

PROPERTIES SCHEDULE					
SIGN SIZE	PIPE SIZE	UPPER & LOWER PLATE	TUBE	BOTTOM PLATE	BOLTS (Ø)
3'x16'	3"Ø SCH. 40	1/2"x7"x 5"	TS 6x4x1/2"	3/4"x15"x12"	5/8"
4'x16'	3"Ø SCH. 40	1/2"x7"x 5"	TS 6x4x1/2"	3/4"x15"x12"	5/8"

SIGN ELEVATION

GENERAL NOTES & SPECIFICATIONS

- 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
- DESIGN LOADS:**
 - DEAD LOAD 6 LBS. PER SQ. FT.
 - WIND LOAD 66.0 LBS. PER SQ. FT.
- RESTRICTIONS:**
 - A. THE DESIGN LOADS ABOVE ARE BASED ON A HEIGHT ABOVE GROUND OF 25 FEET MAXIMUM.
 - B. THE DESIGN ANCHORAGES ARE BASED ON ATTACHMENT TO CONCRETE, BRICK, AND CONCRETE BLOCK WALLS ONLY.
- 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.
- MATERIALS:**
 - A. ALUMINUM - ALLOY 6061-T6
 - BOLTS - ASTM F593
 - SIGN PANELS - TO BE UNDERWRITERS LABORATORY APPROVED. USE ONLY APPROVED PLASTICS.
 - B. ADHESIVE ANCHORAGE
 - WALL ANCHORS ARE TO BE ARRANGED TO AVOID JOINTS IN WALL.
 - THREADED RODS SHALL BE HILTI "HIT" ROD OR MEET SAME MATERIAL SPECIFICATIONS (ASTM F593/AISI 304).
 - INSTALL WALL ANCHORS ACCORDING TO I.C.B.O. REPORT NO. 5193 AND MANUFACTURER'S TECHNICAL GUIDES & RECOMMENDATIONS.
 - PROVIDE SPECIAL INSPECTION FOR ALL ANCHOR INSTALLATIONS.
- 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 APPLICABLE CODES. CERTIFIED WELDERS ARE REQUIRED.
- 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.

4' x 16' SIGN

WIND: $W = 66 \times 4' \times 0.5 = 132 \text{ LB/FT}$
 $M (\text{MAX.}) = 2380 \text{ FT. LB.}$
 $f = 2380 \times 12 / 5.116 = 5582 \text{ PSI} < 20000 \text{ PSI O.K.}$

GRAVITY:
 LOWER FRAME:
 $W = 6 \times 4' / 2 = 12 \text{ LB./FT.}$
 $M = 12 \times (16')^2 / 2 = 216 \text{ FT. LB.} = 2592 \text{ IN. LB.}$
 $f (\text{FLG}) = 2592 / 0.481 \text{ IN.}^3 = 5389 \text{ PSI}$
 $f (\text{WEB}) = 2592 / 1.477 \text{ IN.}^3 = 1755 \text{ PSI}$

COMBINED STRESS:
 $5582 / 12500 + 5389 / 20000 = 0.45 + 0.27 = 0.72 < 1.33 \text{ O.K.}$

POLE:
 $\text{FORCE} = (66 \times 4' \times 16') / 2 = 2112 \text{ LB}$
 $M = 2112 \times 2' = 4224 \text{ FT LB} = 50688 \text{ IN LB}$
 $F(b) = 0.66 \times 35000 \times 1.33 = 30700 \text{ PSI}$
 $S (\text{NEEDED}) = 50688 / 30700 = 1.65 \text{ IN}^3$
 $S = 1.72 \text{ IN}^3 > 1.65 \text{ IN}^3 \text{ O.K.}$

UPPER & LOWER PLATE: 3" PIPE SCH. 40

BOLT TENSION
 $T = 2380 \times 12 / 0.99 \times 4" = 7212 \text{ LB}$

TENSION IN 1 BOLT:
 $T = 7212 \text{ LB} / 2 = 3606 \text{ LB}$ USE 4 - 5/8" S.S. BOLTS

BENDING DUE TO BEARING:
 $M = (7212 + 96)(1.30 - 0.04) / 7.0 = 1315 \text{ IN LB}$

PLATE THICKNESS:
 $t = (6 \times 1315 / 1.33 \times 27000)^{0.5} = 0.47 \text{ IN.}$ USE PLATE 1/2" x 5" x 7"

WELD
 $Z = \pi \times 1.75^2 = 9.61 \text{ IN}^2$ USE 1/4" FILLET WELD AROUND
 $f = 12 \times 2380 / 9.61 = 2971 \text{ LB/IN}$

BOTTOM CONNECTION:
 TORSION MOMENT: 66LB/FT² x 4' x 8' x 2.5' = 5280 LB-FT = 63360 LB-IN

CHECK TORSION FOR TS6x4x1/2"
 $a = 5.5" \quad b = 3.5" \quad t = 0.5"$
 $\text{SHEARING STRESS: } S(a) = M(t) / 2(a)(b) \times t = 63360 / 2 \times (5.5)(3.5) \times 0.5 = 3291 \text{ PSI}$
 ALLOW. STRESS: $F(b) = 48000 \times .66 \times 1.33 = 40380 \text{ PSI} > 3291 \text{ PSI O.K.}$

BOTTOM PLATE:

BOLT TENSION
 $T = 5280 \times 2 \times 12 / 0.99 \times 10.5" = 12190 \text{ LB}$

TENSION IN 1 BOLT:
 $T = 12190 \text{ LB} / 2 = 6095 \text{ LB}$ USE 4 - 5/8" S.S. BOLTS

BENDING DUE TO BEARING:
 $M = (12190 + 530)(4.00 - 0.11) / 15.00 = 3303 \text{ IN LB}$

PLATE THICKNESS:
 $t = (6 \times 3303 / 1.33 \times 27000)^{0.5} = 0.74 \text{ IN.}$ USE PLATE 3/4" x 15" x 12"

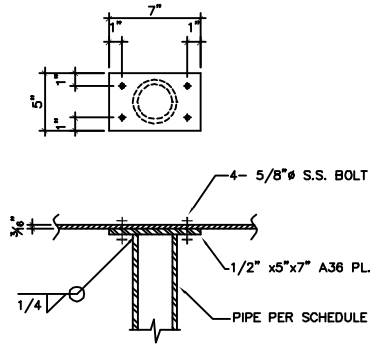
WELD:
 $Z = \pi \times 5.0^2 = 78.54 \text{ IN}^2$ USE 1/4" FILLET WELD AROUND
 $f = 12 \times 10680 / 78.54 = 1613 \text{ LB/IN}$

WELD TO TUBE:
 $\text{FORCE} = M/d = 128720 / 9" = 25344 \text{ LB}$
 $\text{WELD UNIT} = 36000 \times 0.4 \times 0.707 \times 0.375" = 3818 \text{ LB/IN}$
 $\text{WELD LENGTH NEEDED } L = 25344 / 3818 = 6.6"$ USE 3/8" FILLET WELD L=15" BOTH SIDES OF TUBE

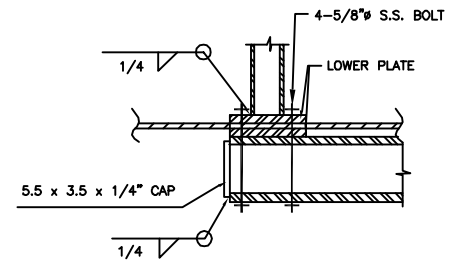
3' x 16' SIGN
 FRAME O.K. BY COMPARISON WITH 4' x 16' SIGN

N.T.S. 1

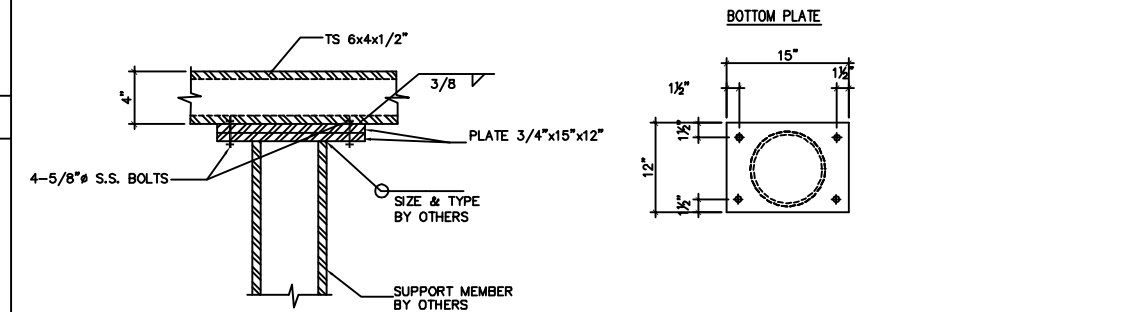
UPPER PLATE (SAW-CUT, NOT SHEARED)



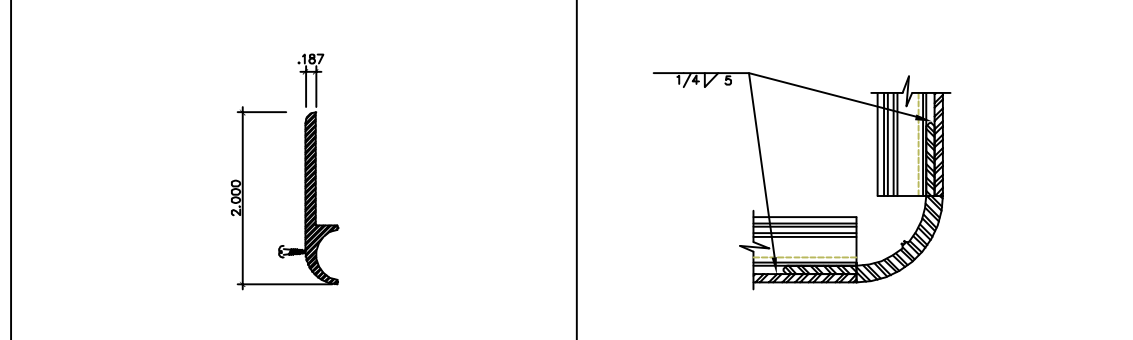
PIPE COL. CONN. AT SIGN TOP N.T.S. 2



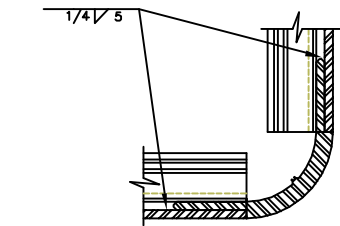
N.T.S. 3



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



EXTRUSION "D" N.T.S. 5



CORNER DETAIL N.T.S. 6

REVISIONS	BY	DATE

STRUCTURAL TECHNOLOGY CONSULTANTS INCORPORATED
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 SAN DIEGO, CA 92103



SIGNTRONIX
 1445 W. SEPULVEDA BLVD., TORRANCE CA. 90509
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DOUBLE CENTER POLE MOUNT
 SIGN ELEVATION, EXTRUSIONS
 AND MISCELLANEOUS DETAILS

DATE: 04/17/01
 JOB No. 489A
 DESIGNED: WTD
 DRAWN BY: WTD
 APPROVED BY: WTD

489-DCPM

SHEET
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 OF 1