

Lake Pontchartrain, LA & Vicinity  
High Level Plan  
London Avenue Outfall Canal

**FRONTING PROTECTION  
AT  
DRAINAGE PUMPING STATION NO. 3**

**PRELIMINARY DESIGN CALCULATIONS**

Jan,  
~~Jan~~ 1995

**PEPPER AND ASSOCIATES  
CONSULTING ENGINEERS  
METAIRIE LA 70002**

00000 1

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AT  
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**PEPPER AND ASSOCIATES  
CONSULTING ENGINEERS  
METAIRIE LA 70002**

**FRONTING PROTECTION AT DPS NO.3**  
**PRELIMINARY DESIGN CALCULATIONS**  
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SLUICE GATES (BY GATE MANUFACTURER)

CALC-1 TO CALC-6

DESIGN NOTES:

1. MATERIALS:

CONCRETE  $f'_c$  @ 28 DAYS 4000 PSI (NORMAL WT.)  
 REINF STL  $f_y$  60,000 PSI  
 STRUCTURAL STL A-36

2. DESIGN METHODS:

REINF CONC : ULTIMATE STRENGTH  
 USACE CODE  
 STR STL : ELASTIC DESIGN  
 AISC CODE

3. LOADS:

HYDRAULIC: 1. HURRICANE TIDE TO EL 11.9  
 NGVD (= 32.33 C.D) W/ 2'-0"  
 FREE BOARD (13.9 NGVD OR  
 34.33 C.D.)  
 2. MAX VACUUM LOAD ON  
 DISCH. TUBES = 25'-0" OF WATER  
 (MIN. SUCTION WATER LEVEL TO  
 TOP OF DISCH. PIPE)  
 CONC : NORMAL WT. (145#/CF)  
 EARTH : 122#/CF  
 SUBMERGED  
 EARTH : 60#/CF

13, 30, 40, 50 SHEETS PER CASE  
 50 SHEETS PER CASE  
 100 SHEETS PER CASE  
 200 SHEETS PER CASE  
 42-389 100 RECYCLED WHITE  
 42-389 200 RECYCLED WHITE  
 42-389 200 RECYCLED WHITE  
 Made in U.S.A.



3. LOADS CONTD...

LIVE LOADS

: 100#/SF ON DISCH. TUBES

: 100#/SF STAIRS, WALKWAYS  
& SLUICEGATE  
OPERATING FLR

LATERAL EARTH  
& HYD. STATIC  
PRESSURES

: SEE PRESSURE  
DIAGRAMS

13 1/2 x 19 1/2  
42-382 100 SHEETS PER CASE  
42-383 200 SHEETS PER CASE  
42-384 100 SHEETS PER CASE  
42-385 200 SHEETS PER CASE  
42-386 100 SHEETS PER CASE  
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42-497 200 SHEETS PER CASE  
42-498 100 SHEETS PER CASE  
42-499 200 SHEETS PER CASE  
42-500 100 SHEETS PER CASE



Made in U.S.A.

STRUCTURAL CAPACITY OF HP 14 X 73

HP 14 X 73

$$A = 21.4 \text{ in}^2$$

$$I_{xx} = 729 \text{ in}^4 \quad S_{xx} = 107 \text{ in}^3 \quad r_{xx} = 5.96$$

$$I_{yy} = 261 \text{ in}^4 \quad S_{yy} = 35.8 \text{ in}^3 \quad r_{yy} = 3.59$$

1. ALLOWABLE COMP

$$= 0.83 K_1 \times F_y \times A$$

$$K_1 = \frac{1}{F_5} = \frac{1}{5/3} = 0.6$$

$$\therefore \text{ACC} = 0.83 \times 0.6 \times 36 \times 21.4 = \underline{385 \text{ KIPS}}$$

2. ALLOWABLE TENSION

$$= 0.5 \times F_y \times A$$

$$\therefore \text{ATT} = 0.5 \times 36 \times 21.4 = \underline{385 \text{ KIPS}}$$

3. AM1 =  $0.55 \times F_y \times S_{yy}$

$$= 0.55 \times 36 \times 35.8 = \underline{709 \text{ in-k}}$$

4. AM2 =  $0.55 \times F_y \times S_{xx}$

$$= 0.55 \times 36 \times 107 = \underline{2119 \text{ in-k}}$$

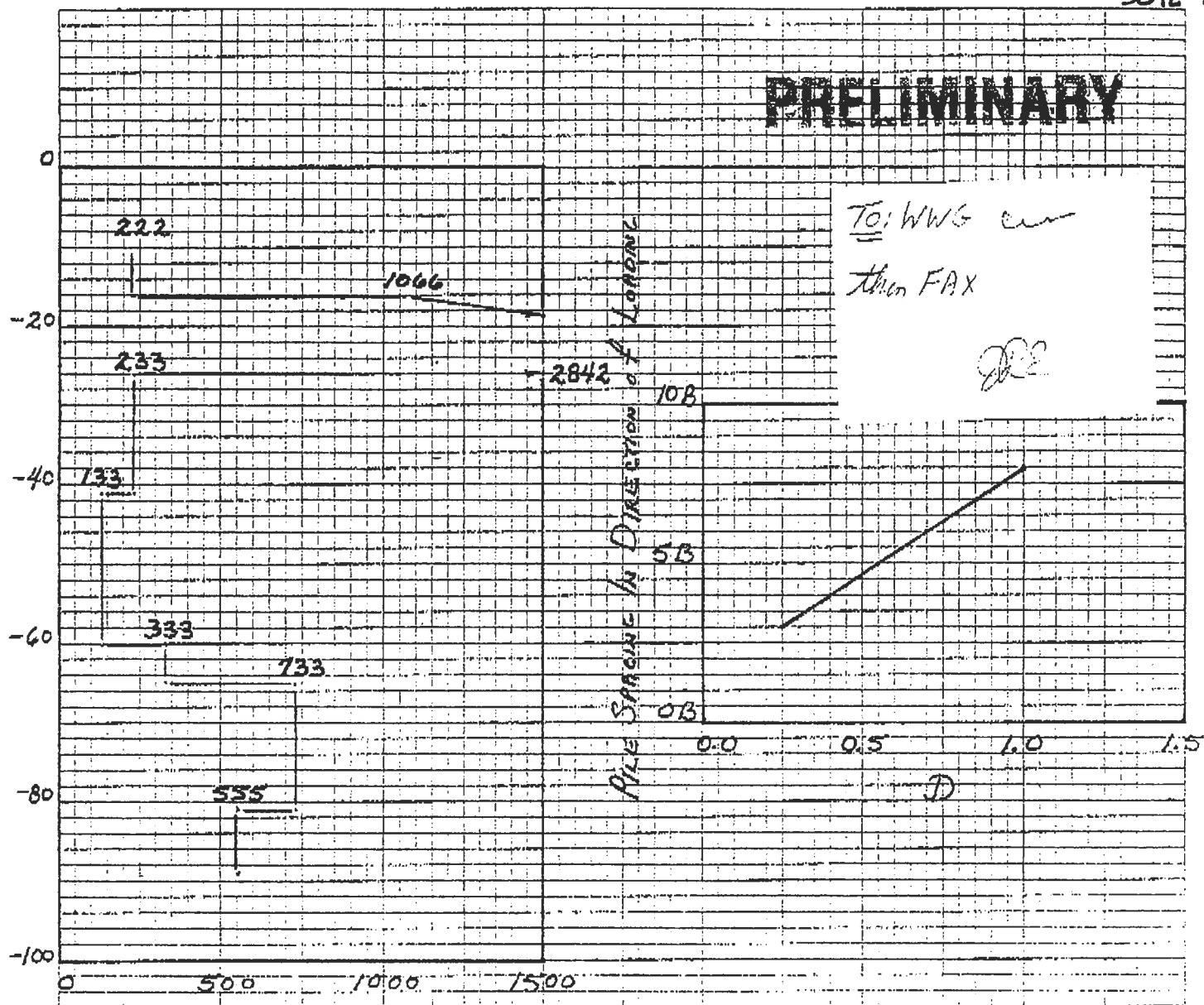
30 SHEETS  
 50 SHEETS  
 60 SHEETS  
 70 SHEETS  
 80 SHEETS  
 90 SHEETS  
 100 SHEETS  
 120 SHEETS  
 150 SHEETS  
 180 SHEETS  
 200 SHEETS  
 100 RECYCLED WHITE  
 200 RECYCLED WHITE  
 5 SQUARE  
 5 SQUARE  
 5 SQUARE  
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 5 SQUARE  
 5 SQUARE  
 5 SQUARE  
 5 SQUARE



DIETZEN CORPORATION  
MADE IN U.S.A.

ELEVATION IN FEET - N. G. V. D.

**PRELIMINARY**



$$K_H \frac{B}{DC}$$

WHERE:

C = 0.5 FOR CYCLIC LOADING  
 = 1.0 FOR INITIAL LOADING

B - PILE WIDTH OR DIAMETER - INCHES

D - GROUP EFFECT REDUCTION FACTOR

$K_H$  - MODULUS OF HORIZONTAL SUBGRADE  
 REACTION -  $\text{lbs/in}^3$

SUBGRADE MODULUS

Post-it <sup>®</sup> Fax Note	7671	Date	1-13-95	# of pages	1
To	SUDHIR MEHTA	From	RANDY EUSTIS		
Co./Dept.	PEPPER	Co.	EUSTIS ENGINEERING		
Phone #	837-7330	Phone #	834-0157		
Fax #	835-7453	Fax #	834-0354		

LONDON AVENUE  
 PUMP STA. # 3

JOB 13065

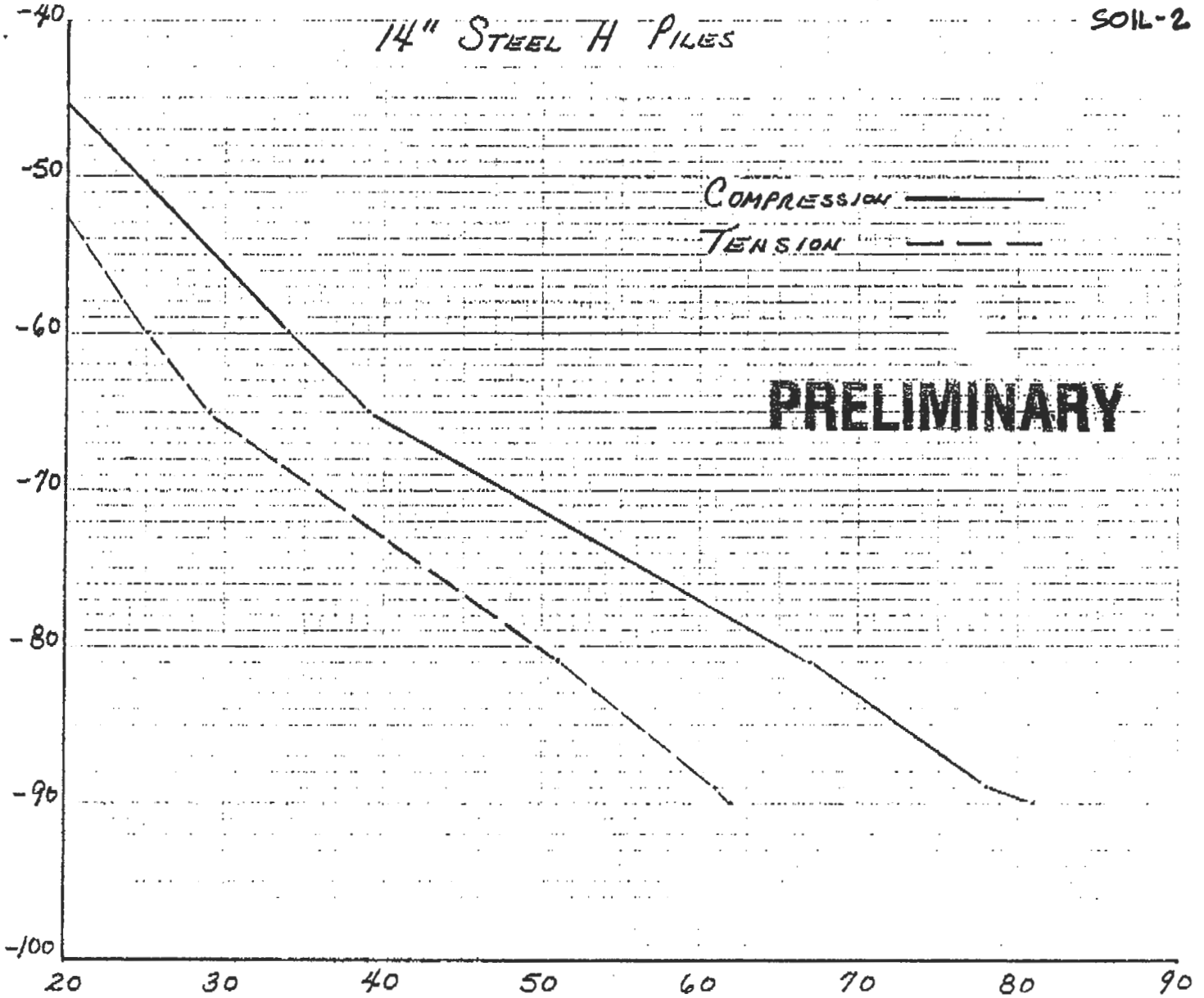
1-13-95

RE



# 14" STEEL H PILES

PILE TIP ELEVATION - N.G.V.D.



ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITY - TONS  
 FACTOR OF SAFETY = 2

Post-It Fax Note 7671	Date 1-12-95	# of pages 1
To SUDHIR MENTA	From RANDY EUSTIS	
Co./Dept. PEPPER	Co. EUSTIS ENGINEERING	
Phone # 837-7330	Phone # 834-0157	
Fax # 835-7453	Fax # 834-0354	

LONDON AVE. PUMP STA. # 3  
 JOB 13065 1-12-95  
 RE

4119

To: <u>SUDHIR MEHTA</u>	From: <u>LJN</u>
Co./Dept: <u>PEPPER</u>	Co: <u>EE</u>
Phone # <u>837-7330</u>	Phone # <u>834-0157</u>
Fax # <u>835-7453</u>	Fax # <u>834-0354</u>

**ENGINEERING COMPANY, INC.**  
 Civil Engineers  
 Lake Charles, Louisiana

Page \_\_\_\_\_

Date 8 SEPT 94

Job 13065

Project LONDON HVE. CANAL - F.S. #3

By LJN

Subject TEMPORARY CONSTRUCTION COFFERDAM

Checked By \_\_\_\_\_

PRELIMINARY SHEETPILE ANALYSES †

TYPE WALL	SWL NGVD	SHEETPILE	MAXIMUM	ANCHOR	SOIL CASE
		TIP ELEV. NGVD FS = 1.5	MOMENT FT-K /LF FS = 1.0	FORCE K/LF FS = 1.0	
CANTILEVERED	0.0	-55	80	--	S
		-46	38	--	Q
	2.0	-64	134	--	S
		-57	78	--	Q
	4.0	-66	138	--	Q
		N/A	N/A	--	S
ANCHORED *	2.0	-33	36	4.5	S
		-30	19	3.0	Q
	4.0	-33	29	4.7	Q
		N/A	N/A	N/A	S

\* Assumes point of support at el. 2.0.

† Assumes temporary cofferdam will not be part of flood protection and will not be reviewed by Corps of Engineers.

‡ = Assumes Lake level will reach el. 4.0 only briefly and therefore S-case (long term) will not be applicable for this condition.



PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS BY CLASSICAL METHODS

DATE: 26-JAN-1995

TIME: 18.47.25

INPUT DATA

I.--HEADING: 'LONDON AVE OUTFALL CANAL FRONTAL PROTECTION 'I-WALL S-CASE

II.--CONTROL CANTILEVER WALL DESIGN

LEVEL 1 FACTOR OF SAFETY FOR ACTIVE PRESSURES = 1.50 LEVEL 1 FACTOR OF SAFETY FOR PASSIVE PRESSURES = 1.50

III.--WALL DATA ELEVATION AT TOP OF WALL = 14.40 (FT)

IV.--SURFACE POINT DATA

IV.A--RIGHTSIDE DIST. FROM WALL (FT) ELEVATION (FT) .00 8.57 100.00 8.57

IV.B-- LEFTSIDE DIST. FROM WALL (FT) ELEVATION (FT) .00 8.57 100.00 8.57

V.--SOIL LAYER DATA

V.A.--RIGHTSIDE LAYER DATA LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

Table with 10 columns: SAT. WGHT. (PCF), MOIST WGHT. (PCF), ANGLE OF INTERNAL FRICTION (DEG), COH-ESION (PSF), ANGLE OF WALL FRICTION (DEG), ADH-ESION (PSF), <--BOTTOM--> ELEV. (FT), <--FACTOR--> SLOPE (FT/FT), <--SAFETY--> ACT. DEF, <--SAFETY--> PASS. DEF. Rows show soil layer data with values like 110.00, 115.00, 23.00, .0, .00, .0, 4.00, .00, DEF, DEF.

120.00	120.00	25.00	.0	.00	.0	-26.00	.00	DEF	DEF
101.00	101.00	23.00	.0	.00	.0	-31.00	.00	DEF	DEF
101.00	101.00	23.00	.0	.00	.0	-36.00	.00	DEF	DEF
101.00	101.00	23.00	.0	.00	.0	-41.00	.00	DEF	DEF
120.00	120.00	25.00	.0	.00	.0	-60.00	.00	DEF	DEF
110.00	110.00	23.00	.0	.00	.0	-65.00	.00	DEF	DEF
119.00	119.00	23.00	.0	.00	.0			DEF	DEF

V.B.-- LEFTSIDE LAYER DATA

LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT  
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	<--FACTOR--> SLOPE (FT/FT)	<-SAFETY-> ACT.	<-FACTOR-> PASS.
115.00	115.00	23.00	.0	.00	.0	4.00	.00	DEF	DEF
115.00	115.00	23.00	.0	.00	.0	-6.00	.00	DEF	DEF
110.00	110.00	23.00	.0	.00	.0	-16.00	.00	DEF	DEF
120.00	120.00	25.00	.0	.00	.0	-26.00	.00	DEF	DEF
101.00	101.00	23.00	.0	.00	.0	-31.00	.00	DEF	DEF
101.00	101.00	23.00	.0	.00	.0	-36.00	.00	DEF	DEF
101.00	101.00	23.00	.0	.00	.0	-41.00	.00	DEF	DEF
120.00	120.00	25.00	.0	.00	.0	-60.00	.00	DEF	DEF
110.00	110.00	23.00	.0	.00	.0	-65.00	.00	DEF	DEF
119.00	119.00	23.00	.0	.00	.0			DEF	DEF

VI.--WATER DATA

UNIT WEIGHT = 62.50 (PCF)  
RIGHTSIDE ELEVATION = 11.90 (FT)  
LEFTSIDE ELEVATION = -6.00 (FT)  
NO SEEPAGE

VII.--SURFACE LOADS

NONE

VIII.--HORIZONTAL LOADS

NONE



PS3S.OUT

January 26, 1995

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(FT)	(LB-FT)	(LB)	(LB-IN3)	(PSF)
14.40	0.	0.	2.4178E+08	.00
13.40	0.	0.	2.1809E+08	.00
12.40	0.	0.	1.9440E+08	.00
11.90	0.	0.	1.8256E+08	.00
11.40	1.	8.	1.7071E+08	31.25
10.40	35.	70.	1.4703E+08	93.75
9.40	163.	195.	1.2342E+08	156.25
8.57	385.	347.	1.0404E+08	208.13
8.40	446.	380.	1.0011E+08	189.19
7.57	817.	499.	8.1347E+07	96.73
7.40	903.	514.	7.7608E+07	77.80
6.70	1274.	541.	6.2767E+07	.00
6.55	1356.	540.	5.9693E+07	-16.80
6.40	1437.	536.	5.6672E+07	-33.60
5.40	1937.	447.	3.8215E+07	-144.99
4.40	2293.	246.	2.3084E+07	-256.38
4.00	2370.	134.	1.8110E+07	-300.94
3.40	2392.	-66.	1.1879E+07	-367.77
2.40	2124.	-490.	4.7544E+06	-479.16
2.10	1952.	-640.	3.3451E+06	-513.01
1.40	1411.	-875.	1.2319E+06	-159.85
.40	541.	-781.	1.2386E+05	347.45
-.60	18.	-180.	1.0436E+02	854.76
-.80	0.	0.	0.0000E+00	955.45

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN\*\*4 TO OBTAIN DEFLECTION IN INCHES.)

III.--SOIL PRESSURES

ELEVATION (FT)	< LEFTSIDE PRESSURE (PSF) >		<RIGHTSIDE PRESSURE (PSF) >	
	PASSIVE	ACTIVE	ACTIVE	PASSIVE
14.40	0.	0.	0.	0.
13.40	0.	0.	0.	0.
12.40	0.	0.	0.	0.
11.90	0.	0.	0.	0.
11.40	0.	0.	0.	0.
10.40	0.	0.	0.	0.
9.40	0.	0.	0.	0.
8.57	0.	0.	0.	0.
8.40	34.	11.	5.	14.
7.57	201.	66.	27.	83.
7.40	235.	77.	32.	97.
6.70	376.	123.	51.	155.
6.55	406.	133.	55.	168.
6.40	436.	143.	59.	180.
5.40	637.	209.	86.	263.
4.40	838.	274.	113.	346.
4.00	919.	301.	124.	380.
3.40	1039.	340.	140.	429.
2.40	1241.	406.	168.	512.
2.10	1302.	426.	176.	538.
1.40	1442.	472.	195.	595.
.40	1643.	537.	222.	678.
-.60	1844.	603.	249.	762.
-.80	2045.	669.	276.	845.

PS3S.OUT

January 26, 1995

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-2.60

2246.

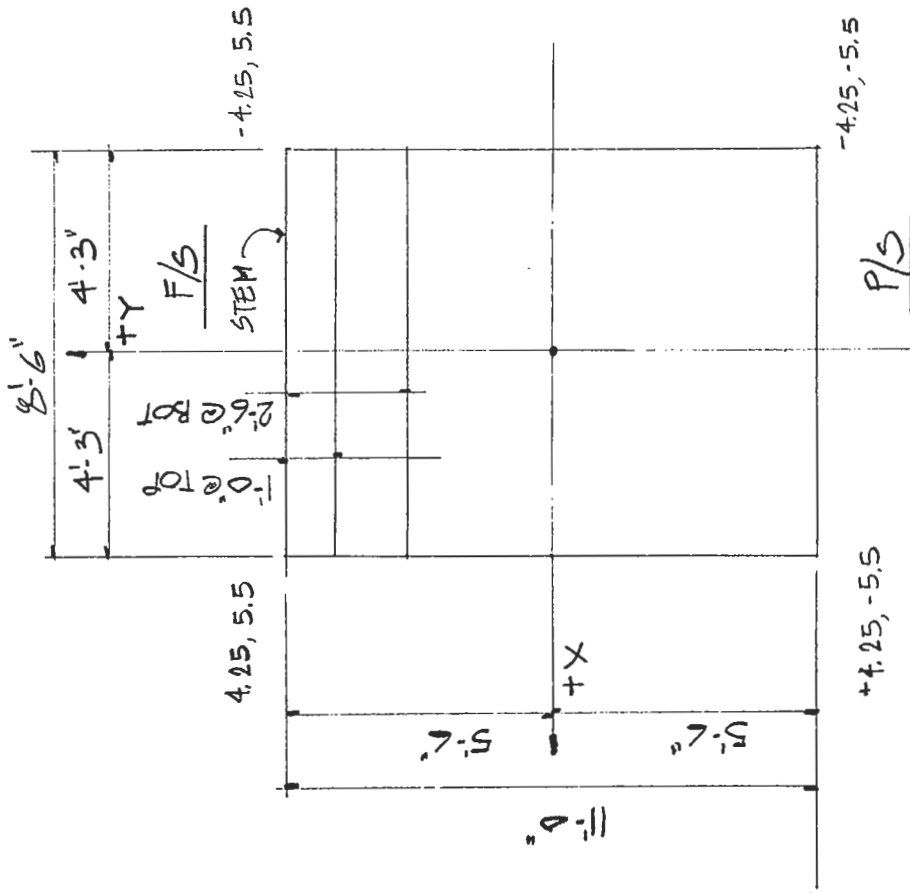
735.

303.

928.



13-7  
42-382  
42-383  
42-388  
42-392  
42-399  
3 SHEET  
100 SHEETS  
100 SHEETS  
200 SHEETS  
100 RECYCLED WHITE  
200 RECYCLED WHITE  
5 SQUARE  
5 SQUARE  
5 SQUARE  
5 SQUARE  
5 SQUARE  
5 SQUARE  
5 SQUARE  
5 SQUARE  
MADE IN U.S.A.

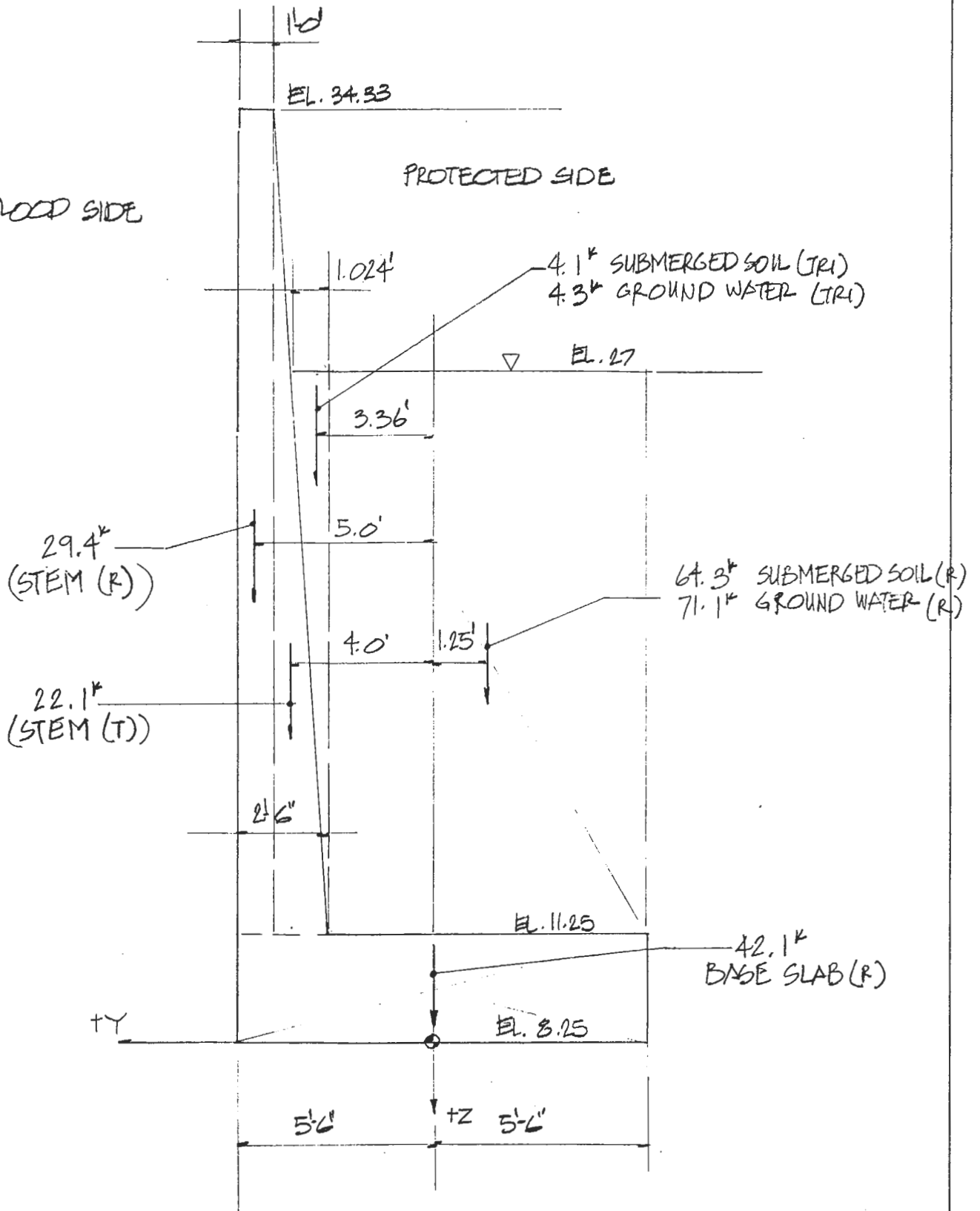


T WALL MONO EAST SIDE

13. 00 SHEET  
42-302 100 SHEETS  
42-303 100 SHEETS  
42-304 100 SHEETS  
42-305 100 SHEETS  
42-306 100 SHEETS  
42-307 100 SHEETS  
42-308 100 SHEETS  
42-309 100 SHEETS  
42-310 100 SHEETS  
42-311 100 SHEETS  
42-312 100 SHEETS  
42-313 100 SHEETS  
42-314 100 SHEETS  
42-315 100 SHEETS  
42-316 100 SHEETS  
42-317 100 SHEETS  
42-318 100 SHEETS  
42-319 100 SHEETS  
42-320 100 SHEETS  
National Brand  
Made in U.S.A.

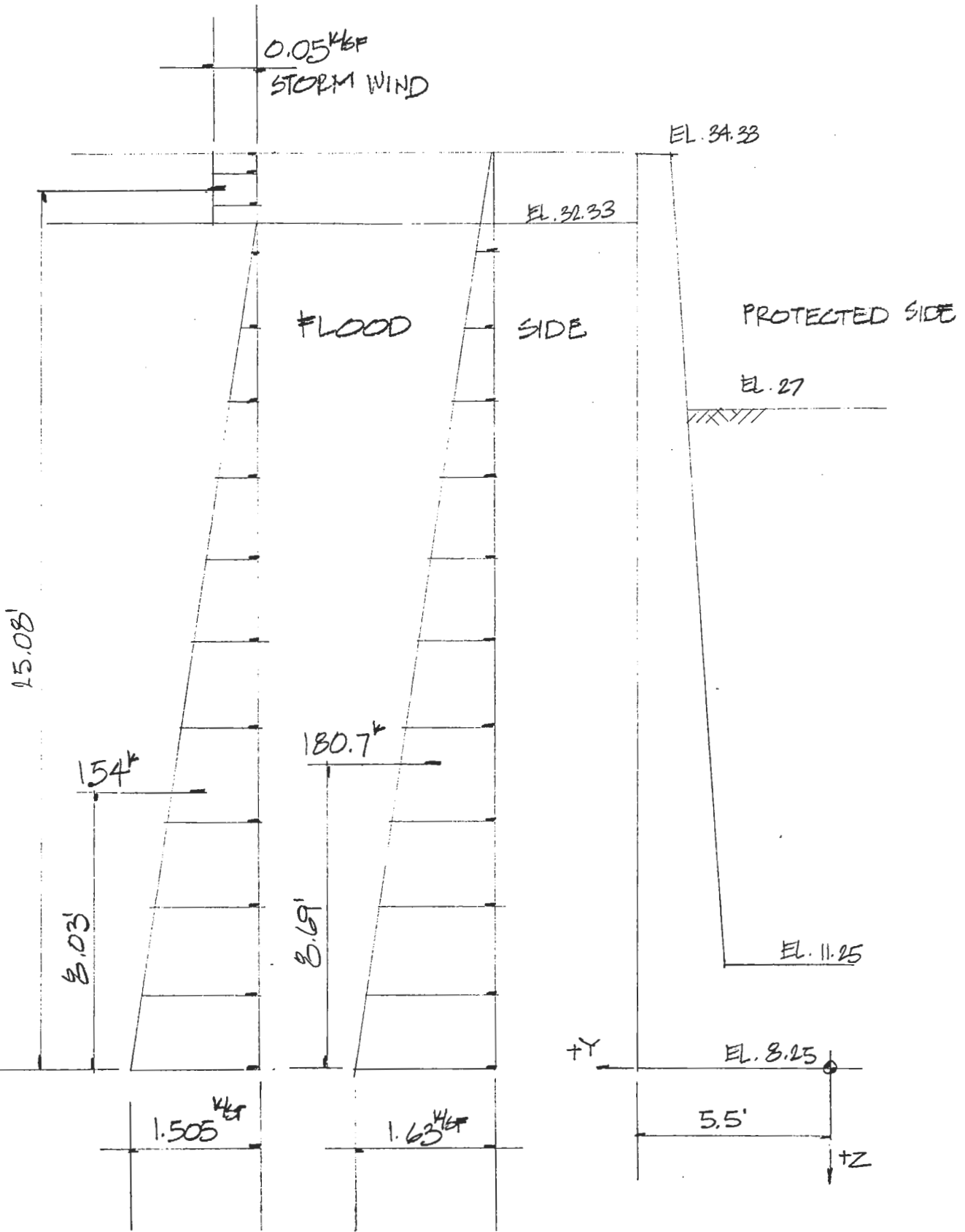
FLOOD SIDE

PROTECTED SIDE



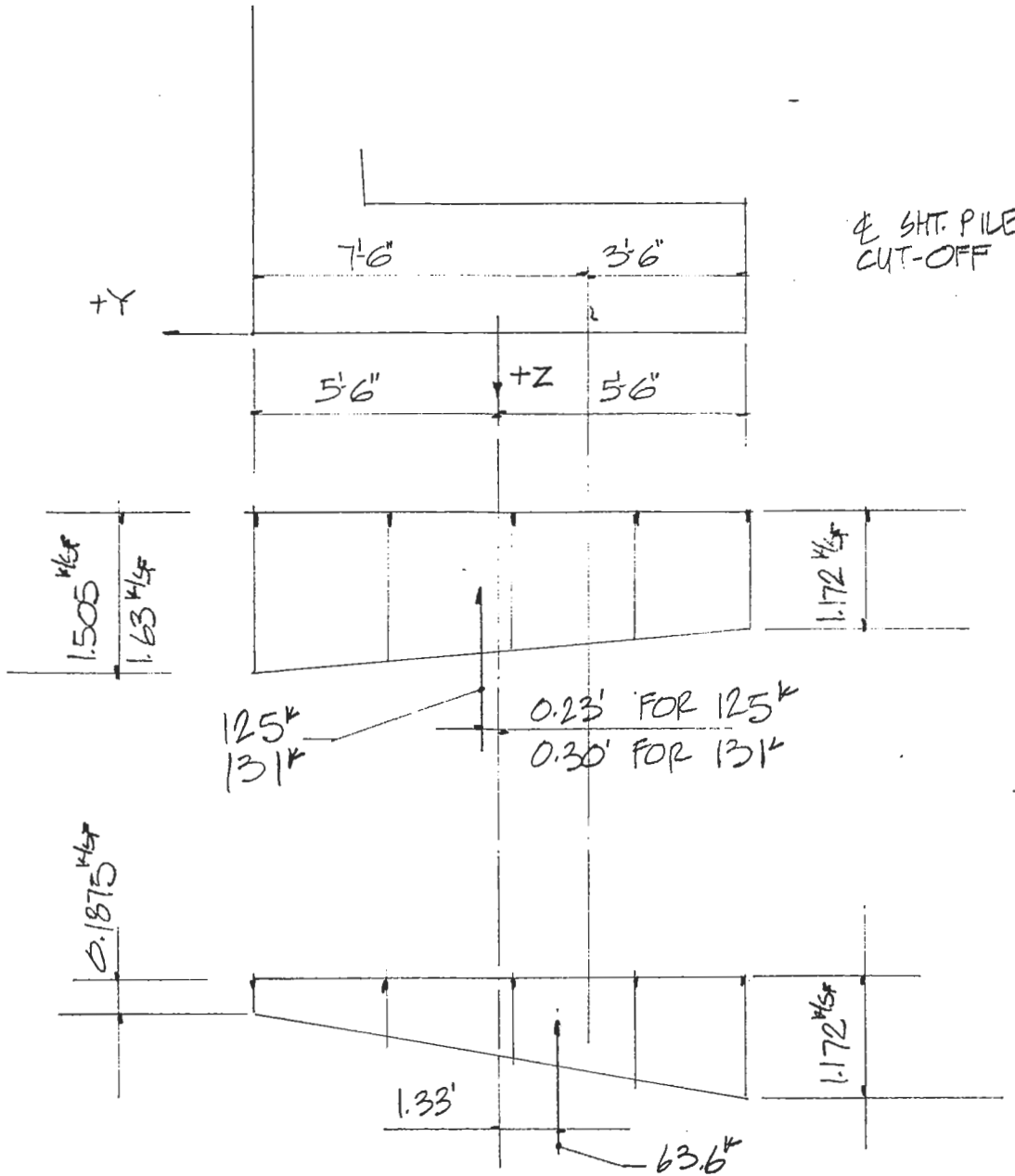
T WALL MONO EAST SIDE

13-367 50 SHEETS PER CASE  
42-382 100 SHEETS PER CASE  
42-389 200 SHEETS PER CASE  
42-392 100 RECYCLED WHITE  
42-393 200 RECYCLED WHITE  
MADE IN U.S.A.



'T' WALL MONO EAST SIDE

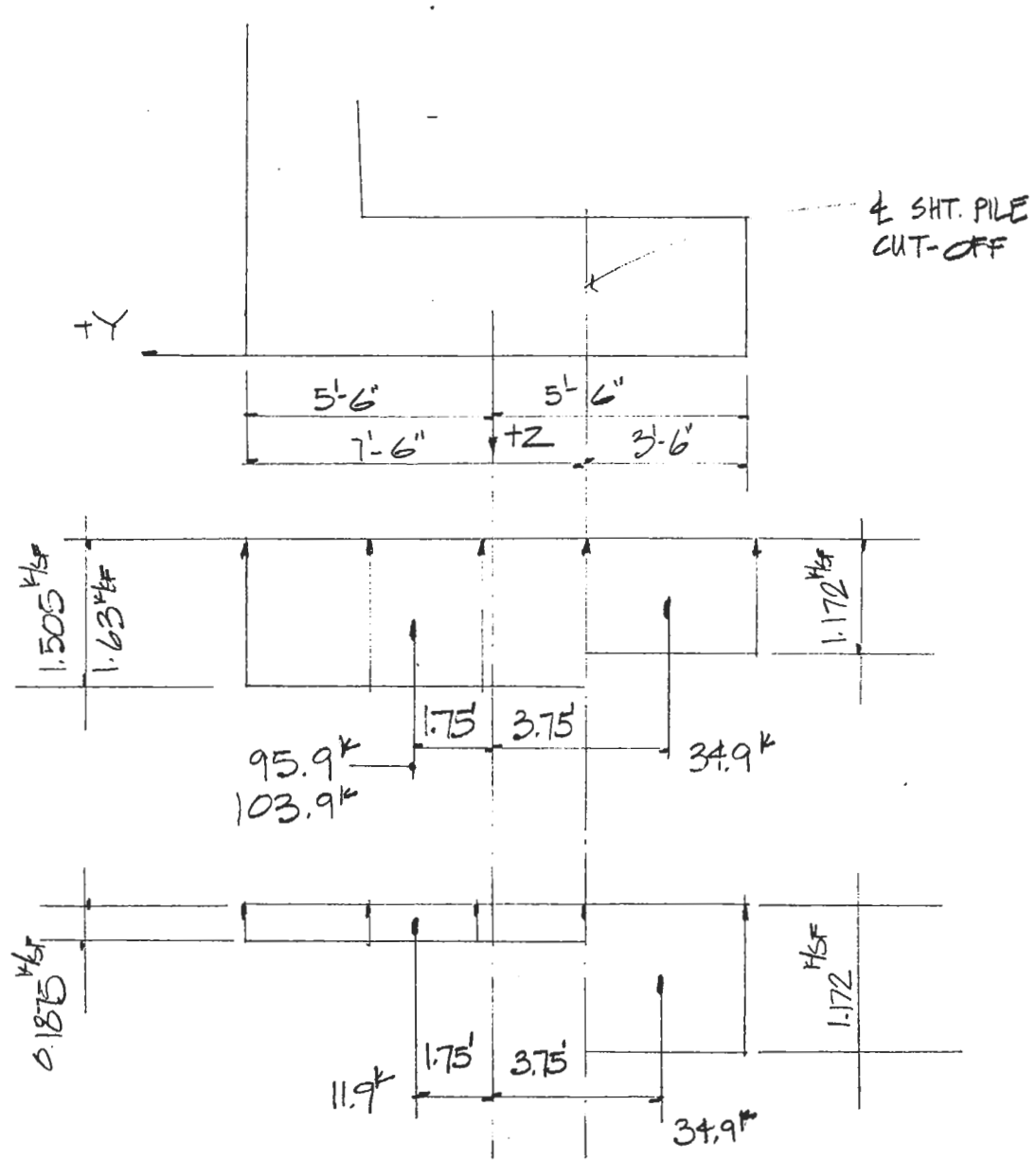
13-381 60 SHEETS 6" x 9" 5 SQUARE  
42-382 100 SHEETS 6" x 9" 5 SQUARE  
42-383 200 SHEETS 6" x 9" 5 SQUARE  
42-384 200 SHEETS 6" x 9" 5 SQUARE  
42-385 200 RECYCLED WHITE 5 SQUARE  
42-386 200 RECYCLED WHITE 5 SQUARE  
MADE IN U.S.A.



UPLIFT - PERVIOUS CUT-OFF

T' WALL MONO EAST SIDE

13704 500 SHEETS FILLER 3 SQUARE  
42-881 50 SHEETS EYEGLASS 2 SQUARE  
42-882 100 SHEETS EYEGLASS 2 SQUARE  
42-886 200 SHEETS EYEGLASS 2 SQUARE  
42-892 100 SHEETS EYEGLASS 2 SQUARE  
42-899 200 SHEETS EYEGLASS 2 SQUARE  
42-302 100 RECYCLED WHITE 2 SQUARE  
42-309 200 RECYCLED WHITE 2 SQUARE  
Made in U.S.A.



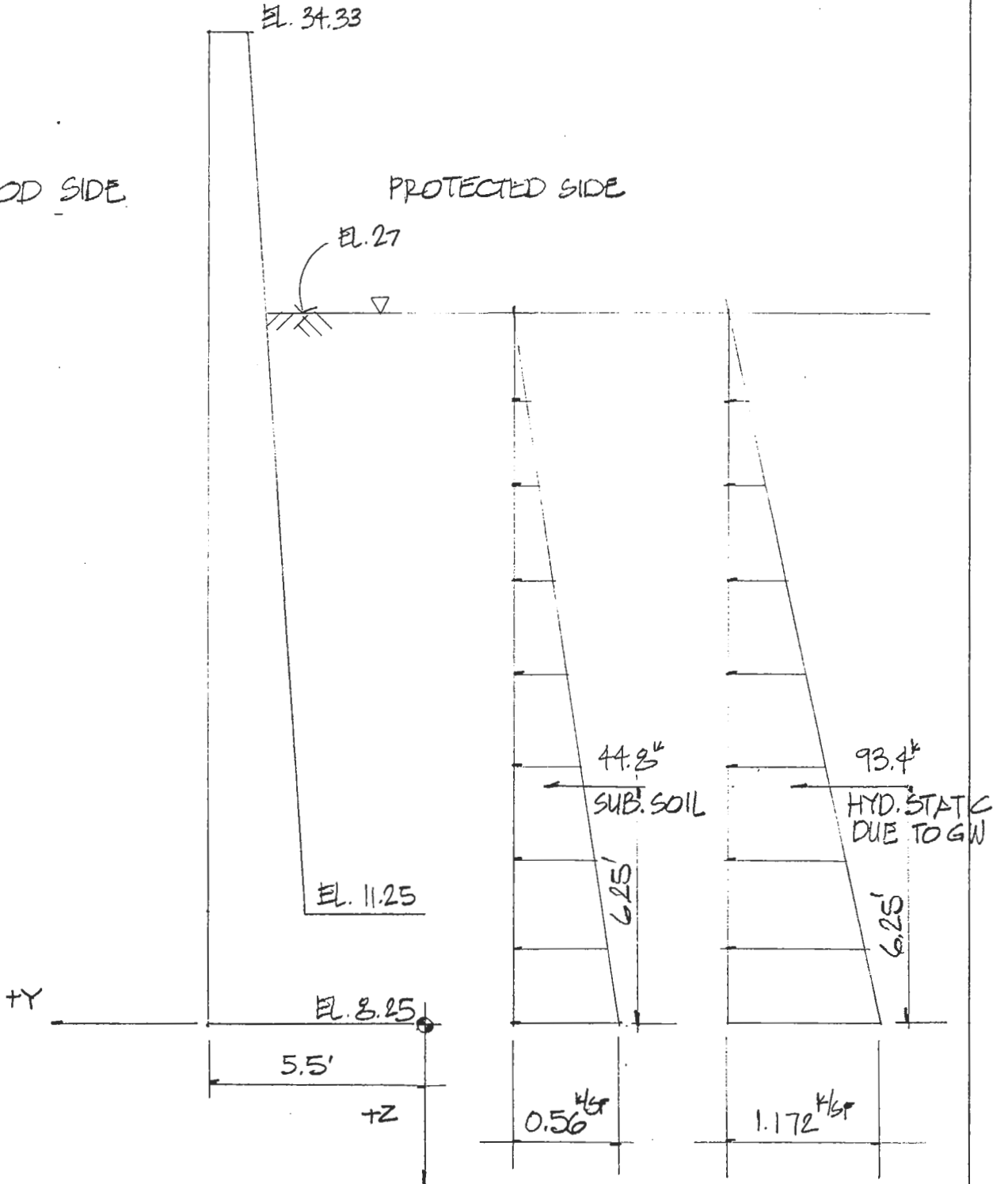
UPLIFT ~ IMPERVIOUS CUT-OFF

T WALL MONO EAST SIDE

FLOOD SIDE

PROTECTED SIDE

30 SHEET  
42 SHEET  
60 SHEET  
80 SHEET  
100 SHEET  
120 SHEET  
150 SHEET  
200 SHEET  
250 SHEET  
300 SHEET  
350 SHEET  
400 SHEET  
450 SHEET  
500 SHEET  
550 SHEET  
600 SHEET  
650 SHEET  
700 SHEET  
750 SHEET  
800 SHEET  
850 SHEET  
900 SHEET  
950 SHEET  
1000 SHEET



D I M E N S I O N A L A N D O T H E R I N P U T			
CELL REF	ITEM		
C6	LENGTH @ F/S FACE OF STEM	8.50	
C8	WIDTH OF MONOLITH	11.00	
C11	DIST FROM F/S FACE OF STEM TO F/S EDGE OF BASE SLAB	0.00	
C13	STEM TH'KNNESS @ TOP	1.00	
C16	STEN TH'KNNESS @ TOP OF BASE SLAB	2.50	
C18	EL OF TOP OF BASE SLAB	11.25	
C20	EL OF TOP OF STEM	34.33	
C22	EL OF BAKFILL ON P/S	27.00	
C25	EL OF GROUND WATER SURFACE ON P/S	27.00	
C27	HT OF STEM	23.08	

C30	SLOPE/FT OF P/S FACE OF STEM	0.06		
C32	HT OF GW ABOVE BASE SLAB	15.75		
C35	HT OF BACKFILL ABOVE BASE SLAB	15.75		
C38	TH'KNNESS OF STEM @ GW SURFACE EL	1.48		
C41	TH'KNNESS OF STEM @ TOP OF BACKFILL	1.48		
C47	WIDTH OF TRIANGULAR SOIL WEDGE BASE (VERT SIDE OF TRIANGLE BEGINS @ P/S EDGE OF STEM TH'KNNESS AT BASE SLAB)@ GW LEVEL	1.02		
C54	WIDTH OF TRIANGULAR SOIL WEDGE BASE (VERT SIDE OF TRIANGLE BEGINS @ P/S EDGE OF STEM TH'KNNESS AT BASE SLAB)@ TOP OF BACKFILL	1.02		



C59	ANGLE MADE BY RIGHT SIDE EDGE OF MONOLITH WITH Y' AXIS IN RADIAN'S CLKWISW	0.00		
C62	ANGLE MADE BY LEFT SIDE EDGE OF MONOLITH WITH Y' AXIS IN RADIAN'S CLKWISW	0.00		
C65	SLOPE/FT OF RIGHT SIDE EDGE OF MONOLITH IN PLAN	0.00		
C68	SLOPE/FT OF LEFT SIDE EDGE OF MONOLITH IN PLAN	0.00		
C70	CANAL WATER LEVEL EL	32.33		
C72	CANAL WATER LEVEL EL	34.33		
C75	FOUNDATION SLAB THICKNESS	3		
C78	HT OF WATER IN CANAL WL @ 32.33 ABOVE FDN BOT	24.08		
C81	HT OF WATER IN CANAL WL @34.33 ABOVE FDN BOT	26.08		
C84	HT OF GROUND WATER			

	ABOVE BOT OF FDN	18.75	
C87	NORMAL WATER LEVEL EL IN CANA	21.43	
C90	HT OF NORMA WATER ABOVE BOT OF FDN	13.18	
C93	HT OF BACKFILL ABOVE FDN BOT	18.75	
C96	SURCHARGE ON PROTECTED SIDE	0	
C100	DISTANCE FROM F/S EDGE OF FDN SLAB TO SHT PILE CUT OFF WALL	7.5	

CO-ORDINATES OF VARIOUS ITEMS	X1	Y1	X2	Y2	X3	Y3	X4	Y4	LENGTH1	LENGTH2	AV. LENGTH
ITEM											
STEM (RECTANGULAR IN PLAN & SECTION)	4.25	5.50	-4.25	5.50	4.25	4.50	-4.25	4.50	8.50	8.50	8.50
STEM (RECTANGULAR IN PLAN & TRIANGULAR IN SECTION)	4.25	4.50	-4.25	4.50	4.25	3.00	-4.25	3.00	8.50	8.50	8.50
BASE SLAB	4.25	5.50	-4.25	5.50	4.25	-5.50	-4.25	-5.50	8.50	8.50	8.50
CANAL WATER @ 34.33	4.25	5.50	-4.25	5.50	4.25	5.50	-4.25	5.50	8.50	8.50	8.50
CANAL WATER @ 32.33	4.25	5.50	-4.25	5.50	4.25	5.50	-4.25	5.50	8.50	8.50	8.50
GROUND WATER @ EL. 27 (RECTANGULAR IN PLAN AND SECTION)	4.25	3.00	-4.25	3.00	4.25	-5.50	-4.25	-5.50	8.50	8.50	8.50
GROUND WATER @ EL. 27 (RECTANGULAR IN PLAN AND TRIANGULAR SECTION)	4.25	4.02	-4.25	4.02	4.25	3.00	-4.25	3.00	8.50	8.50	8.50
SUBMERGED BACKFILL TO TOP OF GW SURFACE (RECTANGULAR IN PLAN AND SECTION)	4.25	3.00	-4.25	3.00	4.25	-5.50	-4.25	-5.50	8.50	8.50	8.50
SUBMERGED BACKFILL TO TOP OF GW SURFACE (RECTANGULAR IN PLAN AND TRIANGULAR IN SECTION)	4.25	4.02	-4.25	4.02	4.25	3.00	-4.25	3.00	8.50	8.50	8.50

TWALEAST.WK4

T WALL MONOLITH EAST SIDE (MONOLITH T-1)

SATURATED SOIL FROM TOP OF GW SURFACE TO TOP OF BACKFILL(FROM EL 21.43 TO EL 27.0)(RECTANGULAR IN PLAN AND IN SECTION)	4.25	4.02	-4.25	4.02	4.25	-5.50	-4.25	-5.50	8.50	8.50	8.50
SATURATED SOIL FROM TOP OF GW SURFACE TO TOP OF BACKFILL(FROM EL 21.43 TO EL 27.0)(RECTANGULAR IN PLAN AND TRIANGULAR IN SECTION)	4.25	4.02	-4.25	4.02	4.25	4.02	-4.25	4.02	8.50	8.50	8.50

VERTICAL LOADS													
ITEM	L	WIDTH	WOR H	T	w	FZ	CENTER OF GRAVITY	LEVER	ARM	MOMENT	CODE	MOMENTS	
	LENGTH	HEIGHT	HEIGHT	THICKNESS	UNITWT	L x H or W x T x w	X	FOR MX	FOR MY	FOR MX	FOR MY	MX	MY
STEM (R)	8.50	23.08		1.00	0.1500	29.43	0.00	5.00	0.00	1.00	1.00	147.14	0.00
STEM (T)	8.50	23.08		1.50	0.1500	22.07	0.00	4.00	0.00	1.00	1.00	88.28	0.00
BASE SLAB (R)	8.50	11.00		3.00	0.1500	42.08	0.00	0.00	0.00	-1.00	1.00	0.00	0.00
BASE SLAB (T-R)	0.00	11.00		3.00	0.1500	0.00	-4.25	-1.83	4.25	-1.00	1.00	0.00	0.00
BASE SLAB (T-L)	0.00	11.00		3.00	0.1500	0.00	4.25	-1.83	4.25	-1.00	-1.00	0.00	0.00
<b>TOTAL VERTICAL LOADS (CONC ETC.)</b>						<b>93.57</b>						<b>235.42</b>	<b>0.00</b>
<b>VERTICAL HYDRAULIC LOADS:</b>													
WATER EL													
32.33	8.50	21.08		0.00	0.0625	0.00	0.00	5.50	0.00	1.00	1.00	0.00	0.00
WATER IN CANAL (R)	0.00	21.08		0.00	0.0625	0.00	-4.25	5.50	4.25	1.00	1.00	0.00	0.00
WATER IN CANAL (T-R)	0.00	21.08		0.00	0.0625	0.00	4.25	5.50	4.25	1.00	-1.00	0.00	0.00
WATER IN CANAL (T-L)													
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 32.33</b>						<b>0.00</b>						<b>0.00</b>	<b>0.00</b>
34.33	8.50	23.08		0.00	0.0625	0.00	0.00	5.50	0.00	1.00	1.00	0.00	0.00
WATER IN CANAL (R)	0.00	23.08		0.00	0.0625	0.00	-4.25	5.50	4.25	1.00	1.00	0.00	0.00
WATER IN CANAL (T-R)	0.00	23.08		0.00	0.0625	0.00	4.25	5.50	4.25	1.00	-1.00	0.00	0.00
WATER IN CANAL (T-L)													
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 34.33</b>						<b>0.00</b>						<b>0.00</b>	<b>0.00</b>
27 PIS	8.50	15.75		8.50	0.0625	71.12	0.00	-1.25	0.00	-1.00	1.00	-88.90	0.00
GROUND WATER (R)	0.00	15.75		8.50	0.0625	0.00	-4.25	2.67	4.25	-1.00	1.00	0.00	0.00
GROUND WATER (T-R)	0.00	15.75		8.50	0.0625	0.00	4.25	-2.67	4.25	-1.00	-1.00	0.00	0.00
GROUND WATER (T-L)													
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR GW LEVEL ON PIS @ EL 27</b>						<b>75.40</b>						<b>-74.59</b>	<b>0.00</b>
<b>VERTICAL EARTH LOADS</b>													
BACKFILL EL													
27 PIS	8.50	15.75		8.50	0.0600	68.28	0.00	-1.25	0.00	-1.00	1.00	-85.35	0.00
SUBMERGED EARTH(R)	0.00	15.75		8.50	0.0600	0.00	-4.25	2.67	4.25	-1.00	1.00	0.00	0.00
SUBMERGED EARTH(T-L)													

	SUBMERGED EARTH(T-R)	0.00	15.75	8.50	0.0600	0.00	4.25	-2.67	2.67	4.25	-1.00	-1.00	0.00	0.00
27 P/S	SUBMERGED EARTH(TRI ANGULAR IN SECTION, RECT IN PLAN)	8.50	15.75	1.02	0.0600	4.11	0.00	3.34	3.34	0.00	1.00	1.00	13.74	0.00
	<b>TOTAL SUBMERGED EARTH LOADS W/ GW LEVEL @ 27</b>					<b>72.39</b>							<b>-71.61</b>	<b>0.00</b>
FROM 21.33 TO 27.00 P/S	SATURATED BACKFILL(R) SATURATED BACKFILL(T-L) SATURATED BACKFILL(T-R)	8.50 0.00 0.00	0.00 0.00 0.00	9.52 9.52 9.52	0.1150 0.1150 0.1150	0.00 0.00 0.00	0.00 -4.25 4.25	-0.74 -2.33 -2.33	0.74 2.33 2.33	0.00 4.25 4.25	-1.00 1.00 -1.00	1.00 1.00 -1.00	0.00 0.00 0.00	0.00 0.00 0.00
FROM 21.33 TO 27.00 P/S	SATURATED BACKFILL(TRI ANGULAR IN SECTION, AND RECT IN PLAN)	8.50	0.00	0.00	0.1150	0.00	0.00	4.02	4.02	0.00	1.00	1.00	0.00	0.00
	<b>TOTAL SATURATED EARTH LOADS W/ GW @ 27 AND TOP OF BACKFILL @ 27.0</b>					<b>0.00</b>							<b>0.00</b>	<b>0.00</b>

NOTE:  
THERE IS NO SATURATED BACKFILL

<u>HORIZONTAL HYDRAULIC LOADS</u>									
WATER EL	ITEM	HT OF WATER HT	UNIT WT w	LENGTH L	SHAPE OF PRES DIAG	HORIZ LD FY w x HT x HT/2 xL	LEVER ARM FOR MX	MOMENT MX FY x LEVARM	
32.33	WATER LEVEL IN CANAL	24.08	0.0625	8.50	TRFS	-154.02	8.03	-1236.28	
34.33	WATER LEVEL IN CANAL	26.08	0.0625	8.50	TRFS	-180.67	8.69	-1570.62	
27.00	GROUND WATER LEVEL	18.75	0.0625	8.50	TRPS	93.38	6.25	583.65	
21.43	NORMAL WL IN CANAL	13.18	0.0625	8.50	TRFS	-46.14	4.39	-202.72	
24.25	WATER LEVEL IN CANAL	13.00	0.06	8.50	TRFS	-44.89	4.33	-194.53	
11.25	GROUND WL ON F/S	3.00	0.06	8.50	TRFS	-2.39	1.00	-2.39	
<u>HORIZONTAL EARTH LOADS</u>									
TOP OF BACKFILL EL.	ITEM	HT OF BACKFILL HT	UNIT WT x Ka w x 0.5	LENGTH L	SHAPE OF PRES DIAG	FY w x Ka x HT x HT/2 xL	LEVER ARM FOR MX	MOMENT MX FY x LEVARM	
27	SATURATED SOIL FROM EL 27 TO TOP OF GW LEVEL @ EL 21.43 (TRIANGULAR PRESSURE DIAG)	0	0.06	8.5	TRPS	0.00	18.75	0.00	
27	SUBMERGED BACKFILL FROM EL 21.43 TO EL 8.25 (RECTANGULAR PRESSURE DIAG)	18.75	0.03	8.50	RECTPS	0.00	9.38	0.00	

NOT APPLICABLE. GW IS ASSUMED @ TOP OF GROUND.

27	SUBMERGED BACKFILL FROM EL 27 TO EL 8.25 (TRIANGULAR PRESSRE DIAG)	18.75	0.03	8.50	TRPS	44.82	6.25	280.15
27	SURCHARGE(0.1 k/sf) (RECTANGULAR PRESURE DIAG)	18.75		8.50		0.00	9.38	0.00
27	HYDROSTATIC PRESSURE FORM GW (TRIANGULAR PRESSURE DIAG)	18.75	0.0625	8.50	TRPS	93.38	6.25	583.65
<b>TOTAL HORIZONTAL EARTH LOADS FOR TOP OF BACKFILL @ 27 AND GW LEVEL @ 21.43</b>						<b>138.21</b>		<b>863.80</b>



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T WALL MONOLITH EAST SIDE (MONOLITH T-1)

ITEM	LENGTH	HEIGHT OF WATER (F/S) HT1	HEIGHT OF WATER (P/S) HT2	UNIT WT w	UPLIFT F/S EDGE w x HT1	UPLIFT P/S EDGE w x HT2	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY X	Y	LEVARM FOR MX	LEVARM FOR MY	MOMENT FOR MX	C O D E FOR MY	MOMENT FOR MY	MOMENT FOR MY	REMARK
<b>HYDROSTATIC UPLIFT LOADS (PERVIOUS CUT-OFF)</b>																		
<b>WL IN CANAL @ 32.33 AND GW LEVEL @ 27 PERVIOUS CUT-OFF</b>																		
WATER EL																		
32.33 (F/S) WATER IN CANAL (F/S)	8.50	24.08	18.75	0.06250	1.51	1.17	11.00	TRAP	-125.14	0.00	0.23	0.23	0.00	-1.00	-1.00	-28.55	0.00	
27.00 (P/S) GROUND WATER (P/S)																		
32.33 (F/S) WATER IN CANAL (F/S)	0.00	24.08	18.75	0.06250	1.51	1.17	11.00	TRAP	0.00	-4.25	-1.83	1.83	4.25	1.00	-1.00	0.00	0.00	
27.00 (P/S) GROUND WATER (P/S)																		
32.33 (F/S) WATER IN CANAL (F/S)	0.00	24.08	18.75	0.06250	1.51	1.17	11.00	TRAP	0.00	4.25	-1.83	1.83	4.25	1.00	1.00	0.00	0.00	
27.00 (P/S) GROUND WATER (P/S)																		
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 AND GW @ 27 AND PERVIOUS CUT-OFF</b>																		
									-125.14								-28.55	0.00
<b>WL IN CANAL @ 34.33 AND GW LEVEL @ 27 PERVIOUS CUT-OFF</b>																		
WATER EL																		
34.33 (F/S) WATER IN CANAL (F/S)	8.50	26.08	18.75	0.06250	1.63	1.17	11.00	TRAP	-130.99	0.00	0.30	0.30	0.00	-1.00	-1.00	-39.27	0.00	
27.00 (P/S) GROUND WATER (P/S)																		
34.33 (F/S) WATER IN CANAL (F/S)	0.00	26.08	18.75	0.06250	1.63	1.17	11.00	TRAP	0.00	-4.25	-1.83	1.83	4.25	1.00	-1.00	0.00	0.00	
27.00 (P/S) GROUND WATER (P/S)																		
34.33 (F/S) WATER IN CANAL (F/S)	0.00	26.08	18.75	0.06250	1.63	1.17	11.00	TRAP	0.00	4.25	-1.83	1.83	4.25	1.00	1.00	0.00	0.00	
27.00 (P/S) GROUND WATER (P/S)																		
<b>WL IN CANAL @ 24.25 AND GW LEVEL @ 27 PERVIOUS CUT-OFF</b>																		
WATER EL																		
24.25 (F/S) WATER IN CANAL (F/S)	8.50	16.00	18.75	0.06250	1.00	1.17	11.00	TRAP	-101.54	0.00	-0.15	-0.15	0.00	1.00	-1.00	-14.73	0.00	
27.00 (P/S) GROUND WATER (P/S)																		
24.25 (F/S) WATER IN CANAL (F/S)	0.00	16.00	18.75	0.06250	1.00	1.17	11.00	TRAP	0.00	-4.25	-1.83	1.83	4.25	1.00	-1.00	0.00	0.00	
27.00 (P/S) GROUND WATER (P/S)																		
24.25 (F/S) WATER IN CANAL (F/S)	0.00	16.00	18.75	0.06250	1.00	1.17	11.00	TRAP	0.00	4.25	-1.83	1.83	4.25	1.00	1.00	0.00	0.00	
27.00 (P/S) GROUND WATER (P/S)																		
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.25 AND GW @ 27 AND PERVIOUS CUT-OFF</b>																		
									-101.54								-14.73	0.00
<b>HYDROSTATIC UPLIFT LOADS (IMPERVIOUS CUT-OFF)</b>																		
<b>WL IN CANAL @ 32.33 AND GW LEVEL @ 21.43 IMPERVIOUS CUT-OFF</b>																		
WATER EL																		
32.33 (F/S) WATER IN CANAL (F/S)	8.50	24.08	24.08	0.06250	1.51	1.51	7.50	RECT	-95.94	0.00	1.75	1.75	0.00	-1.00	-1.00	-167.90	0.00	
27.00 (P/S) GROUND WATER (P/S)	8.50	18.75	18.75	0.06250	1.17	1.17	3.50	RECT	-34.86	0.00	-3.75	3.75	0.00	1.00	-1.00	130.74	0.00	
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 AND GW @ 27 IMPERVIOUS CUT-OFF</b>																		
									-130.81								-37.16	0.00
<b>WL IN CANAL @ 34.33 AND GW LEVEL @ 27 IMPERVIOUS CUT-OFF</b>																		
WATER EL																		
34.33 (F/S) WATER IN CANAL (F/S)	8.50	26.08	26.08	0.06250	1.63	1.63	7.50	RECT	-103.91	0.00	1.75	1.75	0.00	-1.00	-1.00	-181.85	0.00	

T WALL MONOLITH EAST SIDE (MONOLITH T-1)

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21.43(P/S) GROUND WATER (P/S)	8.50	18.75	18.75	0.06250	1.17	1.17	3.50	RECT	-34.86	0.00	-3.75	3.75	0.00	1.00	-1.00	130.74	0.00
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 AND GW @ 27 IMPERVIOUS CUT-OFF</b>																	
									-138.78							-51.11	0.00
<b>WL IN CANAL @ 24.25 AND GW LEVEL @ 27 IMPERVIOUS CUT-OFF</b>																	
24.25 (P/S) WATER IN CANAL (P/S)	8.50	16.00	16.00	0.06250	1.00	1.00	7.50	RECT	-63.75	0.00	1.75	1.75	0.00	-1.00	-1.00	-111.56	0.00
21.43(P/S) GROUND WATER (P/S)	8.50	18.75	18.75	0.06250	1.17	1.17	3.50	RECT	-34.86	0.00	-3.75	3.75	0.00	1.00	-1.00	130.74	0.00
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.25 AND GW @ 27 IMPERVIOUS CUT-OFF</b>																	
									-98.61							19.17	0.00

WATER EL	ITEM	LENGTH	HEIGHT OF WATER (F/S) HT1	HEIGHT OF WATER (F/S) HT2	UNIT WT w	UPLIFT F/S EDGE w x HT1	UPLIFT P/S EDGE w x HT2	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY X	Y	LEVARM FOR MX	MOMENT FOR MX	C O D E FOR MY	MOMENT FOR MY	FZ x LEVARM x MOMENT CODE	MOMENT MY	REMARK	
	<b>HYDROSTATIC UPLIFT LOADS</b>																			
	<b>PERVIOUS CUT-OFF</b>																			
11.25 (F/S)	WATER IN CANAL (F/S)	8.50	3.00	18.75	0.06250	0.19	1.17	11.00	TRAP	-63.55	0.00	1.33	1.33	0.00	-1.00	-84.37	0.00			
27.00 (P/S)	GROUND WATER (P/S)																			
11.25 (F/S)	WATER IN CANAL (F/S)	0.00	3.00	18.75	0.06250	0.19	1.17	11.00	TRAP	0.00	-4.25	-1.83	1.83	4.25	-1.00	0.00	0.00			
27.00 (P/S)	GROUND WATER (P/S)																			
11.25 (F/S)	WATER IN CANAL (F/S)	0.00	3.00	18.75	0.06250	0.19	1.17	11.00	TRAP	0.00	4.25	-1.83	1.83	4.25	1.00	0.00	0.00			
27.00 (P/S)	GROUND WATER (P/S)																			
	<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 27.00 PERVIOUS CUT-OFF</b>																			
										-63.55							-84.37	0.00		
	<b>HYDROSTATIC UPLIFT LOADS</b>																			
	<b>IMPERVIOUS CUT-OFF</b>																			
WATER EL	ITEM	LENGTH	HEIGHT OF WATER (F/S) HT1	HEIGHT OF WATER (F/S) HT2	UNIT WT w	UPLIFT F/S EDGE w x HT1	UPLIFT P/S EDGE w x HT2	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY X	Y	LEVARM FOR MX	MOMENT FOR MX	C O D E FOR MY	MOMENT FOR MY	FZ x LEVARM x MOMENT CODE	MOMENT MY	REMARK	
11.25 (F/S)	WATER IN CANAL (F/S)	8.50	3.00	3.00	0.06250	0.19	0.19	7.50	RECT	-11.95	0.00	1.75	1.75	0.00	-1.00	-20.92	0.00			
27 (P/S)	GROUND WATER (P/S)	8.50	18.75	18.75	0.06250	1.17	1.17	3.50	RECT	-34.86	0.00	-3.75	3.75	0.00	-1.00	130.74	0.00			
	<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 27.00 IMPERVIOUS CUT-OFF</b>																			
										-46.82							-37.18	0.00		

<b>H O R I Z O N T A L W I N D L O A D S</b>									
<b>STORM WIND LOADS:</b>									
<b>WATER EL</b>	<b>ITEM</b>	<b>LENGTH</b>	<b>EXPOSED HEIGHT</b>	<b>WIND INTENSITY</b>	<b>SHAPE OF PRES DIAG</b>	<b>FY</b>	<b>LEVARM</b>	<b>MOMENT</b>	
			<b>HT</b>	<b>q</b>				<b>MX</b>	
32.33	EXPOSED WALL SURFACE	8.5	2	0.05	RECTFS	-0.85	25.08	-21.318	
34.33	EXPOSED WALL SURFACE	8.5	0	0.05	RECTFS	0	26.08	0	
<b>OPERATING WIND LOADS</b>									
11.25	EXPOSED WALL SURFACE	8.5	23.08	0.01	RECTFS	-1.9618	14.54	-28.5246	
24.25	EXPOSED WALL SURFACE	8.5	13	0.01	RECTFS	-1.105	9.5	-10.4975	

LOAD COMBINATIONS:									
CASE I : CONSTRUCTION CASE. OP. WIND, NO WATER OR EARTH LOADS:									
ITEM	FX	FY	FZ	MX	MY	MZ			
CONCRETE LOADS			93.57225	235.416					
OPERATING WINDS		-1.9618		-28.5246					
<b>TOTAL FOR CASE I :</b>		<b>-1.9618</b>	<b>93.57225</b>	<b>206.8914</b>					
CASE II : WL IN CANAL @ 32.33, STORM WIND, BACKFILL IN PLACE GW @ 27.00, IMPERVIOUS CUT-OFF.									
CONCRETE LOADS			93.57225	235.416					
WATER LOADS			0.00	0.00					
SUBMERGED BACKFILL			72.38734	-71.6093					
SATURATED BACKFILL			0	0					
UPLIFT			-130.81	-37.16					

HYDROSTATIC PRESSURE	-154.02		-1236.28	
EARTH PRESSURE	138.21		863.8	
STORM WIND	-0.85		-21.318	
<b>TOTAL FOR CASE II :</b>	<b>-16.6637</b>	<b>35.15256</b>	<b>-267.156</b>	
<b>CASE III : WL IN CANAL @ 32.33, STORM WIND BACKFILL IN PLACE</b>				
<b>GW @ 27.00, PERVIOUS CUT-OFF.</b>				
CONCRETE LOADS		93.57225	235.416	
WATER LOADS		0.00	0.00	
SUBMERGED BACKFILL		72.38734	-71.6093	
SATURATED BACKFILL		0	0	
UPLIFT		-125.14	-28.55	
HYDROSTATIC PRESSURE	-154.02		-1236.28	
EARTH PRESSURE	138.21		863.8	
STORM WIND	-0.85		-21.318	
<b>TOTAL FOR CASE III :</b>	<b>-16.6637</b>	<b>40.81568</b>	<b>-258.544</b>	
<b>CASE IV : WL IN CANAL EMPTY, BACKFILL IN PLACE OP. WIND</b>				
<b>GW @ 27.00, IM PERVIOUS CUT-OFF.</b>				
CONCRETE LOADS		93.57225	235.416	

SUBMERGED BACKFILL			72.38734	-71.6093	
SATURATED BACKFILL			0	0	
UPLIFT			-46.8164	-37.1643	
HYDROSTATIC PRESSURE		-2.39063		-2.39063	
EARTH PRESSURE		138.208		863.8	
OPERATING WIND		-1.9618		-28.5246	
<b>TOTAL FOR CASE IV :</b>		<b>133.8556</b>	<b>119.1432</b>	<b>959.5273</b>	
<b>CASE V : WL IN CANAL EMPTY, BACKFILL IN PLACE, OP. WIND</b>					
<b>GW @ 27.00, PERVIOUS CUT-OFF.</b>					
CONCRETE LOADS			93.57225	235.416	
SUBMERGED BACKFILL			72.38734	-71.6093	
SATURATED BACKFILL			0	0	
UPLIFT			-63.5508	-84.3691	
HYDROSTATIC PRESSURE		-2.39063		-2.39063	
EARTH PRESSURE		138.208		863.8	
OPERATING WIND		-1.9618		-28.5246	
<b>TOTAL FOR CASE V :</b>		<b>133.8556</b>	<b>102.4088</b>	<b>912.3224</b>	
<b>CASE VI : WL IN CANAL @ 34.33, STORM WIND, BACKFILL IN PLACE</b>					
<b>GW @ 27.00, IMPERVIOUS CUT-OFF.</b>					

CONCRETE LOADS										
WATER LOADS			93.57225					235.416		
SUBMERGED BACKFILL			0.00					0.00		
SATURATED BACKFILL			72.38734					-71.6093		
UPLIFT						0		0		
HYDROSTATIC PRESSURE			-138.78					-51.11		
EARTH PRESSURE					-180.67			-1570.62		
STORM WIND					138.21			863.8		
					-0.85			-21.318		
<b>TOTAL FOR CASE VI :</b>			<b>-43.3112</b>			<b>27.18381</b>		<b>-615.438</b>		
<b>CASE VII : WL IN CANAL@34.33, STORM WIND, BACKFILL IN PLACE</b>										
<b>GW @ 27.00, PERVIOUS CUT-OFF.</b>										
CONCRETE LOADS										
WATER LOADS			93.57225					235.416		
SUBMERGED BACKFILL			0.00					0.00		
SATURATED BACKFILL			72.38734					-71.6093		
UPLIFT						0		0		
HYDROSTATIC PRESSURE			-130.99					-39.27		
EARTH PRESSURE					-180.67			-1570.62		
STORM WIND					138.21			863.8		
					-0.85			-21.318		
<b>TOTAL FOR CASE VII :</b>			<b>-43.3112</b>			<b>34.97193</b>		<b>-603.594</b>		



<b>CASE VIII : WL IN CANAL EMPTY, BACKFILL IN PLACE, OP. WIND</b>									
<b>GW @ 21.43, IMPERVIOUS CUT-OFF.</b>									
CONCRETE LOADS									
SUBMERGED BACKFILL									
SATURATED BACKFILL									
UPLIFT									
HYDROSTATIC PRESSURE									
EARTH PRESSURE									
OPERATING WIND									
<b>TOTAL FOR CASE VIII :</b>									
<b>CASE IX : WL IN CANAL EMPTY, BACKFILL IN PLACE, OP. WIND</b>									
<b>GW @ 21.43, PERVIOUS CUT-OFF.</b>									
CONCRETE LOADS									
SUBMERGED BACKFILL									
SATURATED BACKFILL									
UPLIFT									
HYDROSTATIC PRESSURE									
EARTH PRESSURE									
OPERATING WIND									

SUMMARY OF LOAD CASES:						
ITEM	FX	FY	FZ	MX	MY	MZ
TOTAL FOR CASE I :	0	-1.9618	93.57225	206.8914		
TOTAL FOR CASE II :	0	-16.6637	35.15256	-267.156		
TOTAL FOR CASE III :	0	-16.6637	40.81568	-258.544		
TOTAL FOR CASE IV :	0	133.8556	119.1432	959.5273		
TOTAL FOR CASE V :	0	133.8556	102.4088	912.3224		
TOTAL FOR CASE VI :	0	-43.3112	27.18381	-615.438		
TOTAL FOR CASE VII :	0	-43.3112	34.97193	-603.594		

10 T WALL MONOLITH EAST SIDE (MONOLITH T-1)  
20 PROP 29000 724 261 21.4 2 0 ALL  
30 SOIL ES 0.079 LEN 78 0 ALL  
40 PIN ALL  
50 ALLOW H 130 100 385 385 709 2119 ALL  
60 BATTER 12 1 TO 2  
75 BATTER 12 3 TO 4  
90 BATTER 2 5 TO 6  
130 ANGLE 90 1 TO 4  
140 ANGLE 270 5 TO 6  
330 PILE 1 2.25 4 0 2 -2.25 4 0 3 2.25 .5 0 4 -2.25 .5 0  
340 PILE 5 2.25 -4 0 6 -2.25 -4 0  
400 LOAD 1 0 -2 93.6 206.9 0 0  
410 LOAD 2 0 -16.7 35.1 -267 0 0  
420 LOAD 3 0 -16.7 40.8 -258.4 0 0  
450 LOAD 4 0 100.40 89.40 719.70 0 0  
460 LOAD 5 0 100.40 76.80 684.24 0 0  
470 LOAD 6 0 -32.50 20.40 -461.60 0 0  
480 LOAD 7 0 -32.50 26.20 -452.70 0 0  
580 FOU 1 2 3 4 5 6 7 B:\T-1.OUT  
590 TOUT 1 2 3 4 5 6 7  
700 PFO ALL  
710 FPL N

\*\*\*\*\*  
 \* CORPS PROGRAM # X0080 \* CPGA - CASE PILE GROUP ANALYSIS PROGRAM  
 \* VERSION NUMBER # 86/09/02-C \* RUN DATE 09-12-95 RUN TIME 16:26:24  
 \*\*\*\*\*

T WALL MONOLITH EAST SIDE (MONOLITH T-1)

THERE ARE 6 PILES AND  
 7 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

WITH DIAGONAL COORDINATES = ( X Y Z )  
 ( -2.25 , -4.00 , .00 )  
 ( 2.25 , 4.00 , .00 )

\*\*\*\*\*

PILE PROPERTIES AS INPUT

E	I1	I2	A	C33	B66
KSI	IN**4	IN**4	IN**2		
.29000E+05	.72400E+03	.26100E+03	.21400E+02	.20000E+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
	.79000E-01	L	.78000E+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	2.25	4.00	.00	12.00	90.00	78.00	P
2	-2.25	4.00	.00	12.00	90.00	78.00	P
3	2.25	.50	.00	12.00	90.00	78.00	P
4	-2.25	.50	.00	12.00	90.00	78.00	P
5	2.25	-4.00	.00	2.00	270.00	78.00	P
6	-2.25	-4.00	.00	2.00	270.00	78.00	P

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APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	-2.0	93.6	206.9	.0	.0
2	.0	-16.7	35.1	-267.0	.0	.0
3	.0	-16.7	40.8	-258.4	.0	.0
4	.0	100.4	89.4	719.7	.0	.0
5	.0	100.4	76.8	684.2	.0	.0
6	.0	-32.5	20.4	-461.6	.0	.0
7	.0	-32.5	26.2	-452.7	.0	.0

\*\*\*\*\*

ORIGINAL PILE GROUP STIFFNESS MATRIX

.42795E+02	-.75722E-05	-.65104E-05	-.11206E-02	.00000E+00	-.85590E+02
-.75722E-05	.59781E+03	-.61929E+03	.62512E+05	.00000E+00	.00000E+00
-.65104E-05	-.61929E+03	.73918E+04	.40284E+05	.00000E+00	.97656E-03
-.11206E-02	.62512E+05	.40284E+05	.11057E+08	.00000E+00	.00000E+00
.00000E+00	.00000E+00	.00000E+00	.00000E+00	.53886E+07	.45146E+06
-.85590E+02	.00000E+00	.00000E+00	.00000E+00	.45146E+06	.50205E+06

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 =	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 =	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 =	2.

\*\*\*\*\*

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.5040E-08	-.4232E-01	.6723E-02	.4393E-03	-.7786E-13	.9293E-12
2	-.5541E-08	.4735E-01	.1199E-01	-.6012E-03	.8560E-13	-.1022E-11
3	-.5246E-08	.4762E-01	.1276E-01	-.5961E-03	.8103E-13	-.9672E-12
4	.3518E-07	.4014E+00	.5493E-01	-.1688E-02	-.5434E-12	.6486E-11
5	.3436E-07	.4091E+00	.5430E-01	-.1768E-02	-.5307E-12	.6335E-11

6    -.1193E-07    .2450E-01    .8466E-02    -.6703E-03    .1844E-12    -.2200E-11  
7    -.1163E-07    .2470E-01    .9236E-02    -.6646E-03    .1797E-12    -.2145E-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
1	-.2	.0	32.1	.0	11.1	.0	.25	.09
2	-.2	.0	32.1	.0	11.1	.0	.25	.09
3	-.2	.0	7.7	.0	10.7	.0	.06	.03
4	-.2	.0	7.7	.0	10.7	.0	.06	.03
5	.2	.0	8.1	.0	-11.0	.0	.06	.03
6	.2	.0	8.1	.0	-11.0	.0	.06	.03

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.3	.0	-17.1	.0	-12.1	.0	.17	.05
2	.3	.0	-17.1	.0	-12.1	.0	.17	.05
3	.3	.0	16.3	.0	-11.6	.0	.13	.05
4	.3	.0	16.3	.0	-11.6	.0	.13	.05
5	-.3	.0	20.4	.0	15.1	.0	.16	.06
6	-.3	.0	20.4	.0	15.1	.0	.16	.06

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.3	.0	-15.7	.0	-12.1	.0	.16	.05
2	.3	.0	-15.7	.0	-12.1	.0	.16	.05
3	.3	.0	17.4	.0	-11.6	.0	.13	.05
4	.3	.0	17.4	.0	-11.6	.0	.13	.05
5	-.3	.0	20.8	.0	15.2	.0	.16	.06
6	-.3	.0	20.8	.0	15.2	.0	.16	.06

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
------	---------	---------	---------	------------	------------	------------	-----	-----

1	2.2	.0	9.7	.0	-100.1	.0	.07	.07
2	2.2	.0	9.7	.0	-100.1	.0	.07	.07
3	2.2	.0	103.4	.0	-98.7	.0	.80	.32
4	2.2	.0	103.4	.0	-98.7	.0	.80	.32
5	-2.3	.0	-76.8	.0	104.5	.0	.77	.25
6	-2.3	.0	-76.8	.0	104.5	.0	.77	.25

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	2.3	.0	4.7	.0	-102.1	.0	.04	.06
2	2.3	.0	4.7	.0	-102.1	.0	.04	.06
3	2.2	.0	102.8	.0	-100.6	.0	.79	.31
4	2.2	.0	102.8	.0	-100.6	.0	.79	.31
5	-2.4	.0	-77.5	.0	106.6	.0	.78	.25
6	-2.4	.0	-77.5	.0	106.6	.0	.78	.25

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.1	.0	-28.6	.0	-6.6	.0	.29	.08
2	.1	.0	-28.6	.0	-6.6	.0	.29	.08
3	.1	.0	8.6	.0	-6.0	.0	.07	.03
4	.1	.0	8.6	.0	-6.0	.0	.07	.03
5	-.2	.0	33.7	.0	10.0	.0	.26	.09
6	-.2	.0	33.7	.0	10.0	.0	.26	.09

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.1	.0	-27.2	.0	-6.6	.0	.27	.07
2	.1	.0	-27.2	.0	-6.6	.0	.27	.07
3	.1	.0	9.7	.0	-6.0	.0	.07	.03
4	.1	.0	9.7	.0	-6.0	.0	.07	.03
5	-.2	.0	34.1	.0	10.1	.0	.26	.09
6	-.2	.0	34.1	.0	10.1	.0	.26	.09

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PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

LE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	2.4	32.0	.0	.0	.0
2	.0	2.4	32.0	.0	.0	.0

3	.0	.4	7.7	.0	.0	.0
4	.0	.4	7.7	.0	.0	.0
5	.0	-3.8	7.1	.0	.0	.0
6	.0	-3.8	7.1	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-1.2	-17.0	.0	.0	.0
2	.0	-1.2	-17.0	.0	.0	.0
3	.0	1.6	16.2	.0	.0	.0
4	.0	1.6	16.2	.0	.0	.0
5	.0	-8.8	18.4	.0	.0	.0
6	.0	-8.8	18.4	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-1.0	-15.7	.0	.0	.0
2	.0	-1.0	-15.7	.0	.0	.0
3	.0	1.7	17.3	.0	.0	.0
4	.0	1.7	17.3	.0	.0	.0
5	.0	-9.0	18.8	.0	.0	.0
6	.0	-9.0	18.8	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	3.0	9.5	.0	.0	.0
2	.0	3.0	9.5	.0	.0	.0
3	.0	10.8	102.9	.0	.0	.0
4	.0	10.8	102.9	.0	.0	.0
5	.0	36.4	-67.6	.0	.0	.0
6	.0	36.4	-67.6	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	2.6	4.5	.0	.0	.0
2	.0	2.6	4.5	.0	.0	.0
3	.0	10.8	102.2	.0	.0	.0
4	.0	10.8	102.2	.0	.0	.0
5	.0	36.8	-68.3	.0	.0	.0
6	.0	36.8	-68.3	.0	.0	.0

LOAD CASE - 6

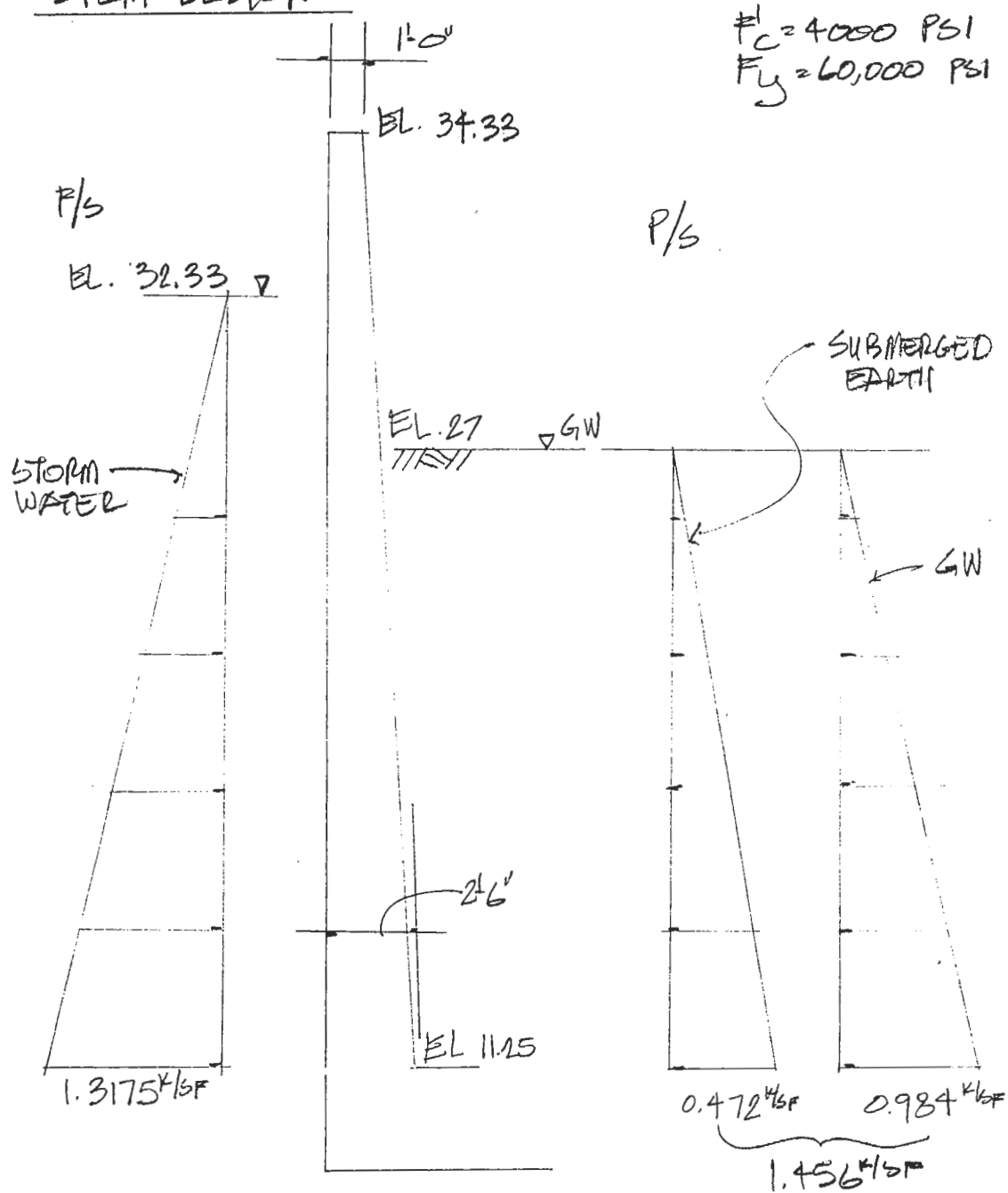


PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-2.2	-28.5	.0	.0	.0
2	.0	-2.2	-28.5	.0	.0	.0
3	.0	.8	8.5	.0	.0	.0
4	.0	.8	8.5	.0	.0	.0
5	.0	-14.9	30.2	.0	.0	.0
6	.0	-14.9	30.2	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-2.1	-27.1	.0	.0	.0
2	.0	-2.1	-27.1	.0	.0	.0
3	.0	.9	9.6	.0	.0	.0
4	.0	.9	9.6	.0	.0	.0
5	.0	-15.1	30.6	.0	.0	.0
6	.0	-15.1	30.6	.0	.0	.0

STEM DESIGN



BM @ BOT. OF STEM (CANAL EMPTY, BACKFILL IN PLACE)

$$= 1.456 \times 0.5 \times 15.75 \times 15.75 / 3 = 60.2' \text{ K (SERVICE LOAD)}$$

$$\therefore M_u = 1.3 \times 1.7 \times 60.2 = 133' \text{ K} \quad M_n = 148' \text{ K}$$

BM @ BOT OF STEM (CANAL @ EL. 32.33, NO BACKFILL)

$$= 1.3175 \times 0.5 \times 21.08 \times 21.08 / 3 = 97.6' \text{ K (SERVICE LOAD)}$$

$$\therefore M_u = 1.3 \times 1.7 \times 97.6 = 216' \text{ K} \quad M_n = 240' \text{ K}$$

500 SHEETS, FILLER, 5 SQUARE  
 50 SHEETS, FILLER, 5 SQUARE  
 43-381 50 SHEETS, FILLER, 5 SQUARE  
 43-382 50 SHEETS, FILLER, 5 SQUARE  
 43-383 100 SHEETS, FILLER, 5 SQUARE  
 43-384 100 SHEETS, FILLER, 5 SQUARE  
 43-385 100 SHEETS, FILLER, 5 SQUARE  
 43-386 100 SHEETS, FILLER, 5 SQUARE  
 43-387 100 SHEETS, FILLER, 5 SQUARE  
 43-388 100 SHEETS, FILLER, 5 SQUARE  
 43-389 100 SHEETS, FILLER, 5 SQUARE  
 43-390 100 SHEETS, FILLER, 5 SQUARE  
 43-391 100 SHEETS, FILLER, 5 SQUARE  
 43-392 100 SHEETS, FILLER, 5 SQUARE  
 43-393 100 SHEETS, FILLER, 5 SQUARE  
 43-394 100 SHEETS, FILLER, 5 SQUARE  
 43-395 100 SHEETS, FILLER, 5 SQUARE  
 43-396 100 SHEETS, FILLER, 5 SQUARE  
 43-397 100 SHEETS, FILLER, 5 SQUARE  
 43-398 100 SHEETS, FILLER, 5 SQUARE  
 43-399 100 SHEETS, FILLER, 5 SQUARE  
 43-400 100 SHEETS, FILLER, 5 SQUARE  
 Made in U.S.A.



USE  $f'_c = 4000 \text{ PSI}$  @ 28 DAYS  
 $F_y = 60,000 \text{ PSI}$ .

$$M_n = 216 / 0.9 = 240 \text{ k}$$

$$\therefore d_{req} = \sqrt{\frac{2.495 M_n}{b}}$$

$$= \sqrt{2.495 \times 240}$$

$$= 24.5''$$

ASSUMING #10 BARS, TOTAL THICKNESS REQ'D @ BASE

$$= 24.5 + 4'' (\text{COVER}) + 0.625 = 29.125'' < 30'' \therefore \text{O.K.}$$

### AREA OF STEEL REQ'D

1. FOR  $BM = 240 \text{ k}$

$$K_u = 1 - \left( 1 - \frac{240 \times 12}{0.425 \times 4 \times 12 \times 25.4^2} \right)^{1/2}$$

$$= 0.1161$$

$$\therefore A_s = \frac{0.85 \times 4 \times 0.1161 \times 12 \times 25.4}{60} = 2.00 \text{ in}^2/\text{FT}$$

$$\therefore \frac{A_s}{bd} = \frac{2.0}{12 \times 25.4} = 0.0065 > A_{s,MIN} \quad \rho_b = 0.0283, 0.25\rho_b = 0.0071$$

$$< 0.25\rho_b$$

2. FOR  $BM = 148 \text{ k}$

$$A_s = \frac{0.85 \times 4 \times 0.0699 \times 12 \times 25.4}{60} = 1.21 \text{ in}^2/\text{FT} \quad \frac{A_s}{bd} = 0.00397 < \frac{\rho_b}{4}$$

$$A_s/bd > A_{s,MIN} (0.0033 \times b \times d)$$

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3 FOR NET BM OF 216-133 = 83'K  $M_n = 92.2'K$

$$A_s = 0.76 \text{ in}^2 \quad \therefore A_s/bd = 0.0025 < A_{s(\text{MIN})} \text{ USE } A_{s(\text{MIN})}$$

SINCE LOADING CONDITION "CANAL @ EL. 32.33, NO BACKFILL" IS VERY UNLIKELY TO OCCUR, MIN. VERTICAL REINF WILL BE USED ON F/S FACE OF STEM. ( $A_s(\text{req'd})$  FOR NET BM, THE DIFF. BETWEEN BM CAUSED BY BACKFILL ON P/S & STORM WATER TO EL. 32.33 ON F/S, AS INDICATED ABOVE IS LESS THAN ACI MINIMUM). IN AN UNLIKELY EVENT THE AFORESAID OCCURS (DURING CONST.), THE NET LOADING FROM F/S CAN BE REDUCED (OR NEUTRALIZED) BY THE CONTRACTOR FLOODING THE PROTECTED SIDE OF THE WALL.

$$\therefore \text{REINF ON F/S FACE OF STEM} = 0.0033 \times 12 \times 23.4 = 1.01 \text{ in}^2/\text{FT.}$$

$$\text{REINF ON F/S FACE OF STEM} = 1.21 \text{ in}^2/\text{FT.}$$

USE # 7 BARS @ 6" O.C. E.F. (VERT)

HORIZ. REINF.

$$= 0.0028 \times 12 \times 30 = 1.0 \text{ in}^2/\text{FT}$$

USE # 7 BARS @ 12" O.C. E.F. (TOTAL = 1.2 in<sup>2</sup> > 1.0 in<sup>2</sup>)

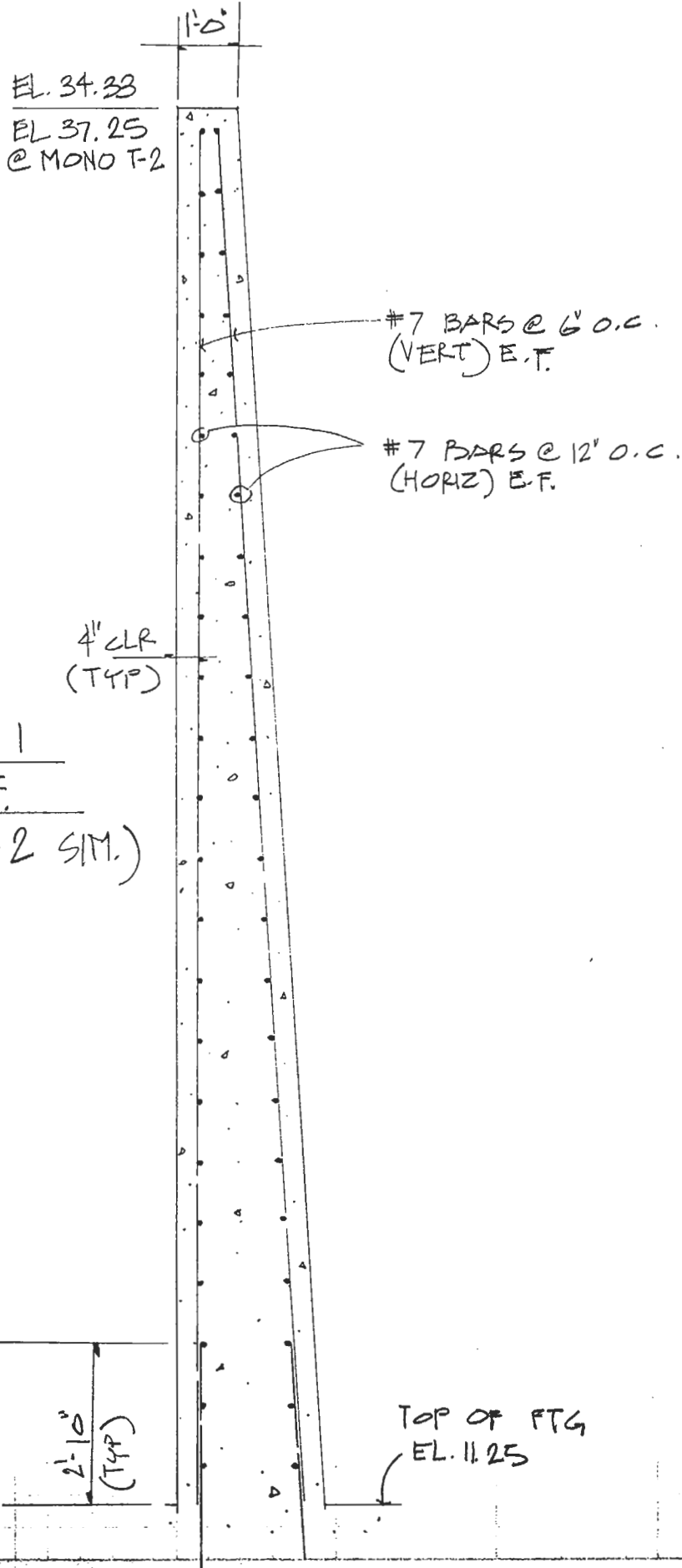
CHECK SHEAR

$$\begin{aligned}\text{ALLOWABLE } V_u &= 0.85 \times 2 \times 63 \times 12 \times 23.93 \\ &= 30.76^k\end{aligned}$$

$$\text{ACTUAL } V_u @ \text{DIST } d' = (11.46^k - 3) \times 1.3 \times 1.7 = 18.7^k < 30.8^k$$

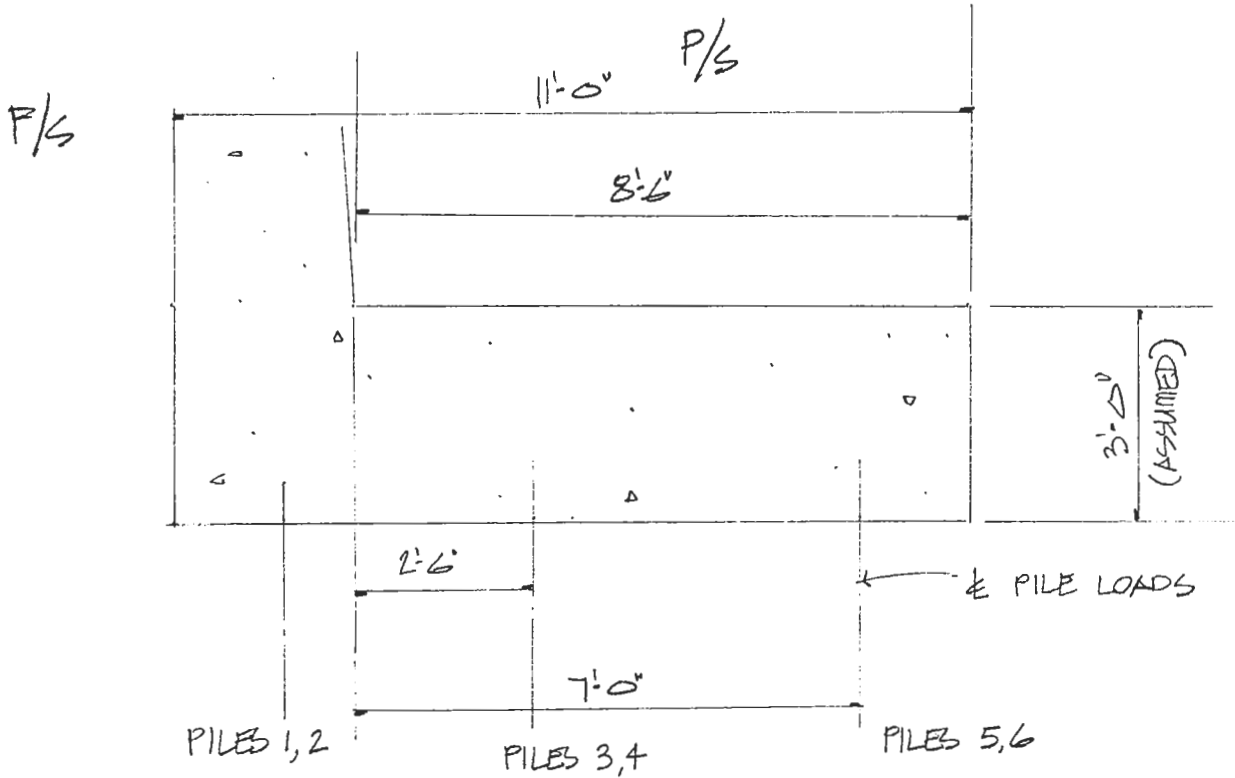
∴ SELECTED STEM THICKNESS IS ADEQUATE & NO  
SHEAR REINF IS NECESSARY.

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MONOLITH T-1  
STEM REINF.  
(STEM FOR T-2 SIM.)

FOUNDATION SLAB DESIGN



- ASSUME:
1. 3'-0" TH'K FDN SLAB
  2.  $F'_c = 4000$
  3.  $F_y = 60,000$ .
  4. FDN SLAB AS CANTILEVER FIXED @ P/S FACE OF STEM.

LOAD CASE 5 LOADS (PAGE TI-31)

1.	PILE	LOAD
	3	102
	4	102
	5	-68
	6	-68
2.	SELF	0.45 W/SF
3.	OTHER LOADS	REFER TO PLATE

13-78: 100 SHEETS 1 SQUARE  
 14-78: 100 SHEETS 1 SQUARE  
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 Made in U.S.A.



FDN SLAB DESIGNBENDING MOM @ P/S FACE OF STEM  
DUE TO:

1. SELF WT.	$42.1 \times (8.5 - 5.5) = -126'k$
2. SUBMERGED SOIL + GW	$(64.3 + 71.1) \times (8.5 - 5.5 + 1.25) = -575'k$
3. UPLIFT	$(63.6) \times (8.5 - 5.5 + 1.33) = +276'k$
4. PILE LOADS	$(204 \times 2.5 - 136 \times 7) = -442'k$
<u>TOTAL</u>	<u>- 867'k</u>

$$\therefore BM/FT = 867/8.5 = 102'k$$

$$\therefore M_u = 102 \times 1.3 \times 1.7 = 225'k \quad M_n = 250'k$$

$$\therefore d_{req} = 25.3''$$

ASSUMING 4" COVER &amp; #9 BARS, TOTAL THICKNESS

REQ'D =  $25.3 + 4 + 9/16 = 29.87'' < 36''$  ASSUMED.  $\therefore$  O.K.

$$\phi V_c = 12 \times (36 - 4 - 9/16) \times 8.5 \times 2 \times 63 \times 0.85 = 343.4'k$$

$$V_u @ \text{dist } 'd' = \left( (42.1'k + 64.3'k + 71.1'k) 0.75 - 204 - \frac{68 \times 2}{2} - 63.6 \times 0.75 \right) \times 1.3 \times 1.4 = 339'k$$

$$\phi V_c = 0.85 \times 2 \times 63.25 \times 12 \times 8.5 \times 31.44 = 344'k > V_u @ d = 339'k \quad \therefore \text{O.K.}$$

PUNCH SHEAR O.K. BY OBSTOP REINFFOR  $b = 12''$ ,  $d = 31.43$   $F = 0.98$ 

$$\therefore \text{FOR } M = 225 \quad K_u = 229 \quad \rho = 0.0060$$

$$\therefore A_s = 0.0060 \times 12 \times 31.43 = 2.26 \text{ in}^2/\text{FT.}$$

USE # 10 BARS @ 6" OR # 9 BARS @ 5" O.C.BOT REINFUSE # 10 BARS @ 6" OR # 9 BARS @ 5" O.C. BOT.

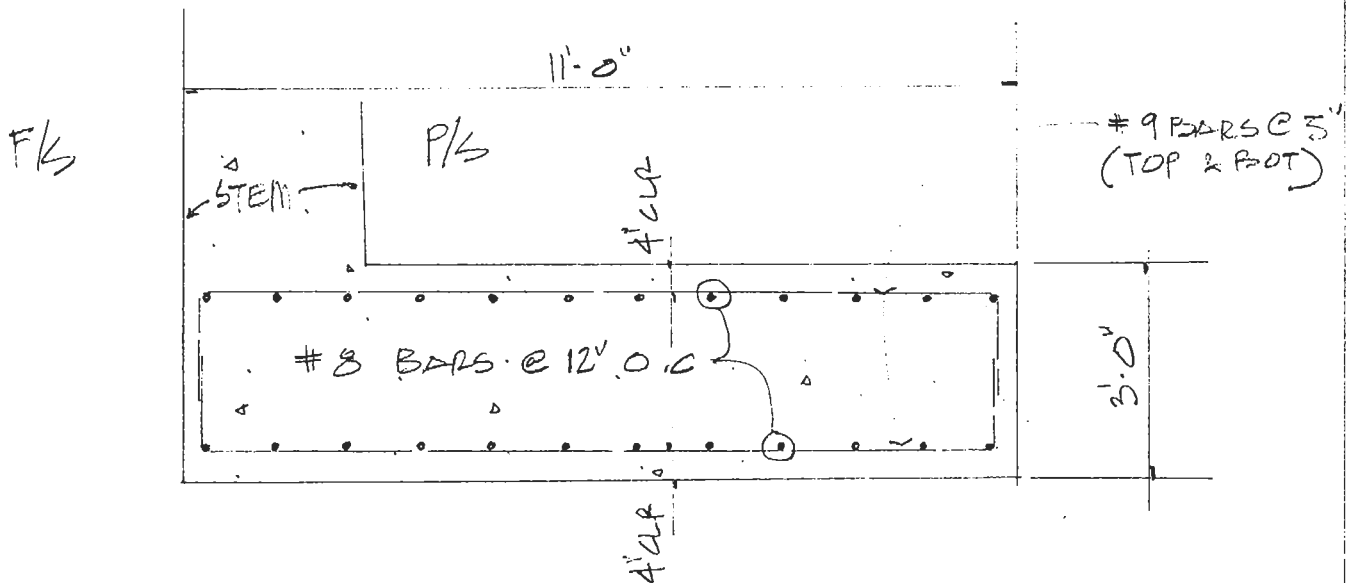


### FDN SLAB DESIGN

#### SHRINKAGE & TEMP REINF

$$12'' \times 36 \times 0.0028 = 1.21''$$

USE #8 @ 12'' O.C. TOP & BOT.  $A_s = 1.58'' > 1.21''$  O.K.



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T WALL BETWEEN  
GATE STRUCTURES

FLOOD SIDE

PROTECTED SIDE

EL. 34.33

EL. 32.33

1'-0"

EL. 37.25

97.8<sup>k</sup> (STEM (R))

74<sup>k</sup> (STEM (T))

0.91'

EL. 27.0

▽GW

128<sup>k</sup>  
140.2<sup>k</sup>  
WATER (R)

9.1<sup>k</sup> SUBMERGED SOIL  
11.3<sup>k</sup> GR. WATER

1.9<sup>k</sup>  
2.0<sup>k</sup>  
WATER (T-R)

1.4<sup>k</sup> SUB. SOIL (T-R)  
1.8<sup>k</sup> GR. WATER (T-R)

4'-0"

3.25'

90.2<sup>k</sup> SUBMERGED BACKFILL (R)  
112.7<sup>k</sup> GROUND WATER (R)

2'-6"

4'-6"

1'-6"

1'-0"

1.83'

EL. 11.25

4.8<sup>k</sup> BASE SLAB (T-R)

+Y

EL. 8.25

120.3<sup>k</sup> BASE SLAB (R)

5'-6"

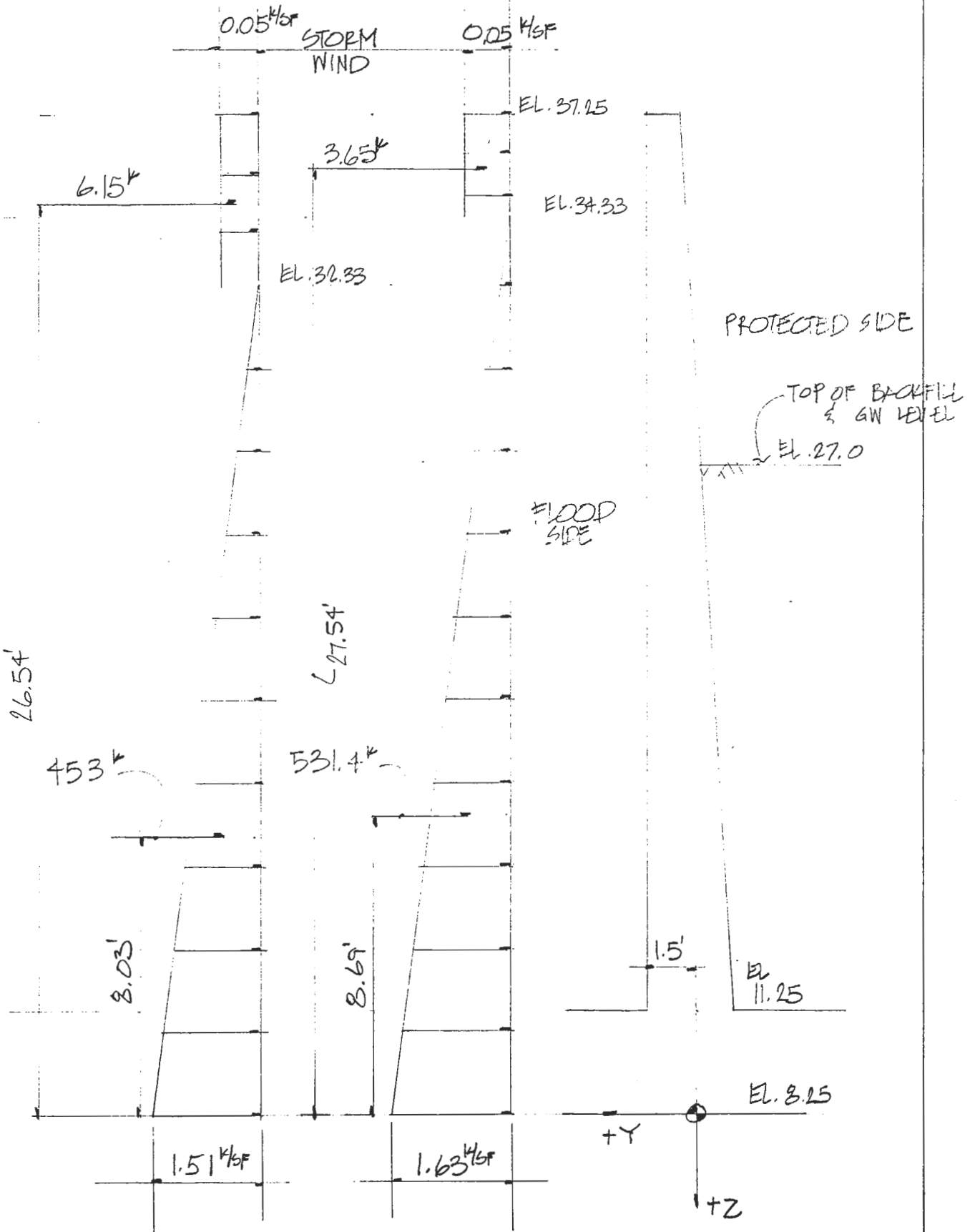
+Z

11'-0"

13 7/8 SHEETS  
3 SQUARE  
100 SHEETS 5 EYE BARS  
100 SHEETS 5 EYE BARS  
200 SHEETS 5 EYE BARS  
100 RECYCLED WHITE 5 SQUARE  
200 RECYCLED WHITE 5 SQUARE  
MADE IN U.S.A.



T WALL BETWEEN GATE  
STRUCTURES  
MONO T-2



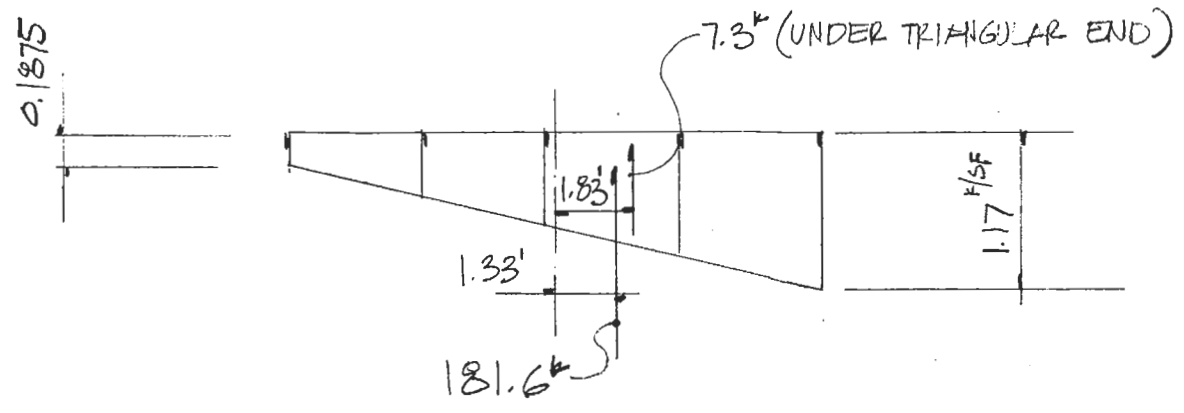
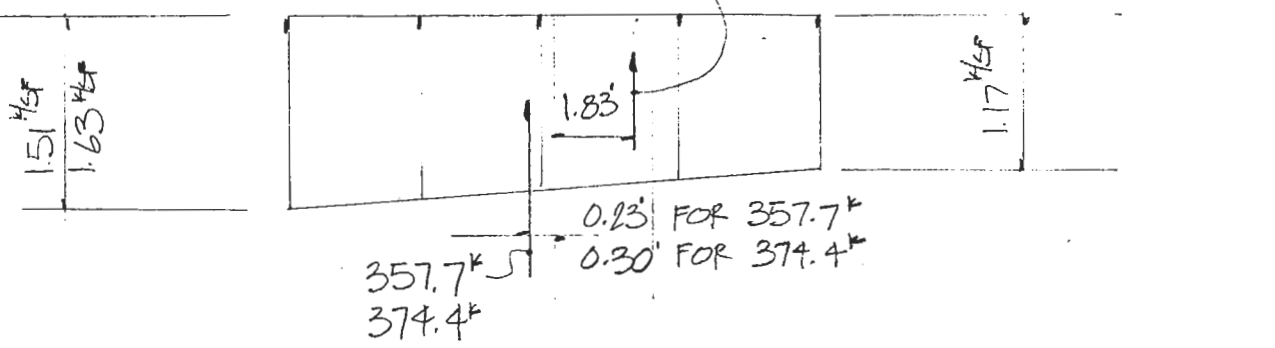
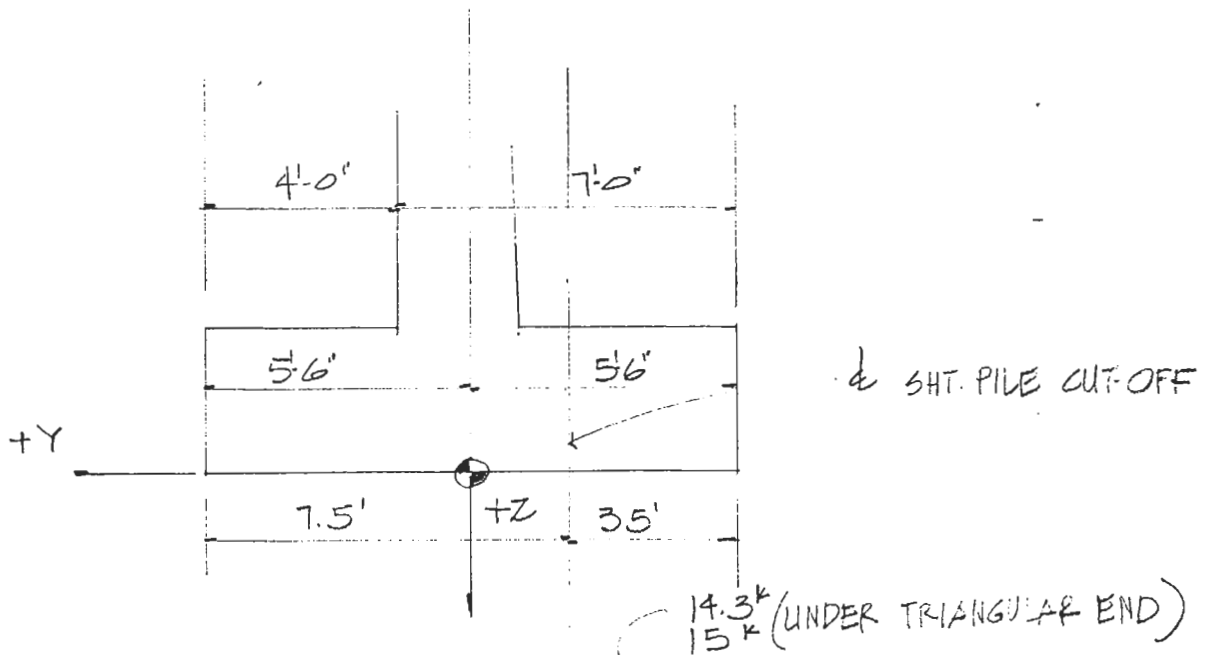
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2000 SHEETS



Made in U.S.A.

T WALL BETWEEN GATE STRUCTURES

137 0 SHEET  
42-361 5 SHEETS  
42-362 100 SHEETS  
42-363 700 SHEETS  
42-364 200 SHEETS  
42-365 200 RECYCLED WHITE  
MADE IN U.S.A.  
National Brand

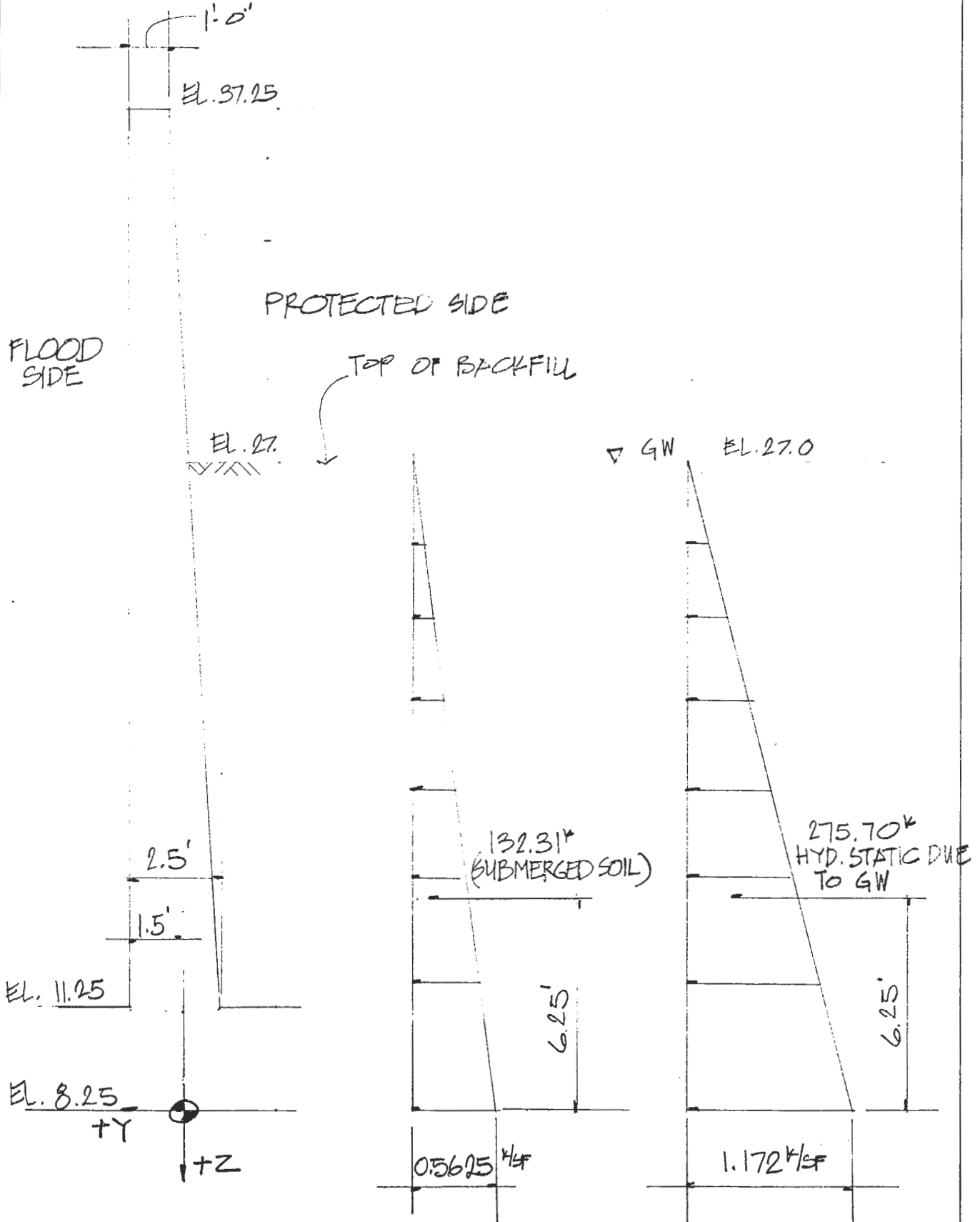


UPLIFT ~ PERVIOUS CUT-OFF



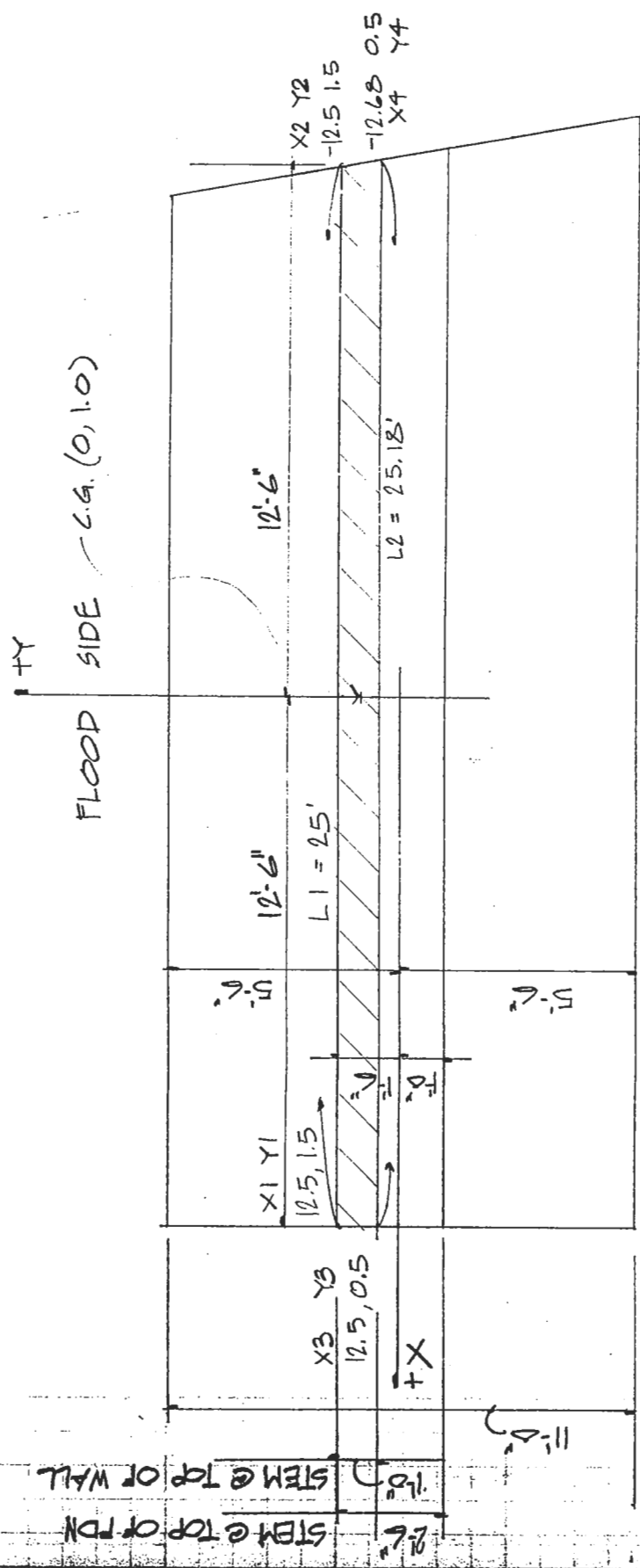
T WALL BETWEEN  
GATE STRUCTURES  
MONO T-2

3 SHEETS: 5 SQUARE  
20 SHEETS: 5 SQUARE  
100 SHEETS: 5 SQUARE  
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'T' WALL BETN GATE  
STRUCTURES  
MONO T-2

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STEM @ TOP OF WALL  
STEM @ TOP OF FDN

PROTECTED SIDE

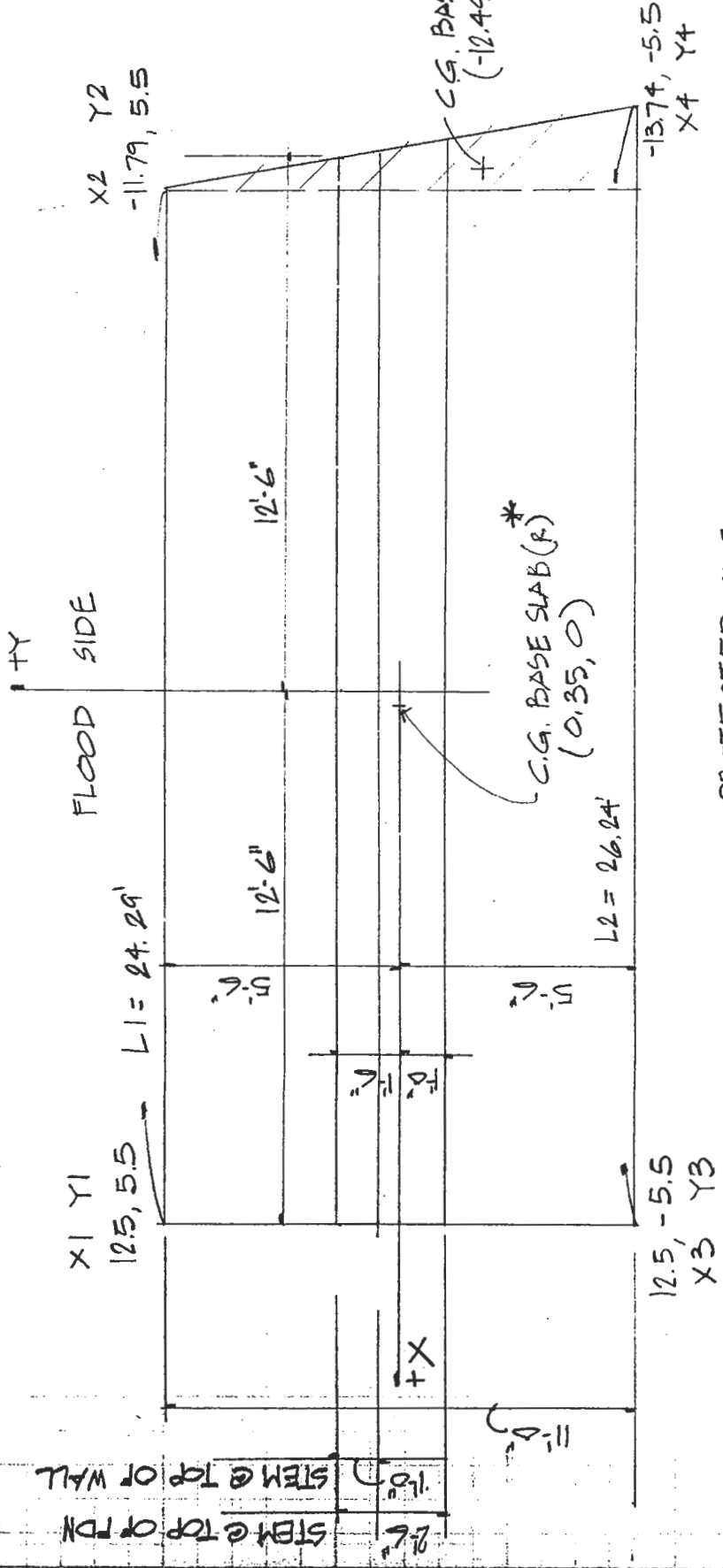




FRONTING PROTECTION  
@ DPS NO 3

DAZE SLAB (F)  
BASE SLAB (T-R) \*\*

T2-8



T WALL BETWEEN GATE  
STRUCTURES  
MONO T-2

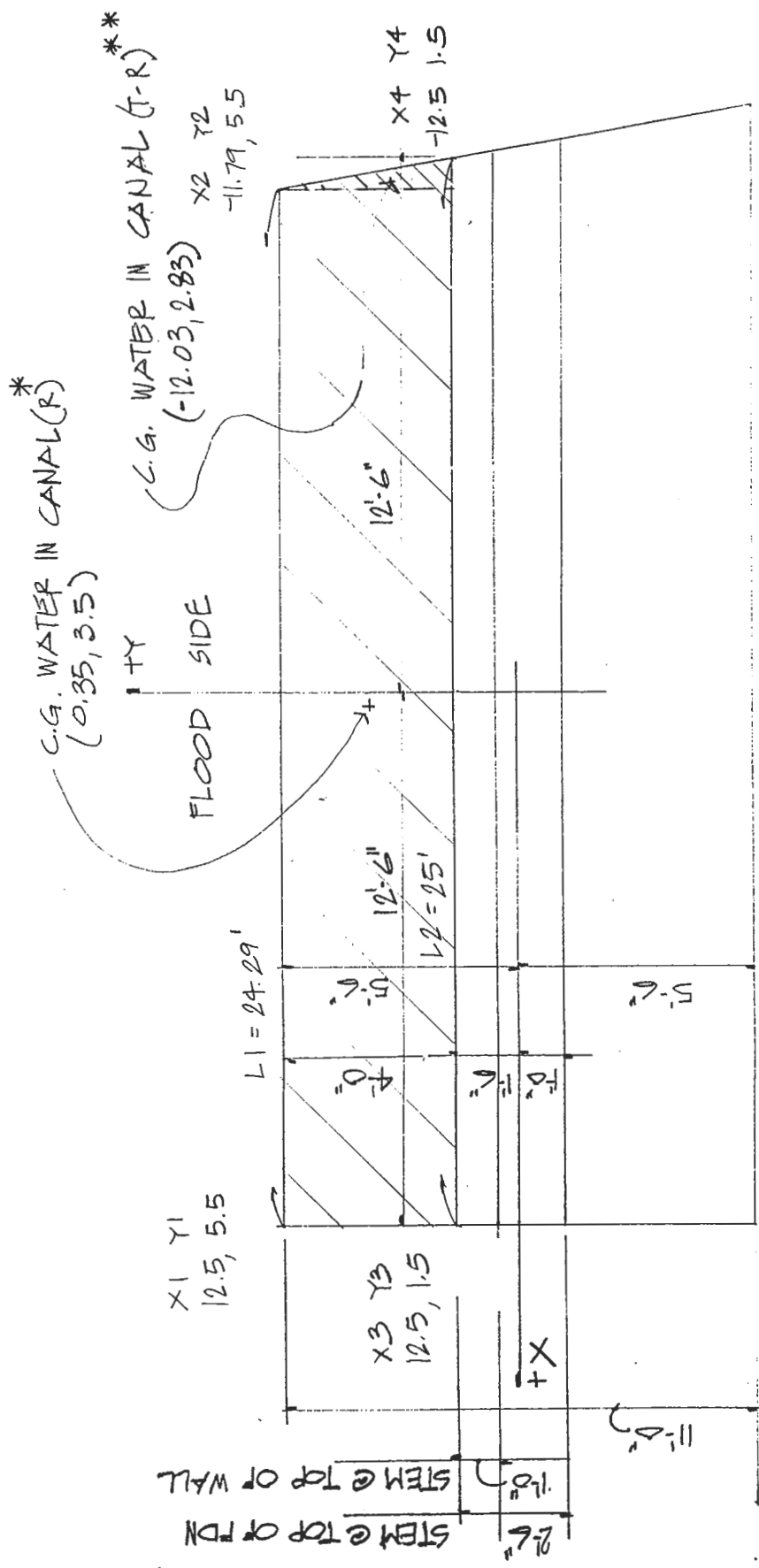
\* RECTANGLE @ RT. END  
\* TRIANGLE @ RT. END  
\* OF BASE SLAB (CROSS-HATCHED)



42362  
06-12-2014  
MD-038 R-6-2-A

T WALL BETWEEN GATE STRUCTURES  
MONO T-2

13-704 50 SHEETS, FULL SIZE, 5 SQUARE  
42-381 50 SHEETS, FULL SIZE, 5 SQUARE  
42-382 50 SHEETS, FULL SIZE, 5 SQUARE  
42-383 50 SHEETS, FULL SIZE, 5 SQUARE  
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42-388 50 SHEETS, FULL SIZE, 5 SQUARE  
42-389 50 SHEETS, FULL SIZE, 5 SQUARE  
42-390 50 SHEETS, FULL SIZE, 5 SQUARE  
42-391 50 SHEETS, FULL SIZE, 5 SQUARE  
42-392 50 SHEETS, FULL SIZE, 5 SQUARE  
42-393 50 SHEETS, FULL SIZE, 5 SQUARE  
42-394 50 SHEETS, FULL SIZE, 5 SQUARE  
42-395 50 SHEETS, FULL SIZE, 5 SQUARE  
42-396 50 SHEETS, FULL SIZE, 5 SQUARE  
42-397 50 SHEETS, FULL SIZE, 5 SQUARE  
42-398 50 SHEETS, FULL SIZE, 5 SQUARE  
42-399 50 SHEETS, FULL SIZE, 5 SQUARE  
42-400 50 SHEETS, FULL SIZE, 5 SQUARE  
100 RECYCLED WHITE 5 SQUARE  
200 RECYCLED WHITE 5 SQUARE  
MOORELL S.S.

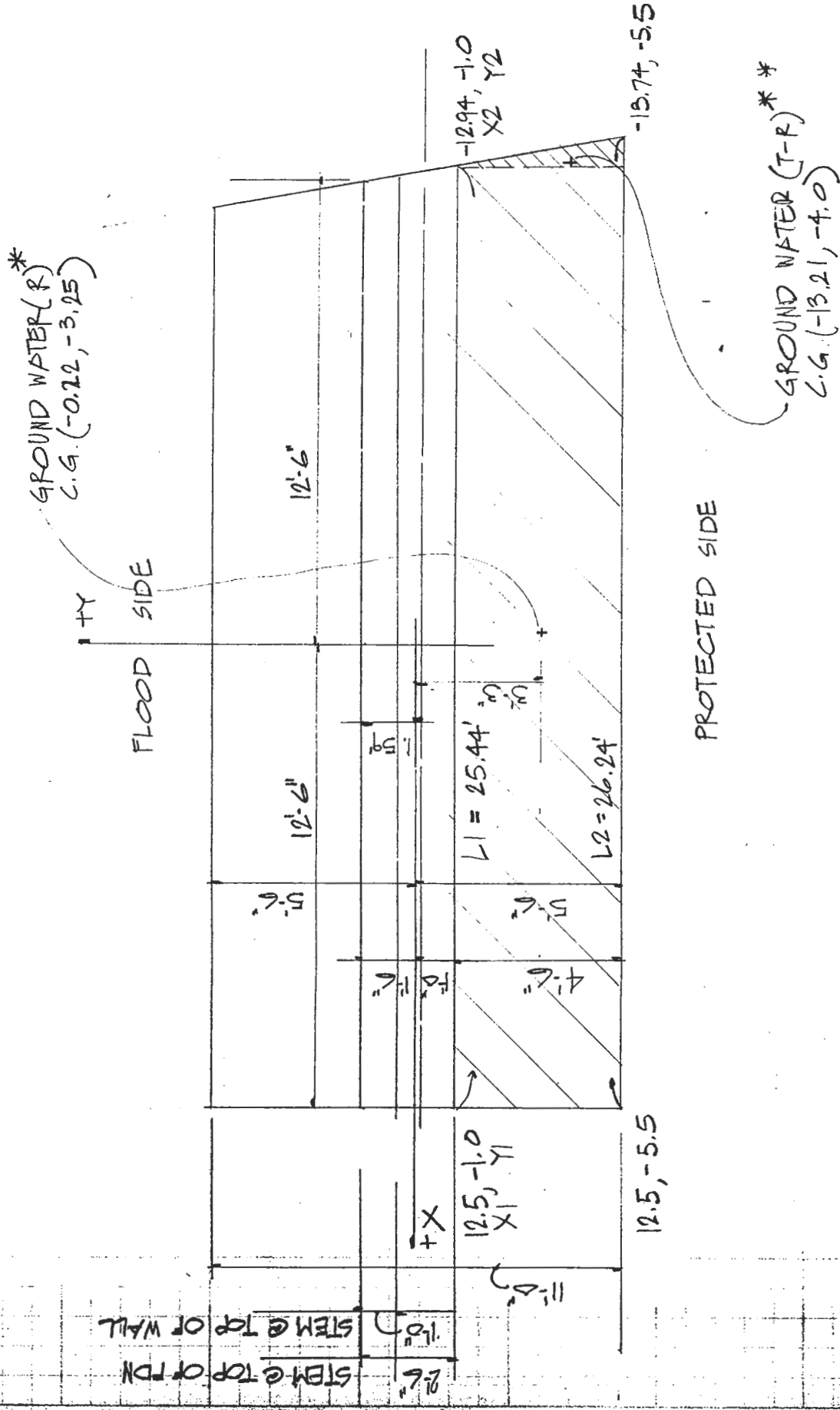


PROTECTED SIDE

\* RECTANGULAR  
\*\* TRIANGLE @ RT. END  
(DENSELY CROSS HATCHED)

T' WALL BETWEEN GATE  
 STRUCTURES

19.1037  
 42-38-381.50 SARENS  
 42-38-389.00 SARENS  
 42-38-392.00 SARENS  
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'T' WALL BETWEEN GATE  
STRUCTURES  
MONO T-2

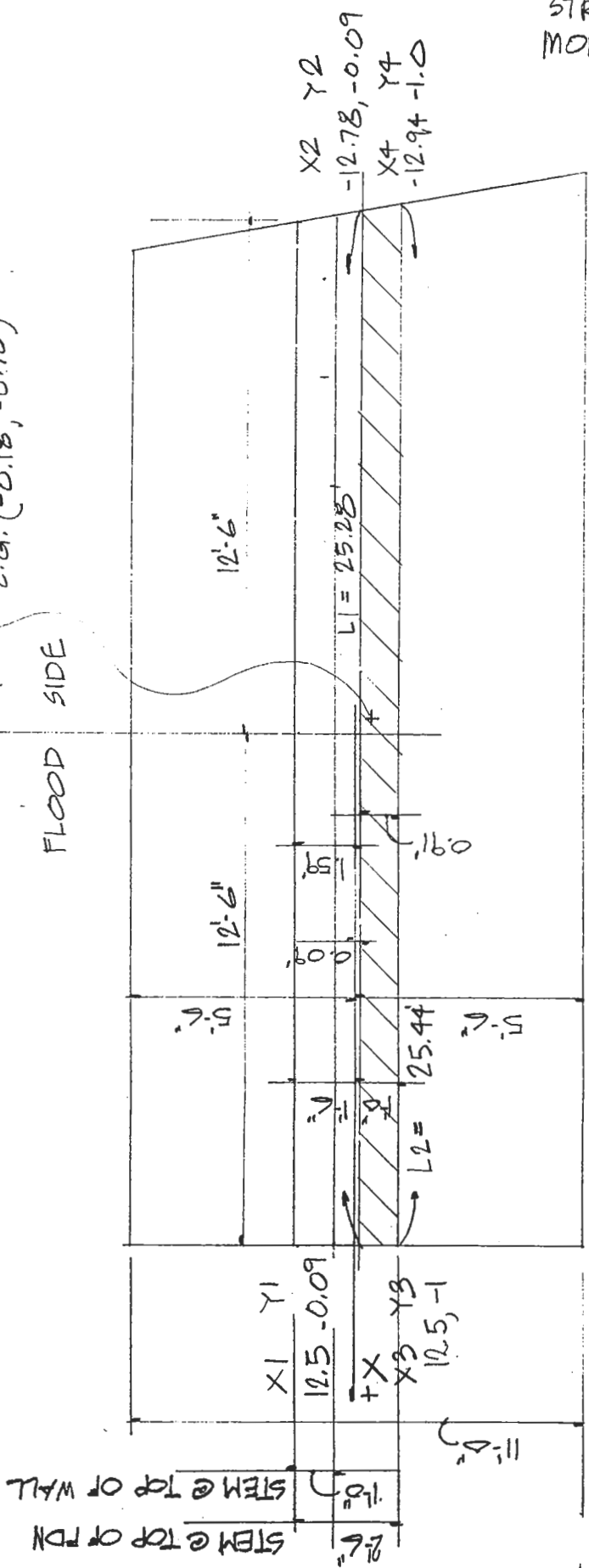
- 13.1 0 SHEET 1 SQUARE
- 42.381 50 SHEETS EYE-EASE 1 SQUARE
- 42.382 100 SHEETS EYE-EASE 1 SQUARE
- 42.383 200 SHEETS EYE-EASE 2 SQUARE
- 42.384 300 SHEETS EYE-EASE 3 SQUARE
- 42.385 400 SHEETS EYE-EASE 4 SQUARE
- 42.386 500 SHEETS EYE-EASE 5 SQUARE
- 42.387 600 SHEETS EYE-EASE 6 SQUARE
- 42.388 700 SHEETS EYE-EASE 7 SQUARE
- 42.389 800 SHEETS EYE-EASE 8 SQUARE
- 42.390 900 SHEETS EYE-EASE 9 SQUARE
- 42.391 100 SHEETS EYE-EASE 10 SQUARE
- 42.392 200 RECYCLED WHITE 2 SQUARE



GROUND WATER (TRI. IN SECTION,  
RECT. IN PLAN)  
G.G. (-0.18, -0.70)

FLOOD SIDE

PROTECTED SIDE

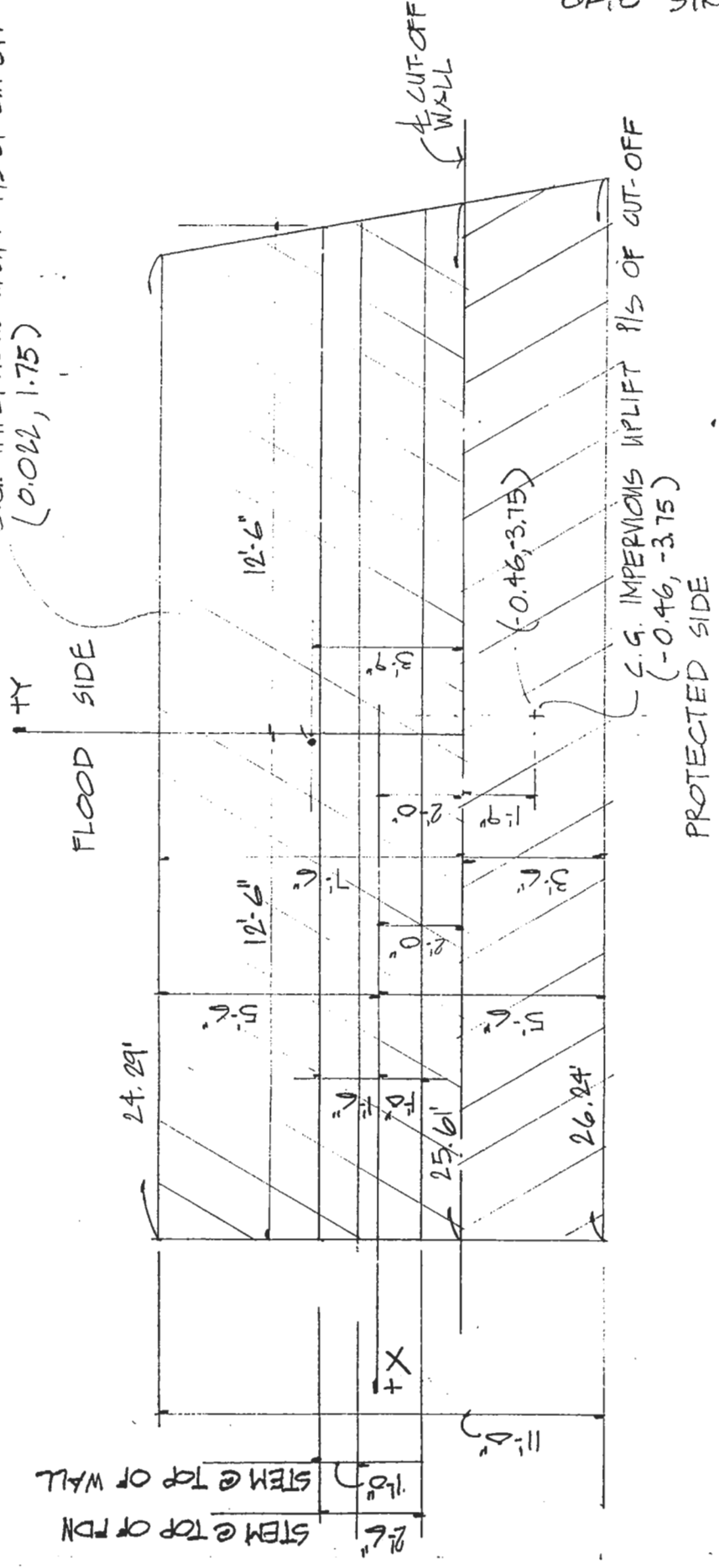


STEM @ TOP OF WALL  
STEM @ TOP OF FDN

T WALL BETWEEN  
GATE STRUCTURES

C.G. IMPERVIOUS UPLIFT F/S OF CUT-OFF  
(0.022, 1.75)

C.G. IMPERVIOUS UPLIFT B/S OF CUT-OFF  
(-0.46, -3.75)



1380  
4280A  
4280B  
4280C  
4280D  
4280E  
4280F  
4280G  
4280H  
4280I  
4280J  
4280K  
4280L  
4280M  
4280N  
4280O  
4280P  
4280Q  
4280R  
4280S  
4280T  
4280U  
4280V  
4280W  
4280X  
4280Y  
4280Z

2'-6" STEM @ TOP OF PDN  
1'-0" STEM @ TOP OF WALL

PROTECTED SIDE

D I M E N S I O N A L   A N D   O T H E R		I N P U T	
CELL REF	ITEM		
C6	LENGTH @ F/S FACE OF STEM	25.00	
C8	WIDTH OF MONOLITH	11.00	
C11	DIST FROM F/S FACE OF STEM TO F/S EDGE OF BASE SLAB	4.00	
C13	STEM TH'KNNESS @ TOP	1.00	
C16	STEM TH'KNNESS @ TOP OF BASE SLAB	2.50	
C18	EL OF TOP OF BASE SLAB	11.25	
C20	EL OF TOP OF STEM	37.25	
C22	EL OF BAKFILL ON P/S	27.00	
C25	EL OF GROUND WATER SURFACE ON P/S	27.00	
C27	HT OF STEM	26.00	

C30	SLOPE/FT OF P/S FACE OF STEM	0.06		
C32	HT OF GW ABOVE BASE SLAB	15.75		
C35	HT OF BACKFILL ABOVE BASE SLAB	15.75		
C38	TH'KNNESS OF STEM @ GW SURFACE EL	1.59		
C41	TH'KNNESS OF STEM @ TOP OF BACKFILL	1.59		
C47	WIDTH OF TRIANGULAR SOIL WEDGE BASE (VERT SIDE OF TRIANGLE BEGINS @ P/S EDGE OF STEM TH'KNNESS AT BASE SLAB)@ GW LEVEL	0.91		
C54	WIDTH OF TRIANGULAR SOIL WEDGE BASE (VERT SIDE OF TRIANGLE BEGINS @ P/S EDGE OF STEM TH'KNNESS AT BASE SLAB)@ TOP OF BACKFILL	0.91		

C59	ANGLE MADE BY RIGHT SIDE EDGE OF MONOLITH WITH Y' AXIS IN RADIAN'S CLKWISW	6.11	
C62	ANGLE MADE BY LEFT SIDE EDGE OF MONOLITH WITH Y' AXIS IN RADIAN'S CLKWISW	0.00	
C65	SLOPE/FT OF RIGHT SIDE EDGE OF MONOLITH IN PLAN	-0.18	
C68	SLOPE/FT OF LEFT SIDE EDGE OF MONOLITH IN PLAN	0.00	
C70	CANAL WATER LEVEL EL	32.33	
C72	CANAL WATER LEVEL EL	34.33	
C75	FOUNDATION SLAB THICKNESS	3	
C78	HT OF WATER IN CANAL WL @ 32.33 ABOVE FDN BOT	24.08	
C81	HT OF WATER IN CANAL WL @34.33 ABOVE FDN BOT	26.08	
C84	HT OF GROUND WATER		



	ABOVE BOT OF FDN	18.75	
C87	NORMAL WATER LEVEL EL IN CANA	21.43	
C90	HT OF NORMA WATER ABOVE BOT OF FDN	13.18	
C93	HT OF BACKFILL ABOVE FDN BOT	18.75	
C96	SURCHARGE ON PROTECTED SIDE	0	
C100	DISTANCE FROM F/S EDGE OF FDN SLAB TO SHT PILE CUT OFF WALL	7.5	

C.O-ORDINATES OF VARIOUS ITEMS	X1	Y1	X2	Y2	X3	Y3	X4	Y4	L1	L2	L
STEM (RECTANGULAR IN PLAN & SECTION)	12.50	1.50	-12.50	1.50	12.50	0.50	-12.68	0.50	25.00	25.18	25.09
STEM (RECTANGULAR IN PLAN & TRIANGULAR IN SECTION)	12.50	0.50	-12.68	0.50	12.50	-1.00	-12.94	-1.00	25.18	25.44	25.31
BASE SLAB	12.50	5.50	-11.79	5.50	12.50	-5.50	-13.74	-5.50	24.29	26.24	25.26
CANAL WATER @ 34.33	12.50	5.50	-11.79	5.50	12.50	1.50	-12.50	1.50	24.29	25.00	24.65
CANAL WATER @ 32.33	12.50	5.50	-11.79	5.50	12.50	1.50	-12.50	1.50	24.29	25.00	24.65
GROUND WATER @ EL 27 (RECTANGULAR IN PLAN AND SECTION)	12.50	-1.00	-12.94	-1.00	12.50	-5.50	-13.74	-5.50	25.44	26.24	25.84
GROUND WATER @ EL 27 (RECTANGULAR IN PLAN AND TRIANGULAR SECTION)	12.50	-0.09	-12.78	-0.09	12.50	-1.00	-12.94	-1.00	25.28	25.44	25.36
SUBMERGED BACKFILL TO TOP OF GW SURFACE (RECTANGULAR IN PLAN AND SECTION)	12.50	-1.00	-12.94	-1.00	12.50	-5.50	-13.74	-5.50	25.44	26.24	25.84
SUBMERGED BACKFILL TO TOP OF GW SURFACE (RECTANGULAR IN PLAN AND TRIANGULAR IN SECTION)	12.50	-0.09	-12.78	-0.09	12.50	-1.00	-12.94	-1.00	25.28	25.44	25.36

SATURATED SOIL FROM TOP OF GW SURFACE TO TOP OF BACKFILL(FROM EL 21.43 TO EL 27.0)(RECTANGULAR IN PLAN AND IN SECTION)	12.50	-0.09	-12.78	-0.09	12.50	-5.50	-13.74	-5.50	25.28	26.24	25.76
SATURATED SOIL FROM TOP OF GW SURFACE TO TOP OF BACKFILL(FROM EL 21.43 TO EL 27.0)(RECTANGULAR IN PLAN AND TRIANGULAR IN SECTION)	12.50	-0.09	-12.78	-0.09	12.50	-0.09	-12.78	-0.09	25.28	25.28	25.28

VERTICAL LOADS		L LENGTH	W WIDTH OR HEIGHT	T THICKNESS	w UNITWT	FZ L x H or W x T x w	CENTER OF GRAVITY		LEVER FOR MX	ARM FOR MY	MOMENT CODE		MOMENTS	
ITEM							X	Y			FOR MX	FOR MY	MX	MY
STEM (R)		25.09	26.00	1.00	0.1500	97.84	0.00	1.00	0.00	1.00	1.00	97.84	0.00	
STEM (T)		25.31	26.00	1.50	0.1500	74.03	-0.09	0.00	0.09	-1.00	1.00	0.00	6.53	
BASE SLAB (R)		24.29	11.00	3.00	0.1500	120.26	0.35	0.00	0.35	-1.00	-1.00	0.00	-42.45	
BASE SLAB (T-R)		1.94	11.00	3.00	0.1500	4.81	-12.44	-1.83	12.44	-1.00	1.00	-8.81	59.79	
BASE SLAB (T-L)		0.00	11.00	3.00	0.1500	0.00	12.50	-1.83	12.50	-1.00	-1.00	0.00	0.00	
<b>TOTAL VERTICAL LOADS (CONC ETC.)</b>						<b>296.93</b>						<b>89.03</b>	<b>23.87</b>	
<b>VERTICAL HYDRAULIC LOADS:</b>														
WATER EL														
32.33	WATER IN CANAL (R)	24.29	21.08	4.00	0.0625	128.03	0.35	3.50	0.35	1.00	-1.00	448.10	-45.20	
	WATER IN CANAL (T-R)	0.71	21.08	4.00	0.0625	1.86	-12.03	2.83	12.03	1.00	1.00	5.27	22.38	
	WATER IN CANAL (T-L)	0.00	21.08	4.00	0.0625	0.00	12.50	2.83	12.50	1.00	-1.00	0.00	0.00	
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 32.33</b>						<b>129.89</b>						<b>453.37</b>	<b>-22.92</b>	
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 34.33</b>														
34.33	WATER IN CANAL (R)	24.29	23.08	4.00	0.0625	140.18	0.35	3.50	0.35	1.00	-1.00	490.62	-49.49	
	WATER IN CANAL (T-R)	0.71	23.08	4.00	0.0625	2.04	-12.03	2.83	12.03	1.00	1.00	5.77	24.50	
	WATER IN CANAL (T-L)	0.00	23.08	4.00	0.0625	0.00	12.50	2.83	12.50	1.00	-1.00	0.00	0.00	
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 34.33</b>						<b>142.21</b>						<b>496.39</b>	<b>-24.98</b>	
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR GW LEVEL ON P/S @ EL 27</b>														
27 P/S	GROUND WATER (R)	25.44	15.75	4.50	0.0625	112.70	-0.22	-3.25	0.22	-1.00	1.00	-366.27	24.87	
	GROUND WATER (T-R)	0.79	15.75	4.50	0.0625	1.76	-13.21	-4.00	13.21	-1.00	1.00	-7.04	23.23	
	GROUND WATER (T-L)	0.00	15.75	4.50	0.0625	0.00	12.50	-4.00	12.50	-1.00	-1.00	0.00	0.00	
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR GW LEVEL ON P/S @ EL 27</b>						<b>125.80</b>						<b>-381.21</b>	<b>50.15</b>	
<b>VERTICAL EARTH LOADS</b>														
BACKFILL EL														
27 P/S	SUBMERGED EARTH(R)	25.44	15.75	4.50	0.0600	108.19	-0.18	-3.25	0.18	-1.00	1.00	-351.61	19.53	
	SUBMERGED EARTH(T-L)	0.79	15.75	4.50	0.0600	1.69	-13.21	-4.00	13.21	-1.00	1.00	-6.76	22.30	

	SUBMERGED EARTH(T-R)	0.00	15.75	4.50	0.0600	0.00	12.50	-4.00	4.00	12.50	-1.00	-1.00	0.00	0.00
27 P/S	SUBMERGED EARTH(TRI ANGULAR IN SECTION, RECT IN PLAN)	25.36	15.75	0.91	0.0600	10.89	-0.18	-0.70	0.70	0.18	-1.00	1.00	-7.59	1.97
	<b>TOTAL SUBMERGED EARTH LOADS W/ GW LEVEL @ 27</b>					<b>120.77</b>							<b>-365.96</b>	<b>43.80</b>
FROM 21.33 TO 27.00 P/S	SATURATED BACKFILL (R) SATURATED BACKFILL (T-L) SATURATED BACKFILL (T-R)	25.28 0.00 0.95	0.00 0.00 0.00	5.41 5.41 5.41	0.1150 0.1150 0.1150	0.00 0.00 0.00	-0.18 -13.10 12.50	-2.80 -3.70 -3.70	2.80 3.70 3.70	0.18 13.10 12.50	-1.00 -1.00 -1.00	1.00 1.00 -1.00	0.00 0.00 0.00	0.00 0.00 0.00
FROM 21.33 TO 27.00 P/S	SATURATED BACKFILL (TRI ANGULAR IN SECTION, AND RECT IN PLAN)	25.28	0.00	0.00	0.1150	0.00	-0.18	-0.09	0.09	0.18	-1.00	1.00	0.00	0.00
	<b>TOTAL SATURATED EARTH LOADS W/ GW @ 27 AND TOP OF BACKFILL @ 27.0</b>					<b>0.00</b>							<b>0.00</b>	<b>0.00</b>

HORIZONTAL HYDRAULIC LOADS										
WATER EL	ITEM	HT OF WATER HT	UNIT WT w	LENGTH L	SHAPE OF PRES DIAG	HORIZ LD FY w x HT x HT/2 xL	LEVER ARM FOR MX	MOMENT FY x LEVARM MX		
32.33	WATER LEVEL IN CANAL	24.08	0.0625	25.09	TRFS	-454.60	8.03	-3648.96		
34.33	WATER LEVEL IN CANAL	26.08	0.0625	25.09	TRFS	-533.26	8.69	-4635.77		
27.00	GROUND WATER LEVEL	18.75	0.0625	25.09	TRPS	275.63	6.25	1722.67		
21.43	NORMAL WL IN CANAL	13.18	0.0625	25.09	TRFS	-136.19	4.39	-598.34		
24.25	WATER LEVEL IN CANAL	13.00	0.06	25.09	TRFS	-132.50	4.33	-574.16		
11.25	GROUND WL ON F/S	3.00	0.06	25.09	TRFS	-7.06	1.00	-7.06		
HORIZONTAL EARTH LOADS										
TOP OF BACKFILL EL.	ITEM	HT OF BACKFILL HT	UNIT WT x Ka w x 0.5	LENGTH L	SHAPE OF PRES DIAG	FY w x Ka x HT x HT/2 xL	LEVER ARM FOR MX	MOMENT FY x LEVARM MX		
27	SATURATED SOIL FROM EL 27 TO TOP OF GW LEVEL @ EL 21.43 (TRIANGULAR PRESSURE DIAG)	0	0.06	25.08826	TRPS	0.00	18.75	0.00		
27	SUBMERGED BACKFILL FROM EL 21.43 TO EL 8.25 (RECTANGULAR PRESSURE DIAG)	18.75	0.03	25.09	RECTPS	0.00	9.38	0.00		

27	SUBMERGED BACKFILL FROM EL 27 TO EL 8.25 (TRIANGULAR PRESSRE DIAG)	18.75	0.03	25.09	TRPS	132.30	6.25	826.88
27	SURCHARGE(0.1 k/sf) (RECTANGULAR PRESURE DIAG)	18.75		25.09		0.00	9.38	0.00
27	HYDROSTATIC PRESSURE FORM GW (TRIANGULAR PRESSURE DIAG)	18.75	0.0625	25.09	TRPS	275.63	6.25	1722.67
<b>TOTAL HORIZONTAL EARTH LOADS FOR TOP OF BACKFILL @ 27 AND GW LEVEL @ 21.43</b>						<b>407.93</b>		<b>2549.56</b>

T WALL MONOLITH BETWEEN GATE STRUCTURES

MONO-T2.WK4

WATER EL	ITEM	LENGTH	HEIGHT OF WATER (FS) HT1	HEIGHT OF WATER (PS) HT2	UNIT WT W	UPLIFT FS EDGE W X HT1	UPLIFT PS EDGE W X HT2	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY X	Y	LEVRM FOR MX	LEVRM FOR MY	MOMENT FOR MX	CO DE FOR MY	MOMENT FOR MY	MOMENT MX	MOMENT MY	REMARK
<b>HYDROSTATIC UPLIFT LOADS (PERVIOUS CUT-OFF)</b>																				
<b>WL IN CANAL @ 32.33 AND GW LEVEL @ 27. PERVIOUS CUT-OFF</b>																				
32.33 (FS)	WATER IN CANAL (FS)	24.29	24.08	18.75	0.06250	1.51	1.17	11.00	TRAP	-357.68	0.35	0.23	0.35	0.35	-1.00	1.00	-81.60	126.27		
27.00 (PS)	GROUND WATER (PS)																			
32.33 (FS)	WATER IN CANAL (FS)	1.94	24.08	18.75	0.06250	1.51	1.17	11.00	TRAP	-14.29	-12.44	-1.83	1.83	12.44	1.00	-1.00	26.20	-177.82		
27.00 (PS)	GROUND WATER (PS)																			
32.33 (FS)	WATER IN CANAL (FS)	0.00	24.08	18.75	0.06250	1.51	1.17	11.00	TRAP	0.00	12.50	-1.83	1.83	12.50	1.00	1.00	0.00	0.00		
27.00 (PS)	GROUND WATER (PS)																			
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 AND GW @ 27 AND PERVIOUS CUT-OFF</b>																				
<b>WL IN CANAL @ 34.33 AND GW LEVEL @ 27. PERVIOUS CUT-OFF</b>																				
34.33 (FS)	WATER IN CANAL (FS)	24.29	26.08	18.75	0.06250	1.63	1.17	11.00	TRAP	-374.38	-0.35	0.30	0.30	-0.35	-1.00	-1.00	-112.22	132.16		
27.00 (PS)	GROUND WATER (PS)																			
34.33 (FS)	WATER IN CANAL (FS)	1.94	26.08	18.75	0.06250	1.63	1.17	11.00	TRAP	-14.96	-12.44	-1.83	1.83	12.44	1.00	-1.00	27.43	-186.13		
27.00 (PS)	GROUND WATER (PS)																			
34.33 (FS)	WATER IN CANAL (FS)	0.00	26.08	18.75	0.06250	1.63	1.17	11.00	TRAP	0.00	12.50	-1.83	1.83	12.50	1.00	1.00	0.00	0.00		
27.00 (PS)	GROUND WATER (PS)																			
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 AND GW @ 27. PERVIOUS CUT-OFF</b>																				
<b>WL IN CANAL @ 24.25 AND GW LEVEL @ 27. PERVIOUS CUT-OFF</b>																				
24.25 (FS)	WATER IN CANAL (FS)	24.29	16.00	18.75	0.06250	1.00	1.17	11.00	TRAP	-290.20	-0.35	-0.15	-0.15	-0.35	1.00	-1.00	-42.10	102.45		
27.00 (PS)	GROUND WATER (PS)																			
24.25 (FS)	WATER IN CANAL (FS)	1.94	16.00	18.75	0.06250	1.00	1.17	11.00	TRAP	-11.60	-12.44	-1.83	1.83	12.44	1.00	-1.00	21.26	-144.28		
27.00 (PS)	GROUND WATER (PS)																			
24.25 (FS)	WATER IN CANAL (FS)	0.00	16.00	18.75	0.06250	1.00	1.17	11.00	TRAP	0.00	12.50	-1.83	1.83	12.50	1.00	1.00	0.00	0.00		
27.00 (PS)	GROUND WATER (PS)																			
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.25 AND GW @ 27.00 AND PERVIOUS CUT-OFF</b>																				
<b>HYDROSTATIC UPLIFT LOADS (IMPERVIOUS CUT-OFF)</b>																				
<b>WL IN CANAL @ 32.33 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF</b>																				
32.33 (FS)	WATER IN CANAL (FS)	24.96	24.08	24.08	0.06250	1.51	1.51	7.50	RECT	-281.69	0.02	1.75	1.75	0.02	-1.00	1.00	-492.96	6.39		
27.00 (PS)	GROUND WATER (PS)	25.93	18.75	18.75	0.06250	1.17	1.17	3.50	RECT	-106.34	-0.46	-3.75	3.75	0.46	1.00	-1.30	388.77	-48.92		
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 AND GW @ 27.00 IMPERVIOUS CUT-OFF</b>																				
<b>WL IN CANAL @ 34.33 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF</b>																				
34.33 (FS)	WATER IN CANAL (FS)	24.74	26.08	26.08	0.06250	1.63	1.63	7.50	RECT	-302.39	0.02	1.75	1.75	0.02	-1.00	1.00	-529.18	5.79		



21.43(P/S) GROUND WATER (P/S)	25.93	18.75	18.75	0.06250	1.17	1.17	3.50	RECT	-106.34	-0.46	-3.75	3.75	0.46	1.00	-1.00	398.77	-48.92
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 AND GW @ 27 IMPERVIOUS CUT-OFF</b>									<b>-408.73</b>							<b>-130.40</b>	<b>-43.73</b>
<b>WL IN CANAL @ 24.28 AND GW LEVEL @ 27 IMPERVIOUS CUT-OFF</b>																	
24.25 (F/S) WATER IN CANAL (F/S)	24.74	16.00	16.00	0.06250	1.00	1.00	7.50	RECT	-185.51	0.02	1.75	1.75	0.02	-1.00	1.00	-324.65	3.55
21.43(P/S) GROUND WATER (P/S)	25.93	18.75	18.75	0.06250	1.17	1.17	3.50	RECT	-106.34	-0.46	-3.75	3.75	0.46	1.00	-1.00	398.77	-48.92
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.28 AND GW @ 27 IMPERVIOUS CUT-OFF</b>									<b>-291.85</b>							<b>74.12</b>	<b>-45.37</b>

<b>HYDROSTATIC UPLIFT LOADS</b>																				
<b>PERVIOUS CUT-OFF</b>																				
WATER EL	ITEM	LENGTH	HEIGHT OF WATER (P/S) HIT	HEIGHT OF WATER (P/S) HTZ	UNIT WT W	UPLIFT FIS EDGE W x HIT	UPLIFT P/EDGE W x HTZ	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY X	Y	LEVARM FOR MX	LEVARM FOR MY	MOMENT FOR MX	MOMENT FOR MY	C O D E	MOMENT FOR MX	MOMENT FOR MY	REMARK
11.25 (F/S)	WATER IN CANAL (F/S)	24.29	3.00	18.75	0.06250	0.19	1.17	11.00	TRAP	-181.64	-0.35	1.33	1.33	-0.35	-1.00	-241.14	-1.00	64.12		
27.00 (P/S)	GROUND WATER (P/S)																			
11.25 (F/S)	WATER IN CANAL (F/S)	1.94	3.00	18.75	0.06250	0.19	1.17	11.00	TRAP	-7.26	-12.44	-1.83	1.83	12.44	1.00	13.31	-1.00	-90.30		
27.00 (P/S)	GROUND WATER (P/S)																			
11.25 (F/S)	WATER IN CANAL (F/S)	0.00	3.00	18.75	0.06250	0.19	1.17	11.00	TRAP	0.00	12.50	-1.83	1.83	12.50	1.00	0.00	1.00	0.00		
27.00 (P/S)	GROUND WATER (P/S)																			
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 27 PERVIOUS CUT-OFF</b>																				
<b>HYDROSTATIC UPLIFT LOADS</b>																				
<b>IMPERVIOUS CUT-OFF</b>																				
WATER EL	ITEM	LENGTH	HEIGHT OF WATER (P/S) HIT	HEIGHT OF WATER (P/S) HTZ	UNIT WT W	UPLIFT FIS EDGE W x HIT	UPLIFT P/EDGE W x HTZ	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY X	Y	LEVARM FOR MX	LEVARM FOR MY	MOMENT FOR MX	MOMENT FOR MY	C O D E	MOMENT FOR MX	MOMENT FOR MY	REMARK
11.25 (F/S)	WATER IN CANAL (F/S)	24.96	3.00	18.75	0.06250	0.19	1.17	7.50	RECT	-35.09	0.02	1.75	1.75	0.02	-1.00	-61.41	1.00	0.67		
27 (P/S)	GROUND WATER (P/S)	25.93	18.75	18.75	0.06250	1.17	1.17	3.50	RECT	-105.34	-0.46	-3.75	3.75	0.46	1.00	398.77	-1.00	-48.92		
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 27 IMPERVIOUS CUT-OFF</b>																				

<b>H O R I Z O N T A L W I N D L O A D S</b>									
<b>STORM WIND LOADS:</b>									
<b>WATER EL</b>	<b>ITEM</b>	<b>LENGTH</b>	<b>EXPOSED HEIGHT</b>	<b>WIND INTENSITY</b>	<b>SHAPE OF PRES DIAG</b>	<b>FY</b>	<b>LEVARM</b>	<b>MOMENT</b>	<b>MX</b>
			<b>HT</b>	<b>q</b>					
32.33	EXPOSED WALL SURFACE	25	4.92	0.05	RECTFS	-6.15	26.54	-163.221	
34.33	EXPOSED WALL SURFACE	25	2.92	0.05	RECTFS	-3.65	27.54	-100.521	
<b>OPERATING WIND LOADS</b>									
11.25	EXPOSED WALL SURFACE	25	26	0.01	RECTFS	-6.5	16	-104	
24.25	EXPOSED WALL SURFACE	25	13	0.01	RECTFS	-3.25	9.5	-30.875	

LOAD COMBINATIONS:						
ITEM	FX	FY	FZ	MX	MY	MZ
<b>CASE I : CONSTRUCTION CASE. OP. WIND, NO WATER OR EARTH LOADS:</b>						
CONCRETE LOADS			296.9333	89.03401	23.86714	
OPERATING WINDS		-6.5		-104		
<b>TOTAL FOR CASE I :</b>		<b>-6.5</b>	<b>296.9333</b>	<b>-14.966</b>	<b>23.86714</b>	
<b>CASE II : WL IN CANAL @ 32.33, STORM WIND, BACKFILL IN PLACE GW @ 27.00, IMPERVIOUS CUT-OFF.</b>						
CONCRETE LOADS			296.9333	89.03401	23.86714	
WATER LOADS			129.89	453.37	-22.8177	
SUBMERGED BACKFILL			120.7664	-365.961	43.80235	
SATURATED BACKFILL			0	0	0	
UPLIFT			-388.03	-94.18	-43.5254	

HYDROSTATIC PRESSURE				-454.60			-3648.96	
EARTH PRESSURE				407.93			2549.557	
STORM WIND				-6.15			-163.221	
<b>TOTAL FOR CASE II :</b>				<b>-52.8251</b>	<b>159.56</b>	<b>-1180.36</b>	<b>1.326379</b>	
<b>CASE III : WL IN CANAL@32.33, STORM WIND, BACKFILL IN PLACE</b>								
<b>GW @ 27.00, PERVIOUS CUT-OFF.</b>								
CONCRETE LOADS					296.9333	89.03401	23.86714	
WATER LOADS					129.89	453.37	-22.8177	
SUBMERGED BACKFILL					120.7664	-365.961	43.80235	
SATURATED BACKFILL					0	0	0	
UPLIFT					-371.97	-55.40	-51.5556	
HYDROSTATIC PRESSURE				-454.60		-3648.96		
EARTH PRESSURE				407.93		2549.557		
STORM WIND				-6.15		-163.221		
<b>TOTAL FOR CASE III :</b>				<b>-52.8251</b>	<b>175.6209</b>	<b>-1141.57</b>	<b>-6.70378</b>	
<b>CASE IV : WL IN CANAL EMPTY, BACKFILL IN PLACE, OP. WIND</b>								
<b>GW @ 27.00, IM PERVIOUS CUT-OFF.</b>								
CONCRETE LOADS					296.9333	89.03401	23.86714	

SUBMERGED BACKFILL			120.7664	-365.961	43.80235	
SATURATED BACKFILL			0	0		
UPLIFT			-141.434	-94.1817	-48.2447	
HYDROSTATIC PRESSURE		-7.05607		-7.05607		
EARTH PRESSURE		407.9292		2549.557		
OPERATING WIND		-6.5		-104		
<b>TOTAL FOR CASE IV :</b>		<b>394.3731</b>	<b>276.2656</b>	<b>2067.393</b>	<b>19.42474</b>	
<b>CASE V : WL IN CANAL EMPTY, BACKFILL IN PLACE, OP. WIND</b>						
<b>GW @ 27.00, PERVIOUS CUT-OFF.</b>						
CONCRETE LOADS			296.9333	89.03401	23.86714	
SUBMERGED BACKFILL			120.7664	-365.961	43.80235	
SATURATED BACKFILL			0	0		
UPLIFT			-188.894	-227.829	-26.181	
HYDROSTATIC PRESSURE		-7.05607		-7.05607		
EARTH PRESSURE		407.9292		2549.557		
OPERATING WIND		-6.5		-104		
<b>TOTAL FOR CASE V :</b>		<b>394.3731</b>	<b>228.8062</b>	<b>1933.745</b>	<b>41.48845</b>	
<b>CASE VI : WL IN CANAL @ 34.33, STORM WIND, BACKFILL IN PLACE</b>						
<b>GW @ 27.00, IMPERVIOUS CUT-OFF.</b>						

CONCRETE LOADS			296.9333	89.03401	<u>23.87</u>
WATER LOADS			142.21	496.39	<u>-24.98</u>
SUBMERGED BACKFILL			120.7664	-365.961	43.80235
SATURATED BACKFILL			0	0	
UPLIFT			-408.73	-130.40	-43.1293
HYDROSTATIC PRESSURE		-533.26		-4635.77	
EARTH PRESSURE		407.93		2549.557	
STORM WIND		-6.15		-163.221	
<b>TOTAL FOR CASE VI :</b>		<b>-131.477</b>	<b>151.1847</b>	<b>-2160.38</b>	<b>-0.44235</b>
<b>CASE VII : WL IN CANAL @ 34.33, STORM WIND, BACKFILL IN PLACE</b>					
<b>GW @ 27.00, PERVIOUS CUT-OFF.</b>					
CONCRETE LOADS			296.9333	89.03401	23.86714
WATER LOADS			142.21	496.39	-24.9826
SUBMERGED BACKFILL			120.7664	-365.961	43.80235
SATURATED BACKFILL			0	0	
UPLIFT			-389.34	-84.80	-53.963
HYDROSTATIC PRESSURE		-533.26		-4635.77	
EARTH PRESSURE		407.93		2549.557	
STORM WIND		-6.15		-163.221	
<b>TOTAL FOR CASE VII :</b>		<b>-131.477</b>	<b>170.5748</b>	<b>-2114.77</b>	<b>-11.2761</b>

<b>CASE VIII : WL IN CANAL EMPTY, BACKFILL IN PLACE, OP. WIND</b>									
<b>GW @ 21.43, IMPERVIOUS CUT-OFF.</b>									
CONCRETE LOADS									
SUBMERGED BACKFILL									
SATURATED BACKFILL									
UPLIFT									
HYDROSTATIC PRESSURE									
EARTH PRESSURE									
OPERATING WIND									
TOTAL FOR CASE VIII :									
<b>CASE IX : WL IN CANAL EMPTY, BACKFILL IN PLACE, OP. WIND</b>									
<b>GW @ 21.43, PERVIOUS CUT-OFF.</b>									
CONCRETE LOADS									
SUBMERGED BACKFILL									
SATURATED BACKFILL									
UPLIFT									
HYDROSTATIC PRESSURE									
EARTH PRESSURE									
OPERATING WIND									



MONO-T2.WK4

T WALL MONOLITH BETWEEN GATE STRUCTURES

6

TOTAL FOR CASE IX :									

PEPPER & ASSOCIATES

CONSULTING ENGINEERS

METAIRIE, LA 70002

SUMMARY OF LOAD CASES:									
ITEM	FX	FY	FZ	MX	MY	MZ			
TOTAL FOR CASE I :	0	-6.5	296.9333	-14.966					
TOTAL FOR CASE II :	0	-52.8251	139.4322	-1119.36					
TOTAL FOR CASE III :	0	-52.8251	155.4931	-1080.58					
TOTAL FOR CASE IV :	0	394.3731	256.1379	2128.386					
TOTAL FOR CASE V :	0	394.3731	208.6784	1994.739					
TOTAL FOR CASE VI :	0	-131.477	131.0569	-2099.39					
TOTAL FOR CASE VII :	0	-131.477	150.4471	-2053.78					

\_0 T WALL MONOLITH BETWEEN SLUICE GATE STRUCTURES ( MONOLITH T-2 )  
20 PROP 29000 724 261 21.4 2 0 ALL  
70 SOIL ES 0.079 LEN 73 0 ALL  
00 PIN ALL  
100 ALLOW H 122 92 385 385 709 2119 ALL  
60 BATTER 3.0 1 3  
120 BATTER 3.5 4 TO 9  
85 BATTER 3.0 10 TO 15  
130 ANGLE 90 1 TO 9  
140 ANGLE 270 10 TO 15  
130 PILE 1 11 4 0  
340 PILE 4 11 -.5 0  
250 PILE 10 11 -4 0  
160 ROW X 3 1 2 AT -10.5  
370 ROW X 6 4 5 AT -4.2  
380 ROW X 6 10 5 AT -4.7  
120 LOAD 1 0 -6.5 296.9 -15 0 0  
130 LOAD 2 0 -52.8 139.4 -1119.4 0 0  
440 LOAD 3 0 -52.8 155.5 -1080.6 0 0  
150 LOAD 4 0 394.4 256.1 2128.4 0 0  
160 LOAD 5 0 394.4 208.7 1994.7 0 0  
470 LOAD 6 0 -98.6 98 -1575 0 0  
480 LOAD 7 0 -98.6 113 -1540 0 0  
180 FOU 1 2 3 4 5 6 7 B:\T-2.OUT  
690 TOUT 1 2 3 4 5 6 7  
700 PFO ALL  
10 FPL N

\*\*\*\*\*  
 \* CORPS PROGRAM # X0080 \* CPGA - CASE PILE GROUP ANALYSIS PROGRAM  
 \* VERSION NUMBER # 86/09/02-C \* RUN DATE 01-21-95 RUN TIME 20:46:00  
 \*\*\*\*\*

T WALL MONOLITH BETWEEN SLUICE GATE STRUCTURES ( MONOLITH T-2 )

THERE ARE 15 PILES AND  
 7 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

	X	Y	Z
	-----	-----	-----
WITH DIAGONAL COORDINATES = (	-12.50 ,	-4.00 ,	.00 )
	( 11.00 ,	4.00 ,	.00 )

\*\*\*\*\*

PILE PROPERTIES AS INPUT

E	I1	I2	A	C33	B66
KSI	IN**4	IN**4	IN**2		
.29000E+05	.72400E+03	.26100E+03	.21400E+02	.20000E+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
	.79000E-01	L	.73000E+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	11.00	4.00	.00	3.00	90.00	73.00	P
2	.50	4.00	.00	V	90.00	73.00	P
3	-10.00	4.00	.00	3.00	90.00	73.00	P
4	11.00	-.50	.00	3.50	90.00	73.00	P
5	6.80	-.50	.00	3.50	90.00	73.00	P
6	2.60	-.50	.00	3.50	90.00	73.00	P

7	-1.60	-.50	.00	3.50	90.00	73.00	P
8	-5.80	-.50	.00	3.50	90.00	73.00	P
9	-10.00	-.50	.00	3.50	90.00	73.00	P
10	11.00	-4.00	.00	3.00	270.00	73.00	P
11	6.30	-4.00	.00	3.00	270.00	73.00	P
12	1.60	-4.00	.00	3.00	270.00	73.00	P
13	-3.10	-4.00	.00	3.00	270.00	73.00	P
14	-7.80	-4.00	.00	3.00	270.00	73.00	P
15	-12.50	-4.00	.00	3.00	270.00	73.00	P

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1095.00

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APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	-6.5	296.9	-15.0	.0	.0
2	.0	-52.8	139.4	-1119.4	.0	.0
3	.0	-52.8	155.5	-1080.6	.0	.0
4	.0	394.4	256.1	2128.4	.0	.0
5	.0	394.4	208.7	1994.7	.0	.0
6	.0	-98.6	98.0	-1575.0	.0	.0
7	.0	-98.6	113.0	-1540.0	.0	.0

\*\*\*\*\*

ORIGINAL PILE GROUP STIFFNESS MATRIX

.10699E+03	-.49627E-04	-.10450E-03	-.26442E-02	.10814E-02	.12838E+04
-.49627E-04	.18511E+04	.54324E+03	.14917E+06	-.41366E+05	-.20931E+04
-.10450E-03	.54324E+03	.19485E+05	-.22411E+06	-.20932E+04	.41366E+05
-.26442E-02	.14917E+06	-.22411E+06	.27062E+08	-.41666E+07	-.93412E+06
.10814E-02	-.41366E+05	-.20932E+04	-.41666E+07	.17082E+09	-.63521E+07
.12838E+04	-.20931E+04	.41366E+05	-.93412E+06	-.63521E+07	.18058E+08

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 =	3.
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 =	7.
LOAD CASE	5.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	7.
LOAD CASE	6.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	3.
LOAD CASE	7.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	3.

\*\*\*\*\*

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.3964E-03	-.4161E-01	.2101E-01	.3953E-03	-.1403E-05	-.3303E-04
2	.3892E-03	.2146E-01	-.5285E-03	-.6218E-03	-.1118E-04	-.3243E-04
3	.4045E-03	.1607E-01	.1150E-02	-.5611E-03	-.1103E-04	-.3371E-04
4	-.2660E-03	.2439E+00	.1980E-02	-.3757E-03	.5075E-04	.2217E-04
5	-.3080E-03	.2615E+00	-.3247E-02	-.5753E-03	.5021E-04	.2568E-04
6	.4362E-03	.1319E-01	-.4618E-02	-.8134E-03	-.1805E-04	-.3635E-04
7	.4506E-03	.8270E-02	-.3071E-02	-.7579E-03	-.1792E-04	-.3755E-04

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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
1	-.3	.0	33.4	-.8	14.0	.0	.26	.09
2	-.2	.0	56.7	-.8	10.4	.0	.44	.15
3	-.3	.0	36.7	-.8	12.0	.0	.28	.10
4	-.3	.0	7.8	-.1	12.3	.0	.06	.03
5	-.3	.0	8.3	-.1	11.9	.0	.06	.03
6	-.3	.0	8.9	-.1	11.5	.0	.07	.03
7	-.2	.0	9.4	-.1	11.1	.0	.07	.03
8	-.2	.0	10.0	-.1	10.7	.0	.08	.03
9	-.2	.0	10.5	-.1	10.3	.0	.08	.03
10	.2	.0	23.6	-.5	-10.7	.0	.18	.07
11	.2	.0	22.6	-.5	-10.2	.0	.17	.06
12	.2	.0	21.7	-.5	-9.8	.0	.17	.06
13	.2	.0	20.8	-.5	-9.4	.0	.16	.06
14	.2	.0	19.8	-.5	-8.9	.0	.15	.06
15	.2	.0	18.9	-.5	-8.5	.0	.15	.05

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.1	.0	-31.2	-.8	-6.3	.0	.31	.09
2	.1	.0	-42.9	-.8	-5.3	.0	.43	.12
3	.2	.0	-31.3	-.8	-8.5	.0	.31	.09
4	.1	.0	13.1	-.1	-3.8	.0	.10	.04
5	.1	.0	12.9	-.1	-4.2	.0	.10	.04
6	.1	.0	12.8	-.1	-4.7	.0	.10	.04
7	.1	.0	12.7	-.1	-5.1	.0	.10	.04
8	.1	.0	12.5	-.1	-5.5	.0	.10	.04

9	.1	.0	12.4	-.1	-5.9	.0	.10	.04
10	-.1	.0	33.7	-.5	6.5	.0	.26	.09
11	-.2	.0	32.0	-.5	6.9	.0	.25	.09
12	-.2	.0	30.4	-.5	7.2	.0	.23	.08
13	-.2	.0	28.7	-.5	7.6	.0	.22	.08
14	-.2	.0	27.0	-.5	8.0	.0	.21	.07
15	-.2	.0	25.4	-.5	8.4	.0	.20	.07

## LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.1	.0	-27.5	-.8	-4.7	.0	.27	.07
2	.1	.0	-36.4	-.8	-4.0	.0	.36	.10
3	.2	.0	-27.4	-.8	-6.9	.0	.27	.08
4	.1	.0	12.7	-.1	-2.4	.0	.10	.03
5	.1	.0	12.6	-.1	-2.8	.0	.10	.03
6	.1	.0	12.5	-.1	-3.3	.0	.10	.03
7	.1	.0	12.4	-.1	-3.7	.0	.10	.03
8	.1	.0	12.3	-.1	-4.2	.0	.09	.03
9	.1	.0	12.2	-.1	-4.6	.0	.09	.03
10	-.1	.0	34.5	-.5	5.1	.0	.27	.09
11	-.1	.0	32.8	-.5	5.5	.0	.25	.09
12	-.1	.0	31.1	-.5	5.9	.0	.24	.08
13	-.1	.0	29.4	-.5	6.3	.0	.23	.08
14	-.1	.0	27.7	-.5	6.7	.0	.21	.08
15	-.2	.0	26.1	-.5	7.1	.0	.20	.07

## LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	1.3	.0	80.0	.6	-60.1	.0	.62	.24
2	1.3	.0	-23.2	.6	-60.8	.0	.23	.09
3	1.3	.0	94.7	.6	-57.8	.0	.73	.27
4	1.3	.0	92.7	.1	-59.3	.0	.71	.27
5	1.3	.0	95.8	.1	-58.8	.0	.74	.28
6	1.3	.0	98.8	.1	-58.4	.0	.76	.28
7	1.3	.0	101.9	.1	-57.9	.0	.78	.29
8	1.3	.0	104.9	.1	-57.5	.0	.81	.30
9	1.3	.0	108.0	.1	-57.1	.0	.83	.31
10	-1.3	.0	-92.7	.3	59.4	.0	.93	.27
11	-1.3	.0	-88.3	.3	59.3	.0	.88	.26
12	-1.3	.0	-83.9	.3	59.2	.0	.84	.25
13	-1.3	.0	-79.5	.3	59.1	.0	.79	.23
14	-1.3	.0	-75.1	.3	59.1	.0	.75	.22
15	-1.3	.0	-70.7	.3	59.0	.0	.71	.21

## LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	1.5	.0	68.3	.6	-65.5	.0	.53	.21
2	1.4	.0	-44.2	.6	-65.2	.0	.44	.15

3	1.4	.0	82.4	.6	-63.0	.0	.63	.24
4	1.4	.0	94.4	.1	-63.9	.0	.73	.28
5	1.4	.0	97.3	.1	-63.4	.0	.75	.28
6	1.4	.0	100.3	.1	-62.9	.0	.77	.29
7	1.4	.0	103.2	.1	-62.4	.0	.79	.30
8	1.4	.0	106.1	.1	-61.9	.0	.82	.31
9	1.4	.0	109.1	.1	-61.4	.0	.84	.31
10	-1.4	.0	-94.9	.4	64.0	.0	.95	.28
11	-1.4	.0	-90.4	.4	63.9	.0	.90	.27
12	-1.4	.0	-85.9	.4	63.7	.0	.86	.25
13	-1.4	.0	-81.5	.4	63.6	.0	.81	.24
14	-1.4	.0	-77.0	.4	63.5	.0	.77	.23
15	-1.4	.0	-72.6	.4	63.4	.0	.73	.22

## LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.1	.0	-51.7	-.9	-5.2	.0	.52	.14
2	.1	.0	-61.7	-.9	-3.2	.0	.62	.16
3	.2	.0	-53.7	-.9	-7.8	.0	.54	.14
4	.0	.0	6.9	-.1	-1.8	.0	.05	.02
5	.1	.0	6.3	-.1	-2.3	.0	.05	.02
6	.1	.0	5.8	-.1	-2.8	.0	.04	.02
7	.1	.0	5.3	-.1	-3.3	.0	.04	.02
8	.1	.0	4.8	-.1	-3.8	.0	.04	.01
9	.1	.0	4.2	-.1	-4.3	.0	.03	.01
10	-.1	.0	45.7	-.5	4.9	.0	.35	.12
11	-.1	.0	43.4	-.5	5.3	.0	.33	.12
12	-.1	.0	41.1	-.5	5.7	.0	.32	.11
13	-.1	.0	38.9	-.5	6.1	.0	.30	.10
14	-.1	.0	36.6	-.5	6.5	.0	.28	.10
15	-.2	.0	34.3	-.5	6.9	.0	.26	.09

## LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.1	.0	-48.4	-.9	-3.7	.0	.48	.13
2	.0	.0	-55.7	-.9	-2.0	.0	.56	.15
3	.1	.0	-50.2	-.9	-6.3	.0	.50	.13
4	.0	.0	6.5	-.1	-.5	.0	.05	.02
5	.0	.0	6.0	-.1	-1.0	.0	.05	.02
6	.0	.0	5.5	-.1	-1.6	.0	.04	.02
7	.0	.0	5.0	-.1	-2.1	.0	.04	.01
8	.1	.0	4.5	-.1	-2.6	.0	.03	.01
9	.1	.0	4.1	-.1	-3.1	.0	.03	.01
10	-.1	.0	46.5	-.6	3.6	.0	.36	.12
11	-.1	.0	44.2	-.6	4.0	.0	.34	.12
12	-.1	.0	41.9	-.6	4.4	.0	.32	.11
13	-.1	.0	39.5	-.6	4.9	.0	.30	.11
14	-.1	.0	37.2	-.6	5.3	.0	.29	.10
15	-.1	.0	34.9	-.6	5.7	.0	.27	.09

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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	10.3	31.8	.0	.0	.0
2	.0	-.2	56.7	.0	.0	.0
3	.0	11.3	34.9	.0	.0	.0
4	.0	1.9	7.5	.0	.0	.0
5	.0	2.0	8.1	.0	.0	.0
6	.0	2.2	8.6	.0	.0	.0
7	.0	2.3	9.1	.0	.0	.0
8	.0	2.5	9.6	.0	.0	.0
9	.0	2.7	10.2	.0	.0	.0
10	.0	-7.7	22.3	.0	.0	.0
11	.0	-7.4	21.4	.0	.0	.0
12	.0	-7.1	20.5	.0	.0	.0
13	.0	-6.8	19.6	.0	.0	.0
14	.0	-6.5	18.7	.0	.0	.0
15	.0	-6.1	17.8	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-9.7	-29.6	.0	.0	.0
2	.0	.1	-42.9	.0	.0	.0
3	.0	-9.7	-29.7	.0	.0	.0
4	.0	3.7	12.5	.0	.0	.0
5	.0	3.6	12.4	.0	.0	.0
6	.0	3.6	12.3	.0	.0	.0
7	.0	3.6	12.1	.0	.0	.0
8	.0	3.6	12.0	.0	.0	.0
9	.0	3.5	11.9	.0	.0	.0
10	.0	-10.5	32.0	.0	.0	.0
11	.0	-10.0	30.4	.0	.0	.0
12	.0	-9.4	28.9	.0	.0	.0
13	.0	-8.9	27.3	.0	.0	.0
14	.0	-8.4	25.7	.0	.0	.0
15	.0	-7.8	24.1	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-8.6	-26.1	.0	.0	.0
2	.0	.1	-36.4	.0	.0	.0
3	.0	-8.5	-26.1	.0	.0	.0
4	.0	3.5	12.2	.0	.0	.0
5	.0	3.5	12.1	.0	.0	.0
6	.0	3.5	12.0	.0	.0	.0

7	.0	3.5	11.9	.0	.0	.0
8	.0	3.5	11.8	.0	.0	.0
9	.0	3.4	11.7	.0	.0	.0
10	.0	-10.8	32.8	.0	.0	.0
11	.0	-10.3	31.2	.0	.0	.0
12	.0	-9.7	29.6	.0	.0	.0
13	.0	-9.2	28.0	.0	.0	.0
14	.0	-8.6	26.4	.0	.0	.0
15	.0	-8.1	24.8	.0	.0	.0

## LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	26.6	75.5	.0	.0	.0
2	.0	1.3	-23.2	.0	.0	.0
3	.0	31.2	89.4	.0	.0	.0
4	.0	26.7	88.8	.0	.0	.0
5	.0	27.6	91.7	.0	.0	.0
6	.0	28.4	94.7	.0	.0	.0
7	.0	29.2	97.6	.0	.0	.0
8	.0	30.1	100.5	.0	.0	.0
9	.0	30.9	103.5	.0	.0	.0
10	.0	30.6	-87.5	.0	.0	.0
11	.0	29.2	-83.3	.0	.0	.0
12	.0	27.8	-79.2	.0	.0	.0
13	.0	26.4	-75.0	.0	.0	.0
14	.0	25.0	-70.8	.0	.0	.0
15	.0	23.6	-66.6	.0	.0	.0

## LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	23.0	64.3	.0	.0	.0
2	.0	1.4	-44.2	.0	.0	.0
3	.0	27.4	77.7	.0	.0	.0
4	.0	27.3	90.3	.0	.0	.0
5	.0	28.1	93.2	.0	.0	.0
6	.0	28.9	96.0	.0	.0	.0
7	.0	29.7	98.8	.0	.0	.0
8	.0	30.5	101.7	.0	.0	.0
9	.0	31.3	104.5	.0	.0	.0
10	.0	31.3	-89.5	.0	.0	.0
11	.0	29.9	-85.3	.0	.0	.0
12	.0	28.5	-81.1	.0	.0	.0
13	.0	27.1	-76.9	.0	.0	.0
14	.0	25.7	-72.6	.0	.0	.0
15	.0	24.3	-68.4	.0	.0	.0

## JAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
------	---------	---------	---------	------------	------------	------------

1	.0	-16.2	-49.1	.0	.0	.0
2	.0	.1	-61.7	.0	.0	.0
3	.0	-16.8	-51.0	.0	.0	.0
4	.0	1.9	6.6	.0	.0	.0
5	.0	1.8	6.1	.0	.0	.0
6	.0	1.7	5.6	.0	.0	.0
7	.0	1.5	5.1	.0	.0	.0
8	.0	1.4	4.6	.0	.0	.0
9	.0	1.3	4.0	.0	.0	.0
10	.0	-14.4	43.4	.0	.0	.0
11	.0	-13.6	41.2	.0	.0	.0
12	.0	-12.9	39.1	.0	.0	.0
13	.0	-12.2	36.9	.0	.0	.0
14	.0	-11.4	34.7	.0	.0	.0
15	.0	-10.7	32.6	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-15.2	-45.9	.0	.0	.0
2	.0	.0	-55.7	.0	.0	.0
3	.0	-15.7	-47.7	.0	.0	.0
4	.0	1.8	6.3	.0	.0	.0
5	.0	1.7	5.8	.0	.0	.0
6	.0	1.6	5.3	.0	.0	.0
7	.0	1.4	4.8	.0	.0	.0
8	.0	1.3	4.4	.0	.0	.0
9	.0	1.2	3.9	.0	.0	.0
10	.0	-14.6	44.1	.0	.0	.0
11	.0	-13.9	41.9	.0	.0	.0
12	.0	-13.1	39.7	.0	.0	.0
13	.0	-12.4	37.6	.0	.0	.0
14	.0	-11.7	35.4	.0	.0	.0
15	.0	-10.9	33.2	.0	.0	.0

11	.0	-26.0	68.6	.0	.0	.0
12	.0	-26.0	68.6	.0	.0	.0
13	.0	-26.0	68.6	.0	.0	.0
14	.0	-26.0	68.6	.0	.0	.0
15	.0	-9.0	23.7	.0	.0	.0
16	.0	-9.0	23.7	.0	.0	.0
17	.0	-9.0	23.7	.0	.0	.0
18	.0	-9.0	23.7	.0	.0	.0
19	.0	-9.0	23.7	.0	.0	.0
20	.0	-9.0	23.7	.0	.0	.0
21	.0	-9.0	23.7	.0	.0	.0

LOAD CASE - 8

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-.4	6.5	119.1	.0	.0	.0
2	-.4	5.3	99.0	.0	.0	.0
3	-.4	4.0	74.8	.0	.0	.0
4	-.4	2.7	50.7	.0	.0	.0
5	-.4	1.4	26.5	.0	.0	.0
6	-.4	.0	2.4	.0	.0	.0
7	-.4	-1.1	-17.8	.0	.0	.0
8	.0	6.9	-14.4	.0	.0	.0
9	.0	3.7	-6.3	.0	.0	.0
10	.0	-.2	3.4	.0	.0	.0
11	.0	-4.1	13.1	.0	.0	.0
12	.0	-8.0	22.8	.0	.0	.0
13	.0	-11.9	32.5	.0	.0	.0
14	.0	-15.1	40.6	.0	.0	.0
15	.4	-7.8	28.5	.0	.0	.0
16	.4	-10.2	34.7	.0	.0	.0
17	.4	-13.0	42.3	.0	.0	.0
18	.4	-15.9	49.8	.0	.0	.0
19	.4	-18.7	57.3	.0	.0	.0
20	.4	-21.6	64.9	.0	.0	.0
21	.4	-24.0	71.1	.0	.0	.0

LOAD CASE - 9

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.4	-1.2	-20.6	.0	.0	.0
2	.4	-.1	-.4	.0	.0	.0
3	.4	1.3	23.7	.0	.0	.0
4	.4	2.6	47.9	.0	.0	.0
5	.4	3.9	72.0	.0	.0	.0
6	.4	5.3	96.2	.0	.0	.0
7	.4	6.4	116.3	.0	.0	.0
8	.0	-14.3	38.6	.0	.0	.0
9	.0	-11.1	30.5	.0	.0	.0
10	.0	-7.2	20.8	.0	.0	.0
11	.0	-3.3	11.1	.0	.0	.0
12	.0	.6	1.3	.0	.0	.0
13	.0	4.5	-8.4	.0	.0	.0
14	.0	7.7	-16.5	.0	.0	.0

LOADS ON THIS MONOLITH ARE SAME AS  
MONOLITH T-1.

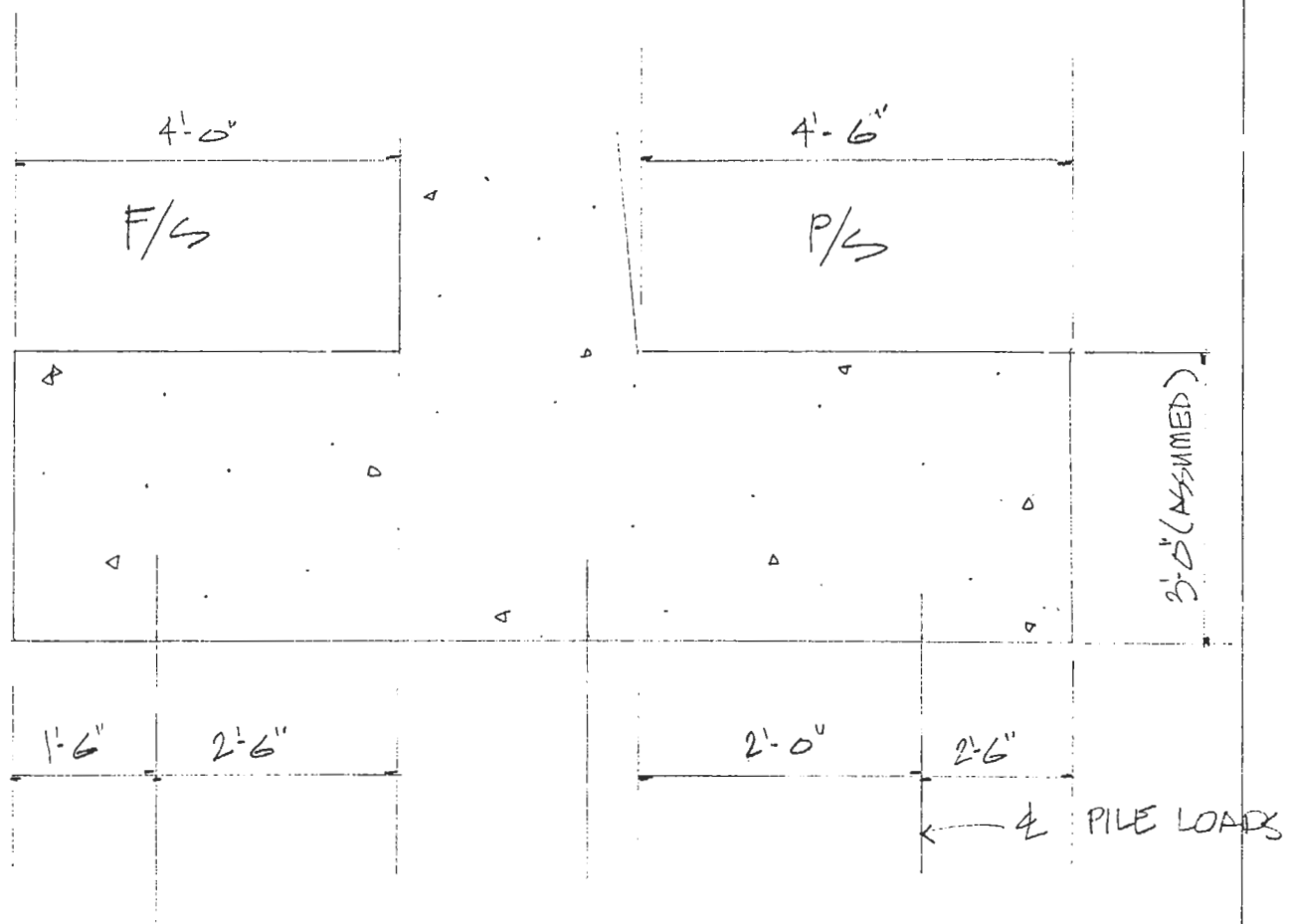
∴ USE SAME STEM DESIGN AS MONO. T-1

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Made in U.S.A.

FOUNDATION SLAB



- ASSUME :
1. 3'-0" THK FOR SLAB
  2.  $F_c = 4000$
  3.  $F_y = 60,000$
  4. ASSUME TOE FIXED @ F/S FACE OF STEM.
  5. ASSUME HEEL FIXED @ P/S FACE

NATIONAL BRAND  
 100% RECYCLED PAPER  
 100% RECYCLED FIBER  
 100% RECYCLED INK  
 100% RECYCLED WHITENING  
 100% RECYCLED GLUE

FDN SLAB DESIGN

REFER TO PAGES T2-1 THRU T2-4 &amp; T2-38 &amp; T2-39

HEEL DESIGN (LOAD CASE 5) TOP REINF.BM @ P/S FACE OF STEM

$$\begin{aligned}
 &= (+95 + 90 + 86 + 82 + 77 + 73) \times 2.0 + (112.7 + 90.2) \times 2.25 \\
 &\quad + 0.45 \times 25.85 \times 4.5^2 / 2 - 181.6 \times (4.5 - (5.5 - 1.33)) \\
 &= 1006 + 456 + 118 - 60 \\
 &= 1520'k
 \end{aligned}$$

$$\therefore \text{BM/FT} = 1520 / 25.85 = 59'k/\text{FT.}$$

$$\therefore M_u = 1.3 \times 1.7 \times 59 = 130'k$$

$$\therefore d_{\text{req}} = 18''$$

$$\begin{aligned}
 \therefore \text{TOTAL THICKNESS REQ'D} &= (\text{ASSUMING \#9 REINFC.}) 18'' + 4.43'' \\
 &= 22.43'' < 36'' \therefore \text{O.K.}
 \end{aligned}$$

$$\phi V_c = 0.85 \times 12 \times 25.58 \times 31.43 \times 2 \times 63 = 1033'k$$

$$\therefore V_u @ d = 758'k < 1033'k \therefore \text{O.K.}$$

PUNCH SHEAR O.K. BY OBS.

$$\therefore \text{FOR } b = 12'' \quad d = 31.43 \quad F = 0.98$$

$$\therefore K_u = 59 \times 1.3 \times 1.7 / 0.98 = 133 \therefore \rho = 0.0027 < A_s(\text{min})$$

$$\therefore A_s = 0.0028 \times 12 \times 31.43 = 1.05''^2$$

$$\text{USE \#9 BARS @ 12'' O.C.} = 1.0''^2 \approx 1.05''^2 \therefore \text{O.K.}$$

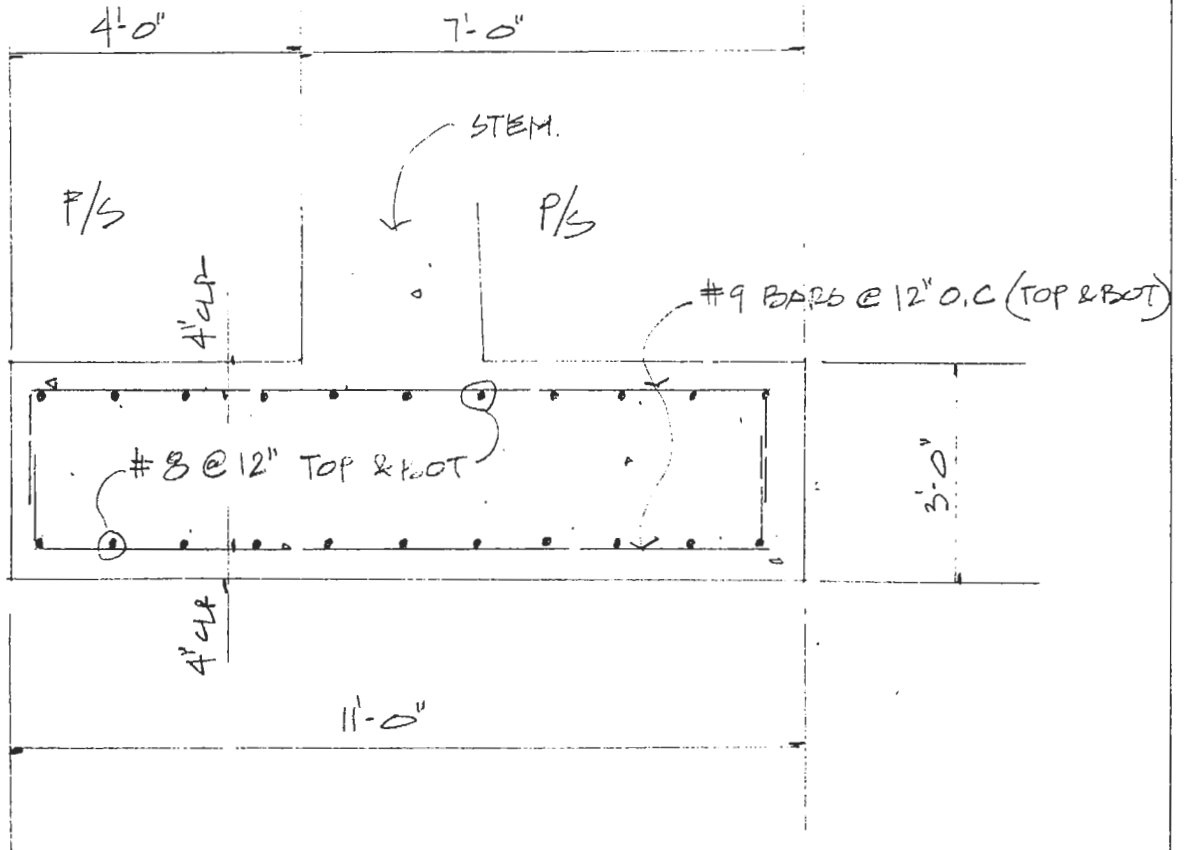
TOE DESIGN

USE #9 BARS @ 12'' O.C. BY OBS.

$$\therefore \text{USE \#9 BARS @ 12'' TOP \& BOT}$$

$$\text{USE \#8 BARS @ 12'' TOP \& BOT FOR SHRINKAGE \& TEMP}$$

FOUNDATION SLAB DESIGN



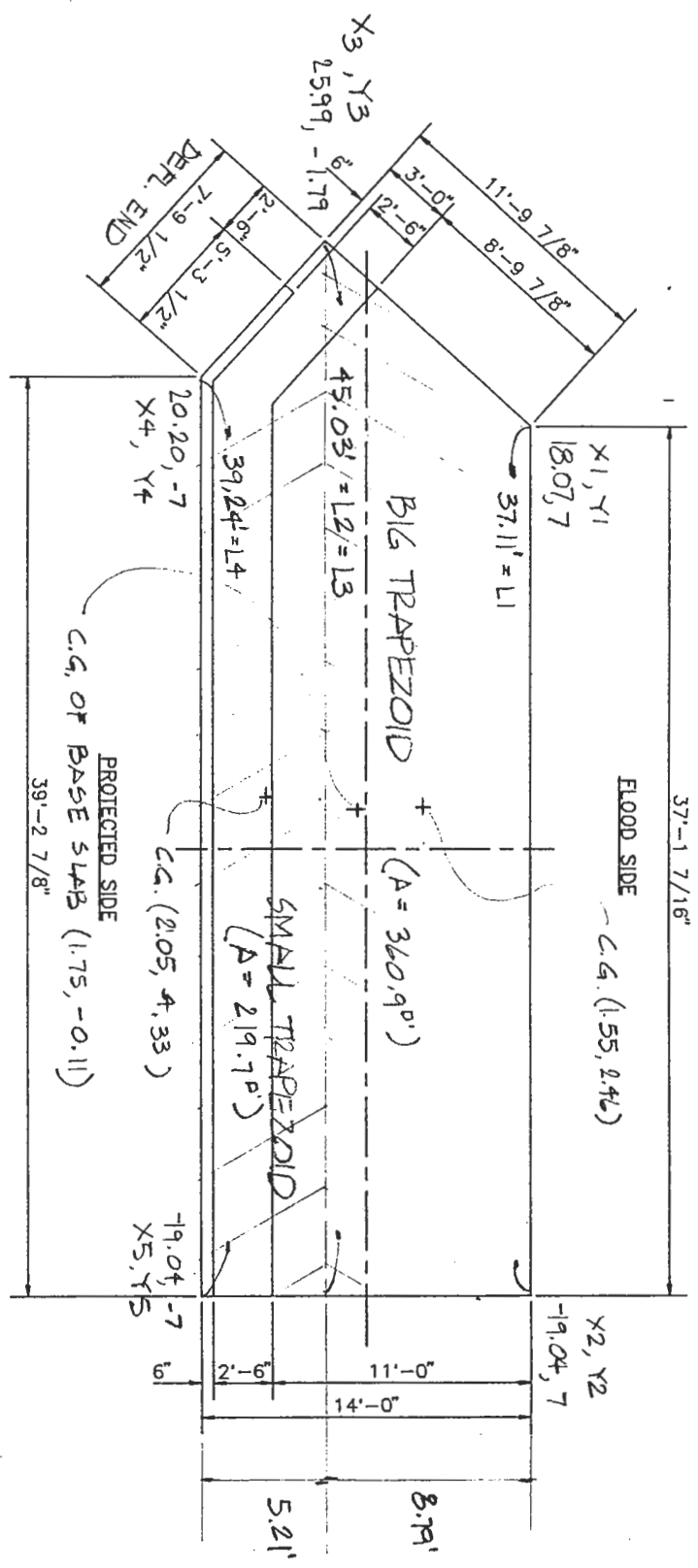
13-78  
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42-389  
MADE IN U.S.A.



SHEETS: 100 SHEETS  
100 SHEETS  
100 SHEETS  
200 SHEETS  
200 SHEETS  
200 RECYCLED WHITE  
200 RECYCLED WHITE



MONO T-3

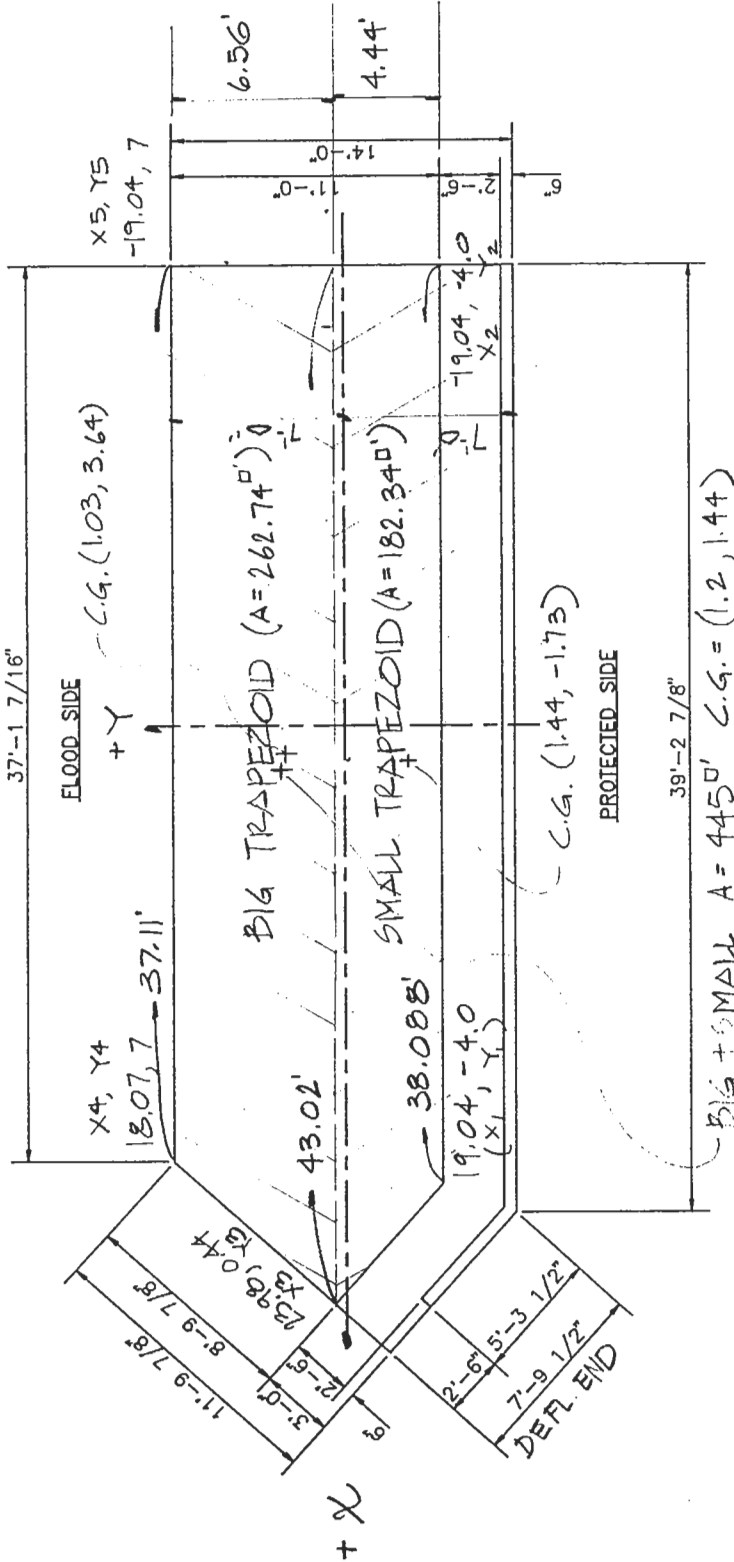


50 SHEET 5 SQUARE  
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 100 SHEETS EYEGLASS 5 SQUARE  
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 42-389 200 RECYCLED WHITE 5 SQUARE  
 Made in U.S.A.  
 13.7



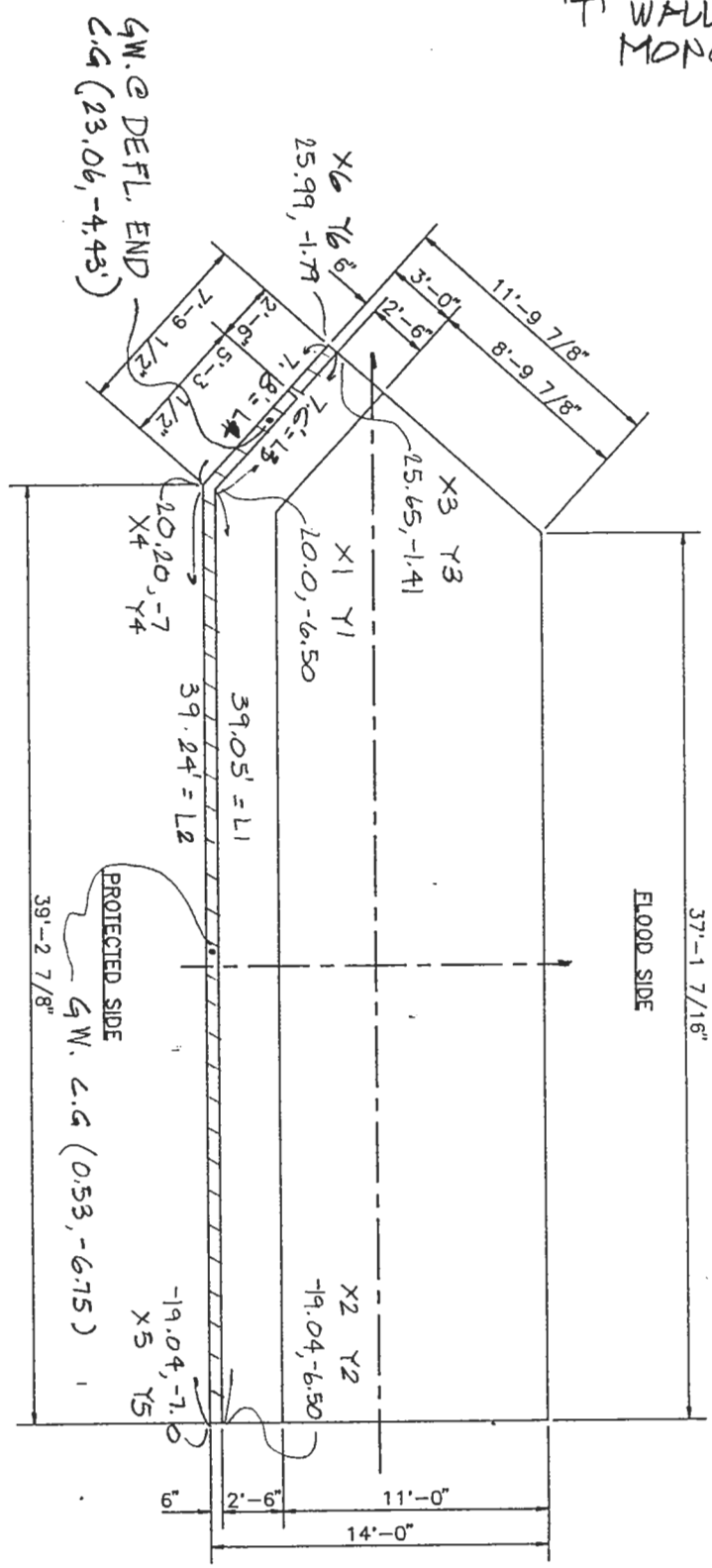
T'WALL MONO WEST SIDE  
MONO T-3

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VERT. HYD. LOADS (F/S)

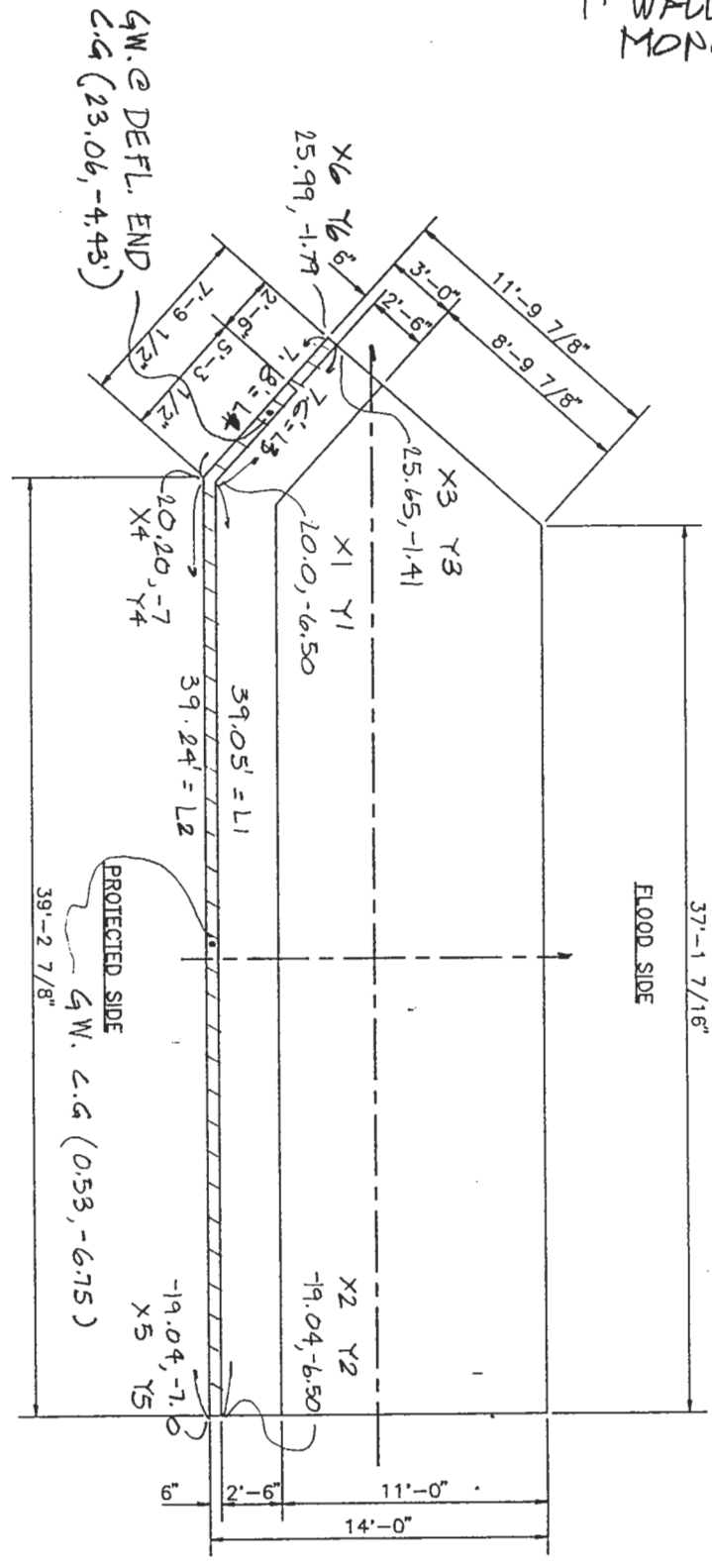
T WALL MONO WEST SIDE  
MONO T-3



13 SHEETS 5 SQUARE  
 42 SHEETS 5 SQUARE  
 50 SHEETS EYE-BASE 5 SQUARE  
 100 SHEETS EYE-BASE 5 SQUARE  
 42 SHEETS EYE-BASE 5 SQUARE  
 100 SHEETS EYE-BASE 5 SQUARE  
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 200 RECYCLED WHITE 5 SQUARE  
 MADE IN U.S.A.



T' WALL MONO WEST SIDE  
MONO T-3

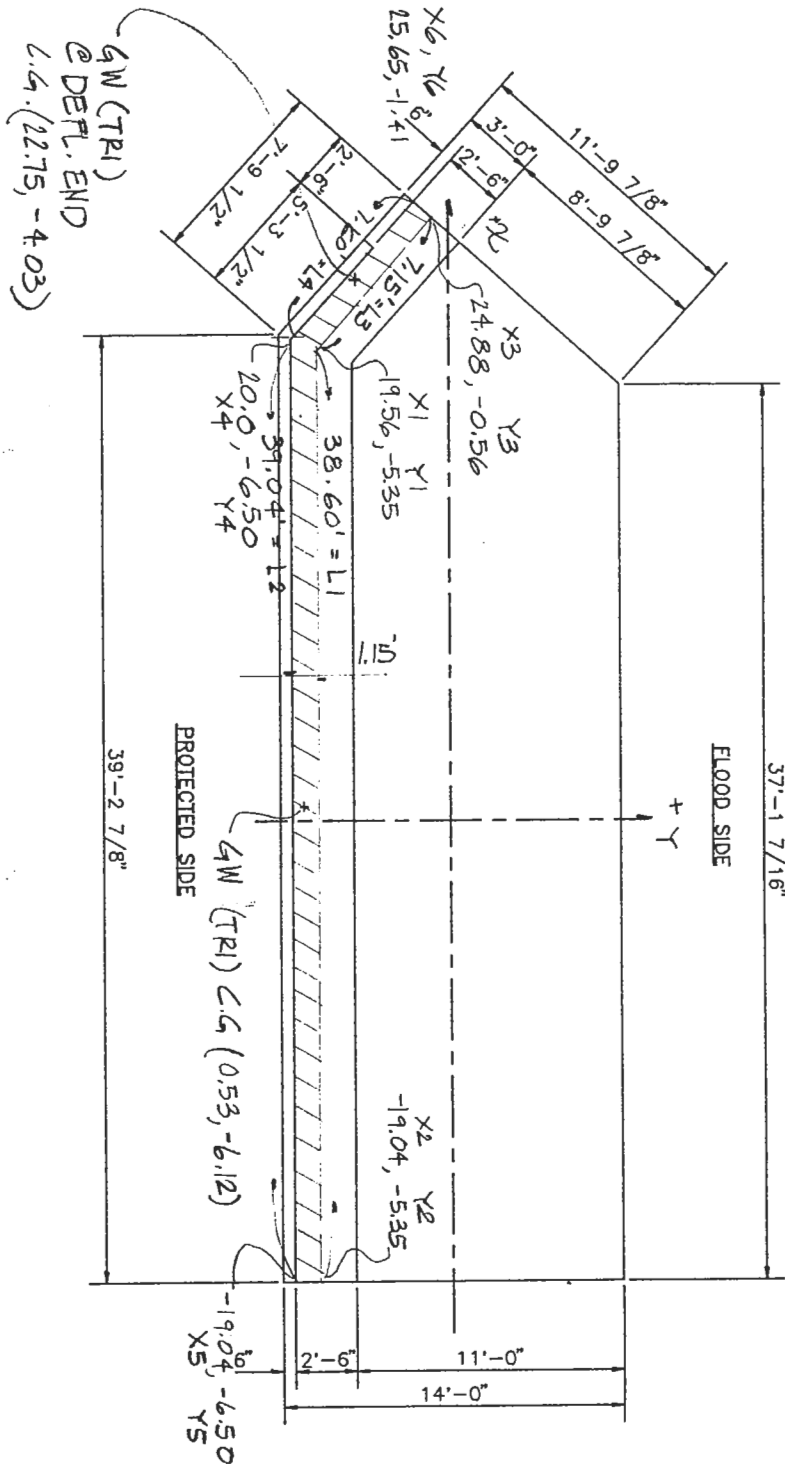


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T1 WALL MONO WEST SIDE  
MONO T-3



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National Brand

D I M E N S I O N A L A N D O T H E R		I N P U T	
CELL REF	ITEM		
C7	LENGTH @ F/S FACE OF STEM	38.09	
C9	WIDTH OF MONOLITH	14.00	
C12	DIST FROM F/S FACE OF STEM TO F/S EDGE OF BASE SLAB	11.00	
C14	STEM TH'KNNESS @ TOP	1.00	
C17	STEN TH'KNNESS @ TOP OF BASE SLAB	2.50	
C19	EL OF TOP OF BASE SLAB	11.25	
C21	EL OF TOP OF STEM	34.33	
C23	EL OF BAKFILL ON P/S	29.00	
C26	EL OF GROUND WATER SURFACE ON P/S	29.00	
C28	HT OF STEM	23.08	

C31	SLOPE/FT OF P/S FACE OF STEM	0.06		
C33	HT OF GW ABOVE BASE SLAB	17.75		
C36	HT OF BACKFILL ABOVE BASE SLAB	17.75		
C39	TH'KNNESS OF STEM @ GW SURFACE EL.	1.35		
C42	TH'KNNESS OF STEM @ TOP OF BACKFILL	1.35		
C48	WIDTH OF TRIANGULAR SOIL WEDGE BASE (VERT SIDE OF TRIANGLE BEGINS @ P/S EDGE OF STEM TH'KNNESS AT BASE SLAB)@ GW LEVEL	1.15		
C55	WIDTH OF TRIANGULAR SOIL WEDGE BASE (VERT SIDE OF TRIANGLE BEGINS @ P/S EDGE OF STEM TH'KNNESS AT BASE SLAB)@ TOP OF BACKFILL	1.15		



C59	ANGLE MADE BY L.S.EDGE OF MONOLITH(P/S) WITH Y' AXIS IN RADIAN'S CLKWISW	5.55		
C63	ANGLE MADE BY LEFT SIDE EDGE OF MONOLITH WITH Y' AXIS IN RADIAN'S CLKWISW	0.73		
C66	SLOPE/FT OF RIGHT SIDE EDGE OF MONOLITH IN PLAN	-0.90		
C69	SLOPE/FT OF LEFT SIDE EDGE OF MONOLITH IN PLAN	0.90		
C71	CANAL WATER LEVEL EL	32.33		
C73	CANAL WATER LEVEL EL	34.33		
C76	FOUNDATION SLAB THICKNESS	3		
C79	HT OF WATER IN CANAL WL @ 32.33 ABOVE FDN BOT	24.08		
C82	HT OF WATER IN CANAL WL @34.33 ABOVE FDN BOT	26.08		
C85	HT OF GROUND WATER			

	ABOVE BOT OF FDN	20.75	
C88	NORMAL WATER LEVEL EL IN CANA	21.43	
C91	HT OF NORMA WATER ABOVE BOT OF FDN	13.18	
C94	HT OF BACKFILL ABOVE FDN BOT	20.75	
C97	SURCHARGE ON PROTECTED SIDE	0	
C102	DISTANCE FROM F/S EDGE OF FDN SLAB TO SHT PILE CUT OFF WALL	7	
C105	DEFLECTION ANGLE @ BREAK PT IN STEM @ LEFT END OF STEM	138	
C109	DIST FROM F/S FACE OF STEM TO P/S EDGE OF FDN SLAB	3	
C113	LENGTH OF F/S FACE OF DEFLECTED LEG OF STEM @		

TWAL14FT.WK4

T WALL MONOLITH WEST SIDE

5

LEFT END	6.64	
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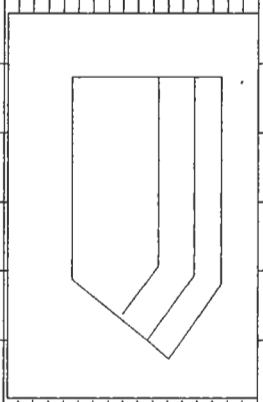
CG COMPUTATIONS:		CENTER OF GRAVITY		AREA	LEVARM	LEVARM
	X1	Y1			X	Y
DEFLECTED STEM	19.23593	-2.21427				
DEFLECTED STEM	20.04663	-3.30374				
TRIANGULAR IN SECTION						
BASE SLAB (RECT)				326.1388	18.55928	
BASE SLAB (TRIANGLE)				34.75601	39.75566	
TOTAL (RECT AND TRI)				360.8948		
BASE SLAB (TOP TRAPEZOID)	1.556599	2.465767				
BASE SLAB (RECT)				204.5793	19.6198	2.606797
BASE SLAB (TRIANGLE)				15.09408	41.16969	1.737864
TOTAL (RECT AND TRI)				219.6734		
BASE SLAB (BOT TRAPEZOID)	2.056521	-4.3335				
ENTIRE BASE SLAB	1.745758	-0.10692		580.5681		
WATER ON F/S						
BIG TRAPEZOID:						
RECTANGLE				243.3853	18.55928	3.278486
TRIANGLE				19.35593	39.08653	4.371315

TOTAL			262.7413		
STORM WATER					
BIG TRAPEZOID	1.027505	3.641006			
SMALL TRAPEZOID					
RETANGLE			169.2261	19.044	2.221514
TRIANGLE			13.11565	39.08653	1.481009
TOTAL			182.3417		
STORM WATER (SMALL TRAP)	1.441638	-1.72522			
IMPERVIOUS UPLIFT					
BIG TRAPEZOID					
BASE SLAB (RECT)			259.8299	18.55928	
BASE SLAB (TRI)			22.05989	39.2195	
TOTAL	1.132089		281.8898		
SM. TRAPEZOID					
BASE SLAB (RECT)			274.6771	19.6198	
BASE SLAB (TRI)			14.63627	41.34053	
	1.674641		289.3134		

T WALL MONOLITH WEST SIDE ( MONOLITH T-3 )

TWALL14FT.WK4

CO-ORDINATES OF VARIOUS ITEMS											LENGTHS PARALLEL TO X AXIS			LENGTHS SKEW TO X AXIS				
	X1	Y1	X2	Y2	X3	Y3	X4	Y4	X5	Y5	X6	Y6	L1	L2	L3	L4	L	
STEM (RECTANGULAR IN PLAN & SECTION)	19.04	-4.00	-19.04	-4.00	23.98	0.44	18.43	-5.00	-19.04	-5.00	24.85	-0.30	38.09	38.47	38.28	6.64	7.02	6.83
STEM (RECTANGULAR IN PLAN & TRIANGULAR IN SECTION)	19.43	-5.00	-19.04	-5.00	24.85	-0.30	20.00	-6.50	-19.04	-6.50	25.65	-1.41	38.47	39.05	38.78	7.02	7.60	7.31
BASE SLAB	18.07	7.00	-19.04	7.00	25.99	-1.79	20.20	-7.00	-19.04	-7.00			37.12	45.03	41.07	45.03	39.24	42.13
CANAL WATER @ 34.33	19.04	-4.00	-19.04	-4.00	23.98	0.44	18.07	7.00	-19.04	7.00			38.08	43.02	40.56			
CANAL WATER @ 32.33	19.04	-4.00	-19.04	-4.00	23.98	0.44	18.07	7.00	-19.04	7.00			38.08	43.02	40.56			
GROUND WATER @ EL 29 (RECTANGULAR IN PLAN AND SECTION)	20.00	-6.50	-19.04	-6.50	25.65	-1.41	20.20	-7.00	-19.04	7.00	25.99	-1.79	39.05	39.24	39.14	7.60	7.76	7.70
GROUND WATER @ EL 29 (RECTANGULAR IN PLAN AND TRIANGULAR SECTION)	19.56	-5.35	-19.04	-5.35	24.88	-0.56	20.00	-6.50	-19.04	-6.50	25.65	-1.41	38.60	39.05	38.83	7.16	7.60	7.38
SUBMERGED BACKFILL TO TOP OF GW SURFACE (RECTANGULAR IN PLAN AND TRIANGULAR IN SECTION)	20.00	-6.50	-19.04	-6.50	25.65	-1.41	20.20	-7.00	-19.04	7.00	25.99	-1.79	39.05	39.24		7.60	7.76	
SATURATED SOIL FROM TOP OF GW SURFACE TO TOP OF BACKFILL (RECTANGULAR IN PLAN AND TRIANGULAR IN SECTION)	19.56	-5.35	-19.04	-5.35	24.88	-0.56	20.00	-6.50	-19.04	-6.50	25.65	-1.41	38.60	39.05	38.83	7.16	7.60	
SATURATED SOIL FROM TOP OF GW SURFACE TO TOP OF BACKFILL (RECTANGULAR IN PLAN AND TRIANGULAR IN SECTION)	18.56	-5.35	-19.04	-5.35	24.88	-0.56	19.56	-5.35	-19.04	-5.35	24.88	-0.56	38.60	38.60	38.60	7.16	7.16	
SATURATED SOIL FROM TOP OF BACKFILL (FROM EL 21.43 TO EL 29.00) (RECTANGULAR IN PLAN AND TRIANGULAR IN SECTION)	18.56	-5.35	-19.04	-5.35	24.88	-0.56	20.20	-7.00	-19.04	-7.00	25.99	-1.79	38.60	39.24	38.92	7.16	7.76	



VERTICAL LOADS		L LENGTH	WORH WIDTH OR HEIGHT	T THICKNESS	w UNITWT	FZ L x H or W x T x w	CENTER OF GRAVITY		LEVER		MOMENT CODE		MOMENTS	
ITEM							X	Y	FOR MX	FOR MY	FOR MX	FOR MY	MX	MY
STEM (R)		38.28	23.08	1.00	0.1500	132.53	0.00	-4.50	4.50	0.00	1.00	-596.36	0.00	
STEM (R)		6.83	23.08	1.00	0.1500	23.65	19.24	-2.21	2.21	19.24	-1.00	-52.37	-454.97	
STEM (T)		38.76	23.08	1.50	0.1500	100.64	0.19	-5.50	5.50	0.19	-1.00	-553.52	-19.32	
STEM (T)		7.31	23.08	1.50	0.1500	18.98	20.05	-3.30	3.30	20.05	-1.00	-62.72	-380.59	
BASE SLAB (BIG TRAP.)		41.07	8.79	3.00	0.1500	162.40	1.56	2.47	2.47	1.56	1.00	400.45	-252.80	
BASE SLAB (SMALL TRAP)		42.13	5.21	3.00	0.1500	49.43	2.06	-4.33	4.33	2.06	-1.00	-214.19	-101.65	
<b>TOTAL VERTICAL LOADS (CONC ETC.)</b>						<b>487.63</b>						<b>-1078.72</b>	<b>-1209.31</b>	
<b>VERTICAL HYDRAULIC LOADS:</b>														
WATER EL														
32.33	WATER IN CANAL (BIG TRAP)	40.07	21.08	6.56	0.0625	346.16	1.03	3.64	3.64	1.03	1.00	1280.38	-355.68	
	WATER IN CANAL (SM TRAP)	40.56	21.08	4.44	0.0625	237.40	1.44	-1.73	1.73	1.44	-1.00	-409.56	-342.24	
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 32.33</b>						<b>583.56</b>						<b>850.81</b>	<b>-697.92</b>	
34.33	WATER IN CANAL (BIG TRAP)	40.07052	23.08	6.56	0.0625	379.00	1.03	3.64	3.64	1.03	1.00	1379.96	-389.43	
	WATER IN CANAL (SM TRAP)	40.56	23.08	4.44	0.0625	259.92	1.44	-1.73	1.73	1.44	-1.00	-448.42	-374.71	
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 34.33</b>						<b>638.93</b>						<b>937.53</b>	<b>-764.14</b>	
29	GROUND WATER (P/S)	39.14	17.75	0.50	0.0625	21.71	0.53	-6.75	6.75	0.53	-1.00	-146.56	-11.46	
29	GROUND WATER (TRI) (P/S)	39.14	17.75	1.15	0.0625	25.05	0.53	-6.12	6.12	0.53	-1.00	-153.18	-13.22	
29	GW @ DEFLECTED END (P/S)	7.70	17.75	0.50	0.0625	4.27	23.06	-4.43	4.43	23.06	-1.00	-18.89	-98.41	
29	GW @ DEF. END (TRI) (P/S)	7.38	17.75	1.15	0.0625	4.72	22.75	-4.03	4.03	22.75	-1.00	-19.03	-107.39	
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR GW LEVEL ON P/S @ EL 29</b>						<b>55.75</b>						<b>-337.66</b>	<b>-230.48</b>	
<b>VERTICAL EARTH LOADS</b>														
29	SUBMERGED BACKFILL	39.14	17.75	0.50	0.0600	20.84	0.53	-6.75	6.75	0.53	-1.00	-140.70	-11.00	

29	SUB. BACKFILL (TRI)	39.14	17.75	1.15	0.0600	24.05	0.53	-6.12	6.12	0.53	-1.00	-1.00	-1.00	-147.05	-12.69
29	SUB. BACKFILL @ DEFL. END	7.70	17.75	0.50	0.0600	4.10	23.06	-4.43	4.43	23.06	-1.00	-1.00	-1.00	-18.13	-94.48
29	SUB. BACKFILL @ DEFL. END (TRI)	7.38	17.75	1.15	0.0600	4.53	22.75	-4.03	4.03	22.75	-1.00	-1.00	-1.00	-18.27	-103.09
<b>TOTAL VERTICAL SUBMERGED EARTH LOADS:</b>						<b>53.52</b>								<b>-324.15</b>	<b>-221.26</b>
<b>TOTAL SUBMERGED EARTH AND GROUND WATER VERTICAL LOADS:</b>						<b>109.27</b>								<b>-661.81</b>	<b>-451.74</b>



HORIZONTAL HYDRAULIC LOADS													
WATER EL	ITEM	HT OF WATER HT	UNIT WT w	LENGTH L	SHAPE OF PRES DIAG	FX	HORIZ LD FY w x HT x HT/2 x L	LEVER ARM FOR MX AND MY	MOMENT MX FY x LEVARM	MOMENT MY FX x LEVARM	LEVER ARM FOR MZ FOR FX	LEVER ARM FOR MZ FOR FY	MOMENT CODE FOR MZ
32.33	WATER LEVEL IN CANAL	24.08	0.0625	38.09	TRFS		-890.16	8.03	-5539.70				
32.33	WATER @ DEFL LEG OF STEM	24.08	0.0625	6.64	TRFS	80.51	-89.41	8.03	-717.69	-646.22	1.78	21.51	Y14XP34 1760.219
<b>TOTAL HORIZONTAL HYD. LOADS FOR WL IN CANAL @ EL. 32.33</b>													
34.33	WATER LEVEL IN CANAL	26.08	0.0625	38.09	TRFS		-779.68		-6257.40				1760.219
34.33	WATER @ DEFL LEG OF STEM	26.08	0.0625	6.64	TRFS	94.44	-104.88	8.69	-911.79	-820.98	1.78	21.51	Y14XP34 2088.22
<b>TOTAL HORIZONTAL HYD. LOADS FOR WL IN CANAL @ EL. 34.33</b>													
29	GROUND WATER LEVEL	20.75	0.0625	39.05	TRPS		525.39	8.92	5633.94				
29	GW @ DEFL LEG OF STEM	20.75	0.0625	7.60	TRPS	-68.42	75.99	8.92	525.59	473.25	4.65	21.99	YP14XN34 1352.93
<b>TOTAL HORIZONTAL HYD. LOADS FOR GW ON PS @ EL. 29</b>													
21.43	NORMAL WL IN CANAL	13.18	0.0625	38.09	TRFS		-206.76	4.39	-908.37				
21.43	NORMAL WL @ DEFL LEG	13.18	0.0625	6.64	TRFS	24.12	-26.79	4.39	-117.68	-105.96			
<b>TOTAL HORIZONTAL HYD. LOADS FOR WL IN CANAL @ EL. 21.43</b>													
11.25	GROUND WL ON FIS	3.00	0.06	37.12	TRFS		-10.44	1.00	-10.44				
HORIZONTAL EARTH LOADS													
TOP OF BACKFILL EL.	ITEM	HT OF BACKFILL HT	UNIT WT w x Ka	LENGTH L	SHAPE OF PRES DIAG	FX	FY w x Ka x HT x HT/2 x L	LEVER ARM FOR MX & FOR MY	MOMENT MX FY x LEVARM	MOMENT MY FX x LEVARM	LEVER ARM FOR MZ FOR FX	LEVER ARM FOR MZ FOR FY	MOMENT CODE FOR MZ
29	SATURATED SOIL FROM EL. 29 TO TOP OF GW LEVEL @ EL. 29 (TRIANGULAR PRESSURE DIAG)	0	0.06	39.24	TRPS		0.00	20.75	0.00				
29	SUBMERGED BACKFILL FROM EL. 29 TO EL. 8.25	20.75	0.03	39.05	RECTPS		252.19	6.92	1744.29				
29	SUBMERGED BACKFILL FROM EL. 29 TO EL. 8.25 @ DEFLECTED LEG	20.75	0.03	7.60	TRPS	-32.84	36.47	6.92	252.29	227.16	4.65	21.99	YP14XN34 640.41
29	SURCHARGE (0.1 k/ft) (RECTANGULAR PRESSURE DIAG)	20.75		38.28			0.00	6.92	0.00				

TWAL14FT.WK4

T WALL MONOLITH WEST SIDE ( MONOLITH T-3)

TOTAL HORIZONTAL EARTH LOADS FOR TOP OF BACKFILL @ EL 29 AND GW LEVEL @ EL 29										1896.68	227.16								649.41	
HORIZONTAL GROUND WATER LOADS:																				
29	GROUND WATER LEVEL	20.75	0.0625	39.05	TRPS					3633.94	6.92									
29	GW @ DEFL LEG OF STEM	20.75	0.0625	7.60	TRPS					525.99	6.92									
TOTAL HORIZONTAL HYD. LOADS FOR GW ON P/S @ EL 29										4159.54	473.25								1352.93	
TOTAL HORIZONTAL SUBMERGED EARTH LOADS FOR TOP OF BACKFILL @ EL 29 AND GROUND WATER LEVEL @ EL 29										6156.12	700.41								2002.336	

T WALL MONOLITH WEST SIDE ( MONOLITH T-3)

TWALL14FT.WK4

WATER EL	ITEM	AREA	HEIGHT OF WATER (F/S) HT1	HEIGHT OF WATER (P/S) HT2	UNIT WT	UPLIFT F/SEGE W X HT1	UPLIFT P/SEGE W X HT2	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY X	CENTER OF GRAVITY Y	LEVARM FOR MX	LEVARM FOR MY	MOMENT FOR MX	MOMENT FOR MY	C O D E FOR MY	MOMENT FOR MX	MOMENT FOR MY	REMARK
<b>HYDROSTATIC UPLIFT LOADS (PERVIOUS CUT-OFF)</b>																				
<b>WL IN CANAL @ 32.33 AND GW LEVEL @ 29 IMPERVIOUS CUT-OFF</b>																				
32.33 (F/S)	WATER IN CANAL (F/S)	580.57	24.08	20.75	0.06250	1.51	1.30	14.00	TRAP	-813.34	1.75	0.17	0.17	1.75	-1.00	1.00	1.00	-140.97	1419.89	
29 (P/S)	GROUND WATER (P/S)																			
NOTE: LOAD APPLIED @ C.G OF PRESSURE DIAGRAM IN Y DIRECTION AND @ C.G OF BASE SLAB IN X DIRECTION																				
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 AND GW @ 29 AND PERVIOUS CUT-OFF</b>																				
										-813.34									-140.97	1419.89
<b>WL IN CANAL @ 34.33 AND GW LEVEL @ 29 IMPERVIOUS CUT-OFF</b>																				
34.33 (F/S)	WATER IN CANAL (F/S)	580.57	26.08	20.75	0.06250	1.63	1.30	14.00	TRAP	-849.63	1.75	0.17	0.17	1.75	-1.00	1.00	1.00	-147.26	1483.24	
29 (P/S)	GROUND WATER (P/S)																			
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 AND GW @ 29 AND PERVIOUS CUT-OFF</b>																				
										-849.63									-147.26	1483.24
<b>HYDROSTATIC UPLIFT LOADS (IMPERVIOUS CUT-OFF)</b>																				
<b>WL IN CANAL @ 32.33 AND GW LEVEL @ 29 IMPERVIOUS CUT-OFF</b>																				
32.33 (F/S)	WATER IN CANAL (F/S)	281.89	24.08	24.08	0.06250	1.51	1.51	7.00	RECT	-424.24	1.13	3.50	3.50	1.13	-1.00	1.00	1.00	-1484.85	480.28	
29 (P/S)	GROUND WATER (P/S)	289.31	20.75	20.75	0.06250	1.30	1.30	7.00	RECT	-375.20	1.87	-3.50	3.50	1.67	1.00	1.00	1.00	1313.21	628.33	
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 AND GW @ 29 IMPERVIOUS CUT-OFF</b>																				
										-799.45									-171.64	1108.61
<b>WL IN CANAL @ 34.33 AND GW LEVEL @ 29 IMPERVIOUS CUT-OFF</b>																				
34.33 (F/S)	WATER IN CANAL (F/S)	281.89	26.08	26.08	0.06250	1.63	1.63	7.00	RECT	-459.48	1.13	3.50	3.50	1.13	-1.00	1.00	1.00	-1608.18	520.17	
29 (P/S)	GROUND WATER (P/S)	289.31	20.75	20.75	0.06250	1.30	1.30	7.00	RECT	-375.20	1.87	-3.50	3.50	1.67	1.00	1.00	1.00	1313.21	628.33	
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 AND GW @ 29 IMPERVIOUS CUT-OFF</b>																				
										-834.68									-324.97	1148.50

WATER EL	ITEM	AREA	HEIGHT OF WATER (FS) HT1	HEIGHT OF WATER (PIS) HT2	UNIT WT W	UPLIFT F/S EDGE W x HT1	UPLIFT P/S EDGE W x HT2	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY X	Y	LEVARM FOR MX	LEVARM FOR MY	MOMENT FOR MX	MOMENT FOR MY	MOMENT CODE FOR MX	MOMENT CODE FOR MY	MOMENT MX	MOMENT MY	REMARK	
	<b>HYDROSTATIC UPLIFT LOADS</b>																					
	<b>PERVIOUS CUT-OFF</b>																					
	11.25 (FS) WATER IN CANAL (FS)	A	3.00	20.75	0.06250	0.19	1.30	14.00	.TRAP	-430.89	1.75	1.74	1.74	1.75	-1.00	1.00			FZ x LEVARM x MOMENT CODE			
	21.43 (PIS) GROUND WATER (PIS)																					752.23
	<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 21.43 PERVIOUS CUT-OFF</b>																					
										-430.89												-751.41
	<b>HYDROSTATIC UPLIFT LOADS</b>																					
	<b>IMPERVIOUS CUT-OFF</b>																					
	11.25 (FS) WATER IN CANAL (FS)	A	3.00	20.75	0.06250	0.19	0.19	7.00	RECT	-52.85	1.13	3.50	3.50	1.13	-1.00	1.00			MOMENT MX	MOMENT MY		
	29 (PIS) GROUND WATER (PIS)									-375.20	1.67	-3.50	3.50	1.67	1.00	1.00						628.33
	<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 21.43 IMPERVIOUS CUT-OFF</b>																					
										-428.05												-171.64

<u>H O R I Z O N T A L W I N D L O A D S</u>									
<u>STORM WIND LOADS:</u>									
WATER EL	ITEM	LENGTH	EXPOSED HEIGHT	HT	WIND INTENSITY	SHAPE OF PRES DIAG	FY	LEVARM	MOMENT
32.33	EXPOSED WALL SURFACE	45.02987	2		0.05	RECTFS	-4.50299	25.08	-112.935
34.33	EXPOSED WALL SURFACE	45.02987	0		0.05	RECTFS	0	26.08	0
<u>OPERATING WIND LOADS</u>									
11.25	EXPOSED WALL SURFACE	45.02987	23.08		0.01	RECTFS	-10.3929	14.54	-151.113
24.25	EXPOSED WALL SURFACE	45.02987	13		0.01	RECTFS	-5.85388	9.5	-55.6119

LOAD COMBINATIONS:						
ITEM	FX	FY	FZ	MX	MY	MZ
<b>CASE I : CONSTRUCTION CASE. OP. WIND, NO WATER OR EARTH LOADS:</b>						
CONCRETE LOADS			487.6311	-1078.72	-1209.31	
OPERATING WINDS		-10.3929		-151.113		
<b>TOTAL FOR CASE I :</b>		<b>-10.3929</b>	<b>487.6311</b>	<b>-1229.83</b>	<b>-1209.31</b>	
<b>CASE II : WL IN CANAL @ 32.33, STORM WIND, BACKFILL IN PLACE</b>						
<b>GW @ 29, IMPERVIOUS CUT-OFF.</b>						
CONCRETE LOADS			487.6311	-1078.72	-1209.31	
WATER LOADS			583.56	850.81	-697.924	
SUBMERGED BACKFILL			109.2696	-661.813	-451.742	
SATURATED BACKFILL			0	0		
UPLIFT			-799.45	-171.64	1108.613	

HYDROSTATIC PRESSURE	80.50853	-779.58		-6257.4	-646.215	1780.219
EARTH PRESSURE	-101.264	890.04		6156.115	700.4061	2002.335
STORM WIND		-4.50		-112.935		
<b>TOTAL FOR CASE II :</b>	<b>-20.755</b>	<b>105.9618</b>	<b>381.0127</b>	<b>-1275.58</b>	<b>-1196.18</b>	<b>3782.554</b>
<b>CASE III : WL IN CANAL @ 32.33, STORM WIND BACKFILL IN PLACE</b>						
<b>GW @ 29, PERVIOUS CUT-OFF.</b>						
CONCRETE LOADS			487.6311	-1078.72	-1209.31	
WATER LOADS			583.56	850.81	-697.924	
SUBMERGED BACKFILL			109.2696	-661.813	-451.742	
SATURATED BACKFILL			0	0		
UPLIFT			-813.34	-140.97	1419.894	
HYDROSTATIC PRESSURE	80.50853	-779.58		-6257.4	-646.215	1780.219
EARTH PRESSURE	-101.264	890.04		6156.115	700.4061	2002.335
STORM WIND		-4.50		-112.935		
<b>TOTAL FOR CASE III :</b>	<b>-20.755</b>	<b>105.9618</b>	<b>367.1205</b>	<b>-1244.9</b>	<b>-884.896</b>	<b>3782.554</b>
<b>CASE IV : WL IN CANAL EMPTY, BACKFILL IN PLACE OP. WIND</b>						
<b>GW @ 29, IMPERVIOUS CUT-OFF.</b>						
CONCRETE LOADS			487.6311	-1078.72	-1209.31	

SUBMERGED BACKFILL			109.2696	-661.813	-451.742	
SATURATED BACKFILL			0	0		
UPLIFT			-428.058	-171.643	688.1669	
HYDROSTATIC PRESSURE		-10.4396		-10.4396		
EARTH PRESSURE	-101.264	890.0408		6156.115	700.4061	2002.335
OPERATING WIND		-10.3929		-151.113		
<b>TOTAL FOR CASE IV :</b>	<b>-101.264</b>	<b>869.2083</b>	<b>168.8431</b>	<b>4082.389</b>	<b>-272.484</b>	<b>2002.335</b>
<b>CASE V : WL IN CANAL EMPTY, BACKFILL IN PLACE, OP. WIND</b>						
<b>GW @ 29, PERVIOUS CUT-OFF.</b>						
CONCRETE LOADS			487.6311	-1078.72	-1209.31	
SUBMERGED BACKFILL			109.2696	-661.813	-451.742	
SATURATED BACKFILL			0	0		
UPLIFT			-430.89	-751.412	752.2304	
HYDROSTATIC PRESSURE		-10.4396		-10.4396		
EARTH PRESSURE	-101.264	890.0408		6156.115	700.4061	2002.335
OPERATING WIND		-10.3929		-151.113		
<b>TOTAL FOR CASE V :</b>	<b>-101.264</b>	<b>869.2083</b>	<b>166.0104</b>	<b>3502.62</b>	<b>-208.42</b>	<b>2002.335</b>
<b>CASE VI : WL IN CANAL @ 34.33, STORM WIND, BACKFILL IN PLACE</b>						
<b>GW @ 29, IMPERVIOUS CUT-OFF.</b>						



CONCRETE LOADS				487.6311	-1078.72	-1209.31		
WATER LOADS				638.93	931.53	-764.141		
SUBMERGED BACKFILL				109.2696	-661.813	-451.742		
SATURATED BACKFILL				0	0			
UPLIFT				-834.68	-294.97	1148.504		
HYDROSTATIC PRESSURE	94.43742	-914.45			-7949.63	-820.976	2088.217	
EARTH PRESSURE	-101.264	890.04			6156.115	700.4061	2002.335	
STORM WIND								
<b>TOTAL FOR CASE VI :</b>	<b>-6.82611</b>	<b>-24.4107</b>		<b>401.1426</b>	<b>-2897.48</b>	<b>-1397.26</b>	<b>4090.552</b>	
<b>CASE VII : WL IN CANAL@34.33, STORM WIND, BACKFILL IN PLACE</b>								
<b>GW @ 29, PERVIOUS CUT-OFF.</b>								
CONCRETE LOADS				487.6311	-1078.72	-1209.31		
WATER LOADS				638.93	931.53	-764.141		
SUBMERGED BACKFILL				109.2696	-661.813	-451.742		
SATURATED BACKFILL				0	0			
UPLIFT				-849.63	-147.26	1483.24		
HYDROSTATIC PRESSURE	94.43742	-914.45			-7949.63	-820.976	2088.217	
EARTH PRESSURE	-101.264	890.04			6156.115	700.4061	2002.335	
STORM WIND		0.00			0			
<b>TOTAL FOR CASE VII :</b>	<b>-6.82611</b>	<b>-24.4107</b>		<b>386.2012</b>	<b>-2749.77</b>	<b>-1062.53</b>	<b>4090.552</b>	

<b>CASE VIII : WL IN CANAL EMPTY,BACKFILL IN PLACE, OP. WIND</b>								
<b>GW @ 21.43, IMPERVIOUS CUT-OFF.</b>								
CONCRETE LOADS								
SUBMERGED BACKFILL								
SATURATED BACKFILL								
UPLIFT								
HYDROSTATIC PRESSURE								
EARTH PRESSURE								
OPERATING WIND								
<b>TOTAL FOR CASE VIII :</b>								
<b>CASE IX : WL IN CANAL EMPTY,BACKFILL IN PLACE OP. WIND</b>								
<b>GW @ 21.43, PERVIOUS CUT-OFF.</b>								
CONCRETE LOADS								
SUBMERGED BACKFILL								
SATURATED BACKFILL								
UPLIFT								
HYDROSTATIC PRESSURE								
EARTH PRESSURE								
OPERATING WIND								

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T WALL MONOLITH WEST SIDE

6

TOTAL FOR CASE IX :									

PEPPER & ASSOCIATES

CONSULTING ENGINEERS

METAIRIE, LA 70002

010A

SUMMARY OF LOAD	CASE:										
ITEM	FX	FY	FZ	MX	MY	MZ					
TOTAL FOR CASE I :	0	-10.3929	487.6311	-1229.83	-1209.31	0					
TOTAL FOR CASE II :	-20.755	105.9618	381.0127	-1275.58	-1196.18	3782.554					
TOTAL FOR CASE III :	-20.755	105.9618	367.1205	-1244.9	-884.896	3782.554					
TOTAL FOR CASE IV :	-101.264	869.2083	168.8431	4082.389	-272.484	2002.335					
TOTAL FOR CASE V :	-101.264	869.2083	166.0104	3502.62	-208.42	2002.335					
TOTAL FOR CASE VI :	-6.82611	-24.4107	401.1426	-2897.48	-1397.26	4090.552					
TOTAL FOR CASE VII :	-6.82611	-24.4107	386.2012	-2749.77	-1062.53	4090.552					

10 T WALL MONOLITH WEST SIDE ( MONOLITH T-3 )  
20 PROP 29000 724 261 21.4 2 0 ALL  
30 SOIL ES 0.079 LEN 78 0 ALL  
40 PIN ALL  
50 ALLOW H 130 100 385 385 709 2119 ALL  
60 BATTER 2.0 1 TO 11  
70 BATTER 2.0 12 TO 19  
80 BATTER 12.0 23 25 27 29 31 33  
85 BATTER 8.0 24 26 28 30 32  
90 BATTER 12.0 34 TO 39  
110 BATTER 35 40  
120 BATTER 12 41  
125 BATTER 6 42  
130 ANGLE 90 1 TO 22  
140 ANGLE 270 23 TO 34 35 TO 39  
150 ANGLE 312 41 TO 43  
160 ANGLE 132 40  
330 PILE 1 17.5 5.0 0 12 17.5 1.5 0 23 17.5 -1.5 0 34 17.5 -5.0 0  
340 PILE 40 21.25 1.5 0 41 23.75 -1.5 0 42 21 -4.5 0  
360 ROW X 11 1 10 AT -3.5  
370 ROW X 11 12 10 AT -3.5  
380 ROW X 11 23 10 AT -3.5  
390 ROW X 6 34 5 AT -7.0  
400 LOAD 1 0 -10 488 -1230 -1209 0  
410 LOAD 2 -21 105 354 -1113 -1086 3783  
420 LOAD 3 -21 105 340 -1083 -774 3783  
450 LOAD 4 -76 652 107 3183 -122 1501  
460 LOAD 5 -76 652 104 2748 -524 1501  
470 LOAD 6 -5 -18 280 -2051 -965 3068  
480 LOAD 7 -5 -18 269 -1941 -714 3068  
680 FOU 1 2 3 4 5 6 7 B:\T-3.OUT  
690 TOUT 1 2 3 4 5 6 7  
700 PFO ALL  
710 FPL N

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\* CORPS PROGRAM # X0080 \* CPGA - CASE PILE GROUP ANALYSIS PROGRAM  
\* VERSION NUMBER # 86/09/02-C \* RUN DATE 09-07-95 RUN TIME 11:52:15  
\*\*\*\*\*

T WALL MONOLITH WEST SIDE ( MONOLITH T-3 )

THERE ARE 42 PILES AND  
7 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

WITH DIAGONAL COORDINATES = ( X Y Z  
-----  
( -17.50 , -5.00 , .00 )  
( 23.75 , 5.00 , .00 )

\*\*\*\*\*

PILE PROPERTIES AS INPUT

E	I1	I2	A	C33	B66
KSI	IN**4	IN**4	IN**2		
.29000E+05	.72400E+03	.26100E+03	.21400E+02	.20000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

\*\*\*\*\*

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL	LENGTH	L	LU
	K/IN**2	L	FT	FT
	.79000E-01	L	.78000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

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PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X	Y	Z	BATTER	ANGLE	LENGTH	FIXITY
	FT	FT	FT			FT	
1	17.50	5.00	.00	2.00	90.00	78.00	P
2	14.00	5.00	.00	2.00	90.00	78.00	P
3	10.50	5.00	.00	2.00	90.00	78.00	P
4	7.00	5.00	.00	2.00	90.00	78.00	P
5	3.50	5.00	.00	2.00	90.00	78.00	P
6	.00	5.00	.00	2.00	90.00	78.00	P

7	-3.50	5.00	.00	2.00	90.00	78.00	P
8	-7.00	5.00	.00	2.00	90.00	78.00	P
9	-10.50	5.00	.00	2.00	90.00	78.00	P
10	-14.00	5.00	.00	2.00	90.00	78.00	P
1	-17.50	5.00	.00	2.00	90.00	78.00	P
12	17.50	1.50	.00	2.00	90.00	78.00	P
13	14.00	1.50	.00	2.00	90.00	78.00	P
14	10.50	1.50	.00	2.00	90.00	78.00	P
15	7.00	1.50	.00	2.00	90.00	78.00	P
16	3.50	1.50	.00	2.00	90.00	78.00	P
17	.00	1.50	.00	2.00	90.00	78.00	P
18	-3.50	1.50	.00	2.00	90.00	78.00	P
19	-7.00	1.50	.00	2.00	90.00	78.00	P
20	-10.50	1.50	.00	V	90.00	78.00	P
21	-14.00	1.50	.00	V	90.00	78.00	P
22	-17.50	1.50	.00	V	90.00	78.00	P
23	17.50	-1.50	.00	12.00	270.00	78.00	P
24	14.00	-1.50	.00	8.00	270.00	78.00	P
25	10.50	-1.50	.00	12.00	270.00	78.00	P
26	7.00	-1.50	.00	8.00	270.00	78.00	P
27	3.50	-1.50	.00	12.00	270.00	78.00	P
28	.00	-1.50	.00	8.00	270.00	78.00	P
29	-3.50	-1.50	.00	12.00	270.00	78.00	P
30	-7.00	-1.50	.00	8.00	270.00	78.00	P
31	-10.50	-1.50	.00	12.00	270.00	78.00	P
32	-14.00	-1.50	.00	8.00	270.00	78.00	P
33	-17.50	-1.50	.00	12.00	270.00	78.00	P
34	17.50	-5.00	.00	12.00	270.00	78.00	P
35	10.50	-5.00	.00	12.00	270.00	78.00	P
36	3.50	-5.00	.00	12.00	270.00	78.00	P
7	-3.50	-5.00	.00	12.00	270.00	78.00	P
38	-10.50	-5.00	.00	12.00	270.00	78.00	P
39	-17.50	-5.00	.00	12.00	270.00	78.00	P
40	21.25	1.50	.00	35.00	132.00	78.00	P
41	23.75	-1.50	.00	12.00	312.00	78.00	P
42	21.00	-4.50	.00	6.00	312.00	78.00	P

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3276.00

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APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	-10.0	488.0	-1230.0	-1209.0	.0
2	-21.0	105.0	354.0	-1113.0	-1086.0	3783.0
3	-21.0	105.0	340.0	-1083.0	-774.0	3783.0
4	-76.0	652.0	107.0	3183.0	-122.0	1501.0
5	-76.0	652.0	104.0	2748.0	-524.0	1501.0
6	-5.0	-18.0	280.0	-2051.0	-965.0	3068.0
7	-5.0	-18.0	269.0	-1941.0	-714.0	3068.0

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ORIGINAL PILE GROUP STIFFNESS MATRIX

.31795E+03	-.20416E+02	.19119E+03	-.95080E+04	-.50517E+05	-.61330E+04
-.20416E+02	.54885E+04	.76997E+04	.50102E+06	-.21012E+06	.14362E+06
.19119E+03	.76997E+04	.50420E+05	.12203E+06	-.90527E+06	.21962E+06
-.95080E+04	.50102E+06	.12203E+06	.83836E+08	.20630E+08	.70694E+07
.50517E+05	-.21012E+06	-.90527E+06	.20630E+08	.11279E+10	-.10750E+09
-.61330E+04	.14362E+06	.21962E+06	.70694E+07	-.10750E+09	.89848E+08

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 = 18.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 18.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 17.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 17.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 18.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 17.

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PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	-.1272E-01	.5528E-02	.9455E-02	-.2221E-03	-.2498E-05	-.1833E-04
2	-.5974E-01	.7063E-01	-.3204E-02	-.6410E-03	.5716E-04	.5149E-03
3	-.5884E-01	.7080E-01	-.3473E-02	-.6385E-03	.6072E-04	.5194E-03
4	-.2313E+00	.2800E+00	-.3615E-01	-.1195E-02	.2897E-04	-.4589E-04
5	-.2341E+00	.3006E+00	-.3886E-01	-.1375E-02	.2827E-04	-.5898E-04
6	-.1390E-01	.4128E-01	-.3245E-03	-.5917E-03	.5029E-04	.4503E-03
7	-.1278E-01	.3731E-01	-.1928E-04	-.5535E-03	.5230E-04	.4554E-03

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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
1	.0	.1	-3.0	4.8	-.7	.0	.03	.01
2	.0	.1	-2.6	4.8	-.9	.0	.03	.01
3	.0	.1	-2.3	4.8	-1.1	.0	.02	.01



15	.6	.5	44.4	28.6	-27.5	.0	.34	.17
16	.5	.5	34.4	28.6	-22.5	.0	.26	.14
17	.4	.5	24.4	28.6	-17.4	.0	.19	.11
18	.3	.5	14.4	28.6	-12.3	.0	.11	.08
9	.2	.5	4.4	28.6	-7.2	.0	.03	.06
20	.0	.5	-10.0	28.6	-1.4	.0	.10	.07
21	-.1	.5	-6.8	28.6	4.0	.0	.07	.06
22	-.2	.5	-3.6	28.6	9.3	.0	.04	.05
23	-1.0	-.4	-24.5	-20.9	44.3	.0	.25	.11
24	-.9	-.4	-27.5	-20.9	38.8	.0	.28	.12
25	-.7	-.4	-13.4	-20.9	33.6	.0	.13	.08
26	-.6	-.4	-14.1	-20.9	28.2	.0	.14	.08
27	-.5	-.4	-2.3	-20.9	23.0	.0	.02	.05
28	-.4	-.4	-.7	-20.9	17.7	.0	.01	.04
29	-.3	-.4	8.8	-20.9	12.4	.0	.07	.06
30	-.2	-.4	12.8	-20.9	7.2	.0	.10	.07
31	.0	-.4	19.9	-20.9	1.7	.0	.15	.08
32	.1	-.4	26.2	-20.9	-3.4	.0	.20	.10
33	.2	-.4	31.0	-20.9	-8.9	.0	.24	.11
34	-1.0	-.2	11.0	-12.0	44.8	.0	.08	.07
35	-.8	-.2	22.2	-12.0	34.2	.0	.17	.09
36	-.5	-.2	33.3	-12.0	23.6	.0	.26	.11
37	-.3	-.2	44.4	-12.0	12.9	.0	.34	.14
38	-.1	-.2	55.5	-12.0	2.3	.0	.43	.16
39	.2	-.2	66.6	-12.0	-8.3	.0	.51	.19
40	1.1	-.6	-31.4	-34.8	-49.1	.0	.31	.15
41	-1.1	.8	-32.0	44.8	48.3	.0	.32	.17
42	-.9	.8	-14.9	45.8	42.5	.0	.15	.12

AD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	1.0	.6	42.0	37.3	-46.1	.0	.32	.18
2	.9	.6	32.1	37.3	-41.0	.0	.25	.16
3	.8	.6	22.2	37.3	-35.8	.0	.17	.13
4	.7	.6	12.3	37.3	-30.7	.0	.09	.10
5	.6	.6	2.3	37.3	-25.6	.0	.02	.07
6	.5	.6	-7.6	37.3	-20.4	.0	.08	.08
7	.3	.6	-17.5	37.3	-15.3	.0	.17	.11
8	.2	.6	-27.4	37.3	-10.1	.0	.27	.13
9	.1	.6	-37.3	37.3	-5.0	.0	.37	.15
10	.0	.6	-47.2	37.3	.2	.0	.47	.18
11	-.1	.6	-57.1	37.3	5.3	.0	.57	.20
12	1.0	.5	73.8	28.3	-43.1	.0	.57	.25
13	.8	.5	63.9	28.3	-38.0	.0	.49	.22
14	.7	.5	54.0	28.3	-32.9	.0	.42	.20
15	.6	.5	44.1	28.3	-27.7	.0	.34	.17
16	.5	.5	34.2	28.3	-22.6	.0	.26	.14
17	.4	.5	24.2	28.3	-17.4	.0	.19	.11
18	.3	.5	14.3	28.3	-12.3	.0	.11	.08
19	.2	.5	4.4	28.3	-7.1	.0	.03	.05
20	.0	.5	-9.7	28.3	-1.3	.0	.10	.07
1	-.1	.5	-6.3	28.3	4.1	.0	.06	.06
22	-.2	.5	-2.9	28.3	9.5	.0	.03	.05
23	-1.0	-.4	-26.1	-20.5	44.5	.0	.26	.12
24	-.9	-.4	-28.9	-20.5	39.0	.0	.29	.12
25	-.8	-.4	-14.5	-20.5	33.8	.0	.15	.08

26	-.6	-.4	-15.0	-20.5	28.4	.0	.15	.08
27	-.5	-.4	-3.0	-20.5	23.1	.0	.03	.05
28	-.4	-.4	-1.1	-20.5	17.7	.0	.01	.04
29	-.3	-.4	8.6	-20.5	12.4	.0	.07	.06
0	-.2	-.4	12.8	-20.5	7.1	.0	.10	.07
31	.0	-.4	20.1	-20.5	1.7	.0	.15	.08
32	.1	-.4	26.7	-20.5	-3.5	.0	.21	.10
33	.2	-.4	31.7	-20.5	-9.1	.0	.24	.12
34	-1.0	-.2	9.4	-11.5	45.1	.0	.07	.06
35	-.8	-.2	20.9	-11.5	34.4	.0	.16	.09
36	-.5	-.2	32.5	-11.5	23.6	.0	.25	.11
37	-.3	-.2	44.0	-11.5	12.9	.0	.34	.14
38	.0	-.2	55.6	-11.5	2.2	.0	.43	.16
39	.2	-.2	67.1	-11.5	-8.5	.0	.52	.19
40	1.1	-.6	-32.9	-35.4	-49.2	.0	.33	.16
41	-1.1	.8	-33.8	45.5	48.4	.0	.34	.17
42	-.9	.8	-16.6	46.5	42.5	.0	.17	.13

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	1.6	1.6	25.2	94.8	-72.9	.0	.19	.23
2	1.6	1.6	27.8	94.8	-73.2	.0	.21	.24
3	1.6	1.6	30.4	94.8	-73.5	.0	.23	.25
4	1.6	1.6	33.0	94.8	-73.8	.0	.25	.25
5	1.6	1.6	35.6	94.8	-74.1	.0	.27	.26
6	1.7	1.6	38.2	94.8	-74.4	.0	.29	.27
7	1.7	1.6	40.7	94.8	-74.7	.0	.31	.27
8	1.7	1.6	43.3	94.8	-75.0	.0	.33	.28
9	1.7	1.6	45.9	94.8	-75.2	.0	.35	.29
10	1.7	1.6	48.5	94.8	-75.5	.0	.37	.30
11	1.7	1.6	51.1	94.8	-75.8	.0	.39	.30
12	1.5	1.6	84.7	95.6	-67.3	.0	.65	.39
13	1.5	1.6	87.3	95.6	-67.6	.0	.67	.39
14	1.5	1.6	89.9	95.6	-67.9	.0	.69	.40
15	1.5	1.6	92.5	95.6	-68.2	.0	.71	.41
16	1.5	1.6	95.1	95.6	-68.5	.0	.73	.41
17	1.5	1.6	97.7	95.6	-68.8	.0	.75	.42
18	1.5	1.6	100.3	95.6	-69.1	.0	.77	.43
19	1.5	1.6	102.8	95.6	-69.4	.0	.79	.43
20	1.6	1.6	-71.6	95.6	-71.2	.0	.72	.35
21	1.6	1.6	-70.0	95.6	-71.6	.0	.70	.35
22	1.6	1.6	-68.4	95.6	-72.1	.0	.68	.35
23	-1.5	-1.7	-57.2	-96.3	66.7	.0	.57	.32
24	-1.5	-1.7	-70.5	-96.3	66.7	.0	.70	.35
25	-1.5	-1.7	-54.4	-96.3	67.7	.0	.54	.31
26	-1.5	-1.7	-67.9	-96.3	67.7	.0	.68	.34
27	-1.5	-1.7	-51.6	-96.3	68.7	.0	.52	.30
28	-1.5	-1.7	-65.3	-96.3	68.7	.0	.65	.34
29	-1.5	-1.7	-48.8	-96.3	69.7	.0	.49	.30
30	-1.5	-1.7	-62.8	-96.3	69.8	.0	.63	.33
31	-1.6	-1.7	-46.0	-96.3	70.7	.0	.46	.29
2	-1.6	-1.7	-60.2	-96.3	70.8	.0	.60	.33
33	-1.6	-1.7	-43.2	-96.3	71.7	.0	.43	.28
34	-1.5	-1.7	9.1	-97.1	67.7	.0	.07	.19
35	-1.5	-1.7	11.9	-97.1	68.7	.0	.09	.20
36	-1.5	-1.7	14.7	-97.1	69.7	.0	.11	.21

37	-1.6	-1.7	17.5	-97.1	70.7	.0	.13	.22
38	-1.6	-1.7	20.3	-97.1	71.7	.0	.16	.22
39	-1.6	-1.7	23.1	-97.1	72.7	.0	.18	.23
40	2.0	-.1	-72.8	-3.4	-88.5	.0	.73	.24
1	-1.9	.0	-69.2	2.5	87.3	.0	.69	.22
42	-2.0	.0	-50.0	2.4	88.3	.0	.50	.18

## LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	1.7	1.6	19.9	95.6	-78.4	.0	.15	.22
2	1.7	1.6	22.8	95.6	-78.8	.0	.18	.23
3	1.8	1.6	25.7	95.6	-79.2	.0	.20	.24
4	1.8	1.6	28.6	95.6	-79.6	.0	.22	.25
5	1.8	1.6	31.4	95.6	-80.0	.0	.24	.25
6	1.8	1.6	34.3	95.6	-80.4	.0	.26	.26
7	1.8	1.6	37.2	95.6	-80.9	.0	.29	.27
8	1.8	1.6	40.1	95.6	-81.3	.0	.31	.28
9	1.8	1.6	42.9	95.6	-81.7	.0	.33	.28
10	1.8	1.6	45.8	95.6	-82.1	.0	.35	.29
11	1.8	1.6	48.7	95.6	-82.5	.0	.37	.30
12	1.6	1.7	88.4	96.7	-71.9	.0	.68	.40
13	1.6	1.7	91.3	96.7	-72.3	.0	.70	.41
14	1.6	1.7	94.2	96.7	-72.8	.0	.72	.42
15	1.6	1.7	97.1	96.7	-73.2	.0	.75	.42
16	1.6	1.7	99.9	96.7	-73.6	.0	.77	.43
17	1.6	1.7	102.8	96.7	-74.0	.0	.79	.44
18	1.7	1.7	105.7	96.7	-74.4	.0	.81	.45
19	1.7	1.7	108.6	96.7	-74.9	.0	.84	.45
20	1.7	1.7	-79.6	96.7	-76.7	.0	.80	.38
21	1.7	1.7	-78.0	96.7	-77.3	.0	.78	.38
22	1.7	1.7	-76.5	96.7	-77.9	.0	.76	.37
23	-1.6	-1.7	-58.2	-97.5	71.1	.0	.58	.32
24	-1.6	-1.7	-72.6	-97.5	71.2	.0	.73	.36
25	-1.6	-1.7	-55.6	-97.5	72.4	.0	.56	.32
26	-1.6	-1.7	-70.3	-97.5	72.5	.0	.70	.35
27	-1.6	-1.7	-53.0	-97.5	73.6	.0	.53	.31
28	-1.6	-1.7	-68.0	-97.5	73.8	.0	.68	.35
29	-1.7	-1.7	-50.4	-97.5	74.9	.0	.50	.30
30	-1.7	-1.7	-65.7	-97.5	75.1	.0	.66	.34
31	-1.7	-1.7	-47.9	-97.5	76.2	.0	.48	.30
32	-1.7	-1.7	-63.4	-97.5	76.4	.0	.63	.34
33	-1.7	-1.7	-45.3	-97.5	77.5	.0	.45	.29
34	-1.6	-1.7	18.1	-98.6	72.3	.0	.14	.22
35	-1.6	-1.7	20.7	-98.6	73.6	.0	.16	.23
36	-1.7	-1.7	23.3	-98.6	74.8	.0	.18	.23
37	-1.7	-1.7	25.9	-98.6	76.1	.0	.20	.24
38	-1.7	-1.7	28.5	-98.6	77.4	.0	.22	.25
39	-1.7	-1.7	31.0	-98.6	78.7	.0	.24	.26
40	2.0	-.1	-79.9	-7.4	-92.1	.0	.80	.26
41	-2.0	.1	-69.8	6.3	90.9	.0	.70	.23
42	-2.0	.1	-43.9	6.1	92.3	.0	.44	.17

## LOAD CASE - 6

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF
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	K	K	K	IN-K	IN-K	IN-K		
1	.8	.3	25.5	17.0	-35.4	.0	.20	.11
2	.7	.3	16.8	17.0	-31.0	.0	.13	.08
3	.6	.3	8.1	17.0	-26.5	.0	.06	.06
4	.5	.3	-.6	17.0	-22.1	.0	.01	.04
5	.4	.3	-9.3	17.0	-17.6	.0	.09	.06
6	.3	.3	-18.0	17.0	-13.2	.0	.18	.08
7	.2	.3	-26.7	17.0	-8.7	.0	.27	.10
8	.1	.3	-35.4	17.0	-4.3	.0	.35	.12
9	.0	.3	-44.1	17.0	.2	.0	.44	.14
10	-.1	.3	-52.9	17.0	4.6	.0	.53	.16
11	-.2	.3	-61.6	17.0	9.1	.0	.62	.19
12	.7	.2	55.0	9.1	-32.7	.0	.42	.17
13	.6	.2	46.3	9.1	-28.2	.0	.36	.15
14	.5	.2	37.6	9.1	-23.8	.0	.29	.12
15	.4	.2	28.9	9.1	-19.3	.0	.22	.10
16	.3	.2	20.2	9.1	-14.9	.0	.16	.07
17	.2	.2	11.5	9.1	-10.4	.0	.09	.05
18	.1	.2	2.8	9.1	-6.0	.0	.02	.02
19	.0	.2	-6.0	9.1	-1.5	.0	.06	.03
20	-.1	.2	-6.2	9.1	3.9	.0	.06	.03
21	-.2	.2	-3.4	9.1	8.6	.0	.03	.03
22	-.3	.2	-.6	9.1	13.3	.0	.01	.02
23	-.7	.0	-15.3	-2.4	33.7	.0	.15	.06
24	-.6	.0	-16.8	-2.4	29.0	.0	.17	.06
25	-.5	.0	-5.5	-2.4	24.4	.0	.06	.03
26	-.4	.0	-5.0	-2.4	19.7	.0	.05	.03
27	-.3	.0	4.2	-2.4	15.1	.0	.03	.02
28	-.2	.0	6.8	-2.4	10.5	.0	.05	.03
29	-.1	.0	14.0	-2.4	5.8	.0	.11	.04
30	.0	.0	18.6	-2.4	1.3	.0	.14	.05
31	.1	.0	23.7	-2.4	-3.5	.0	.18	.07
32	.2	.0	30.4	-2.4	-7.9	.0	.23	.09
33	.3	.0	33.5	-2.4	-12.8	.0	.26	.10
34	-.8	.1	17.6	5.4	34.2	.0	.14	.07
35	-.6	.1	27.3	5.4	24.9	.0	.21	.09
36	-.3	.1	37.1	5.4	15.6	.0	.29	.11
37	-.1	.1	46.8	5.4	6.3	.0	.36	.13
38	.1	.1	56.6	5.4	-3.0	.0	.44	.16
39	.3	.1	66.3	5.4	-12.3	.0	.51	.19
40	.7	-.6	-26.6	-36.5	-32.7	.0	.27	.14
41	-.7	.8	-19.6	45.3	32.2	.0	.20	.13
42	-.6	.8	1.2	46.2	27.3	.0	.01	.08

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.8	.3	26.4	16.6	-34.5	.0	.20	.11
2	.7	.3	17.7	16.6	-30.0	.0	.14	.08
3	.6	.3	8.9	16.6	-25.5	.0	.07	.06
4	.5	.3	.2	16.6	-21.0	.0	.00	.03
5	.4	.3	-8.5	16.6	-16.5	.0	.09	.05
6	.3	.3	-17.3	16.6	-12.0	.0	.17	.07
7	.2	.3	-26.0	16.6	-7.5	.0	.26	.09
8	.1	.3	-34.8	16.6	-3.0	.0	.35	.12
9	.0	.3	-43.5	16.6	1.5	.0	.43	.14

10	-.1	.3	-52.2	16.6	6.0	.0	.52	.16
11	-.2	.3	-61.0	16.6	10.5	.0	.61	.19
12	.7	.1	54.0	8.7	-31.9	.0	.42	.17
13	.6	.1	45.2	8.7	-27.4	.0	.35	.14
4	.5	.1	36.5	8.7	-22.9	.0	.28	.12
15	.4	.1	27.8	8.7	-18.4	.0	.21	.09
16	.3	.1	19.0	8.7	-13.9	.0	.15	.07
17	.2	.1	10.3	8.7	-9.4	.0	.08	.04
18	.1	.1	1.5	8.7	-4.9	.0	.01	.02
19	.0	.1	-7.2	8.7	-.4	.0	.07	.03
20	-.1	.1	-4.5	8.7	5.0	.0	.04	.03
21	-.2	.1	-1.6	8.7	9.8	.0	.02	.02
22	-.3	.1	1.3	8.7	14.5	.0	.01	.02
23	-.7	.0	-16.0	-1.9	33.0	.0	.16	.06
24	-.6	.0	-17.2	-1.9	28.2	.0	.17	.06
25	-.5	.0	-6.0	-1.9	23.6	.0	.06	.03
26	-.4	.0	-5.1	-1.9	18.8	.0	.05	.02
27	-.3	.0	4.0	-1.9	14.2	.0	.03	.02
28	-.2	.0	6.9	-1.9	9.5	.0	.05	.03
29	-.1	.0	14.0	-1.9	4.8	.0	.11	.04
30	.0	.0	19.0	-1.9	.2	.0	.15	.05
31	.1	.0	24.1	-1.9	-4.6	.0	.19	.07
32	.2	.0	31.1	-1.9	-9.1	.0	.24	.09
33	.3	.0	34.1	-1.9	-14.0	.0	.26	.10
34	-.7	.1	14.7	6.0	33.4	.0	.11	.06
35	-.5	.1	24.7	6.0	24.0	.0	.19	.08
36	-.3	.1	34.7	6.0	14.6	.0	.27	.11
37	-.1	.1	44.8	6.0	5.2	.0	.34	.13
38	.1	.1	54.8	6.0	-4.2	.0	.42	.15
39	.3	.1	64.8	6.0	-13.6	.0	.50	.18
40	.7	-.6	-26.1	-36.1	-32.0	.0	.26	.13
41	-.7	.8	-20.6	45.0	31.5	.0	.21	.13
42	-.6	.8	-1.1	45.8	26.5	.0	.01	.08

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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	-1.3	-2.7	.0	.0	.0
2	-.1	-1.2	-2.4	.0	.0	.0
3	-.1	-1.0	-2.1	.0	.0	.0
4	-.1	-.9	-1.8	.0	.0	.0
5	-.1	-.7	-1.5	.0	.0	.0
6	-.1	-.6	-1.2	.0	.0	.0
7	-.1	-.4	-.9	.0	.0	.0
8	-.1	-.3	-.6	.0	.0	.0
9	-.1	-.1	-.3	.0	.0	.0
10	-.1	.1	.0	.0	.0	.0
11	-.1	.2	.3	.0	.0	.0
12	-.1	3.6	7.2	.0	.0	.0
13	-.1	3.8	7.5	.0	.0	.0
14	-.1	3.9	7.8	.0	.0	.0

15	-.1	4.1	8.1	.0	.0	.0
16	-.1	4.2	8.4	.0	.0	.0
17	-.1	4.4	8.7	.0	.0	.0
18	-.1	4.5	9.0	.0	.0	.0
19	-.1	4.7	9.3	.0	.0	.0
20	-.1	.0	6.8	.0	.0	.0
21	-.1	.0	6.7	.0	.0	.0
22	-.1	.1	6.5	.0	.0	.0
23	-.1	-1.5	18.2	.0	.0	.0
24	-.1	-2.2	17.7	.0	.0	.0
25	-.1	-1.5	17.8	.0	.0	.0
26	-.1	-2.1	17.2	.0	.0	.0
27	-.1	-1.4	17.3	.0	.0	.0
28	-.1	-2.0	16.7	.0	.0	.0
29	-.1	-1.4	16.9	.0	.0	.0
30	-.1	-2.0	16.1	.0	.0	.0
31	-.1	-1.3	16.4	.0	.0	.0
32	-.1	-1.9	15.6	.0	.0	.0
33	-.1	-1.3	16.0	.0	.0	.0
34	-.1	-2.5	30.5	.0	.0	.0
35	-.1	-2.5	30.1	.0	.0	.0
36	-.1	-2.4	29.6	.0	.0	.0
37	-.1	-2.4	29.2	.0	.0	.0
38	-.1	-2.3	28.7	.0	.0	.0
39	-.1	-2.3	28.3	.0	.0	.0
40	-.2	.2	8.4	.0	.0	.0
41	.9	-1.1	17.7	.0	.0	.0
42	2.8	-3.3	26.4	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-.6	19.9	37.4	.0	.0	.0
2	-.6	15.3	28.6	.0	.0	.0
3	-.6	10.7	19.7	.0	.0	.0
4	-.6	6.2	10.8	.0	.0	.0
5	-.6	1.6	1.9	.0	.0	.0
6	-.6	-3.0	-6.9	.0	.0	.0
7	-.6	-7.5	-15.8	.0	.0	.0
8	-.6	-12.1	-24.7	.0	.0	.0
9	-.6	-16.7	-33.6	.0	.0	.0
10	-.6	-21.2	-42.4	.0	.0	.0
11	-.6	-25.8	-51.3	.0	.0	.0
12	-.5	34.1	66.0	.0	.0	.0
13	-.5	29.5	57.2	.0	.0	.0
14	-.5	24.9	48.3	.0	.0	.0
15	-.5	20.4	39.4	.0	.0	.0
16	-.5	15.8	30.5	.0	.0	.0
17	-.5	11.3	21.7	.0	.0	.0
18	-.5	6.7	12.8	.0	.0	.0
19	-.5	2.1	3.9	.0	.0	.0
20	-.5	.0	-10.0	.0	.0	.0
21	-.5	-.1	-6.8	.0	.0	.0
22	-.5	-.2	-3.6	.0	.0	.0
23	-.4	3.0	-24.4	.0	.0	.0
24	-.4	4.3	-27.2	.0	.0	.0
25	-.4	1.9	-13.3	.0	.0	.0

26	-.4	2.4	-13.9	.0	.0	.0
27	-.4	.7	-2.3	.0	.0	.0
28	-.4	.5	-.6	.0	.0	.0
29	-.4	-.5	8.8	.0	.0	.0
30	-.4	-1.4	12.7	.0	.0	.0
31	-.4	-1.6	19.8	.0	.0	.0
32	-.4	-3.3	26.0	.0	.0	.0
33	-.4	-2.8	30.9	.0	.0	.0
34	-.2	.1	11.1	.0	.0	.0
35	-.2	-1.1	22.1	.0	.0	.0
36	-.2	-2.2	33.2	.0	.0	.0
37	-.2	-3.4	44.2	.0	.0	.0
38	-.2	-4.6	55.3	.0	.0	.0
39	-.2	-5.7	66.3	.0	.0	.0
40	.3	.5	-31.4	.0	.0	.0
41	-1.9	3.3	-31.8	.0	.0	.0
42	-1.7	3.0	-14.5	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-.6	19.7	37.1	.0	.0	.0
2	-.6	15.2	28.3	.0	.0	.0
3	-.6	10.6	19.5	.0	.0	.0
4	-.6	6.1	10.7	.0	.0	.0
5	-.6	1.6	1.8	.0	.0	.0
6	-.6	-3.0	-7.0	.0	.0	.0
7	-.6	-7.5	-15.8	.0	.0	.0
8	-.6	-12.1	-24.6	.0	.0	.0
9	-.6	-16.6	-33.4	.0	.0	.0
10	-.6	-21.1	-42.2	.0	.0	.0
11	-.6	-25.7	-51.1	.0	.0	.0
12	-.5	33.9	65.6	.0	.0	.0
13	-.5	29.3	56.8	.0	.0	.0
14	-.5	24.8	48.0	.0	.0	.0
15	-.5	20.3	39.1	.0	.0	.0
16	-.5	15.7	30.3	.0	.0	.0
17	-.5	11.2	21.5	.0	.0	.0
18	-.5	6.6	12.7	.0	.0	.0
19	-.5	2.1	3.9	.0	.0	.0
20	-.5	.0	-9.7	.0	.0	.0
21	-.5	-.1	-6.3	.0	.0	.0
22	-.5	-.2	-2.9	.0	.0	.0
23	-.4	3.1	-25.9	.0	.0	.0
24	-.4	4.4	-28.5	.0	.0	.0
25	-.4	2.0	-14.4	.0	.0	.0
26	-.4	2.5	-14.8	.0	.0	.0
27	-.4	.8	-2.9	.0	.0	.0
28	-.4	.5	-1.0	.0	.0	.0
29	-.4	-.4	8.6	.0	.0	.0
30	-.4	-1.4	12.7	.0	.0	.0
31	-.4	-1.6	20.1	.0	.0	.0
32	-.4	-3.4	26.5	.0	.0	.0
33	-.4	-2.8	31.5	.0	.0	.0
34	-.2	.2	9.4	.0	.0	.0
35	-.2	-1.0	20.9	.0	.0	.0
36	-.2	-2.2	32.4	.0	.0	.0

37	-.2	-3.4	43.9	.0	.0	.0
38	-.2	-4.6	55.4	.0	.0	.0
39	-.2	-5.8	66.9	.0	.0	.0
40	.4	.5	-32.9	.0	.0	.0
41	-2.0	3.4	-33.6	.0	.0	.0
42	-1.9	3.3	-16.2	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-1.6	12.7	21.8	.0	.0	.0
2	-1.6	13.9	24.2	.0	.0	.0
3	-1.6	15.1	26.5	.0	.0	.0
4	-1.6	16.2	28.8	.0	.0	.0
5	-1.6	17.4	31.1	.0	.0	.0
6	-1.6	18.5	33.4	.0	.0	.0
7	-1.6	19.7	35.7	.0	.0	.0
8	-1.6	20.9	38.0	.0	.0	.0
9	-1.6	22.0	40.3	.0	.0	.0
10	-1.6	23.2	42.6	.0	.0	.0
11	-1.6	24.4	44.9	.0	.0	.0
12	-1.6	39.2	75.1	.0	.0	.0
13	-1.6	40.4	77.4	.0	.0	.0
14	-1.6	41.6	79.7	.0	.0	.0
15	-1.6	42.7	82.1	.0	.0	.0
16	-1.6	43.9	84.4	.0	.0	.0
17	-1.6	45.0	86.7	.0	.0	.0
18	-1.6	46.2	89.0	.0	.0	.0
19	-1.6	47.4	91.3	.0	.0	.0
20	-1.6	1.6	-71.6	.0	.0	.0
21	-1.6	1.6	-70.0	.0	.0	.0
22	-1.6	1.6	-68.4	.0	.0	.0
23	-1.7	6.2	-56.8	.0	.0	.0
24	-1.7	10.2	-69.7	.0	.0	.0
25	-1.7	6.0	-54.1	.0	.0	.0
26	-1.7	9.9	-67.2	.0	.0	.0
27	-1.7	5.8	-51.3	.0	.0	.0
28	-1.7	9.6	-64.6	.0	.0	.0
29	-1.7	5.6	-48.5	.0	.0	.0
30	-1.7	9.3	-62.1	.0	.0	.0
31	-1.7	5.4	-45.7	.0	.0	.0
32	-1.7	9.0	-59.5	.0	.0	.0
33	-1.7	5.2	-42.9	.0	.0	.0
34	-1.7	.7	9.2	.0	.0	.0
35	-1.7	.5	12.0	.0	.0	.0
36	-1.7	.3	14.8	.0	.0	.0
37	-1.7	.1	17.6	.0	.0	.0
38	-1.7	-.1	20.4	.0	.0	.0
39	-1.7	-.3	23.1	.0	.0	.0
40	.1	.0	-72.8	.0	.0	.0
41	-5.1	5.7	-68.8	.0	.0	.0
42	-6.8	7.6	-49.0	.0	.0	.0

LOAD CASE - 5

PILE	PX	PY	PZ	MX	MY	MZ
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	K	K	K	IN-K	IN-K	IN-K
1	-1.6	10.5	17.0	.0	.0	.0
2	-1.6	11.8	19.6	.0	.0	.0
3	-1.6	13.1	22.2	.0	.0	.0
4	-1.6	14.4	24.8	.0	.0	.0
5	-1.6	15.6	27.3	.0	.0	.0
6	-1.6	16.9	29.9	.0	.0	.0
7	-1.6	18.2	32.5	.0	.0	.0
8	-1.6	19.5	35.0	.0	.0	.0
9	-1.6	20.8	37.6	.0	.0	.0
10	-1.6	22.1	40.2	.0	.0	.0
11	-1.6	23.4	42.7	.0	.0	.0
12	-1.7	41.0	78.4	.0	.0	.0
13	-1.7	42.3	80.9	.0	.0	.0
14	-1.7	43.6	83.5	.0	.0	.0
15	-1.7	44.9	86.1	.0	.0	.0
16	-1.7	46.2	88.6	.0	.0	.0
17	-1.7	47.4	91.2	.0	.0	.0
18	-1.7	48.7	93.8	.0	.0	.0
19	-1.7	50.0	96.4	.0	.0	.0
20	-1.7	1.7	-79.6	.0	.0	.0
21	-1.7	1.7	-78.0	.0	.0	.0
22	-1.7	1.7	-76.5	.0	.0	.0
23	-1.7	6.4	-57.9	.0	.0	.0
24	-1.7	10.6	-71.9	.0	.0	.0
25	-1.7	6.2	-55.3	.0	.0	.0
26	-1.7	10.3	-69.6	.0	.0	.0
27	-1.7	6.0	-52.7	.0	.0	.0
28	-1.7	10.1	-67.3	.0	.0	.0
29	-1.7	5.8	-50.1	.0	.0	.0
30	-1.7	9.8	-65.0	.0	.0	.0
31	-1.7	5.7	-47.5	.0	.0	.0
32	-1.7	9.5	-62.7	.0	.0	.0
33	-1.7	5.5	-45.0	.0	.0	.0
34	-1.7	.1	18.2	.0	.0	.0
35	-1.7	-.1	20.7	.0	.0	.0
36	-1.7	-.3	23.3	.0	.0	.0
37	-1.7	-.5	25.9	.0	.0	.0
38	-1.7	-.7	28.5	.0	.0	.0
39	-1.7	-.8	31.1	.0	.0	.0
40	.3	-.1	-79.9	.0	.0	.0
41	-5.1	5.9	-69.4	.0	.0	.0
42	-6.1	6.9	-43.0	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-.3	12.1	22.5	.0	.0	.0
2	-.3	8.1	14.7	.0	.0	.0
3	-.3	4.2	7.0	.0	.0	.0
4	-.3	.2	-.7	.0	.0	.0
5	-.3	-3.8	-8.5	.0	.0	.0
6	-.3	-7.8	-16.2	.0	.0	.0
7	-.3	-11.8	-24.0	.0	.0	.0
8	-.3	-15.8	-31.7	.0	.0	.0
9	-.3	-19.7	-39.5	.0	.0	.0

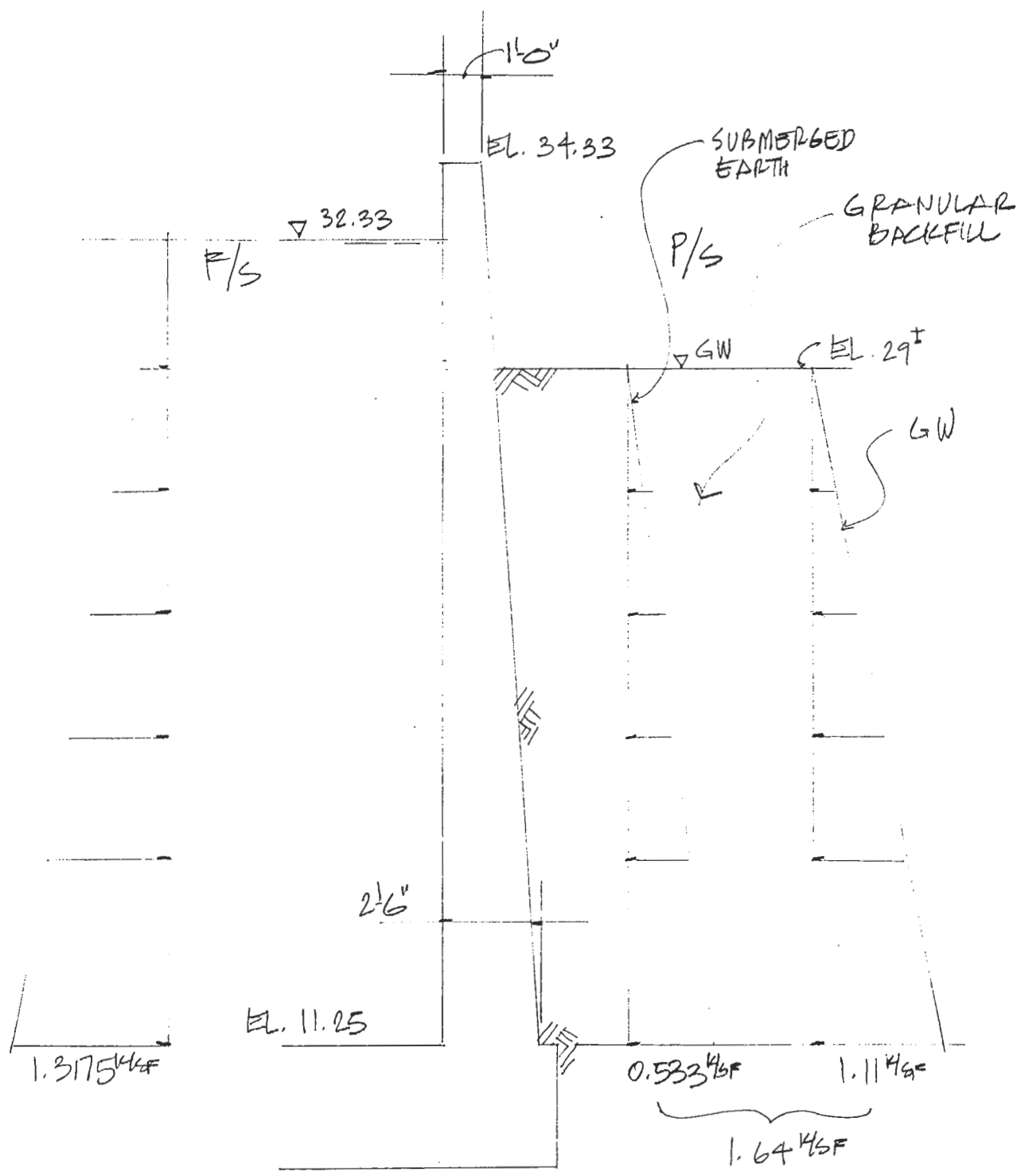
10	-.3	-23.7	-47.2	.0	.0	.0
11	-.3	-27.7	-55.0	.0	.0	.0
12	-.2	25.3	48.9	.0	.0	.0
13	-.2	21.3	41.1	.0	.0	.0
14	-.2	17.3	33.4	.0	.0	.0
15	-.2	13.3	25.6	.0	.0	.0
16	-.2	9.3	17.9	.0	.0	.0
17	-.2	5.3	10.1	.0	.0	.0
18	-.2	1.3	2.4	.0	.0	.0
19	-.2	-2.6	-5.3	.0	.0	.0
20	-.2	-.1	-6.2	.0	.0	.0
21	-.2	-.2	-3.4	.0	.0	.0
22	-.2	-.3	-.6	.0	.0	.0
23	.0	2.0	-15.2	.0	.0	.0
24	.0	2.7	-16.6	.0	.0	.0
25	.0	1.0	-5.5	.0	.0	.0
26	.0	1.1	-4.9	.0	.0	.0
27	.0	.0	4.2	.0	.0	.0
28	.0	-.6	6.8	.0	.0	.0
29	.0	-1.0	13.9	.0	.0	.0
30	.0	-2.3	18.4	.0	.0	.0
31	.0	-2.0	23.6	.0	.0	.0
32	.0	-3.9	30.1	.0	.0	.0
33	.0	-3.1	33.3	.0	.0	.0
34	.1	-.7	17.6	.0	.0	.0
35	.1	-1.7	27.3	.0	.0	.0
36	.1	-2.7	37.0	.0	.0	.0
37	.1	-3.7	46.7	.0	.0	.0
38	.1	-4.8	56.4	.0	.0	.0
39	.1	-5.8	66.1	.0	.0	.0
40	.5	.4	-26.6	.0	.0	.0
41	-1.0	2.3	-19.5	.0	.0	.0
42	.3	.8	1.3	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-.3	12.5	23.3	.0	.0	.0
2	-.3	8.5	15.5	.0	.0	.0
3	-.3	4.5	7.7	.0	.0	.0
4	-.3	.5	.0	.0	.0	.0
5	-.3	-3.5	-7.8	.0	.0	.0
6	-.3	-7.5	-15.6	.0	.0	.0
7	-.3	-11.5	-23.4	.0	.0	.0
8	-.3	-15.5	-31.1	.0	.0	.0
9	-.3	-19.5	-38.9	.0	.0	.0
10	-.3	-23.5	-46.7	.0	.0	.0
11	-.3	-27.5	-54.4	.0	.0	.0
12	-.1	24.8	48.0	.0	.0	.0
13	-.1	20.8	40.2	.0	.0	.0
14	-.1	16.8	32.4	.0	.0	.0
15	-.1	12.8	24.6	.0	.0	.0
16	-.1	8.8	16.9	.0	.0	.0
17	-.1	4.8	9.1	.0	.0	.0
18	-.1	.8	1.3	.0	.0	.0
19	-.1	-3.2	-6.4	.0	.0	.0
20	-.1	-.1	-4.5	.0	.0	.0

21	-.1	-.2	-1.6	.0	.0	.0
22	-.1	-.3	1.3	.0	.0	.0
23	.0	2.1	-15.9	.0	.0	.0
24	.0	2.8	-17.0	.0	.0	.0
25	.0	1.0	-5.9	.0	.0	.0
26	.0	1.1	-5.0	.0	.0	.0
27	.0	.0	4.0	.0	.0	.0
28	.0	-.7	6.9	.0	.0	.0
29	.0	-1.1	14.0	.0	.0	.0
30	.0	-2.4	18.9	.0	.0	.0
31	.0	-2.1	24.0	.0	.0	.0
32	.0	-4.1	30.8	.0	.0	.0
33	.0	-3.1	33.9	.0	.0	.0
34	.1	-.5	14.7	.0	.0	.0
35	.1	-1.5	24.7	.0	.0	.0
36	.1	-2.6	34.7	.0	.0	.0
37	.1	-3.6	44.6	.0	.0	.0
38	.1	-4.6	54.6	.0	.0	.0
39	.1	-5.7	64.5	.0	.0	.0
40	.5	.4	-26.1	.0	.0	.0
41	-1.0	2.3	-20.4	.0	.0	.0
42	.1	1.1	-1.0	.0	.0	.0

13-764 50 SHEETS, 11" x 17" SQUARE  
42-381 50 SHEETS, 11" x 17" SQUARE  
42-382 100 SHEETS, 11" x 17" SQUARE  
42-383 100 SHEETS, 11" x 17" SQUARE  
42-384 100 SHEETS, 11" x 17" SQUARE  
42-385 100 SHEETS, 11" x 17" SQUARE  
42-386 100 SHEETS, 11" x 17" SQUARE  
42-387 100 SHEETS, 11" x 17" SQUARE  
42-388 100 SHEETS, 11" x 17" SQUARE  
42-389 200 SHEETS, 11" x 17" SQUARE  
MADE IN U.S.A.



BM @ FOOT OF STEM = 97.6'k (SERVICE LOAD) F/S

BM @ FOOT OF STEM =  $1.64 \times 0.5 \times 17.75 \times 17.75 / 3$   
= 86'k (SERVICE LOAD) P/S

$M_u (F/S) = 1.3 \times 1.7 \times 97.6 = 216'k$      $M_n = 240'k$

$M_u (P/S) = 1.3 \times 1.7 \times 86 = 190'k$      $M_n = 211'k$

$$A_s(\text{req'd}) \text{ (P/S FACE)} = \frac{0.85 \times 4 \times 0.1013 \times 12 \times 25.4}{L_0} \\ = 1.75 \text{ } ^\circ\text{/FT.} \quad \frac{A_s}{b_d} = 0.0057$$

USE # 8 BARS @ 5" O.C. (VERT)

$$\therefore A_s(\text{PROVIDED}) = 1.89 \text{ } ^\circ\text{/FT} > 1.75 \text{ } ^\circ\text{/FT.} \quad \therefore \text{o.k.} \quad \frac{A_s}{b_d} = 0.0062 < 0.25 \rho_b$$

USE # 7 BARS @ 6" O.C. VERT ON P/S FACE. (SEE MONO T-1 STEM DESIGN)

HORIZ. REINF

$$= 0.0028 \times 12 \times 30 = 1 \text{ } ^\circ\text{/FT}$$

$$\therefore \text{USE # 7 @ 12" O.C. E.F. (TOTAL = 1.2 } ^\circ\text{ > 1.0 } ^\circ\text{)}$$

CHECK SHEAR

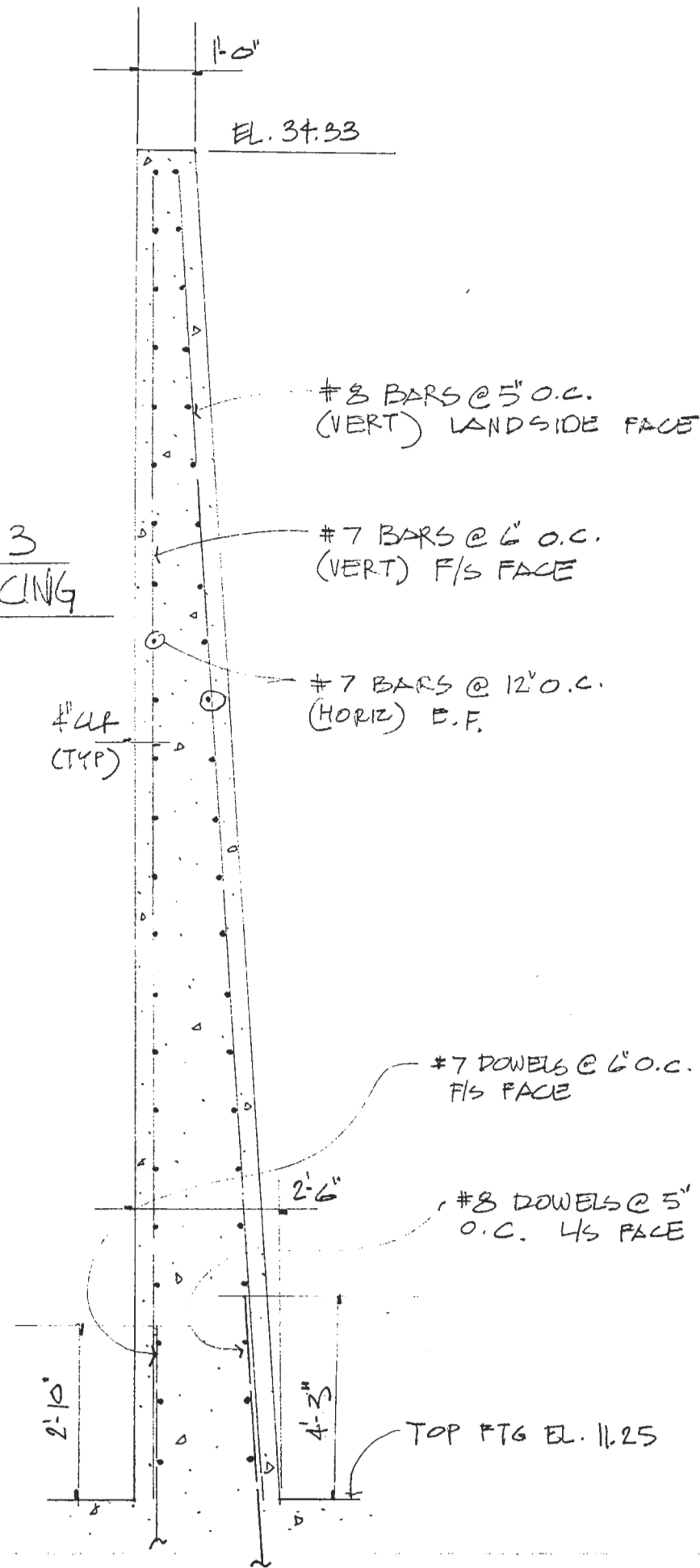
$$V_u = (14.55 - \frac{25.4}{12} \times 1.64) \times 1.3 \times 1.7 \\ = 24.5 \text{ k} < \phi V_c = 30.76 \text{ k} \quad \therefore \text{o.k.}$$

SELECTED STEM THICKNESS @ BASE IS ADEQUATE  
& NO SHEAR REINF IS NECESSARY.

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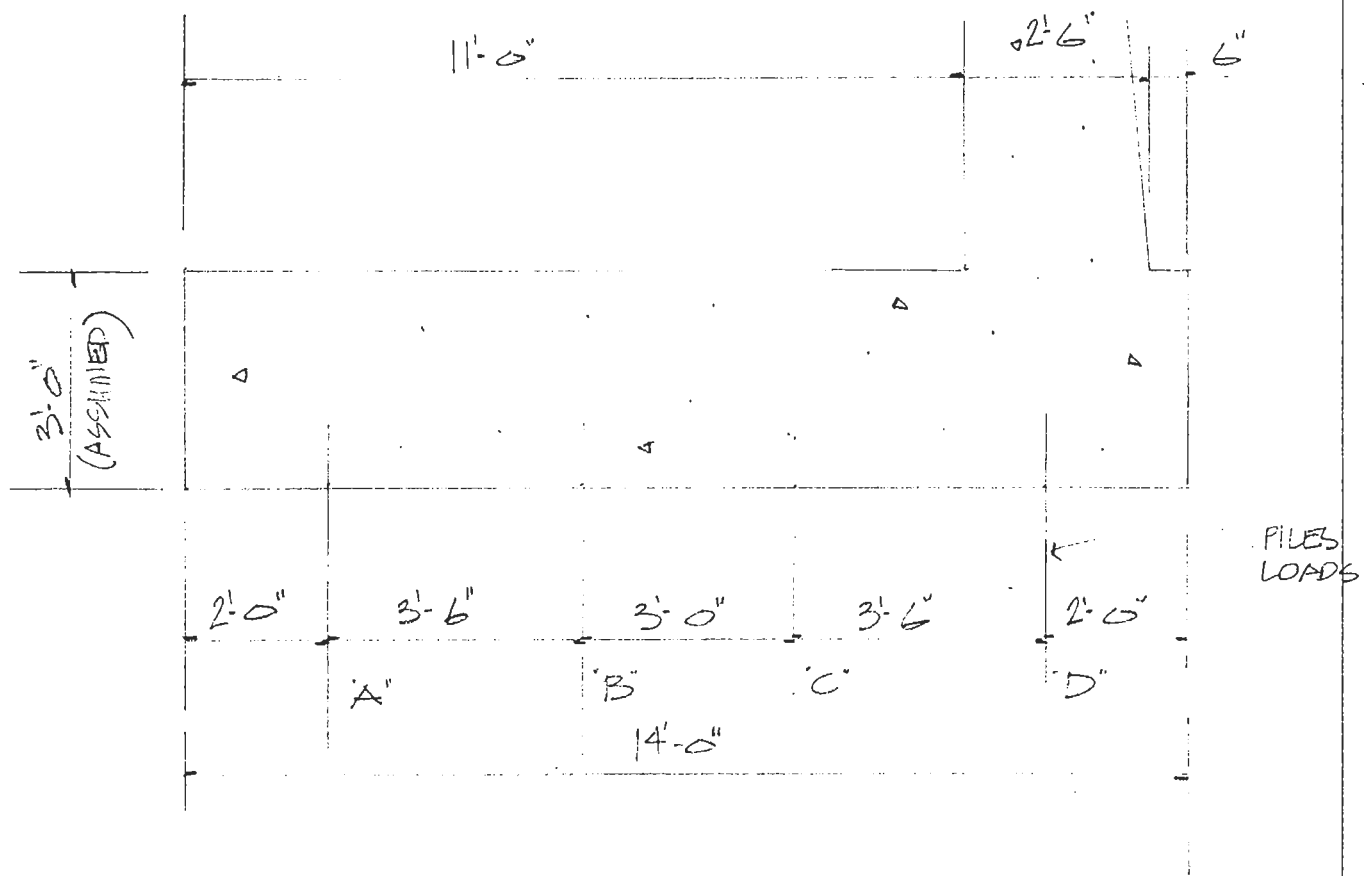


# MONOLITH T-3 STEM-REINFORCING



FOUNDATION SLAB DESIGN

- ASSUME :
1. SLAB THICK = 3'-0"
  2.  $F'_c = 4000$
  3.  $F_y = 60,000$
  4. DESIGN AS CANTILEVER FIXED @ F/S FACE OF STEM.



LOAD CASE 5 LOADS (CANAL EMPTY, GW @ 29)  
(PAGE T3-39)

1.	PILE	LOADS	PILE	LOAD
	8	42 <sup>k</sup>	9	50 <sup>k</sup>
	19	128 <sup>k</sup>	20	-106 <sup>k</sup>
	30	-87 <sup>k</sup>	31	-63 <sup>k</sup>
			38	38 <sup>k</sup>

2. SELF WT. (ASSUMING 3' THK SLAB) = 0.45<sup>k</sup>/sf.
3. UPLIFT. REFER TO PLATE 24.

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FDN SLAB DESIGNDESIGN A 3'-6" WIDE STRIP.BENDING MOM @ F/S FACE OF WALL @ 3'-6" STRIP  
@ PILES 8, 19 & 30.

$$1. \text{ SELF WT BM} = 0.45 \times 14^2 / 2 \times 3.5 \\ = -154'k$$

$$2. \text{ BM DUE TO UPLIFT} = 0.19 \times 3.5 \times 14^2 / 2 + \left( \frac{1.297 - 0.19}{2} \times 14 \right) \times 3.5 \times (4.67 - 3) \\ = 63 + 45 \\ = 110'k$$

$$3. \text{ BM DUE TO PILE LOADS} = 46 \times 9 + 128 \times 5.5 - 87 \times 2.5 \\ = 459'k$$

$$\therefore \text{ TL BM} = 154 + 110 + 459 = 715'k$$

$$\therefore \text{ BM/FT} = 715 / 3.5 = 204'k$$

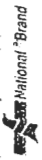
$$\therefore M_u = 1.3 \times 1.7 \times 204 = 463'k$$

$$\therefore \underline{d_{req}} = 25.60''$$

$$\text{ASSUMING } \# 9 \text{ BARS \& 4" COVER, THICKNESS REQ'D} \\ = 25.6'' + 4'' + \frac{9}{16}'' = 30.20'' < 36'' \therefore \text{O.K.}$$

 $\therefore$  O.K.

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FOUNDATION SLAB DESIGN

$$\phi V_c = 12 \times (36 - 4 - \frac{9}{16}) \times 2 \times 63 \times .85$$

$$= 39^k$$

$$V_u @ d' = 1. \text{ SELF WT. } 0.45 \times 14 \times 3.5 - 0.45 \times 3.5 \times 2.5 = -18^k$$

$$2. \text{ UPLIFT. } = 36^k$$

$$3. \text{ PILES } 46^k + 128^k - \frac{1}{2} \cdot 87 = 131^k$$


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$$\text{TOTAL} = 149^k$$

$$\therefore V_u @ d/FT = 149/3.5 = 42.6^k > \phi V_c \text{ N.G.}$$

TRY 40" THICK BASE SLAB

$$\therefore \phi V_c = 45.6^k > V_u @ d \quad \therefore \text{O.K.}$$

(IGNORE SLIGHT INCREASE IN HORIZONTAL & VERTICAL LOADS DUE TO INCREASE IN SLAB THICKNESS TO 40" FROM 36" ASSUMED IN ANALYSIS)

PUNCH SHEAR O.K. BY OBS.CHECK ADEQUACY OF 40" FDN @ PILES 9, 20, 31 & 38

BENDING MOM @ F/S FACE OF WALL

$$= -154^k + 110^k + (50 \times 9 - 106 \times 5.5 - 63 \times 2.5)$$

$$= -154 + 110 + (-291) = -335^k < 415^k \quad \therefore \text{O.K.}$$

$$\phi V_c = 45.6^k$$

$$V_u @ d = -18 + 36 + (50 - 106 - 63/2) = -70^k < 149^k \quad \therefore \text{O.K.}$$

F DN SLAB DESIGN

$f'_{cr} = 12" \quad d = 35.44" \quad F = 1.25$

$\therefore \text{FOR } M_u = 263, F = 1.25$   
 $K_u = 210 \therefore \rho = 0.0040$

$A_s(\text{req'd}) = 0.0040 \times 12 \times 35.44 = 1.71"$

USE # 9 BARS @ 6" O.C. (BOT). ( $A_s = 2.0" \therefore \text{O.K.}$ )

TOP REINF.

$B/1 = (335/3.5) \times 1.3 \times 1.7 = 212'K = M_u.$

USE # 9 BARS @ 6" O.C. (TOP) O.K BY OBS.

TEMP & SHRINKAGE

$= 0.0028 \times 12 \times 40 = 1.344"$

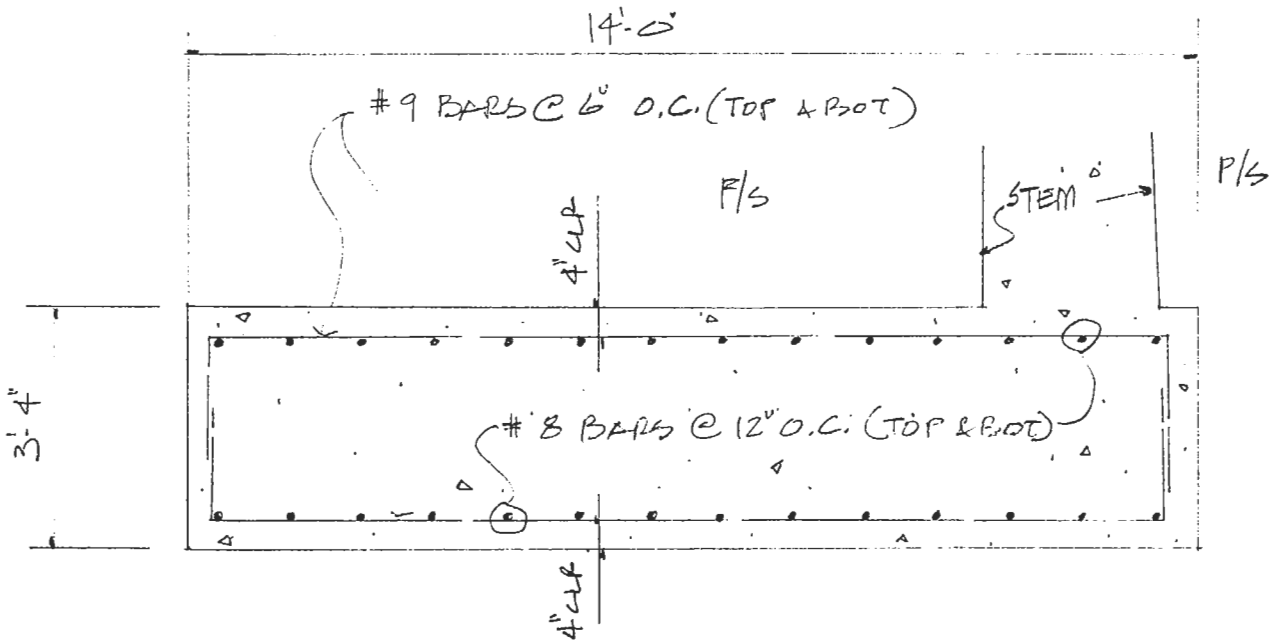
USE # 8 @ 12" TOP & BOT = 1.584" > 1.344"  $\therefore \text{O.K.}$

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FON SLAB DESIGN

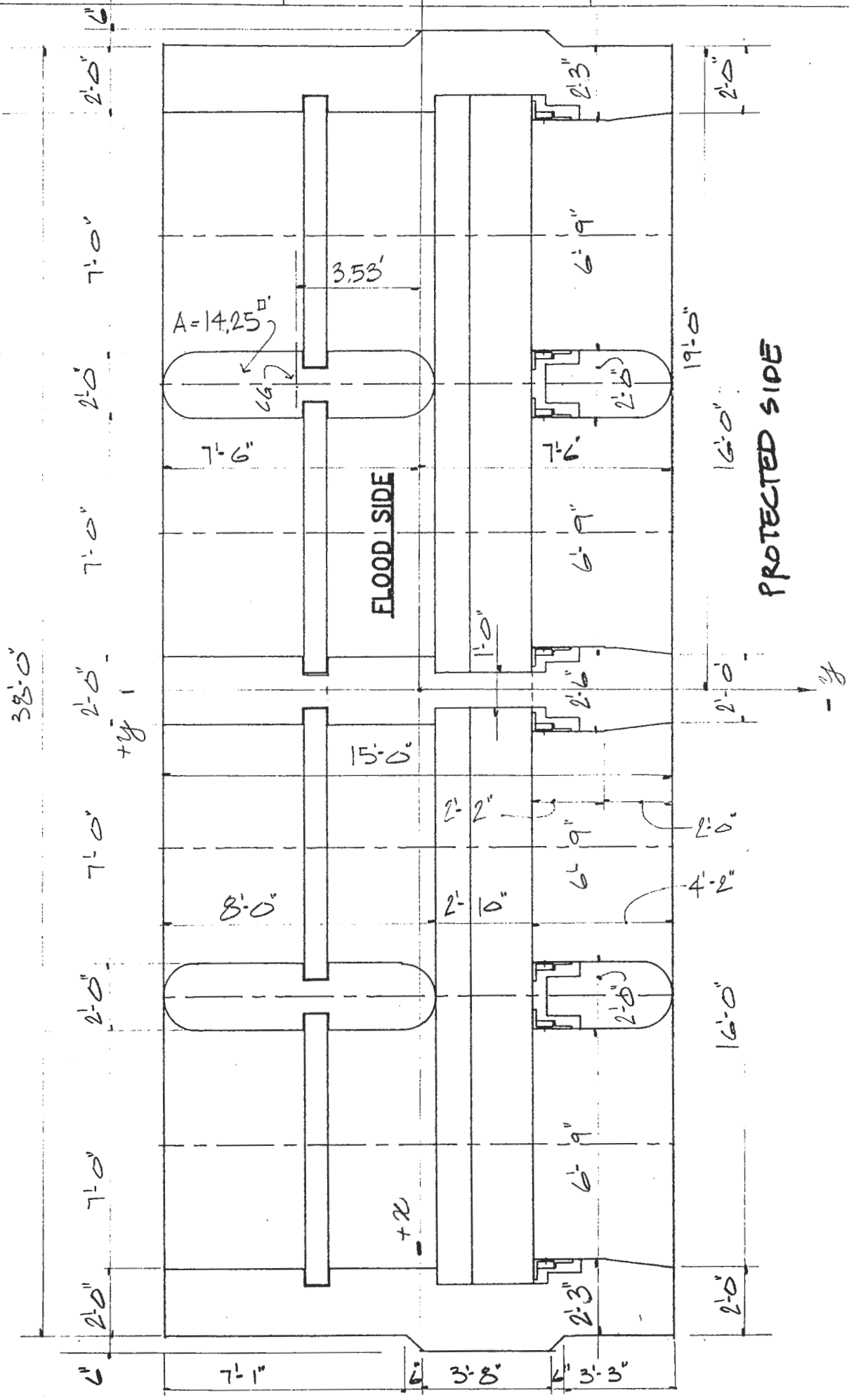
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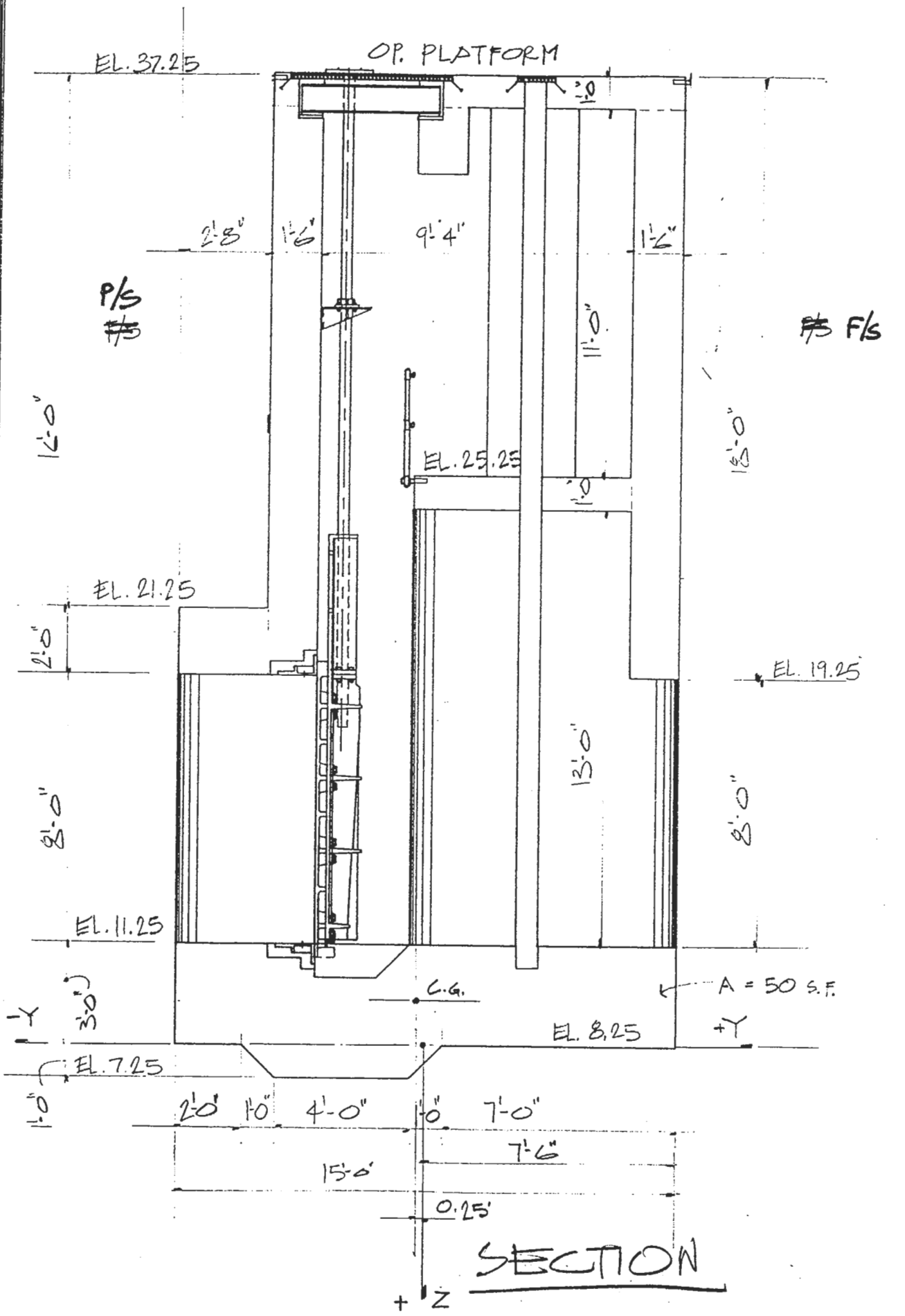


38'-0"



PLAN

13. THE USE OF THIS DRAWING IS LIMITED TO THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREIN. ANY OTHER USE, REPRODUCTION, OR TRANSMISSION OF THIS DRAWING WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER IS STRICTLY PROHIBITED. THE ENGINEER ASSUMES NO LIABILITY FOR ANY DAMAGE OR INJURY TO PERSONS OR PROPERTY ARISING FROM THE USE OF THIS DRAWING. THE ENGINEER'S OFFICE IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS IN THIS DRAWING. THE USER OF THIS DRAWING SHALL BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND CONDITIONS BEFORE CONSTRUCTION. THE ENGINEER'S OFFICE IS NOT RESPONSIBLE FOR ANY DELAYS OR COST INCREASES RESULTING FROM CHANGES TO THIS DRAWING. THE ENGINEER'S OFFICE IS NOT RESPONSIBLE FOR ANY UNDESIRABLE CONSEQUENCES ARISING FROM THE USE OF THIS DRAWING. THE ENGINEER'S OFFICE IS NOT RESPONSIBLE FOR ANY DAMAGE TO THE ENVIRONMENT OR PUBLIC HEALTH ARISING FROM THE USE OF THIS DRAWING. THE ENGINEER'S OFFICE IS NOT RESPONSIBLE FOR ANY VIOLATIONS OF ANY APPLICABLE LAWS OR REGULATIONS ARISING FROM THE USE OF THIS DRAWING. THE ENGINEER'S OFFICE IS NOT RESPONSIBLE FOR ANY OTHER MATTERS ARISING FROM THE USE OF THIS DRAWING.

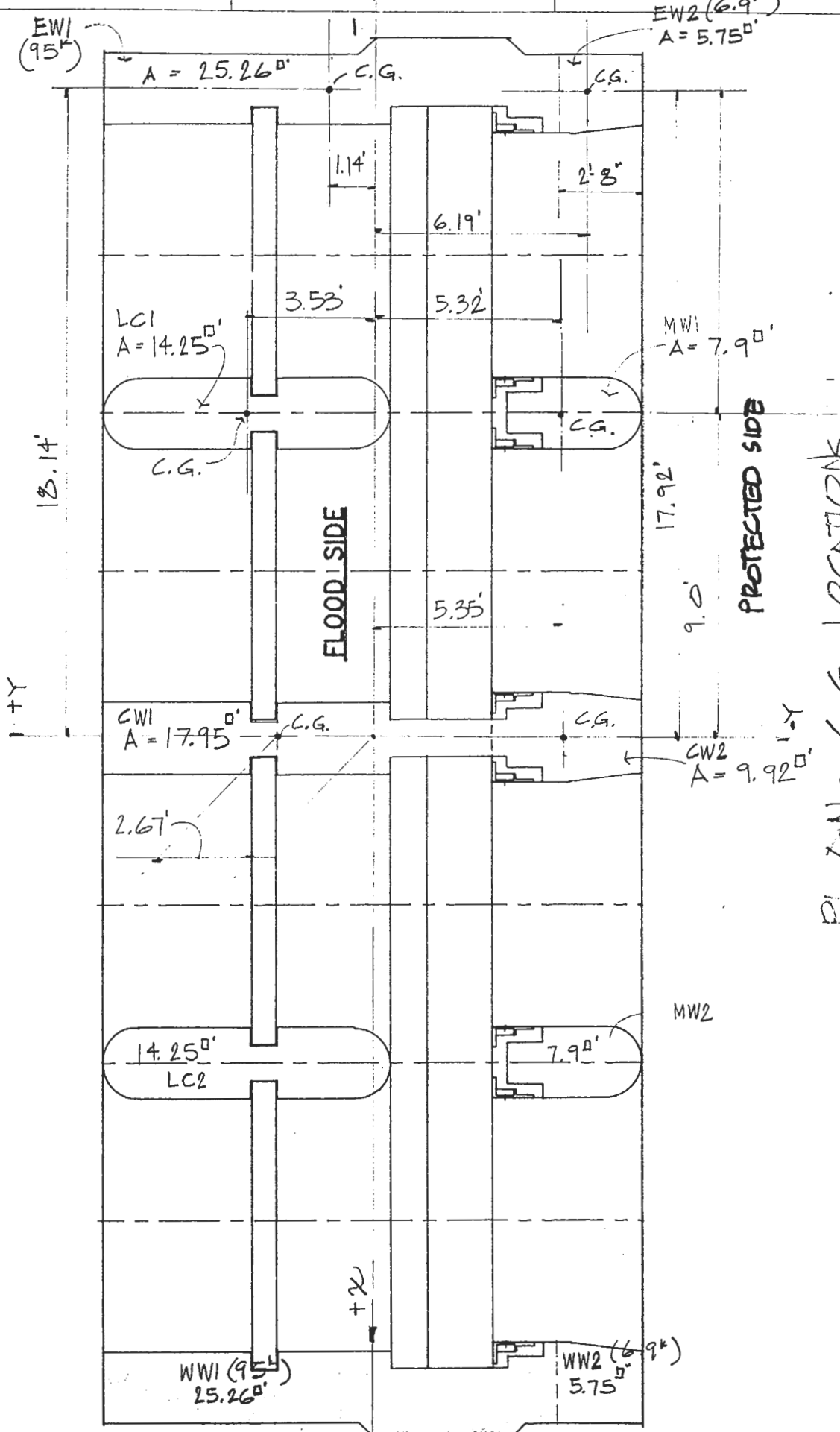


**SECTION**

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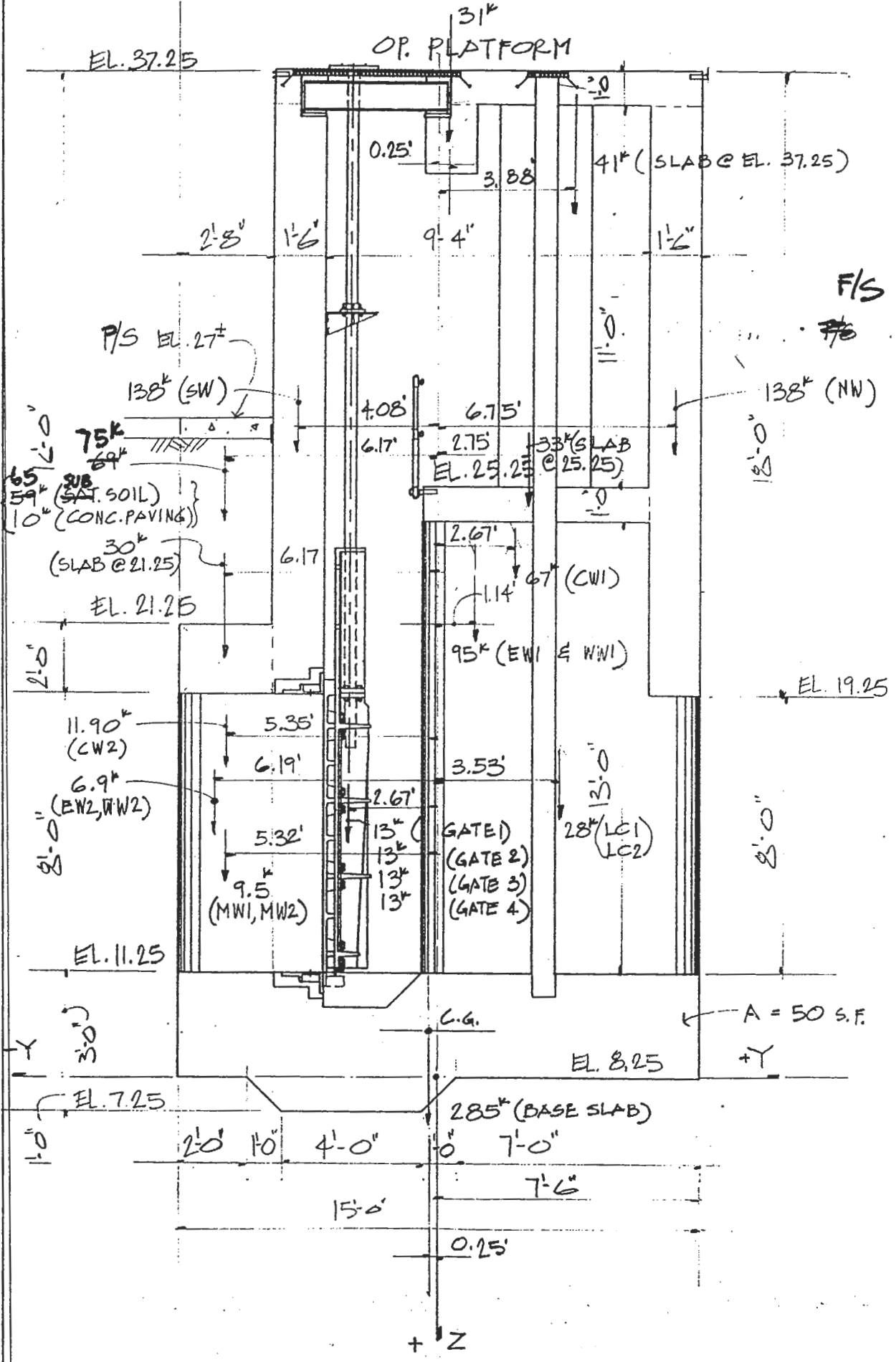
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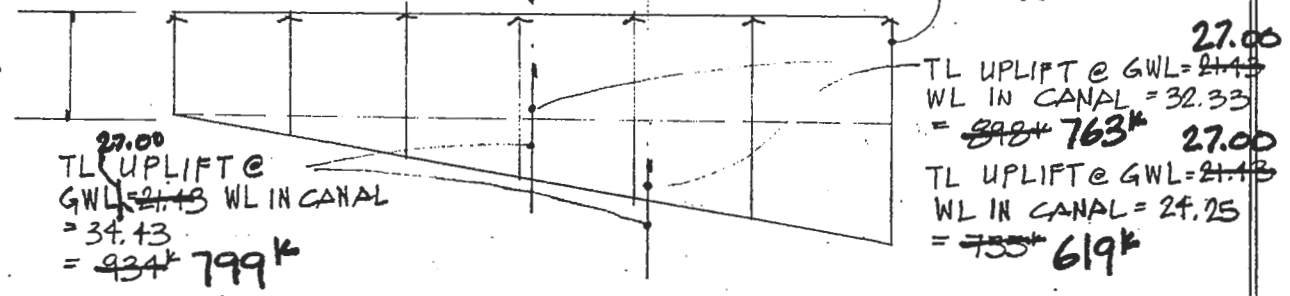
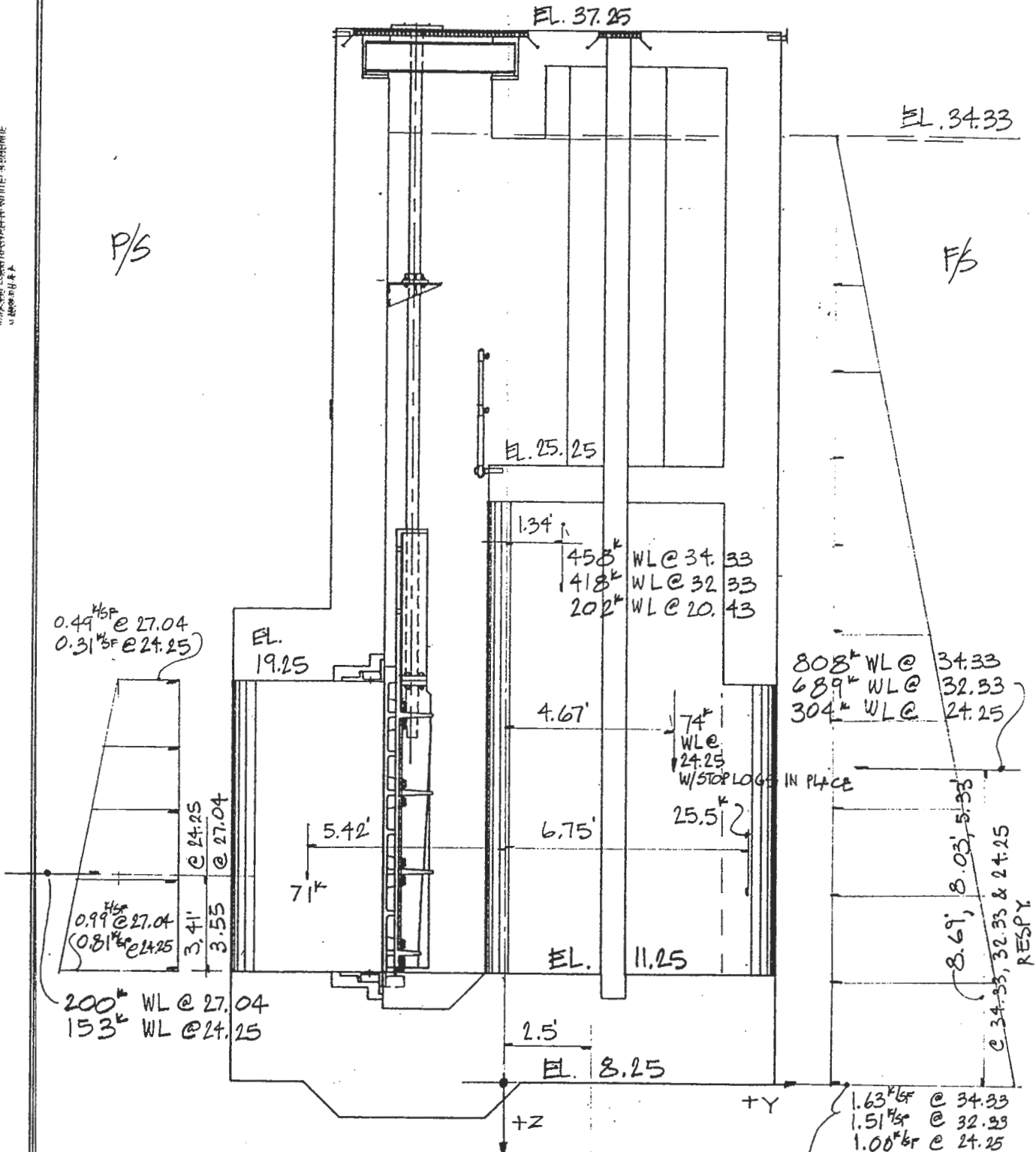


PLAN - C.G. LOCATIONS

# GRAVITY LOADS (CONC & EARTH)



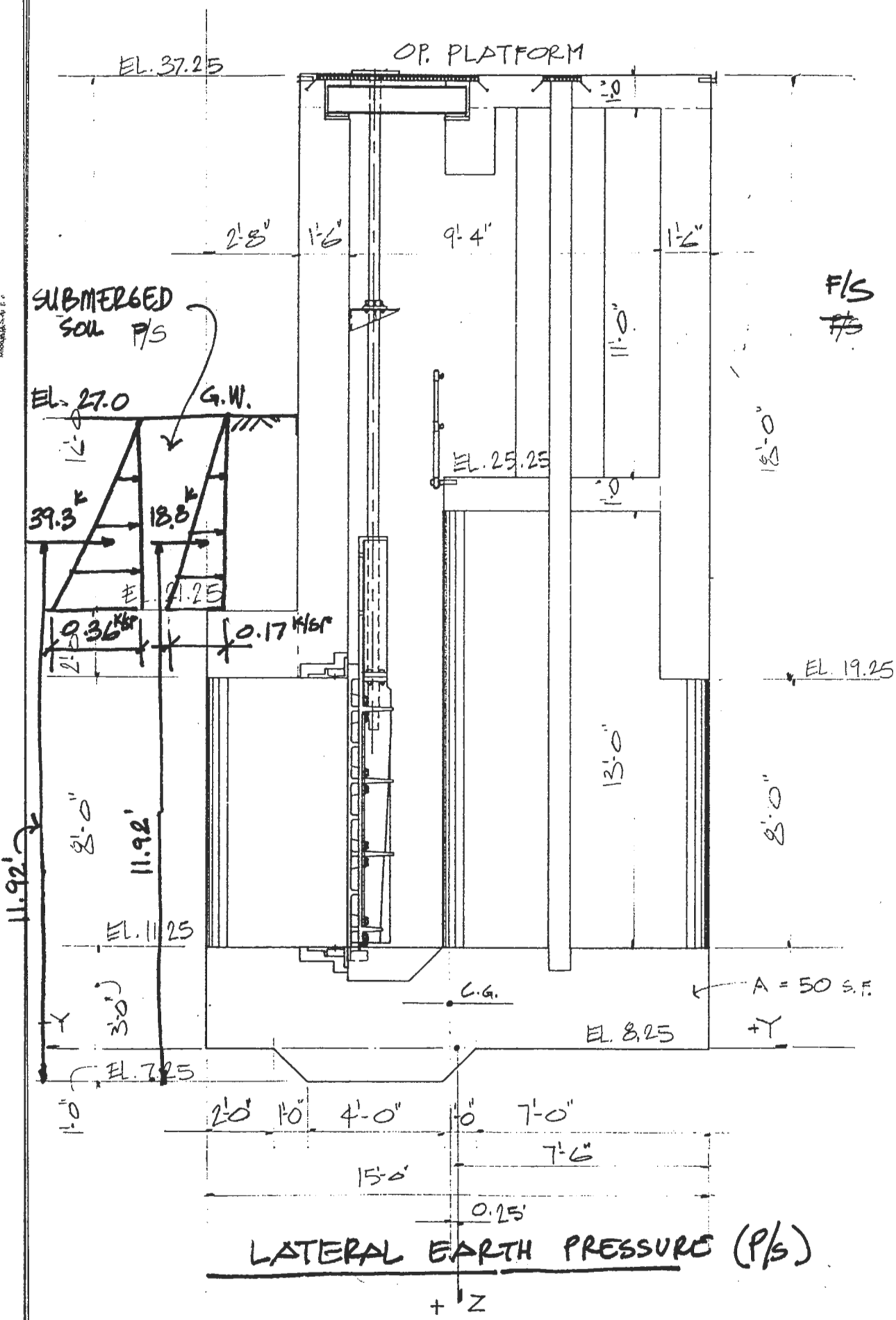
HYDRAULIC LOADS



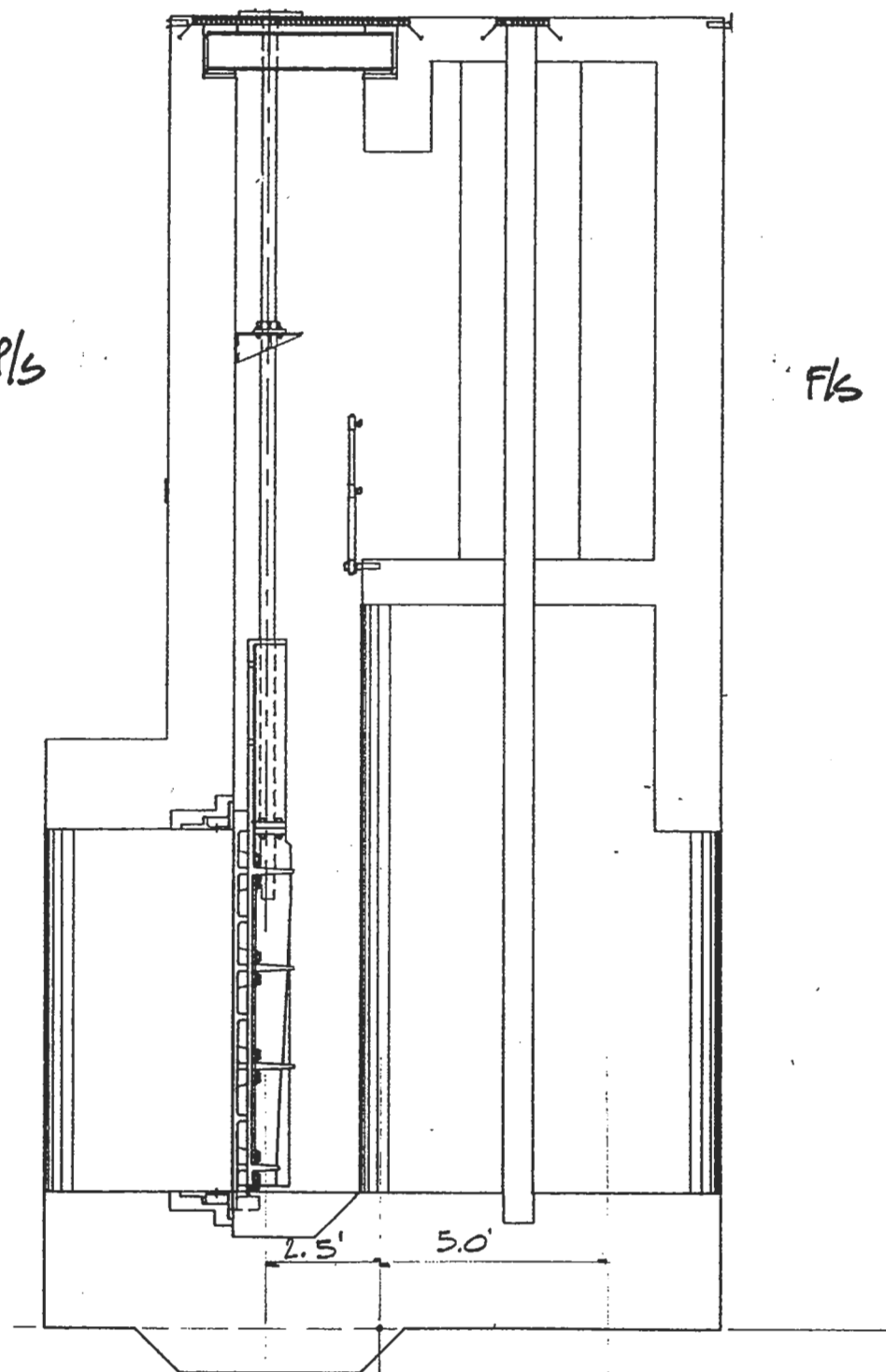
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HYDRAULIC LOADS



P/S

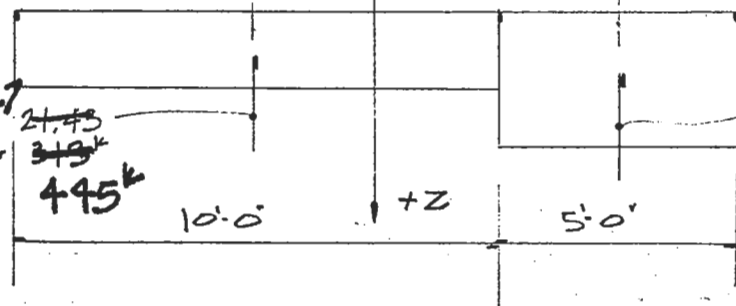
F/S

2.5' 5.0'

GWL @ 27  
UPLIFT = 21.43  
313k  
495k

UPLIFT

310k WL @ 31.33 GW 27.0  
286k WL @ 32.33 GW 27.0  
154k NL @ 24.25 GW 27.0



10.0'

+Z

5.0'

SLUICE GATE STRUCTURE AT PUMP "A" & "B" DISCHARGE ( MONOLITH G-1 )

VERTICAL LOADS																								
ITEM	LEN OR HT	DIMENSIONS		THK	AREA		W	QX	MOM CODE	QZ	LAX FOR MX		LEVER ARM		LXZ	FX	FY	FZ	L X L O R H T X	FZ X LAX	MX	MY	FZ X LAY	MZ
		WIDTH	HT		W X T O R	P E R S K T C H					FOR MX	FOR MY	FOR MX	FOR MY										
EW1	25.00				25.30		0.15	2			1.14	18.14						94.88		108.16			1721.03	
EW2	8.00				14.25		0.15	3			6.19	17.92						27.79		98.09			250.09	
LC1	13.00				7.90		0.15	3			5.32	9.00						9.48		-50.43			85.32	
MW1	8.00				17.95		0.15	3			0.00	0.00						67.31		0.00			0.00	
CW1	25.00				9.82		0.15	3			5.35	9.00						11.90		-63.69			0.00	
LC2	13.00				14.25		0.15	1			3.53	9.00						27.79		98.09			-250.09	
MW2	8.00				7.90		0.15	4			5.32	9.00						9.48		-50.43			-85.32	
WW1	25.00				25.30		0.15	1			1.14	18.14						94.88		108.16			-1721.03	
WW2	8.00				5.75		0.15	4			6.19	17.92						6.90		-42.71			-123.65	
BASESLAB	38.00				50.00		0.15	3			0.25	0.00						285.00		-71.25				
NW	18.00				51.00		0.15	1			6.75	0.00						137.70		929.48				
SW	18.00				51.00		0.15	3			4.08	0.00						137.70		-562.23				
SLAB@21.25	38.00				5.33		0.15	3			6.17	0.00						30.40		-187.57				
SLAB@25.25	34.00				6.50		0.15	2			2.75	0.00						33.15		91.16				
SLAB@37.25	38.00				7.25		0.15	2			3.88	0.00						41.33		160.13				
RCBM@37.25	34.00				6.00		0.15	2			0.25	0.00						30.60		7.65				
GATE 1								4			2.67	13.38						13.00		-34.67			-173.88	
GATE 2								4			2.67	4.63						13.00		-34.67			-60.13	
GATE 3								3			2.67	4.63						13.00		-34.67			60.13	
GATE 4								3			2.67	13.38						13.00		-34.67			173.88	
SUBM. SOIL	38				5.33		0.06	3			6.17							32.41		-199.95				
GR. WATER	38				5.33		0.0625	3			6.17							33.76		-208.281				
CONC PAVING	38				1.79		0.15	3			6.17							10.18		-62.84				
<b>TOTAL VERTICAL LOADS (CONC., GATES AND EARTH LOADS):</b>																								
																			<b>1181.62</b>		<b>-79.68</b>			<b>0.00</b>
VERTICAL HYDRAULIC LOADS																								
WATER ITEM	LENGTH	DIMENSIONS		WIDTH	AREA		W	QX	MOM CODE	QZ	LAX FOR MX		LEVER ARM		LXZ	FX	FY	FZ	L X L O R H T X	FZ X LAX	MX	MY	FZ X LAY	MZ
		HT	HT		W X T O R	P E R S K T C H					FOR MX	FOR MY	FOR MX	FOR MY										
32.33	34.00	21.08	9.33	9.33	196.68		0.0625	2			1.34	0						417.94		557.95			0.00	
UNDER N WALL	34.00	8.00	1.50	1.50	12.00		0.0625	2			6.75	0						25.50		172.13			0.00	
UNDER S WALL	34.00	8.00	4.17	4.17	33.33		0.0625	3			5.42	0						70.83		-383.92			0.00	
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR STORM WATER LEVEL IN CANAL @ 32.33</b>																								
																			<b>614.27</b>		<b>348.16</b>			
20.43	34.00	10.18	9.33	9.33	94.98		0.0625	2			1.34	0						201.83		269.44			0.00	
UNDER N WALL	34.00	8.00	1.50	1.50	12.00		0.0625	2			6.75	0						25.50		172.13			0.00	
UNDER S WALL	34.00	8.00	4.17	4.17	33.33		0.0625	3			5.42	0						70.83		-383.92			0.00	
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR WATER LEVEL IN CANAL @ 20.43</b>																								
																			<b>298.17</b>		<b>67.65</b>			
34.33	34.00	23.10	9.33	9.33	215.52		0.0625	2			1.34	0						457.98		611.41			0.00	
UNDER N WALL	34.00	8.00	1.50	1.50	12.00		0.0625	2			6.75	0						25.50		172.13			0.00	
UNDER S WALL	34.00	8.00	4.17	4.17	33.33		0.0625	3			5.42	0						70.83		-383.92			0.00	
<b>TOTAL VERTICAL HYDRAULIC LOADS FOR STORM WATER LEVEL IN CANAL @ 34.33</b>																								
																			<b>664.32</b>		<b>399.62</b>			
VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN USE:																								



SLUCEABR.WK3 SLUICE GATE STRUCTURE AT PUMP "A" & "B" DISCHARGE (MONOLITH G.F.)

VERTICAL LOADS		UPLIFT LOADS		WL IN CANAL @ 34.33 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF		WATER EL		TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 GW @ 27.00 AND IMPERVIOUS CUT-OFF		WL IN CANAL @ 32.33 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF		32.33		27.00		TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 GW @ 27.00 AND IMPERVIOUS CUT-OFF		WL IN CANAL @ 24.25 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF		24.25		27.00		TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.25 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF				
ITEM	HT1	HT2	w	w X HT1	w X HT2	L	WIDTH	SHAPE	FX	FY	FZ	LAX	LAY	MOMCODE	MX	MY												
WL IN CANAL	26.08		0.0625	1.63	0.000	38	5	R			-309.70	5.00		1	-1548.50													
GRND WL		18.75	0.0625	0.00	1.172	38	10	R			-445.31	2.50		2	1113.28													
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 GW @ 27.00 AND IMPERVIOUS CUT-OFF</b>																												
											<b>-755.01</b>				<b>-435.22</b>													
<b>WL IN CANAL @ 32.33 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF</b>																												
WL IN CANAL	24.08		0.0625	1.51	0.000	38	5	R			-285.95	5.00		1	-1429.75													
GRND WL		18.75	0.0625	0.00	1.172	38	10	R			-445.31	2.50		2	1113.28													
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 GW @ 27.00 AND IMPERVIOUS CUT-OFF</b>																												
											<b>-731.26</b>				<b>-316.47</b>													
<b>WL IN CANAL @ 24.25 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF</b>																												
WL IN CANAL	13		0.0625	0.81	0.000	38	5	R			-154.38	5.00		1	-771.88													
GRND WL		18.75	0.0625	0.00	1.172	38	10	R			-445.31	2.50		2	1113.28													
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.25 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF</b>																												
											<b>-599.69</b>				<b>-341.41</b>													
<b>WL IN CANAL @ 34.33 AND GW LEVEL @ 27.00 PERVIOUS CUT-OFF</b>																												
GRND WL	26.08		0.0625	0.00	1.172	38	15	R			-667.97	0.00		1	0.00													
WL IN CANAL		18.75	0.0625	1.63	0.000	38	15	TR			-130.57	2.50		1	-326.41													
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 GW @ 27.00 AND PERVIOUS CUT-OFF</b>																												
											<b>-798.53</b>				<b>-326.41</b>													
<b>WL IN CANAL @ 32.33 AND GW LEVEL @ 27.00 PERVIOUS CUT-OFF</b>																												
GRND WL	24.08		0.0625	0.00	1.172	38	15	R			-667.97	0.00		1	0.00													
WL IN CANAL		18.75	0.0625	1.51	0.000	38	15	TR			-94.94	2.50		1	-237.35													
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 GW @ 27.00 AND PERVIOUS CUT-OFF</b>																												
											<b>-762.91</b>				<b>-237.35</b>													
<b>WL IN CANAL @ 24.25 AND GW LEVEL @ 27.00 PERVIOUS CUT-OFF</b>																												
WL IN CANAL	16		0.0625	1.00	0.00	38	15	R			-570.00	0.00		1	0.00													
GRND WL		18.75	0.0625	0.00	1.172	38	15	TR			-48.98	2.50		3	122.46													
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.25 AND GW LEVEL @ 27.00 PERVIOUS CUT-OFF</b>																												
											<b>-521.02</b>				<b>122.46</b>													



HORIZONTAL HYDRAULIC LOADS:														
WATER EL	ITEM	HT1	HT2	w	w x HT1	w x HT2	L	HT	SHAPE	FX	FY	LAX	MOMCODE	MX
34.33	WL IN CANAL	26.08		0.0625	1.63	0.00	38.00	26.08	TRFS		-807.70	8.69	1	-7021.58
27.04	WL IN DISCH TUBE	15.79	7.79	0.0625	0.99	0.49	34.00	8.00	TRFS		200.43	6.55	2	1312.34
32.33	WL IN CANAL	24.08		0.0625	1.51	0.00	38.00	24.08	TRFS		-688.57	8.03	1	-5526.90
HORIZONTAL EARTH LOADS														
EARTH TOP	EARTH BOT	HT1	HT2	w	w x HT1 x.5	w x HT2 x.5	LENGTH	HT	SHAPE					
27	21.25	5.75	0	0.06	0.17	0.00	38	5.75	TRFS		18.85	11.92	2	224.58
HORIZONTAL GROUND WATER LOADS														
27.00	GW ON P/S	5.75	0.00	0.0625	0.36	0.00	38.00	5.75	TRFS		39.26	11.92	2	467.87
TOTAL HORIZONTAL SUBMERGED EARTH LOADS														
											58.10734			692.4458

HORIZONTAL HYDRAULIC LOADS WHEN STOP LOGS IN USE:													
STOP LOGS @ BOTH PUMPS 'A' & 'B'													
WATER EL	WATER EL	BOT OF FDN SLAB	TOP OF GATE OPNG	HT OF WATER HT	UNIT WT	W X HT	LENGTH	SHAPE	FY	LEVER ARM FOR MX	LEVER ARM FOR MZ	MOMENT CODE FOR MZ	
24.25	24.25	8.25	19.25	16	0.0625	1	38	TRFS	-304.00	5.33	MZ	MZ	MX -1621.33
STOP LOGS AT PUMP 'A' ONLY													
24.25	24.25	8.25	19.25	16	0.0625	1	20	TRFS	-160.00	5.33	9.00	1FS	-853.33 -1440.00
24.25	24.25	8.25	19.25	5	0.0625	0.3125	18	TRFS	-14.06	12.67	10.00	2FS	-178.13 140.63
TOTAL HORIZONTAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE AT PUMP 'A' ONLY													
									-174.08				-1031.46 -1299.38
STOP LOGS AT PUMP 'B' ONLY													
24.25	24.25	8.25	19.25	16	0.0625	1	20	TRFS	-160.00	5.33	9.00	2FS	-853.33 1440.00
24.25	24.25	8.25	19.25	5	0.0625	0.3125	18	TRFS	-14.06	12.67	10.00	1FS	-178.13 -140.63
TOTAL HORIZONTAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE AT PUMP 'B' ONLY													
									-174.08				-1031.46 1299.38



<b>H O R I Z O N T A L W I N D L O A D S:</b>												
<b>STROM WIND LOADS</b>												
WL IN CANAL	TOP OF STR	EXP HT	WIND LD q	q x HT	LENGTH	SHAPE	q x HT x L	LAX	MOMCODE	FY x LAX	MX	
32.33	37.25	4.92	0.05	0.246	38	RFS	-9.348	26.54	1	-248.10		
34.33	37.25	2.92	0.05	0.146	38	RFS	-5.548	27.54	1	-152.79		
<b>OPERATING WIND LOADS:</b>												
11.25	37.25	26	0.01	0.26	38	RFS	-9.88	16	1	-158.08		
24.25	37.25	13	0.01	0.13	38	RFS	-4.94	22.5	1	-111.15		

L O A D C O M B I N A T I O N S :									
CASE I: CONSTRUCTION CASE, OP. WIND.									
NO WATER OR EARTH LOADS									
	ITEM	FX	FY	FZ	MX	MY	MZ		
	DEAD LOADS			1105.18	391.21				
	OP. WIND FROM F/S		-9.88		-158.08				
	TOTAL CASE I:		<u>-9.88</u>	<u>1105.18</u>	<u>233.13</u>				
CASE II: WL IN CANAL @ 32.33, WL IN DISCH TUBE @ 27.04, GATES CLOSED									
STORM WIND, BACKFILL IN PLACE, IMPERVIOUS CUT-OFF									
	ITEM	FX	FY	FZ	MX	MY	MZ		
	DEAD LOADS			1181.52	-79.86	0.00			
	WT OF WATER			514.27	346.15				
	UPLIFT			-731.26	-316.47				
	HYD.STATIC PRESSURE		-688.57		-5526.90				
	HYD.STATIC PRESSURE		200.43		1312.34				
	LATERAL EARTH		58.11		692.45				
	STORM WIND		-9.35		-248.10				
	TOTAL CASE II:		<u>-439.38</u>	<u>964.53</u>	<u>-3820.39</u>				

CASE III:	WL IN CANAL @ 32.33, WL IN DISCH TUBE @ 27.04, GATES CLOSED												
	STORM WIND, BACKFILL IN PLACE, PERVIOUS CUT-OFF												
	ITEM	FX	FY	FZ	MX	MY	MZ						
	DEAD LOADS			1181.52	-79.86	0.00							
	WT OF WATER			514.27	346.15								
	UPLIFT			-762.91	-237.35								
	HYD.STATIC PRESSURE		-688.57		-5526.90								
	HYD.STATIC PRESSURE		200.43		1312.34								
	LATERAL EARTH		58.11		692.45								
	STORM WIND		-9.35		-248.10								
	<b>TOTAL CASE III:</b>		<b>-439.38</b>		<b>932.89</b>								
CASE IV:	WL IN CANAL @ 34.33, WL IN DISCH TUBE @ 27.04, GATES CLOSED												
	STORM WIND, BACKFILL IN PLACE, IMPERVIOUS CUT-OFF												
	ITEM	FX	FY	FZ	MX	MY	MZ						
	DEAD LOADS			1181.52	-79.86	0.00							
	WT OF WATER			554.32	399.62								
	UPLIFT			-755.01	-435.22								
	HYD.STATIC PRESSURE		-807.70		-7021.58								
	HYD.STATIC PRESSURE		200.43		1312.34								
	LATERAL EARTH		58.11		692.45								
	STORM WIND		-5.55		-152.79								
	<b>TOTAL CASE IV:</b>		<b>-554.71</b>		<b>980.83</b>								

CASE V;	WL IN CANAL @ 34.33, WL IN DISCH TUBE @ 27.04, GATES CLOSED								
	STORM WIND, BACKFILL IN PLACE, PERVIOUS CUT-OFF								
	ITEM	FX	FY	FZ	MX	MY	MZ		
	DEAD LOADS			1181.52	-79.86	0.00			
	WT OF WATER			554.32	399.62				
	UPLIFT			-798.53	-326.41				
	HYD.STATIC PRESSURE		-807.70		-7021.58				
	HYD.STATIC PRESSURE		200.43		1312.34				
	LATERAL EARTH		58.11		692.45				
	STORM WIND		-5.55		-152.79				
	<b>TOTAL CASE V:</b>		<b>-554.71</b>	<b>937.31</b>	<b>-5176.24</b>				
CASE VI;	STOP LOG IN PLACE @ BOTH PUMPS "A" & "B" WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25								
	OP WIND, BACKFILL IN PLACE, IMPERVIOUS CUT-OFF								
	ITEM	FX	FY	FZ	MX	MY	MZ		
	DEAD LOADS			1181.52	-79.86	0.00			
	WT OF WATER			99.17	516.15				
	UPLIFT			-599.69	341.41				
	HYD.STATIC PRESSURE		-304.00		-1621.33				
	HYD.STATIC PRESSURE								
	LATERAL EARTH		58.11		692.45				
	OP. WIND		-4.94		-111.15				

<b>TOTAL CASE VI:</b>			<b>-250.83</b>	<b>681.00</b>	<b>-262.34</b>		
<b>CASE VII:</b>	<b>STOP LOG IN PLACE @ BOTH PUMPS "A" &amp; "B" WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25</b>						
	<b>OP WIND, BACKFILL IN PLACE, PERVIOUS CUT-OFF</b>						
	<b>ITEM</b>	<b>FX</b>	<b>FY</b>	<b>FZ</b>	<b>MX</b>	<b>MY</b>	<b>MZ</b>
	DEAD LOADS			1181.52	-79.86		
	WT OF WATER			99.17	516.15		
	UPLIFT			-618.98	122.46		
	HYD.STATIC PRESSURE		-304.00	0.00	-1621.33		
	HYD.STATIC PRESSURE						
	LATERAL EARTH		58.11	0.00	692.45		
	OP. WIND		-4.94	0.00	-111.15		
	<b>TOTAL CASE VII:</b>		<b>-250.83</b>	<b>661.71</b>	<b>-481.29</b>		
<b>CASE VIII</b>	<b>STOP LOG IN PLACE @ PUMP "B" ONLY WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25</b>						
	<b>OP WIND, BACKFILL IN PLACE, IMPERVIOUS CUT-OFF</b>						
	<b>ITEM</b>	<b>FX</b>	<b>FY</b>	<b>FZ</b>	<b>MX</b>	<b>MY</b>	<b>MZ</b>
	DEAD LOADS			1181.52	-79.86		
	WT OF WATER			213.32	305.61	-1079.85	
	UPLIFT			-599.69	341.41		
	HYD.STATIC PRESSURE		-174.06	0.00	-1031.46		1299.38
	HYD.STATIC PRESSURE						
	LATERAL EARTH		58.11	0.00	692.45		

OP. WIND				-4.94	0.00	-111.15			
<b>TOTAL CASE VIII:</b>				<b>-120.90</b>	<b>795.15</b>	<b>116.99</b>	<b>-1079.85</b>	<b>1299.38</b>	
<b>CASE IX</b>	<b>STOP LOG IN PLACE @ PUMP "A" ONLY WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25</b>								
	<b>OP WIND, BACKFILL IN PLACE, PERVIOUS CUT-OFF</b>								
	<b>ITEM</b>	<b>FX</b>	<b>FY</b>	<b>FZ</b>	<b>MX</b>	<b>MY</b>	<b>MZ</b>		
	DEAD LOADS			1181.52	-79.86				
	WT OF WATER			213.32	305.61	1079.85			
	UPLIFT			-618.98	122.46				
	HYD.STATIC PRESSURE		-174.06	0.00	-1031.46			-1299.38	
	HYD.STATIC PRESSURE								
	LATERAL EARTH		58.11	0.00	692.45				
	OP. WIND		-4.94	0.00	-111.15				
<b>TOTAL CASE IX:</b>			<b>-120.90</b>	<b>775.86</b>	<b>-101.95</b>	<b>1079.85</b>	<b>-1299.38</b>		

ITEM	FX	FY	FZ	MX	MY	MZ
S U M M A R Y O F L O A D C A S E S:						
TOTAL CASE I:	0	-9.88	1105.177	233.1276		
TOTAL CASE II:	0	-439.378	964.5337	-3820.39		
TOTAL CASE III:	0	-439.378	932.8868	-3741.27		
TOTAL CASE IV:	0	-554.708	980.8327	-5285.05	0	
TOTAL CASE V:	0	-554.708	937.3108	-5176.24		
TOTAL CASE VI:	0	-250.833	681.0042	-262.342		
TOTAL CASE VII:	0	-250.833	661.7073	-481.287		
TOTAL CASE VIII:	0	-120.895	795.1541	116.995	-1079.85	1299.375
TOTAL CASE IX:	0	-120.895	775.8572	-101.95	1079.85	-1299.38

10 SLUICE GATES @ PUMPS A & B DISCHARGE ( MONOLITH G-1 )  
20 PROP 29000 724 261 21.4 2 0 ALL  
30 SOIL ES 0.079 LEN 70 0 ALL  
40 PIN ALL  
50 ALLOW H 130 100 385 385 709 2119 ALL  
60 BATTER 24 1 TO 7  
75 BATTER 2.75 8 TO 14  
87 BATTER 3 15 TO 21  
130 ANGLE 90 1 TO 7  
140 ANGLE 270 8 TO 21  
180 PILE 1 17 6 0 2 12 6 0 7 -17 6 0  
230 PILE 8 17 .875 0 9 12 .875 0 14 -17 .875 0  
280 PILE 15 17 -6 0 16 12 -6 0 21 -17 -6 0  
360 ROW X 5 2 4 AT -6  
370 ROW X 5 9 4 AT -6  
380 ROW X 5 16 4 AT -6  
420 LOAD 1 0 -10 1106 233 0 0  
430 LOAD 2 0 -439 965 -3820 0 0  
440 LOAD 3 0 -439 933 -3741 0 0  
450 LOAD 4 0 -415 736 -3954 0 0  
460 LOAD 5 0 -415 703 -3883 0 0  
470 LOAD 6 0 -251 681 -262 0 0  
480 LOAD 7 0 -251 662 -481 0 0  
490 LOAD 8 0 -121 795 117 -1080 1299  
500 LOAD 9 0 -121 776 -102 1080 -1299  
680 FOU 1 2 3 4 5 6 7 B:\G-1.OUT  
690 TOUT 1 2 3 4 5 6 7  
700 PFO ALL  
710 FPL N



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* CORPS PROGRAM # X0080 * CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 86/09/02-C * RUN DATE 01-28-95 RUN TIME 08:11:42
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SLUICE GATES @ PUMPS A & B DISCHARGE ( MONOLITH G-1 )

THERE ARE 21 PILES AND 9 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

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                X           Y           Z
                -----
WITH DIAGONAL COORDINATES = (  -17.00 ,  -6.00 ,  .00 )
                              (   17.00 ,   6.00 ,   .00 )

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PILE PROPERTIES AS INPUT

E	I1	I2	A	C33	B66
KSI	IN**4	IN**4	IN**2		
.29000E+05	.72400E+03	.26100E+03	.21400E+02	.20000E+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
	.79000E-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	17.00	6.00	.00	24.00	90.00	70.00	P
2	12.00	6.00	.00	24.00	90.00	70.00	P
3	6.00	6.00	.00	24.00	90.00	70.00	P
4	.00	6.00	.00	24.00	90.00	70.00	P
5	-6.00	6.00	.00	24.00	90.00	70.00	P
6	-12.00	6.00	.00	24.00	90.00	70.00	P

7	-17.00	6.00	.00	24.00	90.00	70.00	P
8	17.00	.88	.00	2.75	270.00	70.00	P
9	12.00	.88	.00	2.75	270.00	70.00	P
10	6.00	.88	.00	2.75	270.00	70.00	P
11	.00	.88	.00	2.75	270.00	70.00	P
12	-6.00	.88	.00	2.75	270.00	70.00	P
13	-12.00	.88	.00	2.75	270.00	70.00	P
14	-17.00	.88	.00	2.75	270.00	70.00	P
15	17.00	-6.00	.00	3.00	270.00	70.00	P
16	12.00	-6.00	.00	3.00	270.00	70.00	P
17	6.00	-6.00	.00	3.00	270.00	70.00	P
18	.00	-6.00	.00	3.00	270.00	70.00	P
19	-6.00	-6.00	.00	3.00	270.00	70.00	P
20	-12.00	-6.00	.00	3.00	270.00	70.00	P
21	-17.00	-6.00	.00	3.00	270.00	70.00	P

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1470.00

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APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	-10.0	1106.0	233.0	.0	.0
2	.0	-439.0	965.0	-3820.0	.0	.0
3	.0	-439.0	933.0	-3741.0	.0	.0
4	.0	-415.0	736.0	-3954.0	.0	.0
5	.0	-415.0	703.0	-3883.0	.0	.0
6	.0	-251.0	681.0	-262.0	.0	.0
7	.0	-251.0	662.0	-481.0	.0	.0
8	.0	-121.0	795.0	117.0	-1080.0	1299.0
9	.0	-121.0	776.0	-102.0	1080.0	-1299.0

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ORIGINAL PILE GROUP STIFFNESS MATRIX

.14978E+03	-.26661E-04	.57595E-04	-.35888E-02	-.11642E-09	-.52424E+03
-.26661E-04	.23678E+04	-.59723E+04	.21869E+06	.23438E-01	-.39063E-02
.57595E-04	-.59723E+04	.28778E+05	.16888E+06	.31250E-01	.78125E-02
-.35888E-02	.21869E+06	.16888E+06	.10281E+09	.40000E+01	.00000E+00
.00000E+00	-.78125E-02	.00000E+00	.40000E+01	.55530E+09	.11524E+09
-.52424E+03	.00000E+00	-.23438E-01	.00000E+00	.11524E+09	.46213E+08

- LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 7.
- LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 7.
- LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 7.
- LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 7.
- LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 7.
- 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 = 3.  
 LOAD CASE 9. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 4.

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PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	-.3298E-09	.4610E+00	.1411E+00	-.1185E-02	.3670E-12	.7062E-10
2	-.3345E-07	-.2225E+00	-.1293E-01	.4868E-04	-.4231E-11	.3613E-11
3	-.3337E-07	-.2416E+00	-.1835E-01	.1074E-03	-.4483E-11	.1494E-11
4	-.3202E-07	-.2686E+00	-.3111E-01	.1609E-03	-.3292E-11	-.7933E-11
5	-.3194E-07	-.2877E+00	-.3655E-01	.2187E-03	-.3523E-11	-.1011E-10
6	-.1699E-07	-.1852E+00	-.1707E-01	.3914E-03	-.7437E-11	.9698E-11
7	-.1723E-07	-.1805E+00	-.1654E-01	.3550E-03	-.6871E-11	.8550E-11
8	.2869E-02	.1050E+00	.5115E-01	-.2938E-03	-.1935E-03	.8198E-03
9	-.2869E-02	.1097E+00	.5168E-01	-.3302E-03	.1935E-03	-.8198E-03

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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
1	2.5	.0	110.6	.0	-114.1	.0	.85	.34
2	2.5	.0	110.6	.0	-114.1	.0	.85	.34
3	2.5	.0	110.6	.0	-114.1	.0	.85	.34
4	2.5	.0	110.6	.0	-114.1	.0	.85	.34
5	2.5	.0	110.6	.0	-114.1	.0	.85	.34
6	2.5	.0	110.6	.0	-114.1	.0	.85	.34
7	2.5	.0	110.6	.0	-114.1	.0	.85	.34
8	-2.6	.0	-54.2	.0	118.8	.0	.54	.20
9	-2.6	.0	-54.2	.0	118.8	.0	.54	.20
10	-2.6	.0	-54.2	.0	118.8	.0	.54	.20
11	-2.6	.0	-54.2	.0	118.8	.0	.54	.20
12	-2.6	.0	-54.2	.0	118.8	.0	.54	.20
13	-2.6	.0	-54.2	.0	118.8	.0	.54	.20
14	-2.6	.0	-54.2	.0	118.8	.0	.54	.20
15	-2.8	.0	101.9	.0	126.7	.0	.78	.32
16	-2.8	.0	101.9	.0	126.7	.0	.78	.32

17	-2.8	.0	101.9	.0	126.7	.0	.78	.32
18	-2.8	.0	101.9	.0	126.7	.0	.78	.32
19	-2.8	.0	101.9	.0	126.7	.0	.78	.32
20	-2.8	.0	101.9	.0	126.7	.0	.78	.32
21	-2.8	.0	101.9	.0	126.7	.0	.78	.32

## LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.2	.0	-27.6	.0	55.3	.0	.28	.10
2	-1.2	.0	-27.6	.0	55.3	.0	.28	.10
3	-1.2	.0	-27.6	.0	55.3	.0	.28	.10
4	-1.2	.0	-27.6	.0	55.3	.0	.28	.10
5	-1.2	.0	-27.6	.0	55.3	.0	.28	.10
6	-1.2	.0	-27.6	.0	55.3	.0	.28	.10
7	-1.2	.0	-27.6	.0	55.3	.0	.28	.10
8	1.2	.0	95.1	.0	-53.1	.0	.73	.27
9	1.2	.0	95.1	.0	-53.1	.0	.73	.27
10	1.2	.0	95.1	.0	-53.1	.0	.73	.27
11	1.2	.0	95.1	.0	-53.1	.0	.73	.27
12	1.2	.0	95.1	.0	-53.1	.0	.73	.27
13	1.2	.0	95.1	.0	-53.1	.0	.73	.27
14	1.2	.0	95.1	.0	-53.1	.0	.73	.27
15	1.2	.0	80.9	.0	-53.9	.0	.62	.24
16	1.2	.0	80.9	.0	-53.9	.0	.62	.24
17	1.2	.0	80.9	.0	-53.9	.0	.62	.24
18	1.2	.0	80.9	.0	-53.9	.0	.62	.24
19	1.2	.0	80.9	.0	-53.9	.0	.62	.24
20	1.2	.0	80.9	.0	-53.9	.0	.62	.24
21	1.2	.0	80.9	.0	-53.9	.0	.62	.24

## LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.3	.0	-30.5	.0	60.0	.0	.31	.11
2	-1.3	.0	-30.5	.0	60.0	.0	.31	.11
3	-1.3	.0	-30.5	.0	60.0	.0	.31	.11
4	-1.3	.0	-30.5	.0	60.0	.0	.31	.11
5	-1.3	.0	-30.5	.0	60.0	.0	.31	.11
6	-1.3	.0	-30.5	.0	60.0	.0	.31	.11
7	-1.3	.0	-30.5	.0	60.0	.0	.31	.11
8	1.3	.0	98.1	.0	-58.0	.0	.75	.28
9	1.3	.0	98.1	.0	-58.0	.0	.75	.28
10	1.3	.0	98.1	.0	-58.0	.0	.75	.28
11	1.3	.0	98.1	.0	-58.0	.0	.75	.28
12	1.3	.0	98.1	.0	-58.0	.0	.75	.28
13	1.3	.0	98.1	.0	-58.0	.0	.75	.28
14	1.3	.0	98.1	.0	-58.0	.0	.75	.28
15	1.3	.0	76.3	.0	-59.1	.0	.59	.23
16	1.3	.0	76.3	.0	-59.1	.0	.59	.23
17	1.3	.0	76.3	.0	-59.1	.0	.59	.23
18	1.3	.0	76.3	.0	-59.1	.0	.59	.23
19	1.3	.0	76.3	.0	-59.1	.0	.59	.23
20	1.3	.0	76.3	.0	-59.1	.0	.59	.23

21 1.3 .0 76.3 .0 -59.1 .0 .59 .23

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.5	.0	-45.3	.0	66.6	.0	.45	.15
2	-1.5	.0	-45.3	.0	66.6	.0	.45	.15
3	-1.5	.0	-45.3	.0	66.6	.0	.45	.15
4	-1.5	.0	-45.3	.0	66.6	.0	.45	.15
5	-1.5	.0	-45.3	.0	66.6	.0	.45	.15
6	-1.5	.0	-45.3	.0	66.6	.0	.45	.15
7	-1.5	.0	-45.3	.0	66.6	.0	.45	.15
8	1.5	.0	94.8	.0	-65.4	.0	.73	.28
9	1.5	.0	94.8	.0	-65.4	.0	.73	.28
10	1.5	.0	94.8	.0	-65.4	.0	.73	.28
11	1.5	.0	94.8	.0	-65.4	.0	.73	.28
12	1.5	.0	94.8	.0	-65.4	.0	.73	.28
13	1.5	.0	94.8	.0	-65.4	.0	.73	.28
14	1.5	.0	94.8	.0	-65.4	.0	.73	.28
15	1.5	.0	65.7	.0	-66.8	.0	.51	.20
16	1.5	.0	65.7	.0	-66.8	.0	.51	.20
17	1.5	.0	65.7	.0	-66.8	.0	.51	.20
18	1.5	.0	65.7	.0	-66.8	.0	.51	.20
19	1.5	.0	65.7	.0	-66.8	.0	.51	.20
20	1.5	.0	65.7	.0	-66.8	.0	.51	.20
21	1.5	.0	65.7	.0	-66.8	.0	.51	.20

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.6	.0	-48.4	.0	71.3	.0	.48	.16
2	-1.6	.0	-48.4	.0	71.3	.0	.48	.16
3	-1.6	.0	-48.4	.0	71.3	.0	.48	.16
4	-1.6	.0	-48.4	.0	71.3	.0	.48	.16
5	-1.6	.0	-48.4	.0	71.3	.0	.48	.16
6	-1.6	.0	-48.4	.0	71.3	.0	.48	.16
7	-1.6	.0	-48.4	.0	71.3	.0	.48	.16
8	1.6	.0	97.7	.0	-70.2	.0	.75	.29
9	1.6	.0	97.7	.0	-70.2	.0	.75	.29
10	1.6	.0	97.7	.0	-70.2	.0	.75	.29
11	1.6	.0	97.7	.0	-70.2	.0	.75	.29
12	1.6	.0	97.7	.0	-70.2	.0	.75	.29
13	1.6	.0	97.7	.0	-70.2	.0	.75	.29
14	1.6	.0	97.7	.0	-70.2	.0	.75	.29
15	1.6	.0	61.1	.0	-72.1	.0	.47	.19
16	1.6	.0	61.1	.0	-72.1	.0	.47	.19
17	1.6	.0	61.1	.0	-72.1	.0	.47	.19
18	1.6	.0	61.1	.0	-72.1	.0	.47	.19
19	1.6	.0	61.1	.0	-72.1	.0	.47	.19
20	1.6	.0	61.1	.0	-72.1	.0	.47	.19
21	1.6	.0	61.1	.0	-72.1	.0	.47	.19

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.0	.0	5.0	.0	46.2	.0	.04	.03
2	-1.0	.0	5.0	.0	46.2	.0	.04	.03
3	-1.0	.0	5.0	.0	46.2	.0	.04	.03
4	-1.0	.0	5.0	.0	46.2	.0	.04	.03
5	-1.0	.0	5.0	.0	46.2	.0	.04	.03
6	-1.0	.0	5.0	.0	46.2	.0	.04	.03
7	-1.0	.0	5.0	.0	46.2	.0	.04	.03
8	1.0	.0	75.5	.0	-44.4	.0	.58	.22
9	1.0	.0	75.5	.0	-44.4	.0	.58	.22
10	1.0	.0	75.5	.0	-44.4	.0	.58	.22
11	1.0	.0	75.5	.0	-44.4	.0	.58	.22
12	1.0	.0	75.5	.0	-44.4	.0	.58	.22
13	1.0	.0	75.5	.0	-44.4	.0	.58	.22
14	1.0	.0	75.5	.0	-44.4	.0	.58	.22
15	1.1	.0	23.1	.0	-47.3	.0	.18	.08
16	1.1	.0	23.1	.0	-47.3	.0	.18	.08
17	1.1	.0	23.1	.0	-47.3	.0	.18	.08
18	1.1	.0	23.1	.0	-47.3	.0	.18	.08
19	1.1	.0	23.1	.0	-47.3	.0	.18	.08
20	1.1	.0	23.1	.0	-47.3	.0	.18	.08
21	1.1	.0	23.1	.0	-47.3	.0	.18	.08

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.0	.0	2.2	.0	45.0	.0	.02	.03
2	-1.0	.0	2.2	.0	45.0	.0	.02	.03
3	-1.0	.0	2.2	.0	45.0	.0	.02	.03
4	-1.0	.0	2.2	.0	45.0	.0	.02	.03
5	-1.0	.0	2.2	.0	45.0	.0	.02	.03
6	-1.0	.0	2.2	.0	45.0	.0	.02	.03
7	-1.0	.0	2.2	.0	45.0	.0	.02	.03
8	1.0	.0	73.4	.0	-43.3	.0	.56	.21
9	1.0	.0	73.4	.0	-43.3	.0	.56	.21
10	1.0	.0	73.4	.0	-43.3	.0	.56	.21
11	1.0	.0	73.4	.0	-43.3	.0	.56	.21
12	1.0	.0	73.4	.0	-43.3	.0	.56	.21
13	1.0	.0	73.4	.0	-43.3	.0	.56	.21
14	1.0	.0	73.4	.0	-43.3	.0	.56	.21
15	1.0	.0	25.3	.0	-46.0	.0	.19	.09
16	1.0	.0	25.3	.0	-46.0	.0	.19	.09
17	1.0	.0	25.3	.0	-46.0	.0	.19	.09
18	1.0	.0	25.3	.0	-46.0	.0	.19	.09
19	1.0	.0	25.3	.0	-46.0	.0	.19	.09
20	1.0	.0	25.3	.0	-46.0	.0	.19	.09
21	1.0	.0	25.3	.0	-46.0	.0	.19	.09

LOAD CASE - 8

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
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1	1.5	.4	119.3	23.3	-67.0	.0	.92	.37
2	1.2	.4	99.1	23.3	-54.9	.0	.76	.32
3	.9	.4	74.9	23.3	-40.4	.0	.58	.25
4	.6	.4	50.7	23.3	-25.8	.0	.39	.18
5	.3	.4	26.5	23.3	-11.3	.0	.20	.11
6	-.1	.4	2.4	23.3	3.3	.0	.02	.04
7	-.3	.4	-17.8	23.3	15.4	.0	.18	.09
8	-1.6	.0	-15.9	-2.4	71.2	.0	.16	.08
9	-1.3	.0	-7.2	-2.4	58.7	.0	.07	.05
10	-1.0	.0	3.2	-2.4	43.7	.0	.02	.03
11	-.6	.0	13.7	-2.4	28.7	.0	.11	.05
12	-.3	.0	24.2	-2.4	13.7	.0	.19	.07
13	.0	.0	34.6	-2.4	-1.3	.0	.27	.09
14	.3	.0	43.3	-2.4	-13.8	.0	.33	.12
15	-1.6	.4	29.5	25.7	73.1	.0	.23	.15
16	-1.3	.4	36.2	25.7	60.6	.0	.28	.16
17	-1.0	.4	44.2	25.7	45.5	.0	.34	.17
18	-.7	.4	52.3	25.7	30.5	.0	.40	.19
19	-.3	.4	60.3	25.7	15.5	.0	.46	.20
20	.0	.4	68.4	25.7	.4	.0	.53	.21
21	.3	.4	75.1	25.7	-12.1	.0	.58	.24

LOAD CASE - 9

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-.3	-.4	-20.6	-23.3	14.2	.0	.21	.09
2	.0	-.4	-.5	-23.3	2.1	.0	.00	.03
3	.3	-.4	23.7	-23.3	-12.5	.0	.18	.10
4	.6	-.4	47.9	-23.3	-27.0	.0	.37	.17
5	.9	-.4	72.1	-23.3	-41.5	.0	.55	.24
6	1.2	-.4	96.3	-23.3	-56.1	.0	.74	.31
7	1.5	-.4	116.5	-23.3	-68.2	.0	.90	.37
8	.3	.0	41.2	2.4	-12.7	.0	.32	.12
9	.0	.0	32.5	2.4	-.2	.0	.25	.09
10	-.3	.0	22.0	2.4	14.8	.0	.17	.07
11	-.7	.0	11.5	2.4	29.8	.0	.09	.05
12	-1.0	.0	1.1	2.4	44.8	.0	.01	.03
13	-1.3	.0	-9.4	2.4	59.8	.0	.09	.06
14	-1.6	.0	-18.1	2.4	72.3	.0	.18	.08
15	.2	-.4	77.3	-25.7	-10.8	.0	.59	.24
16	.0	-.4	70.6	-25.7	1.8	.0	.54	.22
17	-.4	-.4	62.5	-25.7	16.8	.0	.48	.21
18	-.7	-.4	54.5	-25.7	31.9	.0	.42	.19
19	-1.0	-.4	46.4	-25.7	46.9	.0	.36	.18
20	-1.4	-.4	38.4	-25.7	61.9	.0	.30	.17
21	-1.7	-.4	31.7	-25.7	74.5	.0	.24	.15

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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	.0	7.1	110.4	.0	.0	.0
2	.0	7.1	110.4	.0	.0	.0
3	.0	7.1	110.4	.0	.0	.0
4	.0	7.1	110.4	.0	.0	.0
5	.0	7.1	110.4	.0	.0	.0
6	.0	7.1	110.4	.0	.0	.0
7	.0	7.1	110.4	.0	.0	.0
8	.0	21.0	-50.0	.0	.0	.0
9	.0	21.0	-50.0	.0	.0	.0
10	.0	21.0	-50.0	.0	.0	.0
11	.0	21.0	-50.0	.0	.0	.0
12	.0	21.0	-50.0	.0	.0	.0
13	.0	21.0	-50.0	.0	.0	.0
14	.0	21.0	-50.0	.0	.0	.0
15	.0	-29.6	97.6	.0	.0	.0
16	.0	-29.6	97.6	.0	.0	.0
17	.0	-29.6	97.6	.0	.0	.0
18	.0	-29.6	97.6	.0	.0	.0
19	.0	-29.6	97.6	.0	.0	.0
20	.0	-29.6	97.6	.0	.0	.0
21	.0	-29.6	97.6	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-2.4	-27.5	.0	.0	.0
2	.0	-2.4	-27.5	.0	.0	.0
3	.0	-2.4	-27.5	.0	.0	.0
4	.0	-2.4	-27.5	.0	.0	.0
5	.0	-2.4	-27.5	.0	.0	.0
6	.0	-2.4	-27.5	.0	.0	.0
7	.0	-2.4	-27.5	.0	.0	.0
8	.0	-33.6	89.0	.0	.0	.0
9	.0	-33.6	89.0	.0	.0	.0
10	.0	-33.6	89.0	.0	.0	.0
11	.0	-33.6	89.0	.0	.0	.0
12	.0	-33.6	89.0	.0	.0	.0
13	.0	-33.6	89.0	.0	.0	.0
14	.0	-33.6	89.0	.0	.0	.0
15	.0	-26.7	76.4	.0	.0	.0
16	.0	-26.7	76.4	.0	.0	.0
17	.0	-26.7	76.4	.0	.0	.0
18	.0	-26.7	76.4	.0	.0	.0
19	.0	-26.7	76.4	.0	.0	.0
20	.0	-26.7	76.4	.0	.0	.0
21	.0	-26.7	76.4	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-2.6	-30.5	.0	.0	.0
2	.0	-2.6	-30.5	.0	.0	.0



3	.0	-2.6	-30.5	.0	.0	.0
4	.0	-2.6	-30.5	.0	.0	.0
5	.0	-2.6	-30.5	.0	.0	.0
6	.0	-2.6	-30.5	.0	.0	.0
7	.0	-2.6	-30.5	.0	.0	.0
8	.0	-34.7	91.7	.0	.0	.0
9	.0	-34.7	91.7	.0	.0	.0
10	.0	-34.7	91.7	.0	.0	.0
11	.0	-34.7	91.7	.0	.0	.0
12	.0	-34.7	91.7	.0	.0	.0
13	.0	-34.7	91.7	.0	.0	.0
14	.0	-34.7	91.7	.0	.0	.0
15	.0	-25.4	72.0	.0	.0	.0
16	.0	-25.4	72.0	.0	.0	.0
17	.0	-25.4	72.0	.0	.0	.0
18	.0	-25.4	72.0	.0	.0	.0
19	.0	-25.4	72.0	.0	.0	.0
20	.0	-25.4	72.0	.0	.0	.0
21	.0	-25.4	72.0	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-3.4	-45.2	.0	.0	.0
2	.0	-3.4	-45.2	.0	.0	.0
3	.0	-3.4	-45.2	.0	.0	.0
4	.0	-3.4	-45.2	.0	.0	.0
5	.0	-3.4	-45.2	.0	.0	.0
6	.0	-3.4	-45.2	.0	.0	.0
7	.0	-3.4	-45.2	.0	.0	.0
8	.0	-33.8	88.6	.0	.0	.0
9	.0	-33.8	88.6	.0	.0	.0
10	.0	-33.8	88.6	.0	.0	.0
11	.0	-33.8	88.6	.0	.0	.0
12	.0	-33.8	88.6	.0	.0	.0
13	.0	-33.8	88.6	.0	.0	.0
14	.0	-33.8	88.6	.0	.0	.0
15	.0	-22.2	61.8	.0	.0	.0
16	.0	-22.2	61.8	.0	.0	.0
17	.0	-22.2	61.8	.0	.0	.0
18	.0	-22.2	61.8	.0	.0	.0
19	.0	-22.2	61.8	.0	.0	.0
20	.0	-22.2	61.8	.0	.0	.0
21	.0	-22.2	61.8	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-3.6	-48.3	.0	.0	.0
2	.0	-3.6	-48.3	.0	.0	.0
3	.0	-3.6	-48.3	.0	.0	.0
4	.0	-3.6	-48.3	.0	.0	.0
5	.0	-3.6	-48.3	.0	.0	.0
6	.0	-3.6	-48.3	.0	.0	.0

7	.0	-3.6	-48.3	.0	.0	.0
8	.0	-34.8	91.3	.0	.0	.0
9	.0	-34.8	91.3	.0	.0	.0
10	.0	-34.8	91.3	.0	.0	.0
11	.0	-34.8	91.3	.0	.0	.0
12	.0	-34.8	91.3	.0	.0	.0
13	.0	-34.8	91.3	.0	.0	.0
14	.0	-34.8	91.3	.0	.0	.0
15	.0	-20.8	57.5	.0	.0	.0
16	.0	-20.8	57.5	.0	.0	.0
17	.0	-20.8	57.5	.0	.0	.0
18	.0	-20.8	57.5	.0	.0	.0
19	.0	-20.8	57.5	.0	.0	.0
20	.0	-20.8	57.5	.0	.0	.0
21	.0	-20.8	57.5	.0	.0	.0

## LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-.8	5.1	.0	.0	.0
2	.0	-.8	5.1	.0	.0	.0
3	.0	-.8	5.1	.0	.0	.0
4	.0	-.8	5.1	.0	.0	.0
5	.0	-.8	5.1	.0	.0	.0
6	.0	-.8	5.1	.0	.0	.0
7	.0	-.8	5.1	.0	.0	.0
8	.0	-26.7	70.6	.0	.0	.0
9	.0	-26.7	70.6	.0	.0	.0
10	.0	-26.7	70.6	.0	.0	.0
11	.0	-26.7	70.6	.0	.0	.0
12	.0	-26.7	70.6	.0	.0	.0
13	.0	-26.7	70.6	.0	.0	.0
14	.0	-26.7	70.6	.0	.0	.0
15	.0	-8.3	21.6	.0	.0	.0
16	.0	-8.3	21.6	.0	.0	.0
17	.0	-8.3	21.6	.0	.0	.0
18	.0	-8.3	21.6	.0	.0	.0
19	.0	-8.3	21.6	.0	.0	.0
20	.0	-8.3	21.6	.0	.0	.0
21	.0	-8.3	21.6	.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	2.3	.0	.0	.0
2	.0	-.9	2.3	.0	.0	.0
3	.0	-.9	2.3	.0	.0	.0
4	.0	-.9	2.3	.0	.0	.0
5	.0	-.9	2.3	.0	.0	.0
6	.0	-.9	2.3	.0	.0	.0
7	.0	-.9	2.3	.0	.0	.0
8	.0	-26.0	68.6	.0	.0	.0
9	.0	-26.0	68.6	.0	.0	.0
10	.0	-26.0	68.6	.0	.0	.0

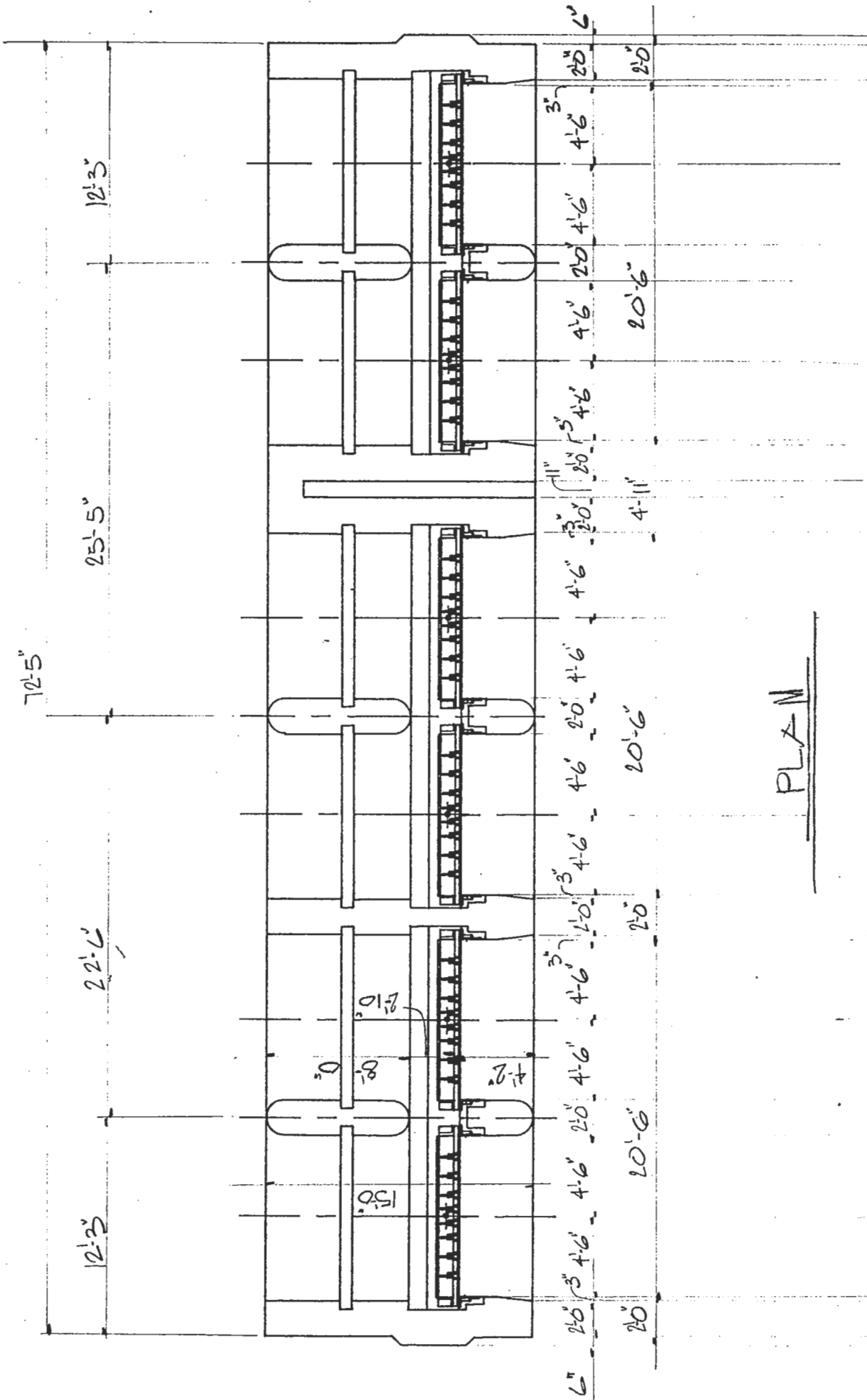
15	-.4	-24.7	73.3	.0	.0	.0
16	-.4	-22.3	67.0	.0	.0	.0
17	-.4	-19.4	59.5	.0	.0	.0
18	-.4	-16.6	51.9	.0	.0	.0
19	-.4	-13.7	44.4	.0	.0	.0
20	-.4	-10.8	36.8	.0	.0	.0
21	-.4	-8.4	30.6	.0	.0	.0

FRONT PROTECTION  
© DPS NO. 3

SLUICE GATE STRUCTURE  
© PUMPS C'D' 1" B'

627

42-381 50 SHEETS EYE-EASE® 5 SQUARE  
42-382 100 SHEETS EYE-EASE® 5 SQUARE  
42-383 200 SHEETS EYE-EASE® 5 SQUARE  
42-384 100 RECYCLED WHITE 5 SQUARE  
42-385 200 RECYCLED WHITE 5 SQUARE  
MADE IN U.S.A.



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National Brand  
42-381 50 SHEETS EYE-EASE® 5 SQUARE  
42-382 100 SHEETS EYE-EASE® 5 SQUARE  
42-383 200 SHEETS EYE-EASE® 5 SQUARE  
42-384 100 RECYCLED WHITE 5 SQUARE  
42-385 200 RECYCLED WHITE 5 SQUARE  
MADE IN U.S.A.



42-381 50 SHEETS EYE-EASE 5 SQUARE  
42-382 100 SHEETS EYE-EASE 5 SQUARE  
42-383 200 SHEETS EYE-EASE 5 SQUARE  
42-392 100 RECYCLED WHITE 5 SQUARE  
42-393 200 RECYCLED WHITE 5 SQUARE  
Made in U.S.A.

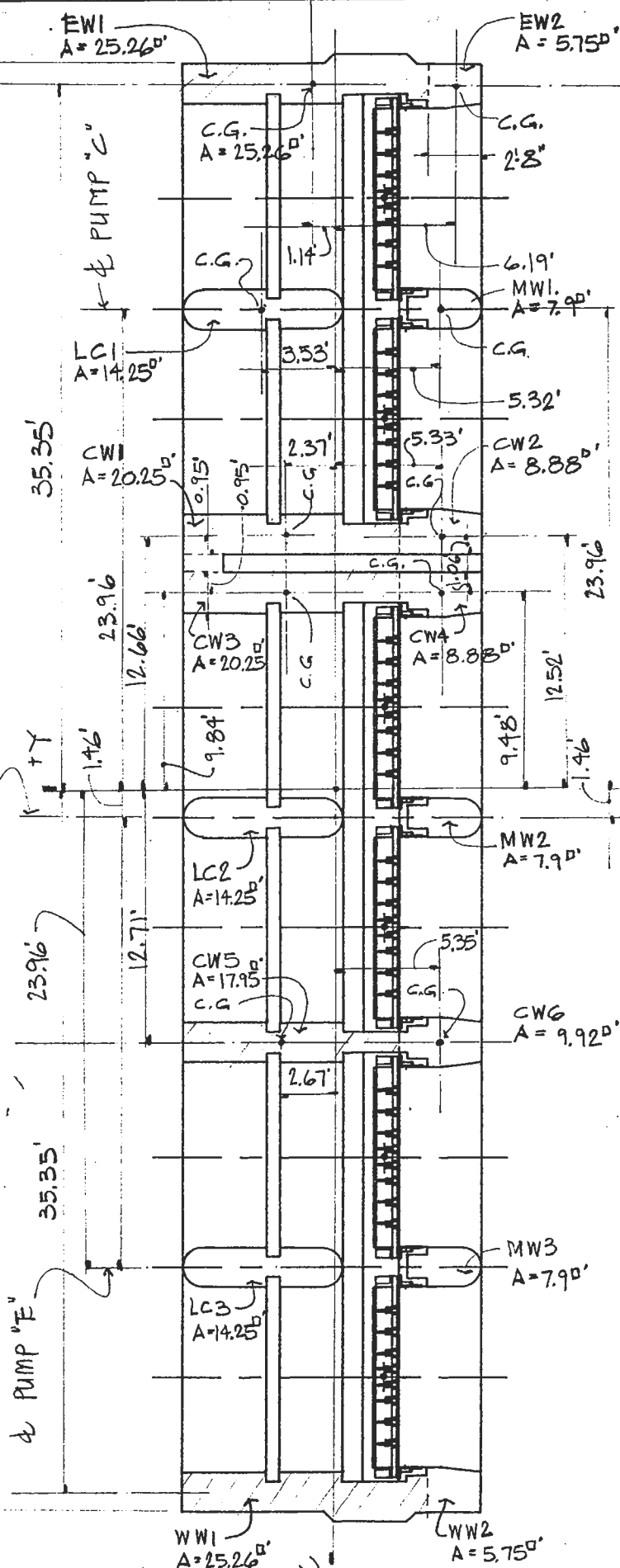


FLOOD SIDE

36.208'

36.208'

PUMP 'D'

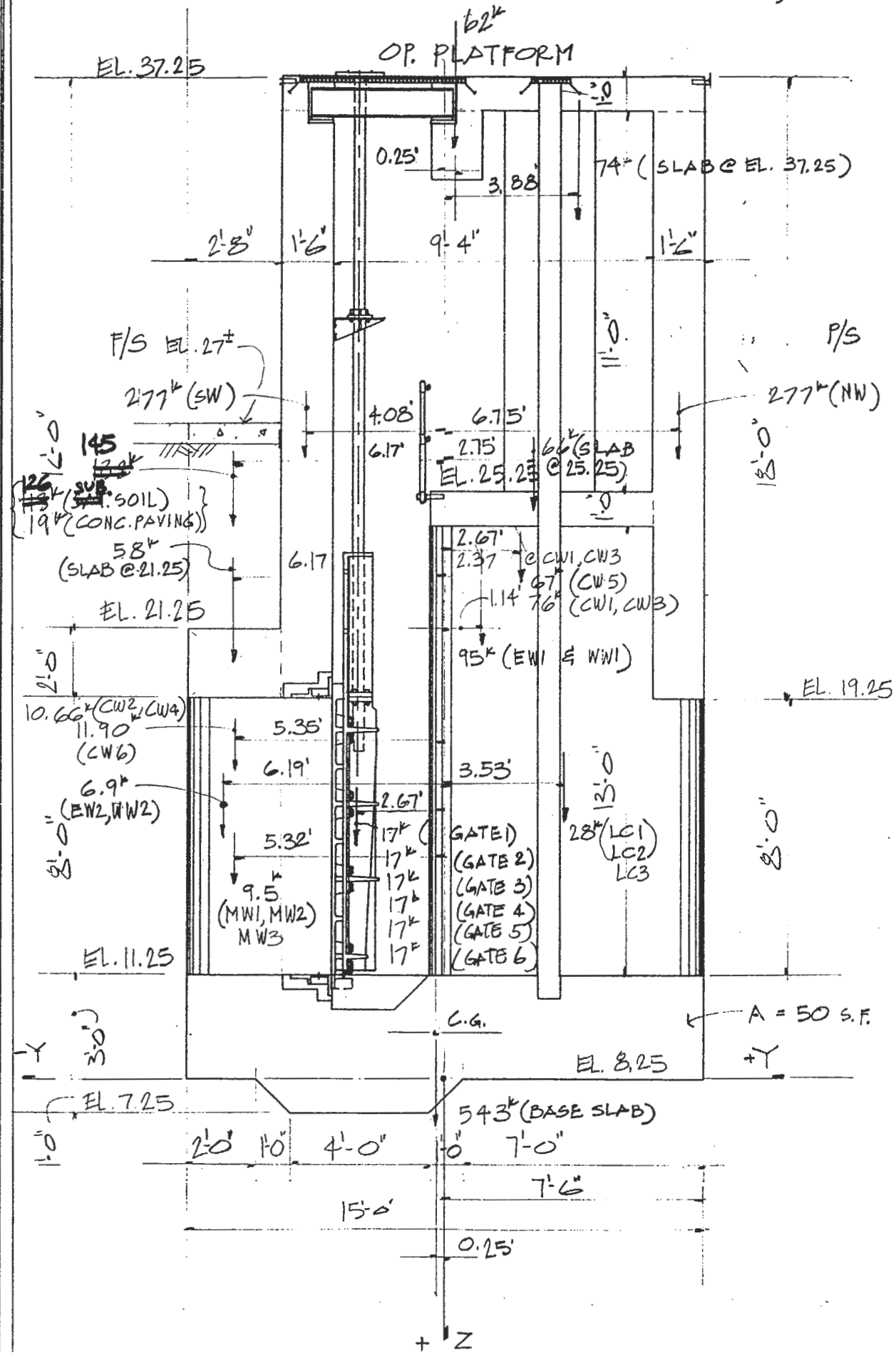


PROTECTED SIDE

42-381 50 SHEETS EYE-EASE 5 SQUARE  
42-382 100 SHEETS EYE-EASE 5 SQUARE  
42-383 200 SHEETS EYE-EASE 5 SQUARE  
42-392 100 RECYCLED WHITE 5 SQUARE  
42-393 200 RECYCLED WHITE 5 SQUARE  
Made in U.S.A.



### GRAVITY LOADS (CONC & EARTH)



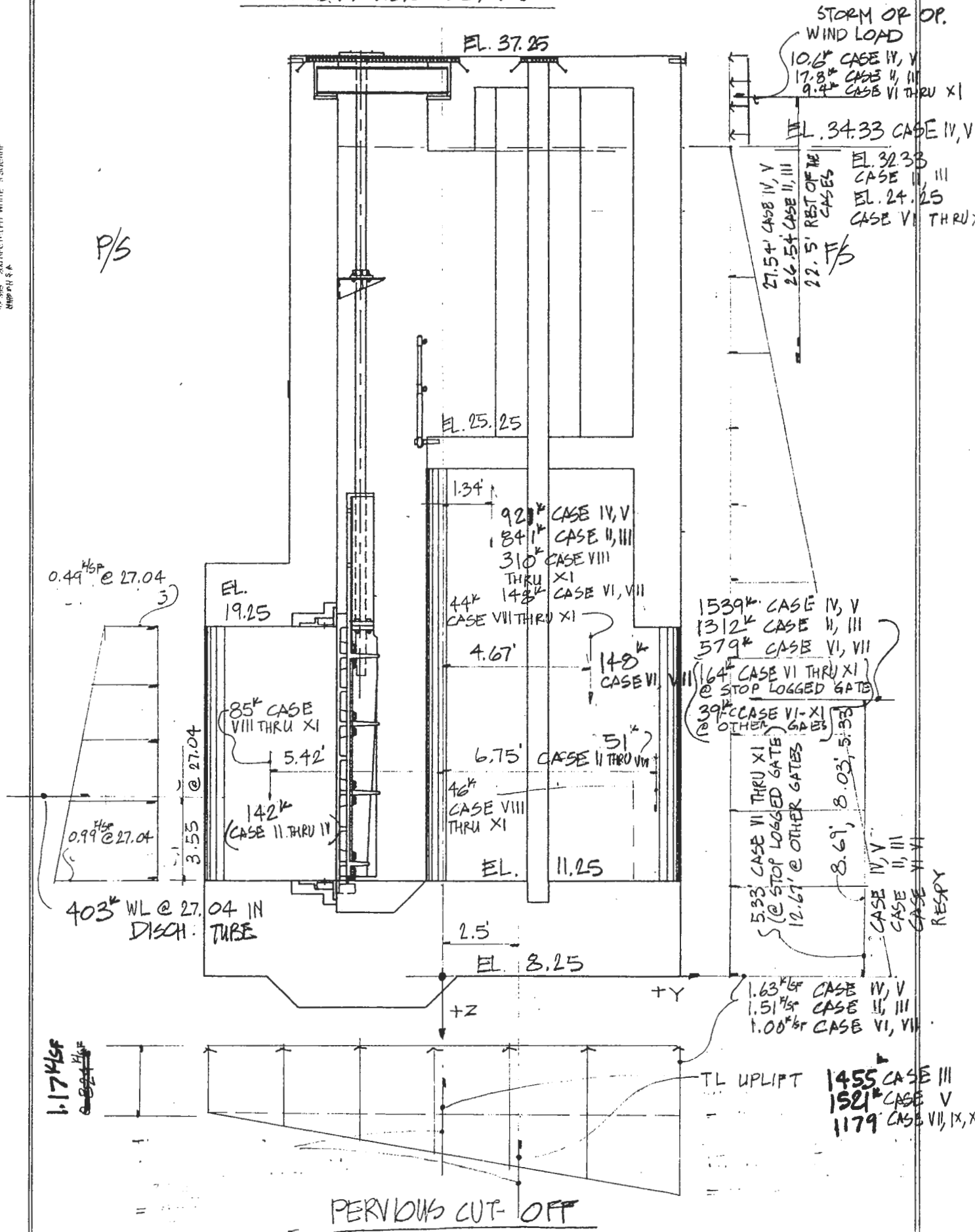
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HYDRAULIC LOADS

P/S

Vertical text on the left margin, possibly a scale or reference.









VERTICAL LOADS:																	
ITEM	LEN OR HT	WIDTH	THK	AREA W x T OR PER SKTCH	W	QX	MOMCODE QY	LAX FOR MX	LAY FOR MY	LAZ	FX	FY	FZ W x L OR HT x L	MX FZ x LAX	MY FZ x LAY	MZ	
																	QZ
EW1	25.00	8.00		25.30	0.15	2	2	1.14	35.35				94.88	108.16	3353.83		
EW2	8.00			5.75	0.15	3	3	6.19	35.13				6.90	-42.71	242.40		
LC1	13.00	8.00		14.25	0.15	2	2	3.53	23.96				27.79	98.09	665.79		
MW1	8.00			7.90	0.15	3	3	5.32	23.96				9.48	-50.43	227.14		
CW1	25.00	8.00		20.25	0.15	2	2	2.37	12.66				75.94	179.97	961.37		
CW2	8.00			8.88	0.15	3	3	5.33	12.52				10.66	-56.80	133.41		
CW3	25.00	8.00		20.25	0.15	2	2	2.37	9.84				75.94	179.97	747.23		
CW4	8.00			8.88	0.15	3	3	5.33	9.48				10.66	-56.80	101.02		
LC2	13.00	8.00		14.25	0.15	1	1	3.53	1.46				27.79	98.09	-40.57		
MW2	8.00			7.90	0.15	4	4	5.32	1.46				9.48	-50.43	-13.84		
CW5	25.00	8.00		17.95	0.15	1	1	2.67	23.96				67.31	179.72	-1612.61		
CW6	8.00			9.92	0.15	4	4	5.36	23.96				11.90	-63.69	-285.22		
LC3	13.00	8.00		14.25	0.15	1	1	3.53	23.96				27.79	98.09	-665.79		
MW3	8.00			7.90	0.15	4	4	5.32	23.96				9.48	-50.43	-227.14		
MW4	25.00	8.00		25.30	0.15	1	1	1.14	35.35				94.88	108.16	-3353.83		
MW5	8.00			5.75	0.15	4	4	6.19	35.13				6.90	-42.71	-242.40		
BASESLAB	72.42			50.00	0.15	3	3	0.25	0.00				543.15	-135.79			
NW	18.00	68.42	1.5	102.63	0.15	1	1	6.75	0.00				277.10	1870.43			
SW	18.00	68.42	1.5	102.63	0.15	3	3	4.08	0.00				277.10	-1131.40			
SLAB@21.25	72.42	2.67	2	5.33	0.15	3	3	6.17	0.00				57.94	-357.47			
SLAB@25.25	68.42	6.50	1	6.50	0.15	2	2	2.75	0.00				66.71	183.45			
SLAB@37.25	68.42	7.25	1	7.25	0.15	2	2	3.88	0.00				74.41	288.33			
RCBM@37.25	68.42	1.50	4	6.00	0.15	2	2	0.25	0.00				61.58	15.39			
GATE 1													17.00	-45.34	-500.82		
GATE 2													17.00	-45.34	-313.82		
GATE 3													17.00	-45.34	-118.32		
GATE 4													17.00	-45.34	146.18		
GATE 5													17.00	-45.39	313.82		
GATE 6													17.00	-45.39	500.82		
SUB. SOIL	72.42	2.6667	5.33	14.21	0.06	3	3	6.17					61.76	-381.06			
GR. WATER	72.42	2.6667	5.33	14.21	0.0625	3	3	6.17					64.33	-396.94			
CONC.PAVING	72.42	2.6667	0.67	1.78	0.15	3	3	6.17					19.41	-119.75			
TOTAL VERTICAL LOADS (CONC., GATES AND EARTH LOADS):														2173.24	189.30	-797.19	
VERTICAL HYDRAULIC LOADS																	
WATER EL ITEM	LENGTH	HT	WIDTH	AREA HT x W TOR PER SKTCH	W	QX	MOMCODE QY	LAX FOR MX	LAY FOR MY	LAZ	FX	FY	FZ L x A x W	MX FZ x LAX	MY FZ x LAY	MZ	
																	QZ
32.33	68.42	21.08	9.33	196.68	0.0625	2	2	1.34	0				841.04	1122.79	0.00		
UNDER N WALL	68.42	8.00	1.50	12.00	0.0625	2	2	6.75	0				51.32	346.38	0.00		
UNDER S WALL	68.42	8.00	4.17	33.33	0.0625	3	3	5.42	0				142.54	-772.58	0.00		
TOTAL VERTICAL HYD. LOADS FOR STORM WATER LEVEL IN CANAL @ 32.33														1034.90	668.68		
20.43	68.42	10.18	9.33	94.98	0.0625	2	2	1.34	0				406.16	542.22	0.00		
UNDER N WALL	68.42	8.00	1.50	12.00	0.0625	2	2	6.75	0				51.32	346.38	0.00		

	UNDER S WALL	68.42	8.00	4.17	33.33	0.0625	3	3	5.42	0	142.54	-772.58	0.00
<b>TOTAL VERTICAL HYD. LOADS FOR STORM WATER LEVEL IN CANAL @ 20.43</b>													
34.33	IN SHAFT	68.42	23.10	9.33	215.52	0.0625	2	2	1.34	0	921.63	1230.38	0.00
	UNDER N WALL	68.42	8.00	1.50	12.00	0.0625	2	2	6.75	0	51.32	346.38	0.00
	UNDER S WALL	68.42	8.00	4.17	33.33	0.0625	3	3	5.42	0	142.54	-772.58	0.00
<b>TOTAL VERTICAL HYD. LOADS FOR STORM WATER LEVEL IN CANAL @ 34.33</b>													
											1115.49	804.17	
<b>VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN USE:</b>													
<b>STOP LOGS IN PLACE @ ALL THREE PUMPS</b>													
24.25	IN SHAFT	68.42	13.00	2.67	34.67	0.0625	2	2	4.67	0	148.24	692.30	0.00
	UNDER N WALL	68.42	8.00	1.50	12.00	0.0625	2	2	6.75	0	51.32	346.38	0.00
<b>TOTAL VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE @ ALL THREE PUMPS</b>													
											199.56	1038.67	0
<b>STOP LOGS IN PLACE @ PUMP "C" ONLY</b>													
24.25	IN SHAFT @ "C"	20.50	13.00	2.67	34.67	0.0625	2	2	4.67	23.96	44.42	207.43	1064.22
	UNDER N WALL	20.50	8.00	1.50	12.00	0.0625	2	2	6.75	23.96	15.38	103.78	368.39
24.25	IN SHAFT @ "D"	20.50	13.00	9.33	121.29	0.0625	1	1	1.34	1.46	155.40	208.24	-226.89
	UNDER N WALL	20.50	8.00	1.50	12.00	0.0625	1	1	6.75	1.46	15.38	103.78	-22.45
24.25	IN SHAFT @ "E"	20.50	13.00	4.17	33.36	0.0625	4	4	5.42	1.46	42.74	-231.66	-62.40
	UNDER N WALL	20.50	8.00	1.50	12.00	0.0625	1	1	1.34	23.96	155.4028125	208.2398	-3723.45
	UNDER S WALL	20.50	8.00	4.17	33.36	0.0625	4	4	5.42	23.96	42.7425	-231.664	-1024.11
<b>TOTAL VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE @ PUMP "C" ONLY</b>													
											486.8323472	471.9207	-3995.08
<b>STOP LOGS IN PLACE @ PUMP "E" ONLY</b>													
24.25	IN SHAFT @ "E"	20.50	13.00	2.67	34.67	0.0625	1	1	4.67	23.96	44.42	207.43	-1064.22
	UNDER N WALL	20.50	8.00	1.50	12.00	0.0625	1	1	6.75	23.96	15.38	103.78	-368.39
24.25	IN SHAFT @ "D"	20.50	13.00	9.33	121.29	0.0625	1	1	1.34	1.46	155.40	208.24	-226.89
	UNDER N WALL	20.50	8.00	1.50	12.00	0.0625	1	1	6.75	1.46	15.38	103.78	-22.45
24.25	IN SHAFT @ "C"	20.50	13.00	4.17	33.36	0.0625	4	4	5.42	1.46	42.74	-231.66	-62.40
	UNDER N WALL	20.50	8.00	1.50	12.00	0.0625	2	2	1.34	23.96	155.4028125	208.2398	3723.451
	UNDER S WALL	20.50	8.00	4.17	33.36	0.0625	3	3	5.42	23.96	42.7425	-231.664	1024.11
<b>TOTAL VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE @ PUMP "E" ONLY</b>													
											486.8323472	471.9207	3371.697
<b>STOP LOGS IN PLACE @ PUMP "D" ONLY</b>													
24.25	IN SHAFT @ "D"	20.50	13.00	2.67	34.67	0.0625	1	1	4.67	1.46	44.42	207.43	-64.85
	UNDER N WALL	20.50	8.00	1.50	12.00	0.0625	1	1	6.75	1.46	15.38	103.78	-22.45
24.25	IN SHAFT @ "E"	20.50	13.00	4.17	33.36	0.0625	1	1	1.34	23.96	155.40	208.24	-3723.45

24.25	UNDER N WALL	20.50	8.00	1.50	12.00	0.0625	1	1	6.75	23.96	15.38	103.78	-368.39
	UNDER S WALL	20.50	8.00	4.17	33.36	0.0625	4	4	5.42	23.96	42.74	-231.66	-1024.11
	IN SHAFT @ "C"	20.50	13.00	9.33	121.29	0.0625	2	2	1.34	23.96	155.4026125	208.2398	3723.451
	UNDER N WALL	20.50	8.00	1.50	12.00	0.0625	2	2	6.75	23.96	15.375	103.7813	968.365
	UNDER S WALL	20.50	8.00	4.17	33.36	0.0625	3	3	5.42	23.96	42.7425	-231.664	1024.11
	<b>TOTAL VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE @ PUMP "D" ONLY</b>												
											<b>488.8323472</b>	<b>471.9207</b>	<b>-97.2959</b>

HORIZONTAL HYDRAULIC LOADS:														
WATER EL	ITEM	HT1	HT2	w	w X HT1	w X HT2	L	HT	SHAPE	FX	FY	LAX	MOMCODE	MX
34.33	WL IN CANAL	26.08		0.0625	1.63	0.00	72.42	26.08	TRFS		-1539.30	8.69	1	-13381.66
27.04	WL IN DISCH TUBE	15.79	7.79	0.0625	0.99	0.49	68.42	8.00	TRFS		403.34	6.55	2	2840.90
32.33	WL IN CANAL	24.08		0.0625	1.51	0.00	72.42	24.08	TRFS		-1312.26	8.03	1	-10533.11
HORIZONTAL EARTH LOADS:														
AT SOUTH WALL														
EARTH TOP	EARTH BOT	HT1	HT2	w	w x HT1 x 0.5	w x HT2 x 0.5	LENGTH	HT	SHAPE					
27	21.25	5.75	0	0.06	0.17	0.00	72.42	5.75	TRPS		35.92	11.92	2	428.00
HORIZONTAL GROUND WATER LOADS:														
27	21.25	5.75	0	0.0625	0.36	0.00	72.42	5.75	TRPS		74.82	11.92	2.00	891.66
TOTAL LATERAL EARTH PRESSURE FOR BACKFILL @ 27.00 AND GW @ 27.00														
AT EAST WALL														
TOP OF BACKFILL EL	ITEM	EL OF BOT OF FDN	TOP OF BACKFILL	GW ELEV	HT OF BACKFILL	UNIT WT x Ka (w x 0.5)	LENGTH L	SHAPE OF PRES DIAG	w x HT x Ka	FX	LEVER ARM FOR MY	MY	FX x LEVARM	
27	SUBMERGED EARTH FROM EL 27 TO EL 8.25	8.25	27	27	18.75	0.02975	15	TRES	0.5578125	78.44	6.25	-490.26		
27	GROUND WATER	8.25	27	27	18.75	0.0625	15	TRES	1.171875	164.79	6.25	-1029.97		
AT WEST WALL														
29	SUBMERGED EARTH FROM EL 29 TO EL 8.25	8.25	29	29	20.75	0.02875	15	TRWS	0.60	-92.84	6.92	642.14		
29	GROUND WATER	8.25	29	29	20.75	0.0625	15	TRWS	1.30	-201.83	6.92	1395.96		
NET LATERAL EARTH LOAD														
										-51.49		517.87		

HORIZONTAL HYDRAULIC LOADS WHEN STOP LOGS IN USE:												
STOP LOGS @ ALL THREE PUMPS "C", "D" & "E"												
WATER EL	WATER EL	BOT OF FDN SLAB	TOP OF GATE OPNG	HT OF WATER HT	UNIT WT	W X HT	LENGTH	SHAPE	FY	LEVER ARM FOR MX	LEVER ARM FOR MZ	MOMENT FOR MZ
24.25	24.25	8.25	19.25	16	0.0625	1	72.42	TRFS	-579.36	5.333333		MX -3089.92
STOP LOGS AT PUMP "C" ONLY												
24.25	24.25	8.25	19.25	16	0.0625	1	20.5	TRFS	-164	5.333333	23.96	2FS -874.667
STOP LOGS @ PUMP "D" ONLY												
24.25	24.25	8.25	19.25	5	0.0625	0.3125	49.92	TRFS	-39	12.66667	11.25	1FS -494
TOTAL HORIZONTAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE AT PUMP "C" ONLY												
									-209			-1968.67
STOP LOGS AT PUMP "E" ONLY												
24.25	24.25	8.25	19.25	16	0.0625	1	20.5	TRFS	-164	5.333333	1.46	1FS -874.667
STOP LOGS @ PUMP "E" ONLY												
24.25	24.25	8.25	19.25	5	0.0625	0.3125	24.5	TRFS	-19.1406	12.66667	23.96	1FS -242.448
TOTAL HORIZONTAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE AT PUMP "D" ONLY												
									-203.781			-1978.58
TOTAL HORIZONTAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE AT PUMP "E" ONLY												
												-859.542

VERTICAL LOADS:																	
UPLIFT LOADS:																	
WL IN CANAL @ 34.33 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF																	
WATER EL	ITEM	HT1	HT2	w	w X HT1	w X HT2	L	WIDTH	SHAPE	FX	FY	FZ	LAX	LAY	MOMCODE	MX	MY
34.33	WL IN CANAL	26.08		0.0625	1.63	0.000	72.42	5	R			-590.22	5.00		1	-2951.12	
27	GRND WL		18.75	0.0625	0.00	1.172	72.42	10	R			-848.67	2.50		2	2121.68	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 ,GW @ 27.00 AND IMPERVIOUS CUT-OFF																	
-1438.89																	
WL IN CANAL @ 32.33 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF																	
32.33	WL IN CANAL	24.08		0.0625	1.51	0.000	72.42	5	R			-544.96	5.00		1	-2724.80	
27	GRND WL		18.75	0.0625	0.00	1.172	72.42	10	R			-848.67	2.50		2	2121.68	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 ,GW @ 27.00 AND IMPERVIOUS CUT-OFF																	
-1383.63																	
WL IN CANAL @ 24.25 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF																	
24.25	WL IN CANAL	16		0.0625	1.00	0.000	72.42	5	R			-362.10	5.00		1	-1810.50	
27	GRND WL		18.75	0.0625	0.00	1.172	72.42	10	R			-848.67	2.50		2	2121.68	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.25 ,GW @ 27.00 AND IMPERVIOUS CUT-OFF																	
-1210.77																	
WL IN CANAL @ 34.33 AND GW LEVEL @ 27.00 PERVIOUS CUT-OFF																	
27	GRND WL		18.75	0.0625	0.00	1.172	72.42	15	R			-1273.01	0.00		1	0.00	
34.33	WL IN CANAL	26.08		0.0625	0.46	0.000	72.42	15	TR			-248.83	2.50		1	-622.08	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 ,GW @ 27.00 AND PERVIOUS CUT-OFF																	
-1521.84																	
WL IN CANAL @ 32.33 AND GW LEVEL @ 27.00 PERVIOUS CUT-OFF																	
27	GRND WL		18.75	0.0625	0.00	1.172	72.42	15	R			-1273.01	0.00		1	0.00	
32.33	WL IN CANAL	24.08		0.0625	0.33	0.000	72.42	15	TR			-180.94	2.50		1	-452.34	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 ,GW @ 27.00 AND PERVIOUS CUT-OFF																	
-1453.94																	
WL IN CANAL @ 24.25 AND GW LEVEL @ 27.00 PERVIOUS CUT-OFF																	



24.25	WL IN CANAL	16.00	0.0625	1.00	0.000	72.42	15	R	-1086.30	0.00	1	0.00
27	GRND WL	18.75	0.0625	0.00	0.172	72.42	15	TR	-93.35	2.50	3	233.38
<b>TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.25 GW @ 27.00 AND PERVIOUS CUT-OFF</b>												
									<b>-1179.65</b>			<b>233.3848</b>

<b>H O R I Z O N T A L W I N D L O A D S:</b>										
<b>STROM WIND LOADS</b>										
WL IN CANAL	TOP OF STR	EXP HT	WIND LD q	q x HT	LENGTH	SHAPE	q x HT x L	LAX	MOMCODE	FY x LAX
32.33	37.25	4.92	0.05	0.246	72.42	RFS	-17.8153	26.54	1	-472.82
34.33	37.25	2.92	0.05	0.146	72.42	RFS	-10.5733	27.54	1	-291.19
<b>OPERATING WIND LOADS:</b>										
11.25	37.25	26	0.01	0.26	72.42	RFS	-18.8292	16	1	-301.27
24.25	37.25	13	0.01	0.13	72.42	RFS	-9.4146	22.5	1	-211.829

LOAD	COMBINATIONS									
<b>CASE I:</b>	<b>CONSTRUCTION CASE, OP. WIND, NO WATER OR EARTH LOADS</b>									
	ITEM	FX	FY	FZ	MX	MY	MZ			
	DEAD LOADS			2027.74	1097.06	-797.19				
	OP. WIND FROM F/S		-18.83		-301.27					
	<b>TOTAL CASE I:</b>		<b>-18.83</b>	<b>2027.74</b>	<b>795.79</b>	<b>-797.19</b>				
<b>CASE II:</b>	<b>WL IN CANAL @ 32.33, GATES CLOSED, WL IN DISCH TUBE @ 27.04 STORM WIND, BACKFILL IN PLACE, IMPERVIOUS CUT-OFF</b>									
	ITEM	FX	FY	FZ	MX	MY	MZ			
	DEAD LOADS			2173.24	199.30	-797.19				
	WT OF WATER			1034.90	696.58					
	UPLIFT			-1393.63	-603.12					
	HYD.STATIC PRESSURE		-1312.26		-10533.11					
	HYD.STATIC PRESSURE		403.34		2640.90					
	LATERAL EARTH	-51.43	110.74		1319.66	517.87				
	STORM WIND		-17.82		-472.82					
	<b>TOTAL CASE II:</b>	<b>-51.43</b>	<b>-816.00</b>	<b>1814.51</b>	<b>-6752.62</b>	<b>-279.32</b>				
<b>CASE III:</b>	<b>WL IN CANAL @ 32.33, GATES CLOSED, WL IN DISCH TUBE @ 27.04 STORM WIND, BACKFILL IN PLACE, PERVIOUS CUT-OFF</b>									

ITEM	FX	FY	FZ	MX	MY	MZ
DEAD LOADS			2173.24	199.30	-797.19	
WT OF WATER			1034.90	696.58		
UPLIFT			-1453.94	-452.34		
HYD.STATIC PRESSURE		-1312.26		-10533.11		
HYD.STATIC PRESSURE		403.34		2640.90		
LATERAL EARTH	-51.43	110.74		1319.66	517.87	
STORM WIND		-17.82		-472.82		
<b>TOTAL CASE III:</b>	<b>-51.43</b>	<b>-816.00</b>	<b>1754.19</b>	<b>-6601.84</b>	<b>-279.32</b>	
<b>CASE IV: WL IN CANAL @ 34.33, GATES CLOSED, WL IN DISCH TUBE @ 27.04</b>						
<b>STORM WIND, BACKFILL IN PLACE, IMPERVIOUS CUT-OFF</b>						
DEAD LOADS	FX	FY	FZ	MX	MY	MZ
WT OF WATER			2173.24	199.30	-797.19	
UPLIFT			1115.49	804.17		
HYD.STATIC PRESSURE		-1539.30	-1438.89	-829.44		
HYD.STATIC PRESSURE		403.34		-13381.66		
LATERAL EARTH	-51.43	110.74		2640.90	517.87	
STORM WIND		-10.57		1319.66		
<b>TOTAL CASE IV:</b>	<b>-51.43</b>	<b>-1035.80</b>	<b>1849.84</b>	<b>-9538.26</b>	<b>-279.32</b>	
<b>CASE V: WL IN CANAL @ 34.33, GATES CLOSED, WL IN DISCH TUBE @ 27.04</b>						
<b>STORM WIND, BACKFILL IN PLACE, PERVIOUS CUT-OFF</b>						
DEAD LOADS	FX	FY	FZ	MX	MY	MZ
			2173.24	199.30	-797.19	

WT OF WATER					1115.49	804.17			
UPLIFT					-1521.84	-622.08			
HYD.STATIC PRESSURE			-1539.30			-13381.66			
HYD.STATIC PRESSURE			403.34			2640.90			
LATERAL EARTH		-51.43	110.74			1319.66	517.87		
STORM WIND			-10.57			-291.19			
<b>TOTAL CASE V:</b>		<b>-51.43</b>	<b>-1035.80</b>		<b>1766.89</b>	<b>-9330.90</b>	<b>-279.32</b>		
<b>CASE VI: STOP LOG IN PLACE @ ALL THREE PUMPS, ALL GATES CLOSED, WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25</b>									
<b>OP WIND, BACKFILL IN PLACE, IMPERVIOUS CUT-OFF</b>									
ITEM	FX	FY	FZ	MX	MY	MZ			
DEAD LOADS			2173.24	199.30	-797.19				
WT OF WATER			199.56	1038.67	0.00				
UPLIFT			-1210.77	311.18					
HYD.STATIC PRESSURE		-579.36		-3089.92					
HYD.STATIC PRESSURE									
LATERAL EARTH	-51.43	110.74		1319.66	517.87				
OP. WIND		-9.41		-211.83					
<b>TOTAL CASE VI:</b>	<b>-51.43</b>	<b>-478.03</b>	<b>1162.03</b>	<b>-432.94</b>	<b>-279.32</b>				
<b>CASE VII: STOP LOG IN PLACE @ ALL THREE PUMPS, ALL GATES CLOSED, WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25</b>									
<b>OP WIND, BACKFILL IN PLACE, PERVIOUS CUT-OFF</b>									
ITEM	FX	FY	FZ	MX	MY	MZ			
DEAD LOADS			2173.24	199.30	-797.19				
WT OF WATER			199.56	1038.67					
UPLIFT			-1179.65	233.38					
HYD.STATIC PRESSURE		-579.36	0.00	-3089.92					

	HYD.STATIC PRESSURE																							
	LATERAL EARTH	-51.43	110.74	0.00	1319.66					517.87														
	OP. WIND		-9.41	0.00	-211.83																			
	<b>TOTAL CASE VII:</b>	<b>-51.43</b>	<b>-478.03</b>	<b>1193.15</b>	<b>-510.73</b>					<b>-279.32</b>														
	<b>CASE VIII STOP LOG IN PLACE @ PUMP "C" ONLY,GATES @ PUMP "C" CLOSED, WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25</b>																							
	<b>OP. WIND,BACKFILL IN PLACE,IMPERVIOUS CUT-OFF</b>																							
	ITEM	FX	FY	FZ	MX	MY	MZ																	
	DEAD LOADS			2173.24	199.30	-797.19																		
	WT OF WATER			486.83	471.92	-3995.08																		
	UPLIFT			-1210.77	311.18																			
	HYD.STATIC PRESSURE		-203.00	0.00	-1368.67																			3490.69
	HYD.STATIC PRESSURE																							
	LATERAL EARTH	-51.43	110.74	0.00	1319.66					517.87														
	OP. WIND		-9.41	0.00	-211.83																			
	<b>TOTAL CASE VIII:</b>	<b>-51.43</b>	<b>-101.67</b>	<b>1449.30</b>	<b>721.56</b>	<b>-4274.39</b>	<b>3490.69</b>																	
	<b>CASE IX STOP LOG IN PLACE @ PUMP "C" ONLY,GATES @ PUMP "C" CLOSED, WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25</b>																							
	<b>OP. WIND,BACKFILL IN PLACE,PERVIOUS CUT-OFF</b>																							
	ITEM	FX	FY	FZ	MX	MY	MZ																	
	DEAD LOADS			2173.24	199.30	-797.19																		
	WT OF WATER			486.83	471.92	-3995.08																		
	UPLIFT			-1179.65	233.38																			
	HYD.STATIC PRESSURE		-203.00	0.00	-1368.67																			3490.69
	HYD.STATIC PRESSURE																							
	LATERAL EARTH	-51.43	110.74	0.00	1319.66					517.87														

OP. WIND			-9.41	0.00	-211.83				
<b>TOTAL CASE IX:</b>	<b>-51.43</b>	<b>-101.67</b>	<b>1480.42</b>	<b>643.77</b>	<b>-4274.39</b>	<b>3490.69</b>			
<b>CASE X STOP LOG IN PLACE @ PUMP "D" ONLY, GATES @ PUMP "D" CLOSED, WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25</b>									
<b>OP. WIND, BACKFILL IN PLACE, IMPERVIOUS CUT-OFF</b>									
ITEM	FX	FY	FZ	MX	MY	MZ			
DEAD LOADS			2173.24	199.30	-797.19				
WT OF WATER			486.83	471.92	-87.30				
UPLIFT			-1210.77	311.18					
HYD.STATIC PRESSURE		-203.78	0.00	-1378.56		-858.54			
HYD.STATIC PRESSURE	-51.43	110.74	0.00	1319.66	517.87				
LATERAL EARTH		-9.41	0.00	-211.83					
OP. WIND									
<b>TOTAL CASE X:</b>	<b>-51.43</b>	<b>-102.46</b>	<b>1449.30</b>	<b>711.67</b>	<b>-366.61</b>	<b>-858.54</b>			
<b>CASE XI STOP LOG IN PLACE @ PUMP "D" ONLY, GATES @ PUMP "D" CLOSED, WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25</b>									
<b>OP. WIND, BACKFILL IN PLACE, PERVIOUS CUT-OFF</b>									
ITEM	FX	FY	FZ	MX	MY	MZ			
DEAD LOADS			2173.24	199.30	-797.19				
WT OF WATER			486.8323	471.9207	-87.2959				
UPLIFT			-1179.65	233.38					
HYD.STATIC PRESSURE		-203.78	0.00	-1378.56					
HYD.STATIC PRESSURE	-51.43	110.74	0.00	1319.66	517.87	-858.54			
LATERAL EARTH		-9.41	0.00	-211.83					
OP. WIND									
<b>TOTAL CASE XI:</b>	<b>-51.43</b>	<b>-102.46</b>	<b>1480.42</b>	<b>633.87</b>	<b>-366.61</b>	<b>-858.54</b>			

SLUSCDER.WK3 SLUICEGATE STRUCTURE AT PUMPS "C", "D" & "E" DISCHARGE (MONOLITH G-2)

SUMMARY OF LOAD CASES:									
ITEM	FX	FY	FZ	MX	MY	MZ			
TOTAL CASE I:	0	-18.8292	2027.739	795.7904	-797.192	0			
TOTAL CASE II:	-51.4289	-816.004	1814.505	-6752.62	-279.317	0			
TOTAL CASE III:	-51.4289	-816.004	1754.193	-6601.84	-279.317	0			
TOTAL CASE IV:	-51.4289	-1035.8	1849.835	-9538.26	-279.317	0			
TOTAL CASE V:	-51.4289	-1035.8	1766.892	-9330.9	-279.317	0			
TOTAL CASE VI:	-51.4289	-478.034	1162.029	-432.937	-279.317	0			
TOTAL CASE VII:	-51.4289	-478.034	1193.147	-510.732	-279.317	0			
TOTAL CASE VIII:	-51.4289	-101.674	1449.303	721.5638	-4274.39	3490.69			
TOTAL CASE IX:	-51.4289	-101.674	1480.421	643.7689	-4274.39	3490.69			
TOTAL CASE X:	-51.4289	-102.455	1449.303	711.6679	-366.613	-858.542			



SLUSCDER.WK3

SLUICEGATE STRUCTURE AT PUMPS "C", "D" & "E" DISCHARGE (MONOLITH G-2)

2

TOTAL CASE XI:	-51.4289	-102.455	1480.421	633.873	-366.613	-858.542
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PEPPER AND ASSOCIATES

CONSULTING ENGINEERS

METAIRIE, LA 70002

62-22

10 SLUICE GATE STRUCTURE @ PUMP "C" ,"D" AND "E" DISCHARGE (MONOLI  
TH G-2)  
20 PROP 29000 724 261 21.4 2 0 ALL  
30 SOIL ES 0.079 LEN 73 0 ALL  
40 PIN ALL  
50 ALLOW H 130 100 385 385 709 2119 ALL  
60 BATTER 0 1 TO 9  
65 BATTER 3 15 TO 17 19 TO 21 23 TO 25  
67 BATTER 3 28 TO 30 32 TO 34 36 TO 38  
70 BATTER 0 14 18 22 26  
80 BATTER 0 27 31 35 39 40 TO 43  
80 BATTER 0 10 TO 13  
130 ANGLE 90 1 TO 13  
140 ANGLE 270 14 TO 26  
150 ANGLE 270 27 TO 39 40 TO 43  
330 PILE 1 34.208 6 0 2 29.208 6 0 8 -5.20 6 0 13 -34.208 6 0  
340 PILE 14 34.208 1 0 15 29.208 1 0 21 -5.2 1 0 26 -34.208 1 0  
350 PILE 27 34.208 -6 0 28 29.208 -6 0 34 -5.2 -6 0 39 -34.208 -6  
0  
355 PILE 40 34.208 -2.5 0 41 21.208 -2.5 0 42 -21.208 -2.5 0  
357 PILE 43 -34.208 -2.5 0  
360 ROW X 6 2 5 AT -6  
365 ROW X 5 8 4 AT -6  
370 ROW X 6 15 5 AT -6  
375 ROW X 5 21 4 AT -6  
380 ROW X 6 28 5 AT -6  
385 ROW X 5 34 4 AT -6  
420 LOAD 1 0 -18.83 2027.73 795.79 -797 0  
430 LOAD 2 -51 -816 1814 -6753 -279 0  
440 LOAD 3 -51 -816 1754 -6602 -279 0  
450 LOAD 4 -38 -777 1387 -7153 -209 0  
460 LOAD 5 -38 -777 1325 -6998 -209 0  
470 LOAD 6 -51 -478 1162 -433 -279 0  
480 LOAD 7 -51 -478 1193 -511 -279 0  
490 LOAD 8 -51 -102 1449 722 -4274 3491  
500 LOAD 9 -51 -102 1480 644 -4274 3491  
510 LOAD 10 -51 -102 1449 712 -367 -859  
520 LOAD 11 -51 -102 1480 634 -367 -859  
680 FOU 1 2 3 4 5 6 7 B:\G-2.OUT  
690 TOUT 1 2 3 4 5 6 7  
700 PFO ALL  
710 FPL N

\*\*\*\*\*  
 \* CORPS PROGRAM # X0080 \*  
 \* VERSION NUMBER # 86/09/02-C \*  
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CPGA - CASE FILE GROUP ANALYSIS PROGRAM  
 RUN DATE 08-25-95 RUN TIME 11:02:51

SLUICE GATE STRUCTURE @ PUMP "C" , "D" AND "E" DISCHARGE (MONOLITH G-2)

THERE ARE 43 PILES AND  
 11 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

	X	Y	Z
	-----	-----	-----
WITH DIAGONAL COORDINATES = (	-34.21 ,	-6.00 ,	.00 )
	( 34.21 ,	6.00 ,	.00 )

\*\*\*\*\*

PILE PROPERTIES AS INPUT

E	I1	I2	A	C33	B66
KSI	IN**4	IN**4	IN**2		
.29000E+05	.72400E+03	.26100E+03	.21400E+02	.20000E+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
	.79000E-01	L	.73000E+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	34.21	6.00	.00	V	90.00	73.00	P
2	29.21	6.00	.00	V	90.00	73.00	P
3	23.21	6.00	.00	V	90.00	73.00	P
4	17.21	6.00	.00	V	90.00	73.00	P
5	11.21	6.00	.00	V	90.00	73.00	P
6	5.21	6.00	.00	V	90.00	73.00	P

7	-.79	6.00	.00	V	90.00	73.00	P
8	-5.20	6.00	.00	V	90.00	73.00	P
9	-11.20	6.00	.00	V	90.00	73.00	P
10	-17.20	6.00	.00	V	90.00	73.00	P
1	-23.20	6.00	.00	V	90.00	73.00	P
12	-29.20	6.00	.00	V	90.00	73.00	P
13	-34.21	6.00	.00	V	90.00	73.00	P
14	34.21	1.00	.00	V	270.00	73.00	P
15	29.21	1.00	.00	3.00	270.00	73.00	P
16	23.21	1.00	.00	3.00	270.00	73.00	P
17	17.21	1.00	.00	3.00	270.00	73.00	P
18	11.21	1.00	.00	V	270.00	73.00	P
19	5.21	1.00	.00	3.00	270.00	73.00	P
20	-.79	1.00	.00	3.00	270.00	73.00	P
21	-5.20	1.00	.00	3.00	270.00	73.00	P
22	-11.20	1.00	.00	V	270.00	73.00	P
23	-17.20	1.00	.00	3.00	270.00	73.00	P
24	-23.20	1.00	.00	3.00	270.00	73.00	P
25	-29.20	1.00	.00	3.00	270.00	73.00	P
26	-34.21	1.00	.00	V	270.00	73.00	P
27	34.21	-6.00	.00	V	270.00	73.00	P
28	29.21	-6.00	.00	3.00	270.00	73.00	P
29	23.21	-6.00	.00	3.00	270.00	73.00	P
30	17.21	-6.00	.00	3.00	270.00	73.00	P
31	11.21	-6.00	.00	V	270.00	73.00	P
32	5.21	-6.00	.00	3.00	270.00	73.00	P
33	-.79	-6.00	.00	3.00	270.00	73.00	P
34	-5.20	-6.00	.00	3.00	270.00	73.00	P
35	-11.20	-6.00	.00	V	270.00	73.00	P
36	-17.20	-6.00	.00	3.00	270.00	73.00	P
7	-23.20	-6.00	.00	3.00	270.00	73.00	P
38	-29.20	-6.00	.00	3.00	270.00	73.00	P
39	-34.21	-6.00	.00	V	270.00	73.00	P
40	34.21	-2.50	.00	V	270.00	73.00	P
41	21.21	-2.50	.00	V	270.00	73.00	P
42	-21.21	-2.50	.00	V	270.00	73.00	P
43	-34.21	-2.50	.00	V	270.00	73.00	P

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3139.00

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APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	-18.8	2027.7	795.8	-797.0	.0
2	-51.0	-816.0	1814.0	-6753.0	-279.0	.0
3	-51.0	-816.0	1754.0	-6602.0	-279.0	.0
4	-38.0	-777.0	1387.0	-7153.0	-209.0	.0
5	-38.0	-777.0	1325.0	-6998.0	-209.0	.0
6	-51.0	-478.0	1162.0	-433.0	-279.0	.0
7	-51.0	-478.0	1193.0	-511.0	-279.0	.0
8	-51.0	-102.0	1449.0	722.0	-4274.0	3491.0
9	-51.0	-102.0	1480.0	644.0	-4274.0	3491.0
10	-51.0	-102.0	1449.0	712.0	-367.0	-859.0
11	-51.0	-102.0	1480.0	634.0	-367.0	-859.0

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ORIGINAL FILE GROUP STIFFNESS MATRIX

.30670E+03	-.28808E-04	.90884E-04	-.27265E-02	.92097E-04	-.25677E+03
-.28808E-04	.27781E+04	-.76214E+04	.22864E+06	-.77231E+04	-.27240E+04
.90884E-04	-.76214E+04	.58386E+05	.12722E+06	.35784E+05	.77231E+04
-.27265E-02	.22864E+06	.12722E+06	.19196E+09	.23066E+06	-.23169E+06
.92097E-04	-.77231E+04	.35784E+05	.23065E+06	.42070E+10	.41818E+09
-.25677E+03	-.27240E+04	.77231E+04	-.23169E+06	.41818E+09	.15735E+09

LOAD CASE	1.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	6.
LOAD CASE	2.	NUMBER OF FAILURES =	9.	NUMBER OF PILES IN TENSION =	25.
LOAD CASE	3.	NUMBER OF FAILURES =	11.	NUMBER OF PILES IN TENSION =	25.
LOAD CASE	4.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	25.
LOAD CASE	5.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	25.
LOAD CASE	6.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	12.
LOAD CASE	7.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	12.
LOAD CASE	8.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	6.
LOAD CASE	9.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	5.
LOAD CASE	10.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	0.
LOAD CASE	11.	NUMBER OF FAILURES =	0.	NUMBER OF PILES IN TENSION =	0.

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PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.7142E-05	.1628E+00	.5638E-01	-.1816E-03	-.3292E-05	.8535E-05
2	-.1663E+00	-.3202E+00	-.1065E-01	-.3374E-04	-.1033E-05	-.2595E-05
3	-.1663E+00	-.3272E+00	-.1264E-01	-.1463E-04	-.1030E-05	-.2600E-05
4	-.1239E+00	-.3282E+00	-.1899E-01	-.4367E-04	-.7286E-06	-.3080E-05
5	-.1239E+00	-.3354E+00	-.2104E-01	-.2399E-04	-.7250E-06	-.3085E-05
6	-.1663E+00	-.2153E+00	-.8719E-02	.2352E-03	-.1100E-05	-.3019E-06
7	-.1663E+00	-.2117E+00	-.7693E-02	.2253E-03	-.1102E-05	-.2993E-06
8	-.1659E+00	.5478E-01	.3204E-01	-.4079E-04	-.5264E-04	.4052E-03
9	-.1659E+00	.5841E-01	.3306E-01	-.5067E-04	-.5264E-04	.4052E-03
10	-.1664E+00	.5455E-01	.3204E-01	-.4181E-04	.7326E-05	-.8594E-04
11	-.1664E+00	.5818E-01	.3306E-01	-.5168E-04	.7324E-05	-.8594E-04

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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
1	.9	.0	63.3	.3	-41.4	.0	.49	.18
2	.9	.0	63.0	.3	-41.3	.0	.48	.18
3	.9	.0	62.7	.3	-41.1	.0	.48	.18
4	.9	.0	62.3	.3	-41.0	.0	.48	.18
5	.9	.0	62.0	.3	-40.8	.0	.48	.18
6	.9	.0	61.7	.3	-40.7	.0	.47	.18
7	.9	.0	61.3	.3	-40.5	.0	.47	.18
8	.9	.0	61.1	.3	-40.4	.0	.47	.18
9	.9	.0	60.7	.3	-40.3	.0	.47	.18
10	.9	.0	60.4	.3	-40.1	.0	.46	.18
11	.9	.0	60.1	.3	-40.0	.0	.46	.18
12	.9	.0	59.7	.3	-39.8	.0	.46	.17
13	.9	.0	59.5	.3	-39.7	.0	.46	.17
14	-.9	.0	78.7	.0	41.4	.0	.61	.22
15	-1.0	.0	.1	.0	43.5	.0	.00	.02
16	-1.0	.0	.1	.0	43.4	.0	.00	.02
17	-1.0	.0	.0	.0	43.2	.0	.00	.02
18	-.9	.0	77.4	.0	40.8	.0	.60	.22
19	-1.0	.0	-.1	.0	42.9	.0	.00	.02
20	-.9	.0	-.1	.0	42.7	.0	.00	.02
21	-.9	.0	-.1	.0	42.6	.0	.00	.02
22	-.9	.0	76.2	.0	40.3	.0	.59	.22
23	-.9	.0	-.2	.0	42.3	.0	.00	.02
24	-.9	.0	-.3	.0	42.1	.0	.00	.02
25	-.9	.0	-.3	.0	41.9	.0	.00	.02
26	-.9	.0	74.9	.0	39.7	.0	.58	.21
27	-.9	.0	100.3	.3	41.4	.0	.77	.28
28	-1.0	.0	20.6	.3	44.7	.0	.16	.08
29	-1.0	.0	20.6	.3	44.6	.0	.16	.07
30	-1.0	.0	20.5	.3	44.4	.0	.16	.07
31	-.9	.0	99.0	.3	40.8	.0	.76	.28
32	-1.0	.0	20.4	.3	44.1	.0	.16	.07
33	-1.0	.0	20.4	.3	43.9	.0	.16	.07
34	-1.0	.0	20.4	.3	43.8	.0	.16	.07
35	-.9	.0	97.8	.3	40.3	.0	.75	.27
36	-1.0	.0	20.3	.3	43.5	.0	.16	.07
37	-1.0	.0	20.2	.3	43.3	.0	.16	.07
38	-1.0	.0	20.2	.3	43.1	.0	.16	.07
39	-.9	.0	96.5	.3	39.7	.0	.74	.27
40	-.9	.0	89.5	.1	41.4	.0	.69	.25
41	-.9	.0	88.8	.1	41.1	.0	.68	.25
2	-.9	.0	86.4	.1	40.0	.0	.66	.24
43	-.9	.0	85.7	.1	39.7	.0	.66	.24

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.8	1.2	-17.9	68.9	80.0	.0	.18	.18
2	-1.8	1.2	-18.0	68.9	79.9	.0	.18	.18
3	-1.8	1.2	-18.1	68.9	79.9	.0	.18	.18
4	-1.8	1.2	-18.2	68.9	79.9	.0	.18	.18
5	-1.8	1.2	-18.3	68.9	79.8	.0	.18	.18
6	-1.8	1.2	-18.4	68.9	79.8	.0	.18	.18
7	-1.8	1.2	-18.5	68.9	79.7	.0	.19	.18
8	-1.8	1.2	-18.6	68.9	79.7	.0	.19	.18
9	-1.8	1.2	-18.7	68.9	79.6	.0	.19	.18
10	-1.8	1.2	-18.8	68.9	79.6	.0	.19	.18
11	-1.8	1.2	-18.9	68.9	79.5	.0	.19	.18
12	-1.8	1.2	-19.0	68.9	79.5	.0	.19	.18
13	-1.8	1.2	-19.1	68.9	79.5	.0	.19	.18
14	1.8	-1.2	-15.1	-68.9	-80.0	.0	.15	.17
15	1.7	-1.2	129.5	-68.9	-76.7	.0	1.00	.47
16	1.7	-1.2	129.3	-68.9	-76.6	.0	.99	.47
17	1.7	-1.2	129.1	-68.9	-76.6	.0	.99	.47
18	1.8	-1.2	-15.5	-68.9	-79.8	.0	.15	.18
19	1.7	-1.2	128.8	-68.9	-76.5	.0	.99	.47
20	1.7	-1.2	128.6	-68.9	-76.5	.0	.99	.47
21	1.7	-1.2	128.4	-68.9	-76.5	.0	.99	.47
22	1.8	-1.2	-15.9	-68.9	-79.6	.0	.16	.18
23	1.7	-1.2	128.1	-68.9	-76.4	.0	.99	.47
24	1.7	-1.2	127.9	-68.9	-76.4	.0	.98	.47
25	1.7	-1.2	127.7	-68.9	-76.3	.0	.98	.46
26	1.8	-1.2	-16.3	-68.9	-79.5	.0	.16	.18
27	1.8	-1.2	-11.0	-69.0	-80.0	.0	.11	.16
28	1.7	-1.2	133.3	-69.0	-76.5	.0	1.03	.48
29	1.7	-1.2	133.1	-69.0	-76.4	.0	1.02	.48
30	1.7	-1.2	132.9	-69.0	-76.4	.0	1.02	.48
31	1.8	-1.2	-11.4	-69.0	-79.8	.0	.11	.16
32	1.7	-1.2	132.6	-69.0	-76.3	.0	1.02	.48
33	1.7	-1.2	132.4	-69.0	-76.3	.0	1.02	.48
34	1.7	-1.2	132.2	-69.0	-76.2	.0	1.02	.48
35	1.8	-1.2	-11.8	-69.0	-79.6	.0	.12	.17
36	1.7	-1.2	131.9	-69.0	-76.2	.0	1.01	.48
37	1.7	-1.2	131.7	-69.0	-76.1	.0	1.01	.48
38	1.7	-1.2	131.5	-69.0	-76.1	.0	1.01	.47
39	1.8	-1.2	-12.2	-69.0	-79.5	.0	.12	.17
40	1.8	-1.2	-13.1	-69.0	-80.0	.0	.13	.17
41	1.8	-1.2	-13.3	-69.0	-79.9	.0	.13	.17
42	1.8	-1.2	-14.0	-69.0	-79.6	.0	.14	.17
43	1.8	-1.2	-14.3	-69.0	-79.5	.0	.14	.17

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LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.8	1.2	-18.8	68.9	81.7	.0	.19	.18
2	-1.8	1.2	-18.9	68.9	81.7	.0	.19	.18
3	-1.8	1.2	-19.0	68.9	81.6	.0	.19	.19
4	-1.8	1.2	-19.1	68.9	81.6	.0	.19	.19
5	-1.8	1.2	-19.2	68.9	81.6	.0	.19	.19
6	-1.8	1.2	-19.3	68.9	81.5	.0	.19	.19

7	-1.8	1.2	-19.4	68.9	81.5	.0	.19	.19	
8	-1.8	1.2	-19.5	68.9	81.4	.0	.19	.19	
9	-1.8	1.2	-19.6	68.9	81.4	.0	.20	.19	
10	-1.8	1.2	-19.7	68.9	81.3	.0	.20	.19	
1	-1.8	1.2	-19.8	68.9	81.3	.0	.20	.19	
12	-1.8	1.2	-19.9	68.9	81.2	.0	.20	.19	
13	-1.8	1.2	-20.0	68.9	81.2	.0	.20	.19	
14	1.8	-1.2	-17.6	-68.9	-81.7	.0	.18	.18	
15	1.7	-1.2	130.3	-68.9	-78.5	.0	1.00	.47	*
16	1.7	-1.2	130.1	-68.9	-78.4	.0	1.00	.47	*
17	1.7	-1.2	129.9	-68.9	-78.4	.0	1.00	.47	
18	1.8	-1.2	-18.0	-68.9	-81.6	.0	.18	.18	
19	1.7	-1.2	129.5	-68.9	-78.3	.0	1.00	.47	
20	1.7	-1.2	129.4	-68.9	-78.3	.0	1.00	.47	
21	1.7	-1.2	129.2	-68.9	-78.3	.0	.99	.47	
22	1.8	-1.2	-18.3	-68.9	-81.4	.0	.18	.18	
23	1.7	-1.2	128.9	-68.9	-78.2	.0	.99	.47	
24	1.7	-1.2	128.7	-68.9	-78.1	.0	.99	.47	
25	1.7	-1.2	128.5	-68.9	-78.1	.0	.99	.47	
26	1.8	-1.2	-18.8	-68.9	-81.2	.0	.19	.18	
27	1.8	-1.2	-15.8	-69.0	-81.7	.0	.16	.18	
28	1.7	-1.2	131.9	-69.0	-78.4	.0	1.01	.48	*
29	1.7	-1.2	131.7	-69.0	-78.3	.0	1.01	.48	*
30	1.7	-1.2	131.6	-69.0	-78.3	.0	1.01	.48	*
31	1.8	-1.2	-16.2	-69.0	-81.6	.0	.16	.18	
32	1.7	-1.2	131.2	-69.0	-78.2	.0	1.01	.48	*
33	1.7	-1.2	131.0	-69.0	-78.2	.0	1.01	.47	*
34	1.7	-1.2	130.9	-69.0	-78.2	.0	1.01	.47	*
35	1.8	-1.2	-16.6	-69.0	-81.4	.0	.17	.18	
36	1.7	-1.2	130.5	-69.0	-78.1	.0	1.00	.47	*
7	1.7	-1.2	130.3	-69.0	-78.1	.0	1.00	.47	*
38	1.7	-1.2	130.1	-69.0	-78.0	.0	1.00	.47	*
39	1.8	-1.2	-17.0	-69.0	-81.2	.0	.17	.18	
40	1.8	-1.2	-16.7	-69.0	-81.7	.0	.17	.18	
41	1.8	-1.2	-16.9	-69.0	-81.6	.0	.17	.18	
42	1.8	-1.2	-17.7	-69.0	-81.3	.0	.18	.18	
43	1.8	-1.2	-17.9	-69.0	-81.2	.0	.18	.18	

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.8	.9	-30.9	51.3	82.0	.0	.31	.19
2	-1.8	.9	-31.0	51.3	82.0	.0	.31	.19
3	-1.8	.9	-31.1	51.3	81.9	.0	.31	.19
4	-1.8	.9	-31.1	51.3	81.9	.0	.31	.19
5	-1.8	.9	-31.2	51.3	81.8	.0	.31	.19
6	-1.8	.9	-31.3	51.3	81.8	.0	.31	.19
7	-1.8	.9	-31.4	51.3	81.7	.0	.31	.19
8	-1.8	.9	-31.4	51.3	81.7	.0	.31	.19
9	-1.8	.9	-31.5	51.3	81.6	.0	.31	.19
10	-1.8	.9	-31.6	51.3	81.6	.0	.32	.19
11	-1.8	.9	-31.6	51.3	81.5	.0	.32	.19
2	-1.8	.9	-31.7	51.3	81.4	.0	.32	.19
13	-1.8	.9	-31.8	51.3	81.4	.0	.32	.19
14	1.8	-.9	-27.2	-51.4	-82.0	.0	.27	.18
15	1.8	-.9	121.6	-51.4	-79.3	.0	.94	.43
16	1.8	-.9	121.5	-51.4	-79.2	.0	.93	.43



17	1.8	-.9	121.3	-51.4	-79.2	.0	.93	.42
18	1.8	-.9	-27.5	-51.4	-81.8	.0	.28	.18
19	1.8	-.9	121.0	-51.4	-79.1	.0	.93	.42
20	1.8	-.9	120.8	-51.4	-79.1	.0	.93	.42
1	1.8	-.9	120.7	-51.4	-79.0	.0	.93	.42
22	1.8	-.9	-27.8	-51.4	-81.6	.0	.28	.18
23	1.8	-.9	120.3	-51.4	-78.9	.0	.93	.42
24	1.8	-.9	120.2	-51.4	-78.9	.0	.92	.42
25	1.7	-.9	120.0	-51.4	-78.8	.0	.92	.42
26	1.8	-.9	-28.1	-51.4	-81.4	.0	.28	.18
27	1.8	-.9	-22.0	-51.5	-82.0	.0	.22	.17
28	1.8	-.9	126.6	-51.5	-79.0	.0	.97	.44
29	1.8	-.9	126.4	-51.5	-79.0	.0	.97	.44
30	1.8	-.9	126.2	-51.5	-78.9	.0	.97	.44
31	1.8	-.9	-22.3	-51.5	-81.8	.0	.22	.17
32	1.7	-.9	125.9	-51.5	-78.8	.0	.97	.44
33	1.7	-.9	125.7	-51.5	-78.8	.0	.97	.44
34	1.7	-.9	125.6	-51.5	-78.7	.0	.97	.44
35	1.8	-.9	-22.6	-51.5	-81.6	.0	.23	.17
36	1.7	-.9	125.3	-51.5	-78.6	.0	.96	.44
37	1.7	-.9	125.1	-51.5	-78.6	.0	.96	.43
38	1.7	-.9	124.9	-51.5	-78.5	.0	.96	.43
39	1.8	-.9	-22.9	-51.5	-81.4	.0	.23	.17
40	1.8	-.9	-24.6	-51.4	-82.0	.0	.25	.18
41	1.8	-.9	-24.8	-51.4	-81.9	.0	.25	.18
42	1.8	-.9	-25.3	-51.4	-81.5	.0	.25	.18
43	1.8	-.9	-25.5	-51.4	-81.4	.0	.25	.18

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.9	.9	-31.8	51.3	83.8	.0	.32	.19
2	-1.9	.9	-31.9	51.3	83.8	.0	.32	.19
3	-1.9	.9	-32.0	51.3	83.7	.0	.32	.19
4	-1.9	.9	-32.0	51.3	83.7	.0	.32	.20
5	-1.9	.9	-32.1	51.3	83.6	.0	.32	.20
6	-1.9	.9	-32.2	51.3	83.6	.0	.32	.20
7	-1.9	.9	-32.3	51.3	83.5	.0	.32	.20
8	-1.9	.9	-32.3	51.3	83.5	.0	.32	.20
9	-1.9	.9	-32.4	51.3	83.4	.0	.32	.20
10	-1.9	.9	-32.5	51.3	83.4	.0	.32	.20
11	-1.8	.9	-32.5	51.3	83.3	.0	.33	.20
12	-1.8	.9	-32.6	51.3	83.3	.0	.33	.20
13	-1.8	.9	-32.7	51.3	83.2	.0	.33	.20
14	1.9	-.9	-29.8	-51.4	-83.8	.0	.30	.19
15	1.8	-.9	122.5	-51.4	-81.1	.0	.94	.43
16	1.8	-.9	122.3	-51.4	-81.1	.0	.94	.43
17	1.8	-.9	122.1	-51.4	-81.1	.0	.94	.43
18	1.9	-.9	-30.1	-51.4	-83.6	.0	.30	.19
19	1.8	-.9	121.8	-51.4	-81.0	.0	.94	.43
20	1.8	-.9	121.6	-51.4	-80.9	.0	.94	.43
21	1.8	-.9	121.5	-51.4	-80.9	.0	.93	.43
2	1.9	-.9	-30.4	-51.4	-83.4	.0	.30	.19
23	1.8	-.9	121.1	-51.4	-80.8	.0	.93	.43
24	1.8	-.9	121.0	-51.4	-80.7	.0	.93	.42
25	1.8	-.9	120.8	-51.4	-80.7	.0	.93	.42
26	1.8	-.9	-30.6	-51.4	-83.2	.0	.31	.19

27	1.9	-.9	-26.9	-51.5	-83.8	.0	.27	.18
28	1.8	-.9	125.2	-51.5	-81.0	.0	.96	.44
29	1.8	-.9	125.0	-51.5	-80.9	.0	.96	.44
30	1.8	-.9	124.8	-51.5	-80.9	.0	.96	.43
1	1.9	-.9	-27.2	-51.5	-83.6	.0	.27	.18
32	1.8	-.9	124.5	-51.5	-80.8	.0	.96	.43
33	1.8	-.9	124.3	-51.5	-80.7	.0	.96	.43
34	1.8	-.9	124.2	-51.5	-80.7	.0	.96	.43
35	1.9	-.9	-27.5	-51.5	-83.4	.0	.28	.18
36	1.8	-.9	123.9	-51.5	-80.6	.0	.95	.43
37	1.8	-.9	123.7	-51.5	-80.6	.0	.95	.43
38	1.8	-.9	123.5	-51.5	-80.5	.0	.95	.43
39	1.8	-.9	-27.8	-51.5	-83.2	.0	.28	.18
40	1.9	-.9	-28.4	-51.4	-83.8	.0	.28	.19
41	1.9	-.9	-28.5	-51.4	-83.7	.0	.29	.19
42	1.8	-.9	-29.1	-51.4	-83.3	.0	.29	.19
43	1.8	-.9	-29.2	-51.4	-83.2	.0	.29	.19

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.2	1.2	12.3	69.0	53.6	.0	.09	.15
2	-1.2	1.2	12.2	69.0	53.6	.0	.09	.15
3	-1.2	1.2	12.1	69.0	53.6	.0	.09	.15
4	-1.2	1.2	12.0	69.0	53.6	.0	.09	.15
5	-1.2	1.2	11.8	69.0	53.6	.0	.09	.15
6	-1.2	1.2	11.7	69.0	53.6	.0	.09	.15
7	-1.2	1.2	11.6	69.0	53.6	.0	.09	.15
8	-1.2	1.2	11.5	69.0	53.6	.0	.09	.15
9	-1.2	1.2	11.4	69.0	53.6	.0	.09	.15
10	-1.2	1.2	11.3	69.0	53.6	.0	.09	.15
11	-1.2	1.2	11.2	69.0	53.6	.0	.09	.15
12	-1.2	1.2	11.1	69.0	53.6	.0	.09	.15
13	-1.2	1.2	11.0	69.0	53.6	.0	.08	.15
14	1.2	-1.2	-7.7	-69.0	-53.6	.0	.08	.14
15	1.1	-1.2	89.1	-69.0	-51.3	.0	.69	.35
16	1.1	-1.2	89.0	-69.0	-51.3	.0	.68	.35
17	1.1	-1.2	88.9	-69.0	-51.3	.0	.68	.35
18	1.2	-1.2	-8.1	-69.0	-53.6	.0	.08	.14
19	1.1	-1.2	88.7	-69.0	-51.3	.0	.68	.35
20	1.1	-1.2	88.5	-69.0	-51.3	.0	.68	.35
21	1.1	-1.2	88.5	-69.0	-51.3	.0	.68	.35
22	1.2	-1.2	-8.6	-69.0	-53.6	.0	.09	.14
23	1.1	-1.2	88.2	-69.0	-51.3	.0	.68	.35
24	1.1	-1.2	88.1	-69.0	-51.3	.0	.68	.35
25	1.1	-1.2	88.0	-69.0	-51.3	.0	.68	.35
26	1.2	-1.2	-9.0	-69.0	-53.6	.0	.09	.15
27	1.2	-1.2	-35.7	-69.0	-53.6	.0	.36	.22
28	1.2	-1.2	62.6	-69.0	-52.9	.0	.48	.28
29	1.2	-1.2	62.5	-69.0	-52.9	.0	.48	.28
30	1.2	-1.2	62.3	-69.0	-52.9	.0	.48	.28
31	1.2	-1.2	-36.1	-69.0	-53.6	.0	.36	.22
2	1.2	-1.2	62.1	-69.0	-52.9	.0	.48	.28
33	1.2	-1.2	62.0	-69.0	-52.9	.0	.48	.28
34	1.2	-1.2	61.9	-69.0	-52.9	.0	.48	.28
35	1.2	-1.2	-36.6	-69.0	-53.6	.0	.37	.22
36	1.2	-1.2	61.7	-69.0	-52.9	.0	.47	.28

37	1.2	-1.2	61.6	-69.0	-52.9	.0	.47	.28
38	1.2	-1.2	61.4	-69.0	-52.9	.0	.47	.28
39	1.2	-1.2	-37.0	-69.0	-53.6	.0	.37	.22
40	1.2	-1.2	-21.7	-69.0	-53.6	.0	.22	.18
41	1.2	-1.2	-22.0	-69.0	-53.6	.0	.22	.18
42	1.2	-1.2	-22.7	-69.0	-53.6	.0	.23	.18
43	1.2	-1.2	-23.0	-69.0	-53.6	.0	.23	.18

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	-1.2	1.2	12.7	69.0	52.7	.0	.10	.16
2	-1.2	1.2	12.6	69.0	52.7	.0	.10	.15
3	-1.2	1.2	12.5	69.0	52.7	.0	.10	.15
4	-1.2	1.2	12.4	69.0	52.7	.0	.10	.15
5	-1.2	1.2	12.3	69.0	52.7	.0	.09	.15
6	-1.2	1.2	12.2	69.0	52.7	.0	.09	.15
7	-1.2	1.2	12.1	69.0	52.7	.0	.09	.15
8	-1.2	1.2	12.0	69.0	52.7	.0	.09	.15
9	-1.2	1.2	11.9	69.0	52.7	.0	.09	.15
10	-1.2	1.2	11.8	69.0	52.7	.0	.09	.15
11	-1.2	1.2	11.7	69.0	52.7	.0	.09	.15
12	-1.2	1.2	11.5	69.0	52.7	.0	.09	.15
13	-1.2	1.2	11.4	69.0	52.7	.0	.09	.15
14	1.2	-1.2	-6.4	-69.0	-52.7	.0	.06	.14
15	1.1	-1.2	88.7	-69.0	-50.4	.0	.68	.35
16	1.1	-1.2	88.6	-69.0	-50.4	.0	.68	.35
17	1.1	-1.2	88.5	-69.0	-50.4	.0	.68	.35
18	1.2	-1.2	-6.9	-69.0	-52.7	.0	.07	.14
19	1.1	-1.2	88.3	-69.0	-50.4	.0	.68	.35
20	1.1	-1.2	88.1	-69.0	-50.4	.0	.68	.35
21	1.1	-1.2	88.1	-69.0	-50.4	.0	.68	.35
22	1.2	-1.2	-7.3	-69.0	-52.7	.0	.07	.14
23	1.1	-1.2	87.8	-69.0	-50.4	.0	.68	.35
24	1.1	-1.2	87.7	-69.0	-50.4	.0	.67	.35
25	1.1	-1.2	87.6	-69.0	-50.4	.0	.67	.35
26	1.2	-1.2	-7.7	-69.0	-52.7	.0	.08	.14
27	1.2	-1.2	-33.2	-69.0	-52.7	.0	.33	.21
28	1.2	-1.2	63.3	-69.0	-51.9	.0	.49	.29
29	1.2	-1.2	63.2	-69.0	-51.9	.0	.49	.29
30	1.2	-1.2	63.0	-69.0	-51.9	.0	.48	.29
31	1.2	-1.2	-33.7	-69.0	-52.7	.0	.34	.21
32	1.2	-1.2	62.8	-69.0	-51.9	.0	.48	.28
33	1.2	-1.2	62.7	-69.0	-51.9	.0	.48	.28
34	1.2	-1.2	62.6	-69.0	-51.9	.0	.48	.28
35	1.2	-1.2	-34.1	-69.0	-52.7	.0	.34	.21
36	1.2	-1.2	62.4	-69.0	-51.9	.0	.48	.28
37	1.2	-1.2	62.3	-69.0	-51.9	.0	.48	.28
38	1.2	-1.2	62.1	-69.0	-51.9	.0	.48	.28
39	1.2	-1.2	-34.5	-69.0	-52.7	.0	.35	.21
40	1.2	-1.2	-19.8	-69.0	-52.7	.0	.20	.17
41	1.2	-1.2	-20.1	-69.0	-52.7	.0	.20	.17
42	1.2	-1.2	-20.9	-69.0	-52.7	.0	.21	.18
43	1.2	-1.2	-21.1	-69.0	-52.7	.0	.21	.18

LOAD CASE - 8

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	1.2	1.4	71.8	80.9	-55.1	.0	.55	.33
2	1.1	1.4	67.4	80.9	-49.0	.0	.52	.31
3	.9	1.4	62.0	80.9	-41.7	.0	.48	.29
4	.8	1.4	56.6	80.9	-34.5	.0	.44	.28
5	.6	1.4	51.3	80.9	-27.2	.0	.39	.26
6	.4	1.4	45.9	80.9	-19.9	.0	.35	.24
7	.3	1.4	40.5	80.9	-12.7	.0	.31	.23
8	.2	1.4	36.6	80.9	-7.3	.0	.28	.21
9	.0	1.4	31.2	80.9	-.1	.0	.24	.20
10	-.2	1.4	25.8	80.9	7.2	.0	.20	.18
11	-.3	1.4	20.5	80.9	14.4	.0	.16	.17
12	-.5	1.4	15.1	80.9	21.7	.0	.12	.16
13	-.6	1.4	10.6	80.9	27.8	.0	.08	.15
14	-1.2	-1.2	75.3	-70.8	55.1	.0	.58	.32
15	-1.1	-1.2	-21.0	-70.8	50.4	.0	.21	.18
16	-1.0	-1.2	-13.0	-70.8	43.2	.0	.13	.15
17	-.8	-1.2	-5.0	-70.8	36.0	.0	.05	.13
18	-.6	-1.2	54.7	-70.8	27.2	.0	.42	.25
19	-.5	-1.2	10.9	-70.8	21.7	.0	.08	.14
20	-.3	-1.2	18.9	-70.8	14.5	.0	.15	.16
21	-.2	-1.2	24.8	-70.8	9.2	.0	.19	.17
22	.0	-1.2	34.7	-70.8	.1	.0	.27	.19
23	.1	-1.2	40.7	-70.8	-5.2	.0	.31	.21
24	.3	-1.2	48.7	-70.8	-12.4	.0	.37	.23
25	.4	-1.2	56.7	-70.8	-19.6	.0	.44	.26
26	.6	-1.2	14.1	-70.8	-27.8	.0	.11	.15
27	-1.2	-1.0	80.2	-56.7	55.1	.0	.62	.31
28	-1.1	-1.0	-16.4	-56.7	50.7	.0	.16	.15
29	-1.0	-1.0	-8.4	-56.7	43.5	.0	.08	.12
30	-.8	-1.0	-.4	-56.7	36.3	.0	.00	.10
31	-.6	-1.0	59.6	-56.7	27.2	.0	.46	.25
32	-.5	-1.0	15.5	-56.7	21.9	.0	.12	.13
33	-.3	-1.0	23.5	-56.7	14.7	.0	.18	.15
34	-.2	-1.0	29.4	-56.7	9.5	.0	.23	.16
35	.0	-1.0	39.5	-56.7	.1	.0	.30	.18
36	.1	-1.0	45.3	-56.7	-4.9	.0	.35	.20
37	.3	-1.0	53.3	-56.7	-12.1	.0	.41	.22
38	.4	-1.0	61.3	-56.7	-19.3	.0	.47	.25
39	.6	-1.0	18.9	-56.7	-27.8	.0	.15	.14
40	-1.2	-1.1	77.7	-63.8	55.1	.0	.60	.32
41	-.9	-1.1	66.1	-63.8	39.3	.0	.51	.28
42	.3	-1.1	28.1	-63.8	-12.0	.0	.22	.17
43	.6	-1.1	16.5	-63.8	-27.8	.0	.13	.15

LOAD CASE - 9

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	1.2	1.4	72.3	80.9	-56.0	.0	.56	.33
2	1.1	1.4	67.8	80.9	-49.9	.0	.52	.31
3	.9	1.4	62.4	80.9	-42.6	.0	.48	.30
4	.8	1.4	57.1	80.9	-35.4	.0	.44	.28
5	.6	1.4	51.7	80.9	-28.1	.0	.40	.26
6	.5	1.4	46.3	80.9	-20.8	.0	.36	.24

7	.3	1.4	41.0	80.9	-13.6	.0	.32	.23
8	.2	1.4	37.0	80.9	-8.2	.0	.28	.21
9	.0	1.4	31.7	80.9	-1.0	.0	.24	.20
10	-.1	1.4	26.3	80.9	6.3	.0	.20	.19
1	-.3	1.4	20.9	80.9	13.5	.0	.16	.17
12	-.5	1.4	15.5	80.9	20.8	.0	.12	.16
13	-.6	1.4	11.1	80.9	26.9	.0	.09	.16
14	-1.2	-1.2	76.6	-70.8	56.0	.0	.59	.33
15	-1.1	-1.2	-21.4	-70.8	51.4	.0	.21	.18
16	-1.0	-1.2	-13.4	-70.8	44.2	.0	.13	.16
17	-.8	-1.2	-5.4	-70.8	37.0	.0	.05	.13
18	-.6	-1.2	56.0	-70.8	28.1	.0	.43	.26
19	-.5	-1.2	10.5	-70.8	22.6	.0	.08	.14
20	-.3	-1.2	18.5	-70.8	15.4	.0	.14	.16
21	-.2	-1.2	24.4	-70.8	10.1	.0	.19	.17
22	.0	-1.2	36.0	-70.8	1.0	.0	.28	.19
23	.1	-1.2	40.3	-70.8	-4.3	.0	.31	.21
24	.3	-1.2	48.3	-70.8	-11.4	.0	.37	.23
25	.4	-1.2	56.3	-70.8	-18.6	.0	.43	.25
26	.6	-1.2	15.4	-70.8	-26.9	.0	.12	.15
27	-1.2	-1.0	82.6	-56.7	56.0	.0	.64	.32
28	-1.1	-1.0	-15.7	-56.7	51.7	.0	.16	.15
29	-1.0	-1.0	-7.7	-56.7	44.5	.0	.08	.12
30	-.8	-1.0	.3	-56.7	37.3	.0	.00	.10
31	-.6	-1.0	62.0	-56.7	28.1	.0	.48	.25
32	-.5	-1.0	16.3	-56.7	22.9	.0	.13	.13
33	-.3	-1.0	24.2	-56.7	15.7	.0	.19	.15
34	-.2	-1.0	30.1	-56.7	10.5	.0	.23	.16
35	.0	-1.0	42.0	-56.7	1.0	.0	.32	.19
36	.1	-1.0	46.0	-56.7	-3.9	.0	.35	.20
37	.2	-1.0	54.0	-56.7	-11.1	.0	.42	.23
38	.4	-1.0	62.0	-56.7	-18.3	.0	.48	.25
39	.6	-1.0	21.4	-56.7	-26.9	.0	.16	.15
40	-1.2	-1.1	79.6	-63.8	56.0	.0	.61	.32
41	-.9	-1.1	68.0	-63.8	40.2	.0	.52	.29
42	.2	-1.1	30.0	-63.8	-11.1	.0	.23	.17
43	.6	-1.1	18.4	-63.8	-26.9	.0	.14	.15

LOAD CASE - 10

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.1	1.1	36.9	66.4	-4.8	.0	.28	.19
2	.1	1.1	37.5	66.4	-6.1	.0	.29	.19
3	.2	1.1	38.2	66.4	-7.6	.0	.29	.20
4	.2	1.1	39.0	66.4	-9.2	.0	.30	.20
5	.2	1.1	39.7	66.4	-10.7	.0	.31	.20
6	.3	1.1	40.5	66.4	-12.2	.0	.31	.20
7	.3	1.1	41.2	66.4	-13.8	.0	.32	.21
8	.3	1.1	41.8	66.4	-14.9	.0	.32	.21
9	.4	1.1	42.5	66.4	-16.5	.0	.33	.21
10	.4	1.1	43.3	66.4	-18.0	.0	.33	.21
11	.4	1.1	44.0	66.4	-19.5	.0	.34	.22
2	.5	1.1	44.8	66.4	-21.1	.0	.34	.22
13	.5	1.1	45.4	66.4	-22.4	.0	.35	.22
14	-.1	-1.2	40.4	-68.6	4.8	.0	.31	.20
15	-.2	-1.2	28.0	-68.6	8.1	.0	.22	.17
16	-.2	-1.2	25.9	-68.6	9.6	.0	.20	.17

17	-.2	-1.2	23.9	-68.6	11.1	.0	.18	.16
18	-.2	-1.2	43.3	-68.6	10.7	.0	.33	.21
19	-.3	-1.2	19.7	-68.6	14.1	.0	.15	.15
20	-.3	-1.2	17.7	-68.6	15.6	.0	.14	.15
21	-.4	-1.2	16.2	-68.6	16.7	.0	.12	.15
22	-.4	-1.2	46.1	-68.6	16.5	.0	.35	.22
23	-.4	-1.2	12.0	-68.6	19.7	.0	.09	.14
24	-.5	-1.2	10.0	-68.6	21.2	.0	.08	.13
25	-.5	-1.2	7.9	-68.6	22.7	.0	.06	.13
26	-.5	-1.2	48.9	-68.6	22.4	.0	.38	.23
27	-.1	-1.2	45.4	-71.6	4.8	.0	.35	.22
28	-.2	-1.2	32.7	-71.6	8.3	.0	.25	.19
29	-.2	-1.2	30.6	-71.6	9.8	.0	.24	.19
30	-.3	-1.2	28.6	-71.6	11.3	.0	.22	.18
31	-.2	-1.2	48.3	-71.6	10.7	.0	.37	.23
32	-.3	-1.2	24.5	-71.6	14.3	.0	.19	.17
33	-.4	-1.2	22.4	-71.6	15.8	.0	.17	.17
34	-.4	-1.2	20.9	-71.6	16.9	.0	.16	.16
35	-.4	-1.2	51.1	-71.6	16.5	.0	.39	.24
36	-.4	-1.2	16.8	-71.6	20.0	.0	.13	.15
37	-.5	-1.2	14.7	-71.6	21.5	.0	.11	.15
38	-.5	-1.2	12.6	-71.6	23.0	.0	.10	.14
39	-.5	-1.2	53.9	-71.6	22.4	.0	.41	.25
40	-.1	-1.2	42.9	-70.1	4.8	.0	.33	.21
41	-.2	-1.2	44.5	-70.1	8.1	.0	.34	.22
42	-.4	-1.2	49.8	-70.1	19.0	.0	.38	.24
43	-.5	-1.2	51.4	-70.1	22.4	.0	.40	.24

LOAD CASE - 11

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.1	1.1	37.3	66.4	-5.7	.0	.29	.19
2	.2	1.1	37.9	66.4	-7.0	.0	.29	.20
3	.2	1.1	38.7	66.4	-8.5	.0	.30	.20
4	.2	1.1	39.4	66.4	-10.1	.0	.30	.20
5	.3	1.1	40.2	66.4	-11.6	.0	.31	.20
6	.3	1.1	40.9	66.4	-13.1	.0	.31	.21
7	.3	1.1	41.7	66.4	-14.7	.0	.32	.21
8	.4	1.1	42.2	66.4	-15.8	.0	.32	.21
9	.4	1.1	43.0	66.4	-17.4	.0	.33	.21
10	.4	1.1	43.7	66.4	-18.9	.0	.34	.22
11	.5	1.1	44.5	66.4	-20.4	.0	.34	.22
12	.5	1.1	45.2	66.4	-22.0	.0	.35	.22
13	.5	1.1	45.8	66.4	-23.3	.0	.35	.22
14	-.1	-1.2	41.7	-68.6	5.7	.0	.32	.21
15	-.2	-1.2	27.6	-68.6	9.0	.0	.21	.17
16	-.2	-1.2	25.5	-68.6	10.5	.0	.20	.17
17	-.3	-1.2	23.5	-68.6	12.0	.0	.18	.16
18	-.3	-1.2	44.6	-68.6	11.6	.0	.34	.22
19	-.3	-1.2	19.3	-68.6	15.0	.0	.15	.15
20	-.4	-1.2	17.3	-68.6	16.5	.0	.13	.15
21	-.4	-1.2	15.8	-68.6	17.6	.0	.12	.15
22	-.4	-1.2	47.4	-68.6	17.4	.0	.36	.23
23	-.5	-1.2	11.6	-68.6	20.6	.0	.09	.14
24	-.5	-1.2	9.6	-68.6	22.1	.0	.07	.13
25	-.5	-1.2	7.5	-68.6	23.6	.0	.06	.13
26	-.5	-1.2	50.2	-68.6	23.3	.0	.39	.24

27	-.1	-1.2	47.9	-71.6	5.7	.0	.37	.23
28	-.2	-1.2	33.4	-71.6	9.3	.0	.26	.19
29	-.2	-1.2	31.4	-71.6	10.8	.0	.24	.19
30	-.3	-1.2	29.3	-71.6	12.3	.0	.23	.18
31	-.3	-1.2	50.7	-71.6	11.6	.0	.39	.24
32	-.3	-1.2	25.2	-71.6	15.3	.0	.19	.17
33	-.4	-1.2	23.1	-71.6	16.8	.0	.18	.17
34	-.4	-1.2	21.6	-71.6	17.9	.0	.17	.17
35	-.4	-1.2	53.5	-71.6	17.4	.0	.41	.25
36	-.5	-1.2	17.5	-71.6	20.9	.0	.13	.16
37	-.5	-1.2	15.4	-71.6	22.5	.0	.12	.15
38	-.5	-1.2	13.3	-71.6	24.0	.0	.10	.15
39	-.5	-1.2	56.4	-71.6	23.3	.0	.43	.26
40	-.1	-1.2	44.8	-70.1	5.7	.0	.34	.22
41	-.2	-1.2	46.4	-70.1	9.0	.0	.36	.22
42	-.4	-1.2	51.7	-70.1	19.9	.0	.40	.24
43	-.5	-1.2	53.3	-70.1	23.3	.0	.41	.25

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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	.9	63.3	.0	.0	.0
2	.0	.9	63.0	.0	.0	.0
3	.0	.9	62.7	.0	.0	.0
4	.0	.9	62.3	.0	.0	.0
5	.0	.9	62.0	.0	.0	.0
6	.0	.9	61.7	.0	.0	.0
7	.0	.9	61.3	.0	.0	.0
8	.0	.9	61.1	.0	.0	.0
9	.0	.9	60.7	.0	.0	.0
10	.0	.9	60.4	.0	.0	.0
11	.0	.9	60.1	.0	.0	.0
12	.0	.9	59.7	.0	.0	.0
13	.0	.9	59.5	.0	.0	.0
14	.0	.9	78.7	.0	.0	.0
15	.0	.9	.4	.0	.0	.0
16	.0	.9	.4	.0	.0	.0
17	.0	.9	.3	.0	.0	.0
18	.0	.9	77.4	.0	.0	.0
19	.0	.9	.2	.0	.0	.0
20	.0	.9	.2	.0	.0	.0
21	.0	.9	.2	.0	.0	.0
22	.0	.9	76.2	.0	.0	.0
23	.0	1.0	.1	.0	.0	.0
24	.0	1.0	.0	.0	.0	.0
25	.0	1.0	.0	.0	.0	.0
26	.0	.9	74.9	.0	.0	.0
27	.0	.9	100.3	.0	.0	.0
28	.0	-5.6	19.9	.0	.0	.0
29	.0	-5.6	19.8	.0	.0	.0
30	.0	-5.6	19.8	.0	.0	.0

31	.0	.9	99.0	.0	.0	.0
32	.0	-5.5	19.7	.0	.0	.0
33	.0	-5.5	19.7	.0	.0	.0
34	.0	-5.5	19.6	.0	.0	.0
35	.0	.9	97.8	.0	.0	.0
36	.0	-5.5	19.5	.0	.0	.0
37	.0	-5.5	19.5	.0	.0	.0
38	.0	-5.5	19.5	.0	.0	.0
39	.0	.9	96.5	.0	.0	.0
40	.0	.9	89.5	.0	.0	.0
41	.0	.9	88.8	.0	.0	.0
42	.0	.9	86.4	.0	.0	.0
43	.0	.9	85.7	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-1.2	-1.8	-17.9	.0	.0	.0
2	-1.2	-1.8	-18.0	.0	.0	.0
3	-1.2	-1.8	-18.1	.0	.0	.0
4	-1.2	-1.8	-18.2	.0	.0	.0
5	-1.2	-1.8	-18.3	.0	.0	.0
6	-1.2	-1.8	-18.4	.0	.0	.0
7	-1.2	-1.8	-18.5	.0	.0	.0
8	-1.2	-1.8	-18.6	.0	.0	.0
9	-1.2	-1.8	-18.7	.0	.0	.0
10	-1.2	-1.8	-18.8	.0	.0	.0
11	-1.2	-1.8	-18.9	.0	.0	.0
12	-1.2	-1.8	-19.0	.0	.0	.0
13	-1.2	-1.8	-19.1	.0	.0	.0
14	-1.2	-1.8	-15.1	.0	.0	.0
15	-1.2	-42.6	122.3	.0	.0	.0
16	-1.2	-42.5	122.1	.0	.0	.0
17	-1.2	-42.4	122.0	.0	.0	.0
18	-1.2	-1.8	-15.5	.0	.0	.0
19	-1.2	-42.3	121.6	.0	.0	.0
20	-1.2	-42.3	121.4	.0	.0	.0
21	-1.2	-42.2	121.3	.0	.0	.0
22	-1.2	-1.8	-15.9	.0	.0	.0
23	-1.2	-42.1	121.0	.0	.0	.0
24	-1.2	-42.0	120.8	.0	.0	.0
25	-1.2	-42.0	120.6	.0	.0	.0
26	-1.2	-1.8	-16.3	.0	.0	.0
27	-1.2	-1.8	-11.0	.0	.0	.0
28	-1.2	-43.8	125.9	.0	.0	.0
29	-1.2	-43.7	125.7	.0	.0	.0
30	-1.2	-43.6	125.6	.0	.0	.0
31	-1.2	-1.8	-11.4	.0	.0	.0
32	-1.2	-43.5	125.2	.0	.0	.0
33	-1.2	-43.5	125.1	.0	.0	.0
34	-1.2	-43.4	124.9	.0	.0	.0
35	-1.2	-1.8	-11.8	.0	.0	.0
36	-1.2	-43.3	124.6	.0	.0	.0
37	-1.2	-43.2	124.4	.0	.0	.0
38	-1.2	-43.2	124.2	.0	.0	.0
39	-1.2	-1.8	-12.2	.0	.0	.0
40	-1.2	-1.8	-13.1	.0	.0	.0



41	-1.2	-1.8	-13.3	.0	.0	.0
42	-1.2	-1.8	-14.0	.0	.0	.0
43	-1.2	-1.8	-14.3	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-1.2	-1.8	-18.8	.0	.0	.0
2	-1.2	-1.8	-18.9	.0	.0	.0
3	-1.2	-1.8	-19.0	.0	.0	.0
4	-1.2	-1.8	-19.1	.0	.0	.0
5	-1.2	-1.8	-19.2	.0	.0	.0
6	-1.2	-1.8	-19.3	.0	.0	.0
7	-1.2	-1.8	-19.4	.0	.0	.0
8	-1.2	-1.8	-19.5	.0	.0	.0
9	-1.2	-1.8	-19.6	.0	.0	.0
10	-1.2	-1.8	-19.7	.0	.0	.0
11	-1.2	-1.8	-19.8	.0	.0	.0
12	-1.2	-1.8	-19.9	.0	.0	.0
13	-1.2	-1.8	-20.0	.0	.0	.0
14	-1.2	-1.8	-17.6	.0	.0	.0
15	-1.2	-42.8	123.0	.0	.0	.0
16	-1.2	-42.8	122.9	.0	.0	.0
17	-1.2	-42.7	122.7	.0	.0	.0
18	-1.2	-1.8	-18.0	.0	.0	.0
19	-1.2	-42.6	122.3	.0	.0	.0
20	-1.2	-42.6	122.2	.0	.0	.0
21	-1.2	-42.5	122.0	.0	.0	.0
22	-1.2	-1.8	-18.3	.0	.0	.0
23	-1.2	-42.4	121.7	.0	.0	.0
24	-1.2	-42.3	121.5	.0	.0	.0
25	-1.2	-42.3	121.3	.0	.0	.0
26	-1.2	-1.8	-18.8	.0	.0	.0
27	-1.2	-1.8	-15.8	.0	.0	.0
28	-1.2	-43.4	124.6	.0	.0	.0
29	-1.2	-43.3	124.4	.0	.0	.0
30	-1.2	-43.3	124.3	.0	.0	.0
31	-1.2	-1.8	-16.2	.0	.0	.0
32	-1.2	-43.1	123.9	.0	.0	.0
33	-1.2	-43.1	123.7	.0	.0	.0
34	-1.2	-43.0	123.6	.0	.0	.0
35	-1.2	-1.8	-16.6	.0	.0	.0
36	-1.2	-42.9	123.3	.0	.0	.0
37	-1.2	-42.9	123.1	.0	.0	.0
38	-1.2	-42.8	122.9	.0	.0	.0
39	-1.2	-1.8	-17.0	.0	.0	.0
40	-1.2	-1.8	-16.7	.0	.0	.0
41	-1.2	-1.8	-16.9	.0	.0	.0
42	-1.2	-1.8	-17.7	.0	.0	.0
43	-1.2	-1.8	-17.9	.0	.0	.0

AD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
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1	-.9	-1.8	-30.9	.0	.0	.0
2	-.9	-1.8	-31.0	.0	.0	.0
3	-.9	-1.8	-31.1	.0	.0	.0
4	-.9	-1.8	-31.1	.0	.0	.0
5	-.9	-1.8	-31.2	.0	.0	.0
6	-.9	-1.8	-31.3	.0	.0	.0
7	-.9	-1.8	-31.4	.0	.0	.0
8	-.9	-1.8	-31.4	.0	.0	.0
9	-.9	-1.8	-31.5	.0	.0	.0
10	-.9	-1.8	-31.6	.0	.0	.0
11	-.9	-1.8	-31.6	.0	.0	.0
12	-.9	-1.8	-31.7	.0	.0	.0
13	-.9	-1.8	-31.8	.0	.0	.0
14	-.9	-1.8	-27.2	.0	.0	.0
15	-.9	-40.1	114.8	.0	.0	.0
16	-.9	-40.1	114.7	.0	.0	.0
17	-.9	-40.0	114.5	.0	.0	.0
18	-.9	-1.8	-27.5	.0	.0	.0
19	-.9	-39.9	114.2	.0	.0	.0
20	-.9	-39.9	114.0	.0	.0	.0
21	-.9	-39.8	113.9	.0	.0	.0
22	-.9	-1.8	-27.8	.0	.0	.0
23	-.9	-39.7	113.6	.0	.0	.0
24	-.9	-39.7	113.4	.0	.0	.0
25	-.9	-39.6	113.3	.0	.0	.0
26	-.9	-1.8	-28.1	.0	.0	.0
27	-.9	-1.8	-22.0	.0	.0	.0
28	-.9	-41.7	119.5	.0	.0	.0
29	-.9	-41.6	119.4	.0	.0	.0
30	-.9	-41.6	119.2	.0	.0	.0
31	-.9	-1.8	-22.3	.0	.0	.0
32	-.9	-41.5	118.9	.0	.0	.0
33	-.9	-41.4	118.7	.0	.0	.0
34	-.9	-41.4	118.6	.0	.0	.0
35	-.9	-1.8	-22.6	.0	.0	.0
36	-.9	-41.3	118.3	.0	.0	.0
37	-.9	-41.2	118.1	.0	.0	.0
38	-.9	-41.2	118.0	.0	.0	.0
39	-.9	-1.8	-22.9	.0	.0	.0
40	-.9	-1.8	-24.6	.0	.0	.0
41	-.9	-1.8	-24.8	.0	.0	.0
42	-.9	-1.8	-25.3	.0	.0	.0
43	-.9	-1.8	-25.5	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-.9	-1.9	-31.8	.0	.0	.0
2	-.9	-1.9	-31.9	.0	.0	.0
3	-.9	-1.9	-32.0	.0	.0	.0
4	-.9	-1.9	-32.0	.0	.0	.0
5	-.9	-1.9	-32.1	.0	.0	.0
6	-.9	-1.9	-32.2	.0	.0	.0
7	-.9	-1.9	-32.3	.0	.0	.0
8	-.9	-1.9	-32.3	.0	.0	.0
9	-.9	-1.9	-32.4	.0	.0	.0
10	-.9	-1.9	-32.5	.0	.0	.0

11	-.9	-1.8	-32.5	.0	.0	.0
12	-.9	-1.8	-32.6	.0	.0	.0
13	-.9	-1.8	-32.7	.0	.0	.0
14	-.9	-1.9	-29.8	.0	.0	.0
15	-.9	-40.4	115.6	.0	.0	.0
16	-.9	-40.4	115.4	.0	.0	.0
17	-.9	-40.3	115.3	.0	.0	.0
18	-.9	-1.9	-30.1	.0	.0	.0
19	-.9	-40.2	115.0	.0	.0	.0
20	-.9	-40.2	114.8	.0	.0	.0
21	-.9	-40.1	114.7	.0	.0	.0
22	-.9	-1.9	-30.4	.0	.0	.0
23	-.9	-40.0	114.4	.0	.0	.0
24	-.9	-40.0	114.2	.0	.0	.0
25	-.9	-39.9	114.0	.0	.0	.0
26	-.9	-1.8	-30.6	.0	.0	.0
27	-.9	-1.9	-26.9	.0	.0	.0
28	-.9	-41.3	118.2	.0	.0	.0
29	-.9	-41.2	118.0	.0	.0	.0
30	-.9	-41.2	117.9	.0	.0	.0
31	-.9	-1.9	-27.2	.0	.0	.0
32	-.9	-41.1	117.5	.0	.0	.0
33	-.9	-41.0	117.4	.0	.0	.0
34	-.9	-41.0	117.3	.0	.0	.0
35	-.9	-1.9	-27.5	.0	.0	.0
36	-.9	-40.9	116.9	.0	.0	.0
37	-.9	-40.8	116.8	.0	.0	.0
38	-.9	-40.8	116.6	.0	.0	.0
39	-.9	-1.8	-27.8	.0	.0	.0
40	-.9	-1.9	-28.4	.0	.0	.0
41	-.9	-1.9	-28.5	.0	.0	.0
42	-.9	-1.8	-29.1	.0	.0	.0
43	-.9	-1.8	-29.2	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-1.2	-1.2	12.3	.0	.0	.0
2	-1.2	-1.2	12.2	.0	.0	.0
3	-1.2	-1.2	12.1	.0	.0	.0
4	-1.2	-1.2	12.0	.0	.0	.0
5	-1.2	-1.2	11.8	.0	.0	.0
6	-1.2	-1.2	11.7	.0	.0	.0
7	-1.2	-1.2	11.6	.0	.0	.0
8	-1.2	-1.2	11.5	.0	.0	.0
9	-1.2	-1.2	11.4	.0	.0	.0
10	-1.2	-1.2	11.3	.0	.0	.0
11	-1.2	-1.2	11.2	.0	.0	.0
12	-1.2	-1.2	11.1	.0	.0	.0
13	-1.2	-1.2	11.0	.0	.0	.0
14	-1.2	-1.2	-7.7	.0	.0	.0
15	-1.2	-29.3	84.2	.0	.0	.0
16	-1.2	-29.2	84.1	.0	.0	.0
17	-1.2	-29.2	84.0	.0	.0	.0
18	-1.2	-1.2	-8.1	.0	.0	.0
19	-1.2	-29.1	83.8	.0	.0	.0
20	-1.2	-29.1	83.6	.0	.0	.0

21	-1.2	-29.1	83.6	.0	.0	.0
22	-1.2	-1.2	-8.6	.0	.0	.0
23	-1.2	-29.0	83.3	.0	.0	.0
24	-1.2	-28.9	83.2	.0	.0	.0
25	-1.2	-28.9	83.1	.0	.0	.0
26	-1.2	-1.2	-9.0	.0	.0	.0
27	-1.2	-1.2	-35.7	.0	.0	.0
28	-1.2	-20.9	59.0	.0	.0	.0
29	-1.2	-20.9	58.9	.0	.0	.0
30	-1.2	-20.8	58.8	.0	.0	.0
31	-1.2	-1.2	-36.1	.0	.0	.0
32	-1.2	-20.8	58.5	.0	.0	.0
33	-1.2	-20.7	58.4	.0	.0	.0
34	-1.2	-20.7	58.4	.0	.0	.0
35	-1.2	-1.2	-36.6	.0	.0	.0
36	-1.2	-20.6	58.1	.0	.0	.0
37	-1.2	-20.6	58.0	.0	.0	.0
38	-1.2	-20.5	57.9	.0	.0	.0
39	-1.2	-1.2	-37.0	.0	.0	.0
40	-1.2	-1.2	-21.7	.0	.0	.0
41	-1.2	-1.2	-22.0	.0	.0	.0
42	-1.2	-1.2	-22.7	.0	.0	.0
43	-1.2	-1.2	-23.0	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-1.2	-1.2	12.7	.0	.0	.0
2	-1.2	-1.2	12.6	.0	.0	.0
3	-1.2	-1.2	12.5	.0	.0	.0
4	-1.2	-1.2	12.4	.0	.0	.0
5	-1.2	-1.2	12.3	.0	.0	.0
6	-1.2	-1.2	12.2	.0	.0	.0
7	-1.2	-1.2	12.1	.0	.0	.0
8	-1.2	-1.2	12.0	.0	.0	.0
9	-1.2	-1.2	11.9	.0	.0	.0
10	-1.2	-1.2	11.8	.0	.0	.0
11	-1.2	-1.2	11.7	.0	.0	.0
12	-1.2	-1.2	11.5	.0	.0	.0
13	-1.2	-1.2	11.4	.0	.0	.0
14	-1.2	-1.2	-6.4	.0	.0	.0
15	-1.2	-29.1	83.8	.0	.0	.0
16	-1.2	-29.1	83.7	.0	.0	.0
17	-1.2	-29.0	83.6	.0	.0	.0
18	-1.2	-1.2	-6.9	.0	.0	.0
19	-1.2	-29.0	83.4	.0	.0	.0
20	-1.2	-28.9	83.3	.0	.0	.0
21	-1.2	-28.9	83.2	.0	.0	.0
22	-1.2	-1.2	-7.3	.0	.0	.0
23	-1.2	-28.8	83.0	.0	.0	.0
24	-1.2	-28.8	82.8	.0	.0	.0
25	-1.2	-28.8	82.7	.0	.0	.0
26	-1.2	-1.2	-7.7	.0	.0	.0
27	-1.2	-1.2	-33.2	.0	.0	.0
28	-1.2	-21.1	59.7	.0	.0	.0
29	-1.2	-21.1	59.6	.0	.0	.0
30	-1.2	-21.0	59.4	.0	.0	.0

31	-1.2	-1.2	-33.7	.0	.0	.0
32	-1.2	-21.0	59.2	.0	.0	.0
33	-1.2	-20.9	59.1	.0	.0	.0
34	-1.2	-20.9	59.0	.0	.0	.0
35	-1.2	-1.2	-34.1	.0	.0	.0
36	-1.2	-20.8	58.8	.0	.0	.0
37	-1.2	-20.8	58.7	.0	.0	.0
38	-1.2	-20.7	58.6	.0	.0	.0
39	-1.2	-1.2	-34.5	.0	.0	.0
40	-1.2	-1.2	-19.8	.0	.0	.0
41	-1.2	-1.2	-20.1	.0	.0	.0
42	-1.2	-1.2	-20.9	.0	.0	.0
43	-1.2	-1.2	-21.1	.0	.0	.0

LOAD CASE - 8

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-1.4	1.2	71.8	.0	.0	.0
2	-1.4	1.1	67.4	.0	.0	.0
3	-1.4	.9	62.0	.0	.0	.0
4	-1.4	.8	56.6	.0	.0	.0
5	-1.4	.6	51.3	.0	.0	.0
6	-1.4	.4	45.9	.0	.0	.0
7	-1.4	.3	40.5	.0	.0	.0
8	-1.4	.2	36.6	.0	.0	.0
9	-1.4	.0	31.2	.0	.0	.0
10	-1.4	-.2	25.8	.0	.0	.0
11	-1.4	-.3	20.5	.0	.0	.0
12	-1.4	-.5	15.1	.0	.0	.0
13	-1.4	-.6	10.6	.0	.0	.0
14	-1.2	1.2	75.3	.0	.0	.0
15	-1.2	7.7	-19.5	.0	.0	.0
16	-1.2	5.0	-12.0	.0	.0	.0
17	-1.2	2.3	-4.5	.0	.0	.0
18	-1.2	.6	54.7	.0	.0	.0
19	-1.2	-3.0	10.5	.0	.0	.0
20	-1.2	-5.7	18.0	.0	.0	.0
21	-1.2	-7.6	23.6	.0	.0	.0
22	-1.2	.0	34.7	.0	.0	.0
23	-1.2	-13.0	38.6	.0	.0	.0
24	-1.2	-15.7	46.1	.0	.0	.0
25	-1.2	-18.3	53.6	.0	.0	.0
26	-1.2	-.6	14.1	.0	.0	.0
27	-1.0	1.2	80.2	.0	.0	.0
28	-1.0	6.2	-15.2	.0	.0	.0
29	-1.0	3.6	-7.7	.0	.0	.0
30	-1.0	.9	-.1	.0	.0	.0
31	-1.0	.6	59.6	.0	.0	.0
32	-1.0	-4.5	14.9	.0	.0	.0
33	-1.0	-7.1	22.4	.0	.0	.0
34	-1.0	-9.1	27.9	.0	.0	.0
35	-1.0	.0	39.5	.0	.0	.0
36	-1.0	-14.4	43.0	.0	.0	.0
37	-1.0	-17.1	50.5	.0	.0	.0
38	-1.0	-19.8	58.0	.0	.0	.0
39	-1.0	-.6	18.9	.0	.0	.0
40	-1.1	1.2	77.7	.0	.0	.0

41	-1.1	.9	66.1	.0	.0	.0
42	-1.1	-.3	28.1	.0	.0	.0
43	-1.1	-.6	16.5	.0	.0	.0

LOAD CASE - 9

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-1.4	1.2	72.3	.0	.0	.0
2	-1.4	1.1	67.8	.0	.0	.0
3	-1.4	.9	62.4	.0	.0	.0
4	-1.4	.8	57.1	.0	.0	.0
5	-1.4	.6	51.7	.0	.0	.0
6	-1.4	.5	46.3	.0	.0	.0
7	-1.4	.3	41.0	.0	.0	.0
8	-1.4	.2	37.0	.0	.0	.0
9	-1.4	.0	31.7	.0	.0	.0
10	-1.4	-.1	26.3	.0	.0	.0
11	-1.4	-.3	20.9	.0	.0	.0
12	-1.4	-.5	15.5	.0	.0	.0
13	-1.4	-.6	11.1	.0	.0	.0
14	-1.2	1.2	76.6	.0	.0	.0
15	-1.2	7.8	-19.9	.0	.0	.0
16	-1.2	5.2	-12.4	.0	.0	.0
17	-1.2	2.5	-4.9	.0	.0	.0
18	-1.2	.6	56.0	.0	.0	.0
19	-1.2	-2.9	10.1	.0	.0	.0
20	-1.2	-5.5	17.7	.0	.0	.0
21	-1.2	-7.5	23.2	.0	.0	.0
22	-1.2	.0	36.0	.0	.0	.0
23	-1.2	-12.8	38.2	.0	.0	.0
24	-1.2	-15.5	45.7	.0	.0	.0
25	-1.2	-18.2	53.3	.0	.0	.0
26	-1.2	-.6	15.4	.0	.0	.0
27	-1.0	1.2	82.6	.0	.0	.0
28	-1.0	6.0	-14.5	.0	.0	.0
29	-1.0	3.4	-7.0	.0	.0	.0
30	-1.0	.7	.5	.0	.0	.0
31	-1.0	.6	62.0	.0	.0	.0
32	-1.0	-4.7	15.6	.0	.0	.0
33	-1.0	-7.3	23.1	.0	.0	.0
34	-1.0	-9.3	28.6	.0	.0	.0
35	-1.0	.0	42.0	.0	.0	.0
36	-1.0	-14.6	43.7	.0	.0	.0
37	-1.0	-17.3	51.2	.0	.0	.0
38	-1.0	-20.0	58.7	.0	.0	.0
39	-1.0	-.6	21.4	.0	.0	.0
40	-1.1	1.2	79.6	.0	.0	.0
41	-1.1	.9	68.0	.0	.0	.0
42	-1.1	-.2	30.0	.0	.0	.0
43	-1.1	-.6	18.4	.0	.0	.0

LOAD CASE - 10

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
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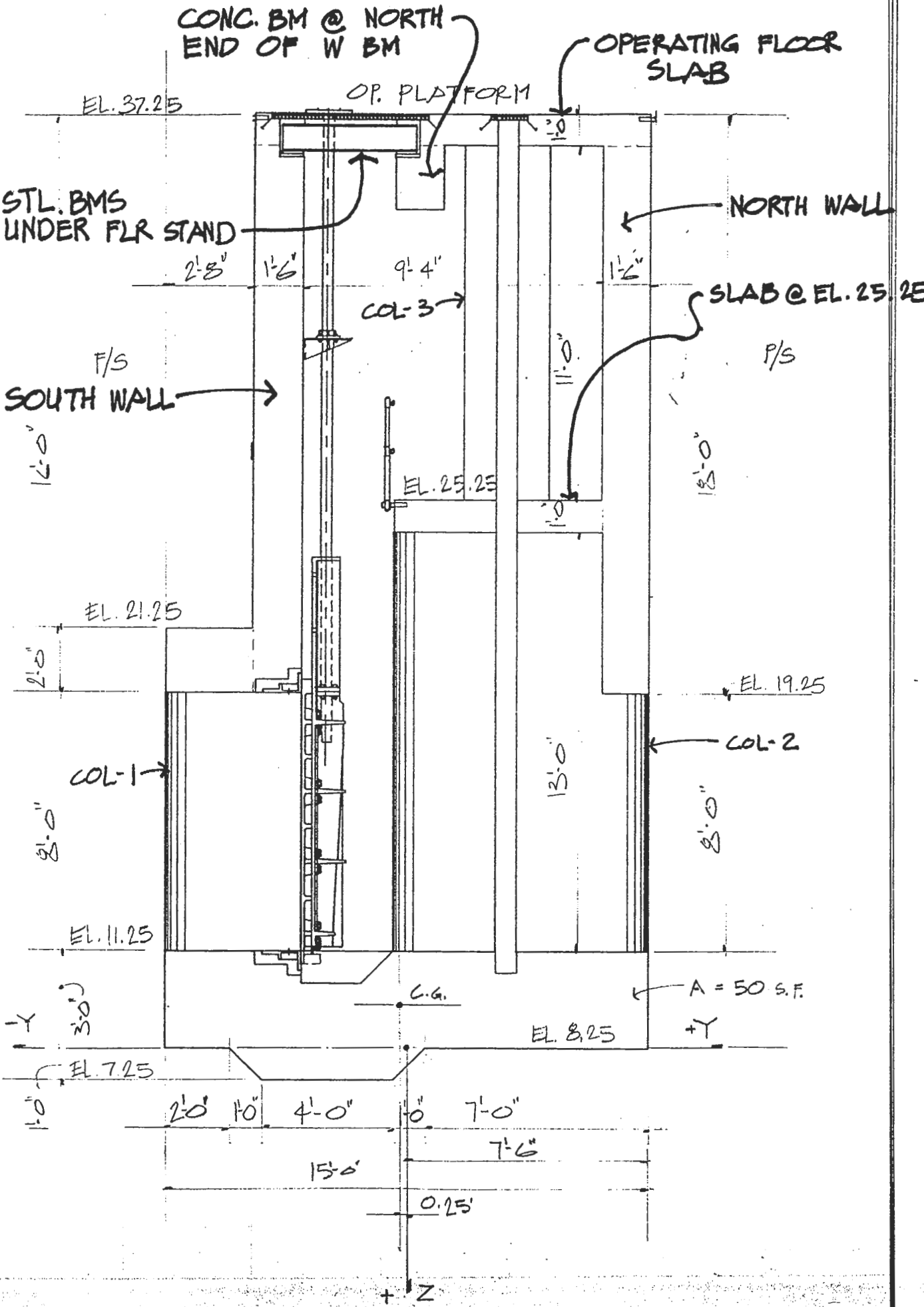
1	-1.1	.1	36.9	.0	.0	.0
2	-1.1	.1	37.5	.0	.0	.0
3	-1.1	.2	38.2	.0	.0	.0
4	-1.1	.2	39.0	.0	.0	.0
5	-1.1	.2	39.7	.0	.0	.0
6	-1.1	.3	40.5	.0	.0	.0
7	-1.1	.3	41.2	.0	.0	.0
8	-1.1	.3	41.8	.0	.0	.0
9	-1.1	.4	42.5	.0	.0	.0
10	-1.1	.4	43.3	.0	.0	.0
11	-1.1	.4	44.0	.0	.0	.0
12	-1.1	.5	44.8	.0	.0	.0
13	-1.1	.5	45.4	.0	.0	.0
14	-1.2	.1	40.4	.0	.0	.0
15	-1.2	-8.7	26.6	.0	.0	.0
16	-1.2	-8.0	24.7	.0	.0	.0
17	-1.2	-7.3	22.7	.0	.0	.0
18	-1.2	.2	43.3	.0	.0	.0
19	-1.2	-5.9	18.8	.0	.0	.0
20	-1.2	-5.3	16.9	.0	.0	.0
21	-1.2	-4.8	15.4	.0	.0	.0
22	-1.2	.4	46.1	.0	.0	.0
23	-1.2	-3.4	11.6	.0	.0	.0
24	-1.2	-2.7	9.6	.0	.0	.0
25	-1.2	-2.0	7.7	.0	.0	.0
26	-1.2	.5	48.9	.0	.0	.0
27	-1.2	.1	45.4	.0	.0	.0
28	-1.2	-10.2	31.1	.0	.0	.0
29	-1.2	-9.5	29.1	.0	.0	.0
30	-1.2	-8.8	27.2	.0	.0	.0
31	-1.2	.2	48.3	.0	.0	.0
32	-1.2	-7.4	23.3	.0	.0	.0
33	-1.2	-6.7	21.4	.0	.0	.0
34	-1.2	-6.2	19.9	.0	.0	.0
35	-1.2	.4	51.1	.0	.0	.0
36	-1.2	-4.9	16.0	.0	.0	.0
37	-1.2	-4.2	14.1	.0	.0	.0
38	-1.2	-3.5	12.1	.0	.0	.0
39	-1.2	.5	53.9	.0	.0	.0
40	-1.2	.1	42.9	.0	.0	.0
41	-1.2	.2	44.5	.0	.0	.0
42	-1.2	.4	49.8	.0	.0	.0
43	-1.2	.5	51.4	.0	.0	.0

LOAD CASE - 11

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-1.1	.1	37.3	.0	.0	.0
2	-1.1	.2	37.9	.0	.0	.0
3	-1.1	.2	38.7	.0	.0	.0
4	-1.1	.2	39.4	.0	.0	.0
5	-1.1	.3	40.2	.0	.0	.0
6	-1.1	.3	40.9	.0	.0	.0
7	-1.1	.3	41.7	.0	.0	.0
8	-1.1	.4	42.2	.0	.0	.0
9	-1.1	.4	43.0	.0	.0	.0
10	-1.1	.4	43.7	.0	.0	.0

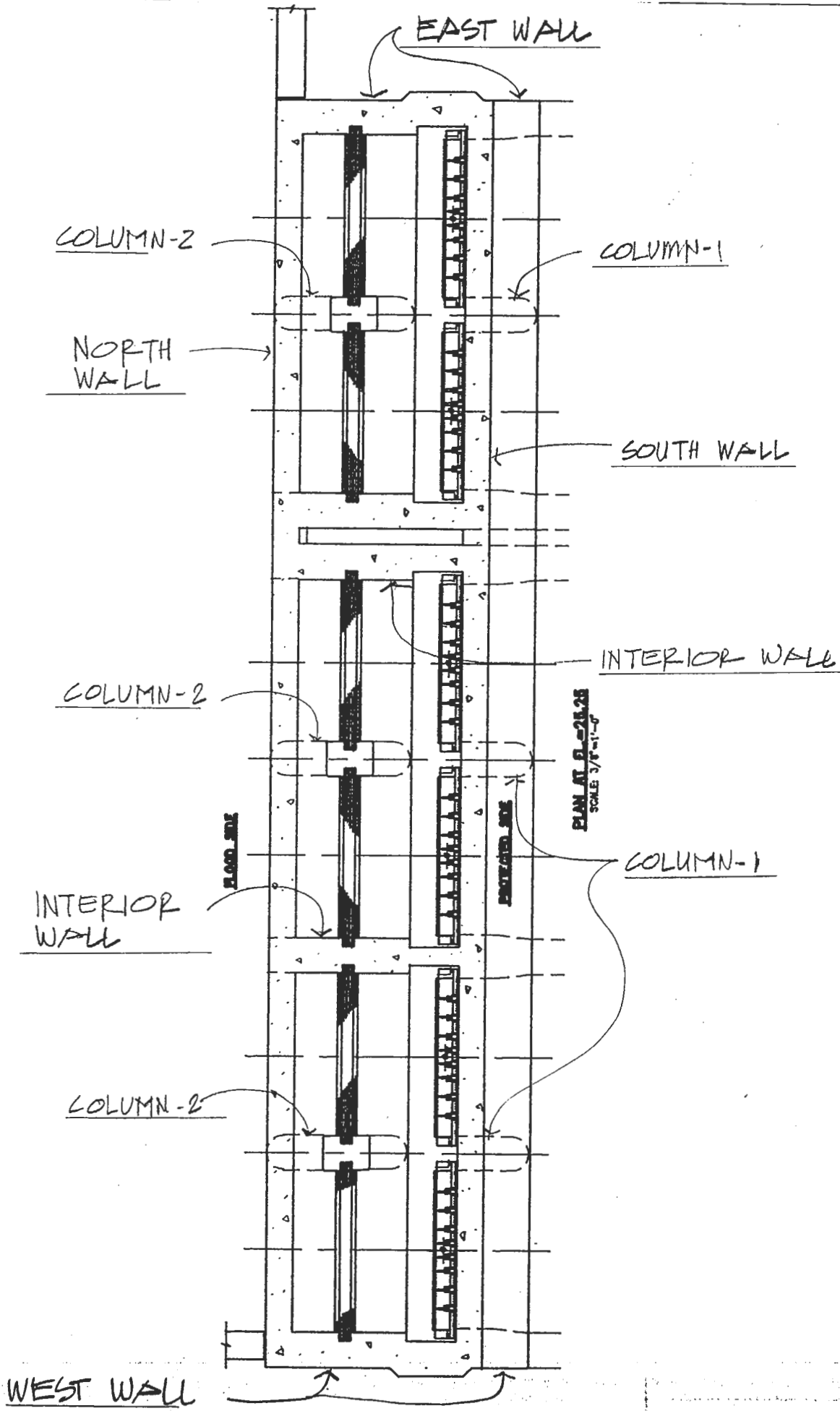
11	-1.1	.5	44.5	.0	.0	.0
12	-1.1	.5	45.2	.0	.0	.0
13	-1.1	.5	45.8	.0	.0	.0
14	-1.2	.1	41.7	.0	.0	.0
15	-1.2	-8.5	26.2	.0	.0	.0
16	-1.2	-7.9	24.3	.0	.0	.0
17	-1.2	-7.2	22.3	.0	.0	.0
18	-1.2	.3	44.6	.0	.0	.0
19	-1.2	-5.8	18.4	.0	.0	.0
20	-1.2	-5.1	16.5	.0	.0	.0
21	-1.2	-4.6	15.1	.0	.0	.0
22	-1.2	.4	47.4	.0	.0	.0
23	-1.2	-3.2	11.2	.0	.0	.0
24	-1.2	-2.6	9.2	.0	.0	.0
25	-1.2	-1.9	7.3	.0	.0	.0
26	-1.2	.5	50.2	.0	.0	.0
27	-1.2	.1	47.9	.0	.0	.0
28	-1.2	-10.4	31.8	.0	.0	.0
29	-1.2	-9.7	29.8	.0	.0	.0
30	-1.2	-9.0	27.9	.0	.0	.0
31	-1.2	.3	50.7	.0	.0	.0
32	-1.2	-7.6	24.0	.0	.0	.0
33	-1.2	-7.0	22.0	.0	.0	.0
34	-1.2	-6.4	20.6	.0	.0	.0
35	-1.2	.4	53.5	.0	.0	.0
36	-1.2	-5.1	16.7	.0	.0	.0
37	-1.2	-4.4	14.8	.0	.0	.0
38	-1.2	-3.7	12.8	.0	.0	.0
39	-1.2	.5	56.4	.0	.0	.0
40	-1.2	.1	44.8	.0	.0	.0
41	-1.2	.2	46.4	.0	.0	.0
42	-1.2	.4	51.7	.0	.0	.0
43	-1.2	.5	53.3	.0	.0	.0





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30 SHEETS 60 SHEETS 90 SHEETS 120 SHEETS 150 SHEETS 180 SHEETS 210 SHEETS 240 SHEETS 270 SHEETS 300 SHEETS 330 SHEETS 360 SHEETS 390 SHEETS 420 SHEETS 450 SHEETS 480 SHEETS 510 SHEETS 540 SHEETS 570 SHEETS 600 SHEETS 630 SHEETS 660 SHEETS 690 SHEETS 720 SHEETS 750 SHEETS 780 SHEETS 810 SHEETS 840 SHEETS 870 SHEETS 900 SHEETS 930 SHEETS 960 SHEETS 990 SHEETS 1000 SHEETS  
100% RECYCLED PAPER  
100% RECYCLED WHITE  
100% RECYCLED  
MADE IN U.S.A.



PLAN AT B-21.25  
SCALE 3/8"=1'-0"

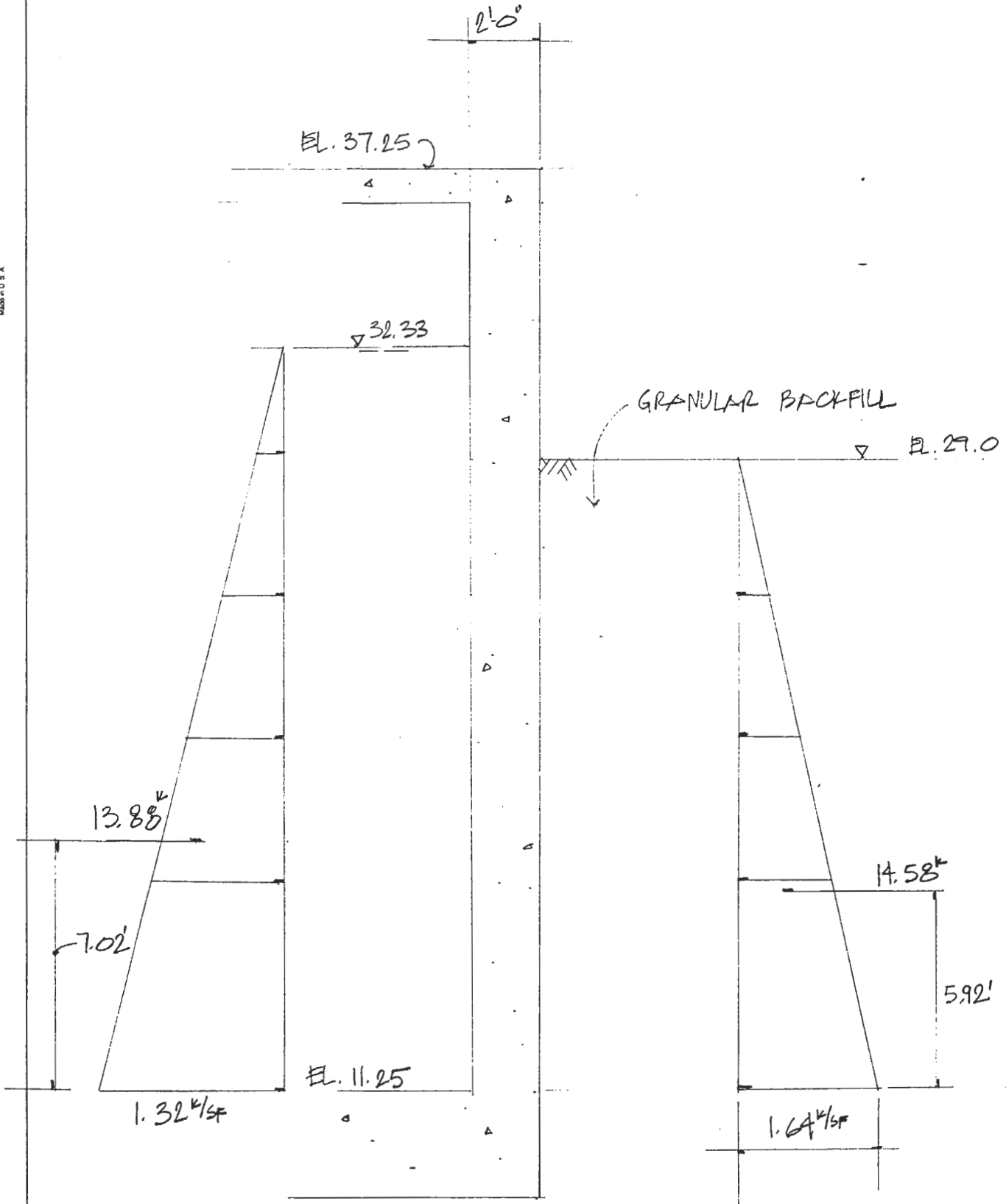
WEST WALL

## WEST WALL DESIGN

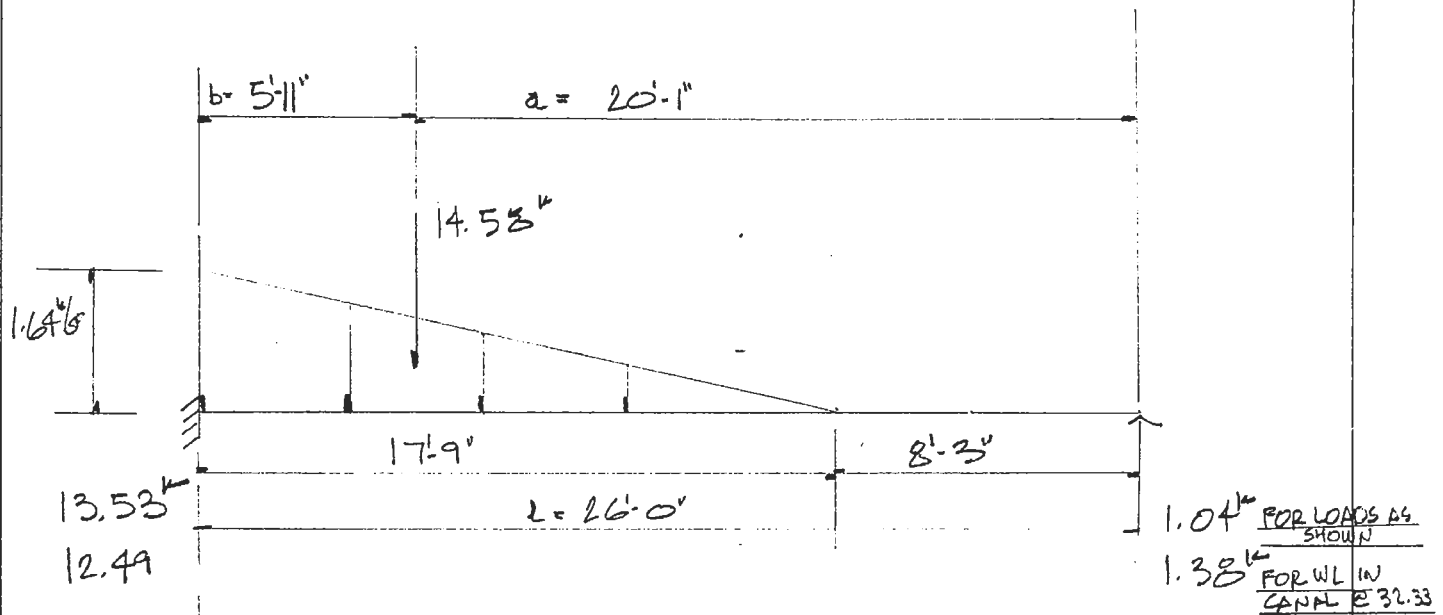
- ASSUME
1. 24" THK WALL
  2.  $F_c = 4000$
  3.  $F_y = 60,000$
  4. WALL AS PROPPED CANTILEVER IN VERTICAL DIRECTION, FIXED @ BASE SLABS
  5. SLAB @ EL. 25.25 OFFERS NO SUPPORT
  6. WALL TO SPAN HORIZONTALLY BETWEEN NORTH & SO. WALL.
  7. WALL TRANSFERS IN PLANE & OUT OF PLANE HORIZ. LOADS TO BASE SLAB & FDN.
  8.  $\gamma_{sat} = 122 \text{ #/sf}$ ,  $\gamma_{sub} = 60 \text{ #/sf}$  CO. EFF OF LATERAL EARTH PRESSURE = 0.5. (BOTH FOR SAT. & SUB SOILS).
  9. GRANULAR BACKFILL BEHIND WALL.
  10. ASSUME NO WATER IN GATE STRUCTURE & BACKFILL IN PLACE.

WEST WALL

13-784 300 SHEETS, FILLED, 5 SQUARE  
42-381 50 SHEETS, EYEGLASS, 5 SQUARE  
42-382 100 SHEETS, EYEGLASS, 5 SQUARE  
42-383 150 SHEETS, EYEGLASS, 5 SQUARE  
42-384 200 SHEETS, EYEGLASS, 5 SQUARE  
42-385 100 RECYCLED WHITE, 5 SQUARE  
42-386 200 RECYCLED WHITE, 5 SQUARE  
Made in U.S.A.



WEST WALL (VERT REINF. LAND SIDE FACE)



$$\begin{aligned} \text{BM @ FIXED END} &= (1.04 + 26 - 14.58 \times 5.92) \times 1.3 \times 1.7 \\ &= 59.3' \times 1.3 \times 1.7 = 131'k \end{aligned}$$

$$d_{req} = \left( \frac{2.4956 \times 131}{0.9} \right)^{1/2} = 19.05''$$

ASSUMING # 8 bars  $d = 24'' - 4'' - \frac{1}{2} = 19.5'' > 19.05''$  o.k.

$$\begin{aligned} \frac{\phi V_c}{V_u @ d} &= \frac{0.85 \times 2 \times 63 \times 12 \times 19.5}{(13.53 - \frac{19.5}{12} \times 1.58) \times 1.3 \times 1.7} = \frac{24.5'k}{24.2'k} < 24.5'k \text{ o.k.} \end{aligned}$$

FROM ACI TABLES

FOR  $b = 12'$   $d = 19.5''$   $F = 0.38$   
 $\therefore K_u = 131 / 0.38 = 344$

FOR  $F'_c = 4000$ ,  $F_y = 60,000$  &  $K_u = 344$   
 $\rho = 0.0068$

$\therefore A_s(\text{req'd})$  ON LAND SIDE FACE =  $0.0068 \times 12 \times 19.5 = 1.59''/ft$   
 TRY # 8 BARS @ 6" O.C. =  $1.58'' \approx A_s(\text{req'd}) = 1.59''$

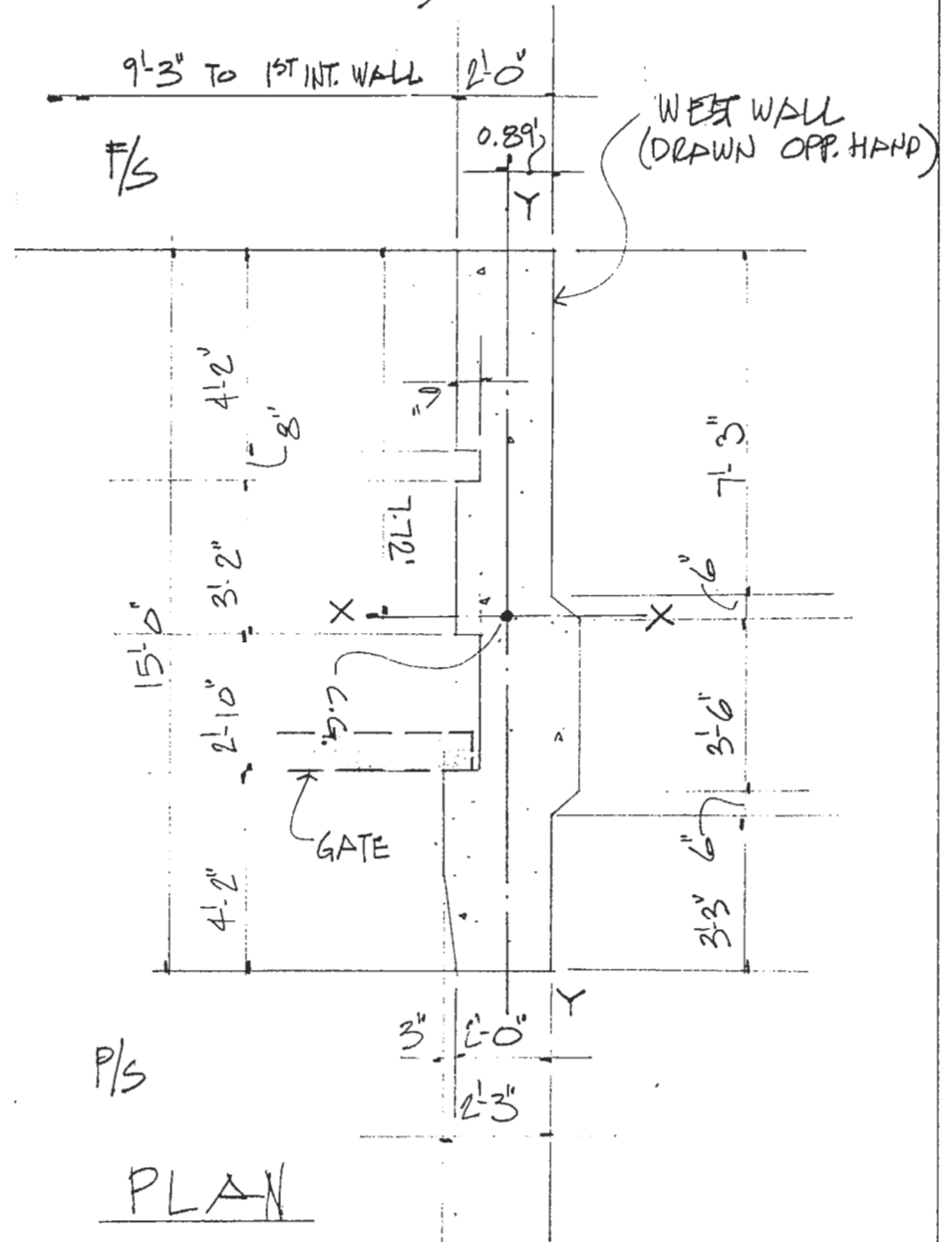
USE # 8 BARS @ 6" O.C. (VERT) ON LAND SIDE FACE

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WEST WALL (BENDING @ X-X AXIS)



PLAN

13-782 500 SHEETS, FILLER 5 SQUARE  
 42-381 100 SHEETS, FILLER 5 SQUARE  
 42-382 100 SHEETS, FILLER 5 SQUARE  
 42-383 200 SHEETS, FILLER 5 SQUARE  
 42-384 100 SHEETS, FILLER 5 SQUARE  
 42-385 100 RECYCLED WHITE 5 SQUARE  
 42-386 200 RECYCLED WHITE 5 SQUARE  
 Made in U.S.A.



WEST WALL (BENDING @ X-X AXIS)

REFER TO PLATE 23 & PREVIOUS PAGE

WL IN CANAL @ EL. 32.33, GATES CLOSED, WL IN DISCH. TUBE @ EL. 27.05

$$M_x = (1312(8.03-3.0) - 403(6.55-3.0) - 74.82(11.92-3.0) - 35.92(11.92-3.0) + 277(6.75 + 7.72-7.5) + 277(4.08-7.72+7.5) - 67(2.75+7.72-7.5) + (126+19)(6.17-7.72+7.5) + 58(6.17-7.72+7.5) + (17 \times 6)(2.67-7.72+7.5) - 74(3.88+7.72-7.5) + 31(0.25+7.72-7.5)) \times 7' / 72.42'$$

$$= 4250 \times 7 / 72.42 = 410.8'k$$

$$\therefore M_{ux} = 1.3 \times 1.7 \times 410.8 = 908'k$$

P (AXIAL LOAD)

$$(277 + 277 + 67 + (126 + 19) + 58 + 102 + 74 + 31) \times 7 / 72.42 + (190/2) + 13.8 / 2 = 201'k$$

$$\therefore P_u = 1.3 \times 1.7 \times 201 = 444'k$$

DESIGN AS COL

b = 24" d = 180 - 5 = 175" L = 26 x 12 = 312" r = 0.57735 x 180 = 104  
 K = 2.0 ∴ KLu/r < 22. SLENDERNESS NEGLECTED.

DESIGN AS SHORT COL FOR Pu = 444'k Mux = 908'k

A REVIEW OF LOAD-MOM STRENGTH INTERACTION DIAGRAM (ACI HANDBK, COL 7.18.3) INDICATES Pg <<< 0.01.

∴ USE Pg = 0.01

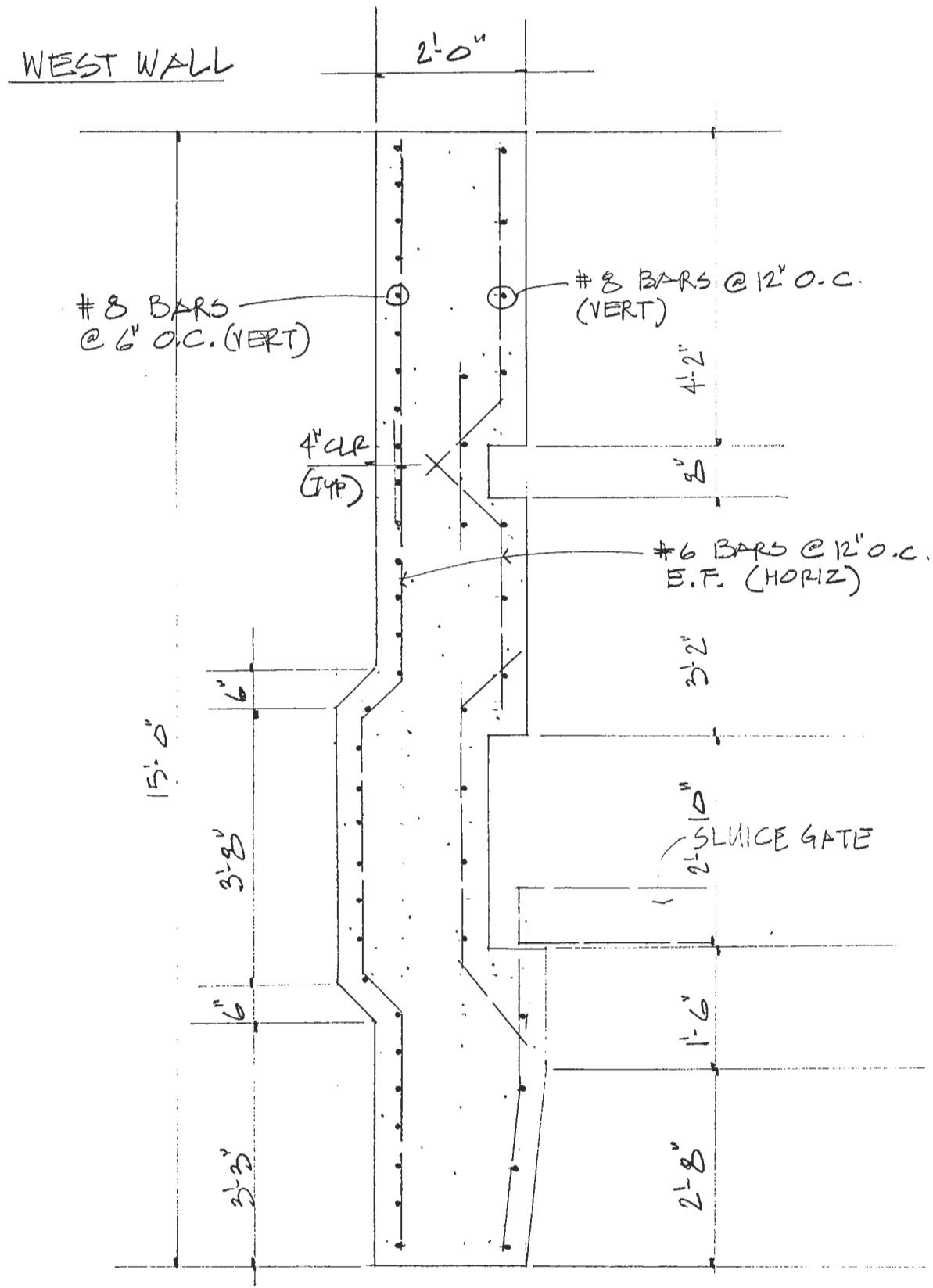
$$\therefore A_s = \frac{1}{4} \times 0.01 \times 180 \times 24 = 21.6 \text{ in}^2 \text{ TOTAL } A_s(\text{provided}) \approx 45 \times 0.79 = 36 \text{ in}^2 \therefore OK$$

\* ACI 10.8.2.4

50 SHEETS 5 SQUARE  
 100 SHEETS 5 SQUARE  
 100 SHEETS 5 SQUARE  
 100 SHEETS 5 SQUARE  
 100 SHEETS 5 SQUARE  
 100 RECYCLED WHITE 5 SQUARE  
 200 RECYCLED WHITE 5 SQUARE  
 Made in U.S.A.  
 National Brand



10 SHEETS 10 SQUARE  
 20 SHEETS 20 SQUARE  
 30 SHEETS 30 SQUARE  
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 1000 SHEETS 1000 SQUARE  
 Made in U.S.A.



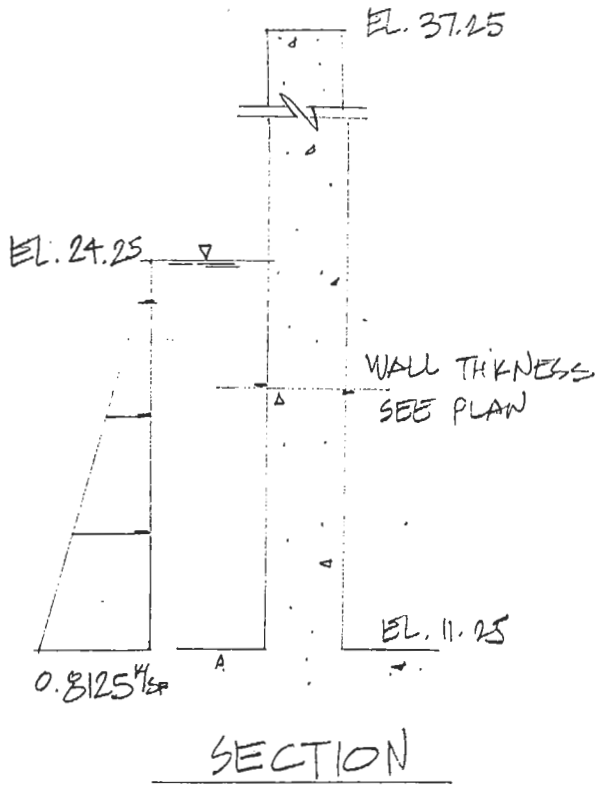
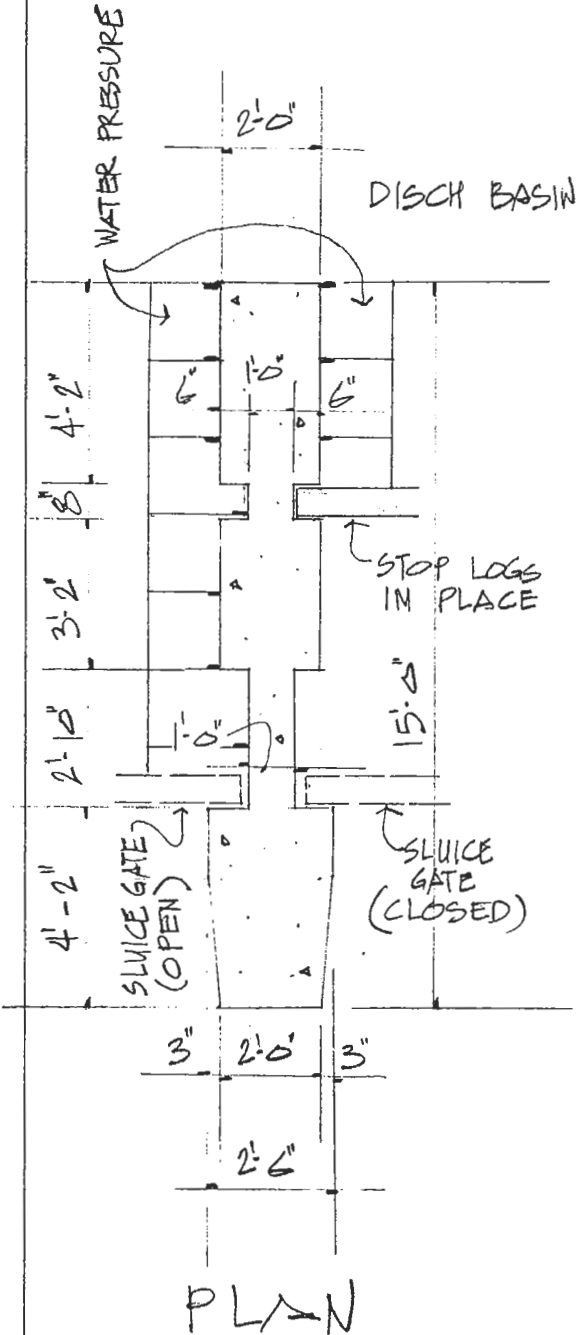
WEST WALL - REINFORCING  
(EAST WALL SIMILAR)

INTERIOR WALL

LOADING CONDITION.

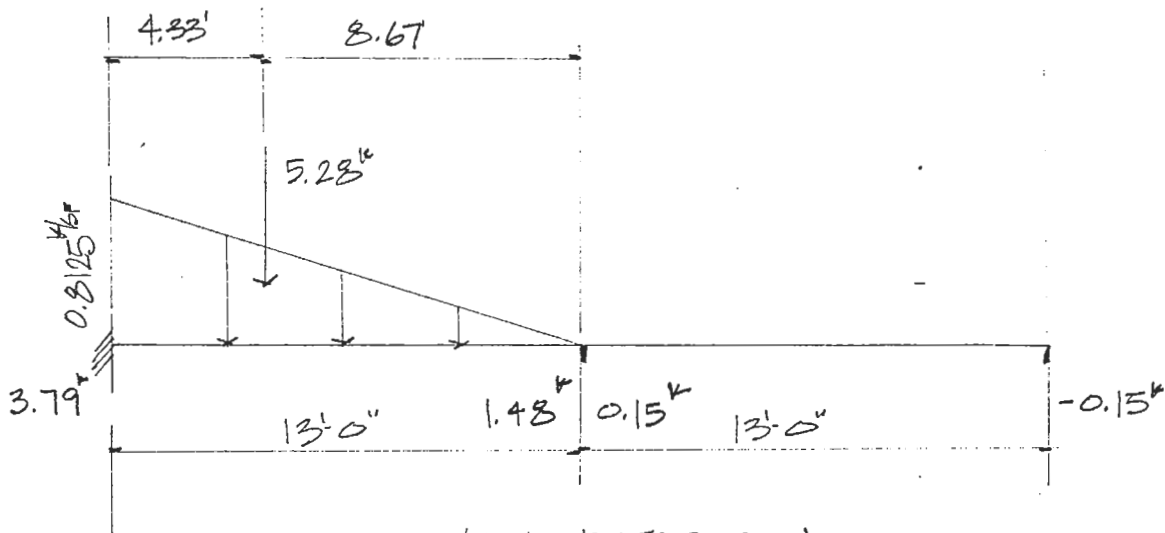
1. STOP LOGS IN PLACE
2. GATES CLOSED
3. WL IN CANAL @ 24.25

13,782 50 SHEETS, FILLER, 5 SQUARE  
42,381 50 SHEETS, FILLER, 5 SQUARE  
42,381 100 SHEETS, FILLER, 5 SQUARE  
42,382 100 SHEETS, FILLER, 5 SQUARE  
42,382 100 SHEETS, FILLER, 5 SQUARE  
42,382 100 RECYCLED WHITE, 5 SQUARE  
42,382 200 RECYCLED WHITE, 5 SQUARE  
MADE IN U.S.A.



1. ASSUME THAT THIS WALL IS FIXED @ BASE SLAB & IS CONTINUOUS OVER SUPPORT @ EL. 24.25 & SIMPLY SUPPORTED @ OPERATING FLR @ EL. 37.25.
2. SEE WEST WALL DESIGN FOR OTHER ASSUMPTIONS.

INTERIOR WALL



MOM. DISTRIBUTION

	0.0	0.5	0.5	1.0	DF.
FEM	-6.86	4.57	0	0	
	0	-2.29	2.29		1 DIST
	1.14	-	-	-1.14	C.O
	0	-	-	+1.14	2 DIST
	0	0	-0.57	-	C.O
	-	-0.29	0.28	-	3 DIST
	+0.14	0	0	-0.14	C.O
	0			+0.14	4 DIST
	-5.58	1.98	1.98	0	

MAX +M = 4.83' k @ 6.24' FROM FIXED END.

$d_{req} = (2.4956 \times 5.58 \times 1.3 \times 1.7) = 5.54$

ASSUMING #7 BARS THICKNESS REQ'D =  $5.54 + 2 + \frac{7}{16} = 8'' < 12''$  (MIN)  
 $\therefore$  O.K.

$\phi V_c = 0.85 \times 2 \times 63 \times 12 \times (12 - 2.4375) = 12.3' > (3.71 \times 1.3 \times 1.7 = 8.4')$  .. O.K

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42-400  
500 SHEETS, FILLER, 5 SQUARE  
60 SHEETS, EYE EARS, 5 SQUARE  
100 SHEETS, EYE EARS, 5 SQUARE  
100 SHEETS, EYE EARS, 5 SQUARE  
100 RECYCLED WHITE, 5 SQUARE  
200 RECYCLED WHITE, 5 SQUARE  
Made in U.S.A.



INTERIOR WALL M @ FIXED END = 12.33'k

VERTICAL REINF :

FOR  $b = 12''$ ,  $d = 9.5''$   $f = 0.09$

$\therefore K_u = 137$

$\therefore \rho = 0.0027$

$A_s(\text{req'd}) = 0.0027 \times 12 \times 9.5 = 0.31 \text{ }^{\text{D}}/\text{FT. @ } 12'' \text{ TH'K SECTION}$

MIN  $A_s(\text{req'd})$  @ 24'' TH'K SECTION

$= 0.0028 \times 12 \times 24 = 0.81 \text{ }^{\text{D}}/\text{FT.}$

HORIZ. REINF

SINCE THERE IS NO SUBSTANTIAL BENDING IN HORIZ. DIRECTION,

USE MIN  $A_s$  IN HORIZ. DIRECTION.

$A_s(\text{MIN}) = 0.81 \text{ }^{\text{D}}/\text{FT.}$



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INTERIOR WALL (BENDING @ X-X AXIS)

APPROX  $M_x = 4250 \times \frac{11.5}{72.42} = 675'k$  SEE CALC. WEST WALL

APPROX  $P = 1031 \times \frac{11.5}{72.42} + (67 + 11.9) = 242'k$  SEE CALC. WEST WALL

∴ DESIGN LOADS ARE:

∴  $P_u = 1.3 \times 1.7 > 242'k = 536'k$   
 $M_{ux} = 1.3 \times 1.7 \times 675 = 1492'k$

GROSS AREA  $A_g = 27.87 \times 144 = 4013''^2$   $h = 180''$

∴  $P_u/A_g = 0.133$  &  $\frac{M_{ux}}{A_g h} = 0.02$

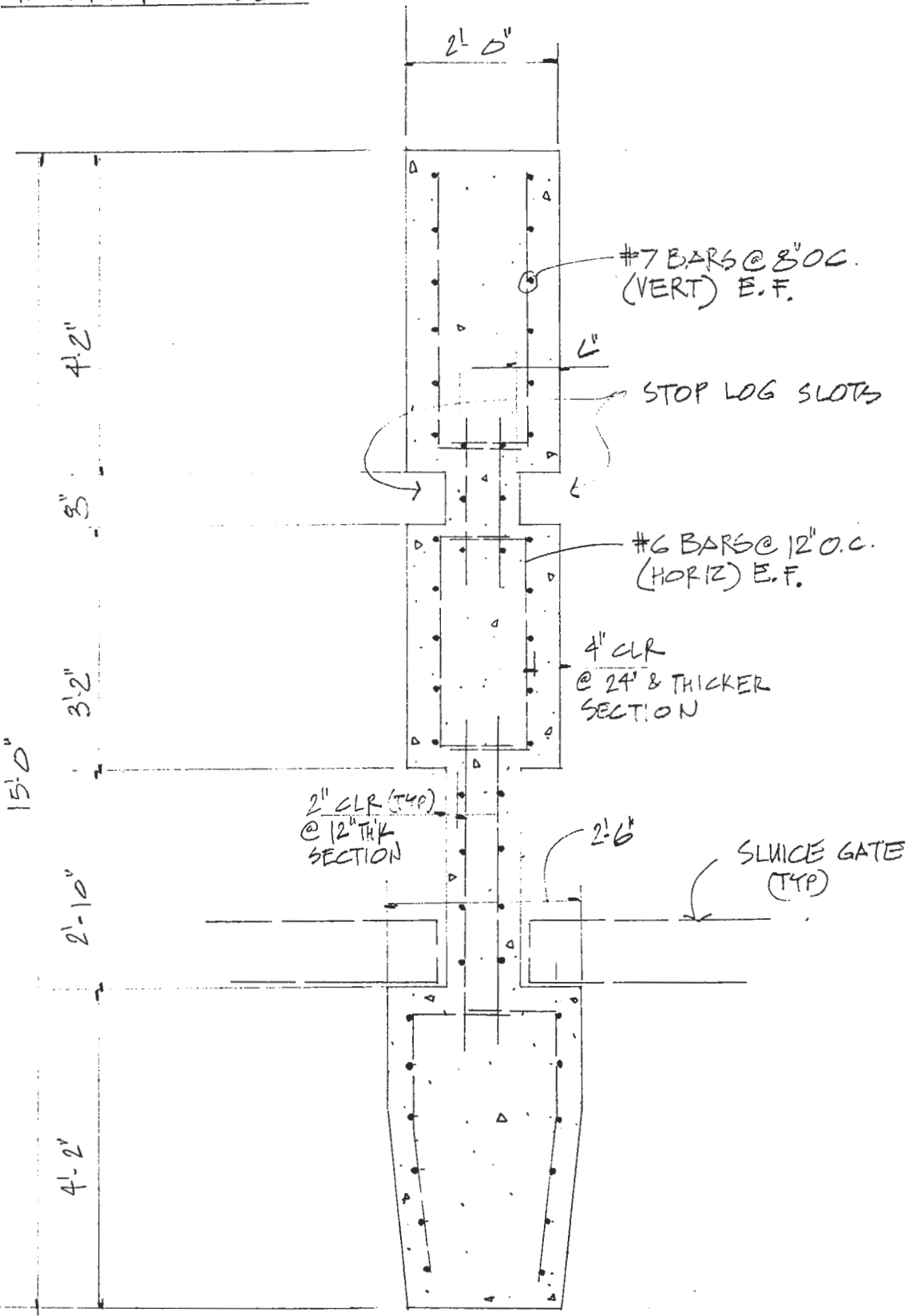
∴ A REVIEW OF LOAD-MOM STRENGTH INTERACTION DIAG  
7.18.3 ACI DESIGN HANDBOOK, VOL 2 INDICATES  
 $P_g \ll \ll 0.1.$

∴ USE  $A_s = 0.01^* \times 0.5^* \times 4013 = 20''^2$  VERTICAL \* ACI 10.8.4  
 GOVERNS DESIGN.

TRY #7 BARS @ 8" O.C. E.F.  
 ∴ TOTAL  $\approx \left(\frac{0.6 \times 12}{8}\right) \times (15' - 0.5') \times 2 = 26''^2 > 20''^2$

∴ USE #7 BARS @ 8" O.C. VERT E.F.

INTERIOR WALL



INT. WALL REINFORCING

15/7/8  
100 SHEETS 1/4" X 1/4" X 3/4"  
200 SHEETS 1/4" X 1/2" X 3/4"  
200 SHEETS 1/4" X 1/2" X 1"  
100 RECYCLED WHITE 5 SQUARE  
200 RECYCLED WHITE 5 SQUARE  
REUSE TO 5 A



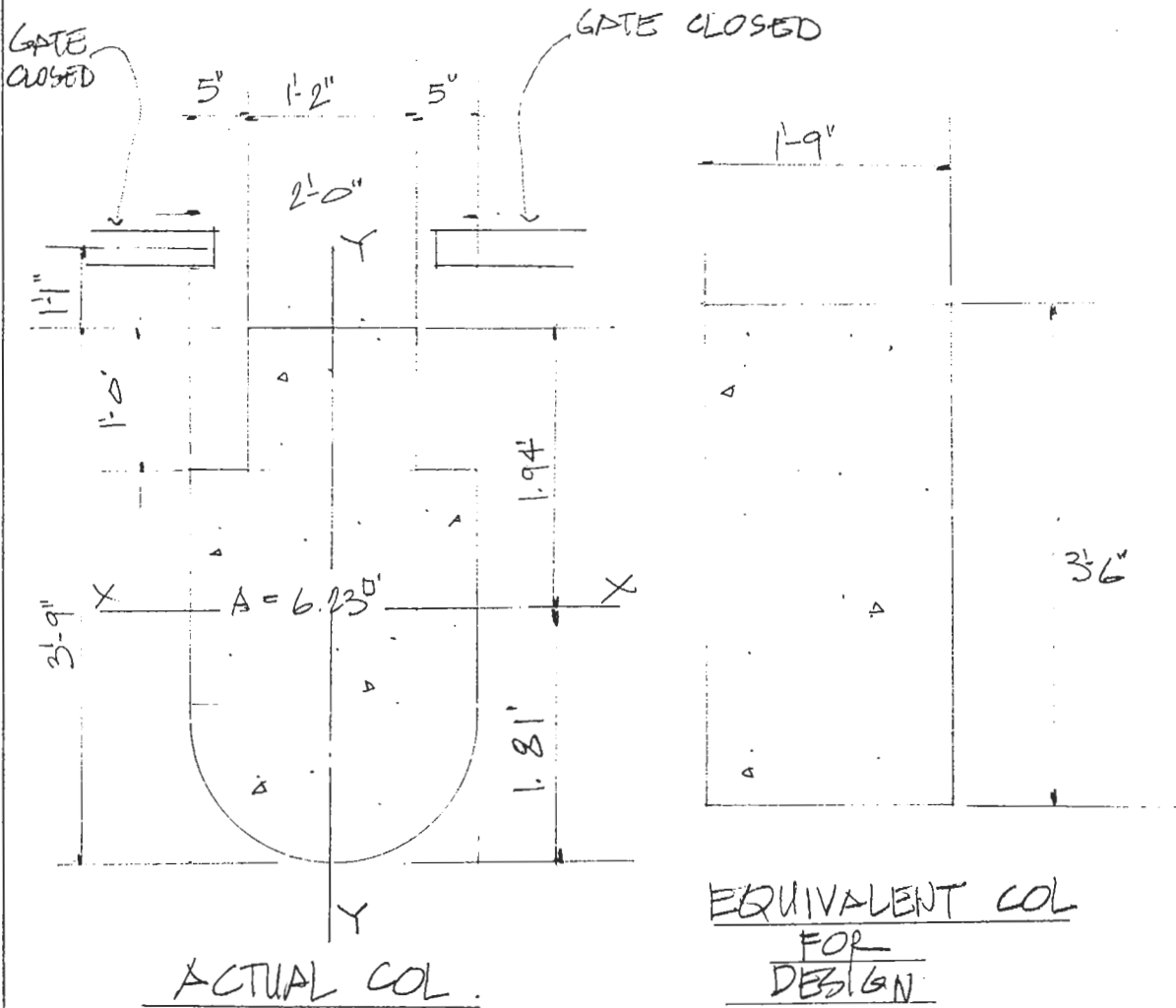
COL. UNDER SO. WALL @ & DISCH. TUBE. COLUMN - 1

LOADING CONDITION:

WL IN CANAL @ 32.33 C.D.  
WL IN DISCH. TUBE @ 27.05, GATES CLOSED, BACKFILL IN PLACE ON PROTECTED SIDE

ASSUME COL ENDS PINNED TO BASE SLAB & ROOF SLAB  
@ EL. 11.25 & EL. 19.25 RESPY.

13-782 500 SHEETS FULLER 3 SQUARE  
42-382 500 SHEETS FULLER 3 SQUARE  
42-382 100 SHEETS EYE-EASE 3 SQUARE  
42-382 200 SHEETS EYE-EASE 3 SQUARE  
42-382 300 RECYCLED WHITE 3 SQUARE  
42-382 200 RECYCLED WHITE 3 SQUARE  
MADE IN U.S.A.



(NOTE: OUT-OF PLANE LOADING NOT CRITICAL)





COLUMN-1 (REFER TO PLATE 23 FOR VERT. LOADS)

AXIAL LOAD

		P
1. SELF WT	= 28.5/3	= 9.50 <sup>k</sup>
2. GATES	= 102 <sup>k</sup> /6	= 17.00 <sup>k</sup>
3. WALL	= (277 <sup>k</sup> /72.42) × 11	= 42.00 <sup>k</sup>
4. SLAB	= (58/72.42) × 11	= 9.00 <sup>k</sup>
5. SOIL BACKFILL	= (145/72.42) × 11	= 22.00 <sup>k</sup>

TL = 99.50<sup>k</sup>

BENDING MOM @ X-X AXIS DUE TO VERT LOADS

$$= 17 \times (1.94 + 1.08) + 42(7.5 - 4.08 - 1.81) - 9 \times (1.81 - (7.5 - 6.17)) - 22(1.81 - (7.5 - 6.17))$$

$$= \underline{104^k}$$

∴ DESIGN LOADS ARE

P<sub>u</sub> = 99.5 × 1.3 × 1.7 = 220<sup>k</sup>

M<sub>ux</sub> = (-292 + 104) × 1.3 × 1.7 = 415<sup>k</sup>

$kL_u/r < 22$ . NEGLECT SLENDERNESS ACI 10.11.4

EQUIVALENT COL. DIMENSIONS: b = 21" h = 42" A<sub>g</sub> = 882<sup>in</sup><sup>2</sup>

$\frac{P_u}{A_g} = 0.25$      $\frac{M_u}{A_g h} = 0.13$

A REVIEW OF INTERACTION DIAG. INDICATES  $\rho_g \ll 0.01$

∴ USE MIN A<sub>s</sub> = 0.01 × 882 = 8.82<sup>in</sup><sup>2</sup>

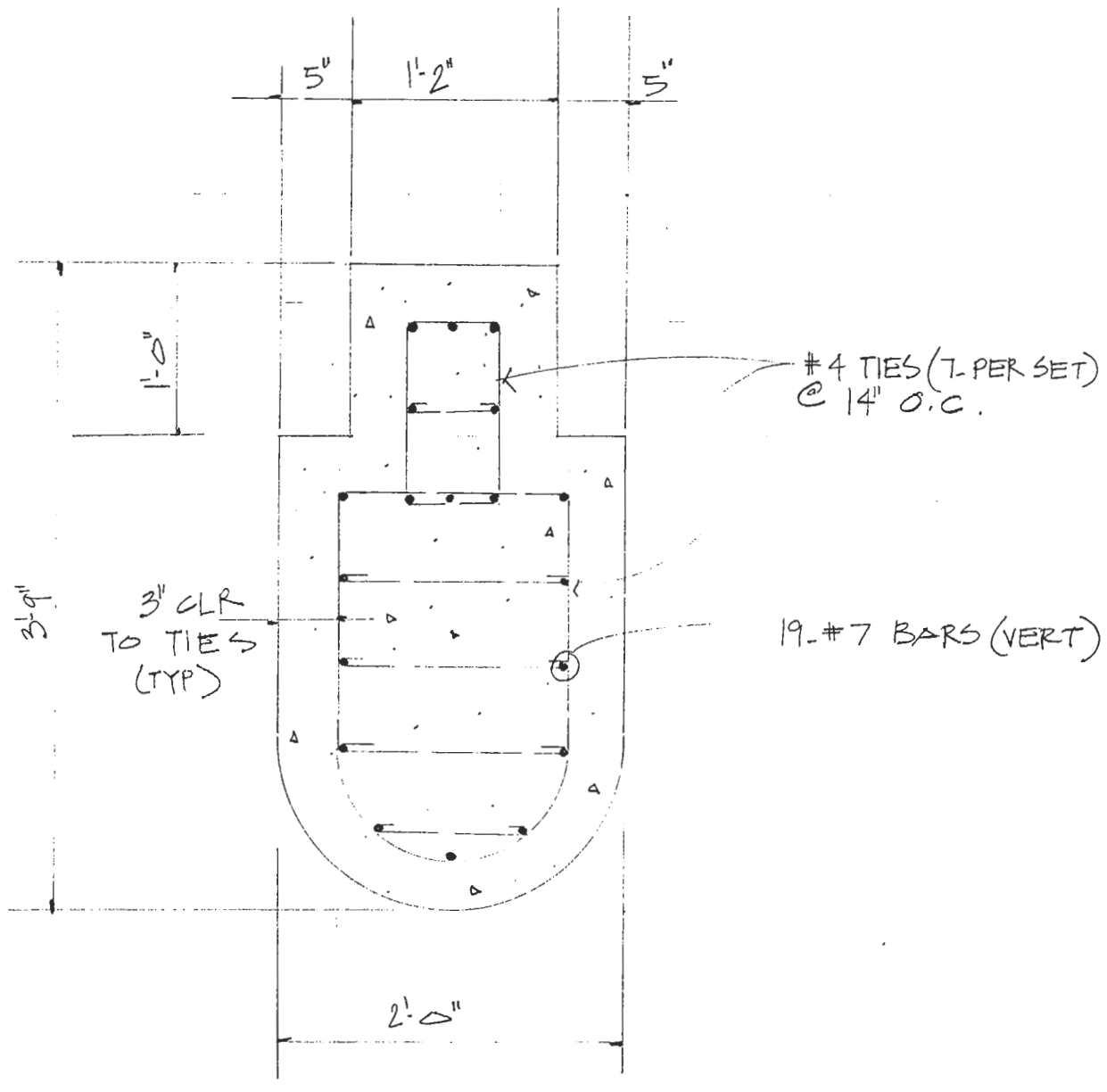
∴ TRY # 7 @ 6" VERTICAL. ASSUMING 4" TO 4" VERTICAL STL FROM FACE OF CONC: 18-#7 BARS MAY BE USED AROUND THE PERIMETER.

∴ USE 19-#7 BARS (VERT) A<sub>s</sub> = 11.40<sup>in</sup><sup>2</sup> > 8.82<sup>in</sup><sup>2</sup>

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13-782 500 SHEETS FILLER 5 SQUARE  
42-381 50 SHEETS FILLER 5 SQUARE  
42-381 100 SHEETS FILLER 5 SQUARE  
42-381 200 SHEETS FILLER 5 SQUARE  
42-392 100 RECYCLED WHITE 5 SQUARE  
42-392 200 RECYCLED WHITE 5 SQUARE  
MADE IN U.S.A.

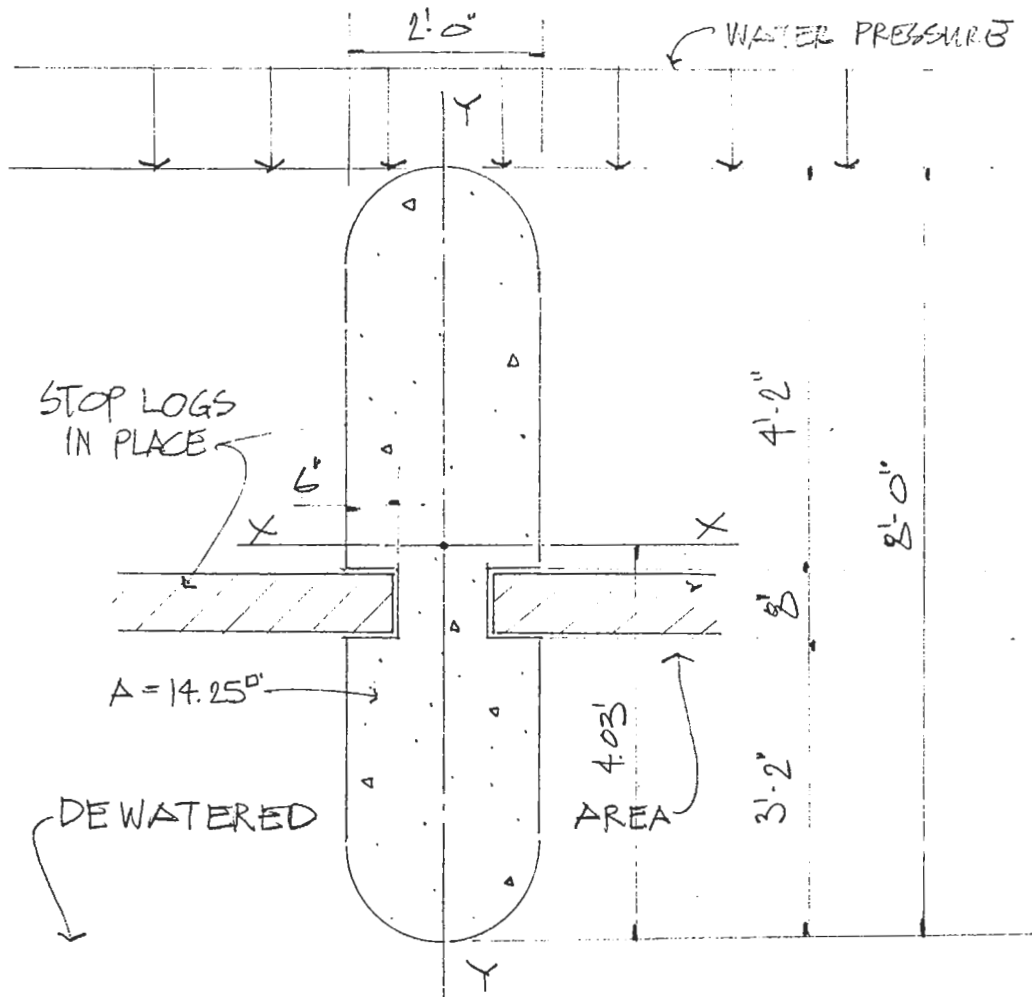


COLUMN - 1  
REINFORCING

# COL. UNDER SLAB @ EL. 25.25 @ DISCH. TUBE COLUMN - 2

## LOADING CONDITION

- 1. WL IN CANAL @ EL. 24.25. STOP LOGS IN PLACE. GATES CLOSED. (SPACE BETWEEN GATES & STOP LOGS DEWATERED).
- 2. OUT OF PLANE LOADING NOT CRITICAL (IN ABOVE LOADING CONDITION)
- 3. ASSUME COL. ENDS PINNED @ BASE SLAB @ EL. 11.25 SLAB @ EL. 25.25.



PLAN ~ COL-2

13-782 500 SHEETS, FILLER 5 SQUARE  
42-382 100 SHEETS, FILLER 5 SQUARE  
42-382 100 SHEETS, FILLER 5 SQUARE  
42-389 200 SHEETS, FILLER 5 SQUARE  
42-392 100 RECYCLED WHITE 5 SQUARE  
42-395 200 RECYCLED WHITE 5 SQUARE



COLUMN - 2

BENDING MOM  $M_x$  DUE TO HORIZ. LOAD

$$\left(\frac{579 \times 2.33}{13}\right) (10.67') \times \frac{11}{72.42} = 168'k$$

AXIAL LOAD (REFER TO PLATE 23)

1. SELF WT.  $\left(\frac{56}{3}\right) = 18.67'k$

2. NORTH WALL  $\left(\frac{277 \times 11.5}{72.42}\right) = 44.00'k$

3. SLAB @ EL. 25.25  $\left(\frac{67 \times 11.5}{72.42}\right) = 11.00'k$

4. SLAB @ EL. 37.25  $\left(\frac{74 \times 11.5}{72.42}\right) = 12.00'k$

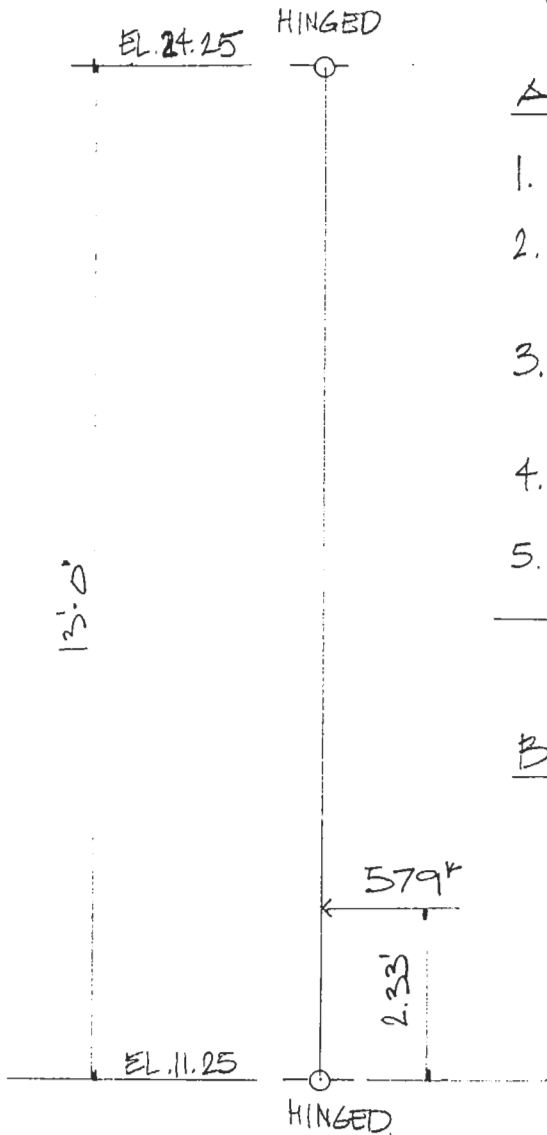
5. BM @ EL. 37.25  $\left(\frac{31 \times 11.5}{72.42}\right) = 5.00'k$

---

TL = 91.0'k

BENDING MOM  $M_x$  DUE TO VERT. LOAD

$$M_x = 44(3.97 - 0.75) - 11(4.75 - 3.97) + 12(3.97 - 3.62) - 5(3.78) = 118.40'k$$



∴ DESIGN LOADS ARE

$$P_u = 91 \times 1.3 \times 1.7 = 201'k$$

$$M_{ux} = (168 + 118) \times 1.3 \times 1.7 = 632'k$$

13.781  
42.381  
42.382  
42.389  
42.395  
42.396  
Made in U.S.A.



500 SHEETS FILLER 1 SQUARE  
50 SHEETS EYEGLASS 5 SQUARE  
100 SHEETS EYEGLASS 5 SQUARE  
200 SHEETS EYEGLASS 5 SQUARE  
100 SHEETS EYEGLASS 5 SQUARE  
200 RECYCLED WHITE 3 SQUARE

COLUMN-2

$$P_u = 201^k \quad M_{ux} = 632^k$$

DIMENSIONS OF AN EQUI. RECTANGULAR  
COL :  $b = 24''$   $h = 85.50''$   $A = 2052''^2$   $\frac{d_u}{F} < 22$ .

$$\therefore \frac{P_u}{A_g} = 0.097 \quad \frac{M_u}{A_g h} = 0.04$$

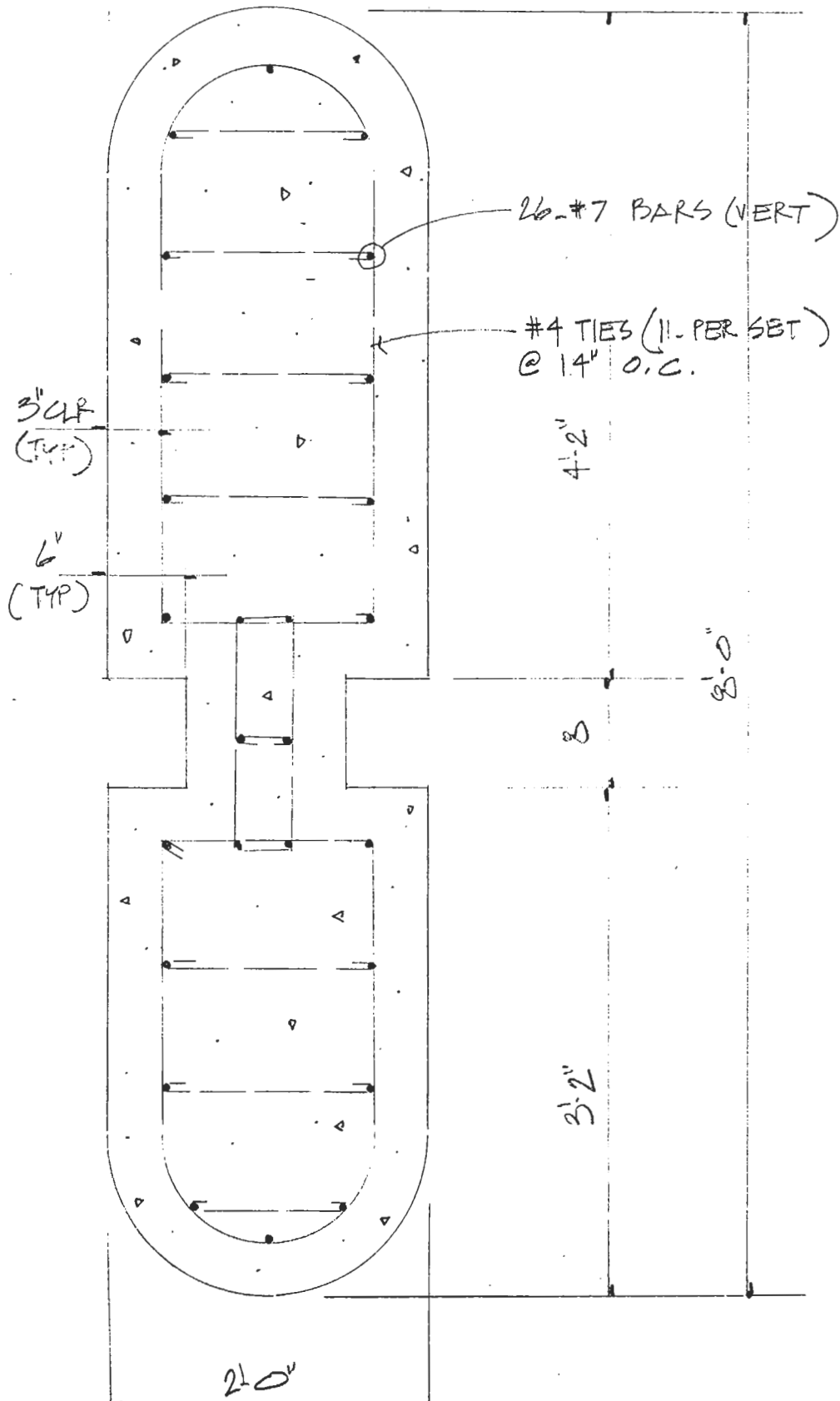
COL IS VERY LARGE FOR APPLIED LOAD.

$$\text{USE } \frac{1}{2} (0.01 \times 2052) = 10.26''^2 \quad (\text{ACI 10.8.4})$$

USE 26-#7 BARS AROUND PERIMETER OF COL-2  
 $\therefore A_s(\text{PROVIDED}) = 13.2''^2 > 10.26''^2 \therefore \text{O.K.}$



COLUMN-2



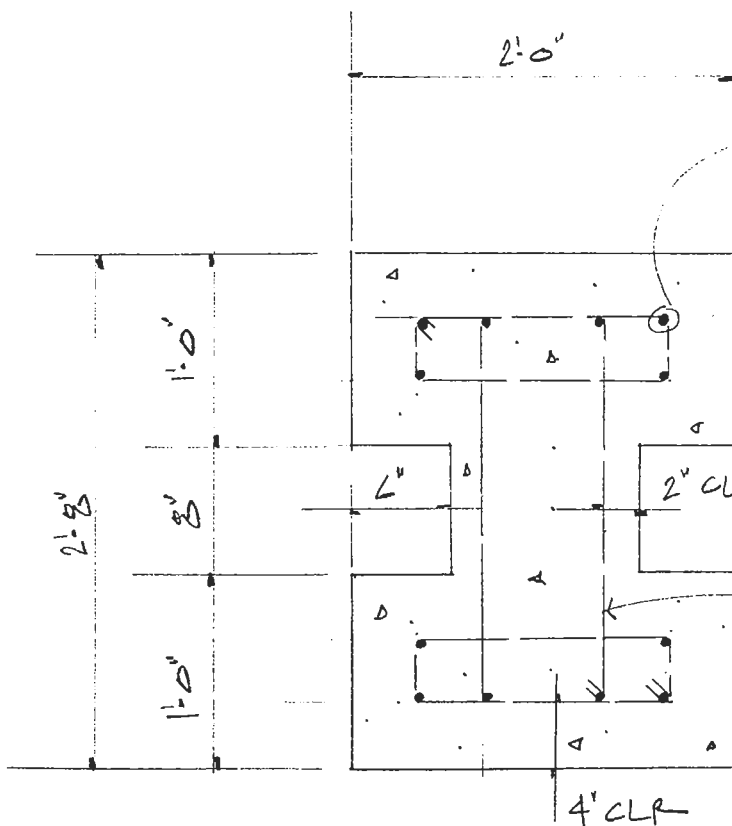
COL-2: REINFORCING

13,762 500 SHEETS FILLER 3 SQUARE  
42,381 50 SHEETS RELEASE 3 SQUARE  
42,382 100 SHEETS RELEASE 3 SQUARE  
42,383 200 SHEETS RELEASE 3 SQUARE  
42,384 400 SHEETS RELEASE 3 SQUARE  
42,385 800 SHEETS RELEASE 3 SQUARE  
42,386 200 RECYCLED WHITE 3 SQUARE  
K&S P U S A



COLUMN-3 DESIGN.

- ASSUMPTIONS:
1. NO LOADING CONDITION WILL IMPOSE LATERAL LOAD ON THIS COL.
  2. THIS COL. WILL CARRY ONLY VERTICAL LOADS FROM OPERATING PLR. & SELF WT.
  3. MIN REINF WILL BE ADEQUATE TO SAFELY CARRY LOADS IMPOSED.

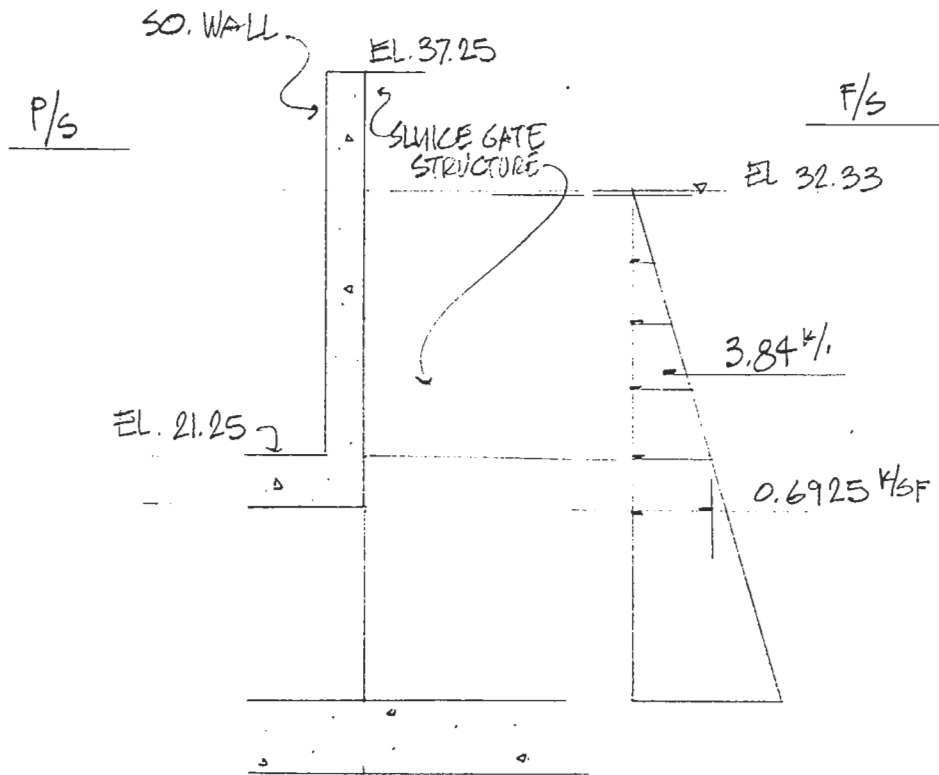


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# SOUTH WALL DESIGN

- ASSUME
- 1. 18" THK WALL
  - 2.  $F_c = 4000$  PSI
  - 3.  $F_y = 60,000$  PSI
  - 4. WALL FIXED @ EAST & WEST WALL  
& CONTINUOUS @ INTERIOR WALLS
  - 5. IN VERTICAL DIRECTION, WALL FIXED @  
EL. 21.25, FREE @ TOP.



14-200 15' 15" HIGH 15" SQUARE  
10 SHELLS 15' 15" 15" SQUARE  
100 SHELLS 15' 15" 15" SQUARE  
42-300 15' 15" 15" SQUARE  
42-300 100 SHELLS 15' 15" SQUARE  
42-300 200 SHELLS 15' 15" SQUARE  
42-300 300 SHELLS 15' 15" SQUARE  
MADE IN U.S.A.



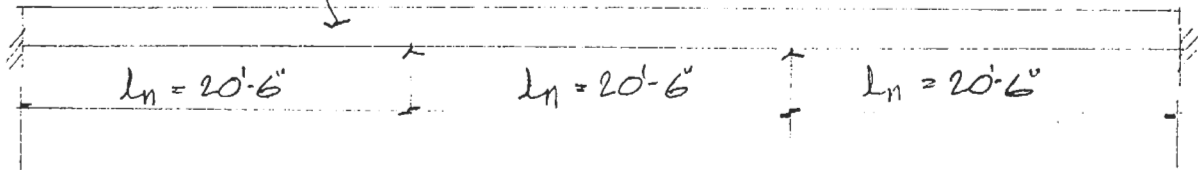


SO. WALL DESIGN

DESIGN MOST HEAVILY LOADED 1'-0" HORIZ. STRIP IN

HORIZONTAL DIRECTION (ASSUME BACKFILL NOT IN PLACE ON P/S)

$$0.66 \text{ k/ft} \times 1.3 \times 1.7 = 1.46 \text{ k/ft} = W_u$$

USE ACI CO-EFF FOR BENDING & SHEAR

$$- \text{MOM @ FIXED END} = \frac{1.46 \times 20.5^2}{16} = \underline{38.4' \text{ k}}$$

$$- \text{MOM @ INT. SUPPORT} = \frac{1.46 \times 20.5^2}{16} = \underline{38.4' \text{ k}}$$

$$+ \text{MOM IN END SPAN} = \frac{1.46 \times 20.5^2}{14} = \underline{43.4' \text{ k}}$$

$$\text{SHEAR @ INT SUPPORT, END SPAN} = \frac{1.15 \times 1.46 \times 20.5}{2} = \underline{17.20' \text{ k}}$$

$$d_{\text{req}} = \left( \frac{2.4956 \times 43.4 \times 12}{0.9 \times 12} \right)^{1/2} = \underline{10.97'' \text{ FOR BM}}$$

$$d_{\text{provided}} = 18'' - 3'' - \frac{7}{16}'' \text{ (ASSUMING \#7 BARS)} = \underline{14.56''} > 10.97'' \text{ O.K.}$$

$$\phi V_c = 0.85 \times 63 \times 2 \times 12 \times 14.56 = \underline{18.72' \text{ k}} > V_u @ d = \left( 17.2 - \frac{14.56}{12} \times 1.46 \right) = \underline{15.42' \text{ k}}$$

SO. WALL DESIGNFROM ACI TABLES

$$\text{FOR } b=12" \quad d=14.5" \quad F=0.21$$

$$\therefore K_u = \frac{43.4}{0.21} = 207$$

$$\text{FOR } F'_c=4000, \quad F_y=60,000 \quad \& \quad K_u=207$$

$$\rho = 0.0040 > 0.0033 \text{ (MIN } A_s)$$

$$\therefore A_s = 0.0040 \times 12 \times 14.56 = 0.698 \text{ in}^2/\text{FT}$$

$$\therefore \text{TRY } \# 7 \text{ BARS @ } 9" \text{ O.C.} = \frac{0.60}{9} \times 12 = 0.80 \text{ in}^2/\text{FT}$$

$$\therefore \text{USE } \# 7 \text{ BARS @ } 9" \text{ O.C. E.F. (HORIZONTAL)}$$

VERTICAL DIRECTION (ASSUME BACKFILL NOT  
IN PLACE ON P/S)

$$\text{MAX BM} = 3.84 \times \left( \frac{32.33 - 21.25}{3} \right)$$

$$= 14.2 \text{ K}$$

$A_s(\text{req'd}) < \text{MIN REQ'D FOR TEMP.}$

$$\therefore A_s = 0.0028 \times 12 \times 18 = 0.60 \text{ in}^2/\text{FT}$$

$$\text{USE } \# 6 \text{ @ } 12" \text{ O.C. (VERTICAL) E.F. TOTAL } A_s = 0.88 \text{ in}^2 > 0.60 \text{ in}^2$$

$\therefore \text{O.K.}$

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42-997  
42-998  
42-999  
43-000

#7 BARS @ 9" O.C.  
(HORIZ) E.F.

INT. WALL

#6 BARS @ 12" O.C.  
(VERT) E.F.

3" CLR  
(TYP)

3" CLR  
(TYP)

1'-6"

SO. WALL - REINFORCING  
(NORTH WALL SIMILAR)

INT. WALL



NORTH WALL DESIGN.

1. THERE ARE NO HORIZONTAL LOADS ON THIS WALL.
2. IN ORDER TO AVOID CONSTRUCTION MISTAKES,  
USE SAME WALL THICKNESS & REINF AS SOUTH  
WALL.
3. ∴ USE 18" TH'K WALL.  
USE # 7 BARS @ 9" O.C. (HORIZ) E.F.  
USE # 6 BARS @ 12" O.C. (VERTICAL) E.F.

13-782 500 SHEETS FILLER 6 SQUARE  
42-381 50 SHEETS EYE-GLASS 6 SQUARE  
42-382 100 SHEETS EYE-GLASS 6 SQUARE  
42-383 100 SHEETS EYE-GLASS 6 SQUARE  
42-384 100 SHEETS EYE-GLASS 6 SQUARE  
42-385 200 RECYCLED WHITE 6 SQUARE  
42-386 200 RECYCLED WHITE 6 SQUARE  
14000 U.S.A.



OPERATING FLOOR SLAB

- ASSUME 1. SLAB TH'K = 1'-0"  
 2.  $F'_c = 4000$   
 3.  $F_y = 60,000$   
 4. LIVELOAD =  $100 \text{ #/sf}$   
 5. SLAB SIMPLY SUPPORTED @ EAST & WEST WALL, CONTINUOUS OVER INT. WALLS.  
 6. USE ACI MOM & SHEAR CO-EFF.

$$l_n = 20'-6" \quad W_u = (0.15 + 0.1) \times 1.3 \times 1.7 = 0.55 \text{ #/sf}$$

$$\therefore +M_u = 0.55 \times 20.5^2 / 11 = 21.10 \text{ k}$$

$$-M_u = 0.55 \times 20.5^2 / 10 = 23.10 \text{ k} \quad M_n = 26 \text{ k}$$

ASSUMING #6 BARS & 2" COVER  
 $d = 12" - 2" - 3/8" = 9 5/8" = 9.63"$

$$d_{req} = (2.4956 \times 26)^{1/2} = 8.05" < d_{provided} (= 9.63")$$

$$A_s( reqd ) = \frac{0.85 \times 4 \times 0.0862 \times 12 \times 9.63}{60}$$

$$= 0.56 \text{ #/FT.}$$

$$\text{USE \# 5 @ 6" O.C.} = 0.62 \text{ #/FT.} > 0.56 \text{ #/FT.} \quad \rho = 0.0053 < 0.25 \rho_b$$

USE SAME  $A_s$  FOR +VE M.

$$\text{TEMP STEEL} = 0.0028 \times 12 \times 12 = 0.40 \text{ #/FT}$$

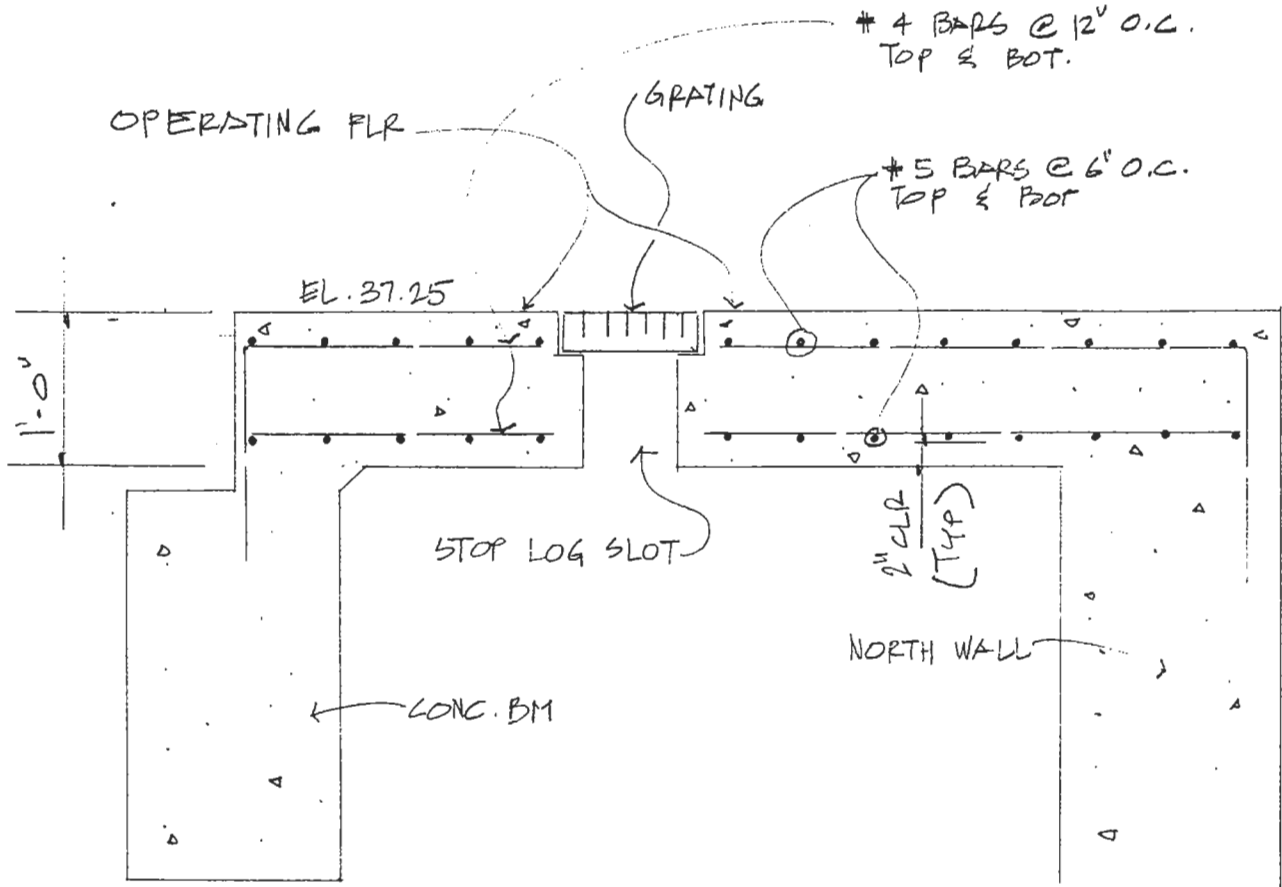
USE # 4 BARS @ 12" TOP & BOT

CHECK SHEAR

$$V_u = (1.15 \times 0.55 \times 20.5 / 2) - \frac{9.63 \times 0.55}{12}; \quad \phi V_c = 0.85 \times 63 \times 12 \times 9.63 \times 2 = 12.4 \text{ k}$$

$$= 6.04 \text{ k} < 12.4 \text{ k} \quad \therefore \text{O.K.}$$

NO SHEAR REINF. REQ'D.



OPERATING FLR - REINFORCING  
(REINF. FOR SLAB @ EL. 25.25 SIM)

13 700 15 SQUARE  
40 381 50 SHIFTS PER YEAR 20 SQUARE  
42 380 75 SHIFTS PER YEAR 20 SQUARE  
42 382 100 SHIFTS PER YEAR 20 SQUARE  
42 383 200 RECYCLED WHITE 5 SQUARE  
42 385 200 RECYCLED WHITE 5 SQUARE  
www.usi.ca



SLAB @ EL. 25.25

- ASSUME
1. SLAB TH'K = 12"
  2.  $F'_c = 4000$
  3.  $F_y = 60,000$
  4. LIVE LOAD = 100<sup>#</sup>/SF
  5. SLAB SIMPLY SUPPORTED @ EAST & WEST WALL & CONT. OVER ALL INT. WALLS
  6. USE ACI MOM & SHEAR CO-EFF.

$l_n = 9.25'$      $W_u = 0.55$  k/SF.

USE SAME DESIGN AS OPERATING FLOOR SLAB (OK BY OBS)

MAIN REINF: # 5 @ 6" O.C. ( $A_s = 0.62$  in<sup>2</sup>) TOP & BOT.  
TEMP REINF: # 4 @ 12" O.C. (TOP & BOT)

13-762  
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42-382  
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42-398  
42-399  
42-400



SLAB @ EL. 21.25 (ASSUME 2' TH'K)

## LOADS

1. SELF	0.3 <sup>k/sf</sup>
2. BACKFILL (6'0" <sup>+</sup> )	0.73 <sup>k/sf</sup>
3. LL	0.20 <sup>k/sf</sup>
4. VACUUM (FROM PRIMING OF) HORIZ PUMPS) 17' OF H <sub>2</sub> O	1.06 <sup>k/sf</sup>
5 GATES CLOSED WATER @ 27.05 IN DISCH. TUBE	- 0.49 <sup>k/sf</sup>

---

TOTAL CASE I (ITEMS 1 TO 4)	2.29 <sup>k/sf</sup>
CASE II (ITEM 1 TO 3 + ITEM 5)	0.74 <sup>k/sf</sup>

CASE I GOVERNS.

$$\therefore W_u = 1.3 \times 1.7 \times 2.29 = 5.06 \text{ }^k/sf \quad L_n = 9.25'$$

USING ACI CO-EFF

$$\text{MAX } -M = \frac{w_u l_n^2}{10} = \frac{5.06 \times 9.25^2}{10} = 43.3'k$$

$$\text{MAX } +M = \frac{10}{11} \times 43.3 = 39.36'k$$

$$\therefore d_{req} = 10.39". \text{ ASSUMING } \# 8 \text{ BARS \& } 4" \text{ COVER}$$

$$\text{SLAB TH'KNES REQ'D} = 14.9" < 24" \therefore \text{O.K.}$$

$$\therefore \phi V_c = (24 - 4.5) \times 85 \times 2 \times 63 \times 12 = 25.06'k$$

$$V_u @ d = \left( \frac{1.15 \times 5.06 \times 9.25}{2} \right) - \left( \frac{19.5}{12} \times 5.06 \right) = 18.69. \therefore \text{O.K.}$$





STEEL BMS UNDER FLR STAND (@ EL. 37.25)

COMPUTE FORCE REQ'D TO OPEN SLUICE GATE (96" x 108")

1. FORCE REQ'D TO OVERCOME WATER FRICTION

$$= \mu H \cdot W \cdot A \quad (\mu = \text{CO-EFF FRICTION} = 0.35, H = \text{head @ GATE} = (32.33 - 15.25) = 17.08', W = 62.5 \#/ft, A = \text{AREA OF SLUICE GATE OPN'G})$$

$$= 0.35 \times 17.08 \times .0625 \times 72 = 27.0 \text{ KIPS.}$$

2. FORCE REQ'D TO WITHDRAW GATE FROM WEDGING SYSTEM

$$= 0.5 \times \text{DISC WT.} = 0.5 \times 9.6^k = 4.8^k$$

3. SELF WT OF GATE = 9.6<sup>k</sup>

∴ TOTAL FORCE REQ'D = 27 + 5 + 10 = 42.0<sup>k</sup>

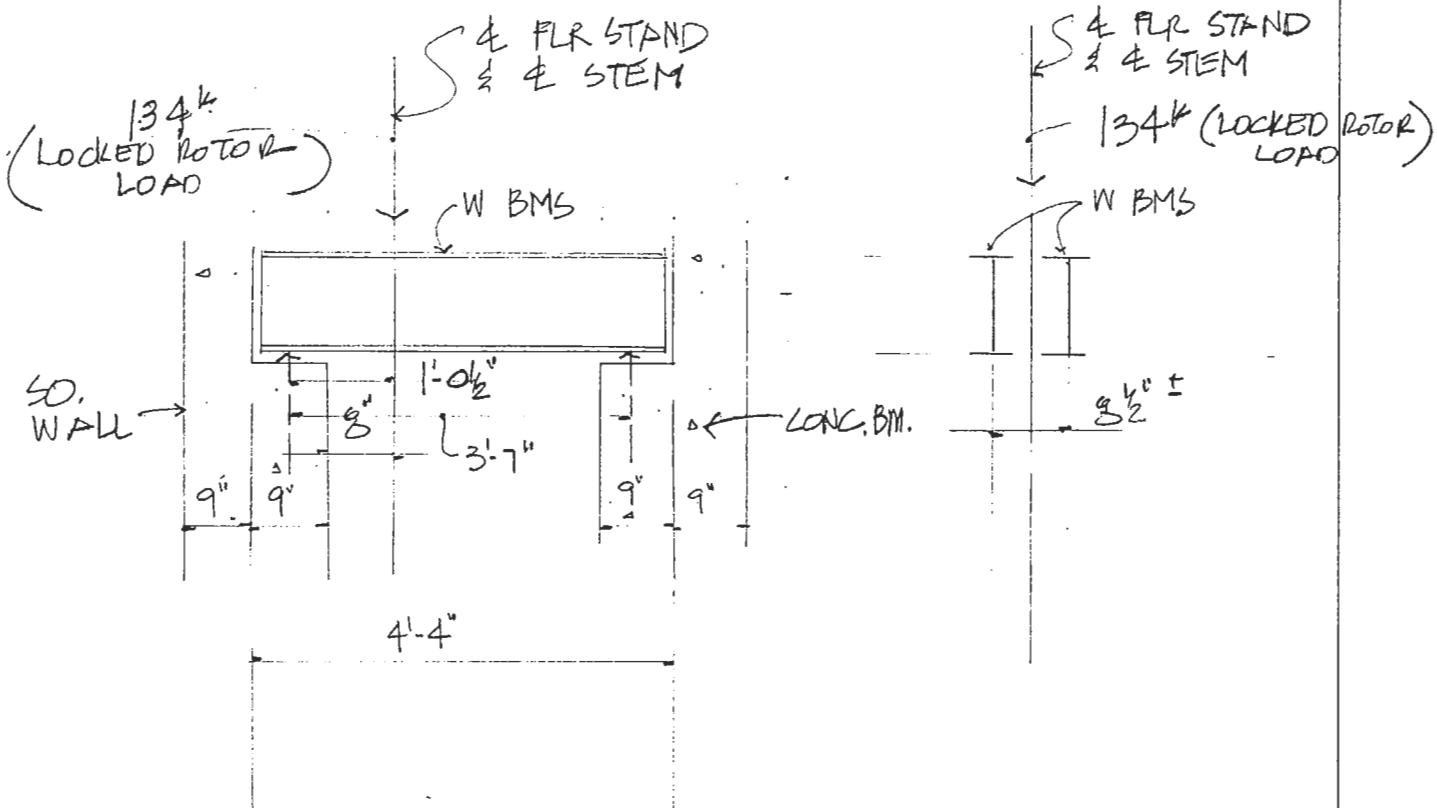
LOCKED ROTOR LOAD: = 134<sup>k</sup> (FURNISHED BY RODNEY HUNT, ORANGE MASS)

∴ DESIGN BM FOR LOCKED ROTOR LOAD.

13-724 100 SHEETS 1/2" X 14" 5 SQUARE  
 42-381 50 SHEETS 1/2" X 14" 5 SQUARE  
 42-382 50 SHEETS 1/2" X 14" 5 SQUARE  
 42-383 50 SHEETS 1/2" X 14" 5 SQUARE  
 42-384 50 SHEETS 1/2" X 14" 5 SQUARE  
 42-385 50 SHEETS 1/2" X 14" 5 SQUARE  
 42-386 50 SHEETS 1/2" X 14" 5 SQUARE  
 42-387 50 SHEETS 1/2" X 14" 5 SQUARE  
 42-388 50 SHEETS 1/2" X 14" 5 SQUARE  
 42-389 50 SHEETS 1/2" X 14" 5 SQUARE  
 42-390 200 RECYCLED WHITE 5 SQUARE  
 MADE IN U.S.A.



STL BMS UNDER FLR STAND



ASSUME : 1. EACH BM WILL CARRY 1/2 THE FORCE REQ'D TO OPEN THE GATE.

2. USE A-36 STL, AISC CODE 1/2 ELASTIC DESIGN.

3. BMS SIMPLY SUPPORTED @ EA-END

$\therefore M = 48 \times 1.04 = 49'k$  UNBRACED  $L = 4.33'$

TRY  $W10 \times 45$   $L_c = 8.5'$   $M_p = 198'k > 49'k$   
 $V = 51k > 48k \therefore O.K.$

SELECT  $W10 \times 45$

137-784  
42-381  
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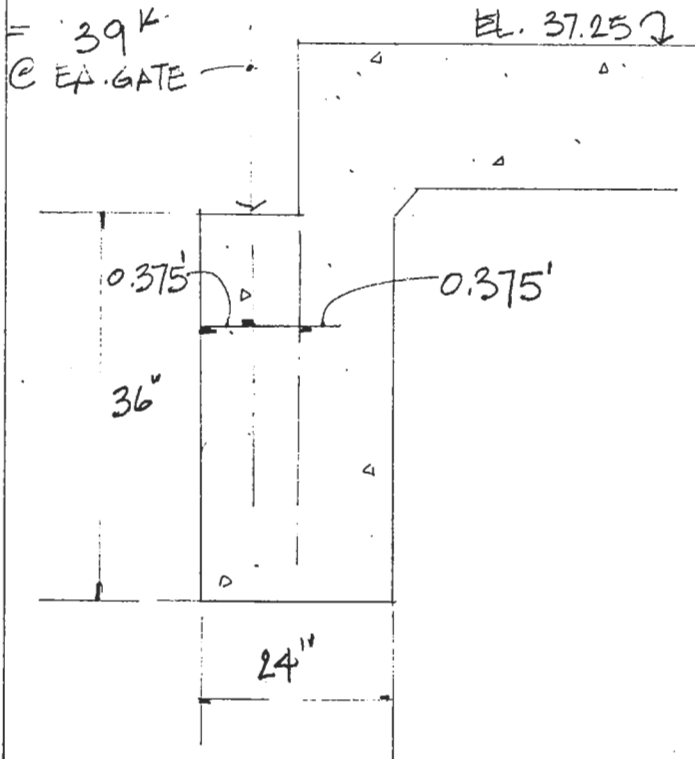


CONC. BM @ NORTH END OF W. BM

- ASSUME
1. 24" x 36" BM.
  2.  $F'_c = 4000$
  3.  $F_y = 60,000$
  4.  $LL = 100 \#/SF$
  5. BM SIMPLY SUPPORTED IN PUMP "C" GATE BAY.
  6. BM TWO SPAN CONT OVER INT. WALL IN PUMPS "D" & "E" GATE BAYS.
  7. ASSUME BOTH GATES ARE BEING OPENED SIMULTANEOUSLY (IN EACH GATE BAY)
  8. DESIGN SIMPLY SUPPORTED BM; USE SAME DESIGN FOR TWO SPAN CONT. BM USING SAME REINF FOR +VE & -VE MOMENT AS SIMPLY SUPPORTED BM (+M)

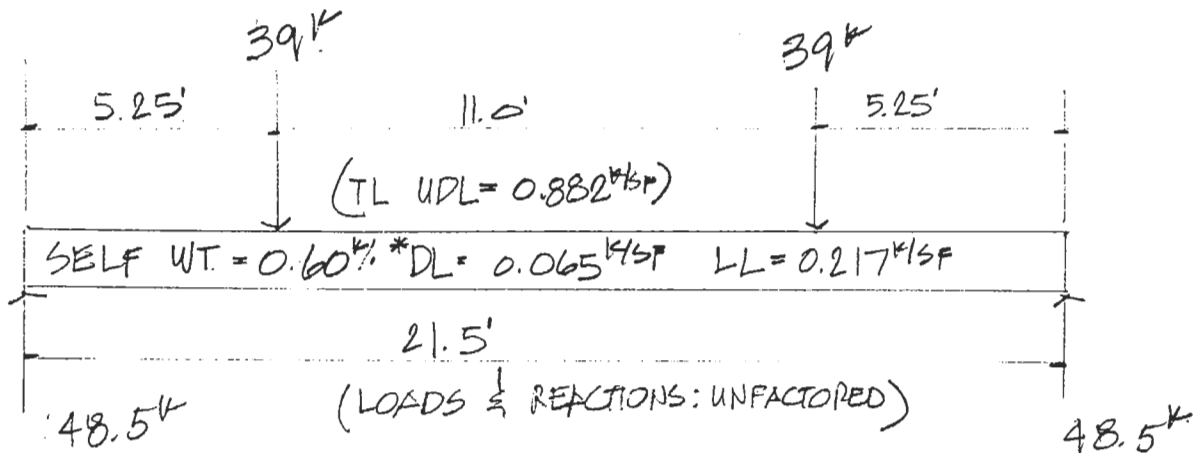
LOCKED ROTOR THRUST

(134 x 12.5" / 43")



13,782 500 SHEETS, FILLER, 5 SQUARE  
42,381 50 SHEETS, EYE-EASER, 5 SQUARE  
42,382 100 SHEETS, EYE-EASER, 5 SQUARE  
42,383 75 SHEETS, EYE-EASER, 5 SQUARE  
42,384 100 SHEETS, EYE-EASER, 5 SQUARE  
42,385 100 RECYCLED, WHITE, 5 SQUARE  
42,386 200 RECYCLED, WHITE, 5 SQUARE  
MADE IN U.S.A.



CONC. BM @ NORTH END OF W. BM\* WT. OF GRATING (30<sup>#</sup>/SF)

$$\text{MAX BM} = 242 \text{ k}$$

$$\therefore M_u = 242 \times 1.3 \times 1.7 = 535 \text{ k} \quad M_n = 595 \text{ k}$$

ASSUME #8 BARS &amp; 4 COVER

$$\therefore d = 36 - 4 - \frac{1}{2} = 31.5''$$

$$d_{req} = (2.4956 \times 595 \times 12 / 24)^{1/2} = 27.2'' < 31.5''$$

FROM ACI HANDBOOK

$$\text{FOR } b = 24, d = 31.5'' \quad F = 1.98 \quad K_u = 300$$

$$\text{FOR } F'_c = 4000 \quad F_y = 60,000 \quad K_u = 300 \quad \rho = 0.0062$$

$$\therefore A_s(\text{REQ'D}) = 0.0062 \times 18 \times 27.5$$

$$= 3.0''$$

$$\text{TRY 4-#8 BARS } A_s = 3.16'' \quad \rho = 0.0063$$

USE 4-#8 POST. 4-#8 TOP CONT.

CHECK SHEAR

$$V_u @ \text{DIST } 'd' = (48.5 - (\frac{31.5}{12} + 1)) \times 0.882 \times 1.3 \times 1.7 = 100 \text{ k}$$

$$\phi V_c = 0.85 \times 2 \times 63 \times 24 \times 31.5 = 81 \text{ k} \approx V_u \quad \text{STIRRUPS REQ'D.}$$

SEE ATTACHED COMP. OUTPUT FOR SHEAR &amp; TORSION

CHECK TORSION

$$T_u = (2 \times 18.3 \times .375 + .882 \times 21.5 \times .375) \times 1.7 \times 1.3$$

$$= 46'k$$

$$V_u @ d = 55'k$$

$$X = 18 \quad Y = 32 \quad X_1 = 14.5 \quad Y_1 = 25.6 \quad b_w = 18 \quad d = 27.5$$

$$\Sigma X^2 Y = 18^2 \times 32 = 10,368$$

$$b_w \cdot d = 18 \times 27.5 = 495$$

$$C_t = \frac{b_w \cdot d}{\Sigma X^2 Y} = \frac{495}{10,368} = 0.0477$$

$$\alpha_t = 0.66 + 0.33 \left( \frac{Y_1}{X_1} \right) = 1.24$$

$$\text{MIN } T_u = \phi (0.5 \sqrt{F_c}) (\Sigma X^2 Y)$$

$$= 0.85 \times 0.5 \times \sqrt{4000} \times 10,368 = 23.2'k < 46'k$$

\(\therefore\) TORSION REINF REQ'D

## TORSION STRENGTH OF CONC

$$\phi T_c = \frac{0.8 \times \sqrt{4000} \times 10,368}{\sqrt{1 + \left( \frac{0.4 \times 55000}{0.0477 \times 46000 \times 12} \right)^2}} = 33.5'k$$

\(\therefore\) PROVIDE TORSION REINF TO CARRY

$$\phi T_s = T_u - \phi T_c = 46 - 33.5 = 12.45'k$$

$$\text{MAX } \phi T_s = 4 \times \phi T_c = 4 \times 33.5 > 12.45$$

\(\therefore\) SECTION IS LARGE ENOUGH.

TORSION

$$A_{t/s} = \frac{T_u - \phi T_c}{\phi F_y \alpha_t \times I_t} = \frac{12.45 \times 12000}{0.85 \times 60,000 \times 1.24 \times 14.5 \times 25.6}$$

$$= 0.0064 \text{ in}^2/\text{in.}$$

FLEXURAL SHEAR

$$\phi V_c = \frac{2 \sqrt{F'_c} b_w \cdot d \cdot .85}{\left(1 + \left(2.5 C_t \cdot \frac{T_u}{V_u}\right)^2\right)^{1/2}} = \frac{53,014}{1.55} = 34 \text{ KIPS}$$

$$\phi V_s = V_u - \phi V_c = 55 - 34 = 21 \text{ K}$$

$$\therefore \frac{A_v}{s} = \frac{\phi V_s}{\phi F_y \cdot d} = \frac{21}{.85 \times 60 \times 27.5} = 0.015$$

\(\therefore\) COMBINED FLEXURAL & TORSIONAL REINF

$$= 0.015 \times 2 \times .0064 = 0.0277 \text{ in}^2/\text{in}$$

TRY #4 STIRRUPS (CLOSED STIRRUPS)

$$s = \frac{0.2 \times 2}{0.0277} = 14.44''$$

$$\text{MAX SPC'G} = \frac{14.5 + 25.6}{4} = 10''$$

\(\therefore\) USE #4 CLOSED HOOPS @ 10" O.C.

LONGIT. STEEL FOR TORSION

$$\begin{aligned} \text{EQ 11-24 } A_L &= \frac{2A_t}{s} (x_1 + y_1) \\ &= 2(.0064)(14.5 + 25.6) = 0.51 \text{ }^{\square}\text{''} \end{aligned}$$

MIN REQ'D

$$\text{EQ 11-25 } A_L = \left[ \frac{400 \times s}{F_y} \left( \frac{T_u}{T_u + \frac{V_u}{3C_t}} \right) - 2A_t \right] \left( \frac{x_1 + y_1}{s} \right)$$

$$T_u = 46 \text{ k } \quad V_u = 55 \text{ k } \quad \therefore T_u + \frac{V_u}{3C_t} = 430.3$$

$$\therefore \frac{T_u}{T_u + \frac{V_u}{3C_t}} = \frac{46}{430.3} = 0.107 \quad \frac{2A_t}{s} = 0.0128$$

$$\therefore A_L = \left( \frac{400 \times 18}{60,000} (0.107) - 0.0128 \right) 40.1 < \text{MIN}$$

$$\therefore \text{USE } A_L = 0.51 \text{ }^{\square}\text{''}$$

USE  $\frac{1}{3} \times 0.51 = 0.17 \text{ }^{\square}\text{''}$  @ TOP, BOT & MID DEPTH.

$$\begin{aligned} \therefore \underline{A_s(\text{req'd}) @ \text{BOT}} &= A_s(\text{FLEXURE}) + A_s(\text{TORSION}) \\ &= 3 \text{ }^{\square}\text{''} + 0.17 \text{ }^{\square}\text{''} = 3.17 \text{ }^{\square}\text{''} \end{aligned}$$

$$\underline{A_s(\text{provided})} = 4 \text{ - \# } 8 = 3.16 \text{ }^{\square}\text{''} \approx 3.17 \text{ }^{\square}\text{''} \therefore \text{O.K.}$$

$$\underline{A_s @ \text{MID DEPTH}} = 2 \text{ - \# } 5$$

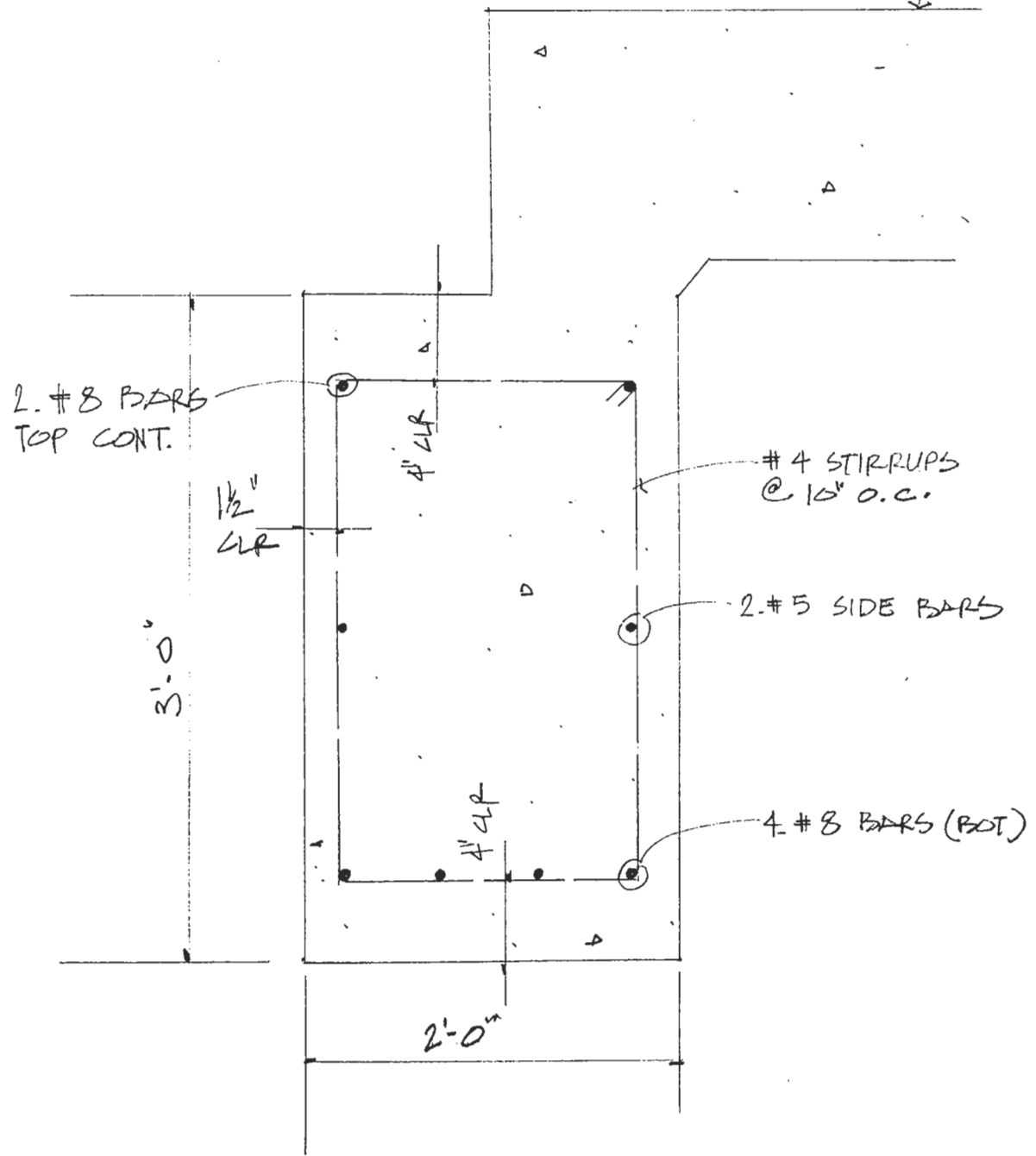
$$\underline{A_s @ \text{TOP}} = 2 \text{ - \# } 8$$

SHEAR & TORSION: #4 CLOSED HOOPS @ 10" o.c.



CONC. BM @ NORTH END OF W10s

OPERATING FLR  
EL. 37.25



2. #8 BARS  
TOP CONT.

1 1/2"  
CLR

4" CLR

#4 STIRRUPS  
@ 10" O.C.

2. #5 SIDE BARS

4. #8 BARS (BOT)

3'-0"

2'-0"

13 SHEETS  
42,381  
42,382  
42,383  
42,384  
42,385  
42,386  
42,387  
42,388  
42,389  
42,390  
MADE IN U.S.A.



## FOUNDATION SLAB DESIGN.

ANALYZE & DESIGN 5'-0" STRIP @ GROUP "D" PILES  
FOR CASE II LOADING.

ASSUMPTIONS: 1. FDN SLAB THK. = 3'-0"

2.  $F_c = 4000$  PSI

3.  $F_y = 60000$  PSI

4. ASSUME SLAB IS SIMPLY SUPPORTED  
@ EAST & WEST WALLS & CONTINUOUS  
OVER INTERIOR WALLS & COLUMNS.

5. ASSUME PILES AS POINT LOADS  
ACTING ON FDN SLAB.

FDN SLAB DESIGN

LOADS ON 5'-0" STRIP

SELF WT.	0.45 x 5	= 2.25 <sup>k/ft</sup>
WATER	0.99 x 5	= 4.95 <sup>k/ft</sup>
UPLIFT	1.17 x 5	= -5.85 <sup>k/ft</sup>
<hr/>		
TOTAL		= 1.35 <sup>k/ft</sup>

CONCENTRATED LOADS

LOAD CASE - 2.

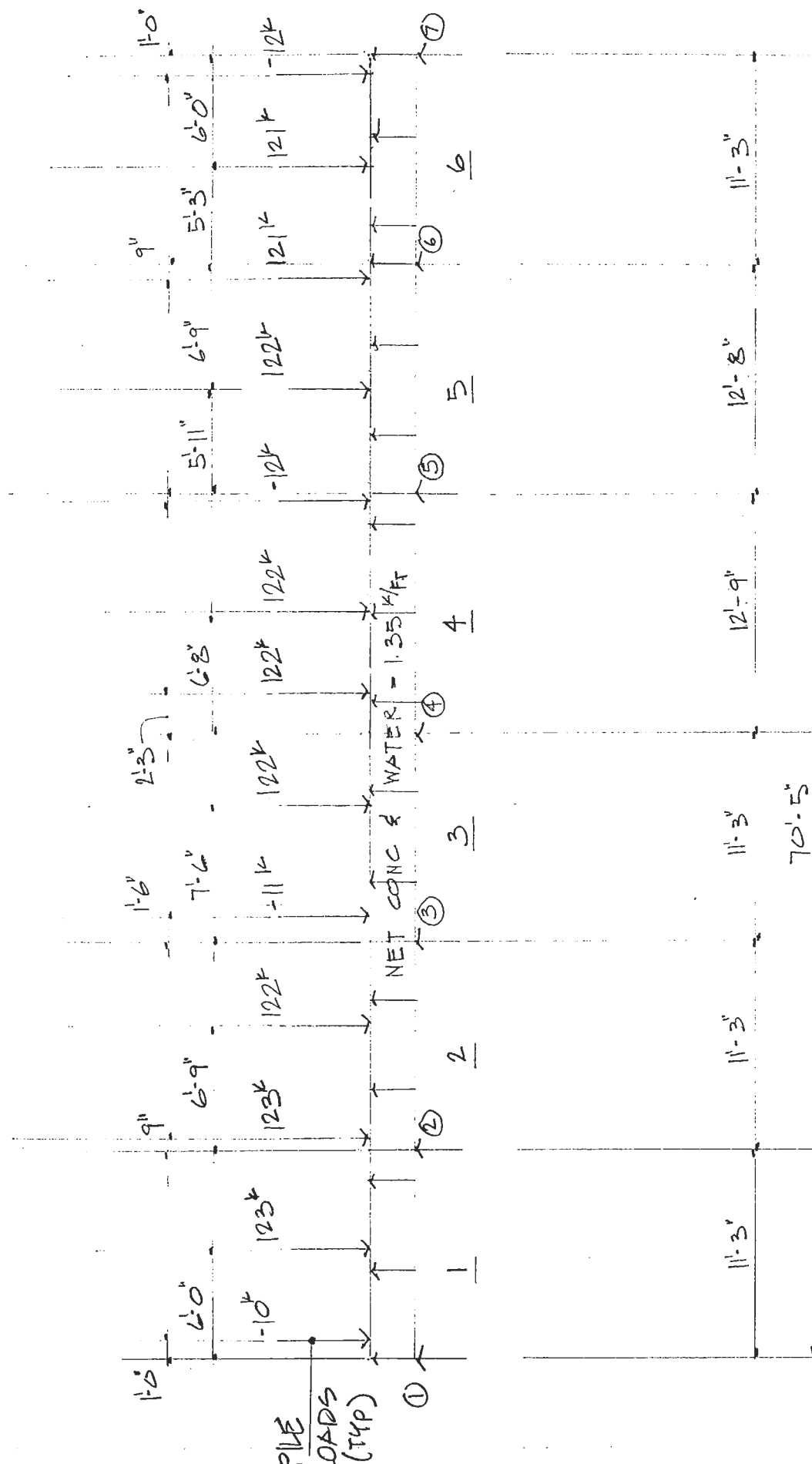
PILE LOADS FOR PILES 27 THRU 39 PAGE 62-37

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FDM SLAB DESIGN

19-7029 14 SHEETS: 1 CASE 5 SQUARE  
 42 381 24 SHEETS: 1 CASE 5 SQUARE  
 45 382 100 SHEETS: 1 CASE 5 SQUARE  
 45 383 200 SHEETS: 1 CASE 5 SQUARE  
 45 384 100 RECYCLED WHITE 5 SQUARE  
 45 385 200 RECYCLED WHITE 5 SQUARE  
 MADE IN U.S.A.



10 FRONTING PROTECTION @ DPS NO. 3. FOUNDATION SLAB FOR SLUICE GATE C D E.  
20 7 6 1 3000 .15  
30 1 0 0 2 11.25 0 3 22.5 0 4 33.75 0 5 46.5 0 6 59.17 0 7 70.42 0  
40 FIX X 1 7 FIX Y 1 2 3 4 5 6 7  
50 1 1 2 2 2 3 3 3 4 4 4 5 5 5 6 6 6 7  
60 0 60 36 1 2 3 4 5 6  
70 LOAD CASE 1 1 0 6 0 0  
80 Y 1.35 1 TO 6  
90 2 1 -10 0 6 123 0 1  
100 2 0.75 123 0 6.75 122 0 2  
110 2 1.5 -11 0 7.5 122 0 3  
120 3 2.25 122 0 6.67 122 0 12.67 -12 0 4  
130 2 5.92 122 0 11.92 121 0 5  
140 2 5.25 121 0 10.25 -12 0 6

1	6.00	.1230E+03	.00
2	.75	.1230E+03	.00
2	6.75	.1220E+03	.00
3	1.50	-.1100E+02	.00
3	7.50	.1220E+03	.00
4	2.25	.1220E+03	.00
4	6.67	.1220E+03	.00
4	12.67	-.1200E+02	.00
5	5.92	.1220E+03	.00
5	11.92	.1210E+03	.00
6	5.25	.1210E+03	.00
6	10.25	-.1200E+02	.00

1                    LOAD CASE            1

JOINT DISPLACEMENTS

JOINT	DX	DY	DR
1	.0000E+00	.0000E+00	.0000E+00
2	.0000E+00	.0000E+00	.0000E+00
3	.0000E+00	.0000E+00	.0000E+00
4	.0000E+00	.0000E+00	.0000E+00
5	.0000E+00	.0000E+00	.0000E+00
6	.0000E+00	.0000E+00	.0000E+00
7	.0000E+00	.0000E+00	.0000E+00

MEMBER END FORCES

MEMBER	JOINT	AXIAL	SHEAR	MOMENT	MOMENT EXTREMA	LOCATION
1	1	.0000E+00	.3163E+02	.0000E+00	.2586E+03	6.07
	2	.0000E+00	.6618E+02	-.1020E+03	-.1020E+03	11.25
2	2	.0000E+00	.1544E+03	-.1020E+03	.2333E+03	6.75
	3	.0000E+00	.7537E+02	-.1196E+03	-.1196E+03	11.25
3	3	.0000E+00	.1185E+02	-.1196E+03	.7082E+02	7.42
	4	.0000E+00	.8396E+02	-.2511E+03	-.2511E+03	11.25
4	4	.0000E+00	.1597E+03	-.2511E+03	.3027E+03	6.63
	5	.0000E+00	.5514E+02	-.1276E+03	-.2511E+03	.00
5	5	.0000E+00	.6381E+02	-.1276E+03	.2672E+03	5.83
	6	.0000E+00	.1621E+03	-.1251E+03	-.1276E+03	.00
6	6	.0000E+00	.6699E+02	-.1251E+03	.2397E+03	5.17
	7	.0000E+00	.2682E+02	.0000E+00	-.1251E+03	.00

STRUCTURE REACTIONS

JOINT	FORCE X	FORCE Y	MOMENT
1	.0000E+00	.3163E+02	.0000E+00
2	.0000E+00	.2206E+03	.0000E+00
3	.0000E+00	.8722E+02	.0000E+00
4	.0000E+00	.2436E+03	.0000E+00
5	.0000E+00	.1189E+03	.0000E+00

6	.0000E+00	.2291E+03	.0000E+00
7	.0000E+00	.2682E+02	.0000E+00

-----  
 DTAL .0000E+00 .9579E+03

1

MEMBER END FORCES

MEMBER	LOAD CASE	JOINT	AXIAL	SHEAR	MOMENT	MOMENT EXTREMA	LOCATION
1	1	1	.0000E+00	.3163E+02	.0000E+00	.2586E+03	6.07
		2	.0000E+00	.6618E+02	-.1020E+03	-.1020E+03	11.25
2	1	2	.0000E+00	.1544E+03	-.1020E+03	.2333E+03	6.75
		3	.0000E+00	.7537E+02	-.1196E+03	-.1196E+03	11.25
3	1	3	.0000E+00	.1185E+02	-.1196E+03	.7082E+02	7.42
		4	.0000E+00	.8396E+02	-.2511E+03	-.2511E+03	11.25
4	1	4	.0000E+00	.1597E+03	-.2511E+03	.3027E+03	6.63
		5	.0000E+00	.5514E+02	-.1276E+03	-.2511E+03	.00
5	1	5	.0000E+00	.6381E+02	-.1276E+03	.2672E+03	5.83
		6	.0000E+00	.1621E+03	-.1251E+03	-.1276E+03	.00
6	1	6	.0000E+00	.6699E+02	-.1251E+03	.2397E+03	5.17
		7	.0000E+00	.2682E+02	.0000E+00	-.1251E+03	.00

PROGRAM CFRAME V02.05 24JUL84

RUN DATE = 95/02/04  
RUN TIME = 0.54.19

FRONTING PROTECTION @ DPS NO. 3. FOUNDATION SLAB FOR SLUICE GATE C D E.

\*\*\* JOINT DATA \*\*\*

JOINT	X	Y	-----FIXITY-----					
			X	Y	R	KX	KY	KR
1	.00	.00	*	*				
2	11.25	.00		*				
3	22.50	.00		*				
4	33.75	.00		*				
5	46.50	.00		*				
6	59.17	.00		*				
7	70.42	.00	*	*				

1 \*\*\* MEMBER DATA \*\*\*

MEMBER	END END		LENGTH	I	A	AS	E	G
	A	B						
1	1	2	11.25	.2333E+06	.2160E+04	.2160E+04	.3000E+04	.1304E+04
2	2	3	11.25	.2333E+06	.2160E+04	.2160E+04	.3000E+04	.1304E+04
3	3	4	11.25	.2333E+06	.2160E+04	.2160E+04	.3000E+04	.1304E+04
4	4	5	12.75	.2333E+06	.2160E+04	.2160E+04	.3000E+04	.1304E+04
5	5	6	12.67	.2333E+06	.2160E+04	.2160E+04	.3000E+04	.1304E+04
6	6	7	11.25	.2333E+06	.2160E+04	.2160E+04	.3000E+04	.1304E+04

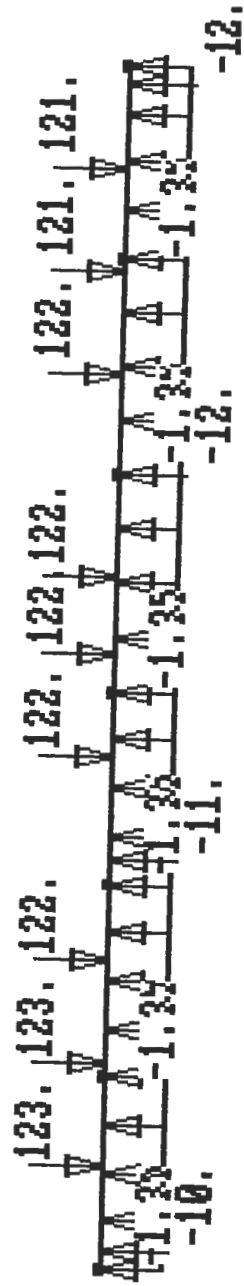
1 \*\*\* LOAD CASE 1

MEMBER	DIRECTION	PROJECTED LOAD
1	Y	.1350E+01
2	Y	.1350E+01
3	Y	.1350E+01
4	Y	.1350E+01
5	Y	.1350E+01
6	Y	.1350E+01

MEMBER	L	P	ANGLE
1	1.00	-.1000E+02	.00



FRONTING PROTECTION @ DPS NO. 3. FOUNDATION SLAB FOR SLIICE GATE C D



LOAD CASE 1

95/02/04

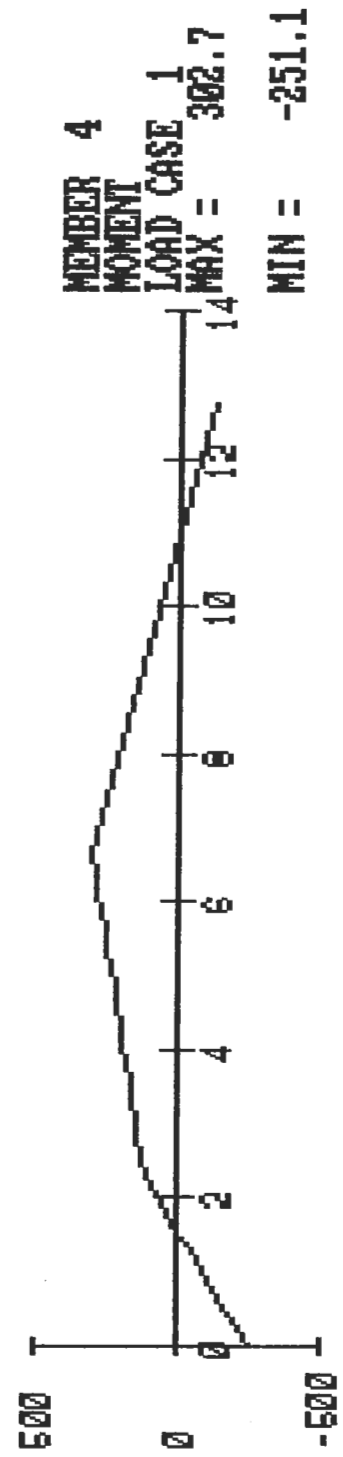
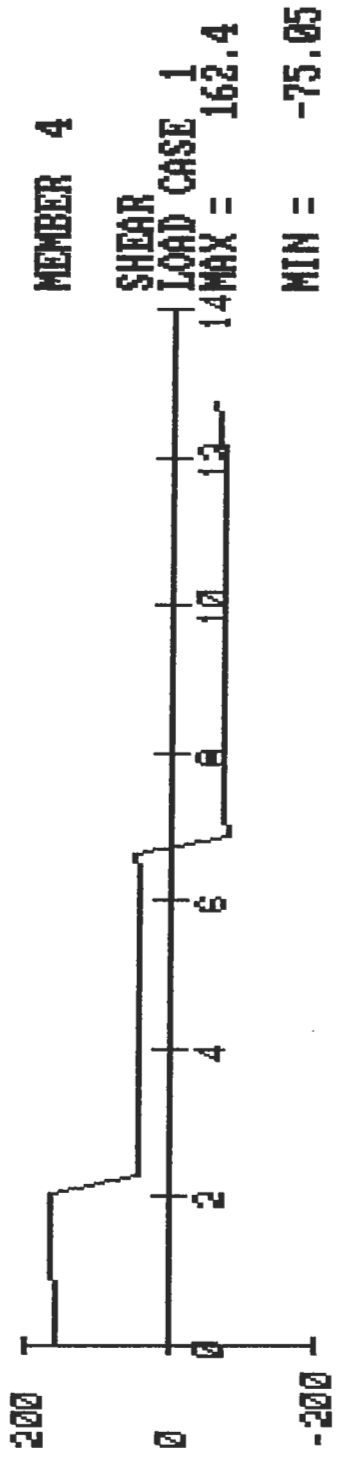
3.52.40

FRONTING PROTECTION @ DPS NO. 3. FOUNDATION SLAB FOR SLUICE GATE C D



	= 302.7	MOMENT	
LOAD CASE		1	95/02/04
			3.55.09

FRONTING PROTECTION @ DPS NO. 3. FOUNDATION SLAB FOR SLIICE GATE C D



LOAD CASE 1      95/02/04      3.55.09

FDN SLAB DESIGN

$$\text{MAX BM} = 303 \text{ k} \quad (\text{SEE ATTACHED COMP. OUTPUT})$$

$$\therefore M_u = (1.3 \times 1.7 \times 303) = 670 \text{ k}$$

$$\therefore M_u / FT = 670 / 5 = 134 \text{ k}$$

$$\therefore d_{\text{req}} = 18.28 \text{ '}$$

ASSUMING # 8 BARS & 4" COVER, REQUIRED

$$\begin{aligned} \text{THICKNESS OF FDN SLAB} &= 18.28 + 4" + 1/2" \\ &= 23" < 36" \text{ PROVIDED.} \end{aligned}$$

CHECK WIDE BM SHEAR

$$V_u = (1.3 \times 1.7 \times 84) = 185.64 \text{ k}$$

$$\therefore V_u @ d = \left( \left( \frac{36 - 4.5}{12} \right) \times 135 \right) 1.3 \times 1.7 + 185.64$$

$$\therefore V_u @ d / FT = \frac{191 \text{ k}}{5} = 38.19 \text{ k}$$

$$\phi V_c = 12 \times (36 - 4.5) \times 2 \times 0.85 \times 63 = 40.5 \text{ k} > 38.2 \text{ k} \therefore \text{O.K.}$$

 $V_u @ d$ 

$$1. \text{ AT JT 2 SPAN 2} = (154 - 123) 1.3 \times 1.7 < 185.64 \text{ k}$$

$$2. \text{ AT JT 4 SPAN 4} = (159 - 122) 1.3 \times 1.7 < 185.64 \text{ k}$$

$$3. \text{ AT JT 6 SPAN 5} = (162 - 121) 1.3 \times 1.7 < 185.64 \text{ k}$$

CHECK PUNCH SHEAR

$$\text{MAX } V_u = 1.3 \times 1.7 \times 122 = 269 \text{ k}$$

$$\phi V_c = 0.85 \times 4 \times 63 \times \left( 4 \times \left( 14 + \frac{31.5}{2} \right) \right) \times 31.5 = 802 \text{ k} > V_u = 269 \text{ k}$$

$\therefore$  PUNCH SHEAR O.K.

# FDN SLAB DESIGN

## REINFORCING

$$K_u = 134 / 0.99 = 135 \quad \rho = 0.0027$$

$$\therefore \text{USE } A_s(\text{MIN}) = 12 \times 31.5 \times 0.0033 = 1.25 \text{ in}^2/\text{ft}$$

$$\text{TRY } \# 9 @ 8" = 1.5 \text{ in}^2/\text{ft} > 1.25 \text{ in}^2/\text{ft} \quad \text{O.K.}$$

USE # 9 @ 8" TOP & BOT. (LONG DIRECTION)

ALSO USE MIN  $A_s$  IN SHORT DIRECTION

\therefore USE # 9 @ 8" TOP & BOT. (SHORT DIRECTION)

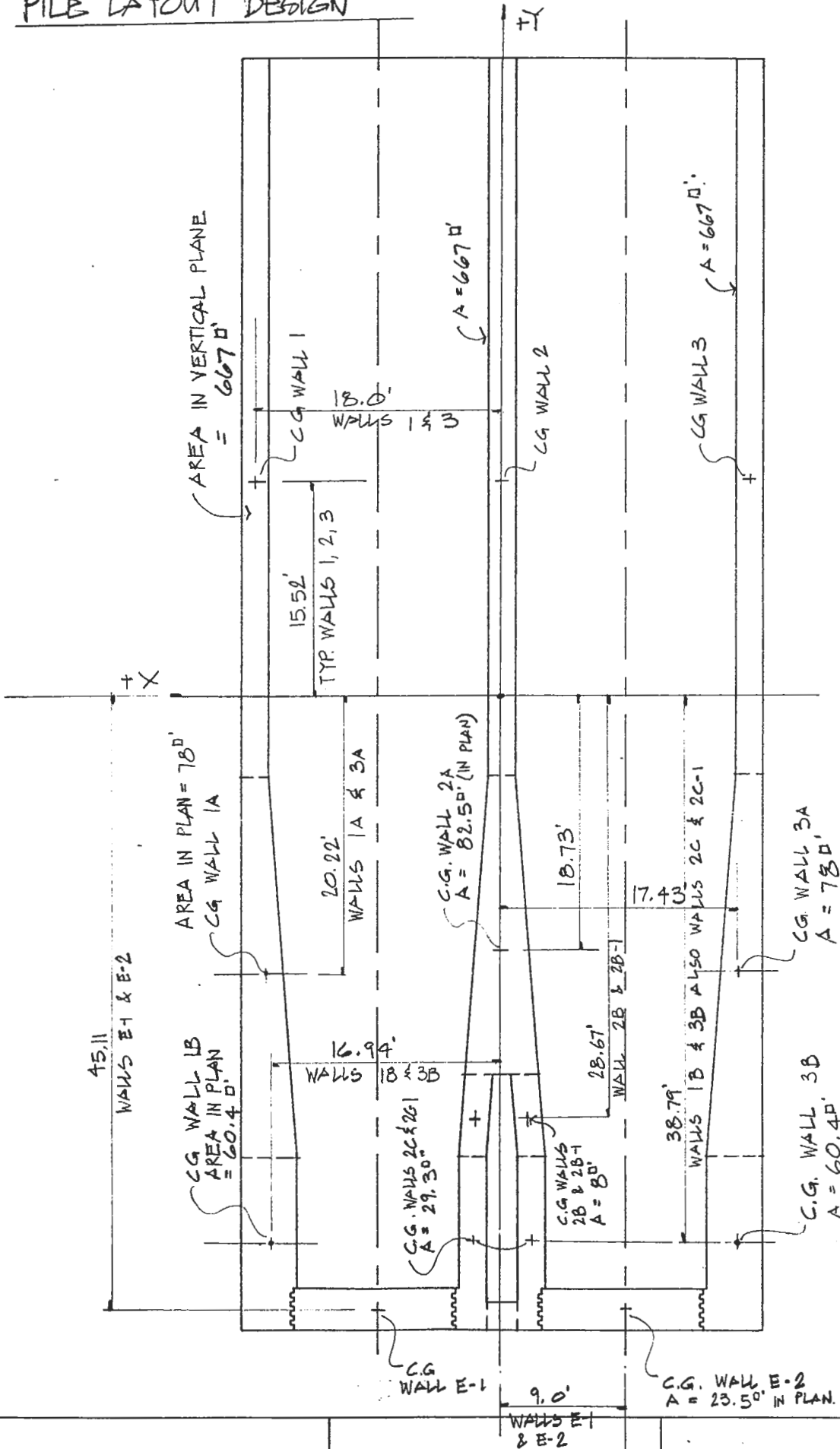


# PILE LAYOUT DESIGN

14-027 50% SHEETS PER 5 SQUARE  
 42-381 50% SHEETS PER 5 SQUARE  
 42-382 100% SHEETS PER 5 SQUARE  
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 MADE IN U.S.A.



42-381 50 SHEETS PER 5 SQUARE  
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 42-384 100 SHEETS PER 5 SQUARE  
 42-385 100 SHEETS PER 5 SQUARE  
 42-386 100 SHEETS PER 5 SQUARE  
 42-387 100 SHEETS PER 5 SQUARE  
 42-388 100 SHEETS PER 5 SQUARE  
 42-389 100 SHEETS PER 5 SQUARE  
 42-390 100 SHEETS PER 5 SQUARE  
 42-391 100 SHEETS PER 5 SQUARE  
 42-392 100 SHEETS PER 5 SQUARE  
 42-393 100 SHEETS PER 5 SQUARE  
 42-394 100 SHEETS PER 5 SQUARE  
 42-395 100 SHEETS PER 5 SQUARE  
 42-396 100 SHEETS PER 5 SQUARE  
 42-397 100 SHEETS PER 5 SQUARE  
 42-398 100 SHEETS PER 5 SQUARE  
 42-399 100 SHEETS PER 5 SQUARE  
 42-400 100 SHEETS PER 5 SQUARE  
 MADE IN U.S.A.



ENTER A ONE, TWO, OR THREE TO COMPUTE AREA  
PROPERTIES ONLY, VOLUME PROPERTIES ONLY, OR BOTH

1

\*\*\* AREA PROPERTIES \*\*\*

AREA= 3.0186E+02  
XBAR= 4.6390E+01  
YBAR= 1.2579E+01  
ARC = 1.9200E+02= TOTAL PERIMETER

INERTIA PROPERTIES

IXX= 8.6535E+05 (INTEGRAL OF X\*X\*DA) ABOUT Y-AXIS  
IYY= 4.8240E+04 (INTEGRAL OF Y\*Y\*DA) ABOUT X-AXIS  
IXY= 1.7247E+05

PRINCIPAL PROPERTIES

IUU= 9.0026E+05  
IVV= 1.3329E+04  
THETA-UU= 1.1443E+01

ANGLES ARE MEASURED COUNTERCLOCKWISE FROM THE  
PLUS X AXIS

MOMENTS OF INERTIA ABOUT  
PARALLEL CENTROIDAL AXES

IXX= 2.1573E+05 (INTEGRAL OF X\*X\*DA) ABOUT Y-AXIS  
IYY= 4.7393E+02 (INTEGRAL OF Y\*Y\*DA) ABOUT X-AXIS  
IXY=-3.6852E+03

PRINCIPAL PROPERTIES FOR CENTROIDAL AXES

IUU= 2.1580E+05  
IVV= 4.1087E+02  
THETA-UU= 1.7902E+02

IF PROPERTIES ARE REQUIRED FOR SHIFTED AXES, INPUT THE COORDINATES  
OF THE SHIFTED ORIGIN AND THE INCLINATION  
ANGLE OF THE SHIFTED X-AXIS. INPUT 0,0,0 TO CONTINUE.

FOR SHIFTED AXIS WITH ORIGIN AT

X= 0.0000E+00 Y= 0.0000E+00  
AND ANGLE OF INCLINATION= 0.0000E+00 DEG

FSLAB.OUT

```

***      PROGRAM GAIP      ***      CORPS - X0018      ***
***
***      GEOMETRICAL ANALYSIS OF REGIONS BOUNDED BY ***
***      STRAIGHT LINES AND CIRCULAR ARCS      ***

```

DATA POINTS GO AROUND THE REGION, WITH THE ENCLOSED AREA TO THE LEFT. THE LAST POINT MUST BE A DUPLICATE OF THE FIRST. FOR VOLUMES, THE AXIS OF REVOLUTION MUST NOT LIE INSIDE THE REGION--ON ONE EDGE IS OK.

INPUT 1 FOR COMPACT LINE SPACING  
 0 FOR PAGED SPACING AS DESCRIBED IN USER GUIDE

1

INPUT BOUNDARY POINTS AS:  
 X-COORD., Y-COORD., INDEX

WHERE

INDEX = 1 FOR BEGINNING OF STRAIGHT LINE SEGMENT  
 2 FOR BEGINNING OF CIRCULAR ARC  
 3 FOR INTERMEDIATE POINT ON CIRCULAR ARC  
 4 FOR CENTER OF A CIRCULAR ARC  
     GENERATED IN A CLOCKWISE SENSE  
 5 FOR CENTER OF A CIRCULAR ARC  
     GENERATED IN A COUNTERCLOCKWISE SENSE  
 6 FOR FINAL POINT (REPEAT OF FIRST POINT)  
 (100 POINTS MAX):

0.000000E+00	11.250000	1
79.150000	11.250000	1
85.020000	9.220000	1
88.530000	8.000000	1
92.230000	8.000000	1
92.230000	11.250000	2
88.920000	11.530000	3
86.000000	12.300000	1
79.640000	14.500000	1
0.000000E+00	14.500000	1
0.000000E+00	11.250000	6

INPUT 1 FOR ALGEBRAIC EQUATIONS OF BOUNDARY SEGMENTS  
 0 TO OMIT THIS OUTPUT

0

TO GET POINTS ON THE BOUNDARY AND KERN, INPUT THE MINIMUM ARC INCREMENT BETWEEN ADJACENT BOUNDARY POINTS. INPUT ZERO FOR NO SUCH TABULATION OR GRAPH  
 .00000



TO GET POINTS ON THE BOUNDARY AND KERN, INPUT THE  
 MINIMUM ARC INCREMENT BETWEEN ADJACENT BOUNDARY POINTS.  
 INPUT ZERO FOR NO SUCH TABULATION OR GRAPH  
 .00000

ENTER A ONE, TWO, OR THREE TO COMPUTE AREA  
 PROPERTIES ONLY, VOLUME PROPERTIES ONLY, OR BOTH  
 1

\*\*\* AREA PROPERTIES \*\*\*

AREA= 1.9008E+02  
 XBAR= 3.7423E+01  
 YBAR= 2.2457E+01  
 ARC = 1.6587E+02= TOTAL PERIMETER

INERTIA PROPERTIES

IXX= 3.4674E+05 (INTEGRAL OF X\*X\*DA) ABOUT Y-AXIS  
 IYY= 9.7570E+04 (INTEGRAL OF Y\*Y\*DA) ABOUT X-AXIS  
 IXY= 1.5416E+05

PRINCIPAL PROPERTIES

IUU= 4.2037E+05  
 IVV= 2.3946E+04  
 THETA-UU= 2.5528E+01

ANGLES ARE MEASURED COUNTERCLOCKWISE FROM THE  
 PLUS X AXIS

MOMENTS OF INERTIA ABOUT  
 PARALLEL CENTROIDAL AXES

IXX= 8.0539E+04 (INTEGRAL OF X\*X\*DA) ABOUT Y-AXIS  
 IYY= 1.7054E+03 (INTEGRAL OF Y\*Y\*DA) ABOUT X-AXIS  
 IXY=-5.5866E+03

PRINCIPAL PROPERTIES FOR CENTROIDAL AXES

IUU= 8.0933E+04  
 IVV= 1.3115E+03  
 THETA-UU= 1.7597E+02

IF PROPERTIES ARE REQUIRED FOR SHIFTED AXES, INPUT THE COORDINATES  
 OF THE SHIFTED ORIGIN AND THE INCLINATION  
 ANGLE OF THE SHIFTED X-AXIS. INPUT 0,0,0 TO CONTINUE.

FOR SHIFTED AXIS WITH ORIGIN AT

X= 0.0000E+00 Y= 0.0000E+00  
 AND ANGLE OF INCLINATION= 0.0000E+00 DEG

BSLAB.OUT

```

*** PROGRAM GAIP *** CORPS - X0018 ***
***
*** GEOMETRICAL ANALYSIS OF REGIONS BOUNDED BY ***
*** STRAIGHT LINES AND CIRCULAR ARCS ***

```

DATA POINTS GO AROUND THE REGION, WITH THE ENCLOSED AREA TO THE LEFT. THE LAST POINT MUST BE A DUPLICATE OF THE FIRST. FOR VOLUMES, THE AXIS OF REVOLUTION MUST NOT LIE INSIDE THE REGION--ON ONE EDGE IS OK.

```

INPUT 1 FOR COMPACT LINE SPACING
0 FOR PAGED SPACING AS DESCRIBED IN USER GUIDE
1

```

```

INPUT BOUNDARY POINTS AS:
X-COORD., Y-COORD., INDEX
WHERE

```

```

INDEX = 1 FOR BEGINNING OF STRAIGHT LINE SEGMENT
        2 FOR BEGINNING OF CIRCULAR ARC
        3 FOR INTERMEDIATE POINT ON CIRCULAR ARC
        4 FOR CENTER OF A CIRCULAR ARC
          GENERATED IN A CLOCKWISE SENSE
        5 FOR CENTER OF A CIRCULAR ARC
          GENERATED IN A COUNTERCLOCKWISE SENSE
        6 FOR FINAL POINT (REPEAT OF FIRST POINT)
(100 POINTS MAX):

```

0.000000E+00	19.380000	1
4.720000	19.380000	1
14.630000	21.960000	1
45.990000	24.050000	1
73.540000	14.500000	1
79.640000	14.500000	1
46.620000	25.940000	2
43.570000	26.240000	3
40.098000	27.040000	2
25.440000	21.850000	3
14.670000	23.910000	1
5.900000	21.730000	2
5.080000	21.560000	3
3.000000	21.380000	1
0.000000E+00	21.380000	1
0.000000E+00	19.380000	6

```

INPUT 1 FOR ALGEBRAIC EQUATIONS OF BOUNDARY SEGMENTS
0 TO OMIT THIS OUTPUT
0

```

MINIMUM ARC INCREMENT BETWEEN ADJACENT BOUNDARY POINTS.  
INPUT ZERO FOR NO SUCH TABULATION OR GRAPH  
.00000

ENTER A ONE, TWO, OR THREE TO COMPUTE AREA  
PROPERTIES ONLY, VOLUME PROPERTIES ONLY, OR BOTH

1

\*\*\* AREA PROPERTIES \*\*\*

AREA= 2.0509E+02  
XBAR= 4.4355E+01  
YBAR= 3.1038E+01  
ARC = 1.9342E+02= TOTAL PERIMETER

INERTIA PROPERTIES

IXX= 5.5253E+05 (INTEGRAL OF X\*X\*DA) ABOUT Y-AXIS  
IYY= 2.0227E+05 (INTEGRAL OF Y\*Y\*DA) ABOUT X-AXIS  
IXY= 2.5891E+05

PRINCIPAL PROPERTIES

IUU= 6.8997E+05  
IVV= 6.4823E+04  
THETA-UU= 2.7962E+01

ANGLES ARE MEASURED COUNTERCLOCKWISE FROM THE  
PLUS X AXIS

MOMENTS OF INERTIA ABOUT  
PARALLEL CENTROIDAL AXES

IXX= 1.4905E+05 (INTEGRAL OF X\*X\*DA) ABOUT Y-AXIS  
IYY= 4.6896E+03 (INTEGRAL OF Y\*Y\*DA) ABOUT X-AXIS  
IXY=-2.3437E+04

PRINCIPAL PROPERTIES FOR CENTROIDAL AXES

IUU= 1.5276E+05  
IVV= 9.7980E+02  
THETA-UU= 1.7101E+02

IF PROPERTIES ARE REQUIRED FOR SHIFTED AXES, INPUT THE COORDINATES  
OF THE SHIFTED ORIGIN AND THE INCLINATION  
ANGLE OF THE SHIFTED X-AXIS. INPUT 0,0,0 TO CONTINUE.

FOR SHIFTED AXIS WITH ORIGIN AT

X= 0.0000E+00 Y= 0.0000E+00  
AND ANGLE OF INCLINATION= 0.0000E+00 DEG

TSLAB.OUT

```

*** PROGRAM GAIP *** CORPS - X0018 ***
***
*** GEOMETRICAL ANALYSIS OF REGIONS BOUNDED BY ***
*** STRAIGHT LINES AND CIRCULAR ARCS ***

```

DATA POINTS GO AROUND THE REGION, WITH THE ENCLOSED AREA TO THE LEFT. THE LAST POINT MUST BE A DUPLICATE OF THE FIRST. FOR VOLUMES, THE AXIS OF REVOLUTION MUST NOT LIE INSIDE THE REGION--ON ONE EDGE IS OK.

INPUT 1 FOR COMPACT LINE SPACING  
0 FOR PAGED SPACING AS DESCRIBED IN USER GUIDE  
1

INPUT BOUNDARY POINTS AS:  
X-COORD., Y-COORD., INDEX  
WHERE

INDEX = 1 FOR BEGINNING OF STRAIGHT LINE SEGMENT  
2 FOR BEGINNING OF CIRCULAR ARC  
3 FOR INTERMEDIATE POINT ON CIRCULAR ARC  
4 FOR CENTER OF A CIRCULAR ARC  
GENERATED IN A CLOCKWISE SENSE  
5 FOR CENTER OF A CIRCULAR ARC  
GENERATED IN A COUNTERCLOCKWISE SENSE  
6 FOR FINAL POINT (REPEAT OF FIRST POINT)  
(100 POINTS MAX):

0.000000E+00	33.130000	1
40.098000	33.820000	2
44.740000	32.980000	3
48.130000	32.580000	1
88.920000	19.750000	2
90.320000	19.420000	3
92.230000	19.250000	1
92.230000	21.250000	2
90.660000	21.380000	3
89.530000	21.660000	1
48.730000	34.490000	2
45.095000	35.380000	3
40.098000	35.820000	1
0.000000E+00	35.820000	1
0.000000E+00	33.130000	6

INPUT 1 FOR ALGEBRAIC EQUATIONS OF BOUNDARY SEGMENTS  
0 TO OMIT THIS OUTPUT  
0

TO GET POINTS ON THE BOUNDARY AND KERN, INPUT THE

ABWALL.OUT

ENTER A ONE, TWO, OR THREE TO COMPUTE AREA  
PROPERTIES ONLY, VOLUME PROPERTIES ONLY, OR BOTH  
1

\*\*\* AREA PROPERTIES \*\*\*

AREA= 6.6676E+02  
XBAR= 2.1538E+01  
YBAR= 2.1183E+01  
ARC = 1.3419E+02= TOTAL PERIMETER

INERTIA PROPERTIES

IXX= 4.5132E+05 (INTEGRAL OF X\*X\*DA) ABOUT Y-AXIS  
IYY= 3.1500E+05 (INTEGRAL OF Y\*Y\*DA) ABOUT X-AXIS  
IXY= 2.8028E+05

PRINCIPAL PROPERTIES

IUU= 6.7161E+05  
IVV= 9.4714E+04  
THETA-UU= 3.8166E+01

ANGLES ARE MEASURED COUNTERCLOCKWISE FROM THE  
PLUS X AXIS

MOMENTS OF INERTIA ABOUT  
PARALLEL CENTROIDAL AXES

IXX= 1.4202E+05 (INTEGRAL OF X\*X\*DA) ABOUT Y-AXIS  
IYY= 1.5816E+04 (INTEGRAL OF Y\*Y\*DA) ABOUT X-AXIS  
IXY=-2.3924E+04

PRINCIPAL PROPERTIES FOR CENTROIDAL AXES

IUU= 1.4640E+05  
IVV= 1.1433E+04  
THETA-UU= 1.6962E+02

IF PROPERTIES ARE REQUIRED FOR SHIFTED AXES, INPUT THE COORDINATES  
OF THE SHIFTED ORIGIN AND THE INCLINATION  
ANGLE OF THE SHIFTED X-AXIS. INPUT 0,0,0 TO CONTINUE.

FOR SHIFTED AXIS WITH ORIGIN AT  
X= 0.0000E+00 Y= 0.0000E+00  
AND ANGLE OF INCLINATION= 0.0000E+00 DEG

\*\*\* PROGRAM GAIP \*\*\* CORPS - X0018 \*\*\*  
 \*\*\*  
 \*\*\* GEOMETRICAL ANALYSIS OF REGIONS BOUNDED BY \*\*\*  
 \*\*\* STRAIGHT LINES AND CIRCULAR ARCS \*\*\*

DATA POINTS GO AROUND THE REGION, WITH THE ENCLOSED  
 AREA TO THE LEFT. THE LAST POINT MUST BE A DUPLICATE  
 OF THE FIRST. FOR VOLUMES, THE AXIS OF REVOLUTION  
 MUST NOT LIE INSIDE THE REGION--ON ONE EDGE IS OK.

INPUT 1 FOR COMPACT LINE SPACING  
 0 FOR PAGED SPACING AS DESCRIBED IN USER GUIDE

1

INPUT BOUNDARY POINTS AS:  
 X-COORD., Y-COORD., INDEX

WHERE

INDEX = 1 FOR BEGINNING OF STRAIGHT LINE SEGMENT  
 2 FOR BEGINNING OF CIRCULAR ARC  
 3 FOR INTERMEDIATE POINT ON CIRCULAR ARC  
 4 FOR CENTER OF A CIRCULAR ARC  
 GENERATED IN A CLOCKWISE SENSE  
 5 FOR CENTER OF A CIRCULAR ARC  
 GENERATED IN A COUNTERCLOCKWISE SENSE  
 6 FOR FINAL POINT (REPEAT OF FIRST POINT)  
 (100 POINTS MAX):

0.000000E+00	14.500000	1
39.550000	14.500000	1
45.910000	12.300000	2
48.830000	11.530000	3
52.130000	11.250000	1
52.130000	19.250000	2
50.220000	19.420000	3
48.830000	19.750000	1
8.030000	32.580000	2
4.650000	32.980000	3
0.000000E+00	33.820000	1
0.000000E+00	14.500000	6

INPUT 1 FOR ALGEBRAIC EQUATIONS OF BOUNDARY SEGMENTS  
 0 TO OMIT THIS OUTPUT

0

TO GET POINTS ON THE BOUNDARY AND KERN, INPUT THE  
 MINIMUM ARC INCREMENT BETWEEN ADJACENT BOUNDARY POINTS.  
 INPUT ZERO FOR NO SUCH TABULATION OR GRAPH  
 .00000

PILE LAYOUT DESIGNCOMPUTE CONC. WT.1. TOP SLAB 2'-0" THICK

$$= 205.1 \text{ (S.F.)} \times 38 \text{ FT} \times 0.15 = 1169 \text{ K}$$

2. BOT SLAB 2'-0" THICK (MIN)

$$= 190 \text{ (S.F.)} \times 38 \times 0.15 = 1083 \text{ K}$$

3. FDN SLAB 3'-3" THICK

$$= 302 \text{ (SF)} \times 38 \times 0.15 = 1721 \text{ K}$$

4. WALLS

(A) 1. WALL 1  $667 \text{ (SF)} \times 2 \times 0.15 = 200 \text{ K}$

2. WALL 2  $= 200 \text{ K}$

3. WALL 3  $= 200 \text{ K}$

(B) 1. WALL 1A  $78 \text{ (SF)} \times 19.57 \times 0.15 = 226 \text{ K}$

2. WALL 2A  $82.5 \text{ (SF)} \times 19.57 \times 0.15 = 239 \text{ K}$

3. WALL 3A  $= 226 \text{ K}$

(C) 1. WALL 1B  $60.4 \text{ (SF)} \times 19.57 \times 0.15 = 177 \text{ K}$

2. WALL 2B  $8 \text{ (SF)} \times 19.57 \times 0.15 = 23.5 \text{ K}$

3. WALL 2B-1  $= 23.5 \text{ K}$

4. WALL 3B  $= 177 \text{ K}$

PILE LAYOUT DESIGN

COMPUTE CONC. WT CONTD..

- (D) 1. WALL 2C       $29.3(SF) \times 19.57 \times 0.15 = 86^k$   
2 WALL 2C-1       $\phantom{29.3(SF) \times 19.57 \times 0.15} = 86^k$

13-782 500 SHEETS, FILLER, 5 SQUARE  
42-201 50 SHEETS, FILLER, 5 SQUARE  
42-202 100 SHEETS, FILLER, 5 SQUARE  
42-203 100 SHEETS, FILLER, 5 SQUARE  
42-204 200 SHEETS, FILLER, 5 SQUARE  
42-205 100 SHEETS, FILLER, 5 SQUARE  
42-206 100 RECYCLED WHITE, 5 SQUARE  
42-207 200 RECYCLED WHITE, 5 SQUARE  
Made in U.S.A.





## FRONTING PROTECTION

## DISCHARGE TUBE

© DPS NO. 3

© PUMPS "A" &amp; "B"

AB-12

PILE LAYOUT DESIGN  
CONC. LOADS

ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM			MX (FT-K)	MY (FT-K)	MZ (FT-K)
				X (FT)	Y (FT)	Z (FT)			
1			1169		1.76		-2062		
2			1083		8.69		-9416		
3			1721		0.28		482		
4			200	18.0	15.52		3104	-3600	
5			200		15.52		3104		
6			200	18.0	15.52		3104	3600	
7			226 <sup>v</sup>	17.43	20.22		-4570	-3939	
8			239 <sup>v</sup>		18.73		-4476		
9			226 <sup>v</sup>	17.43	20.22		-4570	+3939	
10			177	16.49	38.79		-6865	-2918	
11			24	1.75	28.67		-688	-42	
12			24	1.75	28.67		-688	42	
13			177	16.49	38.79		-6865	2918	
14			86	2	38.79		-3336	172	
15			86	2	38.79		-3336	-172	
16			17	9	45.11		-767	153	
17			17	9	45.11		-767	-153	
TOTAL CONC. LOADS			5872				-38612	0	

13,400 SHEETS OF PAPER  
 4,265 SHEETS OF PAPER  
 408 SHEETS OF PAPER  
 208 SHEETS OF PAPER  
 408 SHEETS OF PAPER  
 42,399 SHEETS OF PAPER  
 42,399 SHEETS OF PAPER  
 42,399 SHEETS OF PAPER  
 42,399 SHEETS OF PAPER  
 Made in U.S.A.







FRONTING PROTECTION

@ DPS NO. 3

DISCHARGE TUBE

@ PUMPS "A" &amp; "B"

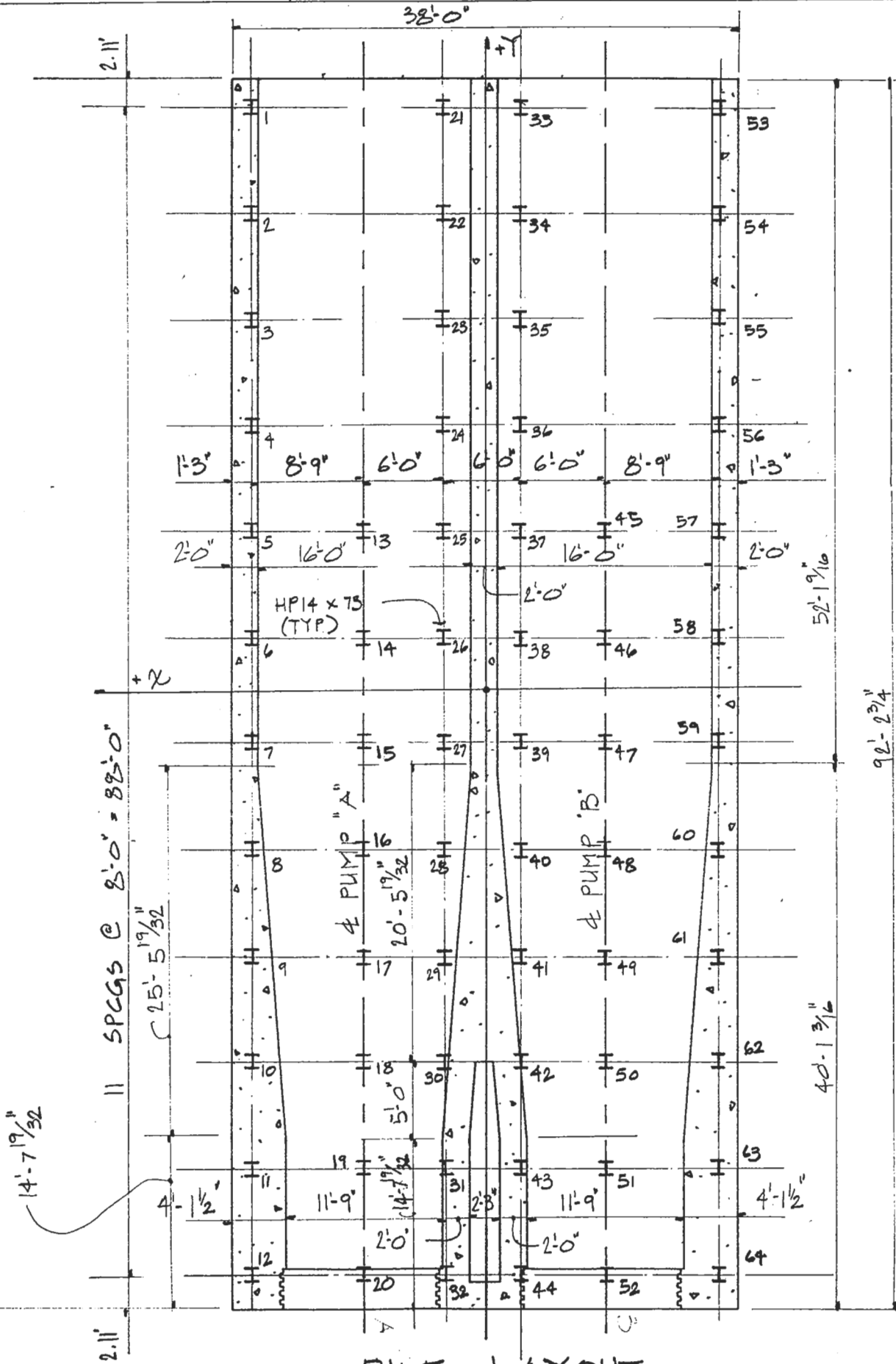
AB-16

FILE LAYOUT DESIGNLOAD COMBINATIONS

ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM			MX (FT-K)	MY (FT-K)	MZ (FT-K)
				X (FT)	Y (FT)	Z (FT)			
CASE (I)	BACKFILL IN PLACE, GATES OPEN, GW @ TOP OF GROUND. DISCH. TUBE @ BOTH PUMPS FULL OF WATER								
1	CONC. LOAD		5872				-38612		
2	LIVE LOAD		701						
3	WT. OF BACKFILL		329				12689		
4	WT OF WATER IN DISCH. TUBES		1375						
5	UPLIFT		-3450						
<u>TOTAL</u>			<u>4827</u>				<u>-25923</u>		
CASE (II)	CASE (I) -UPLIFT (i.e. GW @ BOT. OF FDN SLAB)								
1.	ITEM 1 THRU 4		8277				-25923		
<u>TOTAL</u>			<u>8277</u>				<u>-25923</u>		

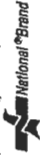
13-702 13-900 SHEETS: BLUE, 230 SQUARE  
 42-381 13-900 SHEETS: GREEN, 230 SQUARE  
 42-382 13-900 SHEETS: RED, 230 SQUARE  
 42-383 13-900 SHEETS: YELLOW, 230 SQUARE  
 42-384 13-900 SHEETS: PINK, 230 SQUARE  
 42-385 13-900 SHEETS: PURPLE, 230 SQUARE  
 42-386 13-900 SHEETS: WHITE, 230 SQUARE  
 Made in U.S.A.





PILE LAYOUT

42-381 5 SHEETS EYE-EASE 5 SQUARE  
42-382 100 SHEETS EYE-EASE 5 SQUARE  
42-383 100 SHEETS EYE-EASE 5 SQUARE  
42-384 100 RECYCLED WHITE 5 SQUARE  
42-385 200 RECYCLED WHITE 5 SQUARE



42-381 50 SHEETS EYE-EASE 5 SQUARE  
42-382 100 SHEETS EYE-EASE 5 SQUARE  
42-383 100 SHEETS EYE-EASE 5 SQUARE  
42-384 100 RECYCLED WHITE 5 SQUARE  
42-385 200 RECYCLED WHITE 5 SQUARE

10 DISCHARGE TUBE FOR PUMPS A AND B  
20 PROP 29000 724 261 21.4 2 0 ALL  
30 SOIL ES 0.079 LEN 78 0 ALL  
40 PIN ALL  
50 ALLOW H 130 100 385 385 709 2119 ALL  
60 PILE 1 17.75 44 0 13 9 12 0 21 3 44 0 33 -3 44 0  
70 PILE 45 -9 12 0 53 -17.75 44 0  
80 ROW Y 12 1 11 AT -8  
90 ROW Y 8 13 7 AT -8  
100 ROW Y 12 21 11 AT -8  
110 ROW Y 12 33 11 AT -8  
120 ROW Y 8 45 7 AT -8  
130 ROW Y 12 53 11 AT -8  
140 LOAD 1 0 0 4827 -25923 0 0  
150 LOAD 2 0 0 8277 -25923 0 0  
160 FOU 1 2 3 4 5 6 7 B:\DTAB.OUT  
170 TOUT 1 2 3 4 5 6 7  
180 PFO ALL  
190 FPL N

\*\*\*\*\*  
 \* CORPS PROGRAM # X0080 \* CPGA - CASE FILE GROUP ANALYSIS PROGRAM  
 \* VERSION NUMBER # 86/09/02-C \* RUN DATE 02-14-95 RUN TIME 02:19:17  
 \*\*\*\*\*

DISCHARGE TUBE FOR PUMPS A AND B

THERE ARE 64 PILES AND  
 2 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

	X	Y	Z
	-----	-----	-----
WITH DIAGONAL COORDINATES = (	-17.75 ,	-44.00 ,	.00 )
	( 17.75 ,	44.00 ,	.00 )

\*\*\*\*\*

PILE PROPERTIES AS INPUT

E	I1	I2	A	C33	B66
KSI	IN**4	IN**4	IN**2		
.29000E+05	.72400E+03	.26100E+03	.21400E+02	.20000E+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
	.79000E-01	L	.78000E+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	17.75	44.00	.00	V	.00	78.00	P
2	17.75	36.00	.00	V	.00	78.00	P
3	17.75	28.00	.00	V	.00	78.00	P
4	17.75	20.00	.00	V	.00	78.00	P
5	17.75	12.00	.00	V	.00	78.00	P
6	17.75	4.00	.00	V	.00	78.00	P



7	17.75	-4.00	.00	V	.00	78.00	P
8	17.75	-12.00	.00	V	.00	78.00	P
9	17.75	-20.00	.00	V	.00	78.00	P
10	17.75	-28.00	.00	V	.00	78.00	P
11	17.75	-36.00	.00	V	.00	78.00	P
12	17.75	-44.00	.00	V	.00	78.00	P
13	9.00	12.00	.00	V	.00	78.00	P
14	9.00	4.00	.00	V	.00	78.00	P
15	9.00	-4.00	.00	V	.00	78.00	P
16	9.00	-12.00	.00	V	.00	78.00	P
17	9.00	-20.00	.00	V	.00	78.00	P
18	9.00	-28.00	.00	V	.00	78.00	P
19	9.00	-36.00	.00	V	.00	78.00	P
20	9.00	-44.00	.00	V	.00	78.00	P
21	3.00	44.00	.00	V	.00	78.00	P
22	3.00	36.00	.00	V	.00	78.00	P
23	3.00	28.00	.00	V	.00	78.00	P
24	3.00	20.00	.00	V	.00	78.00	P
25	3.00	12.00	.00	V	.00	78.00	P
26	3.00	4.00	.00	V	.00	78.00	P
27	3.00	-4.00	.00	V	.00	78.00	P
28	3.00	-12.00	.00	V	.00	78.00	P
29	3.00	-20.00	.00	V	.00	78.00	P
30	3.00	-28.00	.00	V	.00	78.00	P
31	3.00	-36.00	.00	V	.00	78.00	P
32	3.00	-44.00	.00	V	.00	78.00	P
33	-3.00	44.00	.00	V	.00	78.00	P
34	-3.00	36.00	.00	V	.00	78.00	P
35	-3.00	28.00	.00	V	.00	78.00	P
36	-3.00	20.00	.00	V	.00	78.00	P
37	-3.00	12.00	.00	V	.00	78.00	P
38	-3.00	4.00	.00	V	.00	78.00	P
39	-3.00	-4.00	.00	V	.00	78.00	P
40	-3.00	-12.00	.00	V	.00	78.00	P
41	-3.00	-20.00	.00	V	.00	78.00	P
42	-3.00	-28.00	.00	V	.00	78.00	P
43	-3.00	-36.00	.00	V	.00	78.00	P
44	-3.00	-44.00	.00	V	.00	78.00	P
45	-9.00	12.00	.00	V	.00	78.00	P
46	-9.00	4.00	.00	V	.00	78.00	P
47	-9.00	-4.00	.00	V	.00	78.00	P
48	-9.00	-12.00	.00	V	.00	78.00	P
49	-9.00	-20.00	.00	V	.00	78.00	P
50	-9.00	-28.00	.00	V	.00	78.00	P
51	-9.00	-36.00	.00	V	.00	78.00	P
52	-9.00	-44.00	.00	V	.00	78.00	P
53	-17.75	44.00	.00	V	.00	78.00	P
54	-17.75	36.00	.00	V	.00	78.00	P
55	-17.75	28.00	.00	V	.00	78.00	P
56	-17.75	20.00	.00	V	.00	78.00	P
57	-17.75	12.00	.00	V	.00	78.00	P
58	-17.75	4.00	.00	V	.00	78.00	P
59	-17.75	-4.00	.00	V	.00	78.00	P
60	-17.75	-12.00	.00	V	.00	78.00	P
61	-17.75	-20.00	.00	V	.00	78.00	P
62	-17.75	-28.00	.00	V	.00	78.00	P
63	-17.75	-36.00	.00	V	.00	78.00	P
64	-17.75	-44.00	.00	V	.00	78.00	P

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4992.00

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APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	.0	4827.0	-25923.0	.0	.0
2	.0	.0	8277.0	-25923.0	.0	.0

\*\*\*\*\*

ORIGINAL PILE GROUP STIFFNESS MATRIX

.35371E+03	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.16978E+05
.00000E+00	.45648E+03	.00000E+00	.00000E+00	.00000E+00	.00000E+00	-.97656E-03
.00000E+00	.00000E+00	.84868E+05	-.40737E+07	.25000E+00	.00000E+00	.00000E+00
.00000E+00	.00000E+00	-.40737E+07	.87992E+10	-.16000E+02	.00000E+00	.00000E+00
.00000E+00	.00000E+00	.25000E+00	-.32000E+02	.17326E+10	.00000E+00	.00000E+00
.16978E+05	-.97656E-03	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.45992E+08

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.  
 LOAD CASE 2. NUMBER OF FAILURES = 28. NUMBER OF PILES IN TENSION = 0.

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PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.0000E+00	.0000E+00	.5643E-01	-.9226E-05	-.8313E-11	.0000E+00
2	.0000E+00	.0000E+00	.9801E-01	.1002E-04	-.1396E-10	.0000E+00

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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
1	.0	.0	68.4	.0	.0	.0	.53	.18

2	.0	.0	69.5	.0	.0	.0	.53	.18
3	.0	.0	70.7	.0	.0	.0	.54	.18
4	.0	.0	71.9	.0	.0	.0	.55	.19
5	.0	.0	73.1	.0	.0	.0	.56	.19
6	.0	.0	74.2	.0	.0	.0	.57	.19
7	.0	.0	75.4	.0	.0	.0	.58	.20
8	.0	.0	76.6	.0	.0	.0	.59	.20
9	.0	.0	77.8	.0	.0	.0	.60	.20
10	.0	.0	78.9	.0	.0	.0	.61	.21
11	.0	.0	80.1	.0	.0	.0	.62	.21
12	.0	.0	81.3	.0	.0	.0	.63	.21
13	.0	.0	73.1	.0	.0	.0	.56	.19
14	.0	.0	74.2	.0	.0	.0	.57	.19
15	.0	.0	75.4	.0	.0	.0	.58	.20
16	.0	.0	76.6	.0	.0	.0	.59	.20
17	.0	.0	77.8	.0	.0	.0	.60	.20
18	.0	.0	78.9	.0	.0	.0	.61	.21
19	.0	.0	80.1	.0	.0	.0	.62	.21
20	.0	.0	81.3	.0	.0	.0	.63	.21
21	.0	.0	68.4	.0	.0	.0	.53	.18
22	.0	.0	69.5	.0	.0	.0	.53	.18
23	.0	.0	70.7	.0	.0	.0	.54	.18
24	.0	.0	71.9	.0	.0	.0	.55	.19
25	.0	.0	73.1	.0	.0	.0	.56	.19
26	.0	.0	74.2	.0	.0	.0	.57	.19
27	.0	.0	75.4	.0	.0	.0	.58	.20
28	.0	.0	76.6	.0	.0	.0	.59	.20
29	.0	.0	77.8	.0	.0	.0	.60	.20
30	.0	.0	78.9	.0	.0	.0	.61	.21
31	.0	.0	80.1	.0	.0	.0	.62	.21
32	.0	.0	81.3	.0	.0	.0	.63	.21
33	.0	.0	68.4	.0	.0	.0	.53	.18
34	.0	.0	69.5	.0	.0	.0	.53	.18
35	.0	.0	70.7	.0	.0	.0	.54	.18
36	.0	.0	71.9	.0	.0	.0	.55	.19
37	.0	.0	73.1	.0	.0	.0	.56	.19
38	.0	.0	74.2	.0	.0	.0	.57	.19
39	.0	.0	75.4	.0	.0	.0	.58	.20
40	.0	.0	76.6	.0	.0	.0	.59	.20
41	.0	.0	77.8	.0	.0	.0	.60	.20
42	.0	.0	78.9	.0	.0	.0	.61	.21
43	.0	.0	80.1	.0	.0	.0	.62	.21
44	.0	.0	81.3	.0	.0	.0	.63	.21
45	.0	.0	73.1	.0	.0	.0	.56	.19
46	.0	.0	74.2	.0	.0	.0	.57	.19
47	.0	.0	75.4	.0	.0	.0	.58	.20
48	.0	.0	76.6	.0	.0	.0	.59	.20
49	.0	.0	77.8	.0	.0	.0	.60	.20
50	.0	.0	78.9	.0	.0	.0	.61	.21
51	.0	.0	80.1	.0	.0	.0	.62	.21
52	.0	.0	81.3	.0	.0	.0	.63	.21
53	.0	.0	68.4	.0	.0	.0	.53	.18
54	.0	.0	69.5	.0	.0	.0	.53	.18
55	.0	.0	70.7	.0	.0	.0	.54	.18
56	.0	.0	71.9	.0	.0	.0	.55	.19
57	.0	.0	73.1	.0	.0	.0	.56	.19
58	.0	.0	74.2	.0	.0	.0	.57	.19
59	.0	.0	75.4	.0	.0	.0	.58	.20
60	.0	.0	76.6	.0	.0	.0	.59	.20
61	.0	.0	77.8	.0	.0	.0	.60	.20

62	.0	.0	78.9	.0	.0	.0	.61	.21
63	.0	.0	80.1	.0	.0	.0	.62	.21
64	.0	.0	81.3	.0	.0	.0	.63	.21

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	
1	.0	.0	137.0	.0	.0	.0	1.05	.36	*
2	.0	.0	135.7	.0	.0	.0	1.04	.35	*
3	.0	.0	134.4	.0	.0	.0	1.03	.35	*
4	.0	.0	133.2	.0	.0	.0	1.02	.35	*
5	.0	.0	131.9	.0	.0	.0	1.01	.34	*
6	.0	.0	130.6	.0	.0	.0	1.00	.34	*
7	.0	.0	129.3	.0	.0	.0	.99	.34	
8	.0	.0	128.1	.0	.0	.0	.99	.33	
9	.0	.0	126.8	.0	.0	.0	.98	.33	
10	.0	.0	125.5	.0	.0	.0	.97	.33	
11	.0	.0	124.2	.0	.0	.0	.96	.32	
12	.0	.0	122.9	.0	.0	.0	.95	.32	
13	.0	.0	131.9	.0	.0	.0	1.01	.34	*
14	.0	.0	130.6	.0	.0	.0	1.00	.34	*
15	.0	.0	129.3	.0	.0	.0	.99	.34	
16	.0	.0	128.1	.0	.0	.0	.99	.33	
17	.0	.0	126.8	.0	.0	.0	.98	.33	
18	.0	.0	125.5	.0	.0	.0	.97	.33	
19	.0	.0	124.2	.0	.0	.0	.96	.32	
20	.0	.0	122.9	.0	.0	.0	.95	.32	
21	.0	.0	137.0	.0	.0	.0	1.05	.36	*
22	.0	.0	135.7	.0	.0	.0	1.04	.35	*
23	.0	.0	134.4	.0	.0	.0	1.03	.35	*
24	.0	.0	133.2	.0	.0	.0	1.02	.35	*
25	.0	.0	131.9	.0	.0	.0	1.01	.34	*
26	.0	.0	130.6	.0	.0	.0	1.00	.34	*
27	.0	.0	129.3	.0	.0	.0	.99	.34	
28	.0	.0	128.1	.0	.0	.0	.99	.33	
29	.0	.0	126.8	.0	.0	.0	.98	.33	
30	.0	.0	125.5	.0	.0	.0	.97	.33	
31	.0	.0	124.2	.0	.0	.0	.96	.32	
32	.0	.0	122.9	.0	.0	.0	.95	.32	
33	.0	.0	137.0	.0	.0	.0	1.05	.36	*
34	.0	.0	135.7	.0	.0	.0	1.04	.35	*
35	.0	.0	134.4	.0	.0	.0	1.03	.35	*
36	.0	.0	133.2	.0	.0	.0	1.02	.35	*
37	.0	.0	131.9	.0	.0	.0	1.01	.34	*
38	.0	.0	130.6	.0	.0	.0	1.00	.34	*
39	.0	.0	129.3	.0	.0	.0	.99	.34	
40	.0	.0	128.1	.0	.0	.0	.99	.33	
41	.0	.0	126.8	.0	.0	.0	.98	.33	
42	.0	.0	125.5	.0	.0	.0	.97	.33	
43	.0	.0	124.2	.0	.0	.0	.96	.32	
44	.0	.0	122.9	.0	.0	.0	.95	.32	
45	.0	.0	131.9	.0	.0	.0	1.01	.34	*
16	.0	.0	130.6	.0	.0	.0	1.00	.34	*
47	.0	.0	129.3	.0	.0	.0	.99	.34	
48	.0	.0	128.1	.0	.0	.0	.99	.33	
49	.0	.0	126.8	.0	.0	.0	.98	.33	
50	.0	.0	125.5	.0	.0	.0	.97	.33	

51	.0	.0	124.2	.0	.0	.0	.96	.32
52	.0	.0	122.9	.0	.0	.0	.95	.32
53	.0	.0	137.0	.0	.0	.0	1.05	.36
54	.0	.0	135.7	.0	.0	.0	1.04	.35
55	.0	.0	134.4	.0	.0	.0	1.03	.35
56	.0	.0	133.2	.0	.0	.0	1.02	.35
57	.0	.0	131.9	.0	.0	.0	1.01	.34
58	.0	.0	130.6	.0	.0	.0	1.00	.34
59	.0	.0	129.3	.0	.0	.0	.99	.34
60	.0	.0	128.1	.0	.0	.0	.99	.33
61	.0	.0	126.8	.0	.0	.0	.98	.33
62	.0	.0	125.5	.0	.0	.0	.97	.33
63	.0	.0	124.2	.0	.0	.0	.96	.32
64	.0	.0	122.9	.0	.0	.0	.95	.32

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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	.0	68.4	.0	.0	.0
2	.0	.0	69.5	.0	.0	.0
3	.0	.0	70.7	.0	.0	.0
4	.0	.0	71.9	.0	.0	.0
5	.0	.0	73.1	.0	.0	.0
6	.0	.0	74.2	.0	.0	.0
7	.0	.0	75.4	.0	.0	.0
8	.0	.0	76.6	.0	.0	.0
9	.0	.0	77.8	.0	.0	.0
10	.0	.0	78.9	.0	.0	.0
11	.0	.0	80.1	.0	.0	.0
12	.0	.0	81.3	.0	.0	.0
13	.0	.0	73.1	.0	.0	.0
14	.0	.0	74.2	.0	.0	.0
15	.0	.0	75.4	.0	.0	.0
16	.0	.0	76.6	.0	.0	.0
17	.0	.0	77.8	.0	.0	.0
18	.0	.0	78.9	.0	.0	.0
19	.0	.0	80.1	.0	.0	.0
20	.0	.0	81.3	.0	.0	.0
21	.0	.0	68.4	.0	.0	.0
22	.0	.0	69.5	.0	.0	.0
23	.0	.0	70.7	.0	.0	.0
24	.0	.0	71.9	.0	.0	.0
25	.0	.0	73.1	.0	.0	.0
26	.0	.0	74.2	.0	.0	.0
27	.0	.0	75.4	.0	.0	.0
28	.0	.0	76.6	.0	.0	.0
29	.0	.0	77.8	.0	.0	.0
30	.0	.0	78.9	.0	.0	.0
31	.0	.0	80.1	.0	.0	.0
32	.0	.0	81.3	.0	.0	.0
33	.0	.0	68.4	.0	.0	.0

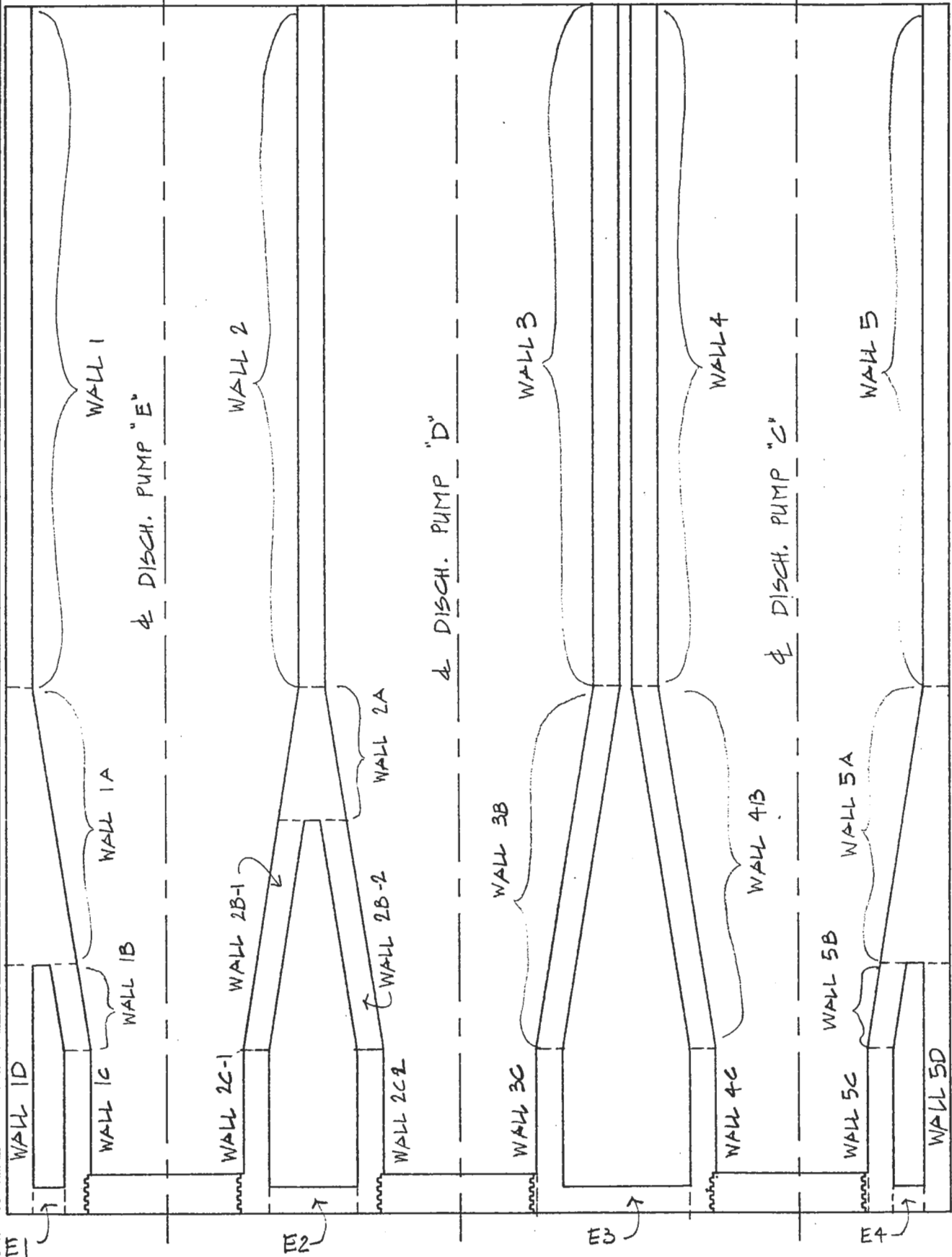
34	.0	.0	69.5	.0	.0	.0
35	.0	.0	70.7	.0	.0	.0
36	.0	.0	71.9	.0	.0	.0
37	.0	.0	73.1	.0	.0	.0
38	.0	.0	74.2	.0	.0	.0
39	.0	.0	75.4	.0	.0	.0
40	.0	.0	76.6	.0	.0	.0
41	.0	.0	77.8	.0	.0	.0
42	.0	.0	78.9	.0	.0	.0
43	.0	.0	80.1	.0	.0	.0
44	.0	.0	81.3	.0	.0	.0
45	.0	.0	73.1	.0	.0	.0
46	.0	.0	74.2	.0	.0	.0
47	.0	.0	75.4	.0	.0	.0
48	.0	.0	76.6	.0	.0	.0
49	.0	.0	77.8	.0	.0	.0
50	.0	.0	78.9	.0	.0	.0
51	.0	.0	80.1	.0	.0	.0
52	.0	.0	81.3	.0	.0	.0
53	.0	.0	68.4	.0	.0	.0
54	.0	.0	69.5	.0	.0	.0
55	.0	.0	70.7	.0	.0	.0
56	.0	.0	71.9	.0	.0	.0
57	.0	.0	73.1	.0	.0	.0
58	.0	.0	74.2	.0	.0	.0
59	.0	.0	75.4	.0	.0	.0
60	.0	.0	76.6	.0	.0	.0
61	.0	.0	77.8	.0	.0	.0
62	.0	.0	78.9	.0	.0	.0
63	.0	.0	80.1	.0	.0	.0
64	.0	.0	81.3	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	.0	137.0	.0	.0	.0
2	.0	.0	135.7	.0	.0	.0
3	.0	.0	134.4	.0	.0	.0
4	.0	.0	133.2	.0	.0	.0
5	.0	.0	131.9	.0	.0	.0
6	.0	.0	130.6	.0	.0	.0
7	.0	.0	129.3	.0	.0	.0
8	.0	.0	128.1	.0	.0	.0
9	.0	.0	126.8	.0	.0	.0
10	.0	.0	125.5	.0	.0	.0
11	.0	.0	124.2	.0	.0	.0
12	.0	.0	122.9	.0	.0	.0
13	.0	.0	131.9	.0	.0	.0
14	.0	.0	130.6	.0	.0	.0
15	.0	.0	129.3	.0	.0	.0
16	.0	.0	128.1	.0	.0	.0
17	.0	.0	126.8	.0	.0	.0
18	.0	.0	125.5	.0	.0	.0
19	.0	.0	124.2	.0	.0	.0
20	.0	.0	122.9	.0	.0	.0
21	.0	.0	137.0	.0	.0	.0
22	.0	.0	135.7	.0	.0	.0

23	.0	.0	134.4	.0	.0	.0
24	.0	.0	133.2	.0	.0	.0
25	.0	.0	131.9	.0	.0	.0
26	.0	.0	130.6	.0	.0	.0
27	.0	.0	129.3	.0	.0	.0
28	.0	.0	128.1	.0	.0	.0
29	.0	.0	126.8	.0	.0	.0
30	.0	.0	125.5	.0	.0	.0
31	.0	.0	124.2	.0	.0	.0
32	.0	.0	122.9	.0	.0	.0
33	.0	.0	137.0	.0	.0	.0
34	.0	.0	135.7	.0	.0	.0
35	.0	.0	134.4	.0	.0	.0
36	.0	.0	133.2	.0	.0	.0
37	.0	.0	131.9	.0	.0	.0
38	.0	.0	130.6	.0	.0	.0
39	.0	.0	129.3	.0	.0	.0
40	.0	.0	128.1	.0	.0	.0
41	.0	.0	126.8	.0	.0	.0
42	.0	.0	125.5	.0	.0	.0
43	.0	.0	124.2	.0	.0	.0
44	.0	.0	122.9	.0	.0	.0
45	.0	.0	131.9	.0	.0	.0
46	.0	.0	130.6	.0	.0	.0
47	.0	.0	129.3	.0	.0	.0
48	.0	.0	128.1	.0	.0	.0
49	.0	.0	126.8	.0	.0	.0
50	.0	.0	125.5	.0	.0	.0
51	.0	.0	124.2	.0	.0	.0
52	.0	.0	122.9	.0	.0	.0
53	.0	.0	137.0	.0	.0	.0
54	.0	.0	135.7	.0	.0	.0
55	.0	.0	134.4	.0	.0	.0
56	.0	.0	133.2	.0	.0	.0
57	.0	.0	131.9	.0	.0	.0
58	.0	.0	130.6	.0	.0	.0
59	.0	.0	129.3	.0	.0	.0
60	.0	.0	128.1	.0	.0	.0
61	.0	.0	126.8	.0	.0	.0
62	.0	.0	125.5	.0	.0	.0
63	.0	.0	124.2	.0	.0	.0
64	.0	.0	122.9	.0	.0	.0

FDN SLAB DESIGN & PILE LAYOUT.



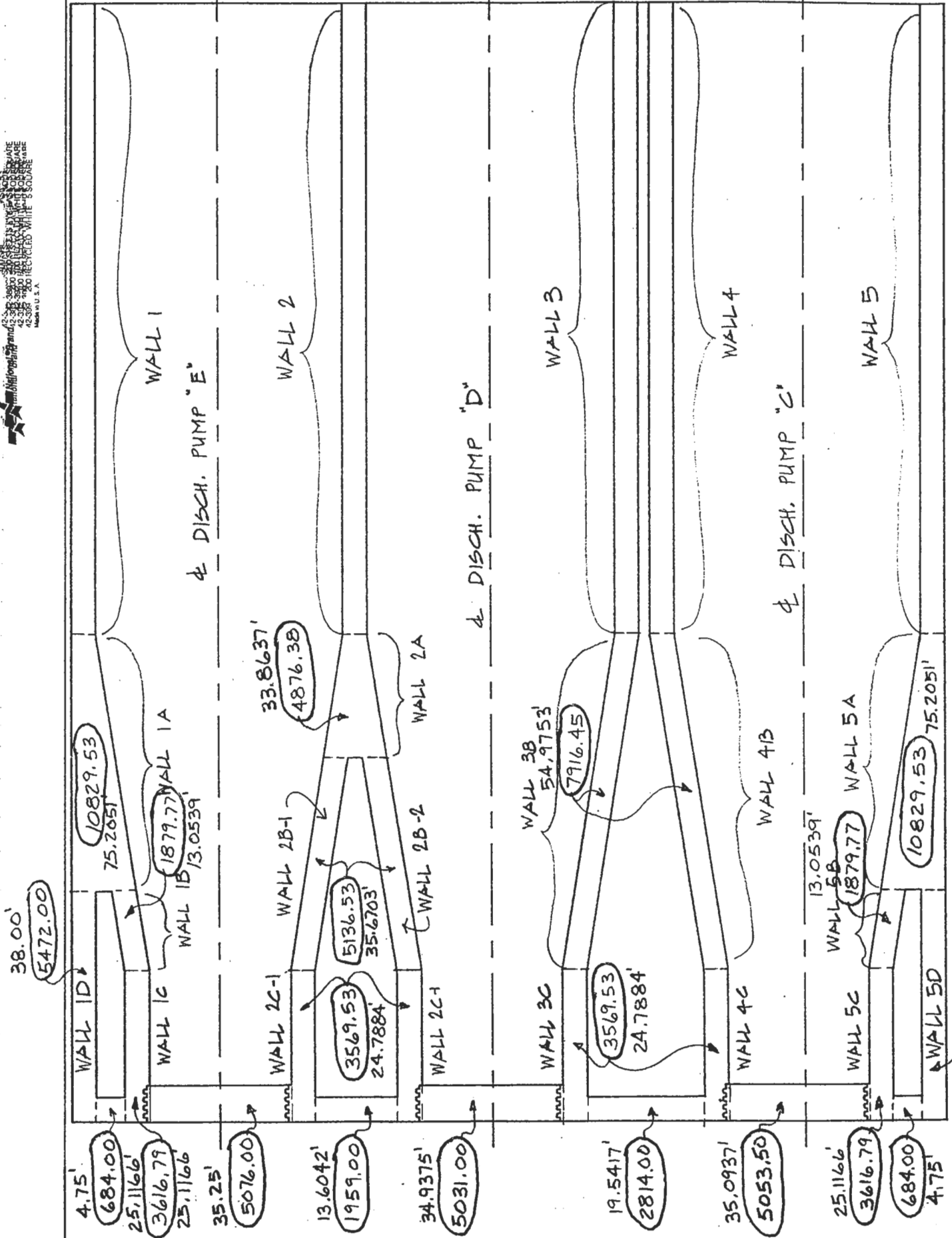
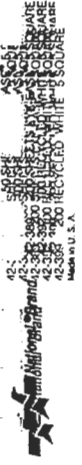
PLAN - DISCH. TUBE



42 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
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MADRID S.A.



# PILE LAYOUT DESIGN



CROSS SECTIONAL AREAS OF WALLS

5472.00  
38.00

FILE LAYOUT DESIGN

2-2

\*\*\* PROGRAM GAIP \*\*\* CORPS - X0018 \*\*\*

\*\*\*  
\*\*\* GEOMETRICAL ANALYSIS OF REGIONS BOUNDED BY \*\*\*  
\*\*\* STRAIGHT LINES AND CIRCULAR ARCS \*\*\*

DATA POINTS GO AROUND THE REGION, WITH THE ENCLOSED AREA TO THE LEFT. THE LAST POINT MUST BE A DUPLICATE OF THE FIRST. FOR VOLUMES, THE AXIS OF REVOLUTION MUST NOT LIE INSIDE THE REGION--ON ONE EDGE IS OK.

INPUT 1 FOR COMPACT LINE SPACING  
0 FOR PAGED SPACING AS DESCRIBED IN USER GUIDE  
1

INPUT BOUNDARY POINTS AS:  
X-COORD., Y-COORD., INDEX

WHERE

INDEX = 1 FOR BEGINNING OF STRAIGHT LINE SEGMENT  
2 FOR BEGINNING OF CIRCULAR ARC  
3 FOR INTERMEDIATE POINT ON CIRCULAR ARC  
4 FOR CENTER OF A CIRCULAR ARC  
GENERATED IN A CLOCKWISE SENSE  
5 FOR CENTER OF A CIRCULAR ARC  
GENERATED IN A COUNTERCLOCKWISE SENSE  
6 FOR FINAL POINT (REPEAT OF FIRST POINT)  
(100 POINTS MAX):

0.000000E+00	13.750000	1
41.720000	13.750000	1
47.050000	12.300000	2
48.830000	11.540000	3
52.130000	11.250000	1
52.130000	19.250000	2
50.210000	19.420000	3
49.350000	19.650000	1
6.920000	31.410000	2
4.490000	31.940000	3
0.000000E+00	32.330000	1
0.000000E+00	13.750000	6

INPUT 1 FOR ALGEBRAIC EQUATIONS OF BOUNDARY SEGMENTS  
0 TO OMIT THIS OUTPUT  
0

TO GET POINTS ON THE BOUNDARY AND KERN, INPUT THE MINIMUM ARC INCREMENT BETWEEN ADJACENT BOUNDARY POINTS.  
INPUT ZERO FOR NO SUCH TABULATION OR GRAPH  
.00000

ENTER A ONE, TWO, OR THREE TO COMPUTE AREA  
PROPERTIES ONLY, VOLUME PROPERTIES ONLY, OR BOTH  
1

\*\*\* AREA PROPERTIES \*\*\*

AREA= 6.5721E+02  
XBAR= 2.1713E+01  
YBAR= 2.0403E+01  
ARC = 1.3295E+02= TOTAL PERIMETER

# PILE LAYOUT DESIGN

0007

## INERTIA PROPERTIES

IXX= 4.4992E+05 (INTEGRAL OF X\*X\*DA) ABOUT Y-AXIS  
IYY= 2.8764E+05 (INTEGRAL OF Y\*Y\*DA) ABOUT X-AXIS  
IXY= 2.7055E+05

## PRINCIPAL PROPERTIES

IUU= 6.5124E+05  
IVV= 8.6328E+04  
THETA-UU= 3.6653E+01

ANGLES ARE MEASURED COUNTERCLOCKWISE FROM THE  
PLUS X AXIS

## MOMENTS OF INERTIA ABOUT PARALLEL CENTROIDAL AXES

IXX= 1.4007E+05 (INTEGRAL OF X\*X\*DA) ABOUT Y-AXIS  
IYY= 1.4054E+04 (INTEGRAL OF Y\*Y\*DA) ABOUT X-AXIS  
IXY=-2.0608E+04

## PRINCIPAL PROPERTIES FOR CENTROIDAL AXES

IUU= 1.4335E+05  
IVV= 1.0769E+04  
THETA-UU= 1.7094E+02

IF PROPERTIES ARE REQUIRED FOR SHIFTED AXES, INPUT THE COORDINATES OF THE SHIFT  
ANGLE OF THE SHIFTED X-AXIS. INPUT 0,0,0 TO CONTINUE.

FOR SHIFTED AXIS WITH ORIGIN AT

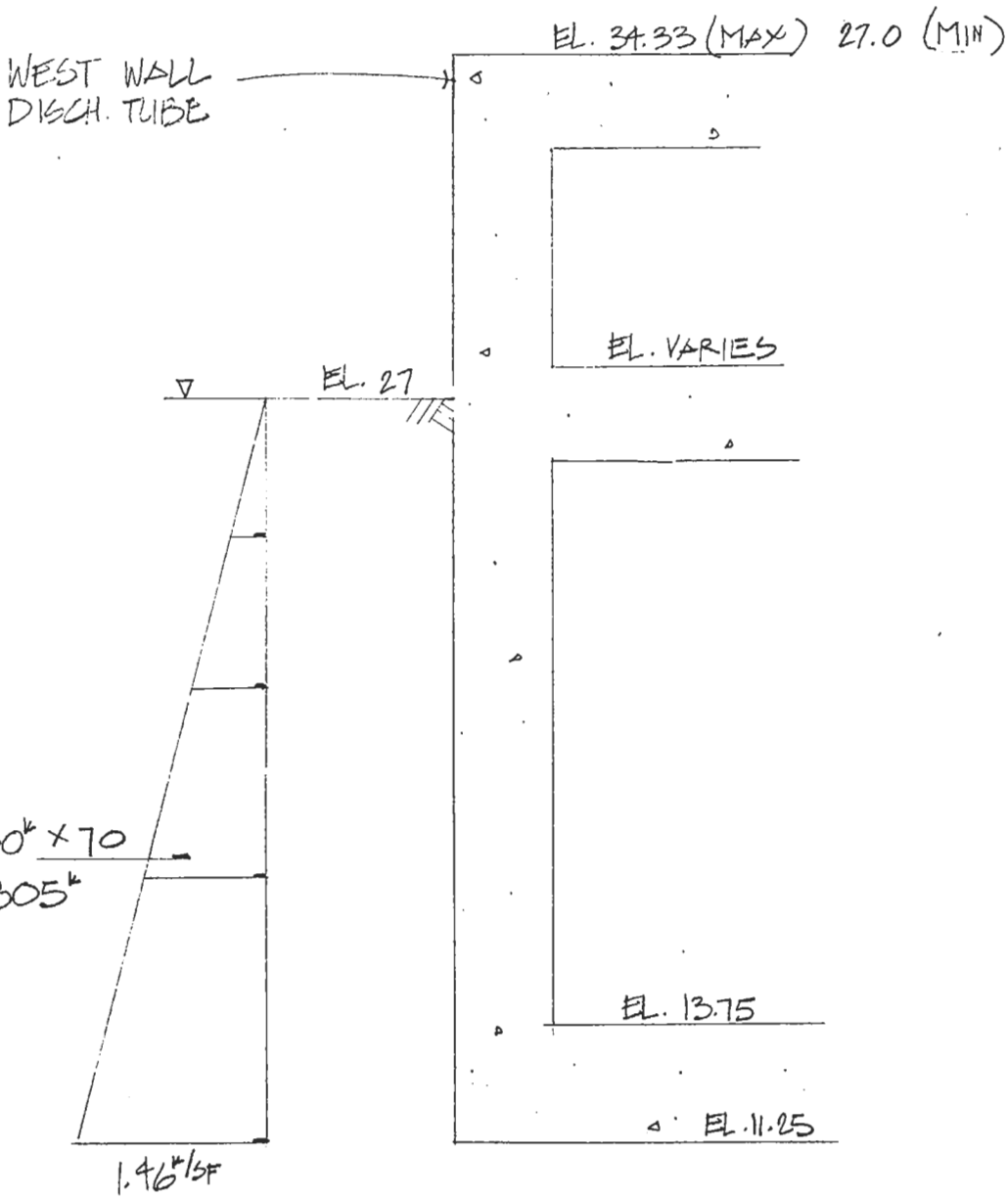
X= 0.0000E+00 Y= 0.0000E+00  
AND ANGLE OF INCLINATION= 0.0000E+00 DEG



# PILE LAYOUT DESIGN

## EARTH PRESSURE (WEST WALL)

1. ASSUME GROUND & GW EL. @ 27.0
2. ASSUME GRANULAR BACKFILL.



EARTH PRESSURE\*  
(SUBMERGED EARTH & GW)

\* APPLIES TO 70.14' LENGTH BEGINNING @ SO. END.

13,782  
42,382  
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42,389  
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42,389  
MADE IN U.S.A.

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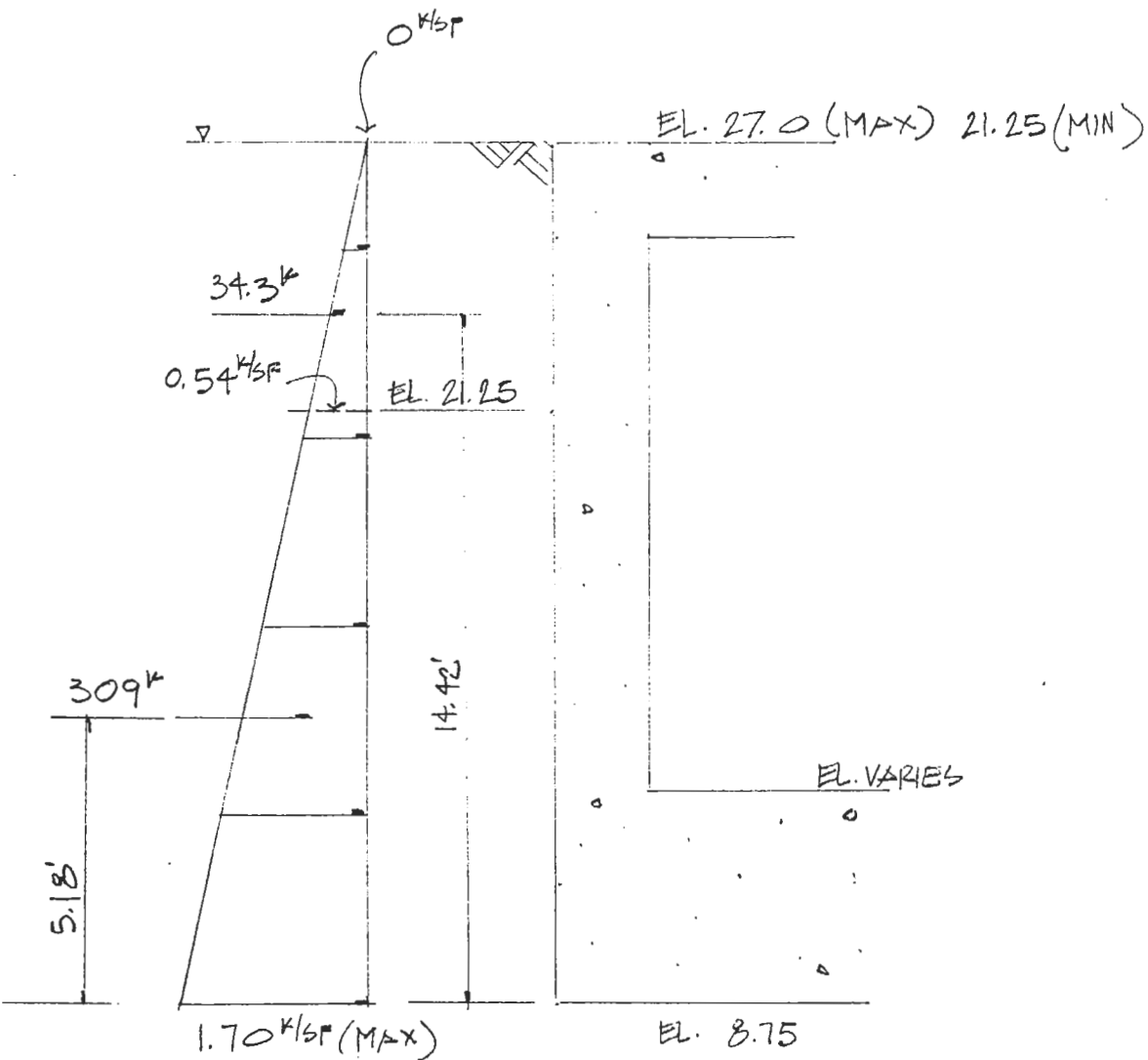
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PILE LAYOUT DESIGN

EARTH PRESSURE (WEST WALL)

13.782 SHEETS OF  
 42.381 SQUARE  
 42.382 SQUARE  
 100 SHEETS EYE LASH 5 SQUARE  
 200 SHEETS EYE LASH 5 SQUARE  
 42.389 SQUARE  
 42.390 SQUARE  
 200 RECYCLED WHITE 5 SQUARE  
 Made in U.S.A.  
 National Brand



EARTH PRESSURE  
 (SUBMERGED EARTH & GW)

\* APPLIES TO 22.08' LENGTH IMMEDIATELY SOUTH OF SLUICE GATE STRUCTURE

# PILE LAYOUT DESIGN

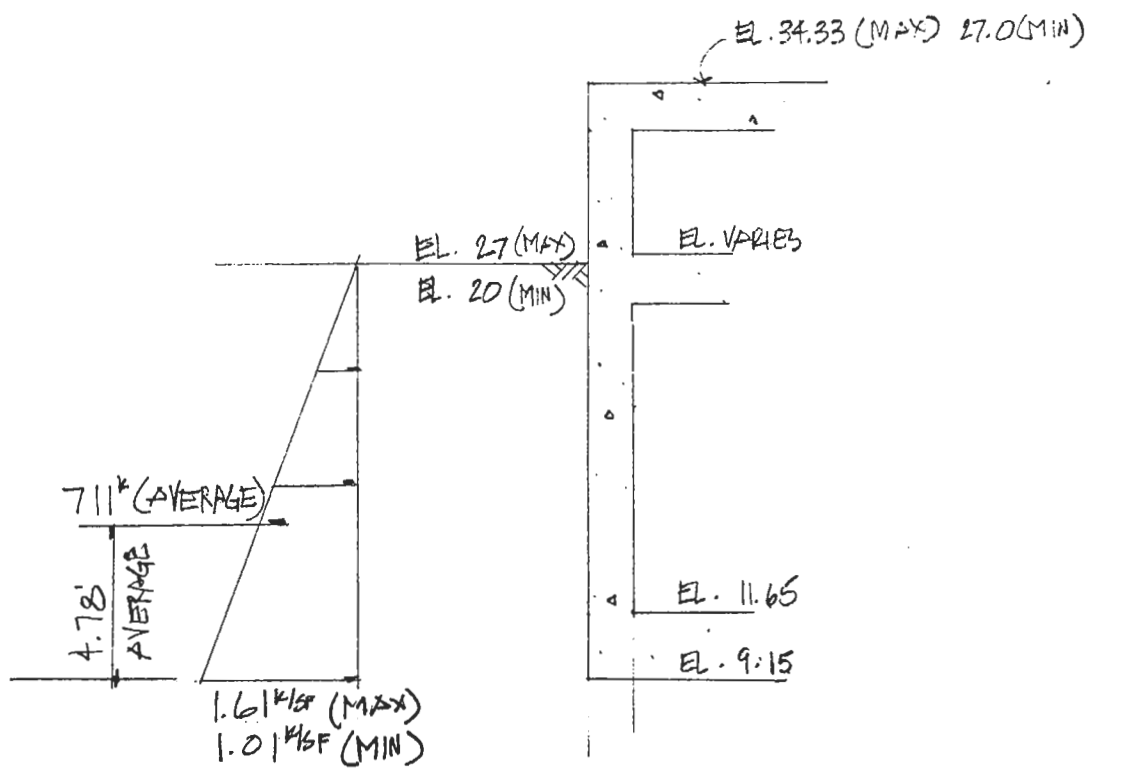
## EARTH PRESSURE (EAST WALL)

1. ASSUME GROUND EL. @ 27 IMMEDIATELY SOUTH OF GATE STRUCTURE FOR A DISTANCE OF 22.083'
2. ASSUME GROUND EL TO VARY FROM EL. 27 @ AFORESAID LOCATION TO EL. 20 @ SOUTH END OF DISCH. TUBE.
3. ASSUME GROUND WATER @ TOP OF GROUND.

1. GROUND @ EL. 27. 22.083' SECTION IMMEDIATELY SO. OF GATE STRUCTURE

TOTAL LATERAL LOAD =  $309k + 34.3k$  SEE PG. PRESSURE DIAG. FOR WEST WALL

2. GROUND EL. VARIES FROM EL. 27 TO 20. 70.14' LONG SECTION FROM ABOVE LOCATION TO SO. END OF DISCH. TUBE



# PILE LAYOUT DESIGN

## UPLIFT PRESSURE

1. ASSUME GW @ EL. 27.0 FOR ENTIRE FDN SLAB FOR UPLIFT COMPUTATIONS. (DISREGARD SLOPING GROUND AGAINST EAST WALL)
2. ASSUME BOT OF FDN SLAB @ EL. 11.25. (IGNORE DEVIATION FROM THIS EL. @ PUMP "C")

∴ UPLIFT PRESSURE =  $.0625 (27 - 11.25) = 0.9844 \text{ Hsf}$

∴ TOTAL UPLIFT LOAD ACTING @ C.G. OF FDN SLAB

=  $0.9844 \times 72.42' \times 92.23'$

= 6582 kips.

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# PILE LAYOUT DESIGN

## COMPUTE CONCRETE WEIGHT.

### 1. TOP SLAB 2'-0" THK

(A) 40.1' LENGTH FROM SO. END. =  $40.1 \times 72.42 \times 2 \times 0.15$   
= 871k @ 20.05' FROM SO. END.

(B) REST OF DISCH. TUBE (52.23' LENGTH) =  $54.54 \times 72.42 \times 2 \times 0.15$   
= 1185k @ 66.2' FROM SO. END.

∴ TOTAL = 871k + 1185k = 2056k @ 46.64' FROM SO. END.

### 2. BOT SLAB 2'-0" THK

218 (S.F.) × 72.42' (WIDE) × 0.15 = 2368k @ 46' FROM SO. END.

### 3. FOUNDATION SLAB

199 (S.F.) × 72.42' (WIDE) × 0.15 = 2161k @ 40.5' FROM SO. END.

### 4. WALLS.

(A) 52.23' LENGTH OF WALL IMMEDIATELY SOUTH OF GATE STRUCTURE

WALL 1	657 SF × 2 × 0.15	=	197k
WALL 2			197k
WALL 3			197k
WALL 4			197k
WALL 5			197k
<hr/>			
TOTAL WALLS 1 THRU 5		=	985k

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MADE IN U.S.A.



PILE LAYOUT DESIGN

## 4. WALLS CONTD..

(B) WALLS 1A, 2A & 5A

WALL 1A	$75.20 \text{ (SF)} \times (32.33 - 13.75) \times 0.15$	= 210 <sup>k</sup>
WALL 5A	$75.20 \text{ (SF)} \times (32.33 - 11.65) \times 0.15$	= 233 <sup>k</sup>
WALL 2A	$= 33.9 \text{ (SF)} \times (32.33 - 13.75) \times 0.15$	= 95 <sup>k</sup>

(C) WALLS 1B, 2B-1, 2B-2, 3B, 4B, 5B

WALL 1B	$13.05 \text{ (SF)} \times (32.33 - 13.75) \times 0.15$	= 36 <sup>k</sup>
WALL 5B	$13.05 \text{ (SF)} \times (32.33 - 11.65) \times 0.15$	= 40 <sup>k</sup>
WALL 2B-1	$35.67 \text{ (SF)} \times (32.33 - 13.75) \times 0.15$	= 99 <sup>k</sup>
WALL 2B-2	$35.67 \text{ (SF)} \times (32.33 - 13.75) \times 0.15$	= 99 <sup>k</sup>
WALL 3B	$55 \text{ (SF)} \times (32.33 - 11.65) \times 0.15$	= 172 <sup>k</sup>
WALL 4B	$55 \text{ (SF)} \times (32.33 - 11.65) \times 0.15$	= 172 <sup>k</sup>

(D) WALLS 1C, 2C-1, 2C-2, 3C, 4C, 5C

WALL 1C	$24.79 \text{ (SF)} \times (32.33 - 13.75) \times 0.15$	= 69 <sup>k</sup>
WALL 2C-1		= 69 <sup>k</sup>
WALL 2C-2		= 69 <sup>k</sup>
WALL 3C		= 69 <sup>k</sup>
WALL 4C	$24.79 \text{ (SF)} \times (32.33 - 11.65) \times 0.15$	= 77 <sup>k</sup>
WALL 5C		= 77 <sup>k</sup>

(E) WALLS 1D & 5D

WALL 1D	$38 \text{ (SF)} \times (32.33 - 13.75) \times 0.15$	= 106 <sup>k</sup>
WALL 5D	$38 \text{ (SF)} \times (32.33 - 11.65) \times 0.15$	= 118 <sup>k</sup>

(F) WALLS E1, E2, E3, E4

WALL E1	$4.75 \text{ (SF)} \times (32.33 - 13.75) \times 0.15$	= 15 <sup>k</sup>
WALL E4	$4.75 \text{ (SF)} \times (32.33 - 11.65) \times 0.15$	= 15 <sup>k</sup>
WALL E2	$13.60 \text{ (SF)} \times (32.33 - 13.75) \times 0.15$	= 38 <sup>k</sup>
WALL E3	$19.50 \text{ (SF)} \times (32.33 - 13.75) \times 0.15$	= 54 <sup>k</sup>

PILE LAYOUT DESIGN  
CONC. LOADS

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ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM			MX (FT-K)	MY (FT-K)	MZ (FT-K)
				X (FT)	Y (FT)	Z (FT)			
1. 2'-0" TOP SLAB			807		26.06		-21030		
2. 2'-0" TOP SLAB			1185		20.08		23794		
3. 2'-0" BOT SLAB			2368		0.11		-271		
4. 2'-6" FDN SLAB			2161		5.61		-12133		
5 WALL 1			197	35.21	15.7'		1125	-6936	
6 WALL 2			197	12.71	15.7'		1125	-2504	
7 WALL 3			197	9.79	15.7'		1125	1929	
8 WALL 4			197	12.71	15.7'		1125	6936	
9 WALL 5			197	35.21	15.7'		1125	2504	
10 WALL 1A			210	34.23	18.5		-3885	-7188	
11 WALL 2A			95	12.71	12.06		-1146	-1207	
12 WALL 5A			233	34.23	18.5		-4311	7976	
13 WALL 1B			36	31.42	31		-1116	-1131	
14 WALL 2B-1			99	15.75	25.75		-2549	-1559	
15 WALL 2B-2			99	9.75	25.75		-2549	-965	
16 WALL 3B			172	7.50	20		-3440	1290	
17 WALL 4B			172	15.0	20		-3440	2580	
18 WALL 5B			40	31.42	31		-1240	1256	

# PILE LAYOUT DESIGN CONC. LOADS

42-86081 50 SHEETS  
 42-86082 100 SHEETS  
 42-86083 150 SHEETS  
 42-86084 200 SHEETS  
 42-86085 250 SHEETS  
 42-86086 300 SHEETS  
 42-86087 350 SHEETS  
 42-86088 400 SHEETS  
 42-86089 450 SHEETS  
 42-86090 500 SHEETS  
 42-86091 550 SHEETS  
 42-86092 600 SHEETS  
 42-86093 650 SHEETS  
 42-86094 700 SHEETS  
 42-86095 750 SHEETS  
 42-86096 800 SHEETS  
 42-86097 850 SHEETS  
 42-86098 900 SHEETS  
 42-86099 950 SHEETS  
 42-86100 1000 SHEETS

ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM			MX (FT-K)	MY (FT-K)	MZ (FT-K)
				X (FT)	Y (FT)	Z (FT)			
19 WALL 1C			69	31	39.87		-2751	-2139	
20 WALL 2C-1			69	17	39.87		-2751	-1173	
21 WALL 2C-2			69	8.33	39.87		-2751	-575	
22 WALL 3C			69	5.67	39.87		-2751	391	
23 WALL 4C			77	17	39.87		-3070	1309	
24 WALL 5C			77	31	39.87		-3070	2387	
25 WALL 1D			106	35.2	37.25		-3949	-3731	
26 WALL 5D			118	35.2	37.25		-4396	4154	
27 WALL E1			13	33.33	45.11		-586	-433	
28 WALL E2			38	12.5	45.11		-1714	-475	
29 WALL E3			54	11.4	45.11		-2436	616	
30 WALL E4			15	33.33	45.11		-677	500	
<b>TOTAL CONC. LOAD</b>			<u>9436</u>				<u>-58593</u>	<u>3812</u>	



# PILE LAYOUT DESIGN

## WT. OF WATER IN DISCH. TUBES

ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM			MX (FT-K)	MY (FT-K)	MZ (FT-K)
				X (FT)	Y (FT)	Z (FT)			
36000 <sup>CF</sup> x 0.0625	-	-	2250	-	-	-	-	-	-

7081 7082  
 42-388 42-389 42-390 42-391 42-392 42-393 42-394 42-395 42-396 42-397 42-398 42-399 42-400 42-401 42-402 42-403 42-404 42-405 42-406 42-407 42-408 42-409 42-410 42-411 42-412 42-413 42-414 42-415 42-416 42-417 42-418 42-419 42-420 42-421 42-422 42-423 42-424 42-425 42-426 42-427 42-428 42-429 42-430 42-431 42-432 42-433 42-434 42-435 42-436 42-437 42-438 42-439 42-440 42-441 42-442 42-443 42-444 42-445 42-446 42-447 42-448 42-449 42-450 42-451 42-452 42-453 42-454 42-455 42-456 42-457 42-458 42-459 42-460 42-461 42-462 42-463 42-464 42-465 42-466 42-467 42-468 42-469 42-470 42-471 42-472 42-473 42-474 42-475 42-476 42-477 42-478 42-479 42-480 42-481 42-482 42-483 42-484 42-485 42-486 42-487 42-488 42-489 42-490 42-491 42-492 42-493 42-494 42-495 42-496 42-497 42-498 42-499 42-500 42-501 42-502 42-503 42-504 42-505 42-506 42-507 42-508 42-509 42-510 42-511 42-512 42-513 42-514 42-515 42-516 42-517 42-518 42-519 42-520 42-521 42-522 42-523 42-524 42-525 42-526 42-527 42-528 42-529 42-530 42-531 42-532 42-533 42-534 42-535 42-536 42-537 42-538 42-539 42-540 42-541 42-542 42-543 42-544 42-545 42-546 42-547 42-548 42-549 42-550 42-551 42-552 42-553 42-554 42-555 42-556 42-557 42-558 42-559 42-560 42-561 42-562 42-563 42-564 42-565 42-566 42-567 42-568 42-569 42-570 42-571 42-572 42-573 42-574 42-575 42-576 42-577 42-578 42-579 42-580 42-581 42-582 42-583 42-584 42-585 42-586 42-587 42-588 42-589 42-590 42-591 42-592 42-593 42-594 42-595 42-596 42-597 42-598 42-599 42-600 42-601 42-602 42-603 42-604 42-605 42-606 42-607 42-608 42-609 42-610 42-611 42-612 42-613 42-614 42-615 42-616 42-617 42-618 42-619 42-620 42-621 42-622 42-623 42-624 42-625 42-626 42-627 42-628 42-629 42-630 42-631 42-632 42-633 42-634 42-635 42-636 42-637 42-638 42-639 42-640 42-641 42-642 42-643 42-644 42-645 42-646 42-647 42-648 42-649 42-650 42-651 42-652 42-653 42-654 42-655 42-656 42-657 42-658 42-659 42-660 42-661 42-662 42-663 42-664 42-665 42-666 42-667 42-668 42-669 42-670 42-671 42-672 42-673 42-674 42-675 42-676 42-677 42-678 42-679 42-680 42-681 42-682 42-683 42-684 42-685 42-686 42-687 42-688 42-689 42-690 42-691 42-692 42-693 42-694 42-695 42-696 42-697 42-698 42-699 42-700 42-701 42-702 42-703 42-704 42-705 42-706 42-707 42-708 42-709 42-710 42-711 42-712 42-713 42-714 42-715 42-716 42-717 42-718 42-719 42-720 42-721 42-722 42-723 42-724 42-725 42-726 42-727 42-728 42-729 42-730 42-731 42-732 42-733 42-734 42-735 42-736 42-737 42-738 42-739 42-740 42-741 42-742 42-743 42-744 42-745 42-746 42-747 42-748 42-749 42-750 42-751 42-752 42-753 42-754 42-755 42-756 42-757 42-758 42-759 42-760 42-761 42-762 42-763 42-764 42-765 42-766 42-767 42-768 42-769 42-770 42-771 42-772 42-773 42-774 42-775 42-776 42-777 42-778 42-779 42-780 42-781 42-782 42-783 42-784 42-785 42-786 42-787 42-788 42-789 42-790 42-791 42-792 42-793 42-794 42-795 42-796 42-797 42-798 42-799 42-800 42-801 42-802 42-803 42-804 42-805 42-806 42-807 42-808 42-809 42-810 42-811 42-812 42-813 42-814 42-815 42-816 42-817 42-818 42-819 42-820 42-821 42-822 42-823 42-824 42-825 42-826 42-827 42-828 42-829 42-830 42-831 42-832 42-833 42-834 42-835 42-836 42-837 42-838 42-839 42-840 42-841 42-842 42-843 42-844 42-845 42-846 42-847 42-848 42-849 42-850 42-851 42-852 42-853 42-854 42-855 42-856 42-857 42-858 42-859 42-860 42-861 42-862 42-863 42-864 42-865 42-866 42-867 42-868 42-869 42-870 42-871 42-872 42-873 42-874 42-875 42-876 42-877 42-878 42-879 42-880 42-881 42-882 42-883 42-884 42-885 42-886 42-887 42-888 42-889 42-890 42-891 42-892 42-893 42-894 42-895 42-896 42-897 42-898 42-899 42-900 42-901 42-902 42-903 42-904 42-905 42-906 42-907 42-908 42-909 42-910 42-911 42-912 42-913 42-914 42-915 42-916 42-917 42-918 42-919 42-920 42-921 42-922 42-923 42-924 42-925 42-926 42-927 42-928 42-929 42-930 42-931 42-932 42-933 42-934 42-935 42-936 42-937 42-938 42-939 42-940 42-941 42-942 42-943 42-944 42-945 42-946 42-947 42-948 42-949 42-950 42-951 42-952 42-953 42-954 42-955 42-956 42-957 42-958 42-959 42-960 42-961 42-962 42-963 42-964 42-965 42-966 42-967 42-968 42-969 42-970 42-971 42-972 42-973 42-974 42-975 42-976 42-977 42-978 42-979 42-980 42-981 42-982 42-983 42-984 42-985 42-986 42-987 42-988 42-989 42-990 42-991 42-992 42-993 42-994 42-995 42-996 42-997 42-998 42-999 43-000  
 Made in U.S.A.

# PILE LAYOUT DESIGN

## UPLIFT LOADS

ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM			MX (FT-K)	MY (FT-K)	MZ (FT-K)
				X (FT)	Y (FT)	Z (FT)			
UPLIFT	-	-	-6582				-	-	-

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PILE LAYOUT DESIGN

EARTH PRESSURE (GW @ TOP OF GROUND)

ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM			MX (FT-K)	MY (FT-K)	MZ (FT-K)
				X (FT)	Y (FT)	Z (FT)			
1 @ WEST WALL	-805	-	-	-	11.04'	5.25	-	4226	8855
2 @ WEST WALL	-309	-	-	-	35.07	5.18	-	1600	10837
3 @ WEST WALL	-34	-	-	-	31.40	14.42'	-	490	1068
4 @ EAST WALL	711				22.73	4.78		-3399	-16161
5 @ EAST WALL	309				35.07	5.18		-1600	-10837
6 @ EAST WALL	34				31.40	14.42		-490	-1068
TOTAL EARTH LOAD	-94							827	-7306

EARTH PRESSURE (WHEN GW @ BOT OF FDM SLAB)

TOTAL EARTH PRESSURE	-60							533	-4714
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 \* CORPS PROGRAM # X0080 \*  
 \* VERSION NUMBER # 86/09/02-C \*  
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CPGA - CASE FILE GROUP ANALYSIS PROGRAM  
 RUN DATE 02-08-95 RUN TIME 22:31:40

DISCHARGE TUBE FOR PUMPS C D AND E

THERE ARE 116 PILES AND  
 2 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

	X	Y	Z
	-----	-----	-----
WITH DIAGONAL COORDINATES = (	-34.96 ,	-44.00 ,	.00 )
	( 34.96 ,	44.00 ,	.00 )

\*\*\*\*\*

PILE PROPERTIES AS INPUT

E	I1	I2	A	C33	B66
KSI	IN**4	IN**4	IN**2		
.29000E+05	.72400E+03	.26100E+03	.21400E+02	.20000E+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
	.79000E-01	L	.78000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

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PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	34.96	44.00	.00	V	.00	78.00	P
2	34.96	36.00	.00	V	.00	78.00	P
3	34.96	28.00	.00	V	.00	78.00	P
4	34.96	20.00	.00	V	.00	78.00	P
5	34.96	12.00	.00	V	.00	78.00	P
6	34.96	4.00	.00	V	.00	78.00	P

7	34.96	-4.00	.00	V	.00	78.00	P
8	34.96	-12.00	.00	V	.00	78.00	P
9	34.96	-20.00	.00	V	.00	78.00	P
10	34.96	-28.00	.00	V	.00	78.00	P
11	34.96	-36.00	.00	V	.00	78.00	P
12	34.96	-44.00	.00	V	.00	78.00	P
13	26.21	44.00	.00	V	.00	78.00	P
14	26.21	36.00	.00	V	.00	78.00	P
15	26.21	28.00	.00	V	.00	78.00	P
16	26.21	20.00	.00	V	.00	78.00	P
17	26.21	12.00	.00	V	.00	78.00	P
18	26.21	4.00	.00	V	.00	78.00	P
19	26.21	-4.00	.00	V	.00	78.00	P
20	26.21	-12.00	.00	V	.00	78.00	P
21	26.21	-20.00	.00	V	.00	78.00	P
22	26.21	-28.00	.00	V	.00	78.00	P
23	26.21	-36.00	.00	V	.00	78.00	P
24	26.21	-44.00	.00	V	.00	78.00	P
25	20.21	44.00	.00	V	.00	78.00	P
26	20.21	36.00	.00	V	.00	78.00	P
27	20.21	28.00	.00	V	.00	78.00	P
28	20.21	20.00	.00	V	.00	78.00	P
29	20.21	12.00	.00	V	.00	78.00	P
30	20.21	4.00	.00	V	.00	78.00	P
31	20.21	-4.00	.00	V	.00	78.00	P
32	20.21	-12.00	.00	V	.00	78.00	P
33	20.21	-20.00	.00	V	.00	78.00	P
34	20.21	-28.00	.00	V	.00	78.00	P
35	20.21	-36.00	.00	V	.00	78.00	P
36	20.21	-44.00	.00	V	.00	78.00	P
37	14.21	44.00	.00	V	.00	78.00	P
38	14.21	36.00	.00	V	.00	78.00	P
39	14.21	28.00	.00	V	.00	78.00	P
40	14.21	20.00	.00	V	.00	78.00	P
41	14.21	12.00	.00	V	.00	78.00	P
42	14.21	4.00	.00	V	.00	78.00	P
43	14.21	-4.00	.00	V	.00	78.00	P
44	14.21	-12.00	.00	V	.00	78.00	P
45	14.21	-20.00	.00	V	.00	78.00	P
46	14.21	-28.00	.00	V	.00	78.00	P
47	14.21	-36.00	.00	V	.00	78.00	P
48	14.21	-44.00	.00	V	.00	78.00	P
49	2.21	44.00	.00	V	.00	78.00	P
50	2.21	36.00	.00	V	.00	78.00	P
51	2.21	28.00	.00	V	.00	78.00	P
52	2.21	20.00	.00	V	.00	78.00	P
53	2.21	12.00	.00	V	.00	78.00	P
54	2.21	4.00	.00	V	.00	78.00	P
55	2.21	-4.00	.00	V	.00	78.00	P
56	2.21	-12.00	.00	V	.00	78.00	P
57	2.21	-20.00	.00	V	.00	78.00	P
58	2.21	-28.00	.00	V	.00	78.00	P
59	2.21	-36.00	.00	V	.00	78.00	P
60	2.21	-44.00	.00	V	.00	78.00	P
61	-14.21	44.00	.00	V	.00	78.00	P
62	-14.21	36.00	.00	V	.00	78.00	P
63	-14.21	28.00	.00	V	.00	78.00	P
64	-14.21	20.00	.00	V	.00	78.00	P
65	-14.21	12.00	.00	V	.00	78.00	P
66	-14.21	4.00	.00	V	.00	78.00	P

67	-14.21	-4.00	.00	V	.00	78.00	P
68	-14.21	-12.00	.00	V	.00	78.00	P
69	-14.21	-20.00	.00	V	.00	78.00	P
70	-14.21	-28.00	.00	V	.00	78.00	P
71	-14.21	-36.00	.00	V	.00	78.00	P
72	-14.21	-44.00	.00	V	.00	78.00	P
73	-20.21	44.00	.00	V	.00	78.00	P
74	-20.21	36.00	.00	V	.00	78.00	P
75	-20.21	28.00	.00	V	.00	78.00	P
76	-20.21	20.00	.00	V	.00	78.00	P
77	-20.21	12.00	.00	V	.00	78.00	P
78	-20.21	4.00	.00	V	.00	78.00	P
79	-20.21	-4.00	.00	V	.00	78.00	P
80	-20.21	-12.00	.00	V	.00	78.00	P
81	-20.21	-20.00	.00	V	.00	78.00	P
82	-20.21	-28.00	.00	V	.00	78.00	P
83	-20.21	-36.00	.00	V	.00	78.00	P
84	-20.21	-44.00	.00	V	.00	78.00	P
85	-26.21	44.00	.00	V	.00	78.00	P
86	-26.21	36.00	.00	V	.00	78.00	P
87	-26.21	28.00	.00	V	.00	78.00	P
88	-26.21	20.00	.00	V	.00	78.00	P
89	-26.21	12.00	.00	V	.00	78.00	P
90	-26.21	4.00	.00	V	.00	78.00	P
91	-26.21	-4.00	.00	V	.00	78.00	P
92	-26.21	-12.00	.00	V	.00	78.00	P
93	-26.21	-20.00	.00	V	.00	78.00	P
94	-26.21	-28.00	.00	V	.00	78.00	P
95	-26.21	-36.00	.00	V	.00	78.00	P
96	-26.21	-44.00	.00	V	.00	78.00	P
97	-34.96	44.00	.00	V	.00	78.00	P
98	-34.96	36.00	.00	V	.00	78.00	P
99	-34.96	28.00	.00	V	.00	78.00	P
100	-34.96	20.00	.00	V	.00	78.00	P
101	-34.96	12.00	.00	V	.00	78.00	P
102	-34.96	4.00	.00	V	.00	78.00	P
103	-34.96	-4.00	.00	V	.00	78.00	P
104	-34.96	-12.00	.00	V	.00	78.00	P
105	-34.96	-20.00	.00	V	.00	78.00	P
106	-34.96	-28.00	.00	V	.00	78.00	P
107	-34.96	-36.00	.00	V	.00	78.00	P
108	-34.96	-44.00	.00	V	.00	78.00	P
109	8.21	-20.00	.00	V	.00	78.00	P
110	8.21	-28.00	.00	V	.00	78.00	P
111	8.21	-36.00	.00	V	.00	78.00	P
112	8.21	-44.00	.00	V	.00	78.00	P
113	-6.00	-20.00	.00	V	.00	78.00	P
114	-6.00	-28.00	.00	V	.00	78.00	P
115	-6.00	-36.00	.00	V	.00	78.00	P
116	-6.00	-44.00	.00	V	.00	78.00	P

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9048.00

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APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
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1	-94.0	.0	7065.0	-34493.0	4639.0	-7306.0
2	-60.0	.0	13647.0	-34493.0	4345.0	-4714.0

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ORIGINAL PILE GROUP STIFFNESS MATRIX

.64110E+03	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.16978E+05
.00000E+00	.82737E+03	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.30265E+04
.00000E+00	.00000E+00	.15382E+06	-.40737E+07	-.56268E+06	.00000E+00	.00000E+00
.00000E+00	.00000E+00	-.40737E+07	.17415E+11	.54017E+08	.00000E+00	.00000E+00
.00000E+00	.00000E+00	-.56268E+06	.54017E+08	.11637E+11	.00000E+00	.00000E+00
.16978E+05	.30265E+04	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.13517E+09

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.

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PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	-.1299E+00	.2313E-02	.4561E-01	-.1312E-04	.7050E-05	-.6323E-03
2	-.8278E-01	.1493E-02	.8867E-01	-.3054E-05	.8782E-05	-.4081E-03

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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
1	1.1	-1.9	47.4	-109.1	-50.8	.0	.36	.30
2	.8	-1.9	49.0	-109.1	-35.7	.0	.38	.30
3	.5	-1.9	50.7	-109.1	-20.6	.0	.39	.30
4	.1	-1.9	52.4	-109.1	-5.4	.0	.40	.29
5	-.2	-1.9	54.1	-109.1	9.7	.0	.42	.30
6	-.6	-1.9	55.7	-109.1	24.8	.0	.43	.31
7	-.9	-1.9	57.4	-109.1	39.9	.0	.44	.32
8	-1.2	-1.9	59.1	-109.1	55.0	.0	.45	.33
9	-1.6	-1.9	60.7	-109.1	70.1	.0	.47	.34

10	-1.9	-1.9	62.4	-109.1	85.2	.0	.48	.36
11	-2.2	-1.9	64.1	-109.1	100.4	.0	.49	.37
12	-2.6	-1.9	65.7	-109.1	115.5	.0	.51	.38
13	1.1	-1.4	48.4	-81.5	-50.8	.0	.37	.26
14	.8	-1.4	50.0	-81.5	-35.7	.0	.38	.26
15	.5	-1.4	51.7	-81.5	-20.6	.0	.40	.26
16	.1	-1.4	53.4	-81.5	-5.4	.0	.41	.26
17	-.2	-1.4	55.0	-81.5	9.7	.0	.42	.26
18	-.6	-1.4	56.7	-81.5	24.8	.0	.44	.27
19	-.9	-1.4	58.4	-81.5	39.9	.0	.45	.29
20	-1.2	-1.4	60.0	-81.5	55.0	.0	.46	.30
21	-1.6	-1.4	61.7	-81.5	70.1	.0	.47	.31
22	-1.9	-1.4	63.4	-81.5	85.2	.0	.49	.32
23	-2.2	-1.4	65.1	-81.5	100.4	.0	.50	.33
24	-2.6	-1.4	66.7	-81.5	115.5	.0	.51	.34
25	1.1	-1.1	49.0	-62.6	-50.8	.0	.38	.24
26	.8	-1.1	50.7	-62.6	-35.7	.0	.39	.24
27	.5	-1.1	52.4	-62.6	-20.6	.0	.40	.23
28	.1	-1.1	54.0	-62.6	-5.4	.0	.42	.23
29	-.2	-1.1	55.7	-62.6	9.7	.0	.43	.24
30	-.6	-1.1	57.4	-62.6	24.8	.0	.44	.25
31	-.9	-1.1	59.0	-62.6	39.9	.0	.45	.26
32	-1.2	-1.1	60.7	-62.6	55.0	.0	.47	.27
33	-1.6	-1.1	62.4	-62.6	70.1	.0	.48	.28
34	-1.9	-1.1	64.1	-62.6	85.2	.0	.49	.29
35	-2.2	-1.1	65.7	-62.6	100.4	.0	.51	.31
36	-2.6	-1.1	67.4	-62.6	115.5	.0	.52	.32
37	1.1	-.8	49.7	-43.8	-50.8	.0	.38	.21
38	.8	-.8	51.4	-43.8	-35.7	.0	.40	.21
39	.5	-.8	53.0	-43.8	-20.6	.0	.41	.21
40	.1	-.8	54.7	-43.8	-5.4	.0	.42	.21
41	-.2	-.8	56.4	-43.8	9.7	.0	.43	.21
42	-.6	-.8	58.0	-43.8	24.8	.0	.45	.22
43	-.9	-.8	59.7	-43.8	39.9	.0	.46	.24
44	-1.2	-.8	61.4	-43.8	55.0	.0	.47	.25
45	-1.6	-.8	63.1	-43.8	70.1	.0	.49	.26
46	-1.9	-.8	64.7	-43.8	85.2	.0	.50	.27
47	-2.2	-.8	66.4	-43.8	100.4	.0	.51	.28
48	-2.6	-.8	68.1	-43.8	115.5	.0	.52	.29
49	1.1	-.1	51.0	-6.0	-50.8	.0	.39	.17
50	.8	-.1	52.7	-6.0	-35.7	.0	.41	.16
51	.5	-.1	54.4	-6.0	-20.6	.0	.42	.16
52	.1	-.1	56.1	-6.0	-5.4	.0	.43	.16
53	-.2	-.1	57.7	-6.0	9.7	.0	.44	.16
54	-.6	-.1	59.4	-6.0	24.8	.0	.46	.17
55	-.9	-.1	61.1	-6.0	39.9	.0	.47	.19
56	-1.2	-.1	62.7	-6.0	55.0	.0	.48	.20
57	-1.6	-.1	64.4	-6.0	70.1	.0	.50	.21
58	-1.9	-.1	66.1	-6.0	85.2	.0	.51	.22
59	-2.2	-.1	67.7	-6.0	100.4	.0	.52	.23
60	-2.6	-.1	69.4	-6.0	115.5	.0	.53	.24
61	1.1	.8	52.9	45.7	-50.8	.0	.41	.23
62	.8	.8	54.6	45.7	-35.7	.0	.42	.22
63	.5	.8	56.2	45.7	-20.6	.0	.43	.22
64	.1	.8	57.9	45.7	-5.4	.0	.45	.22
65	-.2	.8	59.6	45.7	9.7	.0	.46	.22
66	-.6	.8	61.2	45.7	24.8	.0	.47	.24
67	-.9	.8	62.9	45.7	39.9	.0	.48	.25
68	-1.2	.8	64.6	45.7	55.0	.0	.50	.26
69	-1.6	.8	66.2	45.7	70.1	.0	.51	.27

70	-1.9	.8	67.9	45.7	85.2	.0	.52	.28
71	-2.2	.8	69.6	45.7	100.4	.0	.54	.29
72	-2.6	.8	71.3	45.7	115.5	.0	.55	.30
73	1.1	1.1	53.6	64.6	-50.8	.0	.41	.25
74	.8	1.1	55.2	64.6	-35.7	.0	.42	.25
75	.5	1.1	56.9	64.6	-20.6	.0	.44	.25
76	.1	1.1	58.6	64.6	-5.4	.0	.45	.25
77	-.2	1.1	60.2	64.6	9.7	.0	.46	.25
78	-.6	1.1	61.9	64.6	24.8	.0	.48	.26
79	-.9	1.1	63.6	64.6	39.9	.0	.49	.28
80	-1.2	1.1	65.3	64.6	55.0	.0	.50	.29
81	-1.6	1.1	66.9	64.6	70.1	.0	.51	.30
82	-1.9	1.1	68.6	64.6	85.2	.0	.53	.31
83	-2.2	1.1	70.3	64.6	100.4	.0	.54	.32
84	-2.6	1.1	71.9	64.6	115.5	.0	.55	.33
85	1.1	1.4	54.2	83.4	-50.8	.0	.42	.28
86	.8	1.4	55.9	83.4	-35.7	.0	.43	.28
87	.5	1.4	57.6	83.4	-20.6	.0	.44	.28
88	.1	1.4	59.2	83.4	-5.4	.0	.46	.27
89	-.2	1.4	60.9	83.4	9.7	.0	.47	.28
90	-.6	1.4	62.6	83.4	24.8	.0	.48	.29
91	-.9	1.4	64.3	83.4	39.9	.0	.49	.30
92	-1.2	1.4	65.9	83.4	55.0	.0	.51	.31
93	-1.6	1.4	67.6	83.4	70.1	.0	.52	.33
94	-1.9	1.4	69.3	83.4	85.2	.0	.53	.34
95	-2.2	1.4	70.9	83.4	100.4	.0	.55	.35
96	-2.6	1.4	72.6	83.4	115.5	.0	.56	.36
97	1.1	1.9	55.2	111.0	-50.8	.0	.42	.32
98	.8	1.9	56.9	111.0	-35.7	.0	.44	.32
99	.5	1.9	58.6	111.0	-20.6	.0	.45	.32
100	.1	1.9	60.2	111.0	-5.4	.0	.46	.32
101	-.2	1.9	61.9	111.0	9.7	.0	.48	.32
102	-.6	1.9	63.6	111.0	24.8	.0	.49	.33
103	-.9	1.9	65.2	111.0	39.9	.0	.50	.34
104	-1.2	1.9	66.9	111.0	55.0	.0	.51	.36
105	-1.6	1.9	68.6	111.0	70.1	.0	.53	.37
106	-1.9	1.9	70.2	111.0	85.2	.0	.54	.38
107	-2.2	1.9	71.9	111.0	100.4	.0	.55	.39
108	-2.6	1.9	73.6	111.0	115.5	.0	.57	.40
109	-1.6	-.4	63.7	-24.9	70.1	.0	.49	.23
110	-1.9	-.4	65.4	-24.9	85.2	.0	.50	.25
111	-2.2	-.4	67.1	-24.9	100.4	.0	.52	.26
112	-2.6	-.4	68.7	-24.9	115.5	.0	.53	.27
113	-1.6	.3	65.3	19.8	70.1	.0	.50	.23
114	-1.9	.3	67.0	19.8	85.2	.0	.52	.24
115	-2.2	.3	68.7	19.8	100.4	.0	.53	.25
116	-2.6	.3	70.3	19.8	115.5	.0	.54	.27

LOAD CASE - 2

FILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF
1	.7	-1.2	110.6	-70.4	-33.0	.0	.85	.40
2	.5	-1.2	110.9	-70.4	-23.3	.0	.85	.40
3	.3	-1.2	111.3	-70.4	-13.5	.0	.86	.39
4	.1	-1.2	111.7	-70.4	-3.8	.0	.86	.39
5	-.1	-1.2	112.1	-70.4	6.0	.0	.86	.39
6	-.3	-1.2	112.5	-70.4	15.7	.0	.87	.40



7	-.6	-1.2	112.9	-70.4	25.5	.0	.87	.40
8	-.8	-1.2	113.3	-70.4	35.2	.0	.87	.41
9	-1.0	-1.2	113.7	-70.4	45.0	.0	.87	.42
10	-1.2	-1.2	114.1	-70.4	54.8	.0	.88	.42
11	-1.4	-1.2	114.4	-70.4	64.5	.0	.88	.43
12	-1.6	-1.2	114.8	-70.4	74.3	.0	.88	.43
13	.7	-.9	111.8	-52.6	-33.0	.0	.86	.38
14	.5	-.9	112.2	-52.6	-23.3	.0	.86	.38
15	.3	-.9	112.6	-52.6	-13.5	.0	.87	.37
16	.1	-.9	112.9	-52.6	-3.8	.0	.87	.37
17	-.1	-.9	113.3	-52.6	6.0	.0	.87	.37
18	-.3	-.9	113.7	-52.6	15.7	.0	.87	.38
19	-.6	-.9	114.1	-52.6	25.5	.0	.88	.38
20	-.8	-.9	114.5	-52.6	35.2	.0	.88	.39
21	-1.0	-.9	114.9	-52.6	45.0	.0	.88	.39
22	-1.2	-.9	115.3	-52.6	54.8	.0	.89	.40
23	-1.4	-.9	115.7	-52.6	64.5	.0	.89	.41
24	-1.6	-.9	116.1	-52.6	74.3	.0	.89	.41
25	.7	-.7	112.6	-40.4	-33.0	.0	.87	.37
26	.5	-.7	113.0	-40.4	-23.3	.0	.87	.36
27	.3	-.7	113.4	-40.4	-13.5	.0	.87	.36
28	.1	-.7	113.8	-40.4	-3.8	.0	.88	.35
29	-.1	-.7	114.2	-40.4	6.0	.0	.88	.36
30	-.3	-.7	114.6	-40.4	15.7	.0	.88	.36
31	-.6	-.7	115.0	-40.4	25.5	.0	.88	.37
32	-.8	-.7	115.3	-40.4	35.2	.0	.89	.37
33	-1.0	-.7	115.7	-40.4	45.0	.0	.89	.38
34	-1.2	-.7	116.1	-40.4	54.8	.0	.89	.38
35	-1.4	-.7	116.5	-40.4	64.5	.0	.90	.39
36	-1.6	-.7	116.9	-40.4	74.3	.0	.90	.40
37	.7	-.5	113.5	-28.2	-33.0	.0	.87	.35
38	.5	-.5	113.8	-28.2	-23.3	.0	.88	.35
39	.3	-.5	114.2	-28.2	-13.5	.0	.88	.34
40	.1	-.5	114.6	-28.2	-3.8	.0	.88	.34
41	-.1	-.5	115.0	-28.2	6.0	.0	.88	.34
42	-.3	-.5	115.4	-28.2	15.7	.0	.89	.35
43	-.6	-.5	115.8	-28.2	25.5	.0	.89	.35
44	-.8	-.5	116.2	-28.2	35.2	.0	.89	.36
45	-1.0	-.5	116.6	-28.2	45.0	.0	.90	.36
46	-1.2	-.5	117.0	-28.2	54.8	.0	.90	.37
47	-1.4	-.5	117.3	-28.2	64.5	.0	.90	.38
48	-1.6	-.5	117.7	-28.2	74.3	.0	.91	.38
49	.7	-.1	115.1	-3.9	-33.0	.0	.89	.32
50	.5	-.1	115.5	-3.9	-23.3	.0	.89	.32
51	.3	-.1	115.9	-3.9	-13.5	.0	.89	.31
52	.1	-.1	116.3	-3.9	-3.8	.0	.89	.31
53	-.1	-.1	116.7	-3.9	6.0	.0	.90	.31
54	-.3	-.1	117.1	-3.9	15.7	.0	.90	.32
55	-.6	-.1	117.5	-3.9	25.5	.0	.90	.32
56	-.8	-.1	117.9	-3.9	35.2	.0	.91	.33
57	-1.0	-.1	118.2	-3.9	45.0	.0	.91	.33
58	-1.2	-.1	118.6	-3.9	54.8	.0	.91	.34
59	-1.4	-.1	119.0	-3.9	64.5	.0	.92	.35
60	-1.6	-.1	119.4	-3.9	74.3	.0	.92	.35
61	.7	.5	117.4	29.5	-33.0	.0	.90	.36
62	.5	.5	117.8	29.5	-23.3	.0	.91	.36
63	.3	.5	118.2	29.5	-13.5	.0	.91	.35
64	.1	.5	118.6	29.5	-3.8	.0	.91	.35
65	-.1	.5	119.0	29.5	6.0	.0	.92	.35
66	-.3	.5	119.4	29.5	15.7	.0	.92	.36

67	-.6	.5	119.8	29.5	25.5	.0	.92	.36
68	-.8	.5	120.2	29.5	35.2	.0	.92	.37
69	-1.0	.5	120.5	29.5	45.0	.0	.93	.38
70	-1.2	.5	120.9	29.5	54.8	.0	.93	.38
71	-1.4	.5	121.3	29.5	64.5	.0	.93	.39
72	-1.6	.5	121.7	29.5	74.3	.0	.94	.39
73	.7	.7	118.3	41.7	-33.0	.0	.91	.38
74	.5	.7	118.7	41.7	-23.3	.0	.91	.38
75	.3	.7	119.0	41.7	-13.5	.0	.92	.37
76	.1	.7	119.4	41.7	-3.8	.0	.92	.37
77	-.1	.7	119.8	41.7	6.0	.0	.92	.37
78	-.3	.7	120.2	41.7	15.7	.0	.92	.38
79	-.6	.7	120.6	41.7	25.5	.0	.93	.38
80	-.8	.7	121.0	41.7	35.2	.0	.93	.39
81	-1.0	.7	121.4	41.7	45.0	.0	.93	.40
82	-1.2	.7	121.8	41.7	54.8	.0	.94	.40
83	-1.4	.7	122.2	41.7	64.5	.0	.94	.41
84	-1.6	.7	122.5	41.7	74.3	.0	.94	.41
85	.7	.9	119.1	53.9	-33.0	.0	.92	.40
86	.5	.9	119.5	53.9	-23.3	.0	.92	.40
87	.3	.9	119.9	53.9	-13.5	.0	.92	.39
88	.1	.9	120.3	53.9	-3.8	.0	.93	.39
89	-.1	.9	120.7	53.9	6.0	.0	.93	.39
90	-.3	.9	121.1	53.9	15.7	.0	.93	.40
91	-.6	.9	121.4	53.9	25.5	.0	.93	.40
92	-.8	.9	121.8	53.9	35.2	.0	.94	.41
93	-1.0	.9	122.2	53.9	45.0	.0	.94	.41
94	-1.2	.9	122.6	53.9	54.8	.0	.94	.42
95	-1.4	.9	123.0	53.9	64.5	.0	.95	.43
96	-1.6	.9	123.4	53.9	74.3	.0	.95	.43
97	.7	1.2	120.3	71.6	-33.0	.0	.93	.43
98	.5	1.2	120.7	71.6	-23.3	.0	.93	.43
99	.3	1.2	121.1	71.6	-13.5	.0	.93	.42
100	.1	1.2	121.5	71.6	-3.8	.0	.93	.42
101	-.1	1.2	121.9	71.6	6.0	.0	.94	.42
102	-.3	1.2	122.3	71.6	15.7	.0	.94	.43
103	-.6	1.2	122.7	71.6	25.5	.0	.94	.43
104	-.8	1.2	123.1	71.6	35.2	.0	.95	.44
105	-1.0	1.2	123.4	71.6	45.0	.0	.95	.44
106	-1.2	1.2	123.8	71.6	54.8	.0	.95	.45
107	-1.4	1.2	124.2	71.6	64.5	.0	.96	.45
108	-1.6	1.2	124.6	71.6	74.3	.0	.96	.46
109	-1.0	-.3	117.4	-16.1	45.0	.0	.90	.35
110	-1.2	-.3	117.8	-16.1	54.8	.0	.91	.35
111	-1.4	-.3	118.2	-16.1	64.5	.0	.91	.36
112	-1.6	-.3	118.6	-16.1	74.3	.0	.91	.37
113	-1.0	.2	119.4	12.8	45.0	.0	.92	.35
114	-1.2	.2	119.8	12.8	54.8	.0	.92	.36
115	-1.4	.2	120.2	12.8	64.5	.0	.92	.36
116	-1.6	.2	120.6	12.8	74.3	.0	.93	.37

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PILE FORCES IN GLOBAL GEOMETRY

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	1.1	-1.9	47.4	.0	.0	.0
2	.8	-1.9	49.0	.0	.0	.0
3	.5	-1.9	50.7	.0	.0	.0
4	.1	-1.9	52.4	.0	.0	.0
5	-.2	-1.9	54.1	.0	.0	.0
6	-.6	-1.9	55.7	.0	.0	.0
7	-.9	-1.9	57.4	.0	.0	.0
8	-1.2	-1.9	59.1	.0	.0	.0
9	-1.6	-1.9	60.7	.0	.0	.0
10	-1.9	-1.9	62.4	.0	.0	.0
11	-2.2	-1.9	64.1	.0	.0	.0
12	-2.6	-1.9	65.7	.0	.0	.0
13	1.1	-1.4	48.4	.0	.0	.0
14	.8	-1.4	50.0	.0	.0	.0
15	.5	-1.4	51.7	.0	.0	.0
16	.1	-1.4	53.4	.0	.0	.0
17	-.2	-1.4	55.0	.0	.0	.0
18	-.6	-1.4	56.7	.0	.0	.0
19	-.9	-1.4	58.4	.0	.0	.0
20	-1.2	-1.4	60.0	.0	.0	.0
21	-1.6	-1.4	61.7	.0	.0	.0
22	-1.9	-1.4	63.4	.0	.0	.0
23	-2.2	-1.4	65.1	.0	.0	.0
24	-2.6	-1.4	66.7	.0	.0	.0
25	1.1	-1.1	49.0	.0	.0	.0
26	.8	-1.1	50.7	.0	.0	.0
27	.5	-1.1	52.4	.0	.0	.0
28	.1	-1.1	54.0	.0	.0	.0
29	-.2	-1.1	55.7	.0	.0	.0
30	-.6	-1.1	57.4	.0	.0	.0
31	-.9	-1.1	59.0	.0	.0	.0
32	-1.2	-1.1	60.7	.0	.0	.0
33	-1.6	-1.1	62.4	.0	.0	.0
34	-1.9	-1.1	64.1	.0	.0	.0
35	-2.2	-1.1	65.7	.0	.0	.0
36	-2.6	-1.1	67.4	.0	.0	.0
37	1.1	-.8	49.7	.0	.0	.0
38	.8	-.8	51.4	.0	.0	.0
39	.5	-.8	53.0	.0	.0	.0
40	.1	-.8	54.7	.0	.0	.0
41	-.2	-.8	56.4	.0	.0	.0
42	-.6	-.8	58.0	.0	.0	.0
43	-.9	-.8	59.7	.0	.0	.0
44	-1.2	-.8	61.4	.0	.0	.0
45	-1.6	-.8	63.1	.0	.0	.0
46	-1.9	-.8	64.7	.0	.0	.0
47	-2.2	-.8	66.4	.0	.0	.0
48	-2.6	-.8	68.1	.0	.0	.0
49	1.1	-.1	51.0	.0	.0	.0
50	.8	-.1	52.7	.0	.0	.0
51	.5	-.1	54.4	.0	.0	.0
52	.1	-.1	56.1	.0	.0	.0
53	-.2	-.1	57.7	.0	.0	.0
54	-.6	-.1	59.4	.0	.0	.0
55	-.9	-.1	61.1	.0	.0	.0
56	-1.2	-.1	62.7	.0	.0	.0
57	-1.6	-.1	64.4	.0	.0	.0

58	-1.9	-.1	66.1	.0	.0	.0
59	-2.2	-.1	67.7	.0	.0	.0
60	-2.6	-.1	69.4	.0	.0	.0
61	1.1	.8	52.9	.0	.0	.0
62	.8	.8	54.6	.0	.0	.0
63	.5	.8	56.2	.0	.0	.0
64	.1	.8	57.9	.0	.0	.0
65	-.2	.8	59.6	.0	.0	.0
66	-.6	.8	61.2	.0	.0	.0
67	-.9	.8	62.9	.0	.0	.0
68	-1.2	.8	64.6	.0	.0	.0
69	-1.6	.8	66.2	.0	.0	.0
70	-1.9	.8	67.9	.0	.0	.0
71	-2.2	.8	69.6	.0	.0	.0
72	-2.6	.8	71.3	.0	.0	.0
73	1.1	1.1	53.6	.0	.0	.0
74	.8	1.1	55.2	.0	.0	.0
75	.5	1.1	56.9	.0	.0	.0
76	.1	1.1	58.6	.0	.0	.0
77	-.2	1.1	60.2	.0	.0	.0
78	-.6	1.1	61.9	.0	.0	.0
79	-.9	1.1	63.6	.0	.0	.0
80	-1.2	1.1	65.3	.0	.0	.0
81	-1.6	1.1	66.9	.0	.0	.0
82	-1.9	1.1	68.6	.0	.0	.0
83	-2.2	1.1	70.3	.0	.0	.0
84	-2.6	1.1	71.9	.0	.0	.0
85	1.1	1.4	54.2	.0	.0	.0
86	.8	1.4	55.9	.0	.0	.0
87	.5	1.4	57.6	.0	.0	.0
88	.1	1.4	59.2	.0	.0	.0
89	-.2	1.4	60.9	.0	.0	.0
90	-.6	1.4	62.6	.0	.0	.0
91	-.9	1.4	64.3	.0	.0	.0
92	-1.2	1.4	65.9	.0	.0	.0
93	-1.6	1.4	67.6	.0	.0	.0
94	-1.9	1.4	69.3	.0	.0	.0
95	-2.2	1.4	70.9	.0	.0	.0
96	-2.6	1.4	72.6	.0	.0	.0
97	1.1	1.9	55.2	.0	.0	.0
98	.8	1.9	56.9	.0	.0	.0
99	.5	1.9	58.6	.0	.0	.0
100	.1	1.9	60.2	.0	.0	.0
101	-.2	1.9	61.9	.0	.0	.0
102	-.6	1.9	63.6	.0	.0	.0
103	-.9	1.9	65.2	.0	.0	.0
104	-1.2	1.9	66.9	.0	.0	.0
105	-1.6	1.9	68.6	.0	.0	.0
106	-1.9	1.9	70.2	.0	.0	.0
107	-2.2	1.9	71.9	.0	.0	.0
108	-2.6	1.9	73.6	.0	.0	.0
109	-1.6	-.4	63.7	.0	.0	.0
110	-1.9	-.4	65.4	.0	.0	.0
111	-2.2	-.4	67.1	.0	.0	.0
112	-2.6	-.4	68.7	.0	.0	.0
113	-1.6	.3	65.3	.0	.0	.0
114	-1.9	.3	67.0	.0	.0	.0
115	-2.2	.3	68.7	.0	.0	.0
116	-2.6	.3	70.3	.0	.0	.0

## LOAD CASE - 2

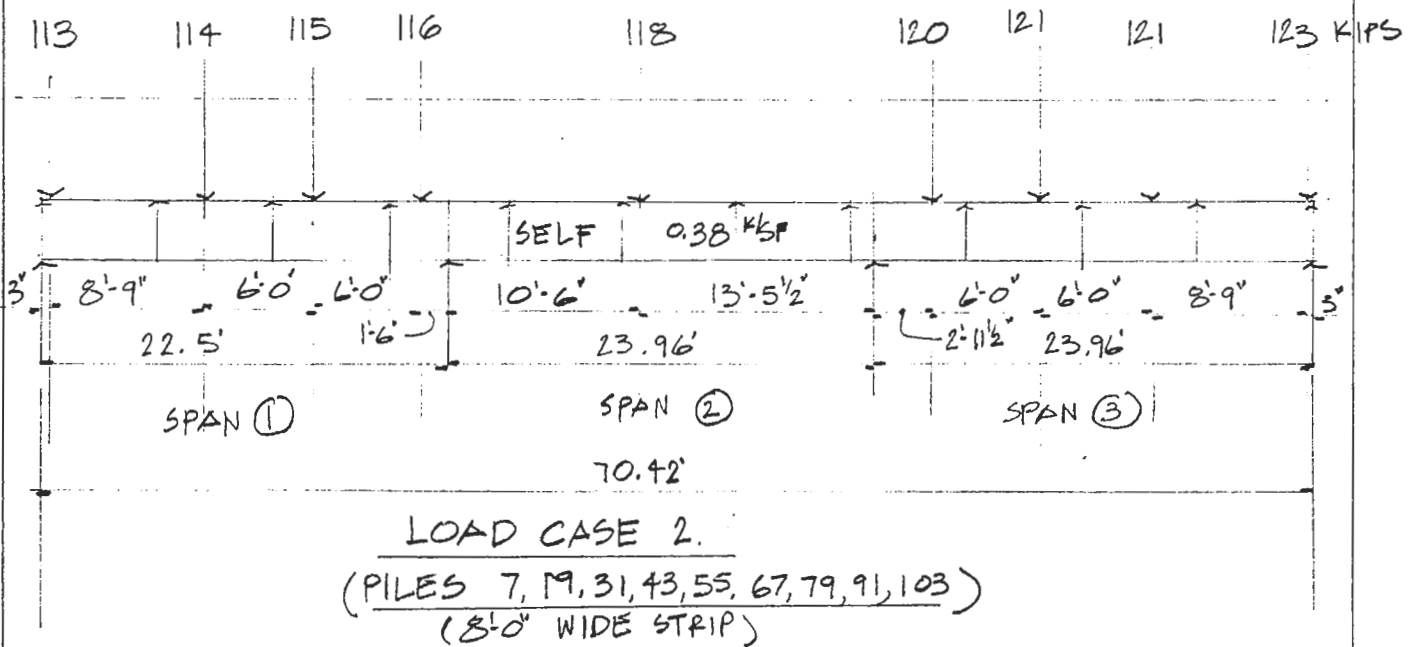
FILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.7	-1.2	110.6	.0	.0	.0
2	.5	-1.2	110.9	.0	.0	.0
3	.3	-1.2	111.3	.0	.0	.0
4	.1	-1.2	111.7	.0	.0	.0
5	-.1	-1.2	112.1	.0	.0	.0
6	-.3	-1.2	112.5	.0	.0	.0
7	-.6	-1.2	112.9	.0	.0	.0
8	-.8	-1.2	113.3	.0	.0	.0
9	-1.0	-1.2	113.7	.0	.0	.0
10	-1.2	-1.2	114.1	.0	.0	.0
11	-1.4	-1.2	114.4	.0	.0	.0
12	-1.6	-1.2	114.8	.0	.0	.0
13	.7	-.9	111.8	.0	.0	.0
14	.5	-.9	112.2	.0	.0	.0
15	.3	-.9	112.6	.0	.0	.0
16	.1	-.9	112.9	.0	.0	.0
17	-.1	-.9	113.3	.0	.0	.0
18	-.3	-.9	113.7	.0	.0	.0
19	-.6	-.9	114.1	.0	.0	.0
20	-.8	-.9	114.5	.0	.0	.0
21	-1.0	-.9	114.9	.0	.0	.0
22	-1.2	-.9	115.3	.0	.0	.0
23	-1.4	-.9	115.7	.0	.0	.0
24	-1.6	-.9	116.1	.0	.0	.0
25	.7	-.7	112.6	.0	.0	.0
26	.5	-.7	113.0	.0	.0	.0
27	.3	-.7	113.4	.0	.0	.0
28	.1	-.7	113.8	.0	.0	.0
29	-.1	-.7	114.2	.0	.0	.0
30	-.3	-.7	114.6	.0	.0	.0
31	-.6	-.7	115.0	.0	.0	.0
32	-.8	-.7	115.3	.0	.0	.0
33	-1.0	-.7	115.7	.0	.0	.0
34	-1.2	-.7	116.1	.0	.0	.0
35	-1.4	-.7	116.5	.0	.0	.0
36	-1.6	-.7	116.9	.0	.0	.0
37	.7	-.5	113.5	.0	.0	.0
38	.5	-.5	113.8	.0	.0	.0
39	.3	-.5	114.2	.0	.0	.0
40	.1	-.5	114.6	.0	.0	.0
41	-.1	-.5	115.0	.0	.0	.0
42	-.3	-.5	115.4	.0	.0	.0
43	-.6	-.5	115.8	.0	.0	.0
44	-.8	-.5	116.2	.0	.0	.0
45	-1.0	-.5	116.6	.0	.0	.0
46	-1.2	-.5	117.0	.0	.0	.0
47	-1.4	-.5	117.3	.0	.0	.0
48	-1.6	-.5	117.7	.0	.0	.0
49	.7	-.1	115.1	.0	.0	.0
50	.5	-.1	115.5	.0	.0	.0
51	.3	-.1	115.9	.0	.0	.0
52	.1	-.1	116.3	.0	.0	.0
53	-.1	-.1	116.7	.0	.0	.0
54	-.3	-.1	117.1	.0	.0	.0

55	-.6	-.1	117.5	.0	.0	.0
56	-.8	-.1	117.9	.0	.0	.0
57	-1.0	-.1	118.2	.0	.0	.0
58	-1.2	-.1	118.6	.0	.0	.0
59	-1.4	-.1	119.0	.0	.0	.0
60	-1.6	-.1	119.4	.0	.0	.0
61	.7	.5	117.4	.0	.0	.0
62	.5	.5	117.8	.0	.0	.0
63	.3	.5	118.2	.0	.0	.0
64	.1	.5	118.6	.0	.0	.0
65	-.1	.5	119.0	.0	.0	.0
66	-.3	.5	119.4	.0	.0	.0
67	-.6	.5	119.8	.0	.0	.0
68	-.8	.5	120.2	.0	.0	.0
69	-1.0	.5	120.5	.0	.0	.0
70	-1.2	.5	120.9	.0	.0	.0
71	-1.4	.5	121.3	.0	.0	.0
72	-1.6	.5	121.7	.0	.0	.0
73	.7	.7	118.3	.0	.0	.0
74	.5	.7	118.7	.0	.0	.0
75	.3	.7	119.0	.0	.0	.0
76	.1	.7	119.4	.0	.0	.0
77	-.1	.7	119.8	.0	.0	.0
78	-.3	.7	120.2	.0	.0	.0
79	-.6	.7	120.6	.0	.0	.0
80	-.8	.7	121.0	.0	.0	.0
81	-1.0	.7	121.4	.0	.0	.0
82	-1.2	.7	121.8	.0	.0	.0
83	-1.4	.7	122.2	.0	.0	.0
84	-1.6	.7	122.5	.0	.0	.0
85	.7	.9	119.1	.0	.0	.0
86	.5	.9	119.5	.0	.0	.0
87	.3	.9	119.9	.0	.0	.0
88	.1	.9	120.3	.0	.0	.0
89	-.1	.9	120.7	.0	.0	.0
90	-.3	.9	121.1	.0	.0	.0
91	-.6	.9	121.4	.0	.0	.0
92	-.8	.9	121.8	.0	.0	.0
93	-1.0	.9	122.2	.0	.0	.0
94	-1.2	.9	122.6	.0	.0	.0
95	-1.4	.9	123.0	.0	.0	.0
96	-1.6	.9	123.4	.0	.0	.0
97	.7	1.2	120.3	.0	.0	.0
98	.5	1.2	120.7	.0	.0	.0
99	.3	1.2	121.1	.0	.0	.0
100	.1	1.2	121.5	.0	.0	.0
101	-.1	1.2	121.9	.0	.0	.0
102	-.3	1.2	122.3	.0	.0	.0
103	-.6	1.2	122.7	.0	.0	.0
104	-.8	1.2	123.1	.0	.0	.0
105	-1.0	1.2	123.4	.0	.0	.0
106	-1.2	1.2	123.8	.0	.0	.0
107	-1.4	1.2	124.2	.0	.0	.0
108	-1.6	1.2	124.6	.0	.0	.0
109	-1.0	-.3	117.4	.0	.0	.0
110	-1.2	-.3	117.8	.0	.0	.0
111	-1.4	-.3	118.2	.0	.0	.0
112	-1.6	-.3	118.6	.0	.0	.0
113	-1.0	.2	119.4	.0	.0	.0
114	-1.2	.2	119.8	.0	.0	.0

115	-1.4	.2	120.2	.0	.0	.0
116	-1.6	.2	120.6	.0	.0	.0

FOUNDATION SLAB DESIGN

- ASSUME: 1. 2'6" THK FDN SLAB  
 2.  $F_c = 4000$   
 3.  $F_y = 60000$   
 4. FDN MAT SIMPLY SUPPORTED @ EAST & WEST WALL & CONTINUOUS OVER INT. WALLS.  
 5. PILE LOAD AS POINT LOADS ACTING @ RESPECTIVE PILE LOCATIONS.  
 6. ACI CODE (NOT USACE CODE)



FOR THE PURPOSE OF PRELIMINARY DESIGN, DETERMINE ADEQUACY OF ASSUMED THICKNESS OF FDN SLAB BASED ON SIMPLE BM BENDING MOM & SHEAR IN SPAN 3. DETERMINE REINFORCING BASED ON SIMPLE BM BENDING MOM & THICKNESS OBTAINED AS DESCRIBED ABOVE.

∴ REACTION @ RT. SUPPORT =  $121.72 + 75.54 + 45.24 + 14.82 = 257.32^k$   
 ∴ REACTION @ LT. SUPPORT =  $227.68^k$   
 ∴ MAX BM =  $257.32 \times 15 - 123 \times 14.75 - 121 \times 6 = 1320^k$   
 ∴ BM/FT =  $165^k$

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FDN SLAB DESIGN

SINCE LL IS APPROX 10% OF TOTAL LOAD

BM DUE TO LL  $\approx 16.5'k$  $\therefore$  BM DUE TO DL & WATER LOADS =  $148.5'k$ 

$$\therefore M_u = 1.4 \times 148.5 + 1.7 \times 16.5 = 236'k$$

$$\therefore d_{req} = \left( \frac{2.4956 \times 236}{12 \times 63 \times 0.85} \right)^{1/2} = 24.26''$$

ASSUMING 4" COVER  $\leq$  #10 BARSTOTAL TH'KNNESS REQ'D =  $24.26 + 4 + \frac{5}{8} = 28.89'' < 30'' \therefore O.K.$ 

$$\phi V_c = 0.85 \times 2 \times 63 \times 12 \times (30 - 4.625)$$

$$= 32.62'k$$

$$V_u @ \text{FACE OF SUPPORT} = (1.7 \times 23 + 1.4 \times 205) / 8 = 40.76'k > \phi V_c \text{ N.G.}$$

 $\therefore d_{req}$  FOR  $V_u = 40.76$ 

$$= \frac{40.76 \times 1000}{0.85 \times 12 \times 63 \times 2} = 31.72''$$

 $\therefore$  TRY 3'-3" TH'K FDN SLAB  $d = 39'' - 4.625 = 34.38'' \therefore O.K.$  $\therefore$  USE 3'-3" TH'K FDN SLABSTOP & BOT REINFORCINGFOR  $b = 12''$ ,  $d = 34.38'$   $F = 1.18$  $\therefore$  FOR  $M_u = 236$  &  $F = 1.18$   $K_u = 200 \therefore \rho = 0.0040$ 

$$\therefore A_s = 0.0040 \times 12 \times 34.38 = 1.65''^2$$

TRY #10 BARS @ 9" O.C. TOP & BOT.  $A_s = 1.69''^2 > 1.65''^2 \therefore O.K.$ TEMP & SHRINKAGE REINF

$$0.0018 \times 12 \times 39 = 0.84''^2/ft$$

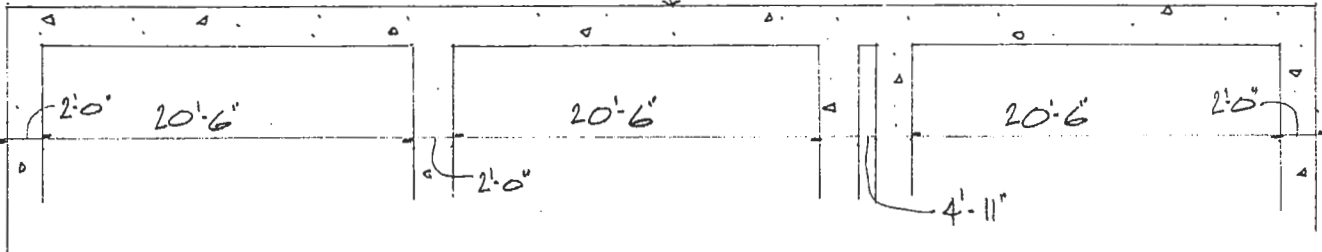
USE #7 BARS @ 12" O.C. TOP & BOT  $A_s = 1.2''^2 > 0.84''^2 \therefore O.K.$



TOP SLAB (IN THE AREA OF NO BACKFILL ON TOP OF SLAB)

$$\therefore W_u = 3.16 \text{ k/sf} - 0.99 \text{ k/sf (BACKFILL WT.)} = 2.17 \text{ k/sf}$$

TOP SLAB



$$l_n = 20.5' \quad W_u = 2.17 \text{ k/sf} \quad \text{LOAD CASE (I)}$$

$$\therefore \text{MAX } -M = \frac{2.17 \times 20.5^2}{10} = 92 \text{ k}$$

$$\text{MAX } +M = 92 \times 10/11 = 84 \text{ k}$$

$$\therefore d_{req} = (94 \times 2.4956)^{1/2} = 15.8''$$

ASSUMING # 9 BARS & 2" COVER TOTAL THICKNESS  
REQ'D = 15.8" + 2" + 9/16 = 18.4" < 24"  $\therefore$  O.K.

$$\phi V_c = 0.85 \times 2 \times 63 \times 12 \times (24 - 2.5625) = 27.56 \text{ k}$$

$$V_u @ d = \frac{1.15 \times 2.17 \times 20.5}{2} - \left( \frac{21.43}{12} \times 2.17 \right)$$

$$21.70 \text{ k} < 27.56 \text{ k} \quad \therefore \text{O.K.}$$

TOP & BOT REINF

$$\text{FOR } b = 12'' \quad d = 21.43 \quad F = 0.46$$

$$\text{FOR } M = 94 \text{ k}, \quad F = 0.46 \quad \therefore K_u = 204 \quad \therefore \rho = 0.0047$$

$$\therefore A_s = 0.0047 \times 12 \times 21.43 = 1.10 \text{ in}^2/\text{FT.}$$

$$\text{TRY } \# 8 @ 6'' \text{ O.C.} \quad A_s = 1.58 \text{ in}^2/\text{FT.} > 1.10 \text{ in}^2$$

$\therefore$  USE # 8 BARS @ 6" O.C. TOP & BOT.

TEMP & SHRINKAGE

$$A_s = 0.0018 \times 12 \times 24 = 0.52 \text{ in}^2$$

$$\text{USE } \# 6 @ 12'' \text{ O.C. TOP & BOT. } A_s = 0.88 \text{ in}^2$$

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TOP SLAB (UNDER BACKFILL ADJ. TO GATE STRUCTURE)

$$l_n = 20.5, w_u = 3.16 \text{ k/ft}$$

$$V_u @ d = 31.60 \text{ k} > 27.56 \text{ k N.G.}$$

∴ USE ONE (1) INTERMEDIATE WALL IN EACH TUBE STARTING @ SO. END OF COL (IN THE GATE STRUCTURE WHICH DIVIDES 20'-6" OPENING @ GATES IN TWO) AND EXTENDING TO SOUTH END OF BACKFILL OVER THE DISCH TUBES.

$$\therefore l_n = \left( \frac{20.5 - 2}{2} \right) = 9.25' \quad w_u = 3.16 \text{ k/ft} \quad b = 12" \quad d = 21.43$$

$$\begin{aligned} \therefore V_u @ d &= 1.15 \times \frac{3.16 \times 9.25}{2} - \left( \frac{21.43}{12} \times 3.16 \right) \\ &= 11.16 \text{ k} < \phi V_c = 27.56 \text{ k} \end{aligned}$$



BOT SLAB DESIGN

LOADS: CASE II ALL PUMPS OPERATING

1. SELF WT.  $1.4 \times 2 \times 0.15 = 0.42 \text{ k/sf}$

2. HYD. STATIC PRESSURE =  $0.0625 \times 18 \times 1.4 = 1.58 \text{ k/sf}$

TOTAL  $= 2.00 \text{ k/sf.}$

SPAN LENGTHS SAME AS TOP SLABS.

$\therefore 2'-0"$  TH'K SLAB IS ADEQUATE BY OBS.

$\therefore$  USE SAME REINF AS TOP SLAB.

$\therefore$  USE #8 BARS @  $6"$  O.C. (TOP & BOT)

USE #6 BARS @  $12"$  O.C. (TOP & BOT) (SHRINKAGE & TEMP)

13-76 1 SHEETS 5 SQUARE  
 42-281 50 SHEETS 5 SQUARE  
 42-381 100 SHEETS 5 SQUARE  
 42-382 100 SHEETS 5 SQUARE  
 42-392 100 RECYCLED WHITE  
 42-393 100 RECYCLED WHITE  
 42-399 200 RECYCLED WHITE  
 Made in U.S.A.



WEST WALL DESIGN. (ASSUME 2'-0" TH'K WALL)

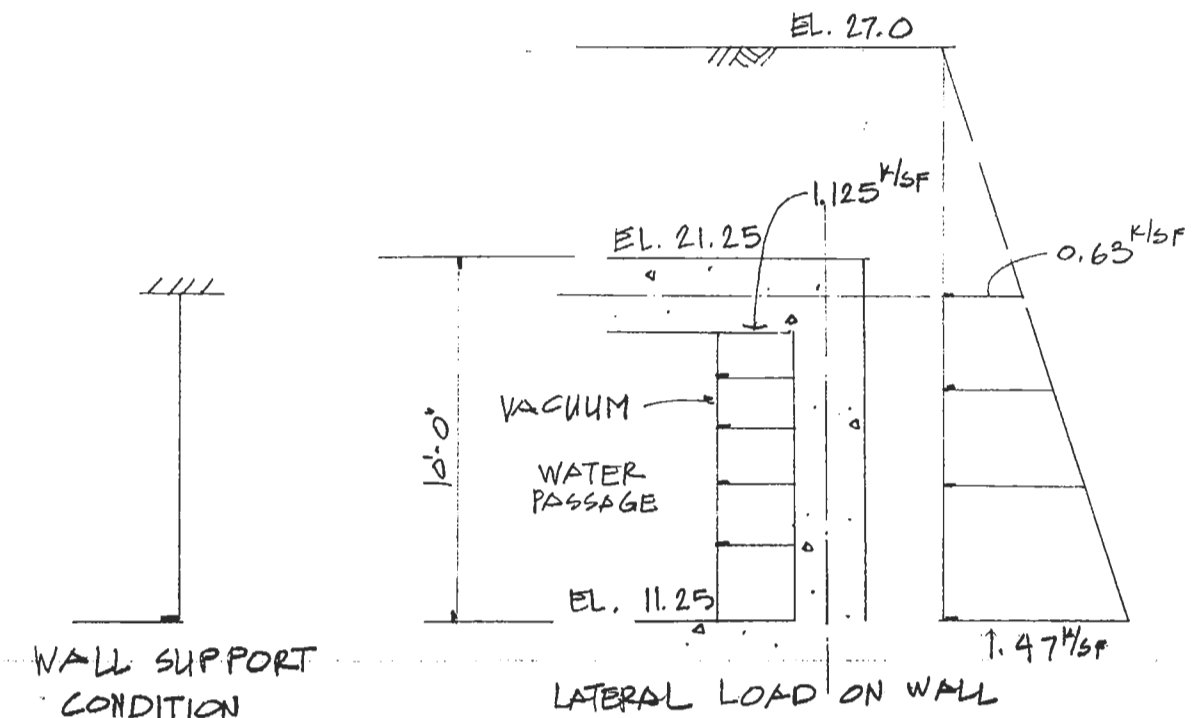
DIRECT LOAD (AXIAL)

1. TOP SLAB	$(2 \times \frac{0.15 \times 22.5}{2}) \times 1.4$	= 4.72
2. BOT SLAB		= 4.72
3. LL	$(2 \times \frac{0.1 \times 22.5}{2}) \times 1.7$	= 3.82 <sup>k</sup>
4. WATER	$\frac{(22.5 \times 8 \times 1)}{2} \times 0.0625$	= 7.88 <sup>k</sup>
5. BACKFILL	$\frac{(0.1225 \times 5.75 \times 22.5)}{2}$	= 13.47
6. SELF WT	$(2 \times 0.15 \times (32.33 - 13.75))$	= 7.80 <sup>k</sup>

TOTAL = 42.41

BENDING MOMENT DUE TO EARTH PRESSURE  
& VACUUM LOAD.

1. AT GATE STRUCTURE  
ASSUME 18'-0" H<sub>2</sub>O FOR VACUUM LOAD.



# WEST WALL DESIGN

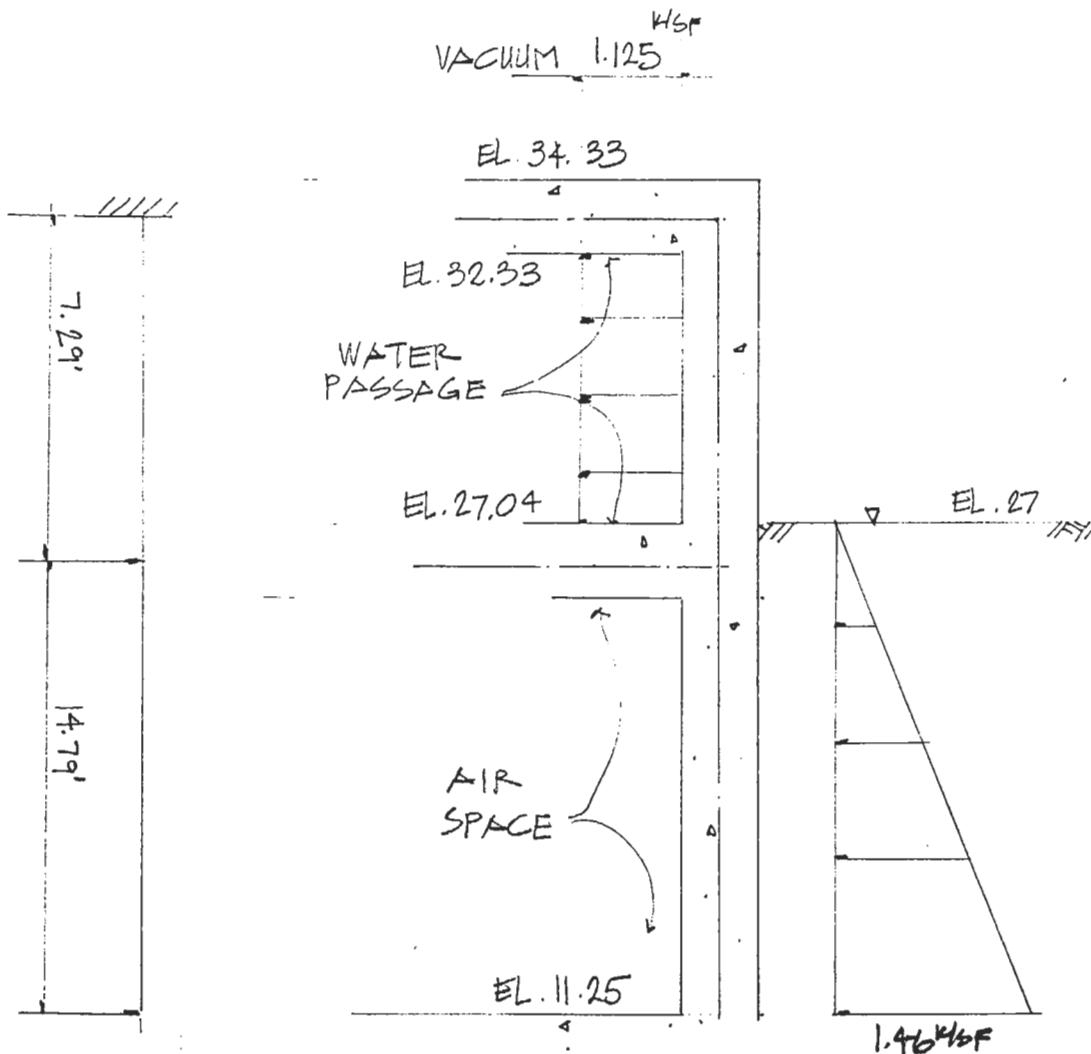
1. CONTD..

FOR TRAPEZOIDAL LOAD USE AN AVG. LOAD  
OF  $(0.63 + 1.47) = 1.05 \text{ k/sf}$

$\therefore \text{TOTAL UDL} = 1.05 \times 1.7 + 1.125 \times 1.4 = 1.78 + 1.58 = 3.36 \text{ k/sf}$

$\therefore \text{BM @ FIXED END} = \frac{3.36 \times 9^2}{8} = 34.02 \text{ k} = M_u$   
 $\text{BM IN SPAN} = \frac{9}{128} \times 9^2 \times 3.36 = 19.13 \text{ k}$

2. AT APPROX 40' FROM SO. END OF DISCH. TUBE



WALL SUPPORT  
CONDITION

LATERAL LOAD ON WALL

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 PROGRAM CFRAME V02.05 24JUL84  
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RUN DATE = 95/02/10  
 RUN TIME = 0.29.35

FRONTING PROTECTION @ DPS NO. 3. WEST WALL

\*\*\* JOINT DATA \*\*\*

JOINT	X	Y	-----FIXITY-----					
			X	Y	R	KX	KY	KR
1	.00	.00	*	*	*			
2	7.29	.00	*	*				
3	22.08	.00	*	*				

\*\*\* MEMBER DATA \*\*\*

MEMBER	END END		LENGTH	I	A	AS	E	G
	A	B						
1	1	2	7.29	.1382E+05	.2880E+03	.2880E+03	.3000E+04	.1304E+04
2	2	3	14.79	.1382E+05	.2880E+03	.2880E+03	.3000E+04	.1304E+04

\*\*\* LOAD CASE 1

MEMBER	DIRECTION	PROJECTED LOAD
1	Y	-.1125E+01

MEMBER	LA	PA	LB	PB	ANGLE
2	.00	.0000E+00	14.79	.1470E+01	.00

LOAD CASE 1

JOINT	JOINT DISPLACEMENTS		
	DX	DY	DR
1	.0000E+00	.0000E+00	.0000E+00
2	.0000E+00	.0000E+00	.0000E+00



3 .0000E+00 .0000E+00 .0000E+00

## MEMBER END FORCES

MEMBER	JOINT	AXIAL	SHEAR	MOMENT	MOMENT EXTREMA	LOCATION
1	1	.0000E+00	.4115E+01	-.4594E+01	.2931E+01	3.64
	2	.0000E+00	.4087E+01	-.4492E+01	-.4594E+01	.00
2	2	.0000E+00	.3927E+01	-.4492E+01	.1878E+02	8.87
	3	.0000E+00	.6943E+01	.0000E+00	-.4492E+01	.00

## STRUCTURE REACTIONS

JOINT	FORCE X	FORCE Y	MOMENT
1	.0000E+00	.4115E+01	.4594E+01
2	.0000E+00	.8014E+01	.0000E+00
3	.0000E+00	.6943E+01	.0000E+00

-----  
TOTAL .0000E+00 .1907E+02

## MEMBER END FORCES

MEMBER	LOAD CASE	JOINT	AXIAL	SHEAR	MOMENT	MOMENT EXTREMA	LOCATION
1	1	1	.0000E+00	.4115E+01	-.4594E+01	.2931E+01	3.64
		2	.0000E+00	.4087E+01	-.4492E+01	-.4594E+01	.00
2	1	2	.0000E+00	.3927E+01	-.4492E+01	.1878E+02	8.87
		3	.0000E+00	.6943E+01	.0000E+00	-.4492E+01	.00

## WEST WALL DESIGN

2. CONTD..

$$\begin{aligned} \text{MAX } M_u &= 1.7 \times 18.8^* \\ &= 31.92'k \end{aligned}$$

\* SEE ATTACHED  
COMP. OUTPUT.

$$\therefore M_u = 31.92'k$$

\(\therefore\) LOADS @ GATE STRUCTURE GOVERNS DESIGN.

$$\begin{aligned} \therefore P_u &= 42.41 \quad M_u = 34.02'k \quad L = 9.0' \quad K = 2.0 \\ r &= 3.46 \quad \therefore \frac{KL}{r} = \frac{2 \times 108}{3.46} = 62 > 22 \end{aligned}$$

\(\therefore\) CONSIDER SLENDERNESS IN WALL DESIGN.

$$I_g = \frac{1}{12} \times 12 \times 24^3 = 13824 \text{ in}^4$$

$$E_c = 3,604 \text{ KSI} \quad \text{ASSUME } \beta_d = 0.75$$

$$\therefore EI = \frac{13824 \times 3604}{1.75} = 11,388,816$$

$$\therefore P_c = \frac{\pi^2 \times 11,388,816}{(2 \times 108)^2} = 2,409$$

$$1 - \frac{P_u}{\phi P_c} = 1 - \frac{42.4}{0.7 \times 2409} = 0.98$$

$$\therefore \delta_s = \frac{1}{0.98} = 1.02$$

$$\therefore M_c = 1.02 \times 34.02 = 34.70'k$$

\(\therefore\) DESIGN FOR  $P_u = 42.40'k$  &  $M_{ux} = 34.70'k$ .

ASSUME  $F'_c = 4000$   
 $F_{ty} = 60000$ .

DESIGN 1'-0" WIDE STRIP OF WALL

VERTICAL REINF

TRY # 8 BARS @ 6"

$$\frac{P_u}{A_g} = 0.14$$

$$\frac{M_u}{A_g h} = 0.06$$

USING INTERACTION  
DIAGRAMS COLS 7.18.3

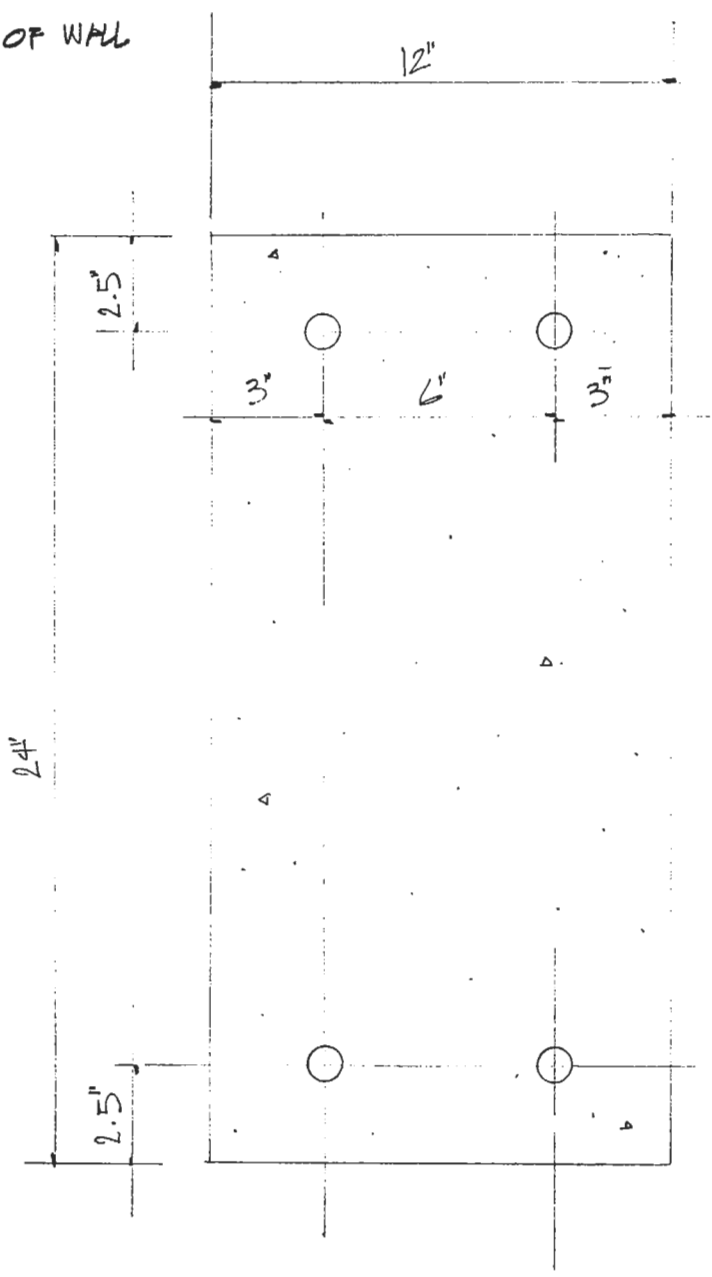
$$\rho \lll 0.01.$$

USE 1% REINF.

$$\therefore A_s = 0.01 \times 12 \times 24$$

$$= 2.88 \text{ in}^2$$

USE 4 # 8  $\cong 2.88 \text{ in}^2$   $\therefore$  O.K.



HORIZ. REINF.

$$A_s = 0.0025 \times 12 \times 24 = 0.72 \text{ in}^2$$

USE # 6 BARS @ 12" O.C. = 0.88 in<sup>2</sup> > 0.72 in<sup>2</sup>  $\therefore$  O.K.

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INTERIOR WALL DESIGN  $F_c = 4000$   $F_y = 60000$ .

$$BM @ \text{FIXED END} = \frac{1.4(2 \times 1.125)}{8} \times q^2 = 32' \text{ k}$$

$$\therefore P_u = 85 \text{ k} \quad M_u = 32' \text{ k} \quad b = 12" \quad h = 24" \quad K = 2.0 \quad l_u = 108"$$

USE MIN  $A_s$ . BY OBSERVATION.

$\therefore$  USE # 8 BARS @ 6" O.C. E.F. (VERTICAL)

USE # 6 BARS @ 12" O.C. E.F. (HORIZ)

C/6

GATE PROGRAM DESIGN OUTPUT

Quote #:  
 Project: New Orleans, LA  
 Item # 1 Plan sheet #  
 Equipment #  
 Location: Pump Station #3

User: BRUNELLE  
 Date: 95/07/06  
 Time: 09:59:07

( 2 ) 8' x 96 Series 120 Sluic gate  
 Score no. : 2131-0101000 Drawing no. : C1265404  
 Self contained : N Inverted operation: N  
 Rising stem : Y Glydaseal : N  
 Floor elevation (ft) : 22  
 Centerline elevation (ft) : 0  
 Centerline to floor (ft) : 22

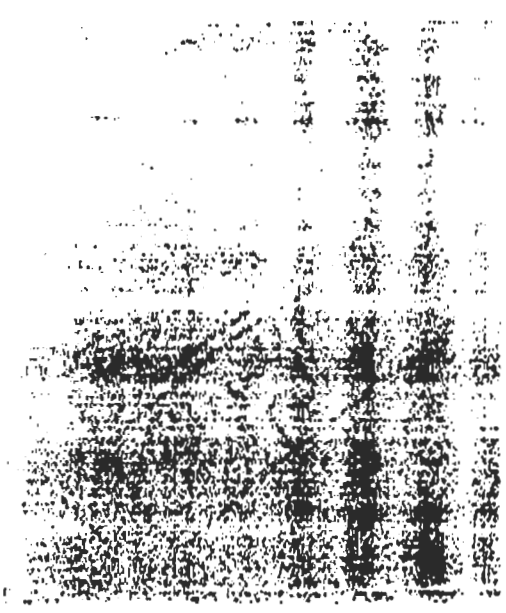
Wall thimble : F section, 12 in. deep

SLUICE GATE OPERATING LOAD

Friction factor : .35		Seating	Unseating
Disc weight : 7200	Head : Design	60	29
Wedge friction : .5	Operating	19	19
Angle of gate : 90			
Stuffing box : N	Force : Raising	34050	34050
Bullnose disc : N	Lowering	19650	19650
Downpull : Y			
	Rod seal : 0		
	Stuffing box : 0		
	Stem+rod force: 528		
	Maximum load : 34050		
	MOL : 34578		

ELECTRIC OPERATOR

Operator : L120-190/60/with 3' inch stem  
 Service : open/close  
 Output : 100090 lbs  
 P/O, Peak, Run : 1548 / 2322 / 542 ft-lbs  
 Nut speed : 30 rpm  
 Weight : 0 lbs  
 Handwheel cl : 36 in  
 Stem speed : 12 in/min  
 Voltage +/- : 10 %  
 SDL S.F. : 1.25  
 Torque factor: 1  
 Nut speed " : 1  
 Motor HP : 3.9  
 Run, Stall : 7 / 48 amps



NON SELF-CONTAINED FRAME

Floor thickness : 12	Wall bracket : N
Hoist grout pad : 1	Offset pedestal : N
Crout/flange proj: 0	Guide length : 0
Stem to wall : 9.5	
Disc travel : 97.38	
Open elevation : 12.91	Thread elevation : 15.74
Centerline to nut: 38	

2/6

GATE PROGRAM DESIGN OUTPUT PAGE 2

Quote #:   
 Project: New Orleans, LA   
 Item # 1

User: BRUNELLE   
 Date: 95/07/06

STEM/ROD DESIGN

Material	:	304	Maximum L/r ratio:	200
Density (lb/in-3)	:	.29	Allowable spacing:	
Tensile str. (psi)	:	75000	plain (in)	: 149.5
Yield str. (psi)	:	30000	threaded (in)	: 110.5
Modulus elas. (psi)	:	2.8E+7	torque (ft)	: 28.66
Torque modul. (psi)	:	1.25E+7		
Diameter mj/mn (in)	:	3 / 2.58	Stems	: 1
Length (ft)	:	21.45	Couplings	: 0
Weight (lbs)	:	528	Tension (psi)	: 19150
Unsupported top(in)	:	286.25	Above floor (in)	: 31.5
Stem factor/TPI	:	.029 / 2.5	Thread length (in)	: 106.63

STEM GUIDE OBSTRUCTION(S)

obstruction	upper	and lower	elevations
1	22	21	

STEM GUIDE LOCATION(S)

no.	elevation	dist. from cl	comments
1	15.63	ft 15 ft 7.5 in	

(3/6)

## OPERATING LOAD VS. GATE POSITION

Quote :  
 Project : New Orleans LA'  
 Item : 1  
 Equipment :  
 Location : Pump Station #3  
 ( 2 ) 84 x 96 Sluic

User : BRUNELLE  
 Date : 95/07/06

Gate opening (ins.)	Seating Condition		Unseating Condition	
	raising (lbs.)	lowering (lbs.)	raising (lbs.)	lowering (lbs.)
0	34580	19120	34580	19120
8	35170	19710	28660	13200
16	32730	17270	26420	10960
24	30360	14900	24250	8790
32	28060	12600	22140	6680
42	25280	9820	19600	4140
48	23660	8200	18130	2670
56	21570	6110	16230	770
64	19540	4060	14390	-1070
72	17580	2120	12620	-2840
80	15680	220	10920	-4540
88	13860	-1600	9290	-6170
96	12100	-3360	7730	-7730
Average	23950	8340	18770	3190

Note : The averages are based on the cumulative totals for gate opening increments of 1 inch. All openings and corresponding loads are not shown for clarity only.

The maximum load of 35700 pounds occurs at 6 inch(es) of opening when raising the gate in the seating condition.

## ACTUATOR SPECIFICATIONS

Disc travel : 97.38 in  
 Stem diameter : 3 in  
 Stem speed : 12 in/min  
 Stem factor : .029 ft  
 Pitch/lead : .4 ft-1  
 Service : open/close  
 Handwheel torque : 1037.91 ft-lb

Allowable stall torque : 3596



GATE PROGRAM DESIGN OUTPUT

Quote #:
Project: New Orleans, LA
Item # 3 Plan sheet #
Equipment #
Location: Pump Station #3

User: BRUNELLE
Date: 95/07/06
Time: 11:30:09

Handwritten circled number 4/6

( 2 ) 108 x 96 Series S140 Sluic gate
Score no. : 2341-0101000 Drawing no. : C1447405
Self contained : N Inverted operation: N
Rising stem : Y Glydaseal : N
Floor elevation (ft) : 22
Centerline elevation (ft) : 0
Centerline to floor (ft) : 22

Wall thimble : F section, 12 in. deep

SLUICE GATE OPERATING LOAD

Friction factor : .35
Disc weight : 10516 Head : Design Seating Unseating
Wedge friction : .5 Operating 55 23
Angle of gate : 90 19 19
Stuffing box : N Force : Raising 45660 45660
Bullnose disc : N Lowering 24630 24630
Downpull : Y
Rod seal : 0
Stuffing box : 0
Stem+rod force: 528
Maximum load : 45660
MOL : 46188

ELECTRIC OPERATOR

Operator : L120-190/80/with 3 Inch stem
Service : open/close
Output : 139450 lbs
P/O, Peak, Run : 1900 / 3096 / 722 ft-lbs
Nut speed : 30 rpm
Weight : 0 lbs
Handwheel cl : 36 in
Stem speed : 12 in/min
Voltage +/- : 10 %
SDL S.F. : 1.25
Torque factor: 1
Nut speed " : 1
Motor HP : 5.2
Run, Stall : 10.6 / 60 amps

NON SELF-CONTAINED FRAME

Floor thickness : 12 Wall bracket : N
Hoist grout pad : 1 Offset pedestal : N
Grout/flange proj: 0 Guide length : 0
Stem to wall : 9.5
Disc travel : 96
Open elevation : 12.79 Thread elevation : 15.85
Centerline to nut: 38

GATE PROGRAM DESIGN OUTPUT PAGE 2

Quote #:   
 Project: New Orleans, LA   
 Item # 3

User: BRUNELLE   
 Date: 93/07/06

STEM/ROD DESIGN

Material	:	304	Maximum L/r ratio:	200
Density (lb/in-3)	:	.29	Allowable spacing:	
Tensile str. (psi)	:	75000	plain (in)	: 129.5
Yield str. (psi)	:	30000	threaded (in)	: 95.5
Modulus elas. (psi)	:	2.8E+7	torque (ft)	: 21.47
Torque modul. (psi)	:	1.23E+7		
Diameter mj/mn (in)	:	3 / 2.38	Stems	: 1
Length (ft)	:	21.46	Couplings	: 0
Weight (lbo)	:	528	Tension (psi)	: 25530
Unsupported top(in)	:	286.25	Above floor (in)	: 31.5
Stem factor/TPI	:	.029 / 2.5	Thread length (in)	: 103.25

STEM GUIDE OBSTRUCTION(S)

obstruction	upper	and lower	elevations
1	22	21	

STEM GUIDE LOCATION(S)

no.	elevation	dist. from cl	comments
1	13.96 ft	13 ft 11.5in	
2	22.0833 ft	22 ft .5 in	flr mtd

6/6

OPERATING LOAD VS. GATE POSITION

Quote :  
Project : New Orleans LA  
Item : 3  
Equipment :  
Location : Pump Station #3  
( 2 ) 108 x 96 sluic

User : BRUNELLE  
Date : 95/07/06

Gate opening (ins.)	Seating Condition raising (lbs.)	Condition lowering (lbs.)	Unseating Condition raising (lbs.)	Condition lowering (lbs.)
0	46190	24100	46190	24100
8	46330	24230	37980	15870
16	43190	21100	35080	12990
24	40150	18050	32290	10190
32	37190	15100	29570	7480
42	33610	11520	26310	4220
48	31530	9440	24420	2320
56	28840	6740	21970	-120
64	26230	4130	19610	-2480
72	23700	1610	17340	-4750
80	21270	-820	15150	-6940
88	18920	-3170	13060	-9040
96	16660	-5430	11050	-11050
Average	31910	9610	25260	3000

Note : The averages are based on the cumulative totals for gate opening increments of 1 inch. All openings and corresponding loads are not shown for clarity only.

The maximum load of 47120 pounds occurs at 6 inch(es) of opening when raising the gate in the seating condition.

ACTUATOR SPECIFICATIONS

Disc travel : 96 in  
Stem diameter : 3 in  
Stem speed : 12 in/min  
Stem factor : .029 ft  
Pitch/lead : .4 ft-l  
Service : open/close  
Handwheel torque : 1366.48 ft-lb

Allowable stall torque : 3596