



CITY OF FAIRMONT – 100 Downtown Plaza – Fairmont, MN 56031

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Permit Required **ALL DECKS REQUIRE A PERMIT.**

Footings	Footings must extend to frost depth 42" when attached to a dwelling.
Overhanging decks	Joists shall not overhang beams by more than two feet, nor shall beams overhang support posts by more than one foot unless a special design is approved.
Setbacks	Deck may extend to area allowed by the Zoning Department. Please call 507-238-9461 for details.  Special Note; if this deck is the first step to a three season porch or an addition then the requirements will change.
Live load	Decks shall be designed to support a live load of 40 pounds per square foot. Ledger boards must be bolted or lagged to the dwelling. Decks not supported from the ground are considered balconies and shall be designed to support a live load of 60 pounds per square foot.
Flashing	All connections between deck and dwelling shall be waterproof. Any cuts in exterior finish shall be flashed appropriately according to the material and manufactures instructions.
Joist Hangers	Joists shall be supported by approved framing anchors such as joist hangers with approved joist hanger nails or shall have 1 ½ " of bearing.
Wood Specifications	All structural members of the deck shall be properly labeled treated wood or wood resistance to decay such as the heartwood of redwood or cedar. Decking and guardrails may be treated wood or sap wood grade cedar or redwood.
Columns or Post	Columns and post in contact with the ground or embedded in concrete, earth or masonry must be of special pressure treated wood approved for ground contact with approved listing. (Grade stamp or tag is required)
Nails & Screws	Use only stainless steel, hot-dipped galvanized or silicon bronze or copper.
Site Plan	Submit a scale drawing of the lot. It shall include all structures, lot lines and setback.
Plans	Submit construction plans with dimensions and material details.
Guards	All decks and open sides of stairs that are more than 30" above grade must be protected by a guardrail. Such rail shall be at least 36" in height with openings such that a 4-inches diameter sphere cannot pass through.
Exceptions:	<ol style="list-style-type: none"><li>1. The triangular openings formed by the riser, tread and bottom element of a guardrail at the open side of the stairway may be of such size that a sphere 6" inches in diameter cannot pass through.</li><li>2. Openings for required guards on the sides of stair shall not allow a sphere 4 3/8" to pass through.</li></ol>
Handrail	Stairs of four or more risers shall have a handrail placed between 34" inches & 38" inches above stair nosing. The handrail shall be easily grasped, continuous and uninterrupted from top to bottom risers, and returned at the top and bottom to the wall or post. Handrails which are also guards on the open side of stairs shall comply with guard requirements and be a minimum 34" above stair noses.
Landings	A landing shall be provided on the exterior side of each door and at each 12 foot of vertical riser on a stair. Landing shall be at least 36 inches x 36 inches. Maximum landing size on a lake bank steps is 32 square feet.

**This handout is written as a guide to common questions and problems. It is not intended nor shall it be considered a complete set of requirements.**

## DECK LEDGER REQUIREMENTS

### R507.1 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. 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, connection 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.

### R507.2 Deck ledger connection to band joist.

For decks supporting a total load of 50 pounds per square foot (2394 Pa) [40 pounds per square foot (1950 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 ½-inch (12.7 mm) lag screws or bolts with washers in accordance with Table R507.2 Lag screws, bolts and washers shall be hot-dipped galvanized or stainless steel.

**TABLE R507.2**

FASTENERS SPACING FOR A SOUTHERN PINE OR HEM-FIR LEDGER AND A 2-INCH-NOMINAL SOLID-SAWN SPRUCE-PINE-FIRE BAND JOIST <sup>c,f,g</sup> (Deck live load = 40 psf, deck dead load = 10 psf)

JOIST SPAN	6' and less	6' 1" to 8'	8' 1" to 10'	10' 1" to 12'	12' 1" to 14'	14' 1" to 16'	16' 1" to 18'
<b>Connection details</b>	<b>On-center spacing of fasteners <sup>d,e</sup></b>						
½" diameter lag screw with 15/32" maximum sheathing <sup>a</sup>	30	23	18	15	13	11	10
½" diameter bolt with 15/32" maximum sheathing	36	36	34	29	24	21	19
½" diameter bolt with 15/32" maximum sheathing and ½" stacked washers <sup>b,h</sup>	36	36	29	24	21	18	16

For SI: 1 inch = 25.4 mm, 1 foot = 304.88 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 bank joist.
- b. The maximum gap between the face of the ledger board and face of the wall sheathing shall be ½ inch.
- c. Ledgers shall be flashed to prevent water from contacting the house band joist.
- d. Lag screw and bolts shall be staggered in accordance with Section R507.2.1.
- e. Deck ledger shall be minimum 2 x 8 pressure-preservative-treated No. 2 grade lumber, or other approved material 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 ½ 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 foam 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.

#### R507.2.1 Placement of lag screws or bolts in deck ledgers and band joists.

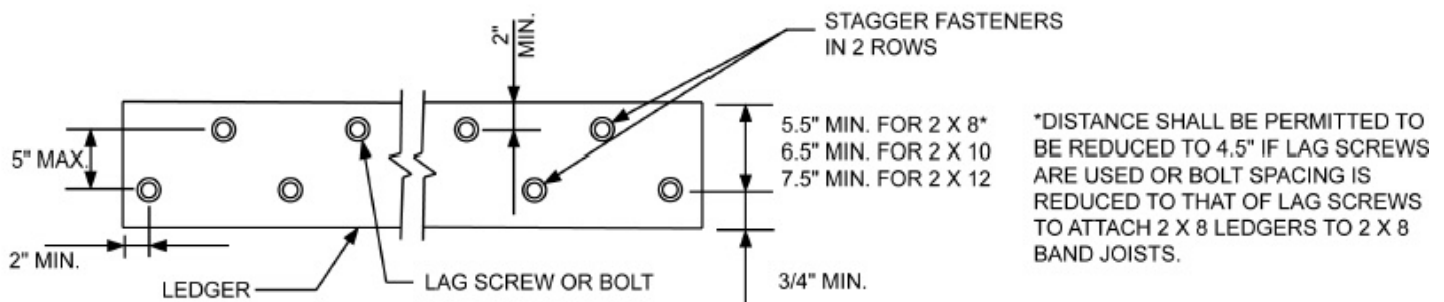
The lag screws or bolts in deck ledgers and band joists shall be placed in accordance with Table R507.2.1 and Figures R507.2.1(1) and R507.2.1(2).

**TABLE 507.2.1 PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS**

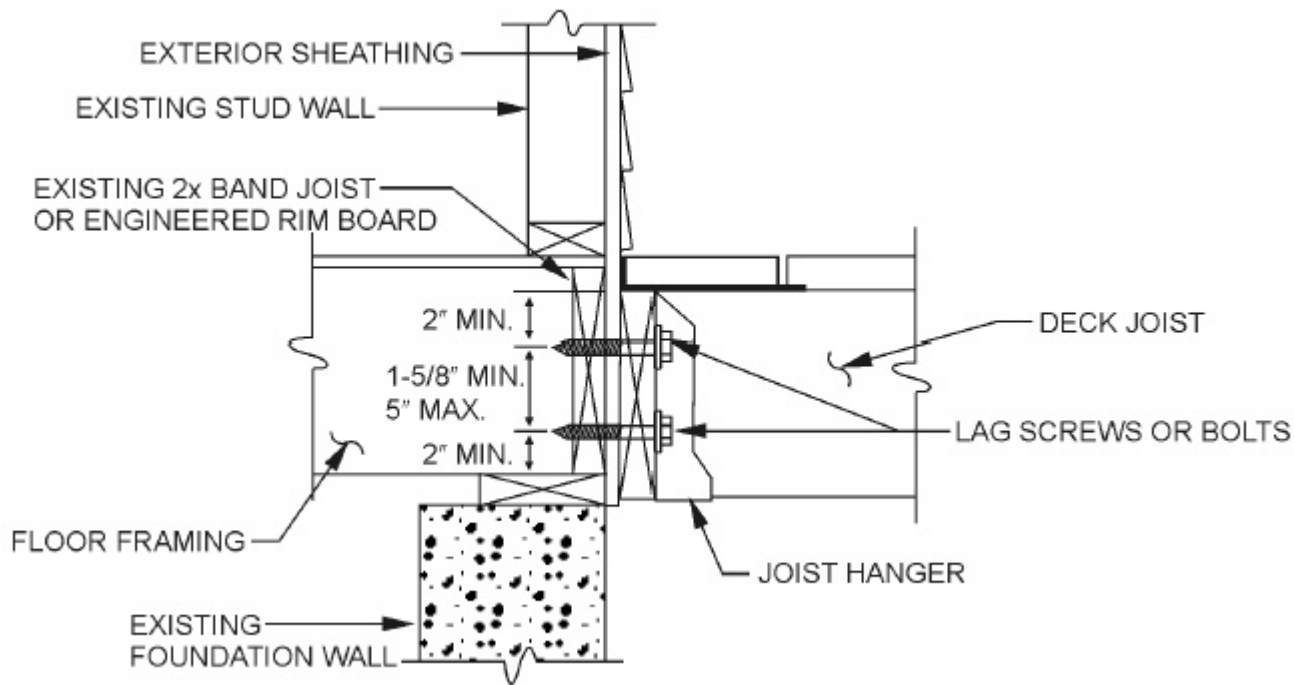
MINIMUM END EDGE DISTANCES AND SPACING BETWEEN ROWS				
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
Ledger <sup>a</sup>	2 inches <sup>d</sup>	¼ inch	2 inches <sup>b</sup>	1 5/8 inches <sup>b</sup>
Band Joist <sup>c</sup>	¾ inch	2 inches	2 inches <sup>b</sup>	1 5/8 inches <sup>b</sup>

For SI: 1 inch = 25.4 mm.

- a. Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.2.1 (1).
- b. Maximum 5 inches.
- c. For engineered rim joists, the manufacturer’s recommendations shall govern.
- d. The minimum distance from bottom row of lag screws or bolts to the top edge of the ledger shall be in accordance with Figure R507.2.1 (1).



**FIGURE R507.2.1(1) PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS**



**FIGURE R507.2.1(2) PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOISTS**

### R507.2.3 Deck Lateral load connection

The lateral load connection required by Section R507.1 shall be permitted to be in accordance with Figure R507.2.3. Where the lateral load connection is provided in accordance with Figure 507.2.3, 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 (6672N).

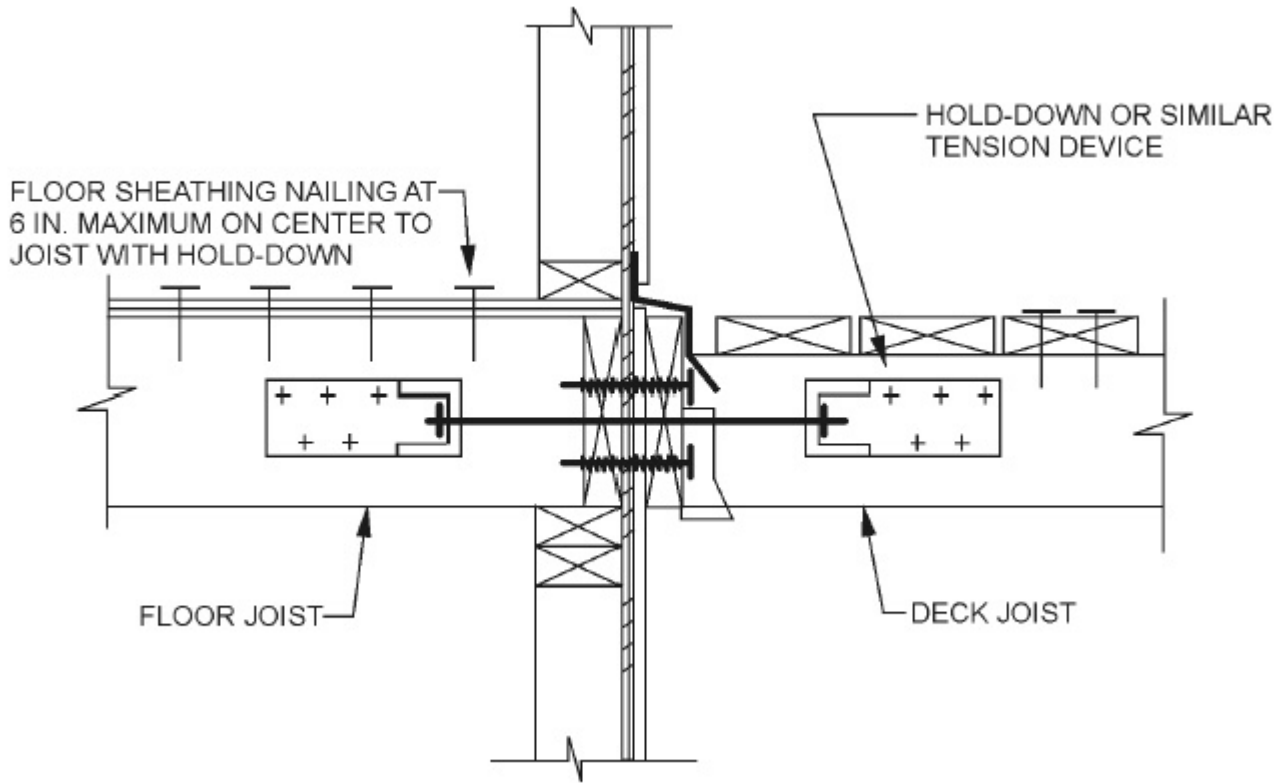
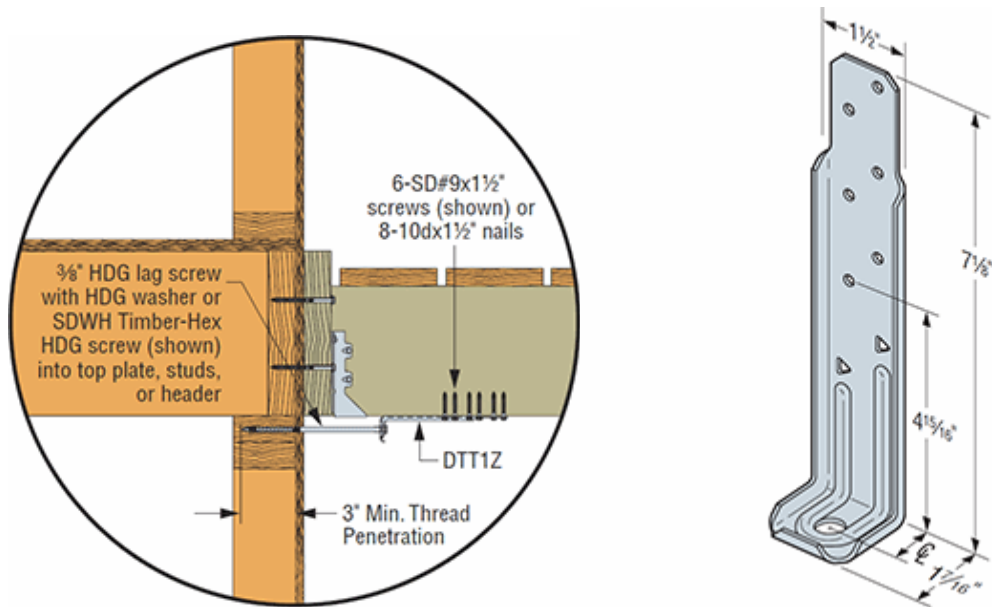


FIGURE 507.2.3 DECK ATTACHMENT FOR LATERAL LOADS



SIMPSON DTT1Z OR SIMILAR

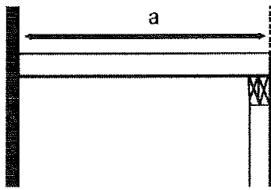
## Joist span

Based on No. 2 or better wood grades. Design Load = 40#LL + 10#DL. Deflection= L/360

	Hem Fir			Southern pine			Western cedar		
	12"OC	16"OC	24"OC	12"OC	16"OC	24"OC	12"OC	16"OC	24"OC
2x6	10-0	9-1	7-11	10-3	9-4	7-7	9-2	8-4	7-3
2x8	13-2	12-0	10-6	13-6	11-10	9-8	12-1	11-0	9-7
2x10	16-10	15-3	13-4	16-2	14-0	11-5	15-5	14-0	12-3
2x12	20-6	18-7	16-3	19-1	16-6	13-6	18-9	17-0	14-11

### Sample calculations for using joist span, beam size and footing size tables

Case I solution:



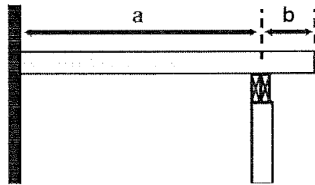
Refer to table for joist, beam and footing size requirements.

Example: a = 12 feet; Post spacing = 8 feet

Use the **joist span** table to find the acceptable joist sizes for a 12 foot span, 2x8s at 12 inches O.C., 2x10s at 16 inches O.C., or 2x12s at 24 inches O.C.

Use the **Beam and footing sizes** table to find the 8 foot post spacing column. With a 12 foot deck span, the beam may be either three 2x8s or two 2x10s, depending on wood used. The footing diameter at the base must be a minimum of 12 inches for the corner post and 17 inches for all intermediate posts.

Case II solution:



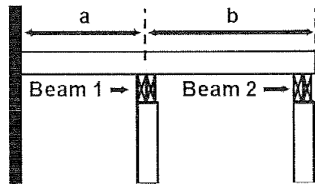
Use "a" to determine joist size and "a" + "2b" to determine beam and footing sizes. The length of "b" is restricted by both the length of "a" and the size of the joists.

Example: a = 8 feet, b = 2 feet, Post spacing = 10 feet.

Refer to the **joist span** table. For an 8 foot joist span, either 2x8s at 24 inches O.C. or 2x6s at 16 inches O.C. are acceptable.

For sizing the beam, use a joist lend of 10 feet (8 feet + 2 feet) and a post spacing of 10 feet. The **beam and footing sizes** table indicates that the beam may be either three 2x10s or two 2x12s depending of wood used. The footing diameter at the base must be a minimum of 15 inches for the corner post and 20 inches for all intermediate posts.

Case III solution:



Use "a" or "b", whichever is greater, to determine joist size. Use "a" + "b" to determine the size of the Beam 1 and post footing size for posts supporting Beam 1. Use joist length "b" to determine both the size of Beam 2 and the post footing size for posts supporting Beam 2.

Example: a = 6 feet, b = 7 feet, Post spacing = 9 feet.

Joist size is determined by using the longest span joist (7 feet). The **joist span** table indicates that 2x6s at 24 inches O.C. would be adequate for this span.

For Beam 1 and footings, use a joist length of 13 feet (6 feet + 7 feet) and a post spacing of 9 feet. The **beam and footing sizes** table indicates that the beam may be two 2x10s or two 2x12s, depending on the wood used. The footing diameters for Beam 1 posts shall be 13 inches for the corner post and 19 inches for all intermediate posts. For Beam 2 and footings use a joist length of 7 feet and post spacing of 9 feet. The beam may be two 2x8s or two 2x10s, depending on wood used. The footing diameters for Beam 2 shall be 10 inches for the corner posts and 14 inches for all intermediate posts.

# BEAM AND FOOTING SIZES

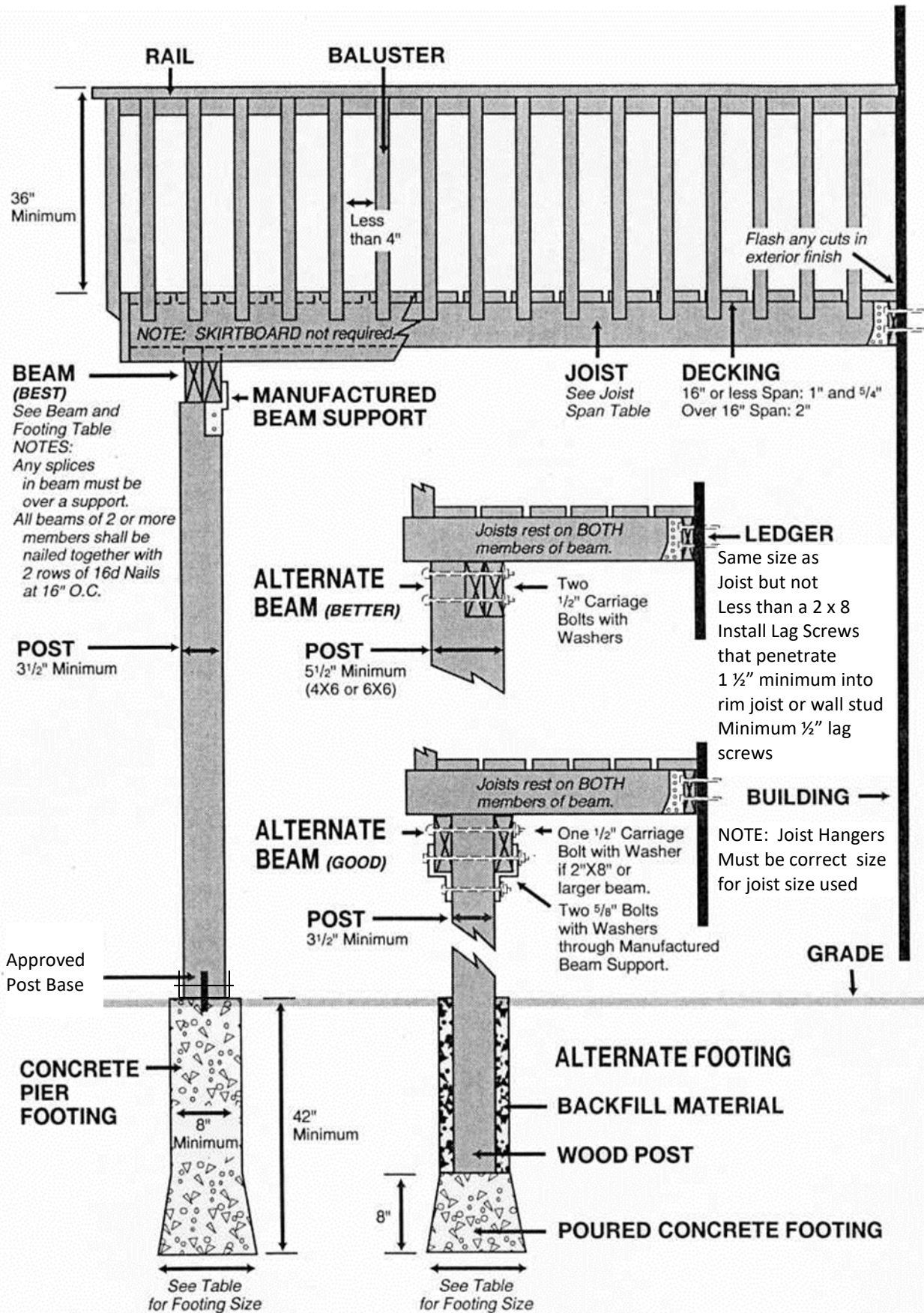
Based on No. 2 or better pressure treated Southern pine lumber (also know as Southern Yellow Pine)

			Post spacing										
			4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
Joist Length	6'	Beam Size	2-2x6	2-2x6	2-2x6	2-2x6	3-2x6 2-2x8	3-2-2x6 2-2x8	3-2x8 2-2x10	3-2x8 2-2x10	3-2x10 2-2x12	3-2x10 2-2x12	3-2x12 Eng Bm
		Corner Footing	8	8	8	8	9	9	10	10	11	11	11
		Intermediate Footing	9	10	10	11	12	13	14	14	15	15	16
	7'	Beam Size	2-2x6	2-2x6	2-2x6	3-2x6 2-2x8	3-2x6 2-2x10	3-2x8 2-2x10	3-2x8 2-2x10	3-2x10 2-2x12	3-2x10 2-2x12	3-2x12 Eng Bm	3-2x12 Eng Bm
		Corner Footing	8	8	8	9	9	10	10	11	11	12	12
		Intermediate Footing	9	10	11	12	13	14	15	15	16	17	17
	8'	Beam Size	2-2x6	2-2x6	2-2x6	3-2x6 2-2x8	3-2x6 2-2x8	3-2x8 2-2x10	3-2x8 2-2x10	3-2x10 2-2x12	3-2x12 Eng Bm	3-2x12 Eng Bm	3-2x12 Eng Bm
		Corner Footing	8	8	9	9	10	10	11	12	12	13	13
		Intermediate Footing	10	11	12	13	14	15	16	16	17	18	18
	9'	Beam Size	2-2x6	2-2x6	2-2x6	3-2x6 2-2x8	3-2x8 2-2x10	3-2x8 2-2x10	3-2x10 2-2x12	3-2x10 2-2x12	3-2x12 Eng Bm	3-2x12 Eng Bm	Eng Bm
		Corner Footing	8	8	9	10	10	11	12	12	13	13	14
		Intermediate Footing	10	12	13	14	15	16	17	17	18	19	20
	10'	Beam Size	2-2x6	2-2x6	3-2x6 2-2x8	3-2x6 2-2x8	3-2x8 2-2x10	3-2x8 2-2x10	3-2x10 2-2x12	3-2x12 Eng Bm	3-2x12 Eng Bm	Eng Bm	Eng Bm
		Corner Footing	8	9	10	10	11	12	12	13	14	14	15
		Intermediate Footing	11	12	14	15	16	17	17	18	19	20	21
	11'	Beam Size	2-2x6	2-2x6	3-2x6 2-2x8	2-2x8 2-2x10	3-2x8 2-2x10	3-2x10 2-2x12	3-2x10 2-2x12	3-2x12 Eng Bm	3-2x12 Eng Bm	Eng Bm	Eng Bm
		Corner Footing	8	9	10	11	12	12	13	14	14	15	15
		Intermediate Footing	12	13	14	15	16	17	18	19	20	21	22
	12'	Beam Size	2-2x6	2-2x6	3-2x6 2-2x8	3-2x8 2-2x10	3-2x8 2-2x10	3-2x10 2-2x12	3-2x12 Eng Bm	3-2x12 Eng Bm	Eng Bm	Eng Bm	Eng Bm
		Corner Footing	9	10	10	11	12	13	14	14	15	15	16
		Intermediate Footing	12	14	15	16	17	18	19	20	21	22	23
	13'	Beam Size	2-2x6	2-2x6	3-2x6 2-2x8	3-2x8 2-2x10	3-2x10 2-2x12	3-2x10 2-2x12	3-2x12 Eng Bm	3-2x12 Eng Bm	Eng Bm	Eng Bm	Eng Bm
		Corner Footing	9	10	11	12	13	13	14	15	15	16	17
		Intermediate Footing	13	14	15	17	18	19	20	21	22	23	24
14'	Beam Size	2-2x6	2-2x6	3-2x6 2-2x8	3-2x8 2-2x10	3-2x10 2-2x12	3-2x10 2-2x12	3-2x12 Eng Bm	3-2x12 Eng Bm	Eng Bm	Eng Bm	Eng Bm	
	Corner Footing	9	10	11	12	13	14	15	15	16	17	17	
	Intermediate Footing	13	15	16	17	18	20	21	22	23	24	24	
15'	Beam Size	2-2x6	2-2x6 2-2x8	2-2x8 2-2x10	3-2x8 2-2x10	3-2x10 2-2x12	3-2x12 Eng Bm	3-2x12 Eng Bm	Eng Bm	Eng Bm	Eng Bm	Eng Bm	
	Corner Footing	10	11	12	13	14	14	15	16	17	17	18	
	Intermediate Footing	14	15	17	18	19	20	21	22	23	24	25	
16'	Beam Size	2-2x6	3-2x6 2-2x8	3-2x8 2-2x10	3-2x8 2-2x10	3-2x10 2-2x12	3-2x12 Eng Bm	3-2x12 Eng Bm	Eng Bm	Eng Bm	Eng Bm	Eng Bm	
	Corner Footing	10	11	12	13	14	15	16	16	17	18	18	
	Intermediate Footing	14	16	17	18	20	21	22	23	24	25	26	

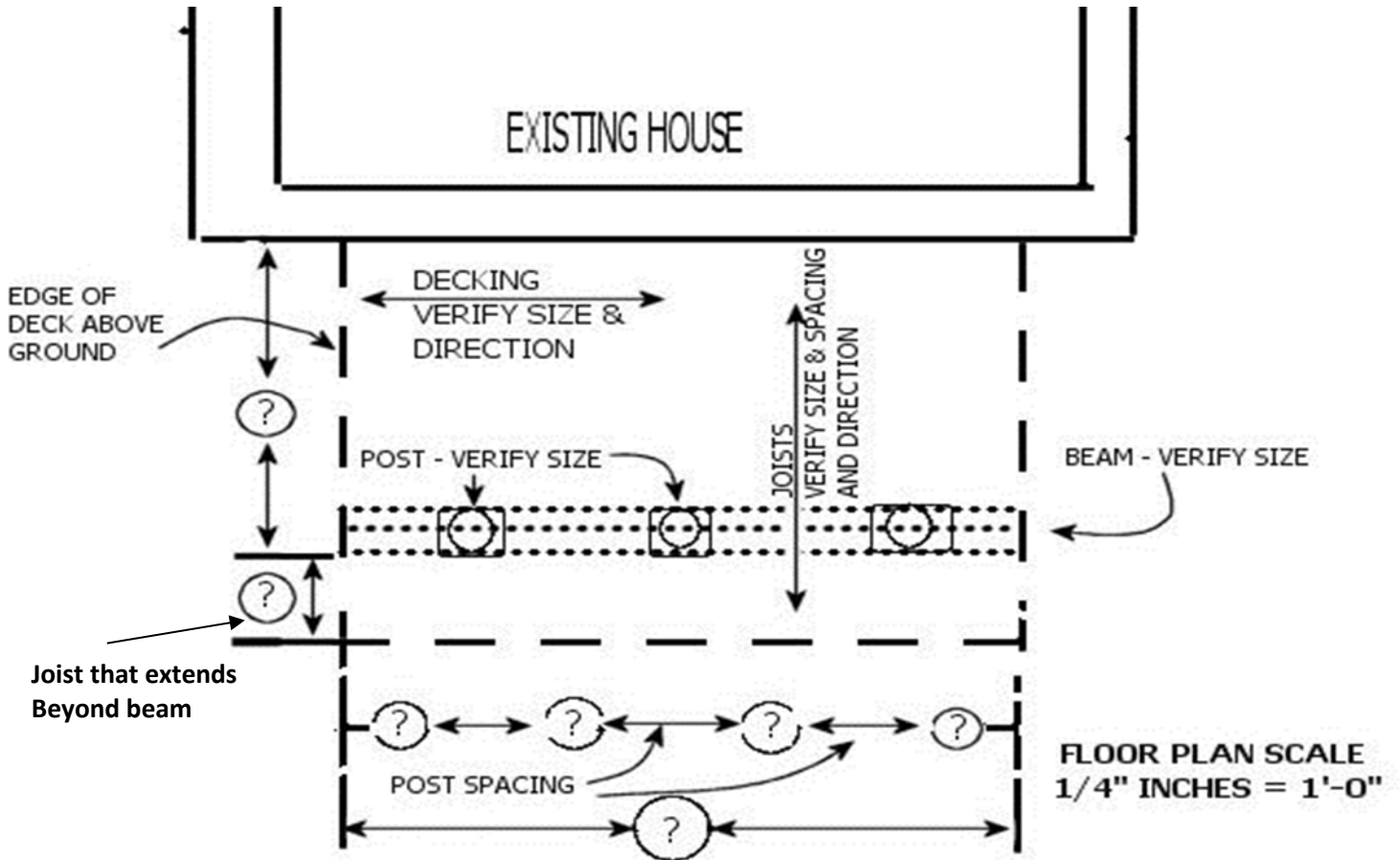
**Notes:**

1. Joist length is total length of joist, including any cantilevers.
2. When joist extends (cantilevers) beyond support beam by 18 inches or more, add 1 inch to footing dimensions shown.
3. Requirements for future 3-season porches or screen porches:
  - a. Increase corner footing by 90%
  - b. Increase center footing by 55%
  - c. Locate all footings at extremities of deck (no cantilevers).
  - d. Beam sizes indicated may need to be altered.
4. Footing sizes may need to be adjusted depending on project.
5. Footings must be a minimum of 8" thick.
6. All footings sizes above are base diameters (in inches) and are listed for Clay Soil Type.

# DECK SIDE VIEW

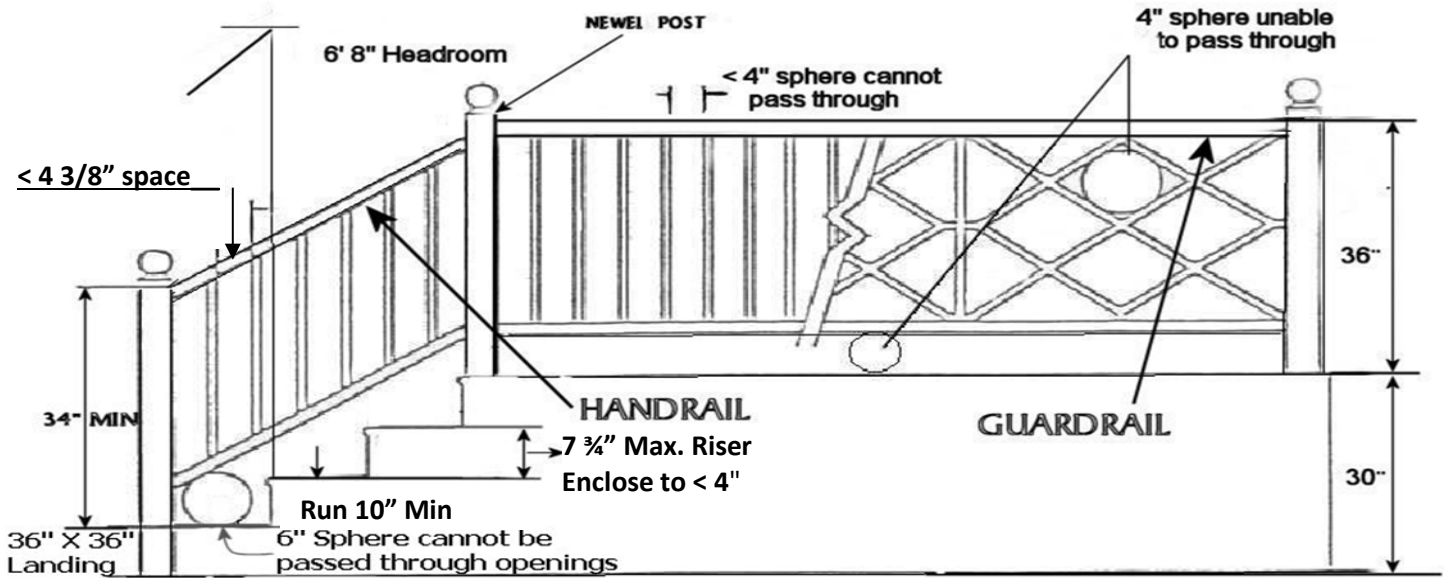


## LAYOUT EXAMPLE



DECK -- LAYOUT --EXAMPLE  
 FILL IN ALL THE BLANKS  
 & VERIFY ALL SIZES

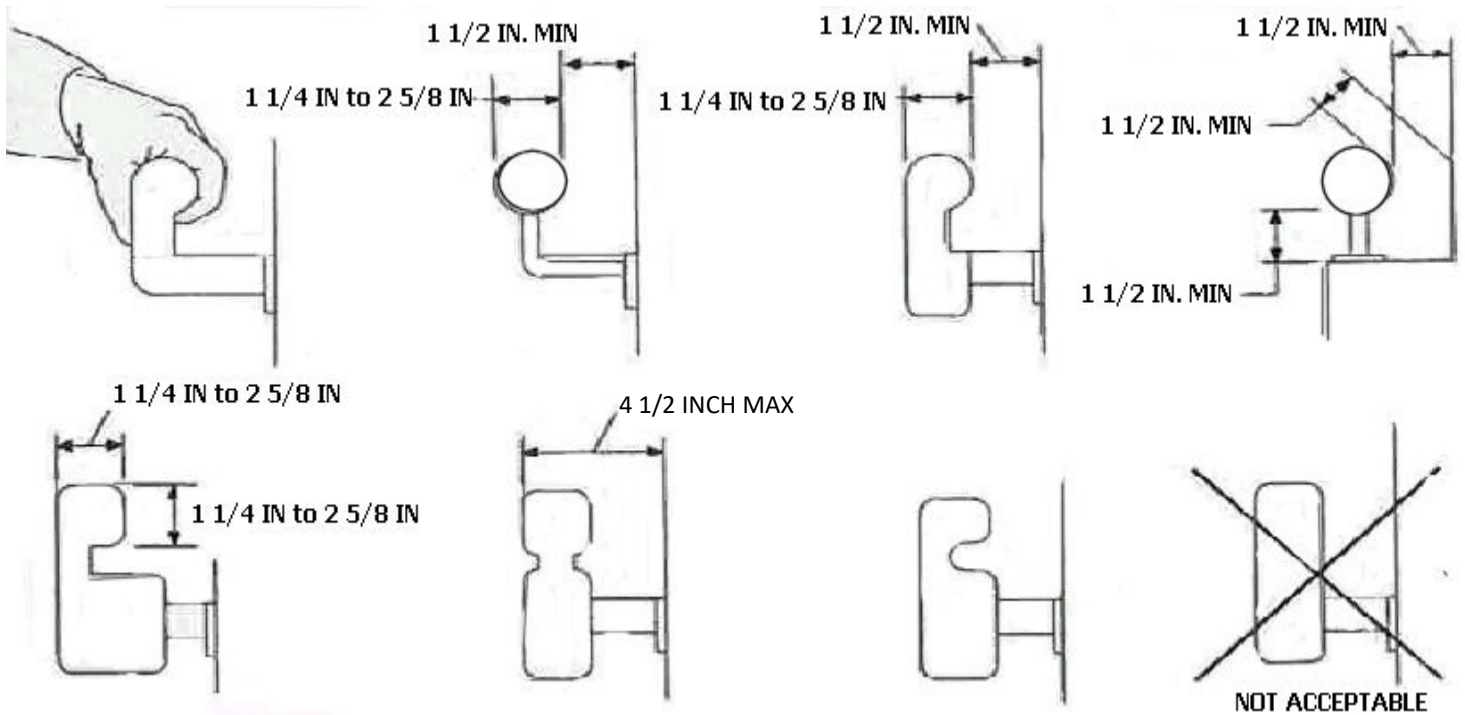
## STAIR SPINKLES AND HAND/GUARD RAIL EXAMPLES



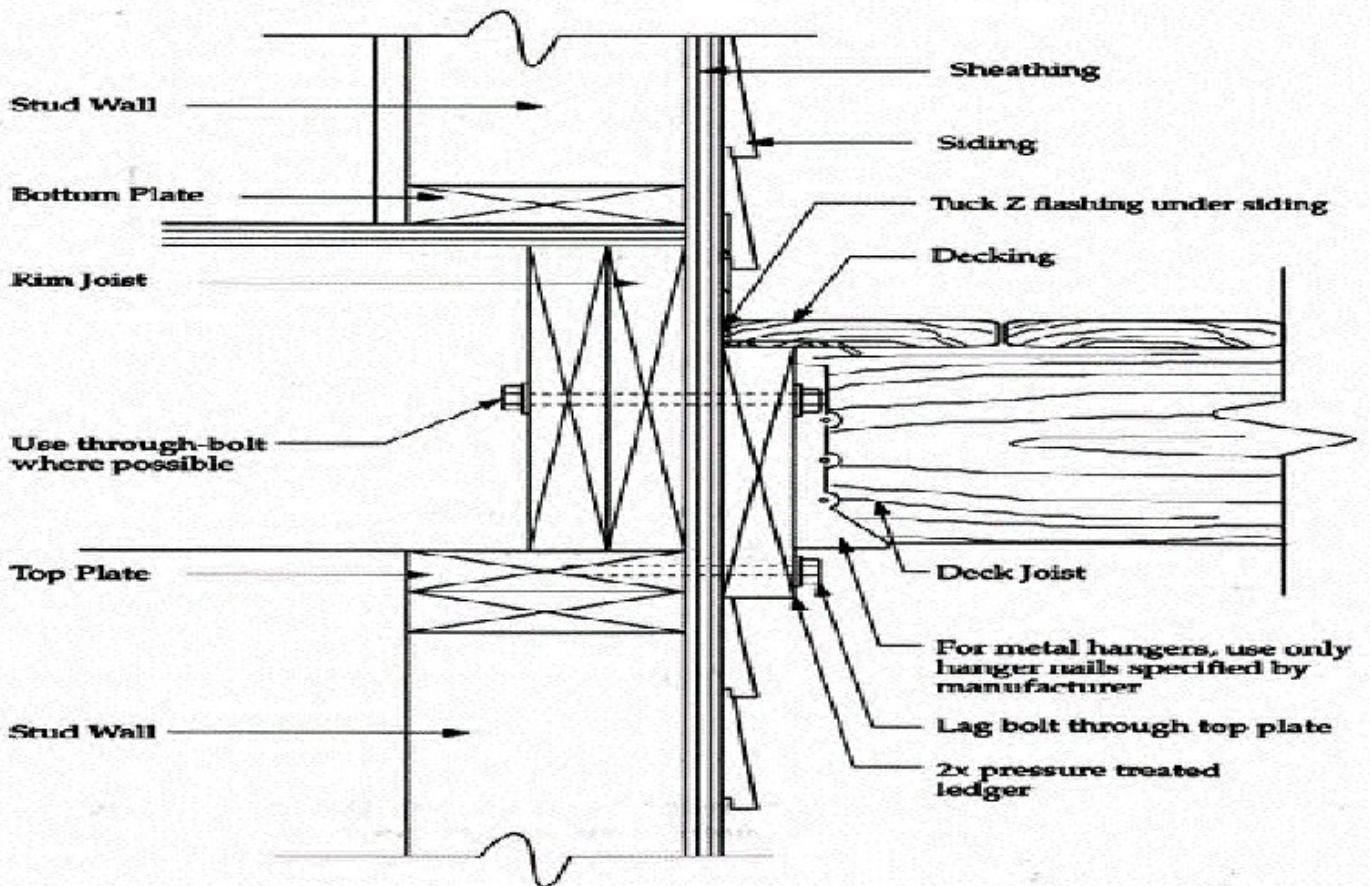


# HANDRAIL STYLES

**MUST BE WEATHER RESISTANT IF USED ON THE EXTERIOR**

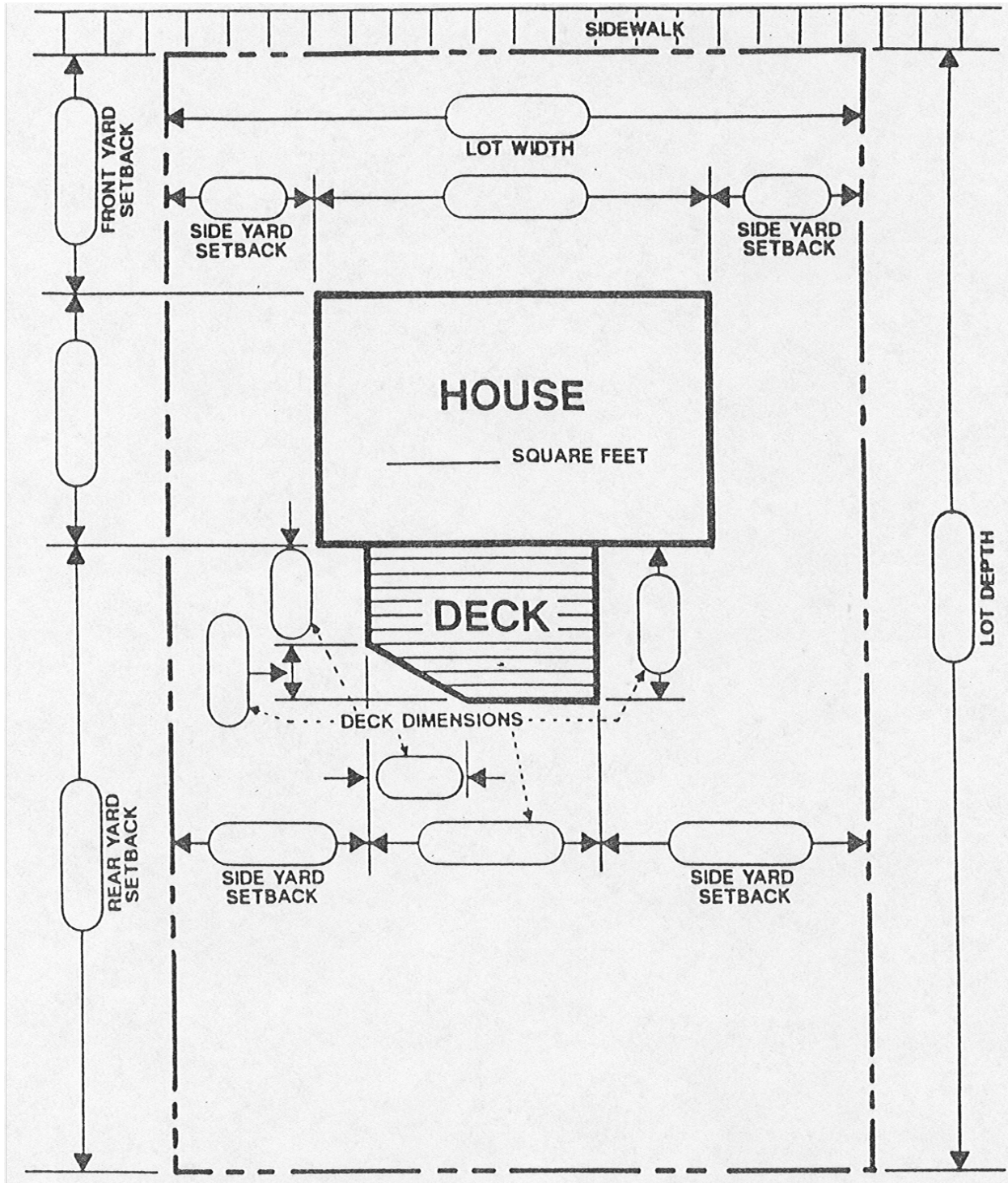


# DECK ATTACHMENT POSITIVELY



# SAMPLE SITE PLAN

ADDRESS: \_\_\_\_\_  
\_\_\_\_\_



**Deck Plans shall include the following information.**

- ❑ Footing depth
- ❑ Footing Size
- ❑ Post spacing
- ❑ Distance between deck and ground
- ❑ Dimension of deck (length and width)
- ❑ Size of beam or beams
- ❑ Size of joist
- ❑ Spacing of joist

**If your deck is 30” above the ground you need:**

- ❑ Height of guardrail
- ❑ Size of openings in guardrail

**If your deck has stairs you need:**

- ❑ Height of the stair riser
- ❑ Length of the stair tread
- ❑ Height of the handrail and its width