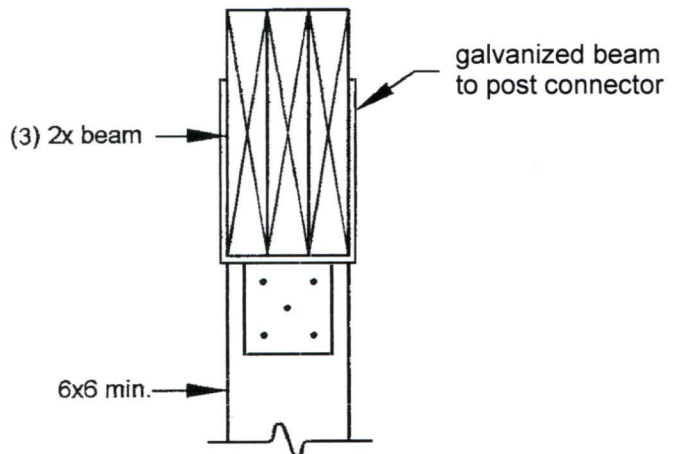
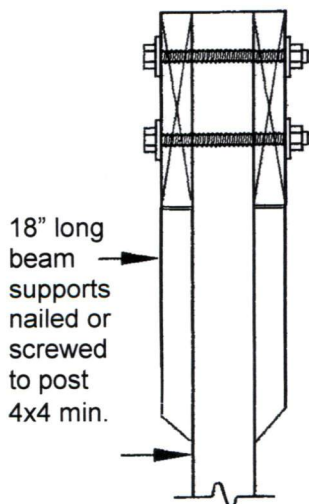


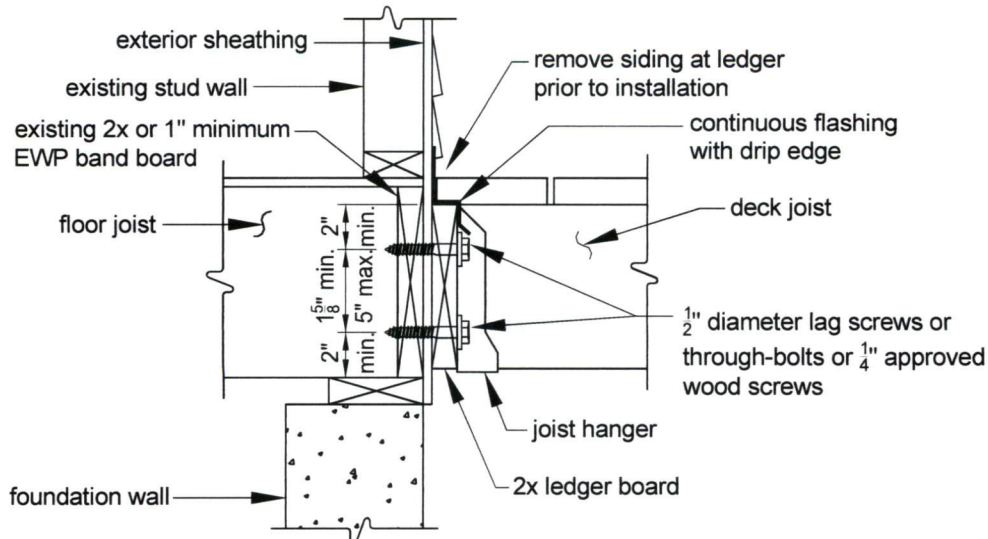
**TYPICAL GUARD DETAIL**  
 BOTTOM OF POST CANNOT BE NOTCHED



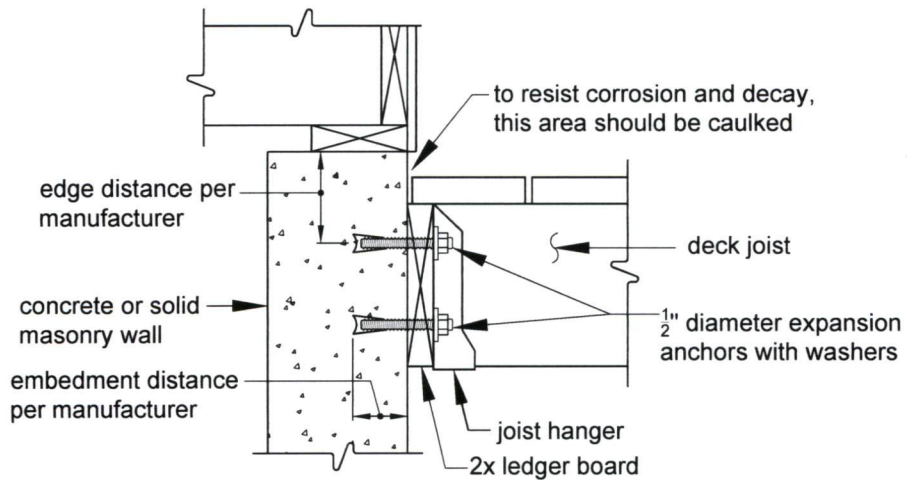
**BEAM TO SUPPORT POST CONNECTION DETAILS**

Note: beam splices shall be directly over the support post.

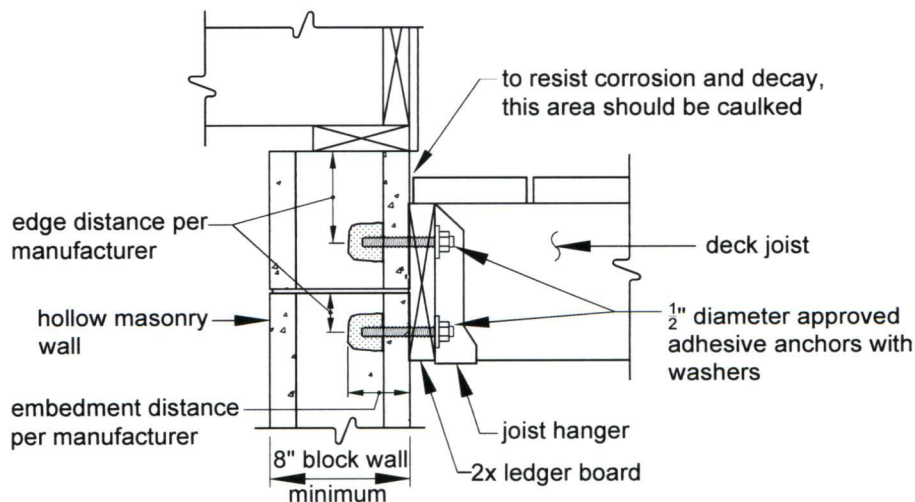




**LEDGER BOARD-TO-BAND BOARD ATTACHMENT**



**LEDGER BOARD-TO-SOLID FOUNDATION ATTACHMENT**



**LEDGER BOARD-TO-HOLLOW FOUNDATION ATTACHMENT**



## DECK LATERAL LOAD CONNECTION (NEW REQUIREMENT FOR THE 2015 IRC CODE)

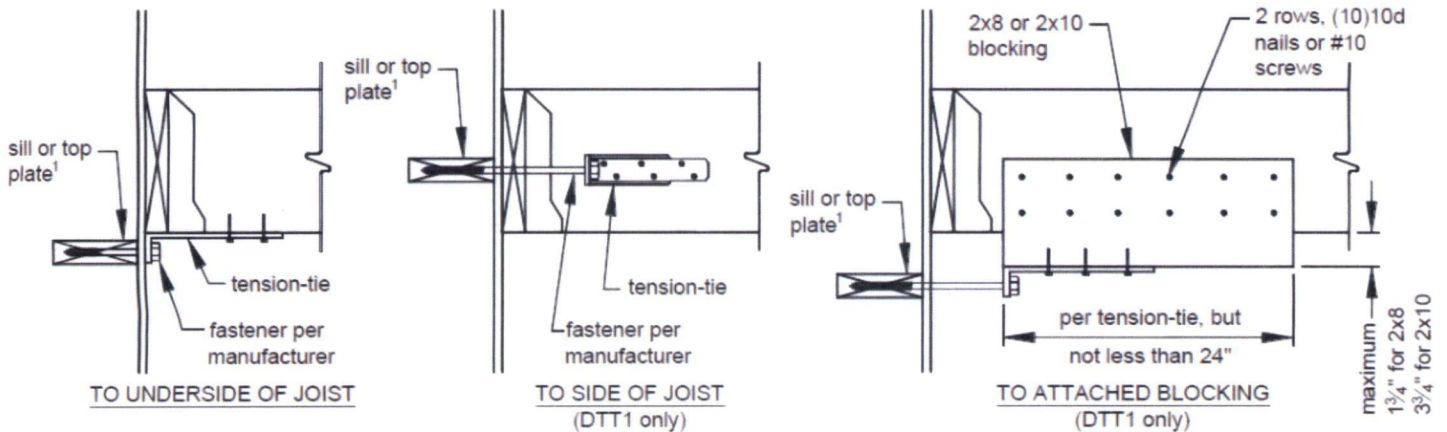
- All decks with post heights greater than 30" above grade are required to be designed to resist lateral load caused by human activity and environmental forces. The lateral load connection required by Section R507.1 of the 2015 IRC shall be permitted to be in accordance with one of two hold-down tension devices as shown below.
- This requirement does not apply for free standing decks. Diagonal bracing or knee bracing is recommended at each post for self supported decks that are elevated.

### METHOD 1, TENSION-TIES (4 required)

- This detail is only applicable where floor joists are parallel to the deck joists.
- Install one tension-tie at each end joist and install the remaining two to inside joists equally spaced along the width of the deck. A set of tension-ties shall be installed for each structurally independent section of deck.
- Tension-ties shall be attached to the joist and exterior per the manufacturer's instructions with specified fasteners as shown in the following detailed sections. Fasteners shall penetrate a minimum of 3 inches into the sill plate or top plate of a wood wall.
- Approved tension-ties include: LTS19 from USP or DTT1 from Simpson Strong-Tie. The minimum capacity of each tension-tie shall be 750 pounds.
- Where attaching to a concrete or solid masonry wall, fasteners are permitted to be substituted with Expansion anchors or adhesive anchors with a threaded rod as recommended by the tension-ties manufacturer. The withdrawal capacity of the anchors shall be a minimum of 750 pounds. The anchor shall be installed per the manufacturer's instructions.



LTS19 DTT1  
**TENSION-TIES**



### METHOD 2, TENSION-TIES (2 required)

- This detail is only applicable where floor joists are parallel to the deck joists.
- Install one tension-tie within 24 inches of each end of the deck.
- Tension-ties shall have an allowable stress design capacity of not less than 1,500 pounds. The anchor shall be installed per the manufacturer's instructions.

