



**ANALYSIS SUMMARY - SUPPORT STRUCTURE**

ANALYSIS PROGRAM - SOCRAC VER 1.8  
 DESIGN CRITERIA:  
 WINDWALL UNIFORM PRESSURE = 17 PSF  
 LEEWIND UNIFORM PRESSURE = 16 PSF  
 TOTAL PRESSURE = 33 PSF

SUMMARY OF WIND LOADS

NO.	SHAPE	AREA	HEIGHT	WIND	FORCE	COEFFICIENT	WIND	FORCE
	TYPE	SQ	FT	DIR	PSF	FT-FT	PSF	LB
1	WINDWALL	60.00	3.00	1	17.00	0.00	3.00	510.00
2	WINDWALL	14.00	3.00	2	17.00	0.00	3.00	238.00
3	WINDWALL	4.50	3.00	3	17.00	0.00	3.00	76.50

MOMENT AT GRADE LINE = 2 (PSF)(2) = 4343 FT-LBS  
 SHEAR AT GRADE LINE = 2 (PSF) = 3077 LBS  
 ELEVATION OF RESULTANT = MOMENT/SHEAR = 1.41 FT  
 TOTAL WIND SURFACE = 2 (AREA) = 88.50 FT<sup>2</sup>

SUMMARY OF UPRIGHT STRESS

DESCRIPTION	FROM	TO	STRESS	MOMENT	N	S
	FT	FT	LB/IN	FT-LBS	PS	PS
TS 6x6x3/16	0.00	1.00	10.00	312	33	245
TS 6x6x3/16	1.00	2.00	10.00	312	33	245

P<sub>u</sub> = 4/3 (2)(WIND) = 4040 PS (ASCE SECT. 15.11.4.1)

ANCHOR BOLT ANALYSIS  
 SOCRAC EXISTING BASE PLATE FOR PLATES  
 LEEWIND PRESSURE ON DRIFT BALANCED AGAINST ANCHOR TENSION  
 MAXIMUM TENSION PER BOLT = 1763 LBS  
 UNGRADED CONDITION  
 MOMENT/ANCHOR COORDINATE = 3170(1.41)/4 = 1128 LBS  
 UNGRADED CONDITION CONTROLS

ANCHOR TENSION STRESS = 4 (TENSION AREA) = 1500/4 = 3000 PS  
 P<sub>u</sub> = 1000/4 = 2500 PS (ASCE SECT. 15.11.4.1)  
 ASTM A36 ANCHORS P<sub>u</sub> = 58000 PS

BENDING IN BASE PLATE  
 CALCULATED AS CANTILEVER  
 BENDING LENGTH = 4 IN.  
 SECTION MODULUS = 7 IN.  
 PLATE THICKNESS = 0.315 IN.  
 I<sub>x</sub> = (7)(0.315)<sup>3</sup> / 12 = 0.148 IN<sup>4</sup>  
 S<sub>x</sub> = (7)(0.315) / 6 = 0.367 IN<sup>3</sup>  
 P<sub>b</sub> = (1)(2500)(0.367) = 917.5 LBS (ASCE SECT. 15.11.4.1)

PLATE WELDING  
 SOCRAC CALCULATION BASED UPON WELD GROUP MOMENT OF INERTIA  
 FROM SHEAR CONNECTIONS  
 P<sub>u</sub> = 3000 PS (ASCE SECT. 15.11.4.1)

**ANALYSIS SUMMARY - FOUNDATION**

ANALYSIS PROGRAM - SOCRAC VER 1.7  
 DESIGN CRITERIA:  
 2000 PSF ALLOWABLE GROSS SOIL BEARING  
 1500 PSF ALLOWABLE NET SOIL BEARING

B = FOUNDATION WIDTH = 5.0 FT  
 L = FOUNDATION LENGTH = 4.5 FT  
 L<sub>1</sub> = FOUNDATION DEPTH = 3.0 FT  
 FOUNDATION DEPT. BELOW GRADE = 4.1 FT  
 ESTIMATED SOIL LOAD TO FOUNDATION = 500 LBS  
 WIND UPRIGHT AT GRADE = 3077 LBS  
 WIND UPRIGHT AT FOUNDATION = 1538 LBS  
 WIND UPRIGHT AT BEARING SURFACE = 713 FT LBS  
 WIND SURFACE = 88.50 FT<sup>2</sup> = 1514.25 LBS

CONCRETE VOLUME = 14.00 CU YD = 37.50 CU YD PER FOOTING  
 SOIL VOLUME = 14.00 CU YD = 37.50 CU YD PER FOOTING

SOIL BEARING  
 REQUIRED BEARING AREA TO SUPPORT CALCULATED WIND UPRIGHT WAS DETERMINED BY SOCRAC COMPUTER ANALYSIS

B = 5.0 FT  
 L = 4.5 FT  
 A = 22.5 FT<sup>2</sup>

BEARING AREA = 8 x 8 = 64 FT<sup>2</sup>  
 B = 8.0 FT  
 L = 8.0 FT  
 BEARING SURFACE AREA = 64 PSF  
 CONCRETE BEARING AREA = 64 PSF  
 SOIL BEARING AREA = 1514 PSF  
 WIND UPRIGHT = 481 PSF  
 1514 PSF < 2000 PSF

OVERSIGHT SAFETY FACTOR  
 WIND UPRIGHT OF SOIL AND CONCRETE ADOPTED FOOTING SLAB NOT INCLUDED  
 CALCULATION  
 SAFETY FACTOR = (22.5/14.0) = 1.61 > 1.5

ALTERNATE LATERAL FOUNDATION ANALYSIS  
 PER UPRIGHT BEARING CODE SECT. 2907

P = 1000 LBS  
 H = 3.00 FT  
 L = 4.5 FT  
 S = 15.0 FT  
 W = 150 PSF  
 S<sub>w</sub> = (150)(15) = 2250 FT  
 L = 4.5 FT  
 D<sub>u</sub> = (1)(2250)(4.5) / 1000 = 101.25 FT

**NOTES:**

- DO NOT SCALE THIS DRAWING.
- SOIL MUST PROVIDE SAFE BEARING CAPACITY OF NOT LESS THAN 2000 POUNDS PER SQUARE FOOT (PSF).
- EXCAVATION SHALL BE LEVEL AND PLUMB AND SHALL HAVE VERTICAL SIDES AND A FLAT BASE. EXCAVATION SHALL BE FREE OF LOOSE SOILS, DEBRIS AND FORMING MATERIALS.
- CONCRETE AND REINFORCING STEEL SHALL BE PLACED IN CONFORMANCE WITH AC 318-83.
- CONCRETE SHALL BE READY MIXED DESIGNED TO DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4000 POUNDS PER SQUARE INCH (PSI) IN 28 DAYS.
- REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.
- DO NOT WELD REINFORCING STEEL.
- ANCHOR BOLTS SHALL BE CUT FROM ROUND STOCK CONFORMING TO ASTM A36 AND GALVANIZED IN ACCORDANCE WITH ASTM A123.
- NUTS SHALL BE THREADED FOR USE WITH GALVANIZED BOLTS.
- LATERAL BEARING FOUNDATIONS SHALL BE INSTALLED IN UNDISTURBED SOIL, DO NOT BACK FILL.
- IF LOCAL EXTREME FROST PENETRATION EXCEEDS 4 FEET, EXCAVATE STANDARD 5'-0" FOUNDATION 6 INCHES BELOW FROSTLINE AND INCREASE CONCRETE QUANTITY.
- SOILS SHALL NOT BE INSTALLED UNTIL CONCRETE HAS CURED 96 HOURS.
- THE SIGN INSTALLER SHALL PACK HIGH STRENGTH NON-SHRINK GROUT INTO THE VOID BETWEEN THE BOTTOM SURFACE OF THE BASE PLATE AND THE TOP SURFACE OF THE FOUNDATION.
- DO NOT FABRICATE FROM THIS DRAWING, SEE FABRICATION DRAWING FOR ADDITIONAL DETAILS.
- FOUNDATION DESIGN IS NOT ADEQUATE FOR LOCATIONS WHERE THE SEASONAL FLUCTUATION OF THE WATER TABLE RISES TO AN ELEVATION HIGHER THAN 5'-0" BELOW GRADE.

**DRAWING STANDARD**

THIS DRAWING DEPICTS TYPICAL CONSTRUCTION WITHOUT PRIOR KNOWLEDGE OF INSTALLATION LOCATION, SITE CONDITIONS, OR LOCAL CODE REQUIREMENTS. THIS NOTICE MAY BE TURNED OFF WHEN PLOTTING FOR ENGINEERING CERTIFICATION AND CONSTRUCTION.

**MANUFACTURER FURNISHED INFORMATION CONCERNING SIGN CABINETS**

**ILLUMINATED AREA**  
 LOGO SIGN: 14.2 FT<sup>2</sup>  
 PRICE/MESSAGE PANELS: 6.3 FT<sup>2</sup> PER PANEL

**DISPLAY AREA**  
 LOGO SIGN: 26.3 FT<sup>2</sup>  
 PRICE/MESSAGE PANELS: 6.6 FT<sup>2</sup> PER PANEL

**ELECTRICAL INFORMATION**  
 LOGO SIGN: CONTAINS FIVE (5) F60 T12 CW/HO LAMPS  
 REQUIRES 3.0 AMPS (MAXIMUM) LINE CURRENT  
 PRICE/MESSAGE PANELS: CONTAINS ONE (1) F60 T11 CW/HO LAMPS PER PANEL  
 REQUIRES 1.2 AMPS (MAXIMUM) LINE CURRENT PER PANEL  
 ONE (1) 15 AMP, 120 VAC CIRCUITS (60Hz) IS REQUIRED AS PRIMARY ELECTRICAL SERVICE TO MAXIMUM SIGN CONFIGURATION.

**MATERIAL SCHEDULE**

ITEM	SUPPLIED BY	INSTALLED BY
IDENTIFICATION SIGN	OWNER	SIGN INSTALLER
PRICE/MESSAGE SIGNS	OWNER	SIGN INSTALLER
A.C.M. SHROUD	OWNER	SIGN INSTALLER
STEEL SUPPORT STRUCTURE	G.C.	G.C.
CONCRETE FOUNDATION	G.C.	G.C.
ANCHOR BOLTS	G.C.	G.C.
GROUT UNDER BASE PLATE	SIGN INSTALLER	SIGN INSTALLER

**BP Oil Co.**  
 RETAIL MARKETING  
 DESIGN AND ENGINEERING  
 200 PUBLIC SQUARE  
 CLEVELAND, OHIO 44114

**ELROD & COMPANY**  
 CONSULTING ENGINEERS  
 2318 OLD FORT PARKWAY, WUPPERBROOK, TN 37178  
 EC 1082-84

PERMIT DRAWING

**5 x 10 SIGN  
 HORIZONTAL GROUND MOUNT  
 WITH SHROUD  
 30 PSF**

DWG. NO.	17-5x10-22R-6	REV.	1
SCALE	AS NOTED	DATE	11/22/89
DATE	11/22/89	BY	GM
REVISIONS		DATE	CHKD
1. GENERAL REVISIONS PER B.P. REQUEST		11/22/89	ROLL
2. REVISIONS PER B.P. REQUEST		11/22/89	GM