

REVIEW MATERIALS

Course 18129 Deck Code Changes – Part 1

6 Hours of Continuing Education



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This Handout is intended for use as a reference guide to our Deck Code Changes Course.
Contact Kevin Wunderlin LLC, 608-348-6688, if you have questions or comments.

Deck Code Changes – Part 1
Wisconsin Department of Safety and Professional Services
Course Identification Number: 18129
Education Credit: 6 Hours

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Course Type: Continuing Education
Dwelling Contractor Qualifier
UDC-Construction Inspector

This course (6 hour Continuing Education) is Part 1 of the Deck Code changes and is designed to familiarize Contractors and Inspectors with the amendments to the deck codes required for building and remodeling decks, according to the Uniform Dwelling Code (UDC).

This course is a distance learning or e-learning course, which allows the attendee to complete the course on their time schedule.

EXAM : 180 questions related to the Reference Materials are used to test the attendee on their comprehension of the materials. A 70% score will need to be attained in order to pass this course.

The course attendee will receive the materials by one of the following delivery methods:

Online: The attendee will receive an email with the instructions and a link to the online course. The Reference/Instructional Materials and Exam will be available after registration is complete. The exam can be completed from the computer screen by use of “radio buttons”. Answers are automatically saved. Reentry is done by the use of a personalized “resume code”. Once the exam has been completed it is submitted. Grading will be done automatically by the computer program. The score and correct and incorrect answers are shown immediately.

Email: All materials are sent via email in PDF form to the attendees email address. The PDF documents can be saved to a file on the computer or they can be printed out. A bubble answer sheet needs to be printed; filled in and returned to us for grading.

Compact Disc: All PDF files are burned to a compact disc and sent to the attendee. The attendee has a choice of saving the PDF's to his/her computer desktop, just opening the files and working off the CD or printing the materials. A bubble answer sheet needs to be printed; filled in and returned to us for grading.

Printed: The Instructional/Reference Materials and Exam is sent in booklet form to the attendees' home or office. The bubble answer sheet is completed and returned to us for grading.

Topics covered in this course include General Requirements, Footings and Post Connections, Posts and Post-to-Beam Connections, Beams, Joists, and Joist-to-Beam Connections.

Outline of Course:

1. Amendments to Deck Code
 - SPS 321.225 –Decks
 - SPS 321.24 (3)(d)8 and 'Note'

2. Chapters SPS 325 APPENDIX B
 1. General Requirements
 2. Footings, and Post Connections
 3. Posts and Post-to-Beam Connections
 4. Beams
 5. Joists
 6. Joist-to-Beam Connections

**This Course has been approved by the Wisconsin Department
of Safety and Professional Services for the following
Certifications, Registrations or License.**

***Effective October 15, 2010 you may not retake the same
training session for credit more than once during the 1, 2 or 4
year term of a specific credential. You may take the same
course in a different education cycle.***

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Course: 18129 DECK CODE CHANGES PART 1

This course is valid for these credentials:

Credential Description	Cred Code	Credit Hours
Dwelling Contractor Qualifier	DCQ	6.0
UDC-Construction Inspector	UCI	6.0

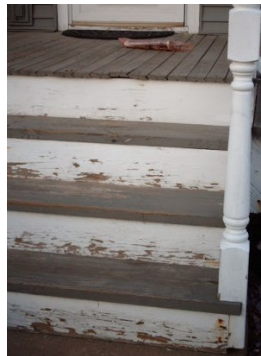
Amendments to Deck Code

SPS 321.225 Decks.

(1) Decks attached to dwellings and any detached decks that serve an exit shall comply with the applicable provisions of subchs. [II](#) to [X](#) of ch. [SPS 321](#), including all of the following:



- (a) Excavation requirements under s. [SPS 321.14](#);
- (b) Footing requirements under s. [SPS 321.15 \(2\) \(f\)](#);
- (c) Frost penetration requirements under s. [SPS 321.16](#);
- (d) Load requirements under s. [SPS 321.02](#);
- (e) Stair, handrail and guard requirements of s. [SPS 321.04](#).
- (f) Decay protection requirements of s. [SPS 321.10](#).



(2) A deck that complies with the standards in ch. [SPS 325 Appendix B](#), and ch. [SPS 325 Appendix C](#), if applicable, shall be considered as complying with sub. (1).

History: Cr. [Register, March, 1992, No. 435](#), eff. 4-1-92; correction in (1) to (6) made under s. [13.92 \(4\) \(b\) 7.](#), Stats., [Register December 2011 No. 672](#); [CR 15-043](#); **Renum. to (1) and am., cr. (2) [Register December 2015 No. 720](#), eff. 1-1-16.**

SPS 321.24 (3)(d)8 and 'Note' are created to read: Along the bottom of door openings that are elevated above-grade.

Note: Flashing placed along the bottom of a door opening that is elevated above-grade can subsequently accommodate adding a deck outside the door.

Chapters SPS 320 to 325

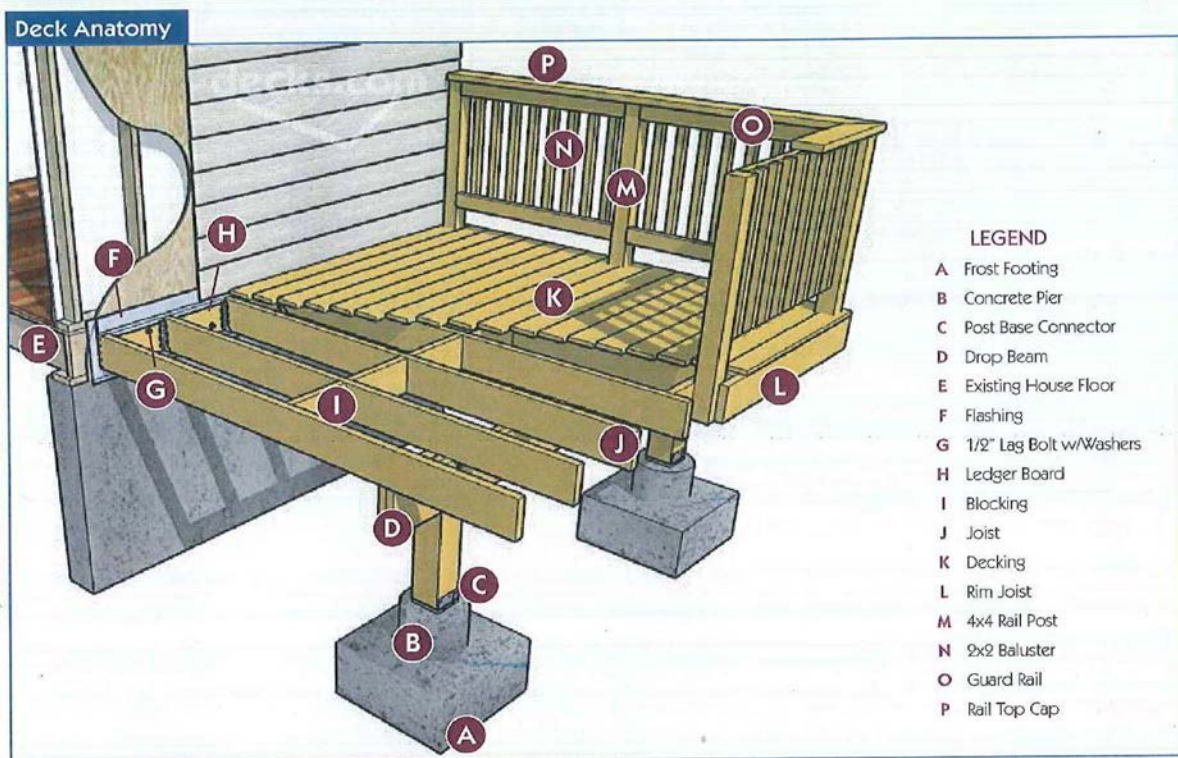
APPENDIX B

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SECTION 1: GENERAL REQUIREMENTS

1. All lumber, including for decking, must be pressure-preservative-treated and must be either douglas fir/larch, hemlock/fir, spruce/pine/fir (SPF), or southern pine, of grade #2 or better – unless a naturally durable species such as a western red cedar is used. Lumber in contact with the ground must be rated as “ground-contact.” The lumber must be identified by the grade mark of, or certificate of inspection issued by, a professional lumber-grading or inspection bureau or agency (www.alsc.org).

Note: Not all treated lumber is rated for ground contact. See Table C-1 in Appendix C for further information.



2. Wood-plastic composites must bear a label indicating their performance criteria and compliance with ASTM D7032.

- Note:** Wood-plastic composites are materials composed of wood fibers or powder that is bound with plastic and used typically as decking and elements of a guard or handrail.
- Note:** When using a wood-plastic composite, exercise caution as some composite members do not have the same capabilities as their equivalent wood sizes.
3. Nails must be threaded, which includes ring-shanked (annular-grooved) and spiral-grooved.
Note: A 1/8 inch pilot hole is recommended for all toe-nailing locations.
 4. All fasteners must be galvanized steel, stainless steel, or approved for use with preservative-treated lumber.
 5. Throughout this document, 1/2 inch-diameter bolts and lag screws are specified for various connections. Edge distance and spacing requirements are based on 1/2 inch-diameter fasteners. If larger (or smaller) fasteners are specified, edge distance and spacing need to be adjusted.
 6. Carriage-bolts may be substituted where through-bolts are specified, if carriage-bolt washers are installed at the bolt head.
Note: Carriage-bolt washers have square holes.
 7. Hardware, including joist hangers or post anchors, must be galvanized steel with 1.85 ounces of zinc per square foot (G-185 coating), or stainless steel. All fasteners that are used with any hardware must be the same material as the hardware. All hardware must be installed in accordance with any instructions from the manufacturer.
Note: For galvanized steel, look for product lines such as "Zmax," "Triple Zinc," or "Gold Coat."
Note: Galvanized steel is not compatible with stainless steel, which can result in rapid corrosion and structural failure.
Note: Hardware and fasteners that are beneath a hot tub which uses salt-water disinfection should be stainless steel, grade 304 or 316.
 8. Every deck must have an electrical outlet along the perimeter of the deck and within 6.5 feet of the floor in accordance with NEC section 210.52(E)(3). See ch. [SPS 316](#) of the Wisconsin Administrative Code for requirements about installing electrical wiring.
 9. A deck constructed in accordance with these standards is not approved for concentrated loads that exceed 40 pounds per square foot (psf), such as from privacy screens, planters, built-in seating, hot tubs, stairs for multiple-level decks, or from snow-drift loads or sliding-snow loads. Engineering analysis is needed for these loads.
Note: See Appendix C for features of a deck which are somewhat uncommon or which have more complexity than is addressed in this Appendix – such as design values for joists consisting of western cedar or red pine, framing details around chimneys and bay windows, or ledger boards for metal-plate-connected wood floor trusses. Appendix C also includes reference material, such as more-detailed specifications for fasteners.
 10. Specifications for fasteners and hardware. All nails must meet the requirements of ASTM F1667. Wood screws must meet the requirements of ANSI/ASME B18.6.1. Bolts and lag screws must meet the requirements of ANSI/ASME B18.2.1.
Fasteners to be hot-dipped galvanized must meet the requirements of ASTM A153, *Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*, Class D for fasteners 3/8" diameter and smaller or Class C for fasteners with diameters over 3/8".
Fasteners other than nails and timber rivets may consist of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B695, Class 55, minimum.
Hardware to be hot-dipped prior to fabrication must meet ASTM A653, *Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process*, G-185 coating.
Hardware to be hot-dipped galvanized after fabrication must meet ASTM A123, *Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products*.
 11. Safety glazing at decks shall be in accordance with the safety glazing requirements of the Uniform Dwelling Code (UDC).

SECTION 2: FOOTINGS, AND POST CONNECTIONS

Footings must comply with all of the following:

1. Concrete must be used and must have a minimum compressive strength of 3,000 pounds per square inch.

2. Footing size and thickness must be in accordance with Table 1. (See sections 4 and 5 for determining post spacing and joist length.)
3. Post attachments must be in accordance with Figure 1 except expansion anchors are also permitted – and any instructions from the manufacturer of the anchor must be followed.
4. Post anchors must include a 1–inch–minimum base plate. Steel plates are not required.
5. Each post must bear directly over the middle one–third of a footing.
6. Footings must bear on solid ground below the frost penetration level or at least 48 inches below finished grade, whichever is deeper. Bearing onto unprepared fill material, organic soil, alluvial soil, or mud is prohibited. The bearing capacity of the soil is presumed to be at least 2000 pounds per square foot (psf), and must be verified by a building inspector prior to placement of concrete.
7. If the edge of a deck footing is closer than 5 feet to an existing house wall, the footing must bear at the same elevation as the existing footing for that wall.
8. Construction of footings over utility lines or any service pipe is prohibited.

Note: Call the utility provider before digging.

Table 1
FOOTING SIZE (In Inches)^{1,2,3}

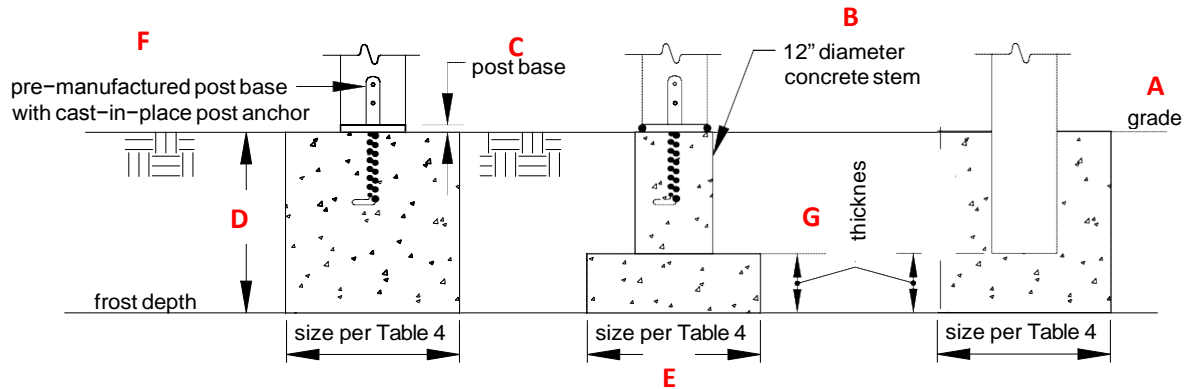
Joist Length		Post Spacing (Measured Center to Center)										
		4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
6'	Corner Footing	8	9	10	11	11	12	12	13	14	14	15
	Intermediate Footing	10	11	12	13	14	15	15	16	17	17	18
	Footing Thickness	6	6	6	6	6	6	6	6	6	6	8
7'	Corner Footing	9	10	11	11	12	13	13	14	15	15	16
	Intermediate Footing	11	12	13	14	15	16	17	17	18	19	19
	Footing Thickness	6	6	6	6	6	6	6	6	8	8	8
8'	Corner Footing	10	10	11	12	13	14	14	15	15	16	17
	Intermediate Footing	12	13	14	15	16	17	18	19	19	20	21
	Footing Thickness	6	6	6	6	6	6	8	8	8	8	8
9'	Corner Footing	10	11	12	13	14	14	15	16	16	17	18
	Intermediate Footing	12	14	15	16	17	18	19	20	20	21	22
	Footing Thickness	6	6	6	6	6	8	8	8	8	8	8
10'	Corner Footing	10	12	12	13	14	15	16	16	17	18	18
	Intermediate Footing	13	14	15	17	18	19	20	21	21	22	23
	Footing Thickness	6	6	6	6	8	8	8	8	8	8	10
11'	Corner Footing	11	12	13	14	15	16	16	17	18	19	19
	Intermediate Footing	13	15	16	17	19	20	21	22	22	23	24
	Footing Thickness	6	6	6	6	8	8	8	8	8	10	10
12'	Corner Footing	11	12	14	15	15	16	17	18	19	19	20
	Intermediate Footing	14	15	17	18	19	20	21	22	23	24	25
	Footing Thickness	6	6	6	8	8	8	8	8	10	10	10
13'	Corner Footing	12	13	14	15	16	17	18	19	19	20	21
	Intermediate Footing	14	16	17	19	20	21	22	23	24	25	26
	Footing Thickness	6	6	6	8	8	8	8	10	10	10	10
14'	Corner Footing	12	13	15	16	17	18	18	19	20	21	22
	Intermediate Footing	15	17	18	19	21	22	23	24	25	26	27
	Footing Thickness	6	6	8	8	8	8	10	10	10	10	10
15'	Corner Footing	12	14	15	16	17	18	19	20	21	22	22
	Intermediate Footing	15	17	19	20	21	23	24	25	26	27	28
	Footing Thickness	6	6	8	8	8	10	10	10	10	10	12
16'	Corner Footing	13	14	15	17	18	19	20	20	21	22	23
	Intermediate Footing	16	18	19	21	22	23	25	26	27	28	29
	Footing Thickness	6	8	8	8	8	10	10	10	10	12	12

¹All footing sizes are base diameters².

²For square footings, insert the diameter (d) into the following formula: $\sqrt{((d/2)^2 \times \pi)}$. This number will give you the square dimension and must be rounded up to the nearest inch.

³Joist length is the joist span plus any overhang beyond a beam. See section 5.4.

Figure 1
FOOTINGS



SECTION 3: POSTS AND POST-TO-BEAM CONNECTIONS

Posts must comply with all of the following:

1. The post height, measured from the top of the footing to the underside of the beam, must be in accordance with Table 2.

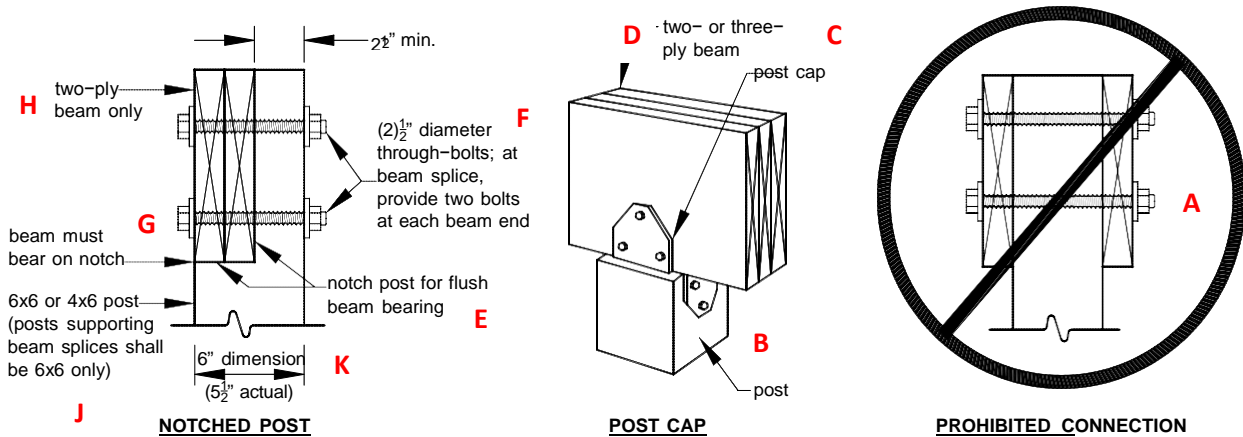
Table 2
MAXIMUM POST HEIGHT

Post Size	Maximum Height
4"x4"	6'
4"x6"	8'
6"x6"	14'

2. Any post supporting a beam splice must be a minimum of 6"x6".
3. Beams must be attached to posts by the appropriate methods shown in Figure 2. Toe-nailing of beams to posts is prohibited.
4. Post caps, as shown in Figure 2, must be specifically designed for 2- or 3-ply beams and the post size used. Attachment must be in accordance with the manufacturer's instructions.
5. It is recommended that cut-ends of posts should be field-treated with a wood preservative. These preservatives can be found in the paint department of most hardware or home-center stores.

Figure 2

POST-TO-BEAM CONNECTIONS

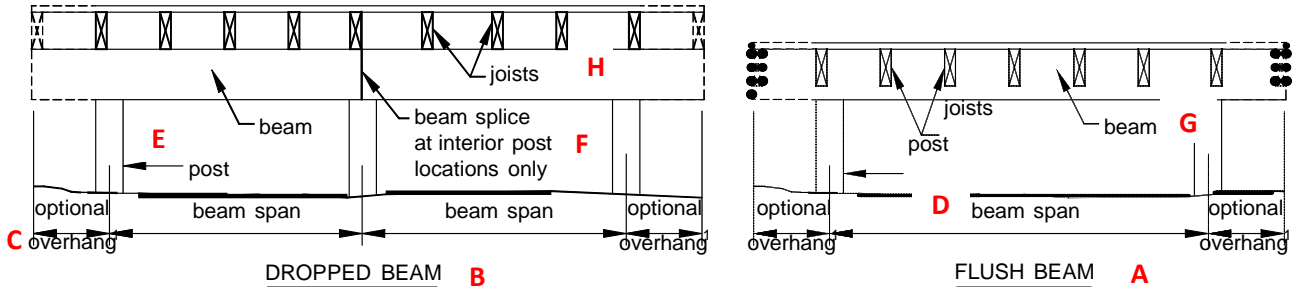


SECTION 4: BEAMS

Beams must comply with all of the following:

1. As shown in Figure 3, the beam-span length is measured between the centerlines of 2 adjacent posts and does not include the overhangs.
2. Beam size is determined using Table 3A or 3B. The depth of flush beams must be greater than or equal to the joist depth.
3. Beams may overhang past the center of the post up to one-fourth of the actual beam span, as shown in Figure 3.
4. Where multiple 2x members are used to assemble a beam, the plies of the beam must be fastened in accordance with Figure 4.
5. Pressure-preservative-treated glulam beams are permissible for spans longer than those shown in Table 3. However, a design and plan submission is required during the permit application process.

**Figure 3
BEAM TYPES**



¹The maximum length of the overhang is equal to one-fourth of the actual beam span length (0.25 x beam span).

**Table 3A
MAXIMUM BEAM-SPAN LENGTH¹ FOR DOUGLAS FIR/LARCH³, HEM/FIR³, SPRUCE/PINE/FIR
(SPF)³, WESTERN CEDAR, PONDEROSA PINE⁴, AND RED PINE⁴**

Joist Span	(Number of Plies) Beam Size ² – Inches											
	3x6 (2)2x6	3x8 (2)2x8	3x10 (2)2x10	3x12 (2)2x12	4x6	4x8	4x10	4x12	(3)2x6	(3)2x8	(3)2x10	(3)2x12
≤ 6'	5'-5"	6'-10"	8'-4"	9'-8"	6'-5"	8'-5"	9'-11"	11'-5"	7'-4"	9'-8"	12'-0"	13'-11"
≤ 8'	4'-8"	5'-11"	7'-3"	8'-5"	5'-6"	7'-3"	8'-7"	9'-11"	6'-8"	8'-6"	10'-5"	12'-1"
≤ 10'	4'-2"	5'-4"	6'-6"	7'-6"	4'-11"	6'-6"	7'-8"	8'-10"	6'-0"	7'-7"	9'-4"	10'-9"
≤ 12'	3'-10"	4'-10"	5'-11"	6'-10"	4'-6"	5'-11"	7'-0"	8'-1"	5'-6"	6'-11"	8'-6"	9'-10"
≤ 14'	3'-6"	4'-6"	5'-6"	6'-4"	4'-2"	5'-6"	6'-6"	7'-6"	5'-1"	6'-5"	7'-10"	9'-1"
≤ 16'	3'-1"	4'-1"	5'-1"	5'-11"	3'-11"	5'-2"	6'-1"	7'-0"	4'-9"	6'-0"	7'-4"	8'-6"
≤ 18'	2'-9"	3'-8"	4'-8"	5'-7"	3'-8"	4'-10"	5'-8"	6'-7"	4'-6"	5'-8"	6'-11"	8'-1"

¹Spans are based on 40 psf live load, 10 psf dead load, normal loading duration, wet service conditions, and deflections of $\Delta = L/360$ for main span and $L/180$ for overhang with a 220 lb. point load.

²Beam depth must be equal to or greater than joist depth if joist hangers are used (see Figure 8, Option 3).

³Incising is assumed.

⁴Design values based on northern species with no incising assumed.

Table 3B
MAXIMUM BEAM-SPAN LENGTH FOR SOUTHERN PINE¹

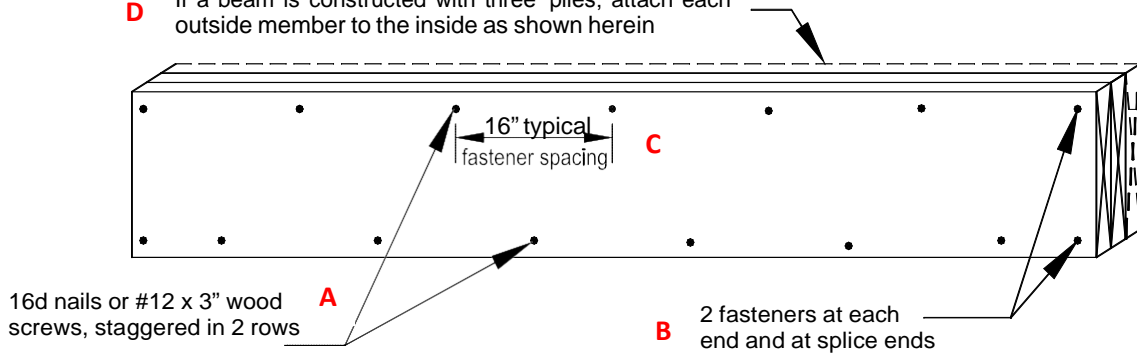
Joist Span	(Number of Plies) Beam Size ² – Inches							
	(2) 2x6	(2) 2x8	(2) 2x10	(2) 2x12	(3) 2x6	(3) 2x8	(3) 2x10	(3) 2x12
≤ 6'	6'-11"	8'-9"	10'-4"	12'-2"	8'-2"	10'-10"	13'-0"	15'-3"
≤ 8'	5'-11"	7'-7"	9'-0"	10'-7"	7'-5"	9'-6"	11'-3"	13'-3"
≤ 10'	5'-4"	6'-9"	8'-0"	9'-5"	6'-8"	8'-6"	10'-0"	11'-10"
≤ 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"

¹Spans are based on 40 psf live load, 10 psf dead load, normal loading duration, wet service conditions, and deflections of $\Delta = L/360$ for main span and $L/180$ for overhang with a 220 lb. point load.

²Beam depth must be equal to or greater than joist depth if joist hangers are used (see Figure 8, Option 3).

Figure 4
BEAM ASSEMBLY

D If a beam is constructed with three-plies, attach each outside member to the inside as shown herein

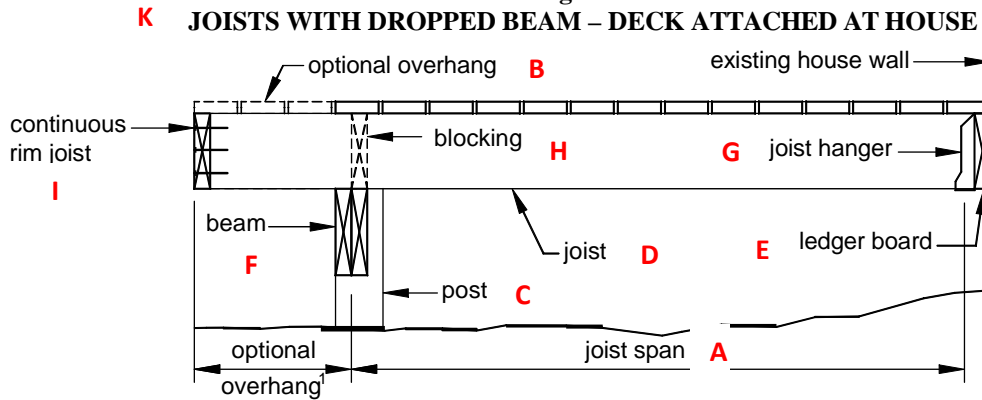


SECTION 5: JOISTS

Joists must comply with all of the following:

1. The joist-span length is measured between the centerline of bearing at each joist-span end and does not include the overhangs. Use Table 4 to determine the joist size based on span length and joist spacing. See section 12.4 for limits on joist spacing if the decking consists of a wood-plastic composite.
2. See Figures 5 through 7 for joist-span types.
3. Joists must bear at least 3 inches nominal onto beams, unless joist hangers are used in accordance with section 7.
4. Joists may overhang past the center of the beam up to one-fourth of the actual joist span.
5. Provide full-depth blocking or bridging for 2"x10" or deeper joists at intervals not exceeding 8 feet – except the blocking can be reduced to 60% of the height if placed above a beam, for drainage purposes. Attach the blocking or bridging with (3)10d toe-nails at each end.
6. Attach a continuous rim joist as shown in Figures 5 and 7 unless blocking or bridging is provided for each joist at the beam where a joist overhang begins. Attach the rim joist to the end of each joist with (3)10d nails or (3)#10 by 3-inch wood screws.

Figure 5



¹The maximum length of the overhang is equal to one-fourth of the actual joist span length (0.25 x joist span).

Figure 6

JOISTS WITH FLUSH BEAM – DECK ATTACHED AT HOUSE

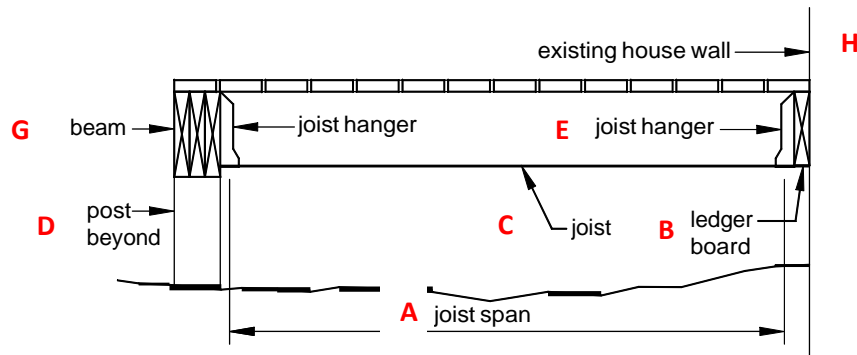
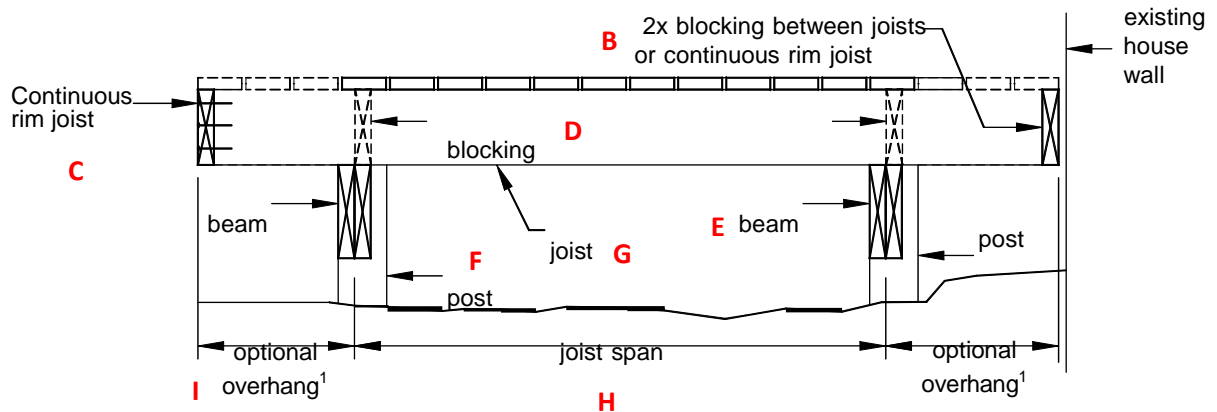


Figure 7

A JOISTS WITH TWO DROPPED BEAMS/FREE-STANDING DECK

(See section 10 for more information.)



¹The maximum length of the overhang is equal to one-fourth of the actual joist span length (0.25 x joist span).

Table 4
MAXIMUM JOIST-SPAN LENGTH¹

Joist Spacing (on center)	Joist Size	Douglas Fir/Larch, Hem/Fir, SPF ²		Southern Pine	
		Without Overhang	With Over- hangs	Without Overhang	With Over- hangs
12"	2"x6"	9'-1"	8'-1"	9'-6"	8'-7"
	2"x8"	12'-6"	9'-5"	13'-1"	10'-1"
	2"x10"	15'-8"	13'-7"	16'-2"	14'-6"
	2"x12"	18'-0"	18'-0"	18'-0"	18'-0"
16"	2"x6"	8'-3"	8'-0"	8'-7"	8'-7"
	2"x8"	11'-1"	9'-5"	11'-10"	10'-1"
	2"x10"	13'-7"	13'-7"	14'-0"	14'-0"
	2"x12"	15'-9"	15'-9"	16'-6"	16'-6"
24"	2"x6"	6'-9"	6'-9"	7'-6"	7'-6"
	2"x8"	9'-1"	9'-1"	9'-8"	9'-8"
	2"x10"	11'-1"	11'-1"	11'-5"	11'-5"
	2"x12"	12'-10"	12'-10"	13'-6"	13'-6"

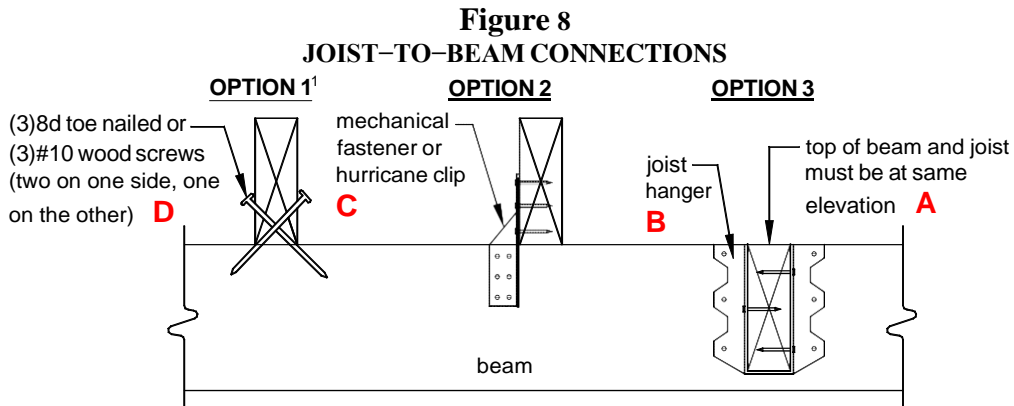
¹Spans are based on 40 psf live load, 10 psf dead load, normal loading duration, wet service conditions, and deflections of $\Delta = L/360$ for main span and $L/180$ for overhang with a 220 lb. point load.

²Incising is assumed.

SECTION 6: JOIST – TO – BEAM CONNECTIONS

Joists must be attached to beams in accordance with Figure 8 and all of the following:

1. Use Options 1 or 2 if joists bear on a dropped beam.
2. Use Option 3 if joists bear at a flush beam; see section 7 for hanger requirements.
3. Mechanical fasteners or hurricane clips must have a minimum capacity of 100 pounds in both uplift and lateral directions. Installation must be in accordance with the manufacturer's instructions.



¹Option 1 is not allowed on free-standing decks.