

Residential Plan Review Guide for Square Footing Sizing

	Footings SIZES	Footings Area		Required (Min.) Soil Load Bearing Capacity (PSF) Total Column Loading				
		Square Footing Size	Footing Sq. In. Area	Footing Sq. Ft. Area	1000 PSF Soil Brg.	1500 PSF Soil Brg.	2000 PSF Soil Brg.	2500 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
12" Ftg. Thickness -	20 x 20	400	2.78	2778	4167	5556	6944	8333
	21 x 21	441	3.06	3063	4594	6125	7656	9188
	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	16333
	29 x 29	841	5.84	5840	8760	11681	14601	17521
	30 x 30	900	6.25	6250	9375	12500	15625	18750
14" Footing	31 x 31	961	6.67	6674	10010	13347	16684	20021
	32 x 32	1024	7.11	7111	10667	14222	17778	21333
	33 x 33	1089	7.56	7563	11344	15125	18906	22688
	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) Total Column Loading					
		Dia. Inches	Footing Sq. In.	Footing Sq. Ft.	1000 PSF	1500 PSF	2000 PSF	2500 PSF	3000 PSF
8" Ftg. Thickness – Min.	8	50.27	0.35	349	524	698	873	1047	
	9	63.62	0.44	442	663	884	1104	1325	
	10	78.54	0.55	545	818	1091	1364	1636	
	11	95.03	0.66	660	990	1320	1650	1980	
	12	113.10	0.79	785	1178	1571	1964	2356	
	13	132.73	0.92	922	1383	1844	2304	2765	
	14	153.94	1.07	1069	1604	2138	2673	3207	
	15	176.72	1.23	1227	1841	2454	3068	3682	
	16	201.06	1.40	1396	2094	2793	3491	4189	
10" Ftg.	17	226.98	1.58	1576	2364	3153	3941	4729	
	18	254.47	1.77	1767	2651	3534	4418	5301	
	19	283.53	1.97	1969	2953	3938	4922	5907	
	20	314.16	2.18	2182	3273	4363	5454	6545	
12" Ftg. Thickness - Minimum	21	346.36	2.41	2405	3608	4811	6013	7216	
	22	380.13	2.64	2640	3960	5280	6600	7919	
	23	415.48	2.89	2885	4328	5771	7213	8656	
	24	452.39	3.14	3142	4712	6283	7854	9425	
	25	490.88	3.41	3409	5113	6818	8522	10227	
	26	530.93	3.69	3687	5531	7374	9218	11061	
	27	572.56	3.98	3976	5964	7952	9940	11928	
	28	615.75	4.28	4276	6414	8552	10690	12828	
	29	660.52	4.59	4587	6880	9174	11467	13761	
	30	706.86	4.91	4909	7363	9818	12272	14726	
14" Footing	31	754.77	5.24	5241	7862	10483	13104	15724	
	32	804.25	5.59	5585	8378	11170	13963	16755	
	33	855.30	5.94	5940	8909	11879	14849	17819	
	34	907.92	6.31	6305	9458	12610	15763	18915	
	35	962.12	6.68	6681	10022	13363	16703	20044	
	36	1017.88	7.07	7069	10603	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.

Formula For Calculating Footing Sizes

Guide Use Only, Verify Local Requirements

Using 50# ground snow load for this example (50# x 0.7 = 35 psf)

Formula:

Roof Area x Roof Loading = Concentrated Load on Footing

$\frac{1}{2}$ of Roof Span (20'-0") + Overhang (1'-0) = 21'

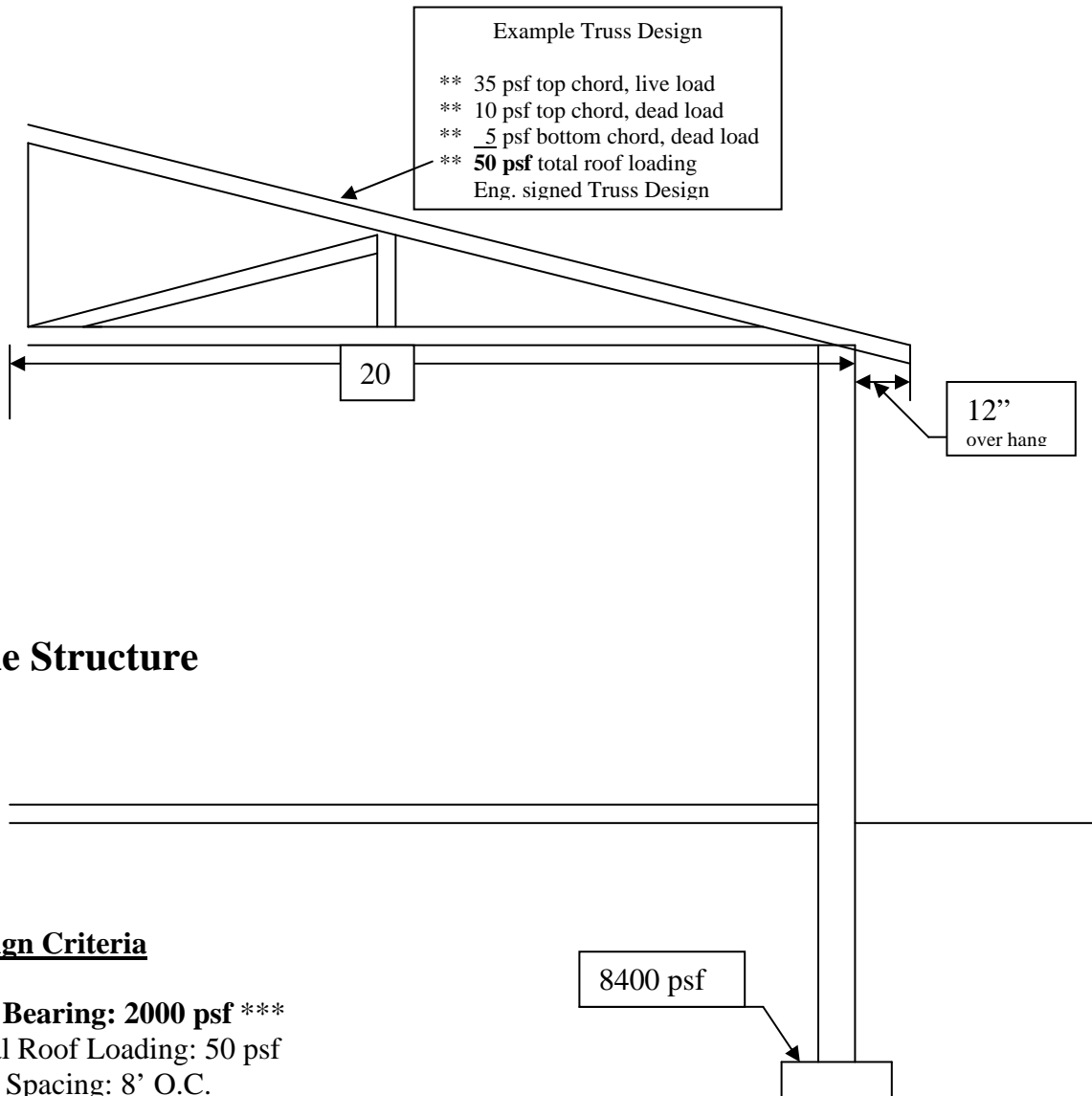
21' x 50# (roof loading) = 1050 PLF

1050 x 8' (Post Spacing) = 8400# (Total Concentrated Load)

Footing Size per Chart:

Round Footing: 28" x 12" (8552) > 8400

Square Footing: 25" x 25" x 12 (8681) > 8400



Design Criteria

Soil Bearing: 2000 psf ***

Total Roof Loading: 50 psf

Post Spacing: 8' O.C.

Footing: 2500 psi concrete

- * Note: Calculations are for intermediate footings.
- ** Verify local snow load requirements, and top and bottom chord loading, from the submitted engineered truss design.
- *** Assuming 2000 psf, soils vary in different areas

Example Footing Sizing

60 pound ground snow load (60# x 0.7 = 42 psf)

Design Criteria - Roof Load

Live Load: 42 psf
 Dead Load Top Chord: + 10 psf
Dead Load Bottom Chord: + 5 psf
Total Load: 57 psf
 Soil Bearing Capacity: 2000 psf
Concrete: 2500 psi

Design Criteria – Floor Load

Live Load: 40 psf
 Dead Load: + 10 psf
Total Load: 50 psf

Formula

$$\frac{1}{2} \text{ Roof Span} + \text{Roof Overhang} \times \text{Total Load} \times \frac{1}{2} \text{ Beam Span} = \text{Total Roof Load on Footing}$$

$$\frac{1}{2} \text{ Floor Joist Span} \times \text{Total Load} \times \frac{1}{2} \text{ Beam Span} = \text{Total Floor Load on Footing}$$

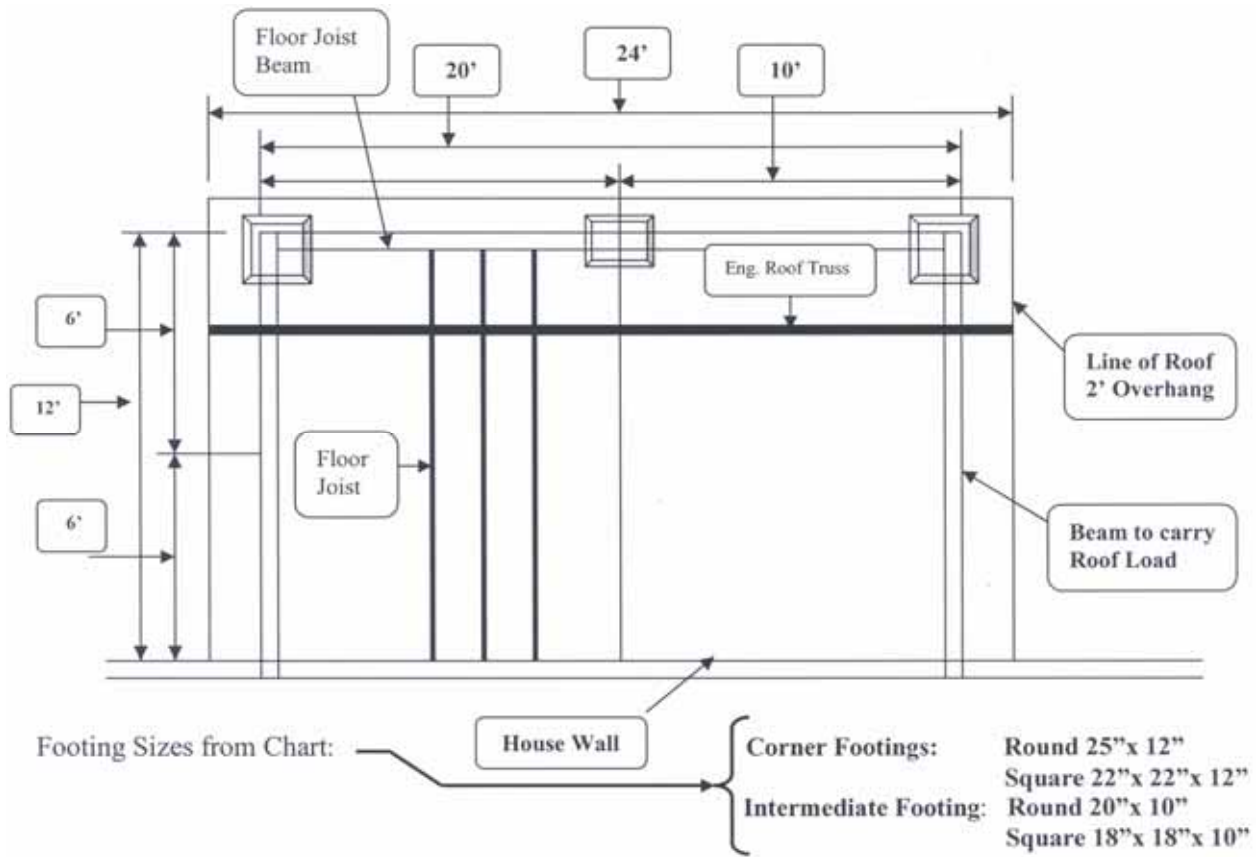
Total Load on Footing

Corner Footings:

Roof Load: $10' + 2' = 12' \times 57 \text{ psf} = 684 \times 7 (6' + 1' \text{ overhang}) = 4788 \# \text{ Total Roof Load}$
 Floor Load: $6' \times 50 \text{ psf} = 300 \times 5' = 1500 \# \text{ Total Floor Load}$
6288 # Total Load

Intermediate Footing:

Roof Load: $* 2' \times 57 \text{ psf} = 114 \times 10' (\frac{1}{2} \text{ the beam each way}) = 1140 \# \text{ Total Roof Load}$
 Floor Load: $6' \times 50 \text{ psf} = 300 \times 10' (\frac{1}{2} \text{ the beam each way}) = 3000 \# \text{ Total Floor Load}$
*** (The above roof load span of 2' is the 1' overhang + 1' to next truss) 4140 # Total Load**



Example: Size Footing

DESIGN CRITERIA:

FLOOR LOAD 40# LL. 10# D.L.

TOTAL LOAD 50# PSF

SOIL BEARING CAPACITY 2000 PSF

CONCRETE: 2500 PSI UNREINFORCED

FORMULA:

$\frac{1}{2}$ SPAN x LOAD x $\frac{1}{2}$ POST SPAN

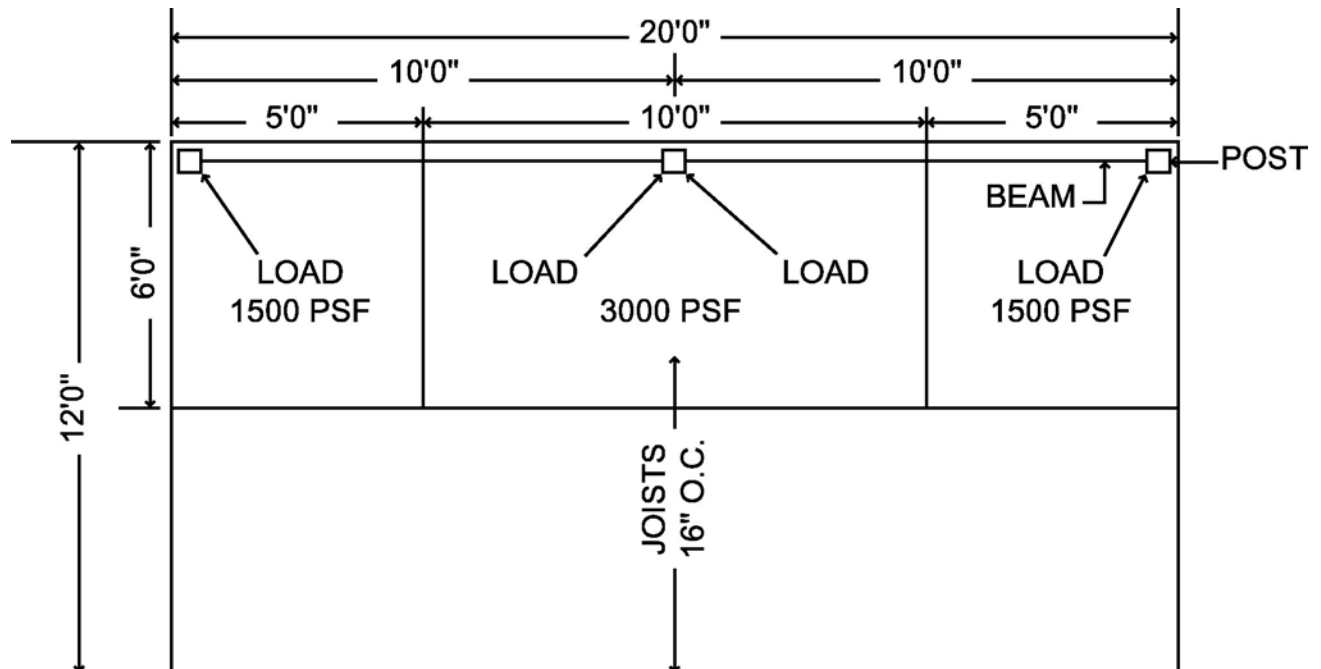
CORNER POSTS: 6'-0" x 50# = 300 x 5'-0" = 1500 PSF TOTAL LOAD

CENTER POST 6'-0" x 50 = 300 x 10'-0" = 3000 PSF TOTAL LOAD

FOOTING SIZE FROM CHART:

CORNER FOOTING – ROUND 12" x 8" SQUARE FOOTING 11" x 11" x 8"

CENTER FOOTING ROUND 17" x 10" SQUARE FOOTING 15" x 15" x 8"



DECK FOUNDATION PLAN $\frac{1}{4}" = 1'-0"$

Beam Sizing Example

10' Beam Span

Determine the amount of floor load bearing on the beam, example below .
 $(\frac{1}{2} \times 12' = 6') + (\frac{1}{2} \times 12' = 6') = 12'$ of floor bearing on beam.

Determine Load: 40 psf live load + 10 psf dead load = 50 psf (pounds per square foot)
 $50 \text{ psf} \times 12' = 600 \text{ plf}$ (pounds per lineal foot) of beam

Determine Total Beam Load: $600 \text{ plf} \times 10'$ (beam length) = 6000 total pounds

Using the **Allowable Total Loads for Beams Supporting Floors** table, look at 10' span on chart.

Example: Using the **Hem-Fir Floor Beam Chart**, it indicates as you go across the 10' span line, a 3 – 2x12's beam will carry 6202 Total Pounds, which is greater than the total beam load above. Therefore, 3 – 2x12's Hem-Fir would work in this situation.

Allowable Total Loads for Beams Supporting Floors

Span in ft.	2 x 6 fb = 1270 psi				Hem-Fir 2 x 8 fb = 1175 psi				No. 2 Grade 2 x 10 fb = 1075 psi				2 x 12 fb = 980 psi			
	Number of Members				Number of Members				Number of Members				Number of Members			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
9	618	1236	1854	2472	995	1990	3431	4575	1482	2963	5110	6813	1997	3994	6891	9188
10	501	1001	1502	2003	895	1791	3088	4118	1333	2667	4599	6132	1797	3594	6202	8269
11	414	828	1241	1655	814	1628	2807	3743	1212	2424	4181	5575	1634	3268	5638	7517

Floor Load Only

