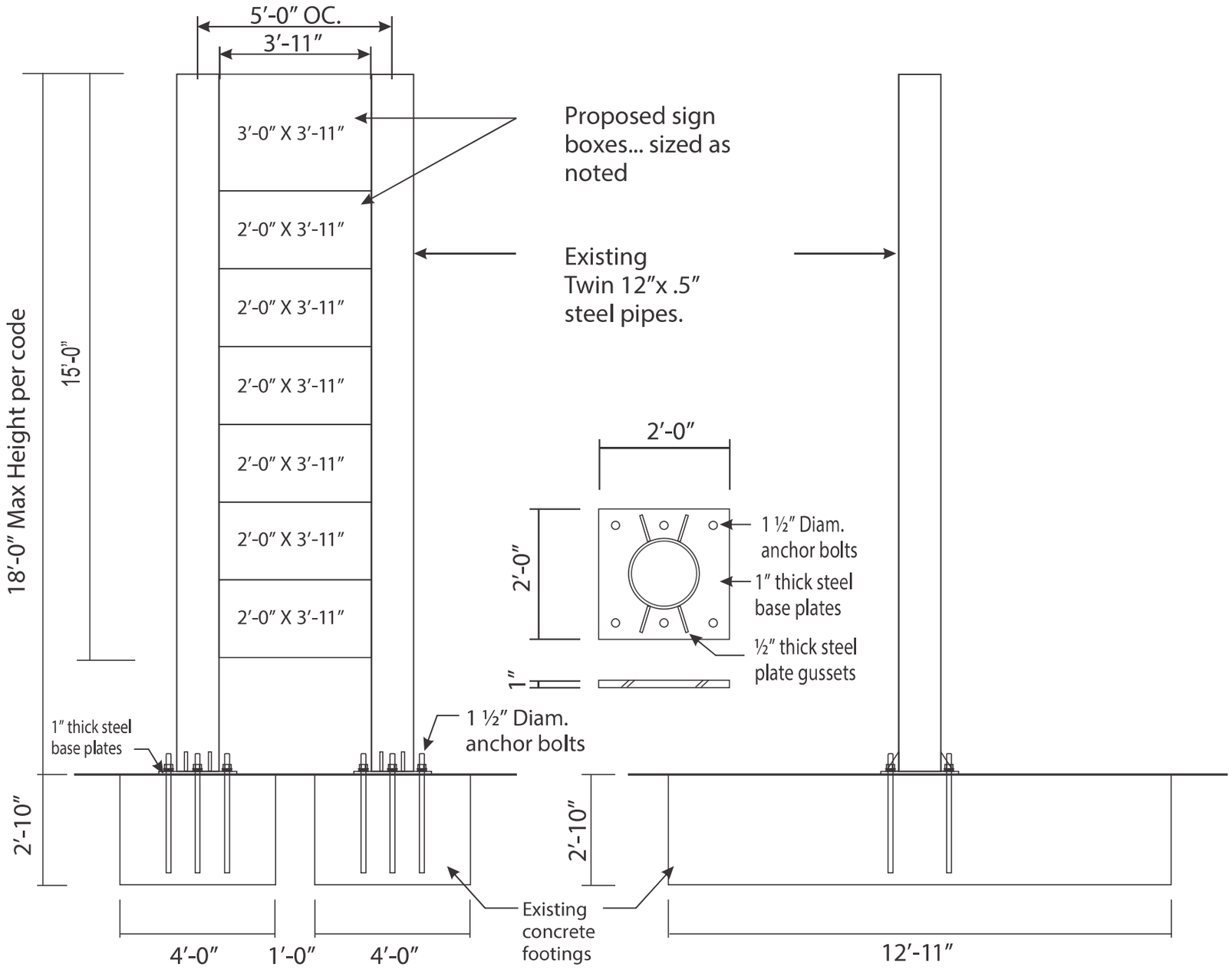


Sign Location:
1445 SW. Main Blvd.
(US Hwy. 41) Lake City FL.

NOTE: This drawing is for structure engineering purposes only & not for construction of sign cabinets or installation of said signs.

JOHN J. ORLANDO LICENSE No 0044089 STATE OF FLORIDA PROFESSIONAL ENGINEER

John J Orlando PE
Digitally signed by John J Orlando PE
Date: 2023.04.09 12:04:11 -04'00'

This item has been electronically signed and sealed by John J. Orlando, PE using a Digital Signature and date.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Conforms to the requirements of the 7th Edition (2020) of the Florida Building Code sections 1609 and 3107, V(ult) = 120 mph, Exposure category = C, Risk category = II

John J. Orlando PE LLC - 165 Old Ridge Road - Macon, GA 31211 - 478 731 5394 - jjorlando@cox.net - Florida registration # 0044089

job 1523SR sheet 1 of 2

Calculations for The Sign Resource
Tenant Pylon Sign 15 -0" OAH sign job #1523SR
To be installed at 1445 SW Main Blvd, Lake City, FL 32055

Section 3107, 1609, 1620 and 1621 of Florida Building Code 2020 applies:
Chapter 29 of ASCE 7-10 (Wind Loads on Other Structures and Building Appurtances) applies:

Type of structure:	pylon sign	
Occupancy Category:	II	
Wind velocity (3 sec gust), FBC 2020, section 1620.2:	120	mph
Wind stagnation pressure (qz)	36.9	psf
Design wind pressure conversion factor	0.77	
Gust effect factor (G) ASCE 7-16 26.9.1	0.85	
Widest part of sign face (B)	3.92	
Height of sign face (s)	15.00	
Overall height of sign (H)	18.00	
Aspect ratio (B/s)	0.26	
Clearance ratio (s/H)	0.83	
Force Coefficient Cf from Figure 29.3-1, ASCE 7-16	1.4	
Wind pressure (p) multiplied by design wind pressure conversion factor a	33.8	psf

1. Calculate wind load and turning moments at base by the provisions of the alternate all-heights method in Section 1609.6. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Hor Dim (ft)	Vert Dim (ft)	Fill Factor	Af (sf)	p	F (lbs)	H (ft)	M (base) (ft-lbs)
3.9	15.0	1.0	58.8	33.8	1988	10.5	20875
1.0	18.0	2.0	36.0	33.8	1217	9.0	10955
			0.0	33.8	0		0
			0.0	33.8	0		0
Total			94.8		3205	9.9	31830

2. Size foundation, using method presented by Dunham, pp.229 forward

Definition of terms:
M=overturning moment (ft - #)
P=total bearing load including weight of foundation (#)
e=eccentricity of resultant pressure at base (ft)
L=length of footer in wind direction (ft), b=width of footer (ft)
D=depth of footer (ft)
p1=maximum soil pressure at full wind load (psf)
L1=location of max pressure (ft)

number of foundations =	2				
number of posts	2				
M=	15915				
L=	12.92	b=	4	D=	2.82
Weight of foundation = volume 145 lbs/ft^3 =					21132
Weight of sign=					2000
load per post =					1603
P=					23132
e=M/P					0.7
L1=3(L/2-e)					17.3
p1=2P/(3b(L/2-e))					667.9

Foundation is OK since L1 greater than 0 (does not overturn)

3. Determine required section modulus (in^3) at base

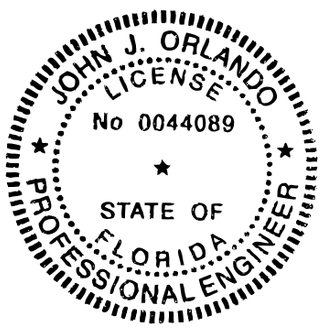
max stress = (P*(H)*12)/section modulus
max stress < allowable stress
for outdoor signs, allowable stress < (0.66)(yield strength)

material	A53GrB	
yield strength (modulus of rupture)	35000	psi
required section > (P*(H)*12)/((0.66*ys))		
At base, minimum section modulus =	8.3	in^3
Use existing 12" diameter 0.500" wall steel pipes, section modulus (W	49.9	in^3

4. Check anchor bolt size

Number of posts	2
Number of anchor bolts per post	6
Diameter of bolt (inches)	1.5
Estimated weight of sign (pounds)	2000
Compressive load per bolt from dead load (pounds)	167
Bolt spacing across neutral axis (inches)	10
Maximum tension load under full wind load (pounds)	3016
Maximum compression load under full wind load (pounds)	3183
Average shear load	267
Maximum combined load (pounds)	3100
Steel alloy of bolt	ASTM A36
Minimum tensile strength (ksi)	36
Stress cross section of selected bolt size (inches)	1.4041
Tensile load (ksi)	2.208
Safety Factor	16.3

References: Structural Engineering Handbook, Gaylord&Gaylord editors,
Fourth edition, McGraw Hill, NY 1997
ASCE 7 16
The 7th Edition (2020) of the Florida Building Code
Mechanics of Materials, Beer and Johnston, McGraw Hill, NY 1981
Standard Handbook for Mechanical Engineers, T. Baumeister and
L.S. Marks, editors, Seventh edition, McGraw Hill, NY 1967



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