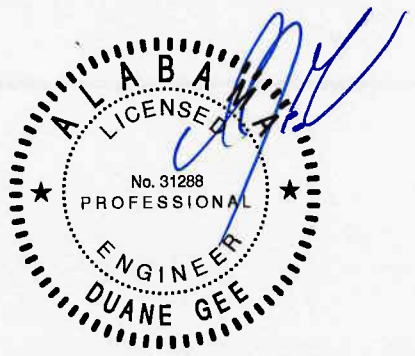
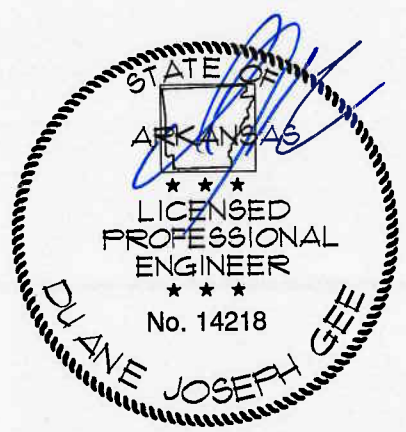
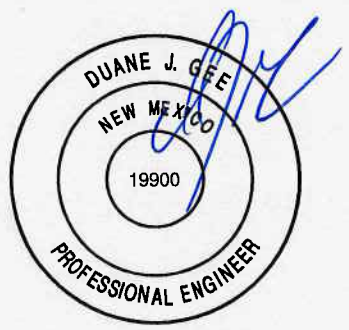


EXPIRATION DATE: 06/30/2011





STRUCTURAL TECHNOLOGY
CONSULTANTS
F-5490

EXP. DATE 03/31/12

EXP. DATE 03/31/13

STRUCTURAL TECHNOLOGY CONSULTANTS INC.

7827 CONVOY COURT, SUITE 406, SAN DIEGO, CA 92111 PHONE (858) 278-2400 FAX (858) 278-2424

PROJECT: POLE SIGN, VARIOUS LOCATIONS
PROJ. NO.: 489-24.1 DESIGNER: LR
CLIENT: SIGNTRONIX

COVER SHEET
DATE: 09-17-10

STRUCTURAL CALCULATIONS FOR:

POLE SIGN, VARIOUS LOCATIONS

PROJECT # 489-24.1

STRUCTURAL TECHNOLOGY CONSULTANTS INC.

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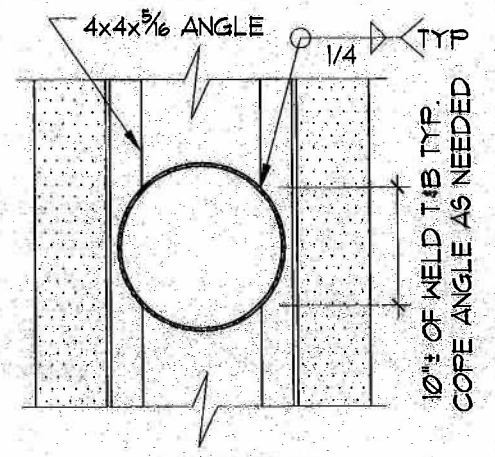
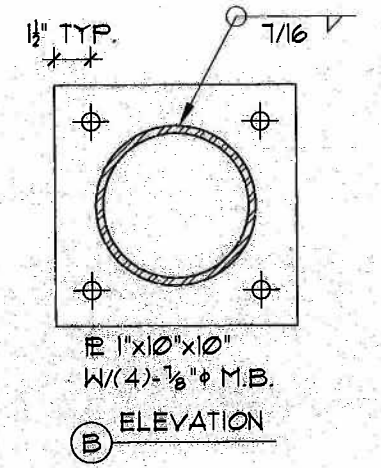
PROJECT: POLE SIGN, VARIOUS LOCATIONS
PROJ. NO.: 489-24.1
CLIENT: SIGNTRONIX
DESIGNER: LR

SHEET: 1 OF 3
DATE: 09-17-10

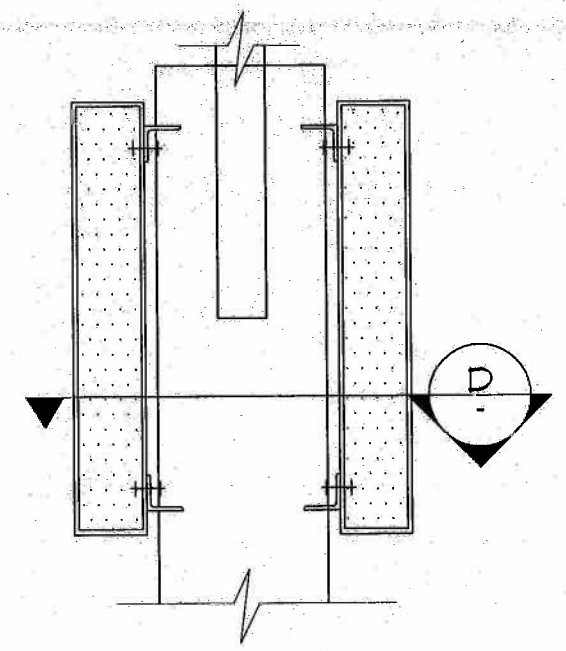
CODE: 2006 IBC
WIND: BASIC WIND SPEED = 110 MPH 3 SEC GUST
EXPOSURE C



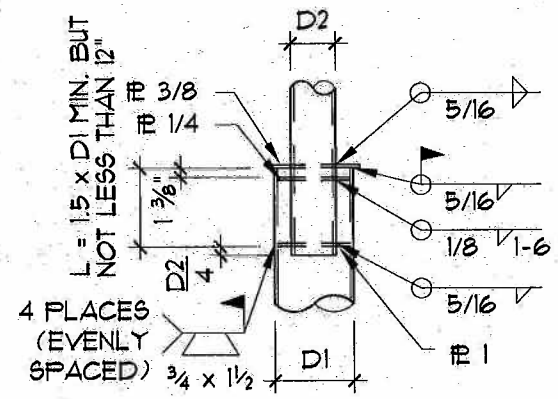
D CONNECTION DETAIL



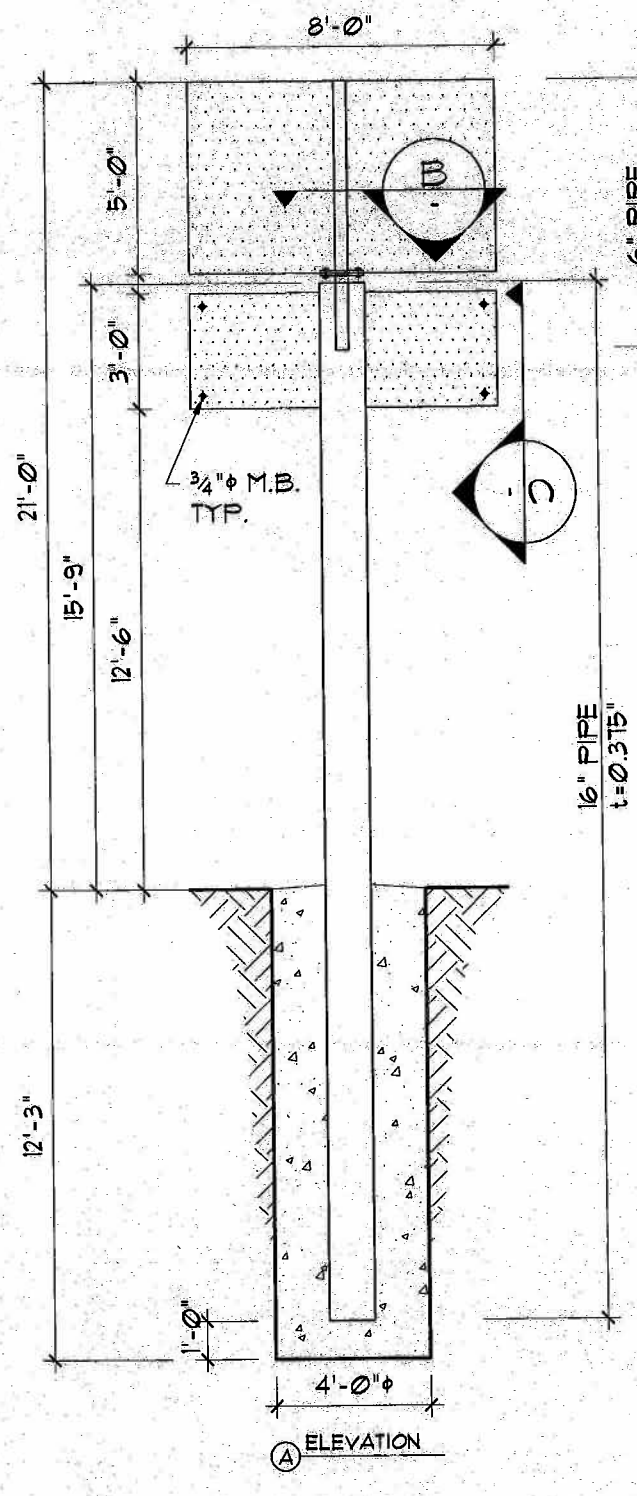
B ELEVATION



C SECTION



E SPLICE DETAIL



A ELEVATION

GENERAL NOTES FOR POLES AND FOOTING:

1. CONCRETE DESIGN AS f'c=2500 PSI., MIN. SPECIAL INSPECTION NOT REQUIRED.
2. PIPE STEEL ASTM A53 GRADE B.
3. ROLLED STEEL ASTM A36.
4. BOLT STEEL ASTM A307.
5. SIGN CABINETRY SHALL BE FABRICATED IN THE SHOP OF AN APPROVED FABRICATOR.
6. SOIL PASSIVE PRESSURE BASED ON 2006 IBC TABLE 1804.2 CLASS 5 MATERIAL. SPECIAL INSPECTION NOT REQUIRED.
7. SITE IS NOT SUBJECTED TO WIND SPEED-UP EFFECT ($K_{zt} \leq 1.0$) AS DEFINED IN SECTION 6.5.7.2 OF ASCE 7-05. CONTACT ENGINEER OF RECORD IF SUCH EFFECTS ARE PRESENT.
8. PROVIDE PERIODIC SPECIAL INSPECTION FOR FIELD WELDING PER IBC SECTION 1704.
9. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS USING E70 ELECTRODES OR WIRES AND AWS APPROVED SYSTEMS AND PROCEDURES.
10. PROVIDE SLOPE AWAY FROM BASE OF POLE.

CONNECTION DESIGN:

CHECK ANGLES:
TRIB. AREA = 90.44 PSFx1.5'x4' = 543#
M = 543#x4' = 2172 #-FT
REQ'D S = 2172x12 /0.6x36000 PSI = 1.207 IN^3
USE STEEL ANGLE L4x4x5/16 CONT. ALONG BACK FACE OF CABINET

BOLT CONNECTION:
T = 2172x12 /8 = 3258 #/CONN
USE ¾"ϕ M.B.
Tall = 9940 #/BOLT
Vall = 5300 #/BOLT

WELD CONNECTION ANGLE TO POLE:
V = 90.44 PSFx8'x3' = 2171#
USE ¼" FILLET WELD, L=10"
WELD CAPACITY
= 0.3x70000 PSIx¼x0.707Ix10
= 37123# OK

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PROJECT: POLE SIGN, VARIOUS LOCATIONS
PROJ. NO.: 489-24.1 DESIGNER: LR
CLIENT: SIGNTRONIX

DESIGN CODE- IBC 2006
units; pounds, feet u.n.o.

WIND (wind governs design)

v2.18

Basic Wind Speed: 170
Exposure C

Design Wind Pressures (psf)

Heights:		
	15	81.78
	20	86.59
	25	90.44

Area	Force	Arm	Moment
19.1	1564	6.4	9971
18.0	1472	13.9	20425
40.0	3464	17.5	60616
8.0	724	20.5	14833
85.1	**7224**		**105846**

Footing Design

IBC Table 1804.2 & Sec. 1804.3.1

Footing Type: round

Soil Pressure(100x2):	200	b= 4.00
S1 = S x d / 3		S1= 800
A = 2.34 x P / (S1 x b)		A= 5.28
d =0.5xA (1+ (1+4.36x h/A) ^.5)=		12.20

Formula Per IBC Section 1805.7.2.1

Footing size: 4'-0'' DIA. x 12'-3'' Depth

Column Design

Pipe Steel - ASTM A53 Grade B

Moment at base (#-ft): 105,846
Required S (in^3): 60.5
S = Moment x 12 / (1*21000)

H	M	S req'd.	Size (in)	lbs / ft	t (in)	S
0.0	105,846	60.5	16.0	62.6	0.375	65.7
15.8	9,693	6.2	6.0	19.0	0.312	7.1

DESIGN CODE- IBC 2006 UNITS; POUNDS, FT U.N.O

ASCE 7-05 Wind Loads

6.5.14 F=qh*G*Cf*As
6.5.10 qh = 0.00256*Kh*Kzt*Kd*V^2*I
Kzt= 1.0 (unless unusual landscape)
Kh= table 6-3
Kd= 0.85 for signs
V= 170 mph
6.5.8 G=0.925 ((1+1.7*gq*Iz*Q)/(1+1.7*gv*Iz)) or 0.85
iz=c*(33/z)^(1/6)
z=max(0.6*h, zmin)
zmin= 15
gv= 3.4
gq= 3.4
Q=sqrt(1.0 / (1+0.63*(B+h)/Lz)^0.63)
Lz= l*(z/33)^e

I= 1 for structural category II
Exposure C
I= 500 (constant for Lz. Table 6.2)
e= 0.2
c= 0.2

sign elem. #	h	Kh	qh	G	s/h	B/s	Cf	pressure	F
1	12.75	0.85	53.45	0.85	0.39	0.97	1.80	81.78	1564
2	15	0.85	53.45	0.85	0.39	0.97	1.80	81.78	1472
3	20	0.9	56.60	0.85	0.39	0.97	1.80	86.59	3464
4	21	0.94	59.11	0.85	0.39	0.97	1.80	90.44	724
								sum:	7224

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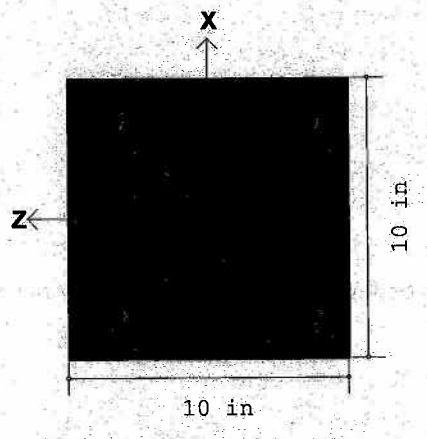
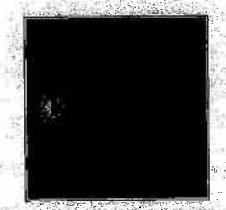


Plain Base Plate Connection

Base Plate Thickness	: 1. in
Base Plate Fy	: 36. ksi
Bearing Surface Fp	: 24.48 ksi
Anchor Bolt Diameter	: .875 in
Anchor Bolt Material	: A307
Anchor Bolt Fu	: 60. ksi
Column Shape	: PIPE_6.0
Design Code	: AISC ASD 13th
Pullout Code	: ACI 2005

Bearing Pressure

Maximum Bearing 4.635 ksi
Max/Allowable Ratio .189 IBC 16-12 (a)
(ABIF = 1.000)



Base Plate Stress

Maximum Stress 19.042 ksi
Max/Allowable Ratio .588 IBC 16-14
(ASIF = 1.000)

Anchor Bolts

Bolt	X (in)	Z (in)	Tens.(k)	Vx (k)	Vz (k)	Fnt (ksi)	ft (ksi)	Fnv (ksi)	fv (ksi)	Unity	Combination
1	-3.5	3.5	7.702	0.	-.949	45.	12.809	24.	1.579	.569 (T)	IBC 16-14 (3)
2	-3.5	-3.5	7.702	0.	.949	45.	12.809	24.	1.579	.569 (T)	IBC 16-14 (4)
3	3.5	-3.5	7.702	0.	.949	45.	12.809	24.	1.579	.569 (T)	IBC 16-14 (4)
4	3.5	3.5	7.702	0.	-.949	45.	12.809	24.	1.579	.569 (T)	IBC 16-14 (3)

Loads

	P (k)	Vx (k)	Vz (k)	Mx (k-ft)	Mz (k-ft)	Reverse
DL	.42					No
WL			3.798	9.693		Yes