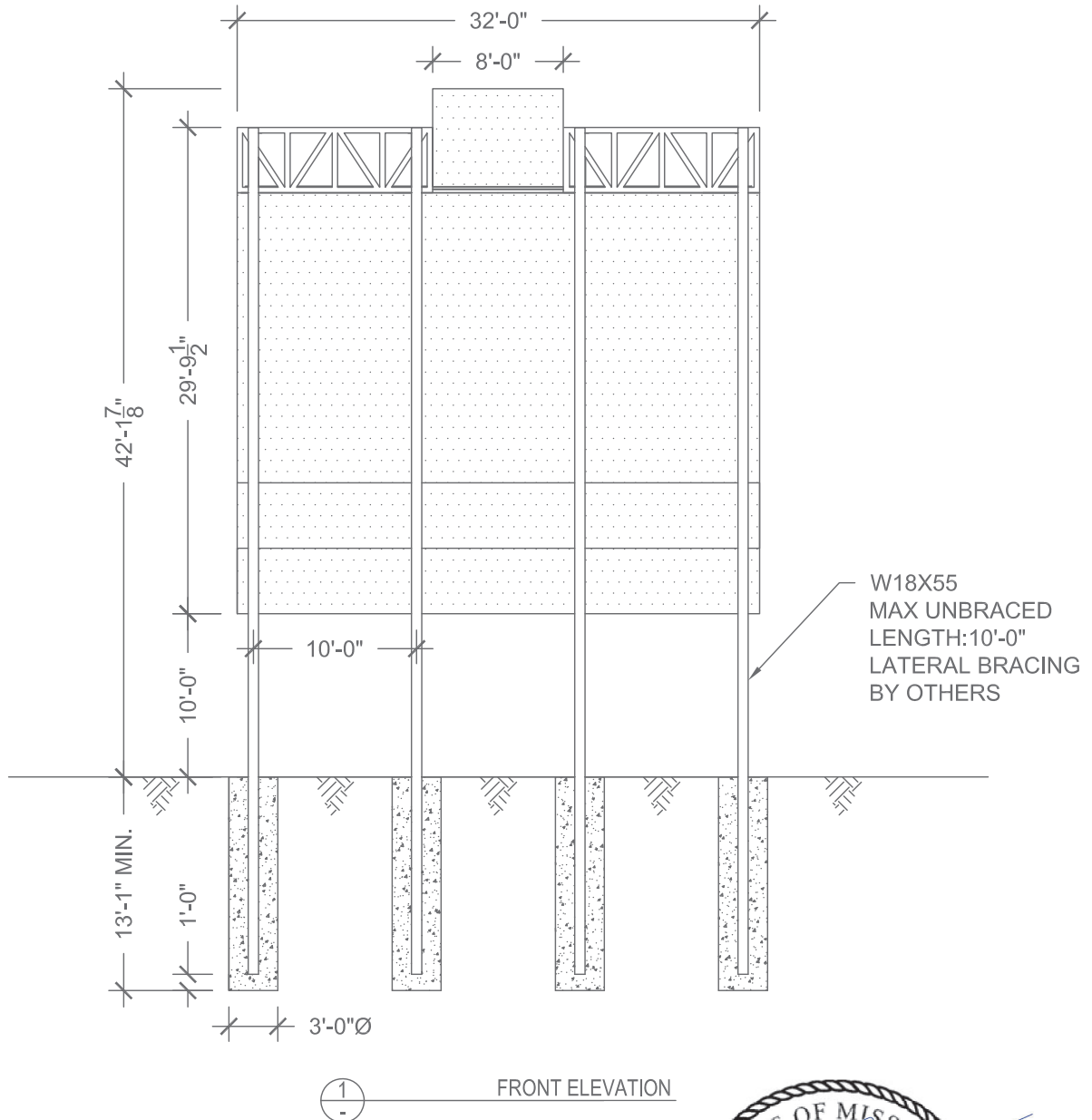




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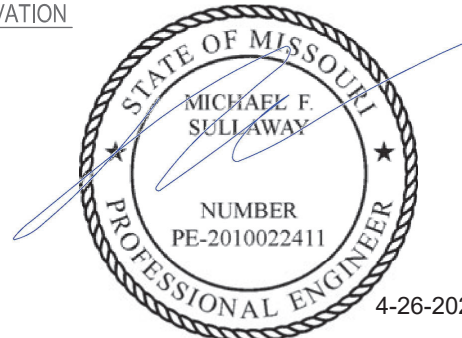
PROJECT: LEE'S SUMMIT WEST HIGH SCHOOL - 2600 SW WARD ROAD, LEE'S SUMMIT, MO
PROJECT #: 34805
CLIENT: NEVCO

DATE: 4/26/2022
ENGINEER: AV
LAST REVISED:



GENERAL NOTES

1. DESIGN CODE: IBC 2018
2. DESIGN LOADS: ASCE 7-16
3. WIND VELOCITY: 110 MPH EXPOSURE C
4. CONCRETE 2500 PSI MIN.
5. WIDE FLANGE STEEL ASTM A992, $F_y = 50$ KSI MIN.
6. PROVIDE 3" CONCRETE COVER MIN. ON ALL STEEL EMBEDDED IN CONCRETE WHEN CAST AGAINST SOIL
7. PROVIDE PROTECTION AGAINST DISSIMILAR METALS USING ANTI-CORROSIVE PAINT OR NEOPRENE GASKETS.
8. LATERAL SOIL BEARING PER IBC CLASS 4 (150 PSF/FT)
9. ALL DIMENSIONS TO BE VERIFIED PRIOR TO FABRICATION.



4-26-2022



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V5.5

units; pounds, feet unless noted otherwise

Applied Wind Loads; from ASCE 7-16

$F = q_z * G * C_f * A_f$ with $q_z = 0.00256 K_z K_{zt} K_d V^2$ (29.3.2 & 29.4)
 $C_f = 1.679$ (Fig. 29.3-1) 1.00 0 max. height= 41.79
 $K_{zt} = 1.0$ (26.8.2) (=1.0 unless unusual landscape) $s = 25.79$
 $K_z =$ from table 28.3-1 Exposure= c
 $K_d = 0.85$ for signs (table 26.6-1)
 $V = 110$ mph
 $G = 0.85$ (26.9) weight= 3.123 kips
 $s/h = 0.617$ $M_{DL} = 0.00$ k-ft
 $B/s = 1.24$

Pole Loads	structure component	height at section c.g.	K_z	q_z	pressure $q_z * G * C_f$	A_f	shear	Wind Moment M_w
	1	5.0	0.850	22.4	31.95	6.4	204	1018
	2	12.5	0.850	22.4	31.95	50.0	1597	19967
	3	17.5	0.876	23.1	32.92	50.0	1646	28809
	4	22.5	0.921	24.2	34.61	50.0	1730	38934
	5	27.5	0.961	25.3	36.11	50.0	1806	49654
	6	32.5	0.996	26.2	37.42	50.0	1871	60807
	7	35.396	1.012	26.7	38.05	7.9	301	10667
	8	37.792	1.027	27.04	38.59	40.0	1544	58339
	9	39.896	1.040	27.38	39.09	0.8	33	1297
	10	40.896	1.045	27.51	39.28	7.2	282	11514
sums:							312.3	11013
							281.01	(M_w) k-ft arm= 25.5
							$P_u = 3.75$ kip	$M = 281.01$ k-ft $M = \sqrt{M_{DL}^2 + M_w^2}$
							$M_u = \sqrt{(1.2M_{DL}^2 + 1.0M_w^2)} = 281.01$ k-ft	

Pole Design

section; W flange

$M_u \leq \phi M_n$ with $M_n = f_y Z$ $f_y = 50$ ksi $\phi = 0.9$

H	M_u (k-ft)	Z req'd. (in)	USE
at grade	281.0	74.94	W18X55 W-FLANGE, $\phi M_n = 362.96$ k-ft (See page #3 for w-flange capacity)

Footing Design

footprint: round

$\omega = 1.3$ IBC 1605.3.2 IBC Table 1806.2, sections 1806.3.4, 1807.3.2 $S = (1.3 \times 2x)$
 $P = 8.59$ kip $S1 = S \times d / 3$ $A = 2.34 \times P / (S1 \times b)$ $S = 400$
 $S1 = 1600$ $d = 0.5 \times A (1 + (1 + 4.36 \times h/A)^{.5})$ IBC 1807.3.2.1
 $A = 4.19$

footing: 3' - 0" dia.

13' - 1" deep



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building code; IBC 2018

units; pounds, feet unless noted otherwise

Check W18X55 for flexure

(AISC 14 F2)

Yielding	$M_u =$	3372 k-in (See Page #2)	$F_y =$	50 ksi
			$Z_x =$	112 in ³
	$M_n = M_p = F_y Z =$	5600 k-in (eq'n. F2-1)	$L_b =$	120 in
			$L_p =$	70.79 in
LTB:			$L_r =$	210.5 in
	$M_n = C_b [M_p - (M_p - 0.7 F_y S_x) ((L_b - L_p) / (L_r - L_p))] =$	4839.4 k-in (eq'n. F2-2)	$E =$	29000 ksi
			$r_y =$	1.67 in
	$F_{cr} = C_b \pi^2 E / (L_b / r_t)^2 (1 + 0.078 J_c / S_x h_o (L_b / r_t)^2)^{1/2} =$	89.566 ksi (eq'n. F2-4)	$S_x =$	98.3 in ³
			$J =$	1.66 in ⁴
	$\phi M_n =$	4355.5 k-in OK	$h_o =$	17.5 in
			$c =$	1
			$r_{ts} =$	1.999
	$P_u / 2 P_c + (M_u / M_c) =$	0.7774 (eq'n. H1-1)	$\phi =$	0.9

OK