



## Planning & Development Services

231 N. Dakota Ave, Sioux Falls, SD 57104

### DECK REQUIREMENTS

**PERMIT FEE:** (as of January 2021)

Permits are value based on estimate of materials and labor

**BUILDING PERMIT APPLICATION:**

One completed per project.

**PLANS REQUIRED:**

ONE (1) set of the following:

Site Plan

Footing Plan

Framing Plan

Elevation with Connection Detail

**INSPECTIONS REQUIRED:**

1. **Footing** - After all post holes are excavated with all loose debris and water cleaned out but before concrete is placed.
2. **Framing** - After all posts and beams are in place with joist hangers, lag/carriage bolts (see details), and fasteners exposed.
3. **Final** - After all work is completed including stairs, handrails and guardrails.

All work shall comply with the 2021 City of Sioux Falls Residential Building Code.

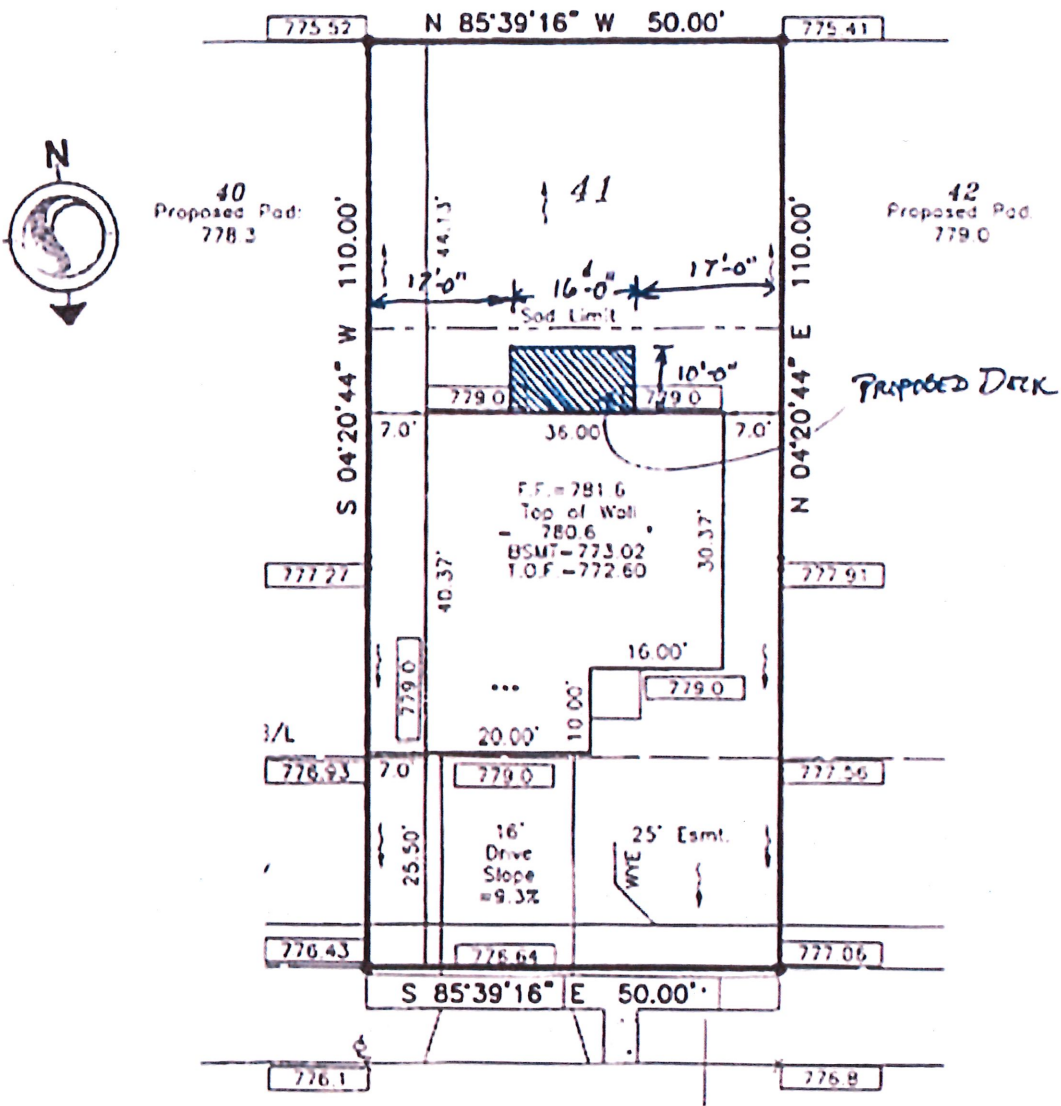
# DECK PLANS AND DETAILS

## SITE PLAN:

Must show:

1. Property Lines with dimensions
2. Setback lines (if any)
3. Residence outline, garage, and all out-buildings with dimensions

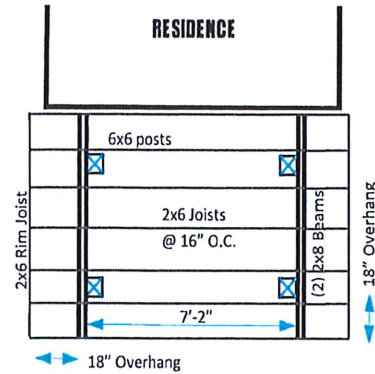
A mortgage survey can be used as a base map for the site plan. Dimensions and proposed deck must be drawn on neatly with a pen and ruler (example below).



# DECK PLANS AND DETAILS

## FRAMING PLAN:

1. Plan must show proposed joists and beams with lumber sizes and dimensions between each and any stair locations. It must be drawn and provided independently from this packet. (Example right)
2. Joist spacing must not exceed values in Table 507.7 (first below) based on the type of proposed decking material.
3. Joists are sized based on allowable spans in Table 15 (second below).
4. Beams are sized based on proposed joist spans bearing on the beam, and beam span between posts shown in Table 16 (third below).
5. Use of LVLs or other engineered beams must be sealed by a design professional or supported by a specification sheet from a lumber company showing that the proposed beam can support the required loads.



## JOIST SPACING:

TABLE 507.7  
MAXIMUM JOIST SPACING FOR DECKING

DECKING MATERIAL TYPE AND NOMINAL SIZE	MAXIMUM ON-CENTER JOIST SPACING	
	Decking perpendicular to joist	Decking diagonal to joist <sup>1</sup>
1 1/2 -inch-thick wood	16 inches	12 inches
2-inch-thick wood	24 inches	16 inches
Plastic composite	In accordance with Section 507.2	In accordance with Section 507.2

## JOIST SIZING:

TABLE 15

LOAD	JOIST SPECIES	JOIST SIZE	ALLOWABLE JOIST			MAXIMUM CANTILEVER							
			Joist spacing(inches)			Joist back span (feet)							
			12	16	24	4	6	8	10	12	14	16	18
40 Live Load	Southern Pine	2x6	9-11	9-0	7-7	1-0	1-6	1-5					
		2x8	13-1	11-10	9-8	1-0	1-6	2-0	2-6	2-3			
		2x10	16-2	14-0	11-5	1-0	1-6	2-0	2-6	3-0	3-4	3-4	
		2x12	18-0	16-6	13-6	1-0	1-6	2-0	2-6	3-0	3-6	4-0	4-1
	Western Cedars	2x6	8-10	8-0	6-10	1-0	1-4	1-1					
		2x8	11-8	10-7	8-8	1-0	1-6	2-0	1-11				
		2x10	14-11	13-0	10-7	1-0	1-6	2-0	2-6	3-0	2-9		
		2x12	17-5	15-1	12-4	1-0	1-6	2-0	2-6	3-0	3-6	3-8	

# DECK PLANS AND DETAILS

## FRAMING PLAN: (CONTINUED)

### BEAM SIZING:

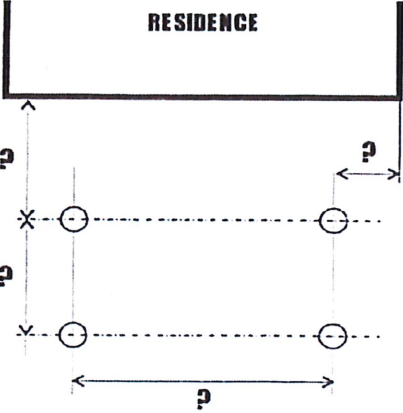
**Table 16**  
**Deck Beam Span Lengths <sup>a, b, g</sup> (feet—inches)**  
**MAXIMUM DECK BEAM SPAN—50 PSF GROUND SNOW LOAD <sup>c</sup>**

BEAM SPECIES	BEAM SIZE	EFFECTIVE DECK JOIST SPAN LENGTH (feet)						
		6	8	10	12	14	16	18
		MAXIMUM DECK BEAM SPAN LENGTH (feet-inches)						
Southern pine	1 – 2 × 6	4-6	3-11	3-6	3-2	2-11	2-9	2-7
	1 – 2 × 8	5-9	4-11	4-5	4-0	3-9	3-6	3-3
	1 – 2 × 10	6-9	5-10	5-3	4-9	4-5	4-2	3-11
	1 – 2 × 12	8-0	6-11	6-2	5-8	5-3	4-11	4-7
	2 – 2 × 6	6-8	5-9	5-2	4-9	4-4	4-1	3-10
	2 – 2 × 8	8-6	7-4	6-7	6-0	5-7	5-2	4-11
	2 – 2 × 10	10-1	8-9	7-10	7-1	6-7	6-2	5-10
	2 – 2 × 12	11-11	10-3	9-2	8-5	7-9	7-3	6-10
	3 – 2 × 6	7-11	7-2	6-6	5-11	5-6	5-1	4-10
	3 – 2 × 8	10-5	9-3	8-3	7-6	6-11	6-6	6-2
	3 – 2 × 10	12-8	10-11	9-9	8-11	8-3	7-9	7-3
3 – 2 × 12	14-11	12-11	11-6	10-6	9-9	9-1	8-7	
Redwood	1 – 2 × 6	4-1	3-6	3-0	2-8	2-5	2-3	2-1
	1 – 2 × 8	5-2	4-6	4-0	3-6	3-2	2-11	2-9
Western cedars	1 – 2 × 10	6-4	5-6	4-11	4-6	4-1	3-9	3-6
	1 – 2 × 12	7-4	6-4	5-8	5-2	4-10	4-6	4-3
Ponderosa pine	2 – 2 × 6	6-1	5-3	4-8	4-4	3-11	3-6	3-3
	2 – 2 × 8	7-8	6-8	5-11	5-5	5-0	4-8	4-3
Red pine	2 – 2 × 10	9-5	8-2	7-3	6-8	6-2	5-9	5-5
	2 – 2 × 12	10-11	9-5	8-5	7-8	7-2	6-8	6-3
	3 – 2 × 6	7-1	6-5	5-11	5-5	5-0	4-8	4-5
	3 – 2 × 8	9-4	8-4	7-5	6-10	6-4	5-11	5-7
	3 – 2 × 10	11-9	10-2	9-1	8-4	7-8	7-2	6-9
	3 – 2 × 12	13-8	11-10	10-7	9-8	8-11	8-4	7-10

# DECK PLANS AND DETAILS

## FOOTER PLAN and DETAIL:

1. Plan must show ALL proposed posts and footings with dimensions between each. It must be drawn and provided independently from this packet. (Example right)
2. Footing detail must show diameter and thickness per Table 19 (below).
3. Tributary Area for each post can be found based on the example graphic (below).
4. Attached deck posts shall bear on footings in accordance with the (example below). Decks that are attached to the dwelling unit shall have frost depth footing not less than 42 inches in depth.



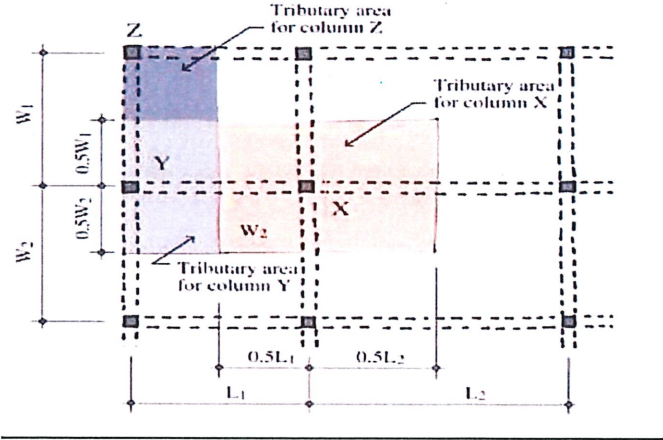
## FOOTING SIZE CHART:

TABLE 19

MINIMUM FOOTING SIZE FOR DECKS

LIVE OR GROUND LOAD	TRIBUTARY AREA(FT <sup>2</sup> )	SIDE OF SQUARE FOOTING(IN)	DIAMETER OF ROUND FOOTING(IN)	THICKNESS(IN)
		40	5	7
	20	7	8	6
	40	10	12	6
	60	12	14	6
	80	14	16	6
	100	15	17	6
	120	17	19	6
	140	18	21	6
	160	20	22	7

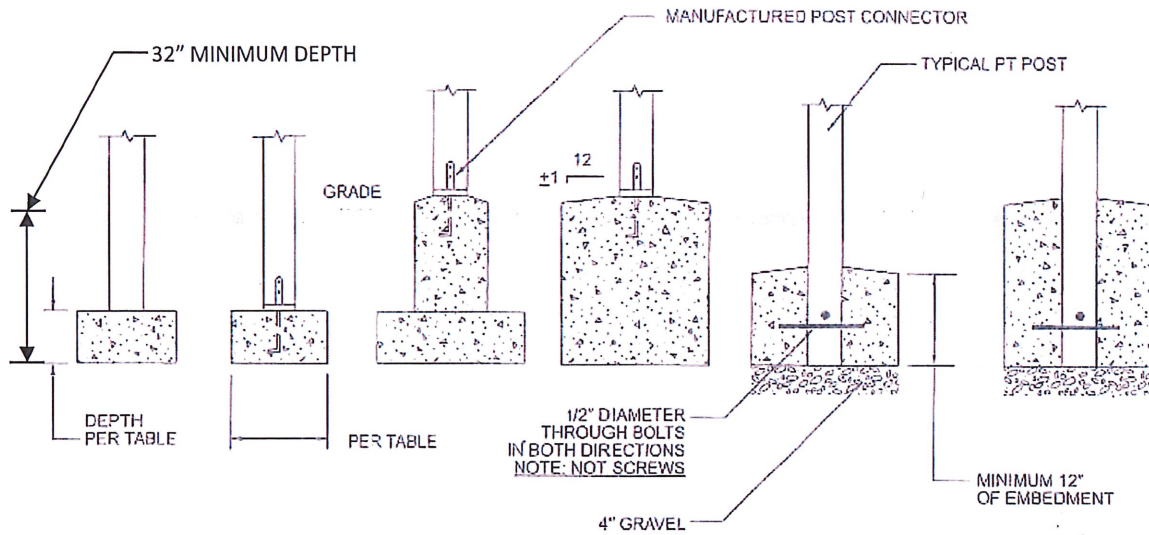
## POST TRIBUTARY AREA:



# DECK PLANS AND DETAILS

## FOOTER PLAN and DETAIL: (CONTINUED)

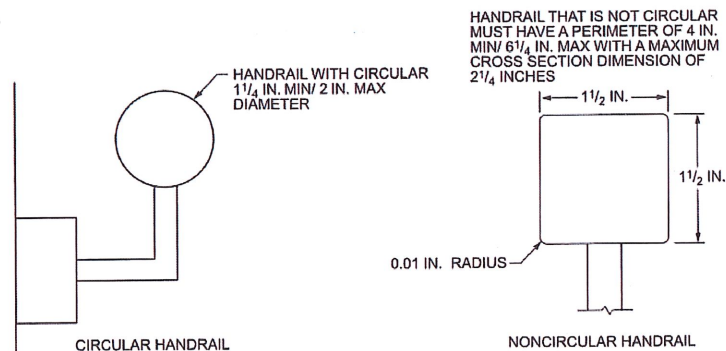
### EXAMPLE FOOTING DETAILS:



NOTE:  
POSTS MUST BE CENTERED ON OR IN FOOTING

### GUARDRAIL, HANDRAIL, STAIR DETAILS:

1. Handrails shall be provided on at least one side of each flight of stairs with four or more risers.
2. Handrail height: No less than 34 inches and no more than 38 inches from tread nosing.
3. Handrails shall be graspable. Exterior stairs are allowed to have a horizontal 2x member to form a 1-1/2-inch graspable dimension.
4. Guardrails **are required** when deck floor height is 30 inches from grade or higher.
5. Guardrails are required to be no less than 36 inches tall and have balusters (vertical or otherwise) that prevent a 5-inch sphere from passing through the openings between balusters.
6. The riser height shall be not more than 8 inches, the greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch. The tread depth shall be not less than 10 inches.



# DECK PLANS AND DETAILS

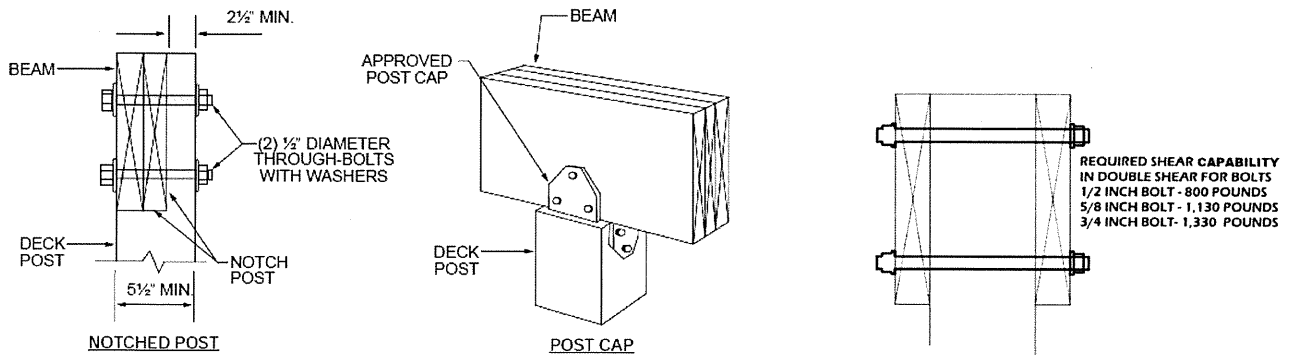
## ELEVATION & DETAILS:

1. Elevation must show proposed height of deck measured from finish grade to deck floor.
2. See Table 17 for post sizing. Height is measured to the underside of the beam.
3. Elevation detail must show connection methods between members:
  - a. Beams to posts - Beams must bear fully on posts. This requires the use of notched 4x6 or 6x6 posts, or a post cap bracket or sandwiched post.
  - b. Joists to beams - Joist hangers required for flush connections.
  - c. Ledger to dwelling framing (if proposed).

**Table 17  
DECK POST HEIGHT**

LOADS (psf) <sup>b</sup>	POST SPECIES <sup>c</sup>	POST SIZE d	TRIBUTARY AREA (ft <sup>2</sup> ) <sup>g, h</sup>							
			20	40	60	80	100	120	140	160
			MAXIMUM DECK POST HEIGHT <sup>a</sup> (feet-inches)							
40 live load	Southern pine	4 × 4	14-0	13-8	11-0	9-5	8-4	7-5	6-9	6-2
		4 × 6	14-0	14-0	13-11	12-0	10-8	9-8	8-10	8-2
		6 × 6	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
		8 × 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Douglas fir, Hem-fir, Spruce-pine-fir Note E	4 × 4	14-0	13-6	10-10	9-3	8-0	7-0	6-2	5-3
		4 × 6	14-0	14-0	13-10	11-10	10-6	9-5	8-7	7-10
		6 × 6	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
		8 × 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Redwood, Western cedars, Ponderosa pine, Red pine,	4 × 4	14-0	13-2	10-3	8-1	5-8	NP	NP	NP
		4 × 6	14-0	14-0	13-6	11-4	9-9	8-4	6-9	4-7
		6 × 6	14-0	14-0	14-0	14-0	14-0	14-0	13-7	9-7

## POST CONNECTION REQUIREMENTS:



# DECK PLANS AND DETAILS

## LEDGER DETAILS:

1. Ledgers shall conform to the tables and detail below. It is acceptable to attach this page to plans if using ledger(s).
2. Ledgers attached to masonry veneer will not be permitted. Ledgers on concrete must be fully through bolted. Inspector may require the seal of a design professional to verify on site conditions and proposed fastening system.

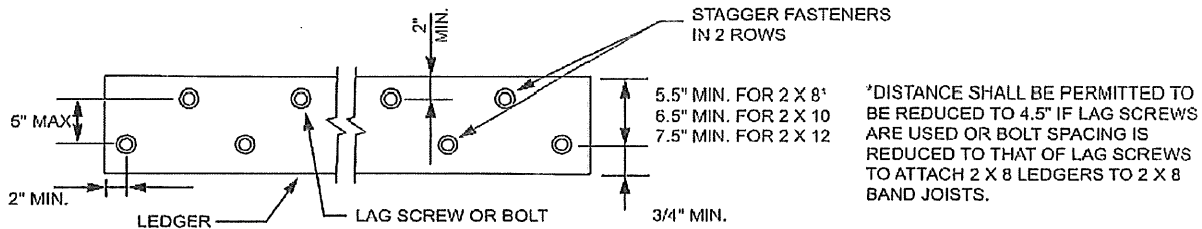
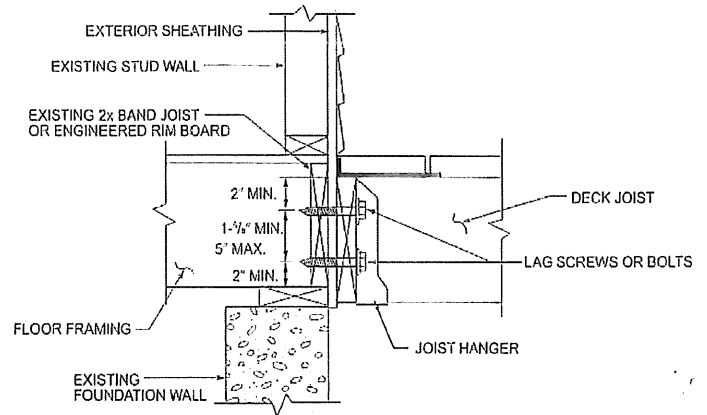


TABLE 507.9.1.3(1)  
DECK LEDGER CONNECTION TO BAND JOIST<sup>a, b</sup>  
(Deck live load = 40 psf, deck dead load = 10 psf, snow load ≤ 40 psf)

CONNECTION DETAILS	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'
<sup>1</sup> / <sub>2</sub> -inch diameter lag screw with <sup>1</sup> / <sub>2</sub> -inch maximum sheathing <sup>c, d</sup>	30	23	18	15	13	11	10
<sup>1</sup> / <sub>2</sub> -inch diameter bolt with <sup>1</sup> / <sub>2</sub> -inch maximum sheathing <sup>d</sup>	36	36	34	29	24	21	19
<sup>1</sup> / <sub>2</sub> -inch diameter bolt with 1-inch maximum sheathing <sup>e</sup>	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.

- Ledgers shall be flashed in accordance with Section 703.4 to prevent water from contacting the house band joist.
- Snow load shall not be assumed to act concurrently with live load.
- The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- Sheathing shall be wood structural panel or solid sawn lumber.
- Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to <sup>1</sup>/<sub>2</sub>-inch thickness of stacked washers shall be permitted to substitute for up to <sup>1</sup>/<sub>2</sub> inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

TABLE 507.9.1.3(2)  
PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS

MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS				
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
Ledger <sup>a</sup>	2 inches <sup>d</sup>	<sup>3</sup> / <sub>4</sub> inch	2 inches <sup>b</sup>	1 <sup>3</sup> / <sub>4</sub> inches <sup>b</sup>
Band Joist <sup>c</sup>	<sup>3</sup> / <sub>4</sub> inch	2 inches	2 inches <sup>b</sup>	1 <sup>3</sup> / <sub>4</sub> inches <sup>b</sup>

For SI: 1 inch = 25.4 mm.

- 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 507.9.1.3(1).
- Maximum 5 inches.
- For engineered rim joists, the manufacturer's recommendations shall govern.
- The minimum distance from bottom row of lag screws or bolts to the top edge of the ledger shall be in accordance with Figure 507.9.1.3(1).

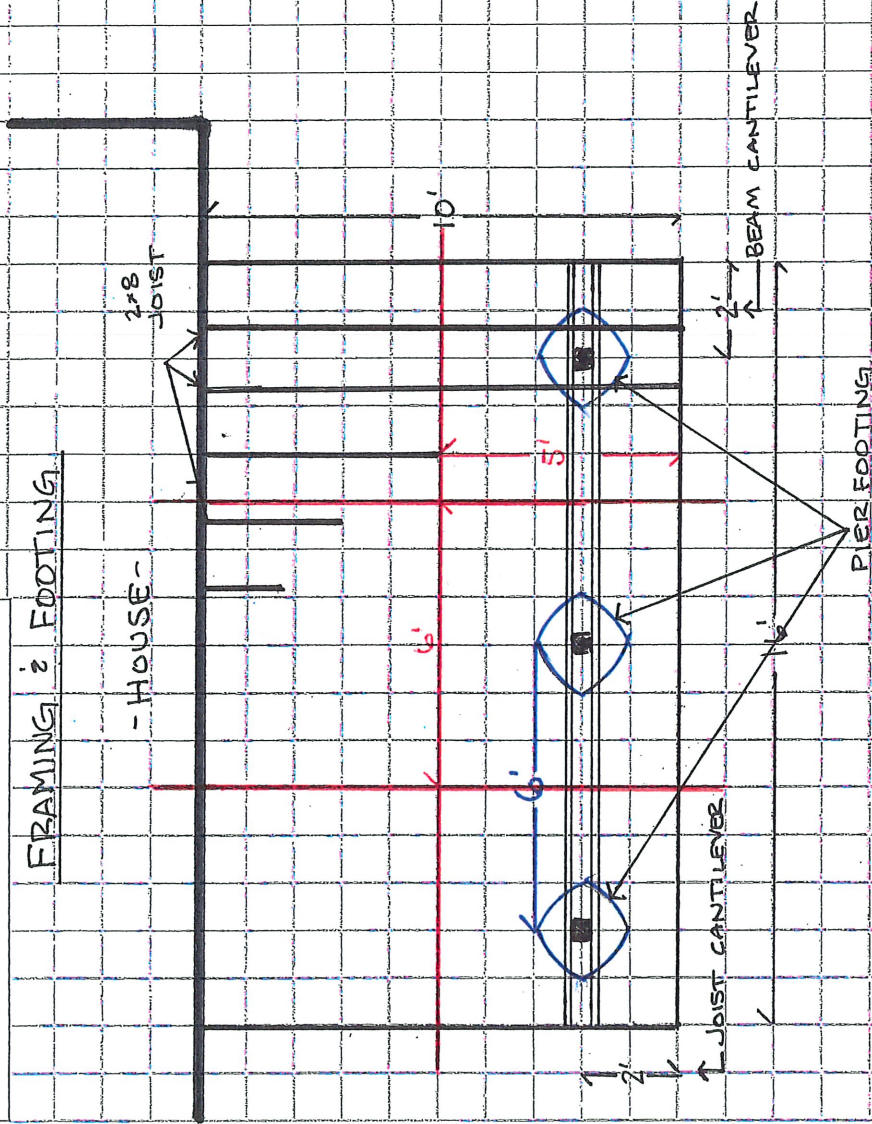


**Residential deck plans.**

Each square equals 12" x 12".  
 Label joist size, and materials  
 Show and label beams, size, location.  
 Show and label footings, size and locations  
 Show and label where deck attaches to house.

DECK PLAN EXAMPLES

FRAMING & FOOTING

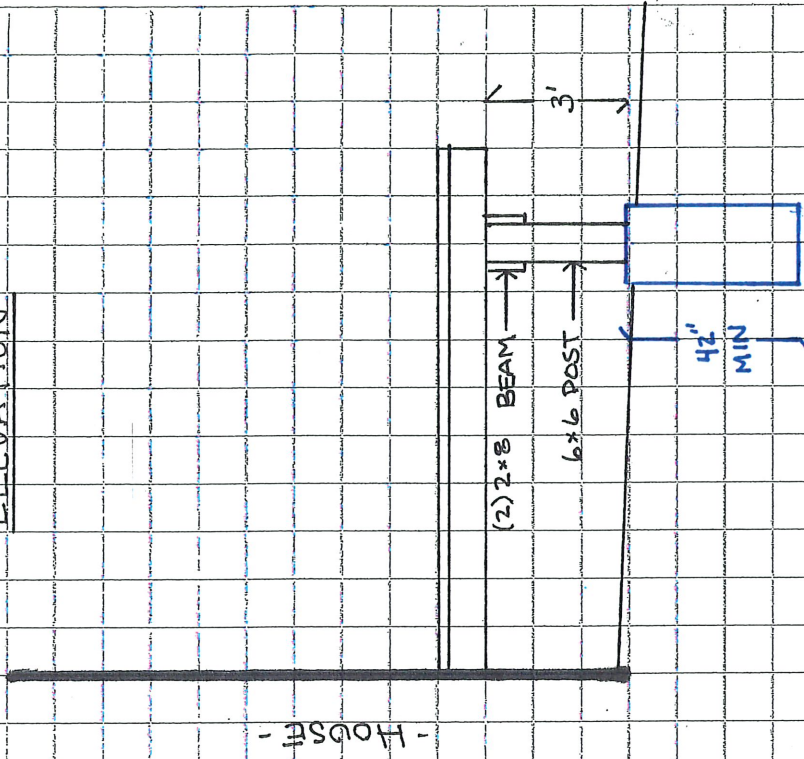


REQUIRED INFORMATION:

- JOIST: 2x8 16" OC
- BEAM: (2) 2x8
- POST: 6x6
- PIER FOOTING: 16'
- JOIST CANTILEVER: 2'
- BEAM CANTILEVER: 2'
- DECK HEIGHT: 3'

4' 6" x 5' = 30.50 SQ FT

ELEVATION



NOTE: RED MARKED AREA DENOTES TRIBUTARY AREA

**Residential deck plans.**

Each square equals 12" x 12"  
Label joist size, and materials  
Show and label beams, size, location.  
Show and label footings, size and locations  
Show and label where deck attaches to house.

