SIGN COMPANY:
Raleigh Signs
SIGN PROJECT:
Piney Grove Self Storage

NOV 0 2 2021

NICHOLAS A. RAMPHOS, P.E.
PO BOX 8018
CANTON, OH. 44711
C. (330) 495-2311
O. (330) 455-0793

JOB NUMBER

21380

WIND LOADS

Sign Company *Raleigh Signs*
Job Name *Piney Grove Self Storage*
Job Number *21380*

Vultimate = 115 mph
0 Vnominal = Vult x sq rt 0.6 = 88 mph

Note # 1 Basic Wind Speed is the 3 second gust @ 33 ft.above ground, exposure

Basic Wind Speed=	90	mph
Exposure=	C	flat terrain, generally open for 1/2 mile.
Cq=	1.2	signs, flagpoles and lightpoles

Note #4 Cq= Pressure Coefficient

Calculation of Design Wind Pressures

Height (ft):	(qs)	(G)	(Cf)	= Wind Pressure		Kz
						0.85
						0.9
15	17.6	0.85	1.2	18.0	psf	0.94
20	15.9	0.85	1.2	16.2	psf	0.98
25	16.6	0.85	1.2	16.9	psf	1.04
30	17.3	0.85	1.2	17.6	psf	1.09
40	18.3	0.85	1.2	18.7	psf	1.13
60	23.4	0.85	1.2	23.9	psf	1.17
80	25.1	0.85	1.2	25.6	psf	1.21
100	21.3	0.85	1.2	21.8	psf	1.24
120	21.9	0.85	1.2	22.3	psf	1.26
160	22.2	0.85	1.2	22.7	psf	1.31
200	23.1	0.85	1.2	23.6	psf	
300	15.0	0.85	1.2	15.3	psf	
400	15.0	0.85	1.2	15.3	psf	

Note # 5 Design Wind Pressu

Seismic Load Comparison

Seismic Zone=	1	
Z=	0.1	
I=	1.0	standard structures
Cp=	2.0	
Wp=	15.0	psf, typical sign box with structure
Fp= (Z)(I)(Cp)(Wp)=	2.3	psf **Design Base Shear**

Note: Less than wind pressure above, so seismic not a factor and wind governs calculations

Note # 2 Signs use a Wind Importance Factor, (Iw) of 1.0

Note # 3 Not Applicable

Seismic Use Group
Spectral response coefficients Sds = .17 Sd1 = .04
Site class D
Basic seismic force resisting system from Table 1617.6 #7

NORTH CAROLINA PROFESSIONAL SEAL 29645 ENGINEER NICHOLAS A. RAMPHOS

NOV 0 2 2021

ALUM COLUMN DESIGN

Sign Company *Raleigh Signs* Job Number:
Job Name. Piney Grove Self Stor 21380

Areas Subject to Wind Forces

Description	Height (ft)	Width (ft)	Area (sqft)	Centroid (ft)	Wind (psf)
1) top	4.00	6.00	24.00	7.5	18.0
2) columns	5.50	1.50	8.25	2.8	18.0
3) bottom					
4)					
5)					
6)					
7)					
8)					

Calculation of Design Forces at Critical Heights

y (ft)	M (#')	V (#)	y (ft)	M (#')	V (#)
@ grade	3,648	581	20.63		
30.00			72.50		
11.30			72.50		

Column Support Design Table

# of Cols	Column Type (P,TS)	Column Size	Length (ft)	Start Elev (ft)	End Elev (ft)	Sleeve Depth (in)	S act (in^3)	fb (ksi)
1	ts	3XX.19	14.00	-4.00	10.00	N/A	1.73	25.3
	p	#DIV/0!	5.00	6.10	11.10	#DIV/0!	#DIV/0!	#DIV/0!
	p	#DIV/0!	9.33	11.30	20.63	#DIV/0!	#DIV/0!	#DIV/0!
		FALSE		72.50	72.50		FALSE	#DIV/0!
		FALSE		72.50	72.50		FALSE	#DIV/0!
		FALSE		72.50	72.50		FALSE	#DIV/0!

Allowable Bending Stresses

Stress increase factor= 1.00

Column Type	Column Size	Criteria						
ts	3XX.19	b/t	<190/sqr(Fy)	so...	Fb=	0.66Fy	30.4	ksi
p	#DIV/0!	d/t	#DIV/0!	so...	Fb=	#DIV/0!	#DIV/0!	ksi
p	#DIV/0!	d/t	#DIV/0!	so...	Fb=	#DIV/0!	#DIV/0!	ksi
	FALSE	help	#N/A	so...	Fb=	#N/A	#N/A	ksi
	FALSE	help	#N/A	so...	Fb=	#N/A	#N/A	ksi
	FALSE	help	#N/A	so...	Fb=	#N/A	#N/A	ksi

NORTH CAROLINA PROFESSIONAL SEAL 29645 ENGINEER NICHOLAS A. RAMPHOS

NOV 0 2 2021

LATERAL BEARING PIER AND CAISSON FOOTINGS

Sign Company *Raleigh Signs* Job Number:
Job Name. Piney Grove Self Storage 21380

# Footings=	1		Moment/Footing, M=	3,648	lb-ft
Pass lat soil res, q=	150	psf	Composite Centroid, h=	6.28	ft
			Equiv Concentrated Load, P= M/h=	581	lb

3000 PSI CONCRETE

Rectangular Pier

Width, W=	3.0	ft, parallel to sign face
Length, L=	3.0	ft, perpendicular to sign face
Depth, D= (A/2)(1+ SQR(1 + (4.36h)/A))=	4.4	ft
S1= (2)(q)(D/3)=	596	psf
b= Sqrt(W^2 + L^2)=	4.2	ft
A= (2.34)(P) / (S1)(b)=	1.1	

Round Caisson

Diameter, b=	2.00	ft, round augered hole
Depth, D= (A/2)(1+ SQR(1 + (4.36h)/A))=	4.20	ft
S1= (q)(2)(D/3)=	426	psf
A= (2.34 P) / (S1)(b)=	1.59	

Foundation Bearing Check

Allowable Bearing Pressure= 1,500 psf

Square			*Round*		
Sign Wt=	1,100	lb	Sign Wt=	200	lb
Base Wt=	5,914	lb	Base Wt=	1,978	lb
Area=	9.0	sq ft	Area=	3.1	sq ft
q max=	779	psf, soil	**q max=**	693	psf,soil
OK, with depth increase			OK, with depth increase		

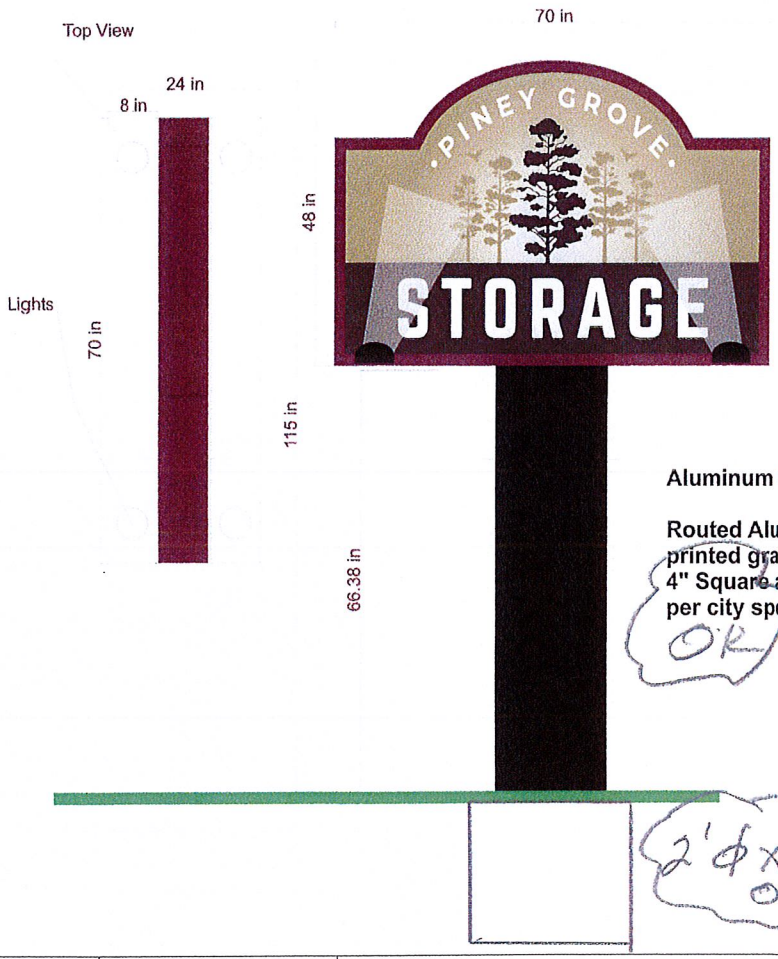
Concrete Volume

Outside Width of Column=	3	in
Depth of Column in Footing=	4.5	ft
Volume of Concrete per Footing=	0.4	cubic yards (+-)
Total Order Volume of Concrete=	0.4	cubic yards (+-)

NORTH CAROLINA PROFESSIONAL SEAL 29645 ENGINEER NICHOLAS A. RAMPHOS

NOV 0 2 2021

Top View



Aluminum Ground Sign

Routed Aluminum sign panel with digitally printed graphics. Panel to be supported by one 4" Square aluminum post. Post to have 18" skirt/sleeve per city spec. Post will be direct buried with concrete.

OK

Project: Ground Sign Client: Priney Grove Storage Contact: Kelly Moore Phone: Email:	Description: QTY: 1 Size: Shown Material: ACM/Alum Colors: Printed	Client Approval: Name: _____ Date : _____	Landlord Approval: Name: _____ Date : _____	Sign Type: RALEIGH SIGN DESIGN 5316 Shadow Valley Rd Holly Springs, NC 27540 919-244-1802

Drawn By: Chris Franks
Date: 8/31/21

Page: 1 of 1

NORTH CAROLINA PROFESSIONAL SEAL 29648 ENGINEER NICHOLAS A. RAMPHOS

NOV 0 2 2021