



City of **BRAHAM**

"Building A Better Tomorrow"

201 Broadway Avenue South • P.O. Box 521 • Braham, Minnesota 55006
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Residential Decks

Building Permits – Are required for any deck attached to a structure or any detached deck more than 30 inches above grade. To obtain a permit, provide the following: an application for permit, a site plan or survey, a deck plan with all structural details in sufficient clarity to determine code compliance.

Site Plan or Survey – Show the deck and all distances to property lines, structures, streets and alleys.

Design and Construction – Decks shall be positively anchored to the primary structure with fasteners not subject to withdraw. It shall be designed for both vertical and lateral loads and support 40 pounds per square foot live load. Ledger boards or rim joists must be attached directly to solid wood framing members of the house. Attachment to the house cantilever may require special design.

Overhanging Decks – Joists should not overhang beams by more than 2 feet for 2x10's, 18 inches for 2x8's, 12 inches for 2x6's. Beams shall be double members of joist size or another single member type of engineered wood for load. Beams shall not overhang post by more than 12 inches.

Materials – The type of deck materials to be used must be indicated on the plans. All exposed wood must be an approved treated wood or naturally resistant to decay. If using composite decking materials, check with the building department before purchasing. Some composite decking materials are not approved.

Special Fasteners – The use of pressure-treated wood required appropriate fasteners and hardware such as stainless steel or hot dipped galvanized that are compatible with the chemical treatment of wood.

Frost Footings – Are required for any deck attached to a structure that has frost footings. Minimum depth shall be 42 inches below grade with a minimum 8 inch diameter at grade level. The bottom of the footing often needs to be more than 8 inches to be properly sized for the deck load, *refer to sizing chart*. Future plans for the roof and wall loads should be considered for proper sizing of footings.

Guards – Are required when decks are more than 30 inches above grade or walking surface below. They shall be at least 36 inches in height, support a 200 pound force and have less than 4 inch openings. Guards along open sides of stairs shall be at least 34 inches in height.

Stairs with Handrails – Refer to attached sheets for code requirements

Weather Protection – All connections between deck and dwelling shall be flashed and caulked.

Safety – Call Gopher One (811) at least 2 business days before you dig any holes for footings. They will provide a free service of locating buried lines.

Inspections – The approved plan and site drawing shall be on site and available for all inspections. Required inspections are: Site/Footing, before pouring concrete and Framing/Final after completed. To schedule an inspection call 320-396-3383 one day before you want the inspection, M-F 8:00-4:30

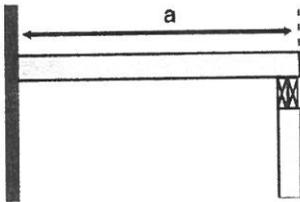
Joist span

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

Examples, using Southern Pine joists and deck site located in sandy soil:

Example 1. $a = 12'$, Post Spacing = 8' (deck width = 16')

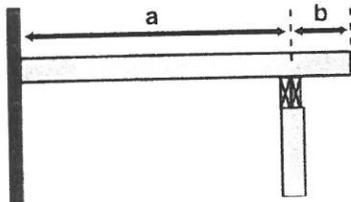


From Joist Span Table: 12' joist span
Minimum joist size required, 2 X 8's - 16" O.C. or 2 X 10's 24" O.C.

From Beam and Footing Size Table: align 8' post spacing with 12' joist length. Beam may be 2 - 2 X 8's or 2 - 2 X 10's.

From Beam and Footing Size Table select appropriate soil column. Use middle column for sandy soil. Footing bottom diameter must be at least 10" for corner footings and 14" for middle footing.

Example 2. $a = 10'$, $b = 2'$, Post Spacing = 10' (deck width = 20')



Use "a" to determine joist size and "a" + "b" to determine beam and footing sizes.

(Joist size must be 2 X 10 or larger for 2' cantilever)

From Joist Span Table find the minimum joist size for a 10' joist span; 2 X 10's at 24" O.C. or 2 X 10's at 16" O.C. (better option).

To size the beam and footings, use a joist length of 12', (10' + 2').

From Beam and Footing Size Table, align 10' post spacing with 12' joist length. Beam size = 2 - 2 X 12's. Footing sizes = 12" for corner footings and 17" for middle footing. **NOTE:** Footing sizes are increased by one inch per note 2 at bottom of table.

Beam and footing sizes

Based on No. 2 or better Ponderosa Pine and Southern Pine
(Treated for weather and/or ground exposure)

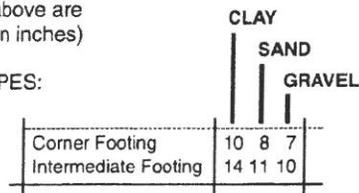
		Post spacing											
		4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	
Joist Length	6'	Southern Pine Beam	1-2x6	1-2x6	1-2x6	2-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10
		Ponderosa Pine Beam	1-2x6	1-2x6	1-2x8	2-2x8	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10
	Corner Footing	6 5 4	7 6 5	7 6 5	8 7 6	9 7 6	9 7 6	10 8 7	10 8 7	10 9 7	11 9 8	11 9 8	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	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	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	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	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	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	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	20 16 14	
10'	Southern Pine Beam	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x10	
	Ponderosa Pine Beam	1-2x6	1-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	2-2x12	3-2x10	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	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	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	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	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	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 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	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	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	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	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	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	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	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	26 21 18	

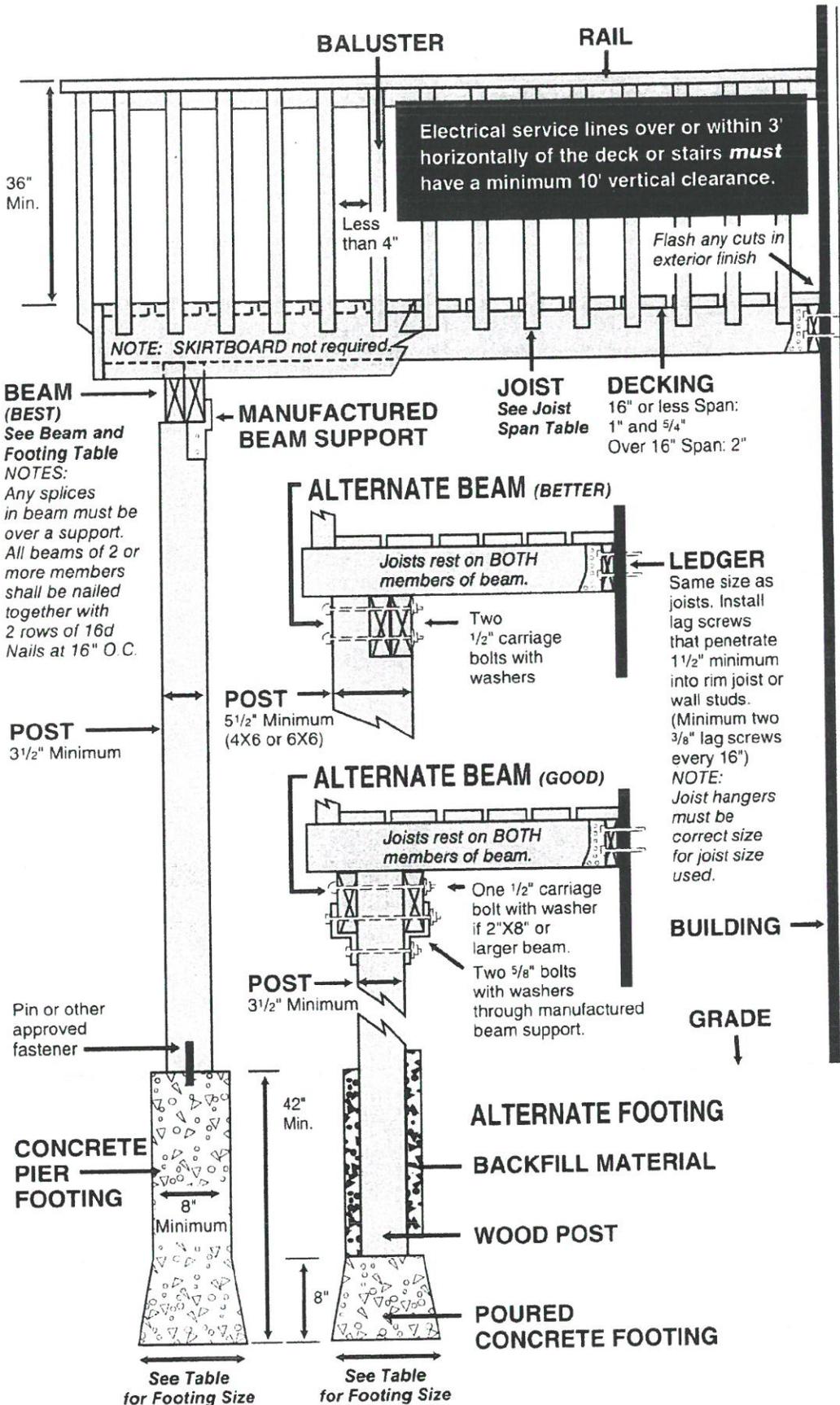
Notes:

- Joist length is total length of joist, **including** any cantilevers.
- When joist extends (cantilevers) beyond support beam by 18 inches or more, add 1 inches to footing dimensions shown.
- Requirements for future 3-season porches or screen porches:
 - Increase corner footing size shown by 90%.
 - Increase center footing size shown by 55%.
 - 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:





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.

Two 1/2" carriage bolts with washers

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.

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.

BUILDING

GRADE

POST
3 1/2" Minimum

Pin or other approved fastener

CONCRETE PIER FOOTING

8" Minimum

ALTERNATE FOOTING

BACKFILL MATERIAL

WOOD POST

POURED CONCRETE FOOTING

42" Min.

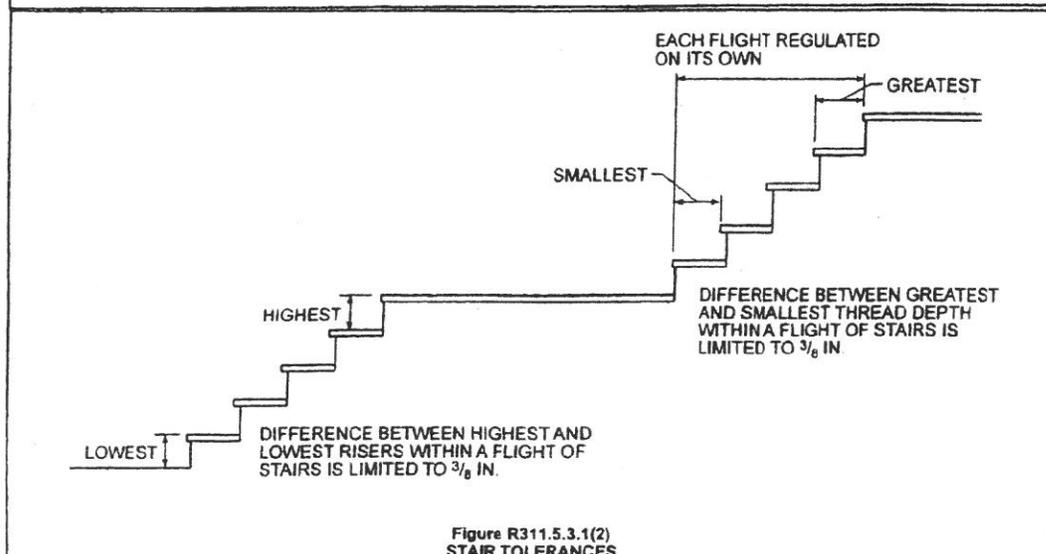
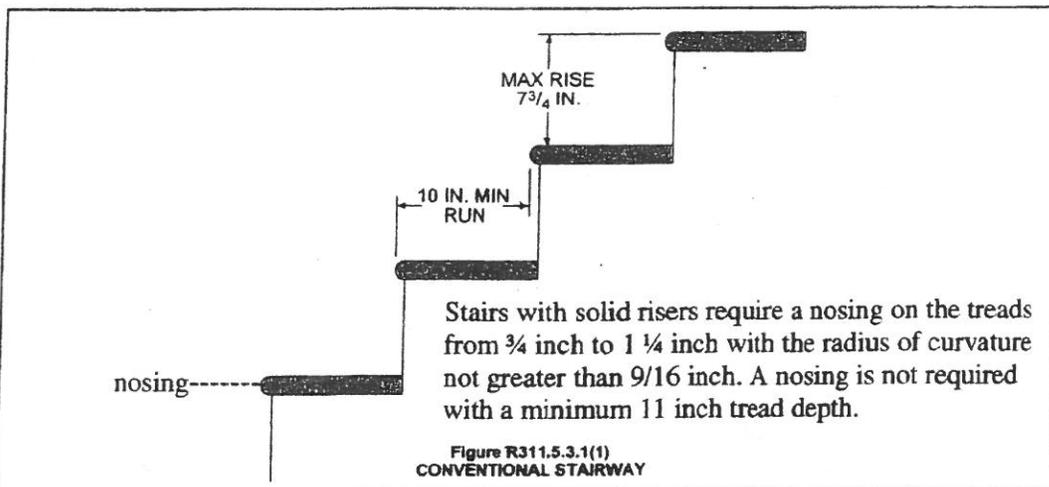
8"

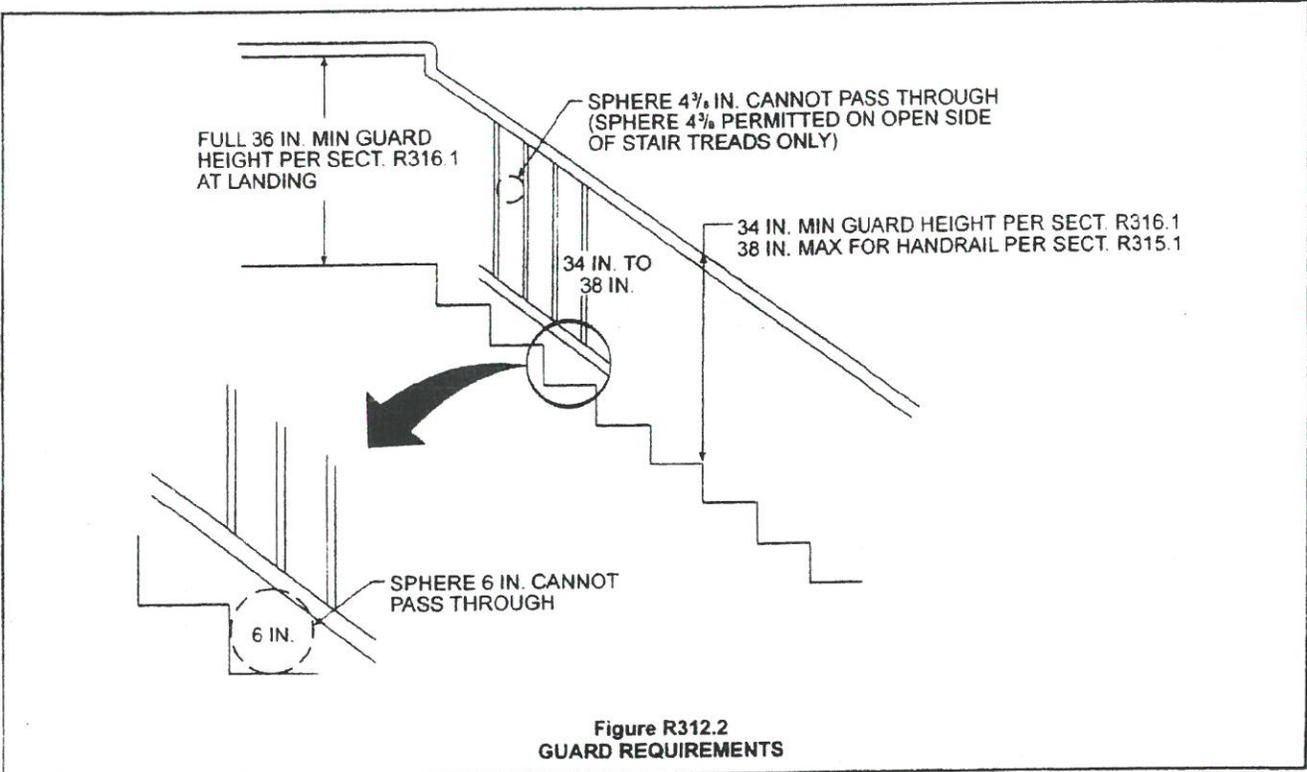
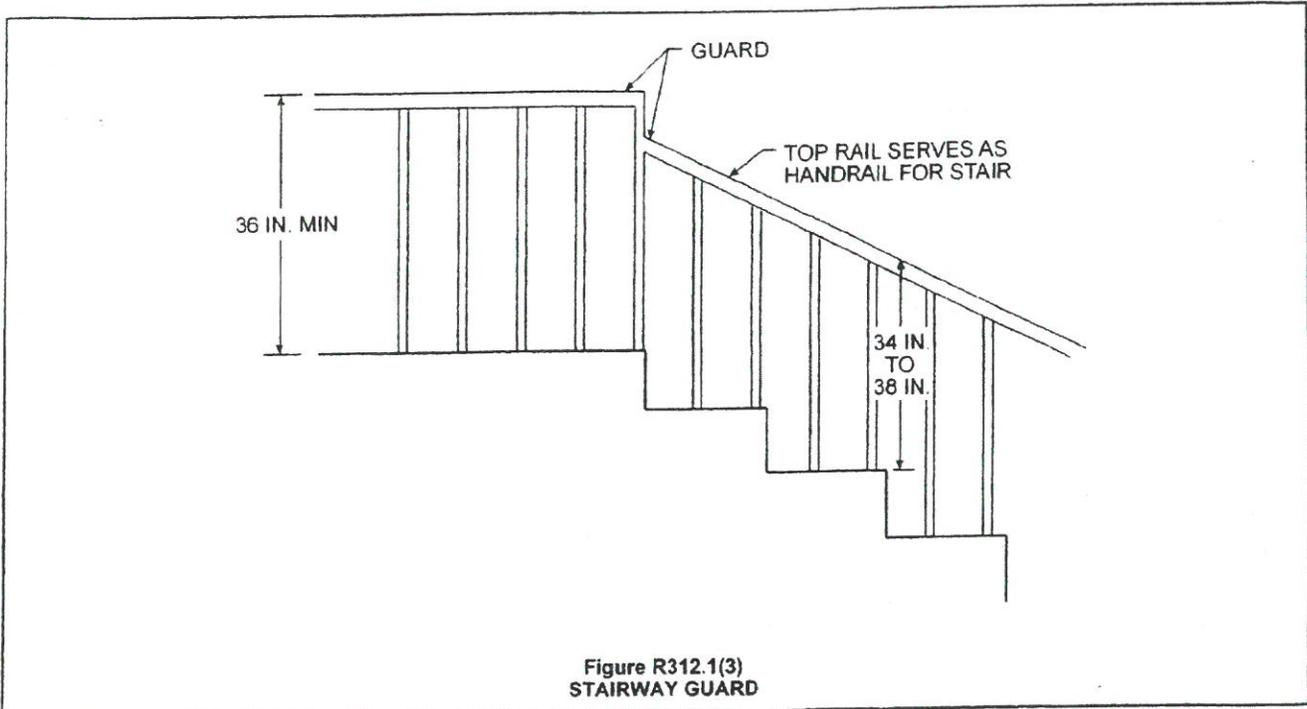
See Table for Footing Size

See Table for Footing Size

RESIDENTIAL STAIRS (2006 IRC)

- Stairs with four or more risers require a continuous full length handrail on one side with no open ends. It shall be mounted from 34 inches to 38 inches above the nosing of the treads and have no sharp edges.
- Clear width must be at least 36 inches above the handrail and 31.5 inches below the handrail. With a handrail on both sides of the stairs, the clear width at and below the handrails shall be 27 inches.
- Stairs and landings require a means of illumination by an artificial light source controlled from inside the dwelling unit or by lights continuously illuminated or automatically controlled.
- Individual stair treads shall be designed for the uniformly distributed live load or a 300 pound concentrated load over 4 square inches.
- Guards and handrails along stairs must support a 200 pound load applied at any point along the top.
- Open sides of stairs more than 30 inches above the floor or grade below shall have guards not less than 34 inches high measured vertically above the nosing of the treads to the top of the guard.
- Openings for guards along the sides of stairs must be less than 4 3/8 inches.
- Triangular openings formed by the riser, tread and bottom rail of a guard must be less than 6 inches.
- Maximum riser height is 7 3/4 inches. Riser openings must be less than 4 inches. Minimum tread depth is 10 inches. The greatest riser height and tread depth shall not exceed the smallest by more than 3/8 inch.





Residential Handrail Requirements (2006 IRC R311.5.6.3)

Handrails:

- Required on at least one side of stairs with four or more risers.
- Shall be continuous for the full length of the stairs and have no sharp edges.
- Ends must be returned to a wall or post, (no open ends).
- Height shall be 34 inches to 38 inches measured vertically above nosing of treads.
- Shall not project more than 4 ½ inches on either side of stairway.
- Must have at least a 1 ½ inch space between the handrail and what it is mounted to.
- Must be secure enough to resist a 200 pound force applied at any point along the top.

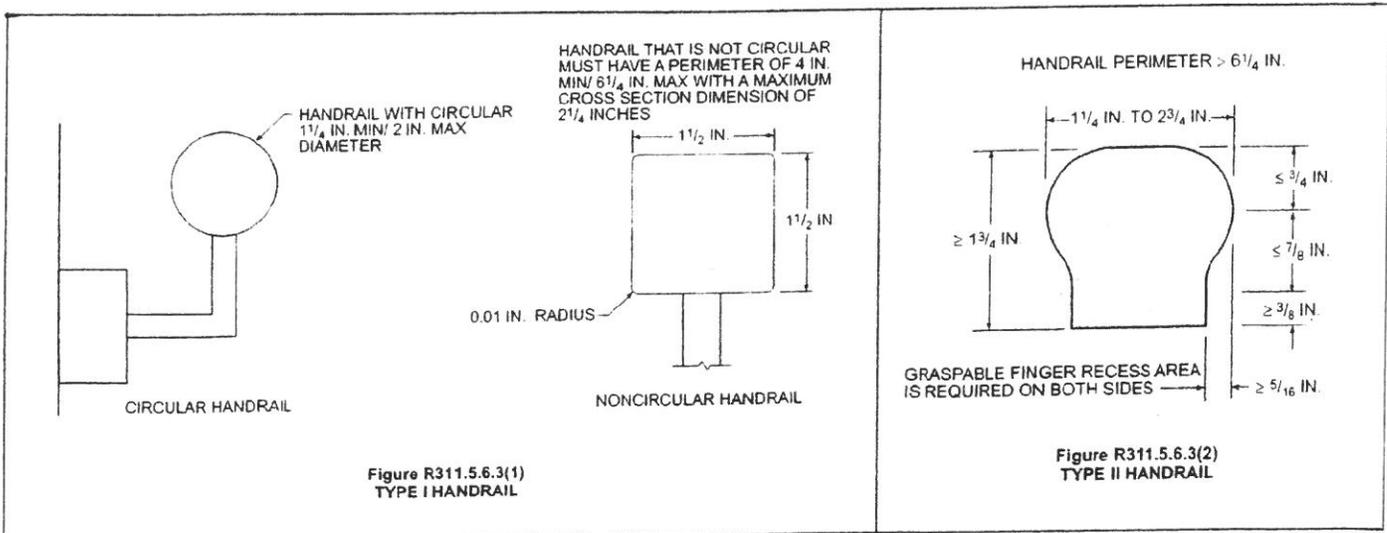
The handgrip portion shall be of type I, type II or other equivalent graspable types.

Type I handrail:

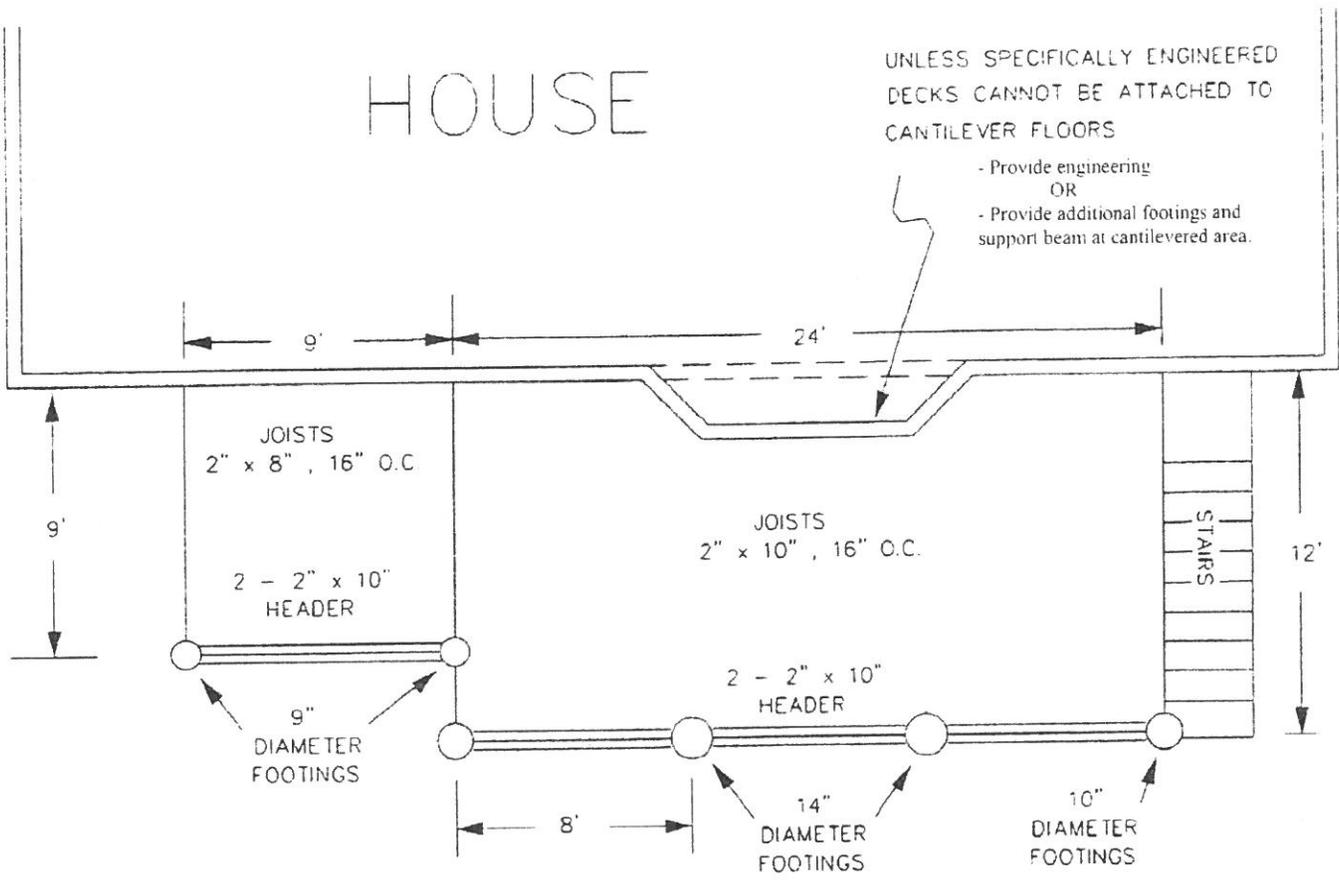
- Shall have a circular cross section outside diameter of 1 ¼ inches to 2 inches. If the handrail is not circular it shall have a perimeter dimension between 4 inches and 6 ¼ inches and have a maximum cross section of 2 ¼ inches.

Type II handrail:

- When the perimeter is greater than 6 ¼ inches there shall be a graspable finger recess area on both sides of the profile.



Note: A 2 x 4 or 2 x 6 laying flat or on edge is not an acceptable handrail.



SAMPLE FLOOR PLAN

DECK PLAN DETAILS

PLEASE FILL IN THE BLANKS WITH YOUR DECK DETAILS, FURNISH A SITE SURVEY AND COMPLETE A BUILDING APPLICATION.

WIDTH _____

JOIST SIZE _____
SPACING _____

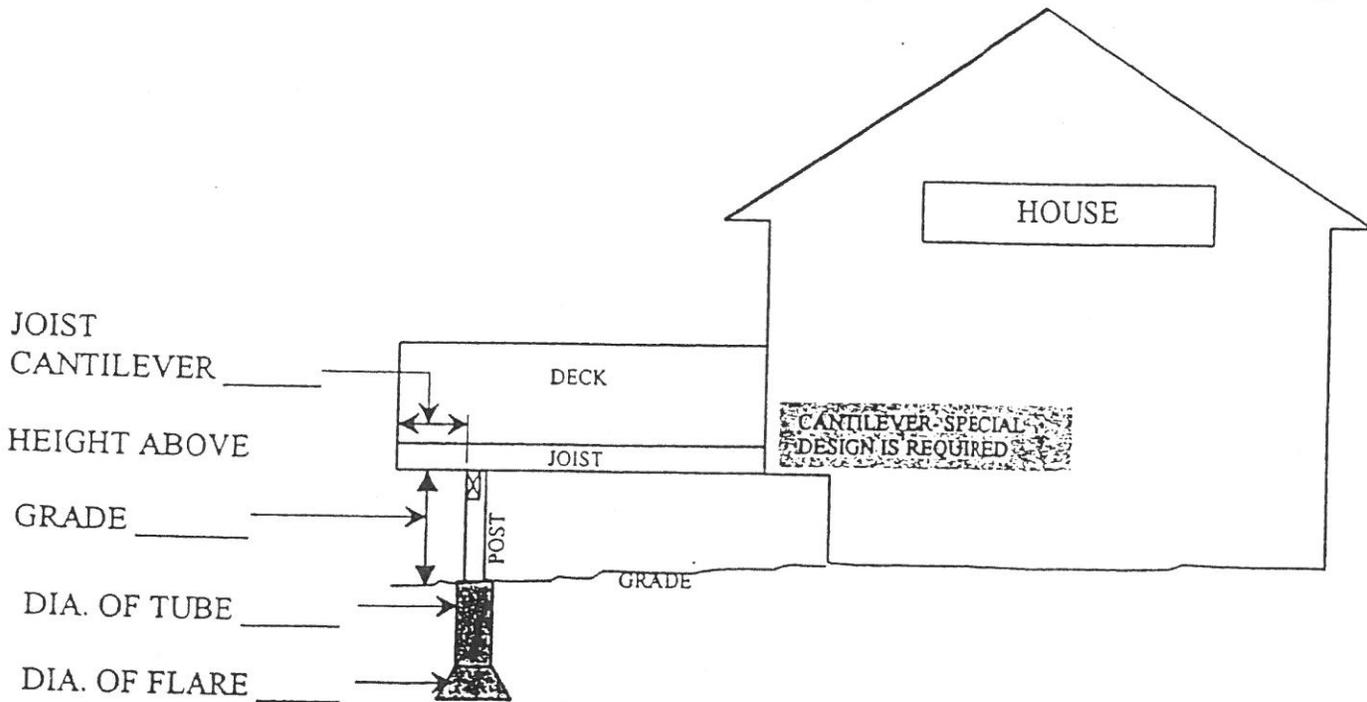
LENGTH _____

NUMBER OF POSTS _____ SIZE OF BEAM _____

POST SPACING _____ SIZE OF POSTS _____
(recommend 4x6 or larger for direct bearing)

1' Max.

LOCATE STAIRS ON SURVEY



APPLICATION CHECKLIST Y N

1. Is a future porch being considered?
2. Will there be a hot tub or spa on the deck?
3. Is the deck being attached to a house cantilever? Yes, provide a special design.
4. Is a guardrail required (over 30" above grade)?
5. Is a handrail required on the stairs (4 or more risers)?
6. Is the deck drawn on the site survey? Show the distance to relevant property lines, identify building and streets or alleys.

