

RB268-13

R507 (NEW)

Proposed Change as Submitted

Proponent: Charles S. Bajnai, Chesterfield County, VA, representing self (bajnaic@chesterfield.gov), Randy Shackelford, Simpson Strong Tie (rshackelford@strongtie.com)

Add new text as follows:

SECTION R507 DECKS

R507.1 Wood decks. Typical wood decks shall be designed and constructed in accordance with this section. Other grades, species, loading, materials and conditions not described herein shall be permitted in accordance with Section 301. Loading for large concentrated loads, such as hot tubs, is beyond the scope of this section.

R507.2 Requirements. Deck construction shall be capable of accommodating applied loads and transmitting them to the supporting structural elements. Figure R507.2 is intended for purposes of identifying typical parts, and not to limit the design.

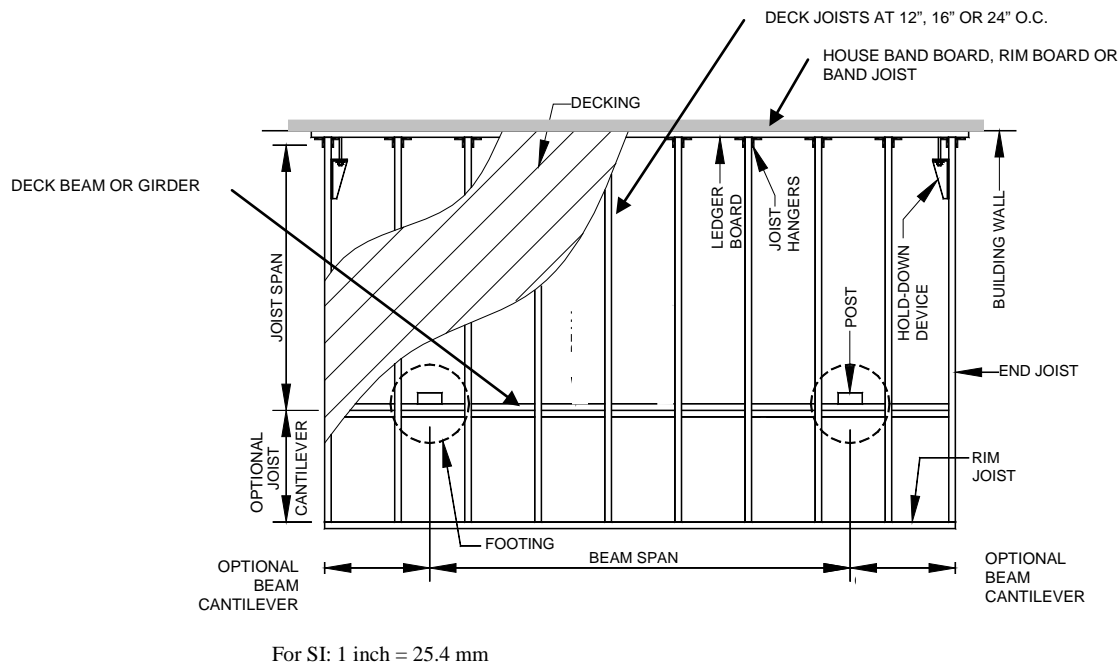


FIGURE R507.2
DECK CONSTRUCTION

R507.3 Materials. Materials used in the construction of a deck shall comply with the provisions of this section.

R507.3.1 Preservative-treated lumber. All lumber for decks shall be either naturally durable, minimum No.2 grade dimension lumber and identified in accordance with Section R502.1 or, preservative-treated in accordance with Section R317. All lumber in contact with the ground shall be identified as suitable for ground contact.

R507.3.2 Wood Decking. Wood decking shall comply with any of the following materials:

1. Wood decking with a minimum nominal thickness of $1\frac{1}{4}$ inches (32 mm) shall be installed at 90 degrees to deck joists that are spaced at a maximum of 16 inches (406 mm) on center and up to 45 degrees when spaced at a maximum of 12 inches (305 mm) on center.
2. Wood decking with a nominal 2 inch (51 mm) thickness shall be installed at an angle between 45 and 90 degrees to deck joists that are spaced at a maximum of 24 inches (610 mm) on center.
3. Wood decking shall be attached to each supporting member with a minimum of (2)8d threaded nails or (2)#8 wood screws.

R507.3.3 Wood/plastic composites. Wood/plastic composites used as exterior deck boards, stair treads, handrails and guardrail systems shall be permitted in accordance with manufacturer's instructions.

R507.3.4 Metal guardrail systems. Metal guardrail and handrail systems shall be permitted in accordance with the manufacturer's instructions.

R507.3.5 Fasteners and connectors. Nails, bolts with nuts and washers, screws and connectors shall be coated in accordance with Section R317.3. Proprietary fasteners shall be permitted provided they are compatible with the pressure-preservative-treated lumber being used. Fasteners and connectors within 300 feet of salt water shoreline shall be stainless steel.

R507.3.6 Flashing. Flashing shall be corrosion-resistant metal of minimum nominal 0.019 inch (0.5 mm) thickness or approved non-metallic material.

R507.4 Deck joists. Spans for typical wood deck joist configurations, as shown in Figure R507.4, shall be in accordance with Table R507.4. Deck joists shall be permitted to cantilever a maximum of one-fourth of the joist span.

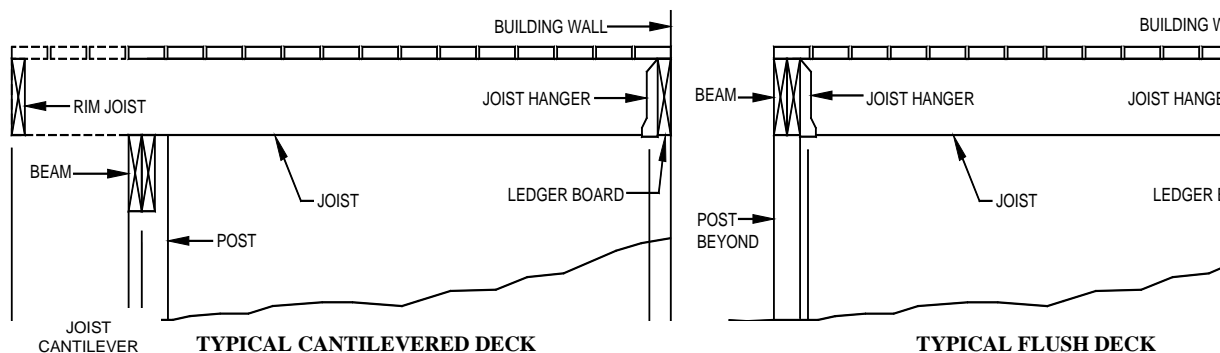


FIGURE R507.4
TYPICAL DECK JOIST SPANS

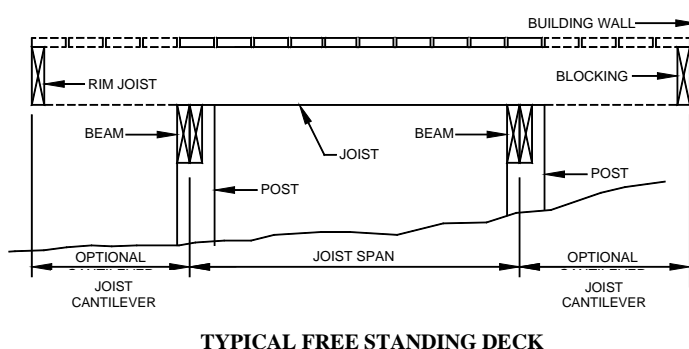


TABLE R507.4
MAXIMUM DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft.-in.)

SPECIES^a	SIZE	MAXIMUM SPACING OF DECK JOISTS WITH NO CANTILEVER^b (in.)			MAXIMUM SPACING OF DECK JOISTS WITH CANTILEVERS^c (in.)		
		12	16	24	12	16	24
<u>Southern pine</u>	<u>2 x 6</u>	<u>10-4</u>	<u>9-5</u>	<u>7-10</u>	<u>7-1</u>	<u>7-1</u>	<u>7-1</u>
	<u>2 x 8</u>	<u>13-8</u>	<u>12-5</u>	<u>10-2</u>	<u>10-9</u>	<u>10-9</u>	<u>10-2</u>
	<u>2 x 10</u>	<u>17-5</u>	<u>15-10</u>	<u>13-1</u>	<u>15-6</u>	<u>15-6</u>	<u>13-1</u>
	<u>2 x 12</u>	<u>18-0</u>	<u>18-0</u>	<u>15-5</u>	<u>18-0</u>	<u>18-0</u>	<u>15-5</u>
<u>Douglas fir-larch^d, hem-fir^d spruce-pine-fir^d</u>	<u>2 x 6</u>	<u>9-6</u>	<u>8-8</u>	<u>7-2</u>	<u>6-3</u>	<u>6-3</u>	<u>6-3</u>
	<u>2 x 8</u>	<u>12-6</u>	<u>11-1</u>	<u>9-1</u>	<u>9-5</u>	<u>9-5</u>	<u>9-1</u>
	<u>2 x 10</u>	<u>15-8</u>	<u>13-7</u>	<u>11-1</u>	<u>13-7</u>	<u>13-7</u>	<u>11-1</u>
	<u>2 x 12</u>	<u>18-0</u>	<u>15-9</u>	<u>12-10</u>	<u>18-0</u>	<u>15-9</u>	<u>12-10</u>
<u>Redwood, western cedars, ponderosa pine^e, red pine^e</u>	<u>2 x 6</u>	<u>8-10</u>	<u>8-0</u>	<u>7-0</u>	<u>5-7</u>	<u>5-7</u>	<u>5-7</u>
	<u>2 x 8</u>	<u>11-8</u>	<u>10-7</u>	<u>8-8</u>	<u>8-6</u>	<u>8-6</u>	<u>8-6</u>
	<u>2 x 10</u>	<u>14-11</u>	<u>13-0</u>	<u>10-7</u>	<u>12-3</u>	<u>12-3</u>	<u>10-7</u>
	<u>2 x 12</u>	<u>17-5</u>	<u>15-1</u>	<u>12-4</u>	<u>16-5</u>	<u>15-1</u>	<u>12-4</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- No. 2 grade with wet service factor.
- Deck joists shall be designed to carry the deck live load in Table R301.5 or the ground snow load, which ever is greater. This table is based on ground snow load or live load = 40 psf, dead load = 10 psf, L/Δ = 360.
- Deck joists shall be designed to carry the deck live load in Table R301.5 or the ground snow load, which ever is greater. This table is based on ground snow load or live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220 pound point load applied to end.
- Includes incising factor.
- Northern species with no incising factor

R507.4.1 Joist bearing. Joist ends shall be provided with vertical and rotational support. The ends of joists shall have a minimum of 1.5 inches (38 mm) of bearing on a wood ledger board or on metal hangers. Where rotational support is provided by joist hangers or blocking between joists, their depth shall equal not less than 60 percent of the joist depth. Where rotational support is provided by rim joists, they shall be secured to the end of each joist with a minimum of (3)10d threaded nails or (3)#10x3 inch (76 mm) long wood screws. For free-standing decks, rotational support of the joist ends adjacent to the building wall shall be permitted by a rim joist or full depth nominal 2x blocking toe nailed at each end with (3)10d nails.

R507.5 Deck Beams. The maximum span for deck beams, as shown in Figure R507.2, shall be in accordance Table R507.5. Beams shall be permitted to cantilever at each end up to one-fourth of the beam span. The plies of a multi-ply beam shall be fastened with a minimum of two rows of 10d threaded nails at 16 inches (406 mm) on center along each edge. Splices of multi-span beams shall be located at interior post locations.

TABLE R507.5
MAXIMUM BEAM SPAN LENGTHS^a

SPECIES	SIZE^b	MAIN JOIST SPAN (ft.) LESS THAN OR EQUAL TO:						
		6	8	10	12	14	16	18
<u>Southern pine</u>	<u>2-2x6</u>	<u>7-1</u>	<u>6-2</u>	<u>5-6</u>	<u>5-0</u>	<u>4-8</u>	<u>4-4</u>	<u>4-1</u>
	<u>2-2x8</u>	<u>9-2</u>	<u>7-11</u>	<u>7-1</u>	<u>6-6</u>	<u>6-0</u>	<u>5-7</u>	<u>5-3</u>
	<u>2-2x10</u>	<u>11-10</u>	<u>10-3</u>	<u>9-2</u>	<u>8-5</u>	<u>7-9</u>	<u>7-3</u>	<u>6-10</u>
	<u>2-2x12</u>	<u>13-11</u>	<u>12-0</u>	<u>10-9</u>	<u>9-10</u>	<u>9-1</u>	<u>8-6</u>	<u>8-0</u>
	<u>3-2x6</u>	<u>8-7</u>	<u>7-8</u>	<u>6-11</u>	<u>6-3</u>	<u>5-10</u>	<u>5-5</u>	<u>5-2</u>
	<u>3-2x8</u>	<u>11-4</u>	<u>9-11</u>	<u>8-11</u>	<u>8-1</u>	<u>7-6</u>	<u>7-0</u>	<u>6-7</u>
	<u>3-2x10</u>	<u>14-5</u>	<u>12-10</u>	<u>11-6</u>	<u>10-6</u>	<u>9-9</u>	<u>9-1</u>	<u>8-7</u>
	<u>3-2x12</u>	<u>17-5</u>	<u>15-1</u>	<u>13-6</u>	<u>12-4</u>	<u>11-5</u>	<u>10-8</u>	<u>10-1</u>
<u>Douglas fir-larch^c, spruce-pine-fir,</u>	<u>3x6 or 2-2x6</u>	<u>5-5</u>	<u>4-8</u>	<u>4-2</u>	<u>3-10</u>	<u>3-6</u>	<u>3-1</u>	<u>2-9</u>
	<u>3x8 or 2-2x8</u>	<u>6-10</u>	<u>5-11</u>	<u>5-4</u>	<u>4-10</u>	<u>4-6</u>	<u>4-1</u>	<u>3-8</u>

redwood ^c , western cedars, ponderosa pine ^d , red pine ^d	3x10 or 2-2x10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3x12 or 2-2x12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4x6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4x8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4x10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4x12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3-2x6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3-2x8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	3-2x10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3-2x12	13-11	12-1	10-9	9-10	9-1	8-6	8-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

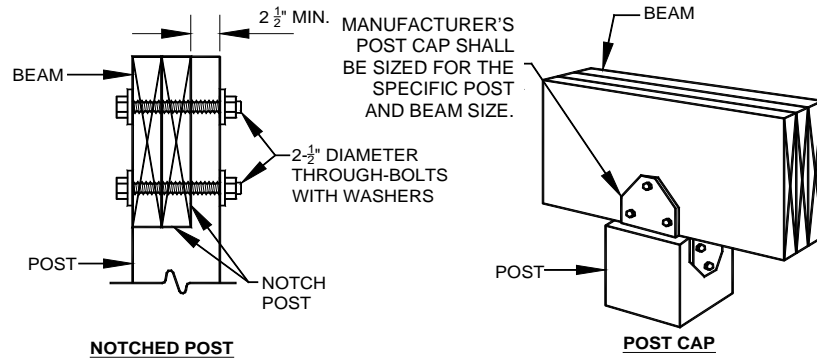
- Deck beams shall be designed to carry the deck live load in Table R301.5 or the ground snow load, whichever is greater. This table is based on ground snow load or live load = 40 psf, dead load = 10 psf, $L/\Delta = 360$ at main span, $L/\Delta = 180$ at cantilever with a 220 pound point load applied to end. No 2 grade, wet service factor.
- Beam depth shall be greater than or equal to depth of joists with a flush beam condition.
- Includes incising factor.
- Northern species with no incising factor.

R507.5.1 Beam bearing. Single-ply beams and multi-ply beams shall have all of their bearing directly on wood posts or on an approved metal post cap in accordance with Figure R507.6.1 and not less than 3 inches (76 mm) on concrete or masonry.

R507.6 Deck posts. For typical single level wood decks, posts shall be measured from the top of the footing to the underside of the beam. The maximum height of the post shall be in accordance with the following:

- Posts comprised of a minimum nominal 4x4 shall be permitted to a maximum height of 8 feet (2438 mm).
- Posts comprised of a minimum nominal 6x6 shall be permitted to a maximum height of 14 feet (5486 mm).
- Posts comprised of southern pine, of 4x4 or 4x6, grade #2 shall be permitted to a maximum height of 10 feet (3048 mm).
- Posts comprised of southern pine, of 6x6 shall be permitted to a maximum height of 18 feet (5486 mm).

R507.6.1 Deck post to deck beam connection. Deck beams shall be attached to deck posts in accordance with Figure R507.6.1. Post to beam connections shall be constructed to resist lateral displacement. Manufactured post-to-beam connectors shall be sized for the post and beam sizes. All bolts shall have washers under the head and nut.



For SI: 1 inch = 25.4 mm

FIGURE R507.6.1
TYPICAL BEAM BEARING

R507.7 Deck footings. Deck footings shall be constructed in accordance with Section R403 and Figure R507.7. The size of the footing shall be adequate for the load applied by the posts.

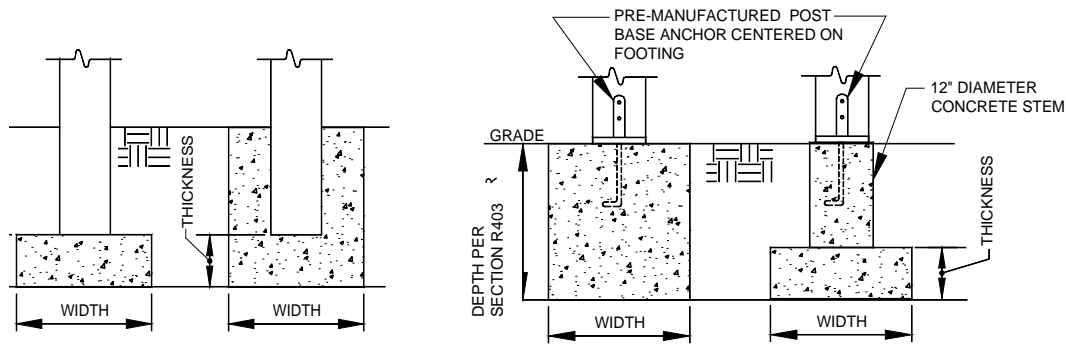


FIGURE R507.7
TYPICAL DECK FOOTINGS

R507.7.1 Footing depth. The minimum depth of footings shall be in accordance with Section R403.1.4 or as approved by the building official. A deck footing within 4 feet of the house shall be set at least to the depth of the house footing.

R507.7.2 Post connection to footing. Where the top of the footings are at or above grade, the posts shall be prevented from being displaced by a connector between the post and the concrete. Where the top of the footings are below grade the post shall be permitted to sit on top of the footing or may be embedded in the concrete.

R507.8 Deck ledger connection to the building. The connection between a deck ledger and the building shall be in accordance with this section.

R507.8.1 Deck ledger connection to band joist. The deck ledger shall be connected to a 2-inch nominal lumber band joist with ½-inch lag screws or bolts with washers in accordance with Table R507.8.1 and Figure R507.8.1(1). The bolts or lag screws shall be spaced in accordance with Figure R507.8.1(2). As an alternative to the detail in Figure R507.8.1, the ledger boards shall be permitted to be offset from the band joist a maximum distance of ½ inch (13 mm) with the installation of stacked washers. The exterior wall finish shall be removed prior to installation of the ledger board. Flashing at a door threshold shall be installed to prevent water intrusion from rain or melting ice and snow.

R507.8.2 Deck ledger connection to concrete foundation walls. A ledger board shall be connected to a concrete or solid masonry foundation wall with approved ½ inch (13 mm) diameter expansion anchors at a spacing specified in Table R507.8.1(1) and as shown in Figure R507.8.2. Expansion anchors shall be installed per the manufacturer.

R507.8.3 Ledger board to hollow masonry foundation wall. A ledger board shall be connected to a hollow masonry foundation wall with approved ½ inch (13 mm) diameter epoxy anchors at a spacing specified in Table R507.8.1(1) and as shown in Figure R507.8.3. Epoxy anchors shall be installed per the manufacturer.

R507.8.4 Alternate connections. An approved engineered wood rim board with a minimum thickness of 1 inch (25 mm) shall be permitted to substitute for a 2x lumber band joist provided it was designed and manufactured to support a deck. A ledger board attachment to a masonry or stone veneer, ribbon board of open web floor trusses, band joist of a cantilevered floor and other conditions not addressed herein

shall be designed in accordance with accepted engineering practice, or the deck shall be free-standing in accordance with Section R507.10.

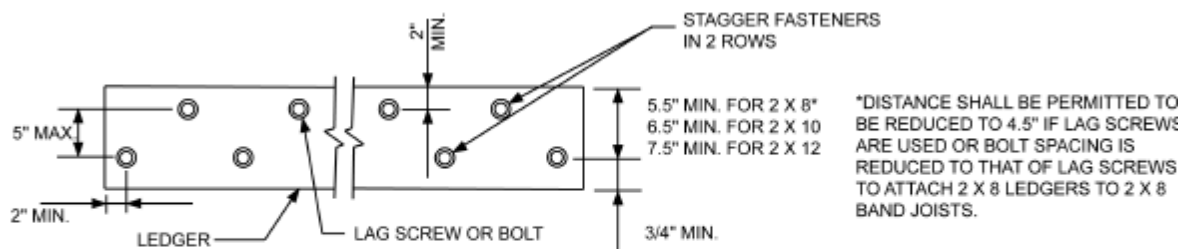
TABLE R507.8.1(1)
FASTENER SPACING

FASTENER	BAND BOARD	JOIST SPAN						
		≤6'	> 6'-8'	≥ 8'-10'	> 10'-12'	≥ 12'-14'	> 14'-16'	≥ 16'-18'
$\frac{1}{2}$ " lag screws ^a	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	30"	23"	18"	15"	13"	11"	10"
$\frac{1}{2}$ " through bolts	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	36"	36"	34"	29"	24"	21"	19"
$\frac{1}{2}$ " through bolts and $\frac{1}{2}$ " stacked washers ^b	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	36"	36"	29"	24"	21"	18"	16"
Expansion anchors	:	36"	36"	34"	29"	24"	21"	19"
Epoxy anchors	:	32"	32"	32"	24"	24"	16"	16"

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

a. The tip of the lag screw shall fully extend beyond the inside face of the band board.

b. The maximum gap between the face of the ledger board and face of the wall sheathing shall be $\frac{1}{2}$ inches (13 mm).



For SI: 1 inch = 25.4 mm.

FIGURE R507.8.1(1)
PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS

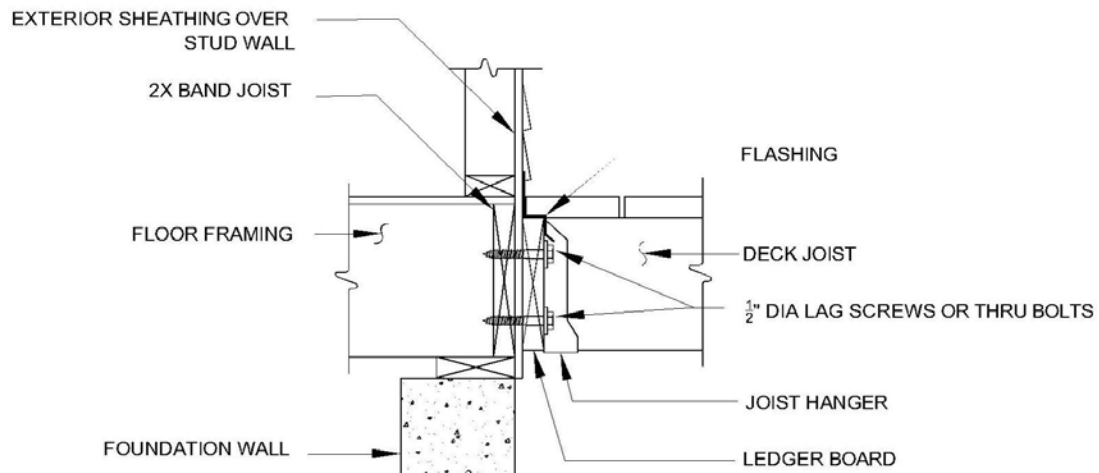


FIGURE R507.8.1(2)
LEDGER BOARD TO BAND BOARD ATTACHMENT

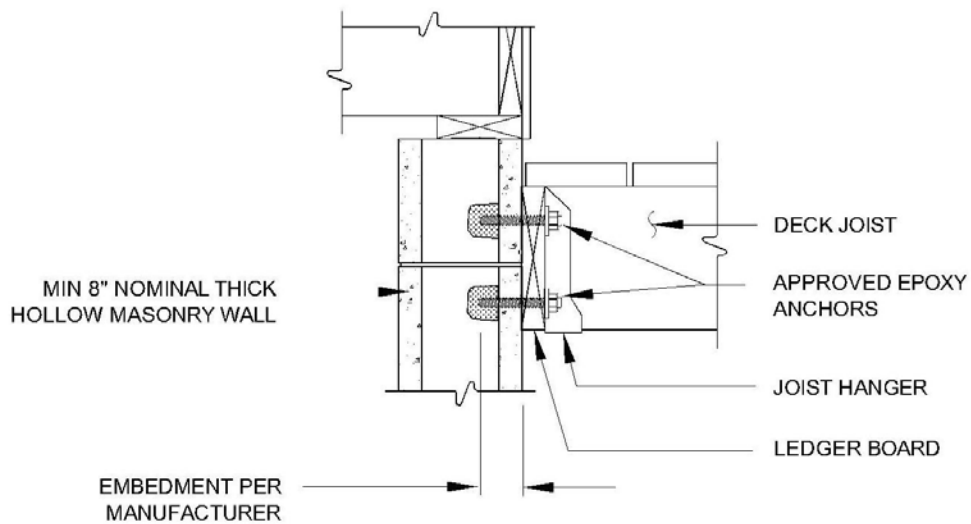


FIGURE R507.8.2
LEDGER BOARD TO SOLID FOUNDATION WALL ATTACHMENT

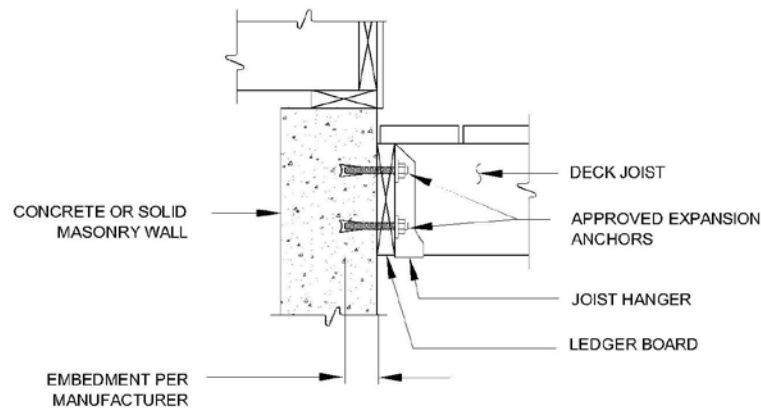
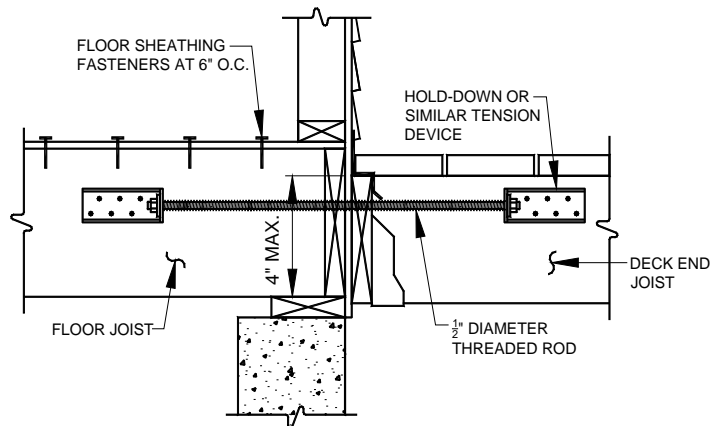


FIGURE R507.8.3
LEDGER BOARD TO HOLLOW MASONRY FOUNDATION WALL ATTACHMENT

R507.9.3 Attachment to resist lateral load. A lateral load connection is required by Section R507.2. The following options shall be deemed to comply; other design solutions are permitted in accordance with R301.

R507.9.3.1 Connection at parallel joists. Where floor joists and deck joists are parallel, a hold-down or similar tension device with a minimum capacity of 1,500 pounds (6672 N) at each end joist as shown in Figures R507.3.1(1) and R507.9.3.1(2) shall be permitted. Floor sheathing to floor joists fasteners shall be permitted to be substituted with two reinforcing angles on each side of the joist with a minimum capacity of 375 pounds (1668 N).



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

FIGURE R507.9.3.1(1)
CONNECTION AT PARALLEL JOISTS

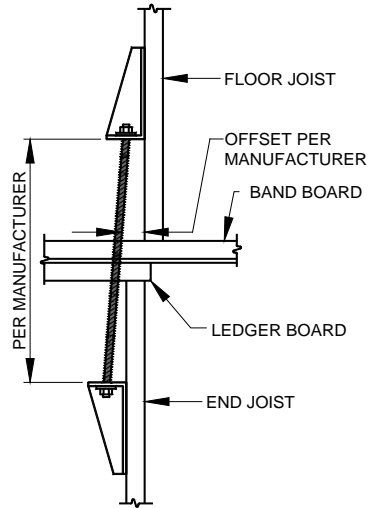
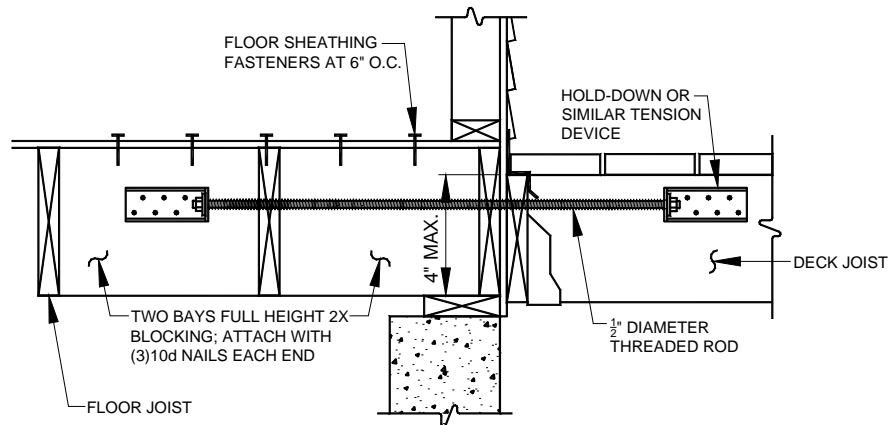


FIGURE R507.9.3.1(2)
OFFSET AT PARALLEL JOISTS

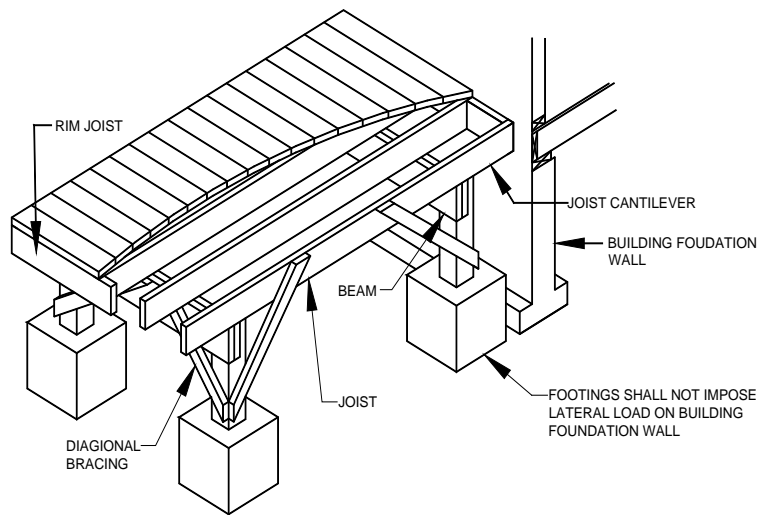
R507.9.3.2 Connection at perpendicular joists. Where floor joists and deck joists are perpendicular, provide a hold-down or similar tension device with a minimum capacity of 1,500 pounds (6672 N) at each end joist and blocking between floor joists as shown in Figure R507.9.3.2. Floor sheathing to floor joists fasteners shall be permitted to be substituted with two reinforcing angles on each side of the joist with a minimum capacity of 375 pounds (1668 N).



For SI: 1 inch = 25.4 mm

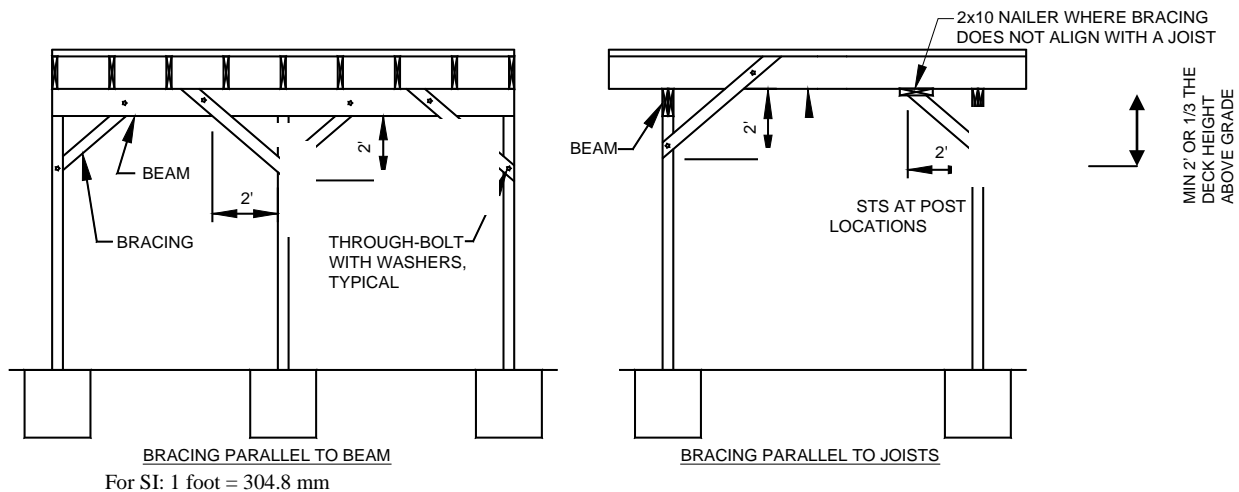
FIGURE R507.9.3.2
LATERAL SUPPORT WHERE INTERIOR JOIST PERPENDICULAR TO DECK

R507.10 Free-standing decks. As shown in Figure R507.10, free-standing decks shall have an additional beam and posts adjacent the building exterior wall in place of a ledger board attachment. The beam shall be sized in accordance with Section R507.6 and shall be located adjacent the exterior wall or at a maximum distance equal to the allowable joist cantilever.



**FIGURE R507.10
FREE-STANDING DECK**

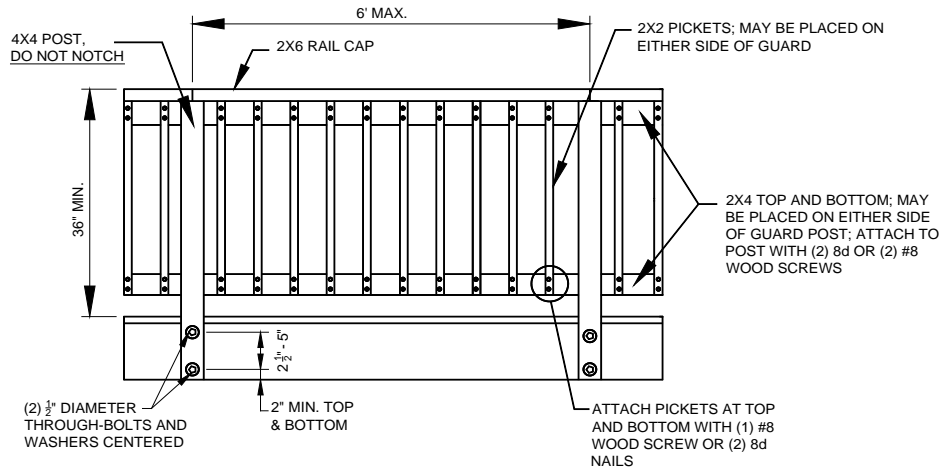
R507.10.1 Diagonal bracing. Diagonal bracing shall be installed on free-standing decks greater than 30 inches (762 mm) above grade in accordance with Figure R507.10.1. Bracing shall be placed at a 45 degree angle at each post location in the parallel and perpendicular directions to the beam. Bracing shall be a minimum of nominal 2x4 lumber and shall be fastened to framing with one 1/2 inch (9 mm) diameter through bolt with washers at each end. The diagonal brace shall be a minimum of 2 feet long measured as shown in Figure R507.10.1 or at least 1/3 the height of the deck above grade.



**FIGURE R507.10.1
FREE-STANDING DECK DIAGONAL BRACING**

R507.12 Deck guards. Deck guards shall be designed and constructed in accordance with Sections R301.5 and R312. Other materials and construction techniques shall be permitted in accordance with Section R301.

R507.12.1 Guard construction. Where the guard requirements of Sections R301.5 and R312 are met using the details shown in Figures R507.12.1(1) through R507.12.1(3), guard posts shall be attached to the inside or outside face of the rim joist or end joist. Hold-down anchors shall have a minimum capacity of 1,800 pounds (8006 N).



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

FIGURE R507.12.1(1)
DECK GUARD

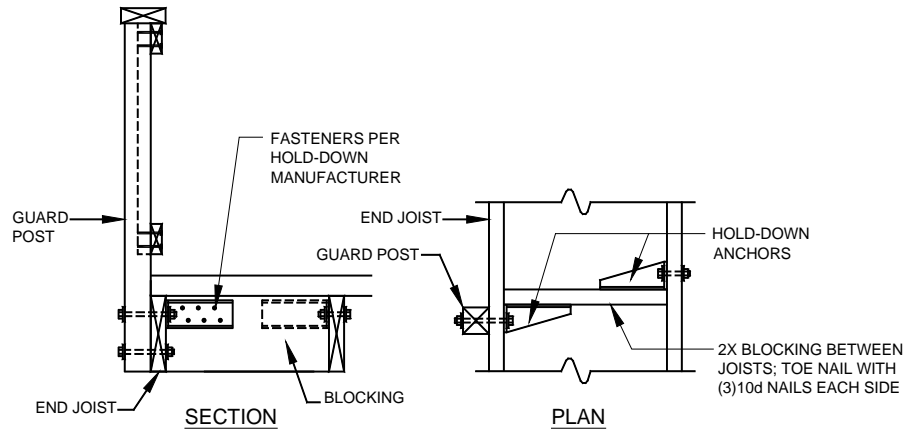


FIGURE R507.12.1(2)
GUARD POST TO END JOIST

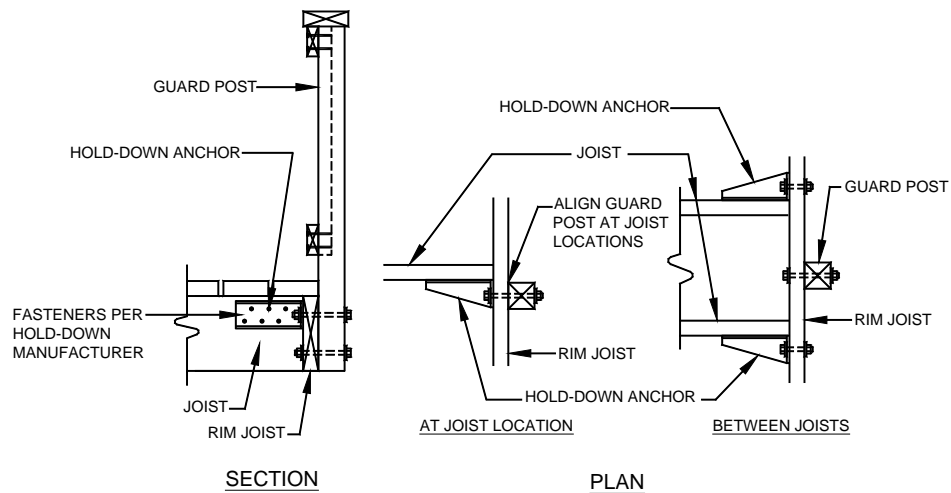
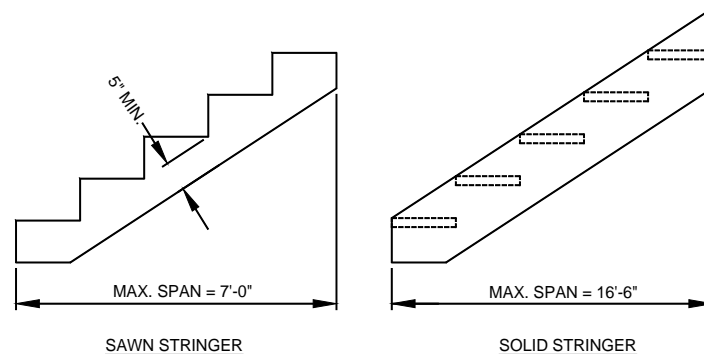


FIGURE R507.12.1(3)
GUARD POST TO RIM JOIST

R507.13 Deck stairs. Deck stairs shall be constructed in accordance with this section and Section R311.7. Where a flight of stairs has a vertical rise greater than that allowed per Section R311.7.3, an intermediate landing shall be provided in accordance with Section R311.7.6 and designed as a free-standing deck in accordance with Section R507.10.

R507.13.1 Stair stringers. Stair stringers shall be constructed of sawn nominal 2x12 members at 18 inches (457 mm) on center with a throat dimension of 5 inches (127 mm) and a maximum span length as shown in Figure R507.13.1. Stairs with a width equal to 36 inches (914 mm) shall be permitted to be constructed with two solid 2x12 stringers with a maximum span length as shown in Figure R507.13.1.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

FIGURE R507.13.1
STAIR STRINGER REQUIREMENTS

R507.13.2 Stringer bearing. Stringers shall be attached to posts or bear on joist hangers attached to the deck structure and on footings at grade in accordance with Figure R507.13.2. Joist hangers shall be specifically designed to accommodate sloped connections and shall have a minimum capacity of 625 pounds (2780 N). Reinforcing angles at rim joist locations only shall have a minimum capacity of 325 pounds (1446 N).

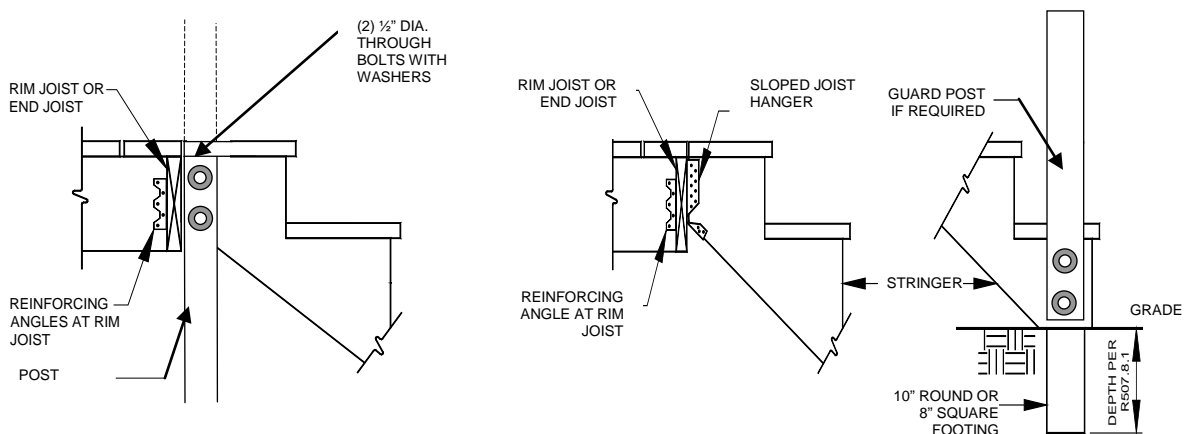


FIGURE R507.13.2
STRINGER BEARING

R507.13.3 Treads and risers. Stair treads shall be constructed in accordance with Section R311.7 and Figure R507.13.3. Treads shall be composed of nominal 2x6 lumber. Treads of stairs constructed with solid stringers shall be permitted to be composed of span rated decking. Risers shall be permitted to be composed of nominal 1x lumber. Openings in risers shall not allow the passage of a 4 inch (102 mm) diameter sphere.

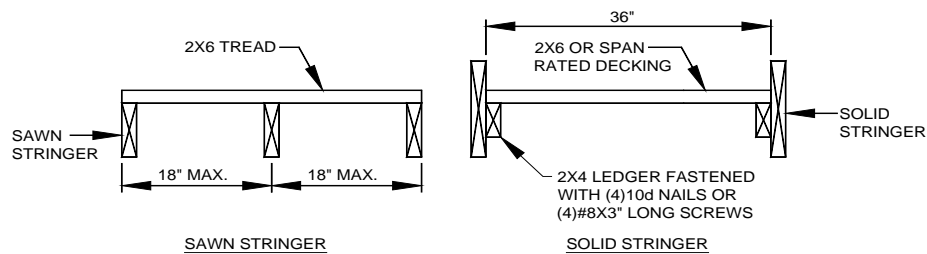
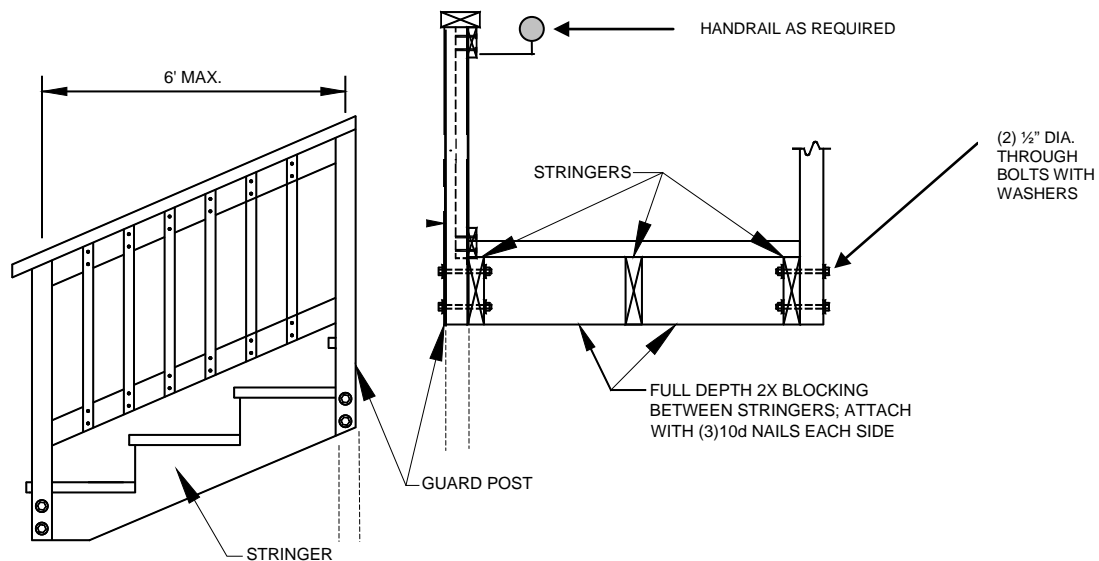


FIGURE R507.13.3
TREAD REQUIREMENTS

R507.13.4 Stair guard. Guards for stairs shall be as required per Section R312.1.1 and constructed in accordance with Section R507.12. The attachment of a stair guard post to the stringers shall be constructed in accordance with Figure R507.13.4.



For SI: 1 foot = 304.8 mm

FIGURE R507.13.4
STAIR GUARD CONNECTION

R507.13.5 Stair handrails. When required, handrails for stairs shall be as required per Section R311.7.8. When required and where the top guard rail does not comply with the handrail grip-size requirements in Section R311.7.8.3, a separate, conforming handrail shall be required.

R507.13.6 Ramps. Ramps from decks shall be as required in Section R311.8. Details for stringers, guards and handrails shall be similar to those for stairs.

Reason: With the increasing attention being paid to deck safety, the 2012 IRC took a major step forward by establishing a new Section R507 that covers deck construction. However, Section R507 consists almost entirely of connection details for anchoring the deck to the house, and does not provide any prescriptive requirements for building the deck itself. Some information is completely missing, like joist spans for wet lumber, beam spans, post sizes, bracing, footings and stair stringer spans.

Currently about one-third of the building permits pulled in our county are for decks. A significant number of these decks are built by homeowners or "handymen", rather than professional deck or home builders. Since the current code provides them no prescriptive guidelines, many jurisdictions across the country have tried to help either by creating locally developed deck guides or

by directing the homeowner/builder to the *Prescriptive Residential Wood Deck Construction Guide (DCA6)*, a free document published by the American Wood Council (AWC).

Background on the *DCA6*: it is a document that originated in August 2006 when an ad-hoc task group was created to address prescriptive provisions for residential wood deck construction. While not a true consensus standard committee, the group was fairly balanced with representatives of ICC, AWC, home builders, municipal representative from Fairfax County, VA, construction hardware manufacturers, and the truss industry represented. The provisions of the *DCA6* gather requirements from throughout the IRC into one place, whether they be prescriptive requirements already contained in other sections, or new solutions derived from the performance provisions. A *Commentary* is also included in the document, to give the user an understanding of the data and/or experience upon which the provision is based.

While deck guides written outside the code development process have served a purpose, we think it is important that a set of deck construction provisions be contained in the IRC itself.

This submittal is based largely upon the provisions of the *DCA6*, with the intent to create a simple yet complete deck code section that provides prescriptive methods for safe deck construction. The submittal is presented in a simplified format so that it can be used by building officials, builders, inspectors and homeowners. The proponents recognize that every possible construction detail or condition is not covered by this submittal – the intent is to provide permitted methods for meeting the code, and not to preclude the use of other construction methods or materials that can always be approved by the authority having jurisdiction using R104.11 or R301.

I have been privy to several other alternate deck proposals that are being considered for the 2015 IRC. My thought is that these proposals are well intentioned, but essential components were omitted for political reasons. Along with members of industry, I have developed what I believe to be a cleaner, more organized, more complete proposal with most of the same provisions of these other drafts and *DCA6* without the worry that some provisions might be politically improper to some constituents.

In conclusion, the average deck builder, plan reviewer and inspector have nothing in the IRC to help them with a deck design. Homeowners and non-professionals need to have simple prescriptive methods for building a safe deck, and we believe this proposal provides those guidelines.

Bibliography:

DCA6. <http://www.awc.org/publications/DCA/DCA6/DCA6-09.pdf>

Cost Impact: The code change proposal may increase the cost of construction.

R507-RB-BAJNAI-SHACKELFORD.doc

Committee Action Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt this is a needed change but there are too many technical flaws such as the diagonal bracing for lateral loads is lacking. The proponent's should work with industry to resolve any differences and bring it back.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

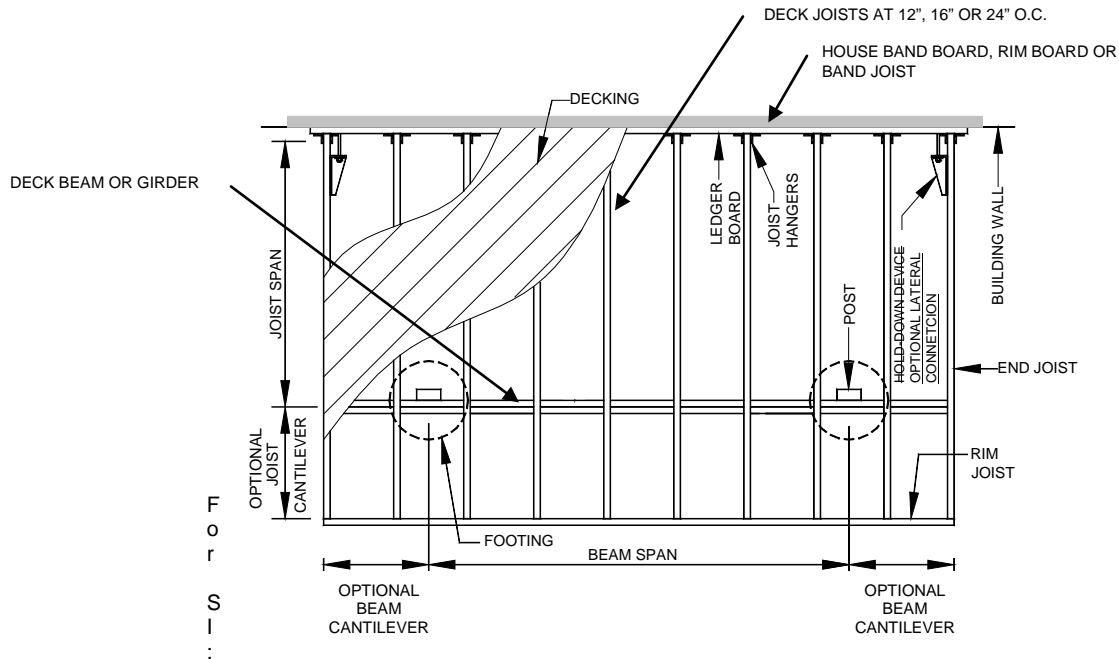
Chuck Bajnai, Chesterfield County, VA, representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

SECTION R507 DECKS

R507.1 Wood decks. ~~Typical wood decks~~ Decks of wood-frame construction shall be designed and constructed in accordance with this section. ~~Other grades, species, loading, materials and conditions~~ The use of other species of lumber or lesser grades of materials or different loading conditions not described herein shall be permitted in accordance with Section 301.1.1. Loading for large concentrated loads, such as hot tubs, is beyond the scope of this section.

R507.2 Requirements. Deck construction shall be capable of accommodating applied loads ~~all vertical and lateral loads in accordance with Section R301~~ and transmitting them to the supporting structural elements. Figure R507.2 is intended for purposes of identifying typical parts, and not to limit the design.



1 inch = 25.4 mm

For SI: 1 inch = 25.4 mm

**FIGURE R507.2
DECK CONSTRUCTION**

R507.3 Materials. Materials used in the construction of a wood-framed deck shall comply with the provisions requirements of this section.

R507.3.1 Preservative-treated Lumber. All lumber shall be minimum No 2 grade dimension lumber. Lumber may be cut, drilled or notched in accordance with Section R502.8 except where prohibited in Section R507.11. In geographical areas where decay-resistant lumber is required, All lumber for decks shall be either naturally durable, minimum No.2 grade dimension lumber and identified in accordance with Section R502.1, or, preservative-treated in accordance with Section R317. All lumber in contact with the ground shall be identified as suitable for ground contact. Where termite-resistant lumber is required per Table R301.2 (1), lumber shall comply with Section R318.

R507.3.2 Wood Decking. Wood decking shall comply with any of the following materials:

1. Wood decking with a minimum nominal thickness of $\frac{5}{4}$ inches (32 mm) shall be installed at 90 degrees to deck joists that are spaced at a maximum of 16 inches (406 mm) on center and up to 45 degrees when spaced at a maximum of 12 inches (305 mm) on center.
2. Wood decking with a nominal 2 inch (51 mm) thickness shall be installed at an angle between 45 and 90 degrees to deck joists that are spaced at a maximum of 24 inches (610 mm) on center.
3. Wood decking shall be attached to each supporting member with a minimum of (2)8d threaded nails or (2)#8 wood screws.

R507.3.3.2 Wood/plastic composites. Wood/plastic composites used as exterior deck boards, stair treads, handrails and guardrail guard and handrail systems shall be permitted comply with the requirements of R317.4 and installed in accordance with the manufacturer's installation instructions.

R507.3.4.3.3 Metal guardrail systems Other materials. Metal guardrail and handrail systems- Metal, glass, concrete or other materials used for deck construction, including guard and handrail systems shall be permitted in accordance with the requirements in Chapter 3 and installed in accordance with the manufacturer's installation instructions.

R507.3.5.3.4 Fasteners and connectors. Nails, bolts with nuts and washers, screws, fasteners and connectors shall be coated protected in accordance with Section R317.3. Proprietary fasteners shall be permitted provided they are compatible with the preservative-treated lumber being used.

Fasteners and connectors within 300 feet of salt water shoreline shall be stainless steel. Fasteners and connectors shall be installed in accordance with manufacturer's installation instructions.

R507.3.6.3.5 Flashing. Flashing shall be corrosion-resistant metal of minimum nominal 0.019 inch (0.5 mm) thickness or approved non-metallic material.

R507.4 Deck boards. Deck board spans shall comply with the requirements of Table R507.4. Wood deck boards shall be attached to each supporting member with a minimum of (2) 8d nails or (2) #8 wood screws.

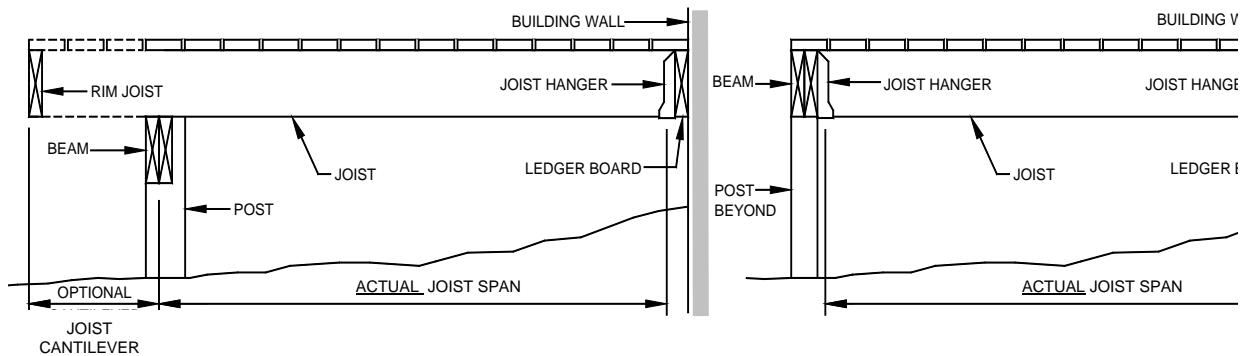
**TABLE R507.4
MAXIMUM DECK BOARD SPANS**

MATERIAL TYPE AND NOMINAL SIZE	DECK BOARDS PERPENDICULAR TO JOIST	DECK BOARDS DIAGONAL TO JOIST^a
5/4-inch thick wood	16 inches	12 inches
2-inch thick wood	24 inches	16 inches
Plastic composite	Per R507.3	Per R507.3

For SI: 1 inch = 25.4 mm

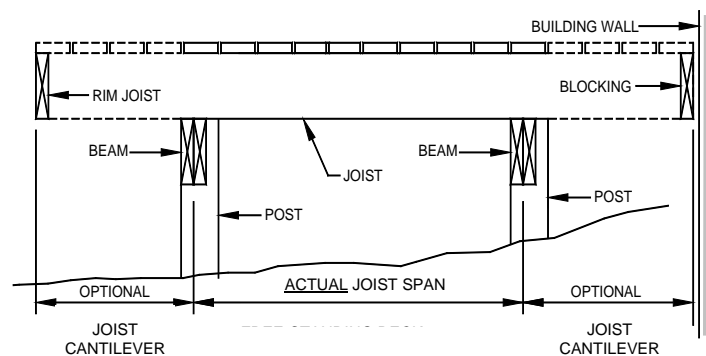
a. Maximum angle of 45 degrees from perpendicular for wood deck boards

R507.4-5 Deck joists. Spans for typical wood deck joist configurations shall be measured as shown in Figure R507.4-5, and shall be in accordance with not exceed the span lengths per Table R507.4-5. Deck joists shall be permitted to cantilever a maximum of one-fourth of the actual joist span.



TYPICAL CANTILEVERED DECK

TYPICAL FLUSH DECK



TYPICAL FREE STANDING DECK

**FIGURE R507.4-5
TYPICAL DECK JOIST CONFIGURATIONS**

R507.4.1-5.1 Joist bearing Deck joist support. Joist ends shall be provided with supported to prevent vertical and rotational support. lateral displacement. The ends of joists shall have a minimum of 1.5 inches (38 mm) of bearing on a deck beam, wood ledger board or on metal hangers. Joists shall be connected to deck beams with approved fasteners or connectors. Where rotational lateral support is provided by joist hangers or blocking between joists, their the depth of hanger or blocking shall equal not less than 60 percent of the joist depth. Where rotational lateral support is provided by rim joists, they the rim joist shall be secured to the end of each joist with a minimum of (3)10d threaded nails or (3)#10x3 inch (76 mm) long

wood screws. For free-standing decks, rotational support of the joist ends adjacent to the building wall shall be permitted by a rim joist or full depth nominal 2x blocking toe nailed at each end with (3) 10d nails.

R507.5.6 Deck Beams. The maximum span for deck beams, as shown in Figure R507.2 shall be in accordance with Table R507.5 allowable deck beam span for single or multiple ply deck beams shall be in accordance with Table R507.6. Beams shall be permitted to cantilever at each end up to one-fourth of the adjacent beam span. The plies of a multi-ply beam shall be fastened with a minimum of two rows of 10d threaded-nails at 16 inches (406 mm) or equivalent screws or bolts, on-center along each edge. Splices of multi-span beams shall be located at interior post locations.

TABLE R507.4.5
MAXIMUM DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft.-in.)

SPECIES ^a	JOIST SIZE	MAXIMUM SPACING OF DECK JOIST SPACING WITHOUT NO CANTILEVER ^{b,f} (in.)			MAXIMUM SPACING OF DECK JOIST SPACING WITH CANTILEVERS ^c (in.)		
		12" o.c.	16" o.c.	24" o.c.	12" o.c.	16" o.c.	24" o.c.
Southern pine	2 x 6	10-4 9-11	9-5 9-0	7-10 7-7	7-4 6-8	7-4 6-8	7-4 6-8
	2 x 8	13-8 13-1	12-5 11-10	10-2 9-8	10-9 10-1	10-9 10-1	10-2 9-8
	2 x 10	17-5 16-2	15-10 14-0	13-4 11-5	15-6 14-6	15-6 14-0	13-4 11-5
	2 x 12	18-0	18-0 16-6	15-5 13-6	18-0	18-0 16-6	15-5 13-6
Douglas fir-larch ^d , hem-fir ^d spruce-pine-fir ^d	2 x 6	9-6	8-8	7-2	6-3	6-3	6-3
	2 x 8	12-6	11-1	9-1	9-5	9-5	9-1
	2 x 10	15-8	13-7	11-1	13-7	13-7	11-1
	2 x 12	18-0	15-9	12-10	18-0	15-9	12-10
Redwood, western cedars, ponderosa pine ^e , red pine ^e	2 x 6	8-10	8-0	7-0	5-7	5-7	5-7
	2 x 8	11-8	10-7	8-8	8-6	8-6	8-6
	2 x 10	14-11	13-0	10-7	12-3	12-3	10-7
	2 x 12	17-5	15-1	12-4	16-5	15-1	12-4

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- No. 2 grade with wet service factor.
- Deck joists shall be designed to carry the deck live load in Table R301.5 or the ground snow load, which ever is greater. This table is based on ground snow load or live load = 40 psf, dead load = 10 psf, L/Δ = 360.
- Deck joists shall be designed to carry the deck live load in Table R301.5 or the ground snow load, which ever is greater. This table is based on ground snow load or live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220 pound point load applied to end.
- Includes incising factor.
- Northern species with no incising factor.
- Joists are permitted to cantilever from the deck beam by a length not to exceed the depth of the deck joist.

R507.5.1-6.1 Beam bearing. Single-ply beams and multi-ply beams shall have all of their bearing bear directly on wood posts or on an approved metal post cap in accordance with Figure R507.6.1-7.1 and not less than 3 inches (76 mm) on concrete or masonry walls or piers.

R507.6.7 Deck posts. For typical single level wood decks, posts shall be measured from the top of the footing to the underside of the beam. The maximum height of the post shall be in accordance with Table R507.7, the following:

- Posts comprised of a minimum nominal 4x4 shall be permitted to a maximum height of 8 feet (2438 mm);
- Posts comprised of a minimum nominal 6x6 shall be permitted to a maximum height of 14 feet (5486 mm);
- Posts comprised of southern pine, of 4x4 or 4x6, grade #2 shall be permitted to a maximum height of 10 feet (3048 mm);
- Posts comprised of southern pine, of 6x6 shall be permitted to a maximum height of 18 feet (5486 mm);

TABLE R507.5.6
MAXIMUM BEAM SPAN LENGTHS ^a

SPECIES	BEAM SIZE ^b	MAXIMUM MAIN JOIST SPAN (ft.-in.) LESS THAN OR EQUAL TO:						
		6 ft	8 ft	10 ft	12 ft	14 ft	16 ft	18 ft
Southern pine	(2) - 2x6	<u>7-4</u> <u>6-11</u>	<u>6-2</u> <u>5-11</u>	<u>5-6</u> <u>5-4</u>	<u>5-0</u> <u>4-10</u>	<u>4-8</u> <u>4-6</u>	<u>4-4</u> <u>4-3</u>	<u>4-4</u> <u>4-0</u>
	(2) - 2x8	<u>9-2</u> <u>8-9</u>	<u>7-11</u> <u>7-7</u>	<u>7-4</u> <u>6-9</u>	<u>6-6</u> <u>6-2</u>	<u>6-0</u> <u>5-9</u>	<u>5-7</u> <u>5-4</u>	<u>5-3</u> <u>5-0</u>
	(2) - 2x10	<u>11-10</u> <u>10-4</u>	<u>10-3</u> <u>9-0</u>	<u>9-2</u> <u>8-0</u>	<u>8-5</u> <u>7-4</u>	<u>7-9</u> <u>6-9</u>	<u>7-3</u> <u>6-4</u>	<u>6-10</u> <u>6-0</u>
	(2) - 2x12	<u>13-11</u> <u>12-2</u>	<u>12-0</u> <u>10-7</u>	<u>10-9</u> <u>9-5</u>	<u>9-10</u> <u>8-7</u>	<u>9-4</u> <u>8-0</u>	<u>8-6</u> <u>7-6</u>	<u>8-0</u> <u>7-0</u>
	2x6	<u>8-7</u> <u>8-2</u>	<u>7-8</u> <u>7-5</u>	<u>6-11</u> <u>6-8</u>	<u>6-3</u> <u>6-1</u>	<u>5-10</u> <u>5-8</u>	<u>5-5</u> <u>5-3</u>	<u>5-2</u> <u>5-0</u>
	(3) - 2x8	<u>11-4</u> <u>10-10</u>	<u>9-11</u> <u>9-6</u>	<u>8-11</u> <u>8-6</u>	<u>8-4</u> <u>7-9</u>	<u>7-6</u> <u>7-2</u>	<u>7-0</u> <u>6-8</u>	<u>6-7</u> <u>6-4</u>
	(3) - 2x10	<u>14-5</u> <u>13-0</u>	<u>12-10</u> <u>11-3</u>	<u>11-6</u> <u>10-0</u>	<u>10-6</u> <u>9-2</u>	<u>9-9</u> <u>8-6</u>	<u>9-4</u> <u>7-11</u>	<u>8-7</u> <u>7-6</u>
	(3) - 2x12	<u>17-5</u> <u>15-3</u>	<u>15-4</u> <u>13-3</u>	<u>13-6</u> <u>11-10</u>	<u>12-4</u> <u>10-9</u>	<u>11-5</u> <u>10-0</u>	<u>10-8</u> <u>9-4</u>	<u>10-4</u> <u>8-10</u>
Douglas fir-larch ^c , spruce- pine-fir, redwood ^c , western cedars, ponderosa pine ^d , red pine ^d	(1) - 3x6 or (2) - 2x6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	(1) - 3x8 or (2) - 2x8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	(1) - 3x10 or (2) - 2x10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	(1) - 3x12 or (2) - 2x12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	(1) - 4x6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	(1) - 4x8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	(1) - 4x10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	(1) - 4x12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	(3) - 2x6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	(3) - 2x8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	(3) - 2x10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	(3) - 2x12	13-11	12-1	10-9	9-10	9-1	8-6	8-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- Deck beams shall be designed to carry the deck live load in Table R301.5 or the ground snow load, whichever is greater. This table is based on ground snow load or live load = 40 psf, dead load = 10 psf, $L/\Delta = 360$ at main span, $L/\Delta = 180$ at cantilever with a 220 pound point load applied to end. No 2 grade, wet service factor.
- Beam depth shall be greater than or equal to depth of joists with a flush beam condition.
- Includes incising factor.
- Northern species with no incising factor.

TABLE R507.7
DECK POST HEIGHT

NOMINAL DECK POST SIZE	MAXIMUM HEIGHT
<u>4x4</u>	<u>8'</u>
<u>4x6</u>	<u>8'</u>
<u>6x6</u>	<u>14'</u>

For SI: 1 foot = 304.8 mm.

507.6.4-7.1 Deck post connection to deck beam connection. Deck beams shall be attached to wood deck posts in accordance with Figure R507.6.4 7.1. Other optional Ppost to beam connections shall be constructed permitted to resist lateral displacement. Manufactured post-to-beam connectors shall be sized for the post and beam sizes. All bolts shall have washers under the head and nut.

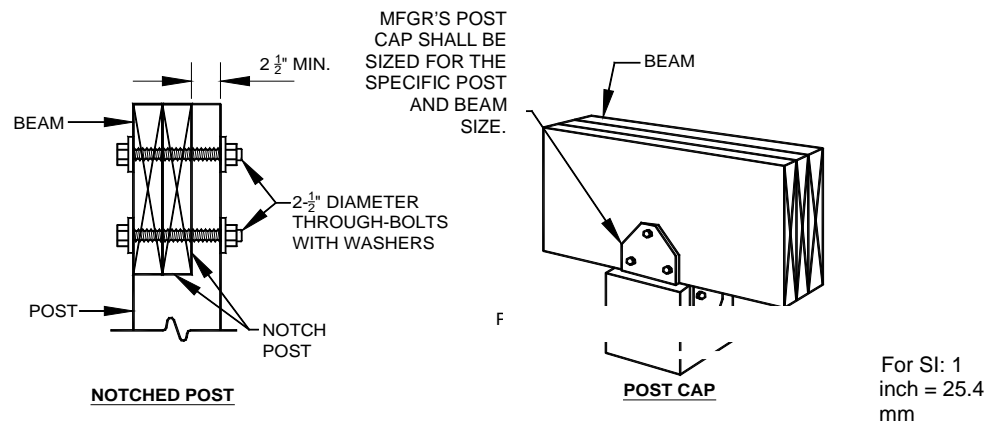


FIGURE R507.6.1-7.1
TYPICAL BEAM BEARING ON WOOD POST

R507.7.8 Deck footings. Deck footings shall be constructed in accordance with Section R403 and Figure R507.7. The size cross sectional area of the footing shall be adequate to carry the load applied by the posts based on the bearing capacity of the soil.

R507.7.1-8.1 Footing depth. The minimum depth of footings shall be in accordance with Section R403.1.4 or as approved by the building official. A deck footing within 4 feet of the house shall be sit at least to the depth of the house footing. Where a deck footing is within 4 feet of an existing, adjacent footing, the deck footing shall bear at the same depth as the existing footing.

R507.7.2-8.2 Deck Post connection to footing. Where the top of the footings are at or above grade, the posts shall be restrained to prevent lateral displacement at the bottom end of the post. Where the top of the footings are below grade the post shall be permitted to sit on top of the footing or may be embedded in the concrete. Deck posts shall be restrained to prevent lateral displacement at the bottom end. Such lateral restraint shall be provided by manufactured connectors or a minimum post embedment of 12-inches in surrounding soils or concrete as shown in Figure R507.8.2.

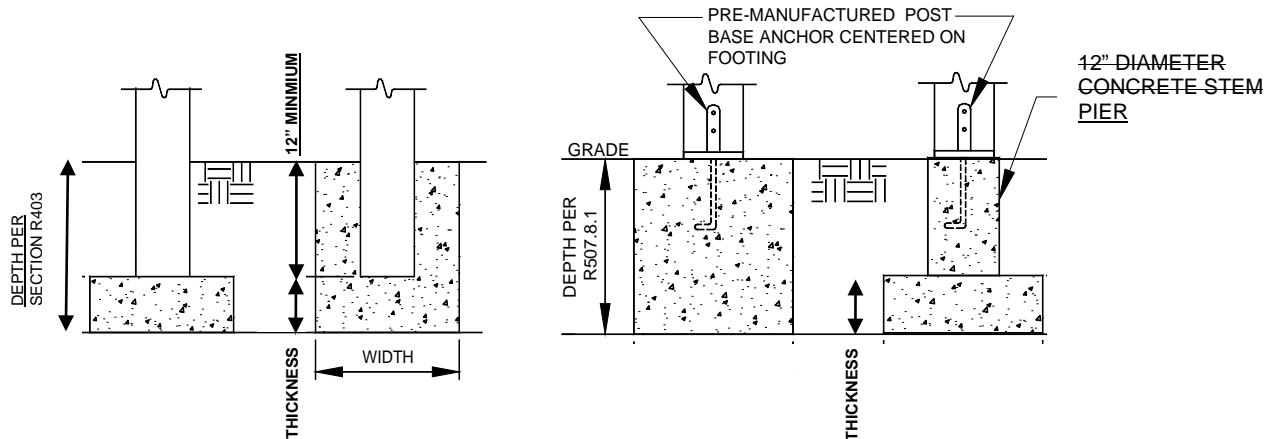


FIGURE R507.7.7-8.2
TYPICAL DECK FOOTINGS

R507.8.9 Deck ledger board connection to the building. The connection between a deck ledger board and the building shall be in accordance with this section.

R507.8.1-9.1 Deck ledger board connection to band joist. The deck ledger board shall be connected to a nominal 2-inch thick nominal lumber band joist with 1/2-inch lag screws or bolts with washers in accordance with Table R507.8.1 and Figures R507.9.1(1) and R507.9.1(2) and 2 The bolts or lag screws shall be spaced in accordance with Figure R507.8.1 (2). Table R507.9.1. As an alternative to the detail in Figure R507.8.1-9.1(2), the ledger board shall be permitted to be offset from the house band joist or exterior sheathing a maximum distance of 1/2 inch (13 mm) with the installation of stacked washers.

The exterior wall finish shall be removed prior to installation of the ledger board. Flashing at a door threshold shall be installed to prevent water intrusion from rain or melting ice and snow.

R507.8.2-9.2 Deck ledger board connection to concrete foundation walls. A ledger board shall be connected to a concrete or solid masonry foundation wall with approved ½ inch (13 mm) diameter expansion anchors at a spacing specified spaced in accordance with Table R507.8.1(1)-9.1 and as shown in Figure R507.8.2-9.2. Expansion Adhesive or mechanical A-anchors shall be installed per the manufacturer's installation instructions.

R507.8.3-9.3 Ledger board connection to hollow masonry foundation wall. A ledger board shall be connected to a hollow masonry foundation wall with approved ½ inch (13 mm) diameter epoxy anchors at a spacing specified in Table R507.8.1(1) anchors spaced in accordance with Table R507.9.1 and as shown in Figure R507.8.3-9.3. Epoxy Adhesive or mechanical anchors shall be installed per the manufacturer's installation instructions.

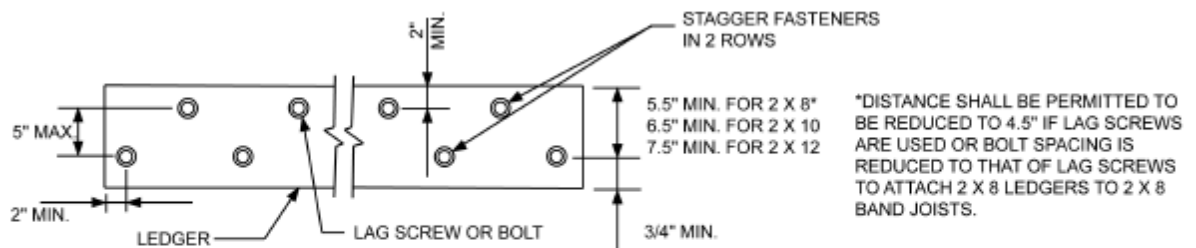
R507.8.4-9.4 Alternate connections. An approved engineered wood rim board with a minimum thickness of 1 inch (25 mm) shall be permitted to substitute for a 2x lumber band joist provided it the engineered wood rim board was designed and by the manufactured to support a deck. A ledger board attachment to a masonry or stone veneer, ribbon board of open web floor trusses, band joist of a cantilevered floor and or other conditions not addressed herein shall be designed in accordance with accepted engineering practice, or the deck shall be free-standing in accordance with Section R507.10.

**TABLE R507.8.1(1)-9.1
FASTENER SPACING**

FASTENER	BAND BOARD	JOIST SPAN						
		≤6'	> 6'-8'	> 8'-10'	> 10'-12'	> 12'-14'	> 14'-16'	> 16'-18'
½" lag screws ^a	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	30"	23"	18"	15"	13"	11"	10"
½" through bolts	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	36"	36"	34"	29"	24"	21"	19"
½" through bolts and ½" stacked washers ^b	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	36"	36"	29"	24"	21"	18"	16"
Expansion Mechanical anchors ^c	-	36"	36"	34"	29"	24"	21"	19"
Epoxy Adhesive anchors ^d	-	32"	32"	32"	24"	24"	16"	16"

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

- The tip of the lag screw shall fully extend beyond the inside face of the band board.
- The maximum gap between the face of the ledger board and face of the wall sheathing shall be ½ inches (13 mm).
- Mechanical anchors shall have a minimum allowable shear of 725 pounds, and a minimum allowable tension of 505 pounds
- Adhesive anchors shall have a minimum allowable shear of 675 pounds, and a minimum allowable tension of 505 pounds.



For SI: 1 inch = 25.4 mm.

**FIGURE R507.8.1(1) 9.1(1)
PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS-BOARDS**

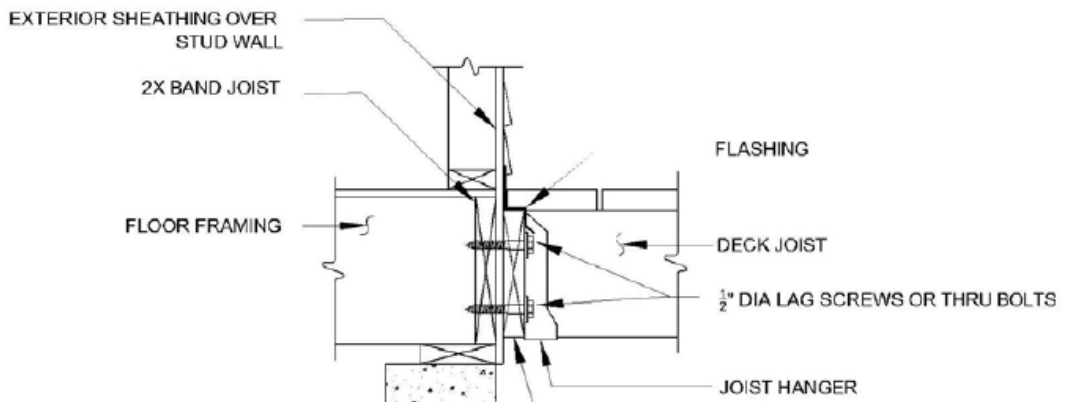


FIGURE R507.8.1(2)-9.1(2)
LEDGER BOARD TO BAND BOARD ATTACHMENT

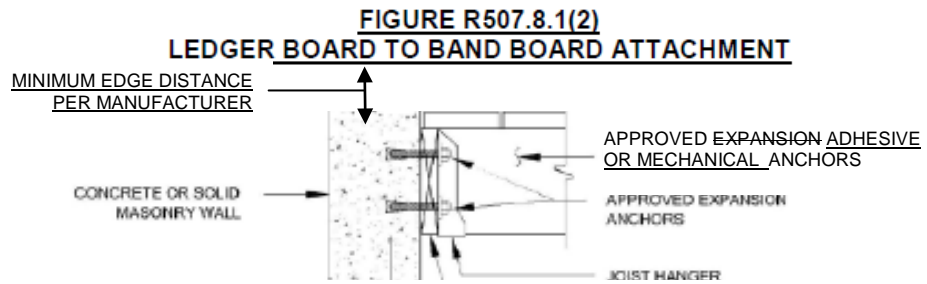


FIGURE R507.8.1(2)
LEDGER BOARD TO BAND BOARD ATTACHMENT

FIGURE R507.8.3-9.2
LEDGER BOARD TO SOLID HOLLOW-MASONRY FOUNDATION WALL ATTACHMENT

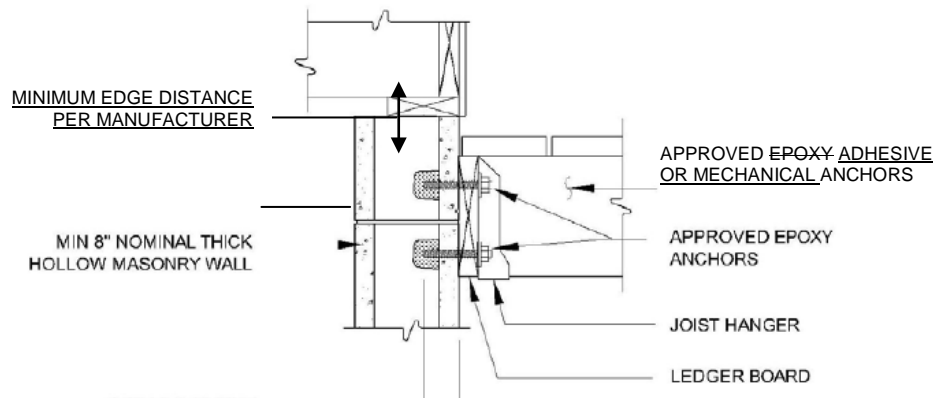
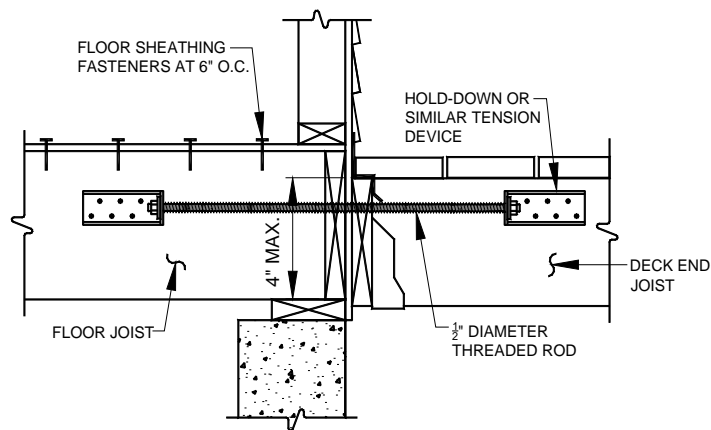


FIGURE R507.8.2-9.3
LEDGER BOARD TO SOLID HOLLOW MASONRY FOUNDATION WALL ATTACHMENT

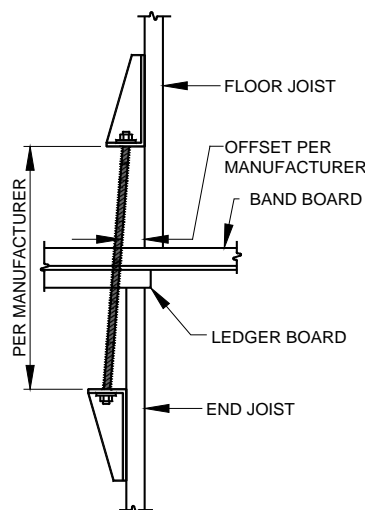
R507.9.3-9.5 Attachment to resist lateral load. A lateral load connection is required by Section R507.2. The following options connections shall be deemed to comply; other design solutions are permitted in accordance with R301.

R507.9.3-1-9.5.1 Connection at parallel joists. Where floor joists and deck joists are parallel to each other, a hold-down or similar tension device with a minimum capacity of 1,500 pounds (6672 N) at each end joist as shown in Figures R507.3.4(1) R507.9.5.1(1) and R507.9.3-9.5.1(2) shall be permitted. The hold-down device shall be located within 24 inches of each end joist. Floor sheathing to floor joists The floor sheathing fasteners shall be permitted to be substituted with two reinforcing angles with a minimum capacity of 375 pounds (1668 N) each on each side of the joist with a minimum capacity of 375 pounds (1668 N).

R507.9.3-2-9.5.2 Connection at perpendicular joists. Where the floor joists and deck joists are perpendicular to each other, provide a hold-down or similar tension device with a minimum capacity of 1,500 pounds (6672 N) at each end joist and blocking between floor joist shall be provided as shown in Figure R507.9.3-2-9.5.2. The hold-down device shall be located within 24 inches of each end joist. The floor sheathing to floor joists fasteners shall be permitted to be substituted with two reinforcing angles on each side of the joist with a minimum capacity of 375 pounds (1668 N) with a minimum capacity of 375 pounds (1668 N) each on each side of the joist.



**FIGURE R507.9.3-4(1)-9.5.1(1)
CONNECTION AT PARALLEL JOISTS**



**FIGURE R507.9.3-4(2)-9.5.1(2)
OFFSET AT PARALLEL JOISTS**

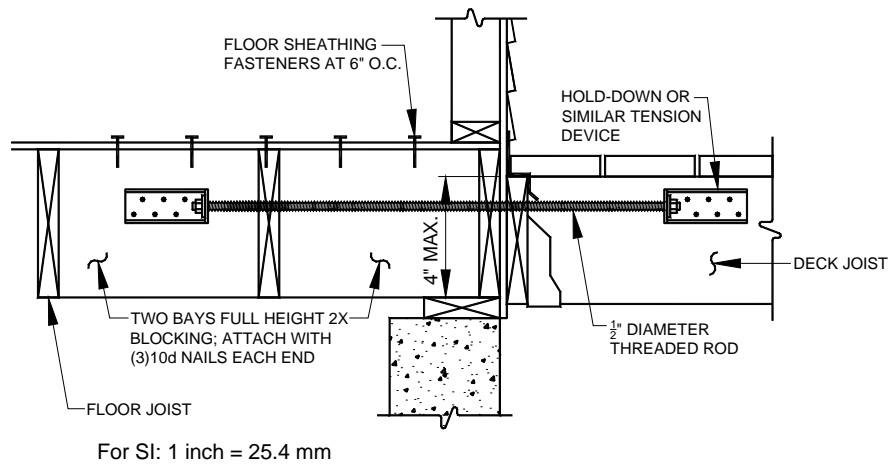


FIGURE R507.9.3.2-9.5.2
LATERAL SUPPORT WHERE INTERIOR JOIST ARE PERPENDICULAR TO DECK

R507.10 Free-standing decks. As shown in Figures R507.5 and R507.10, free-standing decks shall have an additional beam and posts adjacent the building exterior wall in place of a ledger board attachment. transfer all of the deck loads directly to the footings. The bBeams shall be sized in accordance with Section R507.6 and shall be located adjacent the exterior wall or at a maximum distance equal to the allowable joist cantilever.

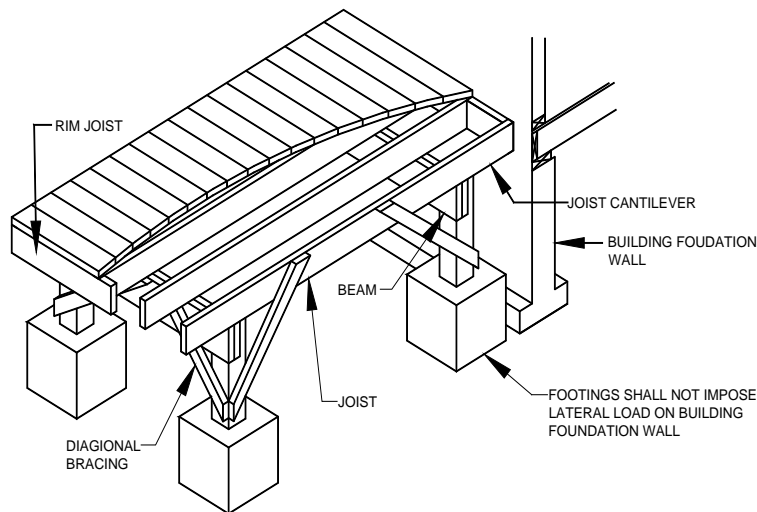
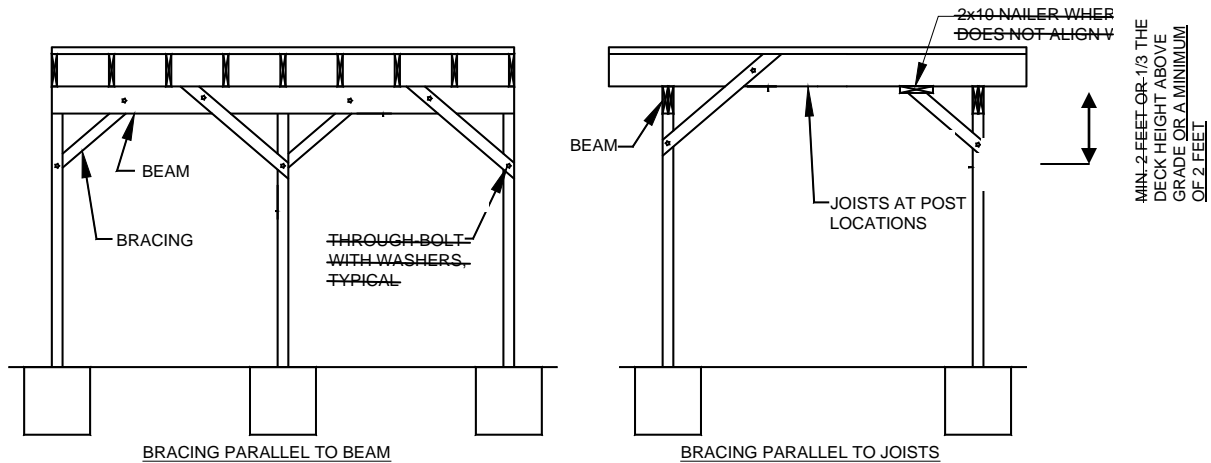


FIGURE R507.10
TYPICAL FREE-STANDING DECK

R507.10.1 Diagonal bracing. Diagonal bracing shall be installed provided in accordance with Figure R507.10.1 on free-standing decks greater than 30 inches above grade in accordance with Figure R507.10.4. Bracing shall be placed at a 45 degree angle at each post location in the parallel and perpendicular directions to the beam. Bracing shall be constructed with minimum of nominal 2x4 lumber and shall be fastened to framing with one 1/2 inch (9 mm) diameter through bolt with washers at each end or by the use of other mechanical devices. The length of the diagonal brace shall be a minimum of 2 feet long measured as shown in Figure R507.10.1 or at least 1/3 the height of the deck above grade or a minimum of 2 feet.



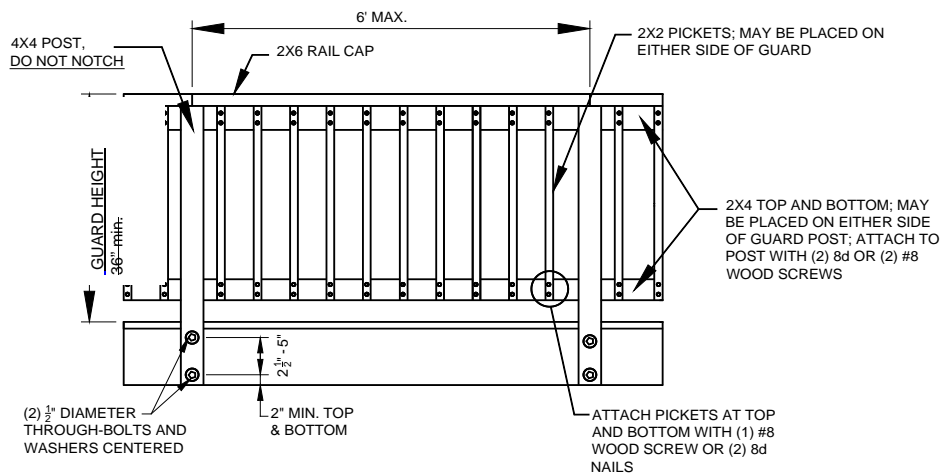
For SI: 1 foot = 304.8 mm

FIGURE R507.10.1
FREE-STANDING DECK DIAGONAL BRACING

R507.12.11 Deck guards. Deck guards shall be designed and constructed in accordance with Sections R301.5 and R312. Other materials and construction techniques details shall be permitted in accordance with Section R301. Wood deck guards shall not be notched.

R507.12.1-11.1 Guard construction. Where the guard requirements of Sections R301.5 and R312 are met using the details shown in Figures R507.12.1(1) through R507.12.1(3), Guard posts shall be attached to the inside or outside face of the rim joist or end joist as shown in Figures R507.11.1(1) through R507.11.1(3). Hold-down anchors fasteners shall have a minimum capacity of 1,800 pounds (8006 N).

R507.11.2 Guard rail construction. The guard rail cap shall be nailed to the top of the guard post with a minimum of four 16d common nails or #12 by 3" long screws, or an alternate connection that will resist 200 pounds of shear force.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

FIGURE R507.12.1(1)-11.1(1)
TYPICAL DECK GUARD

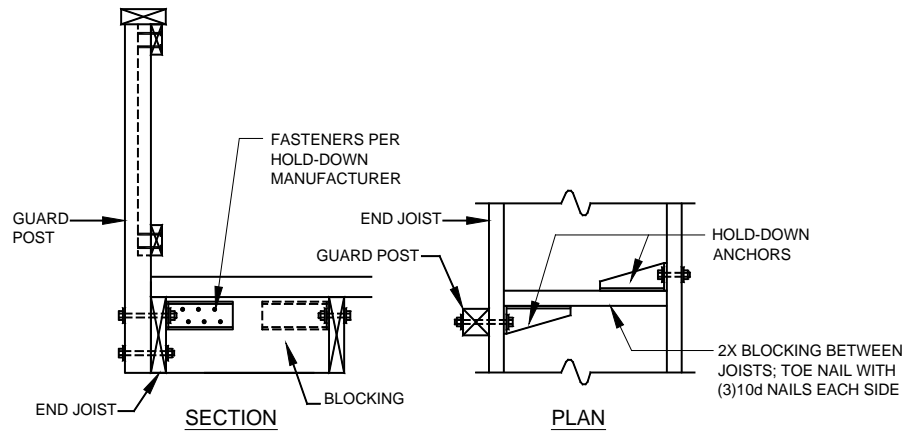


FIGURE R507.12.4(2) 11.1(2)
GUARD POST TO END JOIST CONNECTION

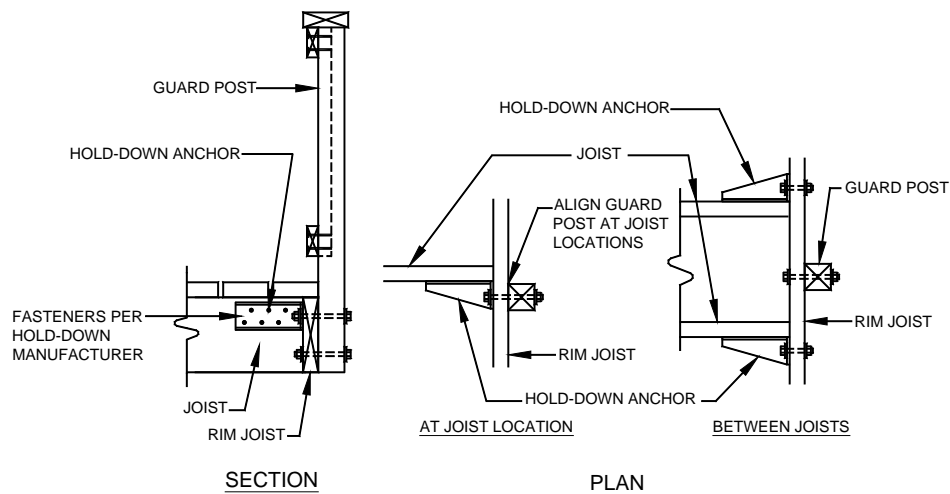
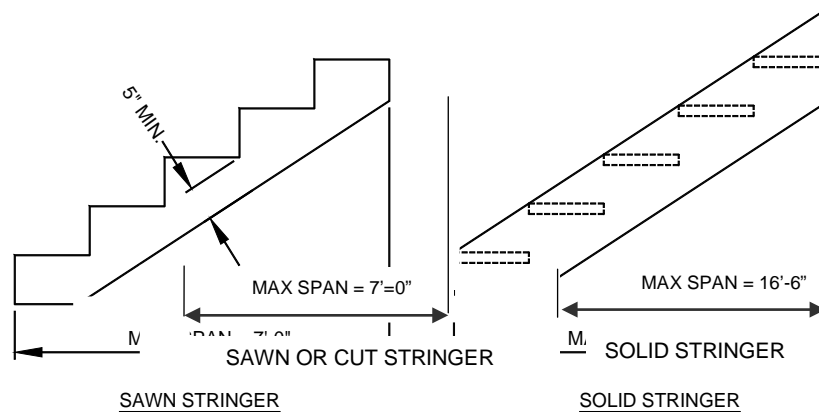


FIGURE R507.12.4(3) 11.1(3)
GUARD POST TO RIM JOIST CONNECTION

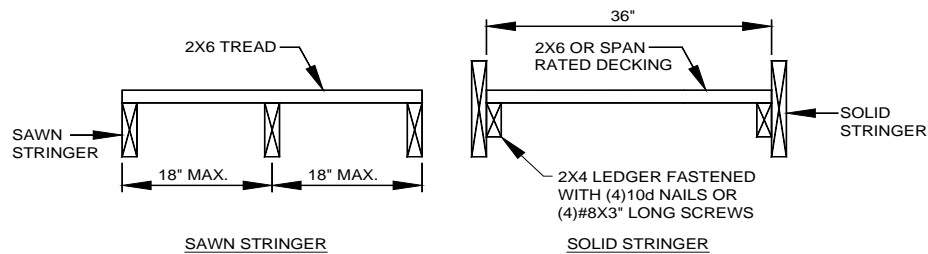
R507.13-12 Deck stairs. Deck stairs shall be constructed in accordance with this section and Section R311.7. Where a flight of stairs has a vertical rise greater than that allowed per Section R311.7.3, an intermediate landing shall be provided in accordance with Section R311.7.6 and designed as a free-standing deck in accordance with Section R507.10.

R507.13.1-12.1 Stair stringers. Stair stringers shall be constructed of sawn nominal 2x12 members at 18 inches on-center with a throat dimension of 5 inches and a maximum span length as shown in Figures R507.13.1-12.1(1) and R507.12.1(2). Stairs with a width equal to 36 inches shall be permitted to be constructed with two solid 2x12 stringers with a maximum span length as shown in Figure R507.13.1. Stringers with spans greater than those shown in Figure R507.12.1(1) shall be supported with intermediate posts and footings spaced along its length.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

**FIGURE R507.13.1 12.1(1)
STAIR STRINGER REQUIREMENTS**



For SI: 1 inch = 25.4 mm

**FIGURE R507.13.3 12.1(2)
TREAD STRINGER WIDTH REQUIREMENTS**

R507.13.2 Stringer bearing. Stringers shall be attached to posts or bear on joist hangers attached to the deck structure and on footings at grade in accordance with Figure R507.13.2. Joist hangers shall be specifically designed to accommodate sloped connections and shall have a minimum capacity of 625 pounds (2780 N). Reinforcing angles at rim joist locations only shall have a minimum capacity of 325 pounds (1446 N).

**FIGURE R507.13.2
STRINGER BEARING**

R507.13.3 12.2 Treads and risers. Stair treads shall be constructed in accordance with Section R311.7 and Figure R507.13.3 12.1(2). Treads shall be composed of nominal 2x6 lumber or plastic composites. Treads of stairs constructed with solid stringers shall be permitted to be composed of span-rated decking. Risers shall be permitted to be composed of nominal 1x lumber. Openings in risers shall not allow the passage of a 4 inch (102 mm) diameter sphere.

R507.13.4 12.3 Stair guards. Guards for stairs shall be as required per Section R312.1.1 and constructed in accordance with Section R507.12. The attachment of a stair guard post to the stringers shall be constructed in accordance with Figure R507.13.4.

**FIGURE R507.13.4
STAIR GUARD CONNECTION**

R507.13.5 12.4 Stair handrails. When required, handrails for stairs shall be as required. A stair handrail may be required per Section R311.7.8. When required and where the top guard rail does not comply with the handrail grip-size requirements in Section R311.7.8.3, a separate, conforming handrail shall be required. When a guard is required in accordance with Section R312.1.1, the top rail shall comply with the handrail grip size requirements of Section R311.7.8.3 or a separate handrail shall be provided.

R507.13.6 13 Ramps. Ramps from decks shall be as required in Section R311.8. Details for stringers, guards and handrails shall be similar to those for stairs.

Commenter's Reason: This proposal was originally submitted to address the lack of prescriptive deck construction details in the IRC. Prescriptive details are needed in the code to help the "weekend warrior" or other inexperienced builders who do not build decks on a regular basis. The construction of safe decks is an important issue that warrants inclusion in the IRC.

The committee in Dallas agreed that Section R507 was woefully deficient in providing minimum prescriptive deck criteria. This public comment integrates many comments from multiple interested parties.

Arguing in support of this proposal in Dallas, several proponents rightfully pointed out that many jurisdictions across the country have deferred to DCA6 as an acceptable guide for building decks. In the absence of IRC criteria, DCA6 was a respected alternative. This submission is based on many of the provisions in DCA6.

The opponents in Dallas argued that some of the details were different than those used in their parts of the country. They missed the opening sentences in the first section – that this proposed code change was intended to provide 1) *typical* requirements and details and 2) other materials and methods were equally acceptable. It was argued that providing minimum requirements for the average homeowner in no way was intended to stifle deck craftsmen.

Numerous examples of engineered solutions and commonly accepted details have been sent to me from many parts of the country. There are YouTube videos from well established stores, like Home Depot, that are offering "how to" videos that are teaching the average homeowner wrong ways to build decks. Some of these are so egregiously wrong that they could jeopardize life safety. In the absence of good code, the handy homeowner will resort to anything – good or bad: to paraphrase a TV commercial: "everyone knows that everything on the internet is correct"

In conclusion, there are several public comments to RB 264 and RB268 being submitted to fill the void on how to build decks safely. There is a short version, a medium length version and this more complete version. We think that less is less, and more is better. We submit this longer version because the average deck builders, plan reviewers and inspectors have nothing in the IRC to help them with a deck design. Homeowners and non-professionals need to have simple prescriptive methods for building a safe deck, and we believe this proposal provides those guidelines.

I strongly recommend that you support RB268 so that we will have prescriptive criteria in the code for building decks.

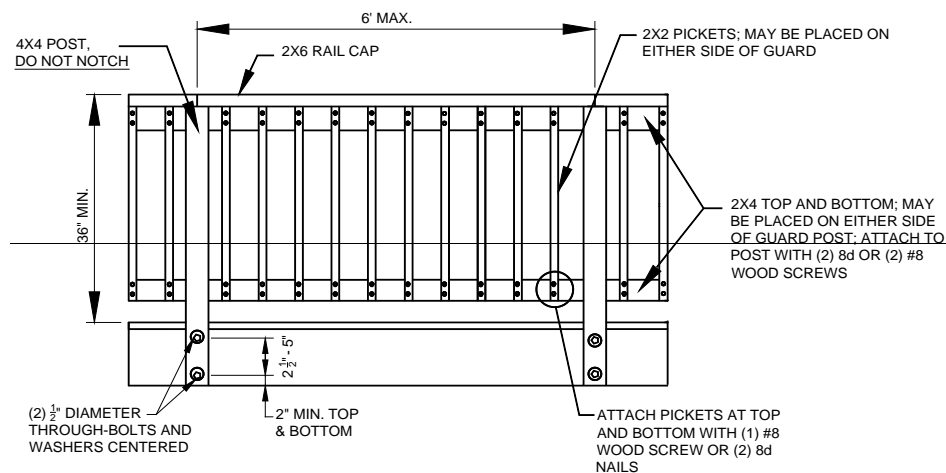
Public Comment 2:

Chuck Bajnai, Chesterfield County, VA, representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

R507.12 Deck guards. Deck guards shall be designed and constructed in accordance with Sections R301.5 and R312. ~~Other materials and construction techniques shall be permitted in accordance with Section R301.~~ Deck guards shall not be notched.

R507.12.1 Guard construction. Guard posts shall be attached to the inside or outside face of the rim joist or end as shown in Figures R507.12.1(1) through R507.12.1(3). Hold-down anchors shall have a minimum capacity of 1,800 pounds (8006 N).



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

**FIGURE R507.12.1(1)
DECK GUARD**

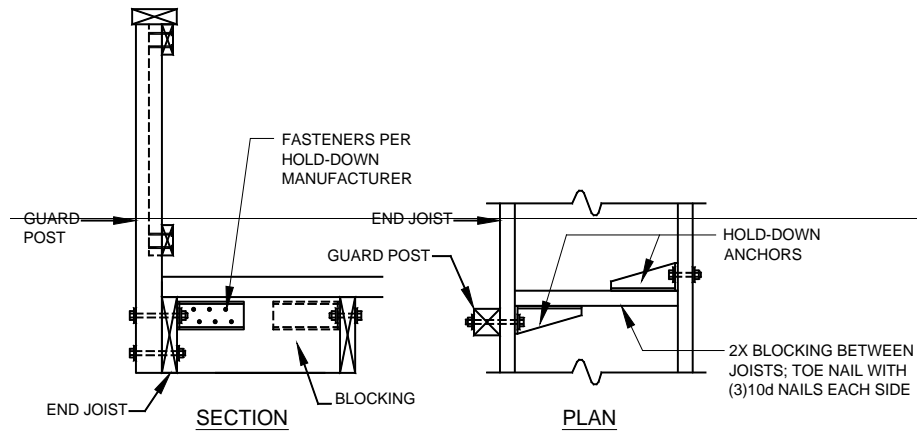


FIGURE R507.12.1(2)
GUARD POST TO END JOIST

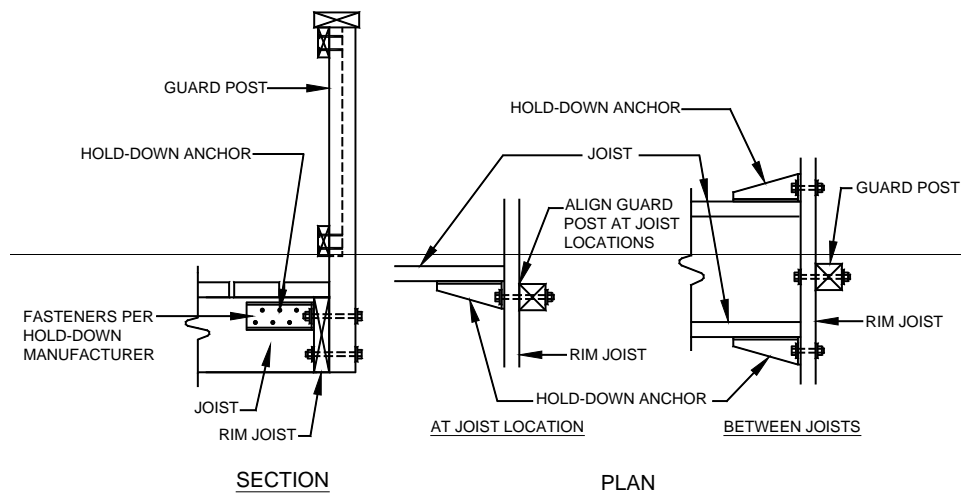


FIGURE R507.12.1(3)
GUARD POST TO RIM JOIST

Commenter's Reason: The guard post detail was created after extensive testing by Virginia Tech. The connector in the detail was the only solution they could get to pass the testing criteria for a guard rail. While other devices or details may be available, no one has provided engineering test data for any other options.

Having said that, a major objection to RB268 by the opponents was this guard-rim joist connection detail. As an effort to reach a compromise, I am requesting these details be deleted.

Public Comment 3:

John Orang, Barefoot Decks, representing self, requests Disapproval.

Commenter's Reason: We have been building decks in Colorado since 1994. During that time we have built hundreds of decks and learned a lot along the way.

When I heard of the new lateral post attachment method that is proposed for the 2015 IRC, I had to stop and take a hard look at it. We have spent several years addressing this very issue and in the past year have come up with our very own patent pending bracket that has tested very well. Our crews are very comfortable with the ease of use that this bracket offers and me. As the company owner, I am extremely happy with the stability of the rail as well as minimum deflection.

The reason I am writing a response to this hearing isn't to pitch my product but only to voice my opinion against being forced to use a product that in my opinion performs less favorably, especially when it comes to deflection. I am sure there are a variety of methods to achieve the current 500 lb safety factor and forcing one product on thousands of creative deck builders seems to go against the grain of what we are all about.

Thanks for your consideration

RB268-13

Final Action:

AS

AM

AMPC_____

D
