



Town of Liberty
Building Department
120 North Main Street
Liberty, New York 12754
(845) 292-8511

Form # 3-W

Owner: _____ Reviewed by: _____
 Location: _____ Date: _____

Residential Code of New York
WOOD FRAME CONSTRUCTION PLAN REVIEW
FOR DECK AND/OR DECK WITH ROOF

Please go to the following link <http://publicecodes.citation.com/st/ny/st/b400v07/index.htm> to find
 the applicable code referred to in each item below.

	ITEM	CODE SECTION	REQUIRED	ACTUAL								
1	<u>Wood Floor Framing</u> <u>Chapter 5</u>	<u>Section 502</u>	<u>Joist material</u> <u>Size and spacing</u>									
	<u>Minimum live loads</u>	<u>Table 301.5</u> <u>Footnote h</u>	<table border="0"> <tr> <td><u>Sleeping</u></td> <td style="text-align: center;"><u>30 psf</u></td> </tr> <tr> <td><u>Other rooms</u></td> <td style="text-align: center;"><u>40 psf</u></td> </tr> <tr> <td><u>Decks</u></td> <td style="text-align: center;"><u>40 psf</u></td> </tr> <tr> <td><u>Attic, fixed stair</u></td> <td style="text-align: center;"><u>30 psf</u></td> </tr> </table>	<u>Sleeping</u>	<u>30 psf</u>	<u>Other rooms</u>	<u>40 psf</u>	<u>Decks</u>	<u>40 psf</u>	<u>Attic, fixed stair</u>	<u>30 psf</u>	
<u>Sleeping</u>	<u>30 psf</u>											
<u>Other rooms</u>	<u>40 psf</u>											
<u>Decks</u>	<u>40 psf</u>											
<u>Attic, fixed stair</u>	<u>30 psf</u>											
	<u>Floor Framing Materials</u> <u>Dimension Lumber</u> <u>Pressure treated</u> <u>I-joist, Glue lam</u> <u>Trusses</u>	<u>502.1</u> <u>R319</u> <u>Manufact'r Instr'ns</u> <u>R502.11</u>	<u>Species and Grade</u> <u>Designed system</u> <u>Certificate</u>									
	<u>Floor Joist Spans</u> <u>10 psf Dead Load Limit</u> <u>Girder Spans</u>	<u>Table R502.3.1(2)</u> <u>R502.3</u> <u>Tables R502.5.1(1)</u> <u>through R502.5.1(2)</u>										

	<u>Joist Framing Details</u> <u>Min. Bearing</u> <u>Lateral restraint</u> <u>Drilling/Notching</u> <u>Fasteners</u>	<u>R502.6</u> <u>R502.7</u> <u>Joist > 1x12</u> <u>Fig. R502.8</u> <u>R502.9</u> <u>Table R602.3(1)</u>	<u>Min 1 ½" on wood</u> <u>3" on conc/masonry</u> <u>Block at ends</u> <u>Bridging @ 8'</u>	
	<u>Floor Sheathing</u> <u>Panel spans</u>	<u>R503</u> <u>Tab R503.2.1.1(1)</u>		

	<u>ITEM</u>	<u>CODE SECTION</u>	<u>REQUIRED</u>	<u>ACTUAL</u>
2	<u>Wood Wall Framing</u> <u>Chapter 6</u>	<u>Section 602</u>	<u>Stud material</u> <u>Size and spacing</u>	
	<u>Framing Materials</u> <u>Dimension Lumber</u>	<u>602.2</u>	<u>Min #3, stud grade</u>	
	<u>Headers - Span Tables</u> <u>Exterior bearing</u> <u>Interior bearing</u> <u>Box header span</u>	<u>R602.7</u> <u>Tab R502.5(1)</u> <u>Tab R 502.5(2)</u> <u>Tab R602.7.2</u> <u>Fig. R602.7.2</u>		

	<u>ITEM</u>	<u>CODE SECTION</u>	<u>REQUIRED</u>	<u>ACTUAL</u>
3				

	<u>ITEM</u>	<u>CODE SECTION</u>	<u>REQUIRED</u>	<u>ACTUAL</u>
4	<u>Roof/Ceiling Framing</u> <u>Chapter 8</u>	<u>Section 802</u> <u>Table 301.2(1)</u>	<u>Rafter material</u> <u>Size and spacing</u> <u>Joist material</u> <u>Size and spacing</u> <u>Ground snow load</u>	
	<u>Design and construction</u> <u>Prescriptive</u> <u>Designed</u> <u>Truss construction</u>	<u>R802.2</u> <u>Fig R606.10(1), (2)</u> <u>and (3)</u> <u>AFPA/NDS and</u> <u>ASCE 7</u> <u>R802.10</u>		
	<u>Framing Details</u> <u>Ridge support</u> <u>Joist/Rafter connection</u> <u>Ceiling joists connection</u> <u>Ceiling joist lapped</u> <u>Min. Bearing</u> <u>Drilling/Notching</u> <u>Lateral restraint</u> <u>Openings</u>	<u>R802.3</u> <u>Tab R802.5.1(9)</u> <u>R802.3.1</u> <u>R802.3.2</u> <u>R802.6</u> <u>R802.7</u> <u>R802.8</u> <u>R802.9</u> <u>Header span > 4'</u> <u>Header span > 6'</u> <u>Tail joist > 12</u>	<u>Ridge board or gusset</u> <u>Continuous wall tie</u> <u>Min 1 1/2" on wood</u> <u>3" on conc/masonry</u> <u>>2x10 Block at bearing</u> <u>>2x12 Bridging @ 8'</u> <u>Double header & trimmer</u> <u>Hangers for header</u> <u>Framing anchor or ledger</u>	
	<u>Allowable Ceiling Spans</u> <u>Without storage</u> <u>With limited storage</u> <u>With fixed stair</u>	<u>R802.4</u> <u>Tab 802.4(1)</u> <u>Tab 802.4(2)</u> <u>Tab 502.3.1(1)</u>		
	<u>Allowable Rafter Spans</u> <u>Roof live load</u>	<u>Tab 802.5.1(1)</u> <u>Tab 802.5.1(2)</u>		

**TABLE R301.2(1)
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA**

GROUND SNOWLOAD ^k	WIND SPEED ^e (mph)	SEISMIC DESIGN CATEGORY ^g	SUBJECT TO DAMAGE FROM				WINTER DESIGN TEMP ^f	ICE SHIELD UNDER-LAYMENT REQUIRED ⁱ	FLOOD HAZARDS ^h	AIR FREEZING INDEX ^j
			Weathering ^a	Frost line depth ^b	Termite ^c	Decay ^d				
	90		Severe	48	Slight to Moderate	6	24			

For SI: 1 pound per square foot = 0.0479 kN/m², 1 mile per hour = 1.609 km/h.

Sullivan	Winter Design	Summer Design	Coincident	Heating	
	Dry-Bulb Temp.	Dry-Bulb Temp.	Dry-Bulb Temp.	Degree Days	Zone
	6	83	73	6750	15

a. Weathering may require a higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code. The weathering column shall be filled in with the weathering index (i.e., “negligible,” “moderate” or “severe”) for concrete as determined from the Weathering Probability Map [Figure R301.2(3)]. The grade of masonry units shall be determined from ASTM C 34, C 55, C 62, C 73, C 90, C 129, C 145, C 216 or C 652.

b. The jurisdiction shall fill in the frost line depth column with the minimum depth of footing below finish grade.

c. The jurisdiction shall fill in this part of the table with “very heavy,” “moderate to heavy,” “slight to moderate,” or “none to slight” in accordance with Figure R301.2(6) depending on whether there has been a history of local damage.

d. The jurisdiction shall fill in this part of the table with “moderate to severe,” “slight to moderate,” or “none to slight” in accordance with Figure R301.2(7) depending on whether there has been a history of local damage.

e. The jurisdiction shall fill in this part of the table with the wind speed from the basic wind speed map [Figure R301.2(4)]. Wind exposure category shall be determined on a site-specific basis in accordance with Section R301.2.1.4.

f. The jurisdiction shall fill in this part of the table with the “Winter Design Dry-Bulb Temperature” determined from Table N1101.2.

g. The jurisdiction shall fill in this part of the table with the Seismic Design Category determined from Section R301.2.2.1.

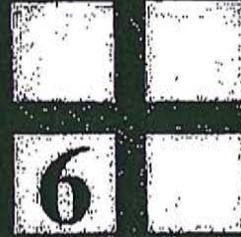
h. The jurisdiction shall fill in this part of the table with (a) the date of the jurisdiction’s entry into the National Flood Insurance Program (date of adoption of the first code or ordinance for management of flood hazard areas), (b) the date(s) of the currently effective FIRMA and FBFM, or other flood hazard map adopted by the community, as may be amended.

i. In accordance with Sections R905.2.7.1, R905.4.3, R905.5.3, R905.6.3, R905.7.3 and R905.8.3, for areas where the average daily temperature in January is 25°F (-4°C) or less, or where there has been a history of local damage from the effects of ice damming, the jurisdiction shall fill in this part of the table with “YES.” Otherwise, the jurisdiction shall fill in this part of the table with “NO.”

j. The jurisdiction shall fill in this part of the table with the 100-year return period air freezing index (BF-days) from Table R403.3(1).

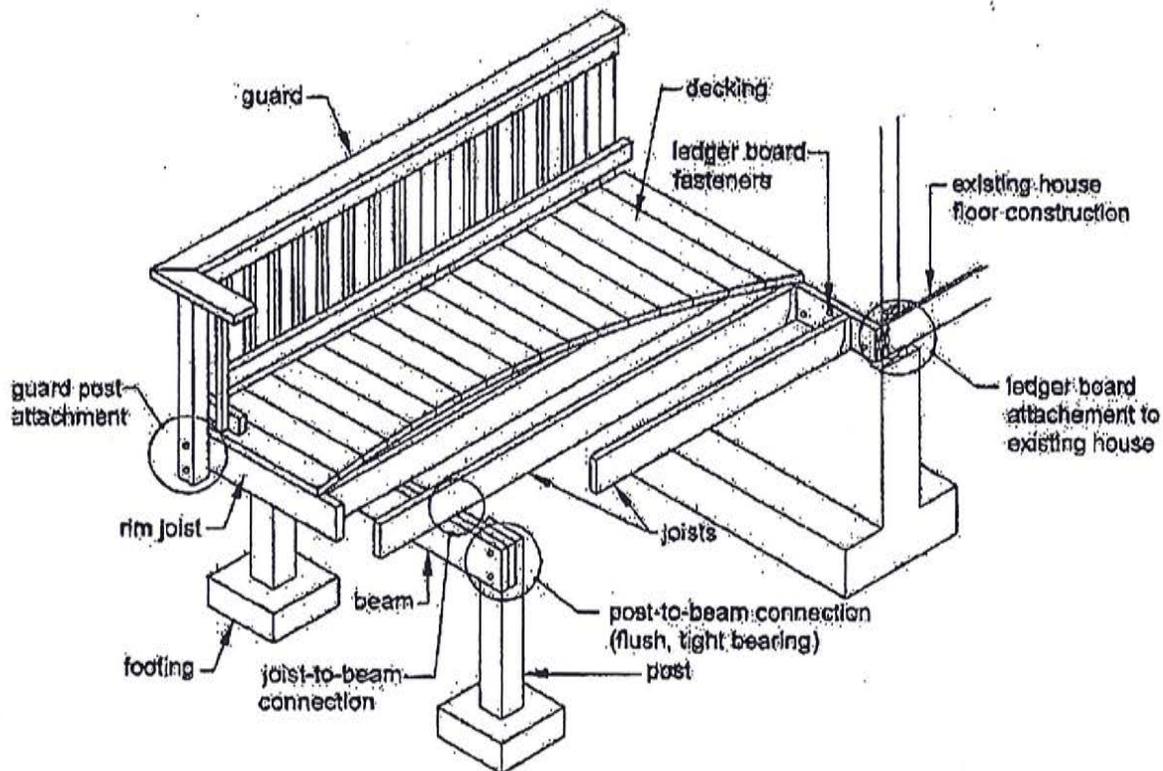
k. The ground snowloads to be used in determining the design snowloads for roofs are given in Figure R301.2(5) for sites at elevations up to 1000 feet. Sites at elevations above 1000 feet shall have their ground snow load increased from the mapped value by 2 psf for every 100 feet above 1000 feet.

Design for Code Acceptance



Prescriptive Residential Deck Construction Guide

Based on the *2006 International Residential Code*



WHERE APPLICABLE, PROVISIONS AND DETAILS CONTAINED IN THIS DOCUMENT ARE BASED ON THE *INTERNATIONAL RESIDENTIAL CODE (IRC)* [bracketed text shows reference to applicable sections of the *IRC*]. PROVISIONS CONTAINED IN THIS DOCUMENT THAT ARE NOT INCLUDED IN THE *IRC* ARE CONSIDERED GOOD PRACTICE RECOMMENDATIONS. WHERE DIFFERENCES OCCUR BETWEEN PROVISIONS OF THIS DOCUMENT AND THE *IRC*, THE PROVISIONS OF THE *IRC* SHALL APPLY.

CONTENTS

MINIMUM REQUIREMENTS.....	2	PROHIBITED LEDGER ATTACHMENTS.....	12
DECKING REQUIREMENTS.....	3	LEDGER BOARD FASTENERS.....	12
JOIST SIZE.....	3	FREE-STANDING DECKS.....	14
BEAM SIZE & ASSEMBLY REQUIREMENTS.....	5	DECK STABILITY.....	14
DECK FRAMING PLAN.....	6	GUARD REQUIREMENTS.....	15
JOIST-TO-BEAM CONNECTION.....	7	GUARD POST ATTACHMENTS.....	16
JOIST HANGERS.....	7	STAIR REQUIREMENTS.....	17
POST REQUIREMENTS.....	7	STAIR HANDRAIL REQUIREMENTS.....	18
RIM JOIST REQUIREMENTS.....	8	STAIR FOOTING REQUIREMENTS.....	19
FOOTINGS.....	9	STAIR LIGHTING REQUIREMENTS.....	19
LEDGER ATTACHMENT REQUIREMENTS.....	10	FRAMING AT CHIMNEY OR BAY WINDOW.....	19

MINIMUM REQUIREMENTS

1. This document applies to single level residential decks only.
2. All lumber shall be identified by the grade mark of, or certificate of inspection issued by, an approved lumber grading or inspection bureau or agency (www.alsc.org). All lumber shall be a naturally durable species (such as Redwood or Western Cedars) or be pressure-treated with an approved process and preservative in accordance with American Wood Protection Association standards (Table 1). All lumber in contact with the ground shall be rated as "ground-contact." [R319.1 and R320.3.1]
3. All nails shall meet the requirements of *ASTM F 1667*. Wood screws shall meet the requirements of *ANSI/ASME Standard B18.6.1*. Bolts and lag screws shall meet the requirements of *ANSI/ASME B18.2.1*.
4. To resist corrosion, the following is required [R319.3]:
 - All screws, bolts, and nails shall be hot-dipped galvanized, stainless steel, silicon bronze or copper. Fasteners to be hot-dipped galvanized shall meet the requirements of *ASTM A 153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*, Class D for fasteners $\frac{3}{8}$ " in diameter and smaller or Class C for fasteners with diameters over $\frac{3}{8}$ ".
 - Fasteners other than nails and timber rivets shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with *ASTM B 695, Class 55*, minimum.
 - All hardware (joist hangers, cast-in-place post anchors, etc.) shall be galvanized or shall be stainless steel. Hardware to be hot-dipped prior to fabrication shall meet *ASTM A 653, 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 shall meet *ASTM A123, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products*.
 - Fasteners and connectors exposed to, and located within 300 feet of, a salt water shoreline shall be stainless steel grade 304 or 316.
 - Other coated or non-ferrous fasteners or hardware shall be as approved by the building official.
5. Decks supporting hot tubs are beyond the scope of this document.
6. This document does not apply to decks which will experience snow loads, snow drift loads, or sliding snow loads that exceed 40 psf. This document does not address lateral loads on decks such as wind or seismic.
7. Flashing shall be corrosion-resistant metal of minimum nominal 0.019-inch thickness or approved non-metallic material [R703.8].
8. Decks shall not be used or occupied until final inspection and approval is obtained.

PRESCRIPTIVE RESIDENTIAL DECK CONSTRUCTION GUIDE**3****Table 1. Common preservative treatments and retention levels (pcf) for sawn lumber in ground contact.^a**

Species	ACQ-B	ACQ-C	ACQ-D	CA-B	CuN-W
Southern Pine	0.40	0.40	0.40	0.21	0.11
Douglas Fir-Larch	0.40	0.40	NR	0.21	0.11
Hem-Fir	0.40	0.40	0.40	0.21	0.11
Spruce-Pine-Fir	NR	0.40	NR	NR	NR
Redwood	NR	NR	NR	NR	NR

^a Unless otherwise indicated, preservatives and retentions listed in Table 1 are based upon the American Wood Protection Association (AWPA) *Book of Standards*.
NR = Treatments Not Recommended.

DECKING REQUIREMENTS

All decking material shall be composed of dimension lumber (2" nominal thickness) or span rated decking in accordance with the American Lumber Standard Committee *Policy for Evaluation of Recommended Spans for Span Rated Decking Products (November 5, 2004)*. Attach decking to each joist with 2-8d common nails or 2-#8 screws. Space decking boards approximately 1/8" apart. See Figure 11 for decking connection requirements at the rim joist. Decking may be placed from an angle perpendicular to the joists to an angle of 45 degrees to the joists. Each segment of decking must bear on a minimum of 4 joists.

Decking not meeting the above requirements may be substituted when the product has been approved by the authority having jurisdiction.

JOIST SIZE

The span of a joist is measured from the centerline of bearing at one end of the joist to the centerline of bearing at the other end of the joist and does not include the length of the overhangs. Use Table 2 to determine joist span based on lumber size and joist spacing. See Figure 1 and Figure 2 for joist span types.

Table 2. Maximum Joist Spans¹

Species	Size	Joist Spacing (o.c.)		
		12"	16"	24"
Southern Pine	2x8	10' - 6"	10' - 6"	10' - 2"
	2x10	15' - 2"	15' - 2"	13' - 1"
	2x12	18' - 0"	18' - 0"	15' - 5"
Douglas Fir-Larch, Hem-Fir, SPF ²	2x8	9' - 3"	9' - 3"	9' - 1"
	2x10	13' - 4"	13' - 4"	11' - 1"
	2x12	17' - 10"	15' - 9"	12' - 10"
Redwood, Western Cedars	2x8	8' - 4"	8' - 4"	8' - 4"
	2x10	12' - 0"	12' - 0"	11' - 3"
	2x12	16' - 1"	16' - 0"	13' - 0"

1. Assumes 40 psf live load, 10 psf dead load, L/180 cantilever deflection with 230 lb point load, No. 2 grade, and wet service conditions. See span calculator at www.awc.org for simple span conditions without cantilevers.

2. Inclusion factor used for refractory species including Douglas fir-larch, hem-fir, and spruce-pine-fir.

4 PRESCRIPTIVE RESIDENTIAL DECK CONSTRUCTION GUIDE

Figure 1A: Joist Span – Deck Attached at House

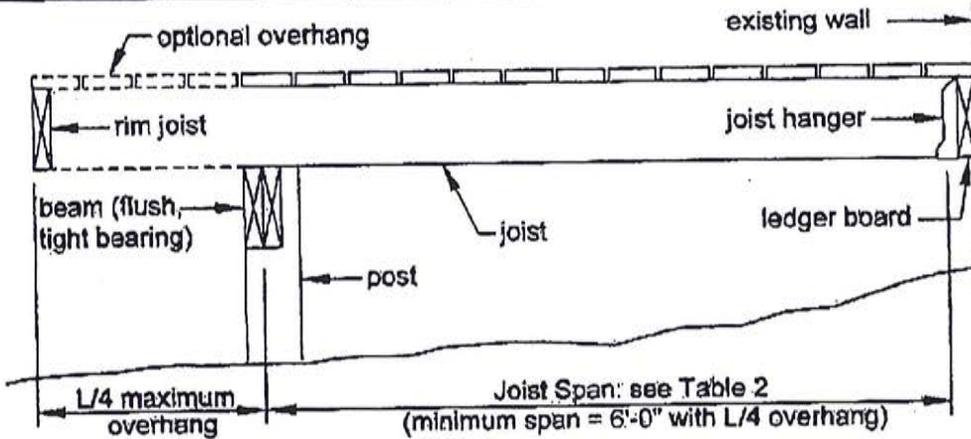


Figure 1B: Joist Span – Joists Attached to Side of Beam

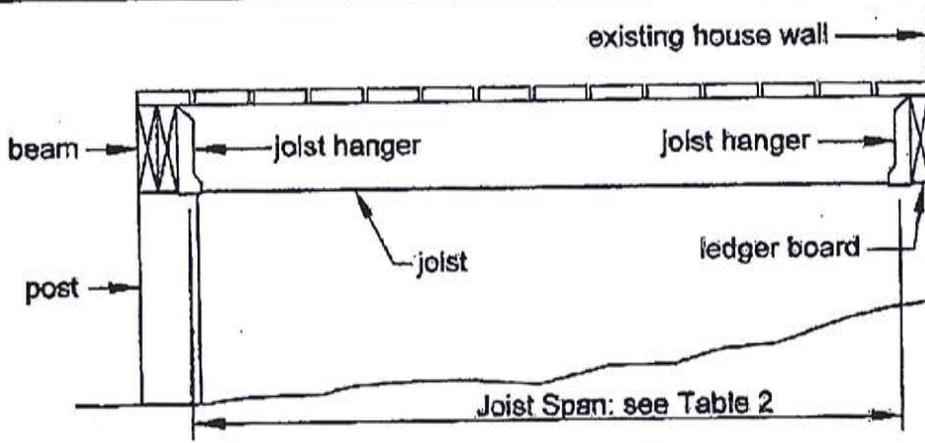
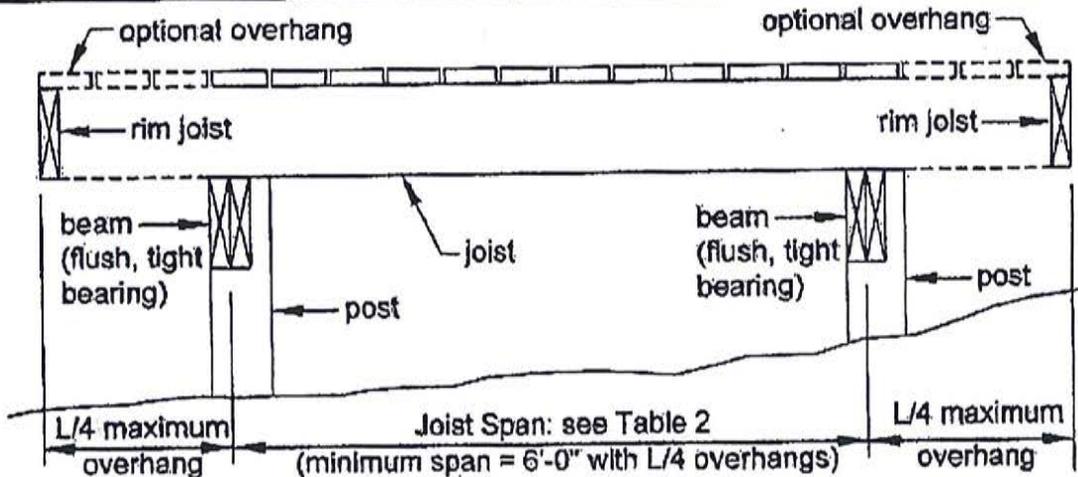


Figure 2: Joist Span – Free Standing Deck



PRESCRIPTIVE RESIDENTIAL DECK CONSTRUCTION GUIDE

BEAM SIZE & ASSEMBLY REQUIREMENTS

Deck beam spans shall be in accordance with Table 3 and can extend past the post centerline up to L/4 as shown in Figure 3. Joists may bear on the beam and extend past the beam centerline up to L/4 as shown in Figures 1A and 2, or the joists may attach to the side of the beam with joist hangers as shown in Figure 1B

(however, joists shall not be attached to opposite sides of the same beam). See JOIST-TO-BEAM CONNECTION details, Figure 6.

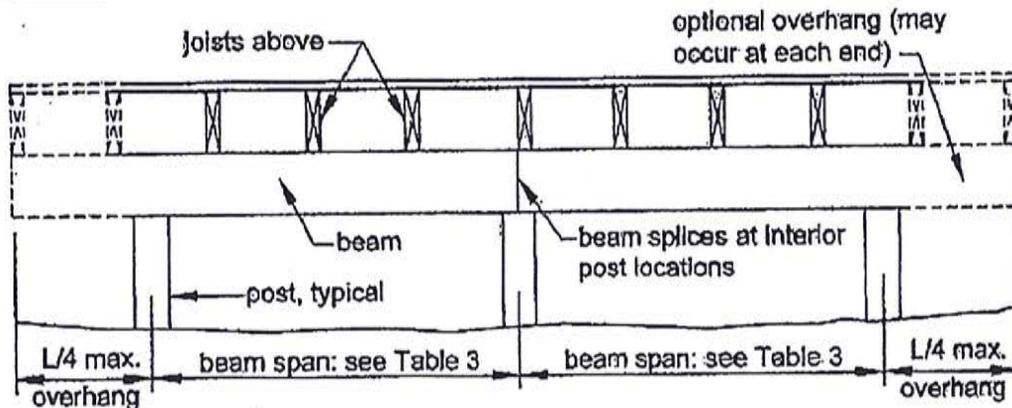
Where multiple 2x members are used, the deck's beam is assembled by attaching the members identified in Table 3 in accordance with Figure 4. [R602.3(1)]

Table 3. Deck Beam Spans¹

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

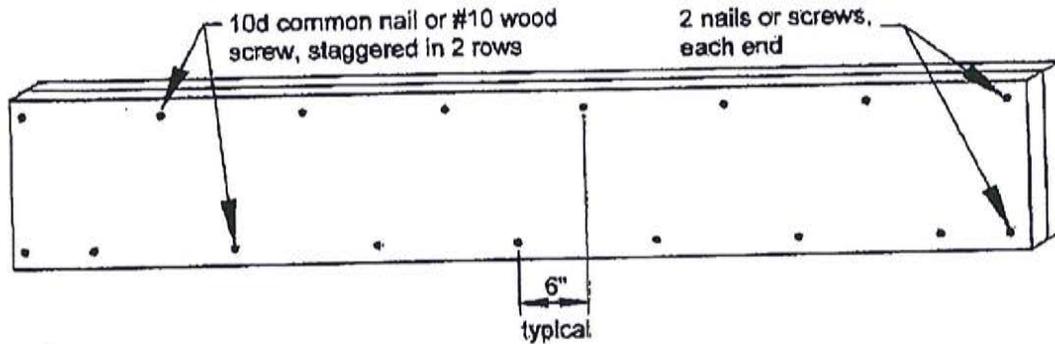
1. Assumes 40 psf live load, 10 psf dead load. L/360 simple span beam deflection limit. L/180 cantilever deflection limit, No. 2 grade, and wet service conditions.
2. Incising factor used for refractory species including Douglas fir-larch, hem-fir, and spruce-pine-fir.

Figure 3: Beam Span Types



6 PRESCRIPTIVE RESIDENTIAL DECK CONSTRUCTION GUIDE

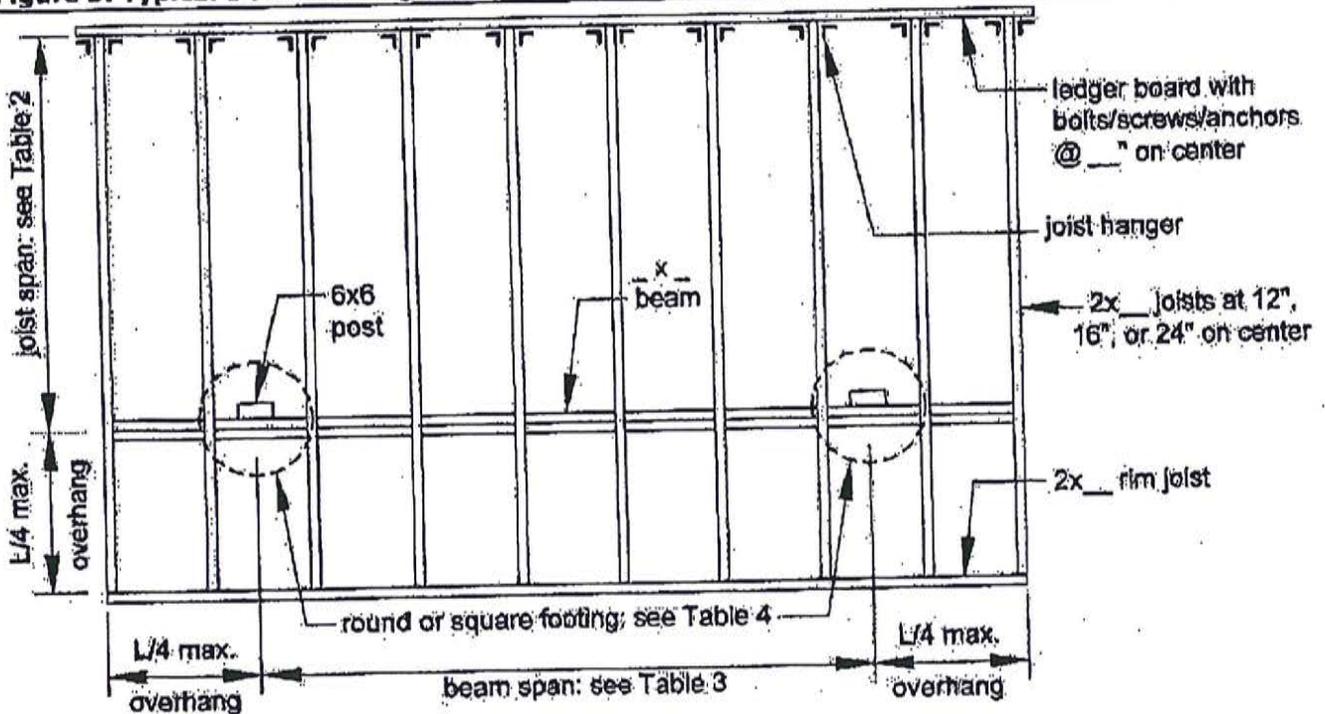
Figure 4: Beam Assembly Details



DECK FRAMING PLAN

A framing plan shows the joist and beam layout; the location of the ledger board, posts, and footings, and the type, size, and spacing of the ledger board fasteners. See Figure 5 for an example of a typical deck framing plan.

Figure 5: Typical Deck Framing Plan



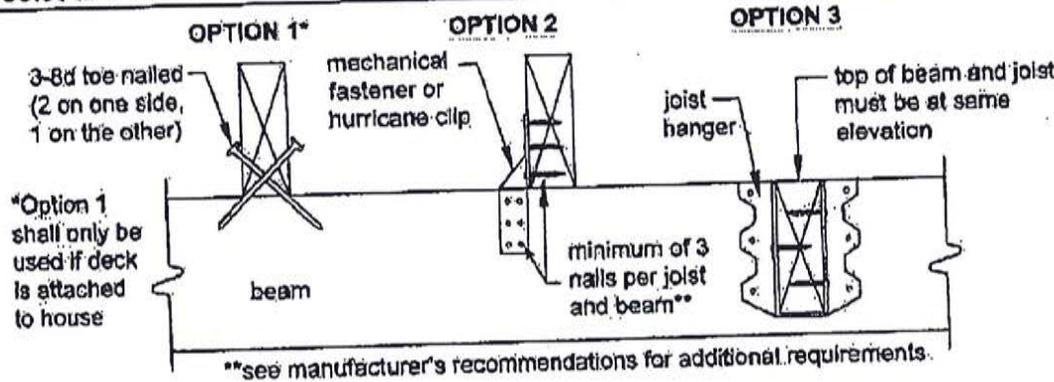
PRESCRIPTIVE RESIDENTIAL DECK CONSTRUCTION GUIDE

JOIST-TO-BEAM CONNECTION

Each joist shall be attached to the beam as shown in Figure 6. Joists may bear on and overhang past the beam a maximum of L/4. Use Option 1 or Option 2 to attach the joist to the beam. Option 1 shall only be used if the deck is attached to the house with a ledger (see LEDGER ATTACHMENT REQUIREMENTS) or as

shown in Figure 23. Joists may also attach to the side of the beam with joist hangers (however, joists shall not be attached to opposite sides of the same beam). See JOIST HANGERS for more information. Hangers, clips, and mechanical fasteners shall be galvanized (see MINIMUM REQUIREMENTS).

Figure 6: Joist-to-Beam Detail

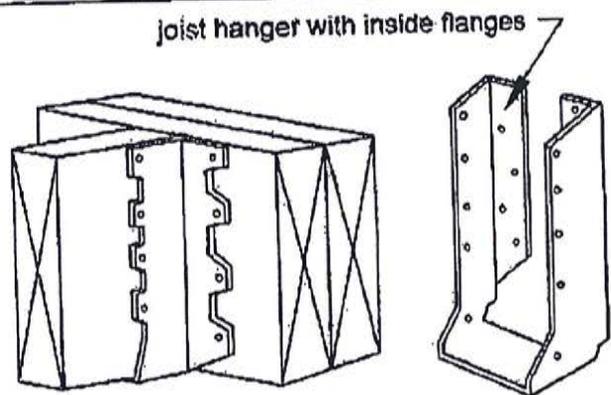


JOIST HANGERS

Joist hangers, as shown in Figure 7, shall each have a minimum capacity of 800 lbs. The joist hanger shall be selected from an approved manufacturer's product data based on the dimensions of the joist or header it is carrying. Joist hangers shall be galvanized (see MINIMUM REQUIREMENTS).

Use joist hangers with inside flanges when clearances to the edge of the beam or ledger board dictate. Do not use clip angles or brackets to support joists.

Figure 7: Typical Joist Hangers



POST REQUIREMENTS [R407]

All deck post sizes shall be 6x6 (nominal) or larger, and the maximum height shall be 14'-0". Posts shall be centered on footings. Cut ends of posts shall be field treated with an approved preservative. The beam shall be attached to the post by notching the 6x6 as shown in Figure 8 or by providing an approved column cap to

connect the beam and post as shown in Figure 10. All 3-ply beams shall be connected to the post by a column cap. All thru-bolts shall have washers at the bolt head and nut. Attachment of the beam to the side of the post without notching is prohibited (see Figure 9).

8 PRESCRIPTIVE RESIDENTIAL DECK CONSTRUCTION GUIDE

Figure 8: Post-to-Beam Attachment Requirements

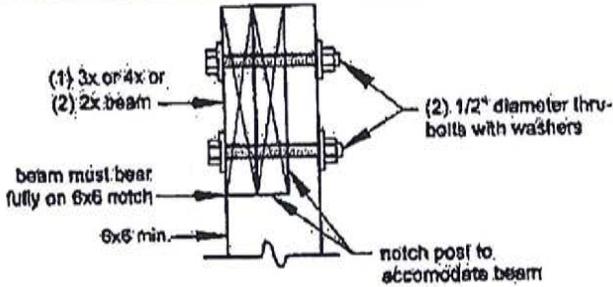
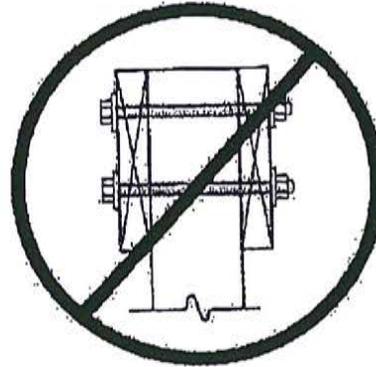


Figure 9: Prohibited Post-to-Beam Attachment Condition



RIM JOIST REQUIREMENTS

Attach a continuous rim joist to the ends of joists as shown in Figure 11. Attach decking to the rim joist as shown in Figure 11. For more decking attachment requirements, see DECKING REQUIREMENTS.

Figure 10: Alternate Approved Post-to-Beam Column Cap Attachment

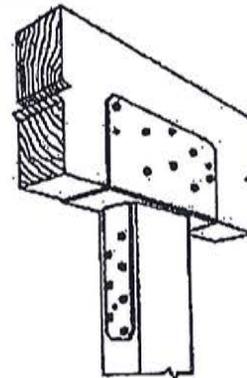
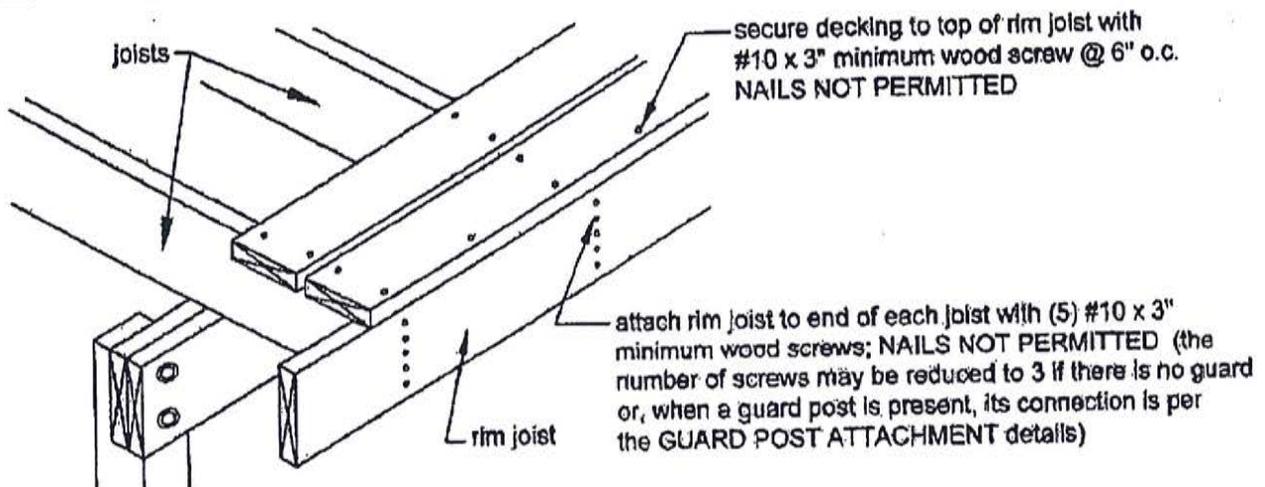


Figure 11: Rim Joist Connection Details



PRESCRIPTIVE RESIDENTIAL DECK CONSTRUCTION GUIDE

FOOTINGS [R403]

See Figure 12 and Table 4 for footing size, footing thickness, and post attachment options and requirements. All footings shall bear on solid ground and shall be placed at least 12 inches below the undisturbed ground surface or below the frost line, whichever is deeper; bearing conditions shall be verified in the field by the building official prior to placement of concrete. Where the building official determines that in-place soils with an allowable bearing capacity of less than 1,500 psf are likely to be present at the site, the allowable bearing capacity shall be determined by a soils investigation. **DECK FOOTINGS CLOSER THAN 5'-0" TO AN EXISTING EXTERIOR HOUSE WALL MUST BEAR AT THE SAME ELEVATION AS THE FOOTING OF THE EXISTING HOUSE FOUNDATION.**

Do not construct footings over utility lines or enclosed meters. Call the local utilities before digging.

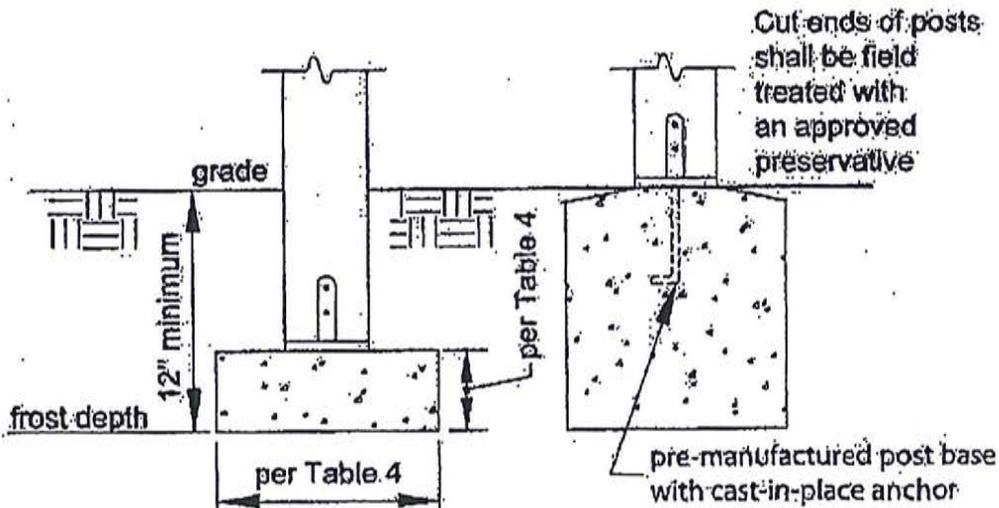
Pre-manufactured post anchors shall be galvanized. See MINIMUM REQUIREMENTS.

TABLE 4. FOOTING SIZES²

Beam Span	Jolst Span	Round ¹ Footing Diameter	Footing Thickness ³
6'	<10'	15"	6"
	<14'	17"	6"
	<18'	20"	7"
8'	<10'	17"	6"
	<14'	20"	7"
	<18'	23"	9"
10'	<10'	19"	7"
	<14'	22"	9"
	<18'	25"	10"
12'	<10'	21"	8"
	<14'	24"	10"
	<18'	28"	11"
14'	<10'	22"	9"
	<14'	26"	11"
	<18'	30"	12"
16'	<10'	24"	9"
	<14'	28"	11"
	<18'	32"	13"

1. Square footings are permitted to have widths 2" less than the given diameter of round footings.
2. Assumes 1,500 psf soil bearing capacity.
3. Assumes 2,500 psf compressive strength of concrete. Coordinate footing thickness with post base and anchor requirements.

Figure 12: Typical Footing Options



10 PRESCRIPTIVE RESIDENTIAL DECK CONSTRUCTION GUIDE

LEDGER ATTACHMENT REQUIREMENTS **[R502.2.1]**

GENERAL: Attach the ledger board, which shall be equal to or greater than the joist size, to the existing exterior wall in accordance with Figure 14 through Figure 16. When attachments are made to the existing house band joist, the band joist shall be capable of supporting the new deck. If this cannot be verified or conditions at the existing house differ from the details herein, then either a free-standing deck or full plan submission is required. See **FREE-STANDING DECKS**.

SIDING AND FLASHING: House siding, or the exterior finish system, must be removed prior to installation of the ledger board. Approved corrosion resistant flashing is required at any ledger board connection to a wall of wood framed construction (see **MINIMUM REQUIREMENTS**). See Figure 14 for continuous flashing with drip edge.

MANUFACTURED WOOD JOIST: The term "I-Joist" denotes manufactured wood "I" joists (see Figure 13A). Many new homes constructed with wood I-joists include 1" or thicker engineered wood products (EWP) – such as oriented strand board (OSB) or structural composite lumber (SCL) including laminated veneer

lumber (LVL) – as band joists (or rim boards) that can support the attachment of a deck (see Figure 14). However, some older homes might be constructed with band boards that are too thin (3/4" or thinner) to support a deck. In such cases, a free-standing deck or a full plan submission is required.

MANUFACTURED WOOD TRUSS: A metal plate connected wood truss (MPCWT) is an engineered, prefabricated structural component designed for each specific application. MPCWT's used in residential floors are often installed with a 2x4 lumber "ribbon" at the ends of the trusses (see Figure 13B), the purpose of which is to tie the ends of the trusses together. The ribbon board, by itself, is not intended to support the deck ledger and deck. Installing residential decks when the floor system for the house uses MPCWT requires a standard detail provided by the truss designer, a free-standing deck, or a full plan submission. Refer to the WTCA Technical Note – *Attachment of Residential Decks to Wood Truss Floor Systems* for special blocking details and attachment requirements (www.sbcindustry.com).

Figure 13A: Wood I-Joist Profile

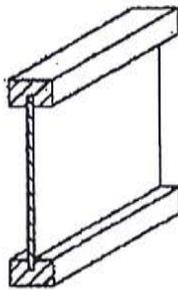
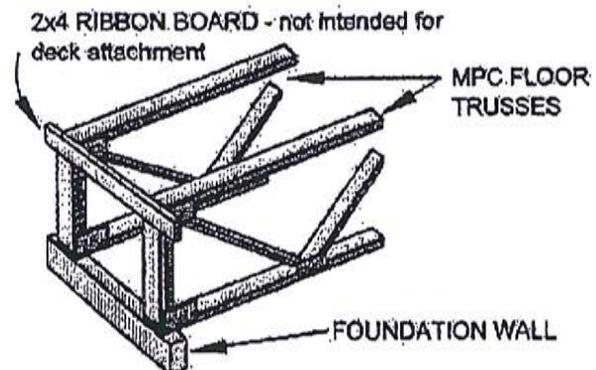


Figure 13B: Metal Plate Connected (MPC) Wood Floor Trusses with a 2x4 Lumber "Ribbon" at the Ends of the Trusses



PRESCRIPTIVE RESIDENTIAL DECK CONSTRUCTION GUIDE

Figure 14: General Attachment of Ledger Board to Band Board

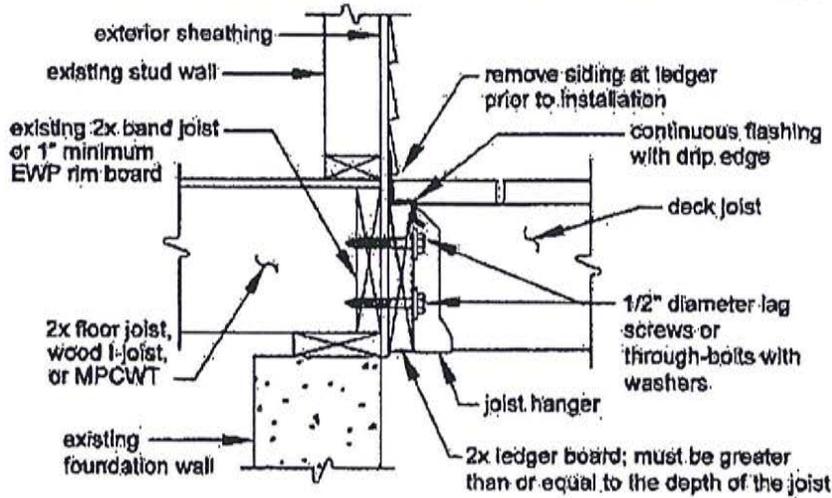


Figure 15: Attachment of Ledger Board to Foundation Wall (Concrete or Solid Masonry)

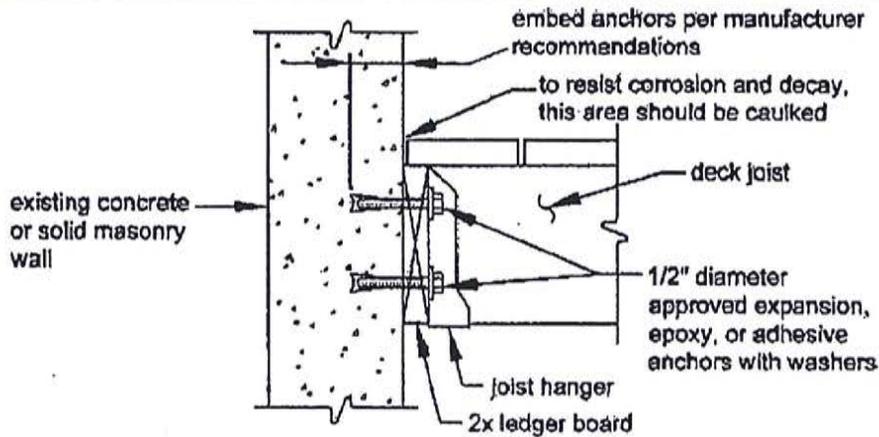
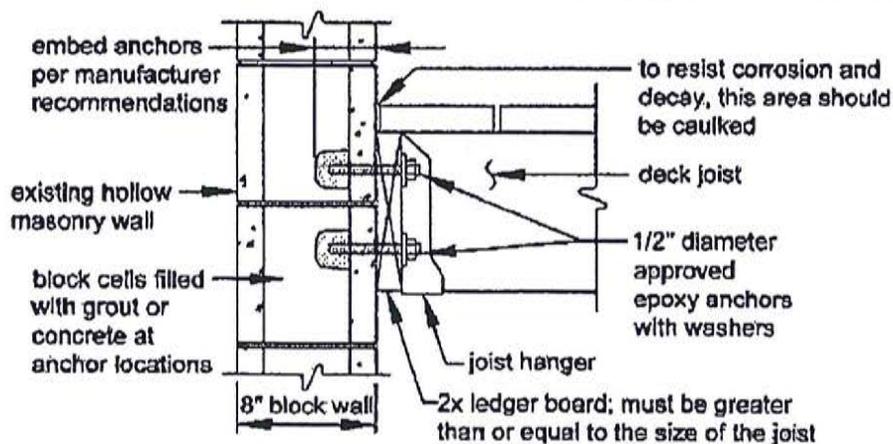


Figure 16: Attachment of Ledger Board to Foundation Wall (Hollow Masonry)



12 PRESCRIPTIVE RESIDENTIAL DECK CONSTRUCTION GUIDE

PROHIBITED LEDGER ATTACHMENTS

Attachments to exterior veneers (brick, masonry, stone) and to cantilevered floor overhangs or bay windows are prohibited (see Figures 17 and 18). In such cases the

deck shall be free-standing (see FREE-STANDING DECKS).

Figure 17: No Attachment to or Through Exterior Veneers (Brick, Masonry, Stone)

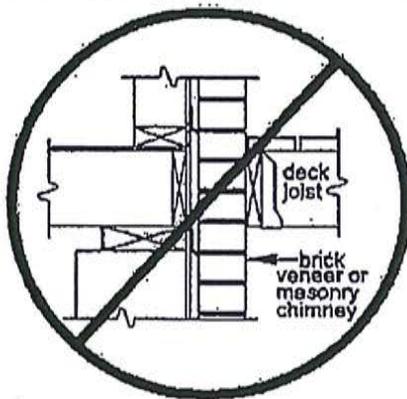
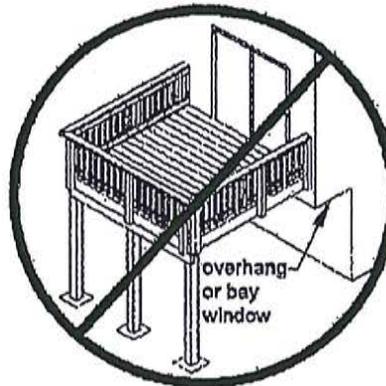


Figure 18: No Attachment to House Overhang



LEDGER BOARD FASTENERS

Deck ledger connection to band joist or rim board.

The connection between a deck ledger and a 2-inch nominal band joist (1-1/2" actual) or EWP rim board bearing on a sill plate or wall plate shall be constructed

with 1/2" lag screws or bolts with washers per Table 5 and Figure 19 (see MINIMUM REQUIREMENTS). Only those fasteners noted below are permitted. LEAD ANCHORS ARE PROHIBITED.

Table 5. Fastener Spacing for a Southern Pine, Douglas Fir-Larch, or Hem-Fir Deck Ledger and a 2-inch Nominal Solid-Sawn Spruce-Pine-Fir^{7,9} Band Joist or EWP Rim Board⁶ (Deck Live Load = 40 psf, Deck Dead Load = 10 psf)^{3,6}

Joist Span	Rim Board or Band Joist	6'-0"	6'-1"	8'-1"	10'-1"	12'-1"	14'-1"	16'-1"
		and less	to 8'-0"	to 10'-0"	to 12'-0"	to 14'-0"	to 16'-0"	to 18'-0"
Connection Details		On-Center Spacing of Fasteners^{4,5}						
1/2" diameter lag screw with 16/32" maximum sheathing ¹	1" EWP ⁸	24"	18"	14"	12"	10"	9"	8"
	1-1/8" EWP ⁶	28"	21"	16"	14"	12"	10"	9"
	1-1/2" Lumber ^{7,9}	30"	23"	18"	15"	13"	11"	10"
1/2" diameter bolt with 16/32" maximum sheathing ¹⁰	1" EWP ⁸	24"	18"	14"	12"	10"	9"	8"
	1-1/8" EWP ⁶	28"	21"	16"	14"	12"	10"	9"
	1-1/2" Lumber ^{7,9}	36"	36"	34"	29"	24"	21"	19"
1/2" diameter bolt with 16/32" maximum sheathing and 1/2" stacked washers ^{2,8}	1" EWP ⁸	24"	18"	14"	12"	10"	9"	8"
	1-1/8" EWP ⁶	28"	21"	16"	14"	12"	10"	9"
	1-1/2" Lumber ^{7,9}	36"	36"	29"	24"	21"	18"	16"

¹ The tip of the lag screw shall fully extend beyond the inside face of the band joist.
² The maximum gap between the face of the ledger board and face of the wall sheathing shall be 1/2".
³ Ledgers shall be flashed or caulked to prevent water from contacting the house band joist (see Figures 14, 15, and 16).
⁴ Lag screws and bolts shall be staggered per Figure 19.
⁵ Deck ledgers shall be minimum 2x8 pressure-preservative-treated No.2 grade lumber, or other approved materials as established by standard engineering practice.
⁶ When solid-sawn pressure-preservative-treated deck ledgers are attached to engineered wood products (oriented strand board or structural composite lumber including laminated veneer lumber), the ledger attachment shall be designed in accordance with accepted engineering practice. Tabulated values based on 300 lb and 350 lb for 1" and 1-1/8" EWP rim board, respectively.
⁷ A minimum 1"x9 1/2" Douglas fir-larch laminated veneer lumber rim board shall be permitted in lieu of the 2" nominal band joist.
⁸ Wood structural panel sheathing, gypsum board sheathing, or foam sheathing not exceeding one inch thickness shall be permitted. The maximum distance between the face of the ledger board and the face of the band joist shall be one inch.
⁹ Fastener spacing also applies to southern pine, Douglas fir-larch, and hem-fir band joists.

PRESCRIPTIVE RESIDENTIAL DECK CONSTRUCTION GUIDE

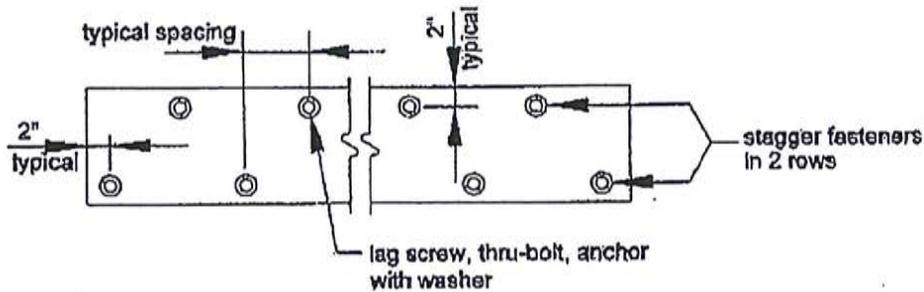
13

Placement of lag screws or bolts in deck ledgers

The lag screws or bolts shall be placed two inches from the bottom or top of the deck ledgers and between two and five inches from the ends. The lag screws or bolts

shall be staggered from the top to the bottom along the horizontal run of the deck ledger (see Figure 19). Proper installation of lag screws or bolts shall be verified by the building official.

Figure 19: Ledger Board Fastener Spacing and Clearances



Thru-Bolts

Thru-bolts shall have a minimum diameter of $\frac{1}{2}$ ". Pilot holes for thru-bolts shall be $\frac{17}{32}$ " to $\frac{9}{16}$ " in diameter. Thru-bolts require washers at the bolt head and nut.

diameter of $\frac{1}{2}$ ". Minimum embedment length shall be per the manufacturer's recommendations. All anchors must have washers.

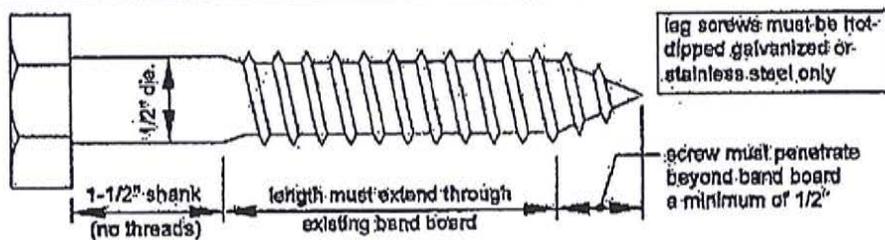
Expansion and Adhesive Anchors

Use approved expansion or adhesive anchors when attaching a ledger board to a concrete or solid masonry wall as shown in Figure 15 or a hollow masonry wall with a grouted cell as shown in Figure 16. Expansion and adhesive anchor bolts shall have a minimum

Lag Screws

Lag screws shall have a minimum diameter of $\frac{1}{2}$ " (see MINIMUM REQUIREMENTS). Lag screws may be used only when the field conditions conform to those shown in Figure 14. See Figure 20 for lag screw length and shank requirements. All lag screws shall be installed with washers.

Figure 20: Lag Screw Requirements



Lag screw installation requirements: Each lag screw shall have pilot holes drilled as follows: 1) Drill a $\frac{1}{2}$ " diameter hole in the ledger board, 2) Drill a $\frac{5}{16}$ " diameter hole into the band board of the existing house. **DO NOT DRILL A $\frac{1}{2}$ " DIAMETER HOLE INTO THE BAND BOARD.**

The threaded portion of the lag screw shall be inserted into the pilot hole by turning. **DO NOT DRIVE LAG SCREWS WITH A HAMMER.** Use soap or a wood-compatible lubricant as required to facilitate tightening. Each lag screw shall be thoroughly tightened (snug but not over-tightened to avoid wood damage).

CHAPTER 5 FLOORS

SECTION R501 GENERAL

R501.1 Application. The provisions of this chapter shall control the design and construction of the floors for all buildings including the floors of *attic* spaces used to house mechanical or plumbing fixtures and *equipment*.

R501.2 Requirements. Floor construction shall be capable of accommodating all loads according to Section R301 and of transmitting the resulting loads to the supporting structural elements.

SECTION R502 WOOD FLOOR FRAMING

R502.1 Identification. Load-bearing dimension lumber for joists, beams and girders shall be identified by a *grade mark* of a lumber grading or inspection agency that has been *approved* by an accreditation body that complies with DOC PS 20. In lieu of a *grade mark*, a certificate of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted.

R502.1.1 Preservative-treated lumber. Preservative treated dimension lumber shall also be identified as required by Section R319.1.

R502.1.2 Blocking and subflooring. Blocking shall be a minimum of utility grade lumber. Subflooring may be a minimum of utility grade lumber or No. 4 common grade boards.

R502.1.3 End-jointed lumber. *Approved* end-jointed lumber identified by a *grade mark* conforming to Section R502.1 may be used interchangeably with solid-sawn members of the same species and grade.

R502.1.4 Prefabricated wood I-joists. Structural capacities and design provisions for prefabricated wood I-joists shall be established and monitored in accordance with ASTM D 5055.

R502.1.5 Structural glued laminated timbers. Glued laminated timbers shall be manufactured and identified as required in ANSI/AITC A190.1 and ASTM D 3737.

R502.1.6 Structural log members. Stress grading of structural log members of nonrectangular shape, as typically used in log buildings, shall be in accordance with ASTM D 3957. Such structural log members shall be identified by the *grade mark* of an *approved* lumber grading or inspection agency. In lieu of a *grade mark* on the material, a certificate of inspection as to species and grade issued by a lumber-grading or inspection agency meeting the requirements of this section shall be permitted to be accepted.

R502.1.7 Exterior wood/plastic composite deck boards. Wood/plastic composites used in exterior deck boards shall comply with the provisions of Section R317.4.

R502.2 Design and construction. Floors shall be designed and constructed in accordance with the provisions of this chap-

ter. Figure R502.2 and Sections R317 and R318 or in accordance with AF&PA/NDS.

R502.2.1 Framing at braced wall lines. A load path for lateral forces shall be provided between floor framing and *braced wall panels* located above or below a floor, as specified in Section R602.10.6.

R502.2.2 Decks. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. For decks with cantilevered framing members, connections to exterior walls or other framing members, shall be designed and constructed to resist uplift resulting from the full live load specified in Table R301.5 acting on the cantilevered portion of the deck.

R502.2.2.1 Deck ledger connection to band joist. For decks supporting a total design load of 50 pounds per square foot (2394 Pa) [40 pounds per square foot (1915 Pa) live load plus 10 pounds per square foot (479 Pa) dead load], the connection between a deck ledger of pressure-preservative-treated Southern Pine, incised pressure-preservative-treated Hem-Fir or *approved* decay-resistant species, and a 2-inch (51 mm) nominal lumber band joist bearing on a sill plate or wall plate shall be constructed with $\frac{1}{2}$ -inch (12.7 mm) lag screws or bolts with washers in accordance with Table R502.2.2.1. Lag screws, bolts and washers shall be hot-dipped galvanized or stainless steel.

R502.2.2.1.1 Placement of lag screws or bolts in deck ledgers. The lag screws or bolts shall be placed 2 inches (51 mm) in from the bottom or top of the deck ledgers and between 2 and 5 inches (51 and 127 mm) in from the ends. The lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger.

R502.2.2.2 Alternate deck ledger connections. Deck ledger connections not conforming to Table R502.2.2.1 shall be designed in accordance with accepted engineering practice. Girders supporting deck joists shall not be supported on deck ledgers or band joists. Deck ledgers shall not be supported on stone or masonry veneer.

R502.2.2.3 Deck lateral load connection. The lateral load connection required by Section R502.2.2 shall be permitted to be in accordance with Figure R502.2.2.3. Hold-down tension devices shall be installed in not less than two locations per deck, and each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N).

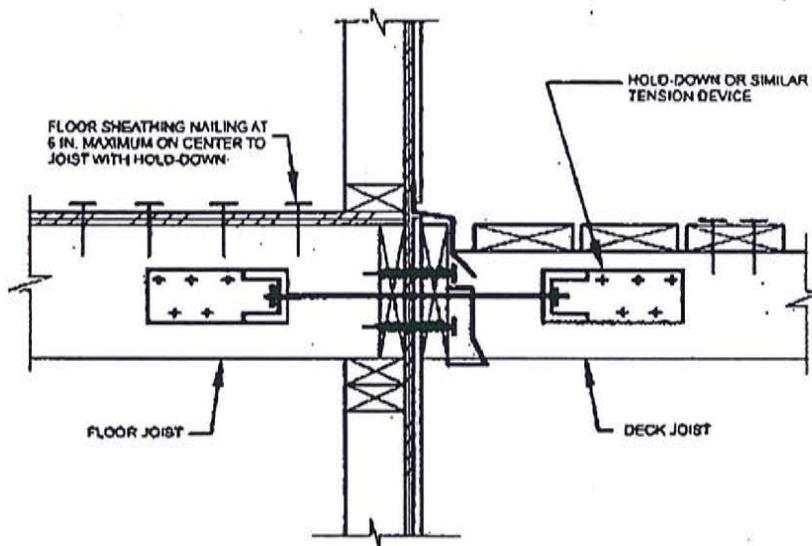
R502.2.2.4 Exterior wood/plastic composite deck boards. Wood/plastic composite deck boards shall be installed in accordance with the manufacturer's instructions.

TABLE R502.2.2.1
FASTENER SPACING FOR A SOUTHERN PINE OR HEM-FIR DECK LEDGER
AND A 2-INCH NOMINAL SOLID-SAWN SPRUCE-PINE-FIR BAND JOIST^{a, b}
 (Deck live load = 40 psf, deck dead load = 10 psf)

JOIST SPAN	6' and less	8'1" to 8'	8'1" to 10'	10'1" to 12'	12'1" to 14'	14'1" to 16'	16'1" to 18'
Connection details	On-center spacing of fasteners^{d, e}						
1/2 inch diameter lag screw with 1 1/2 inch maximum sheathing ^a	30	33	18	15	13	11	10
1/2 inch diameter bolt with 1 1/2 inch maximum sheathing	36	36	34	29	24	21	19
1/2 inch diameter bolt with 1 1/2 inch maximum sheathing and 1/2 inch stacked washers ^{b, h}	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. The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- b. The maximum gap between the face of the ledger board and face of the wall sheathing shall be 1/2".
- c. Ledgers shall be flashed to prevent water from contacting the house band joist.
- d. Lag screws and bolts shall be staggered in accordance with Section R502.2.2.1.1.
- e. Deck ledger shall be minimum 2 x 8 pressure-preservative-treated No. 2 grade lumber, or other approved materials as established by standard engineering practice.
- f. When solid-sawn pressure-preservative-treated deck ledgers are attached to a minimum 1 inch thick engineered wood product (structural composite lumber, laminated veneer lumber or wood structural panel band joist), the ledger attachment shall be designed in accordance with accepted engineering practice.
- g. A minimum 1 x 9 1/2 Douglas Fir laminated veneer lumber rimboard shall be permitted in lieu of the 2-inch nominal band joist.
- h. Wood structural panel sheathing, gypsum board sheathing or fume sheathing not exceeding 1 inch in thickness shall be permitted. The maximum distance between the face of the ledger board and the face of the band joist shall be 1 inch.



For SI: 1 inch = 25.4 mm.

FIGURE 502.2.2.3
DECK ATTACHMENT FOR LATERAL LOADS

R502.3 Allowable joist spans. Spans for floor joists shall be in accordance with Tables R502.3.1(1) and R502.3.1(2). For other grades and species and for other loading conditions, refer to the AF&PA Span Tables for Joists and Rafters.

R502.3.1 Sleeping areas and attic joists. Table R502.3.1(1) shall be used to determine the maximum allowable span of floor joists that support sleeping areas and

attics that are accessed by means of a fixed stairway in accordance with Section R311.7 provided that the design live load does not exceed 30 pounds per square foot (1.44 kPa) and the design dead load does not exceed 20 pounds per square foot (0.96 kPa). The allowable span of ceiling joists that support attics used for limited storage or no storage shall be determined in accordance with Section R802.4.