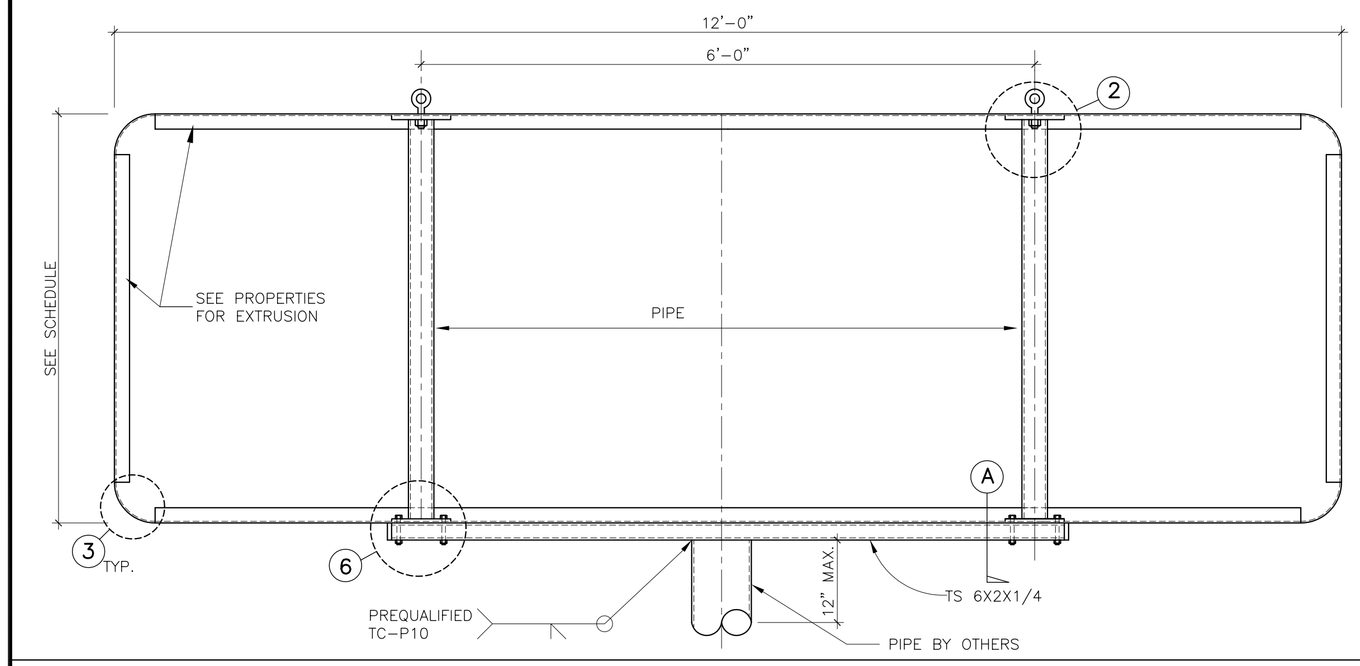


PROPERTIES SCHEDULE				
SIGN SIZE	PIPE SIZE	LOWER PLATE	BOLTS	EXT
32"x12'	2 1/2" STD. PIPE	1/2 x 5 x 8	1/2"	E
3'x12'	2 1/2" STD. PIPE	1/2 x 5 x 8	1/2"	E
4'x12'	3" STD. PIPE	3/4 x 5 x 8	3/4"	C
6'x12'	4" STD. PIPE	3/4 x 5 x 9 1/2	3/4"	C

SIGN ELEVATION N.T.S. 1

GENERAL NOTES & SPECIFICATIONS

1. GOVERNING CODES:

SOUTH FLORIDA BUILDING CODE (ASCE 7-98)	120 MPH, EXP. C
SOUTHERN STANDARD BUILDING CODE	138 MPH
UNIFORM BUILDING CODE, 1997	124 MPH, EXP. C

2. DESIGN LOADS:

DEAD LOAD	6 LBS. PER SQ. FT.
WIND LOAD	66.0 LBS. PER SQ. FT.

3. RESTRICTIONS:

A. THE DESIGN LOADS ABOVE ARE BASED ON A HEIGHT ABOVE GROUND OF 25 FEET MAXIMUM.

4. LIMITATIONS:

THE DESIGN AND CONSTRUCTION OF THE SIGN SHOWN HEREON CONFORMS TO THE ABOVE GOVERNING CODES WHEN INSTALLED AS SPECIFIED ON THIS DRAWING. NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. ANY ALTERATIONS OF THIS DRAWING WILL VOID THE SHEET. THIS SHEET IS VALID ONLY IF SIGNED IN INK BY THE ENGINEER. THE METHOD OF ATTACHMENT TO SUPPORTS (POLES, WALLS, ETC.) IS NOT A PART OF THIS WORK AND MUST BE DESIGNED AND DETAILED BY OTHERS.

5. MATERIALS:

A. ALUMINUM – ALLOY 6061-T6 OR 6005-T5
BOLTS – ASTM F593
SIGN PANELS – TO BE UNDERWRITERS LABORATORY APPROVED. USE ONLY APPROVED PLASTICS.

PLATE STEEL – A36
PIPE – ASTM A53, GRADE B
TUBE – ASTM A500, GRADE B

B. PROVIDE FOR ISOLATION OF DISSIMILAR MATERIALS.

6. WORKMANSHIP:

ALL MATERIAL AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF THE GOVERNING CODE (LATEST EDITION) AND THE LOCAL BUILDING OFFICIAL. WELDING SHALL CONFORM TO ALL APLICABLE CODES. CERTIFIED WELDERS ARE REQUIRED.

7. WELD SPECIFICATIONS:

STEEL WELDING
ALL WELDING SHOULD BE PERFORMED BY CERTIFIED WELDERS. WELDS USING E70 ELECTRODES OR WIRES AND AWS APPROVED SYSTEMS AND PROCEDURES ARE ACCEPTABLE. PROVIDE PERIODIC SPECIAL INSPECTION FOR FIELD WELDING IN ACCORDANCE WITH UBC SECTION 1701.5.

ALUMINUM WELDING
ALL WELDING SHALL BE DONE IN ACCORDANCE WITH LATEST EDITION OF THE AMERICAN WELDING SOCIETY D1.2 STRUCTURAL WELDING CODE ALUMINUM.

6' x 12' SIGN

WIND:

W = 66 x 3 x 3 = 594 LB
M = 594 x 1.5 = 891 FT. LB.
f = 891 x 12 / 5.028 = 2126 PSI < 19000 O.K.

GRAVITY:

FRAMES RESIST LOAD BASED ON RELATIVE STIFFNESS
PL^3/3EI = WL^3/8EI, P = 3W/8
W = 6 x 6 x 3 = 108 LB
P = 3 x 108 / 8 = 41 LB

TOP FRAME:

M = 41 x 3 = 123 FT. LB.
f = 123 x 12 / .630 = 2343 PSI < 28000 O. K.
f = 123 x 12 / 1.845 = 800 PSI < 28000 O.K.

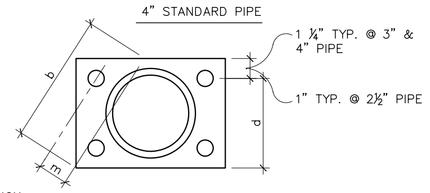
COMBINED STRESS O.K.

POLE:

FORCE = 66 x 6 x 6 = 2376 LB
M = 2376 x 3 = 7128 FT LB
S = 7128 x 12 / 1.33 x 23100 = 2.78 IN^3

4" STANDARD PIPE

PLATE:



BOLT TENSION:

T = 7128 x 12 / 3.75 = 22810 LB.

CANTILEVER LENGTH:

m = ((5^2 + 9.5^ 2)^.5 / 2 - (2 (1.25^2))^ .5 - (.8 x 4.5) / 2 = 1.79 IN.

BENDING:

M = .5 x 22810 x 1.79 = 20415 IN. LB.
t = (6 x 20415 / 6.9 x 1.33 x 27000)^.5 = .70 IN

PLATE 3/4 x 5 x 9.5"

WELD:

Z = PI x 1.75^2 = 9.62
f = 7128 x 12 / 9.62 = 8891 LB. / IN.

USE PARTIAL PENETRATION GROOVE WELD TC-P10

CROSSBEAM

WIND:

P = 66 x 6 x 6 = 2376 LB
M = 2376 x 3 = 7128 FT LB
f = 7128 x 12 / 4.6 = 18594 PSI O.K.

GRAVITY:

W = 6 x 6 x 6 = 216 LB
M = 216 x 3 = 648 FT LB
f = 648 x 12 / 2.31 = 3367 PSI
SUM M = 18594 + 3367 = 21961 PSI O.K.

TORSION:

REFERENCE BLODGETT, DESIGN OF WELDED STRUCTURES
M = 7128 FT LB
R = 2 x .25 x 2^2 x 6^2 / (2 + 6) = 9
f = .25 x 7128 x 12 / 9 = 2376 PSI O.K.

TS 6 x 2 x .25

CENTER PIPE:

BENDING AT ONE FOOT BELOW SIGN
M = 66 x 6 x 12 x 3 = 14256 FT LB
S = 14256 x 12 / 1.33 x 23100 = 5.57 IN^3

5" EXTRA STRONG PIPE, MIN.

WELD:

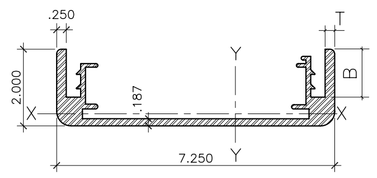
Z = 2.7815^2 PI = 24.3
f = 14256 x 12 / 24.3 = 7040 LB/IN

USE PARTIAL PENETRATION GROOVE WELD TC-P10

EXTRUSION "C"

SECTION PROPERTIES

X-X AXIS	Y-Y AXIS
A = 2.50	A = 2.50
I = 1.03	I = 18.23
S = 1.845 BOTTOM	S = 5.028 LEFT
S = 0.630 TOP	S = 5.028 RIGHT



ALLOWABLE STRESSES:

BENDING TENSION:

X-X AXIS
Fb = 28 KSI
Y-Y AXIS
Fb = 19 KSI

BENDING COMPRESSION:

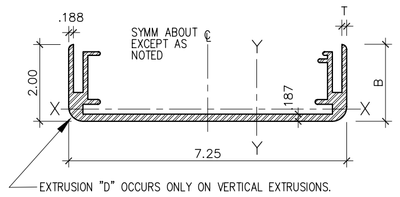
X-X AXIS
FLANGES:
b / t = 2.00 / .250 = 8.0 < 8.9
Fb = 28 KSI

Y-Y AXIS
FLANGES:
b / t = 2.00 / .250 = 8.0
Fb = 27.3 - 0.93 b / t = 19.9 KSI
WEB:
Lb / ry = 6 x 12 / 2.777 = 26
Fb = 23.9 - 0.124 Lb / ry = 20.7 KSI

EXTRUSION "E"

SECTION PROPERTIES

X-X AXIS	Y-Y AXIS
A = 2.50	A = 2.50
I = 0.83	I = 15.43
S = 1.728 BOTTOM	S = 4.239 LEFT
S = 0.490 TOP	S = 4.239 RIGHT



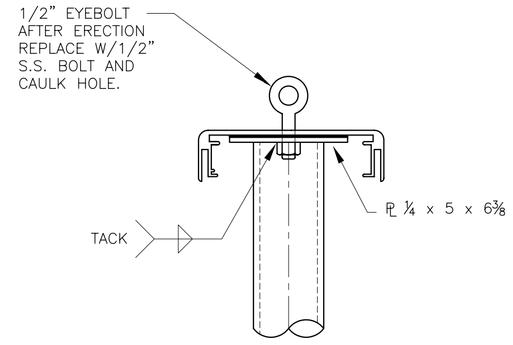
ALLOWABLE STRESSES

BENDING TENSION

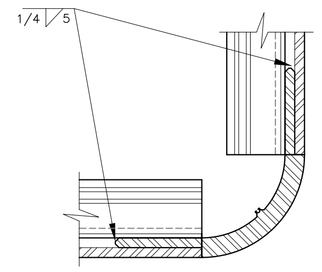
X-X AXIS
Fb = 28 KSI
Y-Y AXIS
Fb = 19 KSI

BENDING COMPRESSION

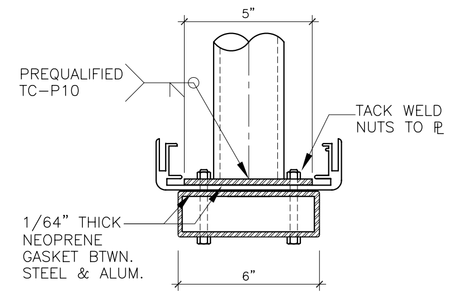
X-X AXIS
FLANGES
b / t = 2.00 / .188 = 10.6
Fb = 40.5 - 1.41 b / t = 25.5 KSI
Y-Y AXIS
FLANGES
b / t = 2.00 / .188 = 10.6
Fb = 27.3 - 0.936 b / t = 17.4 KSI
WEB
Lb / ry = 6x12 / 2.701 = 27
Fb = 23.9 - 0.124 Lb / ry = 19.5 KSI



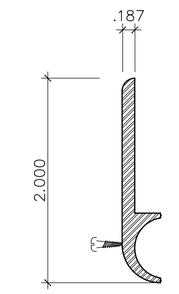
INTERNAL PIPE CONN. AT SIGN TOP N.T.S. 2



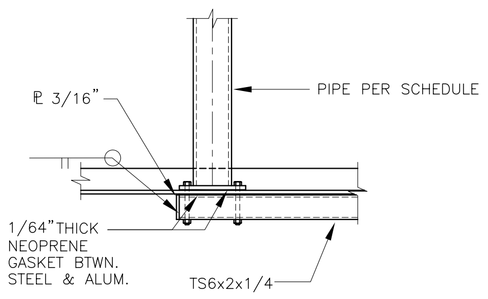
CORNER DETAIL N.T.S. 3



PIPE CONN. SECT. AT SIGN BOTTOM N.T.S. 4



EXTRUSION "D" OCCURS ONLY ON VERTICAL EXTRUSION PIECES N.T.S. 5



INTERNAL PIPE CONN. @ SIGN BOTTOM N.T.S. 6

REVISIONS	BY	DATE
	YY	10/01/01
3/16" EXTRUSION		

STRUCTURAL TECHNOLOGY CONSULTANTS INCORPORATED
619.296.2096
651 ARROYO DRIVE SAN DIEGO, CA 92103

SIGNTRON
1445 W. SEPULVEDA BLVD. TORRANCE CA. 90509
(310) 534-7500

6'x12'DUAL INTERNAL POLE SIGN ELEVATION,EXTRUSIONS AND MISCELLANEOUS DETAILS

DATE: 4/07/98
JOB No. 489-08A
DESIGNED: WT NORTHCUTT
DRAWN BY: YY
APPROVED BY: WTN
489-DIP

SHEET 4 OF 14

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