AMERICAN WOOD COUNCIL

May 2013

ADDENDUM

to the *2009 IRC* version of *Design for Code Acceptance No. 6 (DCA 6)* *Prescriptive Residential Wood Deck Construction Guide*

Effective June 1, 2013, design values for all grades and sizes of visually-graded Southern Pine and Mixed Southern Pine lumber, 2"- 4" thick will change. New tables and other criteria to use with DCA 6-09 are shown below (spans and other criteria that will change on June 1, 2013 are shown as underlined).

Table 2. Maximum Joist Spans (L_J)

		Joist Spacing (o.c.)					
		Without Overhangs[1]			With Overhangs up to $L_J/4$[2]		
Species	Size	12"	16"	24"	12"	16"	24"
Southern Pine	2x8	~~13' - 8"~~ 13' - 1"	~~12' - 5"~~ 11' - 10"	~~10' - 2"~~ 9' - 8"	~~10' - 9"~~ 10' - 1"	~~10' - 9"~~ 10' - 1"	~~10' - 2"~~ 9' - 8"
	2x10	~~17' - 5"~~ 16' - 2"	~~15' - 10"~~ 14' - 0"	~~13' - 1"~~ 11' - 5"	~~15' - 6"~~ 14' - 6"	~~15' - 6"~~ 14' - 0"	~~13' - 1"~~ 11' - 5"
	2x12	18' - 0"	~~18' - 0"~~ 16' - 6"	~~15' - 5"~~ 13' - 6"	18' - 0"	~~18' - 0"~~ 16' - 6"	~~15' - 5"~~ 13' - 6"
Douglas Fir-Larch, Hem-Fir, SPF[3]	2x8	12' - 6"	11' - 1"	9' - 1"	9' - 5"	9' - 5"	9' - 1"
	2x10	15' - 8"	13' - 7"	11' - 1"	13' - 7"	13' - 7"	11' - 1"
	2x12	18' - 0"	15' - 9"	12' - 10"	18' - 0"	15' - 9"	12' -10"
Redwood, Western Cedars, Ponderosa Pine[4], Red Pine[4]	2x8	11' - 8"	10' - 7"	8' - 8"	8' - 6"	8' - 6"	8' - 6"
	2x10	14' - 11"	13' - 0"	10' - 7"	12' - 3"	12' - 3"	10' - 7"
	2x12	17' - 5"	15' - 1"	12' - 4"	16' - 5"	15' - 1"	12' - 4"

1. Assumes 40 psf live load, 10 psf dead load, L/360 deflection, No. 2 grade, and wet service conditions. See Figure 1B.
2. Assumes 40 psf live load, 10 psf dead load, L/180 cantilever deflection with 220 lb point load, No. 2 grade, and wet service conditions. See Figure 1A and Figure 2.
3. Incising assumed for refractory species including Douglas fir-larch, hem-fir, and spruce-pine-fir.
4. Design values based on northern species with no incising assumed.

Table 3. Deck Beam Spans (L_B)[1] for Joists Framing from One Side Only

Species	Size[4]	Joist Spans (L_J) Less Than or Equal to: 6'	8'	10'	12'	14'	16'	18'
Southern Pine	2-2x6	~~7' - 1"~~ 6' - 11"	~~6' - 2"~~ 5' - 11"	~~5' - 6"~~ 5' - 4"	~~5' - 0"~~ 4' - 10"	~~4' - 8"~~ 4' - 6"	~~4' - 4"~~ 4' - 3"	~~4' - 1"~~ 4' - 0"
	2-2x8	~~9' - 2"~~ 8' - 9"	~~7' - 11"~~ 7' - 7"	~~7' - 1"~~ 6' - 9"	~~6' - 6"~~ 6' - 2"	~~6' - 0"~~ 5' - 9"	~~5' - 7"~~ 5' - 4"	~~5' - 3"~~ 5' - 0"
	2-2x10	~~11' - 10"~~ 10' - 4"	~~10' - 3"~~ 9' - 0"	~~9' - 2"~~ 8' - 0"	~~8' - 5"~~ 7' - 4"	~~7' - 9"~~ 6' - 9"	~~7' - 3"~~ 6' - 4"	~~6' - 10"~~ 6' - 0"
	2-2x12	~~13' - 11"~~ 12' - 2"	~~12' - 0"~~ 10' - 7"	~~10' - 9"~~ 9' - 5"	~~9' - 10"~~ 8' - 7"	~~9' - 1"~~ 8' - 0"	~~8' - 6"~~ 7' - 6"	~~8' - 0"~~ 7' - 0"
	3-2x6	~~8' - 7"~~ 8' - 2"	~~7' - 8"~~ 7' - 5"	~~6' - 11"~~ 6' - 8"	~~6' - 3"~~ 6' - 1"	~~5' - 10"~~ 5' - 8"	~~5' - 5"~~ 5' - 3"	~~5' - 2"~~ 5' - 0"
	3-2x8	~~11' - 4"~~ 10' - 10"	~~9' - 11"~~ 9' - 6"	~~8' - 11"~~ 8' - 6"	~~8' - 1"~~ 7' - 9"	~~7' - 6"~~ 7' - 2"	~~7' - 0"~~ 6' - 8"	~~6' - 7"~~ 6' - 4"
	3-2x10	~~14' - 5"~~ 13' - 0"	~~12' - 10"~~ 11' - 3"	~~11' - 6"~~ 10' - 0"	~~10' - 6"~~ 9' - 2"	~~9' - 9"~~ 8' - 6"	~~9' - 1"~~ 7' - 11"	~~8' - 7"~~ 7' - 6"
	3-2x12	~~17' - 5"~~ 15' - 3"	~~15' - 1"~~ 13' - 3"	~~13' - 6"~~ 11' - 10"	~~12' - 4"~~ 10' - 9"	~~11' - 5"~~ 10' - 0"	~~10' - 8"~~ 9' - 4"	~~10' - 1"~~ 8' - 10"
Douglas Fir-Larch[2], Hem-Fir[2], SPF[2], Redwood, Western Cedars, Ponderosa Pine[3], Red Pine[3]	3x6 or 2-2x6	5' - 5"	4' - 8"	4' - 2"	3' - 10"	3' - 6"	3' - 1"	2' - 9"
	3x8 or 2-2x8	6' - 10"	5' - 11"	5' - 4"	4' - 10"	4' - 6"	4' - 1"	3' - 8"
	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"

Table 3A: Joist Hanger Download Capacity

Joist Size	Minimum Capacity, lbs
2x8	~~600~~ 500
2x10	~~700~~ 600
2x12	~~800~~ 700

Figure 28: Stair Stringer Requirements

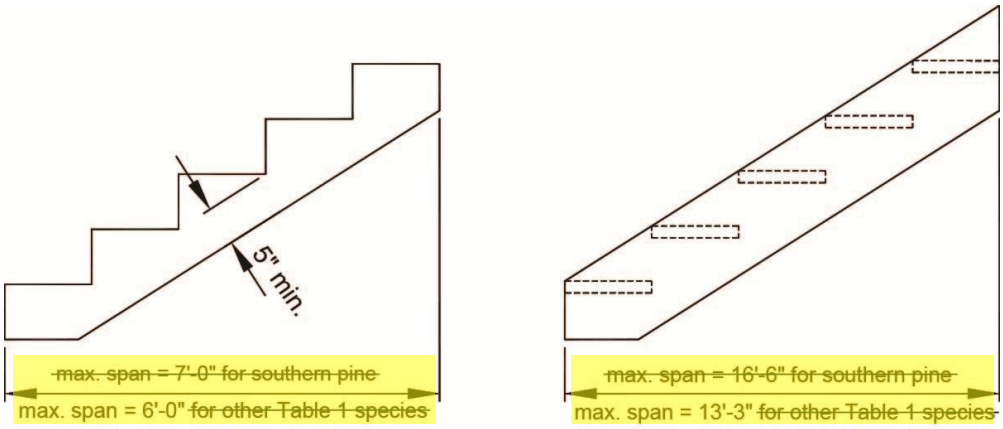

Table 6: Minimum Tread Size for Cut and Solid Stringers[1]

Species	Cut Stringer	Solid Stringer
Southern Pine	2x4 or 5/4	~~2x6~~ 2x8
Douglas Fir Larch, Hem-Fir, SPF[2]	2x4 or 5/4	2x8 or 3x4
Redwood, Western Cedars, Ponderosa Pine[3], Red Pine[3]	2x4 or 5/4	2x10 or 3x4

1. Assumes 300 lb concentrated load, L/288 deflection limit, No. 2 grade, and wet service conditions.
2. Incising assumed for refractory species including Douglas fir-larch, hem-fir, and spruce-pine-fir.
3. Design values based on northern species with no incising assumed.

Commentary page C5

JOIST HANGERS

The loads listed in the Table 3A are derived from the worst case condition for each joist size based on Table 2 (~~508 lbs, 654 lbs, and 771 lbs~~ 483 lbs, 570 lbs, and 675 lbs for southern pine at 24" o.c. for 2x8, 2x10, and 2x12, respectively). For simple span applications without overhangs, as shown in Table 2, note that spans are identical to those shown in Table 2 with overhangs for southern pine joists at 24" o.c., therefore the same joist hanger capacities as shown in Table 3A will work for spans with or without overhangs.

Commentary page C6

POST REQUIREMENTS

Assuming that identical species will be used for joists and beams, an analysis of Table 3 reveals that a maximum tributary area of approximately ~~81~~ 71 ft^2 will result if southern pine is used (see calculations under FOOTINGS for L_J = 18'-0" and L_B = ~~8'-0"~~ 7'-0" for 2-2x12). This results in a load on the post of ~~4,061~~ 3,562 lbs. A 4x4 southern pine No. 2 post 10' in height would work in this situation (assuming pinned end fixity). Similarly, for other Table 3 species, assuming joists and beams are the same species, a maximum

post load of 3,717 lbs is calculated. A 4x4 No. 2 post 8' in height will work in this case (western cedar controls). If different species are used for joists than are used for beams, an analysis is required to determine the maximum tributary area on the post.

Commentary page C10

STAIR REQUIREMENTS

Additionally, *IRC* Table R301.5 footnote (c) requires a 300 lb concentrated load check on stair treads. Analysis revealed that 2x6 No. 2 ~~southern pine works~~ treads do not work for a 34.5" span (36" – ¾" bearing at each end) when the 300 lbs is distributed across 2 inches (e.g. 150 pli). This is based on L/288 deflection criteria (ICC ES Acceptance Criteria 174 requires $^1/_8$" deflection limit: 36"/0.125" = 288). ~~Other species will not calculate for that span using 2x6.~~

STAIR FOOTING REQUIREMENTS

Stair stringers should be supported by bearing at the end where the stairway meets grade. The detail shown assumes a 40 psf live load and 10 psf dead load over a tributary area of 18" and one-half of the maximum span permitted for solid stringers (~~16'-6" for southern pine and~~ 13'-3" for ~~other~~ all species). This calculates to ~~625 lbs and~~ 500 lbs ~~respectively~~. ~~For southern pine, seven #8 wood screws would be required.~~ Northern species would require eight #8 wood screws (16d box or common nails would be comparable).

Commentary page C11

Table C7a. Maximum Distance "a" from Trimmer Joist End to a Point where a 6' Header Frames into a 2-ply Trimmer Joist.

Species	Trimmer Size	a_{max}
Southern Pine	2-2x8	~~18"~~ 17"
	2-2x10	~~24"~~ 19"
	2-2x12	~~29"~~ 22"
Douglas Fir-Larch, Hem-Fir, SPF[1]	2-2x8	14"
	2-2x10	16"
	2-2x12	19"
Redwood, Western Cedars, Ponderosa Pine[2], Red Pine[2]	2-2x8	14"
	2-2x10	16"
	2-2x12	18"

1. Incising assumed for refractory species including Douglas fir-larch, hem-fir, and spruce-pine-fir.
2. Design values based on northern species with no incising assumed.

Commentary page C12

3) Assume a 2x12 southern pine joist spanning 18'-0" at 16" o.c. (per Table 2) framing around a 5' wide by 1.5' deep bay window. Set a 6' header ~~2'~~ 20" from the end of the trimmer joist. A double trimmer joist is permitted since a = ~~24"~~ 20" which is less than a_{max} = ~~29"~~ 22" in Table C7a. However, if the trimmer hanger does not attach through the ledger to the rim board or band joist, the trimmer joist span is limited to 11'-2" per Table C7b. Several solutions exist:

- Reduce all joist spans to 11'-2".
- Place a post under the center of the header to reduce the header span.