City of Brooklyn Center
Building & Community Standards
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RESIDENTIAL DECKS

Buildings permits are required for any deck attached to a structure or more than 30 inches above grade. A survey/site plan is required with plan submittal, even when a permit is not, for zoning verification. A survey should indicate lot dimensions, deck location and setbacks from property lines. Three sets of building plans are required to include:

- Deck size and location of stairs.
- Size, type and spacing of floor joists.
- Size and type of decking materials.
- Size, type, location & spacing of posts, beams, headers.
- Height of structure from grade.
- Diameter and depth of footings.
- Joist hangers, flashings and fasteners.
- Guard height and spacing of intermediate rails.

An elevation plan is required to include:

- Height of structure from grade.
- Size and depth of footings.
- Guard height and spacing (if any).
- Stairway rise or run and handrails height (if any).
- Clearance of overhead wires.

Required Inspections:

- Footing, Framing and Final

Special Design Note s

Decks need to be designed for a 40 lb. per sq. ft. live load and balconies to a 60 lb. per sq. ft. live load.

Some deck designs may not be appropriate should the placement of a screen porch or three-season porch on the deck platform be a future consideration. Setbacks for porches are not the same as setbacks for decks. Verify with Building Official.

Cedar or Redwood posts need an 8 in. separation from the ground.

When locating a deck, check the location of outside gas and electric meters and hose bibs. They may need to be relocated to allow for construction of the deck.

Cantilevers (Overhanging Posts & Beams) - Joists should not overhang beams by more than two feet, nor should beams overhang posts by more than one foot at the ends unless a special design is approved.

Wood Requirements - All exposed wood used in the construction of decks is required to be of approved wood of natural resistance to decay (redwood, cedar, etc.) or approved treated wood. This includes posts, beams, joists, decking, and railing. All lumber shall bear the quality mark of an approved inspection agency.

Frost Footings - are required for any deck attached to a dwelling, porch, or garage that has frost footings. Footings must be a minimum of 42" deep for frost protection.

Flashing - All connections between deck and dwelling shall be weatherproof. Any cuts in exterior finish shall be flashed. (IRC Sec. R703.8)

Live Load - All decks shall be designed to support a live load of 40 pounds per square foot. (IRC Table R301.5)

Materials: If you plan to use plastic/composite deck materials to build your deck, you must provide an Evaluation Report and the manufacturer's installation instructions at the time of permit application. This report must remain on the job site for all inspections.

Gopher State One Call
Call at least two working days before you dig.
Gopher State will locate and mark underground utilities.
Phone: 811 or 651-454-0002

Stairs - Minimum width is 36 inches. Maximum rise is 7 ¾ inches (3/8" maximum variation in riser heights), minimum rise is 4 inches. Minimum tread depth shall be 10 inches. Stairway illumination is required. Open risers are permitted provided that the opening between threads does not permit the passage of a 4" diameter sphere. (IRC Sec. R314) For minimum width stairs, a minimum of three stringers is required. If 5/4" decking material is used for treads, stringers shall be spaced a maximum 16" on center.

Ledger Board –Siding must be removed to allow proper installation. 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. Fasteners must be long enough to penetrate framing. Ledger boards must be bolted or lagged to the building and all connections between the deck and dwelling must be flashed. Decks shall not be supported by cantilevered floor framing without specific engineering. (IRC Sec.R502.2.2)

Joist/Beams – Joist spacing of 24" on center requires decking with a 2" nominal thickness, 5/4" decking material requires joist spacing no greater than 16" on center. Joists with cantilevers which exceed three times the depth of the joist will require structural engineering. Beams must not overhang posts by more than 12" unless a special design is approved. Built-up beams (two or more) are to be nailed together. A positive, mechanical connection between post and beam is required.

Joist Hangers – Joist framing into the side of a beam or ledger shall be supported by approved framing anchors such as joist hangers. (IRC Sec.R502.6.2)

Fasteners – All fasteners shall be non-corrosive. (IRC Sec.R319.3) Joist hangers and other framing anchors are to be installed with nails that are hot dipped zinc coated galvanized steel, stainless steel, silicon bronze or copper. The weights for zinc coated shall be in accordance with ASTM A153.

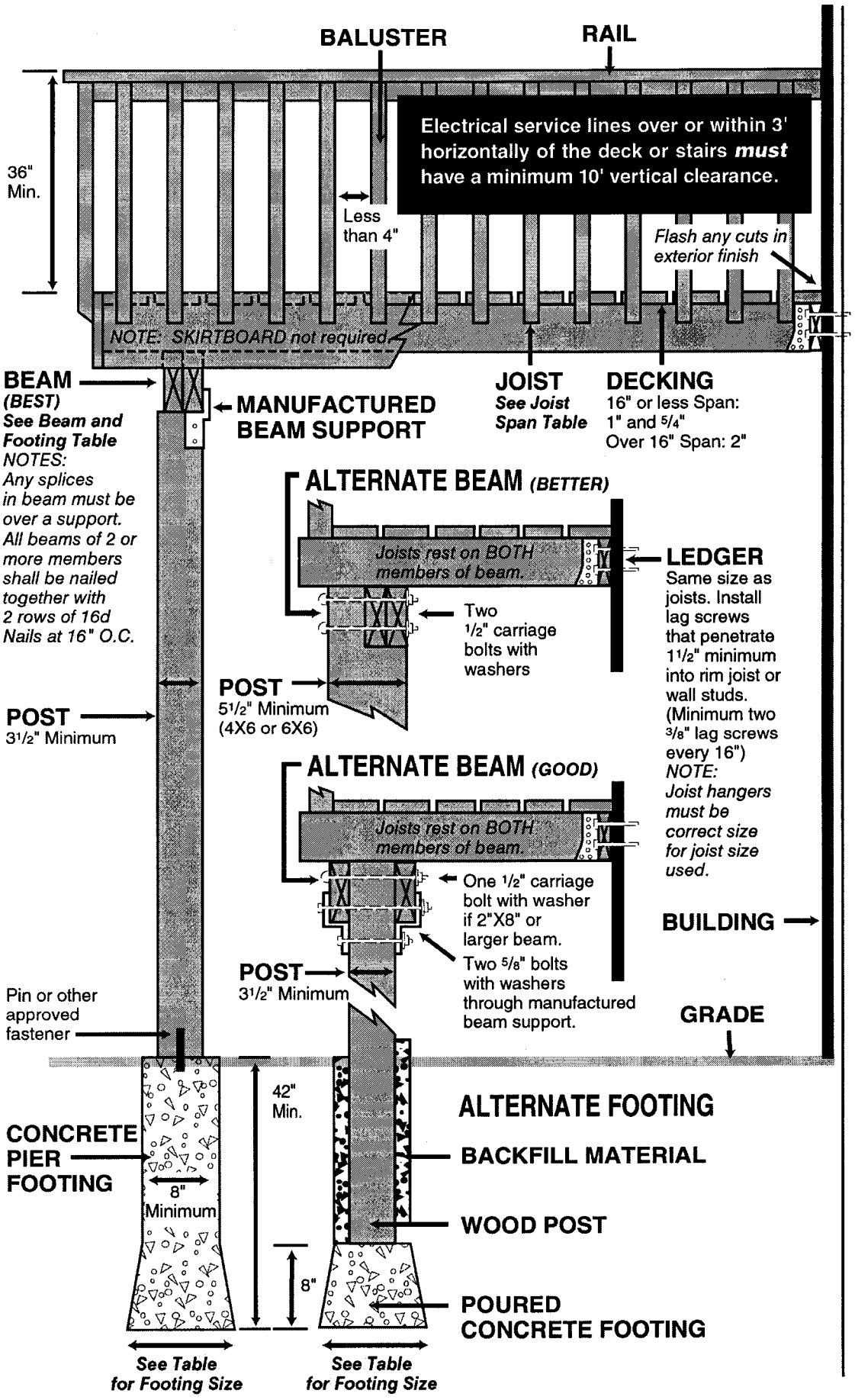
Guardrails – All *open sides of decks, landings, balconies*, etc. which are more than 30" above grade or floor below, require a guard at least 36" in height. *Open sides of stairs* with a total rise of more than 30" above the floor or grade below shall have guards not less than 34" in height measured vertically from the nosing of the treads. Open guardrails and stair railings must have intermediate rails or an ornamental pattern that a 4" sphere cannot pass through. The triangular openings formed by the riser, tread and bottom rail of a guard at the open side of a stairway may be sized so that a 6 "sphere cannot pass thru. (IRC Sec. R312.2 Exc.1)

Handrails – Handrails are required on at least one side of all stairways having four or more risers. Handrails must be placed between 34 and 38 inches above the nosing of the treads and be continuous to the full length of the stairs. Handrails projecting from a wall or guardrail must have a space of not less than 1 1/2" between the wall or guardrail and the handrail. The handgrip portion of handrails shall have a cross section of 1 ¼" minimum to 2 " maximum in cross sectional dimension with ends returned. (IRC Sec.R311.5.6.3)

Setbacks - Decks may extend to within 5 ft. of rear lot lines and 3 ft. of side lot lines, provided they do not encroach into dedicated easement areas. No decks are allowed in the front setback area. The electrical code requires overhead power lines to be located a minimum of 10 ft. above decks and platforms. Existing lines may need to be raised if a new deck is to be installed beneath them. See staff for corner lots.

Residential contractors are required to be licensed
To confirm if your contractor is licensed contact:
Department of Labor and Industry
Residential Building Contractors
Phone 651-284-5069
www.dli.mn.gov/ccld/LicVerify.asp
E-mail: DLI.Contractor@state.mn.us

This information is for general reference for residential construction. Contact the City for any additional code requirements.


BALUSTER
RAIL
Electrical service lines over or within 3' horizontally of the deck or stairs *must* have a minimum 10' vertical clearance.
36" Min.
Less than 4"
Flash any cuts in exterior finish
NOTE: SKIRTBOARD not required
BEAM (BEST) See Beam and Footing Table
NOTES: Any splices in beam must be over a support. All beams of 2 or more members shall be nailed together with 2 rows of 16d Nails at 16" O.C.
MANUFACTURED BEAM SUPPORT
JOIST See Joist Span Table
DECKING 16" or less Span: 1" and 5/4" Over 16" Span: 2"
ALTERNATE BEAM (BETTER)
Joists rest on BOTH members of beam.
LEDGER Same size as joists. Install lag screws that penetrate 1 1/2" minimum into rim joist or wall studs. (Minimum two 3/8" lag screws every 16")
NOTE: Joist hangers must be correct size for joist size used.
Two 1/2" carriage bolts with washers
POST 5 1/2" Minimum (4X6 or 6X6)
POST 3 1/2" Minimum
ALTERNATE BEAM (GOOD)
Joists rest on BOTH members of beam.
One 1/2" carriage bolt with washer if 2"X8" or larger beam.
Two 5/8" bolts with washers through manufactured beam support.
POST 3 1/2" Minimum
BUILDING
GRADE
Pin or other approved fastener
42" Min.
ALTERNATE FOOTING
CONCRETE PIER FOOTING
8" Minimum
BACKFILL MATERIAL
WOOD POST
8"
POURED CONCRETE FOOTING
See Table for Footing Size
See Table for Footing Size

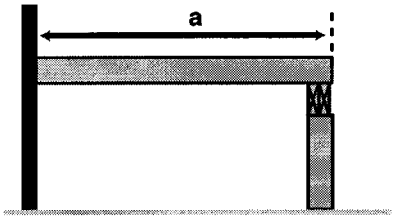
Joist span

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

	Ponderosa pine			Southern pine			Western cedar		
	12"OC	16"OC	24"OC	12"OC	16"OC	24"OC	12"OC	16"OC	24"OC
2x6	9-2	8-4	7-2	10-4	9-5	7-10	8-10	8-0	7-0
2x8	12-1	11-0	9-0	13-8	12-5	10-2	11-8	10-7	9-2
2x10	15-4	13-6	11-0	17-5	15-10	13-1	14-11	13-6	11-3
2x12	18-1	15-8	12-10	21-2	18-10	15-5	18-1	16-0	13-0

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

Case I solution:



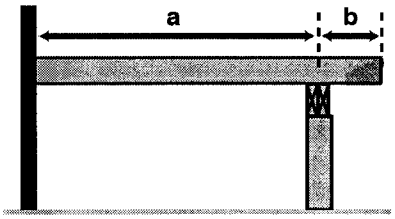
Refer to tables for joist, beam and footing size requirements.

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 and find the 8 foot post spacing column. With a 12 foot deck span, the beam may be either two 2x8s or two 2x10s, depending on wood used. Depending on the type of soil, the footing diameter at the base must be a minimum of 12 inches, 10 inches or 9 inches for the corner post and 17 inches, 14 inches or 12 inches for all intermediate posts.

Case II solution:

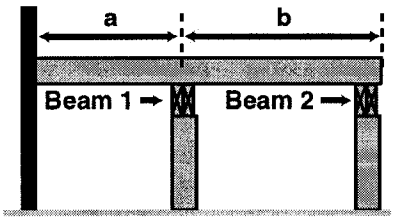


Use "a" to determine joist size and "a" + "b" to determine beam and footing sizes. The length of "b" is restricted by both the length of "a" and the size of the joists.
Example: a = 8 ft, b = 2 ft, Post spacing = 10 ft

Refer to the **joist span table**. For an 8 ft joist span, either 2X8's at 24 in O.C. or 2X6's at 16 in O.C. are acceptable.

For sizing the beam, use a joist length of 10 ft (8 ft + 2 ft) and a post spacing of 10 ft. The **beam and footing** sizes table indicates that the beam may be either two 2 X 10's or two 2 X 12's, depending on wood used. Depending on the type of soil, the footing diameter at the base must be a minimum of 12 in, 10 in or 9 in for the corner post and 17 in, 14 in or 12 in for all intermediate posts. Note that because of the 2 ft cantilever all footing sizes must be increased by 1 in as required by footnote 2 at the end of the table.

Case III solution:



Use "a" or "b", whichever is greater, to determine joist size. Use "a" + "b" to determine the size of Beam 1 and the post footing size for the posts supporting Beam 1. Use joist length "b" to determine both the size of Beam 2 and the post footing size for the 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" 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. Depending on the type of soil, the footing diameters for Beam 1 posts shall be 13 inches, 11 inches or 9 inches for the corner (outside) post and 19 inches, 15 inches or 13 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. Depending on the type of soil, the footing diameters for Beam 2 shall be 10 inches, 8 inches or 7 inches for the corner posts, and 14 inches, 11 inches or 10 inches for all intermediate posts.

Beam and footing sizes

Based on No. 2 or better Ponderosa Pine and Southern Pine

Joist Length			Post spacing										
			4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
	6'	Southern Pine Beam	1-2x6	1-2x6	1-2x6	2-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10
		Ponderosa Pine Beam	1-2x6	1-2x6	1-2x8	2-2x8	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10
		Corner Footing	6 5 4	7 6 5	7 6 5	8 7 6	9 7 6	9 7 6	10 8 7	10 8 7	10 9 7	11 9 8	11 9 8
		Intermediate Footing	9 8 7	10 8 7	10 9 7	11 9 8	12 10 9	13 10 9	14 11 10	14 12 10	15 12 10	15 13 11	16 13 11
	7'	Southern Pine Beam	1-2x6	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	2-2x12
		Ponderosa Pine Beam	1-2x6	1-2x6	1-2x8	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	2-2x12	3-2x10	3-2x10
		Corner Footing	7 5 5	7 6 5	8 7 6	9 7 6	9 8 7	10 8 7	10 8 7	11 9 8	11 9 8	12 10 9	12 10 9
		Intermediate Footing	9 8 7	10 8 7	11 9 8	12 10 9	13 11 9	14 11 10	15 12 10	15 13 11	16 13 11	17 14 12	17 14 12
	8'	Southern Pine Beam	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12
		Ponderosa Pine Beam	1-2x6	2-2x6	2-2x8	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	3-2x10	3-2x10	3-2x12
		Corner Footing	7 6 5	8 6 6	9 7 6	9 8 7	10 8 7	10 8 7	11 9 8	11 9 8	12 10 9	13 10 9	13 11 9
		Intermediate Footing	10 8 7	11 9 8	12 10 9	13 11 9	14 11 10	15 12 10	16 13 11	16 13 12	17 14 12	18 15 13	18 15 13
	9'	Southern Pine Beam	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10
		Ponderosa Pine Beam	1-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	3-2x10	3-2x10	3-2x12	3-2x12
		Corner Footing	7 6 5	8 7 6	9 7 6	10 8 7	10 9 7	11 9 8	12 10 8	12 10 9	13 10 9	13 11 9	14 11 10
		Intermediate Footing	10 9 7	12 10 8	13 10 9	14 11 10	15 12 10	16 13 11	17 14 12	17 14 12	18 15 13	19 15 13	20 16 14
	10'	Southern Pine Beam	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x10
		Ponderosa Pine Beam	1-2x6	1-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12	Eng Bm
		Corner Footing	8 6 6	9 7 6	10 8 7	10 8 7	11 9 8	12 10 8	12 10 9	13 11 9	14 11 10	14 12 10	15 12 10
		Intermediate Footing	11 9 8	12 10 9	14 11 10	15 12 10	16 13 11	17 14 12	17 14 12	18 15 13	19 16 14	20 16 14	21 17 15
	11'	Southern Pine Beam	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12
		Ponderosa Pine Beam	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	3-2x12	Eng Bm
		Corner Footing	8 7 6	9 7 6	10 8 7	11 9 8	12 9 8	12 10 9	13 11 9	14 11 10	14 12 10	15 12 10	15 13 11
		Intermediate Footing	12 9 8	13 11 9	14 12 10	15 12 10	16 13 11	17 14 12	17 14 12	18 15 13	19 16 14	20 16 14	21 17 15
	12'	Southern Pine Beam	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x10	3-2x12
		Ponderosa Pine Beam	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x12	3-2x12	Eng Bm	Eng Bm
		Corner Footing	9 7 6	10 8 7	10 9 7	11 9 8	12 10 9	13 10 9	14 11 10	14 12 10	15 12 10	15 13 11	16 13 11
		Intermediate Footing	12 10 9	14 11 10	15 12 10	16 13 11	17 14 12	18 15 13	19 16 14	20 16 14	21 17 15	22 18 15	23 18 16
	13'	Southern Pine Beam	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12
		Ponderosa Pine Beam	2-2x6	2-2x6	2-2x8	2-2x10	2-2x12	2-2x12	2-2x12	3-2x12	3-2x12	Eng Bm	Eng Bm
		Corner Footing	9 7 6	10 8 7	11 9 8	12 10 8	13 10 9	13 11 9	14 12 10	15 12 10	15 13 11	16 13 11	17 14 12
		Intermediate Footing	13 10 9	14 12 10	15 13 11	17 14 12	18 15 13	19 15 13	20 16 14	21 17 15	22 18 15	23 19 16	24 19 17
	14'	Southern Pine Beam	1-2x6	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12	3-2x12
		Ponderosa Pine Beam	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12	Eng Bm	Eng Bm	Eng Bm
		Corner Footing	9 8 7	10 8 7	11 9 8	12 10 9	13 11 9	14 11 10	15 12 10	15 13 11	16 13 11	17 14 12	17 14 12
		Intermediate Footing	13 11 9	15 12 10	16 13 11	17 14 12	18 15 13	20 16 14	21 17 15	22 18 15	23 18 16	24 19 17	24 20 17
	15'	Southern Pine Beam	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	3-2x12	Eng Bm
		Ponderosa Pine Beam	2-2x6	2-2x8	2-2x8	2-2x10	3-2x10	3-2x10	3-2x12	3-2x12	Eng Bm	Eng Bm	Eng Bm
		Corner Footing	10 8 7	11 9 8	12 10 8	13 10 9	14 11 10	14 12 10	15 12 11	16 13 11	17 14 12	17 14 12	18 15 13
		Intermediate Footing	14 11 10	15 12 11	17 14 12	18 15 13	19 16 14	20 17 14	21 17 15	22 18 16	23 19 17	24 20 17	25 21 18
	16'	Southern Pine Beam	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	3-2x12	Eng Bm
		Ponderosa Pine Beam	2-2x6	2-2x8	2-2x10	2-2x10	3-2x10	3-2x10	3-2x12	3-2x12	Eng Bm	Eng Bm	Eng Bm
		Corner Footing	10 8 7	11 9 8	12 10 9	13 11 9	14 11 10	15 12 10	16 13 11	16 13 12	17 14 12	18 15 13	18 15 13
		Intermediate Footing	14 11 10	16 13 11	17 14 12	18 15 13	20 16 14	21 17 15	22 18 16	23 19 16	24 20 17	25 21 18	26 21 18

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 inches to footing dimensions shown.
3. Requirements for future 3-season porches or screen porches:
   a. Increase corner footing size shown by 90%.
   b. Increase center footing size shown by 55%.
   c. Locate all footings at extremities of deck (no cantilevers).
   d. Beam sizes indicated need not be altered.
4. All footing sizes above are base diameters (in inches) and are listed for THREE SOIL TYPES: