



Sheet	TITLE
Project No.	23-016
Date	02/23/23
Engr.	ECW

STRUCTURAL CALCULATIONS

For: **Score Board Columns**
Newberry Springs Park
30884 Newberry Road
Newberry Springs, CA

Project No. 23-016

Client: Newberry CSD



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General Design Information
Support Post and Footing Calcs
Score Board Post/Footing Detail
Seismic Design Parameters

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(Including Title)

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Sheet 1
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GENERAL DESIGN INFORMATION

BUILDING CODE USED: 2022 CBC/2021 IBC

MATERIAL PROPERTIES:

STRUCTURAL STEEL: Wide Flanges, Angles, Plates: $F_y = 36$ ksi (per ASTM A36)
Hollow Structural Steel (HSS): $F_y = 46$ ksi (per ASTM A500, Grade B)
Steel Pipe Columns (SPC): $F_y = 35$ ksi (per ASTM A53, Grade B)

CONCRETE: The 28 day strength and weight of concrete assumed for design is as follows:

	f'_c	Weight
Slabs on Grade	2500 psi	150 pcf
Footings	2500 psi	150 pcf

REINFORCING: Typical Reinforcing: #4 and smaller Grade 40
#5 and larger Grade 60
Stirrups, Ties, Slabs on Grade, and Non-Structural Items: Grade 40

FOUNDATIONS:

Allowable Foundation Pressure: 1500 psf. (per 2022 CBC Table 1806.2)
Footings shall be carried a minimum of 12" into natural grade (per 2022 CBC Section 1809.4).

WIND LOADING:

Basic Wind Speed: $V = 95$ mph (Figure 26.5-1B)
Exposure Category: C Alpha = 9.50 (Table 26.11-1)
Directionality Factor, $K_d = 0.85$ (Table 26.6-1) $Z_g = 900$ ft (Table 26.11-1)
Topographic Effects? N Topographic Factor, $K_{zt} = 1.00$ (Section 26.8)
Ground Elevation: Default Ground Elevation Factor, $K_e = 1.00$ (Table 26.9-1)
Mean Height: $h = 18$ ft $K_h = 0.88$ (Table 26.10-1)
Velocity Pressure, $q_h = 17.32$ psf (Eqn 26.10-1)
DESIGN WIND PRESSURE (ASCE 7-16 Section 29.3)
 $s/h = 0.3333333$ $G = 0.85$ (Section 26.11.1)
 $B/s = 1.5$ $C_f = 1.80$ (Figure 29.3-1)
 $F_w = 26.50$ psf (Eqn. 29.3-1)
Net Wind Load $F_w = 1431$ lbs

SEISMIC LOADING:

Site Class: D Default $F_a = 1.20$ (Table 11.4-1)
 $S_s = 1.456$ g (for 0.2 sec) $S_{ds} = 1.165$ (Formula 11.4-3)
 $R = 1.25$ (From Table 15.4-2)
Seismic Response Coef, $C_s = 0.932$ (Formula 12.8-2)
Sign Weight: $W = 300$ lbs
Net Seismic Load $F_s = 280$ lbs

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Post Calculations

Lateral Load, P = 429 lbs (Wind ASD=0.6*Fw)
Pole Height, h = 15 ft

Steel Design:

Allow Drift, x = 2.14 in. (per ASCE 7-16 Sections 12.12.1 and 12.8.6)
Bending Moment, M = 6441 ft*lbs
Z req'd = 3.59 in³ < 10.6
I req'd = 13.43 in⁴ < 26.5

Use 6" Dia STD Pipe

Footing Calculations

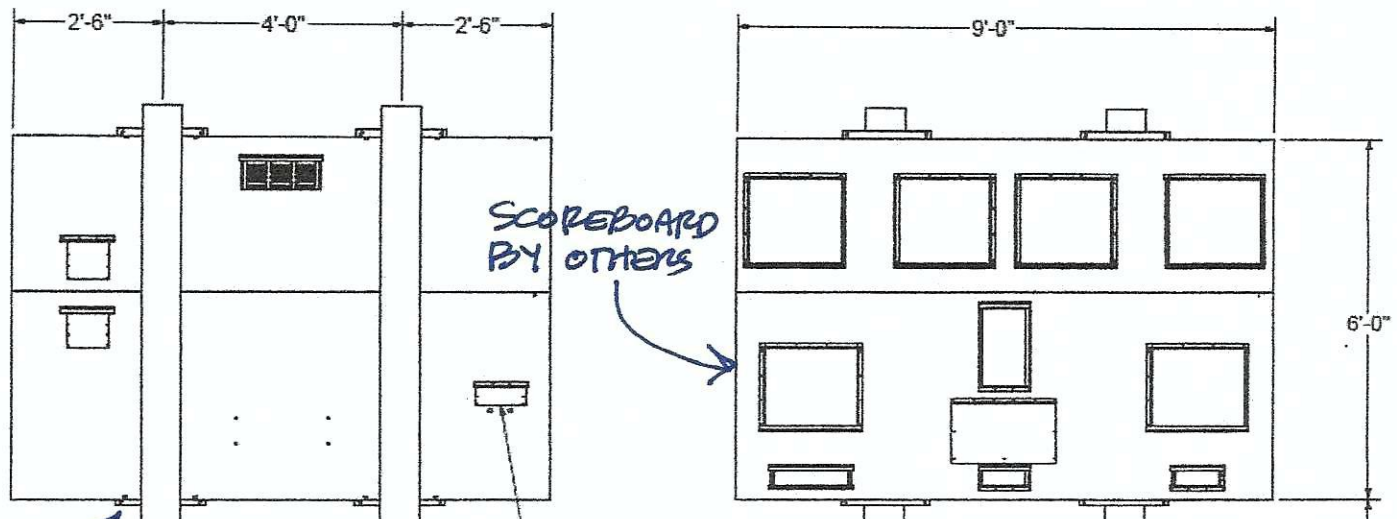
Allow. Passive Soil Bearing = 100 psf/ft (per Table 1806.2)
Increase Factor = 2 (per Section 1806.3.4)
Short Term Load Increase Factor = 1.33 (per Section 1806.1)

Nonconstrained (Section 1807.3.2.1):

Pole Diameter, b = 2 ft
Depth of Embedment, d = 5 ft (input value)
Allow. Lat. S.B.. S1 = 444 psf
A = 1.13
Calculated d = 4.90 ft

Constrained (Section 1807.3.2.2):

Pole Diameter, b = 2 ft
Allow. Lat. S.B.. S3 = 991 psf
Calculated d = 3.72 ft



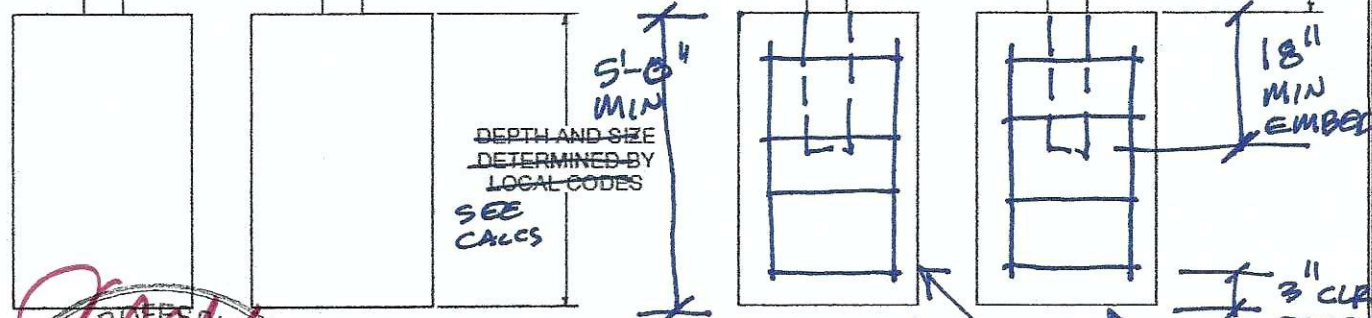
SCOREBOARD BY OTHERS

ATTACH TO COL. PER MANUF

POWER ACCESS

6" MIN DIA STD STEEL PIPE COLUMNS EMBED INTO FOOTINGS

10'-0" 12 FT MAX ABOVE GRADE



DEPTH AND SIZE DETERMINED BY LOCAL CODES SEE CALCS

5'-0" MIN

18" MIN EMBED

2'-0" DIA

3" CLR TYP



2/26/2023

NEW 2500 PSI, TYPE V CONCRETE FOOTINGS WITH (6) #4 VERT AND #4 TIES AT 12" o/c

30884 NEWBERRY SPRINGS (USE #23-016)



Newberry Scoreboard 23-016

Latitude, Longitude: 34.813328, -116.663331



Google

Map data ©2023

Date	2/23/2023, 3:58:22 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S _S	1.456	MCE _R ground motion. (for 0.2 second period)
S ₁	0.525	MCE _R ground motion. (for 1.0s period)
S _{MS}	1.747	Site-modified spectral acceleration value
S _{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S _{DS}	1.165	Numeric seismic design value at 0.2 second SA
S _{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F _a	1.2	Site amplification factor at 0.2 second
F _v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.633	MCE _G peak ground acceleration
F _{PGA}	1.2	Site amplification factor at PGA
PGA _M	0.76	Site modified peak ground acceleration
T _L	8	Long-period transition period in seconds
SsRT	1.456	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.612	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.295	Factored deterministic acceleration value. (0.2 second)
S1RT	0.525	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.578	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.871	Factored deterministic acceleration value. (1.0 second)
PGAd	0.96	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA _{UH}	0.633	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C _{RS}	0.903	Mapped value of the risk coefficient at short periods
C _{R1}	0.908	Mapped value of the risk coefficient at a period of 1 s
C _V	1.391	Vertical coefficient