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Pole Type Structures

(post frame construction)

The following specifications are minimum standards and limitations for pole type structures. Standard applies to building of **1000 sq. ft maximum** measured from outside of post to outside of post.

Post frame structures and portions thereof outside the above structural limitations of this standard shall be accompanied **by structural calculations as required by the Building Official** and shall comply with the structural design requirements of section R301.1 of the 2020 MN Residential Code (MRC)

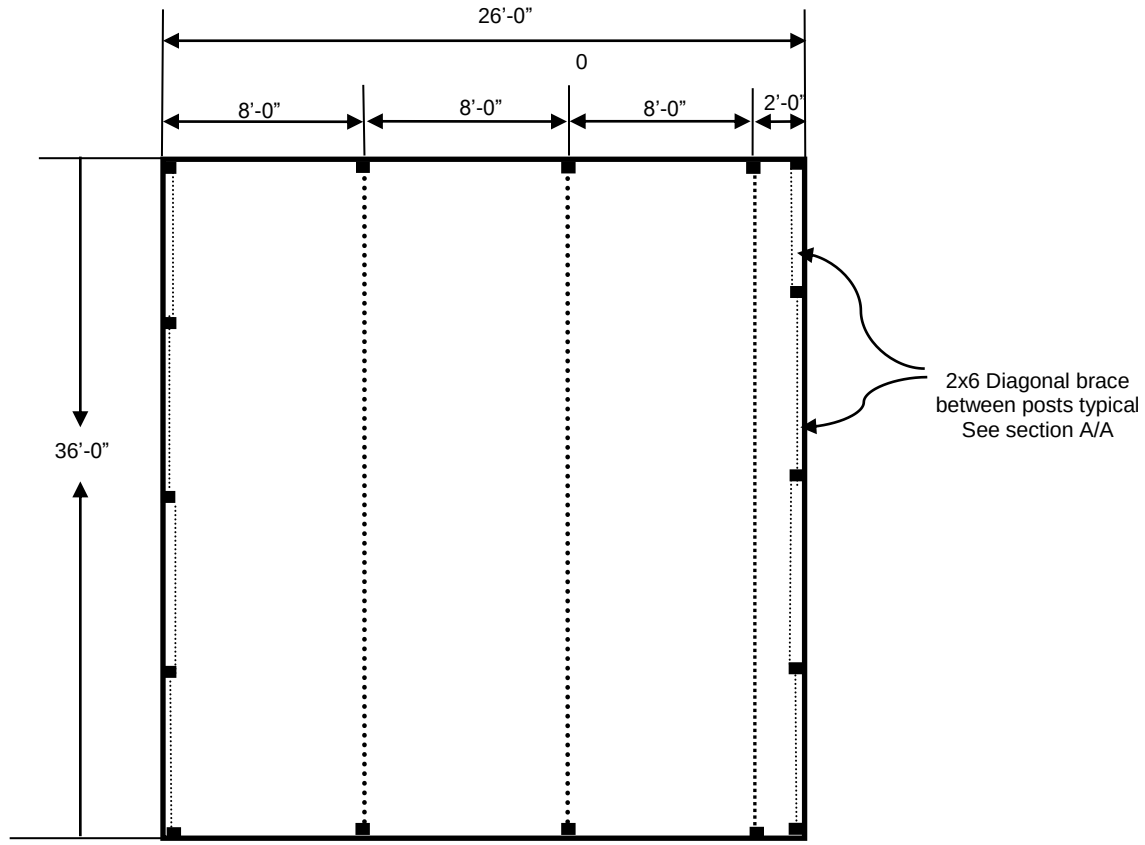
1. Limited to residential accessory structures
2. Single story (lofts, mezzanines, second story, or habitable attics not permitted)
3. Metal roof on purlins with required bracing, metal wall panels on girts with required bracing.
4. No attic storage or attic trusses.
5. 36’ Maximum building width
6. 10’ maximum wall height
7. 20’ maximum roof height as measured from grade to midpoint of fascia at end wall truss
8. Maximum post spacing 8’ on center

Post frame structures and portions thereof that fall outside of the parameters of this standard as listed above shall be designed and submitted with appropriate structural calculations as required by the building official and/or shall comply with R301.1- R301.1.3 MN residential code and may require a licensed design professional to prepare and sign submitted documents.

Definition: Post frame construction
Typically post frame construction consists of primary members (posts, beams, single span trusses, rafters, and ceiling joists) and secondary members (purlins, girts, additional bracing and sheathing) where all loads are transmitted from the secondary members to the primary members which transfers the load through vertical posts into the ground to an appropriate footing.

Footings and Foundations

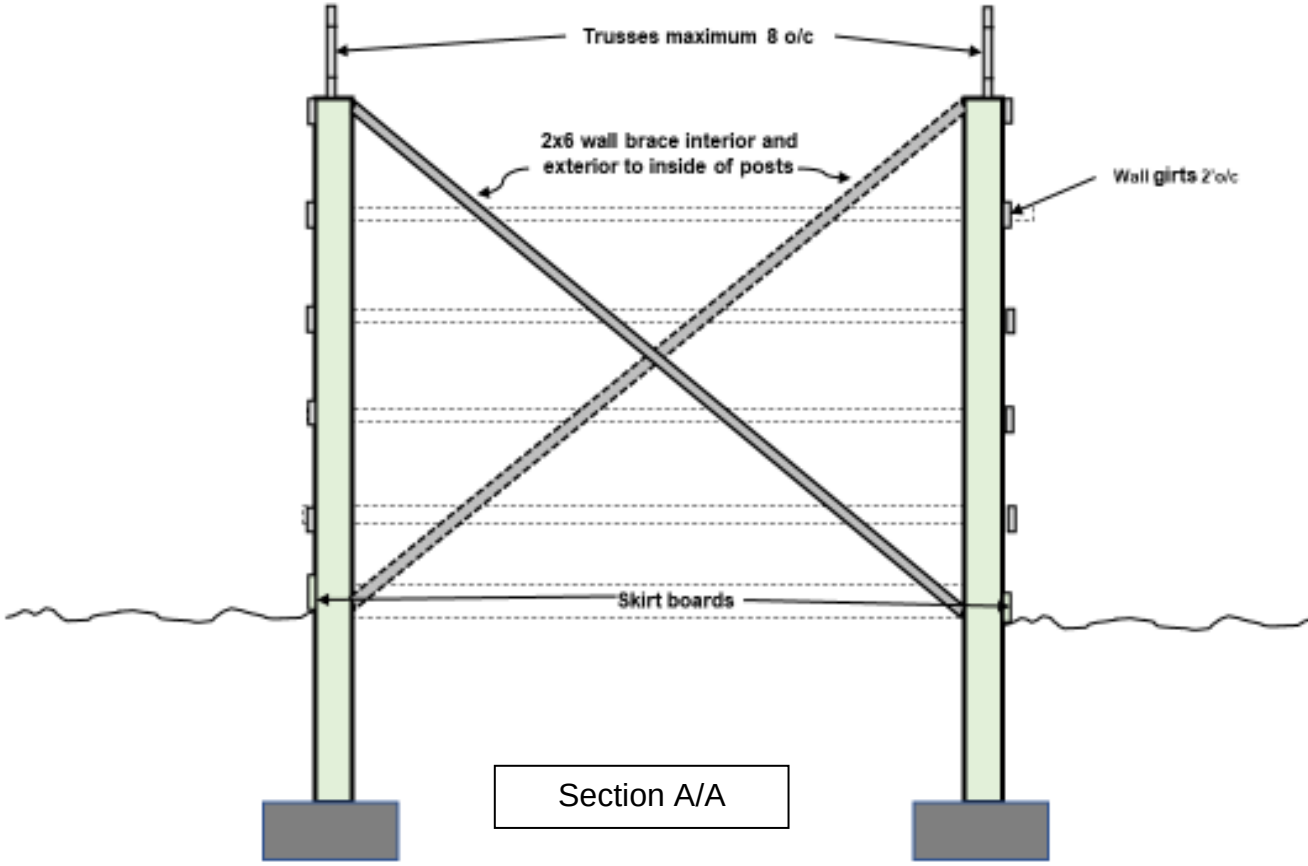
Footings and foundations shall comply with the applicable provisions of MN residential code R-401.2. Post frame structures shall have poured in place concrete footing installed below posts. Depth of the footing shall be a minimum of 42” from finished grade to the bottom of the hole.



Example above:
Posts 8’ o/c carrying 36’ wide truss with 50 psf load = 7200 psf at footing =
12” thick x 26” round footing with 2000 psf soil

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" Footing	**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" Footing Thickness	**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**
14" Footing	**30**	706.86	1.91	4909	7363	9818	12272	**14726**
	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**

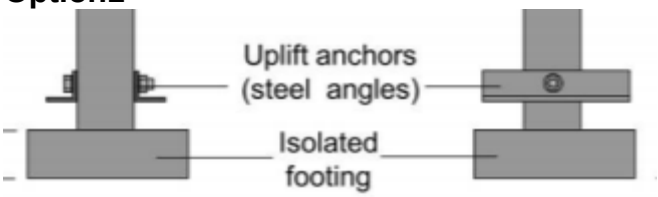

Trusses maximum 8 o/c
2x6 wall brace interior and exterior to inside of posts
Wall girts 2'o/c
Skirt boards

Section A/A

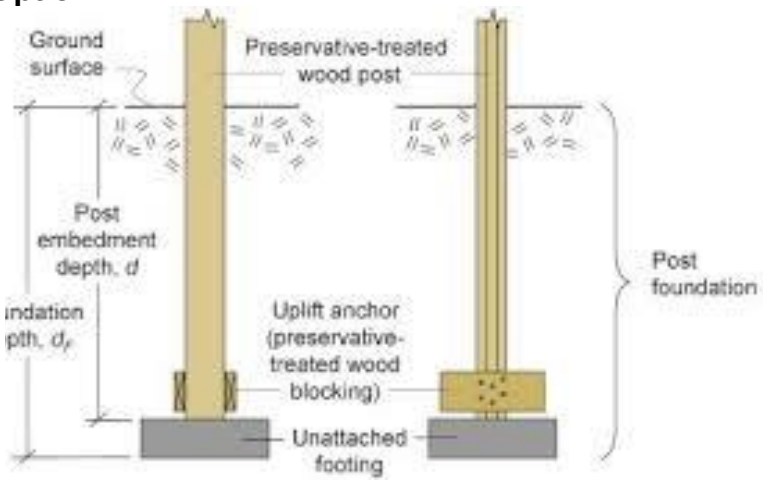
Column and Wall Construction
Columns shall be 3 ply unspliced, reinforced spliced, of solid wood posts.
Columns shall be a minimum of 6”x6” nominal size.Columns shall be decay resistant in accordance with MN residential code section 317. Posts shall br restrained to prevet lateral displacement.

Column Uplift Resistance
Columns shall be capable of resisting uplift with one of the following methods or approved equal:

Option1



Option 2



Option 2 shall be fastened per table 5

Table 5 – Fastener Schedule for Structural Members

Fastener Schedule for Structural Members

Description of Building Element	Number and Type of Fastener	Attachment Type
Uplift blocking to column	5-16d Hot Dipped Galvanized	Each block

Additional Notes

Skirt Boards. Skirt boards shall be treated lumber meeting the requirements of Section R317 and attached per Table 5.

Wall Girts. Girts shall be a minimum 2 x 4 spaced not more than 24" on center attached per Table .5

Table 5 – Fastener Schedule for Structural Members

Fastener Schedule for Structural Members

Skirt board to column	2-16d Hot Dipped Galvanized	Face nail
Wall girt to column	2-16d Hot Dipped Galvanized	Face nail

Exterior Structural Sheathing or Wall Bracing.

Provide exterior structural sheathing or wall bracing to resist all racking and shear forces, or by installing 2 x 6 diagonal braces between two adjoining columns at 8 feet on center. The diagonal brace shall be placed from the top header or girt to the next adjoining column at the skirt board. The bracing shall be placed installed on each side of the building and shall be a minimum of 25 feet on center and within 12 feet of the end of the building and attached to the wall girts and columns per Table 5. Any splices of the diagonal brace required due to excessive length, must lap over two consecutive wall girts.

Beams Supporting Trusses or Rafters and Ceiling Joists Attachment to Column.
Bearing beams supporting roof trusses or rafters and ceiling josts shall be connected to the columns by one of the following methods:

- Bolts that are ½" diameter through-bolted to the side of the column
- Bolts that are ½" diameter, directly attached to a 3-ply column notch, enclosing the truss or rafter at the top of column; or
- Other fasteners that are equal or better than the above.

Table 5 – Fastener Schedule for Structural Members

Fastener Schedule for Structural Members

Description of Building Element	Number and Type of Fastener	Attachment Type
Uplift blocking to column	5-16d Hot Dipped Galvanized	Each block
Skirt board to column	2-16d Hot Dipped Galvanized	Face nail
Wall girt to column	2-16d Hot Dipped Galvanized	Face nail
Diagonal bracing to column	2-16d Hot Dipped Galvanized	Toe nail
Diagonal bracing to skirt board	2-16d Hot Dipped Galvanized	Face nail
Diagonal bracing to wall girts	2-10d Hot Dipped Galvanized	Face nail
Knee brace to column	2-10d	Face nail
Knee brace to top of truss or rafter	3-16d Hot Dipped Galvanized	Face nail
Knee brace to bottom chord of truss	3-10d	Face nail
Or ceiling joist		
Roof purlin to truss or rafter	2-16d	Face nail
With span of 2′ or 4′		