



Home of the...  
"Iron Man Mining Memorial"  
"Bridge of Nations"  
"Chisholm Heritage Mural"  
"Ironworld Discovery Center" and  
"The Museum of Mining"

City Hall – 316 West Lake Street - Chisholm, MN 55719  
Tel: (218) 254-7906 Fax: (218) 254-7955

## Decks

These instructions are for one-floor uncovered decks serving the first or second level of a one or two family dwelling.

### Checklist

All plans must be drawn to scale in black or blue ink with scale noted on plan.

Do not use pencil.

Clearly designate proposed work and existing conditions.

Provide complete structural information.

Two copies of each sheet required.

Submit the Deck Application Form fully and accurately completed

Site Plan

Indicating

- Legal description and north arrow
- All existing structures
- Dimensions of lot
- Distance from proposed deck to property lines

Plan view

Indicating

- Dimensions
- Joist beam and footing size and spacing
- Wood species and grade
- Guardrail location, height and baluster spacing

Permits will not be issued without a complete application



# Beam and Footing Sizes for Decks

Design wood is Southern Pine No. 2, must be treated		Post Spacing											
		4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	
Joist Length	6'	Beam size	1-2x6	1-2x6	1-2x6	2-2x6	2-2x6	2-2x6	2-2x6	2-2x6	2-2x10	2-2x10	2-2x10
		Corner Footing	6	7	7	8	9	9	10	10	10	11	11
		Intermediate Footing	9	10	10	11	12	12	13	14	14	15	16
	7'	Beam size	1-2x6	1-2x6	1-2x6	2-2x6	2-2x6	2-2x6	2-2x6	2-2x6	2-2x10	2-2x10	2-2x10
		Corner Footing	7	7	8	9	9	10	10	11	11	11	12
		Intermediate Footing	9	10	11	12	13	13	14	15	15	16	17
	8'	Beam size	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x6	2-2x6	2-2x6	2-2x10	2-2x10	2-2x12
		Corner Footing	7	8	9	9	10	10	11	11	11	12	13
		Intermediate Footing	10	11	12	13	14	14	15	15	16	17	18
	9'	Beam size	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x6	2-2x10	2-2x10	2-2x10	2-2x12	2-2x12
		Corner Footing	7	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	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x6	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10	
	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	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	
	Corner Footing	8	9	10	11	12	12	13	14	14	15	15	
	Intermediate Footing	12	13	14	15	16	17	17	18	19	20	21	
12'	Beam size	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x10	3-2x12	
	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	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12	
	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	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12	
	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	2-2x6	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	3-2x12	Eng Bm	
	Corner Footing	10	11	12	13	14	14	15	16	16	17	18	
	Intermediate Footing	14	15	17	18	19	20	21	22	23	24	25	
16'	Beam size	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	3-2x12	Eng Bm	
	Corner Footing	10	11	12	13	14	15	16	16	17	18	19	
	Intermediate Footing	14	15	17	18	20	21	22	23	24	25	26	

Minimum footing thickness is 8" unless shaded:

 Denotes minimum 10" thick footing  
 Denotes minimum 12" thick footing

Footing pad sizes are for diameter in inches.

Minimum depth to bottom of footing = 60"

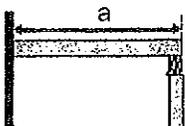
## JOIST SPAN

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	7-0	10-9	9-9	8-6	9-2	8-4	7-3
2X8	12-1	10-10	8-10	14-2	12-10	11-0	12-1	11-0	9-2
2X10	15-4	13-3	10-10	18-0	16-1	13-5	15-5	13-9	11-3
2X12	17-9	15-5	12-7	21-9	19-0	15-4	18-5	16-0	13-0

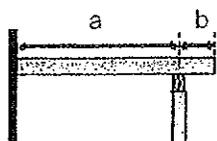
### Case One Solution



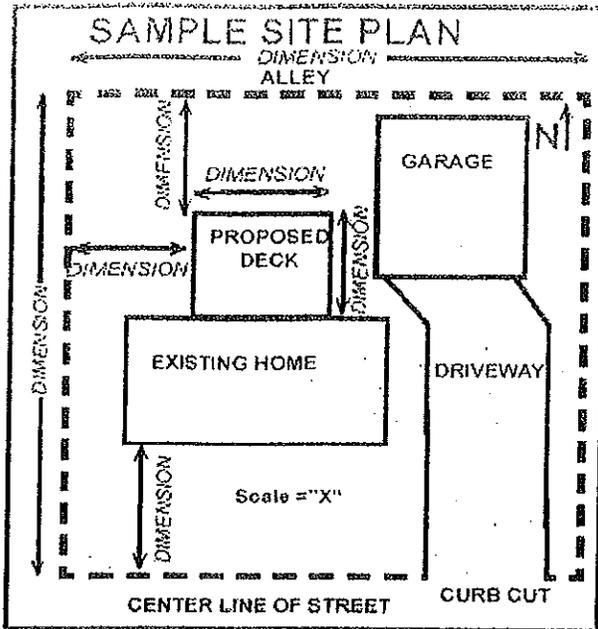
Refer to tables for joist, beam and footing size requirements. Example: a = 12'; Post spacing = 8'  
 Use the joist span table to find the acceptable joist sizes for a 12' span, 2x8s at 12" O.C., 2x10s at 16" O.C. or 2x12s at 24" O.C. Use the Beam and footing sizes table and find the 8' post spacing column. With a 12' 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", 10" or 9" for the corner post and 17", 14" or 12" for all intermediate posts.

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', b = 2', Post spacing = 10'

### Case Two Solution



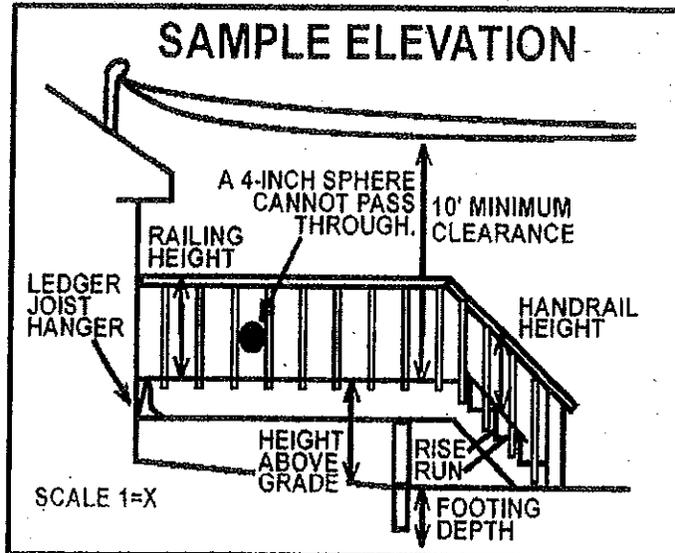
Refer to the joist span table. For an 8' joist span, either 2x8s at 24" O.C. or 2x6s at 16" O.C. are acceptable. For sizing the beam, use a joist length of 12' (8' + 4') and a post spacing of 10'. The beam and footing sizes table indicates that the beam may be either two 2x10s or two 2x12s, depending on wood used. Depending on the type of soil, the footing diameter at the base must be a minimum of 15", 12" or 11" for the corner post and 20", 17" or 15" for all intermediate posts. Note that because of the 2' cantilever all footing sizes were increased by 1" as required by footnote 2 at the end of the table. a b



**PLANS: SITE, FLOOR, and ELEVATION**  
 The following text and sample drawings show the minimum detail expected so the permit process can proceed smoothly. TWO sets of each plan are required. Plans do not need to be professionally drawn. However, plans should include all of the information requested. The application for permit can be filled out at the time you drop off your plans. Certificate of Survey or Site Plan drawn to scale indicating the lot dimensions, the location and size of the existing structure(s), and the location and a size of the proposed structure. Indicate the setbacks from property lines of the existing and proposed structure(s), including septic system area and wells if applicable.

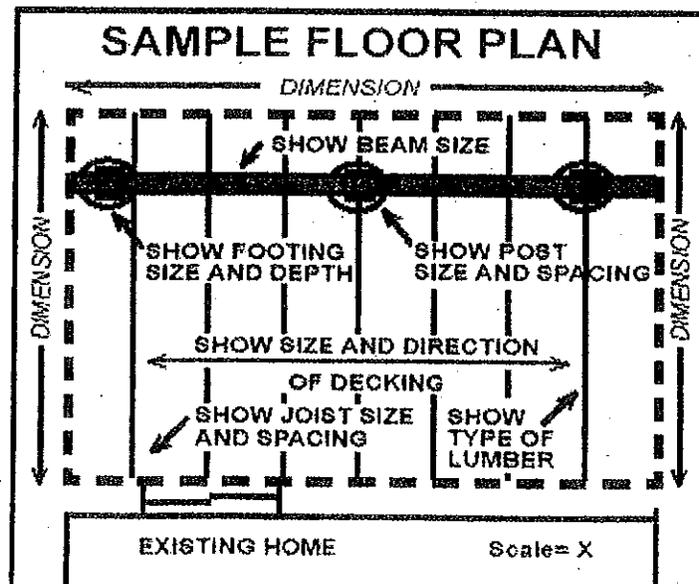
#### ELEVATION PLAN

1. Height of structure from grade.
2. Size and depth of footings.
3. Guard height and spacing (if any).
4. Stairway rise/run and handrail height (if any).
5. Clearance of over-head wires (if applicable).



#### FLOOR PLAN

1. Proposed deck size.
2. Size and spacing of floor joists.
3. Size and type of decking material.
4. Size, type, location, and spacing of posts.
5. Size and type of beams.

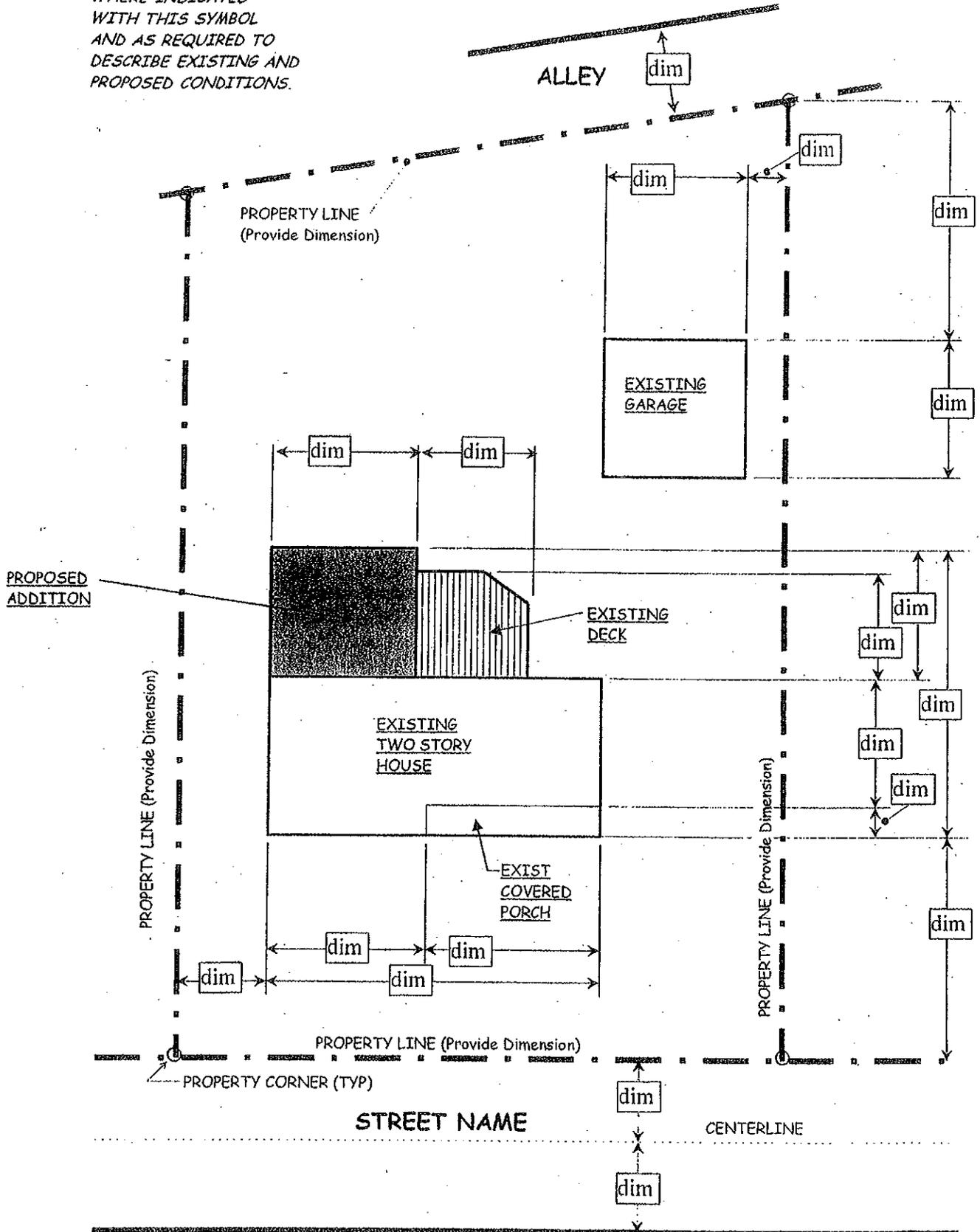


# SAMPLE SITE PLAN

Do not use this sheet-create your own drawing.

SCALE: 1" = \_\_\_\_\_ FEET

**dim** PROVIDE DIMENSIONS WHERE INDICATED WITH THIS SYMBOL AND AS REQUIRED TO DESCRIBE EXISTING AND PROPOSED CONDITIONS.



# Decking Materials

## WOOD DECKING MATERIALS ALLOWED BY MINNESOTA STATE BUILDING CODE

Naturally decay and termite resistant wood species such as:

Redwood and Cedar  
Treated Wood

## NATURALLY DECAY RESISTENT WOODS ALLOWED AS ALTERNATE MATERIALS BY THE BUILDING OFFICIAL

Douglas Fir heartwood  
Lodgepole Pine heartwood  
Redwood heartwood and sapwood  
Western Red Cedar heartwood  
White Oak sapwood and heartwood  
Western White Pine heartwood  
Red Oak sapwood and heartwood  
Eucalyptus heartwood  
Ponderosa Pine heartwood

## APPROVED COMPOSITE DECKING MATERIALS

Composite decking material is not addressed in the Building Code. Thus, it is allowed as an alternative material only when the building official finds that the material is, for the purpose intended, at least the equivalent of that [material] prescribed [by the code]. (MSBC 1300.0110 Subp. 13) The building official evaluates composite decking products on a product by product basis to determine their equivalence with prescribed materials and other code requirements applicable to decking. ICC Evaluation Services provides reports about products that have been tested and evaluated specifically for compliance with the building code.

The following composite decking products have been approved for use.

CORRECTDECK NER-688  
CERTAINTEED KINGSTON, OXFORD AND CAMBRIDGE RAILING SYSTEMS ESR-1555 AND NER 605  
CERTAINTEED PVC DECK PLANKS NER-605  
ENDURA BOARD ESR-1890  
EON DECKING ESR-1300  
EPOCH EVERGRAIN DECKING (Manufactured by ECP in Lamar MO NOT Epoch Decking) ESR-1625  
FIBERON ICC-ES 22-41  
GEODECK  
LIFE LONG COMPOSITE ICC-ES 1278 & 1279  
MONARCH DECKING ESR-1084  
PROFECTION DECK BOARDS & PRO PERFECT DECKING ICC-ES 22-41  
RHINO ICBO ER 6134  
TIMBER TECH DECKING ICC ES-2325  
TREX COMPOSITE LUMBER ICBO ER 5747  
ULTRADECK (Manufactured by MME in Eau Claire WI NOT Ultra-Dek) ESR-1674  
VEKADECK ESR-1469  
VERANDA DECK BOARDS ICC-ES 22-41  
WEATHERBEST ICC ESR 1088 (Special stair requirements)  
XTENDEX NER-695

*The product supplier or manufacturer can tell you whether an ICC Evaluation report is available for other products. Approval of alternate materials must be by the Building Official.*



MEMORANDUM

DATE: March 2, 2004

TO: All Building Officials and Interested Parties

FROM: Thomas R. Joachim  
State Building Official

SUBJECT: Pressure Treated Wood Fasteners

A handwritten signature in black ink that reads "Thomas R. Joachim". The signature is written in a cursive style and is positioned to the right of the typed name and title.

On February 12, 2002, the United States Environmental Protection Agency (EPA) announced a voluntary decision by industry to move consumer use of treated lumber products away from a variety of pressure-treated woods that contains arsenic, in favor of new alternative wood preservatives. This transition affects virtually all residential uses of wood treated with chromated copper arsenate, also known as CCA, including wood used in play-structures, decks, picnic tables, landscaping timbers, residential fencing, and boardwalks. As of January 1, 2004, EPA will not allow CCA products to be used to treat wood intended for any of these residential uses.

Although the EPA has not concluded that there is unreasonable risk to the public from these products, they do believe that any reduction in exposure to arsenic is desirable (U. S. EPA statement of February 12, 2002).

CCA treated wood can be used until the supply runs out. This voluntary agreement is affecting the supply of CCA material available for decks or other outdoor structures. Lumber suppliers are clearing their inventories and beginning to stock new materials treated with other chemicals. The most common alternate treatments are Alkaline Copper Quaternary (ACQ), Copper Azole and Sodium Borate. According to the lumber and fastener industry, the newer chemicals being used to treat the wood approved for outdoor use may be considerably more corrosive than those previously treated with CCA and therefore require special fasteners, hangers and greater care in the selection of materials that may come in contact with the wood.

Designers, builders, supplies and Building Officials will need to pay particular attention to the grade marks on the lumber, and verify that proper hardware (hangers, nails, brackets) is appropriate with the particular treatment of the lumber. This not only applies to decks utilizing these products but sill plates and posts as well. The code references the American Wood Preservers Association (AWPA), which has published information on this issue. Particular attention should also be made to the manufacturer's installation instructions for the hardware. The International Code Council Evaluation Reports should also be referenced to insure proper product use.

In addition to proper fasteners, the flashing, windows and door surrounds that may be in contact with the wood must be carefully selected to insure they will not fail prematurely. Code enforcers are also cautioned to the potential for galvanic corrosion to occur if dissimilar metals are mixed. Questions should be directed to the manufacturer of the treated material or hardware supplier.

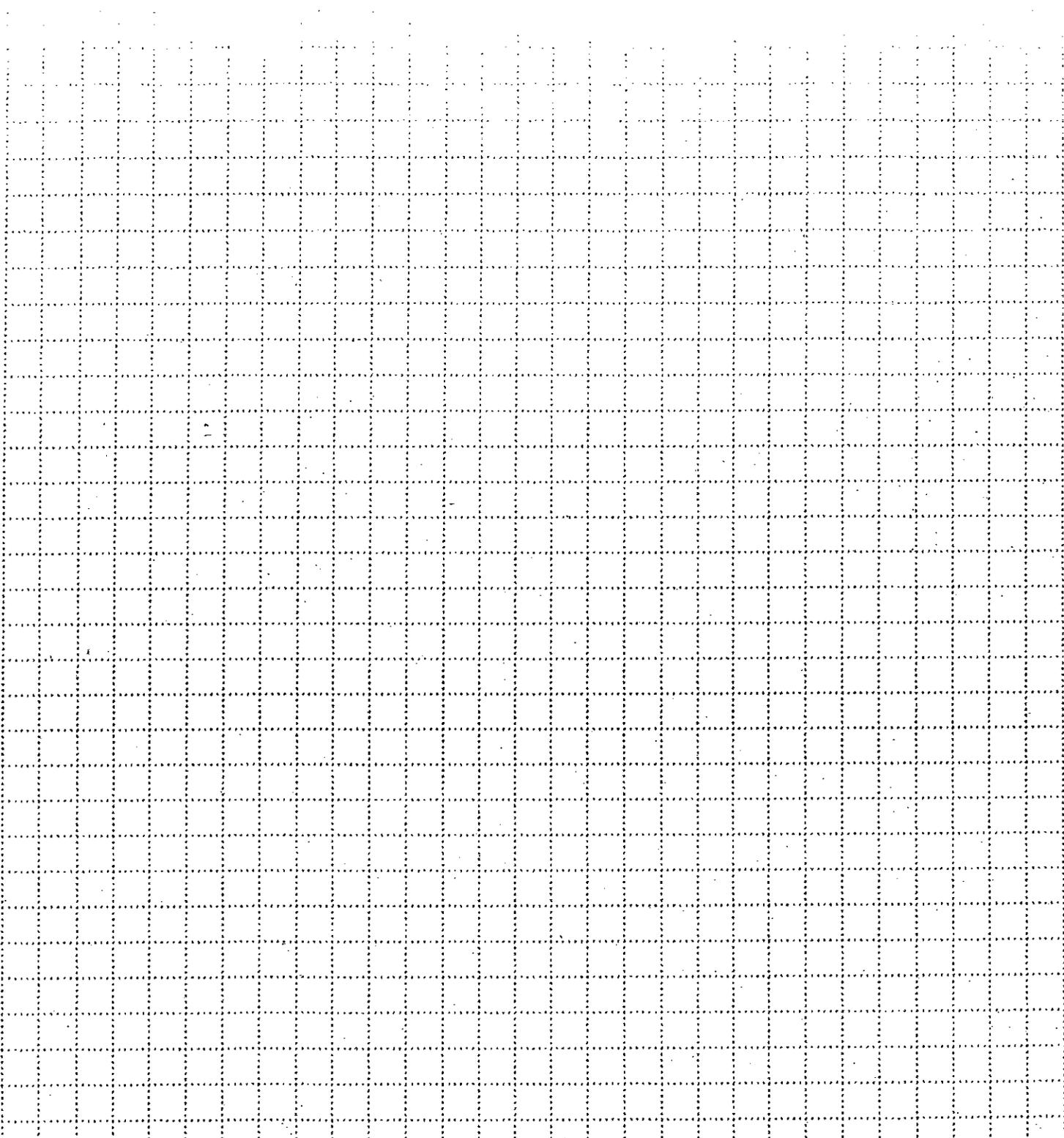
We have provided a resource web link contact list and an updated deck handout for you use on the division web site [Building Codes and Standards Division Home Page](#)

Os/tj/WoodFastenerMemo3-2-04  
DO013

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Building Codes and Standards Division  
408 Metro Square Building  
121 7th Place East  
Saint Paul, MN 55101  
[www.buildingcodes.admin.state.mn.us](http://www.buildingcodes.admin.state.mn.us)

651.296.4639 Fax: 651.297.1973 TTY: 800.627.3529



North arrow required  
Scale: 1"= feet

# SITE PLAN

Grid is 4 squares per  
inch

**Site Address**

**Owner's Name**

*This site plan is an accurate and complete representation of the footprint(s) of all existing and proposed structure(s) and their location(s) on the subject property*

**Applicant's Signature**

**Date**

**Legal Description**

*Required*

# Residential Plan Review Guide for Square Footing Sizing

	Footings		Required (Min.) Soil Load Bearing Capacity (PSF)					
	Footings		Total Column Loading					
	Square Footing Size	Footings Sq. In. Area	Footings Sq. Ft. Area	1000 PSF Soil Brg.	1500 PSF Soil Brg.	2000 PSF Soil Brg.	2500 PSF Soil Brg.	3000 PSF Soil Brg.
8" Ftg. Thickness - Min.	8 x 8	64	0.44	444	667	889	1111	1333
	9 x 9	81	0.56	563	844	1125	1406	1688
	10 x 10	100	0.69	694	1042	1389	1736	2083
	11 x 11	121	0.84	840	1260	1681	2101	2521
	12 x 12	144	1.00	1000	1500	2000	2500	3000
	13 x 13	169	1.17	1174	1760	2347	2934	3521
	14 x 14	196	1.36	1361	2042	2722	3403	4083
	15 x 15	225	1.56	1563	2344	3125	3906	4688
10" Ftg.	16 x 16	256	1.78	1778	2667	3556	4444	5333
	17 x 17	289	2.01	2007	3010	4014	5017	6021
	18 x 18	324	2.25	2250	3375	4500	5625	6750
	19 x 19	361	2.51	2507	3760	5014	6267	7521
	20 x 20	400	2.78	2778	4167	5556	6944	8333
	21 x 21	441	3.06	3063	4594	6125	7656	9188
12" Ftg. Thickness - Minimum	22 x 22	484	3.36	3361	5042	6722	8403	10083
	23 x 23	529	3.67	3674	5510	7347	9184	11021
	24 x 24	576	4.00	4000	6000	8000	10000	12000
	25 x 25	625	4.34	4340	6510	8681	10851	13021
	26 x 26	676	4.69	4694	7042	9389	11736	14083
	27 x 27	729	5.06	5063	7594	10125	12656	15188
	28 x 28	784	5.44	5444	8167	10889	13611	16393
	29 x 29	841	5.84	5840	8760	11681	14601	17521
	30 x 30	900	6.25	6250	9375	12500	15625	18750
	31 x 31	961	6.67	6674	10010	13347	16684	20021
	32 x 32	1024	7.11	7111	10667	14222	17778	21333
	14" Footing	33 x 33	1089	7.56	7563	11344	15125	18906
34 x 34		1156	8.03	8028	12042	16056	20069	24083
35 x 35		1225	8.51	8507	12760	17014	21267	25521
36 x 36		1296	9.00	9000	13500	18000	22500	27000

*Shaded total load numbers may require special column types and/or additional footing reinforcement.*

**NOTE:** This table should only be used as a guide for establishing square column footing pad sizes. When the actual column type, size and total loading has been determined, each column footing condition should be reviewed to determine the required square footing size and thickness. Although actual concrete compressive strength (PSI) may vary, it is assumed that at a minimum, Plain Structural Concrete (2500 PSI) will be used for column footings sized herein. Soil types and bearing capacities must also be verified at each site. Consult with the local Building Code Official prior to using this table.

# Residential Plan Review Guide for Round Footing Sizing

	Footing Sizes	Footing Area		Required (Min.) Soil Load Bearing Capacity (PSF)				
		Footing Sq. In.	Footing Sq. Ft.	Total Column Loading				
	Dia. Inches			1000 PSF	1500 PSF	2000 PSF	2500 PSF	3000 PSF
8" Ftg. Thickness - Min.	8	50.27	0.35	649	524	698	873	1047
	9	63.62	0.44	442	663	884	1105	1326
	10	78.54	0.55	545	818	1081	1358	1630
	11	95.03	0.66	660	990	1320	1650	1980
	12	113.10	0.79	785	1178	1571	1963	2356
	13	132.73	0.92	922	1383	1844	2307	2799
	14	153.94	1.07	1069	1604	2138	2673	3247
	15	176.72	1.23	1227	1841	2444	3057	3632
10" Ftg.	16	201.06	1.40	1396	2094	2792	3490	4188
	17	226.98	1.58	1573	2364	3139	3947	4705
	18	254.47	1.77	1767	2661	3528	4395	5211
	19	283.53	1.97	1969	2973	3978	4944	5907
12" Ftg. Thickness - Minimum	20	314.16	2.18	2182	3273	4383	5493	6603
	21	346.36	2.41	2403	3608	4811	6022	7232
	22	380.13	2.64	2640	3980	5280	6600	7919
	23	415.48	2.89	2895	4373	5771	7213	8656
	24	452.39	3.14	3162	4792	6284	7857	9425
	25	490.88	3.41	3449	5113	6818	8532	10227
	26	530.93	3.69	3667	5451	7274	9118	11061
	27	572.56	3.98	3976	5904	7852	9820	11935
	28	615.75	4.28	4276	6412	8457	10550	12828
	29	660.52	4.59	4587	6880	9174	11437	13761
	30	706.86	4.91	4909	7363	9810	12272	14726
	14" Footing	31	754.77	5.24	5241	7862	10480	13104
32		804.25	5.59	5585	8370	11079	13863	16755
33		855.30	5.94	5940	8909	11870	14849	17819
34		907.92	6.31	6305	9458	12610	15763	18915
35		962.12	6.68	6681	10022	13363	16793	20044
36		1017.88	7.07	7069	10693	14137	17672	21206

*Shaded total load numbers may require special column types or sizes and/or addition footing steel reinforcement.*

NOTE: This table should only be used as a guide for establishing round column pad sizes. When the actual column type, size and total loading has been determined, each column footing condition should be reviewed to determine the required round column pad size and thickness. Although actual concrete compressive strength (PSI) may vary, it is assumed that at a minimum, Plain Structural Concrete (2500 PSI) will be used for column footings sized herein. Soil types and bearing capacities must also be verified at each site. Consult with the local Building Code Official prior to using this table.