LAKE PONTCHARTRAIN, LA.
AND VICINITY

LAKE PONTCHARTRAIN HIGH LEVEL PLAN

DESIGN MEMORANDUM NO. 20

GENERAL DESIGN

ORLEANS PARISH
JEFFERSON PARISH
17th. St. Outfall Canal
(Metairie Relief)

IN TWO VOLUMES

VOLUME II

US Army Corps
of Engineers
New Orleans District

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
MARCH 1990

SERIAL NO.

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 20 - GENERAL DESIGN
17TH STREET OUTFALL CANAL
(METAIRIE RELIEF)

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LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 20 - GENERAL DESIGN
17TH STREET OUTFALL CANAL
(METAIRIE RELIEF)

PERTINENT DATA

Location of Project:

Southeastern Louisiana in Jefferson Parish,
along south shore of Lake Pontchartrain
Orleans/Jefferson Parish line.

Datum Plane	Vertical Datum (NGVD)[1]
Hydrologic Data	
Temperature:	
Maximum monthly	90.6 degrees Fahrenheit
Minimum monthly	45.3 degrees Fahrenheit
Average annual	69.5 degrees Fahrenheit
Annual precipitation:	
Maximum	83.54 inches
Minimum	40.11 inches
Average	61.55 inches
Hydraulic Design Criteria-Tidal	
Design hurricane-	
Standard Project Hurricane (SPH)	
Frequency	1 in 300 years
Central Pressure Index (CPI)	27.6 inches of mercury
Maximum 5-minute avg. wind speed	100 m.p.h.
Radius of maximum winds	30 miles
Average forward speed	6 knots
Still water level	11.5 feet
Floodwall in Existing Levees	
Type of floodwall	
I-Wall length East side	2.38 miles
I-Wall length West side	2.27 miles
Elevation (varies)	14.0 to 16.0 feet

1/ Elevations throughout this DM are in feet referenced to National Geodetic Vertical Datum (NGVD) unless otherwise noted.

PERTINENT DATA (Continued)

Gates

Location	
No. 1, Sta. 2+93.10 W/L & No. 2, Sta. 3+78.00 W/L West Bank; No. 3, Sta. 7+83.09 W/L East Bank	No. 1 swing gate; Nos. 2 & 3 roller gates

Rights-of-Way

Permanent rights-of-way (Existing prior to 1965)	approx. 50 acres
Permanent new rights-of-way	none

Estimated First Cost

Federal	$14,490,000
Non-Federal	$ 6,210,000
Total	$20,700,000

Economics

Remaining Benefit to Remaining Cost Ratio (3.125%)	5.0 to 1
Remaining Benefit to Remaining Cost Ratio (current)	1.9 to 1

Estimated Operations and Maintenance Cost

Average Annual Cost	$17,000

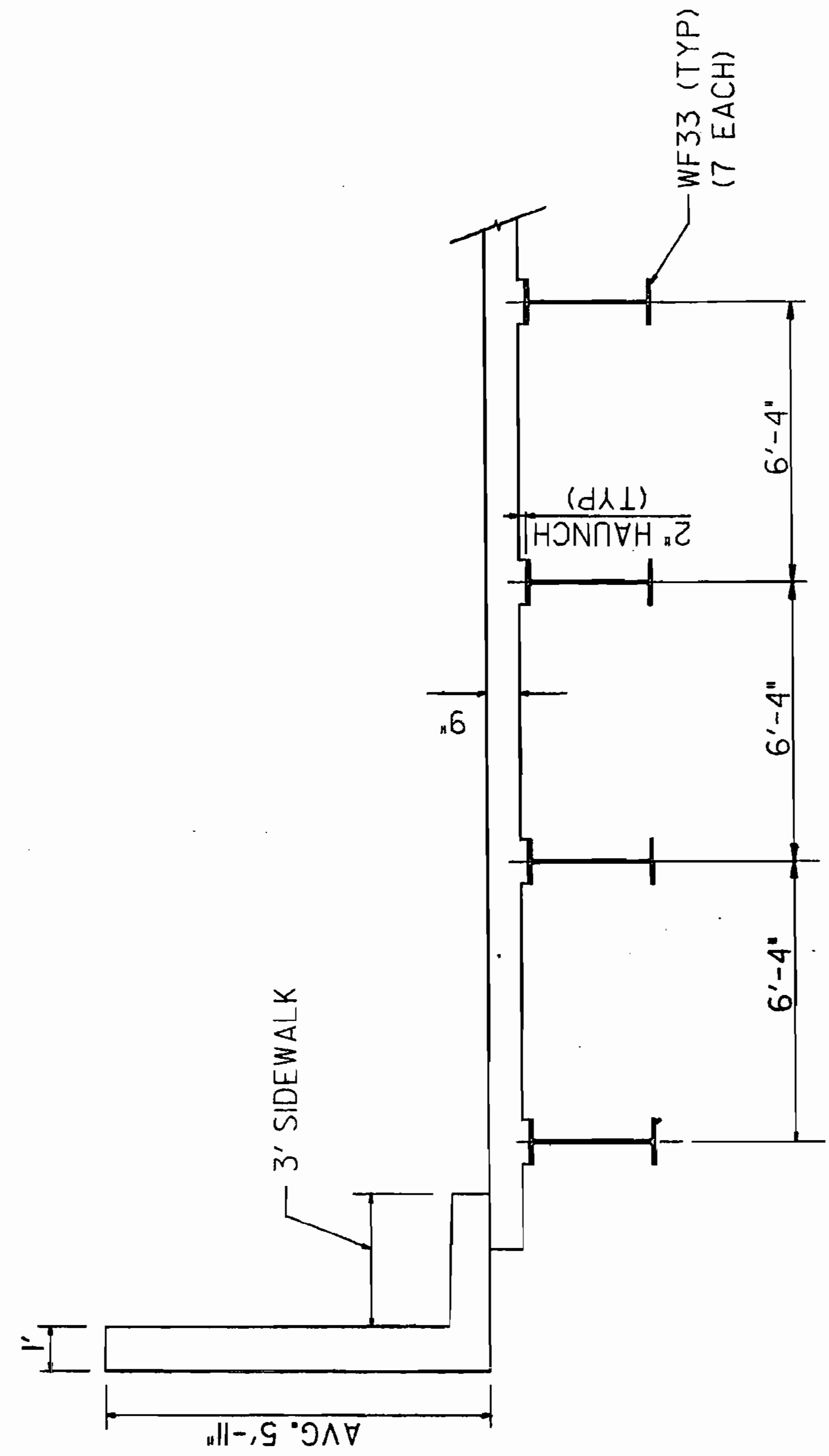
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 20, GENERAL DESIGN
17TH STREET OUTFALL CANAL

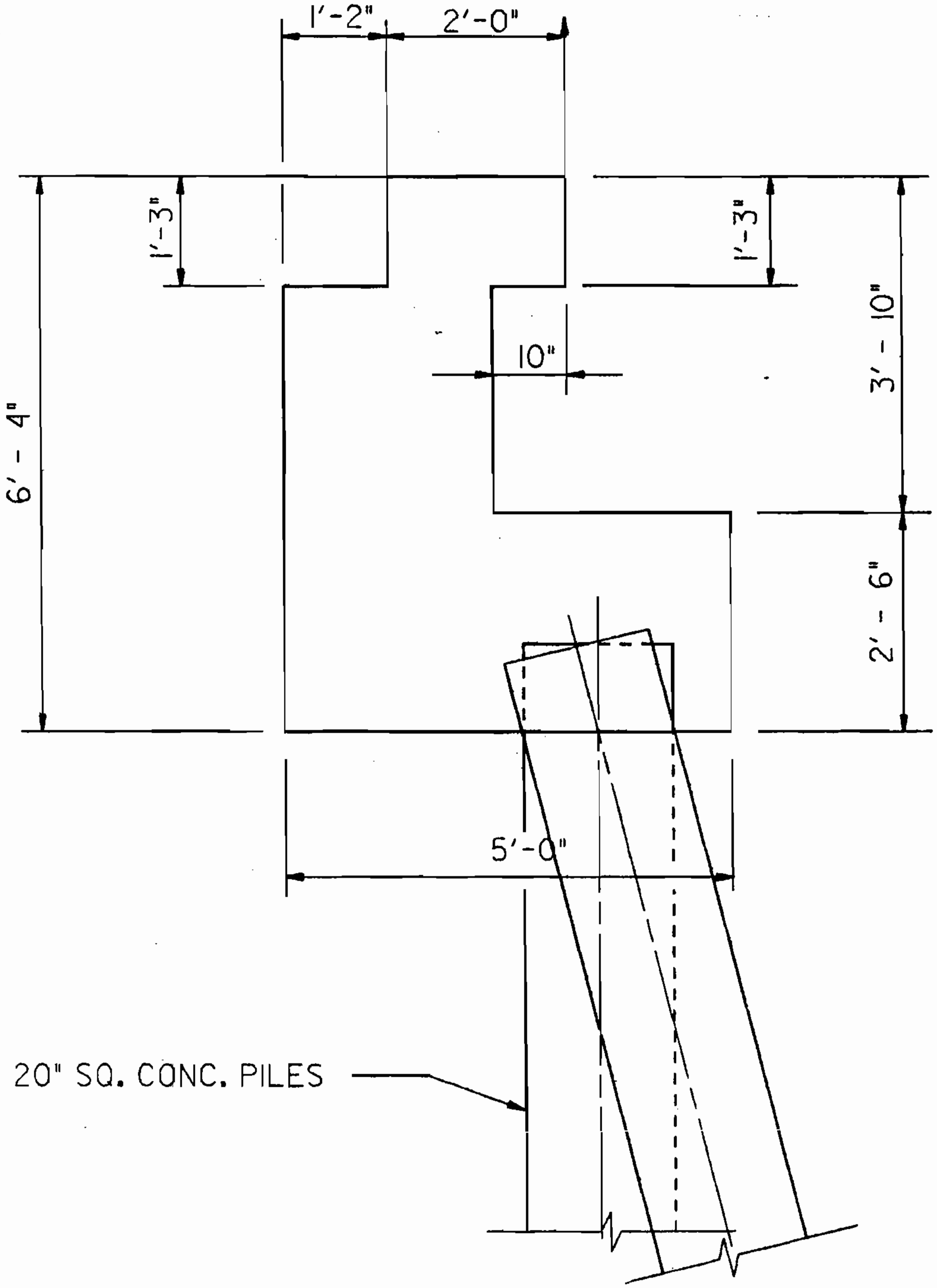
APPENDIX DD

TYPICAL STRUCTURAL DESIGN COMPUTATIONS

APPENDIX DD
VOLUME II

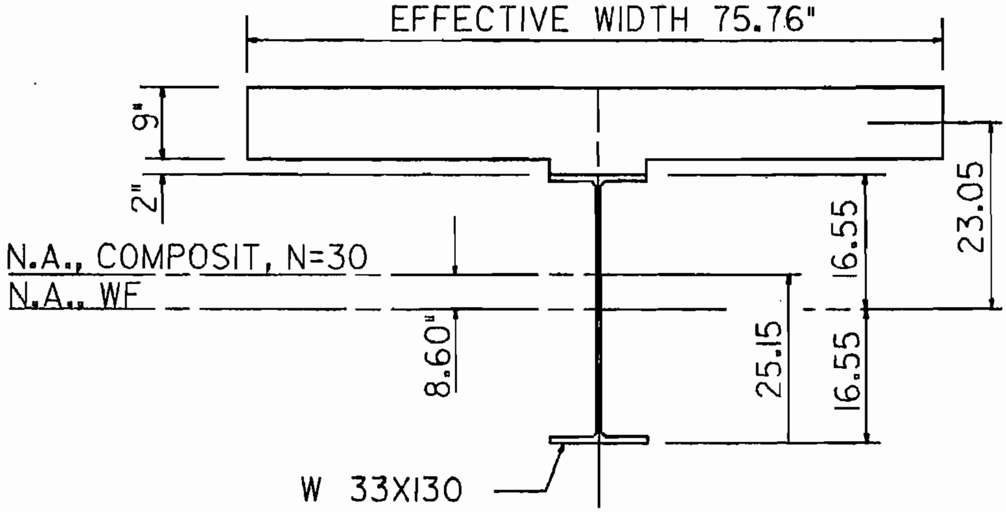
17TH STREET CANAL GDM	PAGE 1/9	DESIGN:MSD	1/15/90
VETERANS BRIDGE		CHECKED:CAL	4/15/90





1'-2"
2'-0"
1'-3"
1'-3"
10"
6' - 4"
3' - 10"
2' - 6"
5'-0"
20" SQ. CONC. PILES

SECTION PROPERTY, COMPOSIT SECTION, N=30 :



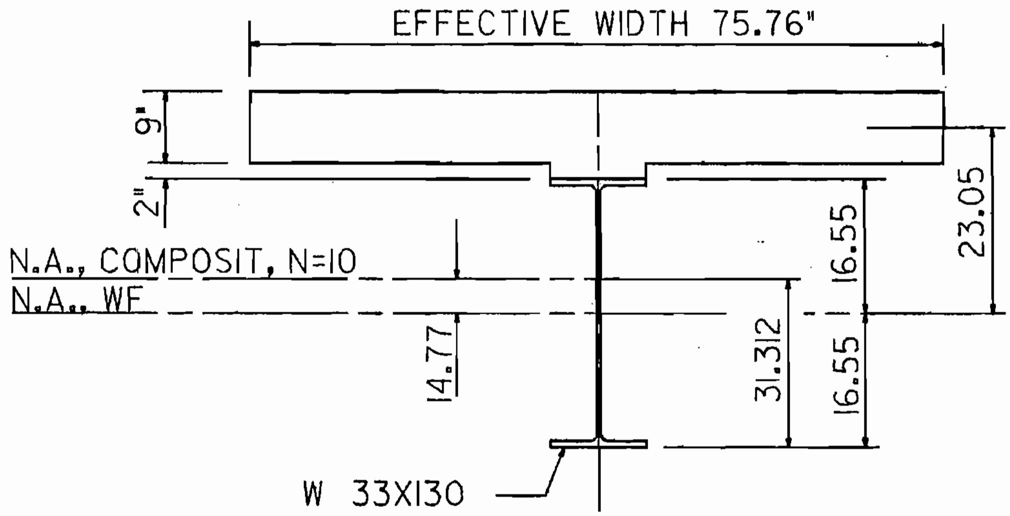
	A	d	Ad	Ad^2	I_0	$Ad^2 + I_0$
W 33X130	38.3	-	-	-	6710	6710
CONC 75.96X9/30	22.80	23.05	525.5	12113	154	12267
	61.1	(8.60)	525.5	12113	6864	18977
				LESS 525.5X8.6=		-4520
						I = 14,457

$S_{TOP/STEEL}$ = 14,457/7.945 =1820 IN^3

$S_{BOTT/STEEL}$ = 14,457/25.15 =575 IN^3

$S_{TOP/CONC}$ = 14457/18.95 =763 IN^3

SECTION PROPERTY, COMPOSIT SECTION, N=10:



	A	d	Ad	Ad^2	I_0	$Ad^2 + I_0$
W 33X130	38.3	_	_	_	6710	6710
CONC . 75.96X9/10	68.36	23.05	15765	36327	461	36788
	106.66	(14.77)	15765	36327	7171	43478
				LESS 1576X14.77	=	-23278
						I = 20,220

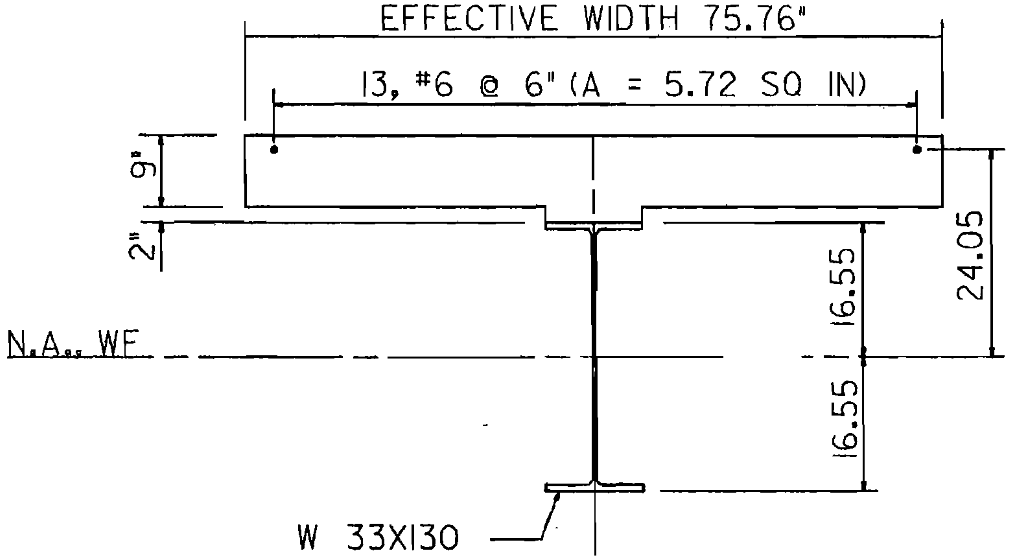
$S_{TOP/STEEL}$ = 20,220/1.775 =11,392 IN^3

$S_{BOTT/STEEL}$ = 20,220/31.312 = 646 IN^3

$S_{TOP/CONC}$ = 20,220/12.78 = 1582 IN^3

17TH STREET CANAL GDM	PAGE 5/9	DESIGN:MSD	1/15/90
VETERANS BRIDGE		CHECKED:CAL	4/15/90

COMPOSITE SECTION FOR -M, NEGLECT CONC. USE #6 @ 6



	A	d	Ad	Ad^2	I_0	$Ad^2 + I_0$
W 33X130	38.3	-	-	-	6710	6710
REINF BARS 13,#6 BARS	5.72	24.05	137.5	3308	-	3308
	44.02	(3.12)	137.5	3308	6710	10018
				LESS 137.5X3.12 =		-429
						9,588

$S_{TOP/STEEL} = 9588/13.43 = 714 \ IN^3$

$S_{BOTT/STEEL} = 9588/19.67 = 488 \ IN^3$

$S_{REINF.\ BAR} = 9588/20.93 = 458 \ IN^3$

DEAD LOAD (DL)

END SPAN , L = 40'

SLAB	(9/12)X6.33X0.15	= 0.712 k/ft
HAUNCH	(2/12)X1.50X0.15	= 0.038 k/ft
WF SECTION		= 0.130 k/ft
MISC. (20% WF WT.)		= 0.026 k/ft
	TOTAL	= 0.906

M_{DL} = 181.20 ft-k
V_{DL} = 18.12 k

SUPERIMPOSED DL (SDL)

PARAPET	= (1/7)X5.08X1X2X0.15	= 0.218 k/ft
SIDEWALK	= (1/7)X3X(10/12)X2X0.15	= 0.107 k/ft
WEARING SURFACE	= 0.02X6.33	= 0.127 k/ft
	TOTAL	= 0.452

M_{SDL} = 90.40 ft-k
V_{SDL} = 9.04 k

LIVE LOAD (LL)

a. HS-20 44 TRUCK LOAD

M_{LL} = 449.80 ft-k

V_{LL} =55.2

LL DISTR. FACTOR = 6.33/11 = 0.576

IMPACT = 50/(40+125) = 0.303 USE MAX. 30%

M_{LL+I} = 337 ft-k
V_{LL+I} = 41.3 k

LIVE LOAD (CONT)

b. HYDRAULIC LOAD

WATER TO EL. 14.5

UPLIFT HEAD = AVG. HT/PARAPET + SIDEWALK + SLAB

UPLIFT LOAD = 6.66X0.064X6.33 = =2.70

$-M_{LL} = 540^{ft-k}$
$-V_{LL} = 54^{k}$

STRESS IN WF-SECTION

	AT TOP/SECTION		AT BOTTOM/SECTION	
CASE I:				
DL	181.2X12/406	= 5.36	181.2X12/406	= 5.36
SDL	90.4X12/1820	= 0.60	90.4X12/575	= 1.89
LL + I (TRUCK)	337X12/11392	= 0.36	337X12/646	= 6.26
		6.32 COMP	< 20	13.51 TEN
CASE II:				
DL	181.2X12/406	= 5.36	181.2X12/406	= 5.36
SDL	90.4X12/1820	= 0.60	90.4X12/575	= 1.89
HYDR	-540X12/7142	= -9.08	-540X12/488	=-13.28
	Σ	3.12 TEN	< 20	6.03 COMP

STRESS IN CONC

CASE I:

SDL	90X12/(763X30)	= 0.047
LL + I (TRUCK)	337X12/(1582X10)	= 0.256
	Σ	0.303 < 1.2

STRESS IN CONC (CONT)

CASE II:

SDL	90X12/458	= 2.36
LL + I	-540X12/458	= -14.15
		11,79 TEN < 20

WEB SHEAR

CASE I:

V_{DL} = 18.12
V_{SDL} = 9.04
V_{LL+I} = 41.30

$\sum$ 68.46   v =68.46/(33.09X0.58) =3.57
< 12

ANCHOR (WF TO PIER CAP)

CASE II:

V_{DL} = 18.12
V_{SDL} = 9.04
V_{HYD} = -54.0

$\sum$ -26.84^{K} UPLIFT

REQUIRED A = 26.84/18 = 1.47 SQ. IN

PROVIDE 2-1"Φ ANCHORS AT EACH GIRDER

PILE BENT AT ABUTMENT
(CHECK FOR UPLIFT)

DL REACTIONS

a. SUPER STRUCTURE

DECK	42.14X.75X.15X20	= 94.82
HAUNCH	7X1.5X0.167X.15X20	= 5.32
GIRDER	7X0.130X20	= 18.20
SDL	0.452X7X20	= 63.28

b. ABUTMENT

2.5X5X49.33X0.15	= 92.49
3.83X0.83X40X0.15	= 19.07
1.17X2.83X40X0.15	= 19.87
1.17X1.83X40X0.15	= 12.85
5.17X4.67X3.17X0.15	= 11.48
4.17X4.67X3.17X0.15	= 9.26

$\sum$ DL = 346.64^{k}

LIVE LOAD (HYDR. LOAD)

CASE I: HWL = 12.5

ON SUPER STRUCTURE

UPLIFT HEAD = 3.08 + 0.83 + 0.75 = 4.66

UPLIFT LOAD = 4.66X0.064X47.33X20 = -282.3^{k}

ON SUB STRUCTURE

UPLIFT HEAD = 3.08 + 0.83 + 3.83 +2.5 =10.24

UPLIFT LOAD = 10.24X0.64X49.33X5 = -161.6^{k}

$\sum$ CASE I: = 346.64 -282.3 -161.6 = -97.26

CASE II: HWL = 12.5 + 2 =14.5

ON SUPER STRUCTURE

UPLIFT LOAD = 6.66X0.064X47.33X20 = -403.5^{k}

ON SUB STRUCTURE

UPLIFT LOAD = 12.24X0.64X49.33X5 = -193.2^{k}

$\sum$ CASE II: = 346.64 -403.5 -193.2 = -250.06

CONTROLS

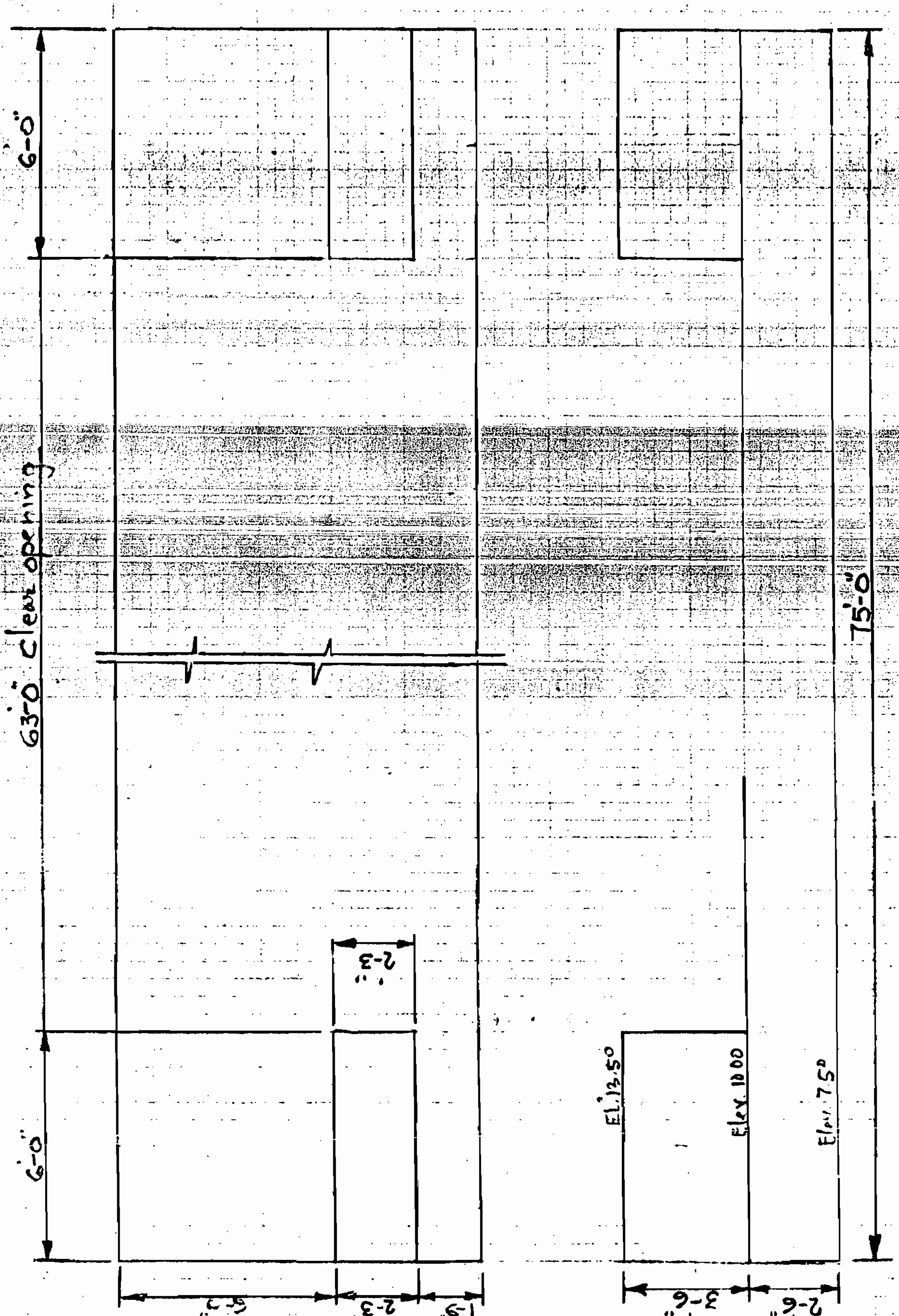
CAPACITY OF EXIST PILES = 5X47.8 + 2X47.8X4/4.12

= $331.82^{k} > 250.06^{k}$

NO EXTRA PILES NEEDED, HOWEVER PROVIDE 2-12" SQ CONCRETE PILES

COMPUTATION SHEET

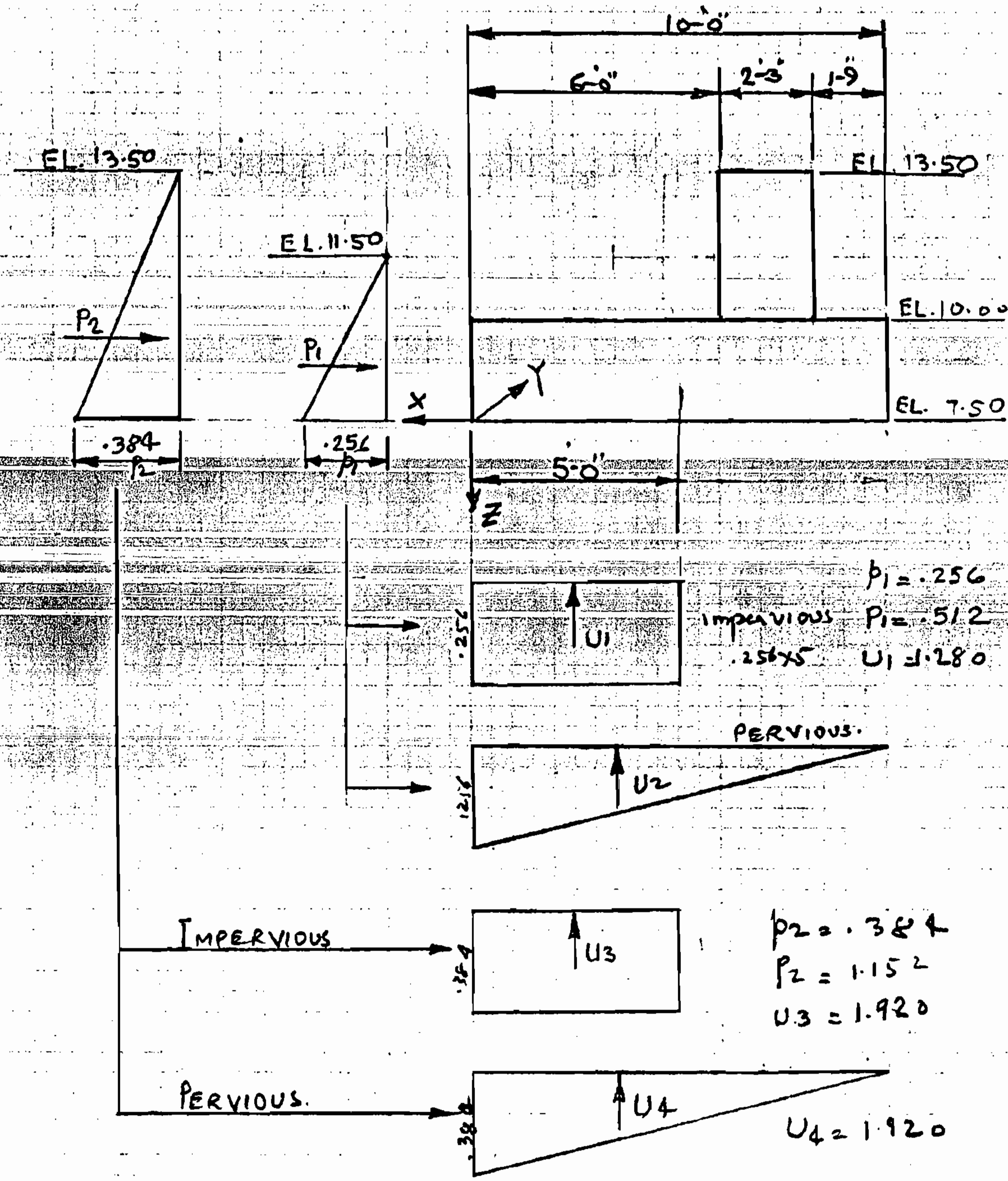
PROJECT 17th Street Canal G.D.M.	PAGE 1 OF 18	COMPUTED BY S A.	DATE 10/31/89
SUBJECT Roller Gate Monolith		CHECKED BY MSD	DATE 3/90



LMV FORM MAR 82 107a PREVIOUS EDITIONS MAY BE USED (FOR USE WITH 8 x 8 GRID)

COMPUTATION SHEET

PROJECT 17th Street CANAL G.D.M.	PAGE 2 OF 16	COMPUTED BY S.A.	DATE 10/27
SUBJECT Roller gate Monolith		CHECKED BY MSD	DATE 3/90



impervious $p_1 = .256$

$P_1 = .512$

$.256 \times 5$ $U_1 = 1.280$

$p_2 = .384$

$P_2 = 1.152$

$U_3 = 1.920$

$U_4 = 1.920$

COMPUTATION SHEET

PROJECT 17th Street CANAL G.D.M.	PAGE 3 OF 18	COMPUTED BY J.A.	DATE 4/85
SUBJECT Roller GATE MONOLITH		CHECKED BY MSD	DATE 3/90

DEAD LOADS

	Fx	FZ	L.A.	MY-Y
Base slab = 1x75x10x2.50x.150	—	281.25	5.00	1406.25
Columns = 2x6.50x2.25x3.50x.150	—	15.36	7.125	109.44
GATE CLOSED Position	—	12.50	7.125	89.06
Σ D.L.		309.11		1604.75

HYDRAULIC LOADS

	Fx	FZ	L.A.	MY-Y
a. Water to (S.W.L.) Elev. 11.50				
Down water = 6x1.50x75x.064		43.20	3.00	129.60
uplift Imp. = 4x.064x5x75.0		-96.00	2.50	-240.00
Pervious = 4x.064x$\frac{10}{2}$x75.0		-96.00	3.33	-320.00
HORIZ. = (4x.064)x4/2x75.0	-38.40		1.33	51.10
b. Water to (SWL+2) Elev. 13.50				
Down Water = 6x3.50x75x.064		100.80	3.00	302.40
uplift Imp. = 6x.064x5x75.0		-144.00	2.50	-360.00
uplift Perv. = 6x.064x$\frac{10}{2}$x75.0		-144.00	3.33	-480.00
HORIZ. = (6x.064)x6/2x75.0	-86.4		2.00	172.80

WIND LOADS

	Fx	FZ	L.A.	MY-Y
From Flood-side = 3.50x.05x75	-13.13		4.25	55.80
From Prot. side = 3.50x.05x75	13.13		4.25	-55.80

TRUCK-LOADING-HS 20-44

	FZ	$\bar{X}$	$\bar{Y}$	Mx-x	My-Y
4 trucks on F.S. Edge	128	10	1.2	160	1280.00

COMPUTATION SHEET

PROJECT 17th Street CANAL G.D.M	PAGE 4 OF 18	COMPUTED BY S.A.	DATE 10/27
SUBJECT Roller Gate Monolith		CHECKED BY MSD	DATE 3/90

SUMMARY
OF
LOAD CASES

CASE No 1. WATER To EL. 11.50, IMPERVIOUS Seepage AND No Dynamic Wave Force (100%)

DESCRIPTION	Fx	Fy	Fz	Mx-x	My-y	Mz-z
D.L. CONC.	—	—	309.11	—	1604.75	—
WATER DOWN	—	—	43.20	—	129.60	—
UPLIFT (Imp.)	—	—	-96.00	—	-240.00	—
HORIZ.	-38.40	—	—	—	51.10	—
TOTAL	-38.40	—	256.31	—	1545.55	

CASE-No. 2 WATER To Elev. 11.50, Pervious seepage and no dynamic WAVE FORCE (100%)

Description	Fx	Fy	Fz	Mx-x	My-y	Mz-z
D.L. CONC.	—	—	309.11	—	1604.75	—
WATER DOWN	—	—	43.20	—	129.60	—
UPLIFT (Perv.)	—	—	-96.00	—	-320.00	—
HORIZ.	-38.40	—	—	—	51.10	—
TOTAL	-38.40	—	256.31	—	1465.45	—

CASE-NO. 3: WATER TO Elev. 13.50, NO WIND, Impervious seepage & No DYNAMIC WAVE FORCE (75%)

Description	Fx	Fy	Fz	Mx-x	My-y	Mz-z
D.L. CONC.	—	—	309.11	—	1604.75	—
WATER DOWN	—	—	100.80	—	302.40	—
Imp. uplift	—	—	-144.00	—	-360.00	—
HORIZ.	-86.4	—	—	—	172.80	—
100%	-86.4	—	265.91	—	1719.95	—
75%	-65.0		200.00		1290.00	

LMV FORM MAR 82 107a PREVIOUS EDITIONS MAY BE USED (FOR USE WITH 8 x 8 GRID)

PROJECT 17TH Street CANAL G·D·M	PAGE 5 OF 18	COMPUTED BY S.A.	DATE 10/27
SUBJECT Roller GATE MONOLITH		CHECKED BY MSD	DATE 3/90

CASE 4: WATER TO Elev. 13.50, NO WIND, Pervious seepage And no Dynamic WIND FORCE (75%)

DESCRIPTIONS	Fx	FY	FZ	Mx-x	My-y	Mz-z
CONC. DL.	—	—	309.11	—	1604.75	—
WATER DOWN	—	—	100.80	—	302.40	—
UPLIF (PERV.)	—	—	-144.00	—	-480.00	—
HORIZ.	-86.4	—	—	—	172.80	—
100% TOTAL	-86.4	—	265.91	—	1599.95	—
75% TOTAL	-65.0	—	200.00	—	1200.00	—

CASE NO. 5: NO WATER, NO WIND (100%)

DESCRIPTIONS	Fx	FY	FZ	Mx-x	My-y	Mz-z
DL. CONC	—	—	309.11	—	1604.75	—
100% TOTAL	—	—	309.11	—	1604.75	—

CASE No. 6: NO WATER, WIND FROM PROT. SIDE (75%)

DESCRIPTIONS	Fx	FY	FZ	Mx-x	My-y	Mz-z
D.L. CONC.	—	—	309.11	—	1604.75	—
P.S. wind Force	—	—	13.13	—	-55.80	—
100% TOTAL	—	—	322.24	—	1548.95	—
75% TOTAL	—	—	241.68	—	1161.71	—

CASE No. 7: NO WATER, WIND FROM FLOOD-SIDE (75%)

DESCRIPTIONS	Fx	FY	FZ	Mx-x	My-y	Mz-z
DL. CONC.	—	—	309.11	—	1604.75	—
F.S. WIND FORCE	—	—	-13.13	—	55.80	—
100% TOTAL	—	—	295.98	—	1660.55	—
75% TOTAL	—	—	221.99	—	1245.41	—

COMPUTATION SHEET

PROJECT 17th Street CANAL	PAGE 6 OF 18	COMPUTED BY S.A.	DATE 10/30
SUBJECT Roller Gate Monolith		CHECKED BY MSJ	DATE 3/96

LOAD CASE 8: D.L. & HS20-44 TRUCK LOADING
Flood side

Description	Fx	FY	FZ	Mx-x	My-Y	Mz-Z
D.L. Conc	—	—	309.11	—	1604.75	—
TRUCK-LOAD	—	—	128	160.0	—	—
TOTAL	—	—	437.11	160	1604.75	—

LOAD CASE 9: D.L. & HS-20-44 TRUCK LOAD, PROT. SIDE

Description	Fx	FY	FZ	Mx-x	My-y	Mz-Z
D.L. Conc	—	—	309.11	—	1604.75	—
TRUCK LOAD	—	—	128	160	1280	—
TOTAL	—	—	437.11	160	2884.75	—

LOAD SUMMARY

DESCRIPTIONS	Fx	FY	FZ	Mx-x	My-y	Mz
LOAD CASE 1	-38.40	—	256.31	—	1545.55	—
LOAD CASE 2	-38.40	—	256.31	—	1465.45	—
LOAD CASE 3	-65.00	—	200.00	—	1290.00	—
LOAD CASE 4	-65.00	—	200.00	—	1200.00	—
LOAD CASE 5	—	—	309.11	—	1604.75	—
LOAD CASE 6	—	—	241.68	—	1161.71	—
LOAD CASE 7	—	—	221.99	—	1245.41	—
LOAD CASE 8	—	—	437.11	160.0	1604.75	—
LOAD CASE 9	—	—	437.11	160.0	2884.75	—

STIFFNESS MATRIX FOR CPGA (3D PILE)

* KhB =	.15 ksi	Ec =	4074 ksi
I1 =	1728 cu in	I2 =	1728 cu in
A =	144 sq in	L =	50 ft
R1 =	82.8 in	R2 =	82.8 in

STIFFNESS COEFFICIENT	FIXITY CONSTANT Co	RESULT
B11 =	1	8.782
B22 =	1	8.782

B33 = 1955.5

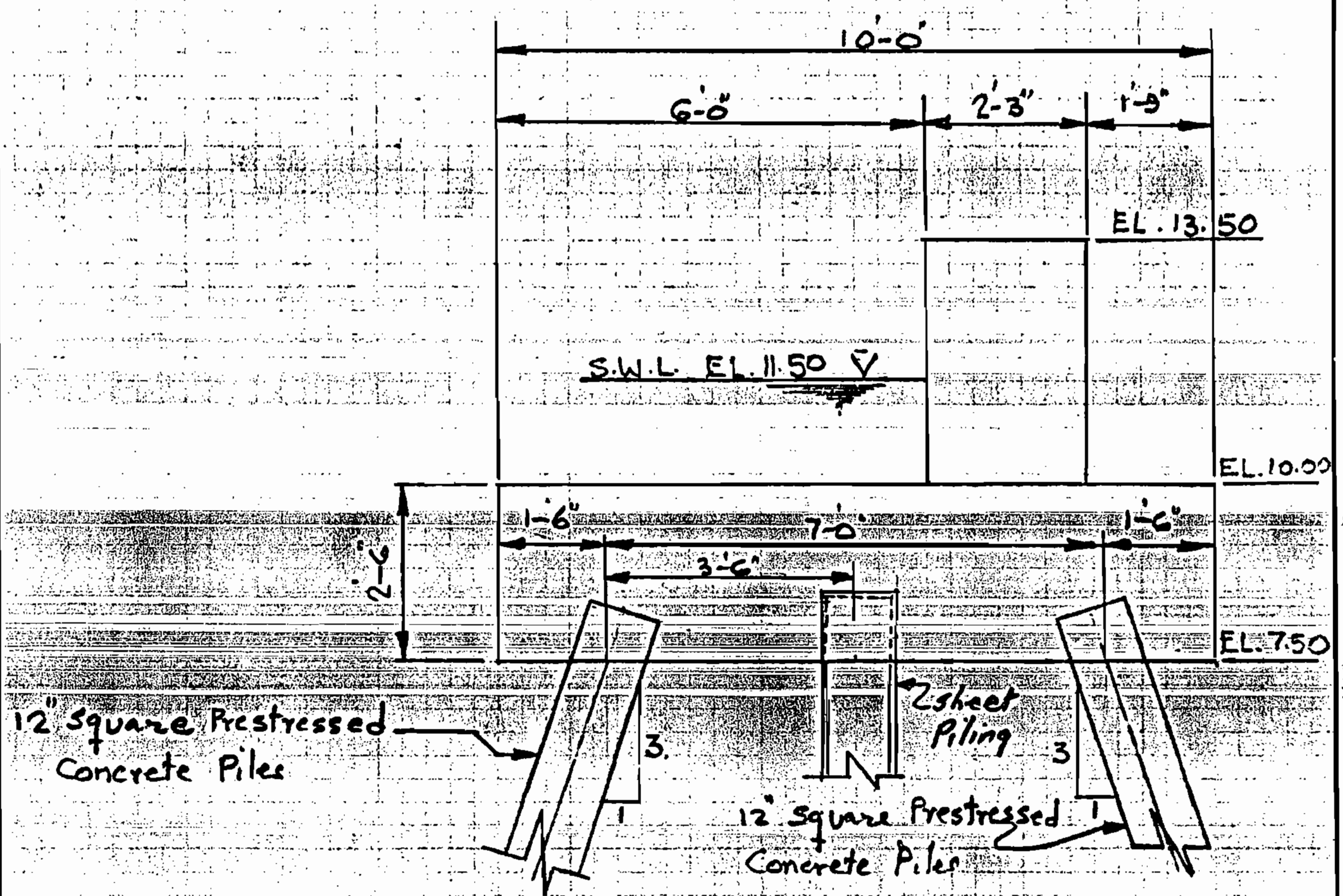
KMP1 = 37.7
KMP2 = 37.7

* -- LOW Kh VALUE TO ACCOUNT FOR GROUP AFFECTS
OF TIMBER PILES 1,2,4,5.

NOTE : ABOVE COMPUTATIONS ARE FOR FLOODWALLS WITH CONSTANT SUBGRADE MODULUS, FULLY EMBEDDED PILES AND FOLLOW THE CALCULATIONS PRESENTED ON PAGE B35 OF THE CPGA MANUAL.

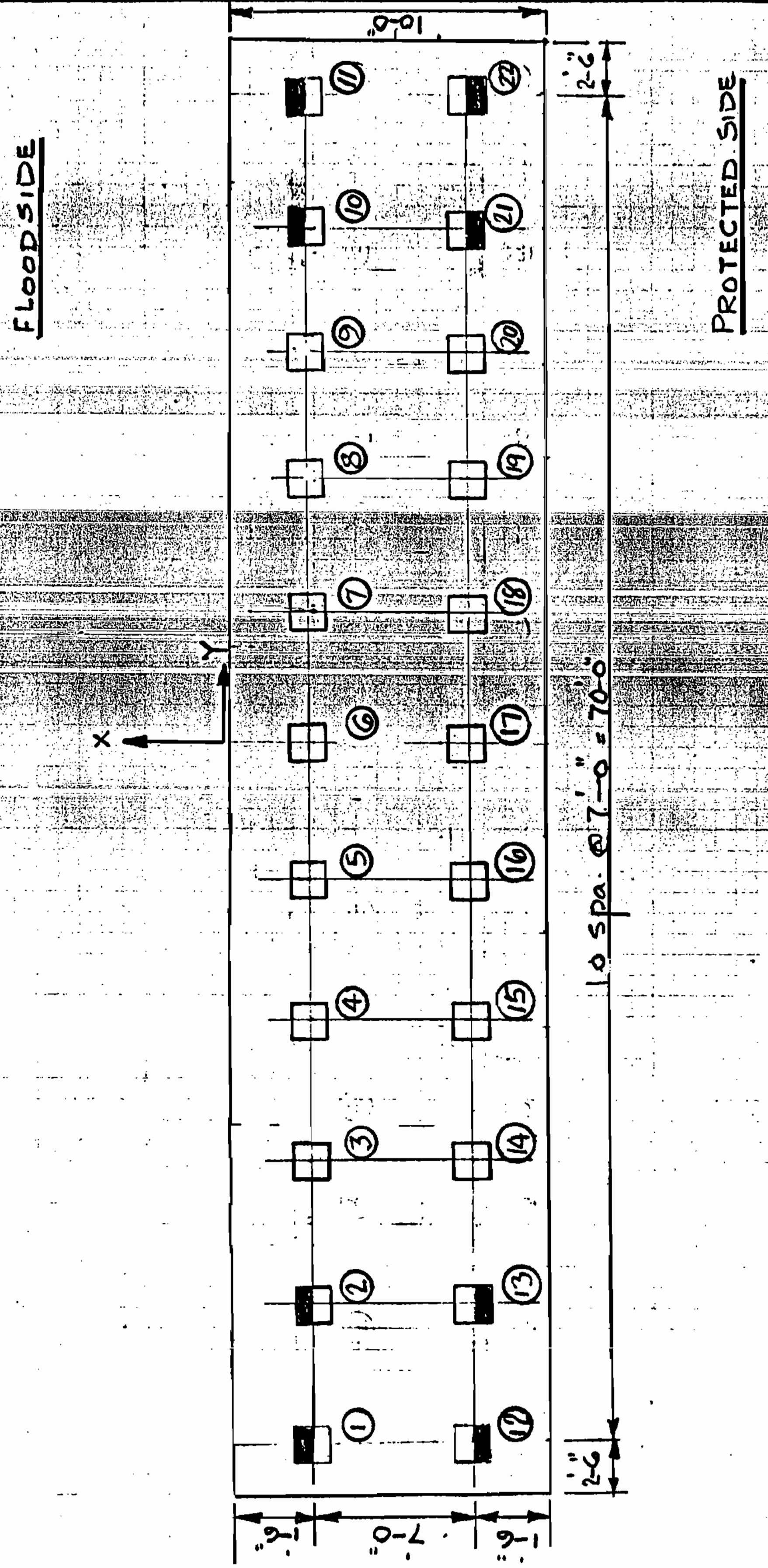
COMPUTATION SHEET

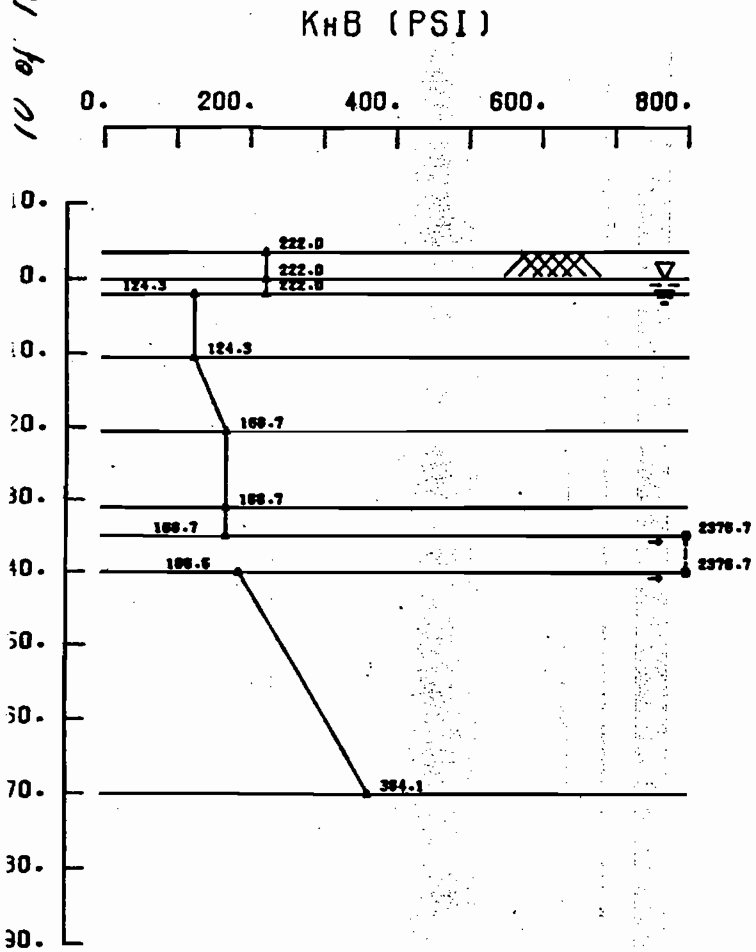
PROJECT 17TH street CANAL G.D.M	PAGE 8 OF 18	COMPUTED BY S.A.	DATE 11/1/89
SUBJECT Roller GATE MONOLITH		CHECKED BY MSD	DATE 3/90



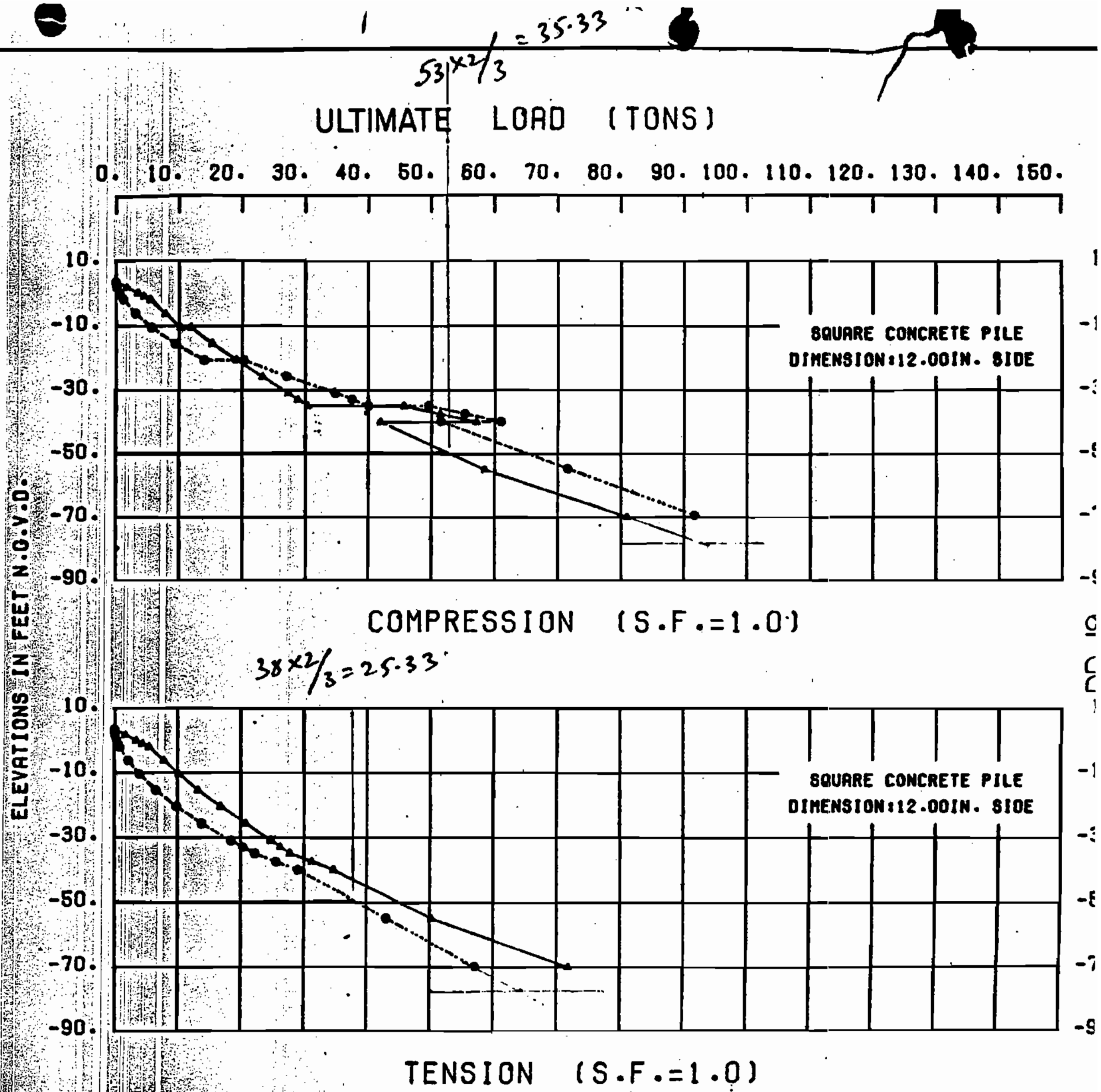
COMPUTATION SHEET

PROJECT 17TH Street Canal G.D.M	PAGE 9 OF 18	COMPUTED BY S.A.	DATE 11/1/89
SUBJECT DESIGN OF GATE MONOLITH		CHECKED BY MJD	DATE 3/90





NOTES: $K_H = \alpha K_1/B = (0.2222 qu/B)(C)(D)$ COHESIVE
α = 0.4 = Factor of material properties of soil and pile
k_1 = Modulus of subgrade reaction for test plate (pci)
B_1 = Width or diameter of test plate (in)
$K_1 = k_1 B_1$ = 80 qu (psf) = 0.5556 qu (psi)
qu = 2·c = Unconfined compressive strength (psf)
C = Reduction for cyclic loading-not applicable
D = Group effect reduction factor
B = Width of pile measured at right angles to the direction of displacement (in)
K_H = (nh)(Z/B)(C)(D) COHESIONLESS
nh = Coefficient of horizontal subgrade reaction (pci)
Z = Depth below equivalent ground surface (in)



THE FACTOR SHOWN, (MODULUS OF HORIZONTAL SUBGRADE K_h, TIMES THE PILE WIDTH IN INCHES (B), MEASURED AT RIGHT ANGLES TO THE DIRECTION OF DISPLACEMENT) MUST BE MODIFIED BY A REDUCTION FACTOR FOR THE EFFECT OF GROUP ACTION (D) AND A REDUCTION FACTOR FOR CYCLIC LOADING (C) EX: $K_h = \frac{0.2222\, qu\, (C)(D)}{(B)}$

------ S-CASE
—— Q-CASE

NOTE: ALLOWABLE CAPACITIES SHOULD BE DETERMINED INCORPORATING F.S.=2.0 WITH PILE TEST OR F.S.=3.0 WITHOUT PILE TEST.

17TH ST OUTFALL CANAL GDM
HAMMOND HIGHWAY FLOODGATE
12" SQUARE PRESTRESSED CONCRETE PI
PILE CAPACITY CUR

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW ORL
JUNE 19

```
$ 10 17TH STREET CANAL G.D.M.-
20 ROLLER GATE MONOLITH DESIGN (A:ROLLER)
30 BIJ 8.782 8.782 1955.5 Ø Ø Ø Ø Ø ALL
40 TENSION Ø.8 ALL
5Ø DLS S 35.33 25.33 539.4 182.Ø 73.7 939.Ø 775.Ø H 12 ALL
6Ø ASC S 144 288 Ø.84 .9975 1.75 Ø ALL
7Ø PMAXMOM 37.7 37.7 ALL
8Ø BATTER 3 1 2 9 TO 13 21 22
9Ø ANGLE ØØ 1 TO 11
ØØ ANGLE 18Ø 12 TO 22
1Ø PILE 1 -1.5 -35 Ø 2 -1.5 -28 Ø 3 -1.5 -21 Ø 4 -1.5 -14 Ø
2Ø PILE 5 -1.5 -7 Ø 6 -1.5 Ø Ø 7 -1.5 7 Ø 8 -1.5 14 Ø
3Ø PILE 9 -1.5 21 Ø 1Ø -1.5 28 Ø 11 -1.5 35 Ø 12 -8.5 -35 Ø
4Ø PILE 13 -8.5 -28 Ø 14 -8.5 -21 Ø 15 -8.5 -14 Ø 16 -8.5 -7 Ø
5Ø PILE 17 -8.5 Ø Ø 18 -8.5 7 Ø 19 -8.5 14 Ø 2Ø -8.5 21 Ø
6Ø PILE 21 -8.5 28 Ø 22 -8.5 35 Ø
7Ø LOAD 1 -38 Ø 256 Ø 1546 Ø
8Ø LOAD 2 -38 Ø 256 Ø 1465 Ø
9Ø LOAD 3 -65 Ø 2ØØ Ø 129Ø Ø
ØØ LOAD 4 -65 Ø 2ØØ Ø 12ØØ Ø
1Ø LOAD 5 Ø Ø 3Ø9 Ø 16Ø5 Ø
2Ø LOAD 6 Ø Ø 242 Ø 1162 Ø
3Ø LOAD 7 Ø Ø 222 Ø 1245 Ø
4Ø LOAD 8 Ø Ø 437 16Ø 16Ø5 Ø
5Ø LOAD 9 Ø Ø 437 16Ø 2885 Ø
6Ø FOUT 1 2 3 4 5 A:ROLOUT
7Ø PSO 1
8Ø PFO ALL
```

```
 ********************************
* CORPS PROGRAM  #  X0080     *  CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 88/11/02   *  RUN DATE 90/04/26  RUN TIME  8.06.00
********************************

17TH STREET CANAL G.D.M.
ROLLER GATE MONOLITH DESIGN (A:ROLLER)

THERE ARE  22 PILES AND
          9 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                    X          Y          Z
                                  -----      -----      -----
WITH DIAGONAL COORDINATES = (     -8.50 ,    -35.00 ,      .00 )
                            (     -1.50 ,     35.00 ,      .00 )


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

        PILE STIFFNESSES AS INPUT

  .87820E+01   .00000E+00   .00000E+00   .00000E+00   .00000E+00   .00000E+00
  .00000E+00   .87820E+01   .00000E+00   .00000E+00   .00000E+00   .00000E+00
  .00000E+00   .00000E+00   .19555E+04   .00000E+00   .00000E+00   .00000E+00
  .00000E+00   .00000E+00   .00000E+00   .00000E+00   .00000E+00   .00000E+00
  .00000E+00   .00000E+00   .00000E+00   .00000E+00   .00000E+00   .00000E+00
  .00000E+00   .00000E+00   .00000E+00   .00000E+00   .00000E+00   .00000E+00

THIS MATRIX APPLIES TO THE FOLLOWING PILES -

   1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16
    ALL


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

        PILE GEOMETRY AS INPUT AND/OR GENERATED
```

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-1.50	-35.00	.00	3.00	.00		P
2	-1.50	-28.00	.00	3.00	.00		P
3	-1.50	-21.00	.00	V	.00		P
4	-1.50	-14.00	.00	V	.00		P
5	-1.50	-7.00	.00	V	.00		P
6	-1.50	.00	.00	V	.00		P
7	-1.50	7.00	.00	V	.00		P
8	-1.50	14.00	.00	V	.00		P
9	-1.50	21.00	.00	3.00	.00		P
10	-1.50	28.00	.00	3.00	.00		P
11	-1.50	35.00	.00	3.00	.00		P
12	-8.50	-35.00	.00	3.00	180.00		P
13	-8.50	-28.00	.00	3.00	180.00		P
14	-8.50	-21.00	.00	V	180.00		P

15	-8.50	-14.00	.00	V	180.00	P
16	-8.50	-7.00	.00	V	180.00	P
17	-8.50	.00	.00	V	180.00	P
18	-8.50	7.00	.00	V	180.00	P
19	-8.50	14.00	.00	V	180.00	P
20	-8.50	21.00	.00	V	180.00	P
21	-8.50	28.00	.00	3.00	180.00	P
22	-8.50	35.00	.00	3.00	180.00	P

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	-38.0	.0	256.0	.0	1546.0	.0
2	-38.0	.0	256.0	.0	1465.0	.0
3	-65.0	.0	200.0	.0	1290.0	.0
4	-65.0	.0	200.0	.0	1200.0	.0
5	.0	.0	309.0	.0	1605.0	.0
6	.0	.0	242.0	.0	1162.0	.0
7	.0	.0	222.0	.0	1245.0	.0
8	.0	.0	437.0	160.0	1605.0	.0
9	.0	.0	437.0	160.0	2885.0	.0

****

ORIGINAL PILE GROUP STIFFNESS MATRIX

.19453E+04	.68075E-04	.58402E+03	.14717E+06	-.18572E+06	-.49057E+05
.68075E-04	.19320E+03	-.20422E-03	.00000E+00	-.20831E-01	-.11592E+05
.58402E+03	-.20422E-03	.41269E+05	-.49057E+05	.24843E+07	-.14717E+06
.14717E+06	.00000E+00	-.49057E+05	.27979E+10	-.88303E+06	-.37087E+08
-.18572E+06	-.20831E-01	.24843E+07	-.88303E+06	.22235E+09	-.26491E+07
-.49057E+05	-.11592E+05	-.14717E+06	-.37087E+08	-.26491E+07	.25230E+09

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 3.

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 = 5.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

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

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

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

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

LOAD CASE 9. 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	-.2551E-01	-.4136E-05	.8630E-02	.1482E-05	-.3430E-04	-.6918E-07
2	-.2786E-01	.1193E-05	.9897E-02	.1622E-05	-.5477E-04	.1965E-07
3	-.4568E-01	-.1846E-03	.1097E-01	.2526E-05	-.9114E-04	-.3076E-05
4	-.4828E-01	-.1786E-03	.1238E-01	.2681E-05	-.1139E-03	-.2977E-05
5	-.1819E-02	.2407E-03	.7336E-02	.2785E-06	.3181E-05	.4011E-05
6	-.4172E-02	.1947E-03	.7230E-02	.3825E-06	-.2152E-04	.3246E-05
7	.1351E-02	.1669E-03	.3834E-02	.4106E-07	.2551E-04	.2781E-05
8	-.2189E-01	.3898E-03	.2079E-01	.2236E-05	-.1638E-03	.6496E-05
9	.1514E-01	.3056E-03	.7793E-03	.2143E-07	.1597E-03	.5092E-05

****

PILE FORCES IN LOCAL GEOMETRY

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

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.2	.0	-2.1	.0	8.8	.0	.08	.06	1.01	.79	
2	-.2	.0	-1.8	.0	8.8	.0	.07	.06	1.02	.80	
3	-.2	.0	14.9	.0	8.5	.0	.42	.13	1.13	.91	#
4	-.2	.0	15.2	.0	8.5	.0	.43	.13	1.13	.92	#
5	-.2	.0	15.4	.0	8.4	.0	.44	.13	1.13	.92	#
6	-.2	.0	15.7	.0	8.4	.0	.44	.13	1.14	.92	#
7	-.2	.0	15.9	.0	8.4	.0	.45	.13	1.14	.92	#
8	-.2	.0	16.2	.0	8.4	.0	.46	.13	1.14	.92	#
9	-.2	.0	-.2	.0	8.9	.0	.01	.03	1.03	.81	
10	-.2	.0	.0	.0	8.9	.0	.00	.20	1.03	.81	
11	-.2	.0	.3	.0	8.9	.0	.01	.20	1.03	.81	
12	.2	.0	24.2	.0	-7.6	.0	.68	.10	1.19	.98	#
13	.2	.0	24.4	.0	-7.5	.0	.69	.10	1.19	.98	#
14	.2	.0	9.3	.0	-8.5	.0	.26	.15	1.09	.88	#
15	.2	.0	9.5	.0	-8.5	.0	.27	.15	1.09	.88	#
16	.2	.0	9.8	.0	-8.4	.0	.28	.15	1.09	.88	#
17	.2	.0	10.0	.0	-8.4	.0	.28	.15	1.10	.88	#
18	.2	.0	10.3	.0	-8.4	.0	.29	.14	1.10	.88	#
9	.2	.0	10.5	.0	-8.4	.0	.30	.14	1.10	.88	#
0	.2	.0	10.8	.0	-8.4	.0	.30	.14	1.10	.89	#
21	.2	.0	26.2	.0	-7.4	.0	.74	.10	1.21	1.00	#
22	.2	.0	26.4	.0	-7.4	.0	.75	.10	1.21	1.00	#

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.3	.0	-2.0	.0	9.6	.0	.08	.06	1.02	.79	
2	-.3	.0	-1.7	.0	9.6	.0	.07	.06	1.02	.79	
3	-.2	.0	16.6	.0	9.2	.0	.47	.13	1.14	.92	#
4	-.2	.0	16.9	.0	9.2	.0	.48	.12	1.15	.93	#
5	-.2	.0	17.2	.0	9.2	.0	.49	.12	1.15	.93	#
6	-.2	.0	17.4	.0	9.2	.0	.49	.12	1.15	.93	#
7	-.2	.0	17.7	.0	9.2	.0	.50	.12	1.15	.93	#
8	-.2	.0	18.0	.0	9.2	.0	.51	.12	1.15	.93	#
9	-.3	.0	.1	.0	9.7	.0	.00	.20	1.03	.81	
10	-.3	.0	.3	.0	9.7	.0	.01	.20	1.03	.81	
11	-.3	.0	.6	.0	9.8	.0	.02	.20	1.04	.81	
12	.2	.0	24.0	.0	-8.4	.0	.68	.10	1.19	.98	#
13	.2	.0	24.2	.0	-8.4	.0	.69	.10	1.19	.98	#
14	.2	.0	7.6	.0	-9.2	.0	.22	.15	1.08	.86	
15	.2	.0	7.9	.0	-9.2	.0	.22	.15	1.08	.86	#
16	.2	.0	8.2	.0	-9.2	.0	.23	.15	1.09	.86	#
17	.2	.0	8.4	.0	-9.2	.0	.24	.15	1.09	.87	#
18	.2	.0	8.7	.0	-9.2	.0	.25	.15	1.09	.87	#
19	.2	.0	9.0	.0	-9.2	.0	.25	.15	1.09	.87	#
20	.2	.0	9.2	.0	-9.2	.0	.26	.15	1.09	.87	#
21	.2	.0	26.2	.0	-8.2	.0	.74	.10	1.21	.99	#
22	.2	.0	26.5	.0	-8.2	.0	.75	.10	1.21	1.00	#

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.4	.0	-13.7	-.0	15.6	.0	.54	.26	.96	.69	
2	-.4	.0	-13.2	-.0	15.6	.0	.52	.25	.96	.69	
3	-.4	.0	17.0	-.0	15.4	.0	.48	.12	1.17	.90	#
4	-.4	.0	17.4	-.0	15.3	.0	.49	.12	1.17	.91	#
5	-.4	.0	17.8	-.0	15.2	.0	.50	.12	1.17	.91	#
6	-.4	.0	18.2	-.0	15.1	.0	.52	.12	1.18	.91	#
7	-.4	.0	18.7	-.0	15.0	.0	.53	.12	1.18	.92	#
8	-.4	.0	19.1	-.0	15.0	.0	.54	.12	1.18	.92	#
9	-.4	.0	-9.3	-.0	15.1	.0	.37	.19	.99	.72	
10	-.4	.0	-8.7	-.0	15.1	.0	.34	.18	.99	.73	
11	-.4	.0	-8.2	-.0	15.0	.0	.32	.17	.99	.73	
12	.4	.0	30.2	-.0	-14.7	.0	.85	.12	1.26	1.00	#
13	.4	.0	30.4	-.0	-14.6	.0	.86	.12	1.26	1.00	#
14	.4	.0	2.0	-.0	-15.4	.0	.06	.21	1.07	.80	
15	.4	.0	2.4	-.0	-15.3	.0	.07	.20	1.07	.80	
16	.4	.0	2.9	-.0	-15.2	.0	.08	.20	1.07	.81	
17	.4	.0	3.3	-.0	-15.1	.0	.09	.20	1.07	.81	
18	.4	.0	3.7	-.0	-15.0	.0	.10	.19	1.08	.81	
19	.4	.0	4.1	-.0	-15.0	.0	.12	.19	1.08	.82	
20	.4	.0	4.5	-.0	-14.9	.0	.13	.19	1.08	.82	
21	.4	.0	32.3	-.0	-13.8	.0	.91	.14	1.27	1.02	#
22	.4	.0	32.5	-.0	-13.7	.0	.92	.14	1.27	1.02	#

LOAD CASE - 4

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST

	K	K	K	IN-K	IN-K	IN-K			KSI	KSI	
1	-.4	.0	-13.6	-.0	16.5	.0	.54	.26	.96	.69	
2	-.4	.0	-13.0	-.0	16.5	.0	.51	.25	.96	.69	
3	-.4	.0	18.9	-.0	16.2	.0	.53	.12	1.19	.91	#
4	-.4	.0	19.3	-.0	16.2	.0	.55	.12	1.19	.92	#
5	-.4	.0	19.8	-.0	16.1	.0	.56	.12	1.19	.92	#
6	-.4	.0	20.2	-.0	16.0	.0	.57	.12	1.19	.92	#
7	-.4	.0	20.6	-.0	15.9	.0	.58	.11	1.20	.93	#
8	-.4	.0	21.1	-.0	15.8	.0	.60	.11	1.20	.93	#
9	-.4	.0	-9.0	-.0	16.1	.0	.35	.19	.99	.72	
10	-.4	.0	-8.4	-.0	16.0	.0	.33	.18	.99	.73	
11	-.4	.0	-7.8	-.0	16.0	.0	.31	.17	1.00	.73	
12	.4	.0	30.0	-.0	-15.6	.0	.85	.12	1.26	.99	#
13	.4	.0	30.2	-.0	-15.5	.0	.86	.12	1.26	1.00	#
14	.4	.0	.2	-.0	-16.2	.0	.00	.22	1.06	.78	
15	.4	.0	.6	-.0	-16.2	.0	.02	.22	1.06	.79	
16	.4	.0	1.0	-.0	-16.1	.0	.03	.21	1.06	.79	
17	.4	.0	1.5	-.0	-16.0	.0	.04	.21	1.06	.79	
18	.4	.0	1.9	-.0	-15.9	.0	.05	.21	1.07	.80	
19	.4	.0	2.4	-.0	-15.8	.0	.07	.21	1.07	.80	
20	.4	.0	2.8	-.0	-15.7	.0	.08	.20	1.07	.80	
21	.4	.0	32.3	-.0	-14.7	.0	.91	.14	1.27	1.01	#
22	.4	.0	32.6	-.0	-14.6	.0	.92	.14	1.27	1.02	#

LOAD CASE - 5

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST	
	K	K	K	IN-K	IN-K	IN-K			KSI	KSI	
1	-.0	.0	13.4	.1	.8	.0	.38	.14	1.09	.93	#
2	-.0	.0	13.3	.1	.9	.0	.38	.14	1.09	.93	#
3	.0	.0	14.3	.1	.3	.0	.41	.13	1.10	.94	#
4	-.0	.0	14.4	.1	.4	.0	.41	.13	1.10	.94	#
5	-.0	.0	14.4	.1	.5	.0	.41	.13	1.10	.94	#
6	-.0	.0	14.5	.1	.6	.0	.41	.13	1.10	.94	#
7	-.0	.0	14.5	.1	.7	.0	.41	.13	1.10	.94	#
8	-.0	.0	14.5	.1	.8	.0	.41	.13	1.10	.94	#
9	-.0	.0	12.1	.1	1.7	.0	.34	.14	1.09	.92	#
10	-.0	.0	11.9	.1	1.8	.0	.34	.14	1.09	.92	#
11	-.1	.0	11.8	.1	1.9	.0	.33	.14	1.09	.91	#
12	-.0	.0	14.1	.1	.7	.0	.40	.13	1.10	.93	#
13	-.0	.0	14.3	.1	.6	.0	.41	.13	1.10	.94	#
14	.0	.0	14.8	.1	-.3	.0	.42	.13	1.10	.94	#
15	.0	.0	14.9	.1	-.4	.0	.42	.13	1.10	.94	#
16	.0	.0	14.9	.1	-.5	.0	.42	.13	1.10	.94	#
17	.0	.0	15.0	.1	-.6	.0	.42	.13	1.10	.94	#
18	.0	.0	15.0	.1	-.7	.0	.43	.13	1.10	.94	#
19	.0	.0	15.1	.1	-.8	.0	.43	.13	1.11	.94	#
20	.0	.0	15.1	.1	-.9	.0	.43	.13	1.11	.94	#
21	.0	.0	16.3	.1	-.2	.0	.46	.13	1.11	.95	#
22	.0	.0	16.6	.1	-.3	.0	.47	.13	1.11	.95	#

LOAD CASE - 6

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

1	-.0	.0	10.7	.0	1.6	.0	.30	.14	1.08	.91	#
2	-.0	.0	10.6	.0	1.7	.0	.30	.14	1.08	.91	#
3	-.0	.0	13.2	.0	1.1	.0	.37	.14	1.09	.93	#
4	-.0	.0	13.3	.0	1.2	.0	.38	.14	1.09	.93	#
5	-.0	.0	13.3	.0	1.3	.0	.38	.14	1.09	.93	#
6	-.0	.0	13.4	.0	1.4	.0	.38	.14	1.10	.93	#
7	-.0	.0	13.4	.0	1.5	.0	.38	.14	1.10	.93	#
8	-.0	.0	13.5	.0	1.6	.0	.38	.14	1.10	.93	#
9	-.1	.0	9.8	.0	2.3	.0	.28	.15	1.07	.90	#
10	-.1	.0	9.7	.0	2.4	.0	.27	.15	1.07	.90	#
11	-.1	.0	9.6	.0	2.5	.0	.27	.15	1.07	.90	#
12	.0	.0	10.8	.0	-.4	.0	.31	.14	1.07	.91	#
13	.0	.0	11.0	.0	-.5	.0	.31	.14	1.08	.91	#
14	.0	.0	9.7	.0	-1.1	.0	.27	.15	1.07	.90	#
15	.0	.0	9.7	.0	-1.2	.0	.28	.15	1.07	.90	#
16	.0	.0	9.8	.0	-1.3	.0	.28	.15	1.07	.90	#
17	.0	.0	9.8	.0	-1.4	.0	.28	.15	1.07	.90	#
18	.0	.0	9.9	.0	-1.5	.0	.28	.15	1.07	.90	#
19	.0	.0	10.0	.0	-1.6	.0	.28	.15	1.07	.90	#
20	.0	.0	10.0	.0	-1.7	.0	.28	.15	1.07	.90	#
21	.0	.0	12.8	.0	-1.1	.0	.36	.14	1.09	.93	#
22	.0	.0	13.1	.0	-1.2	.0	.37	.14	1.09	.93	#

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.0	.0	9.5	.0	-.3	.0	.27	.15	1.06	.90	#
2	.0	.0	9.4	.0	-.3	.0	.26	.15	1.06	.90	#
3	.0	.0	8.4	.0	-.7	.0	.24	.15	1.06	.90	#
4	.0	.0	8.4	.0	-.6	.0	.24	.15	1.06	.90	#
5	.0	.0	8.4	.0	-.5	.0	.24	.15	1.06	.90	#
6	.0	.0	8.4	.0	-.4	.0	.24	.15	1.06	.90	#
7	.0	.0	8.4	.0	-.4	.0	.24	.15	1.06	.90	#
8	.0	.0	8.4	.0	-.3	.0	.24	.15	1.06	.90	#
9	.0	.0	8.4	.0	.2	.0	.24	.15	1.06	.90	#
10	.0	.0	8.2	.0	.3	.0	.23	.15	1.06	.90	#
11	-.0	.0	8.1	.0	.4	.0	.23	.15	1.06	.89	#
12	-.0	.0	10.4	.0	1.5	.0	.29	.14	1.07	.91	#
13	-.0	.0	10.5	.0	1.4	.0	.30	.14	1.08	.91	#
14	-.0	.0	12.6	.0	.7	.0	.36	.14	1.09	.92	#
15	-.0	.0	12.6	.0	.6	.0	.36	.14	1.09	.93	#
16	-.0	.0	12.6	.0	.5	.0	.36	.14	1.09	.93	#
17	-.0	.0	12.6	.0	.4	.0	.36	.14	1.09	.93	#
18	.0	.0	12.6	.0	.4	.0	.36	.14	1.09	.93	#
19	.0	.0	12.6	.0	.3	.0	.36	.14	1.09	.93	#
20	.0	.0	12.6	.0	.2	.0	.36	.14	1.09	.93	#
21	-.0	.0	11.7	.0	.8	.0	.33	.14	1.08	.92	#
22	-.0	.0	11.9	.0	.7	.0	.34	.14	1.08	.92	#

' AD CASE - 8

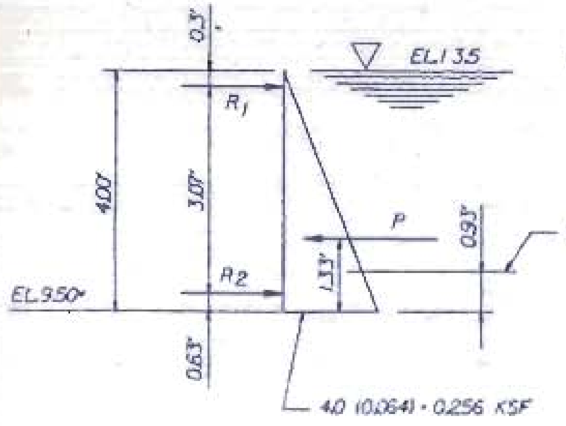
PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.2	.0	19.5	.1	7.8	.0	.55	.12	1.16	.95	#
2	-.2	.0	19.5	.1	8.0	.0	.55	.12	1.16	.95	#

3	-.2	.0	33.8	.1	6.7	.0	.96	.15	1.26	1.05	#
4	-.2	.0	34.1	.1	6.9	.0	.97	.16	1.26	1.05	#
5	-.2	.0	34.5	.1	7.1	.0	.98	.16	1.26	1.05	#
6	-.2	.0	34.9	.1	7.2	.0	.99	.16	1.27	1.06	#
7	-.2	.0	35.2	.1	7.4	.0	1.00	.17	1.27	1.06	#
8	-.2	.0	35.6	.1	7.6	.0	1.01	.17	1.27	1.06	#
9	-.2	.0	19.6	.1	9.3	.0	.55	.12	1.17	.94	#
10	-.3	.0	19.6	.1	9.5	.0	.55	.12	1.17	.94	#
11	-.3	.0	19.6	.1	9.7	.0	.56	.12	1.17	.94	#
12	.2	.0	17.7	.1	-5.7	.0	.50	.12	1.14	.94	#
13	.2	.0	18.4	.1	-5.8	.0	.52	.12	1.15	.95	#
14	.2	.0	6.9	.1	-6.7	.0	.19	.15	1.07	.86	#
15	.2	.0	7.2	.1	-6.9	.0	.20	.15	1.07	.87	#
16	.2	.0	7.6	.1	-7.1	.0	.22	.15	1.08	.87	#
17	.2	.0	8.0	.1	-7.2	.0	.23	.15	1.08	.87	#
18	.2	.0	8.3	.1	-7.4	.0	.24	.15	1.08	.87	#
19	.2	.0	8.7	.1	-7.6	.0	.25	.15	1.08	.87	#
20	.2	.0	9.1	.1	-7.8	.0	.26	.15	1.09	.88	#
21	.2	.0	23.8	.1	-7.1	.0	.67	.10	1.19	.98	#
22	.2	.0	24.5	.1	-7.2	.0	.69	.10	1.19	.98	#

LOAD CASE - 9

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.1	.0	17.4	.1	-5.0	.0	.49	.12	1.14	.94	#
2	.1	.0	17.2	.1	-4.9	.0	.49	.12	1.13	.94	#
3	.1	.0	7.1	.1	-5.4	.0	.20	.15	1.07	.87	#
4	.1	.0	7.1	.1	-5.3	.0	.20	.15	1.07	.87	#
5	.1	.0	7.1	.1	-5.2	.0	.20	.15	1.07	.87	#
6	.1	.0	7.1	.1	-5.0	.0	.20	.15	1.06	.87	#
7	.1	.0	7.1	.1	-4.9	.0	.20	.15	1.06	.87	#
8	.1	.0	7.2	.1	-4.7	.0	.20	.15	1.06	.87	#
9	.1	.0	15.4	.1	-4.0	.0	.43	.13	1.12	.93	#
10	.1	.0	15.1	.1	-3.8	.0	.43	.13	1.12	.93	#
11	.1	.0	14.8	.1	-3.7	.0	.42	.13	1.11	.93	#
12	-.2	.0	21.0	.1	7.2	.0	.59	.11	1.17	.96	#
13	-.2	.0	21.2	.1	7.1	.0	.60	.11	1.17	.96	#
14	-.1	.0	33.4	.1	5.4	.0	.94	.15	1.25	1.05	#
15	-.1	.0	33.4	.1	5.3	.0	.94	.15	1.25	1.05	#
16	-.1	.0	33.4	.1	5.2	.0	.94	.15	1.25	1.05	#
17	-.1	.0	33.4	.1	5.0	.0	.94	.15	1.25	1.05	#
18	-.1	.0	33.4	.1	4.9	.0	.94	.15	1.25	1.05	#
19	-.1	.0	33.4	.1	4.7	.0	.94	.15	1.25	1.06	#
20	-.1	.0	33.4	.1	4.6	.0	.95	.15	1.25	1.06	#
21	-.2	.0	23.4	.1	6.0	.0	.66	.11	1.18	.98	#
22	-.2	.0	23.6	.1	5.9	.0	.67	.11	1.18	.98	#

LOADING



$P = \frac{1}{2}(0.256)(4.0) = 0.512$ K/FT

$R_1 = \frac{0.70\,(0.512)}{3.00} = 0.12$ K/FT

$R_2 = 0.512 - 0.12 = 0.39$ K/FT

SKIN PLATE

LOAD, $w = 0.064\,(4.0 - 0.93) = 0.196$ K/FT

USE $\frac{5}{16}$" MINIMUM THICKNESS OF SKIN PLATE

$S = \frac{bt^2}{6} = 0.1953$ IN^3/FT

MAXIMUM ALLOWABLE MOMENT $= SF_b =$

$0.1953\,(20.0) = 3.91^{\text{in-K}}/\text{FT} = 0.3255^{\text{ft-K}}/\text{FT}$

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

$\frac{1}{12} w\ell^2 = 0.3255$

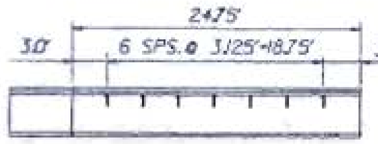
$\frac{1}{12}(0.196)\ell^2 = 0.3255$

$\ell = 4.46$ FT (ALLOW. SPAN), USE 3.125 FT

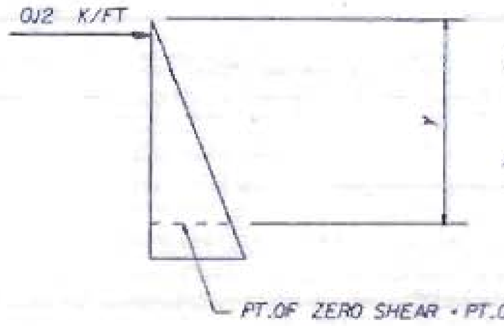
EXTERIOR SPAN, $M = \frac{1}{10} w\ell^2$

$\frac{1}{10} w\ell^2 = 0.3255$

$\ell = 4.08$ FT (ALLOW. SPAN), USE 3.00 FT



VERTICAL STIFFENERS

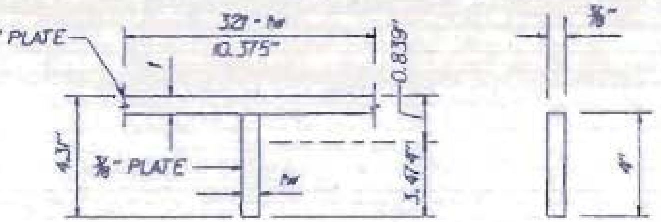


$\frac{1}{2}\,(0.064)\,y^2 = 0.12$ K/FT

$y = 1.94$

MOMENT $= 0.12\,(1.94 - 0.30) - \frac{1}{6}\,(0.064)(1.94)$

$= 0.12$ K/FT



EFFECTIVE FLANGE WIDTH

AISC 1.9.1.2

$\frac{95^k}{\sqrt{36{,}000}} = 16$

$32 \times 0.3125" + 0.375 = 10.375"$

ITEM	AREA	Y	Ay	Ay^2	Io
PLATE 10.375" x 5/16"	3.242	0.156	0.506	0.079	—
PLATE 4" x 3/8"	1.50	2.313	3.470	8.026	2
	4.742	(0.838)	3.976	8.105	2

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

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

$2 + 8.105 - (3.976 \times 0.839)$

$= 6.769$ In^4

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

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

$f_s = \frac{M}{S_{BOT}} = \frac{(0.12)(3.125)(12)}{1.949} = 2.309$ ksi << allow = 20 ksi

GIRDERS

Span = Opening + Column Face to c/l Hinge + Column Face to c/l 1 1/2" Bearing Bar

Span = 24.0 + 1.08 + 0.60 = 24.68'

TOP GIRDER

Try W14 x 34 (5/16" min thickness requirement)

Load, $w = 0.12$ k/ft

$M = \frac{1}{8} w\ell^2 = \frac{1}{8}(0.12)(24.68)^2 = 9.14$ ft-k

per AISC 1.5.1.4.1 and EM 1110 - 1 - 2101

$f_b = \frac{M}{S} = \frac{9.14(12)}{48.6} = 2.26$ ksi < 20.0 ksi, ok use W14 x 34

BOTTOM GIRDER:

Load, $w = 0.39$ k/ft

$M = \frac{1}{8} w\ell^2 = \frac{1}{8}(0.39)(24.68) = 29.69$ ft-k

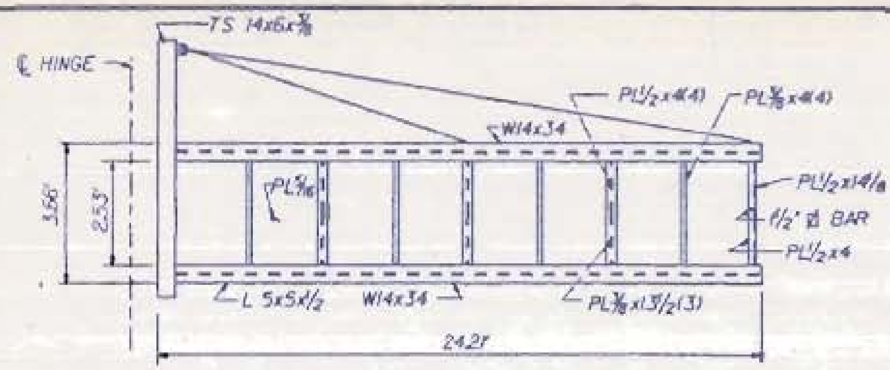
$S_{req'd} = \frac{M}{S} = \frac{29.69(12)}{20.0} = 17.81$ In^3

DEFLECTION:

$\Delta_{max} = \frac{5w\ell^4}{384EI}$

$= \frac{5(0.39)(24.69)(24.69 \times 12)^3}{384(29 \times 10^3)(340)} = 0.33"$

$\Delta_{allow} = \frac{\ell}{360} = 0.82" < 0.33"$ OK USE WF14x34



ITEM	COMPUTATION	WEIGHT (LB)	x (FT)	wx (FT – LB)
5/16 PL	3.66x24.21x12.8	1134	12.77	14,481
W14x34	2x34x25.12	1708	12.77	21,811
PL 1/2x14 1/2	3.1x24.65	76	24.88	1,891
PL 3/8x13 1/2	3x3.1x17.21	160	12.77	2,043
PL 3/8x4 (4)	4x3.1x5.10	63	12.77	805
PL 1/2x4 (3)	3x2.53x6.8	52	12.77	664
PL 1/2x4	2.53x6.8	17	24.88	423
L 5x5x1/2	24.21x16.2	392	12.77	5,006
1 1/2 in² Bar	3.66x7.65	28	24.88	697
WELD	0.21x(4x24.2+15x3.66)	32	12.77	409
SEAL		60	12.77	766
TS 14x6x3/8	10x47.9	479	1.0	479
			4.201	49,475

GATE DEAD WEIGHT

TUBING POST

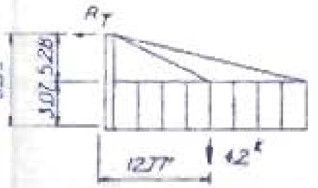
$F_y = 46$ ksi $F_S = 0.6 \times F_y = 0.6 \times 46 = 27.6$ ksi

Try TS 14 x 6 x 3/8, $S_x = 48.1$ In^3 $S_y = 29.7$ In^3

A.I.S.C. 1.9.2.2

$\frac{b}{t} = \frac{13.25}{0.375} = 35.3 < \frac{238}{\sqrt{F_y}} = \frac{238}{\sqrt{46}} = 36$

GATE WEIGHT FORCE



$R_T = \frac{4.2 \times 12.77}{8.35} = 6.4^k$

$M_Y = 6.4 \times 5.28 = 33.8^k$

$f_y = \frac{33.8 \times 12}{29.7} = 13.7$ ksi

WATER FORCE

$F = 0.53$ k

$M_x = 0.53 \times 5.28 = 2.8$ ft-k

$f_x = \frac{2.8 \times 12}{48.1} = 0.7$ ksi

COMBINED STRESS

$f = \frac{0.7}{27.6} + \frac{13.7}{27.6} = 0.03 \quad 0.5 = 0.53 < 1.0$

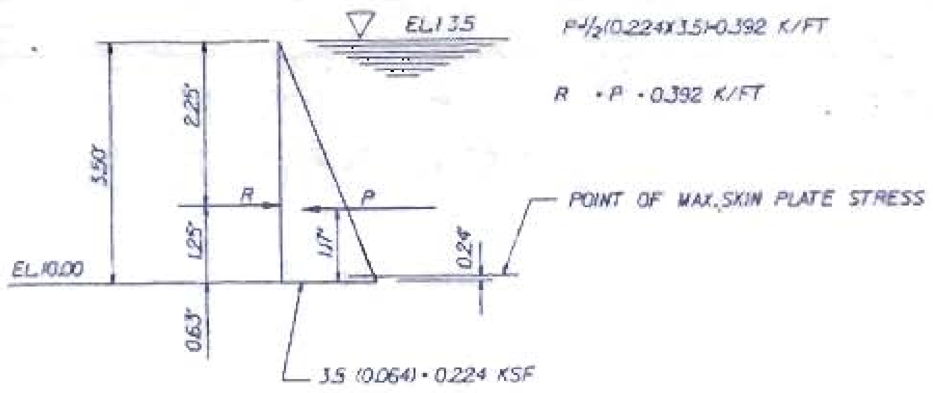
LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 20 GENERAL DESIGN
ORLEANS PARISH - JEFFERSON PARISH
17TH. STREET OUTFALL CANAL
(METAIRIE RELIEF)

SWING GATE DESIGN

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: MARCH 1990 FILE NO. H-2-30300

PLATE DD 1

LOADING



SKIN PLATE

LOAD, w = 0.064 (3.5-0.24) = 0.209 K/FT

USE 5/16" MINIMUM THICKNESS OF SKIN PLATE

$S = \frac{bt^2}{6} = 0.1953\ IN^3/FT$

MAXIMUM ALLOWABLE MOMENT $= SF_b =$

$0.1953\ (20.0) = 3.91^{IN\text{-}K}/FT = 0.3255^{FT\text{-}K}/FT$

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

$\frac{1}{12} w\ell^2 = 0.3255$

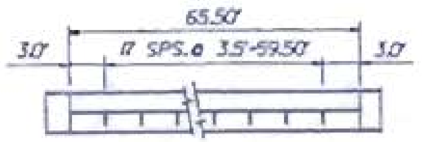
$\frac{1}{12}(0.209)\ell^2 = 0.3255$

$\ell = 4.32$ FT (ALLOW. SPAN), USE 3.50 FT

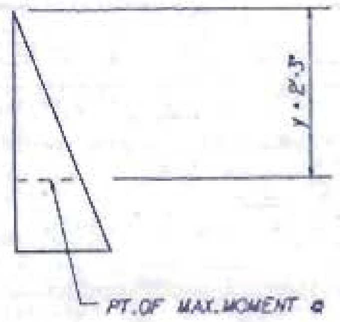
EXTERIOR SPAN, $M = \frac{1}{10} w\ell^2$

$\frac{1}{10} w\ell^2 = 0.3255$

$\ell = 4.08$ FT (ALLOW. SPAN), USE 3.00 FT

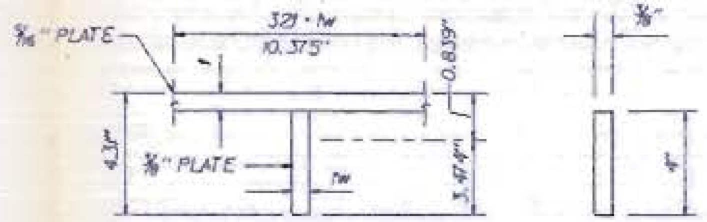


VERTICAL STIFFENERS



MOMENT $= 0.064 \times 2.25^3 \times 1/6$

$= 0.12$ K/FT



EFFECTIVE FLANGE WIDTH

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PLATE 10.375" x 5/16"	3.242	0.156	0.506	0.079	—
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	4.742	(0.838)	3.976	8.105	2

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

$f_s = \frac{M}{S_{BOT}} = \frac{(0.12)(3.125)(12)}{1.949} = 2.309$ ksi << allow = 20 ksi

GIRDERS

Span = Opening + Column Face to c/l Seal + Column Face to c/l Seal

Span = 62.0 + 1.75 + 2.75 = 66.50'

Try W30 x 99

Load, w = 0.39 k/ft

$M = \frac{1}{8} w\ell^2 = \frac{1}{8}(0.39)(66.50) = 215.6$ ft-k

per AISC 1.5.1.4.1 and EM 1110-1-2101

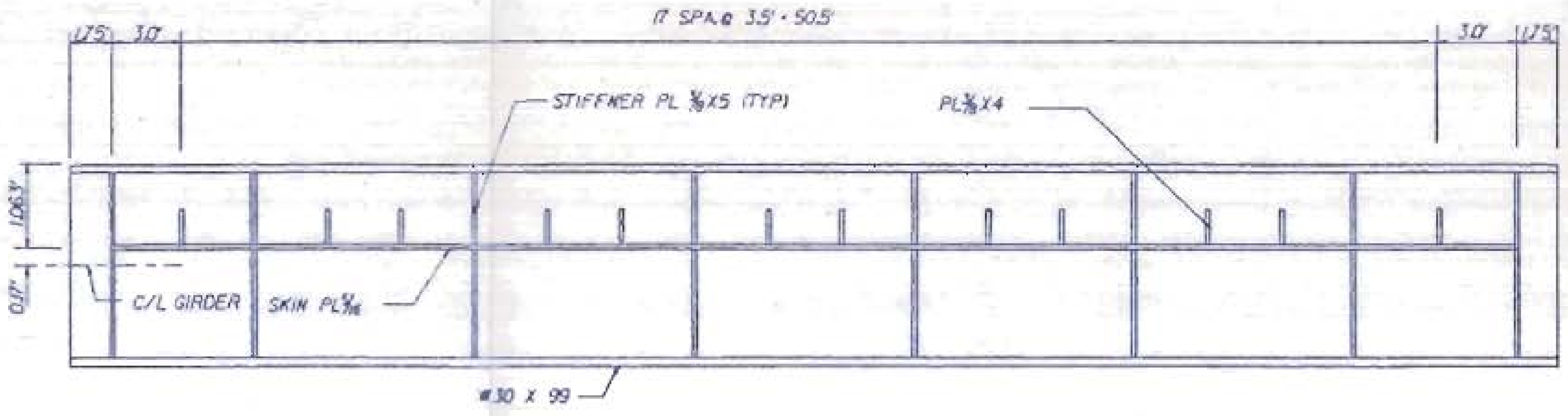
$f_b = \frac{M}{S} = \frac{215.6(12)}{269} = 9.62$ ksi < 20.0 ksi, ok use W30 x 99

DEFLECTION:

$\Delta_{max} = \frac{5w\ell^4}{384EI}$

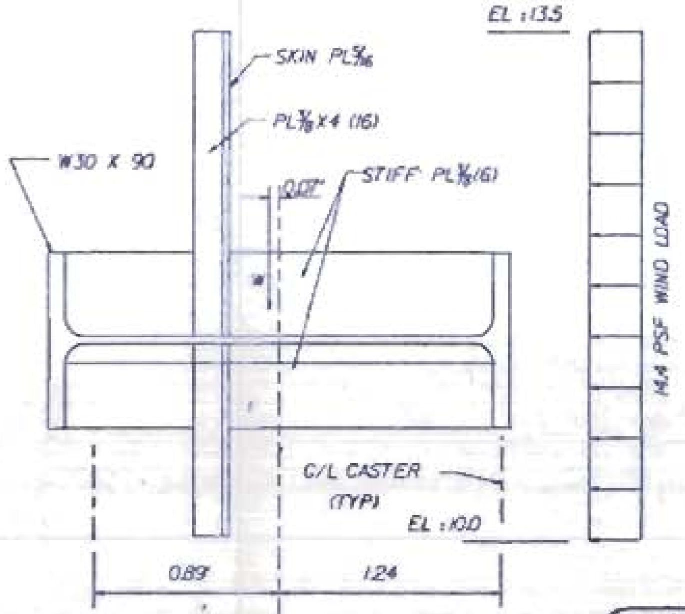
$= \frac{5(0.39)(66.50)(66.50 \times 12)^3}{384(29 \times 10^3)(3990)} = 0.12"$

$\Delta_{allow} = \frac{\ell}{360} = 2.21" < 0.33"$ OK USE WF30X99



ITEM	COMPUTATION	WEIGHT (LB)	x (FT) TO C/L GIRDER	wx (FT - LB)
5/16 PL	3.42x65.50x12.8	2867	0.17	487
W30x99	69x99	6831	0.0	0.0
PL 3/8x4X2.25 (12)	12x2.25x5.1	138	0.33	45
PL 3/8x4X1.25 (12)	12x1.25x5.1	77	0.33	25
PL 3/8x4X0.83 (6)	6x0.83x5.1	25	0.33	8
PL 3/8x4X1.83 (6)	6x1.83x5.1	56	0.33	18
PL 3/8x5 (16)	16x2.36x6.38	241	0.0	0
L 5x3 1/2x1/2	65.5x13.6	891	0.1	9
L 6x4x1/2	2x3.50x16.2	113	1.11	125
WELD 1/4	0.21x(2x65.5+40x3.50)	57	0.17	10
1 1/2 in² Bar	2x3.5x7.66	54	1.30	70
		11,350	(0.070)	797

GATE DEAD WEIGHT



CHECK GATE STABILITY

GATE WEIGHT 'W' = 11,350

RESISTING MOMENT 'M_R' = 11,350 (0.89 - .07)

= 9,799 FT-LBS

FOR 75 MPH WIND, WIND PRESSURE = 0.00256×75^2

= 14.40 PSF

OVER TURNING MOMENT 'M_O' = $\frac{1}{2} \times 14.4 \times 3.5^2 \times 65.5$

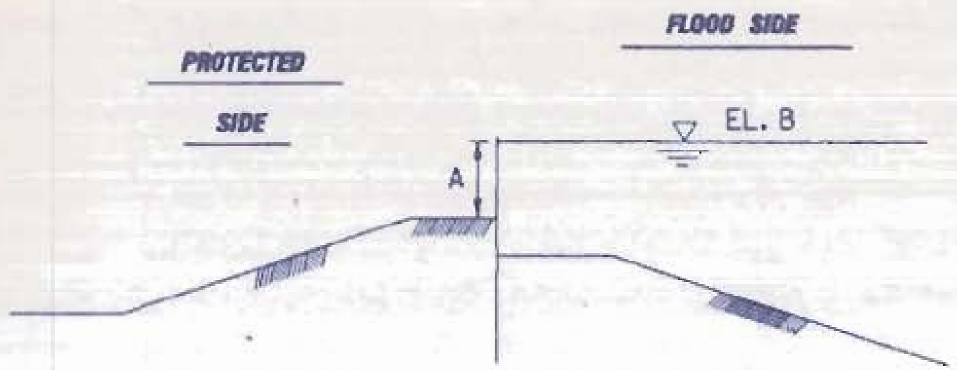
= 5,777 FT-LBS

$M_R > M_O$ GATE IS STABLE

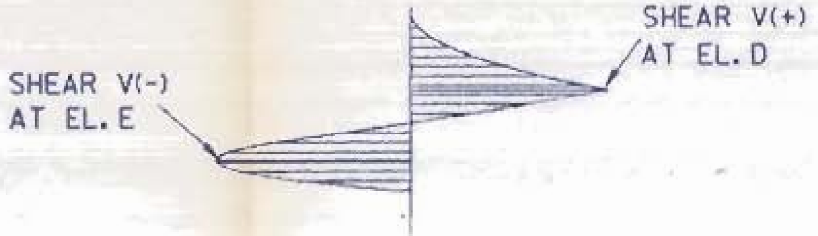
LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 20 GENERAL DESIGN
ORLEANS PARISH - JEFFERSON PARISH
17TH. STREET OUTFALL CANAL
(METAIRIE RELIEF)

ROLLER GATE DESIGN

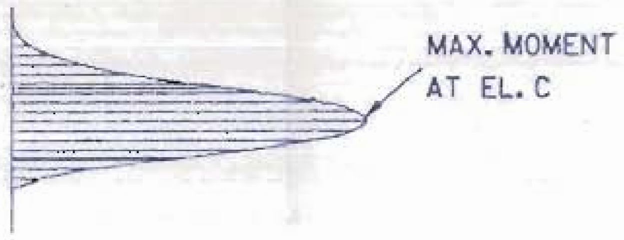
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE MARCH 1990 FILE NO. H-2-30300



I-WALL / LEVEE SECTION



SHEAR DIAGRAM



BENDING MOMENT DIAGRAM

JEFFERSON PARISH SIDE (WEST BANK)

STATION TO STATION LIMITS	SHEET PILE TYPE	NET SHEET PILE STICKUP (A)	PLATE NO. FOR PRESS. DIAGRAM	FACTOR OF SAFETY	GOVERNING LOAD CASE (Q OR S)	SWL (NGVD) FOR GOVERNING LOAD CASE (B)	MAX. BENDING STRESS f_b (ksi)	LOCATION OF MAX. BENDING STRESS EL. (NGVD) (C)	MAX. SHEAR STRESS f_v (ksi)	LOCATION OF MAX. SHEAR STRESS EL. (NGVD) (D OR E)	MAX. DEFLECTION (IN.)
STA 549+22 TO 552+70 B/L	PZ-22	4.0	109	1.0	Q	13.5	0.6	8.63	-0.4	7.35	0.01
STA 549+22 TO 552+70 B/L *	PZ-27	*	121	1.5	Q	-5.0	2.3	-9.19	0.3	-2.00	-0.10
STA 554+00 TO 589+00 B/L	PZ-22	7.6	110	1.0	Q	13.6	4.9	3.04	-1.1	-0.33	0.37
STA 589+00 TO 614+00 B/L	PZ-22	6.6	111	1.0	Q	13.6	3.0	4.90	-0.9	2.30	0.14
STA 614+00 TO 625+25 B/L	PZ-22	6.1	112	1.0	Q	13.6	2.3	5.76	-0.8	3.52	0.08
STA 625+25 TO 635+00 B/L	PZ-22	6.1	113	1.0	Q	14.1	2.3	6.27	-0.8	4.00	0.08
STA 635+00 TO 641+50 B/L	PZ-22	2.6	114	1.0	Q	14.1	0.1	11.18	-0.2	10.57	0.00
STA 641+50 TO 663+00 B/L	PZ-22	2.6	115	1.0	Q	14.6	0.1	11.74	-0.2	11.33	0.00
STA 663+00 TO 670+00 B/L	PZ-22	4.1	116	1.0	Q	14.6	0.6	10.00	-0.8	8.94	0.00

* TIEBACK SHEET PILE WALL TO SUPPORT I-WALL SECTION IN THIS REACH

ORLEANS PARISH SIDE (EAST BANK)

STATION TO STATION LIMITS	SHEET PILE TYPE	NET SHEET PILE STICKUP (A)	PLATE NO. FOR PRESS. DIAGRAM	FACTOR OF SAFETY	GOVERNING LOAD CASE (Q OR S)	SWL (NGVD) FOR GOVERNING LOAD CASE (B)	MAX. BENDING STRESS f_b (ksi)	LOCATION OF MAX. BENDING STRESS EL. (NGVD) (C)	MAX. SHEAR STRESS f_v (ksi)	LOCATION OF MAX. SHEAR STRESS EL. (NGVD) (D OR E)	MAX. DEFLECTION (IN.)
STA 545+80 TO 552+70 B/L	ARBED BZ12JL	5.0	100	1.5	Q	-5.0	0.2	5.05	-0.2	4.26	0.00
STA 554+00 TO 568+00 B/L	PZ-22	8.1	101	1.0	Q	13.6	6.2	2.00	1.1	5.50	0.59
STA 568+00 TO 589+00 B/L	PZ-22	8.1	102	1.0	Q	13.6	6.2	2.00	1.1	5.50	0.59
STA 589+00 TO 614+00 B/L	PZ-22	8.1	103	1.0	Q	13.6	6.2	2.00	1.1	5.50	0.59
STA 614+00 TO 625+00 B/L	PZ-22	7.1	104	1.0	Q	13.6	3.8	4.00	-0.9	1.02	0.23
STA 625+00 TO 635+00 B/L	PZ-22	6.6	105	1.0	Q	14.1	3.0	5.41	-0.9	2.81	0.14
STA 635+00 TO 642+00 B/L	PZ-22	4.6	106	1.0	Q	14.1	0.8	8.78	-0.5	7.58	0.01
STA 642+00 TO 663+00 B/L	PZ-22	2.6	107	1.0	Q	14.6	0.1	11.74	-0.2	11.40	0.00
STA 663+00 TO 670+63 B/L	PZ-22	3.6	108	1.0	Q	14.6	0.4	10.57	-0.3	9.79	0.00

NOTE:

THE SHEARS, DEFLECTIONS, AND BENDING MOMENTS WERE OBTAINED BY THE USE OF THE BEAMS PROGRAM (X0015) OF THE WES LIBRARY.

COMPUTER AIDED DESIGN DRAFTING

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 20 GENERAL DESIGN
ORLEANS PARISH - JEFFERSON PARISH
17TH STREET OUTFALL CANAL
(METAIRIE RELIEF)

STRUCTURAL ANALYSIS OF I-WALLS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

DATE: MARCH 1990 FILE NO. H-2-30300

PLATE DD3

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HIGH LEVEL PLAN

DESIGN MEMORANDUM NO. 20, GENERAL DESIGN
17TH STREET OUTFALL CANAL

APPENDIX E

ARCHITECT/ENGINEERING
SOILS INVESTIGATION AND DESIGNS

APPENDIX E
VOLUME II

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REG. C. E.

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LLOYD A. HELD, JR.
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EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

BORINGS • TESTS • ANALYSES

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CHIEF ADMINISTRATIVE OFFICER
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VICE PRESIDENT AND
CHIEF ENGINEER
LLOYD A. HELD, JR.

27 June 1985

Modjeski and Masters
Consulting Engineers
John Hancock Building
1055 St. Charles Avenue
New Orleans, Louisiana 70115

Attention Mr. Barney Martin

Gentlemen:

Installation & Monitoring of Piezometers
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

1. This report contains piezometric data obtained during the period 4 December 1984 to 23 April 1985, during which time dredging operations were performed by Boh Bros. between approximately Stations 640+00 and 670+00 in the Metairie Relief Canal for the Sewerage and Water Board of New Orleans. Installation and monitoring of the piezometers were performed in accordance with our letter of proposal dated 27 August 1984, which was verbally accepted by Mr. Barney Martin representing Modjeski and Masters, Consulting Engineers for the project.

2. A test section located near the I-10 Eastbound lane was excavated and monitored during the period September 1983 to January 1984 and assisted the Sewerage and Water Board in obtaining a permit from the Corps of Engineers for the planned improvements to the Metairie Relief Canal. The results of the

test section indicated that hydrostatic pressures in the underlying sand did not respond to water level variations in the canal. However, the underlying sand was not exposed over the entire bottom of the test section which was quickly covered by sedimentation deposits.

3. Considering the relatively small area of the underlying sand that was exposed and the short duration of the exposure during the performance of the test section, additional precautions were deemed necessary to minimize the possibility of a landside failure of the levee during and after full scale excavation of the canal to design grade. Therefore, the purpose of this project was to closely monitor the reaction of hydrostatic pressures in the underlying sand on both sides of the canal along the entire alignment of the planned dredging operation between approximately Stations 640+00 and 670+00.

4. To accomplish this, measurements of the water level were made in seventeen (17) piezometers which were installed at the following locations.

Jefferson Side

No.	Station	Date
J-1	669+92	12-3-84
J-2	665+45	12-3-84
J-3	660+60	12-4-84
J-4	658+10	1-9-85
J-5	654+30	1-9-85
J-6	650+50	1-9-85
J-7	648+80	1-9-85
J-8	642+91	9-27-83*
J-9	642+69	9-27-83*

Orleans Side

No.	Station	Date
O-1	670+35	12-7-84
O-2	667+00	12-7-84
O-3	663+50	12-11-84
O-4	659+75	12-11-84
O-5	656+50	12-11-84
O-6	652+25	1-8-85
O-7	649+00	1-8-85
O-8	645+50	1-8-85

*Previously installed for test section.

5. It was considered desirable to locate the piezometers at or near the landside toe of the levees, however, this was not always feasible due to adjacent private property, particularly on

the Orleans side where property fences are generally located approximately one-third of the way up the levee side slope. The approximate location of the piezometers are shown on Figure 1. All survey work to establish stations, ground surface elevations and the elevation of the top of the riser pipes was performed by Modjeski and Masters.

6. All of the piezometers consist of a 5-ft long, 2-in. diameter, plastic slotted (0.01" openings) screen set in the bottom of a 6-in. diameter drilled hole which extends approximately 6.5 feet below the surface of the underlying sand stratum. The slotted screen is surrounded by a select filter sand material having a gradation designed for use with the size openings of the slotted screen. This is topped by 18 inches of very fine sand to prevent intrusion of the sealing material into the filter sand. The hole is sealed with 15 inches of 0.5-in. bentonite pellets and an aquagel/cement grout which extends to the ground surface. The riser extending from the screen is a 2-in. diameter PVC pipe which is protected by a 6-in. diameter steel pipe protector cover with a lock. A typical piezometer installation is shown graphically on Figure 2.

7. A total of 502 measurements were taken in the seventeen (17) piezometers during a 140-day period beginning on 4 December 1984 and ending on 23 April 1985. Dredging operations began on or about 11 December 1984 and were completed on or about 11 April 1985. The scheduling of measurements was coordinated with the progress of the dredging operations to assure that the water level in each piezometer was obtained as the dredging reached final design grade near the location of the piezometer. In addition, measurements were obtained just prior to initiation of the work, for a short period after completion of operations, and during periods when the work slowed or stopped for various reasons. All of the measurements obtained are shown graphically in the form of Water Elevations vs. Time Plots on Figures 3 through 19. The plotted measurement from each individual piezo-

meter is shown along with a sketch indicating the elevation of the top and bottom of the piezometer as well as the elevation of the ground surface and surface of the sand stratum. Also shown is the approximate date dredging operations reached design grade at the station of the piezometer.

8. In addition to the piezometer data, information regarding water surface elevation in the canal and the amount of rainfall in the area was also obtained and this data is shown graphically on Figures 20 and 21.

9. Based on the information shown on Figures 3 through 21 and information obtained from Modjeski & Masters, the following observations appear reasonable:

1) All seventeen (17) piezometers functioned during the dredging operations.

2) The underlying sand stratum was exposed over a significant portion of the canal alignment during dredging.

3) Sedimentation deposits covered the bottom of the canal shortly after dredging reached design grade.

4) Variations of the water level in the piezometers appear to have depended more on the amount of rainfall in the area than on the water level in the canal or the location of the dredging operations.

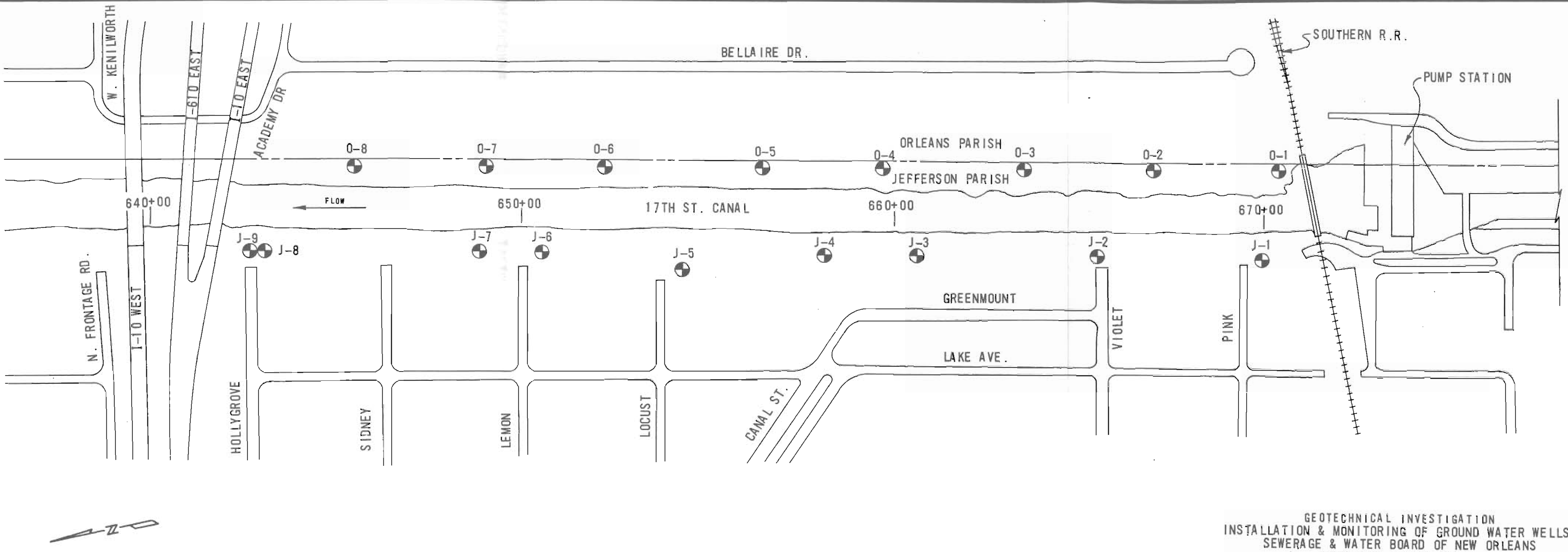
10. Considering these observations, it is believed that additional monitoring of the sand stratum will not be necessary

until a storm condition or high water in the canal is experienced. It is our opinion that even these conditions will not appreciably raise the water level in the piezometer.

EUSTIS ENGINEERING COMPANY

By Lloyd A. Held, Jr.
Lloyd A. Held, Jr.

L. J. Napolitano:ln



LOCATION PLAN

SCALE: 1"=200

GEOTECHNICAL INVESTIGATION
INSTALLATION & MONITORING OF GROUND WATER WELLS
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
APPROXIMATE STATIONS 640+00 TO 670+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

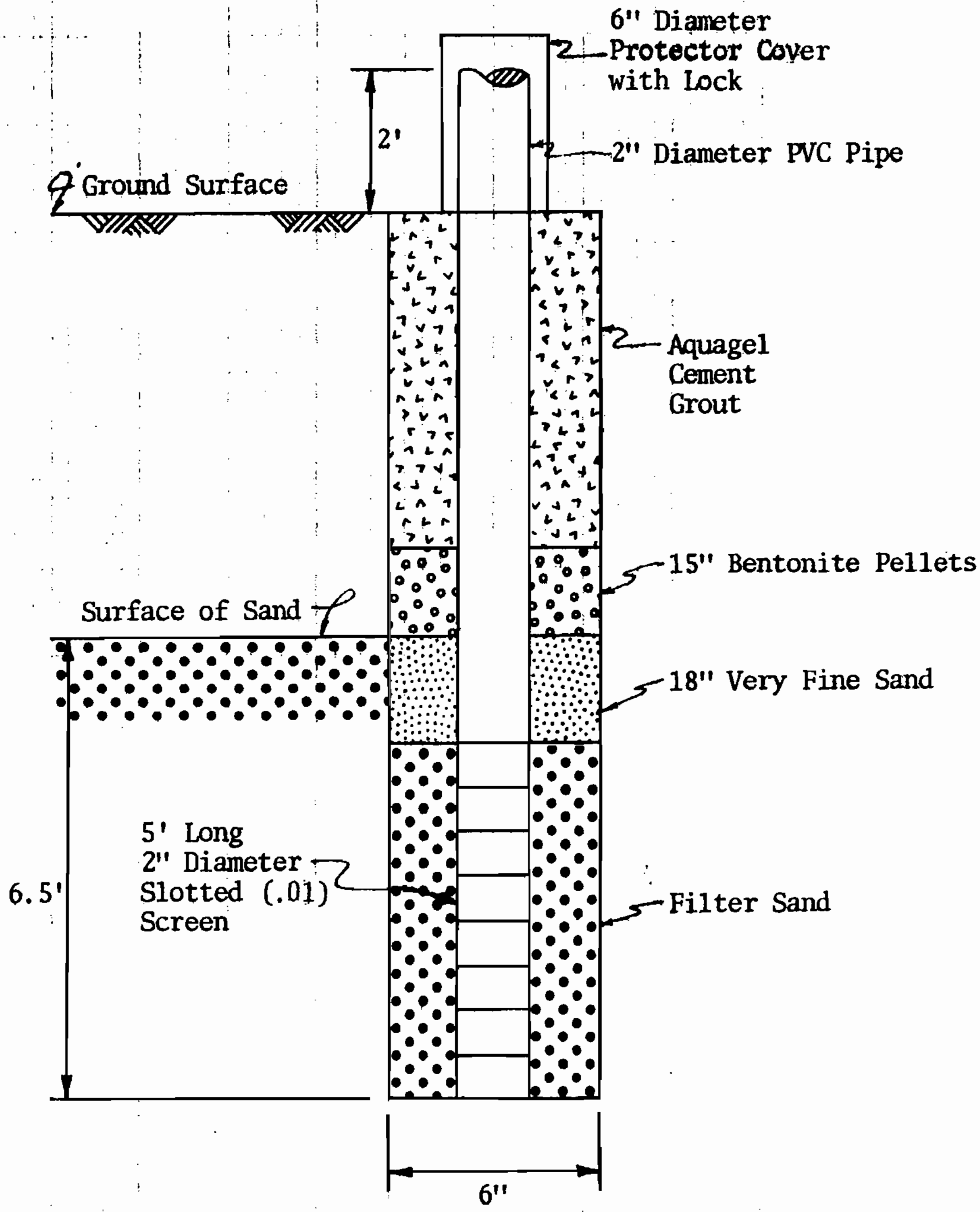
LOCATION PLAN

FOR
MODJESKI & MASTERS
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
JUNE 1985 METAIRIE, LA.

FIGURE 1

TYPICAL PIEZOMETER INSTALLATION

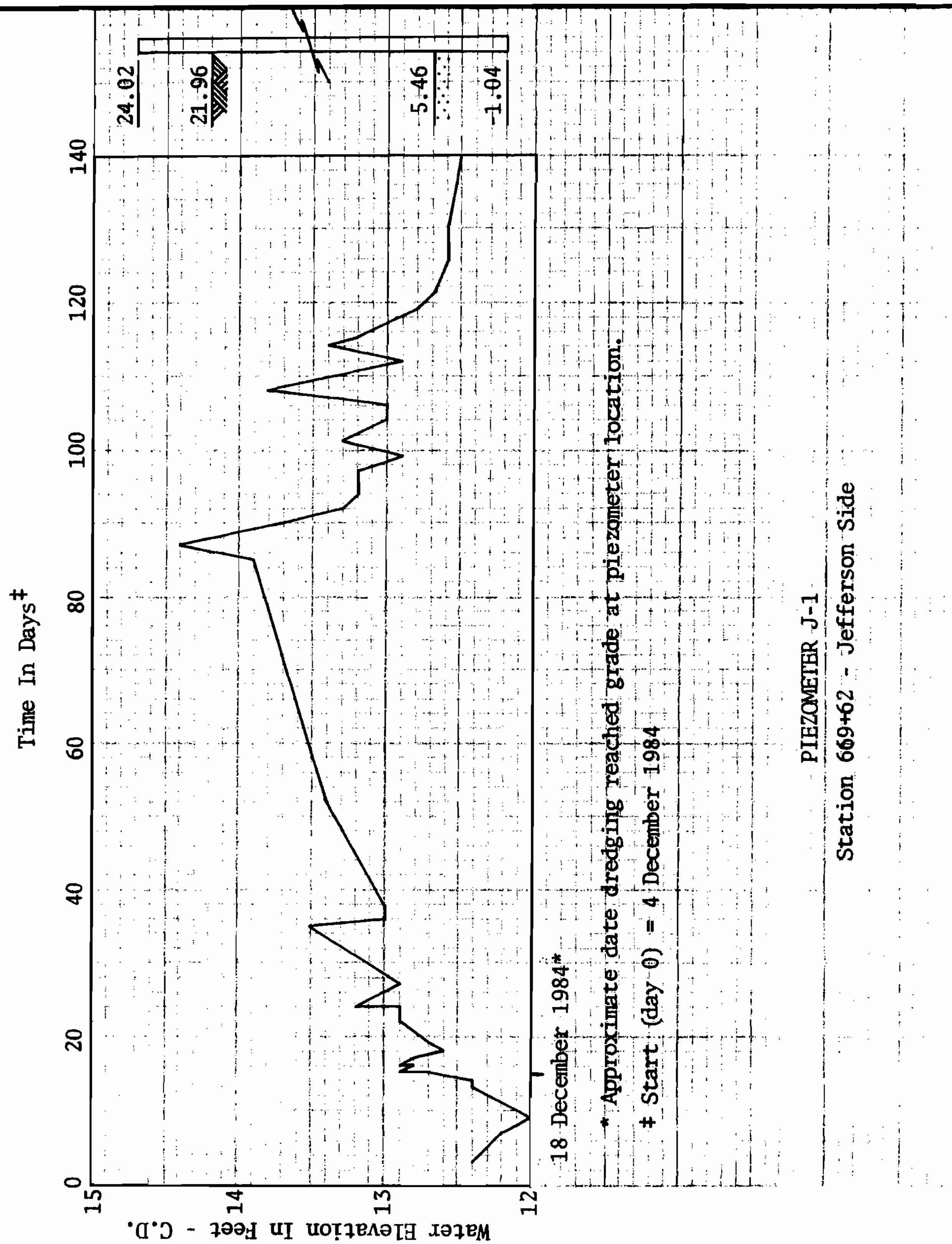


Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 2

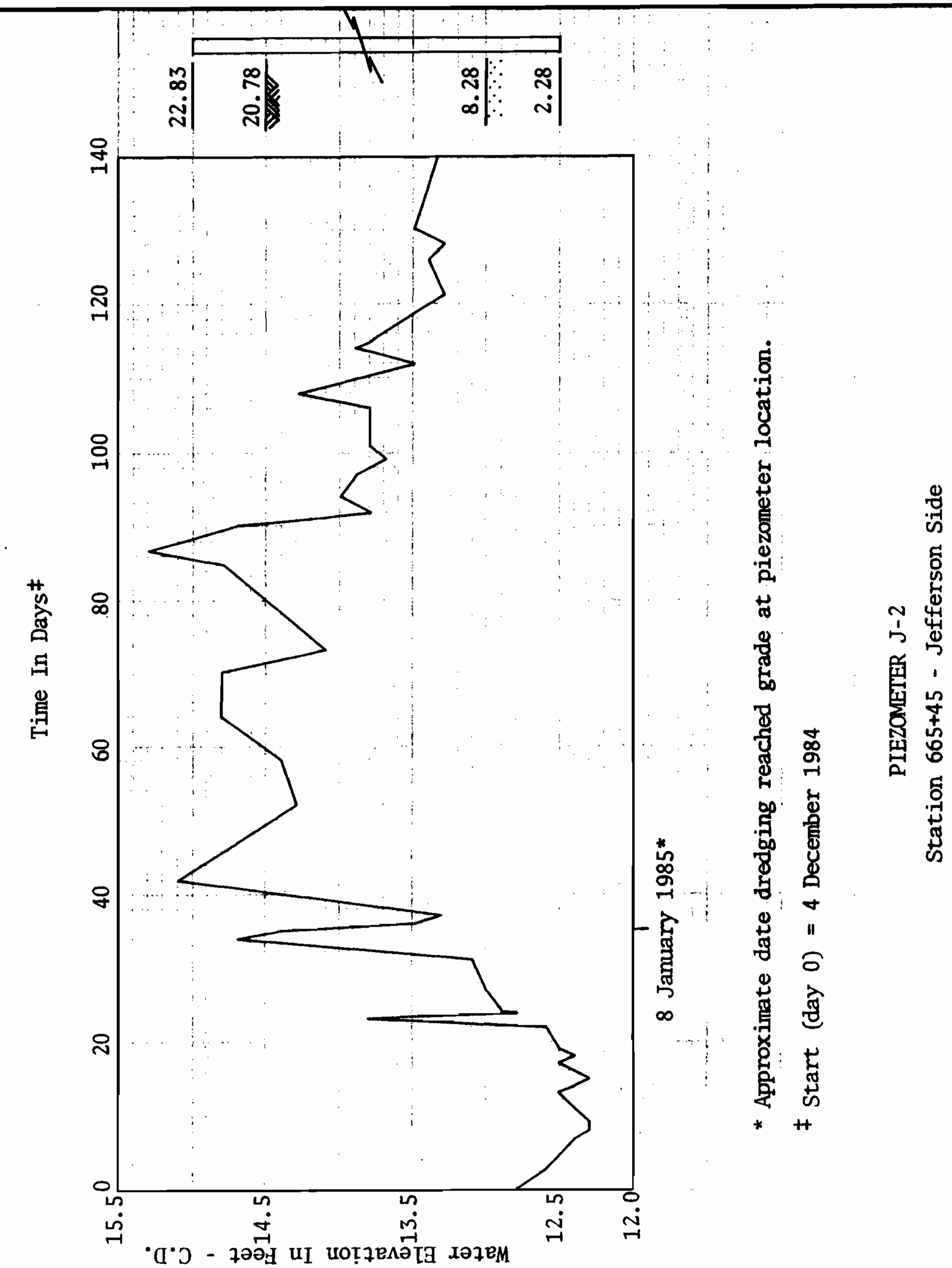
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS



Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

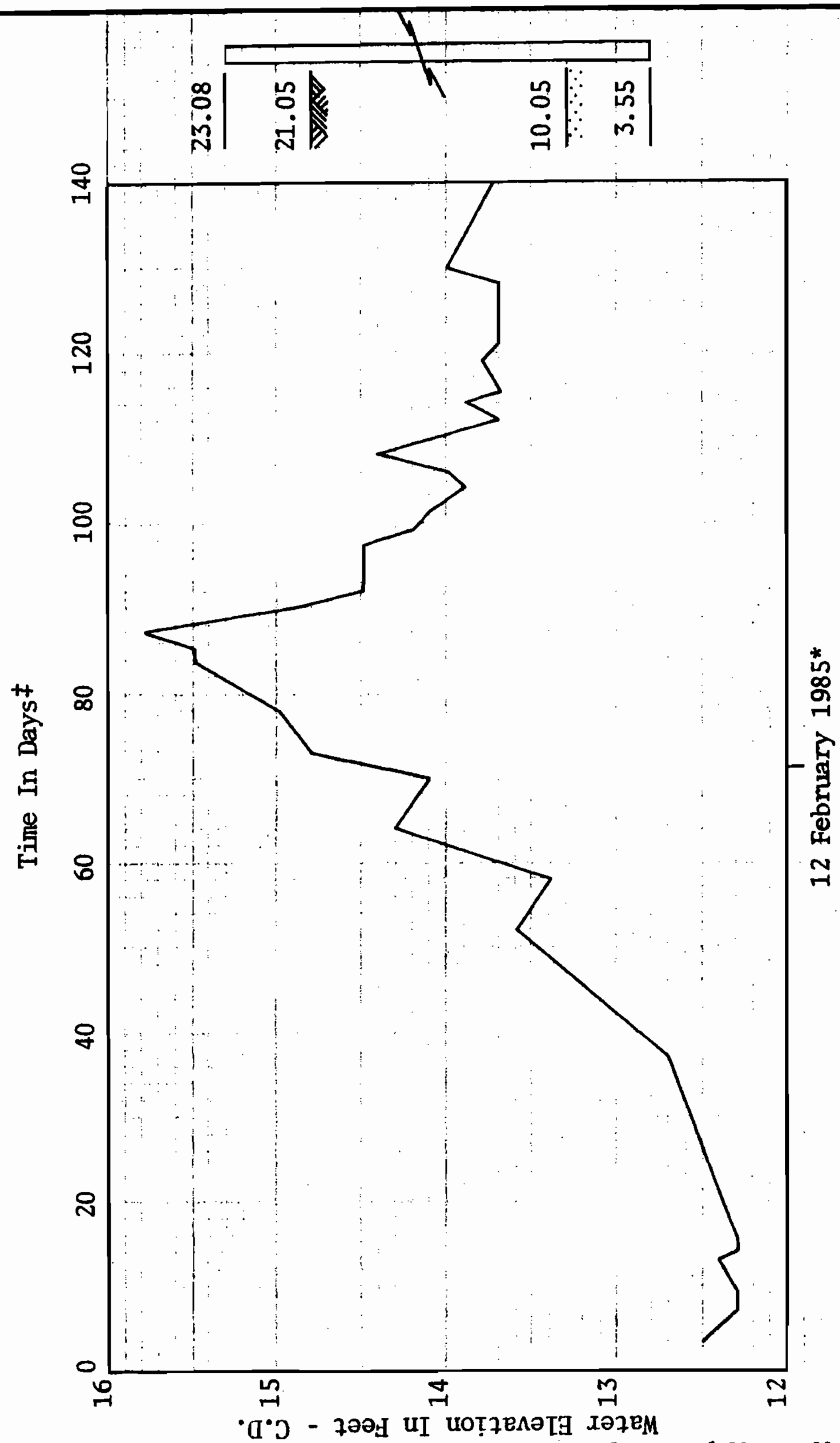
Fig. 3



Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 4



* Approximate date dredging reached grade at piezometer location.

‡ Start (day 0) = 4 December 1984

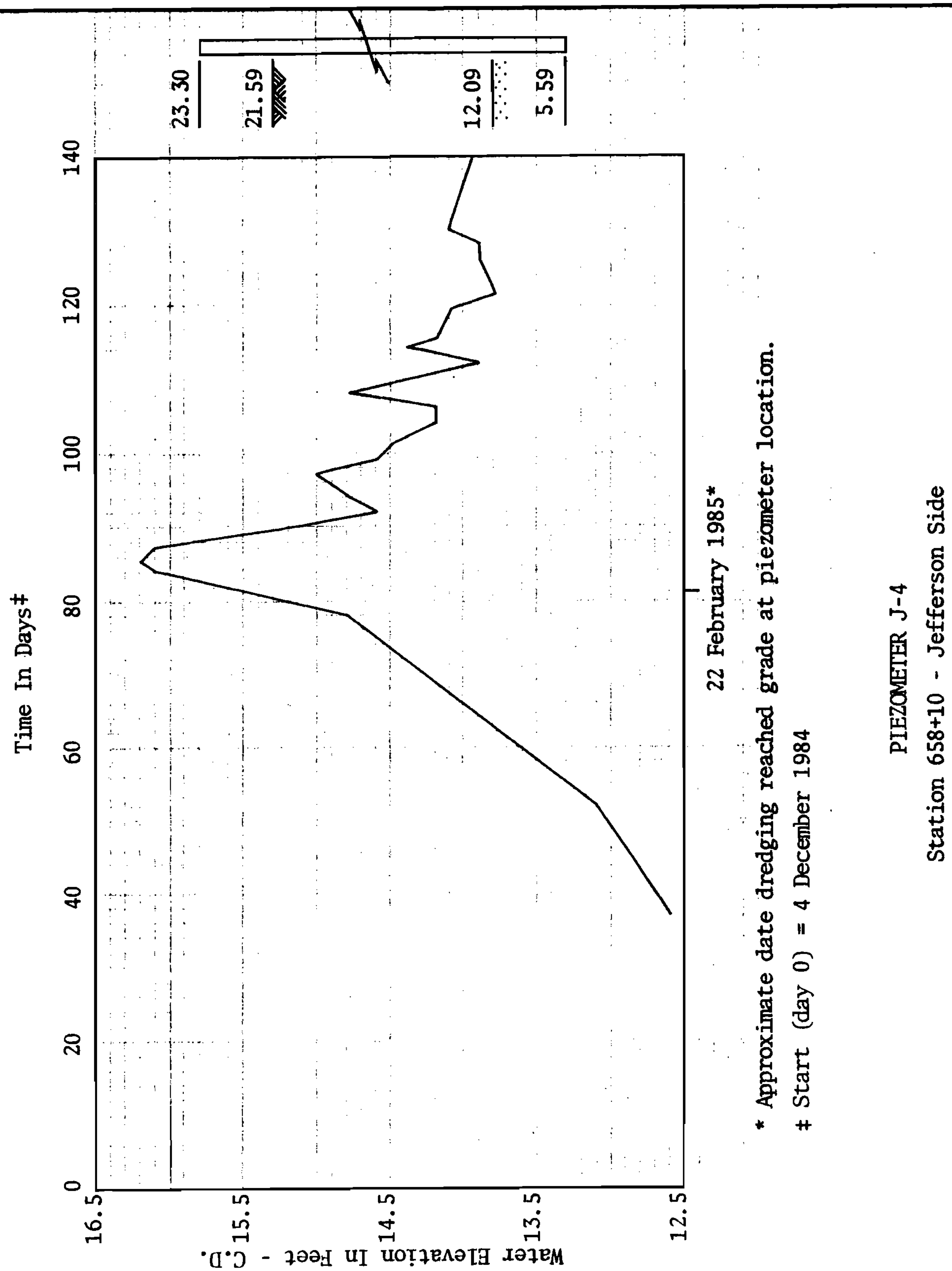
PIEZOMETER J-3

Station 660+60 - Jefferson Side

Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 5

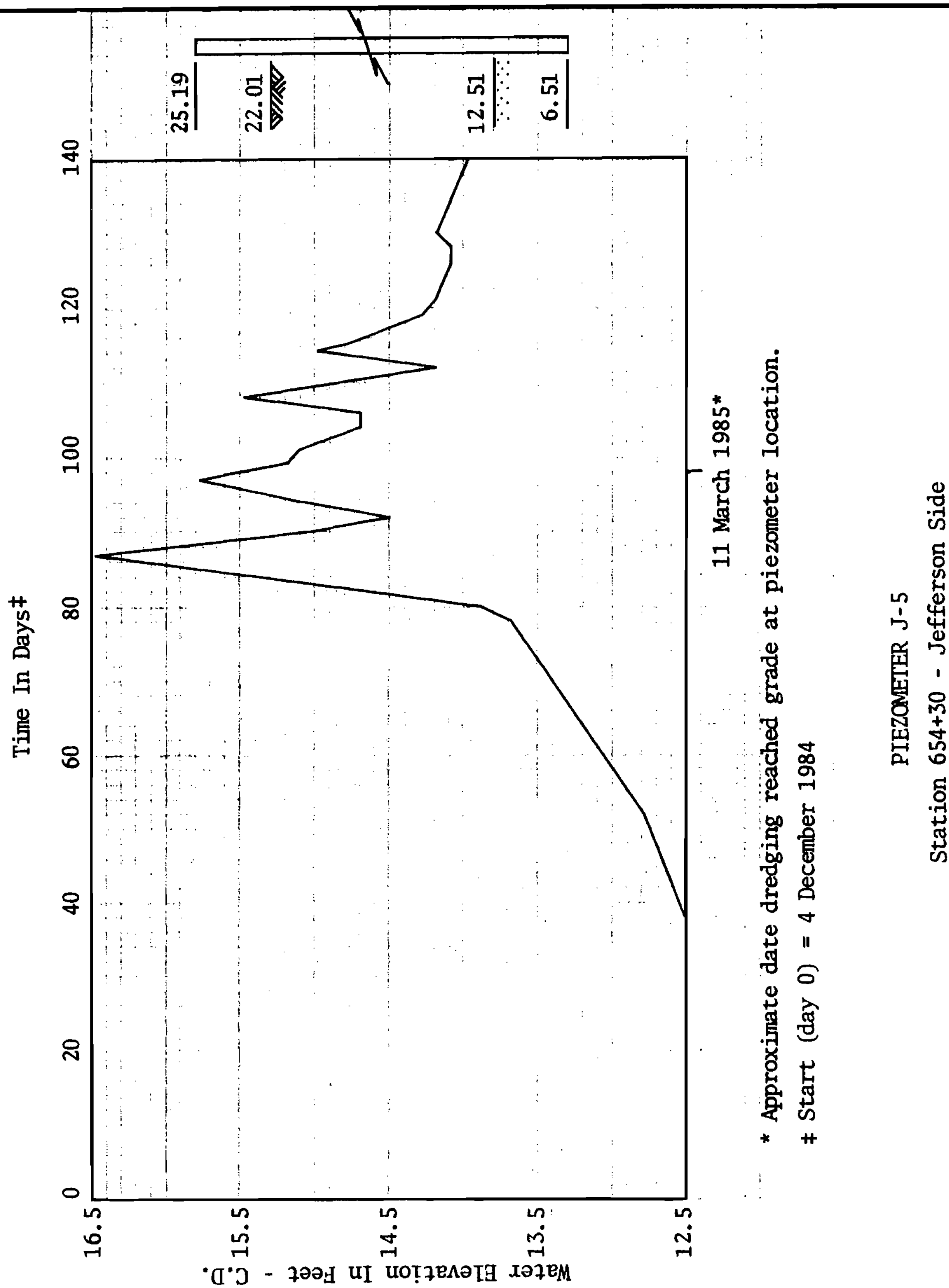


Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 6

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS

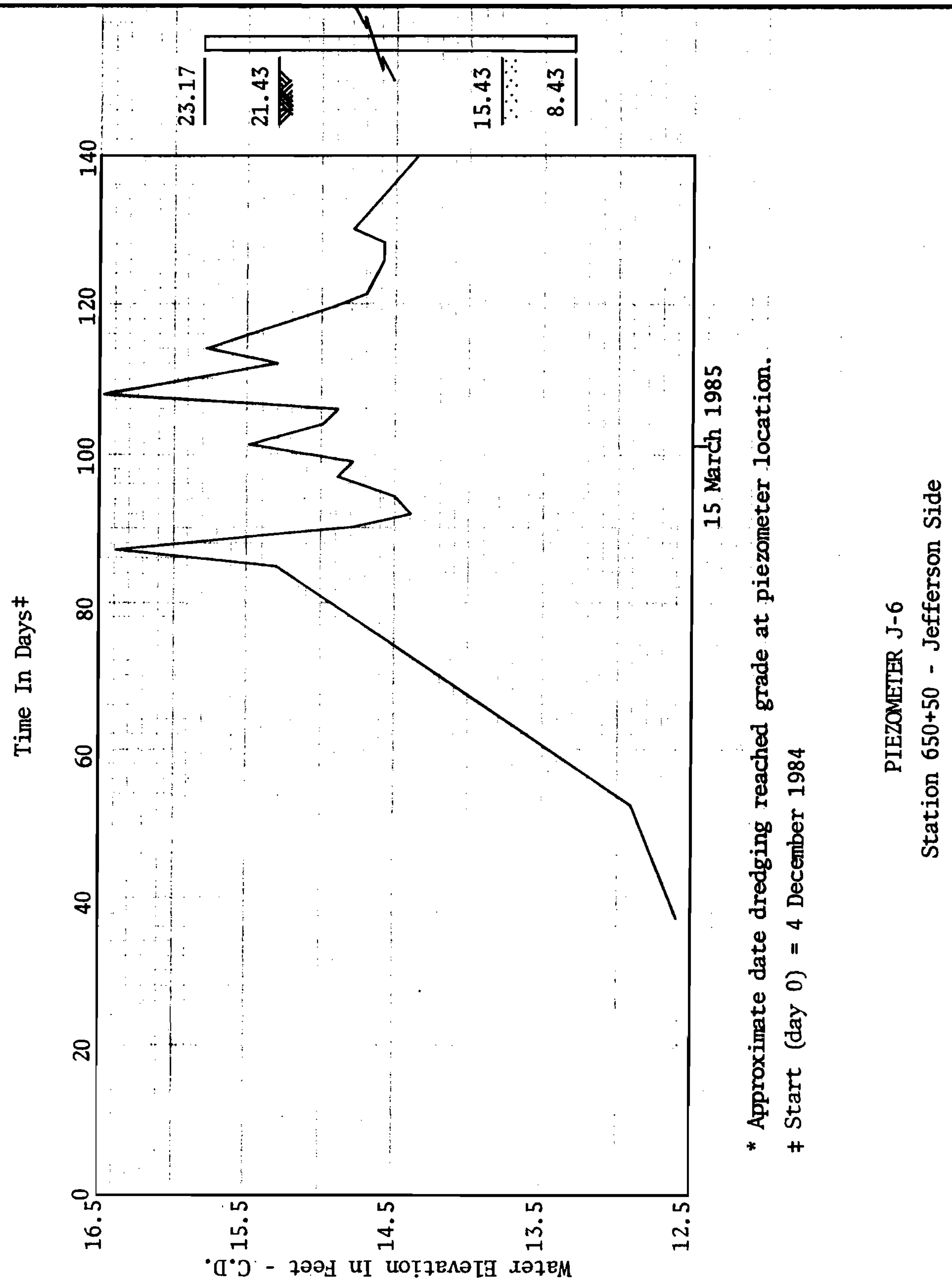


Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 7

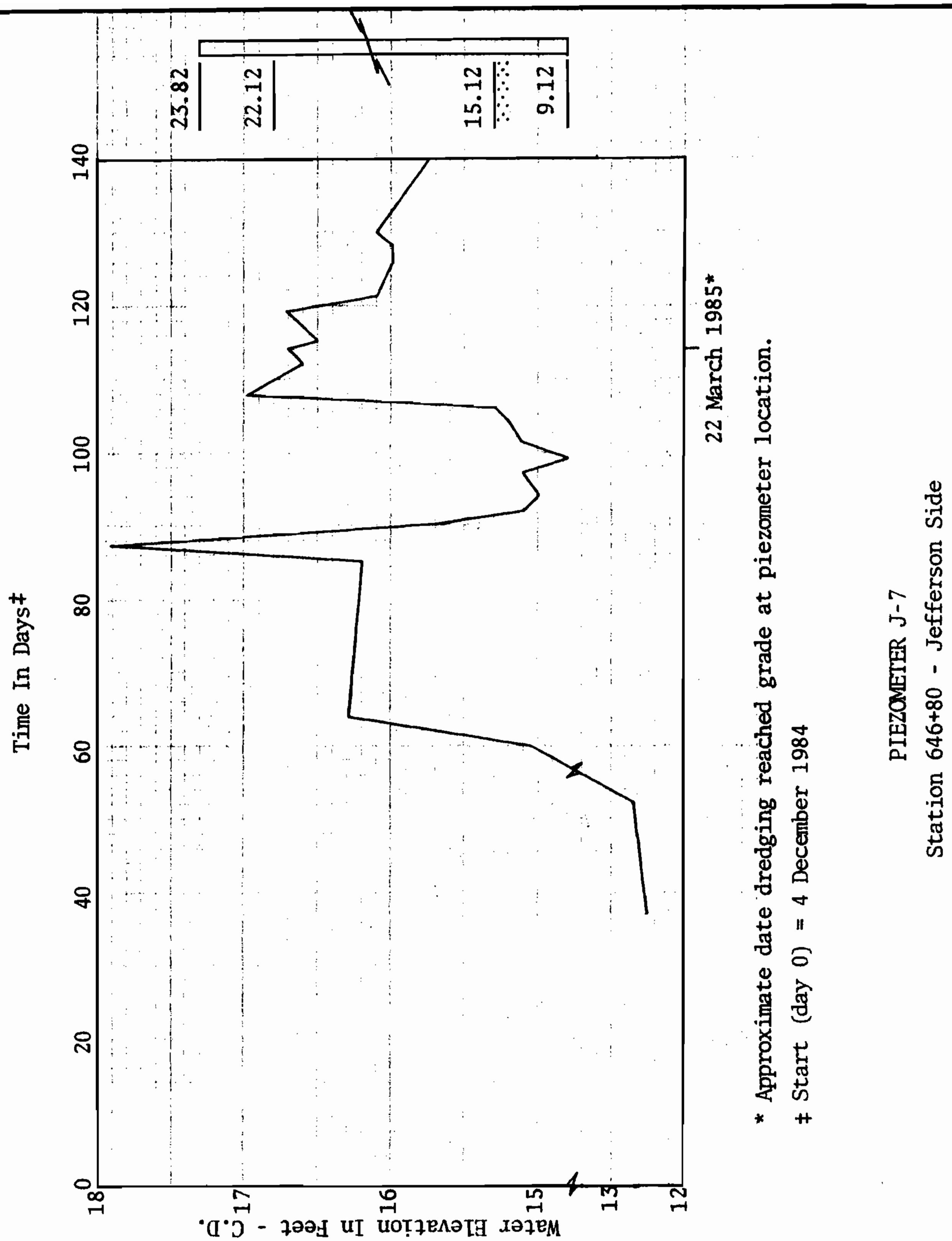
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS



Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

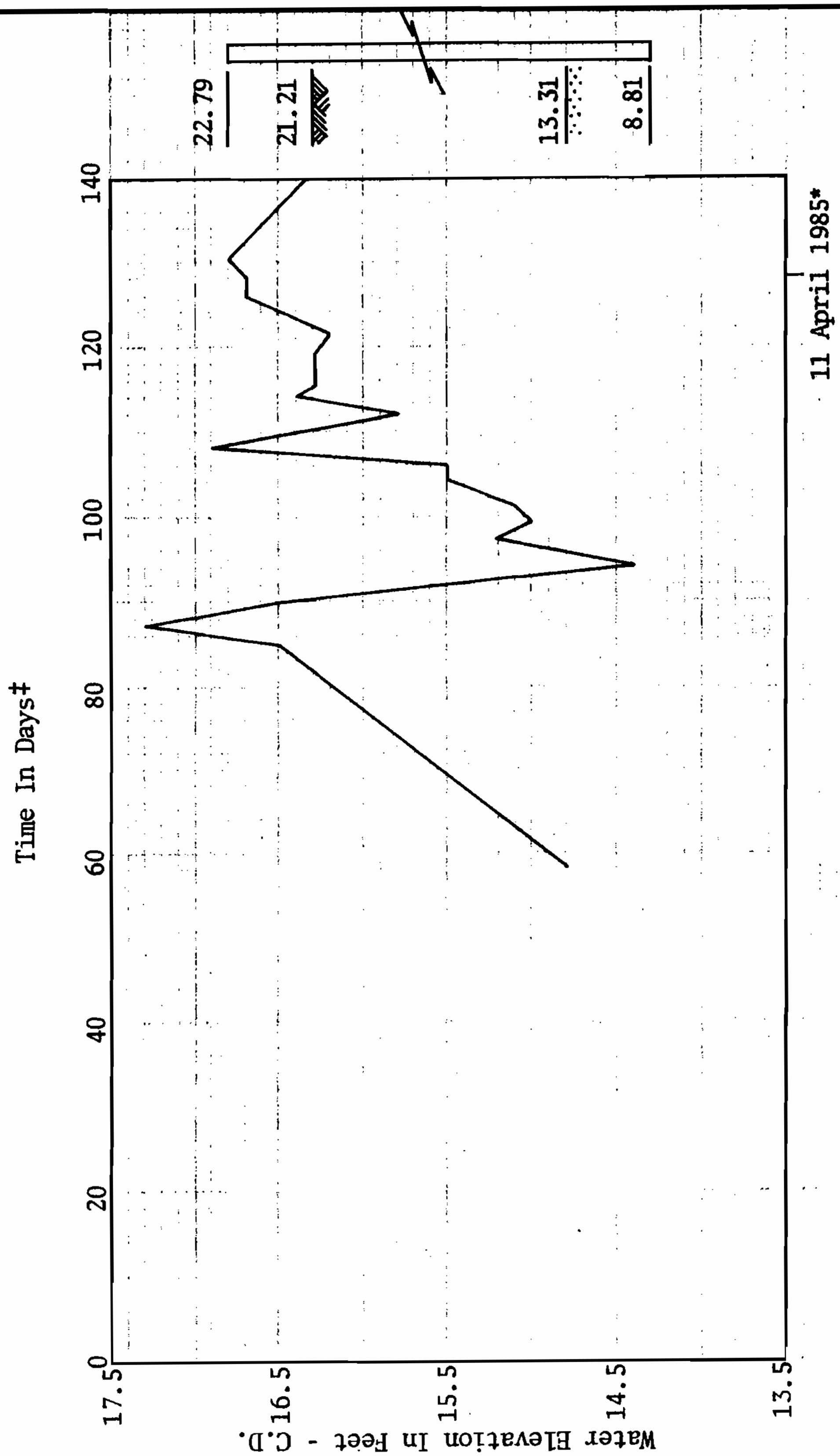
Fig. 8



Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 9



* Approximate date dredging reached grade at piezometer location.

‡ Start (day 0) = 4 December 1984

PIEZOMETER J-8

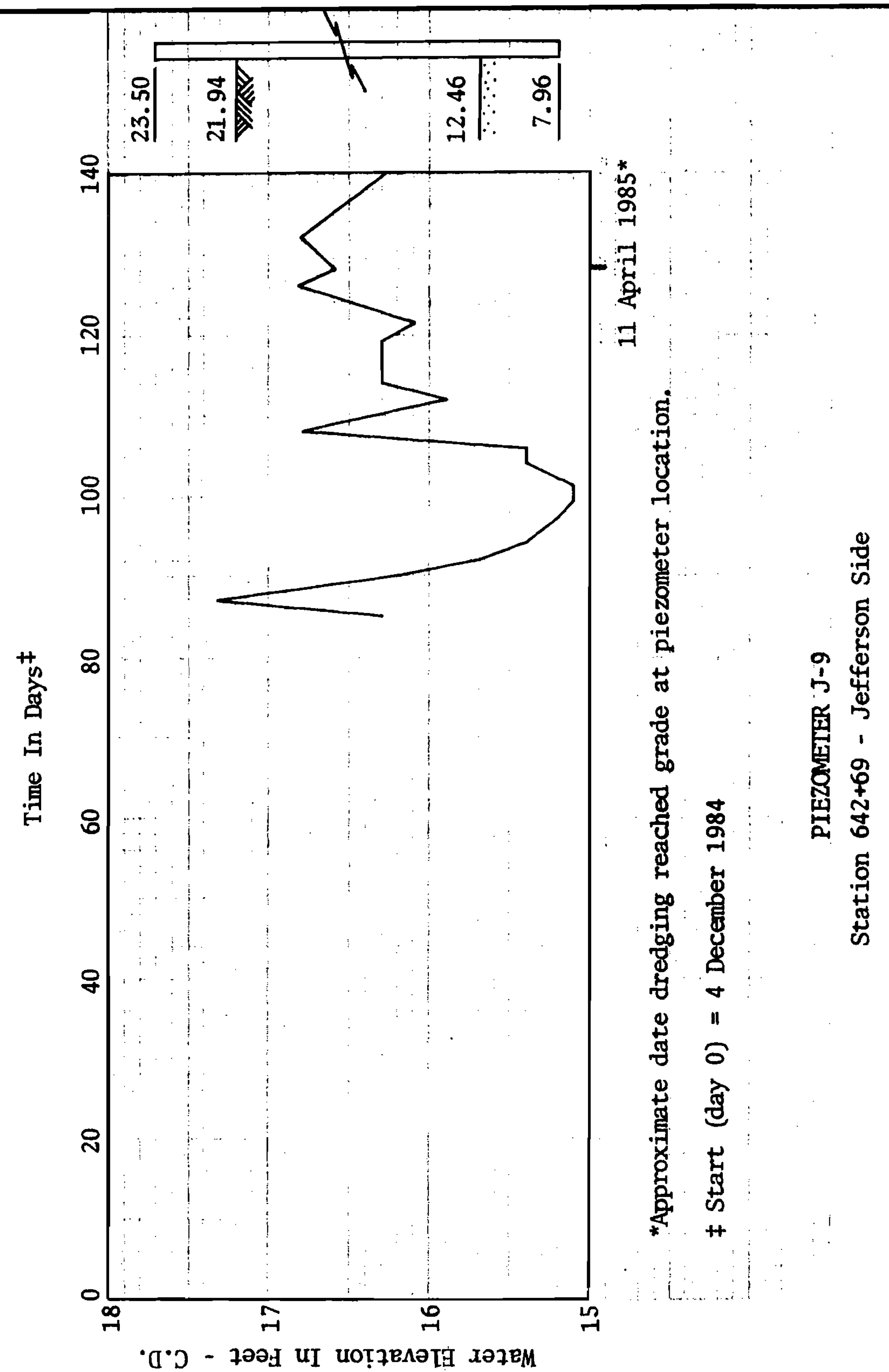
Station 642+91 - Jefferson Side

Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 10

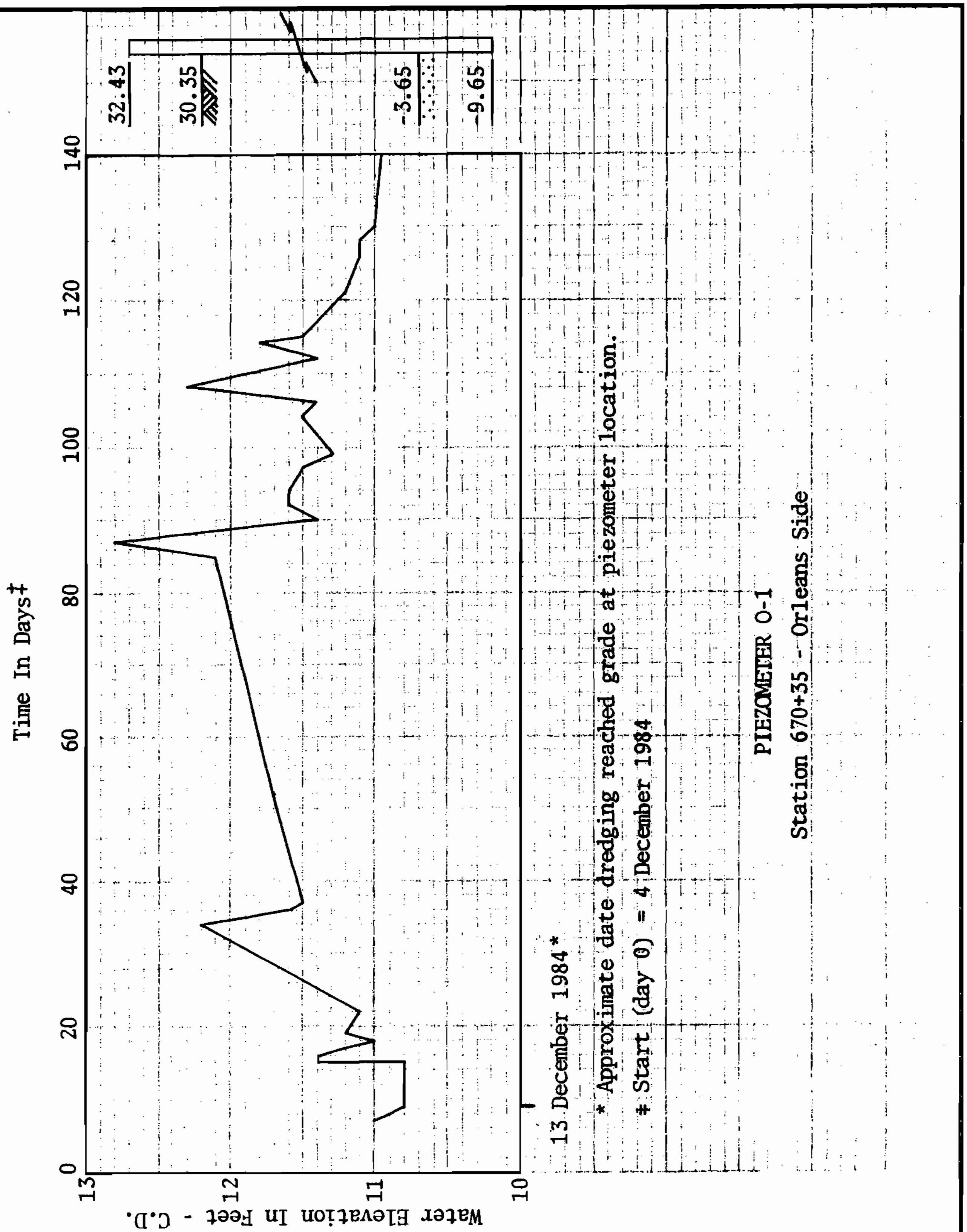
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA



Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

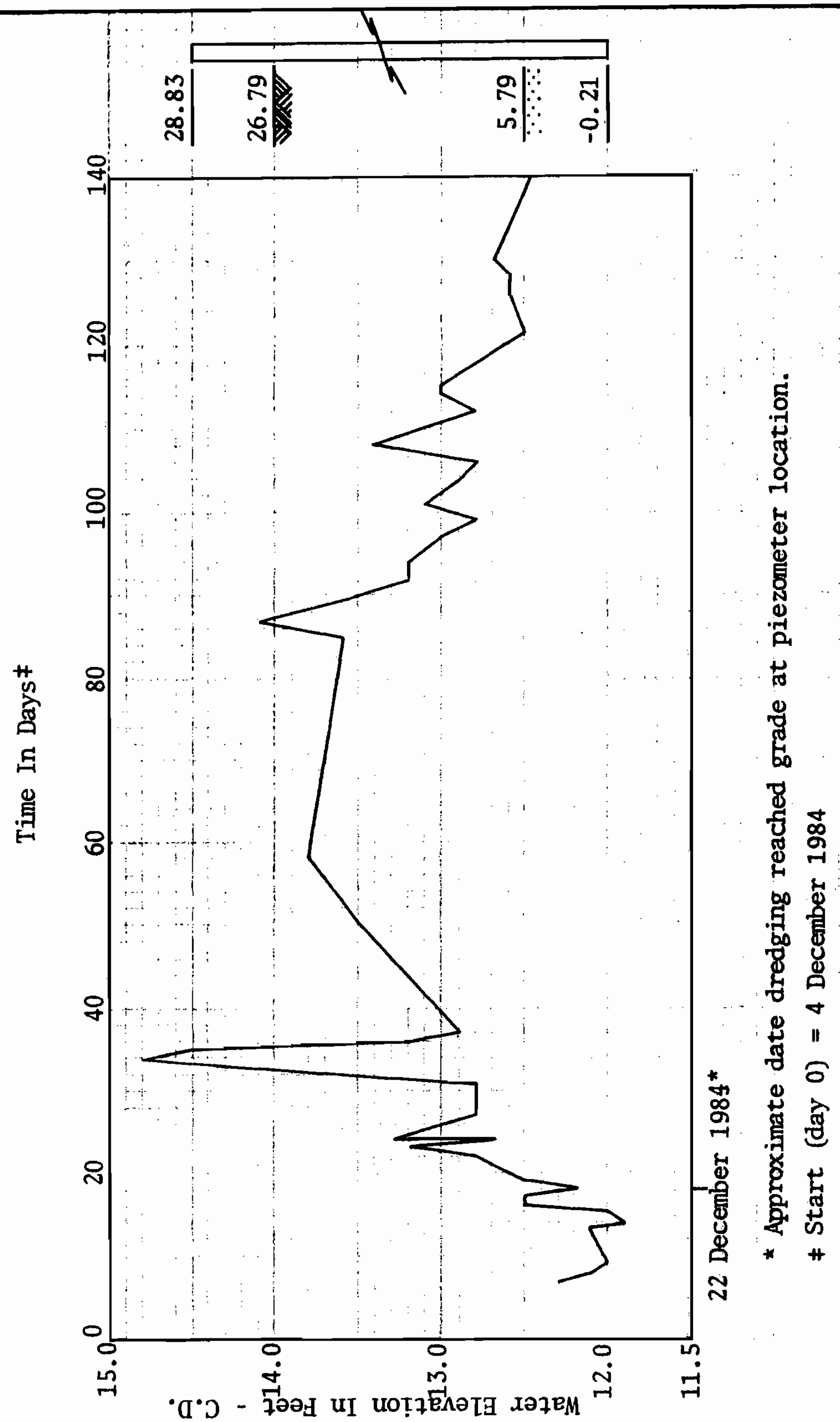
Fig. 11



Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 12



* Approximate date dredging reached grade at piezometer location.

‡ Start (day 0) = 4 December 1984

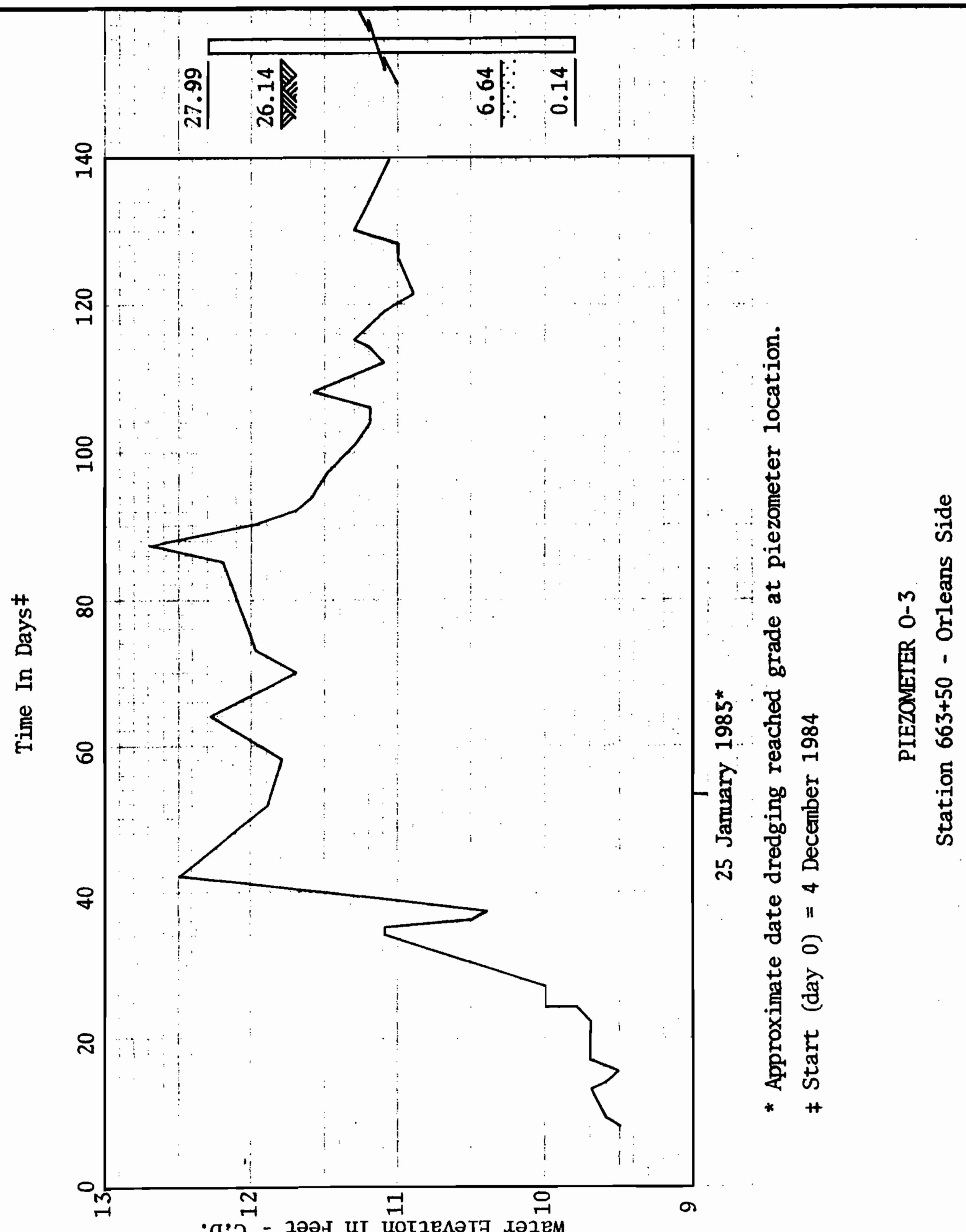
PIEZOMETER O-2

Station 667+00 - Orleans Side

Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

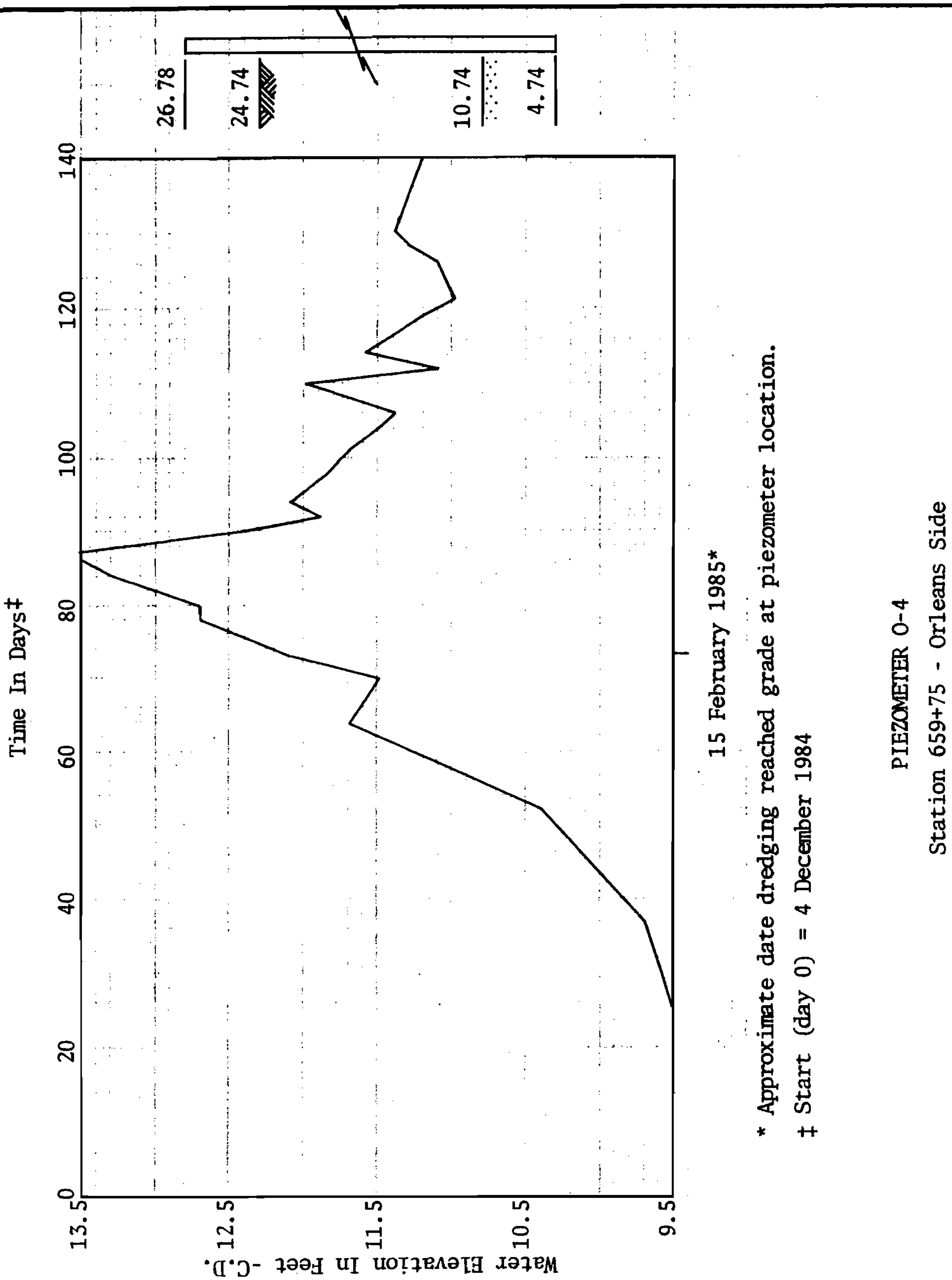
Fig. 13



Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 14

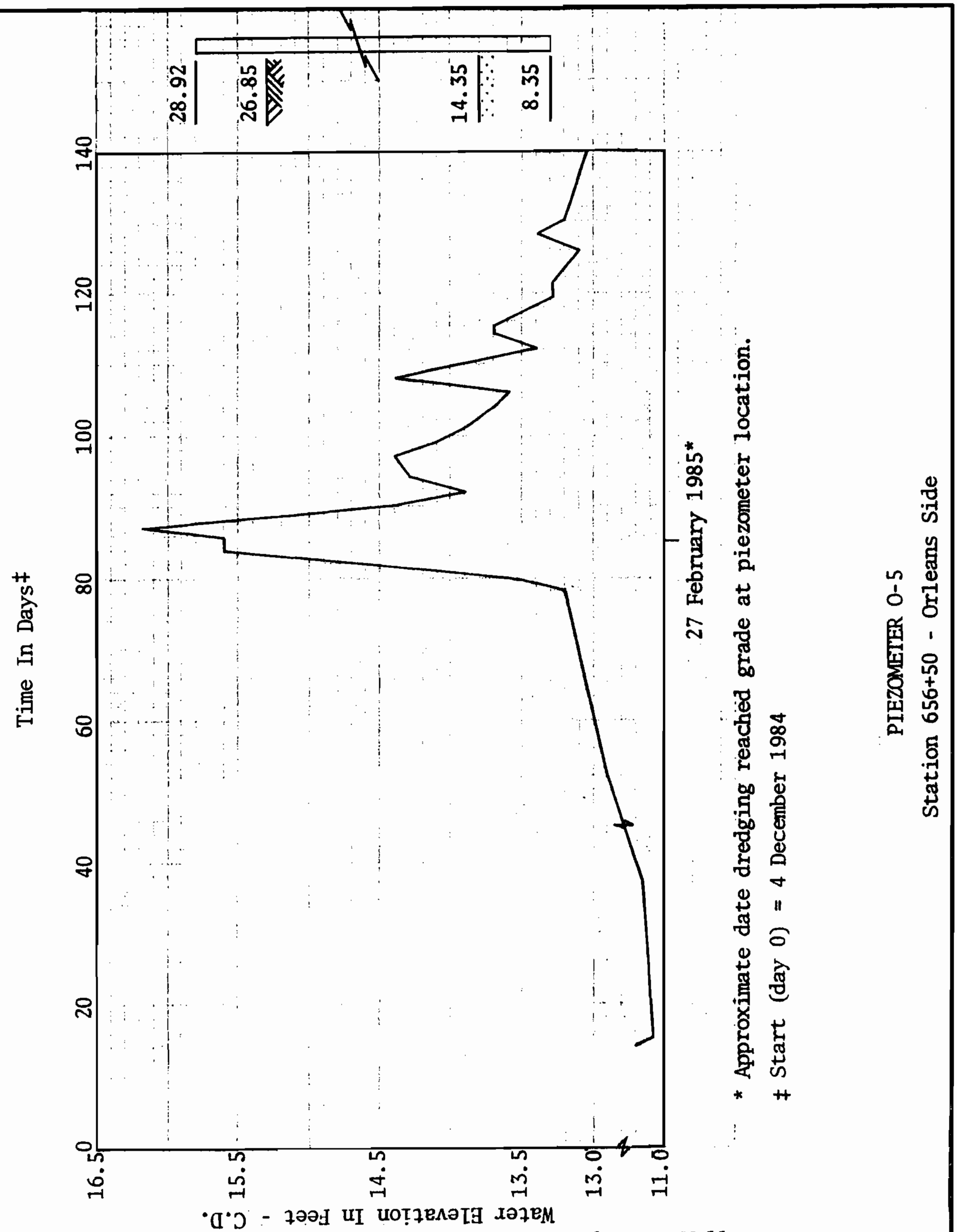


Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 15

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS

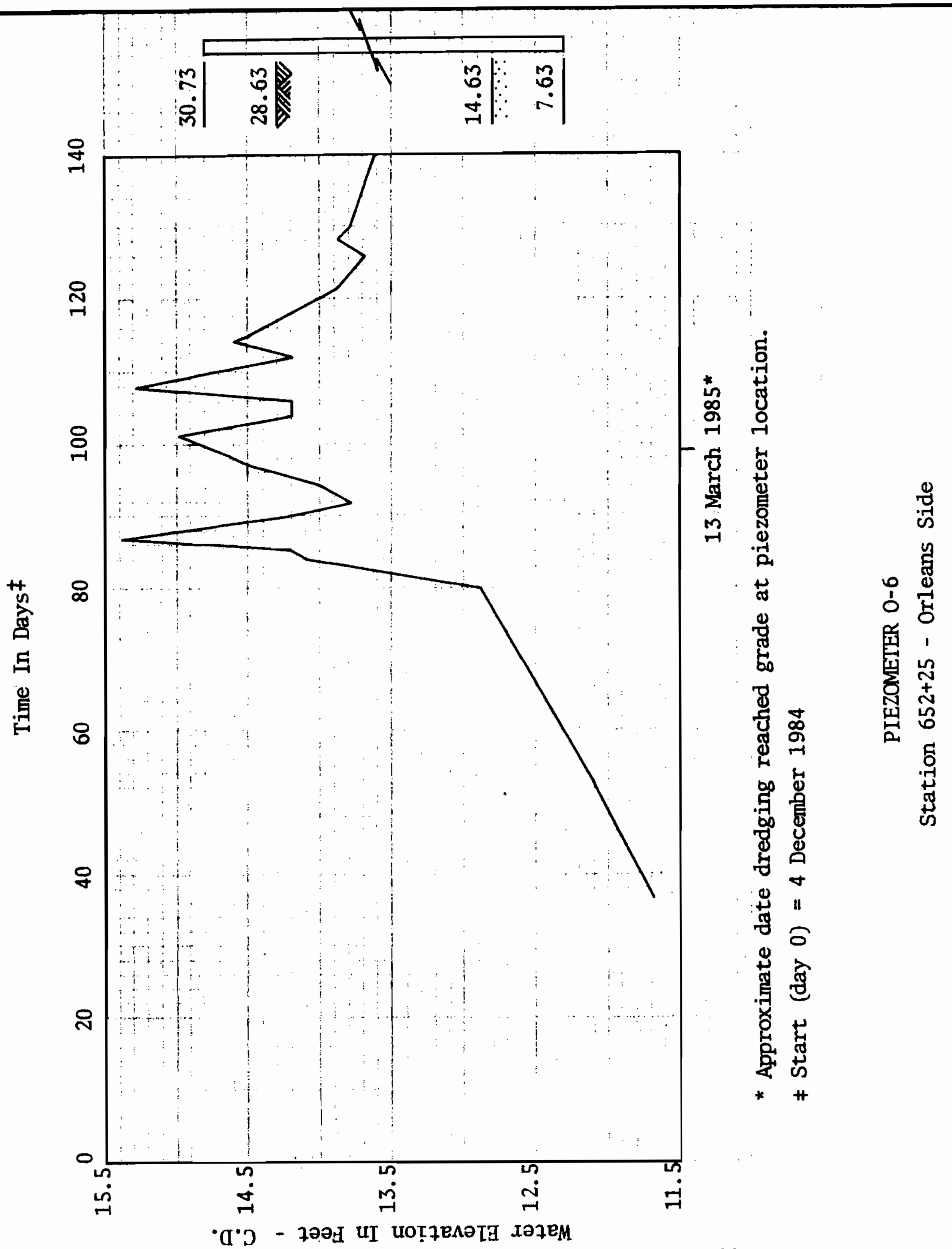


Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 16

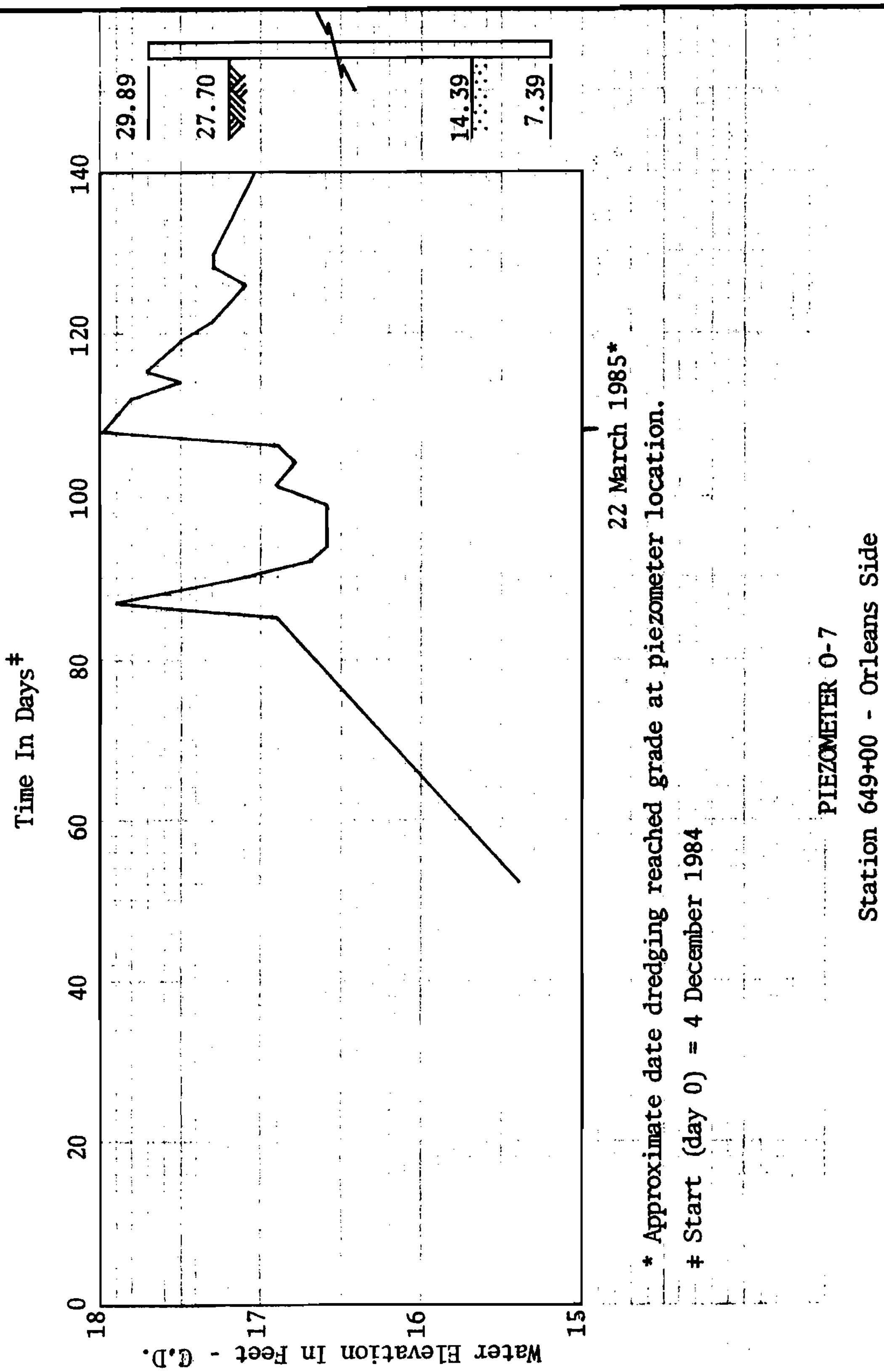
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS



Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

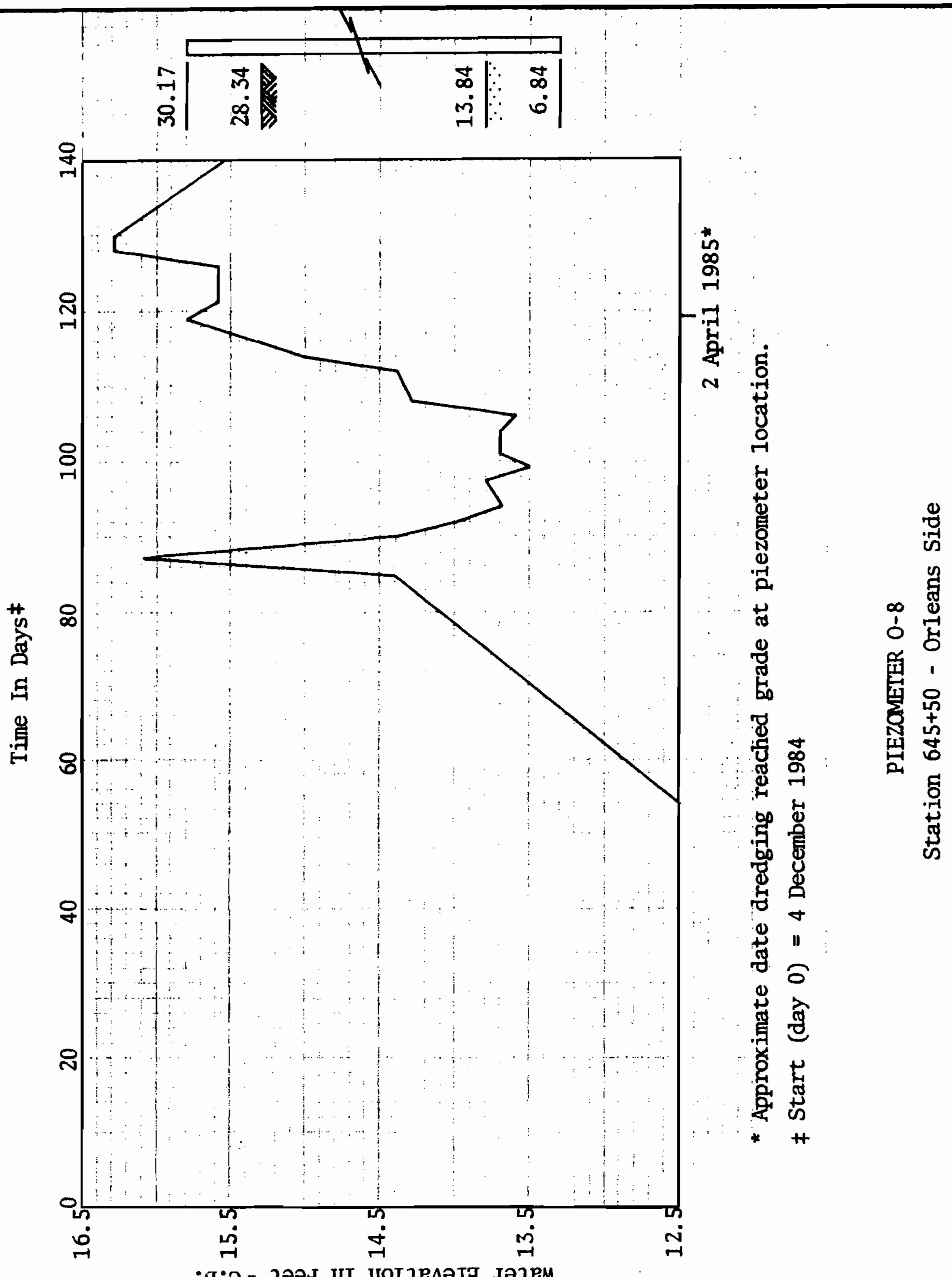
Fig. 17



Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

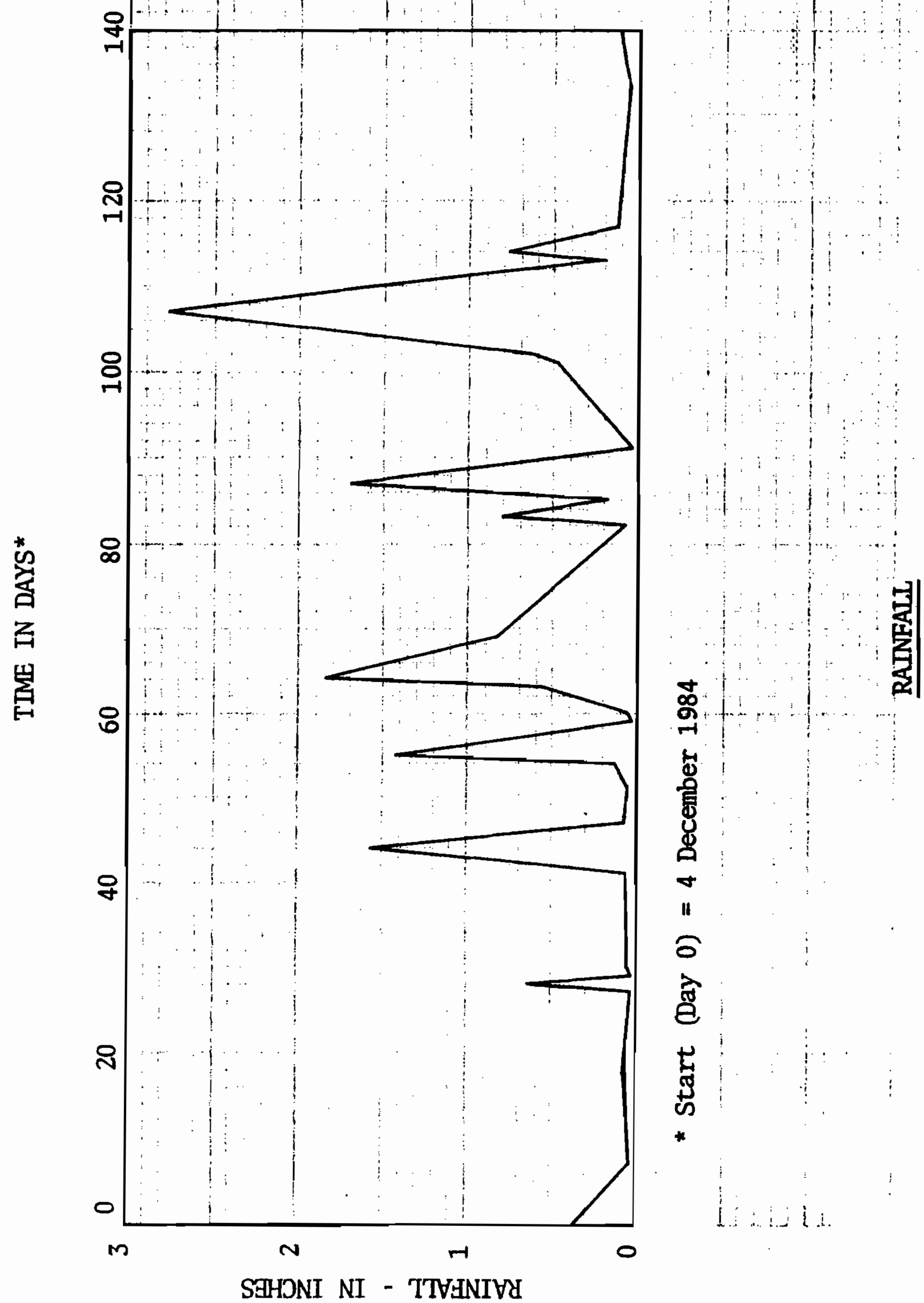
Fig. 18



Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 19



Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

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Fig. 20

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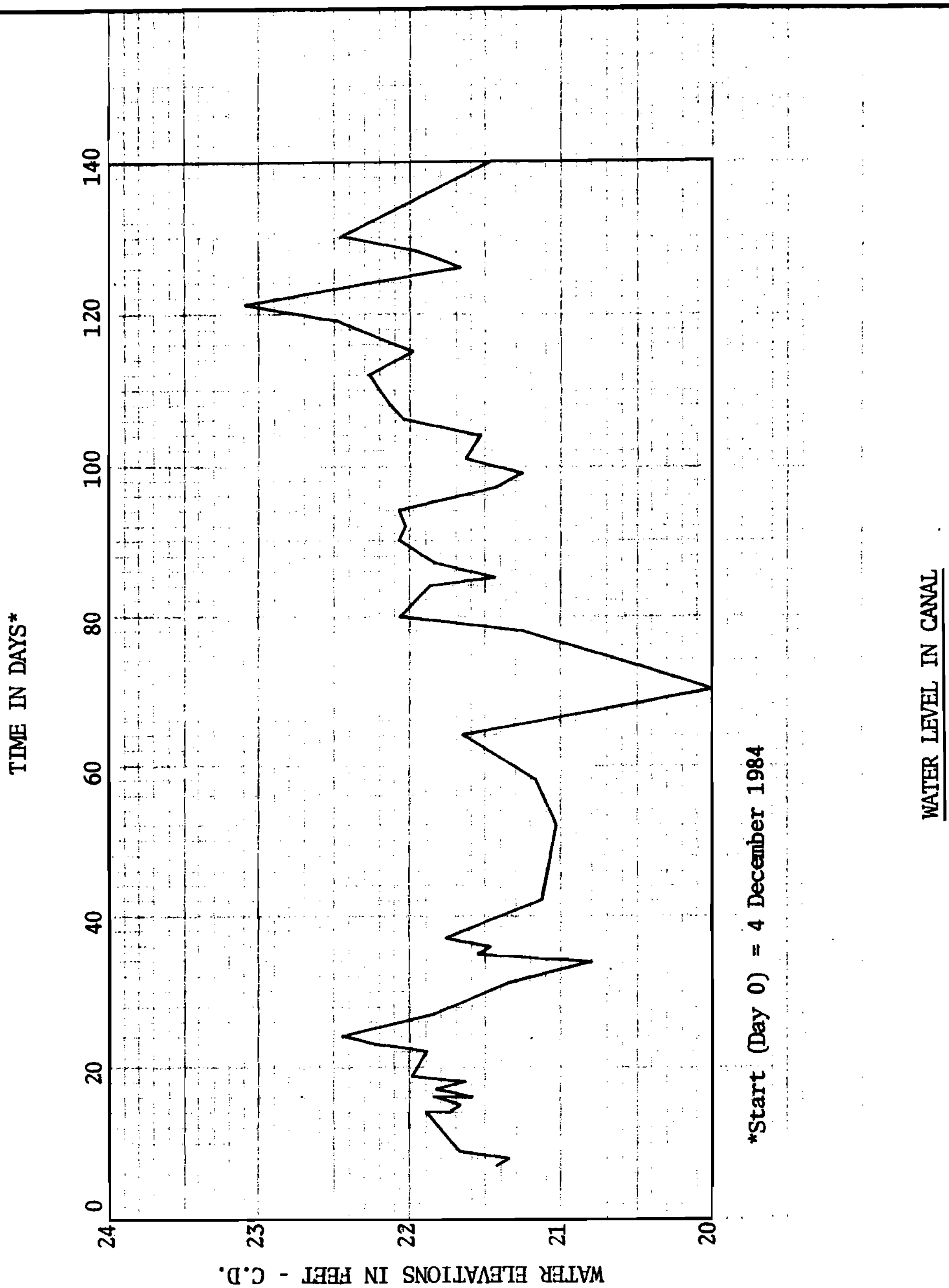

Installation & Monitoring of Ground Water Wells
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Approximate Stations 640+00 to 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana

Fig. 21

PARTNERS

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REG. C. E.

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REG. C. E.

JOHN W. ROACH, JR.
REG. C. E.

GERALD A. BRAGG
REG. C. E.

LLOYD A. HELD, JR.
REG. C. E.

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

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METAIRIE, LOUISIANA 70011
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LLOYD A. HELD, JR.

12 January 1984

Modjeski and Masters
Consulting Engineers
John Hancock Building
1055 St. Charles Avenue
New Orleans, Louisiana 70113

Attention Mr. Barney Martin

Gentlemen:

Piezometric Data - Test Section
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

This report contains piezometric data obtained before, during and after excavation of a test section in the Metairie Relief Canal located in Orleans and Jefferson Parishes, Louisiana. Verbal authorization to obtain piezometric data was received from Mr. Barney Martin of Modjeski and Masters, Consulting Engineers for the project. Excavation of a test section was recommended by Eustis Engineering Company to assist the Sewerage and Water Board in obtaining a permit from the Corps of Engineers for the planned improvements to the Metairie Relief Canal between Station 617+50 and Station 663+00.

The purpose of a test section is to develop more definitive information regarding the potential for a blow-out at the landside toe of the levee during high water conditions in the canal. Subsoil information indicated that an underlying sand stratum may be uncovered by the planned improvement along the subject reach allowing the possible development of excessive hydrostatic pressure. To obtain this information, excavation of a test section was recommended to the proposed design grades in order to observe changes in hydrostatic pressures on the landside of the levee. The recommended location of a test section is shown on Enclosure 1 and a typical cross-section is shown on Enclosure 2.

Six (6) piezometers were installed on the Jefferson Parish side of the canal at the locations shown on Enclosure 1 to closely monitor changes in the hydrostatic pressures before, during and after completion of the excavation. All of the piezometers were installed in accordance with the diagram shown on Enclosure 3. The ground surface elevation and the elevation of the bottom of each screen is shown in the following tabulation.

			Elevations - Cairo Datum	
No.	Station	Offset	Ground Surface	Bottom of Screen
P-1	642+77	℄ of Levee	32.41	7.91
P-2	642+69	Toe of Levee	20.96	7.96
P-3	642+91	Toe of Levee	20.31	8.81
P-4	642+61	50' from Levee Toe	18.54	8.04
P-5	642+91	50' from Levee Toe	19.06	8.56
P-6	642+61	145' from Levee Toe	18.80	4.30

A total of fifteen (15) borings were drilled in the area of the test section at the locations shown on Enclosure 1. One (1) undisturbed boring designated B-17 and four (4) probe borings designated B-100 through B-103 were drilled for previous investigations and the logs of these borings are shown on Enclosures 4, 5 and 6. An auger boring designated A-17 was drilled near the water's edge and the log of this boring is shown on Enclosure 7. Holes drilled for installation of the six (6) piezometers designated P-1 through P-6 were logged and the results are shown on Enclosures 8 and 9. Upon completion of the piezometric readings, three (3) borings designated E-1 through E-3 were drilled in the bottom of the test section and the logs of these borings are shown on Enclosure 10.

The water surface elevation in the canal and each piezometer was obtained on thirty (30) separate occasions including: Nine (9) occasions prior to the initiation of the excavation; twelve (12) occasions during excavation; and nine (9) occasions after completion of the excavation. The results are shown graphically on Enclosures 11 through 16.

Excavation of the test section began on or about 29 November 1983 and reached final design grade during the period 15 to 16 December 1983. Information furnished by Modjeski and Masters indicates that the excavation was accomplished in strips perpendicular to the canal centerline using a dragline bucket. The width of each excavated strip corresponded to the width of the bucket and operations proceeded in sequence from one end of the test section to the other. Furnished information also indicates that excavation operations during the period 15 to 16 December consisted of cleaning and/or shaping of the test section to final grade and, during this sweeping operation, sand was excavated from the bottom of the test section. It is further understood that the final sweeping operation was completed in a period of approximately four hours and soundings were subsequently taken to verify the configuration of the test section. All excavation operations terminated at approximately 4:00 p.m. on 16 December.

Twelve (12) sets (a total of 72) of readings were obtained in the piezometers during the construction period. The maximum variation in the water elevation was 1.41 feet which occurred at P-6 located 145 feet from the toe of the levee. At P-2 and P-3 (located at the toe of the levee) and at P-4 and P-5 (located 50 feet from the toe) the maximum variation in the water elevation was approximately 1 foot.

After excavation operations terminated, three (3) borings designated E-1 through E-3 were drilled on 19 December 1983 in the bottom of the test section to verify exposure of the underlying sand stratum. However, these borings encountered 2.7 to 4 feet of sediment at the canal bottom which was apparently deposited after excavation operations terminated on 16 December. This sediment is underlain by medium dense gray fine sand at all three boring locations.

Nine (9) sets (a total of 54) of readings were obtained in the piezometers after completion of excavation operations. Except in P-1, the water elevation in the piezometers ranged between 13.29 and 13.59 C.D. while the water elevation in the canal ranged between

21.43 and 22.59 C.D. The water elevation in P-1 ranged between 17.59 and 17.72 C.D. during this period.

Based on the water elevations obtained in the piezometers and canal, information furnished by Modjeski and Masters, and rainfall data furnished by the Sewerage and Water Board, the following observations appear reasonable:

1) All six (6) piezometers functioned throughout the test period.

2) Variations of the water elevation in the piezometers before, during and after excavation did not respond to the variations of the water elevation in the canal but, instead, responded to the amount of rainfall in the area.

3) The underlying sand stratum was exposed over some portion if not over the entire bottom area of the test section on 16 December.

4) During the period when the underlying sand stratum was exposed on 16 December, the water elevation in the canal rose 0.41 of a foot but the water elevation in the piezometers fell slightly or remained unchanged.

5) Sedimentation deposits covered the bottom of the test section in a relatively short period of time.

Based on the foregoing observations, the following conclusions may be reasonable.

1) The water elevation in the piezometers was not affected by the water level in the canal because the surface of the underlying sand has become intermixed with fines to some depth below design grade (el 4.0 C.D.). This layer of contaminated sand acts as a seal preventing the water in the canal from influencing the hydrostatic head at and beyond the levee toe.

2) Upon completion of the proposed dredging to design grade in the canal, sedimentation will probably deposit on the bottom in a relatively short period of time further sealing off the water pressure in the canal from the surrounding ground water.

The preceding conclusions may be supported by the present thickness of sedimentation on the canal bottom which suggest that at one time the bottom of the canal was as deep if not deeper than the proposed design grade. Such a situation could account for the layer of contaminated sand at the surface of this stratum, and confirm that sedimentation will deposit on the canal bottom after excavation to design grade. It should also be noted that the location of the test section was selected where the surface of the underlying sand is at the highest elevation based on borings in the canal. If the surface of the sand was deeper than the design grade, there will be many areas in which the sand stratum will not be exposed by the proposed dredging.

The foregoing observations and conclusions appear to be reasonable and, therefore, it is believed that the possibility of a blow-out during high water conditions in the canal is probably slight. However, sound engineering judgment would indicate that piezometers should be installed along the entire reach in which the sand stratum may be exposed at the bottom of the canal. Readings should be taken during and subsequent to excavation operations to more definitively define the reaction of the sand strata to the water level in the canal.

Yours very truly,

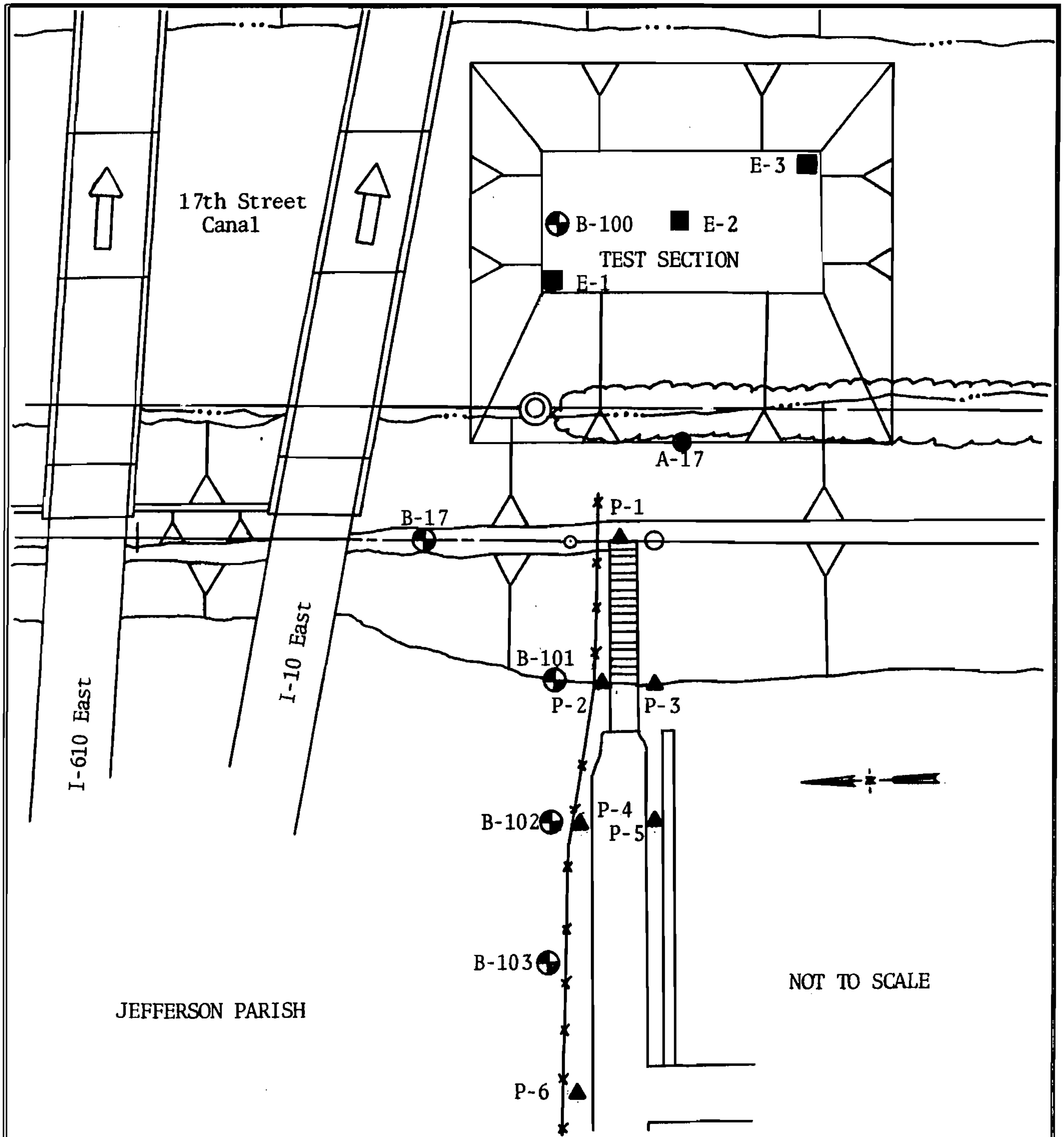
EUSTIS ENGINEERING COMPANY

By Lloyd A. Held, Jr.

Lloyd A. Held, Jr.

L. J. Napolitano:kdl

Enclosures

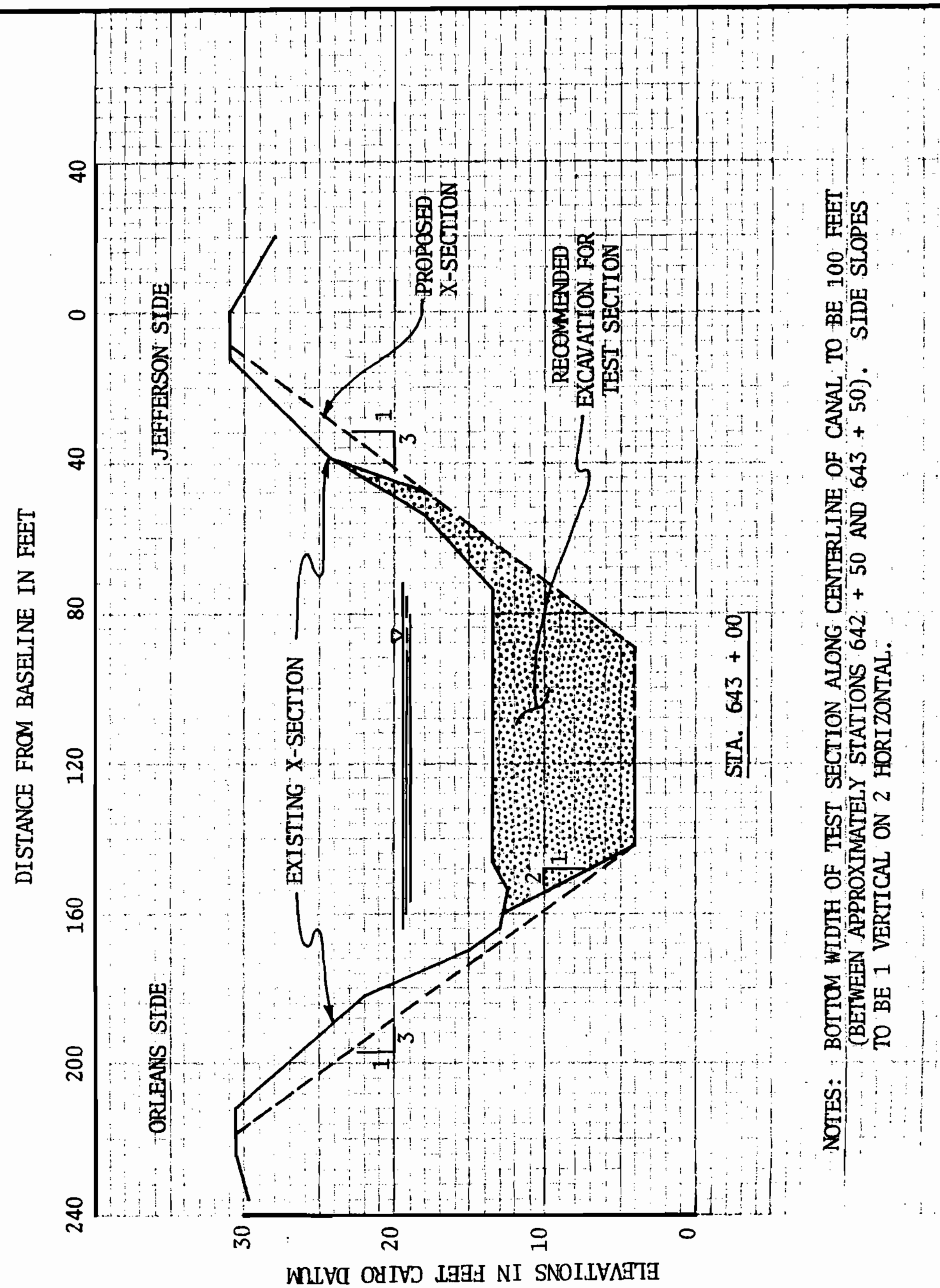


Piezometric Data-Test Section
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 1

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE LOUISIANA

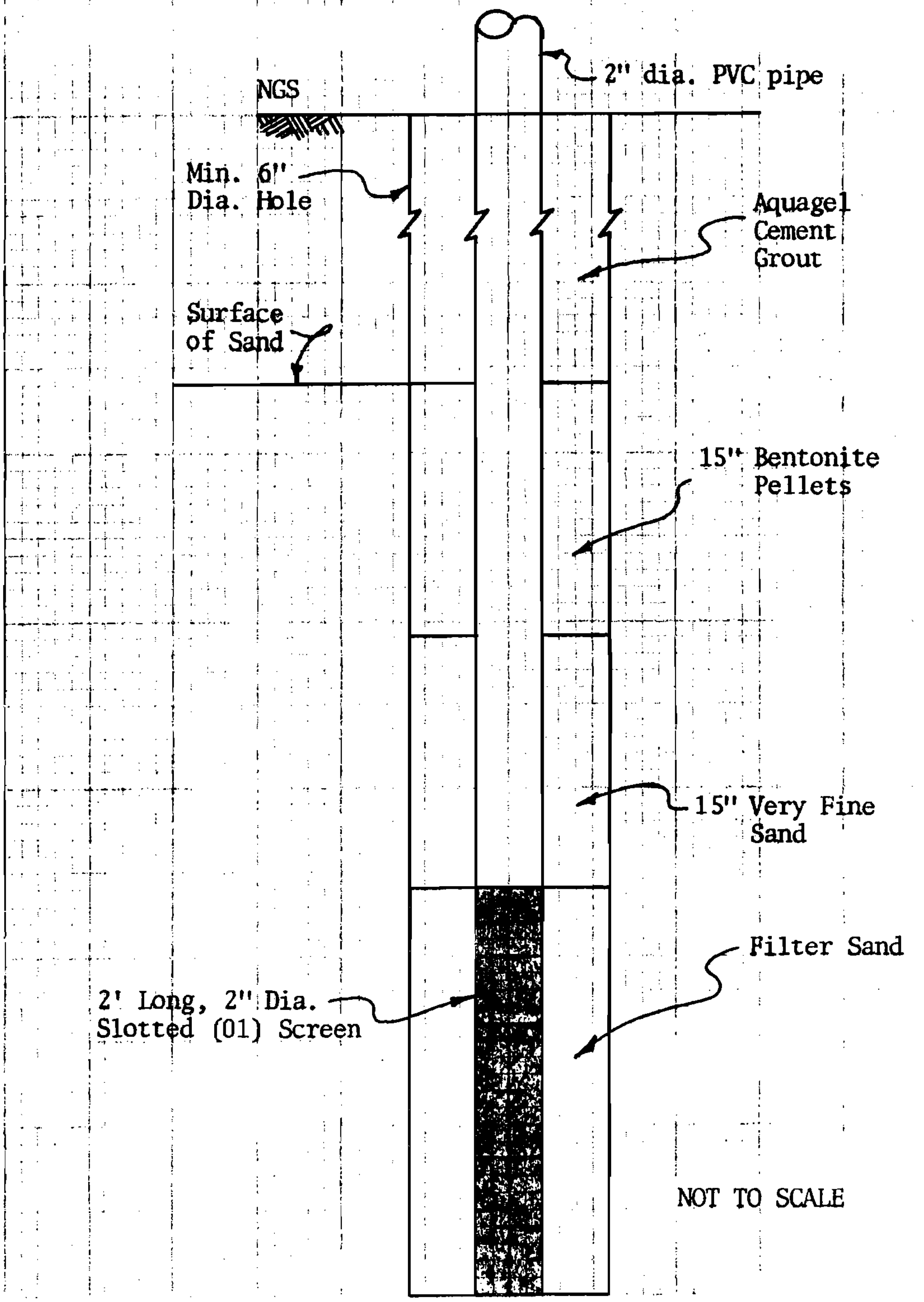


Piezometric Data - Test Section
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 2

TYPICAL PIEZOMETER INSTALLATION



Piezometric Data-Test Section
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 3

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

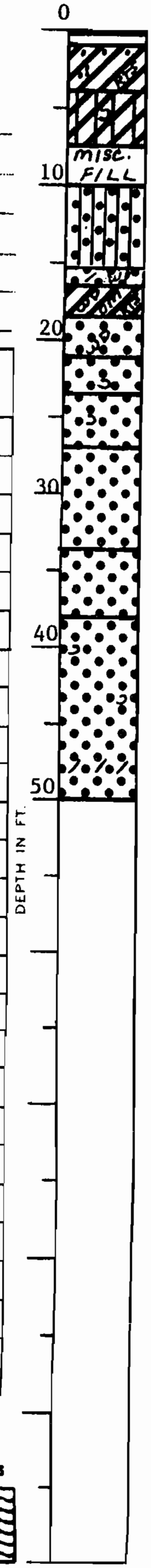
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 17 Soil Technician A. J. Mayeux Date 26 May 1981

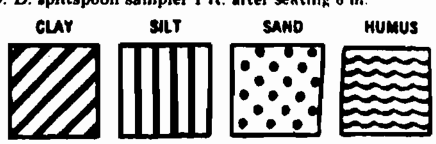
Ground Elev. 31 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.3	Asphalt		
			0.3	1.0	Fill		
1	2.0	2.5	1.0	4.0	Medium stiff gray & tan clay w/sand		
					lenses, pockets & roots		
2	5.0	5.5	4.0	7.5	Stiff gray & tan silty clay w/shell		
					fragments		
3	8.0	8.5	7.5	10.0	Miscellaneous fill (clay, sandy clay,		
					sand, gravel, bricks & etc.)		
4	11.5	13.0	10.0	15.5	Loose tan silty sand	2	5
5	15.0	16.5	15.5	16.5	Loose tan sand w/clay & wood	2	4
6	17.5	18.0	16.5	18.5	Medium stiff gray clay w/wood, organic		
					matter & roots		
7	18.5	20.0	18.5	21.0	Medium dense gray sand w/wood	3	19
8	21.0	22.5	21.0	23.5	Dense gray sand w/shell fragments	8	37
9	23.5	25.0	23.5	27.0	Very dense gray sand w/shell fragments	10	50=8"
10	28.5	30.0	27.0	33.5	Dense gray sand	5	42
11	33.5	35.0	33.5	38.0	Very dense gray sand	7	50=8"
12	38.5	40.0	38.0		Medium dense gray sand w/shell	5	12
					fragments & clay layers		
13	43.5	45.0			Ditto	6	17
14	48.5	50.0		50.0	Ditto	7	22



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta.
No. 642+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Enc. 4

LOG OF BORING

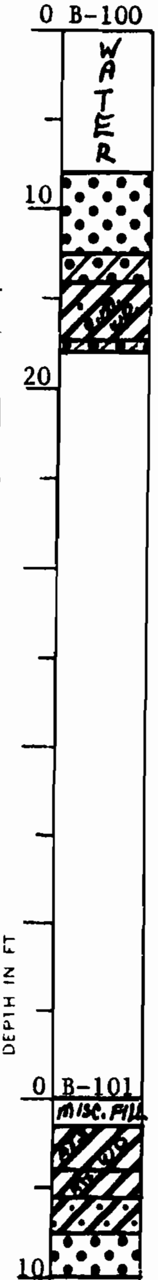
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage and Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. ______ Soil Technician G. Hardee & R. Courtiade Date 7 & 10 May 1982

Ground Elev. ______ Datum Cairo Gr. Water Depth ______

Sample No.	Sample Depth — Feet From	Sample Depth — Feet To	Depth Stratum Feet From	Depth Stratum Feet To	Visual Classification	*Standard Penetration Test	
					BORING 100 (Water Surface @ el. 21.6)		
			0.0	8.0	Water		
1	8.5	9.0	8.0		Loose black sand w/oil (Sediment)		
2	10.5	11.0		12.5	Ditto		
3	13.5	14.0	12.5	14.0	Loose dark gray clayey sand (Sediment)		
4	15.0	15.5	14.0		Soft gray clay w/organic matter		
5	16.5	17.0			Soft gray clay w/organic matter & wood		
6	17.0	17.5		17.5	Soft gray clay w/trace of sand		
7	17.5	18.0	17.5	18.0	Medium dense gray sand w/clay layers		
			NOTE:	Boring located near ℄ of canal.			
					BORING 101 (Ground Surface @ el. 19.2)		
			0.5	1.5	Miscellaneous fill		
1	2.5	3.0	1.5	4.0	Medium stiff tan & gray clay w/roots & wood		
2	5.0	5.5	4.0	5.5	Medium stiff gray clay w/roots		
3	7.0	7.5	5.5	7.5	Soft gray sandy clay		
			7.5	10.0	Medium dense gray fine sand		
			NOTE:	Boring located at landside toe of west side levee.			



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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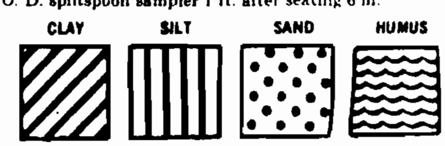
Remarks: Borings located @ Sta. 642+50.



Predominant type shown heavy. Modifying type shown light.

Enc. 5

LOG OF BORING

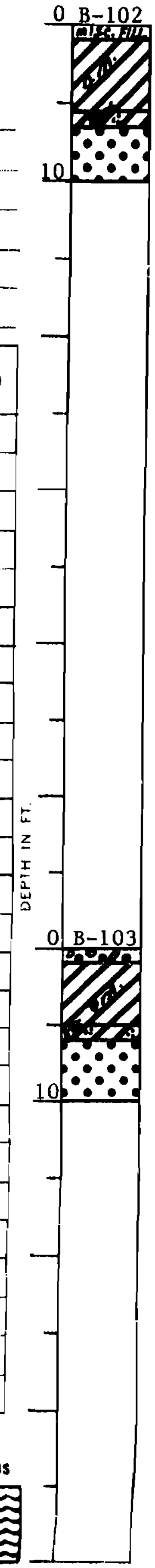
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage and Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. ________ Soil Technician G. Hardee Date 7 May 1982

Ground Elev. ________ Datum Cairo Gr. Water Depth ________

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
					BORING 102 (Ground Surface @ el. 18.6)		
			0.0	1.0	Miscellaneous fill		
1	2.5	3.0	1.0	5.5	Medium stiff gray clay w/organic matter		
					& roots		
2	5.5	6.0	5.5	6.5	Soft gray clay w/roots & sand pockets		
3	9.5	10.0	6.5	10.0	Medium dense gray fine sand		
			NOTE:	Boring located 50' from landside toe of west side			
				levee.			
					BORING 103 (Ground Surface @ el. 18.4)		
			0.0	1.0	Medium dense gray & tan sand w/shells &		
					clay pockets		
1	2.5	3.0	1.0	5.0	Medium stiff gray clay w/organic matter		
					& roots		
2	5.5	6.0	5.0	6.0	Soft gray clay w/roots & sand pockets		
3	9.5	10.0	6.0	10.0	Medium dense gray fine sand		
			NOTE:	Boring located 100' from landside toe of west side			
				levee.			



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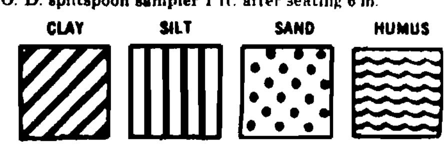


Predominant type shown heavy. Modifying type shown light.

Remarks: Borings located @ Sta. 642+50.

Enc. 6

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. A-17 **Soil Technician** Bruce Gerosa **Date** 20 July 1983

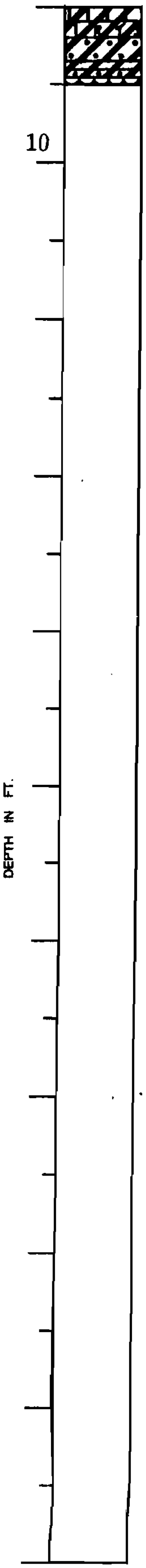
Ground Elev. 23.75 (est.) **Datum** C.D. **Gr. Water Depth** 20.75 (est.)

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	0.0	1.0	0.0	1.0	Stiff brown & gray silty clay w/clayey		
					silt layers		
2	1.0	2.0	1.0	2.0	Soft brown & gray clay w/silt & decayed		
					roots		
3	2.0	3.0	2.0		Soft gray sandy clay		
4	3.0	3.5		3.5	Soft gray sandy clay w/sand layers		
5	3.5	4.0	3.5	4.0	Medium stiff gray clay		
6	4.0	4.5	4.0	4.5	Soft gray & brown clay w/sand layers		
					& organic matter		
7	4.5	5.0	4.5	5.0	Soft brown humus		

0

10

DEPTH IN FT.



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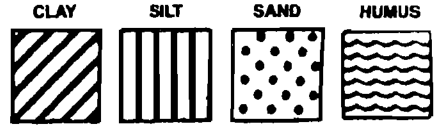
CLAY SILT SAND HUMUS



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Jefferson Side at Approximately Station 643+00. Approximately 35' from ℄ of Levee on the Canal Side

Enc. 7

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. ________ Soil Technician Richard K. Blum Date 27 September 1983

Ground Elev. See Text Datum ________ Gr. Water Depth ________

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
					BORING P-1		
			0.0	0.2	Asphalt		
1	1.0	1.5	0.2	7.5	Medium stiff tan & brown silty clay		
2	8.0	8.5	7.5	15.0	Medium dense tan sand w/clay & gravel		
3	16.0	16.5	15.0	20.0	Medium stiff gray & tan clay w/wood		
4	21.0	21.5	20.0	24.5	Medium dense to dense tan & gray silty		
					sand		
					BORING P-2		
1	1.5	2.0	0.0	5.0	Soft to medium stiff brown silty clay		
					w/roots		
2	5.0	5.5	5.0	6.5	Soft to medium stiff gray & tan clay		
3	7.0	7.5	6.5	8.5	Soft to medium stiff gray clay		
4	11.0	11.5	8.5	13.0	Medium dense to dense gray silty sand		
					BORING P-3		
1	1.5	2.0	0.0	4.0	Soft to medium stiff brown silty clay		
					w/roots		
2	4.5	5.0	4.0	5.5	Soft to medium stiff gray & tan clay		
					w/roots & sand pockets		
3	6.5	7.0	5.5	7.0	Soft gray clay w/roots & organic matter		
4	8.0	8.5	7.0	11.5	Medium dense to dense gray silty sand		

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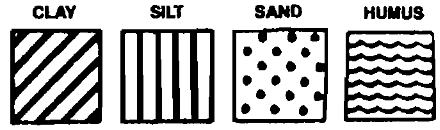
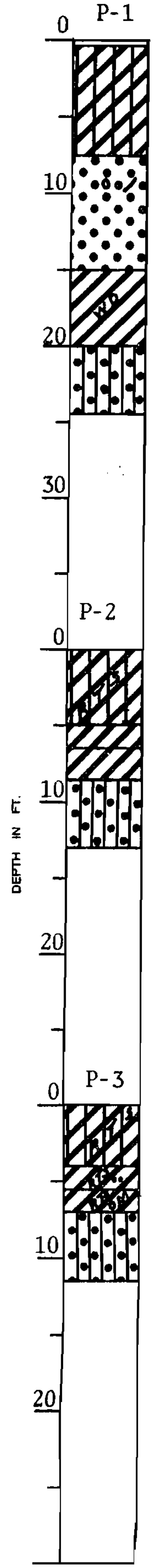
CLAY SILT SAND HUMUS



Predominant type shown heavy. Modifying type shown light.

Remarks: ________



Enc. 8

LOG OF BORING

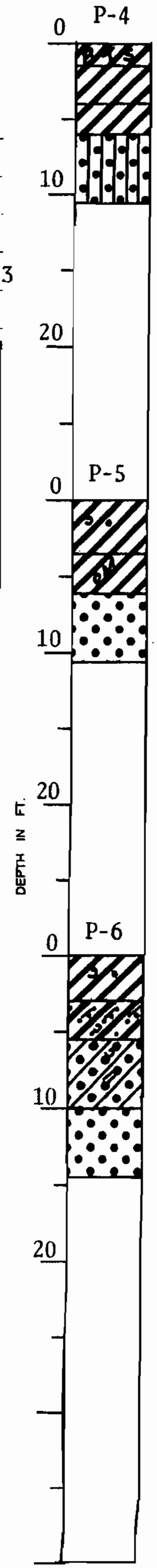
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. ______ Soil Technician R. K. Blum & A. Croal, Jr. Date 27-28 September 1983

Ground Elev. See Text Datum ______ Gr. Water Depth ______

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
					BORING P-4		
1	0.0	0.5	0.0	1.5	Soft to medium stiff brown clay w/roots		
2	2.5	3.0	1.5	4.0	Soft to medium stiff gray & tan clay		
3	5.0	5.5	4.0	6.0	Soft to medium stiff gray clay		
4	6.0	6.5	6.0	10.5	Medium dense to dense gray silty sand		
					BORING P-5		
1	1.5	2.0	0.0	3.5	Medium stiff to stiff brown & gray clay		
					w/fine sand & shells		
2	3.5	4.0	3.5	6.0	Medium stiff gray clay w/organic matter		
3	6.0	6.5	6.0	10.5	Loose gray fine sand		
					BORING P-6		
1	1.5	2.0	0.0	3.0	Stiff brown & gray clay w/fine sand &		
					shells		
2	3.5	4.0	3.0	5.5	Soft gray sandy clay w/shells & clayey		
					sand layers		
3	6.5	7.0	5.5	10.0	Very loose gray clayey sand w/shells		
					& clay pockets		
4	11.0	11.5	10.0	14.5	Loose gray fine sand		



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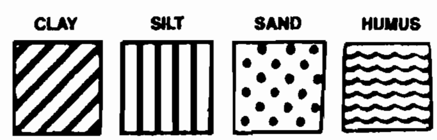
Remarks: ______



Predominant type shown heavy. Modifying type shown light.

Enc. 9

LOG OF BORING

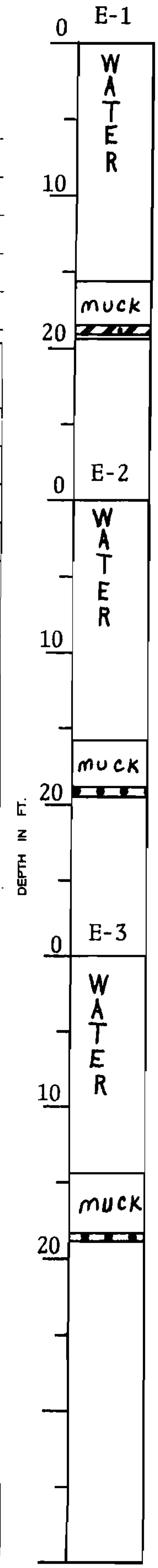
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. ________ Soil Technician A. J. Mayeux Date 19 December 1983

Ground Elev. ________ Datum C.D. Gr. Water Depth 22.55

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
					BORING E-1		
			0.0	15.5	Water		
1	16.0	16.5	15.5		Extremely soft black muck		
2	17.5	18.0		18.5	Ditto		
3	18.5	19.0	18.5	19.0	Very soft black clay w/sand		
4	19.0	19.3	19.0	19.3	Medium dense gray fine sand		
					BORING E-2		
			0.0	15.8	Water		
1	16.3	16.8	15.8		Extremely soft black muck		
2	17.5	18.0		18.9	Ditto		
3	18.9	19.2	18.9	19.2	Medium dense gray fine sand		
					BORING E-3		
			0.0	14.5	Water		
1	15.5	16.0	14.5	18.5	Extremely soft black muck		
2	18.5	19.0	18.5	19.0	Medium dense gray fine sand		



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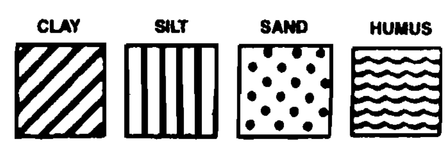
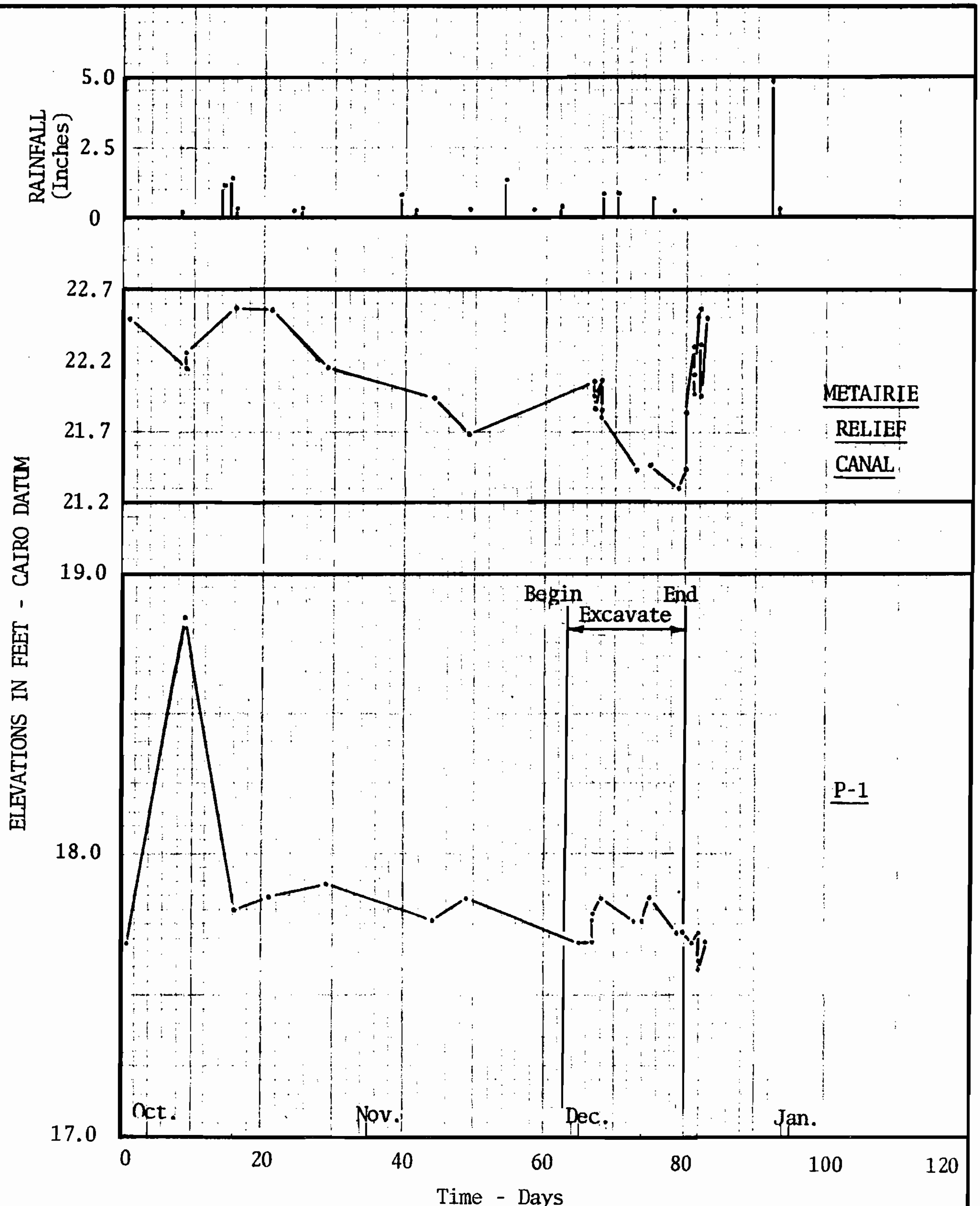


Remarks: ________

Predominant type shown heavy. Modifying type shown light.

Enc. 10

P-1



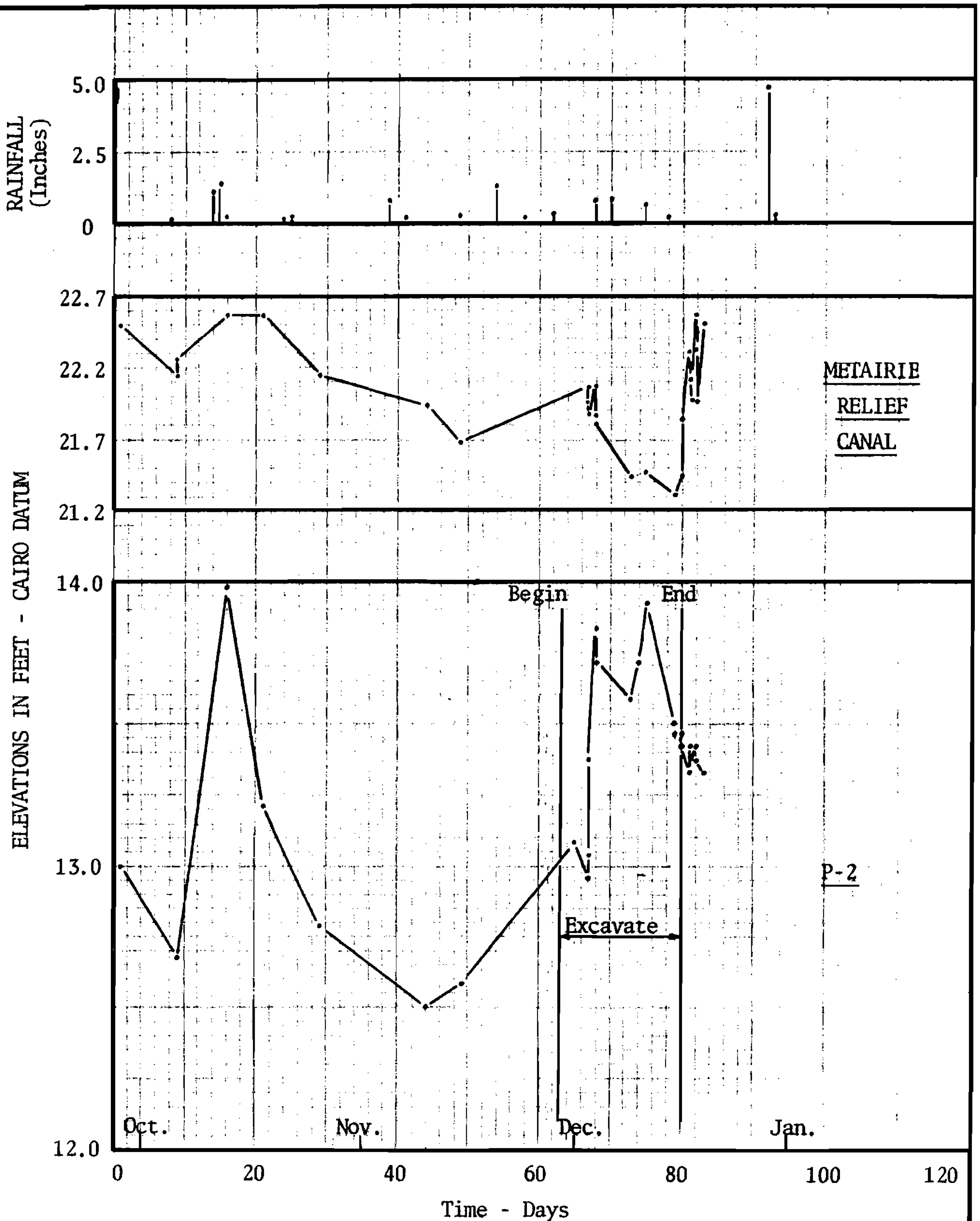
Piezometric Data-Test Section
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 11

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

P-2



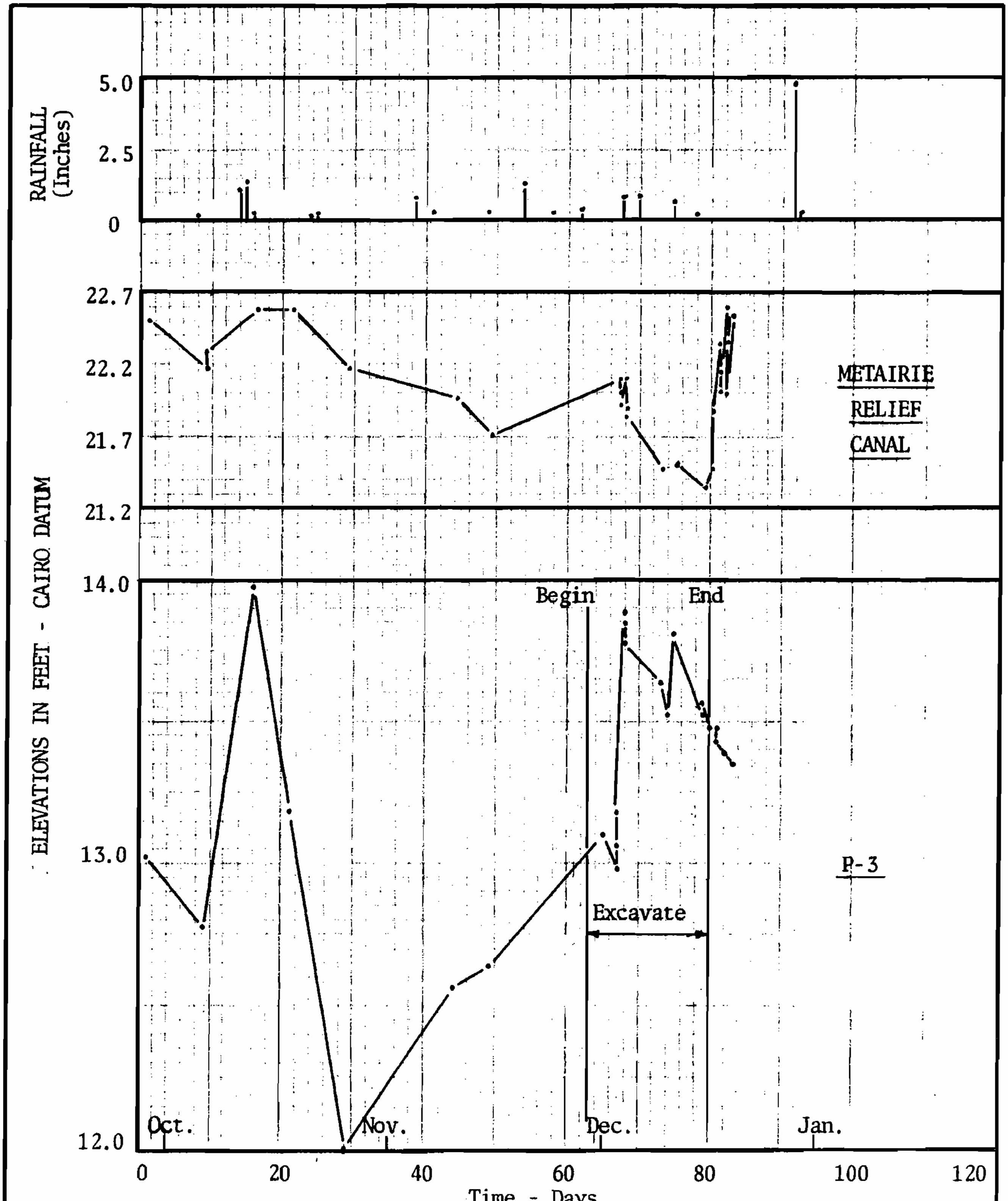
Piezometric Data—Test Section
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 12

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS

P-3



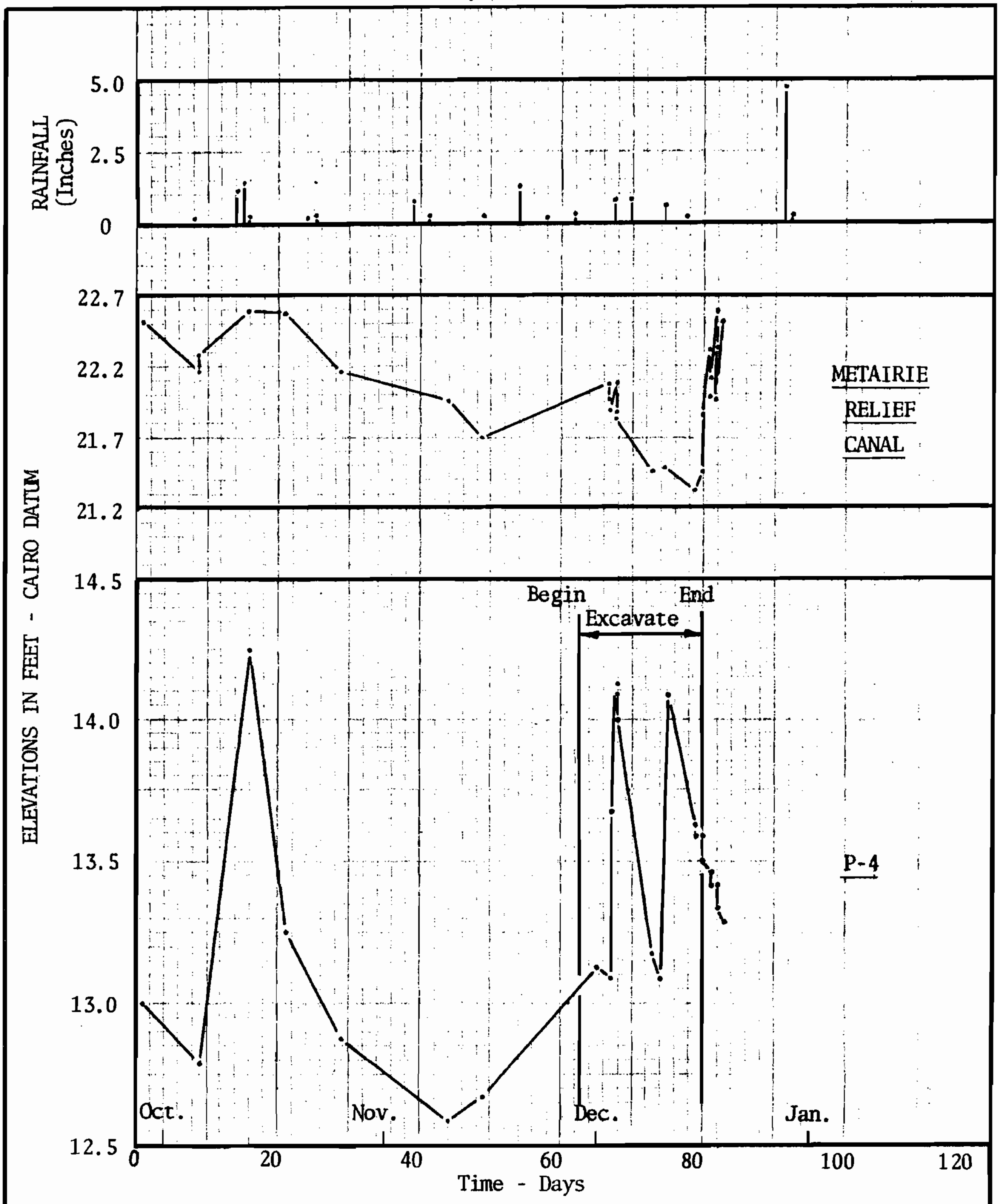
Piezometric Data-Test Section
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 13

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS

P-4

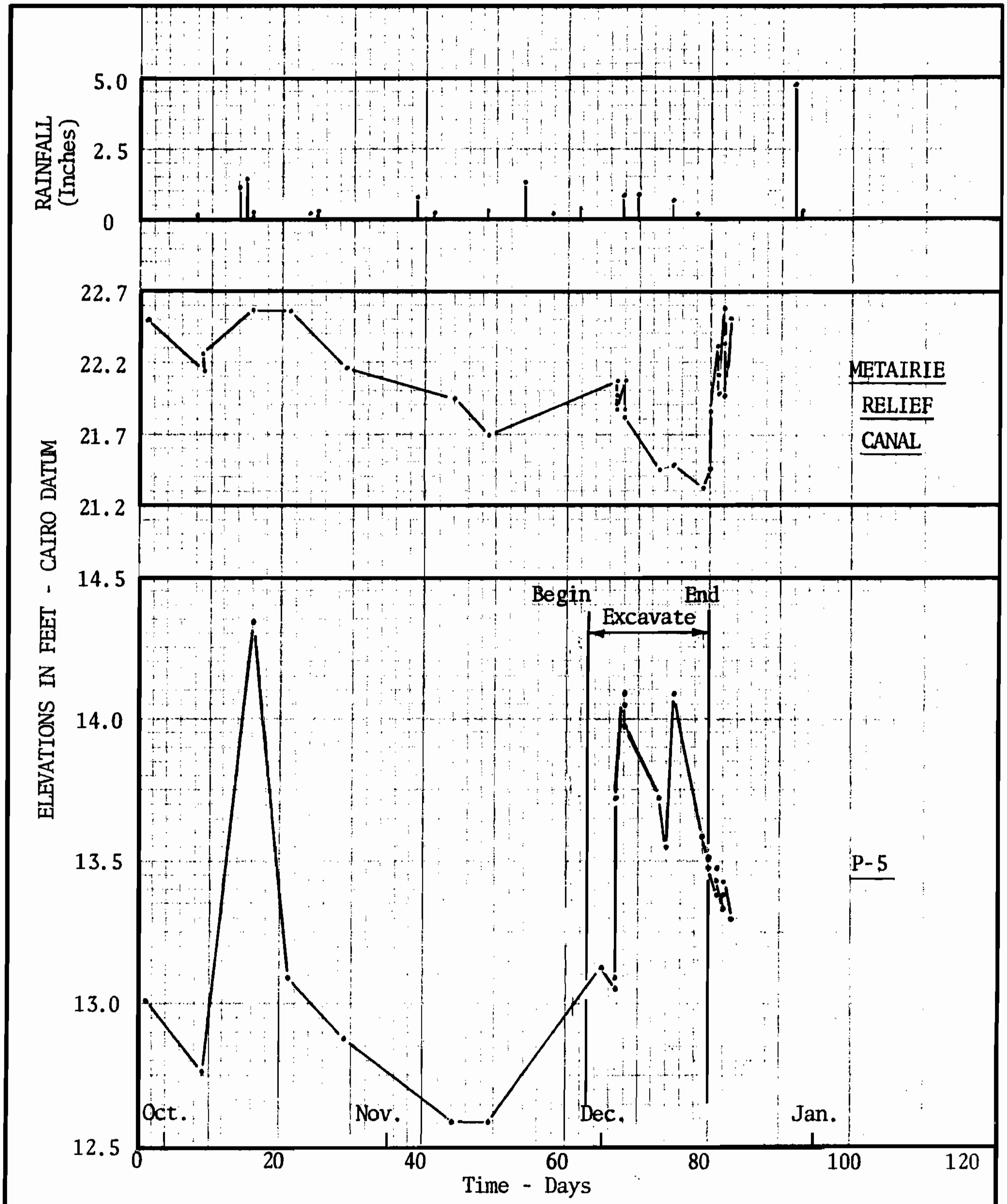


Piezometric Data-Test Section
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 14

P-5



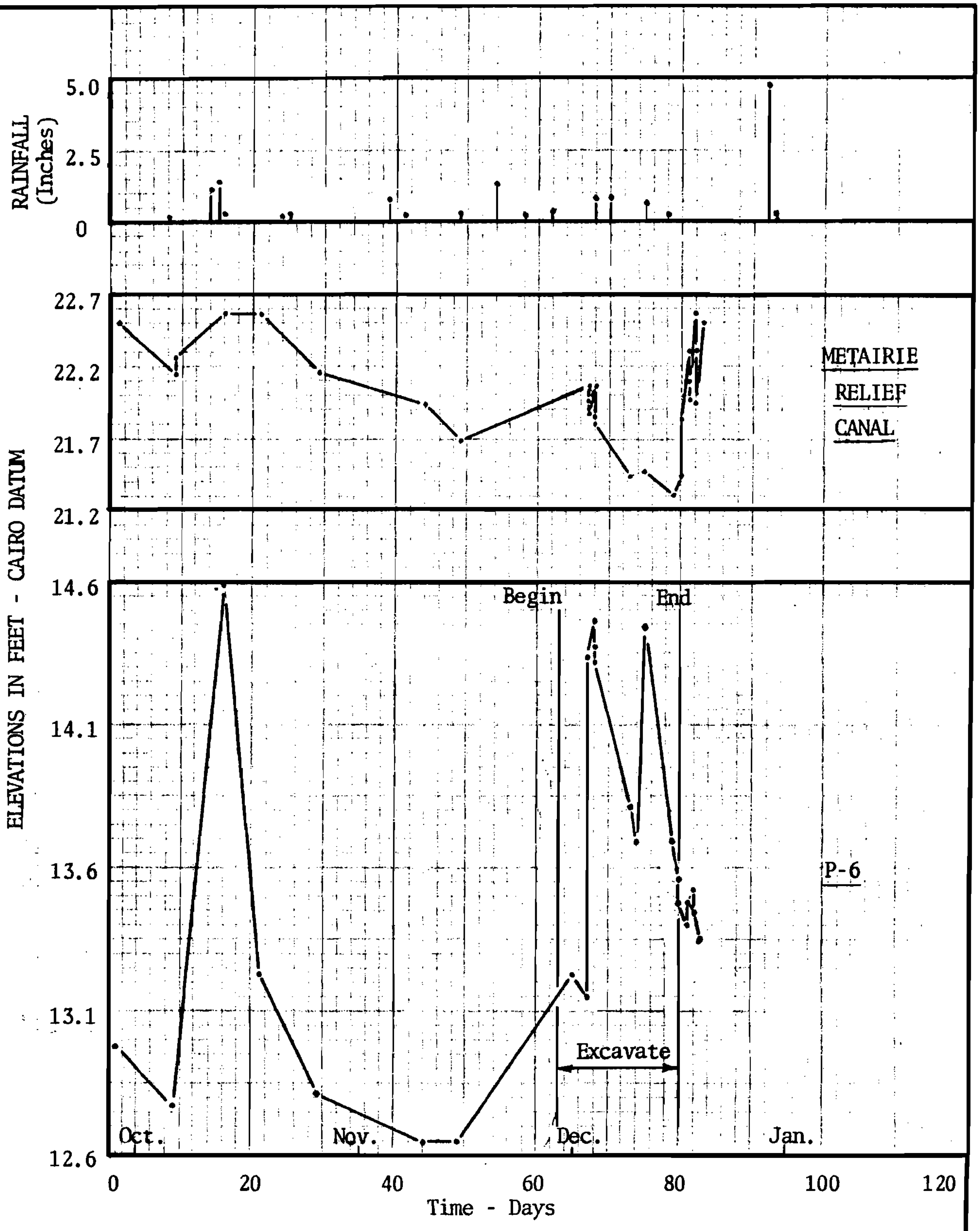
Piezometric Data-Test Section
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 15

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS

P-6



Piezometric Data-Test Section
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 16

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS

PARTNERS

J. BRES EUSTIS
REG. C. E.

CHARLES A. BRAGG (1918-1979)
REG. C. E.

JOHN W. ROACH, JR.
REG. C. E.

GERALD A. BRAGG
REG. C. E.

LLOYD A. HELD, JR.
REG. C. E.

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

BORINGS • TESTS • ANALYSES

3011 28TH STREET
METAIRIE, LOUISIANA 70002

P. O. BOX 8708
METAIRIE, LOUISIANA 70011

PHONE (504) 834-0157

OFFICERS

EUSTIS ENGINEERING CO., INC.
ASSOCIATED WITH
EUSTIS ENGINEERING CO.
CHAIRMAN OF THE BOARD
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PRESIDENT
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CORP. VICE-PRESIDENT AND
CHIEF ADMINISTRATIVE OFFICER
GERALD A. BRAGG
VICE PRESIDENT AND
CHIEF ENGINEER
LLOYD A. HELD, JR.

23 August 1982

Modjeski and Masters
Consulting Engineers
John Hancock Building
1055 St. Charles Avenue
New Orleans, Louisiana 70113

Attention Mr. Barney Martin

Gentlemen:

Additional Subsoil Investigation
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

Transmitted is our engineering report for an additional subsoil investigation for the subject project.

Thank you for asking us to perform this work.

Yours very truly,

EUSTIS ENGINEERING COMPANY

By J. Bres Eustis
J. Bres Eustis

ADDITIONAL SUBSOIL INVESTIGATION

SEWERAGE AND WATER BOARD OF NEW ORLEANS

METAIRIE RELIEF CANAL

STATION 617+50 TO STATION 663+00

ORLEANS AND JEFFERSON PARISHES, LOUISIANA

FOR
MODJESKI AND MASTERS
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

By
Eustis Engineering Company
Metairie, Louisiana

23 August 1982

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FIGURES 1 THROUGH 20

ADDITIONAL SUBSOIL INVESTIGATION
SEWERAGE AND WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 617+50 TO STATION 663+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

INTRODUCTION

1. This report contains the results of an additional subsoil investigation performed for proposed improvements to the existing Metairie Relief Canal located between Stations 617+50 and 663+00 in Orleans and Jefferson Parishes, Louisiana. The investigation was performed in accordance with Eustis Engineering Company's letter of estimated cost for professional engineering services dated 25 March 1982. Authorization to proceed with the investigation was received on 5 May 1982 from Mr. Barney T. Martin of Modjeski and Masters, Consulting Engineers for the project.

2. This report has been prepared in accordance with generally accepted soil and foundation engineering practice for the exclusive use of Modjeski and Masters and their representatives for specific application to the proposed improvements to the Metairie Relief Canal between Stations 617+50 and 663+00 in Orleans and Jefferson Parishes, Louisiana. In the event that any changes in the nature, design or location of the improvements are planned, the conclusions and

recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing.

3. The analyses and recommendations contained in this report are based in part on data obtained from the soil borings. The nature and extent of variations that may exist between boring locations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations contained in this report.

SCOPE

4. The scope of the investigation included the drilling of undisturbed and auger type soil borings to determine subsoil conditions and stratification. Information regarding subsoil conditions was also obtained from borings previously drilled at the site and for other projects in the general area of the site. Piezometers were installed to periodically determine the ground water conditions and hydrostatic conditions on both sides of the canal. Soil mechanics laboratory tests were performed on samples obtained from borings previously drilled at the site to evaluate their physical properties. Engineering analyses were made to determine the stability of the levees adjacent to the canal and to determine the potential for a "blow-out" at the landside toe due to hydrostatic uplift.

SOIL BORINGS

5. Soil borings were drilled during the period 5-10 May 1982 at the locations shown on Figure 1. All survey work necessary to determine the ground surface elevation at the boring locations was performed by Modjeski and Masters. Boring coordinates were estimated using survey data previously developed by Modjeski and Masters. Detailed descriptive logs of the individual borings are shown in both tabular and graphical form on Figures 2 through 9.

6. Two of the undisturbed borings (Borings 5 and 12) previously drilled at the site to a depth of 50 feet were each deepened to 70 feet below the existing ground surface using a truck mounted rotary type drill rig. These borings were extended to verify the thickness of the underlying sand stratum. After first washing to a depth of 40 feet with a fishtail bit, cohesive and semi-cohesive soils were obtained at intervals of 5 feet using a 3-in. diameter Shelby tube sampling barrel. Cohesionless soils were sampled during performance of in situ Standard Penetration Tests.

7. A total of nine (9) auger type borings were drilled to depths ranging between 10 and 17.5 feet below existing ground surface using a power-operated auger. These borings were drilled for the purpose of determining the thickness of the clay cover at and beyond the landside toe of the levee. Samples were obtained at close intervals, visually classified and placed in

glass jars for preservation. The auger borings are designated as Borings 101 through 103, 201 through 203 and 301 through 303.

8. Three (3) borings, designated as Borings 100, 200 and 300, were drilled in the canal to depths of 18, 19.5 and 24 feet below the water surface, respectively. Samples were obtained at close intervals using a piston-type sampler, visually classified and placed in moisture proof containers for preservation. These borings were necessary to determine the thickness and composition of the sediment at the bottom of the canal and to determine the depth to the underlying sand stratum.

9. The results of soil borings previously drilled at the site are contained in Eustis Engineering Company's report entitled "Subsoil Investigation, Sewerage and Water Board of New Orleans, Metairie Relief Canal, Station 554+00 to Station 670+00, Orleans and Jefferson Parishes, Louisiana," dated 3 November 1981. Information regarding subsoil conditions was also obtained from borings previously drilled for other projects in the general area of the site. The approximate location of these borings is shown on Figure 1.

PIEZOMETERS

10. A total of five (5) piezometers were installed on 10 and 31 May 1982 at the locations shown on Figure 1. The elevation of the ground surface and riser pipe at the three locations on the Jefferson side were surveyed by Modjeski and Masters, and, at the two locations on the Orleans side, were

estimated from survey data previously developed. These elevations and the estimated ground coordinates are tabulated on Figure 18. Measurements of the water level were made periodically and the results are tabulated on Figure 19.

LABORATORY TESTS

11. Permeability tests were performed on samples of cohesive soils obtained from borings previously drilled at the site and the results are summarized in tabular form on Figure 10. Grain size analyses were performed on samples of granular soils that were also previously obtained. The results of these tests are shown graphically in the form of grain size distribution curves on Figures 11 through 17.

DESCRIPTION OF SUBSOIL CONDITIONS

12. The surface of the underlying sand stratum varies from el 15 C.D. to el 3 C.D. and may extend as deep as el -25 C.D. to el -30 C.D. The coefficient of permeability (k) of this stratum estimated from the grain size distribution curves ranges from 2×10^{-4} to 200×10^{-4} cm/sec.

13. The landside clay cover consists primarily of soft to medium stiff clay with a coefficient of permeability (k) ranging between 3.6×10^{-8} to 7.2×10^{-7} cm/sec. The thickness of the clay is generally uniform in a direction perpendicular to the levee centerline.

14. Sediment at the canal bottom appears to be 4.5 to 6.5 feet thick and consists of soft clay and loose sandy soil. The elevation of the underlying sand stratum is 8 to 10 feet lower at the canal indicating that the bottom may have been deeper at one time in the past than at present.

Ground Water Conditions

15. Readings shown on Figure 19 indicate a relatively horizontal piezometric head in the underlying sand stratum generally between el 12 C.D. and el 13 C.D. on the Jefferson side and generally between el 11 C.D. and el 12 C.D. on the Orleans side. Considering that the water level in the canal is generally between el 22 C.D. and el 23 C.D., it appears that a seal has formed on the canal bottom and side slopes preventing the development of excess hydrostatic head in the sand stratum. Therefore, the piezometric readings should reflect the true ground water level adjacent to the canal and levees.

FOUNDATION ANALYSIS

Stability Analysis

16. Analyses were made to determine the stability of the levee with respect to a potential failure toward the landside toe during high water conditions in the canal. The computations were based on furnished cross-sections of the final levee configuration and assumed a high water level one foot below the levee crown or sheetpile floodwall.

17. The "Method of Planes" analysis was used wherein horizontal potential failure surfaces are varied along with active and passive wedge locations to arrive at the lowest numerical value of safety factor. Soil parameters developed from the previous investigation at the site were used, and for conservative purposes, computations were based on full hydrostatic uplift pressures in the underlying sand stratum. Although excess hydrostatic pressures are not presently evident in the sand stratum, the planned improvements to deepen and enlarge the canal may remove the seal that has apparently developed on the bottom and side slopes, thereby allowing a buildup of such pressures in the sand stratum.

18. The cross-sections and soil parameters along with typical computations for the critical, active and passive wedge locations are shown on Figure 20. The results of the computations indicate a minimum factor of safety of 1.38 which occurs at Station 646+00 on the Jefferson side. This factor of safety is considered acceptable. Computations for cross-sections located just beyond the north and south ends of the study area indicate factors of safety of 2.13 and 2.28, respectively.

Uplift Analysis

19. Analyses were made to determine the potential for a blow-out at the landside toe of the levee due to hydrostatic uplift pressure from high water in the canal. The computations were based on the assumption that the planned improvements may

allow development of excess hydrostatic pressure in the underlying sand stratum.

20. The magnitude of hydrostatic pressure at the levee toe will depend on the amount of material sealing the canal removed during enlargement of the canal cross-section, the area of the sand stratum that becomes exposed, the duration of the high water level, and the head loss that occurs between the levee toe and seepage entrance point. For conservative purposes, the full hydrostatic uplift pressure was used to determine the theoretical factor of safety against a blow-out. Also, the resistance of the clay cover at the toe was based on the dead weight of the soil only without consideration of the soil shear strength. Under these conditions, a theoretical factor of safety slightly greater than 1.0 is considered acceptable since the actual safety factor should be higher.

21. Based on the results of the computations shown on Figure 20, it is believed that a blow-out on the landside levee toe should not occur north of Station 617+50 or south of Station 663+00. Between Stations 617+50 and 663+00, computations indicate the possibility of a blow-out during extreme high water in the canal. Unless more definitive information can be developed regarding the potential hydrostatic uplift pressure at the levee toe through this reach, measures should be taken to prevent a blow-out during extreme high water conditions.

Test Section

22. Consideration should be given to the excavation of a segment of the canal to the planned cross-section prior to finalization of design plans to determine more definitive information regarding the potential for a blow-out at the landside toe. The test section should be located between Station 659+00 and Station 660+50 in order to utilize five piezometers installed in this area. Installation of several additional piezometers will be required to augment the existing piezometers in order to closely monitor changes in the hydrostatic pressures in the sand stratum.

Preventative Measures

23. In the event that it is not practical or economically feasible to accomplish the test section previously described, measures must be taken to prevent a blow-out. Preventative measures include the installation of a seepage cutoff through the levee crown, installation of pressure relief wells near the landside toe of the levee, and sealing the canal bottom.

24. Seepage Cutoff. The most positive measure to minimize the possibility of a blow-out is the installation of a seepage cutoff through the levee crown. To provide an effective seepage cutoff, steel sheetpiling and/or a slurry wall should penetrate the sand stratum. Considering that the bottom of the sand stratum is at or near el -30 C.D., a 65-ft long cutoff wall would be required. General experience indicates that the use of steel sheetpiling should be more economical and

practical than the installation of a slurry wall. Additional computations will be necessary to determine the stability of the levee during the installation of a slurry wall.

25. Relief Wells. Consideration should also be given to installation of pressure relief wells near the landside to of the levee. To be effective, relief wells should penetrate close to the bottom of the sand, and, therefore, wells approximately 50 feet deep will be required. For planning purposes, it is estimated that a well spacing of 30 to 45 feet may be necessary. However, detailed analyses should be performed to determine the exact spacing required. The use of pumps will not be necessary and seepage into the wells can be collected in header pipes buried a few feet below ground surface for discharge into the drainage system.

26. Dry Bottom Seal. The canal bottom may be sealed to minimize seepage by placement of a concrete liner, an impervious membrane, or a ler of cohesive type soil. To insure a positive seal, placement of these materials should be accomplished on a dry canal bottom. This will require stage construction to maintain continuous operation of the pump station. All liner materials should extend from the canal bottom up the side slopes to at least el 20 C.D. If the liner is constructed of cohesive soil, a minimum thickness of 18 inches is required. Cohesive soil must be placed in layers and each layer compacted to the degree necessary to provide a relatively impervious blanket.

27. Underwater Seal. Concrete and membrane liners have been successfully placed under water; however, this type of installation must be closely supervised by qualified and experienced divers. If a soil liner is to be placed under water, the feasibility of this operation should be verified prior to initiation of construction. Bentonite (trade name Volclay) has been successfully deposited under water to seal the bottom of shallow ponds and lakes in other areas. In pellet form, the bentonite can be deposited by loose dumping from the side of marine equipment. Bentonite may be available in panel form which may permit greater control of placement. The placement of bentonite in gradual form will probably be the most difficult to control, if deposited by loose dumping. Probably the most practical means for using granular bentonite is to form a slurry which can be pumped through discharge tubes to the canal bottom. Continuous supervision during placement must be maintained by qualified and experienced divers to insure complete coverage is obtained. Information from a local supplier of bentonite indicates that an estimate of the quantity of material required should be based on 1.5 pounds per square foot of area to be covered.

CONCLUSIONS

28. Unless a test section can be dredged to develop more definitive information regarding the potential hydrostatic pressure at the landside levee toe, measures should be taken

between Stations 617+50 and 663+00 to prevent a possible blowout indicated by theoretical analysis. The most positive method is installation of a seepage cutoff. Use of steel sheetpiling will be very costly, but should be more economical and practical than installation of a slurry wall.

29. Placement of a dry bottom seal using a concrete liner, impervious membrane or a layer of cohesive soils is the most favorable alternate to the use of a seepage cutoff. Considering that stage construction will be required to maintain continuous operation of the station, the cost of this method may also be prohibitive.

30. Pressure relief wells have been successfully used for similar conditions and are considered to be an acceptable alternate method. The initial cost may be less than sheetpiling or a dry bottom seal. However, periodic inspection is necessary because wells may become clogged and must be flushed to remain functional. In some areas, particularly on the Orleans side, it may be necessary to locate wells at or near the levee crown due to insufficient right-of-way at the landside toe.

31. Concrete, membrane liners and bentonite have been successfully placed under water, but, because control and inspection are difficult, an underwater seal is not as positive an alternate as the preceding methods. If bentonite is used, the most practical means probably will be to form a slurry which can be pumped through tubes to the canal bottom. If construction will extend through the hurricane season, a stage operation

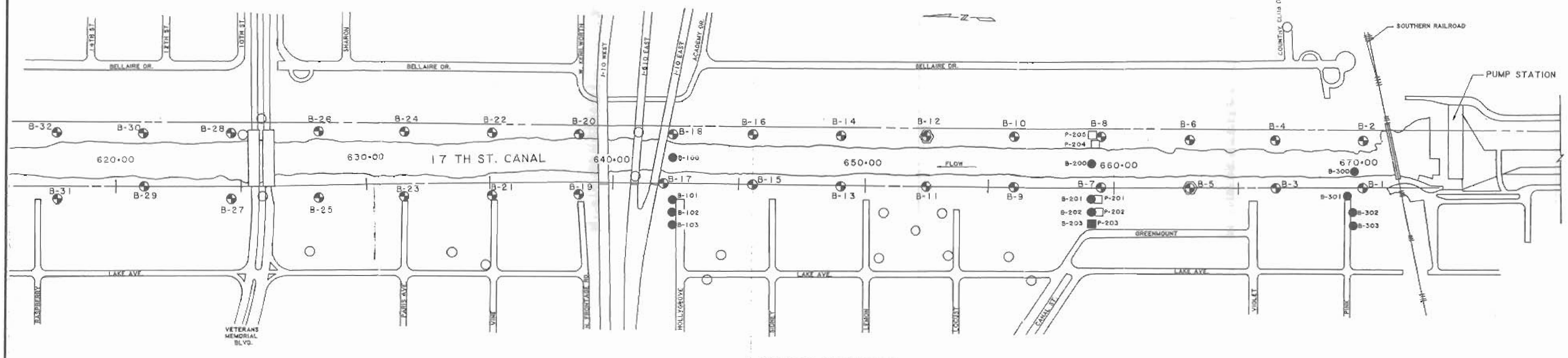
is necessary to avoid the possibility of a high water condition occurring before the sealing material can be placed. If dredging can be completed before the approach of hurricane season, placement of the seal may be delayed in order to investigate the potential hydrostatic pressure and determine the necessity for placing the seal. In this event, several additional piezometers will be required to augment the existing piezometers in order to closely monitor changes in the hydrostatic pressure before and after dredging operations.

EUSTIS ENGINEERING COMPANY

By J. Bres Eustis

J. Bres Eustis

L. J. Napolitano:bh



LOCATION OF BORINGS

SCALE: 1"= 20'

- UNDISTURBED BORING: DRILLED DURING PERIOD 14 MAY - 22 JULY 1981.
- UNDISTURBED BORING: DEEPENED TO 70' BELOW GROUND SURFACE.
- UNDISTURBED BORING: DRILLED FOR OTHER PROJECTS BETWEEN 1957 AND 1978.
- AUGER BORING: DRILLED DURING PERIOD 6 - 11 MAY 1982.
- PIEZOMETER: INSTALLED DURING PERIOD 6 - 31 MAY 1982.

ADDITIONAL SUBSOIL INVESTIGATION
SEWERAGE AND WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 617+50 TO STATION 663+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

LOCATION OF BORINGS

FOR
MODJESKI AND MASTERS
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
JULY, 1982 METAIRIE, LA.

FIGURE 1

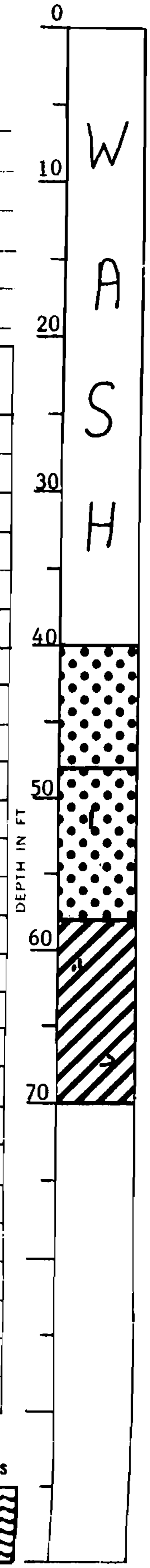
LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage and Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

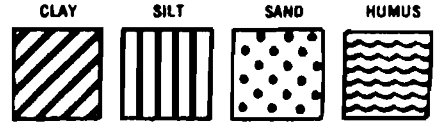
Boring No. 5A Soil Technician George Hardee Date 5 May 1982
Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	40.0	Wash		
1	40.0	41.5	40.0		Very dense gray fine sand	6	53
2	43.5	45.0		48.0	Ditto	16	50=9"
3	48.5	50.0	48.0		Medium dense gray fine sand w/silt	6	27
4	53.5	55.0		58.0	Medium dense gray fine sand	5	22
5	58.5	60.0	58.0		Medium stiff gray clay	2	3
6	63.5	64.0			Medium stiff gray clay w/sand pockets & shells		
7	68.5	69.0		70.0	Ditto		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on west side of canal @ Sta. 663+00 in crown of levee.

Fig. 2

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage and Water Board of New Orleans

Metairie Relief Canal, Station 617+50 to Station 663+00

Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. 12A Soil Technician George Hardee Date 6 May 1982

Ground Elev. 30.5 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	40.0	Wash		
1	40.0	41.5	40.0	43.0	Very dense gray fine sand	18	50=10"
2	43.5	45.0	43.0		Dense gray fine sand	14	36
3	48.5	50.0			Dense gray fine sand w/shell fragments	13	41
					& small clay		
4	53.5	55.0		58.0	Dense gray fine sand w/shell fragments	11	31
5	58.5	60.0	58.0		Medium stiff gray clay w/sand pockets	1	3
					& shell fragments		
6	63.5	64.0			Ditto		
7	68.5	69.0		70.0	Ditto		

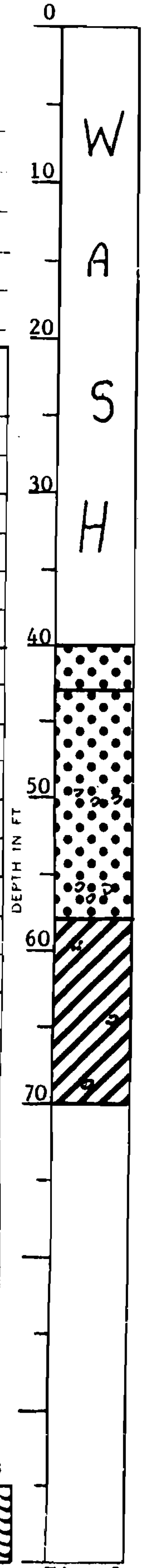


Fig. 3

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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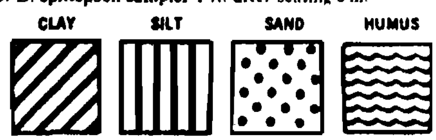


Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on east side of canal @ Sta. 652+50 in crown of levee.

LOG OF BORING

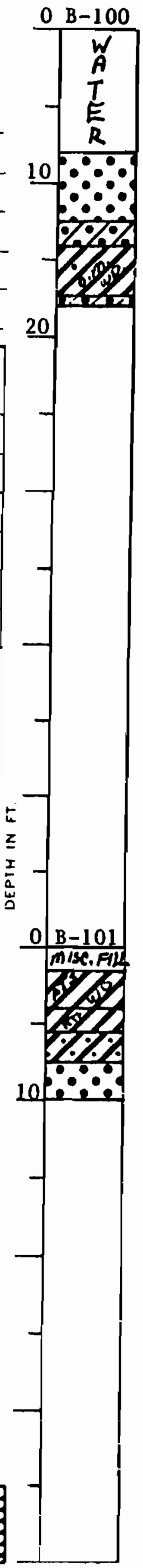
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA

Name of Project: Sewerage and Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. ______ Soil Technician G. Hardee & R. Courtiade Date 7 & 10 May 1982

Ground Elev. ______ Datum Cairo Gr. Water Depth ______

Sample No.	Sample Depth — Feet From	Sample Depth — Feet To	Depth Stratum Feet From	Depth Stratum Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
					BORING 100 (Water Surface @ el. 21.6)		
			0.0	8.0	Water		
1	8.5	9.0	8.0		Loose black sand w/oil (Sediment)		
2	10.5	11.0		12.5	Ditto		
3	13.5	14.0	12.5	14.0	Loose dark gray clayey sand (Sediment)		
4	15.0	15.5	14.0		Soft gray clay w/organic matter		
5	16.5	17.0			Soft gray clay w/organic matter & wood		
6	17.0	17.5		17.5	Soft gray clay w/trace of sand		
7	17.5	18.0	17.5	18.0	Medium dense gray sand w/clay layers		
			NOTE:	Boring located near ℄ of canal.			
					BORING 101 (Ground Surface @ el. 19.2)		
			0.5	1.5	Miscellaneous fill		
1	2.5	3.0	1.5	4.0	Medium stiff tan & gray clay w/roots & wood		
2	5.0	5.5	4.0	5.5	Medium stiff gray clay w/roots		
3	7.0	7.5	5.5	7.5	Soft gray sandy clay		
			7.5	10.0	Medium dense gray fine sand		
			NOTE:	Boring located at landside toe of west side levee.			



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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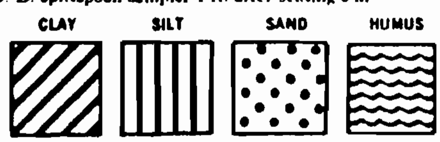


Remarks: Borings located @ Sta. 642+50.

Predominant type shown heavy. Modifying type shown light.

Fig. 4

LOG OF BORING

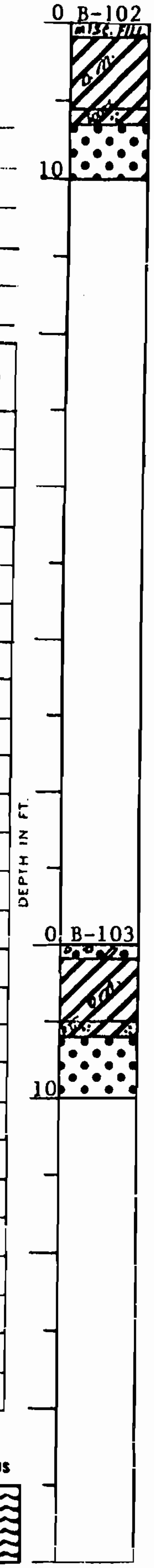
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE LA.

Name of Project: Sewerage and Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. ______ Soil Technician G. Hardee Date 7 May 1982

Ground Elev. ______ Datum Cairo Gr. Water Depth ______

Sample No.	Sample Depth — Feet From	Sample Depth — Feet To	Depth Stratum Feet From	Depth Stratum Feet To	Visual Classification	*Standard Penetration Test	
					BORING 102 (Ground Surface @ el. 18.6)		
			0.0	1.0	Miscellaneous fill		
1	2.5	3.0	1.0	5.5	Medium stiff gray clay w/organic matter & roots		
2	5.5	6.0	5.5	6.5	Soft gray clay w/roots & sand pockets		
3	9.5	10.0	6.5	10.0	Medium dense gray fine sand		
			NOTE:	Boring located 50' from landside toe of west side levee.			
					BORING 103 (Ground Surface @ el. 18.4)		
			0.0	1.0	Medium dense gray & tan sand w/shells & clay pockets		
1	2.5	3.0	1.0	5.0	Medium stiff gray clay w/organic matter & roots		
2	5.5	6.0	5.0	6.0	Soft gray clay w/roots & sand pockets		
3	9.5	10.0	6.0	10.0	Medium dense gray fine sand		
			NOTE:	Boring located 100' from landside toe of west side levee.			



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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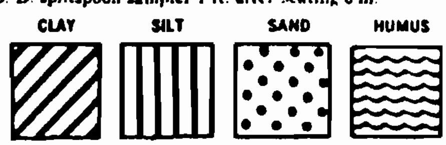


Predominant type shown heavy. Modifying type shown light.

Remarks: Borings located @ Sta. 642+50.

Fig. 5

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage and Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

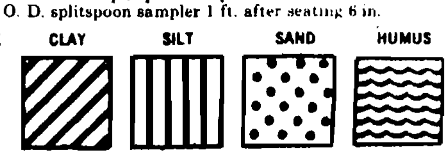
Boring No. ______ Soil Technician G. Hardee & R. Courtiade Date 6 & 10 May 1982

Ground Elev. ______ Datum Cairo Gr. Water Depth ______

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
					BORING 200 (Water Surface @ el. 21.6)		
			0.0	8.0	Water		
1	8.5	9.0	8.0	9.0	Loose black sand w/oil (Sediment)		
2	9.5	10.0	9.0	10.0	Soft dark gray clay w/vegetation		
					(Sediment)		
3	11.5	12.0	10.0	12.5	Loose black sand w/miscellaneous		
					materials (Sediment)		
4	13.5	14.0	12.5	14.0	Medium stiff gray clay w/organic matter		
5	15.5	16.0	14.0	16.5	Soft gray clay w/organic matter		
6	17.5	18.0	16.5	18.0	Very soft gray clay		
7	18.5	19.0	18.0	19.0	Medium stiff gray clay		
8	19.0	19.5	19.0	19.5	Loose gray silty sand		
			NOTE:	Boring located near ℄ of canal.			
					BORING 201 (Ground Surface @ el. 22.3)		
1	2.0	2.5	0.0	3.0	Stiff tan, gray & brown sandy clay		
2	3.0	3.5	3.0	4.0	Loose tan & gray clayey sand w/shells,		
					bricks, roots & wood		
3	6.5	7.0	4.0	9.0	Medium stiff tan & gray clay w/silt		
					pockets & roots		
4	9.5	10.0	9.0	10.0	Medium dense gray & white fine sand		
			NOTE:	Boring located at landside toe of west side levee.			

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Borings located @ Sta. 659+30.

Predominant type shown heavy. Modifying type shown light.

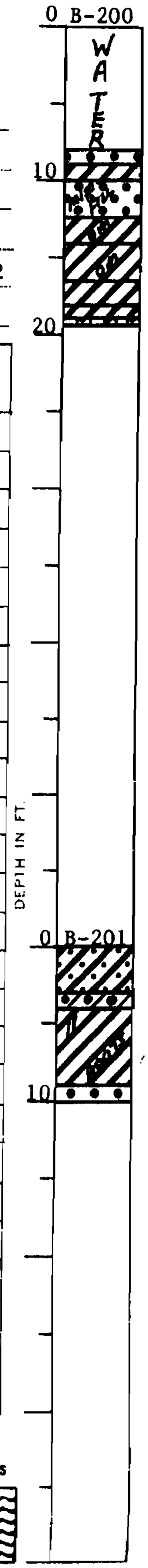


Fig. 6

LOG OF BORING

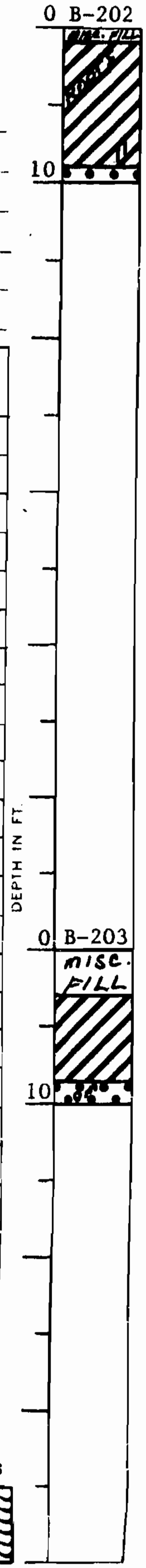
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage and Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. ______ Soil Technician G. Hardee Date 6 May 1982

Ground Elev. ______ Datum Cairo Gr. Water Depth ______

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
					BORING 202 (Ground Surface @ el. 19.9)		
			0.0	1.0	Miscellaneous fill		
1	2.5	3.0	1.0		Medium stiff tan & gray clay w/roots		
2	5.5	6.0		9.0	Medium stiff tan & gray clay w/silt		
					pockets		
3	9.5	10.0	9.0	10.0	Medium dense gray & tan fine sand		
			NOTE:		Boring located 50' from landside toe of west side levee.		
					BORING 203 (Ground Surface @ el. 19.6)		
1	2.5	3.0	0.0	3.0	Miscellaneous fill		
2	5.5	6.0	3.0		Medium stiff tan & gray clay		
3	8.0	8.5		8.5	Ditto		
4	9.5	10.0	8.5	10.0	Medium dense gray fine sand w/organic		
					matter		
			NOTE:		Boring located 100' from landside toe of west side levee.		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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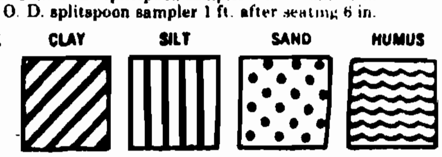

Predominant type shown heavy. Modifying type shown light.

Remarks: Borings located @ Sta. 659+30.

Fig. 7

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage and Water Board of New Orleans
Metairie Relief Canal, Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. ______ Soil Technician G. Hardee & R. Courtiade Date 6 & 10 May 1982

Ground Elev. ______ Datum Cairo Gr. Water Depth ______

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
					BORING 300 (Water Surface @ el. 21.6)		
			0.0	12.0	Water		
1	13.0	13.5	12.0	14.0	Very soft gray clay w/organic matter &		
					vegetation		
2	15.0	15.5	14.0		Soft gray clay w/organic matter &		
					vegetation		
3	17.0	17.5		18.5	Soft gray clay		
4	19.0	19.5	18.5	20.0	Medium stiff gray clay w/organic matter		
5	21.0	21.5	20.0	22.5	Very soft gray clay		
6	22.5	23.0	22.5	23.5	Medium compact gray clayey silt		
7	23.5	24.0	23.5	24.0	Medium compact gray silty sand w/clay		
					lenses		
			NOTE:		Boring located 30' from west bank of canal.		
					BORING 301 (Ground Surface @ el. 22.9)		
			0.0	3.0	Miscellaneous fill		
1	5.5	6.0	3.0		Medium stiff tan & gray clay		
2	8.5	9.0			Ditto		
3	11.5	12.0		12.0	Ditto		
4	14.5	15.0	12.0	15.0	Medium stiff gray clay w/roots		
5	17.0	17.5	15.0	17.5	Soft gray clay w/roots & organic matter		
			17.5	18.0	Loose to medium dense gray sand		
			NOTE:		Boring located at landside toe of west side levee.		

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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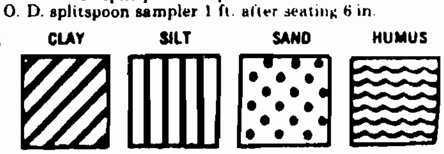


Predominant type shown heavy. Modifying type shown light.

Remarks: Borings located @ Sta. 669+80.

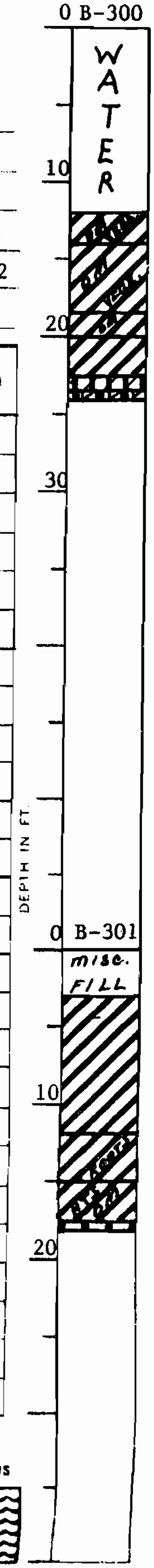


Fig. 8

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage and Water Board of New Orleans

Metairie Relief Canal, Station 617+50 to Station 663+00

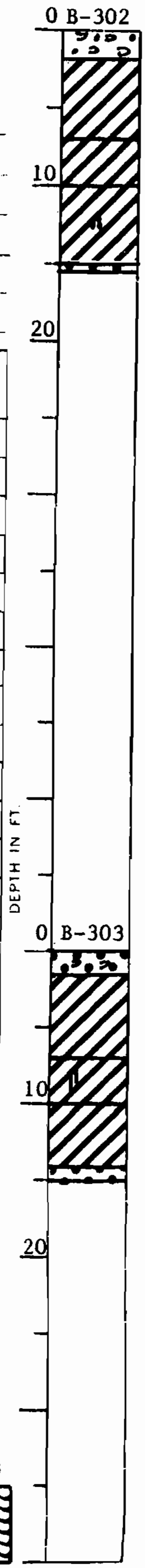
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Boring No. ______ Soil Technician G. Hardee Date 6 & 7 May 1982

Ground Elev. ______ Datum Cairo Gr. Water Depth ______

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
					BORING 302 (Ground surface @ el. 21.0)		
			0.0	2.0	Shells w/sand		
1	3.0	3.5	2.0		Medium stiff tan & gray clay		
2	5.5	6.0		7.0	Ditto		
3	8.5	9.0	7.0	10.0	Stiff tan & gray clay		
4	11.5	12.0	10.0	15.0	Medium stiff gray clay w/sand pockets		
			15.0	15.5	Loose to medium dense gray sand		
			NOTE:		Boring located 50' from landside toe of west side levee.		
					BORING 303 (Ground Surface @ el. 20.6)		
			0.0	1.5	Medium dense tan sand w/shells		
1	2.5	3.0	1.5		Medium stiff tan & gray clay		
2	5.0	5.5		7.0	Ditto		
3	8.0	8.5	7.0	10.0	Stiff tan & gray clay w/silt pockets		
4	11.0	11.5	10.0	14.0	Medium stiff gray & tan clay		
5	14.5	15.0	14.0	15.0	Medium dense gray fine sand		
			NOTE:		Boring located 100' from landside toe of west side levee.		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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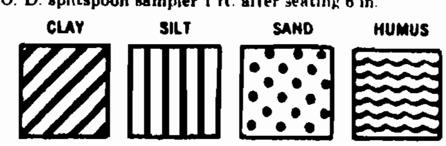


Remarks: Borings located @ Sta. 669+80.

Predominant type shown heavy. Modifying type shown light.

Fig. 9

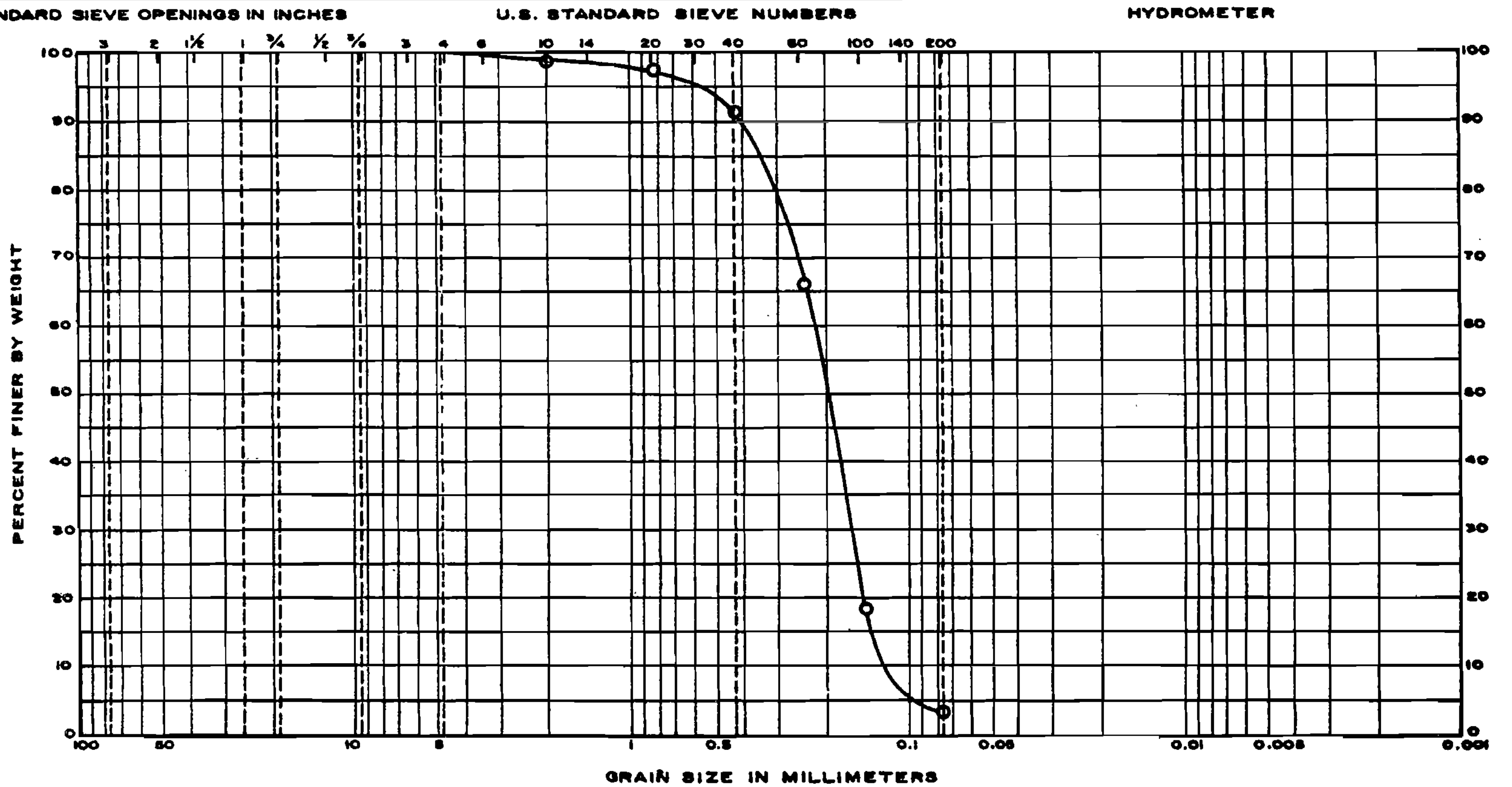
Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY PERMEABILITY TESTS

Sample No.	Depth in Feet	Classification	Moisture Content Percent Initial	Moisture Content Percent Final	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Coefficient of Permeability in cm/sec
		BORING 7					
8	19.5	Medium stiff gray sandy clay w/roots	26.3	28.4	95.9	121.2	7.2×10^{-7}
		BORING 12					
5	18.0	Very soft gray & tan clay w/sand pockets & roots	37.4	37.9	81.1	111.4	3.6×10^{-8}
		BORING 14					
5	14.0	Very soft gray clay w/sand pockets, wood & organic matter	49.3	51.1	69.3	103.4	4.1×10^{-8}
		BORING 20					
5	14.0	Soft dark gray organic silty clay w/sandy silt pockets, wood & roots	48.1	49.5	70.3	104.2	3.5×10^{-7}
		BORING 29					
5	14.0	Very soft gray clay w/roots	67.0	71.3	59.0	98.4	9.4×10^{-8}

Fig. 10



UNIFIED	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE		
AASHO	GRAVEL			SAND		SILT	CLAY
	COARSE	MEDIUM	FINE	COARSE	FINE		

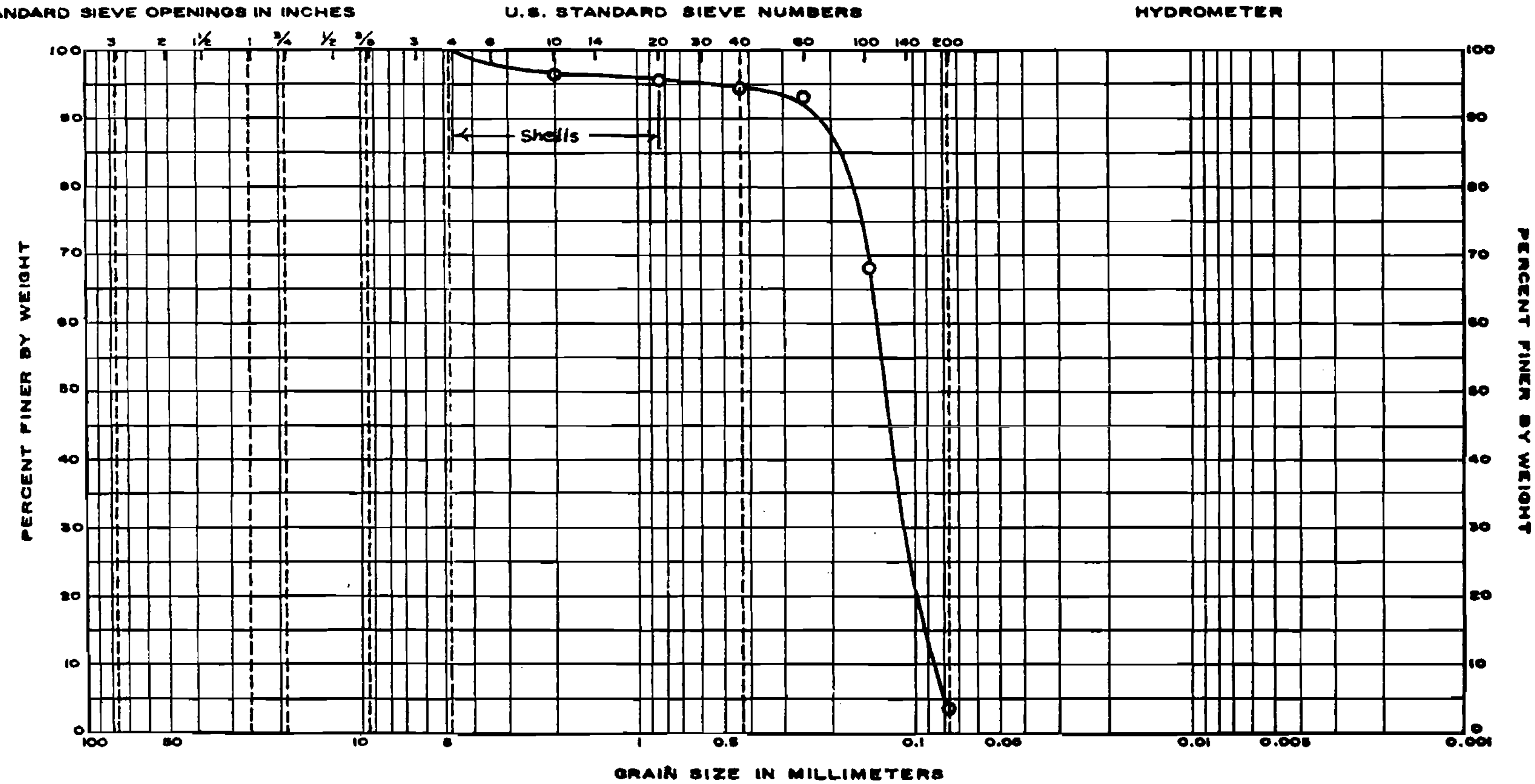
GRAIN SIZE ANALYSIS

CURVE NO.	BORING NO.	SAMPLE NO.	DEPTH IN FT.	NATURAL WATER CONTENT	ATTERBERG LIMITS LL	PL	PI
	7	12	28.5				

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters
Consulting Engineers, New Orleans, Louisiana

EUSTIS ENGINEERING COMPANY
CONSULTING FOUNDATION ENGINEERS
METAIRIE, LA.

Fig. 11



UNIFIED	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE		
AASHO	GRAVEL			SAND		SILT	CLAY
	COARSE	MEDIUM	FINE	COARSE	FINE		

GRAIN SIZE ANALYSIS

CURVE NO.	BORING NO.	SAMPLE NO.	DEPTH IN FT.	NATURAL WATER CONTENT	ATTERBERG LIMITS LL	PL	PI
	12	10	38.5				

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal
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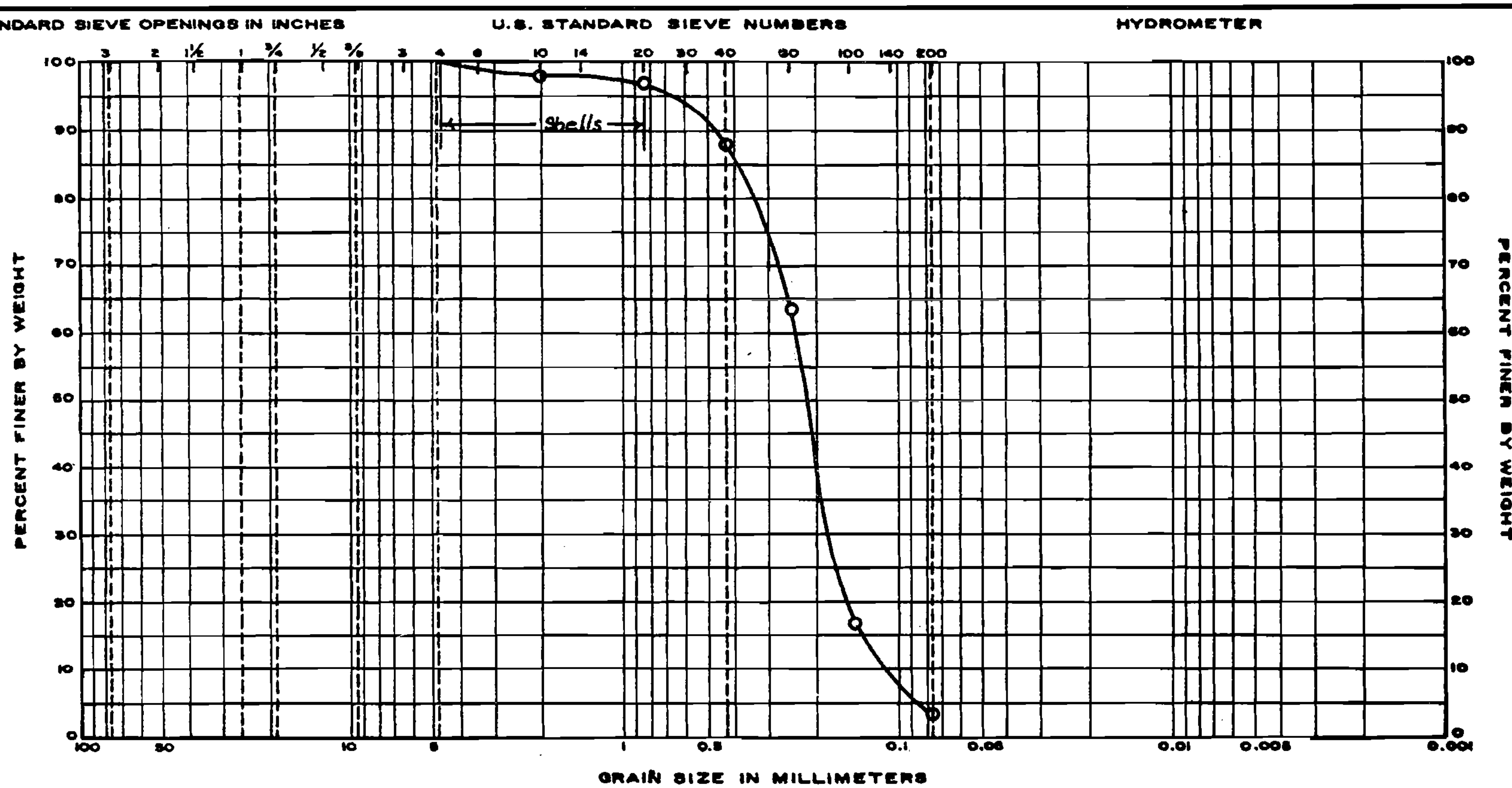
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters
Consulting Engineers, New Orleans, Louisiana

EUSTIS ENGINEERING COMPANY
CONSULTING FOUNDATION ENGINEERS
METAIRIE, LA.

Fig. 12



UNIFIED	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE		

AASHO	GRAVEL			SAND		SILT	CLAY
	COARSE	MEDIUM	FINE	COARSE	FINE		

GRAIN SIZE ANALYSIS

CURVE NO.	BORING NO.	SAMPLE NO.	DEPTH IN FT.	NATURAL WATER CONTENT	ATTERBERG LIMITS LL	PL	PI
	14	8	28.5				

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal
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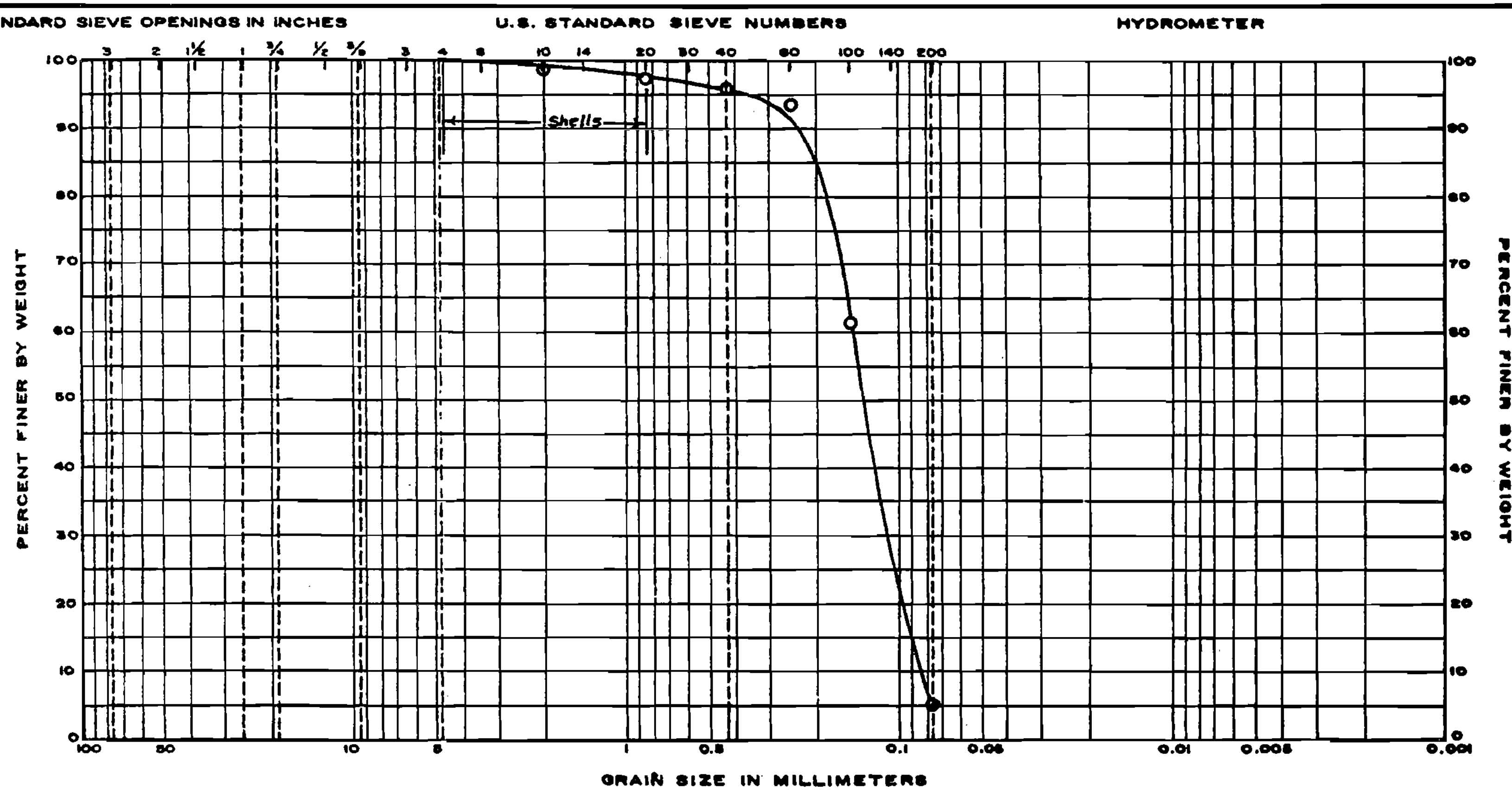
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters
Consulting Engineers, New Orleans, Louisiana

EUSTIS ENGINEERING COMPANY
CONSULTING FOUNDATION ENGINEERS
METAIRIE, LA.

Fig. 13



UNIFIED	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE		
AASHO	GRAVEL			SAND		SILT	CLAY
	COARSE	MEDIUM	FINE	COARSE	FINE		

GRAIN SIZE ANALYSIS

CURVE NO.	BORING NO.	SAMPLE NO.	DEPTH IN FT.	NATURAL WATER CONTENT	ATTERBERG LIMITS LL	PL	PI
	16	11	38.5				

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal
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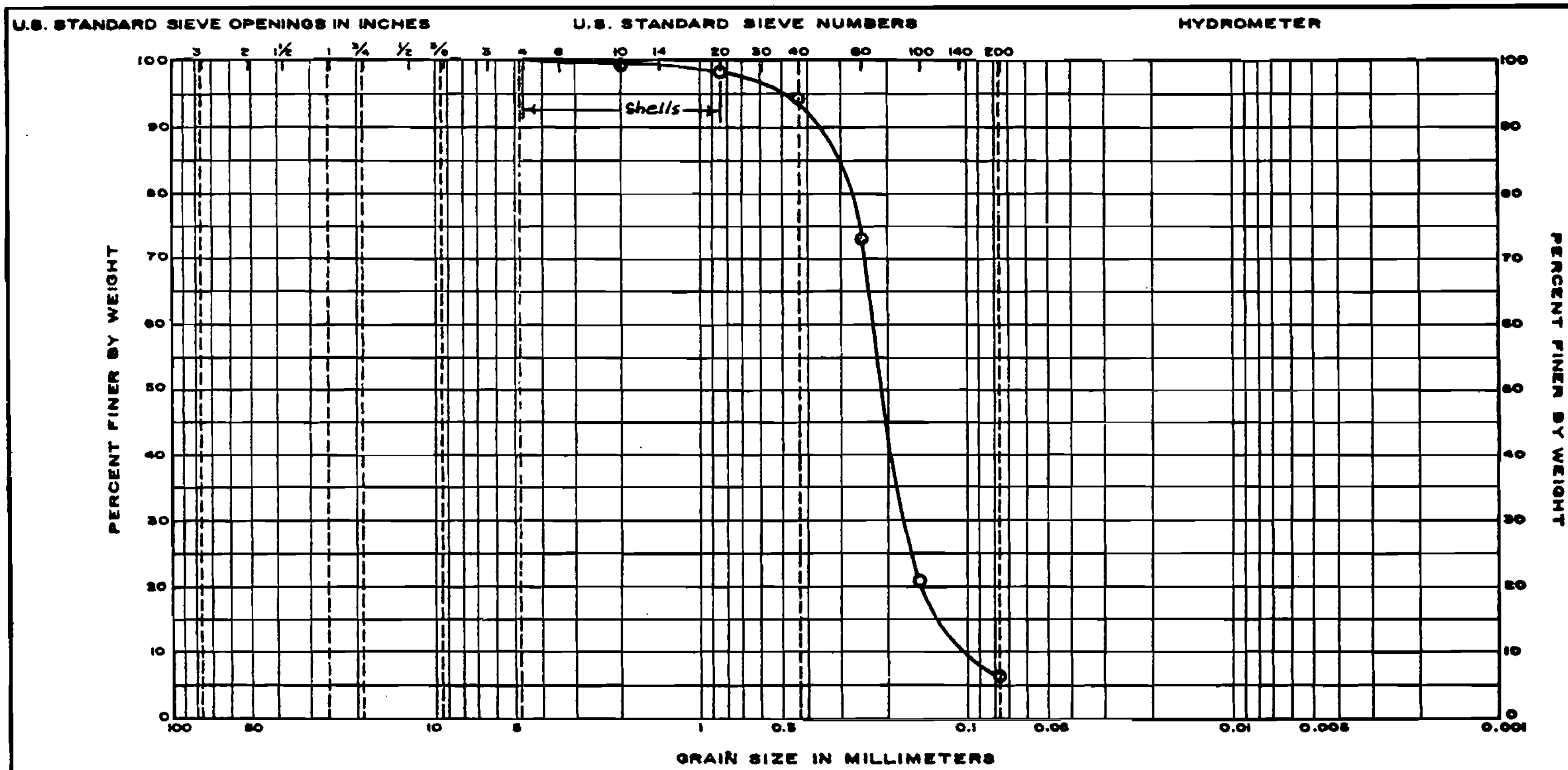
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters
Consulting Engineers, New Orleans, Louisiana

EUSTIS ENGINEERING COMPANY
CONSULTING FOUNDATION ENGINEERS
METAIRIE, LA.

Fig. 14



UNIFIED	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

AASHO	GRAVEL			SAND		SILT	CLAY
	COARSE	MEDIUM	FINE	COARSE	FINE		

GRAIN SIZE ANALYSIS

CURVE NO.	BORING NO.	SAMPLE NO.	DEPTH IN FT.	NATURAL WATER CONTENT	ATTERBERG LIMITS LL	PL	PI
	20	8	28.5				

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal
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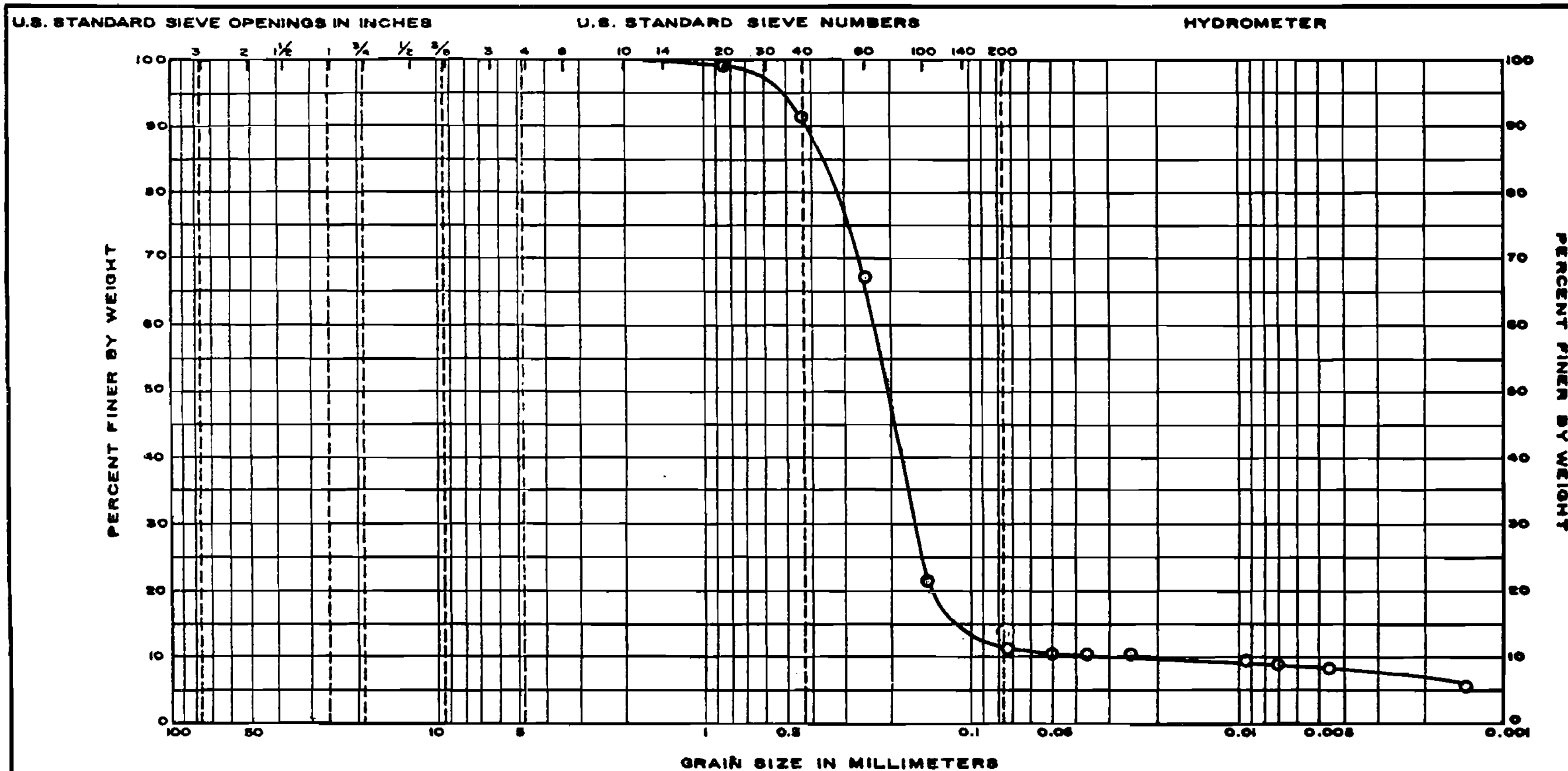
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters
Consulting Engineers, New Orleans, Louisiana

EUSTIS ENGINEERING COMPANY
CONSULTING FOUNDATION ENGINEERS
METAIRIE, LA.

Fig. 15



UNIFIED	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

AASHO	GRAVEL			SAND		SILT	CLAY
	COARSE	MEDIUM	FINE	COARSE	FINE		

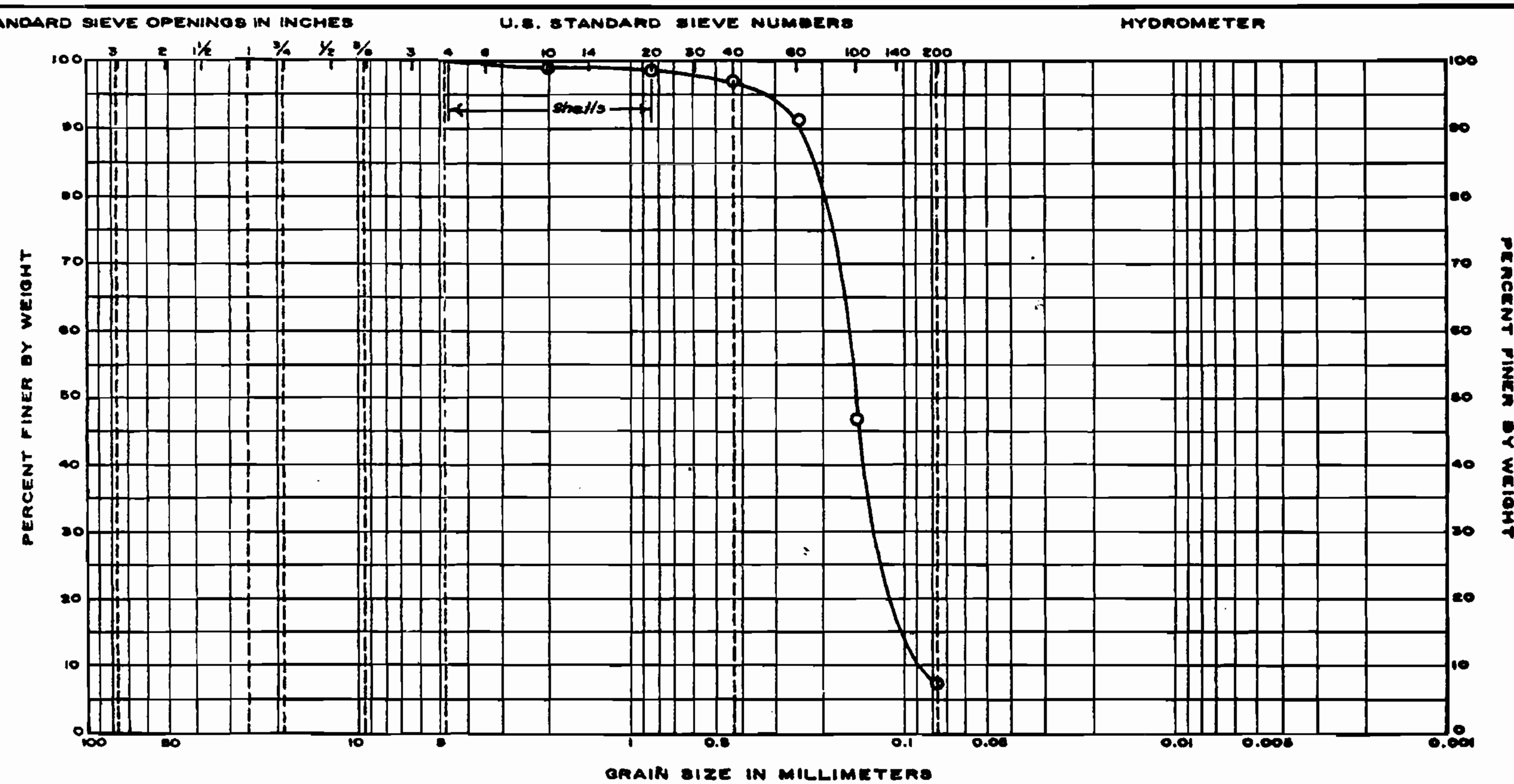
GRAIN SIZE ANALYSIS

CURVE NO.	BORING NO.	SAMPLE NO.	DEPTH IN FT.	NATURAL WATER CONTENT	ATTERBERG LIMITS LL	PL	PI
	26	8	23.5				

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters
Consulting Engineers, New Orleans, Louisiana

EUSTIS ENGINEERING COMPANY
CONSULTING FOUNDATION ENGINEERS
METAIRIE, LA.

Fig. 16



UNIFIED	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE		
AASHO	GRAVEL			SAND		SILT	CLAY
	COARSE	MEDIUM	FINE	COARSE	FINE		

GRAIN SIZE ANALYSIS

CURVE NO.	BORING NO.	SAMPLE NO.	DEPTH IN FT.	NATURAL WATER CONTENT	ATTERBERG LIMITS LL	PL	PI
	29	9	26.0				

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters
Consulting Engineers, New Orleans, Louisiana

EUSTIS ENGINEERING COMPANY
CONSULTING FOUNDATION ENGINEERS
METAIRIE, LA.

Fig. 17

Additional Subsoil Investigation
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

PIEZOMETER INSTALLATIONS

No.	Location	Elevations - Cairo Datum: Top of Riser	Ground Surface	Bottom of Screen
P 201	Landside toe of west side levee near Sta. 659+50	25.6	22.5	10.5
P 202	50" from landside toe of west side levee near Sta. 659+40	22.1	19.8	9.8
P 203	100' from landside toe of west side levee near Sta. 659+30	22.6	19.6	8.6
P 204	Canalside toe of east side levee near Sta. 660+00	26.2	23.2	7.7
P 205	Crown of east side levee near Sta. 660+00	31.0	31.0	6.0

NOTE: P 201, P 202 & P 203 set on 7 May 1982.
P 204 & P 205 set on 31 May 1982.

Fig. 18

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Additional Subsoil Investigation
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 617+50 to Station 663+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

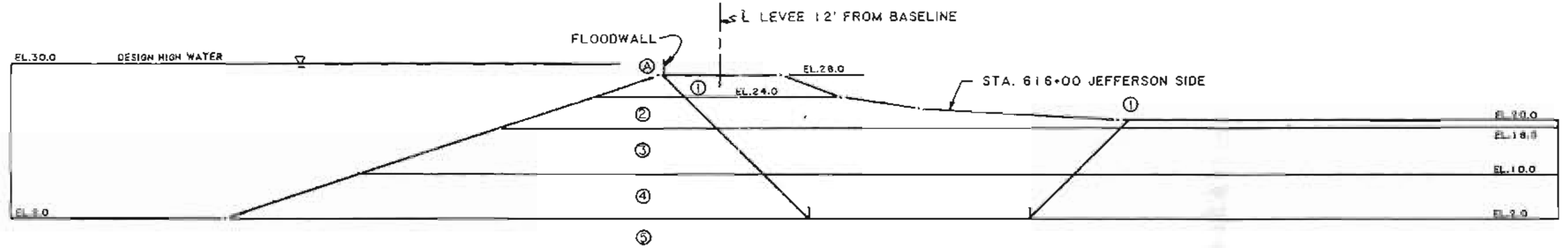
PIEZOMETER READINGS

Date of Reading	Elevation of Water Surface - Cairo Datum					
	P 201	P 202	P 203	P 204	P 205	Canal*
10 May 1982	14.4	13.0	12.7	----	----	21.6
17 May 1982	12.9	12.8	13.0	----	----	22.5
31 May 1982	14.0	12.9	13.3	12.2	11.9	22.2
10 Jun 1982	13.4	12.2	12.6	11.4	11.5	21.8
24 Jun 1982	13.6	12.5	12.7	11.5	11.2	**

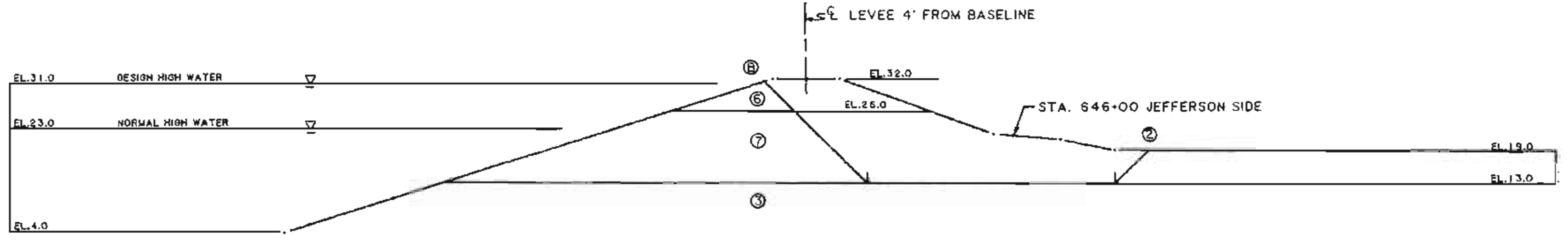
*Benchmark set at water's edge on west side near Sta. 659+50. Elevation of red line on stake is 23.5.

**Stake uprooted.

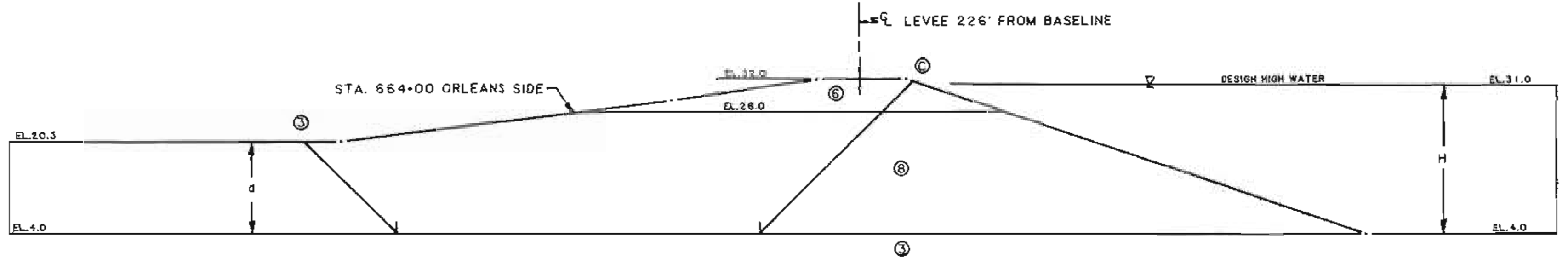
Fig. 19



LAKE PONTCHARTRAIN TO STA. 617+50



STA. 617+50 TO STA. 663+00



STA. 663+00 TO PUMP STATION

SOIL PARAMETERS

ST. No.	γ PCF	ϕ DEG.	C_A PSF	C_B PSF
1	120	0	500	500
2	120	0	500	500
3	103	0	280	280
4	103	0	320	360
5	122	30	0	0
6	117	0	600	300
7	107	0	360	420
8	107	0	410	520

STABILITY ANALYSIS

SLIP SURFACE		DRIVING FORCE			RESISTING FORCE				FACTOR OF SAFETY
No.	EL.	D_A	D_P	ΣD	R_A	R_B*	R_P	ΣR	
A-1	2.0	36100	17410	18690	19380	9086	11380	39846	2.132
B-2	13.0	19770	1920	17850	16560	3800	4320	24680	1.383
C-3	4.0	42498	15228	27270	24640	24005	13530	62176	2.280

* INCLUDES FULL HYDROSTATIC UPLIFT AT SURFACE OF SAND STRATUM.

UPLIFT ANALYSIS

$FS = d(\gamma) \div H(62.5)$

FS= FACTOR OF SAFETY AGAINST BLOWOUT. (A VALUE OF 1.0 IS ACCEPTABLE CONSIDERING THAT HEAD LOSS AND SOIL SHEAR STRENGTH IS NEGLECTED.)

d= THICKNESS OF CLAY COVER ABOVE SURFACE OF SAND IN FEET.

γ= SATURATED UNIT WEIGHT OF CLAY COVER ABOVE SURFACE OF SAND IN PCF.

H= HYDROSTATIC HEAD ABOVE SURFACE OF SAND IN FEET.

STA. 616+00 $FS = \frac{18\ (103)}{28\ (62.5)} = 1.06$ OK (DESIGN HIGH WATER).

STA. 646+00 $FS = \frac{6\ (107)}{18\ (62.5)} = 0.57$ NO GOOD (DESIGN HIGH WATER).

$FS = \frac{6\ (107)}{10\ (62.5)} = 1.03$ OK (NORMAL HIGH WATER).

STA. 664+00 $FS = \frac{16.5\ (107)}{27\ (62.5)} = 1.05$ OK (DESIGN HIGH WATER).

ADDITIONAL SUBSOIL INVESTIGATION
SEWERAGE AND WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 617+50 TO STATION 663+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

STABILITY ANALYSIS

FOR
MODJESKI AND MASTERS
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
JULY, 1982 METAIRIE, LA.

FIGURE 20

PARTNERS

J. BRES EUSTIS
REG. C. E.

CHARLES A. BRAGG (1918-1979)
REG. C. E.

JOHN W. ROACH, JR.
REG. C. E.

GERALD A. BRAGG
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REG. C. E.

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

BORINGS • TESTS • ANALYSES

3011 28TH STREET
METAIRIE, LOUISIANA 70002

P. O. BOX 8708
METAIRIE, LOUISIANA 70011

PHONE (504) 834-0157

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EUSTIS ENGINEERING CO., INC.
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VICE PRESIDENT AND
CHIEF ENGINEER
LLOYD A. HELD, JR.

2 November 1981

Modjeski and Masters, Inc.
Consulting Engineers
1055 St. Charles Avenue
New Orleans, Louisiana 70113

Attention Mr. William B. Conway

Gentlemen:

Subsoil Investigation
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

Transmitted is our engineering report covering a subsoil investigation performed for the subject project.

Thank you for asking us to perform this investigation.

Yours very truly,

EUSTIS ENGINEERING COMPANY

By Lloyd A. Held, Jr.

Lloyd A. Held, Jr.

SUBSOIL INVESTIGATION

SEWERAGE AND WATER BOARD OF NEW ORLEANS

METAIRIE RELIEF CANAL

STATION 554+00 TO STATION 670+00

ORLEANS AND JEFFERSON PARISHES, LOUISIANA

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

By
Eustis Engineering Company
Metairie, Louisiana

2 November 1981

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FIGURES 1 THROUGH 168

SUBSOIL INVESTIGATION

SEWERAGE AND WATER BOARD OF NEW ORLEANS

METAIRIE RELIEF CANAL

STATION 554+00 TO STATION 670+00

ORLEANS AND JEFFERSON PARISHES, LOUISIANA

INTRODUCTION

1. This report contains the results of a subsoil investigation performed for proposed improvements to the existing Metairie Relief Canal between Stations 554+00 and 670+00 in Orleans and Jefferson Parishes, Louisiana. The investigation was performed in accordance with Eustis Engineering Company's letter of estimated cost for professional soil engineering services, dated 27 February 1981. This proposal was accepted on 12 March 1981 by Mr. William B. Conway of Modjeski and Masters, Inc., Consulting Engineers for the project.

2. This report has been prepared in accordance with generally accepted soil and foundation engineering practice for the exclusive use of Modjeski and Masters and their representatives for specific application to the proposed improvements to the Metairie Relief Canal between Stations 554+00 and 670+00 in Orleans and Jefferson Parishes, Louisiana. In the event that any changes in the nature, design or location of the improvements are planned, the conclusions and recommendations

contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing.

3. The analyses and recommendations contained in this report are based in part on data obtained from the soil borings. The nature and extent of variations that may exist between boring locations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations contained in this report.

SCOPE

4. The scope of the investigation included the drilling of undisturbed soil borings to determine subsoil conditions and stratification and to obtain samples of the various strata encountered. Soil mechanics laboratory tests were performed on samples obtained from the borings to evaluate the physical properties of the subsoils. Analyses were made to determine the stability of the levees adjacent to the canal, and floodwall analyses were made to determine maximum bending moments and required sheetpile penetrations.

SOIL BORINGS

5. A total of sixty-eight (68) undisturbed sample type soil test borings were drilled during the period 14 May to 22 July 1981 at the locations shown on Figure 1. Results

of the borings are shown graphically in the form of subsoil profiles on Figures 2, 3 and 4. The boring coordinates and ground surface elevations are summarized in tabular form on Figure 5, and they were estimated from maps and cross-sections of the canal furnished by Modjeski and Masters, Inc. Detailed descriptive logs of the individual borings are shown in both tabular and graphical form on Figures 6 through 73.

6. The borings were drilled with a truck mounted rotary type drill rig to depths of 40 and 50 feet below the existing ground surface. Samples of cohesive and semi-cohesive soils were obtained at close intervals or at a change in stratum using 3-in. and 5-in. diameter Shelby tube sampling barrels. Samples were carefully extruded from the sampling barrel in the field, inspected and visually classified by Eustis Engineering Company's soil technician. Representative portions of the samples were placed in moisture proof containers and sealed with paraffin for preservation.

7. Cohesionless soils were sampled during the performance of in situ Standard Penetration Tests which provide a measure of the relative density of these soils. The test consists of counting the number of blows of a 140-lb weight dropped 30 inches required to drive a 2-in. diameter splitspoon sampler one foot after first seating the sampler six inches. The results of these tests are shown on the subsoil profiles at the depths at which these tests were performed and are also shown on the boring logs under the column headed "Standard Penetration Test."

LABORATORY TESTS

8. Soil mechanics laboratory tests consisting of natural water content, unit weight, and either unconfined compression or one point unconsolidated undrained triaxial compression shear were performed on a majority of the undisturbed samples obtained from the borings. Atterberg liquid and plastic limit determinations were made on selected representative samples to aid in classification. The results of these tests are summarized and shown in tabular form on Figures 74 through 113. In addition, three point unconsolidated undrained triaxial compression (Q) shear tests were performed on selected samples and the results of these tests are shown individually on Figures 114 through 163.

DESCRIPTION OF SUBSOIL CONDITIONS

9. The ground surface ranges between el 33 C.D. and 19 C.D. at the boring locations. Several borings on the west side of the canal were drilled through the asphalt roadway surface and base material. Beneath the roadway and beginning at the ground surface is a layer of fill materials 4 to 21.5 feet in thickness. The fill consists mainly of clay soils intermixed with silts, sands, organic matter and miscellaneous fill materials.

10. What appears to be the natural ground surface varies from a low point of el 6 C.D. near the north end of the

project to a high point of el 22 C.D. near the south end of the project. At most locations between Station 554+00 and Station 631+00, the upper stratum of natural subsoils consists of extremely soft to medium stiff gray, brown and black humus, organic clay, wood and clay with organic matter and humus. This stratum of predominantly organic soils is not present south of Station 631+00.

11. Beneath the upper stratum of organic soils north of Station 631+00 and following the fill material at most locations south of Station 631+00 is a stratum of extremely soft to medium stiff gray clay. Beginning at elevations ranging between 14 C.D. and -17 C.D. is a stratum of very loose to very dense gray sand, silty sand and clayey sand. This stratum continues to the final depth of the borings, except on the east side of the canal between Station 554+00 and Station 614+00, where the bottom 1.5 to 2 feet consists of very soft to medium stiff gray clay at most of the borings.

Ground Water

12. Because of the location of the borings, each boring was sealed with a soil-cement grout in accordance with U.S. Army Corps of Engineers requirements immediately upon completion of the drilling operations. Therefore, observations of the ground water were not made in the undisturbed borings. The ground water will fluctuate with climatic conditions and changes in the water level in the Metairie Relief Canal. If important to construction, it should be verified immediately prior to beginning work.

FOUNDATION ANALYSIS

13. Furnished information indicates that design plans include: a) enlargement of the existing Metairie Relief Canal between Stations 554+00 and 670+00; b) installation of a sheetpile floodwall on the east side and west side of the canal between Stations 554+00 and 635+00; and c) raising the existing levee on the east side and west side of the canal between Stations 635+00 and 670+00.

Criteria for Analyses

14. In accordance with instructions, analyses were performed following criteria furnished by the U.S. Army Corps of Engineers New Orleans District. Slope stability analyses were performed using the "Method of Planes" in which horizontal potential failure surfaces are varied along with active and passive wedge locations to arrive at the lowest numerical value of safety factor. Floodwall analyses were performed using a factor of safety of 1.5 applied to the estimated soil shear strengths to determine the sheetpile penetration, and a factor of safety of 1.0 to determine the maximum bending moment. Floodwall analyses were based on full hydrostatic pressure and included evaluation using the "Q" and "S" soil shear strengths. High and low water elevations used in the stability and floodwall analyses were based on information furnished by the Corps of Engineers pertaining to the "Existing" and "Authorized" flood protection plans.

Soil Parameters

15. Due to changes in the subsoil conditions along the alignment of the proposed improvements, the project is divided into two reaches for the purpose of assigning soil parameters for the analyses. Reach I extends between Stations 554+00 and 635+00, and Reach II extends between Stations 635+00 and 670+00. Values of cohesion and unit weight from the laboratory tests are represented graphically on Figure 164 in the form of plots of "Cohesion versus Elevation" and "Unit Weight versus Elevation" for each Reach. Emphasis was placed on the results of the "Q" test in the selection of soil parameters for design. The selection of "S" strengths was based on past experience with similar soils.

Levee Stability

16. Reach I. Enlargement of the existing canal through Reach I will require degrading of the existing levees in order to provide a factor of safety of at least 1.3 against a stability failure of the levee and canal slopes. Considering that the depth of the sand stratum has an appreciable influence on the stability of these adjacent levees, Reach I is subdivided into segments to delineate the amount of degrading that will be required.

17. Stability analyses were performed to determine the elevation to which these existing levees should be degraded in each segment of Reach I, and the results of the computations are summarized in the following tabulation.

Location Within Reach I	Maximum Elevation of Levee Crown for Factor of Safety = 1.3
Sta. 554+00 to Sta. 589+00	26 C.D.
Sta. 589+00 to Sta. 614+00	27 C.D.
Sta. 614+00 to Sta. 625+00	28 C.D.
Sta. 625+00 to Sta. 635+00	29 C.D.

Cross-sections, critical wedge locations and typical computations are shown on Figures 165 through 168.

18. Reach II. Computations indicate that enlargement of the canal through Reach II should not prevent raising of the existing levees to el 34 C.D. A cross-section, critical wedge locations and typical computations are shown on Figure 169.

Floodwall

19. In order to provide flood protection to the required elevation through Reach I, a sheetpile floodwall will be installed through the crown of the degraded levee. Analyses were performed to determine the required sheetpile penetration and maximum bending moment based on the design high water elevation of the "Existing" and "Authorized" flood protection plans. The computations were based on a minimum crown width of 10 feet and the results are summarized in the following tabulation.

Location Within Reach I	Tip Elevation of Sheetpiles C.D.	Maximum Bending Moment Ft-Kips
Stations 554+00 to 589+00		
Existing Plan	-6.3	11.9
Authorized Plan	12.1	3.9
Stations 589+00 to 614+00		
Existing Plan	9.2	6.9
Authorized Plan	16.8 (15.0)*	1.7
Stations 614+00 to 625+00		
Existing Plan	14.8	3.7
Authorized Plan	21.0 (16.0)*	0.6
Stations 625+00 to 635+00		
Existing Plan	17.7 (17.0)*	2.6
Authorized Plan	23.5 (17.0)*	0.3

*Recommended minimum sheetpile tip elevations.

Cross-sections and combined earth and hydrostatic pressure diagrams are shown on Figures 165 through 168.

20. Considering the presence of miscellaneous materials and other localized weak zones in the existing levee embankment, it is recommended that sheetpiles for the new floodwall be driven to the specified tip elevation or a minimum embedment of 12 feet below the degraded levee crown, whichever is greater.

Backfill Material

21. Soils obtained during degrading of the existing levee in Reach I may be used for backfill to raise the existing levee in Reach II. After removal of any wood, organic matter

and miscellaneous materials, these soils should be placed and compacted in accordance with Corps of Engineers Standard Specifications for Semi-Compacted Levees. Soil obtained from the excavation of the canal bottom and slopes should not be used for backfill material.

Erosion Control

22. Removal of soil from the canal side by erosion and/or scour may affect the stability of the new bulkheads and side slopes. The determination of the need for erosion control is beyond the scope of this report and should be accomplished by qualified specialists.

EUSTIS ENGINEERING COMPANY

By Lloyd A. Held, Jr.

Lloyd A. Held, Jr.

L. J. Napolitano:bh

NOTES

LOCATION PLAN REPRODUCED FROM FURNISHED DRAWING.

BORINGS DRILLED DURING PERIOD OF 14 MAY TO 22 JULY 1981.

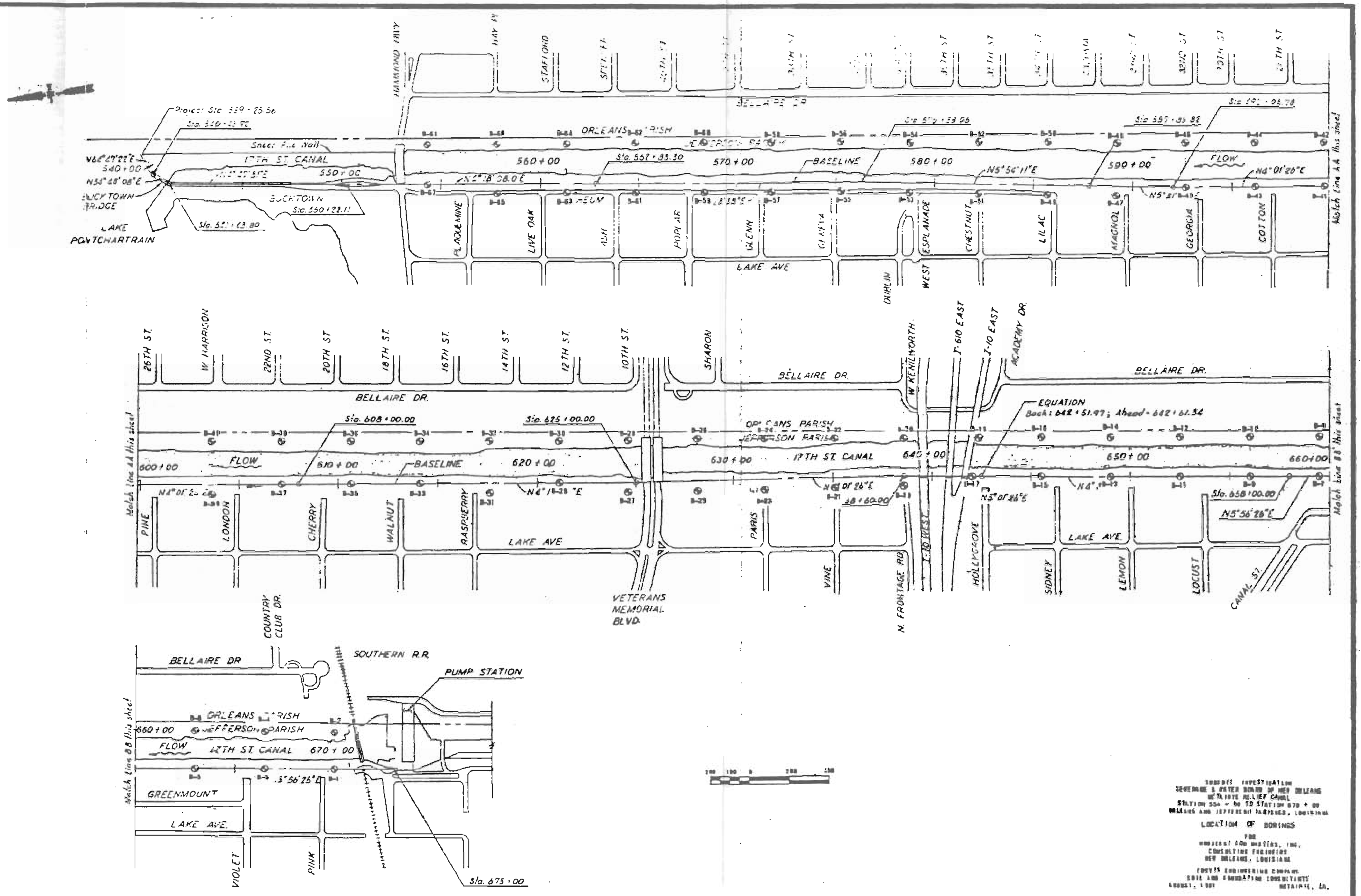


FIGURE 1

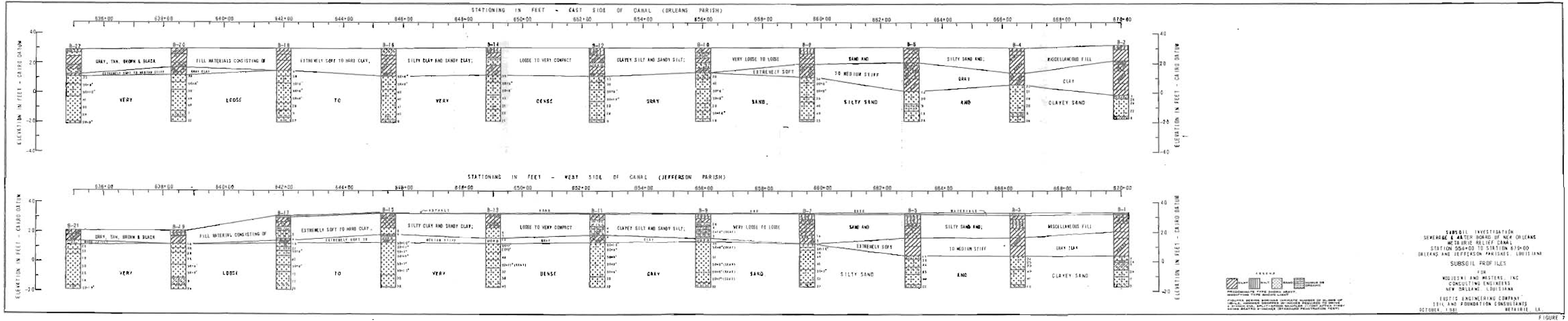
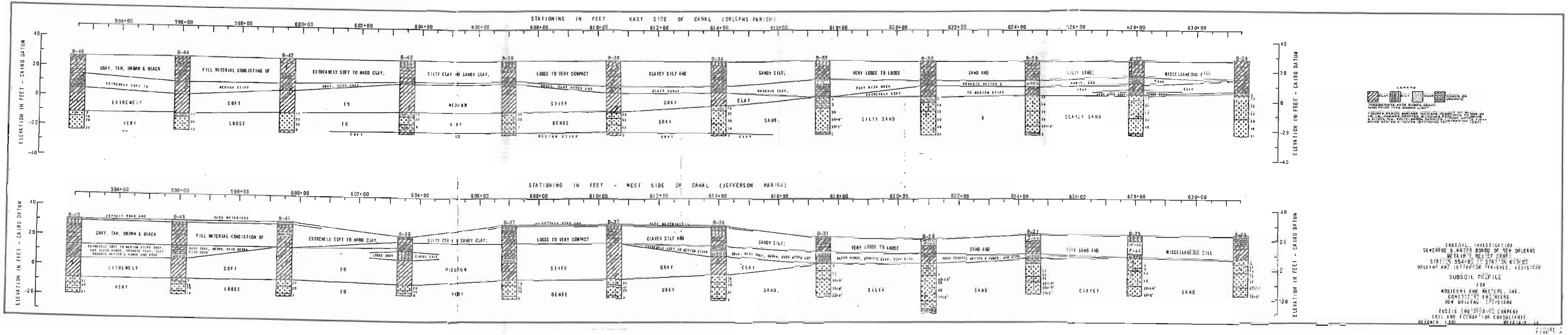

STATIONING IN FEET - EAST SIDE OF CANAL (ORLEANS PARISH)
STATIONING IN FEET - WEST SIDE OF CANAL (JEFFERSON PARISH)
ELEVATION IN FEET - CAIRO DATUM
GRAY, TAN, BROWN & BLACK
FILL MATERIALS CONSISTING OF
EXTREMELY SOFT TO HARD CLAY,
SILTY CLAY AND SANDY CLAY;
LOOSE TO VERY COMPACT
CLAYEY SILT AND SANDY SILT;
VERY LOOSE TO LOOSE
SAND AND
SILTY SAND AND;
MISCELLANEOUS FILL
EXTREMELY SOFT
TO MEDIUM STIFF
GRAY
CLAY
VERY
LOOSE
TO
VERY
DENSE
GRAY
SAND,
SILTY SAND
AND
CLAYEY SAND
SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 554+00 TO STATION 679+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA
SUBSOIL PROFILES
FOR
MODJESKI AND MASTERS, INC
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981
METAIRIE, LA.

FIGURE 7



STATIONING IN FEET - EAST SIDE OF CANAL (ORLEANS PARISH)
STATIONING IN FEET - WEST SIDE OF CANAL (JEFFERSON PARISH)
ELEVATION IN FEET - CAIRO DATUM
GRAY, TAN, BROWN & BLACK
FILL MATERIAL CONSISTING OF
EXTREMELY SOFT TO HARD CLAY,
SILTY CLAY AND SANDY CLAY;
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CLAYEY SILT AND
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MISCELLANEOUS FILL
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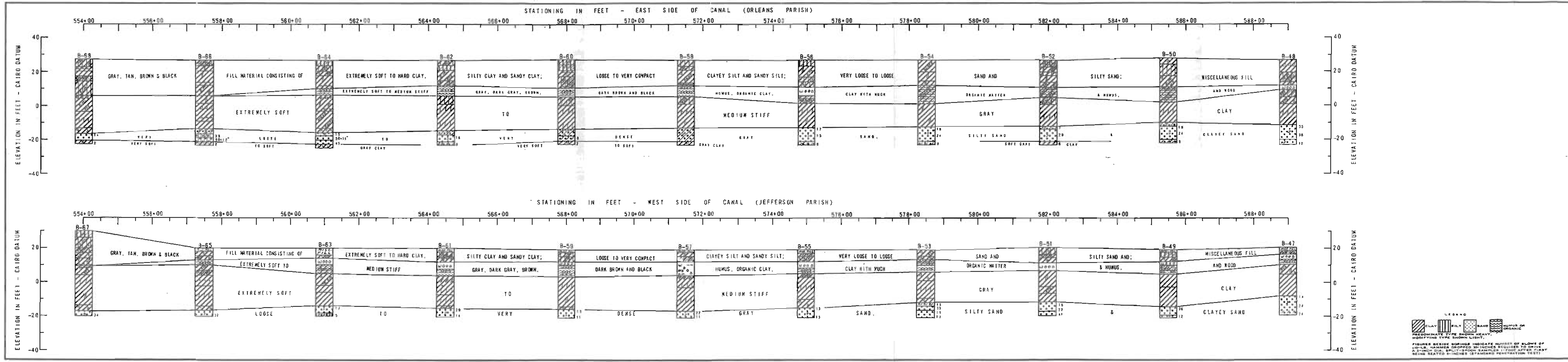
TO
MEDIUM
STIFF
GRAY
CLAY
VERY
LOOSE
TO
DENSE
GRAY
SAND.
SILTY SAND
CLAYEY SAND
SILTY
SAND
CLAYEY
LEGEND
SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 554+05 TO STATION 673+05
ORLEANS AND JEFFERSON PARISHES, LOUISIANA
SUBSOIL PROFILE
FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981
METAIRIE, LA.

FIGURE 3



SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 554+00 TO STATION 670+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

SUBSOIL PROFILES

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981 METAIRIE, LA.

FIGURE 4

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No.	Station No.	Estimated Ground Surface Elev. in Feet (Cairo Datum)	Depth of Boring In Feet
1	Westside of canal @ 670+00	33	50
2	Eastside of canal @ 670+00	32.5	50
3	Westside of canal @ 666+50	33	50
4	Eastside of canal @ 666+50	30.5	50
5	Westside of canal @ 663+00	33	50
6	Eastside of canal @ 663+00	31	50
7	Westside of canal @ 659+50	33	50
8	Eastside of canal @ 659+50	31	50
9	Westside of canal @ 656+00	33	50
10	Eastside of canal @ 656+00	31	50
11	Westside of canal @ 652+50	33	50
12	Eastside of canal @ 652+50	30.5	50
13	Westside of canal @ 649+00	33	50
14	Eastside of canal @ 649+00	31	50
15	Westside of canal @ 645+50	33	50
16	Eastside of canal @ 645+50	30	50
17	Westside of canal @ 642+00	31	50
18	Eastside of canal @ 642+00	30	50
19	Westside of canal @ 638+50*	20	40
20	Eastside of canal @ 638+50	30	50
21	Westside of canal @ 635+00*	21	40
22	Eastside of canal @ 635+00	29	50
23	Westside of canal @ 631+50*	23	40
24	Eastside of canal @ 631+50	27	50
25	Westside of canal @ 628+00*	23	40
26	Eastside of canal @ 628+00	27	50
27	Westside of canal @ 624+50*	24	40
28	Eastside of canal @ 624+50	27	50
29	Westside of canal @ 621+00*	21	50
30	Eastside of canal @ 621+00	27	50
31	Westside of canal @ 617+50*	22	40
32	Eastside of canal @ 617+50	27.5	50
33	Westside of canal @ 614+00	30	50
34	Eastside of canal @ 614+00	27	50
35	Westside of canal @ 610+50	31	50
36	Eastside of canal @ 610+50	27	50
37	Westside of canal @ 607+00	30	50
38	Eastside of canal @ 607+00	27	50
39	Westside of canal @ 603+50*	22	40
40	Eastside of Canal @ 603+50	27	50

*Boring drilled at toe of levee instead of crown.

Fig. 5
(Sheet #1)

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No.	Station No.	Estimated Ground Surface Elev. in Feet (Cairo Datum)	Depth of Boring In Feet
41	Westside of canal @ 599+50	30.5	50
42	Eastside of canal @ 599+50	27	50
43	Westside of canal @ 596+00	30.5	50
44	Eastside of canal @ 596+00	27.5	50
45	Westside of canal @ 592+50	30.5	50
46	Eastside of canal @ 592+50	27	50
47	Westside of canal @ 589+00*	21	40
48	Eastside of canal @ 589+00	27	50
49	Westside of canal @ 585+50*	19.5	40
50	Eastside of canal @ 585+50	28	50
51	Westside of canal @ 582+00*	20.5	40
52	Eastside of canal @ 582+00	27	50
53	Westside of canal @ 578+50*	19	40
54	Eastside of canal @ 578+50	27	50
55	Westside of canal @ 575+00*	19	40
56	Eastside of canal @ 575+00	27	50
57	Westside of canal @ 571+50*	19	40
58	Eastside of canal @ 571+50	27	50
59	Westside of canal @ 568+00*	19	40
60	Eastside of canal @ 568+00	27.5	50
61	Westside of canal @ 564+50*	20	40
62	Eastside of canal @ 564+50	27	50
63	Westside of canal @ 561+00*	20	40
64	Eastside of canal @ 561+00	27	51.5
65	Westside of canal @ 557+50*	20	40
66	Eastside of canal @ 557+50	27	50
67	Westside of canal @ 554+00	30	50
68	Eastside of canal @ 554+00	27.5	50

*Boring drilled at toe of levee instead of crown.

Fig. 5
(Sheet #2)

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

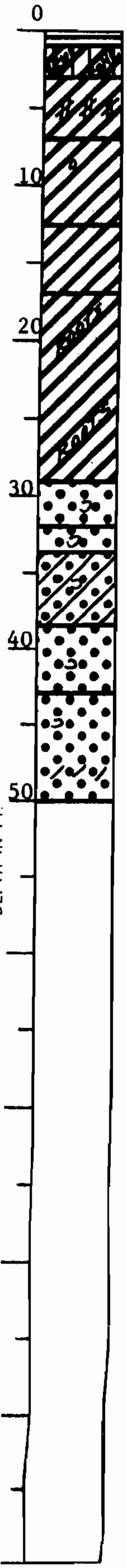
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 1 Soil Technician A. J. Mayeux Date 23 May 1981

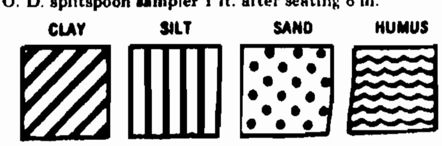
Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	0.3	Asphalt		
			0.3	1.0	Fill		
1	2.0	2.5	1.0	3.0	Stiff brown & gray silty clay w/brick		
					fragments & concretions		
2	5.0	5.5	3.0	7.0	Stiff brown & gray clay w/clayey silt		
					layers		
3	8.0	8.5	7.0		Medium stiff gray & tan clay w/gravel		
4	11.0	11.5		12.5	Medium stiff gray & tan clay		
5	14.0	14.5	12.5	17.0	Soft gray clay		
6	19.0	19.5	17.0		Medium stiff gray & tan clay w/roots		
7	24.0	24.5		29.0	Ditto		
8	30.0	31.5	29.0	32.0	Loose gray sand w/shell fragments	1	7
9	32.0	33.5	32.0	33.5	Medium dense gray sand w/shell	3	14
					fragments		
10	33.5	35.0	33.5	38.5	Loose gray clayey sand w/shell	1	4
					fragments		
11	38.5	40.0	38.5	43.0	Medium dense gray sand w/shell	5	24
					fragments		
12	43.5	45.0	43.0		Loose gray sand w/shell fragments &	2	7
					clay layers		
13	48.5	50.0		50.0	Ditto	1	3



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 670+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 6

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

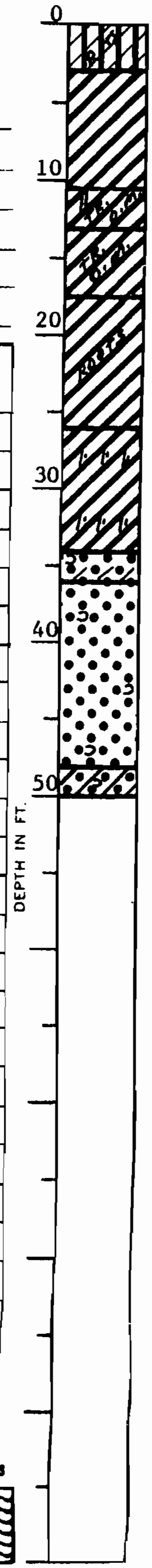
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 2 Soil Technician A. J. Mayeux Date 19 June 1981

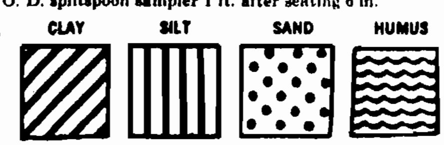
Ground Elev. 32.5 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	3.0	Medium compact brown clayey silt with		
					roots		
2	5.0	5.5	3.0		Soft gray & tan clay		
3	8.0	8.5		10.5	Ditto		
4	11.0	11.5	10.5	13.0	Soft gray clay w/silt pockets & trace		
					of organic matter		
5	14.0	14.5	13.0	17.5	Stiff gray clay w/trace of organic		
					matter		
6	19.0	19.5	17.5		Medium stiff gray & tan clay w/roots		
7	24.0	24.5		26.0	Ditto		
8	29.0	29.5	26.0	34.0	Soft gray clay w/silty sand layers &		
					lenses		
9	34.0	35.5	34.0	36.0	Loose gray sand w/shell fragments &	2	7
					clay layers		
10	36.0	37.5	36.0		Medium dense gray sand w/shell	3	26
					fragments		
11	38.5	40.0			Ditto	8	26
12	43.5	45.0		48.0	Ditto	6	22
13	48.5	50.0	48.0	50.0	Loose gray clayey sand w/shell	2	6
					fragments		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 670+00 in crown of levee.

Fig. 7

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

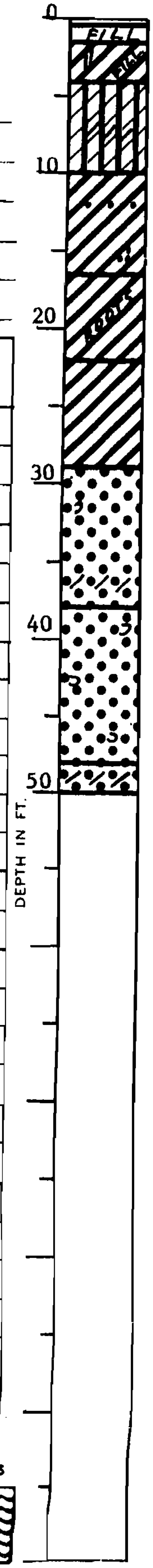
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 3 Soil Technician A. J. Mayeux Date 25 May 1981

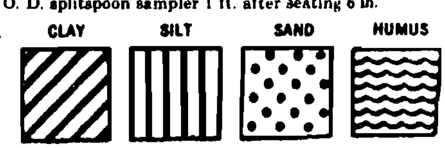
Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.3	Asphalt		
			0.3	1.5	Fill		
1	2.0	2.5	1.5	4.0	Medium stiff gray & tan clay w/silt		
					pockets & some fill		
2	5.0	5.5	4.0		Medium compact brown & gray clayey silt		
					w/clay lenses		
3	8.0	8.5		10.0	Ditto		
4	11.0	11.5	10.0		Medium stiff gray & tan clay w/sand		
					lenses		
5	14.0	14.5		16.5	Medium stiff gray & tan clay w/sand		
					pockets		
6	19.0	19.5	16.5	22.0	Medium stiff gray & tan clay w/roots		
7	24.0	24.5	22.0	29.0	Soft gray clay		
8	30.0	31.5	29.0		Medium dense gray sand w/shell	3	24
					fragments & clay layers		
9	32.5	34.0			Ditto	7	29
10	35.0	36.5		38.0	Ditto	5	20
11	38.5	40.0	38.0		Dense gray sand w/shell fragments	7	40
12	43.5	45.0		48.0	Ditto	8	41
13	48.5	50.0	48.0	50.0	Loose gray sand w/clay layers	2	10



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal @ Sta. No. 666+50 in crown of levee.

Fig. 8

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

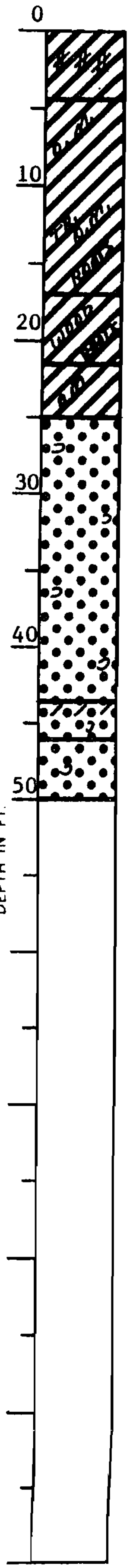
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 4 Soil Technician A. J. Mayeux Date 20 June 1981

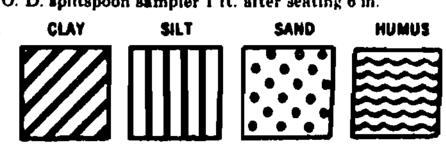
Ground Elev. 30.5 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	3.0	0.0	4.5	Medium stiff gray & tan clay w/clayey silt layers		
2	5.0	6.0	4.5		Soft gray clay w/organic matter		
3	8.0	9.0			Ditto		
4	11.0	12.0			Ditto		
5	14.0	15.0		17.0	Soft gray clay w/trace of organic matter & roots		
6	19.0	20.0	17.0	21.5	Soft gray clay w/wood & roots		
7	23.0	24.0	21.5	25.0	Soft gray clay w/organic matter		
8	25.0	26.5	25.0		Medium dense gray sand w/shell fragments	5	22
9	28.5	30.0			Ditto	8	21
10	33.5	35.0			Ditto	6	26
11	38.5	40.0		43.5	Ditto	6	26
12	43.5	45.0	43.5	46.0	Loose gray sand w/clay layers & shell fragments	3	9
13	48.5	50.0	46.0	50.0	Dense gray sand w/shell fragments	8	36



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of Canal @ Sta. No. 666+50 in crown of levee.

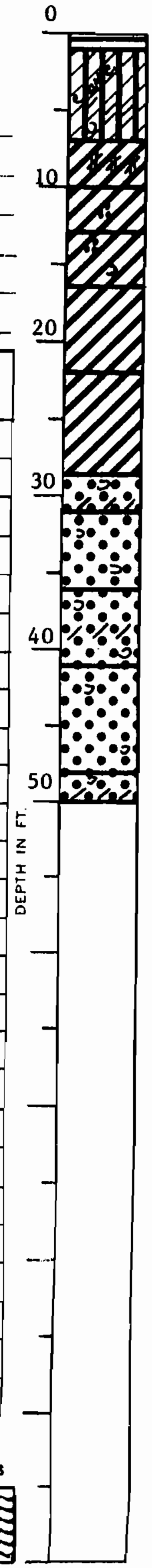
Fig. 9

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

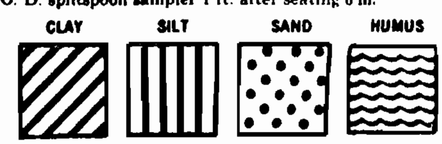
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana
Boring No. 5 Soil Technician A. J. Mayeux Date 25 May 1981
Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	0.3	Asphalt		
			0.3	1.0	Fill		
1	2.0	2.5	1.0		Compact brown clayey silt w/concretions		
2	5.0	5.5		7.0	Compact brown clayey silt w/clay layers		
					& shell fragments		
3	8.0	8.5	7.0	10.0	Medium stiff gray & tan clay w/clayey		
					silt layers		
4	11.0	11.5	10.0	13.0	Stiff gray & tan clay w/sand pockets		
5	14.0	14.5	13.0	16.5	Medium stiff gray & tan clay w/sand		
					pockets & shells		
6	19.0	19.5	16.5	22.0	Medium stiff gray & tan clay		
7	24.0	24.5	22.0	28.5	Medium stiff gray clay		
8	28.5	30.0	28.5	31.0	Medium dense gray sand w/shell fragments	4	17
					& clay layers		
9	31.0	32.5	31.0		Dense gray sand w/shell fragments	5	39
10	33.5	35.0		36.0	Ditto	10	44
11	38.5	40.0	36.0	41.0	Medium dense gray sand w/shell fragments	7	23
					w/clay layers		
12	43.5	45.0	41.0	48.0	Dense gray sand w/shell fragments	10	44
13	48.5	50.0	48.0	50.0	Medium dense gray sand w/shell fragments	5	22
					& clay layers		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 663+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 10

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

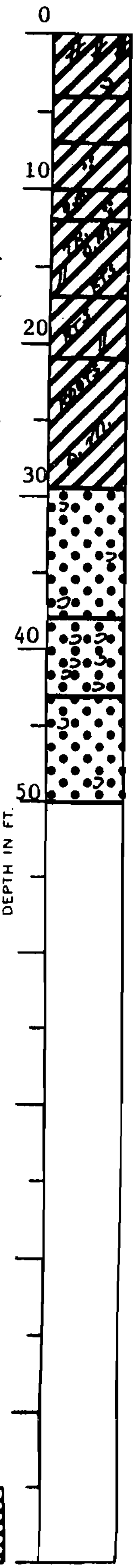
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 6 Soil Technician A. J. Mayeux Date 19 June 1981

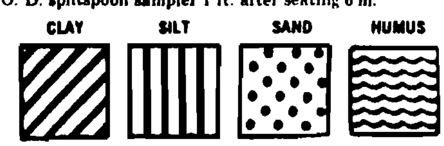
Ground Elev. 31 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	4.0	Stiff gray & brown clay w/clayey silt		
					layers & shells		
2	5.0	5.5	4.0	7.0	Soft gray clay		
3	8.0	8.5	7.0	10.0	Soft gray & tan clay w/sand pockets		
4	11.0	11.5	10.0	12.0	Soft gray clay w/organic matter & sand		
					pockets		
5	14.0	14.5	12.0	17.0	Very soft gray clay w/trace of organic		
					matter, silt pockets & roots		
6	19.0	19.5	17.0	21.0	Medium stiff gray & tan clay w/roots &		
					silt pockets		
7	24.0	24.5	21.0	29.5	Medium stiff gray clay w/roots & organic		
					matter		
8	29.5	31.0	29.5		Medium dense gray sand w/shell fragments	3	13
9	33.5	35.0		38.0	Ditto	4	20
10	38.5	40.0	38.0	43.0	Loose gray sand & shell fragments	3	5
11	43.5	45.0	43.0		Medium dense gray sand w/shell fragments	3	13
12	48.5	50.0		50.0	Ditto	3	24



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on East side of canal @ Sta. No. 663+00 in crown of levee.

Fig. 11

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

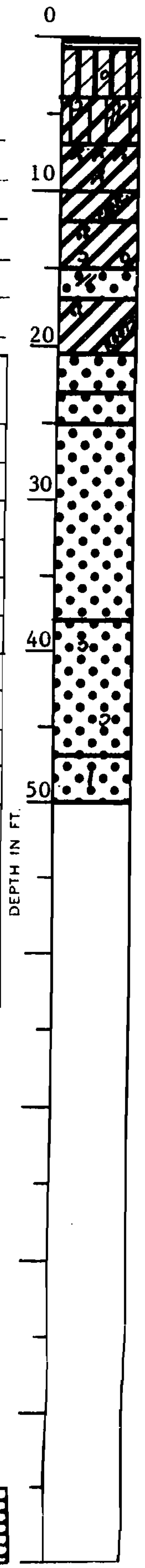
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 7 Soil Technician George Hardee Date 28 May 1981

Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.2	Asphalt w/shells		
			0.2	0.7	Loose tan silty sand		
1	1.5	2.5	0.7	4.0	Medium compact brown clayey silt with		
					gravel		
2	4.5	5.5	4.0	7.0	Stiff brown silty clay w/shells & clayey		
					silt pockets		
3	7.5	8.5	7.0	10.0	Medium stiff tan & gray clay w/clayey		
					sand layers & pockets		
4	10.5	11.5	10.0	12.0	Medium stiff gray & tan clay with		
					concretions		
5	13.5	14.5	12.0	15.0	Soft tan & gray clay w/sand pockets,		
					shells & gravel		
6	15.0	16.5	15.0	17.0	Medium dense tan & gray sand w/clay	1	14
					pockets		
7	17.5	19.0	17.0		Medium stiff gray & tan clay w/sand	1	5
					pockets & roots		
8	19.5	20.5		20.5	Ditto		
9	20.5	22.0	20.5	23.0	Dense gray sand	4	47
10	23.0	24.5	23.0	25.0	Very dense gray sand	21	50=10"
11	25.5	27.0	25.0		Dense gray sand	13	48
12	28.5	30.0			Ditto	15	49
13	33.5	35.0		38.0	Ditto	12	46
14	38.5	40.0	38.0		Very dense gray sand w/shell fragments	21	50=9"
15	43.5	45.0		47.0	Very dense gray sand	15	53
16	48.5	50.0	47.0	50.0	Medium dense gray sand w/silt	6	23



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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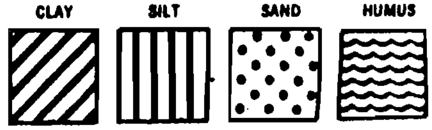


Remarks: Boring located on Westside of canal @ Sta. No. 659+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 12

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

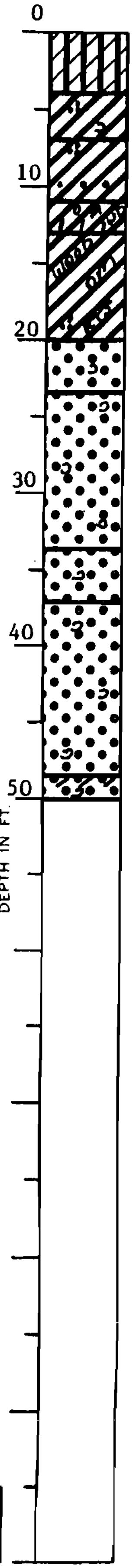
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 8 Soil Technician A. J. Mayeux Date 20 June 1981

Ground Elev. 31 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	4.0	Medium compact brown clayey silt		
2	5.0	5.5	4.0	7.0	Very soft gray clay w/many sand pockets		
					& trace of shells		
3	8.0	8.5	7.0	11.0	Soft gray clay w/sand pockets & lenses		
4	11.0	11.5	11.0	13.0	Medium stiff gray clay w/organic matter,		
					wood & silt lenses		
5	14.0	14.5	13.0		Soft gray clay w/wood & organic matter		
6	19.0	19.5		20.0	Soft gray clay w/sand pockets & roots		
7	20.0	21.5	20.0	23.5	Dense gray sand w/shell fragments	6	34
8	23.5	25.0	23.5		Very dense gray sand w/shell fragments	10	50=8
9	28.5	30.0		33.5	Ditto	12	50=8"
10	33.5	35.0	33.5	37.0	Medium dense gray sand w/shell fragments	8	28
11	38.5	40.0	37.0		Dense gray sand w/shell fragments	10	48
12	43.5	45.0		48.5	Ditto	12	49
13	48.5	40.0	48.5	50.0	Dense gray sand w/clay layers & shell	2	35
					fragments		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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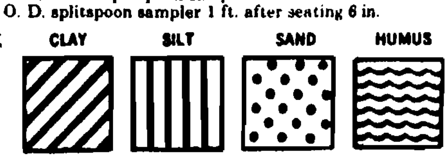


Remarks: Boring located on Eastside of canal @ Sta. No. 659+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 13

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

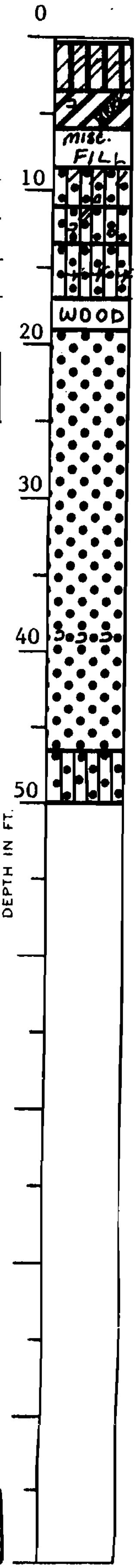
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 9 Soil Technician R. Courtiade Date 25 May 1981

Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	0.3	Asphalt		
1	2.0	2.5	0.3	3.5	Compact gray & tan clayey silt w/clay layers		
2	5.0	5.5	3.5	6.0	Medium stiff gray & tan clay w/shell & brick fragments		
3	6.5	8.0	6.0	8.5	Miscellaneous fill (cinders, gravel, lignite, glass, clayey silt & clay layers)	9	28
4	9.0	10.5	8.5	11.0	Loose tan silty sand w/clay layers & some gravel	5	8
5	11.5	13.0	11.0	13.5	Very loose tan silty sand w/few clay pockets, shells & gravel	2=	18"(Seat)
6	14.0	15.5	13.5	17.0	Loose tan silty sand w/organic clay layers	1	5
7	17.5	18.0	17.0	19.0	Wood		
8	19.0	20.5	19.0		Very dense gray sand	7	54
9	23.5	23.5			Ditto	50	=8"(Seat)
10	28.5	30.0			Ditto	22	51
11	33.5	35.0			Ditto	50	=9"(Seat)
12	38.5	40.0			Very dense gray sand w/a layer of shell fragments	50	=9"(Seat)
13	43.5	45.0		46.5	Very dense gray sand	50	=7"(Seat)
14	48.5	50.0	46.5	50.0	Very dense gray silty sand	25	52



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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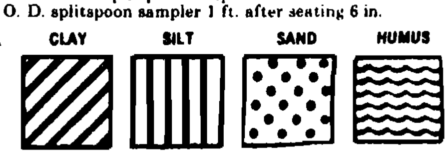


Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal @ Sta. No. 656+00 in crown of levee.

Fig. 14

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

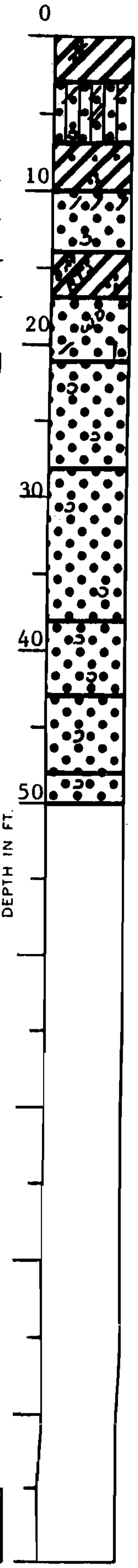
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 10 Soil Technician A. J. Mayeux Date 22 June 1981

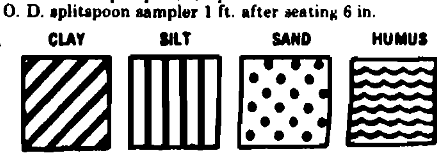
Ground Elev. 31 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	3.0	Medium stiff brown & gray clay w/clayey silt pockets		
2	5.0	5.5	3.0	7.0	Very loose gray & tan silty sand w/clay pockets, lenses & shell fragments		
3	8.0	8.5	7.0	10.0	Very soft gray & tan clay w/many sand layers & pockets		
4	11.0	11.5	10.0	14.0	Loose tan sand w/clay layers & shell fragments		
5	14.0	14.5	14.0	17.0	Medium stiff gray clay w/organic matter, roots, & sand pockets		
6	18.5	20.0	17.0	21.0	Medium dense tan & gray sand w/wood, clay & silt	6	26
7	23.5	25.0	21.0	28.0	Dense gray sand w/shell fragments	10	42
8	28.5	30.0	28.0		Very dense gray sand w/shell fragments	12	50=8"
9	33.5	35.0		38.0	Ditto	10	50=9"
10	38.5	40.0	38.0	43.0	Medium dense gray sand w/shell fragments	7	29
11	43.5	45.0	43.0	48.0	Very dense gray sand w/shell fragments	10	50=10"
12	48.5	50.0	48.0	50.0	Medium dense gray sand w/shell fragments	10	18



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. 656+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 15

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

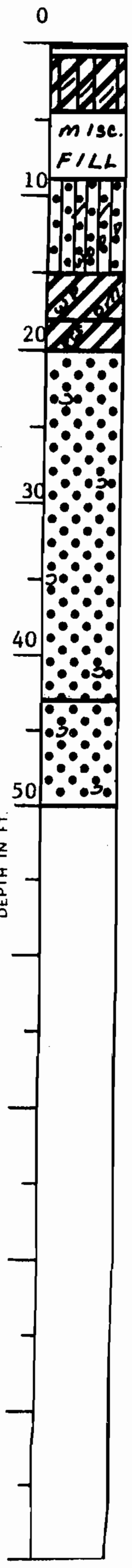
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 11 Soil Technician A. J. Mayeux Date 25 May 1981

Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.3	Asphalt		
			0.3	.75	Fill		
1	2.0	2.5	.75	4.5	Stiff gray & tan silty clay w/clay		
					layers		
	5.0	5.5	4.5		Miscellaneous fill (Bricks, glass, sand,		
					clay & etc.)		
2	8.0	8.5		9.0	Ditto		
3	9.0	10.5	9.0		Loose tan silty sand w/some clay	2	4
4	11.5	13.0		15.0	Loose tan silty sand w/some wood	1	4
5	15.0	16.5	15.0	18.0	Soft gray clay w/wood & organic matter	1	4
6	19.0	19.5	18.0	20.0	Medium stiff gray & tan clay w/roots		
7	20.0	21.5	20.0		Very dense gray sand w/shell fragments	10	50=10"
8	23.5	25.0			Ditto	11	50=8"
9	28.5	30.0			Ditto	11	50=8"
10	33.5	35.0			Ditto	12	50=8"
11	38.5	40.0		43.0	Ditto	13	50=8"
12	43.5	45.0	43.0		Dense gray sand w/shell fragments	9	33
13	48.5	50.0		50.0	Ditto	7	32



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

CLAY SILT SAND HUMUS

Remarks: Boring located on Westside of canal @ Sta. No. 652+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 16

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

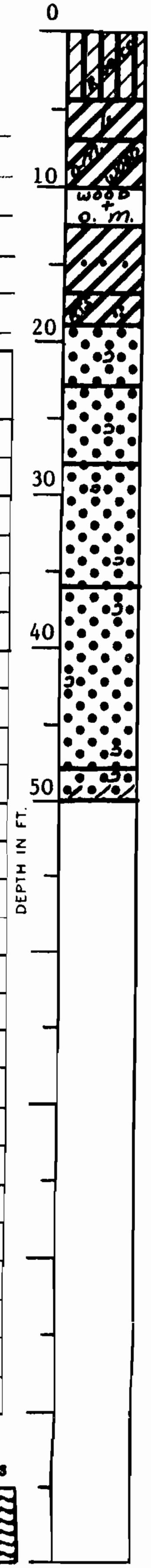
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 12 Soil Technician A. J. Mayeux Date 22 June 1981

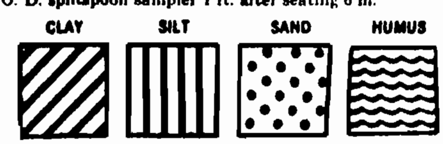
Ground Elev. 30.5 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	3.0	0.0	4.5	Medium compact brown clayey silt w/roots		
2	5.0	6.0	4.5	7.0	Soft gray & tan clay w/silty sand		
					pockets		
3	8.0	9.0	7.0	10.0	Soft dark gray clay w/organic matter &		
					wood		
			10.0	12.5	Wood & organic matter w/clay		
4	14.0	15.0	12.5	17.0	Very soft gray clay w/sand layers		
5	18.0	19.0	17.0	19.0	Very soft gray & tan clay w/roots &		
					sand pockets		
6	20.0	21.5	19.0	23.0	Medium dense gray sand w/shell fragments	5	13
7	23.5	25.0	23.0	28.0	Dense gray sand w/shell fragments	10	36
8	28.5	30.0	28.0		Very dense gray sand w/shell fragments	15	50=8"
9	33.5	35.0		36.0	Ditto	12	50=10"
10	38.5	40.0	36.0		Medium dense gray sand w/shell fragments	7	23
11	43.5	45.0		48.0	Ditto	5	22
12	48.5	50.0	48.0	50.0	Loose gray sand w/shell fragments &	2	9
					clay layers		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 652+50 in crown of levee.

Fig. 17

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

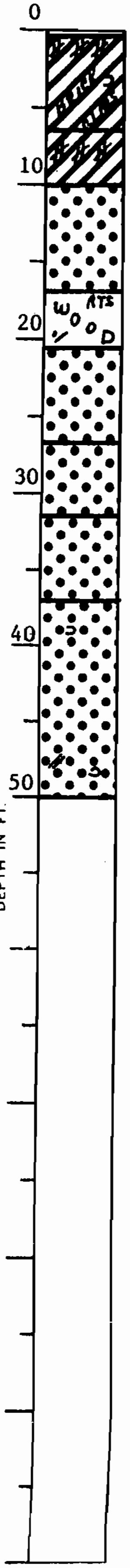
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 13 Soil Technician R. Courtiade Date 25 May 1981

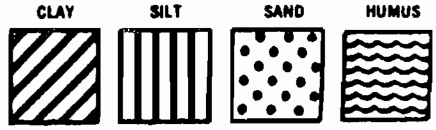
Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.3	Asphalt		
1	2.0	2.5	0.3		Stiff gray & tan clay w/clayey silt		
					layers, brick & shell fragments		
2	5.0	5.5		6.5	Stiff gray & tan clay w/shell & brick		
					fragments & glass		
3	8.0	8.5	6.5	10.0	Stiff gray & tan clay w/clayey silt		
					lenses		
4	10.5	11.0	10.0		Loose tan sand		
5	12.0	13.5			Ditto	2	5
6	14.5	16.0		17.0	Ditto	2	7
7	17.0	18.5	17.0		Wood	3	13
8	19.5	20.0		20.5	Wood w/large roots & sandy clay		
9	21.0	22.5	20.5		Very dense gray sand	5	50=7"
10	23.5	25.0		26.5	Ditto	31	20=2"
11	28.5	30.0	26.5	31.5	Dense gray sand	12	48
12	33.5	35.0	31.5	37.0	Very dense gray sand	52=12"(Seat)	
13	38.5	40.0	37.0		Dense gray sand w/shell fragments	12	32
14	43.5	44.0			Dense gray sand	13	35
15	48.5	50.0		50.0	Dense gray sand w/clay pockets & shell	17	45
					fragments		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 649+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 18

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE. LA.

Name of Project: Sewerage & Water Board of New Orleans

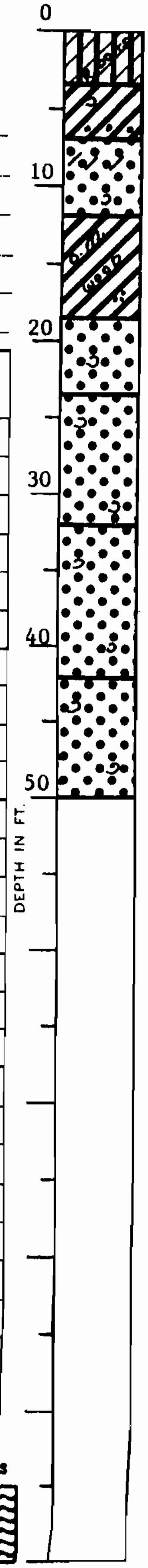
Metairie Relief Canal, Station 554+00 to Station 670+00

Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 14 Soil Technician A. J. Mayeux Date 23 June 1981

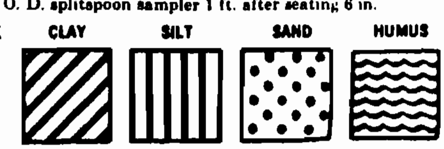
Ground Elev. 31 (Est.) Datum Cairo Gr. Water Depth See Text



Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	3.5	Medium compact gray & brown clayey		
					silt w/roots		
2	5.0	5.5	3.5	7.0	Medium stiff gray & brown clay w/shell		
					fragments & sand layers		
3	8.0	8.5	7.0		Loose gray & tan sand w/clay layers &		
					shell fragments		
4	11.0	11.5		12.0	Ditto		
5	14.0	14.5	12.0	18.5	Very soft gray clay w/organic matter,		
					wood & sand pockets		
6	18.5	20.0	18.5	23.5	Dense gray sand w/shell fragments	8	35
7	23.5	25.0	23.5		Very dense gray sand w/shell fragments	15	50=9"
8	28.5	30.0		32.0	Ditto	15	50=9"
9	33.5	35.0	32.0		Dense gray sand w/shell fragments	8	43
10	38.5	40.0		42.0	Ditto	8	31
11	43.5	45.0	42.0		Medium dense gray sand w/shell	5	22
					fragments		
12	48.5	50.0		50.0	Ditto	8	21

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. No. 649+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

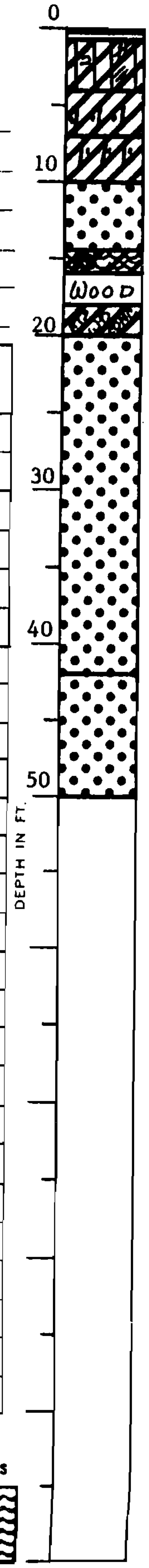
Fig. 19

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

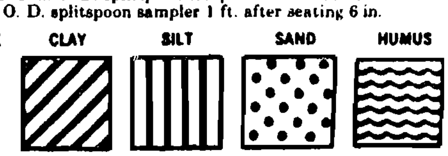
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana
Boring No. 15 Soil Technician George Hardee Date 29 May 1981
Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.2	Asphalt w/shells		
			0.2	0.6	Loose tan silty sand		
1	1.5	2.5	0.6	4.0	Medium stiff brown silty clay w/shells,		
					clayey silt & clay pockets		
2	4.5	5.5	4.0	7.0	Medium stiff gray & brown clay w/sandy		
					silt layers		
3	7.5	8.5	7.0	10.0	Stiff gray & brown clay w/silty sand		
					lenses		
4	11.0	11.5	10.0		Loose tan & gray sand		
5	11.5	13.0		14.5	Ditto	2	6
6	14.0	15.5	14.5	16.0	Medium stiff dark gray organic clay	2	4
					w/roots & humus pockets		
			16.0	18.0	Wood		
7	19.5	20.0	18.0	20.0	Medium stiff gray clay w/roots, wood &		
					concretions		
8	20.0	21.5	20.0		Very dense gray sand	11	50=10"
9	22.5	24.0			Ditto	14	50=11"
10	25.5	27.0			Ditto	27	50=7"
11	28.5	30.0			Ditto	14	50=11"
12	33.5	35.0			Ditto	20	50=7"
13	38.5	40.0		42.0	Ditto	15	50=10"
14	43.5	45.0	42.0		Dense gray sand	12	35
15	48.5	50.0		50.0	Ditto	12	38



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 645+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 20

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

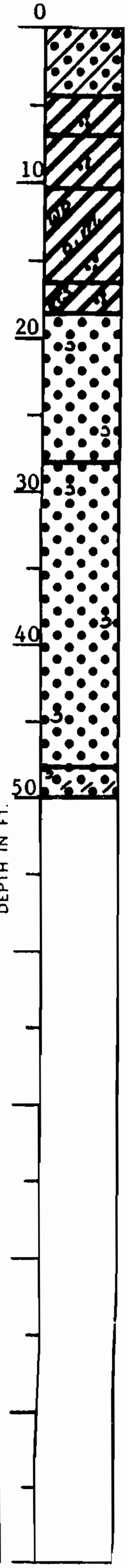
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 16 Soil Technician A. J. Mayeux Date 23 June 1981

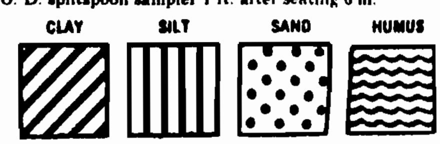
Ground Elev. 30 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	4.5	Compact brown & gray clayey sand with		
					trace of asphalt		
2	5.0	5.5	4.5	7.0	Soft brown & gray clay w/sand pockets		
3	8.0	8.5	7.0	10.5	Medium stiff dark gray clay w/sand		
					pockets		
4	11.0	11.5	10.5		Medium stiff gray clay w/wood, organic		
					matter & sand pockets		
5	14.0	14.5		16.5	Ditto		
6	17.0	17.5	16.5	18.5	Soft gray clay w/roots & sand pockets		
7	18.5	20.0	18.5		Very dense gray sand w/shell fragments	14	50=9"
8	23.5	25.0		28.0	Ditto	15	50=9"
9	28.5	30.0	28.0		Dense gray sand w/shell fragments	10	40
10	33.5	35.0			Ditto	14	42
11	38.5	40.0			Ditto	15	47
12	43.5	45.0		48.0	Ditto	14	43
13	48.5	50.0	48.0	50.0	Loose gray sand w/shell fragments &	2	9
					clay layers		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta.
No. 645+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 21

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

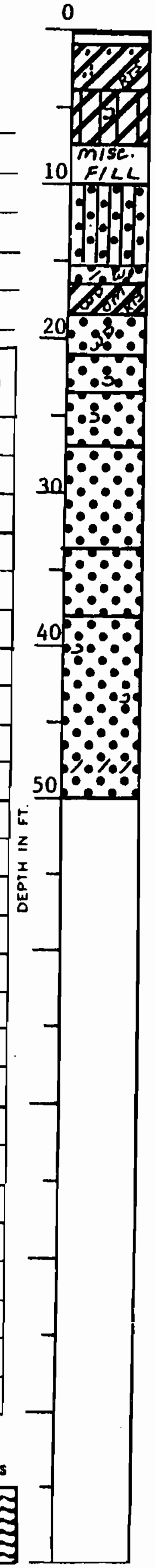
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 17 Soil Technician A. J. Mayeux Date 26 May 1981

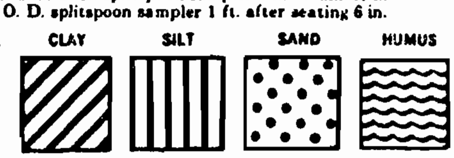
Ground Elev. 31 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.3	Asphalt		
			0.3	1.0	Fill		
1	2.0	2.5	1.0	4.0	Medium stiff gray & tan clay w/sand		
					lenses, pockets & roots		
2	5.0	5.5	4.0	7.5	Stiff gray & tan silty clay w/shell		
					fragments		
3	8.0	8.5	7.5	10.0	Miscellaneous fill (clay, sandy clay,		
					sand, gravel, bricks & etc.)		
4	11.5	13.0	10.0	15.5	Loose tan silty sand	2	5
5	15.0	16.5	15.5	16.5	Loose tan sand w/clay & wood	2	4
6	17.5	18.0	16.5	18.5	Medium stiff gray clay w/wood, organic		
					matter & roots		
7	18.5	20.0	18.5	21.0	Medium dense gray sand w/wood	3	19
8	21.0	22.5	21.0	23.5	Dense gray sand w/shell fragments	8	37
9	23.5	25.0	23.5	27.0	Very dense gray sand w/shell fragments	10	50=8"
10	28.5	30.0	27.0	33.5	Dense gray sand	5	42
11	33.5	35.0	33.5	38.0	Very dense gray sand	7	50=8"
12	38.5	40.0	38.0		Medium dense gray sand w/shell	5	12
					fragments & clay layers		
13	43.5	45.0			Ditto	6	17
14	48.5	50.0		50.0	Ditto	7	22



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 642+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 22

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

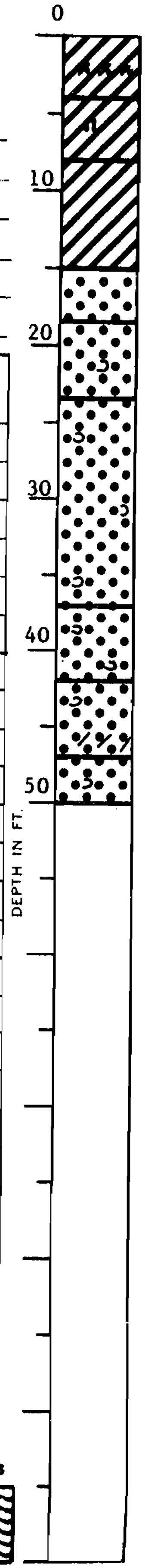
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 18 Soil Technician A. J. Mayeux Date 2 July 1981

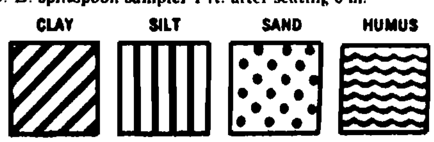
Ground Elev. 30 (Est.) Datum Cairo Gr. Water Depth 2 July 1981

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	4.0	Soft dark gray clay w/clayey sand layers		
2	5.0	5.5	4.0	8.0	Soft gray & tan clay w/sand pockets		
3	8.0	8.5	8.0		Soft gray clay		
4	11.0	11.5			Ditto		
5	14.0	14.5		15.0	Ditto		
6	15.0	16.5	15.0	18.5	Loose gray sand	2	6
7	18.5	20.0	18.5	23.5	Dense gray sand w/shell fragments	10	38
8	23.5	25.0	23.5		Very dense gray sand w/shell fragments	18	50=8"
9	28.5	30.0			Ditto	18	50=8"
10	33.5	35.0		37.0	Ditto	16	50=8"
11	38.5	40.0	37.0	42.0	Medium dense gray sand w/shell fragments	10	26
12	43.5	45.0	42.0	47.0	Loose gray sand w/shell fragments & clay layers	4	9
13	48.5	50.0	47.0	50.0	Medium dense gray sand w/shell fragments	8	27



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 642+00 in crown of levee.

Fig. 23

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

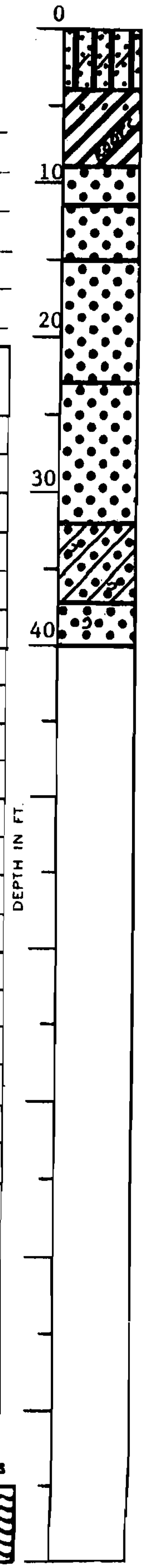
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 19 Soil Technician A. J. Mayeux Date 26 May 1981

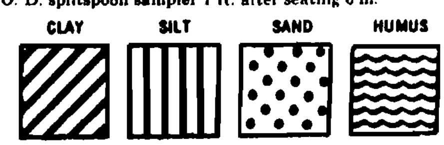
Ground Elev. 20 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	4.0	Compact brown & gray sandy silt w/clay layers		
2	5.0	5.5	4.0	9.0	Medium stiff gray & tan clay w/sand lenses & roots		
3	9.0	10.5	9.0	11.5	Medium dense gray sand	4	16
4	11.5	13.0	11.5	15.0	Dense gray sand	6	36
5	15.0	16.5	15.0		Medium dense gray sand	6	28
6	18.5	20.0		23.0	Ditto	5	15
7	23.5	25.0	23.0		Very dense gray sand	10	50=8"
8	28.5	30.0		32.0	Ditto	10	50=8"
9	33.5	35.0	32.0	37.0	Loose gray clayey sand w/shell fragments	2	5
10	38.5	40.0	37.0	40.0	Medium dense gray sand w/shell fragments	6	24



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal @ Sta. No. 638+50 near toe of levee.

Fig. 24

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

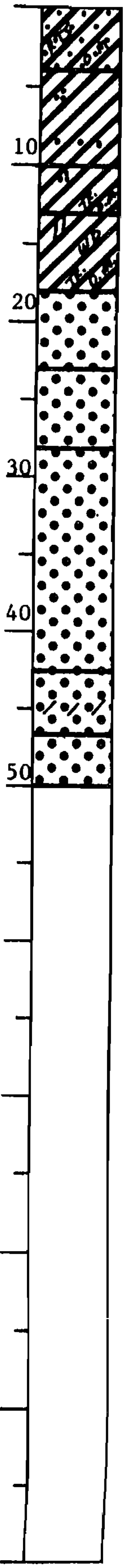
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 20 Soil Technician A. J. Mayeux Date 6 July 1981

Ground Elev. 30 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	3.0	0.0	4.0	Stiff brown & gray sandy clay w/roots		
					& organic matter		
2	5.0	6.0	4.0		Soft gray & tan clay w/sand pockets &		
					layers		
3	8.0	9.0		10.0	Ditto		
4	11.0	12.0	10.0	13.0	Soft dark gray clay w/many sand pockets		
					& trace of organic matter		
5	14.0	15.0	13.0	18.0	Very soft gray clay w/silt pockets,		
					wood & trace of organic matter		
6	18.5	20.0	18.0	23.0	Dense gray sand	6	38
7	23.5	25.0	23.0	28.0	Very dense gray sand	18	50=8"
8	28.5	30.0	28.0		Dense gray sand	10	39
9	33.5	35.0			Ditto	15	48
10	38.5	40.0		42.5	Ditto	16	43
11	43.5	45.0	42.5	46.5	Loose gray sand w/clay layers	2	7
12	48.5	50.0	46.5	50.0	Dense gray sand	6	32

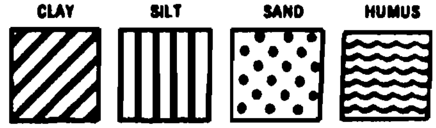
0
10
20
30
40
50



DEPTH IN FT.

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. No. 638+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 25

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

Orleans and Jefferson Parishes, Louisiana

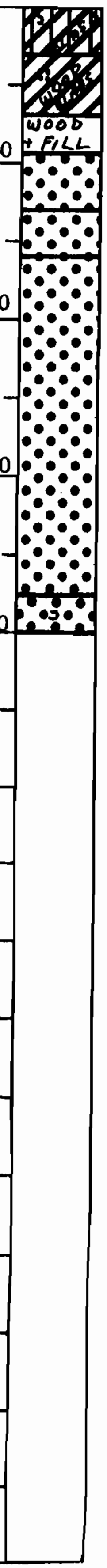
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 21 Soil Technician A. J. Mayeux Date 26 May 1981

Ground Elev. 21 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	3.0	Hard tan & gray silty clay w/shells & glass		
2	5.0	5.5	3.0	7.0	Hard tan & gray clay w/sand pockets, wood & glass		
			7.0	9.5	Wood & fill (clay, sand & organic matter)		
3	10.5	12.0	9.5	13.0	Medium dense gray sand	5	25
4	13.5	15.0	13.0	16.0	Dense gray sand	11	33
5	18.5	20.0	16.0		Medium dense gray sand	3	18
6	23.5	25.0			Ditto	6	30
7	28.5	30.0			Ditto	5	25
8	33.5	35.0		37.5	Ditto	4	16
9	38.5	40.0	37.5	40.0	Very dense gray sand w/shell fragments	10	50=10"

0
10
20
30
40

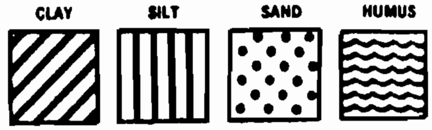


DEPTH IN FT.

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

CLAY SILT SAND HUMUS



Remarks: Boring located on Westside of canal @ Sta. No. 635+00 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 26

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

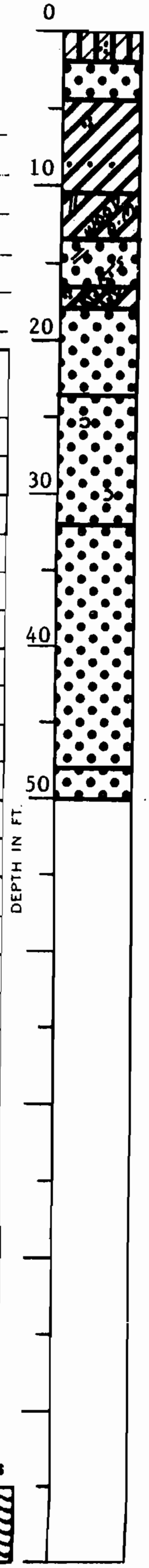
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 22 Soil Technician A. J. Mayeux Date 6 July 1981

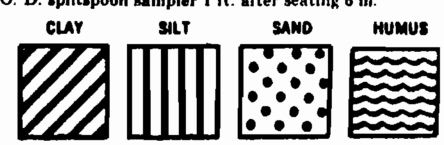
Ground Elev. 29 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	2.0	Very compact tan clayey silt w/sand		
					pockets		
			2.0	4.5	Medium dense tan sand		
1	5.0	5.5	4.5		Medium stiff gray & tan clay w/sand		
					pockets & layers		
2	8.0	8.5		10.5	Ditto		
3	11.0	11.5	10.5	13.5	Soft gray clay w/silt pockets, wood &		
					organic matter		
4	14.0	14.5	13.5	16.5	Very loose gray sand w/clay pockets &		
					roots		
5	17.0	17.5	16.5	18.0	Very soft gray clay w/roots, wood &		
					sand pockets		
6	18.5	20.0	18.0	23.5	Dense gray sand	10	35
7	23.5	25.0	23.5		Very dense gray sand w/shell fragments	15	50=8"
8	28.5	30.0		32.0	Ditto	15	50=10"
9	33.5	35.0	32.0		Dense gray sand	10	41
10	38.5	40.0			Ditto	6	30
11	43.5	45.0		48.5	Ditto	7	39
12	48.5	50.0	48.5	50.0	Very dense gray sand	10	50=8"



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. No. 635+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 27

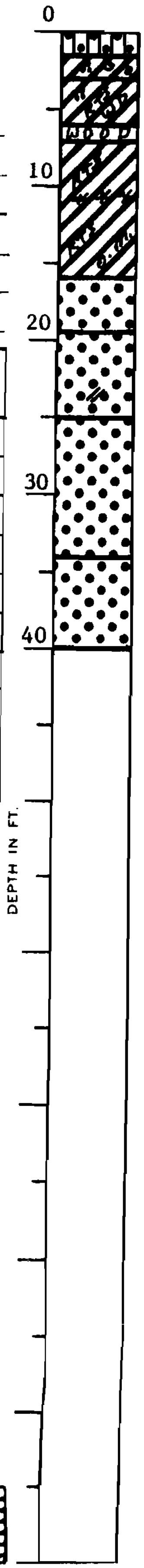
LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

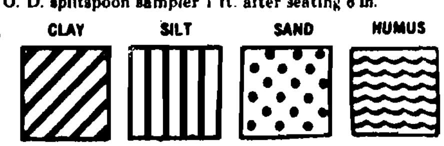
Boring No. 23 Soil Technician George Hardee Date 29 May 1981
Ground Elev. 23 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	1.5	Medium dense tan silty sand		
1	1.0	2.5	1.5	3.0	Very stiff tan & gray clay w/sand	8	16
					pockets, shells & gravel		
2	5.5	6.0	3.0	6.0	Medium stiff gray & tan clay w/sand		
					pockets, roots & wood		
			6.0	7.0	Wood		
3	7.5	8.5	7.0		Very soft gray clay w/roots & organic		
					clay layers		
4	10.5	11.5		16.0	Very soft gray clay w/roots & organic		
					matter		
5	17.0	18.5	16.0	19.5	Loose gray sand	2	5
6	19.0	20.5	19.5		Medium dense gray sand	4	21
7	21.5	23.0		25.0	Medium dense gray sand w/clay pockets	6	24
8	25.0	26.5	25.0		Dense gray sand	10	32
9	28.5	30.0		34.0	Ditto	12	42
10	33.5	35.0	34.0		Very dense gray sand	12	50=11"
11	38.5	40.0		40.0	Very dense gray sand	19	50=9"



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 631+50 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 28

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

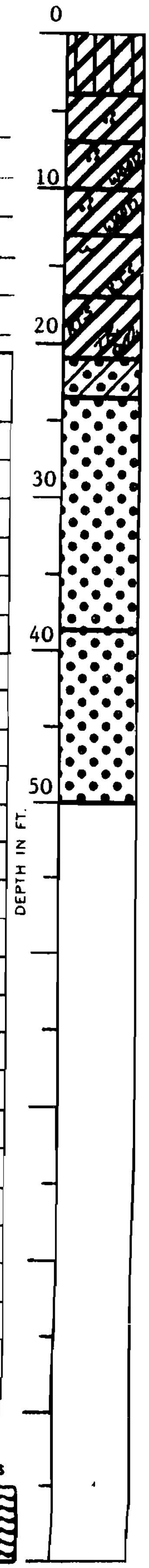
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 24 Soil Technician A. J. Mayeux Date 7 July 1981

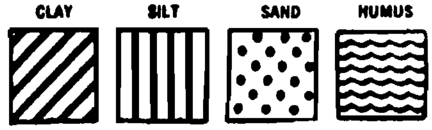
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	4.0	Stiff brown silty clay		
2	5.0	5.5	4.0	7.0	Medium stiff dark gray clay w/sand		
					pockets		
3	8.0	8.5	7.0	10.0	Soft dark gray clay w/sand pockets		
					& wood		
4	11.0	11.5	10.0	13.0	Very soft dark gray clay w/sand		
					pockets & wood		
5	14.0	14.5	13.0	17.0	Soft gray clay w/humus pockets & roots		
6	19.0	19.5	17.0	21.0	Soft gray clay w/roots & trace of		
					organic matter		
7	21.0	22.5	21.0	23.5	Loose gray clayey sand	2	5
8	23.5	25.0	23.5		Medium dense gray sand	3	14
9	28.5	30.0			Ditto	7	22
10	33.5	35.0		38.5	Ditto	7	24
11	38.5	40.0	38.5		Dense gray sand	9	39
12	43.5	45.0			Ditto	10	46
13	48.5	50.0		50.0	Ditto	12	35



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. No. 631+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 29

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

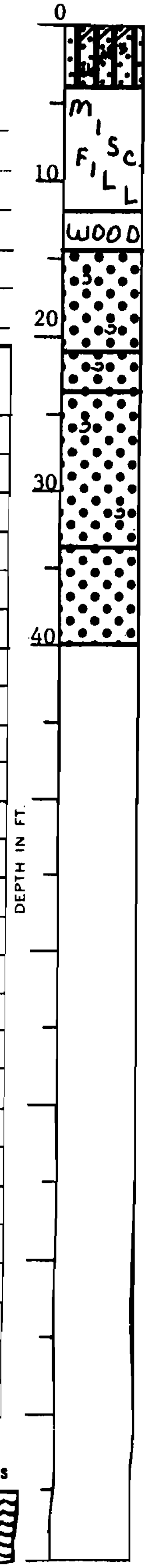
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 25 Soil Technician A. J. Mayeux Date 27 May 1981

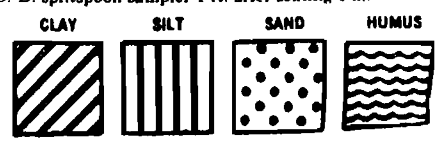
Ground Elev. 23 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	4.0	Very compact gray & tan sandy silt		
					w/clay layers & glass		
2	5.5	7.0	4.0		Miscellaneous fill (clay,sand, silty		
					clay, wood, glass & etc.)		
3	9.5	10.0		12.0	Ditto		
			12.0	14.5	Wood w/fill & clay		
4	14.5	15.0	14.5		Very loose gray sand w/shell fragments		
5	18.5	20.0		21.0	Ditto	1	4
6	21.0	22.5	21.0	23.5	Loose gray sand w/shell fragments	1	8
7	23.5	25.0	23.5		Medium dense gray sand w/shell	3	15
					fragments		
8	28.5	30.0		33.5	Ditto	3	15
9	33.5	35.0	33.5		Very dense gray sand	10	50=10"
10	38.5	40.0		40.0	Ditto	15	50=8"



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal @ Sta. No. 628+00 near toe of levee.

Fig. 30

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

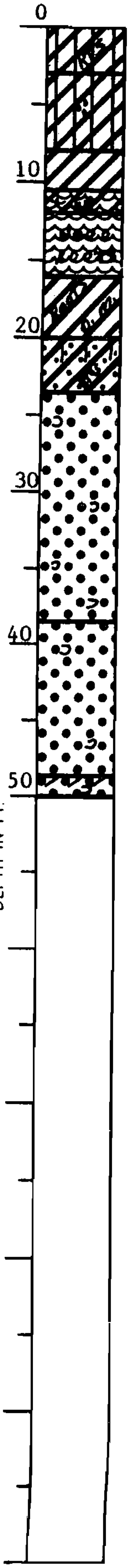
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 26 Soil Technician A. J. Mayeux Date 7 July 1981

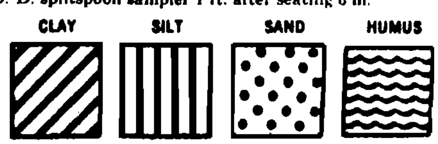
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	3.0	Medium stiff gray & brown silty clay		
					w/roots		
2	5.0	5.5	3.0	8.0	Medium stiff gray & tan silty clay		
					w/sand pockets		
3	8.0	8.5	8.0	10.5	Soft gray & tan clay		
4	11.0	11.5	10.5	12.0	Soft dark gray organic clay w/humus		
					pockets & wood		
5	14.0	14.5	12.0	16.0	Soft dark gray humus w/wood & roots		
6	19.0	19.5	16.0	20.0	Soft gray clay w/roots & organic		
					matter		
7	22.0	22.5	20.0	23.5	Very soft gray sandy clay w/silty sand		
					layers & roots		
8	23.5	25.0	23.5		Medium dense gray sand w/shell	5	19
					fragments		
9	28.5	30.0			Ditto	4	21
10	33.5	35.0		38.5	Ditto	5	17
11	38.5	40.0	38.5		Dense gray sand w/shell fragments	8	34
12	43.5	45.0		48.5	Ditto	8	40
13	48.5	50.0	48.5	50.0	Loose gray sand w/clay layers & shell		
					fragments		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. No. 628+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 31

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

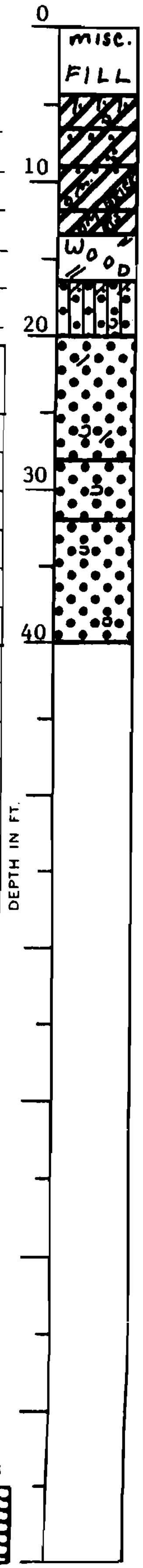
Metairie Relief Canal, Station 554+00 to Station 670+00

Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 27 Soil Technician Robert Waldron Date 14 May 1981

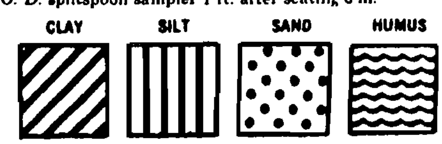
Ground Elev. 24 (Est.) Datum Cairo Gr. Water Depth See Text



Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	4.5	Loose miscellaneous fill (Sand,		
					shells, brick & roots)		
2	5.0	5.5	4.5	6.5	Very stiff tan & gray clay w/silty sand		
					lenses & shell fragments		
3	8.0	8.5	6.5	9.0	Soft gray clay w/sand layers & pockets		
4	11.0	11.5	9.0	12.0	Soft dark gray clay w/sand layers,		
					organic matter & brick fragments		
5	13.0	13.5	12.0	13.5	Soft gray clay w/organic matter & roots		
			13.5	16.5	Wood w/some clay		
6	19.0	19.5	16.5	20.0	Loose gray silty sand w/clayey sand		
					layers & trace of shells		
7	23.5	25.0	20.0		Medium dense gray sand w/trace of clay	3	17
8	26.0	27.5		28.0	Medium dense gray sand w/trace of clay,	6	24
					& shell fragments		
9	28.5	30.0	28.0	32.0	Dense gray sand w/shell fragments	9	33
10	32.0	33.5	32.0		Very dense gray sand w/shell fragments	13	50=10"
11	35.0	36.5			Ditto	13	50=10"
12	38.5	40.0		40.0	Ditto	15	50=9"

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal @ Sta. No. 624+50 near toe of levee.

Fig. 32

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

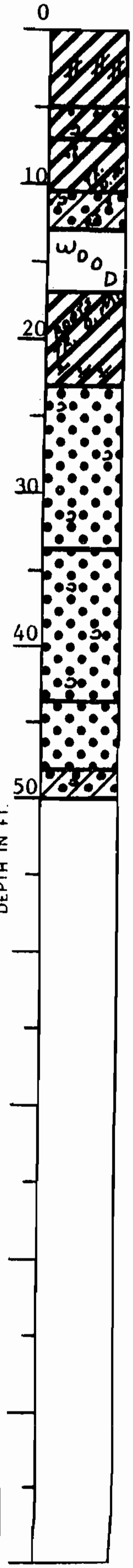
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 28 Soil Technician A. J. Mayeux Date 8 July 1981

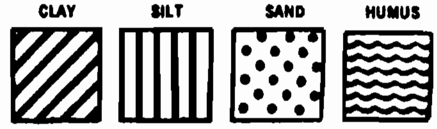
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	3.0	0.0	5.0	Very stiff brown clay w/many clayey		
					silt lenses		
2	5.0	6.0	5.0	7.0	Stiff gray & brown clay w/sand layers,		
					trace of shells & roots		
3	8.0	9.0	7.0	10.5	Soft gray & tan clay w/sand pockets &		
					trace of organic matter		
4	11.0	12.0	10.5	13.0	Very loose gray clayey sand w/shell		
					fragments & roots		
			13.0	17.0	Wood w/humus, organic matter & clay		
5	18.0	19.0	17.0	23.0	Soft gray clay w/roots, trace of		
					organic matter & sandy clay layers		
6	23.5	25.0	23.0		Medium dense gray sand w/shell	8	22
					fragments		
7	28.5	30.0		33.5	Ditto	3	16
8	33.5	35.0	33.5		Dense gray sand w/shell fragments	6	35
9	38.5	40.0		43.5	Ditto	8	36
10	43.5	45.0	43.5	48.0	Very dense gray sand	13	50=10"
11	48.5	50.0	48.0	50.0	Loose gray clayey sand w/shell	2	5
					fragments		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. No.624+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 33

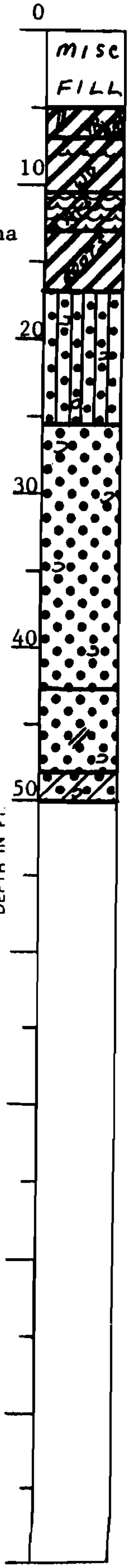
LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

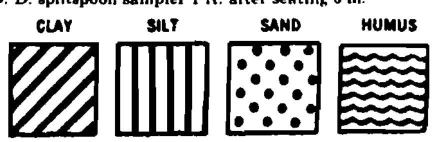
Boring No. 29 Soil Technician Robert Waldron Date 14 May 1981
Ground Elev. 21 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	5.0	Medium compact gray miscellaneous fill		
					(Sand, shells & roots)		
2	5.0	5.5	5.0	7.0	Very stiff gray & tan clay w/silt		
					pockets & trace of organic matter		
3	8.0	8.5	7.0	10.5	Medium stiff gray clay w/humus layers		
					& wood		
4	11.0	11.5	10.5	13.0	Very soft gray organic clay w/roots		
5	14.0	14.5	13.0	17.0	Very soft gray clay w/roots		
6	18.5	19.0	17.0		Very loose gray silty sand w/shell		
					fragments		
7	22.5	23.0			Ditto		
8	23.5	25.0		25.5	Ditto	2	6
9	26.0	27.5	25.5		Very dense gray sand w/shell fragments	10	50=10"
10	28.5	30.0			Very dense gray sand	13	50
11	33.5	35.0			Very dense gray sand w/shell fragments	11	50
12	38.5	40.0		42.5	Very dense gray sand	23	50=8"
13	43.5	45.0	42.5	48.0	Medium dense gray sand w/clay pockets		
					& shell fragments		
14	48.5	49.0	48.0	50.0	Medium dense gray clayey sand w/shell		
					fragments		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal @ Sta. No. 621+00 near toe of levee.

Fig. 34

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

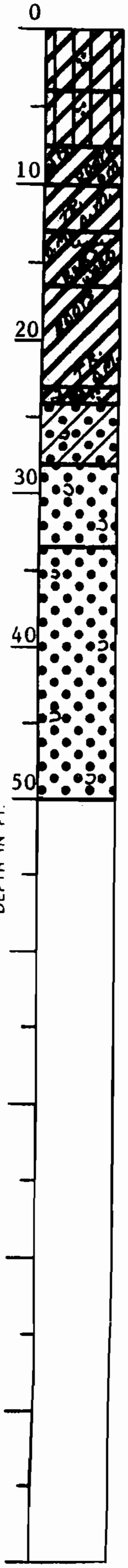
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 30 Soil Technician A. J. Mayeux Date 8 July 1981

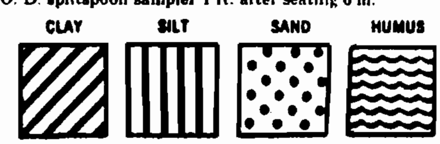
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	4.0	Medium stiff gray & brown silty clay		
					w/sand pockets		
2	5.0	5.5	4.0	7.5	Very soft gray & brown silty clay		
					w/sand pockets		
3	8.0	8.5	7.5	10.0	Soft gray clay w/wood, roots &		
					organic matter		
4	11.0	11.5	10.0	13.0	Very soft dark gray clay w/trace of		
					organic matter		
5	14.0	14.5	13.0	16.5	Extremely soft gray clay w/organic		
					matter, humus, roots & wood		
6	19.0	19.5	16.5	23.0	Soft gray clay w/roots & trace of		
					organic matter		
7	23.0	23.5	23.0	24.0	Very soft gray clay w/shell fragments,		
					sand pockets & roots		
8	24.5	26.0	24.0	28.0	Loose gray clayey sand w/shell	2	6
					fragments		
9	28.5	30.0	28.0	33.5	Medium dense gray sand w/shell	4	16
					fragments		
10	33.5	35.0	33.5		Dense gray sand w/shell fragments	6	32
11	38.5	40.0			Ditto	10	40
12	43.5	45.0			Ditto	7	40
13	48.5	50.0		50.0	Ditto	8	37



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta.
No. 621+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 35

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

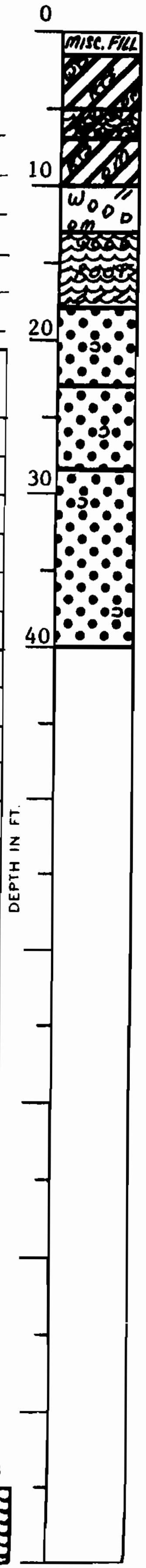
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 31 Soil Technician A. J. Mayeux Date 12 June 1981

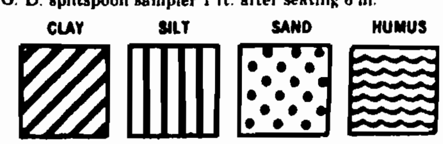
Ground Elev. 22 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	1.5	Miscellaneous fill		
1	2.0	3.0	1.5	5.0	Very stiff gray & brown clay w/wood,		
					roots & organic matter		
2	5.0	6.0	5.0	7.0	Medium stiff dark gray, black & brown		
					organic clay w/humus layers, roots &		
					wood		
3	8.0	9.0	7.0	10.0	Very soft gray clay w/roots & organic		
					matter		
			10.0	13.0	Wood w/clay & organic matter		
4	14.0	15.0	13.0	18.0	Very soft dark brown & gray humus with		
					wood, roots & clay layers		
5	18.5	20.0	18.0	23.0	Loose gray sand w/shell fragments	2	5
6	23.5	25.0	23.0	28.5	Medium dense gray sand w/shell fragments	3	15
7	28.5	30.0	28.5		Very dense gray sand w/shell fragments	12	50=9"
8	33.5	35.0			Ditto	12	50=9"
9	38.5	40.0		40.0	Ditto	13	50=9"



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 617+50 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 36

LOG OF BORING

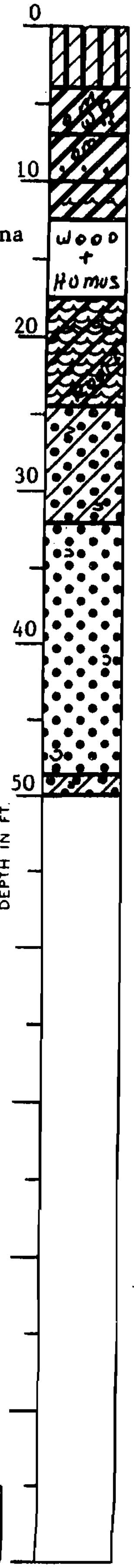
EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 32 Soil Technician S. Porta Date 9 July 1981

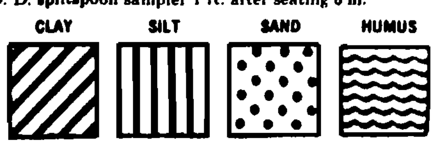
Ground Elev. 27.5 (Est.) Datum Cairo Gr. Water Depth See Text



Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	4.0	Very compact tan & gray clayey silt		
2	5.0	5.5	4.0	7.0	Medium stiff brown & gray clay with		
					organic matter, wood & sand pockets		
3	8.5	9.0	7.0	10.0	Soft gray clay w/organic matter & sand		
					lenses		
4	11.5	12.0	10.0	12.5	Medium stiff gray clay w/humus layers		
	12.5	17.5	12.5	17.5	Wood & humus		
5	19.5	20.0	17.5	24.5	Soft dark gray organic clay w/humus &		
					roots		
6	24.5	25.0	24.5		Loose gray clayey sand w/shell fragments		
7	25.0	26.5			Ditto	1	4
8	28.5	30.0		32.0	Ditto	1	8
9	33.5	35.0	32.0		Very dense gray sand w/shell fragments	9	50
10	38.5	40.0			Ditto	11	50=9"
11	43.5	45.0		48.5	Ditto	15	50=7"
12	48.5	50.0	48.5	50.0	Loose gray clayey sand w/shell fragments	4	6

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal
@ Sta. No. 617+50 in crown of levee.

Fig. 37

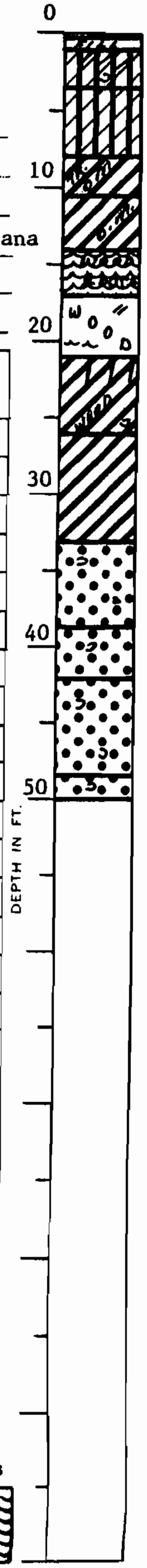
LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

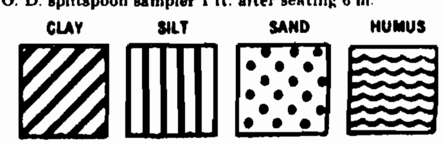
Boring No. 33 Soil Technician A. J. Mayeux Date 27 May 1981
Ground Elev. 30 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.3	Asphalt		
			0.3	1.0	Fill		
1	2.0	2.5	1.0	3.5	Medium compact gray & brown clayey silt		
					w/clay layers & shells		
2	5.0	5.5	3.5	8.0	Very compact brown & gray clayey silt		
3	8.0	8.5	8.0	10.5	Medium stiff gray clay w/trace of		
					organic matter		
4	11.0	11.5	10.5	14.0	Soft gray clay w/organic matter		
5	14.0	14.5	14.0	17.0	Medium stiff dark gray humus w/wood &		
					roots		
			17.0	21.0	Wood w/humus & clay		
6	24.0	24.5	21.0	26.0	Soft gray clay w/silt lenses, wood &		
					shell fragments		
7	29.0	29.5	26.0		Soft gray clay		
8	32.0	32.5		33.0	Ditto		
9	34.0	35.5	33.0		Medium dense gray sand w/shell fragments	5	16
10	36.0	37.5		38.5	Ditto	6	17
11	38.5	40.0	38.5	42.0	Dense gray sand w/shell fragments	10	39
12	43.5	45.0	42.0	48.5	Medium dense gray sand w/shell fragments	6	21
13	48.5	50.0	48.5	50.0	Loose gray sand w/shell fragments	2	9



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal
@ Sta. No. 614+00 in crown of levee.

Fig. 38

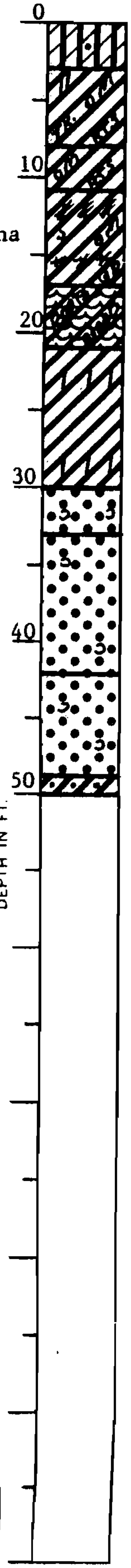
LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

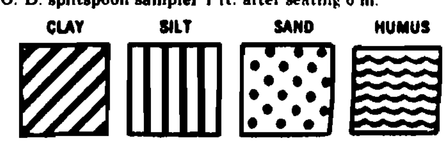
Boring No. 34 Soil Technician S. Porta Date 9 July 1981
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.5	3.0	0.0	3.0	Compact brown clayey silt w/trace of sand		
2	5.5	6.0	3.0	8.0	Soft gray & tan clay w/silt pockets, trace of organic matter & roots		
3	8.5	9.0	8.0	11.0	Soft gray clay w/organic matter & roots		
4	11.5	12.0	11.0		Soft gray clay w/silty clay layers, shells & organic matter		
5	14.5	15.0		17.0	Soft gray clay w/organic clay layers & wood		
6	19.5	20.0	17.0	21.0	Soft gray organic clay w/roots & wood		
7	24.5	25.0	21.0		Soft gray clay w/silt lenses		
8	29.5	30.0		30.0	Ditto		
9	30.0	31.5	30.0	33.0	Medium dense gray sand w/shell fragments	5	16
10	33.5	35.0	33.0		Dense gray sand w/shell fragments	8	32
11	38.5	40.0		42.0	Ditto	10	36
12	43.5	45.0	42.0	48.5	Medium dense gray sand w/shell fragments	5	16
13	48.5	50.0	48.5	50.0	Medium stiff gray clay w/sand layers	2	4



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 614+00 in crown of levee.

Fig. 39

LOG OF BORING

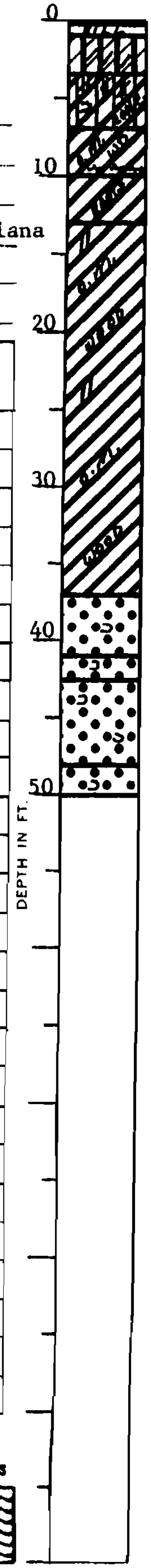
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 35 Soil Technician A. J. Mayeux Date 28 May 1981

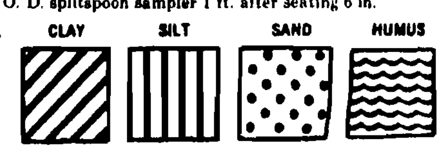
Ground Elev. 31 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.3	Asphalt		
			0.3	1.0	Fill		
1	2.0	2.5	1.0	3.5	Very compact brown clayey silt w/clay		
					layers		
2	5.0	5.5	3.5	7.0	Stiff brown & tan silty clay w/clayey		
					silt layers, shells & concretions		
3	8.0	8.5	7.0	10.0	Soft gray clay w/organic matter, humus		
					& wood		
4	11.0	11.5	10.0	13.0	Soft gray clay w/roots		
5	14.0	14.5	13.0		Soft gray clay w/silt pockets, organic		
					matter & wood		
6	19.0	19.5			Ditto		
7	24.0	24.5			Ditto		
8	29.0	29.5			Ditto		
9	34.0	34.5		37.0	Ditto		
10	38.5	40.0	37.0	41.0	Medium dense gray sand w/shell fragments	5	21
11	41.0	42.5	41.0	42.5	Dense gray sand w/shell fragments	8	41
12	43.5	45.0	42.5	48.0	Medium dense gray sand w/shell fragments	5	22
13	48.5	50.0	48.0	50.0	Loose gray sand w/shell fragments	2	4



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal
@ Sta. No. 610+50 in crown of levee.

Fig. 40

LOG OF BORING

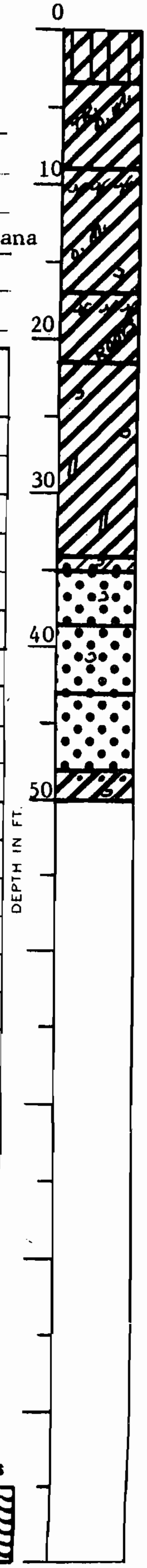
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 36 Soil Technician A. J. Mayeux Date 20 July 1981

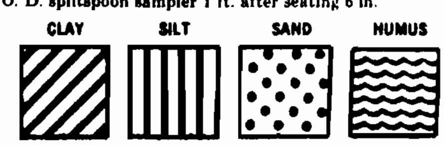
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	3.0	0.0	3.5	Hard tan silty clay		
2	5.0	6.0	3.5		Soft gray & tan clay w/trace of organic		
					matter		
3	8.0	9.0		9.0	Ditto		
4	11.0	12.0	9.0		Soft gray clay w/organic clay layers		
5	14.0	15.0		17.0	Soft gray clay w/organic matter & shell		
					fragments		
6	19.0	20.0	17.0	21.5	Very soft gray clay w/organic clay		
					layers & roots		
7	24.0	25.0	21.5		Soft gray clay w/shell fragments		
8	29.0	30.0		34.0	Soft gray clay w/silt pockets		
9	34.0	35.0	34.0	35.0	Loose gray clayey sand w/shell fragments		
10	35.0	36.5	35.0	38.5	Medium dense gray sand w/shell fragments	4	20
11	38.5	40.0	38.5	43.0	Dense gray sand w/shell fragments	8	33
12	43.5	45.0	43.0	48.0	Medium dense gray sand	8	12
13	48.5	50.0	48.0	50.0	Soft gray clay w/sand layers & shell	2	5
					fragments		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located Eastside of canal
@ Sta. No. 610+50 in crown of levee.

Fig. 41

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE. LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

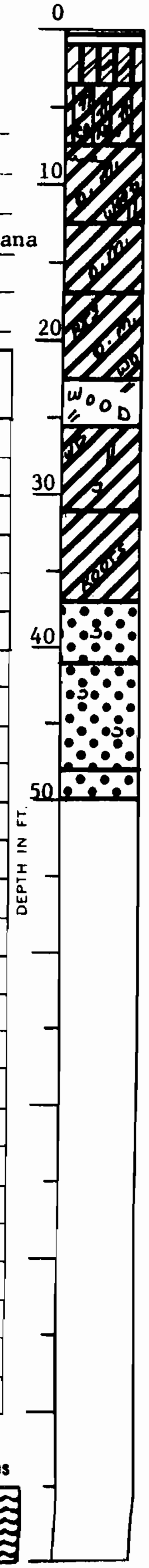
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 37 Soil Technician A. J. Mayeux Date 28 May 1981

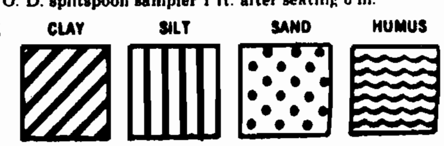
Ground Elev. 30 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.3	Asphalt		
			0.3	1.0	Fill		
1	2.0	2.5	1.0	3.5	Compact brown & tan clayey silt w/clay		
					layers		
2	5.0	5.5	3.5	7.5	Very stiff brown & gray silty clay		
					w/clayey silt layers & concretions		
3	8.0	8.5	7.5		Soft brown & gray clay w/humus, organic		
					matter, wood & silt pockets		
4	11.0	11.5		12.5	Ditto		
5	14.0	14.5	12.5	17.0	Soft gray clay w/organic matter		
6	19.0	19.5	17.0	22.5	Soft gray clay w/roots, organic matter		
					& wood		
			22.5	25.5	Wood w/clay		
7	29.0	29.5	25.5	31.0	Soft gray clay w/wood, silt pockets &		
					shell fragments		
8	34.0	34.5	31.0	37.0	Very soft gray clay w/roots		
9	38.5	40.0	37.0	41.0	Loose gray sand w/shell fragments	2	10
10	41.0	42.5	41.0		Dense gray sand w/shell fragments	7	33
11	43.5	45.0		48.0	Ditto	8	35
12	48.5	50.0	48.0	50.0	Loose gray sand	2	9



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



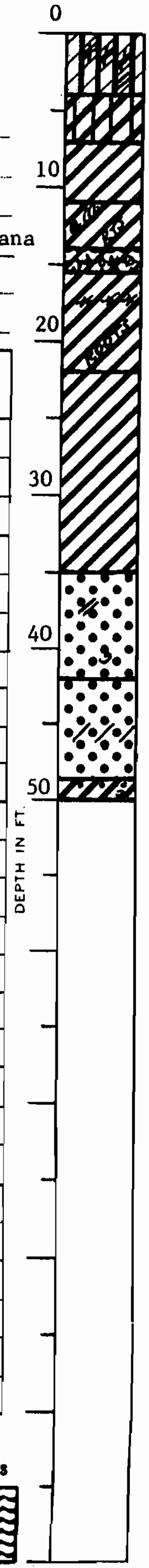
Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal @ Sta. No. 607+00 in crown of levee.

Fig. 42

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.



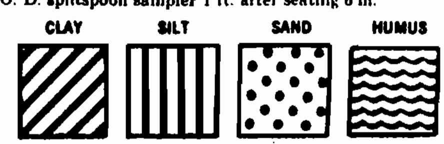
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 38 Soil Technician S. Porta Date 10 July 1981
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.5	3.0	0.0	4.0	Very compact gray clayey silt w/silty		
					clay layers & clay pockets		
2	5.5	6.0	4.0	7.0	Medium stiff gray silty clay		
3	8.5	9.0	7.0	11.0	Soft gray & tan clay		
4	11.5	12.0	11.0	14.0	Very soft gray clay w/organic matter &		
					roots		
5	14.5	15.0	14.0	15.5	Soft brown organic clay w/wood		
6	19.5	20.0	15.5	22.0	Very soft gray clay w/organic clay		
					layers & roots		
7	24.5	25.0	22.0		Soft gray clay		
8	29.5	30.0			Ditto		
9	34.5	35.0		35.0	Ditto		
10	35.0	36.5	35.0		Medium dense gray sand w/clay pockets &	7	30
					shells		
11	38.5	40.0		42.0	Ditto	7	30
12	43.5	45.0	42.0	48.5	Loose gray sand w/clay layers	1	7
13	48.5	50.0	48.5	50.0	Soft gray clay w/sand layers, lenses &		
					shell fragments		

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 607+00 in crown of levee.

Fig. 43

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

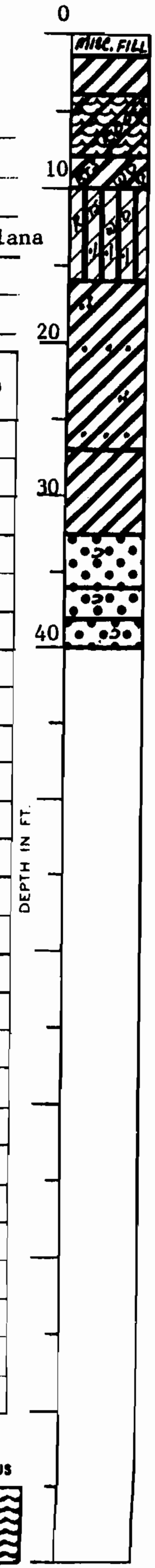
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 39 Soil Technician A. J. Mayeux Date 11 June 1981

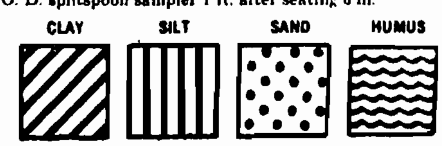
Ground Elev. 22 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	1.5	Miscellaneous fill		
1	2.0	3.0	1.5	4.0	Stiff gray & brown clay		
2	5.0	6.0	4.0	8.0	Soft dark brown organic clay w/roots		
3	8.0	9.0	8.0	10.0	Soft gray clay w/roots, wood & sand		
					pockets		
4	10.0	11.0	10.0		Loose gray clayey silt w/roots, wood &		
					sandy silt layers		
5	13.0	14.0		16.0	Ditto		
6	18.0	19.0	16.0		Soft gray clay w/sand pockets & lenses		
7	23.0	24.0		27.0	Ditto		
8	28.0	29.0	27.0	32.5	Medium stiff gray clay		
9	33.5	35.0	32.5	36.0	Medium dense gray sand w/shell fragments	6	29
10	36.0	37.5	36.0	38.0	Dense gray sand w/shell fragments	10	45
11	38.5	40.0	38.0	40.0	Loose gray sand w/shell fragments	3	9



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 603+50 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 44

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

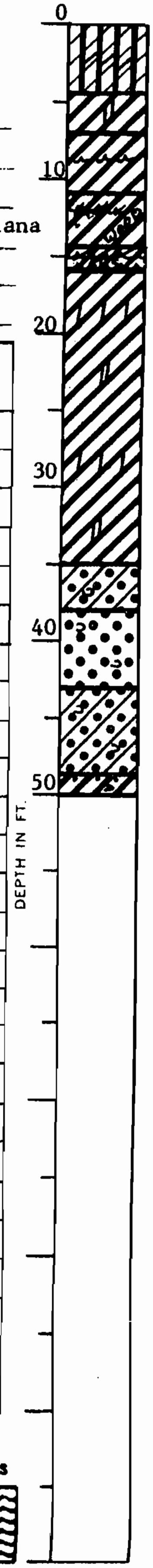
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 40 Soil Technician S. Porta Date 10 July 1981

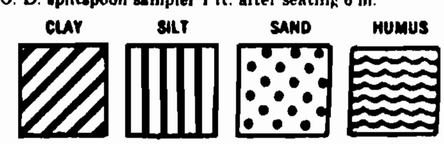
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	0.0	0.5	0.0		Very compact brown clayey silt w/clay		
					lenses		
2	2.5	3.0		4.5	Ditto		
3	5.5	6.0	4.5	7.0	Medium stiff gray & tan clay w/silt		
					pockets		
4	8.5	9.0	7.0	11.0	Soft gray & tan clay w/humus layers		
5	11.5	12.0	11.0	14.5	Very soft gray clay w/organic clay		
					layers & wood		
6	14.5	15.0	14.5	16.0	Medium stiff brown organic clay w/clay		
					layers & roots		
7	19.5	20.0	16.0		Very soft gray clay w/silt lenses &		
					pockets		
8	24.5	25.0			Ditto		
9	29.5	30.0			Ditto		
10	34.5	35.0		35.0	Ditto		
11	35.0	36.5	35.0	38.0	Loose gray clayey sand w/shell fragments	4	13
12	38.5	40.0	38.0	43.0	Medium dense gray sand w/shell fragments	5	22
13	43.5	45.0	43.0	48.5	Loose gray clayey sand w/shells	3	8
14	49.5	50.0	48.5	50.0	Medium stiff gray clay w/sand lenses &		
					shell fragments		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located Eastside of canal

@ Sta. No. 603+50 in crown of levee.

Fig. 45

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

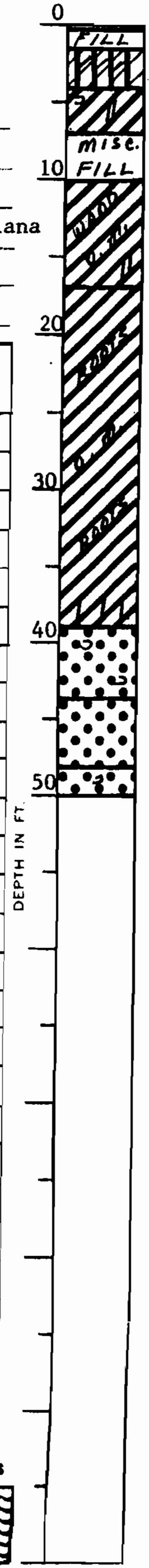
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 41 Soil Technician A. J. Mayeux Date 28 May 1981

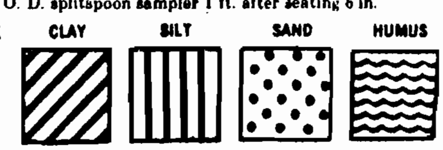
Ground Elev. 30.5 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.3	Asphalt		
			0.3	1.5	Fill		
1	2.0	2.5	1.5	4.0	Very compact brown clayey silt w/clay		
					layers		
2	5.0	5.5	4.0	7.0	Very stiff tan & gray clay w/shells &		
					silt pockets		
			7.0	10.0	Miscellaneous fill (Clay, gravel, glass,		
					shells, etc.)		
3	11.0	11.5	10.0		Stiff gray clay w/wood, organic matter		
					& silt pockets		
4	14.0	14.5		17.0	Ditto		
5	19.0	19.5	17.0		Soft gray clay w/roots		
6	24.0	24.5			Soft gray clay w/roots & organic matter		
7	29.0	29.5			Soft gray clay w/roots		
8	34.0	34.5		39.0	Soft gray clay w/roots & silt lenses		
9	40.0	41.5	39.0	43.5	Medium dense gray sand w/shell fragments	6	27
10	43.5	45.0	43.5	48.0	Dense gray sand	10	35
11	48.5	50.0	48.0	50.0	Loose gray sand w/shell fragments	2	7



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal

@ Sta. No. 599+50 in crown of levee.

Fig. 46

LOG OF BORING

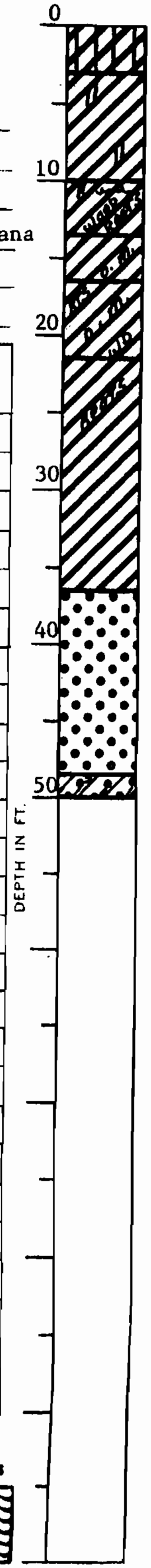
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 42 Soil Technician A. J. Mayeux Date 13 July 1981

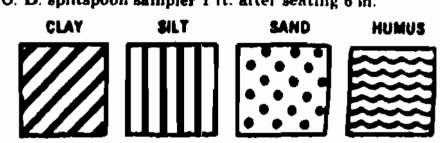
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	3.0	Soft brown silty clay		
2	5.0	5.5	3.0		Soft gray & tan clay w/silt pockets		
3	8.0	8.5		10.0	Ditto		
4	11.0	11.5	10.0	13.5	Soft gray clay w/silt pockets, humus,		
					wood & roots		
5	14.0	14.5	13.5	16.5	Soft gray clay w/organic matter		
6	19.0	19.5	16.5	21.5	Soft gray clay w/roots, organic matter		
					& wood		
7	24.0	24.5	21.5		Soft gray clay w/roots		
8	29.0	29.5			Soft gray clay		
9	34.0	34.5		36.5	Ditto		
10	36.5	38.0	36.5		Medium dense gray sand	5	15
11	40.0	41.5			Ditto	4	25
12	43.5	45.0		48.5	Ditto	8	26
13	48.5	50.0	48.5	50.0	Loose gray clayey sand w/shell	6	6
					fragments & clay layers		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located Eastside of canal
@ Sta. No. 599+50 in crown of levee.

Fig. 47

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

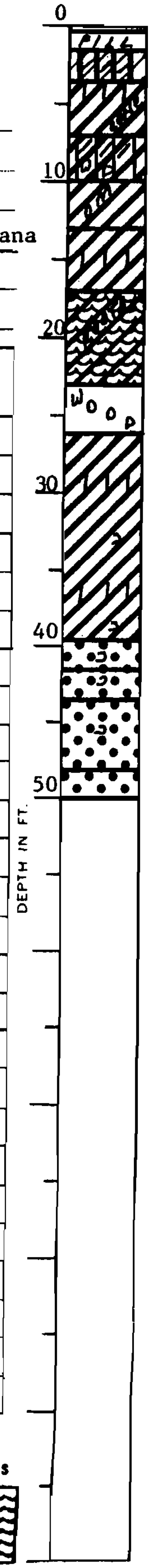
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 43 Soil Technician A. J. Mayeux Date 29 May 1981

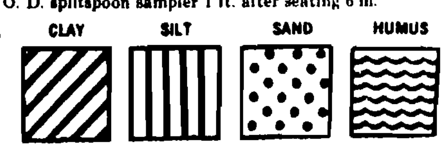
Ground Elev. 30.5 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.3	Asphalt		
			0.3	1.5	Fill		
1	2.0	2.5	1.5	3.5	Compact brown clayey silt w/clay lenses		
2	5.0	5.5	3.5	7.0	Stiff gray & tan clay w/silt lenses &		
					concretions		
3	8.0	8.5	7.0	10.0	Stiff gray silty clay w/clay layers &		
					wood		
4	11.0	11.5	10.0	13.0	Medium stiff gray clay w/organic matter		
5	14.0	14.5	13.0	17.0	Soft gray clay w/silt lenses		
6	19.0	19.5	17.0	23.0	Medium stiff gray organic clay w/roots		
			23.0	26.0	Wood, organic matter & clay		
7	29.0	29.5	26.0		Very soft gray clay w/silt lenses &		
					shell fragments		
8	34.0	34.5		39.5	Ditto		
9	40.0	41.5	39.5	41.5	Loose gray sand w/shell fragments	3	9
10	42.0	43.5	41.5	43.5	Medium dense gray sand w/shell fragments	7	26
11	44.5	46.0	43.5	48.0	Dense gray sand w/shell fragments	10	39
12	48.5	50.0	48.0	50.0	Medium dense gray sand	5	18



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located Westside of canal @ Sta. No. 596+00 in crown of levee.

Fig. 48

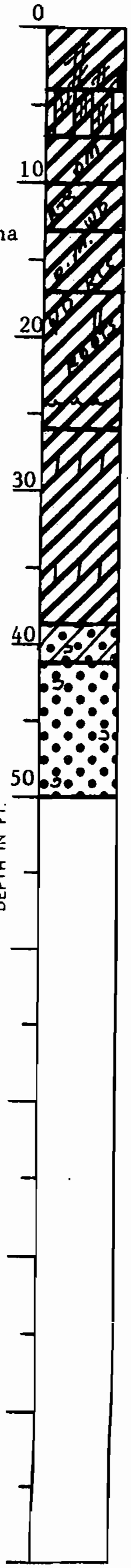
LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

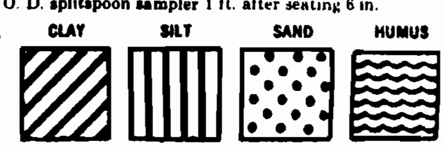
Boring No. 44 Soil Technician A. J. Mayeux Date 20 & 21 July 1981
Ground Elev. 27.5 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	3.0	0.0	4.0	Stiff brown & gray clay w/clayey silt pockets & lenses		
2	5.0	6.0	4.0	7.0	Medium stiff gray & tan silty clay w/clayey silt layers		
3	8.0	9.0	7.0	10.0	Soft gray clay w/organic matter		
4	11.0	12.0	10.0	13.0	Medium stiff gray clay w/roots & wood		
5	14.0	15.0	13.0	17.0	Soft gray clay w/organic matter & roots		
6	19.0	20.0	17.0		Soft gray clay w/wood, silt pockets & roots		
7	24.0	25.0		26.0	Soft gray clay w/silt pockets, humus layers & wood		
8	29.0	30.0	26.0		Soft gray clay w/silt lenses		
9	34.0	35.0		38.5	Ditto		
10	38.5	40.0	38.5	41.0	Medium dense gray clayey sand w/shell fragments	4	17
11	43.5	45.0	41.0		Medium dense gray sand w/shell fragments	6	21
12	48.5	50.0		50.0	Ditto	5	15



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located Eastside of canal @ Sta. No. 596+00 in crown of levee.

Fig. 49

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

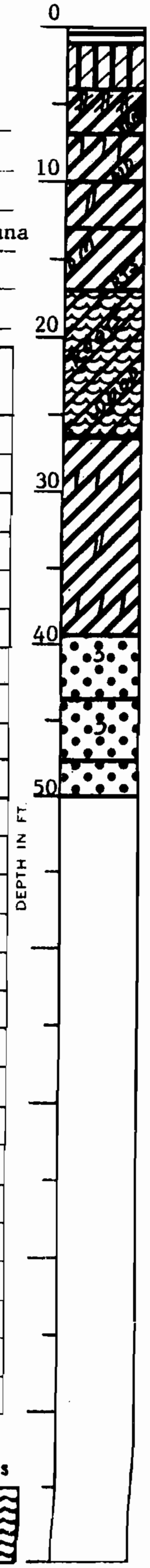
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 45 Soil Technician A. J. Mayeux Date 29 May 1981

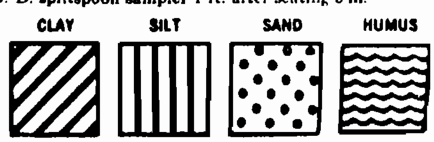
Ground Elev. 30.5 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	0.3	Asphalt		
			0.3	1.0	Fill		
1	2.0	2.5	1.0	4.0	Compact brown clayey silt		
2	5.0	5.5	4.0	7.0	Medium stiff gray & tan clay w/clayey		
					silt layers & brick fragments		
3	8.0	8.5	7.0	10.0	Stiff gray clay w/silt lenses & wood		
4	11.0	11.5	10.0	13.0	Medium stiff gray & tan clay w/silt		
					pockets		
5	14.0	14.5	13.0	17.0	Soft gray clay w/organic matter & roots		
6	19.0	19.5	17.0		Soft dark gray organic clay w/roots &		
					wood		
7	24.0	24.5		26.5	Ditto		
8	29.0	29.5	26.5		Soft gray clay w/silt lenses & pockets		
9	34.0	34.5			Ditto		
10	39.0	39.5		39.5	Ditto		
11	41.0	42.5	39.5	43.5	Medium dense gray sand w/shell	6	23
					fragments		
12	43.5	45.0	43.5	47.5	Dense gray sand w/shell fragments	8	40
13	48.5	50.0	47.5	50.0	Medium dense gray sand	11	27



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located Westside of canal

@ Sta. No. 592+50 in crown of levee.

Fig. 50

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

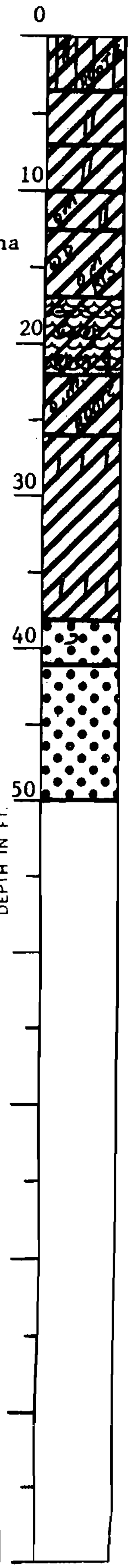
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 46 Soil Technician A. J. Mayeux Date 13 July 1981

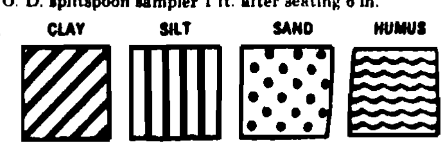
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	3.5	Medium stiff brown & gray silty clay		
					w/clayey silt pockets & roots		
2	5.0	5.5	3.5	7.0	Soft gray & tan clay w/silt pockets		
3	8.0	8.5	7.0	10.0	Medium stiff gray & tan clay w/silt		
					pockets		
4	11.0	11.5	10.0	12.5	Medium stiff gray clay w/organic matter		
					& silt pockets		
5	14.0	14.5	12.5	17.0	Very soft gray clay w/wood, organic		
					matter & roots		
6	19.0	19.5	17.0	22.0	Soft gray organic clay w/humus layers,		
					wood & roots		
7	24.0	24.5	22.0	26.0	Very soft gray clay w/organic matter &		
					roots		
8	29.0	29.5	26.0		Soft gray clay w/silt lenses		
9	34.0	34.5		38.0	Ditto		
10	38.5	40.0	38.0	41.0	Loose gray sand w/shell fragments	3	8
11	41.0	42.5	41.0		Medium dense gray sand	5	16
12	43.5	45.0			Ditto	7	26
13	48.5	50.0		50.0	Ditto	8	27



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located Eastside of canal

@ Sta. No. 592+50 in crown of levee.

Fig. 51

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

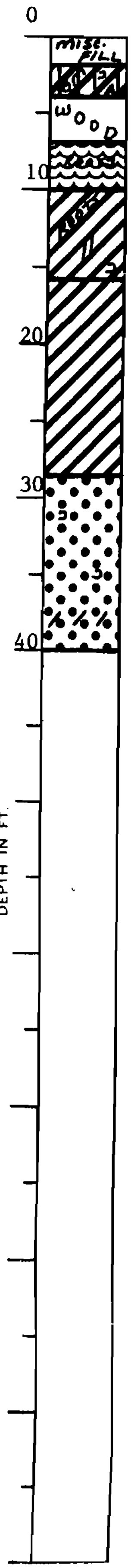
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 47 Soil Technician A. J. Mayeux Date 12 June 1981

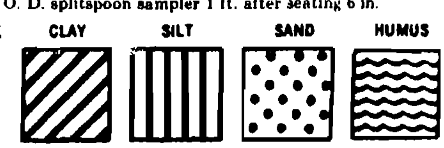
Ground Elev. 21 (Est.) Datum Cairo Gr. Water Depth See text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	2.0	Miscellaneous fill		
1	2.0	3.0	2.0	4.0	Stiff gray silty clay w/organic matter,		
					shells & cinders		
			4.0	7.0	Wood w/organic matter & roots		
2	8.0	9.0	7.0	10.0	Very soft dark brown humus w/roots		
3	11.0	12.0	10.0		Very soft gray clay w/roots & silt		
					pockets		
4	14.0	15.0		16.0	Very soft gray clay w/silt pockets &		
					shell fragments		
5	18.0	19.0	16.0		Very soft gray clay		
6	23.0	24.0		28.5	Ditto		
7	28.5	30.0	28.5		Medium dense gray sand w/shell fragments	4	14
8	33.5	35.0			Ditto	6	24
9	38.5	40.0		40.0	Medium dense gray sand w/clay layers	5	24



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 589+00 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 52

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

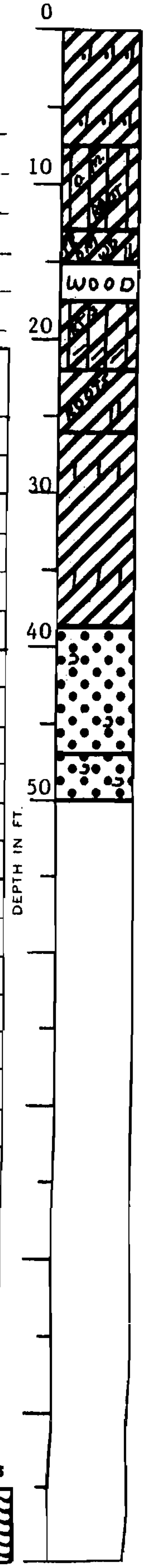
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 48 Soil Technician A. J. Mayeux Date 14 July 1981

Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0		Soft gray & tan clay w/sandy silt layers		
2	5.0	5.5		7.5	Ditto		
3	8.0	8.5	7.5		Medium stiff gray & tan silty clay		
					w/organic matter & roots		
4	11.0	11.5		13.0	Ditto		
5	14.0	14.5	13.0	15.0	Very soft gray clay w/trace of organic		
					matter, wood & silt pockets		
			15.0	17.5	Wood w/organic matter, humus & clay		
6	19.0	19.5	17.5	22.0	Soft gray silty clay w/roots & clay		
					layers		
7	24.0	24.5	22.0	26.0	Very soft gray clay w/roots & silt		
					pockets		
8	29.0	29.5	20.0		Soft gray clay w/silt lenses		
9	34.0	34.5		38.5	Ditto		
10	38.5	40.0	38.5		Dense gray sand w/shell fragments	7	35
11	43.5	45.0		47.0	Ditto	10	36
12	48.5	50.0	47.0	50.0	Medium dense gray sand w/shell fragments	4	12



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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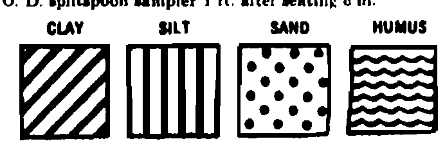


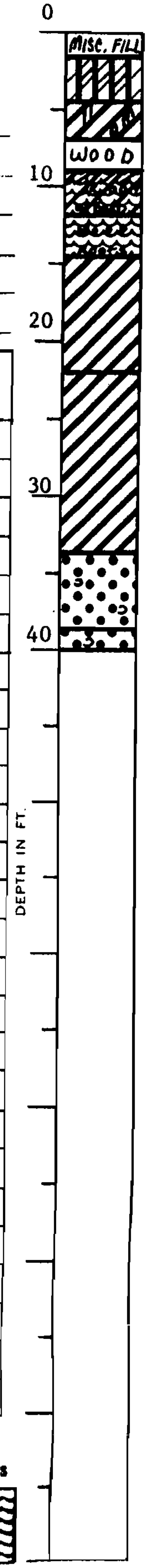
Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 589+00 in crown of levee.

Fig. 53

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.



Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

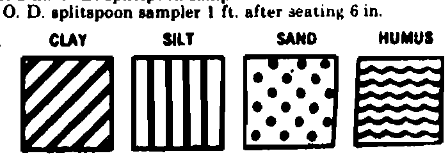
Boring No. 49 Soil Technician A. J. Mayeux Date 17 June 1981

Ground Elev. 19.5 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	1.5	Miscellaneous fill		
1	2.0	2.5	1.5	4.5	Medium compact gray clayey silt w/clay		
					layers		
2	5.0	5.5	4.5	7.0	Medium stiff dark gray clay w/silt		
					pockets & organic matter		
			7.0	9.0	Wood w/humus & roots		
3	11.0	11.5	9.0	12.0	Very soft gray organic clay w/clay		
					layers, roots & wood		
4	14.0	14.5	12.0	14.5	Very soft dark brown humus w/wood &		
					roots		
5	19.0	19.5	14.5	22.0	Very soft gray clay		
6	24.0	24.5	22.0		Soft gray clay		
7	29.0	29.5		33.5	Ditto		
8	33.5	35.0	33.5	38.5	Dense gray sand w/shell fragments	8	36
9	38.5	40.0	38.5	40.0	Medium dense gray sand w/shell fragments	5	12

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 585+50 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 54

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS
METAIRIE. LA.

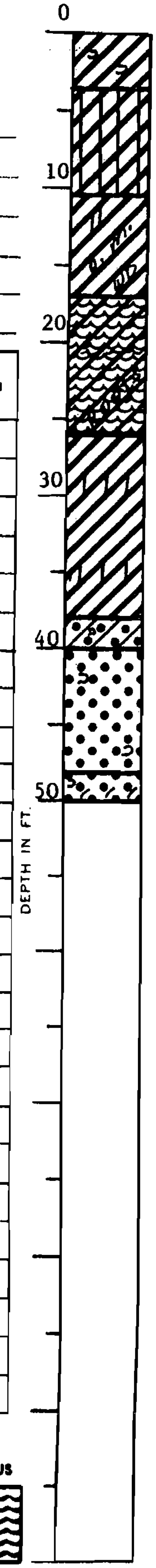
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 50 Soil Technician A. J. Mayeux Date 14 July 1981

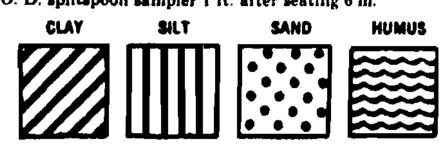
Ground Elev. 28 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	3.5	Medium stiff gray & brown clay w/shells		
2	5.0	5.5	3.5		Medium stiff brown & gray silty clay		
3	8.0	8.5		10.5	Ditto		
4	11.0	11.5	10.5		Soft gray clay w/silt pockets, organic		
					matter & wood		
5	14.0	14.5		17.0	Ditto		
6	19.0	19.5	17.0		Soft dark gray organic clay w/humus		
					layers & roots		
7	24.0	24.5		26.0	Ditto		
8	29.0	29.5	26.0		Very soft gray clay w/silt lenses		
9	34.0	34.5		38.0	Ditto		
10	38.5	39.0	38.0	40.0	Loose gray clayey sand w/shell fragments		
11	40.0	41.5	40.0		Medium dense gray sand w/shell fragments	6	18
12	43.5	45.0		48.0	Ditto	8	24
13	48.5	50.0	48.0	50.0	Loose gray sand w/shell fragments	4	9
					& clay layers		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. No. 585+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 55

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

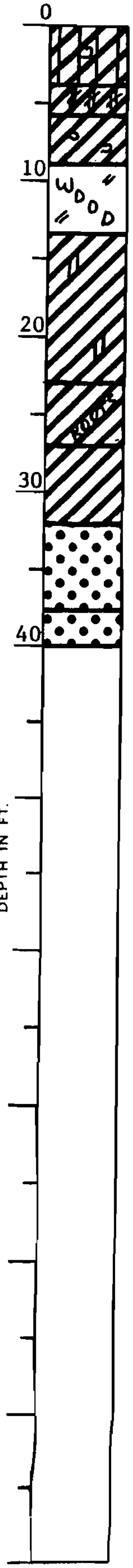
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 51 Soil Technician Jack Pratt Date 16 June 1981

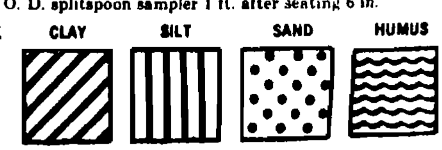
Ground Elev. 20.5 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	4.0	Medium stiff gray silty clay w/shell		
					fragments		
2	5.0	5.5	4.0	6.0	Medium stiff gray clay w/clayey silt		
					layers & lenses		
3	8.0	8.5	6.0	9.0	Very soft gray clay w/many shells		
			9.0	13.5	Wood w/clay		
4	14.0	14.5	13.5		Very soft gray clay w/silt pockets		
5	19.0	19.5		23.0	Ditto		
6	24.0	24.5	23.0	27.0	Very soft gray clay w/roots		
7	29.0	29.5	27.0	32.0	Soft gray clay		
8	33.0	34.5	32.0		Medium dense gray sand	6	16
9	35.5	37.0		37.5	Ditto	10	22
10	38.0	39.5	37.5	40.0	Dense gray sand	11	41



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 582+00 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 56

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

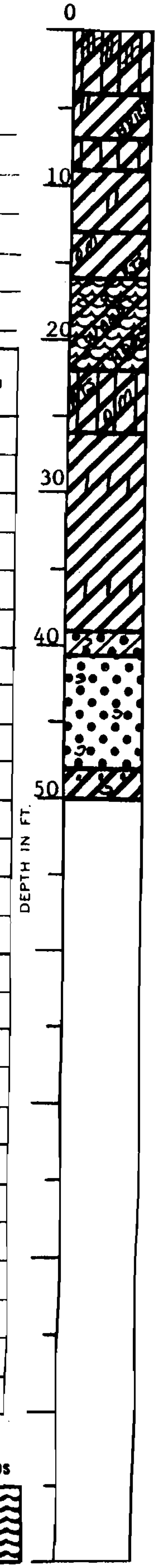
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 52 Soil Technician A. J. Mayeux Date 21 July 1981

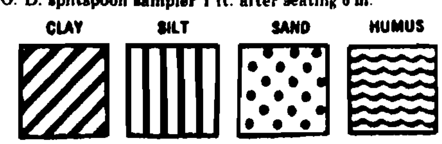
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	3.0	0.0	4.0	Stiff gray & brown silty clay w/clayey		
					silt layers		
2	5.0	6.0	4.0	7.0	Soft gray & tan clay w/silt pockets &		
					brick fragments		
3	8.0	9.0	7.0	9.0	Soft gray & tan silty clay		
4	11.0	12.0	9.0	13.0	Medium stiff gray clay w/silt pockets		
5	14.0	15.0	13.0	16.0	Soft gray clay w/organic matter & roots		
6	19.0	20.0	16.0	22.0	Soft gray organic clay w/humus layers,		
					wood & roots		
7	24.0	25.0	22.0	26.0	Very soft gray silty clay w/roots &		
					organic matter		
8	29.0	30.0	26.0		Very soft gray clay w/silt lenses		
9	34.0	35.0		39.0	Ditto		
10	39.0	40.5	39.0	40.5	Loose gray clayey sand w/shell	2	7
					fragments		
11	43.5	45.0	40.5	48.0	Medium dense gray sand w/shell fragments	6	20
12	48.5	50.0	48.0	50.0	Soft gray clay w/sand layers & shell	2	6
					fragments		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 582+00 in crown of levee.

Fig. 57

LOG OF BORING

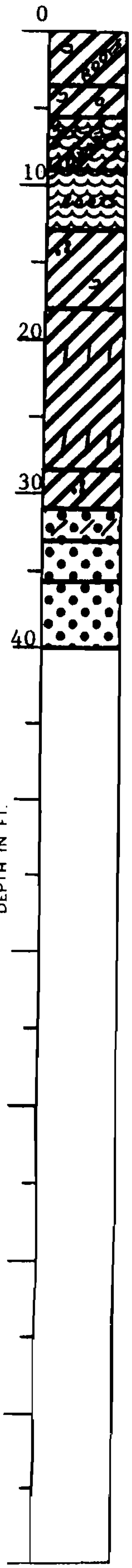
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 53 Soil Technician Jack Pratt Date 16 June 1981

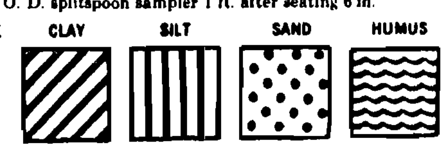
Ground Elev. 19 (Est.) Datum Cairo Gr. Water Depth See Text



Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	3.5	Stiff gray & tan clay w/shells & roots		
2	5.0	5.5	3.5	5.5	Medium stiff gray & tan clay w/shells &		
					gravel		
3	8.0	8.5	5.5	9.0	Soft dark gray organic clay w/humus		
					layers & wood		
4	11.0	11.5	9.0	13.0	Very soft dark brown humus w/roots		
5	14.0	14.5	13.0	18.0	Very soft gray clay w/sand pockets &		
					shell fragments		
6	19.0	19.5	18.0		Very soft gray clay w/silt lenses		
7	24.0	24.5		28.5	Ditto		
8	29.0	29.5	28.5	31.0	Very soft gray clay w/sand pockets		
9	31.0	32.5	31.0	33.0	Medium dense gray sand w/clay	6	18
10	33.5	35.0	33.0	35.5	Dense gray sand	11	33
11	36.0	37.5	35.5		Medium dense gray sand	9	19
12	38.5	40.0		40.0	Ditto	6	18

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 578+50 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 58

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

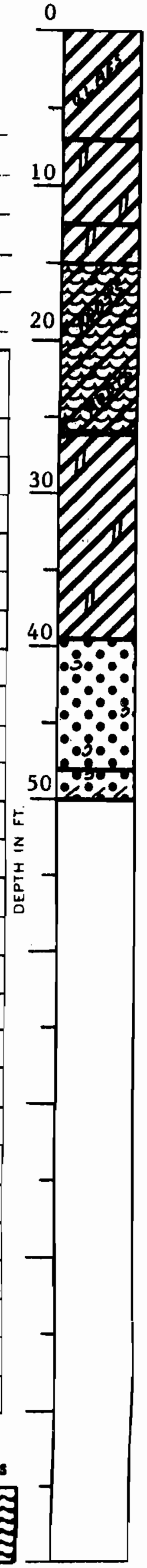
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 54 Soil Technician A. J. Mayeux Date 15 July 1981

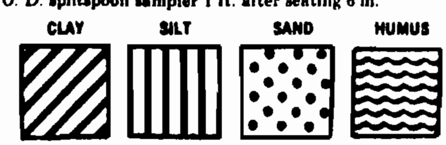
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0		Stiff gray & tan clay w/glass		
2	5.0	5.5		7.0	Ditto		
3	8.0	8.5	7.0		Medium stiff gray clay w/silt pockets		
4	11.0	11.5		12.5	Ditto		
5	14.0	14.5	12.5	15.0	Soft gray clay w/silt pockets		
6	19.0	19.5	15.0		Very soft brown & gray organic clay		
					w/roots		
7	24.0	24.5		26.0	Ditto		
8	29.0	29.5	26.0		Soft gray clay w/silt pockets		
9	34.0	34.5			Ditto		
10	39.0	39.5		39.5	Ditto		
11	40.0	41.5	39.5		Medium dense gray sand w/shell fragments	4	18
12	43.5	45.0		48.0	Ditto	8	24
13	48.5	50.0	48.0	50.0	Loose gray sand w/shell fragments	4	9
					& clay layers		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. No. 578+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 59

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

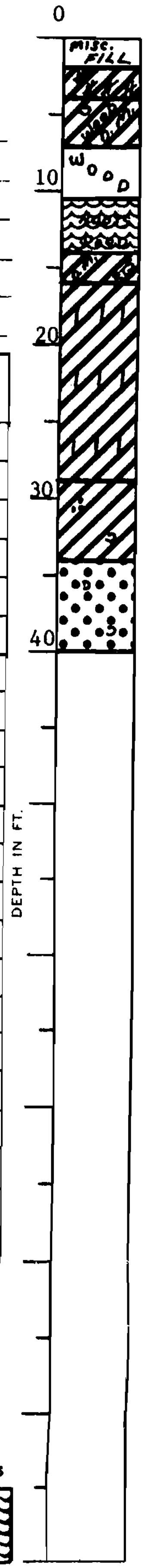
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 55 Soil Technician A. J. Mayeux Date 15 June 1981

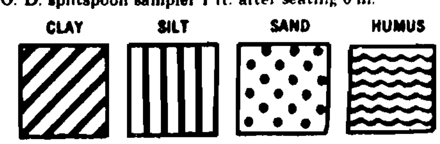
Ground Elev. 19 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	2.0	Miscellaneous fill		
1	2.0	3.0	2.0	4.0	Medium stiff gray clay w/clayey silt		
					pockets & layers		
2	5.0	6.0	4.0	7.0	Very soft gray clay w/shells, wood &		
					organic matter		
			7.0	10.5	Wood w/roots, organic matter, humus &		
					clay		
3	11.0	12.0	10.5	14.0	Very soft dark brown humus, w/roots &		
					wood		
4	14.0	15.0	14.0	16.0	Soft gray clay w/organic matter & roots		
5	18.0	19.0	16.0		Soft gray clay w/silt lenses		
6	23.0	24.0		29.0	Ditto		
7	32.0	33.0	29.0	34.0	Soft gray clay w/sand pockets & shell		
					fragments		
8	34.0	35.5	34.0		Medium dense gray sand w/shell fragments	4	13
9	38.5	40.0		40.0	Ditto	5	13



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 575+00 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 60

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

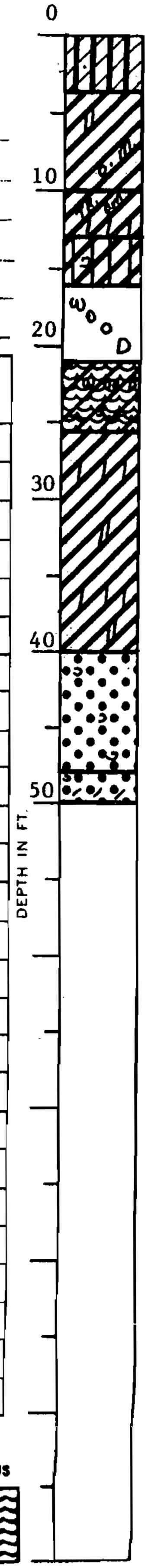
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 56 Soil Technician A. J. Mayeux Date 15 July 1981

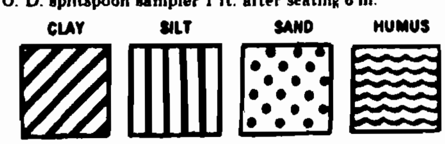
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	3.5	Medium compact tan clayey silt		
2	5.0	5.5	3.5		Soft gray & brown clay w/silt pockets &		
					organic matter		
3	8.0	8.5		10.0	Ditto		
4	11.0	11.5	10.0	13.0	Soft gray clay w/trace of organic matter		
					& silt lenses		
5	14.0	14.5	13.0	16.0	Soft gray silty clay w/shell fragments		
6	19.0	19.5	16.0	21.0	Wood w/humus, organic matter & clay		
7	24.0	24.5	21.0	25.5	Medium stiff gray & black organic clay		
					w/humus layers & wood		
8	29.0	29.5	25.5		Soft gray clay w/silt lenses & pockets		
9	34.0	34.5			Ditto		
10	39.0	39.5		40.0	Ditto		
11	40.0	41.5	40.0		Medium dense gray sand w/shell fragments	3	17
12	43.5	45.0		48.0	Ditto	4	15
13	48.5	50.0	48.0	50.0	Loose gray sand w/shell fragments &	7	8
					clay layers		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 575+00 in crown of levee.

Fig. 61

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

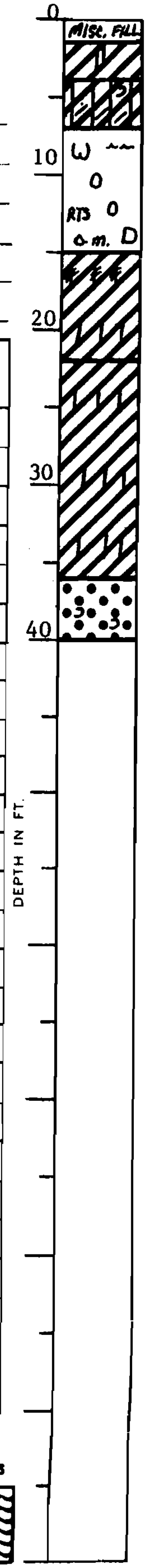
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 57 Soil Technician A. J. Mayeux Date 17 June 1981

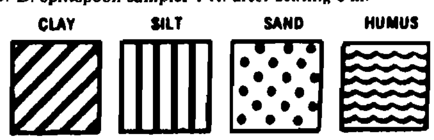
Ground Elev. 19 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	1.5	Miscellaneous fill		
1	2.0	2.5	1.5	4.0	Stiff gray & tan clay w/silt pockets		
2	5.0	5.5	4.0	7.0	Soft gray silty clay w/shells & clay		
					layers		
			7.0	15.0	Wood w/humus, roots & organic matter		
3	15.0	15.5	15.0		Very soft gray clay w/silty clay layers		
4	19.0	19.5		22.0	Very soft gray clay w/silt lenses		
5	24.0	24.5	22.0		Soft gray clay w/silt lenses		
6	29.0	29.5			Ditto		
7	34.0	34.5		36.0	Ditto		
8	36.0	37.5	36.0		Medium dense gray sand w/shell	6	22
					fragments		
9	38.5	40.0		40.0	Ditto	4	11



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal @ Sta. No. 571+50 near toe of levee.

Fig. 62

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

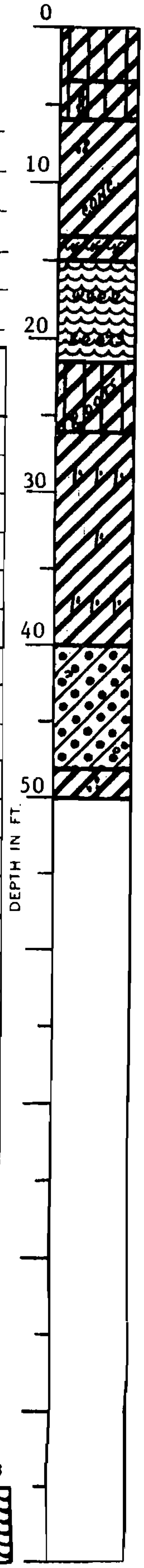
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 58 Soil Technician A. J. Mayeux Date 16 July 1981

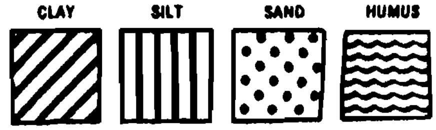
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	3.5	Stiff brown & gray silty clay		
2	5.0	5.5	3.5	6.0	Very stiff gray & tan silty clay with		
					large clayey silt pockets		
3	8.0	8.5	6.0		Soft gray & tan clay w/sand pockets &		
					concretions		
4	11.0	11.5		13.5	Ditto		
5	14.0	14.5	13.5	15.0	Soft black & gray clay w/organic clay		
					layers & pockets		
6	19.0	19.5	15.0	21.5	Soft brown humus w/wood & roots		
7	24.0	24.5	21.5	26.0	Very soft gray silty clay w/roots		
8	29.0	29.5	26.0		Soft gray clay w/silty sand lenses &		
					pockets		
9	34.0	34.5			Ditto		
10	39.0	39.5		40.0	Ditto		
11	44.0	44.5	40.0	48.0	Very loose gray clayey sand w/shell		
					fragments		
12	49.0	49.5	48.0	50.0	Soft gray clay w/sand pockets		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 571+50 in crown of levee.

Fig. 63

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

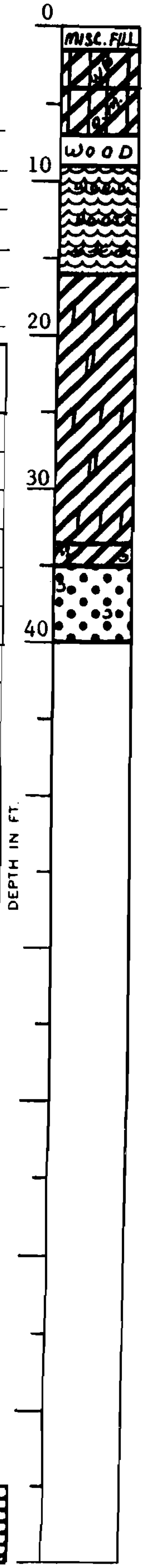
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 59 Soil Technician A. J. Mayeux Date 16 June 1981

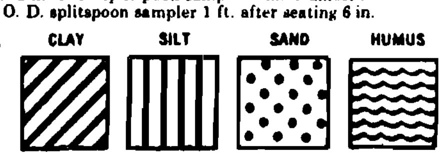
Ground Elev. 19 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	1.5	Miscellaneous fill		
1	2.0	2.5	1.5	4.0	Medium stiff green & tan silty clay w/wood		
2	5.0	5.5	4.0	7.0	Soft gray silty clay w/organic matter		
			7.0	9.0	Wood w/humus & organic matter		
3	11.0	11.5	9.0		Soft dark brown humus w/wood, roots & organic clay layers		
4	14.0	14.5		16.0	Ditto		
5	19.0	19.5	16.0		Soft gray clay w/silt lenses & pockets		
6	24.0	24.5			Ditto		
7	29.0	29.5		33.5	Ditto		
8	34.0	34.5	33.5	35.0	Soft gray clay w/sand pockets & shell fragments		
9	35.0	36.5	35.0		Medium dense gray sand w/shell fragments	5	19
10	38.5	40.0		40.0	Ditto	3	11



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 568+00 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 64

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

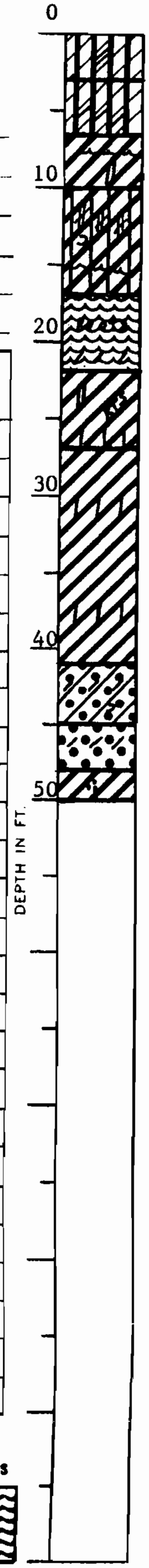
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 60 Soil Technician Jack Pratt Date 22 July 1981

Ground Elev. 27.5 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	3.0	Medium compact gray & tan clayey silt		
					w/clay pockets		
2	5.0	5.5	3.0	6.5	Medium compact brown & tan clayey silt		
					w/clay layers		
3	8.0	8.5	6.5	10.0	Medium stiff gray clay w/humus layers		
					& silt pockets		
4	11.0	11.5	10.0		Soft gray silty clay w/clayey silt		
					lenses & trace of shells		
5	14.0	14.5		17.0	Soft gray silty clay w/clayey silt		
					lenses & humus layers		
6	19.0	19.5	17.0	22.0	Very soft dark brown humus w/roots &		
					clay layers		
7	24.0	24.5	22.0	27.0	Very soft gray clay w/silt pockets,		
					lenses & roots		
8	29.0	29.5	27.0		Soft gray clay w/silt lenses		
9	34.0	34.5			Ditto		
10	39.0	39.5		41.0	Ditto		
11	44.0	44.5	41.0	45.0	Loose gray clayey sand w/clay layers &		
					shell fragments		
12	45.5	47.0	45.0	48.0	Loose gray fine sand w/clay layers	4	8
13	48.5	50.0	48.0	50.0	Very soft gray clay w/sand pockets	1	2



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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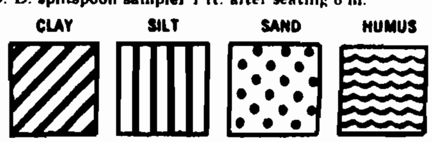


Remarks: Boring located on Eastside of canal @ Sta. No. 568+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 65

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

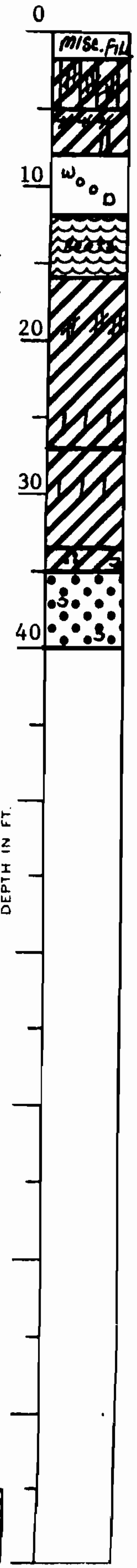
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 61 Soil Technician A. J. Mayeux Date 16 June 1981

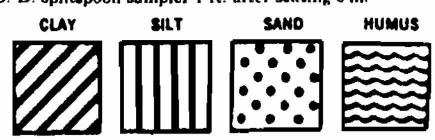
Ground Elev. 20 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	2.0	Miscellaneous fill		
1	2.0	2.5	2.0	5.0	Medium stiff gray silty clay w/clayey		
					silt layers		
2	5.0	5.5	5.0	8.0	Very soft gray clay w/organic clay		
					layers & silt pockets		
			8.0	12.0	Wood w/humus, organic matter & roots		
3	14.0	14.5	12.0	16.0	Very soft dark brown humus w/roots		
4	19.0	19.5	16.0		Very soft gray clay w/clayey silt		
					layers		
5	24.0	24.5		27.0	Very soft gray clay w/silt lenses		
6	29.0	29.5	27.0	33.5	Soft gray clay w/silt lenses		
7	34.0	34.5	33.5	35.0	Soft gray clay w/sand pockets & shell		
					fragments		
8	35.0	36.5	35.0		Medium dense gray sand w/shell	4	20
					fragments		
9	38.5	40.0		40.0	Ditto	3	14



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 564+50 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 66

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 62 Soil Technician A. J. Mayeux Date 16 July 1981

Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	3.0	Stiff brown & gray silty clay w/roots		
2	5.0	5.5	3.0	6.0	Compact tan clayey silt		
3	8.0	8.5	6.0		Soft gray clay w/organic matter & roots		
4	11.0	11.5		12.0	Ditto		
5	14.0	14.5	12.0	15.0	Medium stiff gray clay w/organic		
					matter, wood & silt pockets		
6	19.0	19.5	15.0	21.0	Soft black humus w/wood		
7	24.0	24.5	21.0	26.0	Soft gray silty clay		
8	29.0	29.5	26.0		Soft gray clay w/silt lenses		
9	34.0	34.5			Ditto		
10	39.0	39.5		41.5	Ditto		
11	42.0	42.5	41.5	44.0	Very loose gray clayey sand w/shell		
					fragments		
12	44.5	46.0	44.0	48.0	Medium dense gray sand w/shell	5	16
					fragments		
13	48.5	50.0	48.0	50.0	Loose gray clayey sand w/shell	2	6
					fragments & clay layers		

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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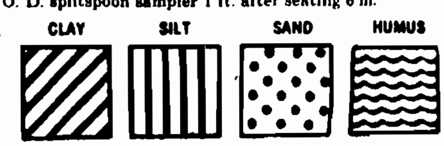


Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 564+50 in crown of levee.

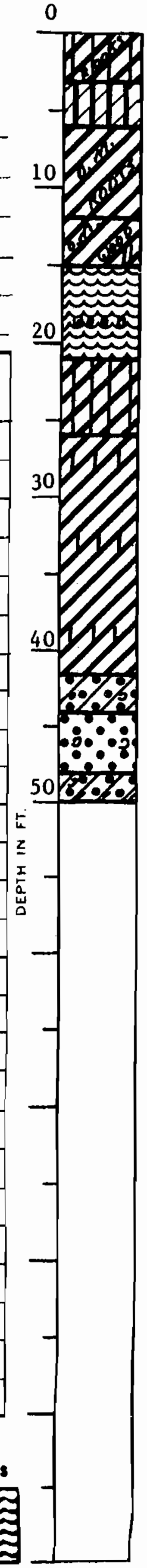


Fig. 67

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

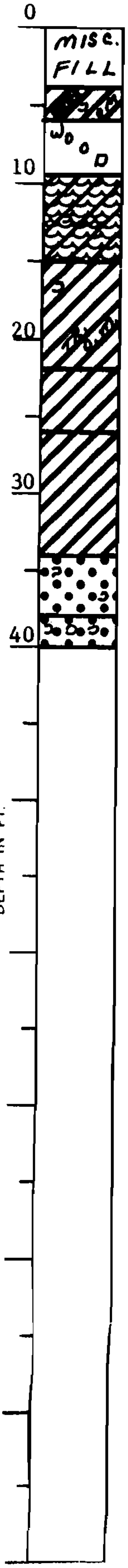
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 63 Soil Technician A. J. Mayeux Date 15 June 1981

Ground Elev. 20 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	4.0	Miscellaneous fill (shells & clay)		
1	5.0	5.5	4.0	6.0	Soft gray clay w/brick fragments,		
					shells & organic matter		
			6.0	9.5	Wood w/organic matter, roots & clay		
2	10.0	11.0	9.5		Soft gray & black organic clay w/humus		
					layers		
3	14.0	15.0		15.0	Ditto		
4	18.0	19.0	15.0	22.0	Very soft gray clay w/shell fragments		
					& trace of organic matter		
5	23.0	24.0	22.0	26.0	Soft gray clay		
			26.0	34.0	Very soft gray clay		
6	34.5	36.0	34.0	38.0	Medium dense gray sand w/shell	4	18
					fragments		
7	38.5	40.0	38.0	40.0	Loose gray sand w/shell fragments &	1	5
					layers		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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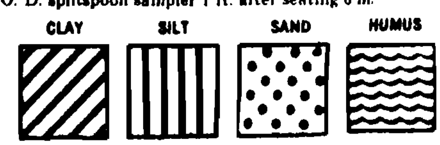


Remarks: Boring located on Westside of canal @ Sta. No. 561+00 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 68

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

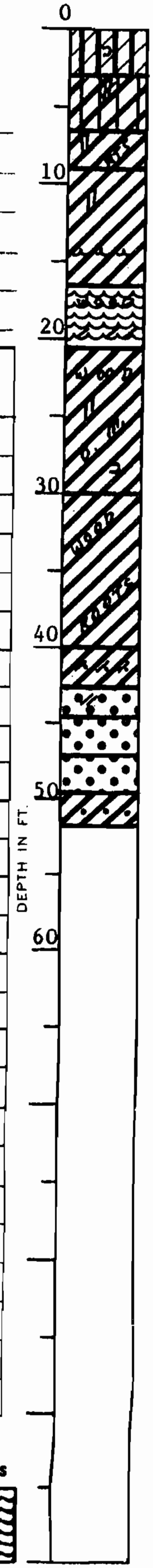
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 64 Soil Technician A. J. Mayeux Date 15 July 1981

Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	1.5	2.0	0.0	3.0	Medium compact gray & tan clayey silt		
					w/shell fragments		
2	5.0	5.5	3.0	6.5	Stiff brown & gray silty clay w/clayey		
					silt pockets		
3	8.0	8.5	6.5	9.0	Stiff gray clay w/silt pockets & small		
					roots		
4	11.0	11.5	9.0		Soft gray clay w/silt pockets & humus		
					layers		
5	14.0	14.5		16.5	Ditto		
6	18.5	19.0	16.5	20.5	Soft brown humus w/wood & clay layers		
7	22.0	22.5	20.5		Extremely soft gray clay w/wood layers,		
					silt pockets, organic matter & shell		
					fragments		
8	27.5	28.0		30.0	Ditto		
9	33.5	34.0	30.0		Soft gray clay w/wood		
10	38.5	39.0		40.0	Soft gray clay w/wood & roots		
11	41.5	42.0	40.0	42.5	Very soft gray clay w/clayey sand		
					layers		
12	42.5	44.0	42.5	44.5	Medium dense gray sand w/clay pockets	5	15
13	45.0	46.5	44.5	47.0	Very dense gray sand	20	50=11"
14	47.5	49.0	47.0	49.5	Dense gray sand	12	45
15	50.0	51.5	49.5	51.5	Soft gray clay w/sand lenses		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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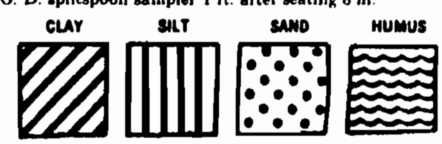


Remarks: Boring located on Eastside of canal @ Sta. No. 561+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 69

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

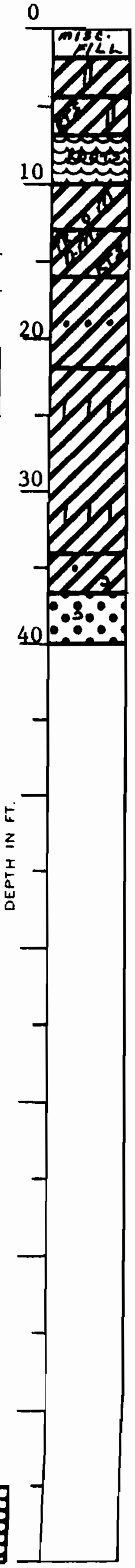
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 65 Soil Technician A. J. Mayeux Date 18 June 1981

Ground Elev. 20 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	Sample Depth — Feet From	Sample Depth — Feet To	Depth Stratum Feet From	Depth Stratum Feet To	Visual Classification	*Standard Penetration Test	
			0.0	2.0	Miscellaneous fill		
1	3.0	3.5	2.0	4.5	Stiff gray clay w/silt pockets		
2	5.0	5.5	4.5	7.0	Soft gray clay w/roots & silt pockets		
3	8.0	8.5	7.0	10.0	Extremely soft dark brown humus w/roots		
4	11.0	11.5	10.0	13.0	Very soft gray clay w/organic matter		
5	14.0	14.5	13.0	16.0	Very soft gray clay w/trace of organic		
					matter & roots		
6	19.0	19.5	16.0	22.0	Very soft gray clay w/sand lenses		
7	24.0	24.5	22.0		Soft gray clay w/silt lenses		
8	29.0	29.5		34.0	Ditto		
9	34.0	34.5	34.0	36.5	Soft gray clay w/trace of sand & shell		
					fragments		
10	38.5	40.0	36.5	40.0	Dense gray sand w/shell fragments	8	32



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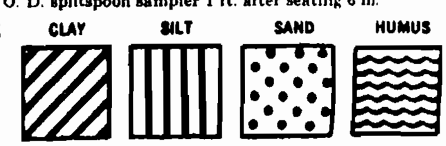


Remarks: Boring located on Westside of canal @ Sta. No. 557+50 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 70

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 554+00 to Station 670+00

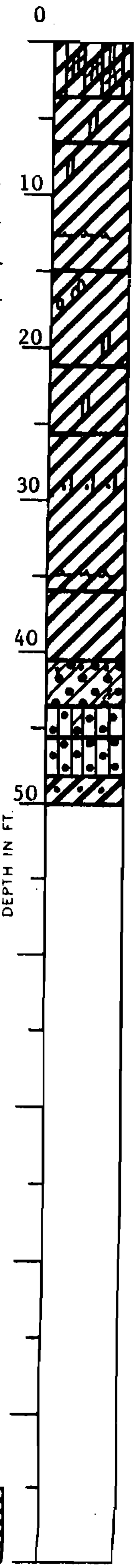
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 66 Soil Technician A. J. Mayeux Date 15 July 1981

Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	3.5	Stiff gray & tan silty clay w/clayey		
					silt layers & silt pockets		
2	5.0	5.5	3.5	6.5	Stiff brown & gray clay w/silt pockets		
3	8.0	8.5	6.5		Medium stiff gray clay w/silt pockets &		
					humus layers		
4	11.0	11.5			Ditto		
5	14.0	14.5		15.0	Ditto		
6	18.5	19.0	15.0	21.0	Soft gray clay w/organic matter & silt		
					pockets		
7	23.5	24.0	21.0	25.5	Very soft gray clay w/silt pockets		
8	28.5	29.0	25.5		Very soft gray clay w/sandy silt		
					lenses		
9	33.5	34.0		36.0	Very soft gray clay w/humus layers		
10	38.5	39.0	36.0	40.5	Soft gray clay		
11	41.0	41.5	40.5	43.5	Loose gray clayey sand w/sandy clay		
					layers & clay pockets		
12	43.5	45.0	43.5	45.5	Dense gray silty sand w/trace of clay	7	39
13	46.0	47.5	45.5	48.0	Very dense gray silty sand	15	50=10"
14	48.5	50.0	48.0	50.0	Soft gray clay w/sand lenses	1	2



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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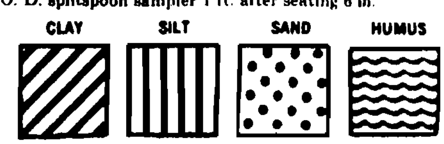


Remarks: Boring located on Eastside of canal @ Sta. No. 557+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 71

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

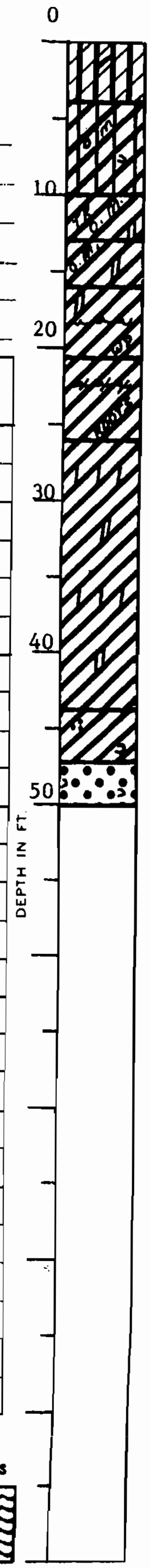
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 67 Soil Technician A. J. Mayeux Date 18 June 1981

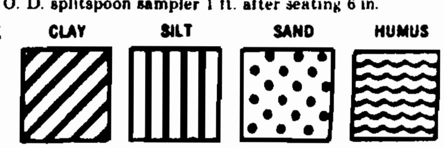
Ground Elev. 30 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	4.0	Very compact tan clayey silt w/clay pockets		
2	8.0	8.5	4.0	10.0	Medium stiff gray silty clay w/organic matter & shells		
3	11.0	11.5	10.0	13.0	Soft gray clay w/trace of organic matter & silt pockets		
4	14.0	14.5	13.0	16.0	Medium stiff gray clay w/organic matter & silt pockets		
5	19.0	19.5	16.0	20.5	Soft gray clay w/silt pockets, humus layers & wood		
6	24.0	24.5	20.5	26.0	Very soft gray clay w/organic clay layers & roots		
7	29.0	29.5	26.0		Soft gray clay w/silt lenses & pockets		
8	34.0	34.5			Ditto		
9	39.0	39.5		43.5	Ditto		
10	44.0	44.5	43.5	47.0	Soft gray clay w/sand pockets & shell fragments		
11	48.5	50.0	47.0	50.0	Dense gray sand w/shell fragments	10	34



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Westside of canal @ Sta. No. 554+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 72

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

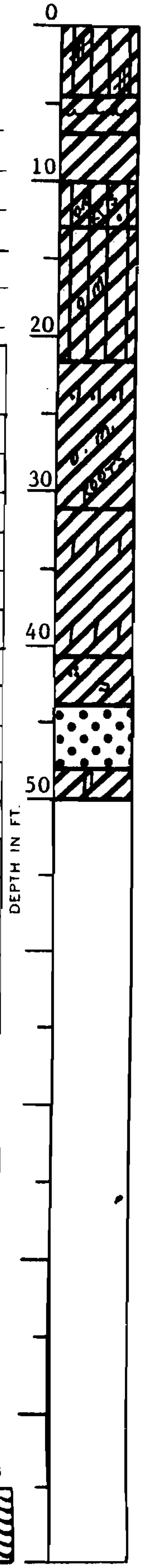
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 68 Soil Technician Jack Pratt Date 22 July 1981

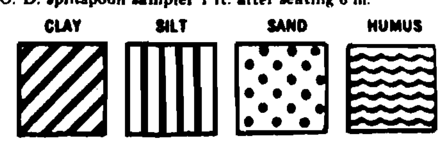
Ground Elev. 27.5 (Est.) Datum Cairo Gr. Water Depth See Text

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	4.5	Very stiff brown silty clay w/clayey silt pockets		
2	5.0	5.5	4.5	7.0	Medium stiff gray & black clay with humus layers		
3	8.0	8.5	7.0	10.0	Soft gray & tan clay		
4	11.0	11.5	10.0	13.0	Soft gray silty clay w/organic matter, roots & trace of sand		
5	14.0	14.5	13.0		Medium stiff gray silty clay w/organic matter		
6	19.0	19.5		21.5	Ditto		
7	24.0	24.5	21.5		Very soft gray clay w/sandy silt lenses, organic matter & roots		
8	29.0	29.5		31.0	Ditto		
9	33.0	33.5	31.0		Soft gray clay w/silt lenses		
10	39.0	39.5		40.5	Ditto		
11	42.5	43.0	40.5	44.0	Soft gray clay w/many sand pockets & shell fragments		
12	44.0	45.5	44.0	48.0	Medium dense gray fine sand	5	14
13	48.5	50.0	48.0	50.0	Very soft gray clay w/silt pockets	1	2



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 554+00 in crown of levee.

Fig. 73

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 1

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Stiff brown & gray silty clay w/brick fragments & concretions	26.4	94.3	119.2	3105*
2	5.0	Stiff brown & gray clay w/clayey silt layers	21.0	99.1	119.9	2585*
3	8.0	Medium stiff gray & tan clay w/gravel	27.1	94.0	119.5	1965
4	11.0	Medium stiff gray & tan clay	52.7	67.7	103.4	1125
5	14.0	Soft gray clay	58.9	64.9	103.2	805
6	19.0	Medium stiff gray & tan clay w/roots	37.5	81.9	112.6	1570
7	24.0	Medium stiff gray & tan clay	36.5	84.3	115.0	1610*

BORING 2

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium compact brown clayey silt w/roots	13.3	101.1	114.5	1455*
2	5.0	Soft gray & tan clay	50.5	70.0	105.4	815
3	8.0	Soft gray & tan clay	41.2	70.7	99.8	850*
4	11.0	Soft gray clay w/silt pockets & trace of organic matter	39.6	77.5	108.2	625
5	14.0	Stiff gray clay w/trace of organic matter	30.3	91.8	119.6	2120
6	19.0	Medium stiff gray & tan clay w/roots	46.4	73.9	108.2	1195
7	24.0	Medium stiff gray & tan clay	42.5	77.7	110.6	1120
8	29.0	Soft gray clay w/silty sand layers & lenses	35.1	88.1	119.0	970

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 74

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 3

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium stiff gray & tan clay w/silt pockets & lenses	27.7	95.0	121.3	1825
2	5.0	Medium compact brown & gray clayey silt w/clay lenses	19.0	101.6	120.9	1865*
3	8.0	Ditto	21.3	94.1	114.2	1740*
4	11.0	Medium stiff gray & tan clay w/sand lenses	28.9	88.4	114.0	1795*
5	14.0	Medium stiff gray & tan clay w/sand pockets	34.0	85.6	114.7	1255
6	19.0	Medium stiff gray & tan clay w/roots	43.5	75.8	108.8	1130
7	24.0	Soft gray clay	52.0	69.9	106.2	990*

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen.
Confined at the approximate overburden pressure.

Fig. 75

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 4

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Medium stiff gray & tan clay w/clayey silt layers	28.4	89.2	114.6	1240*			
2	5.0	Soft gray & tan clay	48.4	65.5	97.2	915*			
3	8.0	Ditto	36.9	77.8	106.5	625*			
4	11.0	Soft gray clay w/trace of organic matter	56.9	60.2	94.5	885*	104	30	74
5	14.0	Soft gray clay w/trace of organic matter & roots	52.8	63.8	97.4	790*			
6	19.0	Soft gray clay w/roots	41.7	80.1	113.6	780			
7	23.0	Soft gray clay w/organic matter	66.3	59.4	98.7	885*	117	37	80

BORING 5

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Compact brown clayey silt w/concretions	19.9	----	----	----			
2	5.0	Compact brown clayey silt w/clay layers & shell fragments	19.5	99.5	118.9	2110*			
3	8.0	Medium stiff gray & tan clay w/clayey silt layers	33.1	86.8	115.4	1830			
4	11.0	Stiff gray & tan clay w/sand pockets	19.6	104.1	124.5	2275*			
5	14.0	Medium stiff gray & tan clay w/sand pockets & shells	41.4	75.7	107.0	1405*			
6	19.0	Medium stiff gray & tan clay	49.4	71.2	106.4	1275			
7	24.0	Medium stiff gray clay	48.8	71.6	106.6	----			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 76

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 6

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	PL	PI
1	2.0	Stiff gray & brown clay w/clayey silt layers & shells	27.7	89.0	113.6	2570*			
2	5.0	Soft gray clay	35.9	79.0	107.3	725*			
3	8.0	Soft gray & tan clay w/sand pockets	48.5	72.9	108.2	955*			
4	11.0	Soft gray clay with organic matter & sand pockets	51.4	68.8	104.2	575			
5	14.0	Very soft gray clay with trace of organic matter, silt pockets & roots	66.4	61.0	101.6	435			
6	19.0	Medium stiff gray & tan clay w/silt pockets	39.9	82.0	114.8	1270			
7	24.0	Medium stiff gray clay w/roots & organic matter	70.4	57.8	98.5	1185			

BORING 7

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	PL	PI
1	1.5	Medium compact brown clayey silt w/gravel	19.3	97.4	116.2	1860*	40	21	19
2	4.5	Stiff brown silty clay w/clayey silt pockets & shell fragments	18.3	108.6	128.4	3675*			
3	7.5	Medium stiff tan & gray clay w/clayey sand layers & pockets	32.7	87.6	116.2	1320*			
4	10.5	Medium stiff gray & tan clay w/concretions	40.5	79.6	111.9	1755*	89	24	65
5	13.5	Soft tan & gray clay w/sand pockets, shells & gravel	42.0	77.7	110.4	490			
8	19.5	Medium stiff gray & tan clay w/sand pockets & roots	36.7	82.0	112.1	1125	76	19	57

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 77

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 8

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium compact brown clayey silt	17.1	91.7	107.4	1415*
2	5.0	Very soft gray clay w/many sand pockets & trace of shells	28.9	82.6	106.5	375*
3	8.0	Soft gray clay w/sand pockets & lenses	34.1	77.6	104.0	605*
4	11.0	Medium stiff gray clay w/silt lenses & organic matter	38.4	----	----	----
5	14.0	Soft gray clay w/decayed wood & organic matter	88.1	45.1	84.8	500
6	19.0	Soft gray fissured clay w/sand pockets & roots	40.8	77.8	109.5	600

BORING 9

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Compact gray & tan clayey silt w/clay layers	22.4	97.3	119.0	2015*
2	5.0	Medium stiff gray & tan clay w/shell & brick fragments	31.7	88.2	116.1	1810
3	6.5	Miscellaneous fill (Cinders, gravel, lignite, glass, clayey silt & clay layers	18.7	----	----	----
4	9.0	Loose tan silty sand with clay layers & some gravel	18.6	----	----	----
5	11.5	Very loose tan silty sand w/few clay pockets, shells & gravel	24.3	----	----	----
6	14.0	Loose tan silty sand with organic clay layers	42.6	----	----	----

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 78

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 10

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium stiff brown & gray clay w/clayey silt pockets	30.6	84.4	110.2	1575*
2	5.0	Very loose gray & tan silty sand w/clay pockets, lenses & shell fragments	17.3	96.3	113.0	235*
3	8.0	Very soft gray & tan clay w/many sand layers & pockets	22.6	90.3	110.7	260*
4	11.0	Loose tan & gray fine sand w/clay layers & shell fragments	30.6	----	----	----
5	14.0	Medium stiff gray clay w/sand pockets, roots & organic matter	34.0	84.9	113.7	1010

BORING 11

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Stiff gray & tan silty clay w/clay layers	21.6	102.3	124.4	3750*
2	8.0	Miscellaneous fill (Brick, glass, sand & some clay)	23.3	----	----	----
5	15.0	Soft gray clay w/wood & organic matter	50.7	----	----	----
6	19.0	Medium stiff gray & tan clay w/roots	39.6	80.5	112.5	1520

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 79

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 12

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium compact brown clayey silt w/roots	22.0	89.2	108.9	1995*
2	5.0	Soft gray & tan clay w/silty sand pockets	25.5	86.3	108.4	785*
3	8.0	Soft dark gray clay w/organic matter	63.2	58.0	94.6	610*
4	14.0	Very soft gray clay w/sand layers	45.3	71.6	104.1	400*
5	18.0	Very soft gray & tan clay w/sand pockets & roots	55.9	69.1	107.8	----

BORING 13

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Stiff gray & tan clay with clayey silt layers, brick & shell fragments	22.6	99.4	121.9	2985*
2	5.0	Stiff gray & tan clay with shells, brick fragments & glass	32.4	----	----	----
3	8.0	Stiff gray & tan clay w/clayey silt lenses	22.7	99.3	121.9	2945*

BORING 14

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium compact gray & brown clayey silt w/roots	19.8	97.1	116.3	1415*
2	5.0	Medium stiff gray & brown clay w/shell fragments & sand layers	31.7	----	----	----
3	8.0	Loose gray & tan fine sand w/clay layers & shell fragments	23.0	95.8	117.9	745*
5	14.0	Very soft gray clay w/sand pockets, decayed wood & organic matter	52.3	68.8	104.8	490

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 80

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 15

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	1.5	Medium stiff brown silty clay	28.0	89.3	114.3	1445*	48	22	26
2	4.5	Medium stiff gray & brown clay w/sandy silt layers	22.9	96.3	118.3	1630*			
3	7.5	Stiff gray & brown clay w/silty sand lenses	23.9	96.8	119.9	2035*			
6	14.0	Medium stiff dark gray & brown organic clay w/roots & humus pockets	160.9	----	----	----	226	84	142
7	19.5	Medium stiff gray clay w/roots, wood & concretions	49.0	----	----	----			
		BORING 16							
1	2.0	Compact brown & gray clayey sand w/trace of asphalt (crumbly)	13.8	94.3	107.3	2905*			
2	5.0	Soft brown & gray clay w/sand pockets	40.5	74.5	104.7	750*			
3	8.0	Medium stiff dark gray & tan clay w/sand pockets	34.6	77.7	104.5	1330*			
4	11.0	Medium stiff gray clay w/organic matter, wood, silt pockets & sand lenses	33.6	----	----	----			
5	14.0	Medium stiff gray clay w/organic matter, sand & large roots	50.3	----	----	----			
6	17.0	Soft gray clay w/sand pockets & roots	44.3	76.1	109.8	620			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 81

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 17

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium stiff gray & tan clay w/sand lenses, pockets & roots	27.8	90.7	115.9	1650
2	5.0	Stiff gray & tan silty clay w/shell fragments	17.5	----	----	----
6	17.5	Medium stiff gray clay with organic matter & roots	59.1	63.9	101.7	1110

BORING 18

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Soft dark gray clay w/clayey sand layers	16.7	93.3	108.9	655*
2	5.0	Soft gray & tan clay w/sand pockets	31.6	83.9	110.4	655
3	8.0	Soft gray clay	68.2	56.2	94.4	630*
4	11.0	Ditto	58.5	64.5	102.2	705

BORING 19

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Compact brown & gray sandy silt w/clay layers	12.5	----	----	----
2	5.0	Medium stiff gray & tan clay w/sand lenses & roots	35.4	74.3	100.6	1860*

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 82

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 20

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Stiff brown & gray sandy clay with decayed roots & organic matter	19.3	94.5	112.8	2910*			
2	5.0	Soft gray & tan clay w/sand layers & pockets	36.2	80.1	109.0	815*	63	21	42
3	8.0	Soft gray & tan clay w/sand pockets	35.4	80.1	108.4	530*			
4	11.0	Soft dark gray clay w/many sand pockets & trace of organic matter	33.0	83.5	111.1	840*			
5	14.0	Very soft gray clay w/silt pockets & trace of organic matter	49.6	69.8	104.4	385	60	22	38

BORING 21

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Hard tan & gray silty clay w/shells & glass	11.7	102.1	114.1	13660*			
2	5.0	Hard brown & gray clay w/sand pockets & glass	13.6	----	----	----			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 22

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	5.0	Medium stiff gray & tan clay w/sand pockets	30.8	86.3	112.9	1015*			
2	8.0	Medium stiff gray & tan clay w/sand pockets	54.6	64.9	100.4	1050			
3	11.0	Soft gray clay w/silt pockets, organic matter & decayed wood	63.6	58.8	96.2	590			
4	14.0	Very loose gray sand w/clay pockets & roots	29.8	----	----	----			
5	17.0	Very soft gray clay w/decayed wood & sand pockets	85.6	48.1	89.3	475			

BORING 23

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	1.0	Very stiff tan & gray clay w/sand pockets, shells & gravel	18.0	----	----	----			
2	5.5	Medium stiff gray & tan clay w/sand pockets, roots & wood	32.1	----	----	----			
3	7.5	Very soft gray clay w/many roots	86.5	47.7	89.0	470			
4	10.5	Very soft gray clay w/roots & organic matter	72.3	55.7	96.0	420	88	26	62

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 84

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 24

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Stiff brown silty clay	20.4	97.9	117.9	2495*
2	5.0	Medium stiff dark gray clay w/sand pockets	26.1	82.6	104.2	1990*
3	8.0	Soft dark gray clay w/sand pockets & decayed wood	41.7	76.4	108.3	900
4	11.0	Very soft dark gray clay w/sand pockets & decayed wood	59.1	61.7	98.2	400
5	14.0	Soft gray clay w/humus pockets & roots	115.3	----	----	----
6	19.0	Soft gray clay w/roots & trace of organic matter	72.1	56.6	97.5	590
		BORING 25				
1	2.0	Very compact gray & tan sandy silt w/clay layers & glass	16.2	95.1	110.5	7010*
		BORING 26				
1	2.0	Medium stiff gray & brown silty clay w/roots	25.5	90.3	113.3	1540*
2	5.0	Medium stiff gray & tan silty clay w/sand pockets	27.5	83.5	106.5	1940*
3	8.0	Soft gray & tan clay	52.2	68.6	104.3	535
4	11.0	Soft dark gray organic clay w/humus pockets & decayed wood	178.4	26.5	73.7	770
5	14.0	Soft dark gray humus w/roots	274.7	----	----	----
6	19.0	Soft gray clay w/roots & organic matter	130.7	35.8	82.6	720
7	22.0	Very soft gray sandy clay w/silty sand layers & roots	23.3	103.5	127.6	405

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 85

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 27

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	PL	PI
2	5.0	Very stiff tan & gray clay w/silty sand lenses & shell fragments	26.5	----	----	----			
3	8.0	Soft gray clay w/sand layers & pockets	18.9	100.4	119.4	850*			
4	11.0	Soft dark gray clay w/sand layers, organic matter & brick fragments	32.4	----	----	----			
5	13.0	Soft gray clay w/roots & organic matter	83.5	51.1	93.8	----			
6	19.0	Loose gray silty sand w/clayey sand layers & trace of shells	19.8	108.7	130.2	520*			

BORING 28

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	PL	PI
1	2.0	Very stiff brown clay w/many clayey silt lenses	22.1	100.5	122.7	4135*			
2	5.0	Stiff gray & brown clay w/sand layers, trace of shells & roots	34.1	77.8	104.4	2070*			
3	8.0	Soft gray & tan clay w/sand pockets & trace of organic matter	30.9	84.6	110.7	950	58	18	40
4	11.0	Very loose gray clayey sand w/roots & trace of shells	20.8	105.1	127.0	335*			
5	18.0	Soft gray clay w/roots & trace of organic matter	64.9	60.4	99.6	815	83	24	59

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 86

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 29

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
2	5.0	Very stiff gray & tan clay w/silt pockets & trace of organic matter	36.1	80.3	109.3	4600
4	11.0	Very soft gray organic clay w/roots	111.7	41.0	86.8	350
5	14.0	Very soft gray clay w/roots	77.9	54.0	96.1	370
6	18.5	Very loose gray silty sand w/shell fragments	24.3	103.5	128.7	205

BORING 30

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium stiff gray & brown silty clay w/sand pockets	22.0	95.9	117.0	1130
2	5.0	Very soft gray & brown silty clay w/sand pockets	34.0	78.1	104.6	340*
3	8.0	Soft gray clay w/organic matter & roots	52.0	65.3	99.3	640*
4	11.0	Very soft dark gray clay w/trace of organic matter	67.7	57.4	96.2	470
5	14.0	Extremely soft gray clay w/organic matter & wood	97.6	45.7	90.2	185
6	19.0	Soft gray clay w/roots & trace of organic matter	59.5	63.1	100.6	605
7	23.0	Very soft gray clay w/sand pockets & roots	36.6	82.8	113.1	435

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 87

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Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 31

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Very stiff gray & brown clay w/roots & wood	31.7	84.7	111.5	5465*			
2	5.0	Medium stiff dark gray, black & brown organic clay w/large humus layers, roots & wood	181.1	23.7	66.5	1345*	229	132	97
3	8.0	Very soft gray clay w/roots & organic matter	80.1	51.0	91.9	370			
4	14.0	Very soft dark brown & gray humus w/roots, wood & clay layers	291.8	18.2	71.3	475*	340	136	204

BORING 32

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Very compact tan & gray clayey silt	13.5	----	-----	----			
2	5.0	Medium stiff brown & gray clay w/organic matter & sand pockets	41.2	68.4	96.6	1130			
3	8.5	Soft gray clay with organic matter & sand lenses	61.7	59.5	96.3	585*			
4	11.5	Medium stiff gray clay w/humus layers	141.2	32.3	78.0	1005			
5	19.5	Soft dark gray organic clay w/humus & roots	163.3	29.8	78.4	645			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 88

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 33

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium compact gray & brown clayey silt w/clay layers & shells	18.8	----	----	----
2	5.0	Very compact brown & gray clayey silt	16.2	108.0	125.5	4415*
3	8.0	Medium stiff gray clay w/trace of organic matter	43.8	72.2	103.8	1815
4	11.0	Soft gray clay w/organic matter	50.9	68.0	102.5	825*
5	14.0	Medium stiff dark brown humus w/roots	250.2	19.1	66.9	1720*
6	24.0	Soft gray clay w/silt lenses & shell fragments	49.0	70.4	104.9	495
7	29.0	Soft gray clay	69.1	57.9	97.9	615
8	32.0	Ditto	69.1	58.6	99.2	920

BORING 34

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.5	Compact brown clayey silt w/trace of sand	16.0	----	----	----
2	5.5	Soft gray & tan clay with silt pockets, trace of organic matter & roots	43.7	76.0	109.2	990
3	8.5	Soft gray clay w/organic matter & roots	64.1	60.0	98.4	735
4	11.5	Soft gray clay w/silty clay layers, shells & organic matter	40.9	77.5	109.2	670
5	14.5	Soft gray clay w/organic clay layers & roots	76.9	51.2	90.6	795
6	19.5	Soft gray organic clay w/roots & decayey wood	166.8	28.6	76.3	665
7	24.5	Soft gray clay w/silt lenses	65.2	61.1	101.0	500
8	29.5	Soft gray clay	69.6	58.5	99.2	675

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 89

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

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Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 35

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	PL	PI
1	2.0	Very compact brown clayey silt w/clay layers	17.9	100.7	118.8	∅=24°c=590**			
2	5.0	Stiff brown & tan silty clay w/clayey silt layers, shells & concretions	20.8	----	----	----			
2	8.0	Soft gray clay with organic matter	57.9	61.9	97.7	840			
4	11.0	Soft gray clay w/roots	54.8	63.5	98.3	705			
5	14.0	Soft gray clay w/silt pockets & organic matter	41.4	76.8	108.7	740			
6	19.0	Soft gray clay w/roots	53.5	68.1	104.5	585			
7	24.0	Soft gray clay w/silt pockets	47.1	73.6	108.3	550			
8	29.0	Soft gray clay	65.4	60.9	100.8	575			
9	34.0	Ditto	65.7	60.8	100.7	585			

BORING 36

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	PL	PI
1	2.0	Hard tan & gray silty clay	12.5	101.8	114.5	10120*			
2	5.0	Soft gray & tan clay w/trace of organic matter	43.8	69.6	100.1	705*			
3	8.0	Ditto	40.5	75.8	106.5	565*			
4	11.0	Soft gray clay w/organic clay layers	69.2	57.7	97.7	745	102	27	75
5	14.0	Soft gray clay w/shell fragments	48.9	70.5	104.9	515			
6	19.0	Very soft gray clay with organic clay layers & roots	90.7	----	----	----	166	41	125
7	24.0	Soft gray clay w/shell fragments	54.9	66.6	103.1	515			
8	29.0	Soft gray clay w/silt pockets	65.5	59.6	98.7	505			

*Unconsolidated-Undrained Triaxial compression Test - One Specimen. Confined at the approximate overburden pressure.
**Unconsolidated-Undrained Triaxial Compression Test - Multiple Stage.
∅ = Angel of internal friction;
c = Cohesion in lb per sq ft.

Fig. 90

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Orleans and Jefferson Parishes, Louisiana

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SUMMARY OF LABORATORY TEST RESULTS

BORING 37

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Compact brown & tan clayey silt w/clay layers	17.7	105.0	123.6	Ø=11°c=1010**
2	5.0	Very stiff brown & gray silty clay w/clayey silt layers & concretions	18.5	----	----	----
3	8.0	Soft brown & gray clay w/silt pockets, organic matter, roots & trace of shells	45.0	66.3	96.2	925*
4	11.0	Soft gray clay w/silt pockets & organic matter	40.7	74.4	104.7	945
5	14.0	Soft gray clay w/organic matter	60.1	62.9	100.6	545
6	19.0	Soft gray clay w/organic matter & roots	95.6	----	----	----
7	29.0	Soft gray clay w/silt pockets & shell fragments	53.6	----	----	----
8	34.0	Very soft gray clay w/roots	66.9	58.7	98.0	490

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

**Unconsolidated-Undrained Triaxial Compression Test - Multiple Stage.
Ø = Angle of internal friction;
c = Cohesion in lb per sq ft.

Fig. 91

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

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Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 38

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.5	Very compact gray clayey silt w/clay pockets	22.4	99.5	121.8	4125*
2	5.5	Medium stiff gray silty clay	48.9	----	----	----
3	8.5	Soft gray & tan clay	52.1	69.8	106.2	905
4	11.5	Very soft gray clay w/roots & organic matter	63.6	60.0	98.2	355
5	14.5	Soft brown organic clay	168.3	26.6	71.4	670
6	19.5	Very soft gray clay w/roots & organic matter	118.1	38.8	84.6	425
7	24.5	Soft gray clay	51.9	69.1	104.9	575
9	34.5	Ditto	70.1	58.6	99.6	935
13	48.5	Soft gray clay w/sand layers, lenses & shells	52.2	68.4	104.1	745

*Unconsoldiated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

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SUMMARY OF LABORATORY TEST RESULTS

BORING 39

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Stiff gray & brown clay	44.2	73.2	105.5	3350*			
2	5.0	Soft dark brown organic clay w/roots	113.1	----	----	----			
3	8.0	Soft gray clay w/many sand pockets	32.6	88.1	116.8	530			
4	10.0	Loose gray clayey silt w/sandy silt layers & wood	29.0	----	----	----	32	25	7
5	13.0	Loose gray clayey silt w/roots & trace of sand	27.0	89.6	113.9	995*			
6	18.0	Soft gray clay w/silt lenses & pockets	44.5	74.6	107.8	705			
7	23.0	Soft gray clay w/silt lenses	50.5	69.4	104.4	770	63	20	43
8	28.0	Medium stiff gray clay	63.7	60.4	98.8	1045			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

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SUMMARY OF LABORATORY TEST RESULTS

BORING 40

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
2	2.5	Very compact brown clayey silt w/clay lenses	20.3	103.3	124.3	6670*
3	5.5	Medium stiff gray & tan clay w/silt pockets	46.8	66.7	98.0	1185
4	8.5	Soft gray & tan clay with humus layers	73.8	52.7	91.6	780*
5	11.5	Very soft gray clay with organic clay layers	90.3	46.2	88.0	460
6	14.5	Medium stiff brown organic clay w/roots	181.6	25.6	72.2	1300
8	24.5	Very soft gray clay with silt lenses	68.6	58.4	98.4	430
10	34.5	Soft gray clay	73.3	55.7	96.5	640
14	49.5	Medium stiff tan & gray clay w/sand lenses & shell fragments	58.5	63.6	100.8	1510

BORING 41

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Very compact brown & gray clayey silt w/clay layers	22.8	101.1	122.1	Ø=22°c=655**
2	5.0	Very stiff tan & gray clay w/silt pockets & shells	23.3	----	----	----
3	11.0	Stiff gray clay w/silt pockets & organic matter	30.4	86.0	112.1	2005*
4	14.0	Medium stiff gray clay w/silt lenses, pockets & roots	50.5	----	----	----
5	19.0	Soft gray clay w/roots	53.1	67.5	103.3	645
6	24.0	Soft gray clay w/organic matter & roots	182.0	26.6	75.1	875*
7	29.0	Soft gray clay w/roots	53.5	67.0	102.8	575
8	34.0	Soft gray clay w/silt layers & roots	65.8	60.4	100.1	500

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

**Unconsolidated-Undrained Triaxial Compression Test - Multiple Stage. Ø = Angle of internal friction; c = Cohesion in lb per sq ft.

Fig. 94

EUSTIS ENGINEERING COMPANY
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METAIRIE, LOUISIANA

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Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 42

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Soft brown silty clay	21.9	95.6	116.5	765*
2	5.0	Very soft gray & tan clay w/silt pockets	45.2	69.7	101.2	500
3	8.0	Soft gray & tan clay	43.8	73.9	106.2	825*
4	11.0	Soft gray clay w/silt pockets & roots	48.3	71.2	105.6	830
5	14.0	Soft gray clay w/organic matter	66.2	58.1	96.5	530
6	19.0	Extremely soft gray clay w/roots & organic matter	100.4	45.3	90.8	195
7	24.0	Soft gray clay w/roots	50.2	67.0	100.6	660
8	29.0	Soft gray clay	71.8	56.6	97.3	665
9	34.0	Ditto	68.5	57.7	97.3	660

BORING 43

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Compact brown clayey silt w/clay lenses	17.6	108.3	127.4	Ø=17°c=1600**
2	5.0	Stiff gray & tan clay w/silt lenses & concretions	21.1	----	----	----
3	8.0	Stiff gray silty clay with clay layers & decayed wood	34.9	79.0	106.5	2015*
4	11.0	Medium stiff gray clay with organic matter	36.7	82.6	113.0	1445
5	14.0	Soft gray clay w/silt lenses	59.4	64.0	102.0	575
6	19.0	Medium stiff gray organic clay w/roots	186.2	----	----	----
7	29.0	Very soft gray clay w/silt lenses & shell fragments	55.1	68.6	106.4	345
8	34.0	Very soft gray clay	67.8	58.8	98.7	410

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen.
Confined at the approximate overburden pressure.

**Unconsolidated-Undrained Triaxial Compression Test - Multiple Stage.
Ø = Angle of internal friction;
c = Cohesion in lb per sq ft.

Fig. 95

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METAIRIE, LOUISIANA

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Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 44

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Stiff brown & gray clay w/clayey silt pockets & lenses	23.9	95.4	118.2	2575*			
2	5.0	Medium stiff gray & tan silty clay w/clayey silt layers	39.8	70.6	98.7	1165*			
3	8.0	Soft gray clay with organic matter	53.6	64.7	99.3	760*			
4	11.0	Medium stiff gray clay w/roots	47.1	71.9	105.7	1810*			
5	14.0	Soft gray clay w/organic matter & roots	65.5	58.3	96.5	550			
6	19.0	Soft gray clay w/silt pockets & roots	57.9	63.6	100.4	550			
7	24.0	Soft gray clay w/silt pockets & humus layers	57.9	62.1	98.1	560			
8	29.0	Soft gray clay w/silt lenses	66.0	58.3	96.8	610*	84	22	62
9	34.0	Ditto	67.2	59.5	99.4	920*			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 96

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For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 45

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Compact brown clayey silt	17.9	101.6	119.8	2655*
2	5.0	Medium stiff gray & tan clay w/clayey silt layers & brick fragments	21.6	----	----	----
3	8.0	Stiff gray clay w/silt lenses & decayed wood	38.8	74.7	103.7	2025
4	11.0	Medium stiff gray & tan clay w/silt pockets	35.7	84.8	115.0	1405
5	14.0	Soft gray clay w/organic matter & roots	64.7	59.3	97.7	905
6	19.0	Soft dark brown organic clay w/many roots	153.7	----	----	----
7	24.0	Soft dark gray organic clay w/roots	207.1	23.3	71.6	895
8	29.0	Soft gray clay w/silt lenses	49.9	68.8	70.3	530
9	34.0	Ditto	64.6	61.7	101.5	755
10	39.0	Soft gray clay w/silt pockets	68.4	58.6	98.6	640

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 97

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For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 46

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium stiff brown & gray silty clay w/clayey silt pockets & roots	27.0	93.0	118.2	1415*
2	5.0	Soft gray & tan clay w/silt pockets	40.5	73.8	103.6	975*
3	8.0	Medium stiff gray & tan clay w/silt pockets	44.9	71.2	103.2	1650*
4	11.0	Medium stiff gray clay w/silt pockets & organic matter	106.7	40.4	83.6	1900
5	14.0	Very soft gray clay w/roots & organic matter	114.8	39.7	85.3	470
6	19.0	Soft gray organic clay w/humus layers & roots	192.3	----	----	----
7	24.0	Very soft gray clay with roots & organic matter	64.7	58.4	96.2	355
8	29.0	Soft gray clay w/silt lenses	63.4	61.3	100.2	705

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 98

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 47

Sample No.	Depth in Feet	Classification	Water Content Percent	Denisty Lb/cu ft		Unconfined Compressive Strength Lb/sq ft	Atterberg Limits		
				Dry	Wet		LL	PL	PI
1	2.0	Stiff gray silty clay w/shells, organic matter & cinders	32.3	83.5	110.5	2540*			
2	8.0	Very soft dark brown humus w/roots	282.6	18.0	69.0	375			
3	11.0	Very soft gray clay w/silt pockets & roots	60.3	62.4	100.0	300	58	21	37
4	14.0	Very soft gray clay w/silt pockets & shell fragments	54.6	66.3	102.5	350			
5	18.0	Very soft gray clay	71.4	56.4	96.7	460			
6	23.0	Ditto	68.1	57.1	95.9	255	82	27	55

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 99

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 48

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
2	5.0	Soft gray & tan clay w/sandy silt layers	35.7	78.7	106.8	510*
4	11.0	Medium stiff gray silty clay w/organic matter & roots	33.4	85.3	113.7	1480
5	14.0	Very soft gray clay w/silt pockets & trace of organic matter	67.4	58.1	97.2	425
6	19.0	Soft gray silty clay w/roots & clay layers	37.7	78.2	107.6	885
7	24.0	Very soft gray clay w/roots & silt pockets	58.3	64.6	102.2	390
8	29.0	Soft gray clay w/silt lenses	64.6	60.0	98.8	550
9	34.0	Soft gray clay	67.2	57.8	96.7	540

BORING 49

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium compact gray clayey silt w/clay layers	23.7	99.1	122.6	1685*
2	5.0	Medium stiff dark gray clay w/silt pockets & organic matter	75.3	----	----	----
3	11.0	Very soft gray organic clay w/clay layers & decayed wood	134.3	35.0	82.0	380
4	14.0	Very soft dark brown humus w/roots	249.4	20.8	72.5	315
5	19.0	Very soft gray clay	65.5	60.0	99.2	450
6	24.0	Soft gray clay	69.5	58.1	98.4	635
7	29.0	Ditto	70.9	56.6	96.7	900

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 100

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 50

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
2	5.0	Medium stiff gray & brown clay	46.9	69.3	101.8	1835*
4	11.0	Soft gray clay w/silt pockets	52.3	69.3	105.5	605
5	14.0	Soft gray clay w/silt pockets, organic matter & decayed wood	66.5	59.3	98.7	520
6	19.0	Soft gray organic clay with humus layers & roots	183.4	----	----	----
7	24.0	Ditto	194.7	24.8	73.1	710*
8	29.0	Very soft gray clay w/silt lenses	53.7	66.7	102.5	375
9	34.0	Very soft gray clay	74.5	59.0	103.0	415
10	38.5	Loose gray clayey sand with shells	28.7	90.1	115.9	600*

BORING 51

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium stiff gray silty clay w/shell fragments	17.3	----	----	----
2	5.0	Medium stiff gray clay w/clayey silt layers & lenses	26.6	----	----	----
3	8.0	Very soft gray clay w/many shells	31.2	----	----	----
4	14.0	Very soft gray clay w/silt pockets	41.8	78.9	111.9	320
5	19.0	Ditto	52.3	67.1	102.1	455
6	24.0	Very soft gray clay w/roots	65.5	60.9	100.7	390
7	29.0	Soft gray clay	70.1	58.3	99.2	665

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 101

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 52

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Stiff gray & brown silty clay w/clayey silt layers	20.8	97.3	117.5	3160*			
2	5.0	Soft gray & tan clay w/many silt pockets & brick fragments	35.8	68.1	92.5	820*			
3	8.0	Soft gray & tan silty clay	28.8	85.6	110.2	500*	47	16	31
4	11.0	Medium stiff gray clay w/silt pockets	43.0	76.7	109.7	1120			
5	14.0	Soft gray clay with organic matter & roots	71.3	54.2	92.8	585			
6	19.0	Soft gray organic clay w/humus layers & roots	147.0	30.8	76.0	925			
7	24.0	Very soft gray silty clay w/roots & organic matter	43.9	74.7	107.5	460*	48	22	26
8	29.0	Very soft gray clay w/silt lenses	63.1	61.2	99.8	475			
9	34.0	Soft gray clay	69.6	58.3	98.9	585			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 102

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 53

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Stiff gray & tan clay w/shells & roots	29.6	81.8	106.0	2310*
2	5.0	Medium stiff gray & tan clay w/shells & gravel	24.8	----	----	----
3	8.0	Soft dark gray organic clay w/humus layers & decayed wood	267.7	----	----	----
4	11.0	Very soft dark brown humus w/roots	334.0	15.5	67.5	470
5	14.0	Very soft gray clay w/sand pockets & shell fragments	42.7	77.0	109.9	260
6	19.0	Very soft gray clay w/silt lenses	65.0	61.1	100.8	395
7	24.0	Very soft gray clay	69.2	58.2	98.5	475
8	29.0	Very soft gray clay w/sand pockets	56.1	65.3	102.0	655

BORING 54

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
2	5.0	Stiff gray & tan clay w/glass	30.1	87.6	113.9	2445*
4	11.0	Medium stiff gray clay w/silt pockets	35.6	84.0	113.9	1025
5	14.0	Soft gray clay w/silt pockets & roots	46.0	74.2	108.3	805
6	19.0	Very soft brown & gray organic clay w/roots	174.8	27.9	76.6	490
8	29.0	Soft gray clay w/silt pockets	61.1	62.5	100.7	545
10	39.0	Ditto	65.2	60.1	99.3	715

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 103

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 55

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Medium stiff gray clay w/clayey silt pockets	29.4	93.3	120.7	1385*			
2	5.0	Very soft gray clay w/shells & organic matter	36.4	----	----	----	59	25	34
3	11.0	Very soft dark brown humus w/decayed roots	277.4	18.7	70.5	475*			
4	14.0	Soft gray clay with organic matter & roots	98.1	43.8	86.8	705			
5	18.0	Soft gray clay with silt lenses	68.5	58.9	99.2	475			
6	23.0	Ditto	64.3	61.4	101.0	755	75	24	51
7	32.0	Soft gray clay w/sand pockets & shell fragments	34.0	84.9	113.7	740			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 104

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 56

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
2	5.0	Soft gray & brown clay w/silt pockets	32.4	77.9	103.1	785*			
4	11.0	Soft gray clay w/silt lenses & trace of organic matter	49.2	71.0	106.0	610			
5	14.0	Soft gray silty clay w/shell fragments	34.1	85.3	114.4	665			
7	24.0	Medium stiff gray & black organic clay w/humus layers	243.3	20.3	69.6	1120			
8	29.0	Soft gray clay with silt lenses	55.5	66.3	103.1	590			
10	39.0	Soft gray clay w/silt pockets	65.2	60.2	99.5	630			

BORING 57

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Stiff gray & tan clay w/silt pockets	27.4	93.2	118.7	3540			
2	5.0	Soft gray silty clay w/clay layers & shells	27.2	----	----	----			
3	15.0	Very soft gray clay w/silty clay layers	56.8	65.3	102.4	340			
4	19.0	Very soft gray clay w/silt lenses	62.7	61.6	100.2	395	71	27	44
5	24.0	Soft gray clay with silt lenses	63.6	61.2	100.1	575			
6	29.0	Ditto	63.6	60.0	98.1	755	81	28	53
7	34.0	Ditto	69.0	57.1	96.4	955			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 105

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 58

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
2	5.0	Very stiff gray silty clay w/large clayey silt pockets	18.9	89.2	106.1	7100*
4	11.0	Soft gray & tan clay w/sand pockets & concretions	46.4	72.9	106.8	800
5	14.0	Soft black & gray clay with organic clay layers & pockets	97.6	44.6	88.1	565
6	19.0	Soft brown humus w/roots & wood	337.5	15.2	66.6	620
7	24.0	Very soft gray silty clay w/roots	41.2	76.2	107.7	365
8	29.0	Soft gray clay w/silty sand lenses	68.2	58.2	97.9	625
10	39.0	Soft gray clay w/silty sand pockets	69.6	57.1	96.9	950
11	44.0	Very loose gray clayey sand w/shell fragments	33.3	86.9	115.9	305*
12	49.0	Soft gray clay w/sand pockets	51.6	69.1	104.7	830

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 106

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 59

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium stiff green & tan silty clay w/decayed wood	26.6	94.0	119.0	1145*
2	5.0	Soft gray silty clay w/organic matter	42.2	76.1	108.2	965
3	11.0	Soft dark brown humus w/roots	332.9	----	----	----
4	14.0	Soft dark brown humus with organic clay layers	205.8	22.9	70.1	705
5	19.0	Soft gray clay w/silt pockets	78.3	54.2	96.6	560
6	24.0	Soft gray clay w/silt lenses	69.0	57.4	97.0	620*
7	29.0	Soft gray clay w/silt pockets	71.5	56.1	96.2	705
8	34.0	Soft gray clay w/sand pockets & shell fragments	42.7	75.7	108.0	775

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 107

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 60

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Medium compact gray & tan clayey silt w/clay pockets	24.8	90.8	113.3	1260*			
2	5.0	Medium compact brown & tan clayey silt w/clay layers	22.2	96.8	118.3	1120*			
3	8.0	Medium stiff gray clay w/silt pockets & humus layers	55.7	59.2	92.2	1275*			
4	11.0	Soft gray silty clay w/clayey silt lenses & trace of shells	38.8	81.0	112.5	830*	43	20	23
6	19.0	Very soft dark brown humus w/roots	405.1	12.9	65.2	----			
7	24.0	Very soft gray clay w/silt pockets, lenses & roots	57.5	64.0	100.8	400			
8	29.0	Soft gray clay with silt lenses	62.7	62.1	101.0	730	66	20	46
9	34.0	Soft gray clay	65.0	60.5	99.7	770			
10	39.0	Ditto	67.6	58.2	97.6	645			
11	44.0	Loose gray clayey sand w/clay layers & shell fragments	31.2	87.0	114.1	485*	26	14	12

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 108

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 61

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium stiff gray silty clay w/clayey silt layers	22.6	98.2	120.5	1685*
2	5.0	Very soft gray clay w/organic clay layers & silt pockets	66.4	56.2	93.4	385*
3	14.0	Very soft dark brown humus w/roots	294.7	17.1	67.6	400
4	19.0	Very soft gray clay w/clayey silt layers	50.4	70.0	105.2	450
5	24.0	Very soft gray clay w/silt lenses	59.0	63.5	101.0	475
6	29.0	Soft gray clay w/silt lenses	74.0	54.1	94.1	700*
7	34.0	Soft gray clay w/sand pockets & shell fragments	36.4	80.5	109.8	----

BORING 62

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Stiff brown & gray silty clay w/roots	22.6	98.0	120.1	3770*
3	8.0	Soft gray clay w/roots & organic matter	51.3	59.2	89.6	765*
5	14.0	Medium stiff gray clay with silt pockets, decayed wood & organic matter	51.9	65.5	99.5	1060
6	19.0	Soft black humus	238.5	20.4	69.1	565
7	24.0	Soft gray silty clay	34.7	84.9	114.4	610
9	34.0	Soft gray clay w/silt lenses	63.6	61.2	100.1	520
11	42.0	Very loose gray clayey sand w/shell fragments	30.2	89.9	117.0	355*

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 109

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 63

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	5.0	Soft gray clay w/brick fragments, shells & organic matter	43.4	----	----	----			
2	10.0	Soft gray & black organic clay with humus layers	174.9	28.0	77.0	545			
3	14.0	Soft dark gray organic clay w/humus pockets & decayed wood	147.0	31.8	78.5	695	210	77	133
4	18.0	Very soft gray clay w/shell fragments & trace of organic matter	73.0	56.2	97.1	395			
5	23.0	Soft gray clay	63.7	60.9	99.6	690	78	23	55

BORING 64

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
2	5.0	Stiff brown & gray silty clay w/clayey silt pockets	19.6	99.2	118.6	2950*			
4	11.0	Soft gray clay w/silt pockets	40.4	78.3	110.0	705			
6	18.5	Soft brown humus w/clay layers & wood	246.6	----	----	----			
7	22.0	Extremely soft gray clay w/silt pockets, organic matter & shell fragments	61.2	63.1	101.7	205			
9	33.5	Soft gray clay	65.9	62.1	103.0	765			
11	41.5	Very soft gray clay	71.4	57.2	98.1	335			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 110

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 65

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	3.0	Stiff gray clay w/silt pockets	31.9	89.3	117.8	2540
2	5.0	Soft gray clay w/roots & silt pockets	42.5	78.2	111.5	715
3	8.0	Extremely soft dark brown humus w/roots	294.0	17.9	70.7	175
4	11.0	Very soft gray clay with organic matter	116.5	39.6	85.8	475
5	14.0	Very soft gray clay w/roots & trace of organic matter	74.7	56.0	97.8	325
6	19.0	Very soft gray clay w/sand lenses	68.8	58.2	98.3	400
7	24.0	Soft gray clay w/silt lenses	64.2	61.7	101.3	525
8	29.0	Soft gray clay	74.8	54.7	95.7	740
9	34.0	Soft gray clay w/trace of sand & shell fragments	65.0	59.7	98.5	850

BORING 66

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
2	5.0	Stiff brown & gray clay w/silt pockets	32.1	86.2	113.8	3165
4	11.0	Medium stiff gray clay w/humus layers & silt pockets	44.2	75.7	109.1	1025
6	18.5	Soft gray clay w/organic matter & silt pockets	96.2	43.4	85.2	950
7	23.5	Very soft gray clay with silt pockets & organic matter	73.9	54.7	95.2	335
8	28.5	Very soft gray clay w/sandy silt lenses	59.9	65.2	104.2	470
10	38.5	Soft gray clay	75.7	54.4	95.6	795

Fig. 111

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 67

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
2	8.0	Medium stiff gray silty clay w/organic matter & shells	25.0	----	----	----
3	11.0	Soft gray clay w/silt pockets & trace of organic matter	42.9	79.1	113.0	845
4	14.0	Medium stiff gray clay w/silt pockets & organic matter	39.7	78.7	110.0	1080
5	19.0	Soft gray clay w/silt pockets, humus layers & wood	59.8	62.7	100.2	695
6	24.0	Very soft gray clay w/organic clay layers & roots	59.2	64.8	103.1	355
7	29.0	Soft gray clay w/silt pockets	60.7	63.6	102.2	580
8	34.0	Soft gray clay w/silt lenses	63.0	62.1	101.2	710
9	39.0	Soft gray clay	71.3	57.0	97.6	545
10	44.0	Soft gray clay w/many sand pockets & shell fragments	35.0	82.1	110.9	735

Fig. 112

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 554+00 to Station 670+00
Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

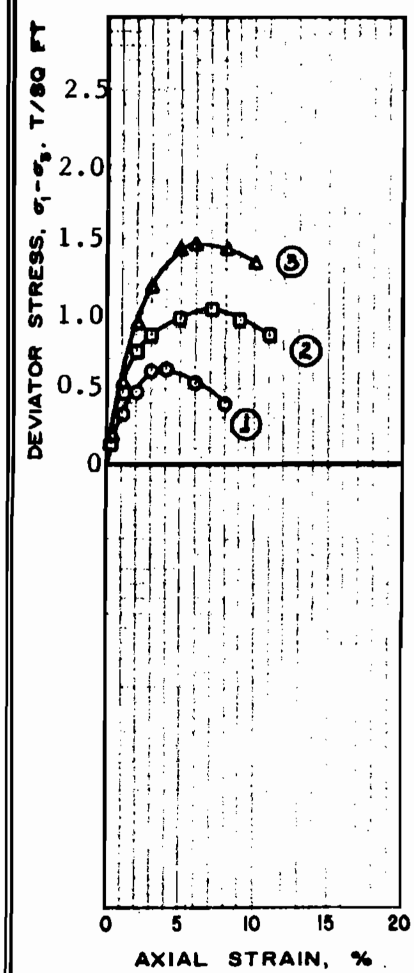
SUMMARY OF LABORATORY TEST RESULTS

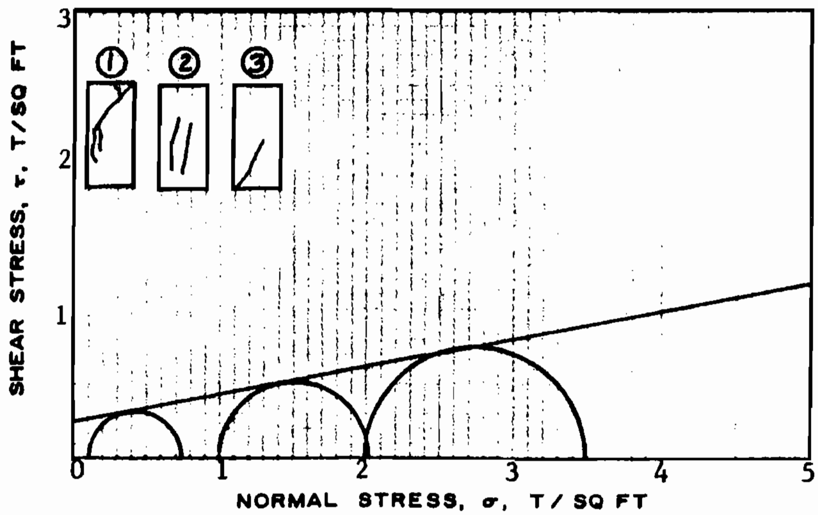
BORING 68

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	2.0	Very stiff brown silty clay w/clayey silt pockets	21.2	104.5	126.7	5150*			
2	5.0	Medium stiff gray & black clay w/humus layers	57.5	58.1	91.6	1400*	96	28	68
3	8.0	Soft gray & tan clay	45.9	71.5	104.4	860*			
4	11.0	Soft gray silty clay w/organic matter, decayed wood & trace of sand	78.5	49.3	88.0	995*			
5	14.0	Medium stiff gray silty clay w/organic matter	45.2	70.4	102.2	1595*	38	18	20
7	24.0	Very soft gray clay w/sandy silt lenses, roots & organic matter	92.0	43.6	83.7	485*			
9	33.0	Soft gray clay w/silt lenses	56.2	65.9	103.0	680	69	17	52
11	42.5	Soft gray clay w/many sand pockets & shells	38.1	79.7	110.1	500*			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 113





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	28.4	36.6	37.5	
	VOID RATIO	e_o	0.887	0.988	1.01	
	SATURATION %	S_o	86	100	100	
	DRY DENSITY, LB/CU FT	γ_d	89.2	84.7	83.7	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	28.4	36.6	37.5	
	VOID RATIO	e_f	0.887	0.988	1.01	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.11	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.62	1.02	1.46	
TIME TO FAILURE, MIN		t_f	4	7	6	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.39	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 10°

TAN ϕ = 0.176

c = 0.253 T/SQ FT

METHOD OF SATURATION ______

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

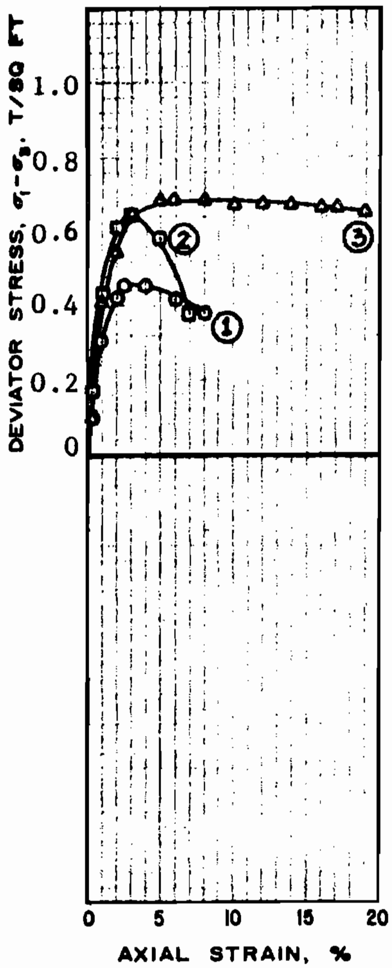
TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed			
CLASSIFICATION Medium stiff gray & tan clay w/thick clayey silt layers				
LL	PL	PI		G_s 2.70

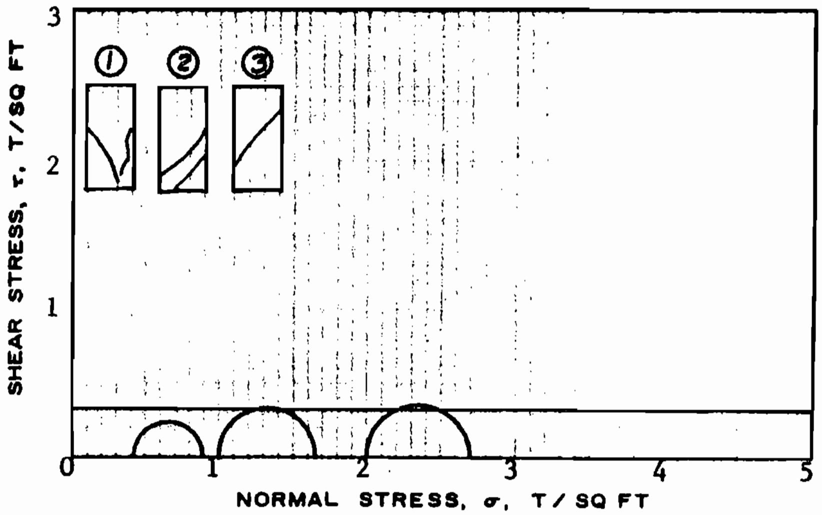
REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans	
Metairie Relief Canal	
AREA Sta. 554+00 to Sta. 670+00	
BORING NO. 4	SAMPLE NO. 1
DEPTH 2.0'	DATE 25 June 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.32 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

				1	2	3	
TEST NO.				1	2	3	
INITIAL	WATER CONTENT %		w_o	56.9	49.9	48.5	
	VOID RATIO		e_o	1.80	1.48	1.46	
	SATURATION %		S_o	85	91	90	
	DRY DENSITY, LB/CU FT		γ_d	60.2	68.0	68.6	
BEFORE SHEAR	WATER CONTENT %		w_c				
	VOID RATIO		e_c				
	SATURATION %		S_c				
	FINAL BACK PRESSURE, T/SQ FT		u_o				
FINAL	WATER CONTENT %		w_f	56.9	49.9	48.5	
	VOID RATIO		e_f	1.80	1.48	1.46	
MINOR PRINCIPAL STRESS, T/SQ FT			σ_3	0.43	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT			$(\sigma_1-\sigma_3)_{max}$	0.45	0.64	0.68	
TIME TO FAILURE, MIN			t_f	2.5	3.0	5.0	
RATE OF STRAIN, PERCENT/MIN				0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT							
ULT DEVIATOR STRESS, T/SQ FT			$(\sigma_1-\sigma_3)_{ult}$	1.40	1.39	1.39	
INITIAL DIAMETER, IN.			D_o	3.00	3.00	3.00	
INITIAL HEIGHT, IN.			H_o				

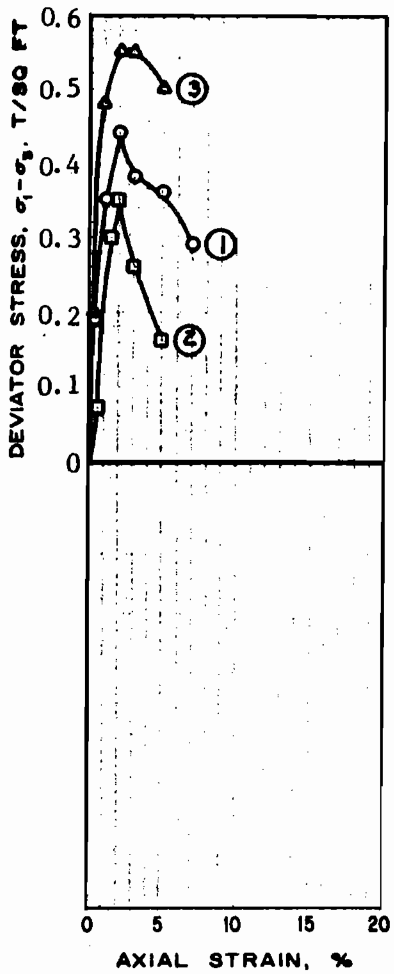
TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed				
CLASSIFICATION Medium stiff gray clay w/trace of organic matter					
LL 104	PL 30	PI 74		G_s 2.70	

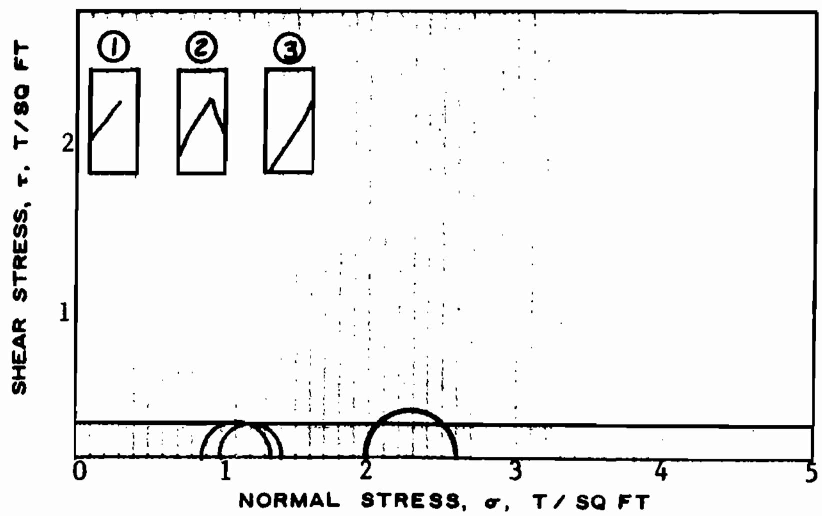
REMARKS Shear values were taken from large scale plot.

PROJECT	Sewerage & Water Board of New Orleans Metairie Relief Canal
AREA	Sta. 554+00 to Sta. 670+00
BORING NO. 4	SAMPLE NO. 4
DEPTH 11.0'	DATE 25 June 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.22 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3
INITIAL	WATER CONTENT %	w_o	66.3	61.3	63.9
	VOID RATIO	e_o	1.88	1.80	1.86
	SATURATION %	S_o	97	93	94
	DRY DENSITY, LB/CU FT	γ_d	59.4	60.9	59.7
BEFORE SHEAR	WATER CONTENT %	w_c			
	VOID RATIO	e_c			
	SATURATION %	S_c			
	FINAL BACK PRESSURE, T/SQ FT	u_o			
FINAL	WATER CONTENT %	w_f	66.3	61.3	63.9
	VOID RATIO	e_f	1.88	1.80	1.86
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.88	1.00	2.00
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.44	0.35	0.55
TIME TO FAILURE, MIN		t_f	2.0	2.0	2.0
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5
EFFECTIVE NORMAL STRESS, T SQ FT					
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$			
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/silt lenses

LL 117 | PL 37 | PI 80 | G_s 2.74

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

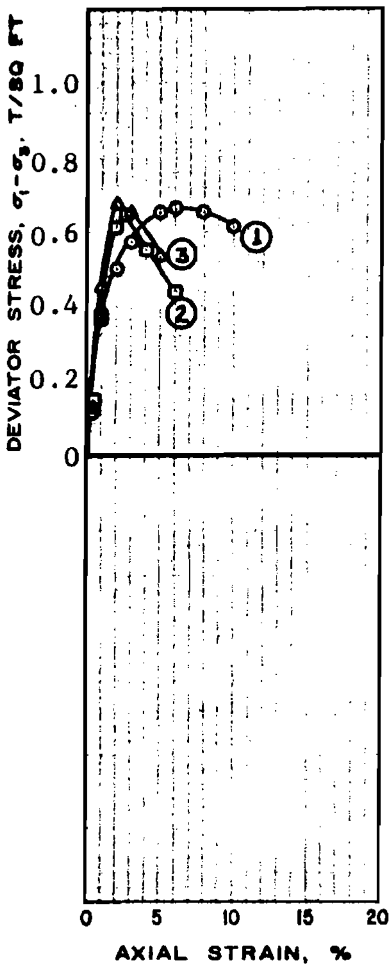
BORING NO. 4 | SAMPLE NO. 7

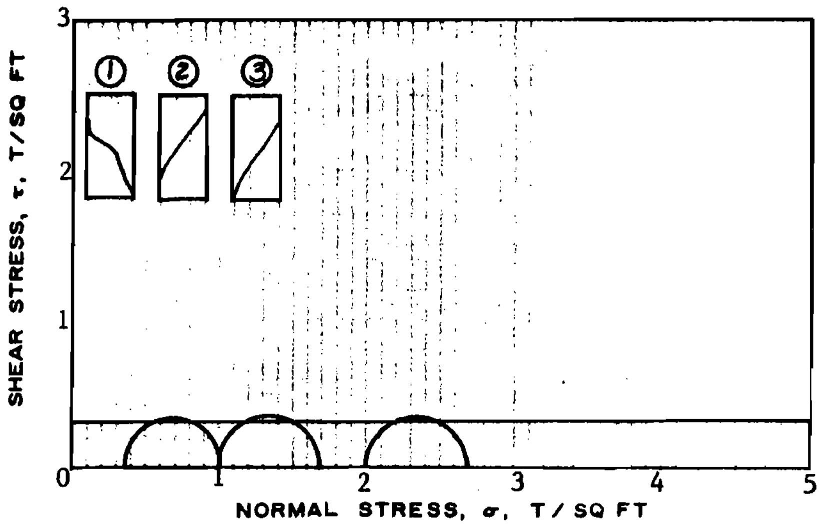
DEPTH 23.0' | DATE 25 June 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 116





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	32.7	39.6	41.0	
	VOID RATIO	e_o	0.923	1.10	1.08	
	SATURATION %	S_o	96	97	100	
	DRY DENSITY, LB/CU FT	γ_d	87.6	80.3	81.0	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	32.7	39.6	41.0	
	VOID RATIO	e_f	0.923	1.10	1.08	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.36	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.66	0.65	0.67	
TIME TO FAILURE, MIN		t_f	6.0	2.5	2.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.39	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.33 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed				
CLASSIFICATION Medium stiff tan & gray clay w/clayey sand layers & pockets					
LL	PL	PI		G_s 2.70	

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

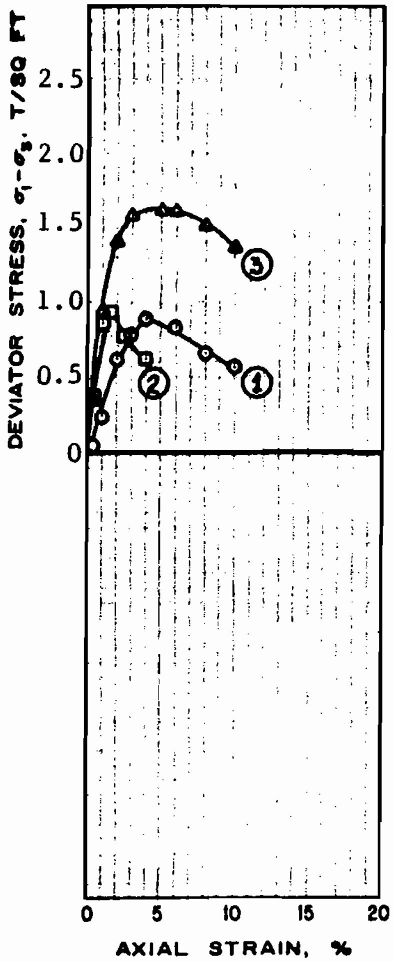
BORING NO. 7 — SAMPLE NO. 3

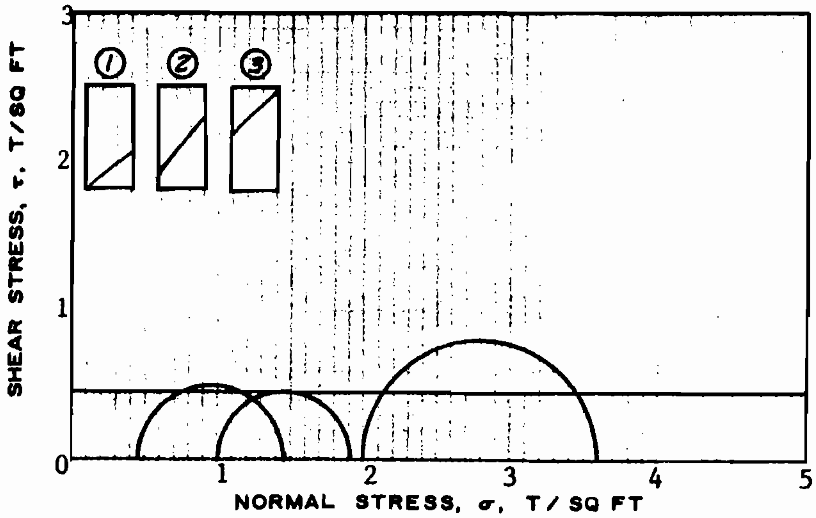
DEPTH 7.5' — DATE 4 June 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 117





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	40.5	39.8	35.3	
	VOID RATIO	e_o	1.15	1.17	0.970	
	SATURATION %	S_o	97	93	100	
	DRY DENSITY, LB/CU FT	γ_d	79.6	78.9	86.8	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	40.5	39.8	35.3	
	VOID RATIO	e_f	1.15	1.17	0.970	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.50	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.89	0.92	1.60	
TIME TO FAILURE, MIN		t_f	5.0	1.5	5.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.42	1.43	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.46 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium stiff gray & tan clay w/silt & concretions

LL 89	PL 24	PI 65		G_s 2.74

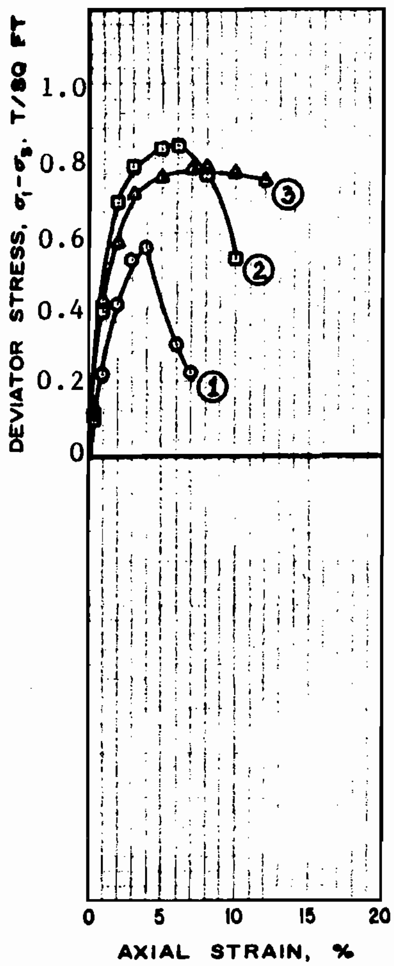
REMARKS Shear values were taken from large scale plot.

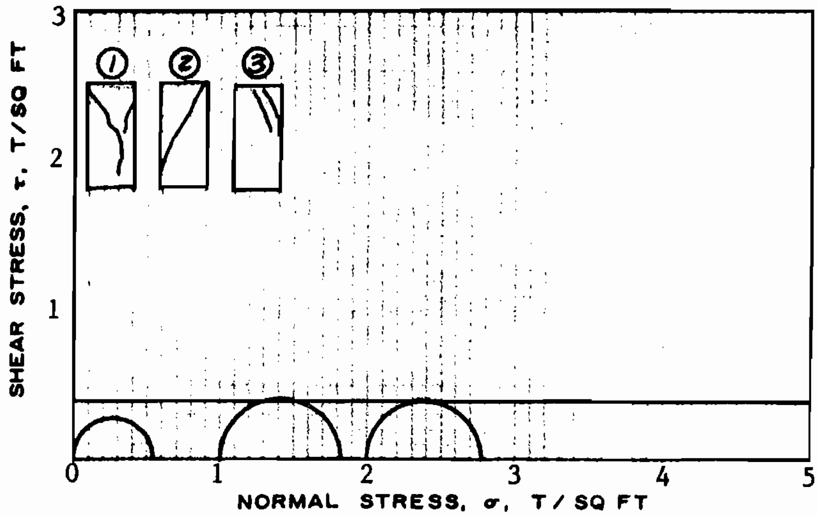
PROJECT	Sewerage & Water Board of New Orleans Metairie Relief Canal
AREA	Stat. 554+00 to Sta. 670+00
BORING NO. 7	SAMPLE NO. 4
DEPTH 10.5'	DATE 4 June 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 118





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.39 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

			TEST NO.	1	2	3	
INITIAL	WATER CONTENT	%	W_o	36.7	38.9	38.3	
	VOID RATIO		e_o	1.05	1.01	1.04	
	SATURATION	%	S_o	94	100	99	
	DRY DENSITY, LB/CU FT		γ_d	82.0	83.9	81.0	
BEFORE SHEAR	WATER CONTENT	%	W_c				
	VOID RATIO		e_c				
	SATURATION	%	S_c				
	FINAL BACK PRESSURE, T/SQ FT		u_o				
FINAL	WATER CONTENT	%	W_f	36.7	38.9	38.3	
	VOID RATIO		e_f	1.05	1.01	1.04	
MINOR PRINCIPAL STRESS, T/SQ FT			σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT			$(\sigma_1-\sigma_3)_{max}$	0.56	0.83	0.77	
TIME TO FAILURE, MIN			t_f	4.0	6.0	7.0	
RATE OF STRAIN, PERCENT/MIN				0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT							
ULT DEVIATOR STRESS, T/SQ FT			$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.			D_o	1.40	1.39	1.39	
INITIAL HEIGHT, IN.			H_o	3.00	3.00	3.00	

TYPE OF TEST: UU	TYPE OF SPECIMEN: Undisturbed
CLASSIFICATION: Medium stiff gray & tan clay w/sand pockets & roots	

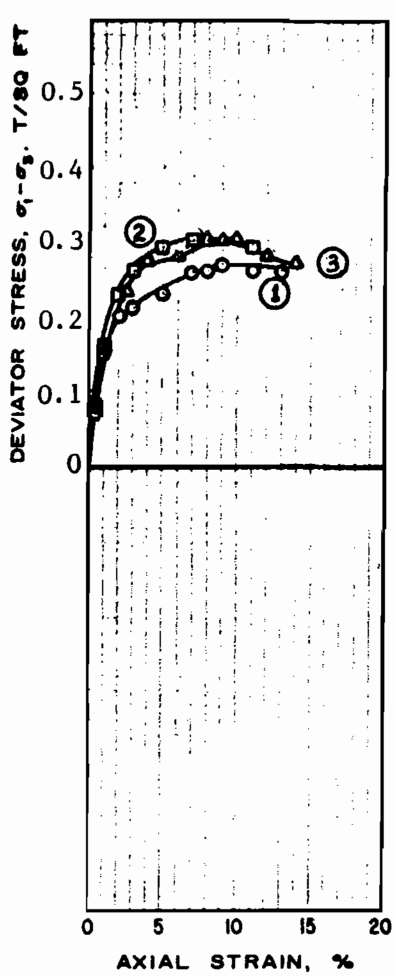
LL 76	PL 19	PI 57		G_s 2.70

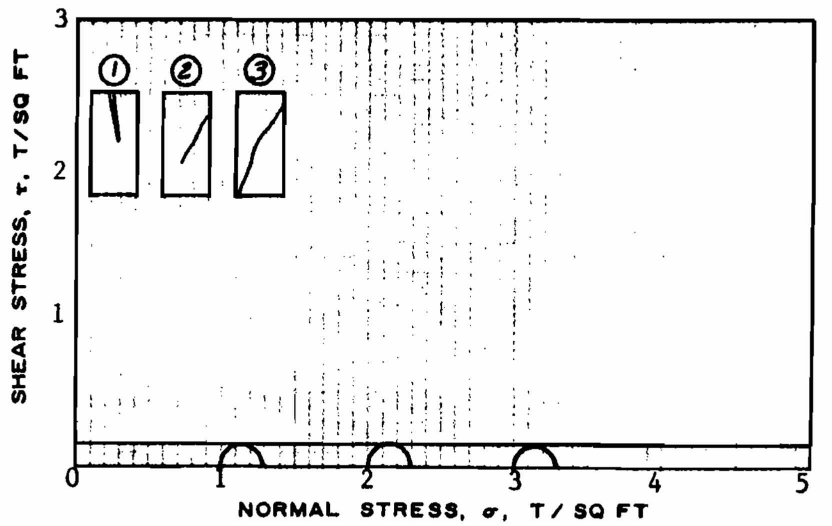
REMARKS: Shear values were taken from large scale plot.

PROJECT: Sewerage & Water Board of New Orleans — Metairie Relief Canal	
AREA: Sta. 554+00 to Sta. 670+00	
BORING NO. 7	SAMPLE NO. 8
DEPTH 19.5'	DATE 4 June 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.15 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	65.8	63.3	58.0	
	VOID RATIO	e_o	1.77	1.78	1.71	
	SATURATION %	S_o	100	96	92	
	DRY DENSITY, LB/CU FT	γ_d	60.9	60.5	62.2	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	65.8	63.3	58.0	
	VOID RATIO	e_f	1.77	1.78	1.71	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.27	0.30	0.31	
TIME TO FAILURE, MIN		t_f	9.0	7.0	10.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.35	1.35	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray & tan clay w/sandy silt lenses, pockets & trace of organic matter

LL | PL | PI | | G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

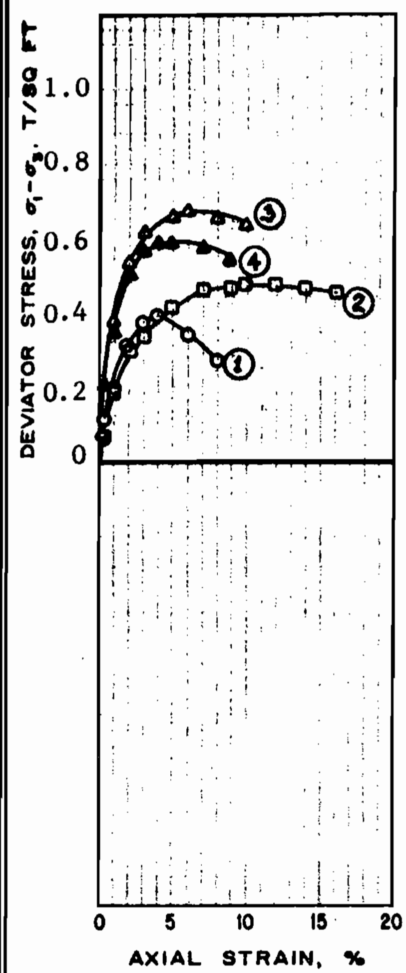
AREA Sta. 554+00 to Sta. 670+00

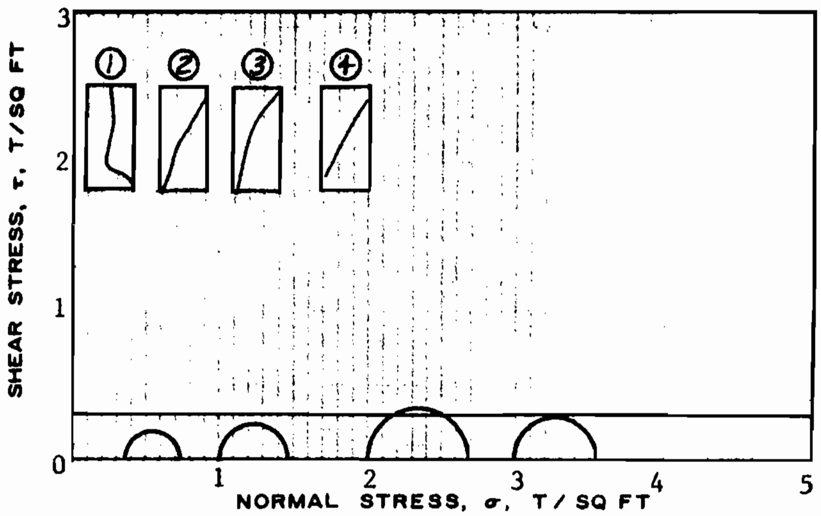
BORING NO. 12 | SAMPLE NO. 2

DEPTH 5.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.30 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	4
INITIAL	WATER CONTENT %	w_o	50.3	57.8	49.5	45.2
	VOID RATIO	e_o	1.57	1.68	1.44	1.55
	SATURATION %	S_o	87	93	93	79
	DRY DENSITY, LB/CU FT	γ_d	65.6	62.9	69.1	66.1
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	50.3	57.8	49.5	45.2
	VOID RATIO	e_f	1.57	1.68	1.44	1.55
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.36	1.0	2.0	3.0
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.39	0.47	0.67	0.58
TIME TO FAILURE, MIN		t_f	4.0	12.0	6.0	5.0
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	0.5
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.39	1.39	1.40
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	3.00

TYPE OF TEST UU

TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium stiff dark gray clay w/trace of organic matter

LL

PL

PI

G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

BORING NO. 12

SAMPLE NO. 3

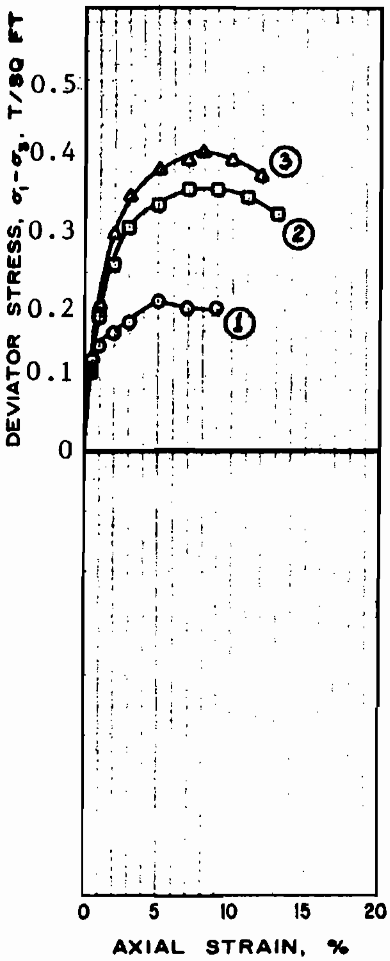
DEPTH 8.0'

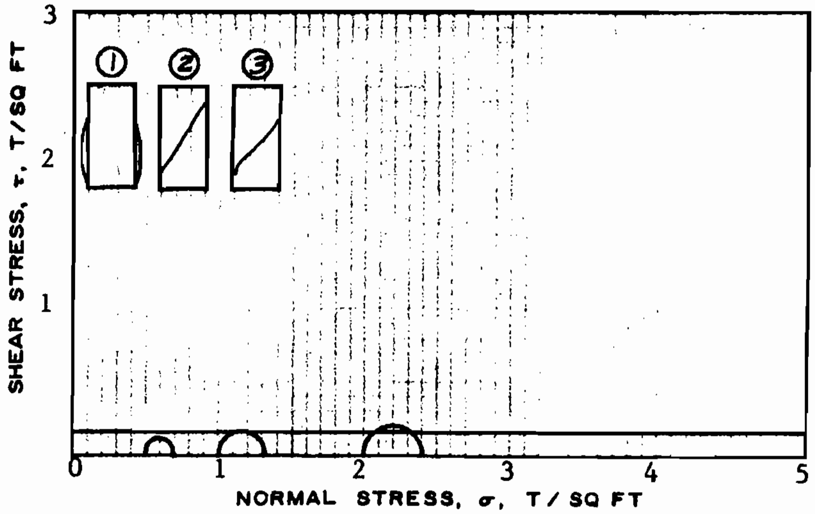
DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 121





			1	2	3	
INITIAL	WATER CONTENT %	w_o	45.3	56.2	58.9	
INITIAL	VOID RATIO	e_o	1.35	1.56	1.64	
INITIAL	SATURATION %	S_o	90	98	97	
INITIAL	DRY DENSITY, LB/CU FT	γ_d	71.6	65.9	63.9	
BEFORE SHEAR	WATER CONTENT %	w_c				
BEFORE SHEAR	VOID RATIO	e_c				
BEFORE SHEAR	SATURATION %	S_c				
BEFORE SHEAR	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	45.3	56.2	58.9	
FINAL	VOID RATIO	e_f	1.35	1.56	1.64	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.20	0.35	0.40	
TIME TO FAILURE, MIN		t_f	5.0	9.0	8.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.39	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ = ______

c = 0.18 T/SQ FT

METHOD OF SATURATION ______

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU

TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/sand layers

LL | PL | PI | | G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

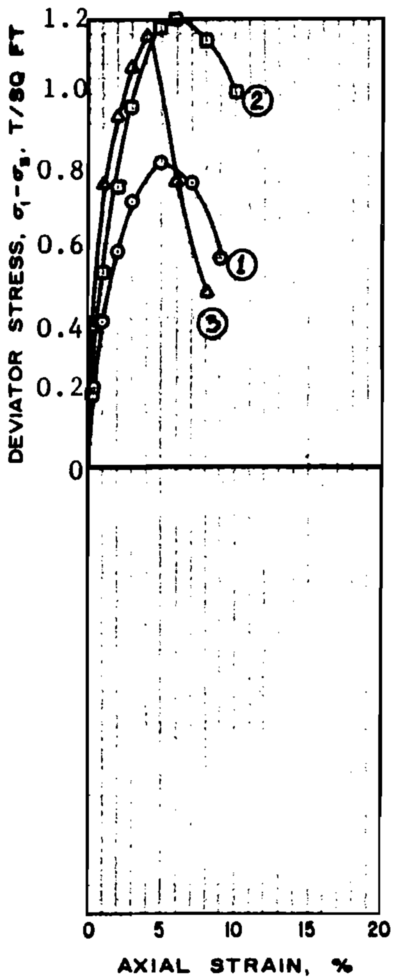
BORING NO. 12 | SAMPLE NO. 4

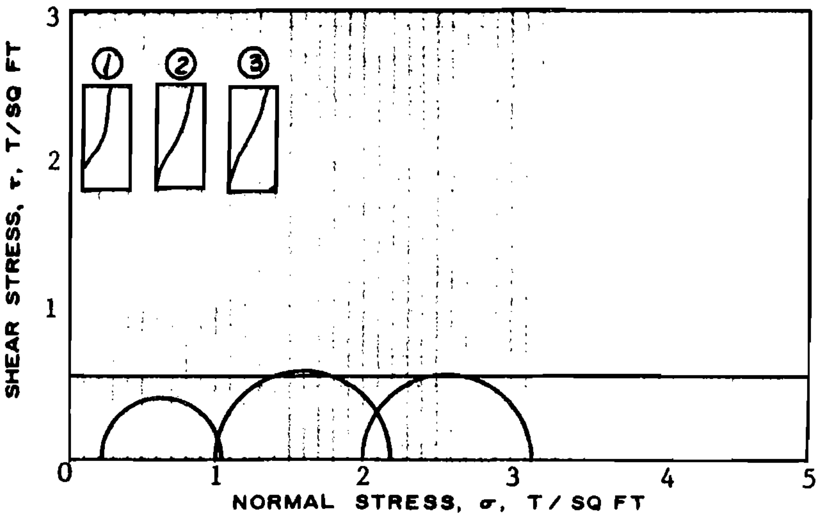
DEPTH 14.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 122





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	22.9	22.6	21.7	
	VOID RATIO	e_o	0.750	0.754	0.782	
	SATURATION %	S_o	82	81	75	
	DRY DENSITY, LB/CU FT	γ_d	96.3	96.1	94.0	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	22.9	22.6	21.7	
	VOID RATIO	e_f	0.750	0.754	0.782	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.22	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.81	1.20	1.15	
TIME TO FAILURE, MIN		t_f	5.0	6.0	4.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.58 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed				
CLASSIFICATION Medium stiff brown & gray clay w/sandy silt layers, lenses, shells & brick					
LL	PL	PI		G_s 2.74	

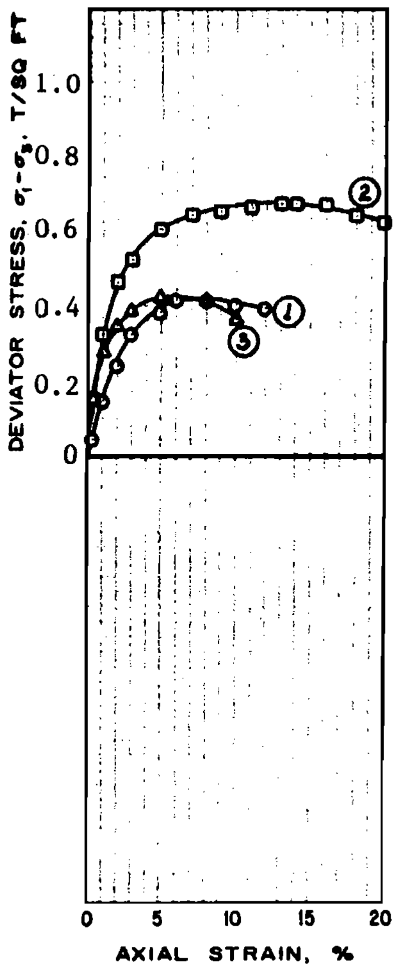
REMARKS Shear values were taken from large scale plot.

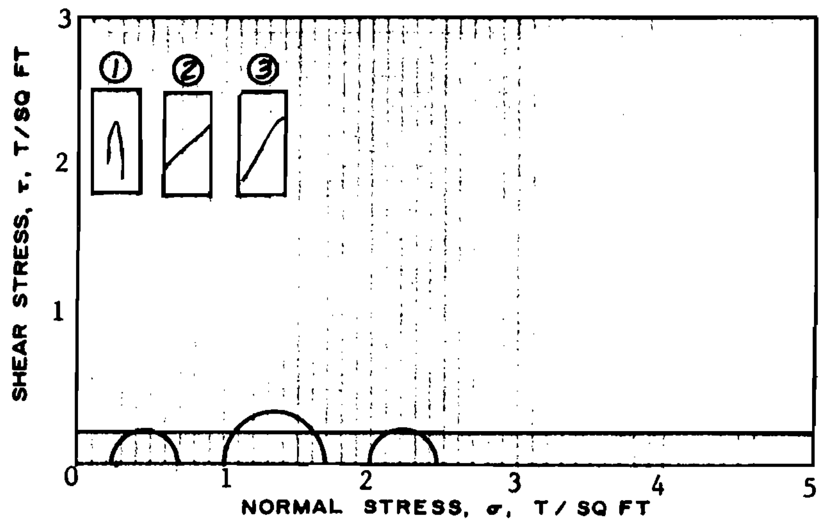
PROJECT Sewerage & Water Board of New Orleans Metairie Relief Canal	
AREA Sta. 554+00 to Sta. 670+00	
BORING NO. 15	SAMPLE NO. 2
DEPTH 4.5'	DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 123





				1	2	3	
TEST NO.				1	2	3	
INITIAL	WATER CONTENT	%	W_o	36.2	28.6	31.4	
	VOID RATIO		e_o	1.10	1.03	1.04	
	SATURATION	%	S_o	88	75	82	
	DRY DENSITY, LB/CU FT		γ_d	80.1	82.9	82.6	
BEFORE SHEAR	WATER CONTENT	%	W_c				
	VOID RATIO		e_c				
	SATURATION	%	S_c				
	FINAL BACK PRESSURE, T/SQ FT		u_o				
FINAL	WATER CONTENT	%	W_f	36.2	28.6	31.4	
	VOID RATIO		e_f	1.10	1.03	1.04	
MINOR PRINCIPAL STRESS, T/SQ FT			σ_3	0.25	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT			$(\sigma_1 - \sigma_3)_{max}$	0.41	0.67	0.42	
TIME TO FAILURE, MIN			t_f	8.0	16.0	6.0	
RATE OF STRAIN, PERCENT/MIN				0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT							
ULT DEVIATOR STRESS, T/SQ FT			$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.			D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.			H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.21 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed		
CLASSIFICATION Soft gray & tan clay w/sand layers & pockets			
LL 63	PL 21	PI 42	G_s 2.70

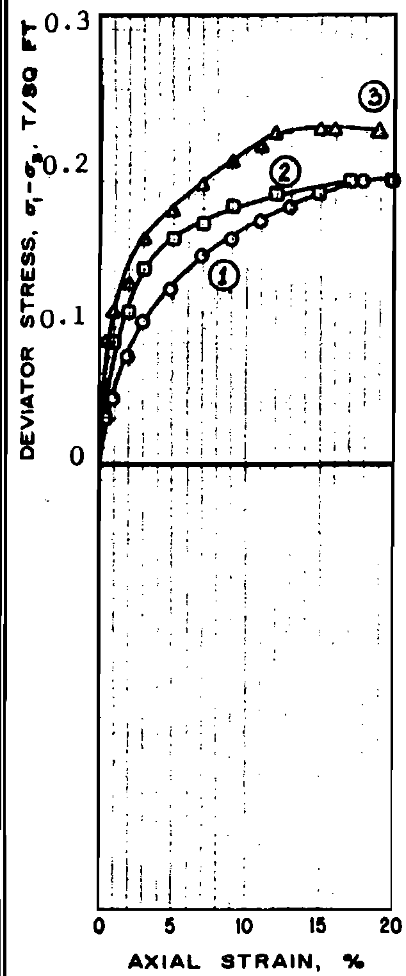
REMARKS Shear values were taken from large scale plot.

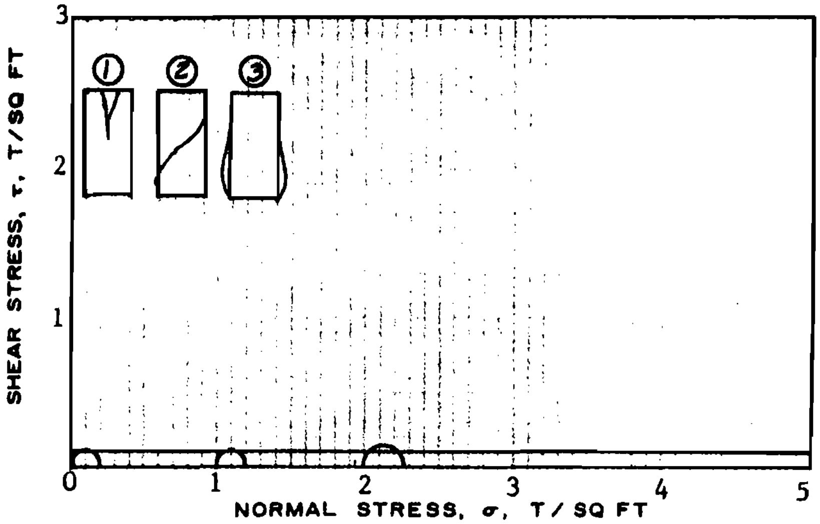
PROJECT Sewerage & water Board of New Orleans Metairie Relief Canal	
AREA Sta. 554+00 to Sta. 670+00	
BORING NO. 20	SAMPLE NO. 2
DEPTH 5.0'	DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 124





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	49.6	47.3	47.8	
	VOID RATIO	e_o	1.41	1.29	1.37	
	SATURATION %	S_o	95	99	94	
	DRY DENSITY, LB/CU FT	γ_d	69.8	73.6	71.1	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	49.6	47.3	47.8	
	VOID RATIO	e_f	1.41	1.29	1.37	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.19	0.20	0.23	
TIME TO FAILURE, MIN		t_f	18.0	18.0	18.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.11 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed				
CLASSIFICATION Very soft gray clay w/silt pockets & trace of organic matter					
LL 60	PL 22	PI 38		G_s 2.70	

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

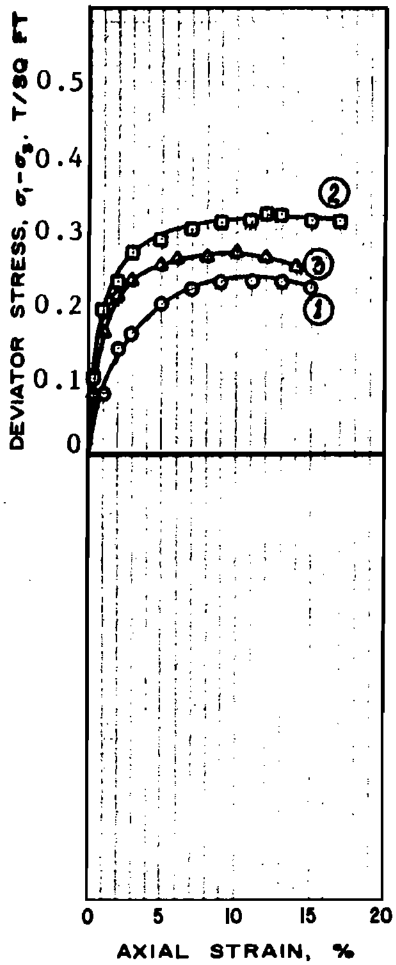
BORING NO. 20 SAMPLE NO. 5

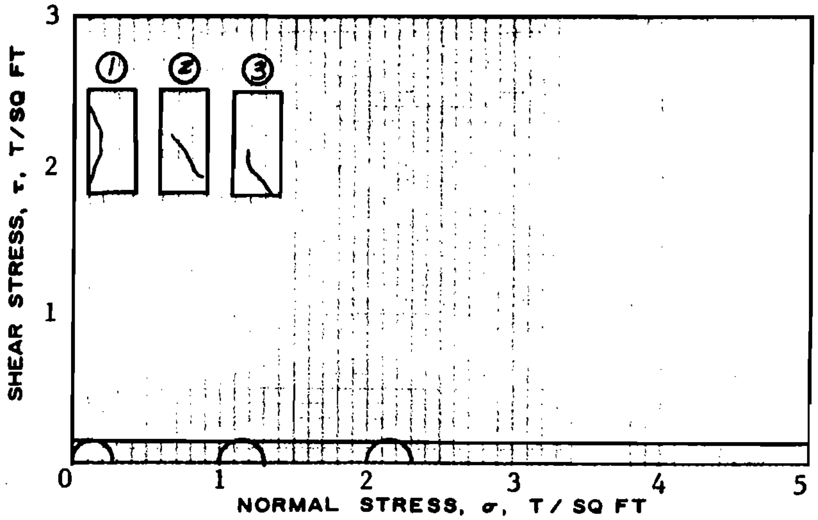
DEPTH 14.0' DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 125





			1	2	3	
TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	86.5	88.4	92.8	
INITIAL	VOID RATIO	e_o	2.46	2.32	2.45	
INITIAL	SATURATION %	S_o	93	100	100	
INITIAL	DRY DENSITY, LB/CU FT	γ_d	47.7	49.9	47.9	
BEFORE SHEAR	WATER CONTENT %	w_c				
BEFORE SHEAR	VOID RATIO	e_c				
BEFORE SHEAR	SATURATION %	S_c				
BEFORE SHEAR	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	86.5	88.4	92.8	
FINAL	VOID RATIO	e_f	2.46	2.32	2.45	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.23	0.32	0.27	
TIME TO FAILURE, MIN		t_f	11.0	13.0	10.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.39	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.14 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU

TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/many roots

LL PL PI G_s 2.65

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

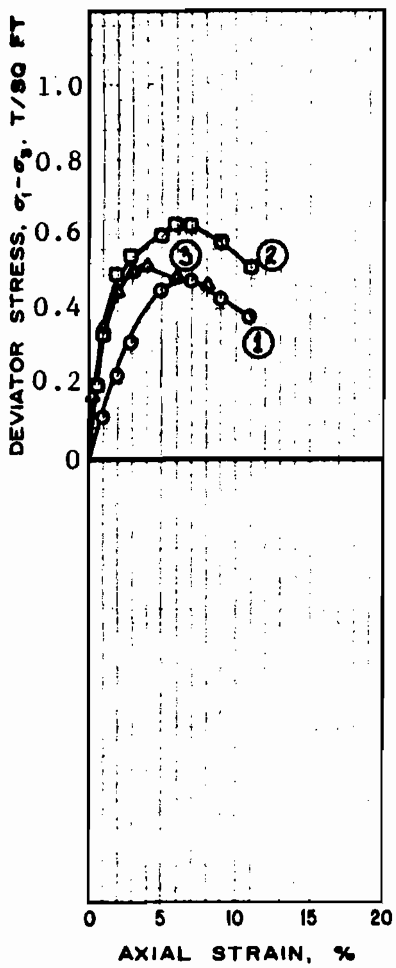
BORING NO. 23 SAMPLE NO. 3

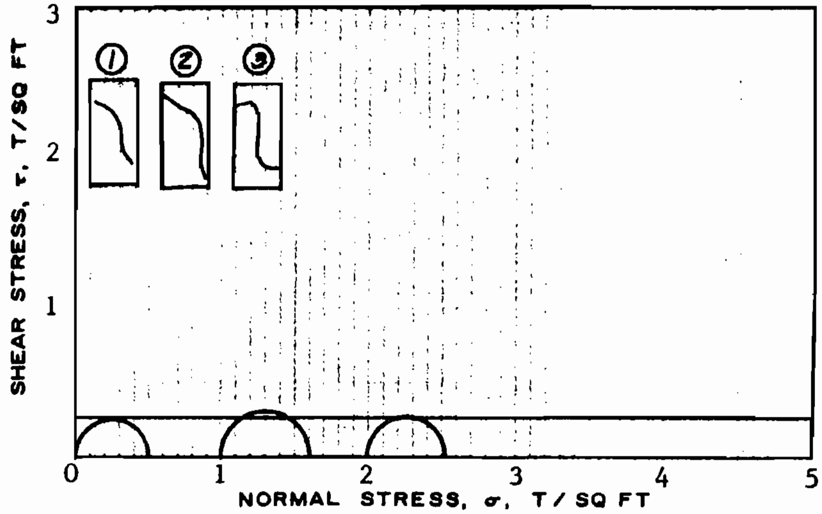
DEPTH 7.5' DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 126





TEST NO.				1	2	3	
INITIAL	WATER CONTENT	%	w_o	30.9	28.6	39.2	
	VOID RATIO		e_o	0.991	0.909	1.30	
	SATURATION	%	S_o	84	85	81	
	DRY DENSITY, LB/CU FT		γ_d	84.6	88.2	73.2	
BEFORE SHEAR	WATER CONTENT	%	w_c				
	VOID RATIO		e_c				
	SATURATION	%	S_c				
	FINAL BACK PRESSURE, T/SQ FT		u_o				
FINAL	WATER CONTENT	%	w_f	30.9	28.6	39.2	
	VOID RATIO		e_f	0.991	0.909	1.30	
MINOR PRINCIPAL STRESS, T/SQ FT			σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT			$(\sigma_1 - \sigma_3)_{max}$	0.48	0.48	0.51	
TIME TO FAILURE, MIN			t_f	7.0	6.0	4.0	
RATE OF STRAIN, PERCENT/MIN				0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT							
ULT DEVIATOR STRESS, T/SQ FT			$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.			D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.			H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.26 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium stiff gray & tan clay w/sand pockets & trace of organic matter

LL 58 | PL 18 | PI 40 | G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

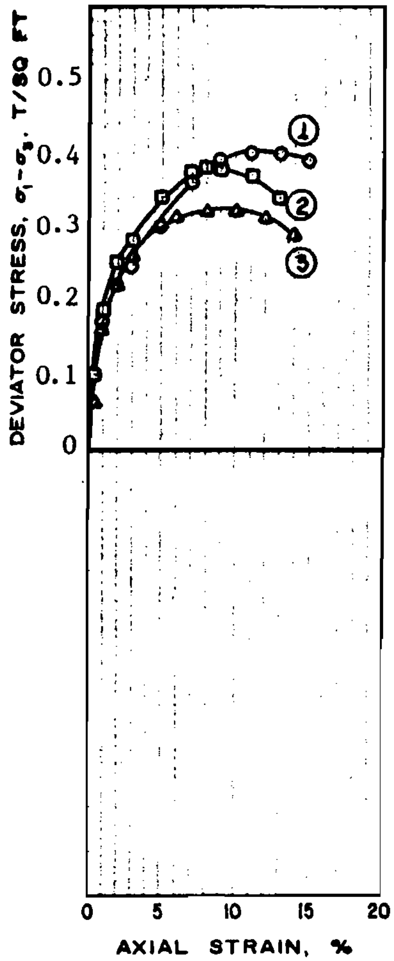
BORING NO. 28 | SAMPLE NO. 3

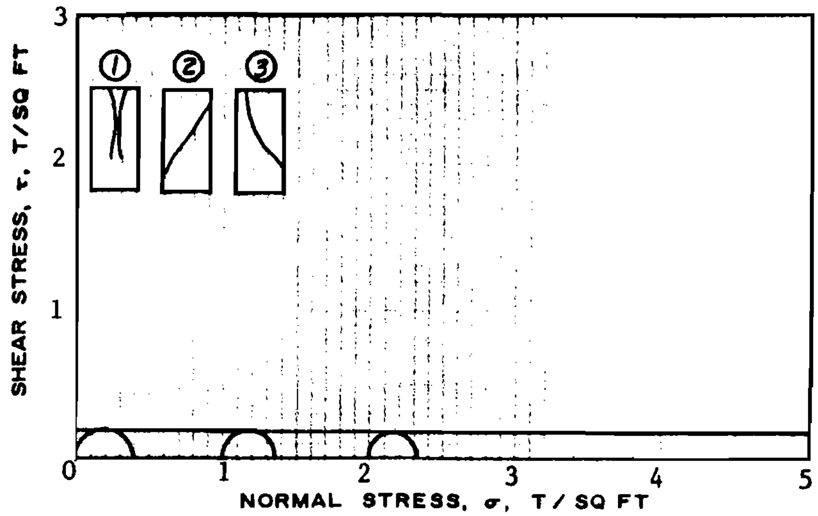
DEPTH 8.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 127





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	64.9	65.0	64.0	
	VOID RATIO	e_o	1.79	1.83	1.78	
	SATURATION %	S_o	98	96	97	
	DRY DENSITY, LB/CU FT	γ_d	60.4	59.5	60.4	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	64.9	65.0	64.0	
	VOID RATIO	e_f	1.79	1.83	1.78	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.40	0.38	0.32	
TIME TO FAILURE, MIN		t_f	11.0	8.0	8.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.19 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed				
CLASSIFICATION Soft gray clay w/roots & trace of organic matter					
LL 83	PL 24	PI 59		G_s 2.70	

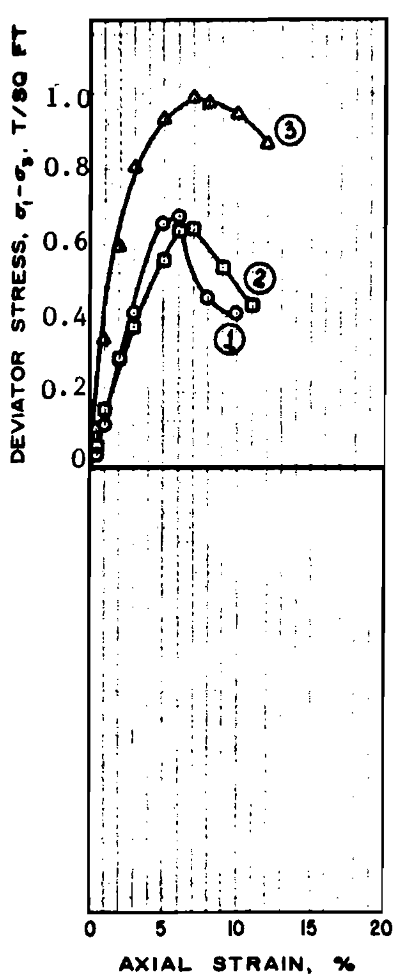
REMARKS Shear values were taken from large scale plot.

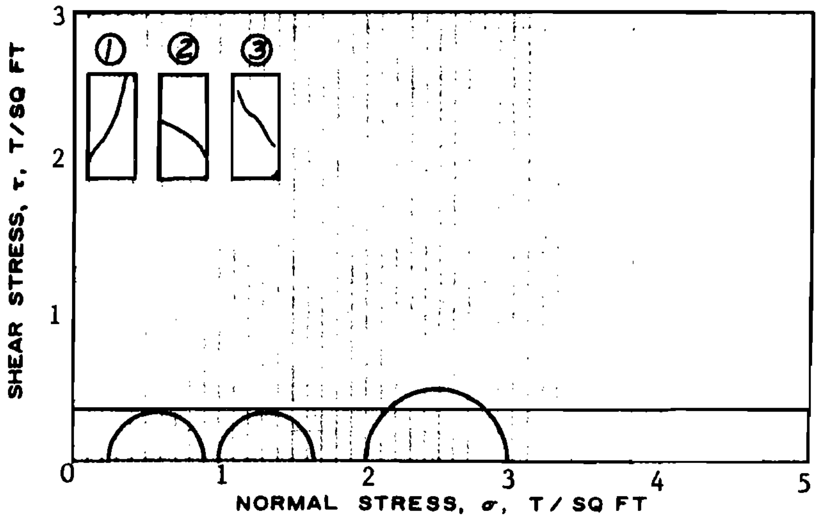
PROJECT	Sewerage & water Board of New Orleans Metairie Relief Canal		
AREA	Sta. 554+00 to Sta. 670+00		
BORING NO.	28	SAMPLE NO.	5
DEPTH	18.0'	DATE	20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 128





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	181.1	166.0	155.5	
	VOID RATIO	e_o	5.86	5.60	5.02	
	SATURATION %	S_o	80	77	81	
	DRY DENSITY, LB/CU FT	γ_d	23.7	24.6	27.0	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	181.1	166.0	155.0	
	VOID RATIO	e_f	5.86	5.60	5.02	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.25	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.67	0.63	0.98	
TIME TO FAILURE, MIN		t_f	6.0	6.0	7.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.34 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium stiff dark gray, black & brown organic clay w/humus layers & roots

LL 229 | PL 132 | PI 97 | | G_s 2.60

REMARKS Shear vlaues were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

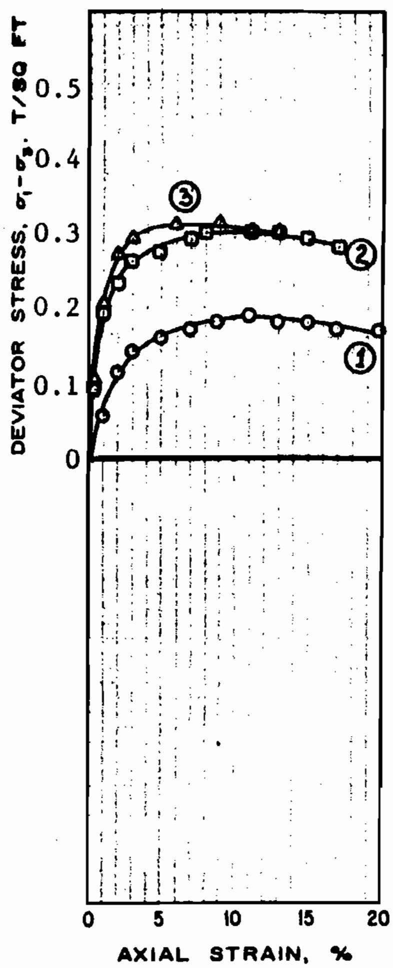
BORING NO. 31 | SAMPLE NO. 2

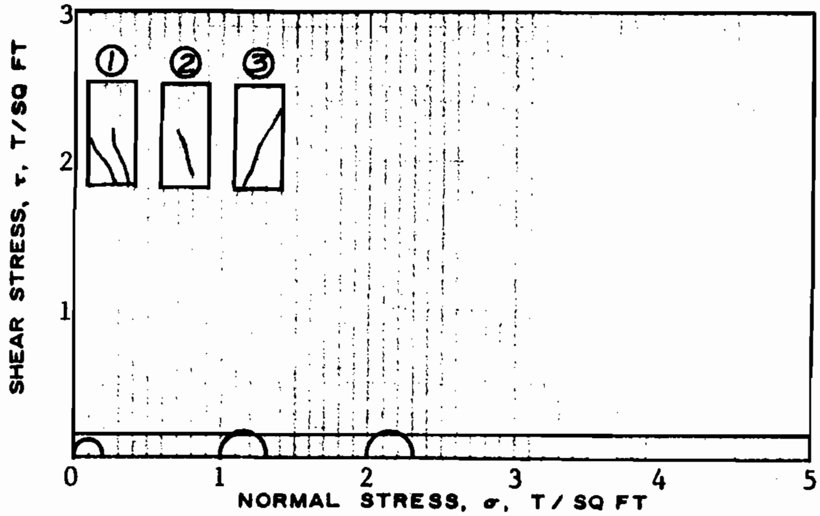
DEPTH 5.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 129





			1	2	3	
TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	80.1	82.4	75.9	
	VOID RATIO	e_o	2.24	2.11	1.95	
	SATURATION %	S_o	95	100	100	
	DRY DENSITY, LB/CU FT	γ_d	51.0	53.1	56.0	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	80.1	82.4	75.9	
	VOID RATIO	e_f	2.24	2.11	1.95	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.19	0.30	0.31	
TIME TO FAILURE, MIN		t_f	11.0	8.0	9.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.39	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.15 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/roots & organic matter

LL	PL	PI		G_s 2.65

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta.554+00 to Sta. 670+00

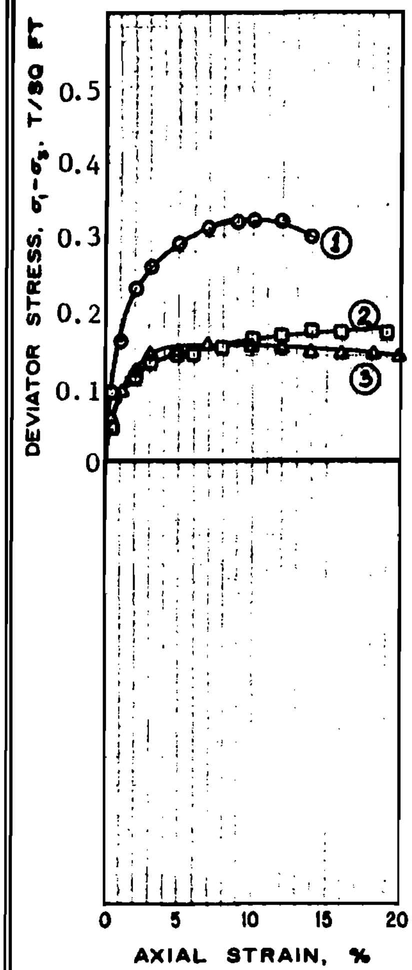
BORING NO. 31 | SAMPLE NO. 3

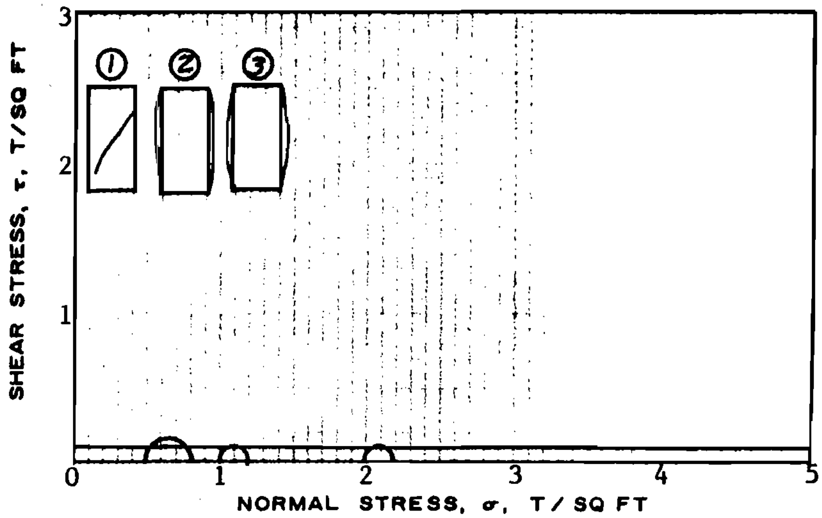
DEPTH 8.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 130





SHEAR STRENGTH PARAMETERS

ϕ =

TAN ϕ =

c = 0.09 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	56.9	80.5	87.4	
	VOID RATIO	e_o	1.55	2.27	2.52	
	SATURATION %	S_o	99	96	94	
	DRY DENSITY, LB/CU FT	γ_d	65.2	51.4	47.9	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	56.9	80.5	87.4	
	VOID RATIO	e_f	1.55	2.27	2.52	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.32	0.17	0.15	
TIME TO FAILURE, MIN		t_f	10.0	14.0	7.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed		
CLASSIFICATION Very soft dark gray clay w/humus & roots			
LL 89	PL 26	PI 63	G_s 2.70

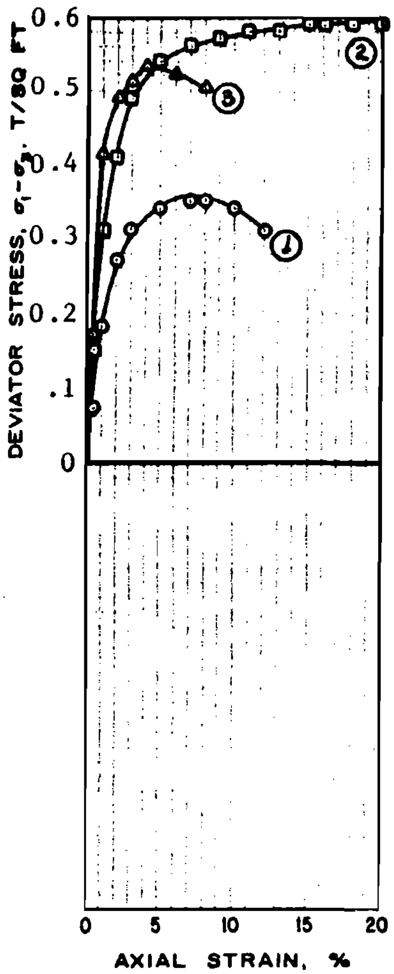
REMARKS Shear values were taken from large scale plot.

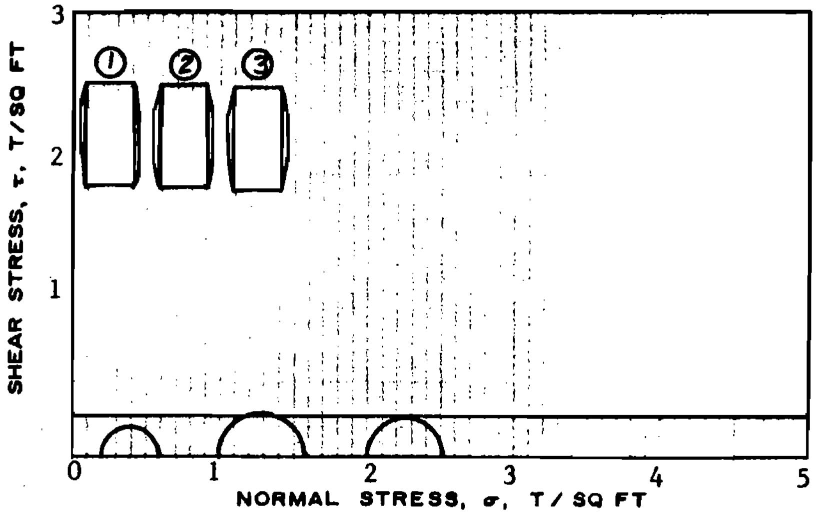
PROJECT Sewerage & Water Board of New Orleans	
Metairie Relief Canal	
AREA Sta. 554+00 to Sta. 670+00	
BORING NO. 31	SAMPLE NO. 4
DEPTH 14.0'	DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 131





			1	2	3	
TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	43.8	48.9	46.8	
	VOID RATIO	e_o	1.45	1.57	1.63	
	SATURATION %	S_o	83	85	79	
	DRY DENSITY, LB/CU FT	γ_d	69.6	66.3	65.1	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	43.8	48.9	46.8	
	VOID RATIO	e_f	1.45	1.57	1.63	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.22	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.35	0.59	0.53	
TIME TO FAILURE, MIN		t_f	8.0	15.0	4.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.27 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed			
CLASSIFICATION Medium stiff gray & tan clay w/silt & trace of organic matter				
LL	PL	PI		G_s 2.74

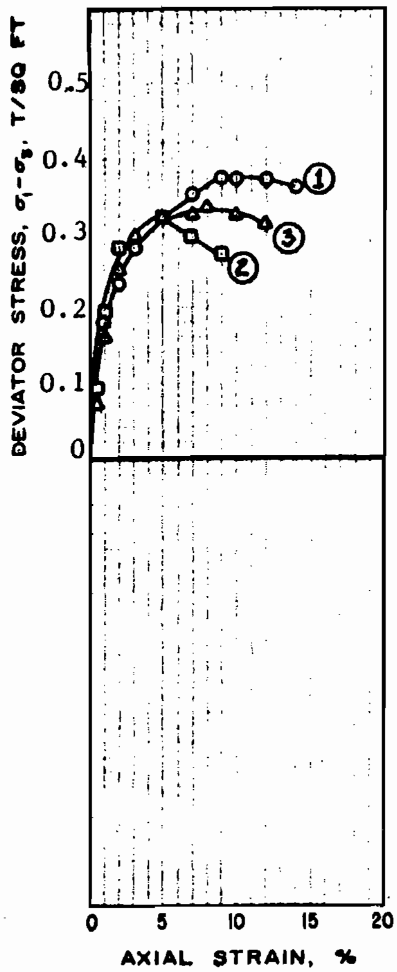
REMARKS Shear values were taken from large scale plot.

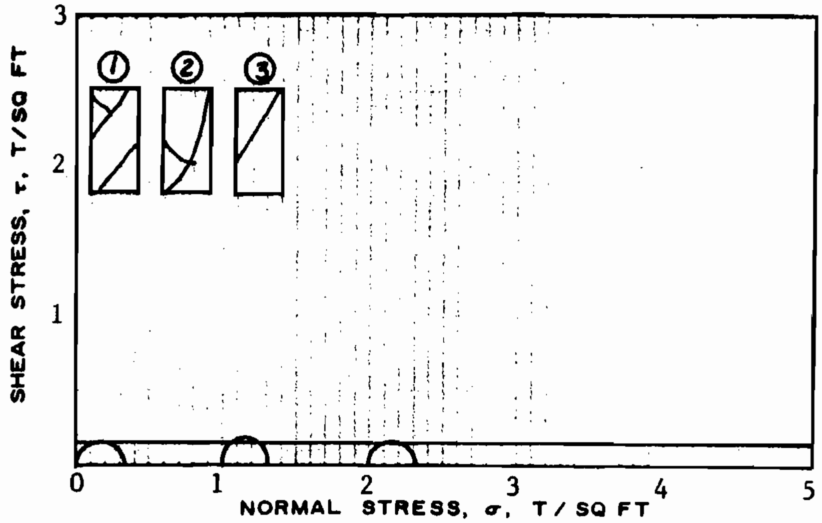
PROJECT Sewerage & Water Board of New Orleans	
Metairie Relief Canal	
AREA Sta. 554+00 to Sta. 670+00	
BORING NO. 36	SAMPLE NO. 2
DEPTH 5.0'	DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 132





			1	2	3	
TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	69.2	73.9	68.9	
	VOID RATIO	e_o	1.92	2.06	1.89	
	SATURATION %	S_o	97	97	99	
	DRY DENSITY, LB/CU FT	γ_d	57.7	55.1	58.3	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	69.2	73.9	68.9	
	VOID RATIO	e_f	1.92	2.06	1.89	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.37	0.32	0.33	
TIME TO FAILURE, MIN		t_f	10.0	5.0	8.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.17 T/SQ FT

METHOD OF SATURATION

CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/organic clay layers

LL 102 | PL 27 | PI 75 | G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

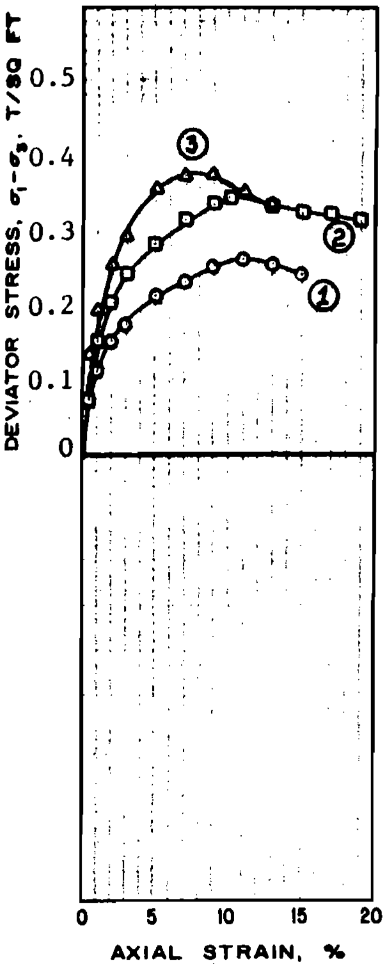
BORING NO. 36 | SAMPLE NO. 4

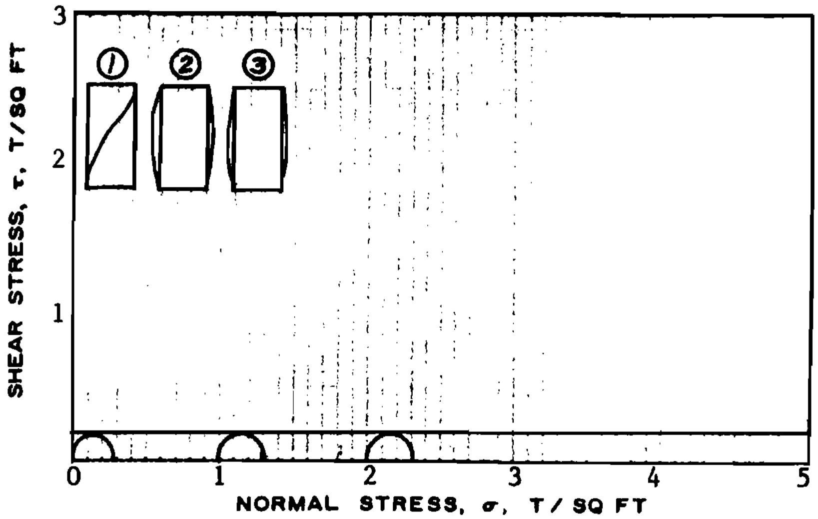
DEPTH 11.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 133





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.17 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	54.9	52.3	51.3	
	VOID RATIO	e_o	1.57	1.49	1.46	
	SATURATION %	S_o	96	97	96	
	DRY DENSITY, LB/CU FT	γ_d	66.6	68.6	69.4	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	54.9	52.3	51.3	
	VOID RATIO	e_f	1.57	1.49	1.46	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.26	0.34	0.37	
TIME TO FAILURE, MIN		t_f	11.0	10.0	7.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed		
CLASSIFICATION Soft gray clay w/shell fragments			
LL	PL	PI	G_s 2.74

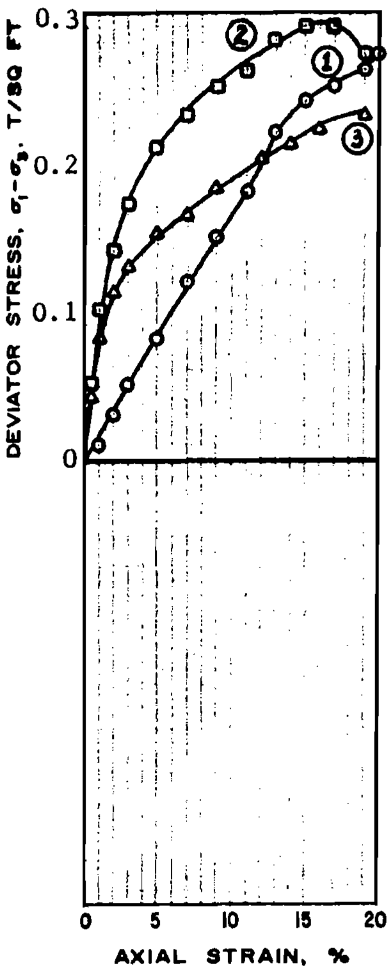
REMARKS Shear values were taken from large scale plot.

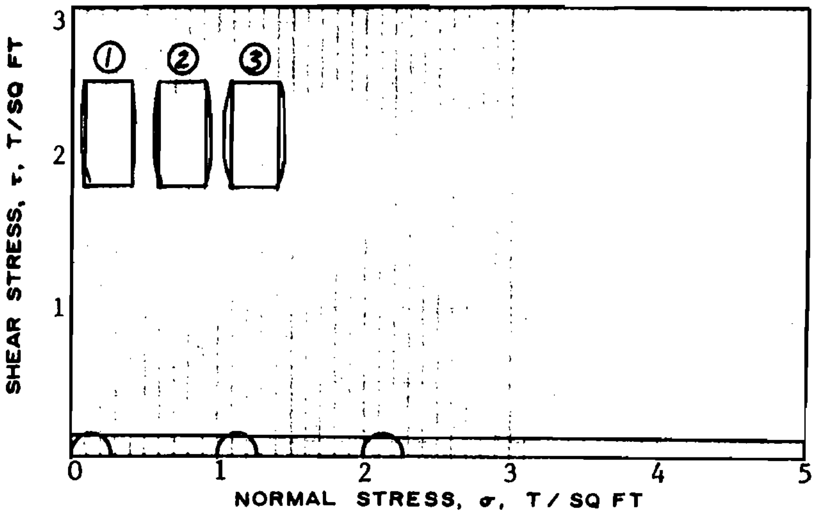
PROJECT	Sewerage & Water Board of New Orleans Metairie Relief Canal		
AREA	Sta. 554+00 to Sta. 670+00		
BORING NO.	36	SAMPLE NO.	7
DEPTH	24.0'	DATE	20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 134





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	32.6	33.8	35.5	
	VOID RATIO	e_o	0.912	0.939	0.998	
	SATURATION %	S_o	96	97	96	
	DRY DENSITY, LB/CU FT	γ_d	88.1	86.8	84.3	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	32.6	33.8	35.5	
	VOID RATIO	e_f	0.912	0.939	0.998	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.27	0.29	0.23	
TIME TO FAILURE, MIN		t_f	20.0	15.0	19.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.13 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/clayey silt layers & roots

LL | PL | PI | | G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

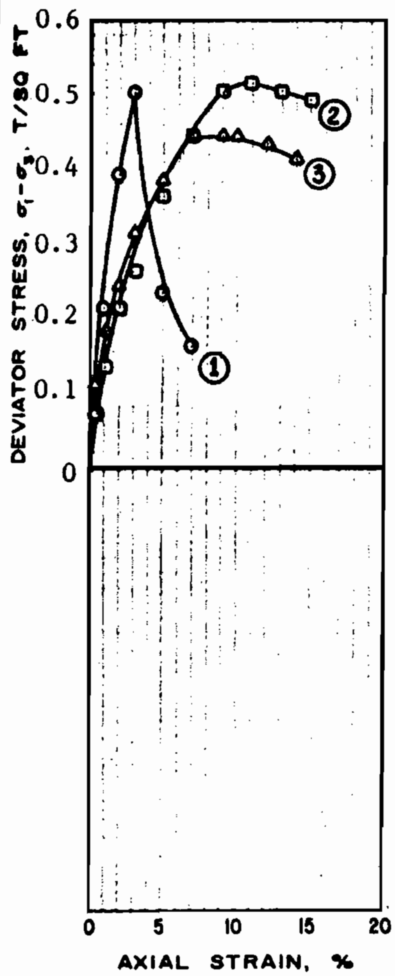
BORING NO. 39 | SAMPLE NO. 3

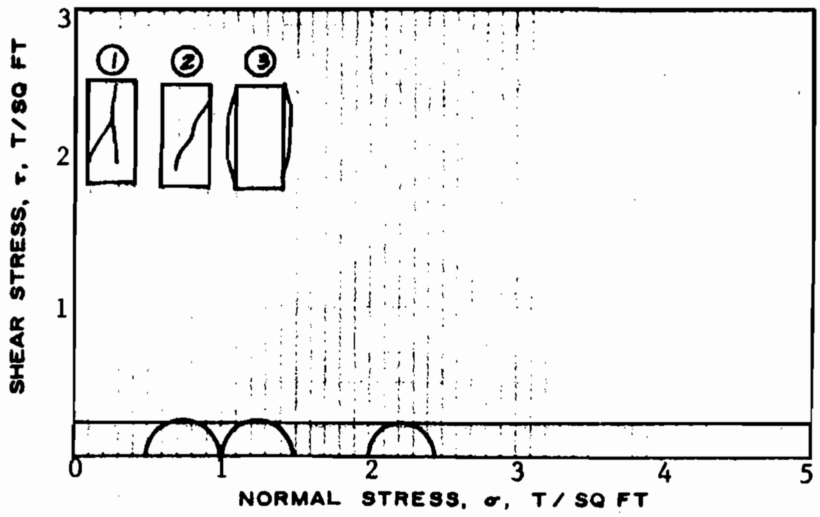
DEPTH 8.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 135





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	27.0	35.0	32.7	
	VOID RATIO	e_o	0.879	1.04	1.00	
	SATURATION %	S_o	83	91	88	
	DRY DENSITY, LB/CU FT	γ_d	89.6	82.4	84.0	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	27.0	35.0	32.7	
	VOID RATIO	e_f	0.879	1.04	1.00	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.49	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.50	0.51	0.44	
TIME TO FAILURE, MIN		t_f	3.0	11.0	7.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.25 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed			
CLASSIFICATION Loose gray clayey silt w/roots				
LL	PL	PI		G_s 2.70

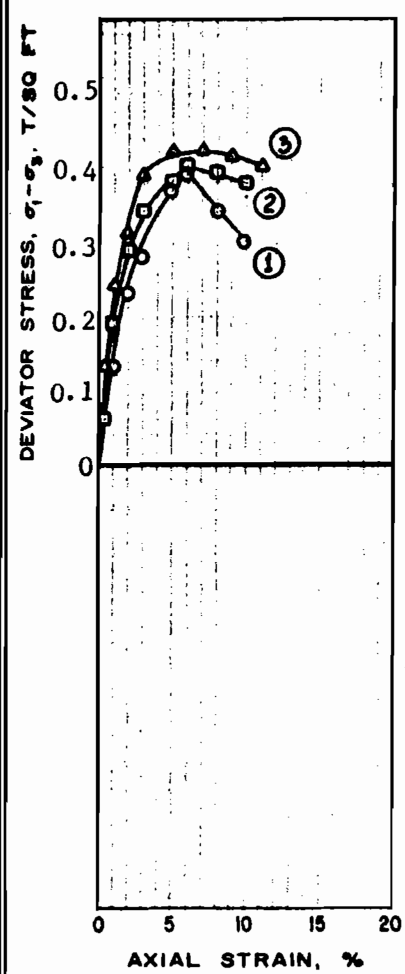
REMARKS Shear values were taken from large scale plot.

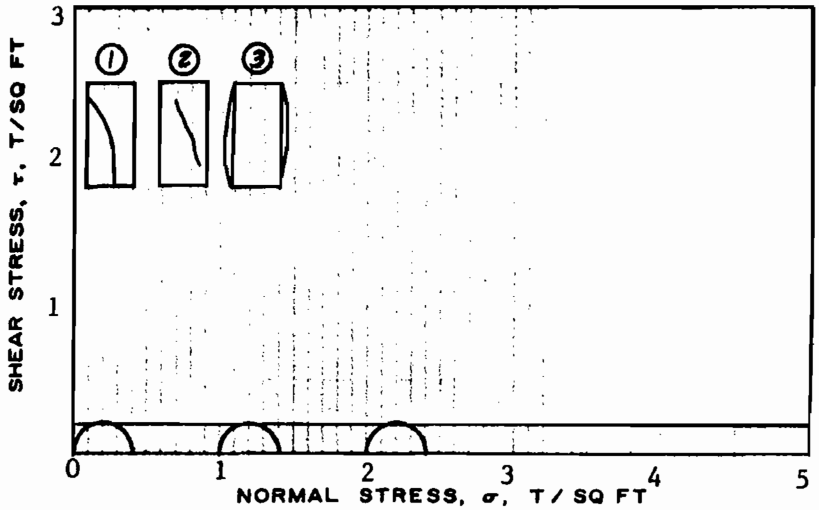
PROJECT	Sewerage & Water Board of New Orleans		
	Metairie Relief Canal		
AREA	Sta. 554+00 to Sta. 670+00		
BORING NO.	39	SAMPLE NO.	5
DEPTH	13.0'	DATE	20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 136





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	50.5	52.0	53.3	
	VOID RATIO	e_o	1.46	1.47	1.54	
	SATURATION %	S_o	95	97	95	
	DRY DENSITY, LB/CU FT	γ_d	69.4	69.1	67.4	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	50.5	52.0	53.3	
	VOID RATIO	e_f	1.46	1.47	1.54	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.39	0.40	0.42	
TIME TO FAILURE, MIN		t_f	6.0	6.0	5.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.20 T/SQ FT

METHOD OF SATURATION ____

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed			
CLASSIFICATION Soft gray clay w/silt lenses				
LL 63	PL 20	PI 43		G_s 2.74

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

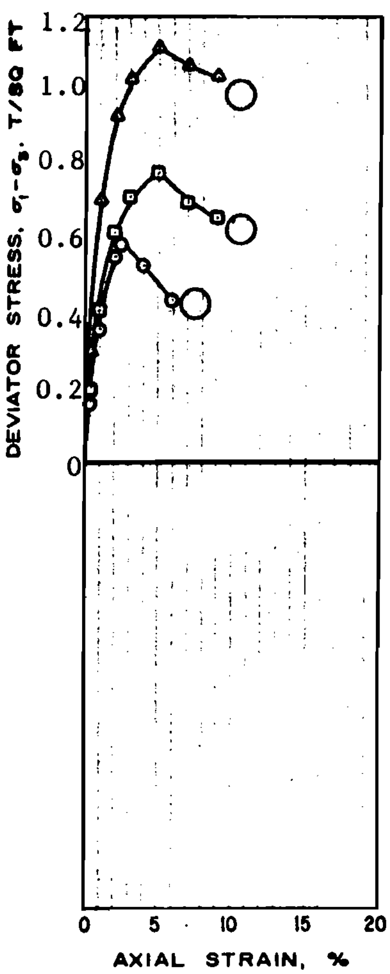
AREA Sta. 554+00 to Sta. 670+00

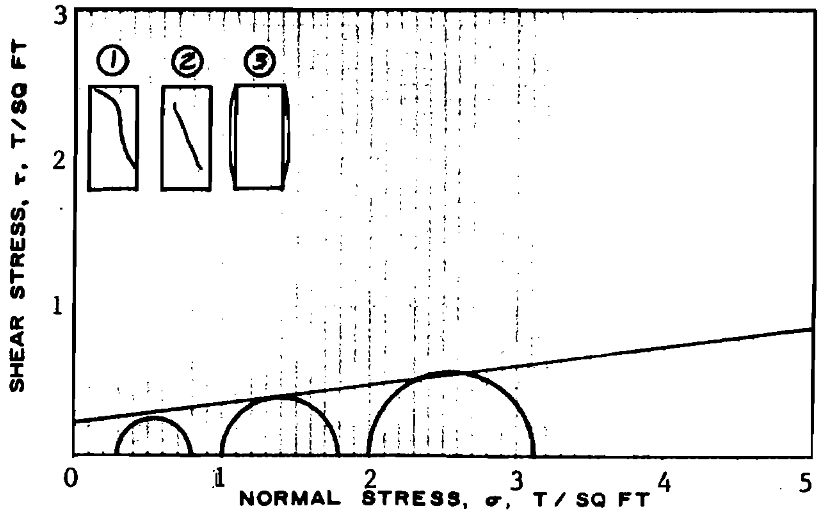
BORING NO. 39	SAMPLE NO. 7
DEPTH 23.0'	DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 137





SHEAR STRENGTH PARAMETERS

ϕ = 7°

TAN ϕ = 0.123

c = 0.23 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	39.8	34.4	33.3	
	VOID RATIO	e_o	1.38	1.35	1.20	
	SATURATION %	S_o	78	69	75	
	DRY DENSITY, LB/CU FT	γ_d	70.6	71.6	76.6	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	39.8	34.4	33.3	
	VOID RATIO	e_f	1.38	1.35	1.20	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.25	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.58	0.77	1.11	
TIME TO FAILURE, MIN		t_f	2.5	5.0	5.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed			
CLASSIFICATION Soft gray & tan silty clay w/clayey silt layers				
LL	PL	PI		G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

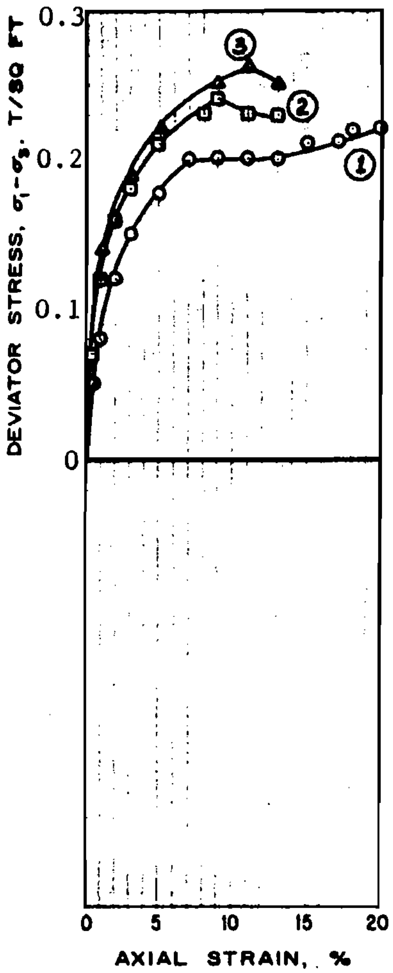
BORING NO. 44 SAMPLE NO. 2

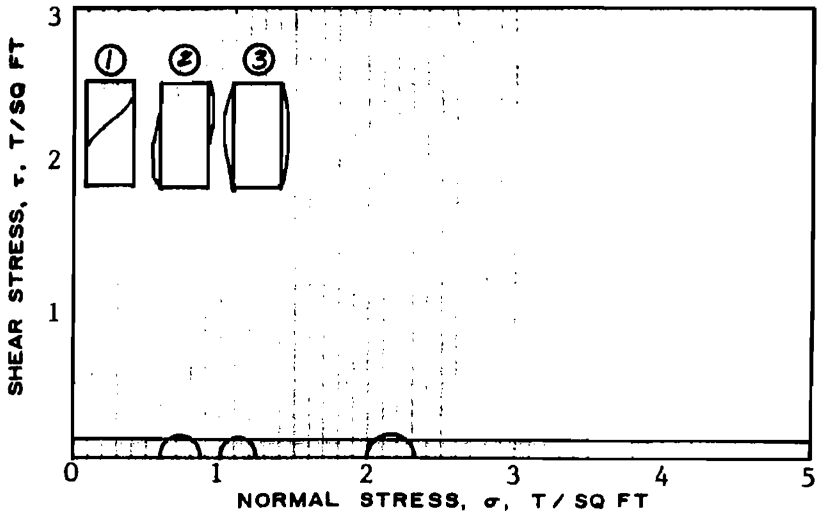
DEPTH 5.0' DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 138





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	57.9	52.6	59.0	
	VOID RATIO	e_o	1.65	1.48	1.68	
	SATURATION %	S_o	95	96	95	
	DRY DENSITY, LB/CU FT	γ_d	63.6	68.0	62.9	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	57.9	52.6	59.0	
	VOID RATIO	e_f	1.65	1.48	1.68	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.61	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.22	0.24	0.26	
TIME TO FAILURE, MIN		t_f	18.0	9.0	11.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.12 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed				
CLASSIFICATION Very soft gray clay w/silt pockets & roots					
LL	PL	PI			G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

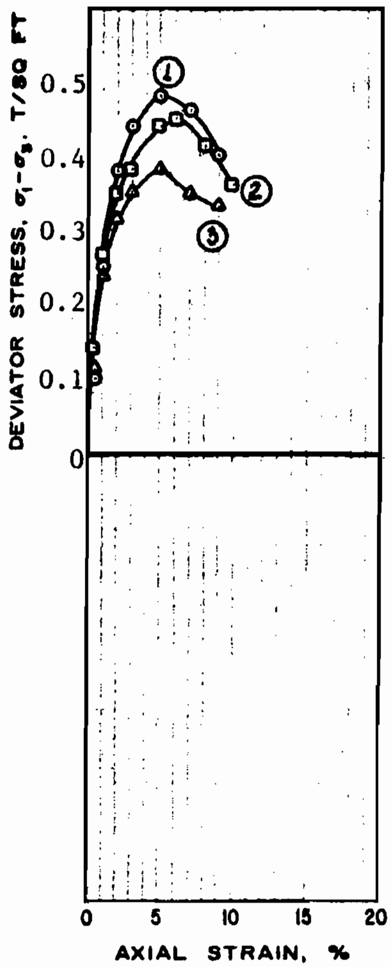
BORING NO. 44 SAMPLE NO. 6

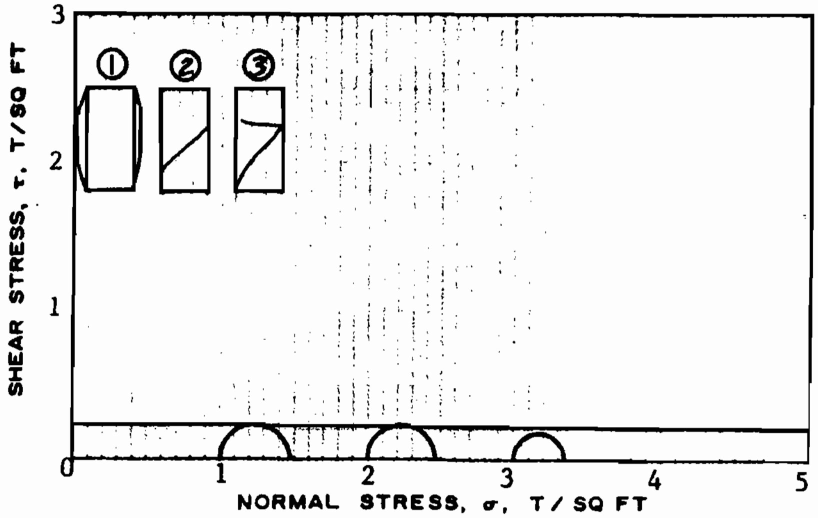
DEPTH 19.0' DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 139





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	69.5	69.0	68.0	
	VOID RATIO	e_o	1.96	1.95	1.95	
	SATURATION %	S_o	97	97	95	
	DRY DENSITY, LB/CU FT	γ_d	57.7	57.9	57.9	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	69.5	69.0	68.0	
	VOID RATIO	e_f	1.96	1.95	1.95	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.48	0.45	0.38	
TIME TO FAILURE, MIN		t_f	5.0	6.0	5.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.22 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

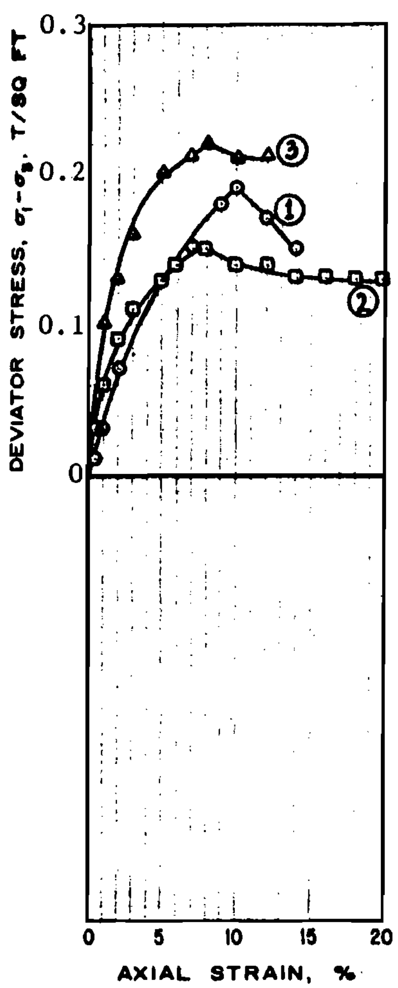
TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed			
CLASSIFICATION Soft gray clay				
LL	PL	PI		G_s 2.74

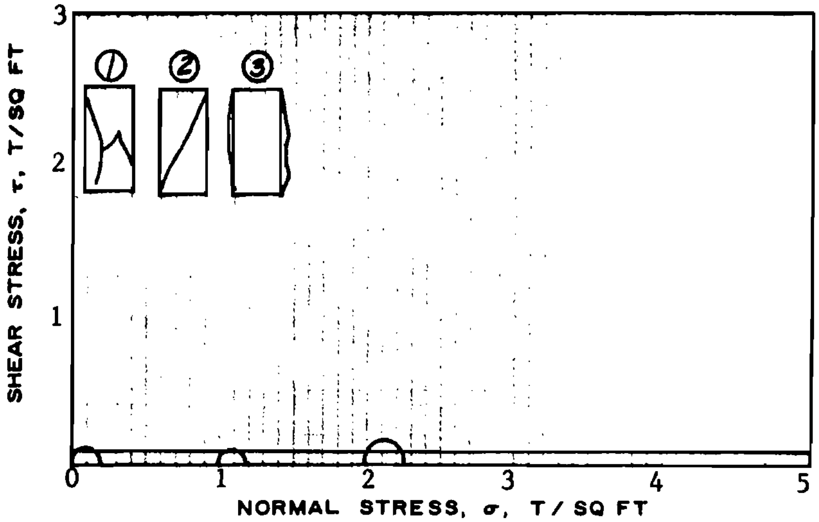
REMARKS Shear values were taken from large scale plot.

PROJECT	Sewerage & Water Board of New Orleans
	Metairie Relief Canal
AREA	Sta. 554+00 to Sta. 670+00
BORING NO. 44	SAMPLE NO. 9
DEPTH 34.0'	DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.09 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	282.6	279.5	257.4	
	VOID RATIO	e_o	5.57	5.26	5.10	
	SATURATION %	S_o	96	100	96	
	DRY DENSITY, LB/CU FT	γ_d	18.0	18.9	19.4	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	282.6	279.5	257.4	
	VOID RATIO	e_f	5.57	5.26	5.10	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.19	0.15	0.22	
TIME TO FAILURE, MIN		t_f	10.0	8.0	8.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed			
CLASSIFICATION Very soft dark brown humus w/roots				
LL	PL	PI		G_s 1.90

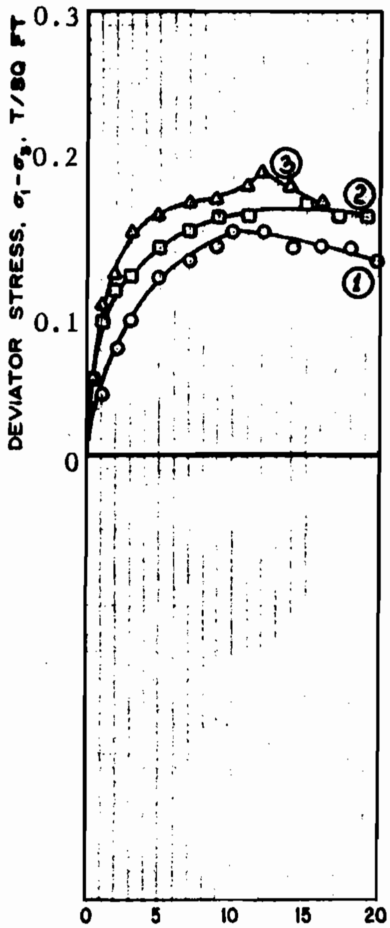
REMARKS Shear values were taken from large scale plot.

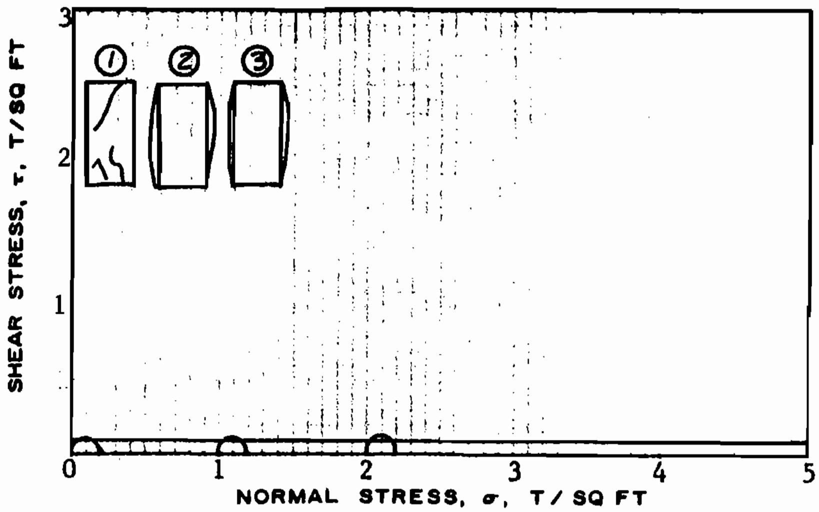
PROJECT	Sewerage & Water Board of New Orleans Metairie Relief Canal		
AREA	Sta. 554+00 to Sta. 670+00		
BORING NO.	47	SAMPLE NO.	2
DEPTH	8.0'	DATE	20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 141





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	60.3	57.4	56.5	
	VOID RATIO	e_o	1.70	1.63	1.62	
	SATURATION %	S_o	96	95	94	
	DRY DENSITY, LB/CU FT	γ_d	62.4	64.0	64.3	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	60.3	57.4	56.5	
	VOID RATIO	e_f	1.70	1.63	1.62	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.15	0.17	0.19	
TIME TO FAILURE, MIN		t_f	10.0	15.0	12.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.09 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST	UU	TYPE OF SPECIMEN	Undisturbed		
CLASSIFICATION	Very soft gray clay w/silt pockets & roots				
LL	58	PL 21	PI 37		G_s 2.70

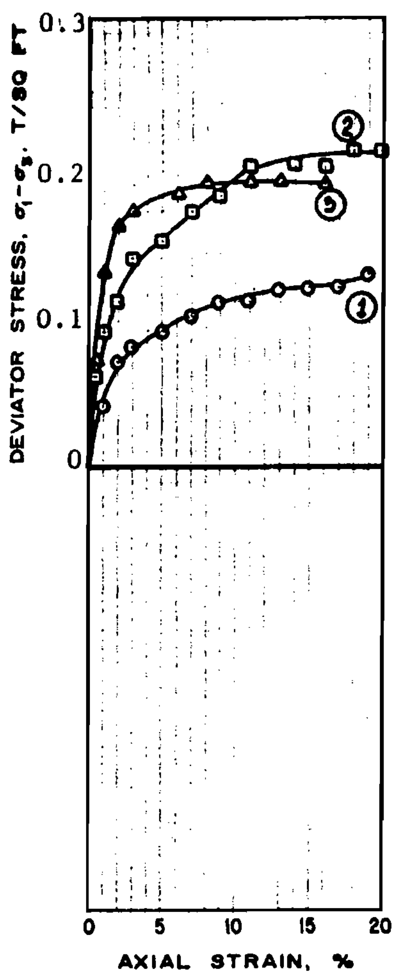
REMARKS Shear values were taken from large scale plot.

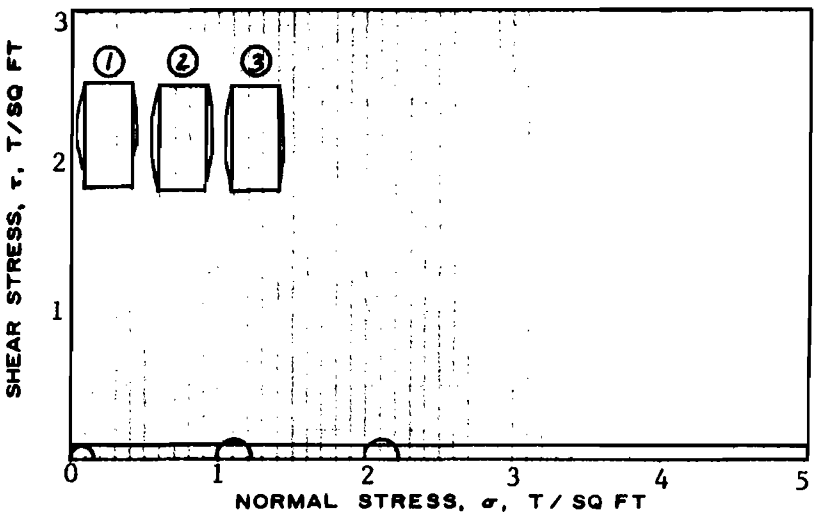
PROJECT	Sewerage & Water Board of New Orleans Metairie Relief Canal		
AREA	Sta. 554+00 to Sta. 670+00		
BORING NO.	47	SAMPLE NO.	3
DEPTH	11.0'	DATE	20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 142





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.10 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	68.1	73.0	73.1	
	VOID RATIO	e_o	2.00	1.91	2.08	
	SATURATION %	S_o	94	100	96	
	DRY DENSITY, LB/CU FT	γ_d	57.1	58.8	55.4	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	68.1	73.0	73.1	
	VOID RATIO	e_f	2.00	1.91	2.08	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.13	0.21	0.20	
TIME TO FAILURE, MIN		t_f	19.0	18.0	14.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed			
CLASSIFICATION Very soft gray clay				
LL 82	PL 27	PI 55		G_s 2.74

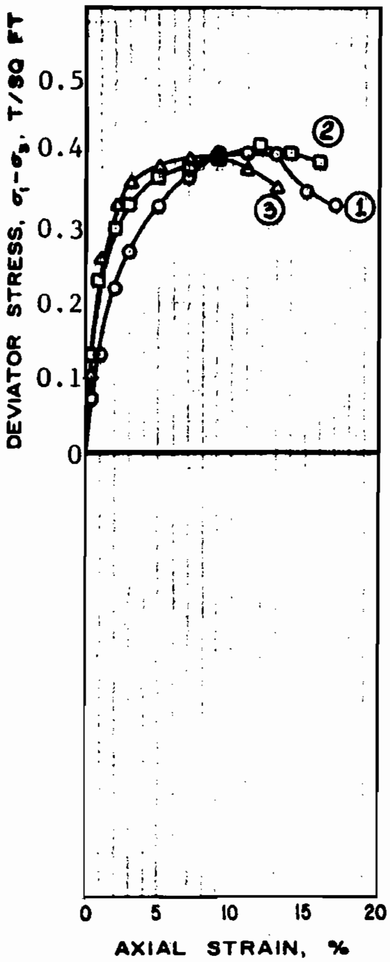
REMARKS Shear values were taken from large scale plot.

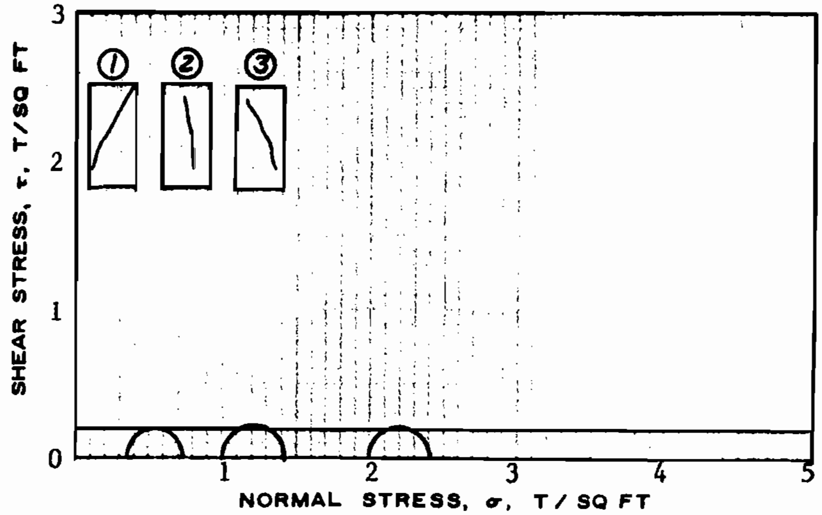
PROJECT Sewerage & Water Board of New Orleans	
Metairie Relief Canal	
AREA Sta. 554+00 to Sta. 670+00	
BORING NO. 47	SAMPLE NO. 6
DEPTH 23.0'	DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 143





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	29.0	29.2	29.6	
	VOID RATIO	e_o	0.791	0.938	0.941	
	SATURATION %	S_o	99	84	85	
	DRY DENSITY, LB/CU FT	γ_d	94.1	86.9	86.8	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	29.0	29.2	29.6	
	VOID RATIO	e_f	0.791	0.938	0.941	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.36	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.40	0.41	0.39	
TIME TO FAILURE, MIN		t_f	9.0	12.0	7.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.39	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.20 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST: UU	TYPE OF SPECIMEN: Undisturbed				
CLASSIFICATION: Soft gray & tan silty clay					
LL: 47	PL: 16	PI: 31		G_s: 2.70	

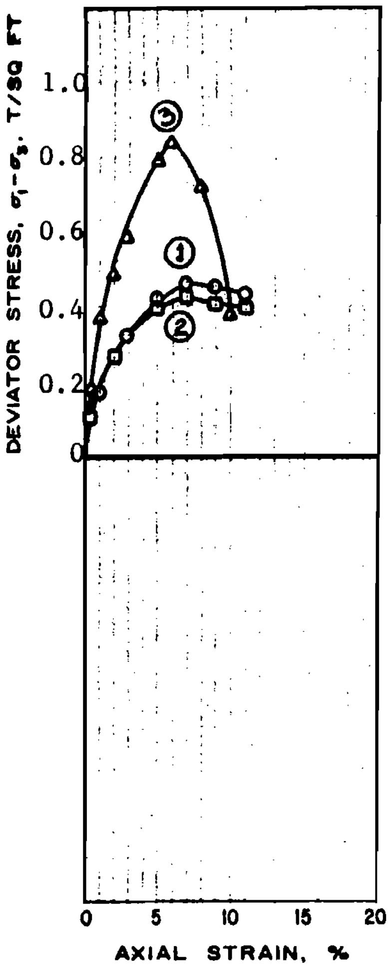
REMARKS: Shear values were taken from large scale plot.

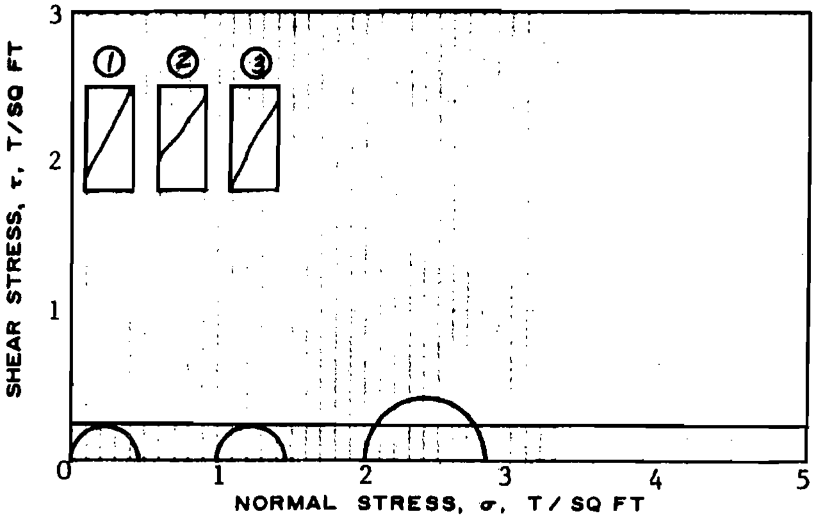
PROJECT	Sewerage & Water Board of New Orleans Metairie Relief Canal
AREA	Sta. 554+00 to Sta. 670+00
BORING NO. 52	SAMPLE NO. 3
DEPTH 8.0'	DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 144





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.23 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

				1	2	3	
TEST NO.				1	2	3	
INITIAL	WATER CONTENT	%	w_o	147.0	149.0	244.7	
INITIAL	VOID RATIO		e_o	4.27	4.34	6.97	
INITIAL	SATURATION	%	S_o	90	89	91	
INITIAL	DRY DENSITY, LB/CU FT		γ_d	30.8	30.4	20.3	
BEFORE SHEAR	WATER CONTENT	%	w_c				
BEFORE SHEAR	VOID RATIO		e_c				
BEFORE SHEAR	SATURATION	%	S_c				
BEFORE SHEAR	FINAL BACK PRESSURE, T/SQ FT		u_o				
FINAL	WATER CONTENT	%	w_f	147.0	149.0	244.7	
FINAL	VOID RATIO		e_f	4.27	4.34	6.97	
MINOR PRINCIPAL STRESS, T/SQ FT			σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT			$(\sigma_1-\sigma_3)_{max}$	0.46	0.42	0.83	
TIME TO FAILURE, MIN			t_f	7.0	7.0	6.0	
RATE OF STRAIN, PERCENT/MIN				0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT							
ULT DEVIATOR STRESS, T/SQ FT			$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.			D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.			H_o	3.00	3.00	3.00	

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray organic clay w/humus layers & roots

LL | PL | PI | | G_s 2.60

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

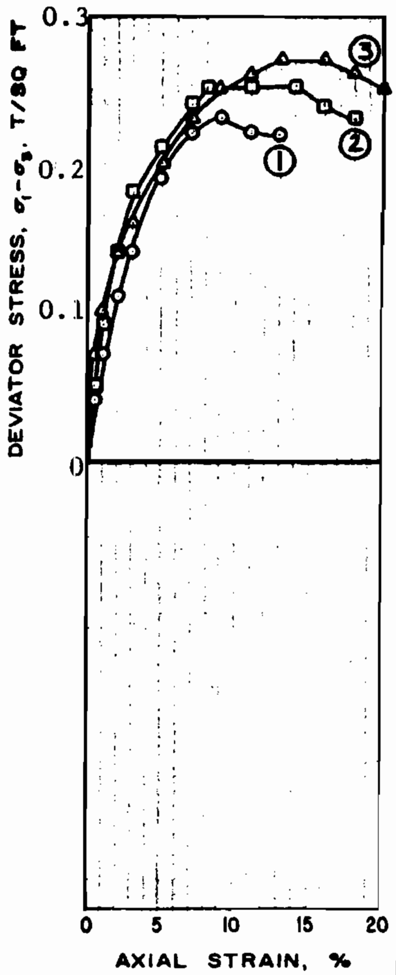
BORING NO. 52 | SAMPLE NO. 6

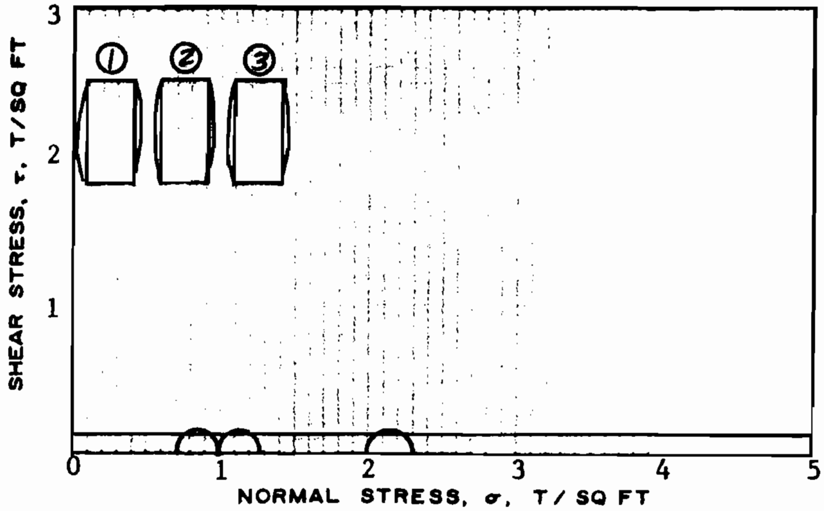
DEPTH 19.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 145





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	43.9	41.4	43.4	
	VOID RATIO	e_o	1.26	1.21	1.28	
	SATURATION %	S_o	94	93	92	
	DRY DENSITY, LB/CU FT	γ_d	74.7	76.2	73.9	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	43.9	41.4	43.4	
	VOID RATIO	e_f	1.26	1.21	1.28	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.72	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.23	0.25	0.27	
TIME TO FAILURE, MIN		t_f	9.0	8.0	13.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.13 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST: UU — TYPE OF SPECIMEN: Undisturbed

CLASSIFICATION: Soft gray silty clay w/roots

LL	PL	PI		G_s
48	22	26		2.70

REMARKS: Shear values were taken from large scale plot.

PROJECT: Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA: Sta. 554+00 to Sta. 670+00

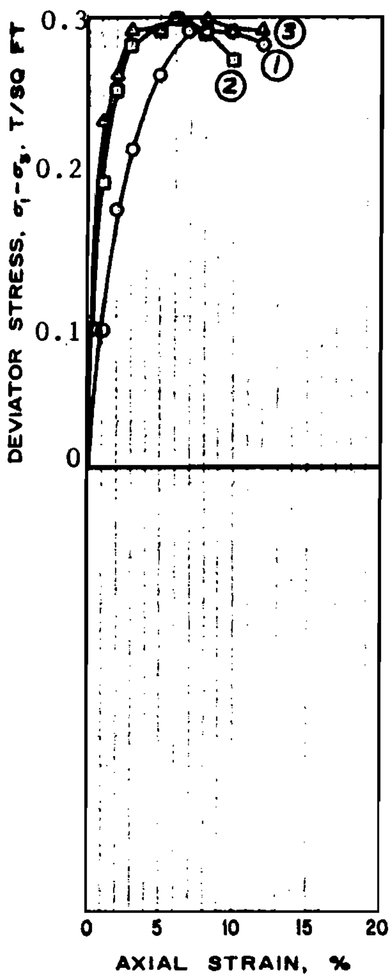
BORING NO. 52 — SAMPLE NO. 7

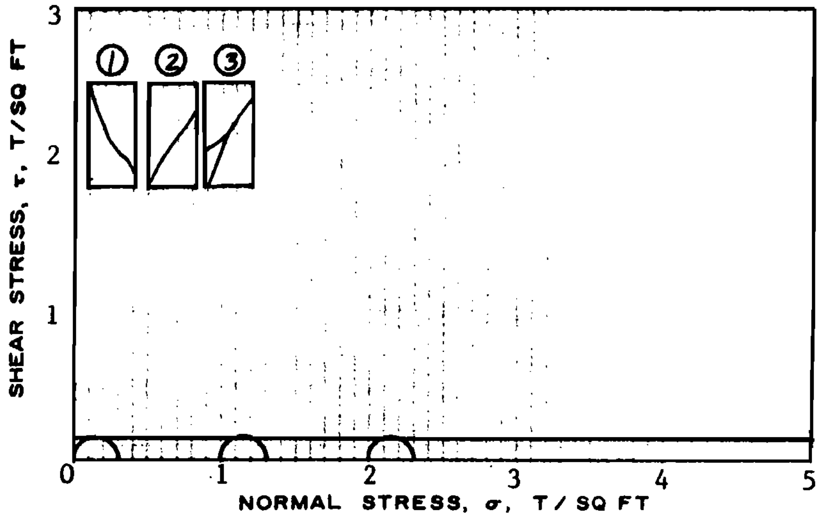
DEPTH 24.0' — DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 146





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	69.6	68.2	66.0	
	VOID RATIO	e_o	1.93	1.97	1.89	
	SATURATION %	S_o	99	95	95	
	DRY DENSITY, LB/CU FT	γ_d	58.3	57.6	59.0	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	69.6	68.2	66.0	
	VOID RATIO	e_f	1.93	1.97	1.89	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.29	0.30	0.30	
TIME TO FAILURE, MIN		t_f	8.0	6.0	6.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.15 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST	UU	TYPE OF SPECIMEN	Undisturbed		
CLASSIFICATION	Soft gray clay				
LL	PL	PI		G_s	2.74

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sat. 554+00 to Sta. 670+00

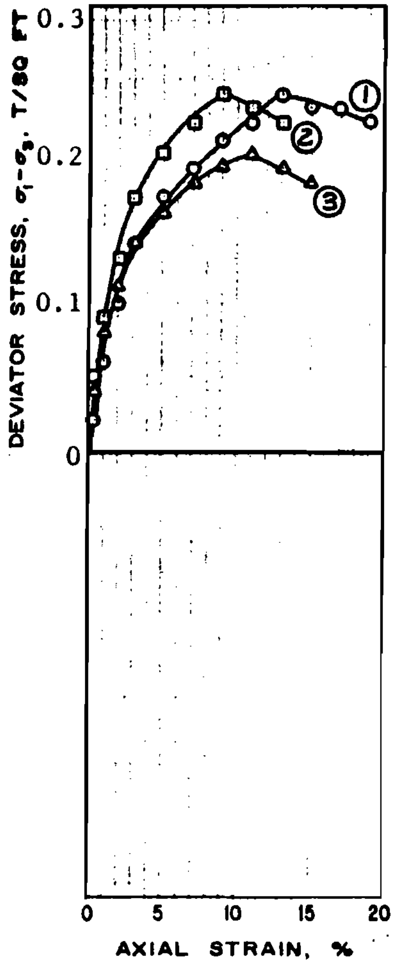
BORING NO. 52 SAMPLE NO. 9

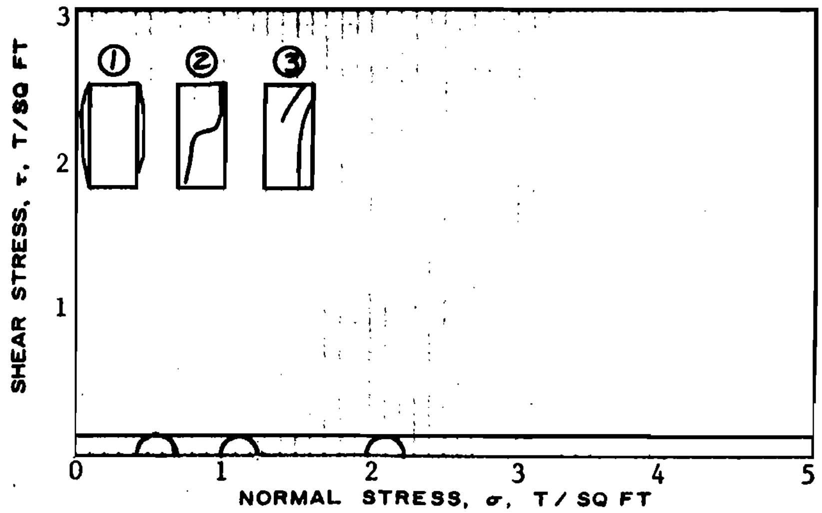
DEPTH 34.0' DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 147





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ = ______

c = 0.12 T/SQ FT

METHOD OF SATURATION ______

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	277.4	256.8	177.4	
	VOID RATIO	e_o	6.51	6.25	4.11	
	SATURATION %	S_o	96	92	97	
	DRY DENSITY, LB/CU FT	γ_d	18.7	19.4	27.5	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	277.4	256.8	177.4	
	VOID RATIO	e_f	6.51	6.25	4.11	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.43	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.24	0.24	0.20	
TIME TO FAILURE, MIN		t_f	13.0	9.0	11.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

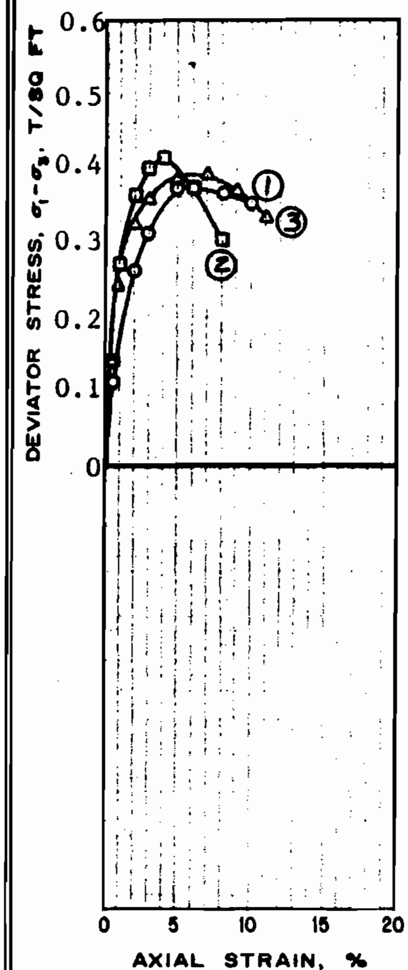
TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed
CLASSIFICATION Very soft dark brown humus w/decayed roots	

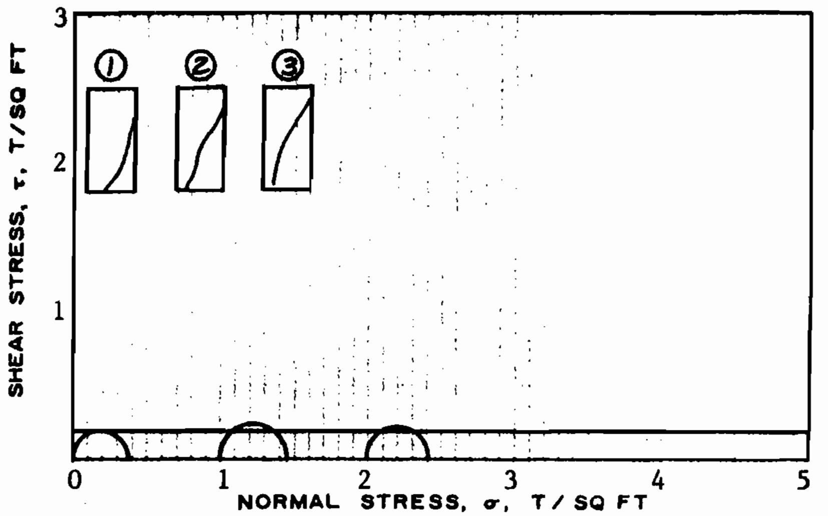
LL	PL	PI		G_s 2.25

REMARKS Shear values were taken from large scale plot.	PROJECT Sewerage & Water Board of New Orleans Metairie Relief Canal
	AREA Sta. 554+00 to Sta. 670+00
	BORING NO. 55 — SAMPLE NO. 3
	DEPTH 11.0' — DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	64.3	63.1	63.6	
	VOID RATIO	e_o	1.78	1.77	1.80	
	SATURATION %	S_o	99	98	97	
	DRY DENSITY, LB/CU FT	γ_d	61.4	61.7	60.9	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	64.3	63.1	63.6	
	VOID RATIO	e_f	1.78	1.77	1.80	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.37	0.41	0.39	
TIME TO FAILURE, MIN		t_f	6.0	4.0	7.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.20 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed		
CLASSIFICATION Soft gray clay w/silt lenses			
LL 75	PL 24	PI 51	G_s 2.74

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

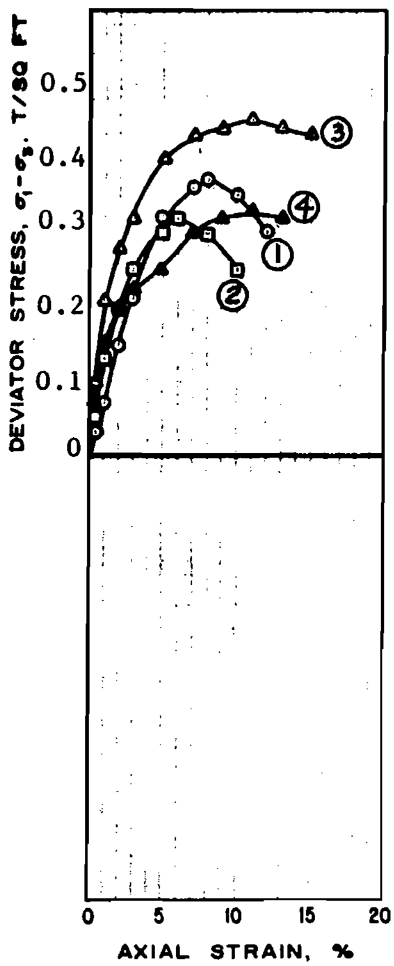
BORING NO. 55 | SAMPLE NO. 6

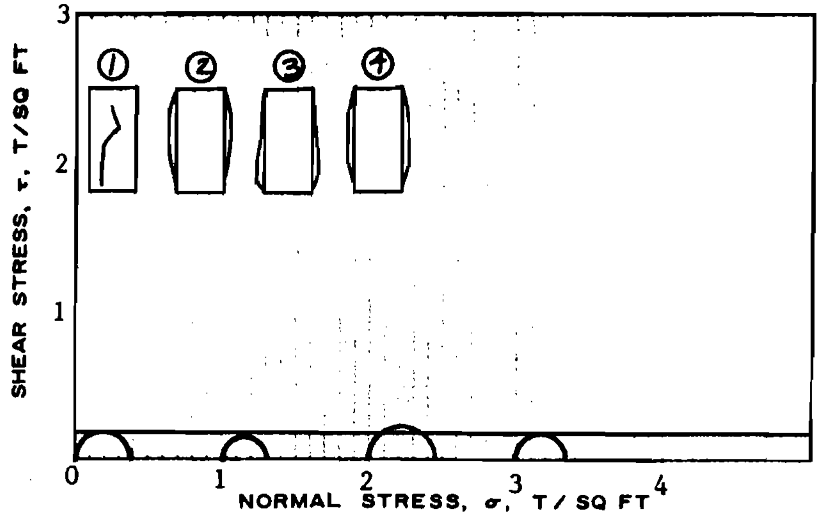
DEPTH 23.0' | DATE 20 August 1980

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 149





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ = ______

c = 0.185 T/SQ FT

METHOD OF SATURATION ______

☐ CONTROLLED STRESS

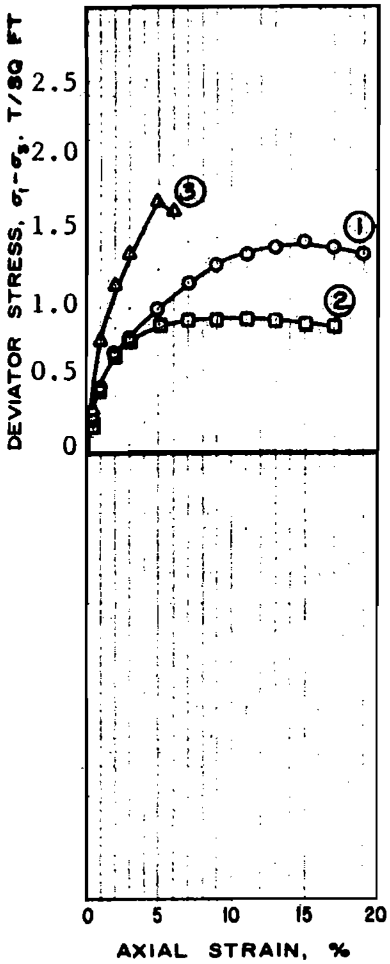
☒ CONTROLLED STRAIN

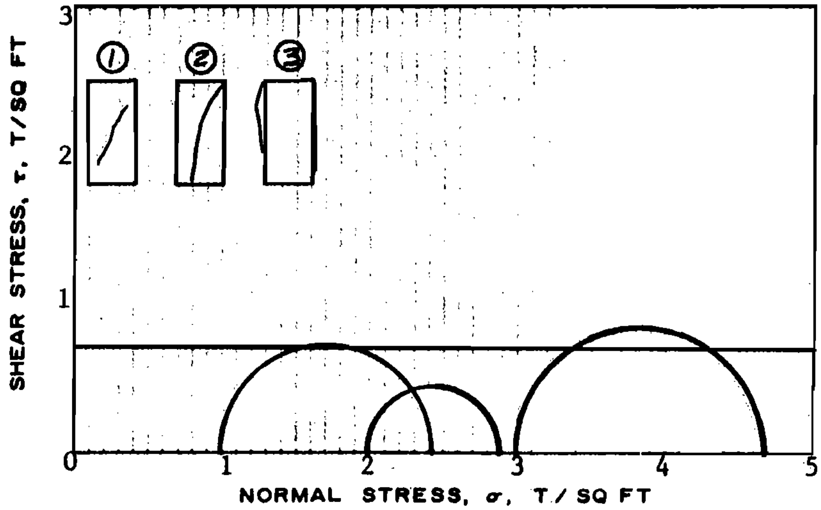
			TEST NO.	1	2	3	
INITIAL	WATER CONTENT %	w_o		34.0	29.5	40.7	30.9
INITIAL	VOID RATIO	e_o		0.985	0.853	1.13	0.945
INITIAL	SATURATION %	S_o		93	93	97	88
INITIAL	DRY DENSITY, LB/CU FT	γ_d		84.9	90.9	79.0	86.6
BEFORE SHEAR	WATER CONTENT %	w_c					
BEFORE SHEAR	VOID RATIO	e_c					
BEFORE SHEAR	SATURATION %	S_c					
BEFORE SHEAR	FINAL BACK PRESSURE, T/SQ FT	u_o					
FINAL	WATER CONTENT %	w_f		34.0	29.5	40.7	30.9
FINAL	VOID RATIO	e_f		0.985	0.853	1.13	0.945
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3		0	1.0	2.0	3.0
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$		0.37	0.32	0.45	0.33
TIME TO FAILURE, MIN		t_f		8.0	6.0	11.0	11.0
RATE OF STRAIN, PERCENT/MIN				0.5	0.5	0.5	0.5
EFFECTIVE NORMAL STRESS, T SQ FT							
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$					
INITIAL DIAMETER, IN.		D_o		1.40	1.40	1.40	1.40
INITIAL HEIGHT, IN.		H_o		3.00	3.00	3.00	3.00

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed
CLASSIFICATION	Soft gray clay w/sand pockets & shell fragments
LL	PL
PI	G_s 2.70
REMARKS Shear values were taken from large scale plot.	PROJECT Sewerage & Water Board of New Orleans Metairie Relief Canal
	AREA Sta. 554+00 to Sta. 670+00
	BORING NO. 55 — SAMPLE NO. 7
	DEPTH 32.0' — DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	26.3	25.9	23.4	
	VOID RATIO	e_o	0.964	0.914	0.794	
	SATURATION %	S_o	75	78	81	
	DRY DENSITY, LB/CU FT	γ_d	87.0	89.3	95.3	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	26.3	25.9	23.4	
	VOID RATIO	e_f	0.964	0.914	0.794	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	1.41	0.89	1.68	
TIME TO FAILURE, MIN		t_f	15.0	11.0	5.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.70 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU — TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium compact gray & brown clayey silt w/roots

LL — PL — PI — G_s 2.74

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

BORING NO. 60 — SAMPLE NO. 1

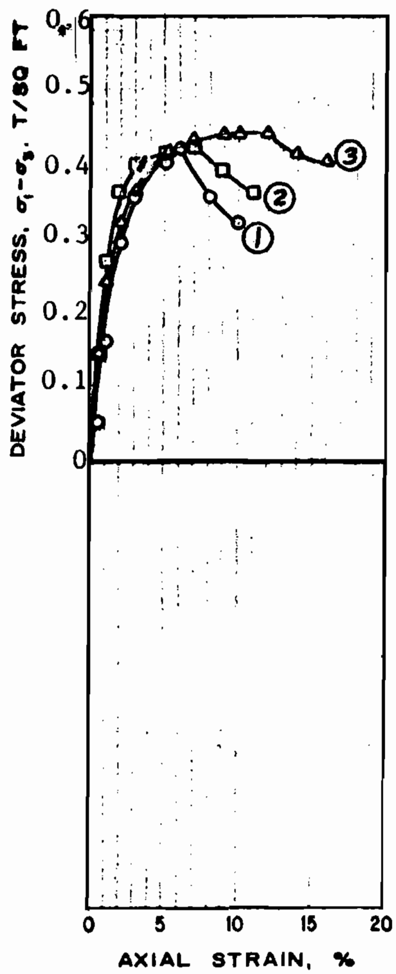
DEPTH 2.0' — DATE 20 August 1981

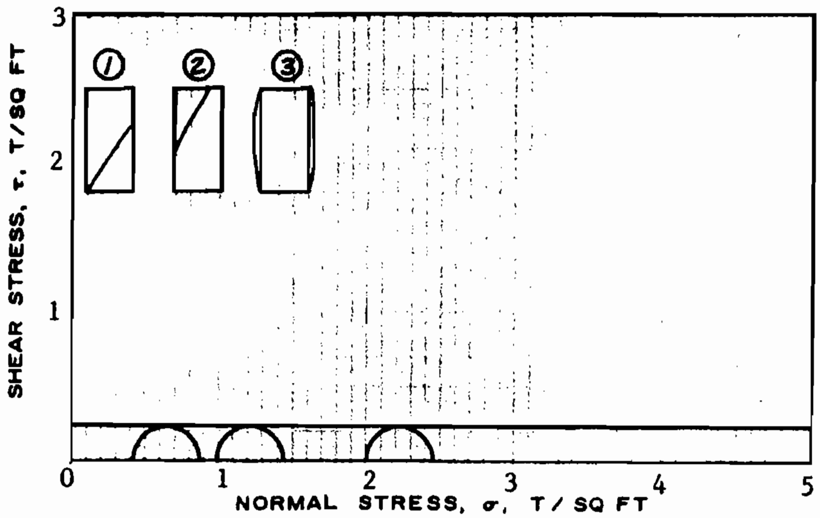
TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 151

60/4





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.21 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	38.8	39.2	42.8	
	VOID RATIO	e_o	1.08	1.15	1.23	
	SATURATION %	S_o	97	94	95	
	DRY DENSITY, LB/CU FT	γ_d	81.0	79.6	76.5	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	38.8	39.2	42.8	
	VOID RATIO	e_f	1.08	1.15	1.23	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.43	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.42	0.42	0.44	
TIME TO FAILURE, MIN		t_f	6.0	7.0	9.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray silty clay w/sandy silt layers & lenses

LL 43 | PL 20 | PI 23 | G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans Metairie Relief Canal

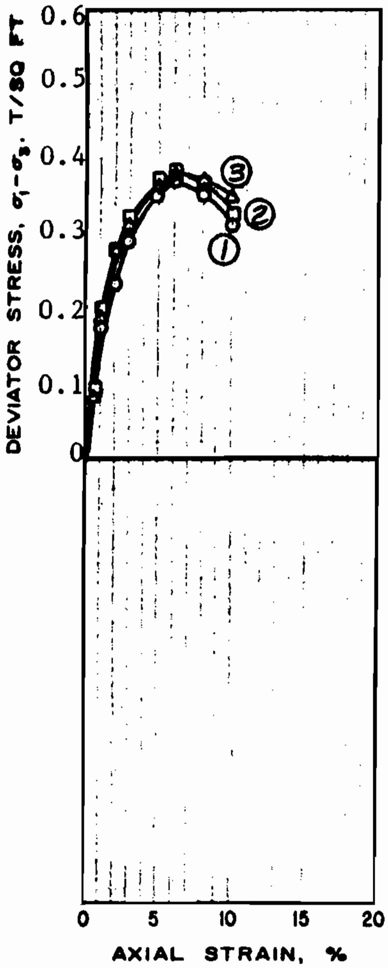
AREA Sta. 554+00 to Sta. 670+00

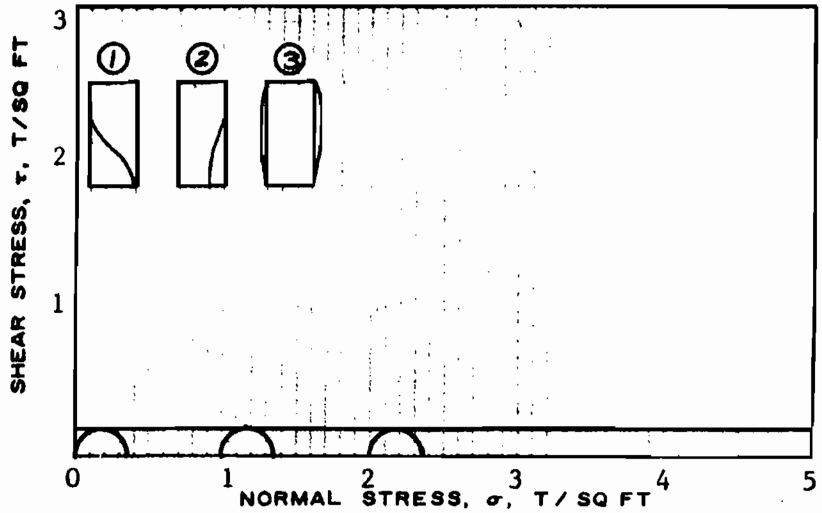
BORING NO. 60 | SAMPLE NO. 4

DEPTH 11.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.19 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

			TEST NO.	1	2	3	
INITIAL	WATER CONTENT	%	w_o	62.7	60.7	59.1	
	VOID RATIO		e_o	1.75	1.73	1.69	
	SATURATION	%	S_o	98	96	96	
	DRY DENSITY, LB/CU FT		γ_d	62.1	62.7	63.4	
BEFORE SHEAR	WATER CONTENT	%	w_c				
	VOID RATIO		e_c				
	SATURATION	%	S_c				
	FINAL BACK PRESSURE, T/SQ FT		u_o				
FINAL	WATER CONTENT	%	w_f	62.7	60.7	59.1	
	VOID RATIO		e_f	1.75	1.73	1.69	
MINOR PRINCIPAL STRESS, T/SQ FT			σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT			$(\sigma_1 - \sigma_3)_{max}$	0.37	0.38	0.38	
TIME TO FAILURE, MIN			t_f	6.0	6.0	6.0	
RATE OF STRAIN, PERCENT/MIN				0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT							
ULT DEVIATOR STRESS, T/SQ FT			$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.			D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.			H_o	3.00	3.00	3.00	

TYPE OF TEST	UU	TYPE OF SPECIMEN	Undisturbed		
CLASSIFICATION	Soft gray clay w/silt lenses				
LL 66	PL 20	PI 46		G_s	2.74

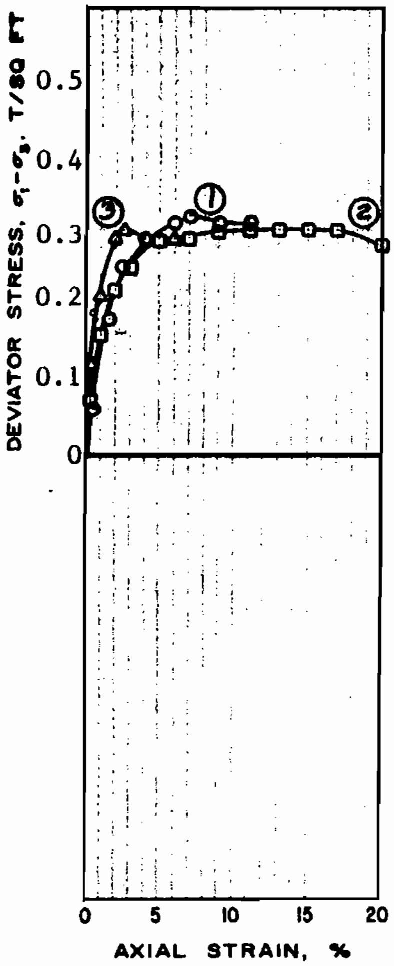
REMARKS Shear values were taken from large scale plot.

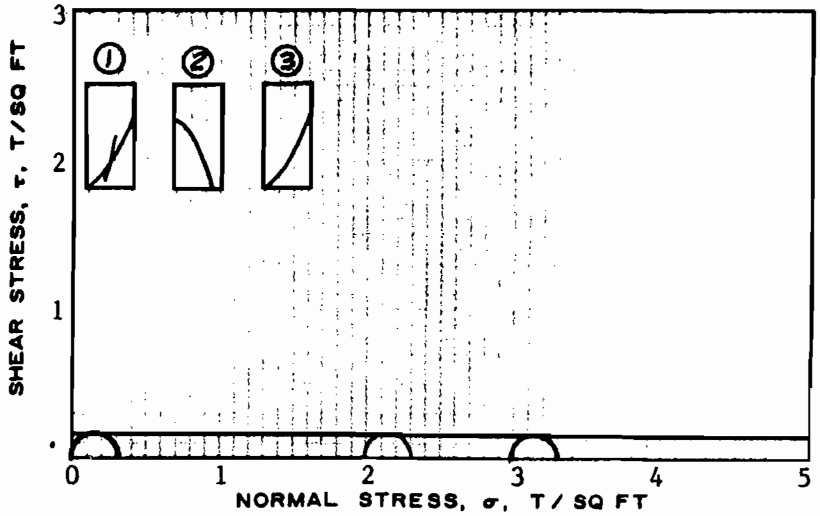
PROJECT	Sewerage & Water Board of New Orleans		
	Metairie Relief Canal		
AREA	Sta. 554+00 to Sta. 670+00		
BORING NO.	60	SAMPLE NO.	8
DEPTH	29.0'	DATE	20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 153





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.15 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	67.6	64.1	67.3	
	VOID RATIO	e_o	1.94	1.89	1.94	
	SATURATION %	S_o	96	93	95	
	DRY DENSITY, LB/CU FT	γ_d	58.2	59.2	58.1	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	67.4	64.1	67.3	
	VOID RATIO	e_f	1.94	1.89	1.94	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	2.0	3.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.32	0.30	0.30	
TIME TO FAILURE, MIN		t_f	7.0	9.0	2.5	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed				
CLASSIFICATION Soft gray clay					
LL	PL	PI		G_s 2.74	

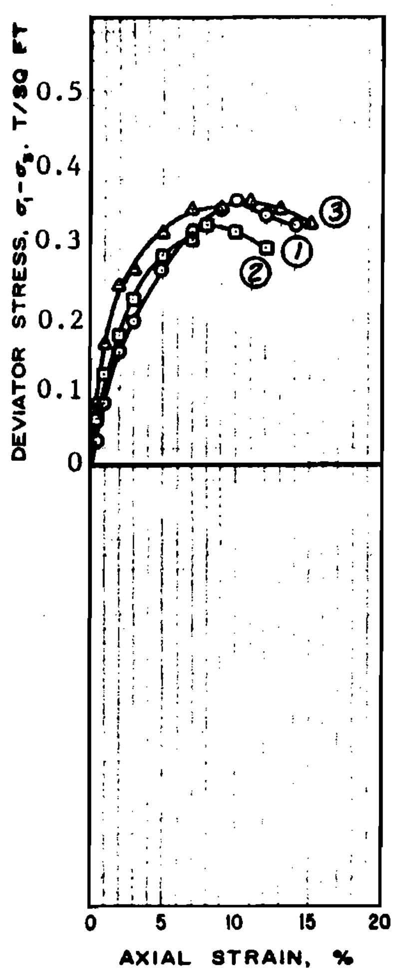
REMARKS Shear values were taken from large scale plot.

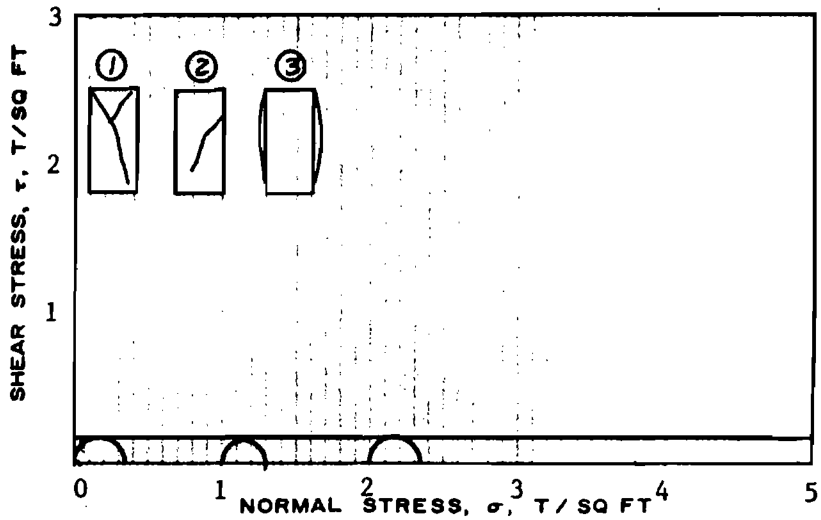
PROJECT Sewerage & Water Board of New Orleans Metairie Relief Canal	
AREA Sta. 554+00 to Sta. 670+00	
BORING NO. 60	SAMPLE NO. 10
DEPTH 39.0'	DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 154





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	147.0	136.8	136.0	
	VOID RATIO	e_o	4.09	3.98	3.83	
	SATURATION %	S_o	93	89	92	
	DRY DENSITY, LB/CU FT	γ_d	31.8	32.3	33.6	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	147.0	136.8	136.0	
	VOID RATIO	e_f	4.09	3.98	3.83	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.35	0.32	0.35	
TIME TO FAILURE, MIN		t_f	10.0	8.0	11.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.18 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray & black organic clay w/humus

LL	PL	PI		G_s
210	77	133		2.60

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

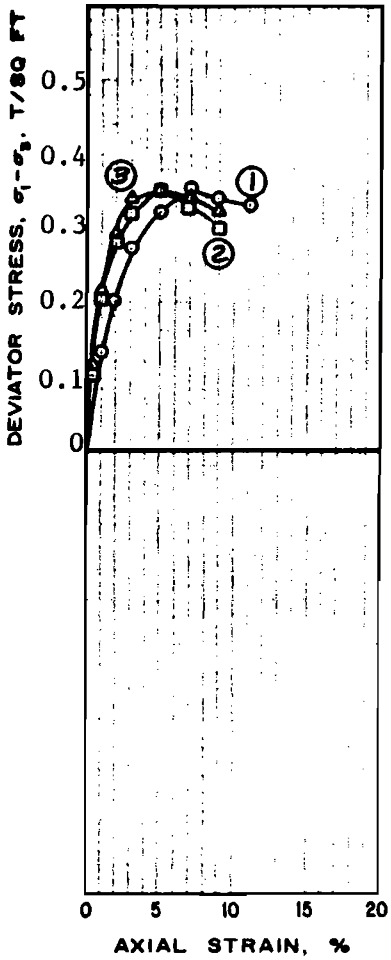
BORING NO. 63 | SAMPLE NO. 3

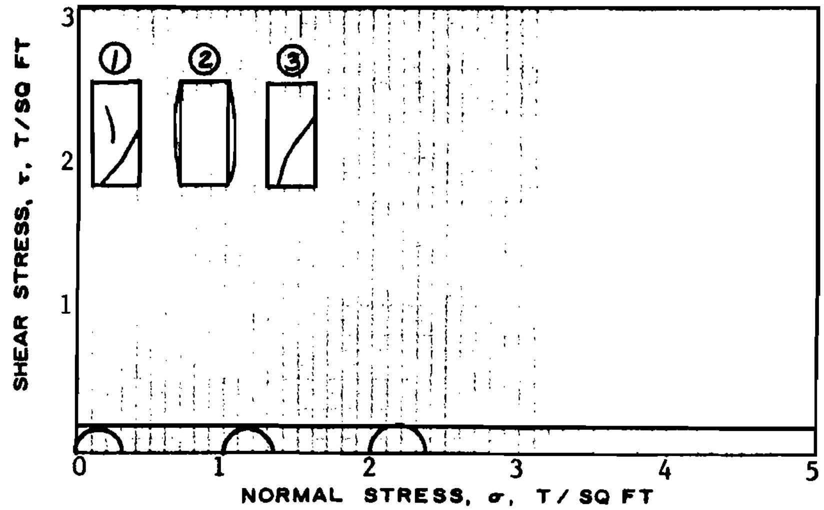
DEPTH 14.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 155





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	63.7	65.9	63.9	
	VOID RATIO	e_o	1.81	1.84	1.83	
	SATURATION %	S_o	97	98	95	
	DRY DENSITY, LB/CU FT	γ_d	60.9	60.2	60.3	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	63.7	65.9	63.9	
	VOID RATIO	e_f	1.81	1.84	1.83	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.35	0.35	0.35	
TIME TO FAILURE, MIN		t_f	7.0	5.0	5.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.18 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay

LL 78 | PL 23 | PI 55 | G_s 2.74

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

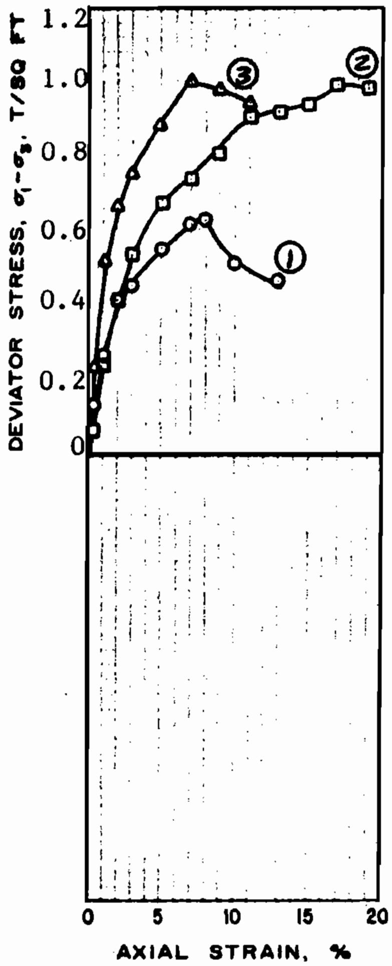
AREA Sta. 554+00 to Sta. 670+00

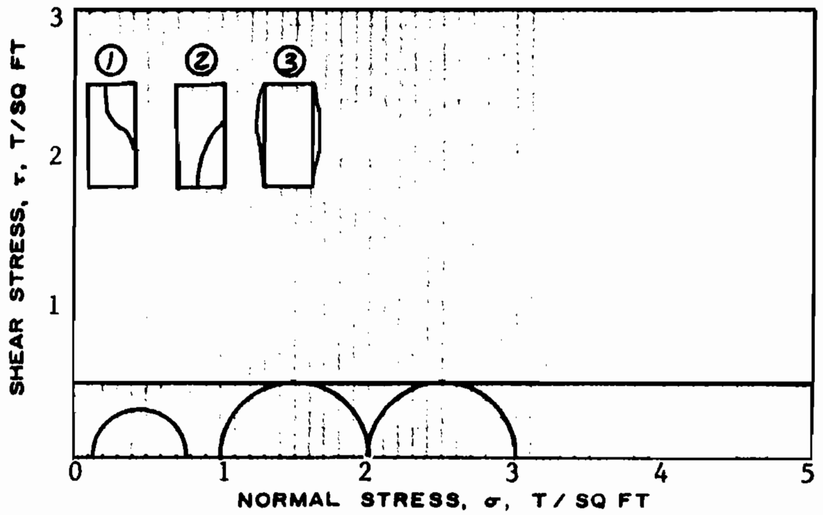
BORING NO. 63 | SAMPLE NO. 5

DEPTH 23.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA





			1	2	3	
TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	28.6	29.9	27.8	
	VOID RATIO	e_o	0.867	0.891	0.905	
	SATURATION %	S_o	89	91	83	
	DRY DENSITY, LB/CU FT	γ_d	90.1	89.1	88.4	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	28.6	29.9	27.8	
	VOID RATIO	e_f	0.867	0.891	0.905	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.14	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.62	0.99	1.00	
TIME TO FAILURE, MIN		t_f	8.0	17.0	7.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ = ______

c = 0.50 T/SQ FT

METHOD OF SATURATION ______

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU — TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium stiff gray & black clay w/silt pockets & trace of organic matter

LL 96	PL 28	PI 68		G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

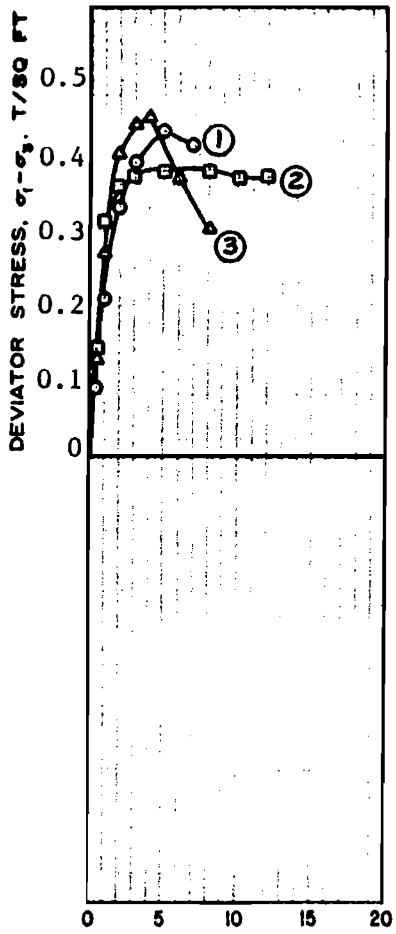
BORING NO. 68 — SAMPLE NO. 2

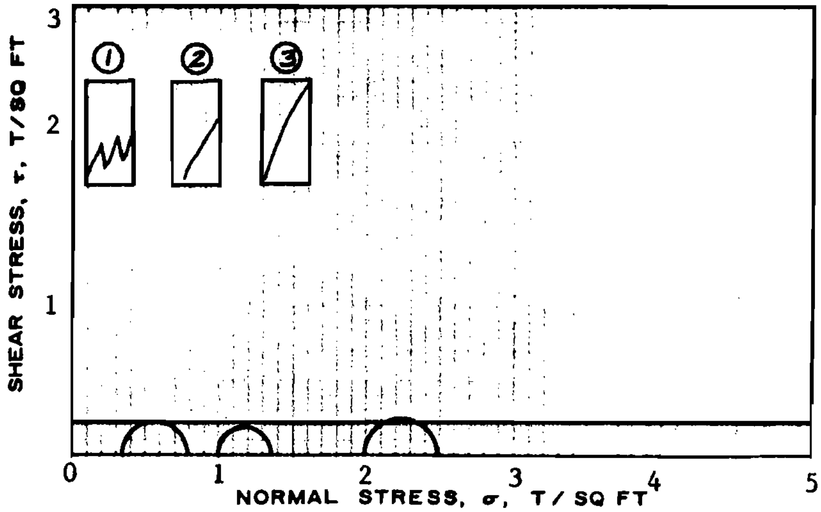
DEPTH 5.0' — DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 157





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.22 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	45.9	45.5	46.6	
	VOID RATIO	e_o	1.39	1.47	1.49	
	SATURATION %	S_o	91	85	85	
	DRY DENSITY, LB/CU FT	γ_d	71.5	69.3	68.6	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	45.9	45.5	46.6	
	VOID RATIO	e_f	1.39	1.47	1.49	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.36	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.43	0.38	0.45	
TIME TO FAILURE, MIN		t_f	5.0	5.0	4.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST UU — TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray & tan clay

LL	PL	PI		G_s 2.74

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

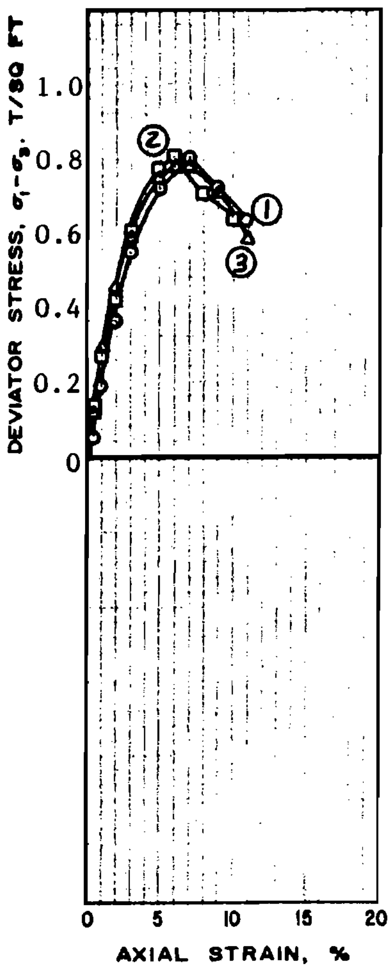
BORING NO. 68 — SAMPLE NO. 3

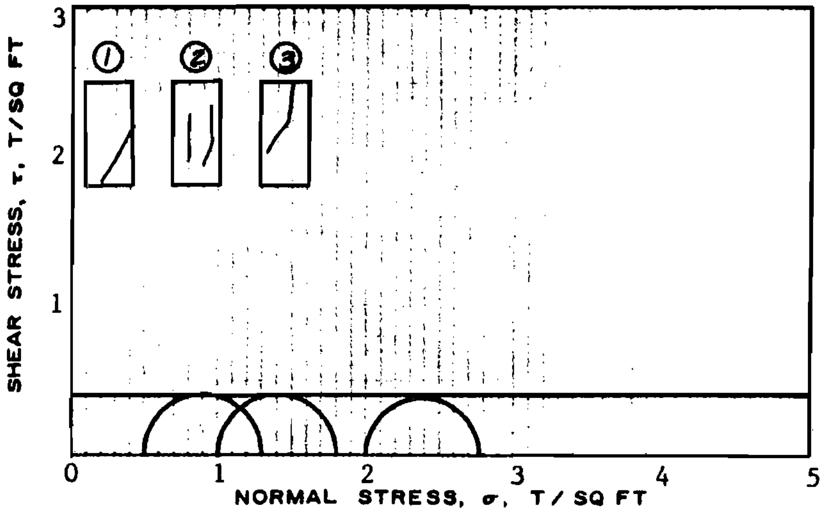
DEPTH 8.0' — DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 158





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	45.2	52.3	51.2	
	VOID RATIO	e_o	1.39	1.62	1.62	
	SATURATION %	S_o	88	87	85	
	DRY DENSITY, LB/CU FT	γ_d	70.4	64.3	64.3	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	45.2	52.3	51.2	
	VOID RATIO	e_f	1.39	1.62	1.62	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.80	0.80	0.78	
TIME TO FAILURE, MIN		t_f	7.0	6.0	6.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.40 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium stiff gray silty clay w/trace or organic matter

LL 38 | PL 18 | PI 20 | G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

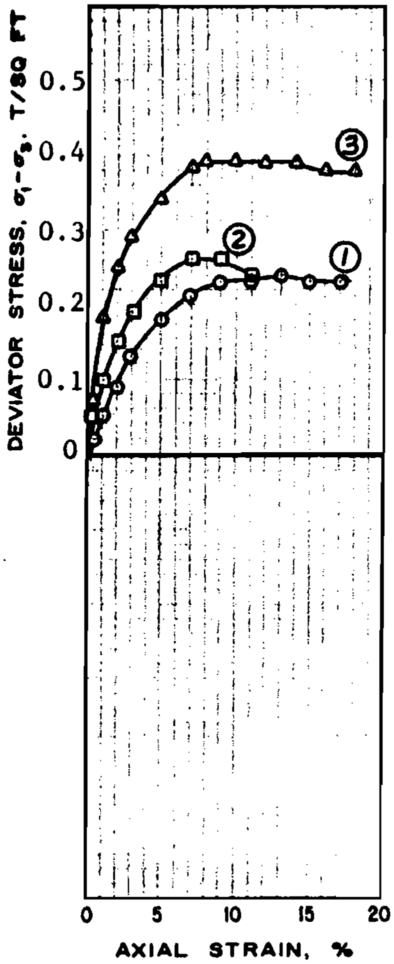
BORING NO. 68 | SAMPLE NO. 5

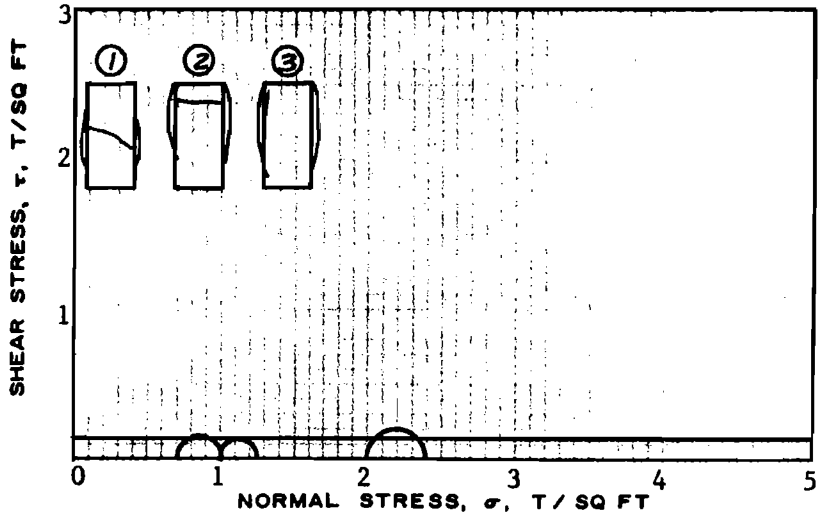
DEPTH 14.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 159





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	92.0	91.8	113.9	
	VOID RATIO	e_o	2.79	2.73	3.63	
	SATURATION %	S_o	87	89	83	
	DRY DENSITY, LB/CU FT	γ_d	43.6	44.3	35.7	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	92.0	91.8	113.9	
	VOID RATIO	e_f	2.79	27.3	3.63	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.73	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.24	0.26	0.39	
TIME TO FAILURE, MIN		t_f	13.0	7.0	8.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.13 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/sandy silt lenses, roots & trace of organic matter

LL | PL | PI | | G_s 2.65

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

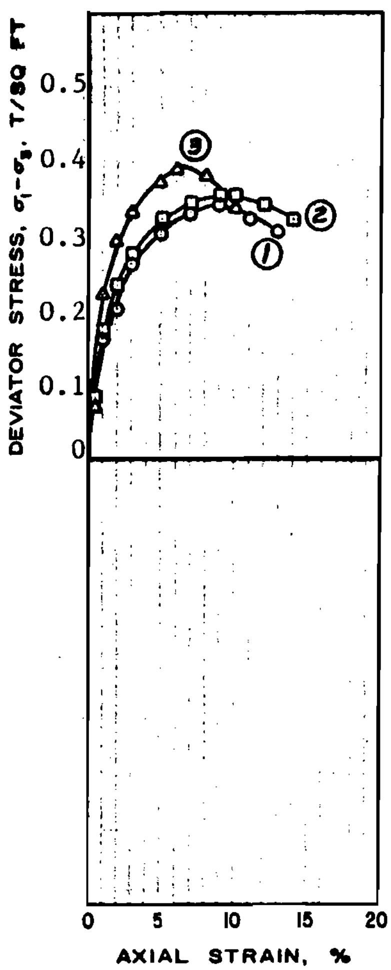
BORING NO. 68 | SAMPLE NO. 7

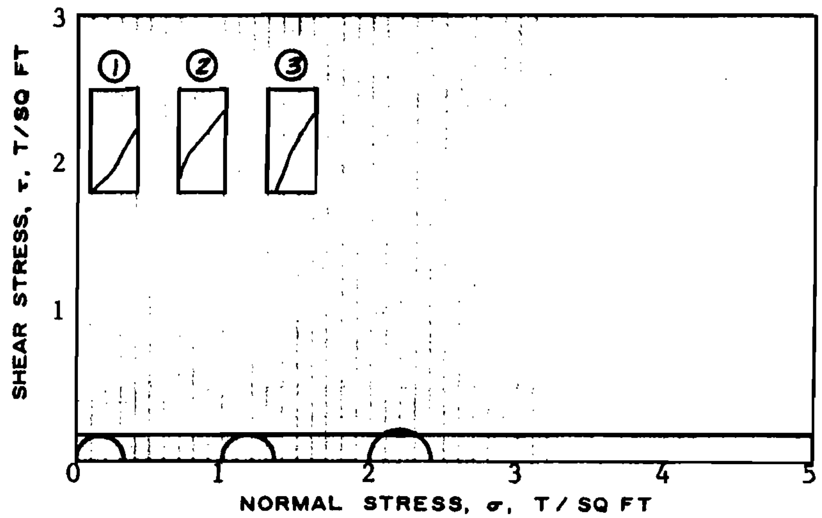
DEPTH 24.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 160





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	56.2	48.6	53.1	
	VOID RATIO	e_o	1.59	1.46	1.54	
	SATURATION %	S_o	97	91	95	
	DRY DENSITY, LB/CU FT	γ_d	65.9	69.4	67.4	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	56.2	48.6	53.1	
	VOID RATIO	e_f	1.59	1.46	1.54	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0	1.0	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.34	0.35	0.39	
TIME TO FAILURE, MIN		t_f	9.0	8.0	6.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.18 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST	UU	TYPE OF SPECIMEN	Undisturbed		
CLASSIFICATION	Soft gray clay w/silt lenses				
LL 69	PL 17	PI 52		G_s	2.74

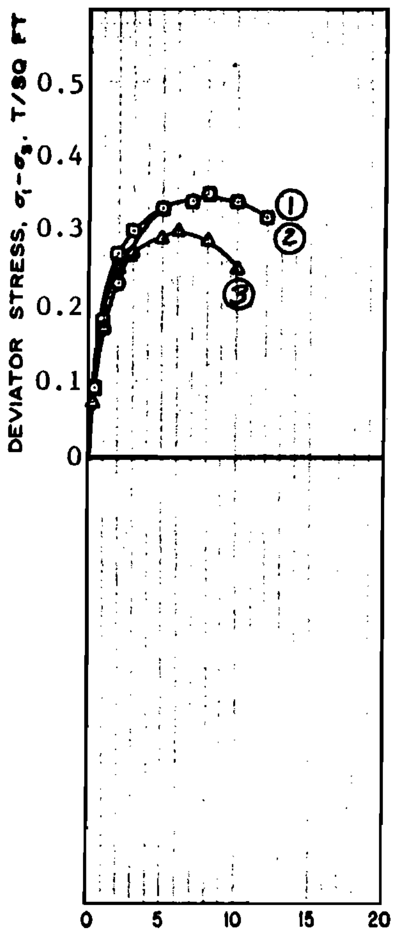
REMARKS Shear values were taken from large scale plot.

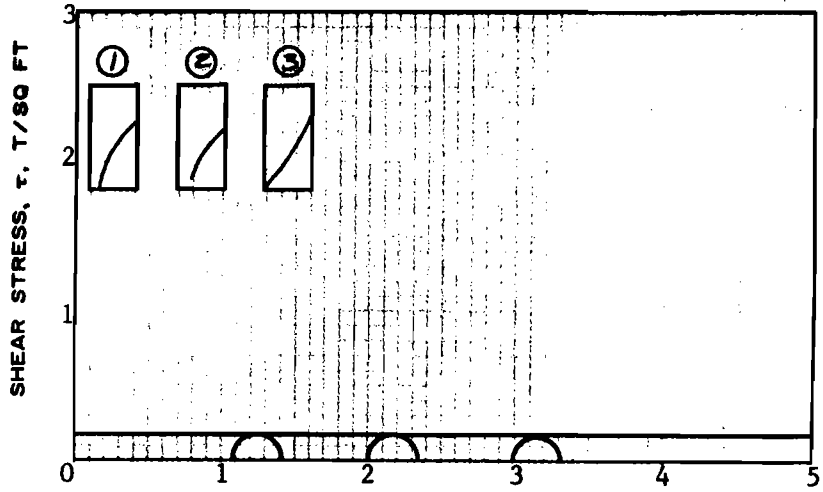
PROJECT	Sewerage & Water Board of New Orleans Metairie Relief Canal		
AREA	Sta. 554+00 to Sta. 670+00		
BORING NO.	68	SAMPLE NO.	9
DEPTH	33.0'	DATE	20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 161





			1	2	3	
TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	70.4	71.3	69.9	
	VOID RATIO	e_o	1.98	2.04	2.01	
	SATURATION %	S_o	97	95	95	
	DRY DENSITY, LB/CU FT	γ_d	57.1	56.0	56.6	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	70.4	71.3	69.9	
	VOID RATIO	e_f	1.98	2.04	2.01	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.08	2.0	3.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.35	0.35	0.30	
TIME TO FAILURE, MIN		t_f	8.0	8.0	6.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.18 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU | TYPE OF SPECIMEN Undistrubed

CLASSIFICATION Very soft gray clay w/silt lenses

LL | PL | PI | | G_s 2.73

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

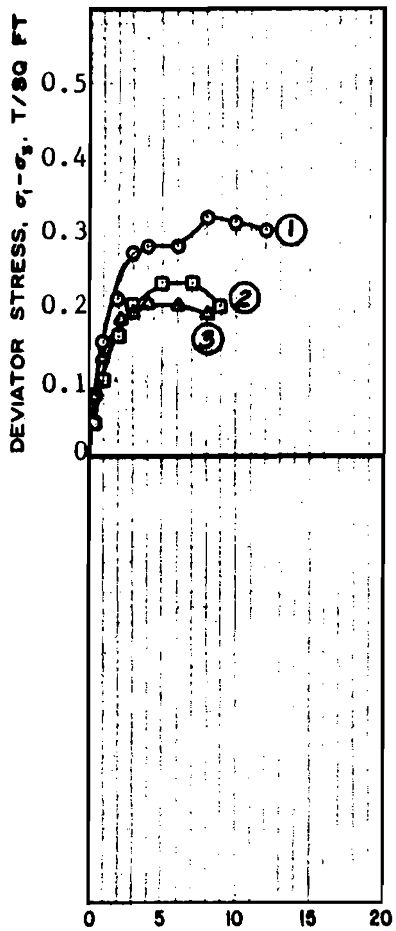
BORING NO. 68 | SAMPLE NO. 10

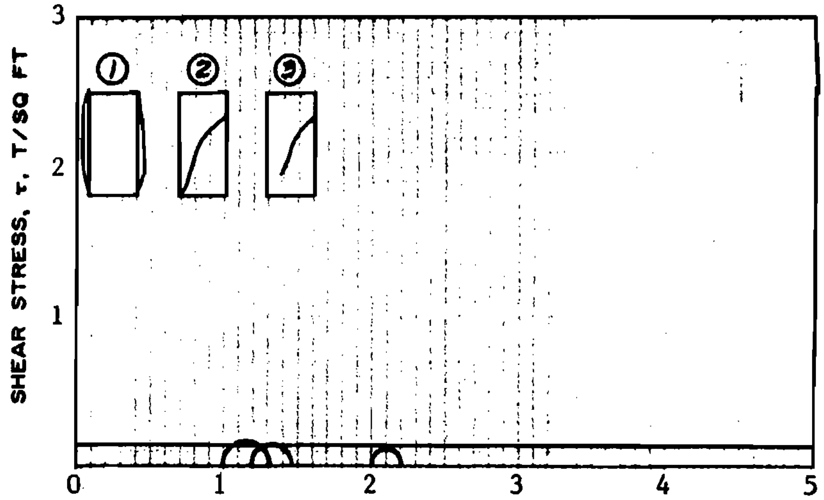
DEPTH 39.0' | DATE 20 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 162





	TEST NO.		1	2	3	
INITIAL	WATER CONTENT %	w_o	35.5	38.1	35.3	
	VOID RATIO	e_o	1.07	1.11	1.04	
	SATURATION %	S_o	90	92	91	
	DRY DENSITY, LB/CU FT	γ_d	81.5	79.7	82.5	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	35.5	38.1	35.3	
	VOID RATIO	e_f	1.07	1.11	1.04	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	1.19	2.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.32	0.23	0.20	
TIME TO FAILURE, MIN		t_f	8.0	5.0	4.0	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.12 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Very soft gray clay w/many sand pockets & shells

LL | PL | PI | | G_s 2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

Metairie Relief Canal

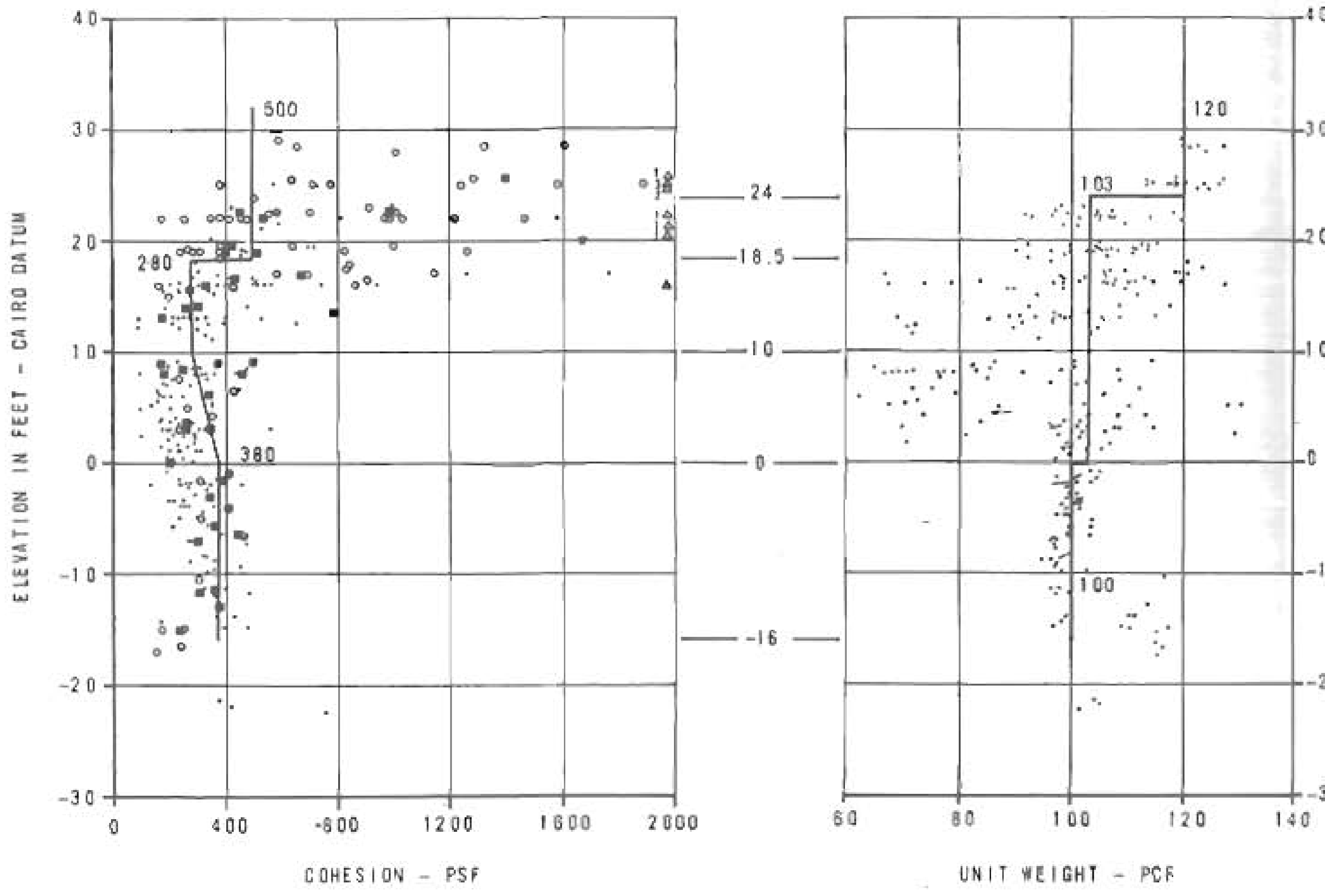
AREA Sta. 554+00 to Sta. 670+00

BORING NO. 68 | SAMPLE NO. 11

DEPTH 42.5' | DATE 20 August 1981

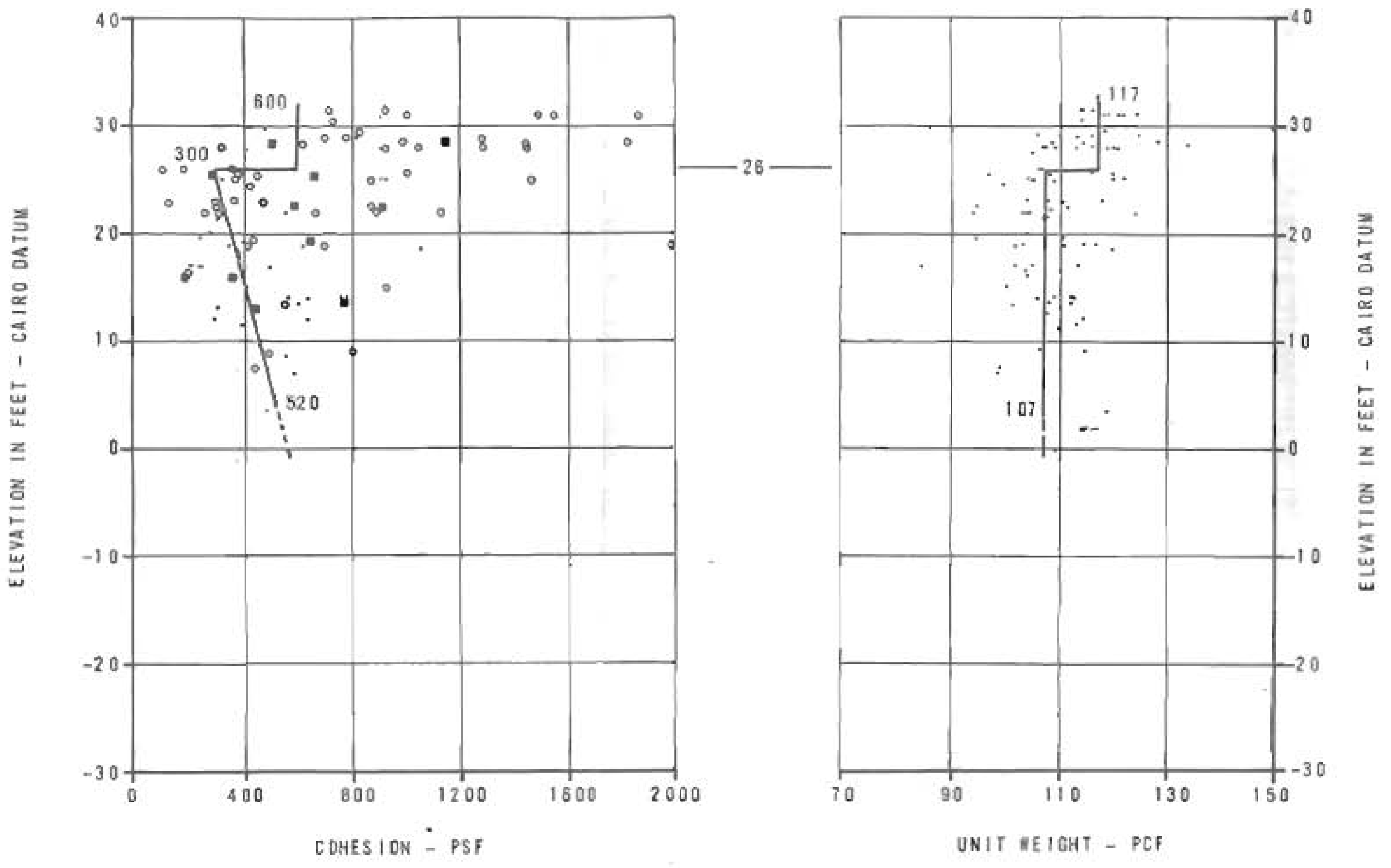
TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA



STATION 554+00 TO STATION 635+00

REACH I



STATION 635+00 TO STATION 670+00

REACH II

LEGEND

- • UNCONFINED COMPRESSION TESTS
- ○ ONE POINT U-U TRIAXIAL TESTS
- ■ THREE POINT U-U TRIAXIAL TESTS
- ▲ NUMBER OF TEST OVER 2000 PSF

NOTE:

1. AN "S" STRENGTH OF C = 0; Φ = 23° WAS ASSIGNED TO ALL CLAY SOILS.
2. A "Q" AND "S" STRENGTH OF C = 0; Φ = 30° WAS ASSIGNED TO ALL SANDS.

SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 554+00 TO STATION 670+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

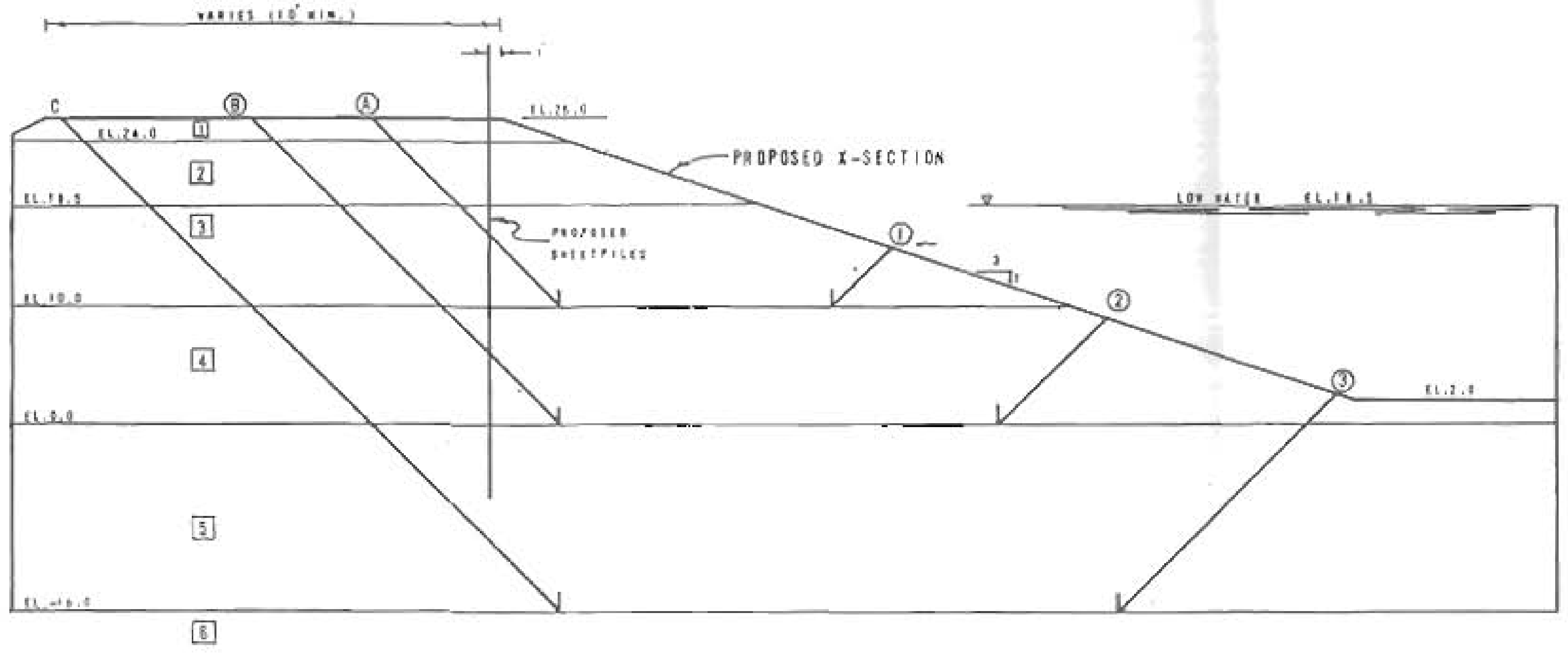
SOIL PARAMETERS

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981 METAIRIE, LA.

FIGURE 164

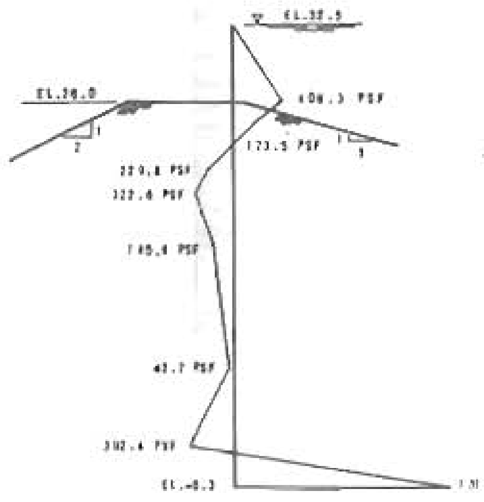
SLOPE STABILITY ANALYSIS



SLIP SURFACE			DRIVING			RESISTING				FACTOR OF SAFETY
NUMBER		EL.	+ D_A	− D_P	ΣD	+ R_A	+ R_B	+ R_P	ΣR	ΣR/ΣD
A	1	10.0	10959	682	12260	12260	6440	2800	21500	2.09
B	2	0.0	24558	2212	22346	18860	14060	5940	38860	1.74
C	3	− 16.0	54723	9222	45901	31020	17860	13810	62690	1.38

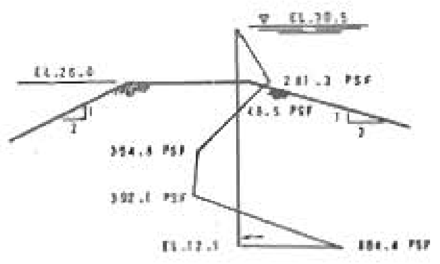
FLOODWALL ANALYSIS

EXISTING PLAN



MAXIMUM BENDING MOMENT:
11.9 FT-KIPS AT EL.19.0

AUTHORIZED PLAN



MAXIMUM BENDING MOMENT:
3.9 FT-KIPS AT EL.21.0

NOTES: 1) A FACTOR OF SAFETY OF 1.5 WAS APPLIED TO THE ESTIMATED SOIL SHEAR STRENGTHS TO DETERMINE THE REQUIRED SHEETPILE PENETRATION.

2) A FACTOR OF SAFETY OF 1.0 WAS APPLIED TO THE ESTIMATED SOIL SHEAR STRENGTHS TO DETERMINE THE MAXIMUM BENDING MOMENT.

3) THE "S" STRENGTHS GOVERN FOR ALL LOAD CONDITIONS.

4) A MINIMUM CROWN WIDTH OF 10 FEET WAS ASSUMED.

SOIL PARAMETERS

		ESTIMATED SHEAR STRENGTH "Q"			"S"
ST Nº	γ PCF	C_A PSF	C_{AP} PSF	φ DEG.	φ DEG.
1	120	500	500	0	23
2	103	500	500	0	23
3	41	280	280	0	23
4	41	330	380	0	23
5	40	380	380	0	23
6	60	0	0	30	30

NOTE: ELEVATIONS REFER TO CAIRO DATUM.

SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 554+00 TO STATION 670+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

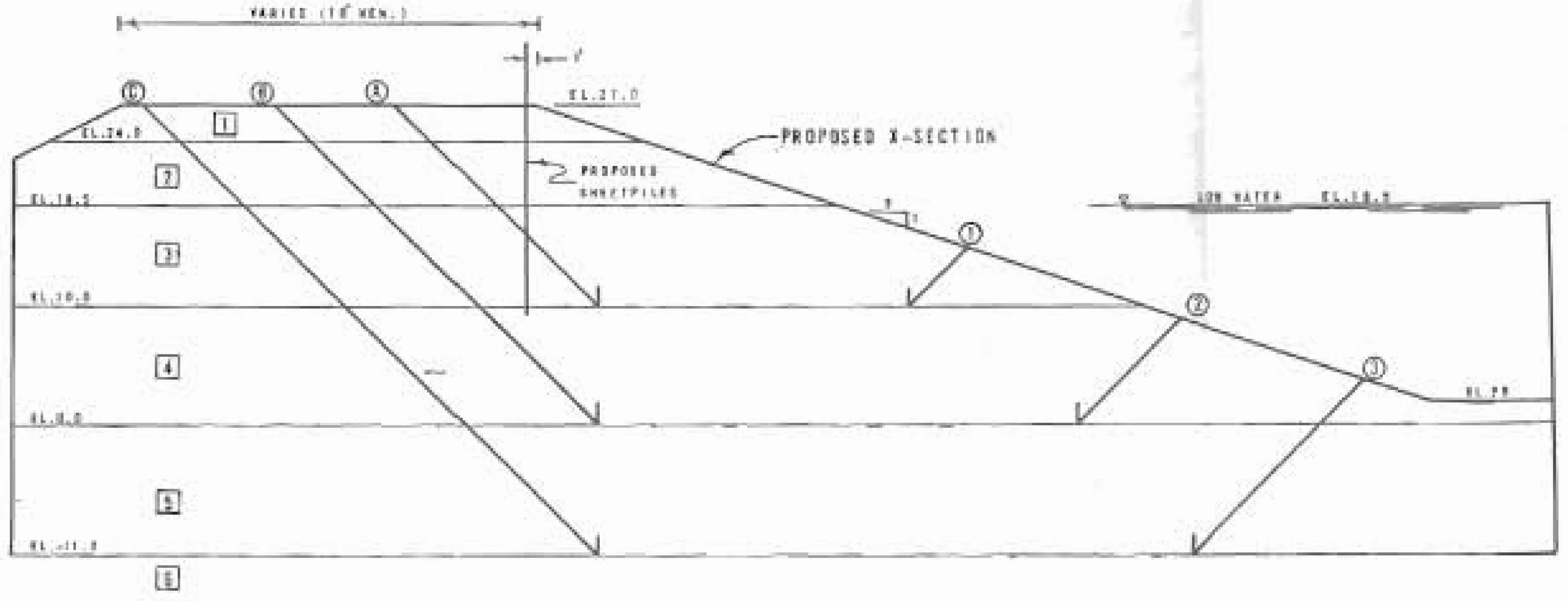
STABILITY & FLOODWALL ANALYSIS
STATION 554+00 TO STATION 589+00

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981 METAIRIE, LA.

FIGURE 165

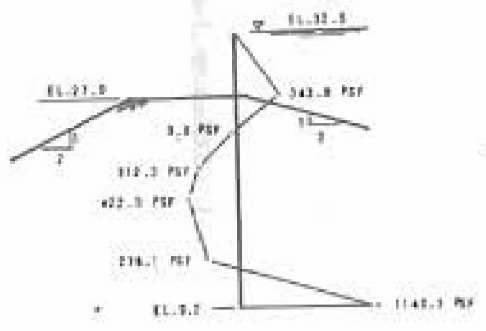
S L O P E   S T A B I L I T Y   A N A L Y S I S



SLIP SURFACE		DRIVING			RESISTING				FACTOR OF SAFETY
NUMBER	EL.	+ D_A	− D_P	ΣD	+ R_A	+ R_B	+ R_P	ΣR	$\Sigma R / \Sigma D$
A 1	10.0	12940	682	12258	13260	7280	2800	23340	1.90
B 2	0.0	27739	2212	25528	19860	15200	5940	41000	1.61
C 3	− 11.0	48608	5883	42815	28220	19000	10835	58055	1.38

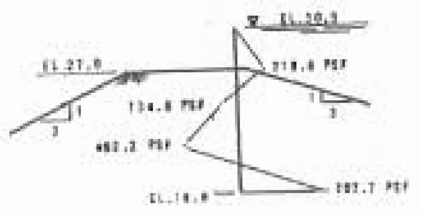
F L O O D W A L L   A N A L Y S I S

EXISTING PLAN



MAXIMUM BENDING MOMENT:
8.9 FT-KIPS AT EL.21.0

AUTHORIZED PLAN



MAXIMUM BENDING MOMENT:
1.7 FT-KIPS AT EL.24.0

NOTES: 1) A FACTOR OF SAFETY OF 1.5 WAS APPLIED TO THE ESTIMATED SOIL SHEAR STRENGTHS TO DETERMINE THE REQUIRED SHEETPILE PENETRATION.

2) A FACTOR OF SAFETY OF 1.0 WAS APPLIED TO THE ESTIMATED SOIL SHEAR STRENGTHS TO DETERMINE THE MAXIMUM BENDING MOMENT.

3) THE "S" STRENGTHS GOVERN FOR ALL LOAD CONDITIONS.

4) A MINIMUM CROWN WIDTH OF 10 FEET WAS ASSUMED.

S O I L   P A R A M E T E R S

		ESTIMATED SHEAR STRENGTH "Q"			ESTIMATED SHEAR STRENGTH "S"
ST Nº	γ PCF	C_A PSF	C_{AB} PSF	ϕ DEG.	ϕ DEG.
1	120	500	500	0	23
2	103	500	500	0	23
3	41	280	280	0	23
4	41	330	380	0	23
5	40	380	380	0	23
6	80	0	0	30	30

NOTE: ELEVATIONS REFER TO CAIRO DATUM.

SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 554+00 TO STATION 670+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

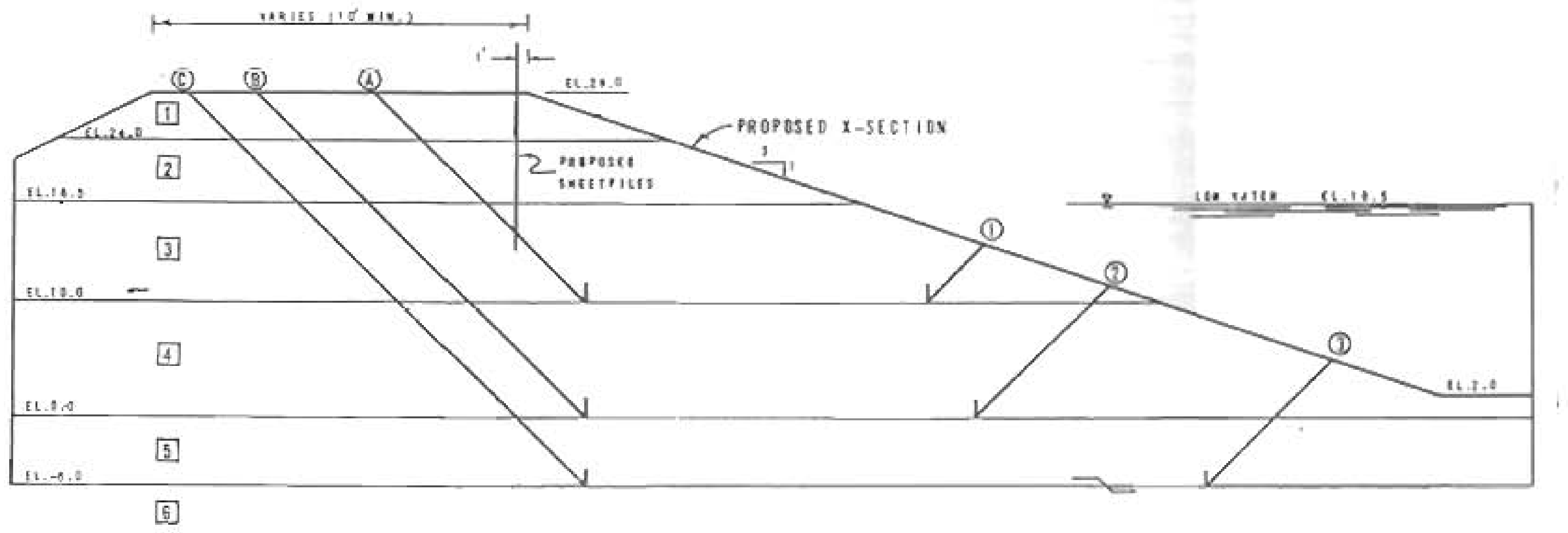
STABILITY & FLOODWALL ANALYSIS
STATION 589+00 TO STATION 614+00

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981 METAIRIE, LA.

FIGURE 16

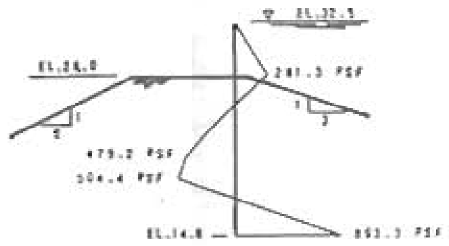
SLOPE STABILITY ANALYSIS



SLIP SURFACE			DRIVING			RESISTING				FACTOR OF SAFETY
NUMBER		EL.	$+D_A$	$-D_P$	ΣD	$+R_A$	$+R_B$	$+R_P$	ΣR	$\Sigma R / \Sigma D$
A	1	10.0	15039	682	14357	14260	8120	2800	25180	1.75
B	2	0.0	31040	3612	27428	20860	12540	7440	40840	1.49
C	3	- 6.0	42592	1955	40637	25420	23495	6210	55125	1.36

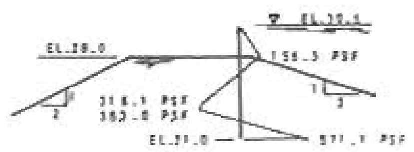
FLOODWALL ANALYSIS

EXISTING PLAN



MAXIMUM BENDING MOMENT:
3.7 FT-KIPS AT EL.23.0

AUTHORIZED PLAN



MAXIMUM BENDING MOMENT:
0.6 FT-KIPS AT EL.26.0

NOTES:
1) A FACTOR OF SAFETY OF 1.5 WAS APPLIED TO THE ESTIMATED SOIL SHEAR STRENGTHS TO DETERMINE THE REQUIRED SHEETPILE PENETRATION.
2) A FACTOR OF SAFETY OF 1.0 WAS APPLIED TO THE ESTIMATED SOIL SHEAR STRENGTHS TO DETERMINE THE MAXIMUM BENDING MOMENT.
3) THE "S" STRENGTHS GOVERN FOR ALL LOAD CONDITIONS.
4) A MINIMUM CROWN WIDTH OF 10 FEET WAS ASSUMED.

SOIL PARAMETERS

		ESTIMATED SHEAR STRENGTH "Q"			ESTIMATED SHEAR STRENGTH "S"
ST Nº	γ PCF	C_A PSF	C_{AB} PSF	ϕ DEG.	ϕ DEG.
1	120	500	500	0	23
2	103	500	500	0	23
3	41	280	280	0	23
4	41	330	380	0	23
5	40	380	380	0	23
6	60	0	0	30	30

NOTE: ELEVATIONS REFER TO CAIRO DATUM.

SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 554+00 TO STATION 670+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

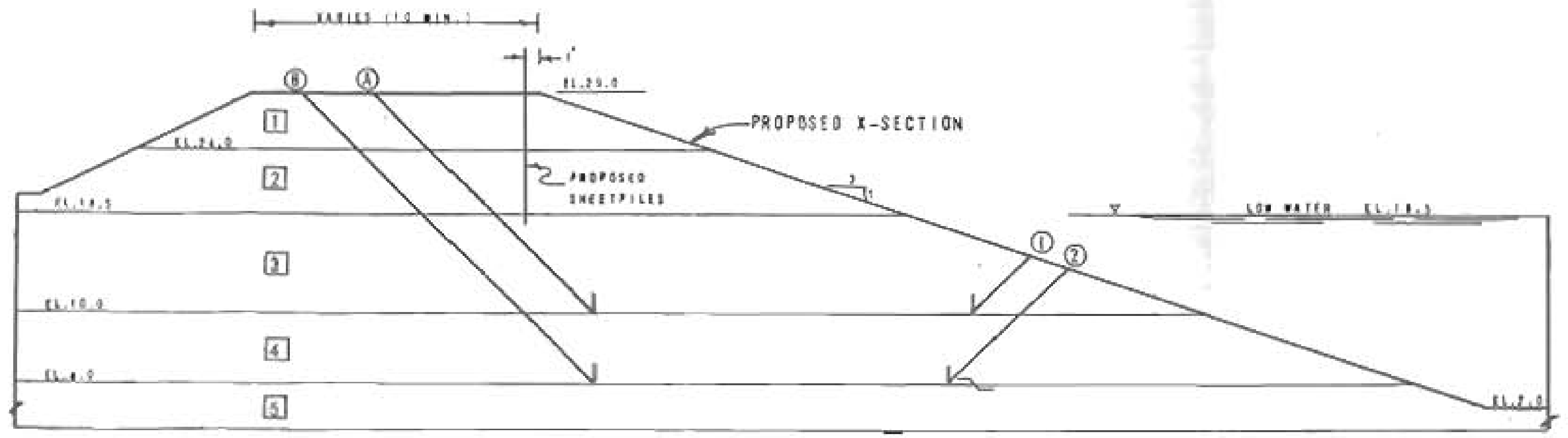
STABILITY & FLOODWALL ANALYSIS
STATION 614+00 TO STATION 625+00

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981 METAIRIE, LA.

FIGURE 167

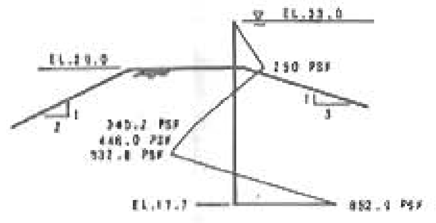
SLOPE STABILITY ANALYSIS



SLIP SURFACE			DRIVING			RESISTING				FACTOR OF SAFETY
NUMBER		EL.	+ D_A	− D_P	ΣD	+ R_A	+ R_B	+ R_P	ΣR	ΣR/ΣD
A	1	10.0	17260	682	16573	15260	8960	2800	27020	1.63
B	2	4.0	27087	2730	24357	18980	10200	5960	35140	1.44

FLOODWALL ANALYSIS

EXISTING PLAN



MAXIMUM BENDING MOMENT:
2.6 FT-KIPS AT EL.25.0

AUTHORIZED PLAN

MAXIMUM BENDING MOMENT:
0.3 FT-KIPS AT EL.27.0

NOTES:
1) A FACTOR OF SAFETY OF 1.5 WAS APPLIED TO ESTIMATED SOIL SHEAR STRENGTHS TO DETERMINE THE REQUIRED SHEETPILE PENETRATION.
2) A FACTOR OF SAFETY OF 1.0 WAS APPLIED TO THE ESTIMATED SOIL SHEAR STRENGTHS TO DETERMINE THE MAXIMUM BENDING MOMENT.
3) THE "S" STRENGTHS GOVERN FOR ALL LOAD CONDITIONS.
4) A MINIMUM CROWN WIDTH OF 10 FEET WAS ASSUMED.

SOIL PARAMETERS

		ESTIMATED SHEAR STRENGTH			
		"Q"			"S"
ST N°	γ PCF	C_A PSF	C_{MB} PSF	φ DEG.	φ DEG.
1	120	500	500	0	23
2	103	500	500	0	23
3	41	280	280	0	23
4	41	310	340	0	23
5	60	0	0	30	30

NOTE: ELEVATIONS REFER TO CAIRO DATUM.

SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 554+00 TO STATION 670+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

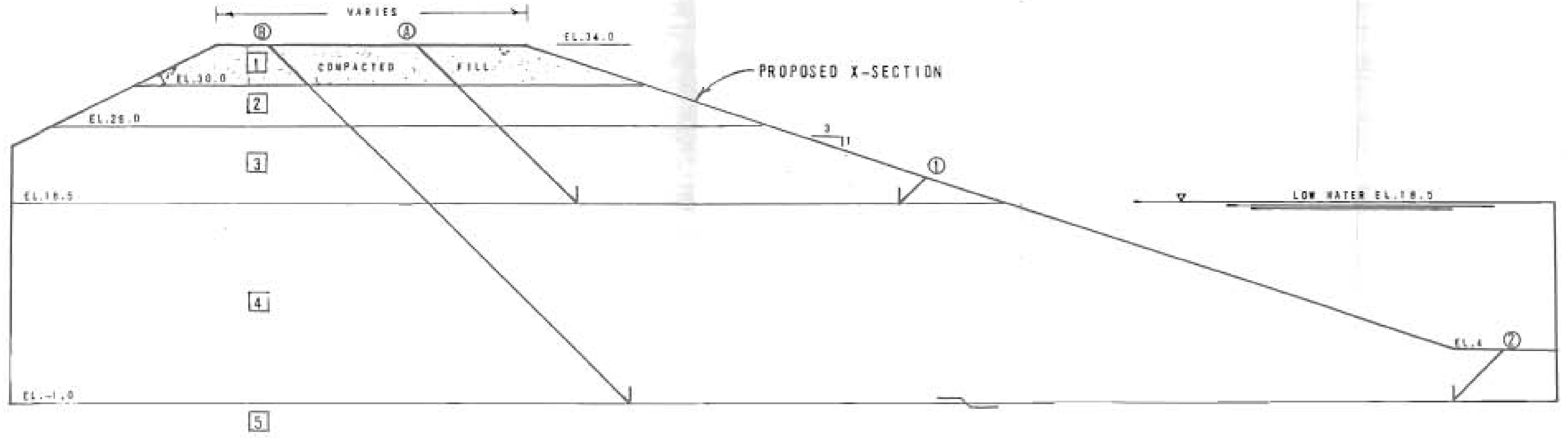
STABILITY & FLOODWALL ANALYSIS
STATION 625+00 TO STATION 635+00

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981 METAIRIE, LA.

FIGURE 168

SLOPE STABILITY ANALYSIS



SLIP SURFACE		DRIVING FORCE			RESISTING FORCE				FACTOR OF SAFETY
NO.	EL.	D_A	D_P	ΣD	R_A	R_B	R_P	ΣR	$\Sigma R / \Sigma D$
A - 1	18.5	13193	446	12747	13055	11812	1685	26553	2.08
B - 2	- 1.0	54060	561	53499	31502	34552	4730	70784	1.32

SOIL PARAMETERS

		ESTIMATED SHEAR STRENGTH			
		"Q"			"S"
ST. NO.	γ PCF	C_A PSF	C_{RB} PSF	ϕ DEG.	ϕ DEG.
1	115	400	400	0	23
2	117	600	300	0	23
3	107	337	375	0	23
4	45	473	570	0	23
5	60	0	0	30	30

NOTE: ELEVATIONS REFER TO CAIRO DATUM

SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 554+00 TO STATION 670+00
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

SLOPE STABILITY ANALYSIS
STATION 635+00 TO STATION 670+00

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981 METAIRIE, LA.

FIGURE 169

PARTNERS

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EUSTIS ENGINEERING COMPANY
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CORP. VICE-PRESIDENT AND
CHIEF ADMINISTRATIVE OFFICER
GERALD A. BRAGG
VICE PRESIDENT AND
CHIEF ENGINEER
LLOYD A. HELD, JR.

27 October 1981

Modjeski and Masters, Inc.
Consulting Engineers
1055 St. Charles Avenue
New Orleans, Louisiana 70113

Attention Mr. William B. Conway

Gentlemen:

Subsoil Investigation
Sewerage and Water Board of New Orleans
Metairie Relief Canal
Station 439+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

Transmitted is our engineering report covering a subsoil foundation investigation performed for the subject project.

Thank you for asking us to perform this investigation.

Yours very truly,

EUSTIS ENGINEERING COMPANY

By Lloyd A. Held, Jr.

Lloyd A. Held, Jr.

SUBSOIL INVESTIGATION

SEWERAGE AND WATER BOARD OF NEW ORLEANS

METAIRIE RELIEF CANAL

STATION 539+00 TO STATION 554+00

JEFFERSON AND ORLEANS PARISHES, LOUISIANA

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

By
Eustis Engineering Company
Metairie, Louisiana

27 October 1981

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FIGURES 1 THROUGH 29

SUBSOIL INVESTIGATION

SEWERAGE AND WATER BOARD OF NEW ORLEANS

METAIRIE RELIEF CANAL

STATION 539+00 TO STATION 554+00

JEFFERSON AND ORLEANS PARISHES, LOUISIANA

INTRODUCTION

1. This report contains the results of a subsoil foundation investigation performed for proposed improvements to the existing Metairie Relief Canal between Station 539+00 and Station 554+00 located in Jefferson and Orleans Parishes, Louisiana. The investigation was performed in accordance with Eustis Engineering Company's letter of proposal for professional soil engineering services dated 27 February 1981. Authorization for performance of the investigation was received in the form of signed acceptance of this proposal on 12 March 1981 by Mr. William B. Conway representing Modjeski and Masters, Inc., Consulting Engineers for the project.

2. This report has been prepared in accordance with generally accepted soil and foundation engineering practice for exclusive use of Modjeski and Masters, Inc. and their representatives for specific application to the site of the proposed improvements to the existing Metairie Relief Canal between Stations 539+00 and 554+00 in Jefferson and Orleans Parishes, Louisiana. In the event that any changes in the

nature, design or location of the improvements are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing.

3. The analyses and recommendations submitted in this report are based in part on data obtained from the soil borings. The nature and extent of variations that may exist between boring locations may not become evident until construction. If variations then appear, it will be necessary to re-evaluate the recommendations contained in this report.

SCOPE

4. The scope of the investigation included the drilling of undisturbed sample type soil test borings to determine subsoil conditions and stratification and to obtain samples of the various strata encountered. Soil mechanics laboratory tests were performed on samples obtained from the borings to evaluate the physical properties of the subsoils. Engineering analyses were made to determine the stability of proposed typical cross-sections of the enlarged canal, to determine the penetration, maximum bending moment and tieback reactions for the proposed new bulkheads, and to determine allowable pile load capacities.

SOIL BORINGS

5. A total of eight (8) undisturbed sample type soil test borings were drilled during the period 16-30 July 1981 at the locations shown on Figure 1. The borings were drilled with a truck mounted rotary type drill rig, each to a depth of 75 feet below the existing ground surface. The borings were numbered B-69 through B-76 because of previous borings drilled between Stations 554+00 and 670+00. Results of the borings are shown graphically in the form of subsoil profiles on Figure 2, and detailed descriptive logs of the individual borings are shown in both tabular and graphical form on Figures 3 through 10.

6. Undisturbed samples of all cohesive and semi-cohesive soils were obtained at close intervals or at a change in stratum using a 3-in. diameter Shelby tube sampling barrel, except at Borings 71 and 74, where samples were recovered using a 5-in. diameter sampling barrel. All samples were carefully extruded in the field, inspected and visually classified by Eustis Engineering Company's soil technician. Representative specimens were carefully cut, placed in moisture proof containers and sealed with paraffin for preservation.

7. Cohesionless soils were sampled during the performance of Standard Penetration Tests, which provides a measure of the relative density of cohesionless soils and gives an indication of the consistency of cohesive soils. The Standard Penetration Test consisting of counting the number

of blows required to drive a 2-in. diameter splitspoon sampler one foot after first seating it six inches using a 140-lb weight dropped 30 inches. The results of these tests are shown on the individual boring logs under the column headed "Standard Penetration Test," and are also shown on the subsoil profiles at the depths at which these tests were performed. Samples obtained during performance of these tests were placed in glass jars for preservation of their natural moisture content.

LABORATORY TESTS

8. Soil mechanics laboratory tests consisting of natural water content, unit weight, and either unconfined compression or one-point unconsolidated undrained triaxial compression shear were performed on a majority of the undisturbed samples. In addition, Atterberg liquid and plastic limit determinations were made on selected representative samples of cohesive soils. The results of these tests are summarized and shown in tabular form on Figures 11 through 18. Three-point unconsolidated undrained triaxial compression shear ("Q") tests were performed on several of the 5-in. diameter samples obtained from Borings 71 and 74. The results of these tests are shown individually on Figures 19 through 26. Soil parameters and stratification used in the engineering analyses are shown on Figure 27 in the form of "Shear Strength versus Elevation" and "Unit Weight versus Elevation." In the

determination of shear strength values for the analyses, emphasis was placed on the results of the three-point unconsolidated undrained triaxial compression shear ("Q") tests.

DESCRIPTION OF SUBSOIL CONDITIONS

9. Based on furnished drawings, it is estimated that the ground surface elevations at the boring locations range between 22.5 and 29.0 Cairo Datum. Fill consisting of shells, sand, silt, clay and miscellaneous materials extends to elevations ranging between 20 C.D. and 16 C.D., except at Borings 75 and 76, where it continues to el 11 C.D. and el 0.0 C.D., respectively. The natural ground surface beneath the fill consists primarily of extremely soft to medium stiff brown, black and gray clay, organic clay, humus and wood that continue to elevations between 7 C.D. and 3.5 C.D. Following this is a stratum of very soft to medium stiff gray clay to elevations ranging between -12.5 C.D. and -16 C.D. Except at Boring 75, this is followed by a stratum of very loose to dense gray sand, silty sand and clayey sand that extends to elevations between -18.5 C.D. and -27 C.D. Below this is a stratum of very soft to medium stiff gray clay that continues to the surface of the Pleistocene formation at elevations between -36 C.D. and -42.5 C.D. The surface of the Pleistocene formation consists of medium stiff to very stiff gray, tan and greenish-gray clay, silty clay and sandy clay and loose to dense gray, brown, yellow, tan and greenish-gray sand, silty sand, and clayey sand

to elevations ranging between -46 C.D. and -52.5 C.D., where the borings are terminated.

Ground Water Conditions

10. Because of the location of the borings, each boring was sealed with a soil-cement grout in accordance with U.S. Army Corps of Engineers requirements immediately upon completion of drilling operations. Therefore, no ground water observations were made in the undisturbed borings. The ground water will fluctuate with climatic conditions and changes in the water elevation in the Metairie Relief Canal. If important to construction, it should be verified immediately prior to beginning work.

FOUNDATION ANALYSIS

11. Improvements to the Metairie Relief Canal between Station 539+00 and Station 554+00 will consist of widening and deepening of the existing canal and will also include installation of a new sheetpile bulkhead along the east and west sides of the enlarged canal. It is understood that consideration will be given to two (2) alternate alignments which are illustrated by the typical cross-sections shown on Figure 27. The proposed cross-section for Alternate Alignment No. 1 is symmetrical and therefore the configuration of the east side and west side is identical. The proposed cross-section for Alternate Alignment No. 2 is not symmetrical although it should be noted the configuration of the west side is identical

to Alternate Alignment No. 1. In view of these similarities, analyses were required for only two typical cross-sections. One typical cross-section represents the east side configuration of Alternate No. 1 as well as the west side configuration of Alternate No. 1 and No. 2, and one typical cross-section represents the east side configuration of Alternate No. 2.

Slope Stability

12. Analyses were performed to determine the stability of the proposed typical cross-sections using the Corps of Engineers Method of Planes Analysis. Horizontal potential failure surfaces were varied along with active and passive wedge locations to arrive at the lowest numerical value of safety factor. Results of the computations are shown on Figures 28 and 29 along with the location of the critical wedges and typical computations. A minimum factor of safety of 1.3 is indicated for the typical cross-section representing the east side of Alternate No. 2 and a minimum value of 1.54 is indicated for the typical cross-section representing the east side of Alternate No. 1 and west side of Alternate Nos. 1 and 2. A factor of safety of 1.3 is acceptable.

New Bulkhead

13. Analysis of the new bulkhead was performed in accordance with the following Corps of Engineers criteria.

a) Application of full hydrostatic pressure without dissipation;

b) Evaluation using "Q" and "S" soil shear strengths for all loading conditions;

c) A factor of safety of 1.5 applied to soil strengths for determination of sheetpile embedment; and

d) A factor of safety of 1.0 applied to soil strengths for determination of anchor force and maximum bending moment.

14. The new bulkhead will require lateral support at el 23.5 C.D. for stability during low water conditions in the canal. A sheetpile penetration to el -12.8, an anchor force of 2.64 klf, and a maximum bending moment of 13.1 ft-kips are indicated for the proposed bulkhead along the east side of Alternate Alignment No. 1 as well as the proposed bulkhead along the west side of Alternate Alignment Nos. 1 and 2. A sheetpile penetration to el -28 C.D., an anchor force of 6.95 klf, and a maximum bending moment of 64.4 ft-kips are indicated for the proposed bulkhead along the east side of Alternate Alignment No. 2.

15. Based on a high water level at el 29.5 C.D., computations indicate that the high water condition is not critical and therefore design of the new bulkheads will be governed by the low water condition.

16. Results of the bulkhead analyses for the low and high water conditions along with the combined earth and water pressure diagrams are shown on Figures 28 and 29.

Pile Supported Anchor

17. A pile supported anchor should be used to provide the necessary lateral support of the sheetpiles, and should be located at least 25 feet behind the sheetpiles, except along the east side if Alternate Alignment No. 2 is selected, where a minimum distance of 35 feet should be provided. Computations were made to determine the allowable horizontal load capacity for treated Class "B" timber piles driven on a batter of 3 vertical on 1 horizontal. The results include a factor of safety of 2.0 against actual failure of the pile through the soil and are summarized in the following tabulation.

TREATED CLASS "B" TIMBER BATTER PILES
3 Vertical on 1 Horizontal

Pile Length Feet	Minimum Pile Size	Approx. Pile Tip Elevation C.D.	Estimated Allowable Horizontal Load Capacity In Tons Factor of Safety = 2	
			Compression	Tension
30	8" Tip, 12" Butt	-5.5	2.2	1.5
40	7" Tip, 12" Butt	-15	3.1	2.2
50	7" Tip, 12" Butt	-24.5	4.6	3.2
60	7" Tip, 13" Butt	-34	6.1	4.3

Fill Material

18. At some locations, placement of fill material will be necessary to obtain the proposed cross-section. Riprap should be used for filling on the canal side of the new

bulkhead. Spoil material obtained from the degrading of the existing levee may be used for backfill on the landside of the new bulkhead. This material should be placed and compacted in accordance with Corps of Engineers Standard Specifications for Semi-Compacted Material. Spoil material obtained from the bottom and/or slopes of the canal should not be used for backfill.

Erosion Control

19. Removal of the canal side berm by erosion and/or scour will appreciably affect the stability of the new bulkheads. The determination of the need for erosion control is beyond the scope of this report and should be accomplished by qualified specialists in the field.

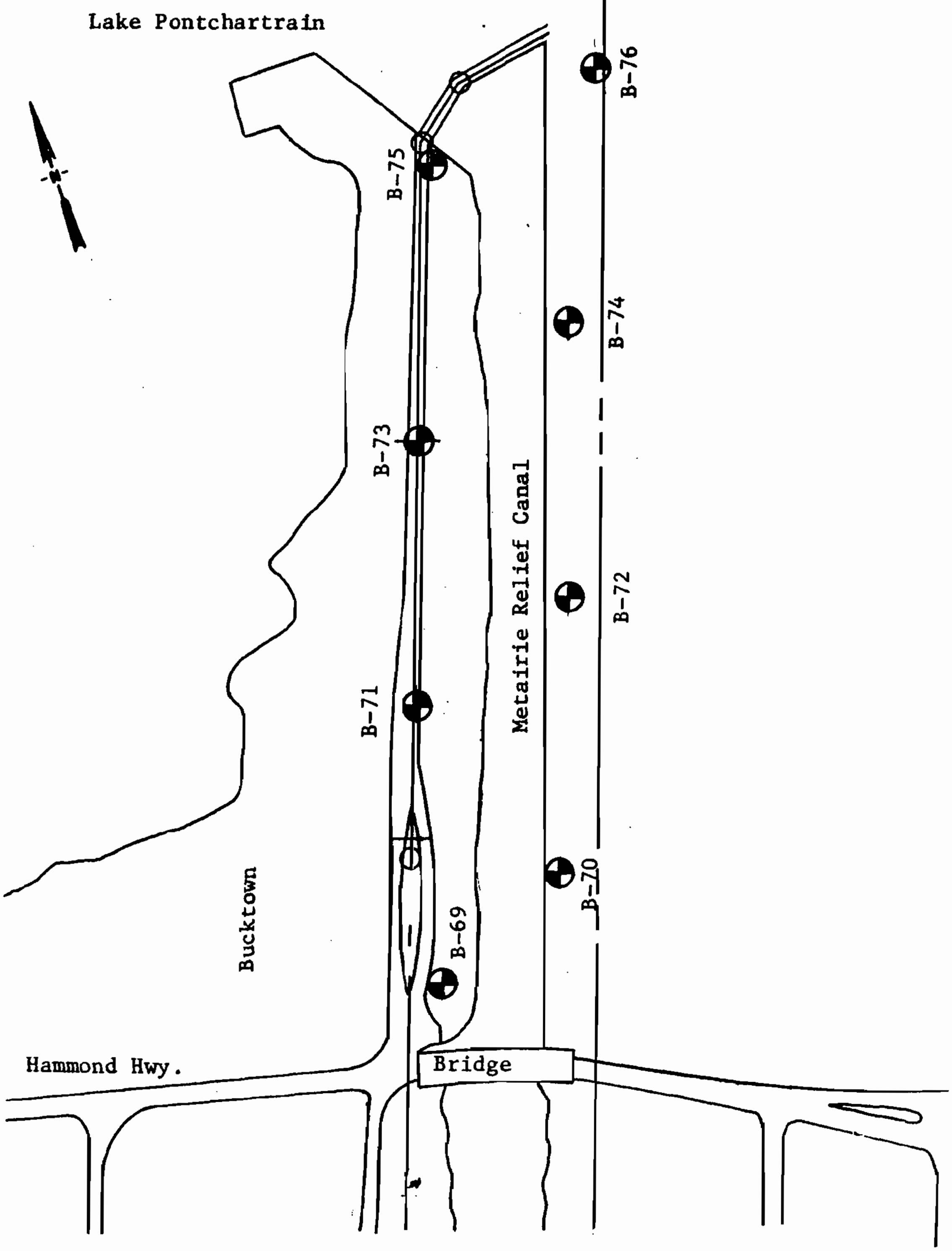
Existing Bulkhead

20. Furnished information indicates that the existing sheetpiles are embedded no deeper than el -7 C.D., and are supported laterally by 3" x 12" creosoted timbers located approximately 14 feet behind the sheetpiles. The new sheetpiles for Alternate Alignment No. 2 (along the east side) will be embedded to el -28 C.D. and will be supported laterally by a pile supported concrete anchor located at least 35 feet behind the sheets. By comparison, it is evident that the existing sheetpile walls are not in accordance with Corps of Engineers design criteria.

EUSTIS ENGINEERING COMPANY

By Lloyd A. Held, Jr.
Lloyd A. Held, Jr.

L. J. Napolitano:bh

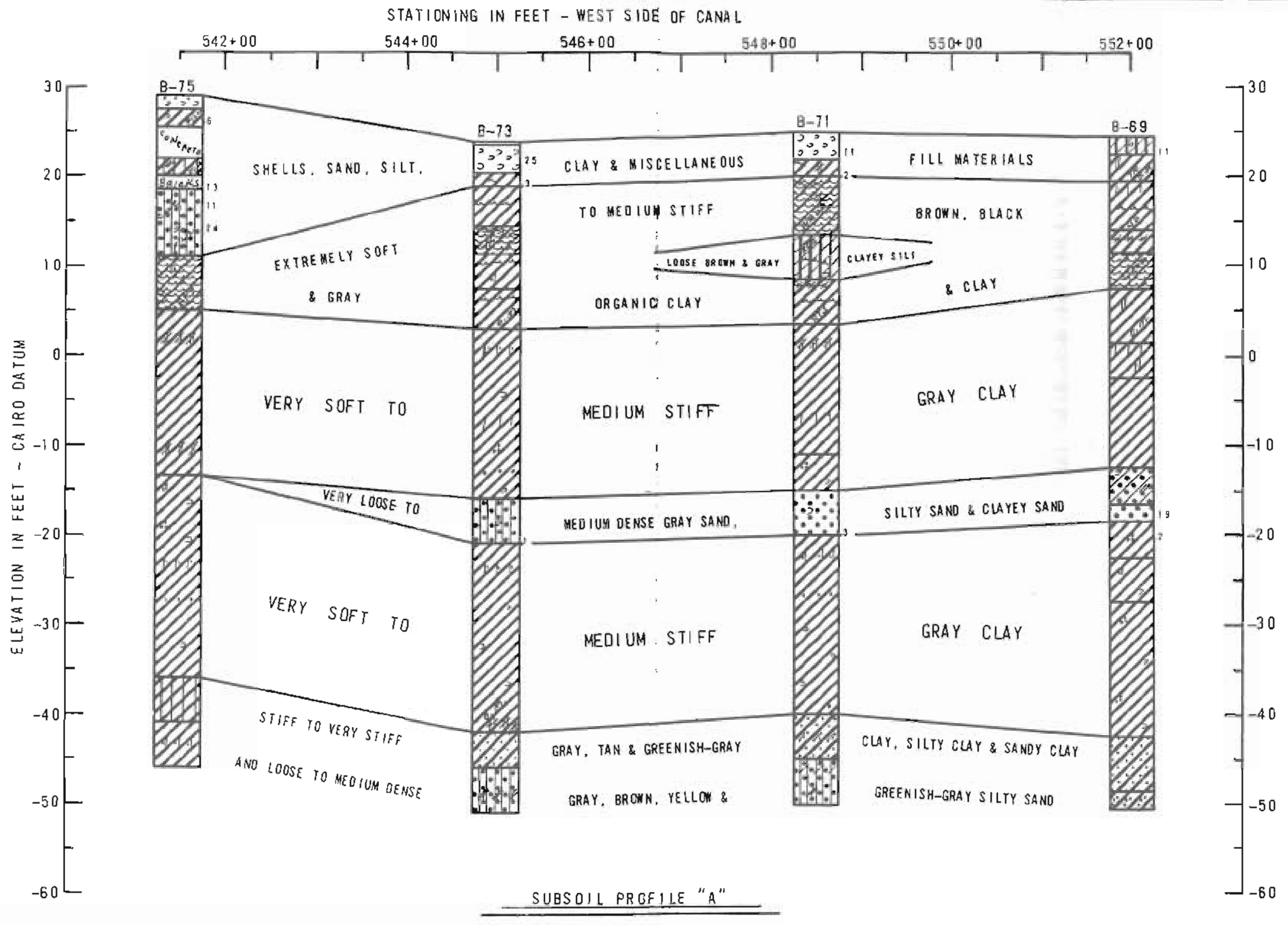


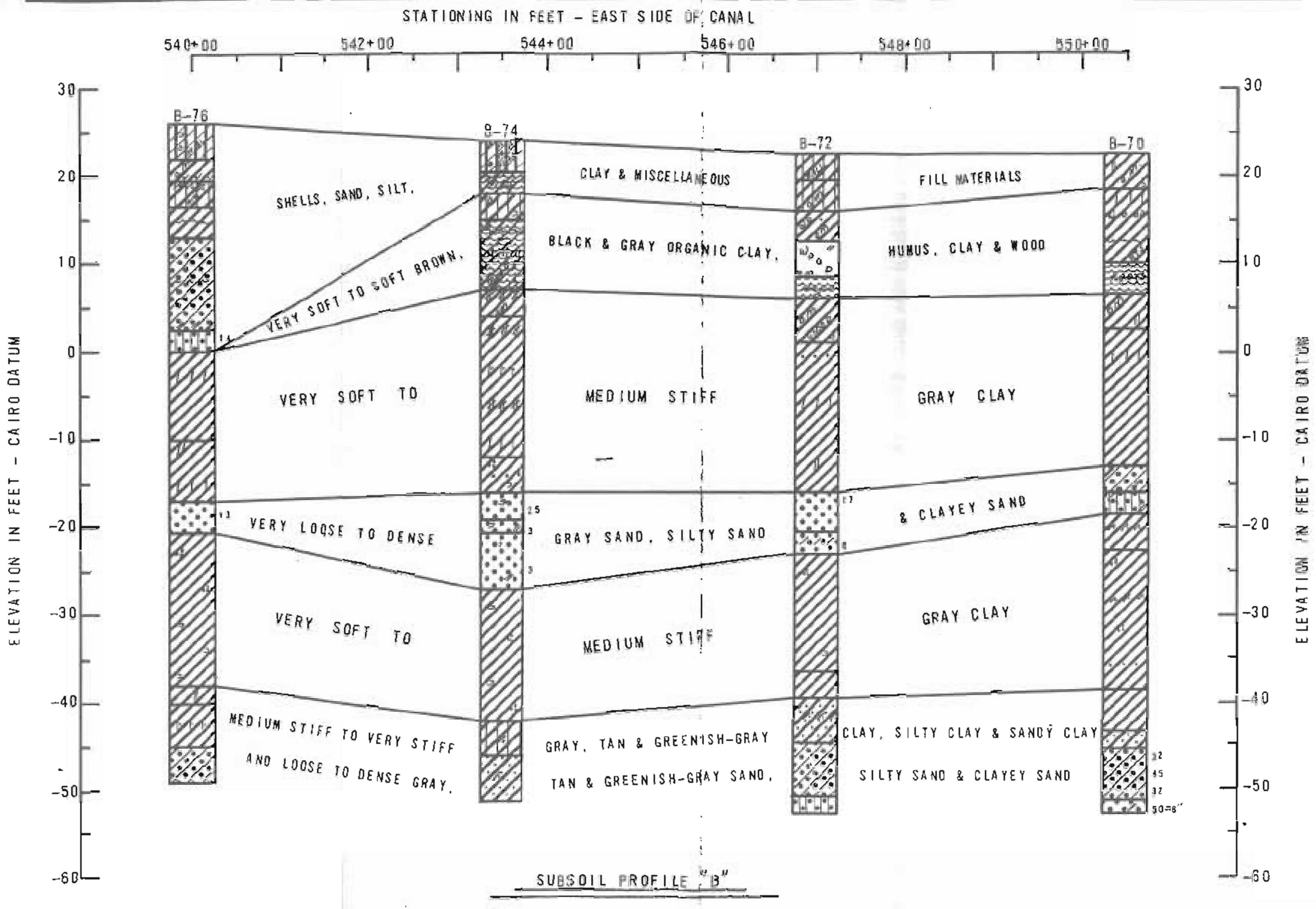
Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Fig. 1

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

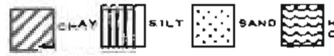




GENERAL NOTES

WHILE THE INDIVIDUAL LOGS OF BORINGS ARE CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THEIR RESPECTIVE LOCATIONS ON THE DATES SHOWN, IT IS NOT WARRANTED THAT THEY ARE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES. THEREFORE, THE SUBSOIL STRATIFICATION SHOWN ON THIS PROFILE IS NOT WARRANTED BUT IS ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND PRACTICES.

LEGEND



PREDOMINATE TYPE SHOWN HEAVY.
MODIFYING TYPE SHOWN LIGHT

FIGURES BESIDE BORINGS INDICATE NUMBER OF BLOWS OF 140-LB. HAMMER DROPPED 30-INCHES REQUIRED TO DRIVE A 2-INCH DIA. SPLIT-SPOON SAMPLER 1-FOOT AFTER FIRST BEING SEATED 6-INCHES (STANDARD PENETRATION TEST)

SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 539+00 TO STATION 554+00
JEFFERSON AND ORLEANS PARISHES, LOUISIANA

SUBSOIL PROFILES

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981 METAIRIE, LA.

FIGURE 2

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Sheet 1 of 2

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

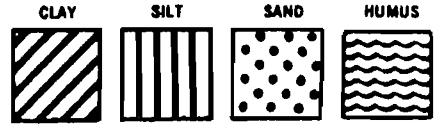
Boring No. 69 Soil Technician Jack Pratt Date 17 July 1981

Ground Elev. 24.5 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	0.5	2.0	0.0	2.0	Loose gray & tan clayey silt w/shells	4	11
2	3.5	4.0	2.0	5.0	Medium stiff gray clay w/silt pockets &		
					trace of organic matter		
3	5.5	6.0	5.0		Very soft gray clay w/humus pockets &		
					wood		
4	8.0	8.5		10.5	Very soft gray clay w/silt, humus,		
					lenses & wood		
5	11.0	11.5	10.5	13.0	Extremely soft gray clay w/organic		
					clay layers		
6	14.0	14.5	13.0	17.0	Soft brown organic clay w/wood		
7	19.0	19.5	17.0	23.0	Soft gray clay w/silt pockets & organic		
					matter		
8	24.0	24.5	23.0	27.0	Very soft gray clay w/silt lenses &		
					pockets		
9	29.0	29.5	27.0		Soft gray clay		
10	34.0	34.5		37.0	Ditto		
11	39.0	39.5	37.0	41.0	Loose gray clayey sand w/shell		
					fragments & clay pockets		
12	41.0	42.5	41.0	43.0	Medium dense gray fine sand	5	19
13	43.5	45.0	43.0	47.0	Very soft gray clay w/sand pockets	1	2
14	48.5	49.0	47.0	52.0	Very soft gray clay w/sand pockets &		
					shells		
15	54.0	54.5	52.0		Soft to medium stiff gray clay w/sand		
					pockets & shell fragments		
16	59.0	59.5			Ditto		
17	64.0	64.5		67.0	Ditto		

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal @ Sta. No. 552+00.

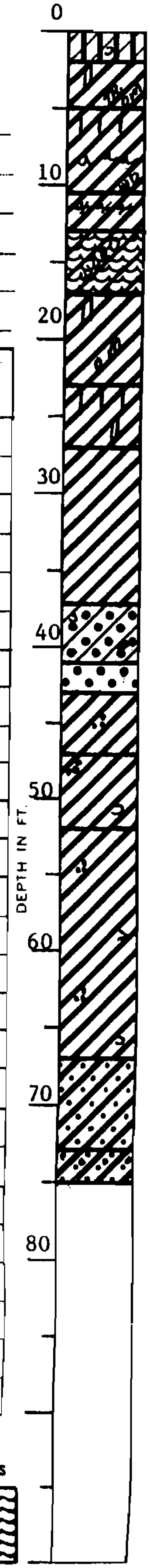


Fig. 3
(Sheet #1)

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 69 Soil Technician Jack Pratt Date 17 July 1981
Ground Elev. (Cont'd) 24,5 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
18	69.0	69.5	67.0	73.0	Stiff greenish-gray sandy clay		
19	73.5	74.0	73.0	75.0	Stiff tan & gray sandy clay w/sand		
					layers		

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

CLAY SILT SAND HUMUS

Predominant type shown heavy. Modifying type shown light.

DEPTH IN FT.

Remarks: Boring located of Westside of canal @ Sta. No. 552+00.

Fig. 3
(Sheet #2)

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

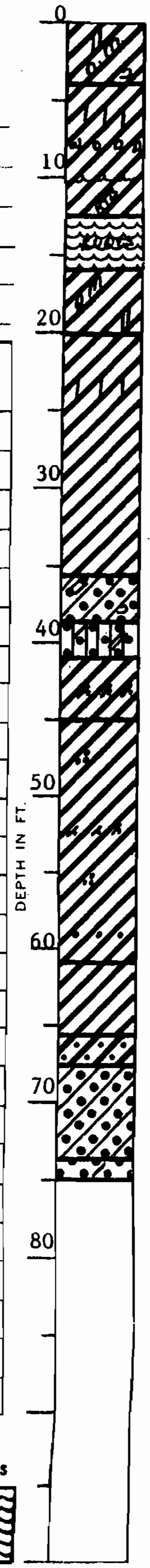
Metairie Relief Canal, Station 539+00 to Station 554+00

Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 70 Soil Technician R. Courtiade Date 16 July 1981

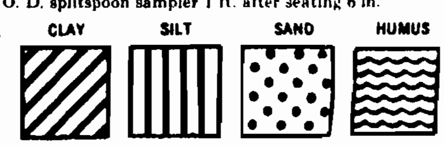
Ground Elev. 22.5 (Est.) Datum Cairo Gr. Water Depth



Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	2.0	2.5	0.0	4.0	Medium stiff gray clay w/silt pockets,		
					organic matter & shells		
2	5.0	5.5	4.0		Very soft gray clay w/silt lenses &		
					wood layers		
3	8.0	8.5			Ditto		
4	11.0	11.5		12.5	Very soft gray clay w/humus layers &		
					roots		
5	14.0	14.5	12.5	16.0	Soft dark brown humus w/roots		
6	18.5	19.0	16.0	20.0	Very soft gray clay w/organic matter		
					& silt pockets		
7	23.5	24.0	20.5		Soft gray clay w/silt lenses		
8	28.5	29.0			Soft gray clay		
9	33.5	34.0		35.5	Ditto		
10	37.0	37.5	35.5	38.5	Very loose gray clayey sand w/clay &		
					shell fragments		
11	38.5	40.0	38.5	41.0	Dense gray silty sand w/clay traces &		
					pockets		
12	41.5	43.0	41.0	45.0	Very soft gray clay w/clayey sand layers		
13	48.5	49.0	45.0		Soft to medium stiff gray clay w/sand		
					pockets & clayey sand layers		
14	53.5	54.0			Soft to medium stiff gray clay w/sand		
					pockets & layers		
15	48.5	49.0		61.0	Ditto		
16	63.5	64.0	61.0	65.5	Stiff gray clay		
17	66.5	67.0	65.5	67.5	Stiff gray sandy clay		
					(Continued)		

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. No. 550+50.

Predominant type shown heavy. Modifying type shown light.

Fig. 4

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 70 (Cont'd) Soil Technician R. Courtiade Date 16 July 1981
Ground Elev. 22.5 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
18	67.5	69.0	67.5		Dense gray clayey sand	11	32
19	69.5	71.0			Ditto	15	45
20	71.5	73.0		73.5	Ditto	8	32
21	73.5	75.0	73.5	75.0	Very dense tan & gray sand w/trace of clay	14	50=8"

DEPTH IN FT.

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

CLAY SILT SAND HUMUS

Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Eastside of canal @ Sta. No. 550+50.

Fig. 4
(Sheet # 2)

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 71 Soil Technician A. Croal, Jr. Date 30 July 1981

Ground Elev. 25.0 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	1.0	2.5	0.0	3.0	Medium dense gray & white shells	10	11
2	3.5	5.0	3.0	5.0	Soft gray clay w/humus & clayey silt	2	2
					pockets		
3	7.5	8.5	5.0	11.5	Medium stiff gray & black organic		
					clay w/humus, clay pockets & wood		
4	13.5	14.5	11.5	16.5	Loose brown & gray clayey silt w/roots,		
					humus & clam shells		
5	18.0	19.0	16.5	21.5	Soft dark gray clay w/organic clay,		
					& humus layers & roots		
6	23.0	24.0	21.5		Soft gray clay w/clayey silt lenses &		
					layers		
7	28.0	29.0			Ditto		
8	33.0	34.0		36.0	Soft gray clay w/few silt lenses		
9	38.0	39.0	36.0	40.0	Medium stiff gray clay w/few fine sand		
					pockets & shell fragments		
10	42.5	43.5	40.0		Very loose gray fine sand w/few shell		
					fragments		
11	43.5	45.0		45.0	Ditto	1	3
12	48.0	49.0	45.0		Soft to medium stiff gray clay w/sandy		
					silt, fine sand lenses & shell		
					fragments		
13	53.0	54.0			Soft to medium stiff gray clay w/shell		
					fragments		
14	58.0	59.0		65.0	Soft to medium stiff gray clay w/trace		
					of sand		
					(Continued)		

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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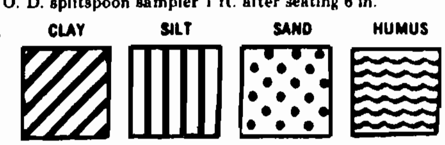

Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located at Westside of canal @ Sta. No. 548+50.

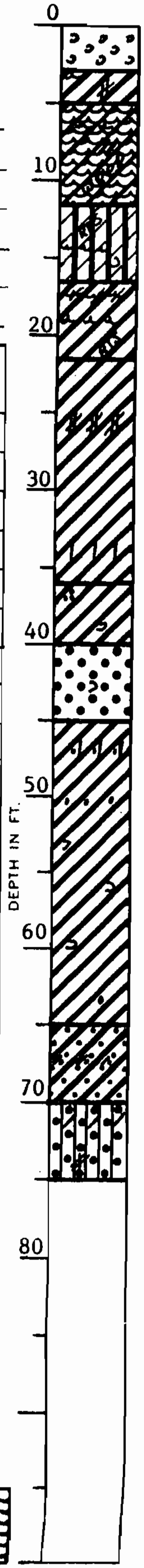

Fig. 5 (Sheet #1)

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 71 (Cont'd) Soil Technician A. Croal, Jr. Date 30 July 1981

Ground Elev. 25.0 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
15	68.0	69.0	65.0	70.0	Stiff greenish-gray sandy clay w/clayey sand layers		
16	71.5	72.5	70.0	75.0	Medium dense greenish-gray silty sand w/clay layers & silty clay pockets		

DEPTH IN FT.

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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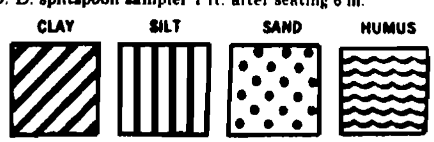


Remarks: Boring located on Westside of canal @ Sta. No. 548+50.

Predominant type shown heavy. Modifying type shown light.

Fig. 5

LOG OF BORING

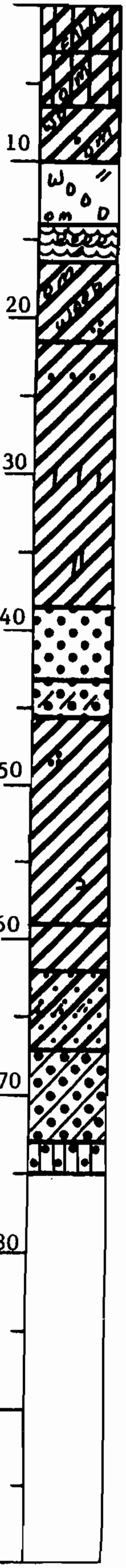
EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 72 Soil Technician A. J. Mayeux Date 18 July 1981
Ground Elev. 22.5 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	3.0	Medium stiff gray silty clay w/brick		
					fragments, shells & gravel		
					(Miscellaneous fill)		
2	5.0	5.5	3.0	6.5	Medium stiff gray silty clay w/organic		
					matter		
3	8.0	8.5	6.5	10.0	Soft gray clay w/wood, sand & organic		
					matter		
			10.0	14.0	Wood w/organic matter & clay		
4	14.0	14.5	14.0	16.5	Very soft black humus w/wood & clay		
5	19.0	19.5	16.5	21.5	Very soft gray clay w/organic matter,		
					wood & sand pockets		
6	24.0	24.5	21.5		Soft gray clay w/sand lenses		
7	29.0	29.5			Soft gray clay w/silt lenses		
8	34.0	34.5		38.5	Soft gray clay w/silt pockets		
9	38.5	40.0	38.5	43.0	Medium dense gray sand	7	17
10	43.5	45.0	43.0	45.5	Loose gray sand w/clay layers	2	6
11	49.0	49.5	45.5		Soft gray clay w/sand pockets & shell		
					fragments		
12	54.0	54.5		59.0	Ditto		
13	59.0	59.5	59.0	62.0	Medium stiff gray & tan clay		
14	64.0	64.5	62.0	67.0	Medium stiff gray sandy clay w/clayey		
					sand layers		
15	69.0	69.5	67.0	73.0	Loose gray clayey sand		
16	74.0	74.5	73.0	75.0	Medium dense tan & gray silty sand		

0
10
20
30
40
50
60
70
80
DEPTH IN FT.



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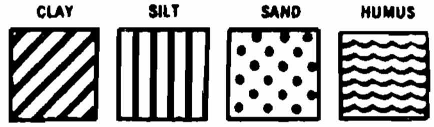
CLAY SILT SAND HUMUS



Remarks: Boring located on Eastside of canal @ Sta.
No. 547+00.

Predominant type shown heavy. Modifying type shown light.

Fig. 6

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

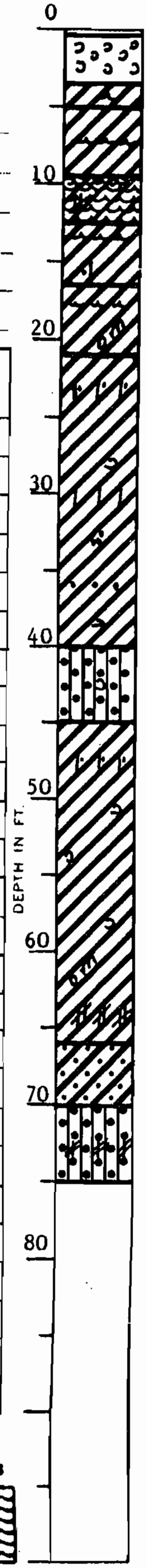
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 73 Soil Technician A. Croal, Jr. Date 29 July 1981

Ground Elev. 24.0 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
			0.0	0.35	Road surface		
1	1.0	2.5	0.35	3.5	Medium dense gray & white shells	10	25
2	3.5	5.0	3.5	5.0	Soft gray clay w/humus pockets	1	3
3	8.0	8.5	5.0	9.5	Very soft dark gray clay w/humus		
4	11.0	11.5	9.5	12.5	Soft black & gray organic clay w/humus		
					layers & clayey silt pockets		
5	14.0	14.5	12.5	16.5	Very soft gray clay w/humus layers &		
					sandy silt pockets		
6	18.5	19.0	16.5	21.0	Soft gray clay w/humus layers & much		
					organic matter		
7	23.5	24.0	21.0		Soft gray clay w/silty sand lenses,		
					layers & shell fragments		
8	28.5	29.0			Soft gray clay w/few silt lenses &		
					sand pockets		
9	33.5	34.0			Ditto		
10	38.5	39.0		40.0	Soft gray clay w/fine sand pockets,		
					layers & few shell fragments		
11	43.0	43.5	40.0		Very loose gray silty sand w/shell		
					fragments		
12	43.5	45.0		45.0	Ditto	3	1
13	48.5	49.0	45.0		Medium stiff gray clay w/silty sand		
					lenses & few shell fragments		
14	53.5	54.0			Medium stiff gray clay w/shell fragments		
15	58.5	59.0			Ditto		
16	63.5	64.0		66.0	Medium stiff gray clay w/organic matter		
					& clayey silt layers		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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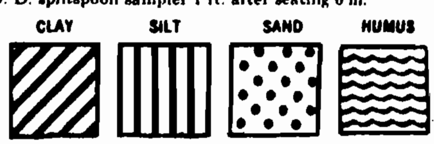


Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal @ Sta. No. 545+00.

Fig. 7
(Sheet #1)

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans

Metairie Relief Canal, Station 539+00 to Station 554+00

Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 73 (Cont'd) Soil Technician A. Croal, Jr. Date 29 July 1981

Ground Elev. 24.0 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
17	68.5	69.0	66.0	70.0	Very stiff greenish-gray sandy clay		
18	72.0	72.5	70.0	75.0	Loose to medium dense yellow, brown &		
					gray silty sand w/silty clay layers		

DEPTH IN FT.

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

Remarks: Boring located on Westside of canal @ Sta. No. 545+00.

CLAY SILT SAND HUMUS

Predominant type shown heavy. Modifying type shown light.

Fig. 7 (Sheet #2)

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

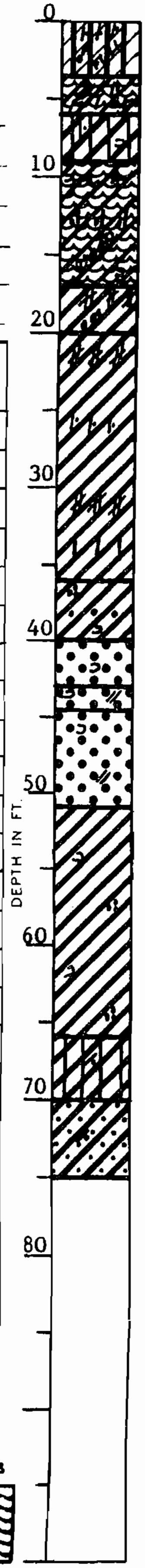
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 74 Soil Technician A. Croal, Jr. Date 27 July 1981

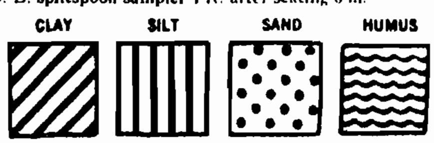
Ground Elev. 24.0 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	1.5	2.5	0.0	3.5	Medium compact brown & gray clayey silt		
					w/silty sand layers, organic matter,		
					concretions & shells (Fill)		
2	4.5	5.5	3.5	6.0	Medium stiff black & gray organic clay		
					w/clay & silty sand pockets, layers &		
					concretions (Fill)		
3	7.5	8.5	6.0	9.0	Soft gray silty clay w/silty sand		
					pockets & shell fragments		
4	13.5	14.5	9.0	17.0	Very soft black & gray organic clay		
					w/humus & sandy silt layers, wood &		
					shells		
5	18.0	19.0	17.0	20.0	Soft gray clay w/clayey silt lenses,		
					layers & organic matter		
6	23.0	24.0	20.0		Soft gray clay w/clayey silt & silty		
					sand pockets		
7	28.0	29.0			Soft gray clay w/clayey silt lenses		
8	33.0	34.0		36.0	Soft gray clay w/silt lenses		
9	38.0	39.0	36.0	40.0	Medium stiff gray clay w/fine sand		
					pockets, layers & shell fragments		
10	41.0	42.5	40.0	43.0	Medium dense gray fine sand w/shell	7	25
					fragments		
11	43.5	45.0	43.0	44.5	Loose gray fine sand w/shell fragments	3	3
					& clay pockets		
12	48.0	49.0	44.5	51.0	Very loose gray fine sand w/shell	3	3
					fragments & clay pockets		
					(Continued)		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. No. 543+50.

Predominant type shown heavy. Modifying type shown light.

Fig. 8
(Sheet #1)

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 74 (Cont'd) Soil Technician A. Croal, Jr. Date 27 July 1981

Ground Elev. 24.0 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
13	53.0	54.0	51.0		Medium stiff gray clay w/shell fragments & sand pockets		
14	58.0	59.0		66.0	Medium stiff gray clay		
15	68.0	69.0	66.0	70.0	Stiff gray silty clay w/clayey sand pockets		
16	73.0	74.0	70.0	75.0	Stiff greenish-gray sandy clay w/clayey sand pockets		

DEPTH IN FT.

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

CLAY SILT SAND HUMUS

Remarks: Boring located on Eastside of canal @ Sta. No. 543+50.

Predominant type shown heavy. Modifying type shown light.

Fig. 8

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

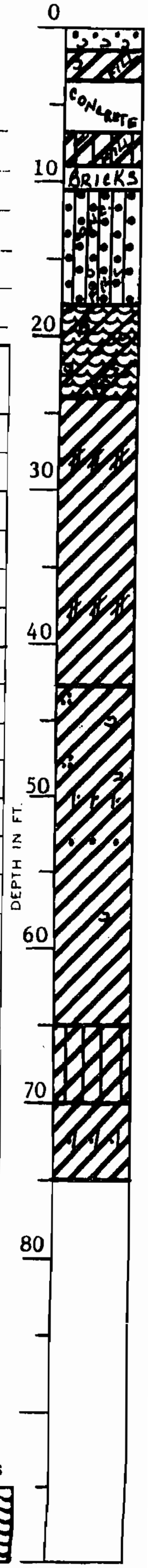
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 75 Soil Technician A. Croal, Jr. Date 28 July 1981

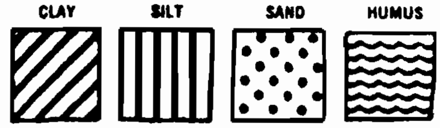
Ground Elev. 29.0 (Est.) Datum Cairo Gr. Water Depth ______

Sample No.	SAMPLE Depth — Feet From	To	DEPTH STRATUM Feet From	To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	0.0	0.5	0.0	1.5	Loose to medium dense tan & white sand		
					& shells (shoulder of road)		
2	1.5	3.0	1.5	3.5	Medium stiff tan clay w/shells (Fill)	4	6
			3.5	7.0	Concrete fragments w/shells & clay		
3	8.5	9.0	7.0	9.0	Very loose gray silty clay w/clay		
					pockets & shells (Fill)		
4	9.0	10.5	9.0	10.5	Bricks	19	13
5	11.0	12.5	10.5		Medium dense gray silty sand w/shells	11	11
6	13.5	15.0		18.0	Medium dense gray silty sand with	12	24
					concrete fragments & shells (Fill)		
7	23.5	24.0	18.0	24.0	Very soft dark gray & brown organic clay		
					w/silty sand, humus pockets, shells		
					& roots		
8	28.5	29.0	24.0		Soft gray clay w/clayey silt lenses		
9	33.5	34.0			Soft gray clay w/clayey silt lenses		
10	38.5	39.0		42.5	Soft gray clay		
11	43.5	44.0	42.5		Soft to medium stiff gray clay w/fine		
					sand pockets & shell fragments		
12	48.5	49.0			Soft to medium stiff gray clay w/fine		
					sand pockets, shell fragments & silty		
					sand layers		
13	52.0	52.5			Soft to medium stiff gray clay w/fine		
					sand lenses & shell fragments		
14	57.0	57.5			Soft to medium stiff gray clay w/few		
					shell fragments		
					(Continued)		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on the Westside of canal @ Sta. No. 541+50.

Fig. 9
(Sheet #1)

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 75 (Cont'd) Soil Technician A. Croal, Jr. Date 28 July 1981

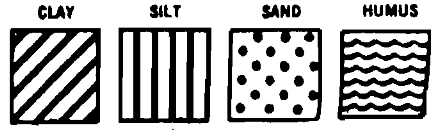
Ground Elev. 29.0 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
15	63.5	64.0		65.0	Soft to medium stiff gray clay		
16	68.5	69.0	65.0	70.0	Very stiff tan & gray silty clay		
17	72.0	72.5	70.0	75.0	Very stiff gray & tan clay w/sandy silt		
					layers		

DEPTH IN FT.

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Predominant type shown heavy. Modifying type shown light.

Remarks: Boring located on Westside of canal @ Sta. No. 541+50.

Fig. 9

LOG OF BORING

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

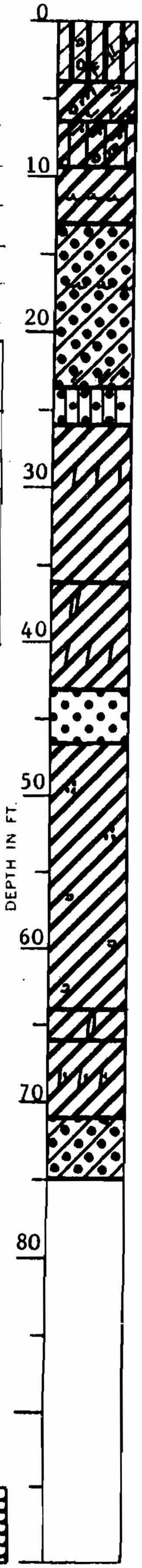
Name of Project: Sewerage & Water Board of New Orleans
Metairie Relief Canal, Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

Boring No. 76 Soil Technician Jack Pratt Date 24 July 1981

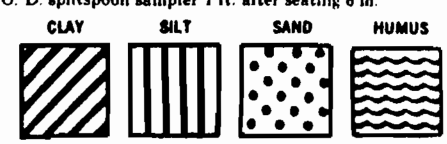
Ground Elev. 26.0 (Est.) Datum Cairo Gr. Water Depth

Sample No.	SAMPLE Depth — Feet		DEPTH STRATUM Feet		VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
	From	To	From	To			
1	2.0	2.5	0.0	4.0	Compact gray & brown clayey silt with		
					shells & gravel (Fill)		
2	5.0	5.5	4.0	6.5	Soft gray clay w/organic matter, shells		
					& sandy clay layers		
3	8.0	8.5	6.5	9.5	Soft gray silty clay w/clayey sand		
					layers & organic matter		
4	11.0	11.5	9.5	13.0	Soft gray clay w/humus layers		
5	14.0	14.5	13.0		Loose gray clayey sand w/humus layers		
6	19.0	19.5		23.5	Loose gray clayey sand w/clay layers		
7	23.5	25.0	23.5	26.0	Medium dense gray silty sand	3	14
8	29.0	29.5	26.0		Soft gray clay w/few silt lenses		
9	34.0	34.5		36.0	Soft gray clay		
10	39.0	39.5	36.0	43.0	Medium stiff gray clay w/silt pockets		
					& lenses		
11	43.5	45.0	43.0	46.5	Medium dense gray fine sand	6	13
12	49.0	49.5	46.5		Medium stiff gray clay w/sand pockets		
13	54.0	54.5			Medium stiff gray clay w/shell fragments		
14	58.5	59.0		64.0	Ditto		
15	64.0	64.5	64.0	66.0	Stiff greenish-gray & tan clay w/silt		
					pockets		
16	69.0	69.5	66.0	71.0	Very stiff greenish-gray clay w/silty		
					sand layers		
17	73.0	73.5	71.0	75.0	Medium dense tan & gray clayey sand		



*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



Remarks: Boring located on Eastside of canal @ Sta. No. 540+00.

Predominant type shown heavy. Modifying type shown light.

Fig. 10

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 69

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	0.5	Loose gray & tan clayey silt w/many shells	10.7	----	----	----
2	3.5	Medium stiff gray clay with silt pockets & trace of organic matter	37.4	82.8	113.7	1105
3	5.5	Very soft gray clay w/humus pockets & wood	70.8	55.6	94.9	440
4	8.0	Very soft gray clay w/humus lenses, silt lenses & wood	60.9	61.9	99.7	420
5	11.0	Extremely soft gray clay w/organic clay layers	84.2	49.2	90.6	230
6	14.0	Soft brown organic clay with decayed wood	172.4	27.0	73.4	840
7	19.0	Soft gray clay w/silt pockets & much organic matter	129.2	36.0	82.5	530
8	24.0	Very soft gray clay w/silt lenses & pockets	73.8	56.6	98.3	355
9	29.0	Soft gray clay	70.1	58.1	98.9	555
10	34.0	Ditto	74.3	55.0	95.9	680
11	39.0	Loose gray clayey sand with clay pockets & shell fragments	28.2	90.7	116.3	610*
14	48.5	Very soft gray clay w/sand pockets & shells	40.6	77.7	109.2	355
15	54.0	Soft gray clay w/shell fragments & sand pockets	72.5	55.6	95.9	785*
17	64.0	Medium stiff gray clay w/sand pockets & trace of organic matter	49.5	70.2	105.0	1115
19	69.0	Stiff greenish-gray sandy clay	19.7	106.6	127.6	3225

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 11

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 70

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium stiff gray clay with silt pockets, shells & organic matter	47.3	69.3	102.1	1110
3	8.0	Very soft gray clay w/silt lenses & pockets	63.7	61.1	100.0	260
4	11.0	Very soft gray clay w/humus layers & roots	74.0	52.4	91.2	435
5	14.0	Soft dark brown humus with roots	317.9	----	----	----
6	18.5	Very soft gray clay w/silt pockets & organic matter	72.2	54.8	94.4	465
7	23.5	Soft gray clay w/silt lenses	70.9	58.3	99.6	585
8	28.5	Soft gray clay	61.5	61.4	99.2	590
9	33.5	Ditto	76.6	53.8	94.9	825
10	37.0	Very loose gray clayey sand w/clay pockets & shell fragments	28.5	91.1	117.1	435*
12	41.5	Very soft gray clay w/clayey sand layers	41.8	76.3	108.2	460*
13	48.5	Soft gray clay w/sand pockets	68.2	57.1	96.1	980
15	58.5	Medium stiff gray clay w/sand pockets	57.2	63.9	100.5	1260
16	63.5	Stiff gray clay	21.6	102.7	124.9	3260

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 12

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 71

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
3	7.5	Medium stiff gray & black organic clay w/humus layers	241.4	20.2	69.1	1115			
4	13.5	Loose brown & gray clayey silt with humus & many clam shells	53.9	63.9	98.2	475*			
5	18.0	Soft dark gray clay w/organic matter & roots	105.7	41.0	84.2	665			
6	23.0	Soft gray clay with clayey silt layers & pockets	68.8	59.3	100.1	640	75	21	54
7	28.0	Soft gray clay w/silt lenses	66.3	59.2	98.4	620			
8	33.0	Soft gray clay	75.3	54.1	95.0	560			
9	38.0	Medium stiff gray clay w/sand pockets & shell fragments	63.4	62.0	101.3	1230	83	19	64
12	48.0	Soft gray clay w/sand lenses & pockets	63.3	61.7	100.8	995*			
13	53.0	Soft gray clay w/shell fragments	62.6	61.4	100.0	1000			
14	58.0	Medium stiff gray clay w/trace of sand	55.6	67.9	105.7	1145	75	18	57
15	68.0	Stiff greenish-gray sandy clay w/clayey sand pockets	19.5	103.9	124.1	2000*			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 13

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, INc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 72

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Medium stiff gray silty clay w/brick fragments, shells & gravel	25.6	----	----	----
2	5.0	Medium stiff gray silty clay w/organic matter	29.2	----	----	----
3	8.0	Soft gray clay w/sand layers, lenses & organic matter	66.5	57.2	95.3	525*
5	19.0	Very soft gray clay w/sand pockets & trace of organic matter	78.7	52.8	94.4	420
6	24.0	Soft gray clay w/sand lenses	69.6	57.3	97.2	510
7	29.0	Soft gray clay w/silt lenses	62.2	62.6	101.5	600
8	34.0	Soft gray clay w/silt pockets	75.4	54.7	96.0	760
11	49.0	Soft gray clay w/shell fragments & sand pockets	60.8	62.0	99.7	965
12	54.0	Ditto	59.9	63.3	101.2	705
13	59.0	Medium stiff gray & tan clay	31.1	89.8	117.7	1950
14	64.0	Medium stiff gray sandy clay w/clayey sand pockets	20.0	106.5	127.8	1555
15	69.0	Loose greenish-gray clayey sand	20.0	101.5	121.8	875*

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 14

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 73

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
3	8.0	Very soft dark gray clay w/humus layers	65.1	56.6	93.4	495*
4	11.0	Soft black & gray organic clay	126.9	35.1	79.6	560
5	14.0	Very soft gray clay w/sandy silt pockets	73.4	55.4	96.1	495
6	18.5	Soft gray clay w/humus layers	123.5	36.9	82.4	545
7	23.5	Soft gray clay w/silty sand layers & lenses	53.1	67.9	103.9	625*
8	28.5	Soft gray clay w/sand pockets	59.9	63.2	101.0	550
9	33.5	Soft gray clay	75.1	54.8	96.0	610
10	38.5	Soft gray clay w/thick sand pockets & shells	45.0	74.4	107.9	575*
13	48.5	Medium stiff gray clay w/silty sand lenses	62.2	60.8	98.7	1225*
15	58.5	Medium stiff gray clay	51.6	69.5	105.4	1185
17	68.5	Very stiff greenish-gray sandy clay	20.3	105.3	126.7	4685

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 15

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 74

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1	1.5	Medium dense brown & gray clayey silt w/silty sand layers, organic matter & concretions	31.1	84.9	111.2	765*			
2	4.5	Medium stiff black & gray organic clay w/silty sand layers	65.6	53.8	89.1	1035*			
3	7.5	Soft gray silty clay w/silty sand layers & shell fragments	31.0	----	----	----			
4	13.5	Very soft black & gray organic clay w/sandy silt layers, lenses & shells	82.6	47.5	86.9	435*	102	29	73
5	18.0	Soft gray clay w/silt lenses & trace of organic matter	40.7	83.7	117.7	665	55	18	37
6	23.0	Soft gray clay w/silty sand layers & lenses	51.3	68.9	104.2	500*			
7	28.0	Soft gray clay w/silt lenses	57.7	65.1	102.6	830			
8	33.0	Ditto	71.6	55.2	94.8	855	80	24	56
9	38.0	Medium stiff gray clay w/sand pockets & shell fragments	46.5	72.6	106.3	1140			
13	53.0	Ditto	57.9	61.3	96.8	1375	81	21	60
14	58.0	Medium stiff gray clay	52.9	68.8	105.2	1800*			
15	68.0	Stiff gray silty clay w/clayey sand pockets	17.0	107.7	126.0	2760*			
16	73.0	Stiff greenish-gray sandy clay w/clayey sand pockets	21.1	105.7	128.0	2450*			

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 16

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 75

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
7	23.5	Very soft dark gray & brown organic clay w/humus layers, roots & silty sand layers	98.1	42.9	85.1	455
8	28.5	Soft gray clay w/silt lenses	60.8	62.9	101.1	590
9	33.5	Ditto	57.3	64.5	101.3	660
10	38.5	Soft gray clay	74.1	54.8	95.4	850
11	43.5	Soft gray clay w/shell fragments	59.7	62.5	99.9	855
13	52.0	Medium stiff gray clay w/sand pockets	55.8	65.4	101.9	1270*
15	63.5	Medium stiff gray clay	52.6	68.2	104.1	1280
17	72.0	Stiff gray & tan clay w/silt lenses	26.9	93.9	119.1	2370*

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 17

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Subsoil Investigation
Sewerage & Water Board of New Orleans
Metairie Relief Canal
Station 539+00 to Station 554+00
Jefferson and Orleans Parishes, Louisiana

For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

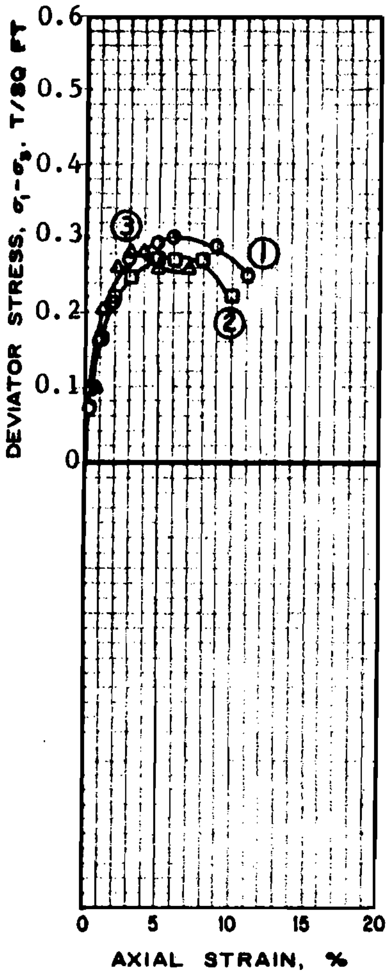
SUMMARY OF LABORATORY TEST RESULTS

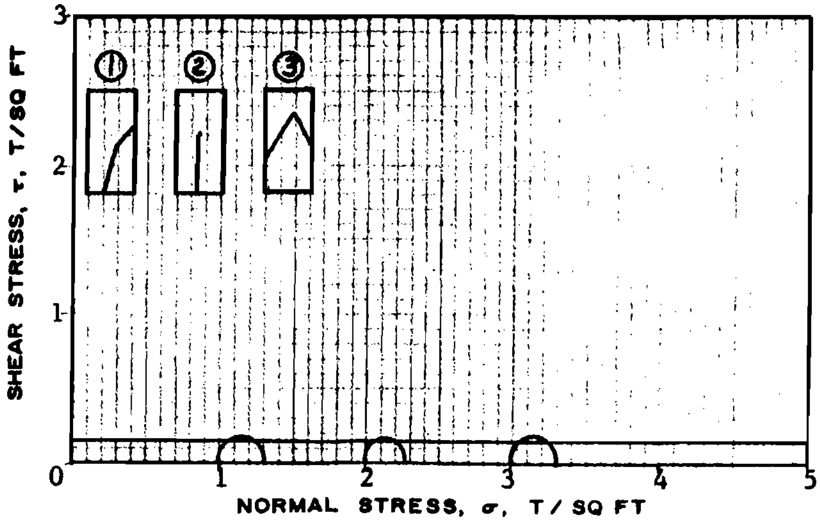
BORING 76

Sample No.	Depth in Feet	Classification	Water Content Percent	Density Lb/cu ft Dry	Density Lb/cu ft Wet	Unconfined Compressive Strength Lb/sq ft
1	2.0	Compact gray & brown clayey silt w/gravel & many shell pockets	13.4	----	----	----
2	5.0	Soft gray clay w/sandy clay layers, organic matter & decayed wood	68.9	56.9	96.1	545
3	8.0	Soft gray silty clay w/clayey sand layers & organic matter	59.0	62.3	99.1	940*
4	11.0	Soft gray clay w/humus layers	99.8	42.9	85.6	525
5	14.0	Loose gray clayey sand with humus layers	46.3	71.0	103.8	635*
6	19.0	Loose gray clayey sand w/clay layers	42.6	77.7	110.7	580*
8	29.0	Soft gray clay w/silt lenses	56.8	65.7	103.0	690
9	34.0	Soft gray clay	69.0	57.6	97.2	650
10	39.0	Medium stiff gray clay w/silt pockets & lenses	68.4	58.6	98.5	1160
12	49.0	Medium stiff gray clay w/sand pockets	66.6	59.0	98.2	1160
13	54.0	Medium stiff gray clay w/shell fragments	59.9	63.6	101.6	1430
14	58.5	Medium stiff gray clay	52.7	69.0	105.4	1425
15	64.0	Stiff greenish-gray & tan clay w/silt pockets	31.2	91.1	119.6	2265
17	73.0	Medium dense tan & gray clayey sand w/silty sand layers	26.3	97.3	122.9	1320*

*Unconsolidated-Undrained Triaxial Compression Test - One Specimen. Confined at the approximate overburden pressure.

Fig. 18





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.16 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	48.4	55.1	47.0	
	VOID RATIO	e_o	1.37	1.58	1.32	
	SATURATION %	S_o	97	96	98	
	DRY DENSITY, LB/CU FT	γ_d	72.1	66.3	73.6	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	48.4	55.1	47.0	
	VOID RATIO	e_f	1.37	1.58	1.32	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.00	2.00	3.00	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.30	0.27	0.28	
TIME TO FAILURE, MIN		t_f	12	10	6	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.39	1.40	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST Q (UU) | TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/clayey silt layers

LL 75 | PL 21 | PI 54 | G_s 2.74 Est.

REMARKS Shear values taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Station 539+00 to Station 554+00

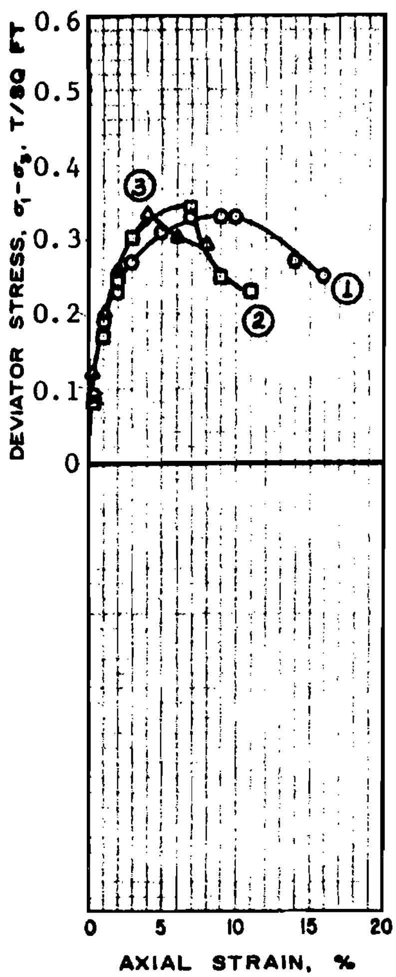
BORING NO. 71 | SAMPLE NO. 6

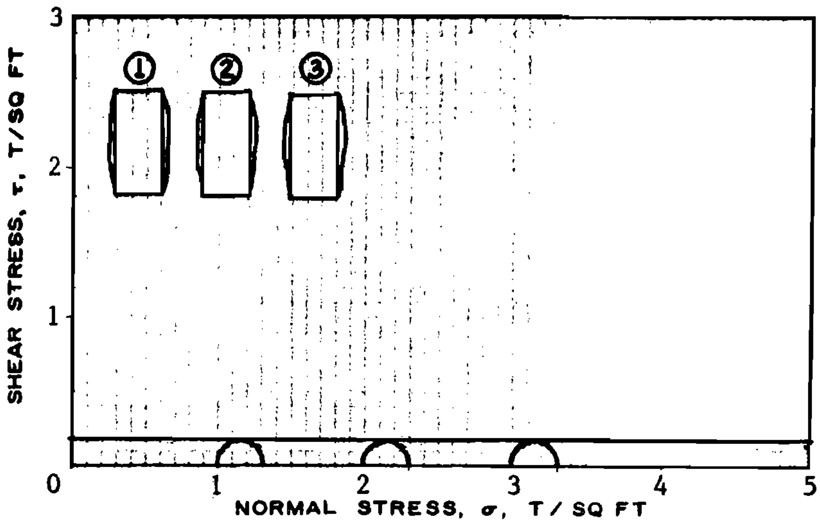
DEPTH 23.0' | DATE 3 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 19





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.20 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

			1	2	3	
TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	65.6	64.8	66.3	
	VOID RATIO	e_o	1.78	1.73	1.80	
	SATURATION %	S_o	100	100	100	
	DRY DENSITY, LB/CU FT	γ_d	61.6	62.6	61.1	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	65.6	64.8	66.3	
	VOID RATIO	e_f	1.78	1.73	1.80	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.33	0.34	0.33	
TIME TO FAILURE, MIN		t_f	10	12	8	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.39	1.39	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed			
CLASSIFICATION Soft gray clay w/silt lenses				
LL	PL	PI		G_s 2.74 Est.

REMARKS Shear values taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans
Metairie Relief Canal

AREA Station 539+00 to Station 554+00

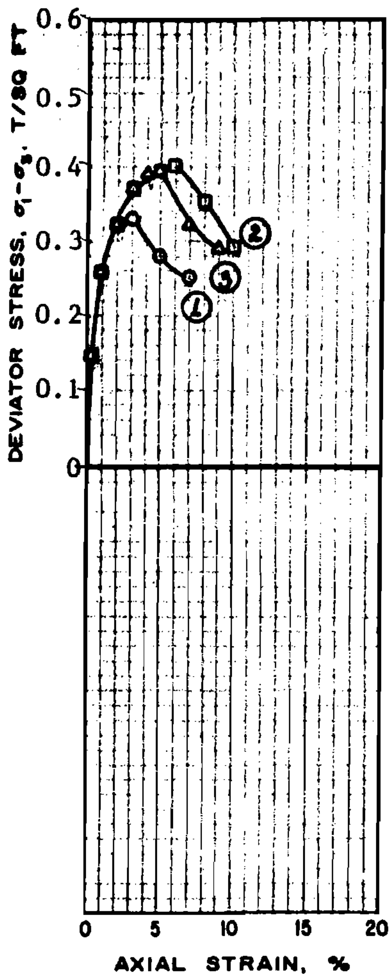
BORING NO. 71 SAMPLE NO. 7

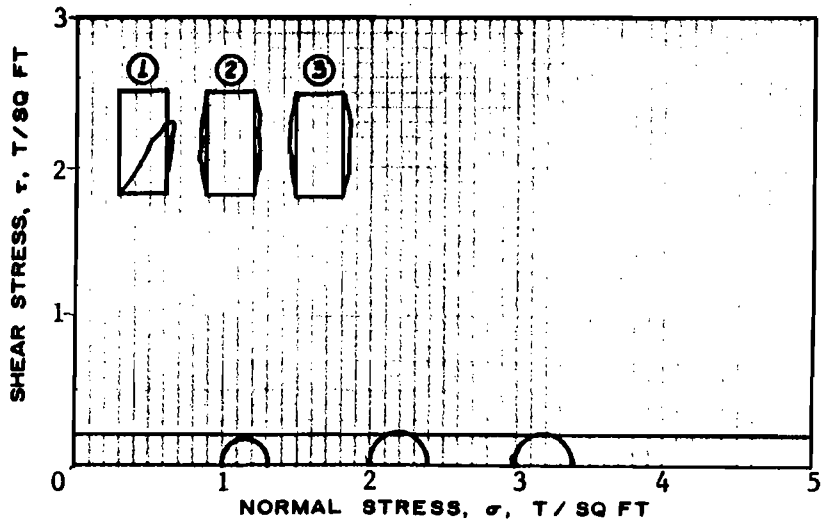
DEPTH 28.0' DATE 1 September 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 20





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.21 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

	TEST NO.		1	2	3	
INITIAL	WATER CONTENT %	w_o	73.8	69.8	67.9	
	VOID RATIO	e_o	2.03	1.90	1.83	
	SATURATION %	S_o	100	100	100	
	DRY DENSITY, LB/CU FT	γ_d	56.5	59.0	60.4	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	73.8	69.8	67.9	
	VOID RATIO	e_f	2.03	1.90	1.83	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.33	0.40	0.40	
TIME TO FAILURE, MIN		t_f	6	12	10	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.39	1.39	1.38	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed				
CLASSIFICATION Soft gray clay					
LL	PL	PI		G_s 2.74 Est.	

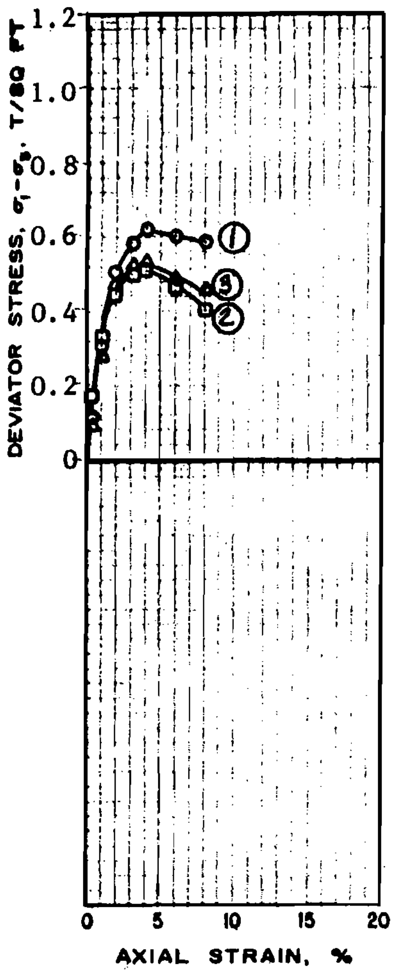
REMARKS Shear values taken from large scale plot.

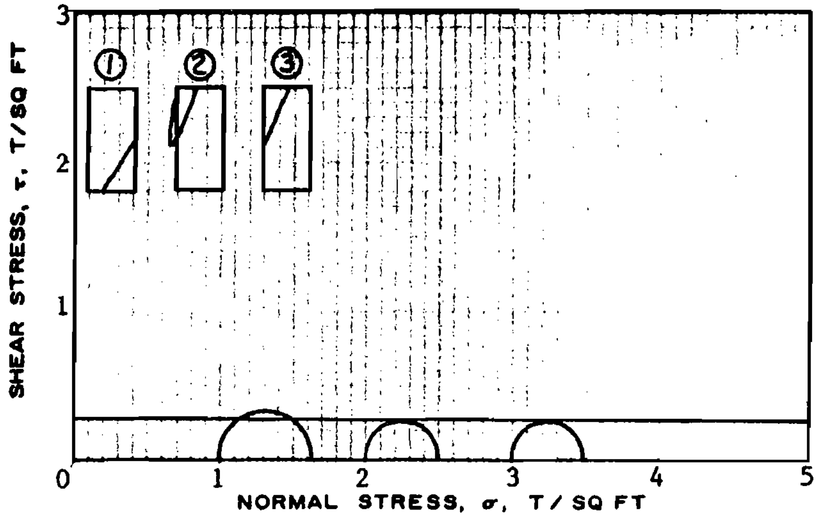
PROJECT Sewerage & Water Board of New Orleans Metairie Relief Canal	
AREA Station 539+00 to Station 554+00	
BORING NO. 71	SAMPLE NO. 8
DEPTH 33.0'	DATE 1 September 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 21





			1	2	3	
TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	64.8	72.8	72.5	
INITIAL	VOID RATIO	e_o	1.83	2.10	2.09	
INITIAL	SATURATION %	S_o	97	95	95	
INITIAL	DRY DENSITY, LB/CU FT	γ_d	60.3	55.1	55.4	
BEFORE SHEAR	WATER CONTENT %	w_c				
BEFORE SHEAR	VOID RATIO	e_c				
BEFORE SHEAR	SATURATION %	S_c				
BEFORE SHEAR	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	64.8	72.8	72.5	
FINAL	VOID RATIO	e_f	1.83	2.10	2.09	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.00	2.00	3.00	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	0.63	0.51	0.53	
TIME TO FAILURE, MIN		t_f	8	6	8	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.38	1.43	1.41	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.27 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST Q(UU) TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium stiff clay w/sand pockets & shell fragments

LL 83 PL 19 PI 64 G_s 2.74 Est.

REMARKS Shear values taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

Metairie Relief Canal

AREA Station 539+00 to Station 554+00

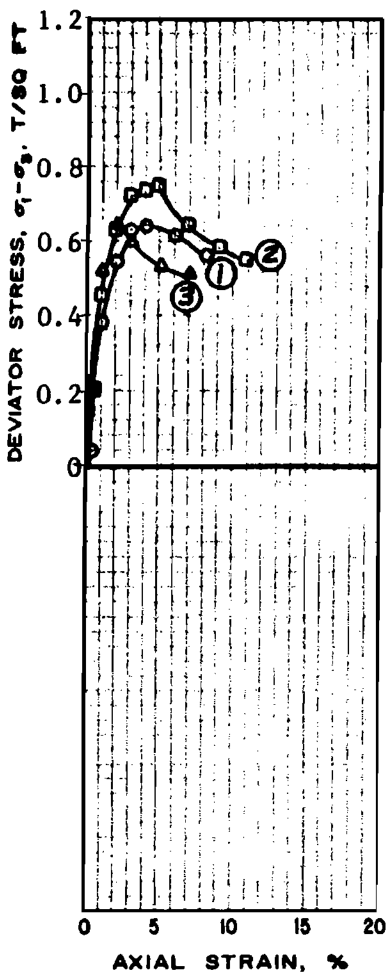
BORING NO. 71 SAMPLE NO. 9

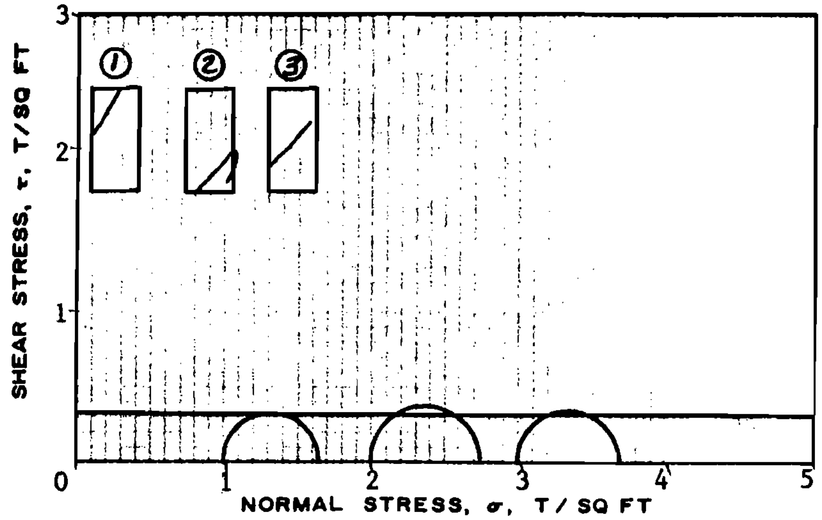
DEPTH 38.0' DATE 3 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 22





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	55.4	52.2	51.8	
	VOID RATIO	e_o	1.60	1.45	1.42	
	SATURATION %	S_o	93	99	100	
	DRY DENSITY, LB/CU FT	γ_d	65.8	69.8	70.7	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	55.4	52.2	51.8	
	VOID RATIO	e_f	1.60	1.45	1.42	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.00	2.00	3.00	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.64	0.74	0.64	
TIME TO FAILURE, MIN		t_f	8	10	4	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.41	1.39	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.32 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST Q (UU)	TYPE OF SPECIMEN Undisturbed		
CLASSIFICATION Medium stiff clay w/trace of sand			
LL 75	PL 18	PI 57	G_s 2.74 Est.

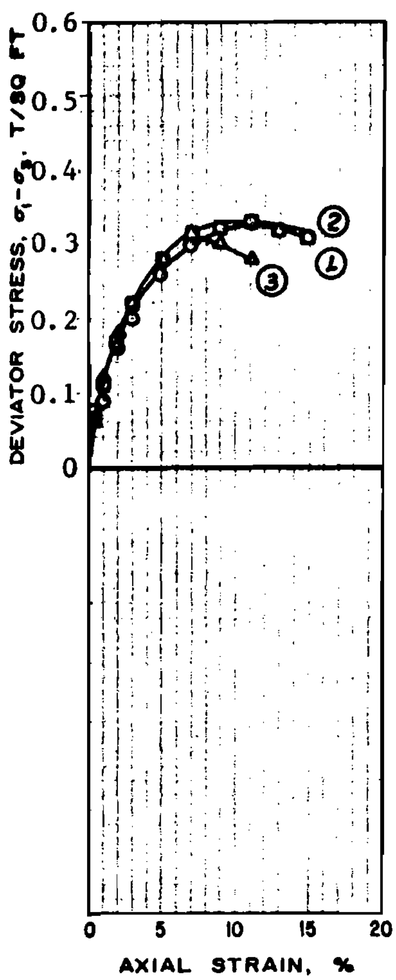
REMARKS Shear values taken from large scale plot.

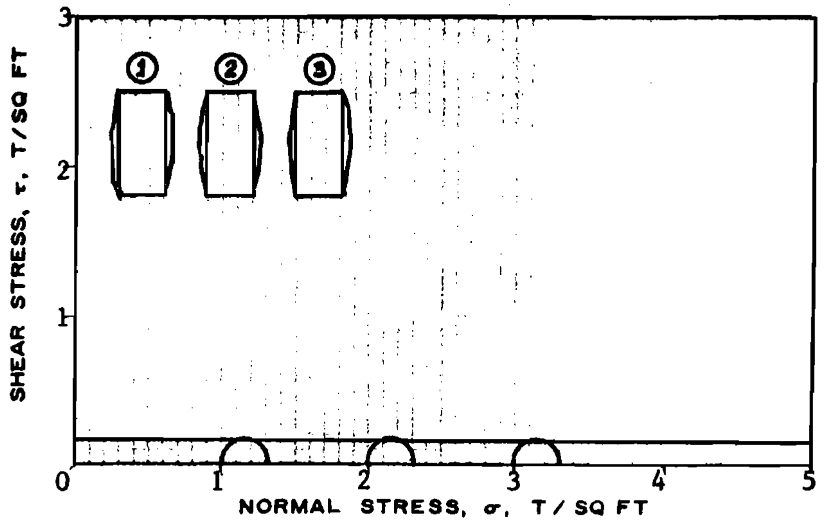
PROJECT	Sewerage & Water Board of New Orleans
	Metairie Relief Canal
AREA	Station 539+00 to Station 554+00
BORING NO. 71	SAMPLE NO. 14
DEPTH 58.0'	DATE 3 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 23





TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	86.9	85.5	77.1	
	VOID RATIO	e_o	2.38	2.20	2.03	
	SATURATION %	S_o	95	100	99	
	DRY DENSITY, LB/CU FT	γ_d	48.1	50.6	53.5	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	86.9	85.5	77.1	
	VOID RATIO	e_f	2.38	2.20	2.03	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.33	0.32	0.31	
TIME TO FAILURE, MIN		t_f	22	18	14	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.16 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF TEST UU	TYPE OF SPECIMEN Undisturbed		
CLASSIFICATION Very soft black & gray organic clay w/sandy silt layers & lenses			
LL 102	PL 29	PI 73	G_s 2.60 Est.

REMARKS Shear values taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

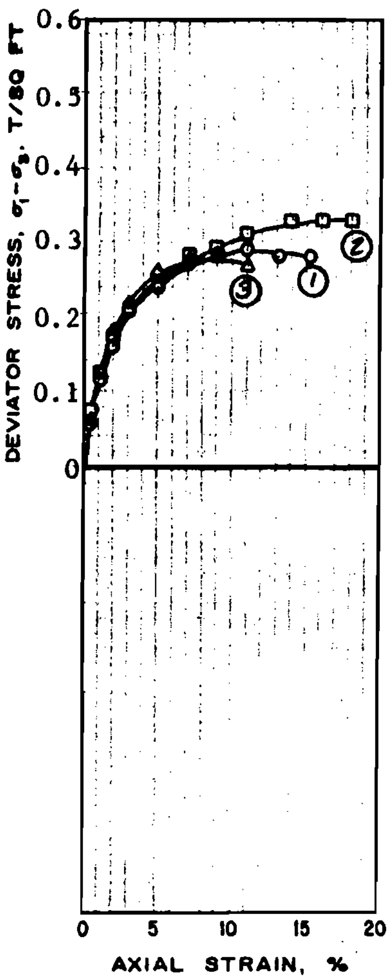
Metairie Relief Canal

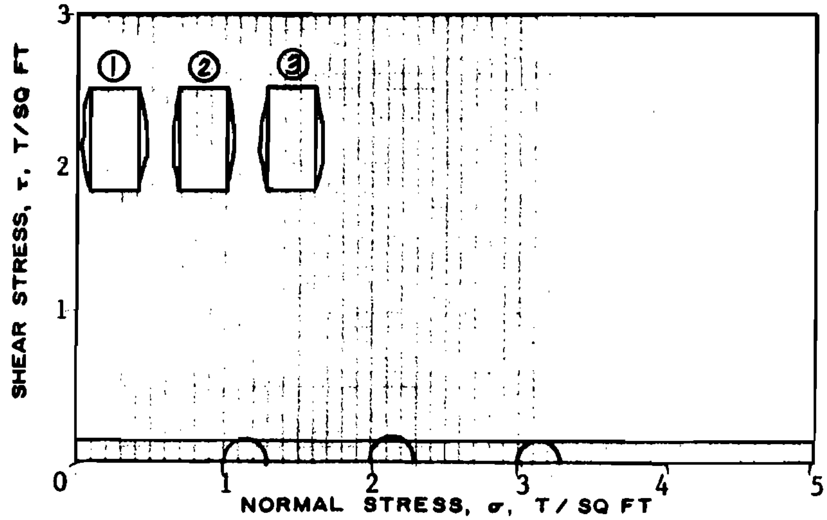
AREA Station 539+00 to Station 554+00

BORING NO. 74	SAMPLE NO. 4
DEPTH 13.5'	DATE 1 September 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.15 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT %	w_o	42.7	42.5	41.4	
	VOID RATIO	e_o	1.27	1.27	1.08	
	SATURATION %	S_o	92	91	100	
	DRY DENSITY, LB/CU FT	γ_d	75.2	75.2	84.0	
BEFORE SHEAR	WATER CONTENT %	w_c				
	VOID RATIO	e_c				
	SATURATION %	S_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
FINAL	WATER CONTENT %	w_f	42.7	42.5	41.4	
	VOID RATIO	e_f	1.27	1.27	1.08	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.00	2.00	3.00	
MAX DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	0.29	0.33	0.28	
TIME TO FAILURE, MIN		t_f	22	28	14	
RATE OF STRAIN, PERCENT/MIN			0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT						
ULT DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.39	1.41	1.35	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

TYPE OF TEST Q (UU)	TYPE OF SPECIMEN Undisturbed		
CLASSIFICATION Soft gray clay w/silt lenses & trace of organic matter			
LL 55	PL 18	PI 37	G_s 2.74 Est.

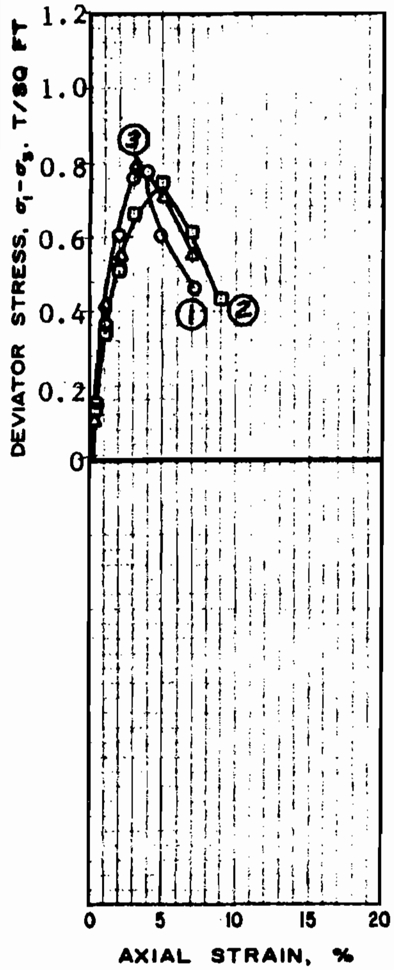
REMARKS Shear values taken from large scale plot.

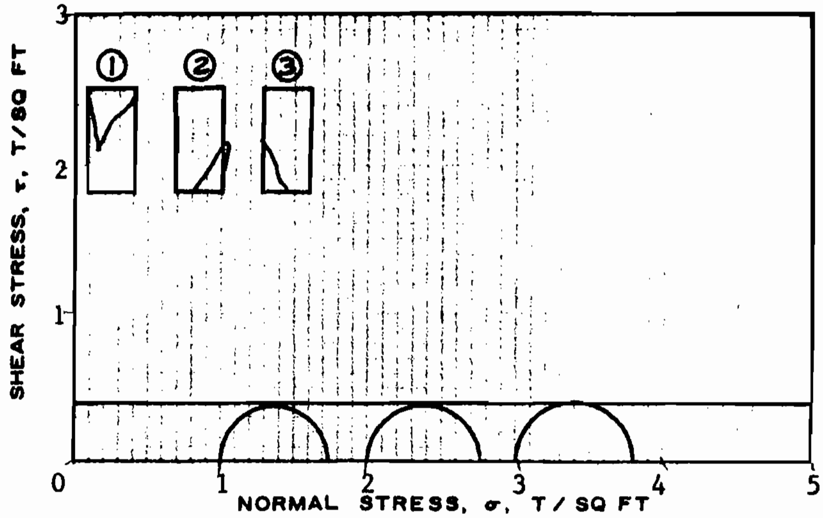
PROJECT Sewerage & Water Board of New Orleans Metairie Relief Canal	
AREA Station 539+00 to Station 554+00	
BORING NO. 74	SAMPLE NO. 5
DEPTH 18.0'	DATE 3 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 25





SHEAR STRENGTH PARAMETERS

ϕ = 0

TAN ϕ =

c = 0.39 T/SQ FT

METHOD OF SATURATION

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

			TEST NO.	1	2	3	
INITIAL	WATER CONTENT	%	W_o	60.9	64.0	60.5	
	VOID RATIO		e_o	1.72	1.86	1.63	
	SATURATION	%	S_o	97	94	98	
	DRY DENSITY, LB/CU FT		γ_d	62.8	59.9	65.0	
BEFORE SHEAR	WATER CONTENT	%	W_c				
	VOID RATIO		e_c				
	SATURATION	%	S_c				
	FINAL BACK PRESSURE, T/SQ FT		u_o				
FINAL	WATER CONTENT	%	W_f	60.9	64.0	60.5	
	VOID RATIO		e_f	1.72	1.86	1.63	
MINOR PRINCIPAL STRESS, T/SQ FT			σ_3	1.00	2.00	3.00	
MAX DEVIATOR STRESS, T/SQ FT			$(\sigma_1 - \sigma_3)_{max}$	0.77	0.75	0.80	
TIME TO FAILURE, MIN			t_f	8	10	6	
RATE OF STRAIN, PERCENT/MIN				0.5	0.5	0.5	
EFFECTIVE NORMAL STRESS, T SQ FT							
ULT DEVIATOR STRESS, T/SQ FT			$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.			D_o	1.39	1.41	1.44	
INITIAL HEIGHT, IN.			H_o	3.00	3.00	3.00	

TYPE OF TEST Q (UU)	TYPE OF SPECIMEN Undisturbed
CLASSIFICATION	Medium stiff clay w/sand pockets & shell fragments

LL 81	PL 21	PI 60		G_s 2.74 Est.

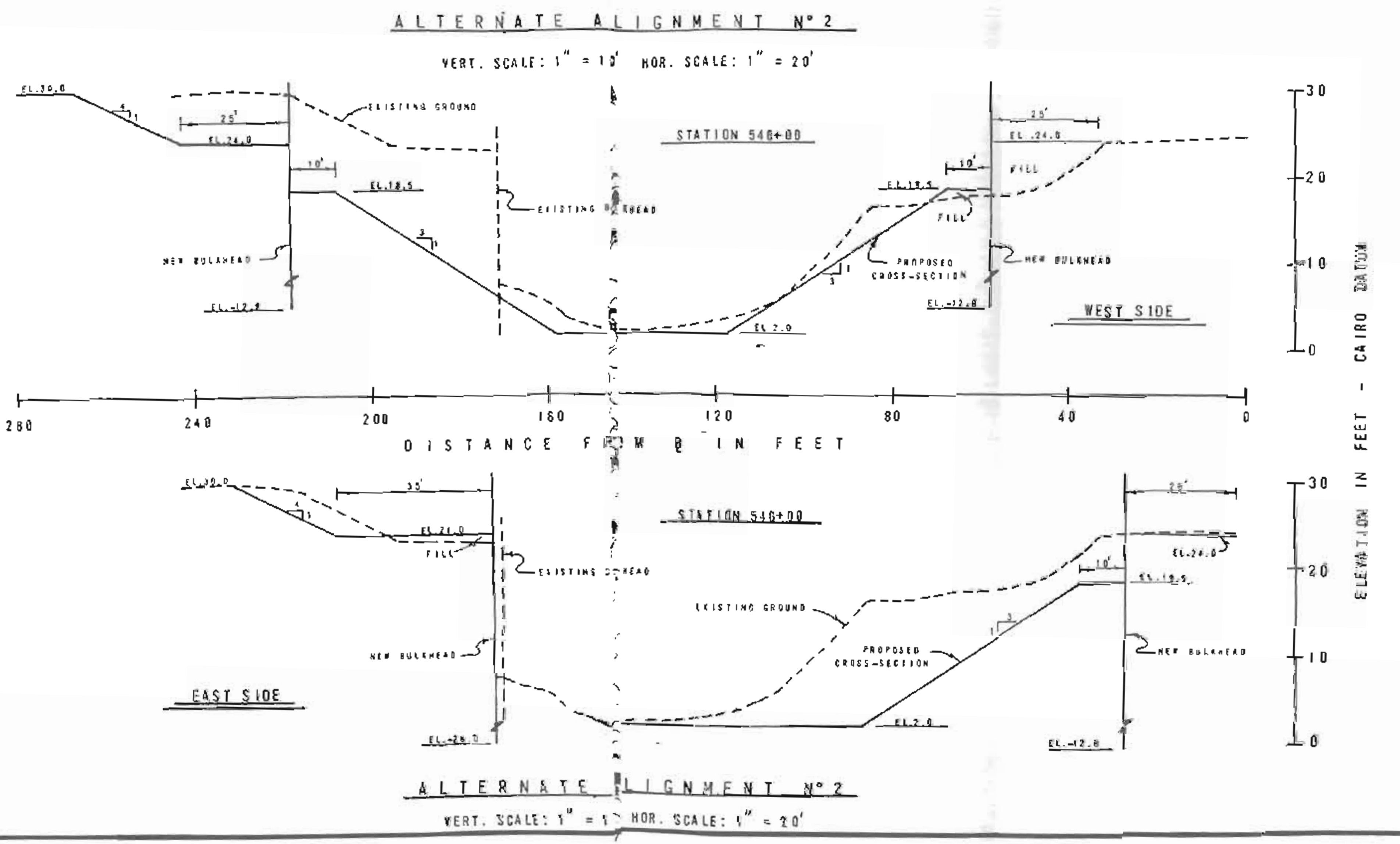
REMARKS Shear values taken from large scale plot.

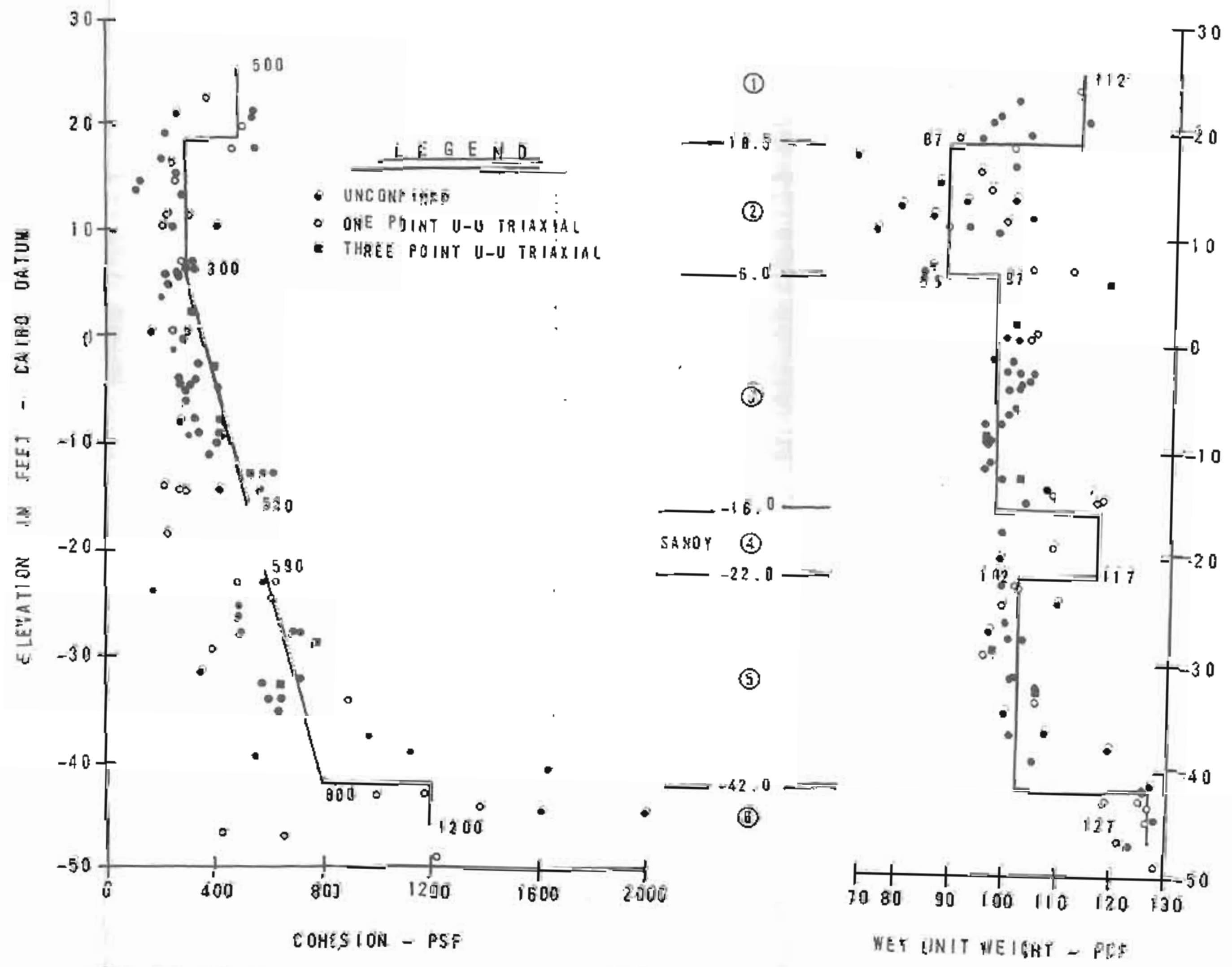
PROJECT	Sewerage & Water Board of New Orleans Metairie Relief Canal
AREA	Station 539+00 to Station 554+00
BORING NO. 74	SAMPLE NO. 13
DEPTH 53.0'	DATE 3 August 1981

TRIAXIAL COMPRESSION TEST REPORT

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LOUISIANA

Fig. 26





NOTE: FOR STRATA 1, 2, 3, 5 & 6, AN "S" STRENGTH OF C = 0, Φ = 2[illegible]° WAS ASSIGNED.
FOR STRATUM 4, AN "S" STRENGTH OF C = 0, Φ = 30° WAS ASSIGNED.

SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 539+00 TO STATION 554+00
JEFFERSON AND ORLEANS PARISHES, LOUISIANA

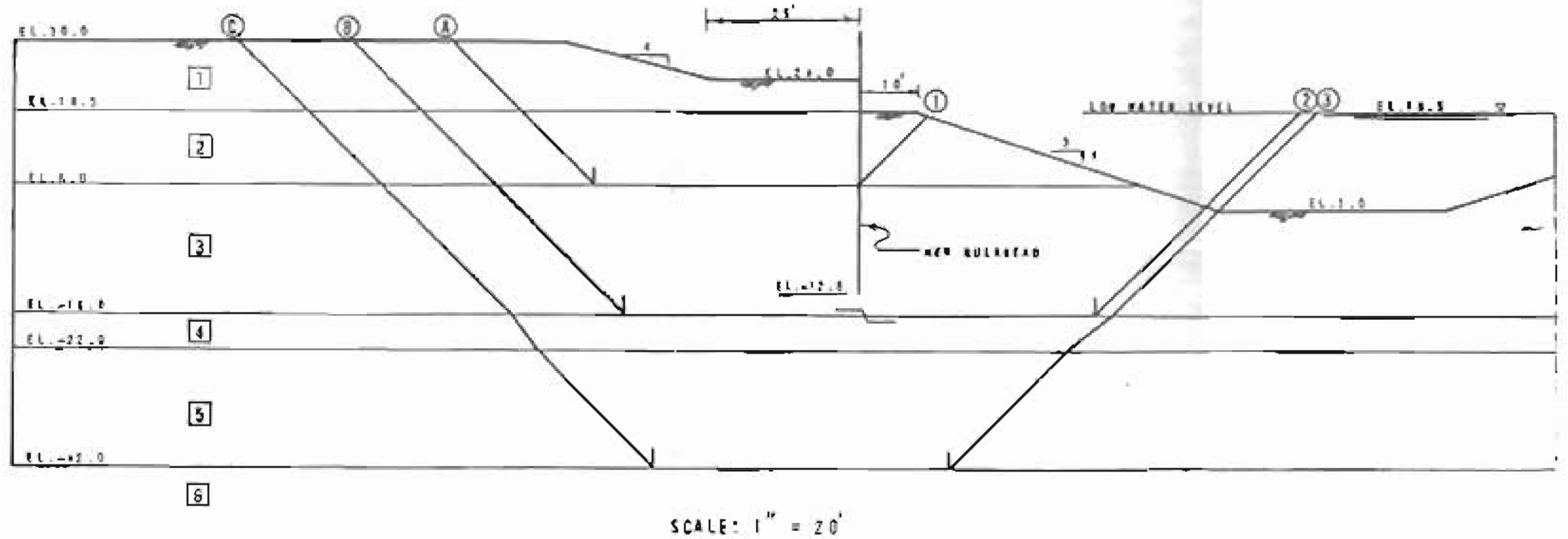
SHEAR STRENGTH PLOT & TYPICAL CROSS-SECTIONS

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 198[illegible] METAIRIE, LA.

FIGURE 27

TYPICAL CROSS-SECTION -- EAST SIDE (ALT. ALIGNMENT No 1) & WEST SIDE (ALT. ALIGNMENT Nos 1 & 2)



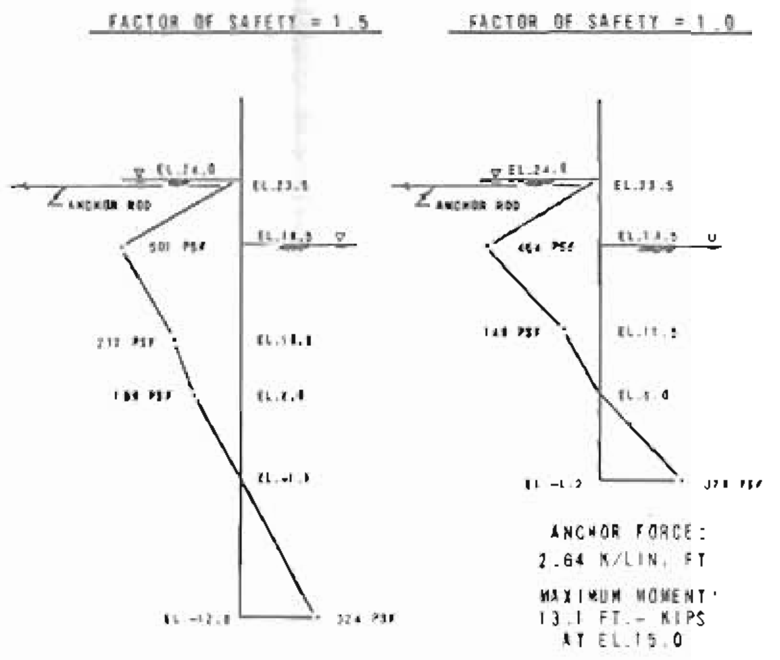
SCALE: 1" = 20'

STABILITY ANALYSIS

SLIP SURFACE N°	EL.	DRIVING FORCE D_A	D_P	ΣD	RESISTING FORCE R_A	R_B	R_P	ΣR	FACTOR OF SAFETY
A-1	6	25117	2240	22877	19000	13200	7125	39325	1.72
B-2	-16	67149	7673	59476	31260	35314	15355	91931	1.54
C-3	-42	143227	42138	96048	73158	39200	50058	182456	1.65

LOW WATER CONDITION

ANCHORED BULKHEAD

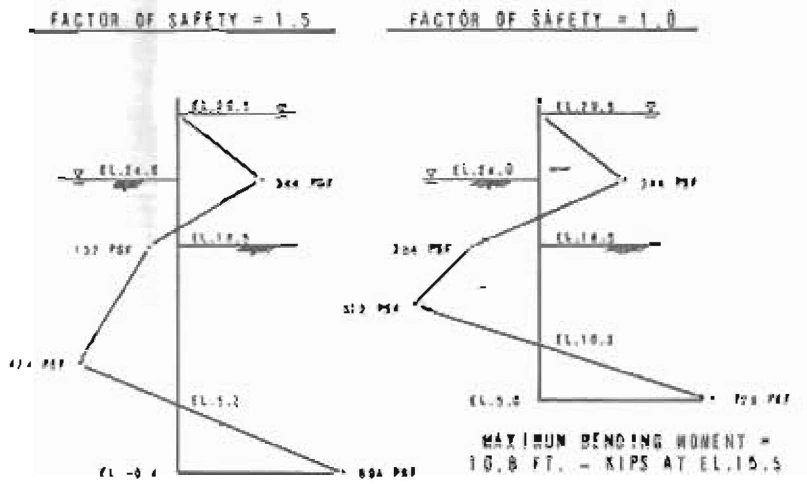


ANCHOR FORCE:
2.64 K/LIN. FT

MAXIMUM MOMENT:
13.1 FT.- KIPS
AT EL. 15.0

HIGH WATER CONDITION

CANTILEVER BULKHEAD



MAXIMUM BENDING MOMENT =
10.8 FT. - KIPS AT EL. 15.5

NOTES

ALL ELEVATIONS REFER TO CAIRO DATUM
ALL BULKHEAD ANALYSES WERE PERFORMED USING "Q" AND "S" SOIL SHEAR STRENGTHS SHOWN ON FIGURE 27, AND THE "S" STRENGTHS WERE FOUND TO GOVERN FOR ALL LOAD CONDITIONS.
LOW WATER CONDITION GOVERNS DESIGN.

SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 539+00 TO STATION 554+00
JEFFERSON AND ORLEANS PARISHES, LOUISIANA

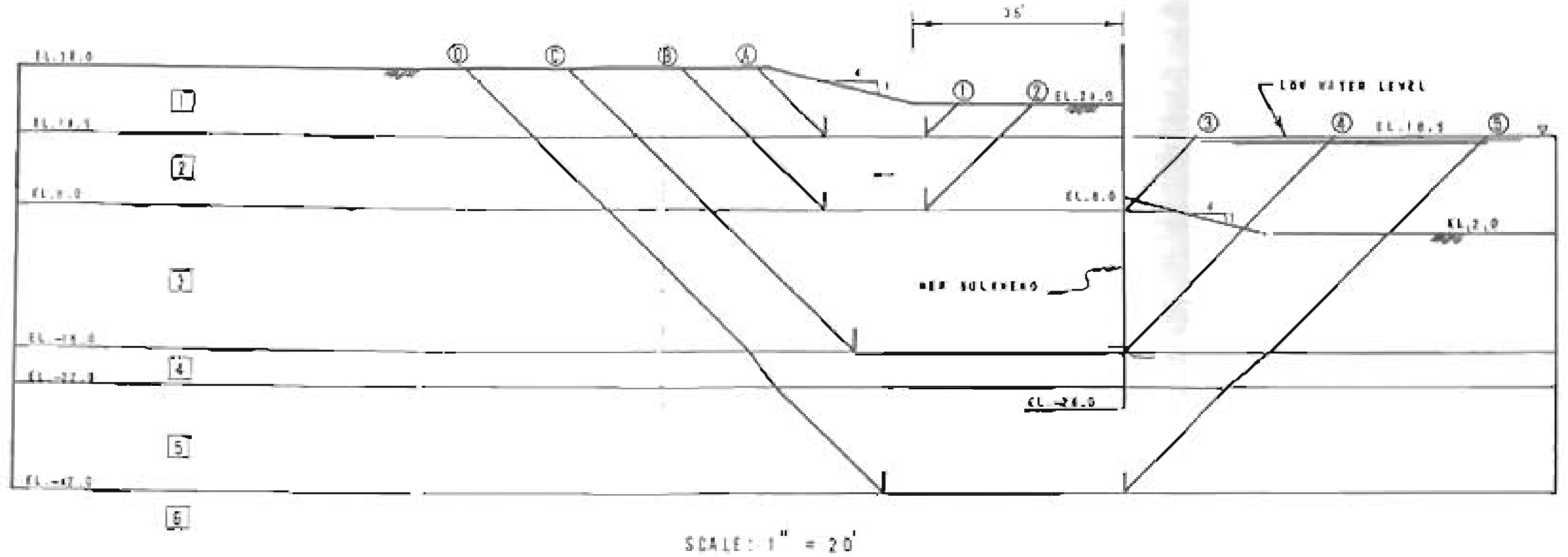
STABILITY & BULKHEAD ANALYSIS

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981 METAIRIE, LA.

FIGURE 28

TYPICAL CROSS - SECTION - - EAST SIDE (ALT. ALIGNMENT N° 2)

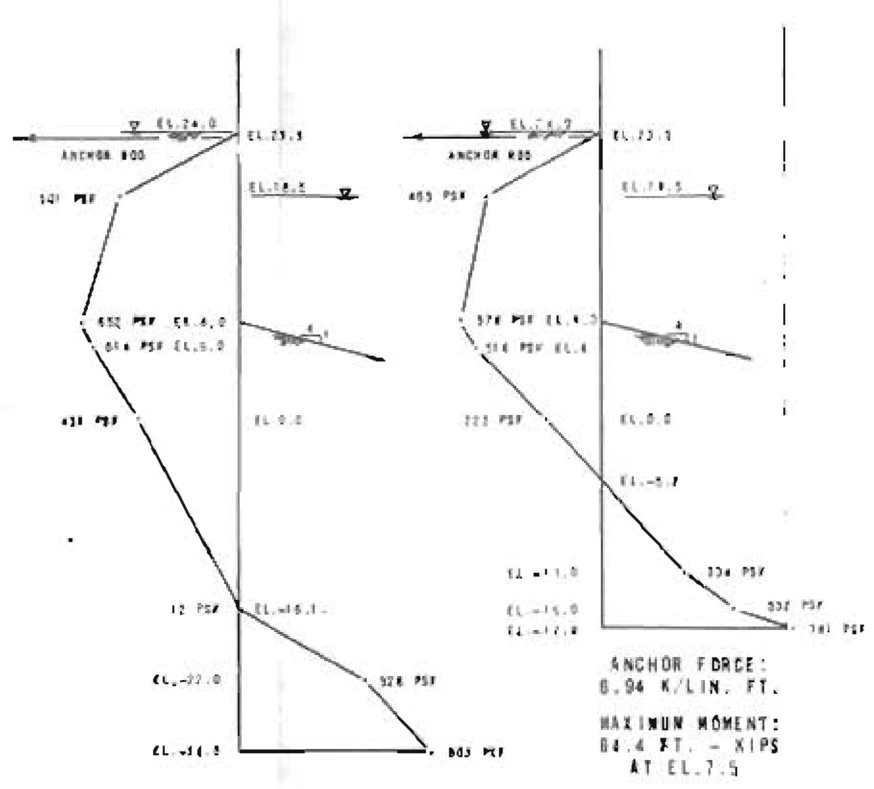


SCALE: 1" = 20'

LOW WATER CONDITION

ANCHORED BULKHEAD

FACTOR OF SAFETY = 1.5 FACTOR OF SAFETY = 1.0



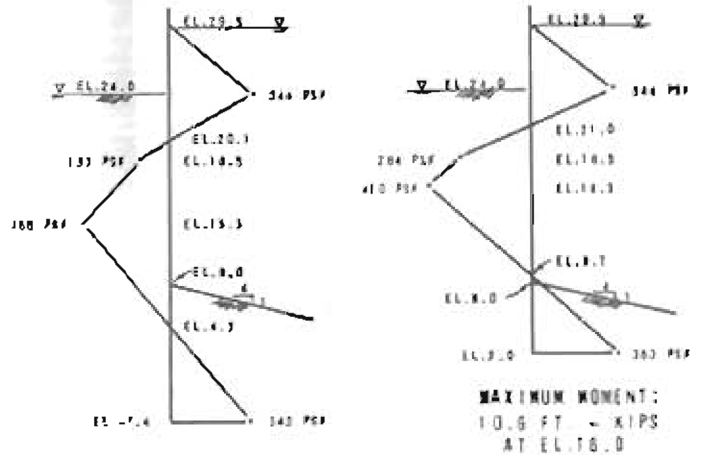
ANCHOR FORCE:
6.94 K/LIN. FT.

MAXIMUM MOMENT:
84.4 FT. - KIPS
AT EL.7.5

HIGH WATER CONDITION

CANTILEVER BULKHEAD

FACTOR OF SAFETY = 1.5 FACTOR OF SAFETY = 1.0



MAXIMUM MOMENT:
10.6 FT. - KIPS
AT EL.16.0

STABILITY ANALYSIS

SLIP SURFACE		DRIVING FORCE			RESISTING FORCE				FACTOR OF SAFETY
N°	EL.	D_A	$-D_P$	ΣD	R_A	R_B	R_P	ΣR	
A-1	18.5	4559	1376	5583	11500	8500	4875	24875	4.45
B-2	6.0	25033	10053	14964	19000	5100	13236	36337	2.43
B-3	8.0	24953	105	24844	19000	15000	960	34960	1.40
C-4	-15.0	67454	8040	59444	27280	33850	15938	77068	1.30
D-5	-42.0	142 [illegible]	40121	102334	73158	52000	48736	154394	1.51

NOTES

ALL ELEVATIONS REFER TO CAIRO DATUM
ALL BULKHEAD ANALYSES WERE PERFORMED USING "D" AND "S" SOIL SHEAR STRENGTHS SHOWN ON FIGURE 27 AND THE "S" STRENGTHS WERE FOUND TO GOVERN FOR ALL LOAD CONDITIONS.
LOW WATER CONDITION GOVERNS DESIGN.

SUBSOIL INVESTIGATION
SEWERAGE & WATER BOARD OF NEW ORLEANS
METAIRIE RELIEF CANAL
STATION 539+00 TO STATION 554+00
JEFFERSON AND ORLEANS PARISHES, LOUISIANA

STABILITY & BULKHEAD ANALYSIS

FOR
MODJESKI AND MASTERS, INC.
CONSULTING ENGINEERS
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
OCTOBER, 1981 METAIRIE, LA.

FIGURE 29

PRESIDENT
WILLIAM R. BURK, III, PE
EXECUTIVE VICE PRESIDENTS
THOMAS L. JACKSON, PE, LS
GEORGE C. KLEINPETER, JR., PE
VICE PRESIDENTS
JAMES W. ARMBRUSTER
JEAN H. BURK

CHAIRMAN OF THE BOARD
WILLIAM R. BURK, JR., PE, LS

BURK AND ASSOCIATES, INC.
ENGINEERS, PLANNERS, ENVIRONMENTAL SCIENTISTS
4176 CANAL STREET
NEW ORLEANS, LOUISIANA 70119-5994
(504) 486-5901
P. O. BOX 19087 - NEW ORLEANS, LA. 70179

ASSOCIATES
JENS J. NIELSEN, PE, LS
JOSEPH H. PRANGE, JR., PE
BLAISE S. D'ANTONI, JR., PE
BRUCE L. BADON
MICHAEL G. JACKSON, PE
OM P. DIXIT, PE

CHIEF FIELD ENGINEER
B. JAMES LEGENDRE, PE
DIRECTOR OF GRAPHICS
KEVIN J. BARRÉ
DIRECTOR OF PERSONNEL
PATRICK F. O'CONNOR

November 13, 1984

Mr. Ronald Ventola, Chief
Regulatory Functions
Operations Division
New Orleans District
Corps of Engineers
P.O. Box 60267
New Orleans, LA 70160

RE: Floodwall Pump Station No. 6
LMNED-DD
B&A Job No. 8133

Dear Mr. Ventola:

As required by the conditions of the COE permit, I am submitting the pile tests for construction of the floodwall at Drainage Pumping Station No. 6 on behalf of the Sewerage and Water Board of New Orleans.

The COE memo of July 11, 1983, stated the following requirements:

	DESIGN LOAD		REQUIRED ULTIMATE LOAD		MIN. SAFETY FACTOR	
MONOLITH	COMP.	TENSION	COMP.	TENSION	COMP.	TENSION
A	15 Tons	10.2 Tons	30 Tons	20.5 Tons	2.0	2.0
B	15 Tons	10.2 Tons	30 Tons	20.5 Tons	2.0	2.0
C	20 Tons	14.0 Tons	30 Tons	24.5 Tons	1.5	1.75

Test pile nos. 2 and 4 were loaded as indicated herein. Test pile reports state the following:

PILE	TEST	YIELD POINT OR ULTIMATE LOAD	PILE TIP
TP-2	Comp.	30.0 Tons	-16.75 C.D.
TP-4	Comp.	35.0 Tons	-16.75 C.D.
TP-2	Tension	28.5 Tons	-16.75 C.D.

Locations are shown on the enclosed drawings.

To reach a tip elevation of -16.75, the pile lengths were increased from 35 feet to 40 feet. The enclosed letter to the contractor, Atlas Construction Co., details the pile requirements.

If you require any further information or if I can be of further assistance, please call.

Sincerely,

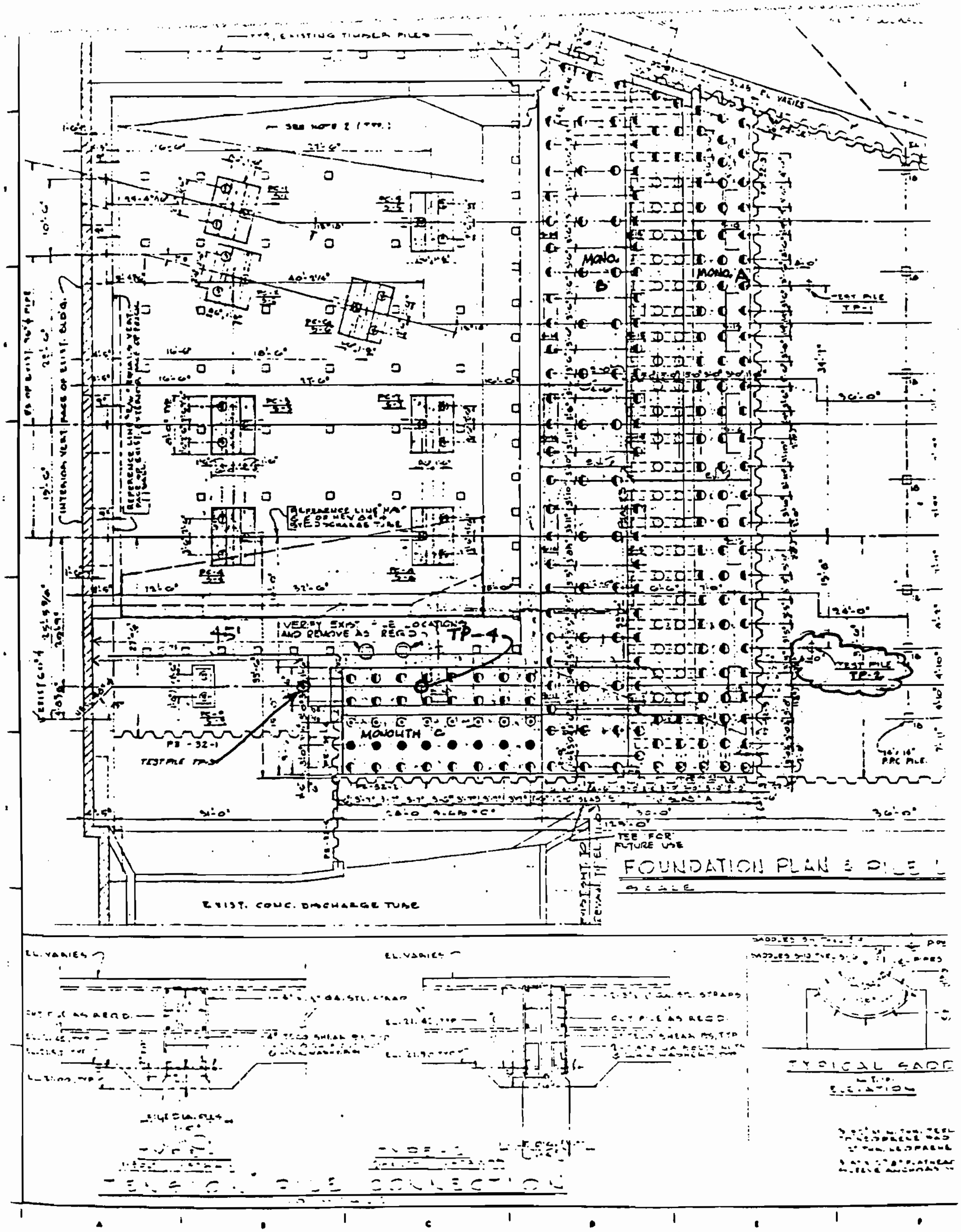
BURK AND ASSOCIATES, INC.
Engineers, Planners and
Environmental Scientists

Deborah Ducote Keller

Deborah Ducote Keller, P.E.
Project Engineer

DDK/ptb
Enclosures

cc: Mr. G. Joseph Sullivan, S&WBNO
Mr. G. Romero, COE

TYP. EXISTING TIMBER PILES
MONO. B
MONO. A
TEST PILE TP-1
TEST PILE TP-2
VERIFY EXIST. PILE LOCATIONS AND REMOVE AS REQ'D.
TP-4
MONOLITH C
TEST PILE TP-3
TEE FOR FUTURE USE
FOUNDATION PLAN & PILE L
SCALE
EXIST. CONC. DISCHARGE TUBE
EL. VARIES
CUT PILE AS REQ'D.
TYPICAL SADD
ELEVATION
A
B
C
D
E
F

PRESIDENT
WILLIAM R. BURK, III, PE
EXECUTIVE VICE PRESIDENTS
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GEORGE C. KLEINPETER, JR., PE
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CHIEF FIELD ENGINEER
B. JAMES LEGENDRE, PE
DIRECTOR OF GRAPHICS
KEVIN J. BARRÉ
DIRECTOR OF PERSONNEL
PATRICK F. O'CONNOR

October 30, 1984

Atlas Construction Co., Inc.
P. O. Box 10
Kenner, Louisiana 70064

RE: Floodwall at Pumping Station
No. 6 - Phase I
Contract No. 5103
B&A Job No. 8133

Gentlemen:

Based on our review of pile test data with Eustis Engineering Company, we have concluded the following:

1. The base length of 35 feet for treated timber piles shall be increased to 40 feet.

2. Prior to placing each pile, prudently pre-jet to elevation (-) 13.0, using a water jet with only a bottom discharge point.

3. Place the pile in the pre-jetted hole and drive this piling with the specified Vulcan No. 1 hammer to elevation (-)18.0(±), or to refusal (30 blows per foot). Additional jetting will be allowed only if approved by the engineer. The Vulcan No. 1 Hammer should be operating efficiently with a 3 foot stroke at approximately 50 to 55 blows per minute.

Please price the additional cost for the two additional compression pile tests, and additional Class B pile lengths based on the price quoted in your proposal to establish the cost of a change order.

Your cooperation is appreciated.

Yours very truly,

BURK AND ASSOCIATES, INC.
Engineers, Planners and
Environmental Scientists

Gasper A. Chifici
Chief Field Engineer

GAC/JJN:lb

cc: Mr. G. J. Sullivan

1855 MASON AVE., BATON ROUGE, LA. 70805

DELTA TESTING AND INSPECTION, INC.

725 S. GENOIS STREET • NEW ORLEANS, LA. 70179 • PHONE (504) 486-5595

REPORT NO. 2 October 15, 1984 DNO-7153

DESCRIPTION	:	FOUNDATION PILE -- COMPRESSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -16.75' TIP ELEVATION
PROJECT	:	PUMPING STATION NO. 6 FLOODWALL CONSTRUCTION PHASE I -- CONTRACT NO: 5103 NEW ORLEANS, LOUISIANA
CONSULTING ENGINEER	:	BURK AND ASSOCIATES
GENERAL CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
PILE DRIVING CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
REPORTED TO	:	SEWERAGE AND WATER BOARD OF NEW ORLEANS ROOM 5W02, CITY HALL CIVIC CENTER NEW ORLEANS, LA 70165 ATTN: MR. G. JOSEPH SULLIVAN

MATERIAL:

Three S.Y.P. ASTM D-25 Untreated Round Timber Piles, were originally driven on September 13, 1984 at the above referred to project. Test pile No. 2 was further driven to -16.75' elevation on September 27, 1984 as directed by Burk and Associates. Log of driving, attached hereto, reflects pile dimensions, penetration driven and blows per foot for test piles.

Test pile No. 2 was selected by the consulting engineer to be tested on October 9, 1984.

EQUIPMENT:

Pile was further driven using a conventional crane rig with swinging leads attached and a Vulcan No. 1 hammer air activated and at full stroke to produce 15,000 foot pounds of energy per blow.

Test was conducted using a single calibrated hydraulic jack bearing against a steel cross beam anchored to four wood reaction piles.

FOUNDATION PILE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
	REBOUND UPON COMPLETION OF HOLD PERIOD		
56:00	22.50	0.51	1st decrement
56:30	"	"	
57:00	22.50	0.51	
57:00	15.00	0.43	2nd decrement
57:30	"	"	
58:00	15.00	0.43	
58:00	7.50	0.31	3rd decrement
58:30	"	"	
59:00	7.50	0.31	
59:00	0.00	0.11	4th decrement
59:30	"	"	
60:00	0.00	0.11	FINAL READING

The above test was conducted in accordance with the City of New Orleans Building Code, Article 2805, Method 1, Forty-eight (48.0) hour hold procedure.

The above test results are to be interpreted by the Burk and Associates, consulting engineer for project.

Field Book No. 106
Supervisor: 6.0 hours

Respectfully submitted,

DELTA TESTING AND INSPECTION, INC.

Donald F. Meyer

DONALD F. MEYNO
President

DJI/DFM/jb
10-16-84
Attachments
1-Sewerage & Water Board of N.O.
1-Burk and Associates, Inc.
1-Atlas Construction Co., Inc.

LOAD TO FAILURE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
3:00	20.0	0.16	4th increment
3:15	"	"	
3:30	20.0	0.17	Movement
3:45	"	"	
4:00	"	"	
4:15	"	"	
4:30	20.0	0.17	
4:30	25.0	0.25	5th increment
4:45	"	"	
5:00	"	"	
5:15	"	"	
5:30	25.0	0.25	
5:30	30.0	0.34	6th increment
5:45	"	"	
6:00	"	"	
6:15	"	"	
6:30	30.0	0.34	
6:30	35.0	0.46	7th increment
6:45	35.0	0.49	Movement
7:00	"	"	
7:15	"	"	
7:30	"	"	
7:45	35.0	0.49	
7:45	40.0	0.60	8th increment
8:00	40.0	0.66	Movement
8:15	40.0	0.73	Movement
8:30	40.0	1.01	Failure
TEST DISCONTINUED -- PILE UNABLE TO SUSTAIN LOAD			
8:30	0.0	0.53	Rebound
8:45	"	"	
9:00	"	"	
9:15	"	"	
9:30	0.0	0.53	FINAL READING

The above test was to be conducted in accordance with the City of New Orleans Building Code, Article 2805, Method 1, Forty-eight (48.0) hour hold procedure.

LOAD TO FAILURE -- (CONTINUED)

Field Book No. 107
Supervisor: 4.0 hours

Burk and Associates called our office on October 11, 1984 and directed us to go out on Friday, October 12, 1984 and push the pile down until the pile would sustain forty (40.0) tons. Once forty tons is established and sustained to hold forty tons in accordance with the original Load Procedure.

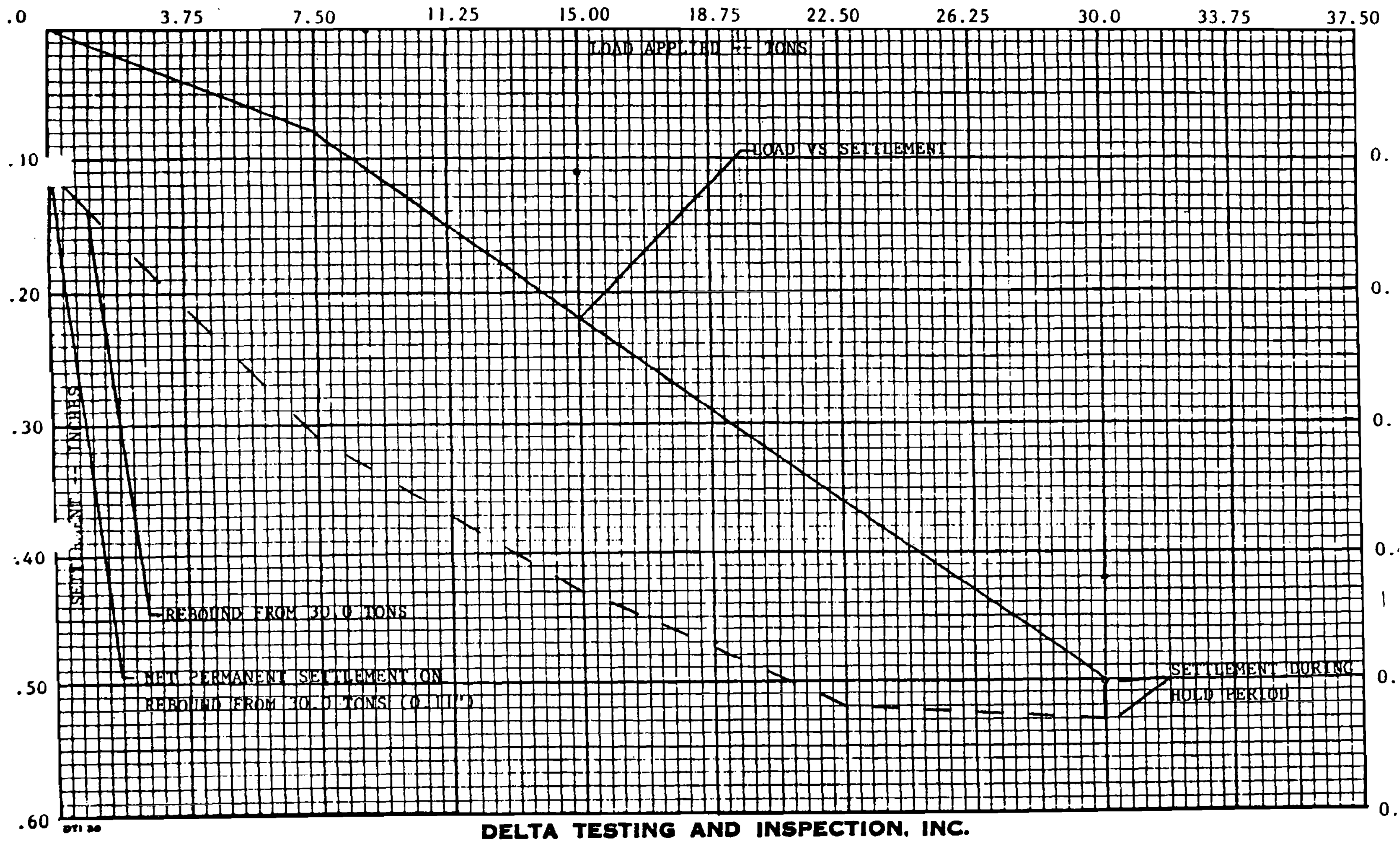
(CONTINUED)

DNO-7153

ASTM D-25 UNTREATED ROUND TIMBER X 16.75'
TIP ELEVATION

TEST PILE NO. 2
-16.75' TIP ELEVATION
DATE TEST PILE DRIVEN: 9-27-8
DATE TEST PILE LOADED: 10-09-8

PROJECT : PUMPING STATION NO. 6
CONSULTING ENGINEER : BURK AND ASSOCIATES
GENERAL CONTRACTOR : ATLAS CONSTRUCTION CO., INC.
PILE DRIVING CONTRACTOR : ATLAS CONSTRUCTION CO., INC.



DELTA TESTING AND INSPECTION, INC.

FOUNDATION PILE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
3:00	15.0	0.22	4th increment
3:15	"	"	
3:30	"	"	
3:45	"	"	
4:00	15.0	0.22	
4:00	18.75	0.29	5th increment
4:15	"	"	
4:30	"	"	
4:45	"	"	
5:00	18.75	0.29	
5:00	22.50	0.36	6th increment
5:15	"	"	
5:30	"	"	
5:45	"	"	
6:00	22.50	0.36	
6:00	26.25	0.43	7th increment
6:15	"	"	
6:30	"	"	
6:45	"	"	
7:00	26.25	0.43	
7:00	30.00	0.49	8th increment
7:15	"	"	Start 48 hour
7:30	"	"	hold
7:45	"	"	
8:00	30.00	0.49	
9:30	30.00	0.50	Movement
16:31	30.00	0.50	12:01AM -- 10-10-84
21:30	30.00	0.51	Movement
26:00	30.00	0.52	Movement
26:30	30.00	0.53	Movement

START FINAL 24.0 HOUR HOLD - NO MOVEMENT

32:00	30.00	0.53	Final 24.0 hour hold
41:31	30.00	0.53	12:01AM -- 10-11-84
56:00	30.00	0.53	End hold period

Settlement measurements were made using a Surveyor's Level, a scale fixed to the test pile proper and two referenced bench marks. Scales were read to the nearest 1/100 inch.

RESULTS OF TEST:

TEST PILE NO. 2

FOUNDATION PILE -- COMPRESSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -16.75' TIP ELEVATION

LOAD TEST PROCEDURE:

The loading procedure, received from the consulting engineer, was as follows for T.P. 2:

A.) Three and three quarters (3.75) ton increments to thirty (30.0) tons.
B.) Maintain forty-eight (48.0) hold at thirty (30.0) tons, final twenty-four (24.0) hour free of movement.
C.) Seven and one-half (7.5) ton decrements to zero (0.0) tons.

Each increment and decrement was held for one hour free of movement before applying the next increment.

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
0:00	0.0	0.00	8:30AM, 10-9-84
0:00	3.75	0.04	1st increment
0:15	"	"	
0:30	"	"	
0:45	"	"	
1:00	3.75	0.04	
1:00	7.50	0.08	2nd increment
1:15	"	"	
1:30	"	"	
1:45	"	"	
2:00	7.50	0.08	
2:00	11.25	0.15	3rd increment
2:15	"	"	
2:30	"	"	
2:45	"	"	
3:00	11.25	0.15	

1855 MASON AVE., BATON ROUGE, LA. 7[illegible]

DELTA TESTING AND INSPECTION, INC.

P. O. BOX 19172 • NEW ORLEANS, LA. 70179 • PHONE 486-5595

TEST PILE REPORT NO. 2

SHEET 1 OF 2

DTI 34

PILE DRIVING RECORD

DATE: 9-27-84

PROJECT	CONTRACTOR	ARCHITECT	ENGINEER	ORDER NO.
Pumping Station No. 6	Atlas Const. Co.	-------------	Burk & Assc.	DNO-7153

NUMBER OF BLOWS

PILE NO.	TP1	TP2	TP3	
TIP. IN.	9.20"	9.60"	8.25"	
BUTT. IN.	14.3"	15.0"	14.25"	
LENGTH FT.	50'	50'	50'	
TIP ELEVATION PENETRATION IN FEET				
+21-+15	WOH	WOH	WOH	
+14				
3				
2				
1				
+10			10	
9			2	
8			2	
7			3	
6			4	
+5		2	4	
4		2	4	
3	1		3	
2			4	
1	1		4	
0			5	
-1			12	
2	7	8	23	
3	6	8	17	
4	5	8	13	
-5	4	9	22	
6	5	6	17	
7	4	6	30	
8	5	7	30@7"	
9	6	6		
-10	11	13		
1	12	20		
2	17	16		Piles were driven with Delmag D-8 to
3	16	12		this elevation
*4	17@7"	20@7"		Piles were then driven to this elevation
*-15	25	22		with Vulcan No. 1
*-16		50		
*-17		41@9"		

ALL PILES LOGGED FROM ELEVATION OF +23.00

SUPERVISOR: G. Mansour 1:00 am/pm 3:00 am/pm

REMARKS 1. TYPE HAMMER: Vulcan No. 1 (15,000 ft. lbs.)

2. TYPE PILE: S.Y.P. Class B untreated round timber pile.

3. DWG NO.: -

INSPECTOR: Chris Schroeder

WORK TIME 1:00 am/pm 3:00 am/pm

TRAVEL TIME: N/A

MILEAGE: N/A

1855 MASON AVE., BATON ROUGE, LA. 70805

DELTA TESTING AND INSPECTION, INC.

725 S. GENOIS STREET • NEW ORLEANS, LA. 70179 • PHONE (504) 486-5595

REPORT NO. 3 October 15, 1984 DNO-7153

DESCRIPTION	:	FOUNDATION PILE -- COMPRESSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -15.5' TIP ELEVATION
PROJECT	:	PUMPING STATION NO. 6 FLOODWALL CONSTRUCTION PHASE I -- CONTRACT NO: 5103 NEW ORLEANS, LOUISIANA
CONSULTING ENGINEER	:	BURK AND ASSOCIATES
GENERAL CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
PILE DRIVING CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
REPORTED TO	:	SEWERAGE AND WATER BOARD OF NEW ORLEANS ROOM 5W02, CITY HALL CIVIC CENTER NEW ORLEANS, LA 70165 ATTN: MR. G. JOSEPH SULLIVAN

MATERIAL:

Three S.Y.P. ASTM D-25 Untreated Round Timber Piles, were originally driven on September 13, 1984 at the above referred to project. Test pile No. 4 was driven on September 28, 1984. Test pile No. 4 was originally a pile that was used as a reaction pile for test pile No. 1 and was extracted by jetting and then driven as T.P. 4. Log of driving, attached hereto, reflects pile dimensions, penetration driven and blows per foot for test pile.

Test pile No. 4 was selected by the consulting engineer to be tested on October 9, 1984.

EQUIPMENT:

Pile was driven using a conventional crane rig with swinging leads attached and a Vulcan No. 1 hammer air activated and at full stroke to produce 15,000 foot pounds of energy per blow.

Test was conducted using a single calibrated hydraulic jack bearing against a steel cross beam anchored to four wood reaction piles.

Settlement measurements were made using a Surveyor's Level, a scale fixed to the test piles proper and two referenced bench marks. Scales were read to the nearest 1/100 inch.

RESULTS OF TEST:

TEST PILE NO. 4

LOAD TO FAILURE -- COMPRESSION TEST ON S.Y.P. ASTM D-25 UNTREATED
ROUND TIMBER PILE X -15.5' TIP ELEVATION

LOAD TEST PROCEDURE:

The loading procedure, received from the consulting engineer, was as follows for T.P. 4:

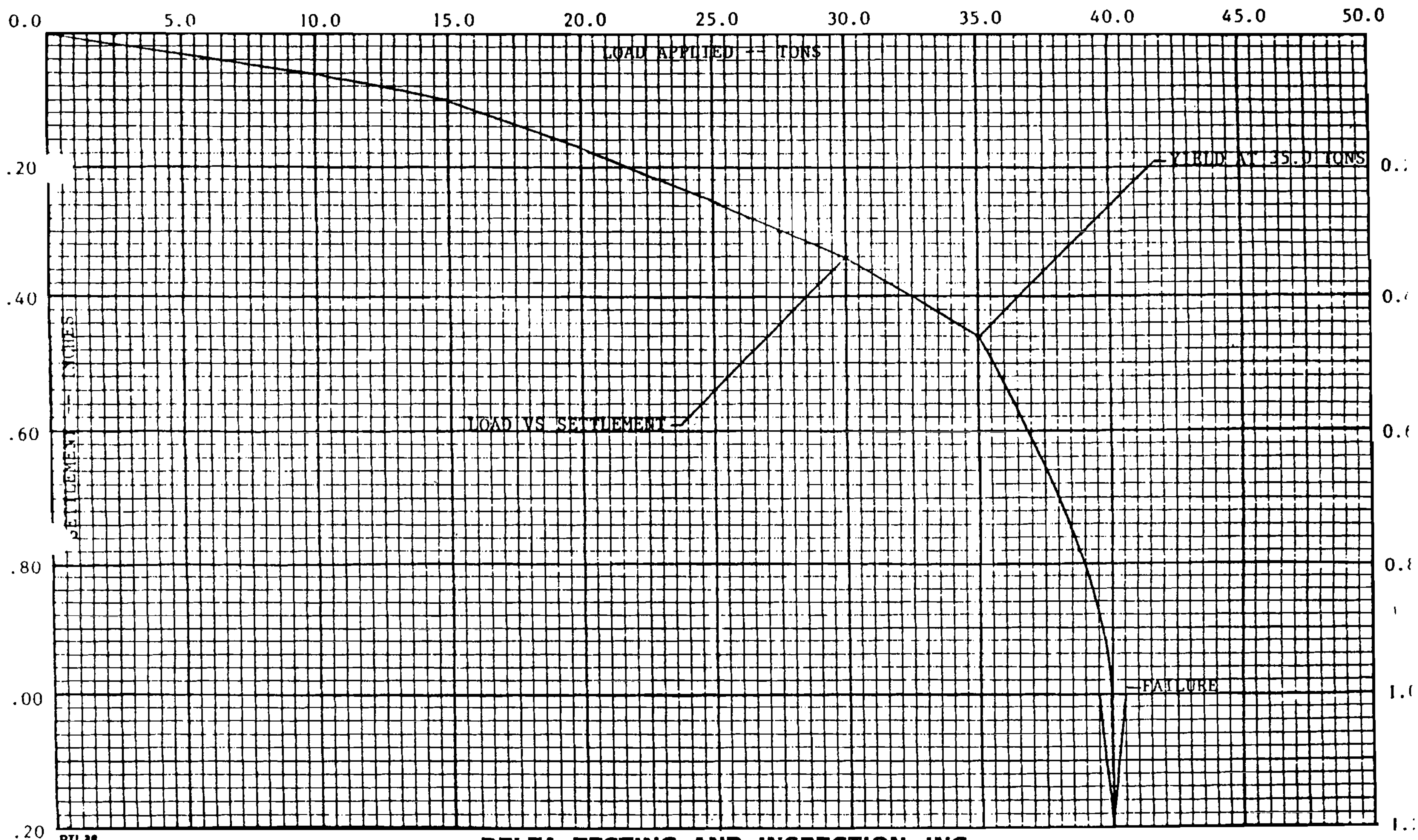
A.) Five (5.0) ton increments to forty (40.0) tons.
B.) Maintain forty-eight (48.0) hold at forty (40.0) tons, final twenty-four (24.0) hour free of movement.
C.) Ten (10.0) ton decrements to zero (0.0) tons.

Each increment and decrement was held for one hour free of movement before applying the next increment.

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
0:00	0.0	0.00	9:00AM, 10-9-84
0:00	5.0	0.03	1st increment
0:15	"	"	
0:30	"	"	
0:45	"	"	
1:00	5.0	0.03	
1:00	10.0	0.06	2nd increment
1:15	"	"	
1:30	"	"	
1:45	"	"	
2:00	10.0	0.06	
2:00	15.0	0.10	3rd increment
2:15	"	"	
2:30	"	"	
2:45	"	"	
3:00	15.0	0.10	

		ASTM D-25 UNTREATED ROUND TIMBER PILE X -15.5' TIP ELEVATION
PROJECT	:	PUMPING STATION NO. 6
CONSULTING ENGINEER	:	BURK AND ASSOCIATES
GENERAL CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
PILE DRIVINE CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.

TEST PILE NO. 4
-15.5' TIP ELEVATION
DATE TEST PILE DRIVEN: 9-28-84
DATE TEST PILE LOADED: 10-09-84



DELTA TESTING AND INSPECTION, INC.

RETEST PILE NO. 4

FOUNDATION PILE -- COMPRESSION LOAD TEST ON S.Y.P. ASTM D-25
UNTREATED TIMBER PILE X 15.5' TIP ELEVATION

LOAD TEST PROCEDURE:

The loading procedure, received from the consulting engineer, was as follows for the retest of T.P. 4:

A.) Apply forty (40.0) tons to pile in one continuous increment until 40.0 tons is sustained or 1.5' of settlement occurs, should the pile fail.
B.) Maintain forty-eight (48.0) hold at forty (40.0) tons, with no movement in the final twenty-four (24.0) hour hold.
C.) Ten (10.0) ton decrements to zero (0.0) tons.

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	SETTLEMENT INCHES	REMARKS
0:00	0.0	0.00	9AM, 10-12-84
0:00	28.5	0.34	Intermittent Reading
0:40	40.0	0.55	1st increment
0:45	"	0.60	Movement
START 48.0 HOUR HOLD PERIOD AT 9:45AM 10-12-84			
1:00	40.0	0.63	Movement
1:15	"	0.66	"
1:30	"	0.66	"
1:45	"	0.67	"
2:00	40.0	0.68	"
2:45	"	0.69	"
3:45	"	0.70	"
4:30	40.0	0.71	"
7:45	40.0	0.72	Movement
9:30	40.0	0.73	" 6:30PM
11:30	40.0	0.74	Movement
14:30	40.0	0.75	"
15:01	40.0	0.75	12:01AM, 10-13-84

The above test was conducted in accordance with the City of New Orleans Building Code, Article 2805, Method I, Forty-eight (48.0) hour hold procedure, as modified by the Burk and Associates, as noted above.

The above test results to be interpreted by the consulting engineer, Burk and Associates.

Field Book No. 101
Supervisor: 4.0 hours

Respectfully submitted,

DELTA TESTING AND INSPECTION, INC.

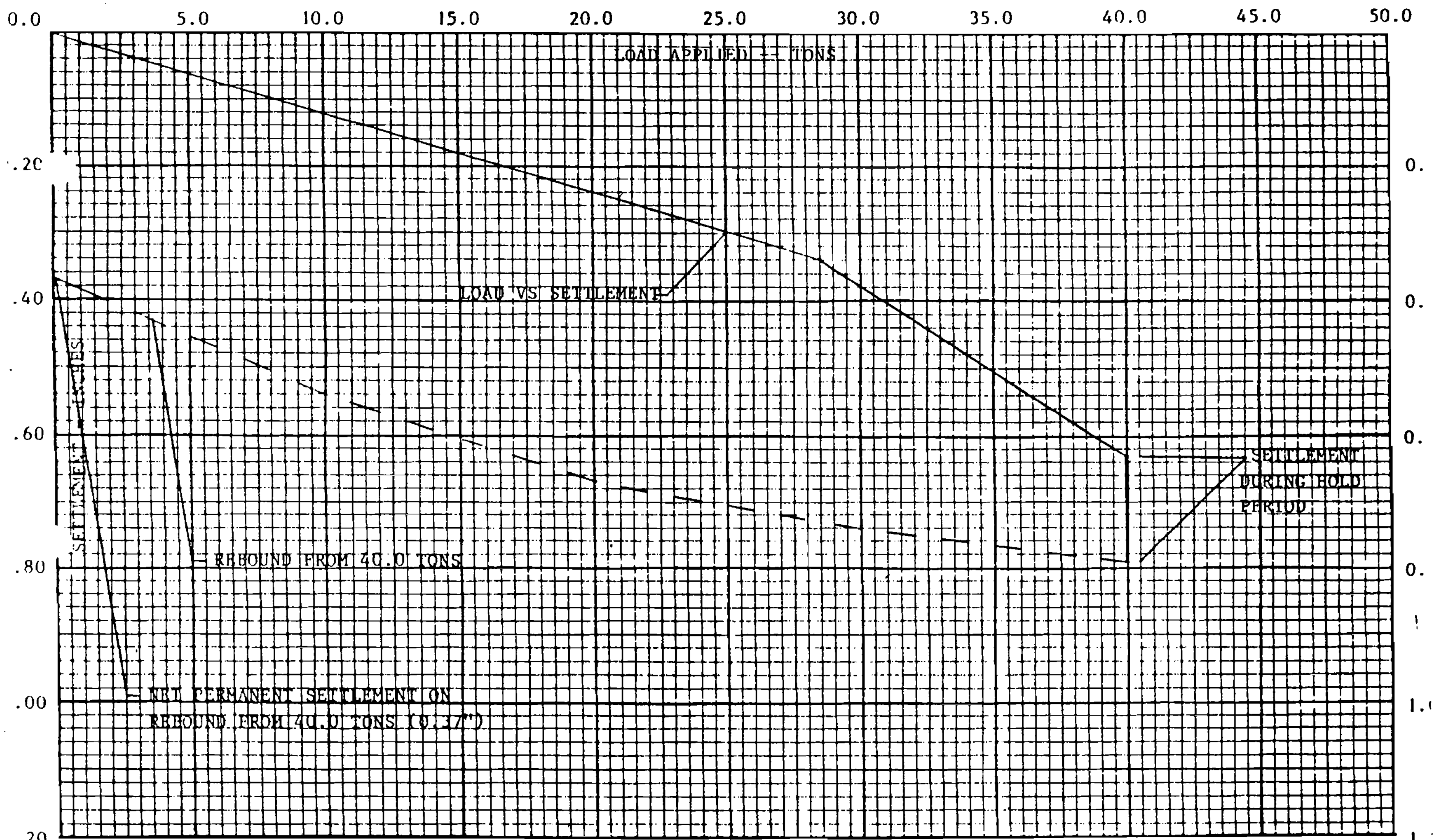
Donald F. Meyer

DONALD F. MEYER
President

DJI/DFM/jb
10-17-84
Attachments
1-Sewerage & Water Board of N.O.
1-Burk and Associates, Inc.
1-Atlas Construction Co., Inc.

		ASTM D-25 UNTREATED ROUND TIMBER PILE X -15.5' TIP ELEVATION
PROJECT	:	PUMPING STATION NO. 6
CONSULTING ENGINEER	:	BURK AND ASSOCIATES
GENERAL CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
PILE DRIVING CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.

TEST PILE NO. 4
-15.5' TIP ELEVATION
DATE TEST PILE DRIVEN: 9-28-
DATE TEST PILE RELOADED: 10-12



DELTA TESTING AND INSPECTION, INC.

1853 MASON AVE., BATON ROUG' \. 70?

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TEST PILE REPORT NO. 3

SHEET 1 OF 1

DTI 34

PILE DRIVING RECORD

DATE: 9-28-84

PROJECT	CONTRACTOR	ARCHITECT	ENGINEER	ORDER NO.
Pumping Station No. 6	Atlas Const. Co.	-------------	Burk & Assc.	DNO-7153

NUMBER OF BLOWS

PILE NO.	TP4	
TIP. IN.	8.00"	
BUTT. IN.	13.80"	
LENGTH FT.	50'	
+21-+15		
+14		
3		
2		
1		
+10		
9		
8		
7		
6		
+5	24	← Foot markings did not start until this elevation.
4	6	These 24 blows account for 19 feet of timber.
3	5	
2	5	
1	6	
0	7	← Pile was driven to this point without jetting.
-1	30	Jetting procedure was used from this elevation
2	60	down to elevation of -12.00
3	41	
4	6	
-5	4	
6	16	
7	6	
8	11	
9	10	
-10	13	
1	12	
2	10	
3	19	← Driving was resumed without jetting.
4	18	
-15	15	
	40@6"	← Driving was stopped at the direction of Mr. Nielsen
		ALL PILES WERE LOGGED FROM AN ELEVATION OF 23.00

TIP ELEVATION PENETRATION IN FEET

REMARKS 1. TYPE HAMMER: Vulcan No. I (15,000 lbs.)

2. TYPE PILE: S.Y.P. Class B untreated round timber pile.

3. DWG NO.: --

INSPECTOR: Chris Schroeder

WORK TIME 7:30 am/pm 9:00 am/pm

TRAVEL TIME: N/A

MILEAGE: N/A

1855 MASON AVE., BATON R E. LA. 7

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TEST PILE
REPORT NO. 3

SHEET 1 OF 1

DTI 34

PILE DRIVING RECORD

DATE: 9-28-84

PROJECT	CONTRACTOR	ARCHITECT	ENGINEER	ORDER NO.
Pumping Station No. 6	Atlas Const. Co.	-------------	Burk & Assc.	DNO-7153

NUMBER OF BLOWS

PILE NO.	TP4	
TIP. IN.	8.00"	
BUTT. IN.	13.80"	
LENGTH FT.	50'	
TIP ELEVATION PENETRATION IN FEET		
+21-+15		
+14		
3		
2		
1		
+10		
9		
8		
7		
6		
+5	24	Foot markings did not start until this elevation.
4	6	These 24 blows account for 19 feet of timber.
3	5	
2	5	
1	6	
0	7	Pile was driven to this point without jetting.
-1	30	Jetting procedure was used from this elevation
2	60	down to elevation of -12.00
3	41	
4	6	
-5	4	
6	16	
7	6	
8	11	
9	10	
-10	13	
1	12	
2	10	
3	19	Driving was resumed without jetting.
4	18	
-15	15	
	40@6"	Driving was stopped at the direction of Mr. Nielsen
		ALL PILES WERE LOGGED FROM AN ELEVATION OF 23.00

REMARKS 1. TYPE HAMMER: Vulcan No. 1 (15,000 lbs.)

2. TYPE PILE: S.Y.P. Class B untreated round timber pile.

3. DWG NO.: —

INSPECTOR: Chris Schroeder

WORK TIME 7:30 am/pm 9:00 am/pm

TRAVEL TIME: N/A

MILEAGE: N/A

PUMPING STATION NO. 6
FLOODWALL CONSTRUCTION
PHASE I -- CONTRACT NO: 5103
NEW ORLEANS, LOUISIANA
TENSION TEST PILE PROGRAM

855 MASON AVENUE, BATON ROUGE, L

DELTA TESTING AND INSPECTION, INC.

725 S. GENOIS STREET • NEW ORLEANS, LA. 70179 • PHONE (504) 486-5595

REPORT NO. 5 October 29, 1984 DNO-7153

DESCRIPTION	:	FOUNDATION PILE -- TENSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -16.75' TIP ELEVATION
PROJECT	:	PUMPING STATION NO. 6 FLOODWALL CONSTRUCTION PHASE I -- CONTRACT NO: 5103 NEW ORLEANS, LOUISIANA
CONSULTING ENGINEER	:	BURK AND ASSOCIATES
GENERAL CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
PILE DRIVING CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
REPORTED TO	:	SEWERAGE AND WATER BOARD OF NEW ORLEANS ROOM 5W02, CITY HALL CIVIC CENTER NEW ORLEANS, LA 70165 ATTN: MR. G. JOSEPH SULLIVAN

MATERIAL:

Three S.Y.P. ASTM D-25 Untreated Round Timber Piles, were originally driven on September 13, 1984 at the above referred to project. Test pile No. 2 was further driven to -16.75' elevation on September 27, 1984 as directed by Burk and Associates. Log of driving, attached hereto, reflects pile dimensions, penetration driven and blows per foot for test piles.

Test pile No. 2 was selected by the consulting engineer to be tension tested on October 23, 1984, which has already been tested in compression on October 9, 1984.

EQUIPMENT:

Pile was further driven using a conventional crane rig with swinging leads attached and a Vulcan No. 1 hammer air activated and at full stroke to produce 15,000 foot pounds of energy per blow.

Test was conducted using a single calibrated hydraulic jack bearing against a steel cross beam anchored to four wood reaction piles.

Uplift measurements were made using a Surveyor's Level, a scale fixed to the test piles proper and two referenced bench marks. Scales were read to the nearest 1/100 inch.

RESULTS OF TEST:

TEST PILE NO. 2

FOUNDATION PILE -- TENSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER PILE X -16.75' TIP ELEVATION

LOAD TEST PROCEDURE:

The loading procedure, received from the consulting engineer, was as follows for T.P. 2:

A.) One (1.0) increment to two and one-half (2.5) tons.
B.) Two (2.0) ton increments to twenty and one-half (20.5) tons.
C.) Maintain forty-eight (48.0) hold at twenty and one-half (20.5) tons with no movement in the final twenty-four (24.0) hours.
D.) Five (5.0) ton decrements to zero (0.0) tons.
E.) One (1.0) increment to two and one-half (2.5) tons.
F.) Two (2.0) ton increments to eighteen and one-half (18.5) tons.
G.) Two (2.0) ton increments to Failure.

Each increment and decrement in A, B, D and G was held one (1.0) hour free of movement.

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
0:00	0.0	0.00	11AM, 10-23-84
0:00	2.50	0.00	1st increment
0:15	"	"	
0:30	"	"	
0:45	"	"	
1:00	2.50	0.00	
1:00	4.50	0.00	2nd increment
1:15	"	"	
1:30	"	"	
1:45	"	"	
2:00	4.50	0.00	

LOAD TO FAILURE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
2:00	6.50	0.05	3rd increment
2:15	"	"	
2:30	"	"	
2:45	"	"	
3:00	6.50	0.05	
3:00	8.50	0.09	4th increment
3:15	"	"	
3:30	"	"	
3:45	"	"	
4:00	8.50	0.09	
4:00	10.50	0.12	5th increment
4:15	"	"	
4:30	"	"	
4:45	"	"	
5:00	10.50	0.12	
5:00	12.50	0.16	6th increment
5:15	"	"	
5:30	"	"	
5:45	"	"	
6:00	12.50	0.16	
6:00	14.50	0.20	7th increment
6:15	"	"	
6:30	"	"	
6:45	"	"	
7:00	14.50	0.20	
7:00	16.50	0.23	8th increment
7:15	"	"	
7:30	"	"	
7:45	"	"	
8:00	16.50	0.23	
8:00	18.50	0.27	9th increment
8:15	"	"	
8:30	"	"	
8:45	"	"	
9:00	18.50	0.27	
9:00	20.50	0.30	10th increment
9:15	"	"	Start 48.0 hour hold 8PM, 10-23-84
9:30	"	"	
9:45	"	"	
10:00	20.50	0.30	

1655 MASON AVE., BATON ROUGE, 70805

DELTA TESTING AND INSPECTION, INC.

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TEST PILE REPORT NO. 2

SHEET 1 OF 2

DTI 34

PILE DRIVING RECORD

DATE: 9-27-84

PROJECT	CONTRACTOR	ARCHITECT	ENGINEER	ORDER NO.
Pumping Station No. 6	Atlas Const. Co.	------------	Burk & Assc.	DNO-7153

NUMBER OF BLOWS

PILE NO.	TP1	TP2	TP3	
TIP. IN.	9.20"	9.60"	8.25"	
BUTT. IN.	14.3"	15.0"	14.25"	
LENGTH FT.	50'	50'	50'	
+21-+15	WOH	WOH	WOH	
+14				
3				
2				
1				
+10			10	
9			2	
8			2	
7			3	
6			4	
+5		2	4	
4		2	4	
3	1		3	
2			4	
1	1		4	
0			5	
-1			12	
2	7	8	23	
3	6	8	17	
4	5	8	13	
-5	4	9	22	
6	5	6	17	
7	4	6	30	
8	5	7	30@7"	
9	6	6		
-10	11	13		
1	12	20		
2	17	16		Piles were driven with Delmag D-8 to
3	16	12		this elevation
• 4	17@7"	20@7"		Piles were then driven to this elevation
• -15	25	22		with Vulcan No. 1
• -16		50		
• -17		41@9"		

ALL PILES LOGGED FROM ELEVATION OF +23.00

TIP ELEVATION PENETRATION IN FEET

SUPERVISOR: G. Mansour 1:00 am/pm 3:00 am/pm

REMARKS 1. TYPE HAMMER: Vulcan No. 1 (15,000 ft. lbs.)

2. TYPE PILE: S.Y.P. Class B untreated round timber pile.

3. DWG NO.:

INSPECTOR: Chris Schroeder

WORK TIME 1:00 am/pm 3:00 am/pm

TRAVEL TIME: N/A

MILEAGE N/A

1355 MASON AVE., BATON ROUGE, LA 70805

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TEST PILE REPORT NO. 2 — SHEET 2 OF 2

DTI 34

PILE DRIVING RECORD

DATE: 9-27-84

PROJECT	CONTRACTOR	ARCHITECT	ENGINEER	ORDER NO.
Pumping Station No. 6	Atlas Const. Co.	-------------	Burk & Assc.	DNO-7153

NUMBER OF BLOWS

PILE NO.	Reaction Pile		
TIP. IN.	Not Known		
BUTT. IN.	"	"	
LENGTH FT.	50'		
+21-+15			
+14			
3			
2			
1			
+10			
9			
8			
7			
6			
+5			
4			
3			
2			
1			
0			
-1			
2			
3			
4	16@5"		
-5	108		These blow counts were at the direction of
6	117		Mr. Louis Napolitano of Eustis Engineering
7			
8			
9			
-10			
1			
2			
3			
4			
-15			

Pile logged from this point. pile is southeast reaction pile for T.P.1

TIP ELEVATION PENETRATION IN FEET

SUPERVISOR: G. Mansour 1:00 am/pm 3:00 am/pm

REMARKS 1. TYPE HAMMER: Vulcan No. 1 (15,000 lbs.)

2. TYPE PILE: S.Y.P. Class B untreated round timber pile.

3. DWG NO.: —

INSPECTOR: Chris Schroeder

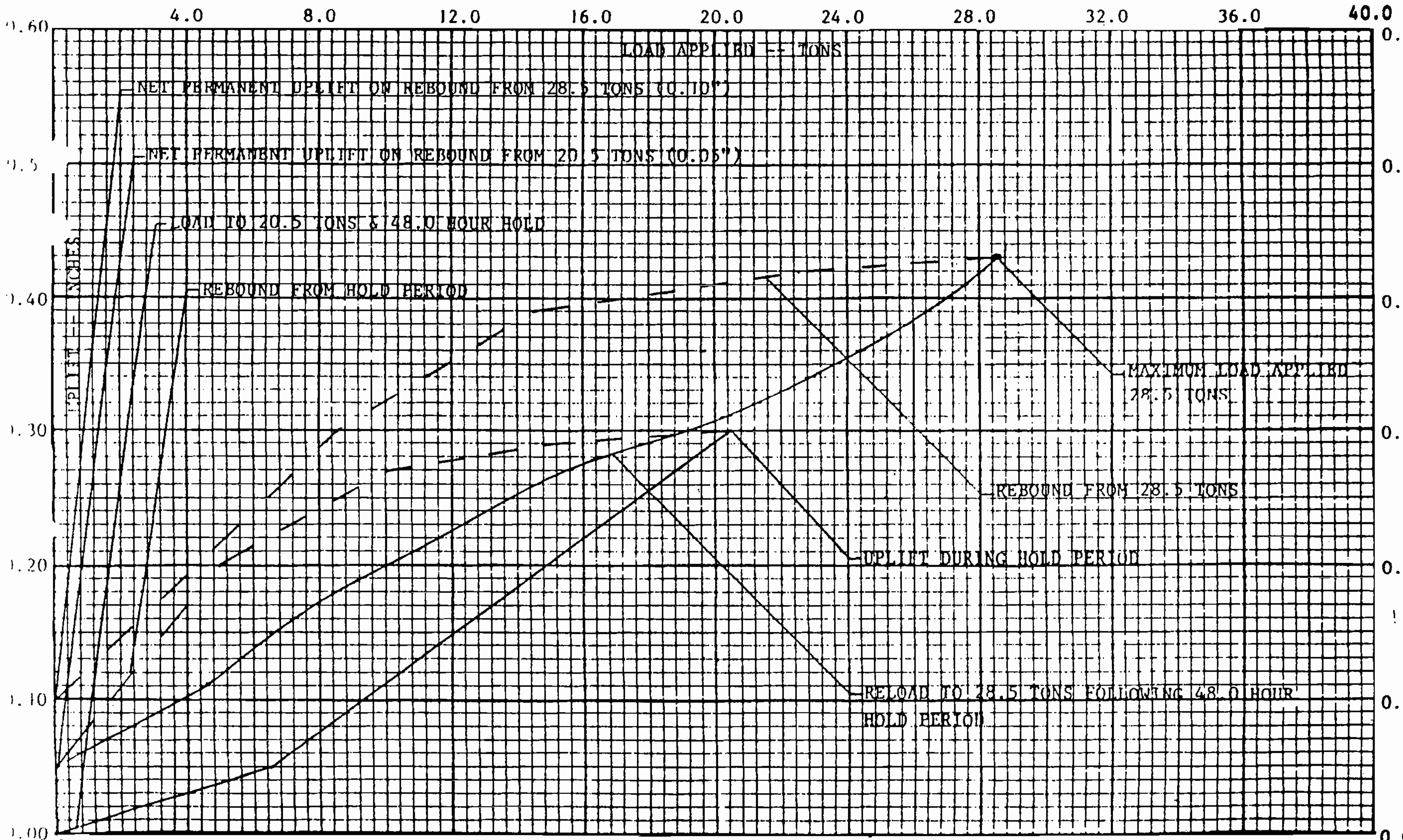
WORK TIME: 1:00 am/pm 3:00 am/pm

TRAVEL TIME: N/A

MILEAGE: N/A

DESCRIPTION	:	FOUNDATION PILE -- TENSION TEST ON S.Y.P. ASTM D-25 UNTREATED ROUND TIMBER X -16.75' TIP ELEVATION
PROJECT	:	PUMPING STATION NO. 6
CONSULTING ENGINEER	:	BURK AND ASSOCIATES
GENERAL CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.
PILE DRIVING CONTRACTOR	:	ATLAS CONSTRUCTION CO., INC.

DNO-7153 **REPORT NO. 5**
TEST PILE NO. 2
-16.75' TIP ELEVATION
DATE TEST PILE DRIVEN: 9-27-84
DATE TEST PILE LOADED: 10-23-84



DELTA TESTING AND INSPECTION, INC.

LOAD TO FAILURE -- (CONTINUED)

NOTE: The hydraulic ram became fully extended at this point. Contractor was called out to jobsite. Contractor placed shoring between the reaction beam and bearing block to support the load at 20.5 tons, while the piston was withdrawn into the ram and steel shims added to fill the void. The ram was loaded back to 20.5 tons and the shoring removed. The pile uplift reading showed no change after this procedure was accomplished. Forty-eight (48.0) hour hold period was restarted at this point.

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
	RESTART 48.0 HOUR HOLD		
11:30	20.50	0.30	11:30PM, 10-23-84
12:01	20.50	0.30	12:01AM, 10-24-84
35:30	20.50	0.30	End 1st 24.0 hour hold
	START FINAL 24.0 HOUR HOLD FREE OF MOVEMENT		
35:30	20.50	0.30	11:30PM, 10-24-84
36:01	20.50	0.30	12:01AM, 10-25-84
59:30	20.50	0.30	End final 24.0 hours No Movement
	REBOUND FROM HOLD PERIOD		
59:30	15.00	0.29	1st decrement
59:45	"	"	
60:00	"	"	
60:15	"	"	
60:30	15.00	0.29	
60:30	10.00	0.27	2nd decrement
60:45	"	"	
61:00	"	"	
61:15	"	"	
61:30	10.00	0.27	

LOAD TO FAILURE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
61:30	5.00	0.20	3rd decrement
61:45	"	"	
62:00	"	"	
62:15	"	"	
62:30	5.00	0.20	
62:30	0.00	0.05	4th decrement
62:45	"	"	
63:00	"	"	
63:15	"	"	
63:30	0.00	0.05	
	RELOAD TO FAILURE PROCEDURE		
63:30	2.50	0.08	1st increment
63:40	"	"	
63:50	2.50	0.08	
63:50	4.50	0.11	2nd increment
64:00	"	"	
64:10	4.50	0.11	
64:10	6.50	0.15	3rd increment
64:20	"	"	
64:30	6.50	0.15	
64:30	8.50	0.18	4th increment
64:40	"	"	
64:50	8.50	0.18	
64:50	10.50	0.20	5th increment
65:00	"	"	
65:10	10.50	0.20	
65:10	12.50	0.23	6th increment
65:20	"	"	
65:30	12.50	0.23	
65:30	14.50	0.26	7th increment
65:40	"	"	
65:50	14.50	0.26	
65:50	16.50	0.28	8th increment
66:00	"	"	
66:10	16.50	0.28	
66:10	18.50	0.30	9th increment
66:20	"	"	
66:30	18.50	0.30	

LOAD TO FAILURE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
66:30	20.50	0.32	10th increment Start each increment 1.0 hour free of movement
66:45	"	"	
67:00	"	"	
67:15	"	"	
67:30	20.50	0.32	
67:30	22.50	0.34	11th increment
67:45	"	"	
68:00	"	"	
68:15	"	"	
68:30	22.50	0.34	
68:30	24.50	0.36	12th increment
68:45	"	"	
69:00	"	"	
69:15	"	"	
69:30	24.50	0.36	
69:30	26.50	0.39	13th increment
69:45	"	"	
70:00	"	"	
70:15	"	"	
70:30	26.50	0.39	
70:30	28.50	0.43	14th increment
70:45	"	"	
71:00	"	"	
71:15	"	"	
71:30	28.50	0.43	

Test discontinued, maximum ram extension - Consulting engineer directed us to stop test and rebound.

REBOUND -- UPON COMPLETION OF LOAD TO FAILURE PROCEDURE

71:30	22.50	0.42	1st decrement
71:40	"	"	
71:50	22.50	0.42	
71:50	14.50	0.39	2nd decrement
72:00	"	"	
72:10	14.50	0.39	

LOAD TO FAILURE -- (CONTINUED)

TIME CUMULATIVE HOURS	LOAD APPLIED TONS	UPLIFT INCHES	REMARKS
72:10	8.50	0.30	3rd decrement
72:20	"	"	
72:30	8.50	0.30	
72:30	0.00	0.10	4th decrement
72:45	"	"	
73:00	"	"	
73:15	"	"	
73:30	0.00	0.10	FINAL READING

The above test was conducted in accordance with the City of New Orleans Building Code, Article 2805, Method 1, Forty-eight (48.0) hour hold procedure and ASTM D-3689.

The above test results are to be interpreted by the Burk and Associates, consulting engineer for project.

Field Book No. 108
Supervisor: 6.0 hours

Respectfully submitted,

DELTA TESTING AND INSPECTION, INC.

Donald F. Meyer

DONALD F. MEYER
President

DJI/DFM/jb
10-30-84
Attachments
1-Sewerage & Water Board of N.O.
2-Burk and Associates, Inc.
1-Atlas Construction Co., Inc.

Gulf South Laboratories, Inc.
383 LAKE AVENUE • METAIRIE, LOUISIANA 70005 • (504) 832-5900
TESTING • INSPECTION • RESEARCH

STATIC AXIAL PILE LOAD TEST
CONDUCTED ON INDIVIDUAL
VERTICAL FOUNDATION PILE

Sewerage & Water Board of New Orleans
Pumping Station #6
New Orleans, Louisiana

SUBMITTED BY
GULF SOUTH LABORATORIES

GSL
GULF SOUTH LABORATORIES, INC.
383 LAKE AVENUE • METAIRIE, LOUISIANA 70005 • (504) 832-5900

August 25, 1986 GSL 2297-1

SUBJECT	: Test on 12" Prestressed Concrete Pile 52' Penetration
PROJECT	: Pumping Station #6 - Improvements (Contract #5097)
ENGINEER	: Burk & Assoc.
GENERAL CONTRACTOR/ PILE CONTRACTOR	: Atlas Const. Co., Inc.
CLIENT	: Sewerage & Water Board of New Orleans 8800 S. Claiborne Avenue Room 105 New Orleans, La. 70118 Attn.: Mr. John Howell

---

MATERIAL : One 12" prestressed concrete pile was driven as part of the probe pile program on August 12, 1986.

In addition, two H-piles were driven adjacent to the test pile for use as anchor piles to perform the pile load test. An attached log of driving reflects length of piles, penetration driven, blows per foot, and tip elevation.

EQUIPMENT : The test pile was driven with a conventional crawler type crane employing a Conmaco No. 65 air hammer rated to deliver 19,500 foot-pounds of energy.

PROCEDURE : This test was conducted using a single calibrated hydraulic jack of 60 tons capacity bearing against a steel cross beam anchored to four steel pipe piles. The test beam reaction system was set up in accordance with the specifications outlined in ASTM D 1143-77.

The apparatus utilized for measuring settlement consisted of a surveyor's level, two established bench marks and a scale fixed on the butt of the test pile and read to the nearest .01 inch.

LOADING SEQUENCE : The test load was applied in accordance with ASTM D 1143-77, and Orleans/Jefferson Parish Building Codes as follows: 8 increments equal to 25% of the design load until a total load of 200%. Each load increment was maintained until the rate of settlement is not greater than 0.01"/hr. or until 2 hours have elapsed. The total test load was held for 48 hours with the last 24 hours free of movement. The test load was removed in 4 decrements equal to 25% of the total test load with ¼ hour between decrements.

CONCRETE PRESTRESS TEST PILE
TIME FROM DRIVING TO LOADING - 7 DAYS

CUMULATIVE TIME HOURS	APPLIED LOAD TONS	SETTLEMENT INCHES	REMARKS
0	0	0.00	Test began 8-19-86
0	3.75	0.01	1st Increment
0:15	"	"	"
0:30	"	"	"
0:45	"	"	"
1:00	3.75	0.01	"
1:00	7.50	0.02	2nd Increment
1:15	"	"	"
1:30	"	"	"
1:45	"	"	"
2:00	7.50	0.02	"
2:00	11.25	0.02	3rd Increment
2:15	"	"	"
2:30	"	"	"
2:45	"	"	"
3:00	11.25	0.02	"
3:00	15.00	0.02	4th Increment
3:15	"	"	"
3:30	"	"	"
3:45	"	"	"
4:00	15.00	0.02	"
4:00	18.75	0.04	5th Increment
4:15	"	"	"
4:30	"	"	"
4:45	"	"	"
5:00	18.75	0.04	"
5:00	22.50	0.05	6th Increment
5:15	"	"	"
5:30	"	"	"
5:45	"	"	"
6:00	22.50	0.05	"
6:00	26.25	0.05	7th Increment
6:15	"	"	"
6:30	"	"	"
6:45	"	"	"
7:00	26.25	0.05	"
7:00	30.00	0.05	8th Increment
7:15	"	"	Begin 48 Hour Hold
7:30	"	"	"
7:45	"	"	"

CUMULATIVE TIME HOURS	APPLIED LOAD TONS	SETTLEMENT INCHES	REMARKS
52:00	"	"	48 Hour Hold
53:00	"	"	(Continued)
54:00	"	"	"
55:00	30.00	0.06	Test Discontinued As Hold Period Expired
55:00	22.50	0.05	1st Decrement
55:15	15.00	0.04	2nd Decrement
55:30	7.50	0.03	3rd Decrement
55:45	0	0.03	4th Decrement (Initial Rebound)
56:15	0	0.03	Final Rebound

TECHNICIAN(S): J. Alchin & R. Veazey

REMARKS : Test data presented herein is for your information and evaluation.

Respectfully submitted,
GULF SOUTH LABORATORIES, INC.

Edward C. Cronic,
President

ECC/dah

cc: Burk & Assoc.
cc: Atlas Const. Co., Inc.

GULF SOUTH LABORATORIES, INC.
383 LAKE AVENUE • METAIRIE, LOUISIANA 70005 • (504) 832-5900

PILE DRIVING RECORD

Report to: | Date: [illegible]

PROJECT	CONTRACTOR	ARCHITECT	ENGINEER	ORDER NO.
[illegible] Station No. 6	[illegible] Const.	—	[illegible]	[illegible] 22711

NUMBER OF BLOWS

FOOTING NO										
PENETRATION IN FEET	Pile # Tip Butt Length	Pile # Tip Butt Length	Pile # Tip: Butt Length.	Pile # Tip. Butt Length	Pile # Tip Butt Length.	Pile # Tip. Butt. Length	Pile # Tip: Butt: Length:	Pile # Tip. Butt Length	Pile # Tip Butt Length	Pile # Tip Butt Length

EQUIPMENT: CONVENTIONAL CRAWLER TYPE CRANE WITH SWINGING LEADS AND A CONMACO "65" AIR HAMMER RATED TO DELIVER 19,500 FOOT POUNDS PER BLOW AND A 6" FISHTAIL BIT WAS USED TO PREDRILL 35 FEET BEFORE DRIVING

MATERIAL: ONE 12"X12" CONCRETE PILE 56'-3" IN LENGTH AND TWO 60' "H" PILES USED AS REACTOR PILES

ELEVATION: TIP PENETRATION IS RELATIVE TO GROUND ELEVATION

Test Date 8-19-86

GULF SOUTH LABORATORIES, INC.
383 LAKE AVENUE • METAIRIE, LOUISIANA 70005 • (504) 832-5900

PILE DRIVING RECORD

Report No

Date 8-1[illegible]

Project	Contractor	Architect	Engineer	Order No
Pumping Station	ATLAS Const		Burk & Assoc	GSL [illegible]

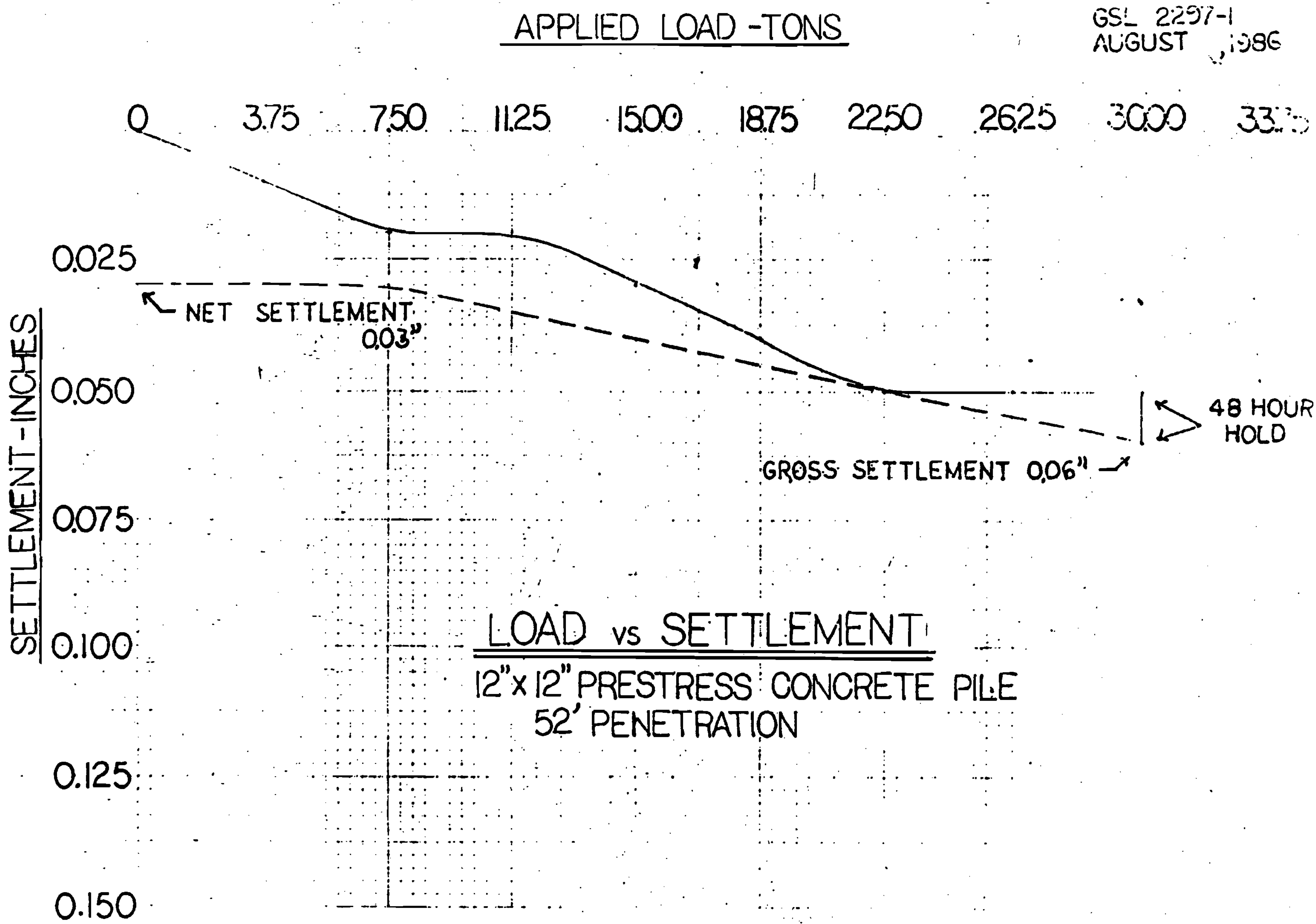
NUMBER OF BLOWS

FOOTING NO										
PENETRATION IN FEET	Pile # TEST Tip 12"x12 Butt 12"x12" Lngth 56'3"	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth
0-10	WOH									
10-20	30									
1	5									
2	3									
3	4									
4	3									
25	4									
6	4									
7	9									
8	9									
9	12									
30	15									
1	21									
2	12									
3	13									
4	10									
35	7									
6	7									
7	7									
8	12									
9	10									
40	9									
1	37									
2	55									
3	43									
4	28									
45	19									
6	18									
7	18									
8	16									
9	18									
50	11									
1	9									
2	10									
3										
4										
55										

* Note
Pile was Predrilled 35'
No Wash

CUMULATIVE TIME HOURS	APPLIED LOAD TONS	SETTLEMENT INCHES	REMARKS
8:00	30.00	0.06	48 Hour Hold
9:00	"	"	(Continued)
10:00	"	"	"
11:00	"	"	"
12:00	"	"	"
13:00	"	"	"
14:00	"	"	"
15:00	"	"	"
16:00	"	"	"
17:00	"	"	"
18:00	"	"	"
19:00	"	"	"
20:00	"	"	"
21:00	"	"	"
22:00	"	"	"
23:00	"	"	"
24:00	"	"	"
25:00	"	"	"
26:00	"	"	"
27:00	"	"	"
28:00	"	"	"
29:00	"	"	"
30:00	"	"	"
31:00	"	"	"
32:00	"	"	"
33:00	"	"	"
34:00	"	"	"
35:00	"	"	"
36:00	"	"	"
37:00	"	"	"
38:00	"	"	"
39:00	"	"	"
40:00	"	"	"
41:00	"	"	"
42:00	"	"	"
43:00	"	"	"
44:00	"	"	"
45:00	"	"	"
46:00	"	"	"
47:00	"	"	"
48:00	"	"	"
49:00	"	"	"
50:00	"	"	"
51:00	"	"	"

GSL 2297-1
AUGUST ,1986



Gulf South Laboratories, Inc.
383 LAKE AVENUE • METAIRIE, LOUISIANA 70005 • (504) 832-5900
TESTING • INSPECTION • RESEARCH

STATIC AXIAL PILE LOAD TEST (TENSION)
CONDUCTED ON INDIVIDUAL
VERTICAL FOUNDATION PILE

Sewerage & Water Board of New Orleans
Pumping Station #6
New Orleans, Louisiana

SUBMITTED BY
GULF SOUTH LABORATORIES

REFERENCE 6)

GULF SOUTH LABORATORIES, INC.
383 LAKE AVENUE • METAIRIE, LOUISIANA 70005 • (504) 832-5900

August 27, 1986 GSL 2297-1

SUBJECT	: Static Axial Pile Load Test (Tension) Conducted on One 12 X 53 "H" Pile
PROJECT	: Pumping Station #6 - Improvements (Contract #5097)
ENGINEER	: Burk & Assoc.
GENERAL CONTRACTOR/ PILE CONTRACTOR	: Atlas Const. Co., Inc.
CLIENT	: Sewerage & Water Board of New Orleans 8800 S. Claiborne Avenue Room 105 New Orleans, La. 70118 Attn.: Mr. John Howell

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MATERIAL	: One 12 X 53 "H" Pile was driven on August 18, 1986, as part of the test pile program. An attached log of driving reflects length of pile, blows per foot, and penetration of the test pile.
EQUIPMENT	: Test piles were driven with a Conmaco 65 hammer rated to deliver 19,500 foot-pounds of energy per blow.
PROCEDURE	: The test was conducted using a 100 ton capacity hydraulic jack with 10000 PSI calibrated pressure gauge. The jack was interposed between the top of

CUMULATIVE TIME HOURS	APPLIED LOAD TONS	SETTLEMENT INCHES		REMARKS
3:00	47.00	0.20		4th Increment
3:15	"	"		"
3:30	"	"		"
3:45	"	"		"
4:00	47.00	0.20	.1	"
4:00	58.75	0.30		5th Increment
4:15	"	0.33		"
4:30	"	0.35		"
4:45	"	0.37		"
5:00	"	0.39		"
5:15	"	0.40		"
5:30	"	0.40		"
5:45	"	0.40		"
6:00	"	0.40	.1°	"
6:15	58.75	0.40		"
6:15	70.50	0.49		6th Increment
6:30	"	0.51		"
6:45	"	0.52		"
7:00	"	0.55		"
7:15	"	0.64		Movement
7:20	"	0.72		"
7:25	"	0.79		"
7:30	70.50	0.92		*Test Discontinued
7:45	47.00	0.85		1st Decrement
8:00	23.50	0.80		2nd Decrement
8:15	0.00	0.71		3rd Decrement
8:30	0.00	0.70		Final Rebound

*Test discontinued as test pile failed.

TECHNICIAN(S): J. Alchin, & R. Veazey

REMARKS : Test results presented herein are for your information and evaluation.

Respectfully submitted,
GULF SOUTH LABORATORIES, INC.

Edward C. Cronic,
President

ECC/dah

cc: Burk & Assoc.
cc: Atlas Const. Co., Inc.

GSL

GULF SOUTH LABORATORIES, INC.

383 LAKE AVENUE • METAIRIE, LOUISIANA 70005 • (504) 832-5900

PILE DRIVING RECORD

Report No.

Date: 8-18/19-86

PROJECT	CONTRACTOR	ARCHITECT	ENGINEER	ORDER NO.
S&WB PUMPING STA #6	ATLAS CONST.	—	BURK + ASSOC.	2297-1

NUMBER OF BLOWS

FOOTING NO.										
PENETRATION IN FEET	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth	Pile # Tip Butt Lngth

MATERIAL: A TWO PIECE H-PILE, 12X53, 73' IN LENGTH, USED AS A TEST PILE.

EQUIPMENT: CONVENTIONAL CRAWLER TYPE CRANE WITH SWINGING LEADS + A CONMACO 65 AIR HAMMER RATED TO DELIVER 19,500 FT/LBS OF ENERGY PER BLOW.

ELEVATION: PENETRATION IS RELATIVE TO TOP OF 18" φ CASING.

NOTE: DRIVING OF TEST PILE REQUIRED TWO DAYS.

P. OSTEHEZ/K. WATSON B C 1 2

GULF SOUTH LABORATORIES, INC.

383 LAKE AVENUE • METAIRIE, LOUISIANA 70005 • (504) 832-5900

PILE DRIVING RECORD

Report No.

Project	Contractor		Engineer	Job No.
Pumping Sta. No. 6	Atlas Const.	—	Burk & Assoc.	2297-1

NUMBER OF BLOWS

FOOTING NO

PENETRATION IN FEET	Pile # TP 7 Tip HP 12" Butt Length 73'	Pile # Tip Butt Length	Pile # Tip Butt Length	Pile # Tip Butt Length	Pile # Tip Butt Length	Pile # Tip Butt Length	Pile # Tip Butt Length	Pile # Tip Butt Length	Pile # Tip Butt Length	Pile # Tip Butt Length
0-20	17									
20-30	38									
30-35	39									
6	11									
7	6									
8	10									
9	10									
40	7									
1	8									
2	8									
3	7									
4	7									
45	6									
6	6									
7	7									
8	8									
9	12									
50	9									
1	7									
2	6									
3	8									
4	7									
55	6									
6	7									
7	6									
8	5									
9	5	NOTE SECOND SECTION WELDED ON @ THIS POINT								
60	5									
1	8									
2	16 *									
3	8									
4	7									
65	6									
6	6									
7	6									
8	7									
9	3 @ 4"									
70										

Kerry D Watson, R Estevez

2 2

Form No.

the reaction beam and a short boxed beam which was welded to straps, which were in turn welded to the test pile.

The apparatus utilized for measuring settlement consisted of a surveyor's level, two established bench marks and a scale fixed on the butt of the test pile and read to the nearest .01 inch.

LOADING SEQUENCE : The test pile was loaded in six increments of 11.75 tons. Each increment was held one hour free of movement through the 4th increment. Three decrements of 23.5 tons each were than applied in 15 minute intervals.

PENETRATION IN FEET - 69
TIME FROM DRIVING TO LOADING - 7 DAYS

CUMULATIVE TIME HOURS	APPLIED LOAD TONS	SETTLEMENT INCHES	REMARKS
0	0	0.00	Test began 8-26-86
0	11.75	0.03	1st Increment
0:15	"	"	"
0:30	"	"	"
0:45	"	"	"
1:00	11.75	0.03	"
1:00	23.50	0.07	2nd Increment
1:15	"	"	"
1:30	"	"	"
1:45	"	"	"
2:00	23.50	0.07	"
2:00	35.25	0.13	3rd Increment
2:15	"	"	"
2:30	"	"	"
2:45	"	"	"
3:00	35.25	0.13	"

CUMULATIVE TIME HOURS	APPLIED LOAD TONS	SETTLEMENT INCHES	REMARKS
3:00	47.00	0.20	4th Increment
3:15	"	"	"
3:30	"	"	"
3:45	"	"	"
4:00	47.00	0.20	"
4:00	58.75	0.30	5th Increment
4:15	"	0.33	"
4:30	"	0.35	"
4:45	"	0.37	"
5:00	"	0.39	"
5:15	"	0.40	"
5:30	"	0.40	"
5:45	"	0.40	"
6:00	"	0.40	"
6:15	58.75	0.40	"
6:15	70.50	0.49	6th Increment
6:30	"	0.51	"
6:45	"	0.52	"
7:00	"	0.55	"
7:15	"	0.64	Movement
7:20	"	0.72	"
7:25	"	0.79	"
7:30	70.50	0.92	*Test Discontinued
7:45	47.00	0.85	1st Decrement
8:00	23.50	0.80	2nd Decrement
8:15	0.00	0.71	3rd Decrement
8:30	0.00	0.70	Final Rebound

*Test discontinued as test pile failed.

TECHNICIAN(S): J. Alchin, & R. Veazey

REMARKS : Test results presented herein are for your information and evaluation.

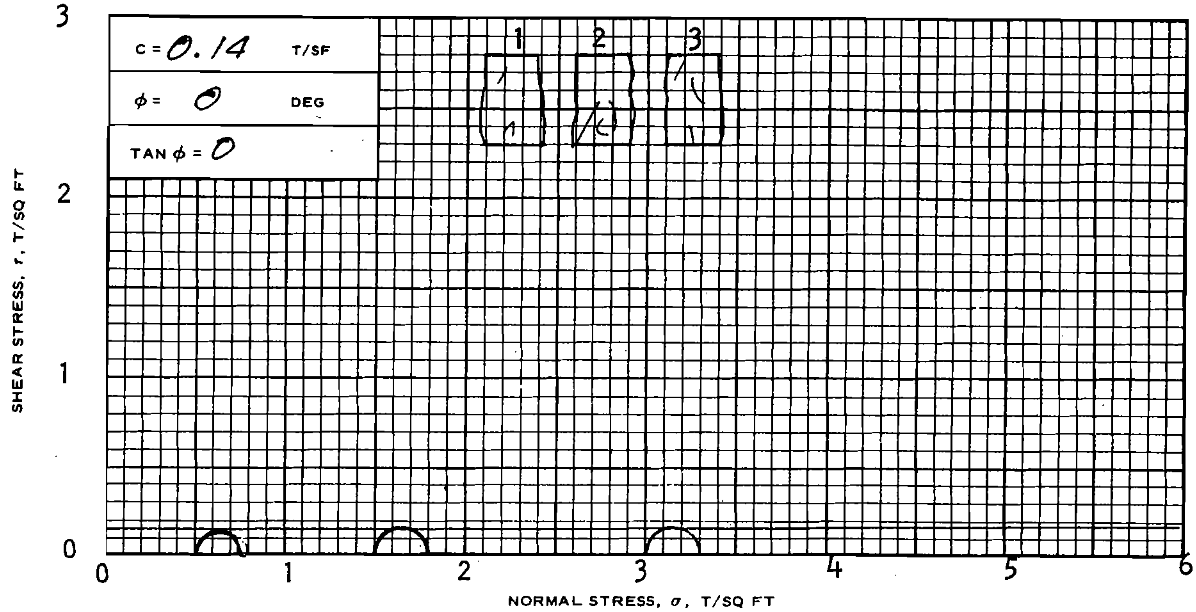
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HIGH LEVEL PLAN

DESIGN MEMORANDUM NO. 20, GENERAL DESIGN
17TH STREET OUTFALL CANAL

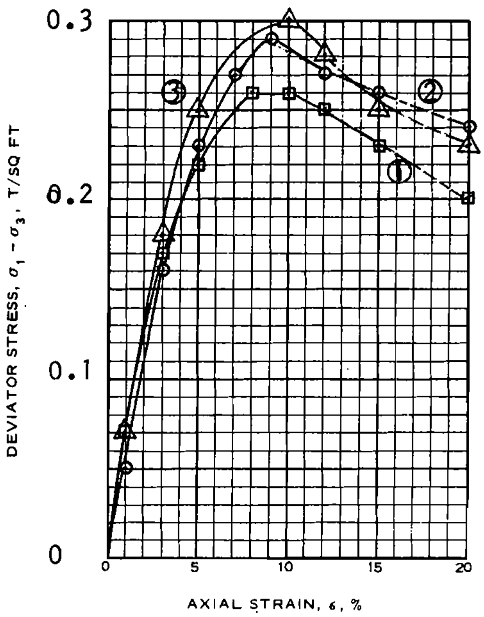
APPENDIX F

CORPS OF ENGINEERS
SOILS TESTS DATA SHEETS

APPENDIX F
VOLUME II



sat. γ = 74.6



			1	2	3	Avg.
SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	229.9	250.4	241.0	240.4
	DRY DENSITY LB/ CU FT	γd_o	22.6	20.9	21.7	
	SATURATION, %	S_o	99.0	98.2	98.7	
	VOID RATIO	e_o	5.32	5.84	5.59	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.26	0.29	0.30	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	10	12	13	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.41	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS ORGANIC CLAY(OH),dark brown

LL 270	PL 110	PI 160	Gs 2.29

TYPE OF SPECIMEN UNDISTURBED — TYPE OF TEST Q

REMARKS: ---Rate of strain increased

PROJECT LK. PONT.,LA.& VIC.-HURR. PROT.
ORLEANS PARISH OUTFALL CANALS-17th.ST.CANAL

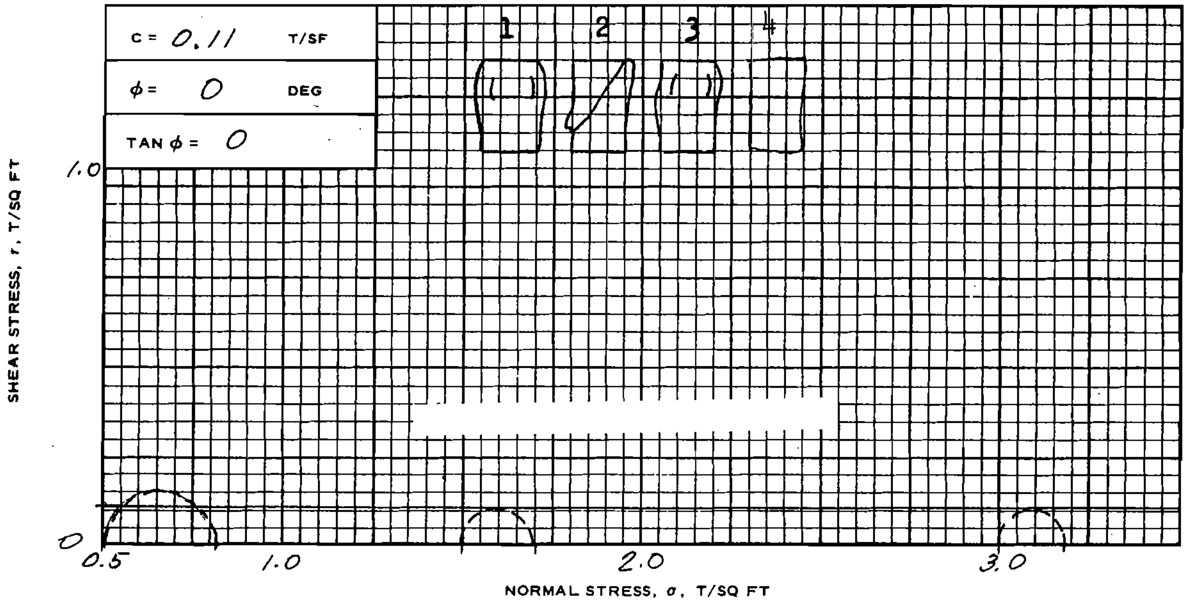
BORING NO. 1-UMP — SAMPLE NO. 4-D

DEPTH/ELEV 13.7/-10.6

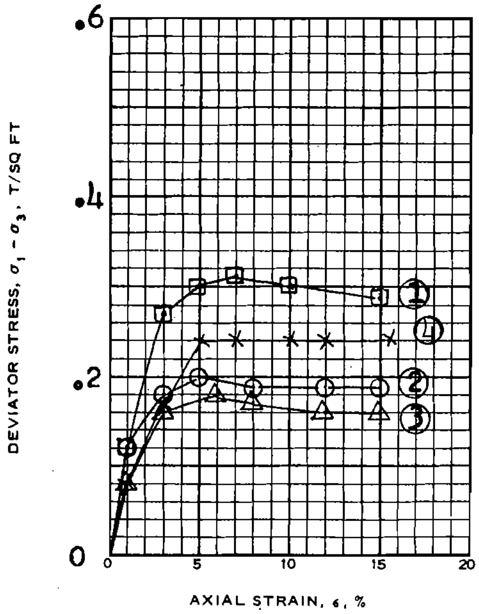
LABORATORY USAEWES — DATE 26 July 1973

RAA TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)
REV JUNE 1970



sat. γ = 103.4



SPECIMEN NO.			1	2	3	4	
INITIAL	WATER CONTENT, %	w_o	60.0	61.9	59.9	59.6	Avg. 60.4
	DRY DENSITY LB/ CU FT	γd_o	64.6	63.3	65.0	65.0	
	SATURATION, %	S_o	100+	100+	100+	100+	
	VOID RATIO	e_o	1.63	1.68	1.61	1.61	
BEFORE SHEAR	WATER CONTENT, %	w_c					
	DRY DENSITY LB/CU FT	γd_c					
	SATURATION, %	S_c					
	VOID RATIO	e_c					
	FINAL BACK PRESSURE, T/SQ FT	u_o					
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.31	0.20	0.18	0.24	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	17	12	16	12	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$					
INITIAL DIAMETER, IN.		D_o	1.40	1.39	1.40	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;silt lenses

LL 67	PL 21	PI 46	Gs 2.72	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS:

PROJECT LK. PONT.,LA.& VIC.-HURR. PROT.(73)
ORLEANS PARISH OUTFALL CANALS- 17th.ST.CANAL

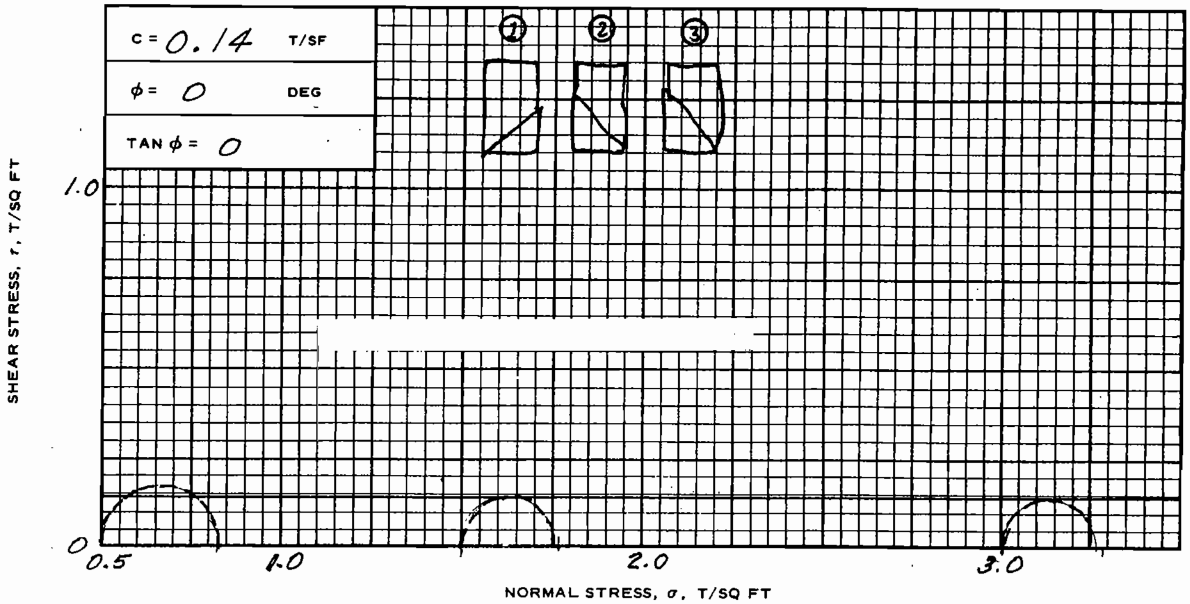
BORING NO. 1-UMP SAMPLE NO. 7-C

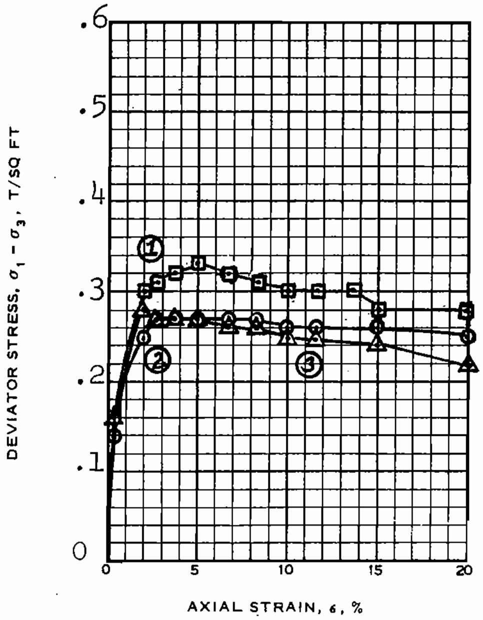
DEPTH/ELEV 24.9/-21.8

LABORATORY USAEWES DATE 27 July,1973

WP TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





sat. γ = 94.8

			SPECIMEN NO.	1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	86.2	89.0	83.7	86.3
INITIAL	DRY DENSITY LB/ CU FT	γ_{d_o}	50.7	49.7	52.2	
INITIAL	SATURATION, %	S_o	99.8	100	100+	
INITIAL	VOID RATIO	e_o	2.35	2.42	2.25	
BEFORE SHEAR	WATER CONTENT, %	w_c				
BEFORE SHEAR	DRY DENSITY LB/CU FT	γ_{d_c}				
BEFORE SHEAR	SATURATION, %	S_c				
BEFORE SHEAR	VOID RATIO	e_c				
BEFORE SHEAR	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.33	0.27	0.28	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	56	29	22	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.39	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;3/8" layer of silt in unused portion of sample

LL 96	PL 28	PI 68	Gs 2.72	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

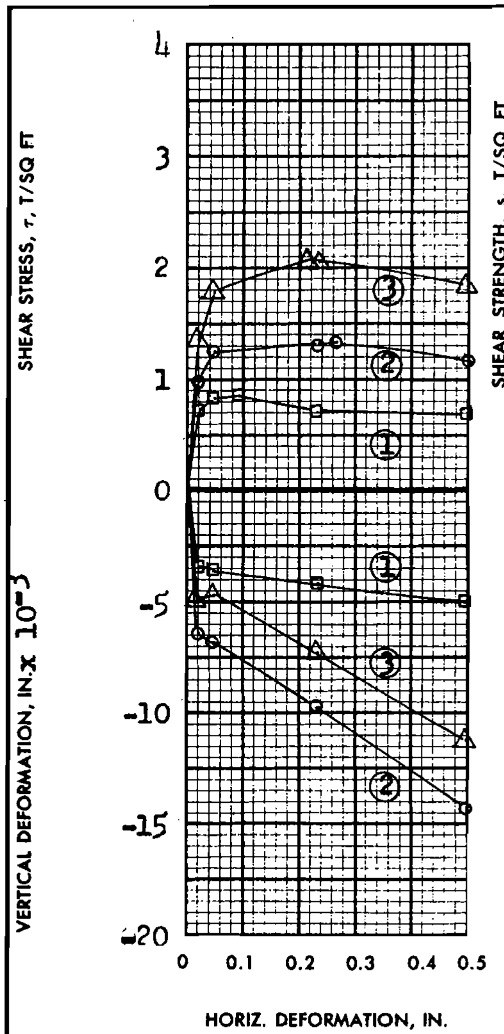
REMARKS:

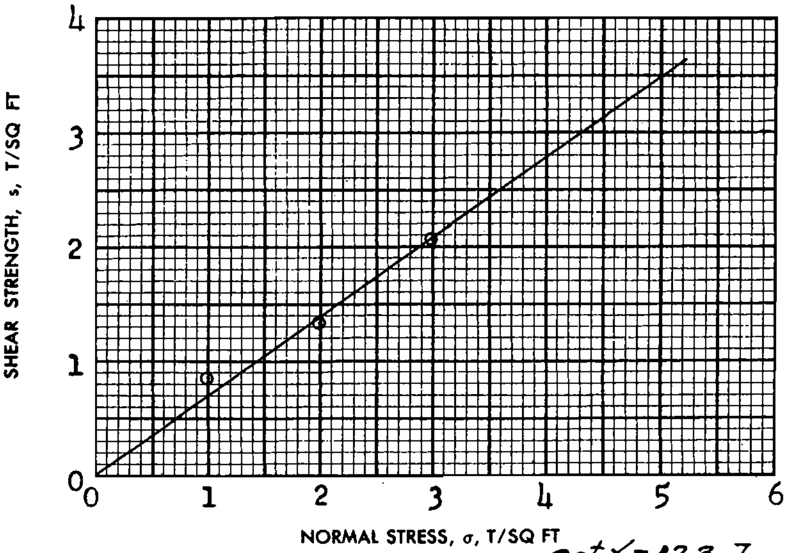
PROJECT LK.PONT.LA.&VIC-HURR. PROT.(73)
ORLEANS PARISH OUTFALL CANALS-17th ST.CANAL

BORING NO. 1-UMP	SAMPLE NO. 9-D
DEPTH/ELEV 33.4/-30.3	
LABORATORY USAEWES	DATE 26 July 1973

GDA **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089
REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT *(EM 1110–2–1906)*





sat.γ=123.7

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	25.1 %	25.3%	26.0%	25.5%
	VOID RATIO	e_o	0.720	0.700	0.718	
	SATURATION	S_o	93.4%	96.9%	97.0%	%
	DRY DENSITY, LB/CU FT	γ_d	97.3	98.4	97.4	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	24.3 %	23.7%	24.9%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.85	1.32	2.07	
ACTUAL TIME TO FAILURE, MIN		t_f	600	1500	1260	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 34°

TAN ϕ' = 0.69

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED	3.01 IN. SQUARE	0.620 IN. THICK	
CLASSIFICATION SILTY SAND(SM),gray;shells			
LL –	PL –	PI –	G_s 2.68

REMARKS

F4

PROJECT LK.PONT.,LA.& VIC.-HURR. PROT.(73)

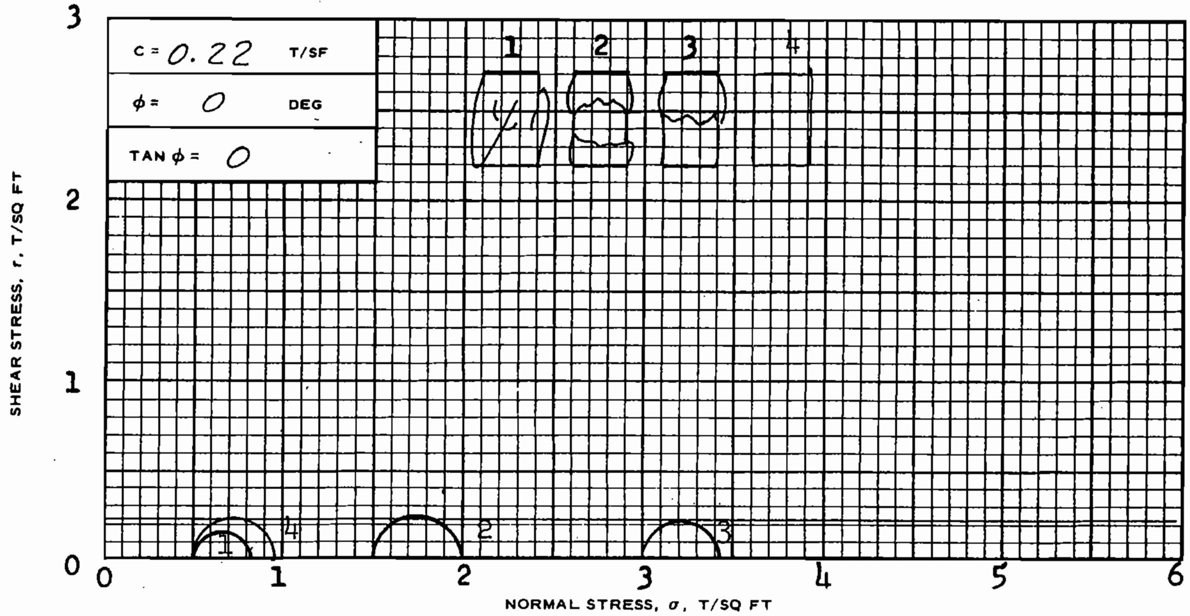
ORLEANS PARISH OUTFALL CANALS-17th.ST CANAL

AREA

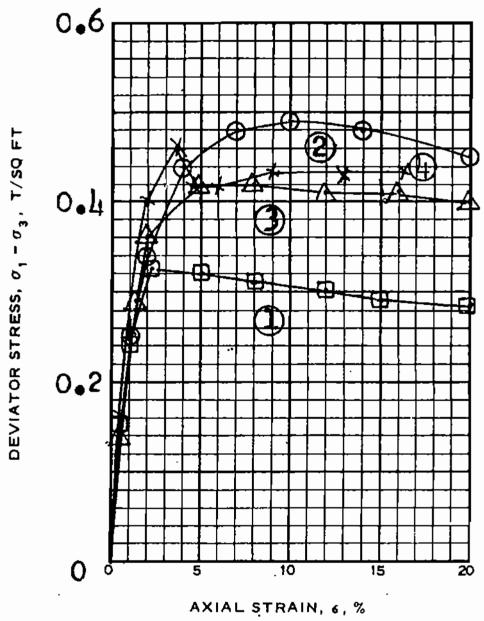
BORING NO. 1-UMP	SAMPLE NO. 11-C
DEPTH/EL 40.9/-37.8	DATE 25 August,1973

RCH **DIRECT SHEAR TEST REPORT**

c = 0.22 T/SF	
ϕ = 0 DEG	
TAN ϕ = 0	



sat. γ = 103.0



			1	2	3	4	
SPECIMEN NO.			1	2	3	4	Avg.
INITIAL	WATER CONTENT, %	w_o	62.7	56.8	55.7	59.2	58.6
	DRY DENSITY LB/CU FT	γ_{d_o}	62.0	66.8	65.8	62.9	
	SATURATION, %	S_o	98.6	100+	96.7	95.4	
	VOID RATIO	e_o	1.71	1.51	1.55	1.67	
BEFORE SHEAR	WATER CONTENT, %	w_c					
	DRY DENSITY LB/CU FT	γ_{d_c}					
	SATURATION, %	S_c					
	VOID RATIO	e_c					
	FINAL BACK PRESSURE, T/SQ FT	u_o					
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	0.5	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.32	0.49	0.42	0.46	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	4	17	8	9	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$					
INITIAL DIAMETER, IN.		D_o	1.40	1.41	1.42	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;shell fragments

LL 70	PL 23	PI 47	Gs 2.69	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS:

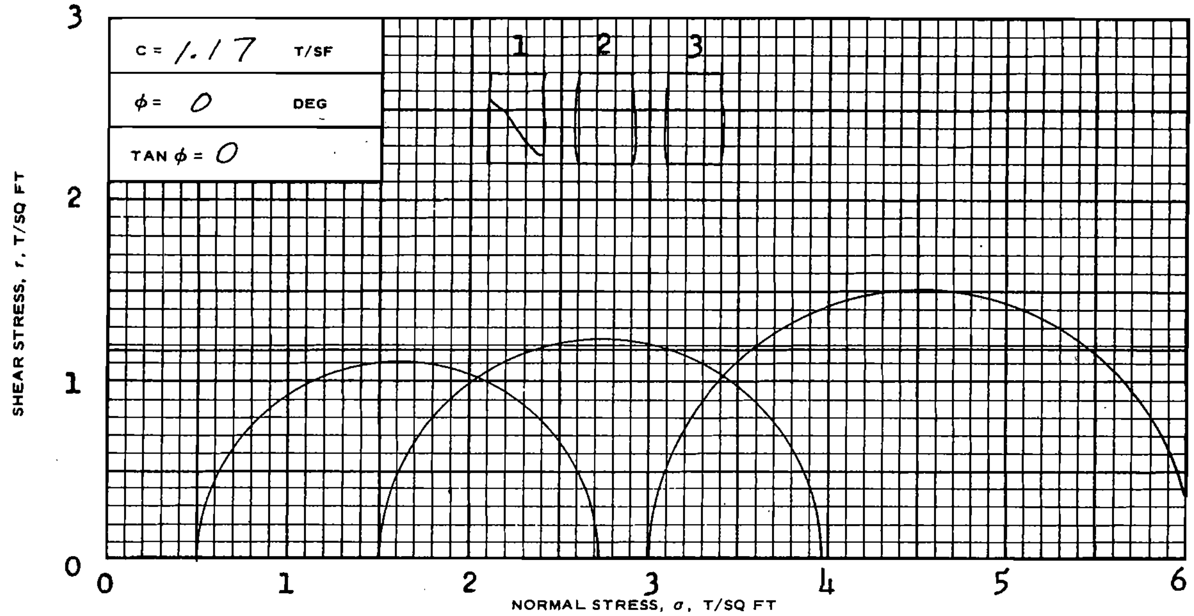
PROJECT LK. PONT.LA. & VIC-HURR. PROT. (73)
ORLEANS PARISH OUTFALL CANALS-17th.ST.CANAL

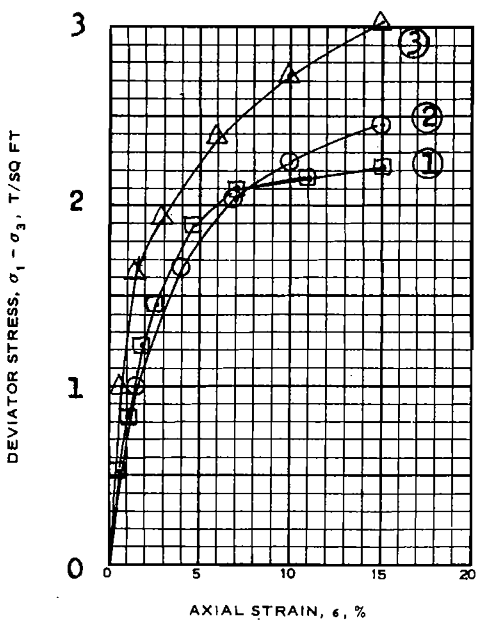
BORING NO. 1-UMP SAMPLE NO. 13-C

DEPTH/ELEV 48.8/-45.7

LABORATORY USAEWES DATE 27 July,1973

RAA TRIAXIAL COMPRESSION TEST REPORT





sat. γ = 131.4

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	18.7	18.8	18.5	18.7
	DRY DENSITY LB/CU FT	γd_o	109.8	109.6	110.7	
	SATURATION, %	S_o	95.6	95.8	97.0	
	VOID RATIO	e_o	0.524	0.526	0.511	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.22	2.46	3.02	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	60	22	24	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.39	1.40	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS LEAN CLAY(CL),light greenish gray;numerous silt pockets

LL 45	PL 15	PI 30	Gs 2.68	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS:

PROJECT LK.PONT.,LA.& VIC.-HURR.PROT(73)

ORLEANS PARISH OUTFALL CANALS-17th.ST.CANAL

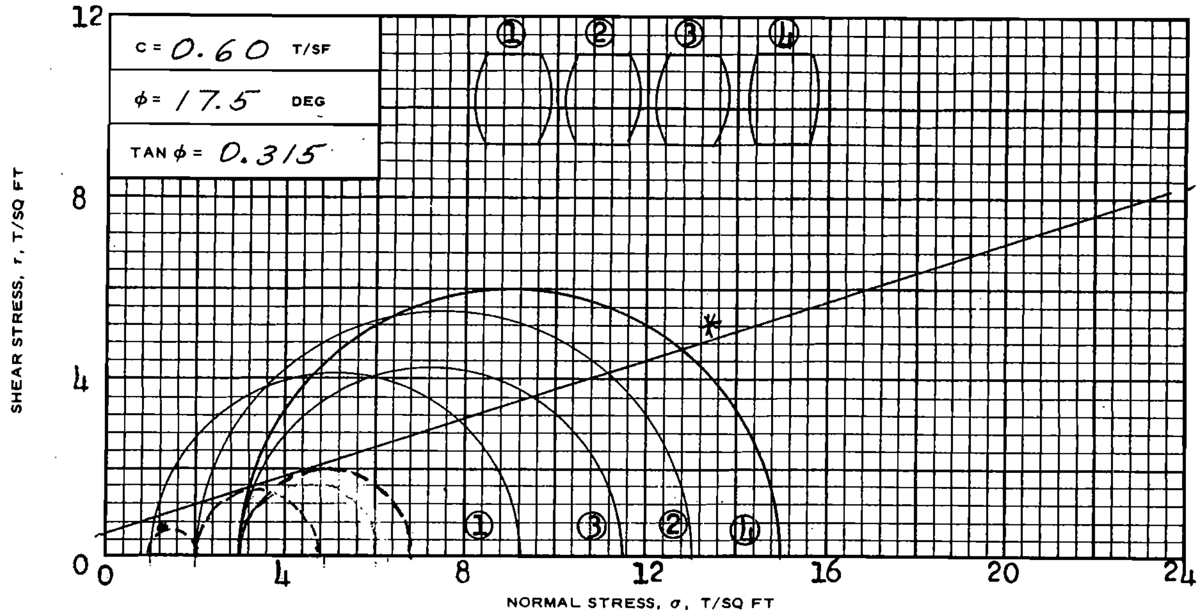
BORING NO. 1-UMP SAMPLE NO. 16-D

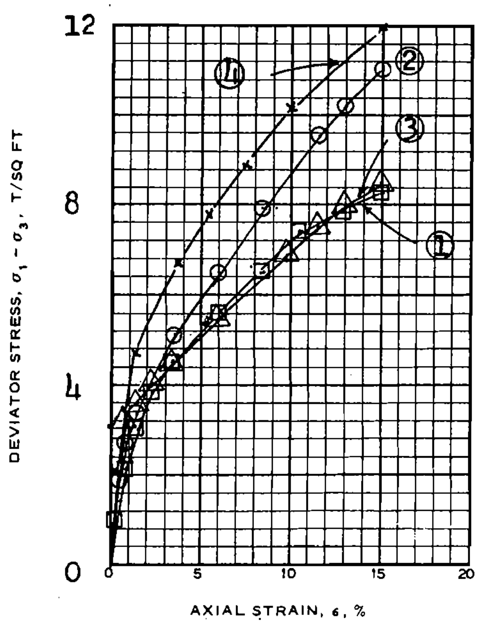
DEPTH/ELEV 61.8/-58.7

LABORATORY USAEWES DATE 27 July,1973

JMS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110–2–1906)





sat. γ = 128.2

SPECIMEN NO.			1	2	3	4	
INITIAL	WATER CONTENT, %	w_o	22.8	21.2	21.3	22.6	Avg. 22.0
	DRY DENSITY LB/CU FT	γd_o	103.1	106.5	106.1	103.0	
	SATURATION, %	S_o	97.0	98.2	97.8	97.1	
	VOID RATIO	e_o	0.635	0.583	0.588	0.624	
BEFORE SHEAR	WATER CONTENT, %	w_c	23.1	20.9	20.9	21.4	
	DRY DENSITY LB/CU FT	γd_c	104.7	109.4	109.6	104.7	
	SATURATION, %	S_c	100+	100+	100+	95.9	
	VOID RATIO	e_c	0.610	0.541	0.538	0.598	
	FINAL BACK PRESSURE, T/SQ FT	u_o	5.54	5.54	5.54	5.04	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	8.25	10.97	8.50	11.95	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	114	113	113	115	
*$(\sigma_1 - \sigma_3)$ at max. pore pressure			1.0	3.2	3.8	4.4	
INITIAL DIAMETER, IN.		D_o	1.39	1.38	1.38	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SANDY SILTY CLAY(CL),gray

LL 28	PL 20	PI 8	Gs 2.70	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST R

REMARKS: See attached Plot for effective values

PROJECT LK. PONT.,LA.&VIC.-HURR. PROT. ORLEANS PARISH OUTFALL CANALS-17th.ST. CANAL

BORING NO. 1-UMP | SAMPLE NO. 17-D

DEPTH/ELEV 65.8/-62.7

LABORATORY USAEWES | DATE 7 July,1973

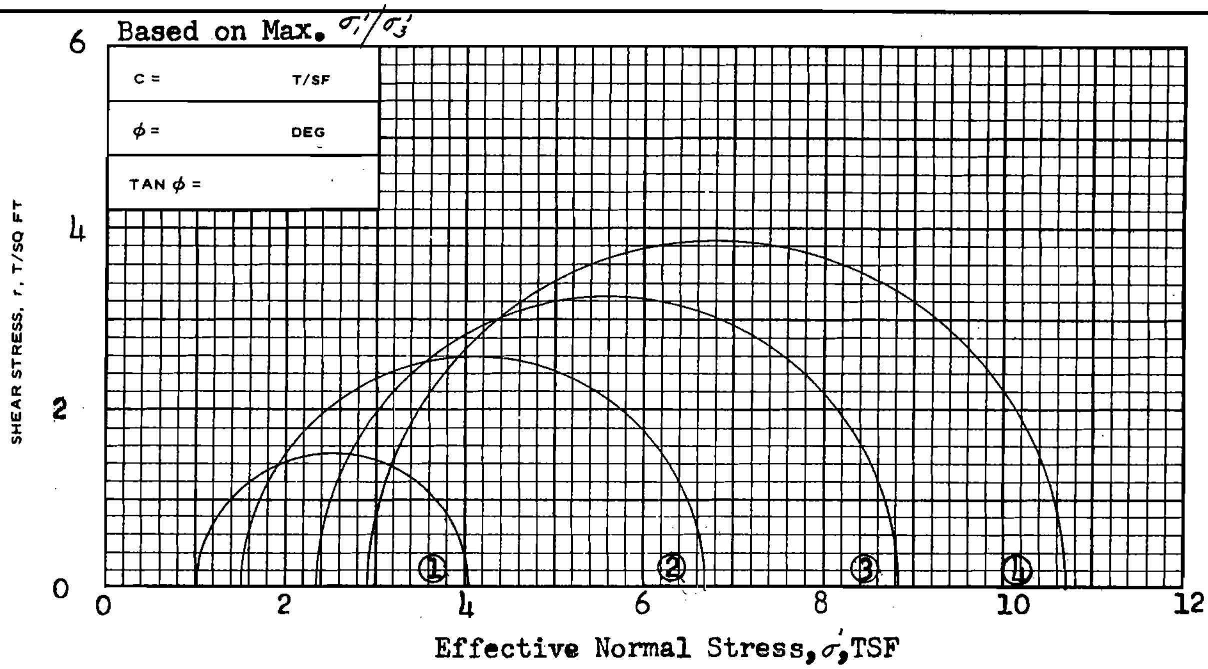
Sheet 1 of 2

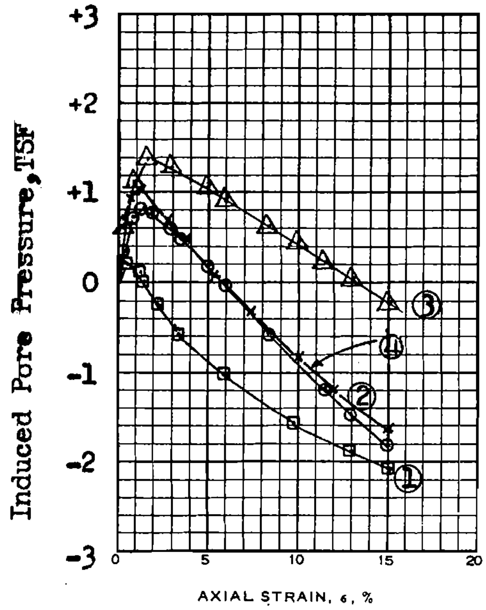
TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Based on Max. σ_1'/σ_3'

C =		T/SF
ϕ =		DEG
TAN ϕ =		





SPECIMEN NO.							
INITIAL	WATER CONTENT, %	w_o					
	DRY DENSITY LB/CU FT	γd_o					
	SATURATION, %	S_o					
	VOID RATIO	e_o					
BEFORE SHEAR	WATER CONTENT, %	w_c					
	DRY DENSITY LB/CU FT	γd_c					
	SATURATION, %	S_c					
	VOID RATIO	e_c					
	FINAL BACK PRESSURE, T/SQ FT	u_o					
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3					
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$					
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f					
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$					
INITIAL DIAMETER, IN.		D_o					
INITIAL HEIGHT, IN.		H_o					

CONTROLLED- TEST

DESCRIPTION OF SPECIMENS

LL	PL	PI	Gs	TYPE OF SPECIMEN	TYPE OF TEST

REMARKS:

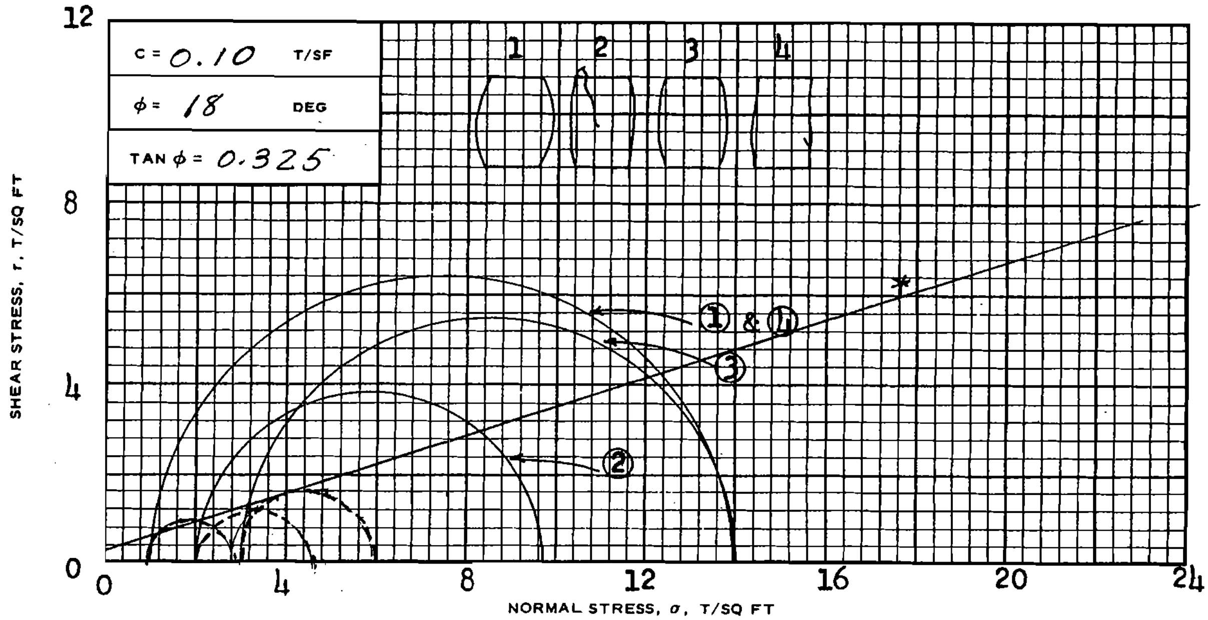
PROJECT LK. PONT.,LA.& VIC-HURR. PROT. ORLEANS PARISH,OUTFALL CANALS, 17th. ST. CANAL

BORING NO. 1-UMP	SAMPLE NO. 17-D
DEPTH/ELEV 65.8/-62.7	
LABORATORY USAEWES	DATE 7 July,1973

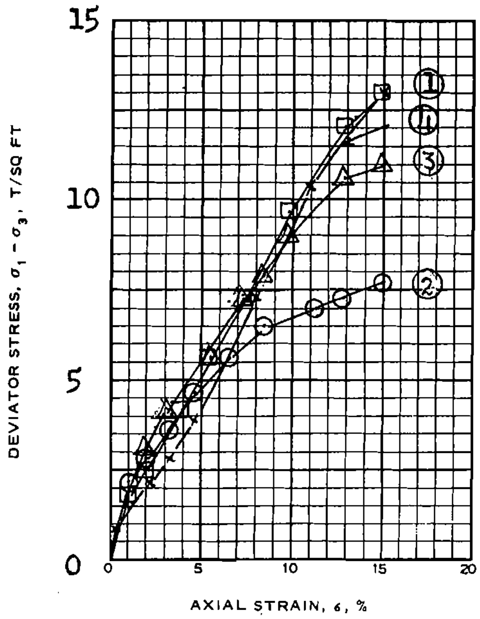
Sheet 2 of 2

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)



sat γ = 128.5



			1	2	3	4	
SPECIMEN NO.			1	2	3	4	Avg.
INITIAL	WATER CONTENT, %	w_o	23.6	23.3	23.8	23.4	23.5
	DRY DENSITY LB/CU FT	γ_{d_o}	104.7	104.2	104.2	103.1	
	SATURATION, %	S_o	100+	100+	100+	100+	
	VOID RATIO	e_o	0.592	0.600	0.599	0.617	
BEFORE SHEAR	WATER CONTENT, %	w_c	22.9	22.3	22.6	22.5	
	DRY DENSITY LB/CU FT	γ_{d_c}	105.9	107.6	107.7	104.2	
	SATURATION, %	S_c	100+	100+	100+	100+	
	VOID RATIO	e_c	0.573	0.549	0.548	0.600	
	FINAL BACK PRESSURE, T/SQ FT	u_o	4.10	4.10	4.10	5.04	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	1.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	13.03	7.68	11.02	13.03	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	64	64	64	125	
*$(\sigma_1' - \sigma_3')$ at max. pore pressure			1.75	2.75	3.0	1.3	
INITIAL DIAMETER, IN.		D_o	1.37	1.37	1.37	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SILT(ML), gray

LL -	PL -	PI -	Gs 2.67	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST R

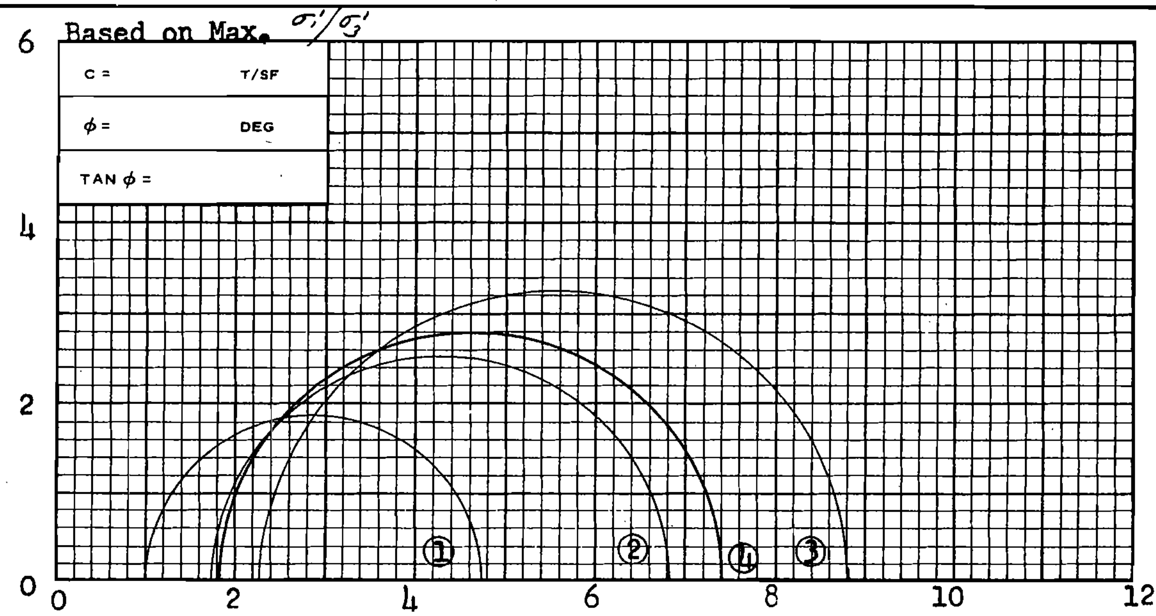
REMARKS: See attached plot for effective values
Portion of sample allowed to drain before trimming
Sheet 1 of 2

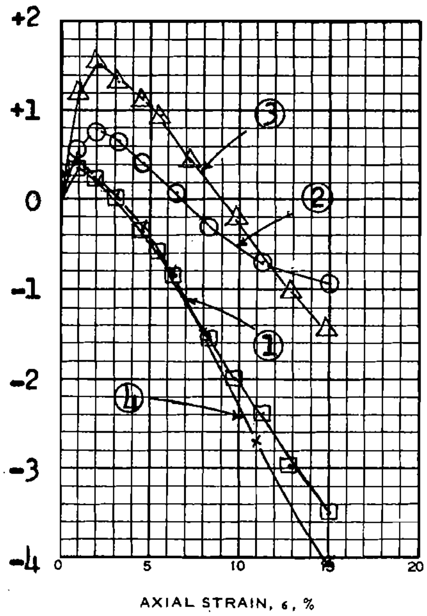
PROJECT LK. PONT., LA&VIC.-HURR. PROT. (73)
ORLEANS PARISH, OUTFALL CANALS, 17th.St.CANAL

BORING NO. 1-UMP	SAMPLE NO. 19-D
DEPTH/ELEV 73.4/-70.3	
LABORATORY USAEWES	DATE 23 July, 1973

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





SPECIMEN NO.						
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/ CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3				
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$				
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f				
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o				
INITIAL HEIGHT, IN.		H_o				

CONTROLLED- TEST

DESCRIPTION OF SPECIMENS

LL	PL	PI	Gs	TYPE OF SPECIMEN	TYPE OF TEST

REMARKS:

PROJECT LK. PONT., LA.&VIC.-HURR.PROT.(73), ORLEANS PARISH, OUTFALL CANALS, 17th.St CANAL

BORING NO. 1-UMP SAMPLE NO. 19-D

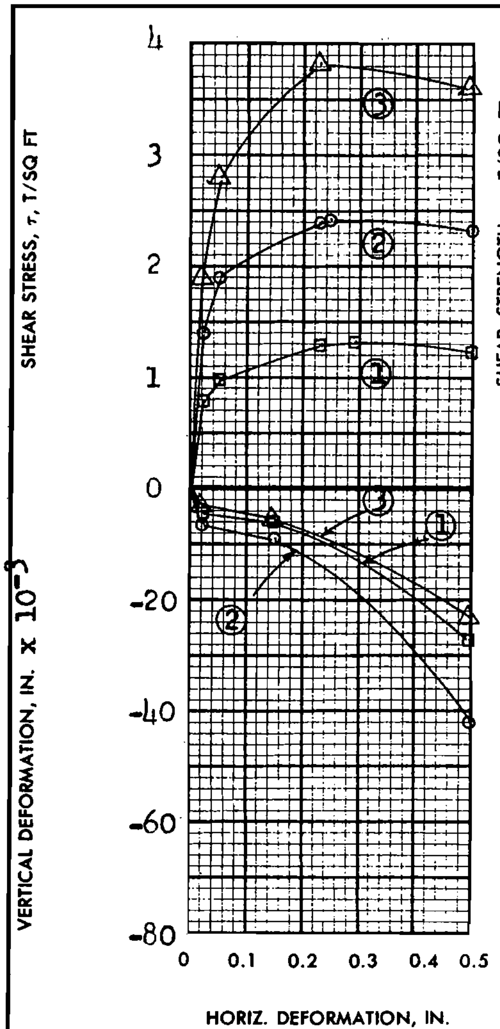
DEPTH/ELEV 73.4/-70.3

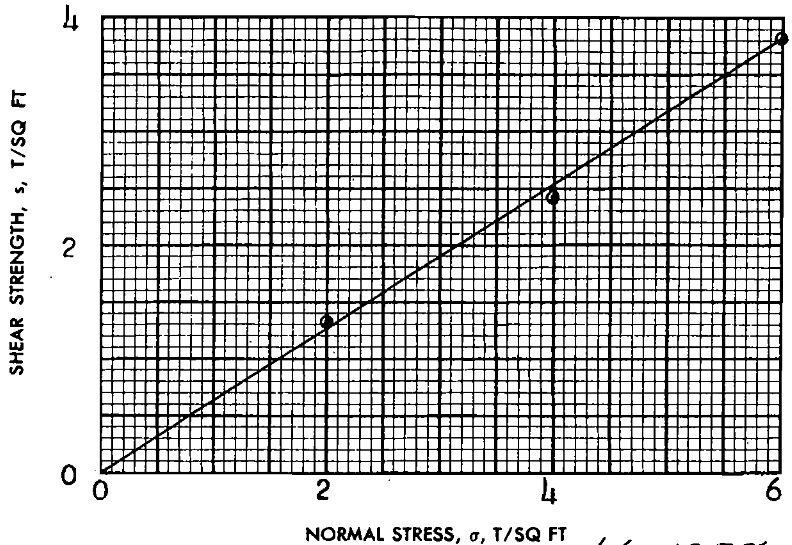
LABORATORY USAEWES DATE 23 July, 1973

Sheet 2 of 2

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





sat γ = 125.8

SHEAR STRENGTH PARAMETERS

ϕ' = 32°

TAN ϕ' = 0.63

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.		1	2	3	Avg.
INITIAL — WATER CONTENT	w_o	24.2 %	22.8 %	23.6 %	23.5 %
INITIAL — VOID RATIO	e_o	0.642	0.660	0.673	
INITIAL — SATURATION	S_o	100+ %	92.6 %	94.0 %	%
INITIAL — DRY DENSITY, LB/CU FT	γ_d	101.9	100.8	100.0	
VOID RATIO AFTER CONSOLIDATION	e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN	t_{50}				
FINAL — WATER CONTENT	w_f	23.4 %	22.9 %	24.5 %	%
FINAL — VOID RATIO	e_f				
FINAL — SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT	σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT	τ_{max}	1.31	2.43	3.83	
ACTUAL TIME TO FAILURE, MIN	t_f	1650	1410	1320	
RATE OF STRAIN, IN./MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT	τ_{ult}				

TYPE OF SPECIMEN	UNDISTURBED	3.01 IN. SQUARE	0.556 IN. THICK
CLASSIFICATION	SAND (SP), tan and gray; vertical clay seams.		
LL -	PL -	PI -	G_s 2.68

REMARKS

F11

PROJECT LK. PONT., LA. & VIC.- HURR. PROT. (73)

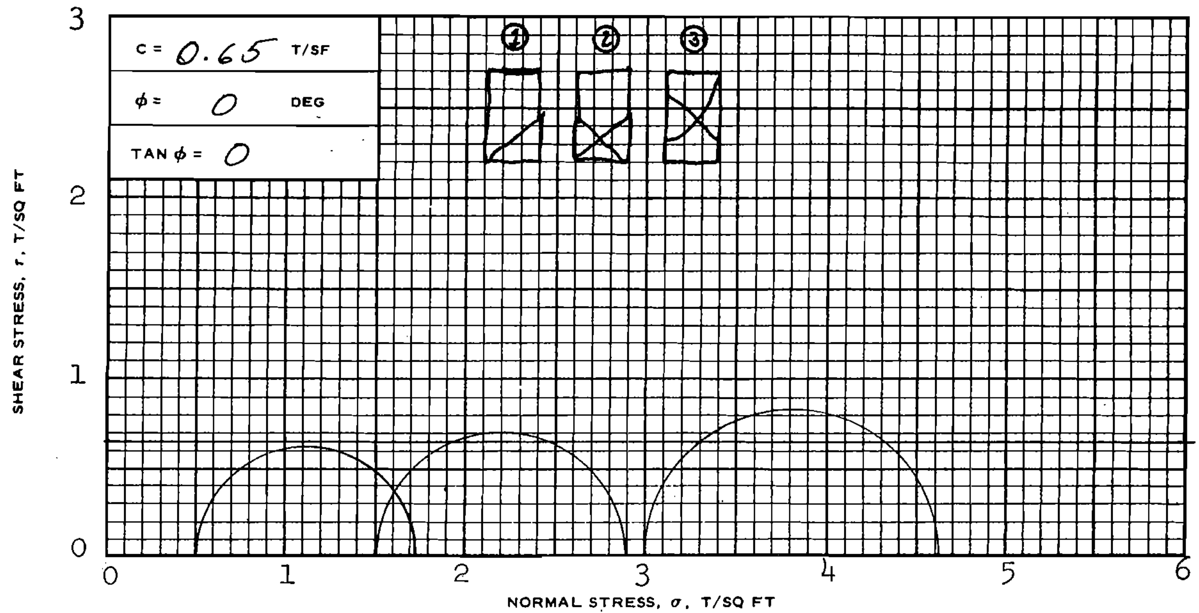
ORLEANS PARISH OUTFALL CANALS - 17th. ST. CANAL

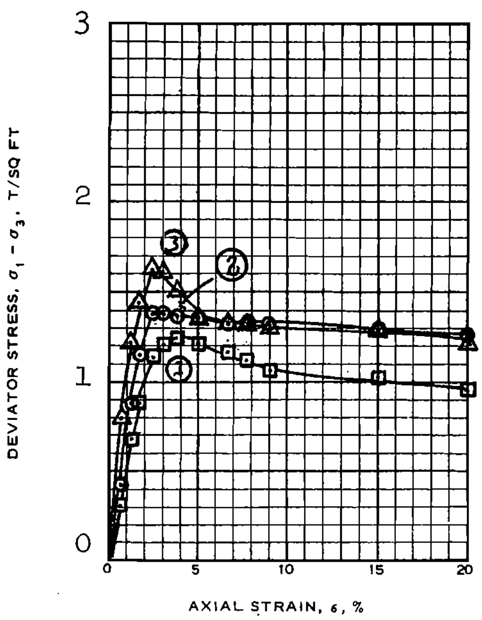
AREA

BORING NO. 1-UMP SAMPLE NO. 20-C

DEPTH / EL 76.9/-73.8 DATE 25 August, 1973

BWG **DIRECT SHEAR TEST REPORT**





sat. γ = 116.1

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	35.4	34.3	35.9	35.2
	DRY DENSITY LB/CU FT	γd_o	85.0	85.1	84.1	
	SATURATION, %	S_o	96.6	93.6	95.2	
	VOID RATIO	e_o	1.00	1.00	1.03	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.24	1.39	1.62	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	25	17	17	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.39	1.39	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;seams of silty sand approx. 1/8" thick

LL 57	PL 20	PI 37	Gs 2.73	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS:

PROJECT LK.PONT.LA.&VIC-HURR. PROT. (73) ORLEANS PARISH OUTFALL CANALS-17th ST.CANAL

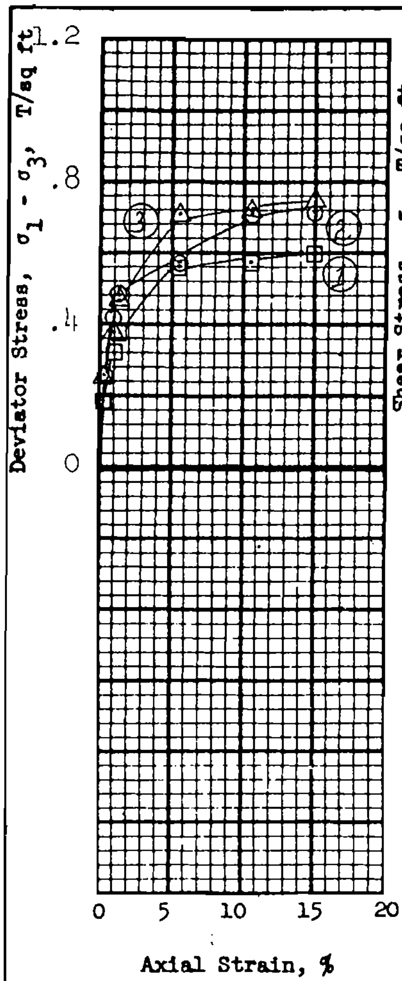
BORING NO. 1-UMP — SAMPLE NO. 24-D

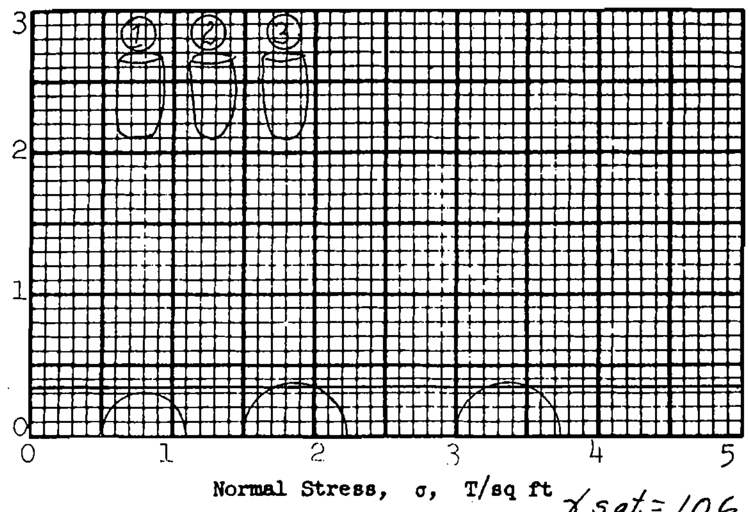
DEPTH/ELEV 93.3/-90.2

LABORATORY USAEWES — DATE 27 July 1973

GDA **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT *(EM 1110-2-1906)*





γ sat. = 106

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.34 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	46.4 %	44.8 %	46.3 %	45.8 %
	Void ratio	e_o	1.30	1.23	1.23	
	Saturation	S_o	90.3 %	92.1 %	95.2 %	%
	Dry density, lb/cu ft	γ_d	68.7	70.8	70.7	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.60	0.72	0.74	
Time to failure, min		t_f	76	76	76	
Rate of strain, percent/min			0.197	0.197	0.197	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.39	1.40	1.39	
Initial height, in.		H_o	3.00	3.00	3.00	

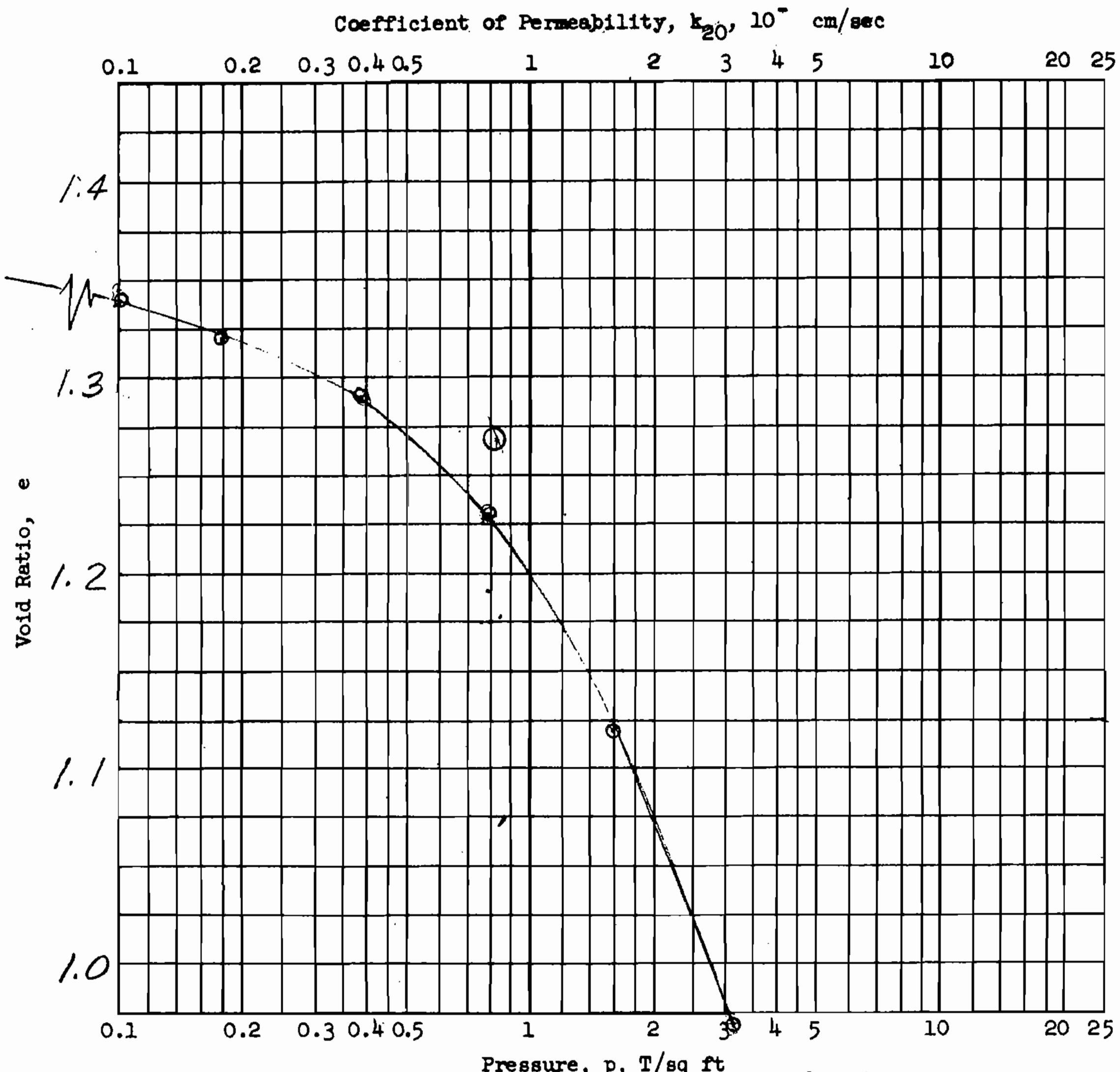
Type of test Q	Type of specimen UNDISTURBED		
Classification PLASTIC CLAY(CH),gray, contains numerous rootlets and large*			
LL 61	PL 23	PI 38	G_s 2.53

Remarks *decayed roots

F 13

Project LK.PONT.LA.&VIC.-HURR. PROT.'71	
Area ORLEANS PARISH L.F. LEVEE WEST OF IHNC(OUTFALL CANALS)ALONG 17th ST.CANAL(GDM#2SUPP.#5)	
Boring No. 6-MUE	Sample No. 1-D
Depth El -3.9	Date 8 March 1971
TES	TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE



$\gamma_{sat} = 103$

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.166 in.	Water Content, w_o	51.3 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.36	e_f	
Preconsol. Pressure, p_c .81 T/sq ft		Saturation, S_o	95.5 %	S_f	%
Compression Index, C_c .1884		Dry Density, γ_d	66.9 lb/ft^3		
Classification PLASTIC CLAY(CH), dark*		k_{20} at e_o = × 10^{-} cm/sec			

LL -	G_s 2.53 From Q
PL -	D_{10}

Remarks See attached pressure versus void ratio curve

*brown

Project LK. PONT., LA. & VIC.-HURR. PORT. '71

ORLEANS PAR. L.F. LEV. WEST OF IHNC (OUTFALL

Area CANALS) ALONG 17th ST. CANAL (GDM#2, SUPP.#5)

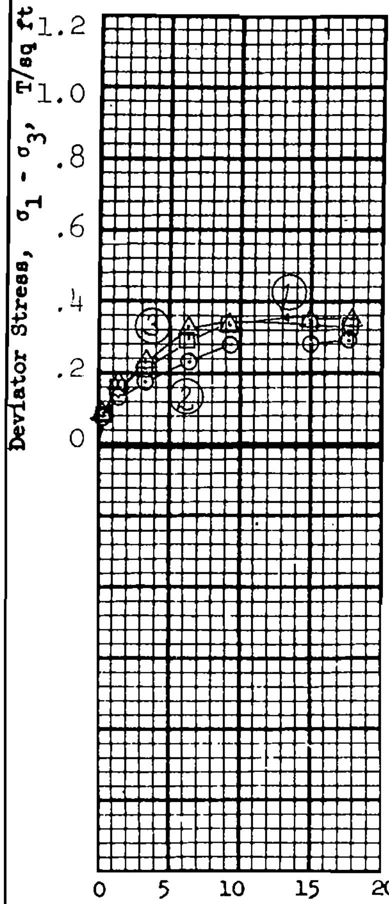
Boring No. 6-MUE | Sample No. 1-D

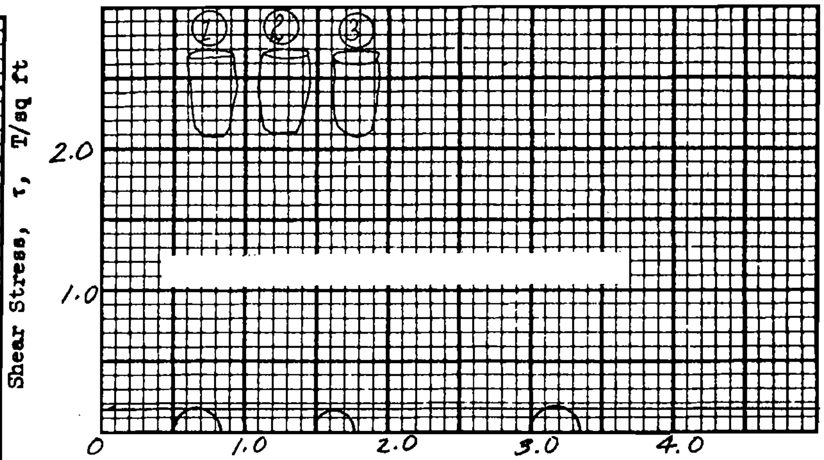
Depth El -3.9 | Date 16 March 1971

CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

0 3424





γ sat. = 92

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.16 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	89.0 %	91.0 %	89.7 %	89.9 %
	Void ratio	e_o	2.30	2.30	2.32	
	Saturation	S_o	99.1 %	100+ %	99.0 %	%
	Dry density, lb/cu ft	γ_d	48.4	48.5	48.1	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.34	0.28	0.35	
Time to failure, min		t_f	55	55	88	
Rate of strain, percent/min			0.170	0.170	0.170	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.39	1.39	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

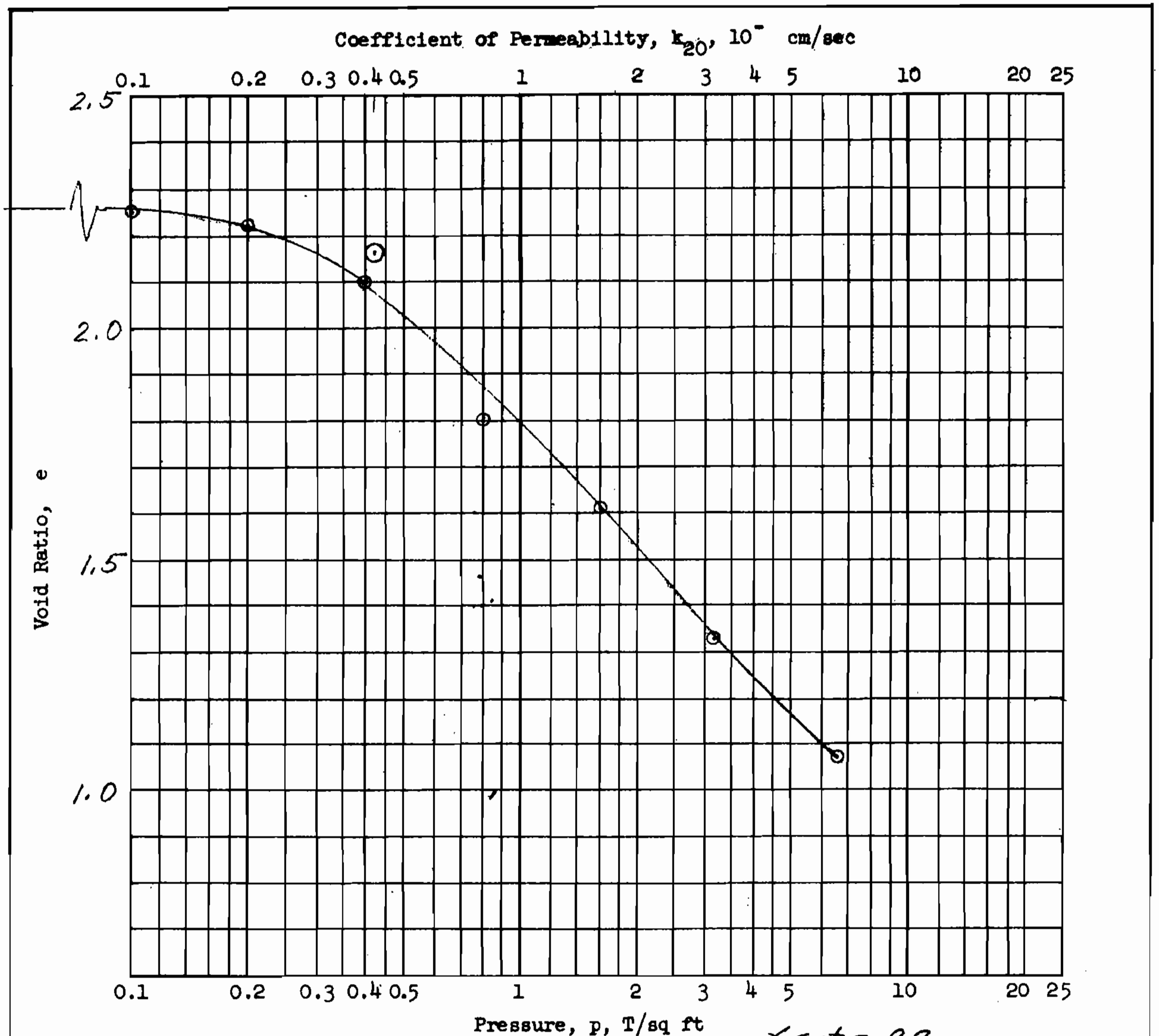
Type of test Q	Type of specimen UNDISTURBED			
Classification PLASTIC CLAY(CH),gray,contains rootlets and decayed large roots				
LL 102	PL 30	PI 72		G_s 2.56

Remarks ________

Project LK.PONT.LA.&VIC.-HURR. PROT.'71	
Area ORLEANS PARISH L.F. LEVEE WEST OF IHNC,(OUTFALL CANALS)ALONG 17th ST.CANAL(GDM#2,SUPP.#5)	
Boring No. 6-MUE	Sample No. 3-C
Depth El -11.2	Date 8 March 1971
TES	TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

F15 TRANSLUCENT



$\gamma_{sat.} = 92$

Type of Specimen UNDISTURBED	Before Test		After Test
Diam 4.25 in. Ht 1.162 in.	Water Content, w_o	87.9 %	w_f %
Overburden Pressure, p_o T/sq ft	Void Ratio, e_o	2.33	e_f
Preconsol. Pressure, p_c .42 T/sq ft	Saturation, S_o	96.6 %	S_f %
Compression Index, C_c .3751	Dry Density, γ_d	48.0 lb/ft^3	
Classification PLASTIC CLAY(CH),*	k_{20} at e_o = × 10^{-} cm/sec		

LL -	G_s 2.56 From Q	Project LK.PONT.,LA.& VIC.-HURR. PROT. '71	
PL -	D_{10}	ORLFANS PARISH LAKEFRONT LEVEF,WEST OF IHNC	
Remarks See attached plot for		(OUTFALL CANALS)ALONG 17th.ST.(GDM#2;SUPP.#5)	
pressure vs void ratio curve		Boring No. 6-MUE	Sample No. 3-C
*brown, contains 1/16" to 3/8"		Depth El -11.2	Date 16 March,1971
dia. roots		JDB CONSOLIDATION TEST REPORT	

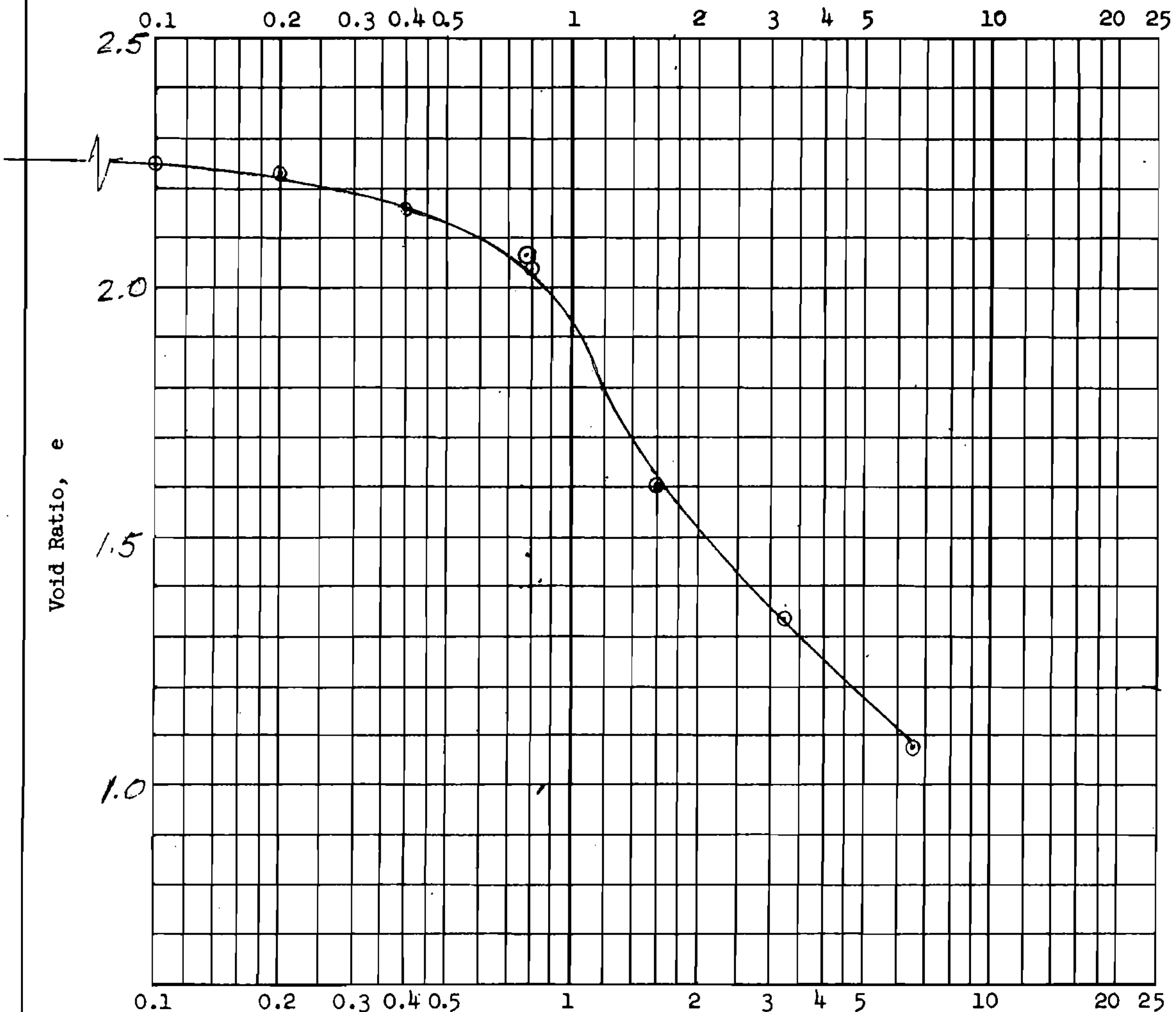
ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

F16

0 3424

SOILS

Coefficient of Permeability, k_{20}, 10^{-} cm/sec



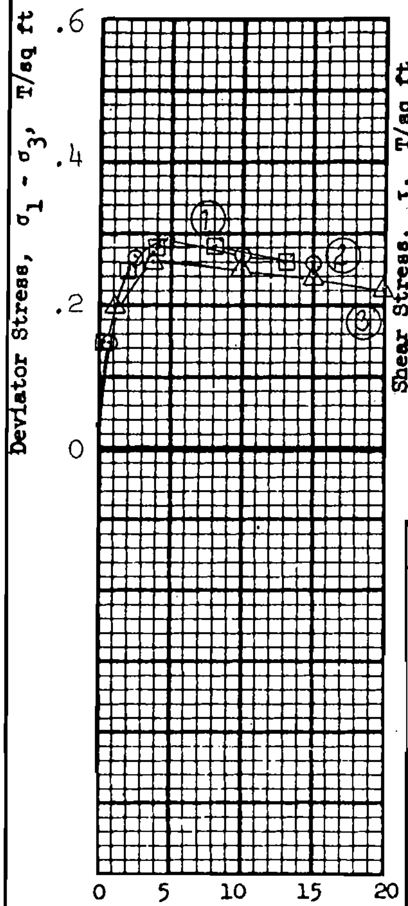
Pressure, p, T/sq ft

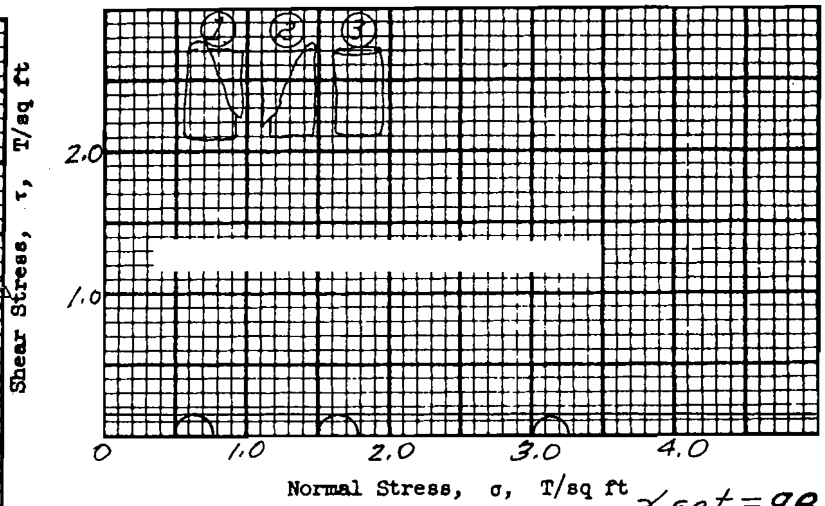
γ sat. = 94

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.152 in.	Water Content, w_o	85.0 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	2.28	e_f	
Preconsol. Pressure, p_c .78 T/sq ft		Saturation, S_o	99.8 %	S_f	%
Compression Index, C_c .7008		Dry Density, γ_d	51.0 lb/ft^3		
Classification PLASTIC CLAY(CH),*		k_{20} at e_o = × 10^{-} cm/sec			
LL 69	G_s 2.68	Project LK.PONT.,LA.& VIC.-HURR. PROT.-1971			
PL 19	D_{10}	ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC			
Remarks * gray		(OUTFALL CANALS) ALONG 17th.ST.(GDM#2;SUPP.#5)			
See attached plot for pressure		Boring No. 6-MUE		Sample No. 5-B	
vs void ratio curve		~~Depth~~ El -18.5		Date 17 March,1971	
		JDB CONSOLIDATION TEST REPORT			

ENG FORM 2090 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. *(TRANSLUCENT)*

0 3424





$\gamma sat. = 98$

Test No.			1	2	3	Avg.
Initial	Water content	w_o	76.8 %	76.1 %	76.5 %	76.5 %
	Void ratio	e_o	2.09	2.03	2.08	
	Saturation	S_o	100+ %	100+ %	100+ %	%
	Dry density, lb/cu ft	γ_d	55.1	56.3	55.3	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.28	0.29	0.26	
Time to failure, min		t_f	7	25	18	
Rate of strain, percent/min			0.542	0.192	0.196	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.14 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH), gray, contains silt seams

LL 81 | PL 20 | PI 61 | | G_s 2.73

Remarks ________

Project LK.PONT.LA.&VIC.-HURR. PROT.'71(OUTFALL CANALS)ALONG 17th ST. CANAL(GDM#2,SUPP.#5)

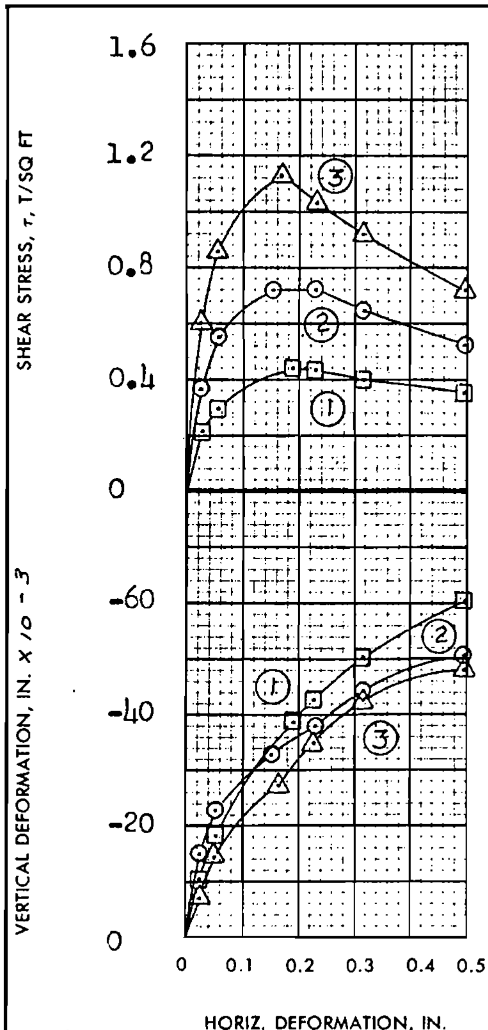
Area ORLEANS PARISH L.F. LEVEE WEST OF IHNC

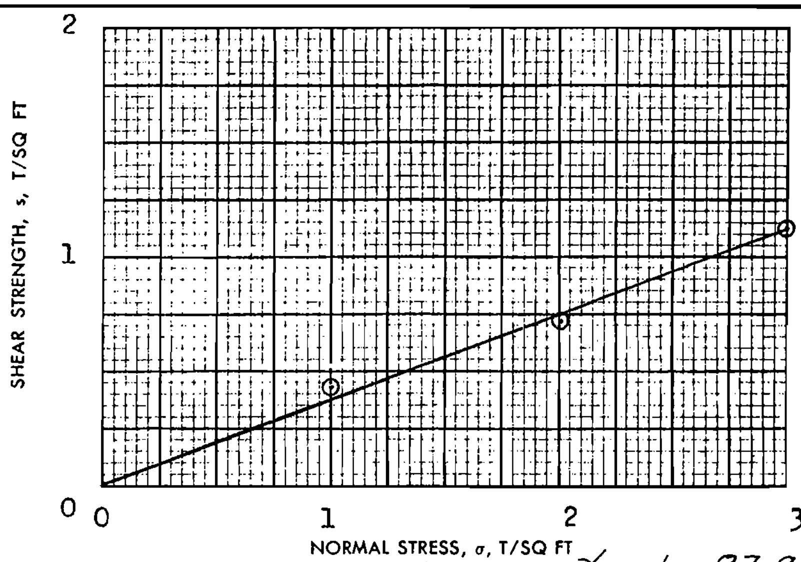
Boring No. 6-MUE | Sample No. 5-C

Depth El -18.9 | Date 9 March 1971

OHR TRIAXIAL COMPRESSION TEST REPORT

F 17





γsat = 97.9

SHEAR STRENGTH PARAMETERS

φ' = 21°

TAN φ' = 0.383

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	70.6%	74.7 %	73.7 %	73.0%
	VOID RATIO	e_o	2.02	2.08	2.08	
	SATURATION	S_o	95.4 %	98.0 %	96.7%	%
	DRY DENSITY, LB/CU FT	γ_d	56.5	55.4	55.4	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	4	11	9	
FINAL	WATER CONTENT	w_f	57.4 %	49.4 %	44.6 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.44	0.72	1.13	
ACTUAL TIME TO FAILURE, MIN		t_f	1110	900	960	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED	3.00 IN. SQUARE	1= 0.550 2&3= 0.625 IN. THICK	
CLASSIFICATION PLASTIC CLAY(CH), dark gray, contains a trace of organic matter,*			
LL 92	PL 29	PI 63	G_s 2.73

REMARKS *slickensided

F18

PROJECT LK.PONT.LA.,&VIC.-HURR.PROT.- 1971

ORLEANS PARISH LK.FT.LEVEE,WEST OF IHNC(OUT-

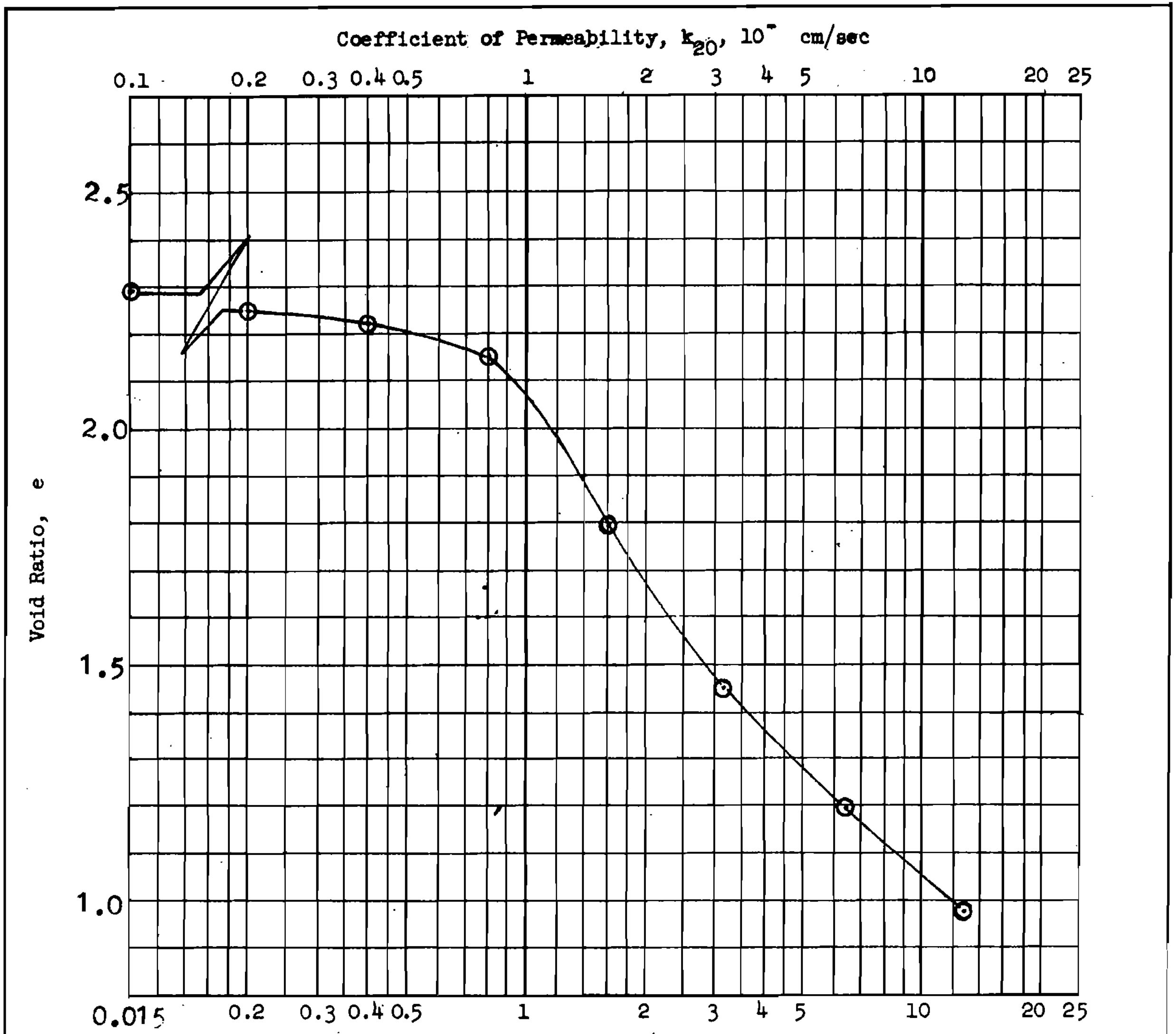
AREA FALL CANALS)ALONG 17TH ST CANAL(GDM#2SUPP#5)

BORING NO. 6-MUE — SAMPLE NO. 7-B

~~DEPTH~~ EL - 26.3 — DATE 10 March 1971

BWG/GDA

DIRECT SHEAR TEST REPORT



γ sat = 95.6

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.160 in.	Water Content, w_o	83.2 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	2.28	e_f	
Preconsol. Pressure, p_c .94 T/sq ft		Saturation, S_o	100 %	S_f	%
Compression Index, C_c .6089		Dry Density, γ_d	52.2 lb/ft^3		
Classification PLASTIC CLAY(CH)*		k_{20} at e_o = × 10^{-} cm/sec			
LL 100	G_s 2.74				
PL 27	D_{10}				

Remarks * gray

Project LK.PONT.,LA.& VIC.-HURR. PROT. '71
ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC
(OUTFALL CANALS) ALONG 17th.ST.(GDM #2;SUPP.#5)

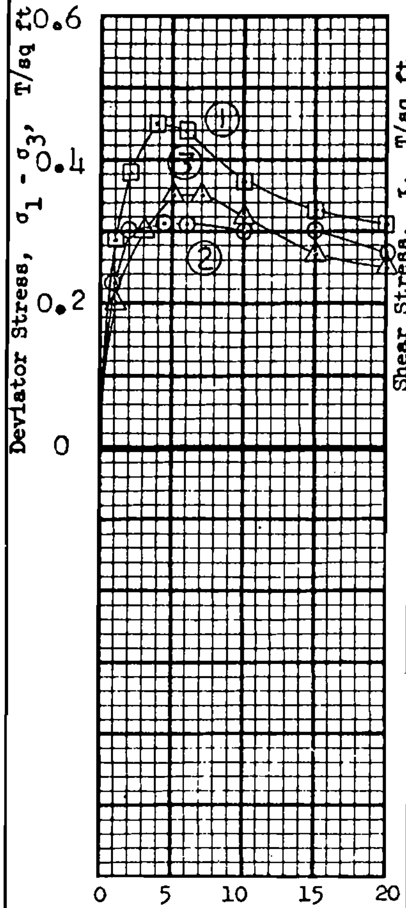
Boring No. 6-MUE	Sample No. 8-B
~~Depth~~ El -30.1	Date 17 March,1971

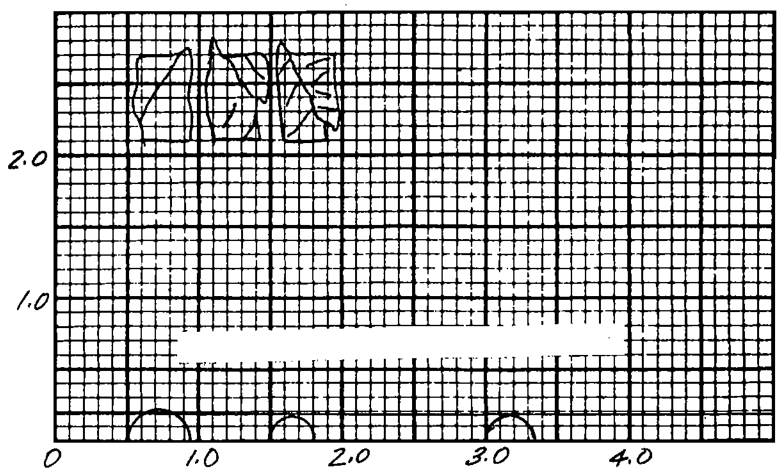
JDB **CONSOLIDATION TEST REPORT**

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. *(TRANSLUCENT)* 0 3424

F19

USAEWES SOILS TEST SECT...





$\gamma sat. = 96.$

Test No.			1	2	3	Avg.
Initial	Water content	w_o	79.3 %	80.5 %	77.9 %	79.2 %
	Void ratio	e_o	2.20	2.21	2.16	
	Saturation	S_o	98.8 %	99.8 %	98.8 %	%
	Dry density, lb/cu ft	γ_d	53.4	53.3	54.2	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.45	0.31	0.35	
Time to failure, min		t_f	24	28	27	
Rate of strain, percent/min			0.155	0.160	0.185	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0°

tan ϕ = 0

c = 0.19 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH), gray

LL - | PL - | PI - | | G_s 2.74 From 8-B Co:

Remarks

Project LK. PONT. LA., &VIC.-HURR. PROT.-1971

ORLEANS PARISH LK.FT.LEVEE, WEST OF IHNC, (OUT-

Area FALL CANALS) ALONG 17thST. CANAL (GDM#2, SUPP.#

Boring No. 6-MUE | Sample No. 8-C

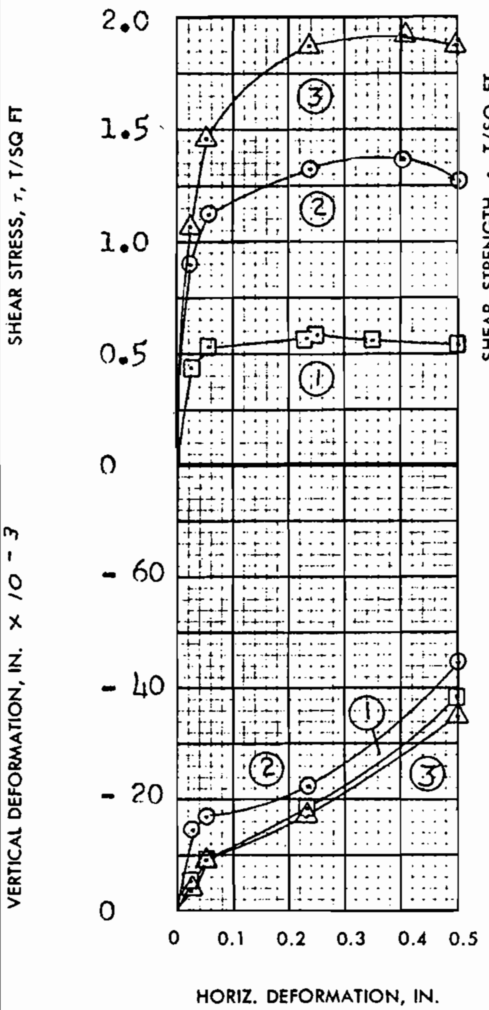
~~Depth~~ El - 31.0 | Date 9 March, 1971

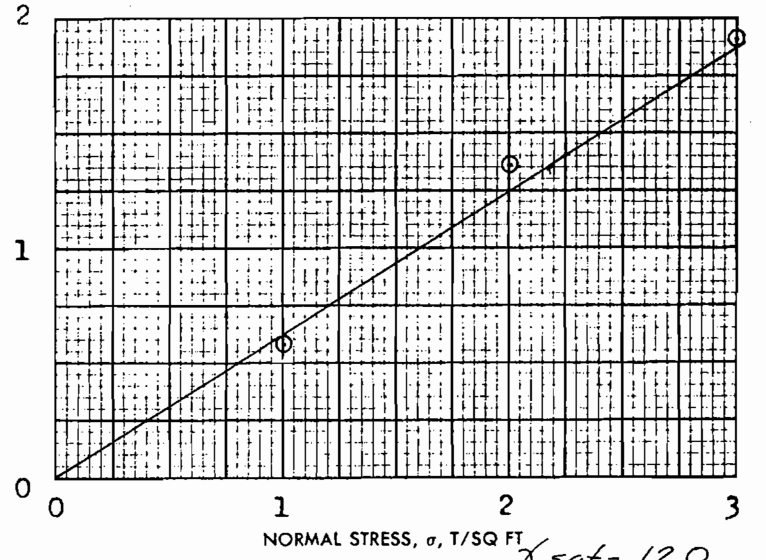
FAM TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

F20

TRANSLUCENT





γsat.= 120

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	29.0 %	30.1 %	31.4 %	30.2 %
	VOID RATIO	e_o	0.817	0.819	0.820	
	SATURATION	S_o	95.1 %	98.5 %	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	92.1	92.0	91.9	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	29.4 %	27.4 %	26.6 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.58	1.36	1.92	
ACTUAL TIME TO FAILURE, MIN		t_f	1380	2190	2190	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

φ' = 32°

TAN φ' = 0.625

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN	UNDISTURBED	3.00 IN. SQUARE	0.550 IN. THICK

CLASSIFICATION SILTY SAND(SM),gray, contains CLAY(CH) lenses and shell fragments

LL -	PL -	PI -		G_s 2.68

REMARKS

F21

PROJECT LK.PONT.LA.,&VIC.-HURR.PROT.-1971

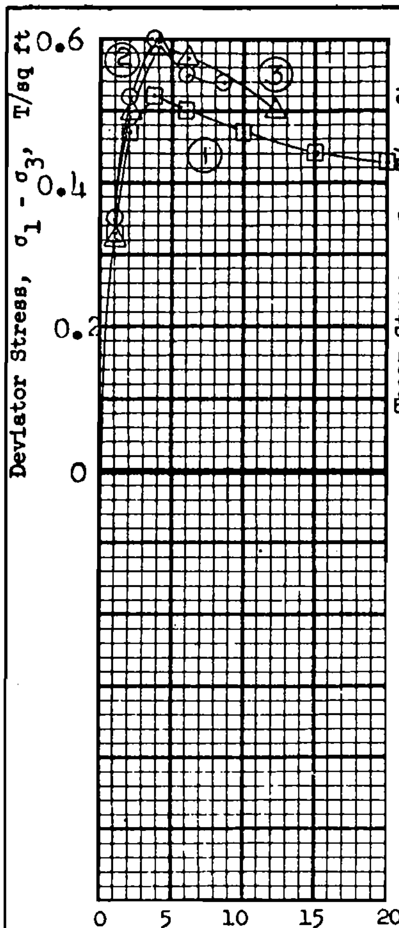
ORLEANS PARISH LK.FRNT. LEVEE,WEST OF IHNC

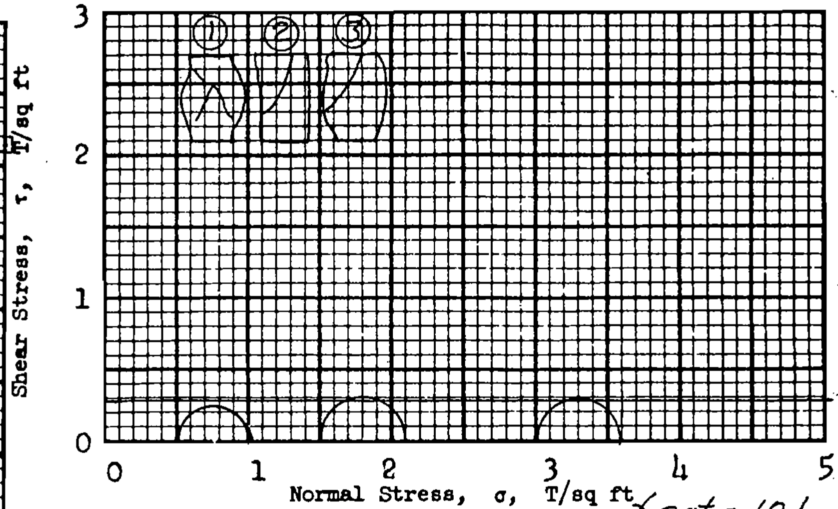
AREA (OUTFALL CANALS)ALONG 17th ST CANAL

BORING NO. 6-MUE	SAMPLE NO. 9-B
~~DEPTH~~ EL -34.3	DATE 22 March 1971

BWG

DIRECT SHEAR TEST REPORT





$\gamma sat = 101$

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.29 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	65.0 %	61.9 %	59.3 %	62.1 %
	Void ratio	e_o	1.76	1.69	1.60	
	Saturation	S_o	98.6 %	97.8 %	99.0 %	%
	Dry density, lb/cu ft	γ_d	60.4	61.9	64.2	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.52	0.60	0.59	
Time to failure, min		t_f	15	23	33	
Rate of strain, percent/min			0.253	0.164	0.120	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray, contains 1/4" silty sand seam

LL 65 | PL 21 | PI 44 | G_s 2.67

Remarks Specimens trimmed from 2nd level-top portion of sample contained 1/2" seam of sand(SP)

F22

Project LK.PONT.LA.,&VIC.-HURR.PROT.-1971 ORLEANS PARISH LK.FT.LEVEE,WEST OF IHNC,(OUT-

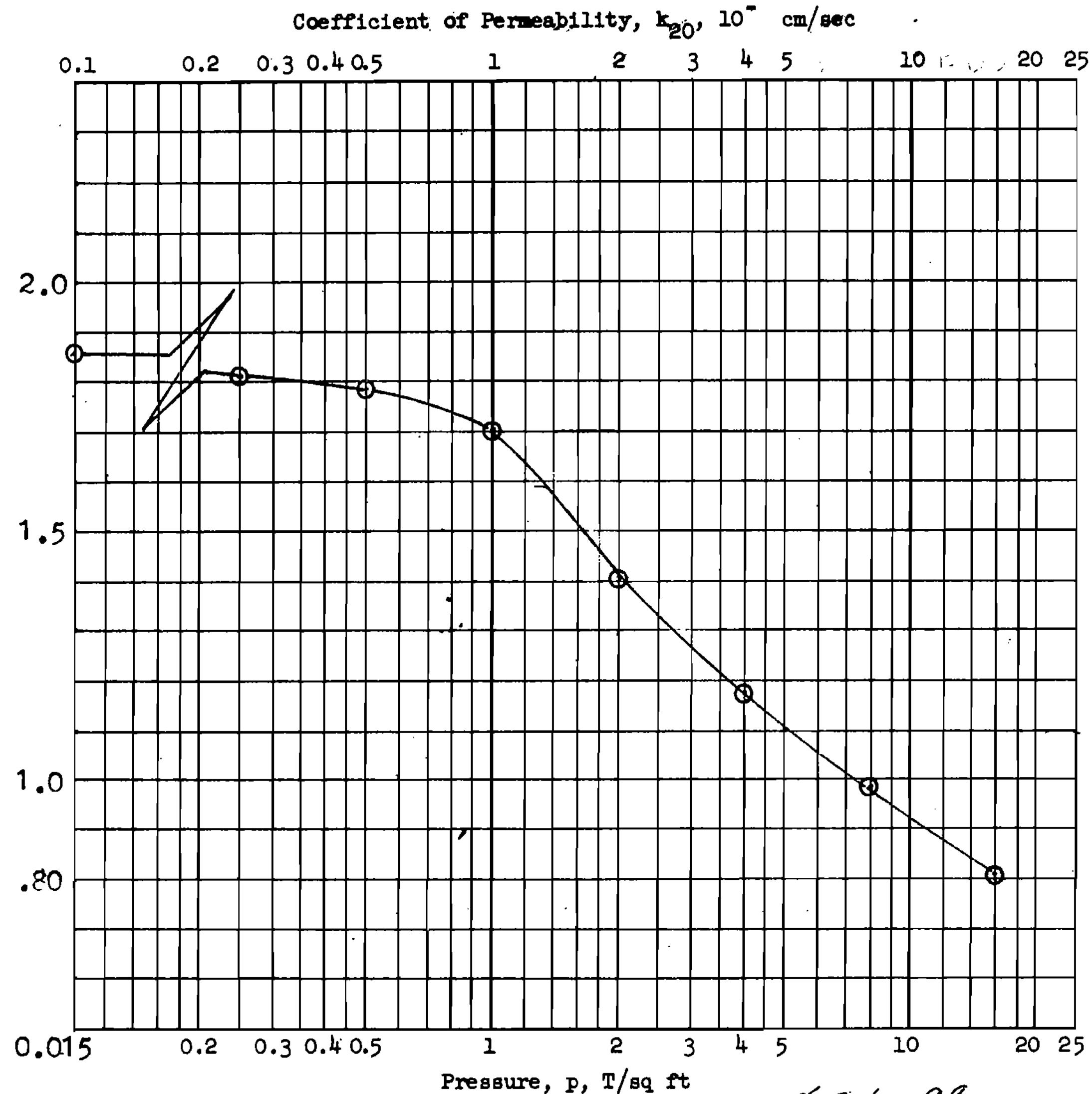
Area FALL CANALS)ALONG 17TH.ST. CANAL(GDM#2SUP-

Boring No. 6-MUE | Sample No. 11-C

~~Depth~~ El -42.7 | Date 10 March 1971

JMS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 *(EM 1110-2-1902)* PREVIOUS EDITIONS ARE OBSOLETE



γ sat. = 99

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.162 in.	Water Content, w_o	68.9 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.86	e_f	
Preconsol. Pressure, p_c 1.04 T/sq ft		Saturation, S_o	98.6 %	S_f	%
Compression Index, C_c .4535		Dry Density, γ_d	58.2 lb/ft³		
Classification PLASTIC CLAY(CH),*		k_{20} at e_o = × 10⁻ cm/sec			
LL -	G_s 2.67 From Q	Project LK.FONT.,LA.& VIC.-HURR. PROT.-1971			
PL -	D_{10}	ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC			
Remarks * gray, contains 1" dia.		(OUTFALL CANALS)ALONG 17th.ST.(GDM#2,SUPP.#5)			
sand pockets		Boring No. 6-MUE		Sample No. 11-C	
		~~Depth~~ El -42.7		Date 17 March,1971	
		JDB CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

F23

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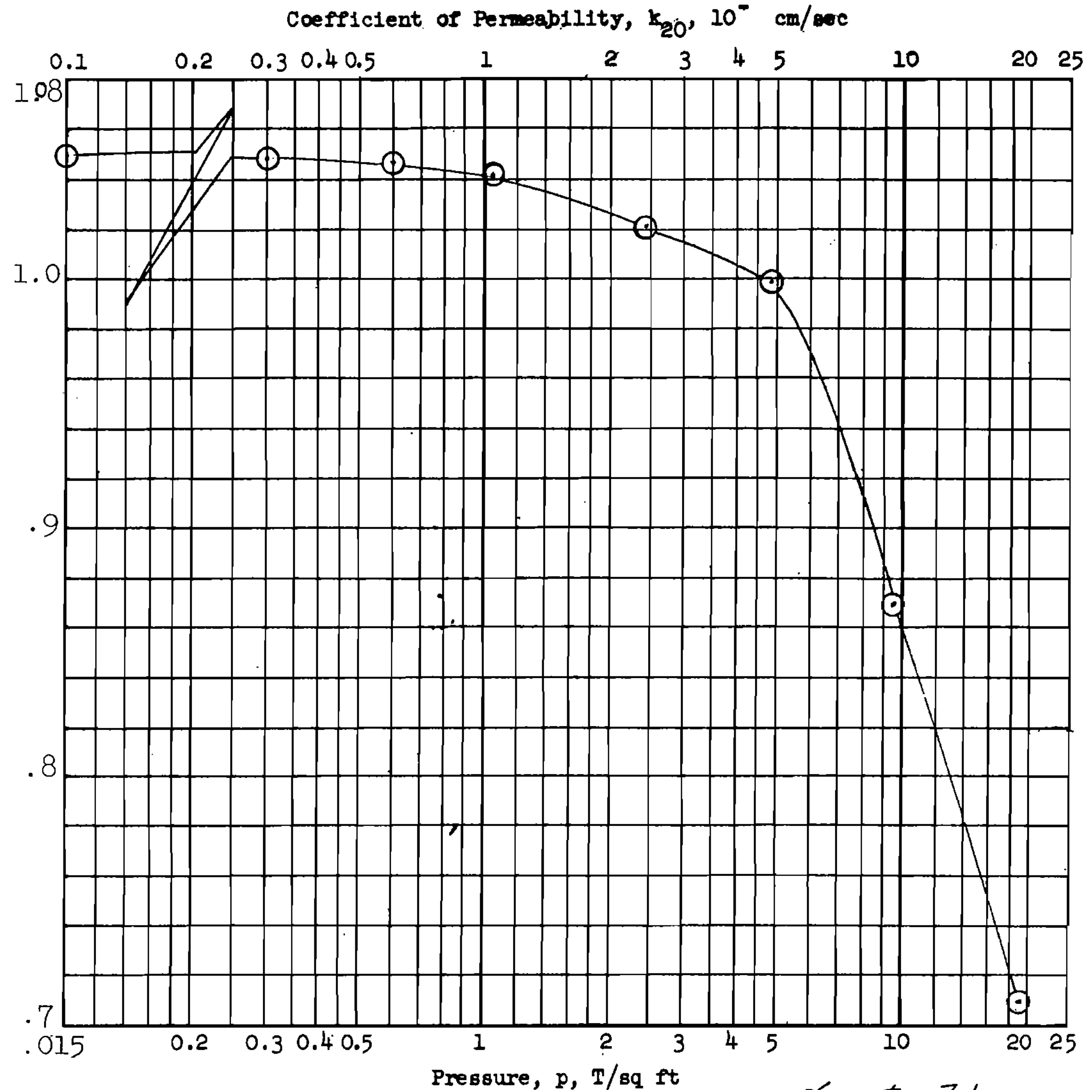
SOILS TEST SECTION



γ sat. = 71

Type of Specimen Undisturbed		Before Test		After Test	
Diam 4.25 in.	Ht 1.165 in.	Water Content, w_o	54.5 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.53	e_f	
Preconsol. Pressure, p_c 5.40 T/sq ft		Saturation, S_o	98.2 %	S_f	%
Compression Index, C_c .2217		Dry Density, γ_d	68.0 lb/ft^3		
Classification LEAN CLAY(CL),gray		k_{20} at e_o = × 10^{-} cm/sec			
LL 49	G_s 2.76				
PL 21	D_{10}				

Project LK.PONT.,LA.&VIC.-HURR. PROT.'71

ORLEANS PAR. L.F. LEV.WEST OF IHNC(OUTFALL

Area CANALS)ALONG 17th ST.CANAL(GDM#2,SUPP.#5)

Boring No. 6-MUE	Sample No. 14-C
~~Depth~~ El -55.5	Date 15 March 1971

Remarks

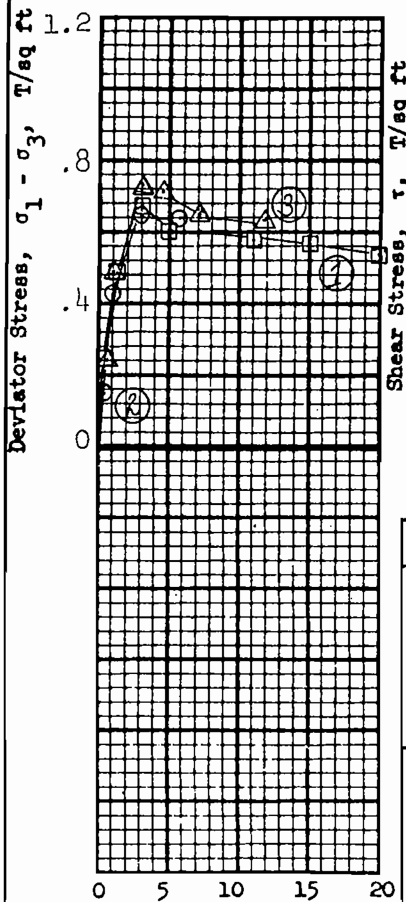
CONSOLIDATION TEST REPORT

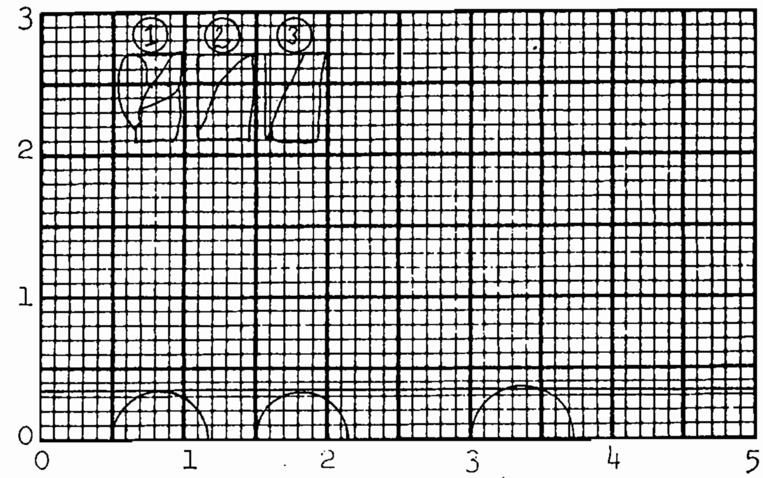
ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

0 3424

F24

ENGINEERS SOILS TEST SECTION





$\gamma sat. = 109$

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.34 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	48.6 %	45.9 %	46.3 %	46.9 %
	Void ratio	e_o	1.34	1.26	1.28	
	Saturation	S_o	98.3 %	98.7 %	98.0 %	%
	Dry density, lb/cu ft	γ_d	72.2	74.8	74.3	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.67	0.65	0.73	
Time to failure, min		t_f	16	30	27	
Rate of strain, percent/min			0.180	0.100	0.111	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.41	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q	Type of specimen UNDISTURBED			
Classification PLASTIC CLAY(CH),gray				
LL 65	PL 16	PI 49		G_s 2.71

Remarks ________

Project LK. PONT.LA.&VIC.-HURR. PROT-'71

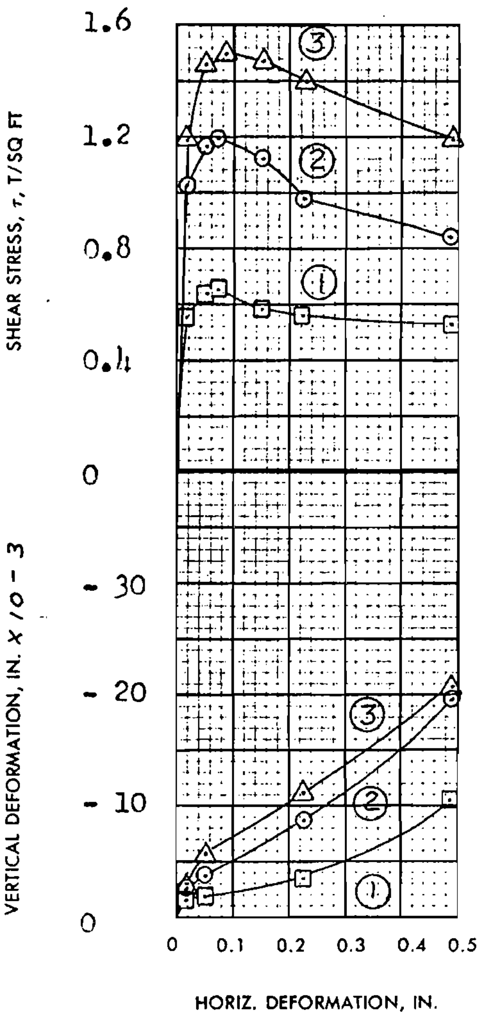
Area ORLEANS PARISH L.F. LEVEE WEST OF IHNC(OUTFALL CANALS)ALONG 17th ST.(GDM#2,SUPP.#5)

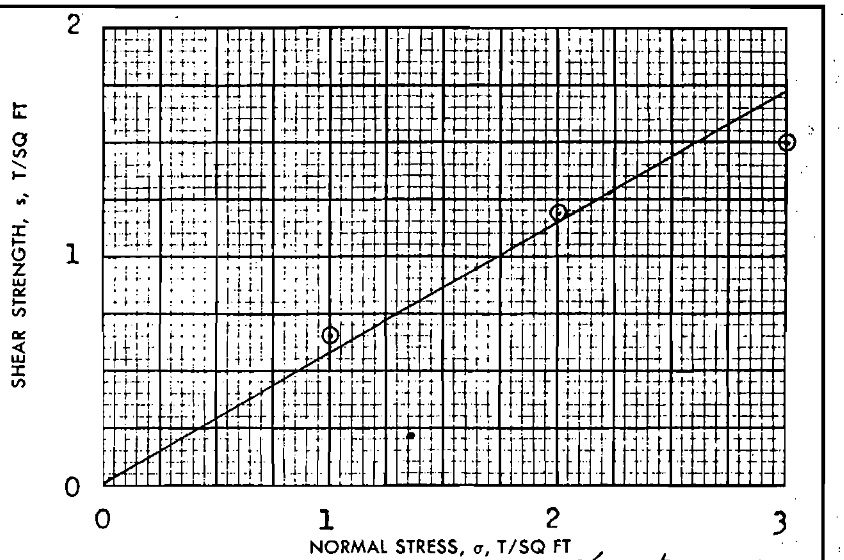
Boring No. 6-MUE | Sample No. 14-D

Depth El -55.9 | Date 9 March 1971

F25

JMS TRIAXIAL COMPRESSION TEST REPORT





γsat.=132

TEST NO.		1	2	3	Avg.
INITIAL — WATER CONTENT	w_o	19.0 %	18.9 %	18.8 %	18.9 %
INITIAL — VOID RATIO	e_o	0.537	0.525	0.537	
INITIAL — SATURATION	S_o	95.9 %	97.6 %	94.9 %	%
INITIAL — DRY DENSITY, LB/CU FT	γ_d	110.1	110.9	110.1	
VOID RATIO AFTER CONSOLIDATION	e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN	t_{50}	1	1	2	
FINAL — WATER CONTENT	w_f	21.0 %	19.6 %	19.3 %	%
FINAL — VOID RATIO	e_f				
FINAL — SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT	σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT	τ_{max}	0.65	1.19	1.50	
ACTUAL TIME TO FAILURE, MIN	t_f	480	480	540	
RATE OF STRAIN, IN./MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT	τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 30°

TAN ϕ' = 0.577

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED	3.00 IN. SQUARE	0.540 IN. THICK	
CLASSIFICATION SANDY CLAY(CL),gray, fissured			
LL 44	PL 15	PI 29	G_s 2.71

REMARKS

F26

PROJECT LK.PONT.LA.,&VIC.-HURR.PROT.-1971

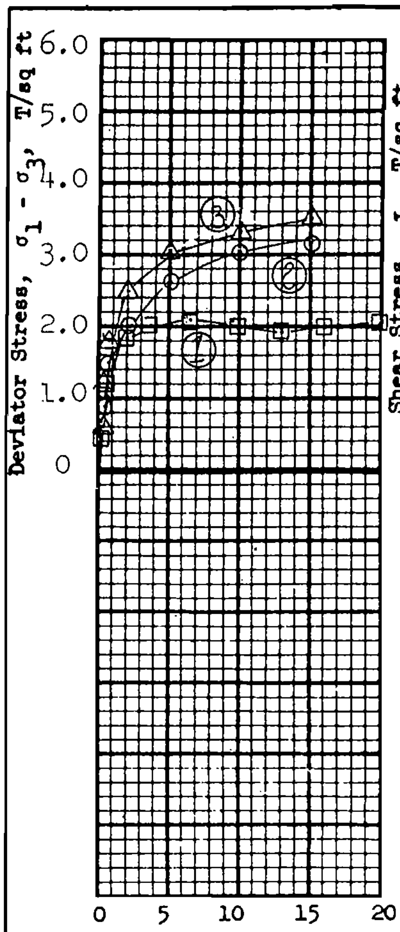
AREA ORLEANS PARISH LK.FT.LEVEE WEST OF IHNC(OUT-FALL CANALS) ALONG 17THSTCANAL(GDM#2,SUPP#5

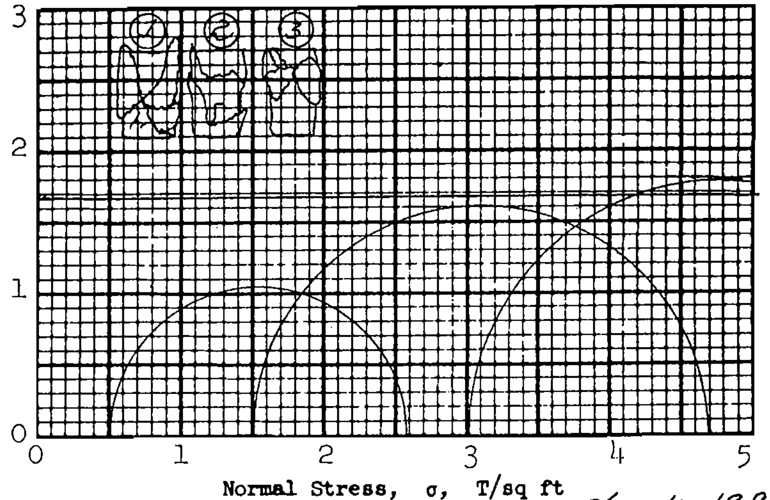
BORING NO. 6-MUE	SAMPLE NO. 16-B
~~DEPTH~~ EL - 62.0	DATE 17 March 1971

GDA

DIRECT SHEAR TEST REPORT

GPO 1966 OF-214-945





$\gamma_{sat.} = 129$

Test No.			1	2	3	Avg.
Initial	Water content	w_o	22.3 %	19.8 %	20.8 %	21.0 %
	Void ratio	e_o	0.621	0.567	0.592	
	Saturation	S_o	97.0 %	94.3 %	94.9 %	%
	Dry density, lb/cu ft	γ_d	104.0	107.6	105.9	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	2.08	3.19	3.53	
Time to failure, min		t_f	42	68	30	
Rate of strain, percent/min			0.154	0.221	0.500	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 1.68 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray, contains iron oxide concretions

LL 51 | PL 18 | PI 33 | G_s 2.70

Remarks Insufficient material to perform check test

Project LK.PONT.LA.&VIC.-HURR. PROT.-'71

Area ORLEANS PARISH L.F. LEVEE WEST OF IHNC(OUT-FALL CANALS)ALONG 17thST. CANAL(GDM#2,SUPP.#5)

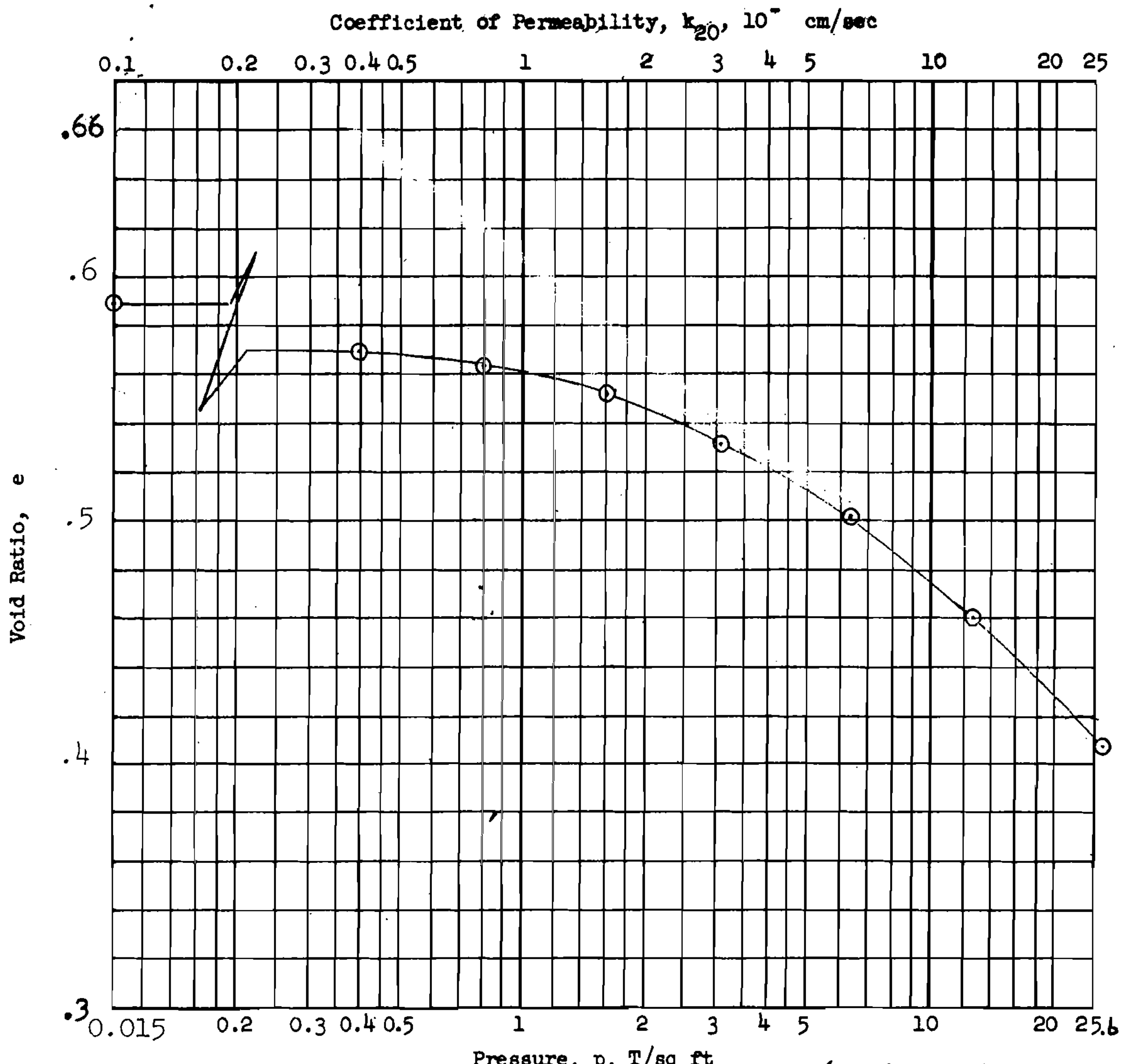
Boring No. 6-MUE | Sample No. 16-C

~~Depth~~ El -62.9 | Date 10 March 1971

F27

OHR TRIAXIAL COMPRESSION TEST REPORT

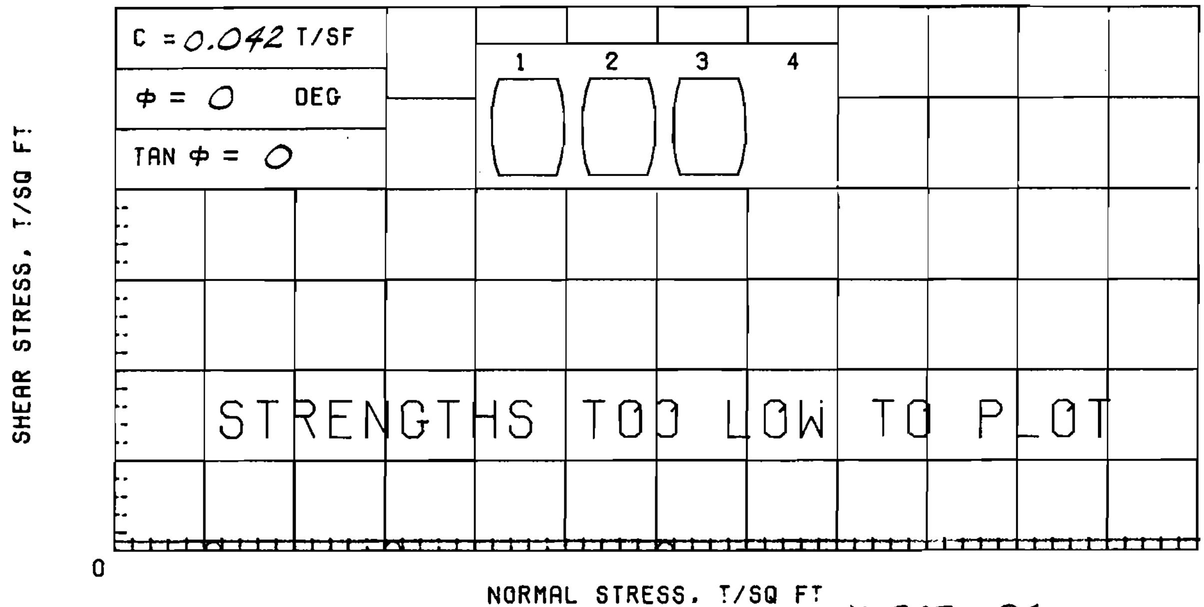
ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE



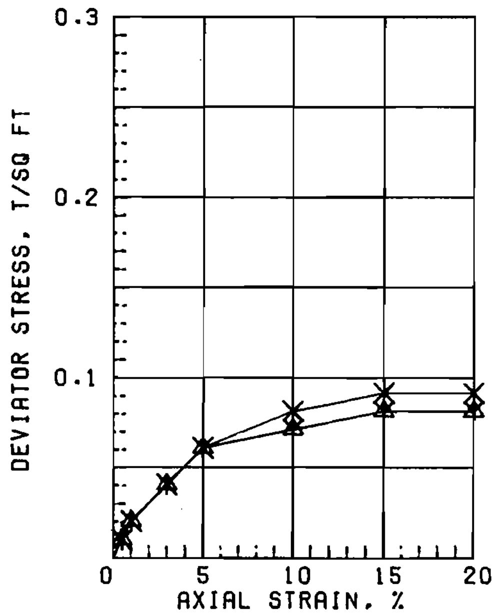
γ sat. = 129

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.159 in.	Water Content, w_o	21.0 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	0.590	e_f	
Preconsol. Pressure, p_c 7.00 T/sq ft		Saturation, S_o	95.7 %	S_f	%
Compression Index, C_c .0721		Dry Density, γ_d	105.9 lb/ft^3		
Classification PLASTIC CLAY(CH),*		k_{20} at e_o = × 10^{-} cm/sec			
LL -	G_s 2.70 From Q	Project LK.PONT.,LA.&VIC.-HURR. PROT.-'71			
PL -	D_{10}	ORLEANS PAR. LF. LEVEE WEST OF IHNC(OUTFALL			
Remarks *greenish gray		Area CANALS)ALONG 17th ST.CANAL(GDM#2,SUPP.#5)			
		Boring No. 6-MUE		Sample No. 16-C	
		Depth El -62.9		Date 19 March 1971	
		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424



γ SAT = 96



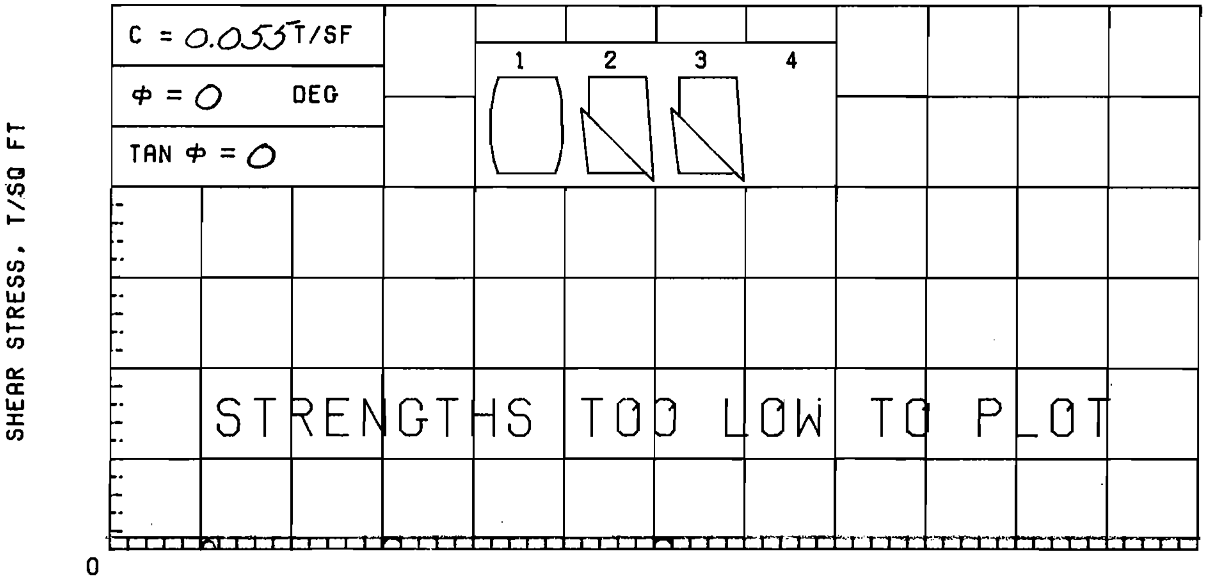
	SPECIMEN NO.	△1	Y2	X3	4	
INITIAL	WATER CONTENT, %	80.1	76.4	80.4		AVG. 79.0
	DRY DENSITY, PCF	52.9	55.2	52.7		
	SATURATION, %	98.9	100+	98.9		
	VOID RATIO	2.186	2.052	2.196		
BEFORE SHEAR	WATER CONTENT, %					
	DRY DENSITY, PCF					
	SATURATION, %					
	VOID RATIO					
	BACK PRESS., TSF					
	MIN PRIN. STRESS, TSF	0.5	1.5	3.0		
	MAX. DEV. STRESS, TSF	0.08	0.08	0.09		
	TIME TO FAILURE, MIN.	30	30	30		
	RATE OF STRAIN INCR.,%					
	INITIAL DIAMETER, IN.	1.39	1.39	1.39		
	INITIAL HEIGHT, IN.	3.00	3.00	3.00		

CONTROLLED-STRAIN TEST

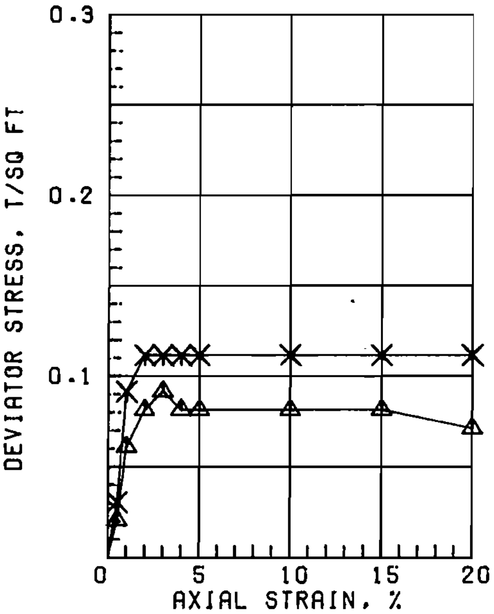
DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 69	PL 20	PI 49	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:		
	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 1-MUG	SAMPLE NO. 2-B
	DEPTH/ELEV 5.0/-12.2	TECH. KOC
	LABORATORY USAE WES	DATE 14 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	



γ SAT = 97



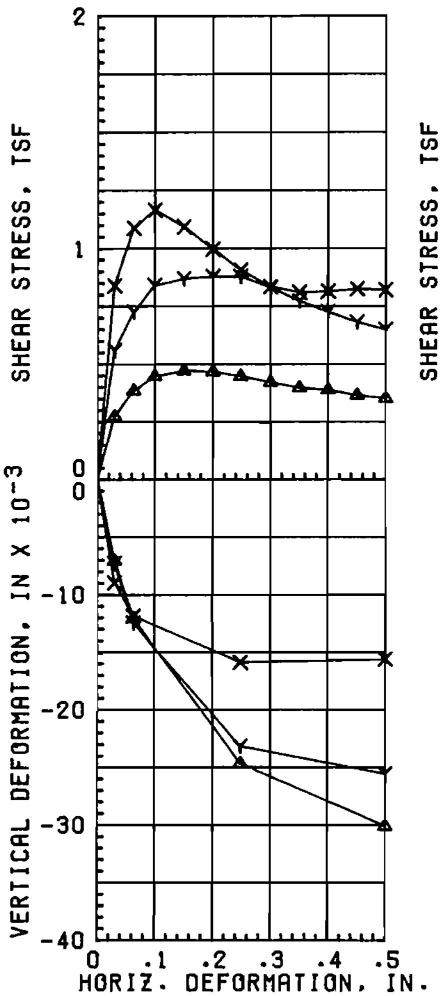
SPECIMEN NO.		Δ1	Y2	X3	4	AVG.
INITIAL	WATER CONTENT, %	77.3	77.4	76.4		77.0
	DRY DENSITY, PCF	54.3	54.1	55.2		
	SATURATION, %	99.3	98.8	100+		
	VOID RATIO	2.102	2.116	2.053		
BEFORE SHEAR	WATER CONTENT, %					
	DRY DENSITY, PCF					
	SATURATION, %					
	VOID RATIO					
	BACK PRESS., TSF					
MIN PRIN. STRESS, TSF		0.5	1.5	3.0		
MAX. DEV. STRESS, TSF		0.09	0.11	0.11		
TIME TO FAILURE, MIN.		6	12	12		
RATE OF STRAIN INCR.%			6	6		
INITIAL DIAMETER, IN.		1.39	1.39	1.39		
INITIAL HEIGHT, IN.		3.00	3.00	3.00		

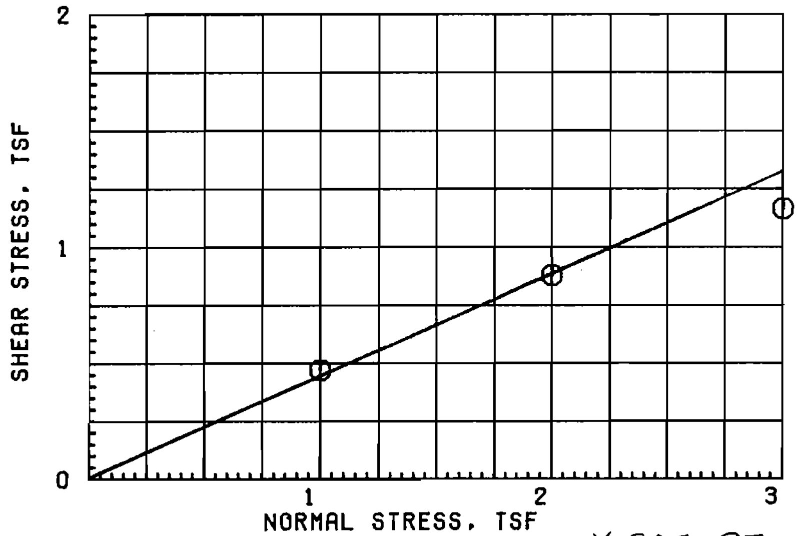
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; SILT LENSES

LL 70	PL 22	PI 48	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 1-MUG	SAMPLE NO. 3-C
	DEPTH/ELEV 9.6/-16.8	TECH. KOC
	LABORATORY USAE WES	DATE 14 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	





γ SAT = 97

ϕ = 24°

TAN ϕ = 0.445

C = 0

		TEST NO.	1 ▲	2 Y	3 X	AVG.
INITAL	WATER CONTENT, %		73.2	72.3	70.3	71.9
	VOID RATIO		1.993	2.071	2.105	
	SATURATION, %		99.2	94.3	90.1	
	DRY DENSITY, PCF		56.3	54.9	54.3	
VOID RATIO AFTER CONSOL						
FIFTY PERCENT CONSOL, MIN			< 1	< 1	< 1	
FINAL	WATER CONTENT, %		47.7	42.8	45.0	
	VOID RATIO					
	SATURATION, %					
NORMAL STRESS, TSF			1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF			0.47	0.88	1.16	
TIME TO FAILURE, MIN			805	1073	537	
RATE OF STRAIN, IN/MIN			.00019	.00019	.00019	
ULTIMATE SHEAR STRESS, TSF						

TYPE SPECIMEN UNDISTURBED	3.00 IN. SQUARE	0.744 IN. THICK

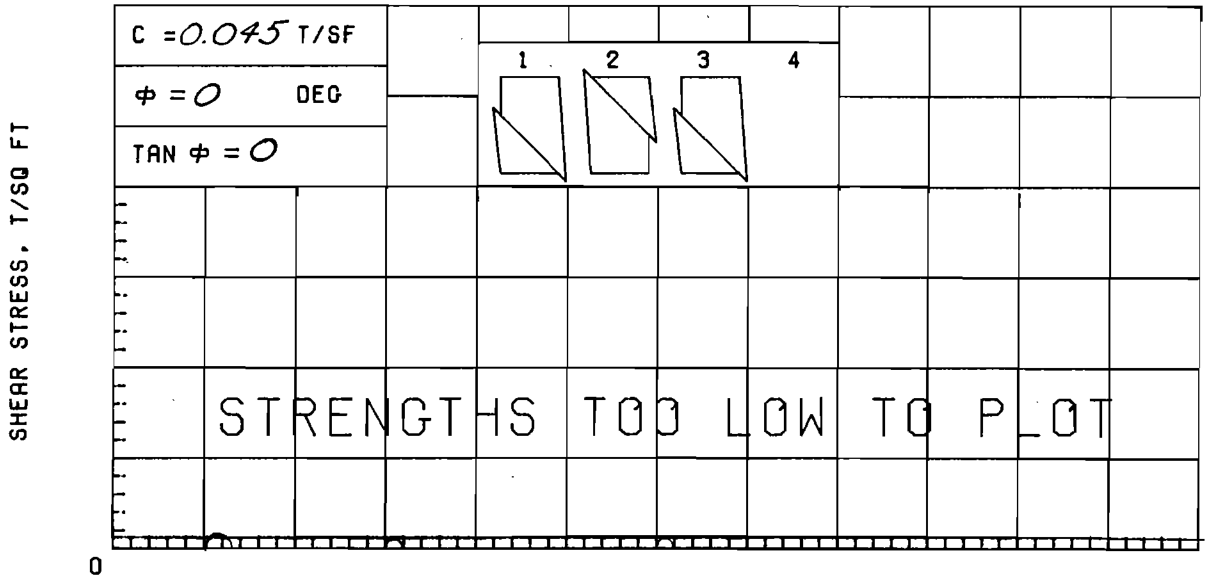
CLASSIFICATION PLASTIC CLAY (CH), GRAY

LL	PL	PI		GS 2.70 (EST)

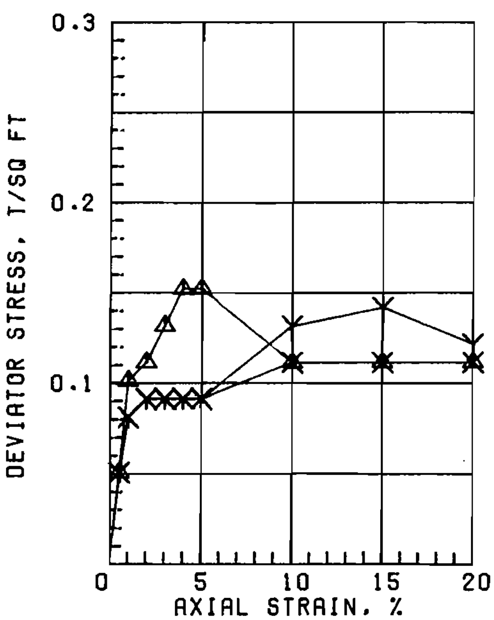
REMARKS;	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 1MUG	SAMPLE 3-C
	DEPTH/ELEV 10.1/-17.3	DATE 28 JUL 86

DIRECT SHEAR TEST REPORT

C = 0.045 T/SF	
Φ = 0 DEG	
TAN Φ = 0	



γ SAT = 94



	SPECIMEN NO.	△1	Y2	X3	4
INITIAL	WATER CONTENT, %	87.8	88.4	85.4	
	DRY DENSITY, PCF	50.3	50.0	51.1	
	SATURATION, %	100+	100+	100+	
	VOID RATIO	2.350	2.372	2.297	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
	MIN PRIN. STRESS, TSF	0.5	1.5	3.0	
	MAX. DEV. STRESS, TSF	0.15	0.09	0.09	
	TIME TO FAILURE, MIN.	8	12	12	
	RATE OF STRAIN INCR.%		6	6	
	INITIAL DIAMETER, IN.	1.39	1.39	1.39	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

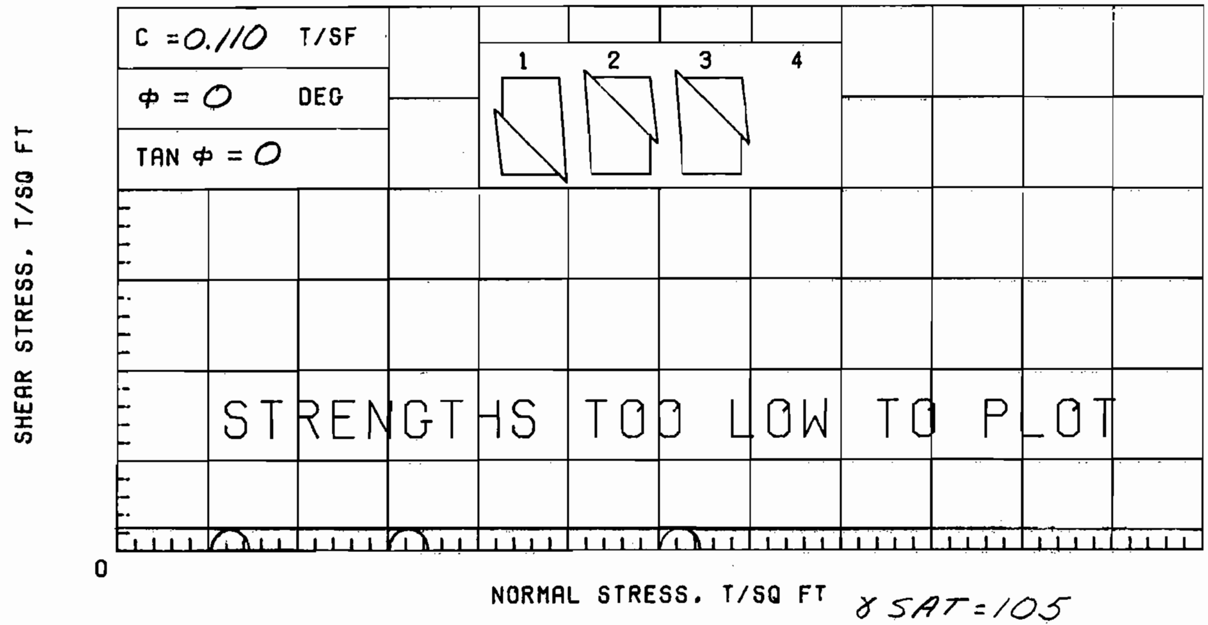
AVG. 87.2

CONTROLLED-STRAIN TEST

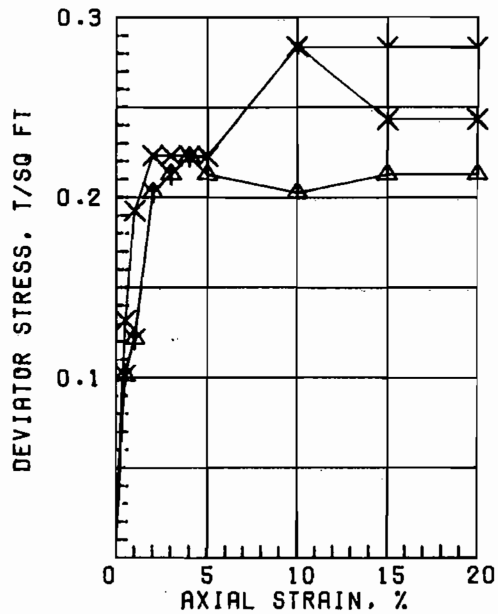
DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY

LL 89	PL 23	PI 66	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 1-MUG	SAMPLE NO. 4-B
	DEPTH/ELEV 13.0/-20.2	TECH. KOC
	LABORATORY USAE WES	DATE 15 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	



γ SAT = 105



	SPECIMEN NO.	△1	Y2	X3	4
INITIAL	WATER CONTENT, %	49.8	48.3	59.3	
INITIAL	DRY DENSITY, PCF	69.3	71.3	63.9	
INITIAL	SATURATION, %	93.9	95.6	97.7	
INITIAL	VOID RATIO	1.432	1.365	1.639	
BEFORE SHEAR	WATER CONTENT, %				
BEFORE SHEAR	DRY DENSITY, PCF				
BEFORE SHEAR	SATURATION, %				
BEFORE SHEAR	VOID RATIO				
BEFORE SHEAR	BACK PRESS., TSF				
	MIN PRIN. STRESS, TSF	0.5	1.5	3.0	
	MAX. DEV. STRESS, TSF	0.22	0.22	0.22	
	TIME TO FAILURE, MIN.	8	24	12	
	RATE OF STRAIN INCR.,%		6	6	
	INITIAL DIAMETER, IN.	1.39	1.39	1.39	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

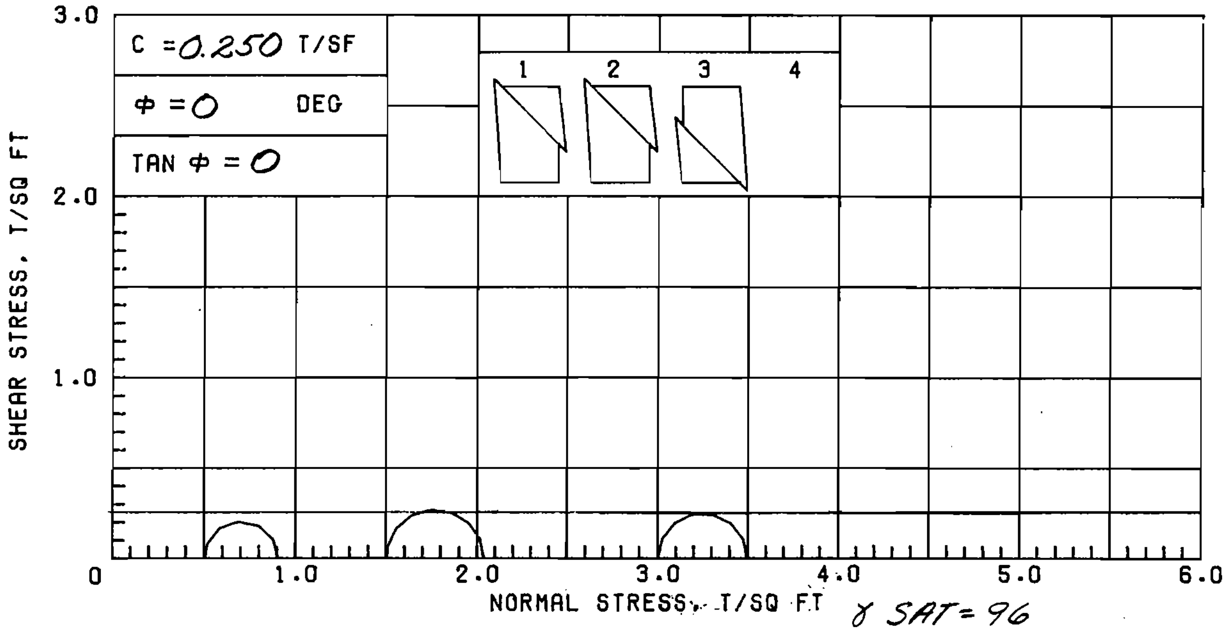
AVG. 52.5

CONTROLLED-STRAIN TEST

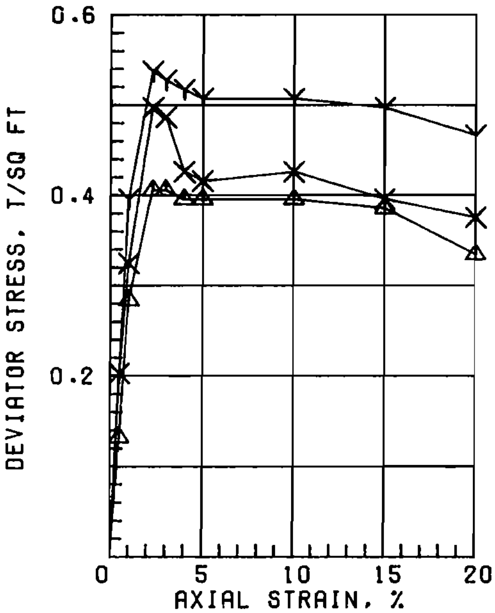
DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SILT POCKETS; SHELL PARTICLES

LL 48	PL 16	PI 32	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	PROJECT LK PONT LA & VIC HURR PROT	
LIMITS ON MIXTURE OF MATERIAL.	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 1-MUG	SAMPLE NO. 5-B
	DEPTH/ELEV 16.7/-23.9	TECH. KOC
	LABORATORY USAE WES	DATE 15 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	



γ SAT = 96



	SPECIMEN NO.	△1	Y2	X3	4
INITIAL	WATER CONTENT, %	75.8	75.5	76.4	
	DRY DENSITY, PCF	54.5	52.7	53.7	
	SATURATION, %	97.7	92.6	96.5	
	VOID RATIO	2.095	2.202	2.138	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
	MIN PRIN. STRESS, TSF	0.5	1.5	3.0	
	MAX. DEV. STRESS, TSF	0.41	0.54	0.50	
	TIME TO FAILURE, MIN.	5	14	14	
	RATE OF STRAIN INCR,%		6	6	
	INITIAL DIAMETER, IN.	1.39	1.39	1.39	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

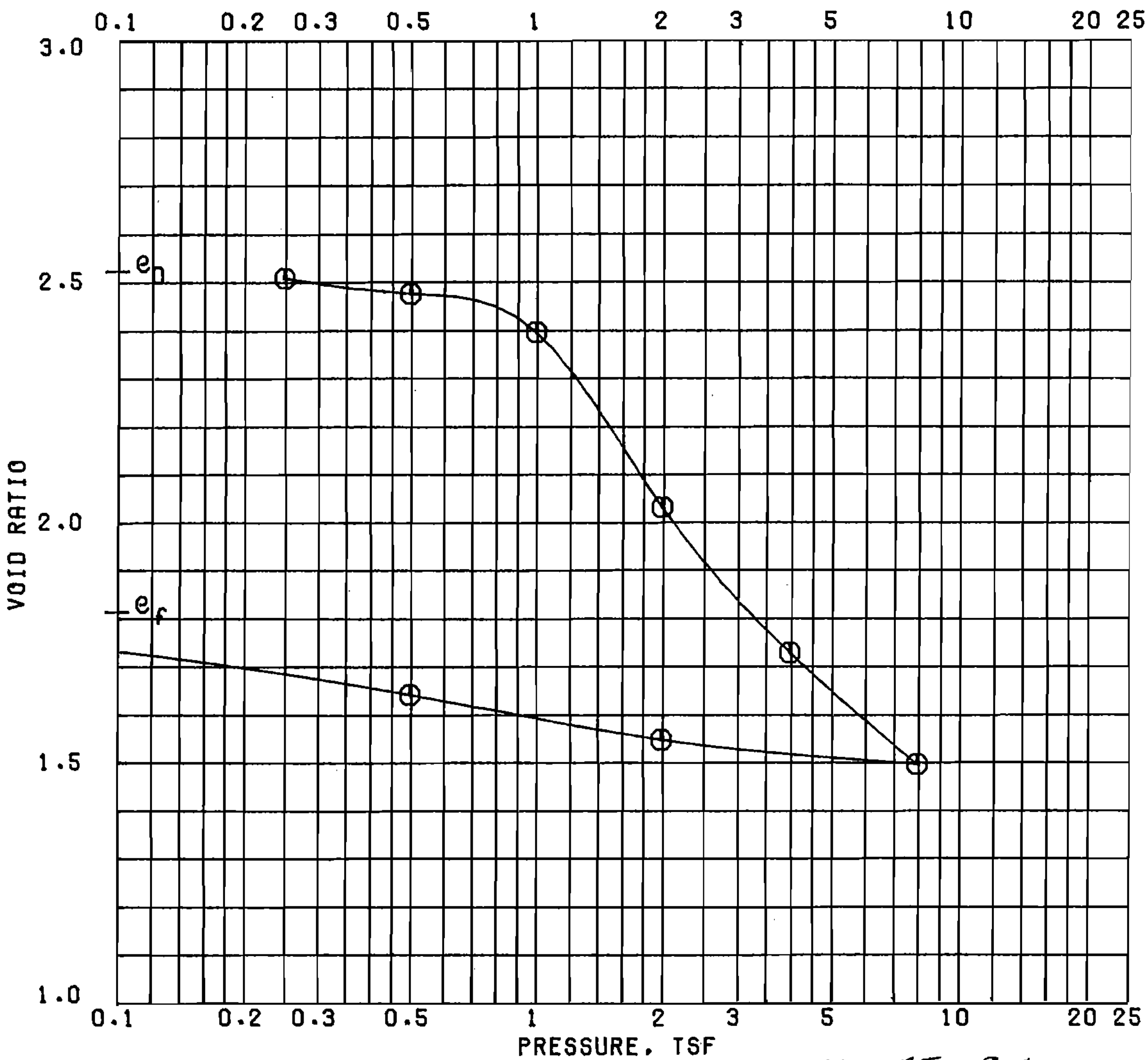
AVG. 75.9

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; SILT LAYERS TO 3/4"

LL 68	PL 21	PI 47	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 1-MUG	SAMPLE NO. 9-C
	DEPTH/ELEV 35.0/-42.2	TECH. KOC
	LABORATORY USAE WES	DATE 19 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	



γ SAT = 84

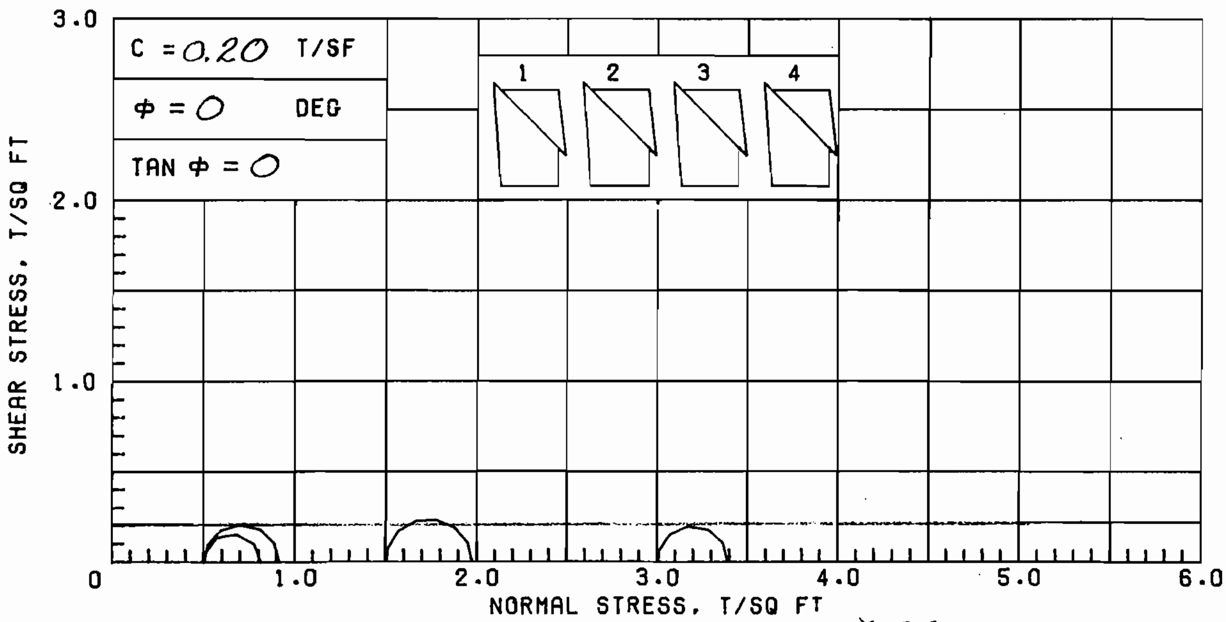
			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	63.5	45.7
PRECONSOL. PRESSURE, TSF	1.05	DRY DENSITY, PCF	47.9	60.0
COMPRESSION INDEX		SATURATION, %	85.0	85.1
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	2.519	1.810
DIA. IN 4.44	HT. IN 1.119	BACK PRESSURE, TSF		

CLASSIFICATION PLASTIC CLAY (CH), GRAY; SHELL PARTICLES

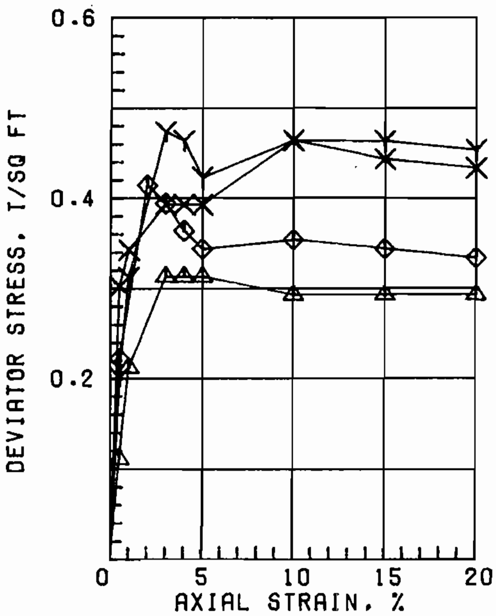
LL	PL	PI	PROJECT LK PONT LA & VIC HURR PROT
GS 2.70 (EST)	D_{10}		ORLEANS PARISH OUTFALL CANALS

REMARKS	BORING NO. 1-MUG	SAMPLE NO. 10-B
	DEPTH/ELEV 37.7/-44.9	DATE 21 JUL 86

CONSOLIDATION TEST REPORT



γ SAT = 100



	SPECIMEN NO.	△1	Y2	X3	◇4
INITIAL	WATER CONTENT, %	66.8	60.8	61.8	70.3
	DRY DENSITY, PCF	58.3	62.6	62.6	57.1
	SATURATION, %	95.5	97.0	98.6	97.3
	VOID RATIO	1.889	1.693	1.693	1.951
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	0.5
MAX. DEV. STRESS, TSF		0.31	0.47	0.39	0.41
TIME TO FAILURE, MIN.		6	18	18	12
RATE OF STRAIN INCR.%			6	6	6
INITIAL DIAMETER, IN.		1.39	1.39	1.39	1.39
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00

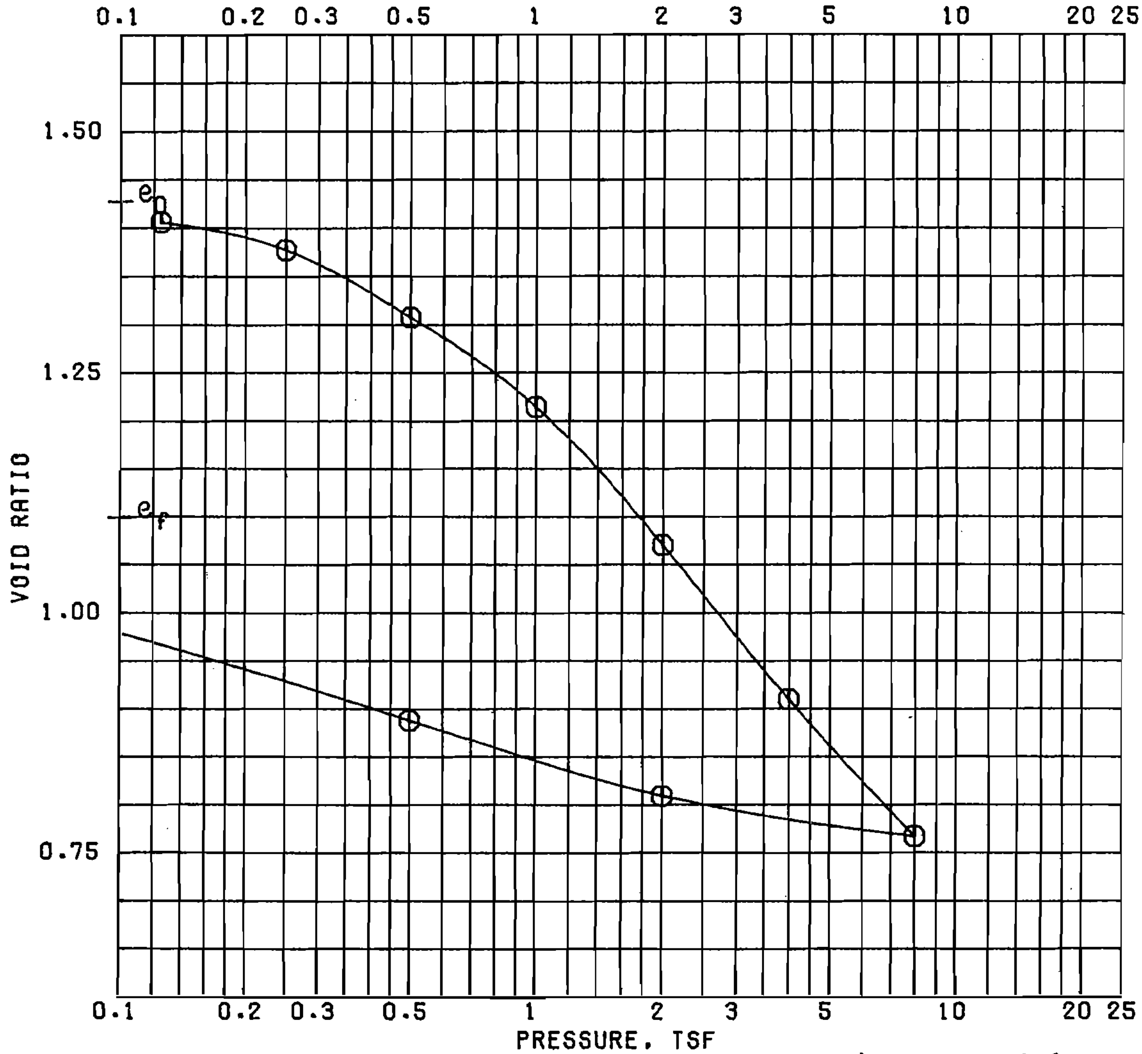
AVG. 64.9

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; SHELL PARTICLES

LL 66	PL 18	PI 48	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

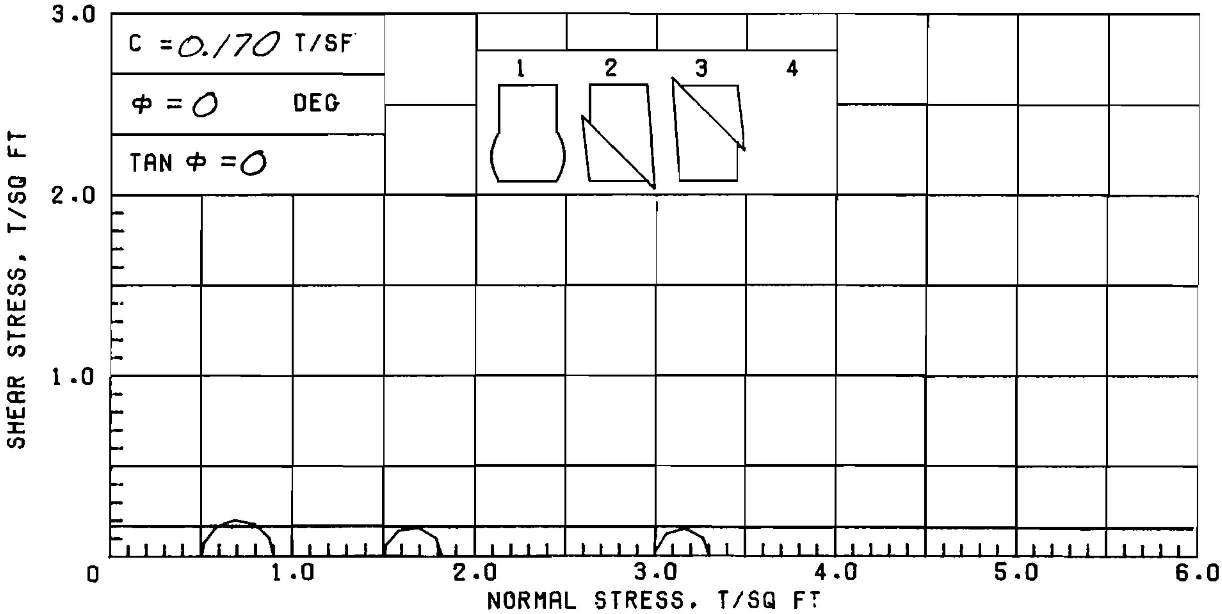
REMARKS;	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 1-MUG	SAMPLE NO. 11-B
	DEPTH/ELEV 42.0/-49.2	TECH. KOC
	LABORATORY USAE WES	DATE 20 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	

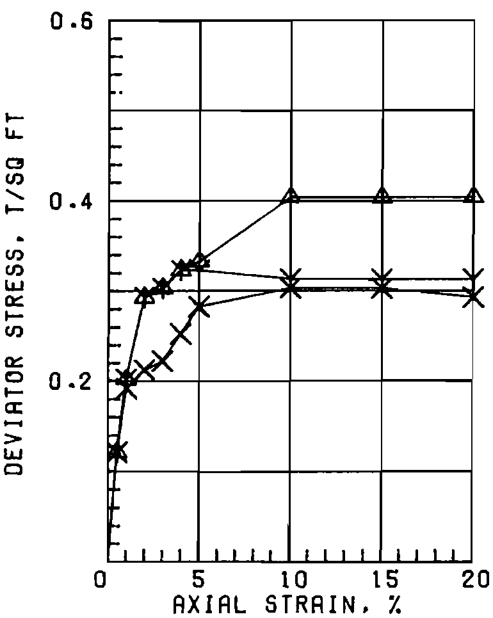


γ SAT = 106

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	50.3	40.2
PRECONSOL. PRESSURE, TSF	0.75	DRY DENSITY, PCF	69.5	80.4
COMPRESSION INDEX		SATURATION, %	95.2	98.7
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.427	1.098
DIA. IN 4.44	HT. IN 1.124	BACK PRESSURE, TSF		
CLASSIFICATION	PLASTIC CLAY (CH), GRAY			
LL	PL	PI	PROJECT LK PONT LA & VIC HURR PROT	
GS 2.70 (EST)	D_{10}		ORLEANS PARISH OUTFALL CANALS	
REMARKS			BORING NO. 1-MUG	SAMPLE NO. 13-B
			DEPTH/ELEV 49.6/-56.8	DATE 23 JUL 86

CONSOLIDATION TEST REPORT





γ SAT = 104

SPECIMEN NO.		Δ1	Y2	X3	4
INITIAL	WATER CONTENT, %	53.5	56.8	53.8	
	DRY DENSITY, PCF	67.8	64.7	67.5	
	SATURATION, %	97.1	95.6	97.0	
	VOID RATIO	1.487	1.603	1.498	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	
MAX. DEV. STRESS, TSF		0.40	0.32	0.30	
TIME TO FAILURE, MIN.		20	8	20	
RATE OF STRAIN INCR.,%					
INITIAL DIAMETER, IN.		1.39	1.39	1.39	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

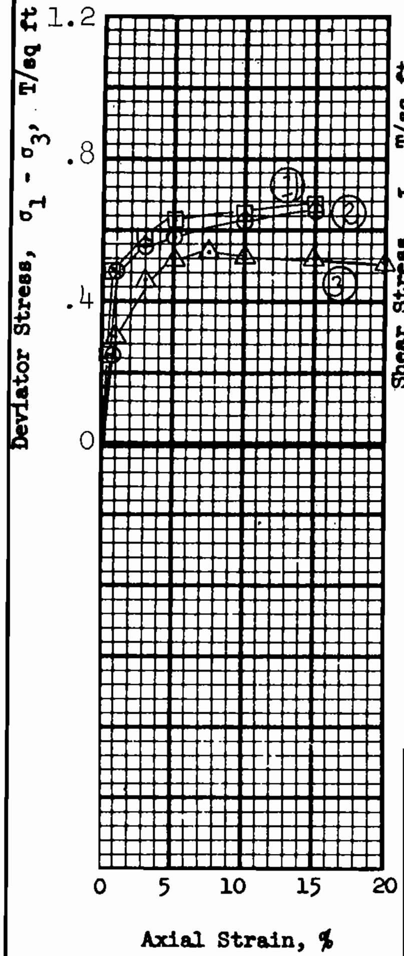
AVG. 54.7

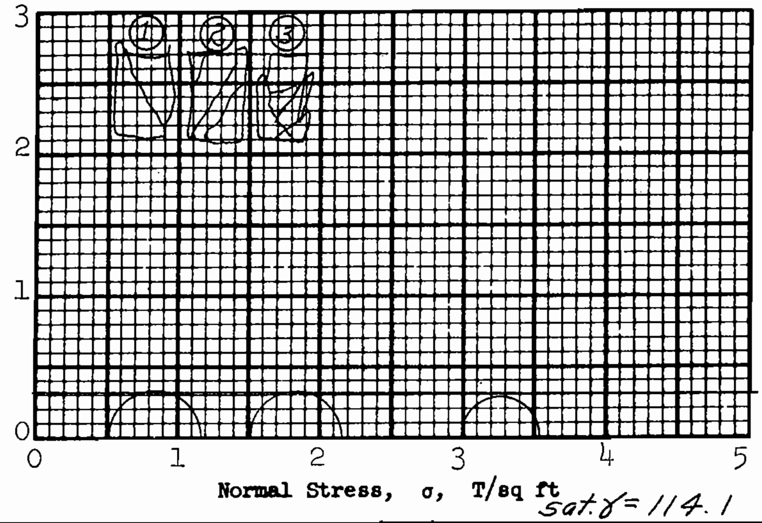
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; ORGANIC MATERIAL

LL 72	PL 19	PI 53	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 1-MUG	SAMPLE NO. 13-C
	DEPTH/ELEV 50.5/-57.7	TECH. KOC
	LABORATORY USAE WES	DATE 20 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	





sat.γ = 114.1

Test No.			1	2	3	Avg.
Initial	Water content	w_o	37.2 %	44.3 %	41.4 %	41.0 %
	Void ratio	e_o	0.965	1.13	1.06	
	Saturation	S_o	100+ %	100+ %	100+ %	%
	Dry density, lb/cu ft	γ_d	84.5	77.8	80.6	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.67	0.66	0.54	
Time to failure, min		t_f	82	36	14	
Rate of strain, percent/min			0.182	0.421	0.523	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.41	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.31 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

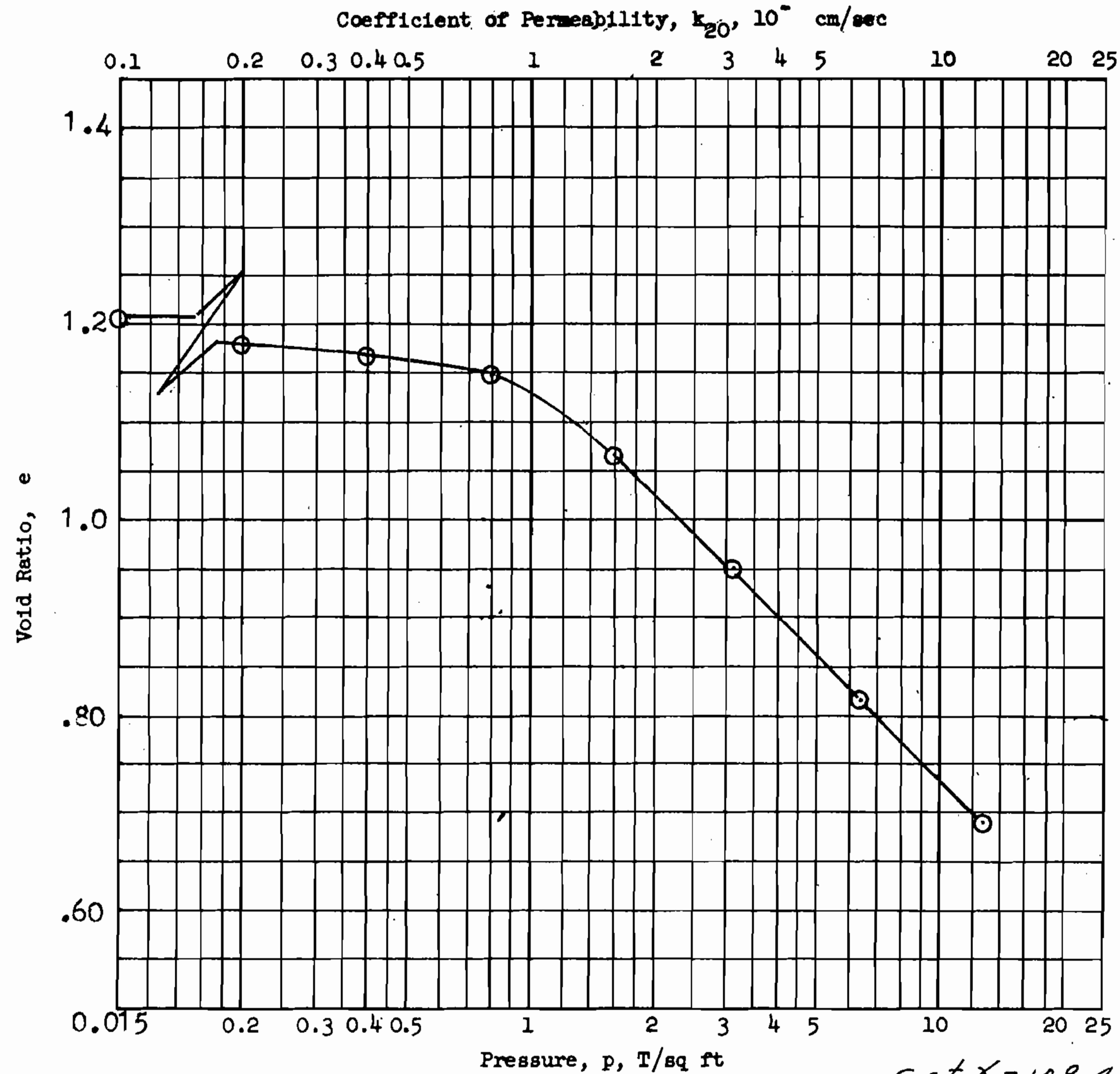
Type of test Q	Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH), gray, contains silt lenses

LL 57	PL 19	PI 38		G_s 2.66

Remarks ________

Project LK. PONT., LA.&VIC.-HURR. PROT.-'71	
ORLEANS PARISH L.F. LEVEE WEST OF IHNC (OUT-	
Area FALL CANALS) ALONG 17th ST. CANAL(GDM#2, SUPP. #5)	
Boring No. 5-MUW	Sample No. 4-B
Depth El -3.1	Date 5 March 1971
FAM	TRIAXIAL COMPRESSION TEST REPORT



sat. γ = 109.4

Type of Specimen UNDISTURBED		Before Test		After Test
Diam 4.25 in.	Ht 1.164 in.	Water Content, w_o	45.3 %	w_f %
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.20	e_f
Preconsol. Pressure, p_c 1.38 T/sq ft		Saturation, S_o	100 %	S_f %
Compression Index, C_c 0.43		Dry Density, γ_d	75.3 lb/ft^3	
Classification PLASTIC CLAY(CH)*		k_{20} at e_o = × 10^{-} cm/sec		

LL -	G_s 2.66 From Q
PL -	D_{10}

Remarks * gray, contains small roots

Project LK. PONT., LA., & VIC.-HURR. PROT.-'71

ORLEANS PARISH LAKEFRONT LEVEE, WEST OF IHNC (OUTFALL CANALS)ALONG 17th.ST.CANAL(GDM#2;SUPP.#5)

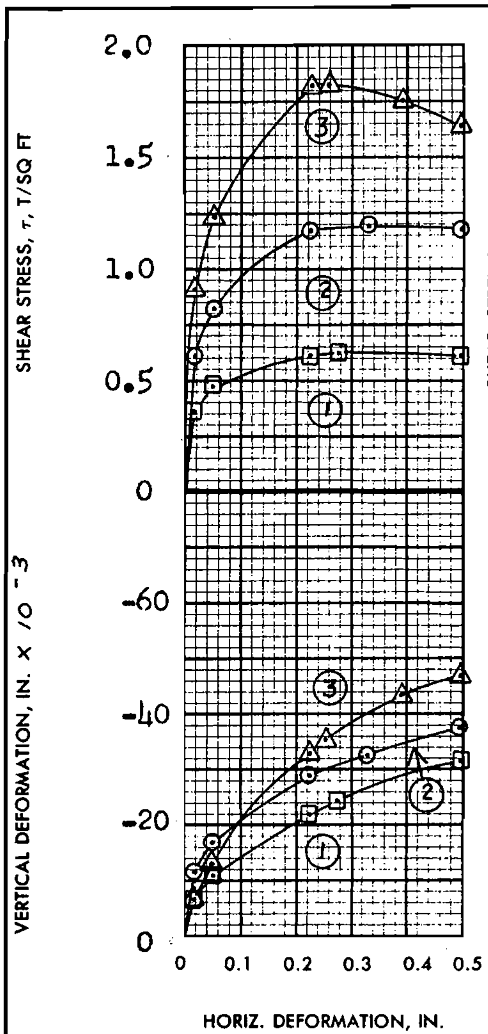
Boring No. 5-MUW	Sample No. 4-B
~~Depth~~ El -3.1	Date 8 March,1971

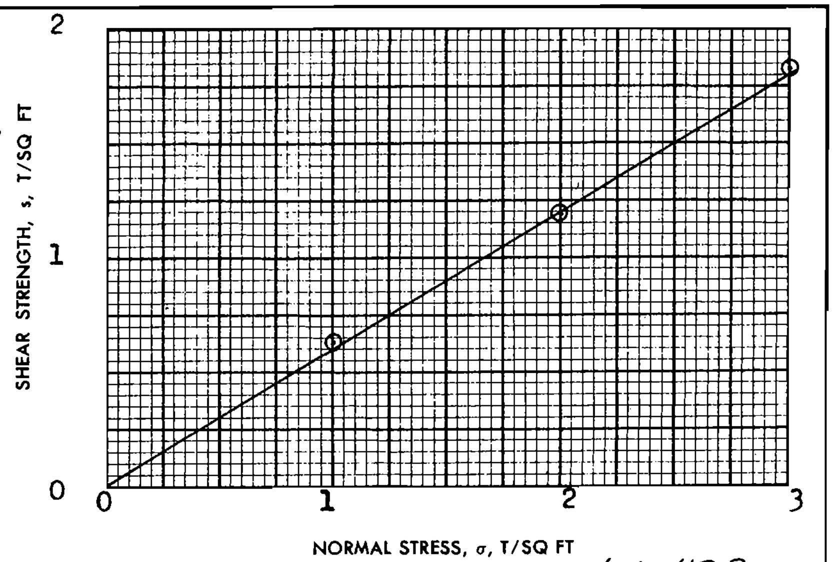
JDB **CONSOLIDATION TEST REPORT**

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. *(TRANSLUCENT)*

F40

0 3424





Sat. γ = 112.2

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	40.4 %	49.5 %	45.7 %	45.2 %
	VOID RATIO	e_o	1.06	1.22	1.23	
	SATURATION	S_o	100+%	100+ %	99.9%	%
	DRY DENSITY, LB/CU FT	γ_d	81.5	75.5	75.4	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	< 1	< 1	< 1	
FINAL	WATER CONTENT	w_f	28.5 %	27.6 %	33.2%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.63	1.19	1.83	
ACTUAL TIME TO FAILURE, MIN		t_f	1620	1860	1500	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 31°

TAN ϕ' = 0.595

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN	UNDISTURBED	3.00 IN. SQUARE	0.550 IN. THICK
CLASSIFICATION	SILTY CLAY(CL),gray,contains organic matter and rootlets		
LL 41	PL 19	PI 22	G_s 2.69

REMARKS

F41

PROJECT LK. PONT.LA.,& VIC.-HURR.PROT.-1971

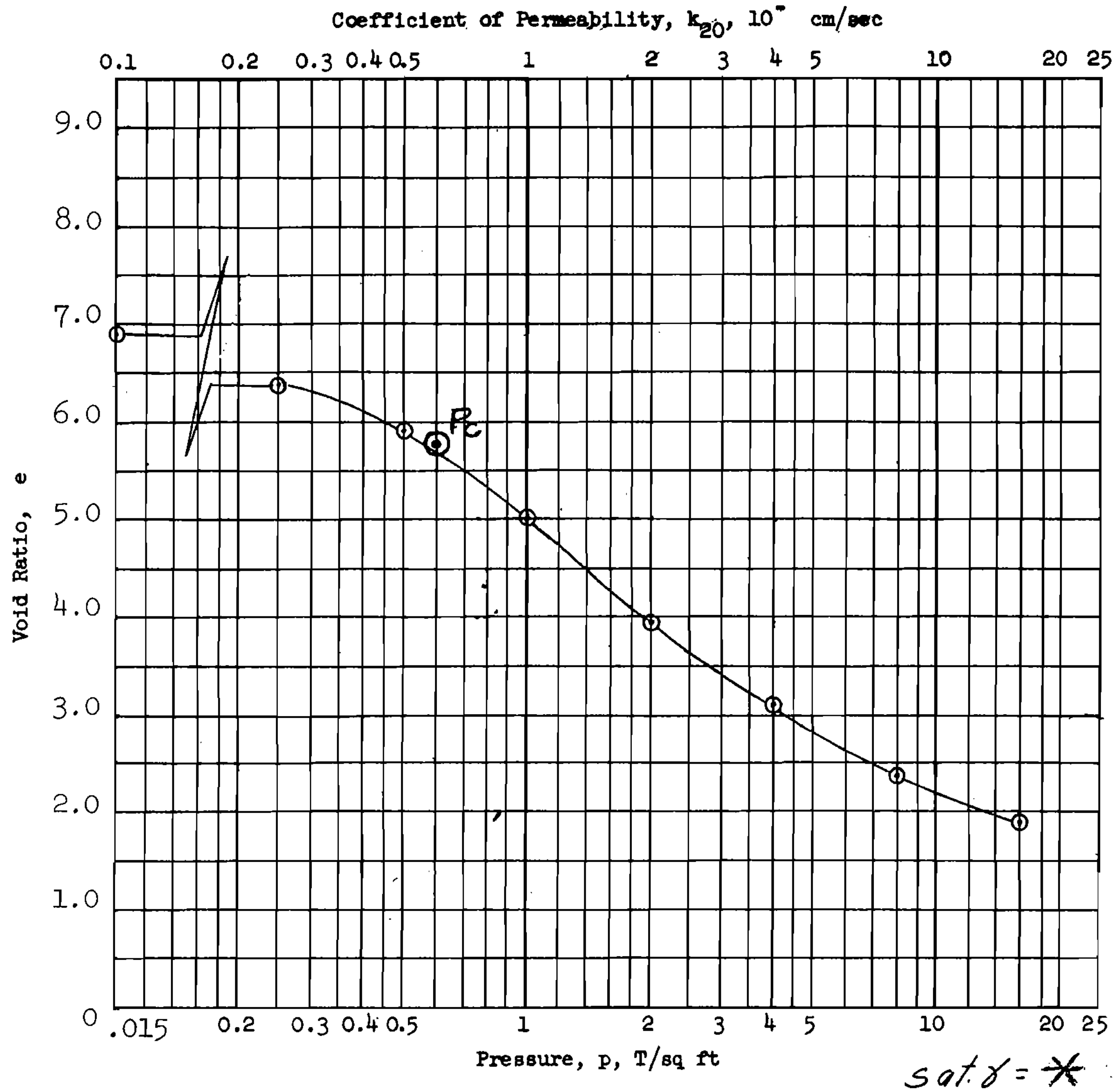
ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC

AREA (OUTFALL CANALS) ALONG 17th ST.CANAL

BORING NO.	5-MUW	SAMPLE NO.	5-C
~~DEPTH~~ EL	- 8.0	DATE	8 March 1971

BWG **DIRECT SHEAR TEST REPORT**

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) ... SOILS TEST SECTION PLATE IX-3



sat γ = *

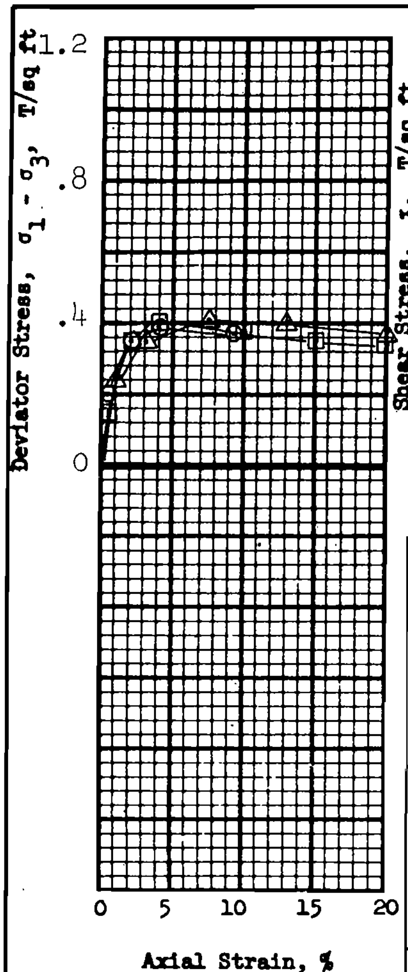
Type of Specimen UNDISTURBED		Before Test		After Test
Diam 4.25 in.	Ht 1.165 in.	Water Content, w_o	363.1 %	w_f %
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	6.98	e_f
Preconsol. Pressure, p_c 0.60 T/sq ft		Saturation, S_o	95.2 %	S_f %
Compression Index, C_c 3.65		Dry Density, γ_d	102.8 lb/ft^3	
Classification PLASTIC CLAY(CH),*		k_{20} at e_o = × 10^{-} cm/sec		
LL -	G_s 1.83	Project LK. PONT.,LA.&VIC.-HURR. PROT.'71		
PL -	D_{10}	ORLEANS PARISH L.F. LEV. WEST OF IHNC(OUT-		
Remarks *brown, contains 1/2"		Area FALL CANALS)ALONG 17th ST.CANAL(GDM#2,SUPP.#5)		
dia. roots, highly organic		Boring No. 5-MUW	Sample No. 6-C	
*calculated sat γ is		~~Depth~~ El -11.6	Date 10 March 1971	
unreasonable		CONSOLIDATION TEST REPORT		

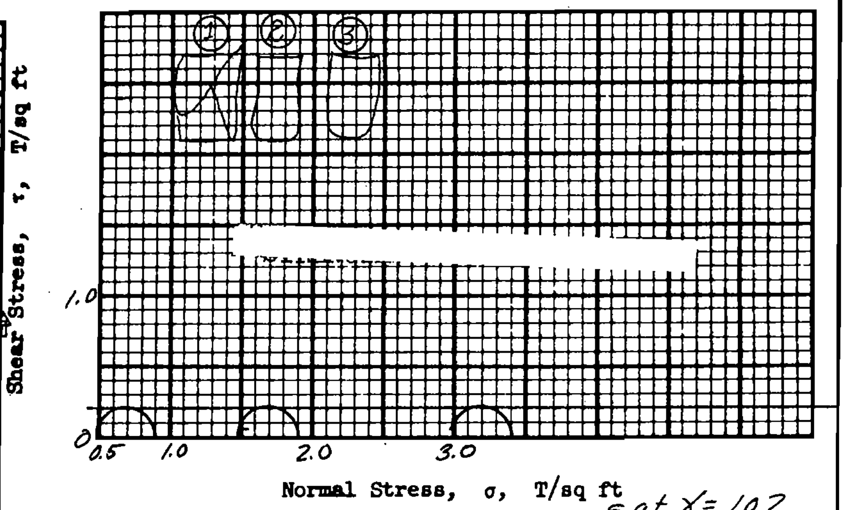
ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

F42

0 3424

[illegible] SOILS TEST SECTI[illegible]





sat. γ = 102

Test No.			1	2	3	Avg.
Initial	Water content	w_o	62.0 %	63.7 %	62.3 %	62.7%
	Void ratio	e_o	1.69	1.72	1.69	
	Saturation	S_o	100+ %	100+ %	99.9 %	%
	Dry density, lb/cu ft	γ_d	63.0	62.3	62.8	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.40	0.39	0.41	
Time to failure, min		t_f	17	24	77	
Rate of strain, percent/min			0.234	0.167	0.098	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.41	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.20 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Type of test Q	Type of specimen UNDISTURBED
Classification	PLASTIC CIAY(CH),gray, contains silt lenses

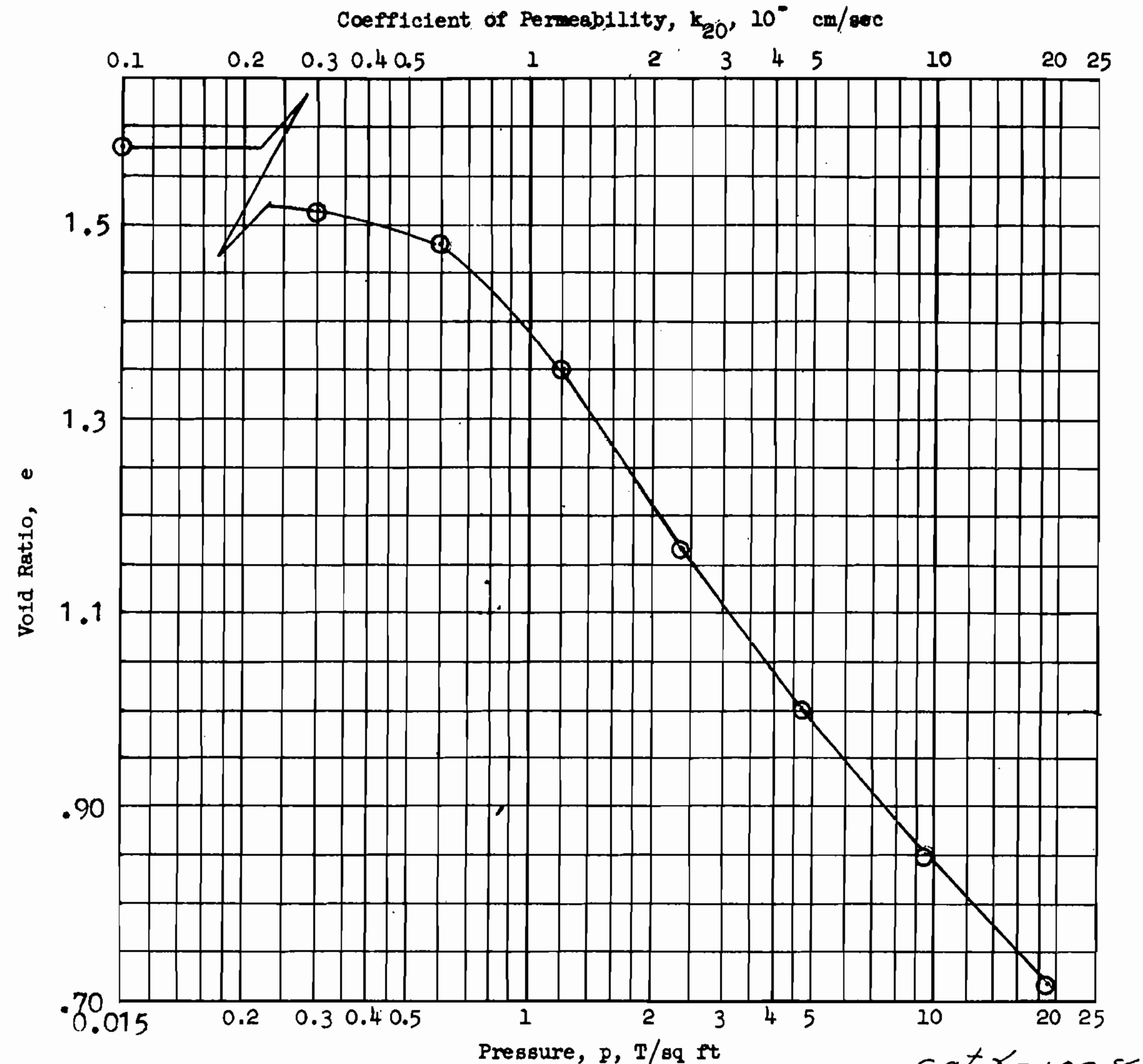
LL 78	PL 21	PI 57		G_s 2.71

Remarks ________

Project LK. PONT.,LA.&VIC.-HURR. PROT-71
ORLEANS PARISH LK.F. LEVEE WEST OF IHNC(OUT-
Area FALL CANALS)ALONG 17th St.CANAL(GDM #2 SUPP. # 5)

Boring No. 5-MUW	Sample No. 9-B
Depth El -23.1	Date 8 March 1971

JMS **TRIAXIAL COMPRESSION TEST REPORT**



sat. γ = 103.8

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.163 in.	Water Content, w_o	57.0 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.58	e_f	
Preconsol. Pressure, p_c 0.72 T/sq ft		Saturation, S_o	97.5 %	S_f	%
Compression Index, C_c 0.43		Dry Density, γ_d	65.5 lb/ft³		
Classification PLASTIC CLAY(CH)*		k_{20} at e_o = × 10⁻ cm/sec			

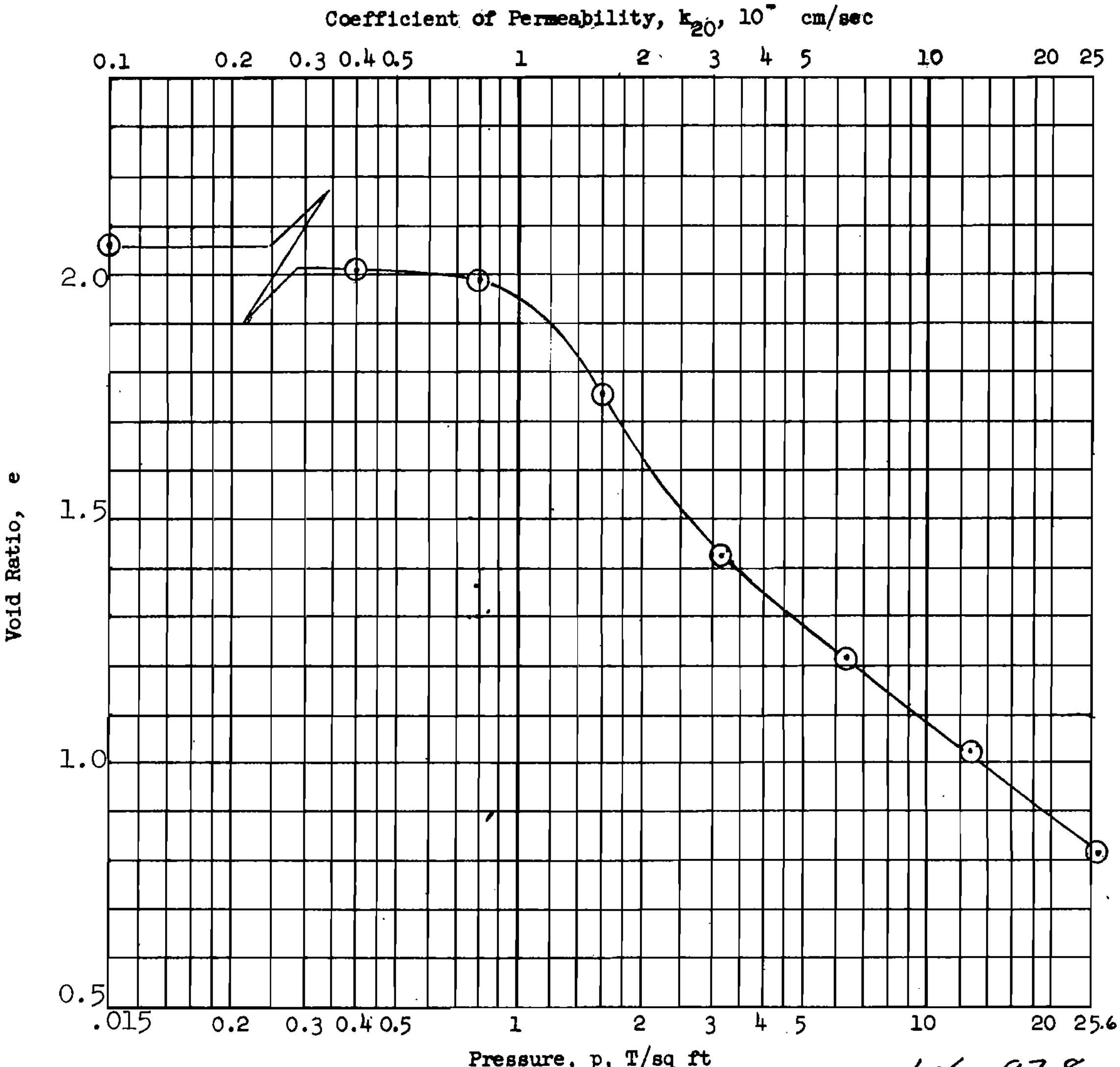
LL -	G_s 2.71 From Q
PL -	D_{10}
Remarks *gray, contains a 1/8" silt stratum	

Project LK. PONT., LA. & VIC.-HURR. PROT.-'71 ORLEANS PARISH LAKEFRONT LEVEE, WEST OF IHNC (OUTFALL CANALS) ALONG 17th ST. CANAL (GDM#2; SUPP.#5)	
Boring No. 5-MUW	Sample No. 9-B
~~Depth~~ El -23.1	Date 10 March, 1971
JDB **CONSOLIDATION TEST REPORT**	

ENG FORM 2090 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424

F44

DRAINS SOILS TEST SECTION



sat. γ = 97.8

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.165 in.	Water Content, w_o	74.9 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	2.06	e_f	
Preconsol. Pressure, p_c 1.13 T/sq ft		Saturation, S_o	99.4 %	S_f	%
Compression Index, C_c 1.17		Dry Density, γ_d	55.8 lb/ft^3		
Classification PLASTIC CLAY(CH),*		k_{20} at e_o = × 10^{-} cm/sec			

LL 95	G_s 2.73
PL 24	D_{10}

Remarks *gray

Project LK. PONT., LA.&VIC.-HURR. PROT.'71

ORLEANS PAR. L.F. LEV. WEST OF IHNC(OUTFALL

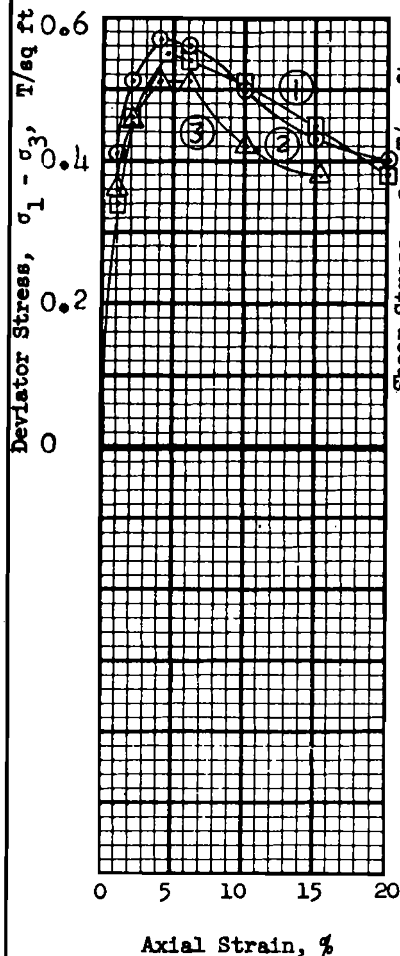
Area CANALS)ALONG17th ST. CANAL(GDM#2,SUPP.#5)

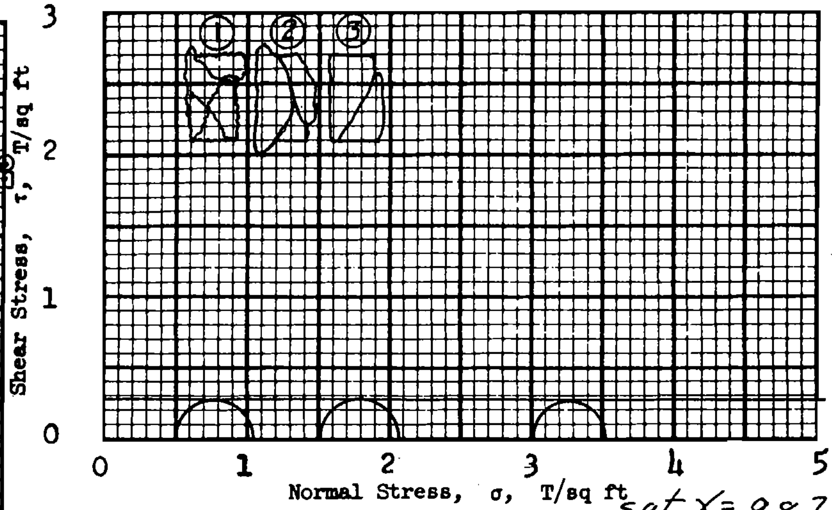
Boring No. 5-MUW	Sample No. 11-B
Depth El -30.9	Date 12 March 1971

CONSOLIDATION TEST REPORT

ENG FORM 2090 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) G 3424

F45





sat γ = 98.7

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.27 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	72.2 %	71.4 %	72.8 %	72.1 %
	Void ratio	e_o	1.97	1.95	2.00	
	Saturation	S_o	100 %	100 %	99.4 %	%
	Dry density, lb/cu ft	γ_d	57.3	57.7	56.9	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.55	0.57	0.51	
Time to failure, min		t_f	28	19	34	
Rate of strain, percent/min			0.163	0.213	0.119	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.40	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH), gray

LL - | PL - | PI - | | G_s 2.73 From 11-B Cons

Remarks ________

Project LK.PONT.LA.,&VIC.-HURR.PROT-1971

ORLEANS PARISH LK.FT.LEVEE, WEST OF IHNC(OUT-

Area FALL CANALS) ALONG 17thST.CANAL(GDM#2,SUPP#5)

Boring No. 5-MUW | Sample No. 11-C

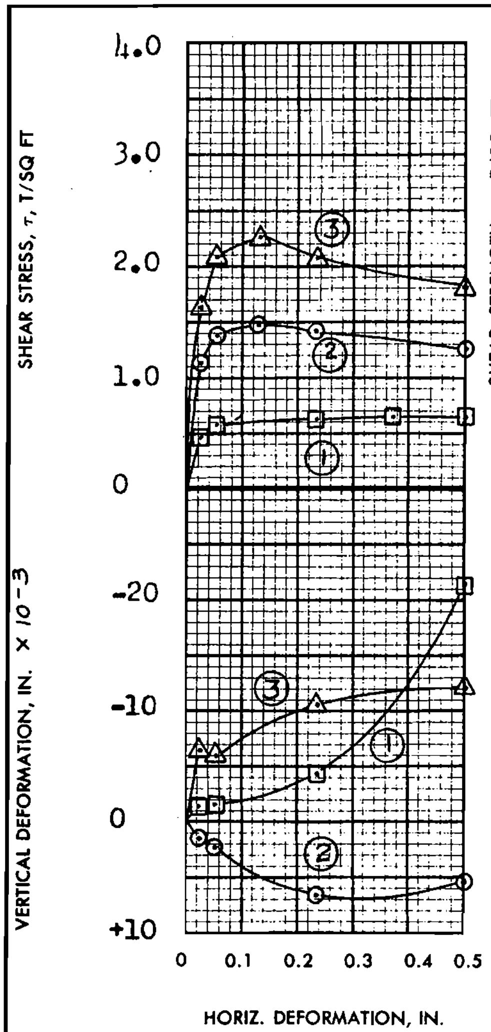
~~Depth~~ El - 31.8 | Date 8 March, 1971

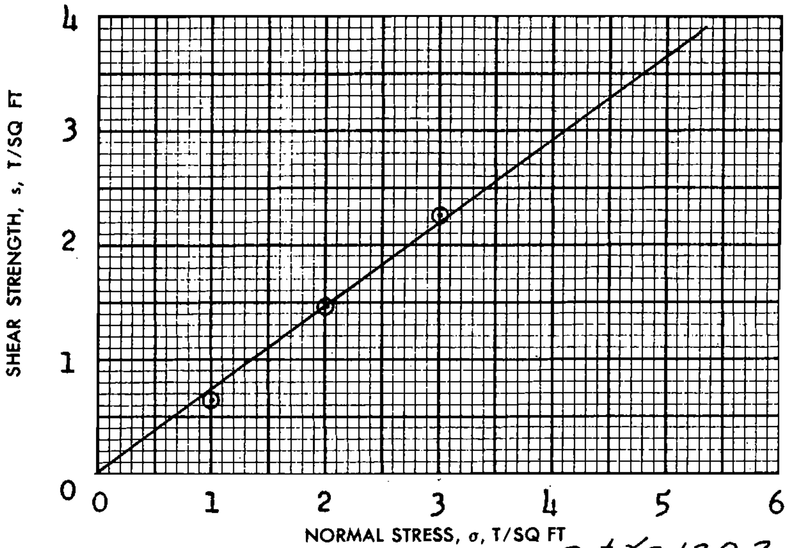
FAM TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

F46 TRANSLUCENT

CHANNELS ... TEST SECTION





Sat. γ = 120.2

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	26.8 %	26.9 %	26.0 %	25.6%
	VOID RATIO	e_o	0.798	0.830	0.785	
	SATURATION	S_o	89.7%	86.5 %	88.4 %	%
	DRY DENSITY, LB/CU FT	γ_d	92.7	91.1	93.4	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	28.1 %	27.3 %	28.5 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.64	1.48	2.27	
ACTUAL TIME TO FAILURE, MIN		t_f	2040	750	750	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 36°

TAN ϕ' = 0.740

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN	UNDISTURBED	3.00 IN. SQUARE	0.550 IN. THICK

CLASSIFICATION SAND(SP), light gray, contains 1/4" dia. shells and shell fragments

LL -	PL -	PI -		G_s 2.67

REMARKS

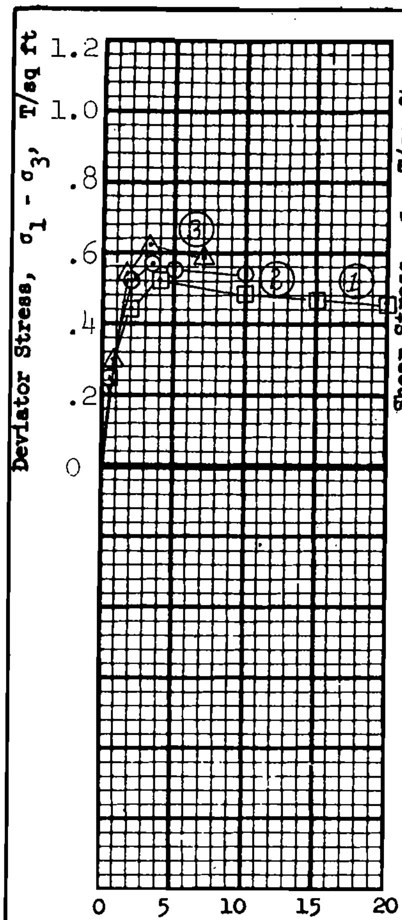
F47

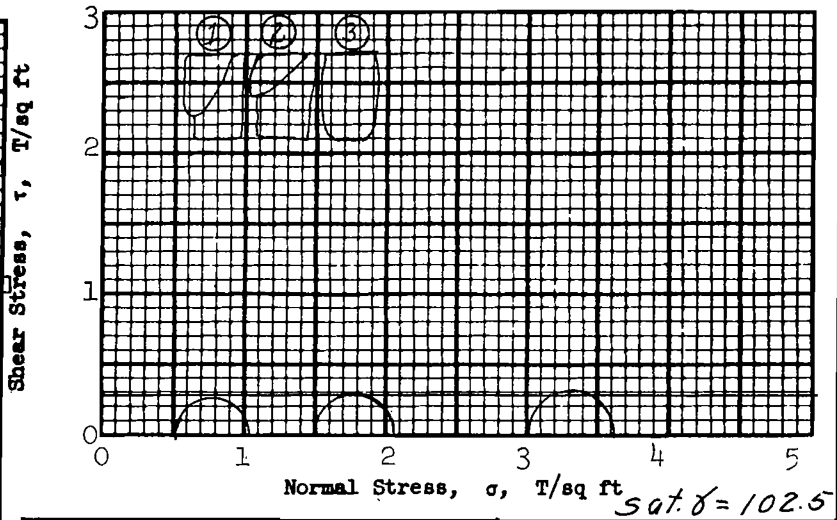
PROJECT LK. PONT. LA., & VIC.-HURR. PROT- 1971

AREA ORLEANS PARISH L.F. LEVEE WEST OF IHNC (OUT-FALL CANALS) ALONG 17th ST. CANAL (GDM#2

BORING NO.	5-MUW	SAMPLE NO.	13-B SUPP.#5)
~~DEPTH~~ EL	- 39.1	DATE	9 March 1971

BWG **DIRECT SHEAR TEST REPORT**





sat. γ = 102.5

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.28 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	60.3 %	61.6 %	56.5 %	59.5 %
	Void ratio	e_o	1.67	1.67	1.57	
	Saturation	S_o	97.1 %	99.2 %	96.8 %	%
	Dry density, lb/cu ft	γ_d	62.9	62.9	65.4	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.52	0.57	0.62	
Time to failure, min		t_f	14	18	32	
Rate of strain, percent/min			0.276	0.198	0.103	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.41	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q | **Type of specimen** UNDISTURBED

Classification PLASTIC CLAY(CH), gray, contains sand and shell fragments

LL 64 | **PL** 22 | **PI** 42 | | G_s 2.69

Remarks ________

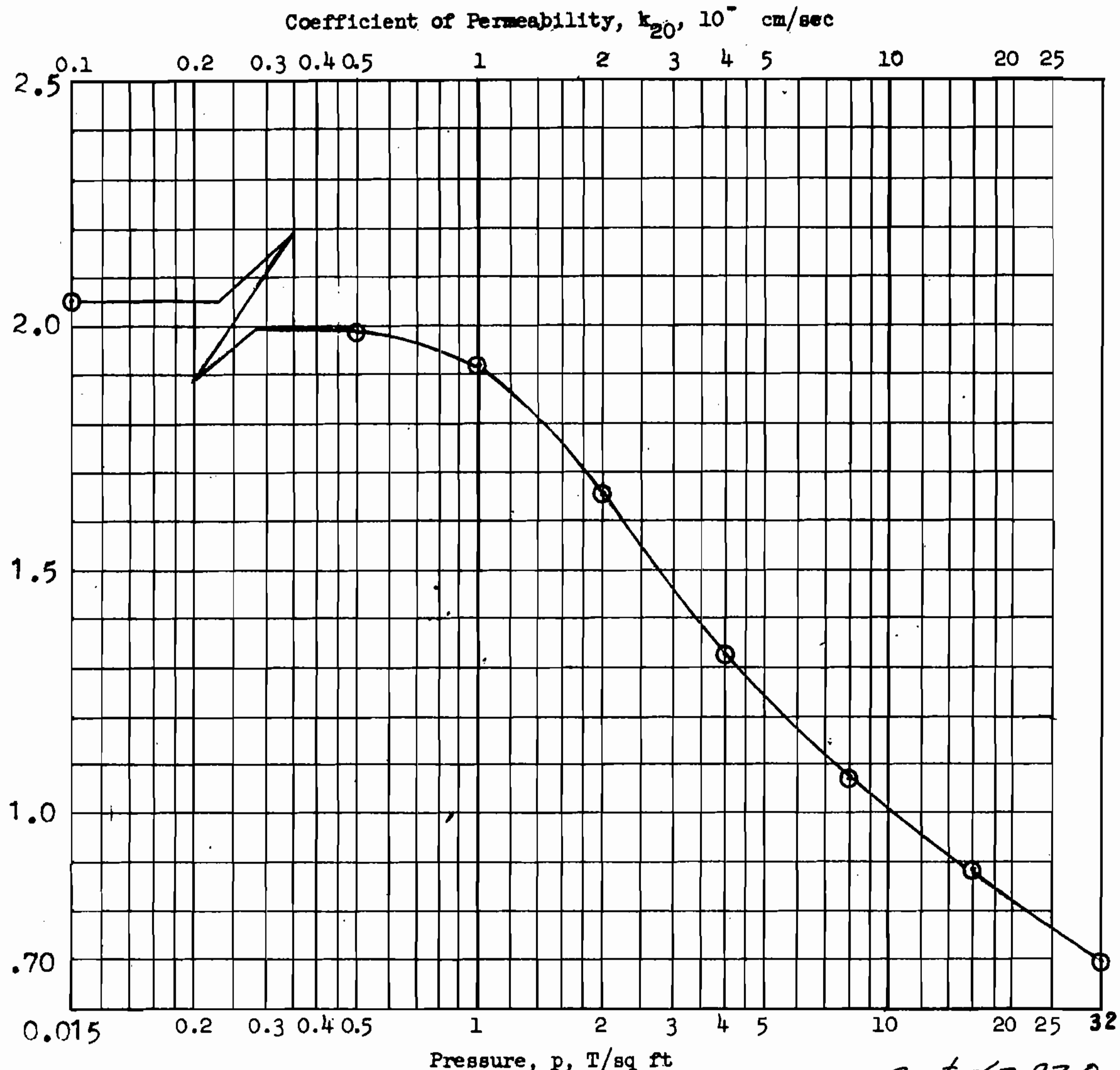
Project LK. PONT.LA.&VIC.-HURR. PROT.'71 ORLEANS PARISH L.F. LEVEE WEST OF IHNC(OUTFALL

Area CANALS)ALONG 17th ST. CANAL(GDM#2,SUPP.#5)

Boring No. 5-MUW | **Sample No.** 16-B

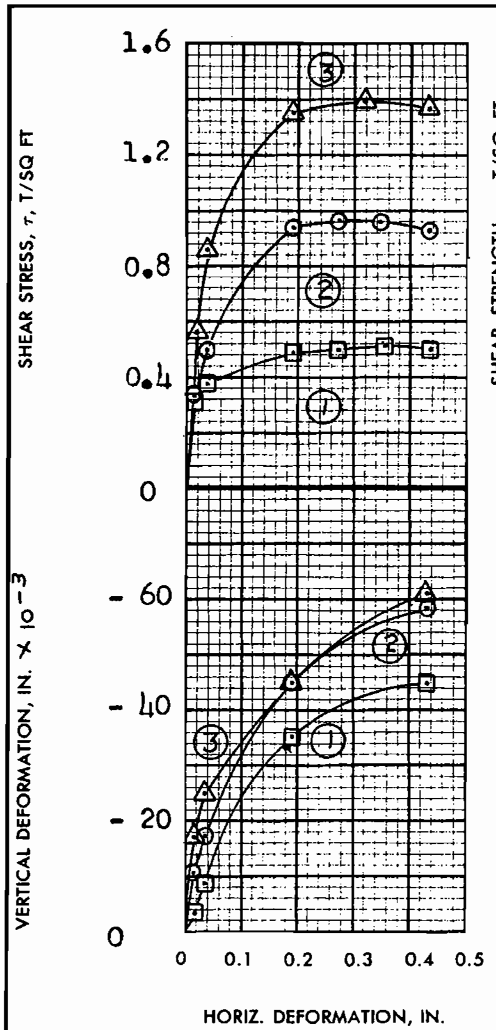
Depth El -50.9 | **Date** 8 March 1971

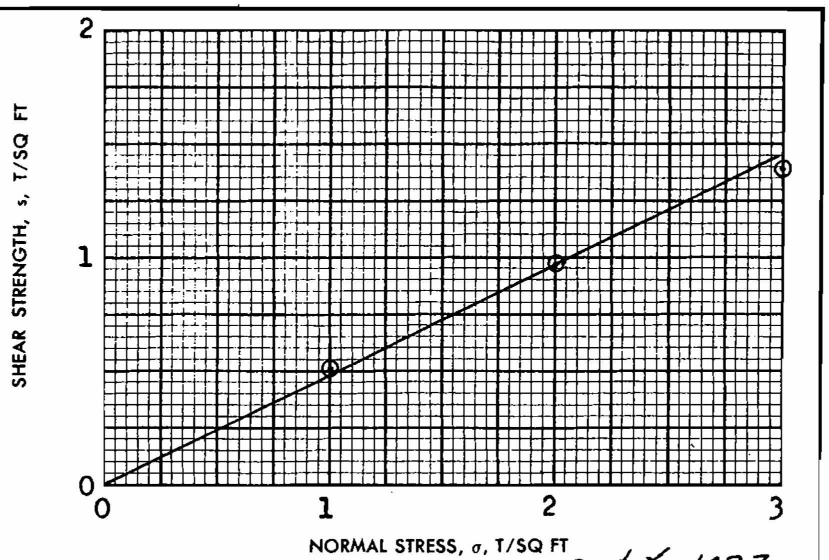
JMS **TRIAXIAL COMPRESSION TEST REPORT**



sat. γ = 97.0

Type of Specimen UNDISTURBED		Before Test	After Test
Diam 4.25 in.	Ht 1.163 in.	Water Content, w_o 76.3 %	w_f %
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o 2.05	e_f
Preconsol. Pressure, p_c 1.41 T/sq ft		Saturation, S_o 100 %	S_f %
Compression Index, C_c 1.10		Dry Density, γ_d 55.0 lb/ft^3	
Classification PLASTIC CLAY(CH),*		k_{20} at e_o = × 10^{-} cm/sec	
LL -	G_s 2.69 From Q	Project LK. PONT., LA. & VIC.-HURR. PROT. '71;	
PL -	D_{10}	ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC	
Remarks * grayish-green, contains		(OUTFALL CANALS) ALONG 17th ST. CANAL (GDM#2; SUPP. #5)	
small sand pockets		Boring No. 5-MUW	Sample No. 16-B
		~~Depth~~ El -50.9	Date 15 March, 1971
		JDB CONSOLIDATION TEST REPORT	





sat. γ = 103.7

SHEAR STRENGTH PARAMETERS

ϕ' = 26°

TAN ϕ' = 0.485

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

	TEST NO.		1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	57.0 %	55.9 %	55.5 %	56.1 %
	VOID RATIO	e_o	1.58	1.58	1.57	
	SATURATION	S_o	97.4 %	95.5 %	95.4 %	%
	DRY DENSITY, LB/CU FT	γ_d	65.3	65.3	65.6	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	1	4	4	
FINAL	WATER CONTENT	w_f	47.8 %	42.6 %	38.2 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.51	0.97	1.39	
ACTUAL TIME TO FAILURE, MIN		t_f	2280	1830	2040	
RATE OF STRAIN, IN./MIN			.00016	.00016	.00016	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE — 0.540 IN. THICK

CLASSIFICATION PLASTIC CLAY(CH),gray, contains shell fragments

LL 82 | PL 24 | PI 58 | G_s 2.70

REMARKS

F50

PROJECT LK.PONT.LA.,&VIC.-HURR.PROT.-1971

AREA ORLEANS PARISH LK.FT.LEVEE,WEST OF IHNC(OUTFALL CANALS) ALONG 17thST.CANAL(GDM#2,SUPP#5)

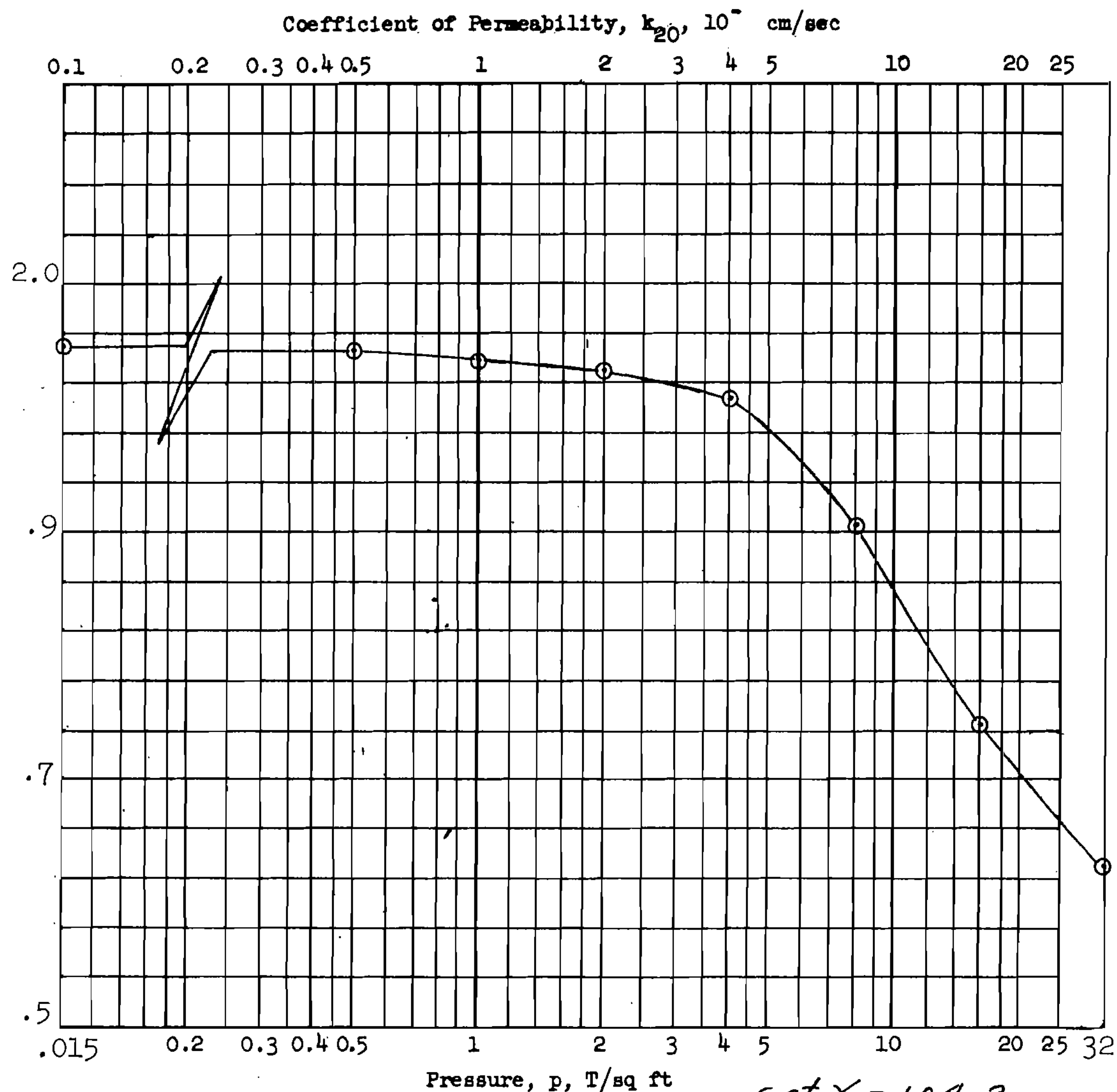
BORING NO. 5-MUW — SAMPLE NO. 17-C

~~DEPTH~~ EL - 56.0 — DATE 10 March, 1971

GDA — **DIRECT SHEAR TEST REPORT**

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

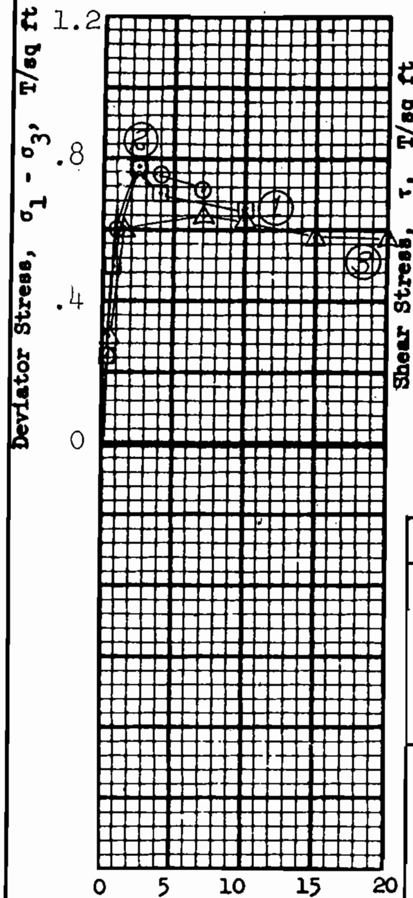
GPO : 1966 OF—214-945

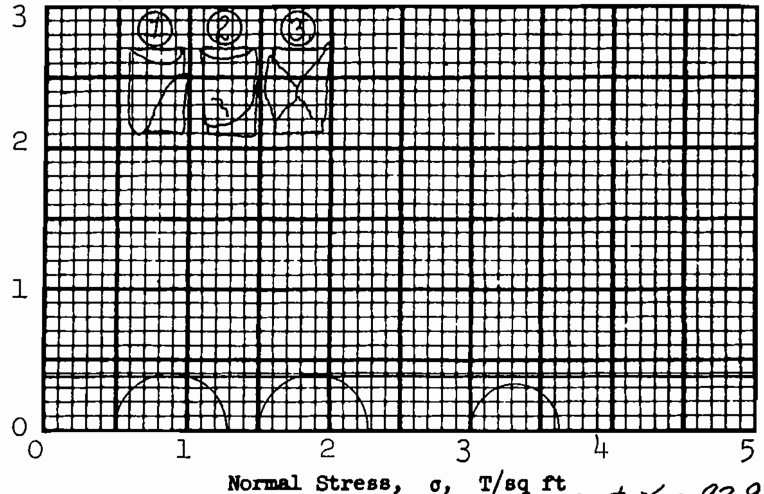


sat. γ = 104.2

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.163 in.	Water Content, w_o	57.8 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.58	e_f	
Preconsol. Pressure, p_c* T/sq ft		Saturation, S_o	99.8 %	S_f	%
Compression Index, C_c*		Dry Density, γ_d	66.0 lb/ft^3		
Classification PLASTIC CLAY(CH)*		k_{20} at e_o = × 10^{-} cm/sec			
LL 81	G_s 2.73	Project LK.PONT.,LA.&VIC.-HURR. PROT.'71			
PL 19	D_{10}	ORLEANS PAR. L.F.LEV.WEST OF IHNC(OUTFALL			
Remarks * gray		Area CANALS)ALONG 17th ST.CANAL(GDM#2,SUPP.#5)			
*Pc & Cc NOT FIGURED		Boring No. 5-MUW		Sample No. 18-C	
BECAUSE SCALE ON ABOVE		Depth El -60.2		Date 15 March 1971	
PLOT IN ERROR		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)





Sat. γ = 93.9

Shear Strength Parameters

φ = 0 °

tan φ = 0

c = 0.37 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	53.6 %	53.3 %	56.3 %	37.7 %
	Void ratio	e_o	1.46	1.46	1.53	
	Saturation	S_o	99.5 %	98.9 %	99.7 %	%
	Dry density, lb/cu ft	γ_d	68.9	68.8	66.8	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.78	0.78	0.64	
Time to failure, min		t_f	14	21	68	
Rate of strain, percent/min			0.182	0.117	0.103	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q | **Type of specimen** UNDISTURBED

Classification PLASTIC CLAY(CH),gray

LL 77 | **PL** 18 | **PI** 59 | G_s 2.71

Remarks ________

Project LK. PONT.,LA.&VIC.-HURR. PROT.-'71

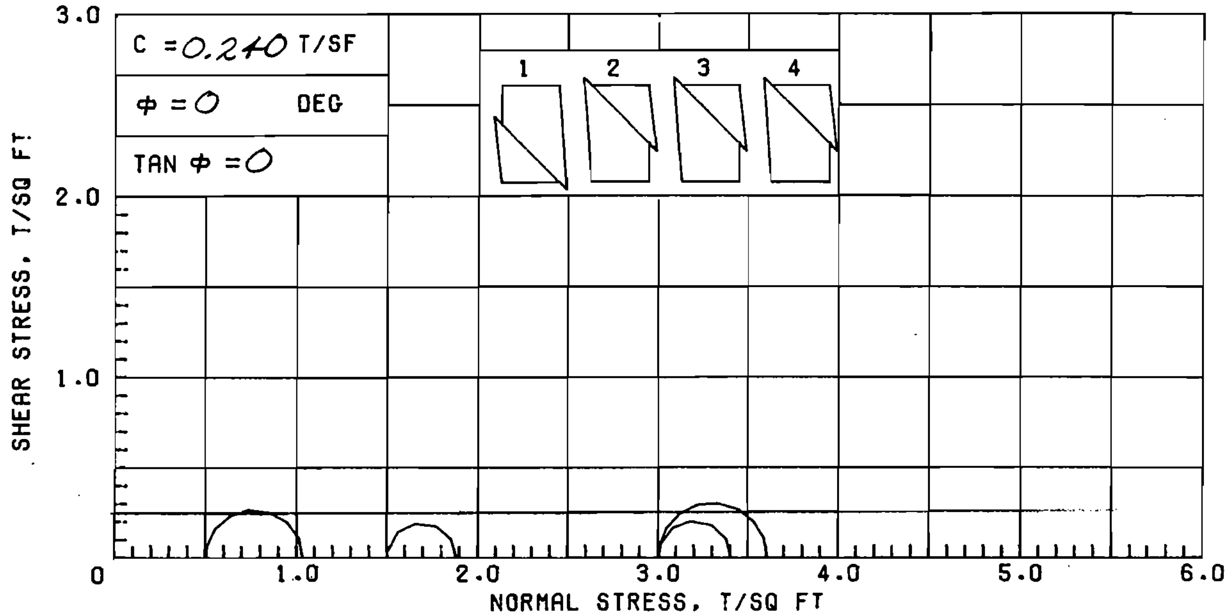
ORLEANS PARISH L.F. LEVEE WEST OF IHNC(OUT-

Area FALL CANALS)ALONG 17th ST.CANAL(GDM#2,SUPP.#5)

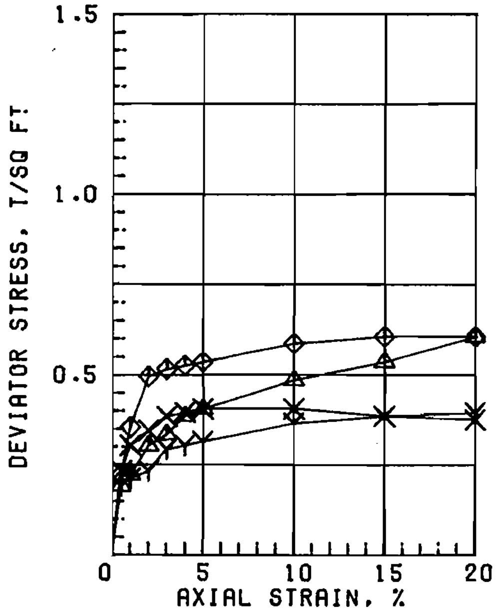
Boring No. 5-MUW | **Sample No.** 18-D

~~**Depth**~~ **El** -60.6 | **Date** 8 March 1971

OHR **TRIAXIAL COMPRESSION TEST REPORT**



γ SAT = 109



		△1	Y2	X3	◇4
	SPECIMEN NO.	△1	Y2	X3	◇4
INITIAL	WATER CONTENT, %	44.6	47.1	47.7	44.1
INITIAL	DRY DENSITY, PCF	76.2	72.8	71.2	73.2
INITIAL	SATURATION, %	99.4	96.7	94.3	91.5
INITIAL	VOID RATIO	1.212	1.315	1.366	1.302
BEFORE SHEAR	WATER CONTENT, %				
BEFORE SHEAR	DRY DENSITY, PCF				
BEFORE SHEAR	SATURATION, %				
BEFORE SHEAR	VOID RATIO				
BEFORE SHEAR	BACK PRESS., TSF				
	MIN PRIN. STRESS, TSF	0.5	1.5	3.0	3.0
	MAX. DEV. STRESS, TSF	0.53	0.38	0.40	0.61
	TIME TO FAILURE, MIN.	30	30	10	30
	RATE OF STRAIN INCR.%				
	INITIAL DIAMETER, IN.	1.39	1.39	1.39	1.39
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	3.00

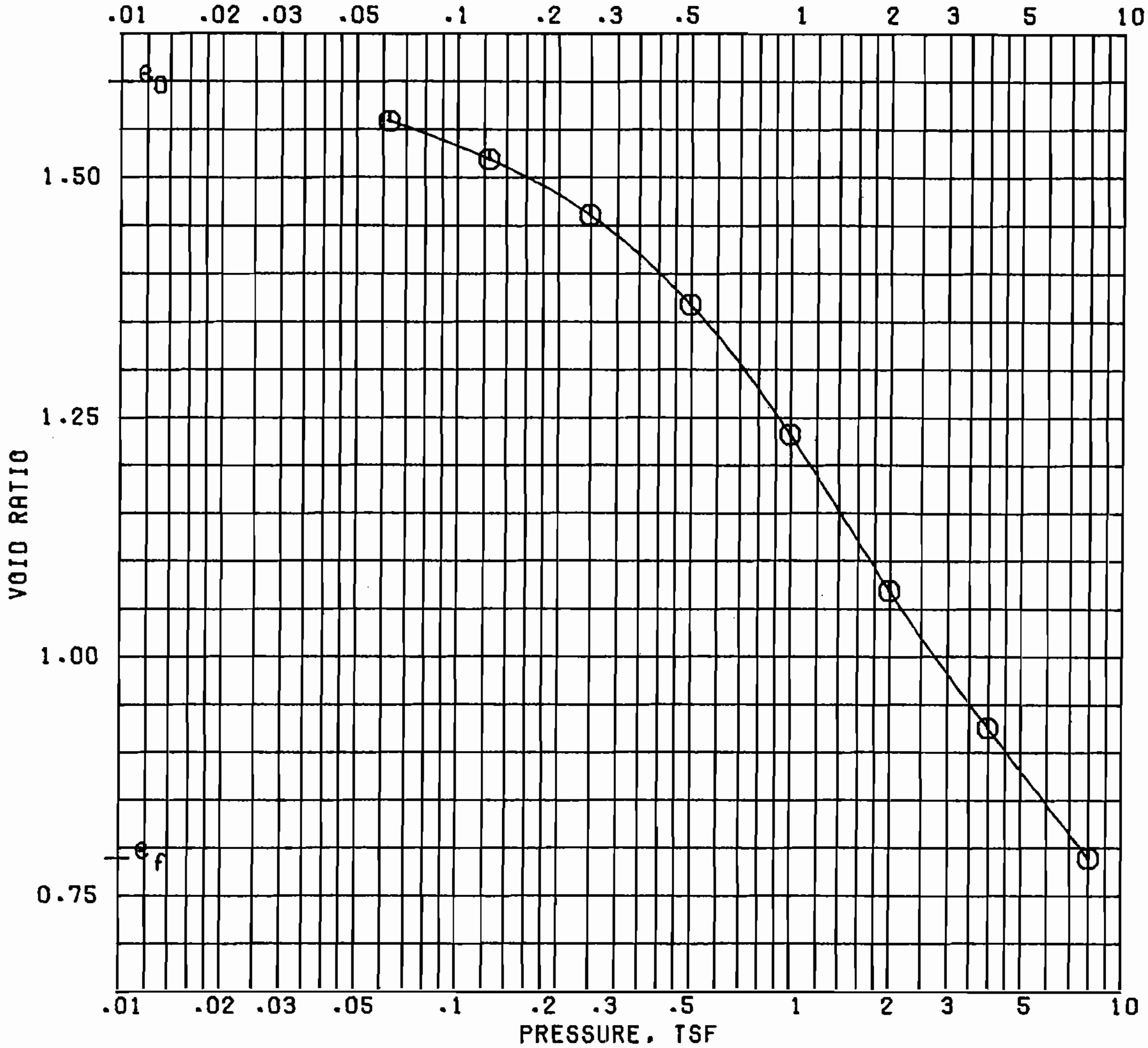
AVG 45.9

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), BROWN; SILT LENSES & POCKETS

LL	PL	PI	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 2-MUG	SAMPLE NO. 3-C
	DEPTH/ELEV 8.9/-1.8	TECH. KOC
	LABORATORY USAE WES	DATE 22 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	

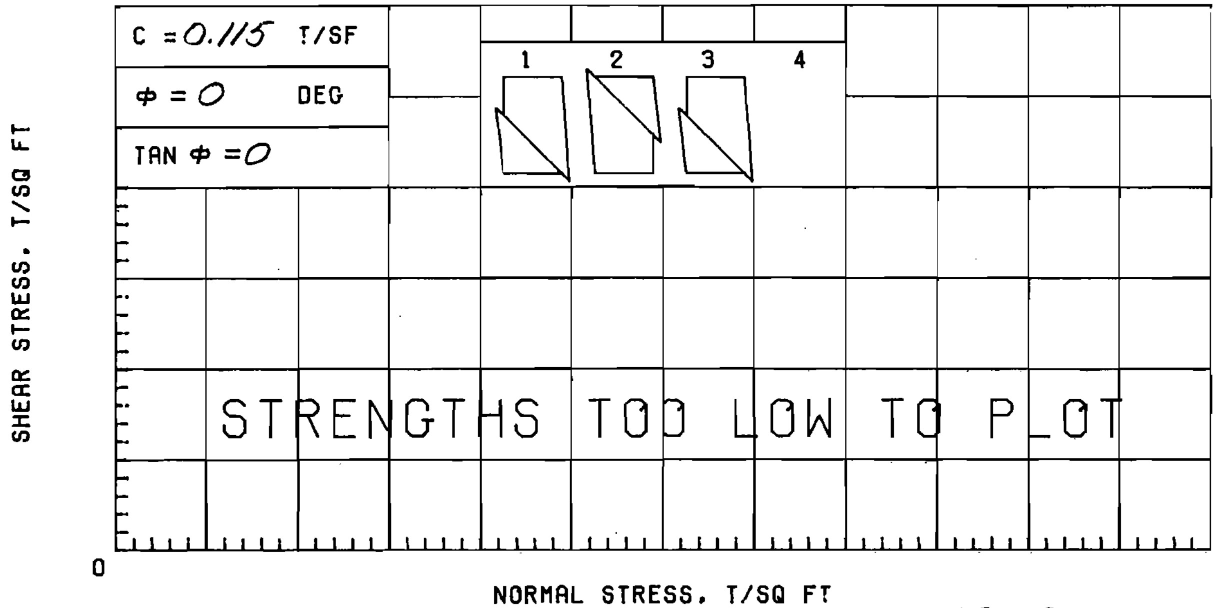


γ SAT = 106

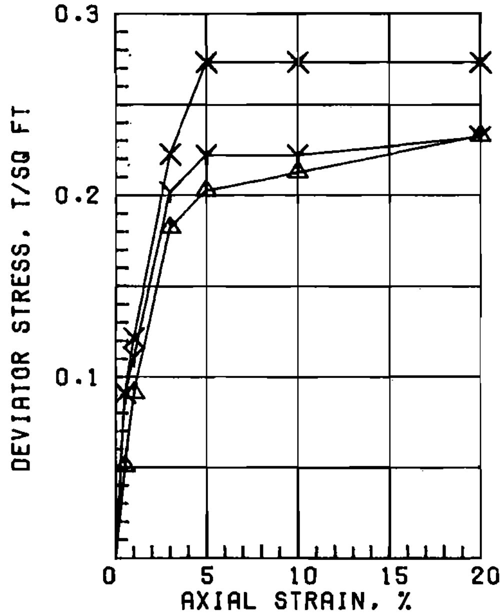
			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	62.8	29.8
PRECONSOL. PRESSURE, TSF	0.31	DRY DENSITY, PCF	64.9	94.3
COMPRESSION INDEX		SATURATION, %	100 +	100 +
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.598	0.788
DIA. IN 4.44	HT. IN 1.120	BACK PRESSURE, TSF		
CLASSIFICATION	PLASTIC CLAY (CH), GRAY			
LL / PL / PI		PROJECT LK PONT LA & VIC HURR PROT		
GS 2.70 (EST)	D_{10}	ORLEANS PARISH OUTFALL CANALS		
REMARKS		BORING NO. 2-MUG	SAMPLE NO. 4-B	
		DEPTH/ELEV 11.5/-4.4	DATE 24 JUL 86	

CONSOLIDATION TEST REPORT

SHEET 1 OF 9



γ SAT = 105



	SPECIMEN NO.	△1	Y2	X3	4
INITIAL	WATER CONTENT, %	56.5	49.6	55.4	
	DRY DENSITY, PCF	65.2	71.3	67.0	
	SATURATION, %	96.2	98.2	98.7	
	VOID RATIO	1.586	1.364	1.516	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
	MIN PRIN. STRESS, TSF	0.5	1.5	3.0	
	MAX. DEV. STRESS, TSF	0.21	0.22	0.27	
	TIME TO FAILURE, MIN.	20	10	10	
	RATE OF STRAIN INCR.,%				
	INITIAL DIAMETER, IN.	1.39	1.39	1.39	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

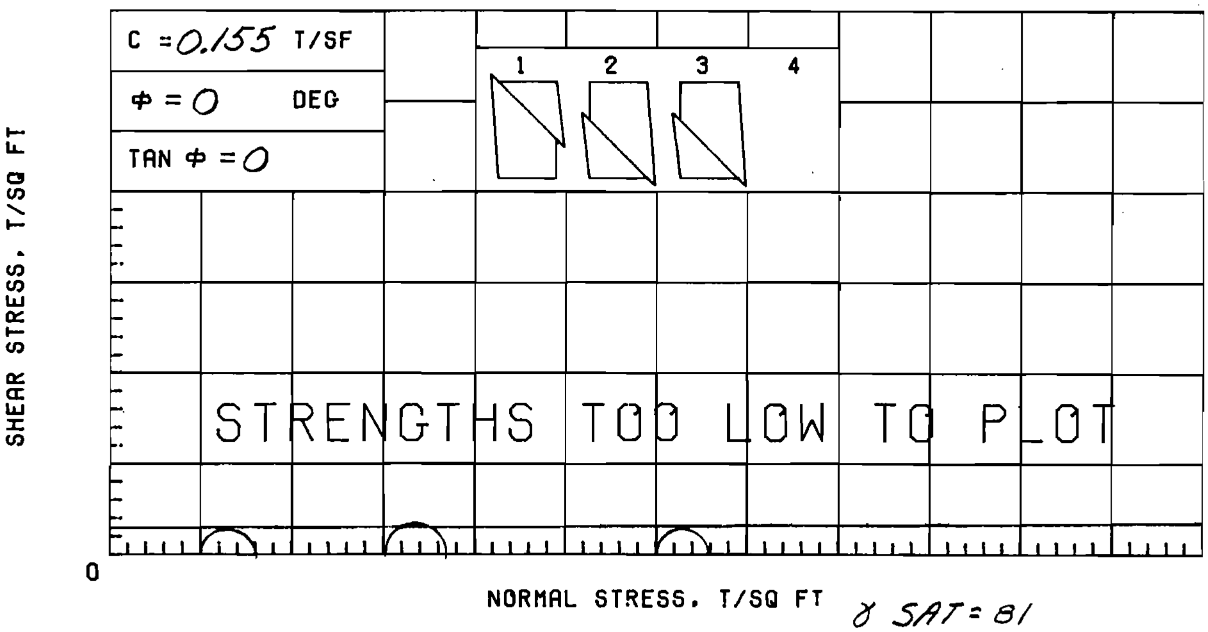
AVG. 53.8

CONTROLLED-STRAIN TEST

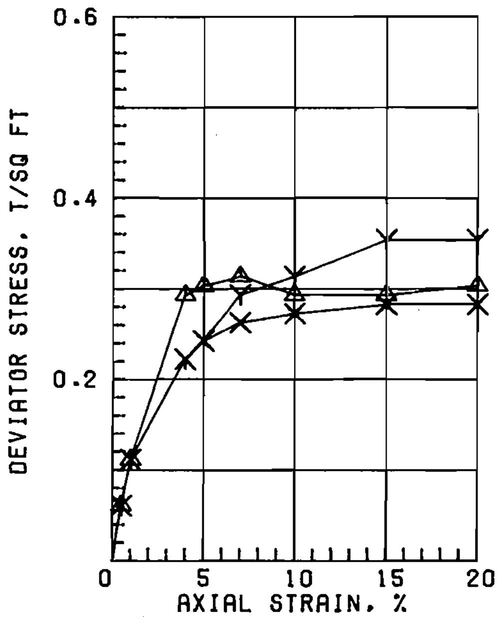
DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; 3/4" ROOT

LL 77	PL 22	PI 55	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 2-MUG	SAMPLE NO. 4-C
	DEPTH/ELEV 12.4/-5.3	TECH. KOC
	LABORATORY USAE WES	DATE 22 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	



γ SAT = 81



		SPECIMEN NO.	△1	Y2	X3	4
INITIAL	WATER CONTENT, %	206.7	157.3	139.7		
	DRY DENSITY, PCF	24.0	29.5	33.9		
	SATURATION, %	92.7	90.3	94.8		
	VOID RATIO	6.021	4.704	3.978		
BEFORE SHEAR	WATER CONTENT, %					
	DRY DENSITY, PCF					
	SATURATION, %					
	VOID RATIO					
	BACK PRESS., TSF					
MIN PRIN. STRESS, TSF		0.5	1.5	3.0		
MAX. DEV. STRESS, TSF		0.31	0.35	0.28		
TIME TO FAILURE, MIN.		14	30	30		
RATE OF STRAIN INCR,%						
INITIAL DIAMETER, IN.		1.39	1.39	1.39		
INITIAL HEIGHT, IN.		3.00	3.00	3.00		

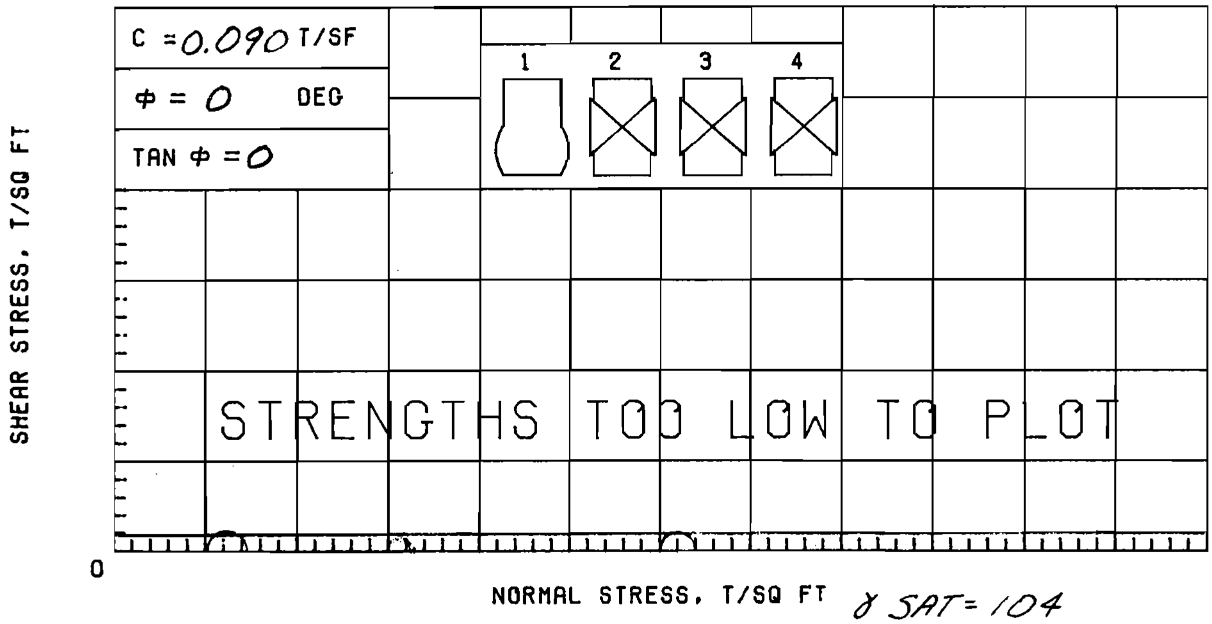
AVG
167.9

CONTROLLED-STRAIN TEST

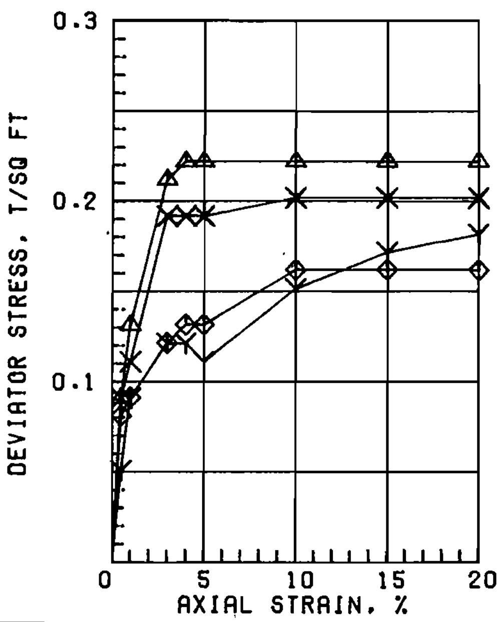
DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), DARK BROWN;
ORGANIC MATERIAL

LL 248	PL 61	PI 187	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	PROJECT LK PONT LA & VIC HURR PROT
	ORLEANS PARISH OUTFALL CANALS
	BORING NO. 2-MUG — SAMPLE NO. 4-D
	DEPTH/ELEV 13.4/-6.3 — TECH. KOC
	LABORATORY USAE WES — DATE 25 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT



γ SAT = 104



	SPECIMEN NO.	△1	Y2	X3	◇4
INITIAL	WATER CONTENT, %	55.7	59.3	57.8	57.4
	DRY DENSITY, PCF	66.5	64.0	65.0	65.4
	SATURATION, %	97.9	98.0	97.9	98.2
	VOID RATIO	1.536	1.634	1.594	1.578
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
	MIN PRIN. STRESS, TSF	0.5	1.5	3.0	1.5
	MAX. DEV. STRESS, TSF	0.22	0.12	0.19	0.13
	TIME TO FAILURE, MIN.	8	18	18	24
	RATE OF STRAIN INCR.,%		6	6	6
	INITIAL DIAMETER, IN.	1.39	1.39	1.39	1.39
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	3.00

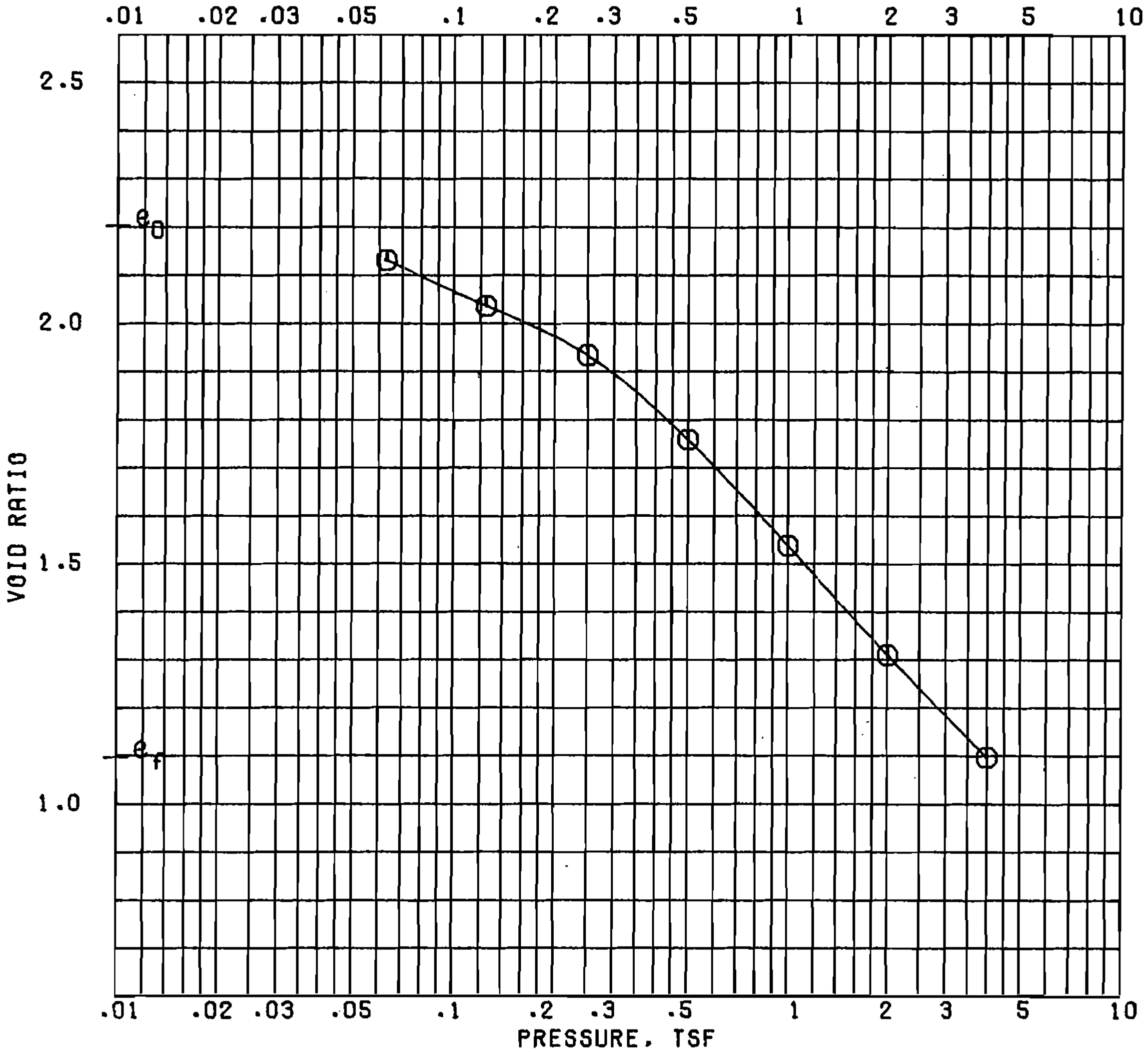
AVG. 57.6

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SILT POCKETS; SHELL PARTICLES

LL 59	PL 18	PI 41	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	PROJECT LK PONT LA & VIC HURR PROT ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 2-MUG	SAMPLE NO. 7-C
	DEPTH/ELEV 24.7/-17.6	TECH. KOC
	LABORATORY USAE WES	DATE 25 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	

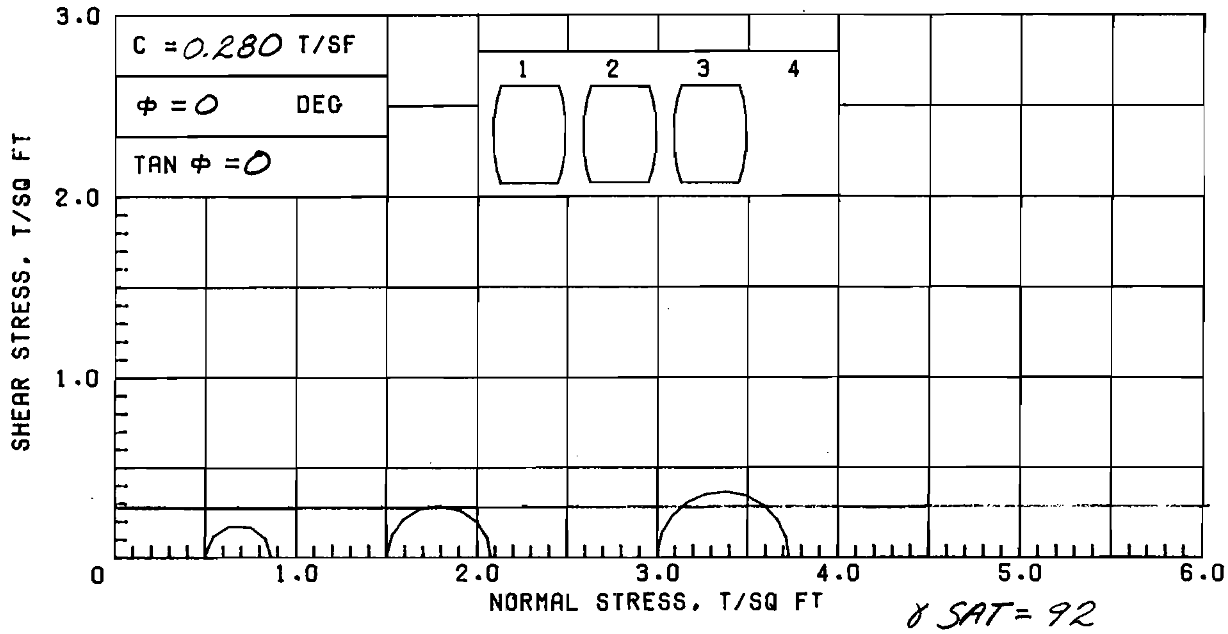


γ SAT = 96

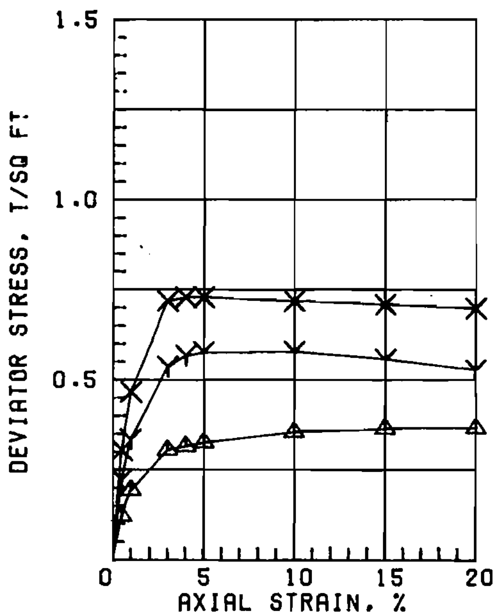
				BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF			WATER CONTENT, %	79.6	41.1
PRECONSOL. PRESSURE, TSF		0.32	DRY DENSITY, PCF	52.7	80.5
COMPRESSION INDEX			SATURATION, %	97.8	100 +
TYPE SPECIMEN	UNDISTURBED		VOID RATIO	2.199	1.093
DIA. IN 4.44	HT. IN 1.123		BACK PRESSURE, TSF		
CLASSIFICATION	PLASTIC CLAY (CH), GRAY				
LL	PL	PI	PROJECT LK PONT LA & VIC HURR PROT		
GS 2.70 (EST)	D_{10}		ORLEANS PARISH OUTFALL CANALS		
REMARKS			BORING NO. 2-MUG		SAMPLE NO. 8-B
			DEPTH/ELEV 28.5/-21.4		DATE 28 JUL 86

CONSOLIDATION TEST REPORT

SHEET 1 OF 8



γ SAT = 92



SPECIMEN NO.		Δ1	Y2	X3	4
INITIAL	WATER CONTENT, %	79.9	80.0	75.7	
	DRY DENSITY, PCF	45.7	47.6	47.8	
	SATURATION, %	80.2	85.0	80.8	
	VOID RATIO	2.690	2.542	2.530	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	
MAX. DEV. STRESS, TSF		0.36	0.58	0.73	
TIME TO FAILURE, MIN.		30	10	8	
RATE OF STRAIN INCR.,%					
INITIAL DIAMETER, IN.		1.39	1.39	1.39	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

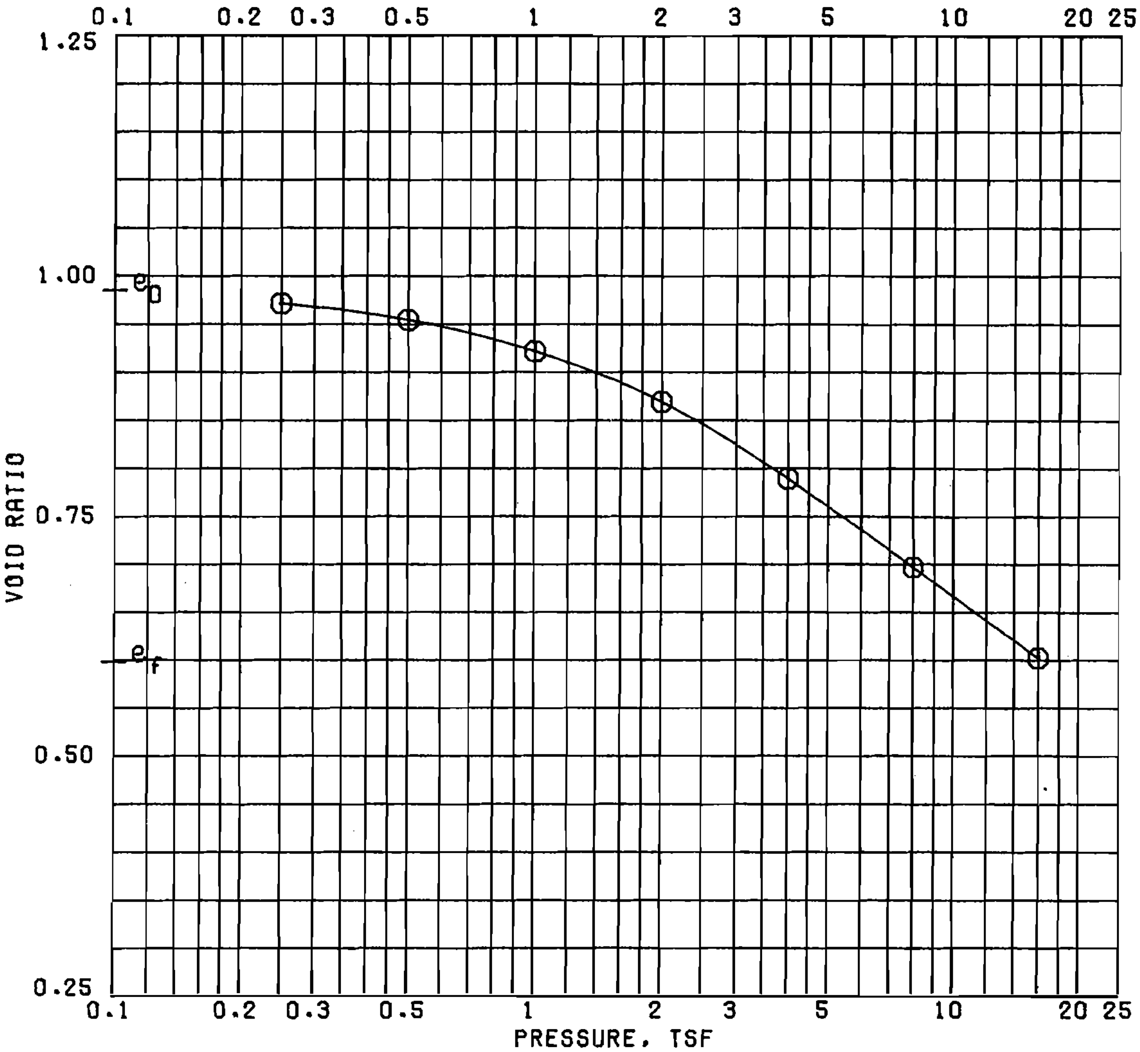
AVG. 78.5

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), DARK BROWN;
ORGANIC MATERIAL

LL 120	PL 46	PI 74	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 3-MUG	SAMPLE NO. 4-B
	DEPTH/ELEV 12.0/-1.1	TECH. KOC
	LABORATORY USAE WES	DATE 26 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	



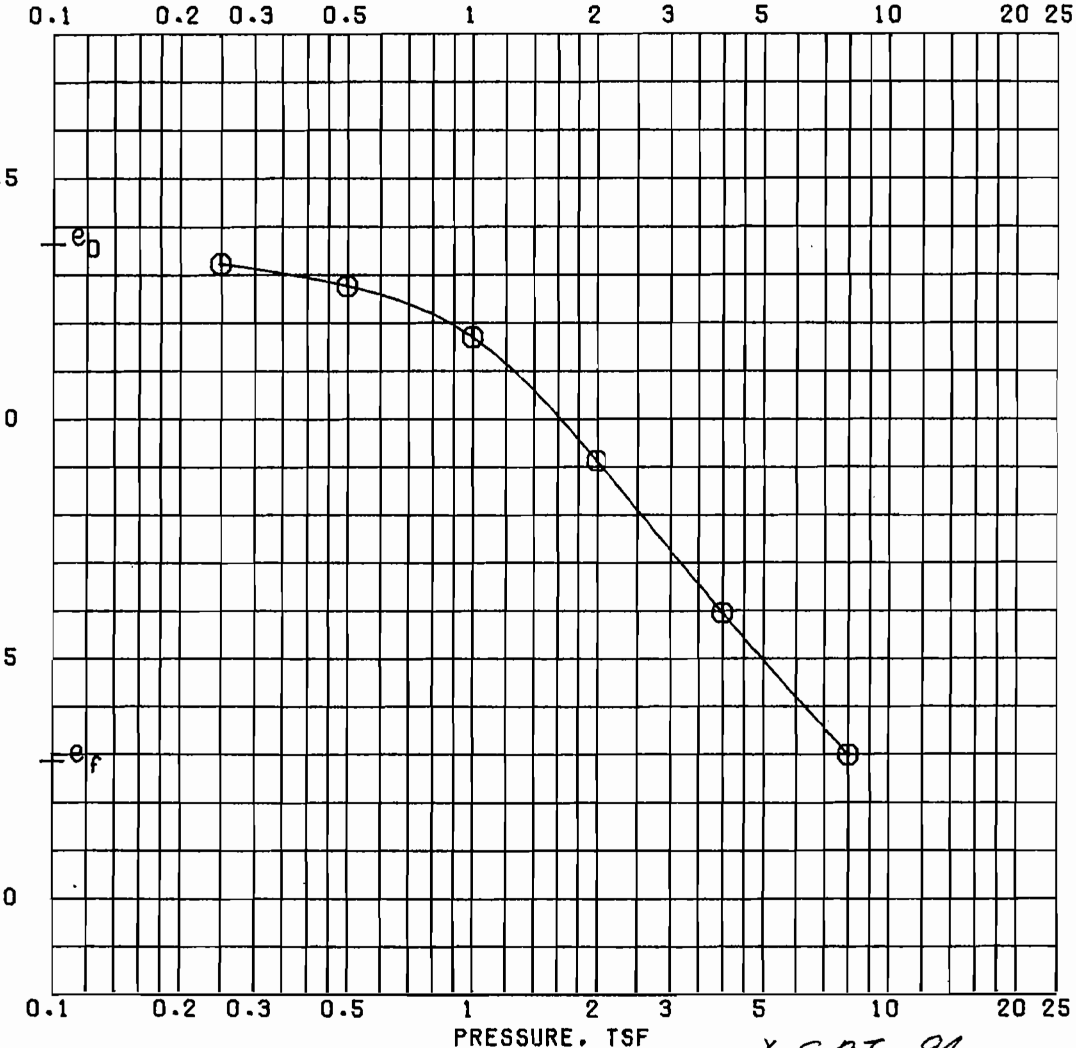
γ SAT = 116

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	32.3	22.5
PRECONSOL. PRESSURE, TSF	1.44	DRY DENSITY, PCF	85.0	105.6
COMPRESSION INDEX		SATURATION, %	88.7	100 +
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	0.983	0.597
DIA. IN 4.44	HT. IN 1.127	BACK PRESSURE, TSF		

CLASSIFICATION	PLASTIC CLAY (CH), GRAY; FINE SAND LENSES

LL	PL	PI	PROJECT LK PONT LA & VIC HURR PROT
GS 2.70 (EST)	D_{10}		ORLEANS PARISH OUTFALL CANALS
REMARKS		BORING NO. 3-MUG	SAMPLE NO. 4-C
		DEPTH/ELEV 12.5/-1.6	DATE 28 JUL 86

CONSOLIDATION TEST REPORT



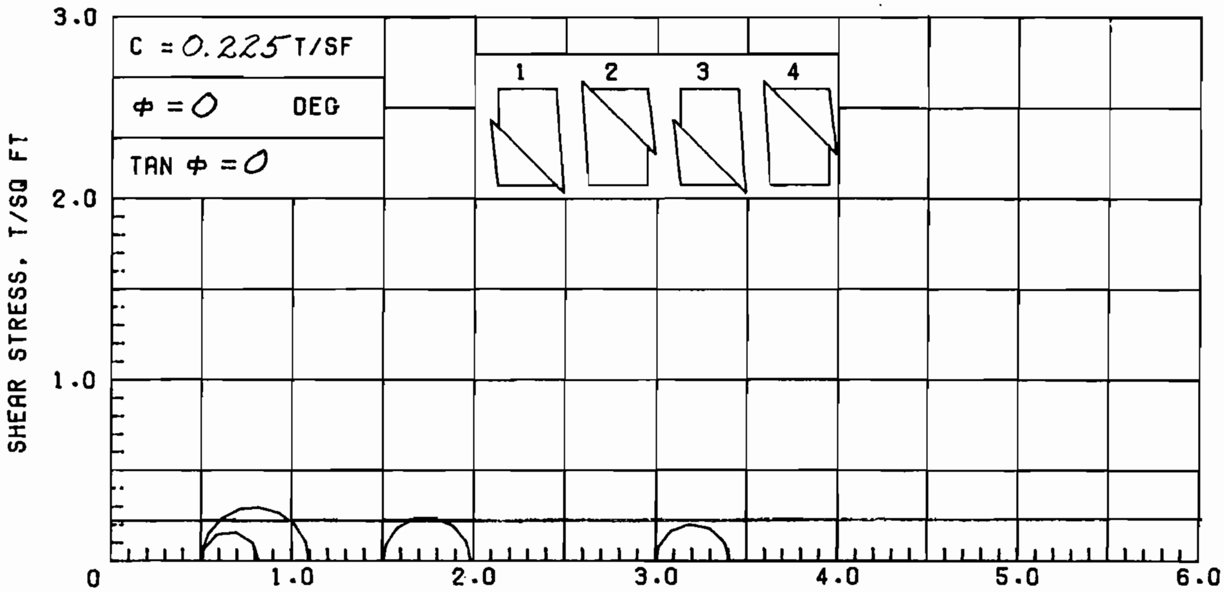
γ SAT = 94

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	82.6	50.2
PRECONSOL. PRESSURE, TSF	1.34	DRY DENSITY, PCF	50.2	73.8
COMPRESSION INDEX		SATURATION, %	94.4	100 +
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	2.360	1.283
DIA. IN 4.44	HT. IN 1.110	BACK PRESSURE, TSF		

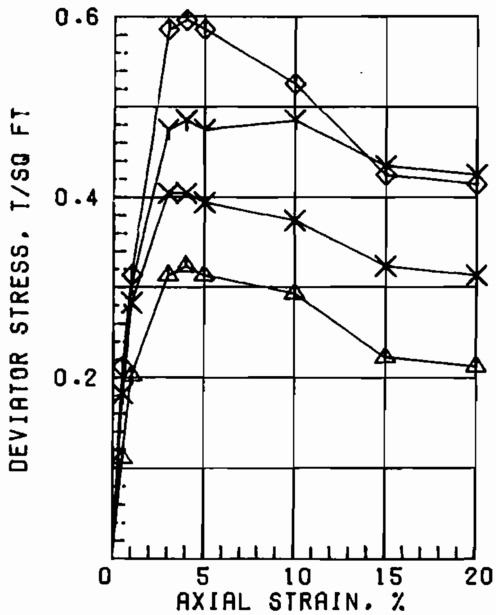
CLASSIFICATION PLASTIC CLAY (CH), GRAY; ROOTLETS			
LL / PL / PI		PROJECT LK PONT LA & VIC HURR PROT	
GS 2.70 (EST)	D_{10}	ORLEANS PARISH OUTFALL CANALS	
REMARKS		BORING NO. 3-MUG	SAMPLE NO. 6-B
		DEPTH/ELEV 19.7/-8.8	DATE 29 JUL 86
		CONSOLIDATION TEST REPORT	

SHEET 1 OF 8

F61



γ SAT = 93



		△1	Y2	X3	◇4	
SPECIMEN NO.		△1	Y2	X3	◇4	AVG.
INITIAL	WATER CONTENT, %	90.5	89.4	87.9	82.1	87.5
	DRY DENSITY, PCF	46.8	48.1	48.9	50.3	
	SATURATION, %	94.0	96.5	97.0	94.3	
	VOID RATIO	2.599	2.503	2.448	2.351	
BEFORE SHEAR	WATER CONTENT, %					
	DRY DENSITY, PCF					
	SATURATION, %					
	VOID RATIO					
	BACK PRESS., TSF					
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	0.5	
MAX. DEV. STRESS, TSF		0.32	0.48	0.40	0.60	
TIME TO FAILURE, MIN.		8	24	18	24	
RATE OF STRAIN INCR.%			6	6	6	
INITIAL DIAMETER, IN.		1.39	1.39	1.39	1.39	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

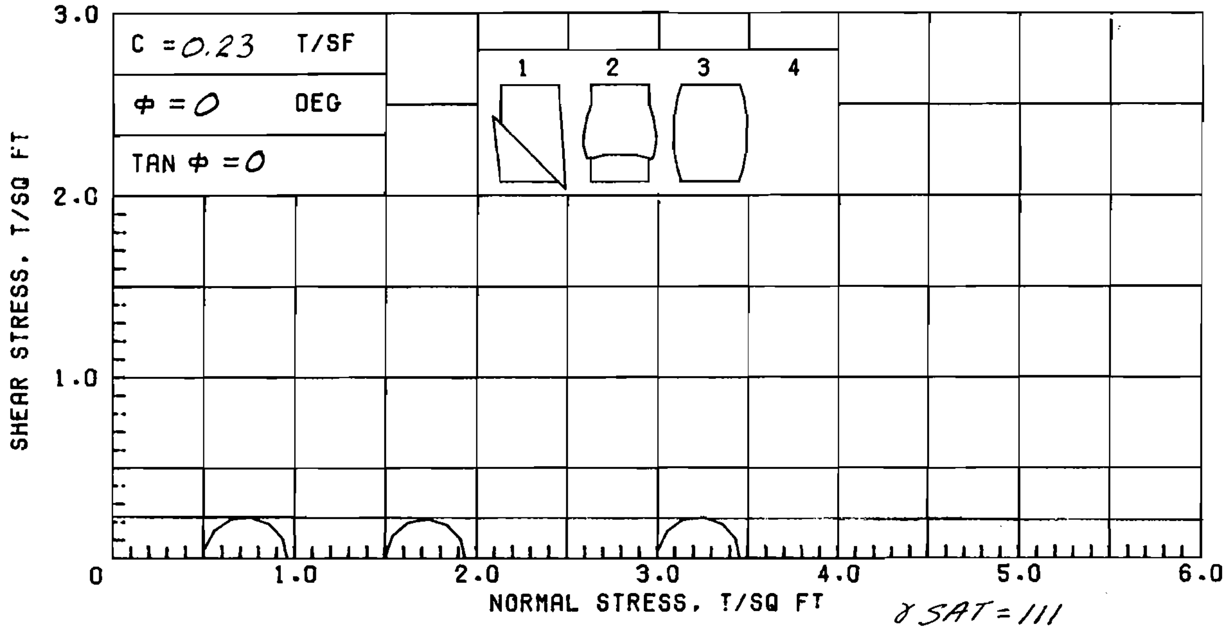
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; DECAYED WOOD

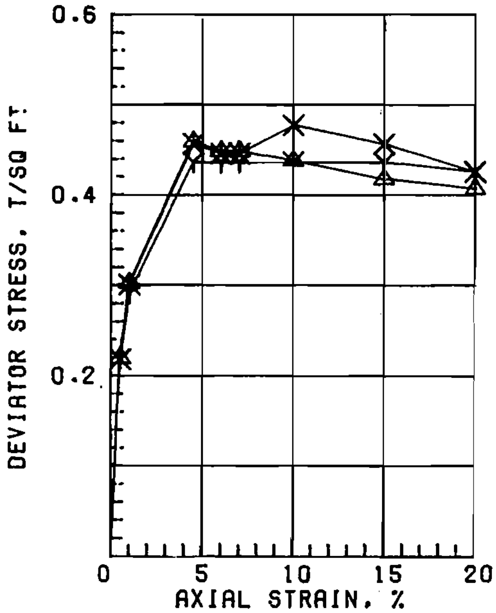
LL 127	PL 31	PI 96	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 3-MUG	SAMPLE NO. 6-C
	DEPTH/ELEV 20.8/-9.9	TECH. KOC
	LABORATORY USAE WES	DATE 27 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	

F62



γ SAT = 111



	SPECIMEN NO.	△1	Y2	X3	4
INITIAL	WATER CONTENT, %	45.8	43.9	40.4	
	DRY DENSITY, PCF	75.1	76.8	79.6	
	SATURATION, %	99.2	99.3	97.7	
	VOID RATIO	1.246	1.194	1.117	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	
MAX. DEV. STRESS, TSF		0.46	0.44	0.46	
TIME TO FAILURE, MIN.		14	14	15	
RATE OF STRAIN INCR,%		7	7	7	
INITIAL DIAMETER, IN.		1.37	1.37	1.37	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

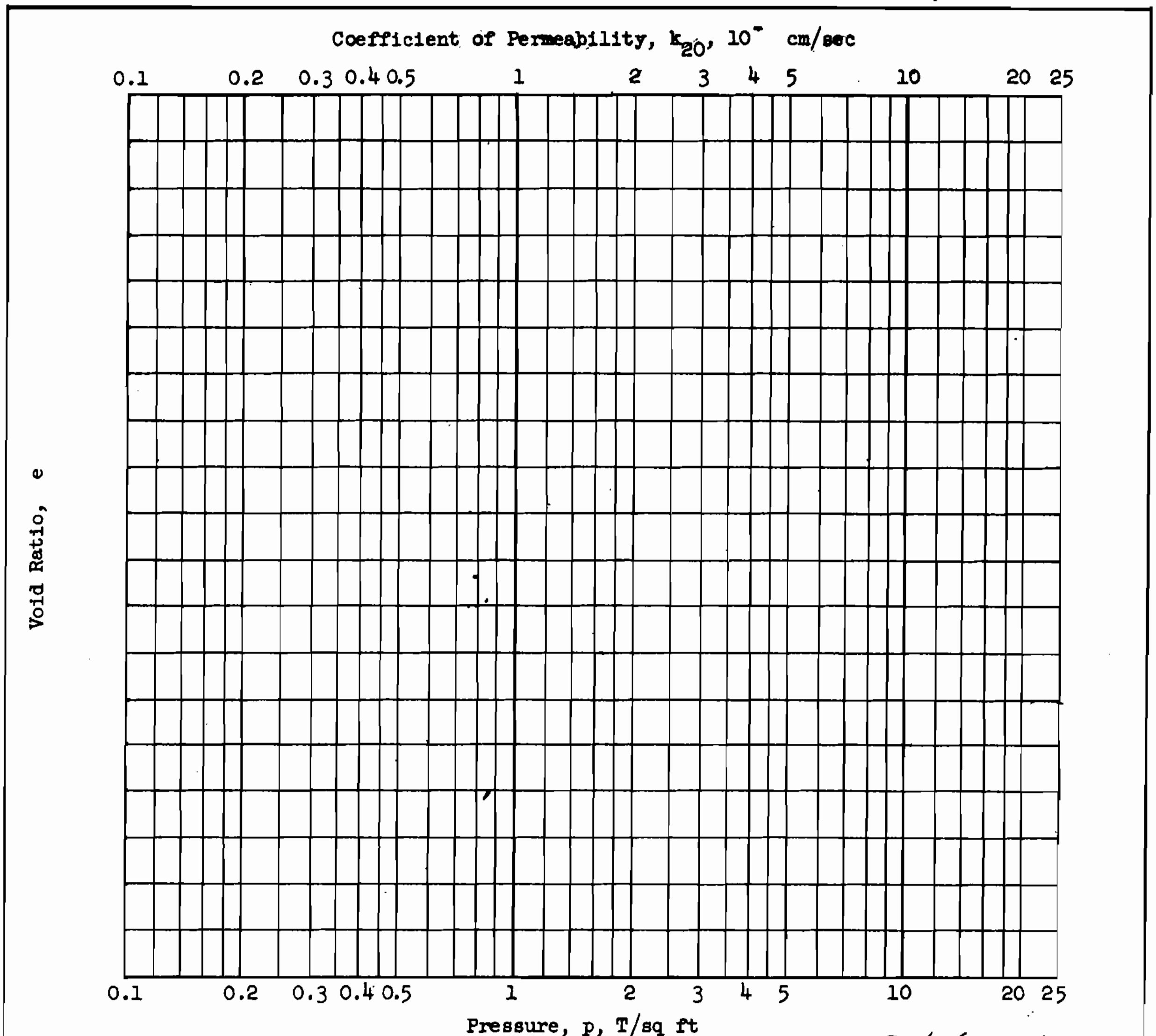
AVG. 43.4

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; SHELL PARTICLES

LL 51	PL 13	PI 38	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 3-MUG	SAMPLE NO. 7-B
	DEPTH/ELEV 24.2/-13.3	TECH. JMS
	LABORATORY USAE WES	DATE 27 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	

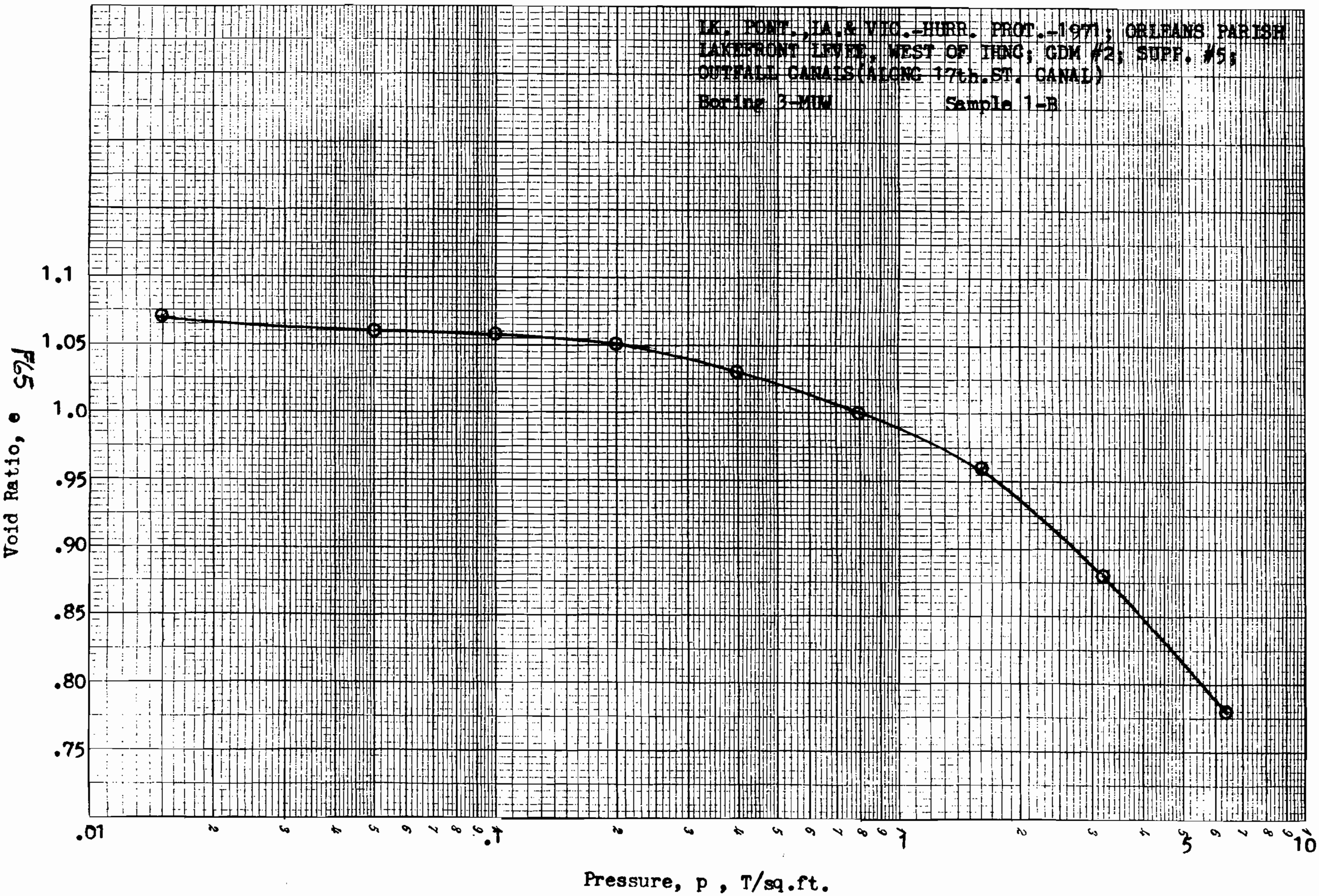


Sat. γ = 114

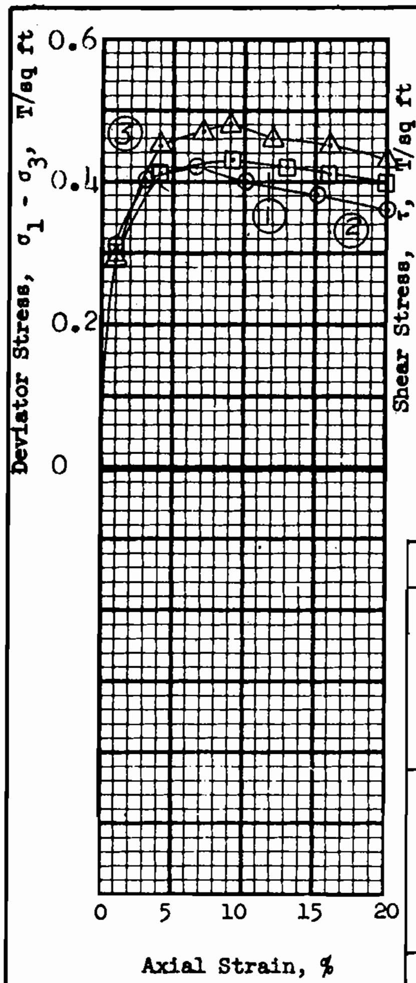
Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.146 in.	Water Content, w_o	25.0 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.07	e_f	
Preconsol. Pressure, p_c 1.41 T/sq ft		Saturation, S_o	63.5 %	S_f	%
Compression Index, C_c 0.33		Dry Density, γ_d	81.8 lb/ft^3		
Classification PLASTIC CLAY(CH),*		k_{20} at e_o = × 10^{-} cm/sec			
LL 51	G_s 2.59 From Undist.	Project LK. PONT.,LA.& VIC.-HURR. PROT.-1971			
PL 23	D_{10}	ORLEANS PARISH LK.FT.LEVEE,WEST OF IHNC;			
Remarks *brown, contains organic		GDM#2;SUPP.#5(ALONG 17th.ST. CANAL)			
matter and zones of clayey silt		Boring No. 3-MUW		Sample No. 1-B	
See attached plot for pressure		~~Depth~~ El -3.2		Date 29 March,1971	
vs void ratio curve		JDB **CONSOLIDATION TEST REPORT**			

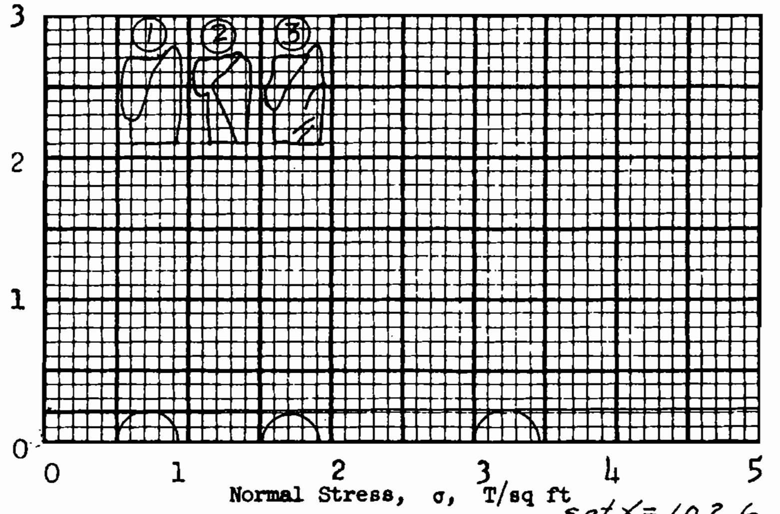
ENG FORM 2090 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) F64 0 3424

USAEWES SOILS TEST SECTION



USAEWES SOILS TEST SECTION





sat.γ = 102.6

Test No.			1	2	3	Avg.
Initial	Water content	w_o	59.5 %	61.3 %	61.1 %	60.6 %
	Void ratio	e_o	1.58	1.66	1.66	
	Saturation	S_o	100+ %	99.3 %	99.0 %	%
	Dry density, lb/cu ft	γ_d	65.1	63.1	63.0	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.43	0.42	0.48	
Time to failure, min		t_f	58	23	21	
Rate of strain, percent/min			0.158	0.272	0.435	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.40	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.22 T/sq ft

Method of saturation ______

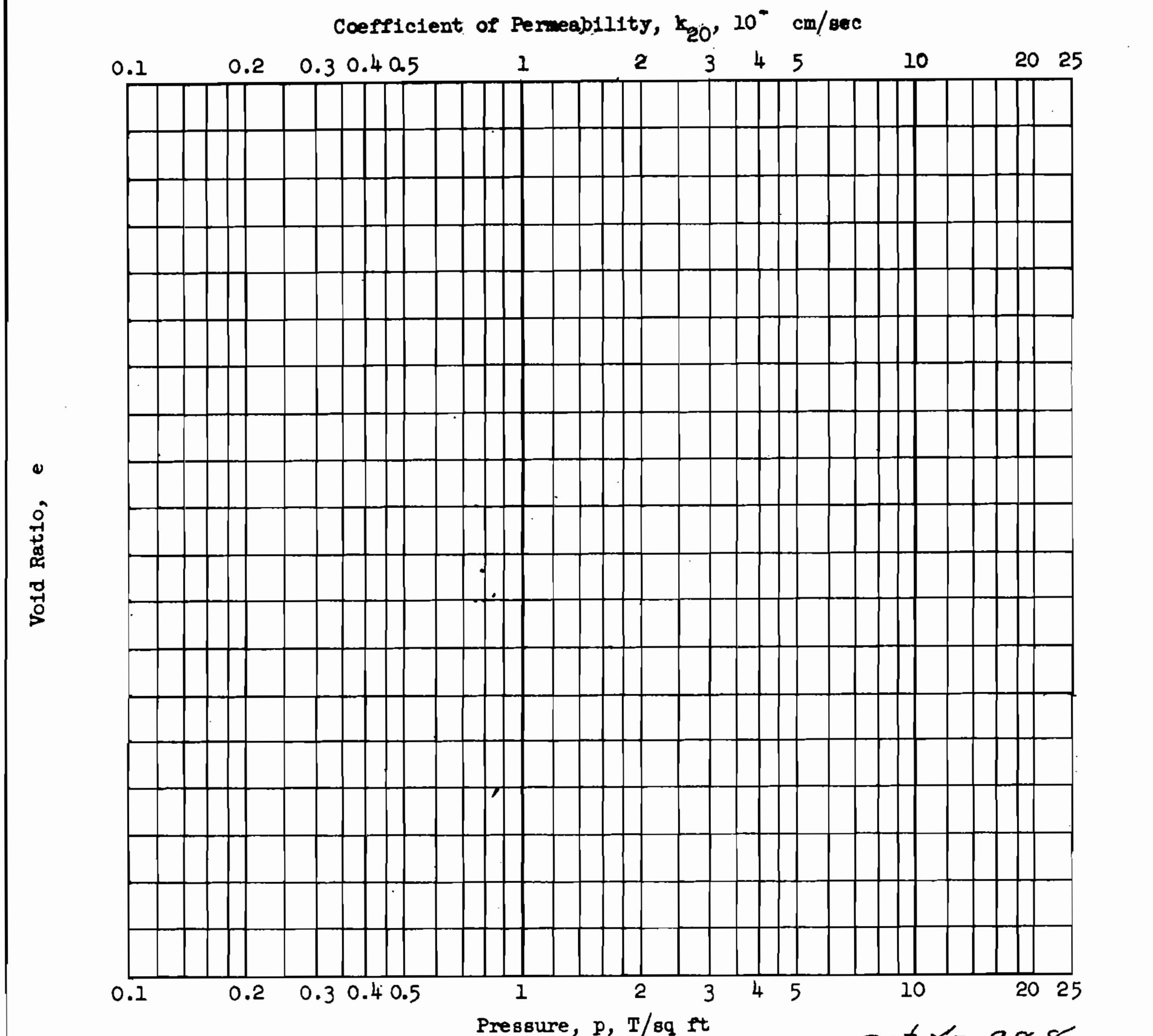
☐ Controlled stress

☒ Controlled strain

Type of test Q	Type of specimen UNDISTURBED			
Classification PLASTIC CLAY(CH),gray, contains numerous rootlets				
LL 105	PL 33	PI 72		G_s 2.69 From Undist.

Remarks ______

Project LK.PONT.LA.,& VIC.-HURR.PROT.-1971	
ORLEANS PARISH LF. LEVEE,WEST OF IHNC,GDM#2,	
Area SUPP.# 5 OUTFALL CANALS(ALONG 17th ST.CANAL)	
Boring No. 3-MUW	Sample No. 2-B
Depth El - 6.7	Date 11 March,1971
FAM TRIAXIAL COMPRESSION TEST REPORT	



sat. γ = 98.8

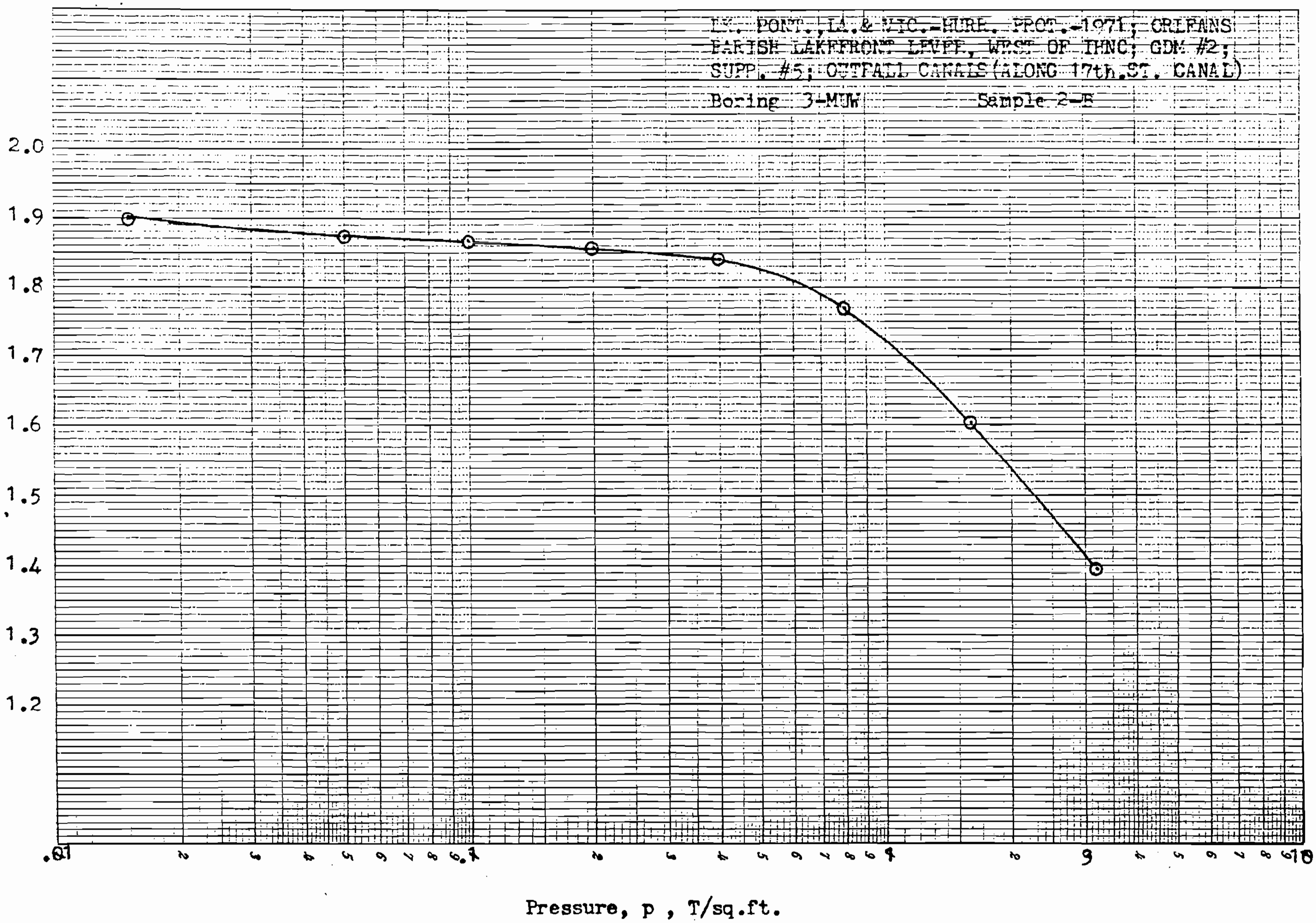
Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.153 in.	Water Content, w_o	68.1 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.90	e_f	
Preconsol. Pressure, p_c 0.83 T/sq ft		Saturation, S_o	96.4 %	S_f	%
Compression Index, C_c 0.69		Dry Density, γ_d	57.9 lb/ft^3		
Classification PLASTIC CLAY (CH)*		k_{20} at e_o = × 10^{-} cm/sec			
LL 105	G_s 2.69 From Undist.	Project LK. PONT., LA.& VIC.-HURR. PROT.-1971			
PL 33	D_{10}	ORLEANS PARISH LAKEFRONT LEVEE, WEST OF IHNC			
Remarks See attached plot for		GDM#2; SUPP.#5; OUTFALL CANALS (ALONG 17th.St.CANAL)			
Pressure vs Void Ratio Curve		Boring No. 3-MUW		Sample No. 2-B	
*gray, contains wood fragments		~~Depth~~ El -6.7		Date 6 April, 1971	
and roots		JDB **CONSOLIDATION TEST REPORT**			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

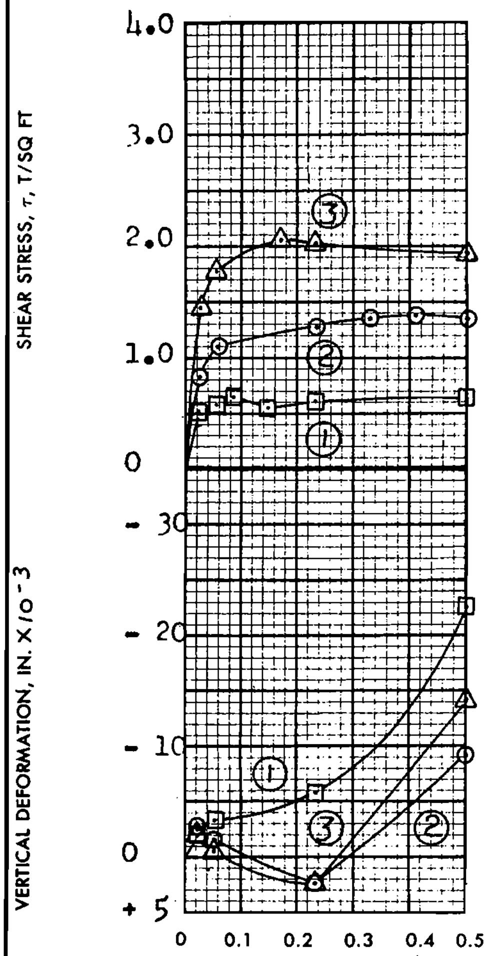
0 3424

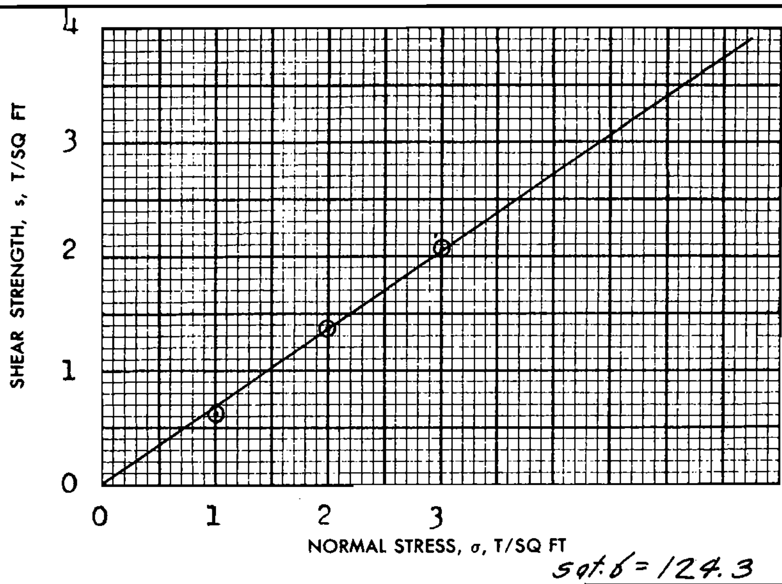
F61

USAEWES SOILS TEST SECTION


LK. PONT., LA. & VIC.-HURR. PROT.-1971; ORLEANS
PARISH LAKEFRONT LEVEE, WEST OF IHNC; GDM #2;
SUPP. #5; OUTFALL CANALS (ALONG 17th.ST. CANAL)
Boring 3-MUW
Sample 2-E
Void Ratio, e
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
.01
0.1
1
10
Pressure, p , T/sq.ft.

F68





Sat. δ = 124.3

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	22.8 %	23.1 %	23.4 %	23.1 %
	VOID RATIO	e_o	0.670	0.685	0.699	
	SATURATION	S_o	90.9 %	90.0 %	89.4 %	%
	DRY DENSITY, LB/CU FT	γ_d	99.8	98.9	98.1	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	25.3 %	25.1 %	24.2 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.64	1.38	2.07	
ACTUAL TIME TO FAILURE, MIN		t_f	480	2220	960	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 35°

TAN ϕ' = 0.690

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED	3.00 IN. SQUARE	0.550 IN. THICK	
CLASSIFICATION SILTY SAND(SM), gray			
LL -	PL -	PI -	G_s 2.67

REMARKS

F 69

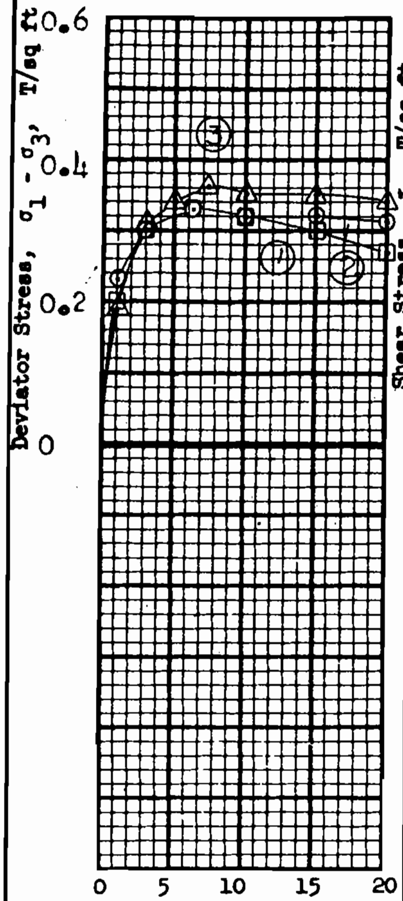
PROJECT LK. PONT. LA., &VIC.-HURR. PROT.-1971

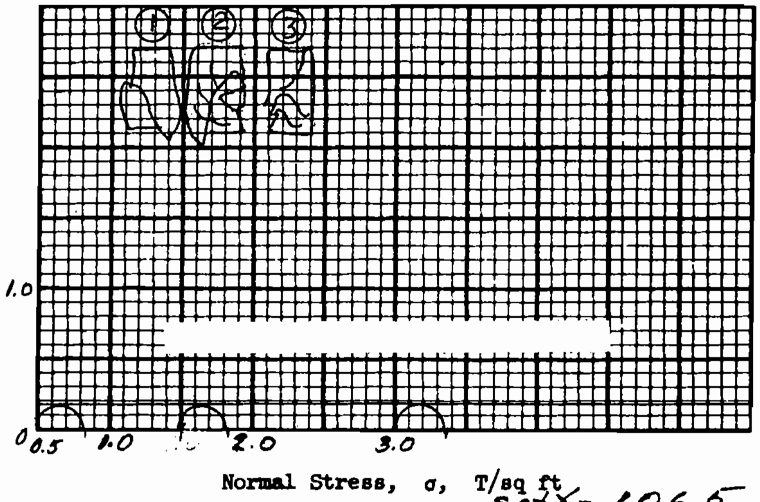
AREA ORLEANS PARISH LK. FRNT. LEVEE, WEST OF IHNC, GDM # 2, SUPP. #5 OUTFALL CANALS

BORING NO. 3-MUW — SAMPLE NO. 3-A

~~DEPTH~~ EL - 10.4 — DATE 29 April 1971

BWG — **DIRECT SHEAR TEST REPORT**





$507\gamma = 106.5$

Test No.			1	2	3	Avg.
Initial	Water content	w_o	49.8 %	54.4 %	49.2%	51.1 %
	Void ratio	e_o	1.35	1.49	1.34	
	Saturation	S_o	99.2 %	98.2 %	100+ %	%
	Dry density, lb/cu ft	γ_d	71.6	67.5	71.7	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f		-		
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.33	0.33	0.36	
Time to failure, min		t_f	25	18	32	
Rate of strain, percent/min			0.253	0.326	0.228	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.17 T/sq ft

Method of saturation _____

☐ Controlled stress

☒ Controlled strain

Type of test Q	Type of specimen UNDISTURBED			
Classification PLASTIC CLAY(CH),gray, contains a few 1/2" dia. roots and a*				
LL 67	PL 18	PI 49		G_s 2.69

Remarks *few sand pockets

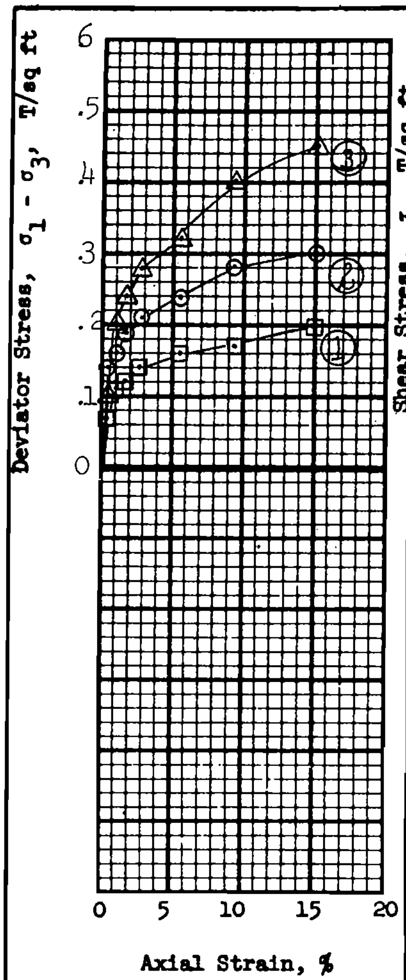
Project LK.PONT.LA.,&VIC.-HURR.PROT.-LKFRNT.
LEV.,WEST OF IHNC-CDM #2,SUPP.#5,OUTFALL
Area CANALS(ALONG 17thST. CANAL) 1971

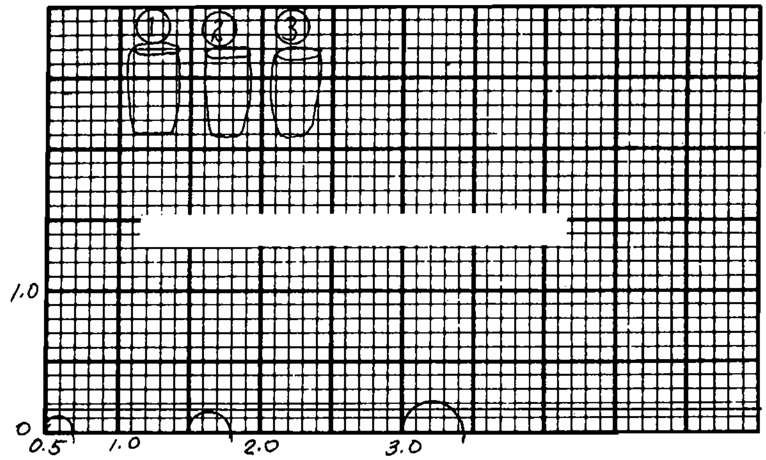
Boring No. 4-MUE	Sample No. 2-B
~~Depth~~ El - 7.5	Date 22 March 1971

FAM TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

F70 TRANSLUCENT





sat. γ = 115.1

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.16 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

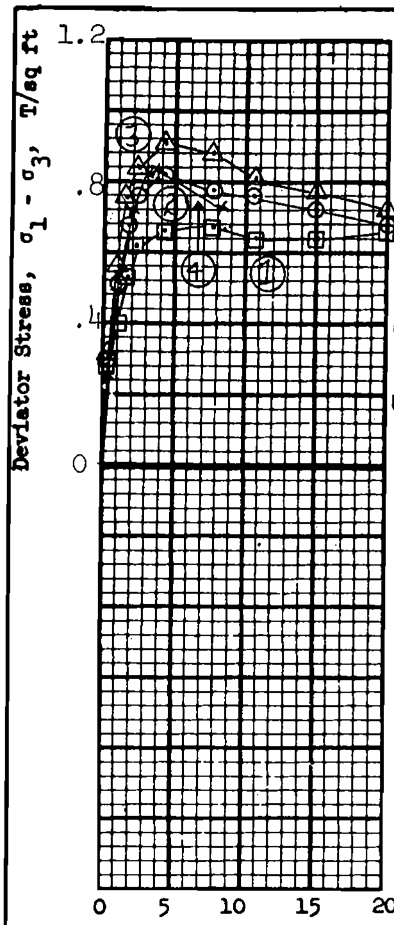
Test No.			1	2	3	Avg.
Initial	Water content	w_o	40.4 %	36.0 %	30.7 %	35.7 %
	Void ratio	e_o	1.08	1.02	0.867	
	Saturation	S_o	99.9 %	94.2 %	94.5 %	%
	Dry density, lb/cu ft	γ_d	80.3	82.7	89.3	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.20	0.30	0.45	
Time to failure, min		t_f	75	75	75	
Rate of strain, percent/min			0.201	0.201	0.201	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.39	1.39	1.38	
Initial height, in.		H_o	3.00	3.00	3.00	

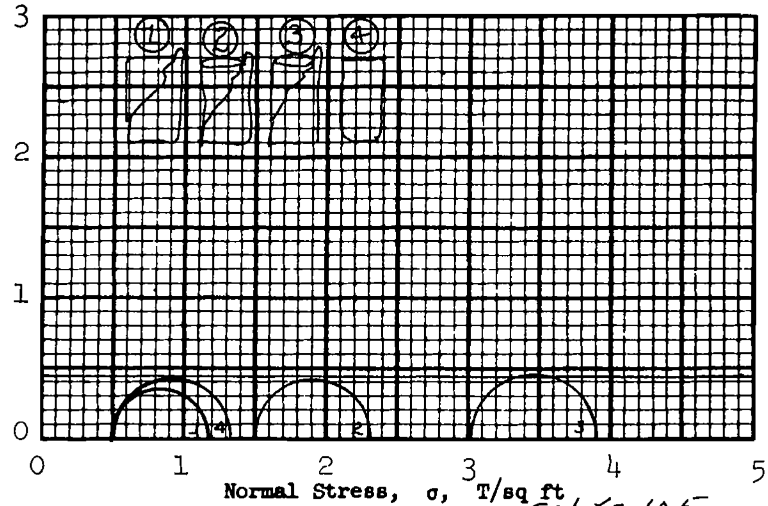
Type of test Q	**Type of specimen** UNDISTURBED			
Classification PLASTIC CLAY(CH), gray, contains a strata of coarse sand				
LL 55	**PL** 17	**PI** 38		**G_s** 2.67

Remarks Insufficient material for check test

F71

Project LK.PONT.,LA.&VIC.-HURR. PROT.-ORLEANS PAR. LKFRNT.LEV;WEST OF IHNC-GDM#2,SUPP.#5,	
Area OUTFALL CANALS(ALONG 17th ST.CANAL)1971	
Boring No. 4-MUE	**Sample No.** 4-B
~~Depth~~ **El** -15.4	**Date** 22 March 1971
TES	**TRIAXIAL COMPRESSION TEST REPORT**





Sat. γ = 105

Test No.			1	2	3	4	Avg.
Initial	Water content	w_o	52.5 %	55.3 %	56.8 %	50.6 %	53.8
	Void ratio	e_o	1.42	1.50	1.52	1.40	
	Saturation	S_o	98.7%	98.4 %	99.8 %	96.5%	
	Dry density, lb/cu ft	γ_d	69.0	66.8	66.2	69.5	
Before Shear	Water content	w_c	%	%	%	%	
	Void ratio	e_c					
	Saturation	S_c	%	%	%	%	
	Final back pressure, T/sq ft	u_o					
Final	Water content	w_f	%	%	%	%	
	Void ratio	e_f					
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	0.5	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.67	0.82	0.91	0.83	
Time to failure, min		t_f	47	26	26	16	
Rate of strain, percent/min			0,163	0.163	0.163	0.237	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$					
Initial diameter, in.		D_o	1.39	1.39	1.39	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.43 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

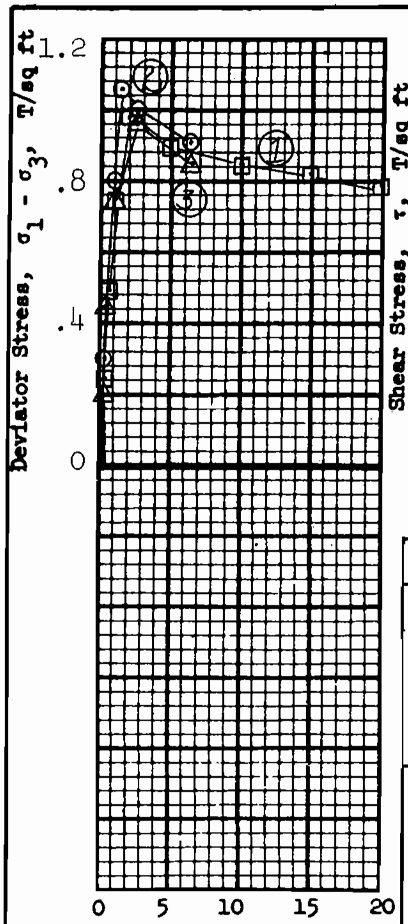
Type of test Q	Type of specimen UNDISTURBED			
Classification PLASTIC CLAY(CH),gray, contains scattered silt pockets				
LL 67	PL 20	PI 47		G_s 2.67

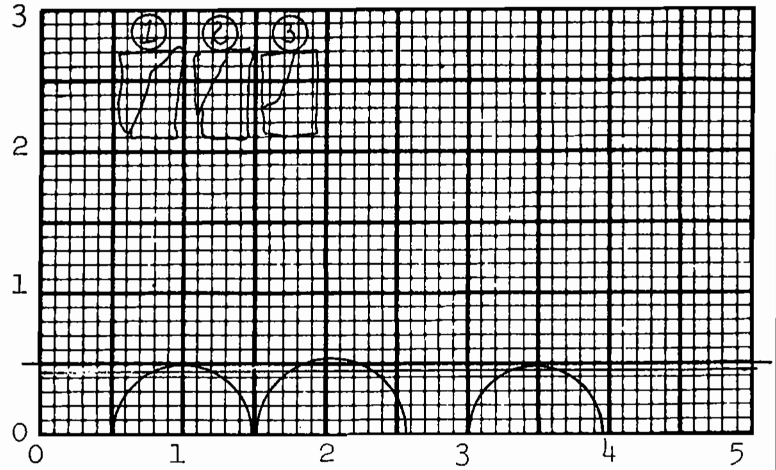
Remarks ________

Project LK.PONT.LA.&VIC.-HURR. PROT.-ORLEANS PAR.LKFRNT.LEV.,WEST OF IHNC-GDM#2,SUPP.#5,	
Area OUTFALL CANALS(ALONG 17th ST. CANAL)1971	
Boring No. 4-MUE	Sample No. 11-D
Depth El -49.5	Date 23 March 1971
TES	TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

F72 TRANSLUCENT





sat. γ = 106.3

Test No.			1	2	3	Avg.
Initial	Water content	w_o	50.8 %	51.1 %	52.4 %	51.4 %
	Void ratio	e_o	1.44	1.42	1.44	
	Saturation	S_o	95.6 %	97.5 %	98.6 %	%
	Dry density, lb/cu ft	γ_d	69.3	69.9	69.3	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.99	1.06	0.96	
Time to failure, min		t_f	12	31	31	
Rate of strain, percent/min			0.172	0.481	0.810	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.50 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Type of test Q	Type of specimen UNDISTURBED			
Classification PLASTIC CLAY(CH),gray, contains numerous 1/4" dia. shells*				
LL 68	PL 24	PI 44		G_s 2.71

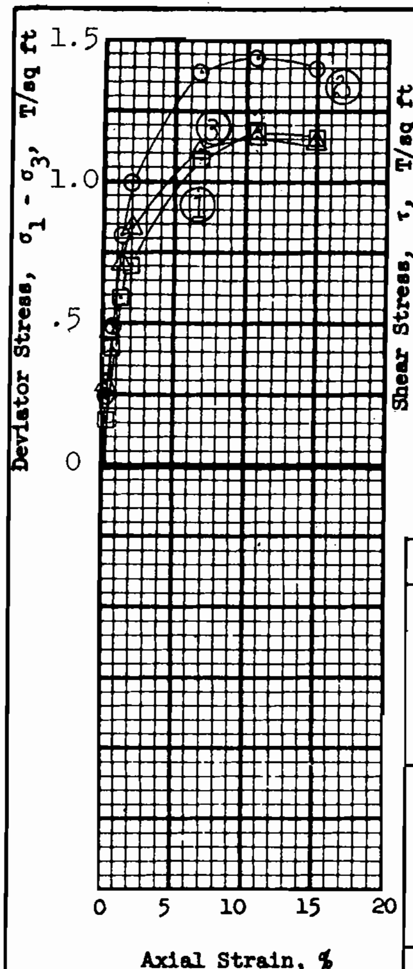
Remarks *shell fragments

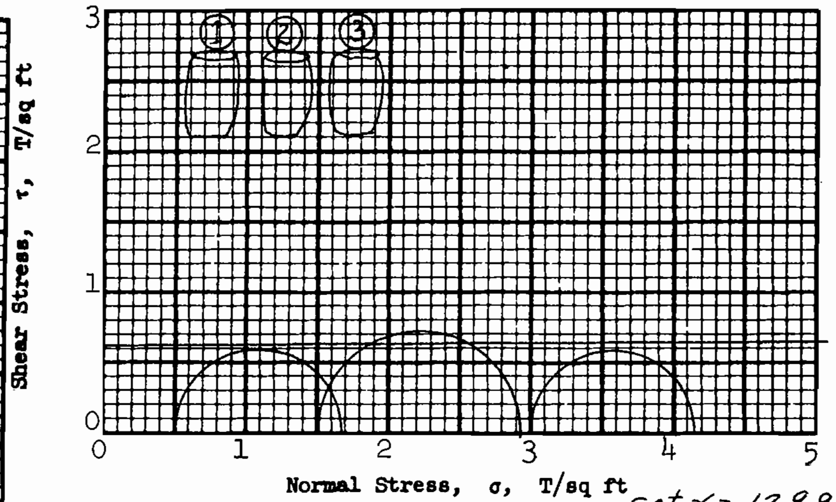
Project LK.PONT.,LA.&VIC.-HURR. PROT.-ORLEANS PAR.LKFRNT.LEV.,WEST OF IHNC-GDM#2,SUPP.#5;

Area OUTFALL CANALS(ALONG 17thST. CANAL)1971

Boring No. 4-MUE	Sample No. 13-C
~~Depth~~ El -56.6	Date 22 March 1971

TES **TRIAXIAL COMPRESSION TEST REPORT**





sat. γ = 129.9

Test No.			1	2	3	Avg.
Initial	Water content	w_o	20.1 %	20.6 %	20.8 %	20.5 %
	Void ratio	e_o	0.548	0.572	0.568	
	Saturation	S_o	98.8 %	96.9 %	98.5 %	%
	Dry density, lb/cu ft	γ_d	108.5	106.8	107.1	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.18	1.44	1.15	
Time to failure, min		t_f	43	43	43	
Rate of strain, percent/min			0.247	0.247	0.247	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.38	1.39	1.38	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.63 T/sq ft

Method of saturation ________

☐ Controlled stress

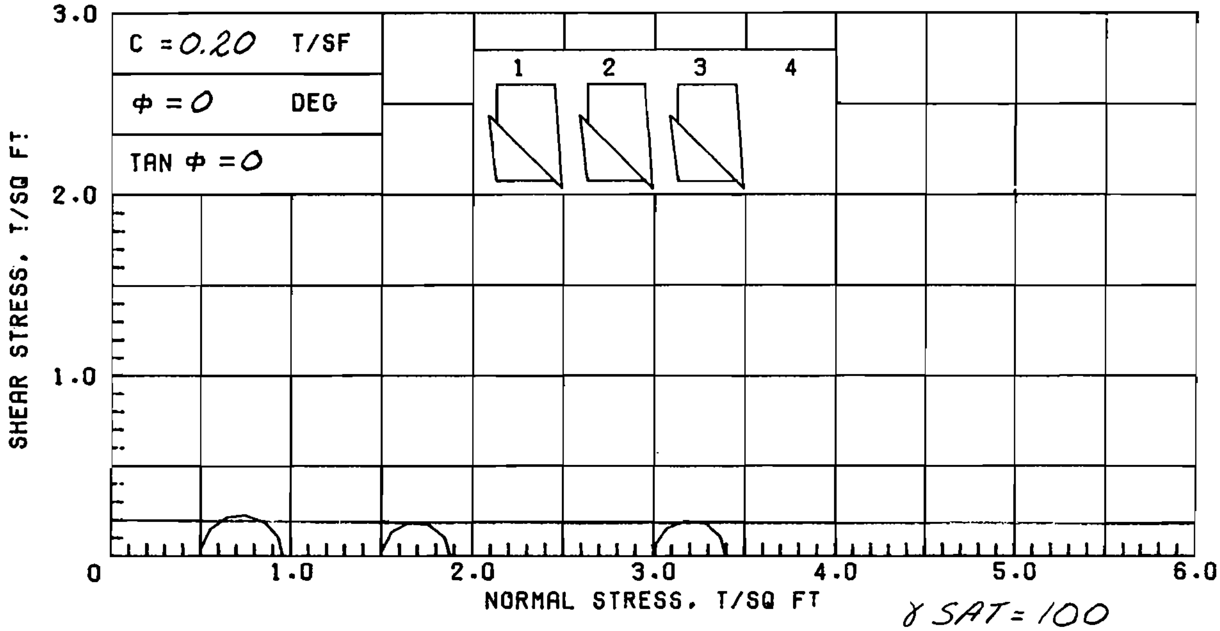
☒ Controlled strain

Type of test Q	Type of specimen UNDISTURBED			
Classification SILTY CLAY(CL),gray, crumbly				
LL 23	PL 13	PI 10		G_s 2.69

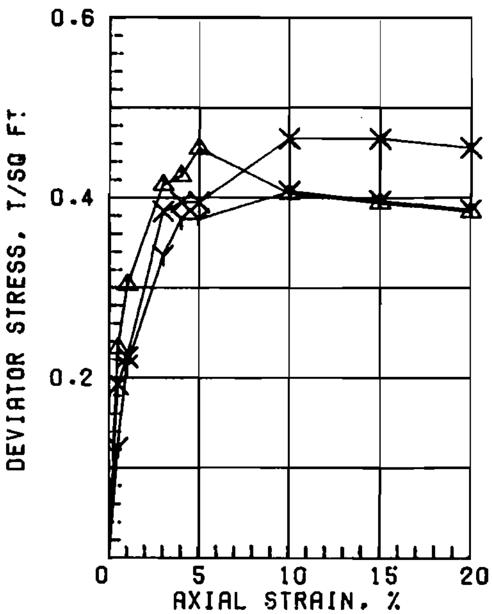
Remarks

Project LK.PONT.,LA.&VIC.-HURR. PROT.-ORLEANS PAR.LKFRNT.LEVL,WEST OF IHNC-GDM#2,SUPP.#5;	
Area OUTFALL CANALS(ALONG 17th ST. CANAL)1971	
Boring No. 4-MUE	Sample No. 15-C
~~Depth~~ El -64.4	Date 22 March 1971
TES	TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 *(EM 1110-2-1902)* PREVIOUS EDITIONS ARE OBSOLETE *TRANSLUCENT*



γ SAT = 100



	SPECIMEN NO.	Δ1	Y2	X3	4	AVG.
INITIAL	WATER CONTENT, %	59.8	78.4	61.5		66.6
	DRY DENSITY, PCF	64.1	52.8	62.7		
	SATURATION, %	99.1	96.6	98.4		
	VOID RATIO	1.630	2.192	1.687		
BEFORE SHEAR	WATER CONTENT, %					
	DRY DENSITY, PCF					
	SATURATION, %					
	VOID RATIO					
	BACK PRESS., TSF					
	MIN PRIN. STRESS, TSF	0.5	1.5	3.0		
	MAX. DEV. STRESS, TSF	0.45	0.38	0.39		
	TIME TO FAILURE, MIN.	10	24	24		
	RATE OF STRAIN INCR.%		6	6		
	INITIAL DIAMETER, IN.	1.39	1.39	1.39		
	INITIAL HEIGHT, IN.	3.00	3.00	3.00		

CONTROLLED-STRAIN TEST

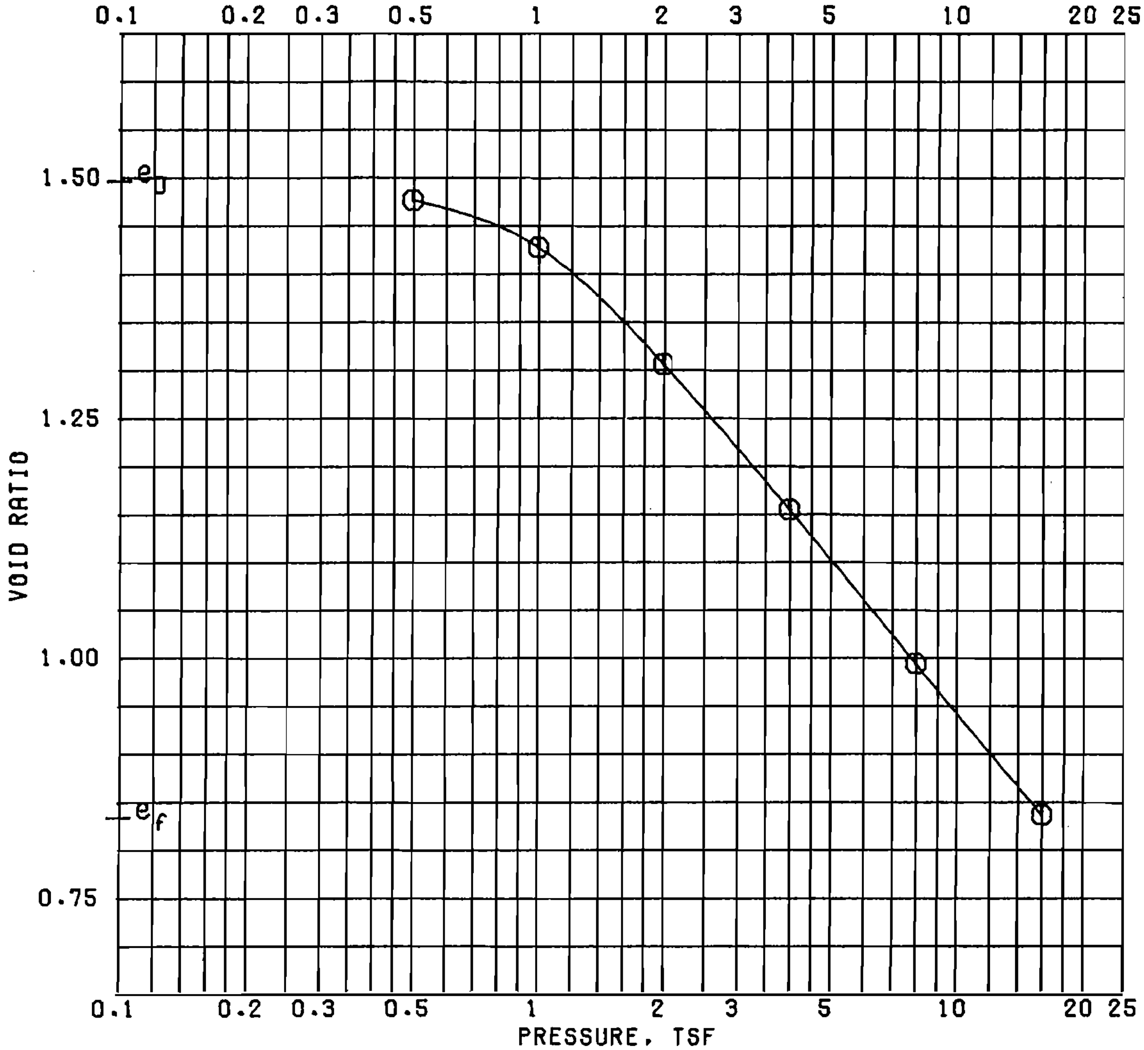
DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; DECAYED ROOTS

LL 116	PL 25	PI 91	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;

PROJECT LK PONT LA & VIC HURR PROT	
ORLEANS PARISH OUTFALL CANALS	
BORING NO. 4-MUG	SAMPLE NO. 7-C
DEPTH/ELEV 17.1/-4.3	TECH. KOC
LABORATORY USAE WES	DATE 28 AUG 86

TRIAXIAL COMPRESSION TEST REPORT



γ SAT = 105

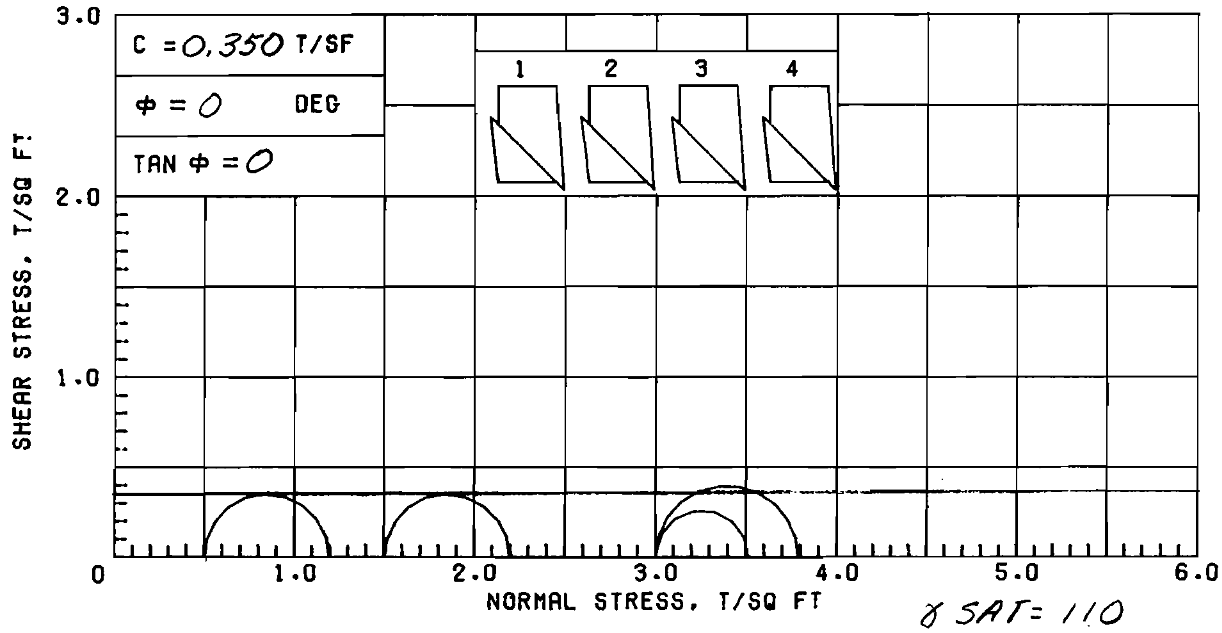
			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	54.5	32.9
PRECONSOL. PRESSURE, TSF	1.20	DRY DENSITY, PCF	67.6	92.0
COMPRESSION INDEX		SATURATION, %	98.4	100 +
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.495	0.832
DIA. IN 4.44	HT. IN 1.122	BACK PRESSURE, TSF		

CLASSIFICATION PLASTIC CLAY (CH), GRAY			
LL	PL	PI	PROJECT LK PONT LA & VIC HURR PROT
GS 2.70 (EST)	D_{10}		ORLEANS PARISH OUTFALL CANALS
REMARKS			BORING NO. 4-MUG — SAMPLE NO. 7-D
			DEPTH/ELEV 17.5/-4.7 — DATE 02 AUG 86

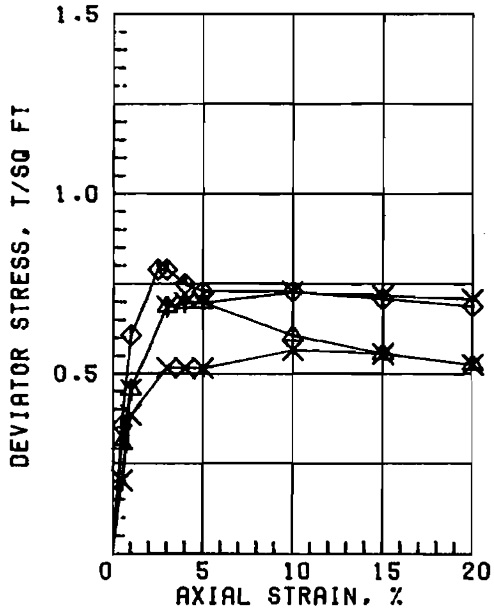
CONSOLIDATION TEST REPORT

SHEET 1 OF 8

F76



γ SAT = 110



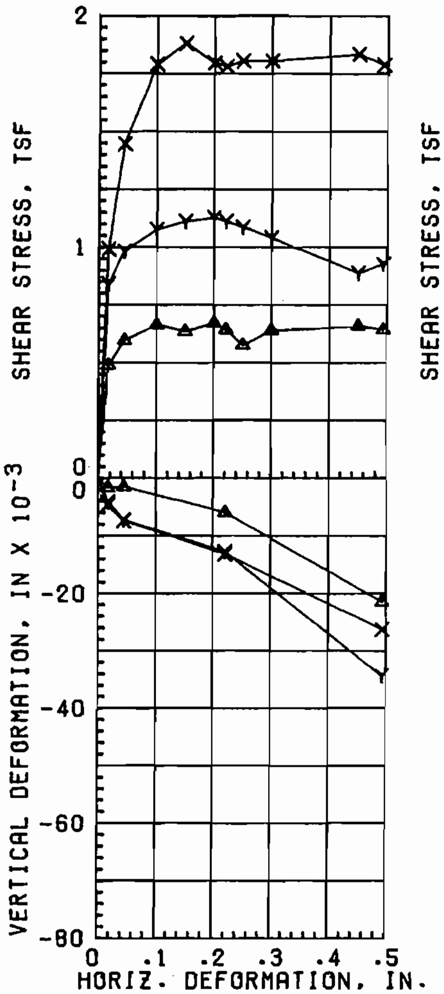
		Δ1	Y2	X3	◇4	
SPECIMEN NO.		Δ1	Y2	X3	◇4	AVG.
INITIAL	WATER CONTENT, %	42.3	40.0	48.3	50.0	45.2
	DRY DENSITY, PCF	78.3	78.4	72.5	69.9	
	SATURATION, %	99.0	93.8	98.5	95.6	
	VOID RATIO	1.154	1.151	1.324	1.411	
BEFORE SHEAR	WATER CONTENT, %					
	DRY DENSITY, PCF					
	SATURATION, %					
	VOID RATIO					
	BACK PRESS., TSF					
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	3.0	
MAX. DEV. STRESS, TSF		0.70	0.70	0.51	0.79	
TIME TO FAILURE, MIN.		8	24	18	15	
RATE OF STRAIN INCR.%			6	6	6	
INITIAL DIAMETER, IN.		1.39	1.39	1.39	1.39	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

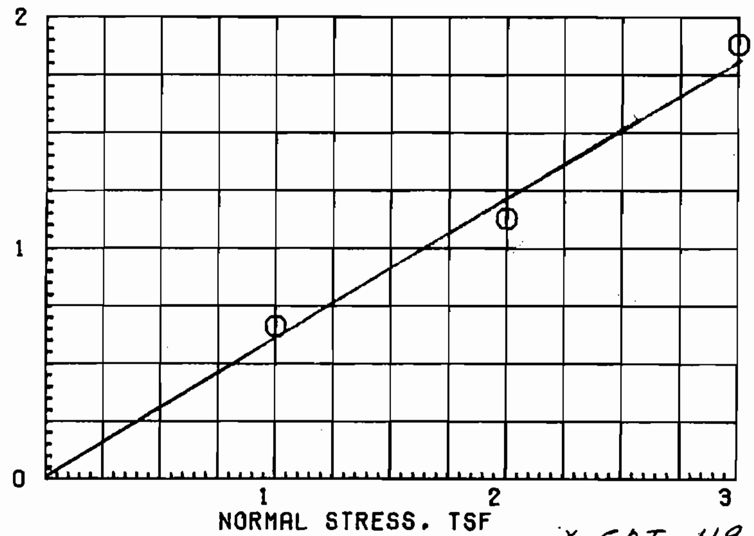
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; SILT POCKETS

LL 74	PL 21	PI 53	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 4-MUG	SAMPLE NO. 8-C
	DEPTH/ELEV 20.9/-8.1	TECH. KOC
	LABORATORY USAE WES	DATE 28 AUG 86
	TRIAXIAL COMPRESSION TEST REPORT	





γ SAT=119

TEST NO.		1 ▲	2 Y	3 X	AVG
INITAL	WATER CONTENT, %	21.4	20.6	21.6	21.2
INITAL	VOID RATIO	0.896	0.773	0.813	
INITAL	SATURATION, %	63.4	70.6	70.4	
INITAL	DRY DENSITY, PCF	87.2	93.3	91.2	
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	24.6	25.8	26.0	
FINAL	VOID RATIO				
FINAL	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.66	1.13	1.88	
TIME TO FAILURE, MIN		559	1119	839	
RATE OF STRAIN, IN/MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, TSF					

Φ = 31°

TAN Φ = 0.601

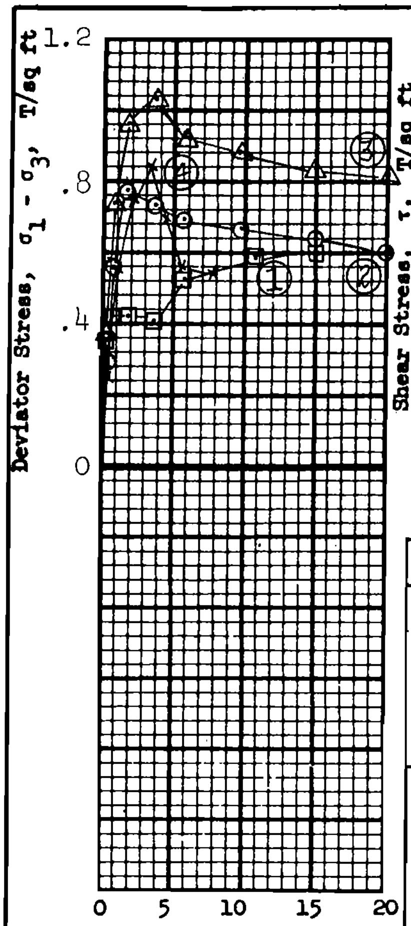
C = 0

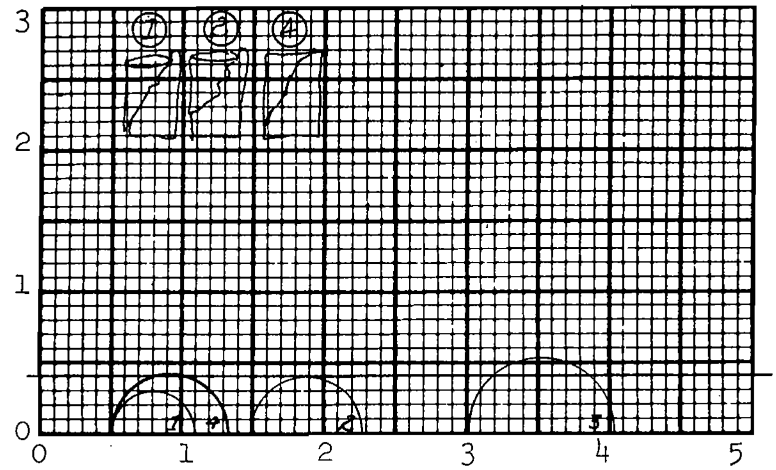
TYPE SPECIMEN UNDISTURBED	3.00 IN. SQUARE	0.553 IN. THICK

CLASSIFICATION SAND (SP), GRAY; SHELL PARTICLES

LL	PL	PI		GS 2.65 (EST)

REMARKS:	PROJECT LK PONT LA & VIC HURR PROT	
	ORLEANS PARISH OUTFALL CANALS	
	BORING NO. 4MUG	SAMPLE 10-C
	DEPTH/ELEV 29.0/-16.2	DATE 04 AUG 86
	DIRECT SHEAR TEST REPORT	





Sat.γ = 107

Test No.			1	2	3	4	
Initial	Water content	w_o	45.8 %	51.5 %	49.4 %	46.6 %	Avg. 48.3
	Void ratio	e_o	1.31	1.49	1.40	1.37	
	Saturation	S_o	94.7 %	93.7 %	95.6 %	92.2 %	
	Dry density, lb/cu ft	γ_d	73.1	67.9	70.6	71.3	
Before Shear	Water content	w_c	%	%	%	%	
	Void ratio	e_c					
	Saturation	S_c	%	%	%	%	
	Final back pressure, T/sq ft	u_o					
Final	Water content	w_f	%	%	%	%	
	Void ratio	e_f					
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	0.5	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.60	0.78	1.03	0.84	
Time to failure, min		t_f	82	9	20	24	
Rate of strain, percent/min			0.184	0.184	0.184	0.141	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$					
Initial diameter, in.		D_o	1.40	1.40	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.40 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Type of test Q	Type of specimen UNDISTURBED			
Classification PLASTIC CLAY(CH), gray, slickensided, contains small concretions				
LL 90	PL 25	PI 65		G_s 2.71

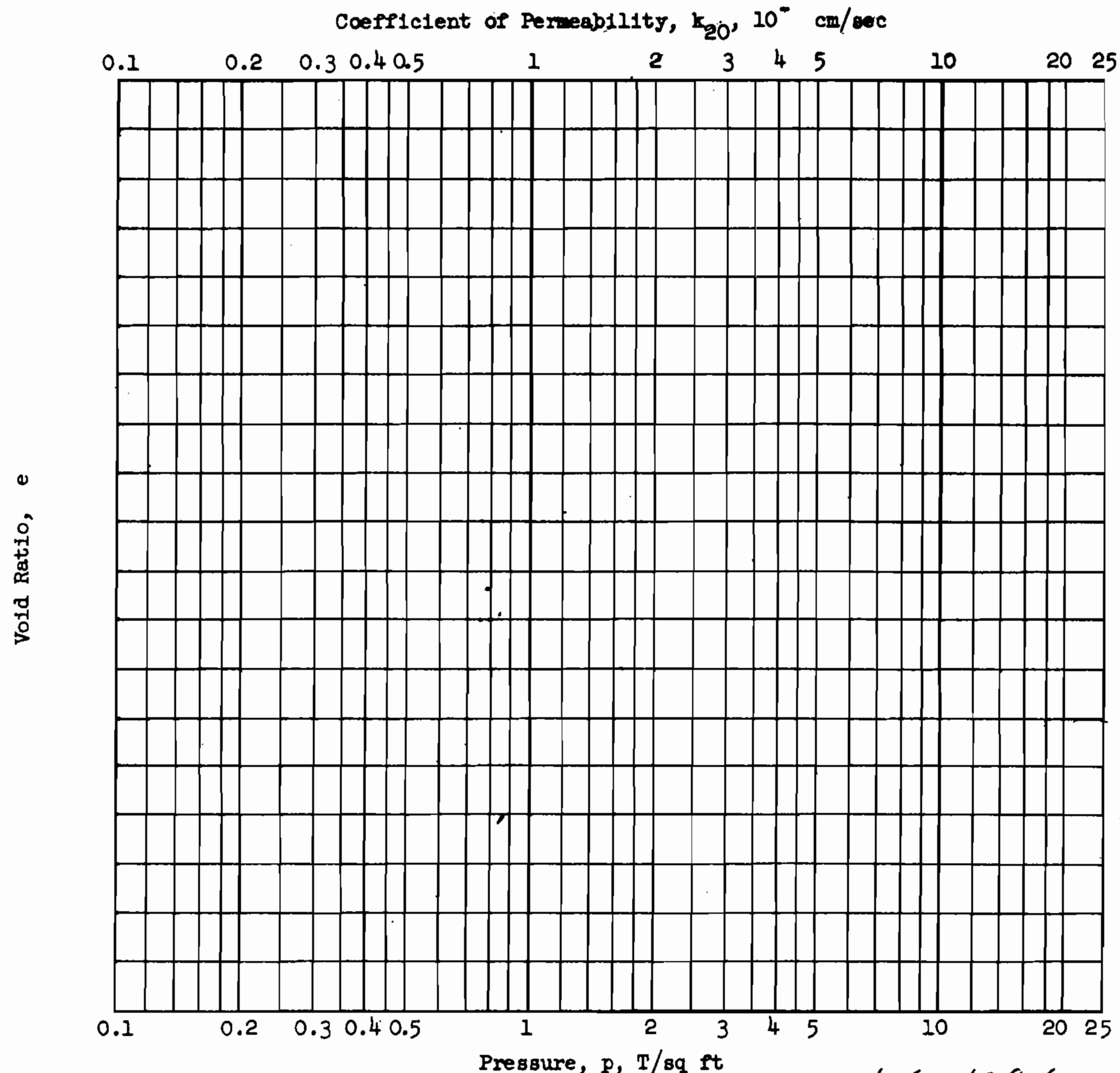
Remarks ______

Project LK. PONT.LA.&VIC.(71) ORLEANS PARISH	
LK.FR. LEVEE, WEST OF IHNC, GDM#2, SUPP.#5,	
Area OUTFALL CANALS	
Boring No. 2-MUE	Sample No. 3-A
Depth El 2.5	Date 9 March 1971
TES TRIAXIAL COMPRESSION TEST REPORT	

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

F79

TRANSLUCENT USAEWES SOILS TEST SECTION



sat. γ = 109.6

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.153 in.	Water Content, w_o	46.8 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.28	e_f	
Preconsol. Pressure, p_c 1.38 T/sq ft		Saturation, S_o	99.3 %	S_f	%
Compression Index, C_c 0.43		Dry Density, γ_d	74.5 lb/ft^3		
Classification PLASTIC CLAY(CH)*		k_{20} at e_o = × 10^{-} cm/sec			

LL 64	G_s 2.72
PL 18	D_{10}

Remarks * tan and gray, fissured

See attached plot for pressure vs void ratio curve

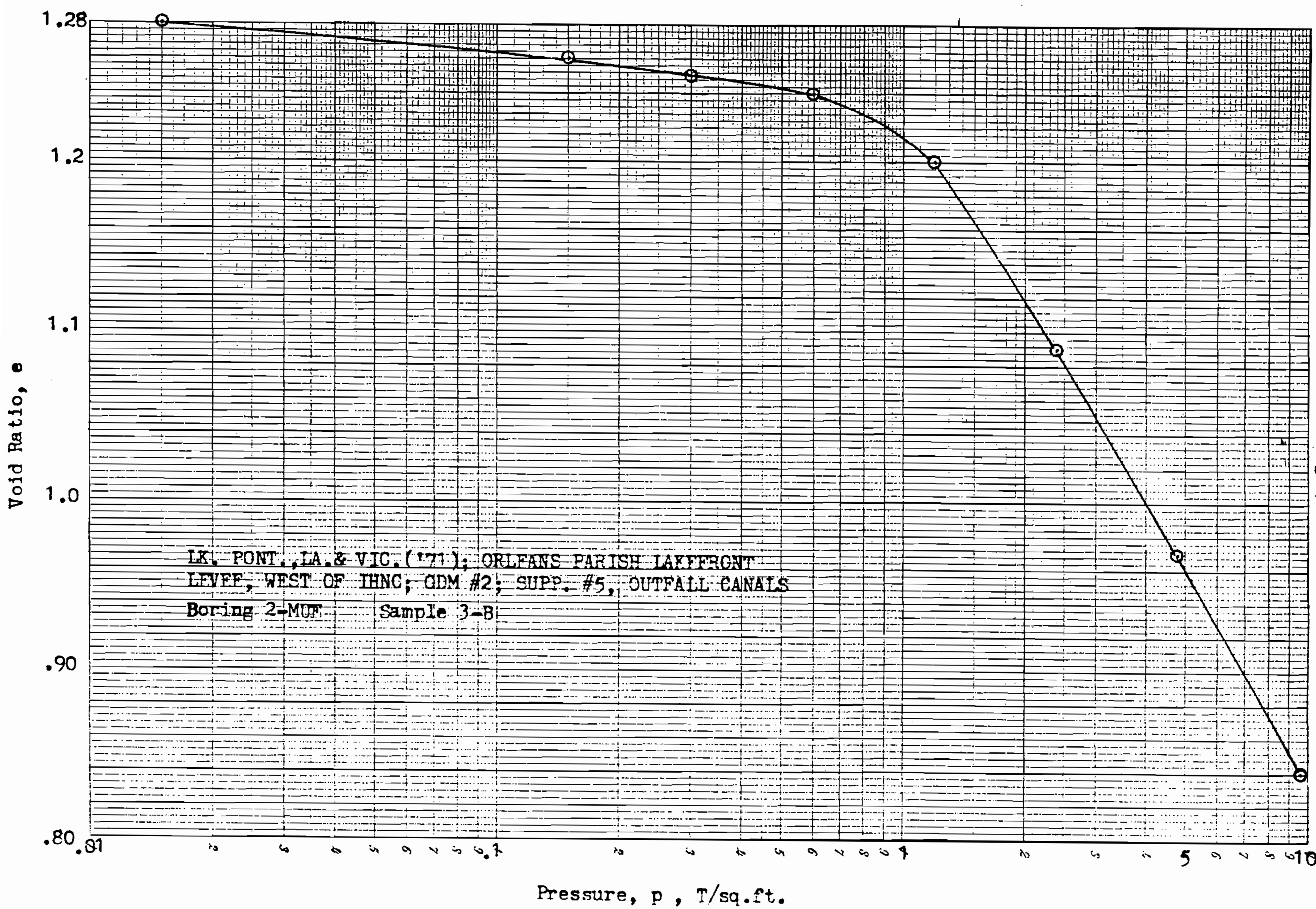
Project LK. PONT., LA.& VIC.('71); ORLEANS PARISH LAKEFRONT LEVEE, WEST OF IHNC; GDM #2; SUPP. #5; OUTFALL CANALS

Boring No. 2-MUE	Sample No. 3-B
~~Depth~~ El +1.6	Date 30 March, 1971

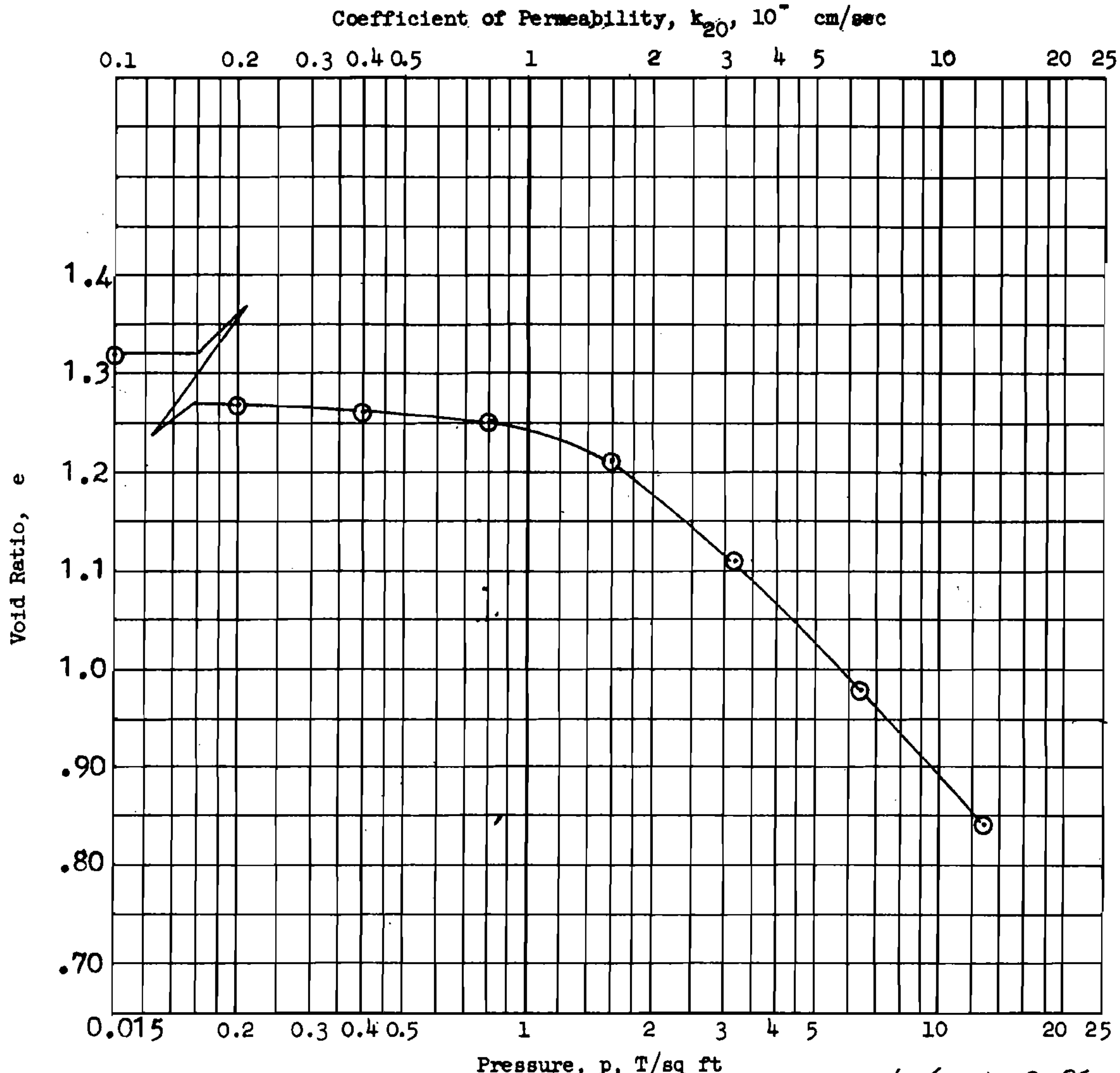
JDB **CONSOLIDATION TEST REPORT**

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424

F80

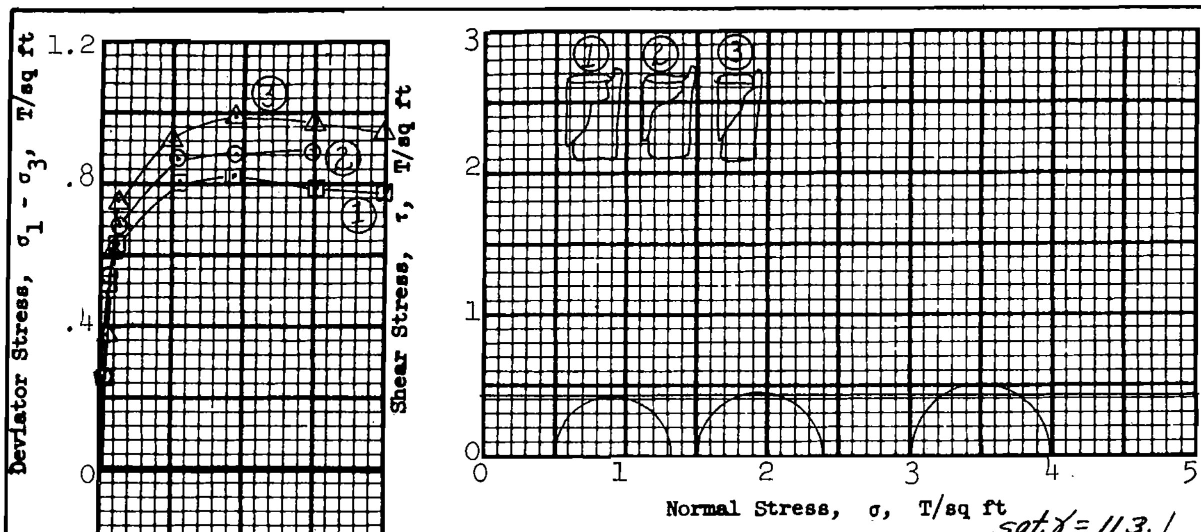

Void Ratio, e
1.28
1.2
1.1
1.0
.90
.80
.01
.1
1
5
10
LK. PONT.,LA.& VIC.('71); ORLEANS PARISH LAKEFRONT
LEVEE, WEST OF IHNC; GDM #2; SUPP. #5, OUTFALL CANALS
Boring 2-MUF Sample 3-B
Pressure, p , T/sq.ft.

F81



sat. γ = 108.8

Type of Specimen UNDISTURBED		Before Test	After Test
Diam 4.25 in.	Ht 1.150 in.	Water Content, w_o 48.0 %	w_f %
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o 1.32	e_f
Preconsol. Pressure, p_c 2.05 T/sq ft		Saturation, S_o 99.1 %	S_f %
Compression Index, C_c 0.46		Dry Density, γ_d 73.3 lb/ft^3	
Classification PLASTIC CLAY (CH),*		k_{20} at e_o = × 10^{-} cm/sec	
LL 88	G_s 2.72	Project LK. PONT., LA.& VIC.('71);ORLEANS	
PL 32	D_{10}	PARISH LAKEFRONT LEVEE, WEST OF IHNC;	
* Remarks mottled tan and gray,		GDM #2; SUPP. #5; OUTFALL CANALS	
contains ½" dia. roots		Boring No. 2-MUE	Sample No. 5-C
		~~Depth~~ El -6.9	Date 24 March, 1971
		JDB **CONSOLIDATION TEST REPORT**	



sat. γ = 113.1

Test No.			1	2	3	Avg.
Initial	Water content	w_o	43.0 %	39.5 %	41.8 %	41.4 %
	Void ratio	e_o	1.18	1.08	1.14	
	Saturation	S_o	99.5 %	99.8 %	100+ %	%
	Dry density, lb/cu ft	γ_d	78.2	81.9	79.7	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.82	0.89	0.99	
Time to failure, min		t_f	48	77	48	
Rate of strain, percent/min			0.196	0.196	0.196	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.39	1.39	1.39	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.42 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Type of test Q	Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH), gray, slightly fissured

LL 79	PL 19	PI 60		G_s 2.73

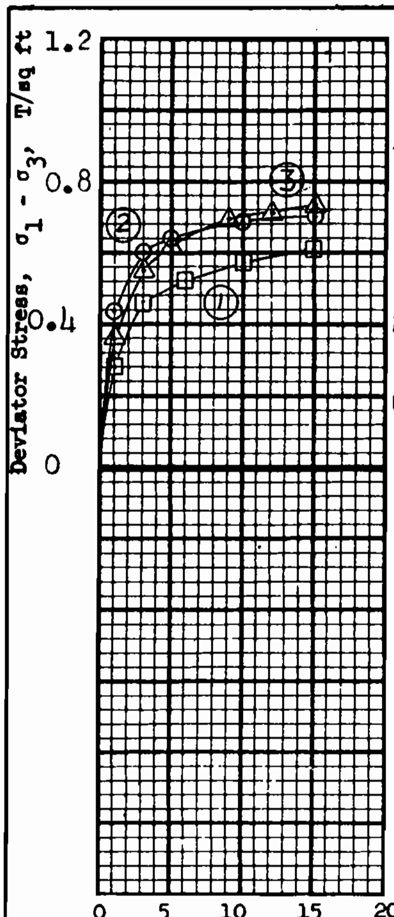
Remarks

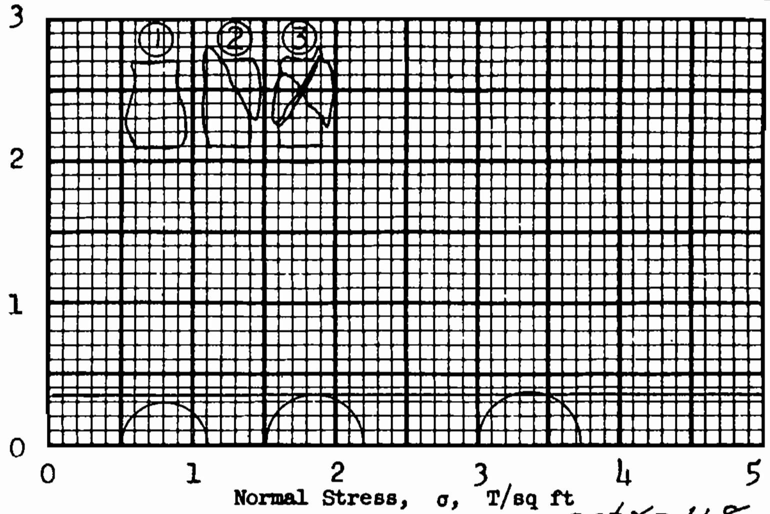
Project LK. PONT. LA. &VIC. (71) ORLEANS PARISH
LAKEFRONT LEVEE, WEST OF IHNC, GDM#2, SUPP.

Area # 5, OUTFALL CANALS

Boring No. 2-MUE	Sample No. 5-D
Depth El -7.4	Date 9 March 1971

TES **TRIAXIAL COMPRESSION TEST REPORT**





sat.γ = 118

Test No.			1	2	3	Avg.
Initial	Water content	w_o	33.4 %	33.1 %	32.9 %	33.1 %
	Void ratio	e_o	0.963	0.927	0.908	
	Saturation	S_o	94.3 %	97.1 %	98.6%	%
	Dry density, lb/cu ft	γ_d	86.5	88.1	89.0	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.61	0.70	0.73	
Time to failure, min		t_f	106	36	42	
Rate of strain, percent/min			0.141	0.416	0.359	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.41	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.36 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification SILTY CLAY(CL),gray

LL 41 | PL 22 | PI 19 | G_s 2.72

Remarks

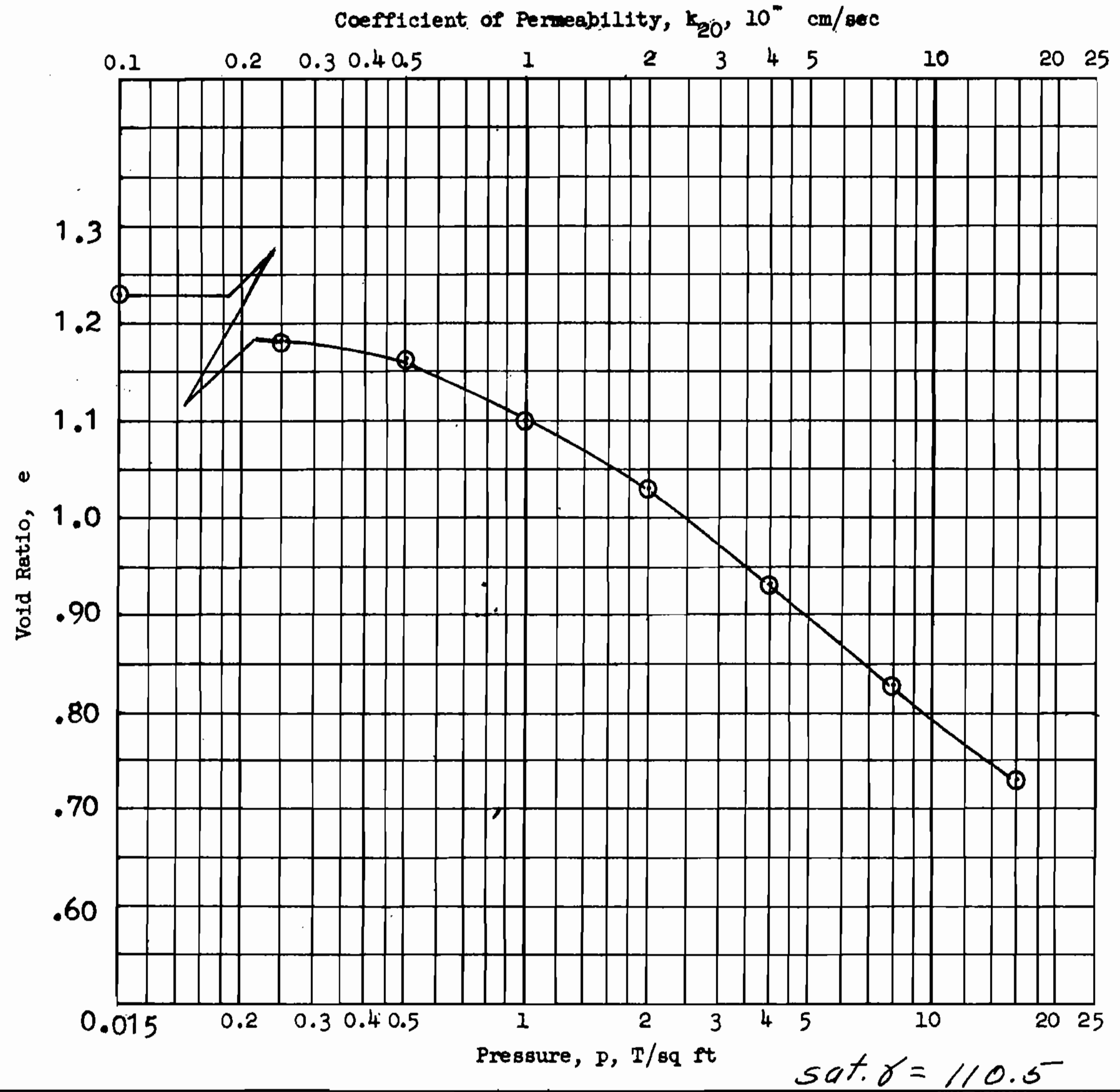
Project LK.PONT.LA.,&VIC.(71)ORLEANS PARISH LAKEFRONT LEVEE,WEST OF IHNC, GDM#2,SUPP.#5,

Area OUTFALL CANALS.

Boring No. 2-MUE | Sample No. 6-B

Depth El - 10.0 | Date 10 March,1971

FAM TRIAXIAL COMPRESSION TEST REPORT



sat. γ = 110.5

Type of Specimen UNDISTURBED		Before Test		After Test
Diam 4.25 in.	Ht 1.154 in.	Water Content, w_o	43.3 %	w_f %
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.23	e_f
Preconsol. Pressure, p_c 0.91 T/sq ft		Saturation, S_o	95.4 %	S_f %
Compression Index, C_c 0.38		Dry Density, γ_d	76.0 lb/ft^3	
Classification SILTY CLAY(CL), *		k_{20} at e_o = × 10^{-} cm/sec		

LL -	G_s 2.72 From Q
PL -	D_{10}

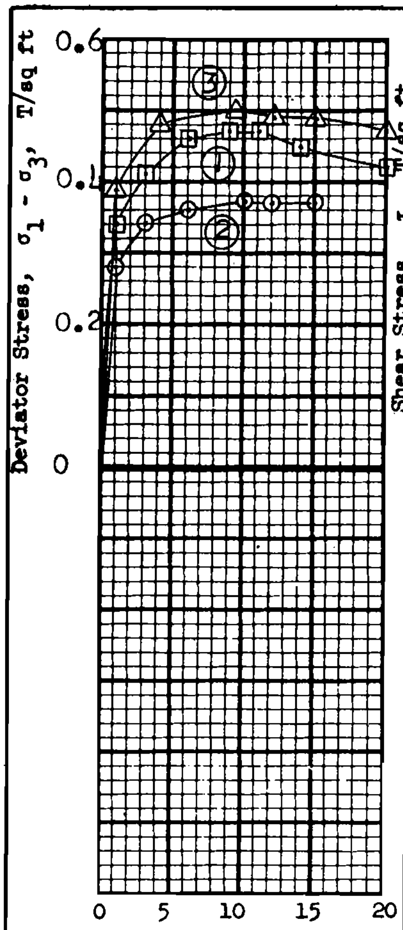
* Remarks gray, contains pockets of clay (CH)

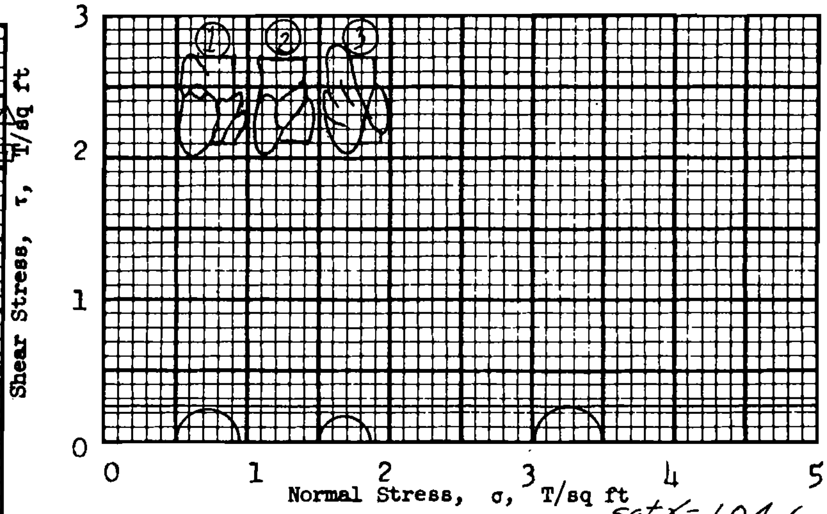
Project LK. PONT., LA. & VIC. ('71); ORLEANS PARISH LAKEFRONT LEVEE, WEST OF IHNC; GDM #2; SUPP. #5, OUTFALL CANALS

Boring No. 2-MUE	Sample No. 6-B
~~Depth~~ El -10.0	Date 26 March, 1971

JDB **CONSOLIDATION TEST REPORT**

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. *(TRANSLUCENT)* 0 3424





Sat.γ = 104.6

Test No.			1	2	3	Avg.
Initial	Water content	w_o	56.1 %	61.4 %	54.3 %	57.3 %
	Void ratio	e_o	1.55	1.68	1.50	
	Saturation	S_o	99.2 %	100+ %	99.2 %	%
	Dry density, lb/cu ft	γ_d	67.1	63.7	68.5	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.47	0.37	0.50	
Time to failure, min		t_f	74	31	16	
Rate of strain, percent/min			0.161	0.326	0.571	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.24 T/sq ft

Method of saturation ________

[ ] Controlled stress

[X] Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray, slickensided,contains rootlets

LL 89 | PL 25 | PI 64 | G_s 2.74

Remarks

Project LK.PONT.LA.,&VIC.(71) ORLEANS PARISH
LK.FT.LEVEE,WEST OF IHNC,GDM#2,SUPP. # 5,

Area OUTFALL CANALS

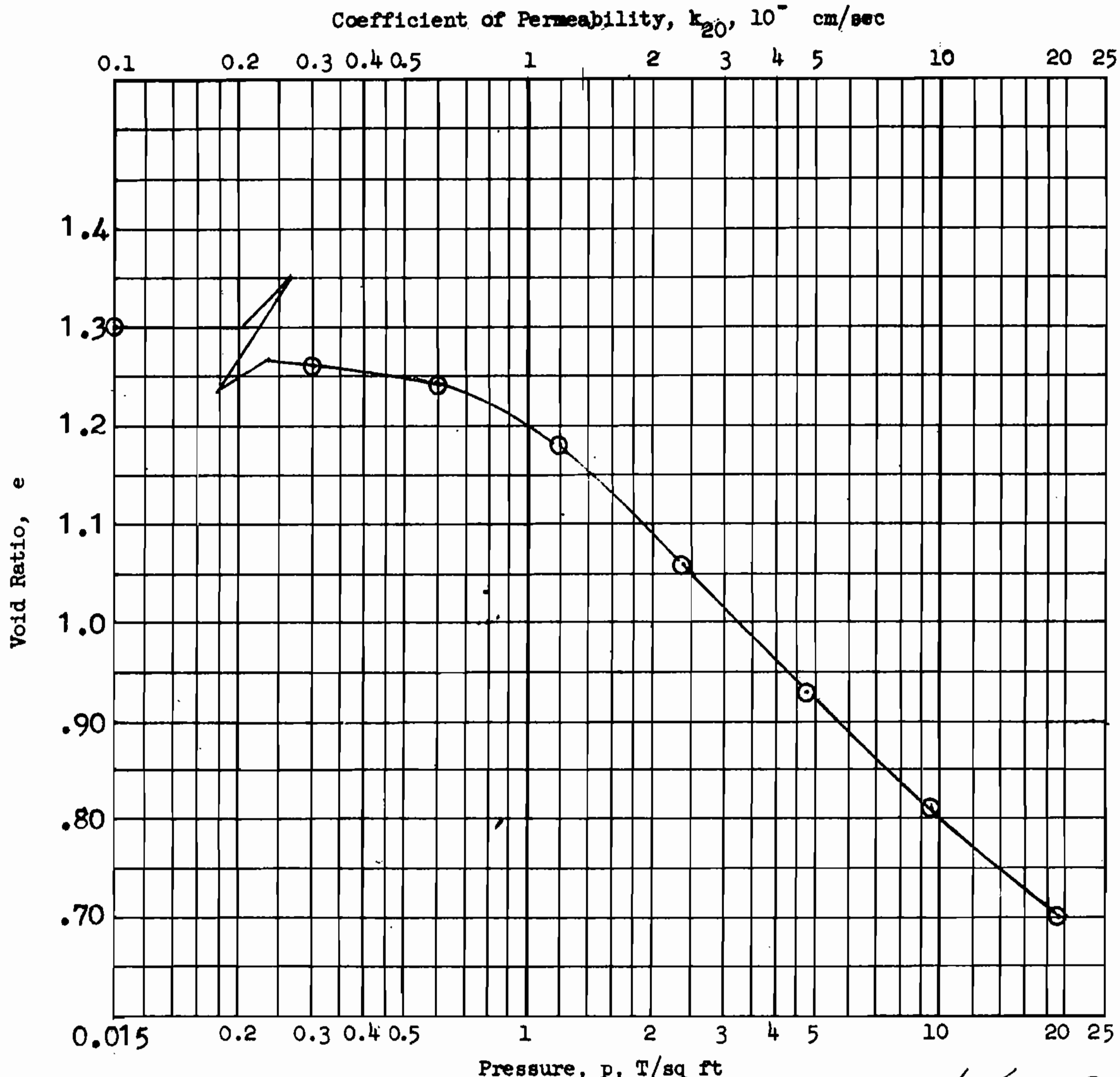
Boring No. 2-MUE | Sample No. 6-D

Depth El - 11.8 | Date 11 March,1971

OHR TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

F86 TRANSLUCENT USAEWES SOILS TEST SHEET



sat. γ = 108.7

Type of Specimen UNDISTURBED		Before Test		After Test
Diam 4.25 in.	Ht 1.155 in.	Water Content, w_o	48.1 %	w_f %
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.30	e_f
Preconsol. Pressure, p_c 1.38 T/sq ft		Saturation, S_o	100 %	S_f %
Compression Index, C_c 0.43		Dry Density, γ_d	73.4 lb/ft^3	
Classification Alternating 1/16" *		k_{20} at e_o = × 10^{-} cm/sec		

LL 50	G_s 2.71
PL 18	D_{10}

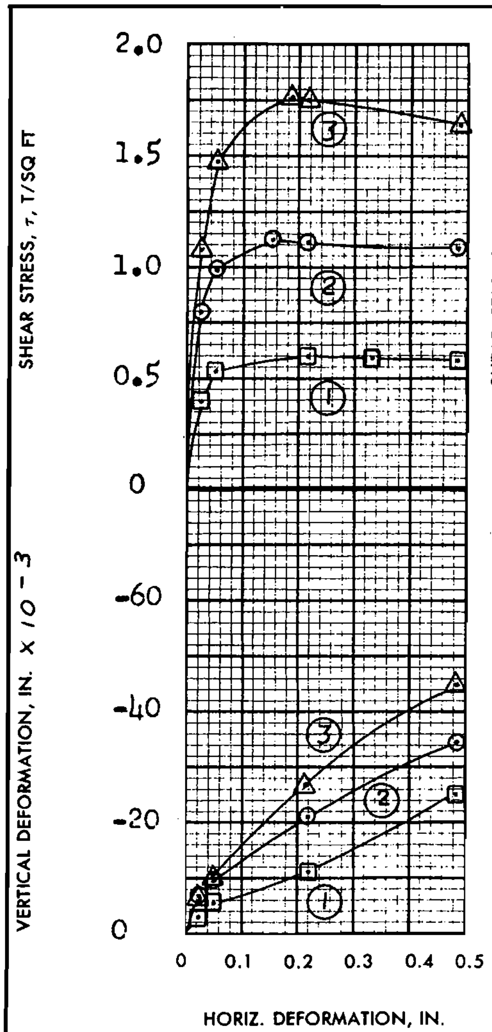
Remarks * strata of PLASTIC CLAY (CH) and SILT (ML), gray

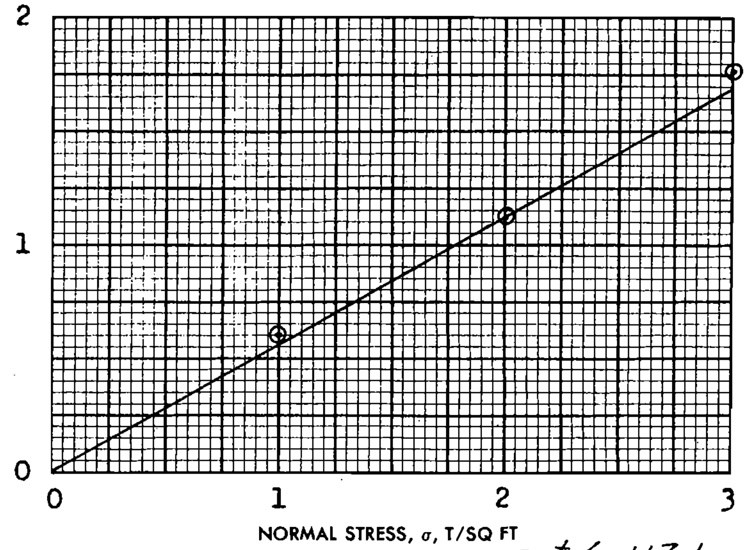
Project LK. PONT., LA. & VIC. ('71); ORLEANS PARISH LAKEFRONT LEVEE, WEST OF IHNC; GDM #2; SUPP. #5; OUTFALL CANALS

Boring No. 2-MUE	Sample No. 8-D
~~Depth~~ El -19.8	Date 26 March, 1971

JDB **CONSOLIDATION TEST REPORT**

ENG FORM 2090 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424





sat γ = 117.1

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	31.3 %	32.4 %	33.5 %	32.4 %
	VOID RATIO	e_o	0.893	0.912	0.950	
	SATURATION	S_o	93.9 %	95.2 %	94.5 %	%
	DRY DENSITY, LB/CU FT	γ_d	88.4	87.5	85.8	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	27.9 %	28.4 %	29.3 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.60	1.12	1.76	
ACTUAL TIME TO FAILURE, MIN		t_f	1320	960	1140	
RATE OF STRAIN, IN./MIN			.00017	.00017	.00017	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 30°

TAN ϕ' = 0.560

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.540 IN. THICK

CLASSIFICATION SILTY SAND(SM),gray, contains seams of plastic clay

LL - | PL - | PI - | G_s 2.68

REMARKS

F 88

PROJECT LK.PONT.LA.&VIC.(71)ORLEANS PARISH LAKE-FRONT LEVEE,WEST OF IHNC,GDM # 2,SUPP. # 5,

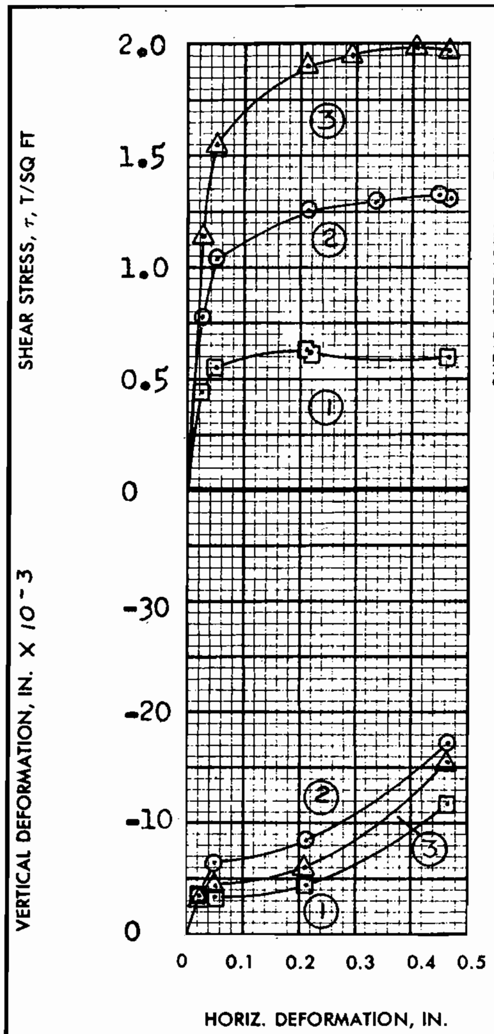
AREA OUTFALL CANALS

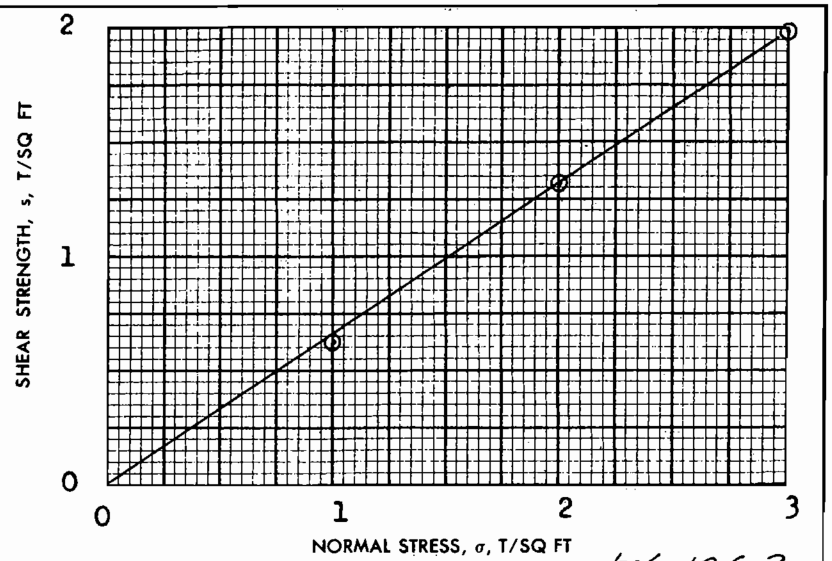
BORING NO. 2-MUE | SAMPLE NO. 9-D

DEPTH EL - 23.8 | DATE 22 March 1971

GDA

DIRECT SHEAR TEST REPORT





sat.γ=126.2

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	23.4 %	22.8 %	22.7 %	23.0%
	VOID RATIO	e_o	0.647	0.658	0.631	
	SATURATION	S_o	96.9%	92.9 %	96.4 %	%
	DRY DENSITY, LB/CU FT	γ_d	101.6	100.9	102.6	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	21.3 %	21.1 %	20.1 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.63	1.32	1.99	
ACTUAL TIME TO FAILURE, MIN		t_f	1290	2640	2400	
RATE OF STRAIN, IN./MIN			.00017	.00017	.00017	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 33°

TAN ϕ' = 0.660

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

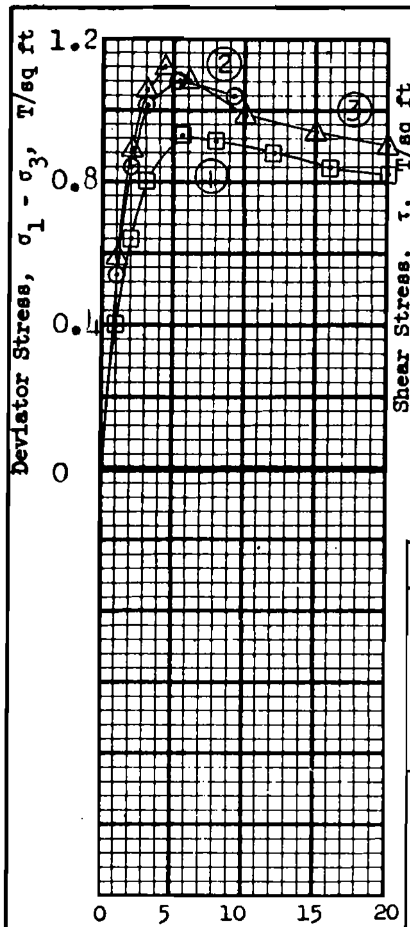
TYPE OF SPECIMEN	UNDISTURBED	3.00 IN. SQUARE	0.540 IN. THICK
CLASSIFICATION	SILTY SAND(SM),gray		
LL -	PL -	PI -	G_s 2.68

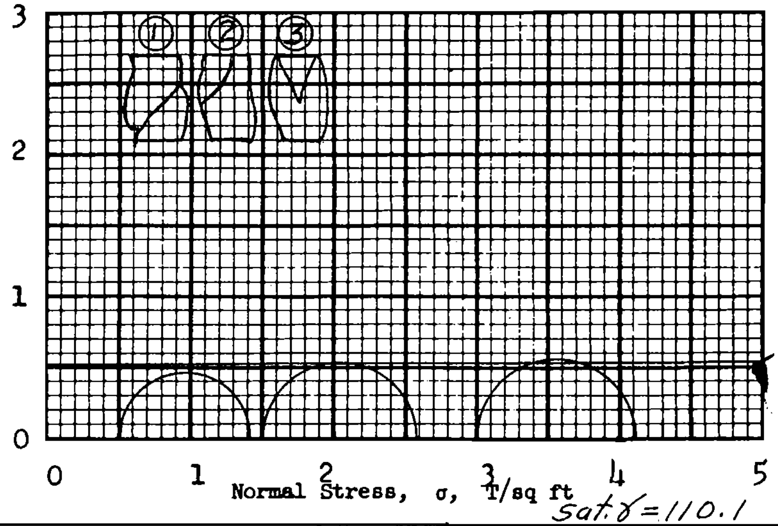
REMARKS

F89

PROJECT	LK.PONT.LA.,&VIC.(71)ORLEANS PARISH
	LKFRNT.LEVEE,WEST OF IHNC,GDM # 2,SUPP. # 5,
AREA	OUT FALL CANALS
BORING NO. 2-MUE	SAMPLE NO. 13-D
DEPTH EL - 40.0	DATE 23 March 1971
GDA	**DIRECT SHEAR TEST REPORT**

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)





Sat. γ = 110.1

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.52 T/sq ft

Method of saturation ________

[ ] Controlled stress

[X] Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	43.6 %	42.7 %	44.1 %	43.5 %
	Void ratio	e_o	1.26	1.21	1.25	
	Saturation	S_o	93.8 %	95.6 %	95.6 %	%
	Dry density, lb/cu ft	γ_d	74.8	76.6	75.2	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.93	1.08	1.12	
Time to failure, min		t_f	26	24	25	
Rate of strain, percent/min			0.216	0.219	0.169	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.41	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH), gray, scattered pockets of sand

LL 56 | PL 17 | PI 39 | G_s 2.71

Remarks ________

Project LK. PONT. LA., & VIC. (71) ORLEANS PARISH

LAKEFRONT LEVEE, WEST OF IHNC, GDM # 2, SUPP.

Area # 5, OUTFALL CANALS

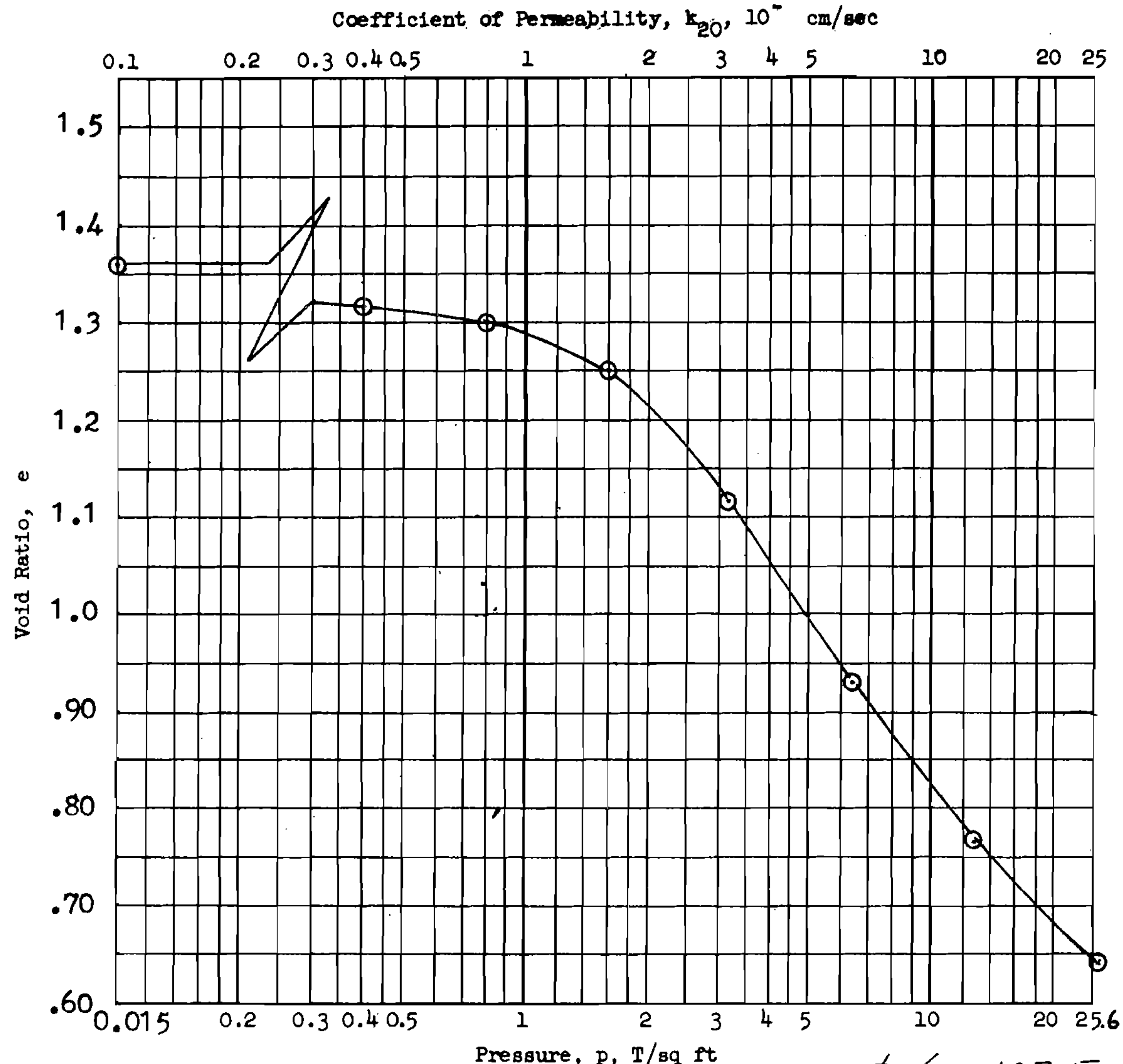
Boring No. 2-MUE | Sample No. 16-A

Depth El - 49.3 | Date 11 March, 1971

JMS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

F90 TRANSLUCENT USAEWES SOILS TEST SEC.

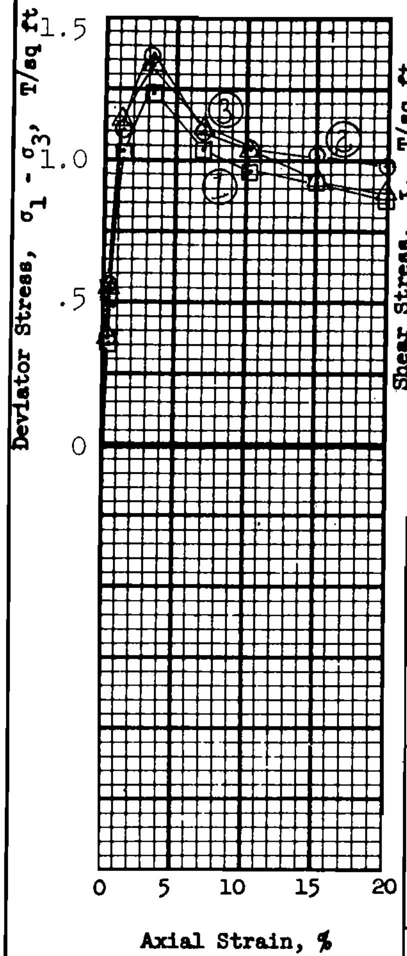


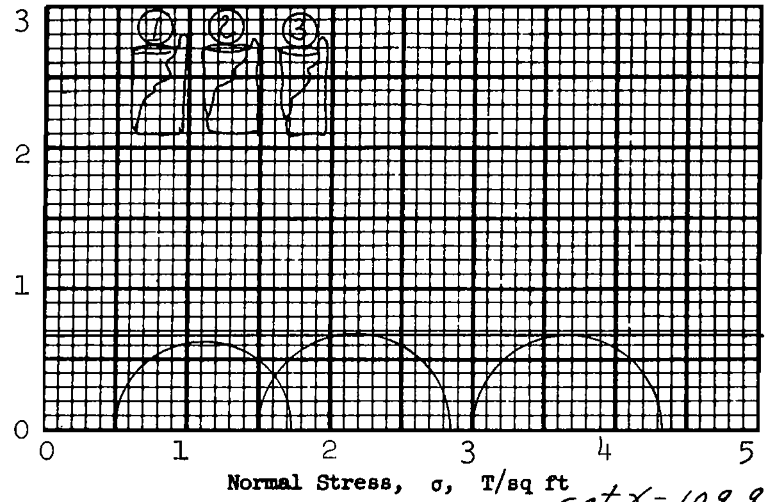
sat. γ = 107.5

Type of Specimen UNDISTURBED		Before Test		After Test
Diam 4.25 in.	Ht 1.155 in.	Water Content, w_o	48.9 %	w_f %
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.36	e_f
Preconsol. Pressure, p_c 2.05 T/sq ft		Saturation, S_o	97.0 %	S_f %
Compression Index, C_c 0.60		Dry Density, γ_d	71.5 lb/ft³	
Classification PLASTIC CLAY (CH)*		k_{20} at e_o = × 10⁻ cm/sec		
LL -	G_s 2.71 From Q	Project LK. PONT.,LA.& VIC.-('71) ORLEANS PARISH LAKEFRONT LEVEE,WEST OF IHNC, GDM #2, SUPP. #5, OUTFALL CANALS		
PL -	D_{10}			
* Remarks grayish-green, contains small shell fragments		Boring No. 2-MUE	Sample No. 16-A	
		~~Depth~~ El -49.3	Date 26 March,1971	
		JDB CONSOLIDATION TEST REPORT		

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424

F91





sat. γ = 109.9

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.67 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

	Test No.		1	2	3	Avg.
Initial	Water content	w_o	46.6 %	44.8 %	47.2 %	46.2 %
	Void ratio	e_o	1.31	1.27	1.32	
	Saturation	S_o	97.8 %	97.0 %	98.3 %	%
	Dry density, lb/cu ft	γ_d	74.3	75.5	74.0	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.24	1.35	1.34	
Time to failure, min		t_f	18	18	18	
Rate of strain, percent/min			0.179	0.179	0.179	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q	Type of specimen UNDISTURBED			
Classification PLASTIC CLAY(CH),gray, numerous pockets of sand and shell *				
LL 75	PL 17	PI 58		G_s 2.75

Remarks *fragments

Project LK. PONT.LA.&VIC.(VIC)ORLEANS PARISH

LAKEFRONT LEVEE, WEST OF IHNC, GDM # 2,SUPP.

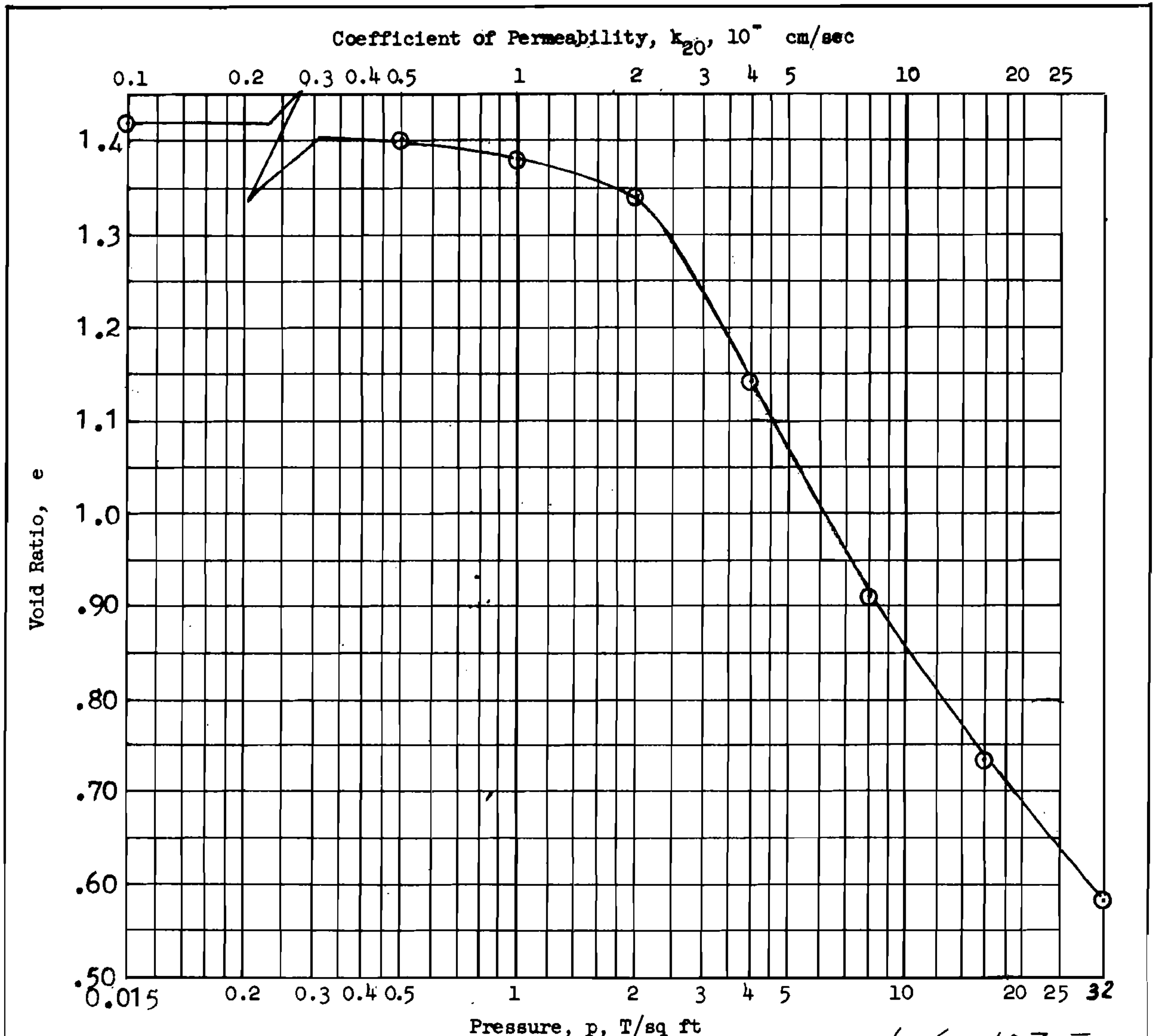
Area #5,OUTFALL CANALS

Boring No. 2-MUE	Sample No. 19-B
Depth El -62.2	Date 11 March 1971

TES **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM 1 JUN 65 2089 *(EM 1110-2-1902)* PREVIOUS EDITIONS ARE OBSOLETE

F92 *TRANSLUCENT* USAEWES SOILS TEST SE



sat. γ = 107.5

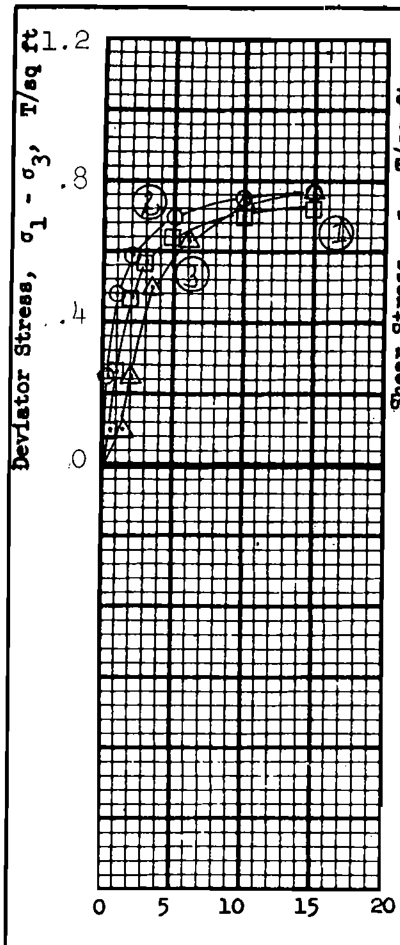
Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.151 in.	Water Content, w_o	51.1 %	w_f	%
Overburden Pressure, p_o T/sq ft		Void Ratio, e_o	1.42	e_f	
Preconsol. Pressure, p_c 2.29 T/sq ft		Saturation, S_o	98.7 %	S_f	%
Compression Index, C_c 0.76		Dry Density, γ_d	70.8 lb/ft^3		
Classification PLASTIC CLAY (CH) *		k_{20} at e_o =	$\times 10^-$ cm/sec		

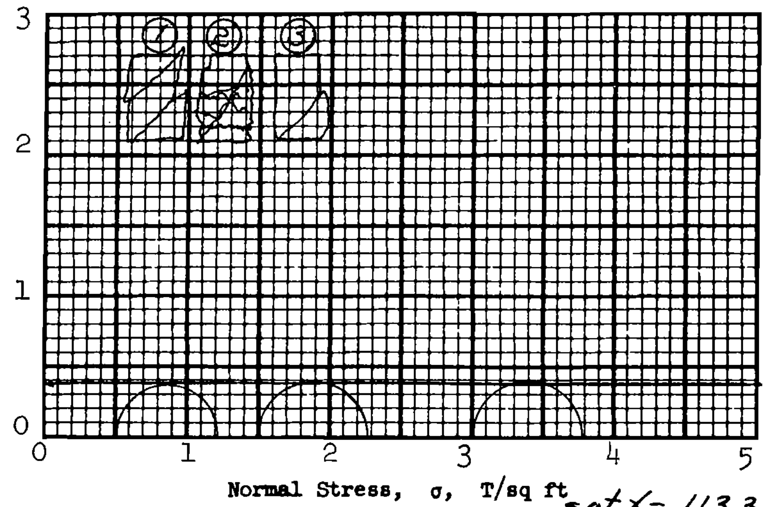
LL -	G_s 2.75 From Q
PL -	D_{10}
Remarks * gray	

Project LK. PONT., LA. & VIC. ('71); ORLEANS PARISH LAKEFRONT LEVEE, WEST OF IHNC; GDM #2; SUPP. #5; OUTFALL CANALS

Boring No. 2-MUE	Sample No. 19-B
~~Depth~~ El -62.2	Date 29 March, 1971

JDB **CONSOLIDATION TEST REPORT**





sat. γ = 113.3

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.38 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	36.4 %	39.0 %	37.4 %	37.6 %
	Void ratio	e_o	0.939	0.994	0.960	
	Saturation	S_o	100+ %	100+ %	100+ %	%
	Dry density, lb/cu ft	γ_d	83.4	81.1	82.5	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.72	0.77	0.78	
Time to failure, min		t_f	24	61	35	
Rate of strain, percent/min			0.612	0.247	0.428	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q | **Type of specimen** UNDISTURBED

Classification PLASTIC CLAY(CH), gray, contains 3/4" brick fragments *

LL 70 | **PL** 22 | **PI** 48 | **G_s** 2.59

Remarks *in unused portion of sample

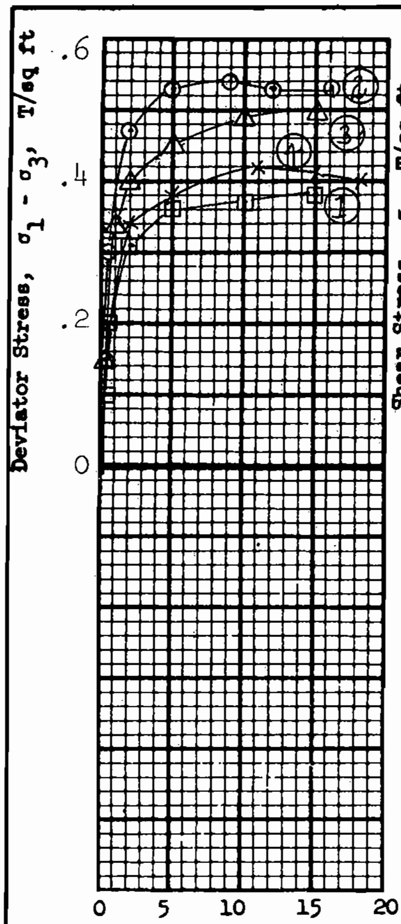
Project LK. PONT., LA.&VIC. -HURR. PROT.-ORLEANS PAR. LKFRNT. LEV., WEST OF IHNC-GDM#2, SUPP.#5,

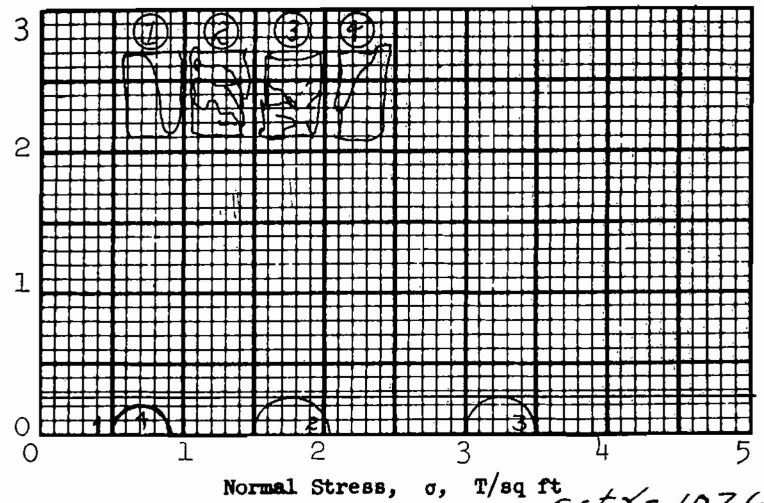
Area OUTFALL CANALS(ALONG 17th ST.CANAL)1971

Boring No. 1-MUW | **Sample No.** 2-B

Depth El 0.4 | **Date** 22 March 1971

FAm **TRIAXIAL COMPRESSION TEST REPORT**





sat. γ = 107.6

Test No.			1	2	3	4	
Initial	Water content	w_o	48.9 %	45.2 %	46.6 %	52.4 %	Avg. 48.3
	Void ratio	e_o	1.35	1.26	1.31	1.49	
	Saturation	S_o	97.8 %	96.9 %	96.0 %	95.0 %	
	Dry density, lb/cu ft	γ_d	71.7	74.7	73.1	67.6	
Before Shear	Water content	w_c	%	%	%	%	
	Void ratio	e_c					
	Saturation	S_c	%	%	%	%	
	Final back pressure, T/sq ft	u_o					
Final	Water content	w_f	%	%	%	%	
	Void ratio	e_f					
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	0.5	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.38	0.54	0.50	0.42	
Time to failure, min		t_f	90	15	27	47	
Rate of strain, percent/min			0.167	0.593	0.552	0.235	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$					
Initial diameter, in.		D_o	1.40	1.40	1.40	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.24 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Type of test Q	Type of specimen UNDISTURBED			
Classification PLASTIC CLAY(CH),gray, contains rootlets and organic matter*				
LL 86	PL 21	PI 65		G_s 2.70

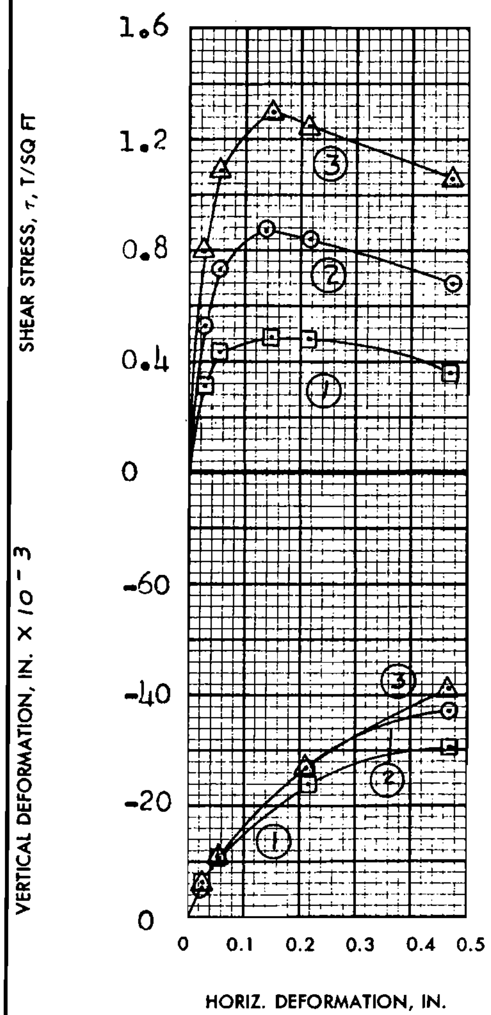
Remarks *slickensided
Strength of test specimen
#1 too low to plot

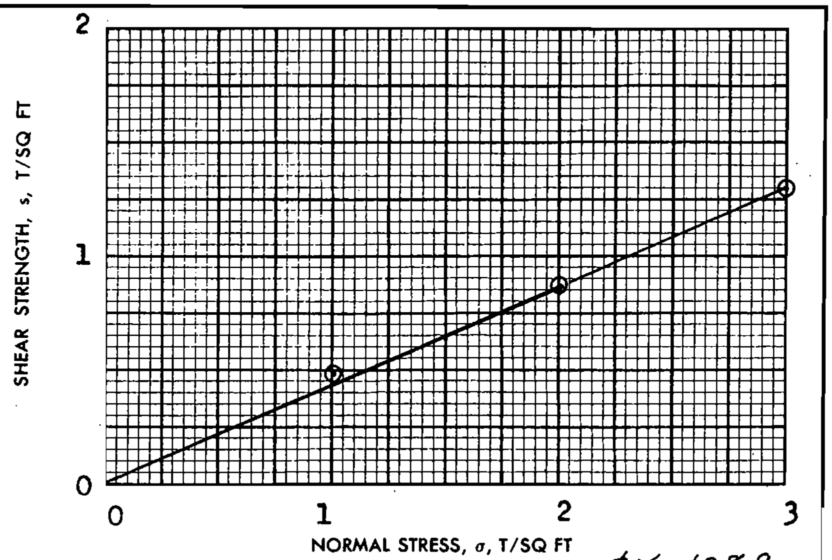
Project LK. PONT.,LA.&VIC.-HURR. PROT.-ORLEANS PAR.LKFRNT.LEV.,WEST OF IHNC-GDM#2,SUPP.#5;	
Area OUTFALL CANALS(ALONG 17th ST.CANAL)1971	
Boring No. 1-MUW	Sample No. 3-C
Depth El -4.0	Date 23 March 1971
OHR	TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE TRANSLUCENT

F95

SOILS TEST SECTION





sat. γ = 108.9

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	48.4 %	48.7%	48.5%	48.5%
	VOID RATIO	e_o	1.34	1.27	1.23	
	SATURATION	S_o	96.4 %	100+ %	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	71.1	73.3	74.6	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	1	2	1	
FINAL	WATER CONTENT	w_f	45.4 %	39.0%	33.4%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.49	0.87	1.30	
ACTUAL TIME TO FAILURE, MIN		t_f	900	840	900	
RATE OF STRAIN, IN./MIN			.00017	.00017	.00017	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 24°

TAN ϕ' = 0.435

c' = 0 T/SQ FT

[ ] CONTROLLED STRESS

[X] CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED		3.00 IN. SQUARE	0.540 IN. THICK

CLASSIFICATION PLASTIC CLAY(CH),gray, contains rootlets, badly slickensided

LL 82	PL 28	PI 54		G_s 2.67

REMARKS

F96

PROJECT LK.PONT.LA.,&VIC.-HURR.PROT.-ORLEANS PARISH LKFRNT.LEV.,WEST OF IHNC-GDM # 2,SUPP.

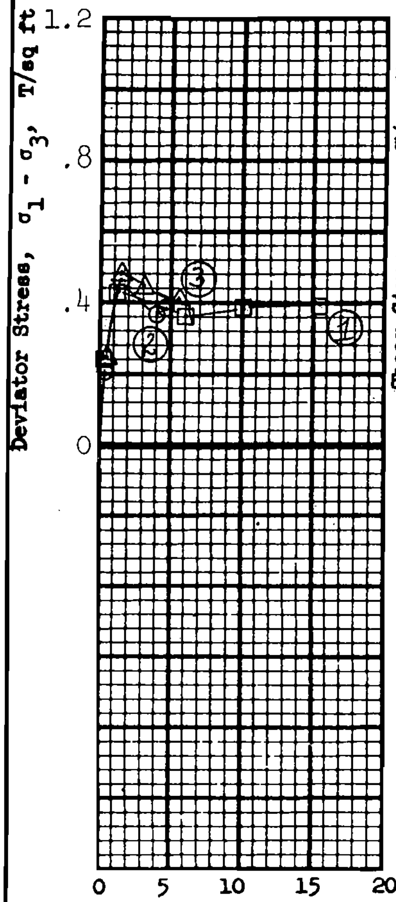
AREA # 5,OUTFALL CANALS(ALONG 17thST.CANAL)1971

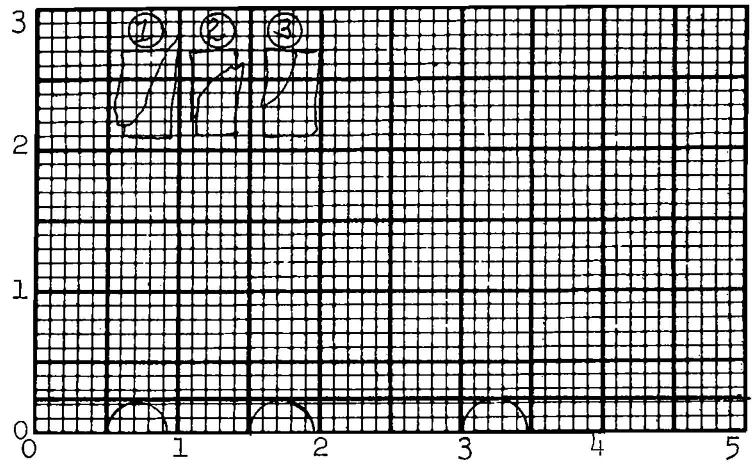
BORING NO. 1-MUW	SAMPLE NO. 3-D
~~DEPTH~~ EL - 4.8	DATE 25 March 1971

GDA **DIRECT SHEAR TEST REPORT**

ENG FORM 1 JUN 65 **2092** *(EM 1110-2-1906)* PREVIOUS EDITIONS ARE OBSOLETE *(TRANSLUCENT)*

GPO : 1966 OF—214-945





Sat. γ = 95.3

Test No.			1	2	3	Avg.
Initial	Water content	w_o	80.4 %	84.7 %	78.9 %	81.3 %
	Void ratio	e_o	2.20	2.31	2.15	
	Saturation	S_o	98.7 %	99.0 %	99.1 %	%
	Dry density, lb/cu ft	γ_d	52.6	50.9	53.5	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.43	0.46	0.48	
Time to failure, min		t_f	7	37	32	
Rate of strain, percent/min			0.173	0.379	0.047	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.23 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray, contains organic matter

LL 119 | PL 30 | PI 89 | G_s 2.70

Remarks ________

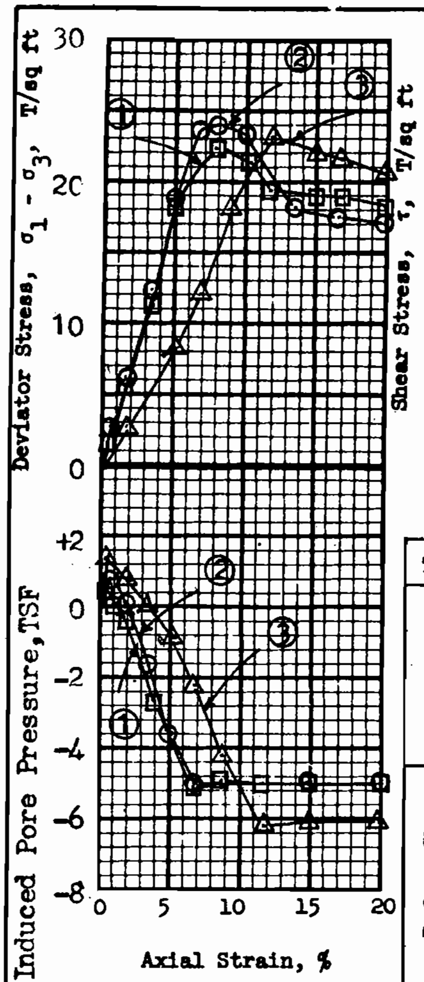
Project LK.PONT.LA.&VIC.-HURR. PROT.-ORLEANS PAR.LKFRNT. LEV.,WEST OF IHNC-GDM #2,SUPP.#5,

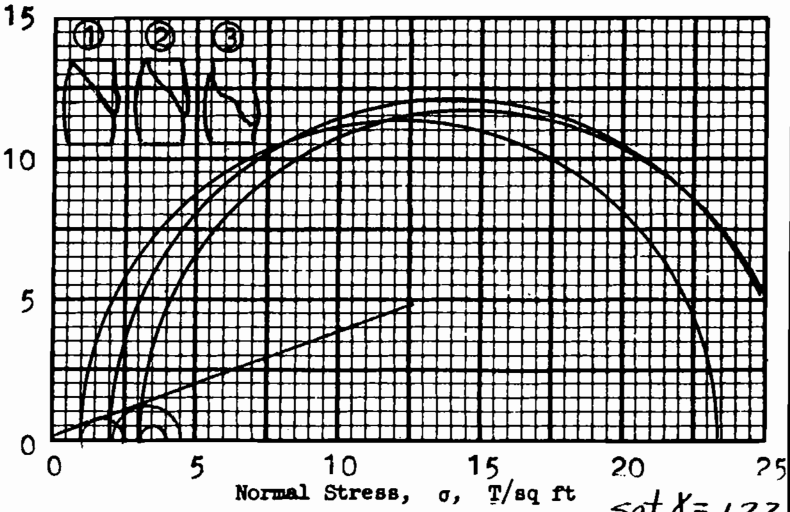
Area OUTFALL CANALS(ALONG 17th ST.CANAL) 1971

Boring No. 1-MUW | Sample No. 5-D

Depth El -13.0 | Date 23 March 1971

JMS **TRIAXIAL COMPRESSION TEST REPORT**





sat γ = 122

Shear Strength Parameters

ϕ = 21°

tan ϕ = .384

c = .1 T/sq ft

Method of saturation BP

☐ Controlled stress

☒ Controlled strain

	Test No.		1	2	3	Avg
Initial	Water content	w_o	27.5 %	28.3 %	27.4 %	27.7 %
	Void ratio	e_o	0.770	0.770	0.750	
	Saturation	S_o	95.7 %	98.5 %	97.9 %	%
	Dry density, lb/cu ft	γ_d	94.5	94.5	95.6	
Before Shear	Water content	w_c	27.9 %	27.3 %	26.9 %	%
	Void ratio	e_c	0.737	0.746	0.692	
	Saturation	S_c	100+ %	98.1 %	100+ %	%
	Final back pressure, PSI	u_o	60	60	60	
	Dry Density Lbs/cu.ft.	γ_d	96.3	95.8	98.9	
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	1.0	2.0	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	22.31	24.04	23.20	
Time to failure, min		t_f	84	84	126	
Rate of strain, percent/min			0.093	0.093	0.094	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test R	Type of specimen UNDISTURBED

Classification SILTY SAND (SM), gray, contains a few pebbles

LL –	PL –	PI –		G_s 2.68

Remarks See attached plot for effective values

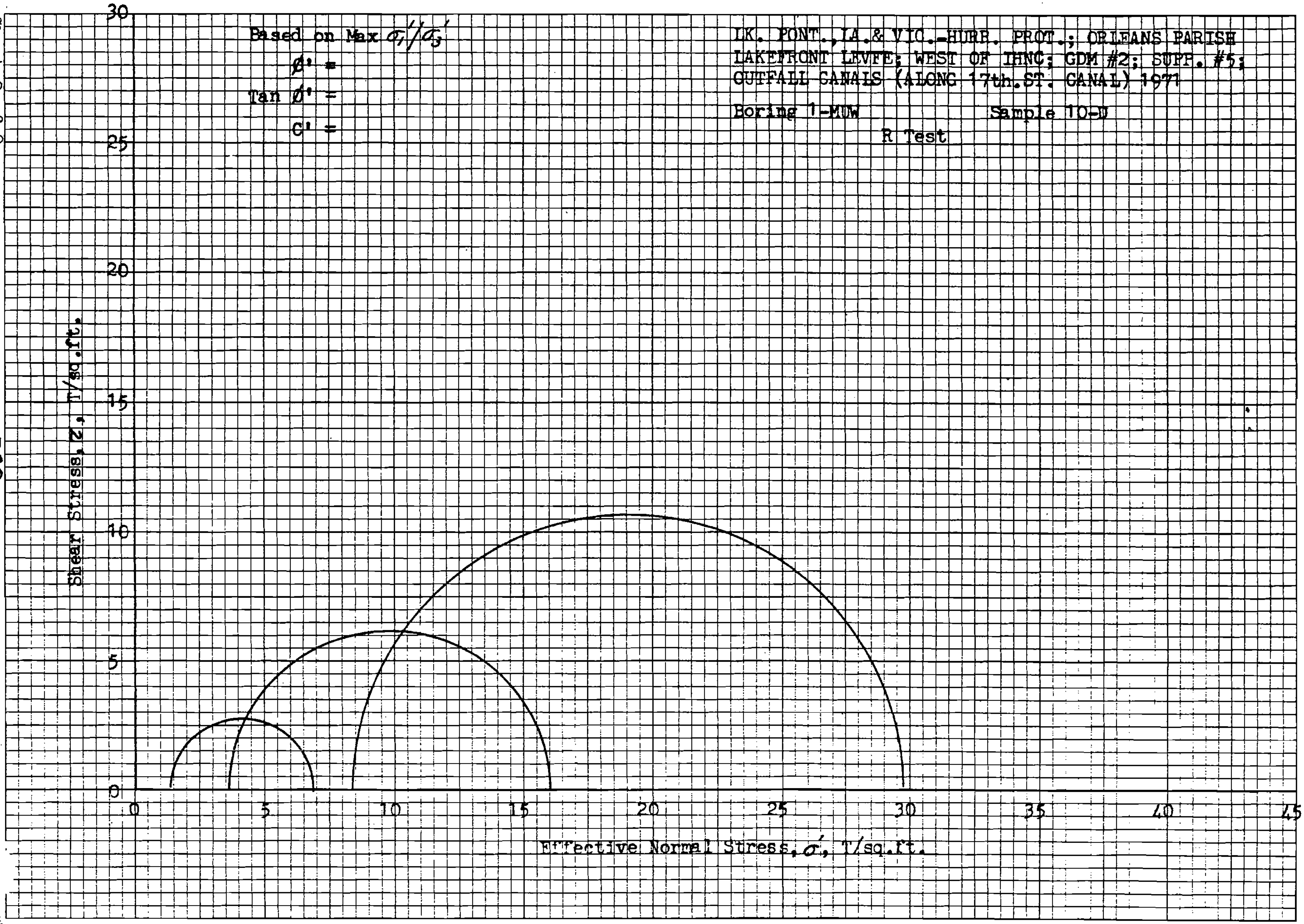
Project LK.PONT.,LA.& VIC.-HURR. PROT.ORLFANS PARISH LAKEFRONT LEVEE;WEST OF IHNC;GDM#2; SUPP.#5;OUTFALL CANALS(ALONG 17th.ST CANAL)'71

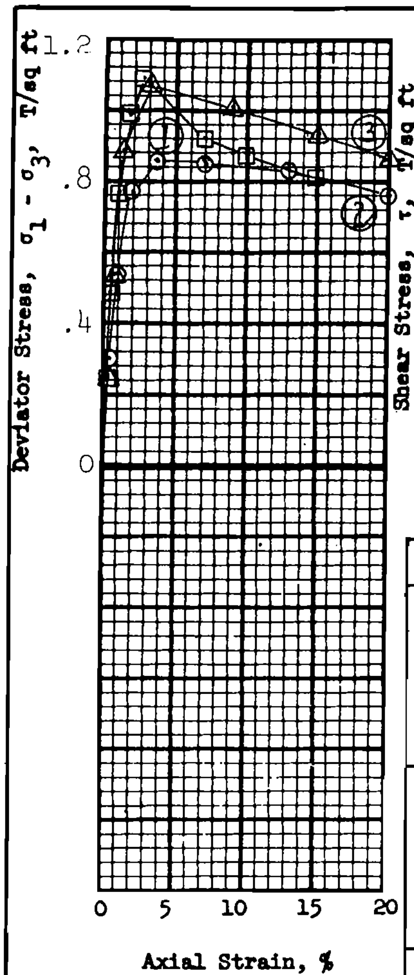
Boring No. 1-MUW	Sample No. 10-D
~~Depth~~ El -33.0	Date 31 March,1971

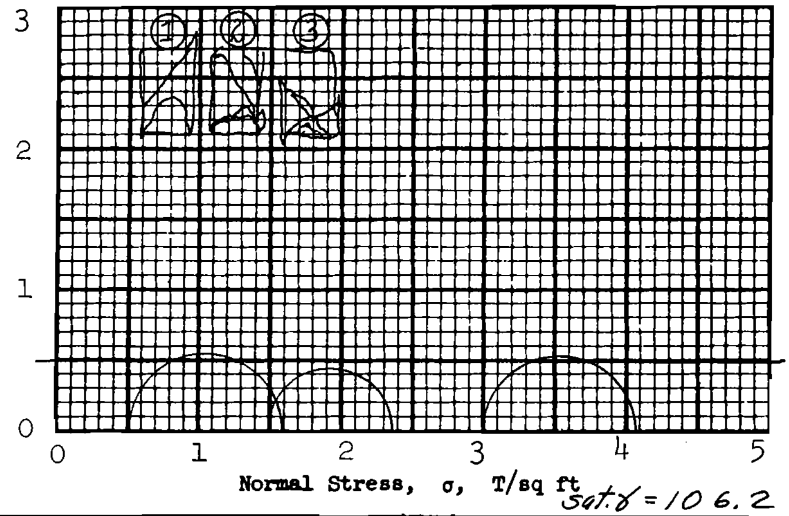
JAL **TRIAXIAL COMPRESSION TEST REPORT**

Sheet 1 of 2

ENG FORM 1 JUN 65 2089 *(EM 1110-2-1902)* PREVIOUS EDITIONS ARE OBSOLETE F98 *TRANSLUCENT*


Based on Max σ_1'/σ_3'
ϕ' =
Tan ϕ' =
C' =
LK. PONT., LA.& VIC.-HURR. PROT.; ORLEANS PARISH
LAKEFRONT LEVEE; WEST OF IHNC; GDM #2; SUPP. #5;
OUTFALL CANALS (ALONG 17th.ST. CANAL) 1971
Boring 1-MUW
Sample 10-D
R Test
Shear Stress, τ, T/sq.ft.
Effective Normal Stress, σ', T/sq.ft.
0
5
10
15
20
25
30
35
40
45





Sat.γ = 106.2

Test No.			1	2	3	Avg.
Initial	Water content	w_o	52.1 %	52.1 %	51.5 %	51.9 %
	Void ratio	e_o	1.40	1.42	1.39	
	Saturation	S_o	99.7 %	98.3 %	99.3 %	%
	Dry density, lb/cu ft	γ_d	69.8	69.1	70.1	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.09	0.86	1.07	
Time to failure, min		t_f	43	28	13	
Rate of strain, percent/min			0.652	0.132	0.235	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.41	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.50 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Type of test Q	Type of specimen UNDISTURBED		
Classification PLASTIC CLAY(CH),gray, contains shell fragments			
LL 73	PL 18	PI 55	G_s 2.68

Remarks ________

Project LK.PONT.,LA.&VIC.-HURR. PROT.-ORLEANS PARISH LKFRNT.LEV.,WEST OF IHNC-GDM#2,SUPP.#5

Area OUTFALL CANALS(SLONG 17th ST.CANAL)1971

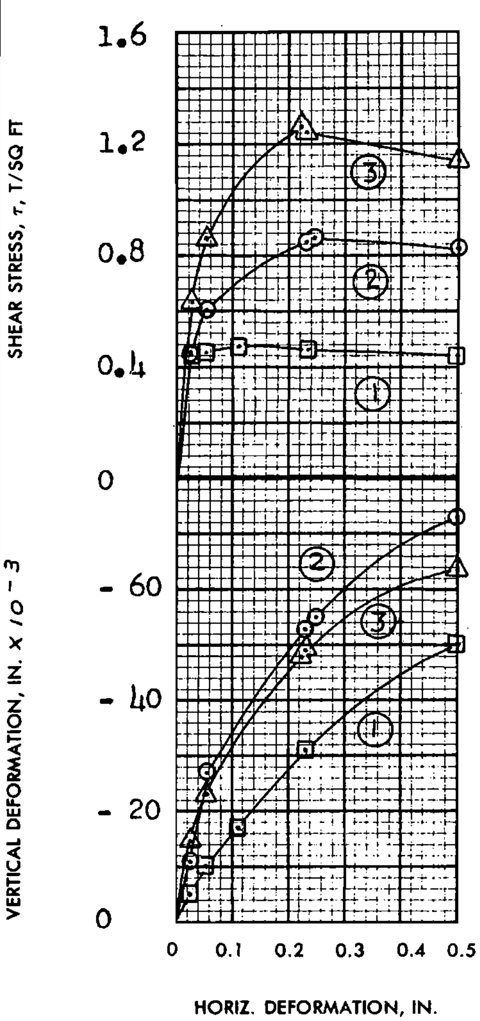
Boring No. 1-MUW | Sample No. 16-C

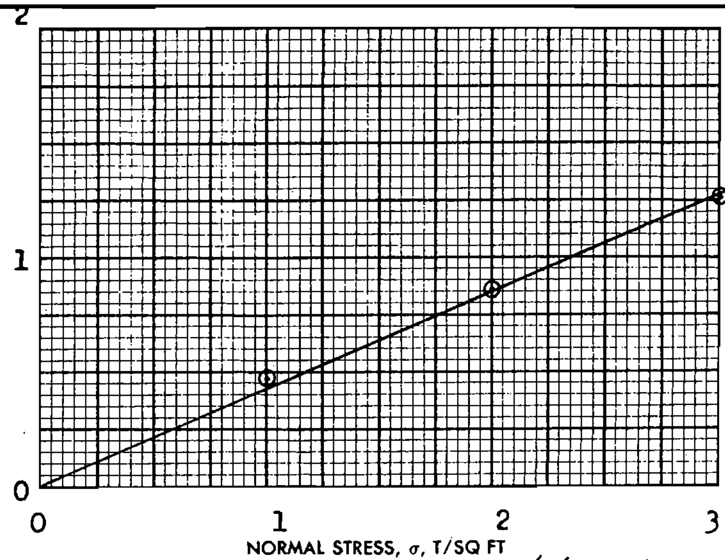
~~Depth~~ El -56.2 | Date 23 March 1971

FAM **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM 1 JUN 65 2089 *(EM 1110-2-1902)* PREVIOUS EDITIONS ARE OBSOLETE

F100 *TRANSLUCENT*





sat. γ = 106

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	49.8 %	50.9 %	50.9 %	50.5 %
	VOID RATIO	e_o	1.43	1.43	1.44	
	SATURATION	S_o	94.0 %	96.1 %	95.4%	%
	DRY DENSITY, LB/CU FT	γ_d	69.3	69.4	69.0	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	<1	2	10	
FINAL	WATER CONTENT	w_f	53.7 %	45.7 %	40.5%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.47	0.86	1.26	
ACTUAL TIME TO FAILURE, MIN		t_f	660	1410	1260	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 23°

TAN ϕ' = 0.430

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN	UNDISTURBED	3.00 IN. SQUARE	0.550 IN. THICK

CLASSIFICATION PLASTIC CLAY(CH),dark gray, fissured

LL 81	PL 19	PI 62		G_s 2.70

REMARKS

F 101

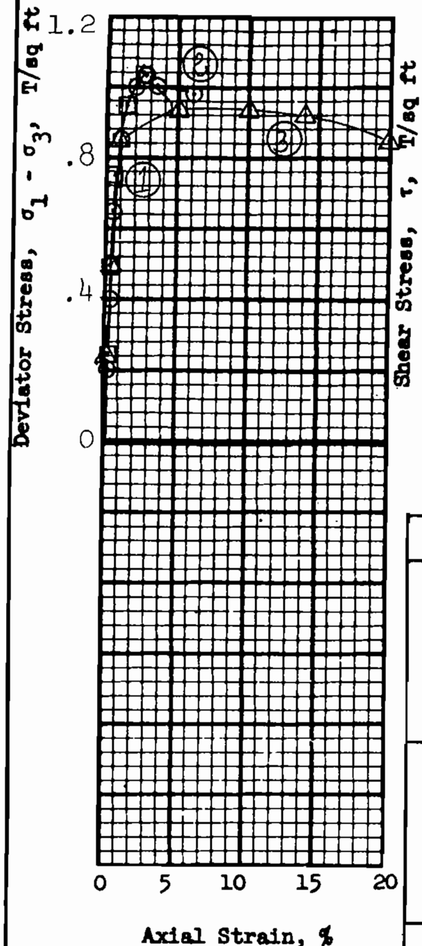
PROJECT LK.PONT.LA.,& VIC-HURR.PROT.-ORLEANS PARISH LKFRNT.LEV.,WEST OF IHNC-GDM#2,SUPP.#5,

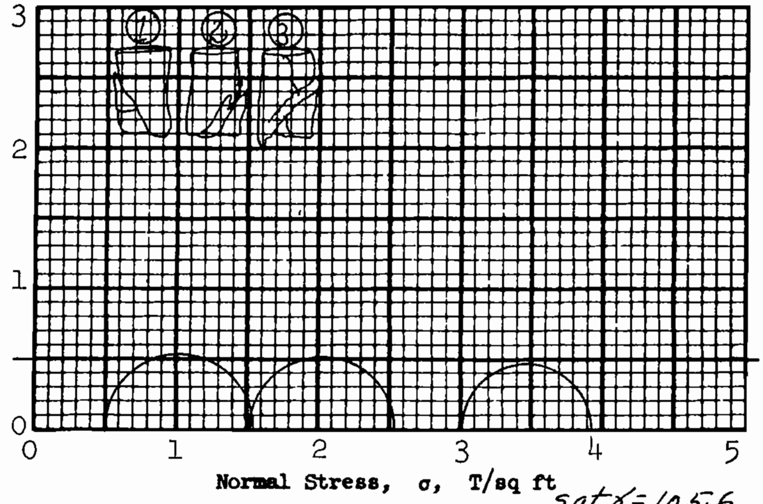
AREA OUTFALL CANALS(ALONG 17thST.CANAL) 1971

BORING NO. 1-MUW	SAMPLE NO. 17-B
~~DEPTH~~ EL - 59.3	DATE 25 March 1971

BWG **DIRECT SHEAR TEST REPORT**

ENG FORM 1 JUN 65 **2092** *(EM 1110-2-1906)* PREVIOUS EDITIONS ARE OBSOLETE *(TRANSLUCENT)* GPO : 1966 OF—214-945





sat.γ=105.6

Test No.			1	2	3	Avg.
Initial	Water content	w_o	54.2 %	54.4 %	54.2 %	54.3 %
	Void ratio	e_o	1.47	1.48	1.48	
	Saturation	S_o	99.9 %	99.6 %	99.2 %	%
	Dry density, lb/cu ft	γ_d	68.6	68.2	68.2	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.04	1.03	0.94	
Time to failure, min		t_f	10	27	44	
Rate of strain, percent/min			0.250	0.102	0.114	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 0.50 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

Type of test Q	Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray, contains silt lenses

LL 86	PL 22	PI 64		G_s 2.71

Remarks ________

Project LK.PONT.LA.&VIC.-HURR. PROT.-ORLEANS PAR.LKFRNT.LEV.,WEST OF IHNC-GDM#2,SUPP.#5;	
Area OUTFALL CANALS(ALONG 17th ST. CANAL)1971	
Boring No. 1-MUW	Sample No. 17-D
Depth El -61.2	Date 24 March 1971
OHR TRIAXIAL COMPRESSION TEST REPORT	