LAKE PONTCHARTRAIN, LA.
AND VICINITY
HURRICANE PROTECTION PROJECT

RELOCATION OF IH-NC FLOOD PROTECTION FRANCE ROAD TERMINAL NEW ORLEANS, LOUISIANA

Design Memorandum No. 2

General Design

Supplement No. 8A

VOLUME III - APPENDIX D

October 15, 1997

FINAL REPORT

Submitted By:

PORT OF
NEW ORLEANS

Prepared By:

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Engineers Scientists Planners Surveyors GIS Specialists

FINAL REPORT

10/15/97

RELOCATION OF IH-NC FLOOD PROTECTION
FRANCE ROAD TERMINAL
NEW ORLEANS, LOUISIANA
GENERAL DESIGN MEMORANDUM NO. 2
GENERAL DESIGN
SUPPLEMENT NO. 8A

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APPENDICES A - C

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APPENDIX D

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4. Typical T-walls

APPENDIX D

TYPICAL STRUCTURAL DESIGN COMPUTATIONS

1. TYPICAL SWING GATE
2. TYPICAL ROLLER GATE
3. TYPICAL GATE FOUNDATION DESIGN
4. TYPICAL T-WALLS

TYPICAL SWING GATE

Client PORT OF NEW ORLEANS Project
Computations for SWING GATE No. 2
Computed by G. FLITTER Date 1/22/97 Checked by Date

SINGLE SWING

OPENING WIDTH = 25'-0"

SILL ELEVATION = 8.0'

TOP OF GATE ELEVATION = 15.0'

HEIGHT OF GATE = 7.0'

GATE LENGTH = 27'-2"

DESIGN OF SKIN PLATE (USING 5/16" PLATE)

$P_{max} = 0.0624 * 7.0' = 0.437$ ksf

$S = \frac{bt^2}{6} = \frac{12(5/16)^2}{6} = 0.1953$ in³/Ft

MAXIMUM ALLOWABLE MOMENT $= S F_b$ $F_b = 1.1 * .75 F_y = 30$ ksi

$0.1953 (30.0) = 5.86$ "-k/ft $= 0.488$ '-k/ft

INTERIOR SPAN : $M = \frac{1}{12} w l^2$

0.488 '-k/Ft $= \frac{1}{12}(0.437) l^2$

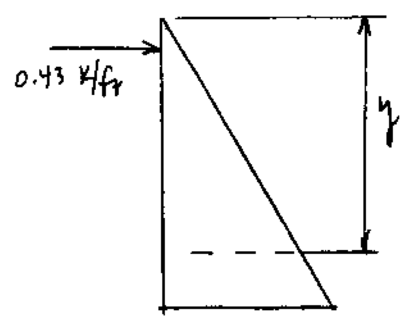
$l = 3.66'$

EXTERIOR SPAN $M = \frac{1}{10} w l^2$

0.488 '-k/Ft $= \frac{1}{10}(0.437) l^2$

$l = 3.3'$

Client________ Project________
Computations for________
Computed by________ Date________ Checked by________ Date________



$\frac{1}{2}(0.0624)y^2 = 0.43\ ^{k}/_{ft}$

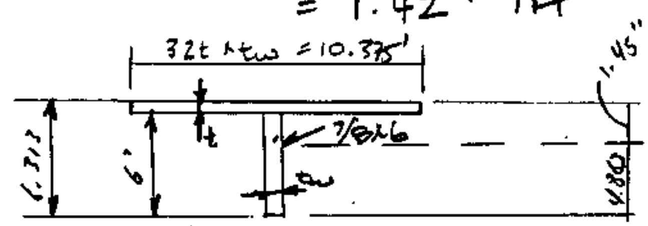
$y = 3.7'$

$M = 0.43\ ^{k}/_{ft}\ (3.7' - 0.5')$

$-\frac{1}{6}(0.0624)(3.7')$

$= 1.46 - 0.07$

$= 1.42\ ^{1\text{-}k}/_{ft}$



ITEM	AREA	Y	Ay	Ay²	I
PL 10.375 x 5/16	3.242	0.156	0.506	0.079	—
PL 3/8 x 6	2.25	3.313	7.454	24.696	6.75
	5.492	(1.45)	7.96	24.775	6.75

$I = I + \Sigma Ay^2 - (Ay * y)$

$= 6.75 + 24.775 - (7.96 * 1.45)$

$= 19.983\ in^4$

$S_{TOP} = 19.983 / 1.45 = 13.781\ in^3$

$S_{BOT} = 19.983 / 4.863 = 4.109\ in^3$

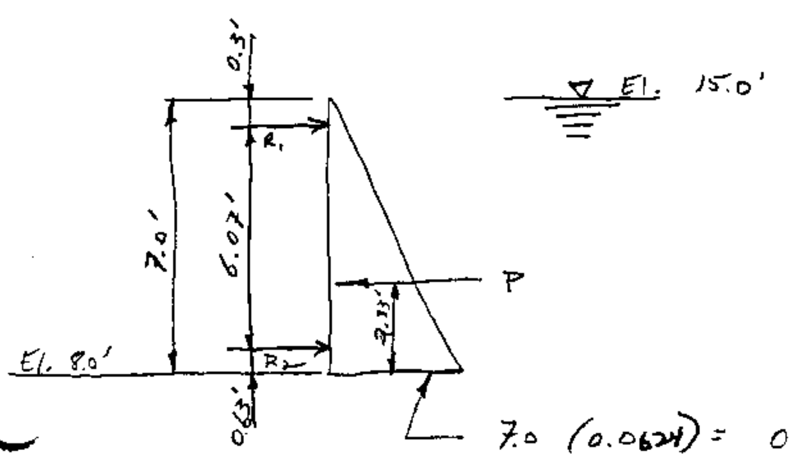
$f_s = M/S_{BOT} = (1.06)(3.33)(12) = 10.308$ KSI

Client: PORT OF NEW ORLEANS Project:
Computations for: SWING GATE No. 2
Computed by: G ELITTER Date: 1/22/97 Checked by: Date:

EFFECTIVE FLANGE WIDTH AISC 1.9.1.2

$= 32t + t_w$

$= 32(0.3125) + 0.375 = 10.375''$



$P = (7)(3.5)(0.0624) = 1.53$ KIP/FT

$\Sigma M_{R_1} = 0 \quad 4.37(1.53) - R_2(6.07)$

$R_2 = 1.10$ KIPS/FT

$-R_1 = 1.10 - 1.53$

$R_1 = 0.43$ KIPS/FT

Client PORT OF NEW ORLEANS Project
Computations for SWING GATE NO. 2
Computed by G. FLITTER Date 1/22/97 Checked by Date

GIRDERS

SPAN = OPENING + COLUMN FACE TO C/L HINGE + COLUMN FACE TO C/L 1½" BEARING BAR

SPAN = 25.0 + 1.08 + 0.60 = 26.68'

$L_b = 6'\text{-}8'' = 6.67' = 80.0''$

$L_c = 85.25'' > 80.0''$

$\therefore F_b = .66 F_y$

TOP GIRDER

TRY W 14 × 34 (5/16" min thickness requirement)

Load, w = 0.44 k/ft

$M = \frac{1}{8} w l^2 = \frac{1}{8}(0.44)(26.68)^2 = 39.15$ ft-k

$f_b = \frac{M}{S} = \frac{(39.15)(12)}{48.6} = 9.67$ ksi < 20.0 ksi

$F_b = 1.11(0.66)(36) = 26.4$ KSI

OK USE W14 X 34

BOTTOM GIRDER

Load, w = 1.10 K/ft W14×53

$M = \frac{1}{8} w l^2 = \frac{1}{8}(1.10)(26.68)^2 = 97.9$ '-k

$S_{req} = \frac{M}{f_b} = \frac{97.9(12)}{24} = 48.95 \text{ in}^3$

∴ Try W14×43 with $S = 62.7 \text{ in}^3 > 48.95 \text{ in}^3$

DEFLECTION

$\Delta max = \frac{5 w l^4}{384 E I} = \frac{5\left(\frac{1.10}{12}\right)(26.68 \times 12)^4}{384(29 \times 10^3)(428)} = 1.01''$

$\Delta allowable = \frac{l}{400} = \frac{26.68(12)}{400} = 0.80''$

W14×43 exceeds allowable deflection

Client: PORT OF NEW ORLEANS Project:
Computations for: SWING GATE NO. 7
Computed by: G. FLITTER Date: 1/22/97 Checked by: Date:

$$\Delta_{max} = \frac{5\,(1.10/12)(26.68 \times 12)^4}{384\,(29E3)(485)} = 0.89''$$

W 14x48 exceeds allowable deflection
∴ try W14x53

$$\Delta_{max} = \frac{5\,(1.10/12)(26.68 \times 12)^4}{384\,(29E3)(541)} = 0.81''$$

$$0.81'' > 0.80''$$

∴ Try W14x68

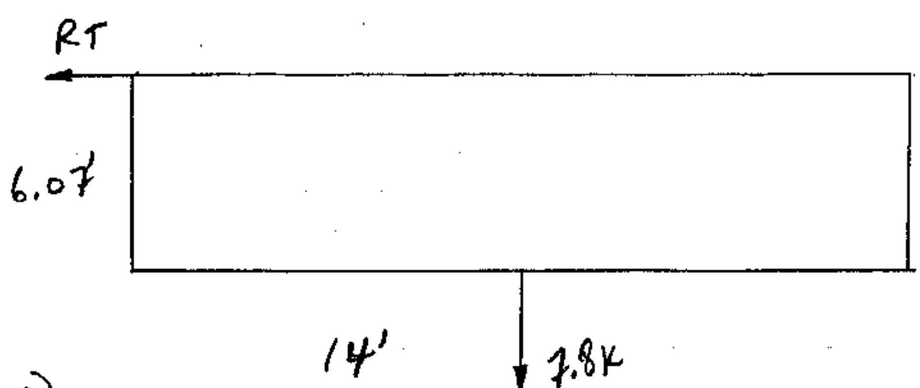
$$\Delta_{max} = \frac{5\,(1.10/12)(26.68 \times 12)^4}{384\,(29E3)(723)} = 0.60'' < 0.80''\ \text{OK}$$

∴ Use <u>W 14x68</u> (Depth (d) = 14.04")

Client: PORT OF NEW ORLEANS Project:
Computations for: SWING GATE # 2
Computed by: G. FLITTER Date: 1/23/97 Checked by: Date:

GATE WEIGHT

		WEIGHT (LB)
5/16 ℙ	7.0 * 27.167 x 12.8	2,434
W14 x 68	2 * 68 * 27.167	3,695
ℙ 1/2 x 14 1/2"	2*7.0 * 24.65	345
ℙ 3/8 x 13 1/2"	3 * 7.0 * 17.21	361
ℙ 3/8 x 4"	4 * 7.0 * 5.10	143
ℙ 1/2 x 4"	4 * 6.0 * 6.8	163
L 5x5x1/2	27.167 * 16.2	440
1 1/2 in² BAR	6.0 * 7.65	46
WELD		60
SEAL		80
		7,767 lbs
		= 7.8 KIPS



$R_T = \frac{14(7.8)}{6.07}$

$R_T = 18.0K$

W14X68 $I_y = 121 \text{ in}^4$

$\Delta_y = \frac{5(7.8/12)(12 \times 26.68)^4}{\ldots} =$

Client PORT OF NEW ORLEANS Project
Computations for GATE NO. 2 HINGE REACTIONS
Computed by G. FLITTER Date 2/4/97 Checked by Date

HINGE REACTIONS

I) MAXIMUM HINGE REACTION DUE TO WATER LOAD:

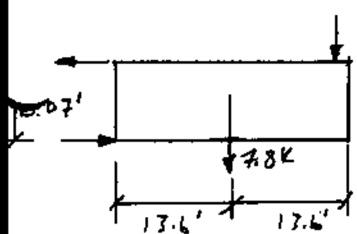
TOP HINGE REACTION = 0.43 * 13.6' = 5.84 KIPS

BOTTOM HINGE REACTION = 1.10 * 13.6' = 14.96 KIPS

II) MAXIMUM HINGE REACTION DUE TO SELF WEIGHT:

TOP HINGE REACTION = $\frac{(7.8 * 13.6)}{6.07}$

= 17.5 KIPS

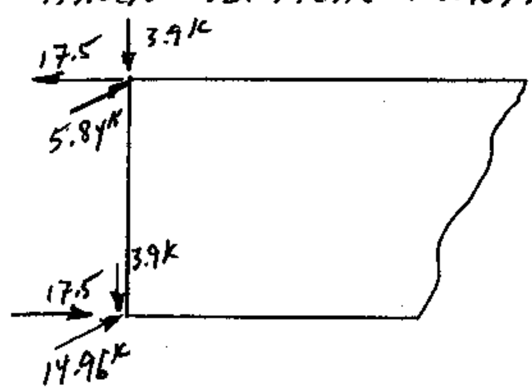


BOTTOM HINGE REACTION = −17.5 KIPS

III) VERTICAL REACTION DUE TO SELF WEIGHT:

THE VERTICAL LOAD MAY BE DISTRIBUTED EQUALLY AMONG THE TWO HINGE.

∴ HINGE VERTICAL REACTION = $\frac{7.8}{2}$ = 3.9 KIPS

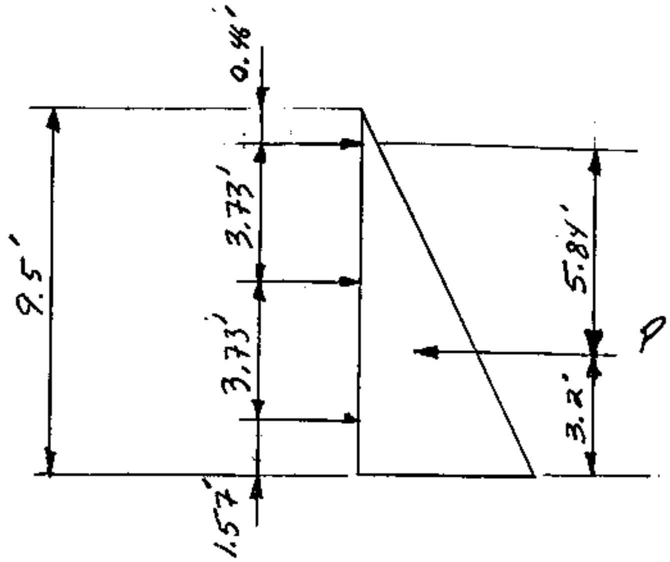


TYPICAL ROLLER GATE

Client PORT OF NEW ORLEANS Project

Computations for ROLLER GATE NO. 2

Computed by G. FLITTER Date 1/22/97 Checked by Date



GATE HEIGHT = 9.5'

OPENING WIDTH = 45'-0"

SILL ELEV. = 5.5'

TOP OF GATE ELEV = 15.0'

GATE LENGTH =

$45' + 1.75' + 2.75' = 49.5'$

$P = (9.5)(4.75)(0.0624 \text{ k/ft}^3) = 2.8 \text{ k/ft}$

SKIN PLATE

LOAD, $w = (0.0624)(9.5) = 0.593 \text{ k/ft}^2$

$$S = \frac{bt^2}{6} = \frac{12(5/16)^2}{6} = 0.1953 \text{ in}^3/\text{ft}$$

MAXIMUM ALLOWABLE MOMENT $= S F_b$

$0.1953 (20.0) = 3.9 \text{ "k/ft} = 0.326 \text{ 'k/ft}$

INTERIOR SPAN $M = \frac{1}{12} w l^2$

$$0.326 = \frac{1}{12}(.593) l^2$$

$l = 2.6' = 2'-6\frac{7}{8}"$ max

$\therefore$ Use 2'-6" spacing

EXTERIOR SPAN $M = \frac{1}{10} w l^2$

$.326 = \frac{1}{10}(.593) l^2$ $l = 2.3' = 2'-4\frac{1}{8}"$

Client: PORT OF NEW ORLEANS Project: ________
Computations for: ROLLER GATE NO. 2
Computed by: G. FLITTER Date: 11/22/77 Checked by: ________ Date: ________

GATE WIDTH = 49.5'

(2'-6")(18) = 45.0'

2 - 2'-3" Exterior Spans

18 - 2'-6" Interior Spans

GIRDERS

SPAN = 45.0' + 1.75' + 2.75' = 49.5'

$F_b = (1.11)(0.60)(36) = 24.0$ KSI

TOP GIRDER

$L_B = 11.25' = 135"$

TRY W 14x 68

$L_c = \frac{76 b_f}{\sqrt{36}} = 126.7 < 135"$

Load w = 0.27 K/FT

$$M = \frac{w l^2}{8} = \frac{0.27(49.5')^2}{8} = 82.7^{\prime K}$$

$$f_b = \frac{M}{S} = \frac{82.7^{\prime K}(12)}{103 \text{ in}^3} = 9.63 \text{ ksi} < 24 \text{ ksi}$$

OK

DEFLECTION (Δ)

$$\Delta_{max} = \frac{5 w l^4}{384 E I}$$

$$\Delta_{max} = \frac{5(.27/12)(49.5 \times 12)^4}{384(29E3)(723)} = 1.7"$$

Client PORT OF NEW ORLEANS Project
Computations for ROLLER GATE # 1
Computed by G. FLITTER Date 1/22/97 Checked by Date

$3.2'' > 1''$ ∴ Try W 18 x 97

$L_c = 141.1'' > 135''$ ∴ $F_b = (1.11)(.66)(36) = 26.34$ KSI $> f_b = \frac{82.7(12)}{188} = 5.3$ KSI

$$\Delta_{max} = \frac{5(.27/12)(49.5 \times 12)^4}{384(29E3)(1750)} = 0.72'' < 1''$$

OK

Use W 18 x 97

MIDDLE GIRDER

LOAD, $w = 0.67$ K/FT

$$M = \frac{w l^2}{8} = \frac{(0.67)(49.5)^2}{8} = 205.2 \text{ 'K}$$

$$S_{req'd} = \frac{M}{F_b} = \frac{(205.2)(12)}{20.0} = 123.1 \text{ in}^3$$

Try W 24 x 117 with $S = 291 \text{ in}^3 > 123.1 \text{ in}^3$

$L_c = 162.1'' > 135''$ ∴ $F_b = 26.37$ KSI $f_b = \frac{205.2(12)}{291.0} = 8.46$ KSI $< F_b$ OK

$$\Delta_{max} = \frac{5(.67/12)(49.5 \times 12)^4}{384(29E3)(3540)} = 0.88'' < 1'' \text{ OK}$$

∴ USE W 24 x 117

BOTTOM GIRDER

LOAD, $w = 1.86$ K/FT

$$M = \frac{(1.86)(49.5)^2}{8} = 569.7 \text{ 'K}$$

$$S_{req'd} = \frac{M}{F_b} = \frac{569.7(12)}{20} = 342 \text{ in}^3$$

PYBURN & ODOM, INC — CONSULTING ENGINEERS Sheet No. 4/6

Client______ Project______

Computations for______

Computed by______ Date______ Checked by______ Date______

TRY W 30 x 124 WITH $S = 355 in^3 > 342 in^3$

$L_c = 133.2" < L_b = 135"$ ∴ $F_b = (1.11)(0.6)(36) = 24 KSI$ $f_b = \frac{569.7(12)}{355} = 19.26 < F_b$

$$\Delta_{max} = \frac{5(1.86/12)(49.5 \times 12)^4}{384(29E3)(5360)} = 1.6" > 1$$ No Good

Try W 36 x 150 with $S = 504 in^3 > 303 in^3$

$L_c = 151.7" > L_B = 135"$ ∴ $F_b = 26.37$ $f_b = \frac{569.7(12)}{504} = 13.56 KSI < F_b$

$$\Delta_{max} = \frac{5(1.86/12)(49.5 \times 12)^4}{384(29E3)(9040)} = 0.96" < 1"$$

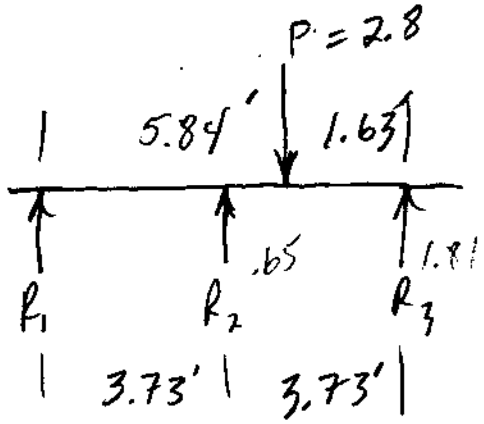
∴ USE W 36 x 150

USE W 36 x 150 FOR BOTTOM GIRDER

USE W 24 x 117 FOR MIDDLE GIRDER

USE W 36 x 150 FOR TOP GIRDER (FOR SYMETRY)

SEE SKETCH PAGE 5/6



$+\circlearrowright\ \Sigma M_{R_1} = -R_2(3.73') + 2.8(5.84) - R_3(7.46) = 0$

$+\circlearrowright\ \Sigma M_{R_3} = -2.8(1.63) + R_2(3.73) + R_1(7.46) = 0$

$+\uparrow\ \Sigma F_y = R_1 + R_2 + R_3 - 2.8 = 0$

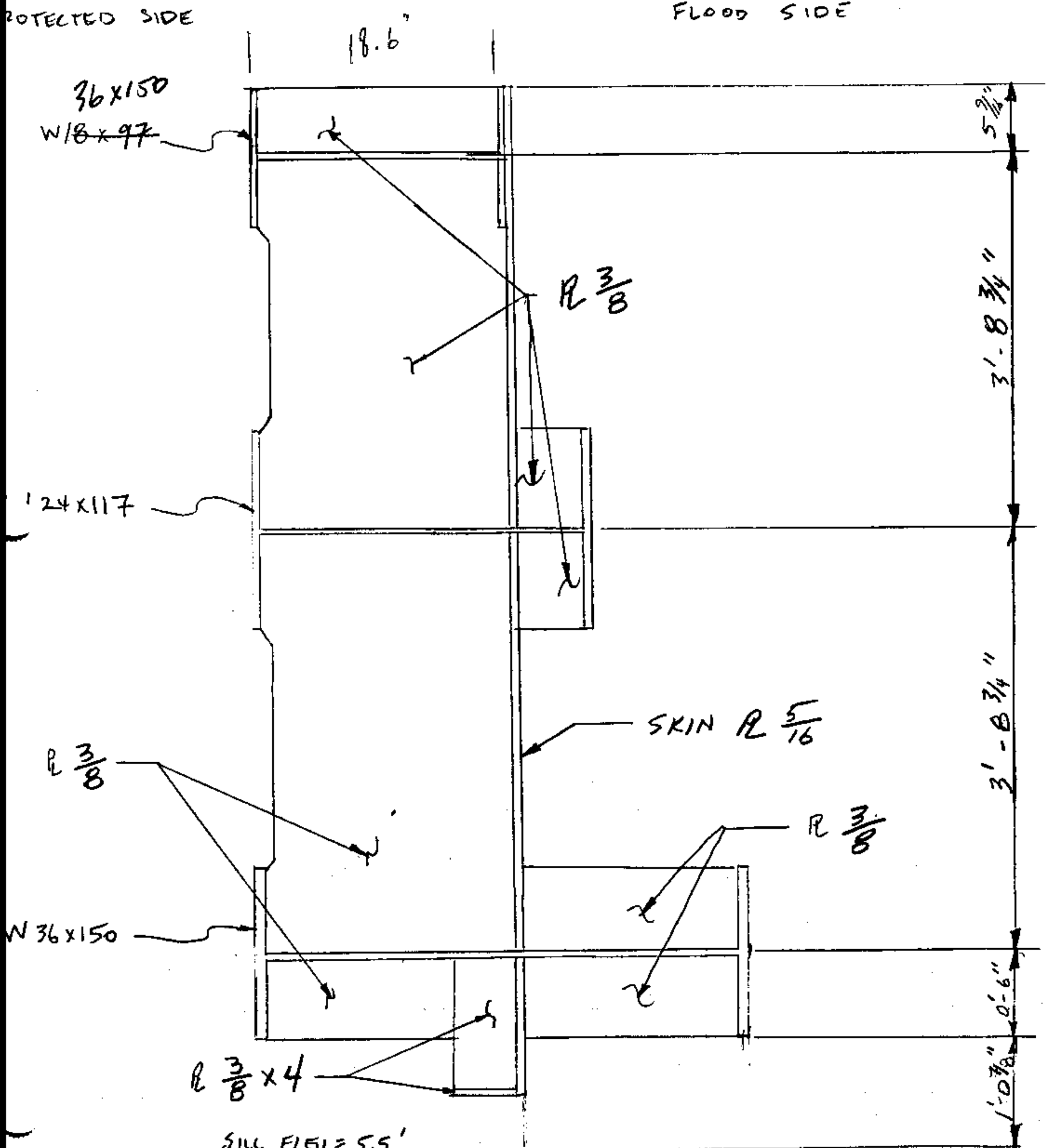
(1) $3.73R_2 + 7.46R_3 = 16.4$

(2) $7.46R_1 + 3.73R_2 = 4.6$

(3) $R_1 + R_2 + R_3 = 2.8$

$R_1 = 0.27$ ✓
$R_2 = 0.67$
$R_3 = 1.86$

Client PORT OF NEW ORLEANS Project
Computations for ROLLER GATE #1
Computed by Date Checked by Date



ROLLER GATE SECTION

SCALE = NTS

Client PORT OF NEW ORLEANS Project
Computations for ROLLER GATE # 1
Computed by G. FLITTER Date 1/23/97 Checked by Date

GATE WEIGHT

		WEIGHT (LBS)
5/16 ℞	9.5 x 49.5 * 12.8	6019
W18x97	97 * 49.5	4802
W24x117	117 * 49.5	5792
W36x150	150 * 49.5	7425
℞ 3/8"x18"	8.5 * 1.5 * 15.3 * 6	1171
℞ 3/8"x6"	0.5 * 1.5 * 15.3 * 12	138
℞ 3/8"x4"	0.3 * 1.5 * 15.3 x 6	41
℞ 3/8"x4"	0.3 * 1.0 * 15.3 x 6	28
℞ 3/8"x6"	0.5 * .5 * 15.3 * 12	161
L 5x3½x½	49.5 * 13.6	673
L 6x4½x½	2 * 9.5 * 16.2	308
WELD		200
1½ in² BAR	2 x 9.5 x 7.66	146
SEAL		160
℞ 3/8"x4"	0.3 * 8.5 * 15.3 * 15	585
		27,649 LBS

W 36x150

$I_y = 270 \text{ in}^4$

= 27.6 KIPS
12 CASTORS @ 200# @ = 2.4
30 KIPS

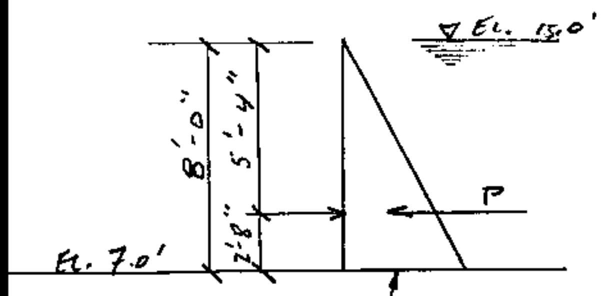
∴ USE 0.6 K/FT

$$\Delta_y = \frac{5(0.6/12)(16*12)^4}{384(29E3)(270)} = 0.02''$$

MUST PLACE STEEL CASTERS MINIMUM 10' c/c

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: GATE @ MECO (GATE NO. 3)
Computed by: MPZ Date: 5/29/97 Checked by: ______ Date: ______

L = 26.125



P = AREA

P = (0.50 K/FT²)(8.0')(1/2) = 2 K/FT

(8.0')(0.0624 K/FT³) = 0.50 K/ft²

OPENING WIDTH = 20'-0"

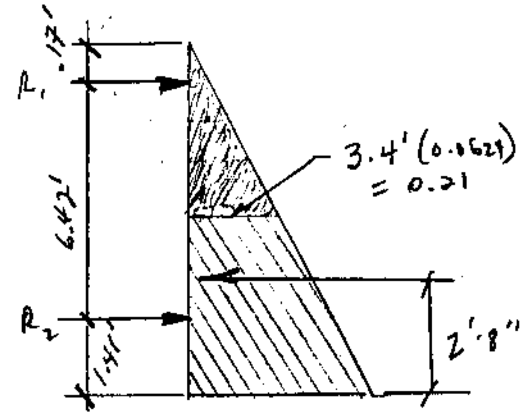
TOP OF GATE EL. 15.0'

SILL EL. 7.0'

HEIGHT OF GATE 8'-0"

ASSUME TOP GIRDER TO BE W12 x 19

ASSUME BOT GIRDER TO BE W21 x 44



R_1 = 0.21 (3.4)(1/2) = 0.36 K/ft

R_2 = 2.0 - 0.36 = 1.64 K/ft

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for GATE @ MEGO
Computed by [signature] Date 5/29/97 Checked by ______ Date ______

BOTTOM GIRDER

$L = 20' + 2.0' + 3.0' = 25'\text{-}0''$

$W = 1.64\ k/FT \qquad F_y = 36\ KSI$

$M = \frac{w\ell^2}{8} = \frac{1.64\,(25)^2}{8} = 128^{\,1K} = 1537^{\,IN\text{-}K}$

TRY W 18X50 WITH $S_x = 88.9\ IN^3$ AND $I_x = 800\ IN^4$

CHECK COMPACTNESS

FLANGE

$b_f = 7.5''$

$t_f = 0.57$

$b_f/t_f = \frac{7.5}{0.57} = 13.2 > \frac{65}{\sqrt{F_y}} = 10.83$

∴ FLANGE NON-COMPACT

WEB

$d = 18''$

$t_w = 0.355''$

$= \frac{18.0}{0.355} = 51. < \frac{640}{\sqrt{F_y}} = 106.7$

∴ COMPACT WEB

∴ NON-COMPACT SECTION

$L_b = 10' > L_c = 7.9'$

∴ $F_b = 0.6F_y = 0.6(36) = 21.6\ KSI$

$f_b = \frac{M}{S_x} = \frac{1537.^{\,IN\cdot K}}{88.9\ IN^3} = 17.3\ KSI < 21.6\ KSI$

CHECK DEFLECTION

$\Delta_{max} = \frac{5w\ell^4}{384EI} = \frac{5(1.64/12)(25' \times 12)^4}{384\,(29E3)\,800} = 0.62''$ ∴ OK

USE W18X50

Client PORT OF NEW ORLEANS Project
Computations for GATE @ MECO
Computed by Date Checked by Date

TOP GIRDER

$L = 25'$

$W = 0.36\ ^{k}/_{FT}$ $\quad F_y = 36\,KSI$

$$M = \frac{w\ell^2}{8} = \frac{0.36\,(25')^2}{8} = 28.125^{'k} = 338^{''\text{-}k}$$

∴ TRY W 12x19 WITH $S_x = 21.3$

$L_b = 10' > L_c = 4.2'$

∴ $F_b = 0.6F_y = 21.6\ KSI$

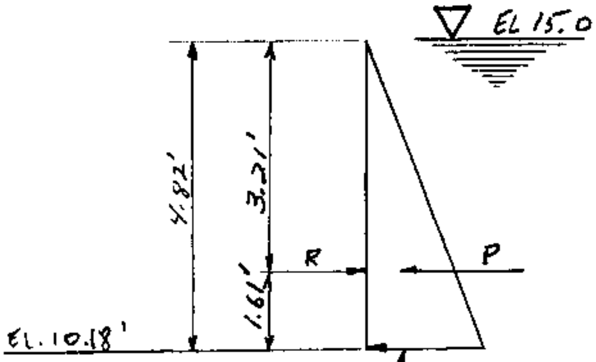
$$f_b = \frac{M}{S_x} = \frac{369}{21.3} = 17.3\,KSI < 21.6\,KSI$$

CHECK DEFLECTION

$$\Delta_{max} = \frac{5w\ell^4}{384EI} = \frac{5\,(0.36/12)(26.125 * 12)^4}{384\,(29E3)(130)} = 1'' \quad OK$$

USE W18x35

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: ROLLER GATE NO. 5
Computed by: [signature] Date: 5/15/97 Checked by: Date:



P = AREA

$P = (0.30\,K/FT^2)(4.82\,FT)(1/2) = \underline{0.72\,K/FT}$

$(4.82')(0.0624\,K/FT^3) = 0.30\,K/FT^2$

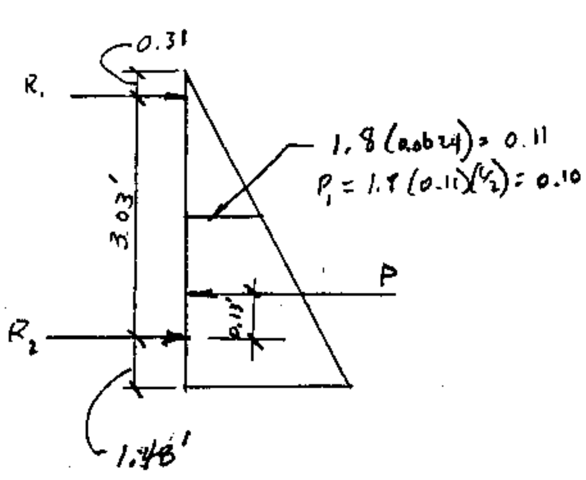
OPENING WIDTH = 48'-0"

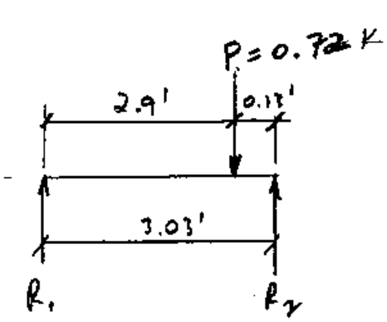
TOP OF GATE EL. = 15.0'

SILL EL. = 10.18'

HEIGHT OF GATE 4.82'

ASSUME TOP GIRDER TO BE W18x60
& BOTTOM GIRDER TO BE W33x118





a = 0.13' b = 2.9'

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE NO. 5
Computed by [initials] Date 5/15/97 Checked by ______ Date ______

$$R_1 = \frac{Pa}{\ell} = \frac{0.72\text{ KIPS}(0.13')}{3.03'} = 0.03 \text{ KIPS}$$

$$R_2 = \frac{Pb}{\ell} = \frac{0.72\text{ KIPS}(2.9')}{3.03'} = 0.69 \text{ KIPS}$$

BOTTOM GIRDER

$$L = 48' + 2.5625' + 3.5625' = 54.125'$$

$$W = 0.69 \text{ K/FT} \qquad F_y = 36\text{ KSI}$$

$$M = \frac{wL^2}{8} = \frac{(0.69\text{ K/FT})(54.125')^2}{8} = 253 \text{ K-FT}$$

$$M = 3032 \text{ K-IN}$$

TRY W 18x65 —— $S_x = 117 \text{ in}^3$

CHECK COMPACTNESS

FLANGE

$b = 7.59''$
$t = 0.75''$

$$b/t = 10.12 < \frac{65}{\sqrt{F_y}} = 10.83$$

∴ COMPACT FLANGE

WEB

$d = 18.35''$
$t = 0.45''$

$$\frac{d}{t} = 41 < \frac{640}{\sqrt{F_y}} = 106.7$$

∴ COMPACT WEB

∴ SECTION IS COMPACT BUT $L_b = 10' > L_c = 8.0'$

∴ USE $F_b = 1.11(0.60)F_y = 1.11(0.60)(36) = 23.98 \text{ KSI}$

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: ROLLER GATE NO. 5
Computed by: DPZ Date: 5/15/97 Checked by: ______ Date: ______

$$f_b = \frac{M}{S} = \frac{3032 \text{ K-IN}}{117 \text{ IN}^3} = 25.91 \text{ KSI}$$

$$f_b = 25.91 \text{ KSI} > F_b = 23.98 \text{ KSI} \qquad \text{N.G.}$$

∴ TRY W 21×62 WITH $S_x = 127 \text{ IN}^3$

CHECK COMPACTNESS

FLANGE

$b = 8.24''$ $t_f = 0.615''$

$$\frac{b}{t} = \frac{8.24}{0.615} = 13.4 > \frac{65}{\sqrt{F_y}} = 10.83$$

∴ FLANGE NON-COMPACT

WEB

$d = 21''$ $t_w = 0.40''$

$$\frac{d}{t} = \frac{21}{0.40} = 52.5 < \frac{640}{\sqrt{F_y}} = 106.7$$

∴ WEB COMPACT

$L_b = 10.0' > L_c = 8.7'$

∴ USE $F_b = 1.11(0.60)F_y = 1.11(0.60)(36) = 23.98 \text{ KSI}$

$$f_b = \frac{M}{S} = \frac{3032 \text{ K-IN}}{127 \text{ IN}^3} = 23.87 \text{ KSI} < F_b = 23.98 \text{ KSI} \quad \text{O/K}$$

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: ROLLER GATE NO. 5
Computed by: JPL Date: 5/15/97 Checked by: ______ Date: ______

CHECK DEFLECTION $I = 1330 \text{ in}^4$ $\Delta_{ALL} = 1''$

$$\Delta_{max} = \frac{5 w \ell^4}{384 EI} = \frac{5(0.69/12)(54.125 * 12)^4}{384(29E3)(1330)}$$

$$= 3.45''$$

$$I_{req} = \frac{5(0.69/12)(54.125 * 12)^4}{384(29E3)} = 4594 \text{ in}^4$$

∴ ~~USE W30 X116~~ FOR A MAXIMUM DEFLECTION OF 1"
~~FOR BOTTOM GIRDER~~ SEE PAGE 9/9

TOP GIRDER

$L = 54.125'$ $w = 0.03$ k/ft $F_y = 36$ ksi

$$M = \frac{(0.03)(54.125)^2}{8} = 10.98 \text{ ik} = 132 \text{ in-k}$$

$$I_{req} = \frac{5(0.03/12)(54.125 * 12)^4}{384(29E3)} = 200 \text{ in}^4$$

TRY W12×26 WITH $S_x = 33.4 \text{ in}^3$

CHECK COMPACTNESS

FLANGE
$b_f = 6.49''$ $t_f = 0.38''$

$$\frac{b}{t} = \frac{6.49}{0.38} = 17.07 > \frac{65}{\sqrt{F_y}} = 10.83$$

∴ FLANGE NON-COMPACT

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: ROLLER GATE NO. 5
Computed by: [initials] Date: 5/15/97 Checked by: ____ Date: ____

WEB

$d = 12.22"$ $t_w = 0.23$

$\frac{d}{t} = \frac{12.22}{0.23} = 53 < \frac{640}{\sqrt{F_y}} = 106.7$

∴ WEB COMPACT

$L_b = 10' > 6.9' = L_c$ ∴ USE

$F_b = 1.11(0.60)F_y = 23.98$ KSI

$f_b = \frac{132 \text{ IN-K}}{33.4 \text{ IN-K}} = 3.95 \text{ KSI} < F_b = 23.98 \text{ KSI}$

~~∴ USE W 12×26~~

SEE PAGE 8/

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE NO. 5
Computed by DPJ Date 5/16/97 Checked by ______ Date ______

SKIN PLATE

LOAD, $w = 0.72\ k/ft^2$ W30 x 116 $\frac{bf}{2} = \frac{10.495}{2} = 0.44'$

$P = (6"$ ABOVE BOT GIRDER FLANGE$) = (0.0624\ k/ft^3)(4.82' - 1.48' - .44' - 0.5')$

$P = 0.15\ ksf$

$p = 0.001\ ksi$ $L = 2.5'$

$M = pL^2/12 = 0.001\,(2.5)^2/12 = 0.0005\ k\text{-}in$

$F_b = 1.11\,(0.75)F_y = 30\ ksi$

t_{min} for stress $= (6M/F_b)^{0.5} = (6(0.0005)/30)^{0.5} = \underline{0.01"}$

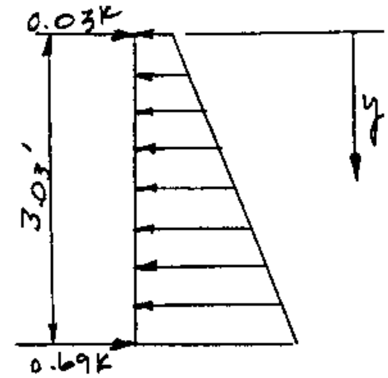
t_{min} for deflection $= (pL^4/12.8E)^{0.25}$

$= [0.001\,(2.5)^4/12.8(29E3)]^{0.25} = \underline{0.018"}$

∴ USE 5/16" PLATE (MINIMUM THICKNESS ALLOWED)

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE NO. 5
Computed by DPZ Date 5/19/97 Checked by ________ Date ________

INTERCOSTAL DESIGN



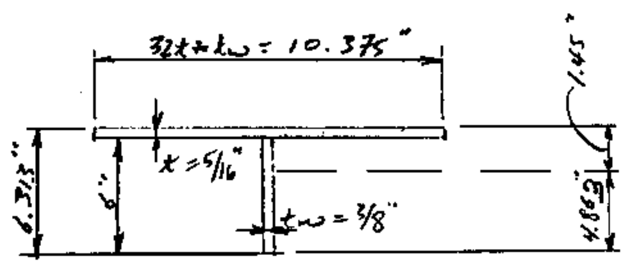
$\frac{1}{2}(0.0624)y * y = 0.03\ ^{K}/_{ft}$

$\frac{1}{2}(0.0624)y^2 = 0.03\ ^{K}/_{ft}$

$y = 0.98\ ft$

$M = 0.03\ ^{K}/_{ft}(0.98ft - 0.31ft) - \frac{1}{6}(0.0624)(0.98ft)$

$M = 0.01\ Ft\cdot K$



ITEM	AREA	Y	Ay	Ay²	I
PL 5/16 x 10 3/8	3.242	0.156	0.506	0.079	—
PL 3/8 x 6	2.25	3.313	7.454	24.696	6.75
TOTAL	5.492	(1.45)	7.96	24.775	6.75

$I = I + \Sigma Ay^2 - (\Delta y * y)$

$= 6.75 + 24.775 - (7.96 * 1.45)$

$= 19.983\ in^4$

$S_{TOP} = 19.983 / 1.45 = 13.781\ in^3$ $S_{BOT} = 19.983 / 4.863 = 4.109\ in^3$

$f_b = M/S_{BOT} = \frac{(0.01)(2.5)(12)}{4.109} = 0.073\ KSI < F_b$ OK

Client: PORT OF NEW ORLEANS Project: ______
Computations for: ROLLER GATE NO. 5
Computed by ______ Date ______ Checked by ______ Date ______

TOP GIRDER

$w = 0.10 \text{ K/ft}$ $L = 54.125'$ $F_y = 36 \text{ KSI}$

$M = \frac{wL^2}{8} = \frac{0.10\,(54.125)^2}{8} = 37.53 \text{ FK} = 450 \text{ IN-K}$

$I_{req} = \frac{5(0.10/12)(54.125 \times 12)^4}{384\,(29E3)} = 666 \text{ IN}^4$

TRY W 21 X 44 WITH $I = 843 \text{ IN}^4$ $S = 81.6 \text{ IN}^3$

CHECK COMPACTNESS

FLANGE

$b_f = 6.5''$ $t_f = 0.45$

$\frac{b_f}{t_f} = \frac{6.5}{0.45} = 14.4 > \frac{65}{\sqrt{36}} = 10.83$

∴ FLANGE NON-COMPACT

WEB

$d = 20.66''$ $t_w = 0.35''$

$\frac{d}{t_w} = \frac{20.66}{0.35} = 59 < \frac{640}{\sqrt{F_y}} = 106.7$

∴ WEB COMPACT

$L_b = 10' > L_c = 6.6'$

∴ $F_b = 0.6\,F_y = 21.6 \text{ KSI}$

$f_b = \frac{M}{S} = \frac{450}{81.6} = 5.5 \text{ KSI} \ll 21.6 \text{ KSI} = F_b$

∴ USE W 21X44

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE NO. 5
Computed by MPJ Date 5/20/97 Checked by ______ Date ______

BOTTOM GIRDER

$w = 0.72 - 0.10 = 0.62$ k/ft $\quad F_y = 36$ KSI

$L = 54.125'$ $\quad M = \frac{wL^2}{8} = \frac{(0.62)(54.125)^2}{8} = 227$ 1-k

$M = 2724$ IN-K

$I_{req} = \frac{5(0.62/12)(54.125 \times 12)^4}{384(29E3)} = 4128$ IN^4

∴ TRY W30×108 WITH $I = 4470$ IN^4 $S = 299$ IN^3

CHECK COMPACTNESS

FLANGE

$b_f = 10.475"$ $\quad t_f = 0.76$

$\frac{b_f}{t_f} = \frac{10.475}{0.76} = 13.78 > \frac{65}{\sqrt{F_y}} = 10.83$

∴ FLANGE NON-COMPACT

WEB

$d = 29.83"$ $\quad t_w = 0.545"$

$\frac{d}{t_w} = \frac{29.83}{0.545} = 55 < \frac{640}{\sqrt{F_y}} = 106.7$

∴ WEB COMPACT

$L_b = 10' < L_c = 11.1'$

∴ $F_b = F_y\left[0.79 - 0.002 \frac{b_f}{2t_f}\sqrt{F_y}\right]$

$= 36\left[0.79 - 0.002\left(\frac{10.475}{2(0.76)}\right)\sqrt{36}\right] = 25.5$ KSI

$f_b = \frac{M}{S} = \frac{2724}{299} = 9.11$ KSI $\ll 25.5$ KSI $= F_b$

∴ USE W30×108

Client: PORT OF NEW ORLEANS Project: 504-005
Computations for: ROLLER GATES # 6 & 7
Computed by: SUNIL S. Date: 01/18/95 Checked by: Date:

STEEL FLOODGATES

(B) ROLLER GATE # 6 & # 7 :-

For roller gates the following analyses need to be performed.

(i) Skin plates :- As fixed plates between intercostals ($\Delta_{max} < 0.4 t_{plate}$)
(ii) ~~Intercostals :- As simple beams spanning between girder webs.~~
(iii) ~~Girders :- As simple beams spanning between bearing blocks.~~
(iv) Deflections :- ≯ L/360
(v) ~~Gate stability under wind loads :- For 50 psf wind load.~~

REF :- EM 1110-2-2705 - Struct. Design of closure structures for Local flood protection structures.

	No. 6	No. 7
Roller gate #6 & 7 have :- opening width =	81'-3"	= 46'-0"
Top of gate =	el 15.0	= 15'-0"
sill elev. =	el 10.53	= 9.30
⇒ ht. of gate ≡	4.50 ft.	= 5.70 ft.

As per EM 1110-2-2502 the foll. load cases shall be used :-

(i) Case I1 :- Gate closed, F/S water el = 13.0, P/S water el. below sill, stability @ flotation should be checked, ~~5/6 of design stresses from AISC shall be used.~~

(ii) Case I2 :- ~~Same as Case I1 except F/S water @ el. 15.0. 1.11 times design stresses from AISC used.~~

(iii) ~~Case I4 :- Short duration wind loads. Design stresses~~ = 1.11 times AISC values.

Here, case I1 does not govern. Case I2 governs for structural steel design while case I4 governs for wind stability check.

For addl. conservatism, AISC design stresses shall not be magnified for case I2.

Client: Port of New Orleans Project: 504-005
Computations for: Roller gates no. 6 & 7
Computed by: SUNIL S. Date: 01/18/95 Checked by: Date:

(i) Skin plates :- Assuming 5'-7" high gate & 12" wide flanges,

P_{max} (6" above girder flg.) $= 0.0624(5.7 - 2 * 0.5 - 0.5)$
$= 0.262$ ksf
$= 0.26 \times \frac{1}{144}$
$= 0.0018$ ksi

Assuming skin plate to be a beam fixed between the intercostals & providing intercostals at no more than 3'-0" c/c. gives,

$\Rightarrow m = pL^2 = 0.0014 \times 36^2/12 = 0.196^{k-in}$

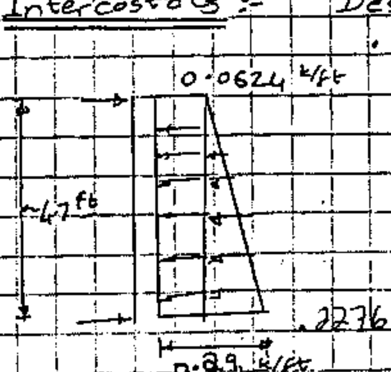
$F_b = 0.6 F_y = 21.6^{ksi}$

$\Rightarrow t_{min}$ for stress $= (6m/F_b)^{0.5} = \left(\frac{6 \times 0.196}{21.6}\right)^{0.5} = 0.23$ in

t_{min} for $\Delta = (pL^4/12.8E)^{0.25}$
$= (0.0018 \times 36^4/12.8 \times 29000)^{0.25}$
$= 0.30$ in $\approx 4.8/16$ in

Use 5/16" thick skin plate for corrosion-resistance.

(ii) Intercostals :- Design as simple spans between webs of girders.



$\Rightarrow M_{max} \simeq \frac{0.0624 \times 4.7^2}{8} + \left(\frac{0.23 \times 4.7}{2}\right) 4.7 \times 0.13$ (.38)
$= 0.50^{k-ft/ft}$
$= 0.50 \times 3$
$= 1.5^{k/ft}$
$= 18^{k-in}$

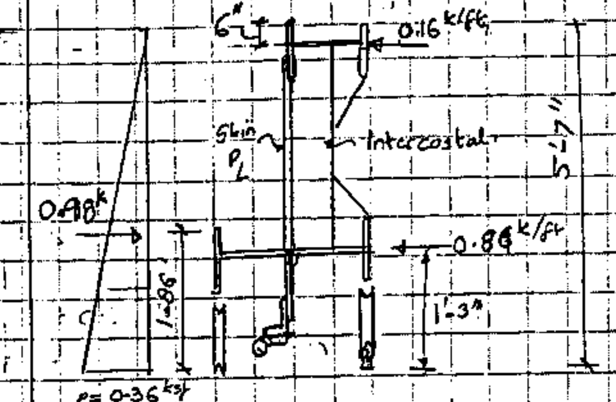
$\Rightarrow S_{req} = \frac{18}{20.6} = 0.87$ in^3

$\Rightarrow$ WT 9x23 w/ $S_{prov} = 9.7$ in^3 is o.k.
& also has $d_w, t_f > 5/16"$:- OK

Stability :- $b_f/2t_f = 6.06/2(0.6) = 5.05$, $65/\sqrt{F_y} = 10.83 > 5.05 \Rightarrow$ Compact section
$d/t_w = 9/3/8 = 24.0$, $640/\sqrt{F_y} = 106.6 > 24.0 \Rightarrow$ Compact web in compression

Client: Port of New Orleans Project: 504-005
Computations for: Roller gates # 6 & 7
Computed by: Sunil S. Date: 01/18/95 Checked by: ______ Date: ______

(iii) Girders :- Design girders separately for Gates 6 & 7.
Assume girders to span simply between bearing bars at gateposts.



Gate no. 7

$\Rightarrow L_{(Gate\ 6)} = 81'\text{-}3" + 2'\text{-}9" + 1'\text{-}9" \doteq 86'\text{-}0"$

$L_{(gate\ 7)} = 46'\text{-}0" + 1'\text{-}9" + 2'\text{-}9" \doteq 51'\text{-}0"$

$\Rightarrow$ For gate no. 7 :-

$P_{@\ bottom\ of\ gate_7} = 0.0624 \times 5.58 = 0.35\ ksf$

$\Rightarrow P_{horiz} = 0.35 \times 5.58/2 = 0.98^{k/ft}$

$\Rightarrow R_{top_{G7}} = (0.98 \times 0.6)/3.75 = 0.16^{k/ft}$

$R_{bottom_{G7}} = (0.98 - 0.16) = 0.82^{k/ft}$

(A) $\Rightarrow$ For roller gate no. 6 :- Elev. $H_{G6} = 4.5' \Rightarrow p = 0.3^{ksf} \Rightarrow P_h = 0.68^{k/ft} \Rightarrow R_t = \frac{0.68 \times 0.25}{2.75} = 0.06^{k/ft}$

$\Rightarrow R_b = (0.68 - 0.06) = 0.61^{k/ft}$

(i) Top :- $M_{top} = \frac{0.06 \times 86^2}{8} = 55.5^{f\text{-}k}$

$\Rightarrow S_{req} = \frac{55.5 \times 12}{20.6} = 32.3\ in^3$ (Use AISC ASD pg 2-10)

$\Rightarrow$ Use W 12 x 65, $L_u = 27.7' > 3'\text{-}0"$ ∴ ok

($t_w = 5/16"$, $t_f = 3/8" > 5/16"$) $S_{prov} = 87.9\ in^3 > 32.3\ in^3$ ∴ ok

(ii) Bottom :- $M_{bottom} = \frac{0.61 \times 86^2}{8} = 564.0^{f\text{-}k}$

$\Rightarrow S_{req} = 328.5\ in^3$

~~$\Rightarrow$ Try W 30 x 116, $L_u = 13.8' > 3'\text{-}0"$ ∴ ok~~

~~($t_w = 9/16"$, $t_f = 7/8" > 5/16"$)~~ $S_{prov} = 329\ in^3 > 328\ in^3$ ∴ ok

$\Rightarrow$ **Use W12x65 on top girder & W 33x118 on bottom girder** / for min. strength

(B) For roller gate no. 7 :- **$\Rightarrow$ Use W12x35 (top) & W33x118 (bottom)** / for min. strength

(i) Top :- $M_{top} = 0.16 \times 51^2/8 = 52.0^{f\text{-}k}$

$\Rightarrow S_{req} = 30.3\ in^3 \Rightarrow$ Use W12x35 w/ $S_{prov} = 45.6\ in^3 > 30.3\ in^3$

($t_f = 1/2"$, $t_w = 5/16"$) & $L_u = 12.5' > 3'\text{-}0"$

(ii) Bottom :- $M_{bottom} = 0.82 \times 51^2/8 = 279.6^{f\text{-}k}$

$\Rightarrow S_{req} = 163\ in^3 \Rightarrow$ Try W 30 x 90 w/ $S_{prov} = 245\ in^3 > 163\ in^3$

Client: Port of New Orleans. Project: 504-005

Computations for: Roller gate no. 6 & 7

Computed by: SUNIL S. Date: 01/24/95 Checked by: Date:

(IV) Deflections :- $\Delta_{max} = L/360 \Rightarrow$

for gate no. 6, $\Delta_{max} = \frac{86 \times 12}{360} = 2.86''$

for gate no. 7, $\Delta_{max} = \frac{51 \times 12}{360} = 1.70''$

However as wheels will remain in contact with rails during loading, the gate Δ's shall be restricted to the wheel/rail tolerance :-

ⓐ Δ_{max} (Gate 6) $= \frac{5}{384}\frac{wL^4}{EI}$

$= \frac{5}{384} \times \frac{(0.61 \times 86) \times (86 \times 12)^3}{29000 \times 5360}$

$= 4.8'' > 2.86''$

⇒ "I" needs to be increased,

⇒ $I_{req_{bot}} = \frac{5 \cdot (0.61 \times 86)(86 \times 12)^3}{384 \times 29000 \times 2.86} = 9050\ in^3$, $I_{req_{top}} = \frac{0.06}{0.61} \times 9050 = 890\ in^3$

⇒ W 33 x 169 will be required at Gate no. 6 (B)
W 18 x 76 will be " " " " (T)

I_{prov} = 1330 in⁴ (T), 9290 in⁴ (B).

ⓑ I_{req} (Gate 7) $= \frac{5(0.82 \times 51)(51 \times 12)^3}{384 \times 29000 \times 1.70} = 2531\ in^3$

⇒ W 33 x 118 is O.K. as I_{prov} = 5900 in⁴

I_{req} (top) $= \frac{0.46}{0.86} \times 2531 = 471\ in^4$

⇒ Use W 18 x 40 on top w/ I_{prov} = 612 in⁴

(V) Resistance to Flotation :- Check gate # 7 as it has lower unit wt.

Using arrangement in sketch,

Max. uplift ld = U = $1.33 \times \frac{1.5''}{12} \times 0.0624 = 0.08$ k/ft

Min. gate wt./ft $= \frac{118 + 40}{1000} = 0.158$ k/ft $> 1.5U$ ∴ OK

⇒ Gates are O.K. in flotation case

Client PORT OF NEW ORLEANS Project 504-005
Computations for Roller gates no. 6 & 7
Computed by SUNIL S. Date 01/24/95 Checked by ______ Date ______

(VI) WIND STABILITY CHECK :-

Assume gate is closed but unlatched & subjected to a 110 mph wind load. Try gate no. 7

⇒ Wind load = 0.030(51) × 5.70 = 8.72^k

⇒ Wt. of gate = [(118 + 40) + (12.8 × 4.7) + (23 × 4.7 / 3)] 51 = 12.96^k (girders, skin pl., WT)

⇒ C.g. of gate @ F/s ≈ [(71.8 × 32.86/2) + {40 × 23.91} + {60.16 × 15.0} + {36.6 × 21.7}] / (254.11)
≈ 18.00 from F/s
≈ 15.0 from P/s

⇒ For wind load from P/s :-
$FS_{(overturn)} = \frac{12.96^k \times 18.00}{8.72 \times 34.2} = 0.78 < 1.00$

⇒ ∴ Gate #7 must be always latched when in closed position.

For gate 6 :- Wind load = 0.03 × (86) 4.5 = 11.61^k

Wt of gate = [(169 + 176) + (12.8 × 3.5) + (23 × 3.5 / 3)] 86 = 27.2^k

C.g. of gate @ F/s ≈ [(169 × 33/2) + (176 × 24) + {44.8 × 15} + (26.8 × 21.7)] / 316.3
= 18.54 in

⇒ For wind load from P/s :-
$F.S. (overturn) = \frac{27.2^k \times 18.5}{11.61 \times 4.5 \times 12 / 2} = 1.60 > 1.50$

∴ Gate # 6 is stable for 110 mph wind load.

WHEELS :- Use std. Corps wheel detail. As our gate is heavier, provide wheels @ 13'-4" in 86'-0" long gate no. 6 ⇒ (7 pairs of wheels)
& provide " @ 15'-6" in 51'-0" long gate no. 7 ⇒ (4 pairs of wheels)
(provide 3'-0" distance from bearing plate to end wheel ℄)

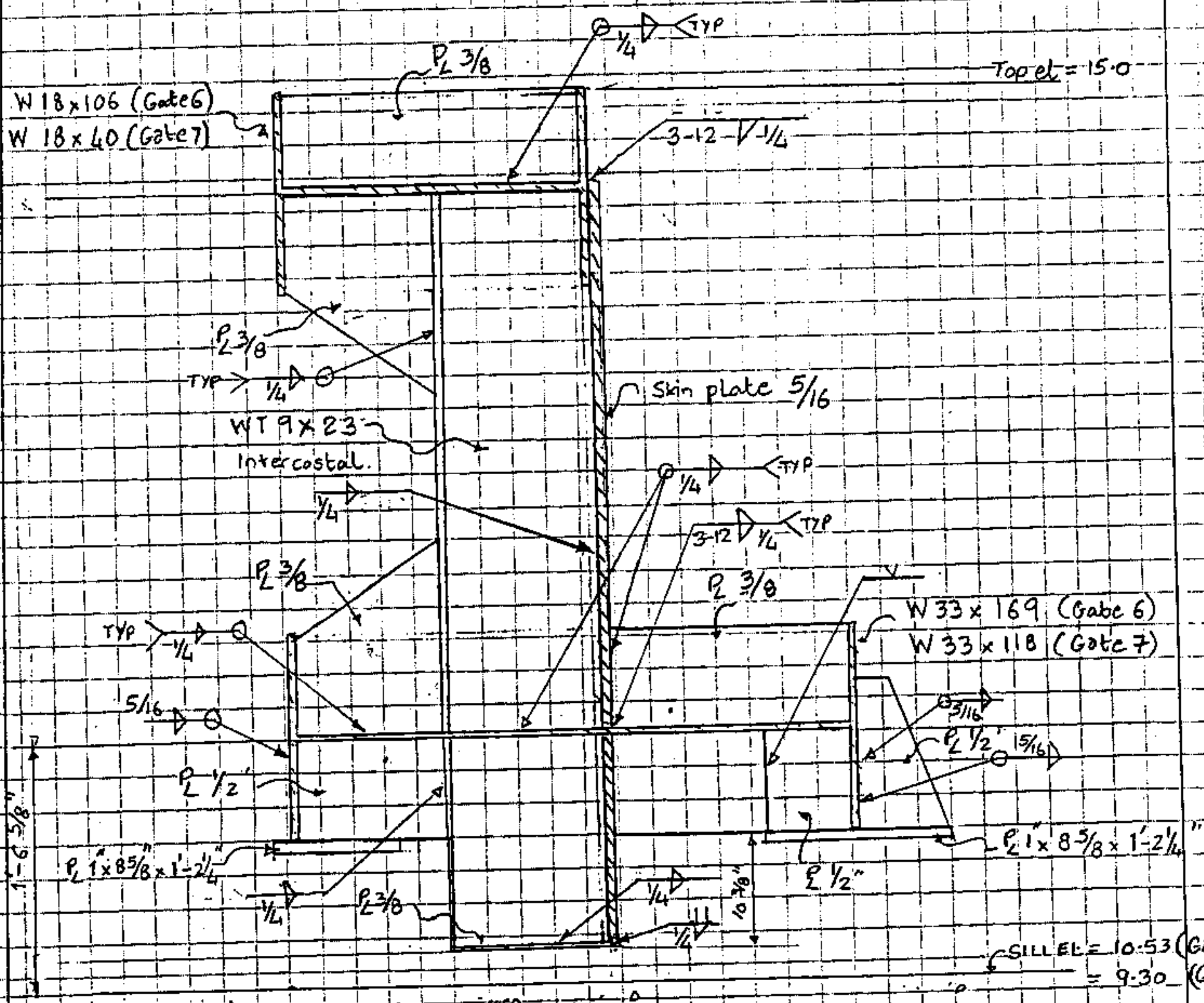
PYBURN & ODOM, INC. — CONSULTING ENGINEERS

Sheet No. 6/8

Client: Port of New Orleans Project: 504-005

Computations for: Roller Gates # 6 & 7

Computed by: SUNIL S. Date: 01/26/95 Checked by: ____ Date: ____



* Place wheel assembly @ every 6th intercostal

* [Place stiffeners eq. sp. @ every 3rd intercostal]

ROLLER GATE SECTIONS
(use 2" = 1'-0" Scale)

Notes:-

* (Sections are to be adapted from PL 55 in Gold book)
* (Three sections in all need to be drawn → At wheels, between wheels, between stiffeners)
* (All welds etc. should be sized similar to PL 55)

Client: PORT OF NEW ORLEANS Project: 504-005
Computations for: Roller gates no. 6 & 7
Computed by: SUNIL S. Date: 02/15/95 Checked by: ______ Date: ______

BASED ON CONVERSATON w/ JORGE Romero on 02/11/95, the girder Δ's should preferably be restricted to 1" in order to prevent damage to casters during flood. Caster connections will have slots permitting 1" Δ.

① ⇒ For gate no. 6 :-

$I_{req\,(bottom)} = 9050 \times \frac{2.86}{1.00} = 25883\ in^3$ ⇒ Use W33×424[a] or W36×393[a]

$I_{req\,(top)} = 890 \times \frac{2.86}{1.00} = 2545\ in^3$ ⇒ Use W18×143[a]

② ⇒ For gate no. 7

$I_{req\,(bottom)} = 2531 \times \frac{1.70}{1} = 4302.5\ in^3$ ⇒ W33×118 O.K. $I_{prov} = 5900\ in^4$

$I_{req\,(top)} = 470 \times \frac{1.70}{1.0} = 799\ in^3$ ⇒ W18×60 reqd. $I_{prov} = 984\ in^3$

∴ Gate 7 is OK.

Top girder should be upgraded to W18×60

③ ⇒ For gate no. 6 :-

a) Reqd. W33×424[a] & W36×393[a] sections are respectively unavailable from domestic producers or have stringent specs. for welding & cutting.

b) W40×298 for bottom girder will work for the bottom girder but is not available domestically.

c) Other options are :-

(i) Use 3 girders to increase lateral stiffness.

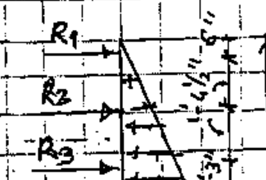
(ii) Use deep plate girder for bottom girder

(iii) Use a removable gate-post to reduce spans.

All three options will need to be evaluated.

Client: PORT OF New Orleans Project: 504-005
Computations for: Roller gates 6 & 7
Computed by: SUNIL S. Date: 02/16/94 Checked by: ______ Date: ______

Option (a) :- Use 3 girders



(This option may be hard to fabricate as the open space, between flanges of two lower girders, available for welding will be on the order of 5'-6")

Girder Loads :- $R_1 = \left(0.0624 \times \frac{1.19^2}{2}\right) = 0.04\ ^{k/ft}$

$R_2 = (0.0624 \times 1.19 \times 1.375) + \left(0.0624 \times \frac{1.375^2}{2}\right)$

$= 0.16\ ^{k/ft}$

$R_3 = (0.0624 \times 1.94 \times 2.56) + (0.0624 \times 1.94^2/2)$

$= 0.43\ ^{k/ft}$

⇒ $I_{req}(R_3) = \frac{5\,(0.43 \times 86)\,(86 \times 12)^3}{384 \times 29000 \times 1.00} = 18250\ in^3$

$I_{(R_2)} = 6790\ in^3$ ⇒ W 33 × 141

$I_{(R_3)} = 1698\ in^3$ ⇒ W 18 × 97

⇒ W 36 × 280 is O.K.
⇒ W 33 × 318 may also be used.

~~⇒ wt of gate = (280 + 97 + 141) = 0.52 k/ft~~

Option (b) :- Use 2 girders w/ plate girder at bottom. ($D \not> 7.75' - 3.5' = 4.25'$ to retain monolith design)

$I_{req\,(bottom)} = 25883\ in^3$

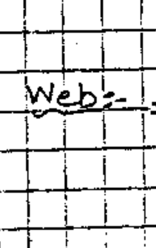
Web :- ⇒ $h/t_w \le \frac{14000}{\sqrt{F_{yf}(F_{yf} + 16.5)}}$

⇒ $t_w \ge \frac{51''\sqrt{36(36 + 16.5)}}{14000} = 0.15''$ ≈ 5/16" web is O.K.

Flange :- ⇒ $I_{req} = (5/16)(51)^3/12 + 2A_f\left(\frac{51}{2} - \frac{t_f}{2}\right)^2$ ⇒ Assume $t_f = 1.5''$

$b/2t_f = 95/\sqrt{F_y}$

⇒ $A_f \ge \frac{25883 - 3455}{1225.13} = 18.3\ in$ ⇒ $b/2t_f \not> 15.8$



⇒ $b_f = 18.3/1.5 = 12.20\ in$

Try $t_f = 1''$ ⇒ $A_f = 22428/1250 = 17.94\ in$

⇒ $b_{f\,req} = 18\ in,\ t_f = 1''$ ⇒ $b_f/2t_f = 9 < 15.8$ ∴ O.K.

⇒ wt of gate = (145 + 775)/... = 0.35 k/ft

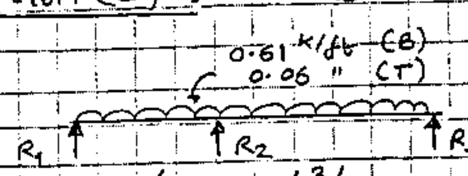
PYBURN & ODOM, INC — CONSULTING ENGINEERS Sheet No. 8/8

Client: PORT OF NEW ORLEANS Project: 506-005

Computations for: Roller gates no. 6 & 7

Computed by: SUNIL S. Date 02/16/94 Checked by: ______ Date: ______

Option (C) :- Use a removable gate post @ ℄ of span.



Reaction at rem. gate post @ bottom

$= R_{2_B} = 0.61 \times 43 = 26.3^{kips}$

$R_{2_T} = 0.06 \times 43 = 2.6^{kips}$

$M_{max(bop)} = \frac{0.61 \times (43)^2}{8} = 140.9^{f\text{-}k} \Rightarrow$ W 33x118 o.k.

$M_{max(b.t)} = \frac{0.06(43)^2}{8} = 14^{f\text{-}k} \Rightarrow$ W 18x60 o.k.

} Like Gate 7

⇒ Shear at base of rem. post = 28.83^k

⇒ Moment @ " " " " $= (26.3 \times 1.25) + (2.6 \times 4.0)$

$= 43.25^{f\text{-}k}$

⇒ $S_{req} = 43.25 \times 12 / 0.6 \times 36 = 24.1\ in^3$

⇒ TS 14x6x1/2 is o.k.

From swing gate 5, 8, 9 design, pg. 8/9.

⇒ $f_v = 28.83/40D_e = 0.72/D_e$ ksi

$f_{v(m)} = 43.25 \times 12 / 96D_e = 5.40/D_e$ ksi

$f_R = \sqrt{f_v^2 + f_m^2} = 5.45/D_e$ ksi

⇒ $D_{req} = \left(\frac{5.45}{0.3 \times 70}\right) / 0.707 = 0.36$ in $= 3/8''$ weld

Min. thick. of base metal $= \frac{0.707 \times 0.3 \times 70 \times 3/8}{0.4 \times 36} = 0.38'' < 1/2''$ ∴ ok

Anchor bolts:- $T_{max} = \frac{43.25 \times 12}{10} = 51.9^k$

⇒ 4 – 1"φ CRS bolts (A-307) will be reqd.

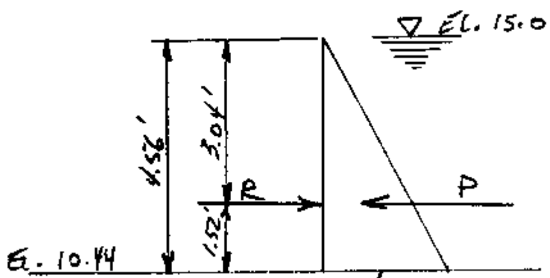
$T_{prov} = 4(15.7) = 62.8^k > 51.9^k$ ok

Wt. of post = (62.5 x 3.63) + base plate = 350#

Wt. of gate = (118 + 60) ≈ 0.18 k/ft

CONCLUSION :- Option C will be most economical but proper bearing at post must be ensured.

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: ROLLER GATE NO. B
Computed by: [initials] Date: 5/19/97 Checked by: Date:



$P =$ AREA

$P = (0.28\ K/FT^2)(4.56')(1/2) = \underline{0.65\ K/FT}$

$(4.56')(0.0624\ K/FT^3) = 0.28\ K/FT^2$

OPENING WIDTH = 58'-0"

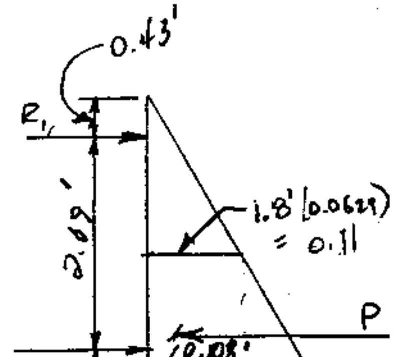
TOP OF GATE EL. = 15.0'

SILL EL. = 10.44'

HEIGHT OF GATE = 4.56'

ASSUME TOP GIRDER TO BE W 30 x 90 $b_f = 10.4"$

ASSUME BOT GIRDER TO BE W 30 x 124 $b_f = 10.5"$



$a = 0.08 \quad b = 2.61'$

$R_1 = \frac{P_a}{\ell} = \frac{0.65(0.08)}{2.69'} = 0.02\ KIPS$

$R_2 = \frac{P_b}{\ell} = \frac{0.65(2.61')}{2.69'} = 0.63\ KIPS$

$0.11\ (1/2)(1.8') = 0.10\ K/FT$

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: ROLLER GATE No. 8
Computed by: [initials] Date: 5/19/97 Checked by: Date:

BOTTOM GIRDER

$L = 58' + 2.5625' + 3.5625' = 64.125'$

$W = 0.63 K/FT \qquad F_y = 36 KSI$

$M = \frac{w \ell^2}{8} = \frac{0.63(64.125)^2}{8} = 324 \text{ K·FT}$

$M = 3886 \text{ K-IN}$

TRY W 30 x 124 WITH $S_x = 355 \text{ IN}^3$

CHECK COMPACTNESS

FLANGE

$b_f = 10.515"$
$t_f = 0.93"$

$b/t = 11.31 > \frac{65}{\sqrt{F_y}} = 10.83$

∴ FLANGE NON-COMPACT

WEB

$d = 30.17"$
$t_w = 0.585"$

$d/t = 52 < \frac{640}{\sqrt{F_y}} = 106.7$

∴ COMPACT WEB

∴ Non-compact SECTION

$L_b = 10' < L_c = 11.1'$

$\therefore F_b = F_y \left[0.79 - 0.002 \frac{b_f}{2t_f} \sqrt{F_y}\right]$

$F_b = 36 \left[0.79 - 0.002 \left(\frac{10.515}{2(.93)}\right) \sqrt{36}\right]$

$F_b = 26.00 \text{ KSI}$

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE NO. 8
Computed by DPZ Date 5/19/97 Checked by ________ Date ____

$$f_b = \frac{M}{S} = \frac{3886^{\text{IN-K}}}{355\ \text{in}^3} = 10.95\ \text{KSI} < 26\ \text{KSI} \quad \text{OK}$$

CHECK DEFLECTION

$$\Delta_{max} = \frac{5 w \ell^4}{384 EI} = \frac{5\,(0.63/12)(64.125' \times 12)^4}{384\,(29E3)(5360)}$$

$$= 1.54'' > 1'' \quad \text{N.G.}$$

$$I_{req} = \frac{5\,(.63/12)(64.125 \times 12)^4}{384\,(29E3)} = 8265\ \text{IN}^4$$

∴ USE ~~W36X150~~ WITH I = 9040
SEE PAGE 81

TOP GIRDER

$L = 64.125'$ $w = 0.02$ KIPS/FT $F_y = 36$ KSI

$$M = \frac{0.02\,(64.125)^2}{8} = 10.28\ \text{'K} = 123\ \text{IN-K}$$

$$I_{req} = \frac{5\,(\overset{0.10}{0.02}/12)(64.125 \times 12)^4}{384\,(29E3)} = \overset{1312\ \text{IN}^4}{262\ \text{IN}^4}$$

Try W16X26 WITH $S_x = 38.4\ \text{IN}^3$
W24X55
CHECK COMPACTNESS

FLANGE
$b_f = 5.5''$ $t_f = 0.345''$

$$\frac{b_f}{t_f} = \frac{5.5}{0.345} = 15.94 > \frac{65}{F_y} = 10.83$$

∴ FLANGE NON-COMPACT

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: ROLLER GATE NO. 8
Computed by: DRZ Date: 5/19/97 Checked by: Date:

WEB

$d = 15.69''$ $t_w = 0.25''$

$\frac{d}{t} = \frac{15.69''}{0.25''} = 62.76 < \frac{640}{\sqrt{F_y}} = 106.7$ OK

∴ WEB COMPACT

$L_b = 10' > L_c = 5.6'$

∴ $F_b = 0.60 F_y = 0.6(36) = 21.6$ KSI

$f_b = \frac{M}{S} = \frac{123}{38.4} = 3.2$ KSI $< F_b = 21.6$ KSI

~~∴ USE W16×26~~

SEE PAGE 7/

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE NO. 8
Computed by DPJ Date 5/19/97 Checked by ______ Date ______

SKIN PLATE

LOAD $w = 0.65\ K/FT^2$

$P = (6''$ ABOVE BOT. GIRDER FLANGE$) = (0.0624\ K/FT^3)(4.56' - 1.44' - .5' - .5')$

$P = 0.13$ KSF

$P = 0.01$ KSI $L = 3.0'$

$M = PL^2/12 = \frac{0.01\ (3.0)^2}{12} = 0.008$ K-IN

$F_b = 1.11\ (0.75) F_y = 30$ KSI

t_{min} FOR STRESS $= (6M/F_b)^{0.5} = 6[(.008)/30]^{0.5} = \underline{0.1''}$

t_{min} FOR DEFLECTION $= (PL^4/12.8E)^{0.25}$

$= [(0.01\ (3.0)^4 / 12.8\ (29E3)]^{0.25} = \underline{0.04''}$

∴ USE 5/16" PLATE (MINIMUM THICKNESS ALLOWED)

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE NO. 8
Computed by [illegible] Date 5/19/97 Checked by Date

INTERCOSTAL DESIGN

$\frac{1}{2}(0.0624\ K/FT^3)\ y \times y = 0.02\ K/FT$

$\frac{1}{2}(0.0624\ K/FT^3) \times y^2 = 0.02\ K/FT$

$y = 0.8\ FT$

$M = 0.02\ K/FT\ (0.80' - 0.43') - \frac{1}{6}(0.0624)(0.80')$

$M = -0.0009\ FT\text{-}K$

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: ROLLER GATE No. B
Computed by: JPZ Date: 5/20/97 Checked by: ______ Date: ______

TOP GIRDER

$w = 0.10$ klf $\quad L = 64.125'$

$$I_{req} = \frac{5(0.10/12)(64.125 \times 12)^4}{384(29E3)} = 1312 \text{ in}^4$$

∴ TRY W 24X55 WITH $I = 1350 \text{ in}^4$ AND $S = 114 \text{ in}^3$

CHECK COMPACTNESS

FLANGE

$b_f = 7.005"$ $\quad t_f = 0.505$

$$\frac{b_f}{t_f} = \frac{7.005}{0.505} = 13.87 > \frac{65}{\sqrt{F_y}} = 10.83$$

∴ FLANGE NON COMPACT

WEB

$d = 23.57"$ $\quad t_w = 0.345"$

$$\frac{d}{t_w} = \frac{23.57"}{0.345"} = 59.7 < \frac{640}{\sqrt{F_y}} = 106.7$$

∴ WEB COMPACT

$L_b = 10' > L_c = 7'$

$$\therefore F_b = 0.6 F_y = 0.6(36) = 21.6 \text{ KSI}$$

$$f_b = \frac{M}{S} = \frac{wl^2/8}{S} = \frac{0.10(64.125 \times 12)^2/8}{114} = 5.41 \text{ KSI} < 21.6 \text{ KSI}$$

∴ USE W 24x55

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE NO. 8
Computed by [illegible] Date 5/20/97 Checked by ______ Date ______

BOTTOM GIRDER

$w = 0.65 - 0.10 = 0.55\ k/ft$ $L = 64.125'$

$F_y = 36\ KSI$

$$M = \frac{0.55\,(64.125)^2}{8} = 283\ FT\text{-}K$$

$M = 3392\ IN\text{-}K$

$$I_{req} = \frac{5\,(0.55/12)(64.125 \times 12)^4}{384\,(29E3)} = 7215\ IN^4$$

$\therefore$ TRY W 36×135

CHECK COMPACTNESS

FLANGE

$b_f = 11.95$ $t_f = 0.79$

$$\frac{b_f}{t_f} = \frac{11.95}{0.79} = 15.1 > \frac{65}{\sqrt{F_y}} = 10.83$$

$\therefore$ FLANGE NON-COMPACT

WEB

$d = 35.55"$ $t_w = 0.6$ $\frac{d}{t_w} = \frac{35.55}{0.6} = 59.25 < \frac{640}{\sqrt{F_y}}$

$\therefore$ WEB COMPACT

$L_b = 10' < 12.3' = L_c$ $\therefore$ $F_b = F_y\left[0.79 - 0.002\,\frac{b_f}{2t_f}\sqrt{F_y}\right]$

$$F_b = 36\left[0.79 - 0.002\left(\frac{11.95}{2(.79)}\right)\sqrt{36}\right] = 25.2\ KSI$$

$$f_b = \frac{M}{S} = \frac{3392}{439} = 7.7\ KSI \ll 25.2\ KSI = F_b$$

$\therefore$ USE W36×135

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: GATE No. 3 GATEPOST DESIGN
Computed by: [illegible] Date: 7/14/97 Checked by: ____ Date: ____

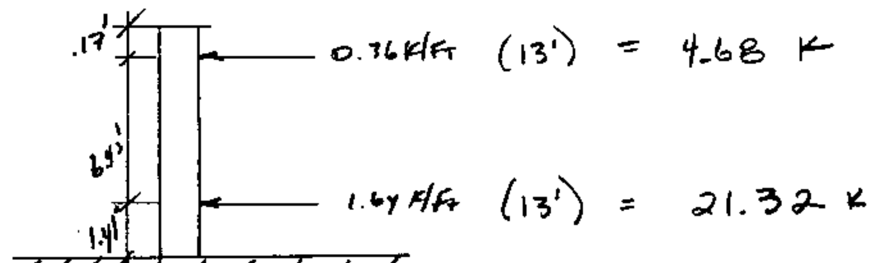
GATE POST DESIGN :

MAY BE DESIGNED AS A BEAM COLUMN WITH UNIAXIAL BENDING

USE $f'_c = 3000$ PSI $f_y = 60{,}000$ PSI

I) DESIGN OF ROLLER GATE GATEPOSTS FOR GATE No. 3

FROM GATE DESIGN DATED 5/29/97 WORST CASE LOAD AS FOLLOWS



$P_{SELF} = 0.15\left[(2.75)(8.75')(7.0') - (.25)(3.5)(8.75)\right]$

$= 24.1$ K   USE $P = 24$ K

$M_x = (4.7)(7.83) + (21.32)(1.41)$

$M_x = 66.9^{\,1\text{-}K}$

(a) DESIGN SECTION USING CASTR PROGRAM w/ $P = 24^K$ &

$M = 66.9^{\,1\text{-}K}$

CHECK FOR $A_s = \dfrac{66.9(12)}{24(.89)(26.5)} = 1.42\ in^2$

USE

$P_u = 24(1.4)(1.3) = 43.68$ K $M_u = 66.9(1.3)(1.7) = 147.8$

Client PORT OF NEW ORLEANS Project

Computations for GATE NO. 3 GATEPOST DESIGN

Computed by ___ Date 7/14/97 Checked by ___ Date ___

USING FILE C:\CORPS\CASTR\GTPOST3.ROC

→

⇒

(b) SHEAR

$V_u = V_{max} = 1.64 + .36 = 2.0 * 13 = 26$ KIPS

$V_c = 2 * \sqrt{3} * 26.5 * 60 = 174.2$ KIPS $\frac{\phi V_c}{2} = 74$

$V_c > U_u = V_{max}$ but $V_u \leq \phi \frac{V_c}{2}$

∴ NO SHEAR REINFORCING REQ'D

TIES (VERTICAL SPACING)

$16 \times 1.0'' = 16''$ ✓

$48 * 0.625'' = 30''$.

30"

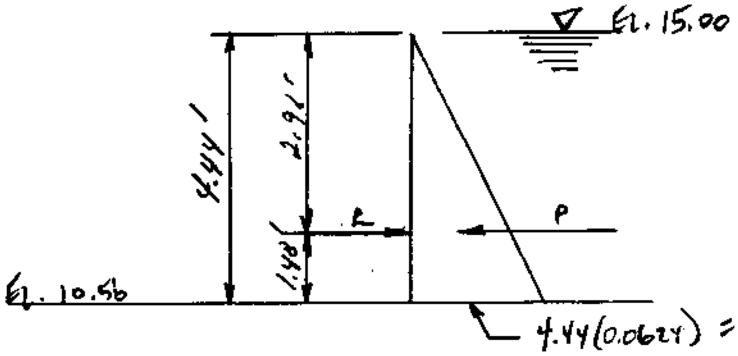
∴ USE #4 @ 12" O/C

PYBURN & ODOM, INC — CONSULTING ENGINEERS Sheet No. 1

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD

Computations for: ROLLER GATE NO. 9

Computed by: DPZ Date: 5/19/97 Checked by: ______ Date: ______



P = AREA

$P = (0.28\ K/FT^2)(4.44)(1/2) = \underline{0.62\ K/FT}$

OPENING WIDTH = 43'-0"

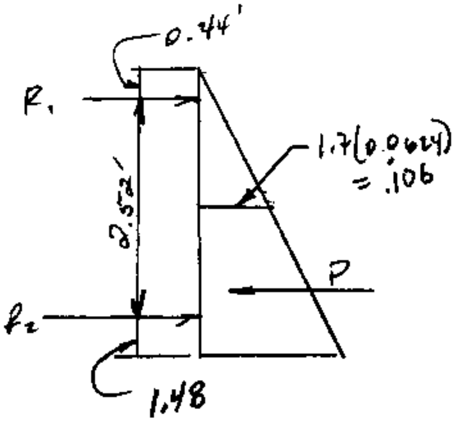
TOP OF GATE EL. = 15.0'

TOP OF SILL EL. = 10.56'

HEIGHT OF GATE = 4.44'

ASSUME TOP GIRDER TO BE W 12x26

ASSUME BOTTOM GIRDER TO BE W 30x116



a = 0' b = 2.52'

P = 0.62 K/FT

$R_1 = 0$ $R_2 = P = 0.62$ KIPS

$\frac{1}{2}(1.7)(.106) = 0.09\ K/FT$

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE NO. 9
Computed by [signature] Date 5/19/97 Checked by ______ Date ______

GIRDER

$L = 43' + 2.5625' + 3.5625' = 49.125'$

$w = 0.62\ K/FT \qquad F_y = 36\ KSI$

$M = \frac{wL^2}{8} = \frac{(0.62\ K/FT)(49.125')^2}{8} = 187\ K\text{-}FT$

$M = 2244\ K\text{-}IN$

$I_{req} = \frac{5(0.62/12)(49.125' \times 12)^4}{384\ (29E3)} = 2801\ IN^4$

∴ TRY W 27 x 84

CHECK COMPACTNESS

FLANGE

$b_f = 9.96'' \qquad t_f = 0.64$

$\frac{b}{t} = \frac{9.96}{0.64} = 15.56'' > \frac{65}{\sqrt{F_y}} = 10.83$

∴ FLANGE NON COMPACT

WEB

$d = 26.71'' \qquad t_w = 0.46''$

$\frac{d}{t_w} = \frac{26.71}{0.46} = 58.1 < \frac{640}{\sqrt{F_y}} = 106.7$

$L_b = 10' < L_c = 10.5'$

$\therefore F_b = F_y \left[0.79 - 0.002 \frac{b_f}{2t_f} \sqrt{F_y}\right]$

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: ROLLER GATE NO. 9
Computed by: [initials] Date: 5/19/97 Checked by: Date:

$$F_b = 36\left[0.79 - 0.002\left(\frac{9.96}{2(.64)}\right)\sqrt{36}\right]$$

$$F_b = 25.08 \text{ KSI}$$

$$f_b = \frac{M}{S} = \frac{2244 \text{ IN-K}}{213 \text{ IN}^3} = 10.54 \text{ KSI} < 25 \text{ KSI OK}$$

$\therefore$ USE W 27 x 84

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE NO. 9
Computed by MPZ Date 5/19/97 Checked by ____ Date ____

SKIN PLATE

LOAD $\omega = 0.62$ K/FT

$p = $ (6" ABOVE GIRDER FLANGE) $= (0.0624\ K/FT^3)(4.44' - 1.48' - .415' - .5')$

$p = 0.128$ KSF

$p = 0.0009$ KSI $L = 3.0'$

$M = PL^2/12 = 0.001(3)^2/12 = 0.0008$ K-IN

$F_b = 1.11\,(0.75)\,F_y = 30$ KSI

t_{min} FOR STRESS $= (6M/F_b)^{0.5} = [6(0.0008)/30]^{0.5} = 0.01"$

t_{min} FOR DEFLECTION $= (PL^4/12.8E)^{0.25}$

$= [0.0009\,(3.0)^4/12.8\,(29E3)]^{0.25} = 0.02"$

∴ USE 5/16" PLATE

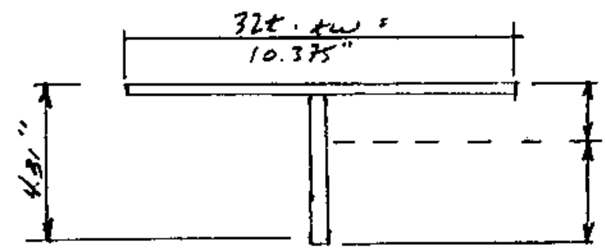
Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE No. 9
Computed by [illegible] Date 5/19/97 Checked by ______ Date ______

INTERCOSTAL DESIGN

$M = (0.0624\ K/FT^3)(2.96)^3(1/6)$

$M = 0.27\ K/FT$

POINT OF MAXIMUM MOMENT @ APPROX C/L OF GIRDER



ITEM	AREA	Y	AY	AY²	I
PL 5/16x10.375	3.242	0.156	0.506	0.079	—
PL 3/8x4	1.5	2.313	3.470	8.026	2
	4.742	(0.838)	3.976	8.105	2

$$y = \frac{\Sigma Ay}{\Sigma A} = \frac{3.976}{4.742} = 0.839$$

$$I = I * \Sigma Ay^2 - (Ay * y)$$
$$= 2 * 8.105 - (3976 * 0.839)$$
$$= 6.769\ IN^4$$

$$S_{TOP} = \frac{I}{C_{TOP}} = \frac{6.769}{0.839} = 8.068\ IN^3$$

$$S_{BOT} = \frac{I}{C_{BOT}} = \frac{6.769}{3.474} = 1.949\ IN^3$$

$$f_s = \frac{M}{S_{BOT}} = \frac{(0.27)(3.0)(12)}{1.949} = 4.99\ KSI << F_B = 20\ KSI$$

Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: ROLLER GATE NO. 9
Computed by: [illegible] Date: 5/20/97 Checked by: Date:

TOP GIRDER

$$I_{req} = \frac{5(0.09/12)(49.125' \times 12)^4}{384\,(29E3)} = 407\ \text{IN}^4$$

$\therefore$ TRY W 18x35 WITH $I = 510\ \text{IN}^4$ $S = 57.6\ \text{IN}^3$

$$M = \frac{wL^2}{8} = \frac{0.09\,(49.125)^2}{8} = 27.2\ \text{'-K} = 325\ \text{IN-K}$$

CHECK COMPACTNESS

FLANGE

$t_f = .425$ $b_f = 6''$

$$\frac{b_f}{t_f} = \frac{6''}{.425''} = 14.11 > \frac{65}{\sqrt{F_y}} = 10.83$$

$\therefore$ FLANGE NON-COMPACT

WEB

$d = 17.7$ $t_w = 0.30$

$$\frac{d}{t_w} = \frac{17.7}{0.3} = 59 < \frac{640}{\sqrt{F_y}} = 106.7$$

$\therefore$ WEB COMPACT

$L_b = 10' > L_c = 6.3'$

$\therefore$ $F_b = 0.60\,F_y = 0.60(36)$

$F_b = 21.6$ KSI

$$f_b = \frac{M}{S} = \frac{325}{57.6} = 5.6\ \text{KSI} \ll 21.6\ \text{KSI} = F_b$$

$\therefore$ USE W18x35

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for ROLLER GATE No. 9
Computed by [signature] Date 5/20/97 Checked by ________ Date ____

BOTTOM GIRDER

$L = 49.125'$ $\quad w = 0.62 - 0.09 = 0.53\ k/ft$ $\quad F_y = 36\ KSI$

$M = \frac{wL^2}{8} = \frac{0.53(49.125)^2}{8} = 160\ 1\text{-}K = 1919\ IN\text{-}K$

$I_{req} = \frac{5(0.53/12)(49.125 \times 12)^4}{384\ (29E3)} = 2395\ IN^4$

∴ TRY W 27×84 WITH $I = 2850\ IN^4$ & $S = 213\ IN^3$

CHECK COMPACTNESS

FLANGE

$b_f = 9.96 \quad t_f = 0.64$

$\frac{b_f}{t_f} = \frac{9.96}{0.64} = 15.6 > \frac{65}{\sqrt{F_y}} = 10.83$

∴ FLANGE NON-COMPACT

WEB

$d = 26.71 \quad t_w = 0.46$

$\frac{d}{t_w} = \frac{26.71}{0.46} = 58 < \frac{640}{\sqrt{F_y}} = 106.7$

∴ WEB COMPACT

$L_b = 10' < 10.5'$

$\therefore F_b = F_y \left[0.79 - 0.002 \left(\frac{b_f}{2t_f}\right)\sqrt{F_y}\right]$

$= 36 \left[0.79 - 0.002\left(\frac{9.96}{2(.64)}\right)\sqrt{36}\right] = 25.1\ KSI$

$f_b = \frac{M}{S} = \frac{1919}{213} = 9.0\ KSI \ll 25\ KSI = F_b$

∴ USE W 27×84

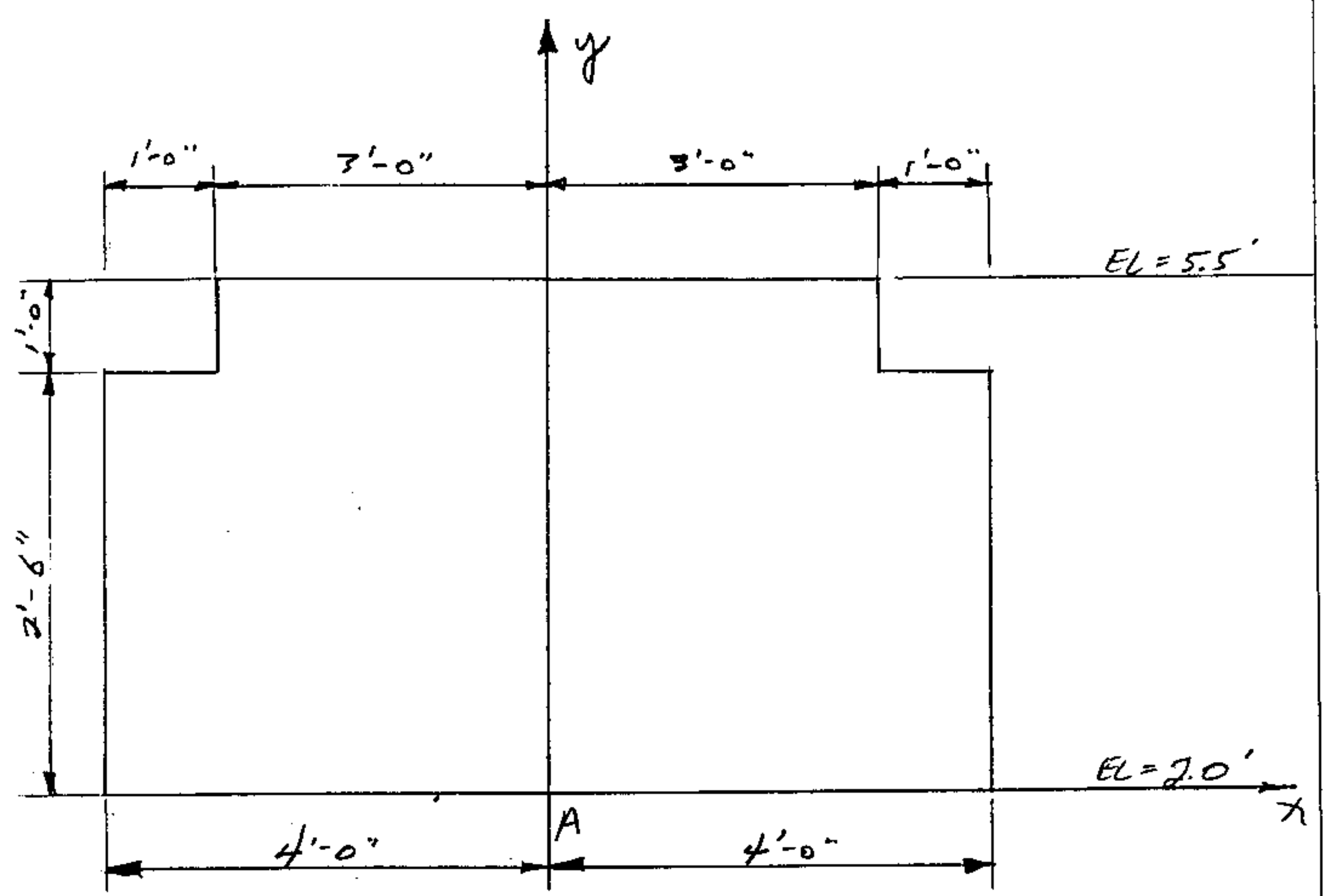
TYPICAL GATE FOUNDATION DESIGN

Client PORT OF NEW ORLEANS Project
Computations for GATE No. 1 MONOLITH
Computed by G. FEITTER Date 1/28/77 Checked by Date

GATE OPENING = 45'-0"

MONOLITH SILL ELEVATION = 5.5'

TOP OF GATE ELEVATION = 15.0'



WT OF MONOLITH (PER FOOT LENGTH)

$W_1 = 0.15[(8.0 \times 3.5) - 2(1*1)]$

$W_1 = 3.9$ KIPS/FT

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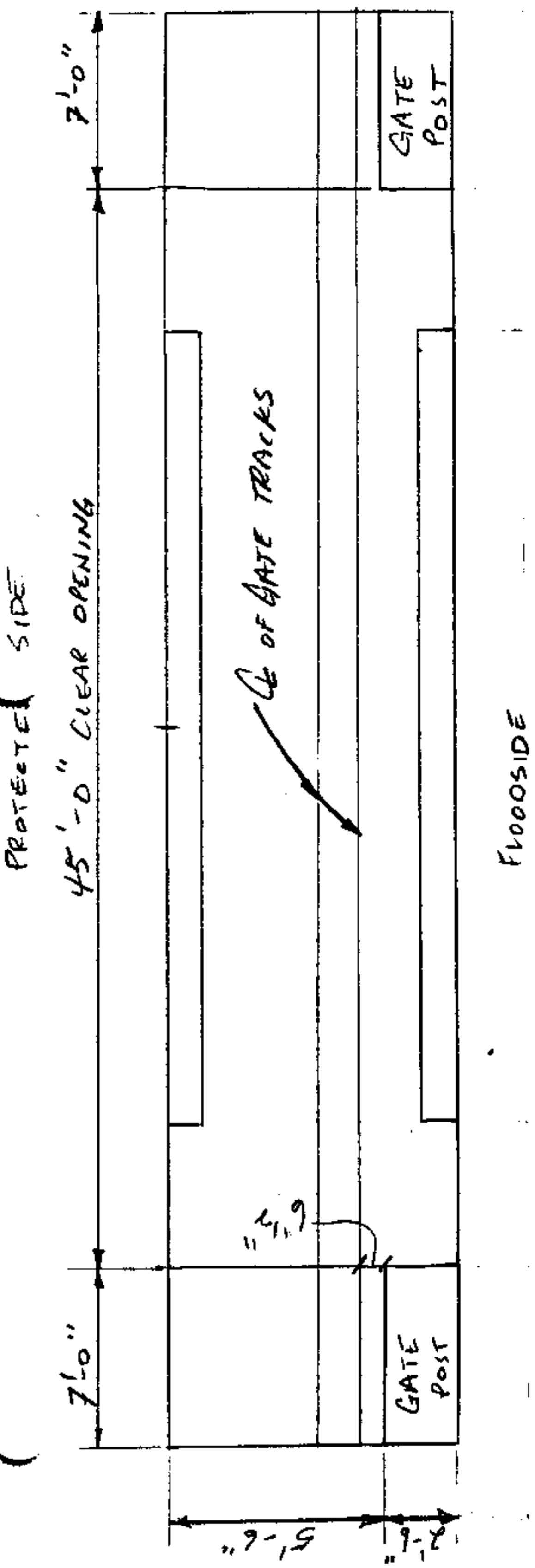
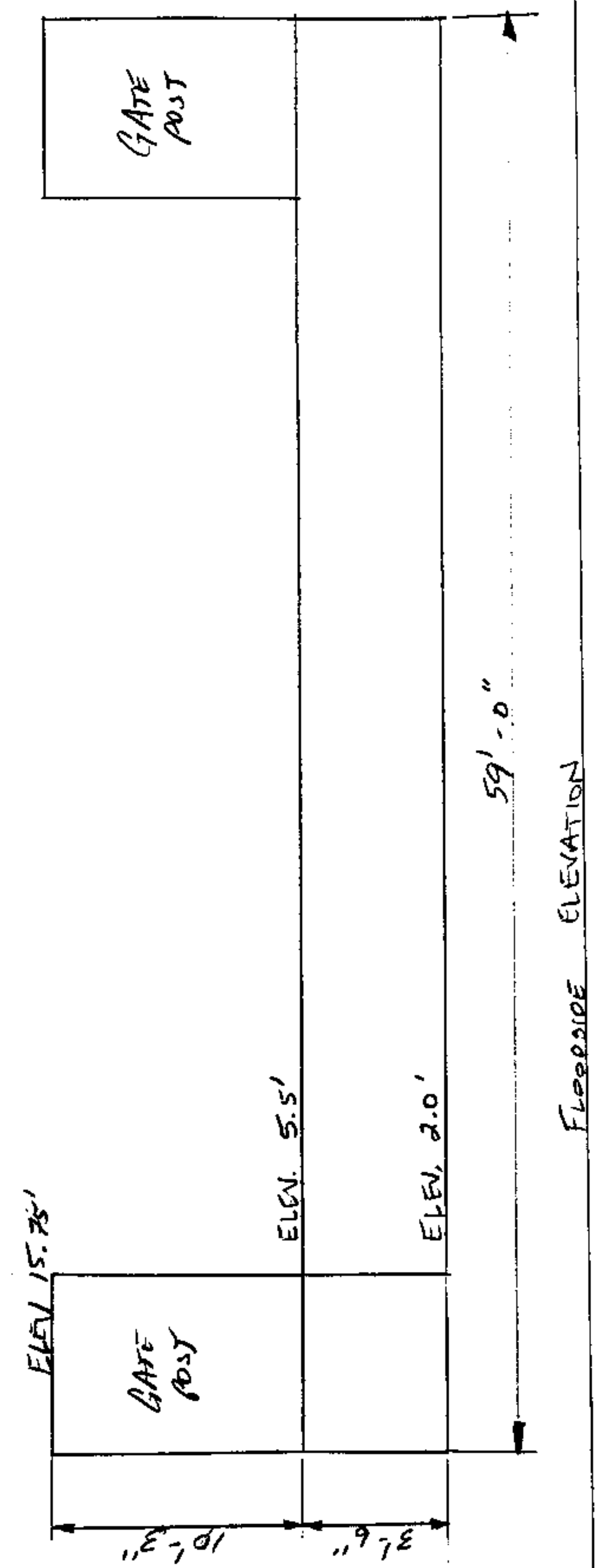
Client PORT OF NEW ORLEANS Project

Computations for GATE No. 1 MONOLITH

Computed by G. FUTTER Date 1/28/97 Checked by Date





Client PORT OF NEW ORLEANS Project
Computations for GATE NO. 1 MONOLITH
Computed by G. FLITTER Date 1/28/97 Checked by Date

GATE WEIGHT = $\frac{30.5 \text{ KIPS}}{49.5'}$ = 0.62 KIPS/FT.

ASSUME GATE C.G. IS @ ℄ OF TRACKS WHICH IS 4.5" FROM CENTER OF THE MONOLITH.

END GATE POSTS

ASSUME: ① GATE POST DIMENSIONS - 2'-6" * 7'-0"

② GATE POST CENTERED 2'-9" FROM VERTICAL LINE THROUGH POINT "A"

③ GATEPOST HEIGHT = GATE HEIGHT + 9" = 10'-3"

WEIGHT OF GATE POST = 0.15 * 2.5 * 7.0 * 10.25

P = 26.9 KIPS ↓

M_A = 26.9 * 2.75 = 74.0 1K EACH

APPROACH RAMP / SLAB (20'-0" X 35'-0")

SLAB WEIGHT = 0.15 * 1.0 * 35

= 5.25 KIPS ↓

ASSUME THAT 1/4 OF THE DEAD LOAD IS TRANSFERRED TO THE MONOLITH.

LOAD /FOOT ON MONOLITH = 5.25/4 = 1.31 K/FT

DEAD LOAD (EXCLUDING GATE POSTS)

P = 3.9 + 0.62 + 1.31 + 1.31 = 7.14 KIPS/FT ↓

M_A = 0.62K/FT * 4.5"/12"/FT = 0.23 FTK/FT

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Computations for: GATE NO. 1 MONOLITH
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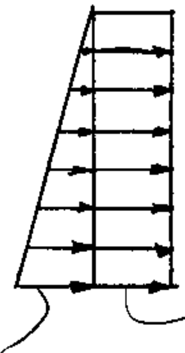
SOIL LOAD ON PROTECTED SIDE

2'-6" OF SOIL W/ 3'-0" SURCHARGE DUE TO LIVE LOAD.



$\gamma = 0.12 \qquad k_a = 1/3$

$H = 1/2 * 0.10 * 2.5 + 0.12 * 2.5$

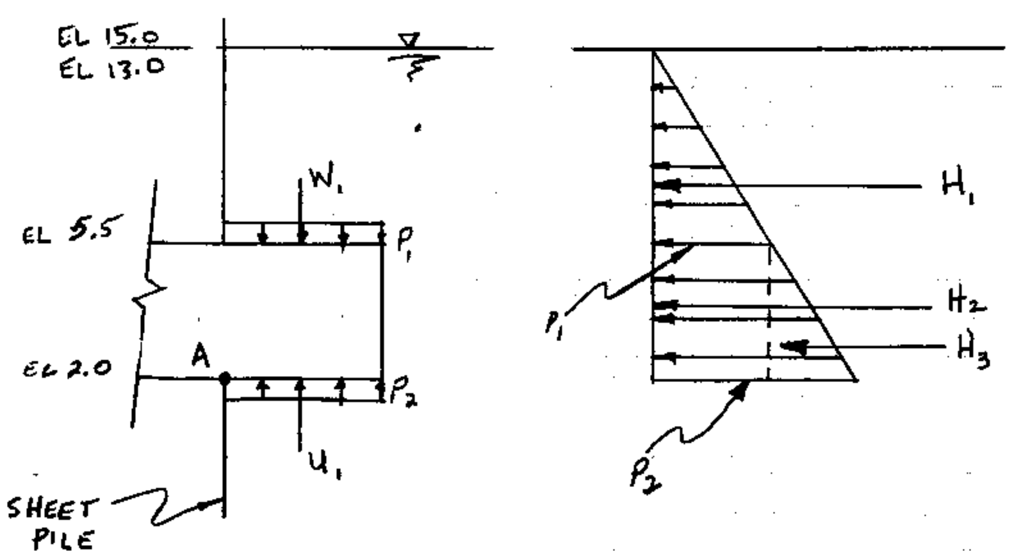
$= 0.125 + 0.30$

$= 0.425$ kips/ft

$M_A = \left(0.125 * \frac{2.5}{3}\right) + \left(0.30 * \frac{2.5}{2}\right)$

$M_A = 0.48$ ftk/ft

HYDRUALIC FORCES



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Computations for GATE No. 1 MONOLITH
Computed by G. FLITTER Date 1/29/97 Checked by Date

WATER UP TO EL. 13.00

$P_1 = 0.0624 * 7.5 = 0.468$ KSF

$P_2 = 0.0624 * 11.0 = 0.686$ KSF

COMPONENT: (K/FT)	* ARM (FT)	=	MOMENT (FT·K/FT)
H2: 0.468 * 3.5 = 1.64	* 1.75	=	2.87
H3: 1/2 * (0.686-0.468) * 3.5 = 0.38	* 1.20	=	0.46
U-W1: (0.686-0.468) * 4.0 = 0.872	* 2.0	=	1.74
			5.07

P = 0.87 K/FT ↑

H = 2.02 K/FT ←

M_A = 5.07 FTK/FT ↻

AT THE GATE POSTS (WATER UP TO EL. 13.0)

$H_1 = 1/2 * 0.468$ KSF $* 7.5' * 49.5' =$ 86.9 KIPS ← (BOTH POSTS)

$M_{A,H_1} =$ 86.9 KIPS $* (3.5' + 7.5/3) =$ 521.2 FT·K ↺

Client PORT OF NEW ORLEANS Project
Computations for GATE NO. 1 MONOLITH
Computed by G. FLITTER Date 1/29/97 Checked by Date

WATER UPTO ELEVATION 15.00

$P_1 = 0.0624 * 9.5 = 0.5928$ KSF

$P2 = 0.0624 * 13.0 = 0.8112$ KSF

COMPONENT : (K/FT)	* ARM (FT)	= MOMENT (FTK/FT)
H2: 0.5928 * 3.5 = 2.07	* 1.75	= 3.62
43: ½*(0.8112-0.5928) * 3.5 = 0.38	* 1.20	= 0.46
U1-W1 = (0.8112-0.5928) * 4.0 = 0.87	* 2.0	= 1.75
		5.83

P = 0.87 KIPS ↑

H = 2.45 KIPS ←

M_A = 5.83 FT.K/FT ↻

AT THE GATE POSTS (WATER UP TO ELEVATION 15.0)

H_1 = ½ * 0.5928 KSF * 9.5' * 49.5' = 139.4 KIPS ←

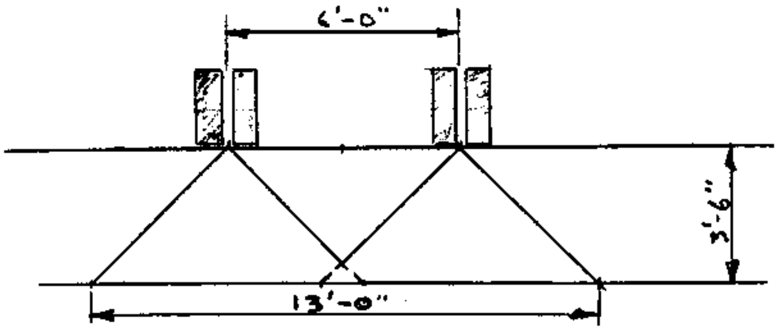
M_{A,H_1} = 139.4 K * (3.5' + 9.5'/3) = 929.2 FT.K ↻

Client: PORT OF NEW ORLEANS Project:
Computations for: GATE NO. 1 MONOLITH
Computed by: G. FLITTER Date: 1/29/97 Checked by: Date:

H_S 20-44 TRUCK LOADING

AXLE LOAD = 32 KIPS

SINCE THE DEPTH OF THE MONOLITH IS 3'-6", IT CAN BE ASSUMED THAT EACH WHEEL LOAD IS DISTRIBUTED OVER 2 * 3.5' = 7'-0"



$$P = \frac{32 \text{ KIPS}}{13 \text{ FT}} = 2.46 \text{ KIPS/FT}$$

LONGITUDINAL FORCE = 5% OF 2.47 = 0.12 K/FT

THE LONGITUDINAL FORCE IS APPLIED 9'-0" ABOVE POINT "A"

H_S 20-44 TRUCK ON PROTECTED OR FLOODSIDE

P = 2.46 KIPS/FT

H = 0.12 KIPS/FT

M_A = 2.46 * 3.5' + 0.12 * 9.0' = 9.69 FT KIPS/FT ↺

WIND LOAD

WIND LOAD OCCURS ONLY AT THE GATEPOSTS. FOR STRUCTURES WITHIN 100 MILES OF THE HURRICANE SHORELINE, USE

P = 50 PSF = 0.05 KSF

WIND LOAD / GATE POST

H = 0.05 * (15.75' - 5.5') * 7' = 3.59 KIPS ⇄

Client PORT OF NEW ORLEANS Project
Computations for GATE No. 1 MONOLITH
Computed by G. FLITTER Date 1/29/97 Checked by Date

WIND LOAD / GATE POST (CONT.)

$$M_A = 3.59 * [(15.75 - 5.5)/2 + 3.5] = 30.96 \text{ K·FT}$$

MONOLITH BETWEEN GATE POSTS:

LOADING CASES:

(1) WATER UP TO ELEV 13.00

(2) WATER UP TO ELEV 15.00 (75% FORCES)

(3) HS 20-44 TRUCK ON PROTECTED SIDE EDGE OF MONOLITH

(4) HS 20-44 TRUCK ON FLOOD SIDE EDGE OF MONOLITH

NOTE: MAXIMUM PILE SPACING ALONG THE LENGTH OF THE MONOLITH IS 6'-6". IN VIEW OF THE EXPECTED LOAD DISTRIBUTION OF TRUCK LOADS WE CAN ASSUME THAT 3 ROWS OF PILES WITHSTAND THESE LOADS
∴ CONSIDER 3 × 6.5' = 19.5' WIDE MONOLITH

CASE (1)

$H = 2.02 \text{ K/FT} * 19.5 \text{ FT} = \underline{39.4 \text{ KIPS}}$ ←

$P = (7.14 \text{ K/FT} - 0.87 \text{ K/FT}) * 19.5 = \underline{122.3 \text{K}}$ ↓

$M_A = (5.07 - 0.23) * 19.5' = \underline{94.38 \text{ 1K}}$

CASE (2)

$H = 0.75 * 2.45 * 19.5' = \underline{35.83 \text{ KIPS}}$ ←

$P = 0.75 (122.3\text{K}) = \underline{91.73 \text{ KIPS}}$ ↓

$M_A = 0.75 [(5.83 - 0.23) * 19.5] = \underline{81.9 \text{ 1K}}$

Client: PORT OF NEW ORLEANS Project: ________
Computations for: GATE NO. 1 MONOLITH
Computed by: G. FLITTER Date: 1/30/97 Checked by: ________ Date: ________

CASE (3)

(SOIL)

$H = 5\%$ of $32 + 0.425 * 19.5 = \underline{9.9 \text{ KIPS}} \rightarrow$

$P = 32 + (7.14 * 19.5) = \underline{171.2 \text{ KIPS}} \downarrow$

$M_A = (-.48 - .23) * 19.5 + (32 * 3.5') + [(0.05)(32) * 9] = \underline{112.6 \text{ FT·K}}$

CASE (4)

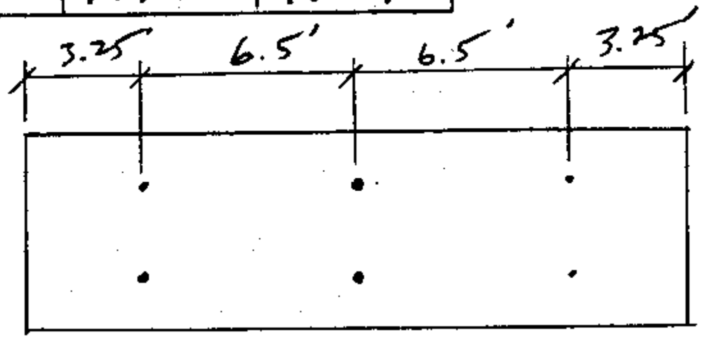
$H = 5\%$ of $32 = \underline{1.6 \text{ KIPS}} \leftarrow$

$P = \underline{171.2 \text{ KIPS}} \downarrow$

$M_A = (-.23 * 19.5) - (32 * 3.5) - (1.6 * 9) = \underline{130.9 \text{ FT·K}}$

SUMMARY

LOADING CASE	P_y (KIPS)	P_z (KIPS)	M_x (FT·K)
1	39.4	122.3	94.38
2	35.8	91.73	81.9
3	9.9	171.2	112.6
4	1.6	171.2	130.9



Client PORT OF NEW ORLEANS Project
Computations for GATE NO. 1 MONOLITH
Computed by G. FLITTER Date 1/30/97 Checked by Date

LOADS ON ENTIRE MONOLITH

LOADING CASES:

①: GATE CLOSED - WATER TO ELEV. 13.0'

②: GATE CLOSED - WATER TO ELEV. 15.0' (75%)

③: GATE OPEN - 2 H_S 20-44 TRUCKS ON PROTECTED SIDE - EDGE OF BASE SLAB.

④: GATE OPEN - 2 H_S 20-44 TRUCKS ON FLOOD SIDE - EDGE OF BASE SLAB.

⑤: CASE ③ + WIND FROM FLOODSIDE (75% FORCE)

⑥ CASE ④ + WIND FROM PROTECTED SIDE (75% FORCE)

⑦ GATE OPEN ; WIND FROM FLOODSIDE

⑧ GATE OPEN ; WIND FROM PROTECTED SIDE

TOTAL LENGTH OF MONOLITH = 45' + 7' + 7' = 59'

CASE ①

$H = 2.02 * 59 + 86.9 = 206.1 \leftarrow$

$P = (7.14 - 0.87) * 59 + (2 * 26.9) = 423.7 \text{ KIPS} \downarrow$

$M_A = (-.23 * 49.5) + (5.07 * 59) + (521.2) + (2 * 74) = 956.9'^{K}$ ↻

Client PORT OF NEW ORLEANS Project
Computations for GATE NO. 1 MONOLITH
Computed by G. FLITTER Date Checked by Date

CASE (2)

$H = 0.75[(2.45 * 59) + 139.4] = 213.0$ KIPS ←

$P = 0.75[(7.14 - 0.87) * 59 + (2 * 26.9)] = 317.8$ KIPS ↓

$M_A = 0.75[(5.82 * 59 - .23 * 49.5) + 929.2 + 2(74.0)] = 1056.9$ 'K ↻

CASE (3)

$H = (2 * 1.6) + (.425 * 59) = 28.3$ KIPS →

$P = (7.14 * 59) + (2 * 32) + 2(26.9) = 539.0$ KIPS ↓

$M_A = (-.23 * 49.5 - .53 * 59) + 2((32 \times 3.5) + 14.4 + 74)$

$= 358.1$ 'K ↻

CASE (4)

$H = 2 * 1.6 = 3.2$ KIPS ←

$P = 539.0$ KIPS ↓

$M_A = (-0.23 * 49.5) + .2(-32 * 3.5 - 14.4 + 74) = -116.2$ 'K

116.2 'K ↺

CASE (5)

$H = 0.75(-2 * 1.6 + 2 * 3.59) = 3.0$ KIPS ←

$P = 0.75(7.14 * 59 + 2 * 32 + 2 * 26.9) = 404.3$ KIPS ↓

$M_A = 0.75(-.23 * 49.5 + 2(32 * 3.5 + 14.4 + 74 + 30.96)$

$= 338.5$ 'K ↻

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Computations for GATE NO. 1 MONOLITH
Computed by G. FLITTER Date 1/30/97 Checked by Date

CASE ⑥ $(-3.2 + 7.2) .75 = 3.0$

$H = 3.0 + 0.75 * .425 * 59 = 21.8$ KIPS →

$P = 404.3$ KIPS ↓

$M_A = 0.75 [(-0.23 * 49.5) + 2 (32 * 7.5 - 14.4 - 74 + 30.96)$

$= 97.7$ 1K ↻

CASE ⑦

$H = 3.59 * 2 = 7.18$ KIPS ←

$P = 7.14 * 59 + 2 * 26.9 = 475.1$ KIPS ↓

$M_A = 2 * 74.0 + 2 * 30.96 = 209.9$ 1K ↻

CASE ⑧

$H = 7.18 + 0.425 * 59 = 32.3$ KIPS →

$P = 475.0$ KIPS ↓

$M_A = 2 * 74.0 - 2 * 30.96 = 86.1$ 1-K ↻

Client: PORT OF NEW ORLEANS Project:
Computations for: GATE NO. 1 MONOLITH
Computed by: G. FLITTER Date: 1/30/97 Checked by: Date:

SUMMARY:

LOADING CASE	P_y (KIPS)	P_z (KIPS)	M_x (FT.K)
1	206.8	423.7	956.9
2	213.0	317.8	1057.0
3	-28.3	539.0	358.1
4	3.2	539.0	-116.2
5	-3.0	404.3	338.5
6	-31.4	404.3	97.7
7	7.18	475.1	209.9
8	32.3	475.0	86.1

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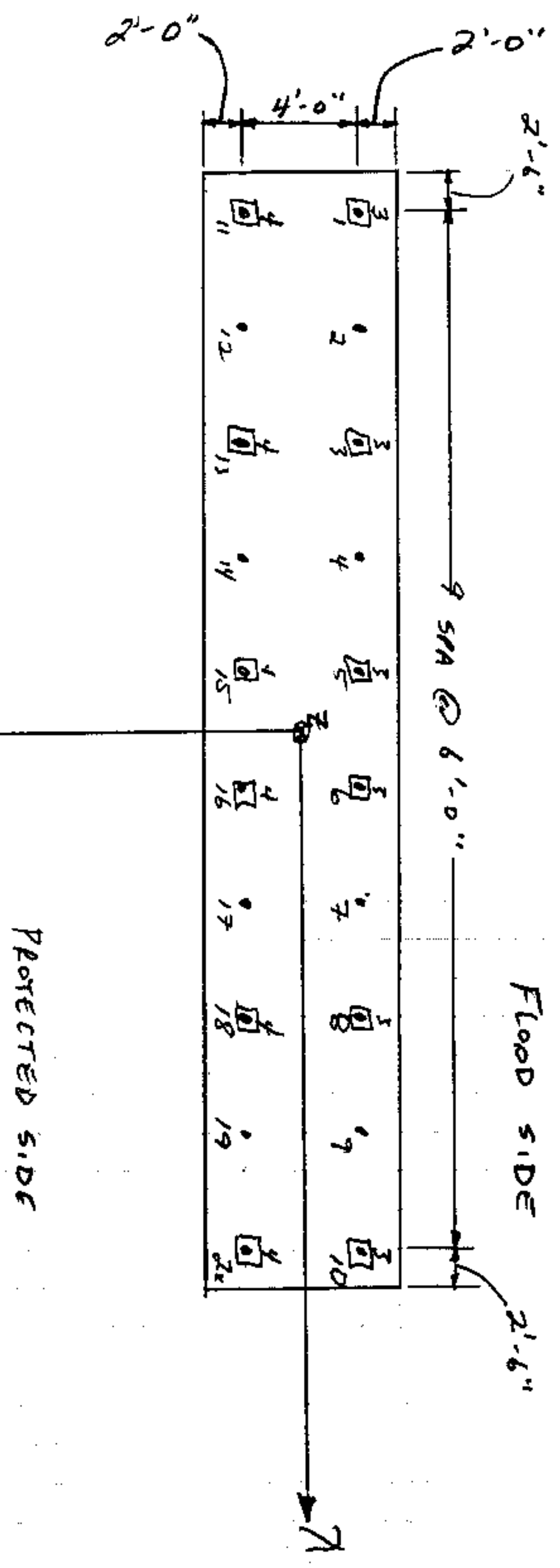
Client: PORT OF NEW ORLEANS Project: ______

Computations for: GATE NO. 1 MONOLITH

Computed by: G. FLITTER Date: 2/3/97 Checked by: ______ Date: ______

PILE LAYOUT



• - VERTICAL

□ - 3:1 BATTER

□ - 4:1 BATTER

ALL PILES 14" x 14" PPC PILES

CPGA ANALYSIS OF PILE GROUP IS ATTACHED

Client PORT OF NEW ORLEANS Project
Computations for GATE NO. 1 MONOLITH
Computed by G. FLITTER Date 2/3/97 Checked by Date

CAP DESIGN

SINCE PILE FORCES ARE LESS IN MAGNITUDE TO THOSE IN THE MONOLITH FOR GATE NO. 8, USE MINUMUM REINFORCEMENT.

MONOLITH THICKNESS = 3'-6" = 42" ; $d = 38"$

$A_s = 0.002 * 12 * 38 = 0.912\ in^2$

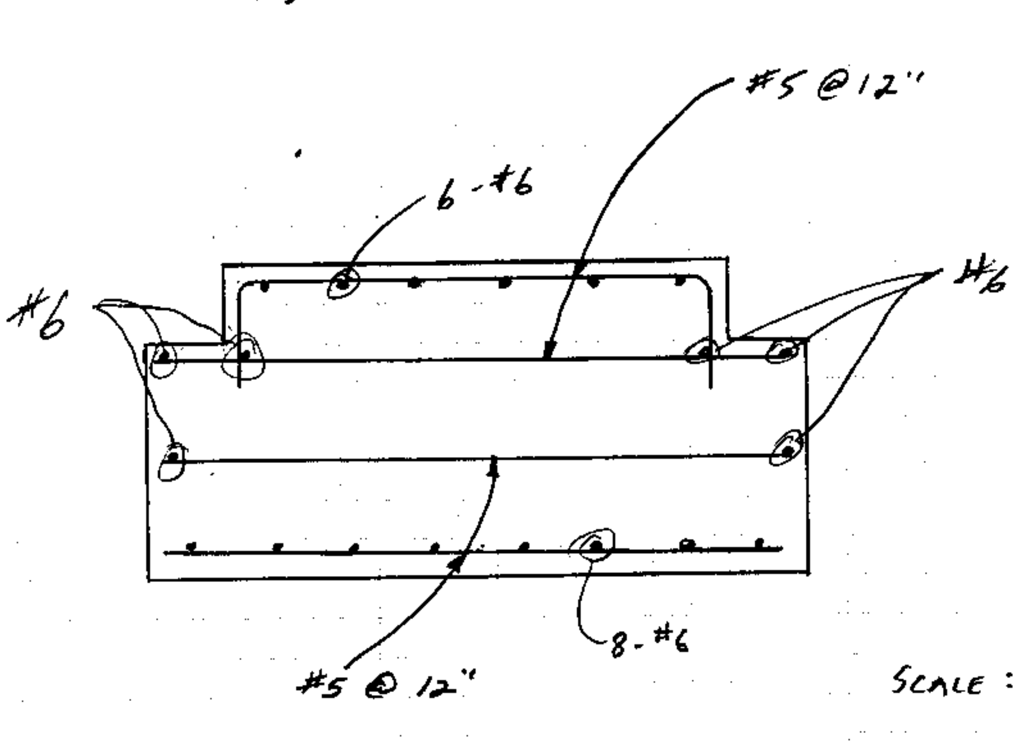
USE 4 LAYERS OF #5 @ 12" ($A_s = 1.24\ in^2$)

LONGITUDINAL STEEL

AREA OF MONOLITH = 26 sq FT = 3744 in^2

$A_s = 0.002 * 3744 = 7.48\ in^2$

A_s PROVIDED = 8.8 in^2



SCALE : NTS

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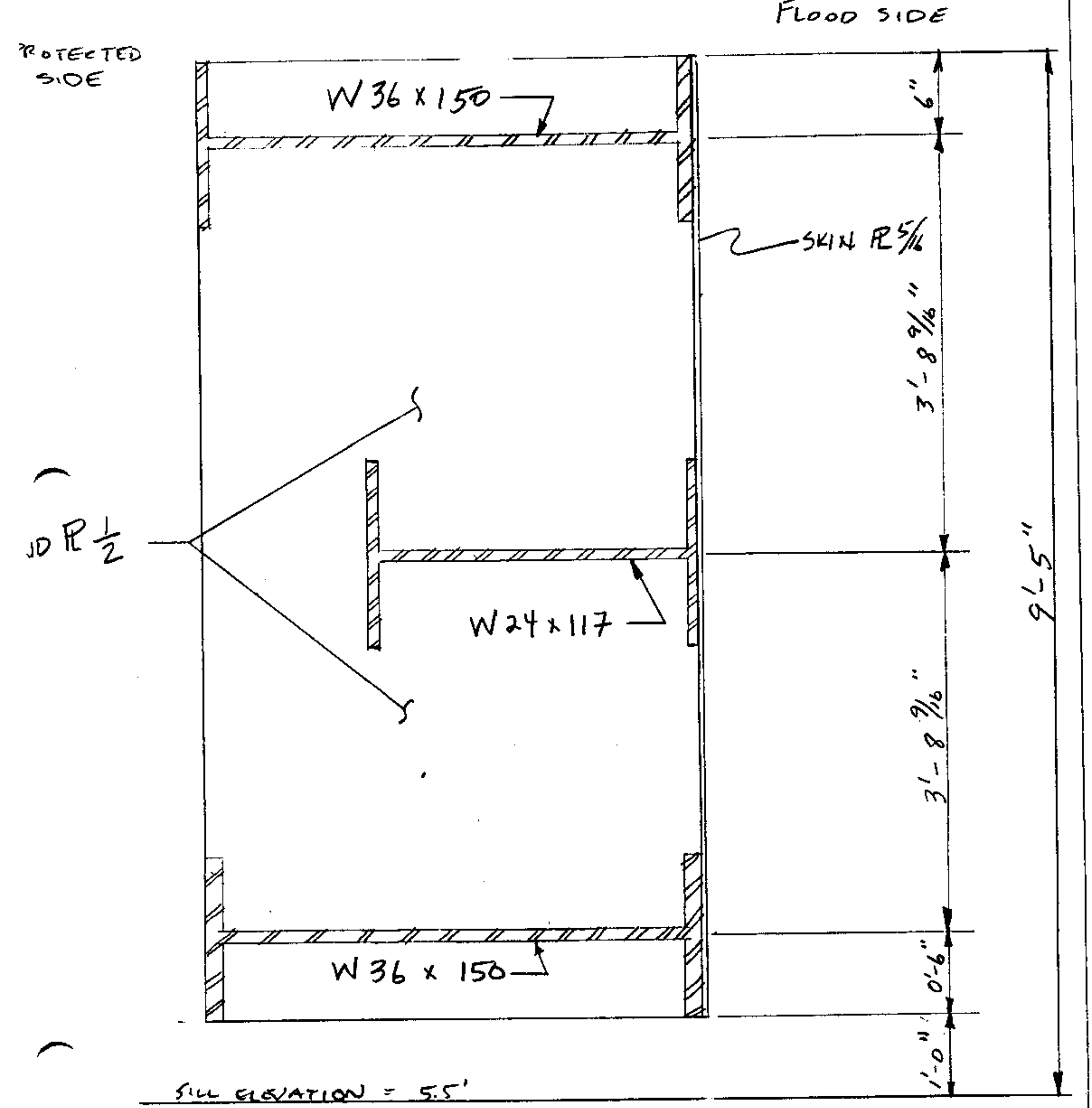
Sheet No. 5/6

Client: PORT OF NEW ORLEANS Project:

Computations for: ROLLER GATE NO. 1

Computed by: G. FLITTER Date: 2/6/97 Checked by: Date:



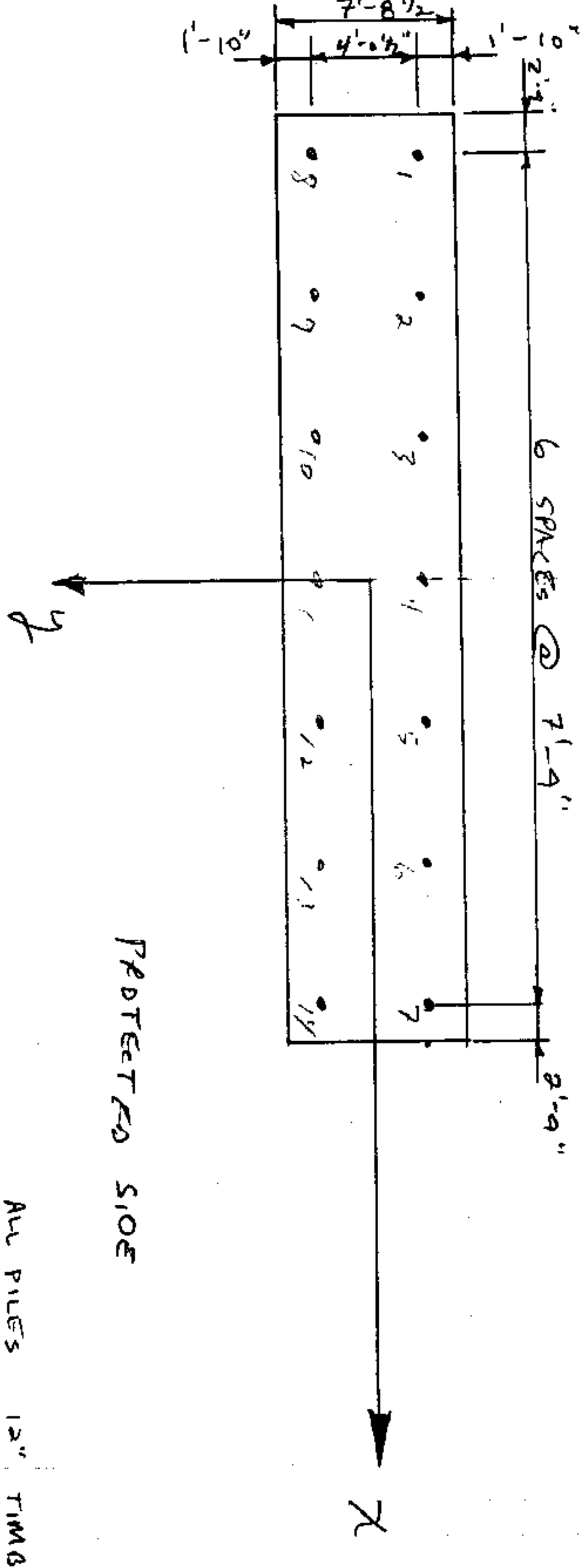
PYBURN & ODOM, INC — CONSULTING ENGINEERS

Sheet No.

Client PORT OF NEW ORLEANS Project

Computations for STORAGE MONOLITH GATE NO. 1

Computed by G. FLITTER Date 2/7/97 Checked by Date



PILE #	x	y
1	-23.25	-2.02
2	-15.5	-2.02
3	-7.75	-2.02
4	0	-2.02
5	7.75	-2.02
6	15.5	-2.02
7	23.25	-2.02

PILE #	x	y
8	-23.25	2.02
9	-15.5	2.02
10	-7.75	2.02
11	0	2.02
12	7.75	2.02
13	15.5	2.02
14	23.25	2.02

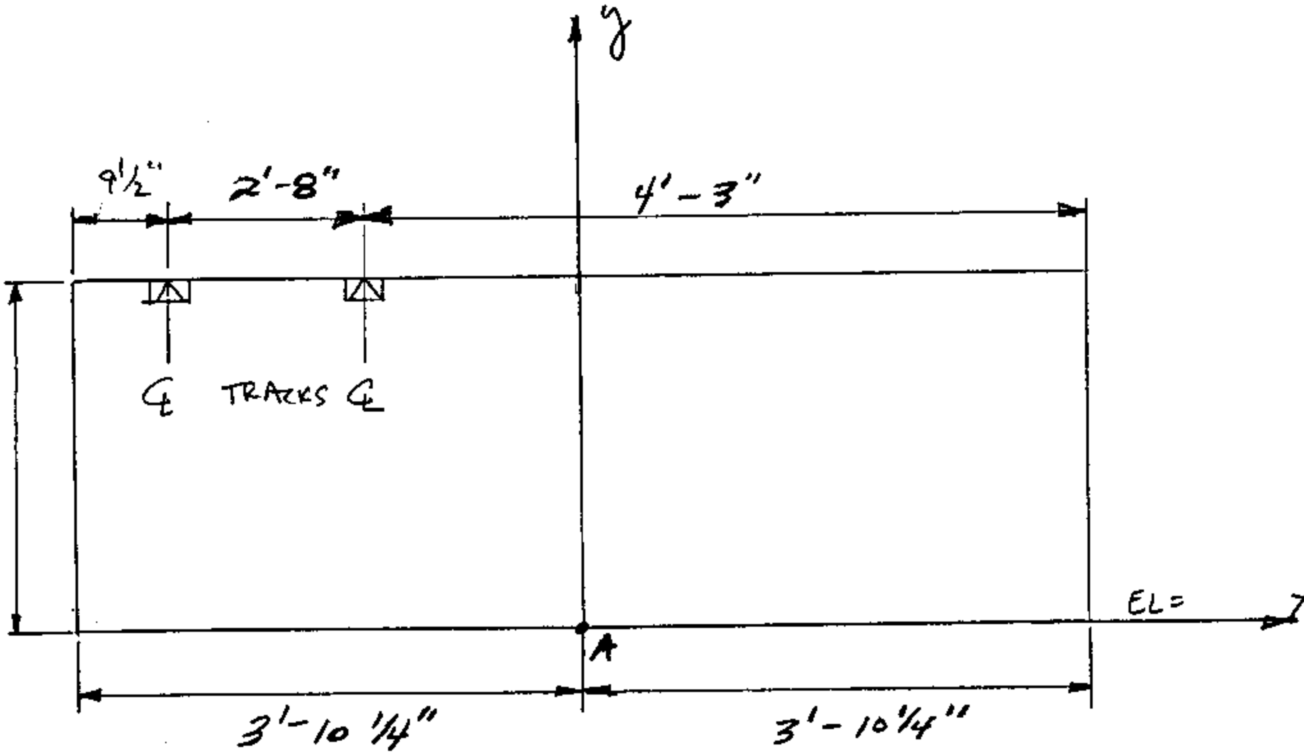
FLOOD SIDE

PROTECTED SIDE

ALL PILES 12" TIMBER

ALL PILES VERTICAL

Client PORT OF NEW ORLEANS Project
Computations for STORAGE MONOLITH GATE NO. 1
Computed by G. FLITTER Date 2/7/97 Checked by Date



C.G. OF GATE IS 1'-8¾" FROM POINT "A"

WT. OF STORAGE MONOLITH = (7'-8½")(3'-6")(0.15) = 4.0 KIPS↓/FT

WT OF GATE = 30 KIPS↓/52 FT = 0.58 KIPS/FT↓

<u>DEAD LOAD</u>

$P = 0.58 + 4 = 4.57$ KIPS /FT ↓

$M_A = (0.58)(1'\text{-}8¾") = 1.0$ FT-K/FT ↶

Client PORT OF NEW ORLEANS Project
Computations for STORAGE MONOLITH GATE No. 1
Computed by G. FLITTER Date 2/11/97 Checked by Date

STORAGE MONOLITH

LOAD

D.L. V1 = 1.5 * (15-3) * 0.15 = 2.70 * 3.25 = 8.78
V2 = 0.5 * (15-3) * 0.15 = 0.90 * 2.33 = 2.10
V3 = 2.5 * 12.5 * 0.15 = 4.69 * 7.0 = 32.83
Σ = 8.29 ... 43.71
} ALL CASES

WINDS H1 = 0.05 * 1 * (15-5) = 0.50 * 9.5 = 4.75(-) III
H2 = -0.05 * 1 * (15-5) = -0.50 * 9.5 = 4.75 IV

SOIL Hs1 = 0.115 * 0.5 * 2.5²/2 = ±0.180 * 1.5 = 0.27(±) ±III IV±
Hs2 = (0.115 - 0.0624) * 0.5 * 2.5²/2 = 0.082 * 1.5 = 0.123(-) I, II

WATER Hw1 = 0.0624 * (13-0.5)²/2 = 4.875 * 4.167 = 20.31(-) I
Hw2 = 0.0624 * (15-0.5)²/2 = 6.56 * 4.83 = 31.69(-) II

UPLIFT LOADS U2 = 0.0624 * 12.5 * 4 = -3.12 * 9.0 = 28.08(-) [32.76] I
U3 = 0.0624 * 14.5 * 4 = -3.61 * 9.0 = 32.58(-) [37.91] II

VERT. LOADS W1 = 0.115 (5-3) * 3.5 = 0.805 * 1.75 = 1.41 ALL CASES
W2 = (0.115 - 0.0624) * 2 * 7] + (0.0624 * 10 * 7) = 5.11 * 7.5 = 38.33 [45.99] II
W3 = (0.115 - 0.0624) * 2 * 7] + (0.0624 * 8 * 7) = 4.23 * 7.5 = 31.73 [35.07] I
W4 = 0.115 (2) * 7 = 1.61 * 7.5 ... 12.08 [14.49] III, IV, V

GRIT Hs = 0.022 ALL CASES

UPLIFT U4 = 0.0624 * 12.5 * 12.5/2 = 4.875(-) * 12.5 (2/3) = 40.63(-) VI
U5 = 0.0624 * 14.5 * 12.5/2 = 5.66(-) * 12.5 (2/3) = 47.13(-) VII

Client PORT OF NEW ORLEANS Project
Computations for GATE MONOLITH NO. 1
Computed by G. FLITTER Date 2/11/97 Checked by Date

LOAD COMBINATIONS

LOAD CASE	$F_x \rightarrow$	$F_z \downarrow$	M_y ↻
I = D.L. + SWL + IMPERVIOUS WALL			
SOIL	0.082	0	-0.123
DEAD	0	8.29	40.19
WATER	4.875	0	-20.31
UPLIFT	0	-3.12	-32.76
VERT	0	0.805	1.41
	0	4.23	38.07
SHEET PILE	0.022	—	—
	4.98	10.21	26.48
II HWL + D.L. + IMPER. WALL			
	0.082	0	-0.123
DEAD	0	8.29	40.19
WATER	6.56	0	-31.69
UPLIFT	0	-3.61	-37.91
VERT.	0	0.805	1.41
	0	5.11	45.99
SHEETPILE	0.022	—	—
	6.66	10.60	17.87
*.75	5.00	7.95	13.40
III WIND (F.S.) + D.L.			
DEAD	0	8.29	40.19
WIND	0.5	0	-4.75
SOIL	0.180	0	-0.27
VERTICAL	0	0.805	1.41
	0	1.61	14.49
SHEET PILE	0.022	—	—
GATE	0	0.58	3.41
	0.70	11.28	54.48
*0.75	0.53	8.46	40.86

LOADCASE	$F_x \rightarrow$	$F_z \downarrow$	M_y ↻
IV WIND (P.S.) + D.L.			
DEAD	0	8.29	40.19
VERT	0	0.805	1.41
	0	1.61	14.49
SHEETPILE	0.022	—	—
WIND	-0.50	—	4.75
SOIL	-0.18	—	0.27
GATE	0	0.58	3.41
	-1.06	11.29	64.52
*0.75	-0.80	8.46	48.39
V D.L.			
DEAD	0	8.29	40.19
SOIL	0	1.61	14.49
	0	0.805	1.41
SHEETPILE	0.022	—	—
GATE	0	0.58	3.41
	0.022	11.29	59.50
VI CASE I w/ PERVIOUS SHEETPILE			
DEAD	0	8.29	40.19
WATER	4.875	0	-20.31
SOIL	0.082	0	-0.123
VERT	0	0.805	1.41
	0	4.23	38.07
SHT PILE	0.022	—	—
UPLIFT	—	-4.875	-40.63
	4.98	8.45	18.61
VII CASE II w/ PERVIOUS SHEETPILE			
SOIL	0.082	0	-0.123
DEAD	0	8.29	40.19
WATER	6.56	0	-31.69
VERT	0	0.805	1.41
	0	5.11	45.99
UPLIFT	0	-5.66	-47.13
	6.66	8.55	8.65
*.75	[illegible]	[illegible]	[illegible]

PYBURN & ODOM, INC — CONSULTING ENGINEERS

Sheet No. 3/5

Client PORT OF NEW ORLEANS Project

Computations for STORAGE MONOLITH GATE NO. 1

Computed by G. FLITTER Date 2/10/97 Checked by Date

SEE T-WALL DESIGN (AREA 1)

LOADS ARE THE SAME EXCEPT FOR THE ADDITION OF THE GATE AND THE ELIMINATION OF THE SOIL ON FLOOD SIDE.

D.L. GATE = 0.58 K/FT

Σ D.L = 7.725 + 0.58 = 8.305

Σ M = 33.57 + (0.58)(5'-10½") = 3.41 → 36.98 1K

LOAD CASE	W/ LOAD FACTOR	F_x (→)		F_z (↓)		M_y (↺)	
	L.F.	ΣFx	* L.F.	Σ	* L.F	Σ	* L.F.
I	1.0	4.98	4.98	10.2	10.2	20.1	20.1
II	0.75	6.66	5.0	10.6	7.95	10.2	7.7
III	0.75	0.70	0.53	11.3	8.5	54.5	40.9
IV	0.75	-1.1	-0.8	11.3	8.5	64.5	48.4
V	1.0	0.02	0.02	11.3	11.3	59.5	59.5
VI	1.0	4.98	4.98	8.5	8.5	18.6	18.6
VII	0.75	6.7	5.0	8.6	6.4	8.7	6.5

Client PORT OF NEW ORLEANS Project
Computations for STORAGE MONOLITH GATE NO. 1
Computed by G. FLITTER Date 2/10/97 Checked by Date

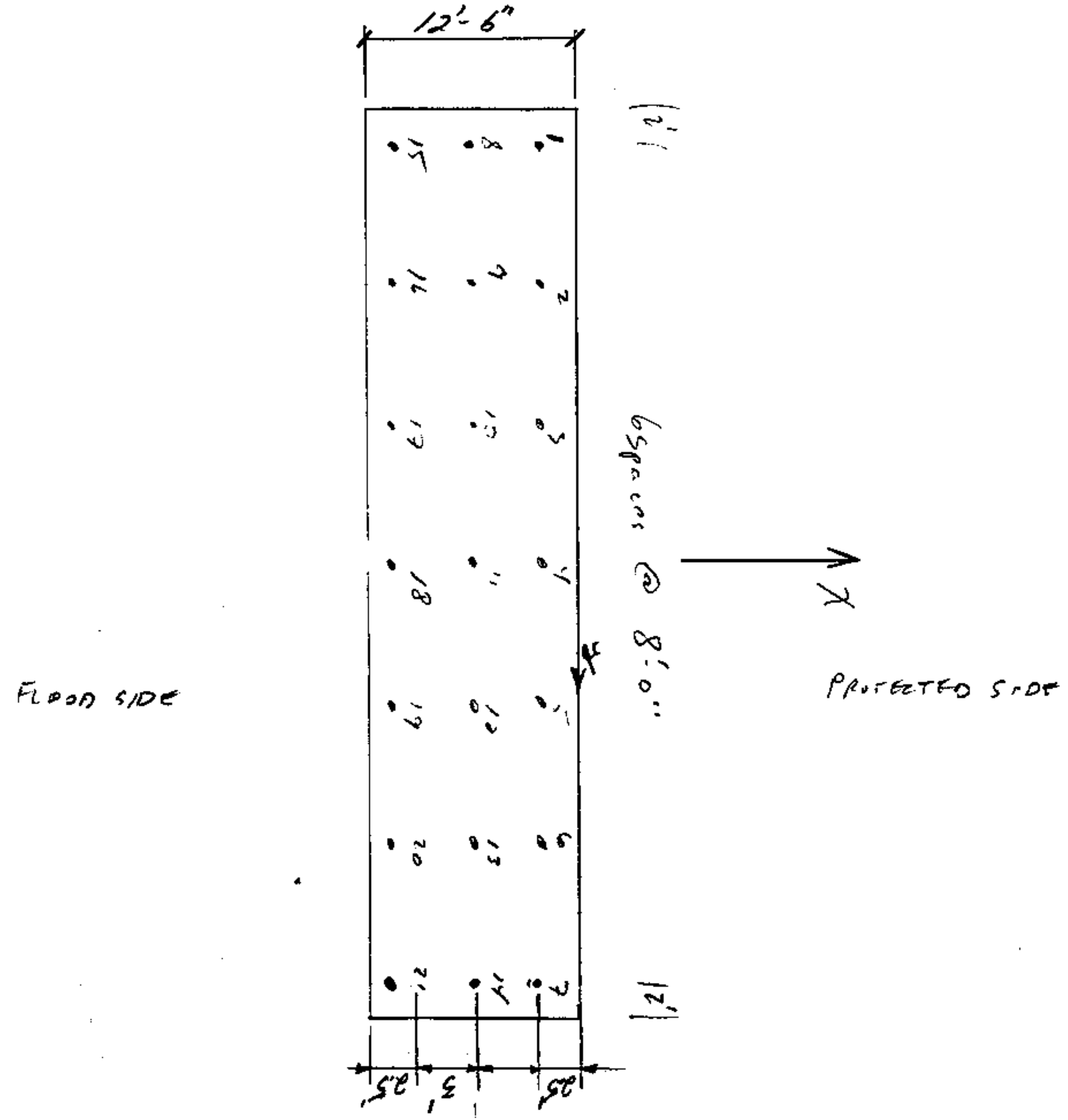
STORAGE MONOLITH = 52'-0" LONG

LOAD CASE	Fx (→)	Fz (↓)	My ↻	COMMENTS
I	259.0	530.4	1045.2	—
II	260.0	413.4	400.4	75% LOADS
III	27.6	442.0	2126.8	75% LOADS
IV	-41.6	442.0	2516.8	75% LOADS
V	1.01	587.6	3094.0	—
VI	259.0	442.0	967.2	—
VII	260.0	332.8	338.0	75% LOADS

CPGA FILE NAME TWMONO1.D

PYBURN & ODOM, INC — CONSULTING ENGINEERS Sheet No. 5/5

Client: PORT OF NEW ORLEANS Project:
Computations for: STORAGE MONOLITH GATE NO. 1
Computed by: G. FLITTER Date: 2/11/97 Checked by: Date:



```
1000 T-WALL MONOLITH AT GATE NO. 1
1005 3 ROWS OF 14 IN. SQ. PPC PILES AT 8.0' C/C, ORIGIN AT CENTER
OF BASE
1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL

1020 SOI ES .046 LEN 70.0 0. ALL

1030 PIN ALL

1040 TEN 0.8 ALL

1050 DLS S 83.0 38.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL

1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL
1070 BAT 3.0 1 TO 7
1075 BAT 4.0 15 TO 21
1076 BAT 6.0 8 TO 14
1080 ANG 180 15 TO 21
1090 ANG 0  1 TO 14

1100 PIL 1 -2.0 -18.0 0.0  8 -7.0 -18.0 0.0 15 -10.5 -18.0 0.0
1110 ROW Y 7 1 6 AT 8
1115 ROW Y 7 8  6 AT 8
1116 ROW Y 7 15 6 AT 8
1120 LOA 1 259.0 0.0 530.4 0.0 1045.2 0.0

1121 LOA 2 260.0 0.0 413.4 0.0 400.4
1122 LOA 3 27.6 0.0 442.0 0.0 2126.8
1123 LOA 4 -41.6 0.0 442.0 0.0 2516.8
1124 LOA 5 1.0 0.0 587.6 0.0 3094.0
1125 LOA 6 259.0 0.0 442.0 0.0 967.2 0.0
1126 LOA 7 260.0 0.0 332.8 0.0 338.0 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\TWMONO1.O

1140 PFO ALL

1150 PLB ALL
1160 FPL C:\CORPS\CPGG\TWMONO1.P
```

```
 *********************************
 * CORPS PROGRAM  #  X0080        *  CPGA - CASE PILE GROUP ANALYSI
S PROGRAM
 * VERSION NUMBER # 1992/02/26    *  RUN DATE 30-JUL-1997   RUN TIM
E 16.34.40
 *********************************


 T-WALL MONOLITH AT GATE NO. 1



 THERE ARE  21 PILES AND
             7 LOAD CASES IN THIS RUN.

 ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                            X           Y           Z
                                          -----       -----       -----
 WITH DIAGONAL COORDINATES = (    -10.50 ,    -18.00 ,        .00 )
                             (     -2.00 ,     30.00 ,        .00 )


 *****************************************************************
**************

          PILE PROPERTIES AS INPUT


      E            I1            I2            A            C33
    B66
     KSI          IN**4         IN**4        IN**2
  .40740E+04   .32010E+04   .32010E+04   .19600E+03   .15000E+01
 .00000E+00

 THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

    ALL


 *****************************************************************
**************
```

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL	LENGTH	L	LU
	K/IN**2		FT	FT
	.46000E-01	L	.70000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****
****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X	Y	Z	BATTER	ANGLE	LENGTH	FIXITY
	FT	FT	FT			FT	
1	-2.00	-18.00	.00	3.00	.00	70.00	P
2	-2.00	-10.00	.00	3.00	.00	70.00	P
3	-2.00	-2.00	.00	3.00	.00	70.00	P
4	-2.00	6.00	.00	3.00	.00	70.00	P
5	-2.00	14.00	.00	3.00	.00	70.00	P
6	-2.00	22.00	.00	3.00	.00	70.00	P
7	-2.00	30.00	.00	3.00	.00	70.00	P
8	-7.00	-18.00	.00	6.00	.00	70.00	P
9	-7.00	-10.00	.00	6.00	.00	70.00	P
10	-7.00	-2.00	.00	6.00	.00	70.00	P
11	-7.00	6.00	.00	6.00	.00	70.00	

```
P
 12      -7.00      14.00       .00     6.00       .00    70.00
P
 13      -7.00      22.00       .00     6.00       .00    70.00
P
 14      -7.00      30.00       .00     6.00       .00    70.00
P
 15     -10.50     -18.00       .00     4.00    180.00    70.00
P
 16     -10.50     -10.00       .00     4.00    180.00    70.00
P
 17     -10.50      -2.00       .00     4.00    180.00    70.00
P
 18     -10.50       6.00       .00     4.00    180.00    70.00
P
 19     -10.50      14.00       .00     4.00    180.00    70.00
P
 20     -10.50      22.00       .00     4.00    180.00    70.00
P
 21     -10.50      30.00       .00     4.00    180.00    70.00
P
                                                          ------
                                                         1470.00
```

```
 *****************************************************************
**************
```

APPLIED LOADS

```
 LOAD     PX        PY        PZ          MX          MY
MZ
 CASE     K         K         K          FT-K        FT-K          F
T-K

   1     259.0      .0      530.4         .0       1045.2
 .0
   2     260.0      .0      413.4         .0        400.4
 .0
   3      27.6      .0      442.0         .0       2126.8
 .0
   4     -41.6      .0      442.0         .0       2516.8
```

```
 .0
  5      1.0         .0     587.6          .0      3094.0
 .0
  6    259.0         .0     442.0          .0       967.2
 .0
  7    260.0         .0     332.8          .0       338.0
 .0
```

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 7.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 7.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 7.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 7.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 7.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 8.

LOAD CASE 7. NUMBER OF FAILURES = 1. NUMBER OF PILES IN TE
NSION = 8.

****
****

PILE CAP DISPLACEMENTS

```
 LOAD
 CASE       DX          DY          DZ          RX          RY
      RZ
            IN          IN          IN          RAD         RAD
    RAD

   1    .2064E+00   .1872E-01  -.2943E-01  -.1759E-04   .4359E-03
```

```
 .2400E-03
  2    .2715E+00   .1962E-01  -.6981E-01  -.8526E-05   .8214E-03
 .2515E-03
  3   -.2057E+00  -.6852E-03   .1390E+00  -.3143E-04  -.1325E-02
-.8785E-05
  4   -.3610E+00  -.6672E-02   .2090E+00  -.3760E-04  -.2054E-02
-.8554E-04
  5   -.3386E+00  -.3999E-02   .2119E+00  -.4497E-04  -.2039E-02
-.5127E-04
  6    .3465E+00   .1933E-01  -.1148E+00  -.1081E-04   .1331E-02
 .2479E-03
  7    .4012E+00   .2018E-01  -.1489E+00  -.2346E-05   .1650E-02
 .2587E-03


*****************************************************************
**************

          PILE FORCES IN LOCAL GEOMETRY

              M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
              * INDICATES PILE FAILURE
              # INDICATES CBF BASED ON MOMENTS DUE TO
                          (F3*EMIN) FOR CONCRETE PILES
              B INDICATES BUCKLING CONTROLS


 LOAD CASE -     1

 PILE     F1       F2       F3         M1          M2          M3    ALF   C
BF   ASC  AST
          K        K        K         IN-K        IN-K        IN-K
    KSI  KSI

   1      1.1      .1     95.9        3.2       -62.3          .0 1.16   .
48 1.61 1.17 #
   2      1.0      .1     83.3        3.2       -57.0          .0 1.00   .
40 1.54 1.11 #
   3       .9      .1     70.6        3.2       -51.7          .0   .85  .
31 1.46 1.06 #
   4       .8      .1     57.9        3.2       -46.3          .0   .70  .
```

```
23 1.38 1.01 #
   5       .7       .1     45.2        3.2       -41.0          .0  .55  .
14 1.31  .95 #
   6       .6       .1     32.6        3.2       -35.7          .0  .39  .
10 1.23  .90 #
   7       .5       .1     19.9        3.2       -30.4          .0  .24  .
13 1.16  .85
   8      1.1       .0     76.0        -.4       -63.1          .0  .92  .
35 1.51 1.07 #
   9      1.0       .0     68.2        -.4       -57.5          .0  .82  .
30 1.45 1.04 #
  10       .9       .0     60.4        -.4       -51.9          .0  .73  .
24 1.40 1.01 #
  11       .8       .0     52.7        -.4       -46.3          .0  .63  .
19 1.35  .99 #
  12       .7       .0     44.9        -.4       -40.7          .0  .54  .
14 1.30  .96 #
  13       .6       .0     37.1        -.4       -35.1          .0  .45  .
09 1.25  .93 #
  14       .5       .0     29.3        -.4       -29.5          .0  .35  .
11 1.19  .90 #
  15     -1.1       .0    -48.8        2.9        64.3          .0 1.28  .
65  .88  .42
  16     -1.0       .0    -43.2        2.9        58.6          .0 1.14  .
58  .89  .47
  17      -.9       .0    -37.5        2.9        52.9          .0  .99  .
51  .91  .51
  18      -.8       .0    -31.9        2.9        47.2          .0  .84  .
44  .93  .55
  19      -.7       .0    -26.3        2.9        41.6          .0  .69  .
37  .94  .59
  20      -.6       .0    -20.6        2.9        35.9          .0  .54  .
30  .96  .63
  21      -.5       .0    -15.0        2.9        30.2          .0  .39  .
22  .98  .67


 LOAD CASE -     2

 PILE     F1       F2       F3         M1         M2          M3   ALF  C
BF  ASC  AST
          K        K        K        IN-K       IN-K        IN-K
```

	KSI	KSI						
1	1.4	.1	81.7	3.4	-80.9	.0	.98	.
39	1.58	1.05	#					
2	1.3	.1	69.7	3.4	-75.3	.0	.84	.
31	1.51	1.00	#					
3	1.2	.1	57.7	3.4	-69.6	.0	.69	.
23	1.43	.95	#					
4	1.1	.1	45.7	3.4	-64.0	.0	.55	.
15	1.36	.91						
5	1.0	.1	33.7	3.4	-58.3	.0	.41	.
12	1.29	.86						
6	.9	.1	21.7	3.4	-52.7	.0	.26	.
16	1.21	.81						
7	.8	.1	9.7	3.4	-47.0	.0	.12	.
20	1.14	.76						
8	1.4	.0	77.8	-.4	-80.1	.0	.94	.
36	1.55	1.04	#					
9	1.3	.0	71.0	-.4	-74.2	.0	.86	.
31	1.51	1.02	#					
10	1.2	.0	64.2	-.4	-68.3	.0	.77	.
27	1.46	1.00	#					
11	1.1	.0	57.4	-.4	-62.4	.0	.69	.
22	1.41	.98	#					
12	1.0	.0	50.6	-.4	-56.5	.0	.61	.
18	1.36	.95	#					
13	.9	.0	43.8	-.4	-50.6	.0	.53	.
13	1.31	.93	#					
14	.8	.0	37.0	-.4	-44.7	.0	.45	.
09	1.27	.91	#					
15	-1.4	.1	-63.5	3.0	81.0	.0	1.67	.
85	.84	.31						
16	-1.3	.1,	-56.3	3.0	75.1	.0	1.48	.
76	.86	.36						
17	-1.2	.1	-49.1	3.0	69.2	.0	1.29	.
67	.89	.41						
18	-1.1	.1	-41.9	3.0	63.3	.0	1.10	.
58	.91	.46						
19	-1.0	.1	-34.7	3.0	57.4	.0	.91	.
49	.94	.51						
20	-.9	.1	-27.4	3.0	51.5	.0	.72	.
40	.96	.56						

21	-.8	.1	-20.2	3.0	45.6	.0	.53	.	31	.98	.61	

LOAD CASE - 3

PILE	F1	F2	F3	M1	M2	M3	ALF	C	BF	ASC	AST	
	K	K	K	IN-K	IN-K	IN-K				KSI	KSI	
1	-1.0	.0	60.6	-.1	58.1	.0	.73	.	24	1.42	1.00	#
2	-1.0	.0	56.9	-.1	57.7	.0	.68	.	22	1.40	.98	#
3	-1.0	.0	53.2	-.1	57.2	.0	.64	.	19	1.38	.97	#
4	-1.0	.0	49.4	-.1	56.8	.0	.60	.	17	1.36	.95	#
5	-1.0	.0	45.7	-.1	56.4	.0	.55	.	14	1.34	.93	#
6	-.9	.0	42.0	-.1	55.9	.0	.51	.	12	1.32	.91	#
7	-.9	.0	38.3	-.1	55.5	.0	.46	.	10	1.30	.89	
8	-.9	.0	-.2	.0	52.5	.0	.01	.	11	1.09	.70	
9	-.9	.0	-4.3	.0	52.2	.0	.11	.	15	1.07	.68	
10	-.9	.0	-8.3	.0	51.8	.0	.22	.	20	1.05	.66	
11	-.9	.0	-12.4	.0	51.5	.0	.33	.	24	1.03	.64	
12	-.9	.0	-16.4	.0	51.2	.0	.43	.	28	1.01	.62	
13	-.9	.0	-20.5	.0	50.8	.0	.54	.	32	.99	.60	
14	-.9	.0	-24.5	.0	50.5	.0	.64	.	37	.97	.58	
15	.9	.0	42.5	-.1	-51.5	.0	.51	.	12	1.31	.92	#
16	.9	.0	38.0	-.1	-51.5	.0	.46	.				

PILE	F1	F2	F3	M1	M2	M3	ALF	C	BF	ASC	AST
									09	1.29	.90 #
17	.9	.0	33.5	-.1	-51.5	.0	.40	.	11	1.26	.88
18	.9	.0	29.1	-.1	-51.5	.0	.35	.	13	1.24	.86
19	.9	.0	24.6	-.1	-51.4	.0	.30	.	14	1.22	.83
20	.9	.0	20.1	-.1	-51.4	.0	.24	.	16	1.20	.81
21	.9	.0	15.7	-.1	-51.4	.0	.19	.	18	1.17	.79

LOAD CASE - 4

PILE	F1	F2	F3	M1	M2	M3	ALF	C	BF	ASC	AST
	K	K	K	IN-K	IN-K	IN-K				KSI	KSI
1	-1.7	.0	55.9	-1.2	103.0	.0	.67	.	26	1.49	.88
2	-1.7	.0	54.7	-1.2	100.8	.0	.66	.	25	1.48	.88
3	-1.7	.0	53.5	-1.2	98.6	.0	.64	.	24	1.47	.87
4	-1.6	.0	52.3	-1.2	96.3	.0	.63	.	23	1.46	.87
5	-1.6	.0	51.1	-1.2	94.1	.0	.62	.	22	1.45	.87
6	-1.6	.0	50.0	-1.2	91.9	.0	.60	.	21	1.44	.87
7	-1.5	.0,	48.8	-1.2	89.6	.0	.59	.	20	1.43	.87
8	-1.6	.0	-26.4	.1	95.2	.0	.69	.	48	1.05	.48
9	-1.6	.0	-29.5	.1	93.0	.0	.78	.	51	1.03	.47
10	-1.5	.0	-32.7	.1	90.8	.0	.86	.	54	1.01	.45
11	-1.5	.0	-35.8	.1	88.7	.0	.94	.	56	.99	.44

```
  12     -1.5       .0   -39.0        .1       86.5        .0 1.03  .
59  .97  .43
  13     -1.4       .0   -42.1        .1       84.3        .0 1.11  .
62  .95  .42
  14     -1.4       .0   -45.3        .1       82.2        .0 1.19  .
65  .93  .41
  15      1.6       .0    73.4      -1.0      -94.3        .0  .88  .
33 1.56  .99 #
  16      1.6       .0    65.6      -1.0      -92.6        .0  .79  .
28 1.52  .95
  17      1.5       .0    57.8      -1.0      -90.8        .0  .70  .
24 1.48  .91
  18      1.5       .0    49.9      -1.0      -89.0        .0  .60  .
21 1.43  .88
  19      1.5       .0    42.1      -1.0      -87.3        .0  .51  .
17 1.39  .84
  20      1.4       .0    34.3      -1.0      -85.5        .0  .41  .
16 1.34  .81
  21      1.4       .0    26.4      -1.0      -83.7        .0  .32  .
19 1.30  .77


 LOAD CASE -     5

 PILE    F1      F2      F3         M1         M2         M3   ALF  C
BF  ASC  AST
          K       K       K       IN-K       IN-K       IN-K
    KSI  KSI

    1    -1.6      .0    75.9       -.7       96.4        .0  .91  .
35 1.58   .99 #
    2    -1.6      .0    72.2       -.7       94.8        .0  .87  .
32 1.56   .98 #
    3    -1.6      .0    68.6       -.7       93.3        .0  .83  .
30 1.54   .96 #
    4    -1.6      .0    65.0       -.7       91.8        .0  .78  .
28 1.51   .95
    5    -1.5      .0    61.4       -.7       90.3        .0  .74  .
26 1.49   .93
    6    -1.5      .0    57.8       -.7       88.8        .0  .70  .
24 1.47   .92
    7    -1.5      .0    54.1       -.7       87.3        .0  .65  .
```

```
22 1.45   .90
   8     -1.5      .0    -11.2         .1       88.1         .0  .30  .
30 1.12   .57
   9     -1.5      .0    -16.2         .1       86.7         .0  .43  .
35 1.09   .55
  10     -1.4      .0    -21.1         .1       85.3         .0  .55  .
40 1.06   .53
  11     -1.4      .0    -26.0         .1       83.9         .0  .68  .
45 1.03   .50
  12     -1.4      .0    -30.9         .1       82.5         .0  .81  .
50 1.00   .48
  13     -1.4      .0    -35.8         .1       81.1         .0  .94  .
55  .97   .46
  14     -1.3      .0    -40.7         .1       79.8         .0 1.07  .
60  .95   .44
  15      1.5      .0     72.0        -.6      -86.7         .0  .87  .
32 1.54  1.00 #
  16      1.5      .0     64.3        -.6      -85.8         .0  .78  .
27 1.50   .96 #
  17      1.4      .0     56.7        -.6      -84.9         .0  .68  .
23 1.46   .92
  18      1.4      .0     49.0        -.6      -84.0         .0  .59  .
19 1.41   .89
  19      1.4      .0     41.3        -.6      -83.0         .0  .50  .
16 1.37   .85
  20      1.4      .0     33.7        -.6      -82.1         .0  .41  .
16 1.33   .81
  21      1.4      .0     26.0        -.6      -81.2         .0  .31  .
19 1.29   .77


  LOAD CASE -     6

  PILE      F1       F2       F3          M1          M2          M3   ALF  C
BF  ASC    AST
            K        K        K         IN-K        IN-K        IN-K
    KSI    KSI

   1      1.7      .1     71.4        3.3     -101.0         .0  .86  .
32 1.57   .96
   2      1.6      .1     59.2        3.3      -95.4         .0  .71  .
26 1.50   .91
```

3	1.5	.1	47.1	3.3	-89.9	.0	.57	.	20	1.42	.86	
4	1.4	.1	35.0	3.3	-84.3	.0	.42	.	16	1.35	.81	
5	1.3	.1	22.9	3.3	-78.8	.0	.28	.	20	1.28	.76	
6	1.2	.1	10.7	3.3	-73.3	.0	.13	.	24	1.20	.71	
7	1.1	.1	-1.4	3.3	-67.7	.0	.04	.	16	1.13	.66	
8	1.7	.0	92.8	-.4	-98.4	.0	1.12	.	46	1.67	1.08	#
9	1.6	.0	85.7	-.4	-92.6	.0	1.03	.	41	1.62	1.05	#
10	1.5	.0	78.7	-.4	-86.8	.0	.95	.	37	1.57	1.03	#
11	1.4	.0	71.6	-.4	-81.0	.0	.86	.	32	1.52	1.01	#
12	1.3	.0	64.6	-.4	-75.2	.0	.78	.	27	1.47	.98	#
13	1.2	.0	57.6	-.4	-69.4	.0	.69	.	22	1.43	.96	#
14	1.1	.0	50.5	-.4	-63.6	.0	.61	.	18	1.38	.94	#
15	-1.7	.1	-62.0	3.0	100.1	.0	1.63	.	87	.89	.28	
16	-1.6	.1	-55.2	3.0	94.3	.0	1.45	.	78	.91	.33	
17	-1.5	.1	-48.4	3.0	88.5	.0	1.27	.	70	.93	.37	
18	-1.4	.1	-41.6	3.0	82.7	.0	1.10	.	62	.95	.42	
19	-1.3	.1	-34.8	3.0	76.8	.0	.92	.	53	.98	.47	
20	-1.2	.1	-28.0	3.0	71.0	.0	.74	.	45	1.00	.52	
21	-1.1	.1	-21.2	3.0	65.2	.0	.56	.	36	1.02	.56	

LOAD CASE - 7

PILE	F1	F2	F3	M1	M2	M3	ALF	C	BF	ASC	AST	
	K	K	K	IN-K	IN-K	IN-K				KSI	KSI	
1	2.0	.1	59.0	3.5	-116.7	.0	.71	.	29	1.54	.86	
2	1.9	.1	47.5	3.5	-110.9	.0	.57	.	23	1.47	.81	
3	1.8	.1	36.0	3.5	-105.0	.0	.43	.	19	1.40	.77	
4	1.7	.1	24.5	3.5	-99.1	.0	.29	.	23	1.33	.72	
5	1.6	.1	13.0	3.5	-93.3	.0	.16	.	27	1.26	.67	
6	1.5	.1	1.5	3.5	-87.4	.0	.02	.	30	1.19	.63	
7	1.4	.1	-10.0	3.5	-81.6	.0	.26	.	28	1.11	.58	
8	1.9	.0	93.5	-.4	-112.8	.0	1.13	.	46	1.70	1.05	#
9	1.8	.0	87.3	-.4	-106.7	.0	1.05	.	42	1.66	1.03	#
10	1.7	.0	81.2	-.4	-100.6	.0	.98	.	38	1.62	1.01	#
11	1.6	.0	75.0	-.4	-94.5	.0	.90	.	34	1.57	1.00	#
12	1.5	.0	68.9	-.4	-88.4	.0	.83	.	30	1.53	.98	#
13	1.4	.0	62.8	-.4	-82.3	.0	.76	.	26	1.48	.96	#
14	1.3	.0	56.6	-.4	-76.2	.0	.68	.	22	1.44	.94	#
15	-1.9	.1	-75.6	3.1	114.2	.0	1.99	1.	04	.85	.18*	
16	-1.8	.1	-67.4	3.1	108.2	.0	1.77	.	94	.88	.23	
17	-1.7	.1	-59.1	3.1	102.1	.0	1.55	.	84	.91	.29	
18	-1.6	.1	-50.8	3.1	96.1	.0	1.34	.	74	.94	.34	
19	-1.5	.1	-42.5	3.1	90.1	.0	1.12	.				

```
64  .97  .40
  20    -1.4       .1   -34.2        3.1        84.1         .0  .90  .
54 1.00  .45
  21    -1.3       .1   -26.0        3.1        78.1         .0  .68  .
44 1.02  .51
```

****
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PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE -   1

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	31.3	.1	90.7	.0	.0	.0
2	27.2	.1	78.7	.0	.0	.0
3	23.2	.1	66.7	.0	.0	.0
4	19.1	.1	54.7	.0	.0	.0
5	15.0	.1	42.7	.0	.0	.0
6	10.9	.1	30.7	.0	.0	.0
7	6.8	.1	18.7	.0	.0	.0
8	13.5	.0	74.8	.0	.0	.0
9	12.2	.0	67.1	.0	.0	.0
10	10.8	.0	59.5	.0	.0	.0
11	9.4	.0	51.8	.0	.0	

.0

12	8.1	.0	44.2	.0	.0	.0
13	6.7	.0	36.5	.0	.0	.0
14	5.3	.0	28.9	.0	.0	.0
15	12.9	.0	-47.1	.0	.0	.0
16	11.4	.0	-41.6	.0	.0	.0
17	10.0	.0	-36.2	.0	.0	.0
18	8.5	.0	-30.7	.0	.0	.0
19	7.1	.0	-25.3	.0	.0	.0
20	5.6	.0	-19.9	.0	.0	.0
21	4.1	.0	-14.4	.0	.0	.0

LOAD CASE - 2

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	27.1	.1	77.0	.0	.0	.0
2	23.2	.1	65.7	.0	.0	.0
3	19.4	.1	54.3	.0	.0	.0
4	15.5	.1	43.0	.0	.0	.0
5	11.6	.1	31.6	.0	.0	.0
6	7.7	.1	20.3	.0	.0	.0

7	3.8	.1	8.9	.0	.0	.0
8	14.1	.0	76.6	.0	.0	.0
9	12.9	.0	69.9	.0	.0	.0
10	11.7	.0	63.1	.0	.0	.0
11	10.5	.0	56.4	.0	.0	.0
12	9.3	.0	49.7	.0	.0	.0
13	8.0	.0	43.0	.0	.0	.0
14	6.8	.0	36.3	.0	.0	.0
15	16.7	-.1	-61.3	.0	.0	.0
16	14.9	-.1	-54.3	.0	.0	.0
17	13.0	-.1	-47.3	.0	.0	.0
18	11.2	-.1	-40.4	.0	.0	.0
19	9.3	-.1	-33.4	.0	.0	.0
20	7.5	-.1	-26.4	.0	.0	.0
21	5.7	-.1	-19.4	.0	.0	.0

LOAD CASE - 3

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	18.2	.0	57.8	.0	.0	.0
2	17.1	.0	54.2	.0	.0	

						.0
3	15.9	.0	50.7	.0	.0	.0
4	14.7	.0	47.2	.0	.0	.0
5	13.6	.0	43.7	.0	.0	.0
6	12.4	.0	40.2	.0	.0	.0
7	11.2	.0	36.7	.0	.0	.0
8	-.9	.0	-.1	.0	.0	.0
9	-1.6	.0	-4.1	.0	.0	.0
10	-2.2	.0	-8.1	.0	.0	.0
11	-2.9	.0	-12.0	.0	.0	.0
12	-3.6	.0	-16.0	.0	.0	.0
13	-4.2	.0	-20.0	.0	.0	.0
14	-4.9	.0	-24.0	.0	.0	.0
15	-11.1	.0	41.0	.0	.0	.0
16	-10.1	.0	36.6	.0	.0	.0
17	-9.0	.0	32.3	.0	.0	.0
18	-7.9	.0	28.0	.0	.0	.0
19	-6.8	.0	23.6	.0	.0	.0
20	-5.7	.0	19.3	.0	.0	.0
21	-4.6	.0	15.0	.0	.0	.0

LOAD CASE - 4

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	16.0	.0	53.5	.0	.0	.0
2	15.7	.0	52.4	.0	.0	.0
3	15.3	.0	51.3	.0	.0	.0
4	15.0	.0	50.1	.0	.0	.0
5	14.7	.0	49.0	.0	.0	.0
6	14.3	.0	47.9	.0	.0	.0
7	14.0	.0	46.7	.0	.0	.0
8	-5.9	.0	-25.7	.0	.0	.0
9	-6.4	.0	-28.8	.0	.0	.0
10	-6.9	.0	-32.0	.0	.0	.0
11	-7.4	.0	-35.1	.0	.0	.0
12	-7.8	.0	-38.2	.0	.0	.0
13	-8.3	.0	-41.3	.0	.0	.0
14	-8.8	.0	-44.4	.0	.0	.0
15	-19.4	.0	70.9	.0	.0	.0
16	-17.4	.0	63.3	.0	.0	.0
17	-15.5	.0	55.7	.0	.0	.0
18	-13.6	.0	48.1	.0	.0	.0

19	-11.6	.0	40.5	.0	.0	.0
20	-9.7	.0	32.9	.0	.0	.0
21	-7.8	.0	25.3	.0	.0	.0

LOAD CASE - 5

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	22.4	.0	72.5	.0	.0	.0
2	21.3	.0	69.0	.0	.0	.0
3	20.2	.0	65.6	.0	.0	.0
4	19.1	.0	62.2	.0	.0	.0
5	18.0	.0	58.7	.0	.0	.0
6	16.8	.0	55.3	.0	.0	.0
7	15.7	.0	51.8	.0	.0	.0
8	-3.3	.0	-10.8	.0	.0	.0
9	-4.1	.0	-15.7	.0	.0	.0
10	-4.9	.0	-20.6	.0	.0	.0
11	-5.7	.0	-25.4	.0	.0	.0
12	-6.5	.0	-30.3	.0	.0	.0
13	-7.2	.0	-35.1	.0	.0	.0
14	-8.0	.0	-40.0	.0	.0	

.0

15	-18.9	.0	69.5	.0	.0	.0
16	-17.0	.0	62.1	.0	.0	.0
17	-15.1	.0	54.6	.0	.0	.0
18	-13.3	.0	47.2	.0	.0	.0
19	-11.4	.0	39.8	.0	.0	.0
20	-9.5	.0	32.3	.0	.0	.0
21	-7.6	.0	24.9	.0	.0	.0

LOAD CASE - 6

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	24.2	.1	67.2	.0	.0	.0
2	20.3	.1	55.7	.0	.0	.0
3	16.3	.1	44.2	.0	.0	.0
4	12.4	.1	32.7	.0	.0	.0
5	8.5	.1	21.3	.0	.0	.0
6	4.6	.1	9.8	.0	.0	.0
7	.6	.1	-1.7	.0	.0	.0
8	16.9	.0	91.2	.0	.0	.0
9	15.6	.0	84.3	.0	.0	.0

10	14.4	.0	77.4	.0	.0	.0
11	13.1	.0	70.4	.0	.0	.0
12	11.9	.0	63.5	.0	.0	.0
13	10.6	.0	56.6	.0	.0	.0
14	9.4	.0	49.7	.0	.0	.0
15	16.7	-.1	-59.7	.0	.0	.0
16	14.9	-.1	-53.2	.0	.0	.0
17	13.2	-.1	-46.6	.0	.0	.0
18	11.5	-.1	-40.0	.0	.0	.0
19	9.7	-.1	-33.5	.0	.0	.0
20	8.0	-.1	-26.9	.0	.0	.0
21	6.2	-.1	-20.3	.0	.0	.0

LOAD CASE - 7

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	20.5	.1	55.3	.0	.0	.0
2	16.8	.1	44.4	.0	.0	.0
3	13.1	.1	33.6	.0	.0	.0
4	9.3	.1	22.7	.0	.0	.0
5	5.6	.1	11.8	.0	.0	

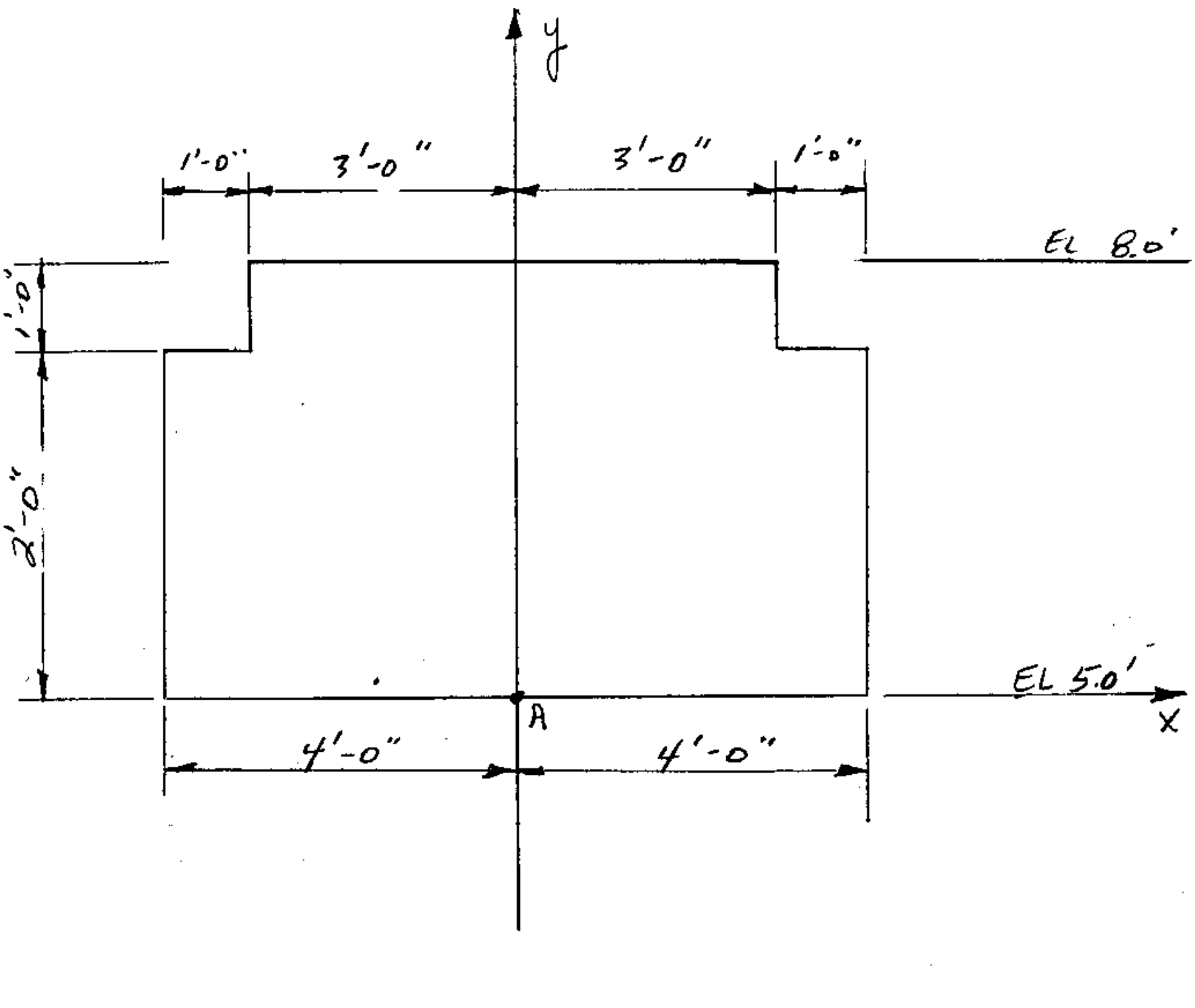
						.0
6	1.9	.1	.9	.0	.0	.0
7	-1.9	.1	-10.0	.0	.0	.0
8	17.2	.0	91.9	.0	.0	.0
9	16.1	.0	85.8	.0	.0	.0
10	15.0	.0	79.8	.0	.0	.0
11	13.9	.0	73.8	.0	.0	.0
12	12.8	.0	67.7	.0	.0	.0
13	11.7	.0	61.7	.0	.0	.0
14	10.6	.0	55.6	.0	.0	.0
15	20.2	-.1	-72.9	.0	.0	.0
16	18.1	-.1	-64.9	.0	.0	.0
17	16.0	-.1	-56.9	.0	.0	.0
18	13.9	-.1	-48.9	.0	.0	.0
19	11.8	-.1	-40.9	.0	.0	.0
20	9.7	-.1	-32.9	.0	.0	.0
21	7.6	-.1	-24.9	.0	.0	.0

Client: PORT OF NEW ORLEANS Project:
Computations for: GATE NO. 2 MONOLITH
Computed by: G. FLITTER Date: 1/23/96 Checked by: Date:

GATE OPENING = 25'-0" [SWING GATE]

MONOLITH SILL ELEVATION = 8.0'

TOP OF GATE ELEVATION = 15.0'



WT OF MONOLITH (PER FOOT LENGTH)

$w_1 = 0.15\ [(8.0 \times 3.0) - (2(1.0 \times 1.0))]$

$w_1 = 3.3$ KIPS/FT ↓ *

Client PORT OF NEW ORLEANS Project

Computations for GATE No. 2 MONOLITH

Computed by G. FLITTER Date 1/27/97 Checked by Date

END GATE POSTS

ASSUME: ① 2'-6" X 5'-0" GATE POSTS

② GATEPOST CENTERED 1'-3" FROM VERTICAL LINE THROUGH POINT "A".

③ GATE POST HEIGHT = GATE HEIGHT + 9"

WEIGHT OF GATE POST = 0.15 * 2.5 * 5 * 7.75

= 14.53 KIPS ↓

M_A = 14.53 (1.25) = 18.2 K·ft ↻

WIND LOAD

WIND LOAD OCCURS ONLY AT THE GATEPOSTS. FOR STRUCTURES WITHIN 100 MILES OF THE HURRICANE SHORELINE, USE

P = 50 PSF = 0.05 KSF

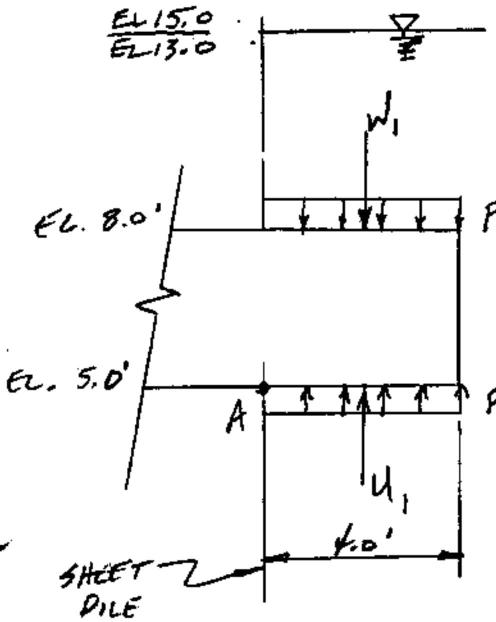
WIND LOAD / GATE POST

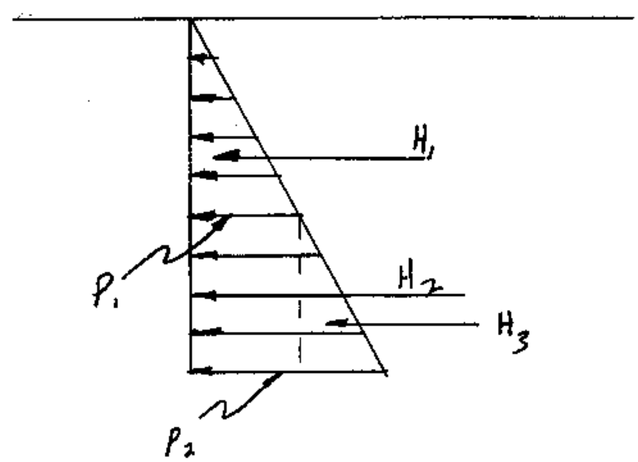
H = 0.05 * (15.75' − 8.0) * 5' = 1.94 KIPS ⇄

M_A = 1.94 * [(15.75' − 8.0)/2 + 3.0] = 13.3 F·K ↺↻

Client: PORT OF NEW ORLEANS Project:
Computations for: GATE NO. 2 MONOLITH
Computed by: G. FLITTER Date: 1/24/97 Checked by: Date:

HYDRAULIC FORCES





WATER UP TO EL. 13.00:

$P_1 = 0.0624 * 5.0 = 0.312$ ksf

$P_2 = 0.0624 * 8.0 = 0.499$ ksf *

Component: (k/ft)	* Arm (ft)	= Moment (k-ft/ft)
H_2: 0.312 * 3.0 = 0.936 *	1.50	= 1.4
H_3: 1/2 * (.499 - .312) * 3.0 = .281 *	1.00	= 0.28
$U_1 - W_1$: (0.499 - 0.31) * 4.0 = 0.76 *	2.00	= 1.51
		3.2

P = 0.76 k/ft ↑

H = 1.21 k/ft ←

M_A = 3.2 k·ft/ft (+)

Client: PORT OF NEW ORLEANS Project:
Computations for: GATE NO. 2 MONOLITH
Computed by: G. FLITTER Date: 1/24/97 Checked by: Date:

GATE (SEE GATE DESIGN PG. 5/5)

$w_2 = 0.29$ kips/ft. ↓

$M_A = 0.29 \times 1 = 0.29$ k.ft/ft ↻

APPROACH RAMP / SLAB (20'-0" x 24'-0")

SLAB WEIGHT = 0.15 * 1.0 * 24.0 * 20.0
= 72 kips

ASSUME THAT 1/4 OF THE DEAD LOAD IS TRANSFERRED TO THE MONOLITH

LOAD / FT ON MONOLITH
$= (0.15 * 1.0 * 20)/4 = 0.75$ k/ft

DEAD LOAD (EXCLUDING GATE POSTS)

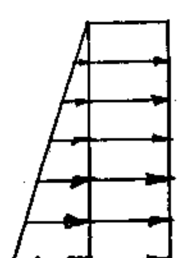
$P = 3.3 + 0.29 + 0.75 + 0.75 = 5.09$ k/ft ↓

$M_A = 0.29$ k.ft/ft ↻

SOIL LOAD ON PROTECTED SIDE

2'-0" OF SOIL w/3'-0" SURCHARGE DUE TO LIVE LOAD.

$\gamma = 0.12$ kcf $k_a = 1/3$



1/3 x .12 x 3 = .12 ksf

x 2.0 = 0.08 ksf

$H = 1/2 * 0.08 * 2.0 + 0.12 * 2.0$
→ $= 0.32$ k/ft

$M_A = 0.08 \times \frac{2.0}{3} + 0.24 * \frac{2.0}{2}$

$M_A = 0.29$ k.ft/ft ↻

Client PORT OF NEW ORLEANS Project

Computations for GATE NO. 2 MONOLITH

Computed by G. FLITTER Date 1/27/97 Checked by Date

AT THE GATE POST (WATER UP TO ELEV 13.0)

$H_1 = 1/2 * 0.312 * 5 * 27.0 = 21.1$ kips ←

$M_{A,H_1} = 21.1 * (3 + 5/3) = 98.5$ k·ft ↻

AT THE GATEPOST (WATER UP TO ELEV 15.0)

$H_1 = 1/2 * 0.4368 * 7 * 27 = 41.3$ KIPS ←

$M_{A,H_1} = 41.3 (5 + 7/3) = 302.9$ ↻

Client: PORT OF NEW ORLEANS Project:
Computations for: GATE NO. 2 MONOLITH
Computed by: G. FLITTER Date: 1/24/97 Checked by: Date:

WATER UP TO ELEV 15.0 ft:

$P_1 = 0.0624 * 7.0 = 0.4368$ ksf

$P_2 = 0.0624 * 10.0 = 0.624$ ksf

COMPONENT (k/ft)	* ARM (ft)	= MOMENT (k-ft/ft)
H_2: 0.4368 * 3.0 = 1.31 *	1.5	= 1.97
H_3: ½(0.624 - 0.4368) * 3.0 = 0.28 *	1.0	= 0.28
$K_1 - W_1$: (0.624 - 0.4368) * 4.0 = 0.75 *	2.0	= 1.5
		3.75

P = 0.75 k/ft ↑

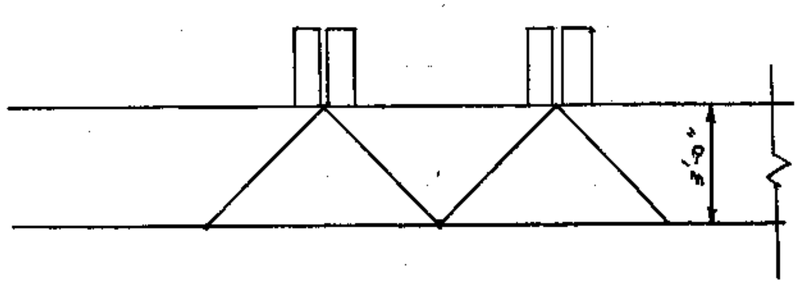
H = 1.59 k/ft ←

M_A = 3.75 k-ft/ft ↻

H_S 20-44 TRUCK LOADING

AXLE LOAD = 32^k

SINCE THE DEPTH OF THE MONOLITH IS 3'-0", IT CAN BE ASSUMED THAT EACH WHEEL LOAD IS DISTRIBUTED OVER 2 * 3'-0" = 6'-0"



Client PORT OF NEW ORLEANS Project
Computations for GATE NO. 2 MONOLITH
Computed by G. FLITTER Date 1/27/97 Checked by Date

$$P = \frac{32}{12} = 2.67 k/ft$$

LONGITUDINAL FORCE = 5% of 32 = 1.6 k

THE LONGITUDINAL FORCE IS APPLIED 10'-0" ABOVE POINT "A"

H_s 20-44 TRUCK ON PROTECTED OR FLOOD SIDE

$P = 32 \, k$

$H = 1.6 \, k/ft$

$M_A = 32(3.5) + 1.6 \times 10 = 128 \, K \cdot FT$ ↻

LOADING CASES

① WATER UP TO ELEV. 13.00

② WATER UP TO ELEV 15.00 (75% FORCES)

③ H_s 20 - 44 TRUCK ON PROTECTED SIDE

④ H_s 20 - 44 TRUCK ON FLOOD SIDE

NOTE: MAXIMUM PILE SPACING ALONG THE LENGTH OF THE MONOLITH IS 6'-6". IN VIEW OF THE EXPECTED LOAD DISTRIBUTION OF THE H_s 20-44 TRUCK LOADS, WE CAN ASSUME THAT 3 ROWS OF PILES WITHSTAND THESE LOADS. CONSIDER A 3×6'-6" = 19'-6" WIDE MONOLITH

CASE ①

$H = 1.21 \times 19.5 = 23.6$ KIP ←

$P = (5.09 - 0.76)(19.5) = 84.4$ KIPS ↓

M ... 56.7 ...

Client: PORT OF NEW ORLEANS Project:
Computations for: GATE NO. 2 MONOLITH
Computed by: G. FLITTER Date: 1/27/97 Checked by: Date:

CASE (2)

$H = 0.75 * 1.59 * 19.5 = 23.3$ kips ←

$P = 0.75 (84.4) = 63.3$ kips ↓

$M_A = .75 ((-.29 + 3.75) * 19.5) = 50.6$ 'k ↻

CASE (3)

$H = (5\% * 32) + 0.4 * 19.5 = 9.4$ kips →

$P = 32 + (5.09 * 19.5) = 131.3$ kips ↓

$M_A = (-0.4) * 19.5 + 32 * 3.5 + (.05 * 32)(10)$

$= 120.2$ ft.k ↺

CASE (4)

$H = (5\% * 32) = 1.6$ kips ←

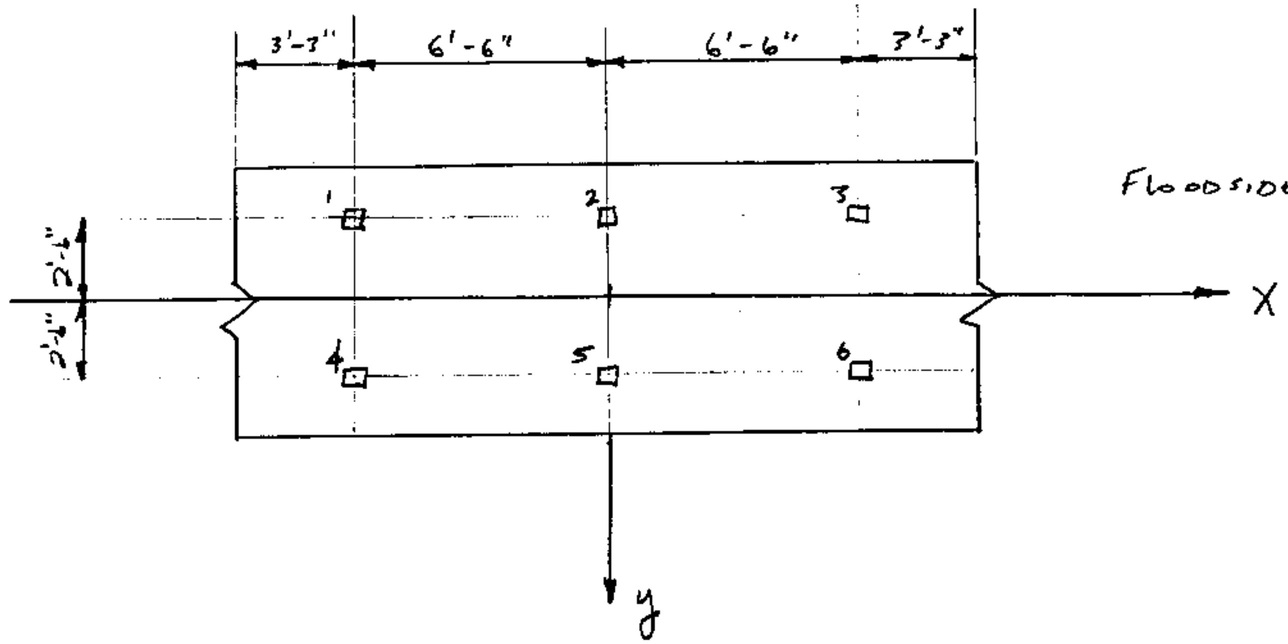
$P = 131.3$ kips ↓

$M_A = (32 * 3.5) + ((.05)(32) * 10) = 128$ ft.k ↻

SUMMARY:

LOADING CASE	P_y (kips)	P_z (kips)	M_x (ft-kips)
1	23.6	84.4	56.7
2	23.3	63.3	50.6
3	-9.4	-131.3	-120.2
4	1.6	131.3	128.0

Client: PORT OF NEW ORLEANS Project:
Computations for: GATE No 2 MONOLITH
Computed by: G. FLITTER Date: 1/27/97 Checked by: Date:



Client: PORT OF NEW ORLEANS Project:
Computations for: GATE NO. 2 MONOLITH
Computed by: G. FLITTER Date: 1/27/97 Checked by: Date:

LOADS ON ENTIRE MONOLITH

LOADING CASES

1. GATE CLOSED - WATER TO ELEV 13.00'
2. GATE CLOSED - WATER TO ELEV 15.00' (75% FORCES)
3. GATE OPEN - 2 TRUCKS ON PROTECTED SIDE EDGE OF BASE SLAB.
4. GATE OPEN - 2 TRUCKS ON FLOOD SIDE EDGE OF BASE SLAB
5. GATE OPEN - 2 TRUCKS ON PROTECTED SIDE EDGE OF BASE SLAB; WIND FROM FLOOD SIDE (75% FORCE)
6. GATE OPEN - 2 TRUCKS ON FLOOD SIDE EDGE OF BASE SLAB; WIND FROM PROTECTED SIDE (75% FORCES)
7. GATE OPEN; WIND FROM FLOOD SIDE
8. GATE OPEN; WIND FROM PROTECTED SIDE

TOTAL LENGTH OF MONOLITH = 35'-0"

CASE 1

(1.5)(.312)(5.0)(35)

$H = 1.2 * 35 + 27.3 = \underline{69.3 \text{ KIPS}} \leftarrow$

$P = (5.09 - 0.76) * 35 + 2 * 14.53 = \underline{180.6 \text{ KIPS}} \downarrow$

$M_A = (0.29 + 3.2) * 35 + 150.2 + 2 * 18.2$

$M_A = \underline{288.5 \text{ k·ft}}$ ↻

Client PORT OF NEW ORLEANS Project
Computations for GATE No. 2 MONOLITH
Computed by G. FLITTER Date 1/27/97 Checked by Date

CASE (2)

$H = 0.75[(1.59 * 35) + 53.5] = \underline{81.9 \text{ kips}} \leftarrow$

$P = 0.75[(5.09 - 0.75) * 35 + (2 * 14.53)] = \underline{135.7 \text{ kips}} \downarrow$

$M_A = 0.75[(0.29 + 3.75) * 35 + 285.3 + (2 * 18.2)] = \underline{332.1 \text{ 'K}}$ ↺

(285.3 = 53.5(3 + 7/3))

CASE (3)

(soil)

$H = (2 * 1.6) + (0.32 * 35) = \underline{14.4 \text{ kips}} \rightarrow$

$P = (5.09 * 35) + (2 * 32) + (2 * 14.53) = \underline{271.2 \text{ kips}} \downarrow$

$M_A = [(-.29 - 0.32) * 35.0] + [2((32 * 3.5) + (1.6 * 10))] + 2 * 18.2$

$= \underline{271.1 \text{ FTK}}$ ↺

CASE (4)

$H = (2 * 1.6) = \underline{3.2 \text{ kips}} \leftarrow$

$P = \underline{271.2 \text{ kips}} \downarrow$

$M_A = -.29 * 35 - [2((32 * 3.5) + (1.6 * 10)) - 18.2] = \underline{229.8 \text{ ftk}}$ ↻

CASE (5)

$H = 0.75(2 * 1.6 + 2 * 1.94) = \underline{5.3 \text{ kips}} \leftarrow$

$P = 0.75[(5.09 * 35) + (2 * 32) + (2 * 14.53)] = \underline{203.4 \text{ kips}} \downarrow$

$M_A = 0.75(-0.29 * 35 + 2[(32 * 3.5) + (1.6 * 10) + 18.2 + 13.3])$

$= \underline{231.6 \text{ FTK}}$ ↺

Client PORT OF NEW ORLEANS Project
Computations for GATE NO. 2 MONOLITH
Computed by G. FLITTER Date 1/27/97 Checked by Date

CASE (6)

H = 5.3 + 0.75 * 0.32 * 35 = 13.7 KIPS →

P = 201.3 KIPS ↓

M_A = 0.75((-0.29 -.32)35 - 2(32+3.5) - 2(1.6*10) + 18.2(2) - 2(13.3))} = -200.7 IK ↺

CASE (7)

H = 1.94 * 2 = 3.9 KIPS ←

P = (5.09 * 35) + 2(14.53) = 207.2 KIPS ↓

M_A = (-0.29 * 35) + (2 * 18.2) + 2(13.33) = 52.9 IK ↺

CASE (8)

H = -3.9 - 0.32 * 35 = 15.1 KIPS →

P = 207.2 KIPS ↓

M_A = (-0.29 * 35) + (2 * 18.2) - 2(13.3) = 0.35 IK ↺

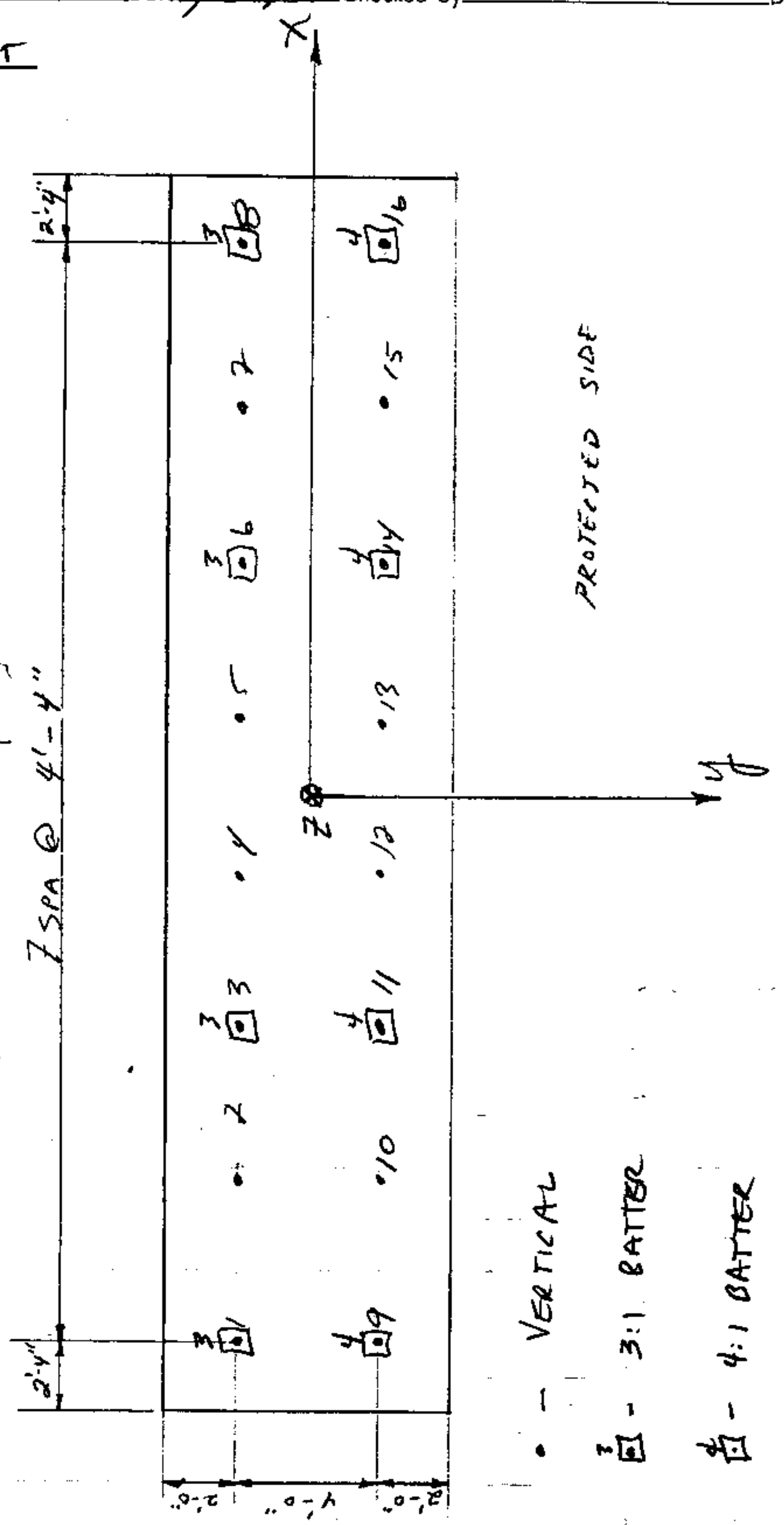
Client PORT OF NEW ORLEANS Project
Computations for GATE NO. 2 MONOLITH
Computed by G. FLITTER Date 1/27/97 Checked by Date

SUMMARY:

LOADING CASE	P_y (KIPS)	P_z (KIPS)	M_x (ft kips)
1	69.3	180.6	288.5
2	81.9	135.7	332.1
3	-14.4	271.2	271.1
4	3.2	271.2	-229.8
5	5.3	203.4	231.6
6	-13.7	203.4	-200.7
7	3.9	207.2	52.9
8	-15.1	207.2	-0.4

Client: PORT OF NEW ORLEANS Project:
Computations for: GATE No. 2 MONOLITH
Computed by: G. FLITTER Date: 1/28/97 Checked by: Date:

PILE LAYOUT



PILE No.	x	y
1	-15.17	-2
2	-10.83	-2
3	-6.5	-2
4	-2.17	-2
5	2.17	-2
6	6.5	-2
7	10.83	-2
8	15.17	-2
9	-15.17	2
10	-10.83	2
11	-6.5	2
12	-2.17	2
13	2.17	2
14	6.5	2
15	10.83	2
16	15.17	2

Client PORT OF NEW ORLEANS Project
Computations for GATE NO. 2 MONOLITH
Computed by G. FLITTER Date 2/3/97 Checked by Date

CAP DESIGN

SINCE PILE FORCES ARE LESS IN MAGNITUDE TO THOSE IN THE MONOLITH FOR GATE NO. 8, USE MINUMUM REINFORCEMENT

MONOLITH THICKNESS = 3'-0" = 36" ; d = 32"

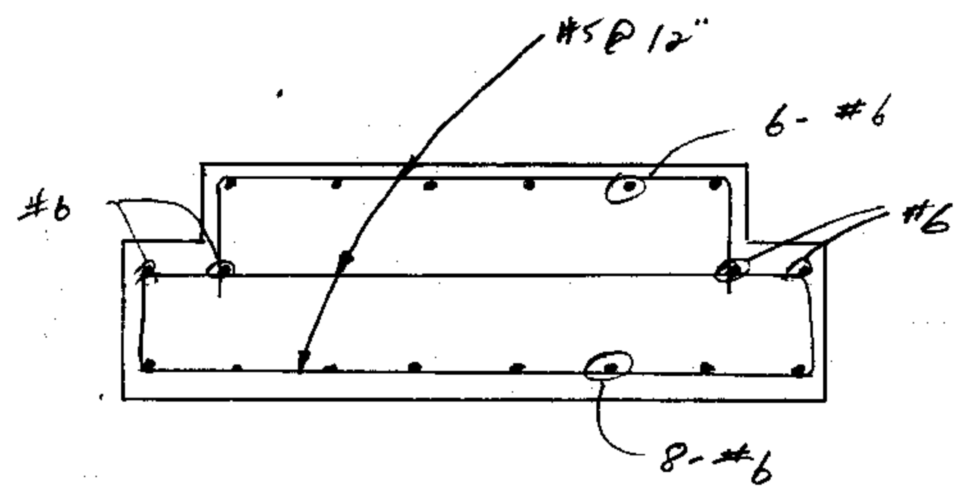
$A_s = 0.002 * 12 x 32 = 0.768 in^2$

USE 3 LAYERS OF #5 @ 12" IN SHORT DIRECTION $A_s = 0.93 in^2$

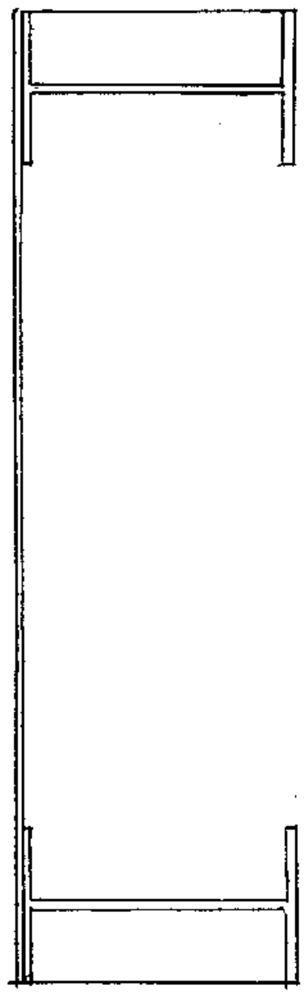
LONGITUDINAL STEEL

AREA OF MONOLITH = 22 ft^2 = 3168 in^2

$A_s = 0.002 * 3168 = 6.34 in^2$



Client ______ Project ______
Computations for ______
Computed by ______ Date ______ Checked by ______ Date ______



```
ROLLER GATE NO. 2 MONOLITH
2 ROWS OF 14 IN. SQ. PPC PILES AT , ORIGIN CENTER OF BASE
1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL
1020 SOI ES .0705 LEN 70.0 0. ALL
1030 PIN ALL
1040 TEN 0.8 ALL
1050 DLS S 109.0 70.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL
1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL
1070 BAT 3.0 1 3 6 8
1075 BAT 4.0 9 11 14 16
1080 ANG 90 9 11 14 16
1090 ANG 270 1 3 6 8
1100 PIL 1 -15.2 -2.0 0.0  2 -10.8 -2.0 0.0 3 -6.5 -2.0 0.0  4 -2.2 -2.0 0.0
1101 PIL 5 2.2 -2.0 0.0 6 6.5 -2.0 0.0 7 10.8 -2.0 0.0 8 15.2 -2.0 0.0
1102 PIL 9 -15.2 2.0 0.0 10 -10.8 2.0 0.0  11 -6.5 2.0 0.0  12 -2.2 2.0 0.0
1103 PIL 13 2.2 2.0 0.0  14 6.5 2.0 0.0  15 10.8 2.0 0.0  16 15.2 2.0 0.0
1120 LOA 1 0.0 70.1 180.6 272.3 0.0 0.0
1121 LOA 2 0.0 77.7 135.7 340.6 0.0 0.0
1122 LOA 3 0.0 -14.4 271.2 271.1 0.0 0.0
1123 LOA 4 0.0 3.2 271.2 -229.8 0.0 0.0
1124 LOA 5 0.0 5.3 203.4 231.6 0.0 0.0
1125 LOA 6 0.0 -13.7 203.4 -200.7 0.0 0.0
1126 LOA 7 0.0 3.9 207.2 52.9 0.0 0.0
1127 LOA 8 0.0 -15.1 207.2 -0.4 0.0 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\GATE2ALT.O
1140 PFO ALL
1150 PLB ALL
1160 FPL C:\CORPS\CPGG\GATE2ALT.P
```

```
**********************************
 CORPS PROGRAM  #  X0080         *  CPGA - CASE PILE GROUP ANALYSIS PROGRAM
 VERSION NUMBER # 1992/02/26     *  RUN DATE 31-JAN-1997   RUN TIME 10.19.19
**********************************
```

ROLLER GATE NO. 2 MONOLITH

THERE ARE 16 PILES AND
8 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

```
                                    X          Y          Z
                                  -----      -----      -----
WITH DIAGONAL COORDINATES = (    -15.20 ,    -2.00 ,     .00 )
                            (     15.20 ,     2.00 ,     .00 )
```

```
*******************************************************************************
```

PILE PROPERTIES AS INPUT

E	I1	I2	A	C33	B66
KSI	IN**4	IN**4	IN**2		
.40740E+04	.32010E+04	.32010E+04	.19600E+03	.15000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

```
*******************************************************************************
```

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL	LENGTH	L	LU
	K/IN**2		FT	FT
	.70500E-01	L	.70000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

```
*******************************************************************************
```

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-15.20	-2.00	.00	3.00	270.00	70.00	P
2	-10.80	-2.00	.00	V	.00	70.00	P
3	-6.50	-2.00	.00	3.00	270.00	70.00	P
4	-2.20	-2.00	.00	V	.00	70.00	P
5	2.20	-2.00	.00	V	.00	70.00	P
6	6.50	-2.00	.00	3.00	270.00	70.00	P
7	10.80	-2.00	.00	V	.00	70.00	P
8	15.20	-2.00	.00	3.00	270.00	70.00	P

9	-15.20	2.00	.00	4.00	90.00	70.00	P
J	-10.80	2.00	.00	V	.00	70.00	P
11	-6.50	2.00	.00	4.00	90.00	70.00	P
12	-2.20	2.00	.00	V	.00	70.00	P
13	2.20	2.00	.00	V	.00	70.00	P
14	6.50	2.00	.00	4.00	90.00	70.00	P
15	10.80	2.00	.00	V	.00	70.00	P
16	15.20	2.00	.00	4.00	90.00	70.00	P

						1120.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	70.1	180.6	272.3	.0	.0
2	.0	77.7	135.7	340.6	.0	.0
3	.0	-14.4	271.2	271.1	.0	.0
4	.0	3.2	271.2	-229.8	.0	.0
5	.0	5.3	203.4	231.6	.0	.0
6	.0	-13.7	203.4	-200.7	.0	.0
7	.0	3.9	207.2	52.9	.0	.0
8	.0	-15.1	207.2	-.4	.0	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 8. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.5260E-07	.9626E-01	.9934E-02	-.3021E-03	-.5280E-13	.2238E-11
2	.6287E-07	.9985E-01	.7934E-02	-.2570E-03	-.8141E-13	.3450E-11
3	-.2870E-07	-.4998E-01	.1140E-01	.5416E-03	.1213E-12	-.5141E-11
4	-.1686E-07	.4261E-01	.1321E-01	-.4708E-03	.9074E-13	-.3845E-11
5	-.6962E-08	-.1251E-01	.8999E-02	.2885E-03	.6402E-13	-.2713E-11
6	-.2721E-07	.6994E-02	.9460E-02	-.2355E-03	.9502E-13	-.4027E-11
7	-.9833E-08	.7081E-02	.9573E-02	.5097E-05	.6735E-13	-.2854E-11
8	-.2717E-07	-.1995E-01	.9093E-02	.1109E-03	.9914E-13	-.4201E-11

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PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
\# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.6	.0	-20.2	.0	29.9	.0	.29	.28	.94	.65	
2	.0	.6	24.5	29.7	.0	.0	.22	.12	1.17	.88	#
3	-.6	.0	-20.2	.0	29.9	.0	.29	.28	.94	.65	
4	.0	.6	24.5	29.7	.0	.0	.22	.12	1.17	.88	#
5	.0	.6	24.5	29.7	.0	.0	.22	.12	1.17	.88	#
6	-.6	.0	-20.2	.0	29.9	.0	.29	.28	.94	.65	
7	.0	.6	24.5	29.7	.0	.0	.22	.12	1.17	.88	#
8	-.6	.0	-20.2	.0	29.9	.0	.29	.28	.94	.65	
9	.5	.0	37.0	.0	-28.6	.0	.34	.09	1.23	.95	#
10	.0	.6	3.8	29.7	.0	.0	.04	.19	1.06	.77	
11	.5	.0	37.0	.0	-28.6	.0	.34	.09	1.23	.95	#
12	.0	.6	3.8	29.7	.0	.0	.04	.19	1.06	.77	
13	.0	.6	3.8	29.7	.0	.0	.04	.19	1.06	.77	
4	.5	.0	37.0	.0	-28.6	.0	.34	.09	1.23	.95	#
5	.0	.6	3.8	29.7	.0	.0	.04	.19	1.06	.77	
16	.5	.0	37.0	.0	-28.6	.0	.34	.09	1.23	.95	#

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.6	.0	-25.9	.0	30.6	.0	.37	.34	.91	.62	
2	.0	.6	20.1	30.8	.0	.0	.18	.13	1.15	.86	
3	-.6	.0	-25.9	.0	30.6	.0	.37	.34	.91	.62	
4	.0	.6	20.1	30.8	.0	.0	.18	.13	1.15	.86	
5	.0	.6	20.1	30.8	.0	.0	.18	.13	1.15	.86	
6	-.6	.0	-25.9	.0	30.6	.0	.37	.34	.91	.62	
7	.0	.6	20.1	30.8	.0	.0	.18	.13	1.15	.86	
8	-.6	.0	-25.9	.0	30.6	.0	.37	.34	.91	.62	
9	.6	.0	37.0	.0	-29.8	.0	.34	.09	1.23	.94	#
10	.0	.6	2.5	30.8	.0	.0	.02	.20	1.06	.77	
11	.6	.0	37.0	.0	-29.8	.0	.34	.09	1.23	.94	#
12	.0	.6	2.5	30.8	.0	.0	.02	.20	1.06	.77	
13	.0	.6	2.5	30.8	.0	.0	.02	.20	1.06	.77	
14	.6	.0	37.0	.0	-29.8	.0	.34	.09	1.23	.94	#
15	.0	.6	2.5	30.8	.0	.0	.02	.20	1.06	.77	
16	.6	.0	37.0	.0	-29.8	.0	.34	.09	1.23	.94	#

LOAD CASE - 3

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST	
	K	K	K	IN-K	IN-K	IN-K			KSI	KSI	
1	.3	.0	20.4	.0	-14.8	.0	.19	.12	1.12	.89	#
2	.0	-.3	-2.3	-15.4	.0	.0	.03	.06	1.00	.77	
3	.3	.0	20.4	.0	-14.8	.0	.19	.12	1.12	.89	#
4	.0	-.3	-2.3	-15.4	.0	.0	.03	.06	1.00	.77	
5	.0	-.3	-2.3	-15.4	.0	.0	.03	.06	1.00	.77	
6	.3	.0	20.4	.0	-14.8	.0	.19	.12	1.12	.89	#
7	.0	-.3	-2.3	-15.4	.0	.0	.03	.06	1.00	.77	
8	.3	.0	20.4	.0	-14.8	.0	.19	.12	1.12	.89	#
9	-.3	.0	16.5	.0	16.8	.0	.15	.13	1.10	.87	#
10	.0	-.3	34.8	-15.4	.0	.0	.32	.10	1.19	.96	#
11	-.3	.0	16.5	.0	16.8	.0	.15	.13	1.10	.87	#
12	.0	-.3	34.8	-15.4	.0	.0	.32	.10	1.19	.96	#
13	.0	-.3	34.8	-15.4	.0	.0	.32	.10	1.19	.96	#
14	-.3	.0	16.5	.0	16.8	.0	.15	.13	1.10	.87	#
15	.0	-.3	34.8	-15.4	.0	.0	.32	.10	1.19	.96	#
16	-.3	.0	16.5	.0	16.8	.0	.15	.13	1.10	.87	#

LOAD CASE - 4

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST	
	K	K	K	IN-K	IN-K	IN-K			KSI	KSI	
1	-.3	.0	13.9	.0	14.9	.0	.13	.13	1.08	.86	#
2	.0	.2	34.9	13.2	.0	.0	.32	.10	1.19	.97	#
3	-.3	.0	13.9	.0	14.9	.0	.13	.13	1.08	.86	#
4	.0	.2	34.9	13.2	.0	.0	.32	.10	1.19	.97	#
5	.0	.2	34.9	13.2	.0	.0	.32	.10	1.19	.97	#
6	-.3	.0	13.9	.0	14.9	.0	.13	.13	1.08	.86	#
7	.0	.2	34.9	13.2	.0	.0	.32	.10	1.19	.97	#
8	-.3	.0	13.9	.0	14.9	.0	.13	.13	1.08	.86	#
9	.2	.0	17.4	.0	-12.6	.0	.16	.13	1.10	.88	#
10	.0	.2	2.7	13.2	.0	.0	.03	.17	1.02	.81	
11	.2	.0	17.4	.0	-12.6	.0	.16	.13	1.10	.88	#
12	.0	.2	2.7	13.2	.0	.0	.03	.17	1.02	.81	
13	.0	.2	2.7	13.2	.0	.0	.03	.17	1.02	.81	
14	.2	.0	17.4	.0	-12.6	.0	.16	.13	1.10	.88	#
15	.0	.2	2.7	13.2	.0	.0	.03	.17	1.02	.81	
16	.2	.0	17.4	.0	-12.6	.0	.16	.13	1.10	.88	#

LOAD CASE - 5

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST	
	K	K	K	IN-K	IN-K	IN-K			KSI	KSI	
1	.1	.0	8.4	.0	-3.5	.0	.08	.14	1.03	.86	#
2	.0	-.1	3.0	-3.9	.0	.0	.03	.15	1.00	.83	#
3	.1	.0	8.4	.0	-3.5	.0	.08	.14	1.03	.86	#
4	.0	-.1	3.0	-3.9	.0	.0	.03	.15	1.00	.83	#
5	.0	-.1	3.0	-3.9	.0	.0	.03	.15	1.00	.83	#
6	.1	.0	8.4	.0	-3.5	.0	.08	.14	1.03	.86	#
7	.0	-.1	3.0	-3.9	.0	.0	.03	.15	1.00	.83	#
8	.1	.0	8.4	.0	-3.5	.0	.08	.14	1.03	.86	#
9	-.1	.0	17.7	.0	4.9	.0	.16	.13	1.08	.90	#
10	.0	-.1	22.7	-3.9	.0	.0	.21	.12	1.10	.93	#
11	-.1	.0	17.7	.0	4.9	.0	.16	.13	1.08	.90	#
12	.0	-.1	22.7	-3.9	.0	.0	.21	.12	1.10	.93	#
13	.0	-.1	22.7	-3.9	.0	.0	.21	.12	1.10	.93	#
4	-.1	.0	17.7	.0	4.9	.0	.16	.13	1.08	.90	#

	.0	-.1	22.7	-3.9	.0	.0	.21	.12	1.10	.93	#
16	-.1	.0	17.7	.0	4.9	.0	.16	.13	1.08	.90	#

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.1	.0	17.3	.0	3.5	.0	.16	.13	1.08	.90	#
2	.0	.0	21.5	2.2	.0	.0	.20	.12	1.09	.93	#
3	-.1	.0	17.3	.0	3.5	.0	.16	.13	1.08	.90	#
4	.0	.0	21.5	2.2	.0	.0	.20	.12	1.09	.93	#
5	.0	.0	21.5	2.2	.0	.0	.20	.12	1.09	.93	#
6	-.1	.0	17.3	.0	3.5	.0	.16	.13	1.08	.90	#
7	.0	.0	21.5	2.2	.0	.0	.20	.12	1.09	.93	#
8	-.1	.0	17.3	.0	3.5	.0	.16	.13	1.08	.90	#
9	.0	.0	7.7	.0	-1.8	.0	.07	.14	1.02	.86	#
10	.0	.0	5.4	2.2	.0	.0	.05	.15	1.01	.84	#
11	.0	.0	7.7	.0	-1.8	.0	.07	.14	1.02	.86	#
12	.0	.0	5.4	2.2	.0	.0	.05	.15	1.01	.84	#
13	.0	.0	5.4	2.2	.0	.0	.05	.15	1.01	.84	#
14	.0	.0	7.7	.0	-1.8	.0	.07	.14	1.02	.86	#
15	.0	.0	5.4	2.2	.0	.0	.05	.15	1.01	.84	#
16	.0	.0	7.7	.0	-1.8	.0	.07	.14	1.02	.86	#

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.1	.0	9.6	.0	3.0	.0	.09	.14	1.04	.86	#
2	.0	.0	13.5	2.2	.0	.0	.12	.13	1.05	.88	#
3	-.1	.0	9.6	.0	3.0	.0	.09	.14	1.04	.86	#
4	.0	.0	13.5	2.2	.0	.0	.12	.13	1.05	.88	#
5	.0	.0	13.5	2.2	.0	.0	.12	.13	1.05	.88	#
6	-.1	.0	9.6	.0	3.0	.0	.09	.14	1.04	.86	#
7	.0	.0	13.5	2.2	.0	.0	.12	.13	1.05	.88	#
8	-.1	.0	9.6	.0	3.0	.0	.09	.14	1.04	.86	#
9	.0	.0	15.9	.0	-1.4	.0	.15	.13	1.06	.90	#
10	.0	.0	13.8	2.2	.0	.0	.13	.13	1.06	.89	#
11	.0	.0	15.9	.0	-1.4	.0	.15	.13	1.06	.90	#
12	.0	.0	13.8	2.2	.0	.0	.13	.13	1.06	.89	#
13	.0	.0	13.8	2.2	.0	.0	.13	.13	1.06	.89	#
14	.0	.0	15.9	.0	-1.4	.0	.15	.13	1.06	.90	#
15	.0	.0	13.8	2.2	.0	.0	.13	.13	1.06	.89	#
16	.0	.0	15.9	.0	-1.4	.0	.15	.13	1.06	.90	#

LOAD CASE - 8

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.1	.0	17.7	.0	-5.2	.0	.16	.13	1.08	.90	#
2	.0	-.1	9.2	-6.2	.0	.0	.08	.14	1.04	.85	#
3	.1	.0	17.7	.0	-5.2	.0	.16	.13	1.08	.90	#
4	.0	-.1	9.2	-6.2	.0	.0	.08	.14	1.04	.85	#
5	.0	-.1	9.2	-6.2	.0	.0	.08	.14	1.04	.85	#
	.1	.0	17.7	.0	-5.2	.0	.16	.13	1.08	.90	#
7	.0	-.1	9.2	-6.2	.0	.0	.08	.14	1.04	.85	#

5	.0	-.1	22.7	-3.9	.0	.0	.21	.12	1.10	.93	#
[illegible]	-.1	.0	17.7	.0	4.9	.0	.16	.13	1.08	.90	#

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.1	.0	17.3	.0	3.5	.0	.16	.13	1.08	.90	#
2	.0	.0	21.5	2.2	.0	.0	.20	.12	1.09	.93	#
3	-.1	.0	17.3	.0	3.5	.0	.16	.13	1.08	.90	#
4	.0	.0	21.5	2.2	.0	.0	.20	.12	1.09	.93	#
5	.0	.0	21.5	2.2	.0	.0	.20	.12	1.09	.93	#
6	-.1	.0	17.3	.0	3.5	.0	.16	.13	1.08	.90	#
7	.0	.0	21.5	2.2	.0	.0	.20	.12	1.09	.93	#
8	-.1	.0	17.3	.0	3.5	.0	.16	.13	1.08	.90	#
9	.0	.0	7.7	.0	-1.8	.0	.07	.14	1.02	.86	#
10	.0	.0	5.4	2.2	.0	.0	.05	.15	1.01	.84	#
11	.0	.0	7.7	.0	-1.8	.0	.07	.14	1.02	.86	#
12	.0	.0	5.4	2.2	.0	.0	.05	.15	1.01	.84	#
13	.0	.0	5.4	2.2	.0	.0	.05	.15	1.01	.84	#
14	.0	.0	7.7	.0	-1.8	.0	.07	.14	1.02	.86	#
15	.0	.0	5.4	2.2	.0	.0	.05	.15	1.01	.84	#
16	.0	.0	7.7	.0	-1.8	.0	.07	.14	1.02	.86	#

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.1	.0	9.6	.0	3.0	.0	.09	.14	1.04	.86	#
2	.0	.0	13.5	2.2	.0	.0	.12	.13	1.05	.88	#
3	-.1	.0	9.6	.0	3.0	.0	.09	.14	1.04	.86	#
4	.0	.0	13.5	2.2	.0	.0	.12	.13	1.05	.88	#
5	.0	.0	13.5	2.2	.0	.0	.12	.13	1.05	.88	#
6	-.1	.0	9.6	.0	3.0	.0	.09	.14	1.04	.86	#
7	.0	.0	13.5	2.2	.0	.0	.12	.13	1.05	.88	#
8	-.1	.0	9.6	.0	3.0	.0	.09	.14	1.04	.86	#
9	.0	.0	15.9	.0	-1.4	.0	.15	.13	1.06	.90	#
10	.0	.0	13.8	2.2	.0	.0	.13	.13	1.06	.89	#
11	.0	.0	15.9	.0	-1.4	.0	.15	.13	1.06	.90	#
12	.0	.0	13.8	2.2	.0	.0	.13	.13	1.06	.89	#
13	.0	.0	13.8	2.2	.0	.0	.13	.13	1.06	.89	#
14	.0	.0	15.9	.0	-1.4	.0	.15	.13	1.06	.90	#
15	.0	.0	13.8	2.2	.0	.0	.13	.13	1.06	.89	#
16	.0	.0	15.9	.0	-1.4	.0	.15	.13	1.06	.90	#

LOAD CASE - 8

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.1	.0	17.7	.0	-5.2	.0	.16	.13	1.08	.90	#
2	.0	-.1	9.2	-6.2	.0	.0	.08	.14	1.04	.85	#
3	.1	.0	17.7	.0	-5.2	.0	.16	.13	1.08	.90	#
4	.0	-.1	9.2	-6.2	.0	.0	.08	.14	1.04	.85	#
5	.0	-.1	9.2	-6.2	.0	.0	.08	.14	1.04	.85	#
6	.1	.0	17.7	.0	-5.2	.0	.16	.13	1.08	.90	#
7	.0	-.1	9.2	-6.2	.0	.0	.08	.14	1.04	.85	#

8	.1	.0	17.7	.0	-5.2	.0	.16	.13	1.08	.90	#
9	-.1	.0	9.4	.0	6.9	.0	.09	.14	1.04	.85	#
10	.0	-.1	16.8	-6.2	.0	.0	.15	.13	1.08	.89	#
11	-.1	.0	9.4	.0	6.9	.0	.09	.14	1.04	.85	#
12	.0	-.1	16.8	-6.2	.0	.0	.15	.13	1.08	.89	#
13	.0	-.1	16.8	-6.2	.0	.0	.15	.13	1.08	.89	#
14	-.1	.0	9.4	.0	6.9	.0	.09	.14	1.04	.85	#
15	.0	-.1	16.8	-6.2	.0	.0	.15	.13	1.08	.89	#
16	-.1	.0	9.4	.0	6.9	.0	.09	.14	1.04	.85	#

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PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	6.9	-18.9	.0	.0	.0
2	.0	.6	24.5	.0	.0	.0
3	.0	6.9	-18.9	.0	.0	.0
4	.0	.6	24.5	.0	.0	.0
5	.0	.6	24.5	.0	.0	.0
6	.0	6.9	-18.9	.0	.0	.0
7	.0	.6	24.5	.0	.0	.0
8	.0	6.9	-18.9	.0	.0	.0
9	.0	9.5	35.8	.0	.0	.0
10	.0	.6	3.8	.0	.0	.0
11	.0	9.5	35.8	.0	.0	.0
12	.0	.6	3.8	.0	.0	.0
13	.0	.6	3.8	.0	.0	.0
14	.0	9.5	35.8	.0	.0	.0
15	.0	.6	3.8	.0	.0	.0
16	.0	9.5	35.8	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	8.8	-24.4	.0	.0	.0
2	.0	.6	20.1	.0	.0	.0
3	.0	8.8	-24.4	.0	.0	.0
4	.0	.6	20.1	.0	.0	.0
5	.0	.6	20.1	.0	.0	.0
6	.0	8.8	-24.4	.0	.0	.0
7	.0	.6	20.1	.0	.0	.0
8	.0	8.8	-24.4	.0	.0	.0
9	.0	9.5	35.7	.0	.0	.0
10	.0	.6	2.5	.0	.0	.0
11	.0	9.5	35.7	.0	.0	.0
12	.0	.6	2.5	.0	.0	.0
13	.0	.6	2.5	.0	.0	.0
14	.0	9.5	35.7	.0	.0	.0
15	.0	.6	2.5	.0	.0	.0
16	.0	9.5	35.7	.0	.0	.0

AD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-6.7	19.2	.0	.0	.0
2	.0	-.3	-2.3	.0	.0	.0
3	.0	-6.7	19.2	.0	.0	.0
4	.0	-.3	-2.3	.0	.0	.0
5	.0	-.3	-2.3	.0	.0	.0
6	.0	-6.7	19.2	.0	.0	.0
7	.0	-.3	-2.3	.0	.0	.0
8	.0	-6.7	19.2	.0	.0	.0
9	.0	3.7	16.1	.0	.0	.0
10	.0	-.3	34.8	.0	.0	.0
11	.0	3.7	16.1	.0	.0	.0
12	.0	-.3	34.8	.0	.0	.0
13	.0	-.3	34.8	.0	.0	.0
14	.0	3.7	16.1	.0	.0	.0
15	.0	-.3	34.8	.0	.0	.0
16	.0	3.7	16.1	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-4.1	13.3	.0	.0	.0
2	.0	.2	34.9	.0	.0	.0
3	.0	-4.1	13.3	.0	.0	.0
4	.0	.2	34.9	.0	.0	.0
5	.0	.2	34.9	.0	.0	.0
6	.0	-4.1	13.3	.0	.0	.0
7	.0	.2	34.9	.0	.0	.0
8	.0	-4.1	13.3	.0	.0	.0
9	.0	4.4	16.8	.0	.0	.0
10	.0	.2	2.7	.0	.0	.0
11	.0	4.4	16.8	.0	.0	.0
12	.0	.2	2.7	.0	.0	.0
13	.0	.2	2.7	.0	.0	.0
14	.0	4.4	16.8	.0	.0	.0
15	.0	.2	2.7	.0	.0	.0
16	.0	4.4	16.8	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-2.7	8.0	.0	.0	.0
2	.0	-.1	3.0	.0	.0	.0
3	.0	-2.7	8.0	.0	.0	.0
4	.0	-.1	3.0	.0	.0	.0
5	.0	-.1	3.0	.0	.0	.0
6	.0	-2.7	8.0	.0	.0	.0
7	.0	-.1	3.0	.0	.0	.0
8	.0	-2.7	8.0	.0	.0	.0
9	.0	4.2	17.2	.0	.0	.0
10	.0	-.1	22.7	.0	.0	.0

11	.0	4.2	17.2	.0	.0	.0
12	.0	-.1	22.7	.0	.0	.0
13	.0	-.1	22.7	.0	.0	.0
14	.0	4.2	17.2	.0	.0	.0
15	.0	-.1	22.7	.0	.0	.0
16	.0	4.2	17.2	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-5.4	16.4	.0	.0	.0
2	.0	.0	21.5	.0	.0	.0
3	.0	-5.4	16.4	.0	.0	.0
4	.0	.0	21.5	.0	.0	.0
5	.0	.0	21.5	.0	.0	.0
6	.0	-5.4	16.4	.0	.0	.0
7	.0	.0	21.5	.0	.0	.0
8	.0	-5.4	16.4	.0	.0	.0
9	.0	1.9	7.4	.0	.0	.0
10	.0	.0	5.4	.0	.0	.0
11	.0	1.9	7.4	.0	.0	.0
12	.0	.0	5.4	.0	.0	.0
13	.0	.0	5.4	.0	.0	.0
14	.0	1.9	7.4	.0	.0	.0
15	.0	.0	5.4	.0	.0	.0
16	.0	1.9	7.4	.0	.0	.0

'AD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-3.0	9.1	.0	.0	.0
2	.0	.0	13.5	.0	.0	.0
3	.0	-3.0	9.1	.0	.0	.0
4	.0	.0	13.5	.0	.0	.0
5	.0	.0	13.5	.0	.0	.0
6	.0	-3.0	9.1	.0	.0	.0
7	.0	.0	13.5	.0	.0	.0
8	.0	-3.0	9.1	.0	.0	.0
9	.0	3.9	15.4	.0	.0	.0
10	.0	.0	13.8	.0	.0	.0
11	.0	3.9	15.4	.0	.0	.0
12	.0	.0	13.8	.0	.0	.0
13	.0	.0	13.8	.0	.0	.0
14	.0	3.9	15.4	.0	.0	.0
15	.0	.0	13.8	.0	.0	.0
16	.0	3.9	15.4	.0	.0	.0

LOAD CASE - 8

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-5.7	16.8	.0	.0	.0
2	.0	-.1	9.2	.0	.0	.0
3	.0	-5.7	16.8	.0	.0	.0

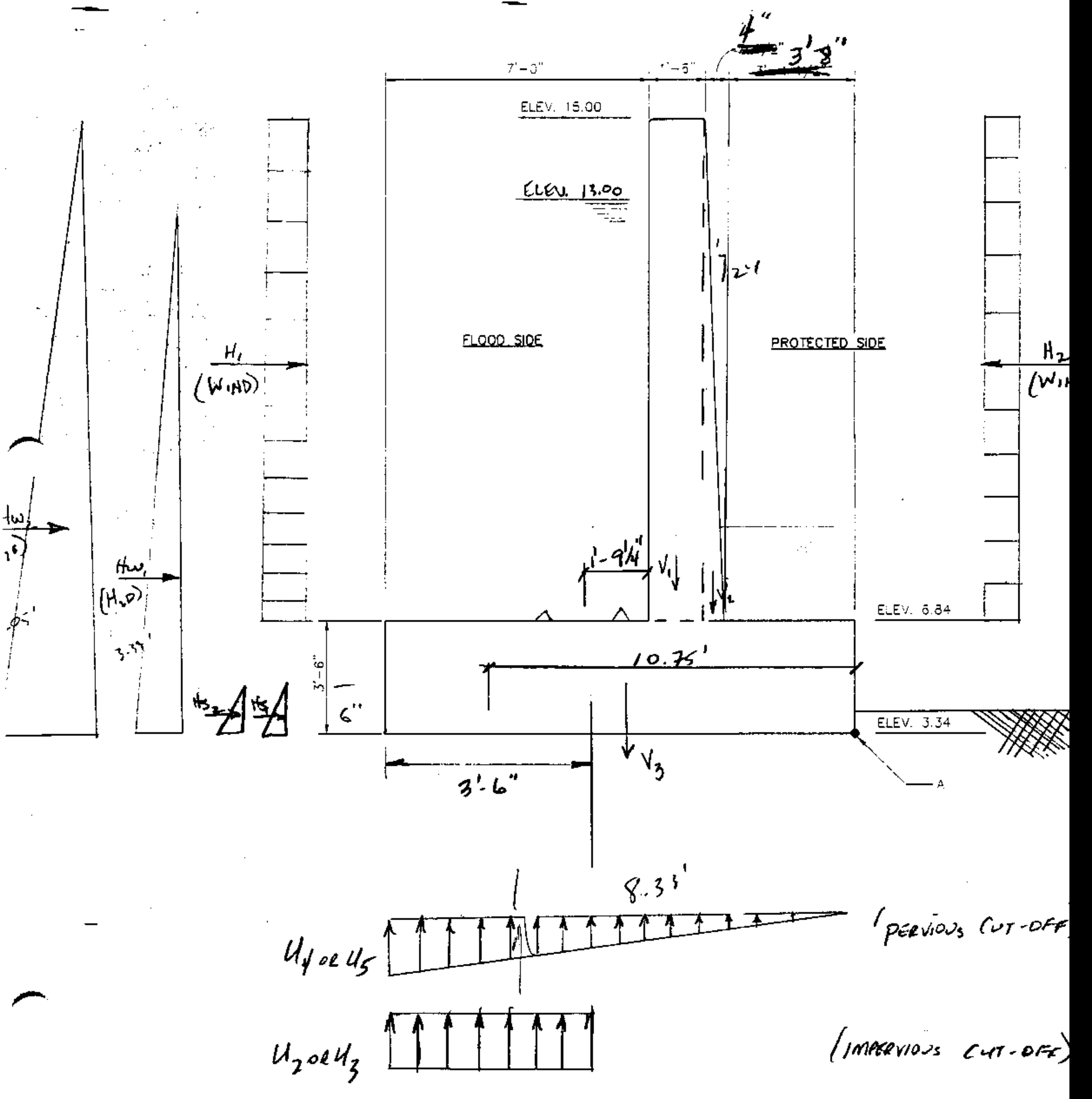
4	.0	-.1	9.2	.0	.0	.0
5	.0	-.1	9.2	.0	.0	.0
6	.0	-5.7	16.8	.0	.0	.0
7	.0	-.1	9.2	.0	.0	.0
8	.0	-5.7	16.8	.0	.0	.0
9	.0	2.1	9.1	.0	.0	.0
10	.0	-.1	16.8	.0	.0	.0
11	.0	2.1	9.1	.0	.0	.0
12	.0	-.1	16.8	.0	.0	.0
13	.0	-.1	16.8	.0	.0	.0
14	.0	2.1	9.1	.0	.0	.0
15	.0	-.1	16.8	.0	.0	.0
16	.0	2.1	9.1	.0	.0	.0

FRANCE ROAD FLOODWALL

GATE NO. 3 T-WALL STORAGE MONOLITH

D. [illegible] 6/17/97

27'-6"



LOAD DIAGRAM

PYBURN & ODOM, INC — CONSULTING ENGINEERS

Sheet No. 1 of 7

Client: PORT OF NEW ORLEANS   Project:
Computations for: STORAGE MONOLITH GATE NO. 3
Computed by: JPJ   Date: 6/23/97   Checked by: Date:

		LOAD (KIPS)	MOMENT ARM (FEET)	MOMENT (1-K)	LOAD CASE
D.L.	$V_1 = 1.5'(15'-6.84')(0.15\ K/ft^3)$	1.84	4.75	8.74	ALL
	$V_2 = 0.625'(15'-6.84')(1/2)(0.15\ K/ft^3)$	0.38	3.69	1.40	
	$V_3 = (6.84'-3.34')(12.5')(0.15\ K/ft^3)$	6.56	6.25	41.00	
		8.78		57.14	
WINDS	$H_1 = 0.05\ ksf(15'-6.84')$	0.408	7.58	3.09	III
	$H_2 = -0.05\ ksf(15'-6.84')$	-0.408	7.58	-3.09	IV
OIL	$H_{S1} = 0.115\ ksf(0.5)(0.5^2/2)$	0.007	0.25	0.002	III, IV
	$H_{S2} = (0.115-0.0624)\ ksf(0.5)(0.5^2/2)$	0.003	0.25	0.001	I, II
WATER	$H_{w1} = 0.0624(13'-3.34')^2/2$	2.91	3.22	9.37	I
	$H_{w2} = 0.0624(15-3.34')^2/2$	4.24	3.89	16.49	II
UPLIFT LOADS	$U_2 = 0.0624(13'-3.34')(3.5')$	2.11	10.75	22.68	I
	$U_3 = 0.0624(15'-3.34')(3.5')$	2.55	10.75	27.41	II
	$U_4 = 0.0624(13-3.34')(12.5/2)$	3.77	8.33	31.42	VI
	$U_5 = 0.0624(15-3.34')(12.5/2)$	4.55	8.33	37.92	VII
HORIZ.	$H_3 = 0.022$				ALL
GATE	$G = 0.6\ K/ft$	0.6	7.3	4.38	

Client PORT OF NEW ORLEANS Project
Computations for STORAGE MONOLITH GATE NO. 3
Computed by [illegible] Date 6/23/97 Checked by Date

LOAD COMBINATIONS

LOAD CASE	$\vec{F_x}$	$F_z \downarrow$	M_y
I = D.L. + SWL + IMPERVIOUS WALL			
SOIL (H_{S2})	0.003	0.00	−0.001
DEAD	0.00	8.78	+51.14
WATER (H_W)	2.91	0.00	−9.4
UPLIFT (U_2)	0.00	−2.11	−22.68
SHTPILE (H_S)	0.027	0.00	0.00
TOTAL	2.94	6.67	19.07
II = HWL + DL + IMPERVIOUS WALL			
DEAD	0.00	8.78	+51.14
WATER (H_{W})	4.24	0.00	−16.5
UPLIFT (U_3)	0.00	−2.55	−27.4
SOIL (H_{S2})	0.003	0.00	−0.001
SHTPILE (H_S)	0.027	0.00	0.00
TOTAL	4.27	6.23	7.24
75% TOTAL	3.20	4.67	5.43
III = WIND (FLOODSIDE + D.L.) + GATE			
GATE	0.00	0.6	+4.38
DEAD	0.00	8.78	+51.14
WIND (H_1)	0.408	0.00	−3.09
SOIL (H_{S1})	0.007	0.00	−0.002
HORIZ (H_S)	0.022	0.00	0.00
TOTAL	0.44	9.38	52.43
75% TOTAL	0.33	7.04	39.32
IV = WIND P/S + D.L. + GATE			
GATE	0.00	0.6	+4.38
DEAD	0.00	8.78	+51.14
WIND (H_2)	−0.408	0.00	+3.09
SOIL (H_{S1})	0.007	0.00	−0.002
HORIZ (H_S)	0.022	0.00	0.00
TOTAL	−0.38	9.38	58.61
75% TOTAL	−0.29	7.04	43.96

LOAD CASE	$\vec{F_x}$	$F_z \downarrow$	M_y
V = D.L. ONLY			
GATE	0.00	0.6	4.38
DEAD	0.00	8.78	51.14
SHTPILE	0.027	0.00	0.00
TOTAL	0.027	9.38	55.52
VI CASE I w/ PERVIOUS SHTPILE			
DEAD	0.00	8.78	51.14
WATER (H_W)	2.91	0.00	−9.4
SOIL (H_{S2})	0.003	0.00	−0.001
SHTPILE (H_S)	0.027	0.00	0.00
UPLIFT (U_4)	0.00	−3.77	−31.42
TOTAL	2.94	5.01	10.32
VII CASE II − w/ PERVIOUS SHTPILE			
DEAD	0.00	8.78	+51.14
WATER (H_W)	4.24	0.00	−16.5
SOIL (H_S)	0.003	0.00	−0.001
SHTPILE (H_S)	0.0027	0.00	0.00
UPLIFT (U_5)	0.00	−4.55	−37.97
TOTAL	4.25	4.23	−3.28
.75 TOTAL	3.19	3.17	−2.46

Client: PORT OF NEW ORLEANS Project:

Computations for: STORAGE MONOLITH GATE NO. 3

Computed by: Date: Checked by: Date:

LOAD CASE	F_x (⟷)	F_z (↓)	M_y (↻+)
I	2.94	6.67	19.07
II	3.20	4.67	5.43
III	0.33	7.04	39.32
IV	-0.29	7.04	43.96
V	0.02	9.38	55.52
VI	2.94	5.01	10.32
VII	3.19	3.17	-2.46
STORAGE MONOLITH = 23'-0"			
I	68.0	153.0	439.0
II	74.0	108.0	125.0
III	8.0	162.0	904.0
IV	-7.0	162.0	1011.0
V	0.5	216.0	1277.0
VI	68.0	115.0	237.0
VII	73.0	73.0	-57.0

CPGA TWMONO3.D

```
1000 ROLLER GATE NO. 3 MONOLITH
1005 2 ROWS OF 14 IN. SQ. PPC PILES AT 5'-9" C\C, ORIGIN CENTER OF
 BASE
1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL

1020 SOI ES .0705 LEN 68.0 0. ALL

1030 PIN ALL

1040 TEN 0.8 ALL

1050 DLS S 140.0 50.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL

1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL
1070 BAT 3.0 1 3 4 6
1075 BAT 4.0 7 9 10 12
1080 ANG 90 7 8 9 10 11 12
1090 ANG 270 1 2 3 4 5 6

1100 PIL 1 -14.4 -2.0 0.0  2 -8.6 -2.0 0.0 3 -2.9 -2.0 0.0 4 2.9 -
2.0 0.0
1101 PIL 5 8.6 -2.0 0.0 6 14.4 -2.0 0.0 7 -14.4 2.0 0.0 8 -8.6 2.0
 0.0
1102 PIL 9 -2.9 2.0 0.0 10 2.9 2.0 0.0 11 8.6 2.0 0.0 12 14.4 2.0
0.0
1120 LOA 1 0.0 116.4 239.4 540.6 0.0 0.0

1121 LOA 2 0.0 120.3 179.5 597.20 0.0 0.0
1122 LOA 3 0.0 -16.0 304.5 208.8 0.0 0.0
1123 LOA 4 0.0 1.8 304.5 -59.2 0.0 0.0
1124 LOA 5 0.0 -1.7 228.4 190.3 0.0 0.0
1125 LOA 6 0.0 -12.3 228.4 46.2 0.0 0.0
1126 LOA 7 0.0 4.10 268.4 118.6 0.0 0.0
1127 LOA 8 0.0 18.2 268.4 48.6 0.0 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\GATE3.O

1140 PFO ALL

1150 PLB ALL
1160 FPL C:\CORPS\CPGG\GATE3.P
```

```
 *********************************
 * CORPS PROGRAM  #  X0080       *  CPGA - CASE PILE GROUP ANALYSI
S PROGRAM
 * VERSION NUMBER # 1992/02/26   *  RUN DATE 29-JUL-1997   RUN TIM
E 14.35.31
 *********************************


 ROLLER GATE NO. 3 MONOLITH



 THERE ARE  12 PILES AND
             8 LOAD CASES IN THIS RUN.

 ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                          X          Y          Z
                                        -----      -----      -----
 WITH DIAGONAL COORDINATES = (      -14.40 ,     -2.00 ,       .00 )
                             (       14.40 ,      2.00 ,       .00 )


 *****************************************************************
**************

          PILE PROPERTIES AS INPUT


       E            I1            I2            A            C33
     B66
      KSI          IN**4         IN**4         IN**2
   .40740E+04   .32010E+04   .32010E+04   .19600E+03   .15000E+01
  .00000E+00

 THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

     ALL


 *****************************************************************
**************
```

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL	LENGTH	L	LU
	K/IN**2		FT	FT
	.70500E-01	L	.68000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****
****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X	Y	Z	BATTER	ANGLE	LENGTH	FIXITY
	FT	FT	FT			FT	
1	-14.40	-2.00	.00	3.00	270.00	68.00	P
2	-8.60	-2.00	.00	V	270.00	68.00	P
3	-2.90	-2.00	.00	3.00	270.00	68.00	P
4	2.90	-2.00	.00	3.00	270.00	68.00	P
5	8.60	-2.00	.00	V	270.00	68.00	P
6	14.40	-2.00	.00	3.00	270.00	68.00	P
7	-14.40	2.00	.00	4.00	90.00	68.00	P
8	-8.60	2.00	.00	V	90.00	68.00	P
9	-2.90	2.00	.00	4.00	90.00	68.00	P
10	2.90	2.00	.00	4.00	90.00	68.00	P
11	8.60	2.00	.00	V	90.00	68.00	

P
12 14.40 2.00 .00 4.00 90.00 68.00
P

816.00

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	116.4	239.4	540.6	.0	.0
2	.0	120.3	179.5	597.2	.0	.0
3	.0	-16.0	304.5	208.8	.0	.0
4	.0	1.8	304.5	-59.2	.0	.0
5	.0	-1.7	228.4	190.3	.0	.0
6	.0	-12.3	228.4	46.2	.0	.0
7	.0	4.1	268.4	118.6	.0	.0
8	.0	18.2	268.4	48.6	.0	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 0.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 0.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 0.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 0.

LOAD CASE 8. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 0.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.1164E-06	.1789E+00	.1866E-01	-.7351E-03	-.1048E-12	.4111E-11
2	.1291E-06	.1716E+00	.1486E-01	-.6048E-03	-.1521E-12	.5966E-11
3	-.5210E-07	-.6965E-01	.1639E-01	.7953E-03	.2325E-12	-.9117E-11
4	-.3525E-07	.3769E-01	.1924E-01	-.3802E-03	.1925E-12	-.7548E-11
5	-.2645E-07	-.3443E-01	.1274E-01	.4991E-03	.1514E-12	-.5938E-11
6	-.4111E-07	-.2707E-01	.1298E-01	.2615E-03	.1750E-12	-.6861E-11
7	-.2551E-07	-.5799E-03	.1602E-01	.1430E-03	.1642E-12	-.6440E-11

```
  8   -.9998E-08   .5105E-01   .1736E-01  -.3489E-03   .1327E-12
 -.5203E-11
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PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

```
 PILE     F1       F2       F3         M1         M2         M3   ALF  C
BF  ASC  AST
          K        K        K        IN-K       IN-K       IN-K
    KSI  KSI

   1     -1.1      .0    -32.5        .0        56.0        .0  .65  .
46  .94   .53
   2     -1.0      .0     53.3        .0        55.2        .0  .38  .
19 1.37   .97 #
   3     -1.1      .0    -32.5        .0        56.0        .0  .65  .
46  .94   .53
   4     -1.1      .0    -32.5        .0        56.0        .0  .65  .
46  .94   .53
   5     -1.0      .0     53.3        .0        55.2        .0  .38  .
19 1.37   .97 #
   6     -1.1      .0    -32.5        .0        56.0        .0  .65  .
46  .94   .53
   7      1.0      .0     65.2        .0       -53.5        .0  .47  .
27 1.43 1.04 #
   8      1.0      .0      1.5        .0       -55.2        .0  .01  .
25 1.11   .71
   9      1.0      .0     65.2        .0       -53.5        .0  .47  .
27 1.43 1.04 #
```

```
   10      1.0       .0    65.2       .0      -53.5       .0  .47  .
27 1.43 1.04 #
   11      1.0       .0     1.5       .0      -55.2       .0  .01  .
25 1.11  .71
   12      1.0       .0    65.2       .0      -53.5       .0  .47  .
27 1.43 1.04 #


 LOAD CASE -     2

 PILE    F1       F2      F3        M1         M2         M3   ALF  C
BF  ASC  AST
          K        K       K      IN-K       IN-K       IN-K
    KSI  KSI

    1    -1.0      .0   -38.7       .0       53.1       .0  .77  .
52  .90  .51
    2    -1.0      .0    43.1       .0       53.0       .0  .31  .
13 1.32  .92 #
    3    -1.0      .0   -38.7       .0       53.1       .0  .77  .
52  .90  .51
    4    -1.0      .0   -38.7       .0       53.1       .0  .77  .
52  .90  .51
    5    -1.0      .0    43.1       .0       53.0       .0  .31  .
13 1.32  .92 #
    6    -1.0      .0   -38.7       .0       53.1       .0  .77  .
52  .90  .51
    7     1.0      .0    61.6       .0      -51.4       .0  .44  .
25 1.41 1.02 #
    8     1.0      .0      .5       .0      -53.0       .0  .00  .
25 1.10  .71
    9     1.0      .0    61.6       .0      -51.4       .0  .44  .
25 1.41 1.02 #
   10     1.0      .0    61.6       .0      -51.4       .0  .44  .
25 1.41 1.02 #
   11     1.0      .0      .5       .0      -53.0       .0  .00  .
25 1.10  .71
   12     1.0      .0    61.6       .0      -51.4       .0  .44  .
25 1.41 1.02 #


 LOAD CASE -     3
```

PILE BF	 ASC KSI	F1 AST K KSI	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	C
1		.4	.0	28.6	.0	-20.7	.0	.20	.
11	1.17	.92 #							
2		.4	.0	-4.0	.0	-21.5	.0	.08	.
09	1.01	.75							
3		.4	.0	28.6	.0	-20.7	.0	.20	.
11	1.17	.92 #							
4		.4	.0	28.6	.0	-20.7	.0	.20	.
11	1.17	.92 #							
5		.4	.0	-4.0	.0	-21.5	.0	.08	.
09	1.01	.75							
6		.4	.0	28.6	.0	-20.7	.0	.20	.
11	1.17	.92 #							
7		-.4	.0	25.7	.0	23.5	.0	.18	.
11	1.16	.90 #							
8		-.4	.0	52.1	.0	21.5	.0	.37	.
19	1.29	1.04 #							
9		-.4	.0	25.7	.0	23.5	.0	.18	.
11	1.16	.90 #							
10		-.4	.0	25.7	.0	23.5	.0	.18	.
11	1.16	.90 #							
11		-.4	.0	52.1	.0	21.5	.0	.37	.
19	1.29	1.04 #							
12		-.4	.0	25.7	.0	23.5	.0	.18	.
11	1.16	.90 #							

LOAD CASE - 4

PILE BF	 ASC KSI	F1 AST K KSI	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	C
1		-.3	.0	22.0	.0	13.8	.0	.16	.
12	1.12	.90 #							
2		-.2	.0	41.6	.0	11.6	.0	.30	.

```
12 1.22 1.01 #
   3     -.3     .0    22.0      .0     13.8      .0  .16  .
12 1.12  .90 #
   4     -.3     .0    22.0      .0     13.8      .0  .16  .
12 1.12  .90 #
   5     -.2     .0    41.6      .0     11.6      .0  .30  .
12 1.22 1.01 #
   6     -.3     .0    22.0      .0     13.8      .0  .16  .
12 1.12  .90 #
   7      .2     .0    27.8      .0    -10.5      .0  .20  .
11 1.14  .94 #
   8      .2     .0    14.8      .0    -11.6      .0  .11  .
13 1.08  .87 #
   9      .2     .0    27.8      .0    -10.5      .0  .20  .
11 1.14  .94 #
  10      .2     .0    27.8      .0    -10.5      .0  .20  .
11 1.14  .94 #
  11      .2     .0    14.8      .0    -11.6      .0  .11  .
13 1.08  .87 #
  12      .2     .0    27.8      .0    -10.5      .0  .20  .
11 1.14  .94 #


 LOAD CASE -     5

 PILE     F1     F2      F3       M1       M2        M3   ALF  C
BF  ASC  AST
          K      K        K      IN-K     IN-K      IN-K
    KSI  KSI

   1      .2     .0    17.0      .0    -10.0      .0  .12  .
13 1.09  .89 #
   2      .2     .0     1.1      .0    -10.6      .0  .01  .
17 1.01  .80
   3      .2     .0    17.0      .0    -10.0      .0  .12  .
13 1.09  .89 #
   4      .2     .0    17.0      .0    -10.0      .0  .12  .
13 1.09  .89 #
   5      .2     .0     1.1      .0    -10.6      .0  .01  .
17 1.01  .80
   6      .2     .0    17.0      .0    -10.0      .0  .12  .
13 1.09  .89 #
```

PILE	F1	F2	F3	M1	M2	M3	ALF	C	BF	ASC	AST
7	-.2	.0	22.9	.0	12.2	.0	.16	.	12	1.12	.91 #
8	-.2	.0	36.3	.0	10.6	.0	.26	.	10	1.19	.98 #
9	-.2	.0	22.9	.0	12.2	.0	.16	.	12	1.12	.91 #
10	-.2	.0	22.9	.0	12.2	.0	.16	.	12	1.12	.91 #
11	-.2	.0	36.3	.0	10.6	.0	.26	.	10	1.19	.98 #
12	-.2	.0	22.9	.0	12.2	.0	.16	.	12	1.12	.91 #

LOAD CASE - 6

PILE	F1 (K)	F2 (K)	F3 (K)	M1 (IN-K)	M2 (IN-K)	M3 (IN-K)	ALF	C	BF	ASC (KSI)	AST (KSI)
1	.1	.0	21.9	.0	-7.3	.0	.16	.	12	1.11	.92 #
2	.2	.0	9.8	.0	-8.4	.0	.07	.	14	1.05	.85 #
3	.1	.0	21.9	.0	-7.3	.0	.16	.	12	1.11	.92 #
4	.1	.0	21.9	.0	-7.3	.0	.16	.	12	1.11	.92 #
5	.2	.0	9.8	.0	-8.4	.0	.07	.	14	1.05	.85 #
6	.1	.0	21.9	.0	-7.3	.0	.16	.	12	1.11	.92 #
7	-.2	.0	17.8	.0	9.6	.0	.13	.	13	1.09	.89 #
8	-.2	.0	28.3	.0	8.4	.0	.20	.	11	1.14	.95 #
9	-.2	.0	17.8	.0	9.6	.0	.13	.	13	1.09	.89 #
10	-.2	.0	17.8	.0	9.6	.0	.13	.	13	1.09	.89 #
11	-.2	.0	28.3	.0	8.4	.0	.20	.			

```
11 1.14   .95 #
  12      -.2        .0    17.8        .0        9.6         .0   .13   .
13 1.09   .89 #


 LOAD CASE -      7

 PILE     F1       F2       F3        M1        M2         M3    ALF   C
BF   ASC  AST
           K        K        K       IN-K      IN-K       IN-K
    KSI   KSI

   1        .0       .0    17.8        .0        1.1         .0   .13   .
13 1.07   .91 #
   2        .0       .0    18.5        .0        -.2         .0   .13   .
13 1.07   .91 #
   3        .0       .0    17.8        .0        1.1         .0   .13   .
13 1.07   .91 #
   4        .0       .0    17.8        .0        1.1         .0   .13   .
13 1.07   .91 #
   5        .0       .0    18.5        .0        -.2         .0   .13   .
13 1.07   .91 #
   6        .0       .0    17.8        .0        1.1         .0   .13   .
13 1.07   .91 #
   7        .0       .0    27.5        .0        1.6         .0   .20   .
11 1.12   .96 #
   8        .0       .0    28.6        .0         .2         .0   .20   .
11 1.13   .97 #
   9        .0       .0    27.5        .0        1.6         .0   .20   .
11 1.12   .96 #
  10        .0       .0    27.5        .0        1.6         .0   .20   .
11 1.12   .96 #
  11        .0       .0    28.6        .0         .2         .0   .20   .
11 1.13   .97 #
  12        .0       .0    27.5        .0        1.6         .0   .20   .
11 1.12   .96 #


 LOAD CASE -      8

 PILE     F1       F2       F3        M1        M2         M3    ALF   C
BF   ASC  AST
```

```
         K        K        K        IN-K      IN-K      IN-K
    KSI  KSI

   1     -.3      .0     12.1        .0      17.5        .0  .09  .
14 1.08  .84
   2     -.3      .0     37.8        .0      15.8        .0  .27  .
09 1.21  .98 #
   3     -.3      .0     12.1        .0      17.5        .0  .09  .
14 1.08  .84
   4     -.3      .0     12.1        .0      17.5        .0  .09  .
14 1.08  .84
   5     -.3      .0     37.8        .0      15.8        .0  .27  .
09 1.21  .98 #
   6     -.3      .0     12.1        .0      17.5        .0  .09  .
14 1.08  .84
   7      .3      .0     31.0        .0     -14.6        .0  .22  .
10 1.17  .95 #
   8      .3      .0     13.2        .0     -15.8        .0  .09  .
13 1.08  .85 #
   9      .3      .0     31.0        .0     -14.6        .0  .22  .
10 1.17  .95 #
  10      .3      .0     31.0        .0     -14.6        .0  .22  .
10 1.17  .95 #
  11      .3      .0     13.2        .0     -15.8        .0  .09  .
13 1.08  .85 #
  12      .3      .0     31.0        .0     -14.6        .0  .22  .
10 1.17  .95 #


 ******************************************************************
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          PILE FORCES IN GLOBAL GEOMETRY


 LOAD CASE -    1

 PILE        PX       PY       PZ       MX        MY         M
Z
             K        K        K       IN-K      IN-K       IN
-K
```

1	.0	11.3	-30.5	.0	.0	.0
2	.0	1.0	53.3	.0	.0	.0
3	.0	11.3	-30.5	.0	.0	.0
4	.0	11.3	-30.5	.0	.0	.0
5	.0	1.0	53.3	.0	.0	.0
6	.0	11.3	-30.5	.0	.0	.0
7	.0	16.8	63.0	.0	.0	.0
8	.0	1.0	1.5	.0	.0	.0
9	.0	16.8	63.0	.0	.0	.0
10	.0	16.8	63.0	.0	.0	.0
11	.0	1.0	1.5	.0	.0	.0
12	.0	16.8	63.0	.0	.0	.0

LOAD CASE - 2

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	.0	13.2	-36.4	.0	.0	.0
2	.0	1.0	43.1	.0	.0	.0
3	.0	13.2	-36.4	.0	.0	.0
4	.0	13.2	-36.4	.0	.0	.0

5	.0	1.0	43.1	.0	.0	.0
6	.0	13.2	-36.4	.0	.0	.0
7	.0	15.9	59.5	.0	.0	.0
8	.0	1.0	.5	.0	.0	.0
9	.0	15.9	59.5	.0	.0	.0
10	.0	15.9	59.5	.0	.0	.0
11	.0	1.0	.5	.0	.0	.0
12	.0	15.9	59.5	.0	.0	.0

LOAD CASE - 3

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	.0	-9.4	27.0	.0	.0	.0
2	.0	-.4	-4.0	.0	.0	.0
3	.0	-9.4	27.0	.0	.0	.0
4	.0	-9.4	27.0	.0	.0	.0
5	.0	-.4	-4.0	.0	.0	.0
6	.0	-9.4	27.0	.0	.0	.0
7	.0	5.8	25.1	.0	.0	.0
8	.0	-.4	52.1	.0	.0	.0
9	.0	5.8	25.1	.0	.0	

.0

10	.0	5.8	25.1	.0	.0	.0
11	.0	-.4	52.1	.0	.0	.0
12	.0	5.8	25.1	.0	.0	.0

LOAD CASE - 4

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	.0	-6.7	20.9	.0	.0	.0
2	.0	.2	41.6	.0	.0	.0
3	.0	-6.7	20.9	.0	.0	.0
4	.0	-6.7	20.9	.0	.0	.0
5	.0	.2	41.6	.0	.0	.0
6	.0	-6.7	20.9	.0	.0	.0
7	.0	6.9	26.9	.0	.0	.0
8	.0	.2	14.8	.0	.0	.0
9	.0	6.9	26.9	.0	.0	.0
10	.0	6.9	26.9	.0	.0	.0
11	.0	.2	14.8	.0	.0	.0
12	.0	6.9	26.9	.0	.0	.0

LOAD CASE - 5

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	.0	-5.6	16.1	.0	.0	.0
2	.0	-.2	1.1	.0	.0	.0
3	.0	-5.6	16.1	.0	.0	.0
4	.0	-5.6	16.1	.0	.0	.0
5	.0	-.2	1.1	.0	.0	.0
6	.0	-5.6	16.1	.0	.0	.0
7	.0	5.3	22.3	.0	.0	.0
8	.0	-.2	36.3	.0	.0	.0
9	.0	5.3	22.3	.0	.0	.0
10	.0	5.3	22.3	.0	.0	.0
11	.0	-.2	36.3	.0	.0	.0
12	.0	5.3	22.3	.0	.0	.0

LOAD CASE - 6

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	.0	-7.1	20.7	.0	.0	.0

2	.0	-.2	9.8	.0	.0	.0
3	.0	-7.1	20.7	.0	.0	.0
4	.0	-7.1	20.7	.0	.0	.0
5	.0	-.2	9.8	.0	.0	.0
6	.0	-7.1	20.7	.0	.0	.0
7	.0	4.1	17.3	.0	.0	.0
8	.0	-.2	28.3	.0	.0	.0
9	.0	4.1	17.3	.0	.0	.0
10	.0	4.1	17.3	.0	.0	.0
11	.0	-.2	28.3	.0	.0	.0
12	.0	4.1	17.3	.0	.0	.0

LOAD CASE - 7

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	.0	-5.6	16.9	.0	.0	.0
2	.0	.0	18.5	.0	.0	.0
3	.0	-5.6	16.9	.0	.0	.0
4	.0	-5.6	16.9	.0	.0	.0
5	.0	.0	18.5	.0	.0	.0
6	.0	-5.6	16.9	.0	.0	

.0

PILE	PX	PY	PZ	MX	MY	MZ
7	.0	6.6	26.7	.0	.0	.0
8	.0	.0	28.6	.0	.0	.0
9	.0	6.6	26.7	.0	.0	.0
10	.0	6.6	26.7	.0	.0	.0
11	.0	.0	28.6	.0	.0	.0
12	.0	6.6	26.7	.0	.0	.0

LOAD CASE - 8

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	.0	-3.5	11.6	.0	.0	.0
2	.0	.3	37.8	.0	.0	.0
3	.0	-3.5	11.6	.0	.0	.0
4	.0	-3.5	11.6	.0	.0	.0
5	.0	.3	37.8	.0	.0	.0
6	.0	-3.5	11.6	.0	.0	.0
7	.0	7.8	30.0	.0	.0	.0
8	.0	.3	13.2	.0	.0	.0
9	.0	7.8	30.0	.0	.0	.0
10	.0	7.8	30.0	.0	.0	.0

11	.0	.3	13.2	.0	.0	.0
12	.0	7.8	30.0	.0	.0	.0

```
1000 T-WALL MONOLITH AT GATE NO. 3
1005 3 ROWS OF 14 IN. SQ. PPC PILES AT 7'-8" C/C, ORIGIN AT CENTER
 OF BASE
1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL

1020 SOI ES .046 LEN 70.0 0. ALL

1030 PIN ALL

1040 TEN 0.8 ALL

1050 DLS S 83.0 38.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL

1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL
1070 BAT 3.0 1 TO 4
1075 BAT 4.0 9 TO 12
1076 BAT 6.0 5 TO 8
1080 ANG 180 9 TO 12
1090 ANG 0  1 TO 4

1100 PIL 1 -2.0 -11.5 0.0  5 -7.0 -11.5 0.0 9 -10.5 -11.5 0.0
1110 ROW Y 4 1 3 AT 7.667
1115 ROW Y 4 5  3 AT 7.667
1116 ROW Y 4 9 3 AT 7.667
1120 LOA 1 68.0 0.0 153.00 439.0 0.0

1121 LOA 2 74.0 0.0 108.0 0.0 125.0 0.0
1122 LOA 3 8.0 0.0 162.0 0.0 904.0 0.0
1123 LOA 4 -7.0 0.0 162.0 0.0 1011.0
1124 LOA 5 0.5 0.0 216.0 0.0 1277.0 0.0
1125 LOA 6 68.0 0.0 115.0 0.0 237.0 0.0
1126 LOA 7 73.0 0.0 73.0 0.0 -57.0 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\TWMONO3.O

1140 PFO ALL

1150 PLB ALL
1160 FPL C:\CORPS\CPGG\TWMONO3.P
```

```
 **********************************
 * CORPS PROGRAM  #  X0080       *  CPGA - CASE PILE GROUP ANALYSI
S PROGRAM
 * VERSION NUMBER # 1992/02/26   *  RUN DATE 30-JUL-1997   RUN TIM
E 16.39.20
 **********************************


 T-WALL MONOLITH AT GATE NO. 3



 THERE ARE  12 PILES AND
             7 LOAD CASES IN THIS RUN.

 ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                         X          Y          Z
                                       -----      -----      -----
 WITH DIAGONAL COORDINATES = (     -10.50 ,   -11.50 ,       .00 )
                             (      -2.00 ,    11.50 ,       .00 )


 *****************************************************************
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          PILE PROPERTIES AS INPUT


      E            I1            I2            A            C33
    B66
     KSI          IN**4         IN**4         IN**2
  .40740E+04   .32010E+04   .32010E+04   .19600E+03   .15000E+01
 .00000E+00

 THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

    ALL


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SOIL DESCRIPTIONS AS INPUT

ES	ESOIL	LENGTH	L	LU
	K/IN**2		FT	FT
	.46000E-01	L	.70000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****
****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X	Y	Z	BATTER	ANGLE	LENGTH	FIXITY
	FT	FT	FT			FT	
1	-2.00	-11.50	.00	3.00	.00	70.00	P
2	-2.00	-3.83	.00	3.00	.00	70.00	P
3	-2.00	3.83	.00	3.00	.00	70.00	P
4	-2.00	11.50	.00	3.00	.00	70.00	P
5	-7.00	-11.50	.00	6.00	.00	70.00	P
6	-7.00	-3.83	.00	6.00	.00	70.00	P
7	-7.00	3.83	.00	6.00	.00	70.00	P
8	-7.00	11.50	.00	6.00	.00	70.00	P
9	-10.50	-11.50	.00	4.00	180.00	70.00	P
10	-10.50	-3.83	.00	4.00	180.00	70.00	P
11	-10.50	3.83	.00	4.00	180.00	70.00	

```
P
 12     -10.50      11.50        .00      4.00   180.00    70.00
P
                                                           ------
                                                           840.00
```

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APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	68.0	.0	153.0	439.0	.0	.0
2	74.0	.0	108.0	.0	125.0	.0
3	8.0	.0	162.0	.0	904.0	.0
4	-7.0	.0	162.0	.0	1011.0	.0
5	.5	.0	216.0	.0	1277.0	.0
6	68.0	.0	115.0	.0	237.0	.0
7	73.0	.0	73.0	.0	-57.0	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 6.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 4.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 4.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE

NSION = 4.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 4.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 4.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TE
NSION = 4.

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PILE CAP DISPLACEMENTS

LOAD CASE	DX	DY	DZ	RX	RY	RZ
	IN	IN	IN	RAD	RAD	RAD
1	-.6566E-01	.3086E-02	.7793E-01	.3419E-04	-.8005E-03	.3956E-04
2	.1607E+00	.2817E-05	-.5602E-01	-.8734E-09	.6320E-03	.3660E-07
3	-.9453E-01	-.1888E-06	.6434E-01	-.5949E-08	-.5916E-03	-.2819E-08
4	-.1423E+00	-.8317E-06	.8531E-01	-.6624E-08	-.8088E-03	-.1122E-07
5	-.1588E+00	-.6875E-06	.1002E+00	-.8389E-08	-.9383E-03	-.9455E-08
6	.1475E+00	.2536E-05	-.5103E-01	-.1416E-08	.5877E-03	.3292E-07
7	.1909E+00	.2888E-05	-.7539E-01	.4446E-09	.8192E-03	.3762E-07

****
****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1	F2	F3	M1	M2	M3	ALF	C
BF ASC	AST							
	K	K	K	IN-K	IN-K	IN-K		
KSI	KSI							
1	-.3	.0	45.9	.5	18.5	.0	.55	.
15 1.26	1.01 #							
2	-.3	.0	48.5	.5	19.6	.0	.58	.
16 1.27	1.02 #							
3	-.4	.0	51.1	.5	20.7	.0	.62	.
18 1.29	1.03 #							
4	-.4	.0	53.7	.5	21.8	.0	.65	.
20 1.30	1.05 #							
5	-.3	.0	-5.7	-.1	15.1	.0	.15	.
09 .98	.76							
6	-.3	.0	-2.1	-.1	16.1	.0	.06	.
06 1.00	.77							
7	-.3	.0	1.4	-.1	17.1	.0	.02	.
18 1.02	.79							
8	-.3	.0	5.0	-.1	18.1	.0	.06	.
17 1.05	.81							
9	.3	.0	-17.4	.5	-16.2	.0	.46	.
22 .93	.69							
10	.3	.0	-11.8	.5	-16.9	.0	.31	.
16 .96	.72							
11	.3	.0	-6.2	.5	-17.6	.0	.16	.
10 .99	.75							
12	.3	.0	-.6	.5	-18.3	.0	.02	.
04 1.02	.78							

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	C	BF	ASC KSI	AST KSI	
1	.7	.0	17.2	.0	-41.2	.0	.21	.	16	1.16	.82	
2	.7	.0	17.2	.0	-41.2	.0	.21	.	16	1.16	.82	
3	.7	.0	17.2	.0	-41.2	.0	.21	.	16	1.16	.82	
4	.7	.0	17.2	.0	-41.2	.0	.21	.	16	1.16	.82	
5	.7	.0	33.5	.0	-39.7	.0	.40	.	10	1.24	.90	#
6	.7	.0	33.5	.0	-39.7	.0	.40	.	10	1.24	.90	#
7	.7	.0	33.5	.0	-39.7	.0	.40	.	10	1.24	.90	#
8	.7	.0	33.5	.0	-39.7	.0	.40	.	10	1.24	.90	#
9	-.7	.0	-22.9	.0	40.3	.0	.60	.	33	.95	.61	
10	-.7	.0	-22.9	.0	40.3	.0	.60	.	33	.95	.61	
11	-.7	.0	-22.9	.0	40.3	.0	.60	.	33	.95	.61	
12	-.7	.0	-22.9	.0	40.3	.0	.60	.	33	.95	.61	

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	C	BF	ASC KSI	AST KSI
1	-.4	.0	25.2	.0	26.3	.0	.30	.			

```
11 1.17   .89 #
    2      -.4      .0     25.2       .0      26.3      .0  .30  .
11 1.17   .89 #
    3      -.4      .0     25.2       .0      26.3      .0  .30  .
11 1.17   .89 #
    4      -.4      .0     25.2       .0      26.3      .0  .30  .
11 1.17   .89 #
    5      -.4      .0     -1.6       .0      23.9      .0  .04  .
07 1.02   .76
    6      -.4      .0     -1.6       .0      23.9      .0  .04  .
07 1.02   .76
    7      -.4      .0     -1.6       .0      23.9      .0  .04  .
07 1.02   .76
    8      -.4      .0     -1.6       .0      23.9      .0  .04  .
07 1.02   .76
    9       .4      .0     18.6       .0     -23.5      .0  .22  .
13 1.13   .86 #
   10       .4      .0     18.6       .0     -23.5      .0  .22  .
13 1.13   .86 #
   11       .4      .0     18.6       .0     -23.5      .0  .22  .
13 1.13   .86 #
   12       .4      .0     18.6       .0     -23.5      .0  .22  .
13 1.13   .86 #


 LOAD CASE -     4

 PILE      F1       F2       F3        M1        M2        M3   ALF  C
BF  ASC   AST
           K        K        K       IN-K      IN-K      IN-K
    KSI   KSI

    1      -.7      .0,    25.0       .0      38.9      .0  .30  .
12 1.19   .86
    2      -.7      .0     25.0       .0      38.9      .0  .30  .
12 1.19   .86
    3      -.7      .0     25.0       .0      38.9      .0  .30  .
12 1.19   .86
    4      -.7      .0     25.0       .0      38.9      .0  .30  .
12 1.19   .86
    5      -.6      .0     -8.9       .0      35.7      .0  .24  .
17 1.01   .70
```

```
     6      -.6        .0    -8.9        .0      35.7       .0  .24  .
17 1.01    .70
     7      -.6        .0    -8.9        .0      35.7       .0  .24  .
17 1.01    .70
     8      -.6        .0    -8.9        .0      35.7       .0  .24  .
17 1.01    .70
     9       .6        .0    26.3        .0     -35.4       .0  .32  .
11 1.19    .88 #
    10       .6        .0    26.3        .0     -35.4       .0  .32  .
11 1.19    .88 #
    11       .6        .0    26.3        .0     -35.4       .0  .32  .
11 1.19    .88 #
    12       .6        .0    26.3        .0     -35.4       .0  .32  .
11 1.19    .88 #


  LOAD CASE -     5

  PILE      F1       F2      F3       M1        M2        M3   ALF  C
BF  ASC    AST
            K        K        K      IN-K      IN-K      IN-K
     KSI   KSI

     1      -.7       .0    33.5        .0      43.7       .0  .40  .
10 1.25    .90 #
     2      -.7       .0    33.5        .0      43.7       .0  .40  .
10 1.25    .90 #
     3      -.7       .0    33.5        .0      43.7       .0  .40  .
10 1.25    .90 #
     4      -.7       .0    33.5        .0      43.7       .0  .40  .
10 1.25    .90 #
     5      -.7       .0    -7.1        .0      39.9       .0  .19  .
16 1.03    .70
     6      -.7       .0    -7.1        .0      39.9       .0  .19  .
16 1.03    .70
     7      -.7       .0    -7.1        .0      39.9       .0  .19  .
16 1.03    .70
     8      -.7       .0    -7.1        .0      39.9       .0  .19  .
16 1.03    .70
     9       .7       .0    30.0        .0     -39.5       .0  .36  .
11 1.22    .89 #
    10       .7       .0    30.0        .0     -39.5       .0  .36  .
```

```
11 1.22   .89 #
  11       .7      .0    30.0        .0      -39.5        .0  .36  .
11 1.22   .89 #
  12       .7      .0    30.0        .0      -39.5        .0  .36  .
11 1.22   .89 #
```

```
 LOAD CASE -     6

 PILE     F1      F2      F3        M1        M2        M3   ALF  C
BF  ASC   AST
           K       K       K       IN-K      IN-K      IN-K
     KSI  KSI

   1       .6      .0    16.5        .0      -37.8        .0  .20  .
15 1.15   .82
   2       .6      .0    16.5        .0      -37.8        .0  .20  .
15 1.15   .82
   3       .6      .0    16.5        .0      -37.8        .0  .20  .
15 1.15   .82
   4       .6      .0    16.5        .0      -37.8        .0  .20  .
15 1.15   .82
   5       .6      .0    32.2        .0      -36.3        .0  .39  .
10 1.22   .90 #
   6       .6      .0    32.2        .0      -36.3        .0  .39  .
10 1.22   .90 #
   7       .6      .0    32.2        .0      -36.3        .0  .39  .
10 1.22   .90 #
   8       .6      .0    32.2        .0      -36.3        .0  .39  .
10 1.22   .90 #
   9      -.6      .0   -19.2        .0       37.1        .0  .50  .
28   .96  .64
  10      -.6      .0   -19.2        .0       37.1        .0  .50  .
28   .96  .64
  11      -.6      .0   -19.2        .0       37.1        .0  .50  .
28   .96  .64
  12      -.6      .0   -19.2        .0       37.1        .0  .50  .
28   .96  .64


 LOAD CASE -     7
```

```
PILE     F1         F2        F3           M1           M2           M3    ALF   C
BF  ASC  AST
         K          K         K            IN-K         IN-K         IN-K
    KSI  KSI

  1        .8       .0     10.7           .0        -49.6           .0   .13   .
20 1.14  .77
  2        .8       .0     10.7           .0        -49.6           .0   .13   .
20 1.14  .77
  3        .8       .0     10.7           .0        -49.6           .0   .13   .
20 1.14  .77
  4        .8       .0     10.7           .0        -49.6           .0   .13   .
20 1.14  .77
  5        .8       .0     35.5           .0        -47.2           .0   .43   .
10 1.26  .90 #
  6        .8       .0     35.5           .0        -47.2           .0   .43   .
10 1.26  .90 #
  7        .8       .0     35.5           .0        -47.2           .0   .43   .
10 1.26  .90 #
  8        .8       .0     35.5           .0        -47.2           .0   .43   .
10 1.26  .90 #
  9       -.8       .0    -27.5           .0         47.9           .0   .72   .
39   .94  .58
 10       -.8       .0    -27.5           .0         47.9           .0   .72   .
39   .94  .58
 11       -.8       .0    -27.5           .0         47.9           .0   .72   .
39   .94  .58
 12       -.8       .0    -27.5           .0         47.9           .0   .72   .
39   .94  .58


 ******************************************************************
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          PILE FORCES IN GLOBAL GEOMETRY


 LOAD CASE -     1

 PILE        PX        PY        PZ        MX         MY          M
Z
```

	K	K	K	IN-K	IN-K	IN-K
1	14.2	.0	43.6	.0	.0	.0
2	15.0	.0	46.1	.0	.0	.0
3	15.8	.0	48.6	.0	.0	.0
4	16.6	.0	51.1	.0	.0	.0
5	-1.2	.0	-5.6	.0	.0	.0
6	-.6	.0	-2.1	.0	.0	.0
7	-.1	.0	1.5	.0	.0	.0
8	.5	.0	5.0	.0	.0	.0
9	4.0	.0	-17.0	.0	.0	.0
10	2.6	.0	-11.5	.0	.0	.0
11	1.2	.0	-6.1	.0	.0	.0
12	-.2	.0	-.7	.0	.0	.0

LOAD CASE - 2

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	6.1	.0	16.1	.0	.0	.0
2	6.1	.0	16.1	.0	.0	.0
3	6.1	.0	16.1	.0	.0	.0

4	6.1	.0	16.1	.0	.0	.0
5	6.2	.0	33.0	.0	.0	.0
6	6.2	.0	33.0	.0	.0	.0
7	6.2	.0	33.0	.0	.0	.0
8	6.2	.0	33.0	.0	.0	.0
9	6.2	.0	-22.1	.0	.0	.0
10	6.2	.0	-22.1	.0	.0	.0
11	6.2	.0	-22.1	.0	.0	.0
12	6.2	.0	-22.1	.0	.0	.0

LOAD CASE - 3

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	7.5	.0	24.0	.0	.0	.0
2	7.5	.0	24.0	.0	.0	.0
3	7.5	.0	24.0	.0	.0	.0
4	7.5	.0	24.0	.0	.0	.0
5	-.7	.0	-1.5	.0	.0	.0
6	-.7	.0	-1.5	.0	.0	.0
7	-.7	.0	-1.5	.0	.0	.0
8	-.7	.0	-1.5	.0	.0	

						.0
9	-4.9	.0	17.9	.0	.0	.0
10	-4.9	.0	17.9	.0	.0	.0
11	-4.9	.0	17.9	.0	.0	.0
12	-4.9	.0	17.9	.0	.0	.0

LOAD CASE - 4

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	7.3	.0	23.9	.0	.0	.0
2	7.3	.0	23.9	.0	.0	.0
3	7.3	.0	23.9	.0	.0	.0
4	7.3	.0	23.9	.0	.0	.0
5	-2.1	.0	-8.7	.0	.0	.0
6	-2.1	.0	-8.7	.0	.0	.0
7	-2.1	.0	-8.7	.0	.0	.0
8	-2.1	.0	-8.7	.0	.0	.0
9	-7.0	.0	25.3	.0	.0	.0
10	-7.0	.0	25.3	.0	.0	.0
11	-7.0	.0	25.3	.0	.0	.0
12	-7.0	.0	25.3	.0	.0	.0

LOAD CASE - 5

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	9.9	.0	32.0	.0	.0	.0
2	9.9	.0	32.0	.0	.0	.0
3	9.9	.0	32.0	.0	.0	.0
4	9.9	.0	32.0	.0	.0	.0
5	-1.8	.0	-6.9	.0	.0	.0
6	-1.8	.0	-6.9	.0	.0	.0
7	-1.8	.0	-6.9	.0	.0	.0
8	-1.8	.0	-6.9	.0	.0	.0
9	-7.9	.0	28.9	.0	.0	.0
10	-7.9	.0	28.9	.0	.0	.0
11	-7.9	.0	28.9	.0	.0	.0
12	-7.9	.0	28.9	.0	.0	.0

LOAD CASE - 6

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K

1	5.8	.0	15.5	.0	.0	.0
2	5.8	.0	15.5	.0	.0	.0
3	5.8	.0	15.5	.0	.0	.0
4	5.8	.0	15.5	.0	.0	.0
5	5.9	.0	31.7	.0	.0	.0
6	5.9	.0	31.7	.0	.0	.0
7	5.9	.0	31.7	.0	.0	.0
8	5.9	.0	31.7	.0	.0	.0
9	5.3	.0	-18.4	.0	.0	.0
10	5.3	.0	-18.4	.0	.0	.0
11	5.3	.0	-18.4	.0	.0	.0
12	5.3	.0	-18.4	.0	.0	.0

LOAD CASE - 7

PILE	PX	PY	PZ	MX	MY	MZ
	K	K	K	IN-K	IN-K	IN-K
1	4.2	.0	9.9	.0	.0	.0
2	4.2	.0	9.9	.0	.0	.0
3	4.2	.0	9.9	.0	.0	.0
4	4.2	.0	9.9	.0	.0	.0
5	6.6	.0	34.9	.0	.0	

.0					
6	6.6	.0	34.9	.0	.0
.0					
7	6.6	.0	34.9	.0	.0
.0					
8	6.6	.0	34.9	.0	.0
.0					
9	7.5	.0	-26.5	.0	.0
.0					
10	7.5	.0	-26.5	.0	.0
.0					
11	7.5	.0	-26.5	.0	.0
.0					
12	7.5	.0	-26.5	.0	.0
.0					

```
1000 GATE 5 MONOLITH - FEB '97 RUN
1005 14 X 14 PPC PILES @ 7' C/C W/ F.S. = 2
1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL

1020 SOI ES .0705 LEN 85.0 0. ALL

1030 PIN ALL

1040 TEN 0.8 ALL

1050 DLS S 140.0 50.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL

1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL
1070 BAT 3.0 1 10 11 12 15 16 19 20
1080 ANG 260 1
1090 ANG 270 2 TO 9
1091 ANG 280 10
1092 ANG 90 11 TO 20

1100 PIL 1 -28.5 -2.5 0.0  2 -23.5 -2.5 0.0  6 2.5 -2.5 0.0
1101 PIL 10 28.5 -2.5 0.0  11 -28.5 2.5 0.0  12 -23.5 2.5 0.0
1102 PIL 16 2.5 2.5 0.0  20 28.5 2.5 0.0
1105 ROW X 4 2 3 AT 7
1106 ROW X 4 6 3 AT 7
1107 ROW X 4 12 3 AT 7
1108 ROW X 4 16 3 AT 7
1120 LOA 1 0.0 126.3 373.3 458.8 0.0 0.0

1121 LOA 2 0.0 151.6 280.0 537.0 0.0 0.0
1122 LOA 3 0.0 -51.5 733.1 833.6 0.0 0.0
1123 LOA 4 0.0 14.3 733.1 -1150.9 0.0 0.0
1124 LOA 5 0.0 12.8 549.8 894.9 0.0 0.0
1125 LOA 6 0.0 -40.7 549.8 -918.4 0.0 0.0
1126 LOA 7 0.0 2.8 447.1 49.2 0.0 0.0
1127 LOA 8 0.0 -40.0 447.1 8.5 0.0 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\GATE5.O

1140 PFO ALL

1150 PLB ALL
1160 FPL C:\CORPS\CPGG\GATE5.P
```

```
**********************************
* CORPS PROGRAM  #  X0080        *  CPGA - CASE PILE GROUP ANALYSIS PRO
GRAM
* VERSION NUMBER # 1992/02/26    *  RUN DATE 08-APR-1997   RUN TIME  9.
57.07
**********************************


GATE 5 MONOLITH - FEB '97 RUN


THERE ARE  20 PILES AND
            8 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                          X          Y          Z
                                        -----      -----      -----
WITH DIAGONAL COORDINATES = (     -28.50 ,     -2.50 ,       .00 )
                            (      28.50 ,      2.50 ,       .00 )


**********************************************************************
*********

          PILE PROPERTIES AS INPUT


      E            I1            I2            A            C33
B66
     KSI         IN**4         IN**4         IN**2
  .40740E+04   .32010E+04   .32010E+04   .19600E+03   .15000E+01    .00
000E+00

 THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

     ALL


**********************************************************************
*********

          SOIL DESCRIPTIONS AS INPUT


    ES     ESOIL      LENGTH       L          LU
           K/IN**2                 FT         FT
```

.70500E-01 L .85000E+02 .00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-28.50	-2.50	.00	3.00	260.00	85.00	P
2	-23.50	-2.50	.00	V	270.00	85.00	P
3	-16.50	-2.50	.00	V	270.00	85.00	P
4	-9.50	-2.50	.00	V	270.00	85.00	P
5	-2.50	-2.50	.00	V	270.00	85.00	P
6	2.50	-2.50	.00	V	270.00	85.00	P
7	9.50	-2.50	.00	V	270.00	85.00	P
8	16.50	-2.50	.00	V	270.00	85.00	P
9	23.50	-2.50	.00	V	270.00	85.00	P
10	28.50	-2.50	.00	3.00	280.00	85.00	P
11	-28.50	2.50	.00	3.00	90.00	85.00	P
12	-23.50	2.50	.00	3.00	90.00	85.00	P
13	-16.50	2.50	.00	V	90.00	85.00	P
14	-9.50	2.50	.00	V	90.00	85.00	P
15	-2.50	2.50	.00	3.00	90.00	85.00	P
16	2.50	2.50	.00	3.00	90.00	85.00	P
17	9.50	2.50	.00	V	90.00	85.00	P
18	16.50	2.50	.00	V	90.00	85.00	P
19	23.50	2.50	.00	3.00	90.00	85.00	P
20	28.50	2.50	.00	3.00	90.00	85.00	P

						1700.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K

1	.0	126.3	373.3	458.8	.0	.0
2	.0	151.6	280.0	537.0	.0	.0
3	.0	-51.5	733.1	833.6	.0	.0
4	.0	14.3	733.1	-1150.9	.0	.0
5	.0	12.8	549.8	894.9	.0	.0
6	.0	-40.7	549.8	-918.4	.0	.0
7	.0	2.8	447.1	49.2	.0	.0
8	.0	-40.0	447.1	8.5	.0	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION
= 2.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION
= 6.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION
= 0.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION
= 0.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION
= 0.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION
= 0.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION
= 0.

LOAD CASE 8. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION
= 0.

****
****

PILE CAP DISPLACEMENTS

LOAD
CASE DX DY DZ RX RY
RZ
IN IN IN RAD RAD
RAD

1 .5457E-07 .1312E+00 .8171E-02 -.2648E-03 .3600E-11 .1
643E-10

```
   2    .7108E-07   .1768E+00   .1083E-02  -.4119E-03   .4802E-11   .2
296E-10
   3   -.5052E-07  -.2344E+00   .4812E-01   .1494E-02  -.4495E-11  -.2
644E-10
   4   -.1817E-07   .4007E-01   .2949E-01  -.8256E-03  -.9120E-12  -.7
890E-11
   5   -.1052E-07  -.1128E+00   .3208E-01   .1017E-02  -.1520E-11  -.1
048E-10
   6   -.4075E-07  -.5078E-01   .2737E-01  -.3144E-03  -.2647E-11  -.1
587E-10
   7   -.1333E-07  -.4790E-01   .2298E-01   .2428E-03  -.1177E-11  -.8
099E-11
   8   -.3590E-07  -.1156E+00   .2738E-01   .5014E-03  -.2813E-11  -.1
640E-10
```

```
**********************************************************************
*********
```

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

```
LOAD CASE -     1

 PILE    F1      F2      F3        M1        M2        M3   ALF  CBF  A
SC  AST
         K       K       K        IN-K      IN-K      IN-K            K
SI  KSI

   1    -.7     -.1   -30.0      -7.0      39.4        .0  .60  .41  .
93  .57
   2    -.8      .0    18.9        .0      40.5        .0  .14  .15 1.
17  .83
   3    -.8      .0    18.9        .0      40.5        .0  .14  .15 1.
17  .83
   4    -.8      .0    18.9        .0      40.5        .0  .14  .15 1.
17  .83
   5    -.8      .0    18.9        .0      40.5        .0  .14  .15 1.
17  .83
   6    -.8      .0    18.9        .0      40.5        .0  .14  .15 1.
```

```
17  .83
   7      -.8      .0    18.9       .0     40.5      .0  .14  .15 1.
17  .83
   8      -.8      .0    18.9       .0     40.5      .0  .14  .15 1.
17  .83
   9      -.8      .0    18.9       .0     40.5      .0  .14  .15 1.
17  .83
  10      -.7      .1   -30.0      7.0     39.4      .0  .60  .41  .
93  .57
  11       .7      .0    49.0       .0    -38.4      .0  .35  .17 1.
31  .99 #
  12       .7      .0    49.0       .0    -38.4      .0  .35  .17 1.
31  .99 #
  13       .8      .0      .3       .0    -40.5      .0  .00  .23 1.
07  .73
  14       .8      .0      .3       .0    -40.5      .0  .00  .23 1.
07  .73
  15       .7      .0    49.0       .0    -38.4      .0  .35  .17 1.
31  .99 #
  16       .7      .0    49.0       .0    -38.4      .0  .35  .17 1.
31  .99 #
  17       .8      .0      .3       .0    -40.5      .0  .00  .23 1.
07  .73
  18       .8      .0      .3       .0    -40.5      .0  .00  .23 1.
07  .73
  19       .7      .0    49.0       .0    -38.4      .0  .35  .17 1.
31  .99 #
  20       .7      .0    49.0       .0    -38.4      .0  .35  .17 1.
31  .99 #


 LOAD CASE -     2

 PILE     F1       F2      F3       M1       M2        M3   ALF  CBF  A
SC  AST
          K        K       K       IN-K     IN-K      IN-K            K
SI  KSI

   1     -1.0     -.2   -49.7     -9.5     52.3      .0  .99  .64  .
86  .43
   2     -1.0      .0    15.8       .0     54.6      .0  .11  .19 1.
18  .78
   3     -1.0      .0    15.8       .0     54.6      .0  .11  .19 1.
18  .78
   4     -1.0      .0    15.8       .0     54.6      .0  .11  .19 1.
18  .78
   5     -1.0      .0    15.8       .0     54.6      .0  .11  .19 1.
```

```
18  .78
   6     -1.0      .0    15.8       .0       54.6       .0  .11  .19 1.
18  .78
   7     -1.0      .0    15.8       .0       54.6       .0  .11  .19 1.
18  .78
   8     -1.0      .0    15.8       .0       54.6       .0  .11  .19 1.
18  .78
   9     -1.0      .0    15.8       .0       54.6       .0  .11  .19 1.
18  .78
  10     -1.0      .2   -49.7      9.5       52.3       .0  .99  .64  .
86  .43
  11      1.0      .0    53.1       .0      -52.9       .0  .38  .19 1.
37  .98 #
  12      1.0      .0    53.1       .0      -52.9       .0  .38  .19 1.
37  .98 #
  13      1.0      .0   -13.2       .0      -54.6       .0  .26  .25 1.
03  .63
  14      1.0      .0   -13.2       .0      -54.6       .0  .26  .25 1.
03  .63
  15      1.0      .0    53.1       .0      -52.9       .0  .38  .19 1.
37  .98 #
  16      1.0      .0    53.1       .0      -52.9       .0  .38  .19 1.
37  .98 #
  17      1.0      .0   -13.2       .0      -54.6       .0  .26  .25 1.
03  .63
  18      1.0      .0   -13.2       .0      -54.6       .0  .26  .25 1.
03  .63
  19      1.0      .0    53.1       .0      -52.9       .0  .38  .19 1.
37  .98 #
  20      1.0      .0    53.1       .0      -52.9       .0  .38  .19 1.
37  .98 #


 LOAD CASE -     3

 PILE     F1       F2       F3        M1        M2        M3   ALF  CBF  A
SC  AST
          K        K        K       IN-K      IN-K      IN-K              K
SI  KSI

   1      1.3      .2    89.4      12.6     -67.3       .0  .64  .44 1.
61 1.10 #
   2      1.4      .0     3.9        .0     -72.4       .0  .03  .27 1.
16  .68
   3      1.4      .0     3.9        .0     -72.4       .0  .03  .27 1.
16  .68
   4      1.4      .0     3.9        .0     -72.4       .0  .03  .27 1.
```

```
16   .68
  5      1.4     .0     3.9      .0     -72.4     .0  .03  .27 1.
16   .68
  6      1.4     .0     3.9      .0     -72.4     .0  .03  .27 1.
16   .68
  7      1.4     .0     3.9      .0     -72.4     .0  .03  .27 1.
16   .68
  8      1.4     .0     3.9      .0     -72.4     .0  .03  .27 1.
16   .68
  9      1.4     .0     3.9      .0     -72.4     .0  .03  .27 1.
16   .68
  10     1.3    -.2    89.4   -12.6     -67.3     .0  .64  .44 1.
61 1.10 #
  11    -1.5     .0    16.5      .0      77.7     .0  .12  .22 1.
23   .73
  12    -1.5     .0    16.5      .0      77.7     .0  .12  .22 1.
23   .73
  13    -1.4     .0   109.1      .0      72.4     .0  .78  .57 1.
70 1.22 #
  14    -1.4     .0   109.1      .0      72.4     .0  .78  .57 1.
70 1.22 #
  15    -1.5     .0    16.5      .0      77.7     .0  .12  .22 1.
23   .73
  16    -1.5     .0    16.5      .0      77.7     .0  .12  .22 1.
23   .73
  17    -1.4     .0   109.1      .0      72.4     .0  .78  .57 1.
70 1.22 #
  18    -1.4     .0   109.1      .0      72.4     .0  .78  .57 1.
70 1.22 #
  19    -1.5     .0    16.5      .0      77.7     .0  .12  .22 1.
23   .73
  20    -1.5     .0    16.5      .0      77.7     .0  .12  .22 1.
23   .73


 LOAD CASE -     4

 PILE    F1      F2      F3      M1       M2       M3   ALF  CBF  A
SC  AST
         K       K       K      IN-K     IN-K     IN-K             K
SI  KSI

   1     -.3     .0    45.8    -2.1      16.9      .0  .33  .15 1.
26 1.01 #
   2     -.2     .0    63.7      .0      12.4      .0  .46  .26 1.
33 1.12 #
   3     -.2     .0    63.7      .0      12.4      .0  .46  .26 1.
```

```
33 1.12 #
   4      -.2      .0    63.7      .0     12.4      .0  .46  .26 1.
33 1.12 #
   5      -.2      .0    63.7      .0     12.4      .0  .46  .26 1.
33 1.12 #
   6      -.2      .0    63.7      .0     12.4      .0  .46  .26 1.
33 1.12 #
   7      -.2      .0    63.7      .0     12.4      .0  .46  .26 1.
33 1.12 #
   8      -.2      .0    63.7      .0     12.4      .0  .46  .26 1.
33 1.12 #
   9      -.2      .0    63.7      .0     12.4      .0  .46  .26 1.
33 1.12 #
  10      -.3      .0    45.8     2.1     16.9      .0  .33  .15 1.
26 1.01 #
  11       .2      .0    20.1      .0    -11.3      .0  .14  .12 1.
11  .90 #
  12       .2      .0    20.1      .0    -11.3      .0  .14  .12 1.
11  .90 #
  13       .2      .0     5.5      .0    -12.4      .0  .04  .16 1.
04  .82
  14       .2      .0     5.5      .0    -12.4      .0  .04  .16 1.
04  .82
  15       .2      .0    20.1      .0    -11.3      .0  .14  .12 1.
11  .90 #
  16       .2      .0    20.1      .0    -11.3      .0  .14  .12 1.
11  .90 #
  17       .2      .0     5.5      .0    -12.4      .0  .04  .16 1.
04  .82
  18       .2      .0     5.5      .0    -12.4      .0  .04  .16 1.
04  .82
  19       .2      .0    20.1      .0    -11.3      .0  .14  .12 1.
11  .90 #
  20       .2      .0    20.1      .0    -11.3      .0  .14  .12 1.
11  .90 #


 LOAD CASE -     5

 PILE    F1      F2      F3       M1       M2       M3   ALF  CBF  A
SC  AST
          K       K       K     IN-K     IN-K     IN-K             K
SI  KSI

   1      .6      .1    43.0      6.0    -32.4      .0  .31  .13 1.
28  .96 #
   2      .7      .0     1.8       .0    -34.8      .0  .01  .21 1.
```

```
07  .75
  3        .7        .0      1.8        .0       -34.8        .0  .01  .21 1.
07  .75
  4        .7        .0      1.8        .0       -34.8        .0  .01  .21 1.
07  .75
  5        .7        .0      1.8        .0       -34.8        .0  .01  .21 1.
07  .75
  6        .7        .0      1.8        .0       -34.8        .0  .01  .21 1.
07  .75
  7        .7        .0      1.8        .0       -34.8        .0  .01  .21 1.
07  .75
  8        .7        .0      1.8        .0       -34.8        .0  .01  .21 1.
07  .75
  9        .7        .0      1.8        .0       -34.8        .0  .01  .21 1.
07  .75
 10        .6       -.1     43.0      -6.0       -32.4        .0  .31  .13 1.
28  .96 #
 11       -.7        .0     27.8        .0        39.2        .0  .20  .11 1.
21  .88
 12       -.7        .0     27.8        .0        39.2        .0  .20  .11 1.
21  .88
 13       -.7        .0     73.5        .0        34.8        .0  .53  .33 1.
43 1.12 #
 14       -.7        .0     73.5        .0        34.8        .0  .53  .33 1.
43 1.12 #
 15       -.7        .0     27.8        .0        39.2        .0  .20  .11 1.
21  .88
 16       -.7        .0     27.8        .0        39.2        .0  .20  .11 1.
21  .88
 17       -.7        .0     73.5        .0        34.8        .0  .53  .33 1.
43 1.12 #
 18       -.7        .0     73.5        .0        34.8        .0  .53  .33 1.
43 1.12 #
 19       -.7        .0     27.8        .0        39.2        .0  .20  .11 1.
21  .88
 20       -.7        .0     27.8        .0        39.2        .0  .20  .11 1.
21  .88


 LOAD CASE -     6

 PILE     F1       F2       F3        M1         M2          M3   ALF  CBF  A
SC  AST
          K        K        K        IN-K       IN-K       IN-K             K
SI  KSI

    1      .2       .1     59.6       2.7       -11.1         .0  .43  .24 1.
```

```
31 1.09 #
    2        .3      .0    43.2       .0     -15.7        .0  .31  .13 1.
23 1.01 #
    3        .3      .0    43.2       .0     -15.7        .0  .31  .13 1.
23 1.01 #
    4        .3      .0    43.2       .0     -15.7        .0  .31  .13 1.
23 1.01 #
    5        .3      .0    43.2       .0     -15.7        .0  .31  .13 1.
23 1.01 #
    6        .3      .0    43.2       .0     -15.7        .0  .31  .13 1.
23 1.01 #
    7        .3      .0    43.2       .0     -15.7        .0  .31  .13 1.
23 1.01 #
    8        .3      .0    43.2       .0     -15.7        .0  .31  .13 1.
23 1.01 #
    9        .3      .0    43.2       .0     -15.7        .0  .31  .13 1.
23 1.01 #
   10        .2     -.1    59.6     -2.7     -11.1        .0  .43  .24 1.
31 1.09 #
   11       -.3      .0     1.1       .0      16.6        .0  .01  .18 1.
02  .79
   12       -.3      .0     1.1       .0      16.6        .0  .01  .18 1.
02  .79
   13       -.3      .0    21.1       .0      15.7        .0  .15  .12 1.
12  .89 #
   14       -.3      .0    21.1       .0      15.7        .0  .15  .12 1.
12  .89 #
   15       -.3      .0     1.1       .0      16.6        .0  .01  .18 1.
02  .79
   16       -.3      .0     1.1       .0      16.6        .0  .01  .18 1.
02  .79
   17       -.3      .0    21.1       .0      15.7        .0  .15  .12 1.
12  .89 #
   18       -.3      .0    21.1       .0      15.7        .0  .15  .12 1.
12  .89 #
   19       -.3      .0     1.1       .0      16.6        .0  .01  .18 1.
02  .79
   20       -.3      .0     1.1       .0      16.6        .0  .01  .18 1.
02  .79


 LOAD CASE -     7

 PILE     F1      F2      F3        M1        M2        M3    ALF  CBF   A
SC  AST
          K       K       K       IN-K      IN-K      IN-K              K
SI  KSI
```

1	.2	.0	35.0	2.6	-12.3	.0	.25	.10	1.	19	.97 #
2	.3	.0	18.4	.0	-14.8	.0	.13	.13	1.	11	.88 #
3	.3	.0	18.4	.0	-14.8	.0	.13	.13	1.	11	.88 #
4	.3	.0	18.4	.0	-14.8	.0	.13	.13	1.	11	.88 #
5	.3	.0	18.4	.0	-14.8	.0	.13	.13	1.	11	.88 #
6	.3	.0	18.4	.0	-14.8	.0	.13	.13	1.	11	.88 #
7	.3	.0	18.4	.0	-14.8	.0	.13	.13	1.	11	.88 #
8	.3	.0	18.4	.0	-14.8	.0	.13	.13	1.	11	.88 #
9	.3	.0	18.4	.0	-14.8	.0	.13	.13	1.	11	.88 #
10	.2	.0	35.0	-2.6	-12.3	.0	.25	.10	1.	19	.97 #
11	-.3	.0	15.9	.0	17.0	.0	.11	.13	1.	10	.86 #
12	-.3	.0	15.9	.0	17.0	.0	.11	.13	1.	10	.86 #
13	-.3	.0	35.5	.0	14.8	.0	.25	.10	1.	19	.97 #
14	-.3	.0	35.5	.0	14.8	.0	.25	.10	1.	19	.97 #
15	-.3	.0	15.9	.0	17.0	.0	.11	.13	1.	10	.86 #
16	-.3	.0	15.9	.0	17.0	.0	.11	.13	1.	10	.86 #
17	-.3	.0	35.5	.0	14.8	.0	.25	.10	1.	19	.97 #
18	-.3	.0	35.5	.0	14.8	.0	.25	.10	1.	19	.97 #
19	-.3	.0	15.9	.0	17.0	.0	.11	.13	1.	10	.86 #
20	-.3	.0	15.9	.0	17.0	.0	.11	.13	1.	10	.86 #

LOAD CASE - 8

PILE F1 F2 F3 M1 M2 M3 ALF CBF A
SC AST

```
                K        K        K        IN-K        IN-K        IN-K             K
SI  KSI

  1        .6       .1     56.0       6.2      -32.1          .0  .40  .22 1.
35 1.02 #
  2        .7       .0     14.5        .0      -35.7          .0  .10  .16 1.
13  .82
  3        .7       .0     14.5        .0      -35.7          .0  .10  .16 1.
13  .82
  4        .7       .0     14.5        .0      -35.7          .0  .10  .16 1.
13  .82
  5        .7       .0     14.5        .0      -35.7          .0  .10  .16 1.
13  .82
  6        .7       .0     14.5        .0      -35.7          .0  .10  .16 1.
13  .82
  7        .7       .0     14.5        .0      -35.7          .0  .10  .16 1.
13  .82
  8        .7       .0     14.5        .0      -35.7          .0  .10  .16 1.
13  .82
  9        .7       .0     14.5        .0      -35.7          .0  .10  .16 1.
13  .82
 10        .6      -.1     56.0      -6.2      -32.1          .0  .40  .22 1.
35 1.02 #
 11       -.7       .0      4.3        .0       38.0          .0  .03  .21 1.
09  .76
 12       -.7       .0      4.3        .0       38.0          .0  .03  .21 1.
09  .76
 13       -.7       .0     49.8        .0       35.7          .0  .36  .17 1.
31 1.00 #
 14       -.7       .0     49.8        .0       35.7          .0  .36  .17 1.
31 1.00 #
 15       -.7       .0      4.3        .0       38.0          .0  .03  .21 1.
09  .76
 16       -.7       .0      4.3        .0       38.0          .0  .03  .21 1.
09  .76
 17       -.7       .0     49.8        .0       35.7          .0  .36  .17 1.
31 1.00 #
 18       -.7       .0     49.8        .0       35.7          .0  .36  .17 1.
31 1.00 #
 19       -.7       .0      4.3        .0       38.0          .0  .03  .21 1.
09  .76
 20       -.7       .0      4.3        .0       38.0          .0  .03  .21 1.
09  .76


 *************************************************************************
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```

PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	1.6	10.1	-28.2	.0	.0	.0
2	.0	.8	18.9	.0	.0	.0
3	.0	.8	18.9	.0	.0	.0
4	.0	.8	18.9	.0	.0	.0
5	.0	.8	18.9	.0	.0	.0
6	.0	.8	18.9	.0	.0	.0
7	.0	.8	18.9	.0	.0	.0
8	.0	.8	18.9	.0	.0	.0
9	.0	.8	18.9	.0	.0	.0
10	-1.6	10.1	-28.2	.0	.0	.0
11	.0	16.2	46.2	.0	.0	.0
12	.0	16.2	46.2	.0	.0	.0
13	.0	.8	.3	.0	.0	.0
14	.0	.8	.3	.0	.0	.0
15	.0	16.2	46.2	.0	.0	.0
16	.0	16.2	46.2	.0	.0	.0
17	.0	.8	.3	.0	.0	.0
18	.0	.8	.3	.0	.0	.0
19	.0	16.2	46.2	.0	.0	.0
20	.0	16.2	46.2	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	2.7	16.4	-46.8	.0	.0	.0
2	.0	1.0	15.8	.0	.0	.0
3	.0	1.0	15.8	.0	.0	.0
4	.0	1.0	15.8	.0	.0	.0
5	.0	1.0	15.8	.0	.0	.0
6	.0	1.0	15.8	.0	.0	.0
7	.0	1.0	15.8	.0	.0	.0
8	.0	1.0	15.8	.0	.0	.0
9	.0	1.0	15.8	.0	.0	.0
10	-2.7	16.4	-46.8	.0	.0	.0

11	.0	17.7	50.1	.0	.0	.0
12	.0	17.7	50.1	.0	.0	.0
13	.0	1.0	-13.2	.0	.0	.0
14	.0	1.0	-13.2	.0	.0	.0
15	.0	17.7	50.1	.0	.0	.0
16	.0	17.7	50.1	.0	.0	.0
17	.0	1.0	-13.2	.0	.0	.0
18	.0	1.0	-13.2	.0	.0	.0
19	.0	17.7	50.1	.0	.0	.0
20	.0	17.7	50.1	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-4.9	-29.1	84.4	.0	.0	.0
2	.0	-1.4	3.9	.0	.0	.0
3	.0	-1.4	3.9	.0	.0	.0
4	.0	-1.4	3.9	.0	.0	.0
5	.0	-1.4	3.9	.0	.0	.0
6	.0	-1.4	3.9	.0	.0	.0
7	.0	-1.4	3.9	.0	.0	.0
8	.0	-1.4	3.9	.0	.0	.0
9	.0	-1.4	3.9	.0	.0	.0
10	4.9	-29.1	84.4	.0	.0	.0
11	.0	3.8	16.1	.0	.0	.0
12	.0	3.8	16.1	.0	.0	.0
13	.0	-1.4	109.1	.0	.0	.0
14	.0	-1.4	109.1	.0	.0	.0
15	.0	3.8	16.1	.0	.0	.0
16	.0	3.8	16.1	.0	.0	.0
17	.0	-1.4	109.1	.0	.0	.0
18	.0	-1.4	109.1	.0	.0	.0
19	.0	3.8	16.1	.0	.0	.0
20	.0	3.8	16.1	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-2.5	-14.0	43.5	.0	.0	.0
2	.0	.2	63.7	.0	.0	.0
3	.0	.2	63.7	.0	.0	.0

4	.0	.2	63.7	.0	.0	.0
5	.0	.2	63.7	.0	.0	.0
6	.0	.2	63.7	.0	.0	.0
7	.0	.2	63.7	.0	.0	.0
8	.0	.2	63.7	.0	.0	.0
9	.0	.2	63.7	.0	.0	.0
10	2.5	-14.0	43.5	.0	.0	.0
11	.0	6.6	19.0	.0	.0	.0
12	.0	6.6	19.0	.0	.0	.0
13	.0	.2	5.5	.0	.0	.0
14	.0	.2	5.5	.0	.0	.0
15	.0	6.6	19.0	.0	.0	.0
16	.0	6.6	19.0	.0	.0	.0
17	.0	.2	5.5	.0	.0	.0
18	.0	.2	5.5	.0	.0	.0
19	.0	6.6	19.0	.0	.0	.0
20	.0	6.6	19.0	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-2.3	-14.0	40.6	.0	.0	.0
2	.0	-.7	1.8	.0	.0	.0
3	.0	-.7	1.8	.0	.0	.0
4	.0	-.7	1.8	.0	.0	.0
5	.0	-.7	1.8	.0	.0	.0
6	.0	-.7	1.8	.0	.0	.0
7	.0	-.7	1.8	.0	.0	.0
8	.0	-.7	1.8	.0	.0	.0
9	.0	-.7	1.8	.0	.0	.0
10	2.3	-14.0	40.6	.0	.0	.0
11	.0	8.1	26.6	.0	.0	.0
12	.0	8.1	26.6	.0	.0	.0
13	.0	-.7	73.5	.0	.0	.0
14	.0	-.7	73.5	.0	.0	.0
15	.0	8.1	26.6	.0	.0	.0
16	.0	8.1	26.6	.0	.0	.0
17	.0	-.7	73.5	.0	.0	.0
18	.0	-.7	73.5	.0	.0	.0
19	.0	8.1	26.6	.0	.0	.0
20	.0	8.1	26.6	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-3.3	-18.8	56.4	.0	.0	.0
2	.0	-.3	43.2	.0	.0	.0
3	.0	-.3	43.2	.0	.0	.0
4	.0	-.3	43.2	.0	.0	.0
5	.0	-.3	43.2	.0	.0	.0
6	.0	-.3	43.2	.0	.0	.0
7	.0	-.3	43.2	.0	.0	.0
8	.0	-.3	43.2	.0	.0	.0
9	.0	-.3	43.2	.0	.0	.0
10	3.3	-18.8	56.4	.0	.0	.0
11	.0	.1	1.2	.0	.0	.0
12	.0	.1	1.2	.0	.0	.0
13	.0	-.3	21.1	.0	.0	.0
14	.0	-.3	21.1	.0	.0	.0
15	.0	.1	1.2	.0	.0	.0
16	.0	.1	1.2	.0	.0	.0
17	.0	-.3	21.1	.0	.0	.0
18	.0	-.3	21.1	.0	.0	.0
19	.0	.1	1.2	.0	.0	.0
20	.0	.1	1.2	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-1.9	-11.1	33.1	.0	.0	.0
2	.0	-.3	18.4	.0	.0	.0
3	.0	-.3	18.4	.0	.0	.0
4	.0	-.3	18.4	.0	.0	.0
5	.0	-.3	18.4	.0	.0	.0
6	.0	-.3	18.4	.0	.0	.0
7	.0	-.3	18.4	.0	.0	.0
8	.0	-.3	18.4	.0	.0	.0
9	.0	-.3	18.4	.0	.0	.0
10	1.9	-11.1	33.1	.0	.0	.0
11	.0	4.7	15.2	.0	.0	.0
12	.0	4.7	15.2	.0	.0	.0
13	.0	-.3	35.5	.0	.0	.0
14	.0	-.3	35.5	.0	.0	.0
15	.0	4.7	15.2	.0	.0	.0
16	.0	4.7	15.2	.0	.0	.0

17	.0	-.3	35.5	.0	.0	.0
18	.0	-.3	35.5	.0	.0	.0
19	.0	4.7	15.2	.0	.0	.0
20	.0	4.7	15.2	.0	.0	.0

LOAD CASE - 8

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-3.1	-18.0	53.0	.0	.0	.0
2	.0	-.7	14.5	.0	.0	.0
3	.0	-.7	14.5	.0	.0	.0
4	.0	-.7	14.5	.0	.0	.0
5	.0	-.7	14.5	.0	.0	.0
6	.0	-.7	14.5	.0	.0	.0
7	.0	-.7	14.5	.0	.0	.0
8	.0	-.7	14.5	.0	.0	.0
9	.0	-.7	14.5	.0	.0	.0
10	3.1	-18.0	53.0	.0	.0	.0
11	.0	.7	4.3	.0	.0	.0
12	.0	.7	4.3	.0	.0	.0
13	.0	-.7	49.8	.0	.0	.0
14	.0	-.7	49.8	.0	.0	.0
15	.0	.7	4.3	.0	.0	.0
16	.0	.7	4.3	.0	.0	.0
17	.0	-.7	49.8	.0	.0	.0
18	.0	-.7	49.8	.0	.0	.0
19	.0	.7	4.3	.0	.0	.0
20	.0	.7	4.3	.0	.0	.0

PYBURN & ODOM, INC. — CONSULTING ENGINEERS Sheet No. 1/1

Client: Port of New Orleans Project: 504-005

Computations for: Roller gates 6 & 7 – Monolith analyses

Computed by: Sunil S. Date: Checked by: Date:

ROLLER GATES NO. 6 & 7

ROLLER GATES:-

Preliminary roller gate analyses for gates no. 6 & 7 were performed between 08/93 & 09/93.

Each gate had two sets of analyses performed:-

1) Monolith at gatepost (4 loadcases)
2) Monolith between gateposts (8 loadcases)

The sill elev. of gate no. 7 was reduced from el 10.36 to el 9.15 to accomodate the revised alignment in Aug '94. The gate will hence be reanalyzed for the changed loads.

As 14" sq. precast piles have been used on all T-walls & swing-gates, the roller gates no. 6 & 7 were also re-analyzed retaining 14" sq. piles similar in number & geometry to those in the preliminary analyses.

The pervious sheetpile case in these gates is more critical than the impervious sheetpile case as the sheetpile wall is closer to the F/s of the monolith hence this case will be included in the final analyses.

The "D.L. only w/ gate open" case also needs to be evaluated for the roller gates & shall be addressed in the final analyses.

The preliminary R.C.C. design shall be modified to include the hydraulic load factor of 1.3.

PYBURN & ODOM, INC. — CONSULTING ENGINEERS Sheet No. 1/2

Client: Port of New Orleans — Project: 504-005

Computations for: Roller gate monoliths — no. 6

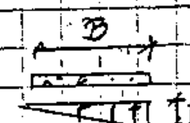
Computed by: SUNIL S. — Date: 02/95 — Checked by: ______ Date: ______

ROLLER GATE NO: 6

A] ROLLER GATE No. 6 :-

Pervious sheetpile & dead ld. only cases were added in 02/95 to the analysis done in 08/93.

All loads & calculations are as per preliminary design for gate no. 6 dated 8/26/95 unless modifications ~~have been indicated in the following calculations.~~



~~(1) Uplift loads "U3" on pg. 9 & 10 (08/26/93)~~ :-

ⓐ Water to el 13.0 :- $U3 = 0.803 \times \frac{15}{2} \times 10 = 60.23^k \uparrow$ (P_5)

$M_{U3} = 60.23 \times \left(\frac{15 \times 2}{3} - 5\right) = 301.15^{fk}$

~~$\Rightarrow \Sigma H = 58.94^k, \ \Sigma V = -15.62 + (40.15 - 60.23) = -35.70^k \uparrow$ (changes)~~

~~$\Sigma M_A = -423.10 + (301.13 - 301.15) = -423.10^{fk}$ (unchanged)~~

ⓑ Water to el 15.0 :- $U3 = 0.928 \times 15/2 \times 10 = 69.6^k \uparrow$ (P_5)

$M_{U3} = 69.6 \times \left(\frac{15 \times 2}{3} - 5\right) = 348^{fk}$

$\Rightarrow \Sigma H = 91.31^k \leftarrow, \ \Sigma V = -18.44 + (46.40 - 69.6) = 41.64^k \uparrow$ (change)

$\Sigma M_A = (-348.0 + 348.0) + 744.40 = 744.40^{fk}$ (unchanged.)

(2) ADDITIONAL LOADCASES :-

Ⓐ ⇒ Monolith under gateposts :- (Pg 11.) (Cases 1-4 are unaffected)

ⓐ Load Case ⑤ :- D.L. + water to el 13.0 (pervious sheetpile)

$V = 126.86 - 35.70 = 91.2^k \downarrow, \quad H = 59.16^k \leftarrow$

~~$M_A = 30.66^{fk}$ (-)~~

~~ⓑ Load Case ⑥~~ :- ~~D.L. + water to el. 15.0 (pervious sheetpile)~~ (75% Loads)

~~$V = 0.75(126.86 - 41.64) = 63.92^k \downarrow$~~

$H = 68.65^k \leftarrow$

$M_A = 218^{fk}$ (+)

Client: Port of New Orleans Project: 504-005
Computations for: Roller gate monoliths no. 6 & 7
Computed by: SUNIL S. Date: 02/95 Checked by: Date:

ⓒ Load case 7 :- Gate open, no water, no wind. (Pg. 7)

$\Sigma H = 0$, $\Sigma V = 126.86^k \downarrow$, $M_A = 453.76^{f\text{-}k}$ (−)

Ⓑ:- Monolith between gateposts :- (Cases 1-8 are unaffected) (Pg 22)

ⓐ Load case no. 9 :- D.L. + water to el 13.0 (pervious sheetpile)

$F_y = 135.71^k$, $M_x = -365.70^{k\text{-}ft}$,

$F_z = \left(12.23 - \frac{35.70}{10}\right) \times 27.25 = 235.99^k \downarrow$

ⓑ Load case no. 10 :- D.L. + water to el 15.0 (pervious sheetpile) (75%)

$F_y = 128.81^k$, $M_x = -99.53^{f\text{-}k}$,

$F_z = \left(12.23 - \frac{41.64}{10}\right) 27.25 \times 0.75 = 164.85^k \downarrow$

ⓒ Loadcase no. 11 :- Gate open, no wind, no water (Pg. 21)

$F_x = 12.23 \times 27.25 = 333.27^k \downarrow$

$F_y = 0.0^k$

$M_x = 46.55 \times 27.25 = 1268.5^{f\text{-}k}$ (−).

The above loadcases were added to the following preliminary calculations conducted in 08/93 to obtain the final CPGA analyses attached at the end of this section.

RESULT:-

The final analyses indicate that all pile loads, stresses & deflections are within the allowable limits.

Hence the final layout attached on the following sheets is satisfactory.

GATE 6 - PRELIMINARY CALCULATIONS (22 pgs.)

See attached sketches.

Gate is located at the North end of Berth 5, on the ramp.

Soil properties correspond to Reach II.

Gate opening = 78'-3"

Sill elevation = 10.62'

Top of footing elevation = 2.9'

Bottom of footing elevation = 0.15 (includes stabilization slab).

Counterfort spacing = 12'-0"

Counterfort thickness = 1'-6"

DEAD LOADS: (See Section "A-A")

①: $0.15\{(7.7083 + 1.8958)(1.25) + (7.7083)(1.5)\}$ — top slab
$= 3.535$ k/ft. (includes slab D.L.)

②: $0.15 \times 2.0 \times 4.97 = 1.491$ k/ft. — wall

③: $0.15 \times 10 \times 2.833 = 4.25$ k/ft. — base

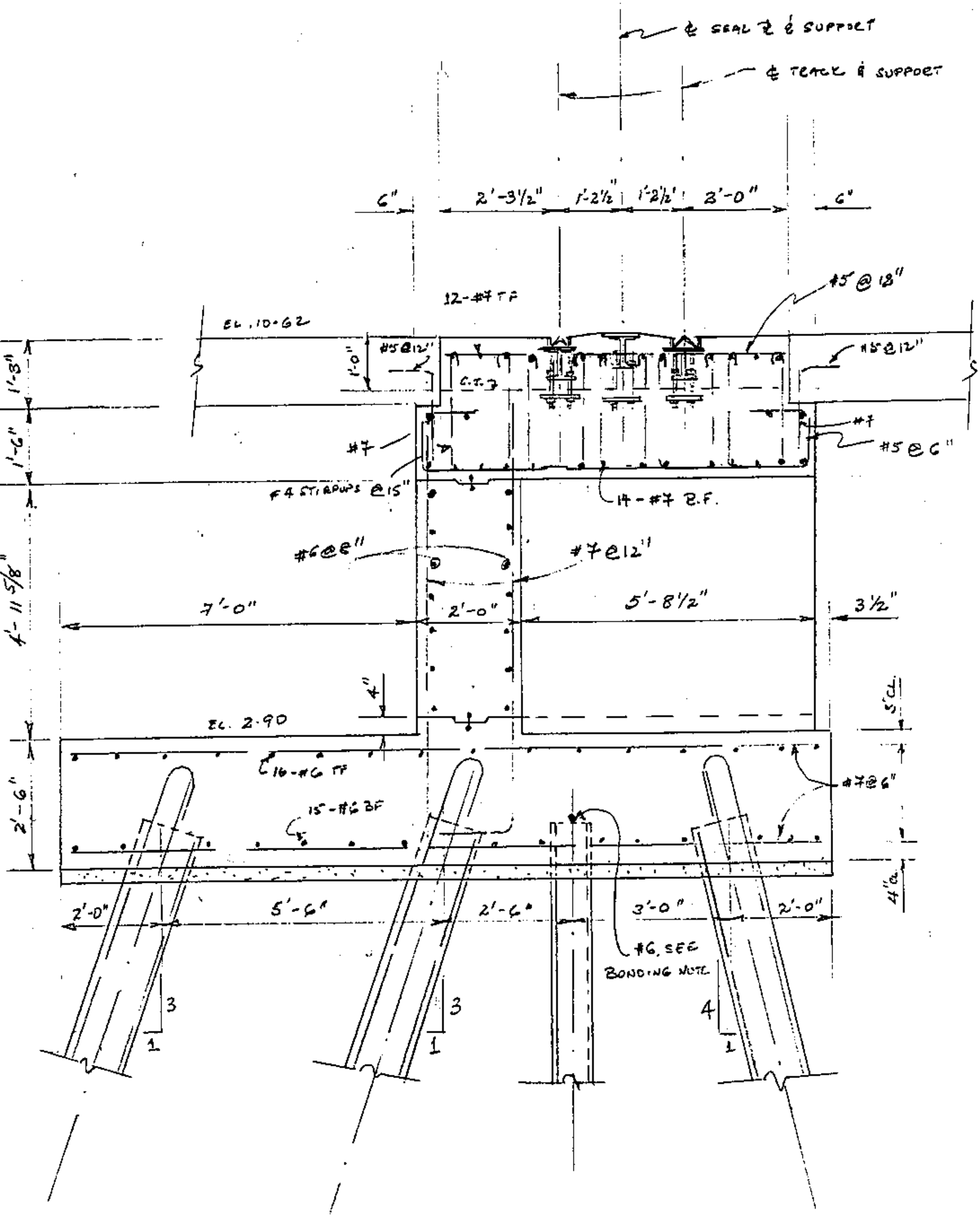
④: $0.15 \times 4.97 \times 5.7083 \times 1.5/12 = 0.532$ k/ft. — cfort

Gate: 0.3 k/ft.

$\therefore \Sigma W = 10.11$ k/ft ↓

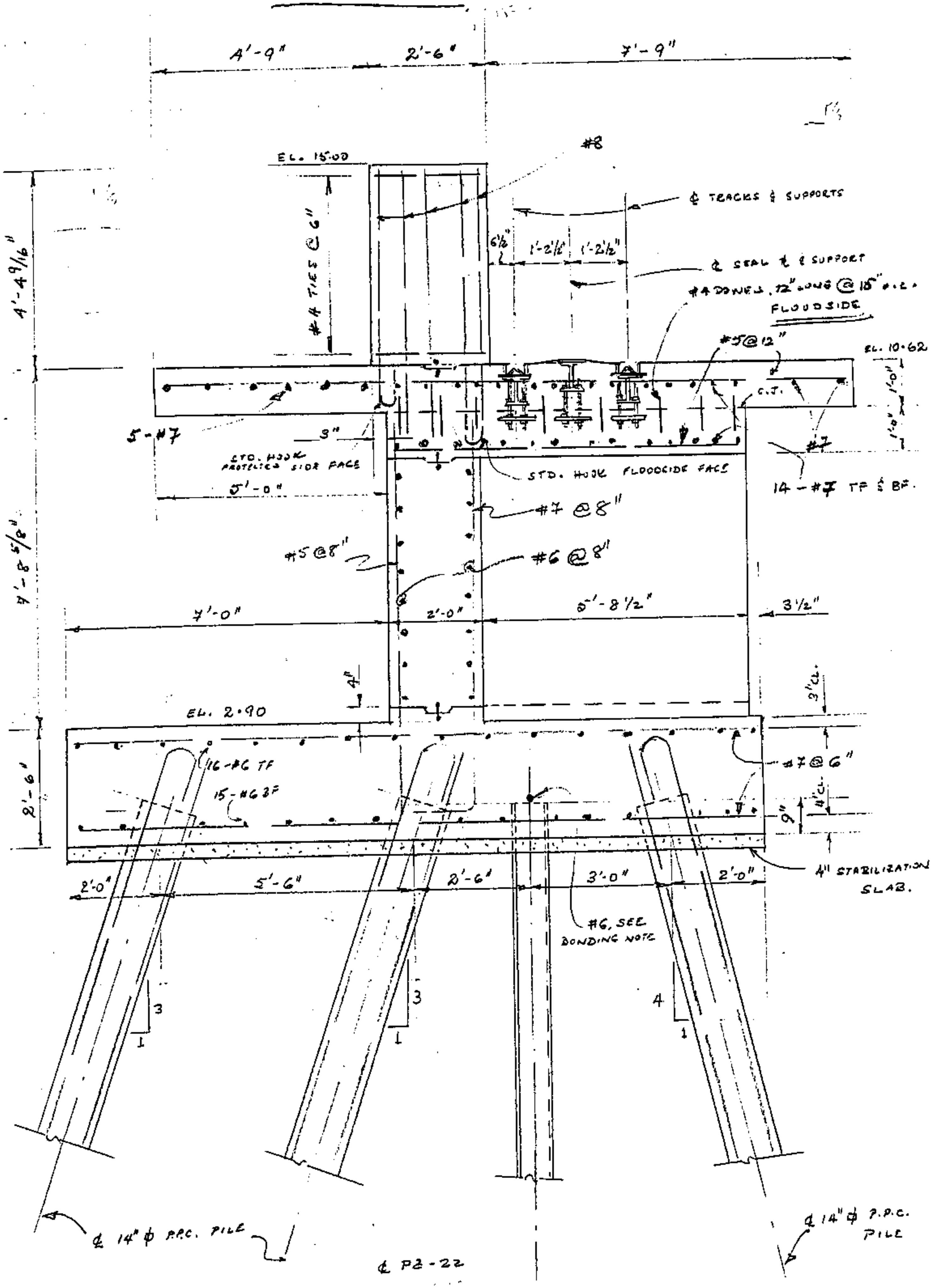
Assume gate c.g. is @ ℄ of tracks.

SECTION BETWEEN GATEPOSTS



SECTION @ GATEPOST

GATE NO. 6



Moments about Point "A":

Component	Arm	Moment ↻
①: 3.535 k	5.85'	20.70 ft-k
②: 1.491 k	3.00'	4.47 ft-k
③: 4.250 k	5.00	21.25 ft-k
④: 0.532 k	6.85'	3.64 ft-k
Gate: 0.3 k	6.00	1.80 ft-k

$\Sigma M = 51.86$ ft-k ↻
(per ft. width)

HYDRAULIC FORCES:

Skin plate is situated above ℄ track on the floodside.

Distance of skin plate from toe of footing

$= 2 + 2.7917 + 2.4167$

$= 7.2083'$

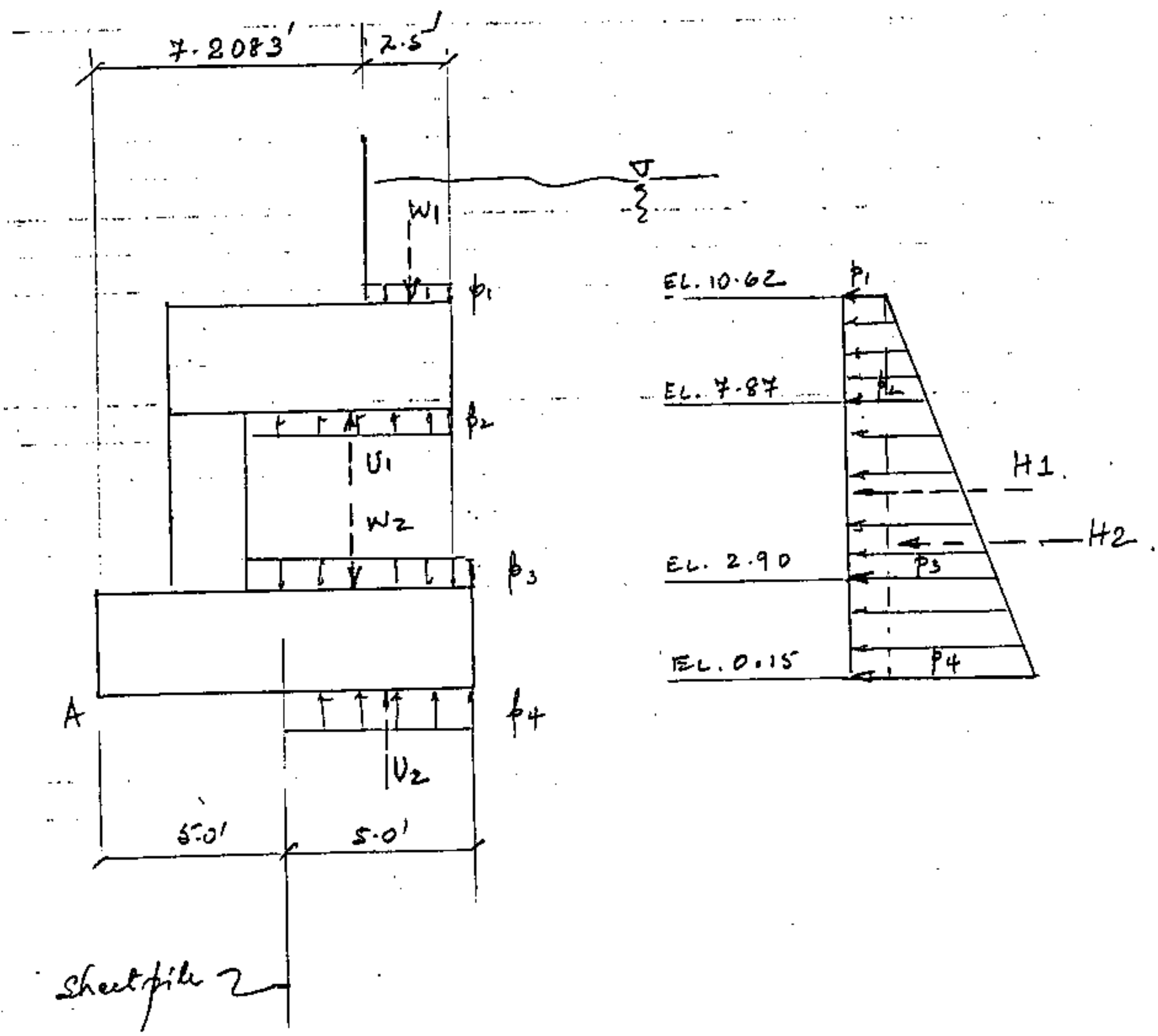
Note: All horizontal pressures applied to the roller gate are transferred to the gate posts.

BERGER, BARNARD & THOMAS, INC.

Job No. 2017-20 Date 8/26/93

Prepared By K. Rebello Checked By ______ Sheet No. 3/22

Subject Roller Gate No. 6 — Monolith.



Water upto Elev. 18.00:

$p_1 = 0.0625 * 2.38 = 0.149$ ksf.

$p_2 = 0.0625 * 5.13 = 0.321$ ksf.

$p_3 = 0.0625 * 10.10 = 0.631$ ksf

$p_4 = 0.0625 * 12.85 = 0.803$ ksf.

FORCE (kips)		×	ARM (ft.)	=	MOMENT (ft-kips) + ↻
H1: 0.149 * 10.47	= 1.560	×	5.235	=	- 8.16
H2: ½ * 0.654 * 10.47	= 3.424	×	3.490	=	- 11.95
W1: 0.149 * 2.5	= 0.373	×	8.458	=	3.15
W2: 0.631 * 6.0	= 3.786	×	7.000	=	26.50
V1: 0.321 * 5.7083	= 1.832	×	6.854	=	- 12.56
V2: 0.803 * 5.0	= 4.015	×	7.500	=	- 30.11

ΣH = 4.98 kips ←

ΣV = 1.69 kips ↑

ΣM_A = 33.13 ft-kips ↺

BERGER, BARNARD & THOMAS, INC.

Job No. 2017-30 Date 8/26/93
Prepared By K. Rebello Checked By ______ Sheet No. 5/22
Subject Roller Gate No. 6 - Monolith.

Water upto Elev. 15.00 :

p_1 = 0.0625 × 4.38 = 0.274 ksf.
p_2 = 0.0625 × 7.13 = 0.446 ksf
p_3 = 0.0625 × 12.10 = 0.756 ksf
p_4 = 0.0625 × 14.85 = 0.928 ksf.

	FORCE (kips)			ARM (ft.)		MOMENT (ft-kips) (+)
H1 :	0.274 × 10.47	= 2.869	×	5.235	=	− 15.02.
H2 :	1/2 × 0.654 × 10.47	= 3.424	×	3.490	=	− 11.95
W1 :	0.274 × 2.5	= 0.685	×	8.458	=	5.79
W2 :	0.756 × 6.0	= 4.536	×	7.000	=	31.75
U1 :	0.446 × 5.7083	= 2.546	×	6.854	=	−17.45
U2 :	0.928 × 5.0	= 4.640	×	7.500	=	− 34.80

ΣH = 6.29 kips ←
ΣV = 1.97 kips ↑
ΣM_A = 41.68 ft-kips ↺

FORK LIFT LOAD: (See calculations for Gate No. 7)

$P = 143$ kips ↓

$H = 07.2$ kips ⇄

Fork lift on protected side:

$M = 143 \times 9.2 + 7.2 \times 20.47 = 1462.98$ k-ft

Fork lift on floodside:

$M = 143 \times 2.5 - 7.2 \times 20.47 = 210.12$ k-ft

WIND LOAD:

Velocity Pressure = 50 psf.

Between gateposts:

$H = 0.05 \times (1.5 + 4.97) = 0.324$ k/ft ⇄

$M_A = 0.05 \times 6.47^2/2 = 1.050$ k-ft/ft

LOADS ON MONOLITH BENEATH GATE POSTS

Consider the entire 10'-0" width of monolith.

Refer to section "B-B".

Also refer to sketch on pg. 7 of design of monolith for gate no. 7 for gatepost geometry.

BERGER, BARNARD & THOMAS, INC.

Job No. 2017-30 Date 8/26/93

Prepared By K. Rebello Checked By ______ Sheet No. 7/22

Subject Roller Gate No. 6 - Monolith.

Weights:

① : $0.15\{(15-10.62)(2.5\times3.5+2\times3+\frac{1}{2}\times0.25\times3)\} = 9.94\ k.$

② : $0.15\times15\times10\times1 = 22.5^k.$

③ : $0.15\times7.7083\times10\times1 = 11.56^k.$

④ : $0.15\times2\times5.72\times10 = 17.16^k.$

⑤ : $0.15\times10\times15\times2.5 = 56.25^k.$

⑥ : $0.15\times1.5\times5.7083\times5.72 = 7.35\ k.$

Gate : $0.3\times7 = 2.1\ k.$

$\Sigma W = 126.86\ k.\downarrow$

	Component (kips)	Arm (ft)	Moment (ft-kips) ↻
① :	9.94	3.00	29.82
② :	22.50	4.50	101.25
③ :	11.56	5.85	67.63
④ :	17.16	3.00	51.48
⑤ :	56.25	2.50	140.63
⑥ :	7.35	6.85	50.35
Gate :	2.10	6.00	12.60

$\Sigma M_A = 453.76$ ft-k. ↻

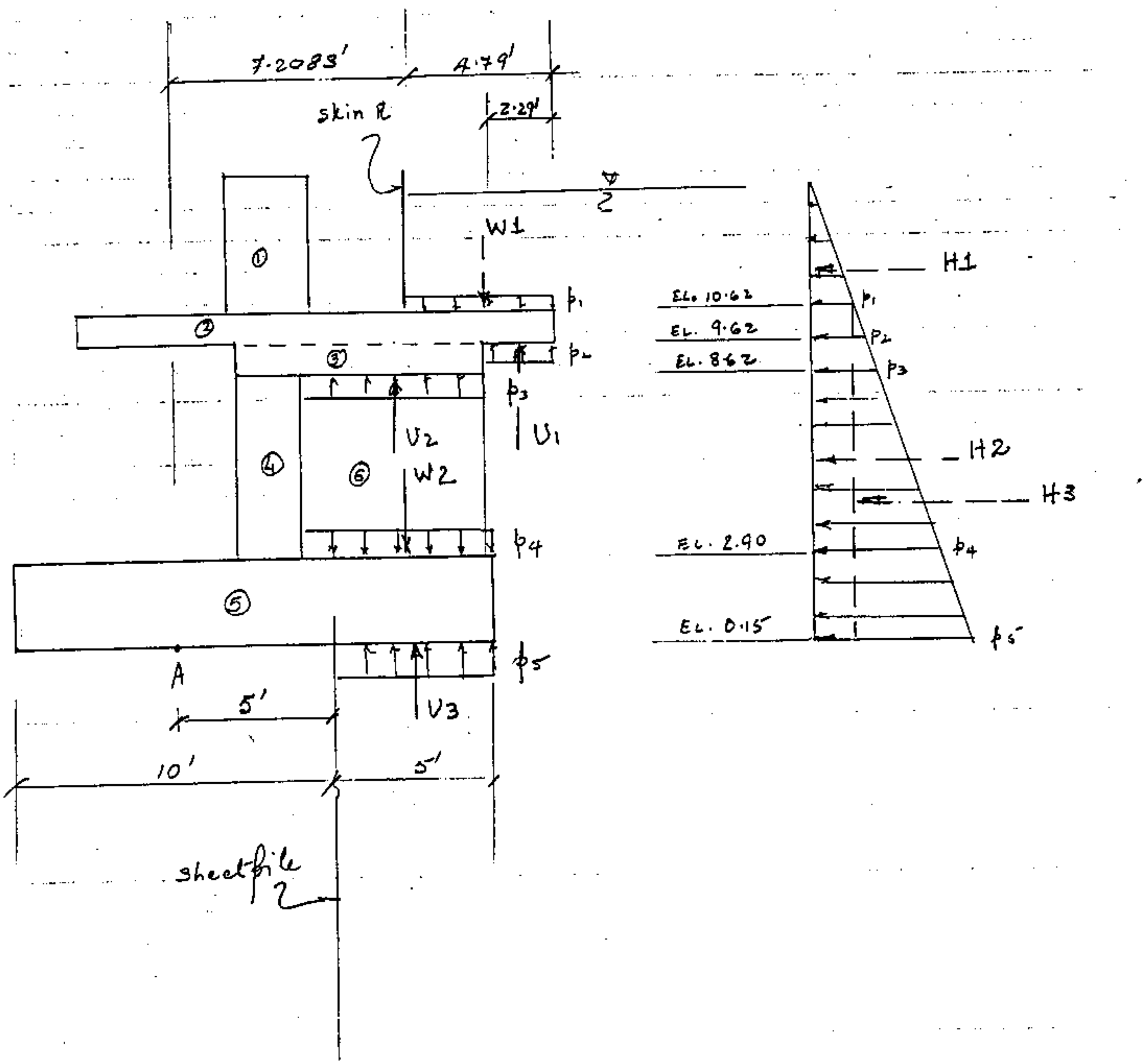
BERGER, BARNARD & THOMAS, INC.

Job No. 2017-80 Date 8/26/93

Prepared By K. Rebello Checked By ______ Sheet No. 8/22

Subject Roller Gate No. 6 - Monolith.

HYDRAULIC FORCES:



Water upto Elev. 13.00:

$p_1 = 0.0625 \times 2.38 = 0.149$ ksf

$p_2 = 0.0625 \times 3.38 = 0.211$ ksf

$p_3 = 0.0625 \times 4.38 = 0.274$ ksf

$p_4 = 0.0625 \times 10.10 = 0.631$ ksf

$p_5 = 0.0625 \times 12.85 = 0.803$ ksf.

FORCE (kips)		×	ARM (ft)	=	MOMENT (k-ft) (+)
H1: ½×0.149×2.38×45.625	= 8.10	×	11.26	=	− 91.21
H2: 0.149×10.47×10	= 15.60	×	5.24	=	− 81.74
H3: ½×0.654×10.47×10	= 35.24	×	3.49	=	−122.99
W1: 0.149×4.79×10	= 7.14	×	9.60	=	68.54
W2: 0.631×6×10	= 37.86	×	7.00	=	265.02
U1: 0.211×2.29×10	= 4.83	×	10.86	=	− 52.45
U2: 0.274×5.7083×10	= 15.64	×	6.85	=	− 107.13
U3: 0.803×5×10	= 40.15	×	7.50	=	− 301.13

$\Sigma H = 58.94$ kips ←

$\Sigma V = 15.62$ kips ↑

$\Sigma M_A = 423.10$ k-ft ↺

BERGER, BARNARD & THOMAS, INC.

Job No. 2017-30 | Date 8/26/93

Prepared By K. Rebello | Checked By ______ | Sheet No. 10/22

Subject Roller Gate No. 6 - Monolith.

Water upto Elev. 15.00:

$p_1 = 0.0625 \times 4.38 = 0.274$ ksf

$p_2 = 0.0625 \times 5.38 = 0.336$ ksf

$p_3 = 0.0625 \times 6.38 = 0.400$ ksf

$p_4 = 0.0625 \times 12.10 = 0.756$ ksf

$p_5 = 0.0625 \times 14.85 = 0.928$ ksf.

	FORCE (kips)		ARM (ft)		MOMENT (k-ft) (+)
H1: ½*0.274*4.38*45.625	= 27.38	x	11.93	=	-326.64
H2: 0.274*10.47*10	= 28.69	x	5.24	=	-150.34
H3: ½*0.654*10.47*10	= 35.24	x	3.49	=	-122.99
W1: 0.274*4.79*10	= 13.12	x	9.60	=	125.95
W2: 0.756*6.0*10	= 45.36	x	7.00	=	317.52
U1: 0.336*2.29*10	= 7.69	x	10.86	=	-83.51
U2: 0.40*5.7083*10	= 22.83	x	6.85	=	-156.39
U3: 0.928*5*10	= 46.40	x	7.50	=	-348.00

ΣH = 91.31 kips ←

ΣV = 18.44 kips ↑

ΣM_A = 744.40 ft-kips ↺

WIND LOADS:

At the gate posts:

$H = 0.05 \times 10' \times (15 - 2.9) = \underline{6.05}$ kips ⇄

$M_A = 0.05 \times 10 \times (15-2.9)^2/2 = \underline{36.60}$ k-ft CC

NOTE: As per "Second Interim Report" by Eustis Engg. Inc. dated 5/25/93; for structures in Reach II; the seepage cut-off sheetpile exerts a horizontal force of 0.022 k/ft at the base. This force will be included for all load cases.

PILE LAYOUT:

Monolith under gatepost:

Loading Cases:

①: D.L. + water upto Elev. 13.00:

$V = 126.86 - 15.62 = \underline{111.24}$ kips ↓

$H = 58.94 + 0.22 = \underline{59.16}$ kips ←

$M_A = 453.76 - 423.10 = \underline{30.66}$ k-ft ↻

→

BERGER, BARNARD & THOMAS, INC.

Job No. 2017-30 Date 8/26/93

Prepared By K. Rebello Checked By ______ Sheet No. 12/22

Subject Roller Gate No. 6 - Monolith.

②: D.L. + water upto elev. 15.00 : (75% Forces used)

$V = 0.75\{126.86 - 18.44\} = \underline{81.32 \text{ kips}} \downarrow$

$H = 0.75 \times \{91.31 + 0.22\} = \underline{68.65 \text{ kips}} \leftarrow$

$M_A = 0.75\{453.76 - 744.40\} = \underline{218 \text{ k-ft}}$ ↺

③: D.L. + wind from protected side: (80% Forces)

$V = 0.8 \times 126.86 = \underline{101.5 \text{ kips}} \downarrow$

$H = 0.8 \times (6.05 + 0.22) = \underline{5.02 \text{ kips}} \longrightarrow$

$M_A = 0.8 \times (453.76 + 36.60) = \underline{392.29 \text{ k-ft}}$ ↻

④: $V = \underline{101.5 \text{ kips}} \downarrow$

$H = \underline{5.02 \text{ kips}} \leftarrow$

$M_A = 0.8 \times (453.76 - 36.60) = \underline{333.73 \text{ k-ft}}$ ↻

SUMMARY:

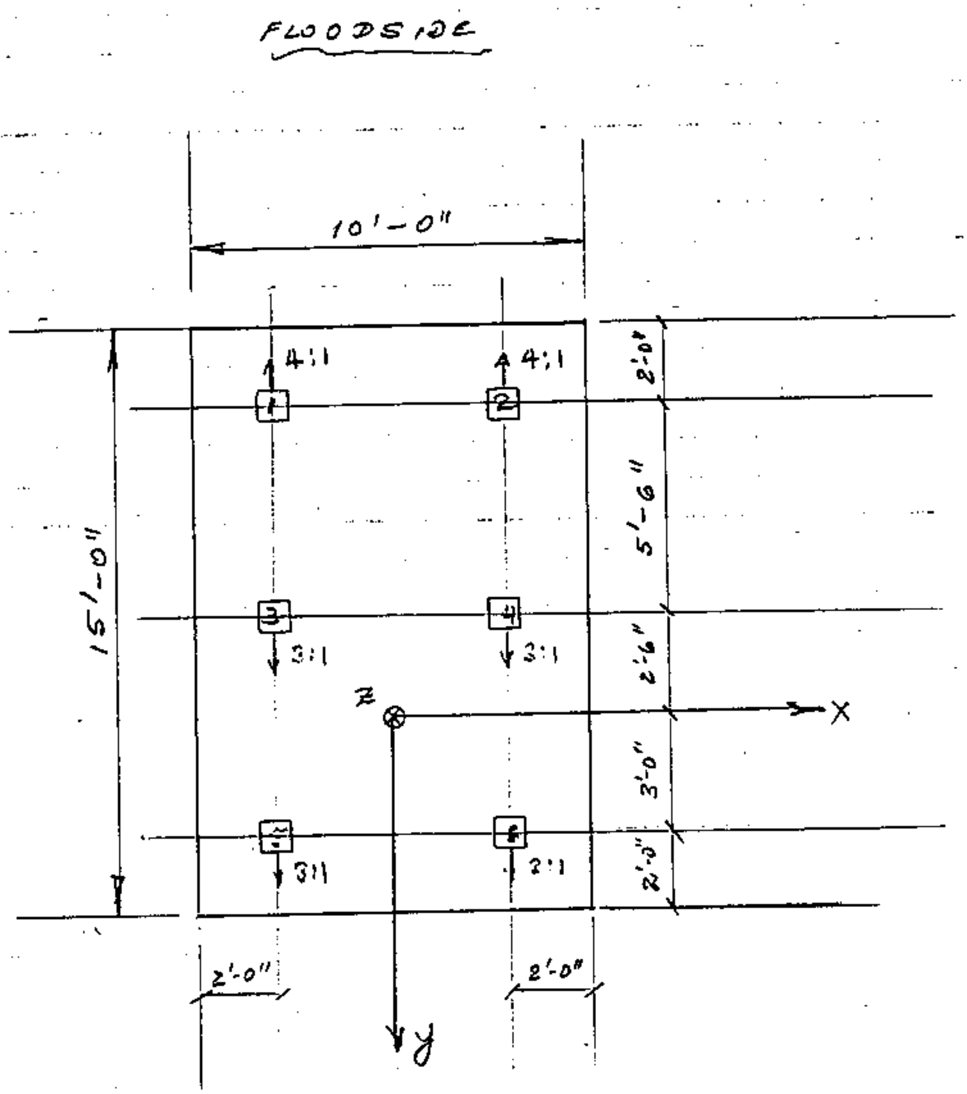
z ⊗ ⟶ x

↓ y (toward protected side)

CASE NO.	Fy (Kips)	Fz (kips)	Mx (ft-kips)
1	159.16	111.24	-30.66
2	68.65	81.32	218.00
3	-5.02	101.50	-392.29
4	5.02	101.50	-333.73

BERGER, BARNARD & THOMAS, INC.

Job No. 2017-30 Date 8/26/93
Prepared By K. Ribello Checked By ______ Sheet No. 13/22
Subject Roller Gate No. 6.



BERGER, BARNARD & THOMAS, INC.

Job No. 2017-30 Date 8/26/93
Prepared By K. Rebello Checked By ________ Sheet No. 14/22
Subject Roller Gate No. 6 – Monolith.

Monolith between posts:

Length of monolith between posts = 70'-3"

Loading Cases:

① : D.L. + Water upto Elev. 13.00:

$V = \{10.11 - 1.69\} \times 70.25 = 591.51$ kips ↓

$H = 4.98 \times 70.25 = 349.85$ kips ←

$M_A = \{51.86 - 33.13\} \times 70.25 = 1,315.78$ ft-k ↻

② : D.L. + water upto Elev. 15.00: (75% Forces)

$V = 0.75\{10.11 - 1.97\} \times 70.25 = 428.87$ kips ↓

$H = 0.75 \times 6.29 \times 70.25 = 331.40$ kips ←

$M_A = 0.75\{51.86 - 41.68\} \times 70.25 = 536.36$ ft-k ↻

③ : D.L. + Fork Lift on Floodside:

$V = 10.11 \times 70.25 + 143 = 853.23$ kips ↓

$H = 7.2$ kips →

$M_A = 51.86 \times 70.25 + 1462.98 = 5,106.15$ k-ft ↻

④ : D.L. + Fork Lift on Protected side:

$V = 853.23$ kips ↓

$H = 7.2$ kips ←

$M_A = 51.86 \times 70.25 + 210.12 = 3,853.29$ k-ft ↻

⑤: D.L. + wind from protected side: (80% Forces)

$V = 0.8 \times 10.11 \times 70.25 = \underline{568.18 \text{ kips}} \downarrow$

$H = 0.8 \times 0.324 \times 70.25 = \underline{18.21 \text{ kips}} \rightarrow$

$M_A = \{51.86 \times 70.25 + 1.050 \times 70.25\} \times 0.8 = \underline{2,973.54 \text{ k-ft}} \circlearrowright$

⑥: D.L. + wind from floodside: (80% Forces)

$V = \underline{568.18 \text{ kips}} \downarrow$

$H = \underline{18.21 \text{ kips}} \leftarrow$

$M_A = 0.8 \times \{51.86 - 1.05\} \times 70.25 = \underline{2,855.52 \text{ k-ft}} \circlearrowright$

⑦: D.L. + fork lift on floodside + wind from protected side:
(75% Forces)

$V = 0.75 \times 853.23 = \underline{639.92 \text{ kips}} \downarrow$

$H = 0.75 \times \{7.2 + 0.324 \times 70.25\} = \underline{22.47 \text{ kips}} \rightarrow$

$M_A = 0.75 \times \{5,106.15 + 1.050 \times 70.25\} = \underline{3,884.93 \text{ k-ft}} \circlearrowright$

⑧: D.L. + fork lift on protected side + wind from floodside:
(75% Forces)

$V = \underline{639.92 \text{ kips}} \downarrow$

$H = \underline{22.47 \text{ kips}} \leftarrow$

$M_A = 0.75 \times \{3,853.29 + 1.05 \times 70.25\} = \underline{2,945.30 \text{ k-ft}} \circlearrowright$

BERGER, BARNARD & THOMAS, INC.

Job No. 2017-20 Date 8/26/93
Prepared By K. Rebello Checked By ______ Sheet No. 15a/22
Subject Roller Gate No. 6 – Monolith

Note: We need to consider a moment about the y-axis of the monolith (see Sheets 16 & 17) for load cases ③, ④, ⑦ & ⑧.

This moment depends on the position of the fork lift on the monolith.

Assume that the forklift carries a 20'-0" wide container. Also assume that the container is 1'-0" clear of the curb at its end. Then the max. distance of the center of the forklift to the center of the ramp is $35' - (10'+1') = 24'\text{-}0"$

$$\therefore M_y = 143 \times 24 = 3{,}432 \text{ k-ft.}$$

Load Case ③ & ④: $M_y = 3432$ k-ft.

Load Case ⑦ & ⑧: $M_y = 0.75 \times 3432 = 2{,}574$ k-ft.

BERGER, BARNARD & THOMAS, INC.

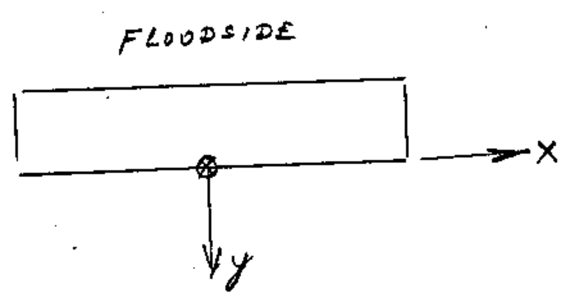
Job No. 2017-30 Date 8/26/93

Prepared By K. Rebello Checked By ______ Sheet No. 16/22

Subject Roller Gate No. 6 – Monolith.

SUMMARY

LOADING CASE	Fy (kips)	Fz (kips)	Mx (k-ft)	My (k-ft)
1	349.85	591.51	-1,315.78	—
2	331.40	428.97	-536.36	—
3	-7.20	853.23	-5,106.15	3,432.0
4	7.20	853.23	-3,853.29	3,432.0
5	-18.21	568.18	-2,973.54	—
6	18.21	568.18	-2,855.52	—
7	-22.47	639.92	-3,884.93	2,574.0
8	22.47	639.92	-2,945.30	2,574.0

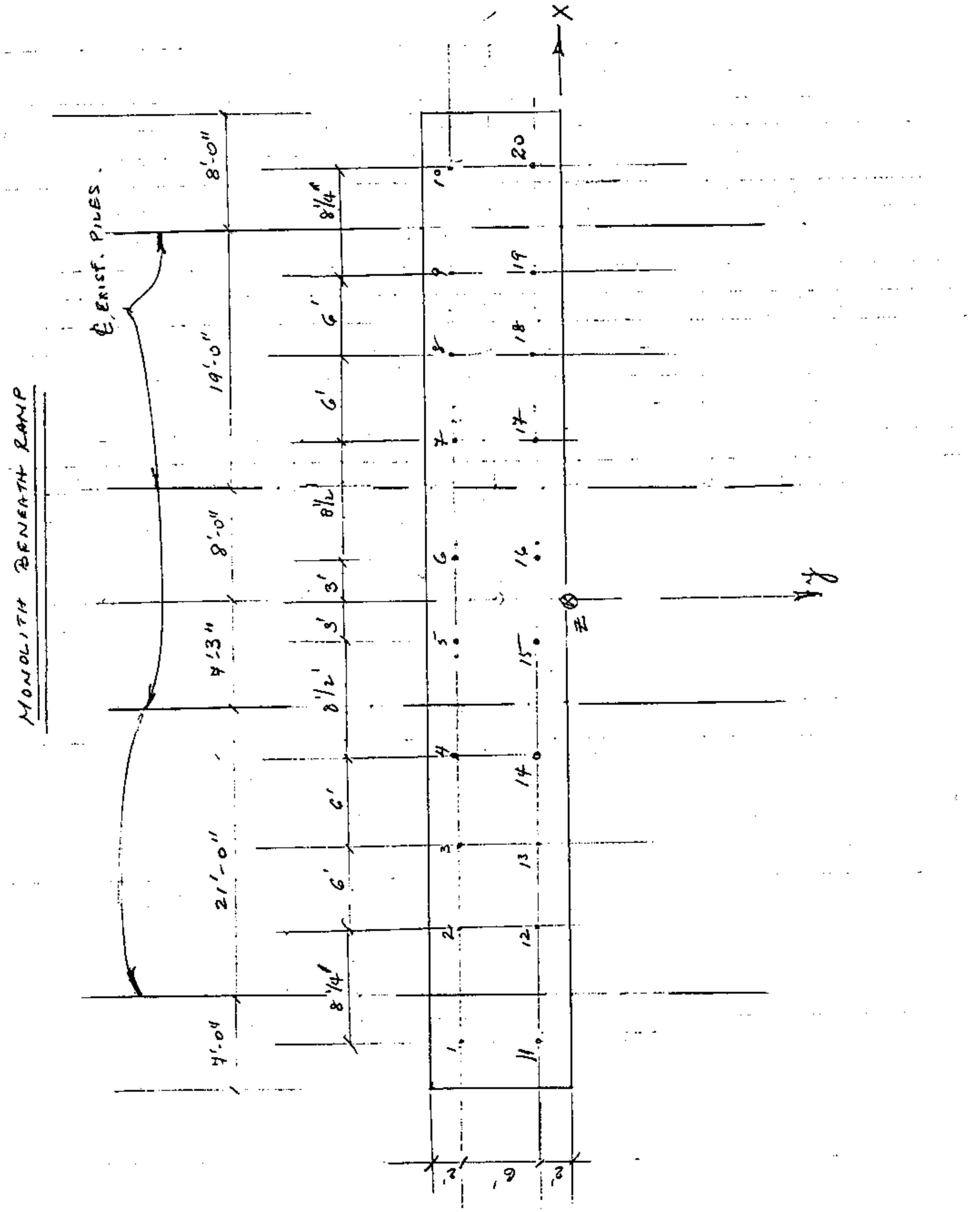


BERGER, BARNARD & THOMAS, INC.

Job No. 2017-30 Date 8/26/93

Prepared By K. Rebello Checked By ________ Sheet No. 17/22

Subject Roller Gate No. 6 - Monolith



BERGER, BARNARD & THOMAS, INC.

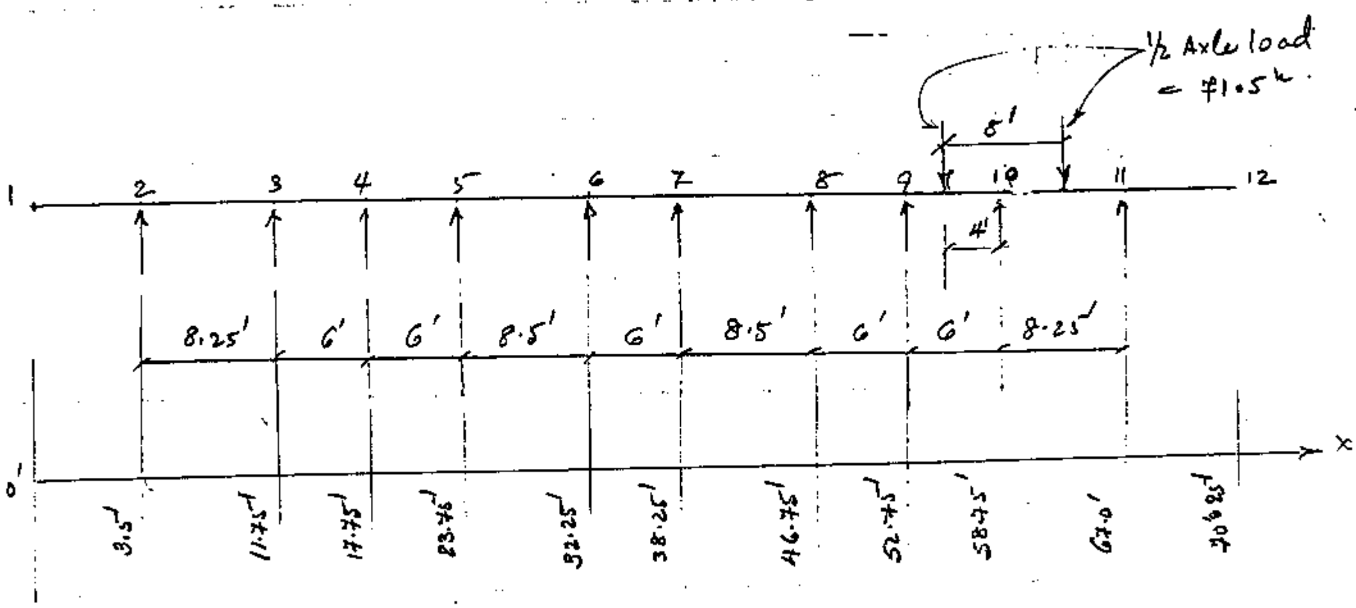
Job No. 2017-30 Date 8/26/93

Prepared By K. Rebello Checked By ______ Sheet No. 18/22

Subject Roller Gate No. 6 - Monolith.

The loads tabulated on sheet 16 are for the entire monolith. However, there is no guarantee that the truck load gets transmitted in the x-direction over the complete monolith length. An elastic analysis of the pile cap supported at the piles and subjected to a concentrated load would provide a fair estimate of the extent of load transfer in the x-direction.

Analyze:

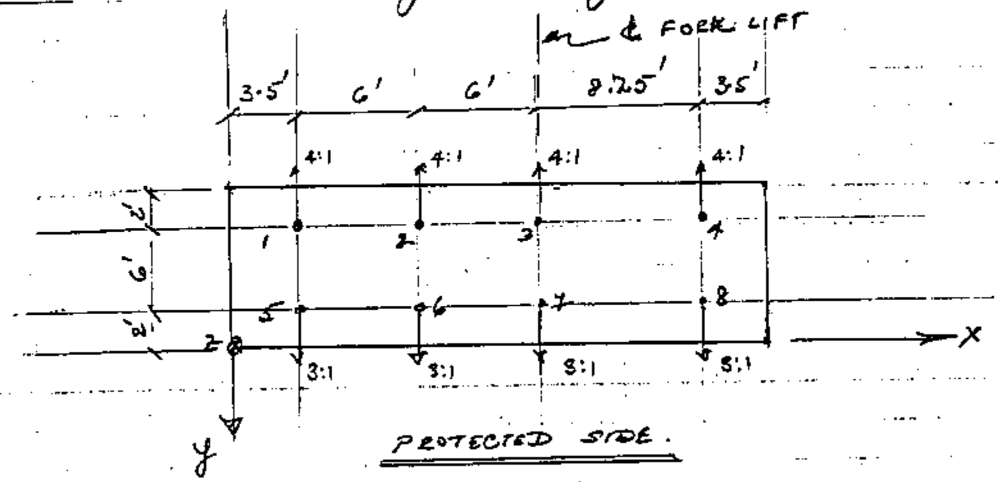


$E = 3074$ ksi

$I = \frac{1}{12}(10\times12)(2.5\times12)^3 = 270,000 \text{ in}^4$

Based on the analysis, only piles at nodes 8-11 will be considered effective.

Consider: (Right end of drawing on sheet 17)



APPLIED LOADS:-

LOADING CASE	Fy (kips)	Fz (kips)	Mx (k-ft)	My (k-ft)
1	135.71	829.45	- 510.39	0
2	128.55	166.36	- 208.05	0
3	-7.20	418.50	- 2,876.17	-2,216.50
4	7.20	418.50	- 1,623.31	-2,216.50
5	-7.06	220.40	-1,153.44	0
6	7.06	220.40	-1,107.66	0
7	-12.02	313.88	-2,178.59	-1,662.38
8	12.02	313.88	-1,238.94	-1,662.38

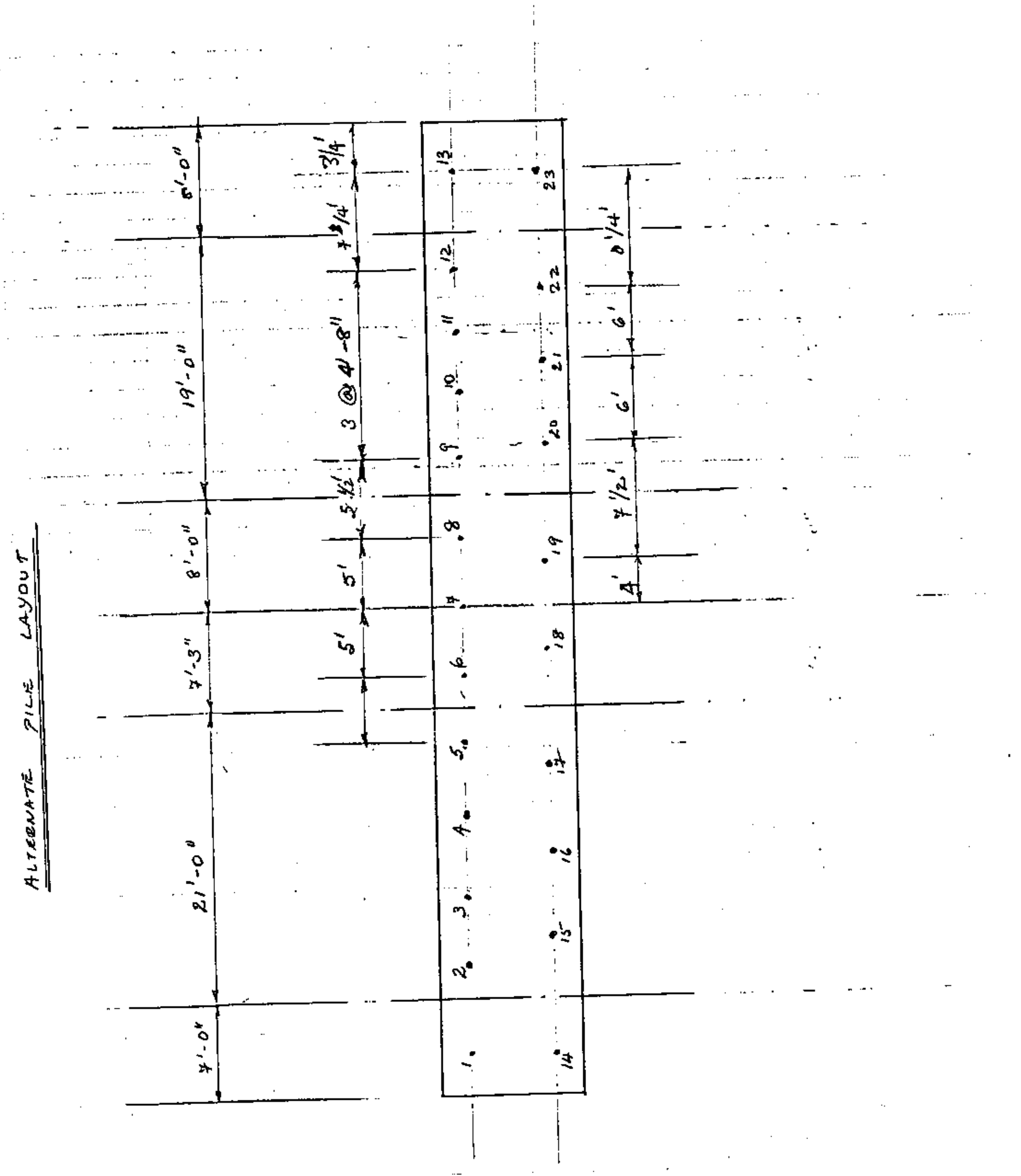
* A "CPGA" analysis indicates excessive y-direction displacement!

BERGER, BARNARD & THOMAS, INC.

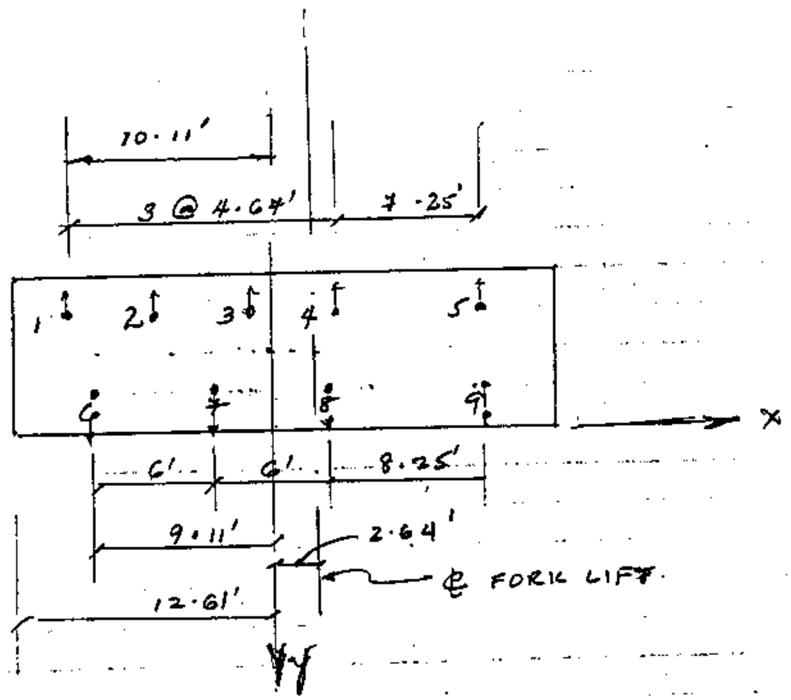
Job No. 2017-30 Date 8/30/93

Prepared By K. Rebello Checked By ________ Sheet No. 20/22

Subject Roller Gate No. 6 – Monolith.



Consider:



Cases ③ & ④ : $M_y = -377.52$ k-ft.

Cases ⑦ & ⑧ : $M_y = -283.14$ k-ft.

With the above configuration, too, y-displacements are excessive.

Increase the footing width by 5'-0" beyond the toe. Then, on sheet 2 for component ③,

$w_{③} = 0.15 * 15 * 2.833 = 6.375 k/ft.$

$M_A = 6.375 * 2.5 = 15.94$ k-ft./ft.

$\therefore \Sigma W = 12.23$ k/ft ↓

$\Sigma M_A = 46.55$ ft-k/ft ↻

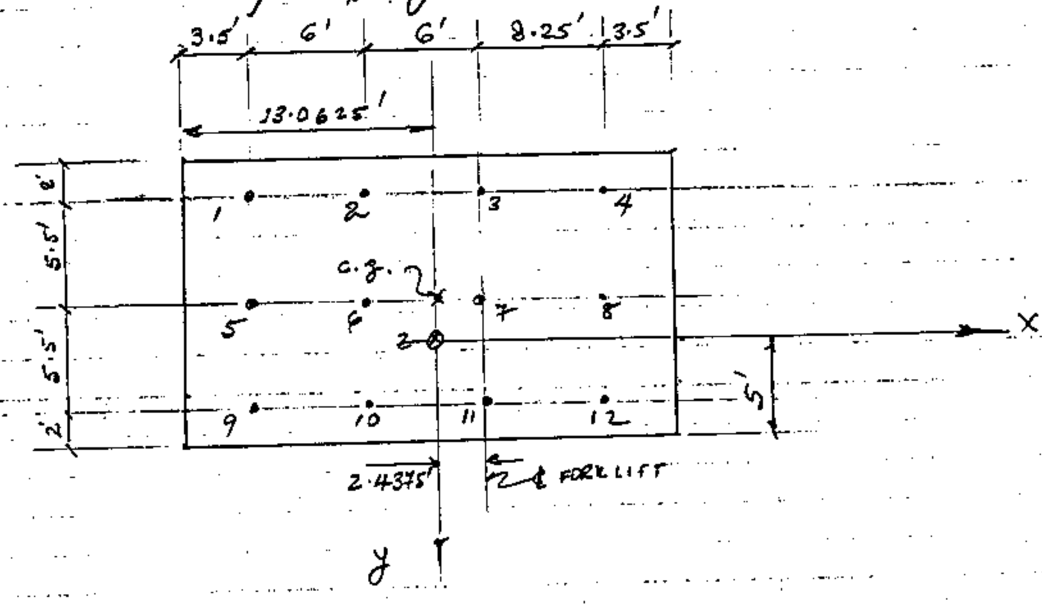
BERGER, BARNARD & THOMAS, INC.

Job No. 2017-30 Date 9/2/93

Prepared By K. Rebello Checked By ______ Sheet No. 22/22

Subject Roller Gate No. 6 - Monolith.

Consider now, a 3-pile row layout similar to those on sheets 17 & 19.



APPLIED LOADS:

LOADING CASE	Fy (kips)	Fz (kips)	Mx (k-ft)	My (k-ft.)
1	135.71	287.22	-365.70	0
2	128.55	209.69	-99.53	0
3	-7.20	476.27	-2,731.47	-348.56
4	7.20	476.27	-1,478.61	-348.56
5	-7.06	266.61	-1,037.68	0
6	7.06	266.61	-991.90	0
7	-12.02	357.20	-2,070.06	-261.42
8	12.02	357.20	-1,130.42	-261.42

"CPGA" indicates that pile layout works.

Use 14" x 14" ☐ PPC Piles!

CPGA ANALYSES FOR ROLLER GATE NO. 6

(Two modified analyses were performed in 02/95 with 3 new load cases for water to el 13.0 and 15.0 with pervious sheetpile wall and for gate open, dead load only load case)

I] ANALYSIS OF MONOLITH AT GATEPOST:

DATA FILE: ROL61.D

```
10      ROLLER GATE NO 6 - MODIFIED ANALYSIS AT GATEPOST - 02/95
20      14 x 14 P.S.C. PILES @ 7' c/c w/ F.S.= 2
30      PROP 4074. 3201. 3201. 196. 1.5 0.0 ALL
35      SOIL ES .0705 LEN 90. 0. ALL
40      PIN ALL
50      TENSION 0.8 ALL
60      DLS S 129.00 86.00 735.4 253.4 102.56 1553.9 1310.2 H 14. ALL
70      ASC S 196. 457.33 0.82 0.98 2.0 0.0 ALL
80      BATTER 3 3 4 5 6
90      BATTER 4 1 2
110     ANGLE 270 1 2
116     ANGLE 90 3 4 5 6
120     PILE 1 -3. -8.  0.  2  3. -8. 0.  3 -3. -2.5 0.
121     PILE 4  3. -2.5 0.  5 -3.  3. 0.  6  3.  3.  0.
150     LOAD 1 0. 59.16 111.24 -30.66 0. 0.
160     LOAD 2 0. 68.65 81.32 218.0 0. 0.
170     LOAD 3 0. -5.02 101.5 -392.29 0. 0.
180     LOAD 4 0.  5.02 101.5 -333.73 0. 0.
182     LOAD 5 0. 59.16 91.2 -30.66 0. 0.
185     LOAD 6 0. 68.65 63.92 218.0 0. 0.
187     LOAD 7 0. 0. 126.86 -453.76 0. 0.
190     FOUT 1 2 4 5 7 C:\CORPS\CPGA\GATES\ROL61.O
200     PFO ALL
210     PLB ALL
```

OUTPUT FILE: ROL61.O

```
 **********************************
 * CORPS PROGRAM  #  X0080       *   CPGA - CASE PILE GROUP ANALYSIS PROGRAM
 * VERSION NUMBER # 1992/02/26   *   RUN DATE 28-FEB-1995    RUN TIME 11.55.09
 **********************************


 ROLLER GATE NO 6 - MODIFIED ANALYSIS AT GATEPOST - 02/95


 THERE ARE    6 PILES AND
              7 LOAD CASES IN THIS RUN.

 ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                      X           Y           Z
                                    -----       -----       -----
 WITH DIAGONAL COORDINATES = (      -3.00 ,     -8.00 ,      .00 )
                             (       3.00 ,      3.00 ,      .00 )


 ******************************************************************************

          PILE PROPERTIES AS INPUT

      E            I1           I2           A           C33          B66
     KSI         IN**4        IN**4        IN**2
 .40740E+04   .32010E+04   .32010E+04   .19600E+03   .15000E+01   .00000E+00
```

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.70500E-01	L	.90000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-3.00	-8.00	.00	4.00	270.00	90.00	P
2	3.00	-8.00	.00	4.00	270.00	90.00	P
3	-3.00	-2.50	.00	3.00	90.00	90.00	P
4	3.00	-2.50	.00	3.00	90.00	90.00	P
5	-3.00	3.00	.00	3.00	90.00	90.00	P
6	3.00	3.00	.00	3.00	90.00	90.00	P

						540.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	59.2	111.2	-30.7	.0	.0
2	.0	68.7	81.3	218.0	.0	.0
3	.0	-5.0	101.5	-392.3	.0	.0
4	.0	5.0	101.5	-333.7	.0	.0
5	.0	59.2	91.2	-30.7	.0	.0
6	.0	68.7	63.9	218.0	.0	.0
7	.0	.0	126.9	-453.8	.0	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

TENSION PILE ITERATION.

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.
IT TOOK 1 ITERATIONS.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.
IT TOOK 1 ITERATIONS.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.
IT TOOK 1 ITERATIONS.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.
IT TOOK 1 ITERATIONS.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.7927E-07	.2081E+00	-.3274E-01	-.7248E-03	.8314E-11	.5181E-10
2	.1062E-06	.2418E+00	-.4355E-01	-.7296E-03	.2449E-10	.1526E-09
3	-.3477E-07	-.7638E-01	.3454E-01	.2502E-03	-.2962E-10	-.2239E-09
4	-.1658E-07	-.3048E-01	.2340E-01	.8658E-04	-.2355E-10	-.1780E-09
5	.8165E-07	.2453E+00	-.4725E-01	-.9159E-03	.1720E-10	.1072E-09
6	.1082E-06	.2741E+00	-.5615E-01	-.8956E-03	.3221E-10	.2007E-09
7	-.3209E-07	-.6676E-01	.3620E-01	.2104E-03	-.3322E-10	-.2511E-09

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.2	.0	-13.1	.0	65.1	.0	.15	.27	1.06	.61	
2	-1.2	.0	-13.1	.0	65.1	.0	.15	.27	1.06	.61	
3	1.2	.0	61.4	.0	-62.0	.0	.48	.25	1.43	1.00	#
4	1.2	.0	61.4	.0	-62.0	.0	.48	.25	1.43	1.00	#
5	1.3	.0	11.1	.0	-66.7	.0	.09	.23	1.18	.73	
6	1.3	.0	11.1	.0	-66.7	.0	.09	.23	1.18	.73	

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.4	.0	-29.2	.0	74.4	.0	.34	.46	.99	.51	
2	-1.4	.0	-29.2	.0	74.4	.0	.34	.46	.99	.51	
3	1.4	.0	62.0	.0	-72.9	.0	.48	.25	1.46	.98	#
4	1.4	.0	62.0	.0	-72.9	.0	.48	.25	1.46	.98	#
5	1.5	.0	11.3	.0	-77.6	.0	.09	.24	1.21	.71	
6	1.5	.0	11.3	.0	-77.6	.0	.09	.24	1.21	.71	

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.4	.0	31.9	.0	-22.1	.0	.25	.10	1.19	.93	#
2	.4	.0	31.9	.0	-22.1	.0	.25	.10	1.19	.93	#
3	-.5	.0	1.7	.0	25.0	.0	.01	.19	1.04	.77	
4	-.5	.0	1.7	.0	25.0	.0	.01	.19	1.04	.77	
5	-.5	.0	19.0	.0	26.6	.0	.15	.12	1.14	.86	#
6	-.5	.0	19.0	.0	26.6	.0	.15	.12	1.14	.86	#

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.2	.0	24.4	.0	-8.0	.0	.19	.12	1.12	.93	#
2	.2	.0	24.4	.0	-8.0	.0	.19	.12	1.12	.93	#
3	-.2	.0	11.2	.0	11.0	.0	.09	.14	1.06	.85	#
4	-.2	.0	11.2	.0	11.0	.0	.09	.14	1.06	.85	#
5	-.2	.0	17.2	.0	11.5	.0	.13	.13	1.09	.88	#
6	-.2	.0	17.2	.0	11.5	.0	.13	.13	1.09	.88	#

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.4	.0	-17.8	.0	76.5	.0	.21	.35	1.06	.56	
2	-1.4	.0	-17.8	.0	76.5	.0	.21	.35	1.06	.56	
3	1.4	.0	65.2	.0	-73.8	.0	.51	.27	1.47	.99	#
4	1.4	.0	65.2	.0	-73.8	.0	.51	.27	1.47	.99	#
5	1.5	.0	1.6	.0	-79.7	.0	.01	.29	1.16	.65	
6	1.5	.0	1.6	.0	-79.7	.0	.01	.29	1.16	.65	

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.6	.0	-33.3	.0	84.3	.0	.39	.53	.99	.47	
2	-1.6	.0	-33.3	.0	84.3	.0	.39	.53	.99	.47	
3	1.6	.0	65.3	.0	-83.1	.0	.51	.28	1.49	.97	#
4	1.6	.0	65.3	.0	-83.1	.0	.51	.28	1.49	.97	#
5	1.7	.0	3.1	.0	-88.9	.0	.02	.30	1.19	.64	
6	1.7	.0	3.1	.0	-88.9	.0	.02	.30	1.19	.64	

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.4	.0	35.2	.0	-18.8	.0	.27	.10	1.20	.96	#
2	.4	.0	35.2	.0	-18.8	.0	.27	.10	1.20	.96	#
3	-.4	.0	8.0	.0	22.5	.0	.06	.16	1.07	.81	
4	-.4	.0	8.0	.0	22.5	.0	.06	.16	1.07	.81	
5	-.4	.0	22.6	.0	23.8	.0	.18	.12	1.15	.88	#
6	-.4	.0	22.6	.0	23.8	.0	.18	.12	1.15	.88	#

****

PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	4.4	-12.4	.0	.0	.0
2	.0	4.4	-12.4	.0	.0	.0
3	.0	20.5	57.9	.0	.0	.0
4	.0	20.5	57.9	.0	.0	.0
5	.0	4.7	10.1	.0	.0	.0
6	.0	4.7	10.1	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	8.4	-28.0	.0	.0	.0
2	.0	8.4	-28.0	.0	.0	.0
3	.0	20.9	58.4	.0	.0	.0
4	.0	20.9	58.4	.0	.0	.0
5	.0	5.0	10.3	.0	.0	.0
6	.0	5.0	10.3	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-8.1	30.8	.0	.0	.0
2	.0	-8.1	30.8	.0	.0	.0
3	.0	.1	1.7	.0	.0	.0
4	.0	.1	1.7	.0	.0	.0
5	.0	5.5	18.2	.0	.0	.0
6	.0	5.5	18.2	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-6.1	23.7	.0	.0	.0
2	.0	-6.1	23.7	.0	.0	.0
3	.0	3.3	10.7	.0	.0	.0
4	.0	3.3	10.7	.0	.0	.0
5	.0	5.2	16.4	.0	.0	.0
6	.0	5.2	16.4	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	5.7	-16.9	.0	.0	.0
2	.0	5.7	-16.9	.0	.0	.0
3	.0	21.9	61.4	.0	.0	.0
4	.0	21.9	61.4	.0	.0	.0
5	.0	1.9	1.1	.0	.0	.0
6	.0	1.9	1.1	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	9.6	-31.9	.0	.0	.0
2	.0	9.6	-31.9	.0	.0	.0
3	.0	22.1	61.5	.0	.0	.0
4	.0	22.1	61.5	.0	.0	.0
5	.0	2.6	2.4	.0	.0	.0
6	.0	2.6	2.4	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-8.9	34.0	.0	.0	.0
2	.0	-8.9	34.0	.0	.0	.0
3	.0	2.1	7.8	.0	.0	.0
4	.0	2.1	7.8	.0	.0	.0
5	.0	6.7	21.6	.0	.0	.0
6	.0	6.7	21.6	.0	.0	.0

II] ANALYSIS OF MONOLITH BETWEEN GATEPOSTS:

```
DATA FILE: ROL62.D
10      ROLLER GATE NO 6 - MODIFIED ANALYSIS BETWEEN GATEPOSTS - 02/95
20      14 x 14 P.S.C. PILES @ 7' c/c w/ F.S.= 2
30      PROP 4074. 3201. 3201. 196. 1.5 0.0 ALL
35      SOIL ES .0705 LEN 90. 0. ALL
40      PIN ALL
50      TENSION 0.8 ALL
60      DLS S 129.00 86.00 735.4 253.4 102.56 1553.9 1310.2 H 14. ALL
70      ASC S 196. 457.33 0.82 0.98 2.0 0.0 ALL
90      BATTER 4 1 TO 12
110     ANGLE 270 1 TO 4
116     ANGLE 90 5 TO 12
120     PILE 1 -9.56 -8. 0.  2 -3.56 -8. 0.   3 2.44 -8. 0.
121     PILE 4 10.69 -8. 0.  5 -9.56 -2.5 0.  6 -3.56 -2.5 0.
122     PILE 7 2.44 -2.5 0.  8 10.69 -2.5 0.  9 -9.56 3. 0.
123     PILE 10 -3.56 3. 0.  11 2.44 3.0 0.   12 10.69 3. 0.
150     LOAD 1 0. 135.7 287.2 -365.7 0. 0.
160     LOAD 2 0. 128.6 209.7 -99.5 0. 0.
170     LOAD 3 0. -7.2 476.3 -2731.5 -348.6 0.
180     LOAD 4 0. 7.2 476.3 -1478.6 -348.6 0.
181     LOAD 5 0. -7.1 266.6 -1037.7 0. 0.
182     LOAD 6 0. 7.1 266.6 -991.9 0. 0.
183     LOAD 7 0. -12.0 357.2 -2070.1 -261.4 0.
184     LOAD 8 0. 12.0 357.2 -1130.4 -261.4 0.
185     LOAD 9 0. 135.7 236. -365.7 0. 0.
186     LOAD 10 0. 128.6 164.9 -99.5 0. 0.
187     LOAD 11 0. 0. 333.27 -1268.5 0. 0.
190     FOUT 1 2 4 5 7 C:\CORPS\CPGA\GATES\ROL62.O
200     PFO ALL
210     PLB ALL
```

```
OUTPUT FILE: ROL62.O
 *********************************
 * CORPS PROGRAM  #  X0080        *   CPGA - CASE PILE GROUP ANALYSIS PROGRAM
 * VERSION NUMBER # 1992/02/26    *   RUN DATE 28-FEB-1995    RUN TIME 11.51.27
 *********************************


 ROLLER GATE NO 6 - MODIFIED ANALYSIS BETWEEN GATEPOSTS - 02/95


 THERE ARE  12 PILES AND
            11 LOAD CASES IN THIS RUN.

 ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                               X          Y          Z
                                             -----      -----      -----
 WITH DIAGONAL COORDINATES = (              -9.56 ,    -8.00 ,      .00 )
                             (              10.69 ,     3.00 ,      .00 )


 ******************************************************************************

         PILE PROPERTIES AS INPUT

      E              I1            I2            A            C33           B66
     KSI           IN**4         IN**4         IN**2
  .40740E+04    .32010E+04    .32010E+04    .19600E+03    .15000E+01    .00000E+00
```

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.70500E-01	L	.90000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-9.56	-8.00	.00	4.00	270.00	90.00	P
2	-3.56	-8.00	.00	4.00	270.00	90.00	P
3	2.44	-8.00	.00	4.00	270.00	90.00	P
4	10.69	-8.00	.00	4.00	270.00	90.00	P
5	-9.56	-2.50	.00	4.00	90.00	90.00	P
6	-3.56	-2.50	.00	4.00	90.00	90.00	P
7	2.44	-2.50	.00	4.00	90.00	90.00	P
8	10.69	-2.50	.00	4.00	90.00	90.00	P
9	-9.56	3.00	.00	4.00	90.00	90.00	P
10	-3.56	3.00	.00	4.00	90.00	90.00	P
11	2.44	3.00	.00	4.00	90.00	90.00	P
12	10.69	3.00	.00	4.00	90.00	90.00	P

						1080.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	135.7	287.2	-365.7	.0	.0
2	.0	128.6	209.7	-99.5	.0	.0
3	.0	-7.2	476.3	-2731.5	-348.6	.0
4	.0	7.2	476.3	-1478.6	-348.6	.0
5	.0	-7.1	266.6	-1037.7	.0	.0
6	.0	7.1	266.6	-991.9	.0	.0
7	.0	-12.0	357.2	-2070.1	-261.4	.0
8	.0	12.0	357.2	-1130.4	-261.4	.0
9	.0	135.7	236.0	-365.7	.0	.0
10	.0	128.6	164.9	-99.5	.0	.0
11	.0	.0	333.3	-1268.5	.0	.0

```
LOAD CASE    1.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   8.
LOAD CASE    2.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   8.
LOAD CASE    3.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   3.
LOAD CASE    4.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   0.
LOAD CASE    5.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   0.
LOAD CASE    6.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   0.
LOAD CASE    7.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   3.
LOAD CASE    8.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   0.
LOAD CASE    9.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   8.
LOAD CASE   10.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   8.
LOAD CASE   11.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   0.

TENSION PILE ITERATION.

LOAD CASE    1.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   8.
                 IT TOOK 1 ITERATIONS.

LOAD CASE    2.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   8.
                 IT TOOK 1 ITERATIONS.

LOAD CASE    3.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   3.
                 IT TOOK 1 ITERATIONS.

LOAD CASE    7.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   3.
                 IT TOOK 1 ITERATIONS.

LOAD CASE    9.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   8.
                 IT TOOK 1 ITERATIONS.

LOAD CASE   10.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   8.
                 IT TOOK 1 ITERATIONS.

*******************************************************************************
          PILE CAP DISPLACEMENTS
```

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.1810E-04	.3964E+00	-.5182E-01	-.1346E-02	.4087E-07	-.6002E-06
2	.1815E-04	.3837E+00	-.5542E-01	-.1268E-02	.1419E-07	-.6019E-06
3	.1454E-02	.9444E-01	.3817E-02	-.8700E-03	-.4741E-04	-.4849E-04
4	.1631E-02	-.7823E-01	.5049E-01	.1997E-03	-.4571E-04	-.5436E-04
5	-.4176E-05	-.5043E-01	.2748E-01	.6752E-04	.9046E-07	.1377E-06
6	-.2153E-05	-.1155E-02	.1828E-01	-.1030E-03	.8491E-07	.7068E-07
7	.1126E-02	.4764E-01	.7329E-02	-.5704E-03	-.3519E-04	-.3753E-04
8	.1224E-02	-.2790E-01	.3162E-01	.2682E-04	-.3428E-04	-.4079E-04
9	.1892E-04	.4422E+00	-.6767E-01	-.1571E-02	.2076E-07	-.6274E-06
10	.1887E-04	.4238E+00	-.6928E-01	-.1465E-02	-.3408E-08	-.6257E-06
11	-.3956E-05	-.3225E-01	.2861E-01	-.2208E-04	.1096E-06	.1302E-06

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-2.3	.0	-18.7	.0	124.5	.0	.22	.46	1.16	.45
2	-2.3	.0	-18.7	.0	124.5	.0	.22	.46	1.16	.45
3	-2.3	.0	-18.7	.0	124.5	.0	.22	.46	1.16	.45
4	-2.3	.0	-18.7	.0	124.5	.0	.22	.46	1.16	.45
5	2.3	.0	94.3	.0	-119.6	.0	.73	.47	1.72	1.04 #
6	2.3	.0	94.3	.0	-119.6	.0	.73	.47	1.72	1.04 #
7	2.3	.0	94.3	.0	-119.6	.0	.73	.47	1.72	1.04 #
8	2.3	.0	94.3	.0	-119.6	.0	.73	.47	1.72	1.04 #
9	2.4	.0	-1.0	.0	-126.3	.0	.01	.27	1.25	.54
10	2.4	.0	-1.0	.0	-126.2	.0	.01	.27	1.25	.54
11	2.4	.0	-1.0	.0	-126.2	.0	.01	.27	1.25	.54
12	2.4	.0	-1.0	.0	-126.2	.0	.01	.27	1.25	.54

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-2.3	.0	-25.5	.0	119.9	.0	.30	.52	1.11	.43
2	-2.3	.0	-25.5	.0	119.9	.0	.30	.52	1.11	.43
3	-2.3	.0	-25.5	.0	119.9	.0	.30	.52	1.11	.43
4	-2.3	.0	-25.5	.0	119.9	.0	.30	.52	1.11	.43
5	2.2	.0	84.5	.0	-116.2	.0	.66	.40	1.67	1.00 #
6	2.2	.0	84.5	.0	-116.2	.0	.66	.40	1.67	1.00 #
7	2.2	.0	84.5	.0	-116.2	.0	.66	.40	1.67	1.00 #
8	2.2	.0	84.5	.0	-116.2	.0	.65	.40	1.67	1.00 #
9	2.3	.0	-4.4	.0	-122.5	.0	.05	.30	1.23	.53
10	2.3	.0	-4.4	.0	-122.5	.0	.05	.30	1.23	.53
11	2.3	.0	-4.4	.0	-122.5	.0	.05	.30	1.23	.53
12	2.3	.0	-4.5	.0	-122.5	.0	.05	.30	1.23	.53

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-.7	.0	61.2	-1.0	36.1	.0	.47	.25	1.37	1.05 #
2	-.7	.0	65.8	-1.0	35.3	.0	.51	.28	1.40	1.08 #
3	-.6	.0	70.4	-1.0	34.5	.0	.55	.31	1.42	1.10 #
4	-.6	.0	76.8	-1.0	33.4	.0	.60	.35	1.45	1.14 #
5	.5	.0	53.2	.0	-28.1	.0	.41	.19	1.31	1.03 #
6	.5	.0	56.0	.0	-26.8	.0	.43	.21	1.32	1.05 #
7	.5	.0	58.7	.0	-25.5	.0	.46	.23	1.34	1.06 #

8	.4	.0	62.5	.0	-23.7	.0	.48	.26	1.35	1.09	#
9	.6	.0	-6.8	-1.0	-32.4	.0	.08	.14	1.02	.71	
10	.6	.0	-4.6	-1.0	-31.1	.0	.05	.11	1.03	.73	
11	.6	.0	-2.5	-1.0	-29.8	.0	.03	.09	1.03	.74	
12	.5	.0	.7	-1.0	-28.0	.0	.01	.20	1.05	.76	

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.4	.0	47.4	-1.1	-19.6	.0	.37	.16	1.27	1.02	#
2	.4	.0	52.0	-1.1	-20.5	.0	.40	.19	1.29	1.04	#
3	.4	.0	56.6	-1.1	-21.5	.0	.44	.22	1.32	1.06	#
4	.4	.0	62.9	-1.1	-22.7	.0	.49	.26	1.35	1.09	#
5	-.5	.0	22.9	.0	24.5	.0	.18	.12	1.15	.88	#
6	-.5	.0	25.4	.0	25.9	.0	.20	.11	1.17	.89	#
7	-.5	.0	27.8	.0	27.3	.0	.22	.11	1.18	.90	#
8	-.6	.0	31.3	.0	29.3	.0	.24	.10	1.20	.92	#
9	-.5	.0	37.1	-1.1	25.5	.0	.29	.09	1.23	.95	#
10	-.5	.0	39.5	-1.1	26.9	.0	.31	.10	1.24	.96	#
11	-.5	.0	42.0	-1.1	28.3	.0	.33	.12	1.26	.97	#
12	-.6	.0	45.4	-1.1	30.3	.0	.35	.14	1.28	.98	#

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.3	.0	36.2	.0	-13.5	.0	.28	.10	1.19	.97	#
2	.3	.0	36.2	.0	-13.5	.0	.28	.10	1.19	.97	#
3	.3	.0	36.2	.0	-13.5	.0	.28	.10	1.19	.97	#
4	.3	.0	36.1	.0	-13.5	.0	.28	.10	1.19	.97	#
5	-.3	.0	13.8	.0	17.0	.0	.11	.13	1.09	.85	#
6	-.3	.0	13.8	.0	17.0	.0	.11	.13	1.09	.85	#
7	-.3	.0	13.8	.0	17.0	.0	.11	.13	1.09	.85	#
8	-.3	.0	13.8	.0	17.0	.0	.11	.13	1.09	.85	#
9	-.3	.0	18.6	.0	17.3	.0	.14	.13	1.11	.88	#
10	-.3	.0	18.6	.0	17.3	.0	.14	.13	1.11	.88	#
11	-.3	.0	18.6	.0	17.3	.0	.14	.13	1.11	.88	#
12	-.3	.0	18.6	.0	17.3	.0	.14	.13	1.11	.88	#

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.0	.0	30.6	.0	1.8	.0	.24	.10	1.14	.97	#
2	.0	.0	30.6	.0	1.8	.0	.24	.10	1.14	.97	#
3	.0	.0	30.6	.0	1.8	.0	.24	.10	1.14	.97	#
4	.0	.0	30.6	.0	1.8	.0	.24	.10	1.14	.97	#
5	.0	.0	22.7	.0	1.9	.0	.18	.12	1.10	.93	#
6	.0	.0	22.7	.0	1.9	.0	.18	.12	1.10	.93	#
7	.0	.0	22.7	.0	1.9	.0	.18	.12	1.10	.93	#
8	.0	.0	22.7	.0	1.9	.0	.18	.12	1.10	.93	#
9	.0	.0	15.4	.0	1.4	.0	.12	.13	1.06	.90	#
10	.0	.0	15.4	.0	1.4	.0	.12	.13	1.06	.90	#
11	.0	.0	15.4	.0	1.4	.0	.12	.13	1.06	.90	#
12	.0	.0	15.4	.0	1.4	.0	.12	.13	1.06	.90	#

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.4	.0	48.5	-.8	19.9	.0	.38	.16	1.27	1.02	#
2	-.4	.0	51.9	-.8	19.3	.0	.40	.19	1.29	1.04	#
3	-.4	.0	55.4	-.8	18.7	.0	.43	.21	1.31	1.06	#
4	-.3	.0	60.1	-.8	17.8	.0	.47	.24	1.33	1.09	#
5	.3	.0	35.9	.0	-14.0	.0	.28	.10	1.19	.97	#
6	.2	.0	37.9	.0	-13.0	.0	.29	.09	1.20	.98	#
7	.2	.0	39.9	.0	-12.0	.0	.31	.11	1.21	1.00	#
8	.2	.0	42.7	.0	-10.7	.0	.33	.12	1.22	1.01	#
9	.3	.0	-3.7	-.8	-16.8	.0	.04	.07	1.00	.76	
10	.3	.0	-2.1	-.8	-15.9	.0	.02	.05	1.01	.77	
11	.3	.0	-.5	-.8	-14.9	.0	.01	.04	1.01	.78	
12	.3	.0	2.2	-.8	-13.5	.0	.02	.17	1.02	.80	

LOAD CASE - 8

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.1	.0	33.3	-.8	-5.1	.0	.26	.10	1.16	.98	#
2	.1	.0	36.7	-.8	-5.8	.0	.28	.10	1.18	.99	#
3	.1	.0	40.2	-.8	-6.5	.0	.31	.11	1.20	1.01	#
4	.1	.0	44.9	-.8	-7.4	.0	.35	.14	1.23	1.03	#
5	-.2	.0	22.7	.0	9.0	.0	.18	.12	1.12	.92	#
6	-.2	.0	24.5	.0	10.0	.0	.19	.12	1.13	.92	#
7	-.2	.0	26.4	.0	11.1	.0	.20	.11	1.14	.93	#
8	-.2	.0	29.0	.0	12.6	.0	.22	.11	1.16	.94	#
9	-.2	.0	24.6	-.8	9.1	.0	.19	.12	1.13	.92	#
10	-.2	.0	26.5	-.8	10.2	.0	.21	.11	1.14	.93	#
11	-.2	.0	28.3	-.8	11.2	.0	.22	.11	1.15	.94	#
12	-.2	.0	30.9	-.8	12.7	.0	.24	.11	1.17	.95	#

LOAD CASE - 9

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-2.6	.0	-23.6	.0	138.7	.0	.27	.54	1.16	.40	
2	-2.6	.0	-23.6	.0	138.7	.0	.27	.54	1.16	.40	
3	-2.6	.0	-23.6	.0	138.7	.0	.27	.54	1.16	.40	
4	-2.6	.0	-23.6	.0	138.7	.0	.27	.54	1.16	.40	
5	2.5	.0	96.9	.0	-134.0	.0	.75	.49	1.77	1.02	#
6	2.5	.0	96.8	.0	-134.0	.0	.75	.49	1.77	1.02	#
7	2.5	.0	96.8	.0	-134.0	.0	.75	.49	1.77	1.02	#
8	2.5	.0	96.8	.0	-134.0	.0	.75	.49	1.77	1.02	#
9	2.7	.0	-11.8	.0	-141.8	.0	.14	.42	1.23	.45	
10	2.7	.0	-11.8	.0	-141.8	.0	.14	.42	1.23	.45	
11	2.7	.0	-11.8	.0	-141.7	.0	.14	.42	1.23	.45	
12	2.7	.0	-11.8	.0	-141.7	.0	.14	.42	1.23	.45	

LOAD CASE - 10

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-2.5	.0	-29.8	.0	132.3	.0	.35	.59	1.12	.38
2	-2.5	.0	-29.8	.0	132.3	.0	.35	.59	1.12	.38
3	-2.5	.0	-29.8	.0	132.3	.0	.35	.59	1.12	.38
4	-2.5	.0	-29.7	.0	132.2	.0	.35	.59	1.12	.38
5	2.4	.0	86.7	.0	-128.8	.0	.67	.43	1.70	.98
6	2.4	.0	86.7	.0	-128.8	.0	.67	.43	1.70	.98
7	2.4	.0	86.7	.0	-128.8	.0	.67	.43	1.70	.98
8	2.4	.0	86.7	.0	-128.8	.0	.67	.43	1.70	.98
9	2.6	.0	-13.8	.0	-136.1	.0	.16	.43	1.21	.45
10	2.6	.0	-13.8	.0	-136.1	.0	.16	.43	1.21	.45
11	2.6	.0	-13.9	.0	-136.1	.0	.16	.43	1.21	.45
12	2.6	.0	-13.9	.0	-136.0	.0	.16	.43	1.21	.45

LOAD CASE - 11

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.1	.0	41.8	.0	-7.4	.0	.32	.12	1.21	1.02	#
2	.1	.0	41.7	.0	-7.4	.0	.32	.12	1.21	1.02	#
3	.1	.0	41.7	.0	-7.4	.0	.32	.12	1.21	1.02	#
4	.1	.0	41.7	.0	-7.4	.0	.32	.12	1.21	1.02	#
5	-.2	.0	22.8	.0	11.9	.0	.18	.12	1.12	.91	#
6	-.2	.0	22.8	.0	11.9	.0	.18	.12	1.12	.91	#
7	-.2	.0	22.8	.0	11.9	.0	.18	.12	1.12	.91	#
8	-.2	.0	22.8	.0	11.8	.0	.18	.12	1.12	.91	#
9	-.2	.0	21.3	.0	11.7	.0	.16	.12	1.11	.90	#
10	-.2	.0	21.3	.0	11.7	.0	.16	.12	1.11	.90	#
11	-.2	.0	21.2	.0	11.7	.0	.16	.12	1.11	.90	#
12	-.2	.0	21.2	.0	11.7	.0	.16	.12	1.11	.90	#

****

PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	6.8	-17.6	.0	.0	.0
2	.0	6.8	-17.6	.0	.0	.0
3	.0	6.8	-17.6	.0	.0	.0
4	.0	6.8	-17.6	.0	.0	.0
5	.0	25.1	91.0	.0	.0	.0
6	.0	25.1	90.9	.0	.0	.0
7	.0	25.1	90.9	.0	.0	.0
8	.0	25.0	90.9	.0	.0	.0
9	.0	2.1	-1.5	.0	.0	.0
10	.0	2.1	-1.6	.0	.0	.0
11	.0	2.1	-1.6	.0	.0	.0
12	.0	2.1	-1.6	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	8.4	-24.2	.0	.0	.0
2	.0	8.4	-24.2	.0	.0	.0
3	.0	8.4	-24.2	.0	.0	.0
4	.0	8.4	-24.2	.0	.0	.0
5	.0	22.6	81.5	.0	.0	.0
6	.0	22.6	81.5	.0	.0	.0
7	.0	22.6	81.4	.0	.0	.0
8	.0	22.6	81.4	.0	.0	.0
9	.0	1.2	-4.8	.0	.0	.0
10	.0	1.2	-4.9	.0	.0	.0
11	.0	1.2	-4.9	.0	.0	.0
12	.0	1.2	-4.9	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-14.2	59.6	.0	.0	.0
2	.0	-15.3	64.0	.0	.0	.0
3	.0	-16.5	68.5	.0	.0	.0
4	.0	-18.0	74.6	.0	.0	.0
5	.0	13.4	51.5	.0	.0	.0
6	.0	14.1	54.2	.0	.0	.0
7	.0	14.7	56.8	.0	.0	.0
8	.0	15.6	60.5	.0	.0	.0
9	.0	-1.1	-6.8	.0	.0	.0
10	.0	-.6	-4.7	.0	.0	.0
11	.0	-.1	-2.5	.0	.0	.0
12	.0	.7	.5	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-11.9	45.9	.0	.0	.0
2	.0	-13.0	50.4	.0	.0	.0
3	.0	-14.1	54.8	.0	.0	.0
4	.0	-15.7	60.9	.0	.0	.0
5	.0	5.1	22.3	.0	.0	.0
6	.0	5.7	24.7	.0	.0	.0
7	.0	6.3	27.1	.0	.0	.0
8	.0	7.0	30.5	.0	.0	.0
9	.0	8.5	36.1	.0	.0	.0
10	.0	9.1	38.5	.0	.0	.0
11	.0	9.7	40.9	.0	.0	.0
12	.0	10.5	44.2	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-9.0	35.0	.0	.0	.0
2	.0	-9.0	35.0	.0	.0	.0
3	.0	-9.0	35.0	.0	.0	.0
4	.0	-9.0	35.0	.0	.0	.0

5	.0	3.0	13.5	.0	.0	.0
6	.0	3.0	13.5	.0	.0	.0
7	.0	3.0	13.5	.0	.0	.0
8	.0	3.0	13.5	.0	.0	.0
9	.0	4.2	18.2	.0	.0	.0
10	.0	4.2	18.1	.0	.0	.0
11	.0	4.2	18.1	.0	.0	.0
12	.0	4.2	18.1	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-7.4	29.7	.0	.0	.0
2	.0	-7.4	29.7	.0	.0	.0
3	.0	-7.4	29.7	.0	.0	.0
4	.0	-7.4	29.7	.0	.0	.0
5	.0	5.5	22.0	.0	.0	.0
6	.0	5.5	22.0	.0	.0	.0
7	.0	5.5	22.0	.0	.0	.0
8	.0	5.5	22.0	.0	.0	.0
9	.0	3.7	14.9	.0	.0	.0
10	.0	3.7	14.9	.0	.0	.0
11	.0	3.7	14.9	.0	.0	.0
12	.0	3.7	14.9	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-11.4	47.1	.0	.0	.0
2	.0	-12.2	50.5	.0	.0	.0
3	.0	-13.1	53.8	.0	.0	.0
4	.0	-14.3	58.4	.0	.0	.0
5	.0	9.0	34.8	.0	.0	.0
6	.0	9.4	36.7	.0	.0	.0
7	.0	9.9	38.7	.0	.0	.0
8	.0	10.5	41.3	.0	.0	.0
9	.0	-.6	-3.6	.0	.0	.0
10	.0	-.2	-2.1	.0	.0	.0
11	.0	.2	-.5	.0	.0	.0
12	.0	.8	2.0	.0	.0	.0

LOAD CASE - 8

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-8.2	32.3	.0	.0	.0
2	.0	-9.0	35.6	.0	.0	.0
3	.0	-9.9	38.9	.0	.0	.0
4	.0	-11.0	43.5	.0	.0	.0
5	.0	5.3	22.0	.0	.0	.0
6	.0	5.8	23.9	.0	.0	.0
7	.0	6.2	25.7	.0	.0	.0
8	.0	6.8	28.2	.0	.0	.0
9	.0	5.8	23.9	.0	.0	.0
10	.0	6.2	25.7	.0	.0	.0
11	.0	6.7	27.5	.0	.0	.0
12	.0	7.3	30.0	.0	.0	.0

LOAD CASE - 9

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	8.3	-22.3	.0	.0	.0
2	.0	8.3	-22.3	.0	.0	.0
3	.0	8.3	-22.3	.0	.0	.0
4	.0	8.3	-22.2	.0	.0	.0
5	.0	25.9	93.4	.0	.0	.0
6	.0	25.9	93.3	.0	.0	.0
7	.0	25.9	93.3	.0	.0	.0
8	.0	25.9	93.3	.0	.0	.0
9	.0	-.3	-12.1	.0	.0	.0
10	.0	-.3	-12.1	.0	.0	.0
11	.0	-.3	-12.1	.0	.0	.0
12	.0	-.3	-12.1	.0	.0	.0

LOAD CASE - 10

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	9.6	-28.3	.0	.0	.0
2	.0	9.6	-28.3	.0	.0	.0
3	.0	9.6	-28.3	.0	.0	.0
4	.0	9.6	-28.3	.0	.0	.0
5	.0	23.4	83.6	.0	.0	.0
6	.0	23.4	83.6	.0	.0	.0
7	.0	23.4	83.5	.0	.0	.0
8	.0	23.4	83.5	.0	.0	.0
9	.0	-.9	-14.0	.0	.0	.0
10	.0	-.9	-14.0	.0	.0	.0
11	.0	-.9	-14.1	.0	.0	.0
12	.0	-.9	-14.1	.0	.0	.0

LOAD CASE - 11

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-10.3	40.5	.0	.0	.0
2	.0	-10.3	40.5	.0	.0	.0
3	.0	-10.3	40.5	.0	.0	.0
4	.0	-10.3	40.4	.0	.0	.0
5	.0	5.3	22.2	.0	.0	.0
6	.0	5.3	22.2	.0	.0	.0
7	.0	5.3	22.2	.0	.0	.0
8	.0	5.3	22.2	.0	.0	.0
9	.0	4.9	20.7	.0	.0	.0
10	.0	4.9	20.7	.0	.0	.0
11	.0	4.9	20.7	.0	.0	.0
12	.0	4.9	20.7	.0	.0	.0

Client: PORT OF NEW ORLEANS Project: 504-005
Computations for: Roller Gate no. 7
Computed by: SUNIL S. Date: 02/95 Checked by: Date:

ROLLER GATE NO. 7

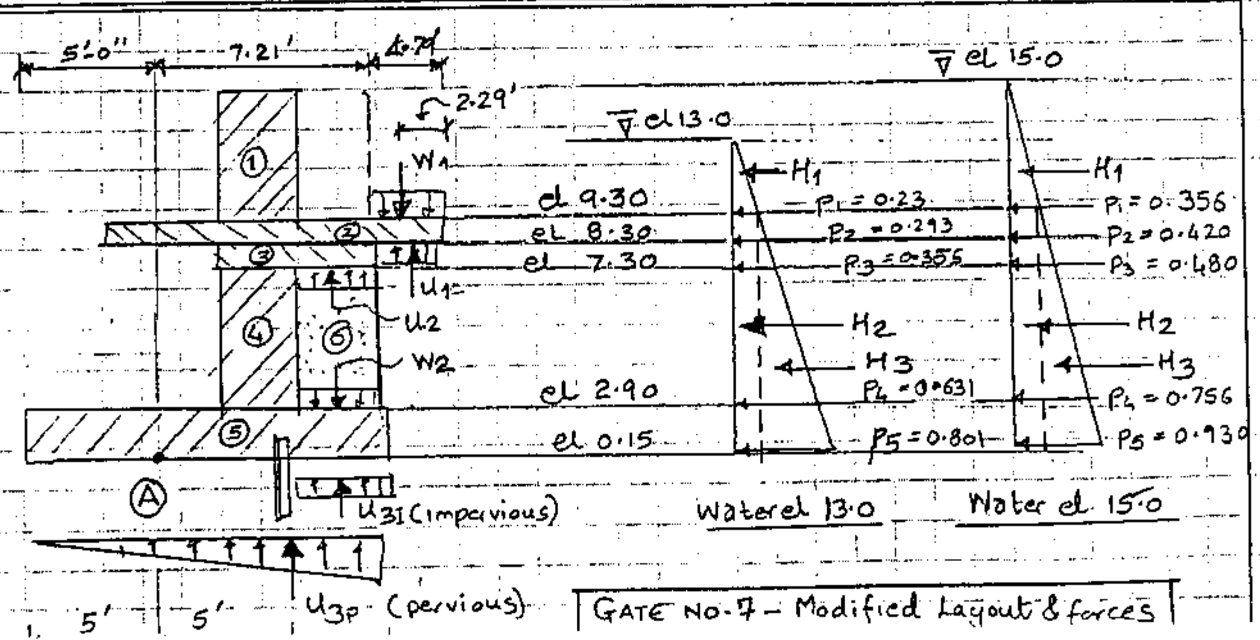
B] ROLLER GATE NO. 7 :- FINAL ANALYSIS FOR SILL LEVEL 9.30

① The sill-level of gate no. 7 was changed to el 9.30 from el 10.36, in Oct. 94, due to an alignment change & the gate was moved further away from the IHNC top of bank than in the preliminary design conducted in 08/93.

② Hence, the gate was reanalysed with sill-level at el 9.30 instead of el 10.36. The top of base level was raised to el 2.90, instead of el 1.00, used in 08/93, as the ground level was higher in the new gate location.

③ The gate geometry & load calculations are similar to the calculations for gate no. 6 dated 02/95 & 08/26/93. Only the loads which are different are recalculated below.

④ Based on the recalculated loads, the gate monolith was analyzed using CPGA at gateposts & between gateposts. The analyses are attached at the end of the following load calculations.



GATE NO. 7 – Modified Layout & forces

Client: PORT OF NEW ORLEANS Project: 504-005
Computations for: Roller gate no. 7
Computed by: Sunil S. Date: 02/15 Checked by: ______ Date: ______

Loading :-

(a) **Self wt :-** For @ 10' long gate section,

		Lever Arm	Moment @ (A)
①	0.15{(15 − 9.30)(2.5×6)} = 12.8^k	3.0 ✓	38.5
②	0.15 (15×10×1) = 22.5^k	4.5 ✓	101.25
③	0.15 (7.08×10×1) = 11.56^k	5.85 ✓	67.63
	0.15 (2×4.4×10) = 13.2^k	3.00 ✓	39.60
④	0.15 (1.5×4.4×5.71) = 5.65^k	6.85 ✓	38.70
⑥	0.15 (10×15×2.5) = 56.25^k	2.50 ✓	140.63
⑤ Gate :-	0.3×10 = 3^k	6.00 ✓	18.00

⇒ For 10' section @ gatepost :- $\Sigma W = 124.9^k \downarrow$ — $\Sigma M_A = 444.31^{f\text{-}k}$ ↻(−)

⇒ For 10' " between posts :- $\Sigma W = 112.1^k \downarrow$ — $\Sigma M_A = 405.8^{fk}$ ↻(−)

(b) **Water Forces :-** For 10' long gate section.

For water at el 13.0 Force (k)	Arm (ft)	Moment (fk) (A)	For water @ el 15.0 Force (k)	Arm (ft)	Moment (fk) (A)
H1:- ½×0.23×3.7×25.5 = 10.9^k	10.38	+ 113.14 ↺	H1:- ½×0.356×5.7×25.5 = 25.8	11.05	+ 285.09 ↺
H2:- 0.23×10×9.15 = 21.04	4.57	+ 96.15 ↺	H2:- 0.356×10×9.15 = 32.6	4.57	+ 148.98 ↺
H3:- ½×0.57×10×9.15 = 26.07	3.05	+ 79.51 ↺	H3:- 0.574×10/2×9.15 = 26.3	3.05	+ 80.21 ↺
W1:- 0.23×4.79×10 = 11.02	9.60	− 105.8 ↻	W1:- 0.356×4.79×10 = 17.05	9.6	− 163.68 ↻
W2:- 0.63×6×10 = 37.8	7.00	− 264.6 ↻	W2:- 0.756×6×10 = 45.36	7.00	− 317.5 ↻
Uplift loads :-			Uplift Loads :-		
U1:- 0.29×2.29×10 = 6.65 (−)	10.86	+ 72.22 ↺	U1:- 0.42×2.29×10 = 9.62 (−)	10.86	+ 104.5 ↺
U2:- 0.356×5.71×10 = 20.32 (−)	6.85	+ 139.20 ↺	U2:- 0.48×5.71×10 = 27.41 (−)	6.85	+ 187.8 ↺
U3I:- 0.803×5×10 = 40.15 (−)	7.5	+ 301.13 ↺	U3I:- 0.93×5×10 = 46.50 (−)	7.5	+ 348.75 ↺
U3P:- ½×0.803×15×10 = 60.23 (−)	5	+ 301.13 ↺	U3P:- ½×0.93×15×10 = 69.75 (−)	5	+ 348.75 ↺

IMPERVIOUS SHEETPILE CASE :-

		ΣH	ΣV	ΣM
⇒ At gatepost :-	for water @ el 13.0 :-	$\Sigma H = 58.01^k \leftarrow$	$\Sigma V_I = -18.3^k \uparrow$	$\Sigma M_A = 430.9^{fk}$ ↺(+)
	" " " el 15.0 :-	$\Sigma H = 84.63^k \leftarrow$	$\Sigma V_I = -21.1^k \uparrow$	$\Sigma M_A = 674.2^{fk}$ ↺(+)
⇒ Between gateposts :-	for water @ el 13.0 :	$\Sigma H = 47.11^k \leftarrow$	$\Sigma V_I = -18.3^k \uparrow$	$\Sigma M_A = 317.8^{fk}$ (+) ↺
	" " " 15.0 :	$\Sigma H = 58.8^k \leftarrow$	$\Sigma V_I = -21.1^k \uparrow$	$\Sigma M_A = 389.1^{fk}$ (+) ↺

PERVIOUS SHEETPILE CASE :- (Horizontal forces & moments @ (A) are same as impervious case)

⇒ ... AT ... [illegible] ... el 13.0 ... $\Sigma V = -38.1^k \uparrow$ (−)

Client: PORT OF NEW ORLEANS Project: 504-005

Computations for: Roller Gate no. 7.

Computed by: SUNIL S. Date: 02/95 Checked by: Date:

(c) Wind loads :- (i) At gate-posts :- $H = 0.05 \times 10 \times (15-2.9) = 6.05^k$ ⇄

$M_A = 6.05 \times (15-2.9)/2 = 36.6^{fk}$

~~(ii) Between gateposts :- $H = 0.05 \times 10 \times (9.3-2.9) = 3.2^k$~~

~~$M_A = 3.2 \times (9.3-2.9)/2 = 10.24^{fk}$~~

(d) ~~Forklift load :- Max. axle load = V = 143^K ; Assuming 20' long container~~

Based on elastic analysis on pg 18 (Ct. no. 5 - 08/26/93), assume four rows of piles effective in carrying load of forklift as shown below.

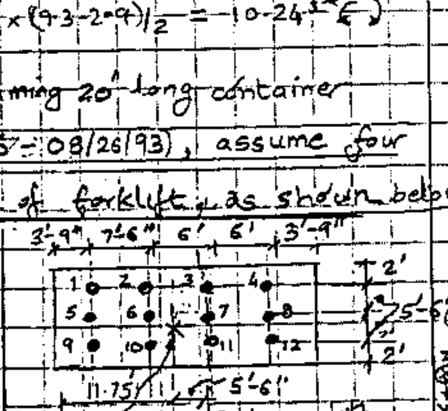
Max. ecc. of load from c.g. of monolith $= \left(\frac{33}{2} - 11\right) = 5.5'$

$\Rightarrow$ Max ecc. @ ℄ design layout $= \left(\frac{27}{2} - 11.75\right) = 1.75'$

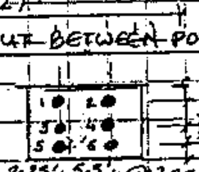
Max "M_A" w/ forklift on F/S = $143 \times 10 = 1430^{f\text{-}k}$ (−)

max "M_A" w/ " on P/S = $143 \times 2 = 286^{f\text{-}k}$ (+)

max "M_y" @ ℄ design layout = $143 \times 1.75 = 251^{f\text{-}k}$ (−)



(a) LAYOUT BETWEEN POSTS



(b) LAYOUT AT GATEPOST

Table of Loads :- (See calcs on pg. 4)

No.	Loadcase	$F_y^{(k)}$	$F_z^{(k)}$	$M_{z@A}^{f\text{-}k}$	$M_y^{f\text{-}k}$
	Monolith @ posts :- (10' section w/ 6 piles under gatepost as shown in Fig (b))				
1.	D.L. + water to el 13.0 (imperv.)	58.01	106.67	−13.40	
2.	" + " el 15.0 (75%) (imperv.)	63.47	77.85	172.41	
3.	D.L. + water to el 13.0 (perv)	58.01	86.50	−13.40	−
4.	D.L. + " " el 15.0 (perv) (75%)	63.47	60.37	172.41	−
5.	D.L + wind (P/S) (75%)	−4.54	93.70	−360.7	−
6.	D.L. + " (F/S) (75%)	4.54	93.70	−305.8	−
7.	D.L. of gate only	−0.30	124.90 k	−444.31	−
	MONOLITH BETWEEN POSTS (27'-0" section w/ 12 piles as shown in Fig (a))				
1.	Same as loadcase at gateposts	127.20	253.30	−237.60	−
2.	"	119.02	184.30	−33.81	−
3.	"	127.20	193.80	−237.60	−
4.	"	119.02	137.10	−33.81	−
5.	D.L + forklift on P/S	−0.60	445.70	−2525.70	−251.0
6.	" " " on F/S	−0.60	445.70	−809.67	−251.0
9.	D.L + forklift on P/S + wind (75%)	−6.48	334.30	−1915.01	−188.3
10.	D.L. + " on F/S + wind (75%)	+6.48	334.30	−586.52	−188.3
7.	D.L. + wind P/S (75%)	−6.48	227.00	−842.50	−
8.	D.L + wind F/S (75%)	+6.48	227.00	−801.10	−
11	D.L. only	−0.60	302.67	−1095.67	−

Client: PORT OF NEW ORLEANS Project: 504-005
Computations for: Roller gate no. 7
Computed by: SUNIL S. Date: 03/95 Checked by: ______ Date: ______

Load combinations :-

(A) Monolith under gateposts :- [10' section w/ 6 piles as shown in fig (b)]

1] D.L + water to el. 13.0 (gate closed, impervious sheetpile) :-

$\Sigma H = 58.01^k (+)$, $\Sigma V = 124.9 - 18.30 = 106.67^k (+)$, $\Sigma M_A = -444.3 + 430.9 = 13.40^{f\cdot k} (-)$

2] D.L. + water to el 15.0 (Gate closed, impervious sheetpile) :- (75% loads)

$\Sigma H = 84.63^k (+)$, $\Sigma V = 124.9 - 21.1 = 103.8^k (+)$, $\Sigma M_A = -444.31 + 674.2 = 229.9^{f\cdot k} (+)$

⇒ 75% Loads ⇒ $\Sigma H = 63.47^k (+)$, $\Sigma V = 77.85^k (+)$, $\Sigma M_A = 172.41^{f\cdot k} (+)$

3] D.L + water to el. 13.0 (Gate closed, pervious sheetpile) :-

$\Sigma H = 58.01^k (+)$, $\Sigma M_A = (-)13.40^{f\cdot k}$, $\Sigma V = 124.9^k - 38.40 = 86.5^k (+)$

4] D.L + water to el 15.0 (Gate closed, pervious sheetpile) (75% loads) :-

$\Sigma H = 63.47^k (+)$, $\Sigma M_A = 172.41^{f\cdot k} (+)$, $\Sigma V = 0.75(124.9 - 44.40) = 60.37^k (+)$

5] D.L + wind from P/S (Gate open, 75% forces) :-

$\Sigma H = 0.75(-6.05) = 4.54(-)^k$, $\Sigma V = (124.9)0.75 = 93.7^k (+)$, $\Sigma M_A = 0.75(-444.3 - 36.6) = 360.7^{fk} (-)$

6] D.L + wind from F/S (Gate open, 75% forces) :-

$\Sigma H = 0.75(6.05) = 4.54^k (+)$, $\Sigma V = 0.75(124.9) = 93.7^k$, $\Sigma M_A = 0.75(-444.3 + 36.6) = 305.8^{fk} (-)$

7] D.L only (Gate open, no wind, no water) :-

$\Sigma H = 0.3^k (-)$, $\Sigma V = 124.9^k (+)$, $\Sigma M_A = 444.31^{fk} (-)$

(B) Monolith between gateposts :- [27'-0" section w/ 12 piles as shown in fig (b)]

(All loads for water & self-wt will be multiplied by $\frac{27}{10} = 2.7$)

1] D.L. + water to el 13.0 (Gate closed, impervious sheetpile) :-

$\Sigma H = 47.11 \times 2.7 = 127.2^k (+)$, $\Sigma V = 2.7(112.1 - 18.3) = 253.3^k$, $\Sigma M_A = 2.7(-405.8 + 317.8) = (-)237.6^{f\cdot k}$

2] D.L + water to el. 15.0 (Gate closed, imperv. sheetpile, 75% loads) :-

$\Sigma H = 0.75 \times 2.7 \times 58.8 = 119.07^k (+)$, $\Sigma V = 0.75 \times 2.7(112.1 - 21.1) = 184.3^k (+)$, $\Sigma M_A = 0.75 \times 2.7(-405.8 + 389.1) = (-) 33.81^{f\cdot k}$

3] D.L. + water to el 13.0 (Gate closed, pervious sheetpile) :-

$\Sigma H = 127.2^k (+)$, $\Sigma M_A = (-)237.6^{f\cdot k}$, $\Sigma V = 2.7 \times (112.1 - 38.4) = 193.0^k (+)$

4] D.L. + water to el 15.0 (Gate closed, perv. sheetpile, 75% loads) :-

$\Sigma H = 119.07^k (+)$, $\Sigma M_A = 33.81^{fk} (-)$, $\Sigma V = 0.75 \times 2.7(112.1 - 44.4) = 137.1^k (+)$

(P.T.O. for remaining loadcases)

Client: PORT OF NEW ORLEANS Project: 504-005

Computations for: Roller gate no. 7

Computed by: SUNIL S. Date: 03/95 Checked by: Date:

(B) (Contd.) :-

5] D.L. + forklift on F/S (Gate open) :-

$\Sigma H = 0.6^k(-)$, $\Sigma V = (112.1)2.7 + 143 = 445.7^k(+)$, $\Sigma M_A = 2.7(-405.8) - 1430$
$= 2525.7^{f\text{-}k}(-)$

6] D.L. + forklift on P/S (Gate open) :-

$\Sigma H = 0.6^k(-)$, $\Sigma V = 445.70^k(+)$, $\Sigma M_A = 2.7(-405.8) + 286.0 = (-)809.67^{fk}$

7] D.L. + wind from P/S (Gate open; 75% loads) :-

$\Sigma H = 2.7 \times 0.75(-3.2) = -6.48^k$, $\Sigma V = 2.7 \times 112.1 \times 0.75 = 227.0^k(+)$

$\Sigma M_A = 0.75 \times 2.7(-405.8 - 10.24) = 842.5^{f\text{-}k}(-)$

8] D.L. + wind from F/S (Gate open, 75% loads) :-

$\Sigma H = 6.48^k(+)$, $\Sigma V = 227.0^k(+)$, $\Sigma M_A = 2.7 \times 0.75(-405.8 + 10.24)$
$= (-)801.1^{fk}$

9] D.L. + forklift on F/S + wind on P/S (Gate open, 75% loads) :-

$\Sigma H = -6.48^k$, $\Sigma V = 0.75(445.7) = 334.3^k(+)$, $\Sigma M_A = 0.75(-2525.7 - 2.7 \times 10.24)$
$= 1915.01^{f\text{-}k}(-)$

10] D.L. + forklift on P/S + wind on F/S (Gate open, 75% loads) :-

$\Sigma H = 6.48^k(+)$, $\Sigma V = 334.30^k(+)$, $\Sigma M_A = 0.75(-809.67 + 2.7 \times 10.24)$
$= -586.52^{f\text{-}k}$

11] D.L. only (Gate open, no water, no wind) :-

$\Sigma H = 0.6^k(-)$, $\Sigma V = 112.1 \times 2.7 = 302.7^k(+)$, $\Sigma M_A = 2.7(-405.8) = 1095.7^{f\text{-}k}(-)$

(Final loads are tabulated on pg. 3.)

The CPGA analyses are given on the following pages. Analyses are attached for the gatepost section & for a section between gateposts.

The analyses indicate that all pile loads, stresses & deflections satisfy the allowable limits. Hence the pile layouts attached on the following pages are satisfactory.

CPGA ANALYSES FOR ROLLER GATE NO. 7

(Two new analyses were performed in 03/95 to account for the changes made in Oct. 1994 to the sill level and base level of roller gate no. 7)

I] ANALYSIS OF MONOLITH AT GATEPOST:

```
DATA FILE: ROL71.D
10      ROLLER GATE NO 7 - MODIFIED ANALYSIS AT GATEPOST - 03/95
20      14 x 14 P.S.C. PILES w/ F.S.= 2
30      PROP 4074. 3201. 3201. 196. 1.5 0.0 ALL
35      SOIL ES .0705 LEN 90. 0. ALL
40      PIN ALL
50      TENSION 0.8 ALL
60      DLS S 129.00 86.00 735.4 253.4 102.56 1553.9 1310.2 H 14. ALL
70      ASC S 196. 457.33 0.82 0.98 2.0 0.0 ALL
80      BATTER 3 3 TO 6
90      BATTER 4 1 2
110     ANGLE 270 1 2
116     ANGLE 90 3 TO 6
120     PILE 1 -3. -8.  0.  2  3. -8. 0.  3 -3. -2.5 0.
121     PILE 4  3. -2.5 0.  5 -3.  3. 0.  6  3.  3.  0.
150     LOAD 1 0. 58.01 106.67 -13.40 0. 0.
160     LOAD 2 0. 63.47 77.85 172.41 0. 0.
170     LOAD 3 0. 58.01 86.50 -13.40 0. 0.
180     LOAD 4 0. 63.47 60.37 172.41 0. 0.
182     LOAD 5 0. -4.54 93.7 -360.7 0. 0.
185     LOAD 6 0. 4.54 93.70 -305.8 0. 0.
187     LOAD 7 0. -0.3 124.9 -444.31 0. 0.
190     FOUT 1 2 4 5 7 C:\CORPS\CPGA\GATES\ROL71.O
200     PFO ALL
210     PLB ALL
```

```
OUTPUT FILE: ROL71.O
 **********************************
 * CORPS PROGRAM  #  X0080        *  CPGA - CASE PILE GROUP ANALYSIS PROGRAM
 * VERSION NUMBER # 1992/02/26    *  RUN DATE 02-MAR-1995   RUN TIME  8.52.00
 **********************************


 ROLLER GATE NO.7 - MODIFIED ANALYSIS AT GATEPOST - 03/95


 THERE ARE    6 PILES AND
              7 LOAD CASES IN THIS RUN.

 ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                        X           Y           Z
                                      -----       -----       -----
 WITH DIAGONAL COORDINATES = (        -3.00 ,     -8.00 ,       .00 )
                             (         3.00 ,      3.00 ,       .00 )

 ********************************************************************************

          PILE PROPERTIES AS INPUT


       E            I1            I2             A             C33           B66
      KSI          IN**4         IN**4          IN**2
  .40740E+04    .32010E+04    .32010E+04    .19600E+03    .15000E+01    .00000E+00
```

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL	LENGTH	L	LU
	K/IN**2		FT	FT
	.70500E-01	L	.90000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-3.00	-8.00	.00	4.00	270.00	90.00	P
2	3.00	-8.00	.00	4.00	270.00	90.00	P
3	-3.00	-2.50	.00	3.00	90.00	90.00	P
4	3.00	-2.50	.00	3.00	90.00	90.00	P
5	-3.00	3.00	.00	3.00	90.00	90.00	P
6	3.00	3.00	.00	3.00	90.00	90.00	P
						------ 540.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	58.0	106.7	-13.4	.0	.0
2	.0	63.5	77.8	172.4	.0	.0
3	.0	58.0	86.5	-13.4	.0	.0
4	.0	63.5	60.4	172.4	.0	.0
5	.0	-4.5	93.7	-360.7	.0	.0
6	.0	4.5	93.7	-305.8	.0	.0
7	.0	-.3	124.9	-444.3	.0	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

TENSION PILE ITERATION.

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.
IT TOOK 1 ITERATIONS.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.
IT TOOK 1 ITERATIONS.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.
IT TOOK 1 ITERATIONS.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.
IT TOOK 1 ITERATIONS.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.7857E-07	.2027E+00	-.3194E-01	-.6964E-03	.8803E-11	.5486E-10
2	.9687E-07	.2287E+00	-.4167E-01	-.7143E-03	.2219E-10	.1383E-09
3	.8097E-07	.2401E+00	-.4654E-01	-.8888E-03	.1775E-10	.1106E-09
4	.9895E-07	.2612E+00	-.5433E-01	-.8810E-03	.2994E-10	.1866E-09
5	-.3190E-07	-.7039E-01	.3189E-01	.2315E-03	-.2730E-10	-.2064E-09
6	-.1539E-07	-.2956E-01	.2203E-01	.8778E-04	-.2185E-10	-.1652E-09
7	-.3200E-07	-.6857E-01	.3646E-01	.2214E-03	-.3297E-10	-.2492E-09

****

PILE FORCES IN LOCAL GEOMETRY
M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.2	.0	-13.6	.0	63.3	.0	.16	.28	1.05	.61	
2	-1.2	.0	-13.6	.0	63.3	.0	.16	.28	1.05	.61	
3	1.1	.0	59.5	.0	-60.5	.0	.46	.24	1.42	.99	#
4	1.1	.0	59.5	.0	-60.5	.0	.46	.24	1.42	.99	#
5	1.2	.0	11.1	.0	-64.9	.0	.09	.22	1.18	.73	
6	1.2	.0	11.1	.0	-64.9	.0	.09	.22	1.18	.73	

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.3	.0	-26.1	.0	70.5	.0	.30	.42	1.00	.53	
2	-1.3	.0	-26.1	.0	70.5	.0	.30	.42	1.00	.53	
3	1.3	.0	58.9	.0	-69.0	.0	.46	.23	1.43	.97	#
4	1.3	.0	58.9	.0	-69.0	.0	.46	.23	1.43	.97	#
5	1.4	.0	9.3	.0	-73.6	.0	.07	.25	1.19	.71	
6	1.4	.0	9.3	.0	-73.6	.0	.07	.25	1.19	.71	

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.4	.0	-18.3	.0	74.8	.0	.21	.35	1.05	.56	
2	-1.4	.0	-18.3	.0	74.8	.0	.21	.35	1.05	.56	
3	1.4	.0	63.3	.0	-72.3	.0	.49	.26	1.46	.98	#
4	1.4	.0	63.3	.0	-72.3	.0	.49	.26	1.46	.98	#
5	1.5	.0	1.6	.0	-78.0	.0	.01	.29	1.16	.66	
6	1.5	.0	1.6	.0	-78.0	.0	.01	.29	1.16	.66	

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.5	.0	-30.2	.0	80.5	.0	.35	.49	1.00	.49	
2	-1.5	.0	-30.2	.0	80.5	.0	.35	.49	1.00	.49	
3	1.5	.0	62.2	.0	-79.2	.0	.48	.25	1.47	.96	#
4	1.5	.0	62.2	.0	-79.2	.0	.48	.25	1.47	.96	#
5	1.6	.0	1.1	.0	-84.9	.0	.01	.30	1.17	.64	
6	1.6	.0	1.1	.0	-84.9	.0	.01	.30	1.17	.64	

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.4	.0	29.3	.0	-20.4	.0	.23	.11	1.17	.93	#
2	.4	.0	29.3	.0	-20.4	.0	.23	.11	1.17	.93	#
3	-.4	.0	1.6	.0	23.1	.0	.01	.19	1.04	.78	
4	-.4	.0	1.6	.0	23.1	.0	.01	.19	1.04	.78	
5	-.5	.0	17.6	.0	24.5	.0	.14	.13	1.12	.86	#
6	-.5	.0	17.6	.0	24.5	.0	.14	.13	1.12	.86	#

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.1	.0	22.6	.0	-7.8	.0	.18	.12	1.11	.92	#
2	.1	.0	22.6	.0	-7.8	.0	.18	.12	1.11	.92	#
3	-.2	.0	10.0	.0	10.6	.0	.08	.14	1.05	.85	#
4	-.2	.0	10.0	.0	10.6	.0	.08	.14	1.05	.85	#
5	-.2	.0	16.1	.0	11.1	.0	.13	.13	1.09	.88	#
6	-.2	.0	16.1	.0	11.1	.0	.13	.13	1.09	.88	#

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.4	.0	34.8	.0	-19.4	.0	.27	.10	1.20	.96	#
2	.4	.0	34.8	.0	-19.4	.0	.27	.10	1.20	.96	#
3	-.4	.0	7.3	.0	23.0	.0	.06	.17	1.07	.81	
4	-.4	.0	7.3	.0	23.0	.0	.06	.17	1.07	.81	
5	-.5	.0	22.7	.0	24.4	.0	.18	.12	1.15	.88	#
6	-.5	.0	22.7	.0	24.4	.0	.18	.12	1.15	.88	#

****

PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	4.4	-12.9	.0	.0	.0
2	.0	4.4	-12.9	.0	.0	.0
3	.0	19.9	56.1	.0	.0	.0
4	.0	19.9	56.1	.0	.0	.0
5	.0	4.7	10.2	.0	.0	.0
6	.0	4.7	10.2	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	7.6	-25.0	.0	.0	.0
2	.0	7.6	-25.0	.0	.0	.0
3	.0	19.9	55.5	.0	.0	.0
4	.0	19.9	55.5	.0	.0	.0
5	.0	4.3	8.4	.0	.0	.0
6	.0	4.3	8.4	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	5.8	-17.4	.0	.0	.0
2	.0	5.8	-17.4	.0	.0	.0
3	.0	21.3	59.6	.0	.0	.0
4	.0	21.3	59.6	.0	.0	.0
5	.0	1.9	1.0	.0	.0	.0
6	.0	1.9	1.0	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	8.8	-28.9	.0	.0	.0
2	.0	8.8	-28.9	.0	.0	.0
3	.0	21.1	58.6	.0	.0	.0
4	.0	21.1	58.6	.0	.0	.0
5	.0	1.9	.5	.0	.0	.0
6	.0	1.9	.5	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-7.5	28.4	.0	.0	.0
2	.0	-7.5	28.4	.0	.0	.0
3	.0	.1	1.6	.0	.0	.0
4	.0	.1	1.6	.0	.0	.0
5	.0	5.1	16.9	.0	.0	.0
6	.0	5.1	16.9	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-5.6	21.9	.0	.0	.0
2	.0	-5.6	21.9	.0	.0	.0
3	.0	3.0	9.6	.0	.0	.0
4	.0	3.0	9.6	.0	.0	.0
5	.0	4.9	15.4	.0	.0	.0
6	.0	4.9	15.4	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-8.8	33.7	.0	.0	.0
2	.0	-8.8	33.7	.0	.0	.0
3	.0	1.9	7.1	.0	.0	.0
4	.0	1.9	7.1	.0	.0	.0
5	.0	6.7	21.7	.0	.0	.0
6	.0	6.7	21.7	.0	.0	.0

II] ANALYSIS OF MONOLITH BETWEEN GATEPOSTS:

DATA FILE: ROL72.D

```
10      ROLLER GATE NO 7 - MODIFIED ANALYSIS BETWEEN GATEPOSTS - 03/95
20      14 x 14 P.S.C. PILES w/ F.S.= 2
30      PROP 4074. 3201. 3201. 196. 1.5 0.0 ALL
35      SOIL ES .0705 LEN 90. 0. ALL
40      PIN ALL
50      TENSION 0.8 ALL
60      DLS S 129.00 86.00 735.4 253.4 102.56 1553.9 1310.2 H 14. ALL
70      ASC S 196. 457.33 0.82 0.98 2.0 0.0 ALL
90      BATTER 4 1 TO 3
100     BATTER 3 4 TO 12
110     ANGLE 270 1 TO 4
116     ANGLE 90 5 TO 12
120     PILE 1 -9.75 -8. 0.  2 -2.25 -8. 0.   3 3.75 -8. 0.
121     PILE 4 9.75 -8. 0.  5 -9.75 -2.5 0.  6 -2.25 -2.5 0.
122     PILE 7 3.75 -2.5 0.  8 9.75 -2.5 0.  9 -9.75 3. 0.
123     PILE 10 -2.25 3. 0.  11 3.75 3.0 0.   12 9.75 3. 0.
150     LOAD 1 0. 127.2 253.3 -237.6 0. 0.
160     LOAD 2 0. 119.0 184.3 -33.8 0. 0.
165     LOAD 3 0. 127.2 193.0 -237.6 0. 0.
166     LOAD 4 0. 119.0 137.1 -33.8 0. 0.
170     LOAD 5 0. -0.6 445.7 -2525.7 -251. 0.
180     LOAD 6 0. -0.6 445.7 -809.7 -251. 0.
181     LOAD 7 0. -6.5 227. -842.5  0. 0.
182     LOAD 8 0. 6.5 227. -801.1 0. 0.
183     LOAD 9 0. -6.5 334.3 -1915. -188.3 0.
184     LOAD 10 0. 6.5 334.3 -586.2 -188.3 0.
187     LOAD 11 0. 0. 302.67 -1095.7 0. 0.
190     FOUT 1 2 4 5 7 C:\CORPS\CPGA\GATES\ROL72.O
200     PFO ALL
210     PLB ALL
```

OUTPUT FILE: ROL62.O

```
**********************************
* CORPS PROGRAM  #  X0080        *  CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 1992/02/26    *  RUN DATE 02-MAR-1995   RUN TIME  8.53.32
**********************************
```

ROLLER GATE NO 7 - MODIFIED ANALYSIS BETWEEN GATEPOSTS - 03/95

THERE ARE 12 PILES AND
11 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

```
                                     X          Y          Z
                                   -----      -----      -----
WITH DIAGONAL COORDINATES = (      -9.75 ,    -8.00 ,      .00 )
                            (       9.75 ,     3.00 ,      .00 )
```

****

PILE PROPERTIES AS INPUT

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.40740E+04	.32010E+04	.32010E+04	.19600E+03	.15000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.70500E-01	L	.90000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-9.75	-8.00	.00	4.00	270.00	90.00	P
2	-2.25	-8.00	.00	4.00	270.00	90.00	P
3	3.75	-8.00	.00	4.00	270.00	90.00	P
4	9.75	-8.00	.00	3.00	270.00	90.00	P
5	-9.75	-2.50	.00	3.00	90.00	90.00	P
6	-2.25	-2.50	.00	3.00	90.00	90.00	P

7	3.75	-2.50	.00	3.00	90.00	90.00	P
8	9.75	-2.50	.00	3.00	90.00	90.00	P
9	-9.75	3.00	.00	3.00	90.00	90.00	P
10	-2.25	3.00	.00	3.00	90.00	90.00	P
11	3.75	3.00	.00	3.00	90.00	90.00	P
12	9.75	3.00	.00	3.00	90.00	90.00	P

						1080.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	127.2	253.3	-237.6	.0	.0
2	.0	119.0	184.3	-33.8	.0	.0
3	.0	127.2	193.0	-237.6	.0	.0
4	.0	119.0	137.1	-33.8	.0	.0
5	.0	-.6	445.7	-2525.7	-251.0	.0
6	.0	-.6	445.7	-809.7	-251.0	.0
7	.0	-6.5	227.0	-842.5	.0	.0
8	.0	6.5	227.0	-801.1	.0	.0
9	.0	-6.5	334.3	-1915.0	-188.3	.0
10	.0	6.5	334.3	-586.2	-188.3	.0
11	.0	.0	302.7	-1095.7	.0	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 8.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 8.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 8. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 9. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 1.

LOAD CASE 10. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 11. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

TENSION PILE ITERATION.

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.
IT TOOK 1 ITERATIONS.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.
IT TOOK 1 ITERATIONS.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 8.
IT TOOK 1 ITERATIONS.

```
LOAD CASE    4.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   8.
                 IT TOOK 1 ITERATIONS.

LOAD CASE    5.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   2.
                 IT TOOK 1 ITERATIONS.

LOAD CASE    6.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   4.
                 IT TOOK 1 ITERATIONS.

LOAD CASE    9.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   1.
                 IT TOOK 1 ITERATIONS.

LOAD CASE   10.  NUMBER OF FAILURES =   0.  NUMBER OF PILES IN TENSION =   4.
                 IT TOOK 1 ITERATIONS.
```

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PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.5210E-02	.2318E+00	-.3706E-01	-.8943E-03	-.3294E-04	-.1737E-03
2	.5416E-02	.2310E+00	-.4243E-01	-.8699E-03	-.3723E-04	-.1805E-03
3	.6459E-02	.2865E+00	-.5921E-01	-.1193E-02	-.4506E-04	-.2153E-03
4	.6423E-02	.2747E+00	-.6043E-01	-.1114E-02	-.4667E-04	-.2141E-03
5	-.4021E-03	.5871E-01	.6411E-02	-.7401E-03	-.2002E-04	.1340E-04
6	-.4558E-02	-.2433E+00	.1044E+00	.1219E-02	.2833E-04	.1519E-03
7	-.2325E-02	-.6698E-01	.3395E-01	.2152E-03	.2594E-04	.7750E-04
8	-.1519E-02	-.3313E-01	.2533E-01	.7538E-04	.1938E-04	.5063E-04
9	-.6510E-03	.2839E-01	.8839E-02	-.4902E-03	-.1173E-04	.2170E-04
10	-.2948E-02	-.1620E+00	.7332E-01	.8285E-03	.1741E-04	.9827E-04
11	-.2563E-02	-.6675E-01	.3953E-01	.1937E-03	.3022E-04	.8542E-04

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.5	-.1	-15.6	-3.5	78.9	.0	.18	.33	1.08	.56	
2	-1.4	-.1	-9.7	-3.5	74.4	.0	.11	.26	1.10	.60	
3	-1.3	-.1	-4.9	-3.5	70.9	.0	.06	.20	1.12	.63	
4	-1.3	-.1	-15.0	-3.5	67.1	.0	.17	.30	1.06	.59	
5	1.4	.0	73.6	.0	-75.2	.0	.57	.33	1.52	1.03	#
6	1.3	.0	71.2	.0	-70.4	.0	.55	.32	1.50	1.03	#
7	1.3	.0	69.4	.0	-66.5	.0	.54	.30	1.48	1.03	#
8	1.2	.0	67.5	.0	-62.6	.0	.52	.29	1.46	1.03	#
9	1.5	-.1	11.5	-3.5	-81.0	.0	.09	.25	1.22	.69	
10	1.4	-.1	9.2	-3.5	-76.1	.0	.07	.25	1.20	.69	
11	1.4	-.1	7.3	-3.5	-72.2	.0	.06	.25	1.18	.69	
12	1.3	-.1	5.4	-3.5	-68.3	.0	.04	.25	1.16	.69	

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.5	-.1	-22.6	-3.7	78.3	.0	.26	.40	1.04	.53	
2	-1.4	-.1	-16.3	-3.7	73.7	.0	.19	.33	1.07	.57	
3	-1.3	-.1	-11.2	-3.7	70.0	.0	.13	.26	1.08	.60	
4	-1.2	-.1	-20.6	-3.7	65.9	.0	.24	.36	1.03	.56	
5	1.4	.0	66.7	.0	-75.9	.0	.52	.28	1.49	.99	#
6	1.3	.0	64.5	.0	-70.8	.0	.50	.27	1.46	.99	#
7	1.3	.0	62.8	.0	-66.7	.0	.49	.26	1.45	.99	#
8	1.2	.0	61.0	.0	-62.7	.0	.47	.25	1.43	.99	#
9	1.5	-.1	6.3	-3.7	-81.5	.0	.05	.27	1.20	.67	
10	1.4	-.1	4.1	-3.7	-76.4	.0	.03	.27	1.18	.67	
11	1.4	-.1	2.4	-3.7	-72.3	.0	.02	.27	1.16	.67	
12	1.3	-.1	.6	-3.7	-68.3	.0	.00	.27	1.14	.67	

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.8	-.1	-24.0	-4.4	97.1	.0	.28	.46	1.08	.48	
2	-1.7	-.1	-16.3	-4.4	91.6	.0	.19	.36	1.11	.53	
3	-1.6	-.1	-10.2	-4.4	87.2	.0	.12	.29	1.13	.57	
4	-1.6	-.1	-22.3	-4.4	82.5	.0	.26	.41	1.06	.52	
5	1.8	.0	79.1	.0	-94.1	.0	.61	.37	1.59	1.02	#
6	1.7	.0	76.6	.0	-88.0	.0	.59	.35	1.56	1.02	#
7	1.6	.0	74.6	.0	-83.2	.0	.58	.34	1.54	1.02	#
8	1.5	.0	72.6	.0	-78.3	.0	.56	.32	1.52	1.02	#
9	1.9	-.1	-3.0	-4.4	-101.8	.0	.03	.24	1.20	.57	
10	1.8	-.1	-5.0	-4.4	-95.7	.0	.06	.25	1.17	.58	
11	1.7	-.1	-6.6	-4.4	-90.9	.0	.08	.26	1.15	.58	
12	1.6	-.1	-8.2	-4.4	-86.0	.0	.10	.27	1.14	.58	

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.7	-.1	-29.2	-4.4	92.9	.0	.34	.50	1.04	.46	
2	-1.6	-.1	-21.4	-4.4	87.4	.0	.25	.41	1.07	.51	
3	-1.6	-.1	-15.2	-4.4	83.0	.0	.18	.34	1.09	.55	
4	-1.5	-.1	-26.3	-4.4	78.2	.0	.31	.44	1.03	.51	
5	1.7	.0	71.0	.0	-91.0	.0	.55	.31	1.54	.98	#
6	1.6	.0	68.6	.0	-84.9	.0	.53	.30	1.52	.98	#
7	1.5	.0	66.8	.0	-80.1	.0	.52	.29	1.50	.99	#
8	1.4	.0	64.9	.0	-75.2	.0	.50	.27	1.48	.99	#
9	1.8	-.1	-5.1	-4.4	-98.2	.0	.06	.26	1.18	.57	
10	1.7	-.1	-7.0	-4.4	-92.1	.0	.08	.27	1.16	.57	
11	1.6	-.1	-8.5	-4.4	-87.3	.0	.10	.27	1.14	.58	
12	1.6	-.1	-10.0	-4.4	-82.4	.0	.12	.28	1.12	.58	

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.4	.0	65.4	.3	22.7	.0	.51	.28	1.36	1.10	#
2	-.4	.0	67.1	.3	23.2	.0	.52	.29	1.37	1.11	#
3	-.4	.0	68.4	.3	23.6	.0	.53	.30	1.38	1.12	#
4	-.5	.0	62.8	.3	25.4	.0	.49	.26	1.36	1.08	#
5	.3	.0	47.7	.0	-14.2	.0	.37	.16	1.25	1.03	#
6	.3	.0	50.0	.0	-14.3	.0	.39	.17	1.27	1.04	#
7	.3	.0	51.9	.0	-14.5	.0	.40	.19	1.28	1.05	#
8	.3	.0	53.7	.0	-14.6	.0	.42	.20	1.29	1.06	#
9	.4	.0	-3.0	.3	-18.9	.0	.03	.07	1.01	.76	
10	.4	.0	-1.1	.3	-19.1	.0	.01	.05	1.02	.77	
11	.4	.0	.5	.3	-19.3	.0	.00	.19	1.03	.78	
12	.4	.0	2.3	.3	-19.4	.0	.02	.18	1.03	.79	

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	1.5	.1	60.2	3.1	-78.9	.0	.47	.24	1.47	.95	#
2	1.4	.1	53.7	3.1	-75.0	.0	.42	.20	1.42	.92	#
3	1.4	.1	48.6	3.1	-71.9	.0	.38	.17	1.39	.90	
4	1.3	.1	62.3	3.1	-67.6	.0	.48	.26	1.45	.98	#
5	-1.6	.0	-13.4	.0	83.4	.0	.16	.31	1.09	.57	
6	-1.5	.0	-11.7	.0	79.2	.0	.14	.29	1.09	.59	
7	-1.4	.0	-10.3	.0	75.8	.0	.12	.27	1.09	.60	
8	-1.4	.0	-9.0	.0	72.4	.0	.10	.24	1.09	.62	
9	-1.7	.1	67.9	3.1	91.3	.0	.53	.29	1.53	.96	#
10	-1.6	.1	70.1	3.1	87.0	.0	.54	.31	1.53	.98	#
11	-1.6	.1	71.7	3.1	83.6	.0	.56	.32	1.54	1.00	#
12	-1.5	.1	73.4	3.1	80.2	.0	.57	.33	1.54	1.01	#

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.4	.0	38.0	1.6	-21.6	.0	.29	.09	1.22	.96	#
2	.4	.0	33.6	1.6	-19.6	.0	.26	.10	1.20	.95	#
3	.3	.0	30.1	1.6	-18.1	.0	.23	.11	1.18	.93	#
4	.3	.0	31.1	1.6	-16.0	.0	.24	.11	1.18	.94	#
5	-.5	.0	5.5	.0	25.3	.0	.04	.18	1.06	.79	
6	-.4	.0	5.4	.0	23.0	.0	.04	.17	1.06	.80	
7	-.4	.0	5.4	.0	21.2	.0	.04	.17	1.05	.80	
8	-.4	.0	5.4	.0	19.4	.0	.04	.17	1.05	.81	
9	-.5	.0	20.4	1.6	26.6	.0	.16	.12	1.15	.86	#
10	-.5	.0	20.4	1.6	24.4	.0	.16	.12	1.14	.87	#
11	-.4	.0	20.4	1.6	22.6	.0	.16	.12	1.14	.87	#
12	-.4	.0	20.4	1.6	20.7	.0	.16	.12	1.13	.88	#

LOAD CASE - 8

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.2	.0	32.4	1.0	-10.2	.0	.25	.10	1.17	.96	#
2	.2	.0	29.3	1.0	-8.9	.0	.23	.11	1.15	.95	#
3	.1	.0	26.8	1.0	-8.0	.0	.21	.11	1.14	.94	#
4	.1	.0	26.2	1.0	-6.4	.0	.20	.11	1.13	.94	#
5	-.3	.0	13.0	.0	13.9	.0	.10	.13	1.08	.86	#
6	-.2	.0	12.7	.0	12.4	.0	.10	.14	1.07	.86	#
7	-.2	.0	12.5	.0	11.2	.0	.10	.14	1.07	.86	#
8	-.2	.0	12.3	.0	10.0	.0	.10	.14	1.06	.86	#
9	-.3	.0	18.2	1.0	14.4	.0	.14	.13	1.11	.88	#
10	-.2	.0	18.0	1.0	12.9	.0	.14	.13	1.10	.88	#
11	-.2	.0	17.8	1.0	11.7	.0	.14	.13	1.10	.88	#
12	-.2	.0	17.6	1.0	10.5	.0	.14	.13	1.09	.88	#

LOAD CASE - 9

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.2	.0	51.7	.4	11.8	.0	.40	.19	1.27	1.06	#
2	-.2	.0	52.3	.4	12.5	.0	.41	.19	1.28	1.06	#
3	-.2	.0	52.8	.4	13.0	.0	.41	.19	1.28	1.06	#
4	-.3	.0	49.4	.4	14.6	.0	.38	.17	1.27	1.04	#
5	.1	.0	32.4	.0	-5.4	.0	.25	.10	1.16	.97	#
6	.1	.0	34.2	.0	-5.9	.0	.27	.10	1.17	.98	#
7	.1	.0	35.6	.0	-6.3	.0	.28	.10	1.18	.99	#
8	.1	.0	37.1	.0	-6.6	.0	.29	.09	1.18	.99	#
9	.2	.0	-1.3	.4	-8.6	.0	.02	.03	.99	.79	
10	.2	.0	.2	.4	-9.0	.0	.00	.17	1.00	.80	
11	.2	.0	1.6	.4	-9.4	.0	.01	.17	1.01	.81	
12	.2	.0	3.0	.4	-9.8	.0	.02	.16	1.02	.81	

LOAD CASE - 10

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	1.0	.0	42.2	2.0	-52.3	.0	.33	.12	1.31	.92	#
2	.9	.0	38.1	2.0	-49.7	.0	.30	.09	1.29	.90	#
3	.9	.0	34.8	2.0	-47.7	.0	.27	.10	1.27	.89	#
4	.8	.0	44.1	2.0	-44.9	.0	.34	.13	1.31	.94	#
5	-1.0	.0	-6.2	.0	55.7	.0	.07	.18	1.07	.67	
6	-1.0	.0	-5.0	.0	53.0	.0	.06	.16	1.07	.68	
7	-1.0	.0	-4.1	.0	50.8	.0	.05	.15	1.07	.69	
8	-.9	.0	-3.1	.0	48.6	.0	.04	.13	1.07	.70	
9	-1.2	.0	49.8	2.0	61.1	.0	.39	.17	1.37	.94	#
10	-1.1	.0	51.3	2.0	58.3	.0	.40	.18	1.37	.95	#
11	-1.1	.0	52.5	2.0	56.1	.0	.41	.19	1.37	.96	#
12	-1.0	.0	53.6	2.0	53.9	.0	.42	.20	1.38	.97	#

LOAD CASE - 11

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.4	.0	47.0	1.7	-21.2	.0	.36	.15	1.27	1.01	#
2	.4	.0	42.0	1.7	-19.1	.0	.33	.12	1.24	.99	#
3	.3	.0	38.0	1.7	-17.4	.0	.29	.09	1.22	.97	#
4	.3	.0	38.2	1.7	-14.9	.0	.30	.10	1.21	.98	#
5	-.5	.0	12.3	.0	26.1	.0	.10	.15	1.10	.83	
6	-.4	.0	12.1	.0	23.6	.0	.09	.15	1.09	.83	
7	-.4	.0	12.0	.0	21.6	.0	.09	.14	1.09	.83	
8	-.4	.0	11.8	.0	19.6	.0	.09	.14	1.08	.84	
9	-.5	.0	25.7	1.7	27.4	.0	.20	.11	1.17	.89	#
10	-.5	.0	25.6	1.7	24.8	.0	.20	.11	1.17	.89	#
11	-.4	.0	25.4	1.7	22.8	.0	.20	.11	1.16	.90	#
12	-.4	.0	25.3	1.7	20.8	.0	.20	.11	1.16	.90	#

****

PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-.1	5.2	-14.8	.0	.0	.0
2	-.1	3.7	-9.0	.0	.0	.0
3	-.1	2.5	-4.5	.0	.0	.0
4	-.1	6.0	-13.9	.0	.0	.0
5	.0	24.6	69.4	.0	.0	.0
6	.0	23.8	67.2	.0	.0	.0
7	.0	23.1	65.4	.0	.0	.0
8	.0	22.5	63.6	.0	.0	.0
9	.1	5.1	10.4	.0	.0	.0
10	.1	4.3	8.2	.0	.0	.0
11	.1	3.6	6.5	.0	.0	.0
12	.1	2.9	4.7	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-.1	6.9	-21.6	.0	.0	.0
2	-.1	5.3	-15.4	.0	.0	.0
3	-.1	4.0	-10.5	.0	.0	.0
4	-.1	7.7	-19.2	.0	.0	.0
5	.0	22.4	62.8	.0	.0	.0
6	.0	21.7	60.8	.0	.0	.0
7	.0	21.0	59.1	.0	.0	.0
8	.0	20.4	57.5	.0	.0	.0
9	.1	3.4	5.5	.0	.0	.0
10	.1	2.7	3.4	.0	.0	.0
11	.1	2.0	1.8	.0	.0	.0
12	.1	1.4	.2	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-.1	7.6	-22.8	.0	.0	.0
2	-.1	5.6	-15.4	.0	.0	.0
3	-.1	4.1	-9.5	.0	.0	.0
4	-.1	8.5	-20.7	.0	.0	.0
5	.0	26.7	74.5	.0	.0	.0
6	.0	25.8	72.1	.0	.0	.0
7	.0	25.1	70.3	.0	.0	.0
8	.0	24.3	68.4	.0	.0	.0
9	.1	.9	-3.4	.0	.0	.0
10	.1	.1	-5.3	.0	.0	.0
11	.1	-.5	-6.8	.0	.0	.0
12	.1	-1.1	-8.3	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-.1	8.8	-27.9	.0	.0	.0
2	-.1	6.8	-20.4	.0	.0	.0
3	-.1	5.2	-14.4	.0	.0	.0
4	-.1	9.7	-24.5	.0	.0	.0
5	.0	24.1	66.8	.0	.0	.0
6	.0	23.2	64.6	.0	.0	.0
7	.0	22.5	62.9	.0	.0	.0
8	.0	21.9	61.1	.0	.0	.0
9	.1	.1	-5.4	.0	.0	.0
10	.1	-.6	-7.2	.0	.0	.0
11	.1	-1.1	-8.5	.0	.0	.0
12	.1	-1.7	-9.9	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-15.5	63.6	.0	.0	.0
2	.0	-15.8	65.2	.0	.0	.0
3	.0	-16.1	66.4	.0	.0	.0
4	.0	-19.4	59.7	.0	.0	.0
5	.0	15.3	45.1	.0	.0	.0
6	.0	16.1	47.3	.0	.0	.0
7	.0	16.7	49.1	.0	.0	.0
8	.0	17.2	50.9	.0	.0	.0
9	.0	-.6	-2.9	.0	.0	.0
10	.0	.0	-1.2	.0	.0	.0
11	.0	.5	.3	.0	.0	.0
12	.0	1.1	2.1	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.1	-16.0	58.0	.0	.0	.0
2	.1	-14.4	51.8	.0	.0	.0
3	.1	-13.1	46.8	.0	.0	.0
4	.1	-20.9	58.7	.0	.0	.0
5	.0	-5.7	-12.2	.0	.0	.0
6	.0	-5.1	-10.6	.0	.0	.0
7	.0	-4.6	-9.4	.0	.0	.0
8	.0	-4.1	-8.1	.0	.0	.0
9	-.1	19.9	65.0	.0	.0	.0
10	-.1	20.6	67.0	.0	.0	.0
11	-.1	21.2	68.6	.0	.0	.0
12	-.1	21.8	70.1	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-9.6	36.8	.0	.0	.0
2	.0	-8.5	32.5	.0	.0	.0
3	.0	-7.6	29.1	.0	.0	.0
4	.0	-10.1	29.4	.0	.0	.0
5	.0	1.3	5.3	.0	.0	.0
6	.0	1.3	5.3	.0	.0	.0
7	.0	1.3	5.3	.0	.0	.0
8	.0	1.4	5.3	.0	.0	.0
9	.0	6.0	19.5	.0	.0	.0
10	.0	6.0	19.5	.0	.0	.0
11	.0	6.0	19.5	.0	.0	.0
12	.0	6.1	19.4	.0	.0	.0

LOAD CASE - 8

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-8.0	31.4	.0	.0	.0
2	.0	-7.3	28.4	.0	.0	.0
3	.0	-6.7	26.0	.0	.0	.0
4	.0	-8.4	24.8	.0	.0	.0
5	.0	3.9	12.4	.0	.0	.0
6	.0	3.8	12.1	.0	.0	.0
7	.0	3.8	12.0	.0	.0	.0
8	.0	3.7	11.8	.0	.0	.0
9	.0	5.5	17.3	.0	.0	.0
10	.0	5.4	17.1	.0	.0	.0
11	.0	5.4	16.9	.0	.0	.0
12	.0	5.4	16.7	.0	.0	.0

LOAD CASE - 9

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-12.3	50.2	.0	.0	.0
2	.0	-12.5	50.8	.0	.0	.0
3	.0	-12.6	51.3	.0	.0	.0
4	.0	-15.4	47.0	.0	.0	.0
5	.0	10.3	30.7	.0	.0	.0
6	.0	10.9	32.4	.0	.0	.0
7	.0	11.4	33.8	.0	.0	.0
8	.0	11.8	35.1	.0	.0	.0
9	.0	-.3	-1.3	.0	.0	.0
10	.0	.2	.1	.0	.0	.0
11	.0	.7	1.4	.0	.0	.0
12	.0	1.1	2.8	.0	.0	.0

LOAD CASE - 10

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-11.2	40.7	.0	.0	.0
2	.0	-10.1	36.7	.0	.0	.0
3	.0	-9.3	33.6	.0	.0	.0
4	.0	-14.7	41.6	.0	.0	.0
5	.0	-2.9	-5.5	.0	.0	.0
6	.0	-2.5	-4.4	.0	.0	.0
7	.0	-2.2	-3.6	.0	.0	.0
8	.0	-1.9	-2.7	.0	.0	.0
9	.0	14.7	47.6	.0	.0	.0
10	.0	15.2	49.0	.0	.0	.0
11	.0	15.6	50.1	.0	.0	.0
12	.0	16.0	51.2	.0	.0	.0

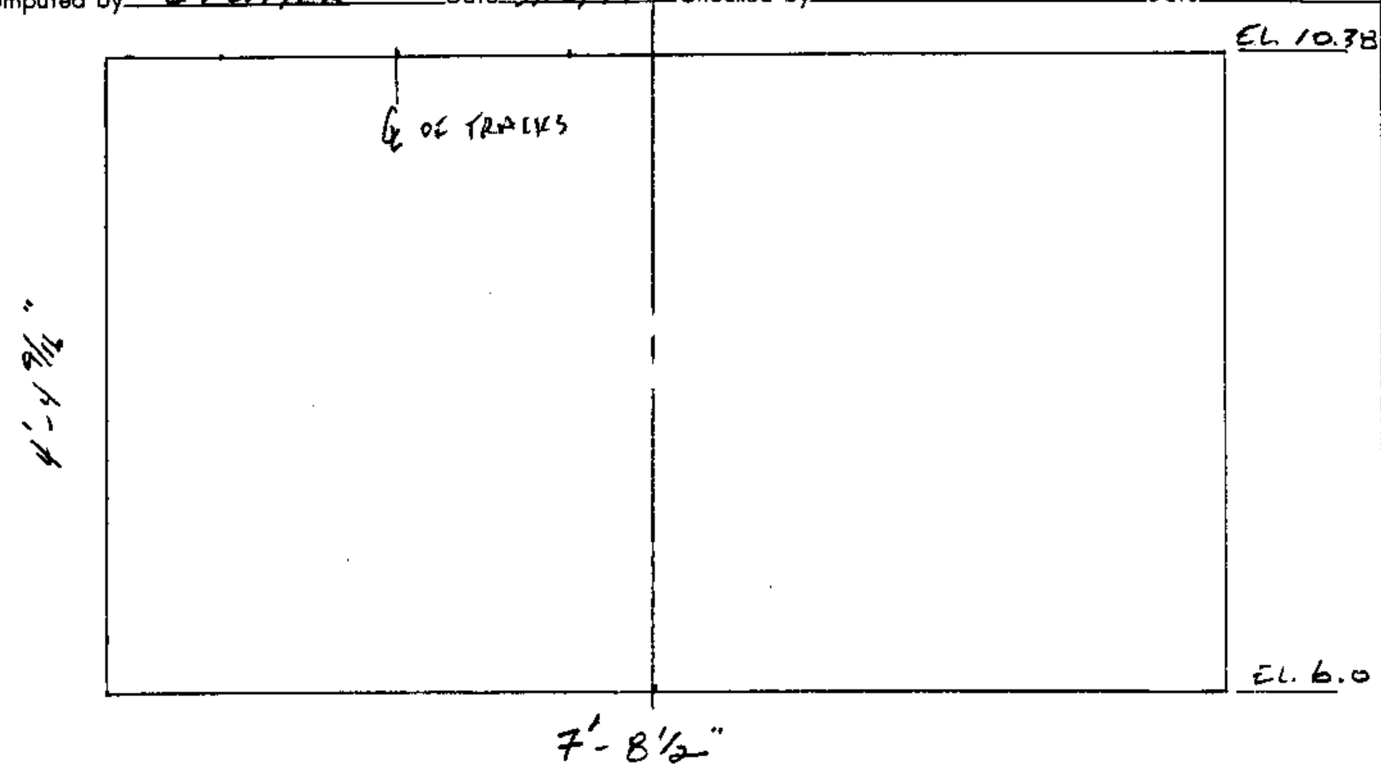
LOAD CASE - 11

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-11.8	45.5	.0	.0	.0
2	.0	-10.5	40.6	.0	.0	.0
3	.0	-9.5	36.8	.0	.0	.0
4	.0	-12.3	36.2	.0	.0	.0
5	.0	3.4	11.8	.0	.0	.0
6	.0	3.4	11.6	.0	.0	.0
7	.0	3.4	11.5	.0	.0	.0
8	.0	3.4	11.4	.0	.0	.0
9	.0	7.6	24.6	.0	.0	.0
10	.0	7.6	24.4	.0	.0	.0
11	.0	7.6	24.3	.0	.0	.0
12	.0	7.6	24.1	.0	.0	.0

Client: PORT OF NEW ORLEANS Project: ____

Computations for: ROLLER GATE #6 STORAGE MONOLITH PILE DESIGN

Computed by: G FLITTER Date: 3/18/97 Checked by: ____ Date: ____



WT. OF STORAGE MONOLITH

$W_1 = 0.15 \text{ KIPS/FT}^2 (7.7083 \text{ FT} * 4.3802 \text{ FT})$

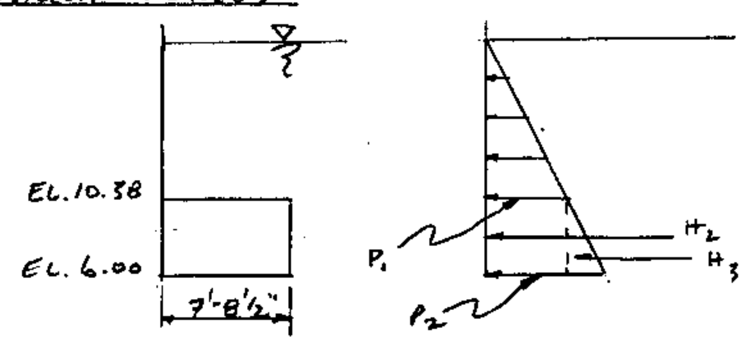
$W_1 = 5.06 \text{ KIPS/FT} \downarrow$

GATE WEIGHT

$W_G = 0.3 \text{ KIPS/FT} \downarrow$

ASSUME GATE C.G. IS @ ℄ OF TRACKS WHICH IS 8" FROM THE CENTER OF THE STORAGE MONOLITH.

HYDRAULIC FORCES



20 *

Client: PORT OF NEW ORLEANS Project:
Computations for: ROLLER GATE # 6 STORAGE MONOLITH PILE DESIGN
Computed by: G. FLITTER Date: 3/18/97 Checked by: Date:

WATER UP TO ELEV. 13.0

$P_1 = 0.0624$ KIPS/FT³ * (13.0 - 10.38) = 0.163 KSF

$P_2 = 0.0624$ KIPS/FT³ * (13.0 - 6.0) = 0.437 KSF

COMPONENT: (K/FT) * ARM (FT) = MOMENT (FT·K/FT)

H_2: 0.163 KSF * 4.38' = 0.71 * 2.19 = 1.56

H_3: ½ * (0.437 - 0.163) * 4.38' = 0.60 * (⅓)(4.38) = 0.88

$U_1 - N_1$: (0.437 - 0.163) * 7.7083 = 2.11 * 0 = 0

Total = 2.44

P = 2.11 K/FT ↑

H = 1.31 K/FT ←

M_A = 2.44 FT·K ↺

WATER UP TO ELEV. 15.0

$P_1 = 0.0624$ KIPS/FT³ * (15.0 - 10.38) = 0.29 KSF

$P_2 = 0.0624$ KIPS/FT³ * (150 - 6.0) = 0.56 KSF

H_2 = 0.29 KSF * 4.38' = 1.27 * 2.19 = 2.78 FT·K/FT

H_3 = ½ * (0.56 - 0.29) * 4.38 = 0.59 * ⅓(4.38) = 0.86 FT·K/FT

W_1 = (0.56 - 0.29) * 7.7083 = 2.08 * 0 = 0.0

Total = 3.64 FT·K/FT

P = 2.08 K/FT ↑

H = 1.86 K/FT ←

M = 3.64 K·FT ↺

Client PORT OF NEW ORLEANS Project
Computations for ROLLER GATE NO.6 STORAGE MONOLITH PILE DESIGN
Computed by G. FLITTER Date 3/18/97 Checked by Date

WIND LOAD

$P = 50 \text{ PSF} = 0.05 \text{ KSF}$

$H = 0.05 * (15 - 6.0) * 85.25 = 38.36 \text{ KIPS} \leftarrow$

$M_A = 38.36 * [(15 - 6.0)/2] = 172.6 \text{ FT-K}$ ↻

Client PORT OF NEW ORLEANS Project
Computations for ROLLER GATE NO.6 STORAGE MONOLITH PILE DESIGN
Computed by G. FLITTER Date 3/18/97 Checked by Date

CASE ①

H = 1.31 * 85.25' = 111.7 KIPS ←

P = (5.06 - 2.11) * 85.25' = 251.5 KIPS ↓

M_A = 2.44 * 85.25 = 208.0 FT·K ↺

CASE ②

H = 0.75 [1.86 * 85.25'] = 118.9 KIPS ←

P = 0.75 [5.06 - 2.08] * 85.25 = 190.5 KIPS ↓

M_A = 0.75 (3.64 * 85.25) = 232.7 FT·K ↺

CASE ③ - CASE ④

H = 0

P = [5.06 + .3] * 85.25 = 456.94 KIPS ↓

M_A = (.3 * 0.6667) * 85.25 = 17.1 FT·K ↺

CASE ⑤ & CASE ⑦

H = 38.4 KIPS ←

P = [5.06 + .3] * 85.25 = 456.94 KIPS ↓

M_A = (.3 * 0.6667) * 85.25 + 172.6 = 189.7 FT·K ↻

Client PORT OF NEW ORLEANS Project
Computations for ROLLER GATE NO. 6 STORAGE MONOLITH PILE DESIGN
Computed by G. FLITTER Date 3/18/97 Checked by Date

CASE ⑦ & CASE ⑧

$H = 0$

$P = 456.94$ kips ↓

$M_A = (.3 * 0.6667) * 85.25 = 17.05$ FT·K ↻

Client: PORT OF NEW ORLEANS Project:
Computations for: ROLLER GATE NO. 6 STORAGE MONOLITH PILE DESIGN
Computed by: G. FLITTER Date: 3/18/97 Checked by: Date:

SUMMARY

LOADING CASE	P_y (KIPS)	P_z (KIPS)	M_x (FT·K)	
1	111.7	251.5	208.0	*
2	118.9	190.5	232.7	*
3	0	456.94	17.1	
4	0	456.94	17.1	
5	38.4	456.94	189.7	*
6	0	456.94	17.1	
7	38.4	456.94	189.7	
8	0	456.94	17.1	

```
1000 ROLLER GATE NO. 6 STORAGE MONOLITH
1005 2 ROWS OF 14 IN. SQUARE PPC PILES AT 8' C\C, ORIGIN CENTER OF BASE

1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL

1020 SOI ES .0705 LEN 88.0 0. ALL

1030 PIN ALL
1040 TEN 0.8 ALL

1050 DLS S 140.0 50.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL

1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL


1100 PIL 1 -40.0 -2.0 0.0  2 -32.0 -2.0 0.0 3 -24.0 -2.0 0.0  4 -16.0 -
2.0 0.0
1101 PIL 5 -8.0 -2.0 0.0 6 0.0 -2.0 0.0 7 8.0 -2.0 0.0 8 16.0 -2.0 0.0
1102 PIL 9 24.0 -2.0 0.0 10 32.0 -2.0 0.0  11 40.0 -2.0 0.0  12 -40.0 2
.0 0.0
1103 PIL 13 -32.0 2.0 0.0  14 -24.0 2.0 0.0  15 -16.0 2.0 0.0  16 -8.0
2.0 0.0
1104 PIL 17 0.0 2.0 0.0  18 8.0 2.0 0.0  19 16.0 2.0 0.0  20 24.0 2.0 0
.0
1105 PIL 21 32.0 2.0 0.0 22 40.0 2.0 0.0
1120 LOA 1 0.0 111.7 251.5 208.0 0.0 0.0
1121 LOA 2 0.0 118.9 190.5 232.7 0.0 0.0
1122 LOA 3 0.0 0.0 456.9 17.1 0.0 0.0
1123 LOA 4 0.0 38.4 456.9 189.7 0.0 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\GT6SM.O

1140 PFO ALL

1150 PLB ALL
1160 FPL C:\CORPS\CPGG\GT6SM.P
```

```
 **********************************
 * CORPS PROGRAM  #  X0080       *  CPGA - CASE PILE GROUP ANALYSIS PRO
GRAM
 * VERSION NUMBER # 1992/02/26   *  RUN DATE 07-APR-1997   RUN TIME 15.
50.54
 **********************************


 ROLLER GATE NO. 6 STORAGE MONOLITH


 THERE ARE  22 PILES AND
             4 LOAD CASES IN THIS RUN.

 ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                             X          Y          Z
                                           -----      -----      -----
 WITH DIAGONAL COORDINATES = (    -40.00 ,    -2.00 ,      .00 )
                             (     40.00 ,     2.00 ,      .00 )


 *************************************************************************
*********

          PILE PROPERTIES AS INPUT


       E            I1           I2           A            C33
B66
      KSI          IN**4        IN**4        IN**2  .
   .40740E+04   .32010E+04   .32010E+04   .19600E+03   .15000E+01   .00
000E+00

 THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

     ALL


 *************************************************************************
*********

          SOIL DESCRIPTIONS AS INPUT


    ES      ESOIL      LENGTH      L            LU
          K/IN**2                  FT           FT
```

.70500E-01 L .88000E+02 .00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****
****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-40.00	-2.00	.00	V	.00	88.00	P
2	-32.00	-2.00	.00	V	.00	88.00	P
3	-24.00	-2.00	.00	V	.00	88.00	P
4	-16.00	-2.00	.00	V	.00	88.00	P
5	-8.00	-2.00	.00	V	.00	88.00	P
6	.00	-2.00	.00	V	.00	88.00	P
7	8.00	-2.00	.00	V	.00	88.00	P
8	16.00	-2.00	.00	V	.00	88.00	P
9	24.00	-2.00	.00	V	.00	88.00	P
10	32.00	-2.00	.00	V	.00	88.00	P
11	40.00	-2.00	.00	V	.00	88.00	P
12	-40.00	2.00	.00	V	.00	88.00	P
13	-32.00	2.00	.00	V	.00	88.00	P
14	-24.00	2.00	.00	V	.00	88.00	P
15	-16.00	2.00	.00	V	.00	88.00	P
16	-8.00	2.00	.00	V	.00	88.00	P
17	.00	2.00	.00	V	.00	88.00	P
18	8.00	2.00	.00	V	.00	88.00	P
19	16.00	2.00	.00	V	.00	88.00	P
20	24.00	2.00	.00	V	.00	88.00	P
21	32.00	2.00	.00	V	.00	88.00	P
22	40.00	2.00	.00	V	.00	88.00	P

						1936.00	

****
****

APPLIED LOADS

LOAD	PX	PY	PZ	MX	MY	MZ

CASE	K	K	K	FT-K	FT-K	FT-K
1	.0	111.7	251.5	208.0	.0	.0
2	.0	118.9	190.5	232.7	.0	.0
3	.0	.0	456.9	17.1	.0	.0
4	.0	38.4	456.9	189.7	.0	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.0000E+00	.8733E+00	.1008E-01	.1737E-03	.5102E-21	.0000E+00
2	.0000E+00	.9296E+00	.7634E-02	.1943E-03	.3865E-21	.0000E+00
3	.0000E+00	.0000E+00	.1831E-01	.1428E-04	.9269E-21	.0000E+00
4	.0000E+00	.3002E+00	.1831E-01	.1584E-03	.9269E-21	.0000E+00

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES

* INDICATES PILE FAILURE
\# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST
	K	K	K	IN-K	IN-K	IN-K			KSI	KSI
1	.0	5.1	6.7	269.6	.0	.0	.05	.60	1.60	.26
2	.0	5.1	6.7	269.6	.0	.0	.05	.60	1.60	.26
3	.0	5.1	6.7	269.6	.0	.0	.05	.60	1.60	.26
4	.0	5.1	6.7	269.6	.0	.0	.05	.60	1.60	.26
5	.0	5.1	6.7	269.6	.0	.0	.05	.60	1.60	.26
6	.0	5.1	6.7	269.6	.0	.0	.05	.60	1.60	.26
7	.0	5.1	6.7	269.6	.0	.0	.05	.60	1.60	.26
8	.0	5.1	6.7	269.6	.0	.0	.05	.60	1.60	.26
9	.0	5.1	6.7	269.6	.0	.0	.05	.60	1.60	.26
10	.0	5.1	6.7	269.6	.0	.0	.05	.60	1.60	.26
11	.0	5.1	6.7	269.6	.0	.0	.05	.60	1.60	.26
12	.0	5.1	16.2	269.6	.0	.0	.12	.56	1.65	.31
13	.0	5.1	16.2	269.6	.0	.0	.12	.56	1.65	.31
14	.0	5.1	16.2	269.6	.0	.0	.12	.56	1.65	.31
15	.0	5.1	16.2	269.6	.0	.0	.12	.56	1.65	.31
16	.0	5.1	16.2	269.6	.0	.0	.12	.56	1.65	.31
17	.0	5.1	16.2	269.6	.0	.0	.12	.56	1.	

```
65  .31
  18       .0     5.1    16.2     269.6        .0          .0  .12  .56 1.
65  .31
  19       .0     5.1    16.2     269.6        .0          .0  .12  .56 1.
65  .31
  20       .0     5.1    16.2     269.6        .0          .0  .12  .56 1.
65  .31
  21       .0     5.1    16.2     269.6        .0          .0  .12  .56 1.
65  .31
  22       .0     5.1    16.2     269.6        .0          .0  .12  .56 1.
65  .31


 LOAD CASE -     2

 PILE     F1      F2      F3        M1         M2         M3  ALF  CBF  A
SC  AST
          K       K       K        IN-K       IN-K       IN-K           K
SI  KSI

   1       .0     5.4     3.4     287.0        .0          .0  .02  .64 1.
62  .21
   2       .0     5.4     3.4     287.0        .0          .0  .02  .64 1.
62  .21
   3       .0     5.4     3.4     287.0        .0          .0  .02  .64 1.
62  .21
   4       .0     5.4     3.4     287.0        .0          .0  .02  .64 1.
62  .21
   5       .0     5.4     3.4     287.0        .0          .0  .02  .64 1.
62  .21
   6       .0     5.4     3.4     287.0        .0          .0  .02  .64 1.
62  .21
   7       .0     5.4     3.4     287.0        .0          .0  .02  .64 1.
62  .21
   8       .0     5.4     3.4     287.0        .0          .0  .02  .64 1.
62  .21
   9       .0     5.4     3.4     287.0        .0          .0  .02  .64 1.
62  .21
  10       .0     5.4     3.4     287.0        .0          .0  .02  .64 1.
62  .21
  11       .0     5.4     3.4     287.0        .0          .0  .02  .64 1.
62  .21
  12       .0     5.4    13.9     287.0        .0          .0  .10  .60 1.
68  .26
  13       .0     5.4    13.9     287.0        .0          .0  .10  .60 1.
68  .26
  14       .0     5.4    13.9     287.0        .0          .0  .10  .60 1.
```

```
68   .26
  15         .0       5.4     13.9       287.0          .0          .0   .10   .60 1.
68   .26
  16         .0       5.4     13.9       287.0          .0          .0   .10   .60 1.
68   .26
  17         .0       5.4     13.9       287.0          .0          .0   .10   .60 1.
68   .26
  18         .0       5.4     13.9       287.0          .0          .0   .10   .60 1.
68   .26
  19         .0       5.4     13.9       287.0          .0          .0   .10   .60 1.
68   .26
  20         .0       5.4     13.9       287.0          .0          .0   .10   .60 1.
68   .26
  21         .0       5.4     13.9       287.0          .0          .0   .10   .60 1.
68   .26
  22         .0       5.4     13.9       287.0          .0          .0   .10   .60 1.
68   .26


 LOAD CASE -      3

 PILE     F1       F2       F3         M1          M2          M3   ALF   CBF   A
SC   AST
          K        K        K         IN-K        IN-K        IN-K               K
SI   KSI

    1       .0       .0     20.4         .0          .0          .0   .15   .12 1.
08   .92 #
    2       .0       .0     20.4         .0          .0          .0   .15   .12 1.
08   .92 #
    3       .0       .0     20.4         .0          .0          .0   .15   .12 1.
08   .92 #
    4       .0       .0     20.4         .0          .0          .0   .15   .12 1.
08   .92 #
    5       .0       .0     20.4         .0          .0          .0   .15   .12 1.
08   .92 #
    6       .0       .0     20.4         .0          .0          .0   .15   .12 1.
08   .92 #
    7       .0       .0     20.4         .0          .0          .0   .15   .12 1.
08   .92 #
    8       .0       .0     20.4         .0          .0          .0   .15   .12 1.
08   .92 #
    9       .0       .0     20.4         .0          .0          .0   .15   .12 1.
08   .92 #
   10       .0       .0     20.4         .0          .0          .0   .15   .12 1.
08   .92 #
   11       .0       .0     20.4         .0          .0          .0   .15   .12 1.
```

										08	.92	#
12	.0	.0	21.2	.0	.0	.0	.15	.12	1.	09	.93	#
13	.0	.0	21.2	.0	.0	.0	.15	.12	1.	09	.93	#
14	.0	.0	21.2	.0	.0	.0	.15	.12	1.	09	.93	#
15	.0	.0	21.2	.0	.0	.0	.15	.12	1.	09	.93	#
16	.0	.0	21.2	.0	.0	.0	.15	.12	1.	09	.93	#
17	.0	.0	21.2	.0	.0	.0	.15	.12	1.	09	.93	#
18	.0	.0	21.2	.0	.0	.0	.15	.12	1.	09	.93	#
19	.0	.0	21.2	.0	.0	.0	.15	.12	1.	09	.93	#
20	.0	.0	21.2	.0	.0	.0	.15	.12	1.	09	.93	#
21	.0	.0	21.2	.0	.0	.0	.15	.12	1.	09	.93	#
22	.0	.0	21.2	.0	.0	.0	.15	.12	1.	09	.93	#

LOAD CASE - 4

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	A	SC	AST
	K	K	K	IN-K	IN-K	IN-K			K	SI	KSI
1	.0	1.7	16.5	92.7	.0	.0	.12	.25	1.	27	.70
2	.0	1.7	16.5	92.7	.0	.0	.12	.25	1.	27	.70
3	.0	1.7	16.5	92.7	.0	.0	.12	.25	1.	27	.70
4	.0	1.7	16.5	92.7	.0	.0	.12	.25	1.	27	.70
5	.0	1.7	16.5	92.7	.0	.0	.12	.25	1.	27	.70
6	.0	1.7	16.5	92.7	.0	.0	.12	.25	1.	27	.70
7	.0	1.7	16.5	92.7	.0	.0	.12	.25	1.	27	.70
8	.0	1.7	16.5	92.7	.0	.0	.12	.25	1.		

```
27  .70
  9      .0     1.7    16.5     92.7      .0      .0  .12  .25 1.
27  .70
 10      .0     1.7    16.5     92.7      .0      .0  .12  .25 1.
27  .70
 11      .0     1.7    16.5     92.7      .0      .0  .12  .25 1.
27  .70
 12      .0     1.7    25.1     92.7      .0      .0  .18  .21 1.
31  .75
 13      .0     1.7    25.1     92.7      .0      .0  .18  .21 1.
31  .75
 14      .0     1.7    25.1     92.7      .0      .0  .18  .21 1.
31  .75
 15      .0     1.7    25.1     92.7      .0      .0  .18  .21 1.
31  .75
 16      .0     1.7    25.1     92.7      .0      .0  .18  .21 1.
31  .75
 17      .0     1.7    25.1     92.7      .0      .0  .18  .21 1.
31  .75
 18      .0     1.7    25.1     92.7      .0      .0  .18  .21 1.
31  .75
 19      .0     1.7    25.1     92.7      .0      .0  .18  .21 1.
31  .75
 20      .0     1.7    25.1     92.7      .0      .0  .18  .21 1.
31  .75
 21      .0     1.7    25.1     92.7      .0      .0  .18  .21 1.
31  .75
 22      .0     1.7    25.1     92.7      .0      .0  .18  .21 1.
31  .75
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PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	5.1	6.7	.0	.0	.0
2	.0	5.1	6.7	.0	.0	.0
3	.0	5.1	6.7	.0	.0	.0
4	.0	5.1	6.7	.0	.0	.0

5	.0	5.1	6.7	.0	.0	.0
6	.0	5.1	6.7	.0	.0	.0
7	.0	5.1	6.7	.0	.0	.0
8	.0	5.1	6.7	.0	.0	.0
9	.0	5.1	6.7	.0	.0	.0
10	.0	5.1	6.7	.0	.0	.0
11	.0	5.1	6.7	.0	.0	.0
12	.0	5.1	16.2	.0	.0	.0
13	.0	5.1	16.2	.0	.0	.0
14	.0	5.1	16.2	.0	.0	.0
15	.0	5.1	16.2	.0	.0	.0
16	.0	5.1	16.2	.0	.0	.0
17	.0	5.1	16.2	.0	.0	.0
18	.0	5.1	16.2	.0	.0	.0
19	.0	5.1	16.2	.0	.0	.0
20	.0	5.1	16.2	.0	.0	.0
21	.0	5.1	16.2	.0	.0	.0
22	.0	5.1	16.2	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	5.4	3.4	.0	.0	.0
2	.0	5.4	3.4	.0	.0	.0
3	.0	5.4	3.4	.0	.0	.0
4	.0	5.4	3.4	.0	.0	.0
5	.0	5.4	3.4	.0	.0	.0
6	.0	5.4	3.4	.0	.0	.0
7	.0	5.4	3.4	.0	.0	.0
8	.0	5.4	3.4	.0	.0	.0
9	.0	5.4	3.4	.0	.0	.0
10	.0	5.4	3.4	.0	.0	.0
11	.0	5.4	3.4	.0	.0	.0
12	.0	5.4	13.9	.0	.0	.0
13	.0	5.4	13.9	.0	.0	.0
14	.0	5.4	13.9	.0	.0	.0
15	.0	5.4	13.9	.0	.0	.0
16	.0	5.4	13.9	.0	.0	.0
17	.0	5.4	13.9	.0	.0	.0
18	.0	5.4	13.9	.0	.0	.0
19	.0	5.4	13.9	.0	.0	.0
20	.0	5.4	13.9	.0	.0	.0
21	.0	5.4	13.9	.0	.0	.0
22	.0	5.4	13.9	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	.0	20.4	.0	.0	.0
2	.0	.0	20.4	.0	.0	.0
3	.0	.0	20.4	.0	.0	.0
4	.0	.0	20.4	.0	.0	.0
5	.0	.0	20.4	.0	.0	.0
6	.0	.0	20.4	.0	.0	.0
7	.0	.0	20.4	.0	.0	.0
8	.0	.0	20.4	.0	.0	.0
9	.0	.0	20.4	.0	.0	.0
10	.0	.0	20.4	.0	.0	.0
11	.0	.0	20.4	.0	.0	.0
12	.0	.0	21.2	.0	.0	.0
13	.0	.0	21.2	.0	.0	.0
14	.0	.0	21.2	.0	.0	.0
15	.0	.0	21.2	.0	.0	.0
16	.0	.0	21.2	.0	.0	.0
17	.0	.0	21.2	.0	.0	.0
18	.0	.0	21.2	.0	.0	.0
19	.0	.0	21.2	.0	.0	.0
20	.0	.0	21.2	.0	.0	.0
21	.0	.0	21.2	.0	.0	.0
22	.0	.0	21.2	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	1.7	16.5	.0	.0	.0
2	.0	1.7	16.5	.0	.0	.0
3	.0	1.7	16.5	.0	.0	.0
4	.0	1.7	16.5	.0	.0	.0
5	.0	1.7	16.5	.0	.0	.0
6	.0	1.7	16.5	.0	.0	.0
7	.0	1.7	16.5	.0	.0	.0
8	.0	1.7	16.5	.0	.0	.0
9	.0	1.7	16.5	.0	.0	.0
10	.0	1.7	16.5	.0	.0	.0
11	.0	1.7	16.5	.0	.0	.0

12	.0	1.7	25.1	.0	.0	.0
13	.0	1.7	25.1	.0	.0	.0
14	.0	1.7	25.1	.0	.0	.0
15	.0	1.7	25.1	.0	.0	.0
16	.0	1.7	25.1	.0	.0	.0
17	.0	1.7	25.1	.0	.0	.0
18	.0	1.7	25.1	.0	.0	.0
19	.0	1.7	25.1	.0	.0	.0
20	.0	1.7	25.1	.0	.0	.0
21	.0	1.7	25.1	.0	.0	.0
22	.0	1.7	25.1	.0	.0	.0

Client: PORT OF NEW ORLEANS Project: ______
Computations for: ROLLER GATE # 7 STORAGE MONOLITH PILE DESIGN
Computed by: G. FLITTER Date: 3/18/97 Checked by: ______ Date: ______

WT. OF STORAGE MONOLITH

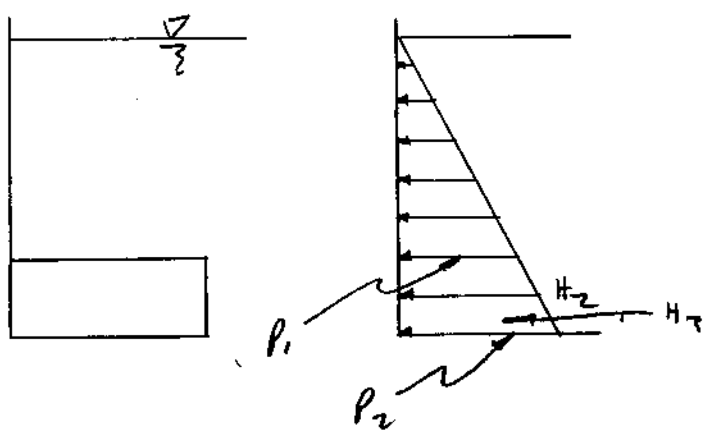
$w_1 = 0.15$ KIPS/FT² (7.7083' * (9.15' - 6.0')) = 3.6 KIPS/FT ↓

GATE WT.

$w_G = 0.3$ KIPS/FT ↓

ASSUME GATE C.G. IS @ ℄ OF TRACKS WHICH IS 8" FROM THE CENTER OF THE STORAGE MONOLITH.

HYDRAULIC FORCES



WATER UP TO EL. 13.0

P_1 = 0.0624 KIPS/FT³ * (13' - 9.15') = 0.24 KSF

P_2 = 0.0624 KIPS/FT³ * (13' - 6') = 0.44 KSF

H_2 = 0.24 KSF * 3.15' = 0.76 * 1.58 = 1.19 KFT/FT

H_3 = ½ * (0.44 - 0.24) * 3.15 = 0.315 * ⅓(3.15) = 0.33 K·FT/FT

$U_1 - W_1$ = 0.44 - 0.24 * 7.7083 = 1.54 * 0 = ______ 1.52

P = 1.54 KIPS/FT ↑ H = 1.08 K/FT ← M = 1.52 FT·K/FT ↻

Client PORT OF NEW ORLEANS Project
Computations for ROLLER GATE NO.7 STORAGE MONOLITH PILE DESIGN
Computed by G. FLITTER Date 3/18/97 Checked by Date

WATER UP TO EL. 15.0

P_1 = 0.0624 KIPS/FT³ * (15.0 - 9.15) = 0.37 KSF

P_2 = 0.0624 KIPS/FT³ * (15.0 - 6.0) = 0.56 KSF

H_2 = 0.37 KSF * 3.15' = 1.17 K/FT * 1.58' = 1.84 FT·K/FT

H_3 = ½ * (0.56 - 0.37) * 3.15 = 0.30 * ⅓(3.15) = 0.31 FT·K/FT

$U_1 - W_1$ = (0.56 - 0.37) * 7.7083 = 1.46 * 0 = 0

2.15 FT·K/FT ↺

P = 1.46 KIPS/FT ↑

H = 1.47 KIPS/FT ←

M_A = 2.15 FT·K/FT ↺

WIND LOAD

P = 50 PSF = 0.05 KSF

H = 0.05 * (15 - 6.0) * 50' = 22.5 KIPS ←

M_A = 22.5 * [(15-6)/2] = 101.3 FT·K ↺

CASE ①

H = 1.08 * 50.0' = 54 KIPS ←

P = (3.6 - 1.54) * 50 = 103 KIPS ↓

M_A = 1.52 * 50' = 76 FT·K ↻

PYBURN & ODOM, INC — CONSULTING ENGINEERS Sheet No. 3/4

Client PORT OF NEW ORLEANS Project
Computations for ROLLER GATE NO. 7 STORAGE MONOLITH PILE DESIGN
Computed by G. FLITTER Date 3/18/97 Checked by Date

CASE ②

$H = 0.75 [1.47 \text{ KIPS/FT} * 50'] = 55 \text{ KIPS} \leftarrow$

$P = 0.75 (3.6 - 1.46) * 50' = 80.25 \text{ KIPS} \downarrow$

$M_A = 0.75 (2.15 * 50') = 80.6 \text{ FT}\cdot\text{K}$ ↻

CASE ③ & CASE ④

$H = 0$

$P = [3.6 + 0.3] * 50' = 195 \text{ KIPS} \downarrow$

$M_A = (0.3 * 0.6667) * 50' = 10 \text{ FT}\cdot\text{K}$ ↻

CASE ⑤ & CASE ⑦

$H = 22.5 \text{ KIPS} \leftarrow$

$P = [3.6 + 0.3] * 50' = 195 \text{ KIPS} \downarrow$

$M_A = [0.3 \times 0.667) * 50' + 101.3 = 111.3 \text{ FT}\cdot\text{K}$ ↻

CASE ⑥ & CASE ⑧

$H = 0$

$P = 195 \text{ KIPS} \downarrow$

$M_A = (0.3 \times 0.6667) * 50' = 10 \text{ FT}\cdot\text{K}$ ↺

Client PORT OF NEW ORLEANS Project
Computations for ROLLER GATE NO. 7 STORAGE MONOLITH PILE DESIGN
Computed by G. FLUTTER Date 7/18/97 Checked by Date

SUMMARY

LOADING CASE	P_y (KIPS)	P_z (KIPS)	M_x (FT-K)	
1	54	103	76	*
2	55	80.3	80.6	*
3 & 4	0	195	10	
5 & 7	22.5	195	111.3	*
6 & 8	0	195	10	

```
1000 ROLLER GATE NO. 7 STORAGE MONOLITH
1005 2 ROWS OF 14 IN. SQUARE PPC PILES AT 7.5' C\C, ORIGIN CENTER OF BA
SE
1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL

1020 SOI ES .0705 LEN 79.0 0. ALL

1030 PIN ALL
1040 TEN 0.8 ALL

1050 DLS S 140.0 50.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL

1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL


1100 PIL 1 -22.5 -2.0 0.0  2 -15.0 -2.0 0.0 3 -7.5 -2.0 0.0  4 0.0 -2.0
 0.0
1101 PIL 5 7.5 -2.0 0.0 6 15.0 -2.0 0.0 7 22.5 -2.0 0.0 8 -22.5 2.0 0.0
1102 PIL 9 -15.0 2.0 0.0 10 -7.5 2.0 0.0  11 0.0 2.0 0.0  12 7.5 2.0 0.
0
1103 PIL 13 15.0 2.0 0.0  14 22.5 2.0 0.0
1120 LOA 1 0.0 54.0 103.0 76.0 0.0 0.0
1121 LOA 2 0.0 55.0 80.3 80.6 0.0 0.0
1122 LOA 3 0.0 0.0 195.0 10.0 0.0 0.0
1123 LOA 4 0.0 22.5 195.0 111.3 0.0 0.0
1124 LOA 5 0.0 0.0 195.0 10.0 0.0 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\GT7SM.O

1140 PFO ALL

1150 PLB ALL
1160 FPL C:\CORPS\CPGG\GT7SM.P
```

```
 ***********************************
 * CORPS PROGRAM  #  X0080        *  CPGA - CASE PILE GROUP ANALYSIS PRO
GRAM
 * VERSION NUMBER # 1992/02/26    *  RUN DATE 07-APR-1997   RUN TIME 15.
39.23
 ***********************************


 ROLLER GATE NO. 7 STORAGE MONOLITH



 THERE ARE  14 PILES AND
             5 LOAD CASES IN THIS RUN.

 ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                        X           Y           Z
                                      -----       -----       -----
 WITH DIAGONAL COORDINATES = (      -22.50 ,     -2.00 ,       .00 )
                             (       22.50 ,      2.00 ,       .00 )


 **********************************************************************
*********

          PILE PROPERTIES AS INPUT


      E            I1            I2            A            C33
B66
     KSI          IN**4         IN**4         IN**2
   .40740E+04   .32010E+04   .32010E+04   .19600E+03   .15000E+01   .00
000E+00

 THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

    ALL


 **********************************************************************
*********

          SOIL DESCRIPTIONS AS INPUT


    ES      ESOIL       LENGTH        L            LU
          K/IN**2                     FT           FT
```

.70500E-01 L .79000E+02 .00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-22.50	-2.00	.00	V	.00	79.00	P
2	-15.00	-2.00	.00	V	.00	79.00	P
3	-7.50	-2.00	.00	V	.00	79.00	P
4	.00	-2.00	.00	V	.00	79.00	P
5	7.50	-2.00	.00	V	.00	79.00	P
6	15.00	-2.00	.00	V	.00	79.00	P
7	22.50	-2.00	.00	V	.00	79.00	P
8	-22.50	2.00	.00	V	.00	79.00	P
9	-15.00	2.00	.00	V	.00	79.00	P
10	-7.50	2.00	.00	V	.00	79.00	P
11	.00	2.00	.00	V	.00	79.00	P
12	7.50	2.00	.00	V	.00	79.00	P
13	15.00	2.00	.00	V	.00	79.00	P
14	22.50	2.00	.00	V	.00	79.00	P

						1106.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	54.0	103.0	76.0	.0	.0
2	.0	55.0	80.3	80.6	.0	.0
3	.0	.0	195.0	10.0	.0	.0
4	.0	22.5	195.0	111.3	.0	.0
5	.0	.0	195.0	10.0	.0	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX	DY	DZ	RX	RY	RZ
	IN	IN	IN	RAD	RAD	RAD
1	.0000E+00	.6635E+00	.5823E-02	.8951E-04	.0000E+00	.0000E+00
2	.0000E+00	.6757E+00	.4540E-02	.9493E-04	.0000E+00	.0000E+00
3	.0000E+00	.0000E+00	.1102E-01	.1178E-04	.0000E+00	.0000E+00
4	.0000E+00	.2764E+00	.1102E-01	.1311E-03	.0000E+00	.0000E+00
5	.0000E+00	.0000E+00	.1102E-01	.1178E-04	.0000E+00	.0000E+00

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO

(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST
	K	K	K	IN-K	IN-K	IN-K			KSI	KSI
1	.0	3.9	4.6	204.8	.0	.0	.03	.49	1.45	.40
2	.0	3.9	4.6	204.8	.0	.0	.03	.49	1.45	.40
3	.0	3.9	4.6	204.8	.0	.0	.03	.49	1.45	.40
4	.0	3.9	4.6	204.8	.0	.0	.03	.49	1.45	.40
5	.0	3.9	4.6	204.8	.0	.0	.03	.49	1.45	.40
6	.0	3.9	4.6	204.8	.0	.0	.03	.49	1.45	.40
7	.0	3.9	4.6	204.8	.0	.0	.03	.49	1.45	.40
8	.0	3.9	10.1	204.8	.0	.0	.07	.47	1.48	.42
9	.0	3.9	10.1	204.8	.0	.0	.07	.47	1.48	.42
10	.0	3.9	10.1	204.8	.0	.0	.07	.47	1.48	.42
11	.0	3.9	10.1	204.8	.0	.0	.07	.47	1.48	.42
12	.0	3.9	10.1	204.8	.0	.0	.07	.47	1.48	.42
13	.0	3.9	10.1	204.8	.0	.0	.07	.47	1.48	.42
14	.0	3.9	10.1	204.8	.0	.0	.07	.47	1.48	.42

LOAD CASE - 2

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST
	K	K	K	IN-K	IN-K	IN-K			K	

```
SI  KSI

   1       .0      3.9     2.9     208.6        .0         .0  .02  .51 1.
45  .38
   2       .0      3.9     2.9     208.6        .0         .0  .02  .51 1.
45  .38
   3       .0      3.9     2.9     208.6        .0         .0  .02  .51 1.
45  .38
   4       .0      3.9     2.9     208.6        .0         .0  .02  .51 1.
45  .38
   5       .0      3.9     2.9     208.6        .0         .0  .02  .51 1.
45  .38
   6       .0      3.9     2.9     208.6        .0         .0  .02  .51 1.
45  .38
   7       .0      3.9     2.9     208.6        .0         .0  .02  .51 1.
45  .38
   8       .0      3.9     8.6     208.6        .0         .0  .06  .48 1.
48  .41
   9       .0      3.9     8.6     208.6        .0         .0  .06  .48 1.
48  .41
  10       .0      3.9     8.6     208.6        .0         .0  .06  .48 1.
48  .41
  11       .0      3.9     8.6     208.6        .0         .0  .06  .48 1.
48  .41
  12       .0      3.9     8.6     208.6        .0         .0  .06  .48 1.
48  .41
  13       .0      3.9     8.6     208.6        .0         .0  .06  .48 1.
48  .41
  14       .0      3.9     8.6     208.6        .0         .0  .06  .48 1.
48  .41


 LOAD CASE -     3

 PILE     F1      F2      F3        M1         M2         M3   ALF  CBF  A
SC  AST
           K       K       K      IN-K       IN-K       IN-K             K
SI  KSI

   1       .0      .0    13.6        .0         .0         .0  .10  .13 1.
05  .89 #
   2       .0      .0    13.6        .0         .0         .0  .10  .13 1.
05  .89 #
   3       .0      .0    13.6        .0         .0         .0  .10  .13 1.
05  .89 #
   4       .0      .0    13.6        .0         .0         .0  .10  .13 1.
05  .89 #
```

```
     5       .0       .0     13.6        .0          .0          .0   .10   .13 1.
05   .89 #
     6       .0       .0     13.6        .0          .0          .0   .10   .13 1.
05   .89 #
     7       .0       .0     13.6        .0          .0          .0   .10   .13 1.
05   .89 #
     8       .0       .0     14.3        .0          .0          .0   .10   .13 1.
05   .89 #
     9       .0       .0     14.3        .0          .0          .0   .10   .13 1.
05   .89 #
    10       .0       .0     14.3        .0          .0          .0   .10   .13 1.
05   .89 #
    11       .0       .0     14.3        .0          .0          .0   .10   .13 1.
05   .89 #
    12       .0       .0     14.3        .0          .0          .0   .10   .13 1.
05   .89 #
    13       .0       .0     14.3        .0          .0          .0   .10   .13 1.
05   .89 #
    14       .0       .0     14.3        .0          .0          .0   .10   .13 1.
05   .89 #


  LOAD CASE -     4

  PILE     F1       F2       F3         M1          M2          M3   ALF   CBF   A
SC   AST
            K        K        K       IN-K        IN-K        IN-K               K
SI   KSI

     1       .0      1.6     10.0       85.4          .0          .0   .07   .26 1.
22   .68
     2       .0      1.6     10.0       85.4          .0          .0   .07   .26 1.
22   .68
     3       .0      1.6     10.0       85.4          .0          .0   .07   .26 1.
22   .68
     4       .0      1.6     10.0       85.4          .0          .0   .07   .26 1.
22   .68
     5       .0      1.6     10.0       85.4          .0          .0   .07   .26 1.
22   .68
     6       .0      1.6     10.0       85.4          .0          .0   .07   .26 1.
22   .68
     7       .0      1.6     10.0       85.4          .0          .0   .07   .26 1.
22   .68
     8       .0      1.6     17.9       85.4          .0          .0   .13   .23 1.
26   .72
     9       .0      1.6     17.9       85.4          .0          .0   .13   .23 1.
26   .72
```

```
  10       .0      1.6     17.9       85.4        .0         .0  .13  .23 1.
26  .72
  11       .0      1.6     17.9       85.4        .0         .0  .13  .23 1.
26  .72
  12       .0      1.6     17.9       85.4        .0         .0  .13  .23 1.
26  .72
  13       .0      1.6     17.9       85.4        .0         .0  .13  .23 1.
26  .72
  14       .0      1.6     17.9       85.4        .0         .0  .13  .23 1.
26  .72


 LOAD CASE -    5

 PILE     F1      F2      F3         M1         M2         M3  ALF  CBF  A
SC  AST
          K        K       K       IN-K       IN-K       IN-K             K
SI  KSI

   1       .0       .0    13.6        .0         .0         .0  .10  .13 1.
05  .89 #
   2       .0       .0    13.6        .0         .0         .0  .10  .13 1.
05  .89 #
   3       .0       .0    13.6        .0         .0         .0  .10  .13 1.
05  .89 #
   4       .0       .0    13.6        .0         .0         .0  .10  .13 1.
05  .89 #
   5       .0       .0    13.6        .0         .0         .0  .10  .13 1.
05  .89 #
   6       .0       .0    13.6        .0         .0         .0  .10  .13 1.
05  .89 #
   7       .0       .0    13.6        .0         .0         .0  .10  .13 1.
05  .89 #
   8       .0       .0    14.3        .0         .0         .0  .10  .13 1.
05  .89 #
   9       .0       .0    14.3        .0         .0         .0  .10  .13 1.
05  .89 #
  10       .0       .0    14.3        .0         .0         .0  .10  .13 1.
05  .89 #
  11       .0       .0    14.3        .0         .0         .0  .10  .13 1.
05  .89 #
  12       .0       .0    14.3        .0         .0         .0  .10  .13 1.
05  .89 #
  13       .0       .0    14.3        .0         .0         .0  .10  .13 1.
05  .89 #
  14       .0       .0    14.3        .0         .0         .0  .10  .13 1.
05  .89 #
```

****
****

PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	3.9	4.6	.0	.0	.0
2	.0	3.9	4.6	.0	.0	.0
3	.0	3.9	4.6	.0	.0	.0
4	.0	3.9	4.6	.0	.0	.0
5	.0	3.9	4.6	.0	.0	.0
6	.0	3.9	4.6	.0	.0	.0
7	.0	3.9	4.6	.0	.0	.0
8	.0	3.9	10.1	.0	.0	.0
9	.0	3.9	10.1	.0	.0	.0
10	.0	3.9	10.1	.0	.0	.0
11	.0	3.9	10.1	.0	.0	.0
12	.0	3.9	10.1	.0	.0	.0
13	.0	3.9	10.1	.0	.0	.0
14	.0	3.9	10.1	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	3.9	2.9	.0	.0	.0
2	.0	3.9	2.9	.0	.0	.0
3	.0	3.9	2.9	.0	.0	.0
4	.0	3.9	2.9	.0	.0	.0
5	.0	3.9	2.9	.0	.0	.0
6	.0	3.9	2.9	.0	.0	.0
7	.0	3.9	2.9	.0	.0	.0
8	.0	3.9	8.6	.0	.0	.0
9	.0	3.9	8.6	.0	.0	.0
10	.0	3.9	8.6	.0	.0	.0
11	.0	3.9	8.6	.0	.0	.0
12	.0	3.9	8.6	.0	.0	.0

13	.0	3.9	8.6	.0	.0	.0
14	.0	3.9	8.6	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	.0	13.6	.0	.0	.0
2	.0	.0	13.6	.0	.0	.0
3	.0	.0	13.6	.0	.0	.0
4	.0	.0	13.6	.0	.0	.0
5	.0	.0	13.6	.0	.0	.0
6	.0	.0	13.6	.0	.0	.0
7	.0	.0	13.6	.0	.0	.0
8	.0	.0	14.3	.0	.0	.0
9	.0	.0	14.3	.0	.0	.0
10	.0	.0	14.3	.0	.0	.0
11	.0	.0	14.3	.0	.0	.0
12	.0	.0	14.3	.0	.0	.0
13	.0	.0	14.3	.0	.0	.0
14	.0	.0	14.3	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	1.6	10.0	.0	.0	.0
2	.0	1.6	10.0	.0	.0	.0
3	.0	1.6	10.0	.0	.0	.0
4	.0	1.6	10.0	.0	.0	.0
5	.0	1.6	10.0	.0	.0	.0
6	.0	1.6	10.0	.0	.0	.0
7	.0	1.6	10.0	.0	.0	.0
8	.0	1.6	17.9	.0	.0	.0
9	.0	1.6	17.9	.0	.0	.0
10	.0	1.6	17.9	.0	.0	.0
11	.0	1.6	17.9	.0	.0	.0
12	.0	1.6	17.9	.0	.0	.0
13	.0	1.6	17.9	.0	.0	.0
14	.0	1.6	17.9	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	.0	13.6	.0	.0	.0
2	.0	.0	13.6	.0	.0	.0
3	.0	.0	13.6	.0	.0	.0
4	.0	.0	13.6	.0	.0	.0
5	.0	.0	13.6	.0	.0	.0
6	.0	.0	13.6	.0	.0	.0
7	.0	.0	13.6	.0	.0	.0
8	.0	.0	14.3	.0	.0	.0
9	.0	.0	14.3	.0	.0	.0
10	.0	.0	14.3	.0	.0	.0
11	.0	.0	14.3	.0	.0	.0
12	.0	.0	14.3	.0	.0	.0
13	.0	.0	14.3	.0	.0	.0
14	.0	.0	14.3	.0	.0	.0

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for GATE NO. B STORAGE MONOLITH
Computed by [illegible] Date ______ Checked by ______ Date ______

DEAD LOADS

		KIPS		FEET		1-K
$V_1 = (15'-5')(1.5')(0.15)$	=	2.25	*	4.75	=	10.7
$V_2 = (0.625')(15'-5')(0.15)$	=	0.94	*	3.69	=	3.5
$V_3 = (2.5')(12.5')(0.15)$	=	4.69	*	6.25	=	29.3
$V_4 = (7.0')(10.26'-7.51')(0.15)$	=	2.89	*	9.0	=	26.0
		10.8				69.5

WIND

$H_1 = (15'-5')(0.05)$	=	0.5	*	7.5	=	3.75
$H_2 = (15'-5')(0.05)$	=	0.5	*	7.5	=	3.75

SOIL

$Hs_1 = (0.115)(2.5^2/2)(0.5)$	=	0.18	*	0.83	=	0.15
$Hs_2 = (0.115-0.0624)(2.5^2/2)(0.5)$	=	0.08	*	0.83	=	0.07

WATER

$Hw_1 = (0.0624)(13-2.5)^2/2$	=	3.44	*	3.5	=	12.0
$Hw_2 = (0.0624)(15-2.5)^2/2$	=	4.88	*	4.16	=	20.3

UPLIFT

$U_2 = (0.0624)(13'-2.5')(3.5')$	=	2.3	*	10.75	=	24.7
$U_3 = (0.0624)(15'-2.5')(3.5')$	=	2.7	*	10.75	=	29.0
$U_4 = (0.0624)(13'-2.5')(12.5'/2)$	=	4.1	*	8.33	=	34.2
$U_5 = (0.0624)(15'-2.5')(12.5'/2)$	=	4.9	*	8.33	=	40.8
$U_6 = (0.0624)(13-2.5)(7.0')$	=	4.6	*	9.00	=	41.4
$U_7 = (0.0624)(15-2.5)(7.0')$	=	5.5	*	9.00	=	49.5

HORIZONTAL

$H_3 = 0.022$	0.022	—		—

GATE

$G_1 = 0.6$ K/ft	0.6	*	7.6	=	4.56

Client PORT OF NEW ORLEANS Project FRANCE ROAD
Computations for GATE NO. 8 STORAGE MONOLITH
Computed by JPF Date Checked by Date

1

LOAD COMBINATIONS

LOAD CASE	$\vec{F_x}$	$F_z \downarrow$	M_y ↺
I = D.L. + SWL + IMPERVIOUS WALL			
SHT PILE	0.022	0.0	0.0
DEAD	0.0	10.8	69.5
WATER (H_{W_1})	3.4	0.0	-12.0
UPLIFT (U_4)	0.0	-2.3	-24.7
SOIL (H_{S2})	0.08	0.0	-0.07
UPLIFT (U_6)	0.0	-4.6	-41.5
TOTAL	3.5	3.9	-8.8
II HWL + D.L. + IMPERVIOUS WALL			
UPLIFT (U_7)	0.0	-5.5	-49.5
DEAD	0.0	10.8	69.5
WATER (H_{W_2})	4.9	0.0	-20.3
UPLIFT (U_3)	0.0	-2.7	-29.0
SOIL (H_{S2})	0.08	0.0	-0.07
SHTPILE (H_3)	0.022	0.0	0.0
TOTAL	5.0	2.6	-29.4
III WIND (FLOODSIDE + D.L.) + GATE			
GATE	0.0	0.6	4.56
DEAD	0.0	10.8	69.5
WIND (H_1)	0.5	0.0	-3.75
SOIL (H_{S1})	0.18	0.0	-0.15
SHTPILE (H_3)	0.022	0.0	0.0
TOTAL	0.70	11.4	70.2
75% TOTAL	0.53	8.6	52.6
IV WIND P/S + D.L. + GATE			
GATE	0.0	0.6	4.56
DEAD	0.0	10.8	69.5
WIND (H_2)	-0.5	0.0	3.75
SOIL (H_{S1})	0.18	0.0	-.15
SHTPILE (H_3)	0.022	0.0	0.0
TOTAL	-0.30	11.4	77.7
75% TOTAL	-0.22	8.6	58.2

LOADCASE	$\vec{F_x}$	$F_y \downarrow$	M_y ↺
V D.L. ONLY			
GATE	0.0	0.6	4.56
DEAD	0.0	10.8	69.5
SHTPILE	0.022	0.0	0.0
TOTAL	0.02	11.4	74.1
VI CASE I W/PERVIOUS SHTPILE			
UPLIFT (U_6)	0.0	-4.6	-41.5
DEAD	0.0	10.8	69.5
WATER (H_{W_1})	3.4	0.0	-12.0
UPLIFT (U_4)	0.0	-4.1	-34.2
SOIL (H_{S2})	0.08	0.0	-0.07
SHTPILE (H_3)	0.022	0.0	0.0
TOTAL	3.5	2.1	-18.3
VII CASE II W/PERVIOUS SHTPILE			
UPLIFT (U_2)	0.0	-5.5	-49.5
DEAD	0.0	10.8	69.5
WATER (H_{W_2})	4.9	0.0	-20.3
UPLIFT (U_5)	0.0	-4.9	-40.8
SOIL (H_{S2})	0.08	0.0	-0.07
SHTPILE (H_3)	0.022	0.0	0.0
TOTAL	5.0	0.4	-41.2
.75 TOTAL	3.75	0.3	-30.9

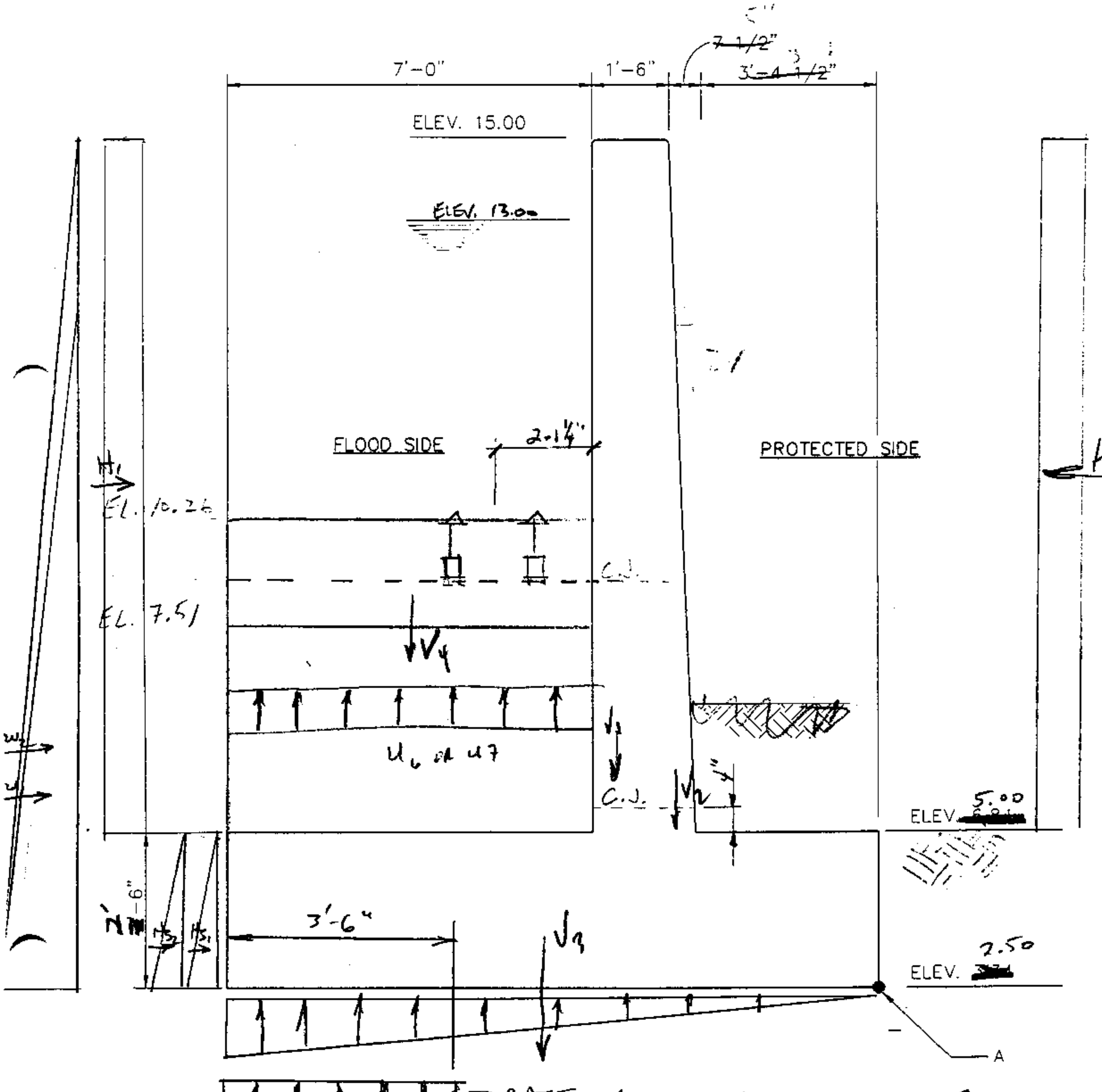
Client: PORT OF NEW ORLEANS Project: FRANCE ROAD
Computations for: GATE NO. 8 STORAGE MONOLITH
Computed by: MPF Date: Checked by: Date:

LOAD CASE	F_x (→)	F_z (↓)	M_y (↻)
I	3.5	3.9	-8.8
II	5.0	2.6	-29.4
III	0.53	8.6	52.6
IV	-0.22	8.6	58.2
V	0.02	11.4	74.1
VI	3.5	2.1	-18.3
VII	3.75	0.3	-30.9
	STORAGE	MONOLITH	= 65'-0"
I	227.5	253.5	-572.0
II	325.0	169.0	-1911.0
III	34.5	559.0	3419.0
IV	-14.3	559.0	3783.0
V	1.3	741.0	4816.5
VI	227.5	136.5	-1189.5
VII	243.8	19.5	-2008.5

CPGA PROGRAM TWMONO8.D

PORT OF NEW ORLEANS
FRANCE ROAD
GATE NO. 8 T-WALL STORAGE MONOLITH
JPZ 7/8/97

65'-0" LONG



STORAGE MONOLITH GATE NO. 8

```
1000 T-WALL MONOLITH AT GATE NO. 8  -  65' LONG
     3 ROWS OF 14 IN. SQ. PPC PILES AT 8.0' C/C, ORIGIN AT CENTER OF BASE
1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL
1020 SOI ES .046 LEN 70.0 0. ALL
1030 PIN ALL
1040 TEN 0.8 ALL
1050 DLS S 83.0 38.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL
1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL
1070 BAT 3.0 1 TO 18
1075 BAT 4.0 19 TO 27
1080 ANG 180 19 TO 27
1090 ANG 0  1 TO 18
1100 PIL 1 -2.0 -30.0 0.0  10 -7.0 -30.0 0.0 19 -10.5 -30.0 0.0
1110 ROW Y 9 1 8 AT 7.5
1115 ROW Y 9 10  8 AT 7.5
1116 ROW Y 9 19 8 AT 7.5
1120 LOA 1 227.5 0.0 253.5 0.0 -572.0 0.0
1121 LOA 2 325.0 0.0 169.0 0.0 -1911.0 0.0
1122 LOA 3 34.5 0.0 559.0 0.0 3419.0 0.0
1123 LOA 4 -14.3 0.0 559.0 0.0 3783.8 0.0
1124 LOA 5 1.3 0.0 741.0 0.0 4816.5 0.0
1125 LOA 6 227.5 0.0 136.5 0.0 -1189.5 0.0
1126 LOA 7 243.8 0.0 19.5 0.0 -2008.5 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\TWMONO8.O
1140 PFO ALL
1150 PLB ALL
1160 FPL C:\CORPS\CPGG\TWMONO8.P
```

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 *******************************
 ORPS PROGRAM  #  X0080        *  CPGA - CASE PILE GROUP ANALYSIS PROGRAM
 VERSION NUMBER # 1992/02/26   *  RUN DATE 14-JUL-1997   RUN TIME 14.18.17
 *******************************
```

T-WALL MONOLITH AT GATE NO. 8 - 65' LONG

THERE ARE 27 PILES AND
7 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

```
                                    X          Y          Z
                                  -----      -----      -----
WITH DIAGONAL COORDINATES = (    -10.50 ,   -30.00 ,      .00 )
                            (     -2.00 ,    30.00 ,      .00 )
```

****

PILE PROPERTIES AS INPUT

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.40740E+04	.32010E+04	.32010E+04	.19600E+03	.15000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.46000E-01	L	.70000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-2.00	-30.00	.00	3.00	.00	70.00	P
2	-2.00	-22.50	.00	3.00	.00	70.00	P
3	-2.00	-15.00	.00	3.00	.00	70.00	P
4	-2.00	-7.50	.00	3.00	.00	70.00	P
5	-2.00	.00	.00	3.00	.00	70.00	P
6	-2.00	7.50	.00	3.00	.00	70.00	P
7	-2.00	15.00	.00	3.00	.00	70.00	P
8	-2.00	22.50	.00	3.00	.00	70.00	P

9	-2.00	30.00	.00	3.00	.00	70.00	P
	-7.00	-30.00	.00	3.00	.00	70.00	P
11	-7.00	-22.50	.00	3.00	.00	70.00	P
12	-7.00	-15.00	.00	3.00	.00	70.00	P
13	-7.00	-7.50	.00	3.00	.00	70.00	P
14	-7.00	.00	.00	3.00	.00	70.00	P
15	-7.00	7.50	.00	3.00	.00	70.00	P
16	-7.00	15.00	.00	3.00	.00	70.00	P
17	-7.00	22.50	.00	3.00	.00	70.00	P
18	-7.00	30.00	.00	3.00	.00	70.00	P
19	-10.50	-30.00	.00	4.00	180.00	70.00	P
20	-10.50	-22.50	.00	4.00	180.00	70.00	P
21	-10.50	-15.00	.00	4.00	180.00	70.00	P
22	-10.50	-7.50	.00	4.00	180.00	70.00	P
23	-10.50	.00	.00	4.00	180.00	70.00	P
24	-10.50	7.50	.00	4.00	180.00	70.00	P
25	-10.50	15.00	.00	4.00	180.00	70.00	P
26	-10.50	22.50	.00	4.00	180.00	70.00	P
27	-10.50	30.00	.00	4.00	180.00	70.00	P

						1890.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	227.5	.0	253.5	.0	-572.0	.0
	325.0	.0	169.0	.0	-1911.0	.0
	34.5	.0	559.0	.0	3419.0	.0
4	-14.3	.0	559.0	.0	3783.8	.0
5	1.3	.0	741.0	.0	4816.5	.0
6	227.5	.0	136.5	.0	-1189.5	.0
7	243.8	.0	19.5	.0	-2008.5	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 9.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 9.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 9.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 9.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 9.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 9.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.4879E-01	-.4507E-07	.1423E-01	.2160E-12	-.1714E-03	.1629E-11

2	.1055E+00	-.8403E-07	-.7692E-02	.4028E-12	-.1908E-04	.3037E-11
[illegible]	-.5421E-01	.4746E-07	.4975E-01	-.2275E-12	-.3388E-03	-.1716E-11
4	-.7890E-01	.6250E-07	.5788E-01	-.2996E-12	-.4005E-03	-.2259E-11
5	-.9734E-01	.7649E-07	.7574E-01	-.3666E-12	-.5307E-03	-.2765E-11
6	.7334E-01	-.5686E-07	-.5004E-02	.2725E-12	-.1070E-04	.2055E-11
7	.1011E+00	-.7386E-07	-.2296E-01	.3540E-12	.1284E-03	.2670E-11

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
\# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

OAD CASE - 1

ILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.2	.0	35.7	.0	-10.7	.0	.43	.10	1.19	.98	#
2	.2	.0	35.7	.0	-10.7	.0	.43	.10	1.19	.98	#
3	.2	.0	35.7	.0	-10.7	.0	.43	.10	1.19	.98	#
4	.2	.0	35.7	.0	-10.7	.0	.43	.10	1.19	.98	#
5	.2	.0	35.7	.0	-10.7	.0	.43	.10	1.19	.98	#
6	.2	.0	35.7	.0	-10.7	.0	.43	.10	1.19	.98	#
	.2	.0	35.7	.0	-10.7	.0	.43	.10	1.19	.98	#
[illegible]	.2	.0	35.7	.0	-10.7	.0	.43	.10	1.19	.98	#
9	.2	.0	35.7	.0	-10.7	.0	.43	.10	1.19	.98	#
10	.2	.0	21.8	.0	-11.6	.0	.26	.12	1.12	.91	#
11	.2	.0	21.8	.0	-11.6	.0	.26	.12	1.12	.91	#
12	.2	.0	21.8	.0	-11.6	.0	.26	.12	1.12	.91	#
13	.2	.0	21.8	.0	-11.6	.0	.26	.12	1.12	.91	#
14	.2	.0	21.8	.0	-11.6	.0	.26	.12	1.12	.91	#
15	.2	.0	21.8	.0	-11.6	.0	.26	.12	1.12	.91	#
16	.2	.0	21.8	.0	-11.6	.0	.26	.12	1.12	.91	#
17	.2	.0	21.8	.0	-11.6	.0	.26	.12	1.12	.91	#
18	.2	.0	21.8	.0	-11.6	.0	.26	.12	1.12	.91	#
19	-.2	.0	-27.1	.0	11.4	.0	.71	.31	.87	.66	
20	-.2	.0	-27.1	.0	11.4	.0	.71	.31	.87	.66	
21	-.2	.0	-27.1	.0	11.4	.0	.71	.31	.87	.66	
22	-.2	.0	-27.1	.0	11.4	.0	.71	.31	.87	.66	
23	-.2	.0	-27.1	.0	11.4	.0	.71	.31	.87	.66	
24	-.2	.0	-27.1	.0	11.4	.0	.71	.31	.87	.66	
25	-.2	.0	-27.1	.0	11.4	.0	.71	.31	.87	.66	
26	-.2	.0	-27.1	.0	11.4	.0	.71	.31	.87	.66	
27	-.2	.0	-27.1	.0	11.4	.0	.71	.31	.87	.66	

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.4	.0	36.6	.0	-25.6	.0	.44	.09	1.22	.95	#
2	.4	.0	36.6	.0	-25.6	.0	.44	.09	1.22	.95	#
[illegible]	.4	.0	36.6	.0	-25.6	.0	.44	.09	1.22	.95	#

4	.4	.0	36.6	.0	-25.6	.0	.44	.09	1.22	.95	#
	.4	.0	36.6	.0	-25.6	.0	.44	.09	1.22	.95	#
6	.4	.0	36.6	.0	-25.6	.0	.44	.09	1.22	.95	#
7	.4	.0	36.6	.0	-25.6	.0	.44	.09	1.22	.95	#
8	.4	.0	36.6	.0	-25.6	.0	.44	.09	1.22	.95	#
9	.4	.0	36.6	.0	-25.6	.0	.44	.09	1.22	.95	#
10	.4	.0	35.0	.0	-25.7	.0	.42	.10	1.21	.94	#
11	.4	.0	35.0	.0	-25.7	.0	.42	.10	1.21	.94	#
12	.4	.0	35.0	.0	-25.7	.0	.42	.10	1.21	.94	#
13	.4	.0	35.0	.0	-25.7	.0	.42	.10	1.21	.94	#
14	.4	.0	35.0	.0	-25.7	.0	.42	.10	1.21	.94	#
15	.4	.0	35.0	.0	-25.7	.0	.42	.10	1.21	.94	#
16	.4	.0	35.0	.0	-25.7	.0	.42	.10	1.21	.94	#
17	.4	.0	35.0	.0	-25.7	.0	.42	.10	1.21	.94	#
18	.4	.0	35.0	.0	-25.7	.0	.42	.10	1.21	.94	#
19	-.4	.0	-50.5	.0	24.9	.0	1.33	.59	.78	.51	
20	-.4	.0	-50.5	.0	24.9	.0	1.33	.59	.78	.51	
21	-.4	.0	-50.5	.0	24.9	.0	1.33	.59	.78	.51	
22	-.4	.0	-50.5	.0	24.9	.0	1.33	.59	.78	.51	
23	-.4	.0	-50.5	.0	24.9	.0	1.33	.59	.78	.51	
24	-.4	.0	-50.5	.0	24.9	.0	1.33	.59	.78	.51	
25	-.4	.0	-50.5	.0	24.9	.0	1.33	.59	.78	.51	
26	-.4	.0	-50.5	.0	24.9	.0	1.33	.59	.78	.51	
27	-.4	.0	-50.5	.0	24.9	.0	1.33	.59	.78	.51	

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
	-.3	.0	31.8	.0	16.1	.0	.38	.10	1.18	.95	#
	-.3	.0	31.8	.0	16.1	.0	.38	.10	1.18	.95	#
3	-.3	.0	31.8	.0	16.1	.0	.38	.10	1.18	.95	#
4	-.3	.0	31.8	.0	16.1	.0	.38	.10	1.18	.95	#
5	-.3	.0	31.8	.0	16.1	.0	.38	.10	1.18	.95	#
6	-.3	.0	31.8	.0	16.1	.0	.38	.10	1.18	.95	#
7	-.3	.0	31.8	.0	16.1	.0	.38	.10	1.18	.95	#
8	-.3	.0	31.8	.0	16.1	.0	.38	.10	1.18	.95	#
9	-.3	.0	31.8	.0	16.1	.0	.38	.10	1.18	.95	#
10	-.2	.0	4.4	.0	14.5	.0	.05	.16	1.03	.81	
11	-.2	.0	4.4	.0	14.5	.0	.05	.16	1.03	.81	
12	-.2	.0	4.4	.0	14.5	.0	.05	.16	1.03	.81	
13	-.2	.0	4.4	.0	14.5	.0	.05	.16	1.03	.81	
14	-.2	.0	4.4	.0	14.5	.0	.05	.16	1.03	.81	
15	-.2	.0	4.4	.0	14.5	.0	.05	.16	1.03	.81	
16	-.2	.0	4.4	.0	14.5	.0	.05	.16	1.03	.81	
17	-.2	.0	4.4	.0	14.5	.0	.05	.16	1.03	.81	
18	-.2	.0	4.4	.0	14.5	.0	.05	.16	1.03	.81	
19	.2	.0	28.5	.0	-12.7	.0	.34	.11	1.15	.94	#
20	.2	.0	28.5	.0	-12.7	.0	.34	.11	1.15	.94	#
21	.2	.0	28.5	.0	-12.7	.0	.34	.11	1.15	.94	#
22	.2	.0	28.5	.0	-12.7	.0	.34	.11	1.15	.94	#
23	.2	.0	28.5	.0	-12.7	.0	.34	.11	1.15	.94	#
24	.2	.0	28.5	.0	-12.7	.0	.34	.11	1.15	.94	#
25	.2	.0	28.5	.0	-12.7	.0	.34	.11	1.15	.94	#
26	.2	.0	28.5	.0	-12.7	.0	.34	.11	1.15	.94	#
27	.2	.0	28.5	.0	-12.7	.0	.34	.11	1.15	.94	#

LOAD CASE - 4

ᵀᴸE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.4	.0	29.7	.0	22.5	.0	.36	.11	1.18	.92	#
2	-.4	.0	29.7	.0	22.5	.0	.36	.11	1.18	.92	#
3	-.4	.0	29.7	.0	22.5	.0	.36	.11	1.18	.92	#
4	-.4	.0	29.7	.0	22.5	.0	.36	.11	1.18	.92	#
5	-.4	.0	29.7	.0	22.5	.0	.36	.11	1.18	.92	#
6	-.4	.0	29.7	.0	22.5	.0	.36	.11	1.18	.92	#
7	-.4	.0	29.7	.0	22.5	.0	.36	.11	1.18	.92	#
8	-.4	.0	29.7	.0	22.5	.0	.36	.11	1.18	.92	#
9	-.4	.0	29.7	.0	22.5	.0	.36	.11	1.18	.92	#
10	-.3	.0	-2.8	.0	20.6	.0	.07	.07	1.01	.76	
11	-.3	.0	-2.8	.0	20.6	.0	.07	.07	1.01	.76	
12	-.3	.0	-2.8	.0	20.6	.0	.07	.07	1.01	.76	
13	-.3	.0	-2.8	.0	20.6	.0	.07	.07	1.01	.76	
14	-.3	.0	-2.8	.0	20.6	.0	.07	.07	1.01	.76	
15	-.3	.0	-2.8	.0	20.6	.0	.07	.07	1.01	.76	
16	-.3	.0	-2.8	.0	20.6	.0	.07	.07	1.01	.76	
17	-.3	.0	-2.8	.0	20.6	.0	.07	.07	1.01	.76	
18	-.3	.0	-2.8	.0	20.6	.0	.07	.07	1.01	.76	
19	.3	.0	37.5	.0	-18.6	.0	.45	.09	1.21	.97	#
20	.3	.0	37.5	.0	-18.6	.0	.45	.09	1.21	.97	#
21	.3	.0	37.5	.0	-18.6	.0	.45	.09	1.21	.97	#
22	.3	.0	37.5	.0	-18.6	.0	.45	.09	1.21	.97	#
23	.3	.0	37.5	.0	-18.6	.0	.45	.09	1.21	.97	#
24	.3	.0	37.5	.0	-18.6	.0	.45	.09	1.21	.97	#
25	.3	.0	37.5	.0	-18.6	.0	.45	.09	1.21	.97	#
26	.3	.0	37.5	.0	-18.6	.0	.45	.09	1.21	.97	#
27	.3	.0	37.5	.0	-18.6	.0	.45	.09	1.21	.97	#

D CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.5	.0	41.3	.0	28.0	.0	.50	.11	1.25	.97	#
2	-.5	.0	41.3	.0	28.0	.0	.50	.11	1.25	.97	#
3	-.5	.0	41.3	.0	28.0	.0	.50	.11	1.25	.97	#
4	-.5	.0	41.3	.0	28.0	.0	.50	.11	1.25	.97	#
5	-.5	.0	41.3	.0	28.0	.0	.50	.11	1.25	.97	#
6	-.5	.0	41.3	.0	28.0	.0	.50	.11	1.25	.97	#
7	-.5	.0	41.3	.0	28.0	.0	.50	.11	1.25	.97	#
8	-.5	.0	41.3	.0	28.0	.0	.50	.11	1.25	.97	#
9	-.5	.0	41.3	.0	28.0	.0	.50	.11	1.25	.97	#
10	-.4	.0	-1.7	.0	25.5	.0	.05	.07	1.03	.76	
11	-.4	.0	-1.7	.0	25.5	.0	.05	.07	1.03	.76	
12	-.4	.0	-1.7	.0	25.5	.0	.05	.07	1.03	.76	
13	-.4	.0	-1.7	.0	25.5	.0	.05	.07	1.03	.76	
14	-.4	.0	-1.7	.0	25.5	.0	.05	.07	1.03	.76	
15	-.4	.0	-1.7	.0	25.5	.0	.05	.07	1.03	.76	
16	-.4	.0	-1.7	.0	25.5	.0	.05	.07	1.03	.76	
17	-.4	.0	-1.7	.0	25.5	.0	.05	.07	1.03	.76	
18	-.4	.0	-1.7	.0	25.5	.0	.05	.07	1.03	.76	
19	.4	.0	45.9	.0	-23.0	.0	.55	.15	1.26	1.00	#
20	.4	.0	45.9	.0	-23.0	.0	.55	.15	1.26	1.00	#
21	.4	.0	45.9	.0	-23.0	.0	.55	.15	1.26	1.00	#
22	.4	.0	45.9	.0	-23.0	.0	.55	.15	1.26	1.00	#
23	.4	.0	45.9	.0	-23.0	.0	.55	.15	1.26	1.00	#
24	.4	.0	45.9	.0	-23.0	.0	.55	.15	1.26	1.00	#
25	.4	.0	45.9	.0	-23.0	.0	.55	.15	1.26	1.00	#

26	.4	.0	45.9	.0	-23.0	.0	.55	.15	1.26	1.00	#
	.4	.0	45.9	.0	-23.0	.0	.55	.15	1.26	1.00	#

OAD CASE - 6

ILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.3	.0	26.0	.0	-17.8	.0	.31	.11	1.15	.91	#
2	.3	.0	26.0	.0	-17.8	.0	.31	.11	1.15	.91	#
3	.3	.0	26.0	.0	-17.8	.0	.31	.11	1.15	.91	#
4	.3	.0	26.0	.0	-17.8	.0	.31	.11	1.15	.91	#
5	.3	.0	26.0	.0	-17.8	.0	.31	.11	1.15	.91	#
6	.3	.0	26.0	.0	-17.8	.0	.31	.11	1.15	.91	#
7	.3	.0	26.0	.0	-17.8	.0	.31	.11	1.15	.91	#
8	.3	.0	26.0	.0	-17.8	.0	.31	.11	1.15	.91	#
9	.3	.0	26.0	.0	-17.8	.0	.31	.11	1.15	.91	#
10	.3	.0	25.1	.0	-17.8	.0	.30	.11	1.15	.91	#
11	.3	.0	25.1	.0	-17.8	.0	.30	.11	1.15	.91	#
12	.3	.0	25.1	.0	-17.8	.0	.30	.11	1.15	.91	#
13	.3	.0	25.1	.0	-17.8	.0	.30	.11	1.15	.91	#
14	.3	.0	25.1	.0	-17.8	.0	.30	.11	1.15	.91	#
15	.3	.0	25.1	.0	-17.8	.0	.30	.11	1.15	.91	#
16	.3	.0	25.1	.0	-17.8	.0	.30	.11	1.15	.91	#
17	.3	.0	25.1	.0	-17.8	.0	.30	.11	1.15	.91	#
18	.3	.0	25.1	.0	-17.8	.0	.30	.11	1.15	.91	#
19	-.3	.0	-34.2	.0	17.4	.0	.90	.40	.84	.61	
20	-.3	.0	-34.2	.0	17.4	.0	.90	.40	.84	.61	
21	-.3	.0	-34.2	.0	17.4	.0	.90	.40	.84	.61	
22	-.3	.0	-34.2	.0	17.4	.0	.90	.40	.84	.61	
	-.3	.0	-34.2	.0	17.4	.0	.90	.40	.84	.61	
	-.3	.0	-34.2	.0	17.4	.0	.90	.40	.84	.61	
25	-.3	.0	-34.2	.0	17.4	.0	.90	.40	.84	.61	
26	-.3	.0	-34.2	.0	17.4	.0	.90	.40	.84	.61	
27	-.3	.0	-34.2	.0	17.4	.0	.90	.40	.84	.61	

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.4	.0	18.7	.0	-25.5	.0	.23	.13	1.13	.86	#
2	.4	.0	18.7	.0	-25.5	.0	.23	.13	1.13	.86	#
3	.4	.0	18.7	.0	-25.5	.0	.23	.13	1.13	.86	#
4	.4	.0	18.7	.0	-25.5	.0	.23	.13	1.13	.86	#
5	.4	.0	18.7	.0	-25.5	.0	.23	.13	1.13	.86	#
6	.4	.0	18.7	.0	-25.5	.0	.23	.13	1.13	.86	#
7	.4	.0	18.7	.0	-25.5	.0	.23	.13	1.13	.86	#
8	.4	.0	18.7	.0	-25.5	.0	.23	.13	1.13	.86	#
9	.4	.0	18.7	.0	-25.5	.0	.23	.13	1.13	.86	#
10	.4	.0	29.1	.0	-24.9	.0	.35	.11	1.18	.91	#
11	.4	.0	29.1	.0	-24.9	.0	.35	.11	1.18	.91	#
12	.4	.0	29.1	.0	-24.9	.0	.35	.11	1.18	.91	#
13	.4	.0	29.1	.0	-24.9	.0	.35	.11	1.18	.91	#
14	.4	.0	29.1	.0	-24.9	.0	.35	.11	1.18	.91	#
15	.4	.0	29.1	.0	-24.9	.0	.35	.11	1.18	.91	#
16	.4	.0	29.1	.0	-24.9	.0	.35	.11	1.18	.91	#
17	.4	.0	29.1	.0	-24.9	.0	.35	.11	1.18	.91	#
18	.4	.0	29.1	.0	-24.9	.0	.35	.11	1.18	.91	#
19	-.4	.0	-44.4	.0	24.1	.0	1.17	.52	.81	.54	

[illegible]	-.4	.0	-44.4	.0	24.1	.0	1.17	.52	.81	.54
[illegible]	-.4	.0	-44.4	.0	24.1	.0	1.17	.52	.81	.54
22	-.4	.0	-44.4	.0	24.1	.0	1.17	.52	.81	.54
23	-.4	.0	-44.4	.0	24.1	.0	1.17	.52	.81	.54
24	-.4	.0	-44.4	.0	24.1	.0	1.17	.52	.81	.54
25	-.4	.0	-44.4	.0	24.1	.0	1.17	.52	.81	.54
26	-.4	.0	-44.4	.0	24.1	.0	1.17	.52	.81	.54
27	-.4	.0	-44.4	.0	24.1	.0	1.17	.52	.81	.54

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PILE FORCES IN GLOBAL GEOMETRY

OAD CASE - 1

ILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	11.5	.0	33.8	.0	.0	.0
2	11.5	.0	33.8	.0	.0	.0
3	11.5	.0	33.8	.0	.0	.0
4	11.5	.0	33.8	.0	.0	.0
5	11.5	.0	33.8	.0	.0	.0
6	11.5	.0	33.8	.0	.0	.0
7	11.5	.0	33.8	.0	.0	.0
8	11.5	.0	33.8	.0	.0	.0
9	11.5	.0	33.8	.0	.0	.0
10	7.1	.0	20.6	.0	.0	.0
1	7.1	.0	20.6	.0	.0	.0
2	7.1	.0	20.6	.0	.0	.0
13	7.1	.0	20.6	.0	.0	.0
14	7.1	.0	20.6	.0	.0	.0
15	7.1	.0	20.6	.0	.0	.0
16	7.1	.0	20.6	.0	.0	.0
17	7.1	.0	20.6	.0	.0	.0
18	7.1	.0	20.6	.0	.0	.0
19	6.8	.0	-26.2	.0	.0	.0
20	6.8	.0	-26.2	.0	.0	.0
21	6.8	.0	-26.2	.0	.0	.0
22	6.8	.0	-26.2	.0	.0	.0
23	6.8	.0	-26.2	.0	.0	.0
24	6.8	.0	-26.2	.0	.0	.0
25	6.8	.0	-26.2	.0	.0	.0
26	6.8	.0	-26.2	.0	.0	.0
27	6.8	.0	-26.2	.0	.0	.0

OAD CASE - 2

ILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	12.0	.0	34.6	.0	.0	.0
2	12.0	.0	34.6	.0	.0	.0
3	12.0	.0	34.6	.0	.0	.0
4	12.0	.0	34.6	.0	.0	.0
5	12.0	.0	34.6	.0	.0	.0
6	12.0	.0	34.6	.0	.0	.0
7	12.0	.0	34.6	.0	.0	.0

8	12.0	.0	34.6	.0	.0	.0
9	12.0	.0	34.6	.0	.0	.0
10	11.5	.0	33.1	.0	.0	.0
11	11.5	.0	33.1	.0	.0	.0
12	11.5	.0	33.1	.0	.0	.0
13	11.5	.0	33.1	.0	.0	.0
14	11.5	.0	33.1	.0	.0	.0
15	11.5	.0	33.1	.0	.0	.0
16	11.5	.0	33.1	.0	.0	.0
17	11.5	.0	33.1	.0	.0	.0
18	11.5	.0	33.1	.0	.0	.0
19	12.6	.0	-48.9	.0	.0	.0
20	12.6	.0	-48.9	.0	.0	.0
21	12.6	.0	-48.9	.0	.0	.0
22	12.6	.0	-48.9	.0	.0	.0
23	12.6	.0	-48.9	.0	.0	.0
24	12.6	.0	-48.9	.0	.0	.0
25	12.6	.0	-48.9	.0	.0	.0
26	12.6	.0	-48.9	.0	.0	.0
27	12.6	.0	-48.9	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	9.8	.0	30.3	.0	.0	.0
2	9.8	.0	30.3	.0	.0	.0
3	9.8	.0	30.3	.0	.0	.0
4	9.8	.0	30.3	.0	.0	.0
5	9.8	.0	30.3	.0	.0	.0
6	9.8	.0	30.3	.0	.0	.0
7	9.8	.0	30.3	.0	.0	.0
8	9.8	.0	30.3	.0	.0	.0
9	9.8	.0	30.3	.0	.0	.0
10	1.1	.0	4.2	.0	.0	.0
11	1.1	.0	4.2	.0	.0	.0
12	1.1	.0	4.2	.0	.0	.0
13	1.1	.0	4.2	.0	.0	.0
14	1.1	.0	4.2	.0	.0	.0
15	1.1	.0	4.2	.0	.0	.0
16	1.1	.0	4.2	.0	.0	.0
17	1.1	.0	4.2	.0	.0	.0
18	1.1	.0	4.2	.0	.0	.0
19	-7.1	.0	27.6	.0	.0	.0
20	-7.1	.0	27.6	.0	.0	.0
21	-7.1	.0	27.6	.0	.0	.0
22	-7.1	.0	27.6	.0	.0	.0
23	-7.1	.0	27.6	.0	.0	.0
24	-7.1	.0	27.6	.0	.0	.0
25	-7.1	.0	27.6	.0	.0	.0
26	-7.1	.0	27.6	.0	.0	.0
27	-7.1	.0	27.6	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	9.0	.0	28.3	.0	.0	.0

2	9.0	.0	28.3	.0	.0	.0
3	9.0	.0	28.3	.0	.0	.0
4	9.0	.0	28.3	.0	.0	.0
5	9.0	.0	28.3	.0	.0	.0
6	9.0	.0	28.3	.0	.0	.0
7	9.0	.0	28.3	.0	.0	.0
8	9.0	.0	28.3	.0	.0	.0
9	9.0	.0	28.3	.0	.0	.0
10	-1.2	.0	-2.5	.0	.0	.0
11	-1.2	.0	-2.5	.0	.0	.0
12	-1.2	.0	-2.5	.0	.0	.0
13	-1.2	.0	-2.5	.0	.0	.0
14	-1.2	.0	-2.5	.0	.0	.0
15	-1.2	.0	-2.5	.0	.0	.0
16	-1.2	.0	-2.5	.0	.0	.0
17	-1.2	.0	-2.5	.0	.0	.0
18	-1.2	.0	-2.5	.0	.0	.0
19	-9.4	.0	36.3	.0	.0	.0
20	-9.4	.0	36.3	.0	.0	.0
21	-9.4	.0	36.3	.0	.0	.0
22	-9.4	.0	36.3	.0	.0	.0
23	-9.4	.0	36.3	.0	.0	.0
24	-9.4	.0	36.3	.0	.0	.0
25	-9.4	.0	36.3	.0	.0	.0
26	-9.4	.0	36.3	.0	.0	.0
27	-9.4	.0	36.3	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	12.6	.0	39.4	.0	.0	.0
2	12.6	.0	39.4	.0	.0	.0
3	12.6	.0	39.4	.0	.0	.0
4	12.6	.0	39.4	.0	.0	.0
5	12.6	.0	39.4	.0	.0	.0
6	12.6	.0	39.4	.0	.0	.0
7	12.6	.0	39.4	.0	.0	.0
8	12.6	.0	39.4	.0	.0	.0
9	12.6	.0	39.4	.0	.0	.0
10	-1.0	.0	-1.5	.0	.0	.0
11	-1.0	.0	-1.5	.0	.0	.0
12	-1.0	.0	-1.5	.0	.0	.0
13	-1.0	.0	-1.5	.0	.0	.0
14	-1.0	.0	-1.5	.0	.0	.0
15	-1.0	.0	-1.5	.0	.0	.0
16	-1.0	.0	-1.5	.0	.0	.0
17	-1.0	.0	-1.5	.0	.0	.0
18	-1.0	.0	-1.5	.0	.0	.0
19	-11.5	.0	44.5	.0	.0	.0
20	-11.5	.0	44.5	.0	.0	.0
21	-11.5	.0	44.5	.0	.0	.0
22	-11.5	.0	44.5	.0	.0	.0
23	-11.5	.0	44.5	.0	.0	.0
24	-11.5	.0	44.5	.0	.0	.0
25	-11.5	.0	44.5	.0	.0	.0
26	-11.5	.0	44.5	.0	.0	.0
27	-11.5	.0	44.5	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	8.5	.0	24.5	.0	.0	.0
2	8.5	.0	24.5	.0	.0	.0
3	8.5	.0	24.5	.0	.0	.0
4	8.5	.0	24.5	.0	.0	.0
5	8.5	.0	24.5	.0	.0	.0
6	8.5	.0	24.5	.0	.0	.0
7	8.5	.0	24.5	.0	.0	.0
8	8.5	.0	24.5	.0	.0	.0
9	8.5	.0	24.5	.0	.0	.0
10	8.2	.0	23.7	.0	.0	.0
11	8.2	.0	23.7	.0	.0	.0
12	8.2	.0	23.7	.0	.0	.0
13	8.2	.0	23.7	.0	.0	.0
14	8.2	.0	23.7	.0	.0	.0
15	8.2	.0	23.7	.0	.0	.0
16	8.2	.0	23.7	.0	.0	.0
17	8.2	.0	23.7	.0	.0	.0
18	8.2	.0	23.7	.0	.0	.0
19	8.6	.0	-33.1	.0	.0	.0
20	8.6	.0	-33.1	.0	.0	.0
21	8.6	.0	-33.1	.0	.0	.0
22	8.6	.0	-33.1	.0	.0	.0
23	8.6	.0	-33.1	.0	.0	.0
24	8.6	.0	-33.1	.0	.0	.0
25	8.6	.0	-33.1	.0	.0	.0
26	8.6	.0	-33.1	.0	.0	.0
27	8.6	.0	-33.1	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	6.3	.0	17.6	.0	.0	.0
2	6.3	.0	17.6	.0	.0	.0
3	6.3	.0	17.6	.0	.0	.0
4	6.3	.0	17.6	.0	.0	.0
5	6.3	.0	17.6	.0	.0	.0
6	6.3	.0	17.6	.0	.0	.0
7	6.3	.0	17.6	.0	.0	.0
8	6.3	.0	17.6	.0	.0	.0
9	6.3	.0	17.6	.0	.0	.0
10	9.6	.0	27.5	.0	.0	.0
11	9.6	.0	27.5	.0	.0	.0
12	9.6	.0	27.5	.0	.0	.0
13	9.6	.0	27.5	.0	.0	.0
14	9.6	.0	27.5	.0	.0	.0
15	9.6	.0	27.5	.0	.0	.0
16	9.6	.0	27.5	.0	.0	.0
17	9.6	.0	27.5	.0	.0	.0
18	9.6	.0	27.5	.0	.0	.0
19	11.2	.0	-42.9	.0	.0	.0
20	11.2	.0	-42.9	.0	.0	.0
21	11.2	.0	-42.9	.0	.0	.0
22	11.2	.0	-42.9	.0	.0	.0
23	11.2	.0	-42.9	.0	.0	.0

24	11.2	.0	-42.9	.0	.0	.0
25	11.2	.0	-42.9	.0	.0	.0
26	11.2	.0	-42.9	.0	.0	.0
27	11.2	.0	-42.9	.0	.0	.0

```
1000 GATE 8 MONOLITH - FEB '97 RUN
1005 14 X 14 PPC PILES @ 7' C/C W/ F.S. = 2
1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL

1020 SOI ES .0705 LEN 90.0 0. ALL

1030 PIN ALL

1040 TEN 0.8 ALL

1050 DLS S 140.0 50.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL

1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL
1070 BAT 3.0 1 12 13 14 16 18 19 21 23 24
1080 ANG 260 1
1090 ANG 270 2 TO 11
1091 ANG 280 12
1092 ANG 90 13 TO 24

1100 PIL 1 -33.5 -2.5 0.0  2 -28.5 -2.5 0.0  7 2.5 -2.5 0.0
1101 PIL 12 33.5 -2.5 0.0  13 -33.5 2.5 0.0  14 -28.5 2.5 0.0
1102 PIL 19 2.5 2.5 0.0  24 33.5 2.5 0.0
1105 ROW X 5 2 4 AT 6.5
1106 ROW X 5 7 4 AT 6.5
1107 ROW X 5 14 4 AT 6.5
1108 ROW X 5 19 4 AT 6.5
1120 LOA 1 0.0 100.0 413.2 499.1 0.0 0.0

1121 LOA 2 0.0 123.4 309.9 563.0 0.0 0.0
1122 LOA 3 0.0 -57.5 789.9 864.2 0.0 0.0
1123 LOA 4 0.0 14.3 789.9 -1060.5 0.0 0.0
1124 LOA 5 0.0 12.6 592.4 927.5 0.0 0.0
1125 LOA 6 0.0 -45.0 592.4 -888.8 0.0 0.0
1126 LOA 7 0.0 2.5 503.9 92.6 0.0 0.0
1127 LOA 8 0.0 -45.7 503.9 57.7 0.0 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\GATE8.O

1140 PFO ALL

1150 PLB ALL
1160 FPL C:\CORPS\CPGG\GATE8.P
```

```
 *********************************
 * CORPS PROGRAM  #  X0080        *  CPGA - CASE PILE GROUP ANALYSIS PRO
GRAM
 * VERSION NUMBER # 1992/02/26    *  RUN DATE 08-APR-1997   RUN TIME  9.
59.02
 *********************************


 GATE 8 MONOLITH - FEB '97 RUN


 THERE ARE  24 PILES AND
             8 LOAD CASES IN THIS RUN.

 ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                           X           Y           Z
                                         -----       -----       -----
 WITH DIAGONAL COORDINATES = (     -33.50 ,     -2.50 ,       .00 )
                             (      33.50 ,      2.50 ,       .00 )


 **********************************************************************
*********

          PILE PROPERTIES AS INPUT


      E             I1            I2            A             C33
B66
     KSI          IN**4         IN**4         IN**2
   .40740E+04   .32010E+04   .32010E+04   .19600E+03   .15000E+01   .00
000E+00

 THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

    ALL


 **********************************************************************
*********

          SOIL DESCRIPTIONS AS INPUT


   ES     ESOIL      LENGTH       L            LU
          K/IN**2                 FT           FT
```

.70500E-01 L .90000E+02 .00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-33.50	-2.50	.00	3.00	260.00	90.00	P
2	-28.50	-2.50	.00	V	270.00	90.00	P
3	-22.00	-2.50	.00	V	270.00	90.00	P
4	-15.50	-2.50	.00	V	270.00	90.00	P
5	-9.00	-2.50	.00	V	270.00	90.00	P
6	-2.50	-2.50	.00	V	270.00	90.00	P
7	2.50	-2.50	.00	V	270.00	90.00	P
8	9.00	-2.50	.00	V	270.00	90.00	P
9	15.50	-2.50	.00	V	270.00	90.00	P
10	22.00	-2.50	.00	V	270.00	90.00	P
11	28.50	-2.50	.00	V	270.00	90.00	P
12	33.50	-2.50	.00	3.00	280.00	90.00	P
13	-33.50	2.50	.00	3.00	90.00	90.00	P
14	-28.50	2.50	.00	3.00	90.00	90.00	P
15	-22.00	2.50	.00	V	90.00	90.00	P
16	-15.50	2.50	.00	3.00	90.00	90.00	P
17	-9.00	2.50	.00	V	90.00	90.00	P
18	-2.50	2.50	.00	3.00	90.00	90.00	P
19	2.50	2.50	.00	3.00	90.00	90.00	P
20	9.00	2.50	.00	V	90.00	90.00	P
21	15.50	2.50	.00	3.00	90.00	90.00	P
22	22.00	2.50	.00	V	90.00	90.00	P
23	28.50	2.50	.00	3.00	90.00	90.00	P
24	33.50	2.50	.00	3.00	90.00	90.00	P

						2160.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	100.0	413.2	499.1	.0	.0
2	.0	123.4	309.9	563.0	.0	.0
3	.0	-57.5	789.9	864.2	.0	.0
4	.0	14.3	789.9	-1060.5	.0	.0
5	.0	12.6	592.4	927.5	.0	.0
6	.0	-45.0	592.4	-888.8	.0	.0
7	.0	2.5	503.9	92.6	.0	.0
8	.0	-45.7	503.9	57.7	.0	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 6.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 8. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

****

PILE CAP DISPLACEMENTS

LOAD CASE RZ	DX IN	DY IN	DZ IN	RX RAD	RY RAD

```
RAD

    1    .3167E-07   .6259E-01   .1130E-01   .7598E-06   .1523E-11   .6
443E-11
    2    .4400E-07   .1071E+00   .3639E-02  -.1644E-03   .2310E-11   .1
085E-10
    3   -.4298E-07  -.2618E+00   .5271E-01   .1626E-02  -.3482E-11  -.2
087E-10
    4   -.1416E-07   .8717E-02   .2984E-01  -.5660E-03  -.7620E-12  -.6
304E-11
    5   -.8894E-08  -.1322E+00   .3440E-01   .1084E-02  -.1294E-11  -.8
878E-11
    6   -.3386E-07  -.7292E-01   .2883E-01  -.1252E-03  -.1971E-11  -.1
198E-10
    7   -.1137E-07  -.6804E-01   .2536E-01   .3636E-03  -.1002E-11  -.6
876E-11
    8   -.3145E-07  -.1405E+00   .3126E-01   .6631E-03  -.2233E-11  -.1
326E-10


 ***********************************************************************
*********

          PILE FORCES IN LOCAL GEOMETRY

              M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
              * INDICATES PILE FAILURE
              # INDICATES CBF BASED ON MOMENTS DUE TO
                          (F3*EMIN) FOR CONCRETE PILES
              B INDICATES BUCKLING CONTROLS


 LOAD CASE -     1

 PILE    F1      F2      F3         M1         M2         M3   ALF  CBF  A
SC  AST
          K       K       K       IN-K       IN-K       IN-K             K
SI  KSI

   1     -.4     -.1    -9.8      -3.4       19.2         .0   .20  .15  .
98  .72
   2     -.4      .0    12.5        .0       19.3         .0   .09  .14 1.
09  .84
   3     -.4      .0    12.5        .0       19.3         .0   .09  .14 1.
09  .84
   4     -.4      .0    12.5        .0       19.3         .0   .09  .14 1.
```

```
RAD

    1    .3167E-07   .6259E-01   .1130E-01   .7598E-06   .1523E-11   .6
443E-11
    2    .4400E-07   .1071E+00   .3639E-02  -.1644E-03   .2310E-11   .1
085E-10
    3   -.4298E-07  -.2618E+00   .5271E-01   .1626E-02  -.3482E-11  -.2
087E-10
    4   -.1416E-07   .8717E-02   .2984E-01  -.5660E-03  -.7620E-12  -.6
304E-11
    5   -.8894E-08  -.1322E+00   .3440E-01   .1084E-02  -.1294E-11  -.8
878E-11
    6   -.3386E-07  -.7292E-01   .2883E-01  -.1252E-03  -.1971E-11  -.1
198E-10
    7   -.1137E-07  -.6804E-01   .2536E-01   .3636E-03  -.1002E-11  -.6
876E-11
    8   -.3145E-07  -.1405E+00   .3126E-01   .6631E-03  -.2233E-11  -.1
326E-10


*******************************************************************
*********

         PILE FORCES IN LOCAL GEOMETRY

            M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
            * INDICATES PILE FAILURE
            # INDICATES CBF BASED ON MOMENTS DUE TO
                        (F3*EMIN) FOR CONCRETE PILES
            B INDICATES BUCKLING CONTROLS


 LOAD CASE -    1

 PILE    F1      F2      F3       M1       M2       M3   ALF  CBF  A
SC  AST
         K       K       K       IN-K     IN-K     IN-K            K
SI  KSI

   1    -.4     -.1     -9.8     -3.4     19.2       .0  .20  .15  .
98  .72
   2    -.4      .0     12.5       .0     19.3       .0  .09  .14 1.
09  .84
   3    -.4      .0     12.5       .0     19.3       .0  .09  .14 1.
09  .84
   4    -.4      .0     12.5       .0     19.3       .0  .09  .14 1.
```

```
09  .84
   5      -.4       .0     12.5        .0       19.3        .0  .09  .14 1.
09  .84
   6      -.4       .0     12.5        .0       19.3        .0  .09  .14 1.
09  .84
   7      -.4       .0     12.5        .0       19.3        .0  .09  .14 1.
09  .84
   8      -.4       .0     12.5        .0       19.3        .0  .09  .14 1.
09  .84
   9      -.4       .0     12.5        .0       19.3        .0  .09  .14 1.
09  .84
  10      -.4       .0     12.5        .0       19.3        .0  .09  .14 1.
09  .84
  11      -.4       .0     12.5        .0       19.3        .0  .09  .14 1.
09  .84
  12      -.4       .1     -9.8       3.4       19.2        .0  .20  .15  .
98  .72
  13       .3       .0     33.9        .0      -17.2        .0  .24  .10 1.
19  .96 #
  14       .3       .0     33.9        .0      -17.2        .0  .24  .10 1.
19  .96 #
  15       .4       .0     12.6        .0      -19.3        .0  .09  .14 1.
09  .84
  16       .3       .0     33.9        .0      -17.2        .0  .24  .10 1.
19  .96 #
  17       .4       .0     12.6        .0      -19.3        .0  .09  .14 1.
09  .84
  18       .3       .0     33.9        .0      -17.2        .0  .24  .10 1.
19  .96 #
  19       .3       .0     33.9        .0      -17.2        .0  .24  .10 1.
19  .96 #
  20       .4       .0     12.6        .0      -19.3        .0  .09  .14 1.
09  .84
  21       .3       .0     33.9        .0      -17.2        .0  .24  .10 1.
19  .96 #
  22       .4       .0     12.6        .0      -19.3        .0  .09  .14 1.
09  .84
  23       .3       .0     33.9        .0      -17.2        .0  .24  .10 1.
19  .96 #
  24       .3       .0     33.9        .0      -17.2        .0  .24  .10 1.
19  .96 #


 LOAD CASE -     2

 PILE    F1       F2       F3         M1         M2         M3   ALF  CBF  A
SC  AST
```

```
           K        K        K        IN-K        IN-K        IN-K               K
SI  KSI

   1      -.6      -.1    -28.0      -5.7        31.7          .0   .56   .37   .
92  .60
   2      -.6       .0      9.5        .0        33.1          .0   .07   .18 1.
10  .80
   3      -.6       .0      9.5        .0        33.1          .0   .07   .18 1.
10  .80
   4      -.6       .0      9.5        .0        33.1          .0   .07   .18 1.
10  .80
   5      -.6       .0      9.5        .0        33.1          .0   .07   .18 1.
10  .80
   6      -.6       .0      9.5        .0        33.1          .0   .07   .18 1.
10  .80
   7      -.6       .0      9.5        .0        33.1          .0   .07   .18 1.
10  .80
   8      -.6       .0      9.5        .0        33.1          .0   .07   .18 1.
10  .80
   9      -.6       .0      9.5        .0        33.1          .0   .07   .18 1.
10  .80
  10      -.6       .0      9.5        .0        33.1          .0   .07   .18 1.
10  .80
  11      -.6       .0      9.5        .0        33.1          .0   .07   .18 1.
10  .80
  12      -.6       .1    -28.0       5.7        31.7          .0   .56   .37   .
92  .60
  13       .6       .0     36.2        .0       -31.5          .0   .26   .10 1.
23  .94 #
  14       .6       .0     36.2        .0       -31.5          .0   .26   .10 1.
23  .94 #
  15       .6       .0     -1.4        .0       -33.1          .0   .03   .08 1.
04  .74
  16       .6       .0     36.2        .0       -31.5          .0   .26   .10 1.
23  .94 #
  17       .6       .0     -1.4        .0       -33.1          .0   .03   .08 1.
04  .74
  18       .6       .0     36.2        .0       -31.5          .0   .26   .10 1.
23  .94 #
  19       .6       .0     36.2        .0       -31.5          .0   .26   .10 1.
23  .94 #
  20       .6       .0     -1.4        .0       -33.1          .0   .03   .08 1.
04  .74
  21       .6       .0     36.2        .0       -31.5          .0   .26   .10 1.
23  .94 #
  22       .6       .0     -1.4        .0       -33.1          .0   .03   .08 1.
04  .74
```

```
  23       .6       .0     36.2        .0      -31.5         .0  .26  .10 1.
23  .94 #
  24       .6       .0     36.2        .0      -31.5         .0  .26  .10 1.
23  .94 #


 LOAD CASE -    3

 PILE    F1       F2       F3        M1         M2         M3  ALF  CBF  A
SC  AST
          K        K        K       IN-K       IN-K       IN-K            K
SI  KSI

   1      1.4       .3     94.6      14.0      -75.1         .0  .68  .48 1.
66 1.11 #
   2      1.5       .0      4.4        .0      -80.8         .0  .03  .28 1.
18  .67
   3      1.5       .0      4.4        .0      -80.8         .0  .03  .28 1.
18  .67
   4      1.5       .0      4.4        .0      -80.8         .0  .03  .28 1.
18  .67
   5      1.5       .0      4.4        .0      -80.8         .0  .03  .28 1.
18  .67
   6      1.5       .0      4.4        .0      -80.8         .0  .03  .28 1.
18  .67
   7      1.5       .0      4.4        .0      -80.8         .0  .03  .28 1.
18  .67
   8      1.5       .0      4.4        .0      -80.8         .0  .03  .28 1.
18  .67
   9      1.5       .0      4.4        .0      -80.8         .0  .03  .28 1.
18  .67
  10      1.5       .0      4.4        .0      -80.8         .0  .03  .28 1.
18  .67
  11      1.5       .0      4.4        .0      -80.8         .0  .03  .28 1.
18  .67
  12      1.4      -.3     94.6     -14.0      -75.1         .0  .68  .48 1.
66 1.11 #
  13     -1.6       .0     15.0        .0       86.6         .0  .11  .25 1.
25  .71
  14     -1.6       .0     15.0        .0       86.6         .0  .11  .25 1.
25  .71
  15     -1.5       .0    112.6        .0       80.8         .0  .80  .59 1.
73 1.22 #
  16     -1.6       .0     15.0        .0       86.6         .0  .11  .25 1.
25  .71
  17     -1.5       .0    112.6        .0       80.8         .0  .80  .59 1.
73 1.22 #
```

```
  18    -1.6      .0    15.0         .0       86.6        .0  .11  .25 1.
25  .71
  19    -1.6      .0    15.0         .0       86.6        .0  .11  .25 1.
25  .71
  20    -1.5      .0   112.6         .0       80.8        .0  .80  .59 1.
73 1.22 #
  21    -1.6      .0    15.0         .0       86.6        .0  .11  .25 1.
25  .71
  22    -1.5      .0   112.6         .0       80.8        .0  .80  .59 1.
73 1.22 #
  23    -1.6      .0    15.0         .0       86.6        .0  .11  .25 1.
25  .71
  24    -1.6      .0    15.0         .0       86.6        .0  .11  .25 1.
25  .71


 LOAD CASE -    4

 PILE     F1      F2      F3         M1         M2         M3  ALF  CBF  A
SC  AST
           K       K       K       IN-K       IN-K       IN-K            K
SI  KSI

   1     -.1      .0    46.2        -.5        7.1        .0  .33  .15 1.
23 1.04 #
   2     -.1      .0    51.9         .0        2.7        .0  .37  .19 1.
25 1.08 #
   3     -.1      .0    51.9         .0        2.7        .0  .37  .19 1.
25 1.08 #
   4     -.1      .0    51.9         .0        2.7        .0  .37  .19 1.
25 1.08 #
   5     -.1      .0    51.9         .0        2.7        .0  .37  .19 1.
25 1.08 #
   6     -.1      .0    51.9         .0        2.7        .0  .37  .19 1.
25 1.08 #
   7     -.1      .0    51.9         .0        2.7        .0  .37  .19 1.
25 1.08 #
   8     -.1      .0    51.9         .0        2.7        .0  .37  .19 1.
25 1.08 #
   9     -.1      .0    51.9         .0        2.7        .0  .37  .19 1.
25 1.08 #
  10     -.1      .0    51.9         .0        2.7        .0  .37  .19 1.
25 1.08 #
  11     -.1      .0    51.9         .0        2.7        .0  .37  .19 1.
25 1.08 #
  12     -.1      .0    46.2         .5        7.1        .0  .33  .15 1.
23 1.04 #
```

```
  13       .0       .0     16.6         .0        -1.3          .0   .12   .13 1.
07  .90 #
  14       .0       .0     16.6         .0        -1.3          .0   .12   .13 1.
07  .90 #
  15       .1       .0     14.3         .0        -2.7          .0   .10   .13 1.
06  .89 #
  16       .0       .0     16.6         .0        -1.3          .0   .12   .13 1.
07  .90 #
  17       .1       .0     14.3         .0        -2.7          .0   .10   .13 1.
06  .89 #
  18       .0       .0     16.6         .0        -1.3          .0   .12   .13 1.
07  .90 #
  19       .0       .0     16.6         .0        -1.3          .0   .12   .13 1.
07  .90 #
  20       .1       .0     14.3         .0        -2.7          .0   .10   .13 1.
06  .89 #
  21       .0       .0     16.6         .0        -1.3          .0   .12   .13 1.
07  .90 #
  22       .1       .0     14.3         .0        -2.7          .0   .10   .13 1.
06  .89 #
  23       .0       .0     16.6         .0        -1.3          .0   .12   .13 1.
07  .90 #
  24       .0       .0     16.6         .0        -1.3          .0   .12   .13 1.
07  .90 #


 LOAD CASE -     5

 PILE    F1       F2       F3          M1          M2          M3   ALF   CBF  A
SC  AST
         K        K        K         IN-K        IN-K        IN-K              K
SI  KSI

   1       .7       .1     47.6        7.1       -37.9          .0   .34   .16 1.
32  .96 #
   2       .8       .0      2.1         .0       -40.8          .0   .01   .22 1.
08  .74
   3       .8       .0      2.1         .0       -40.8          .0   .01   .22 1.
08  .74
   4       .8       .0      2.1         .0       -40.8          .0   .01   .22 1.
08  .74
   5       .8       .0      2.1         .0       -40.8          .0   .01   .22 1.
08  .74
   6       .8       .0      2.1         .0       -40.8          .0   .01   .22 1.
08  .74
   7       .8       .0      2.1         .0       -40.8          .0   .01   .22 1.
08  .74
```

```
   8       .8      .0      2.1        .0      -40.8        .0  .01  .22 1.
08  .74
   9       .8      .0      2.1        .0      -40.8        .0  .01  .22 1.
08  .74
  10       .8      .0      2.1        .0      -40.8        .0  .01  .22 1.
08  .74
  11       .8      .0      2.1        .0      -40.8        .0  .01  .22 1.
08  .74
  12       .7     -.1     47.6      -7.1      -37.9        .0  .34  .16 1.
32  .96 #
  13      -.9      .0     24.1        .0       45.3        .0  .17  .14 1.
20  .84
  14      -.9      .0     24.1        .0       45.3        .0  .17  .14 1.
20  .84
  15      -.8      .0     74.2        .0       40.8        .0  .53  .34 1.
45 1.11 #
  16      -.9      .0     24.1        .0       45.3        .0  .17  .14 1.
20  .84
  17      -.8      .0     74.2        .0       40.8        .0  .53  .34 1.
45 1.11 #
  18      -.9      .0     24.1        .0       45.3        .0  .17  .14 1.
20  .84
  19      -.9      .0     24.1        .0       45.3        .0  .17  .14 1.
20  .84
  20      -.8      .0     74.2        .0       40.8        .0  .53  .34 1.
45 1.11 #
  21      -.9      .0     24.1        .0       45.3        .0  .17  .14 1.
20  .84
  22      -.8      .0     74.2        .0       40.8        .0  .53  .34 1.
45 1.11 #
  23      -.9      .0     24.1        .0       45.3        .0  .17  .14 1.
20  .84
  24      -.9      .0     24.1        .0       45.3        .0  .17  .14 1.
20  .84


  LOAD CASE -     6

  PILE    F1      F2      F3        M1         M2         M3  ALF  CBF  A
SC  AST
           K       K       K      IN-K       IN-K       IN-K              K
SI  KSI

   1       .3      .1     59.5       3.9      -17.9        .0  .42  .24 1.
33 1.08 #
   2       .4      .0     36.1        .0      -22.5        .0  .26  .10 1.
21  .96 #
```

```
   3       .4      .0    36.1       .0      -22.5         .0   .26   .10 1.
21  .96 #
   4       .4      .0    36.1       .0      -22.5         .0   .26   .10 1.
21  .96 #
   5       .4      .0    36.1       .0      -22.5         .0   .26   .10 1.
21  .96 #
   6       .4      .0    36.1       .0      -22.5         .0   .26   .10 1.
21  .96 #
   7       .4      .0    36.1       .0      -22.5         .0   .26   .10 1.
21  .96 #
   8       .4      .0    36.1       .0      -22.5         .0   .26   .10 1.
21  .96 #
   9       .4      .0    36.1       .0      -22.5         .0   .26   .10 1.
21  .96 #
  10       .4      .0    36.1       .0      -22.5         .0   .26   .10 1.
21  .96 #
  11       .4      .0    36.1       .0      -22.5         .0   .26   .10 1.
21  .96 #
  12       .3     -.1    59.5     -3.9      -17.9         .0   .42   .24 1.
33 1.08 #
  13      -.4      .0      .8       .0       23.8         .0   .01   .19 1.
04  .77
  14      -.4      .0      .8       .0       23.8         .0   .01   .19 1.
04  .77
  15      -.4      .0    27.8       .0       22.5         .0   .20   .11 1.
17  .91 #
  16      -.4      .0      .8       .0       23.8         .0   .01   .19 1.
04  .77
  17      -.4      .0    27.8       .0       22.5         .0   .20   .11 1.
17  .91 #
  18      -.4      .0      .8       .0       23.8         .0   .01   .19 1.
04  .77
  19      -.4      .0      .8       .0       23.8         .0   .01   .19 1.
04  .77
  20      -.4      .0    27.8       .0       22.5         .0   .20   .11 1.
17  .91 #
  21      -.4      .0      .8       .0       23.8         .0   .01   .19 1.
04  .77
  22      -.4      .0    27.8       .0       22.5         .0   .20   .11 1.
17  .91 #
  23      -.4      .0      .8       .0       23.8         .0   .01   .19 1.
04  .77
  24      -.4      .0      .8       .0       23.8         .0   .01   .19 1.
04  .77


 LOAD CASE -     7
```

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST	
	K	K	K	IN-K	IN-K	IN-K			KSI	KSI	
1	.3	.1	38.7	3.6	-18.2	.0	.28	.10	1.23	.97	#
2	.4	.0	16.0	.0	-21.0	.0	.11	.13	1.11	.86	#
3	.4	.0	16.0	.0	-21.0	.0	.11	.13	1.11	.86	#
4	.4	.0	16.0	.0	-21.0	.0	.11	.13	1.11	.86	#
5	.4	.0	16.0	.0	-21.0	.0	.11	.13	1.11	.86	#
6	.4	.0	16.0	.0	-21.0	.0	.11	.13	1.11	.86	#
7	.4	.0	16.0	.0	-21.0	.0	.11	.13	1.11	.86	#
8	.4	.0	16.0	.0	-21.0	.0	.11	.13	1.11	.86	#
9	.4	.0	16.0	.0	-21.0	.0	.11	.13	1.11	.86	#
10	.4	.0	16.0	.0	-21.0	.0	.11	.13	1.11	.86	#
11	.4	.0	16.0	.0	-21.0	.0	.11	.13	1.11	.86	#
12	.3	-.1	38.7	-3.6	-18.2	.0	.28	.10	1.23	.97	#
13	-.4	.0	14.3	.0	23.5	.0	.10	.14	1.10	.84	
14	-.4	.0	14.3	.0	23.5	.0	.10	.14	1.10	.84	
15	-.4	.0	40.2	.0	21.0	.0	.29	.11	1.23	.98	#
16	-.4	.0	14.3	.0	23.5	.0	.10	.14	1.10	.84	
17	-.4	.0	40.2	.0	21.0	.0	.29	.11	1.23	.98	#
18	-.4	.0	14.3	.0	23.5	.0	.10	.14	1.10	.84	
19	-.4	.0	14.3	.0	23.5	.0	.10	.14	1.10	.84	
20	-.4	.0	40.2	.0	21.0	.0	.29	.11	1.23	.98	#
21	-.4	.0	14.3	.0	23.5	.0	.10	.14	1.		

```
10  .84
  22     -.4      .0    40.2         .0       21.0        .0  .29  .11 1.
23  .98 #
  23     -.4      .0    14.3         .0       23.5        .0  .10  .14 1.
10  .84
  24     -.4      .0    14.3         .0       23.5        .0  .10  .14 1.
10  .84


 LOAD CASE -     8

 PILE    F1       F2      F3         M1         M2          M3  ALF  CBF  A
SC  AST
          K        K       K       IN-K       IN-K        IN-K            K
SI  KSI

   1      .7      .1    60.5        7.5      -39.4        .0  .43  .25 1.
39 1.03 #
   2      .8      .0    12.6         .0      -43.4        .0  .09  .18 1.
14  .79
   3      .8      .0    12.6         .0      -43.4        .0  .09  .18 1.
14  .79
   4      .8      .0    12.6         .0      -43.4        .0  .09  .18 1.
14  .79
   5      .8      .0    12.6         .0      -43.4        .0  .09  .18 1.
14  .79
   6      .8      .0    12.6         .0      -43.4        .0  .09  .18 1.
14  .79
   7      .8      .0    12.6         .0      -43.4        .0  .09  .18 1.
14  .79
   8      .8      .0    12.6         .0      -43.4        .0  .09  .18 1.
14  .79
   9      .8      .0    12.6         .0      -43.4        .0  .09  .18 1.
14  .79
  10      .8      .0    12.6         .0      -43.4        .0  .09  .18 1.
14  .79
  11      .8      .0    12.6         .0      -43.4        .0  .09  .18 1.
14  .79
  12      .7     -.1    60.5       -7.5      -39.4        .0  .43  .25 1.
39 1.03 #
  13     -.9      .0     4.5         .0       46.2        .0  .03  .22 1.
10  .74
  14     -.9      .0     4.5         .0       46.2        .0  .03  .22 1.
10  .74
  15     -.8      .0    56.7         .0       43.4        .0  .41  .22 1.
36 1.01 #
  16     -.9      .0     4.5         .0       46.2        .0  .03  .22 1.
```

```
10  .74
  17     -.8      .0    56.7       .0     43.4         .0  .41  .22 1.
36 1.01 #
  18     -.9      .0     4.5       .0     46.2         .0  .03  .22 1.
10  .74
  19     -.9      .0     4.5       .0     46.2         .0  .03  .22 1.
10  .74
  20     -.8      .0    56.7       .0     43.4         .0  .41  .22 1.
36 1.01 #
  21     -.9      .0     4.5       .0     46.2         .0  .03  .22 1.
10  .74
  22     -.8      .0    56.7       .0     43.4         .0  .41  .22 1.
36 1.01 #
  23     -.9      .0     4.5       .0     46.2         .0  .03  .22 1.
10  .74
  24     -.9      .0     4.5       .0     46.2         .0  .03  .22 1.
10  .74
```

****
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PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.5	3.4	-9.1	.0	.0	.0
2	.0	.4	12.5	.0	.0	.0
3	.0	.4	12.5	.0	.0	.0
4	.0	.4	12.5	.0	.0	.0
5	.0	.4	12.5	.0	.0	.0
6	.0	.4	12.5	.0	.0	.0
7	.0	.4	12.5	.0	.0	.0
8	.0	.4	12.5	.0	.0	.0
9	.0	.4	12.5	.0	.0	.0
10	.0	.4	12.5	.0	.0	.0
11	.0	.4	12.5	.0	.0	.0
12	-.5	3.4	-9.1	.0	.0	.0
13	.0	11.0	32.0	.0	.0	.0
14	.0	11.0	32.0	.0	.0	.0
15	.0	.4	12.6	.0	.0	.0
16	.0	11.0	32.0	.0	.0	.0

17	.0	.4	12.6	.0	.0	.0
18	.0	11.0	32.0	.0	.0	.0
19	.0	11.0	32.0	.0	.0	.0
20	.0	.4	12.6	.0	.0	.0
21	.0	11.0	32.0	.0	.0	.0
22	.0	.4	12.6	.0	.0	.0
23	.0	11.0	32.0	.0	.0	.0
24	.0	11.0	32.0	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	1.5	9.3	-26.4	.0	.0	.0
2	.0	.6	9.5	.0	.0	.0
3	.0	.6	9.5	.0	.0	.0
4	.0	.6	9.5	.0	.0	.0
5	.0	.6	9.5	.0	.0	.0
6	.0	.6	9.5	.0	.0	.0
7	.0	.6	9.5	.0	.0	.0
8	.0	.6	9.5	.0	.0	.0
9	.0	.6	9.5	.0	.0	.0
10	.0	.6	9.5	.0	.0	.0
11	.0	.6	9.5	.0	.0	.0
12	-1.5	9.3	-26.4	.0	.0	.0
13	.0	12.0	34.2	.0	.0	.0
14	.0	12.0	34.2	.0	.0	.0
15	.0	.6	-1.4	.0	.0	.0
16	.0	12.0	34.2	.0	.0	.0
17	.0	.6	-1.4	.0	.0	.0
18	.0	12.0	34.2	.0	.0	.0
19	.0	12.0	34.2	.0	.0	.0
20	.0	.6	-1.4	.0	.0	.0
21	.0	12.0	34.2	.0	.0	.0
22	.0	.6	-1.4	.0	.0	.0
23	.0	12.0	34.2	.0	.0	.0
24	.0	12.0	34.2	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-5.2	-30.8	89.3	.0	.0	.0

2	.0	-1.5	4.4	.0	.0	.0
3	.0	-1.5	4.4	.0	.0	.0
4	.0	-1.5	4.4	.0	.0	.0
5	.0	-1.5	4.4	.0	.0	.0
6	.0	-1.5	4.4	.0	.0	.0
7	.0	-1.5	4.4	.0	.0	.0
8	.0	-1.5	4.4	.0	.0	.0
9	.0	-1.5	4.4	.0	.0	.0
10	.0	-1.5	4.4	.0	.0	.0
11	.0	-1.5	4.4	.0	.0	.0
12	5.2	-30.8	89.3	.0	.0	.0
13	.0	3.2	14.7	.0	.0	.0
14	.0	3.2	14.7	.0	.0	.0
15	.0	-1.5	112.6	.0	.0	.0
16	.0	3.2	14.7	.0	.0	.0
17	.0	-1.5	112.6	.0	.0	.0
18	.0	3.2	14.7	.0	.0	.0
19	.0	3.2	14.7	.0	.0	.0
20	.0	-1.5	112.6	.0	.0	.0
21	.0	3.2	14.7	.0	.0	.0
22	.0	-1.5	112.6	.0	.0	.0
23	.0	3.2	14.7	.0	.0	.0
24	.0	3.2	14.7	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-2.5	-14.3	43.9	.0	.0	.0
2	.0	.1	51.9	.0	.0	.0
3	.0	.1	51.9	.0	.0	.0
4	.0	.1	51.9	.0	.0	.0
5	.0	.1	51.9	.0	.0	.0
6	.0	.1	51.9	.0	.0	.0
7	.0	.1	51.9	.0	.0	.0
8	.0	.1	51.9	.0	.0	.0
9	.0	.1	51.9	.0	.0	.0
10	.0	.1	51.9	.0	.0	.0
11	.0	.1	51.9	.0	.0	.0
12	2.5	-14.3	43.9	.0	.0	.0
13	.0	5.3	15.7	.0	.0	.0
14	.0	5.3	15.7	.0	.0	.0
15	.0	.1	14.3	.0	.0	.0
16	.0	5.3	15.7	.0	.0	.0
17	.0	.1	14.3	.0	.0	.0

18	.0	5.3	15.7	.0	.0	.0
19	.0	5.3	15.7	.0	.0	.0
20	.0	.1	14.3	.0	.0	.0
21	.0	5.3	15.7	.0	.0	.0
22	.0	.1	14.3	.0	.0	.0
23	.0	5.3	15.7	.0	.0	.0
24	.0	5.3	15.7	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-2.6	-15.5	45.0	.0	.0	.0
2	.0	-.8	2.1	.0	.0	.0
3	.0	-.8	2.1	.0	.0	.0
4	.0	-.8	2.1	.0	.0	.0
5	.0	-.8	2.1	.0	.0	.0
6	.0	-.8	2.1	.0	.0	.0
7	.0	-.8	2.1	.0	.0	.0
8	.0	-.8	2.1	.0	.0	.0
9	.0	-.8	2.1	.0	.0	.0
10	.0	-.8	2.1	.0	.0	.0
11	.0	-.8	2.1	.0	.0	.0
12	2.6	-15.5	45.0	.0	.0	.0
13	.0	6.8	23.1	.0	.0	.0
14	.0	6.8	23.1	.0	.0	.0
15	.0	-.8	74.2	.0	.0	.0
16	.0	6.8	23.1	.0	.0	.0
17	.0	-.8	74.2	.0	.0	.0
18	.0	6.8	23.1	.0	.0	.0
19	.0	6.8	23.1	.0	.0	.0
20	.0	-.8	74.2	.0	.0	.0
21	.0	6.8	23.1	.0	.0	.0
22	.0	-.8	74.2	.0	.0	.0
23	.0	6.8	23.1	.0	.0	.0
24	.0	6.8	23.1	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-3.2	-18.8	56.3	.0	.0	.0
2	.0	-.4	36.1	.0	.0	.0

3	.0	-.4	36.1	.0	.0	.0
4	.0	-.4	36.1	.0	.0	.0
5	.0	-.4	36.1	.0	.0	.0
6	.0	-.4	36.1	.0	.0	.0
7	.0	-.4	36.1	.0	.0	.0
8	.0	-.4	36.1	.0	.0	.0
9	.0	-.4	36.1	.0	.0	.0
10	.0	-.4	36.1	.0	.0	.0
11	.0	-.4	36.1	.0	.0	.0
12	3.2	-18.8	56.3	.0	.0	.0
13	.0	-.2	.9	.0	.0	.0
14	.0	-.2	.9	.0	.0	.0
15	.0	-.4	27.8	.0	.0	.0
16	.0	-.2	.9	.0	.0	.0
17	.0	-.4	27.8	.0	.0	.0
18	.0	-.2	.9	.0	.0	.0
19	.0	-.2	.9	.0	.0	.0
20	.0	-.4	27.8	.0	.0	.0
21	.0	-.2	.9	.0	.0	.0
22	.0	-.4	27.8	.0	.0	.0
23	.0	-.2	.9	.0	.0	.0
24	.0	-.2	.9	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-2.1	-12.4	36.6	.0	.0	.0
2	.0	-.4	16.0	.0	.0	.0
3	.0	-.4	16.0	.0	.0	.0
4	.0	-.4	16.0	.0	.0	.0
5	.0	-.4	16.0	.0	.0	.0
6	.0	-.4	16.0	.0	.0	.0
7	.0	-.4	16.0	.0	.0	.0
8	.0	-.4	16.0	.0	.0	.0
9	.0	-.4	16.0	.0	.0	.0
10	.0	-.4	16.0	.0	.0	.0
11	.0	-.4	16.0	.0	.0	.0
12	2.1	-12.4	36.6	.0	.0	.0
13	.0	4.1	13.7	.0	.0	.0
14	.0	4.1	13.7	.0	.0	.0
15	.0	-.4	40.2	.0	.0	.0
16	.0	4.1	13.7	.0	.0	.0
17	.0	-.4	40.2	.0	.0	.0
18	.0	4.1	13.7	.0	.0	.0

19	.0	4.1	13.7	.0	.0	.0
20	.0	-.4	40.2	.0	.0	.0
21	.0	4.1	13.7	.0	.0	.0
22	.0	-.4	40.2	.0	.0	.0
23	.0	4.1	13.7	.0	.0	.0
24	.0	4.1	13.7	.0	.0	.0

LOAD CASE - 8

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-3.3	-19.6	57.2	.0	.0	.0
2	.0	-.8	12.6	.0	.0	.0
3	.0	-.8	12.6	.0	.0	.0
4	.0	-.8	12.6	.0	.0	.0
5	.0	-.8	12.6	.0	.0	.0
6	.0	-.8	12.6	.0	.0	.0
7	.0	-.8	12.6	.0	.0	.0
8	.0	-.8	12.6	.0	.0	.0
9	.0	-.8	12.6	.0	.0	.0
10	.0	-.8	12.6	.0	.0	.0
11	.0	-.8	12.6	.0	.0	.0
12	3.3	-19.6	57.2	.0	.0	.0
13	.0	.6	4.6	.0	.0	.0
14	.0	.6	4.6	.0	.0	.0
15	.0	-.8	56.7	.0	.0	.0
16	.0	.6	4.6	.0	.0	.0
17	.0	-.8	56.7	.0	.0	.0
18	.0	.6	4.6	.0	.0	.0
19	.0	.6	4.6	.0	.0	.0
20	.0	-.8	56.7	.0	.0	.0
21	.0	.6	4.6	.0	.0	.0
22	.0	-.8	56.7	.0	.0	.0
23	.0	.6	4.6	.0	.0	.0
24	.0	.6	4.6	.0	.0	.0

```
1000 GATE 9 MONOLITH - FEB '97 RUN
1005 14 X 14 PPC PILES @ 7' C/C W/ F.S. = 2
1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL

1020 SOI ES .0705 LEN 90.0 0. ALL

1030 PIN ALL

1040 TEN 0.8 ALL

1050 DLS S 140.0 50.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL

1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL
1070 BAT 3.0 1 10 11 12 15 16 19 20
1080 ANG 260 1
1090 ANG 270 2 TO 9
1091 ANG 280 10
1092 ANG 90 11 TO 20

1100 PIL 1 -26.0 -2.5 0.0  2 -21.0 -2.5 0.0  3 -17.0 -2.5 0.0  6 2.5 -2
.5 0.0
1101 PIL 9 21.0 -2.5 0.0  10 26.0 -2.5 0.0  11 -26.0 2.5 0.0  12 -21.0
2.5 0.0
1102 PIL 13 -17.0 2.5 0.0  16 2.5 2.5 0.0  19 21.0 2.5 0.0  20 26.0 2.5
 0.0
1105 ROW X 3 3 2 AT 7.25
1106 ROW X 3 6 2 AT 7.25
1107 ROW X 3 13 2 AT 7.25
1108 ROW X 3 16 2 AT 7.25
1120 LOA 1 0.0 99.9 357.2 331.5 0.0 0.0

1121 LOA 2 0.0 124.5 267.9 405.6 0.0 0.0
1122 LOA 3 0.0 -48.5 711.1 789.5 0.0 0.0
1123 LOA 4 0.0 14.3 711.1 -913.2 0.0 0.0
1124 LOA 5 0.0 12.6 533.3 856.9 0.0 0.0
1125 LOA 6 0.0 -38.3 533.3 -908.4 0.0 0.0
1126 LOA 7 0.0 2.5 425.1 -1.5 0.0 0.0
1127 LOA 8 0.0 -36.7 425.1 -37.4 0.0 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\GATE9.O

1140 PFO ALL

1150 PLB ALL
1160 FPL C:\CORPS\CPGG\GATE9.P
```

```
 **********************************
 * CORPS PROGRAM  #  X0080         *  CPGA - CASE PILE GROUP ANALYSIS PRO
GRAM
 * VERSION NUMBER # 1992/02/26    *  RUN DATE 08-APR-1997   RUN TIME 11.
11.07
 **********************************


 GATE 9 MONOLITH - FEB '97 RUN


 THERE ARE  20 PILES AND
             8 LOAD CASES IN THIS RUN.

 ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                              X           Y           Z
                                            -----       -----       -----
 WITH DIAGONAL COORDINATES = (     -26.00 ,     -2.50 ,       .00 )
                             (      26.00 ,      2.50 ,       .00 )


 ***********************************************************************
*********

          PILE PROPERTIES AS INPUT


       E              I1             I2             A             C33
B66
      KSI           IN**4          IN**4          IN**2
   .40740E+04    .32010E+04    .32010E+04    .19600E+03    .15000E+01    .00
000E+00

 THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

     ALL


 ***********************************************************************
*********

          SOIL DESCRIPTIONS AS INPUT


    ES      ESOIL       LENGTH       L             LU
           K/IN**2                   FT            FT
```

.70500E-01 L .90000E+02 .00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-26.00	-2.50	.00	3.00	260.00	90.00	P
2	-21.00	-2.50	.00	V	270.00	90.00	P
3	-17.00	-2.50	.00	V	270.00	90.00	P
4	-9.75	-2.50	.00	V	270.00	90.00	P
5	-2.50	-2.50	.00	V	270.00	90.00	P
6	2.50	-2.50	.00	V	270.00	90.00	P
7	9.75	-2.50	.00	V	270.00	90.00	P
8	17.00	-2.50	.00	V	270.00	90.00	P
9	21.00	-2.50	.00	V	270.00	90.00	P
10	26.00	-2.50	.00	3.00	280.00	90.00	P
11	-26.00	2.50	.00	3.00	90.00	90.00	P
12	-21.00	2.50	.00	3.00	90.00	90.00	P
13	-17.00	2.50	.00	V	90.00	90.00	P
14	-9.75	2.50	.00	V	90.00	90.00	P
15	-2.50	2.50	.00	3.00	90.00	90.00	P
16	2.50	2.50	.00	3.00	90.00	90.00	P
17	9.75	2.50	.00	V	90.00	90.00	P
18	17.00	2.50	.00	V	90.00	90.00	P
19	21.00	2.50	.00	3.00	90.00	90.00	P
20	26.00	2.50	.00	3.00	90.00	90.00	P

						1800.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K

1	.0	99.9	357.2	331.5	.0	.0
2	.0	124.5	267.9	405.6	.0	.0
3	.0	-48.5	711.1	789.5	.0	.0
4	.0	14.3	711.1	-913.2	.0	.0
5	.0	12.6	533.3	856.9	.0	.0
6	.0	-38.3	533.3	-908.4	.0	.0
7	.0	2.5	425.1	-1.5	.0	.0
8	.0	-36.7	425.1	-37.4	.0	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 6.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 8. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX	DY	DZ	RX	RY	RZ
	IN	IN	IN	RAD	RAD	RAD
1	.4068E-07	.1044E+00	.1010E-01	-.2163E-03	.2785E-11	.1283E-10

```
    2    .5651E-07   .1508E+00   .2905E-02  -.3667E-03   .4000E-11   .1
985E-10
    3   -.4742E-07  -.2338E+00   .4896E-01   .1493E-02  -.4494E-11  -.2
843E-10
    4   -.1725E-07   .2374E-01   .3150E-01  -.6479E-03  -.1025E-11  -.9
431E-11
    5   -.9719E-08  -.1132E+00   .3277E-01   .1026E-02  -.1543E-11  -.1
156E-10
    6   -.3875E-07  -.4799E-01   .2783E-01  -.3514E-03  -.2621E-11  -.1
698E-10
    7   -.1267E-07  -.4375E-01   .2282E-01   .1954E-03  -.1157E-11  -.8
676E-11
    8   -.3309E-07  -.1088E+00   .2705E-01   .4444E-03  -.2716E-11  -.1
705E-10


 ***********************************************************************
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          PILE FORCES IN LOCAL GEOMETRY

              M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
              * INDICATES PILE FAILURE
              # INDICATES CBF BASED ON MOMENTS DUE TO
                          (F3*EMIN) FOR CONCRETE PILES
              B INDICATES BUCKLING CONTROLS



 LOAD CASE -     1

 PILE     F1       F2       F3         M1         M2         M3   ALF   CBF   A
SC  AST
          K        K        K        IN-K       IN-K       IN-K               K
SI  KSI

   1     -.6      -.1    -18.6       -5.6       31.7          .0   .37   .27  .
97  .64
   2     -.6       .0     18.4         .0       32.2          .0   .13   .14 1.
14  .84
   3     -.6       .0     18.4         .0       32.2          .0   .13   .14 1.
14  .84
   4     -.6       .0     18.4         .0       32.2          .0   .13   .14 1.
14  .84
   5     -.6       .0     18.4         .0       32.2          .0   .13   .14 1.
14  .84
   6     -.6       .0     18.4         .0       32.2          .0   .13   .14 1.
```

```
14  .84
   7      -.6       .0    18.4       .0      32.2       .0  .13  .14 1.
14  .84
   8      -.6       .0    18.4       .0      32.2       .0  .13  .14 1.
14  .84
   9      -.6       .0    18.4       .0      32.2       .0  .13  .14 1.
14  .84
  10      -.6       .1   -18.6      5.6      31.7       .0  .37  .27  .
97  .64
  11       .6       .0    40.4       .0     -30.2       .0  .29  .11 1.
25  .96 #
  12       .6       .0    40.4       .0     -30.2       .0  .29  .11 1.
25  .96 #
  13       .6       .0     4.0       .0     -32.2       .0  .03  .20 1.
07  .77
  14       .6       .0     4.0       .0     -32.2       .0  .03  .20 1.
07  .77
  15       .6       .0    40.4       .0     -30.2       .0  .29  .11 1.
25  .96 #
  16       .6       .0    40.4       .0     -30.2       .0  .29  .11 1.
25  .96 #
  17       .6       .0     4.0       .0     -32.2       .0  .03  .20 1.
07  .77
  18       .6       .0     4.0       .0     -32.2       .0  .03  .20 1.
07  .77
  19       .6       .0    40.4       .0     -30.2       .0  .29  .11 1.
25  .96 #
  20       .6       .0    40.4       .0     -30.2       .0  .29  .11 1.
25  .96 #


 LOAD CASE -     2

 PILE     F1        F2        F3         M1         M2         M3   ALF  CBF  A
SC  AST
          K         K         K        IN-K       IN-K       IN-K            K
SI  KSI

   1      -.8      -.2   -37.5     -8.1      44.9       .0  .75  .50  .
90  .51
   2      -.9       .0    15.4       .0      46.6       .0  .11  .17 1.
16  .80
   3      -.9       .0    15.4       .0      46.6       .0  .11  .17 1.
16  .80
   4      -.9       .0    15.4       .0      46.6       .0  .11  .17 1.
16  .80
   5      -.9       .0    15.4       .0      46.6       .0  .11  .17 1.
```

```
16   .80
   6      -.9       .0    15.4        .0       46.6          .0  .11  .17 1.
16   .80
   7      -.9       .0    15.4        .0       46.6          .0  .11  .17 1.
16   .80
   8      -.9       .0    15.4        .0       46.6          .0  .11  .17 1.
16   .80
   9      -.9       .0    15.4        .0       46.6          .0  .11  .17 1.
16   .80
  10      -.8       .2   -37.5       8.1       44.9          .0  .75  .50  .
90   .51
  11       .8       .0    44.4        .0      -45.0          .0  .32  .14 1.
30   .95 #
  12       .8       .0    44.4        .0      -45.0          .0  .32  .14 1.
30   .95 #
  13       .9       .0    -9.0        .0      -46.6          .0  .18  .19 1.
04   .67
  14       .9       .0    -9.0        .0      -46.6          .0  .18  .19 1.
04   .67
  15       .8       .0    44.4        .0      -45.0          .0  .32  .14 1.
30   .95 #
  16       .8       .0    44.4        .0      -45.0          .0  .32  .14 1.
30   .95 #
  17       .9       .0    -9.0        .0      -46.6          .0  .18  .19 1.
04   .67
  18       .9       .0    -9.0        .0      -46.6          .0  .18  .19 1.
04   .67
  19       .8       .0    44.4        .0      -45.0          .0  .32  .14 1.
30   .95 #
  20       .8       .0    44.4        .0      -45.0          .0  .32  .14 1.
30   .95 #


 LOAD CASE -      3

 PILE     F1       F2       F3         M1         M2         M3   ALF  CBF   A
SC   AST
          K        K        K        IN-K       IN-K       IN-K              K
SI   KSI

   1      1.3       .2    85.1      12.5      -67.0          .0  .61  .42 1.
59 1.08 #
   2      1.4       .0     4.6        .0      -72.2          .0  .03  .26 1.
16   .69
   3      1.4       .0     4.6        .0      -72.2          .0  .03  .26 1.
16   .69
   4      1.4       .0     4.6        .0      -72.2          .0  .03  .26 1.
```

```
16  .69
   5     1.4      .0     4.6        .0      -72.2         .0  .03  .26 1.
16  .69
   6     1.4      .0     4.6        .0      -72.2         .0  .03  .26 1.
16  .69
   7     1.4      .0     4.6        .0      -72.2         .0  .03  .26 1.
16  .69
   8     1.4      .0     4.6        .0      -72.2         .0  .03  .26 1.
16  .69
   9     1.4      .0     4.6        .0      -72.2         .0  .03  .26 1.
16  .69
  10     1.3     -.2    85.1     -12.5      -67.0         .0  .61  .42 1.
59 1.08 #
  11    -1.5      .0    16.6        .0       77.6         .0  .12  .22 1.
23  .74
  12    -1.5      .0    16.6        .0       77.6         .0  .12  .22 1.
23  .74
  13    -1.4      .0   104.0        .0       72.2         .0  .74  .53 1.
67 1.19 #
  14    -1.4      .0   104.0        .0       72.2         .0  .74  .53 1.
67 1.19 #
  15    -1.5      .0    16.6        .0       77.6         .0  .12  .22 1.
23  .74
  16    -1.5      .0    16.6        .0       77.6         .0  .12  .22 1.
23  .74
  17    -1.4      .0   104.0        .0       72.2         .0  .74  .53 1.
67 1.19 #
  18    -1.4      .0   104.0        .0       72.2         .0  .74  .53 1.
67 1.19 #
  19    -1.5      .0    16.6        .0       77.6         .0  .12  .22 1.
23  .74
  20    -1.5      .0    16.6        .0       77.6         .0  .12  .22 1.
23  .74


 LOAD CASE -     4

 PILE    F1       F2       F3        M1         M2         M3   ALF  CBF  A
SC  AST
         K        K        K       IN-K       IN-K       IN-K            K
SI  KSI

   1     -.2      .0    45.4      -1.3       11.8         .0  .32  .14 1.
24 1.02 #
   2     -.1      .0    56.5        .0        7.3         .0  .40  .22 1.
28 1.09 #
   3     -.1      .0    56.5        .0        7.3         .0  .40  .22 1.
```

```
28 1.09 #
   4     -.1      .0    56.5       .0        7.3         .0  .40  .22 1.
28 1.09 #
   5     -.1      .0    56.5       .0        7.3         .0  .40  .22 1.
28 1.09 #
   6     -.1      .0    56.5       .0        7.3         .0  .40  .22 1.
28 1.09 #
   7     -.1      .0    56.5       .0        7.3         .0  .40  .22 1.
28 1.09 #
   8     -.1      .0    56.5       .0        7.3         .0  .40  .22 1.
28 1.09 #
   9     -.1      .0    56.5       .0        7.3         .0  .40  .22 1.
28 1.09 #
  10     -.2      .0    45.4      1.3       11.8         .0  .32  .14 1.
24 1.02 #
  11      .1      .0    21.0       .0       -5.8         .0  .15  .12 1.
10  .91 #
  12      .1      .0    21.0       .0       -5.8         .0  .15  .12 1.
10  .91 #
  13      .1      .0    13.4       .0       -7.3         .0  .10  .13 1.
06  .87 #
  14      .1      .0    13.4       .0       -7.3         .0  .10  .13 1.
06  .87 #
  15      .1      .0    21.0       .0       -5.8         .0  .15  .12 1.
10  .91 #
  16      .1      .0    21.0       .0       -5.8         .0  .15  .12 1.
10  .91 #
  17      .1      .0    13.4       .0       -7.3         .0  .10  .13 1.
06  .87 #
  18      .1      .0    13.4       .0       -7.3         .0  .10  .13 1.
06  .87 #
  19      .1      .0    21.0       .0       -5.8         .0  .15  .12 1.
10  .91 #
  20      .1      .0    21.0       .0       -5.8         .0  .15  .12 1.
10  .91 #


 LOAD CASE -     5

 PILE     F1      F2      F3         M1         M2         M3  ALF  CBF  A
SC  AST
          K       K       K        IN-K       IN-K       IN-K             K
SI  KSI

   1      .6      .1    41.2      6.1      -32.5         .0  .29  .12 1.
27  .95 #
   2      .7      .0     2.2       .0      -35.0         .0  .02  .21 1.
```

```
07  .75
   3       .7       .0      2.2        .0      -35.0          .0  .02  .21 1.
07  .75
   4       .7       .0      2.2        .0      -35.0          .0  .02  .21 1.
07  .75
   5       .7       .0      2.2        .0      -35.0          .0  .02  .21 1.
07  .75
   6       .7       .0      2.2        .0      -35.0          .0  .02  .21 1.
07  .75
   7       .7       .0      2.2        .0      -35.0          .0  .02  .21 1.
07  .75
   8       .7       .0      2.2        .0      -35.0          .0  .02  .21 1.
07  .75
   9       .7       .0      2.2        .0      -35.0          .0  .02  .21 1.
07  .75
  10       .6      -.1     41.2      -6.1      -32.5          .0  .29  .12 1.
27  .95 #
  11      -.7       .0     27.2        .0       39.4          .0  .19  .11 1.
20  .87
  12      -.7       .0     27.2        .0       39.4          .0  .19  .11 1.
20  .87
  13      -.7       .0     70.5        .0       35.0          .0  .50  .31 1.
42 1.10 #
  14      -.7       .0     70.5        .0       35.0          .0  .50  .31 1.
42 1.10 #
  15      -.7       .0     27.2        .0       39.4          .0  .19  .11 1.
20  .87
  16      -.7       .0     27.2        .0       39.4          .0  .19  .11 1.
20  .87
  17      -.7       .0     70.5        .0       35.0          .0  .50  .31 1.
42 1.10 #
  18      -.7       .0     70.5        .0       35.0          .0  .50  .31 1.
42 1.10 #
  19      -.7       .0     27.2        .0       39.4          .0  .19  .11 1.
20  .87
  20      -.7       .0     27.2        .0       39.4          .0  .19  .11 1.
20  .87


 LOAD CASE -     6

 PILE     F1       F2       F3         M1         M2         M3  ALF  CBF  A
SC  AST
          K        K        K        IN-K       IN-K       IN-K             K
SI  KSI

   1       .2       .0     56.9       2.6      -10.1          .0  .41  .23 1.
```

```
30 1.08 #
   2      .3       .0    42.6        .0      -14.8        .0  .30  .12 1.
23 1.00 #
   3      .3       .0    42.6        .0      -14.8        .0  .30  .12 1.
23 1.00 #
   4      .3       .0    42.6        .0      -14.8        .0  .30  .12 1.
23 1.00 #
   5      .3       .0    42.6        .0      -14.8        .0  .30  .12 1.
23 1.00 #
   6      .3       .0    42.6        .0      -14.8        .0  .30  .12 1.
23 1.00 #
   7      .3       .0    42.6        .0      -14.8        .0  .30  .12 1.
23 1.00 #
   8      .3       .0    42.6        .0      -14.8        .0  .30  .12 1.
23 1.00 #
   9      .3       .0    42.6        .0      -14.8        .0  .30  .12 1.
23 1.00 #
  10      .2       .0    56.9      -2.6      -10.1        .0  .41  .23 1.
30 1.08 #
  11     -.3       .0     1.4        .0       15.7        .0  .01  .18 1.
02  .79
  12     -.3       .0     1.4        .0       15.7        .0  .01  .18 1.
02  .79
  13     -.3       .0    19.2        .0       14.8        .0  .14  .12 1.
11  .89 #
  14     -.3       .0    19.2        .0       14.8        .0  .14  .12 1.
11  .89 #
  15     -.3       .0     1.4        .0       15.7        .0  .01  .18 1.
02  .79
  16     -.3       .0     1.4        .0       15.7        .0  .01  .18 1.
02  .79
  17     -.3       .0    19.2        .0       14.8        .0  .14  .12 1.
11  .89 #
  18     -.3       .0    19.2        .0       14.8        .0  .14  .12 1.
11  .89 #
  19     -.3       .0     1.4        .0       15.7        .0  .01  .18 1.
02  .79
  20     -.3       .0     1.4        .0       15.7        .0  .01  .18 1.
02  .79


 LOAD CASE -     7

 PILE    F1       F2       F3         M1         M2         M3   ALF  CBF  A
SC  AST
          K        K        K       IN-K       IN-K       IN-K             K
SI  KSI
```

```
   1       .2      .0     33.0      2.3     -11.0        .0  .24  .10 1.
18  .96 #
   2       .3      .0     18.8       .0     -13.5        .0  .13  .12 1.
11  .89 #
   3       .3      .0     18.8       .0     -13.5        .0  .13  .12 1.
11  .89 #
   4       .3      .0     18.8       .0     -13.5        .0  .13  .12 1.
11  .89 #
   5       .3      .0     18.8       .0     -13.5        .0  .13  .12 1.
11  .89 #
   6       .3      .0     18.8       .0     -13.5        .0  .13  .12 1.
11  .89 #
   7       .3      .0     18.8       .0     -13.5        .0  .13  .12 1.
11  .89 #
   8       .3      .0     18.8       .0     -13.5        .0  .13  .12 1.
11  .89 #
   9       .3      .0     18.8       .0     -13.5        .0  .13  .12 1.
11  .89 #
  10       .2      .0     33.0     -2.3     -11.0        .0  .24  .10 1.
18  .96 #
  11      -.3      .0     14.8       .0      15.6        .0  .11  .13 1.
09  .86 #
  12      -.3      .0     14.8       .0      15.6        .0  .11  .13 1.
09  .86 #
  13      -.3      .0     31.8       .0      13.5        .0  .23  .10 1.
17  .95 #
  14      -.3      .0     31.8       .0      13.5        .0  .23  .10 1.
17  .95 #
  15      -.3      .0     14.8       .0      15.6        .0  .11  .13 1.
09  .86 #
  16      -.3      .0     14.8       .0      15.6        .0  .11  .13 1.
09  .86 #
  17      -.3      .0     31.8       .0      13.5        .0  .23  .10 1.
17  .95 #
  18      -.3      .0     31.8       .0      13.5        .0  .23  .10 1.
17  .95 #
  19      -.3      .0     14.8       .0      15.6        .0  .11  .13 1.
09  .86 #
  20      -.3      .0     14.8       .0      15.6        .0  .11  .13 1.
09  .86 #


 LOAD CASE -    8

 PILE     F1       F2       F3        M1        M2        M3  ALF  CBF  A
SC  AST
```

```
            K          K          K           IN-K          IN-K          IN-K                   K
SI  KSI

    1       .6         .1       52.0          5.8         -30.0            .0   .37   .19 1.
32 1.01 #
    2       .6         .0       15.2           .0         -33.6            .0   .11   .15 1.
13  .82
    3       .6         .0       15.2           .0         -33.6            .0   .11   .15 1.
13  .82
    4       .6         .0       15.2           .0         -33.6            .0   .11   .15 1.
13  .82
    5       .6         .0       15.2           .0         -33.6            .0   .11   .15 1.
13  .82
    6       .6         .0       15.2           .0         -33.6            .0   .11   .15 1.
13  .82
    7       .6         .0       15.2           .0         -33.6            .0   .11   .15 1.
13  .82
    8       .6         .0       15.2           .0         -33.6            .0   .11   .15 1.
13  .82
    9       .6         .0       15.2           .0         -33.6            .0   .11   .15 1.
13  .82
   10       .6        -.1       52.0         -5.8         -30.0            .0   .37   .19 1.
32 1.01 #
   11      -.7         .0        4.3           .0          35.8            .0   .03   .20 1.
08  .76
   12      -.7         .0        4.3           .0          35.8            .0   .03   .20 1.
08  .76
   13      -.6         .0       44.8           .0          33.6            .0   .32   .14 1.
28  .98 #
   14      -.6         .0       44.8           .0          33.6            .0   .32   .14 1.
28  .98 #
   15      -.7         .0        4.3           .0          35.8            .0   .03   .20 1.
08  .76
   16      -.7         .0        4.3           .0          35.8            .0   .03   .20 1.
08  .76
   17      -.6         .0       44.8           .0          33.6            .0   .32   .14 1.
28  .98 #
   18      -.6         .0       44.8           .0          33.6            .0   .32   .14 1.
28  .98 #
   19      -.7         .0        4.3           .0          35.8            .0   .03   .20 1.
08  .76
   20      -.7         .0        4.3           .0          35.8            .0   .03   .20 1.
08  .76


 ************************************************************************
*********
```

PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	1.0	6.4	-17.4	.0	.0	.0
2	.0	.6	18.4	.0	.0	.0
3	.0	.6	18.4	.0	.0	.0
4	.0	.6	18.4	.0	.0	.0
5	.0	.6	18.4	.0	.0	.0
6	.0	.6	18.4	.0	.0	.0
7	.0	.6	18.4	.0	.0	.0
8	.0	.6	18.4	.0	.0	.0
9	.0	.6	18.4	.0	.0	.0
10	-1.0	6.4	-17.4	.0	.0	.0
11	.0	13.3	38.1	.0	.0	.0
12	.0	13.3	38.1	.0	.0	.0
13	.0	.6	4.0	.0	.0	.0
14	.0	.6	4.0	.0	.0	.0
15	.0	13.3	38.1	.0	.0	.0
16	.0	13.3	38.1	.0	.0	.0
17	.0	.6	4.0	.0	.0	.0
18	.0	.6	4.0	.0	.0	.0
19	.0	13.3	38.1	.0	.0	.0
20	.0	13.3	38.1	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	2.0	12.5	-35.3	.0	.0	.0
2	.0	.9	15.4	.0	.0	.0
3	.0	.9	15.4	.0	.0	.0
4	.0	.9	15.4	.0	.0	.0
5	.0	.9	15.4	.0	.0	.0
6	.0	.9	15.4	.0	.0	.0
7	.0	.9	15.4	.0	.0	.0
8	.0	.9	15.4	.0	.0	.0
9	.0	.9	15.4	.0	.0	.0
10	-2.0	12.5	-35.3	.0	.0	.0

11	.0	14.8	41.8	.0	.0	.0
12	.0	14.8	41.8	.0	.0	.0
13	.0	.9	-9.0	.0	.0	.0
14	.0	.9	-9.0	.0	.0	.0
15	.0	14.8	41.8	.0	.0	.0
16	.0	14.8	41.8	.0	.0	.0
17	.0	.9	-9.0	.0	.0	.0
18	.0	.9	-9.0	.0	.0	.0
19	.0	14.8	41.8	.0	.0	.0
20	.0	14.8	41.8	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-4.6	-27.7	80.4	.0	.0	.0
2	.0	-1.4	4.6	.0	.0	.0
3	.0	-1.4	4.6	.0	.0	.0
4	.0	-1.4	4.6	.0	.0	.0
5	.0	-1.4	4.6	.0	.0	.0
6	.0	-1.4	4.6	.0	.0	.0
7	.0	-1.4	4.6	.0	.0	.0
8	.0	-1.4	4.6	.0	.0	.0
9	.0	-1.4	4.6	.0	.0	.0
10	4.6	-27.7	80.4	.0	.0	.0
11	.0	3.9	16.3	.0	.0	.0
12	.0	3.9	16.3	.0	.0	.0
13	.0	-1.4	104.0	.0	.0	.0
14	.0	-1.4	104.0	.0	.0	.0
15	.0	3.9	16.3	.0	.0	.0
16	.0	3.9	16.3	.0	.0	.0
17	.0	-1.4	104.0	.0	.0	.0
18	.0	-1.4	104.0	.0	.0	.0
19	.0	3.9	16.3	.0	.0	.0
20	.0	3.9	16.3	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-2.5	-13.9	43.1	.0	.0	.0
2	.0	.1	56.5	.0	.0	.0
3	.0	.1	56.5	.0	.0	.0

4	.0	.1	56.5	.0	.0	.0
5	.0	.1	56.5	.0	.0	.0
6	.0	.1	56.5	.0	.0	.0
7	.0	.1	56.5	.0	.0	.0
8	.0	.1	56.5	.0	.0	.0
9	.0	.1	56.5	.0	.0	.0
10	2.5	-13.9	43.1	.0	.0	.0
11	.0	6.7	19.9	.0	.0	.0
12	.0	6.7	19.9	.0	.0	.0
13	.0	.1	13.4	.0	.0	.0
14	.0	.1	13.4	.0	.0	.0
15	.0	6.7	19.9	.0	.0	.0
16	.0	6.7	19.9	.0	.0	.0
17	.0	.1	13.4	.0	.0	.0
18	.0	.1	13.4	.0	.0	.0
19	.0	6.7	19.9	.0	.0	.0
20	.0	6.7	19.9	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-2.2	-13.4	38.9	.0	.0	.0
2	.0	-.7	2.2	.0	.0	.0
3	.0	-.7	2.2	.0	.0	.0
4	.0	-.7	2.2	.0	.0	.0
5	.0	-.7	2.2	.0	.0	.0
6	.0	-.7	2.2	.0	.0	.0
7	.0	-.7	2.2	.0	.0	.0
8	.0	-.7	2.2	.0	.0	.0
9	.0	-.7	2.2	.0	.0	.0
10	2.2	-13.4	38.9	.0	.0	.0
11	.0	7.9	26.0	.0	.0	.0
12	.0	7.9	26.0	.0	.0	.0
13	.0	-.7	70.5	.0	.0	.0
14	.0	-.7	70.5	.0	.0	.0
15	.0	7.9	26.0	.0	.0	.0
16	.0	7.9	26.0	.0	.0	.0
17	.0	-.7	70.5	.0	.0	.0
18	.0	-.7	70.5	.0	.0	.0
19	.0	7.9	26.0	.0	.0	.0
20	.0	7.9	26.0	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-3.1	-17.9	54.0	.0	.0	.0
2	.0	-.3	42.6	.0	.0	.0
3	.0	-.3	42.6	.0	.0	.0
4	.0	-.3	42.6	.0	.0	.0
5	.0	-.3	42.6	.0	.0	.0
6	.0	-.3	42.6	.0	.0	.0
7	.0	-.3	42.6	.0	.0	.0
8	.0	-.3	42.6	.0	.0	.0
9	.0	-.3	42.6	.0	.0	.0
10	3.1	-17.9	54.0	.0	.0	.0
11	.0	.1	1.4	.0	.0	.0
12	.0	.1	1.4	.0	.0	.0
13	.0	-.3	19.2	.0	.0	.0
14	.0	-.3	19.2	.0	.0	.0
15	.0	.1	1.4	.0	.0	.0
16	.0	.1	1.4	.0	.0	.0
17	.0	-.3	19.2	.0	.0	.0
18	.0	-.3	19.2	.0	.0	.0
19	.0	.1	1.4	.0	.0	.0
20	.0	.1	1.4	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-1.8	-10.5	31.2	.0	.0	.0
2	.0	-.3	18.8	.0	.0	.0
3	.0	-.3	18.8	.0	.0	.0
4	.0	-.3	18.8	.0	.0	.0
5	.0	-.3	18.8	.0	.0	.0
6	.0	-.3	18.8	.0	.0	.0
7	.0	-.3	18.8	.0	.0	.0
8	.0	-.3	18.8	.0	.0	.0
9	.0	-.3	18.8	.0	.0	.0
10	1.8	-10.5	31.2	.0	.0	.0
11	.0	4.4	14.2	.0	.0	.0
12	.0	4.4	14.2	.0	.0	.0
13	.0	-.3	31.8	.0	.0	.0
14	.0	-.3	31.8	.0	.0	.0
15	.0	4.4	14.2	.0	.0	.0
16	.0	4.4	14.2	.0	.0	.0

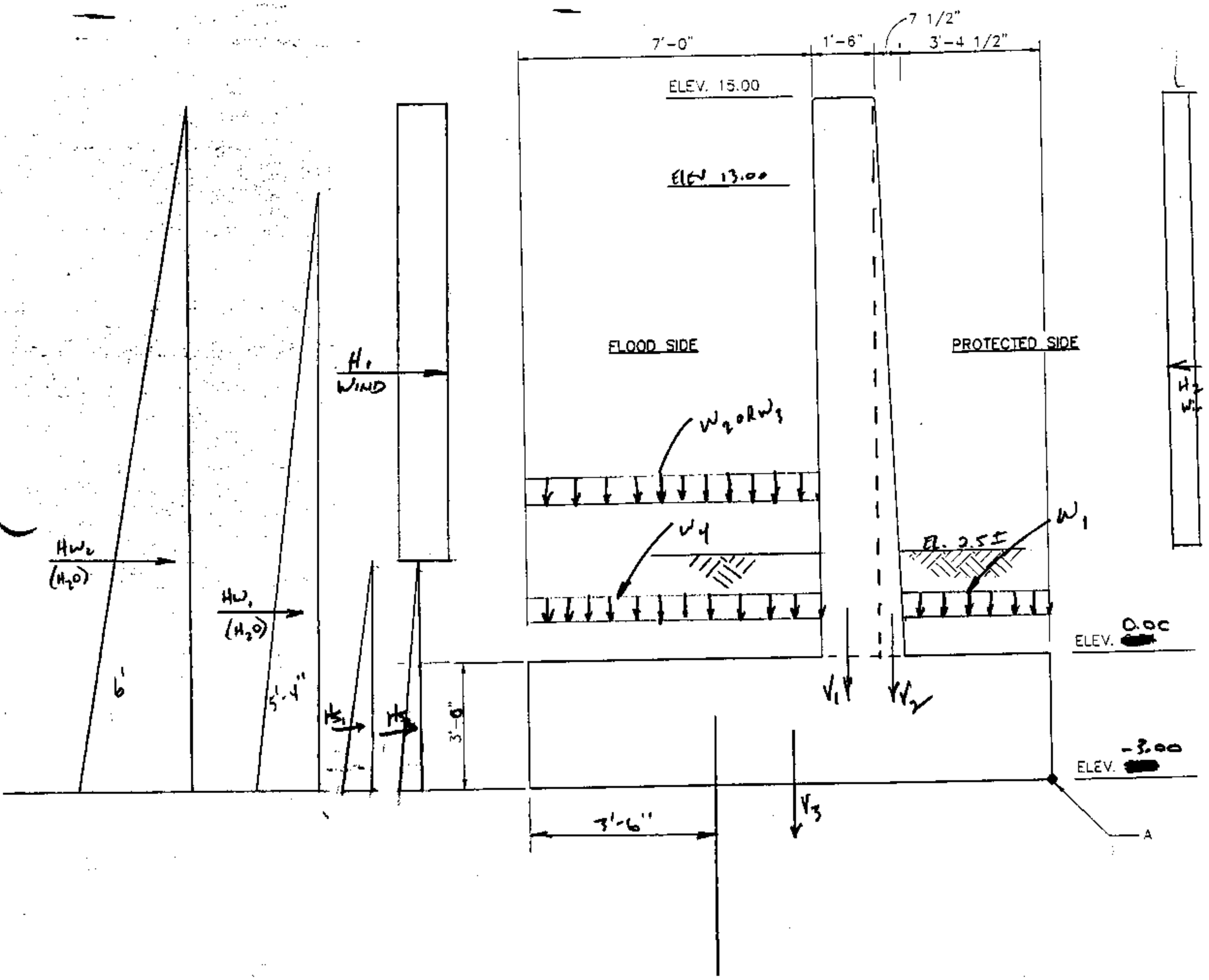
17	.0	-.3	31.8	.0	.0	.0
18	.0	-.3	31.8	.0	.0	.0
19	.0	4.4	14.2	.0	.0	.0
20	.0	4.4	14.2	.0	.0	.0

LOAD CASE - 8

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-2.8	-16.7	49.2	.0	.0	.0
2	.0	-.6	15.2	.0	.0	.0
3	.0	-.6	15.2	.0	.0	.0
4	.0	-.6	15.2	.0	.0	.0
5	.0	-.6	15.2	.0	.0	.0
6	.0	-.6	15.2	.0	.0	.0
7	.0	-.6	15.2	.0	.0	.0
8	.0	-.6	15.2	.0	.0	.0
9	.0	-.6	15.2	.0	.0	.0
10	2.8	-16.7	49.2	.0	.0	.0
11	.0	.7	4.3	.0	.0	.0
12	.0	.7	4.3	.0	.0	.0
13	.0	-.6	44.8	.0	.0	.0
14	.0	-.6	44.8	.0	.0	.0
15	.0	.7	4.3	.0	.0	.0
16	.0	.7	4.3	.0	.0	.0
17	.0	-.6	44.8	.0	.0	.0
18	.0	-.6	44.8	.0	.0	.0
19	.0	.7	4.3	.0	.0	.0
20	.0	.7	4.3	.0	.0	.0

TYPICAL T-WALLS

FRANCE ROAD FLOOD WALL
T-WALL @ ME20
DPZ 6/23/97



Client: PORT OF NEW ORLEANS Project:
Computations for: T-WALL @ MECO
Computed by: G. FLITTER Date: 2/11/97 Checked by: Date:

DEAD LOADS

			FEET	1-K
V_1	$= 1.5 (15) * 0.15 =$	3.38 *	4.75' =	16.06
V_2	$= 0.625 (15) * 0.15 * 1/2 =$	0.70 *	3.69' =	2.58
V_3	$= 3 * 12.5 * 0.15 =$	5.63 *	6.25' =	35.19
		9.71		53.83

WIND
SOIL
WATER

} SAME AS PAGE 4 T-WALL @ MECO SITE 8/94 CALCULATIONS

UPLIFT

$U_2 = 4.0 (-) * 10.5 = 42.00 (-)$ I

$U_3 = 4.5 (-) * 10.5 = 47.25 (-)$ II

$U_4 = 0.0624 * 16 * 12.5/2 = 6.24 * 12.5 (2/3) = 520 (-)$ VI

$U_5 = 0.0624 * 18 * 12.5/2 = 7.02 * 12.5 (2/3) = 58.5 (-)$ VII

VERT LOADS

W_1 = SAME AS PG 4 = 0.58 * 1.75 = 1.02 (+) ALL CASES

W_2 = SAME AS PG.5 = 7.47 * 9.0 = 67.23 (+) II

W_3 = SAME AS PG.5 = 6.59 * 9.0 = 59.31 (+) I

W_4 = SAME AS PG.5 = 2.02 * 9.0 = 18.18 (+) III, IV, V

WT PILE H_5 = SAME AS PG.5 = 0.022 — —

Client: PORT OF NEW ORLEANS Project:
Computations for: I-WALL @ MECO
Computed by: G. FLITTER Date: 2/11/97 Checked by: Date:

LOAD COMBINATIONS (12.5' BASE)

LOAD CASE	$\vec{F_x}$	$F_z\downarrow$	M_y
I = D.L. + SWL + IMPER WALL			
DEAD	0	9.71	53.83
WATER	8.0	0	-42.64
SOIL	0.40	0	-0.74
UPLIFT	0	-4.0	-42.00
VERT (W1)	0	0.58	1.02
(W3)	0	6.59	59.31
SHTPILE	0.022		
	8.42	12.88	28.78
II = HWL + DL + IMPER WALL			
DEAD	0	9.71	53.83
WATER	10.10	0	-60.60
SOIL	0.40	0	-0.74
UPLIFT	0	-4.5	-47.25
VERT (W1)	0	0.58	1.02
(W2)	0	7.47	67.23
SHTPILE	0.022	0	0
	10.52	13.26	13.49
*0.75	7.89	9.95	10.12
III = WIND (F.S.) + D.L.			
DEAD	0	9.71	53.87
WIND	0.625	0	-7.35
SOIL	0.87	0	-1.60
VERT W1	0	0.58	1.02
W4	0	2.02	18.18
SHTPILE	0.022	0	0
	1.51	12.31	64.08
*0.75	1.13	9.23	48.06
WIN (P.S.) + D.L.			
DEAD	0	9.71	53.83
WIND	-0.625	0	7.35
SOIL	-0.87	0	1.60
VERT W1	0	0.58	1.02
W4	0	2.02	18.18

LOAD CASE	$\vec{F_x}$	$F_z\downarrow$	M_y
IV (CONT.)	-1.47	12.31	81.98
*0.75	-1.10	9.23	61.49
V D.L ONLY (NO WATER, NO WIND)			
DEAD	0	9.71	53.83
SOIL	0	2.02	15.10
	0	0.58	1.02
SHTPILE	0.022	0	0
	0.02	12.31	69.95
VI CASE I W/PERVIOUS WALL			
DEAD	0	9.71	53.83
WATER	8.0	0	-42.64
SOIL	0.40	0	-0.74
VERT (W1)	0	0.58	1.02
(W3)	0	6.59	59.31
SHTPILE	0.022	0	0
UPLIFT (U4)	0	-6.24	-52.0
	8.42	10.64	18.78
VII CASE II W/PERVIOUS WALL			
DEAD	0	9.71	53.83
WATER	10.10	0	-60.60
SOIL	0.40	0	-0.74
UPLIFT (U5)	0	-7.02	-58.50
VERT W1	0	0.58	1.02
W2	0	7.47	+67.23
SHTPILE	0.022	0	0
	10.52	10.74	2.24
*0.75	7.89	8.06	1.68

Client: PORT OF NEW ORLEANS Project:
Computations for: T-WALL @ MECO
Computed by: G. FLITTER Date: 2/11/97 Checked by: Date:

LOAD CASE	W/LOAD FACTOR	F_x (→)		F_z (↓)		M_y (↺)	
	L.F.	ΣFx	*L.F.	ΣFz	*L.F.	ΣMy	*L.F.
I	1.0	8.42	8.4	12.9	12.9	28.8	28.8
II	0.75	10.5	7.9	13.3	10.0	13.5	10.1
III	0.75	1.5	1.1	12.3	9.2	64.1	48.1
IV	0.75	-1.5	-1.1	12.3	9.2	82.0	61.5
V	1.0	0.02	0.02	12.3	12.3	70.0	70.0
VI	1.0	8.4	8.4	10.6	10.6	18.8	18.8
VII	0.75	10.5	7.9	10.7	8.1	2.2	1.7

28.5' LONG WALL

LOAD CASE	F_x →	F_z ↓	M_y ↺	COMMENTS
I	239.4	367.65	820.8	—
II	225.2	285.0	287.9	75% LOADS
III	31.4	262.2	1370.9	75% LOADS
IV	-31.4	262.2	1752.8	75% LOADS
V	0.57	350.6	1995.0	—
VI	239.4	302.1	535.8	—
VII	225.2	230.9	48.5	75% LOADS

```
1000 T-WALL ANALYSIS - 28.5' LONG - FRANCE ROAD MECO SITE - 12.5' BASE
1005 3 ROWS OF 14 IN. SQ. PPC PILES AT 3.5' C/C, ORIGIN AT CENTER OF BASE
1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL
1020 SOI ES .046 LEN 70.0 0. ALL
1030 PIN ALL
1040 TEN 0.8 ALL
1050 DLS S 83.0 38.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL
1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL
1070 BAT 3.0 1 TO 8
1075 BAT 6.0 9 TO 16
1078 BAT 4.0 17 TO 24
1080 ANG 180 17 TO 24
1090 ANG 0  1 TO 16
1100 PIL 1 -2.0 -12.25 0.0  9 -7.0 -12.25 0.0 17 -10.5 -12.25 0.0
1110 ROW Y 8 1 7 AT 3.5
1115 ROW Y 8 9 7 AT 3.5
1116 ROW Y 8 17 7 AT 3.5
1120 LOA 1 239.4 0.0 367.7 0.0 820.8 0.0
1121 LOA 2 225.2 0.0 285.0 0.0 287.9 0.0
1122 LOA 3 31.4 0.0 262.2 0.0 1370.9 0.0
1123 LOA 4 -31.4 0.0 262.2 0.0 1752.80 0.0
1124 LOA 5 0.57 0.0 350.6 0.0 1995.0 0.0
1125 LOA 6 239.4 0.0 302.1 0.0 535.8 0.0
1126 LOA 7 225.2 0.0 230.9 0.0 48.5 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\TWMECO.O
1140 PFO ALL
1150 PLB ALL
1160 FPL C:\CORPS\CPGG\TWMECO.P
```

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*********************************
* CORPS PROGRAM  #  X0080       *  CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 1992/02/26   *  RUN DATE 14-JUL-1997   RUN TIME 13.11.50
*********************************
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T-WALL ANALYSIS - 28.5' LONG - FRANCE ROAD MECO SITE - 12.5' BASE

THERE ARE 24 PILES AND
7 LOAD CASES IN THIS RUN.

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ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                          X           Y          Z
                                        -----       -----      -----
WITH DIAGONAL COORDINATES = (        -10.50 ,    -12.25 ,       .00 )
                            (         -2.00 ,     12.25 ,       .00 )
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PILE PROPERTIES AS INPUT

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.40740E+04	.32010E+04	.32010E+04	.19600E+03	.15000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.46000E-01	L	.70000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-2.00	-12.25	.00	3.00	.00	70.00	P
2	-2.00	-8.75	.00	3.00	.00	70.00	P
3	-2.00	-5.25	.00	3.00	.00	70.00	P
4	-2.00	-1.75	.00	3.00	.00	70.00	P
5	-2.00	1.75	.00	3.00	.00	70.00	P
6	-2.00	5.25	.00	3.00	.00	70.00	P
7	-2.00	8.75	.00	3.00	.00	70.00	P
8	-2.00	12.25	.00	3.00	.00	70.00	P

9	-7.00	-12.25	.00	6.00	.00	70.00	P
10	-7.00	-8.75	.00	6.00	.00	70.00	P
11	-7.00	-5.25	.00	6.00	.00	70.00	P
12	-7.00	-1.75	.00	6.00	.00	70.00	P
13	-7.00	1.75	.00	6.00	.00	70.00	P
14	-7.00	5.25	.00	6.00	.00	70.00	P
15	-7.00	8.75	.00	6.00	.00	70.00	P
16	-7.00	12.25	.00	6.00	.00	70.00	P
17	-10.50	-12.25	.00	4.00	180.00	70.00	P
18	-10.50	-8.75	.00	4.00	180.00	70.00	P
19	-10.50	-5.25	.00	4.00	180.00	70.00	P
20	-10.50	-1.75	.00	4.00	180.00	70.00	P
21	-10.50	1.75	.00	4.00	180.00	70.00	P
22	-10.50	5.25	.00	4.00	180.00	70.00	P
23	-10.50	8.75	.00	4.00	180.00	70.00	P
24	-10.50	12.25	.00	4.00	180.00	70.00	P

						1680.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	239.4	.0	367.7	.0	820.8	.0
2	225.2	.0	285.0	.0	287.9	.0
3	31.4	.0	262.2	.0	1370.9	.0
4	-31.4	.0	262.2	.0	1752.8	.0
5	.6	.0	350.6	.0	1995.0	.0
6	239.4	.0	302.1	.0	535.8	.0
7	225.2	.0	230.9	.0	48.5	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 8.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 8.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 8.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 8.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 8.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 8.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.3147E+00	-.6119E-07	-.1234E+00	.1300E-11	.1389E-02	.1618E-10
2	.2940E+00	-.6348E-07	-.1155E+00	.1349E-11	.1277E-02	.1678E-10
3	-.3922E-01	.1653E-07	.3443E-01	-.3511E-12	-.2931E-03	-.4369E-11
4	-.1525E+00	.4341E-07	.8628E-01	-.9222E-12	-.8351E-03	-.1148E-10

5	-.1452E+00	.4059E-07	.9105E-01	-.8624E-12	-.8683E-03	-.1073E-10
6	.3599E+00	-.6959E-07	-.1512E+00	.1478E-11	.1670E-02	.1840E-10
7	.3304E+00	-.7037E-07	-.1379E+00	.1495E-11	.1503E-02	.1860E-10

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	1.4	.0	20.1	.0	-81.6	.0	.24	.22	1.26	.74	
2	1.4	.0	20.1	.0	-81.6	.0	.24	.22	1.26	.74	
3	1.4	.0	20.1	.0	-81.6	.0	.24	.22	1.26	.74	
4	1.4	.0	20.1	.0	-81.6	.0	.24	.22	1.26	.74	
5	1.4	.0	20.1	.0	-81.6	.0	.24	.22	1.26	.74	
6	1.4	.0	20.1	.0	-81.6	.0	.24	.22	1.26	.74	
7	1.4	.0	20.1	.0	-81.6	.0	.24	.22	1.26	.74	
8	1.4	.0	20.1	.0	-81.6	.0	.24	.22	1.26	.74	
9	1.3	.0	64.4	.0	-77.7	.0	.78	.27	1.48	.98	#
10	1.3	.0	64.4	.0	-77.7	.0	.78	.27	1.48	.98	#
11	1.3	.0	64.4	.0	-77.7	.0	.78	.27	1.48	.98	#
12	1.3	.0	64.4	.0	-77.7	.0	.78	.27	1.48	.98	#
13	1.3	.0	64.4	.0	-77.7	.0	.78	.27	1.48	.98	#
14	1.3	.0	64.4	.0	-77.7	.0	.78	.27	1.48	.98	#
15	1.3	.0	64.4	.0	-77.7	.0	.78	.27	1.48	.98	#
16	1.3	.0	64.4	.0	-77.7	.0	.78	.27	1.48	.98	#
17	-1.3	.0	-37.4	.0	79.3	.0	.98	.56	.96	.46	
18	-1.3	.0	-37.4	.0	79.3	.0	.98	.56	.96	.46	
19	-1.3	.0	-37.4	.0	79.3	.0	.98	.56	.96	.46	
20	-1.3	.0	-37.4	.0	79.3	.0	.98	.56	.96	.46	
21	-1.3	.0	-37.4	.0	79.3	.0	.98	.56	.96	.46	
22	-1.3	.0	-37.4	.0	79.3	.0	.98	.56	.96	.46	
23	-1.3	.0	-37.4	.0	79.3	.0	.98	.56	.96	.46	
24	-1.3	.0	-37.4	.0	79.3	.0	.98	.56	.96	.46	

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	1.3	.0	17.9	.0	-76.3	.0	.22	.22	1.24	.74	
2	1.3	.0	17.9	.0	-76.3	.0	.22	.22	1.24	.74	
3	1.3	.0	17.9	.0	-76.3	.0	.22	.22	1.24	.74	
4	1.3	.0	17.9	.0	-76.3	.0	.22	.22	1.24	.74	
5	1.3	.0	17.9	.0	-76.3	.0	.22	.22	1.24	.74	
6	1.3	.0	17.9	.0	-76.3	.0	.22	.22	1.24	.74	
7	1.3	.0	17.9	.0	-76.3	.0	.22	.22	1.24	.74	
8	1.3	.0	17.9	.0	-76.3	.0	.22	.22	1.24	.74	
9	1.2	.0	57.4	.0	-72.7	.0	.69	.22	1.43	.95	#

10	1.2	.0	57.4	.0	-72.7	.0	.69	.22	1.43	.95	#
11	1.2	.0	57.4	.0	-72.7	.0	.69	.22	1.43	.95	#
12	1.2	.0	57.4	.0	-72.7	.0	.69	.22	1.43	.95	#
13	1.2	.0	57.4	.0	-72.7	.0	.69	.22	1.43	.95	#
14	1.2	.0	57.4	.0	-72.7	.0	.69	.22	1.43	.95	#
15	1.2	.0	57.4	.0	-72.7	.0	.69	.22	1.43	.95	#
16	1.2	.0	57.4	.0	-72.7	.0	.69	.22	1.43	.95	#
17	-1.3	.0	-38.8	.0	73.9	.0	1.02	.57	.94	.46	
18	-1.3	.0	-38.8	.0	73.9	.0	1.02	.57	.94	.46	
19	-1.3	.0	-38.8	.0	73.9	.0	1.02	.57	.94	.46	
20	-1.3	.0	-38.8	.0	73.9	.0	1.02	.57	.94	.46	
21	-1.3	.0	-38.8	.0	73.9	.0	1.02	.57	.94	.46	
22	-1.3	.0	-38.8	.0	73.9	.0	1.02	.57	.94	.46	
23	-1.3	.0	-38.8	.0	73.9	.0	1.02	.57	.94	.46	
24	-1.3	.0	-38.8	.0	73.9	.0	1.02	.57	.94	.46	

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.2	.0	19.4	.0	11.4	.0	.23	.12	1.10	.89	#
2	-.2	.0	19.4	.0	11.4	.0	.23	.12	1.10	.89	#
3	-.2	.0	19.4	.0	11.4	.0	.23	.12	1.10	.89	#
4	-.2	.0	19.4	.0	11.4	.0	.23	.12	1.10	.89	#
5	-.2	.0	19.4	.0	11.4	.0	.23	.12	1.10	.89	#
6	-.2	.0	19.4	.0	11.4	.0	.23	.12	1.10	.89	#
7	-.2	.0	19.4	.0	11.4	.0	.23	.12	1.10	.89	#
8	-.2	.0	19.4	.0	11.4	.0	.23	.12	1.10	.89	#
9	-.2	.0	4.6	.0	10.1	.0	.06	.16	1.03	.82	
10	-.2	.0	4.6	.0	10.1	.0	.06	.16	1.03	.82	
11	-.2	.0	4.6	.0	10.1	.0	.06	.16	1.03	.82	
12	-.2	.0	4.6	.0	10.1	.0	.06	.16	1.03	.82	
13	-.2	.0	4.6	.0	10.1	.0	.06	.16	1.03	.82	
14	-.2	.0	4.6	.0	10.1	.0	.06	.16	1.03	.82	
15	-.2	.0	4.6	.0	10.1	.0	.06	.16	1.03	.82	
16	-.2	.0	4.6	.0	10.1	.0	.06	.16	1.03	.82	
17	.2	.0	10.1	.0	-9.6	.0	.12	.14	1.05	.85	#
18	.2	.0	10.1	.0	-9.6	.0	.12	.14	1.05	.85	#
19	.2	.0	10.1	.0	-9.6	.0	.12	.14	1.05	.85	#
20	.2	.0	10.1	.0	-9.6	.0	.12	.14	1.05	.85	#
21	.2	.0	10.1	.0	-9.6	.0	.12	.14	1.05	.85	#
22	.2	.0	10.1	.0	-9.6	.0	.12	.14	1.05	.85	#
23	.2	.0	10.1	.0	-9.6	.0	.12	.14	1.05	.85	#
24	.2	.0	10.1	.0	-9.6	.0	.12	.14	1.05	.85	#

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-.7	.0	20.8	.0	41.3	.0	.25	.14	1.18	.84
2	-.7	.0	20.8	.0	41.3	.0	.25	.14	1.18	.84
3	-.7	.0	20.8	.0	41.3	.0	.25	.14	1.18	.84
4	-.7	.0	20.8	.0	41.3	.0	.25	.14	1.18	.84
5	-.7	.0	20.8	.0	41.3	.0	.25	.14	1.18	.84
6	-.7	.0	20.8	.0	41.3	.0	.25	.14	1.18	.84
7	-.7	.0	20.8	.0	41.3	.0	.25	.14	1.18	.84
8	-.7	.0	20.8	.0	41.3	.0	.25	.14	1.18	.84
9	-.6	.0	-13.1	.0	38.2	.0	.34	.22	1.00	.67

10	-.6	.0	-13.1	.0	38.2	.0	.34	.22	1.00	.67	
11	-.6	.0	-13.1	.0	38.2	.0	.34	.22	1.00	.67	
12	-.6	.0	-13.1	.0	38.2	.0	.34	.22	1.00	.67	
13	-.6	.0	-13.1	.0	38.2	.0	.34	.22	1.00	.67	
14	-.6	.0	-13.1	.0	38.2	.0	.34	.22	1.00	.67	
15	-.6	.0	-13.1	.0	38.2	.0	.34	.22	1.00	.67	
16	-.6	.0	-13.1	.0	38.2	.0	.34	.22	1.00	.67	
17	.6	.0	26.5	.0	-38.0	.0	.32	.11	1.20	.87	
18	.6	.0	26.5	.0	-38.0	.0	.32	.11	1.20	.87	
19	.6	.0	26.5	.0	-38.0	.0	.32	.11	1.20	.87	
20	.6	.0	26.5	.0	-38.0	.0	.32	.11	1.20	.87	
21	.6	.0	26.5	.0	-38.0	.0	.32	.11	1.20	.87	
22	.6	.0	26.5	.0	-38.0	.0	.32	.11	1.20	.87	
23	.6	.0	26.5	.0	-38.0	.0	.32	.11	1.20	.87	
24	.6	.0	26.5	.0	-38.0	.0	.32	.11	1.20	.87	

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.7	.0	29.5	.0	39.9	.0	.36	.11	1.22	.88	#
2	-.7	.0	29.5	.0	39.9	.0	.36	.11	1.22	.88	#
3	-.7	.0	29.5	.0	39.9	.0	.36	.11	1.22	.88	#
4	-.7	.0	29.5	.0	39.9	.0	.36	.11	1.22	.88	#
5	-.7	.0	29.5	.0	39.9	.0	.36	.11	1.22	.88	#
6	-.7	.0	29.5	.0	39.9	.0	.36	.11	1.22	.88	#
7	-.7	.0	29.5	.0	39.9	.0	.36	.11	1.22	.88	#
8	-.7	.0	29.5	.0	39.9	.0	.36	.11	1.22	.88	#
9	-.6	.0	-8.5	.0	36.5	.0	.22	.17	1.02	.70	
10	-.6	.0	-8.5	.0	36.5	.0	.22	.17	1.02	.70	
11	-.6	.0	-8.5	.0	36.5	.0	.22	.17	1.02	.70	
12	-.6	.0	-8.5	.0	36.5	.0	.22	.17	1.02	.70	
13	-.6	.0	-8.5	.0	36.5	.0	.22	.17	1.02	.70	
14	-.6	.0	-8.5	.0	36.5	.0	.22	.17	1.02	.70	
15	-.6	.0	-8.5	.0	36.5	.0	.22	.17	1.02	.70	
16	-.6	.0	-8.5	.0	36.5	.0	.22	.17	1.02	.70	
17	.6	.0	24.8	.0	-36.2	.0	.30	.12	1.19	.87	
18	.6	.0	24.8	.0	-36.2	.0	.30	.12	1.19	.87	
19	.6	.0	24.8	.0	-36.2	.0	.30	.12	1.19	.87	
20	.6	.0	24.8	.0	-36.2	.0	.30	.12	1.19	.87	
21	.6	.0	24.8	.0	-36.2	.0	.30	.12	1.19	.87	
22	.6	.0	24.8	.0	-36.2	.0	.30	.12	1.19	.87	
23	.6	.0	24.8	.0	-36.2	.0	.30	.12	1.19	.87	
24	.6	.0	24.8	.0	-36.2	.0	.30	.12	1.19	.87	

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	1.6	.0	12.0	.0	-93.9	.0	.14	.27	1.25	.68	
2	1.6	.0	12.0	.0	-93.9	.0	.14	.27	1.25	.68	
3	1.6	.0	12.0	.0	-93.9	.0	.14	.27	1.25	.68	
4	1.6	.0	12.0	.0	-93.9	.0	.14	.27	1.25	.68	
5	1.6	.0	12.0	.0	-93.9	.0	.14	.27	1.25	.68	
6	1.6	.0	12.0	.0	-93.9	.0	.14	.27	1.25	.68	
7	1.6	.0	12.0	.0	-93.9	.0	.14	.27	1.25	.68	
8	1.6	.0	12.0	.0	-93.9	.0	.14	.27	1.25	.68	
9	1.5	.0	69.0	.0	-89.0	.0	.83	.30	1.53	.98	#

10	1.5	.0	69.0	.0	-89.0	.0	.83	.30	1.53	.98	#
11	1.5	.0	69.0	.0	-89.0	.0	.83	.30	1.53	.98	#
12	1.5	.0	69.0	.0	-89.0	.0	.83	.30	1.53	.98	#
13	1.5	.0	69.0	.0	-89.0	.0	.83	.30	1.53	.98	#
14	1.5	.0	69.0	.0	-89.0	.0	.83	.30	1.53	.98	#
15	1.5	.0	69.0	.0	-89.0	.0	.83	.30	1.53	.98	#
16	1.5	.0	69.0	.0	-89.0	.0	.83	.30	1.53	.98	#
17	-1.5	.0	-42.5	.0	90.7	.0	1.12	.64	.96	.40	
18	-1.5	.0	-42.5	.0	90.7	.0	1.12	.64	.96	.40	
19	-1.5	.0	-42.5	.0	90.7	.0	1.12	.64	.96	.40	
20	-1.5	.0	-42.5	.0	90.7	.0	1.12	.64	.96	.40	
21	-1.5	.0	-42.5	.0	90.7	.0	1.12	.64	.96	.40	
22	-1.5	.0	-42.5	.0	90.7	.0	1.12	.64	.96	.40	
23	-1.5	.0	-42.5	.0	90.7	.0	1.12	.64	.96	.40	
24	-1.5	.0	-42.5	.0	90.7	.0	1.12	.64	.96	.40	

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	1.5	.0	11.3	.0	-86.2	.0	.14	.26	1.23	.69	
2	1.5	.0	11.3	.0	-86.2	.0	.14	.26	1.23	.69	
3	1.5	.0	11.3	.0	-86.2	.0	.14	.26	1.23	.69	
4	1.5	.0	11.3	.0	-86.2	.0	.14	.26	1.23	.69	
5	1.5	.0	11.3	.0	-86.2	.0	.14	.26	1.23	.69	
6	1.5	.0	11.3	.0	-86.2	.0	.14	.26	1.23	.69	
7	1.5	.0	11.3	.0	-86.2	.0	.14	.26	1.23	.69	
8	1.5	.0	11.3	.0	-86.2	.0	.14	.26	1.23	.69	
9	1.4	.0	61.1	.0	-81.8	.0	.74	.25	1.47	.95	#
10	1.4	.0	61.1	.0	-81.8	.0	.74	.25	1.47	.95	#
11	1.4	.0	61.1	.0	-81.8	.0	.74	.25	1.47	.95	#
12	1.4	.0	61.1	.0	-81.8	.0	.74	.25	1.47	.95	#
13	1.4	.0	61.1	.0	-81.8	.0	.74	.25	1.47	.95	#
14	1.4	.0	61.1	.0	-81.8	.0	.74	.25	1.47	.95	#
15	1.4	.0	61.1	.0	-81.8	.0	.74	.25	1.47	.95	#
16	1.4	.0	61.1	.0	-81.8	.0	.74	.25	1.47	.95	#
17	-1.4	.0	-43.0	.0	83.1	.0	1.13	.63	.94	.42	
18	-1.4	.0	-43.0	.0	83.1	.0	1.13	.63	.94	.42	
19	-1.4	.0	-43.0	.0	83.1	.0	1.13	.63	.94	.42	
20	-1.4	.0	-43.0	.0	83.1	.0	1.13	.63	.94	.42	
21	-1.4	.0	-43.0	.0	83.1	.0	1.13	.63	.94	.42	
22	-1.4	.0	-43.0	.0	83.1	.0	1.13	.63	.94	.42	
23	-1.4	.0	-43.0	.0	83.1	.0	1.13	.63	.94	.42	
24	-1.4	.0	-43.0	.0	83.1	.0	1.13	.63	.94	.42	

****

PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	7.7	.0	18.7	.0	.0	.0
2	7.7	.0	18.7	.0	.0	.0
3	7.7	.0	18.7	.0	.0	.0

4	7.7	.0	18.7	.0	.0	.0
5	7.7	.0	18.7	.0	.0	.0
6	7.7	.0	18.7	.0	.0	.0
7	7.7	.0	18.7	.0	.0	.0
8	7.7	.0	18.7	.0	.0	.0
9	11.9	.0	63.3	.0	.0	.0
10	11.9	.0	63.3	.0	.0	.0
11	11.9	.0	63.3	.0	.0	.0
12	11.9	.0	63.3	.0	.0	.0
13	11.9	.0	63.3	.0	.0	.0
14	11.9	.0	63.3	.0	.0	.0
15	11.9	.0	63.3	.0	.0	.0
16	11.9	.0	63.3	.0	.0	.0
17	10.4	.0	-36.0	.0	.0	.0
18	10.4	.0	-36.0	.0	.0	.0
19	10.4	.0	-36.0	.0	.0	.0
20	10.4	.0	-36.0	.0	.0	.0
21	10.4	.0	-36.0	.0	.0	.0
22	10.4	.0	-36.0	.0	.0	.0
23	10.4	.0	-36.0	.0	.0	.0
24	10.4	.0	-36.0	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	6.9	.0	16.5	.0	.0	.0
2	6.9	.0	16.5	.0	.0	.0
3	6.9	.0	16.5	.0	.0	.0
4	6.9	.0	16.5	.0	.0	.0
5	6.9	.0	16.5	.0	.0	.0
6	6.9	.0	16.5	.0	.0	.0
7	6.9	.0	16.5	.0	.0	.0
8	6.9	.0	16.5	.0	.0	.0
9	10.7	.0	56.4	.0	.0	.0
10	10.7	.0	56.4	.0	.0	.0
11	10.7	.0	56.4	.0	.0	.0
12	10.7	.0	56.4	.0	.0	.0
13	10.7	.0	56.4	.0	.0	.0
14	10.7	.0	56.4	.0	.0	.0
15	10.7	.0	56.4	.0	.0	.0
16	10.7	.0	56.4	.0	.0	.0
17	10.6	.0	-37.3	.0	.0	.0
18	10.6	.0	-37.3	.0	.0	.0
19	10.6	.0	-37.3	.0	.0	.0
20	10.6	.0	-37.3	.0	.0	.0
21	10.6	.0	-37.3	.0	.0	.0
22	10.6	.0	-37.3	.0	.0	.0
23	10.6	.0	-37.3	.0	.0	.0
24	10.6	.0	-37.3	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	5.9	.0	18.4	.0	.0	.0
2	5.9	.0	18.4	.0	.0	.0
3	5.9	.0	18.4	.0	.0	.0

4	5.9	.0	18.4	.0	.0	.0
5	5.9	.0	18.4	.0	.0	.0
6	5.9	.0	18.4	.0	.0	.0
7	5.9	.0	18.4	.0	.0	.0
8	5.9	.0	18.4	.0	.0	.0
9	.6	.0	4.6	.0	.0	.0
10	.6	.0	4.6	.0	.0	.0
11	.6	.0	4.6	.0	.0	.0
12	.6	.0	4.6	.0	.0	.0
13	.6	.0	4.6	.0	.0	.0
14	.6	.0	4.6	.0	.0	.0
15	.6	.0	4.6	.0	.0	.0
16	.6	.0	4.6	.0	.0	.0
17	-2.6	.0	9.8	.0	.0	.0
18	-2.6	.0	9.8	.0	.0	.0
19	-2.6	.0	9.8	.0	.0	.0
20	-2.6	.0	9.8	.0	.0	.0
21	-2.6	.0	9.8	.0	.0	.0
22	-2.6	.0	9.8	.0	.0	.0
23	-2.6	.0	9.8	.0	.0	.0
24	-2.6	.0	9.8	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	5.9	.0	20.0	.0	.0	.0
2	5.9	.0	20.0	.0	.0	.0
3	5.9	.0	20.0	.0	.0	.0
4	5.9	.0	20.0	.0	.0	.0
5	5.9	.0	20.0	.0	.0	.0
6	5.9	.0	20.0	.0	.0	.0
7	5.9	.0	20.0	.0	.0	.0
8	5.9	.0	20.0	.0	.0	.0
9	-2.8	.0	-12.8	.0	.0	.0
10	-2.8	.0	-12.8	.0	.0	.0
11	-2.8	.0	-12.8	.0	.0	.0
12	-2.8	.0	-12.8	.0	.0	.0
13	-2.8	.0	-12.8	.0	.0	.0
14	-2.8	.0	-12.8	.0	.0	.0
15	-2.8	.0	-12.8	.0	.0	.0
16	-2.8	.0	-12.8	.0	.0	.0
17	-7.1	.0	25.6	.0	.0	.0
18	-7.1	.0	25.6	.0	.0	.0
19	-7.1	.0	25.6	.0	.0	.0
20	-7.1	.0	25.6	.0	.0	.0
21	-7.1	.0	25.6	.0	.0	.0
22	-7.1	.0	25.6	.0	.0	.0
23	-7.1	.0	25.6	.0	.0	.0
24	-7.1	.0	25.6	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	8.7	.0	28.2	.0	.0	.0
2	8.7	.0	28.2	.0	.0	.0
3	8.7	.0	28.2	.0	.0	.0

4	8.7	.0	28.2	.0	.0	.0
5	8.7	.0	28.2	.0	.0	.0
6	8.7	.0	28.2	.0	.0	.0
7	8.7	.0	28.2	.0	.0	.0
8	8.7	.0	28.2	.0	.0	.0
9	-2.0	.0	-8.3	.0	.0	.0
10	-2.0	.0	-8.3	.0	.0	.0
11	-2.0	.0	-8.3	.0	.0	.0
12	-2.0	.0	-8.3	.0	.0	.0
13	-2.0	.0	-8.3	.0	.0	.0
14	-2.0	.0	-8.3	.0	.0	.0
15	-2.0	.0	-8.3	.0	.0	.0
16	-2.0	.0	-8.3	.0	.0	.0
17	-6.6	.0	23.9	.0	.0	.0
18	-6.6	.0	23.9	.0	.0	.0
19	-6.6	.0	23.9	.0	.0	.0
20	-6.6	.0	23.9	.0	.0	.0
21	-6.6	.0	23.9	.0	.0	.0
22	-6.6	.0	23.9	.0	.0	.0
23	-6.6	.0	23.9	.0	.0	.0
24	-6.6	.0	23.9	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	5.3	.0	10.8	.0	.0	.0
2	5.3	.0	10.8	.0	.0	.0
3	5.3	.0	10.8	.0	.0	.0
4	5.3	.0	10.8	.0	.0	.0
5	5.3	.0	10.8	.0	.0	.0
6	5.3	.0	10.8	.0	.0	.0
7	5.3	.0	10.8	.0	.0	.0
8	5.3	.0	10.8	.0	.0	.0
9	12.8	.0	67.8	.0	.0	.0
10	12.8	.0	67.8	.0	.0	.0
11	12.8	.0	67.8	.0	.0	.0
12	12.8	.0	67.8	.0	.0	.0
13	12.8	.0	67.8	.0	.0	.0
14	12.8	.0	67.8	.0	.0	.0
15	12.8	.0	67.8	.0	.0	.0
16	12.8	.0	67.8	.0	.0	.0
17	11.8	.0	-40.9	.0	.0	.0
18	11.8	.0	-40.9	.0	.0	.0
19	11.8	.0	-40.9	.0	.0	.0
20	11.8	.0	-40.9	.0	.0	.0
21	11.8	.0	-40.9	.0	.0	.0
22	11.8	.0	-40.9	.0	.0	.0
23	11.8	.0	-40.9	.0	.0	.0
24	11.8	.0	-40.9	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	4.9	.0	10.2	.0	.0	.0
2	4.9	.0	10.2	.0	.0	.0
3	4.9	.0	10.2	.0	.0	.0

4	4.9	.0	10.2	.0	.0	.0
5	4.9	.0	10.2	.0	.0	.0
6	4.9	.0	10.2	.0	.0	.0
7	4.9	.0	10.2	.0	.0	.0
8	4.9	.0	10.2	.0	.0	.0
9	11.4	.0	60.0	.0	.0	.0
10	11.4	.0	60.0	.0	.0	.0
11	11.4	.0	60.0	.0	.0	.0
12	11.4	.0	60.0	.0	.0	.0
13	11.4	.0	60.0	.0	.0	.0
14	11.4	.0	60.0	.0	.0	.0
15	11.4	.0	60.0	.0	.0	.0
16	11.4	.0	60.0	.0	.0	.0
17	11.8	.0	-41.4	.0	.0	.0
18	11.8	.0	-41.4	.0	.0	.0
19	11.8	.0	-41.4	.0	.0	.0
20	11.8	.0	-41.4	.0	.0	.0
21	11.8	.0	-41.4	.0	.0	.0
22	11.8	.0	-41.4	.0	.0	.0
23	11.8	.0	-41.4	.0	.0	.0
24	11.8	.0	-41.4	.0	.0	.0

Client PORT OF NEW ORLEANS Project
Computations for T-WALL
Computed by G. FLITTER Date 2/11/97 Checked by Date

T-WALL

D.L.
V1 = 1.5 * (15-3) * 0.15 = 2.7 * 3.25 = 8.78
V2 = 0.5 * (15-3) * 0.15 = 0.9 * 2.33 = 2.10
V3 = 2.5 * 12.5 * 0.15 = 4.69 * 7.0 = 32.83
Σ = 8.29 43.71
} ALL CASES

WINDS
H_1 = 0.05 * 1 * (15-5) = 0.50 * 9.5 = 4.75(-) III
H_2 = -0.05 * 1 * (15-5) = -0.50 * 9.5 = 4.75 IV

SOIL
H_{S1} = 0.115 * 0.5 * $4.5^2/2$ = ± 0.582 * 1.5 = 0.87 (±) ±III IV∓
H_{S2} = (0.115 - 0.0624) * 0.5 * $4.5^2/2$ = 0.267 * 1.5 = 0.40 (-) I, II

WATER
H_{W1} = 0.0624 * $(13 - 0.5)^2/2$ = 4.875 * 4.167 = 20.31 (-) I
H_{W2} = 0.0624 * $(15 - 0.5)^2/2$ = 6.56 * 4.83 = 31.69 (-) II

UPLIFT LOADS
U_2 = 0.0624 × 12.5 × 4 = -3.12 * 10.5 = 32.76(-) I
U_3 = 0.0624 × 14.5 × 4 = -3.61 * 10.5 = 37.91 (-) II

VERT LOADS
W_1 = 0.115 (5-3) * 3.5 = 0.805 * 1.75 = 1.41 ALL CASES

W_2 = [(0.115 - 0.0624) * 2 * 7] + (0.0624 × 10 * 7) = 5.11 * 9.0 = 45.99 II
W_3 = [(0.115 - 0.0624) * 2 * 7] + (0.0624 × 10 × 7) = 4.23 * 9.0 = 38.07 I

W_4 = 0.115 (2) * 7 = 1.61 * 9.0 = 14.49 III, IV, V

HORIZ ON PILE
H_5 = 0.022 ALL CASES

UPLIFT LOADS
U_4 = 0.0624 * 12.5 * 12.5/2 = 4.875(-) * 12.5 (2/3) = 40.63(-) VI
U_5 = 0.0624 * 14.5 * 12.5/2 = 5.66 (-) * 12.5 (2/3) = 47.13(-) VII

PYBURN & ODOM, INC — CONSULTING ENGINEERS   Sheet No. 2/1

Client: PORT OF NEW ORLEANS   Project:
Computations for: T-WALL
Computed by: G. FLITTER   Date: 2/11/97   Checked by: Date:

LOADCASE	$\vec{F_x}$	$F_z \downarrow$	M_y ↺
I = D.L. + SWL + IMPERVIOUS WALL			
SOIL	0.267	0	-0.40
DEAD	0	8.29	40.19
WATER	4.875	0	-20.31
UPLIFT	0	-3.12	-32.76
VERTICAL	0	0.805	1.41
	0	4.23	38.07
SHT PILE	0.022	—	—
	5.16	10.21	26.2
II = HWL + DL + IMP. WALL			
SOIL	0.267	0	-0.40
DEAD	0	8.29	40.19
WATER	6.56	0	-31.69
UPLIFT	0	-3.61	-37.91
VERT.	0	0.805	1.41
	0	5.11	45.99
SHT PILE	0.022	—	—
	6.85	10.60	17.59
* 0.75	5.00	7.95	13.19
III = WIND (F.S.) + D.L			
DEAD	0	8.29	40.19
WIND	0.5	0	-4.75
SOIL	0.582	0	-0.87
VERT	0	0.805	1.41
	0	1.61	14.49
SHT PILE	0.022	—	—
	1.1	10.71	50.47
*.75	0.83	8.03	37.85

LOADCASE	$\vec{F_x}$	$F_z \downarrow$	M_y ↺
IV = WIND (P.S.) + D.L			
DEAD	0	8.29	40.19
VERT.	0	0.805	1.41
	0	1.61	14.49
SHT PILE	0.022	—	—
WIND	-0.50	0	4.75
SOIL	-0.582	0	0.87
	-1.06	10.71	61.71
* 0.75	-0.80	8.03	46.28
V = D.L.			
DEAD	0	8.29	40.19
VERT	0	0.805	1.41
	0	1.61	14.49
SHT PILE	0.022	—	—
	0.02	10.71	56.09
VI = CASE I w/PERV. SHT PILE			
DEAD	0	8.29	40.19
WATER	4.875	0	-20.31
SOIL	0.267	—	-0.40
VERT	0	0.805	1.41
	0	4.23	38.07
SHT PILE	0.022	—	—
UPLIFT	—	-4.875	-40.63
	5.16	8.45	18.33
VII = CASE II w/PERV. SHT PILE			
SOIL	0.267	0	-0.40
DEAD	0	8.29	40.19
WATER	6.56	0	-31.69
VERT	0	0.805	1.41
	0	5.11	45.99
UPLIFT	0	-5.66	-47.13
SHT PILE	0.022	0	0
	6.85	8.55	8.37
* 0.75	5.14	6.41	6.28

PYBURN & ODOM, INC — CONSULTING ENGINEERS   Sheet No. 371

Client: PORT OF NEW ORLEANS   Project:
Computations for: T-WALL
Computed by: G. FLITTER   Date: 2/11/97   Checked by: Date:

LOAD CASE	W/LOAD FACTOR	$\vec{F_x}$		F_z (↓)		M_y (↻)	
	L.F.	ΣFx	* L.F.	ΣFz	* L.F	ΣMy	* L.F
I	1.0	5.2	5.2	10.2	10.2	26.2	26.2
II	0.75	6.9	5.0	10.6	8.0	17.6	13.2
III	0.75	1.1	0.8	10.7	8.0	50.5	37.9
IV	0.75	-1.1	-0.8	10.7	8.0	61.7	46.3
V	1.0	0.02	0.02	10.7	10.7	56.1	56.1
VI	1.0	5.2	5.2	8.5	8.5	18.3	18.3
VII	0.75	6.9	5.1	8.6	6.4	8.4	6.3

28'-6" LONG

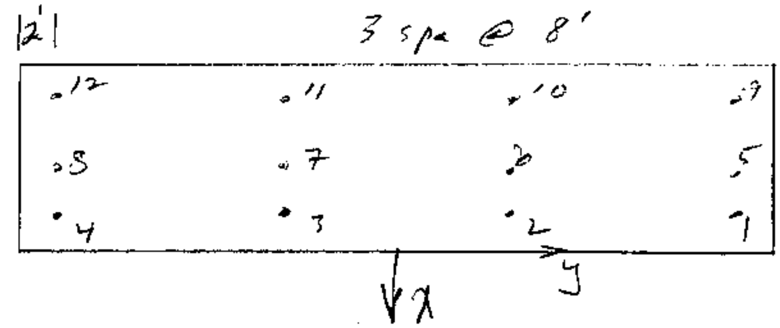
LOAD CASE	$\vec{F_x}$	F_z ↓	M_y ↻	COMMENTS
I	148.2	290.7	746.7	—
II	142.5	228.0	376.2	75% LOADS
III	22.8	228.0	1080.2	75% LOADS
IV	-22.8	228.0	1319.6	75% LOADS
V	0.57	305.0	1598.9	—
VI	148.2	242.3	521.6	—
VII	145.4	182.4	179.6	75% LOADS

CPGA FILE NAME TWBERTH.D

Client: PORT OF NEW ORLEANS Project:
Computations for: T-WALL
Computed by: G. FLITTER Date: 2/11/97 Checked by: Date:

17.5' LONG

LOAD CASE	$\vec{F_x}$	$F_z \downarrow$	M_y ↻	COMMENTS
I	91.0	178.5	463.8	—
II	87.5	140.0	231.0	75% LOADS
III	14.0	140.0	663.3	75% LOADS
IV	-14.0	140.0	810.3	75% LOADS
V	0.35	187.3	981.8	—
VI	91.0	148.8	320.3	—
VII	69.3	112.0	110.3	75% LOADS



```
1000 T-WALL BEHIND BERTH  REACH 1
1005 3 ROWS OF 14 IN. SQ. PPC PILES AT 8.0' C/C, ORIGIN AT CENTER OF BASE
1010 PRO 4074. 3201. 3201. 196. 1.5 0.0 ALL
1020 SOI ES .046 LEN 70.0 0. ALL
1030 PIN ALL
1040 TEN 0.8 ALL
1050 DLS S 83.0 38.0 735.4 253.4 102.56 1553.9 1310.2 H 14.0 ALL
1060 ASC S 196.0 457.33 0.82 0.98 2.0 0.0 ALL
1070 BAT 3.0 1 TO 8
1075 BAT 4.0 9 TO 12
1080 ANG 180 9 TO 12
1090 ANG 0  1 TO 8
1100 PIL 1 -2.0 -12.0 0.0  5 -7.0 -12.0 0.0 9 -10.5 -12.0 0.0
1110 ROW Y 4 1 3 AT 8
1115 ROW Y 4 5  3 AT 8
1116 ROW Y 4 9 3 AT 8
1120 LOA 1 91.0 0.0 178.5 0.0 463.8 0.0
1121 LOA 2 87.5 0.0 140.0 0.0 231.0 0.0
1122 LOA 3 14.0 0.0 140.0 0.0 663.3 0.0
1123 LOA 4 -14.0 0.0 140.0 0.0 810.3 0.0
1124 LOA 5 0.35 0.0 187.3 0.0 981.8 0.0
1125 LOA 6 91.0 0.0 148.8 0.0 320.3 0.0
1126 LOA 7 89.3 0.0 112.0 0.0 110.3 0.0
1130 FOU 1 2 4 5 7 C:\CORPS\CPGA\TWBERTH.O
1140 PFO ALL
1150 PLB ALL
1160 FPL C:\CORPS\CPGG\TWBERTH.P
```

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**********************************
* CORPS PROGRAM  #  X0080        *  CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 1992/02/26    *  RUN DATE 12-FEB-1997   RUN TIME  8.33.11
**********************************
```

T-WALL BEHIND BERTH REACH 1

THERE ARE 12 PILES AND
7 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

	X	Y	Z
WITH DIAGONAL COORDINATES =	(-10.50 ,	-12.00 ,	.00)
	(-2.00 ,	12.00 ,	.00)

****

PILE PROPERTIES AS INPUT

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.40740E+04	.32010E+04	.32010E+04	.19600E+03	.15000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.46000E-01	L	.70000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-2.00	-12.00	.00	3.00	.00	70.00	P
2	-2.00	-4.00	.00	3.00	.00	70.00	P
3	-2.00	4.00	.00	3.00	.00	70.00	P
4	-2.00	12.00	.00	3.00	.00	70.00	P
5	-7.00	-12.00	.00	3.00	.00	70.00	P
6	-7.00	-4.00	.00	3.00	.00	70.00	P
7	-7.00	4.00	.00	3.00	.00	70.00	P
8	-7.00	12.00	.00	3.00	.00	70.00	P

9	-10.50	-12.00	.00	4.00	180.00	70.00	P
10	-10.50	-4.00	.00	4.00	180.00	70.00	P
11	-10.50	4.00	.00	4.00	180.00	70.00	P
12	-10.50	12.00	.00	4.00	180.00	70.00	P

						840.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	91.0	.0	178.5	.0	463.8	.0
2	87.5	.0	140.0	.0	231.0	.0
3	14.0	.0	140.0	.0	663.3	.0
4	-14.0	.0	140.0	.0	810.3	.0
5	.4	.0	187.3	.0	981.8	.0
6	91.0	.0	148.8	.0	320.3	.0
7	89.3	.0	112.0	.0	110.3	.0

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.4786E-01	-.2129E-07	.9130E-02	.4810E-12	-.5163E-04	.3627E-11
2	.5418E-01	-.2783E-07	.2488E-02	.6288E-12	-.9153E-05	.4741E-11
3	-.4604E-01	.2196E-07	.4325E-01	-.4961E-12	-.3582E-03	-.3741E-11
4	-.8671E-01	.4083E-07	.6077E-01	-.9224E-12	-.5122E-03	-.6956E-11
5	-.8859E-01	.4175E-07	.6960E-01	-.9433E-12	-.5828E-03	-.7113E-11
6	.6375E-01	-.2788E-07	-.3347E-02	.6299E-12	.5598E-04	.4750E-11
7	.7517E-01	-.3512E-07	-.1311E-01	.7936E-12	.1309E-03	.5984E-11

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO

(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.2	.0	32.3	.0	-10.7	.0	.39	.10	1.17	.96	#
2	.2	.0	32.3	.0	-10.7	.0	.39	.10	1.17	.96	#
3	.2	.0	32.3	.0	-10.7	.0	.39	.10	1.17	.96	#
4	.2	.0	32.3	.0	-10.7	.0	.39	.10	1.17	.96	#
5	.2	.0	28.1	.0	-10.9	.0	.34	.11	1.15	.94	#
6	.2	.0	28.1	.0	-10.9	.0	.34	.11	1.15	.94	#
7	.2	.0	28.1	.0	-10.9	.0	.34	.11	1.15	.94	#
8	.2	.0	28.1	.0	-10.9	.0	.34	.11	1.15	.94	#
9	-.2	.0	-12.9	.0	11.7	.0	.34	.16	.94	.73	
10	-.2	.0	-12.9	.0	11.7	.0	.34	.16	.94	.73	
11	-.2	.0	-12.9	.0	11.7	.0	.34	.16	.94	.73	
12	-.2	.0	-12.9	.0	11.7	.0	.34	.16	.94	.73	

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.2	.0	27.5	.0	-12.6	.0	.33	.11	1.15	.93	#
2	.2	.0	27.5	.0	-12.6	.0	.33	.11	1.15	.93	#
3	.2	.0	27.5	.0	-12.6	.0	.33	.11	1.15	.93	#
4	.2	.0	27.5	.0	-12.6	.0	.33	.11	1.15	.93	#
5	.2	.0	26.8	.0	-12.7	.0	.32	.11	1.14	.93	#
6	.2	.0	26.8	.0	-12.7	.0	.32	.11	1.14	.93	#
7	.2	.0	26.8	.0	-12.7	.0	.32	.11	1.14	.93	#
8	.2	.0	26.8	.0	-12.7	.0	.32	.11	1.14	.93	#
9	-.2	.0	-16.9	.0	13.2	.0	.44	.21	.92	.70	
10	-.2	.0	-16.9	.0	13.2	.0	.44	.21	.92	.70	
11	-.2	.0	-16.9	.0	13.2	.0	.44	.21	.92	.70	
12	-.2	.0	-16.9	.0	13.2	.0	.44	.21	.92	.70	

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.2	.0	26.1	.0	13.6	.0	.31	.11	1.14	.92	#
2	-.2	.0	26.1	.0	13.6	.0	.31	.11	1.14	.92	#
3	-.2	.0	26.1	.0	13.6	.0	.31	.11	1.14	.92	#
4	-.2	.0	26.1	.0	13.6	.0	.31	.11	1.14	.92	#
5	-.2	.0	-2.9	.0	11.9	.0	.08	.06	.99	.78	
6	-.2	.0	-2.9	.0	11.9	.0	.08	.06	.99	.78	
7	-.2	.0	-2.9	.0	11.9	.0	.08	.06	.99	.78	
8	-.2	.0	-2.9	.0	11.9	.0	.08	.06	.99	.78	
9	.2	.0	13.3	.0	-11.3	.0	.16	.13	1.07	.86	#
10	.2	.0	13.3	.0	-11.3	.0	.16	.13	1.07	.86	#
11	.2	.0	13.3	.0	-11.3	.0	.16	.13	1.07	.86	#
12	.2	.0	13.3	.0	-11.3	.0	.16	.13	1.07	.86	#

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.4	.0	26.5	.0	24.3	.0	.32	.11	1.17	.90	#
2	-.4	.0	26.5	.0	24.3	.0	.32	.11	1.17	.90	#
3	-.4	.0	26.5	.0	24.3	.0	.32	.11	1.17	.90	#
4	-.4	.0	26.5	.0	24.3	.0	.32	.11	1.17	.90	#
5	-.4	.0	-15.1	.0	21.9	.0	.40	.21	.95	.70	
6	-.4	.0	-15.1	.0	21.9	.0	.40	.21	.95	.70	
7	-.4	.0	-15.1	.0	21.9	.0	.40	.21	.95	.70	
8	-.4	.0	-15.1	.0	21.9	.0	.40	.21	.95	.70	
9	.4	.0	24.8	.0	-21.2	.0	.30	.11	1.15	.90	#
10	.4	.0	24.8	.0	-21.2	.0	.30	.11	1.15	.90	#
11	.4	.0	24.8	.0	-21.2	.0	.30	.11	1.15	.90	#
12	.4	.0	24.8	.0	-21.2	.0	.30	.11	1.15	.90	#

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.4	.0	35.3	.0	25.3	.0	.43	.10	1.22	.94	#
2	-.4	.0	35.3	.0	25.3	.0	.43	.10	1.22	.94	#
3	-.4	.0	35.3	.0	25.3	.0	.43	.10	1.22	.94	#
4	-.4	.0	35.3	.0	25.3	.0	.43	.10	1.22	.94	#
5	-.4	.0	-12.0	.0	22.6	.0	.32	.17	.97	.71	
6	-.4	.0	-12.0	.0	22.6	.0	.32	.17	.97	.71	
7	-.4	.0	-12.0	.0	22.6	.0	.32	.17	.97	.71	
8	-.4	.0	-12.0	.0	22.6	.0	.32	.17	.97	.71	
9	.4	.0	25.3	.0	-21.7	.0	.31	.11	1.16	.90	#
10	.4	.0	25.3	.0	-21.7	.0	.31	.11	1.16	.90	#
11	.4	.0	25.3	.0	-21.7	.0	.31	.11	1.16	.90	#
12	.4	.0	25.3	.0	-21.7	.0	.31	.11	1.16	.90	#

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.3	.0	26.0	.0	-15.2	.0	.31	.11	1.15	.92	#
2	.3	.0	26.0	.0	-15.2	.0	.31	.11	1.15	.92	#
3	.3	.0	26.0	.0	-15.2	.0	.31	.11	1.15	.92	#
4	.3	.0	26.0	.0	-15.2	.0	.31	.11	1.15	.92	#
5	.3	.0	30.6	.0	-15.0	.0	.37	.10	1.17	.94	#
6	.3	.0	30.6	.0	-15.0	.0	.37	.10	1.17	.94	#
7	.3	.0	30.6	.0	-15.0	.0	.37	.10	1.17	.94	#
8	.3	.0	30.6	.0	-15.0	.0	.37	.10	1.17	.94	#
9	-.3	.0	-16.9	.0	15.6	.0	.45	.21	.93	.70	
10	-.3	.0	-16.9	.0	15.6	.0	.45	.21	.93	.70	
11	-.3	.0	-16.9	.0	15.6	.0	.45	.21	.93	.70	
12	-.3	.0	-16.9	.0	15.6	.0	.45	.21	.93	.70	

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI

1	.3	.0	20.4	.0	-18.6	.0	.25	.12	1.12	.88	#
2	.3	.0	20.4	.0	-18.6	.0	.25	.12	1.12	.88	#
3	.3	.0	20.4	.0	-18.6	.0	.25	.12	1.12	.88	#
4	.3	.0	20.4	.0	-18.6	.0	.25	.12	1.12	.88	#
5	.3	.0	31.0	.0	-18.0	.0	.37	.10	1.18	.94	#
6	.3	.0	31.0	.0	-18.0	.0	.37	.10	1.18	.94	#
7	.3	.0	31.0	.0	-18.0	.0	.37	.10	1.18	.94	#
8	.3	.0	31.0	.0	-18.0	.0	.37	.10	1.18	.94	#
9	-.3	.0	-21.3	.0	18.4	.0	.56	.27	.91	.67	
10	-.3	.0	-21.3	.0	18.4	.0	.56	.27	.91	.67	
11	-.3	.0	-21.3	.0	18.4	.0	.56	.27	.91	.67	
12	-.3	.0	-21.3	.0	18.4	.0	.56	.27	.91	.67	

****

PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	10.4	.0	30.5	.0	.0	.0
2	10.4	.0	30.5	.0	.0	.0
3	10.4	.0	30.5	.0	.0	.0
4	10.4	.0	30.5	.0	.0	.0
5	9.1	.0	26.6	.0	.0	.0
6	9.1	.0	26.6	.0	.0	.0
7	9.1	.0	26.6	.0	.0	.0
8	9.1	.0	26.6	.0	.0	.0
9	3.3	.0	-12.5	.0	.0	.0
10	3.3	.0	-12.5	.0	.0	.0
11	3.3	.0	-12.5	.0	.0	.0
12	3.3	.0	-12.5	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	8.9	.0	26.0	.0	.0	.0
2	8.9	.0	26.0	.0	.0	.0
3	8.9	.0	26.0	.0	.0	.0
4	8.9	.0	26.0	.0	.0	.0
5	8.7	.0	25.3	.0	.0	.0
6	8.7	.0	25.3	.0	.0	.0
7	8.7	.0	25.3	.0	.0	.0
8	8.7	.0	25.3	.0	.0	.0
9	4.3	.0	-16.3	.0	.0	.0
10	4.3	.0	-16.3	.0	.0	.0
11	4.3	.0	-16.3	.0	.0	.0
12	4.3	.0	-16.3	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K

1	8.0	.0	24.9	.0	.0	.0
2	8.0	.0	24.9	.0	.0	.0
3	8.0	.0	24.9	.0	.0	.0
4	8.0	.0	24.9	.0	.0	.0
5	-1.1	.0	-2.7	.0	.0	.0
6	-1.1	.0	-2.7	.0	.0	.0
7	-1.1	.0	-2.7	.0	.0	.0
8	-1.1	.0	-2.7	.0	.0	.0
9	-3.4	.0	12.9	.0	.0	.0
10	-3.4	.0	12.9	.0	.0	.0
11	-3.4	.0	12.9	.0	.0	.0
12	-3.4	.0	12.9	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	8.0	.0	25.3	.0	.0	.0
2	8.0	.0	25.3	.0	.0	.0
3	8.0	.0	25.3	.0	.0	.0
4	8.0	.0	25.3	.0	.0	.0
5	-5.1	.0	-14.2	.0	.0	.0
6	-5.1	.0	-14.2	.0	.0	.0
7	-5.1	.0	-14.2	.0	.0	.0
8	-5.1	.0	-14.2	.0	.0	.0
9	-6.4	.0	24.0	.0	.0	.0
10	-6.4	.0	24.0	.0	.0	.0
11	-6.4	.0	24.0	.0	.0	.0
12	-6.4	.0	24.0	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	10.8	.0	33.6	.0	.0	.0
2	10.8	.0	33.6	.0	.0	.0
3	10.8	.0	33.6	.0	.0	.0
4	10.8	.0	33.6	.0	.0	.0
5	-4.2	.0	-11.3	.0	.0	.0
6	-4.2	.0	-11.3	.0	.0	.0
7	-4.2	.0	-11.3	.0	.0	.0
8	-4.2	.0	-11.3	.0	.0	.0
9	-6.5	.0	24.5	.0	.0	.0
10	-6.5	.0	24.5	.0	.0	.0
11	-6.5	.0	24.5	.0	.0	.0
12	-6.5	.0	24.5	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	8.5	.0	24.6	.0	.0	.0
2	8.5	.0	24.6	.0	.0	.0
3	8.5	.0	24.6	.0	.0	.0
4	8.5	.0	24.6	.0	.0	.0

5	9.9	.0	28.9	.0	.0	.0
6	9.9	.0	28.9	.0	.0	.0
7	9.9	.0	28.9	.0	.0	.0
8	9.9	.0	28.9	.0	.0	.0
9	4.4	.0	-16.4	.0	.0	.0
10	4.4	.0	-16.4	.0	.0	.0
11	4.4	.0	-16.4	.0	.0	.0
12	4.4	.0	-16.4	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	6.8	.0	19.3	.0	.0	.0
2	6.8	.0	19.3	.0	.0	.0
3	6.8	.0	19.3	.0	.0	.0
4	6.8	.0	19.3	.0	.0	.0
5	10.1	.0	29.3	.0	.0	.0
6	10.1	.0	29.3	.0	.0	.0
7	10.1	.0	29.3	.0	.0	.0
8	10.1	.0	29.3	.0	.0	.0
9	5.5	.0	-20.6	.0	.0	.0
10	5.5	.0	-20.6	.0	.0	.0
11	5.5	.0	-20.6	.0	.0	.0
12	5.5	.0	-20.6	.0	.0	.0