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

FRONTING PROTECTION
AT
DRAINAGE PUMPIMG STATION NO.3

PRELIMINARY DESIGN CALCULATIONS

Jan, ~~[illegible]~~ 1995

PEPPER AND ASSOCIATES
CONSULTING ENGINEERS
METAIRIE LA 70002

FRONTING PROTECTION
AT
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METAIRIE LA 70002

FRONTING PROTECTION AT DPS NO.3

PRELIMINARY DESIGN CALCULATIONS

INDEX

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

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	

STRUCTURAL CAPACITY OF HP 14 X 73

HP 14 X 73

$A = 21.4 \square''$

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

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

1. ALLOWABLE COMP

$= 0.83\, K_1 \times F_Y \times A$

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

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

2. ALLOWABLE TENSION

$= 0.5 \times F_Y \times A$

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

3. $AM1 = 0.55 \times F_Y \times S_{YY}$

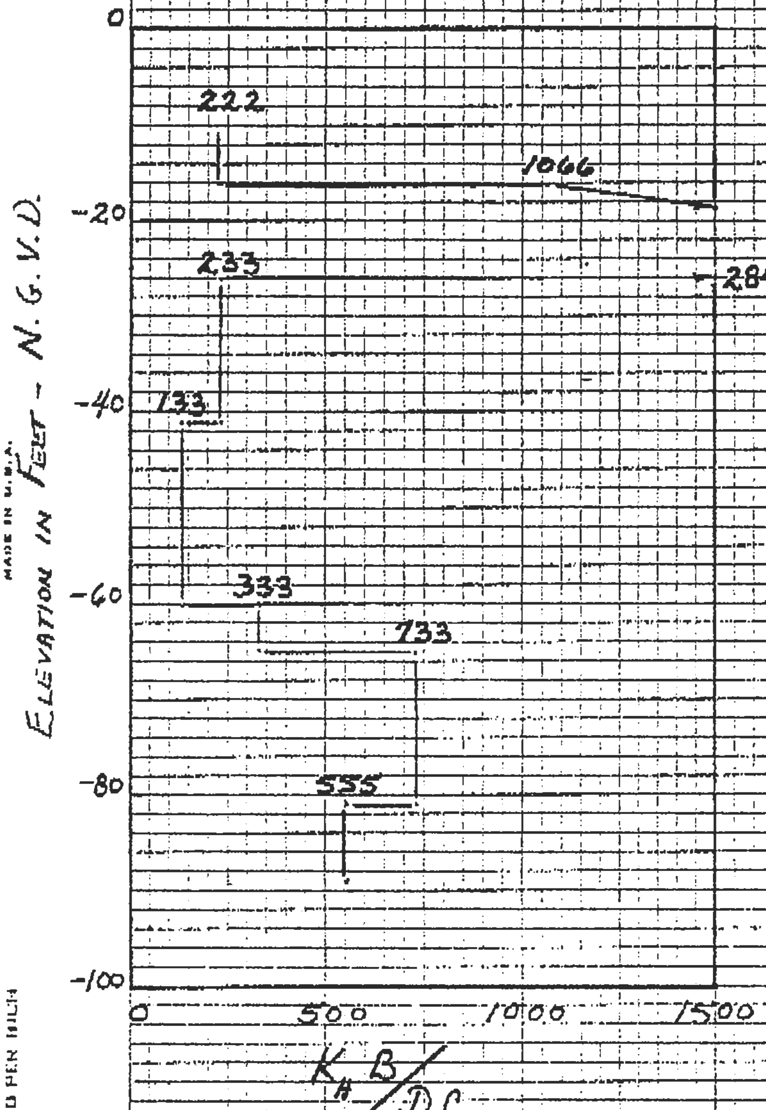
$= 0.55 \times 36 \times 35.8 = 709 \text{ in-k}$

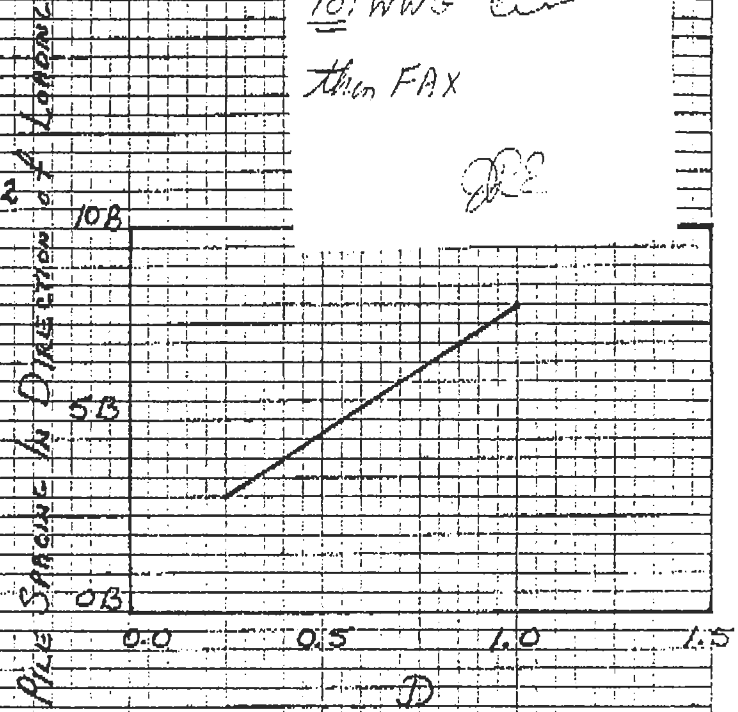
4. $AM2 = 0.55 \times F_Y \times S_{XX}$

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

SOIL-1

PRELIMINARY





TO: WWG
then FAX

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 - lbs/in^3

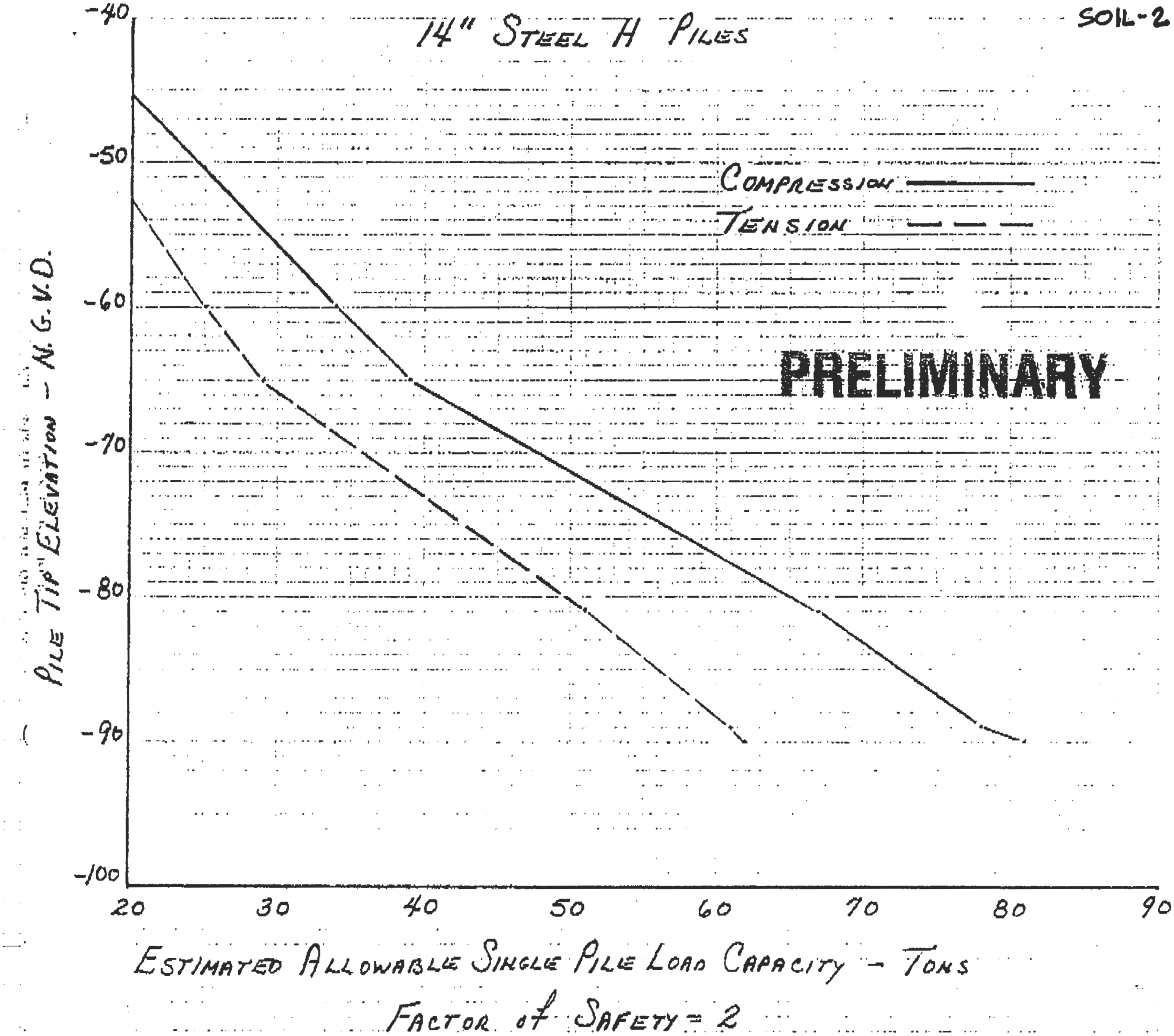
SUBGRADE MODULI

LONDON AVENUE
PUMP STA. #3

JOB 13065 1-13-95

Post-it™ 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

SOIL-2



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Co./Dept. Plepper	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

JRE

SEP-08-1994 08:27 ... 14 pages ... 4119 504 834 0354 P.01/01

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

...RING COMPANY, INC.
...nical Engineers
...ie, Louisiana

Page ____

Date 8 SEPT 94

Job 13065

By LJN

Checked By ____

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

Subject TEMPORARY CONSTRUCTION COFFERDAM

PRELIMINARY SHEETPILE ANALYSES ‡

TYPE WALL	SWL NGVD	SHEETPILE TIP ELEV. NGVD FS = 1.5	MAXIMUM MOMENT FT-K/LF FS=1.0	ANCHOR FORCE K/LF FS=1.0	SOIL CASE
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.

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

TOTAL P.01

HORIZ. MOD. OF SUBGRADE REACTION & VALUE OF 'ES'

AVERAGE VALUE OF $K_H B/_{D \cdot C}$ FROM SOILS REPORT = 316 (WEIGHTED AVERAGE)

$\therefore K_H B/_{DC} = 316$

WHERE B = PILE WIDTH = 14.58"
C = 1.0
D = GROUP EFFECT REDUCTION FACTOR
= 0.25 FOR MIN. SPACING OF 3x PILE WIDTH

$\therefore K_H = \frac{316 \times 0.25}{14.58} \times 1.0 = 5.41$ LB/in^3

$\therefore E_S = K_H \cdot B = \frac{5.41 \times 14.58}{1000} = 0.079$ K/in^2

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

DATE: 26-JAN-1995 TIME: 18.47.25

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¤ INPUT DATA ¤
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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

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)	<--BOTTOM--> SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	<-SAFETY-> <-FACTOR-> PASS.
110.00	115.00	23.00	.0	.00	.0	4.00	.00	DEF	DEF
110.00	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

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)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	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

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¤ SUMMARY OF RESULTS FOR ¤
¤ CANTILEVER WALL DESIGN ¤
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I.--HEADING

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

II.--SUMMARY

RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

```
WALL BOTTOM ELEV. (FT)      :          -.80
     PENETRATION (FT)       :          9.37

MAX. BEND. MOMENT (LB-FT)  :          2398.
     AT ELEVATION (FT)      :          3.59

MAX. SCALED DEFL. (LB-IN3):     2.4178E+08
     AT ELEVATION (FT)      :         14.40
```

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

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

DATE: 26-JAN-1995 TIME: 18.47.52

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¤ COMPLETE RESULTS FOR ¤
¤ CANTILEVER WALL DESIGN ¤
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I.--HEADING

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

II.--RESULTS

ELEVATION	BENDING MOMENT	SHEAR	SCALED DEFLECTION	NET PRESSURE

(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	< LEFTSIDE PRESSURE (PSF)>		<RIGHTSIDE PRESSURE (PSF)>	
(FT)	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.

sdL-9

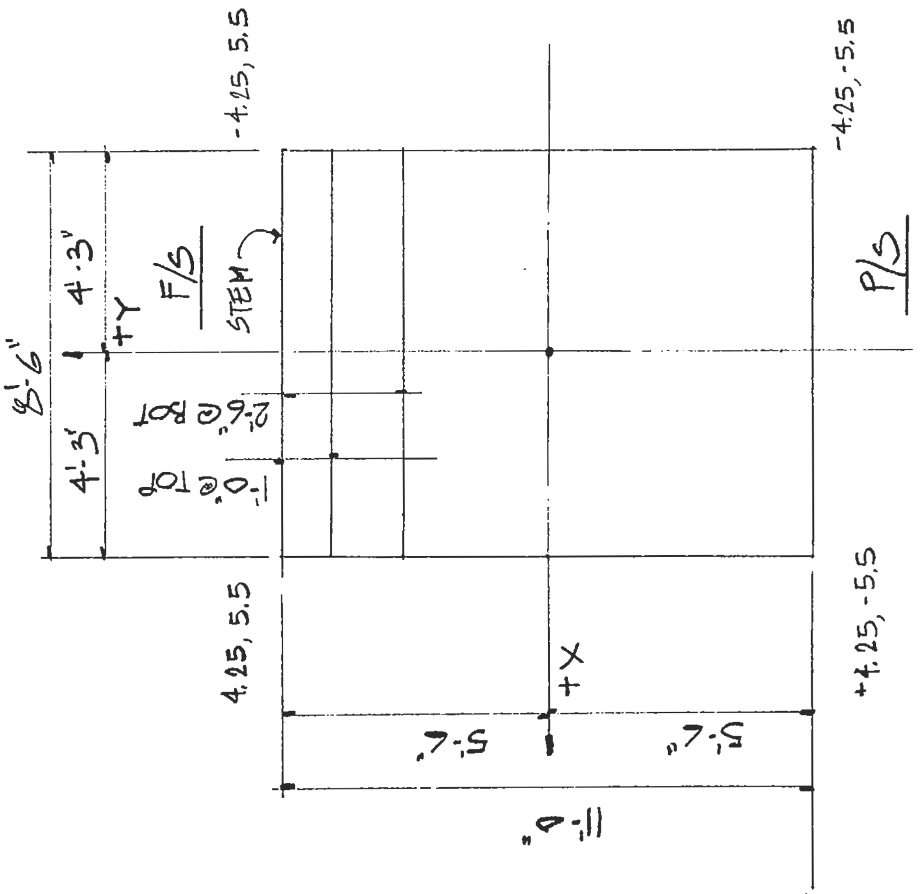
-2.60	2246.	735.	303.	928.

MOUNTING PROJECTION
@ DPS NO. 3

MONOLITH PLAN

T1-7

'T' WALL MONO EAST SIDE

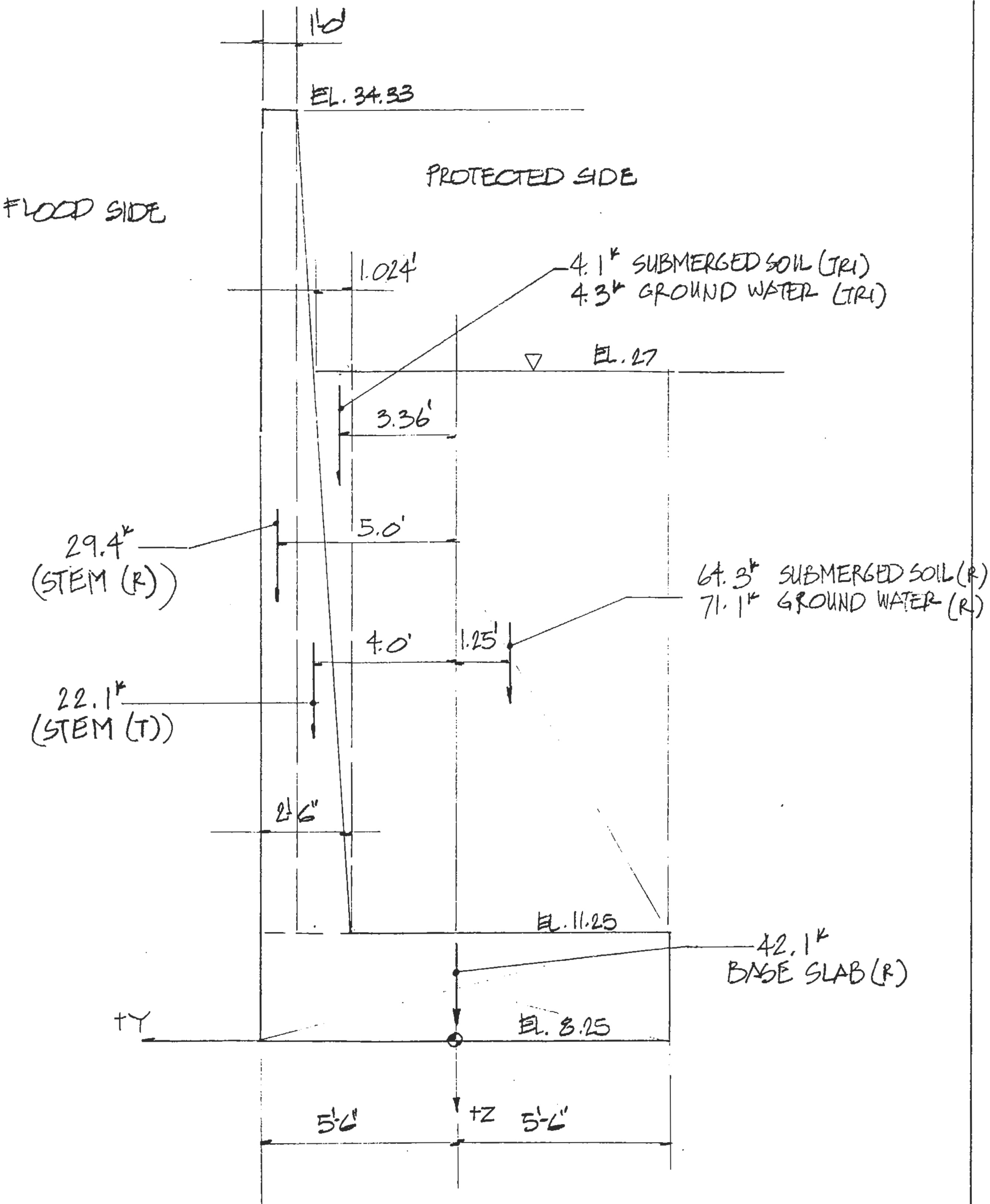


FRONTING PROTECTION
@ DPS NO.3

VERTICAL LOADS

T1-2

'T' WALL MONO EASTSIDE

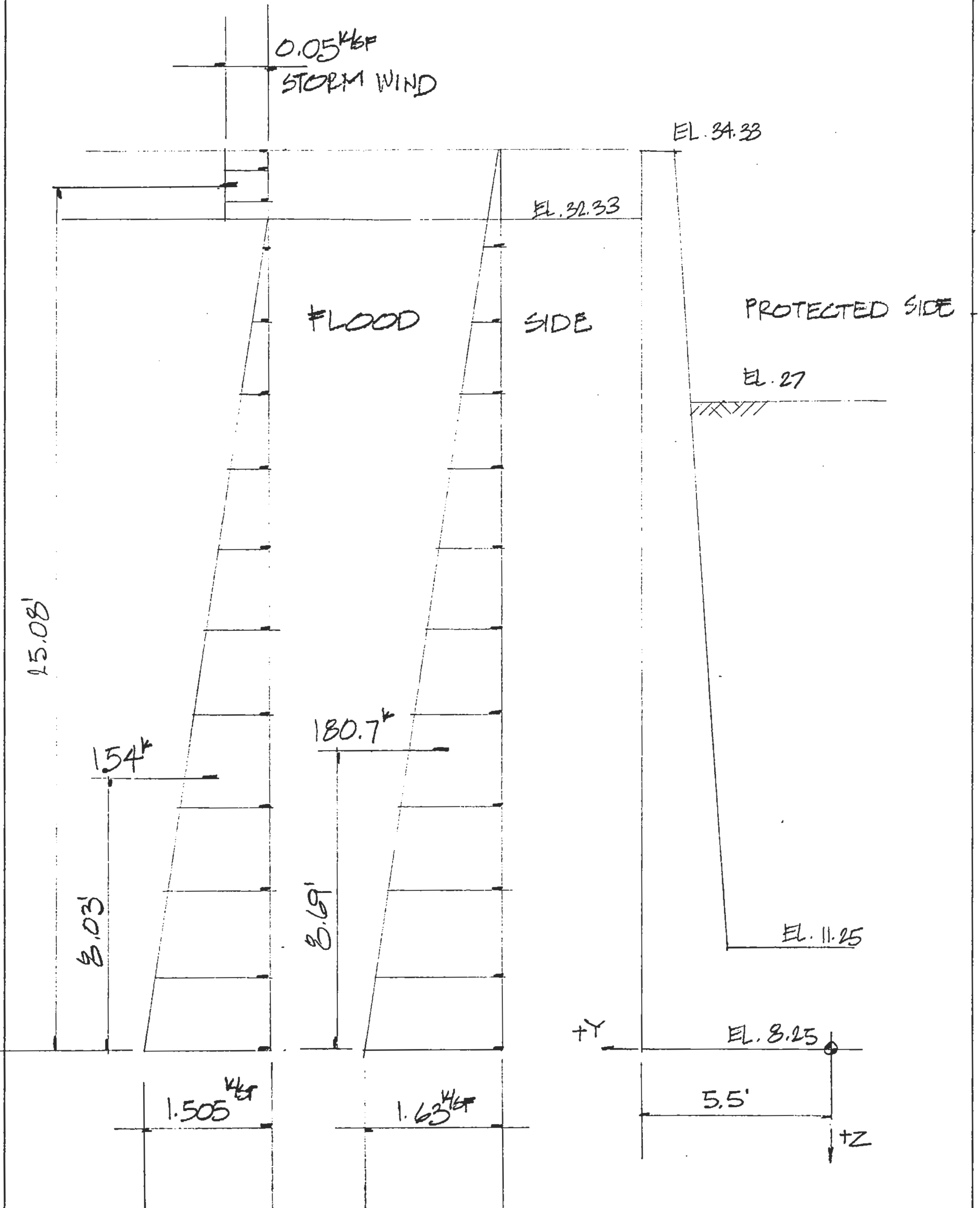


@ DPS NO.3

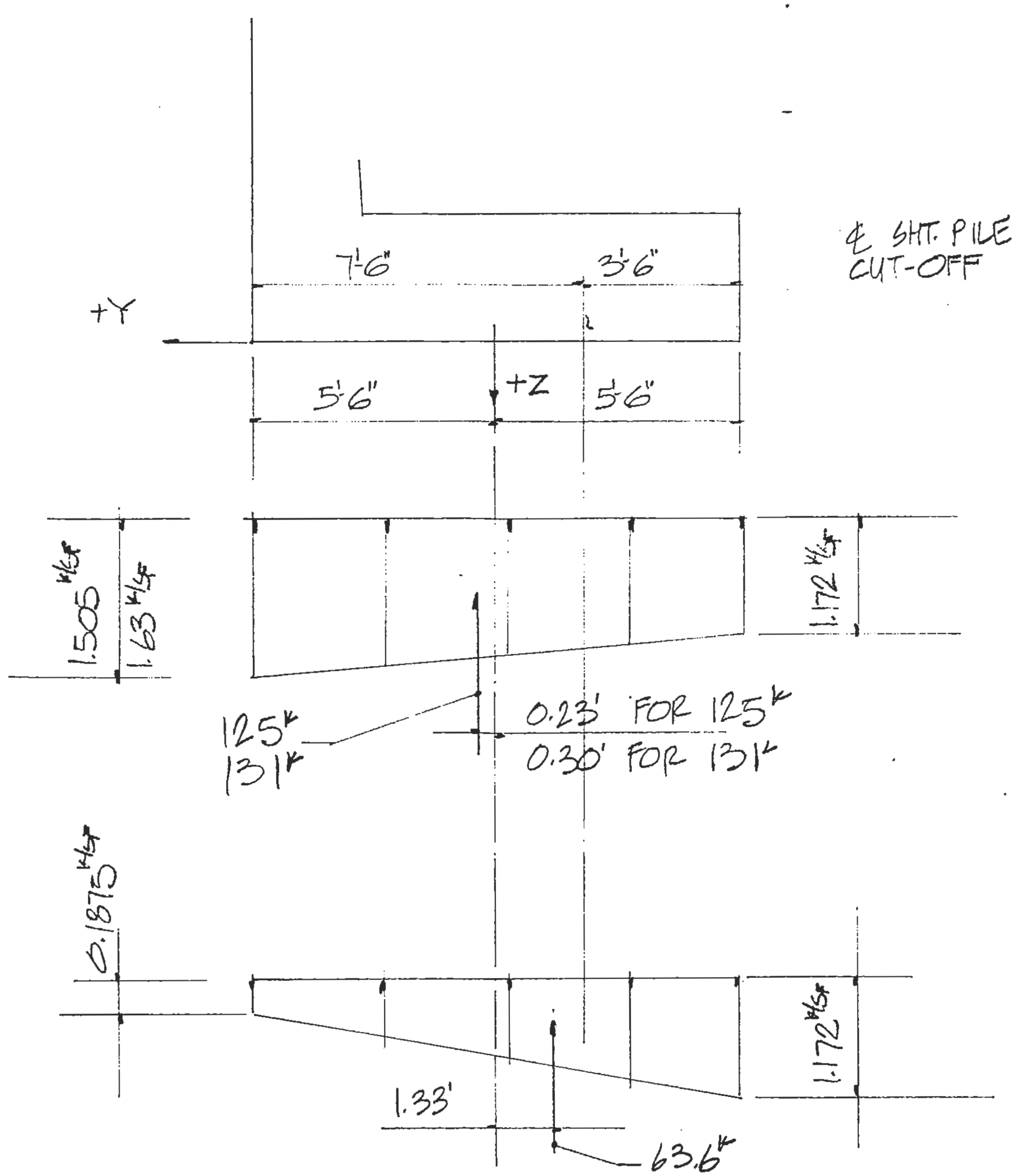
STORM. ALSO WIND LOADS

T1-3

'T' WALL MONO EAST SIDE

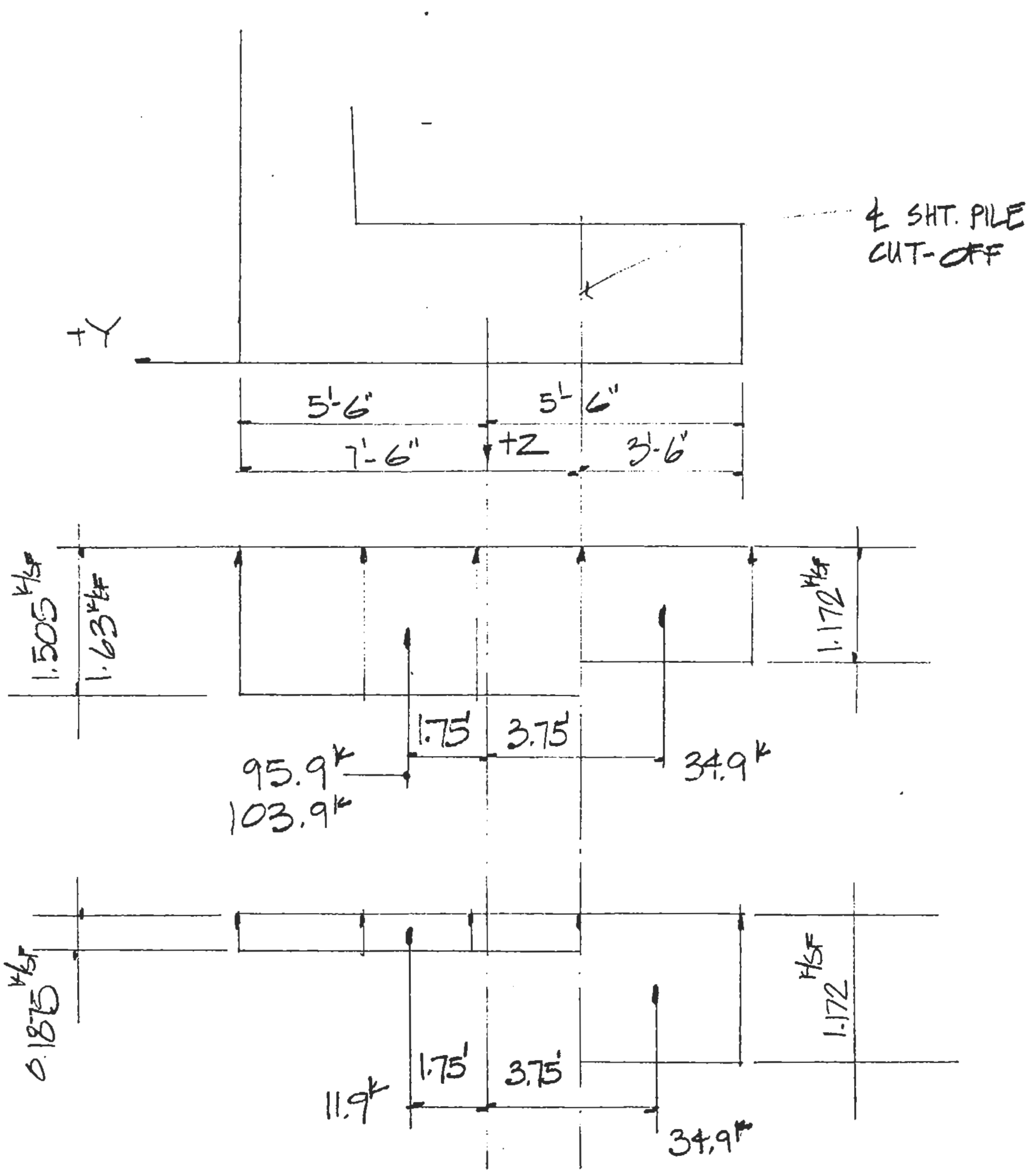


'T' WALL MONO EAST SIDE



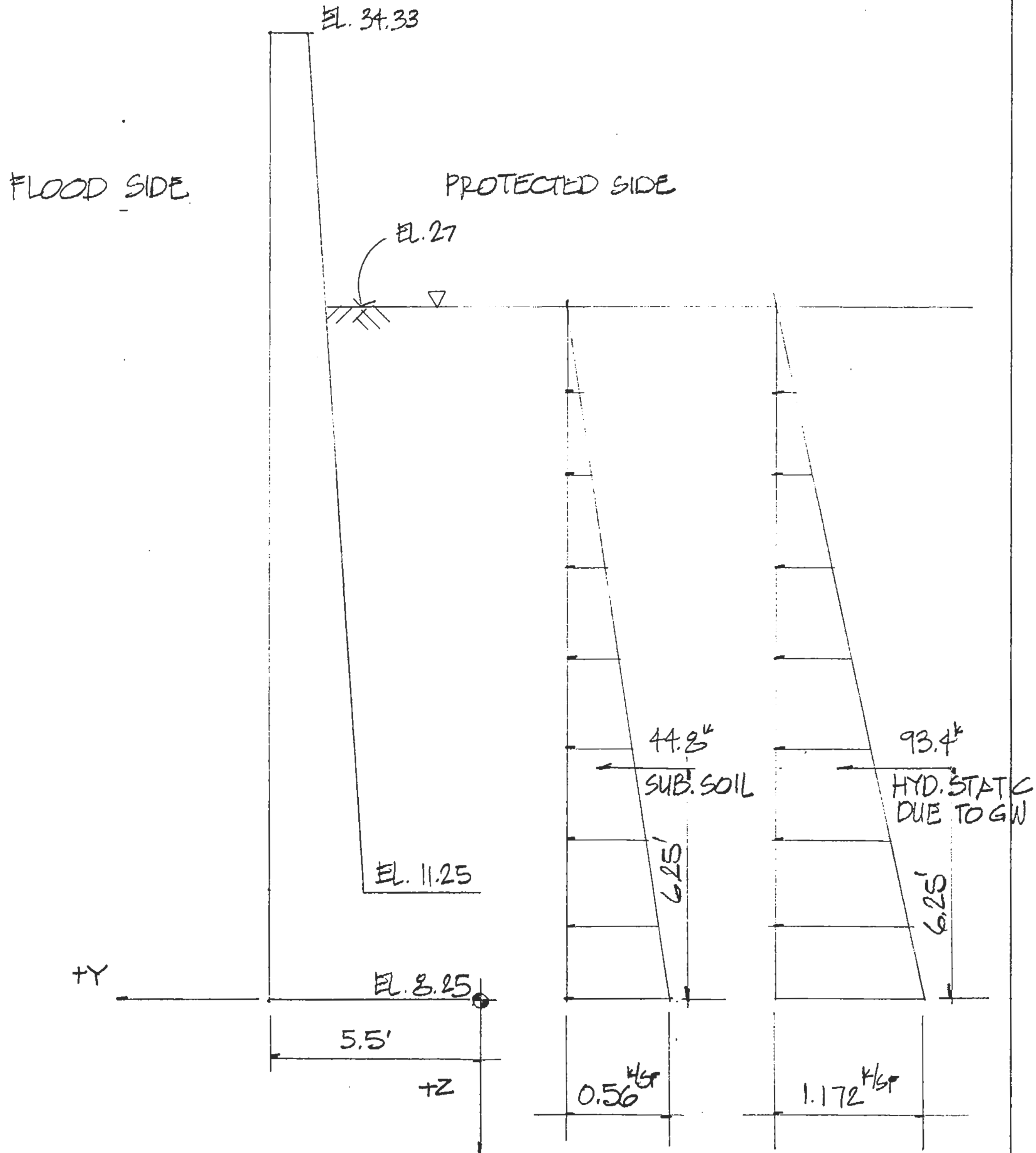
UPLIFT - PERVIOUS CUT-OFF

'T' WALL MONO EAST SIDE



UPLIFT ~ IMPERVIOUS CUT-OFF

'T' WALL MONO EAST SIDE



DIMENSIONAL AND OTHER INPUT

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'KNESS @ TOP	1.00		
C16	STEN TH'KNESS @ 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		

T1-7

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'KNESS OF STEM @ GW			
	SURFACE EL	1.48		
C41	TH'KNESS 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'KNESS			
	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'KNESS			
	AT BASE SLAB)@ TOP OF			
	BACKFILL	1.02		

T1-8

C59	ANGLE MADE BY RIGHT SIDE			
	EDGE OF MONOLITH WITH			
	Y' AXIS IN RADIANS CLKWISW	0.00		
C62	ANGLE MADE BY LEFT SIDE			
	EDGE OF MONOLITH WITH			
	Y' AXIS IN RADIANS 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			

TI-9

	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		

T1-11

CO-ORDINATES OF VARIOUS ITEMS											
									L1	L2	L
ITEM	X1	Y1	X2	Y2	X3	Y3	X4	Y4	LENGTH1	LENGTH 2	AV.LENGTH
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

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

T1-13

	ITEM	L	W OR H WIDTH OR	T	w		CENTER OF GRAVITY		LEVER ARM		MOMENT CODE		MOMENTS	
		LENGTH	HEIGHT	TH'KNESS	UNITWT	FZ	X	Y	FOR MX	FOR MY	FOR MX	FOR MY	MX	MY
VERTICAL LOADS														
						L x H or W x T x w								
	STEM (R)	8.50	23.08	1.00	0.1500	29.43	0.00	5.00	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	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	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	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	1.83	4.25	-1.00	-1.00	0.00	0.00
	TOTAL VERTICAL LOADS (CONC ETC.)					***93.57***							***235.42***	***0.00***
VERTICAL HYDRAULIC LOADS:														
WATER EL														
32.33	WATER IN CANAL (R)	8.50	21.08	0.00	0.0625	0.00	0.00	5.50	5.50	0.00	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	5.50	4.25	1.00	1.00	0.00	0.00
	WATER IN CANAL (T-L)	0.00	21.08	0.00	0.0625	0.00	4.25	5.50	5.50	4.25	1.00	-1.00	0.00	0.00
TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 32.33						***0.00***							***0.00***	***0.00***
34.33	WATER IN CANAL (R)	8.50	23.08	0.00	0.0625	0.00	0.00	5.50	5.50	0.00	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	5.50	4.25	1.00	1.00	0.00	0.00
	WATER IN CANAL (T-L)	0.00	23.08	0.00	0.0625	0.00	4.25	5.50	5.50	4.25	1.00	-1.00	0.00	0.00
TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 34.33						***0.00***							***0.00***	***0.00***
27 P/S	GROUND WATER (R)	8.50	15.75	8.50	0.0625	71.12	0.00	-1.25	1.25	0.00	-1.00	1.00	-88.90	0.00
	GROUND WATER (T-R)	0.00	15.75	8.50	0.0625	0.00	-4.25	-2.67	2.67	4.25	-1.00	1.00	0.00	0.00
	GROUND WATER (T-L)	0.00	15.75	8.50	0.0625	0.00	4.25	-2.67	2.67	4.25	-1.00	-1.00	0.00	0.00
27 P/S	GROUND WATER (TRI ANGULAR IN SECTION, RECT IN PLAN)	8.50	15.75	1.02	0.0625	4.28	0.00	3.34	3.34	0.00	1.00	1.00	14.31	0.00
TOTAL VERTICAL HYDRAULIC LOADS FOR GW LEVEL ON P/S @ EL 27						***75.40***							***-74.59***	***0.00***
VERTICAL EARTH LOADS														
BACKFILL EL														
27 P/S	SUBMERGED EARTH(R)	8.50	15.75	8.50	0.0600	68.28	0.00	-1.25	1.25	0.00	-1.00	1.00	-85.35	0.00
	SUBMERGED EARTH(T-L)	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

	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	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
	ANGULAR IN SECTION,													
	RECT IN PLAN)													
TOTAL SUBMERGED EARTH LOADS W/ GW LEVEL @ 27						***72.39***							***-71.61***	***0.00***
FROM 21.33	SATURATED BACKFILL(R)	8.50	0.00	9.52	0.1150	0.00	0.00	-0.74	0.74	0.00	-1.00	1.00	0.00	0.00
TO 27.00 P/S	SATURATED BACKFILL(T-L)	0.00	0.00	9.52	0.1150	0.00	-4.25	-2.33	2.33	4.25	-1.00	1.00	0.00	0.00
	SATURATED BACKFILL(T-R)	0.00	0.00	9.52	0.1150	0.00	4.25	-2.33	2.33	4.25	-1.00	-1.00	0.00	0.00
FROM 21.33	SATURATED BACKFILL(TRI	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
TO 27.00 P/S	ANGULAR IN SECTION,													
	AND RECT IN PLAN)													
TOTAL SATURATED EARTH LOADS W/ GW @ 27														
AND TOP OF BACKFILL @ 27.0						***0.00***							***0.00***	***0.00***

NOTE:
THERE IS NO SATURATED BACKFILL

T1-14

TI-15

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 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

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

T1-16

T1-17

WATER EL	ITEM	LENGTH	HEIGHT OF WATER(F/S)	HEIGHT OF WATER(P/S)	UNIT WT	UPLIFT F/S EDGE	UPLIFT P/S EDGE	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY		LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE		MOMENT	MOMENT	REMARK
		L	HT1	HT2	w	w x HT1	w x HT2				X	Y			FOR MX	FOR MY	MX	MY	
HYDROSTATIC UPLIFT LOADS (PERVIOUS CUT-OFF)																			
WL IN CANAL @ 32.33 AND GW LEVEL @ 27,PERVIOUS CUT-OFF																			
																	FZ x LEVARM x MOMENTCODE		
32.33 (F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	
32.33 (F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	
32.33 (F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 AND GW @ 27 AND PERVIOUS CUT-OFF										**-125.14**							**-28.55**	**0.00**	
WL IN CANAL @ 34.33 AND GW LEVEL @ 27,PERVIOUS CUT-OFF																			
34.33(F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	
34.33(F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	
34.33(F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	
										-130.99							**-39.27**	**0.00**	
WL IN CANAL @ 24.25 AND GW LEVEL @ 27,PERVIOUS CUT-OFF																			
24.25(F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	
24.25(F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	
24.25(F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.25 AND GW @ 27.00 AND PERVIOUS CUT-OFF										**-101.54**							**-14.73**	**0.00**	
HYDROSTATIC UPLIFT LOADS (IMPERVIOUS CUT-OFF)																			
WL IN CANAL @ 32.33 AND GW LEVEL @ 21.43,IMPERVIOUS CUT-OFF																			
WATER EL	ITEM	LENGTH	HEIGHT OF WATER(F/S)	HEIGHT OF WATER(P/S)	UNIT WT	UPLIFT F/S EDGE	UPLIFT P/S EDGE	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY		LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE		MOMENT	MOMENT	REMARK
		L	HT1	HT2	w	w x HT1	w x HT2				X	Y			FOR MX	FOR MY	MX	MY	
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	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 AND GW @ 27,IMPERVIOUS CUT-OFF										**-130.81**							**-37.16**	**0.00**	
WL IN CANAL @ 34.33 AND GW LEVEL @ 27,IMPERVIOUS CUT-OFF																			
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	

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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	
TOTAL UPLIFT LOADS FOR WL IN CANAL@ 34.33 AND GW @ 27,IMPERVIOUS CUT-OFF										*-138.78*							*-51.11*	*0.00*	
WL IN CANAL @ 24.25 AND GW LEVEL @ 27,IMPERVIOUS CUT-OFF																			
24.25 (F/S)	WATER IN CANAL (F/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	
TOTAL UPLIFT LOADS FOR WL IN CANAL@ 24.25 AND GW @ 27,IMPERVIOUS CUT-OFF										*-98.61*							*19.17*	*0.00*	

T1-19

HYDROSTATIC UPLIFT LOADS

PERVIOUS CUT-OFF

WATER EL	ITEM	LENGTH	HEIGHT OF WATER(F/S)	HEIGHT OF WATER(P/S)	UNIT WT	UPLIFT F/S EDGE	UPLIFT P/S EDGE	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY		LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE		MOMENT	MOMENT	REMARK
		L	HT1	HT2	w	w x HT1	w x HT2				X	Y			FOR MX	FOR MY	MX	MY	
11.25 (F/S)	WATER IN CANAL (F/S)																FZ x LEVARM x MOMENTCODE		
27.00(P/S)	GROUND WATER (P/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	-1.00	-84.37	0.00	
11.25 (F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	-1.00	0.00	0.00	
11.25 (F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	1.00	0.00	0.00	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 27,PERVIOUS CUT-OFF										-63.55							-84.37	0.00	

HYDROSTATIC UPLIFT LOADS

IMPERVIOUS CUT-OFF

WATER EL	ITEM	LENGTH	HEIGHT OF WATER(F/S)	HEIGHT OF WATER(P/S)	UNIT WT	UPLIFT F/S EDGE	UPLIFT P/S EDGE	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY		LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE		MOMENT	MOMENT	REMARK
		L	HT1	HT2	w	w x HT1	w x HT2				X	Y			FOR MX	FOR MY	MX	MY	
11.25 (F/S)	WATER IN CANAL (F/S)	8.50	3.00	3	0.06250	0.19	0.19	7.50	RECT	-11.95	0.00	1.75	1.75	0.00	-1.00	-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	-1.00	130.74	0.00	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 27,IMPERVIOUS CUT-OFF										-46.82							-37.18	0.00	

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HORIZONTAL WIND LOADS								
STORM WIND LOADS:								
WATER EL	**ITEM**	**LENGTH**	**EXPOSED HEIGHT HT**	**WIND INTENSITY q**	**SHAPE OF PRES DIAG**	**FY**	**LEVARM**	**MOMENT MX**
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
OPERATING WIND LOADS								
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		
TOTAL FOR CASE I :		***-1.9618***	***93.57225***	***206.8914***		

CASE II : WL IN CANAL@32.33, STORM WIND, BACKFILL IN PLACE GW @ 27.00, IMPERVIOUS CUT-OFF.

ITEM	FX	FY	FZ	MX	MY	MZ
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		

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HYDROSTATIC PRESSURE		-154.02		-1236.28			
EARTH PRESSURE		138.21		863.8			
STORM WIND		-0.85		-21.318			
TOTAL FOR CASE II :		***-16.6637***	***35.15256***	***-267.156***			
CASE III : WL IN CANAL@32.33,STORM WIND,BACKFILL IN PLACE							
GW @ 27.00, PERVIOUS 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			-125.14	-28.55			
HYDROSTATIC PRESSURE		-154.02		-1236.28			
EARTH PRESSURE		138.21		863.8			
STORM WIND		-0.85		-21.318			
TOTAL FOR CASE III :		***-16.6637***	***40.81568***	***-258.544***			
CASE IV : WL IN CANAL EMPTY,BACKFILL IN PLACE, OP. WIND							
GW @ 27.00, IMPERVIOUS CUT-OFF.							
CONCRETE LOADS			93.57225	235.416			

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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			
TOTAL FOR CASE IV :		***133.8556***	***119.1432***	***959.5273***			
CASE V : WL IN CANAL EMPTY, BACKFILL IN PLACE, OP. WIND							
GW @ 27.00, PERVIOUS CUT-OFF.							
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			
TOTAL FOR CASE V :		***133.8556***	***102.4088***	***912.3224***			
CASE VI : WL IN CANAL@34.33, STORM WIND, BACKFILL IN PLACE							
GW @ 27.00, IMPERVIOUS CUT-OFF.							

T1-23

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

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

T1-25

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
65 BATTER 12 3 TO 4
70 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
680 FOU 1 2 3 4 5 6 7 B:\T-1.OUT
690 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
                                        X          Y          Z
                                      -----      -----      -----
WITH DIAGONAL COORDINATES = (        -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
```

468.00

****

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

AD 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

****

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

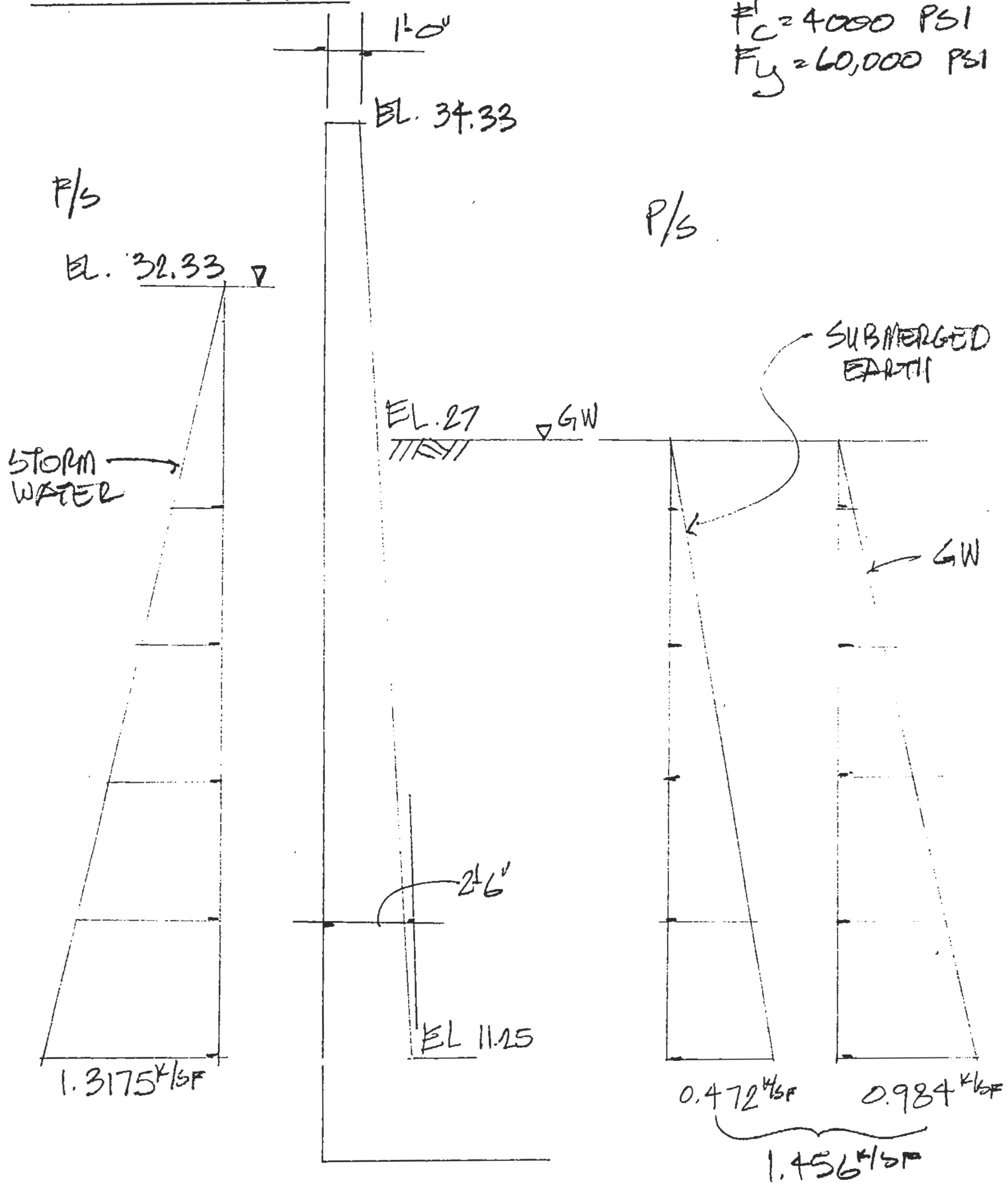
PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-2.2	-28.5	.0	.0	.0
2	.0	-2.2	-28.5	.0	.0	.0
3	.0	.8	8.5	.0	.0	.0
4	.0	.8	8.5	.0	.0	.0
5	.0	-14.9	30.2	.0	.0	.0
6	.0	-14.9	30.2	.0	.0	.0

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

$f'_c = 4000$ PSI
$F_y = 60{,}000$ PSI



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

$= 1.456^{k/sf} \times 0.5 \times 15.75 \times 15.75/3 = 60.2'^{k}$ (SERVICE LOAD)

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

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

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

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

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

$M_n = 216/0.9 = 240'^k$

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

$= \sqrt{2.495 \times 240}$

$= 24.5''$

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

$= 24.5 + 4''$ (COVER) $+ 0.625 = 29.125'' < 30''$ ∴ O.K.

AREA OF STEEL REQ'D

1. FOR BM = 240' K

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

$= 0.1161$

$\therefore A_s = \frac{0.85 \times 4 \times .1161 \times 12}{60} \times 25.4 = 2.00^{\square''}/\text{FT.}$

$\therefore \frac{A_s}{bd} = \frac{2.0}{12 \times 25.4} = 0.0065 > A_{s_{MIN}}$ $\quad \rho_b = 0.0285,\ 0.25\rho_b = .0071$
$< 0.25\rho_b$

2. FOR BM = 148'k

$A_s = \frac{0.85 \times 4 \times .0699}{60} \times 12 \times 25.4 = 1.21^{\square''}/\text{FT}$ $\quad \frac{A_s}{bd} = 0.00397 < \frac{\rho_b}{4}$

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

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

$A_s = 0.76^{\square''}$ $\therefore A_s/bd = 0.0025 < A_{s(min)}$ USE $A_{s(min)}$

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. ($A_{s(req'd)}$ 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.

$\therefore$ REINF ON F/S FACE OF STEM $= 0.0033 \times 12 \times 25.4$
$= 1.01^{\square''}/FT.$

REINF ON F/S FACE OF STEM $= 1.21^{\square''}/FT.$

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

HORIZ. REINF.

$= 0.0028 \times 12 \times 30 = 1^{\square''}/FT$

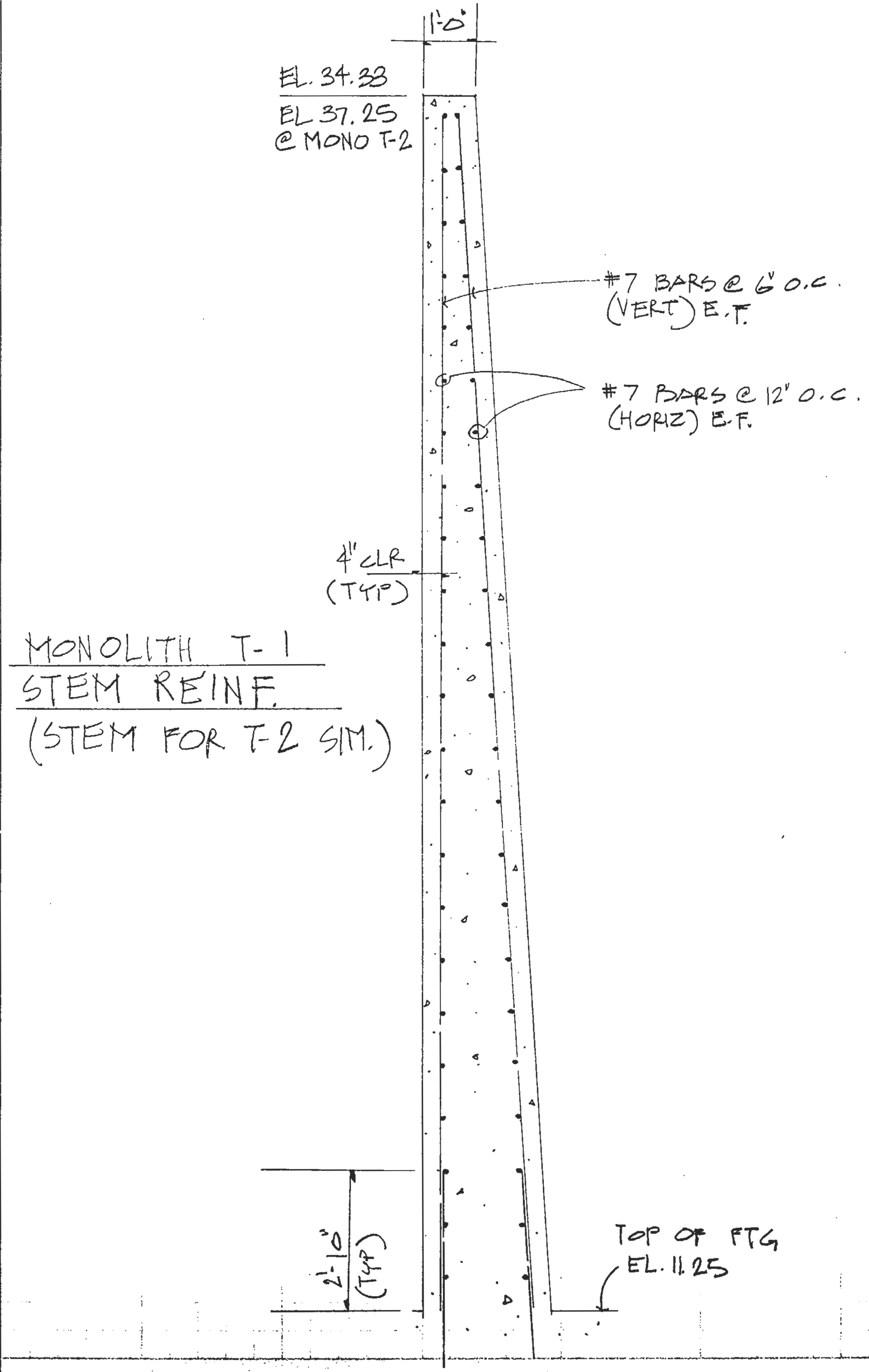
USE #7 BARS @ 12" O.C. E.F. (TOTAL $= 1.2^{\square''} > 1.0^{\square''}$)

CHECK SHEAR

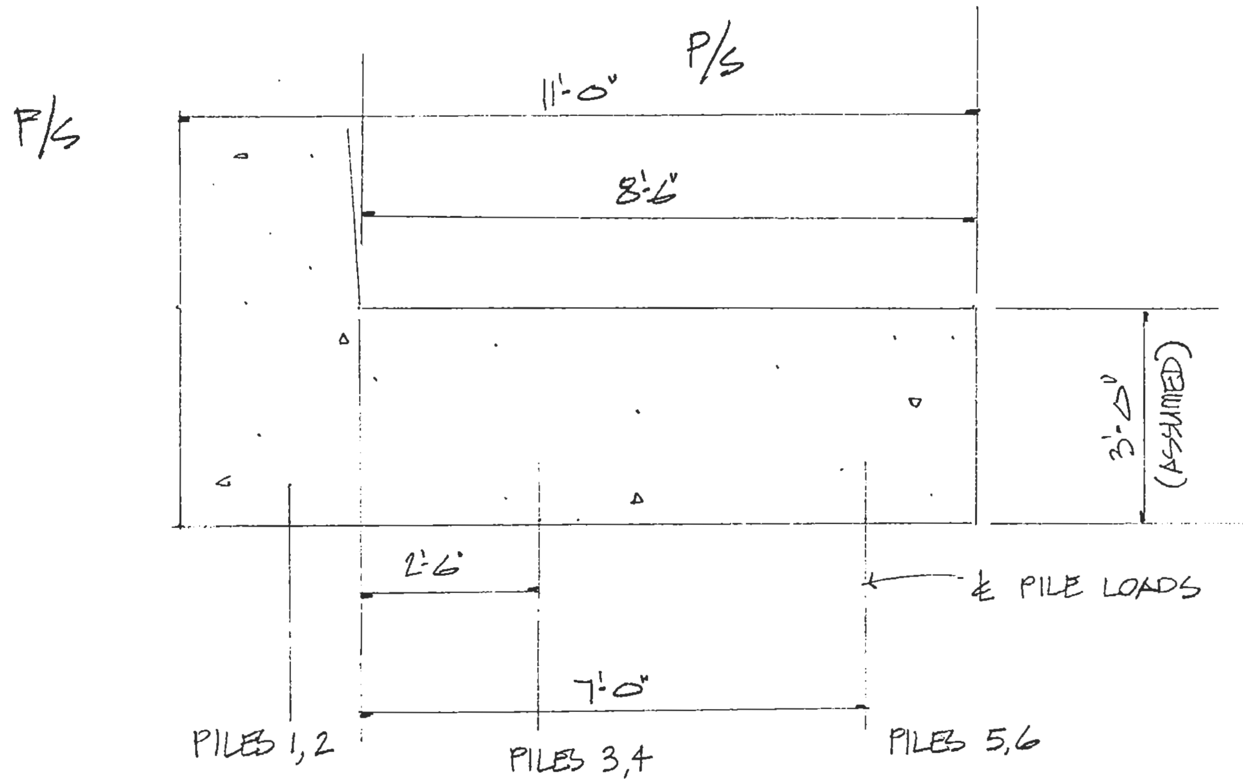
ALLOWABLE $V_u = 0.85 \times 2 \times 63 \times 12 \times 23.93$
$= 30.76^k$

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

∴ SELECTED STEM TH'KNESS IS ADEQUATE & NO SHEAR REINF IS NECESSARY.


1'-0"
EL. 34.33
EL 37.25 @ MONO T-2
#7 BARS @ 6" O.C. (VERT) E.F.
#7 BARS @ 12" O.C. (HORIZ) E.F.
4" CLR (TYP)
MONOLITH T-1
STEM REINF.
(STEM FOR T-2 SIM.)
2'-10" (TYP)
TOP OF FTG EL. 11.25

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 T1-31)

1.

PILE	LOAD
3	102
4	102
5	-68
6	-68

2. SELF $0.45^{k/SF}$

3. OTHER LOADS REFER TO PLATE

FDN SLAB DESIGN

BENDING 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 $(204 \times 2.5 - 136 \times 7) = -442'^k$

TOTAL $= -867'^k$

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

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

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

ASSUMING 4" COVER & #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 @ dist 'd' $= ((42.1^k + 64.3^k + 71.1^k) 0.75 - 204 - \frac{68 \times 2}{2} - 63.6 \times .75) \times 1.3 \times 1.4 = 339^k$

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

PUNCH SHEAR O.K. BY OBS

TOP REINF

FOR $b = 12''$, $d = 31.43$ $F = 0.98$
$\therefore$ FOR $M = 225$ $K_u = 229$ $\rho = 0.0060$

$\therefore A_s = 0.0060 \times 12 \times 31.43 = 2.26^{\square''}/FT.$

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

BOT REINF.

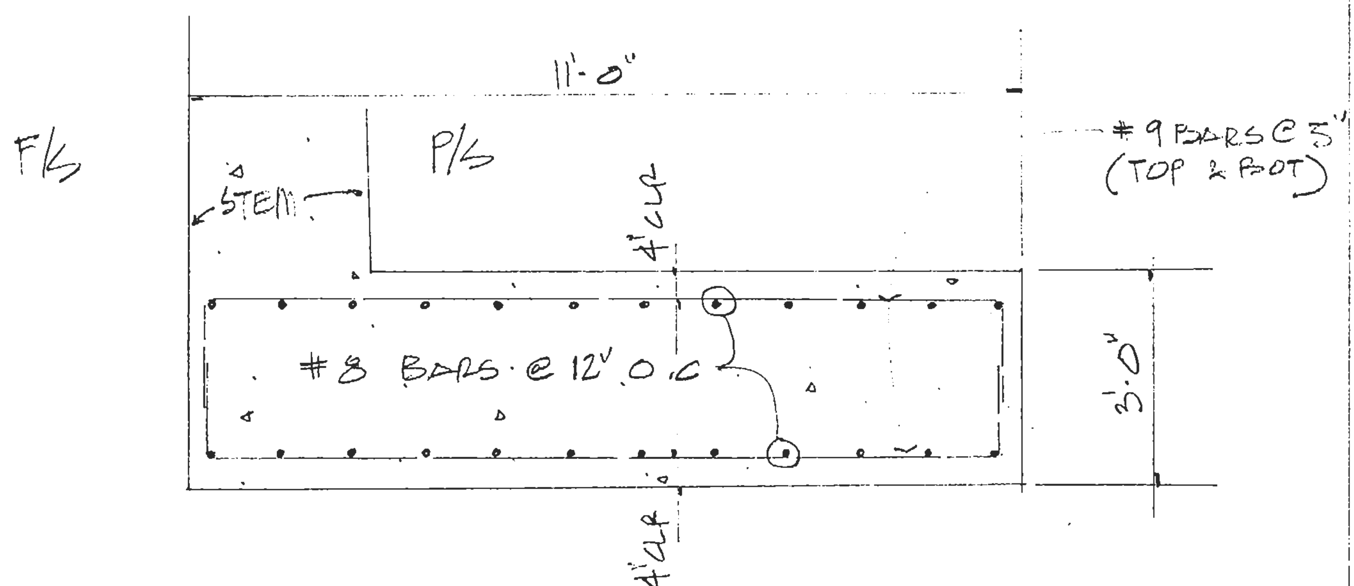
USE #10 BARS @ 6" OR #9 BARS @ 5" O.C. BOT.

FDN SLAB DESIGN

SHRINKAGE & TEMP REINF

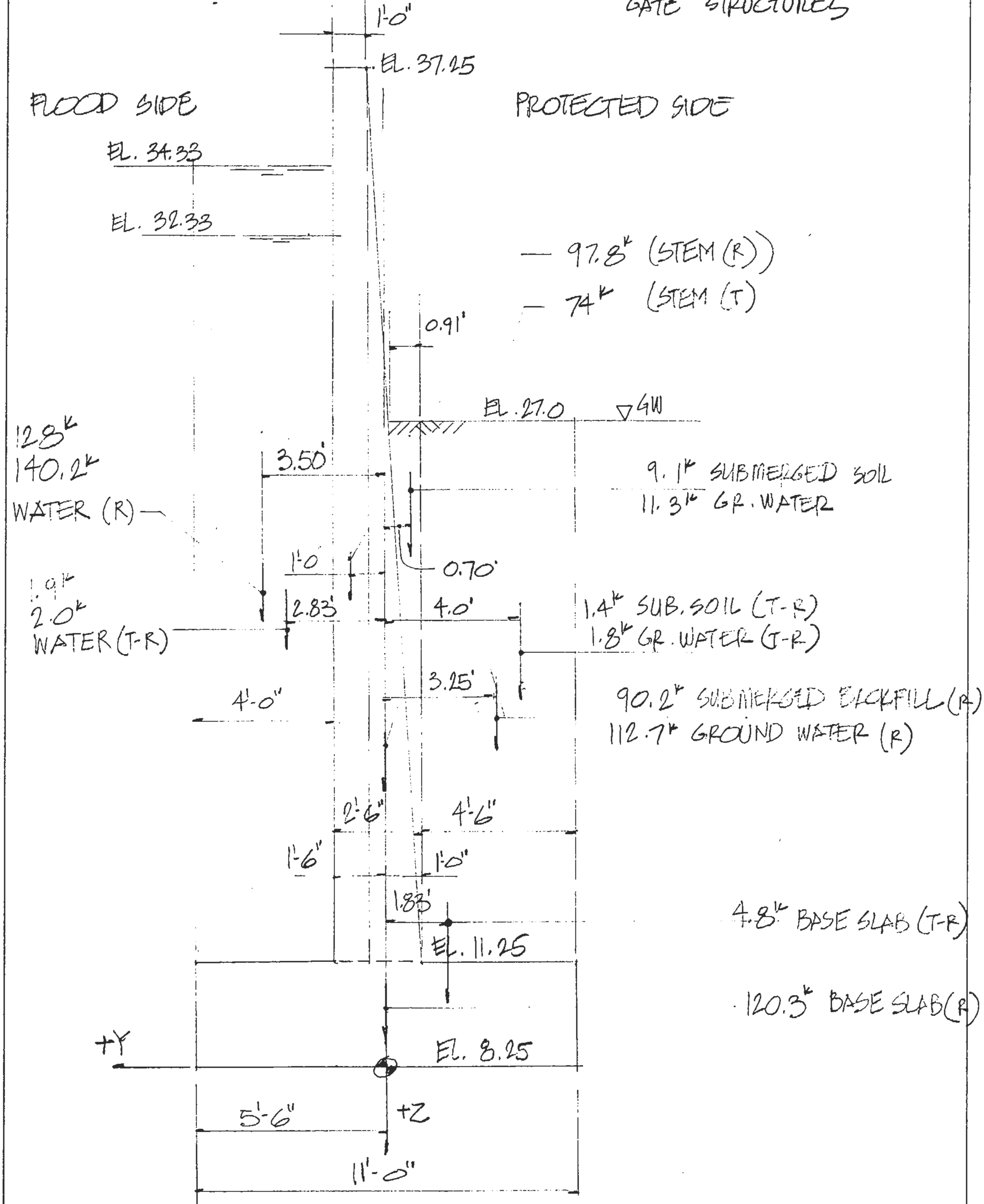
$12'' \times 36 \times 0.0028 = 1.21\,\square''$

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



FRONT PROTECTION @ DPS NO. 3 | VERTICAL WALLS MONO T-2 | T24

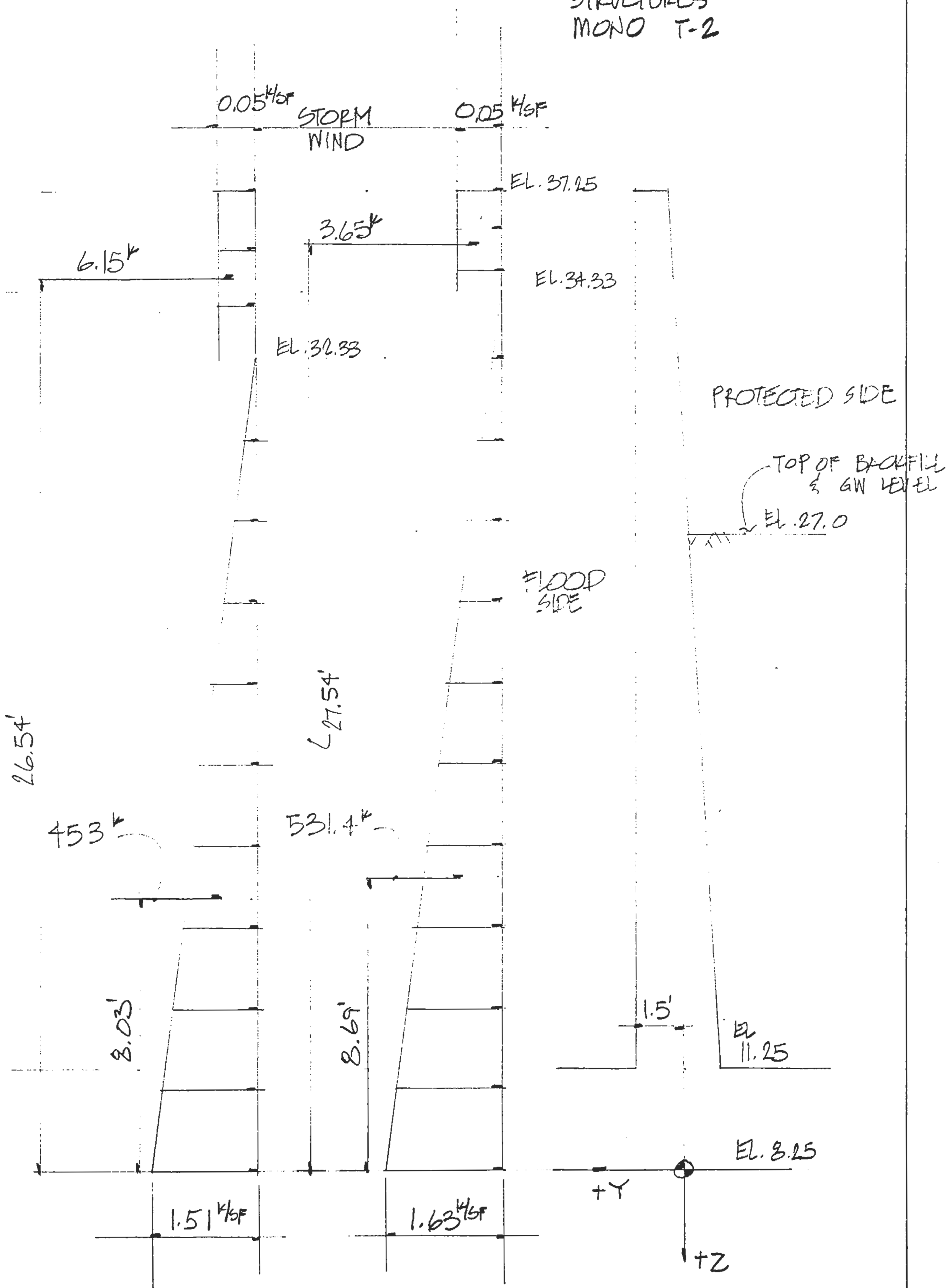
'T' WALL BETWEEN GATE STRUCTURES



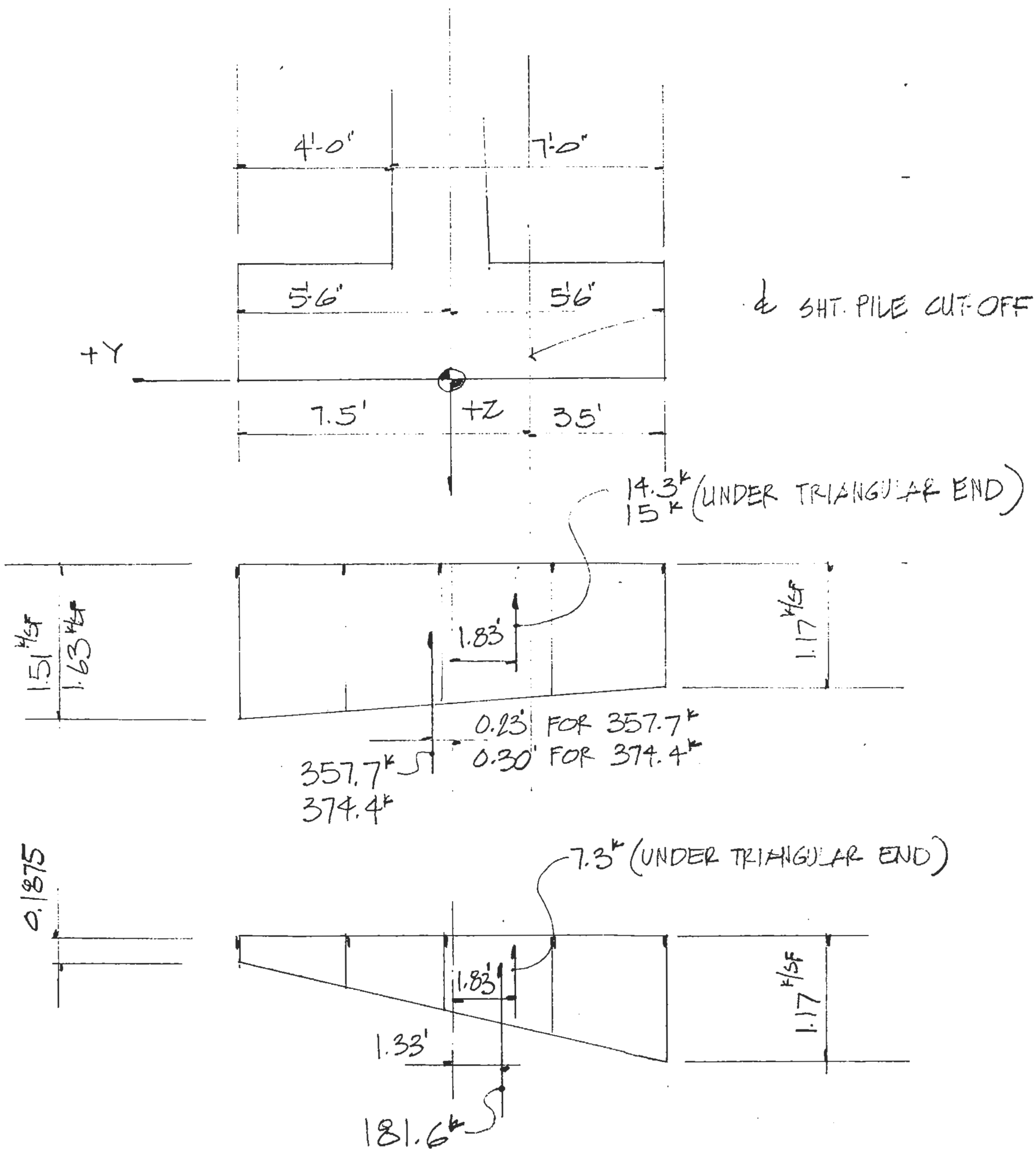
FLOOD PROTECTION
@ DPS NO. 3

HYD. STATIC PRESSURE FROM
STORM. ALSO WIND LOADS. T2-2

'T' WALL BETWEEN GATE
STRUCTURES
MONO T-2

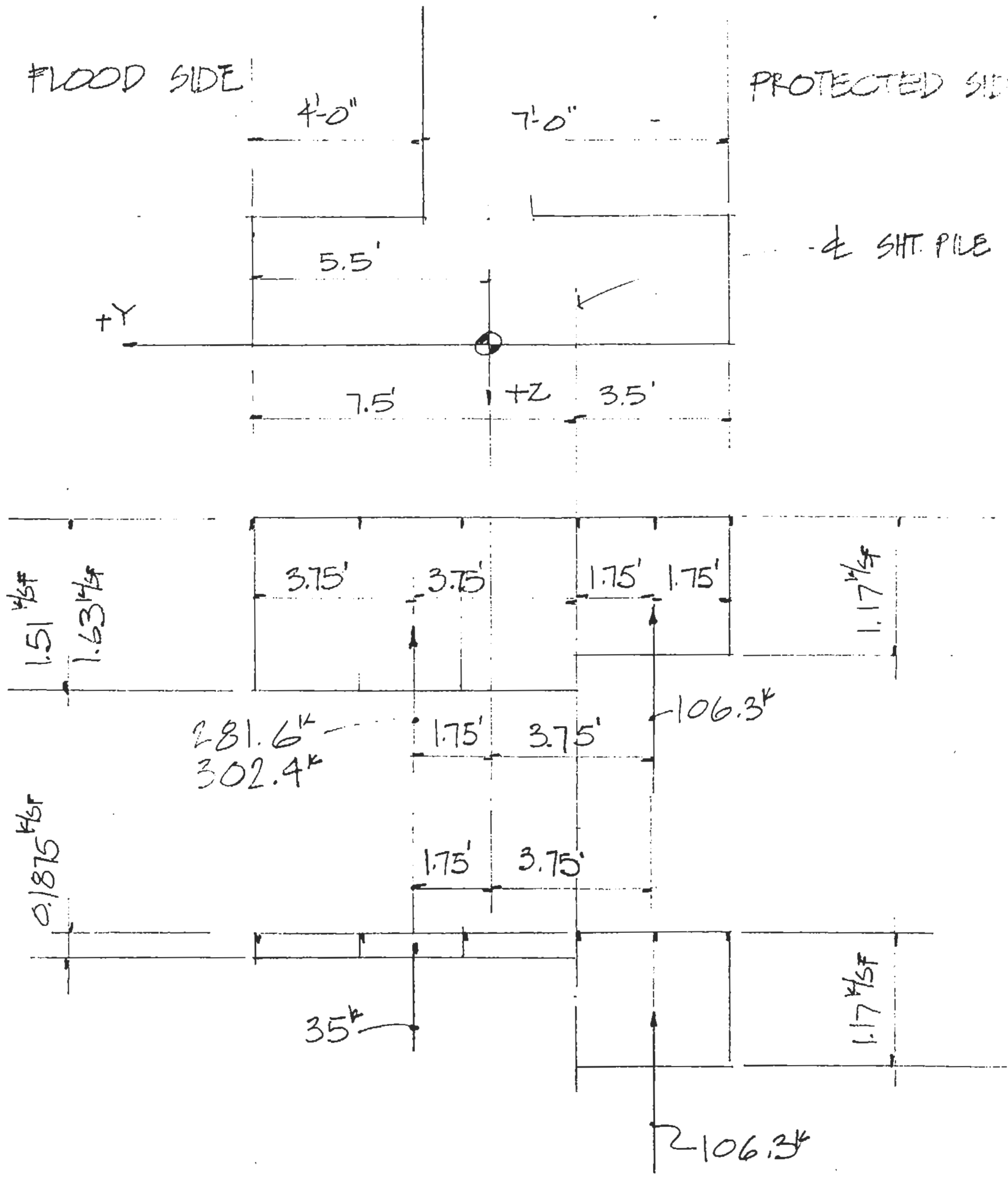


T' WALL BETWEEN
GATE STRUCTURES



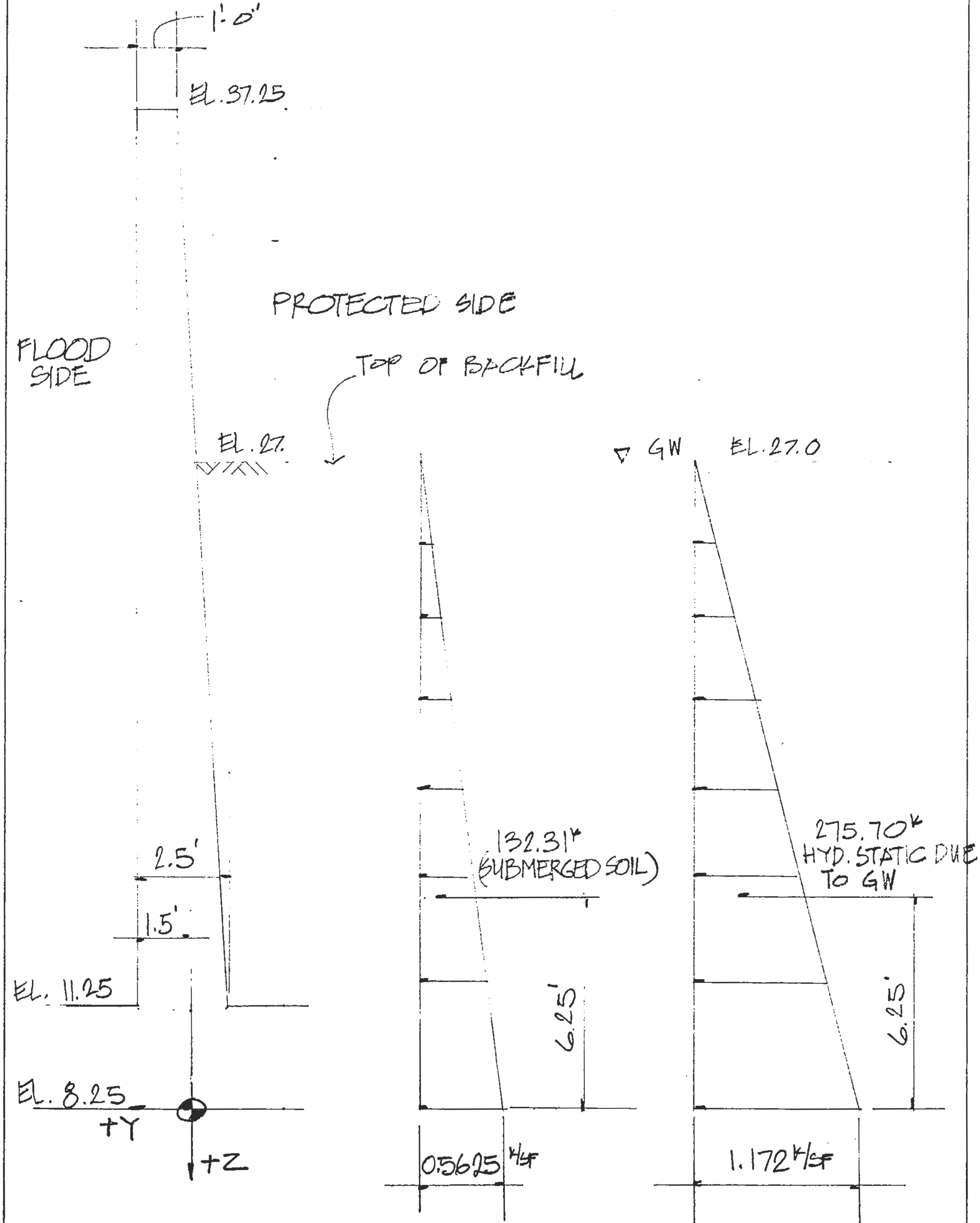
UPLIFT ~ PERVIOUS CUT-OFF

'T' WALL BETWEEN GATE STRUCTURES



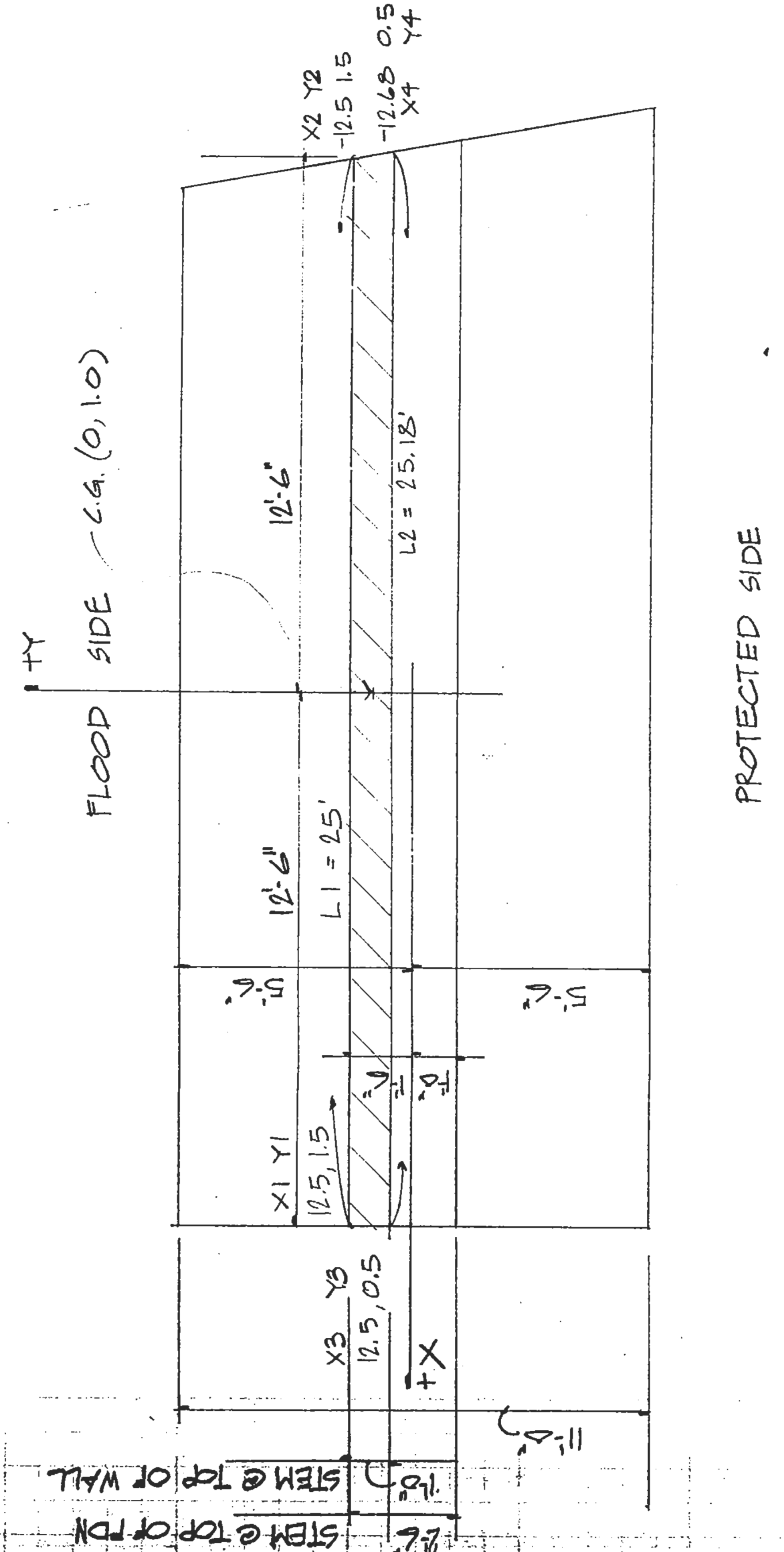
UPLIFT ~ IMPERVIOUS CUT-OFF

'T' WALL BETWEEN
GATE STRUCTURES
MONO T-2



FRONTING PROTECTION @ DPS NO. 3		STEM. RECT. IN PLAN & SECTION.	T2-6

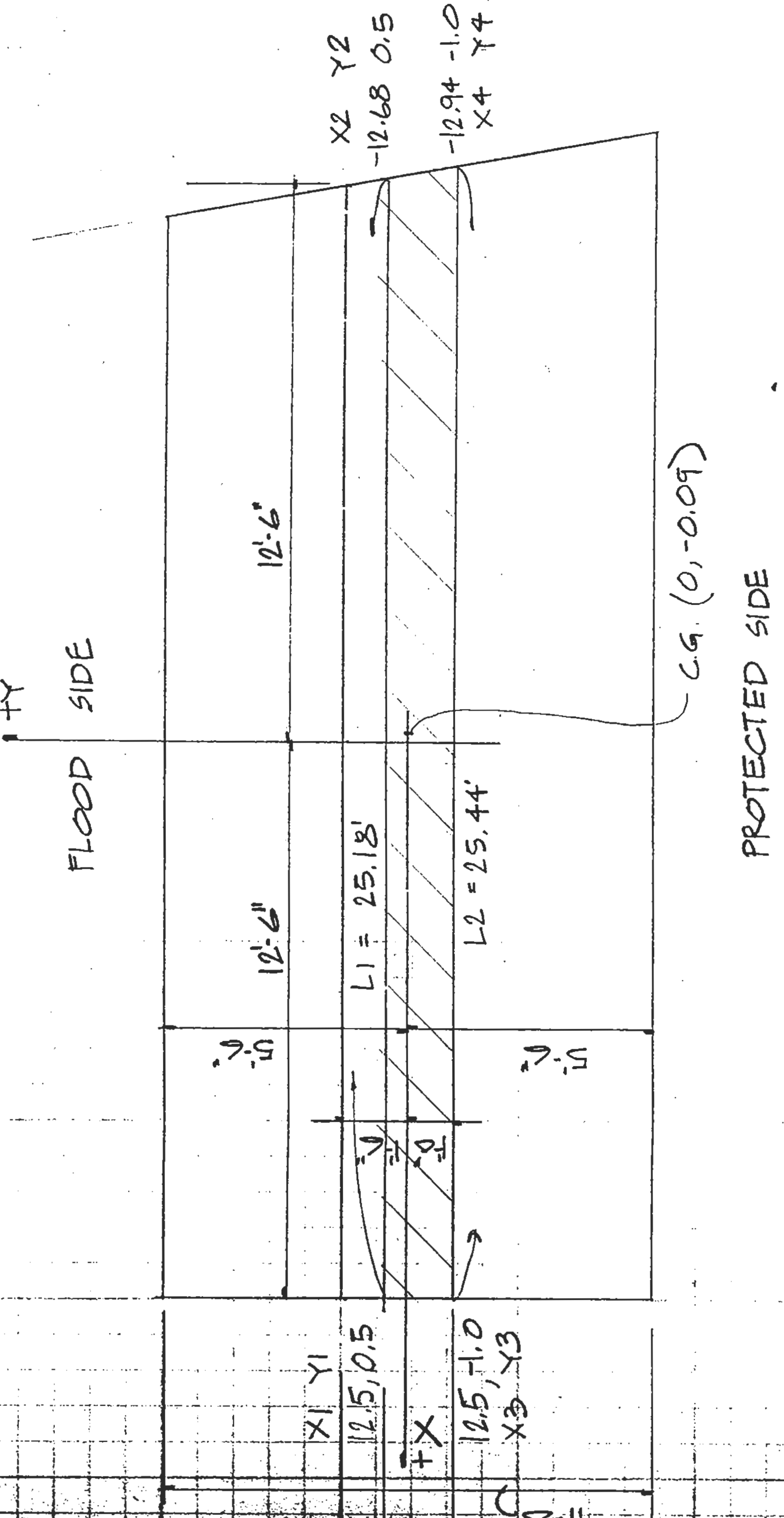
'T' WALL BETN GATE STRUCTURES
MONO T-2



FRONTING PROTECTION
@ DPS NO. 3

STEM RECT. IN PLAN
& TRI. IN SECTION

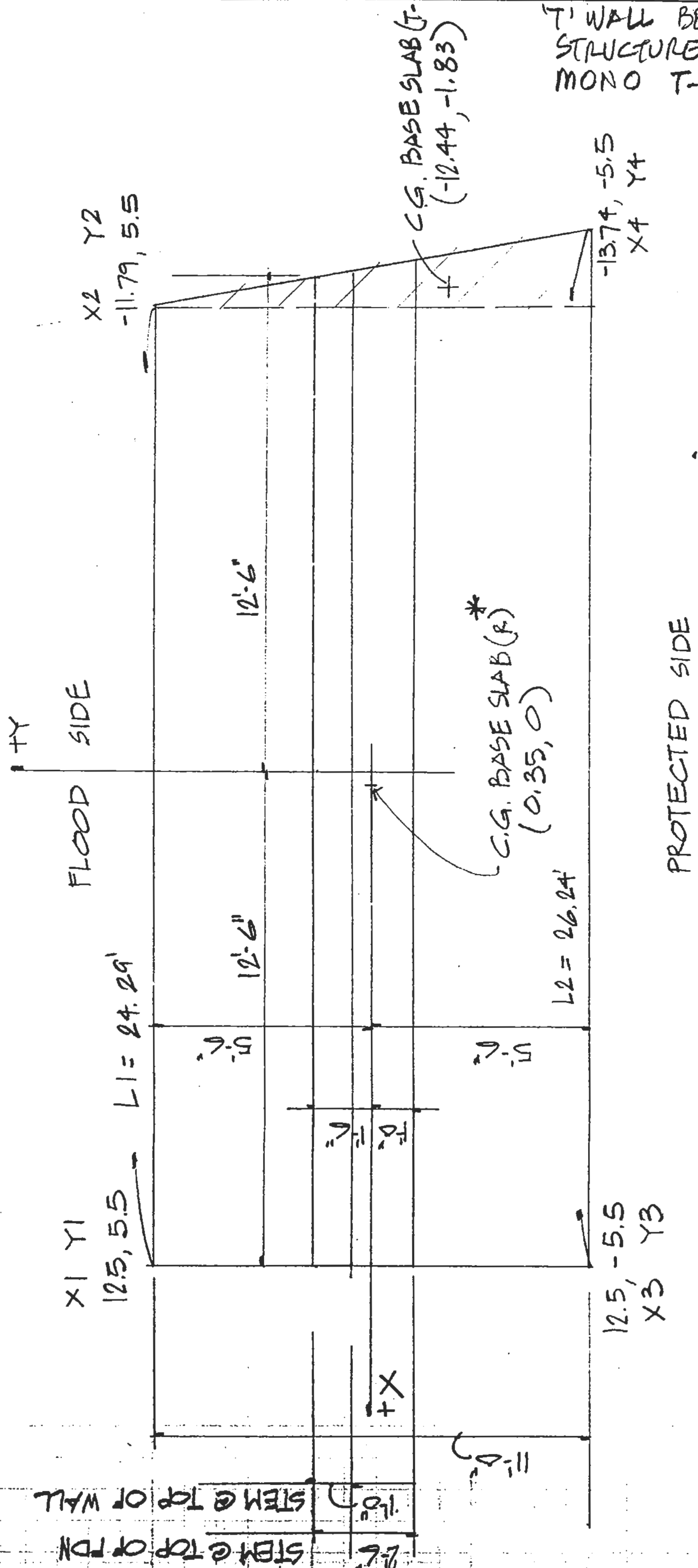
T' WALL BTWN GATE
STRUCTURES
MONO T-2



FRONTING PROTECTION
@ DPS NO. 3

BASE SLAB (R)*
BASE SLAB (T-R)**

T' WALL BETWN GATE
STRUCTURES
MONO T-2

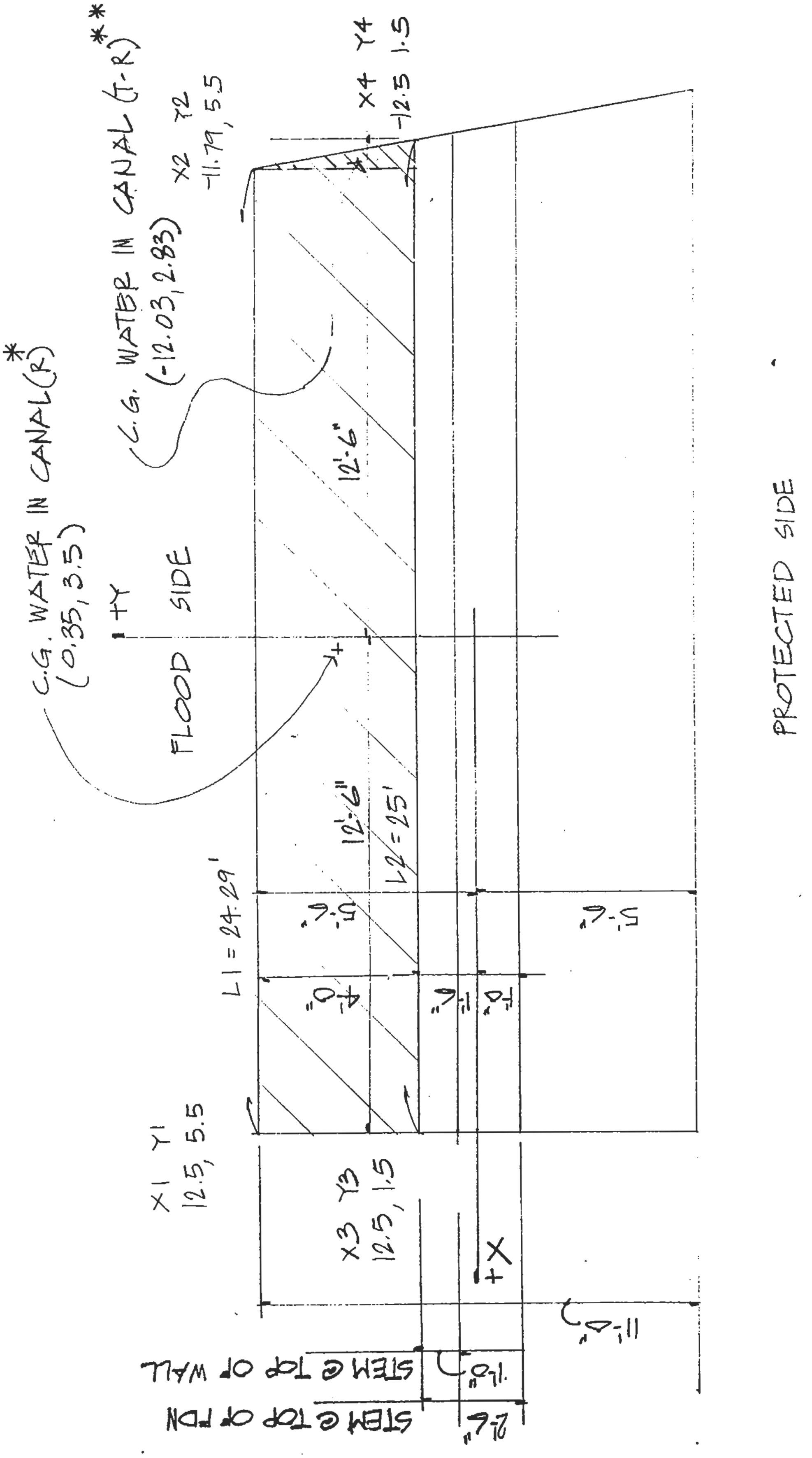


* RECTANGLE
** TRIANGLE @ RT. END OF BASE SLAB (CROSS-HATCHED)

@ DPS NO. 5

WATER IN CANAL (R)*
~~WATER IN CANAL (T-R)**~~ T2-9

'T' WALL BETWEEN GATE STRUCTURES
MONO T-2



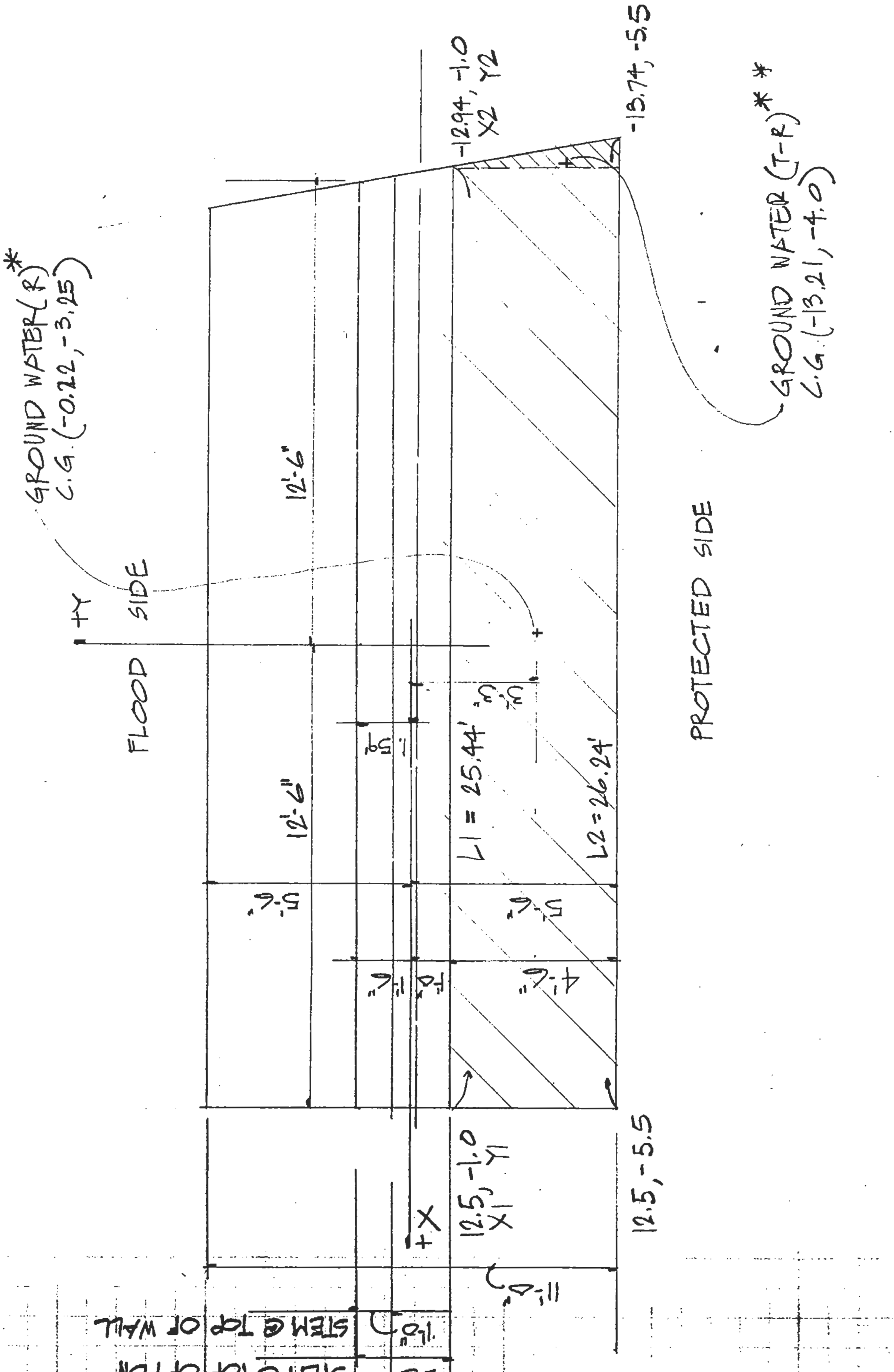
* RECTANGULAR
** TRIANGLE @ RT. END (DENSER CROSS HATCHED)

FRONTING PROTECTION
@ DPS NO. 3

GROUND WATER (C.G. IN PLAN & SECTION)
MONO T-2

T2-40

'T' WALL BETWEEN GATE STRUCTURES

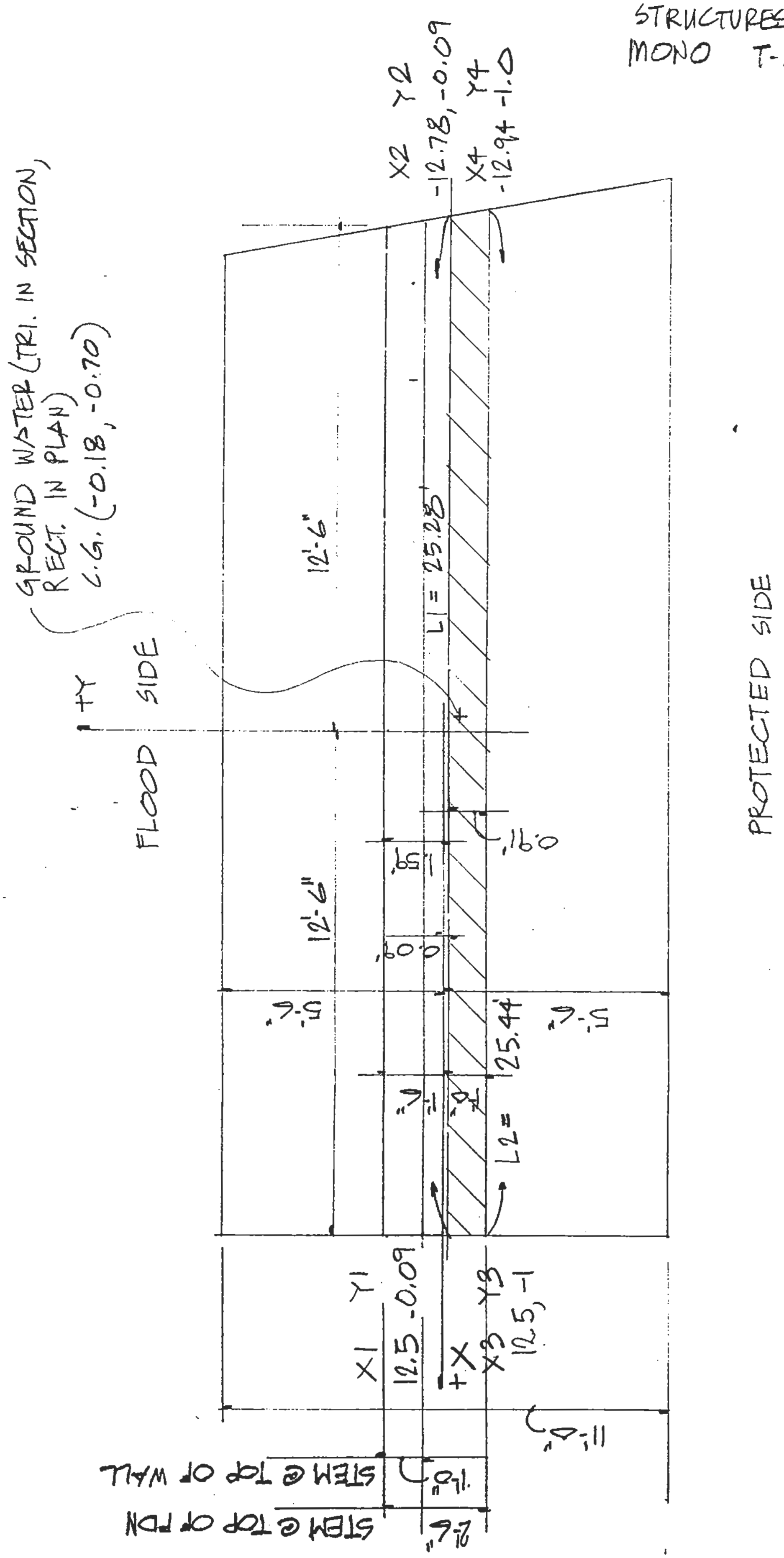


@ DPS NO. 3

GROUND WATER
RECT. IN PLAN, TRI. IN
SECTION

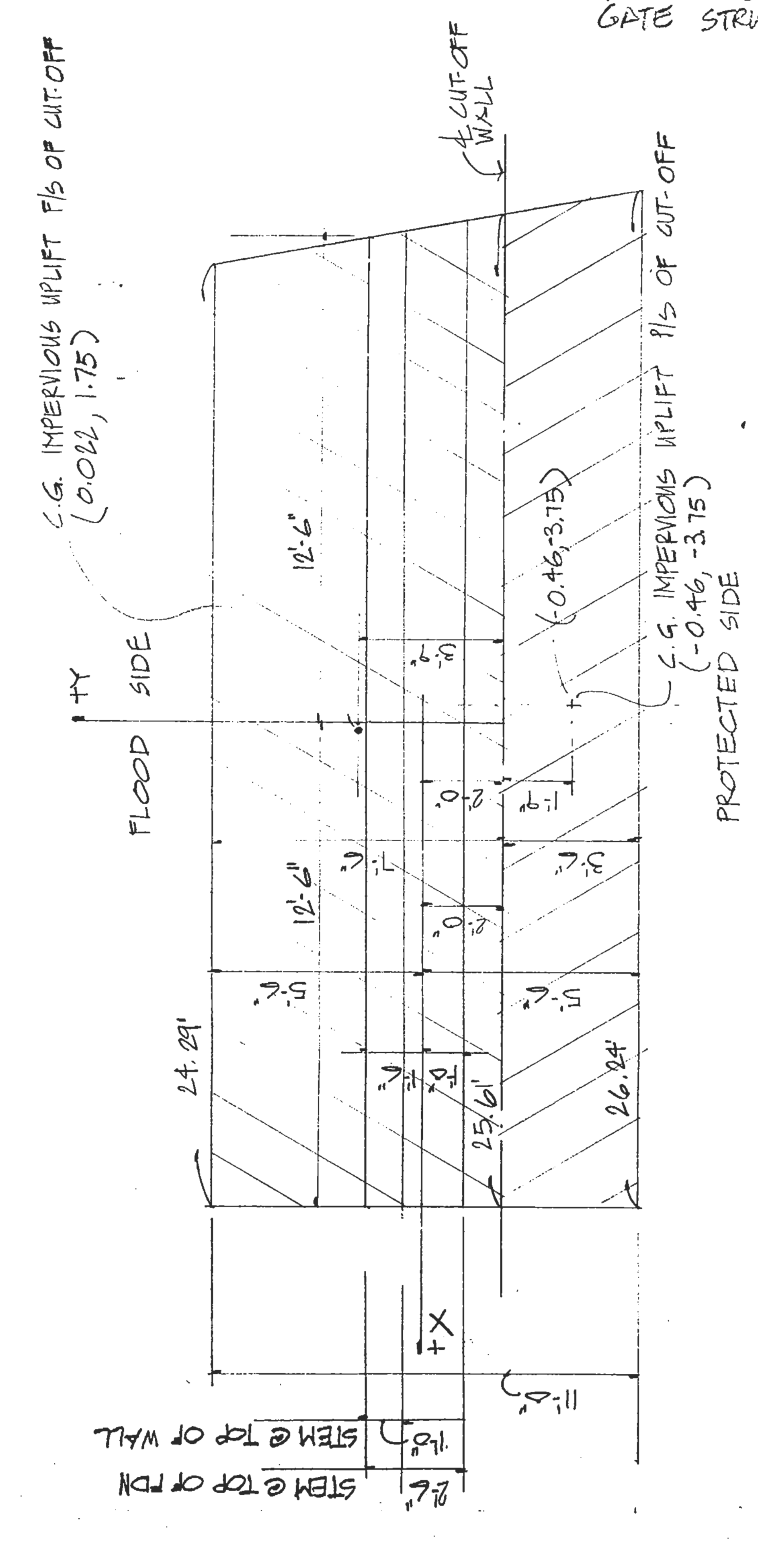
T2-11

'T' WALL BETWN GATE
STRUCTURES
MONO T-2



FRONTING PROTECTION @ DPS NO. 3		IMPERVIOUS UPLIFT MONO T-2	T2-12

'T' WALL BETWEEN GATE STRUCTURES



DIMENSIONAL AND OTHER INPUT

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'KNESS @ TOP	1.00
C16	STEN TH'KNESS @ 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'KNESS OF STEM @ GW			
	SURFACE EL	1.59		
C41	TH'KNESS 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'KNESS			
	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'KNESS			
	AT BASE SLAB)@ TOP OF			
	BACKFILL	0.91		

C59	ANGLE MADE BY RIGHT SIDE			
	EDGE OF MONOLITH WITH			
	Y' AXIS IN RADIANS CLKWISW	6.11		
C62	ANGLE MADE BY LEFT SIDE			
	EDGE OF MONOLITH WITH			
	Y' AXIS IN RADIANS 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		

CO-ORDINATES OF VARIOUS ITEMS

									L1	L2	L
ITEM	X1	Y1	X2	Y2	X3	Y3	X4	Y4	LENGTH1	LENGTH 2	AV.LENGTH
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

T2-17

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

1-10

	ITEM	L LENGTH	W OR H WIDTH OR HEIGHT	T TH'KNESS	w UNITWT	FZ L x H or W x T x w	CENTER OF GRAVITY X	CENTER OF GRAVITY Y	LEVER ARM FOR MX	LEVER ARM FOR MY	MOMENT CODE FOR MX	MOMENT CODE FOR MY	MOMENTS MX	MOMENTS MY
VERTICAL LOADS														
	STEM (R)	25.09	26.00	1.00	0.1500	97.84	0.00	1.00	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	0.00	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	0.00	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	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	1.83	12.50	-1.00	-1.00	0.00	0.00
	TOTAL VERTICAL LOADS (CONC ETC.)					***296.93***							***89.03***	***23.87***
VERTICAL HYDRAULIC LOADS:														
WATER EL														
32.33	WATER IN CANAL (R)	24.29	21.08	4.00	0.0625	128.03	0.35	3.50	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	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	2.83	12.50	1.00	-1.00	0.00	0.00
TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 32.33						***129.89***							***453.37***	***-22.82***
34.33	WATER IN CANAL (R)	24.29	23.08	4.00	0.0625	140.18	0.35	3.50	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	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	2.83	12.50	1.00	-1.00	0.00	0.00
TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 34.33						***142.21***							***496.39***	***-24.98***
27 P/S	GROUND WATER (R)	25.44	15.75	4.50	0.0625	112.70	-0.22	-3.25	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	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	4.00	12.50	-1.00	-1.00	0.00	0.00
27 P/S	GROUND WATER (TRI ANGULAR IN SECTION, RECT IN PLAN)	25.36	15.75	0.91	0.0625	11.34	-0.18	-0.70	0.70	0.18	-1.00	1.00	-7.91	2.05
TOTAL VERTICAL HYDRAULIC LOADS FOR GW LEVEL ON P/S @ EL 27						***125.80***							***-381.21***	***50.15***
VERTICAL EARTH LOADS														
BACKFILL EL														
27 P/S	SUBMERGED EARTH(R)	25.44	15.75	4.50	0.0600	108.19	-0.18	-3.25	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	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	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
	ANGULAR IN SECTION,													
	RECT IN PLAN)													
TOTAL SUBMERGED EARTH LOADS W/ GW LEVEL @ 27						***120.77***							***-365.96***	***43.80***
FROM 21.33	SATURATED BACKFILL(R)	25.28	0.00	5.41	0.1150	0.00	-0.18	-2.80	2.80	0.18	-1.00	1.00	0.00	0.00
TO 27.00 P/S	SATURATED BACKFILL(T-L)	0.00	0.00	5.41	0.1150	0.00	-13.10	-3.70	3.70	13.10	-1.00	1.00	0.00	0.00
	SATURATED BACKFILL(T-R)	0.95	0.00	5.41	0.1150	0.00	12.50	-3.70	3.70	12.50	-1.00	-1.00	0.00	0.00
FROM 21.33	SATURATED BACKFILL(TRI	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
TO 27.00 P/S	ANGULAR IN SECTION,													
	AND RECT IN PLAN)													
TOTAL SATURATED EARTH LOADS W/ GW @ 27														
AND TOP OF BACKFILL @ 27.0						***0.00***							***0.00***	***0.00***

HORIZONTAL HYDRAULIC LOADS

WATER EL	ITEM	HT OF WATER HT	UNIT WT w	LENGTH L	SHAPE OF PRES DIAG	HORIZ LD FY	LEVER ARM FOR MX	MOMENT MX
						w x HT x HT/2 xL		FY x LEVARM
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 MX FY x LEVARM
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	18.75	0.03	25.09	TRPS	132.30	6.25	826.88
	FROM EL 27 TO							
	EL 8.25 (TRIANGULAR							
	PRESSRE DIAG)							
27	SURCHARGE(0.1 k/sf)	18.75		25.09		0.00	9.38	0.00
	(RECTANGULAR PRESURE							
	DIAG)							
27	HYDROSTATIC	18.75	0.0625	25.09	TRPS	275.63	6.25	1722.67
	PRESSURE FORM GW							
	(TRIANGULAR							
	PRESSURE DIAG)							
TOTAL HORIZONTAL EARTH LOADS FOR TOP OF BACKFILL @ 27								
AND GW LEVEL @ 21.43						***407.93***		***2549.56***

HYDROSTATIC UPLIFT LOADS (PERVIOUS CUT-OFF)

WL IN CANAL @ 32.33 AND GW LEVEL @ 27.PERVIOUS CUT-OFF

WATER EL	ITEM	LENGTH L	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	CENTER OF GRAVITY Y	LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE FOR MX	MOMENT CODE FOR MY	MOMENT MX	MOMENT MY	REMARK
																	FZ x LEVARM x MOMENTCODE		
32.33 (F/S) 27.00(P/S)	WATER IN CANAL (F/S) GROUND WATER (P/S)	24.29	24.08	18.75	0.06250	1.51	1.17	11.00	TRAP	-357.68	0.35	0.23	0.23	0.35	-1.00	1.00	-81.60	126.27	
32.33 (F/S) 27.00(P/S)	WATER IN CANAL (F/S) GROUND WATER (P/S)	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	
32.33 (F/S) 27.00(P/S)	WATER IN CANAL (F/S) GROUND WATER (P/S)	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	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 AND GW @ 27 AND PERVIOUS CUT-OFF										-371.97							-55.40	-51.56	

WL IN CANAL @ 34.33 AND GW LEVEL @ 27.PERVIOUS CUT-OFF

WATER EL	ITEM	LENGTH L	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	CENTER OF GRAVITY Y	LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE FOR MX	MOMENT CODE FOR MY	MOMENT MX	MOMENT MY	REMARK
34.33(F/S) 27.00(P/S)	WATER IN CANAL (F/S) GROUND WATER (P/S)	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	
34.33(F/S) 27.00(P/S)	WATER IN CANAL (F/S) GROUND WATER (P/S)	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	
34.33(F/S) 27.00(P/S)	WATER IN CANAL (F/S) GROUND WATER (P/S)	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	
										-389.34							-84.80	-53.98	

WL IN CANAL @ 24.25 AND GW LEVEL @ 27.PERVIOUS CUT-OFF

WATER EL	ITEM	LENGTH L	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	CENTER OF GRAVITY Y	LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE FOR MX	MOMENT CODE FOR MY	MOMENT MX	MOMENT MY	REMARK
24.25(F/S) 27.00(P/S)	WATER IN CANAL (F/S) GROUND WATER (P/S)	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	
24.25(F/S) 27.00(P/S)	WATER IN CANAL (F/S) GROUND WATER (P/S)	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	
24.25(F/S) 27.00(P/S)	WATER IN CANAL (F/S) GROUND WATER (P/S)	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	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.25 AND GW @ 27.00 AND PERVIOUS CUT-OFF										-301.80							-20.84	-41.83	

HYDROSTATIC UPLIFT LOADS (IMPERVIOUS CUT-OFF)

WL IN CANAL @ 32.33 AND GW LEVEL @ 21.43,IMPERVIOUS CUT-OFF

WATER EL	ITEM	LENGTH L	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	CENTER OF GRAVITY Y	LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE FOR MX	MOMENT CODE FOR MY	MOMENT MX	MOMENT MY	REMARK
32.33 (F/S)	WATER IN CANAL (F/S)	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	5.39	
27.00(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	
TOTAL UPLIFT LOADS FOR WL IN CANAL@ 32.33 AND GW @ 27,IMPERVIOUS CUT-OFF										-388.03							-94.18	-43.63	

WL IN CANAL @ 34.33 AND GW LEVEL @ 27.IMPERVIOUS CUT-OFF

WATER EL	ITEM	LENGTH L	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	CENTER OF GRAVITY Y	LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE FOR MX	MOMENT CODE FOR MY	MOMENT MX	MOMENT MY	REMARK
34.33 (F/S)	WATER IN CANAL (F/S)	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	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 AND GW @ 27.IMPERVIOUS CUT-OFF										***-408.73***							***-130.40***	***-43.13***	
WL IN CANAL @ 24.25 AND GW LEVEL @ 27.IMPERVIOUS CUT-OFF																			
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	
TOTAL UPLIFT LOADS FOR WL IN CANAL@ 24.25 AND GW @ 27.IMPERVIOUS CUT-OFF										***-291.85***							***74.12***	***-45.37***	

HYDROSTATIC UPLIFT LOADS

PERVIOUS CUT-OFF

WATER EL	ITEM	LENGTH	HEIGHT OF WATER(F/S)	HEIGHT OF WATER(P/S)	UNIT WT	UPLIFT F/S EDGE	UPLIFT P/S EDGE	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY		LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE		MOMENT	MOMENT	REMARK
		L	HT1	HT2	w	w x HT1	w x HT2				X	Y			FOR MX	FOR MY	MX	MY	
11.25 (F/S)	WATER IN CANAL (F/S)																FZ x LEVARM x MOMENTCODE		
27.00(P/S)	GROUND WATER (P/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	-1.00	-241.14	64.12	
11.25 (F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	-1.00	13.31	-90.30	
11.25 (F/S)	WATER IN CANAL (F/S)																		
27.00(P/S)	GROUND WATER (P/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	1.00	0.00	0.00	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 27,PERVIOUS CUT-OFF										-188.89							-227.83	-26.18	

HYDROSTATIC UPLIFT LOADS

IMPERVIOUS CUT-OFF

WATER EL	ITEM	LENGTH	HEIGHT OF WATER(F/S)	HEIGHT OF WATER(P/S)	UNIT WT	UPLIFT F/S EDGE	UPLIFT P/S EDGE	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY		LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE		MOMENT	MOMENT	REMARK
		L	HT1	HT2	w	w x HT1	w x HT2				X	Y			FOR MX	FOR MY	MX	MY	
11.25 (F/S)	WATER IN CANAL (F/S)	24.96	3.00	3	0.06250	0.19	0.19	7.50	RECT	-35.09	0.02	1.75	1.75	0.02	-1.00	1.00	-61.41	0.67	
27(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	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 27 IMPERVIOUS CUT-OFF										-141.43							-94.18	-48.24	

HORIZONTAL WIND LOADS								
STORM WIND LOADS:								
WATER EL	**ITEM**	**LENGTH**	**EXPOSED HEIGHT HT**	**WIND INTENSITY q**	**SHAPE OF PRES DIAG**	**FY**	**LEVARM**	**MOMENT MX**
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
OPERATING WIND LOADS								
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:

CASE I : CONSTRUCTION CASE. OP. WIND, NO WATER OR EARTH LOADS:

ITEM	FX	FY	FZ	MX	MY	MZ
CONCRETE LOADS			296.9333	89.03401	23.86714	
OPERATING WINDS		-6.5		-104		
TOTAL FOR CASE I :		**-6.5**	**296.9333**	**-14.966**	**23.86714**	

CASE II : WL IN CANAL@32.33, STORM WIND, BACKFILL IN PLACE GW @ 27.00, IMPERVIOUS CUT-OFF.

ITEM	FX	FY	FZ	MX	MY	MZ
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		
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			
TOTAL FOR CASE II :		***-52.8251***	***159.56***	***-1180.36***	***1.326379***		
CASE III : WL IN CANAL@32.33,STORM WIND,BACKFILL IN PLACE							
GW @ 27.00, PERVIOUS CUT-OFF.							
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			
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			
TOTAL FOR CASE III :		***-52.8251***	***175.6209***	***-1141.57***	***-6.70378***		
CASE IV : WL IN CANAL EMPTY,BACKFILL IN PLACE, OP. WIND							
GW @ 27.00, IMPERVIOUS CUT-OFF.							
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			
TOTAL FOR CASE IV :		***394.3731***	***276.2656***	***2067.393***	***19.42474***		
CASE V : WL IN CANAL EMPTY, BACKFILL IN PLACE, OP. WIND							
GW @ 27.00, PERVIOUS CUT-OFF.							
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			
TOTAL FOR CASE V :		***394.3731***	***228.8062***	***1933.745***	***41.48845***		
CASE VI : WL IN CANAL@34.33, STORM WIND, BACKFILL IN PLACE							
GW @ 27.00, IMPERVIOUS CUT-OFF.							

CONCRETE LOADS			296.9333	89.03401	***23.87***		
WATER LOADS			142.21	496.39	***-24.98***		
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			
TOTAL FOR CASE VI :		***-131.477***	***151.1847***	***-2160.38***	***-0.44235***		
CASE VII : WL IN CANAL@34.33, STORM WIND, BACKFILL IN PLACE							
GW @ 27.00, PERVIOUS CUT-OFF.							
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			
TOTAL FOR CASE VII :		*-131.477*	*170.5748*	*-2114.77*	***-11.2761***		

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

TOTAL FOR CASE IX :							

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
0 SOIL ES 0.079 LEN 73 0 ALL
0 PIN ALL
  ALLOW H 122 92 385 385 709 2119 ALL
60 BATTER 3.0 1 3
2 BATTER 3.5 4 TO 9
65 BATTER 3.0 10 TO 15
130 ANGLE 90 1 TO 9
40 ANGLE 270 10 TO 15
30 PILE 1 11 4 0
340 PILE 4 11 -.5 0
50 PILE 10 11 -4 0
60 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
20 LOAD 1 0 -6.5 296.9 -15 0 0
30 LOAD 2 0 -52.8 139.4 -1119.4 0 0
440 LOAD 3 0 -52.8 155.5 -1080.6 0 0
50 LOAD 4 0 394.4 256.1 2128.4 0 0
60 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
80 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
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*******************************
* 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
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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 KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.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 K/IN**2	LENGTH	L FT	LU 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

						1095.00	

****

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

ILE	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

****

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

ɔAD 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

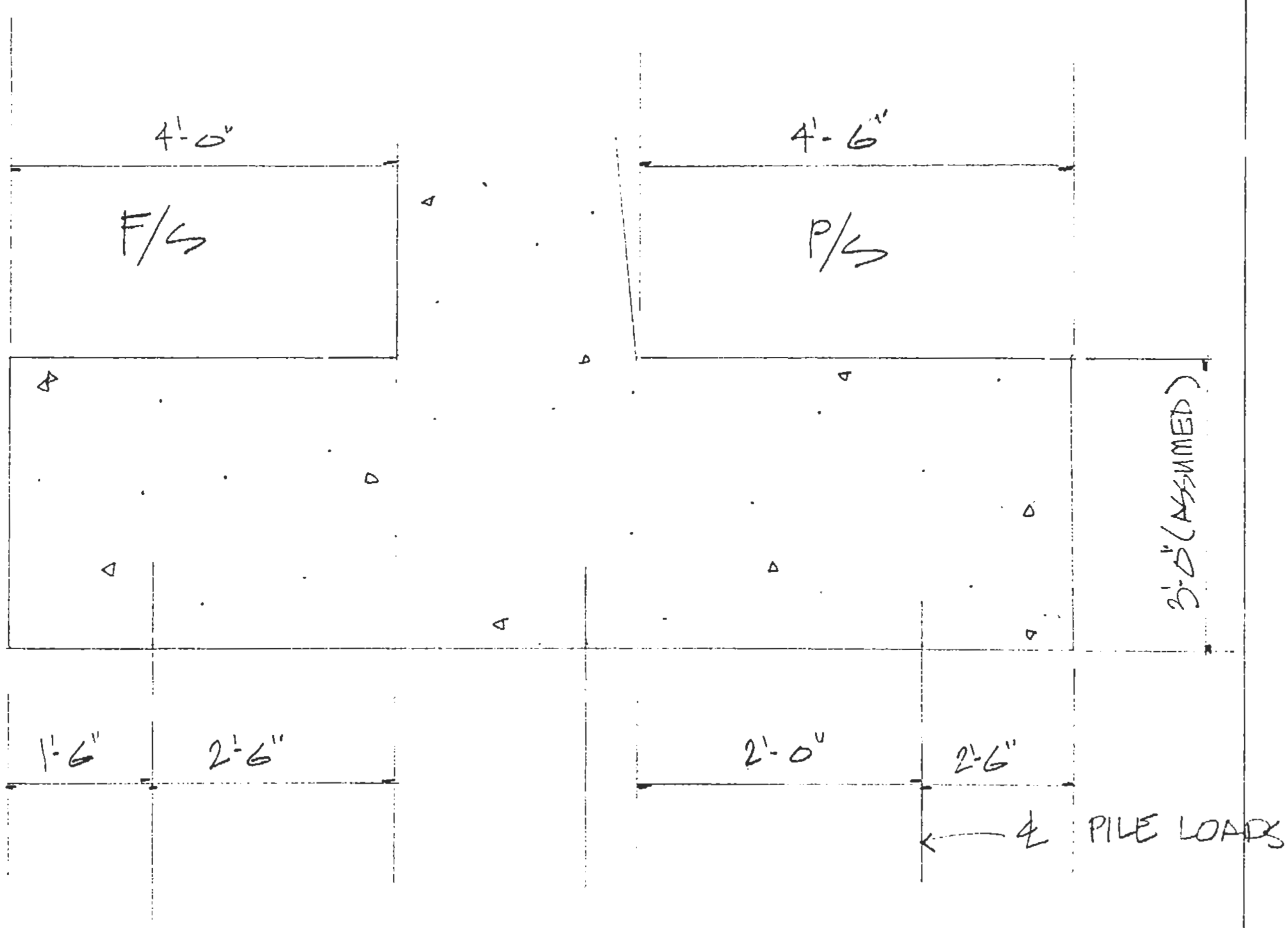
LOAD CASE - 9

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

FOUNDATION SLAB



ASSUME : 1. 3'-0" THK FDN 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

FDN SLAB DESIGN

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

HEEL DESIGN (LOAD CASE 5) TOP REINF.

BM @ P/S FACE OF STEM

$= (+95+90+86+82+77+73)\times 2.0 + (112.7+90.2)\times 2.25$

$+ 0.45 \times 25.85 \times 4.5^2/2 - 181.6\times(4.5-(5.5-1.33))$

$= 1006 + 456 + 118 - 60$

$= 1520'^{K}$

$\therefore BM/FT = 1520/25.85 = 59'^{K}/FT.$

$\therefore M_U = 1.3\times1.7\times59 = 130'^{K}$

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

$\therefore$ TOTAL TH'KNESS REQ'D = (ASSUMING #9 BARS [illegible]) $18''+4.43''$
$= 22.43'' < 36''$ $\therefore$ O.K.

$\phi V_c = 0.85\times12\times25.58\times31.43\times2\times63 = 1033^{K}$

$\therefore V_u @ d = 758^{K} < 1033^{K}$ $\therefore$ O.K.
PUNCH SHEAR O.K. BY OBS.

$\therefore$ FOR $b=12''$ $d=31.43$ $F=0.98$
$\therefore K_u = 59\times1.3\times1.7/0.98 = 133$ $\therefore \rho = 0.0027 < A_{s(min)}$

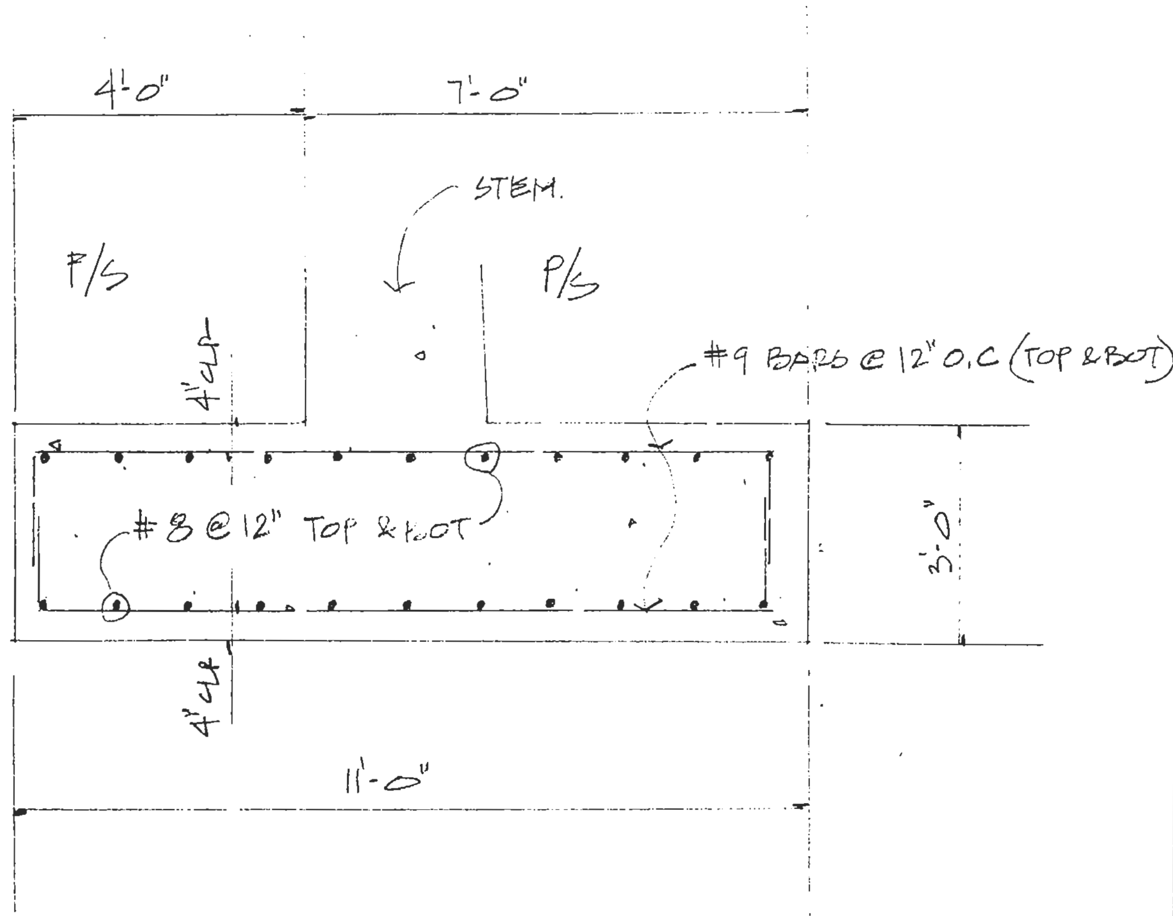
$\therefore A_s = 0.0028\times12\times31.43 = 1.05^{\square''}$

USE #9 BARS @ 12" O.C. $=1.0^{\square''} \simeq 1.05^{\square''}$ $\therefore$ O.K.

TOE DESIGN

USE #9 BARS @ 12" O.C. BY OBS.
$\therefore$ USE #9 BARS @ 12" TOP & BOT
USE #8 BARS @ 12" TOP & BOT FOR SHRINKAGE & TEMP.

FOUNDATION SLAB DESIGN

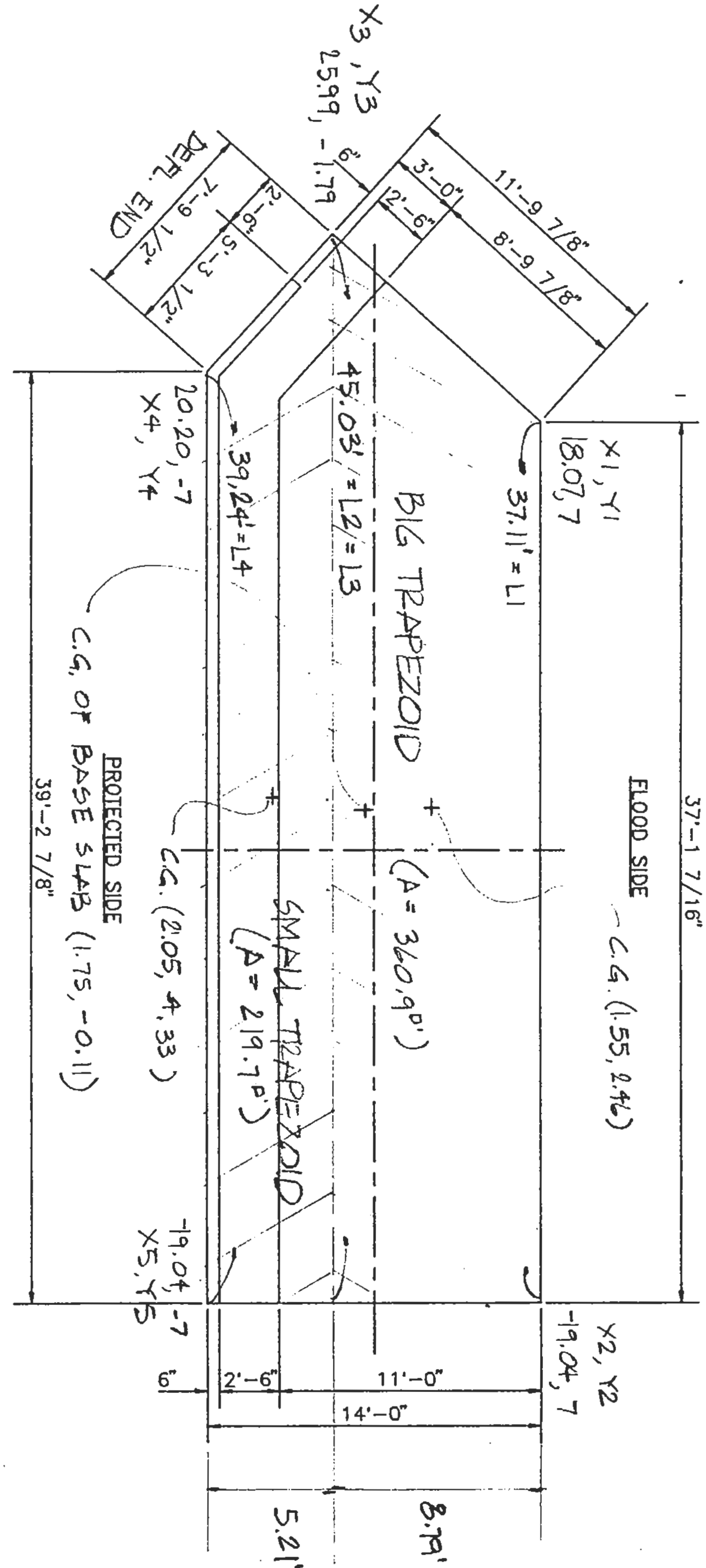


FRONTING PROTECTION
@ DPS NO. 3

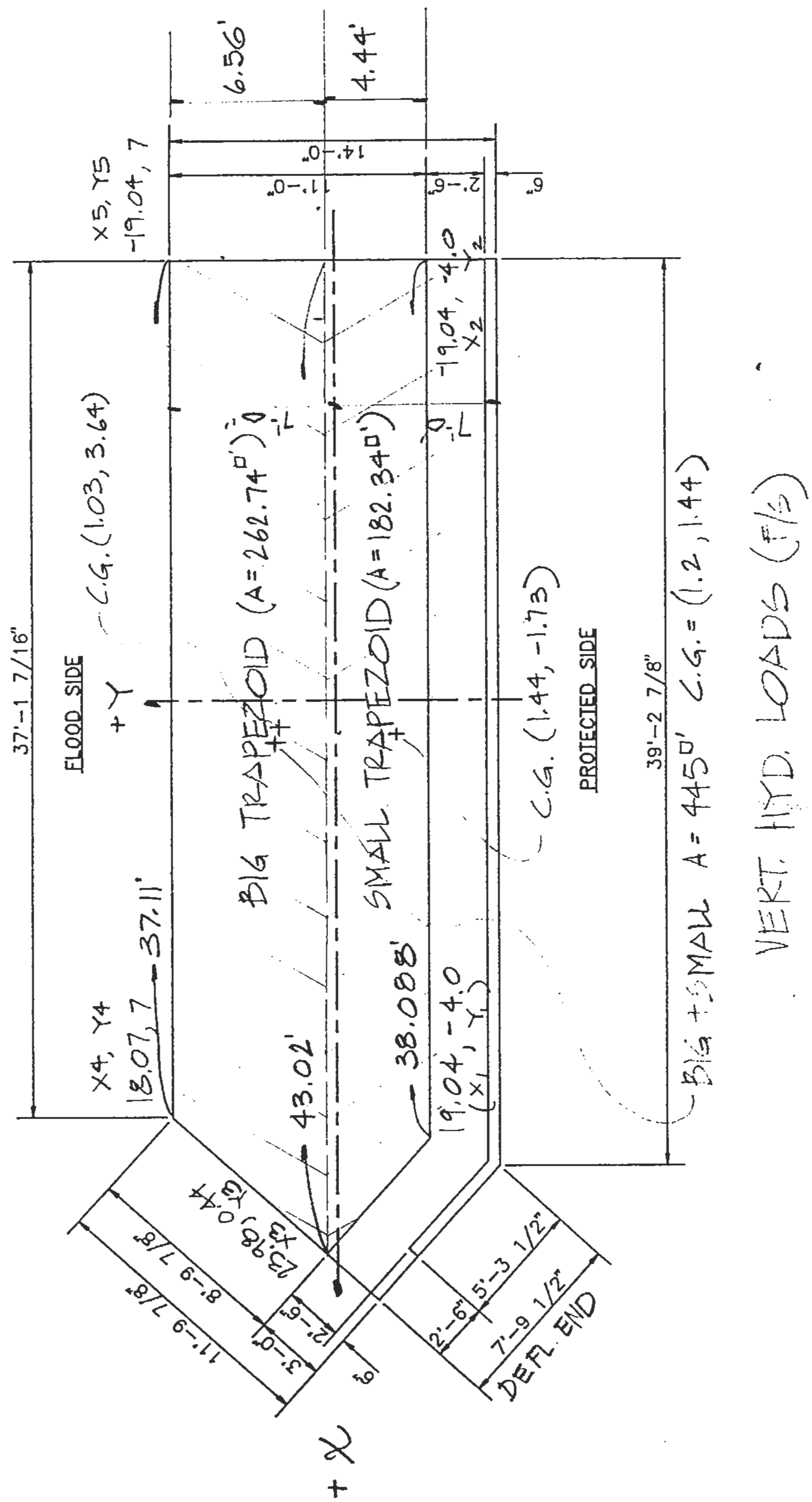
BASE SLAB LOAD
'T' WALL MONO WEST SIDE

T3-4

MONO T-3

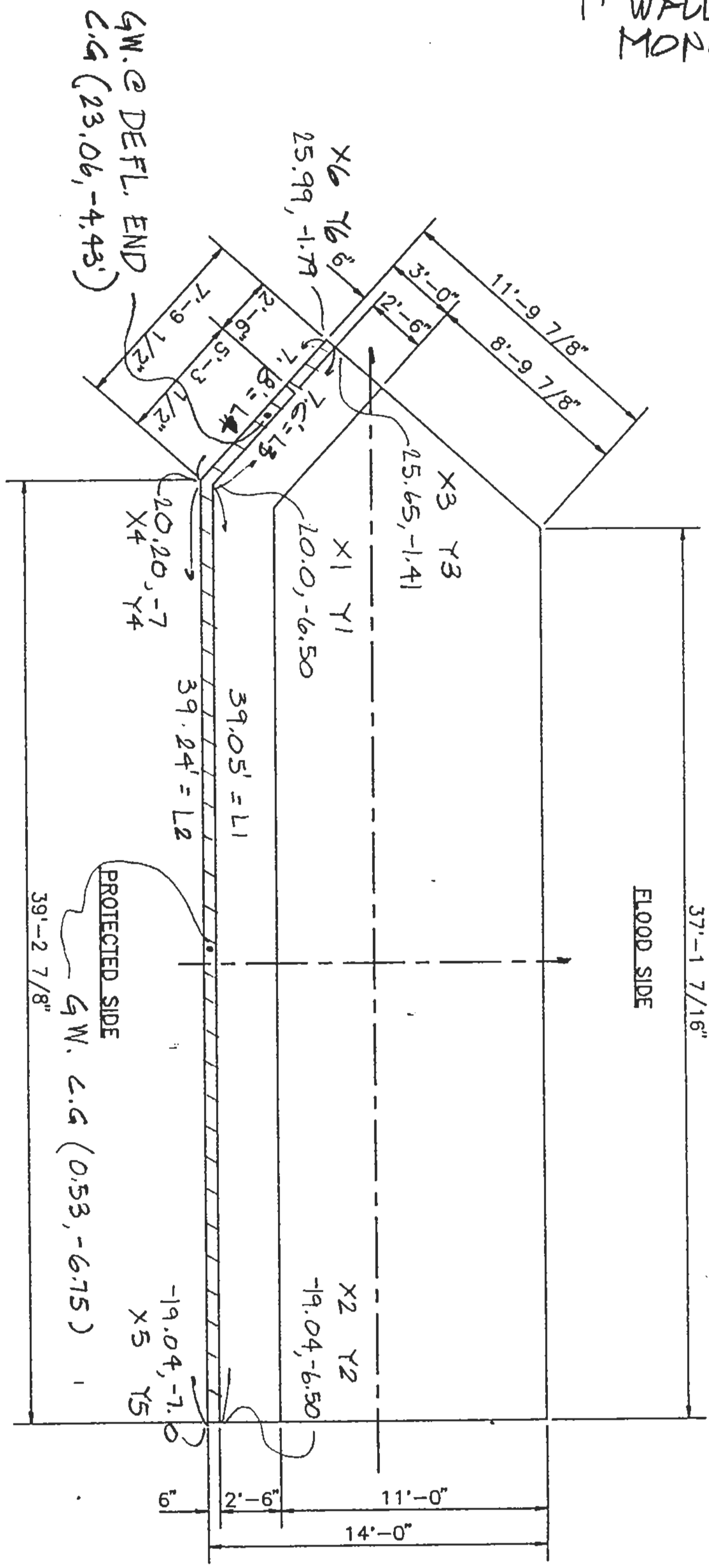


'T'WALL MONO WEST SIDE
MONO T-3



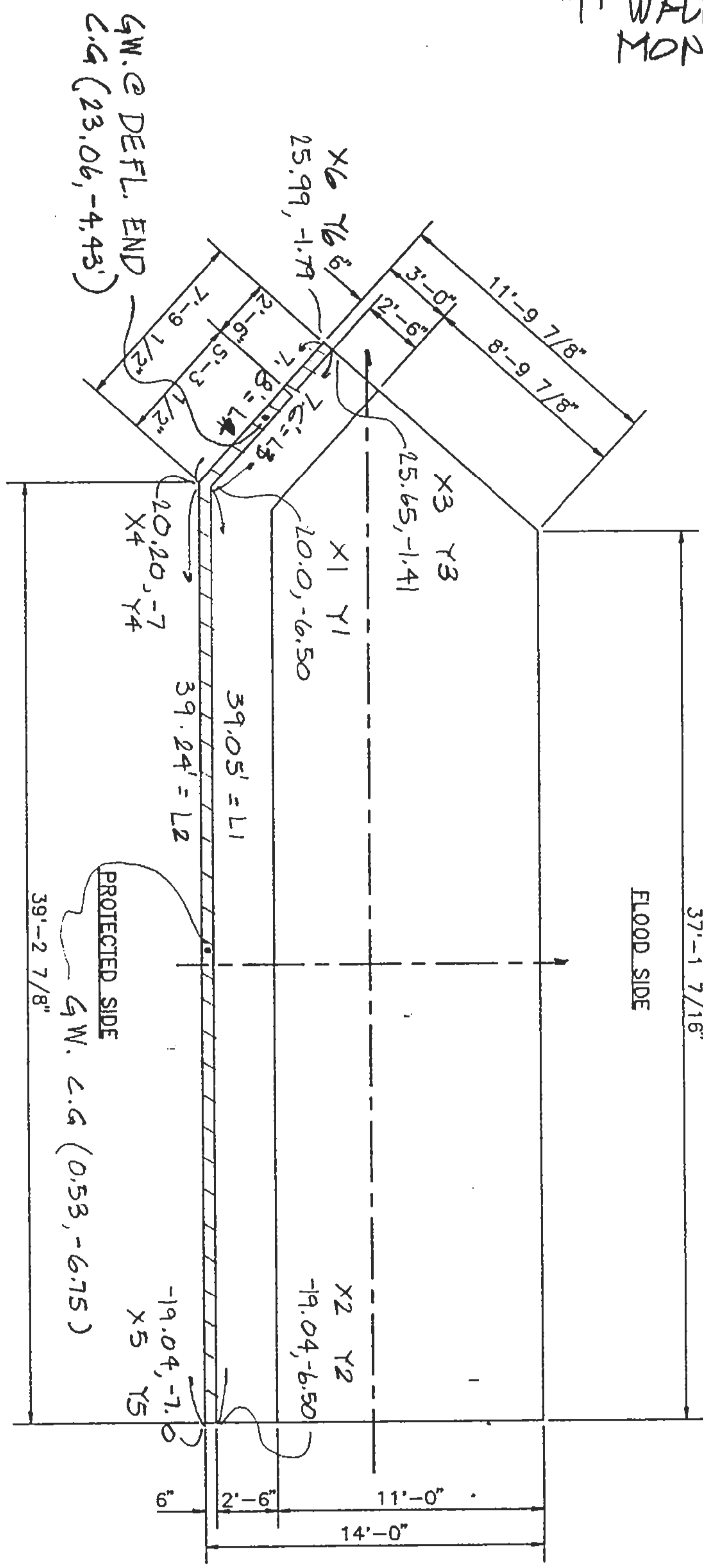
FRONTING PROTECTION @ DPS NO3 | GROUND WATER LOAD (P/S) (RECTANGULAR) | T3-3

'T' WALL MONO WEST SIDE
MONO T-3



FRONTING PROTECTION @ DPS NO3		GROUND WATER LOAD (P/S) (RECTANGULAR)	T3-3

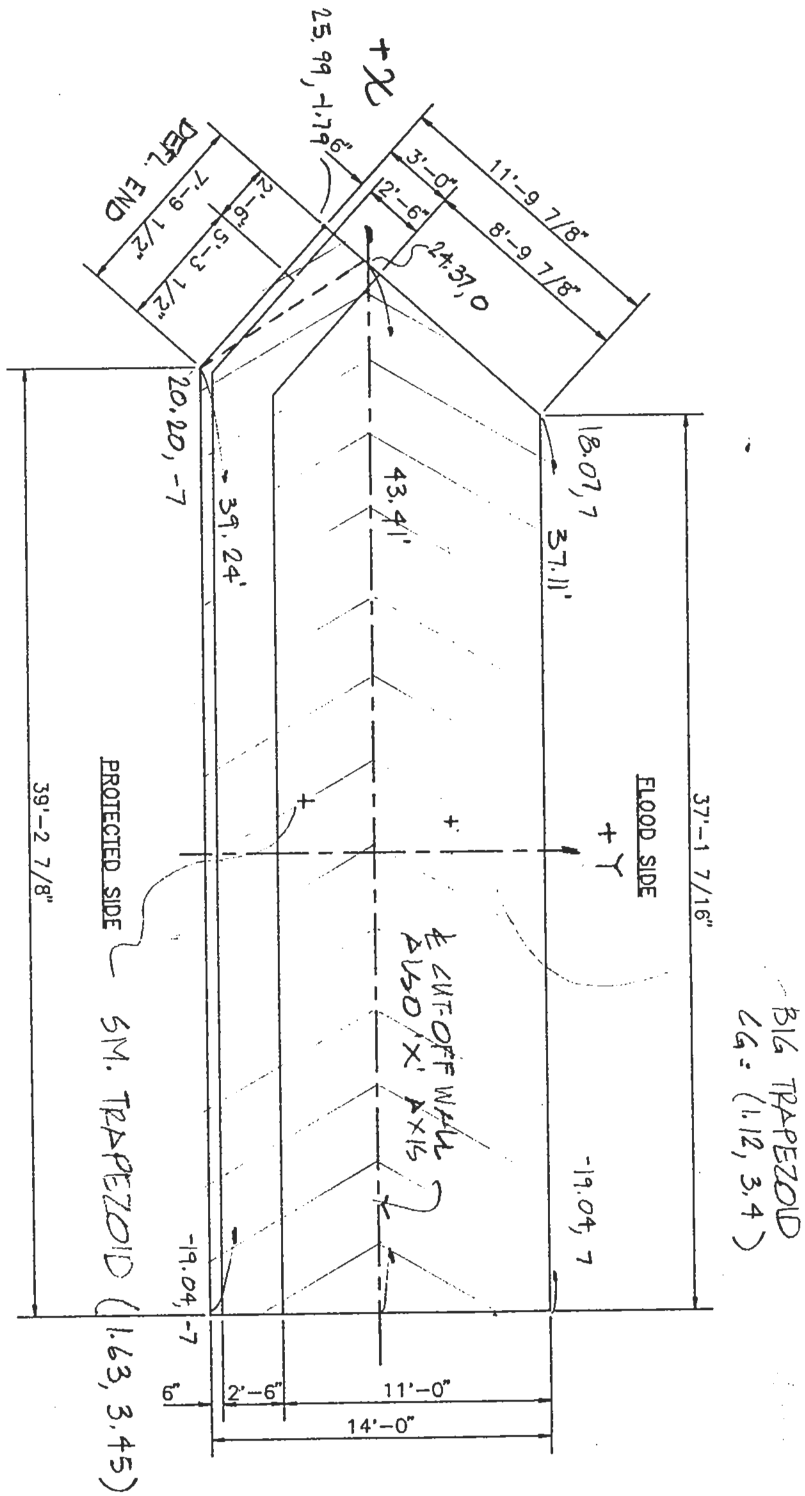
'T' WALL MONO WEST SIDE
MONO T-3



FRONTING PROTECTION
@ DPS NO.3

C.G. LOCATIONS FOR
IMPERVIOUS UPLIFT
IN 'X' DIRECTION.
'T' WALL MONO WEST SIDE
MONO T-3

T3-4

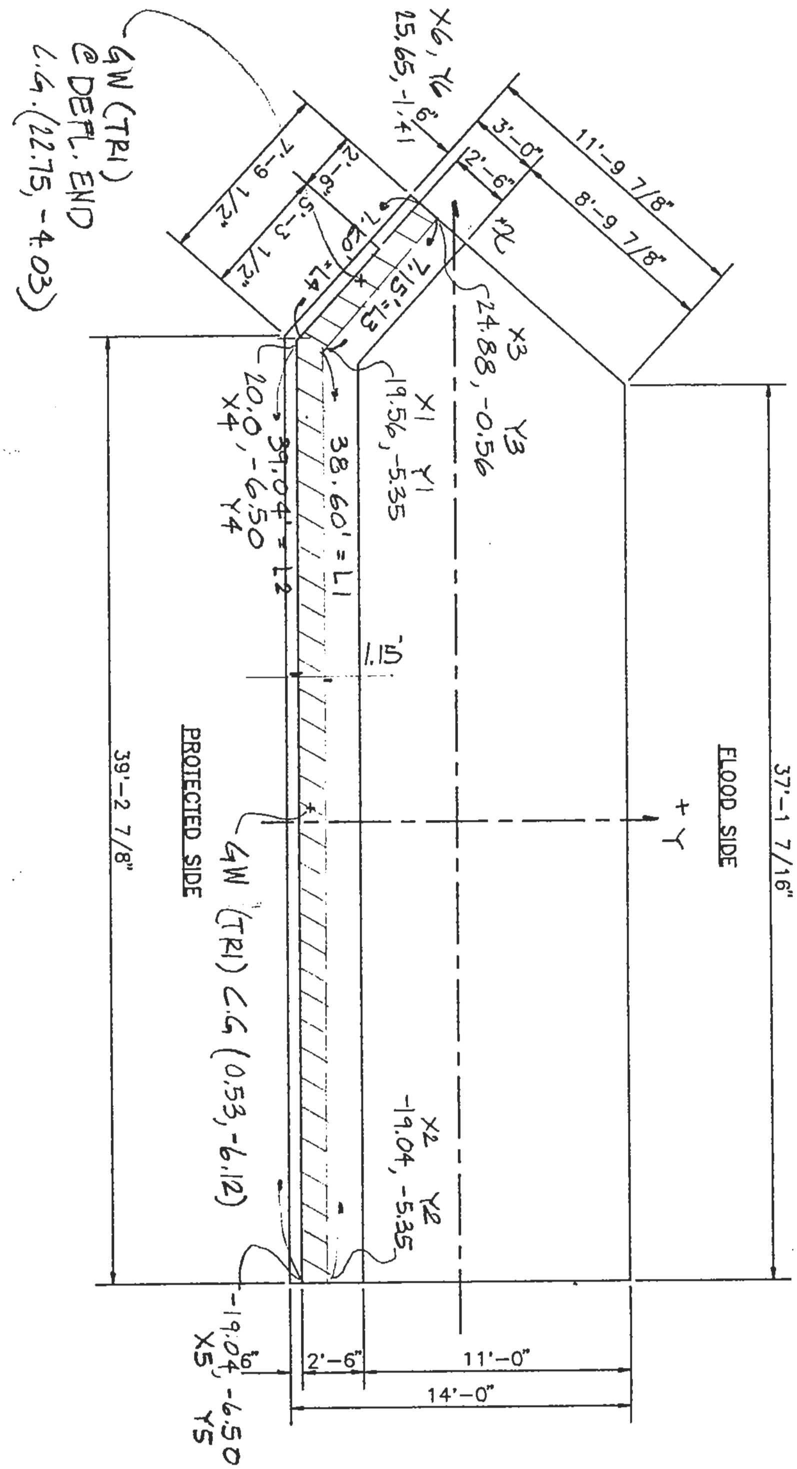


FRONTING PROTECTION @ DPS NO. 3

GROUND WATER LOAD (P/S) TRIANGULAR WEDGE

T3-5

'T' WALL MONO WEST SIDE
MONO T-3



DIMENSIONAL AND OTHER INPUT

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'KNESS @ TOP	1.00
C17	STEN TH'KNESS @ 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

T3-6

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'KNESS OF STEM @ GW			
	SURFACE EL.	1.35		
C42	TH'KNESS 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'KNESS			
	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'KNESS			
	AT BASE SLAB)@ TOP OF			
	BACKFILL	1.15		

T3-7

C59	ANGLE MADE BY L.S.EDGE			
	OF MONOLITH(P/S) WITH			
	Y' AXIS IN RADIANS CLKWISW	5.55		
C63	ANGLE MADE BY LEFT SIDE			
	EDGE OF MONOLITH WITH			
	Y' AXIS IN RADIANS 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			

T3-8

	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 @			

T3-9

	LEFT END	6.64		

T3-1c

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

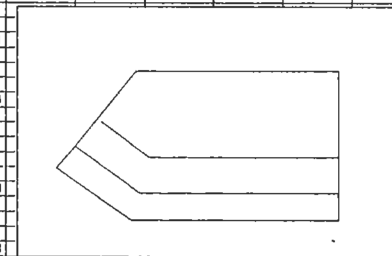
T3-11

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		

T3-12

CO-ORDINATES OF VARIOUS ITEMS

ITEM	X1	Y1	X2	Y2	X3	Y3	X4	Y4	X5	Y5	X6	Y6	LENGTHS PARALLEL TO X AXIS L1 LENGTH1	L2 LENGTH 2	L AV.LENGTH	LENGTHS SKEW TO X AXIS L3	L4	L
STEM (RECTANGULAR IN PLAN & SECTION)	19.04	-4.00	-19.04	-4.00	23.98	0.44	19.43	-5.00	-19.04	-5.00	24.65	-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	24.65	-0.30	20.00	-6.50	-19.04	-6.50	25.65	-1.41	38.47	39.05	38.76	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			38.09	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			38.09	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	7.79	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 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	7.79	
SUBMERGED BACKFILL TO TOP OF GW SURFACE (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(FROM EL 21.43 TO EL 29.0)(RECTANGULAR IN PLAN AND TRIANGULAR IN SECTION)	19.56	-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 GW SURFACE TO TOP OF BACKFILL(FROM EL 21.43 TO EL 29.0)(RECTANGULAR IN PLAN AND IN SECTION)	19.56	-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	7.79	



T3-13

VERTICAL LOADS														
	ITEM	L	W OR H WIDTH OR	T	w		CENTER OF GRAVITY		LEVER ARM		MOMENT CODE		MOMENTS	
		LENGTH	HEIGHT	TH'KNESS	UNITWT	FZ	X	Y	FOR MX	FOR MY	FOR MX	FOR MY	MX	MY
						L x H or W x T x w								
	STEM (R)	38.28	23.08	1.00	0.1500	132.53	0.00	-4.50	4.50	0.00	-1.00	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	-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	-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	-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	-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	-1.00	-214.19	-101.65
	TOTAL VERTICAL LOADS (CONC ETC..)					487.63							-1078.72	-1209.31
VERTICAL HYDRAULIC LOADS:														
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	-1.00	1260.38	-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	-1.00	-409.56	-342.24
TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 32.33						583.56							850.81	-697.92
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	-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	-1.00	-448.42	-374.71
TOTAL VERTICAL HYDRAULIC LOADS FOR WL IN CANAL @ 34.33						638.93							931.53	-764.14
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	-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	-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	-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	-1.00	-19.03	-107.39
TOTAL VERTICAL HYDRAULIC LOADS FOR GW LEVEL ON P/S @ EL 29						55.75							-337.66	-230.48
VERTICAL EARTH LOADS														
29	SUBMERGED BACKFILL	39.14	17.75	0.50	0.0600	20.84	0.53	-6.75	6.75	0.53	-1.00	-1.00	-140.70	-11.00

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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	-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	-18.13	-94.48
29	SUB.BACKFILL @ DEFL. END	7.38	17.75	1.15	0.0600	4.53	22.75	-4.03	4.03	22.75	-1.00	-1.00	-18.27	-103.09
	(TRI)													
TOTAL VERTICAL SUBMERGED EARTH LOADS:						***53.52***							***-324.15***	***-221.26***
TOTAL SUBMERGED EARTH AND GROUND WATER VERTICAL LOADS:						***109.27***							***-661.81***	***-451.74***

T3-16

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 xL	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	MOMENT MZ
32.33	WATER LEVEL IN CANAL	24.08	0.0625	38.09	TRFS		-690.16	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	YN14XP34	1780.219
TOTAL HORIZONTAL HYD. LOADS FOR WL IN CANAL @ EL.32.33						*80.51*	*-779.58*		*-6257.40*	*-646.22*				*1780.219*
34.33	WATER LEVEL IN CANAL	26.08	0.0625	38.09	TRFS		-809.57	8.69	-7037.84					
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	YN14XP34	2088.22
TOTAL HORIZONTAL HYD. LOADS FOR WL IN CANAL @ EL.34.33						*94.44*	*-914.45*		*-7949.63*	*-820.98*				*2088.22*
29	GROUND WATER LEVEL	20.75	0.0625	39.05	TRPS		525.39	6.92	3633.94					
29	GW @ DEFL LEG OF STEM	20.75	0.0625	7.60	TRPS	-68.42	75.99	6.92	525.59	473.25	4.65	21.99	YP14XN34	1352.93
TOTAL HORIZONTAL HYD. LOADS FOR GW ON P/S @ EL.29						*-68.42*	*601.38*		*4159.54*	*473.25*				*1352.93*
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				
TOTAL HORIZONTAL HYD. LOADS FOR WL IN CANAL @ EL.21.43						*24.12*	*-233.55*		*-1026.05*	*-105.96*				
11.25	GROUND WL ON F/S	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 x Ka w x 0.5	LENGTH L	SHAPE OF PRES DIAG	FX	FY w x Ka x HT x HT/2 xL	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	MOMENT MZ
29	SATURATED SOIL FROM EL 29 TO TOP OF GW LEVEL @ EL 29 (TRIANGULAR PRESSURE DIAG)	0 0	0.06 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	649.41
29	SURCHARGE(0.1 k/sf) (RECTANGULAR PRESURE DIAG)	20.75		38.28			0.00	6.92	0.00					

TOTAL HORIZONTAL EARTH LOADS FOR TOP OF BACKFILL @ 29 AND GW LEVEL @ 29						*-32.84*	*288.66*		*1996.58*	*227.16*				*649.41*
HORIZONTAL GROUND WATER LOADS:														
29	GROUND WATER LEVEL	20.75	0.0625	39.05	TRPS		525.39	6.92	3633.94					
29	GW @ DEFL LEG OF STEM	20.75	0.0625	7.60	TRPS	-68.42	75.99	6.92	525.59	473.25	4.65	21.99	YP14XN34	1352.93
TOTAL HORIZONTAL HYD. LOADS FOR GW ON P/S @ EL.29						*-68.42*	*601.38*		*4159.54*	*473.25*				*1352.93*
TOTAL HORIZONTAL SUBMERGED EARTH LOADS FOR TOP OF BACKFILL @ EL 29 AND GROUND WATER LEVEL @ EL 29						*-101.26*	*890.04*		*6156.12*	*700.41*				*2002.335*

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T3-18

HYDROSTATIC UPLIFT LOADS (PERVIOUS CUT-OFF)

WL IN CANAL @ 32.33 AND GW LEVEL @ 29,PERVIOUS CUT-OFF

WATER EL	ITEM	AREA	HEIGHT OF WATER(F/S)	HEIGHT OF WATER(P/S)	UNIT WT	UPLIFT F/S EDGE	UPLIFT P/S EDGE	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY		LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE		MOMENT	MOMENT	REMARK
		A	HT1	HT2	w	w x HT1	w x HT2				X	Y			FOR MX	FOR MY	MX	MY	
																	FZ x LEVARM x MOMENTCODE		
32.33 (F/S)	WATER IN CANAL (F/S)																		
29(P/S)	GROUND WATER (P/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	-140.97	1419.89	

NOTE: LOAD APPLIED @ C.G OF PRESSURE DIAGRAM IN 'Y' DIRECTION AND @ C.G OF BASE SLAB IN 'X' DIRECTION

TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33 AND GW @ 29 AND PERVIOUS CUT-OFF: FZ -813.34; MX -140.97; MY 1419.89

WL IN CANAL @ 34.33 AND GW LEVEL @ 29,PERVIOUS CUT-OFF

WATER EL	ITEM	AREA	HT1	HT2	w	w x HT1	w x HT2	WIDTH	SHAPE	FZ	X	Y	LEVARM FOR MX	LEVARM FOR MY	CODE FOR MX	CODE FOR MY	MX	MY	REMARK
34.33(F/S)	WATER IN CANAL (F/S)																		
21.43(P/S)	GROUND WATER (P/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	-147.26	1483.24	

TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33 AND GW @ 29 AND PERVIOUS CUT-OFF: FZ -849.63; MX -147.26; MY 1483.24

HYDROSTATIC UPLIFT LOADS (IMPERVIOUS CUT-OFF)

WL IN CANAL @ 32.33 AND GW LEVEL @ 29,IMPERVIOUS CUT-OFF

WATER EL	ITEM	AREA	HEIGHT OF WATER(F/S)	HEIGHT OF WATER(P/S)	UNIT WT	UPLIFT F/S EDGE	UPLIFT P/S EDGE	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY		LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE		MOMENT	MOMENT	REMARK
		A	HT1	HT2	w	w x HT1	w x HT2				X	Y			FOR MX	FOR MY	MX	MY	
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	-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	1.67	-3.50	3.50	1.67	1.00	1.00	1313.21	628.33	

TOTAL UPLIFT LOADS FOR WL IN CANAL@ 32.33 AND GW @ 29,IMPERVIOUS CUT-OFF: FZ -799.45; MX -171.64; MY 1108.61

WL IN CANAL @ 34.33 AND GW LEVEL @ 29,IMPERVIOUS CUT-OFF

WATER EL	ITEM	AREA	HT1	HT2	w	w x HT1	w x HT2	WIDTH	SHAPE	FZ	X	Y	LEVARM FOR MX	LEVARM FOR MY	CODE FOR MX	CODE FOR MY	MX	MY	REMARK
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	-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	1.67	-3.50	3.50	1.67	1.00	1.00	1313.21	628.33	

TOTAL UPLIFT LOADS FOR WL IN CANAL@ 34.33 AND GW @ 29,IMPERVIOUS CUT-OFF: FZ -834.68; MX -294.97; MY 1148.50

HYDROSTATIC UPLIFT LOADS

PERVIOUS CUT-OFF

WATER EL	ITEM	AREA	HEIGHT OF WATER(F/S)	HEIGHT OF WATER(P/S)	UNIT WT	UPLIFT F/S EDGE	UPLIFT P/S EDGE	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY		LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE FOR MX	MOMENT CODE FOR MY	MOMENT MX	MOMENT MY	REMARK
		A	HT1	HT2	w	w x HT1	w x HT2				X	Y					MX	MY	
11.25 (F/S)	WATER IN CANAL (F/S)																FZ x LEVARM x MOMENTCODE		
21.43(P/S)	GROUND WATER (P/S)	580.57	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	-751.41	752.23	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 29,PERVIOUS CUT-OFF										-430.89							-751.41	752.23	

HYDROSTATIC UPLIFT LOADS

IMPERVIOUS CUT-OFF

WATER EL	ITEM	AREA	HEIGHT OF WATER(F/S)	HEIGHT OF WATER(P/S)	UNIT WT	UPLIFT F/S EDGE	UPLIFT P/S EDGE	WIDTH	SHAPE OF PRES DIAG	FZ	CENTER OF GRAVITY		LEVARM FOR MX	LEVARM FOR MY	MOMENT CODE FOR MX	MOMENT CODE FOR MY	MOMENT MX	MOMENT MY	REMARK
		A	HT1	HT2	w	w x HT1	w x HT2				X	Y					MX	MY	
11.25 (F/S)	WATER IN CANAL (F/S)	281.89	3.00	3	0.06250	0.19	0.19	7.00	RECT	-52.85	1.13	3.50	3.50	1.13	-1.00	1.00	-184.99	59.84	
29 (P/S)	GROUND WATER (P/S)	289.31	20.75	20.75	0.06250	1.30	1.30	7.00	RECT	-375.20	1.67	-3.50	3.50	1.67	1.00	1.00	1313.21	628.33	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 11.25 AND GW @ 21.43,IMPERVIOUS CUT-OFF										-428.06							-171.64	688.17	

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HORIZONTAL WIND LOADS								
STORM WIND LOADS:								
WATER EL	**ITEM**	**LENGTH**	**EXPOSED HEIGHT HT**	**WIND INTENSITY q**	**SHAPE OF PRES DIAG**	**FY**	**LEVARM**	**MOMENT MX**
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
OPERATING WIND LOADS								
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

T3-20

LOAD COMBINATIONS:

CASE I : CONSTRUCTION CASE. OP. WIND, NO WATER OR EARTH LOADS:

ITEM	FX	FY	FZ	MX	MY	MZ
CONCRETE LOADS			487.6311	-1078.72	-1209.31	
OPERATING WINDS		-10.3929		-151.113		
TOTAL FOR CASE I :		***-10.3929***	***487.6311***	***-1229.83***	***-1209.31***	

CASE II : WL IN CANAL@32.33, STORM WIND, BACKFILL IN PLACE GW @ 29, IMPERVIOUS CUT-OFF.

ITEM	FX	FY	FZ	MX	MY	MZ
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			
TOTAL FOR CASE II :	***-20.755***	***105.9618***	***381.0127***	***-1275.58***	***-1196.18***	***3782.554***	
CASE III : WL IN CANAL@32.33,STORM WIND,BACKFILL IN PLACE							
GW @ 29, PERVIOUS CUT-OFF.							
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			
TOTAL FOR CASE III :	***-20.755***	***105.9618***	***367.1205***	***-1244.9***	***-884.896***	***3782.554***	
CASE IV : WL IN CANAL EMPTY,BACKFILL IN PLACE, OP. WIND							
GW @ 29, IMPERVIOUS CUT-OFF.							
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			
TOTAL FOR CASE IV :	***-101.264***	***869.2083***	***168.8431***	***4082.389***	***-272.484***	***2002.335***	
CASE V : WL IN CANAL EMPTY, BACKFILL IN PLACE, OP. WIND							
GW @ 29, PERVIOUS CUT-OFF.							
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			
TOTAL FOR CASE V :	**-101.264**	***869.2083***	***166.0104***	***3502.62***	***-208.42***	***2002.335***	
CASE VI : WL IN CANAL @ 34.33, STORM WIND, BACKFILL IN PLACE							
GW @ 29, IMPERVIOUS CUT-OFF.							

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							
TOTAL FOR CASE VI :	***-6.82611***	***-24.4107***	***401.1426***	***-2897.48***	***-1397.26***	***4090.552***	
CASE VII : WL IN CANAL@34.33,STORM WIND,BACKFILL IN PLACE							
GW @ 29, PERVIOUS CUT-OFF.							
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	0.00	-7949.63	-820.976	2088.217	
EARTH PRESSURE	-101.264	890.04	0	6156.115	700.4061	2002.335	
STORM WIND		0.00		0			
TOTAL FOR CASE VII :	*-6.82611*	*-24.4107*	*386.2012*	*-2749.77*	***-1062.53***	***4090.552***	

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

TOTAL FOR CASE IX :							

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

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.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 K/IN**2	LENGTH	L FT	LU 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 FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
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

						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.

****

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
.8	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

	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
14	.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

,AD 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

	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

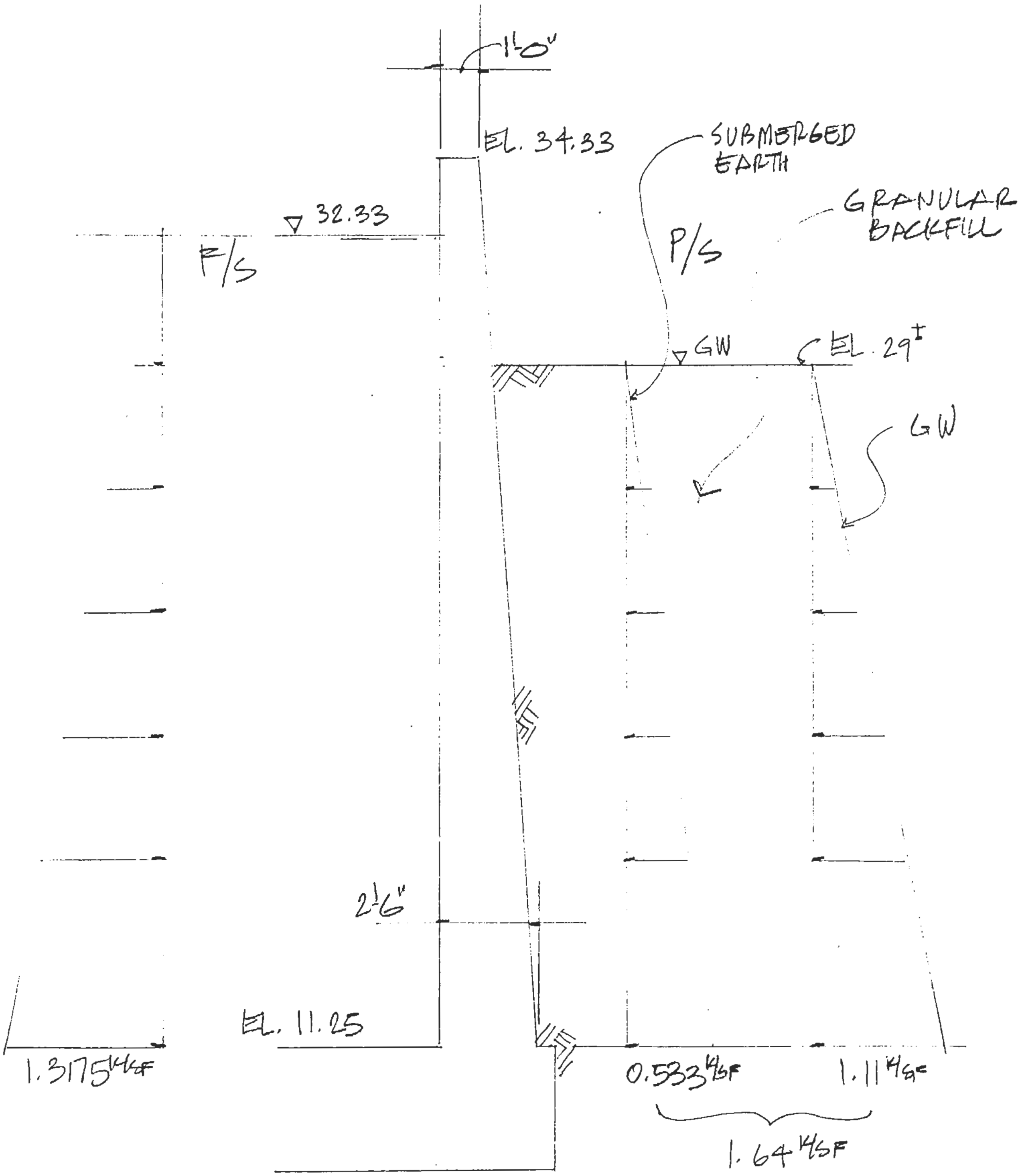
PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-.3	12.1	22.5	.0	.0	.0
2	-.3	8.1	14.7	.0	.0	.0
3	-.3	4.2	7.0	.0	.0	.0
4	-.3	.2	-.7	.0	.0	.0
5	-.3	-3.8	-8.5	.0	.0	.0
6	-.3	-7.8	-16.2	.0	.0	.0
7	-.3	-11.8	-24.0	.0	.0	.0
8	-.3	-15.8	-31.7	.0	.0	.0
9	-.3	-19.7	-39.5	.0	.0	.0

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



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

BM @ BOT OF STEM = 1.64 × 0.5 × 17.75 × 17.75/3

= 86'k (SERVICE LOAD) P/S

M_u (F/S) = 1.3 × 1.7 × 97.6 = 216'k M_n = 240'k

M_u (P/S) = 1.3 × 1.7 × 86 = 190'k M_n = 211'k

$$A_s(\text{req'd})\ (\text{P/S FACE}) = \frac{0.85\times4\times0.1013\times12\times25.4}{60}$$

$$= 1.75^{\square''}/\text{FT.} \qquad \frac{A_s}{bd} = 0.0057$$

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

$\therefore A_s\ (\text{PROVIDED}) = 1.89^{\square''}/\text{FT} > 1.75^{\square''}/\text{FT.} \therefore$ O.K. $\frac{A_s}{bd} = 0.0062 < 0.25\rho_b$

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

HORIZ. REINF

$= 0.0028\times12\times30 = 1^{\square''}/\text{FT}$

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

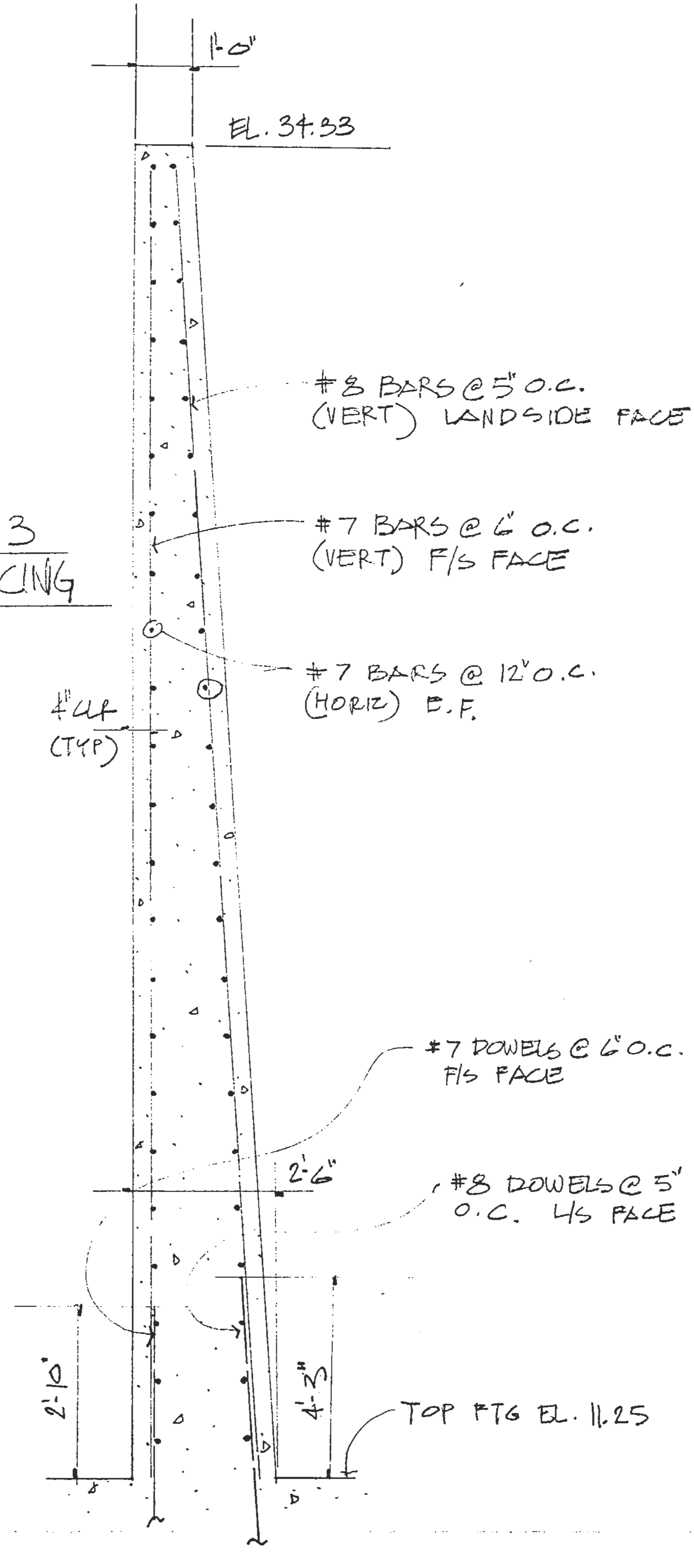
CHECK SHEAR

$$V_u = \left(14.55 - \frac{25.4}{12}\times1.64\right)\times1.3\times1.7$$

$$= 24.5^k < \phi V_c = 30.76^k \quad \therefore \text{O.K.}$$

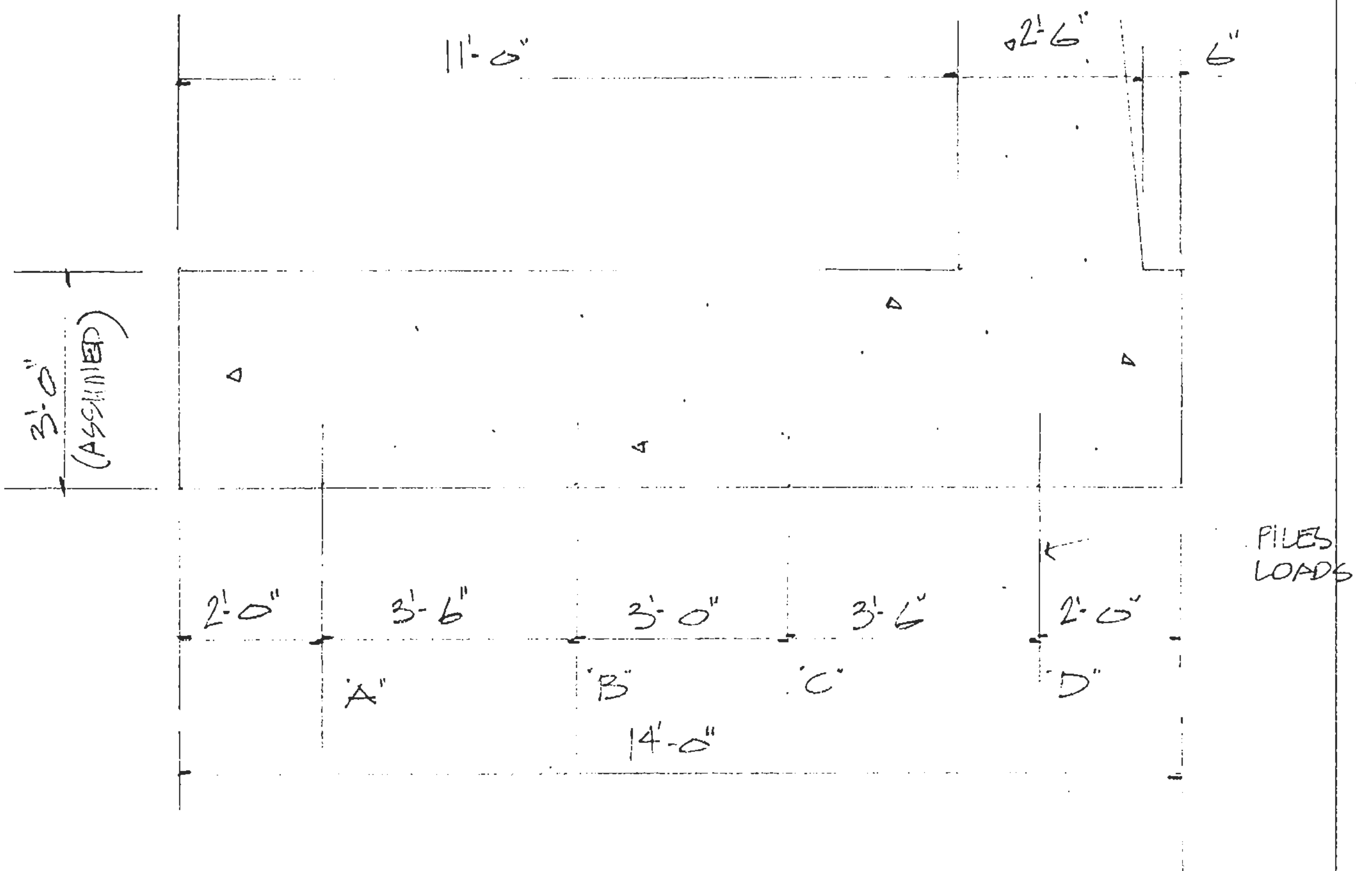
SELECTED STEM THICKNESS @ BASE IS ADEQUATE & NO SHEAR REINF IS NECESSARY.

MONOLITH T-3
STEM- REINFORCING



FOUNDATION SLAB DESIGN

ASSUME:
1. SLAB TH'K = 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	46^k	9	50^k
19	128^k	20	-106^k
30	-87^k	31	-63^k
		38	38^k

2. SELF WT. (ASSUMING 3' TH'K SLAB) = $0.45^{k}/_{SF}$.

3. UPLIFT. REFER TO PLATE 24.

FDN SLAB DESIGN

DESIGN A 3'-6" WIDE STRIP.

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

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

2. BM DUE TO UPLIFT $= 0.19 \times 3.5 \times 14^2/2 + \left(\left(\frac{1.297-0.19}{2}\right) \times 14\right) \times 3.5 \times (4.67-3)$
   $= 65 + 45$
   $= 110'k$

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

$\therefore$ TL BM $= 154 + 110 + 459 = 415'k$

$\therefore$ BM/FT $= 415/3.5 = 119'$

$\therefore M_u = 1.3 \times 1.7 \times 119 = 263'k$

$\therefore d_{req} = 25.60"$

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

$\therefore$ O.K.

FOUNDATION SLAB DESIGN

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

$= 39^k$

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

2. UPLIFT $= 36^k$

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

TOTAL $= 149^k$

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

TRY 40" TH'K BASE SLAB

$\therefore \phi V_c = 45.6^k > V_u$ @ d $\therefore$ 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

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

$= -154 + 110 + (-291) = -335'^k < 415'^k \therefore$ o.k.

$\phi V_c = 45.6^k$

V_u @ d $= -18 + 36 + (50 - 106 - 63/2) = -70^k < 149^k \therefore$ o.k.

FDN SLAB DESIGN

FOR $b = 12''$ $d = 35.44''$ $F = 1.25$

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

$\therefore$ A_s(req'd) = $0.0040 \times 12 \times 35.44 = 1.7^{\square''}$

USE # 9 BARS @ 6" O.C. (BOT). ($A_s = 2^{\square''}$ $\therefore$ O.K.)

TOP REINF.

$BM = (335/3.5)\,1.3 \times 1.7 = 212'^{k} = M_u$.

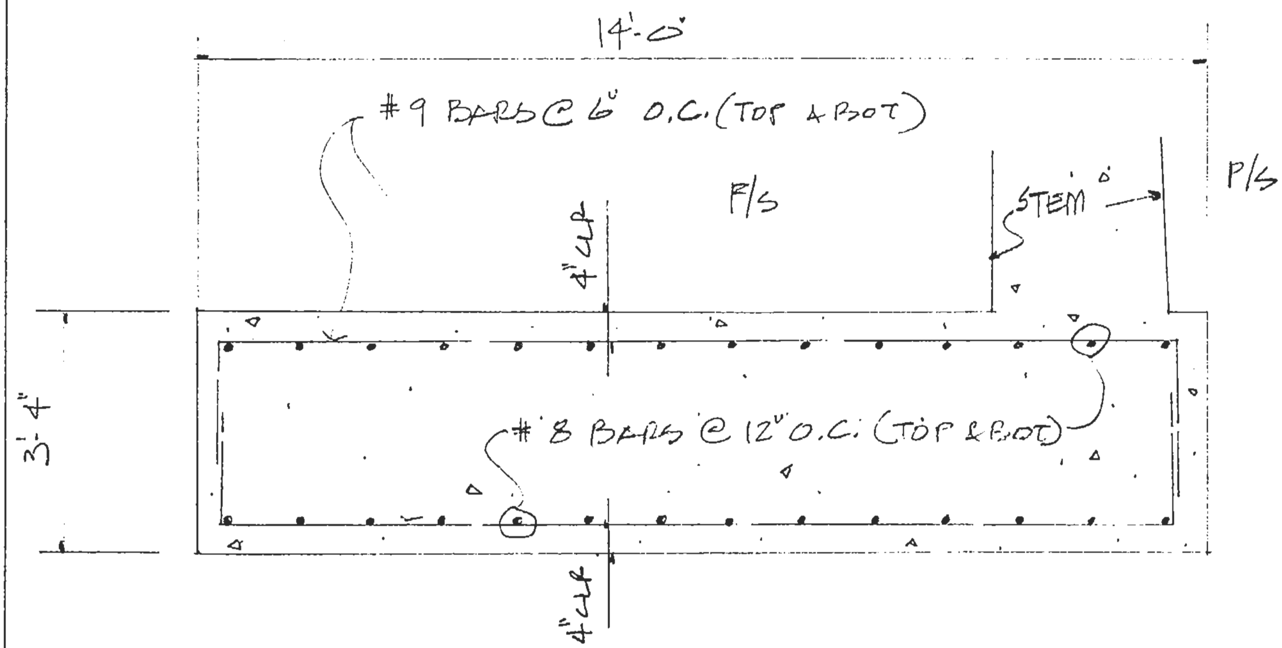
USE # 9 BARS @ 6" O.C. (TOP) O.K BY OBS.

TEMP & SHRINKAGE

$= 0.0028 \times 12 \times 40 = 1.34^{\square''}$

USE # 8 @ 12" TOP & BOT $= 1.58^{\square''} > 1.34^{\square''}$ $\therefore$ O.K.

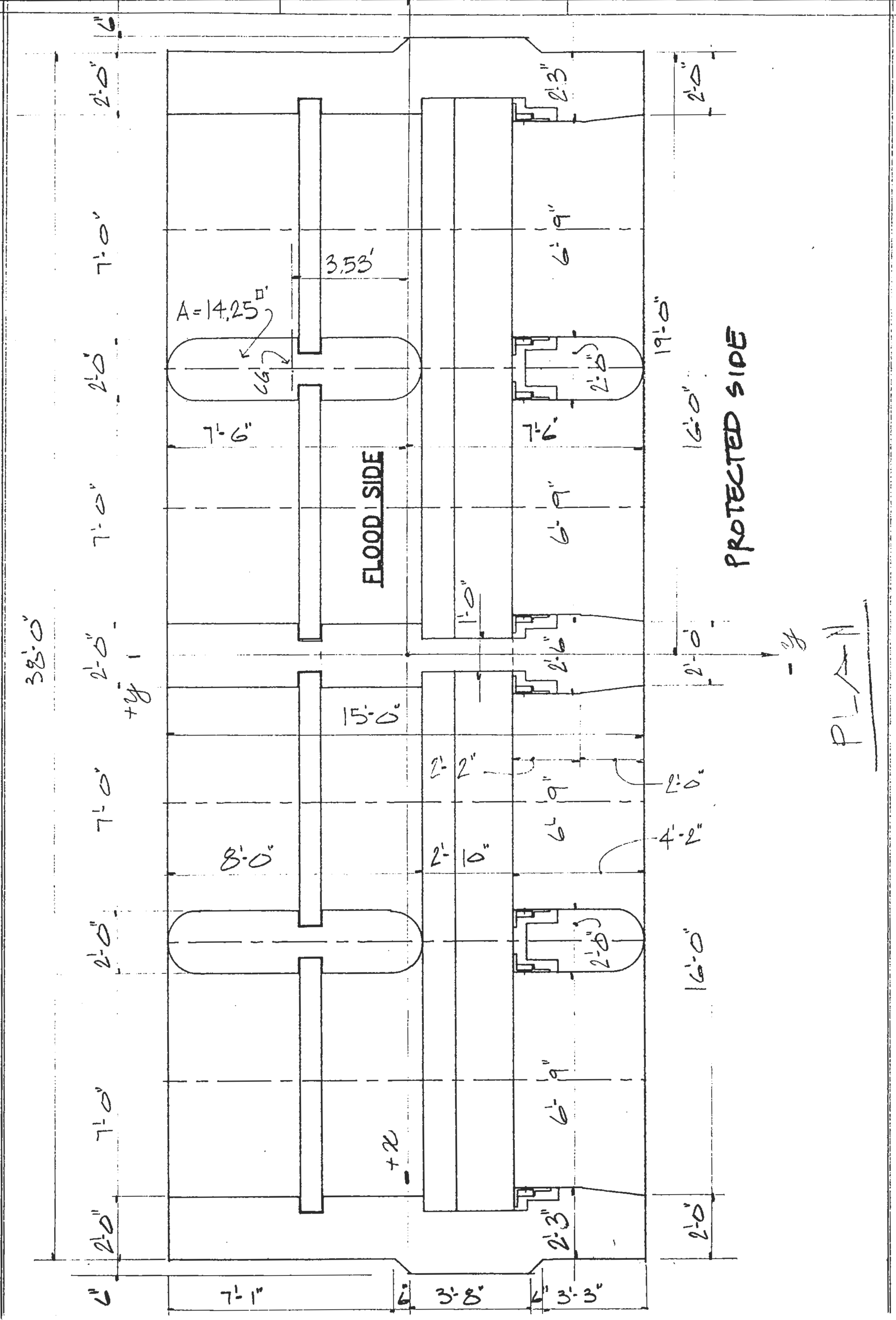
FDN SLAB DESIGN



@ DPS NO. 3

SLUICE GATE STRUCTURE @ PUMPS "A" & "B"

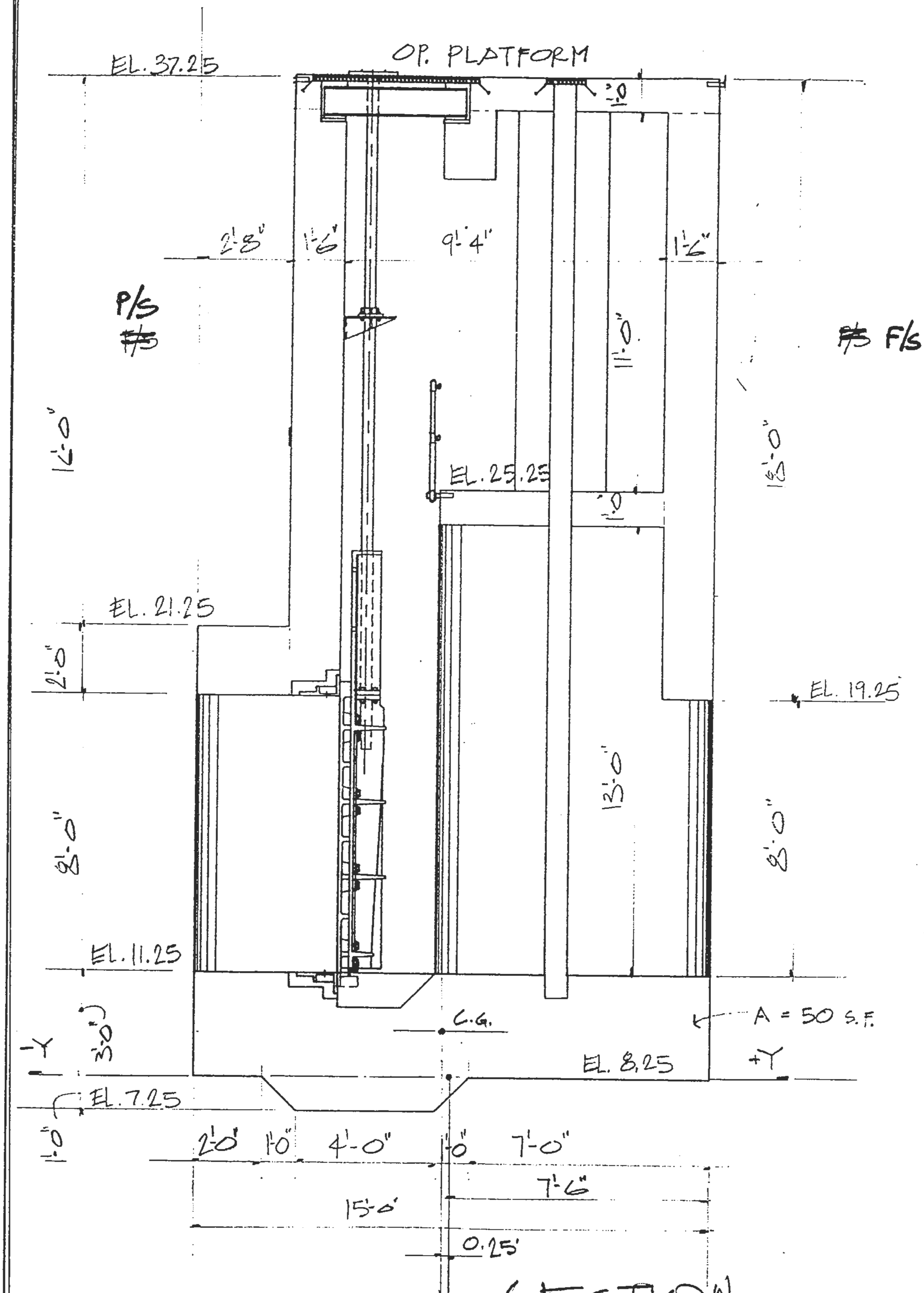
G1-1



FRONT PROTECTION @ DPS NO. 3

SLUICE GATE STRUCTURE @ PUMPS "A" & "B"

G1-2

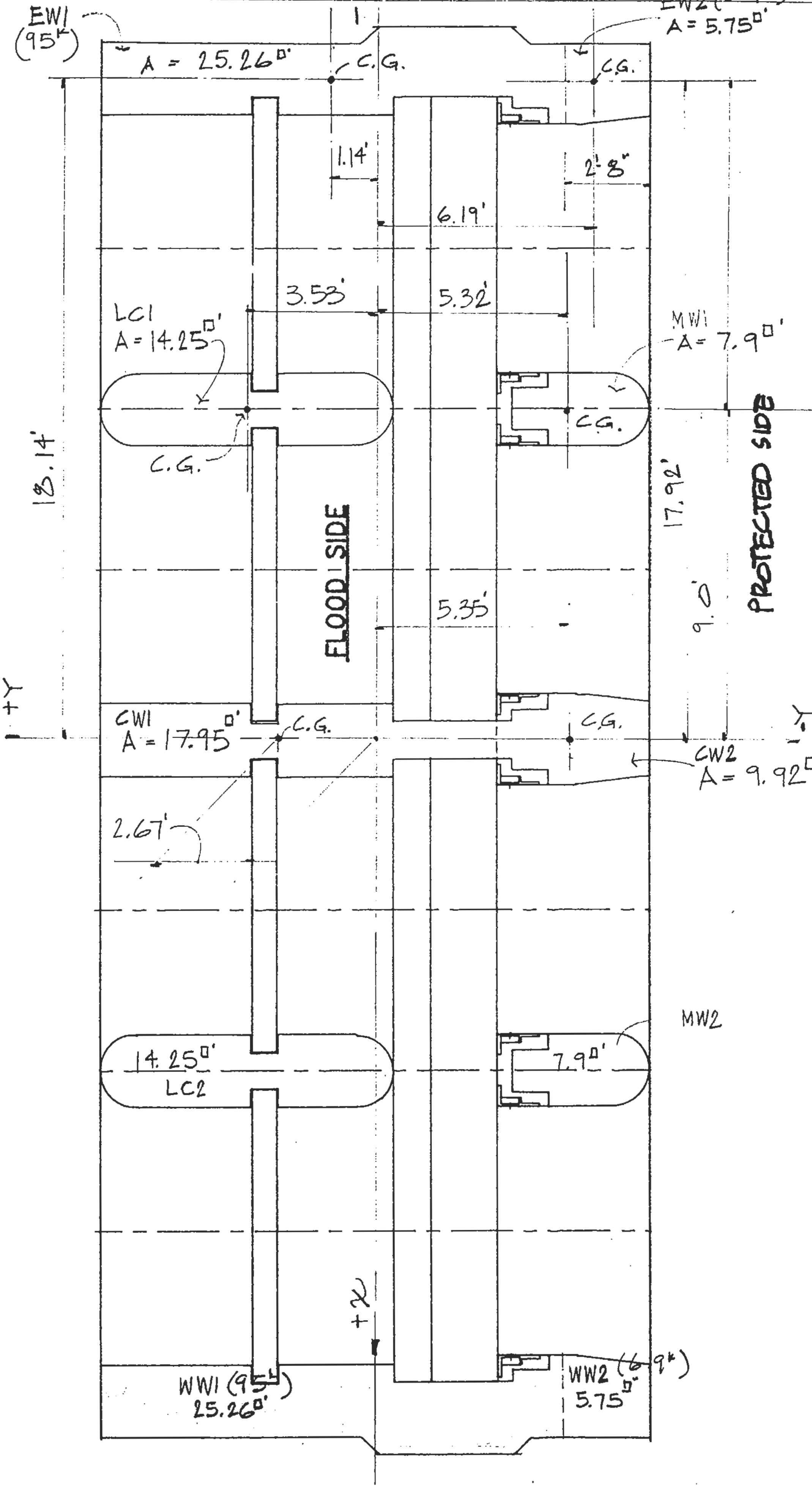


SECTION

FRONT. PROTECTION @ DPS NO3

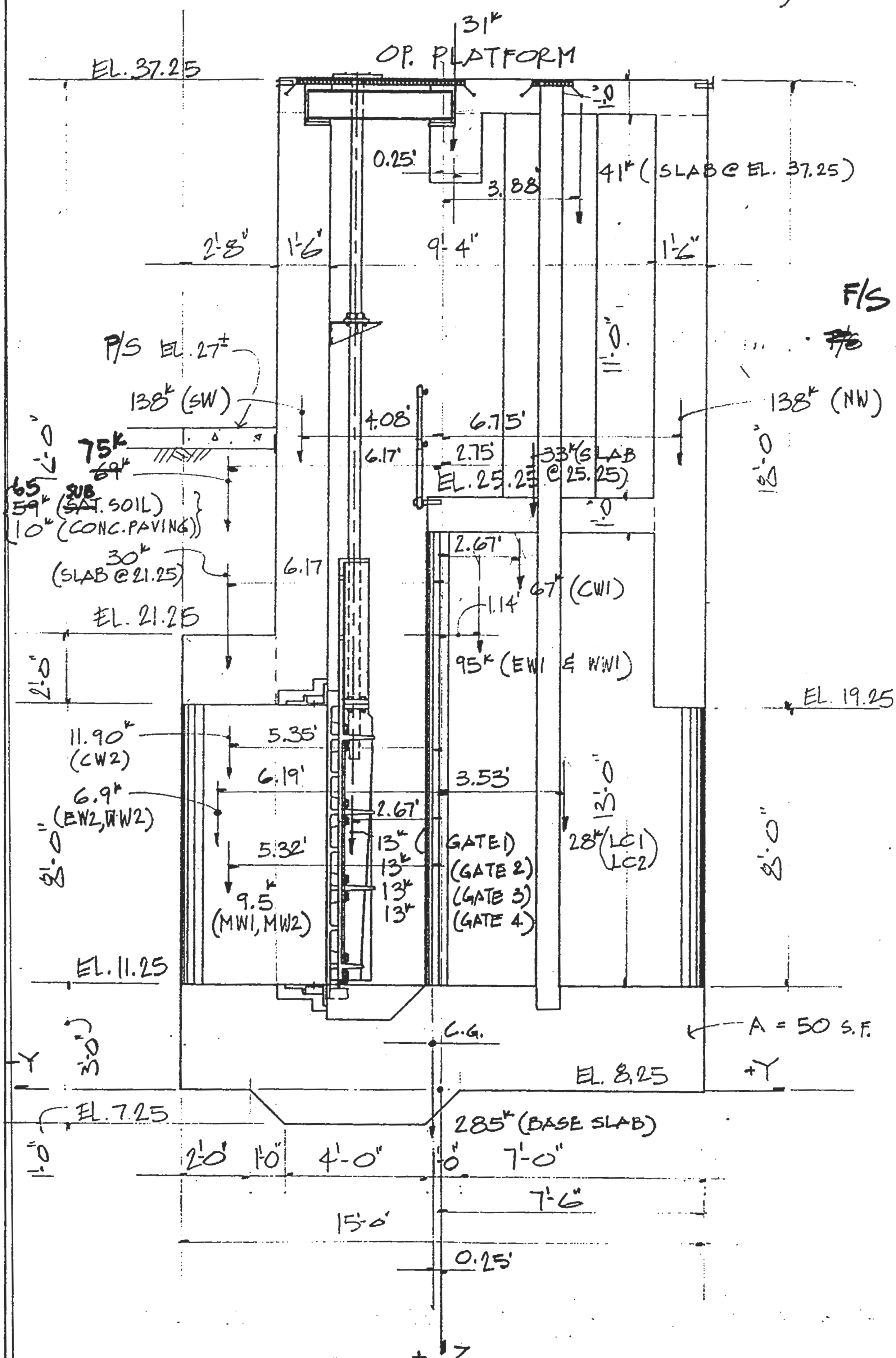
SLUICE GATE STRUCTURE @ PUMPS "A" & "B"

G1-3

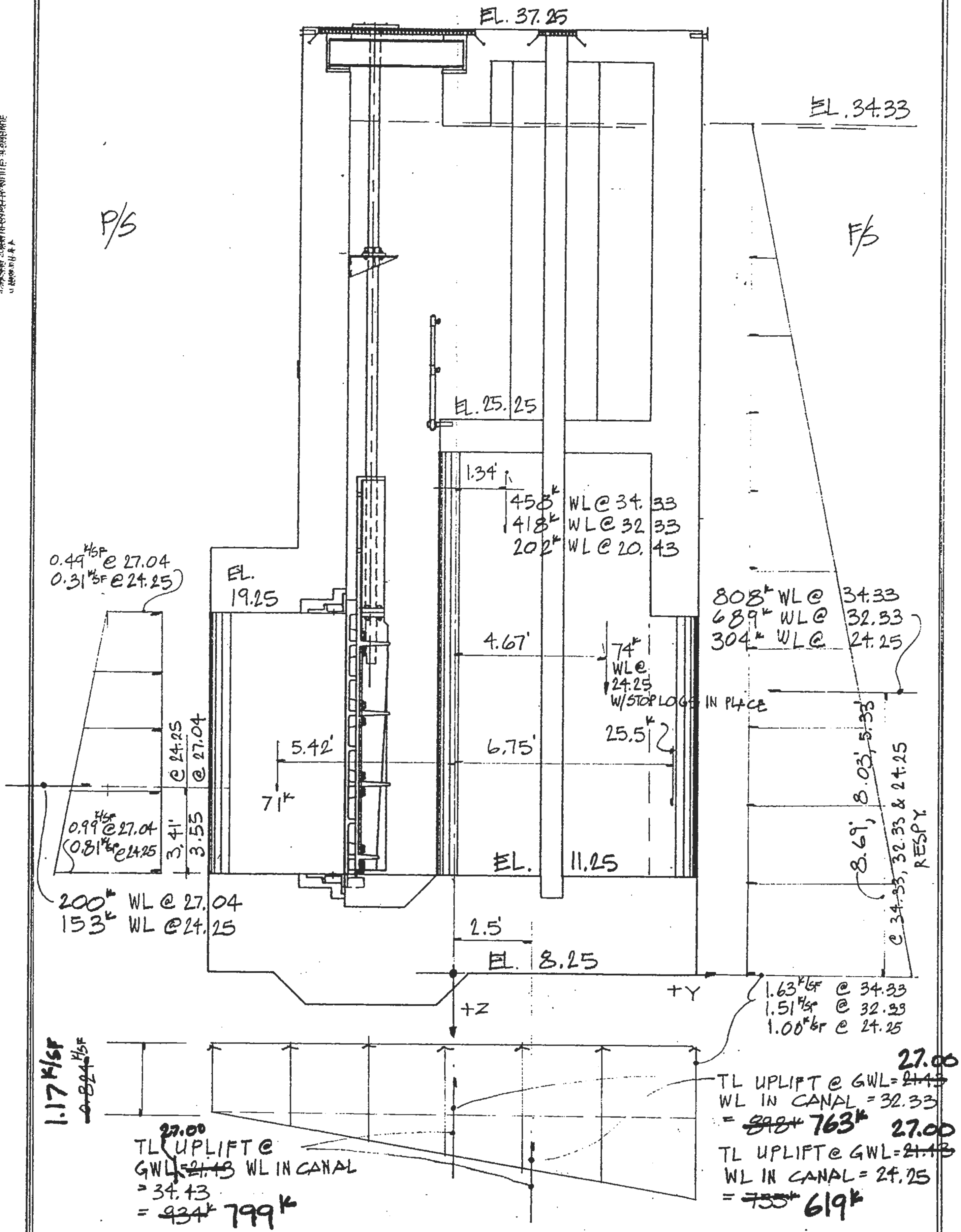


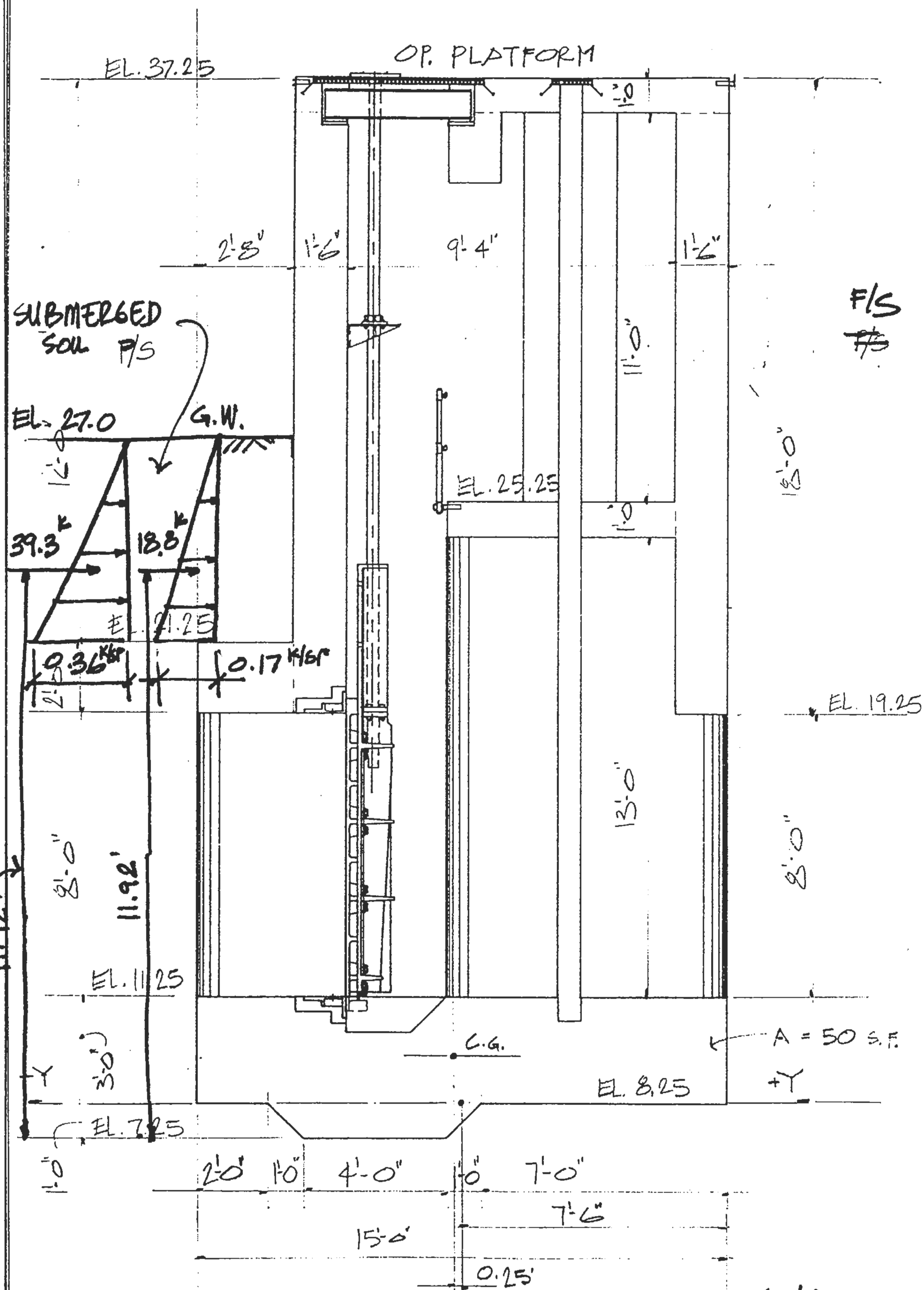
PLAN - C.G. LOCATIONS

GRAVITY LOADS (CONC & EARTH)



HYDRAULIC LOADS

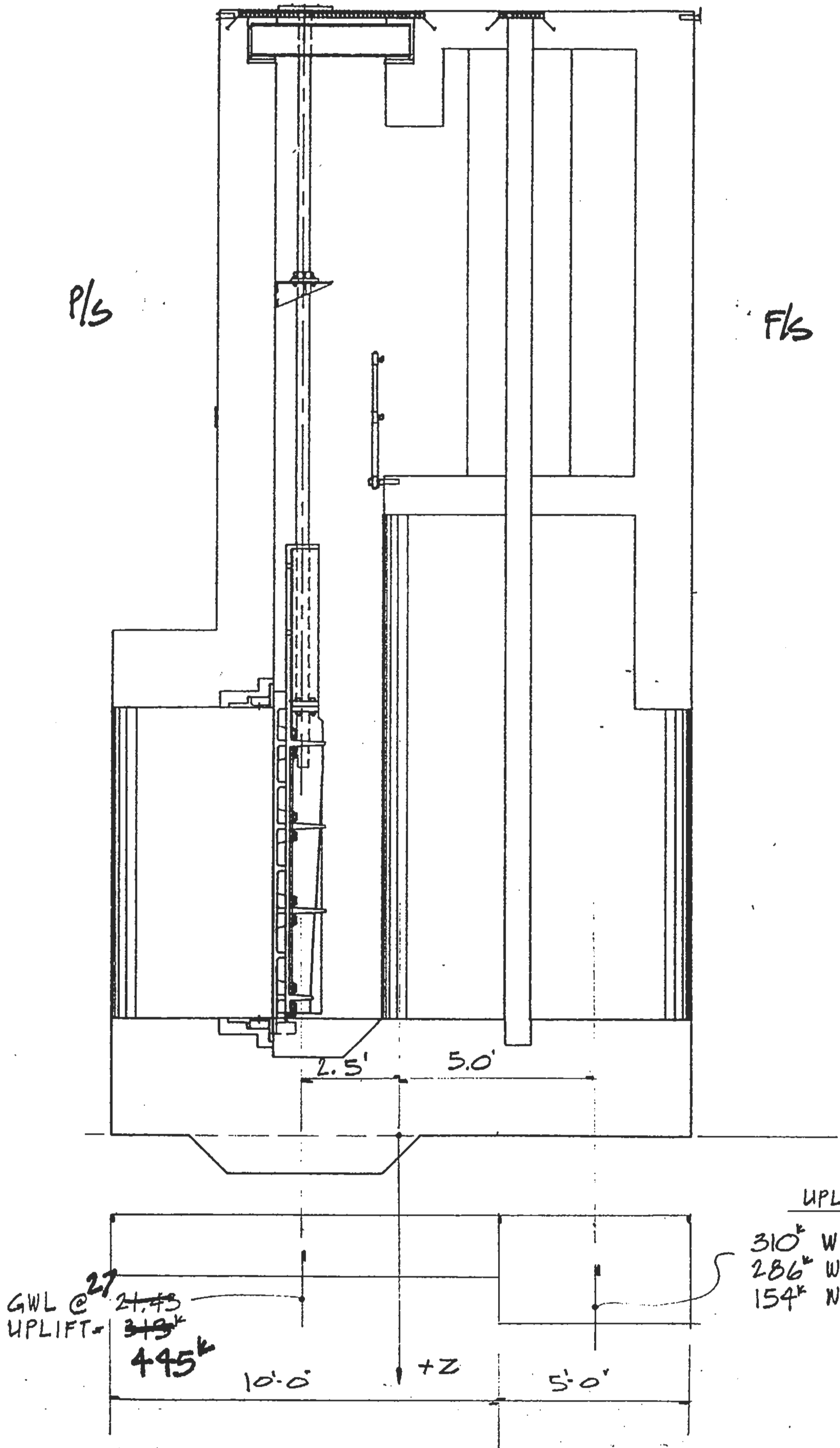




LATERAL EARTH PRESSURE (P/S)

+Z

HYDRAULIC LOADS



UPLIFT

310^k WL @ 34.33 GW 27.0
286^k WL @ 32.33 GW 27.0
154^k WL @ 24.25 GW 27.0

G1-8

VERTICAL LOADS

	ITEM	DIMENSIONS LEN OR HT	WIDTH	TH'K	AREA W x T OR PER SKTCH	w	QX	MOMCODE QY	QZ	LEVER ARM LAX FOR MX	LAY FOR MY	LAZ	FX	FY	FZ w x L OR HT x	MX FZ x LAX	MY FZ x LAY	MZ
	EW1	25.00			25.30	0.15	2	2		1.14	18.14				94.88	108.16	1721.03	
	EW2	8.00			5.75	0.15	3	3		6.19	17.92				6.90	-42.71	123.65	
	LC1	13.00			14.25	0.15	2	2		3.53	9.00				27.79	98.09	250.09	
	MW1	8.00			7.90	0.15	3	3		5.32	9.00				9.48	-50.43	85.32	
	CW1	25.00			17.95	0.15				0.00	0.00				67.31	0.00	0.00	
	CW2	8.00			9.92	0.15	3	3		5.35	0.00				11.90	-63.69	0.00	
	LC2	13.00			14.25	0.15	1	1		3.53	9.00				27.79	98.09	-250.09	
	MW2	8.00			7.90	0.15	4	4		5.32	9.00				9.48	-50.43	-85.32	
	WW1	25.00			25.30	0.15	1	1		1.14	18.14				94.88	108.16	-1721.03	
	WW2	8.00			5.75	0.15	4	4		6.19	17.92				6.90	-42.71	-123.65	
	BASESLAB	38.00			50.00	0.15	3	3		0.25	0.00				285.00	-71.25		
	NW	18.00	34.00	1.5	51.00	0.15	1	1		6.75	0.00				137.70	929.48		
	SW	18.00	34.00	1.5	51.00	0.15	3	3		4.08	0.00				137.70	-562.23		
	SLAB@21.25	38.00	2.67	2	5.33	0.15	3	3		6.17	0.00				30.40	-187.57		
	SLAB@25.25	34.00	6.50	1	6.50	0.15	2	2		2.75	0.00				33.15	91.16		
	SLAB@37.25	38.00	7.25	1	7.25	0.15	2	2		3.88	0.00				41.33	160.13		
	RCBM@37.25	34.00	1.50	4	6.00	0.15	2	2		0.25	0.00				30.60	7.65		
	GATE 1						4	4		2.67	13.38				13.00	-34.67	-173.88	
	GATE 2						4	4		2.67	4.63				13.00	-34.67	-60.13	
	GATE 3						3	3		2.67	4.63				13.00	-34.67	60.13	
	GATE 4						3	3		2.67	13.38				13.00	-34.67	173.88	
	SUBM. SOIL	38	2.6667	5.33	14.21	0.06	3	3		6.17					32.41	-199.95		
	GR. WATER	38	2.6667	5.33	14.21	0.0625	3	3		6.17					33.76	-208.281		
	CONC PAVING	38	2.6667	0.67	1.79	0.15	3	3		6.17					10.18	-62.84		
TOTAL VERTICAL LOADS (CONC., GATES AND EARTH LOADS):															***1181.52***	***-79.88***	***0.00***	

VERTICAL HYDRAULIC LOADS

WATER EL	ITEM	DIMENSIONS LENGTH	HT	WIDTH	AREA HT x W OR PER SKTCH	w	QX	MOMCODE QY	QZ	LEVER ARM LAX FOR MX	LAY FOR MY	LAZ	FX	FY	FZ L x A x w	MX FZ x LAX	MY FZ x LAY	MZ
32.33	IN SHAFT	34.00	21.08	9.33	196.68	0.0625	2	2		1.34	0				417.94	557.95	0.00	
	UNDER N WALL	34.00	8.00	1.50	12.00	0.0625	2	2		6.75	0				25.50	172.13	0.00	
	UNDER S WALL	34.00	8.00	4.17	33.33	0.0625	3	3		5.42	0				70.83	-383.92	0.00	
TOTAL VERTICAL HYDRAULIC LOADS FOR STORM WATER LEVEL IN CANAL @ 32.33															***514.27***	***346.15***		
20.43	IN SHAFT	34.00	10.18	9.33	94.98	0.0625	2	2		1.34	0				201.83	269.44	0.00	
	UNDER N WALL	34.00	8.00	1.50	12.00	0.0625	2	2		6.75	0				25.50	172.13	0.00	
	UNDER S WALL	34.00	8.00	4.17	33.33	0.0625	3	3		5.42	0				70.83	-383.92	0.00	
TOTAL VERTICAL HYDRAULIC LOADS FOR WATER LEVEL IN CANAL @ 20.43															***298.17***	***57.65***		
34.33	IN SHAFT	34.00	23.10	9.33	215.52	0.0625	2	2		1.34	0				457.99	611.41	0.00	
	UNDER N WALL	34.00	8.00	1.50	12.00	0.0625	2	2		6.75	0				25.50	172.13	0.00	
	UNDER S WALL	34.00	8.00	4.17	33.33	0.0625	3	3		5.42	0				70.83	-383.92	0.00	
TOTAL VERTICAL HYDRAULIC LOADS FOR STORM WATER LEVEL IN CANAL @ 34.33															***554.32***	***399.62***		

VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN USE:

STOP LOGS IN PLACE @ BOTH PUMPS "A" & "B"																		
24.25	IN SHAFT	34.00	13.00	2.67	34.67	0.0625	2	2		4.67	0				73.67	344.02	0.00	
	UNDER N WALL	34.00	8.00	1.50	12.00	0.0625	2	2		6.75	0				25.50	172.13	0.00	
TOTAL VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE @ BOTH PUMPS "A" & "B"															99.16675875	516.1488		
STOP LOGS IN PLACE @ PUMP "B" ONLY																		
24.25	IN SHAFT @ "B"	16.00	13.00	2.67	34.67	0.0625	2	2		4.67	9				34.67	161.89	312.00	
	UNDER N WALL	16.00	8.00	1.50	12.00	0.0625	2	2		6.75	9				12.00	81.00	108.00	
24.25	IN SHAFT @ "A"	16.00	13.00	9.33	121.29	0.0625	1	1		1.34	9				121.29	162.53	-1091.61	
	UNDER N WALL	16.00	8.00	1.50	12.00	0.0625	1	1		6.75	9				12.00	81.00	-108.00	
	UNDER S WALL	16.00	8	4.17	33.36	0.0625	4	4		5.42	9				33.36	-180.811	-300.24	
TOTAL VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE @ PUMP "B" ONLY															213.31671	305.6109	-1079.85	
STOP LOGS IN PLACE @ PIUMP "A" ONLY																		
24.25	IN SHAFT @ "A"	16.00	13.00	2.67	34.67	0.0625	1	1		4.67	9				34.67	161.89	-312.00	
	UNDER N WALL	16.00	8.00	1.50	12.00	0.0625	1	1		6.75	9				12.00	81.00	-108.00	
24.25	IN SHAFT @ "B"	16.00	13.00	9.33	121.29	0.0625	2	2		1.34	9				121.29	162.53	1091.61	
	UNDER N WALL	16.00	8.00	1.50	12.00	0.0625	2	2		6.75	9				12.00	81.00	108.00	
	UNDER S WALL	16.00	8.00	4.17	33.36	0.0625	3	3		5.42	9				33.36	-180.81	300.24	
TOTAL VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE @ PUMP "A" ONLY															213.31671	305.6109	1079.85	

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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	38	5	R			-309.70	5.00		1	-1548.50	
27.00	GRND WL		18.75	0.0625	0.00	1.172	38	10	R			-445.31	2.50		2	1113.28	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33, GW @ 27.00 AND IMPERVIOUS CUT-OFF												-755.01				-435.22	
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	38	5	R			-285.95	5.00		1	-1429.75	
27.00	GRND WL		18.75	0.0625	0.00	1.172	38	10	R			-445.31	2.50		2	1113.28	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33, GW @ 27.00 AND IMPERVIOUS CUT-OFF												-731.26				-316.47	
WL IN CANAL @ 24.25 AND GW LEVEL @ 27.00 IMPERVIOUS CUT-OFF																	
24.25	WL IN CANAL	13		0.0625	0.81	0.000	38	5	R			-154.38	5.00		1	-771.88	
27.00	GRND WL		18.75	0.0625	0.00	1.172	38	10	R			-445.31	2.50		2	1113.28	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 27.00, GW @ 21.43 AND IMPERVIOUS CUT-OFF												-599.69				341.41	
WL IN CANAL @ 34.33 AND GW LEVEL @ 27.00 PERVIOUS CUT-OFF																	
27.00	GRND WL		18.75	0.0625	0.00	1.172	38	15	R			-667.97	0.00		1	0.00	
34.33	WL IN CANAL	26.08		0.0625	1.63	0.000	38	15	TR			-130.57	2.50		1	-326.41	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 34.33, GW @ 27.00 AND PERVIOUS CUT-OFF												-798.53				-326.41	
WL IN CANAL @ 32.33 AND GW LEVEL @ 27.00 PERVIOUS CUT-OFF																	
27.00	GRND WL		18.75	0.0625	0.00	1.172	38	15	R			-667.97	0.00		1	0.00	
32.33	WL IN CANAL	24.08		0.0625	1.51	0.000	38	15	TR			-94.94	2.50		1	-237.35	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 32.33, GW @ 27.00 AND PERVIOUS CUT-OFF												-762.91				-237.35	
WL IN CANAL @ 24.25 AND GW LEVEL @ 27.00 PERVIOUS CUT-OFF																	
27.00	WL IN CANAL	16		0.0625	1.00	0.00	38	15	R			-570.00	0.00		1	0.00	
24.25	GRND WL		18.75	0.0625	0.00	1.172	38	15	TR			-48.98	2.50		3	122.46	

TOTAL UPLIFT LOADS FOR WL IN CANAL @ 27.00, GW @ 21.43 AND PERVIOUS CUT-OFF				*-618.98*				*122.46*	

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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	TRPS		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	TRPS		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	TRPS		39.26	11.92	2	467.87
TOTAL HORIZONTAL SUBMERGED EARTH LOADS											58.10734			692.4458

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H O R I Z O N T A L H Y D R A U L I C L O A D S W H E N S T O P L O G S I N U S E:

WATER EL		WATER EL	BOT OF FDN SLAB	TOP OF GATE OPNG	HT OF WATER HT	UNIT WT w	w x HT	LENGTH L	SHAPE	FY	LEVER ARM FOR MX	LEVER ARM FOR MZ	MOMENT CODE FOR MZ	MX	MZ
STOP LOGS @ BOTH PUMPS "A" & "B"															
24.25	WATER LEVEL IN CANAL	24.25	8.25	19.25	16	0.0625	1	38	TRFS	-304.00	5.33			-1621.33	
STOP LOGS AT PUMP "A" ONLY															
24.25	WATER LEVEL ON F/S OF STOP LOGS @ PUMP "A" DISCHARGE	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	WATER ABOVE GATE OPN'GS @ PUMPS "B"	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										***-174.06***				***-1031.46***	***-1299.38***
STOP LOGS AT PUMP "B" ONLY															
24.25	WATER LEVEL ON F/S OF STOP LOGS @ PUMP "B" DISCHARGE	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	WATER ABOVE GATE OPN'GS @ PUMP "A"	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										***-174.06***				***-1031.46***	***1299.38***

HORIZONTAL WIND LOADS:										
STROM WIND LOADS										
							FY			MX
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	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
OPERATING WIND LOADS:										
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

LOAD COMBINATIONS:

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:		***-9.88***	***1105.18***	***233.13***		

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:		***-439.38***	***964.53***	***-3820.39***		

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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			
	TOTAL CASE III:		***-439.38***	***932.89***	***-3741.27***			
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			
	TOTAL CASE IV:		***-554.71***	***980.83***	***-5285.05***			

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		
	TOTAL CASE V:		***-554.71***	***937.31***	***-5176.24***		
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		

	TOTAL CASE VI:		***-250.83***	***681.00***	***-262.34***			
CASE VII;	***STOP LOG IN PLACE @ BOTH PUMPS "A" & "B" WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25***							
	OP WIND,BACKFILL IN PLACE, PERVIOUS CUT-OFF							
	ITEM	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**	
	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			
	TOTAL CASE VII:		***-250.83***	***661.71***	***-481.29***			
CASE VIII	***STOP LOG IN PLACE @ PUMP "B" ONLY 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			
	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			

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	OP. WIND		-4.94	0.00	-111.15			
	TOTAL CASE VIII:		***-120.90***	***795.15***	***116.99***	***-1079.85***	***1299.38***	
CASE IX	***STOP LOG IN PLACE @ PUMP "A" ONLY WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25***							
	OP WIND,BACKFILL IN PLACE,PERVIOUS CUT-OFF							
	ITEM	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**	
	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			
	TOTAL CASE IX:		***-120.90***	***775.86***	***-101.95***	***1079.85***	***-1299.38***	

SUMMARY OF LOAD CASES:

ITEM	FX	FY	FZ	MX	MY	MZ
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

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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
   ALLOW H 130 100 385 385 709 2119 ALL
60 BATTER 24 1 TO 7
65 BATTER 2.75 8 TO 14
67 BATTER 3 15 TO 21
130 ANGLE 90 1 TO 7
140 ANGLE 270 8 TO 21
330 PILE 1 17 6 0 2 12 6 0 7 -17 6 0
340 PILE 8 17 .875 0 9 12 .875 0 14 -17 .875 0
350 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

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

****

PILE PROPERTIES AS INPUT

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.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 K/IN**2	LENGTH	L FT	LU 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 FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
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

						1470.00	

****

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

****

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.

)AD 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.

****

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

****

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

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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

ILE	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

)AD CASE - 8

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

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

****

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

:LE	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

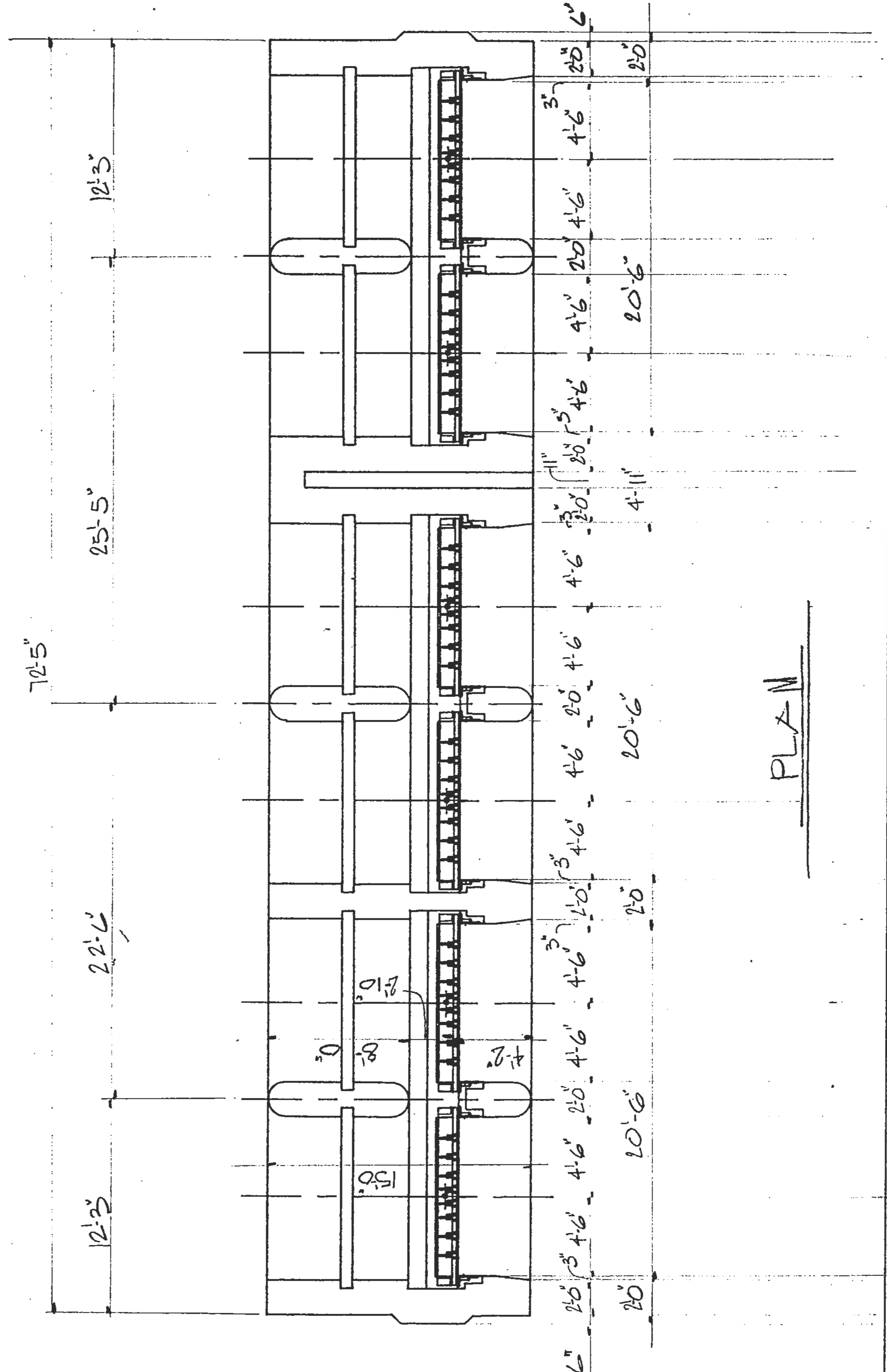
PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-.9	2.3	.0	.0	.0
2	.0	-.9	2.3	.0	.0	.0
3	.0	-.9	2.3	.0	.0	.0
4	.0	-.9	2.3	.0	.0	.0
5	.0	-.9	2.3	.0	.0	.0
6	.0	-.9	2.3	.0	.0	.0
7	.0	-.9	2.3	.0	.0	.0
8	.0	-26.0	68.6	.0	.0	.0
9	.0	-26.0	68.6	.0	.0	.0
10	.0	-26.0	68.6	.0	.0	.0

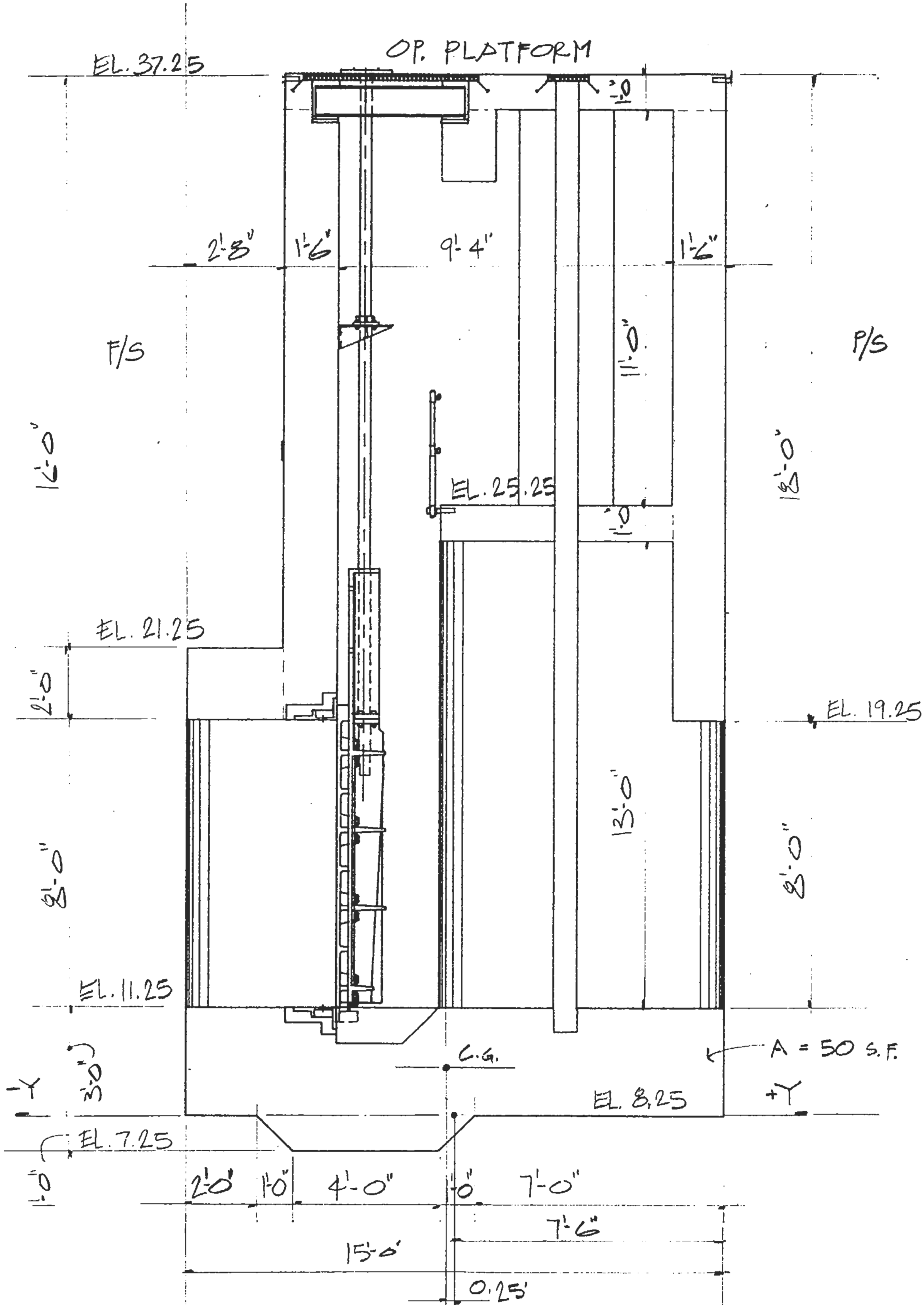
15	-.4	-24.7	73.3	.0	.0	.0
16	-.4	-22.3	67.0	.0	.0	.0
17	-.4	-19.4	59.5	.0	.0	.0
18	-.4	-16.6	51.9	.0	.0	.0
19	-.4	-13.7	44.4	.0	.0	.0
20	-.4	-10.8	36.8	.0	.0	.0
21	-.4	-8.4	30.6	.0	.0	.0

FRONT PROTECTION
@ DPS NO. 3

SLUICE GATE STRUCTURE
@ PUMPS "C" "D" & "E"

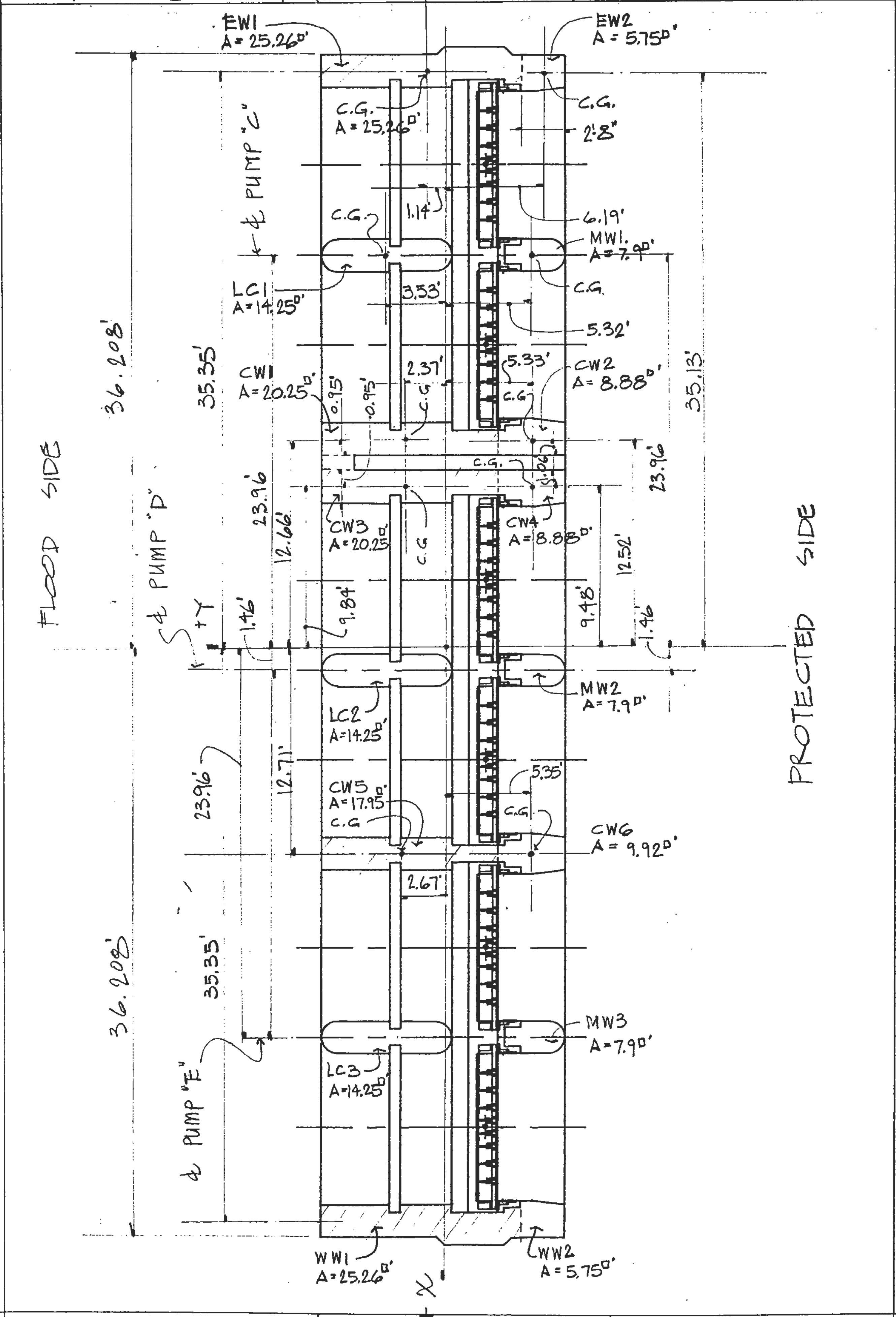
G2-1




OP. PLATFORM
EL. 37.25
1'-0
2'-8"
1'-6
9'-4"
1'-6"
F/S
P/S
11'-0
16'-0
18'-0
EL. 25.25
1'-0
EL. 21.25
2'-0
EL. 19.25
13'-0
8'-0
8'-0
EL. 11.25
A = 50 S.F.
C.G.
3'-0
-Y
+Y
EL. 8.25
EL. 7.25
1'-0
2'-0
1'-0
4'-0"
1'-0
7'-0"
7'-6
15'-0
0.25'
+Z

SECTION

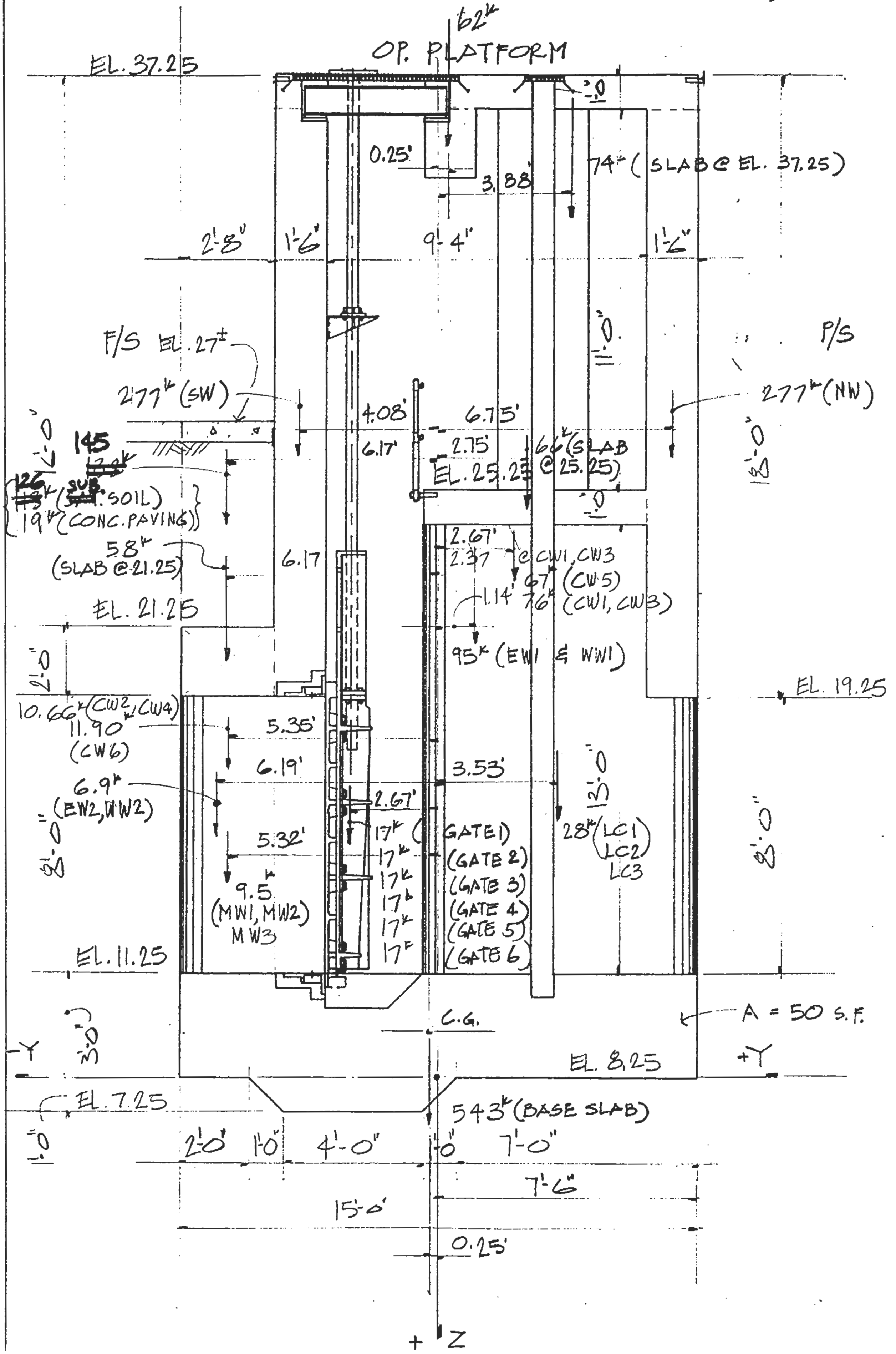
FRONT. PROTECTION @ DPS NO. 3 | C. G. LOCATIONS | SLUICE GATE STRUCTURE @ PUMPS "C" "D" & "E" | G2-3



FRONT PROTECTION @ DPS NO. 3

SLUICE GATE STRUCTURE @ PUMPS "C", "D" & "E"

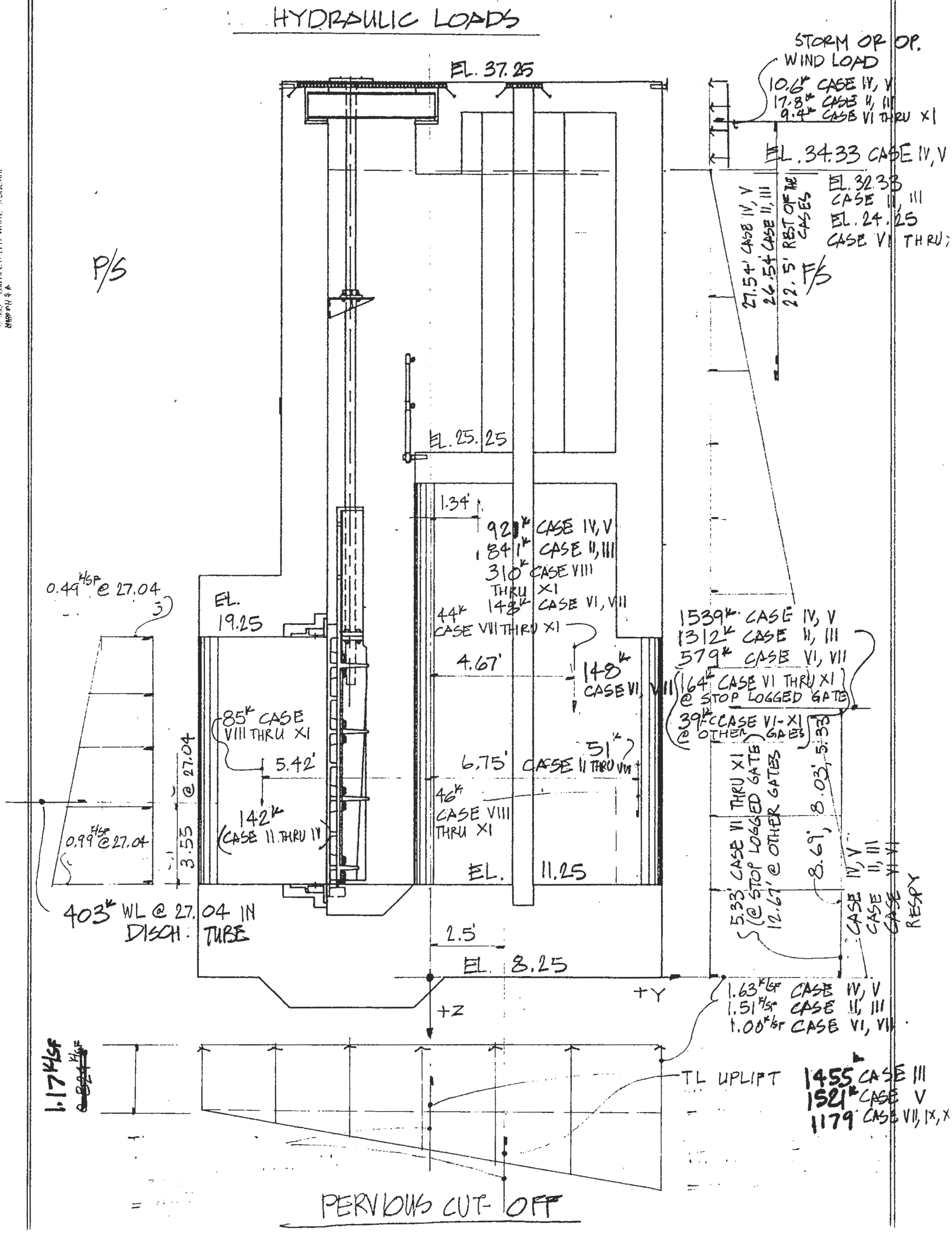
GRAVITY LOADS (CONC & EARTH)



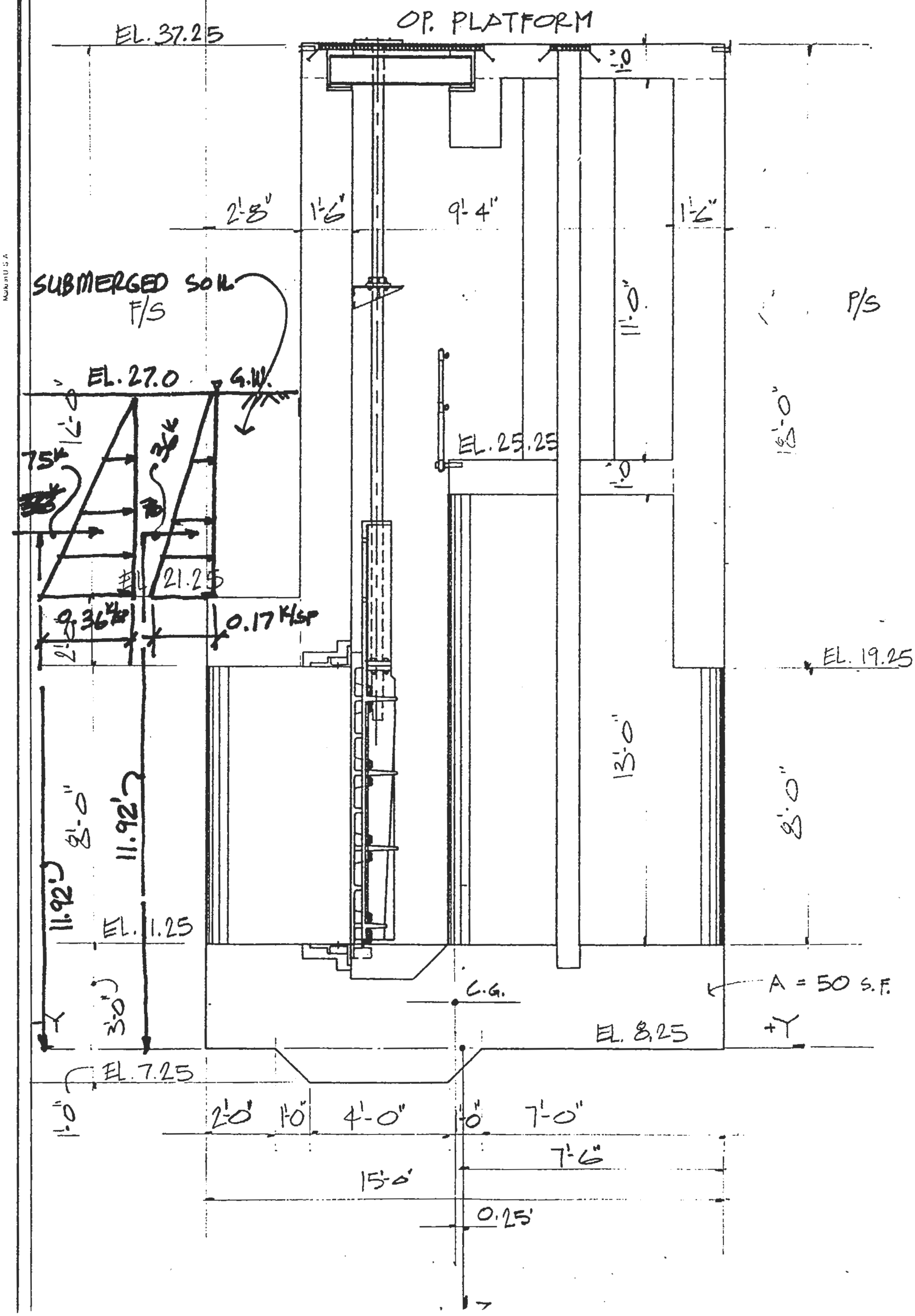
FRONT PROTECTION
@ DPS NO.3

SLUICE GATE STRUCTURE
@ PUMPS "C" "D" & "E"

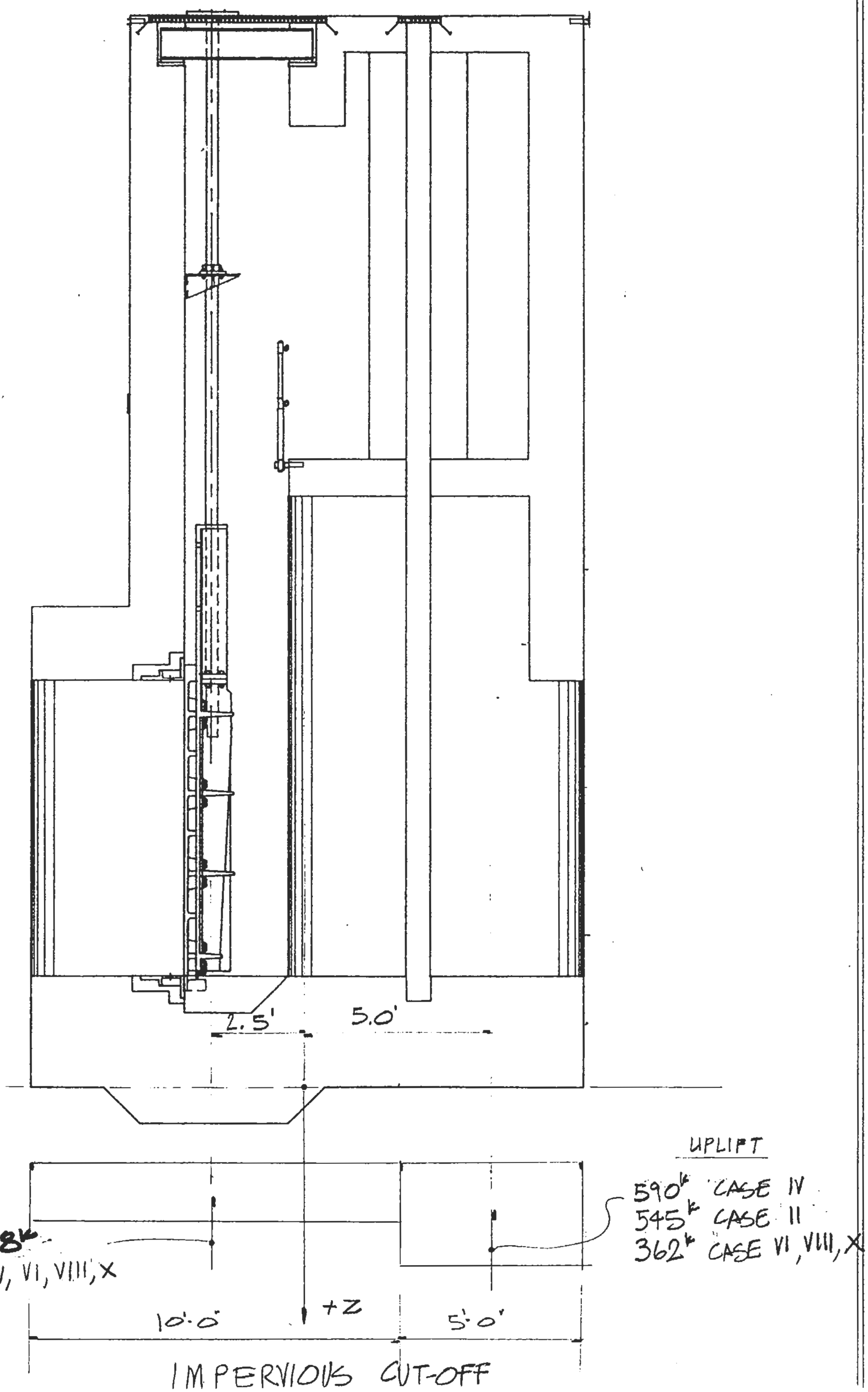
G2-5



LATERAL EARTH PRESSURE (P/S)



HYDRAULIC LOADS



G2-8

VERTICAL LOADS:

	ITEM	DIMENSIONS			AREA		MOMCODE			LEVER ARM								
		LEN OR HT	WIDTH	TH'K	W x T OR PER SKTCH	w	QX	QY	QZ	LAX FOR MX	LAY FOR MY	LAZ	FX	FY	FZ w x L OR HT x	MX FZ x LAX	MY FZ x LAY	MZ
	EW1	25.00			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			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			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			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			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			17.95	0.15	1	1		2.67	23.96				67.31	179.72	-1612.81	
	CW6	8.00			9.92	0.15	4	4		5.35	23.96				11.90	-63.69	-285.22	
	LC3	13.00			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	
	WW1	25.00			25.30	0.15	1	1		1.14	35.35				94.88	108.16	-3353.83	
	WW2	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						4	4		2.67	29.46				17.00	-45.34	-500.82	
	GATE 2						4	4		2.67	18.46				17.00	-45.34	-313.82	
	GATE 3						4	4		2.67	6.96				17.00	-45.34	-118.32	
	GATE 4						3	3		2.67	8.54				17.00	-45.34	145.18	
	GATE 5						3	3		2.67	18.46				17.00	-45.39	313.82	
	GATE 6						3	3		2.67	29.46				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	1.79	0.15	3	3		6.17					19.41	-119.75		
TOTAL VERTICAL LOADS (CONC.,GATES AND EARTH LOADS):															***2173.24***	***199.30***	***-797.19***	

VERTICAL HYDRAULIC LOADS

WATER EL	ITEM	DIMENSIONS			AREA		MOMCODE			LEVER ARM								
		LENGTH	HT	WIDTH	HT x W OR PER SKTCH	w	QX	QY	QZ	LAX FOR MX	LAY FOR MY	LAZ	FX	FY	FZ L x A x w	MX FZ x LAX	MY FZ x LAY	MZ
32.33	IN SHAFT	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***	***696.58***		
20.43	IN SHAFT	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
TOTAL VERTICAL HYD. LOADS FOR STORM WATER LEVEL IN CANAL @ 20.43											800.01	116.01	
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
TOTAL VERTICAL HYD. LOADS FOR STORM WATER LEVEL IN CANAL @ 34.33											1115.49	804.17	
VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN USE:													
STOP LOGS IN PLACE @ ALL THREE PUMPS													
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
TOTAL VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE @ ALL THREE PUMPS											199.56	1038.67	0
STOP LOGS IN PLACE @PUMP "C" ONLY													
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
	UNDER S WALL	20.50	8.00	4.17	33.36	0.0625	4	4	5.42	1.46	42.74	-231.66	-62.40
24.25	IN SHAFT @ "E"	20.50	13.00	9.33	121.29	0.0625	1	1	1.34	23.96	155.4028125	208.2398	-3723.45
	UNDER N WALL	20.5	8.00	1.50	12.00	0.0625	1	1	6.75	23.96	15.375	103.7813	-368.385
	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
TOTAL VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE @ PUMP "C" ONLY											486.8323472	471.9207	-3995.08
STOP LOGS IN PLACE @ PUMP "E" ONLY													
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
	UNDER S WALL	20.50	8.00	4.17	33.36	0.0625	4	4	5.42	1.46	42.74	-231.66	-62.40
24.25	IN SHAFT @ "C"	20.50	13.00	9.33	121.29	0.0625	2	2	1.34	23.96	155.4028125	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	368.385
	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
TOTAL VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE @ PUMP "E" ONLY											486.8323472	471.9207	3371.597
STOP LOGS IN PLACE @ PUMP "D" ONLY													
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	9.33	121.29	0.0625	1	1	1.34	23.96	155.40	208.24	-3723.45

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	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	
24.25	IN SHAFT @ "C"	20.50	13.00	9.33	121.29	0.0625	2	2		1.34	23.96				155.4028125	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	368.385	
	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	
TOTAL VERTICAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE @ PUMP "D' ONLY															***486.8323472***	***471.9207***	***-87.2959***	

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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	TRPS		403.34	6.55	2	2640.90
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.5	w x HT2 x.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											***110.74***			***1319.66***
AT EAST WALL														
TOP OF BACKFILL EL	ITEM	EL OF BOT OF FDN	TOP OF BACKFILL	GW ELEV	HT OF BACKFILL HT	UNIT WT x Ka (w x 0.5)	LENGTH L	SHAPE OF PRES DIAG	w x HT x Ka F	FX .5 x F x HT x L	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									***-51.43***		***517.87***		

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HORIZONTAL HYDRAULIC LOADS WHEN STOP LOGS IN USE:

WATER EL		WATER EL	BOT OF FDN SLAB	TOP OF GATE OPNG	HT OF WATER HT	UNIT WT w	w x HT	LENGTH L	SHAPE	FY	LEVER ARM FOR MX	LEVER ARM FOR MZ	MOMENT CODE FOR MZ	MX	MZ
STOP LOGS @ ALL THREE PUMPS "C" "D" & "E"															
24.25	WATER LEVEL IN CANAL	24.25	8.25	19.25	16	0.0625	1	72.42	TRFS	-579.36	5.333333			-3089.92	
STOP LOGS AT PUMP "C" ONLY															
24.25	WATER LEVEL ON F/S OF STOP LOGS @ PUMP "C" DISCHARGE	24.25	8.25	19.25	16	0.0625	1	20.5	TRFS	-164	5.333333	23.96	2FS	-874.667	3929.44
24.25	WATER ABOVE GATE OPN'GS @ PUMPS "D" AND "E"	24.25	8.25	19.25	5	0.0625	0.3125	49.92	TRFS	-39	12.66667	11.25	1FS	-494	-438.75
TOTAL HORIZONTAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE AT PUMP "C" ONLY										***-203***				***-1368.67***	***3490.69***
STOP LOGS AT PUMP "D" ONLY															
24.25	WATER LEVEL ON F/S OF STOP LOGS @ PUMP "D" DISCHARGE	24.25	8.25	19.25	16	0.0625	1	20.5	TRFS	-164	5.333333	1.46	1FS	-874.667	-874.667
24.25	WATER ABOVE GATE OPN'GS @ PUMP "E"	24.25	8.25	19.25	5	0.0625	0.3125	24.5	TRFS	-19.1406	12.66667	23.96	1FS	-242.448	-458.609
24.25	WATER ABOVE GATE OPN'G @ PUMP "C"	24.25	8.25	19.25	5	0.0625	0.3125	26.42	TRFS	-20.6406	12.66667	23	2FS	-261.448	474.7344
TOTAL HORIZONTAL HYDRAULIC LOADS WHEN STOP LOGS IN PLACE AT PUMP "D" ONLY										***-203.781***				***-1378.56***	***-858.542***

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***				***-829.435***	
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												***-1393.63***				***-603.123***	
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***				***311.1797***	
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***				***-622.076***	
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***				***-452.342***	
WL IN CANAL @ 24.25 AND GW LEVEL @ 27.00 PERVIOUS CUT-OFF																	

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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	
TOTAL UPLIFT LOADS FOR WL IN CANAL @ 24.25 ,GW @ 27.00 AND PERVIOUS CUT-OFF												***-1179.65***				***233.3848***	

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HORIZONTAL WIND LOADS:										
STROM WIND LOADS										
							FY			MX
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
OPERATING WIND LOADS:										
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

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LOAD COMBINATIONS

CASE I: ***CONSTRUCTION CASE,OP. WIND.***
NO WATER OR EARTH LOADS

ITEM	FX	FY	FZ	MX	MY	MZ
DEAD LOADS			2027.74	1097.06	-797.19	
OP. WIND FROM F/S		-18.83		-301.27		
TOTAL CASE I:		***-18.83***	***2027.74***	***795.79***	***-797.19***	

CASE II; ***WL IN CANAL @ 32.33, GATES CLOSED, WL IN DISCH TUBE @ 27.04***
STORM WIND,BACKFILL IN PLACE, IMPERVIOUS CUT-OFF

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		
TOTAL CASE II:	***-51.43***	***-816.00***	***1814.51***	***-6752.62***	***-279.32***	

CASE III; ***WL IN CANAL @ 32.33, GATES CLOSED, WL IN DISCH TUBE @ 27.04***
STORM WIND,BACKFILL IN PLACE, PERVIOUS CUT-OFF

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	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		
	TOTAL CASE III:	***-51.43***	***-816.00***	***1754.19***	***-6601.84***	***-279.32***	
CASE IV;	***WL IN CANAL @ 34.33, GATES CLOSED,WL IN DISCH TUBE @ 27.04***						
	STORM WIND,BACKFILL IN PLACE, IMPERVIOUS CUT-OFF						
	ITEM	FX	FY	FZ	MX	MY	MZ
	DEAD LOADS			2173.24	199.30	-797.19	
	WT OF WATER			1115.49	804.17		
	UPLIFT			-1438.89	-829.44		
	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		
	TOTAL CASE IV:	***-51.43***	***-1035.80***	***1849.84***	***-9538.26***	***-279.32***	
CASE V;	***WL IN CANAL @ 34.33, GATES CLOSED, WL IN DISCH TUBE @ 27.04***						
	STORM WIND,BACKFILL IN PLACE, PERVIOUS CUT-OFF						
	ITEM	FX	FY	FZ	MX	MY	MZ
	DEAD LOADS			2173.24	199.30	-797.19	

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	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			
	TOTAL CASE V:	***-51.43***	***-1035.80***	***1766.89***	***-9330.90***	***-279.32***		
CASE VI;	***STOP LOG IN PLACE @ ALL THREE PUMPS ,ALL GATES CLOSED, 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			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			
	TOTAL CASE VI:	***-51.43***	***-478.03***	***1162.03***	***-432.94***	***-279.32***		
CASE VII;	***STOP LOG IN PLACE @ ALL THREE PUMPS ,ALL GATES CLOSED,WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25***							
	OP WIND,BACKFILL IN PLACE, PERVIOUS CUT-OFF							
	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		
	TOTAL CASE VII:	***-51.43***	***-478.03***	***1193.15***	***-510.73***	***-279.32***	
CASE VIII	***STOP LOG IN PLACE @ PUMP "C" ONLY ,GATES @ PUMP "C" CLOSED, 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			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		
	TOTAL CASE VIII:	***-51.43***	***-101.67***	***1449.30***	***721.56***	***-4274.39***	***3490.69***
CASE IX	***STOP LOG IN PLACE @ PUMP "C" ONLY,GATES @ PUMP "C" CLOSED, WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25***						
	OP WIND,BACKFILL IN PLACE,PERVIOUS CUT-OFF						
	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	

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	OP. WIND		-9.41	0.00	-211.83					
	TOTAL CASE IX:	***-51.43***	***-101.67***	***1480.42***	***643.77***	***-4274.39***	***3490.69***			
CASE X	***STOP LOG IN PLACE @ PUMP "D" ONLY ,GATES @ PUMP "D" CLOSED, 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			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									
	LATERAL EARTH	-51.43	110.74	0.00	1319.66	517.87				
	OP. WIND		-9.41	0.00	-211.83					
	TOTAL CASE X:	***-51.43***	***-102.46***	***1449.30***	***711.67***	***-366.61***	***-858.54***			
CASE XI	***STOP LOG IN PLACE @ PUMP "D" ONLY,GATES @ PUMP "D" CLOSED, WL IN CANAL @ 24.25, WL IN DISCH TUBE @ 11.25***									
	OP WIND,BACKFILL IN PLACE,PERVIOUS CUT-OFF									
	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									
	LATERAL EARTH	-51.43	110.74	0.00	1319.66	517.87	-858.54			
	OP. WIND		-9.41	0.00	-211.83					
	TOTAL CASE XI:	***-51.43***	***-102.46***	***1480.42***	***633.87***	***-366.61***	***-858.54***			

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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

TOTAL CASE XI:	-51.4289	-102.455	1480.421	633.873	-366.613	-858.542

G2-22

SLUSCDER.INP

```
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
```

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********************************
* CORPS PROGRAM  #  X0080      *   CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 86/09/02-C  *   RUN DATE 08-25-95    RUN TIME 11:02:51
********************************
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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 KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.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 K/IN**2	LENGTH	L FT	LU 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	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

						3139.00	

****

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

****

ORIGINAL PILE 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.

****

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

****

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	

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
21	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
22	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
2	-.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

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

'AD CASE - 10

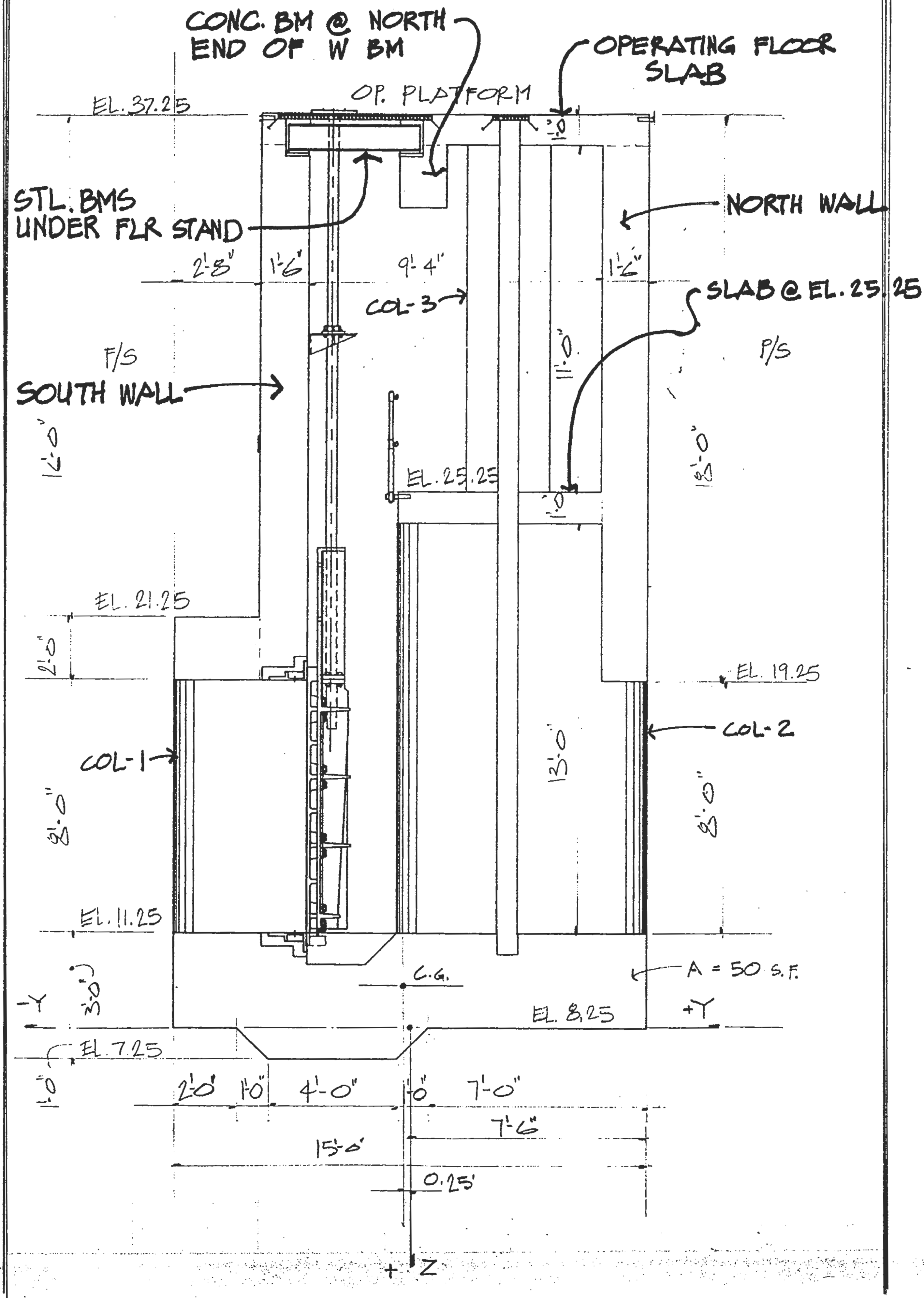
PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K

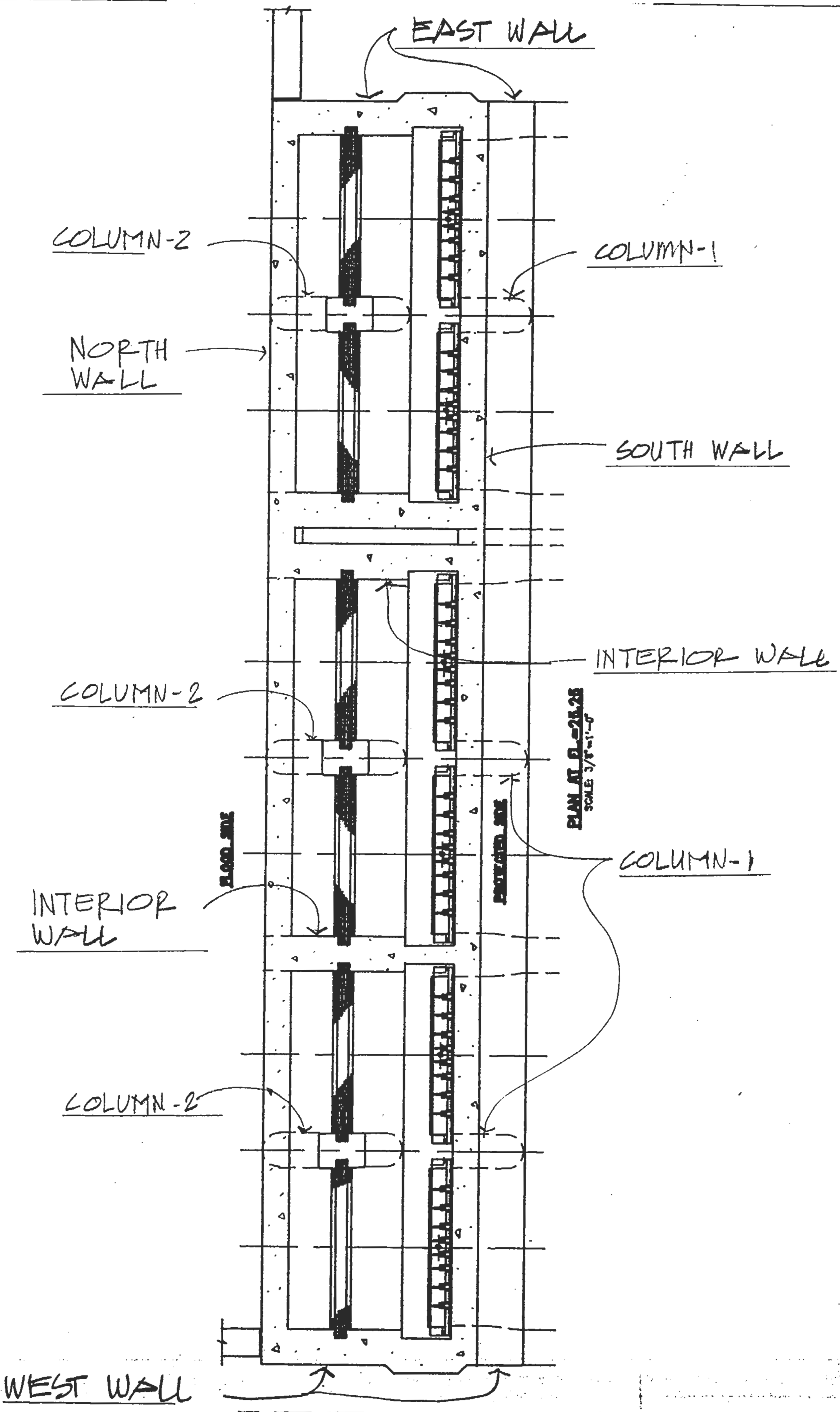
1	-1.1	.1	36.9	.0	.0	.0
2	-1.1	.1	37.5	.0	.0	.0
3	-1.1	.2	38.2	.0	.0	.0
4	-1.1	.2	39.0	.0	.0	.0
5	-1.1	.2	39.7	.0	.0	.0
6	-1.1	.3	40.5	.0	.0	.0
7	-1.1	.3	41.2	.0	.0	.0
8	-1.1	.3	41.8	.0	.0	.0
9	-1.1	.4	42.5	.0	.0	.0
10	-1.1	.4	43.3	.0	.0	.0
11	-1.1	.4	44.0	.0	.0	.0
12	-1.1	.5	44.8	.0	.0	.0
13	-1.1	.5	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


CONC. BM @ NORTH END OF W BM
OPERATING FLOOR SLAB
OP. PLATFORM
EL. 37.25
STL. BMS UNDER FLR STAND
NORTH WALL
2'-8"
1'-6"
9'-4"
1'-6"
COL-3
SLAB @ EL. 25.25
F/S
P/S
SOUTH WALL
12'-0"
12'-0"
EL. 25.25
EL. 21.25
2'-0"
EL. 19.25
COL-2
COL-1
13'-0"
8'-0"
8'-0"
EL. 11.25
C.G.
A = 50 S.F.
-Y
+Y
3'-0"
EL. 8.25
EL. 7.25
1'-0"
2'-0"
1'-0"
4'-0"
1'-0"
7'-0"
7'-6"
15'-0"
0.25'
+Z

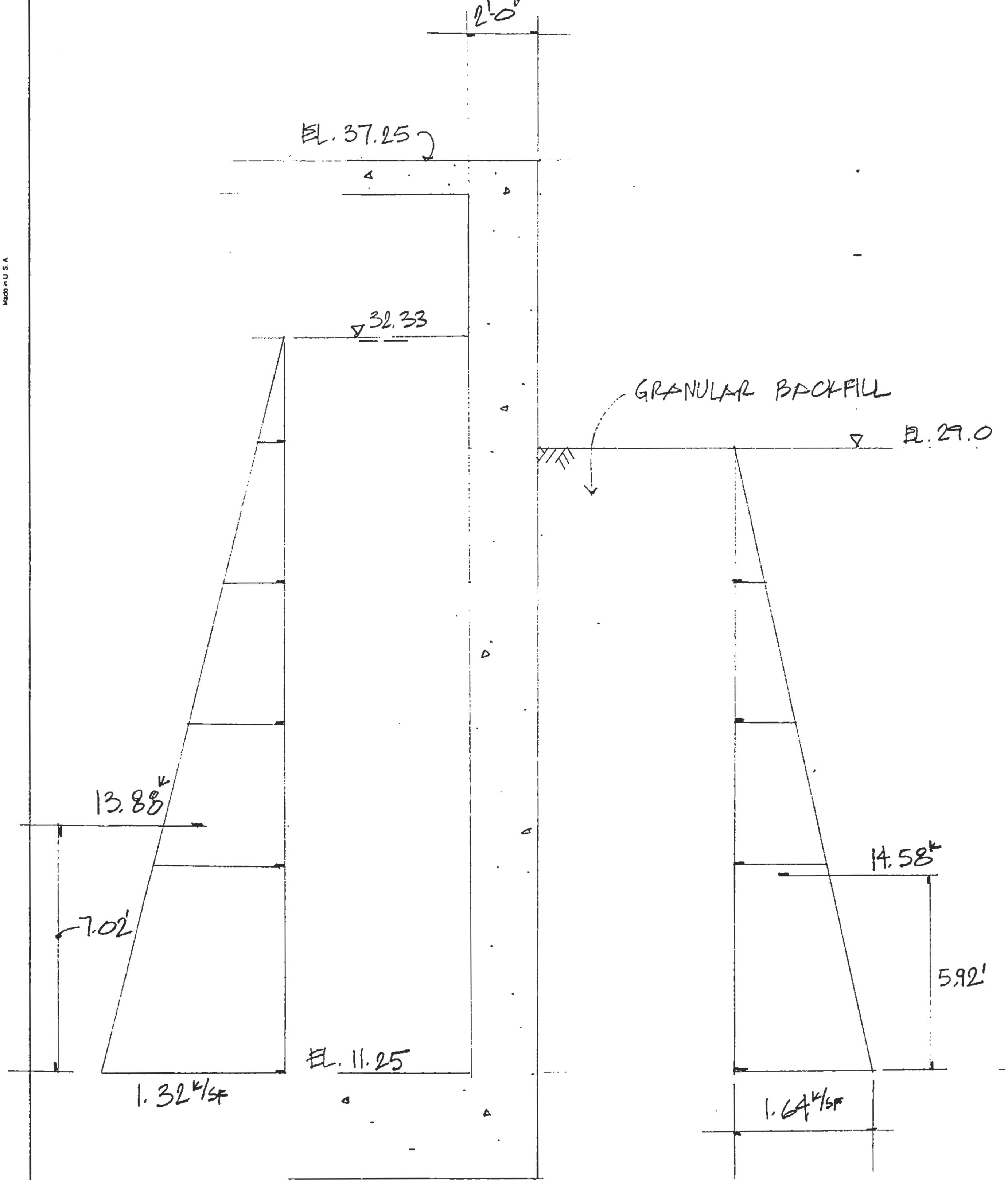


EAST WALL
COLUMN-2
COLUMN-1
NORTH WALL
SOUTH WALL
INTERIOR WALL
COLUMN-2
FLOOD SIDE
PROTECTED SIDE
PLAN AT EL.=25.25
SCALE: 3/8"=1'-0"
COLUMN-1
INTERIOR WALL
COLUMN-2
WEST WALL

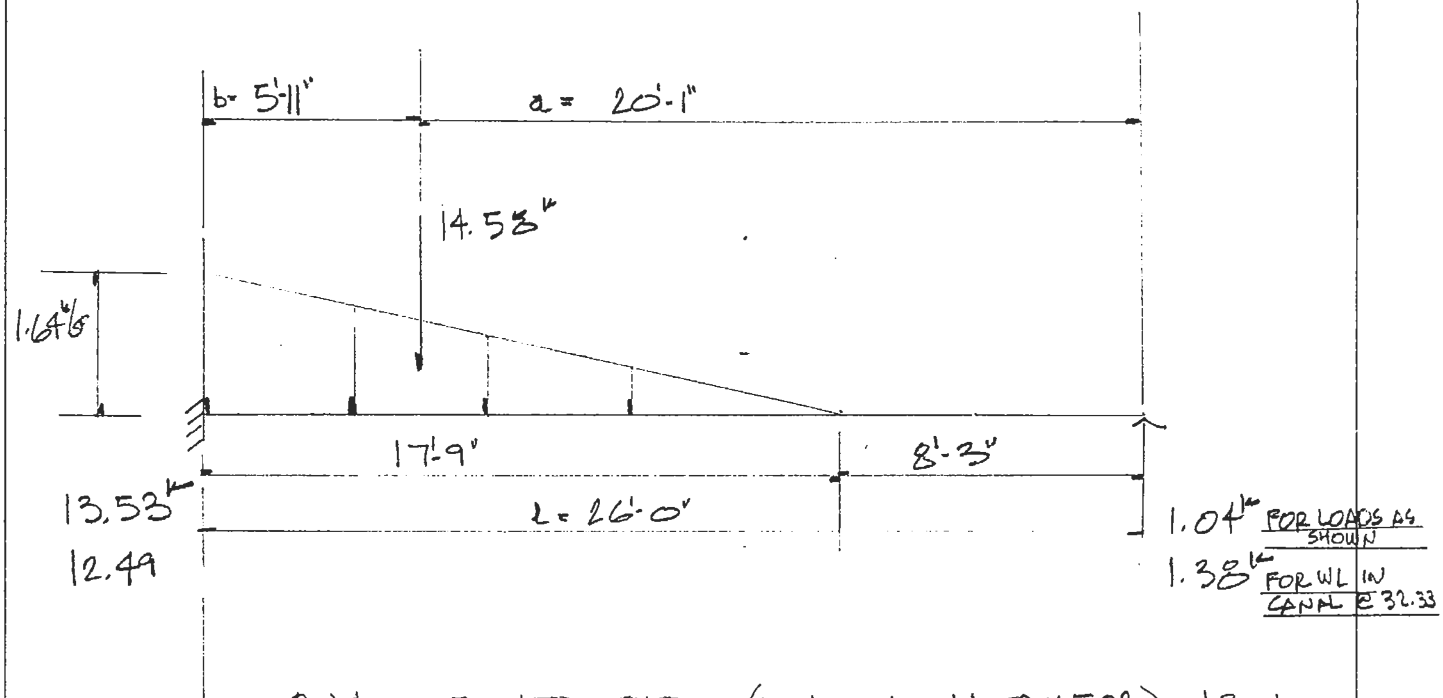
WEST WALL DESIGN

ASSUME
1. 24" TH'K WALL
2. $F'_c = 4000$
3. $F_y = 60{,}000$
4. WALL AS PROPPED CANTILEVER IN VERTICAL DIRECTION, FIXED @ BASE SLAB
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. $\gamma_{sat} = 122^{\#/sf}$, $\gamma_{sub} = 60^{\#/sf}$ 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


2'-0"
EL. 37.25
32.33
GRANULAR BACKFILL
EL. 29.0
13.88 k
7.02'
14.58 k
5.92'
EL. 11.25
1.32 k/SF
1.64 k/SF

WEST WALL (VERT REINF. LAND SIDE FACE)



BM @ FIXED END $= (1.04 \times 26 - 14.58 \times 5.92) \times 1.3 \times 1.7$

$= 59.3'^{k} \times 1.3 \times 1.7 = 131'^{k}$

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

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

$\phi V_c = 0.85 \times 2 \times 63 \times 12 \times 19.5 = 24.5^k$

$V_u @ d = \left(13.53 - \frac{19.5}{12} \times 1.58\right) \times 1.3 \times 1.7 = 24.2^k < 24.5^k$ ∴ o.k.

FROM ACI TABLES

FOR $b = 12"$ $d = 19.5"$ $F = 0.38$

∴ $K_u = \frac{131}{0.38} = 344.$

FOR $f'_c = 4000$, $F_y = 60{,}000$ & $K_u = 344$

$\rho = 0.0068$

∴ A_s(req'd) ON LAND SIDE FACE $= 0.0068 \times 12 \times 19.5 = 1.59^{\square''}/ft$

TRY # 8 BARS @ 6" O.C. $= 1.58" \doteq A_s(req'd) = 1.59^{\square''}$

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

WEST WALL (VERT. REINF, CANAL SIDE FACE)
(WATER IN CANAL @ 32.33, BACKFILL IN PLACE)

BM @ FIXED END (DUE TO WL @ 32.33 ONLY)

$= 1.38 \times 26 - 13.88 \times 7.02 = 62'^k$

$\therefore$ NET BM @ FIXED END $= 62'^k - 59'^k = 3'^k$

$\therefore$ USE MIN REINF FOR TEMP $= 0.0028 \times 12 \times 24 = 0.80^{\square''}/FT.$

USE #8 BARS @ 12" O.C (VERT) CANAL SIDE FACE.
SHEAR O.K. BY OBS.

HORIZ. DIRECTION

1'-0" WIDE HORIZ. STRIP @ EL. 25.25.

ASSUME WALL ENDS FIXED @ NORTH & SO. WALL

$\therefore$ MAX BM $= \left(\dfrac{0.66^* \times 14^2}{12}\right) \times 1.3 \times 1.7 = 24'^k$ (*SEE PRESSURE DIAG. FOR SO. WALL.)

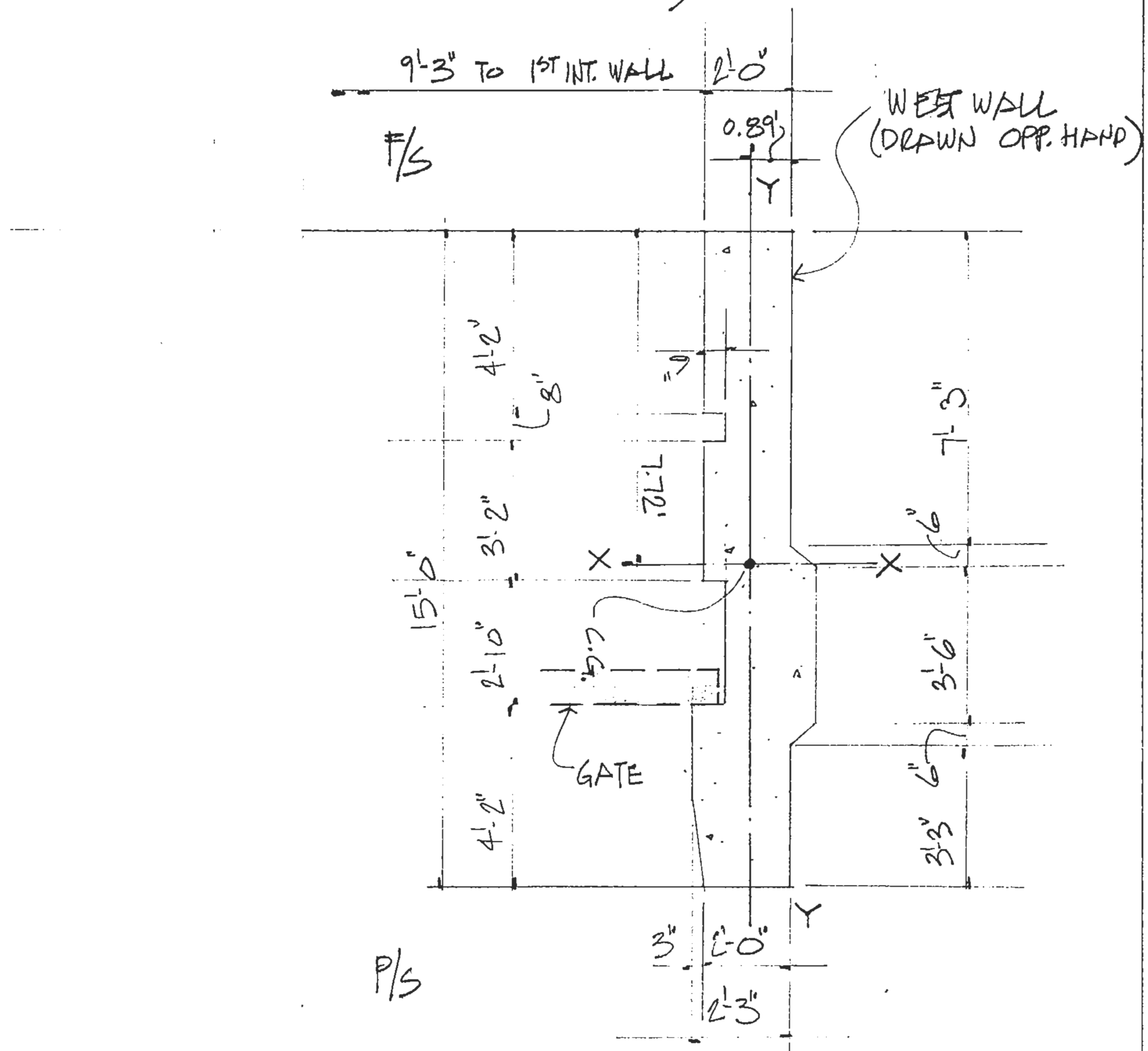
$d = 24 - 4 - 1 - 3/8 = 18.63$ ASSUMIN #6 BARS
$F = 70$, $K_u =$ $\rho = 0.0013 <$ MIN.

$\therefore$ USE $A_{S(MIN)}$ IN HORIZ. DIRECTION

$A_{S(MIN)} = .0028 \times 12 \times 24 = 0.81^{\square''}/FT$

$\therefore$ #6 BARS @ 12" O.C. E.F. $\therefore A_{S(PROVIDED)} = 0.88^{\square''} > 0.81^{\square''} \therefore$ O.K.

WEST WALL (BENDING @ X-X AXIS)



PLAN

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

$$M_x = \big(1312(8.03-3.0) - 403(6.55-3.0) - 74.82(11.92-3.0) - 35.92(11.92-3.0)$$
$$- 277(6.75+7.72-7.5) + 277(4.08-7.72+7.5) - 67(2.75+7.72-7.5)$$
$$+ (126+19)(6.17-7.72+7.5) + 58(6.17-7.72+7.5) + (17\times6)(2.67-7.72+7.5)$$
$$-74(3.88+7.72-7.5) + 31(0.25+7.72-7.5)\big)\times 7'/72.42'$$

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

$$\therefore\ M_{ux} = 1.3\times1.7\times410.8 = 908'^k$$

P (AXIAL LOAD)

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

$$\therefore\ P_u = 1.3\times1.7\times201 = 444^k$$

DESIGN AS COL

$b = 24''$ $d = 180-5 = 175''$ $L = 26\times12 = 312''$ $r = 0.57735\times180 = 104$

$K = 2.0$ $\therefore\ KL_u/r < 22.$ SLENDERNESS NEGLECTED.

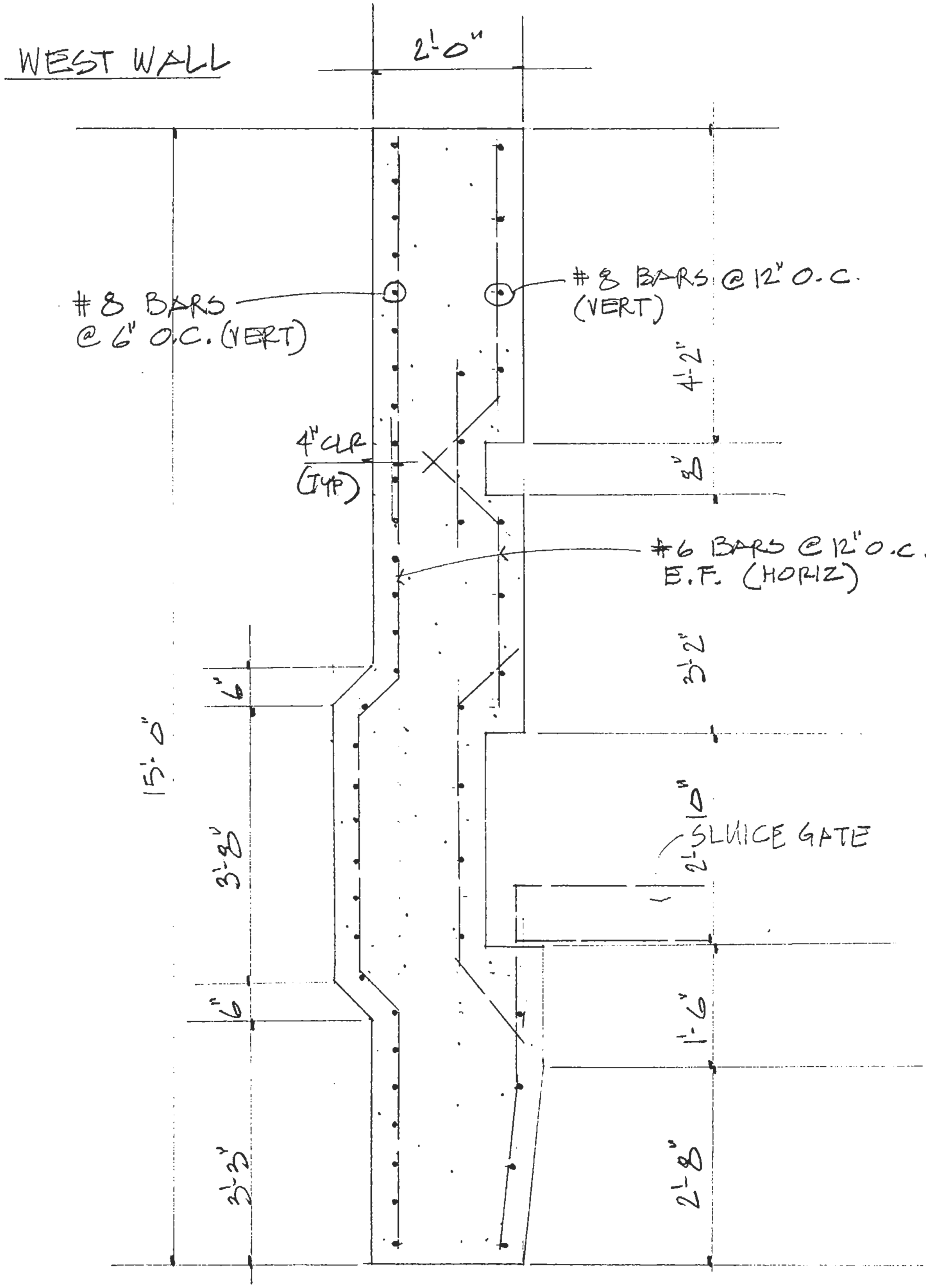
DESIGN AS SHORT COL FOR $P_u = 444^k$ $M_{ux} = 908'^k$

A REVIEW OF LOAD-MOM STRENGTH INTERACTION DIAGRAM (ACI HAND BK, COL 7.18.3) INDICATES $\rho_g <<< 0.01$.

$\therefore$ USE $\rho_g = 0.01$

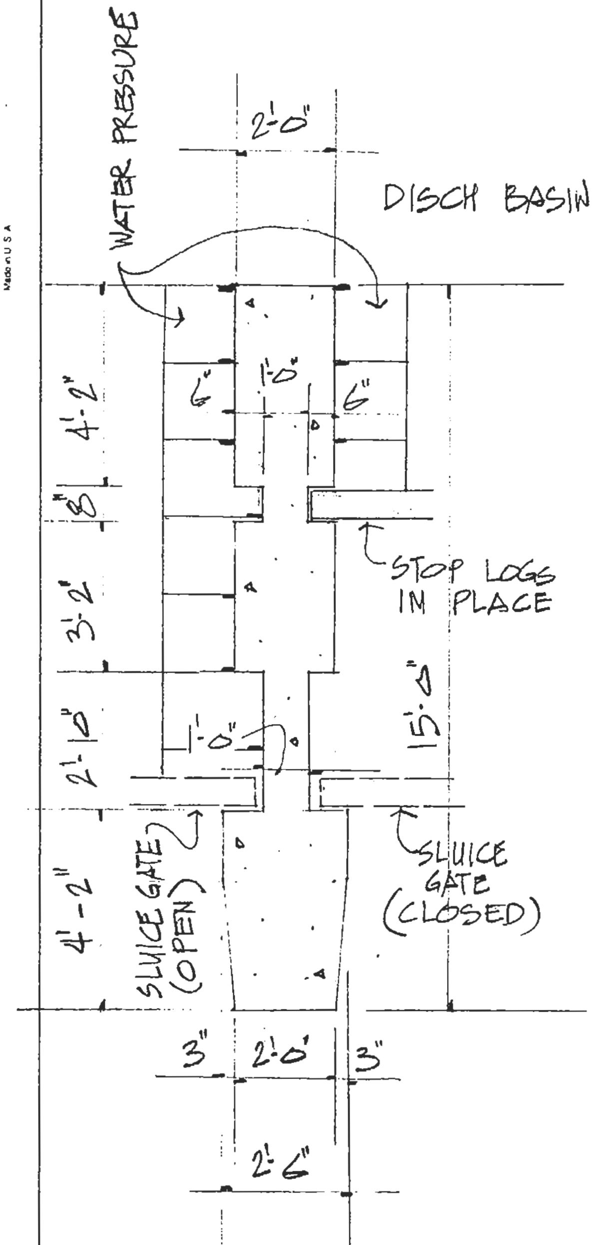
$\therefore\ A_s = \frac{1}{2}^* \times 0.01\times180\times24 = 21.6^{\square''}$ TOTAL A_s(provided) $\doteq 45\times0.79 = 36^{\square''}$ $\therefore$ O.K.

* ACI 10.8.4



WEST WALL - REINFORCING
(EAST WALL SIMILAR)

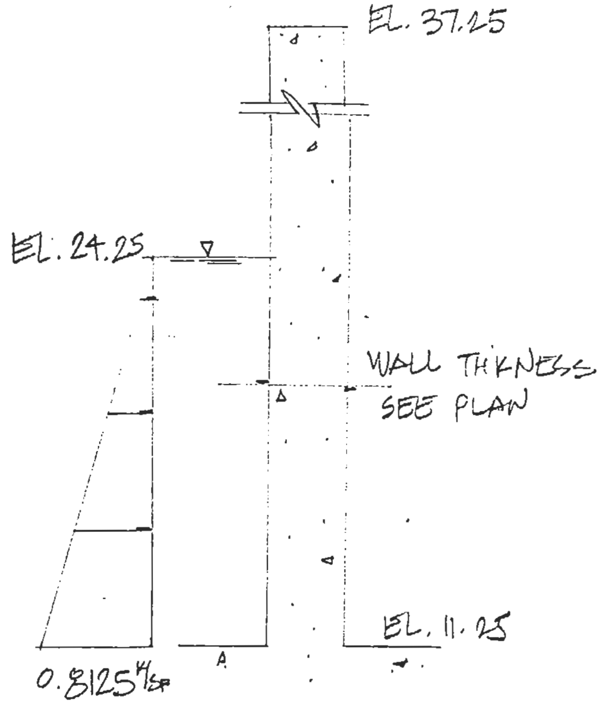
INTERIOR WALL



PLAN

LOADING CONDITION.

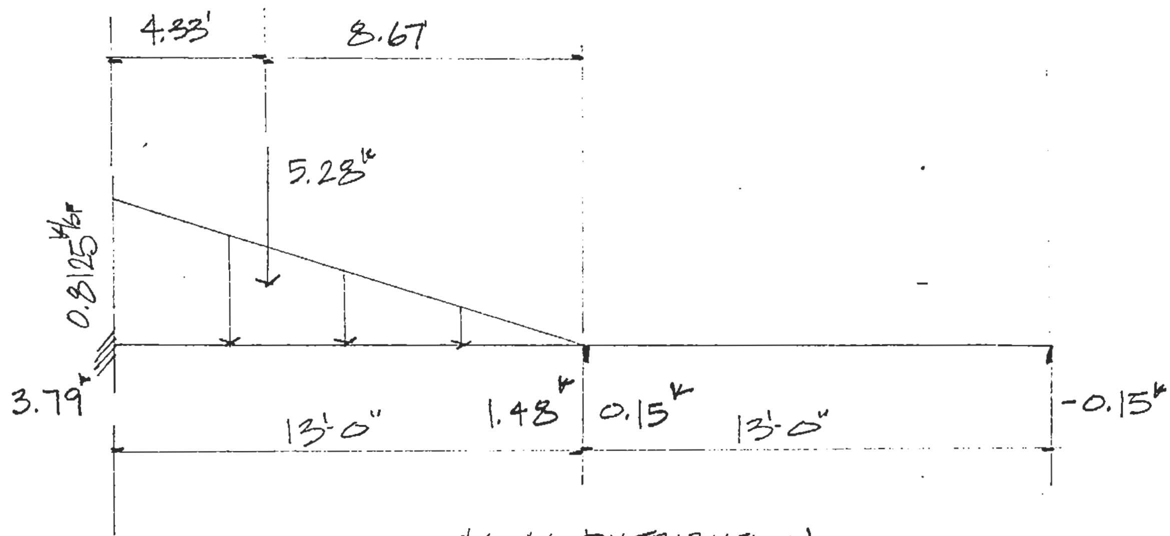
1. STOP LOGS IN PLACE
2. GATES CLOSED
3. WL IN CANAL @ 24.25



SECTION

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	D.F.
FEM	-6.86	4.57	0	0	
	0	-2.29	2.29		1 DIST
	1.14	-	-	-1.14	CO
	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.

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

ASSUMING #7 BARS TH'KNESS REQ'D = 5.54 + 2 + 7/16 = 8" < 12" (MIN)
∴ O.K.

$\phi V_c = 0.85 \times 2 \times 63 \times 12 \times (12 - 2.4375) = 12.3^k > (3.79 \times 1.3 \times 1.7 = 8.4^k)$ ∴ o.k

INTERIOR WALL   M @ FIXED END = $12.33'^{k}$

VERTICAL REINF :

FOR $b = 12"$, $d = 9.5"$ $F = 0.09$
$\therefore K_u = 137$.

$\therefore \rho = 0.0027$
$A_{s(req'd)} = 0.0027 \times 12 \times 9.5 = 0.31^{\square''}/FT.$ @ 12" TH'K SECTION

MIN $A_{s(req'd)}$ @ 24" TH'K SECTION
$= 0.0028 \times 12 \times 24 = 0.81^{\square''}/FT.$

HORIZ. REINF

SINCE THERE IS NO SUBSTANTIAL BENDING IN HORIZ DIRECTION,

USE MIN A_s IN HORIZ. DIRECTION.

$A_{s(MIN)} = 0.81^{\square''}/FT.$

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:

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

GROSS AREA $A_g = 27.87 \times 144 = 4013^{\square''}$ $h = 130''$

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

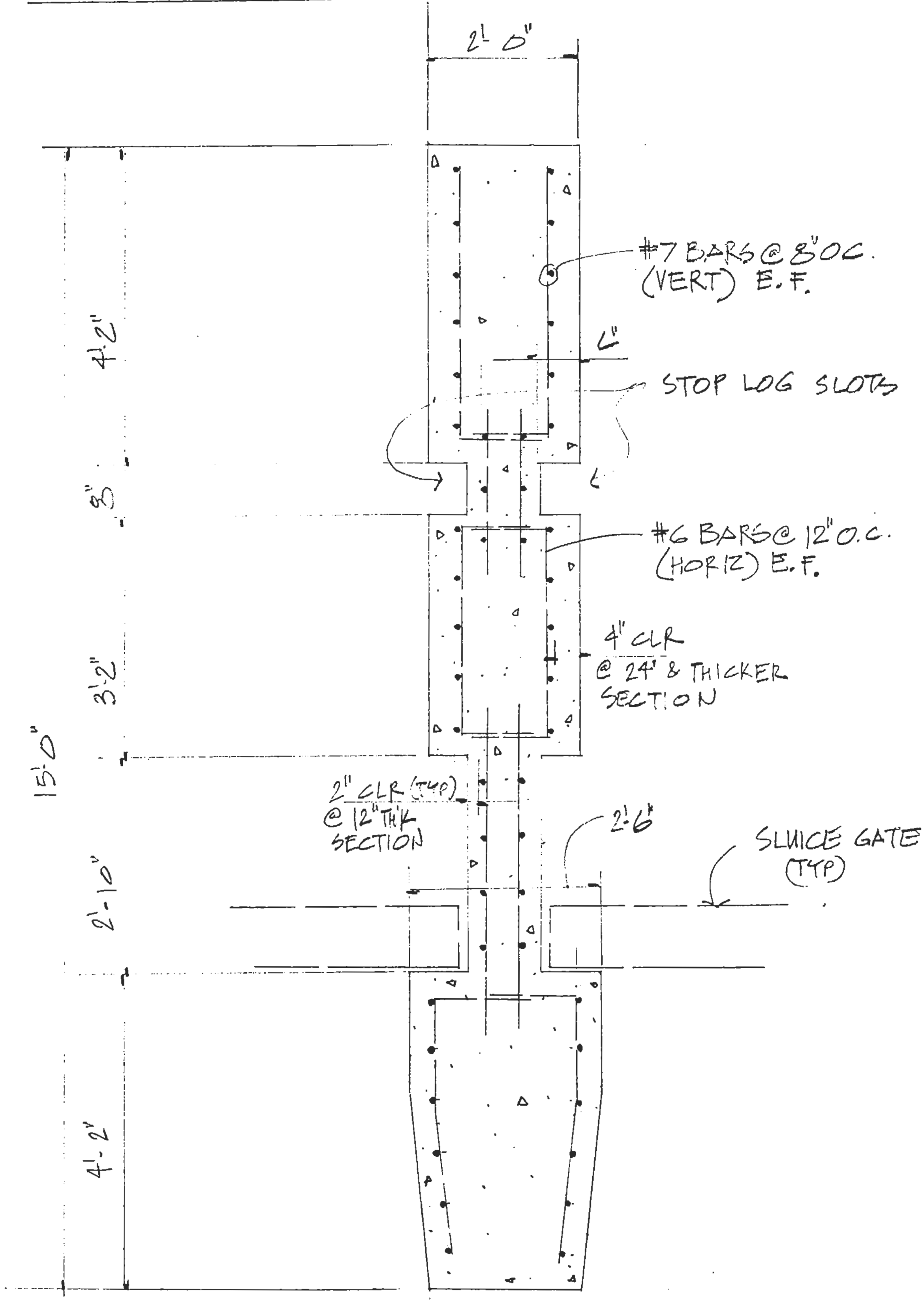
∴ A REVIEW OF LOAD-MOM STRENGTH INTERACTION DIAG 7.18.3 ACI DESIGN HANDBOOK, VOL 2 INDICATES $\rho_g <<< 0.1$.

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

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

∴ USE #7 BARS @ 8" O.C. VERT E.F.

INTERIOR WALL



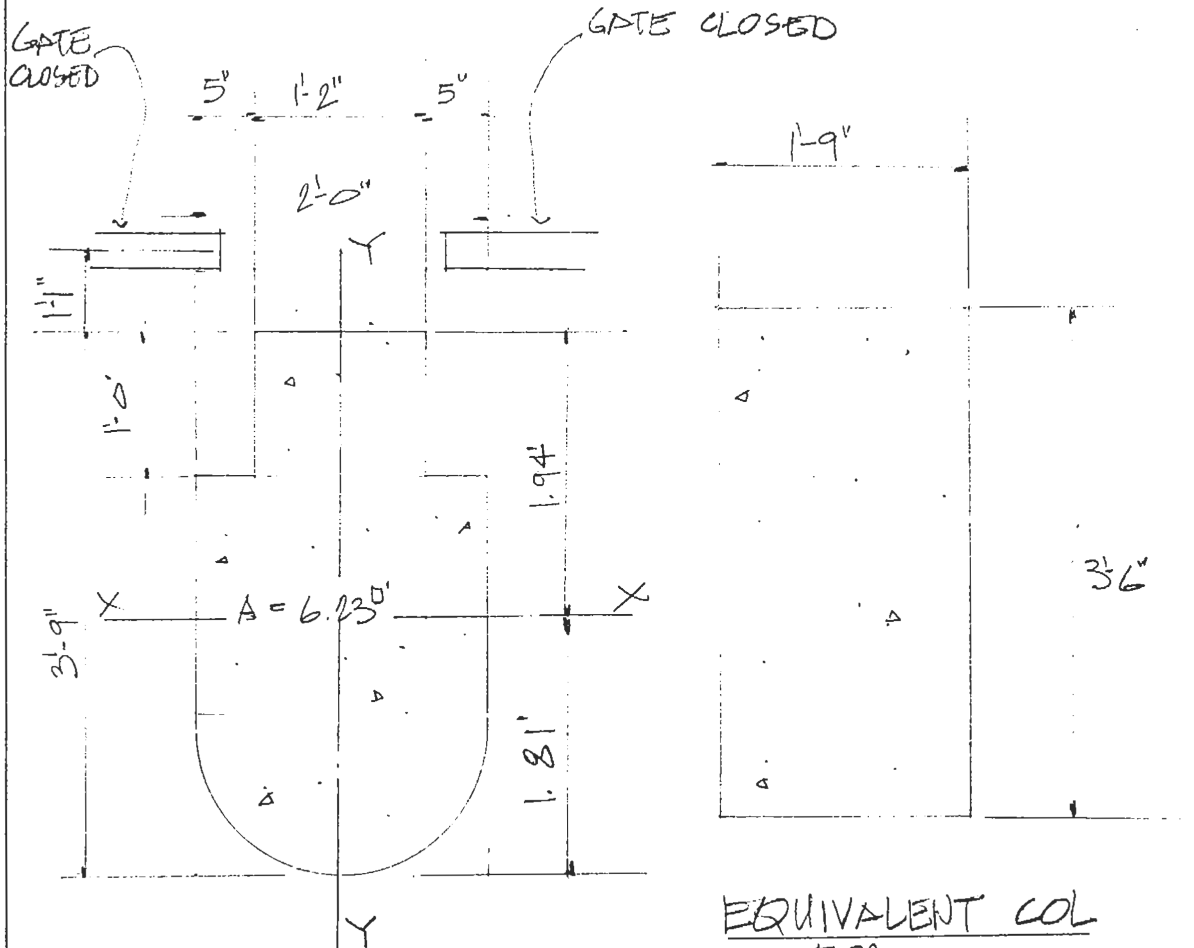
INT. WALL REINFORCING

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.



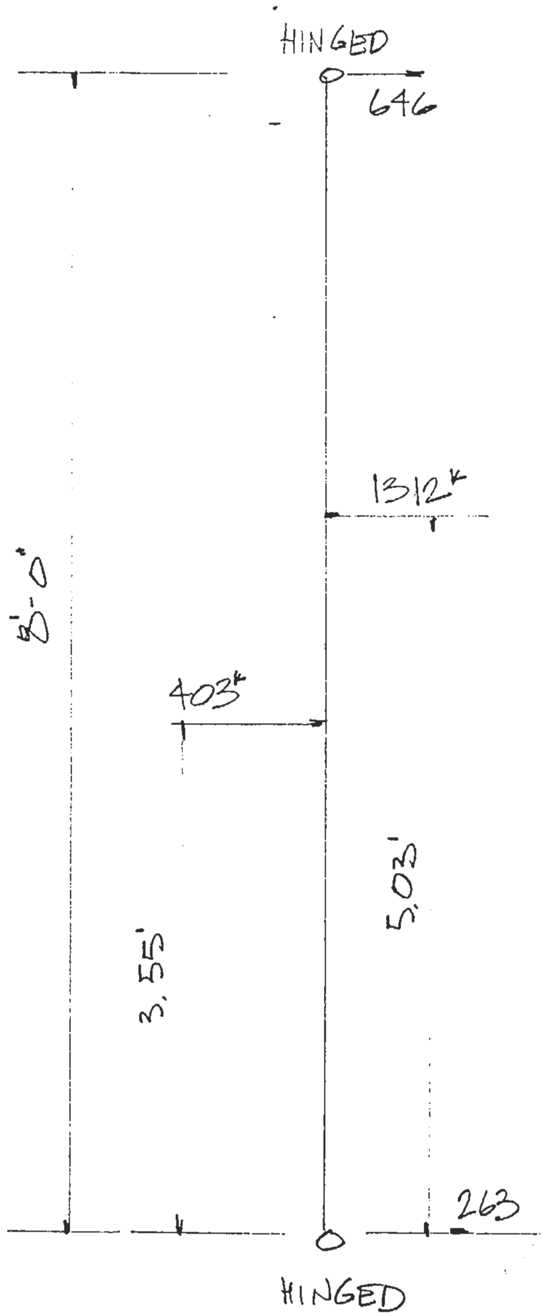
ACTUAL COL.

EQUIVALENT COL FOR DESIGN

(NOTE: OUT-OF PLANE LOADING NOT CRITICAL)

COLUMN-1 (REFER TO PLATE 23 FOR HORIZ. LOAD)

M_x DUE TO HORIZ. LOAD.



MAX BM = 1919'k

$\therefore M_x$ DUE TO HORIZ. LOAD

$= (1919/72.42) \times 11$

$= -292'^{k}$

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

AXIAL LOAD

			P
1. SELF WT	=	28.5/3	= 9.50^k
2. GATES	=	$102^k/6$	= 17.00^k
3. WALL	=	$(277^k/72.42)\times 11$	= 42.00^k
4. SLAB	=	$(58/72.42)\times 11$	= 9.00^k
5. SOIL BACKFILL	=	$(145/72.42)\times 11$	= 22.00^k
		TL	= 99.50^k

BENDING MOM @ X-X AXIS DUE TO VERT LOADS

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

$= 104'^k$

∴ DESIGN LOADS ARE

$P_u = 99.5\times1.3\times1.7 = 220^k$

$M_{ux} = (-292+104)\times1.3\times1.7 = 415'^k$

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

EQUIVALENT COL. DIMENSIONS: b = 21" h = 42" $A_g = 882^{\square''}$

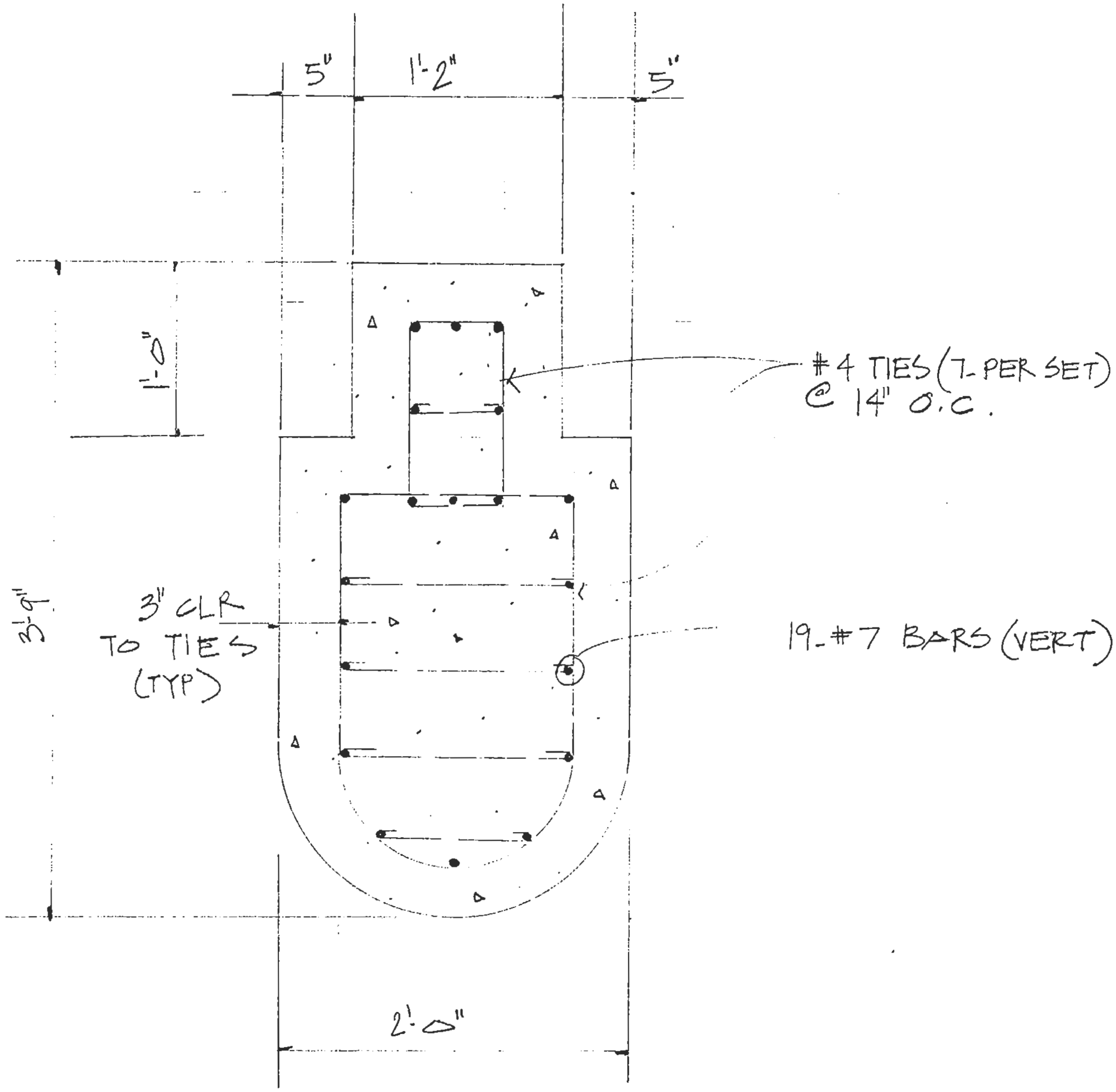
$\frac{P_u}{A_g} = 0.25 \quad \frac{M_u}{A_g h} = 0.13.$

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

∴ USE MIN $A_s = 0.01\times882 = 8.82^{\square''}$

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

∴ USE 19-#7 BARS (VERT) $A_s = 11.40^{\square''} > 8.82^{\square''}$



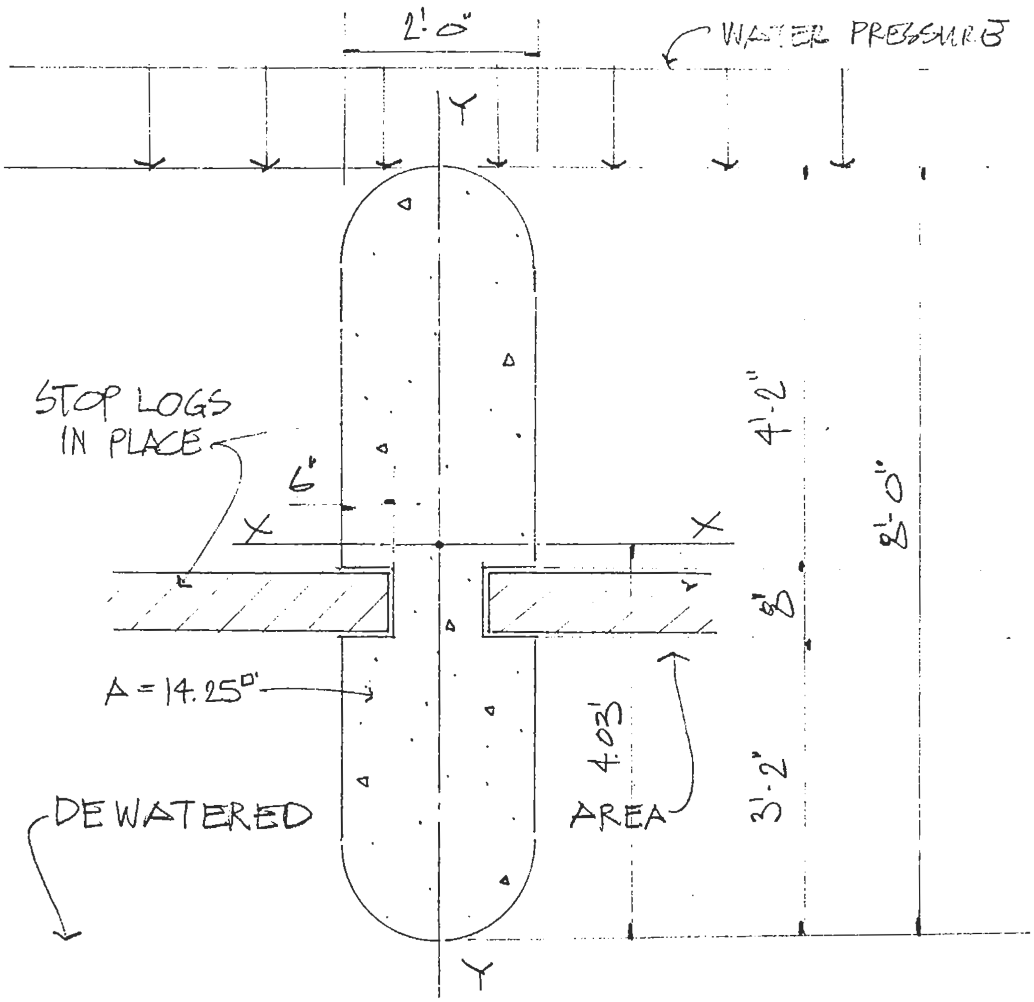
COLUMN - 1

REINFORCING

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

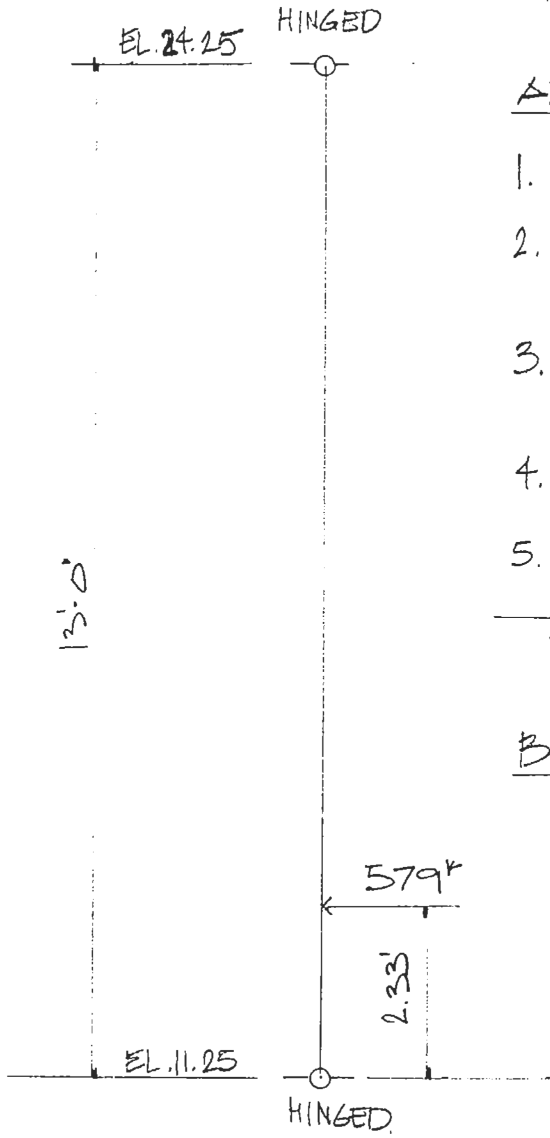
LOADING CONDITION

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

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. $(56^k/3)$ = 18.67^k
2. NORTH WALL $\left(\frac{277}{72.42} \times 11.5\right)$ = 44.00^k
3. SLAB @ EL. 25.25 $\left(\frac{67}{72.42} \times 11.5\right)$ = 11.00^k
4. SLAB @ EL. 37.25 $\left(\frac{74}{72.42} \times 11.5\right)$ = 12.00^k
5. BM @ EL. 37.25 $\left(\frac{31}{72.42} \times 11.5\right)$ = 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

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

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

COLUMN - 2

$P_u = 201^k$ $M_{ux} = 632'^k$

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

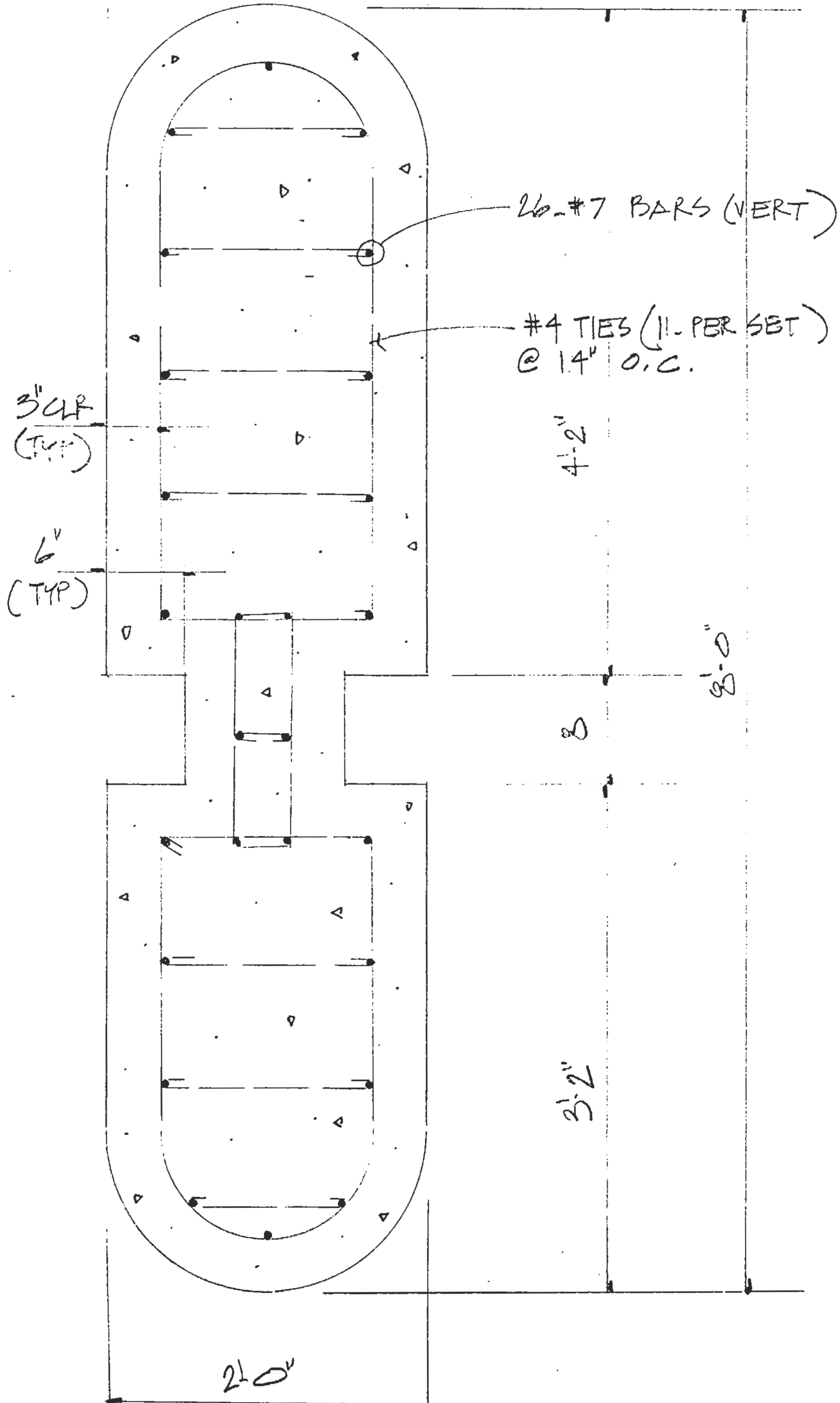
$\therefore P_u / A_g = 0.097$ $\frac{M_u}{A_g h} = 0.04$.

COL IS VERY LARGE FOR APPLIED LOAD.

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

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

COLUMN - 2

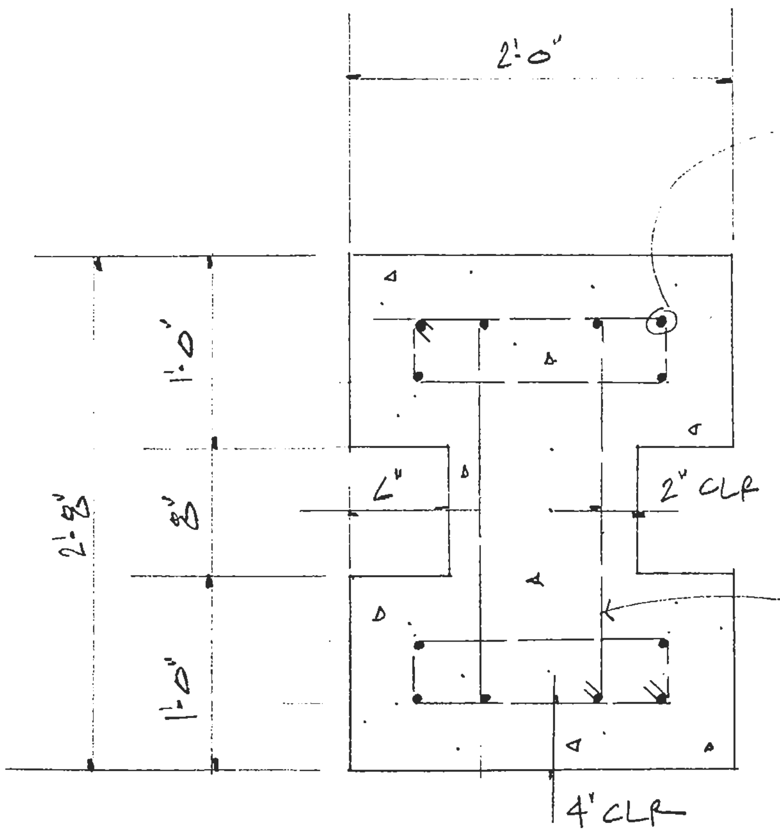


COL-2 : REINFORCING

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 FLR. & SELF WT.
3. MIN REINF WILL BE ADEQUATE TO SAFELY CARRY LOADS IMPOSED.



$A_g = 672\square''$

$\therefore A_s = 0.01 \times 672$
$= 6.72\square''$

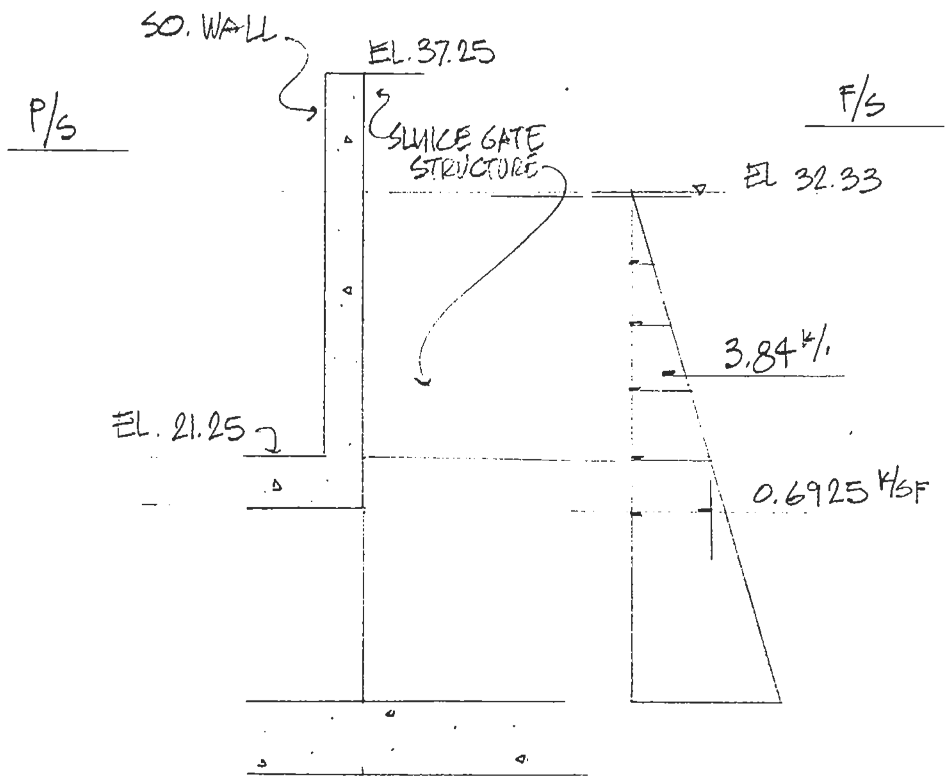
USE 12-#7 AS SHOWN

A_s(provided) $= 7.20\square'' > 6.72\square''$

SOUTH WALL DESIGN

ASSUME

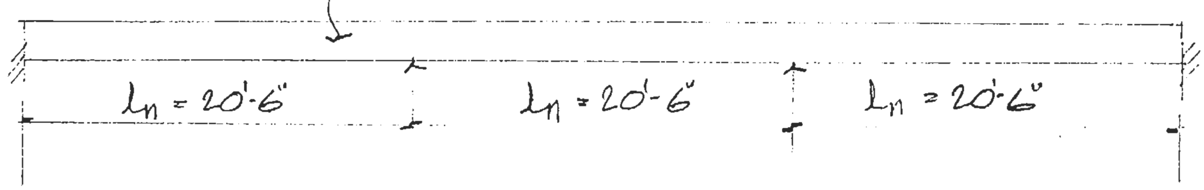
1. 18" TH'K WALL
2. $F'_c = 4000$ PSI
3. $F_y = 60{,}000$ PSI
4. WALL FIXED @ EAST & WEST WALL & CONTINUOUS @ INTERIOR WALLS
5. IN VERTICAL DIRECTION, WALL FIXED @ EL. 21.25, FREE @ TOP.



SO. WALL DESIGN

DESIGN MOST HEAVILY LOADED 1'-0" HORIZ. STRIP IN HORIZONTAL DIRECTION (ASSUME BACKFILL NOT IN PLACE ON P/S)

$0.66^{k/sf} \times 1.3 \times 1.7 = 1.46^{k/sf} = w_u$



USE ACI CO-EFF FOR BENDING & SHEAR

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

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

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

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

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

d provided $= 18" - 3" - 7/16"$ (ASSUMING #7 BARS) $= \underline{14.56" > 10.97"}$ O.K.

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

SO. WALL DESIGN

FROM ACI TABLES

FOR $b = 12"$ $d = 14.5"$ $F = 0.21$

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

FOR $F'_c = 4000$, $F_y = 60{,}000$ & $K_u = 207$
$\rho = 0.0040 > 0.0033$ (min A_s)

$\therefore A_s = 0.0040 \times 12 \times 14.56 = 0.698^{\square"}/FT$

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

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

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

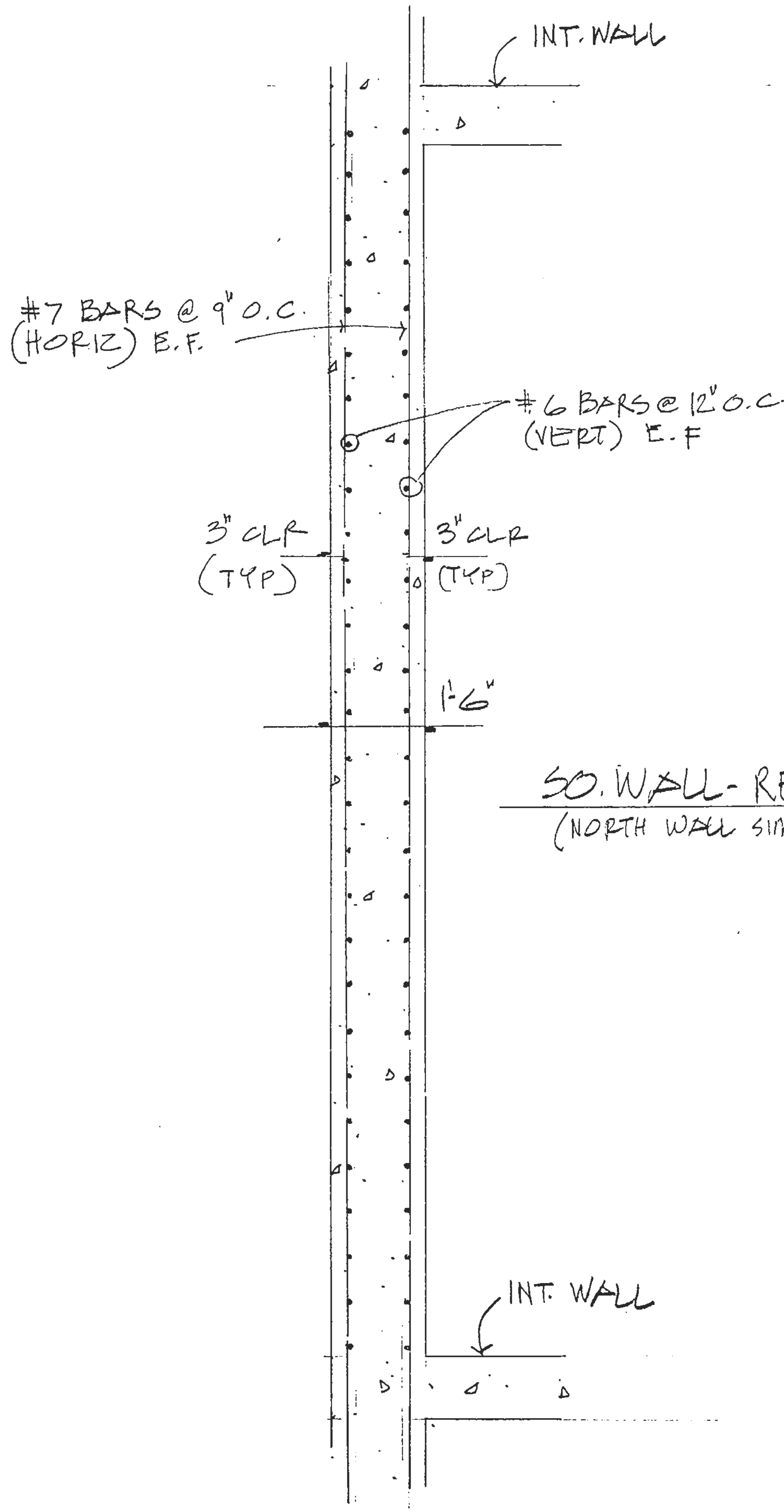
MAX BM $= 3.84 \times \left(\frac{32.33 - 21.25}{3}\right)$

$= 14.2'^{K}$

As(req'd) < MIN REQ'D FOR TEMP.

$\therefore A_s = 0.0028 \times 12 \times 18 = 0.60^{\square"}/FT$

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



SO. WALL - REINFORCING
(NORTH WALL SIMILAR)

NORTH WALL DESIGN

1. THERE ARE NO HORIZONTAL LOADS ON THIS WALL.

2. IN ORDER TO AVOID CONSTRUCTION MISTAKES, USE SAME WALL TH'KNESS & 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.

OPERATING FLOOR SLAB

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

$l_n = 20'\text{-}6"$ $W_u = (0.15 + 0.1) \times 1.3 \times 1.7 = 0.55^{K/SF}$

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

$-M_u = 0.55 \times 20.5^2/10 = 23.10'^{K}$ $M_n = 26'^{K}$

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

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

$$A_{s(req'd)} = \frac{0.85 \times 4 \times 0.0862}{60} \times 12 \times 9.63$$

$= 0.56^{\square"}/FT.$

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

USE SAME A_s FOR +VE M.

TEMP STEEL $= 0.0028 \times 12 \times 12 = 0.40^{\square"}/FT$

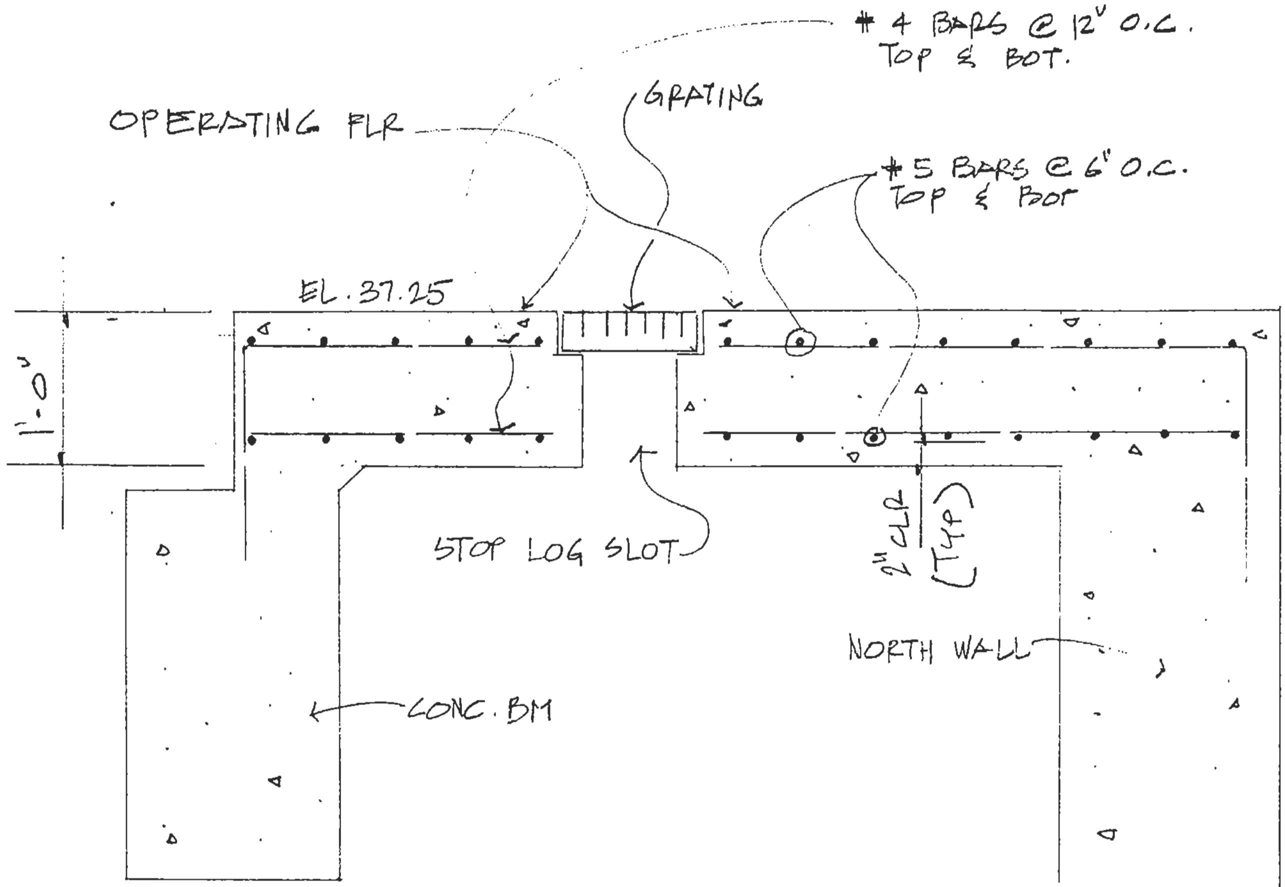
USE #4 BARS @ 12" TOP & BOT

CHECK SHEAR

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

$= 6.04^{K} < 12.4^{K}$ $\therefore$ O.K.

NO SHEAR REINF. REQ'D.



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

SLAB @ EL. 25.25

ASSUME
1. SLAB TH'K = 12"
2. F'_c = 4000
3. F_y = 60,000
4. LIVE LOAD = 100 #/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. ($A_s = 0.62^{\square''}$) TOP & BOT.
TEMP REINF: #4 @ 12" O.C. (TOP & BOT)

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

LOADS

1. SELF	$0.3^{K/SF}$
2. BACKFILL (6'-0" ±)	$0.73^{K/SF}$
3. LL	$0.20^{K/SF}$
4. VACUUM (FROM PRIMING OF HORIZ PUMPS) 17' OF H_2O	$1.06^{K/SF}$
5 GATES CLOSED WATER @ 27.05 IN DISCH. TUBE	$-0.49^{K/SF}$
TOTAL CASE I (ITEMS 1 TO 4)	$2.29^{K/SF}$
CASE II (ITEM 1 TO 3 + ITEM 5)	$0.74^{K/SF}$

CASE I GOVERNS.

$\therefore W_u = 1.3 \times 1.7 \times 2.29 = 5.06^{K/SF}$ $\quad l_n = 9.25'$

USING ACI CO-EFF

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

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

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

SLAB TH'KNESS REQ'D = 14.9" < 24" $\therefore$ O.K.

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

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

SLAB @ EL 21.25

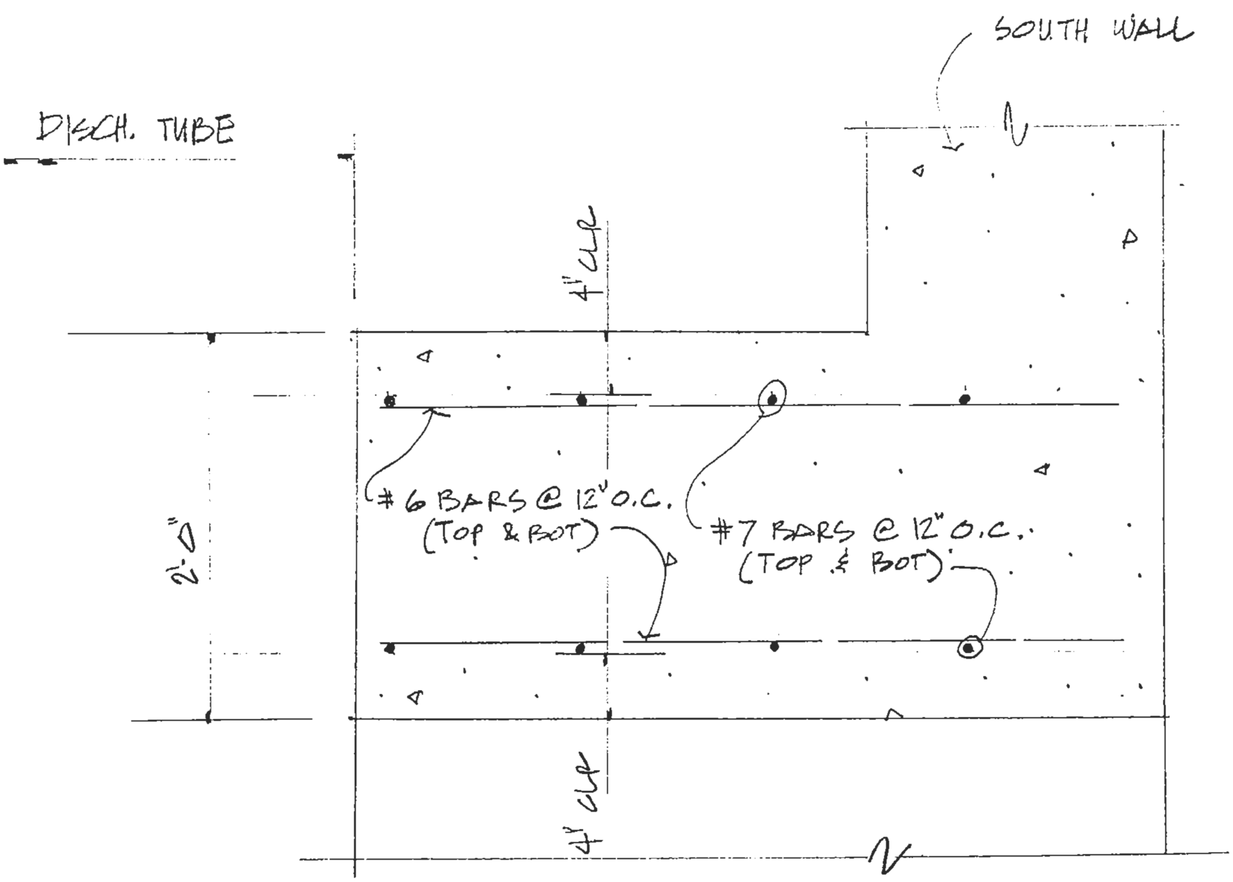
FOR $b = 12''$ $d = 19.5''$ $F = 0.38$

$\therefore K_u = \dfrac{43.3}{0.38} = 114 \quad \therefore \rho = 0.0021$ (ACI TABLES)

USE MIN $A_s = 0.0021 \times 12 \times 19.5 = 0.49^{\square''}/FT$

USE #7 BARS @ 12" O.C. (TOP & BOT) CONT.

USE #6 BARS @ 12" O.C. (TOP & BOT) CONT. (SHRINKAGE & TEMP)



STEEL BMS UNDER FLR STAND (@ EL. 37.25)

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

1. FORCE REQ'D TO OVERCOME WATER FRICTION

$= \mu \cdot H \cdot w \cdot A$ (μ = CO-EFF FRICTION = 0.35, H = head @ ℄ GATE = (32.33 - 15.25) = 17.08', w = 62.5#/cf, A = AREA OF SLUICE GATE OPN'G)

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

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

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

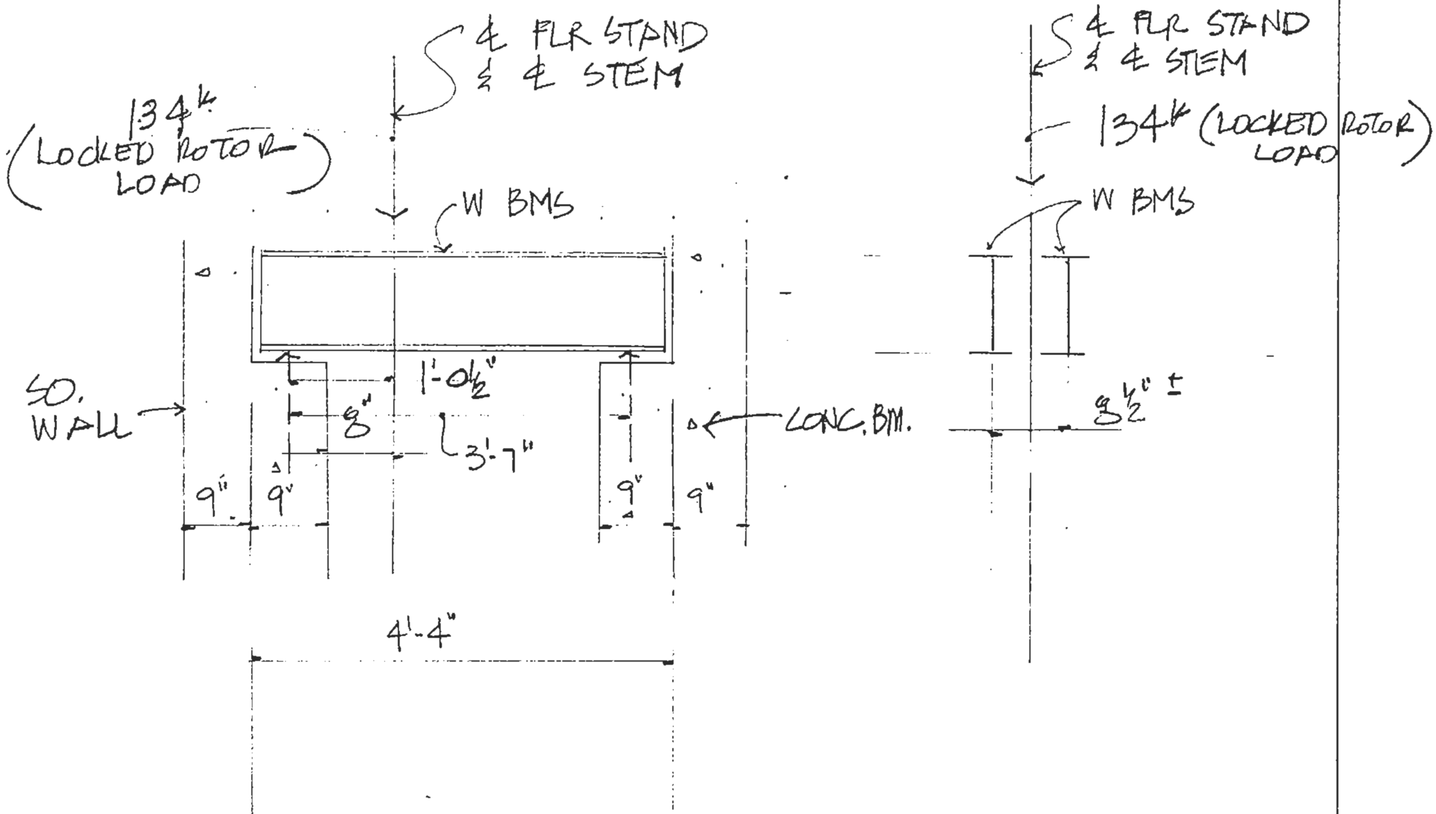
3. SELF WT OF GATE $= 9.6^{k}$

∴ TOTAL FORCE REQ'D $= 27 + 5 + 10 = 42.0^{k}$

LOCKED ROTOR LOAD: $= 134^{k}$ (FURNISHED BY RODNEY HUNT, ORANGE MASS)

∴ DESIGN BM FOR LOCKED ROTOR LOAD.

STL BMS UNDER FLR STAND



ASSUME : 1. EACH BM WILL CARRY ½ THE FORCE REQ'D TO OPEN THE GATE.

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

3. BMS SIMPLY SUPPORTED @ EA. END

∴ +M = 48 × 1.04 = 49'ᵏ UNBRACED L = 4.33'

TRY W10 × 45 L_c = 8.5' M_R = 98'ᵏ > 49'ᵏ
V = 51ᵏ > 48ᵏ ∴ O.K.

SELECT W10 × 45

CONC. BM @ NORTH END OF W. BM

ASSUME 1. 24" × 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.

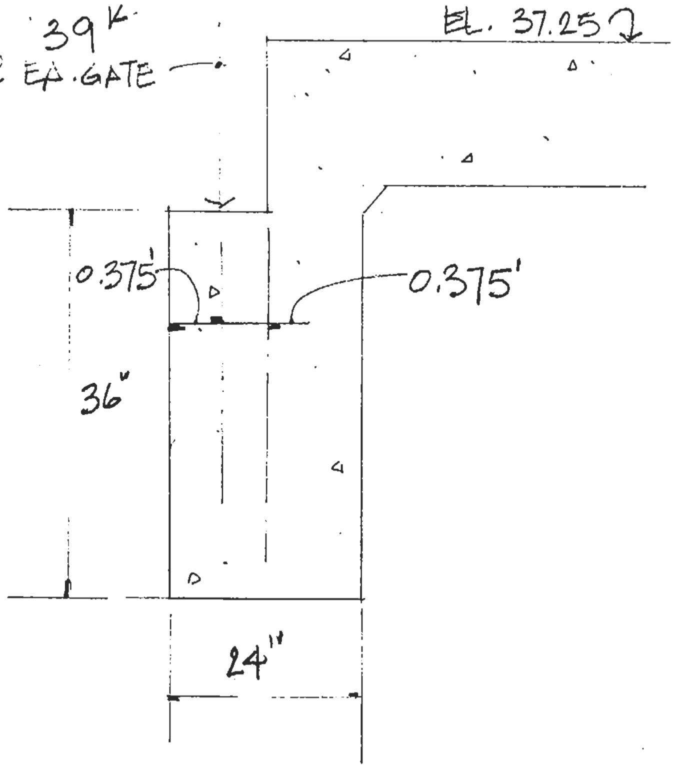
7. ASSUME BOTH GATES ARE BEING OPENED SIMULTANEOUSLY (IN EACH GATE BAY)

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

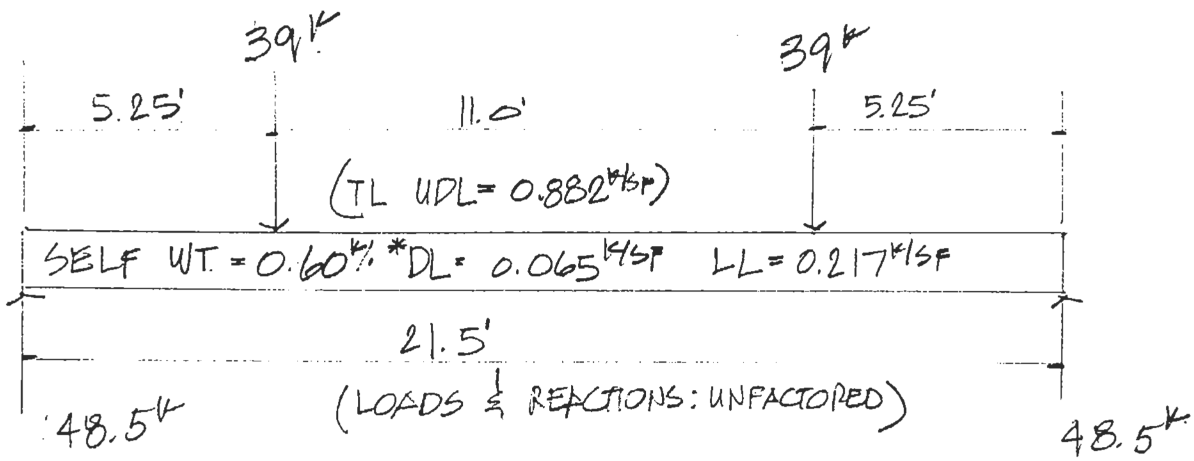
(134×12.5"/43")

= 39 K @ EA. GATE



CONC. BM @ NORTH END OF W. BM

* WT. OF GRATING ($30^{\#}/SF$)



MAX BM = $242'^k$

$\therefore M_u = 242 \times 1.3 \times 1.7 \quad 535'^k \qquad M_n = 595'^k$

ASSUME #8 BARS & 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

FOR $b = 24$, $d = 31.5''$ $F = 1.98$ $K_u = 300$

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

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

$= 3^{\square''}$

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

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

CHECK SHEAR

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

$\phi V_c = 0.85 \times 2 \times 63 \times 24 \times 31.5 = 81^k \simeq V_u$ STIRRUPS REQ'D.

SEE ATTACHED COMP. OUTPUT FOR SHEAR ~~& 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 $= 55^k$

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

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

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

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

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

MIN $T_u = \phi (0.5\sqrt{f'_c})(\Sigma X^2 Y)$

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

∴ TORSION REINF REQ'D

TORSION STRENGTH OF CONC

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

∴ PROVIDE TORSION REINF TO CARRY

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

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

∴ SECTION IS LARGE ENOUGH.

TORSION

$$A_t/s = \frac{T_u - \phi T_c}{\phi F_y \alpha_t x_1 y_1} = \frac{12.45 \times 12000}{0.85 \times 60{,}000 \times 1.24 \times 14.5 \times 25.6}$$

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

FLEXURAL SHEAR

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

$$\phi V_s = V_u - \phi V_c = 55 - 34 = 21^K$$

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

$\therefore$ COMBINED FLEXURAL & TORSIONAL REINF

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

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

EQ 11-24 $A_\ell = \dfrac{2A_t}{s}(x_1 + y_1)$

$= 2(.0064)(14.5 + 25.6) = 0.51^{\square''}$

MIN REQ'D
EQ 11-25 $A_\ell = \left[\dfrac{400 \times s}{F_y}\left(\dfrac{T_u}{T_u + \dfrac{V_u}{3C_t}}\right) - 2A_t\right]\left(\dfrac{x_1 + y_1}{s}\right)$

$T_u = 46'^k \quad V_u = 55^k \quad \therefore \; T_u + \dfrac{V_u}{3C_t} = 430.3$

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

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

$\therefore$ USE $A_\ell = 0.51^{\square''}$

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

$\therefore$ A_s(req'd) @ BOT $= A_{s(\text{FLEXURE})} + A_{s(\text{TORSION})}$

$= 3^{\square''} + 0.17^{\square''} = 3.17^{\square''}$

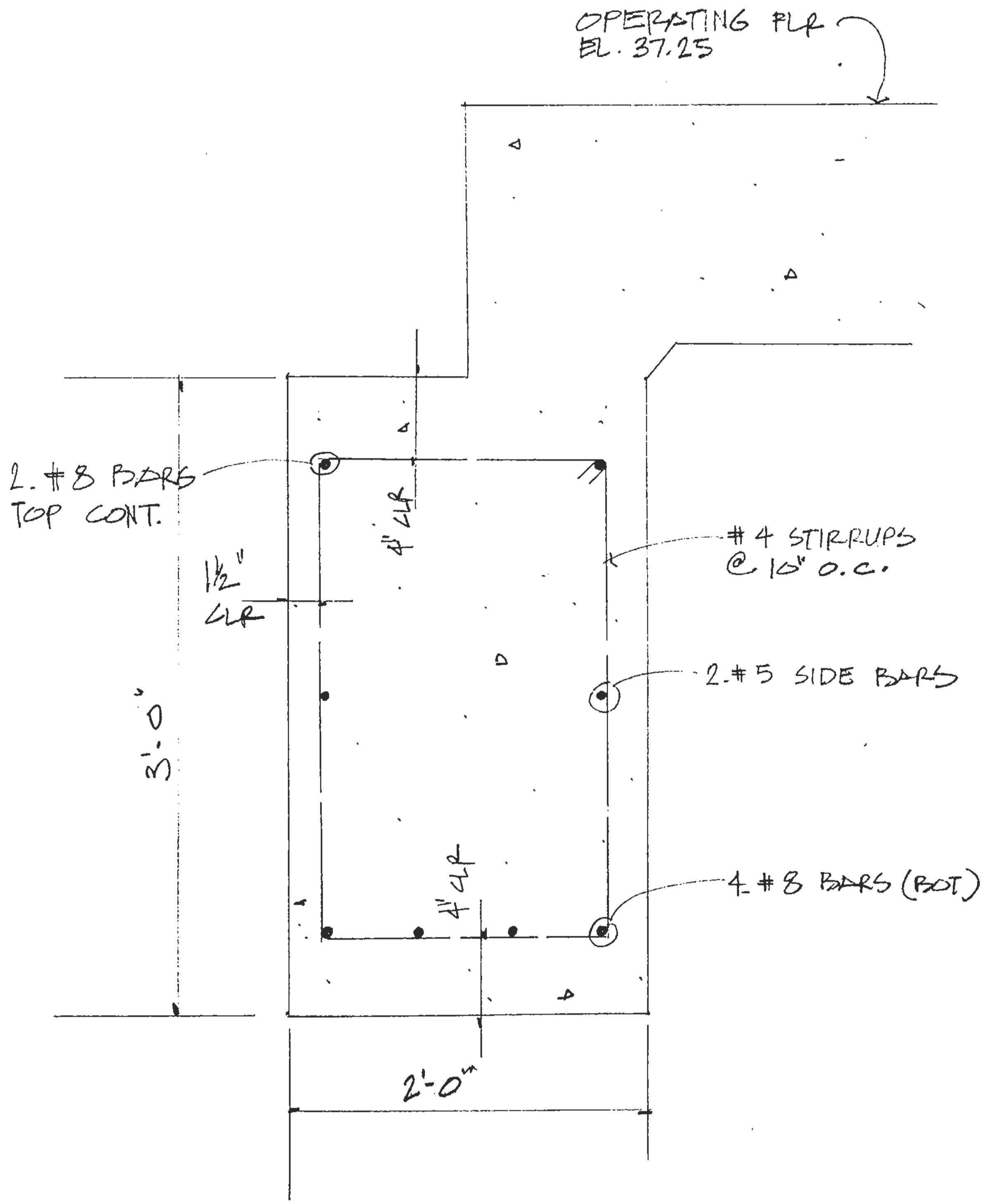
A_s(provided) $= 4\text{-}\#8 = 3.16^{\square''} \doteq 3.17^{\square''} \therefore$ O.K.

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

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

SHEAR & TORSION: #4 CLOSED HOOPS @ 10" O.C.

CONC. BM @ NORTH END OF W10s



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

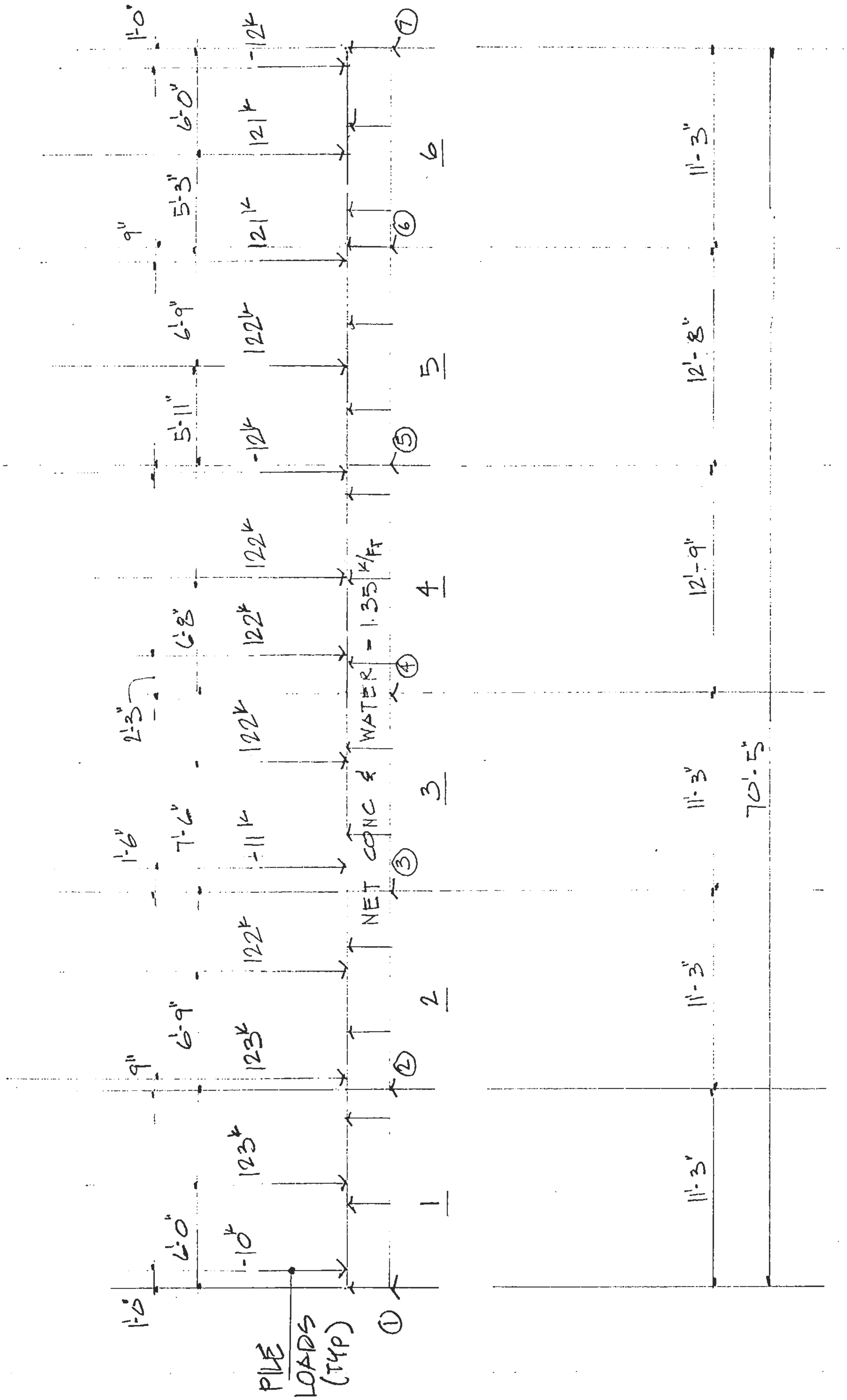
SELF WT.	0.45 × 5	= 2.25 K/SF
WATER	0.99 × 5	= 4.95 K/SF
UPLIFT	1.17 × 5	= −5.85 K/SF
TOTAL		= 1.35 K/FT

CONCENTRATED LOADS

LOAD CASE -2.

PILE LOADS FOR PILES 27 THRU 39 PAGE G2-37

FDN SLAB DESIGN



62-90

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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
70 2 1 -10 0 6 123 0 1
80 2 0.75 123 0 6.75 122 0 2
90 2 1.5 -11 0 7.5 122 0 3
100 3 2.25 122 0 6.67 122 0 12.67 -12 0 4
110 2 5.92 122 0 11.92 121 0 5
120 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

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

)TAL	.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

G2-43

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*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
PROGRAM CFRAME V02.05 24JUL84
*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
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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 ***

			FIXITY					
JOINT	X	Y	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 ***

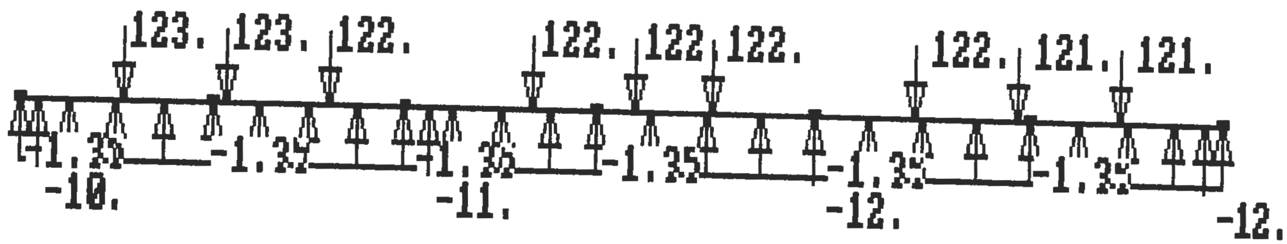
MEMBER	END A	END B	LENGTH	I	A	AS	E	G
1	1	2	11.25	.2333E+06	.2160E+04	.2160E+04	.3000E+04	.1304E+04
2	2	3	11.25	.2333E+06	.2160E+04	.2160E+04	.3000E+04	.1304E+04
3	3	4	11.25	.2333E+06	.2160E+04	.2160E+04	.3000E+04	.1304E+04
4	4	5	12.75	.2333E+06	.2160E+04	.2160E+04	.3000E+04	.1304E+04
5	5	6	12.67	.2333E+06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



LOAD CASE 1 95/02/04 3.52.40

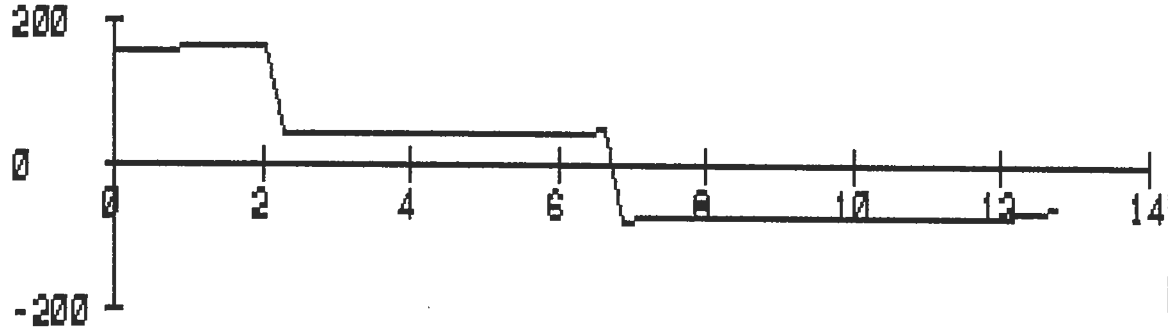
G2-95

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

= 302.7 MOMENT
LOAD CASE 1

95/02/04 3.55.09

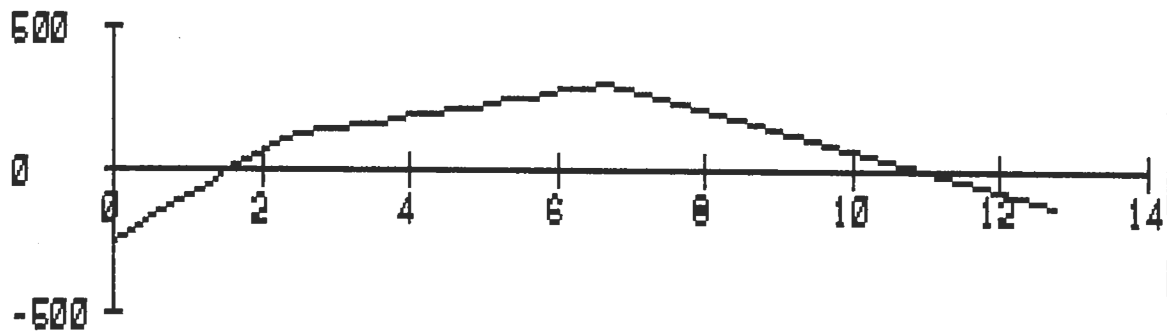
FRONTING PROTECTION @ DPS NO. 3. FOUNDATION SLAB FOR SLUICE GATE C D



MEMBER 4

SHEAR
LOAD CASE 1
MAX = 162.4

MIN = -75.05



MEMBER 4
MOMENT
LOAD CASE 1
MAX = 302.7

MIN = -251.1

95/02/04 3.55.09

LOAD CASE 1

FDN SLAB DESIGN

MAX BM = $303'^k$ (SEE ATTACHED COMP. OUTPUT)

$\therefore M_u = (1.3 \times 1.7 \times 303) = 670'^k$

$\therefore M_u/FT = 670/5 = 134'^k$

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

ASSUMING # 8 BARS & 4" COVER, REQUIRED THICKNESS OF FDN SLAB = $18.28 + 4'' + \frac{1}{2}''$

$= \underline{23''} < 36''$ PROVIDED.

CHECK WIDE BM SHEAR

$V_u = (1.3 \times 1.7 \times 84) = 185.64^k$

$\therefore V_u @ d = \left(\left(\frac{36-4.5}{12}\right) \times 1.35\right) 1.3 \times 1.7 + 185.64$
$= 191'^k$

$\therefore V_u @ d/_{FT} = 191/5 = 38.19^k$

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

$V_u @ d$

1. AT JT 2 SPAN 2 = $(154-123) 1.3 \times 1.7 < 185.64^k$
2. AT JT. 4 SPAN 4 = $(159-122) 1.3 \times 1.7 < 185.64^k$
3. AT JT 6 SPAN 5 = $(162-121) 1.3 \times 1.7 < 185.64^k$

CHECK PUNCH SHEAR

MAX $V_u = 1.3 \times 1.7 \times 122 = 269^k$

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

$\therefore$ PUNCH SHEAR O.K.

FDN SLAB DESIGN

REINFORCING

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

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

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

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

ALSO USE MIN A_s IN SHORT DIRECTION

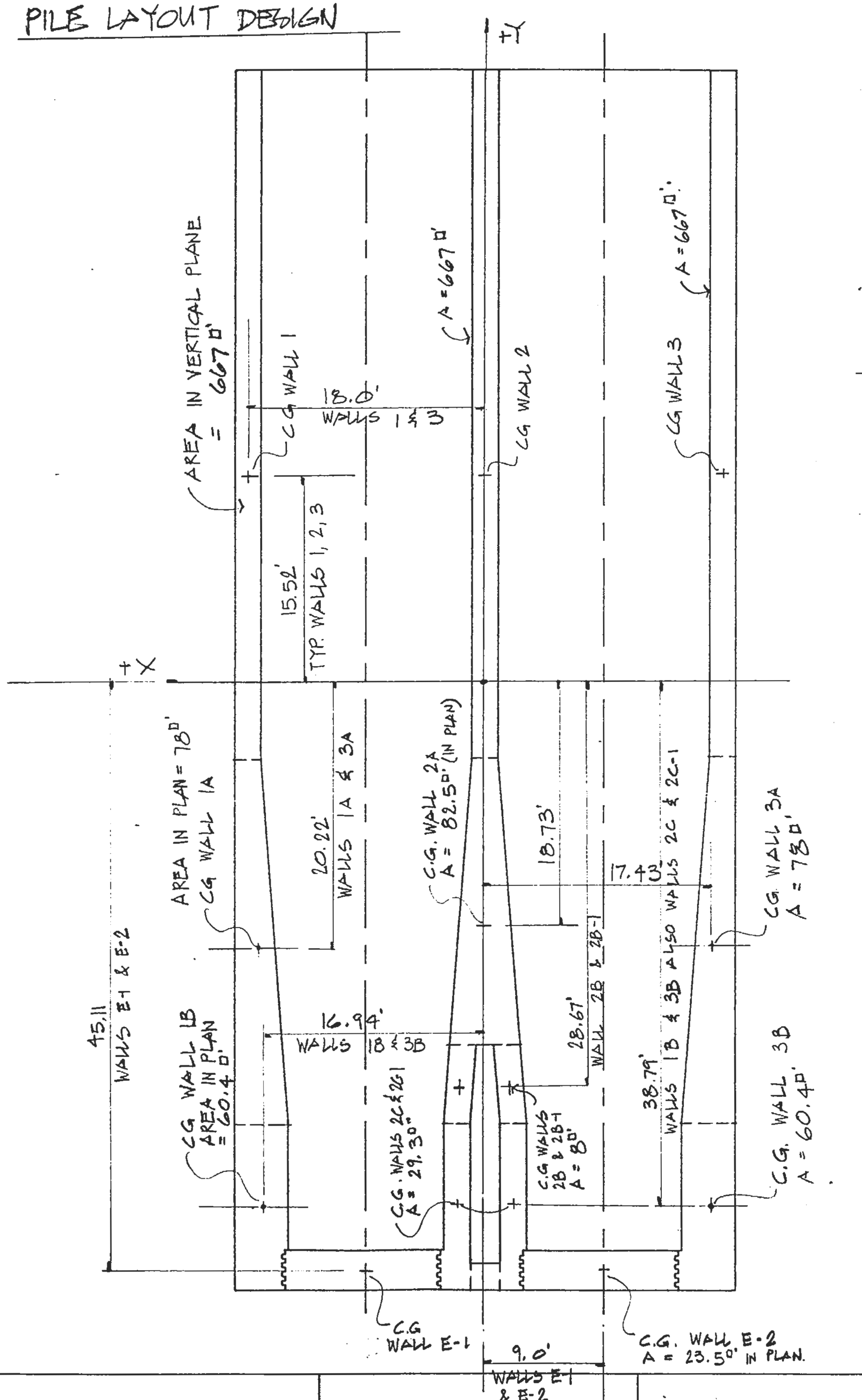
$\therefore$ USE #9 @ 8" TOP & BOT. (SHORT DIRECTION)

FRONTING PROTECTION
@ DPS NO. 3

DISCHARGE TUBE
@ PUMPS "A" & "B"

AB-1

PILE LAYOUT DESIGN



```
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
```

```
***    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
```

```
***    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
```

```
***    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
```

```
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 DESIGN

COMPUTE CONC. WT.

1. TOP SLAB 2'-0"+ THICK

= 205.1 (S.F.) × 38 FT × 0.15 = 1169 K

2. BOT SLAB 2'-0" TH'K (MIN)

= 190 (S.F.) × 38 × 0.15 = 1083 K

3. FDN SLAB 3'-3" TH'K

= 302 (SF) × 38 × 0.15 = 1721 K

4. WALLS

(A)	1.	WALL 1	667 (SF) × 2 × 0.15	= 200 K
	2.	WALL 2		= 200 K
	3.	WALL 3		= 200 K
(B)	1.	WALL 1A	78 (SF) × 19.57 × 0.15	= 226 K
	2	WALL 2A	82.5 (SF) × 19.57 × 0.15	= 239 K
	3.	WALL 3A		= 226 K
(C)	1.	WALL 1B	60.4 (SF) × 19.57 × 0.15	= 177 K
	2.	WALL 2B	8 (SF) × 19.57 × 0.15	= 23.5 K
	3	WALL 2B-1		= 23.5 K
	4	WALL 3B		= 177 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 86^k

PILE LAYOUT DESIGN
CONC. LOADS

	ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	LEVER ARM Y (FT)	LEVER ARM Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
1	2'-0" TH'K TOP SLAB			1169		1.76		-2062		
2	2'-0" TH'K BOT SLAB	-		1083		8.69		-9416		
3	3'-3" TH'K FDN SLAB			1721		0.28		482		
4	WALL 1			200	18.0	15.52		3104	-3600	
5	WALL 2			200		15.52		3104		
6	WALL 3			200	18.0	15.52		3104	3600	
7	WALL 1A			226k	17.43	20.22		-4570	-3939	
8	WALL 2A			239k		18.73		-4476		
9	WALL 3A			226k	17.43	20.22		-4570	+3939	
10	WALL 1B			177	16.49	38.79		-6865	-2918	
11	WALL 2B			24	1.75	28.67		-688	-42	
12	WALL 2B-1			24	1.75	28.67		-688	42	
13	WALL 3B			177	16.49	38.79		-6865	2918	
14	WALL 2C			86	2	38.79		-3336	172	
15	WALL 2C-1			86	2	38.79		-3336	-172	
16	WALL E-1			17	9	45.11		-767	153	
17	WALL E-2			17	9	45.11		-767	-153	
	TOTAL CONC. LOADS			5872				-38612	0	

PILE LAYOUT DESIGN

EARTH LOADS (BACKFILL BEHIND GATE STRUCTURE)

	ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	Y (FT)	Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
1	EARTH WT (RECT.)			42		44.03		1849		
2	EARTH WT. (TRI.)			287		37.77		10840		
	TOTAL EARTH LOAD			329				12689		

FRONTING PROTECTION		DISCHARGE TUBE	
@ DPS NO. 3		@ PUMPS "A" & "B"	AB-14

PILE LAYOUT DESIGN

WT. OF WATER IN DISCH. TUBE

	ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	Y (FT)	Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
1.	WT. OF WATER									
	=APPROX									
	11000 C.F. × 2 × 0.0625			1375[k]						
∴	WT. OF WATER IN DISCH. TUBES			1375[k]						

FRONTING PROTECTION @ DPS NO. 3		DISCHARGE TUBE @ PUMPS "A" & "B"	AB-15

PILE LAYOUT DESIGN

UPLIFT LOADS. (ASSUMING GW @ TOP OF GROUND)

	ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	LEVER ARM Y (FT)	LEVER ARM Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
1	UPLIFT			-3450						
	TOTAL UPLIFT			-3450						

PILE LAYOUT DESIGN

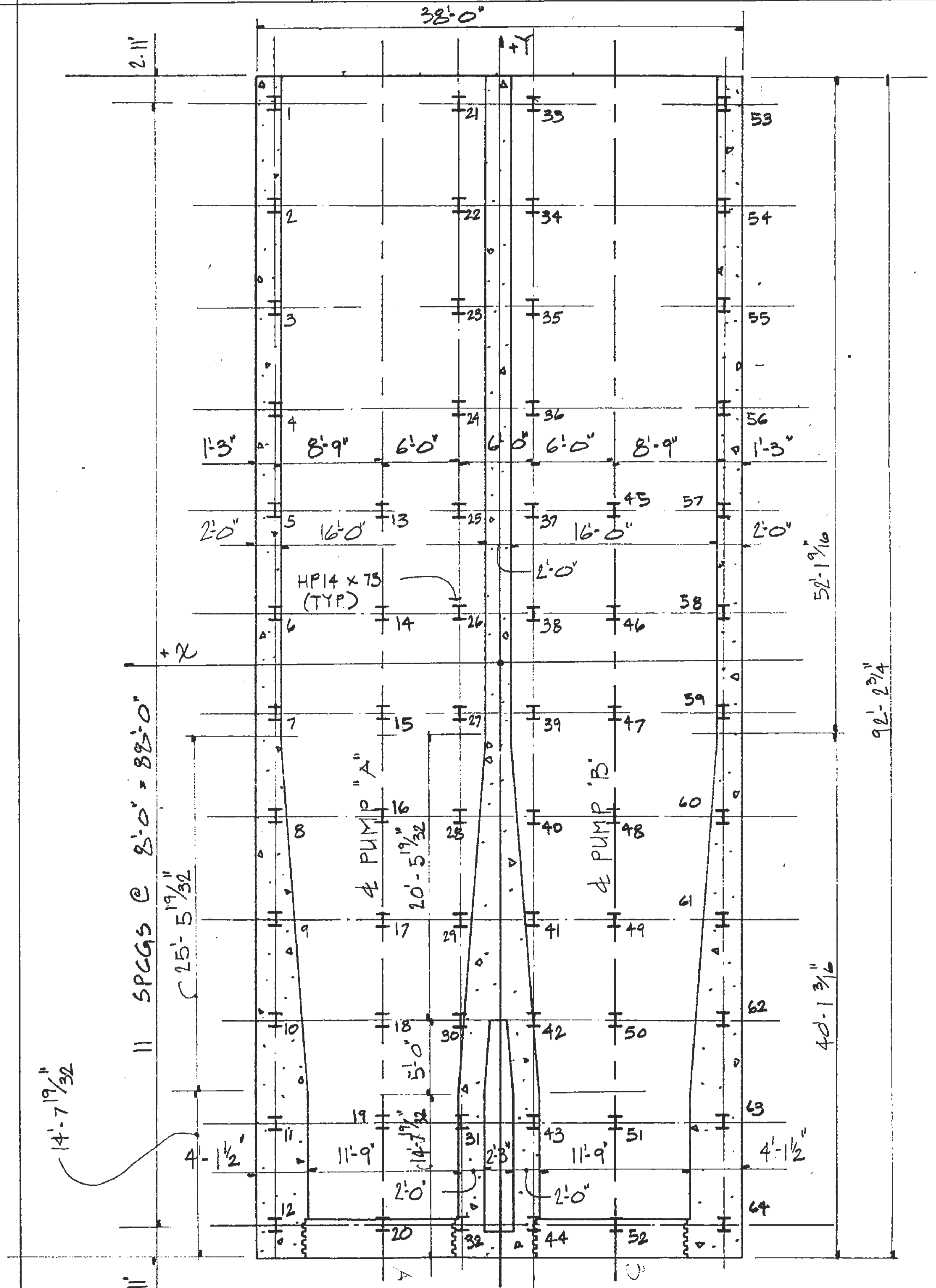
LOAD COMBINATIONS

	ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	LEVER ARM Y (FT)	LEVER ARM Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
	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						
	TOTAL			4827				-25923		
	CASE (II)	CASE (I) -UPLIFT (i.e. GW @ BOT. OF FDN SLAB)								
1.	ITEM 1 THRU 4			8277				-25923		
	TOTAL			8277				-25923		

FRONTING PROTECTION @ DPS NO 3

DISCHARGE TUBE @ PUMPS "A" & "B"

AB-17



PILE LAYOUT

```
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
   ALLOW H 130 100 385 385 709 2119 ALL
330 PILE 1 17.75 44 0 13 9 12 0 21 3 44 0 33 -3 44 0
335 PILE 45 -9 12 0 53 -17.75 44 0
350 ROW Y 12 1 11 AT -8
355 ROW Y 8 13 7 AT -8
365 ROW Y 12 21 11 AT -8
370 ROW Y 12 33 11 AT -8
375 ROW Y 8 45 7 AT -8
385 ROW Y 12 53 11 AT -8
400 LOAD 1 0 0 4827 -25923 0 0
410 LOAD 2 0 0 8277 -25923 0 0
680 FOU 1 2 3 4 5 6 7 B:\DTAB.OUT
690 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 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 KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.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 K/IN**2	LENGTH	L FT	LU 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 FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
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

AB-W

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

						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	.16978E+05
.00000E+00	.45648E+03	.00000E+00	.00000E+00	.00000E+00	-.97656E-03
.00000E+00	.00000E+00	.84868E+05	-.40737E+07	.25000E+00	.00000E+00
.00000E+00	.00000E+00	-.40737E+07	.87992E+10	-.16000E+02	.00000E+00
.00000E+00	.00000E+00	.25000E+00	-.32000E+02	.17326E+10	.00000E+00
.16978E+05	-.97656E-03	.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.

****

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

****

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

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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

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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	*
46	.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	

PD-LT

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

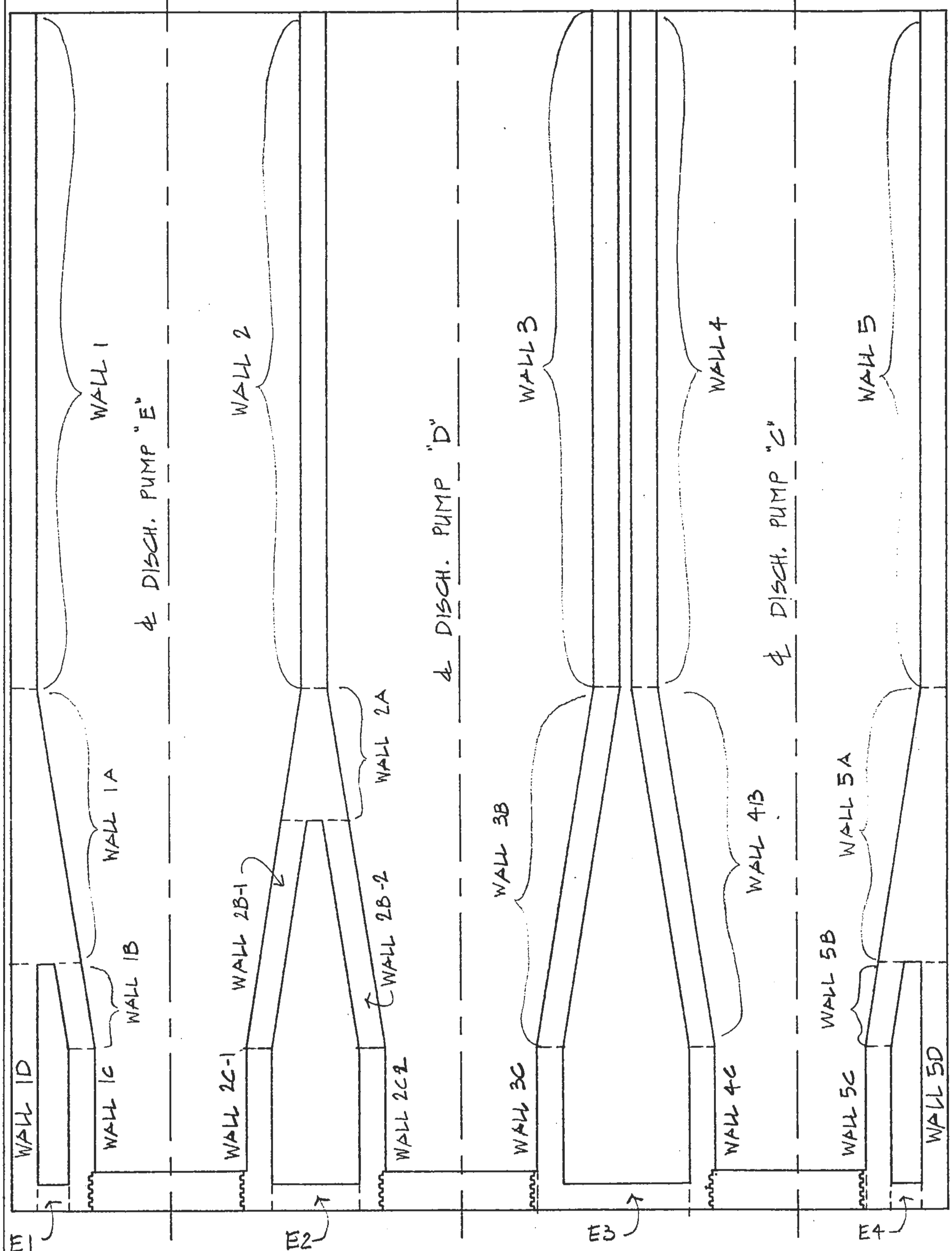
LOAD CASE - 2

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

AB-46

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

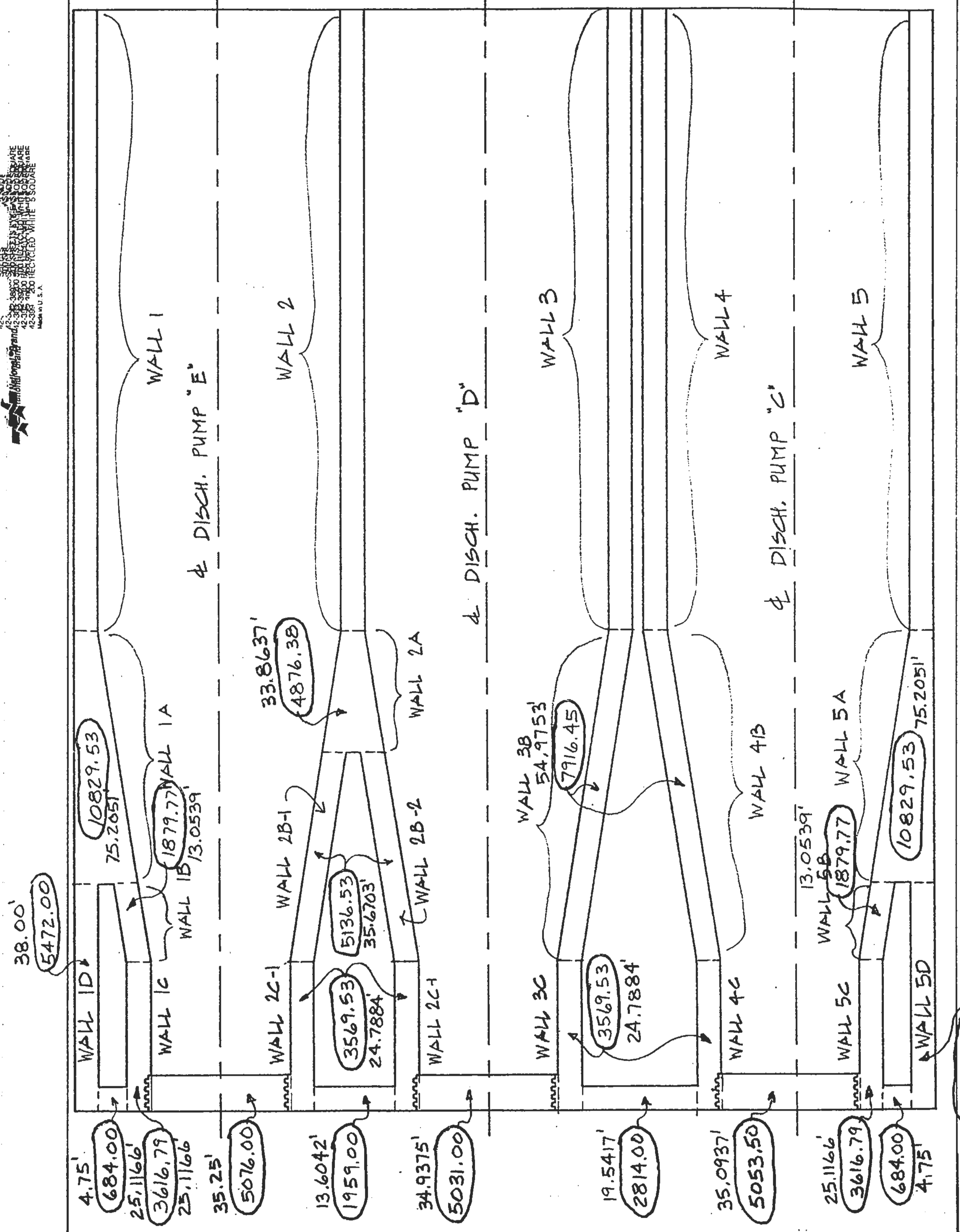
FDN SLAB DESIGN & PILE LAYOUT.



PLAN - DISCH. TUBE

@ DPS NO 3 | @ PUMPS "C" "D" & "E" | CDE-2

PILE LAYOUT DESIGN



CROSS SECTIONAL AREAS OF WALLS

FILE LAYOUT DESIGN

```
       ***    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


```
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

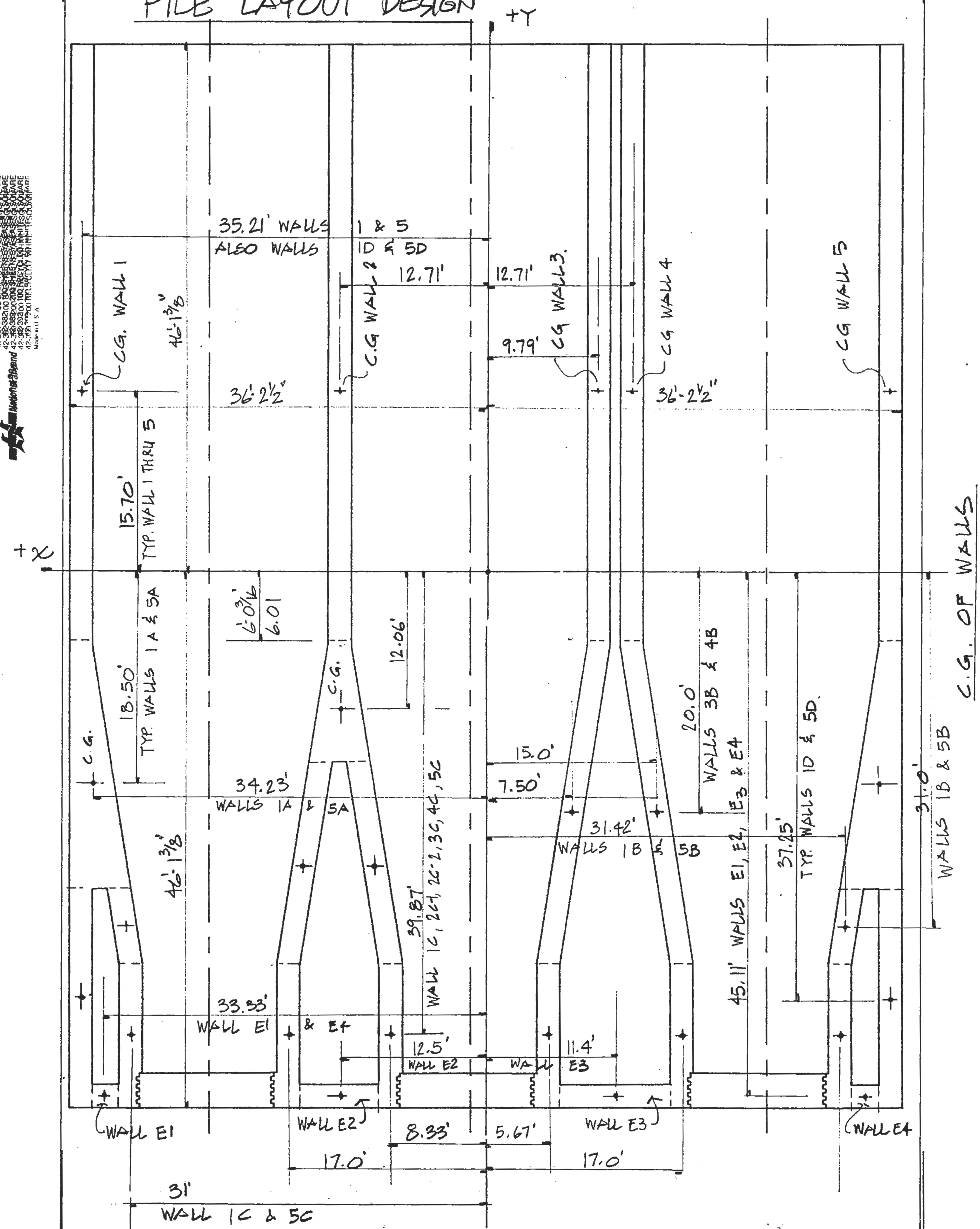
MOMENTS OF INERTIA ABOUT
PARALLEL CENTROIDAL AXES
IXX= 1.4007E+05 (INTEGRAL OF X*X*DA) ABOUT Y-AXIS
IYY= 1.4054E+04 (INTEGRAL OF Y*Y*DA) ABOUT X-AXIS
IXY=-2.0608E+04

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
```

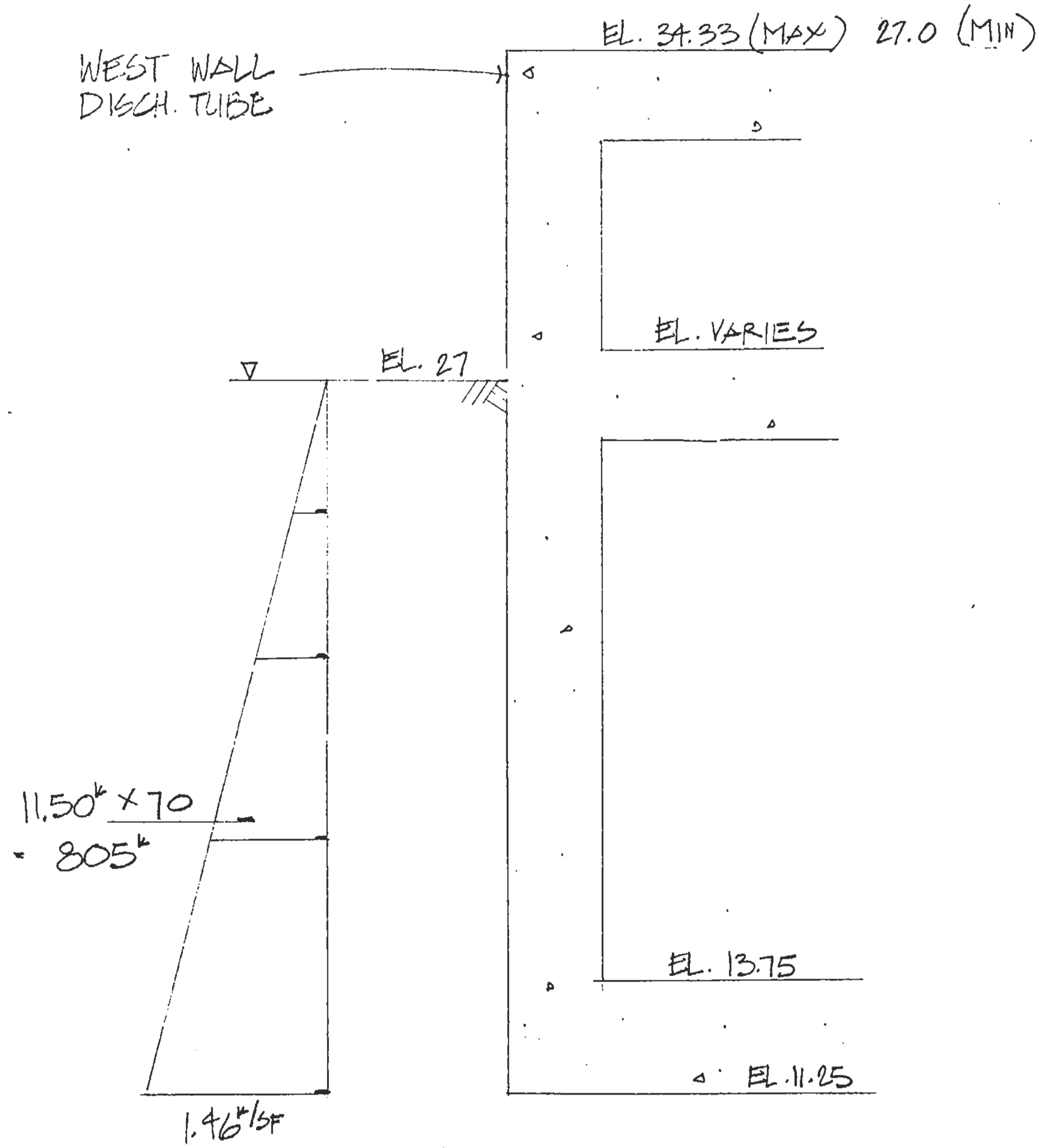
PILE LAYOUT DESIGN



PILE LAYOUT DESIGN

EARTH PRESSURE (WEST WALL)

1. ASSUME GROUND & GW EL. @ 27.0
2. ASSUME GRANULAR BACKFILL.

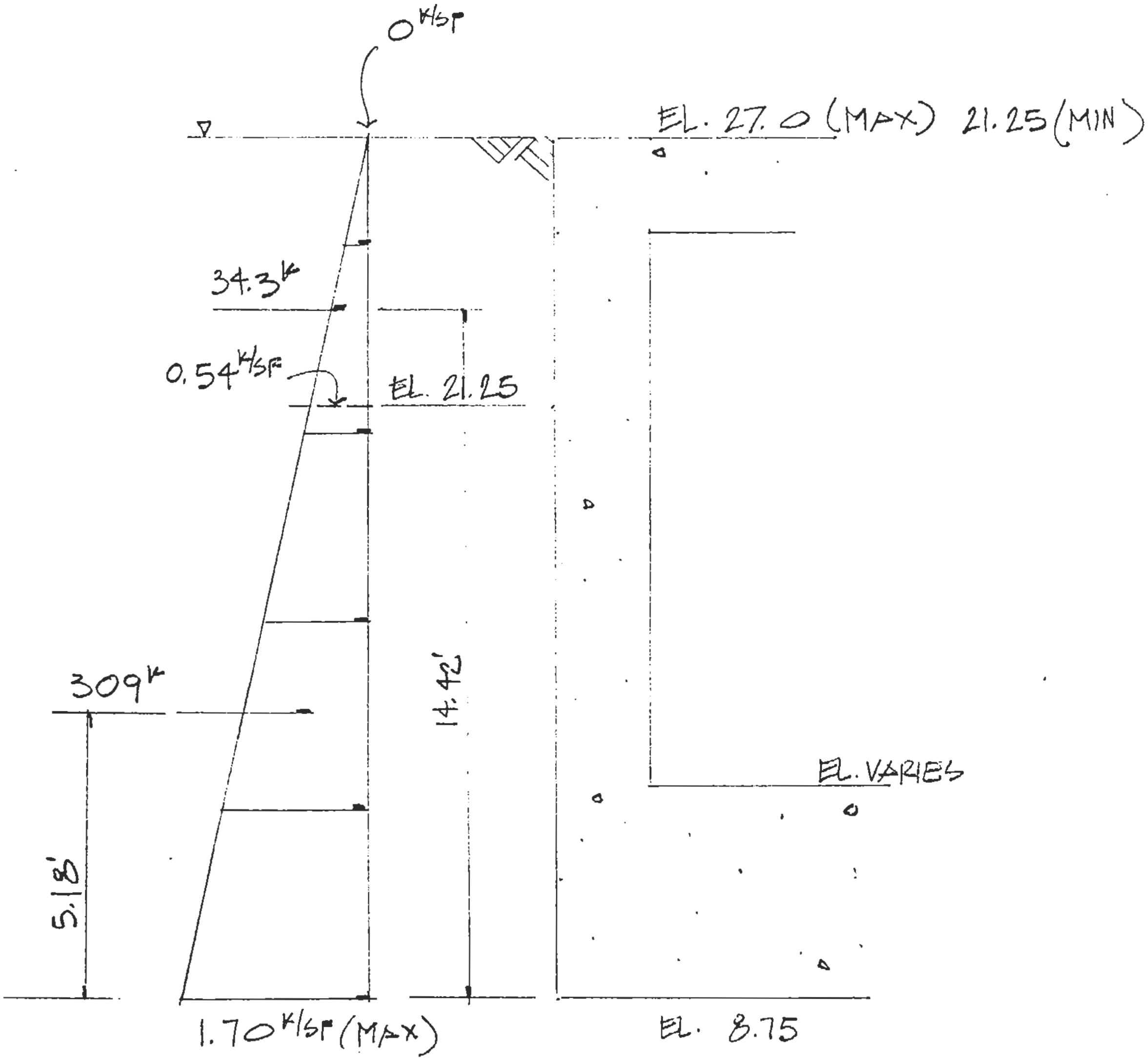


EARTH PRESSURE*
(SUBMERGED EARTH & GW)

* APPLIES TO 70.14' LENGTH BEGINNING @ SO. END.

PILE LAYOUT DESIGN

EARTH PRESSURE (WEST WALL)



EARTH PRESSURE*
(SUBMERGED EARTH & GW)

* APPLIES TO 22.08' LENGTH IMMEDIATELY SOUTH OF SLUICE GATE STRUCTURE

PILE LAYOUT DESIGN

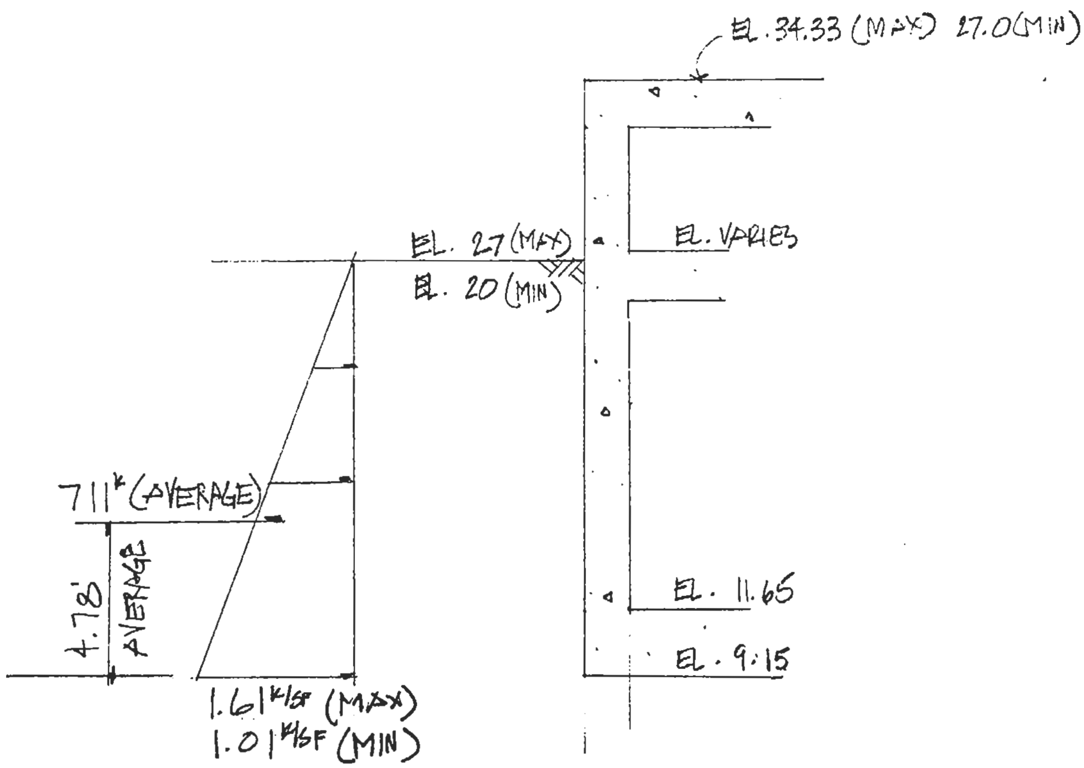
EARTH PRESSURE (EAST WALL)

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 = $309^k + 34.3^k$ 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")

$\therefore$ UPLIFT PRESSURE = $.0625\,(27-11.25) = 0.9844^{KSF}$

$\therefore$ TOTAL UPLIFT LOAD ACTING @ C.G. OF FDN SLAB

$= 0.9844 \times 72.42' \times 92.23'$

$= 6582^{KIPS.}$

PILE LAYOUT DESIGN

COMPUTE CONCRETE WEIGHT.

1. TOP SLAB 2'-0" TH'K

(A) 40.1' LENGTH FROM SO. END. = 40.1×72.42×2×0.15
= 871^k @ 20.05' FROM SO. END.

(B) REST OF DISCH. TUBE (52.23' LENGTH) = 54.54×72.42×2×0.15
= 1185^k @ 66.2' FROM SO. END.

∴ TOTAL = 871^k + 1185^k = 2056^k @ 46.64' FROM SO. END.

2. BOT SLAB 2'-0" TH'K

218 (S.F.) × 72.42' (WIDE) × 0.15 = 2368^k @ 46' FROM SO. END.

3. FOUNDATION SLAB

199 (S.F) × 72.42' (WIDE) × 0.15 = 2161^k @ 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	=	197^k
WALL 2			197^k
WALL 3			197^k
WALL 4			197^k
WALL 5			197^k
TOTAL WALLS 1 THRU 5		=	985^k

PILE LAYOUT DESIGN

4. WALLS CONTD..

(B) WALLS 1A, 2A & 5A

WALL 1A	75.20 (SF) × (32.33 - 13.75) × 0.15	= 210^k
WALL 5A	75.20 (SF) × (32.33 - 11.65) × 0.15	= 233^k
WALL 2A	= 33.9 (SF) × (32.33 - 13.75) × 0.15	= 95^k

(C) WALLS 1B, 2B-1, 2B-2, 3B, 4B, 5B

WALL 1B	13.05 (SF) × (32.33 - 13.75) × 0.15	= 36^k
WALL 5B	13.05 (SF) × (32.33 - 11.65) × 0.15	= 40^k
WALL 2B-1	35.67 (SF) × (32.33 - 13.75) × 0.15	= 99^k
WALL 2B-2	35.67 (SF) × (32.33 - 13.75) × 0.15	= 99^k
WALL 3B	55 (SF) × (32.33 - 11.65) × 0.15	= 172^k
WALL 4B	55 (SF) × (32.33 - 11.65) × 0.15	= 172^k

(D) WALLS 1C, 2C-1, 2C-2, 3C, 4C, 5C

WALL 1C	24.79 (SF) × (32.33 - 13.75) × 0.15	= 69^k
WALL 2C-1		= 69^k
WALL 2C-2		= 69^k
WALL 3C		= 69^k
WALL 4C	24.79 (SF) × (32.33 - 11.65) × 0.15	= 77^k
WALL 5C		= 77^k

(E) WALLS 1D & 5D

WALL 1D	38 (SF) × (32.33 - 13.75) × 0.15	= 106^k
WALL 5D	38 (SF) × (32.33 - 11.65) × 0.15	= 118^k

(F) WALLS E1, E2, E3, E4

WALL E1	4.75 (SF) × (32.33 - 13.75) × 0.15	= 13^k
WALL E4	4.75 (SF) × (32.33 - 11.65) × 0.15	= 15^k
WALL E2	13.60 (SF) × (32.33 - 13.75) × 0.15	= 38^k
WALL E3	19.50 (SF) (32.33 - 13.75) × 0.15	= 54^k

PILE LAYOUT DESIGN
CONC. LOADS

	ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	LEVER ARM Y (FT)	LEVER ARM Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
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	

FRONTING PROTECTION @ DPS NO: 3		DISCHARGE TUBE @ PUMPS "C" "D" & "E"	CDE-13

PILE LAYOUT DESIGN
CONC. LOADS

	ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	LEVER ARM Y (FT)	LEVER ARM Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
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	
	TOTAL CONC. LOAD			9436				-58593	3812	

PILE LAYOUT DESIGN

EARTH WEIGHT (BACKFILL BEHIND GATE STRUCTURE)

	ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	LEVER ARM Y (FT)	LEVER ARM Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
1.	EARTH WT. (RECTANGULAR)			79k		44.03		3478		
2.	EARTH WT (TRIANGULAR)			546k		37.77		20622		
	TOTAL EARTH WEIGHT.			625				24100		

PILE LAYOUT DESIGN

WT. OF WATER IN DISCH. TUBES

ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	LEVER ARM Y (FT)	LEVER ARM Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
36000 CF × 0.0625	-	-	2250	-	-	-	-	-	-

PILE LAYOUT DESIGN

UPLIFT LOADS

ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	Y (FT)	Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
UPLIFT	-	-	-6582				-	-	-

PILE LAYOUT DESIGN

EARTH PRESSURE (GW @ TOP OF GROUND)

	ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	LEVER ARM Y (FT)	LEVER ARM Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
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 FDN SLAB)

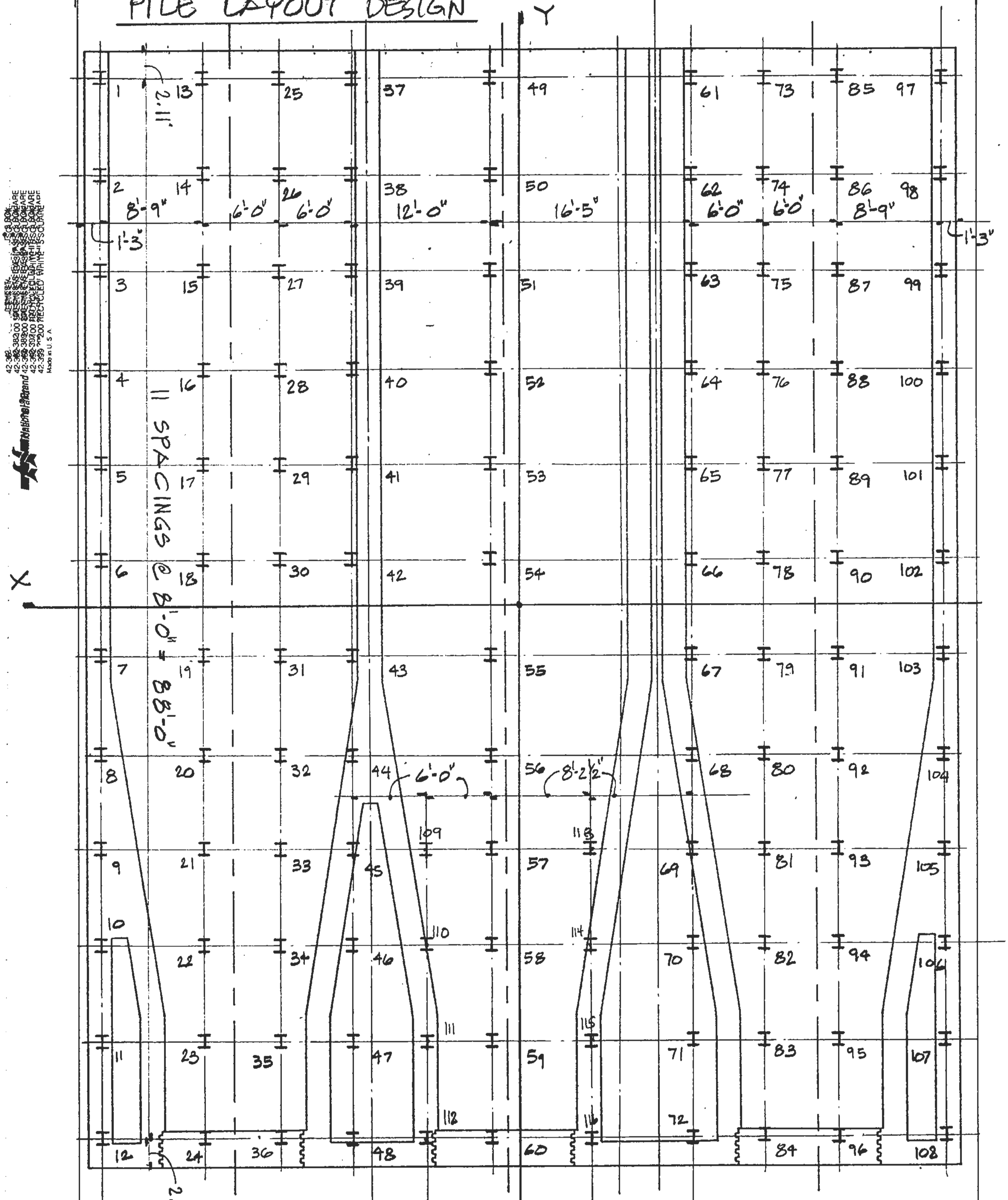
	TOTAL EARTH PRESSURE	-60							533	-4714

PILE LAYOUT DESIGN
LOAD COMBINATIONS

	ITEM	FX (KIPS)	FY (KIPS)	FZ (KIPS)	LEVER ARM X (FT)	LEVER ARM Y (FT)	LEVER ARM Z (FT)	MX (FT-K)	MY (FT-K)	MZ (FT-K)
	CASE (I) BACKFILL IN PLACE, GATES OPEN, GW @ TOP OF GROUND. DISCH TUBE @ ALL THREE PUMPS FULL OF WATER.									
1	CONC. LOAD			9436				-58593	3812	
2	LIVE LOAD			1336						
3	WT. OF BACKFILL (@ NO. END)	-		625				24100		
4.	WT. OF WATER IN DISCH. TUBES			2250						
5.	UPLIFT			-6582						
6.	EARTH PRESSURE	-94							827	-7306
	TOTAL	-94	0.0	7065				-34493	4639	-7306
	CASE (II) BACKFILL IN PLACE, GATES OPEN, GW @ BOT OF FDN SLAB, DISCH TUBE @ ALL THREE PUMPS FULL OF WATER									
1	ITEMS 1 THRU 4 (CASE I)			13647				-34493	3812	
2	ITEM 6 (CASE I)	-60							533	-4714
	TOTAL	-60	0.0	13647				-34493	4345	-4714

FRONTING PROTECTION @ DPS NO 3		DISCHARGE TUBE @ PUMPS "C" "D" & "E"	LOE-19

PILE LAYOUT DESIGN



PILE LAYOUT

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********************************
* CORPS PROGRAM  #  X0080      *  CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 86/09/02-C  *  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 KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.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 K/IN**2	LENGTH	L FT	LU 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 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

						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

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	.16978E+05
.00000E+00	.82737E+03	.00000E+00	.00000E+00	.00000E+00	.30265E+04
.00000E+00	.00000E+00	.15382E+06	-.40737E+07	-.56268E+06	.00000E+00
.00000E+00	.00000E+00	-.40737E+07	.17415E+11	.54017E+08	.00000E+00
.00000E+00	.00000E+00	-.56268E+06	.54017E+08	.11637E+11	.00000E+00
.16978E+05	.30265E+04	.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 ASE	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

PILE	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

LOAD CASE - 1

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

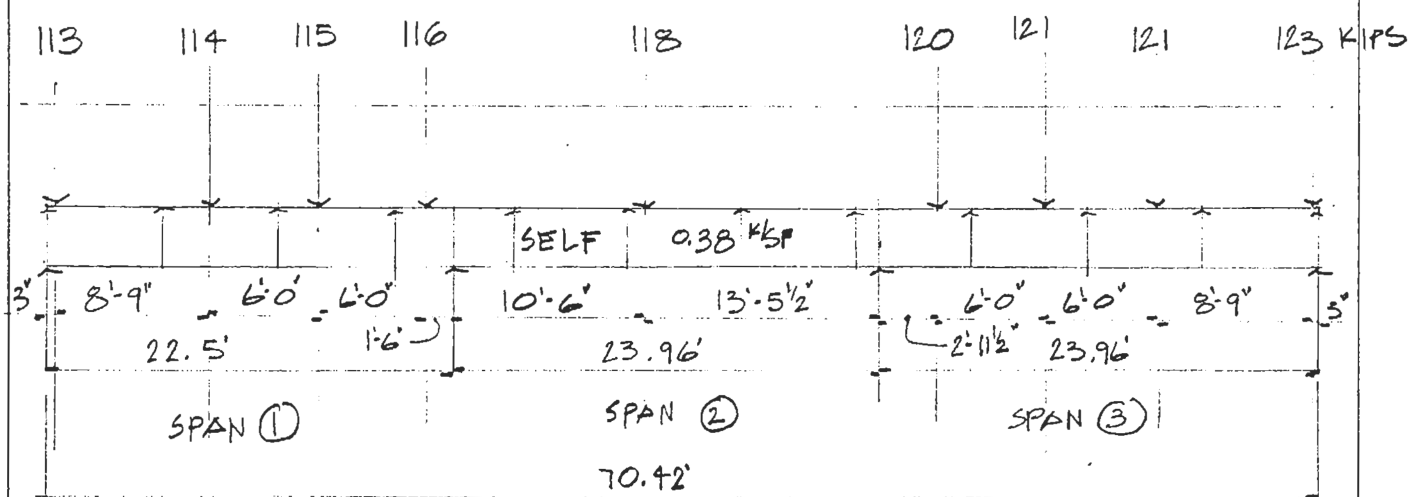
PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.7	-1.2	110.6	.0	.0	.0
2	.5	-1.2	110.9	.0	.0	.0
3	.3	-1.2	111.3	.0	.0	.0
4	.1	-1.2	111.7	.0	.0	.0
5	-.1	-1.2	112.1	.0	.0	.0
6	-.3	-1.2	112.5	.0	.0	.0
7	-.6	-1.2	112.9	.0	.0	.0
8	-.8	-1.2	113.3	.0	.0	.0
9	-1.0	-1.2	113.7	.0	.0	.0
10	-1.2	-1.2	114.1	.0	.0	.0
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" TH'K 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)



LOAD CASE 2.

(PILES 7, 19, 31, 43, 55, 67, 79, 91, 103)

(8'-0" WIDE STRIP)

FOR THE PURPOSE OF PRELIMINARY DESIGN, DETERMINE ADEQUACY OF ASSUMED TH'KNESS 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 × 15 − 123 × 14.75 − 121 × 6 = 1320'^{k}

∴ BM/FT = 165'^{k}

FDN SLAB DESIGN

SINCE LL IS APPROX 10% OF TOTAL LOAD

BM DUE TO LL $\simeq 16.5'^k$

$\therefore$ BM DUE TO DL & WATER LOADS = $148.5'^k$

$\therefore M_u = 1.4 \times 148.5 + 1.7 \times 16.5 = 236'^k$

$\therefore d_{req} = (2.4956 \times 236)^{1/2} = 24.26''$

ASSUMING 4" COVER & #10 BARS

TOTAL TH'KNESS REQ'D = $24.26 + 4 + 5/8 = 28.89'' < 30''$ $\therefore$ O.K.

$\phi V_c = 0.85 \times 2 \times 63 \times 12 \times (30 - 4.625)$

$= 32.62^k$

V_u @ FACE OF SUPPORT = $(1.7 \times 23 + 1.4 \times 205)/8 = 40.76^k > \phi V_c$ 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 SLAB

TOP & BOT REINFORCING

FOR $b = 12''$, $d = 34.38''$ $F = 1.18$

$\therefore$ FOR $M_u = 236$ & $F = 1.18$ $K_u = 200$ $\therefore \rho = 0.0040$

$\therefore A_s = 0.0040 \times 12 \times 34.38 = 1.65^{\square''}$

TRY #10 BARS @ 9" O.C. TOP & BOT. $A_s = 1.69^{\square''} > 1.65^{\square''}$ $\therefore$ O.K.

TEMP & SHRINKAGE REINF

$0.0018 \times 12 \times 39 = 0.84^{\square''}/FT$

USE #7 BARS @ 12" O.C. TOP & BOT $A_s = 1.2^{\square''} > 0.84^{\square''}$ $\therefore$ O.K.

DISCHARG TUBE DESIGN

ASSUME
1. TOP SLAB 2'-0" TH'K
2. BOT SLAB 2'-0" TH'K
3. ALL WALLS 2'-0" TH'K
4. $F'_c = 4000$
5. $F_y = 60000$
6. GOVERNING CODE : ACI
7. LIVE LOAD : 100 #/SF (ON TOP OF DISCH. TUBE)
8. VACUUM LOAD WITHIN WATER PASSAGE : 18 FT OF H_2O
9. HYD. STATIC PRESSURE WITHIN WATER PASSAGE : 18' OF H_2O
10. $\gamma_{sat} = 122.5$ #/SF, $\gamma_{sub} = 60$ #/SF, $K_a = 0.5$

TOP SLAB DESIGN

1. FOR THE PURPOSE OF PRELIMINARY DESIGN, ASSUME TOP SLAB SIMPLY SUPPORTED @ EAST & WEST WALL & CONTINUOUS OVER INT. WALLS (DISREGARD WALL STIFFNESS).

2. USE ACI CO-EFF FOR MOMENTS & SHEAR

LOADS: CASE (I) PRIMING OF ALL PUMPS IN PROGRESS

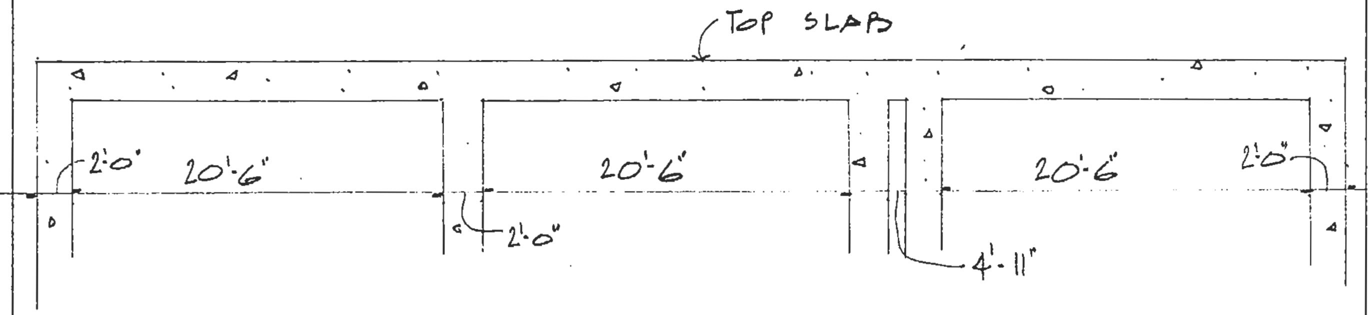
1. SELF WT. = $1.4 \times 2 \times 0.15$	= 0.42 K/SF
2. BACKFILL = $1.4 \times 0.1225 \times 5.75'$	= 0.99 K/SF
3. VACUUM = 1.4×1.125	= 1.58 K/SF
4. LIVE LOAD = 1.7×0.1	= 0.17 K/SF
TOTAL	= 3.16 K/SF

LOADS: CASE II ALL PUMPS OPERATING

1. SELF WT + BACKFILL	= 1.41 K/SF
2. LIVE LOAD	= 0.17 K/SF
3. HYD. STATIC PRESSURE = $0.0625 \times 18 \times 1.4$	= -1.58 K/SF
TL	0 K/SF
TL W/O LL	= -0.17 K/SF

TOP SLAB (IN THE AREA OF NO BACKFILL ON TOP OF SLAB)

$\therefore W_u = 3.16^{k/sf} - 0.99^{k/sf}$ (BACKFILL WT.) $= 2.17^{k/sf}$



$l_n = 20.5'$ $W_u = 2.17^{k/sf}$ LOAD CASE (I)

$\therefore$ MAX $-M = \dfrac{2.17 \times 20.5^2}{10} = 92'^k$

MAX $+M = 92 \times 10/_{11} = 84'$

$\therefore d_{req} = (94 \times 2.4956)^{1/2} = 15.8"$

ASSUMING #9 BARS & 2" COVER TOTAL THIKNESS REQ'D $= 15.8" + 2" + 9/_{16} = 18.4" < 24"$ $\therefore$ O.K.

$\phi V_c = 0.85 \times 2 \times 63 \times 12 \times (24 - 2.5625) = 27.56^k$

V_u @ $d = 1.15 \times \dfrac{2.17 \times 20.5}{2} - \left(\dfrac{21.43}{12} \times 2.17\right)$

$21.70^k < 27.56^k$ $\therefore$ O.K.

TOP & BOT REINF

FOR $b - 12"$ $d = 21.43$ $F = 0.46$
FOR $M = 94'^k$, $F = 0.46$ $\therefore K_u = 204$ $\therefore \rho = 0.0047$

$\therefore A_s = 0.0047 \times 12 \times 21.43 = 1.10^{\square"}/FT.$
TRY # 8 @ 6" O.C. $A_s = 1.58^{\square"}/FT. > 1.10^{\square"}$

$\therefore$ USE # 8 BARS @ 6" O.C. TOP & BOT.

TEMP & SHRINKAGE

$A_s = 0.0018 \times 12 \times 24 = 0.52^{\square"}$
USE # 6 @ 12" O.C. TOP & BOT. $A_s = 0.88^{\square"}$

TOP SLAB (UNDER BACKFILL ADJ. TO GATE STRUCTURE)

$\ell_n = 20.5$, $W_u = 3.16^{K/SF}$

V_u @ $d = 31.60^K > 27.56^K$ N.G.

∴ USE ONE (1) INTERMEDIATE WALL IN EACH TUBE STARTING @ SO. END OF COL (IN THE GATE STRUCTURE WHICH DEVIDES 20'-6" OPENING @ GATES IN TWO) AND EXTENDING TO SOUTH END OF BACKFILL OVER THE DISCH TUBES.

$\therefore \ell_n = \left(\frac{20.5}{2} - 2\right) = 9.25'$ $\quad W_u = 3.16^{K/SF}$ $\quad b = 12"$ $\quad d = 21.43$

$\therefore V_u @ d = \frac{1.15 \times 3.16 \times 9.25}{2} - \left(\frac{21.43}{12} \times 3.16\right)$

$= 11.16^K < \phi V_c = 27.56^K$

BOT SLAB DESIGN

LOADS: CASE II ALL PUMPS OPERATING

1. SELF WT. $1.4 \times 2 \times 0.15$ $= 0.42^{K/SF}$

2. HYD. STATIC PRESSURE $= 0.0625 \times 18 \times 1.4$ $= 1.58^{K/SF}$

TOTAL $= 2.00^{K/SF}$

SPAN LENGTHS SAME AS TOP SLAB.
∴ 2'-0" TH'K SLAB IS ADEQUATE BY OBS.

∴ USE SAME REINF AS TOP SLAB.

∴ USE #8 BARS @ 6" O.C. (TOP & BOT)
USE #6 BARS @ 12" O.C. (TOP & BOT) (SHRINKAGE & TEMP)

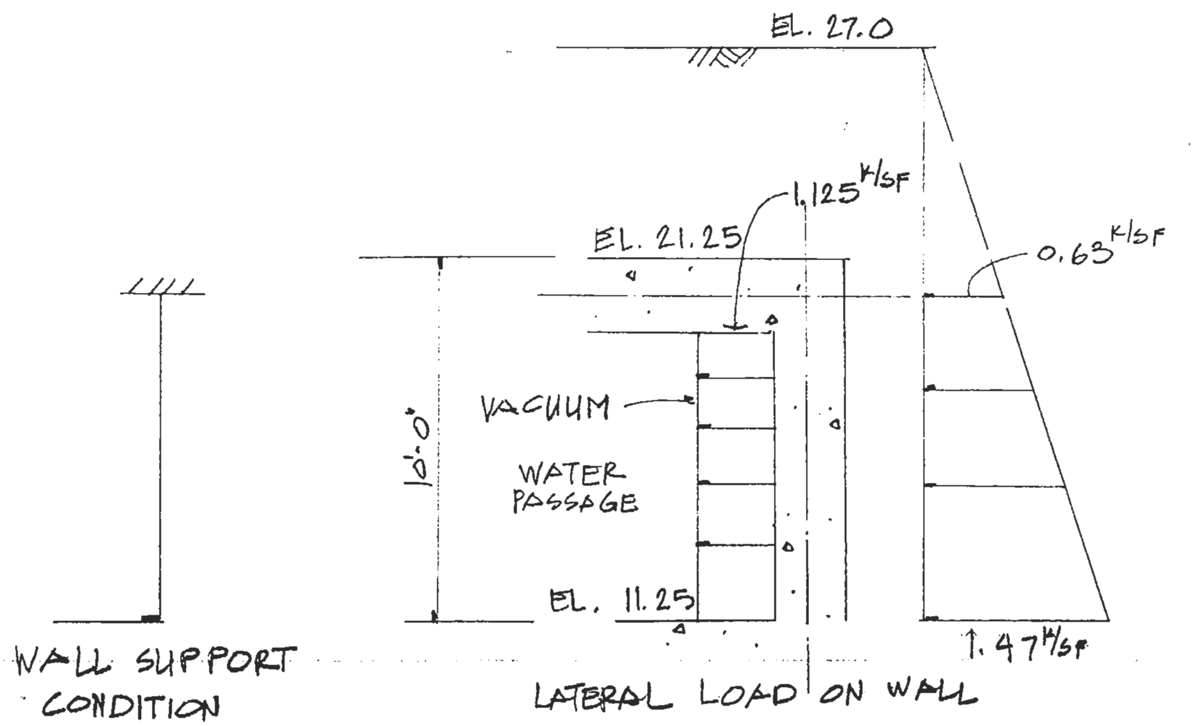
WEST WALL DESIGN. (ASSUME 2'-0" TH'K WALL)

DIRECT LOAD (AXIAL)

1. TOP SLAB	$\left(\frac{2 \times 0.15 \times 22.5}{2}\right) \times 1.4$	$= 4.72$
2. BOT SLAB		$= 4.72$
3. LL	$\left(\frac{2 \times 0.1 \times 22.5}{2}\right) \times 1.7$	$= 3.82^k$
4. WATER	$\left(\frac{22.5 \times 8 \times 1}{2}\right) \times .0625$	$= 7.88^k$
5. BACKFILL	$\left(\frac{0.1225 \times 5.75 \times 22.5}{2}\right)$	$= 13.47$
6. SELF WT	$(2 \times 0.15 \times (32.33 - 13.75))$	$= 7.80^k$
TOTAL		$= 42.41$

BENDING MOMENT DUE TO EARTH PRESSURE & VACUUM LOAD.

1. AT GATE STRUCTURE
   ASSUME 18'-0" H_2O FOR VACUUM LOAD.



WEST WALL DESIGN

1. CONTD..

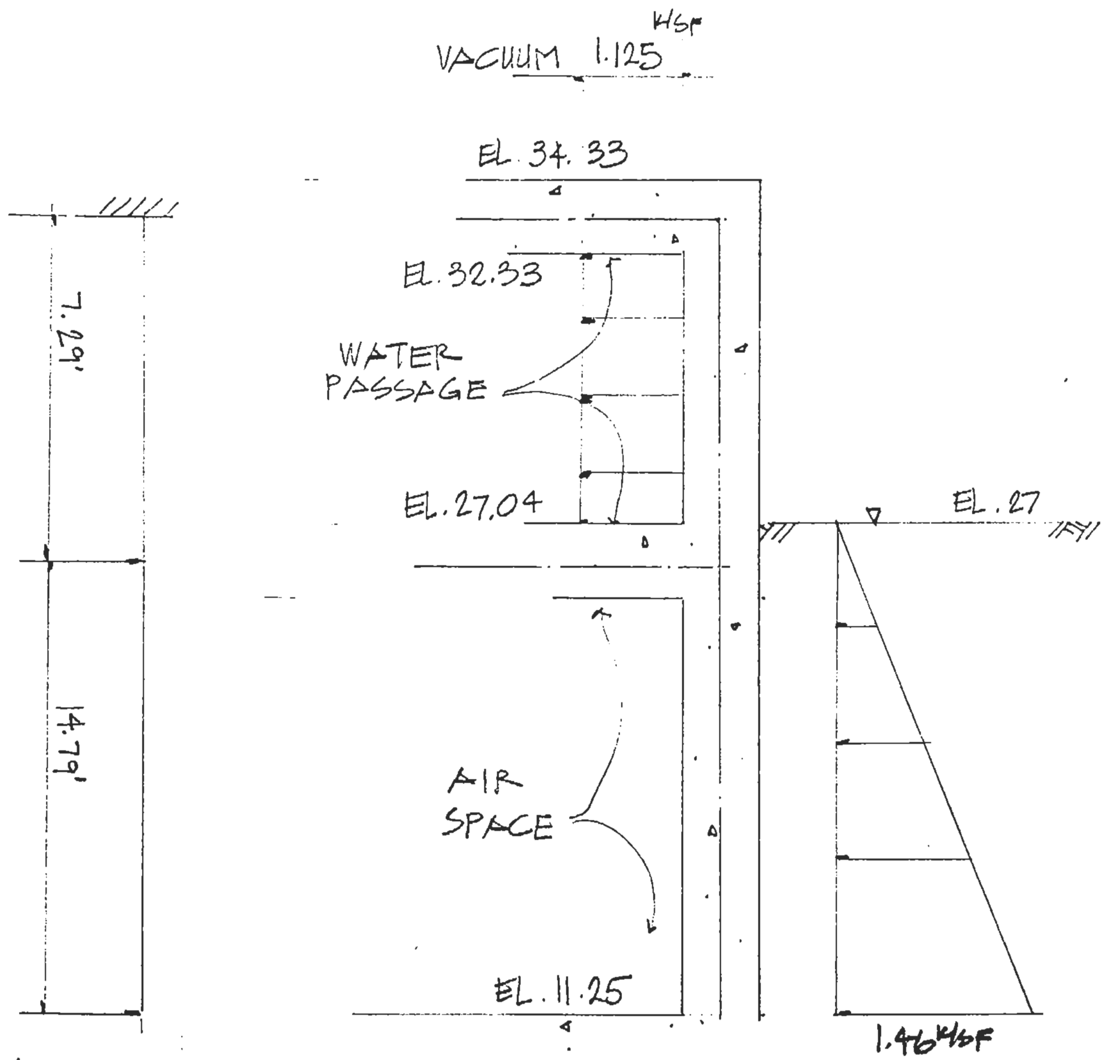
FOR TRAPEZOIDAL LOAD USE AN AVG. LOAD OF $\left(\frac{0.63 + 1.47}{2}\right) = 1.05\ ^{k}/_{sF}$

$\therefore$ TOTAL UDL $= 1.05 \times 1.7 + 1.125 \times 1.4 = 1.78 + 1.58 = 3.36\ ^{k}/_{sF}$

$\therefore$ BM @ FIXED END $= 3.36 \times 9^2/8 = \underline{34.02'^{k}} = M_u$

BM IN SPAN $= \frac{9}{128} \times 9^2 \times 3.36 = \underline{19.13'^{k}}$

2. AT APPROX 40' FROM SO. END OF DISCH. TUBE



WALL SUPPORT CONDITION

LATERAL LOAD ON WALL

--*-*-*-*-*-*-*-*-*-*-*-*-*
PROGRAM CFRAME V02.05 24JUL84
--*-*-*-*-*-*-*-*-*-*-*-*-*

RUN DATE = 95/02/10
RUN TIME = 0.29.35

FRONTING PROTECTION @ DPS NO. 3. WEST WALL

*** JOINT DATA ***

JOINT	X	Y	X	Y	R	KX	KY	KR
			FIXITY					
1	.00	.00	*	*	*			
2	7.29	.00	*	*				
3	22.08	.00	*	*				

*** MEMBER DATA ***

MEMBER	END A	END B	LENGTH	I	A	AS	E	G
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 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

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..

$$MAX\ M_u = 1.7 \times 18.8^{*}$$

$$= 31.92'^{k}$$

* SEE ATTACHED COMP. OUTPUT.

$$\therefore M_u = 31.92'^{k}$$

$\therefore$ LOADS @ GATE STRUCTURE GOVERNS DESIGN.

$$\therefore P_u = 42.41 \quad M_u = 34.02'^{k} \quad L = 9.0' \quad K = 2.0$$

$$r = 3.46 \quad \therefore \frac{KL}{r} = \frac{2 \times 108}{3.46} = 62 > 22$$

$\therefore$ CONSIDER SLENDERNESS IN WALL DESIGN.

$$I_g = \frac{1}{12} \times 12 \times 24^3 = 13824\ in^4$$

$$E_c = 3{,}604\ KSI \qquad ASSUME\ \beta_d = 0.75$$

$$\therefore EI = \frac{13824 \times 3604 / 2.5}{1.75} = 11{,}388{,}816$$

$$\therefore P_c = \frac{\pi^2 \times 11{,}388{,}816}{(2 \times 108)^2} = 2{,}409$$

$$1 - \frac{P_u}{\phi P_c} = 1 - \frac{42.4}{.7 \times 2409} = 0.98$$

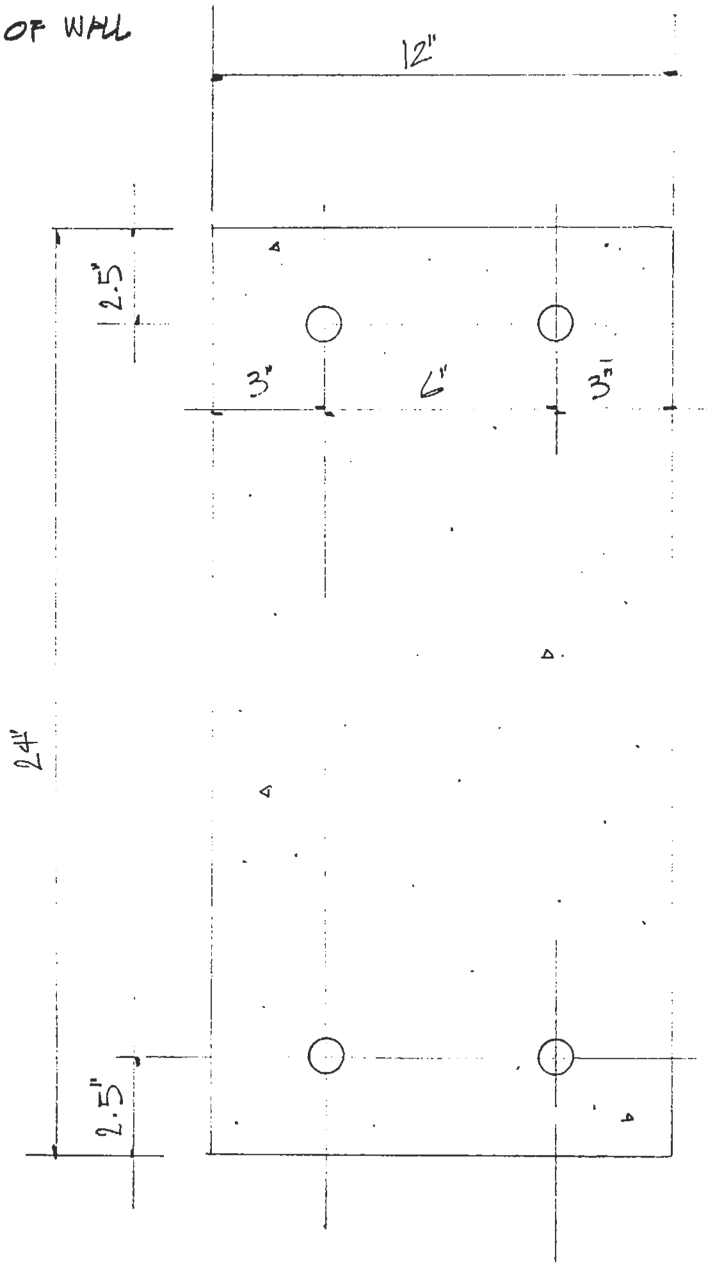
$$\therefore \delta_s = \frac{1}{0.98} = 1.02$$

$$\therefore M_c = 1.02 \times 34.02 = 34.70'^{k}$$

$\therefore$ DESIGN FOR $P_u = 42.40^{k}$ & $M_{ux} = 34.70'^{k}$.

ASSUME $F'_c = 4000$
$F_y = 60000.$

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

$\rho <<< 0.01.$

USE 1% REINF.

$\therefore A_s = 0.01 \times 12 \times 24$

$= 2.88^{\square''}$

USE 4 #8 $\doteq 2.88^{\square''}$ ∴ O.K.

HORIZ. REINF.

$A_s = 0.0025 \times 12 \times 24 = 0.72^{\square''}$

USE #6 BARS @ 12" O.C. $= 0.88^{\square''} > 0.72^{\square''}$ ∴ O.K.

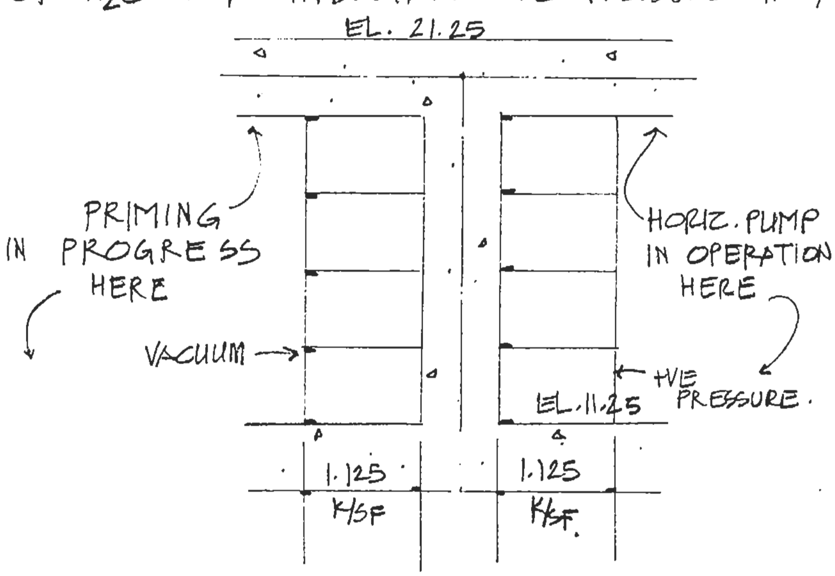
INTERIOR WALL DESIGN (ASSUME 2'-0" TH'K WALL)

AXIAL LOAD

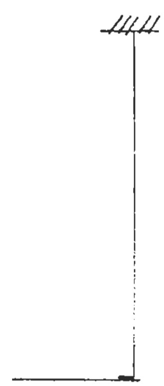
		P_u
1. TOP SLAB	$(2 \times 22.5 \times 0.15) \times 1.4$	9.45^k
2. BOT SLAB		9.45^k
3 LL		7.64^k
4. WATER		15.76^k
5. BACKFILL		26.94^k
6 SELF WT.		15.60
TOTAL P_u =		84.84^k

BENDING MOM DUE TO VACUUM & HYD. STATIC PRESSURE.

1. ASSUME 18'-0" H_2O FOR VACUUM LOAD. ALSO ASSUME 18'-0" OF H_2O FOR HYD. STATIC +VE PRESSURE IN ADJACENT TUBE.



SEC. ADJ. TO GATE STRUCTURE



WALL SUPPORT CONDITION

INTERIOR WALL DESIGN $F'_c = 4000$ $F_y = 60000$.

$$BM \text{ @ FIXED END} = \frac{1.4(2 \times 1.125)}{8} \times 9^2 = 32'^k$$

$\therefore P_u = 85^k$ $M_u = 32'^k$. $b = 12"$ $h = 24"$ $K = 2.0$ $l_u = 108"$

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)

CALC-1

C/6

GATE PROGRAM DESIGN OUTPUT

Quote #:
Project: New Orleans, LA — User: BRUNELLE
Item # 1 — Plan sheet # — Date: 95/07/06
Equipment # — Time: 09:59:07
Location: Pump Station #3

(2) 8[illegible] 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
Disc weight : 7200
Wedge friction : .5
Angle of gate : 90
Stuffing box : N
Bullnose disc : N
Downpull : Y

		Seating	Unseating
Head :	Design	80	29
	Operating	19	19
Force :	Raising	34050	34050
	Lowering	19650	19650

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
Hoist grout pad : 1
Grout/flange proj: 0
Stem to wall : 9.5
Disc travel : 97.38
Open elevation : 12.91
Centerline to nut: 38

Wall bracket : N
Offset pedestal : N
Guide length : 0

Thread elevation : 15.74

CALC-2

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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	

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 raising (lbs.)	Seating Condition lowering (lbs.)	Unseating Condition raising (lbs.)	Unseating Condition lowering (lbs.)
0	34580	19120	34580	19120
8	33170	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	4080	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 35790 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

CALC-4

4/6

GATE PROGRAM DESIGN OUTPUT

Quote #:
Project: New Orleans, LA   User: BRUNELLE
Item # 3   Plan sheet #   Date: 95/07/06
Equipment #   Time: 11:30:09
Location: Pump Station #3

(2) 108 x 96 Series 5140 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

				Seating	Unseating
Friction factor	.35				
Disc weight	10516	Head :	Design	55	23
Wedge friction	.5		Operating	19	19
Angle of gate	90				
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 : 133450 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		

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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 / 2.58	Stems	: 1
Length (ft)	: 21.46	Couplings	: 0
Weight (lbs)	: 528	Tension (psi)	: 25530
Unsupported top(in)	: 286.25	Above floor (in)	: 31.5
Stem factor/TPI	: .029 / 2.5	Thread length (in)	: 105.25

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

CALC-6

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.)	Seating Condition lowering (lbs.)	Unseating Condition raising (lbs.)	Unseating Condition lowering (lbs.)
0	46190	24100	46190	24100
8	46330	24230	37960	15870
16	43190	21100	35080	12990
24	40150	18050	32280	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-1
Service : open/close
Handwheel torque : 1366.48 ft-lb

Allowable stall torque : 3596