

Lower Swatara Township

Deck Specifications-2018 International Residential Code

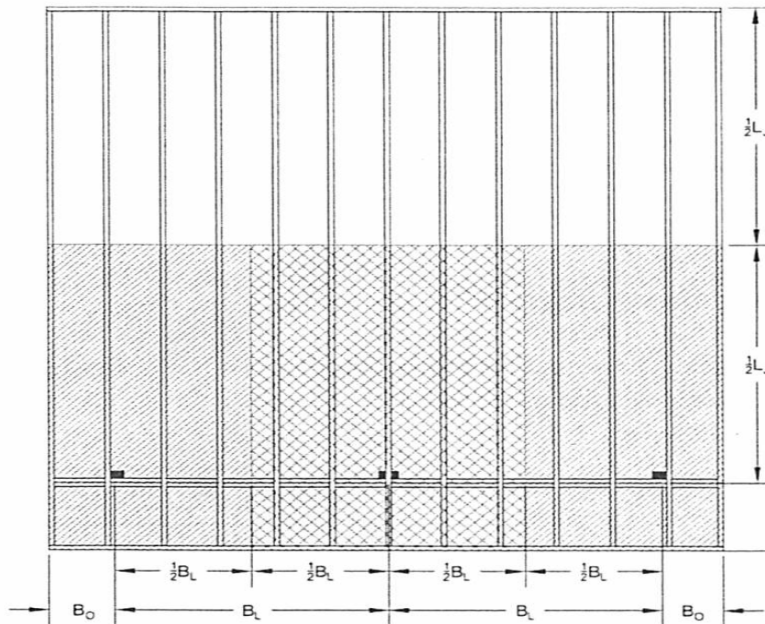
The following applies to all uncovered decks greater than 30" above grade. Covered decks regardless of height require a building and zoning permit. Provide the following information to assist with plan review. Additional information may be required after a plan review is performed. For decks at pools, show compliance with the 2018 International Swimming Pool and Spa Code.

1. Plot Plan, see attached sample plot plan. Provide height from deck boards to grade
2. Footing detail:
 - Depth of footing below grade-36" minimum required below grade.
 - Dimensions of footing
 - Footings can be sized by below perceptive method or by engineer design. Provide detail on sizing.

**TABLE R607.3.1
MINIMUM FOOTING SIZE FOR DECKS**

LIVE OR GROUND SNOW LOAD ^a (psf)	TRIBUTARY AREA (sq. ft.)	LOAD BEARING VALUE OF SOILS ^{b,c,d} (psf)											
		1500 ^a			2000 ^a			2500 ^a			≥ 3000 ^a		
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)
40	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	14	16	6	12	14	6	12	14	6	12	14	6
	60	17	19	6	15	17	6	13	15	6	12	14	6
	80	20	22	7	17	19	6	15	17	6	14	16	6
	100	22	25	8	19	21	6	17	19	6	15	17	6
	120	24	27	9	21	23	7	19	21	6	17	19	6
	140	26	29	10	22	25	8	20	23	7	18	21	6
	160	28	31	11	24	27	9	21	24	8	20	22	7

Figure B1. Examples of Tributary Areas.



Tributary Area

Since uniform loading is prescriptively set for *DCA 6*, only the area the post or footing is supporting needs to be determined. This is called the tributary area and is shown in Figure B1. Tributary area of a center or corner post can be found from Figure B1 or by using the following formulas:

$$A_{\text{Center Post}} = \left(\frac{1}{2} J_L + J_O \right) (B_L) \quad \text{Eq. B-1}$$

$$A_{\text{Corner Post}} = \left(\frac{1}{2} J_L + J_O \right) \left(\frac{1}{2} B_L + B_O \right) \quad \text{Eq. B-2}$$

A is tributary area (ft²)
 J_L is length of joist (ft)
 J_O is length of joist overhang (ft)
 B_L is the length of the beam span (ft)
 B_O is the length of the beam overhang (ft)

Joist Length, J_L

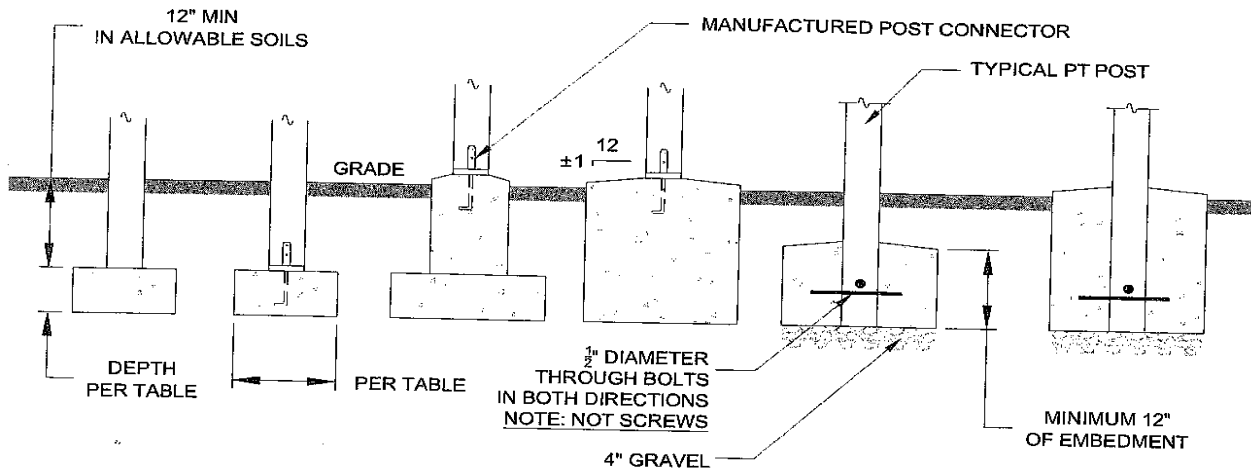
The joist length is defined differently for this appendix than the main provisions of *DCA 6*. The joist length is not the design span of the joist, but is from the ledger face to either the center point of the beam, if there is an overhang, or to the outside face of the rimboard if there is not an overhang. See Figure B2.

Joist Overhang Length, J_O

The length of the joist overhang is measure from the outside edge of the deck to the centerline of the beam. See Figure B2. If no overhang exists, zero is entered into equation B-1 or B-2 for J_O.

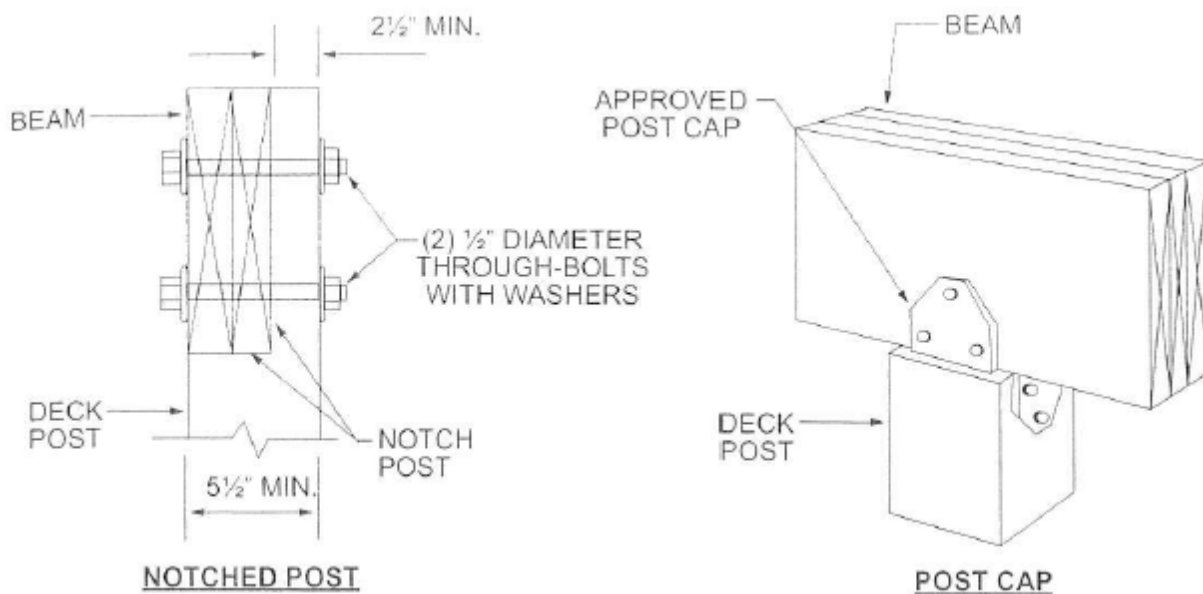
3. Post detail:

- Post Size
- Height of post to beam (max height 4x4=8', 4x6=8', 6x6 =14')
- All post buried in ground must be ground contact rated (separate from pressure treated)
- Method of attachment to footing-see illustration-connection to footing must be by mechanical fastener where not embedded by concrete or soil of at least 12"
- Spacing of post under beams-See table R507.5 on page 6



4. Beam detail:

- Size of beam See table R507.6 on page 5
- Attachment of beam to post? Required to be by mechanical fastener or notched post. If post is notched, it must be a 6x6 post-See details below



5. Joist detail:

- Size and spacing of joist-See table R507.6 on page 5
- Attachment to band board
- Attachment to beam-by hanger, approved fastener or toenail
- Cantilever detail

6. Band board detail:

- Size of lags and spacing for attachment to house. Tip of lags must extend thru inside face of band board
- Detail on lateral connections. A minimum of 2 hold down tension devices with stress design of minimum 1,500 pounds within 24" of ends of deck (Figure 2) or 4 tension devices are required having a stress design of minimum 750 pound (figure 1). Provide specs of hardware.
- Ledgers are required to be flashed.

Figure 1

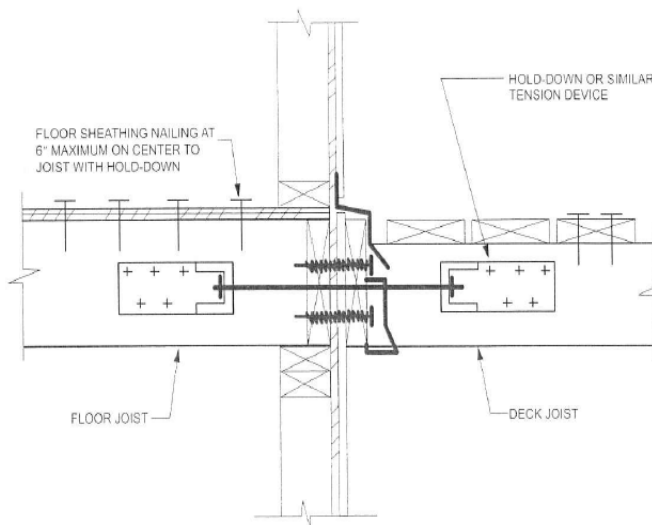
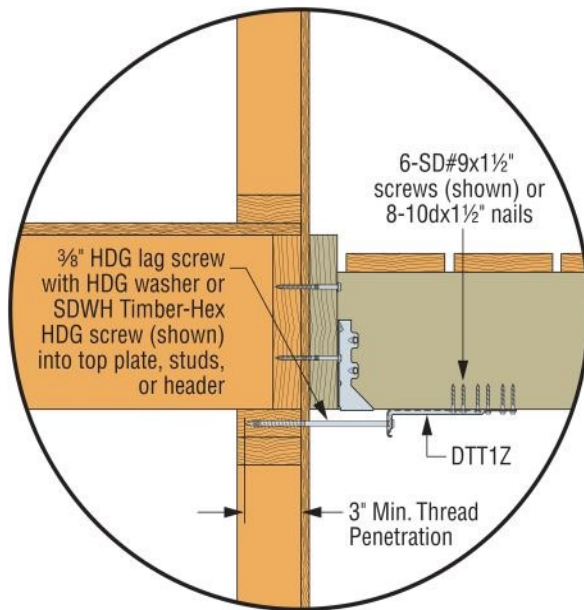
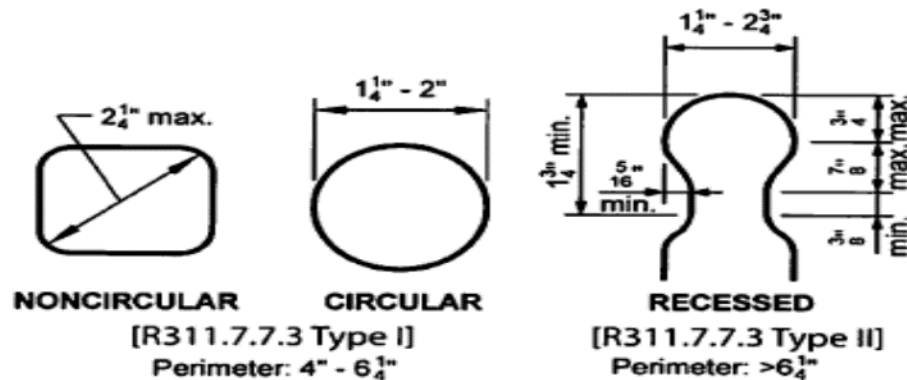


Figure 2

7. Guardrail detail: (If deck leads to a pool, it must comply with pool barrier requirements)
 - 36" minimum height, balusters max spaced 4" at deck, 4 3/8" at stairs
 - Spacing and attachment method. Must withstand 200 pounds of pressure
8. Handrail detail:
 - Size of handrail. See below for required dimensions.
 - Handrail to be full length of stairs. 34"-38" in height and must be returned.
 - If guardrail is used as handrail, it cannot be interrupted by a newel post at stairs, a continuous handrail is required. Must be able to withstand 200 pounds of applied side force



9. Stair detail: (If deck leads to a pool, it must comply with pool barrier requirements)
 - Width of stairs-3' minimum clear width (handrails can impede in clear width)
 - Rise and run of treads-maximum rise 8 $\frac{1}{4}"$, minimum tread 9"
 - Stairs to be mounted to post or footing minimum 36" below grade

TABLE R507.9.1.3(1)
DECK LEDGER CONNECTION TO BAND JOIST^{a, b}
 (Deck live load = 40 psf, deck dead load = 10 psf, snow load \leq 40 psf)

CONNECTION DETAILS	JOIST SPAN						
	6' and less	6'1" to 8'	8'1" to 10'	10'1" to 12'	12'1" to 14'	14'1" to 16'	16'1" to 18'
	On-center spacing of fasteners						
$\frac{1}{2}$ -inch diameter lag screw with $\frac{1}{2}$ -inch maximum sheathing ^{c, d}	30	23	18	15	13	11	10
$\frac{1}{2}$ -inch diameter bolt with $\frac{1}{2}$ -inch maximum sheathing ^d	36	36	34	29	24	21	19
$\frac{1}{2}$ -inch diameter bolt with 1-inch maximum sheathing ^e	36	36	29	24	21	18	16

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.

b. Snow load shall not be assumed to act concurrently with live load.

c. The tip of the lag screw shall fully extend beyond the inside face of the band joist.

d. Sheathing shall be wood structural panel or solid sawn lumber.

e. Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to $\frac{1}{2}$ -inch thickness of stacked washers shall be permitted to substitute for up to $\frac{1}{2}$ inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

**TABLE R507.6
DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft. - in.)**

SPECIES ^a	SIZE	ALLOWABLE JOIST SPAN ^b			MAXIMUM CANTILEVER ^{c,1}		
		SPACING OF DECK JOISTS (Inches)			SPACING OF DECK JOISTS WITH CANTILEVERS ^e (Inches)		
		12	16	24	12	16	24
Southern pine	2 x 6	9-11	9-0	7-7	1-3	1-4	1-6
	2 x 8	13-1	11-10	9-8	2-1	2-3	2-5
	2 x 10	16-2	14-0	11-5	3-4	3-6	2-10
	2 x 12	18-0	16-6	13-6	4-6	4-2	3-4
Douglas fir-larch ^d , hem-fir ^d , spruce-pine-fir ^d ,	2 x 6	9-6	8-8	7-2	1-2	1-3	1-5
	2 x 8	12-6	11-1	9-1	1-11	2-1	2-3
	2 x 10	15-8	13-7	11-1	3-1	3-5	2-9
	2 x 12	18-0	15-9	12-10	4-6	3-11	3-3
Redwood, western cedars, ponderosa pine ^e , red pine ^e	2 x 6	8-10	8-0	7-0	1-0	1-1	1-2
	2 x 8	11-8	10-7	8-8	1-8	1-10	2-0
	2 x 10	14-11	13-0	10-7	2-8	2-10	2-8
	2 x 12	17-5	15-1	12-4	3-10	3-9	3-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

a. No. 2 grade with wet service factor.

b. Ground snow load, live load = 40 psf, dead load = 10 psf, L/A = 360.

c. Ground snow load, live load = 40 psf, dead load = 10 psf, L/A = 360 at main span, L/A = 180 at cantilever with a 220-pound point load applied to end.

d. Includes incising factor.

e. Northern species with no incising factor.

f. Cantilevered spans not exceeding the nominal depth of the joist are permitted.

**TABLE R507.5
DECK BEAM SPAN LENGTHS^{a,b,c} (feet - inches)**

SPECIES ^a	SIZE ^a	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
		6	8	10	12	14	16	18
Southern pine	1-2 x 6	4-11	4-0	3-7	3-3	3-0	2-10	2-8
	1-2 x 8	5-11	5-1	4-7	4-2	2-10	3-7	3-5
	1-2 x 10	7-0	6-0	5-5	4-11	4-7	4-3	4-0
	1-2 x 12	8-3	7-1	6-4	5-10	5-5	5-0	4-9
	2-2 x 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0
	2-2 x 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0
	2-2 x 10	10-4	9-0	8-0	7-4	6-9	6-4	6-0
	2-2 x 12	12-2	10-7	9-5	8-7	8-0	7-6	7-0
	3-2 x 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
	3-2 x 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
Douglas fir-larch ^d , hem-fir ^d , spruce-pine-fir ^d , redwood, western cedars, ponderosa pine ^e , red pine ^e	3-2 x 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6
	3-2 x 12	15-3	13-3	11-10	10-9	10-0	9-4	8-10
	3 x 6 or 2-2 x 6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	3 x 8 or 2-2 x 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3 x 10 or 2-2 x 10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3 x 12 or 2-2 x 12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4 x 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4 x 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4 x 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4 x 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3-2 x 6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3-2 x 8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	3-2 x 10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3-2 x 12	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, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

a. Ground snow load, live load = 40 psf, dead load = 10 psf, L/A = 360 at main span, L/A = 180 at cantilever with a 220-pound point load applied at the end.

b. Beams supporting deck joists from one side only.

c. No. 2 grade, wet service factor.

d. Beam depth shall be greater than or equal to depth of joists with a finish beam condition.

e. Includes incising factor.

f. Northern species. Incising factor not included.

g. Beam cantilevers are limited to the adjacent beam's span divided by 4.