SHUCRI "CHUCK" I. YAGHI
Consulting Engineers: Residential & Commercial
112 E. Chapman Ave, Suite D, Orange, CA 92866 TEL: 714/997-9120 FAX: 714/744-3676

STRUCTURAL CALCULATIONS

DESIGNED BY: F.S.

JOB NUMBER: 23088

DATE: 3/23/23

PROJECT: SOUTH GATE PARK -FENCING IMPROVEMENTS
4900 SOUTHERN AVE. SOUTH GATE, CA. 90280

CLIENT: DAVID VOLZ DESIGN LANDSCAPE ARCHITECHTS INC.

BUILDING CODE: INTERNATIONAL BUILDING CODE 2021 EDITION, C.B.C.2022 EDITION

MATERIALS: Except as otherwise specified herein:

Concrete	3,000 PSI at 28 days.
Concrete Block	Grade N. Light Weight Units, ASTM C-90
Brick Masonry	Grade MW, 2,500 PSI Units, ASTM -62
Reinforced Steel	20,000 PSI (ASTM A615, Grade 40)
Structural Steel	24,000 PSI (Compact) ASTM A572 Grade 50
Structural Pipe	22,000 PSI (ASTM A-36)
Plywood Sheathing	D.F.P.A., Structural II, INTR., P.S.1-95
Glu-Laminated Beams	2,400 PSI (D.F.- Larch Comb."A" or Comb. 24F)
Lumber	Grade Marked D.F.-Larch, W.C.L.B. Grading Rule 16.
Soils Bearing Pressure	1500 PSF min. unless specified in soils report.

DATE SIGNED:

DESIGN REFERENCE: (Including Charts & Tables from):

Lumber & Timber	Wood Structural Design Data (Volume1) National Lumber Manufacturers Association
Steel	Manual of Steel Construction, AISC
Concrete	Reinforced Concrete Design Handbook, ACI: Ultimate Strength Design Handbook, ACI
Concrete Block & Brick Masonry	Masonry Design Manual, by Masonry Industry

ASCE 7 Hazards Report

Address:
4900 Southern Ave
South Gate, California
90280

Standard: ASCE/SEI 7-22
Risk Category: II
Soil Class: Default

Latitude: 33.945592
Longitude: -118.18382
Elevation: 107.32901408413464 ft (NAVD 88)

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

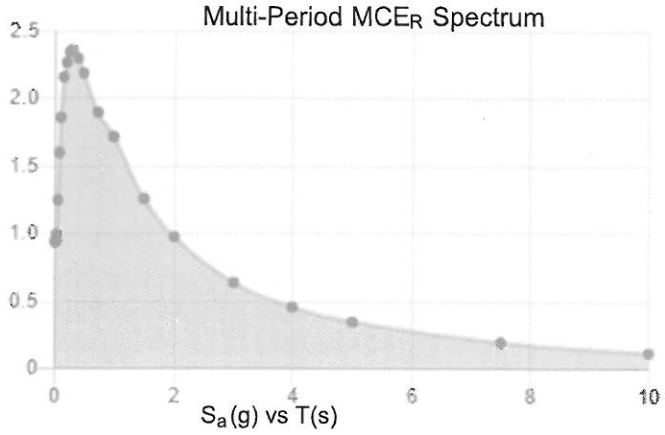
Default

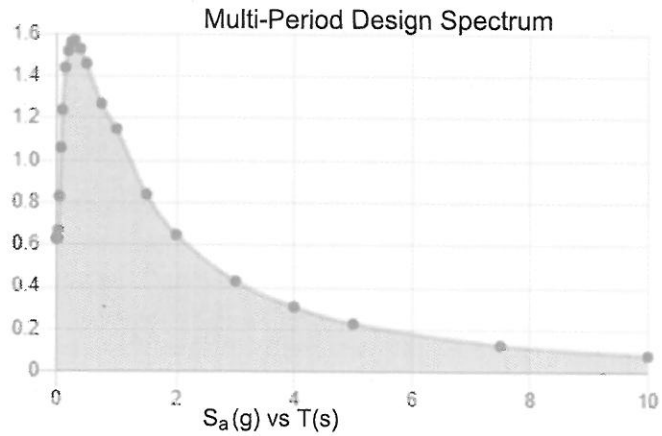
Site Soil Class:

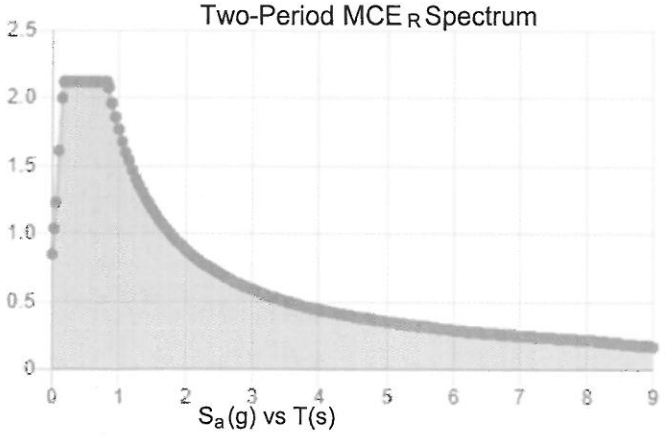
Results:

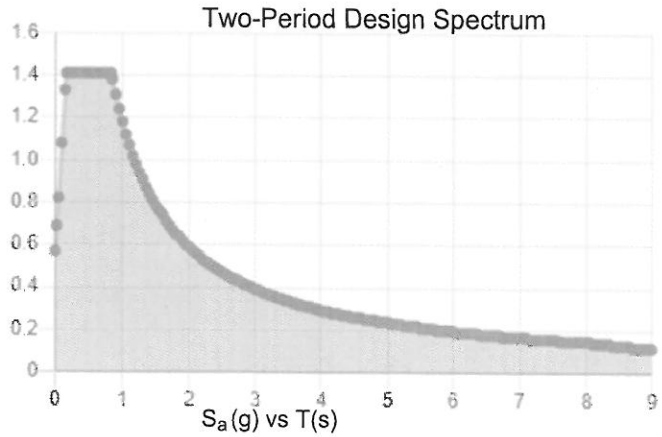
PGA_M :	0.84	T_L :	8
S_{MS} :	2.12	S_S :	1.97
S_{M1} :	1.77	S_1 :	0.82
S_{DS} :	1.41	V_{S30} :	260
S_{D1} :	1.18		

Seismic Design Category: E









MCER Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

YAGHI ENGINEERS

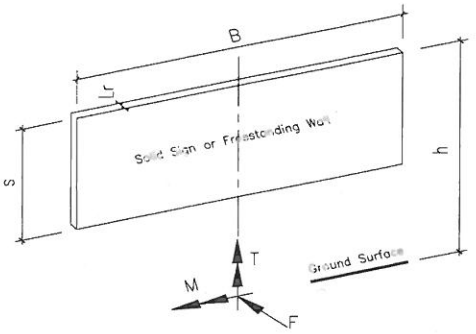
PROJECT :
CLIENT :
JOB NO. :
DATE :

PAGE :
DESIGN BY :
REVIEW BY :

Wind Analysis for Freestanding Wall & Sign Based on ASCE 7-22

INPUT DATA

Exposure category (B, C or D)		=	C	
Importance factor, 1.0 only, (Table 1.5-2)	I_w	=	1.00	
Basic wind speed (ASCE 7 26.5.1)	V =	110	*mph, (177.03 kph)*	
Topographic factor (26.8 & Table 26.8-1)	K_{zt}	=	1	Flat
Height of top	h =	12	*ft, (3.66 m)*	
Vertical dimension (for wall, s = h)	s =	12	*ft, (3.66 m)*	
Horizontal dimension	B =	20	*ft, (6.10 m)*	
Dimension of return corner	L_r =	0.5	*ft, (0.15 m)*	



DESIGN SUMMARY

Max horizontal wind pressure	p	=	27 *psf, (1290 N/m²)*
Max total horizontal force at centroid of base	F	=	6.47 *kips, (29 kN)*
Max bending moment at centroid of base	M	=	42.69 *ft-kips, (58 kN-m)*
Max torsion at centroid of base	T	=	25.87 *ft-kips, (35 kN-m)*

ANALYSIS

Velocity pressure

$q_h K_d = (0.00256 K_z K_{zt} K_e V^2) K_d$ = **22.38** psf

where: q_h = velocity pressure at mean roof height, h. (Eq. 26.10-1 page 277), K_e = **1.00** , (Tab. 26.9-1 page 275)

K_h = velocity pressure exposure coefficient evaluated at height, h, (Tab. 26.10-1, pg 277) = **0.85**

K_d = wind directionality factor. (Tab. 26.6-1, page 274) = **0.85**

h = height of top = **12.00** ft

Wind Force Case A: resultant force though the geometric center (Sec. 29.3.1)

$p = q_h K_d G C_N$	=	**27**	psf
$F = p A_s$	=	**6.47**	kips
M = F (h - 0.5s) for sign, F (0.55h) for wall	=	**42.69**	ft-kips
T =	=	**0.00**	ft-kips

where: G = gust effect factor. (Sec. 26.9) = **0.85**

C_f = net force coefficient. (Fig. 29.3-1, page 301) **1.42**

A_s = B s = **240.0** ft^2

Wind Force Case B: resultant force at 0.2 B offset of the geometric center (Sec. 29.3.1)

p = Case A	=	**27**	psf
F = Case A	=	**6.47**	kips
M = Case A	=	**42.69**	ft-kips
T = 0.2 F B	=	**25.87**	ft-kips

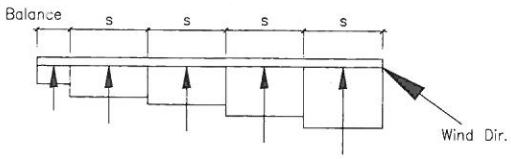
Wind Force Case C: resultant force different at each region (Sec. 29.4.1)

$p = q_h G C_f$

$F = \Sigma p A_s$

M = Σ [F (h - 0.5s) for sign, F (0.55h) for wall]

$T = \Sigma T_s$



Distance	C_f	P_i	A_{si}	F_i	M_i	T_i
(ft)	(Fig. 29.3-1)	(psf)	(ft^2)	(kips)	(ft-kips)	(ft-kips)
12.0	1.800	34	144	4.93	32.54	19.72
20.0	1.200	23	96	2.19	14.46	-13.15
Σ				**7.12**	**47.01**	**6.57**

<== Case C may not be considered, footnote 3 of Fig. 6-20

YAGHI ENGINEERS

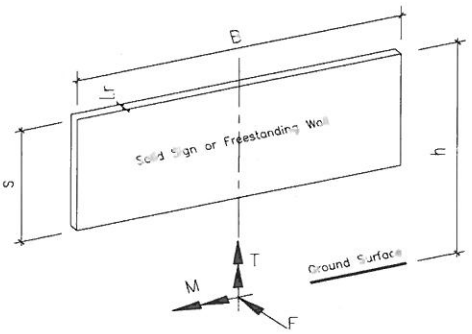
PROJECT :
CLIENT :
JOB NO. :
DATE :

PAGE :
DESIGN BY :
REVIEW BY :

Wind Analysis for Freestanding Wall & Sign Based on ASCE 7-22

INPUT DATA

Exposure category (B, C or D)		=	C	
Importance factor, 1.0 only, (Table 1.5-2)	I_w	=	1.00	
Basic wind speed (ASCE 7 26.5.1)	V =	110	*mph, (177.03 kph)*	
Topographic factor (26.8 & Table 26.8-1)	K_{zt}	=	1	Flat
Height of top	h =	30	*ft, (9.14 m)*	
Vertical dimension (for wall, s = h)	s =	30	*ft, (9.14 m)*	
Horizontal dimension	B =	20	*ft, (6.10 m)*	
Dimension of return corner	L_r =	0.5	*ft, (0.15 m)*	



DESIGN SUMMARY

Max horizontal wind pressure	p	=	33 *psf, (1593 N/m²)*
Max total horizontal force at centroid of base	F	=	19.96 *kips, (89 kN)*
Max bending moment at centroid of base	M	=	329.32 *ft-kips, (446 kN-m)*
Max torsion at centroid of base	T	=	79.83 *ft-kips, (108 kN-m)*

ANALYSIS

Velocity pressure

$q_h K_d = (0.00256 K_z K_{zt} K_e V^2) K_d$ = **25.80** psf

where: q_h = velocity pressure at mean roof height, h. (Eq. 26.10-1 page 277), K_e = **1.00** , (Tab. 26.9-1 page 275)

K_h = velocity pressure exposure coefficient evaluated at height, h, (Tab. 26.10-1, pg 277) = **0.98**

K_d = wind directionality factor. (Tab. 26.6-1, page 274) = **0.85**

h = height of top = **30.00** ft

Wind Force Case A: resultant force though the geometric center (Sec. 29.3.1)

$p = q_h K_d G C_N$	=	**33**	psf
$F = p A_s$	=	**19.96**	kips
M = F (h - 0.5s) for sign, F (0.55h) for wall	=	**329.32**	ft-kips
T =	=	**0.00**	ft-kips

where: G = gust effect factor. (Sec. 26.9) = **0.85**

C_f = net force coefficient. (Fig. 29.3-1, page 301) **1.52**

A_s = B s = **600.0** ft^2

Wind Force Case B: resultant force at 0.2 B offset of the geometric center (Sec. 29.3.1)

p = Case A	=	**33**	psf
F = Case A	=	**19.96**	kips
M = Case A	=	**329.32**	ft-kips
T = 0.2 F B	=	**79.83**	ft-kips

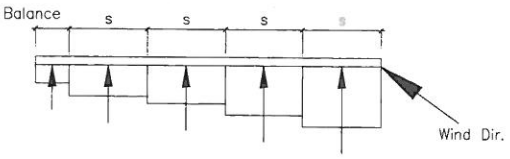
Wind Force Case C: resultant force different at each region (Sec. 29.4.1)

$p = q_h G C_f$

$F = \Sigma p A_s$

M = Σ [F (h - 0.5s) for sign, F (0.55h) for wall]

$T = \Sigma T_s$



Distance (ft)	C_f (Fig. 29.3-1)	P_i (psf)	A_{si} (ft^2)	F_i (kips)	M_i (ft-kips)	T_i (ft-kips)
20.0	1.800	39	600	23.69	390.84	0.00
20.0	1.200	26	0	0.00	0.00	0.00
Σ				**23.69**	**390.84**	**0.00**

<== Case C may not be considered, footnote 3 of Fig. 6-20

- 30' HIGH CHAIN LINK FENCE W/ POSTS @ 10' O/C.

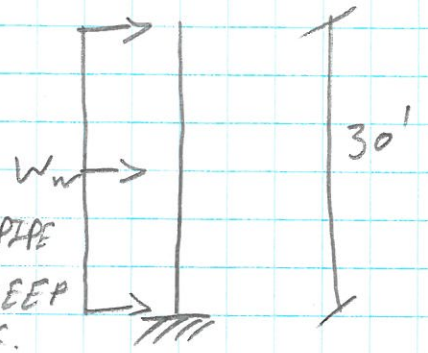
$W_W = 33 \times 0.6 = 19.8$ PSF

$W_W = 19.8 \times 10 \times 0.15$

$= 29.7^{\#/'}$ (15% SOLID)

SEE COMP. RUN.

USE 5" ø STD PIPE W/ 24" ø X 6' DEEP FTG.

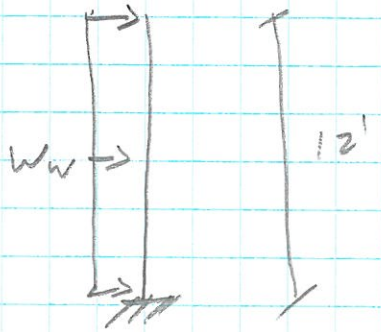


- 12' HIGH CHAIN LINK FENCE W/ POSTS @ 10' O/C. MAX

$W_W = 27 \times 0.6 = 16.2$ PSF

$W_W = 16.2 \times 10 \times 0.15 = 24.3^{\#/'}$

SEE COMP. RUN



- 10' SEE COMP. RUN.

$W_W = 24.3^{\#/'}$

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Column

Project File: southgate park.ec6

DESCRIPTION: 30'-0' fence

Code References

Calculations per AISC 360-16, IBC 2021, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Steel Section Name : **Pipe5STD**

Analysis Method :	Allowable Strength
Steel Stress Grade	
Fy : Steel Yield	36.0 ksi
E : Elastic Bending Modulus	29,000.0 ksi

Overall Column Height	30 ft
Top & Bottom Fixity	Top Free, Bottom Fixed

Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Fully braced against buckling ABOUT Y-Y Axis
Y-Y (depth) axis :
Fully braced against buckling ABOUT X-X Axis

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 438.0 lbs * Dead Load Factor
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, W = 0.030 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.6627** : 1

Load Combination	+D+0.60W
Location of max.above base	0.0 ft
At maximum location values are . . .	
Pa : Axial	0.4380 k
Pn / Omega : Allowabl	86.443 k
Ma-x : Applied	-8.10 k-ft
Mn-x / Omega : Allowable	12.269 k-ft
Ma-y : Applied	0.0 k-ft
Mn-y / Omega : Allowable	12.269 k-ft

PASS Maximum Shear Stress Rati **0.02082** : 1

Load Combination	+D+0.60W
Location of max.above base	0.0 ft
At maximum location values are . . .	
Va : Applied	0.540 k
Vn / Omega : Allowable	25.933 k

Maximum Load Reactions . .

Top along X-X	0.0 k
Bottom along X-X	0.0 k
Top along Y-Y	0.0 k
Bottom along Y-Y	0.90 k

Maximum Load Deflections . . .

Along Y-Y 12.60 in at 30.0ft above base
for load combination : W Only

Along X-X 0.0 in at 0.0ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.005	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.000	PASS	0.00 ft
+D+0.60W	0.663	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.021	PASS	0.00 ft
+D+0.450W	0.498	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.016	PASS	0.00 ft
+0.60D+0.60W	0.662	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.021	PASS	0.00 ft
+0.60D	0.003	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.000	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments k-ft @ Base	@ Top	My - End Moments @ Base	@ Top
D Only	0.438									
+D+0.60W	0.438				0.540		-8.100			
+D+0.450W	0.438				0.405		-6.075			
+0.60D+0.60W	0.263				0.540		-8.100			
+0.60D	0.263									
W Only					0.900		-13.500			

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Column

Project File: southgate park.ec6

DESCRIPTION: 30'-0' fence

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top	k	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments @ Base	Mx - End Moments @ Top	k-ft	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	0.438										
"	Minimum					0.900		-13.500				
Reaction, X-X Axis Base	Maximum	0.438										
"	Minimum	0.438										
Reaction, Y-Y Axis Base	Maximum					0.900		-13.500				
"	Minimum	0.438										
Reaction, X-X Axis Top	Maximum	0.438										
"	Minimum	0.438										
Reaction, Y-Y Axis Top	Maximum	0.438										
"	Minimum	0.438										
Moment, X-X Axis Base	Maximum	0.438										
"	Minimum		-13.500			0.900		-13.500				
Moment, Y-Y Axis Base	Maximum	0.438										
"	Minimum	0.438										
Moment, X-X Axis Top	Maximum	0.438										
"	Minimum	0.438										
Moment, Y-Y Axis Top	Maximum	0.438										
"	Minimum	0.438										

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.60W	0.0000 in	0.000 ft	7.560 in	30.000 ft
+D+0.450W	0.0000 in	0.000 ft	5.670 in	30.000 ft
+0.60D+0.60W	0.0000 in	0.000 ft	7.560 in	30.000 ft
+0.60D	0.0000 in	0.000 ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000 ft	12.487 in	29.799 ft

Steel Section Properties : Pipe5STD

Depth	=	5.563 in	I xx	=	14.30 in^4	J	=	28.600 in^4
			S xx	=	5.14 in^3			
Diameter	=	5.563 in	R xx	=	1.880 in			
Wall Thick	=	0.259 in	Zx	=	6.830 in^3			
Area	=	4.010 in^2	I yy	=	14.300 in^4			
Weight	=	14.600 plf	S yy	=	5.140 in^3			
			R yy	=	1.880 in			
Ycg	=	0.000 in						

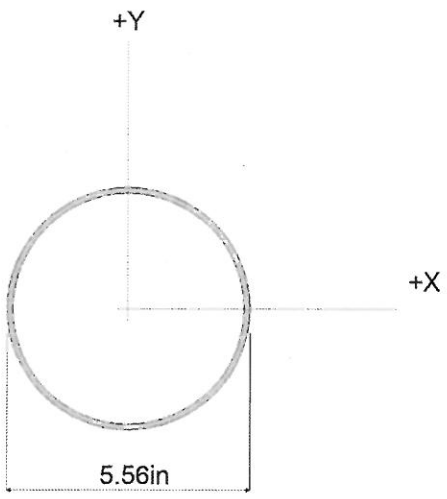
Project Title:
Engineer:
Project ID:
Project Descr:

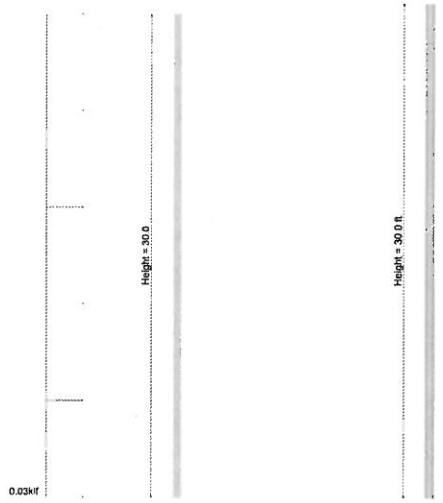
Steel Column

Project File: southgate park.ec6

DESCRIPTION: 30'-0' fence

Sketches





Project Title:
Engineer:
Project ID:
Project Descr:

Steel Column

Project File: southgate park.ec6

DESCRIPTION: 12'

Code References

Calculations per AISC 360-16, IBC 2021, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Steel Section Name : **Pipe4STD**
Analysis Method : Allowable Strength
Steel Stress Grade
Fy : Steel Yield 36.0 ksi
E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 12 ft
Top & Bottom Fixity Top Free, Bottom Fixed
Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Fully braced against buckling ABOUT Y-Y Axis
Y-Y (depth) axis :
Fully braced against buckling ABOUT X-X Axis

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 129.60 lbs * Dead Load Factor
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, W = 0.02430 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.1453** : 1
Load Combination +D+0.60W
Location of max.above base 0.0 ft
At maximum location values are . . .
Pa : Axial 0.1296 k
Pn / Omega : Allowabl 63.808 k
Ma-x : Applied -1.050 k-ft
Mn-x / Omega : Allowable 7.275 k-ft
Ma-y : Applied 0.0 k-ft
Mn-y / Omega : Allowable 7.275 k-ft

PASS Maximum Shear Stress Rati **0.009140** : 1
Load Combination +D+0.60W
Location of max.above base 0.0 ft
At maximum location values are . . .
Va : Applied 0.1750 k
Vn / Omega : Allowable 19.143 k

Maximum Load Reactions . .
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 0.0 k
Bottom along Y-Y 0.2916 k

Maximum Load Deflections . . .
Along Y-Y 0.5478 in at 12.0 ft above base
for load combination : W Only
Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.002	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.000	PASS	0.00 ft
+D+0.60W	0.145	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.009	PASS	0.00 ft
+D+0.450W	0.109	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.007	PASS	0.00 ft
+0.60D+0.60W	0.145	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.009	PASS	0.00 ft
+0.60D	0.001	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.000	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction k @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments k-ft @ Base	@ Top	My - End Moments @ Base	@ Top
D Only	0.130								
+D+0.60W	0.130			0.175		-1.050			
+D+0.450W	0.130			0.131		-0.787			
+0.60D+0.60W	0.078			0.175		-1.050			
+0.60D	0.078								
W Only				0.292		-1.750			

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Column

Project File: southgate park.ec6

DESCRIPTION: 12'

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base	@ Top	k Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments k-ft @ Base	@ Top	My - End Moments @ Base	@ Top
Axial @ Base	Maximum	0.130								
"	Minimum				0.292		-1.750			
Reaction, X-X Axis Base	Maximum	0.130								
"	Minimum	0.130								
Reaction, Y-Y Axis Base	Maximum				0.292		-1.750			
"	Minimum	0.130								
Reaction, X-X Axis Top	Maximum	0.130								
"	Minimum	0.130								
Reaction, Y-Y Axis Top	Maximum	0.130								
"	Minimum	0.130								
Moment, X-X Axis Base	Maximum	0.130								
"	Minimum		-1.750		0.292		-1.750			
Moment, Y-Y Axis Base	Maximum	0.130								
"	Minimum	0.130								
Moment, X-X Axis Top	Maximum	0.130								
"	Minimum	0.130								
Moment, Y-Y Axis Top	Maximum	0.130								
"	Minimum	0.130								

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.60W	0.0000 in	0.000 ft	0.329 in	12.000 ft
+D+0.450W	0.0000 in	0.000 ft	0.247 in	12.000 ft
+0.60D+0.60W	0.0000 in	0.000 ft	0.329 in	12.000 ft
+0.60D	0.0000 in	0.000 ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000 ft	0.543 in	11.919 ft

Steel Section Properties : Pipe4STD

Depth	=	4.500 in	I xx	=	6.82 in^4	J	=	13.600 in^4
			S xx	=	3.03 in^3			
Diameter	=	4.500 in	R xx	=	1.510 in			
Wall Thick	=	0.237 in	Zx	=	4.050 in^3			
Area	=	2.960 in^2	I yy	=	6.820 in^4			
Weight	=	10.800 plf	S yy	=	3.030 in^3			
			R yy	=	1.510 in			
Ycg	=	0.000 in						

Project Title:
Engineer:
Project ID:
Project Descr:

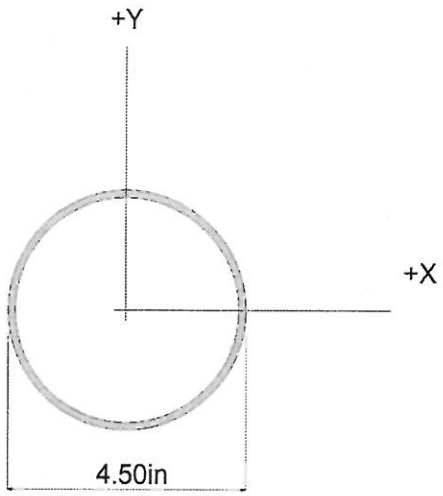
Steel Column

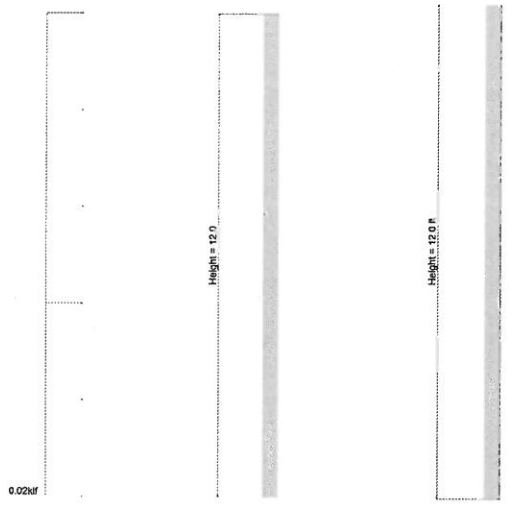
Project File: southgate park.ec6

LIC# : KW-06018037, Build:20.23.2.14 CHUCK YAGHI & ASSOCIATES (c) ENERCALC INC 1983-2022

DESCRIPTION: 12'

Sketches





Project Title:
Engineer:
Project ID:
Project Descr:

Steel Column

Project File: southgate park.ec6

DESCRIPTION: 10'

Code References

Calculations per AISC 360-16, IBC 2021, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Steel Section Name : **Pipe4STD**

Analysis Method :	Allowable Strength
Steel Stress Grade	
Fy : Steel Yield	36.0 ksi
E : Elastic Bending Modulus	29,000.0 ksi

Overall Column Height	10 ft
Top & Bottom Fixity	Top Free, Bottom Fixed

Brace condition for deflection (buckling) along columns :
X-X (width) axis :
Fully braced against buckling ABOUT Y-Y Axis
Y-Y (depth) axis :
Fully braced against buckling ABOUT X-X Axis

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 108.0 lbs * Dead Load Factor
BENDING LOADS . . .
Lat. Uniform Load creating Mx-x, W = 0.02430 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.1010** : 1

Load Combination	+D+0.60W
Location of max.above base	0.0 ft
At maximum location values are . . .	
Pa : Axial	0.1080 k
Pn / Omega : Allowabl	63.808 k
Ma-x : Applied	-0.7290 k-ft
Mn-x / Omega : Allowable	7.275 k-ft
Ma-y : Applied	0.0 k-ft
Mn-y / Omega : Allowable	7.275 k-ft

PASS Maximum Shear Stress Rati **0.007617** : 1

Load Combination	+D+0.60W
Location of max.above base	0.0 ft
At maximum location values are . . .	
Va : Applied	0.1458 k
Vn / Omega : Allowable	19.143 k

Maximum Load Reactions . .

Top along X-X	0.0 k
Bottom along X-X	0.0 k
Top along Y-Y	0.0 k
Bottom along Y-Y	0.2430 k

Maximum Load Deflections . . .

Along Y-Y 0.2642 in at 10.0 ft above base
for load combination : W Only

Along X-X 0.0 in at 0.0 ft above base
for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.002	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.000	PASS	0.00 ft
+D+0.60W	0.101	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.008	PASS	0.00 ft
+D+0.450W	0.076	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.006	PASS	0.00 ft
+0.60D+0.60W	0.101	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.008	PASS	0.00 ft
+0.60D	0.001	PASS	0.00 ft	1.00	1.00	0.00	0.00	0.000	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Mx - End Moments k-ft @ Base	@ Top	My - End Moments @ Base	@ Top
D Only	0.108									
+D+0.60W	0.108				0.146		-0.729			
+D+0.450W	0.108				0.109		-0.547			
+0.60D+0.60W	0.065				0.146		-0.729			
+0.60D	0.065									
W Only					0.243		-1.215			

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Column

Project File: southgate park.ec6

DESCRIPTION: 10'

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base	X-X Axis Reaction @ Top	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Mx - End Moments k-ft @ Base	Mx - End Moments k-ft @ Top	My - End Moments @ Base	My - End Moments @ Top
Axial @ Base	Maximum	0.108								
"	Minimum				0.243		-1.215			
Reaction, X-X Axis Base	Maximum	0.108								
"	Minimum	0.108								
Reaction, Y-Y Axis Base	Maximum				0.243		-1.215			
"	Minimum	0.108								
Reaction, X-X Axis Top	Maximum	0.108								
"	Minimum	0.108								
Reaction, Y-Y Axis Top	Maximum	0.108								
"	Minimum	0.108								
Moment, X-X Axis Base	Maximum	0.108								
"	Minimum		-1.215		0.243		-1.215			
Moment, Y-Y Axis Base	Maximum	0.108								
"	Minimum	0.108								
Moment, X-X Axis Top	Maximum	0.108								
"	Minimum	0.108								
Moment, Y-Y Axis Top	Maximum	0.108								
"	Minimum	0.108								

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.60W	0.0000 in	0.000 ft	0.159 in	10.000 ft
+D+0.450W	0.0000 in	0.000 ft	0.119 in	10.000 ft
+0.60D+0.60W	0.0000 in	0.000 ft	0.159 in	10.000 ft
+0.60D	0.0000 in	0.000 ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000 ft	0.262 in	9.933 ft

Steel Section Properties : Pipe4STD

Depth	=	4.500 in	I xx	=	6.82 in^4	J	=	13.600 in^4
			S xx	=	3.03 in^3			
Diameter	=	4.500 in	R xx	=	1.510 in			
Wall Thick	=	0.237 in	Zx	=	4.050 in^3			
Area	=	2.960 in^2	I yy	=	6.820 in^4			
Weight	=	10.800 plf	S yy	=	3.030 in^3			
			R yy	=	1.510 in			
Ycg	=	0.000 in						

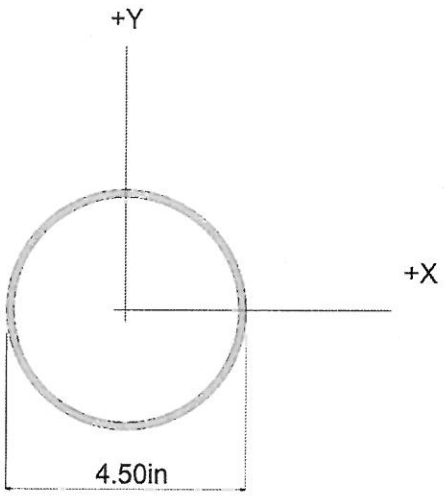
Project Title:
Engineer:
Project ID:
Project Descr:

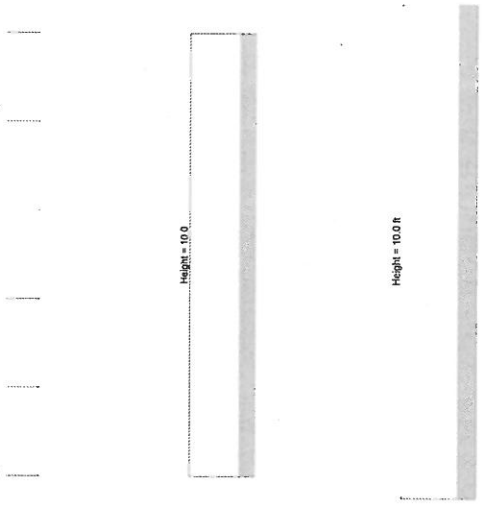
Steel Column

Project File: southgate park.ec6

DESCRIPTION: 10'

Sketches





Project Title:
Engineer:
Project ID:
Project Descr:

Pole Footing Embedded in Soil

Project File: southgate park.ec6

LIC# : KW-06018037, Build:20.23.2.14 CHUCK YAGHI & ASSOCIATES

DESCRIPTION: 30'

Code References

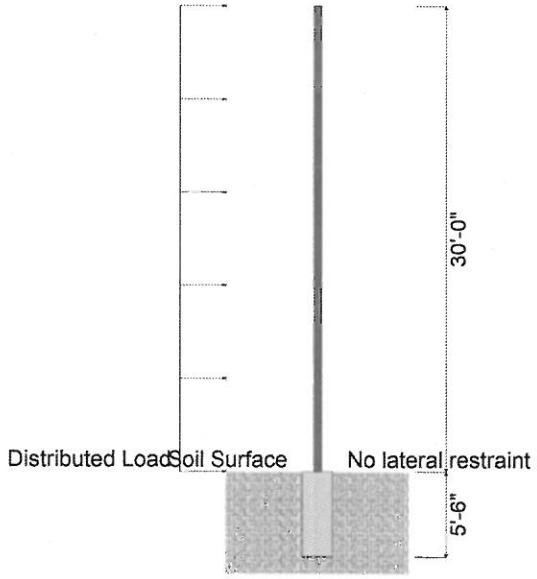
Calculations per IBC 2021 1807.3, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Pole Footing Shape	Circular
Pole Footing Diameter	24.0 in
Calculate Min. Depth for Allowable Pressures	
No Lateral Restraint at Ground Surface	
Allow Passive	250.0 pcf
Max Passive	1,500.0 psf

Controlling Values

Governing Load Combinatio	+0.60W
Lateral Load	0.540 k
Moment	8.10 k-ft
NO Ground Surface Restraint	
Pressures at 1/3 Depth	
Actual	**456.876** psf
Allowable	**458.036** psf
Minimum Required Depth	**5.50 ft**
Footing Base Area	3.142 ft^2
Maximum Soil Pressure	0.0 ksf



Applied Loads

Lateral Concentrated Load (k)		Lateral Distributed Loads (k		Vertical Load (k)
D : Dead Load	k		k/ft	k
Lr : Roof Live	k		k/ft	k
L : Live	k		k/ft	k
S : Snow	k		k/ft	k
W : Wind	k	0.030	k/ft	k
E : Earthquake	k		k/ft	k
H : Lateral Earth	k		k/ft	k
Load distance above ground surface	ft	TOP of Load above ground surface 30.0	ft	
		BOTTOM of Load above ground surface	ft	

Load Combination Results

Load Combination	Forces @ Ground Surface Loads - (k)	Moments - (ft-k)	Required Depth - (ft)	Pressure at 1/3 Depth Actual - (psf)	Allow - (psf)	Soil Increase Factor
	0.000	0.000	0.13	0.0	0.0	1.000
+0.60W	0.540	8.100	5.50	456.9	458.0	1.000
+0.450W	0.405	6.075	5.00	412.2	412.3	1.000

Project Title:
Engineer:
Project ID:
Project Descr:

Pole Footing Embedded in Soil

Project File: southgate park.ec6

DESCRIPTION: 8'

Code References

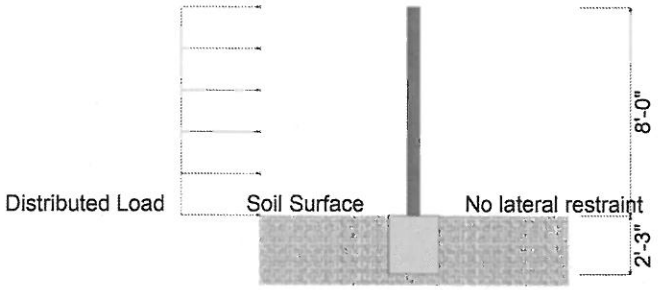
Calculations per IBC 2021 1807.3, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Pole Footing Shape	Circular
Pole Footing Diameter	24.0 in
Calculate Min. Depth for Allowable Pressures	
No Lateral Restraint at Ground Surface	
Allow Passive	250.0 pcf
Max Passive	1,500.0 psf

Controlling Values

Governing Load Combinatio	0.60W
Lateral Load	0.1166 k
Moment	0.4666 k-ft
NO Ground Surface Restraint	
Pressures at 1/3 Depth	
Actual	**183.285** psf
Allowable	**184.342** psf
Minimum Required Depth	**2.250 ft**
Footing Base Area	3.142 ft^2
Maximum Soil Pressure	0.0 ksf



Applied Loads

	Lateral Concentrated Load (k)		Lateral Distributed Loads (k		Vertical Load (k)
D : Dead Load	k			k/ft	k
Lr : Roof Live	k			k/ft	k
L : Live	k			k/ft	k
S : Snow	k			k/ft	k
W : Wind	k		0.02430	k/ft	k
E : Earthquake	k			k/ft	k
H : Lateral Earth	k			k/ft	k
Load distance above ground surface	ft	TOP of Load above ground surface	8.0	ft	
		BOTTOM of Load above ground surface		ft	

Load Combination Results

Load Combination	Forces @ Ground Surface Loads - (k)	Moments - (ft-k)	Required Depth - (ft)	Pressure at 1/3 Depth Actual - (psf)	Allow - (psf)	Soil Increase Factor
	0.000	0.000	0.13	0.0	0.0	1.000
+0.60W	0.117	0.467	2.25	183.3	184.3	1.000
+0.450W	0.087	0.350	2.00	163.9	166.0	1.000

Project Title:
Engineer:
Project ID:
Project Descr:

Pole Footing Embedded in Soil

Project File: southgate park.ec6

LIC# : KW-06018037, Build:20.23.2.14 CHUCK YAGHI & ASSOCIATES (c) ENERCALC INC 1983-2022

DESCRIPTION: 10'

Code References

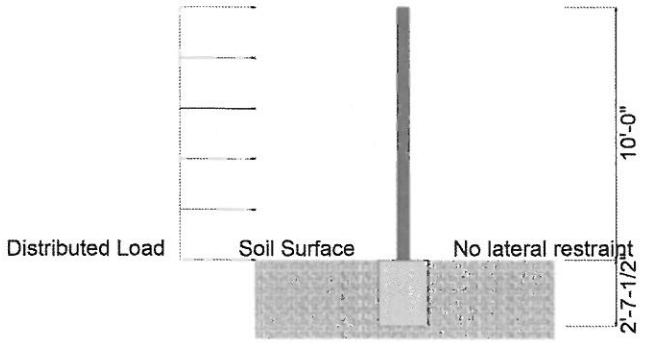
Calculations per IBC 2021 1807.3, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Pole Footing Shape	Circular
Pole Footing Diameter	24.0 in
Calculate Min. Depth for Allowable Pressures	
No Lateral Restraint at Ground Surface	
Allow Passive	250.0 pcf
Max Passive	1,500.0 psf

Controlling Values

Governing Load Combinatio	0.60W
Lateral Load	0.1458 k
Moment	0.7290 k-ft
NO Ground Surface Restraint	
Pressures at 1/3 Depth	
Actual	**211.20** psf
Allowable	**211.704** psf
Minimum Required Depth	**2.625 ft**
Footing Base Area	3.142 ft^2
Maximum Soil Pressure	0.0 ksf



Applied Loads

	Lateral Concentrated Load (k)		Lateral Distributed Loads (k		Vertical Load (k)
D : Dead Load	k			k/ft	k
Lr : Roof Live	k			k/ft	k
L : Live	k			k/ft	k
S : Snow	k			k/ft	k
W : Wind	k		0.02430	k/ft	k
E : Earthquake	k			k/ft	k
H : Lateral Earth	k			k/ft	k
Load distance above ground surface	ft	TOP of Load above ground surface	10.0	ft	
		BOTTOM of Load above ground surface		ft	

Load Combination Results

Load Combination	Forces @ Ground Surface Loads - (k)	Moments - (ft-k)	Required Depth - (ft)	Pressure at 1/3 Depth Actual - (psf)	Allow - (psf)	Soil Increase Factor
	0.000	0.000	0.13	0.0	0.0	1.000
+0.60W	0.146	0.729	2.63	211.2	211.7	1.000
+0.450W	0.109	0.547	2.38	189.9	190.2	1.000

Project Title:
Engineer:
Project ID:
Project Descr:

Pole Footing Embedded in Soil

Project File: southgate park.ec6

DESCRIPTION: 12'

Code References

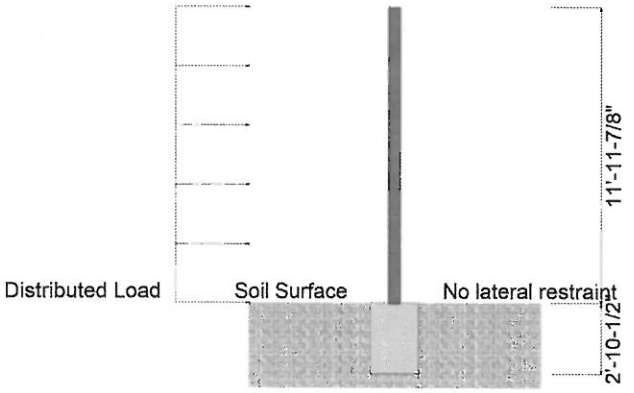
Calculations per IBC 2021 1807.3, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Pole Footing Shape	Circular
Pole Footing Diameter	24.0 in
Calculate Min. Depth for Allowable Pressures	
No Lateral Restraint at Ground Surface	
Allow Passive	250.0 pcf
Max Passive	1,500.0 psf

Controlling Values

Governing Load Combinatio	0.60W
Lateral Load	0.1748 k
Moment	1.048 k-ft
NO Ground Surface Restraint	
Pressures at 1/3 Depth	
Actual	**236.715** psf
Allowable	**237.262** psf
Minimum Required Depth	**2.875 ft**
Footing Base Area	3.142 ft^2
Maximum Soil Pressure	0.0 ksf



Applied Loads

Lateral Concentrated Load (k)		Lateral Distributed Loads (k		Vertical Load (k)
D : Dead Load	k		k/ft	k
Lr : Roof Live	k		k/ft	k
L : Live	k		k/ft	k
S : Snow	k		k/ft	k
W : Wind	k	0.02430	k/ft	k
E : Earthquake	k		k/ft	k
H : Lateral Earth	k		k/ft	k
Load distance above ground surface	ft	TOP of Load above ground surface 11.990	ft	
		BOTTOM of Load above ground surface	ft	

Load Combination Results

Load Combination	Forces @ Ground Surface Loads - (k)	Moments - (ft-k)	Required Depth - (ft)	Pressure at 1/3 Depth Actual - (psf)	Allow - (psf)	Soil Increase Factor
	0.000	0.000	0.13	0.0	0.0	1.000
+0.60W	0.175	1.048	2.88	236.7	237.3	1.000
+0.450W	0.131	0.786	2.63	212.5	213.6	1.000