

CITY OF DE PERE

Building Inspection

335 South Broadway, De Pere, WI 54115 | 920-339-4053 | www.deperewi.gov



Decks

Permit Required

The City of De Pere requires a building permit for the construction of decks and porches. **Prior to obtaining a permit application for a deck, please check with your subdivision covenant to see if there are any restrictions you will need to adhere to.**

Definition

Deck – Any structure which serves as a raised horizontal platform on a floor constructed of wood or other materials; without enclosing walls or roof.

General Requirements

- a. An accurately drawn site plan must be presented for review, which shows us the location of property lines, buildings, driveways, and the proposed location of the deck or porch on your property.
- b. Decks must meet the same setback requirements as the principal structure. Therefore, the deck must be at least thirty (30) feet from the front and rear lot lines and at least ten (10) feet from the side lot lines. If the principal structure is already closer to any of these setbacks, please contact the Building Inspection Department for more information.
- c. These rules also apply to decks that connect the house to a swimming pool. Please refer to the Swimming Pools, Hot Tubs, and Spas handout for additional zoning and protective enclosure requirements.
- d. SPS 321.225, appendix B & C – Decks attached to dwellings and detached decks which serve as an exit shall be constructed in accordance with the Wisconsin Uniform Dwelling Code.

Permit Requirements

Applicants must provide the following minimum information to obtain a building permit:

1. Legible site plan, drawn to scale which shows the following:
 - a. Property lines and lot dimensions
 - b. Location of all buildings on the lot and distances to lot lines
 - c. Location of public streets, sidewalks, and alleys
 - d. Location and size of proposed deck or porch and distance to lot lines and structures
 - e. Estimated value – materials and labor (if you are doing the work yourself, a fair market value for all labor may be used)
 - f. If located in River Park Subdivision, all plans must be approved, stamped and signed by Harry Macco

Please use this checklist to ensure you are providing the basic information needed to obtain your building permit. Additional information may be required after review of your site plan depending on site conditions.

Section I: Soil & Excavation Requirements for Deck Piers or Foundations

1. Footings shall be placed on solid ground below the frost penetration level or at least 48 inches below finished grade, whichever is deeper. The bearing capacity of the soil shall be at least and not less than 2,000 pounds per square foot unless the footing is designed through structural analysis.
2. All organic materials (roots, etc.) shall be cut off at the side walls of the borings or trench. All organic and loose material must be removed from the cavity area prior to pouring concrete.
3. For footings, concrete must be used and have a minimum compressive strength of 3,000 pounds per square inch.
4. Footing size shall be in accordance with **Table 1**.
5. Post attachments and positive connections shall be done in accordance with **Figure 1**.

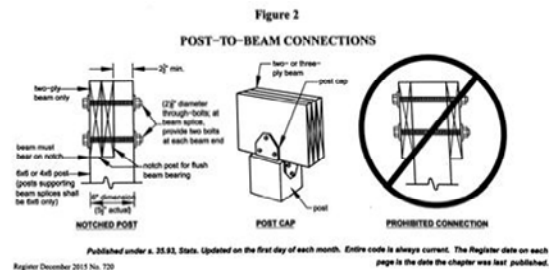
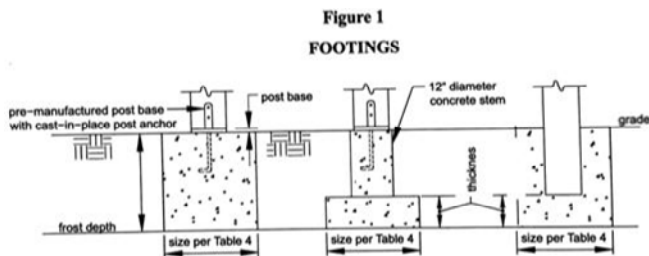


Table 1
FOOTING SIZE (In Inches)^{1,2,3}

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	6	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.

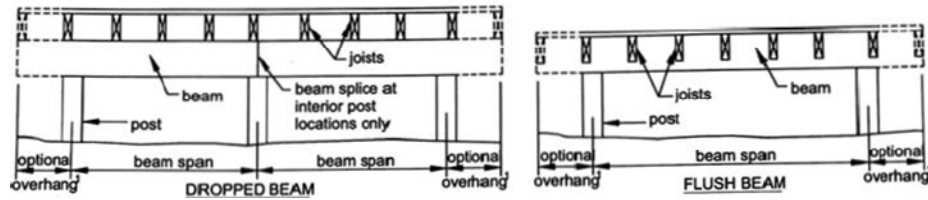
Section II: General Requirements

1. All lumber, including for decking, must be pressure-preservative-treated and must be Douglass fir/larch, hemlock/fir, spruce/pine/fir (SPF), or southern pine # 2 or better – unless a naturally durable species such as 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.
2. Wood-plastic composites must bear a label indicating their performance criteria and compliance with ASTM D7032.
3. Nails must be threaded, which includes ring-shanked (annular-grooved) and spiral-grooved.
4. All fasteners must be galvanized steel, stainless steel, or approved for use with preservative-treated lumber.
5. Lag screws and bolts shall be $\frac{1}{2}$ inch diameter. Edge distance and spacing requirements are based on $\frac{1}{2}$ inch diameter fasteners. If larger (or smaller) fasteners are specified, edge distance and spacing need to be adjusted.
6. Hardware, including joist hangers or post anchors, must be galvanized steel with 1.85 ounces of zinc per square foot, 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.
7. Every deck must have an electrical outlet along the perimeter of the deck within 6.5 feet of the floor in accordance with NEC section 210.52(E) (3).
8. A deck constructed in accordance with these standards is not approved for concentrated loads that exceed 40 pounds per square foot (psf).
9. 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 are to be hot-dipped galvanized and must meet the requirements of ASTM A153. Hardware to be hot-dipped prior to fabrication must meet the requirements of ASTM A653.

Section III: Posts & Beams

1. The post height, measured from the top of the footing to the underside of the beam, shall meet the following:
 - a. 4"x4" shall not exceed 6 feet in height.
 - b. 4"x6" shall not exceed 8 feet in height.
 - c. 6"x6" shall not exceed 14 feet in height.
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. Beams must comply with all the following:
 - a. As shown in **Figure 3**, the beam-span length is measured between the centerlines of 2 adjacent posts and does not include the overhangs.
 - b. Beam size is determined using **Tables 3A or 3B**. The depth of flush beams must be greater than or equal to the joist depth.
 - c. Beams may overhang past the center of the post up to one-fourth of the actual beam span, as shown in **Figure 3**.
 - d. Where multiple 2x members are used to assemble a beam, the plies of the beam must be fastened in accordance with **Figure 4**.
 - e. Pressure-preservative-treated glulam beams are permissible for spans longer than those shown in **Table 3**. However, a design plan submission is required during the permit application process.

Figure 3
BEAM TYPES



*The 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 LENGTH FOR DOUGLAS FIR/LARCH³, HEM/FIR³, SPRUCE/PINE/FIR³, WESTERN CEDAR, PONDEROSA PINE⁴, AND RED PINE⁴

Joist (Number of Plies) Beam Size - 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
5 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"
5 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"
5 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"
5 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"
5 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"
5 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"
5 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"

*Spans are based on 40 psf live load, 10 psf dead load, normal loading duration, wet service conditions, and deflections of $\Delta_i = L/360$ for main span and U180 for overhang with a 220 lb. point load.

Beam 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

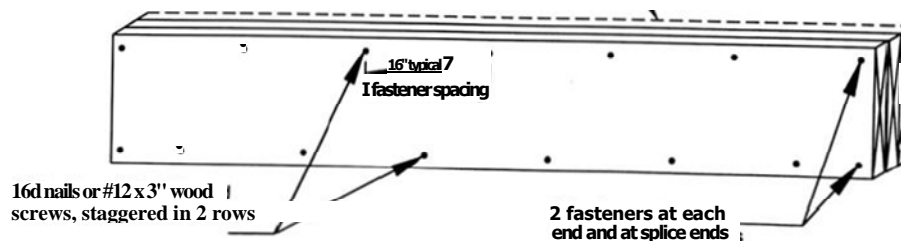
Joist Span	Beam Size ² - Inches							
	(2) 2x6	(2) 2x11	(2) 2x10	(2) 2x12	(3) 2x6	(3) 2x8	(3) 2x10	(3) 2x12
5 6'	6'-11"	8'-9"	10'-4"	12'-2"	8'-2"	10'-10"	13'-0"	15'-3"
5 8'	5'-11"	7'-7"	9'-0"	10'-7"	7'-5"	9'-6"	11'-3"	13'-3"
5 10'	5'-4"	6'-9"	8'-0"	9'-5"	6'-8"	8'-6"	10'-0"	11'-10"
5 12'	4'-10"	6'-2"	7'-4"	8'-7"	6'-1"	7'-9"	9'-2"	10'-9"
5 14'	4'-6"	5'-9"	6'-9"	8'-0"	5'-8"	7'-2"	8'-6"	10'-0"
5 16'	4'-3"	5'-4"	6'-4"	7'-6"	5'-3"	6'-8"	7'-11"	9'-4"
5 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 $\Delta_i = L/360$ for main span and U180 for overhang with a 220 lb. point load.

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

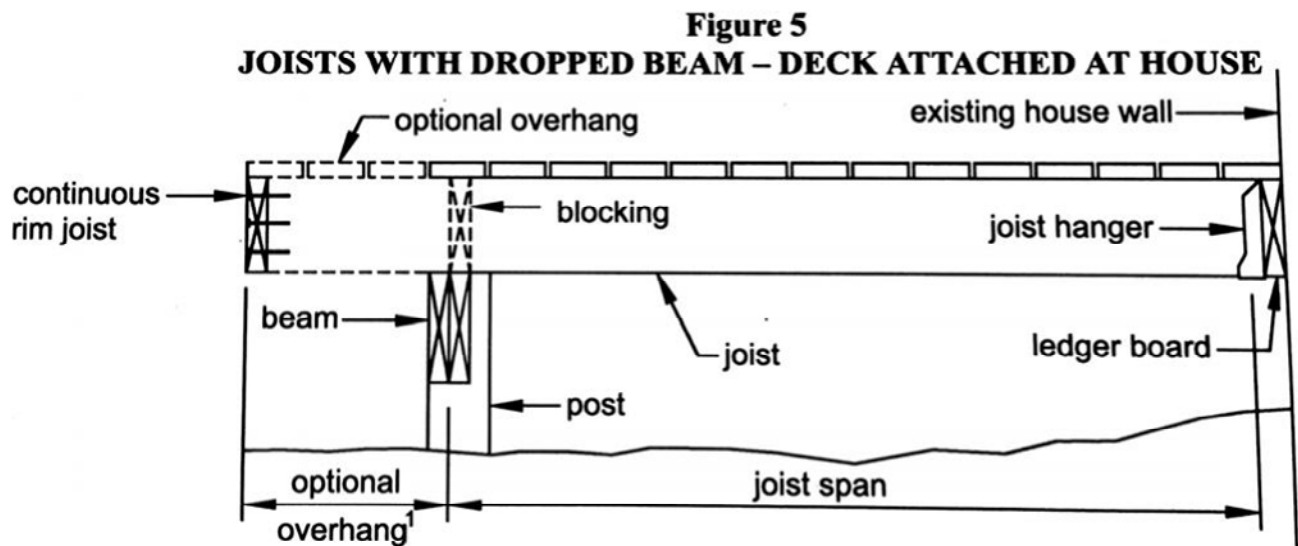
Figure 4
BEAM ASSEMBLY

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



Section IV: Joists and Joist to Beam Connections

1. The joist span length is measured between the centerline of the 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.
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.
4. Joists may overhang past the center of the beam up to one-fourth of the actual span.
5. Provide full-depth 2x blocking or bridging for 2" x 10" or deeper joists at intervals not exceeding 8 feet except blocking can be reduced to 60% of the height if placed above the beam, for draining purposes.
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.
7. Joists must be attached to beams with a positive connection using (3) 8d toe nailed or a mechanical fastener or hurricane clip, or by a joist hanger with flush beam attachment.
8. Joist hangers shall be applied per manufacturer's specs and all of the following:
 - a. The joist hanger must be at least 60% of the joist depth.
 - b. The manufactured width of the joist hanger must accommodate the number of plies being carried.
 - c. Do not bend hanger flanges to accommodate field conditions.
 - d. For hangers that are attached to the ledger board, screws which are recommended by the manufacturer must be used. All other fasteners are permitted to be nails.
 - e. Use joist hangers with inside flanges if clearances to the edge of the beam or ledger dictate.
 - f. Clip-angles or brackets used to support framing members in lieu of joist hangers are prohibited.
 - g. Joists must not be framed in from both sides of the same beam. Engineering analysis is needed if more beams are needed. Each joist hanger must have the minimum capacity of the following: 2"x6" 500 lbs.; 2"x8" 500 lbs.; 2"x10" 600 lbs. and 2"x12" 700 lbs.



¹The maximum length of the overhang is equal to one-fourth of the actual joist span length ($0.25 \times \text{joist span}$).

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.

Figure 6
JOISTS WITH FLUSH BEAM — DECK ATTACHED AT HOUSE

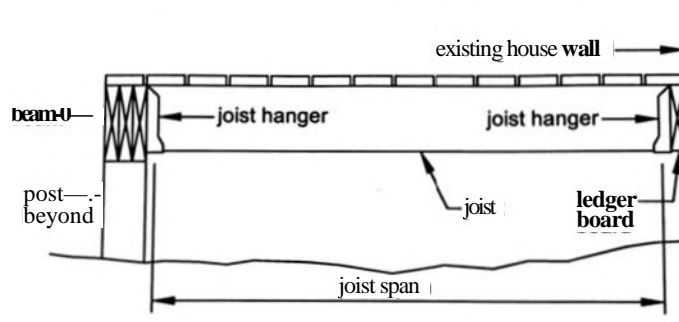
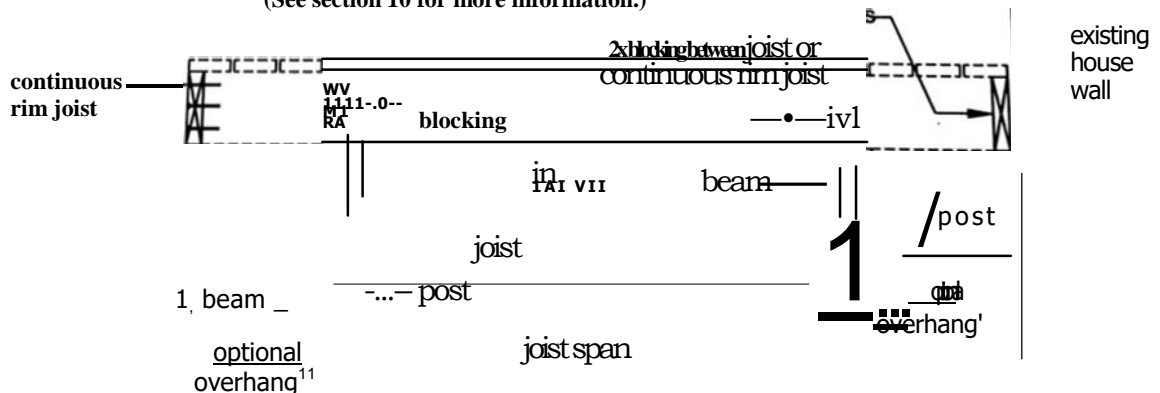


Figure 7
JOISTS WITH TWO DROPPED BEAMS/FREE—STANDING DECK

(See section 10 for more information.)



Section V: Ledger Attachments

1. The ledger board depth must be greater than or equal to the depth of the deck joists, but not less than a 2"x8".
2. The ledger board must be attached in accordance with one of the conditions shown in **Figures 11 through 13**, except if metal plate connected wood floor trusses were used in the house (See text for manufactured wood trusses).
3. The existing band board on the house must be capable of supporting the deck. If this cannot be verified or if existing conditions differ from the details in this text, then a free-standing deck or an engineered design is required.
4. The top of the ledger board and the top of the deck joists must be at the same elevation. (See the following details and Figures).
5. Flashing must be installed to the ledge at the exterior finish, such as house siding, must be removed in the area for the ledger board prior to installation of the ledger board. Continuous flashing with a drip edge, as shown in **Figure 11**, is required at a ledger board that is attached to wood-framed construction. Caulking is needed with the flashing at a threshold to prevent water intrusion due to splash from the deck or due to melting snow and ice.
6. Attaching a ledger board to or through an exterior veneer such as brick or stone, or to or through a masonry chimney, or to a house cantilever is **prohibited**. In such cases, the deck must be free-standing. Attaching a ledger board to a house overhang/cantilever is allowed if supported by engineered analysis.
7. Ledger board fasteners must be installed in accordance with **Figure 15 and Table 6**. Only the fastener types listed here are approved for use; lead anchors are prohibited. Adequacy of connections may be verified by local inspectors.

Wood I-joists. Many homes are constructed with wood I-joists, as shown in Figure 10. Rather than utilize a 2x band board, these systems are often constructed with a minimum 1-inch-thick engineered wood product (EWP) band board capable of supporting a deck. If a minimum 1-inch EWP or 2x band board is not present, then a free-standing deck is required, as addressed in section 10.

Figure 10: WOOD I-JOISTS



Manufactured wood trusses. A metal-plate-connected wood truss (MPCWT) is an engineered, prefabricated structural component that is designed for each specific application. MPCWT systems that are used in residential floors are often installed with a 2"x4" lumber "ribbon" board at the ends of the trusses to tie the ends of the trusses together (see Detail 1 in Appendix C.). The ribbon board, by itself, is not intended to support the deck ledger and deck. Installing a residential deck where the floor for the house uses a MPCWT system must be in accordance with a standard detail provided by the truss designer, a corresponding detail in section 7 of Appendix C, or a full plan submission – unless the deck is free-standing as addressed in section 10.

Siding and flashing. Flashing must be installed in accordance with all of the following:

1. The exterior finish, such as house siding, must be removed in the area for the ledger board prior to the installation of the ledger board.
2. Continuous flashing with a drip edge, as shown in Figure 11, is required at a ledger board that is attached to wood-framed construction. Caulking is needed with the flashing at a threshold to prevent water intrusion due to splash from the deck or due to melting snow and ice.

Through-bolts. Through-bolts must have a diameter of 1/2 inch. Pilot holes for through-bolts must be 17/32 to 9/16 inches in diameter. Through-bolts must be equipped with washers at the bolt head and nut. Bolts should be tightened 6 to 12 months after construction due to drying and wood shrinkage.

Expansion anchors. Expansion or adhesive anchors must be used for attaching a ledger board to a concrete or solid masonry wall, as shown in Figure 12. The bolt or threaded rod of expansion anchors must have a diameter of 1/2 inch, which in some cases may result in needing a 5/8 inch-diameter anchor. Expansion anchors must be installed in accordance with the manufacturer's instructions and must be equipped with washers.

Adhesive anchors. Approved adhesive anchors with a 1/2 inch-diameter threaded rod must be used for attaching a ledger board to hollow masonry, as shown in Figure 13. Examples of approved adhesive anchors include the Epcon Acrylic 7 by ITW Ramset/Red Head, and the HY-20 by Hilti. Adhesive anchors are also permitted with concrete or

Figure 11
ATTACHMENT OF LEDGER BOARD TO BAND BOARD OR BAND JOIST

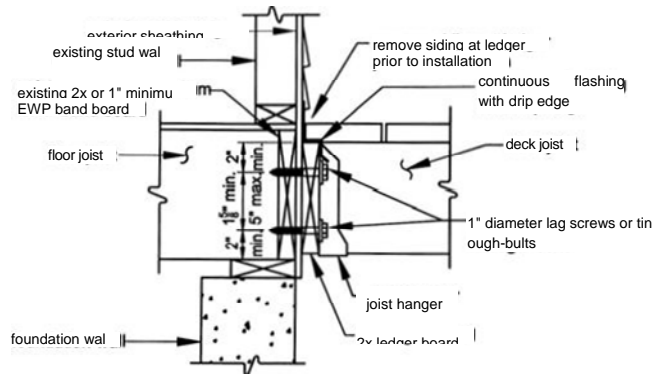


Figure 12
ATTACHMENT OF LEDGER BOARD TO SOLID FOUNDATION

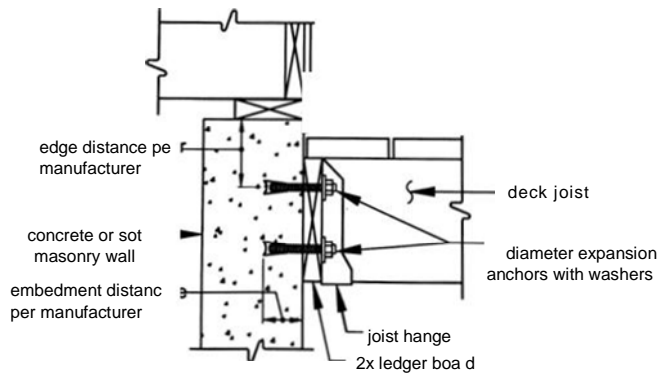
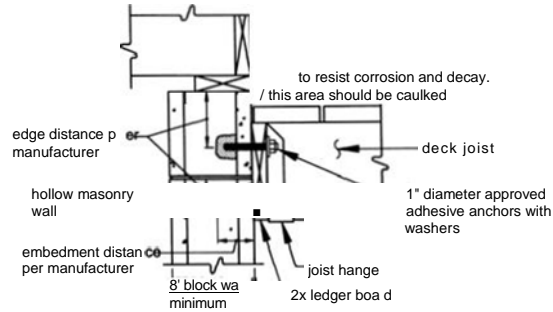


Figure 13

ATTACHMENT OF LEDGER BOARD TO HOLLOW FOUNDATION



Prohibited ledger attachments. Attaching a ledger board to or through an exterior veneer such as brick or stone, or to or through a masonry chimney, or to a house overhang - as shown below - are prohibited. In such cases, the deck must be free-standing, as addressed in section 10. Attaching a ledger board to a house overhang is allowed if supported by engineering.

Figure 14
PROHIBITED LEDGER ATTACHMENTS

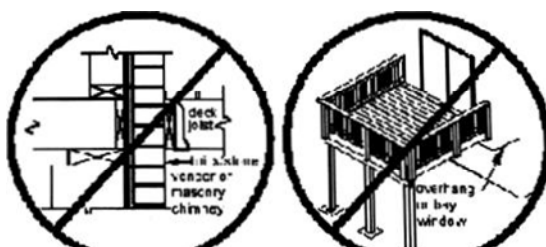


Figure 15
LEDGER BOARD FASTENER SPACING AND CLEARANCES

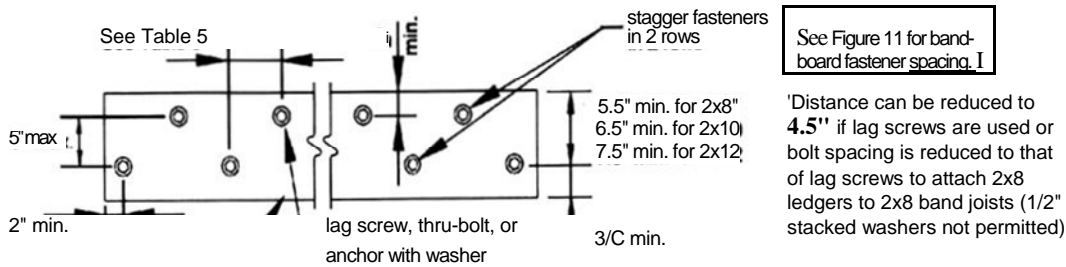


Table 6
LEDGER BOARD FASTENER SPACING, ON CENTER^{1,2,3}

Fastener	Band Board	Joist Span: less than or equal to						
		6'	8'	10'	12'	14'	16'	18'
Lag screws	1" EWP	24"	18"	14"	12"	10"	9"	8"
	1 1/8" EWP	28"	21"	16"	14"	12"	10"	9"
	2x Lumber	30"	23"	18"	15"	13"	11"	10"
Through—Bolts	1" EWP	24"	18"	14"	12"	10"	9"	8"
	1 1/8" EWP	28"	21"	16"	14"	12"	10"	9"
	2x Lumber	36"	36"	34"	29"	24"	21"	19"
Through—Bolts with 1/2" stacked washers ^{4,5}	2x Lumber	36"	36"	29"	24"	21"	18"	16"
Adhesive anchors		32"	32"	32"	24"	24"	16"	16"

¹These values are valid for deck ledgers consisting of douglas fir/larch, hem/fir, or southern pine and for band boards consisting of douglas fir-larch, hem-fir, spruce-pine-fir, southern pine, or engineered wood product (EWP).

²Where solid-sawn pressure-preservative-treated deck ledgers are attached to engineered wood products (minimum 1" thick wood structural panel band joist or structural composite lumber including laminated veneer lumber), the ledger attachment must be designed in accordance with accepted engineering practice. These tabulated values are in accordance with that practice and are based on 300 lbs and 350 lbs for 1" and 1 1/8" EWP rim board, respectively.

³ The thickness of the sheathing over the band board must not exceed 15/32".

⁴ The maximum gap between the face of the ledger board and face of the wall sheathing is 1/2".

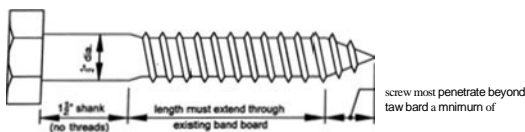
⁵ Wood structural panel sheathing, gypsum board sheathing, or foam sheathing is permitted between the ledger board and the band board. Stacked washers are permitted in combination with wood structural panel sheathing, but are not permitted in combination with gypsum board or foam sheathing. The maximum distance between the face of the ledger board and the face of the band board is 1".

solid masonry installations. Adhesive anchors must be installed in accordance with the manufacturer's instructions and must be equipped with washers. Adhesive cartridges should remain on the jobsite for inspector verification.

Lag screws. The diameter, length, and shank of lag screws must comply with Figure 16. Lag screws must be equipped with washers and be installed in the following sequence:

1. Drill a 1/2 inch-diameter hole in the ledger board and a 5/16 inch-diameter pilot hole into the solid-connection material of the existing house.
2. Insert the lag screw through the ledger board and into the pilot hole by turning. Do not drive with a hammer. Use soap or a wood-compatible lubricant if needed to facilitate tightening.
3. Tighten each lag screw snugly, but do not over-tighten so as to cause wood damage.

Figure 16
LAG SCREW



SECTION 10: FREE-STANDING

A deck that is free-standing does not utilize the exterior wall of the existing house to support vertical loads. Instead, an additional beam is provided at or offset from the existing house wall, as shown in Figure 17. If the edge of a deck footing is closer than 5 feet to an existing exterior house wall, the footing must bear at the same elevation as the existing wall footing as shown in Figure 17. For a house with a basement, a cylindrical footing (caisson) is recommended to minimize required excavation at the basement wall.

Section VI: Decking

1. Wood decking must be 2x4s, 2x6, or 5/4 inch span-rated decking boards. Wood-plastic composite sizes must be installed per manufacturer's instructions. Plastic decking may be used if it is approved by a professional testing organization for supporting a live load of 40 psf. and is installed according to the manufacturer's instructions.
2. Decking must be attached in accordance with **Figure 22**, and may be placed at an angle of 45 to 90 degrees to the joists unless disallowed in the manufacturer's instructions. If the decking is wet, place it with no gaps so that after drying a gap is required.
3. Decking may overhang a joist by up to 3 inches unless disallowed in the manufacturer's instructions.
4. The center-to-center joist spacing may be up to 24 inches for wood decking, but may not exceed 16 inches for wood-plastic-composite decking unless specified otherwise by the manufacturer.
5. Each wood decking member must bear on a minimum of four joists or intermediate blocking between joists.
6. Placement and attachment of wood-plastic-composites must be done in accordance with the manufacturer's instructions
7. Attach the decking and rim joists in accordance with **Figure 23**.

Figure 22
TYPICAL DECKING

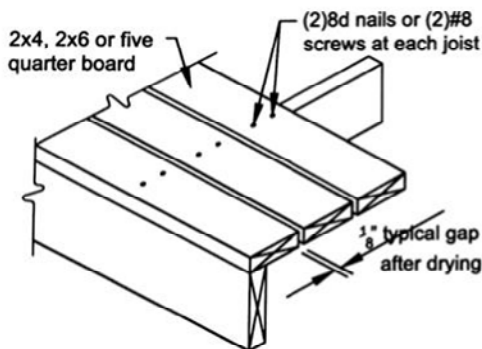
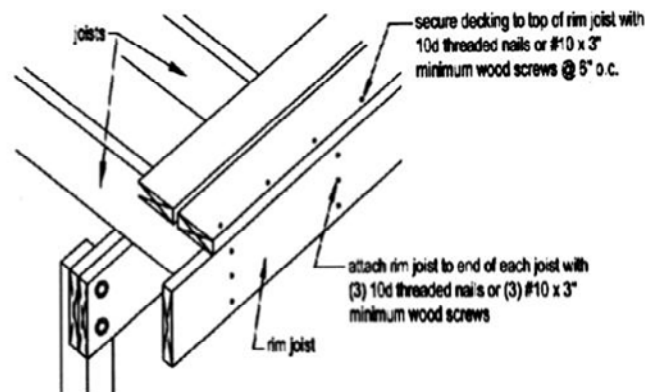


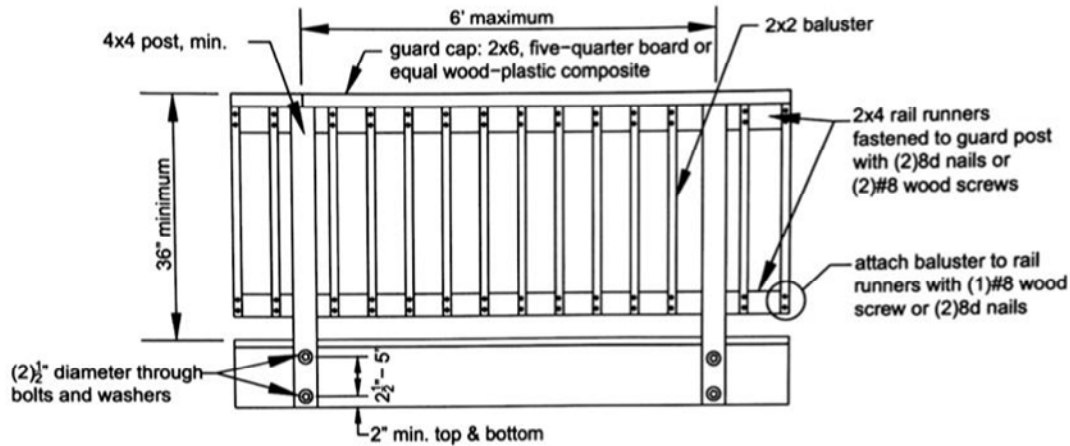
Figure 23
RIM JOIST CONNECTION



Section VII: Guards & Posts

1. All open sides of a deck area that is more than 24 inches above grade at any point within 36 inches beyond the edge of the deck, must have a guard that complies with **Figure 24**.
2. Required horizontal guards shall not have openings from the walking surface to the required height which allows passage of a sphere 4 inches in diameter, when applying a force of 4 pounds.
3. Required guards at stairs shall not have openings which allow passage of a sphere 4 3/8 inches in diameter, when applying a force of 4 pounds, other than the triangular opening at the side of an open stair formed by the riser, tread, and bottom rail of a guard, which shall not allow passage of a 6 inch sphere, when applying a force of 4 pounds.
4. Rope, cable, or similar non-rigid material may be used instead of balusters if it is strung with a maximum of 3 1/2 inches and with vertical supports no more than 4 feet apart.
5. The guard and posts must withstand a 200-pound applied load applied in any direction.
6. Guard infill components, such as balusters and panel fillers, must withstand a horizontally applied, perpendicular load of 50 pounds on any one-foot square area.
7. Wood-plastic composites of equivalent dimensions may be substituted for the guard cap and infill elements shown in **Figure 24** if the manufacturer's instructions permit this use.

**Figure 24
GUARDS**



Guard posts. Guard posts must be attached to the deck structure in accordance with all of the following:

Notching guard posts, as shown in Figure 25, is prohibited.

1. Notching guard posts, as shown in Figure 25, is prohibited.
2. Hold-down anchors must have a minimum capacity of 1,800 pounds.
3. Guard posts may be attached to either side of the end joist or rim joist.
4. Bolt holes for a post must be at least 2 inches from the wood edge, at least 2 1/2 inches apart, and no more than 5 inches apart.
5. Hold-down anchors, as shown in Figures 26 and 27, must be used to attach the guard post to the end joist and rim joist, respectively.

**Figure 25
POST NOTCHING PROHIBITED**



Section VIII: Stairs, Treads, & Risers

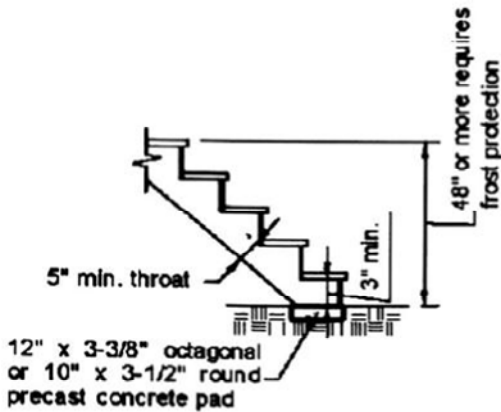
1. Stair Dimensions must comply with all of the following::
 - a. The minimum width of a stair is 36 inches.
 - b. Handrails and associated trim may project a maximum of 4 1/2 inches into the required width at each side of the stairs. The minimum clear width at and below the handrail, including at treads and landings, cannot be less than 31 1/2 inches where a handrail is installed at one side, and 27 inches where handrails are provided at both sides.
 - c. Stair configuration and openings must be in accordance with **Figure 27**.
 - d. Within a stairs, the largest tread depth may not exceed the smallest tread depth by more than 3/8 inch, and the largest riser height may not exceed the smallest riser height by more than 3/8 inch.
 - e. If the total vertical height of a stairs exceeds 12 feet, an intermediate landing is required and must be constructed as a free-standing deck with flush beams and with posts.
 - f. Any landing width must equal or exceed the total width of the stairs it serves.

8" _____
max. riser _____

9" min. _____
[' s t e a d _____

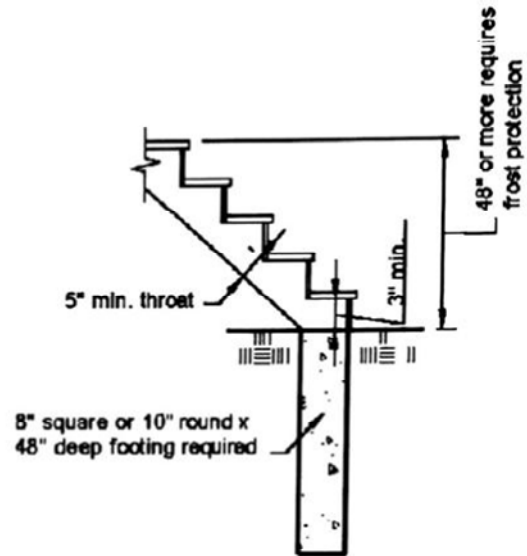
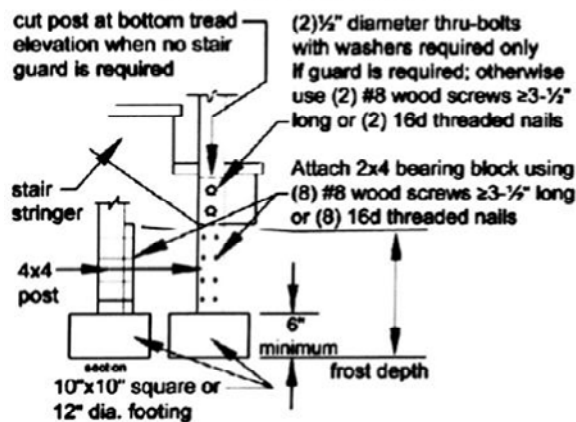
tread _____
_____ } -4" diameter
_____ sphere shall
not pass
riser _____

Intermediate—supported stringers: If the total stringer length exceeds the above dimensions, a 4"x4" post may be provided to support the stringer and shorten its span length. The 4"x4" post must be notched and bolted to the stringer in accordance with Figure 2. The post must bear over the middle one—third of a footing that is constructed in accordance with Figure 29 and must be attached as shown in Figure 2. An intermediate landing as described above may also be provided to shorten the stringer span.



LOWER BEARING AT FOOTING

Figure 29
STRINGER BEARING



LOWER BEARING AT FOOTING – FROST PROTECTED

Figure 30
STRINGER SPAN LENGTH

Tread and riser material. Treads and risers must comply with all of the following:

1. Tread material must be equivalent to the decking specified in section 12 and be attached in accordance with Figure 31, except wood-plastic composites must be attached in accordance with the manufacturer's instructions.
2. Stairs constructed using the solid-stringer exception noted above must have treads constructed of 2x wood material only and be attached in accordance with Figure 30.
3. Risers that are not open (as shown in Figure 27) must be framed with 1x lumber minimum or an manufacturer recommended wood-plastic composite.

2. Stair Stringers must comply with all of the following:

- a. Stringers must be sawn or solid 2'x12's complying with the required tread and riser dimension.
- b. Cut stringers must be spaced no more than 18 inches on center.
- c. Stringers must bear on a solid surface, a minimum of 3 1/2 inches thick and 8 inches in diameter, and attached to the deck or a landing in accordance with **Figure 28**. Prior to the placement of solid surface, all loose or organic material shall be removed.
- d. Stringer span length is measured using the horizontal projected distance between the centerlines of bearing at each end.
- e. The span length of a cut stringer must not exceed 6 feet, and the throat size of cut stringers must not be less than 5 inches, as shown in **Figure 30**.

3. Stair Handrails. A stairs with more than 3 risers must have at least one handrail that complies with all the following:
 - a. The handrail must be located at least 30 inches, but no more than 38 inches, above nosing and treads. Measurement must be taken from the nosing to the top of the rail.
 - b. The handrail must be attached to a stair guard or exterior wall acting as a barrier as shown in **Figure 33**.
 - c. The handrail and connecting hardware must be decay-and-corrosion resistant.
 - d. The handrail must have a smooth surface with no sharp corners and must be graspable, as shown in **Figure 34**. Recessed sections may be shaped from a 2"x6" or 5/4-inch board as shown in **Figure 33**.
 - e. Handrails must run continuously from a point directly over the lowest riser to a point directly over the highest riser.
 - f. Handrails may be interrupted by guard posts.

Figure 31
STAIRWAY TREADS

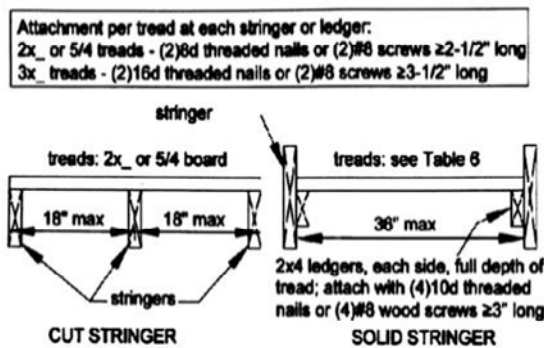


Table 7
MINIMUM TREAD SIZES¹

Species	Cut Stringer	Solid Stringer
Douglas Fir/ Larch, Hem/ Fir, SPF ²	2x4 or 5/4	2x8 or 3x4
Southern Pine	2x4 or 5/4	2x8
Redwood, West- ern Cedars, Pon- derosa 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.

Stair guards. Guards must be provided on all open sides of stairs consisting of more than 3 risers. Stair guards must comply with section 13 and Figure 32.

Figure 32
STAIR GUARDS

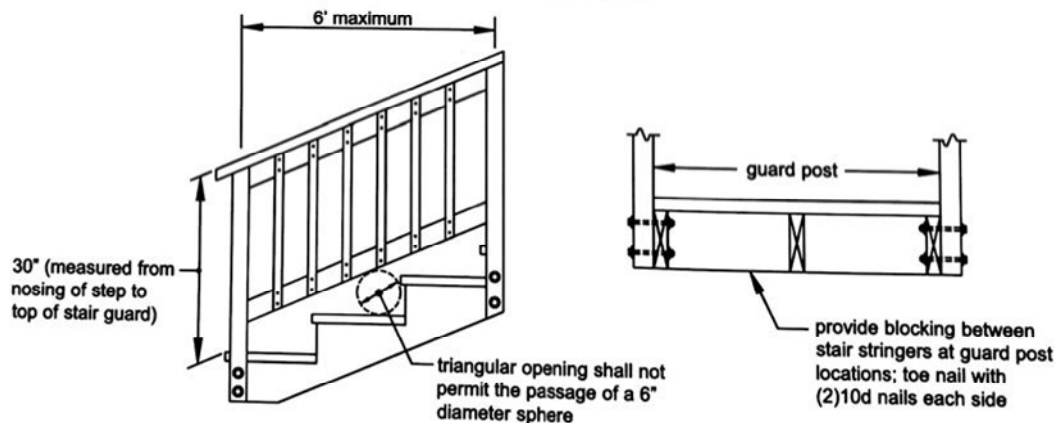


Figure 33
STAIR HANDRAILS

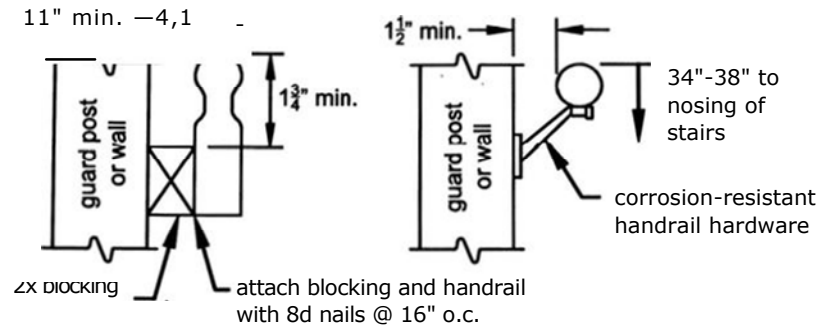
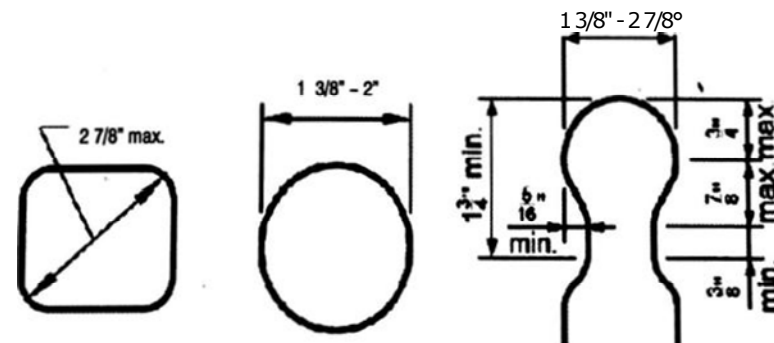


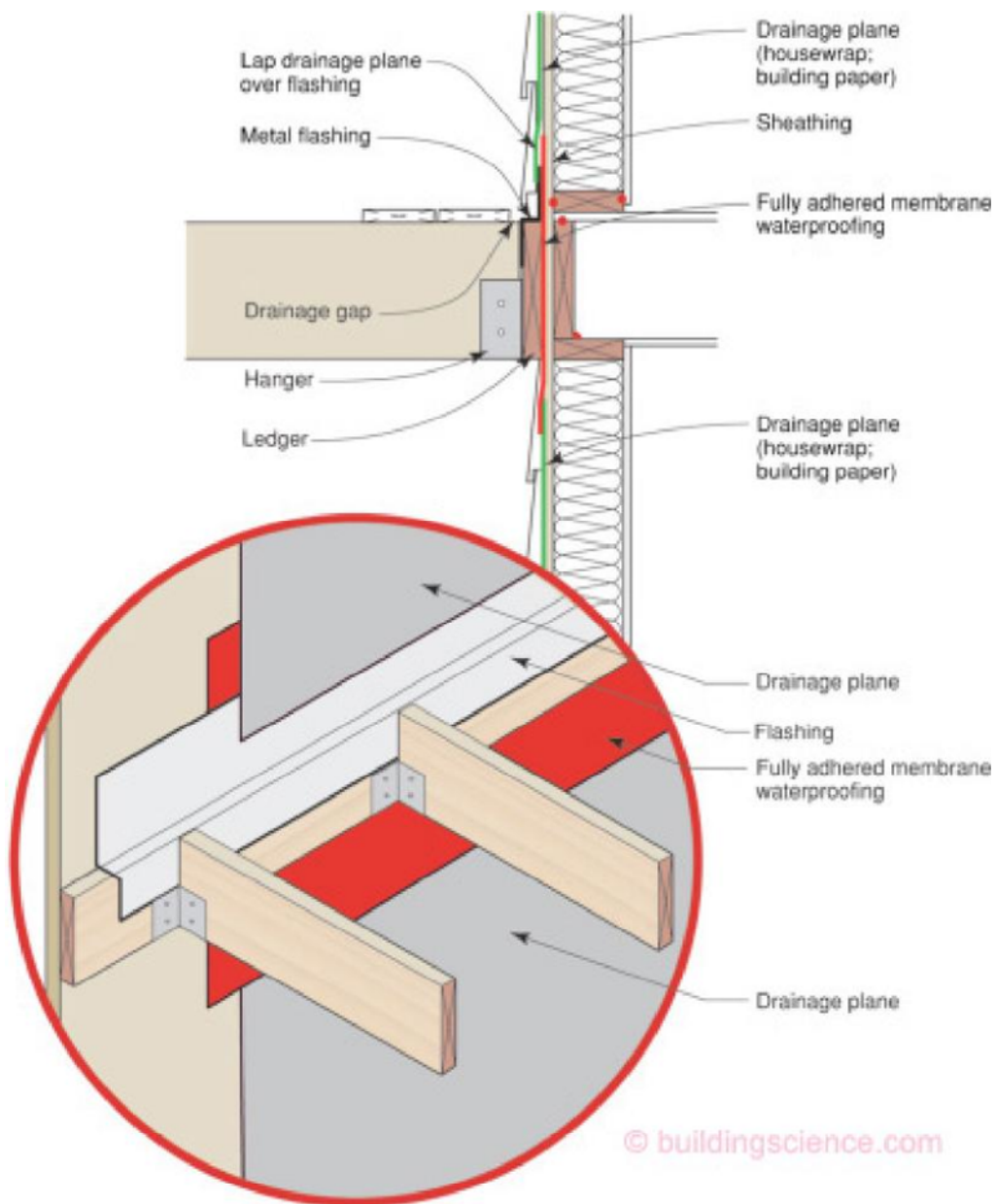
Figure 34
HANDRAIL GRASPABILITY



NONCIRCULAR CIRCULAR RECESSED

Perimeter: 4" - 6 1/4"

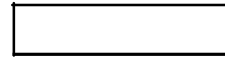
WRB Behind Deck Ledger



- Drainage plane above ledger to lap over flashing which is placed over waterproof membrane
- Drainage plane to be tucked under waterproof membrane below ledger
- Deck joist ends should be treated to reduce absorption of water

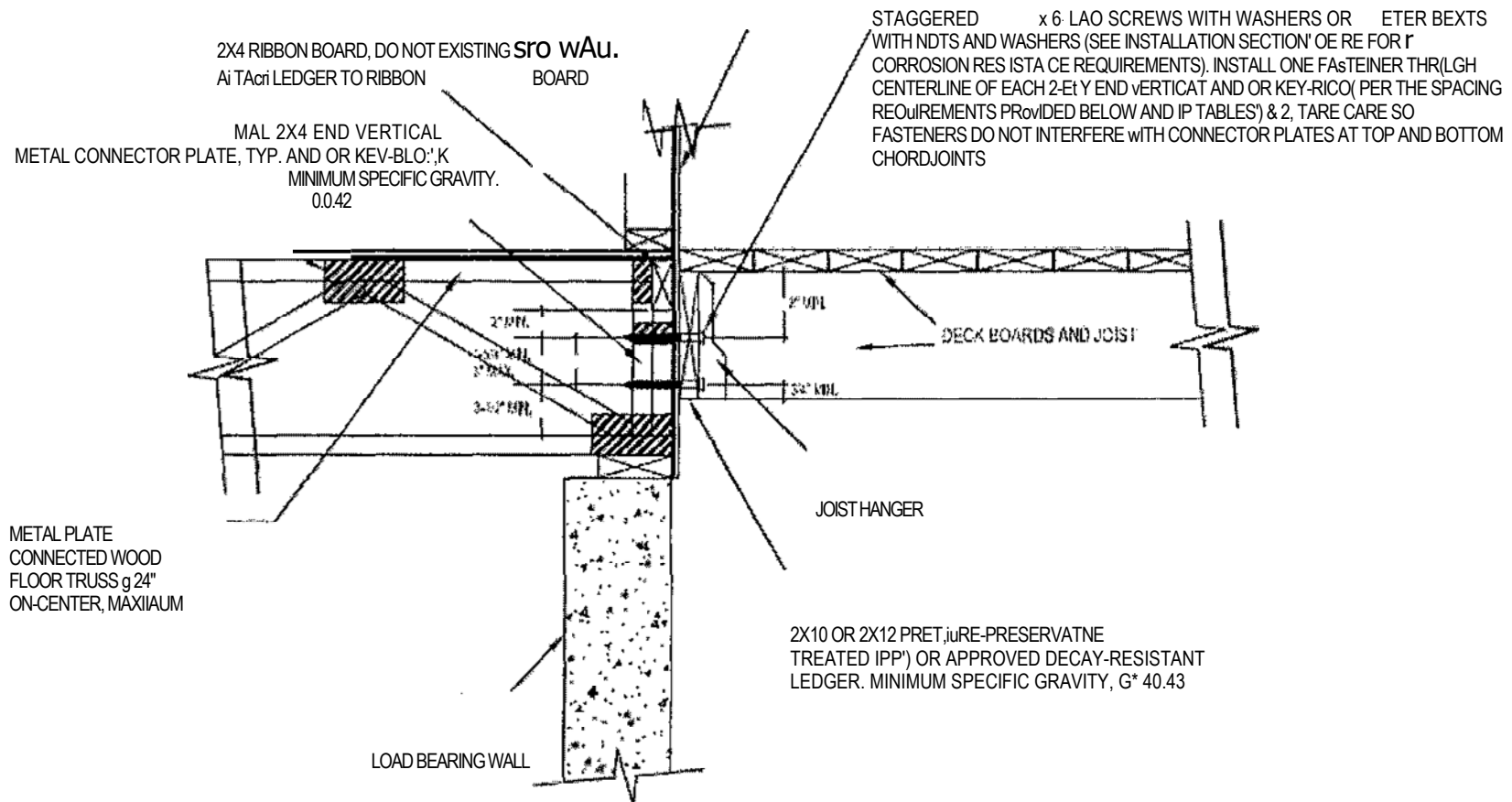
Detail 1 (p 39)

Ledger Perpendicular to Floor Truss



NOTE EXTERIOR CLADDING
AND FLASHING NOT SHOWN
FOR CLARITY,

MAX 1/2" THICK WOOD
STRUCTURAL PANEL SHEATHING
FASTENED PER BUILDING CODE



Detail 2 (p 41)

Parallel to Floor Truss

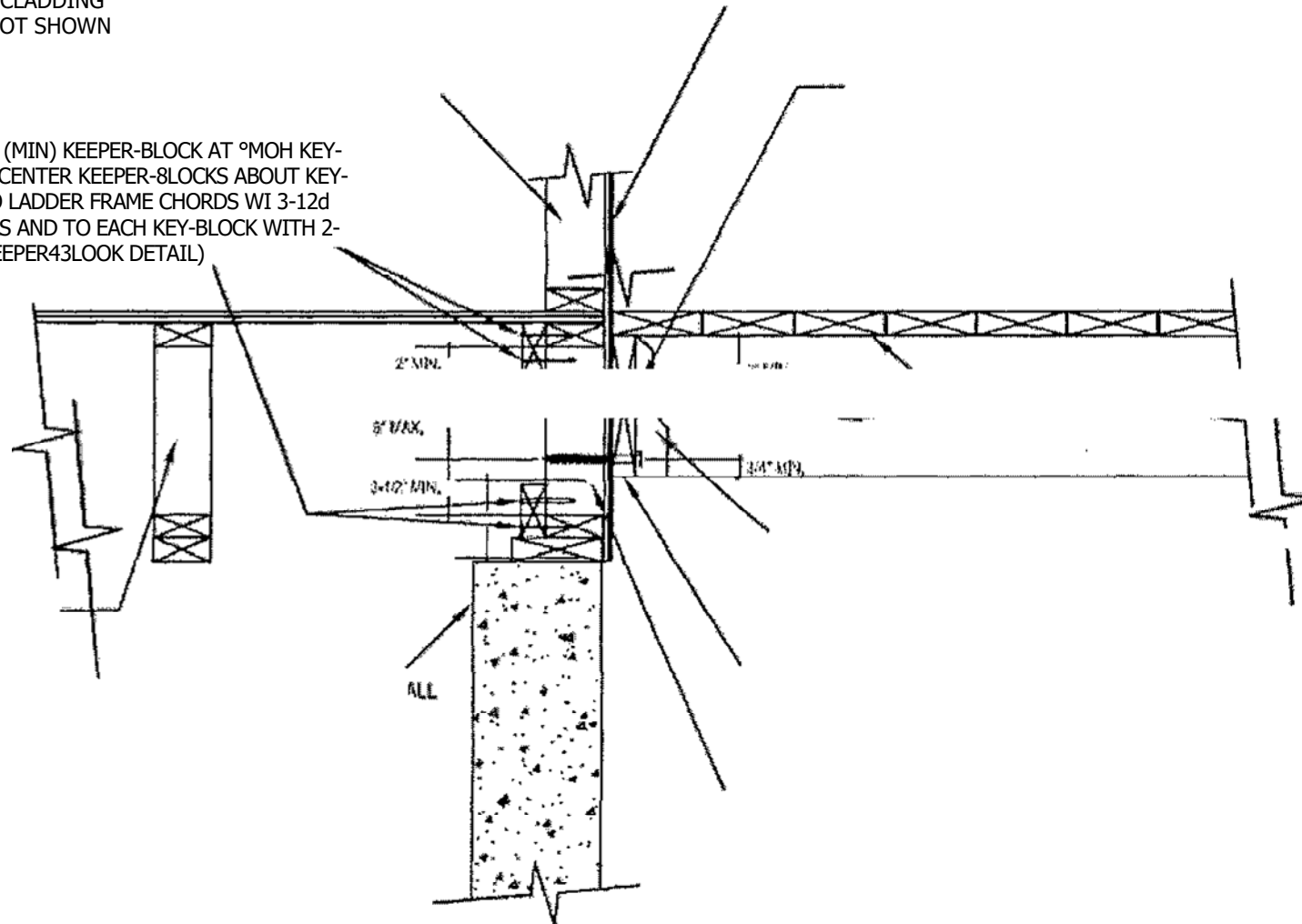
WALL SECTION

NOTE-EXTERIOR CLADDING
AND FLASHING NOT SHOWN
FOR CLARITY,

MAX 15132* THICK WOOD STRUCTURAL PANEL
SHEATHING FASTENED PER BUILDING CODE

EXISTING STUD WALL

1'2" LONG 2X4 SPF (MIN) KEEPER-BLOCK AT MOH KEY-BLOCK LOCATION, CENTER KEEPER-8BLOCKS ABOUT KEY-BLOCK, ATTACH TO LADDER FRAME CHORDS WI 3-12d (0,131"X3,251 NAILS AND TO EACH KEY-BLOCK WITH 2-12d NAILS. {SEE KEEPER43LOOK DETAIL)



STACCCERED 112" DIA, x 6" LAG SCREWS WITH WASHERS

OR 1/4" DIA. BOLTS WITH NUTS AND WASHERS
(SEE INSTALLATION SECTION OF REPORT
FOR MINIMUM CORROSION RESISTANCE
REQUIREMENTS), INSTALL ONE FASTENER
THROUGH CENTERLINE OF EACH 4x4

VERTICAL TRUSS WEB AND/OR KEY-BLOCK PER
THE SPACING REQUIREMENTS PROVIDED BELOW
AND IN TABLES 3 & 4, TAKE CARE SO FASTENERS
DO NOT DAMAGE DISTURB MTH CONNECTOR
PLATES AT TOP AND BOTTOM CHORD JOINTS



METAL PLATE CONNECTED WOOD FLOOR TRUSS @ 24° ONCE NTER,
MAXIMUM

JOIST HANGER

1

LOAD BEARING W

***NOTE - IF VERTICAL WEBS IN LADDER FRAME ARE
ONLY 1-PLY 2X4s INSTEAD OF 4X4 LUMBER, DO NOT
ATTACH LEDGER TO 2X4 VERTICAL WEB MEMBERS,
INSTALL KEY-BLOCKS (SEE KEY-BLOCK DETAIL
BELOW) AT THE REQUIRED SPACING INDICATED IN
TABLES 3 & 4

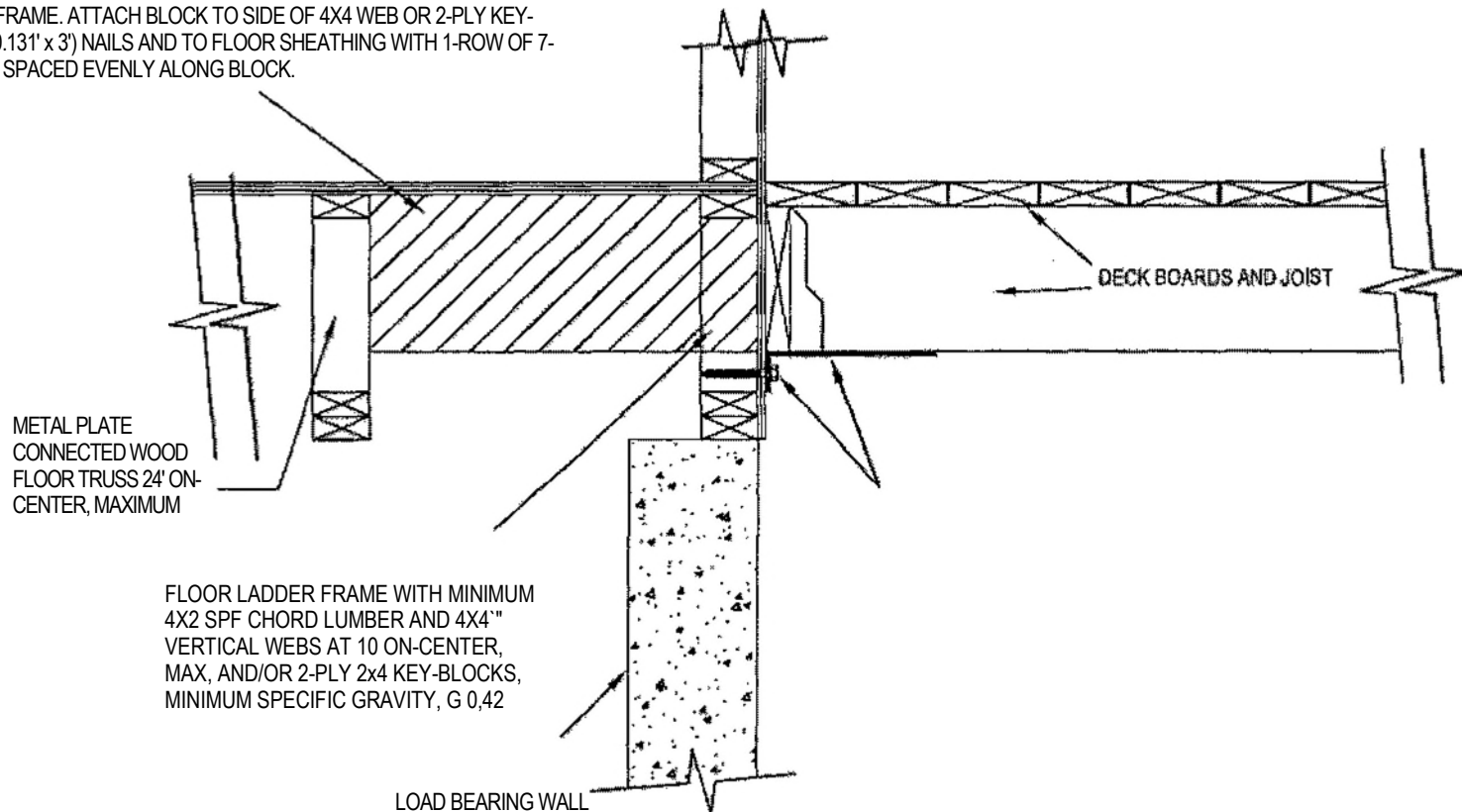
2X10 OR 2X12 PRESSURE-PRESERVATIVE TREATED
(PP' fl OR APPROVED DECAY-RESISTANT LEDGER,
MINIMUM SPECIFIC GRAVITY, G=0421

FLOOR LADDER FRAME WITH MINIMUM
4X2 SPF CHORD LUMBER AND 4X4" SPE
VERTICAL WEBS AT 16 ON-C,E.NTE.R, MAX,
AND/OR 2-PLY 2X4 KEY;-9LOCKS,
MINIMUM SPECIFIC GRAVITY, G 0A2

Ledger Board Attachment (p.44) Detail 3

LEDGER ATTACHED TO SIDE OF FLOOR LADDER A E

APPLY MINIMUM 2x SPF BLOCK OF SAME DEPTH AS DECK JOISTS TO ONE SIDE OF EACH 4X4 VERTICAL WEB OR KEY-BLOCK TO WHICH THE HOLDOWN IS ATTACHED, CUT BLOCK TO FIT TIGHT BETWEEN EXTERIOR SHEATHING AND SIDE OF FIRST INTERIOR FLOOR TRUSS. CAREFULLY NOTCH BLOCK FOR TIGHT FIT AROUND TOP CHORD OF LADDER FRAME. ATTACH BLOCK TO SIDE OF 4X4 WEB OR 2-PLY KEY-BLOCK WITH 0-1.0d (0.131" x 3") NAILS AND TO FLOOR SHEATHING WITH 1-ROW OF 7-108 (0.131" x 3") NAILS SPACED EVENLY ALONG BLOCK.



REFER TO DETAIL 2 FOR
ADDITIONAL INFORMATION
HOLDOWN DEVICE CAPABLE OF RESISTING 750 LBS MINIMUM, INSTALL HOLDOWNS AT
FOUR (4) LOCATIONS, EVENLY DISTRIBUTED ALONG LEDGER WITH ONE (1) HOLDOWN
WITHIN 2' OF EACH END OF LEDGER, ATTACH HOLDOWN TO 4X4 VERTICAL TRUSS WEB
OR 2-PLY KEY-BLOCKS WITH 3/8" DIA, FULLY THREADED LAG SCREW PRE-DRILLED,
WITH MINIMUM 3-1 1/2" PENETRATION INTO WEB/KEY-BLOCK, AND TO DECK JOIST PER
MANUFACTURER'S SPECIFICATIONS, INSTALL LAG SCREW THROUGH CENTER OF WEB
OR KEY-BLOCK SO AS NOT TO DAMAGE/DISTURB WITH OR DAMAGE CONNECTOR
PLATES