

**LAKE PONTCHARTRAIN, LA.  
AND VICINITY  
LAKE PONTCHARTRAIN  
HIGH LEVEL PLAN**

**US-CE-C** PROPERTY OF THE  
UNITED STATES GOVERNMENT

**DESIGN MEMORANDUM NO. 20  
GENERAL DESIGN  
ORLEANS PARISH  
JEFFERSON PARISH  
17th. St. Outfall Canal  
(Metairie Relief)**

**IN TWO VOLUMES  
VOLUME II**

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US ARMY ENGINEER WATERWAYS  
EXPERIMENT STATION  
VICKSBURG, MISSISSIPPI

**DEPARTMENT OF THE ARMY  
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS  
NEW ORLEANS, LOUISIANA**

**MARCH 1990**



**US Army Corps  
of Engineers**  
New Orleans District

**SERIAL NO.**

26028368

TC 202  
N466396  
no. 20  
1990  
v. 2

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)<sup>1/</sup>

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

<sup>1/</sup> 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
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LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY  
HIGH LEVEL PLAN  
DESIGN MEMORANDUM NO. 20, GENERAL DESIGN  
17TH STREET OUTFALL CANAL

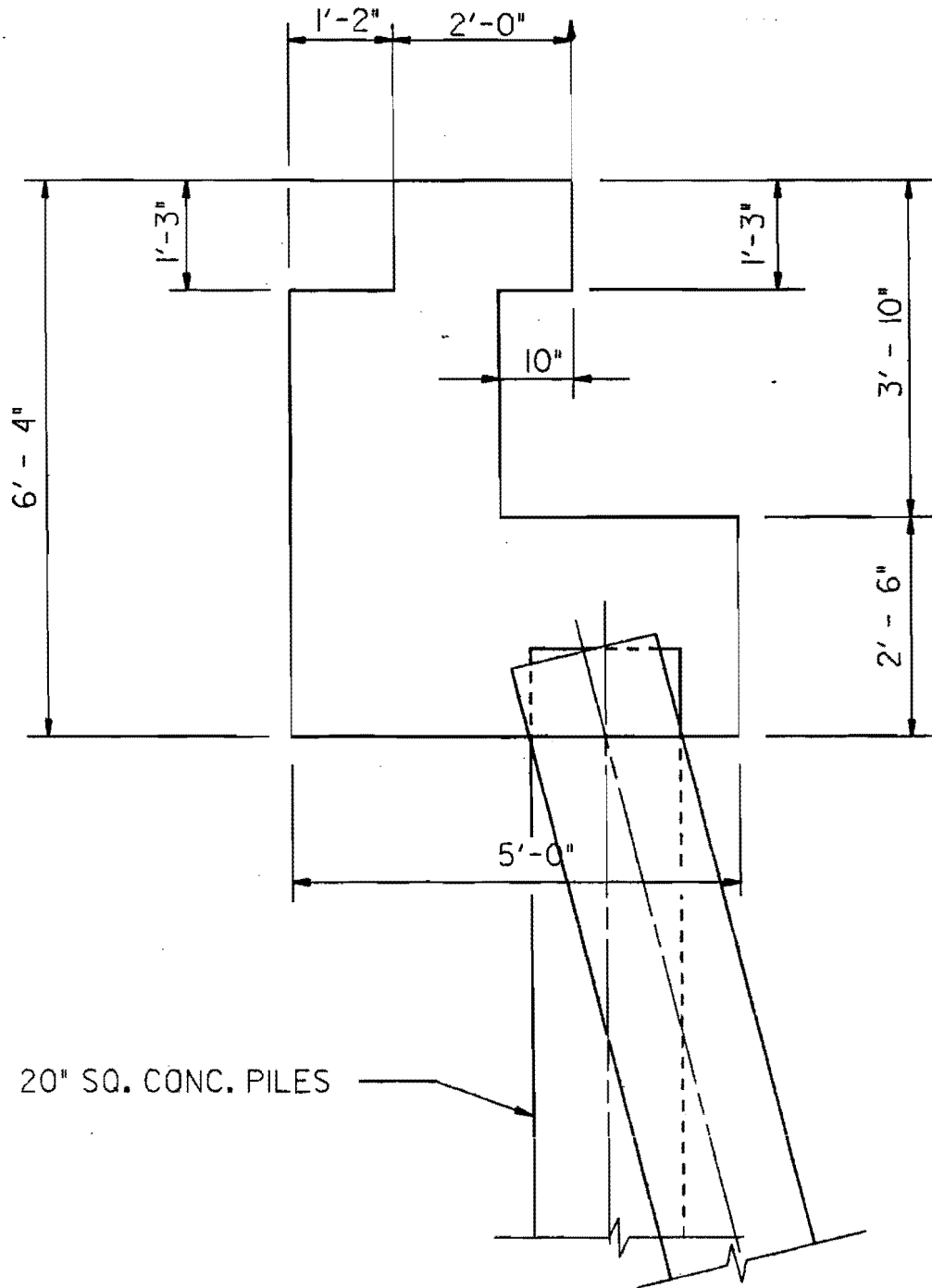
APPENDIX DD

TYPICAL STRUCTURAL DESIGN COMPUTATIONS

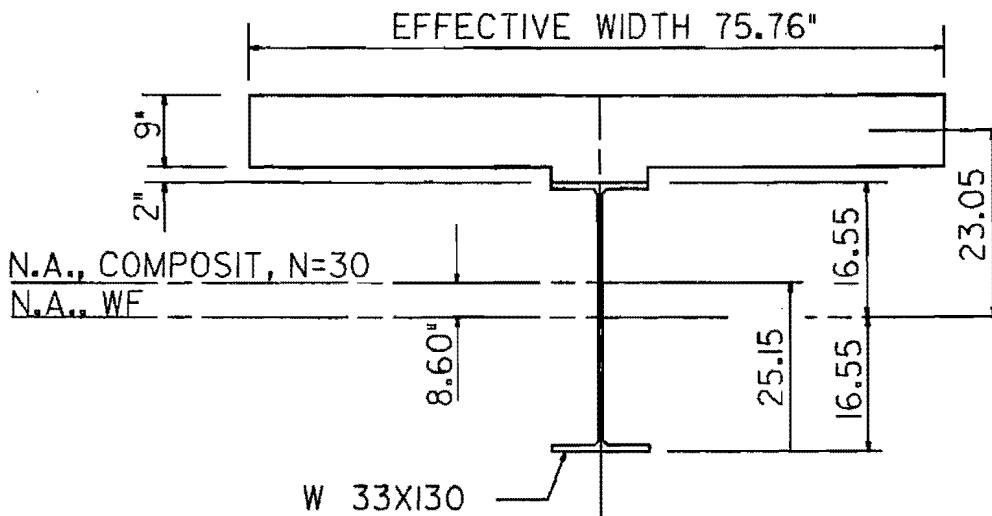
APPENDIX DD  
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SECTION PROPERTY, COMPOSIT SECTION, N=30 :



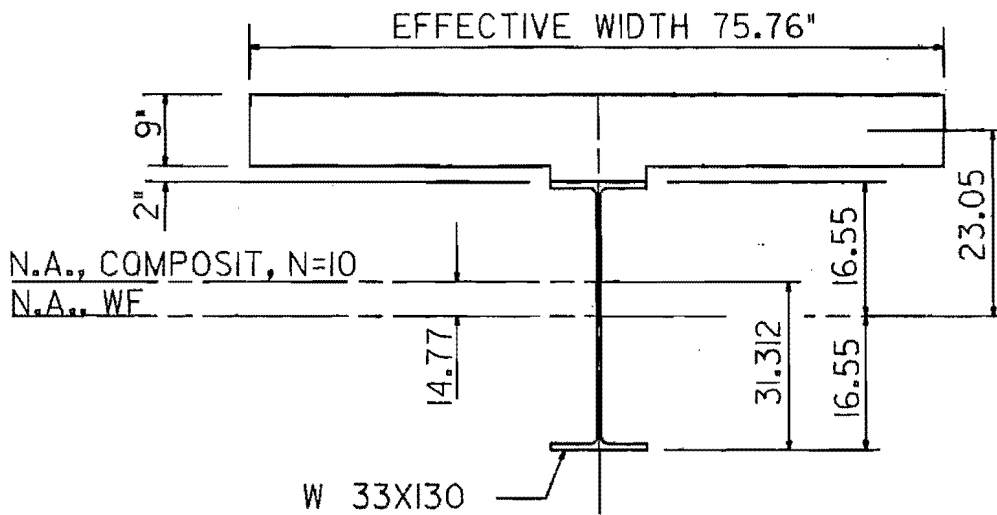
	A	d	Ad	Ad <sup>2</sup>	I <sub>0</sub>	Ad <sup>2</sup> + I <sub>0</sub>
W 33X130	38.3	-	-	-	6710	6710
CONC 75.96X9/30	22.80	23.05	525.5	12113	154	12267
	61.1	(8.60)	525.5	12113	6864	18977
					LESS 525.5X8.6=	-4520
						I = 14,457

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

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

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

SECTION PROPERTY, COMPOSIT SECTION, N=10:



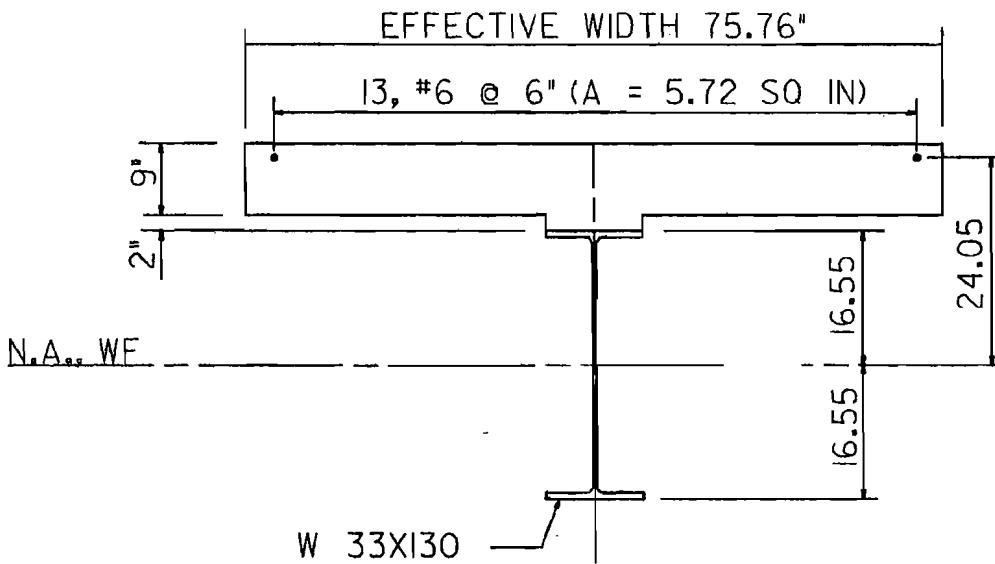
	A	d	Ad	Ad <sup>2</sup>	I <sub>0</sub>	Ad <sup>2</sup> + I <sub>0</sub>
W 33X130	38.3	-	-	-	6710	6710
CONC . 75.96X9/10	68.36	23.05	15765	36327	461	36788
	<u>106.66</u>	<u>(14.77)</u>	15765	<u>36327</u>	<u>7171</u>	<u>43478</u>
				LESS 1576X14.77 =		<u>-23278</u>
						I = 20,220

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

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

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

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



	<u>A</u>	<u>d</u>	<u>Ad</u>	<u>Ad<sup>2</sup></u>	<u>I<sub>0</sub></u>	<u>Ad<sup>2</sup> + I<sub>0</sub></u>
W 33X130	38.3	-	-	-	6710	6710
REINF BARS 13,#6 BARS	5.72	24.05	137.5	3308	-	3308
	<u>44.02</u>	<u>(3.12)</u>	<u>137.5</u>	<u>3308</u>	6710	<u>10018</u>
				LESS 137.5X3.12 =		<u>-429</u>
						<u>9,588</u>

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

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

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

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

$$M_{DL} = 18.20 \text{ ft-k}$$

$$V_{DL} = 18.12 \text{ k}$$

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

$$M_{SDL} = 90.40 \text{ ft-k}$$

$$V_{SDL} = 9.04 \text{ k}$$

LIVE LOAD (LL)

a. HS-20 44 TRUCK LOAD

$$M_{LL} = 449.80 \text{ ft-k}$$

$$V_{LL} = 55.2$$

$$LL \text{ DISTR. FACTOR} = 6.33/11 = 0.576$$

$$IMPACT = 50/(40+125) = 0.303 \text{ USE MAX. 30\%}$$

$$M_{LL+I} = 337 \text{ ft-k}$$

$$V_{LL+I} = 41.3 \text{ k}$$

LIVE LOAD (CONT)

## b. HYDRAULIC LOAD

WATER TO EL. 14.5

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

UPLIFT LOAD =  $6.66 \times 0.064 \times 6.33 = 2.70$ 

-M <sub>LL</sub>	= 540 <sup>ft-k</sup>
-V <sub>LL</sub>	= 54 <sup>k</sup>

STRESS IN WF-SECTION

	<u>AT TOP/SECTION</u>	<u>AT BOTTOM/SECTION</u>
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 ←	13.51 TEN →
		< 20
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 ←	6.03 COMP →
		< 20

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:

$$\text{SDL} \quad 90 \times 12 / 458 \quad = \quad 2.36$$

$$\text{LL} + \text{I} \quad -540 \times 12 / 458 \quad = \quad \underline{-14.15}$$

$$11.79 \text{ TEN} < 20$$

WEB SHEAR

## CASE I:

$$V_{DL} \quad = \quad 18.12$$

$$V_{SDL} \quad = \quad 9.04$$

$$V_{LL+I} \quad = \quad \underline{41.30}$$

$$\Sigma \quad 68.46 \quad v = 68.46 / (33.09 \times 0.58) = 3.57$$

$$< 12$$

ANCHOR (WF TO PIER CAP)

## CASE II:

$$V_{DL} \quad = \quad 18.12$$

$$V_{SDL} \quad = \quad 9.04$$

$$V_{HYD} \quad = \quad \underline{-54.0}$$

$$\Sigma \quad -26.84^{\text{K}} \text{ UPLIFT}$$

$$\text{REQUIRED A} = 26.84 / 18 = 1.47 \text{ SQ. IN}$$

PROVIDE 2-1"  $\Phi$  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

$$\Sigma DL = 346.64^k$$

LIVE LOAD (HYDR. LOAD)

CASE I: HWL = 12.5

## ON SUPER STRUCTURE

$$UPLIFT HEAD = 3.08 + 0.83 + 0.75 = 4.66$$

$$UPLIFT LOAD = 4.66 \times 0.064 \times 47.33 \times 20 = -282.3^k$$

## ON SUB STRUCTURE

$$UPLIFT HEAD = 3.08 + 0.83 + 3.83 + 2.5 = 10.24^k$$

$$UPLIFT LOAD = 10.24 \times 0.64 \times 49.33 \times 5 = -161.6^k$$

$$\Sigma \text{ CASE I: } = 346.64 - 282.3 - 161.6 = -97.26$$

CASE II: HWL = 12.5 + 2 = 14.5

## ON SUPER STRUCTURE

$$UPLIFT LOAD = 6.66 \times 0.064 \times 47.33 \times 20 = -403.5^k$$

## ON SUB STRUCTURE

$$UPLIFT LOAD = 12.24 \times 0.64 \times 49.33 \times 5 = -193.2^k$$

$$\Sigma \text{ CASE II: } = 346.64 - 403.5 - 193.2 = -250.06$$

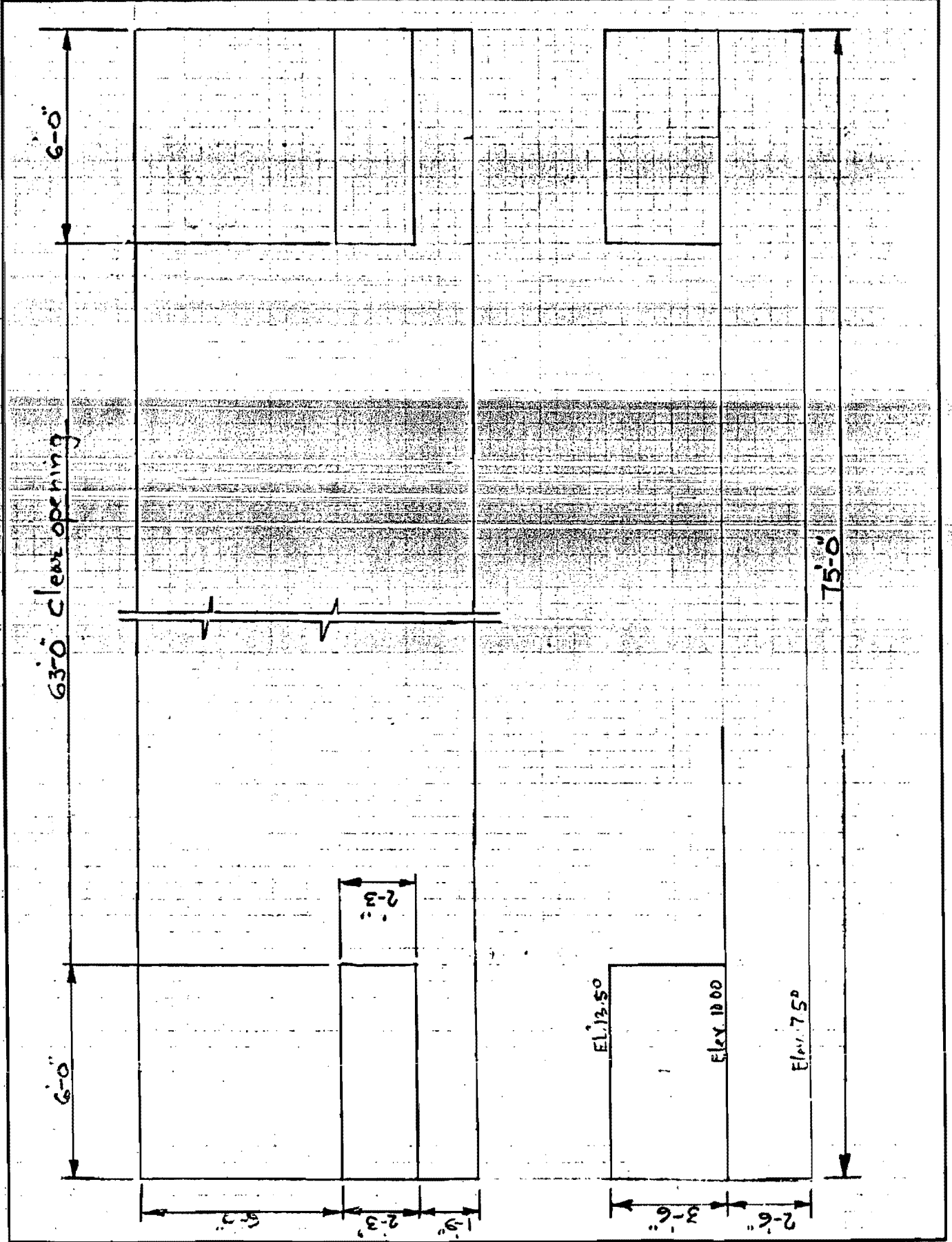
CONTROLS 

$$\begin{aligned} \text{CAPACITY OF EXIST PILES} &= 5 \times 47.8 + 2 \times 47.8 \times 4 / 4.12 \\ &= 331.82^k > 250.06^k \end{aligned}$$

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

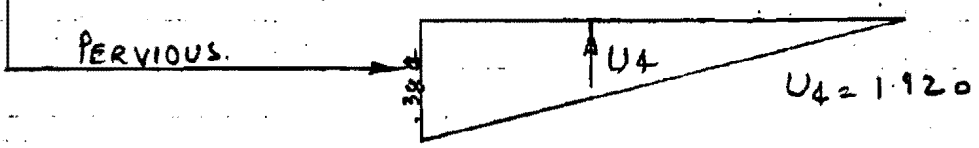
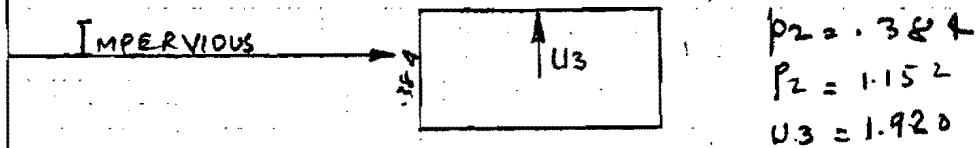
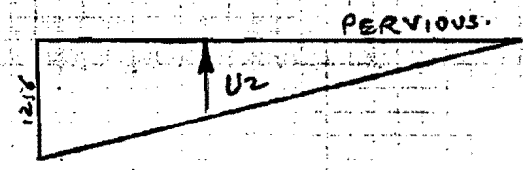
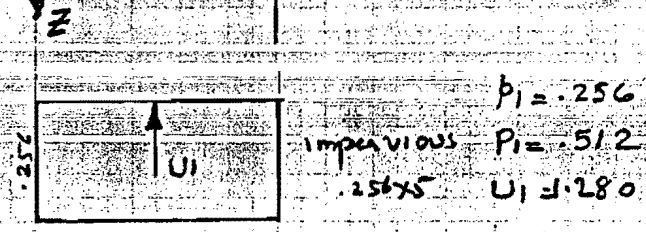
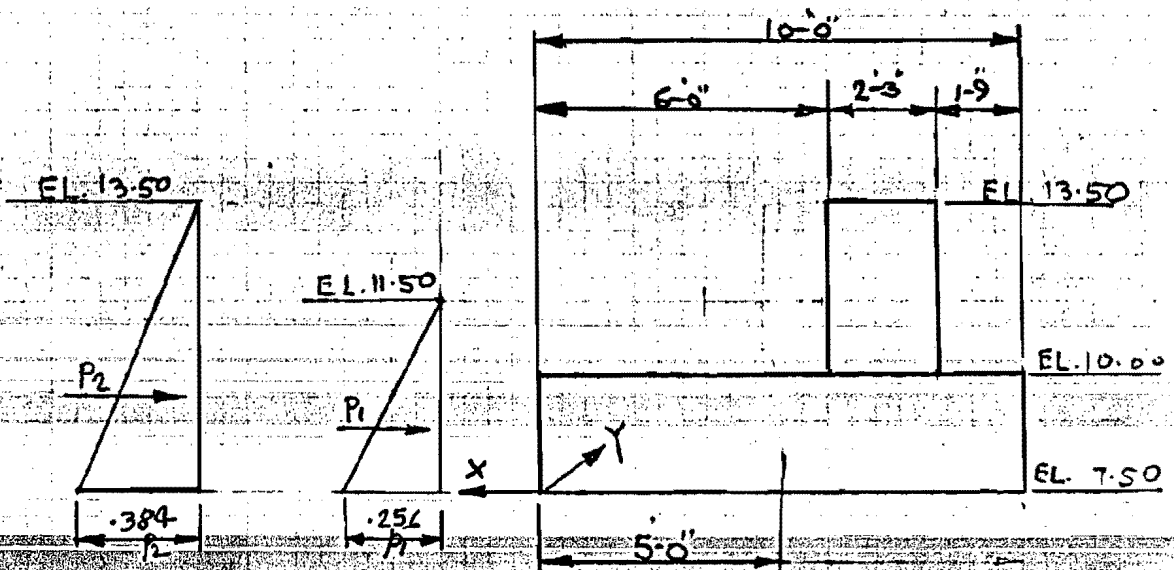
COMPUTATION SHEET

PROJECT	17th Street Canal G.D.M.	PAGE 1 OF 8	COMPUTED BY S.H.	DATE 10/31/89
SUBJECT	Roller Gate Monolith		CHECKED BY MSD	DATE 3/90



COMPUTATION SHEET

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



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
$\Sigma$ D.L.		309.11		1604.75

HYDRAULIC LOADS

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)x $\frac{4}{2}$ x75.0	-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)x $\frac{6}{2}$ x75.0	-86.4		2.00	172.80

WIND LOADS

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 3/96

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, Perivous 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 (Periv.)	—	—	-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	—

COMPUTATION SHEET

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	F <sub>x</sub>	F <sub>y</sub>	F <sub>z</sub>	M <sub>x-x</sub>	M <sub>y-y</sub>	M <sub>z-z</sub>
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	F <sub>x</sub>	F <sub>y</sub>	F <sub>z</sub>	M <sub>x-x</sub>	M <sub>y-y</sub>	M <sub>z-z</sub>
DL. CONC.	—	—	309.11	—	1604.75	—
100% TOTAL	—	—	309.11	—	1604.75	—

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

DESCRIPTIONS	F <sub>x</sub>	F <sub>y</sub>	F <sub>z</sub>	M <sub>x-x</sub>	M <sub>y-y</sub>	M <sub>z-z</sub>
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	F <sub>x</sub>	F <sub>y</sub>	F <sub>z</sub>	M <sub>x-x</sub>	M <sub>y-y</sub>	M <sub>z-z</sub>
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	17 1/2 street CANAL	PAGE 6 OF 18	COMPUTED BY S.A.	DATE 10/30
SUBJECT	Rolley Gate Monolith		CHECKED BY MSJ	DATE 3/90

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-z
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	—

17TH STREET CANAL G.D.M.  
ROLLER GATE MONOLITH DESIGN

10/31/89  
CAL

STIFFNESS MATRIX FOR CPGA ( 3D FILE )

\*       $K_h B = .15 \text{ ksi}$                        $E_c = 4074 \text{ ksi}$

$I_1 = 1728 \text{ cu in}$                        $I_2 = 1728 \text{ cu in}$

$A = 144 \text{ sq in}$                        $L = 50 \text{ ft}$

$R_1 = 82.8 \text{ in}$                        $R_2 = 82.8 \text{ in}$

STIFFNESS COEFFICIENT	FIXITY CONSTANT Co	RESULT
$B_{11} =$	1	8.782
$B_{22} =$	1	8.782

$B_{33} = 1955.5$

~~$K_{MP1} = 37.7$~~

~~$K_{MP2} = 37.7$~~

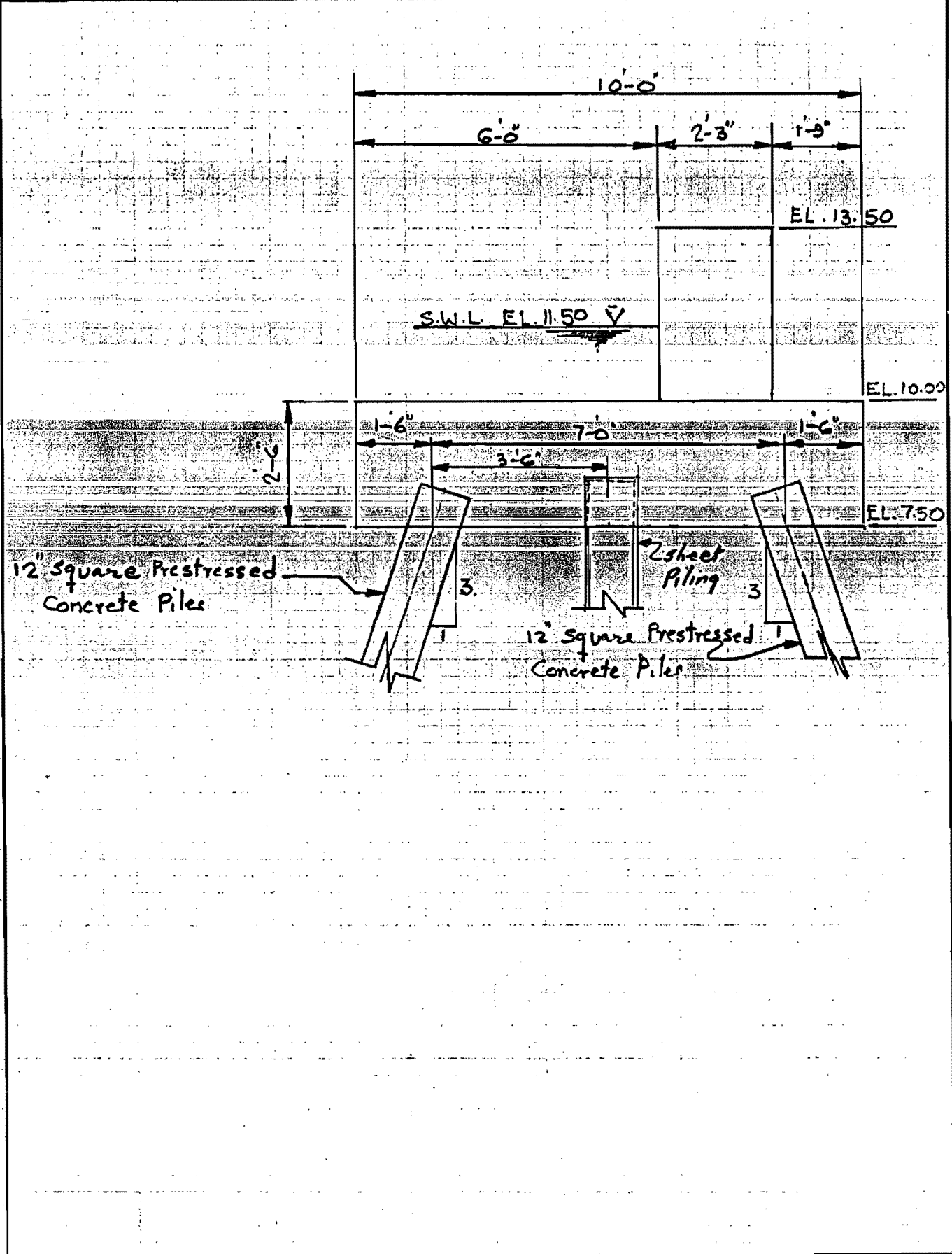
\* -- LOW  $K_h$  VALUE TO ACCOUNT FOR GROUP AFFECTS  
OF TIMBER PILES 1,2,4,5.

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.



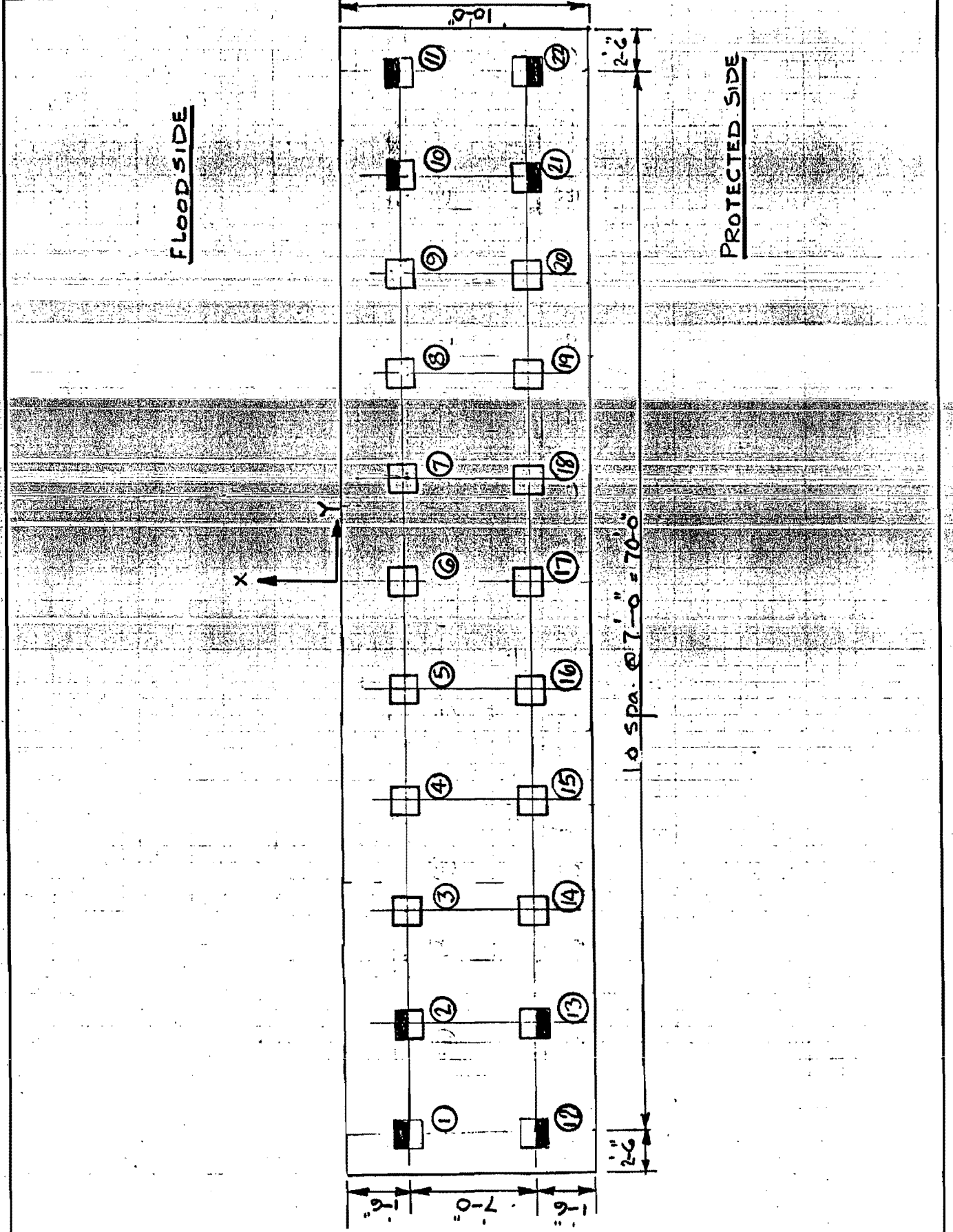
COMPUTATION SHEET

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



COMPUTATION SHEET

PROJECT	17TH Street CANAL G.D.M	PAGE 9 OF 18	COMPUTED BY SA.	DATE 11/1/69
SUBJECT	DESIGN OF GATE MONOLITH		CHECKED BY MJD	DATE 3/90

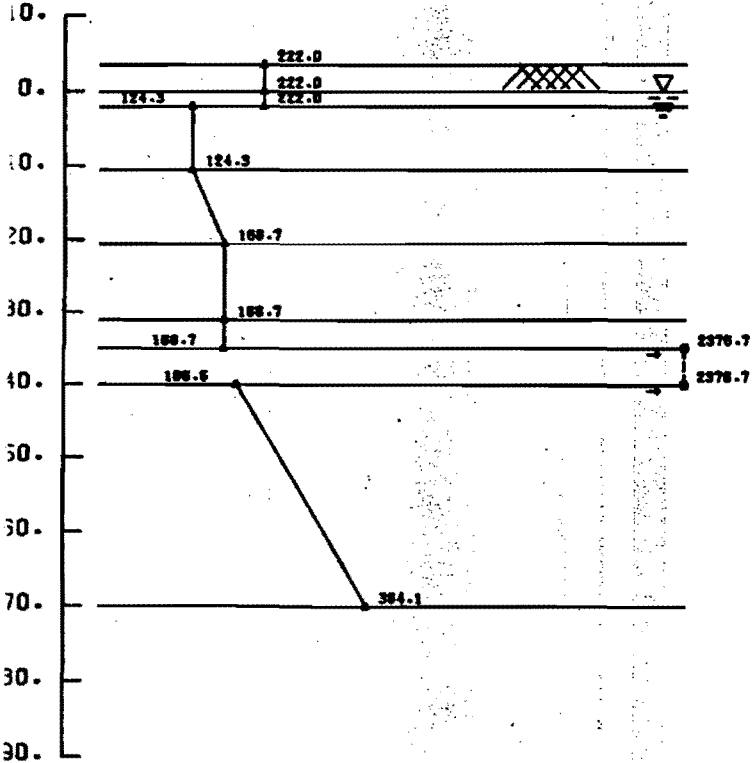


DB-18

01 to 01

K<sub>H</sub>B (PSI)

0. 200. 400. 600. 800.

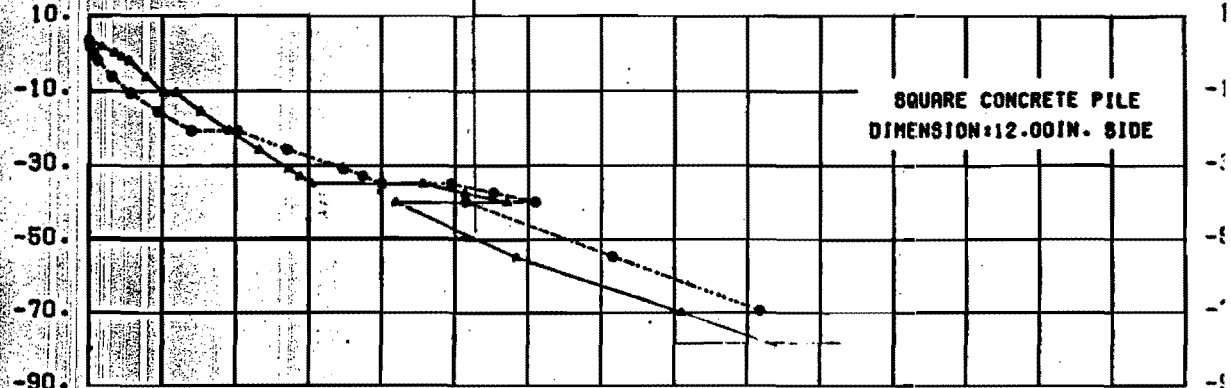


NOTES:  $K_H = \frac{K_1}{B} = (0.2222 \text{ } q_u / B)(C)(D)$  COHESIVE  
 $\alpha = 0.4$  = Factor of material properties of soil and pile  
 $k_1$  = Modulus of subgrade reaction for test plate (pci)  
 $B_1$  = Width or diameter of test plate (in)  
 $K_1 = k_1 B_1 = 80 \text{ } q_u \text{ (pcf)} = 0.5556 \text{ } q_u \text{ (pci)}$   
 $q_u = 2 \cdot \sigma =$  Unconfined compressive strength (pcf)  
 $C =$  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)

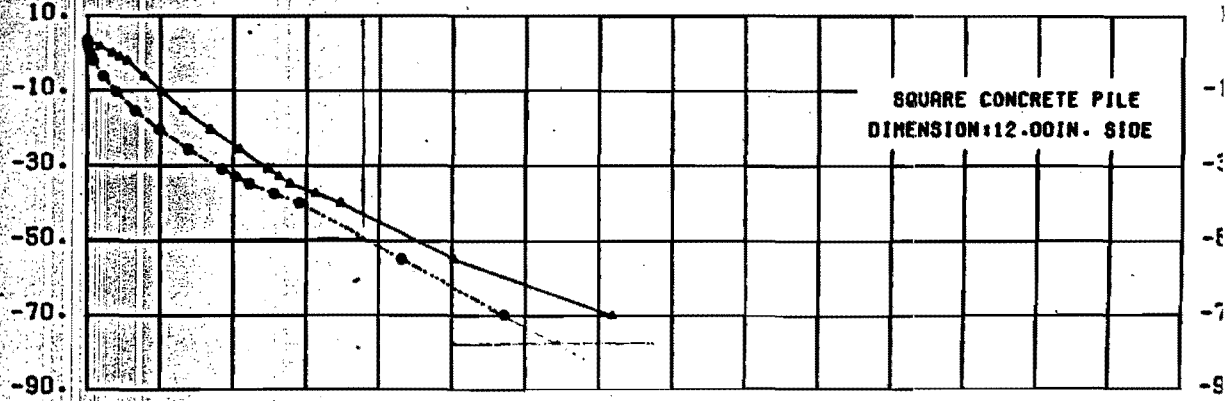
NOTE: ALLOWABLE CAPACITIES SHOULD BE DETERMINED INCORPORATING F.S.=2.0 WITH PILE TEST OR F.S.=3.0 WITHOUT PILE TEST.

53 x 2/3 = 35.33  
 ULTIMATE LOAD (TONS)

0. 10. 20. 30. 40. 50. 60. 70. 80. 90. 100. 110. 120. 130. 140. 150.



38 x 2/3 = 25.33  
 COMPRESSION (S.F.=1.0)



TENSION (S.F.=1.0)

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:  $K_H = 0.2222 \text{ } q_u (C)(D)$  (B)

--- S-CASE  
 — Q-CASE

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

```

$ 10 17TH STREET CANAL G.D.M.-
20 ROLLER GATE MONOLITH DESIGN (A:ROLLER)
30 BIJ 8.782 8.782 1955.5 0 0 0 0 0 ALL
40 TENSION 0.8 ALL
50 DLS S 35.33 25.33 539.4 182.0 73.7 939.0 775.0 H 12 ALL
60 ASC S 144 288 0.84 .9975 1.75 0 ALL
70 PMAXMOM 37.7 37.7 ALL
80 BATTER 3 1 2 9 TO 13 21 22
90 ANGLE 00 1 TO 11
00 ANGLE 180 12 TO 22
10 PILE 1 -1.5 -35 0 2 -1.5 -28 0 3 -1.5 -21 0 4 -1.5 -14 0
20 PILE 5 -1.5 -7 0 6 -1.5 0 0 7 -1.5 7 0 8 -1.5 14 0
30 PILE 9 -1.5 21 0 10 -1.5 28 0 11 -1.5 35 0 12 -8.5 -35 0
40 PILE 13 -8.5 -28 0 14 -8.5 -21 0 15 -8.5 -14 0 16 -8.5 -7 0
50 PILE 17 -8.5 0 0 18 -8.5 7 0 19 -8.5 14 0 20 -8.5 21 0
60 PILE 21 -8.5 28 0 22 -8.5 35 0
70 LOAD 1 -38 0 256 0 1546 0
80 LOAD 2 -38 0 256 0 1465 0
90 LOAD 3 -65 0 200 0 1290 0
00 LOAD 4 -65 0 200 0 1200 0
10 LOAD 5 0 0 309 0 1605 0
20 LOAD 6 0 0 242 0 1162 0
30 LOAD 7 0 0 222 0 1245 0
40 LOAD 8 0 0 437 160 1605 0
50 LOAD 9 0 0 437 160 2885 0
60 FOUT 1 2 3 4 5 A:ROLOUT
70 PSO 1
80 PFO ALL

```



|    |       |        |     |      |        |   |
|----|-------|--------|-----|------|--------|---|
| 15 | -8.50 | -14.00 | .00 | V    | 180.00 | P |
| 16 | -8.50 | -7.00  | .00 | V    | 180.00 | P |
| 7  | -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<br>IN   | DY<br>IN   | DZ<br>IN  | RX<br>RAD | RY<br>RAD  | RZ<br>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  | .5892E-05  |

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PILE FORCES IN LOCAL GEOMETRY

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

LOAD CASE - 1

| PILE | F1<br>K | F2<br>K | F3<br>K | M1<br>IN-K | M2<br>IN-K | M3<br>IN-K | ALF | CBF | ASC<br>KSI | AST<br>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 #      |
| 19   | .2      | .0      | 10.5    | .0         | -8.4       | .0         | .30 | .14 | 1.10       | .88 #      |
| 20   | .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<br>K | F2<br>K | F3<br>K | M1<br>IN-K | M2<br>IN-K | M3<br>IN-K | ALF | CBF | ASC<br>KSI | AST<br>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<br>K | F2<br>K | F3<br>K | M1<br>IN-K | M2<br>IN-K | M3<br>IN-K | ALF | CBF | ASC<br>KSI | AST<br>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

| PILE | F1<br>K | F2<br>K | F3<br>K | M1<br>IN-K | M2<br>IN-K | M3<br>IN-K | ALF | CBF | ASC<br>KSI | AST<br>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<br>K | F2<br>K | F3<br>K | M1<br>IN-K | M2<br>IN-K | M3<br>IN-K | ALF | CBF | ASC<br>KSI | AST<br>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  | F2 | F3   | M1   | M2   | M3   | ALF | CBF | ASC  | AST |   |
|------|-----|----|------|------|------|------|-----|-----|------|-----|---|
|      | K   | K  | K    | IN-K | IN-K | IN-K |     |     | KSI  | 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 | # |

LOAD CASE - 8

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

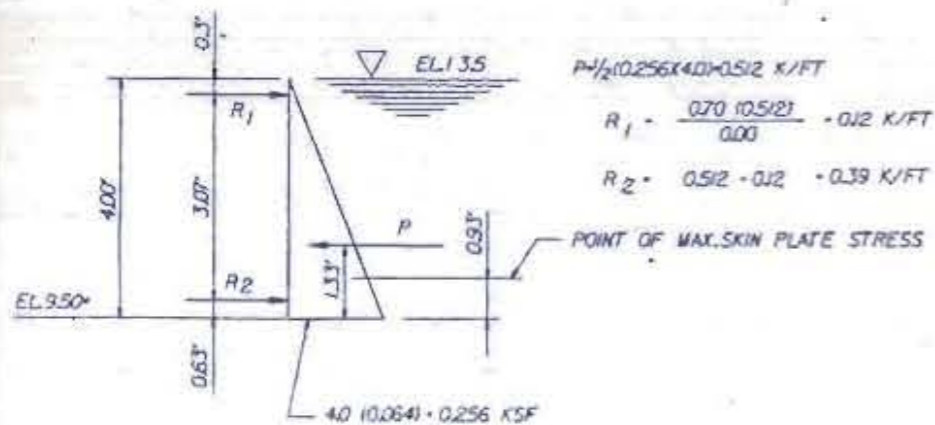
|    |     |    |      |    |      |    |      |     |      |      |   |
|----|-----|----|------|----|------|----|------|-----|------|------|---|
| 3  | -.2 | .0 | 33.8 | .1 | 6.7  | .0 | .96  | .15 | 1.26 | 1.05 | # |
| 4  | -.2 | .0 | 34.1 | .1 | 6.9  | .0 | .97  | .16 | 1.26 | 1.05 | # |
| 5  | -.2 | .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  | F2 | F3   | M1   | M2   | M3   | ALF | CBF | ASC  | AST  |   |
|------|-----|----|------|------|------|------|-----|-----|------|------|---|
|      | K   | K  | K    | IN-K | IN-K | IN-K |     |     | KSI  | 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  | # |

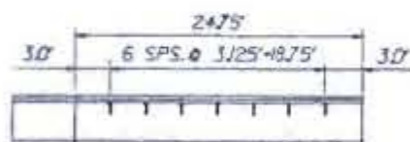


**LOADING**

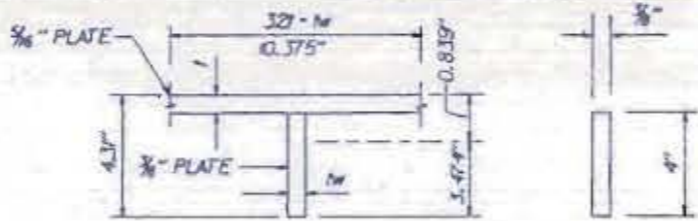
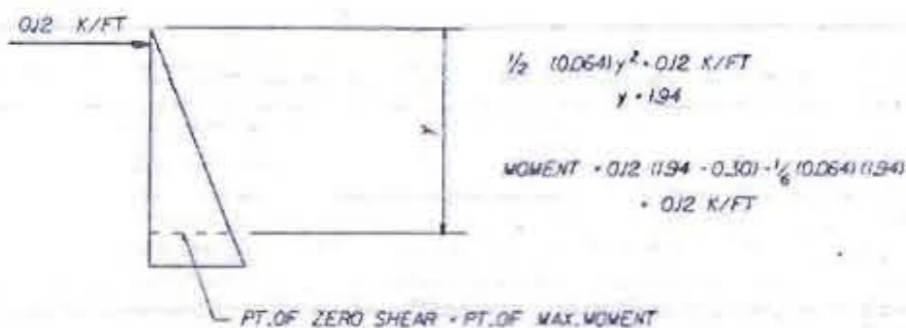


**SKIN PLATE**

LOAD,  $w = 0.064 (4.0 \times 0.33) = 0.196 \text{ K/FT}$   
 USE  $\frac{3}{16}$ " MINIMUM THICKNESS OF SKIN PLATE.  
 $S = \frac{M}{c} = 0.1953 \text{ IN}^3/\text{FT}$   
 MAXIMUM ALLOWABLE MOMENT  $= S F_b$   
 $0.1953 (20.0) = 3.91 \text{ K/FT} = 0.3255 \text{ K/FT}$   
 INTERIOR SPAN,  $M = \frac{1}{2} w l^2$   
 $\frac{1}{2} w l^2 = 0.3255$   
 $\frac{1}{2} (0.196) l^2 = 0.3255$   
 $l = 4.46 \text{ FT (ALLOW. SPAN), USE } 3.25 \text{ FT}$   
 EXTERIOR SPAN,  $M = \frac{1}{10} w l^2$   
 $\frac{1}{10} w l^2 = 0.3255$   
 $l = 4.08 \text{ FT (ALLOW. SPAN), USE } 3.00 \text{ FT}$



**VERTICAL STIFFENERS**



**EFFECTIVE FLANGE WIDTH**

$\frac{NSC 1.9.2}{95} = 16$   
 $\frac{\sqrt{36,000}}{95} = 16$   
 $32 \times 0.3125 = 0.375 = 0.375"$

| ITEM                 | AREA  | Y       | Ay    | Ay <sup>2</sup> | Io |
|----------------------|-------|---------|-------|-----------------|----|
| PLATE 0.375" x 3/16" | 3.242 | 0.156   | 0.506 | 0.079           | —  |
| PLATE 4" x 3/16"     | 1.50  | 2.313   | 3.470 | 8.026           | 2  |
|                      | 4.742 | (0.838) | 3.976 | 8.105           | 2  |

$Y = \frac{\sum Ay}{\sum A} = \frac{3.976}{4.742} = 0.839$

$I = I + \sum Ay^2 = (Iy + y)$   
 $I = 8.105 + (3.976 \times 0.839)$   
 $= 6.769 \text{ in}^4$

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

$S_{BOT} = \frac{I}{C_{BOT}} = \frac{6.769}{3.674} = 1.849$

$f_s = \frac{M}{S_{BOT}} = \frac{(0.12) (3.25) (1.12)}{1.849} = 2.309 \text{ ksi} < \text{allow } = 20 \text{ ksi}$

**GIRDERS**

Span = Opening = Column Face to c/1 Hinge = Column Face to c/1 1/2" Bearing Bar  
 $S_{pan} = 24.0 \times 1.08 \times 0.60 = 24.68$

**TOP GIRDER**

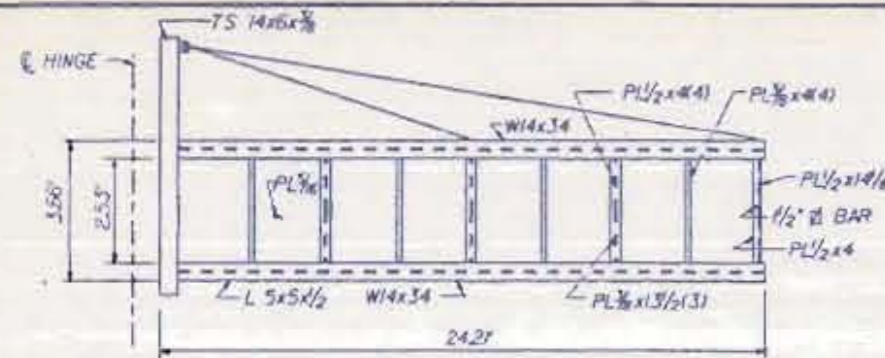
Try W14 x 34 ( $\frac{3}{16}$ " min thickness requirement)  
 Load,  $w = 0.12 \text{ K/FT}$   
 $M = \frac{1}{8} w l^2 = \frac{1}{8} (0.12) (24.68)^2 = 9.14 \text{ ft-k}$   
 per AISC 1.5.1.4.1 and EM 110-1-201  
 $f_b = \frac{M}{S} = \frac{9.14 (12)}{48.6} = 2.26 \text{ ksi} < 20.0 \text{ ksi, ok use W14 x 34}$

**BOTTOM GIRDER:**

Load,  $w = 0.39 \text{ K/FT}$   
 $M = \frac{1}{8} w l^2 = \frac{1}{8} (0.39) (24.68)^2 = 29.69 \text{ ft-k}$   
 $S_{req'd} = \frac{M}{f_b} = \frac{29.69 (12)}{20.0} = 17.81 \text{ in}^3$

**DEFLECTION:**

$\Delta_{max} = \frac{5 w l^4}{384 E I}$   
 $= \frac{5 (0.39) (24.68)^4 (12)^3}{384 (29) (10^3) (33.40)} = 0.33$   
 $\Delta_{allow} = \frac{l}{360} = 0.067 < 0.33 \text{ OK USE W14 x 34}$



| ITEM            | COMPUTATION                  | WEIGHT (LB) | x (FT) | wx (FT - LB) |
|-----------------|------------------------------|-------------|--------|--------------|
| 3/16 PL         | 3.66 x 24.27 x 12.8          | 1134        | 12.77  | 14,481       |
| W14x34          | 2 x 34 x 25.12               | 1708        | 12.77  | 21,811       |
| PL 1/2 x 4 1/2  | 3 x 24.65                    | 76          | 24.88  | 1,894        |
| PL 3/8 x 3 1/2  | 3 x 31 x 7.21                | 160         | 12.77  | 2,043        |
| PL 3/8 x 4 (4)  | 4 x 31 x 5.10                | 63          | 12.77  | 805          |
| PL 1/2 x 4 (3)  | 3 x 25.3 x 6.8               | 52          | 12.77  | 664          |
| PL 1/2 x 4      | 2.53 x 6.8                   | 17          | 24.88  | 423          |
| L 5 x 5 1/2     | 24.27 x 5.2                  | 392         | 12.77  | 5,006        |
| 1/2 inch Bar    | 3.66 x 7.65                  | 28          | 24.88  | 697          |
| WELD            | 0.21 x 4 x 24.27 x 15 x 3.66 | 32          | 12.77  | 409          |
| SEAL            |                              | 60          | 12.77  | 766          |
| TS 14 x 6 x 3/8 | 10 x 47.9                    | 479         | 1.0    | 479          |
|                 |                              |             | 4.29   | 49,475       |

**GATE DEAD WEIGHT**

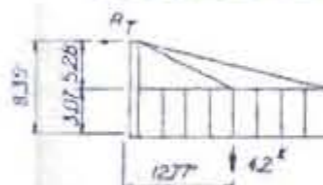
**TUBING POST**

$F_y = 46 \text{ ksi}$   $F_s = 0.6 F_y = 0.6 \times 46 = 27.6 \text{ ksi}$   
 Try TS 14 x 6 x 3/8,  $S_x = 48.1 \text{ in}^3$ ,  $S_y = 29.7 \text{ in}^3$

**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**



$R_T = \frac{4.2 (2.77)}{8.35} = 6.4 \text{ k}$   
 $M_y = 6.4 \times 5.28 = 33.8 \text{ ft-k}$   
 $f_y = \frac{33.8 \times 12}{297} = 1.37 \text{ ksi}$

**WATER FORCE**

$F = 0.53 \text{ k}$   
 $M_x = 0.53 \times 5.28 = 2.8 \text{ ft-k}$   
 $f_x = \frac{2.8 \times 12}{48.1} = 0.7 \text{ ksi}$

**COMBINED STRESS**

$f = \frac{0.7}{27.6} + \frac{1.37}{27.6} = 0.03 + 0.5 = 0.53 < 1.0$



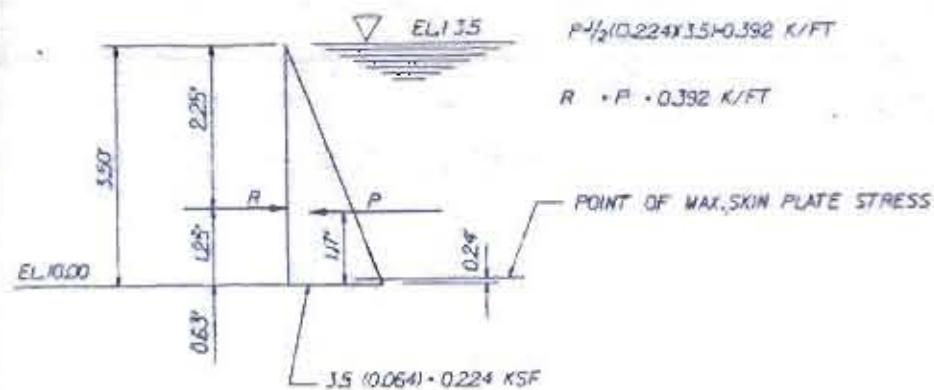
LAKE PORTCHARTRAIN, LA AND VICINITY  
 HIGH LEVEL PLAN  
 DESIGN MEMORANDUM NO. 20 GENERAL DESIGN  
 ORLEANS PARISH - JEFFERSON PARISH  
 17TH STREET OUTFALL CANAL  
 (MPTAIRIE RELIEF)

**SWING GATE DESIGN**

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

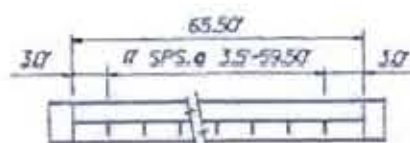


**LOADING**

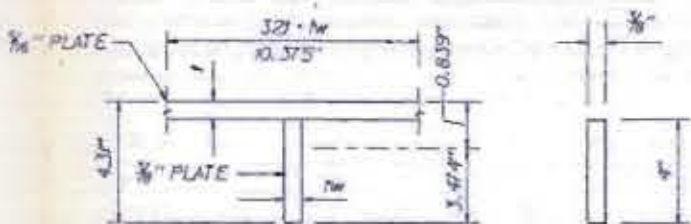
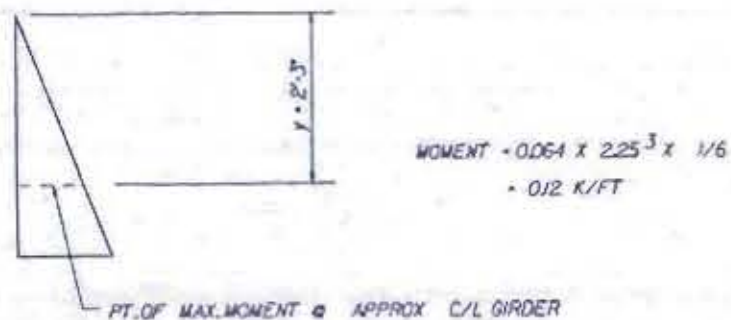


**SKIN PLATE**

LOAD,  $w = 0.064 (3.5 - 0.24) = 0.209$  K/FT  
 USE  $3/16$ " MINIMUM THICKNESS OF SKIN PLATE  
 $S = \frac{w \cdot l^2}{6} = 0.1953$  IN<sup>3</sup>/FT  
 MAXIMUM ALLOWABLE MOMENT =  $S \cdot F_b$   
 $0.1953 (20.0) = 3.91$  FT-K/FT =  $0.3255$  FT-K/FT  
 INTERIOR SPAN,  $M = \frac{1}{2} w l^2$   
 $\frac{1}{2} w l^2 = 0.3255$   
 $\frac{1}{2} (0.209) l^2 = 0.3255$   
 $l = 4.32$  FT (ALLOW. SPAN) USE 3.50 FT  
 EXTERIOR SPAN,  $M = \frac{1}{10} w l^2$   
 $\frac{1}{10} w l^2 = 0.3255$   
 $l = 4.08$  FT (ALLOW. SPAN) USE 3.00 FT



**VERTICAL STIFFENERS**



EFFECTIVE FLANGE WIDTH  
 $NSC 1912$   
 $\frac{95 \cdot t}{\sqrt{36,000}}$   
 $32 \times 0.3125 = 10.375 = 10.375$

| ITEM                  | AREA  | y       | Ay    | Ay <sup>2</sup> | I <sub>o</sub> |
|-----------------------|-------|---------|-------|-----------------|----------------|
| PLATE 10.375" x 3/16" | 3.242 | 0.156   | 0.506 | 0.079           | —              |
| PLATE 4" x 3/16"      | 1.50  | 2.313   | 3.470 | 8.026           | 2              |
|                       | 4.742 | (0.838) | 3.976 | 8.105           | 2              |

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

$I = I + \sum Ay^2 = (Ay \times y)$   
 $2 \cdot 8.105 + (3.976 \times 0.839)$   
 $= 6.769$  in<sup>4</sup>

$S_{TOP} = \frac{I}{C_{TOP}} = \frac{6.769}{0.839} = 8.069$

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

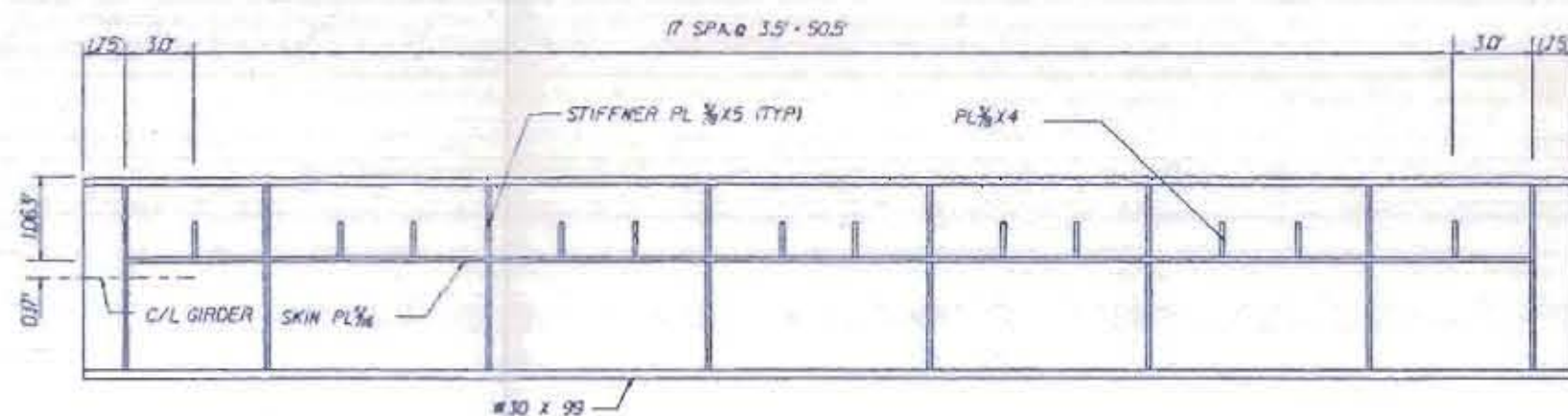
$f_s = \frac{M}{S_{BOT}} = \frac{(0.12)(3.125)(12)}{1.949} = 2.309$  ksi << allow = 20 ksi

**GIRDERS**

Span = Opening + Column Face to c/l Seal + Column Face to c/l Seal  
 Span = 62.0 + 1.75 + 2.75 = 66.50

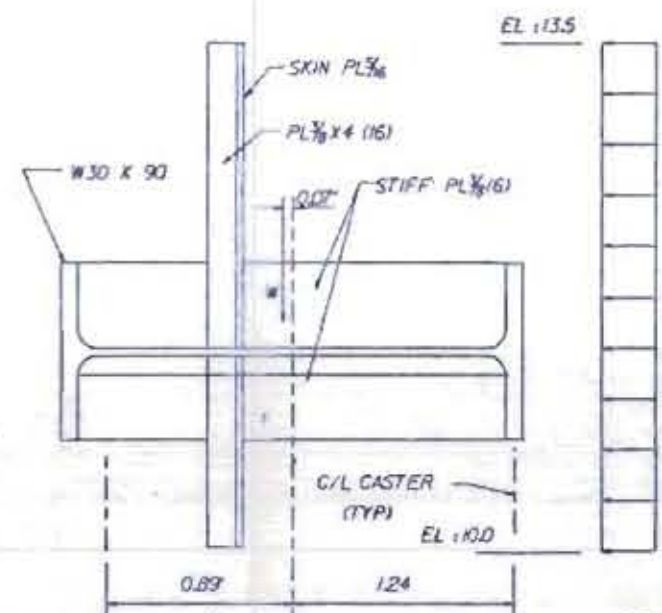
Try W30 x 99  
 Load,  $w = 0.39$  K/FT  
 $M = \frac{1}{8} w l^2 = \frac{1}{8} (0.39)(66.50)^2 = 2156$  FT-K  
 per NSC 1.5.1.4.1 and EM 110-1-201  
 $f_b = \frac{M}{S} = \frac{2156(12)}{269} = 962$  ksi < 20.0 ksi, ok use W30 x 99

DEFLECTION:  
 $\Delta_{max} = \frac{5w l^4}{384EI}$   
 $= \frac{5(0.39)(66.50)(12)^4}{384(29)(10^3)(3990)} = 0.12$   
 $\Delta_{allow} = \frac{l}{360} = \frac{66.50}{360} = 0.185 < 0.33$  OK USE WF30X99



| ITEM                   | COMPUTATION                 | WEIGHT (LB) | x (FT) TO CL GIRDER | wx (FT - LB) |
|------------------------|-----------------------------|-------------|---------------------|--------------|
| 3/16 PL                | 3.42 x 65.50 x 12.8         | 2957        | 0.17                | 487          |
| W30 x 99               | 69 x 99                     | 6831        | 0.0                 | 0.0          |
| PL 3/8 x 4 x 2.25 (12) | 12 x 2.25 x 5.1             | 138         | 0.33                | 45           |
| PL 3/8 x 4 x 1.25 (12) | 12 x 1.25 x 5.1             | 77          | 0.33                | 25           |
| PL 3/8 x 4 x 0.83 (16) | 4 x 0.83 x 5.1              | 25          | 0.33                | 8            |
| PL 3/8 x 4 x 1.83 (16) | 6 x 1.83 x 5.1              | 56          | 0.33                | 18           |
| PL 3/8 x 5 (16)        | 16 x 2.36 x 6.38            | 241         | 0.0                 | 0            |
| L 5 x 3 1/2 x 1/2      | 65.5 x 13.6                 | 891         | 0.1                 | 9            |
| L 6 x 4 x 1/2          | 12 x 3.50 x 16.2            | 113         | 1.1                 | 125          |
| WELD                   | 3.21 x 2 x 65.5 x 40 x 3.50 | 57          | 0.17                | 10           |
| 1/2" Bar               | 2 x 3.5 x 7.66              | 54          | 1.30                | 70           |
|                        |                             | 11,350      | (0.070)             | 797          |

**GATE DEAD WEIGHT**



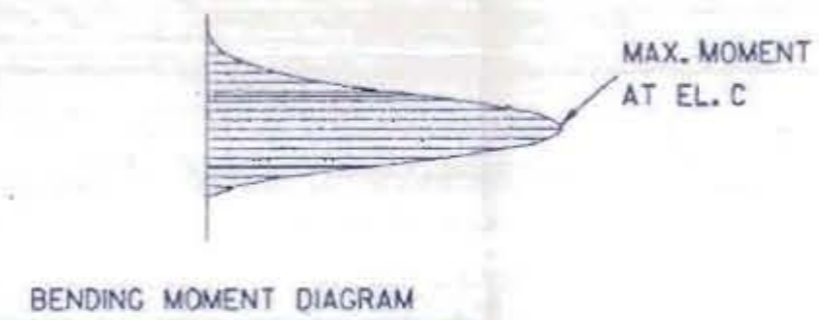
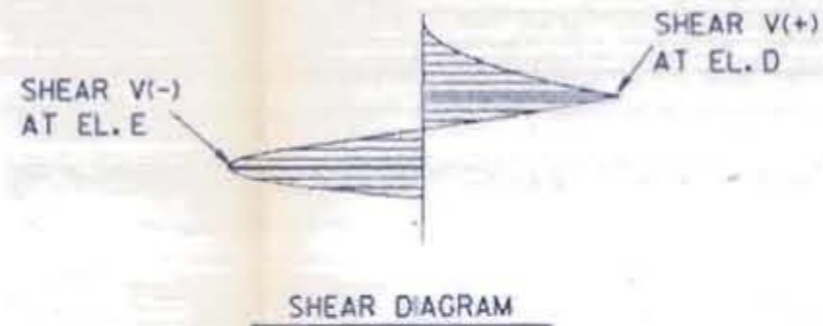
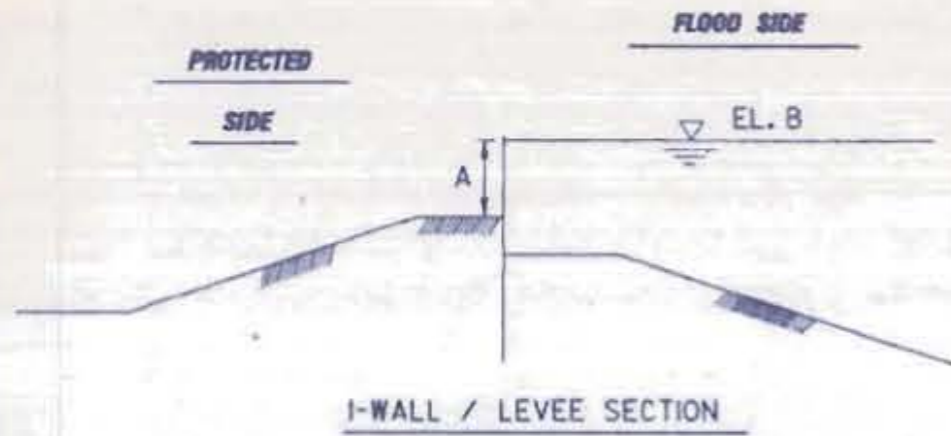
**CHECK GATE STABILITY**

GATE WEIGHT  $W = 11,350$   
 RESISTING MOMENT  $M_R = 11,350 (0.89 - 0.17) = 9,799$  FT-LBS  
 FOR 15 MPH WIND, WIND PRESSURE =  $0.00256 \times 175^2 = 14.40$  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 PORTCHARTRAIN LA AND VEEDRY  
 RIDGE LEVEL PLAN  
 DESIGN MEMORANDUM NO. 20 GENERAL DESIGN  
 ORLEANS PARISH - JEFFERSON PARISH  
 177E STREET OUTFALL CANAL  
 (MEFAIRIE RELIEF)  
**ROLLER GATE DESIGN**  
 U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS  
 CORPS OF ENGINEERS  
 DATE MARCH 1950 FILE NO. H-2-30300





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 (O 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              | O                            | -5.0                                   | 2.3                             | -3.9   | 0.3                           | -2.00   | -0.10                 |
| STA 554+00 TO 589+00 B/L   | PZ-22           | 7.6                        | 110                          | 1.0              | O                            | 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              | O                            | 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              | O                            | 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              | O                            | 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              | O                            | 14.1                                   | 0.1                             | 11.8   | -0.2                          | 10.57   | 0.00                  |
| STA 641+50 TO 663+00 B/L   | PZ-22           | 2.6                        | 115                          | 1.0              | O                            | 14.6                                   | 0.1                             | 11.74  | -0.2                          | 8.33  | 0.00                  |
| STA 663+00 TO 670+00 B/L   | PZ-22           | 4.1                        | 116                          | 1.0              | O                            | 14.6                                   | 0.6                             | 10.00  | -0.8                          | 8.94  | 0.00                  |

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

NOTE:

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

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 (O 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  | ARRED BZ12JL    | 5.0                        | 100                          | 1.5              | O                            | -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              | O                            | 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              | O                            | 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              | O                            | 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              | O                            | 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              | O                            | 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              | O                            | 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              | O                            | 14.6                                   | 0.1                             | 11.74  | -0.2                          | 8.40  | 0.00                  |
| STA 663+00 TO 670+63 B/L  | PZ-22           | 3.6                        | 108                          | 1.0              | O                            | 14.6                                   | 0.4                             | 10.57  | -0.3                          | 9.79  | 0.00                  |

COMPUTER AIDED DESIGN DRAFTING

LAKE PORTCHARTRON, LA. AND VICINITY  
HIGH LEVEL PLAN  
DESIGN MEMORANDUM NO. 30 GENERAL DESIGN  
ORLEANS PARISH - JEFFERSON PARISH  
17TH STREET OUTFALL CANAL  
(MONTAIGNE BRIDGE)  
**STRUCTURAL ANALYSIS OF I-WALLS**  
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS  
CORPS OF ENGINEERS  
DATE: MARCH 1990 FILE NO. H-2-30300

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

**PARTNERS**

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REG. C. E.

**EUSTIS ENGINEERING COMPANY**

**SOIL AND FOUNDATION CONSULTANTS**

**BORINGS • TESTS • ANALYSES**

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METAIRIE, LOUISIANA 70002  
P. O. BOX 8708  
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PHONE (504) 634-0157

27 June 1985

**OFFICERS**

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

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 |         |          | Orleans Side |         |          |
|----------------|---------|----------|--------------|---------|----------|
| No.            | Station | Date     | No.          | Station | Date     |
| J-1            | 669+92  | 12-3-84  | O-1          | 670+35  | 12-7-84  |
| J-2            | 665+45  | 12-3-84  | O-2          | 667+00  | 12-7-84  |
| J-3            | 660+60  | 12-4-84  | O-3          | 663+50  | 12-11-84 |
| J-4            | 658+10  | 1-9-85   | O-4          | 659+75  | 12-11-84 |
| J-5            | 654+30  | 1-9-85   | O-5          | 656+50  | 12-11-84 |
| J-6            | 650+50  | 1-9-85   | O-6          | 652+25  | 1-8-85   |
| J-7            | 648+80  | 1-9-85   | O-7          | 649+00  | 1-8-85   |
| J-8            | 642+91  | 9-27-83* | O-8          | 645+50  | 1-8-85   |
| J-9            | 642+69  | 9-27-83* |              |         |          |

\*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.

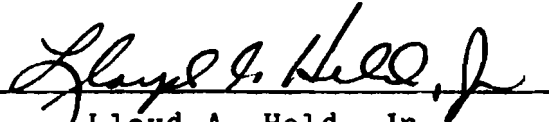
9. Based on the information shown on Figures 3 through 21 and information obtained from Modjeski & Masters, the following observations appear reasonable:

- 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.

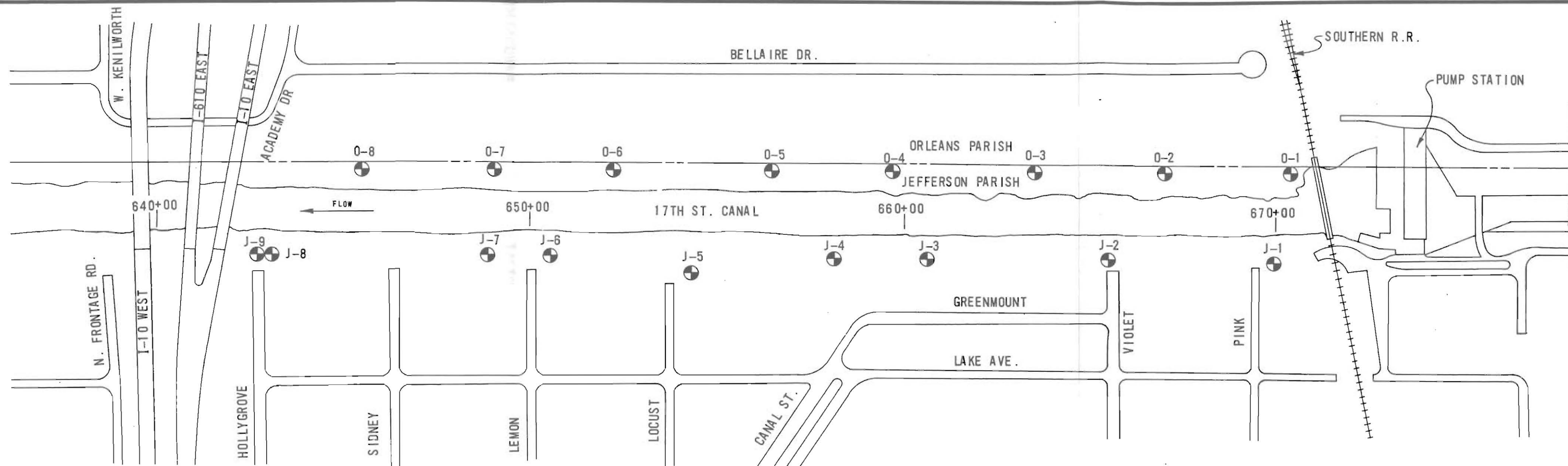
10. Considering these observations, it is believed that additional monitoring of the sand stratum will not be necessary

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.

L. J. Napolitano:ln



LOCATION PLAN

SCALE: 1"=200

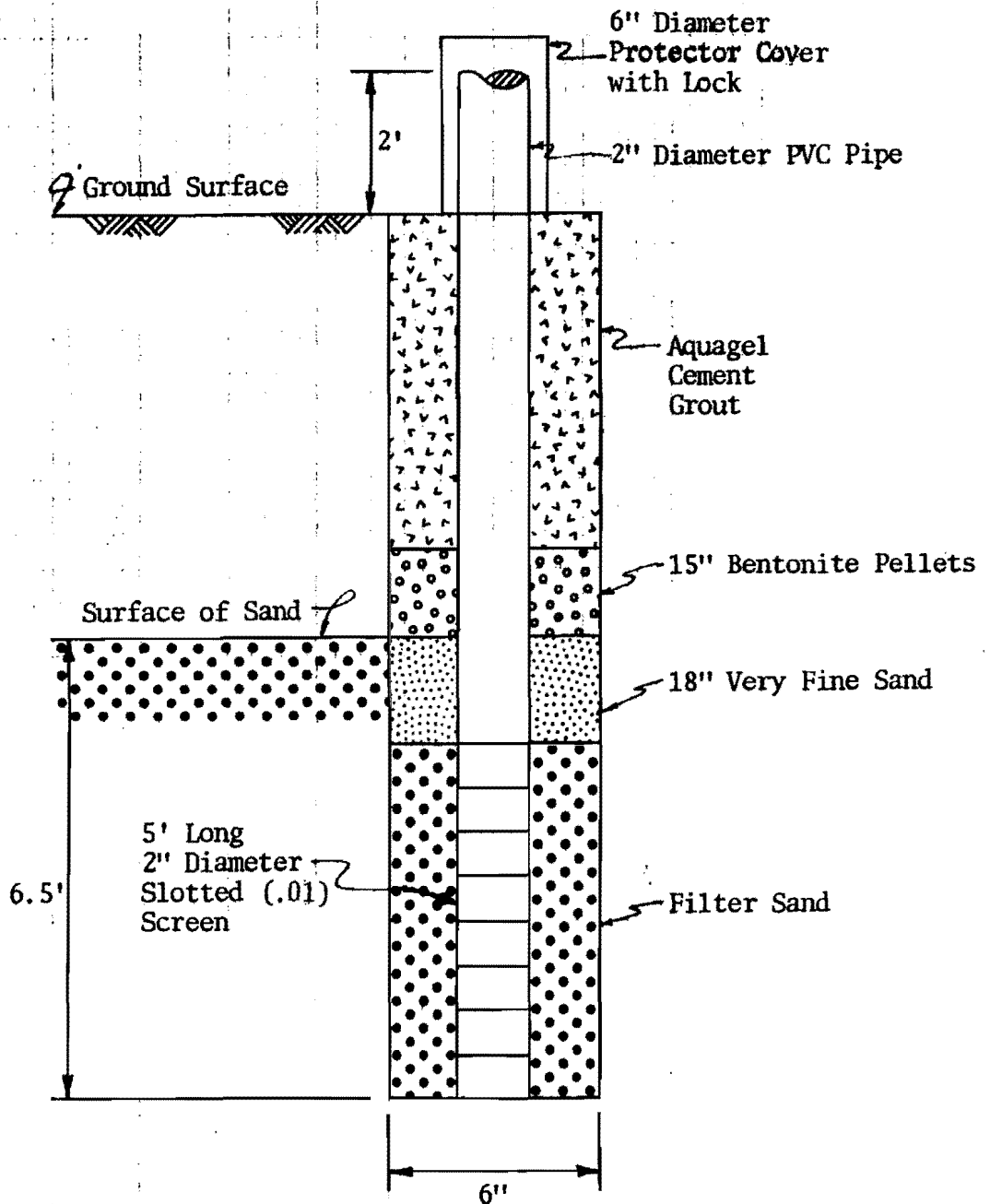
GEOTECHNICAL INVESTIGATION  
 INSTALLATION & MONITORING OF GROUND WATER WELLS  
 SEWERAGE & WATER BOARD OF NEW ORLEANS  
 METAIRIE RELIEF CANAL  
 APPROXIMATE STATIONS 640+00 TO 670+00  
 ORLEANS AND JEFFERSON PARISHES, LOUISIANA

LOCATION PLAN

FOR  
 MODJESKI & MASTERS  
 CONSULTING ENGINEERS  
 NEW ORLEANS, LOUISIANA

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

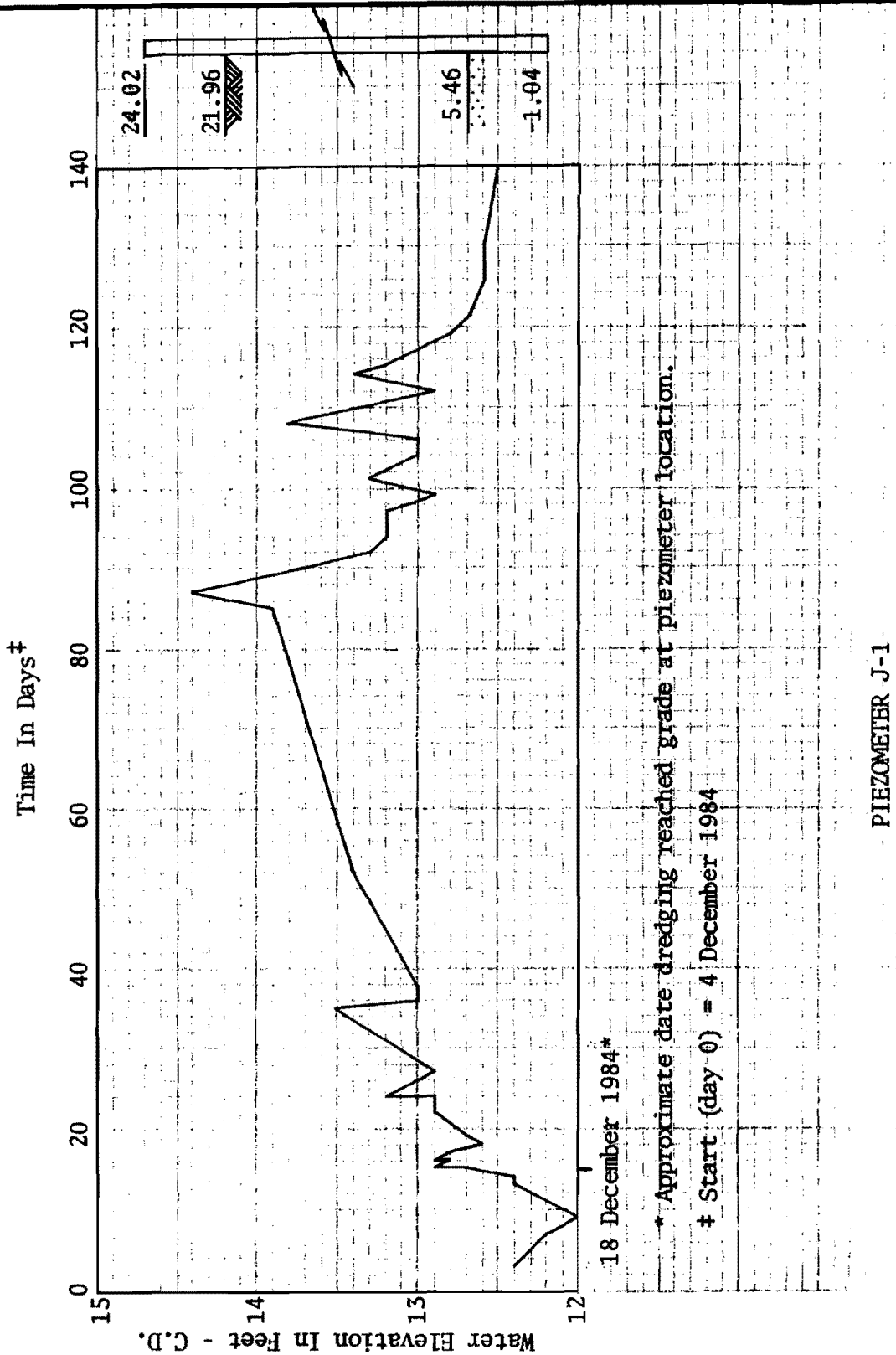
TYPICAL PIEZOMETER INSTALLATION



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



18 December 1984\*

\* Approximate date dredging reached grade at piezometer location.

† Start (day 0) = 4 December 1984

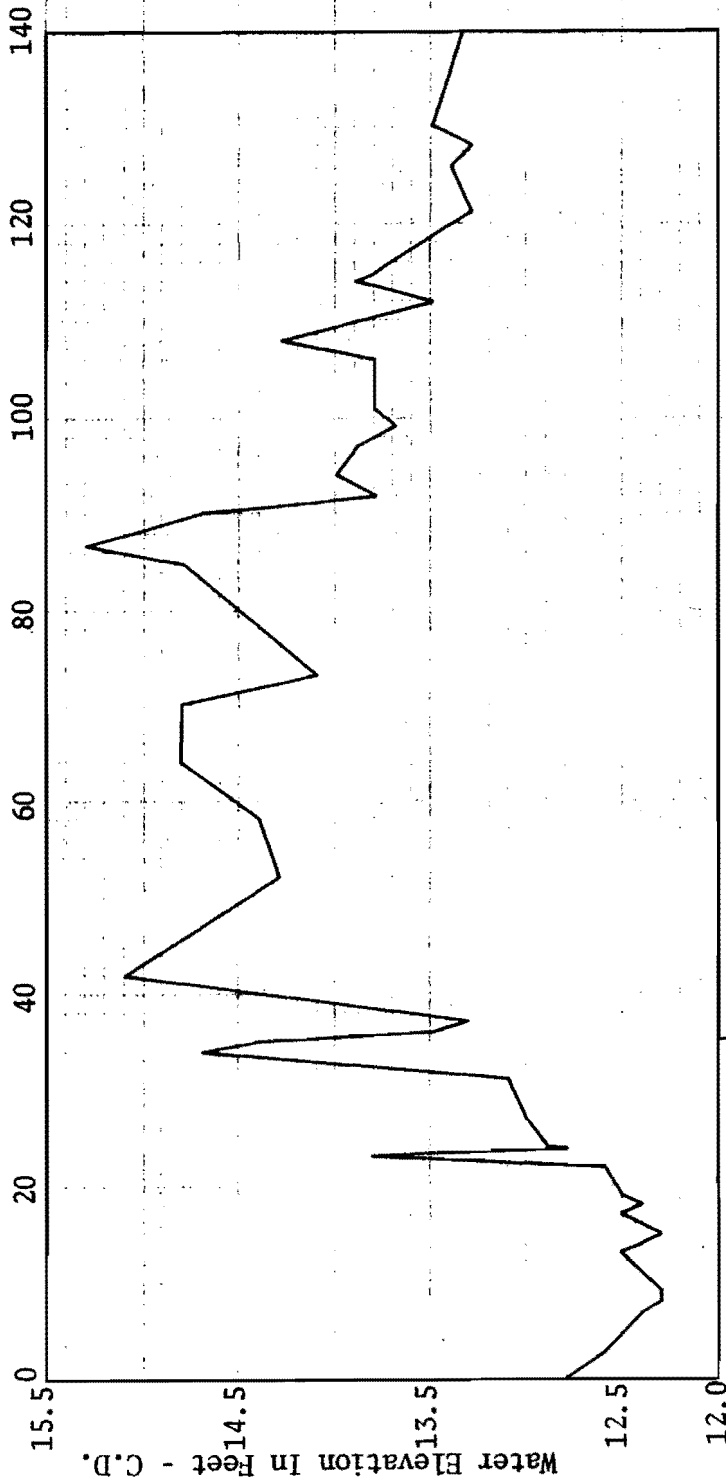
PIEZOMETER J-1  
Station 669+62 - Jefferson Side

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. 3

Time In Days †



8 January 1985\*

\* Approximate date dredging reached grade at piezometer location.

† Start (day 0) = 4 December 1984

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

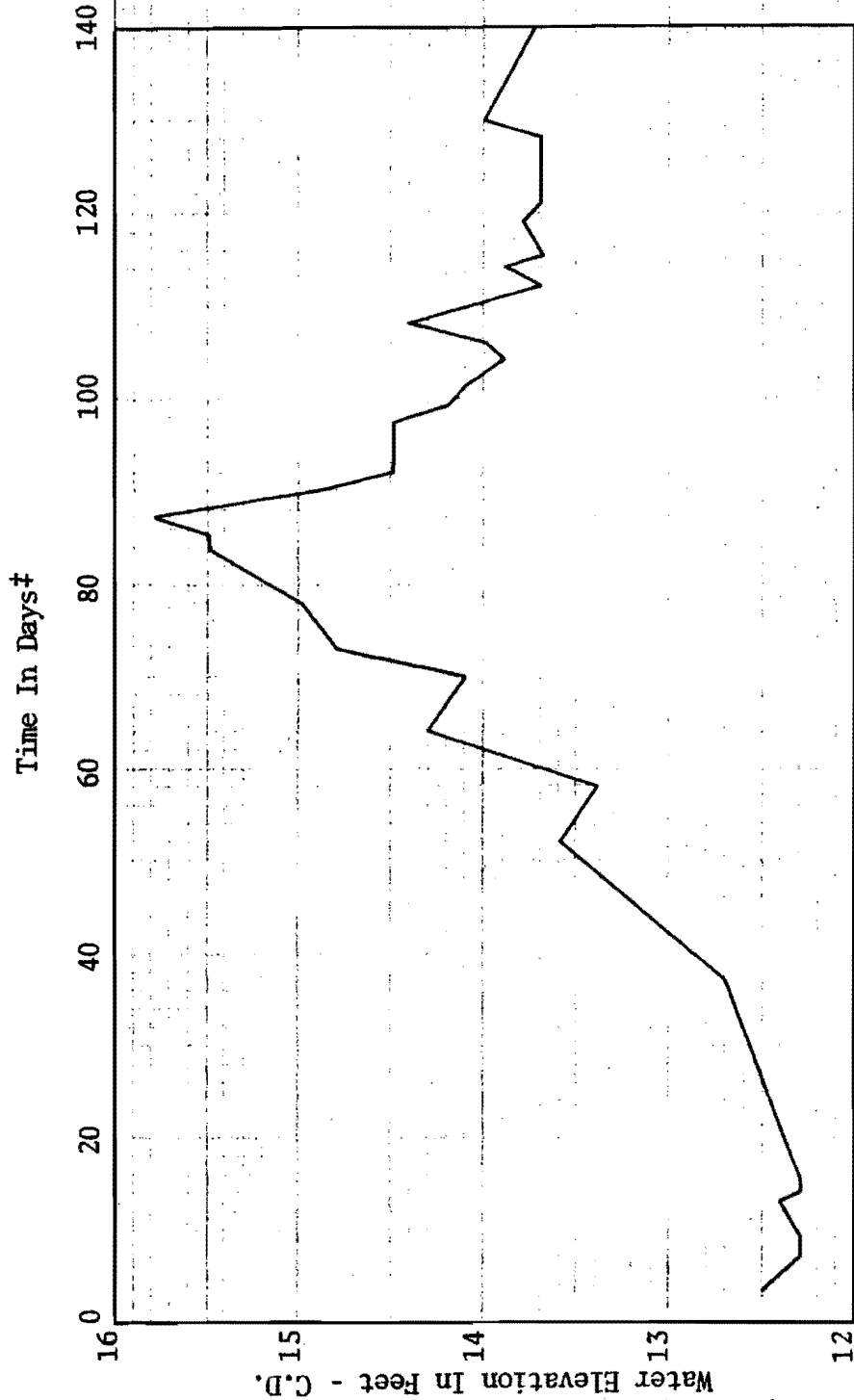
PIEZOMETER J-2

Station 665+45 - Jefferson Side

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

Fig. 4





12 February 1985\*

\* Approximate date dredging reached grade at piezometer location.

# Start (day 0) = 4 December 1984

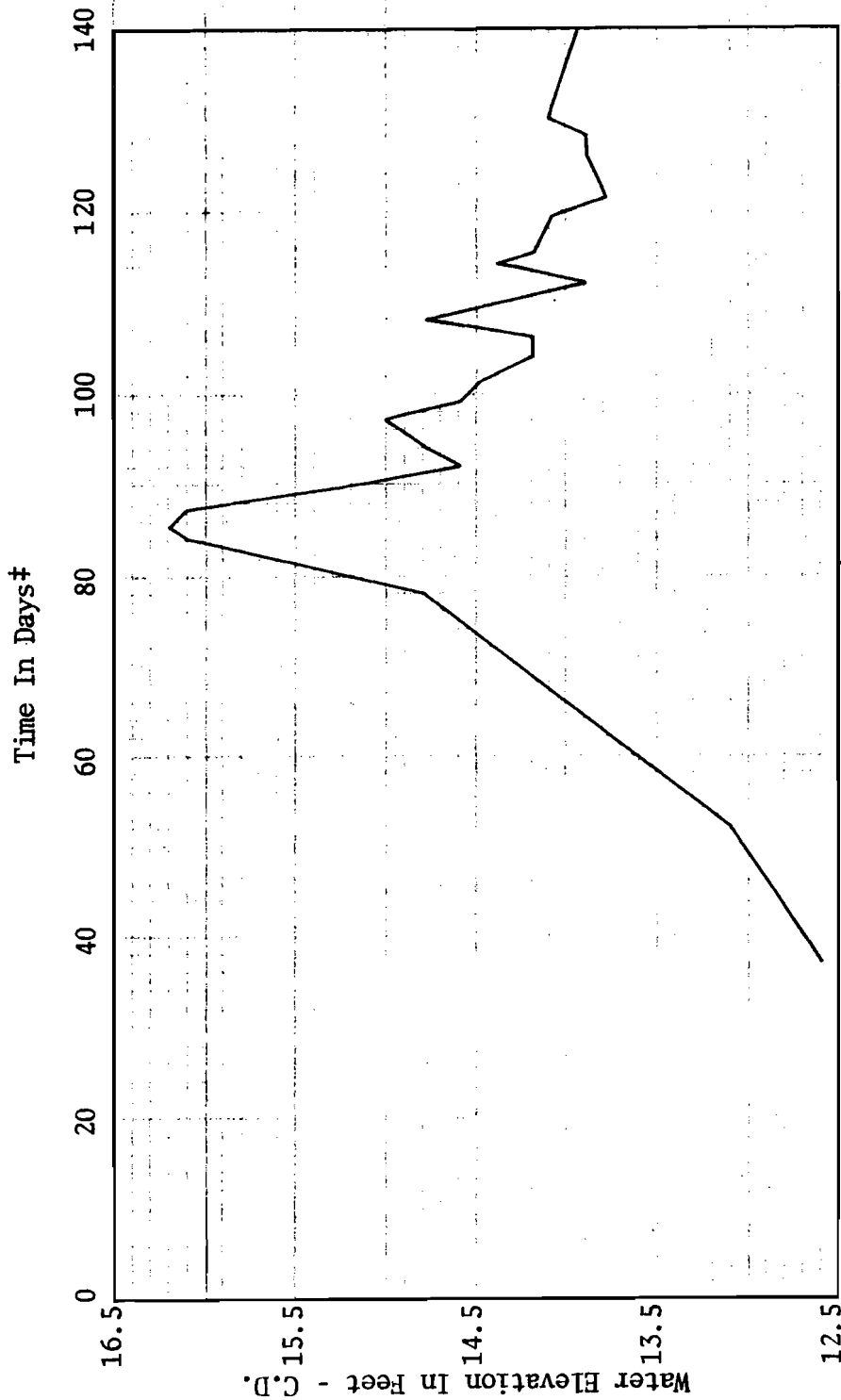
PIEZOMETER J-3

Station 660+60 - Jefferson Side

Water Elevation In Feet - C.D.  
 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



22 February 1985\*

\* Approximate date dredging reached grade at piezometer location.

# Start (day 0) = 4 December 1984

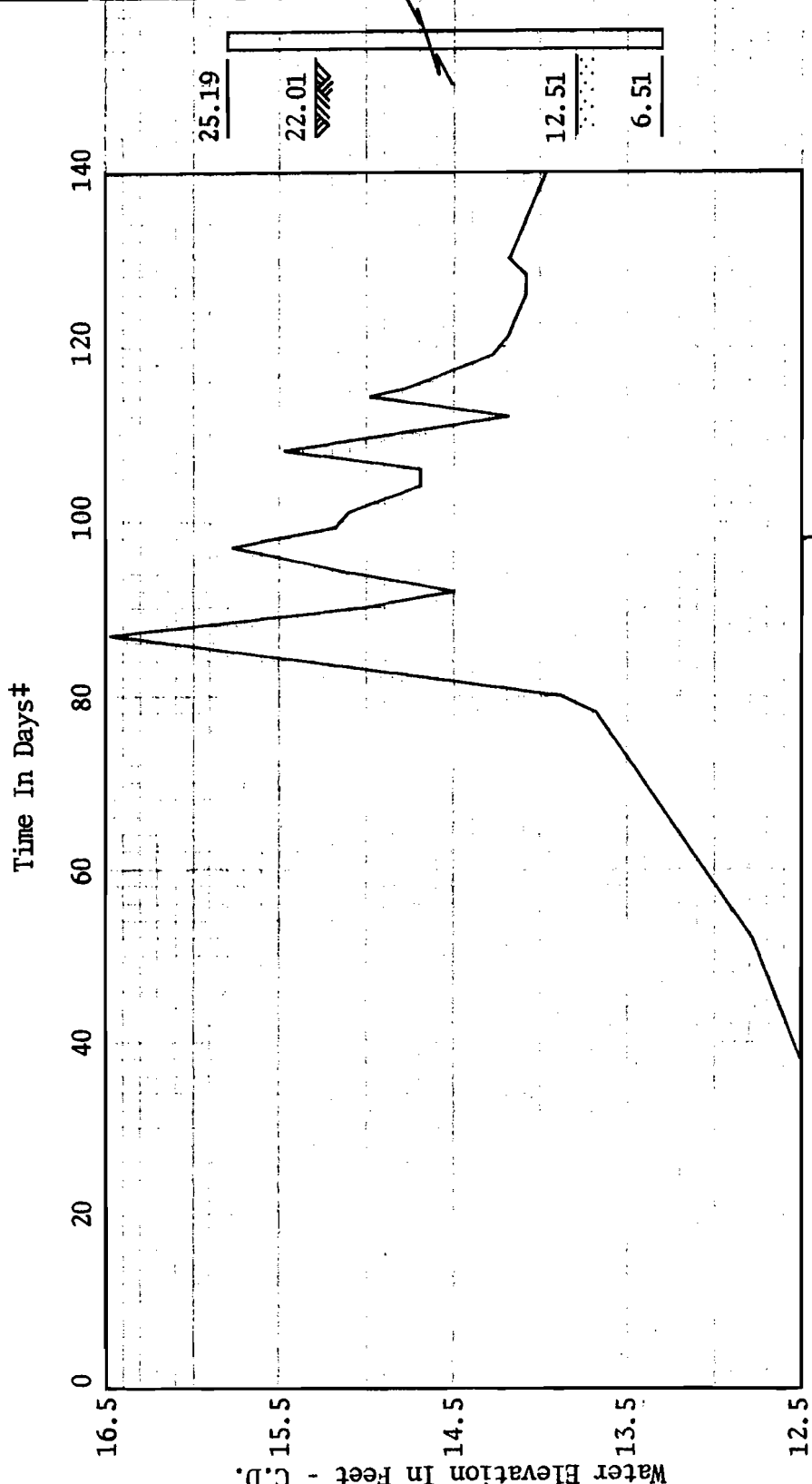
PIEZOMETER J-4

Station 658+10 - 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. 6



11 March 1985\*

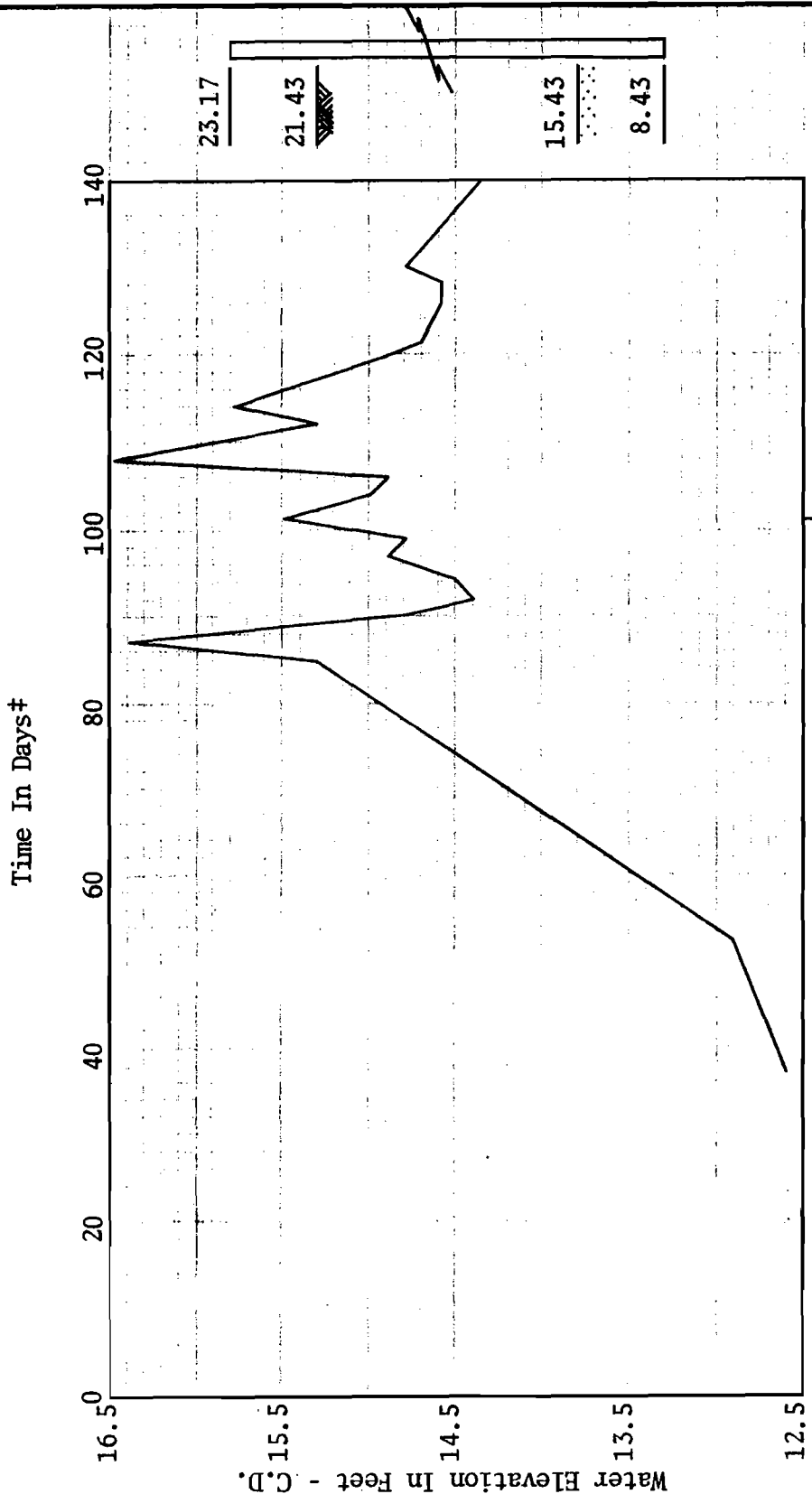
\* Approximate date dredging reached grade at piezometer location.  
 † Start (day 0) = 4 December 1984

PIEZOMETER J-5  
 Station 654+30 - 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. 7



\* Approximate date dredging reached grade at piezometer location.

# Start (day 0) = 4 December 1984

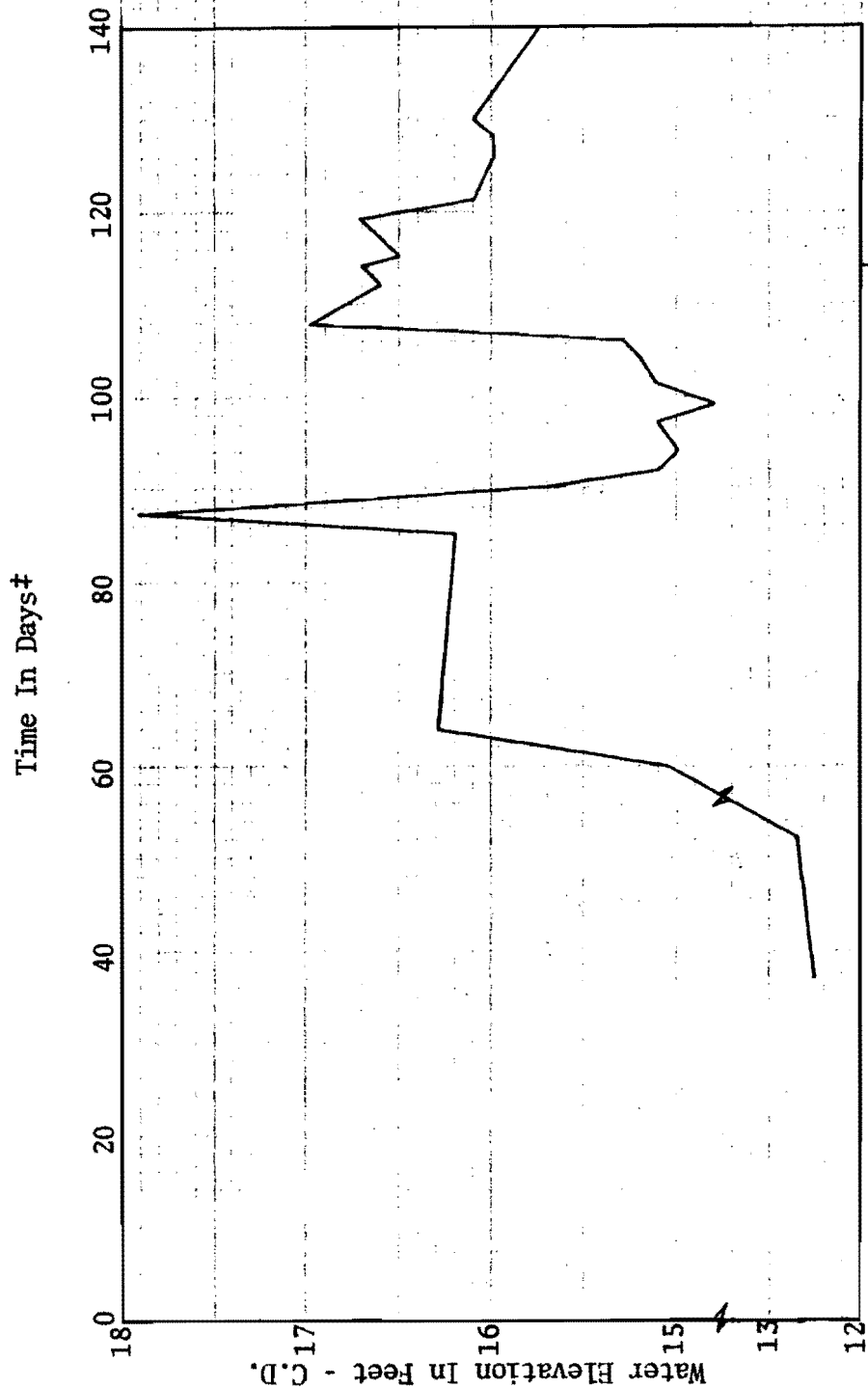
15 March 1985

PIEZOMETER J-6  
Station 650+50 - 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. 8



22 March 1985\*

\* Approximate date dredging reached grade at piezometer location.

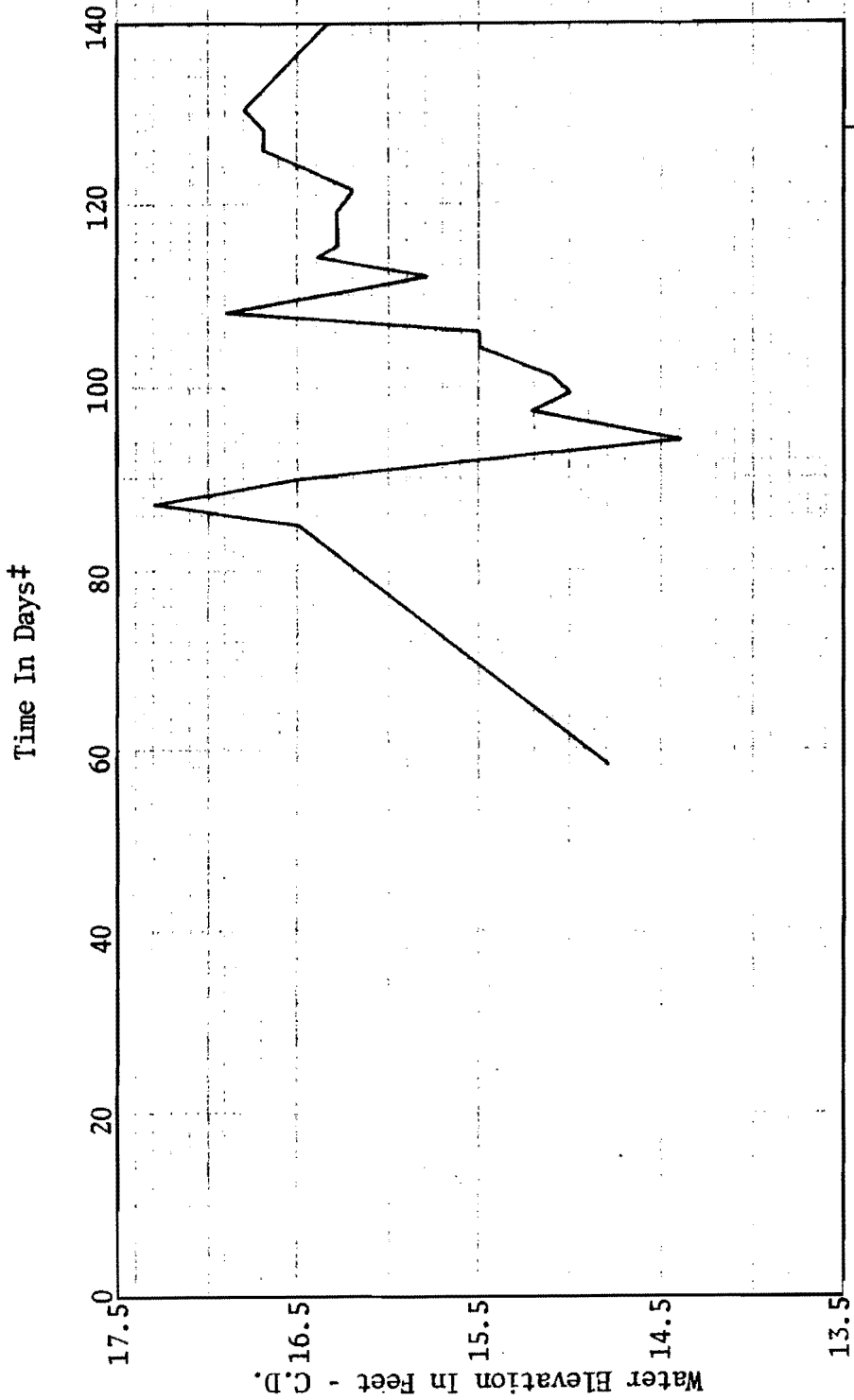
† Start (day 0) = 4 December 1984

PIEZOMETER J-7  
Station 646+80 - 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. 9



11 April 1985\*

\* Approximate date dredging reached grade at piezometer location.

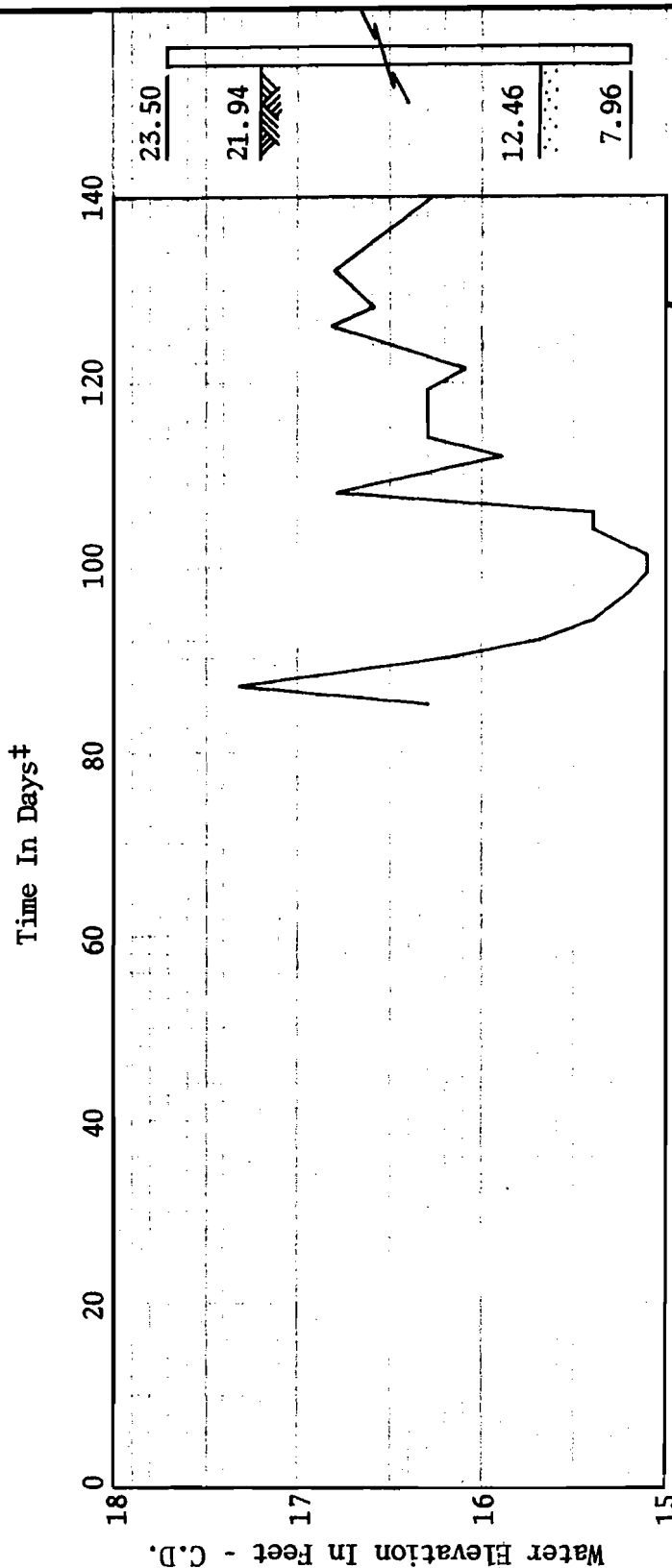
‡ Start (day 0) = 4 December 1984

Water Elevation In Feet - C.D.  
 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

PIEZOMETER J-8  
 Station 642+91 - Jefferson Side

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

Fig. 10



11 April 1985\*

\*Approximate date dredging reached grade at piezometer location.

‡ Start (day 0) = 4 December 1984

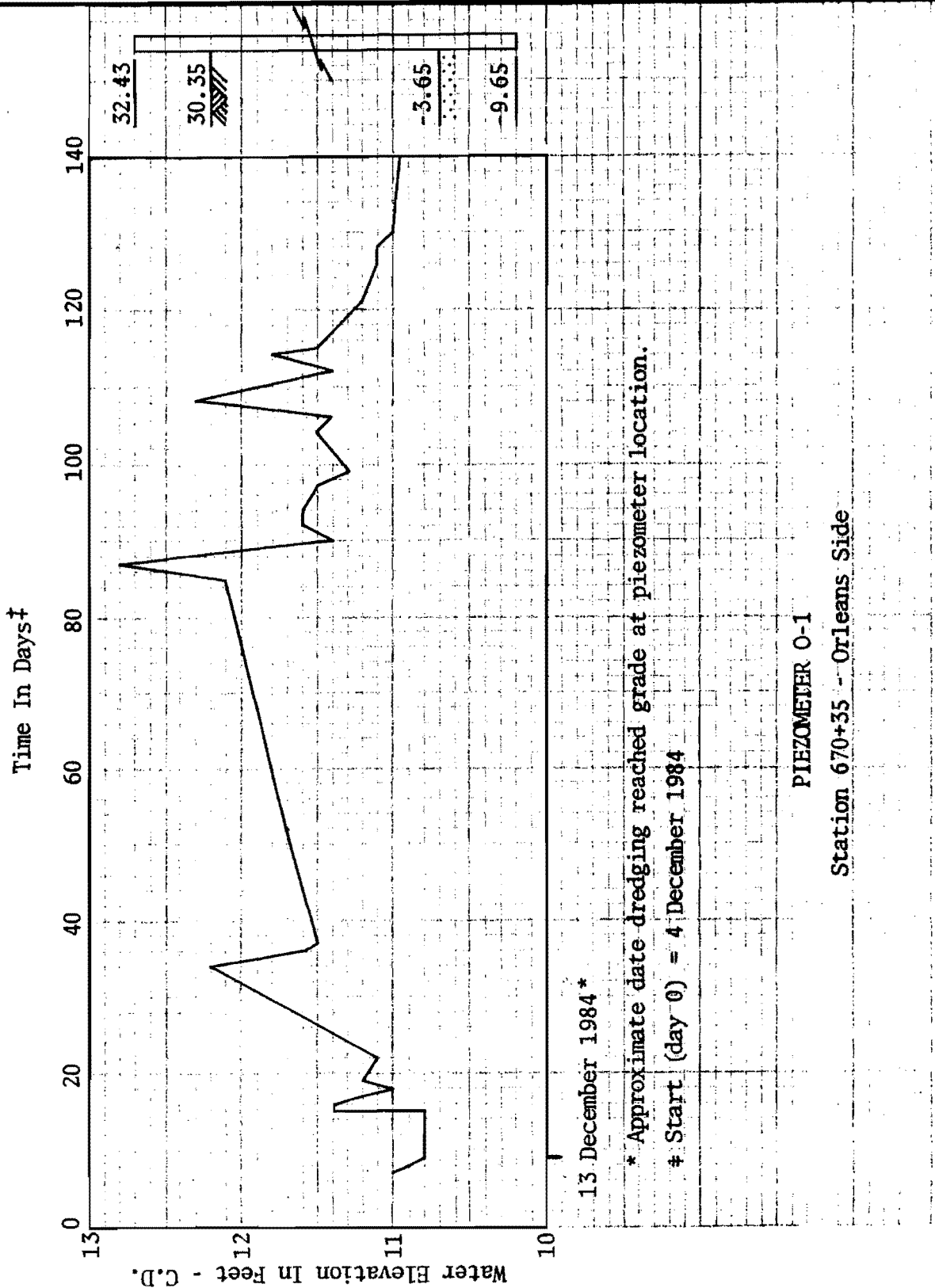
PIEZOMETER J-9

Station 642+69 - 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. 11



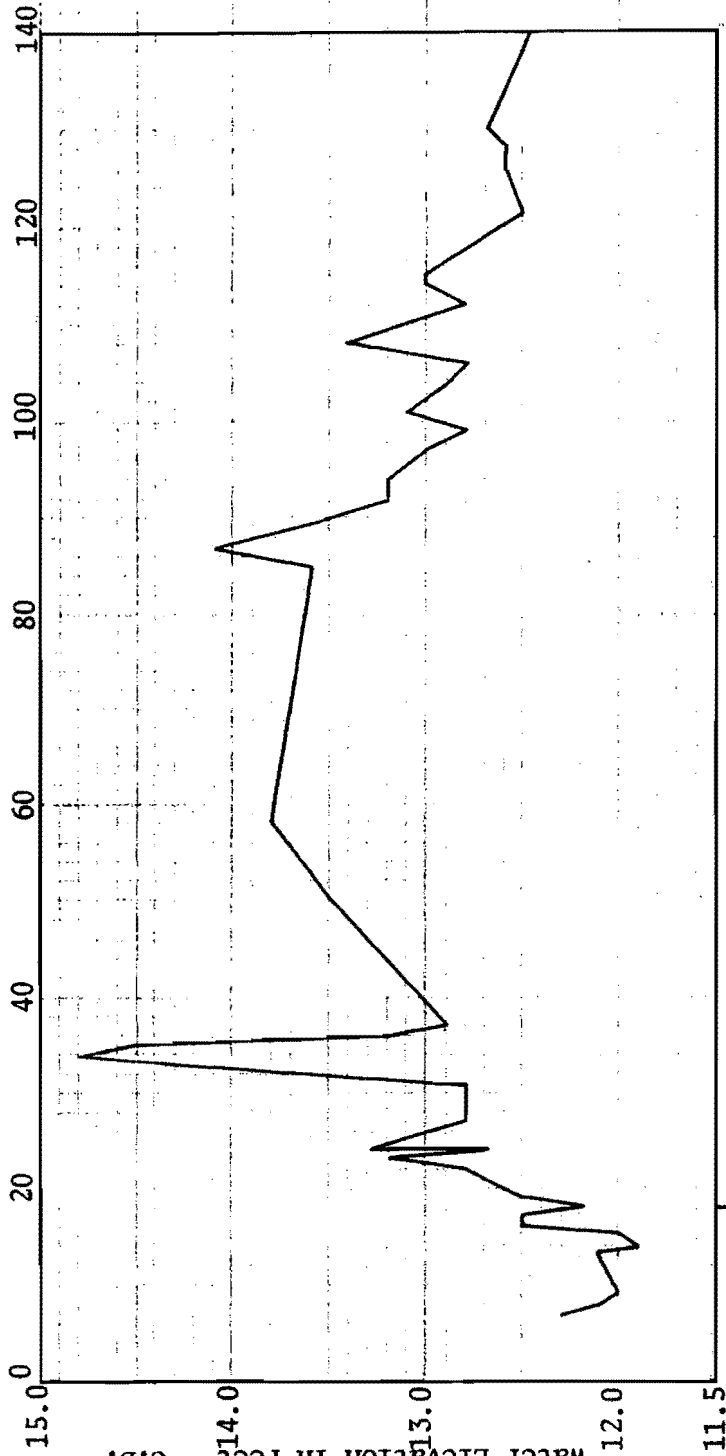
Installation & Monitoring of Ground Water Wells  
 Sewerage & Water Board of New Orleans  
 Metairie Relief Canal  
 Approximate Stations 640+00 to 670+00  
 Orleans and Jefferson Parishes, Louisiana

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

Fig. 12



Time In Days†



22 December 1984\*

\* Approximate date dredging reached grade at piezometer location.

† Start (day 0) = 4 December 1984

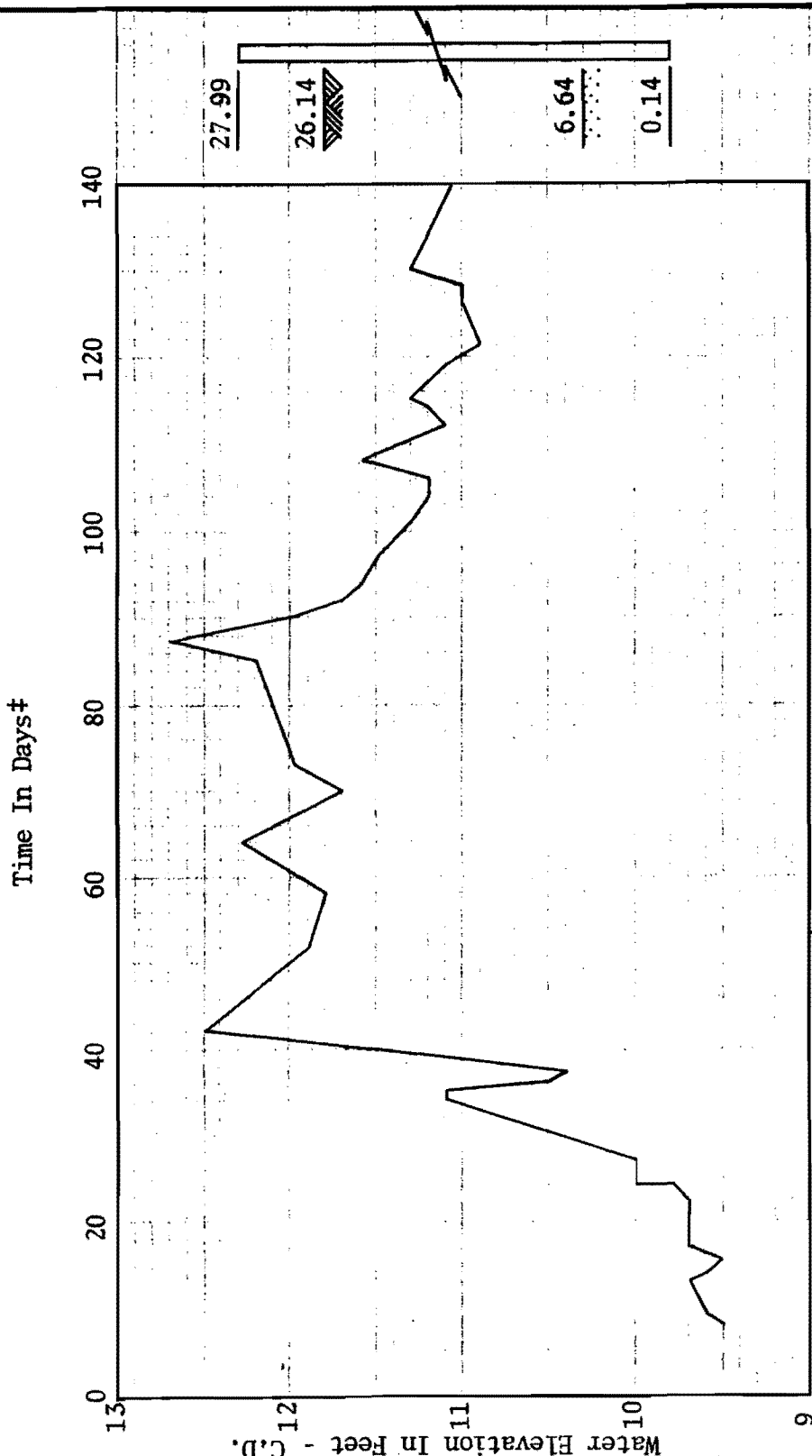
PIEZOMETER 0-2

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



25 January 1985\*

\* Approximate date dredging reached grade at piezometer location.

# Start (day 0) = 4 December 1984

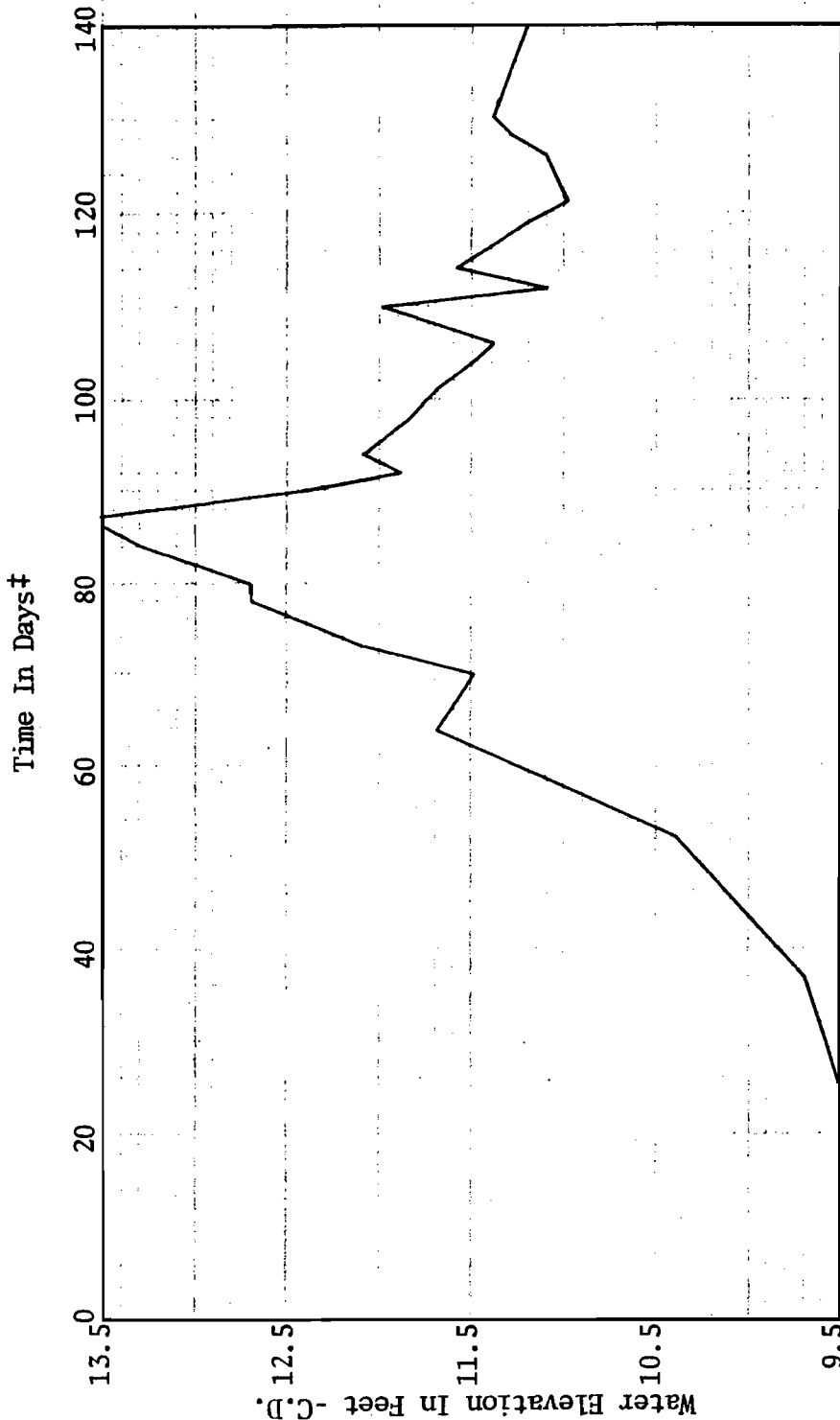
PIEZOMETER O-3

Station 663+50 - Orleans Side

Water Elevation In Feet - C.D.  
 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



15 February 1985\*

\* Approximate date dredging reached grade at piezometer location.

† Start (day 0) = 4 December 1984

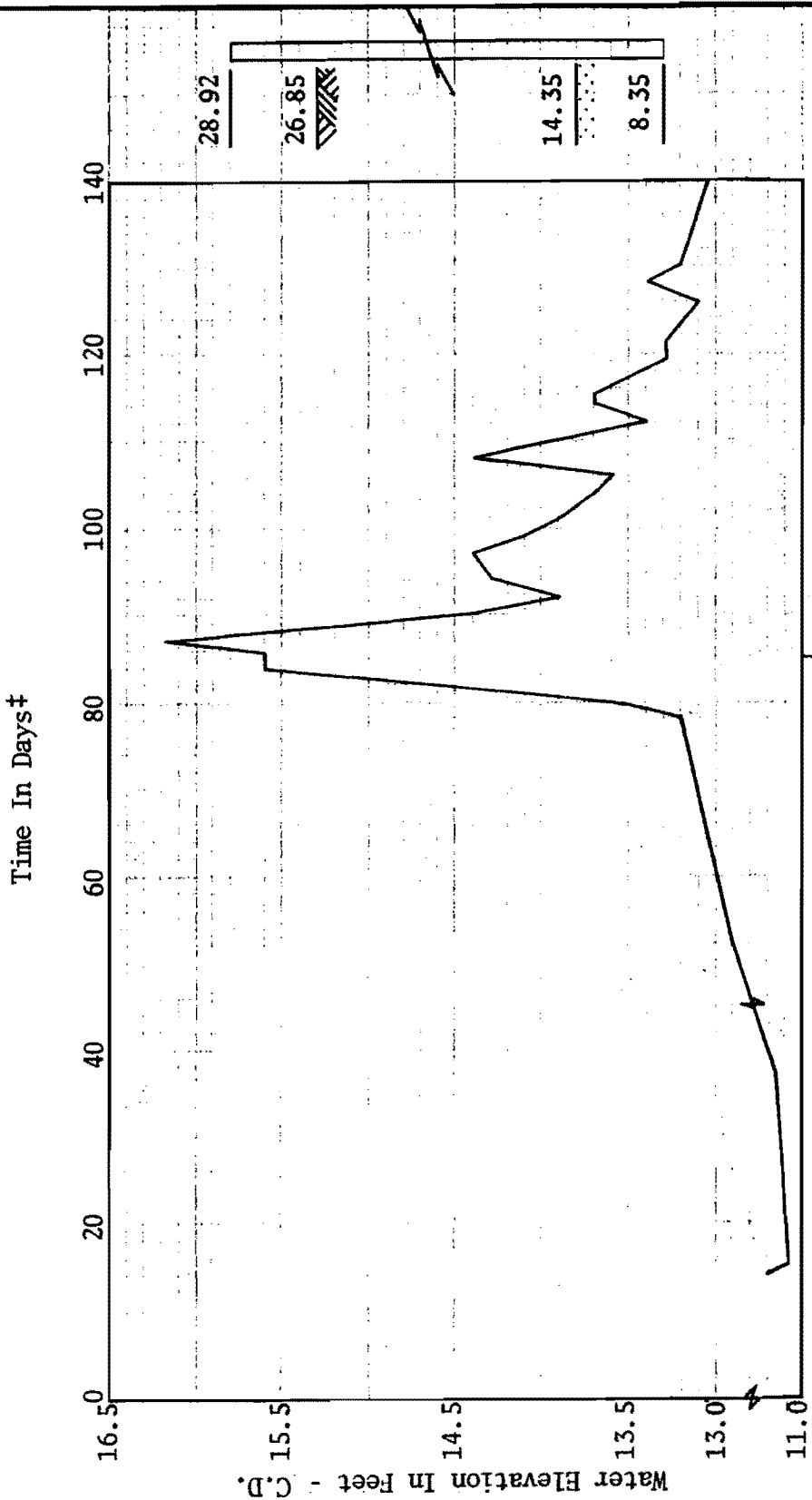
PIEZOMETER O-4

Station 659+75 - 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. 15



27 February 1985\*

\* Approximate date dredging reached grade at piezometer location.

‡ Start (day 0) = 4 December 1984

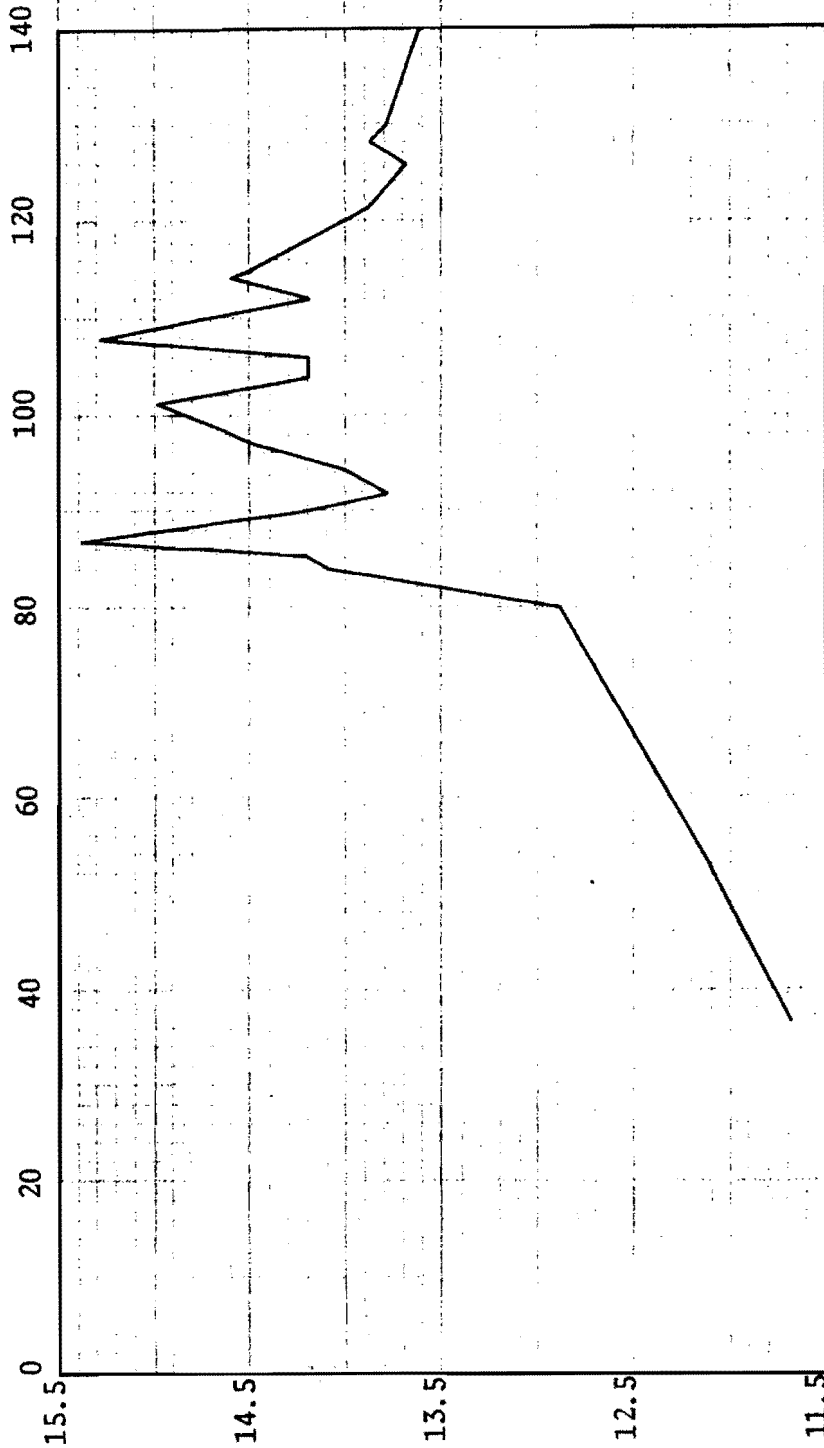
Water Elevation In Feet - C.D.

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

PIEZOMETER O-5  
 Station 656+50 - Orleans Side

For: Modjeski & Masters, Consulting Engineers, New Orleans, Louisiana  
 Fig. 16

Time In Days†



Water Elevation In Feet - C.D.  
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

13 March 1985\*

\* Approximate date dredging reached grade at piezometer location.

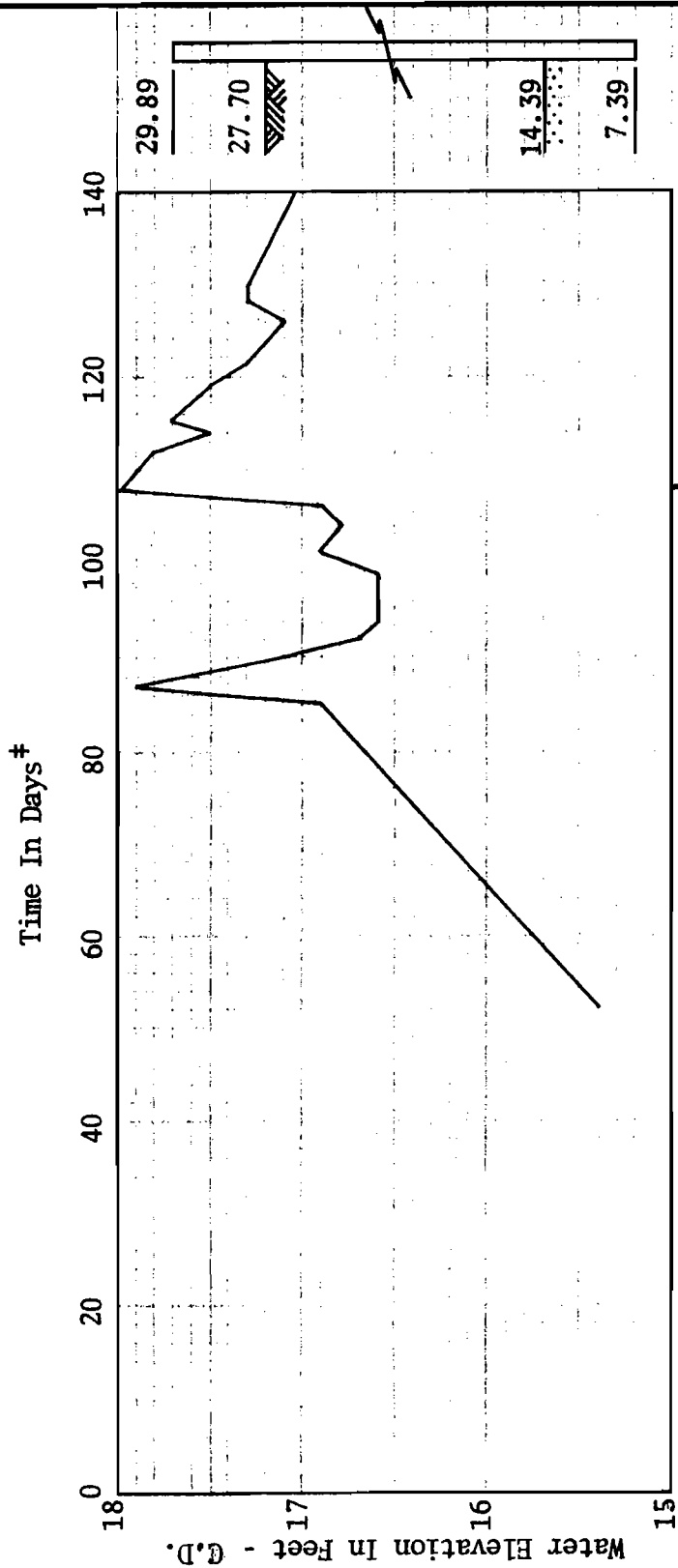
† Start (day 0) = 4 December 1984

PIEZOMETER O-6

Station 652+25 - Orleans Side

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

Fig. 17



22 March 1985\*

\* Approximate date dredging reached grade at piezometer location.

# Start (day 0) = 4 December 1984

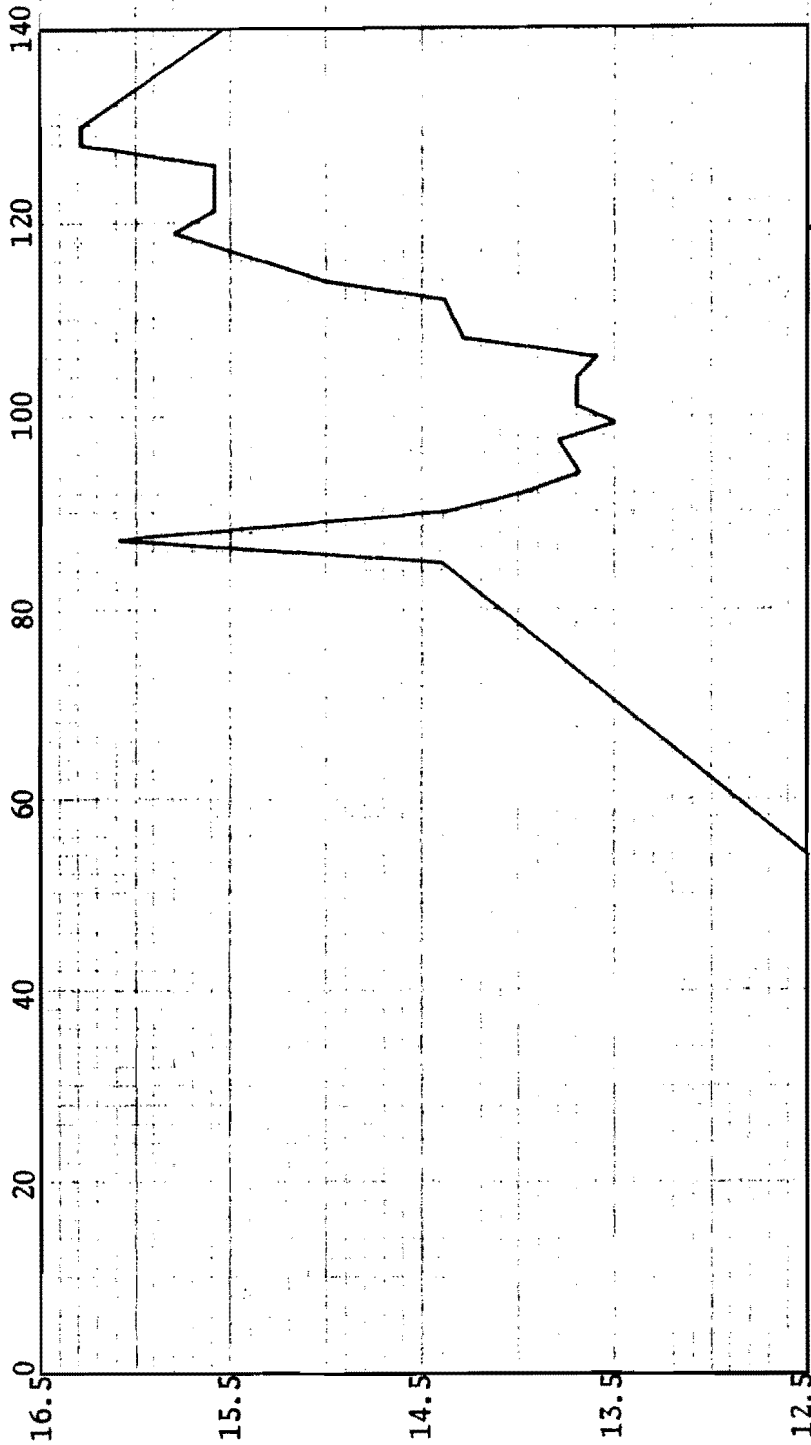
PIEZOMETER O-7  
Station 649+00 - Orleans Side

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. 18

Time In Days†



2 April 1985\*

\* Approximate date dredging reached grade at piezometer location.

† Start (day 0) = 4 December 1984

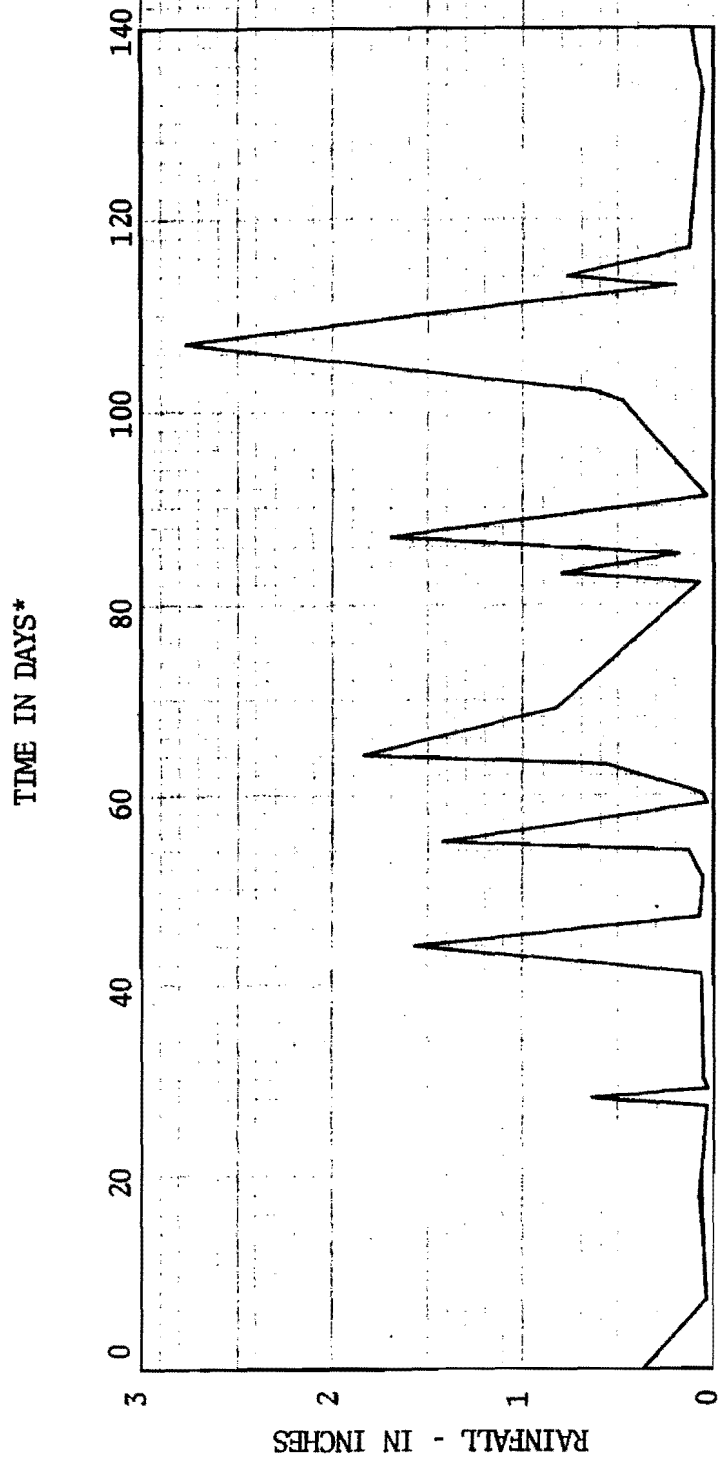
Water Elevation In Feet - C.D.  
 Installation & Monitoring of Ground Water Wells  
 Sewerage & Water Board of New Orleans  
 Metairie Relief Canal  
 Approximate Stations 640+00 to 670+00  
 Orleans and Jefferson Parishes, Louisiana

PIEZOMETER O-8

Station 645+50 - Orleans Side

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

Fig. 19



\* Start (Day 0) = 4 December 1984

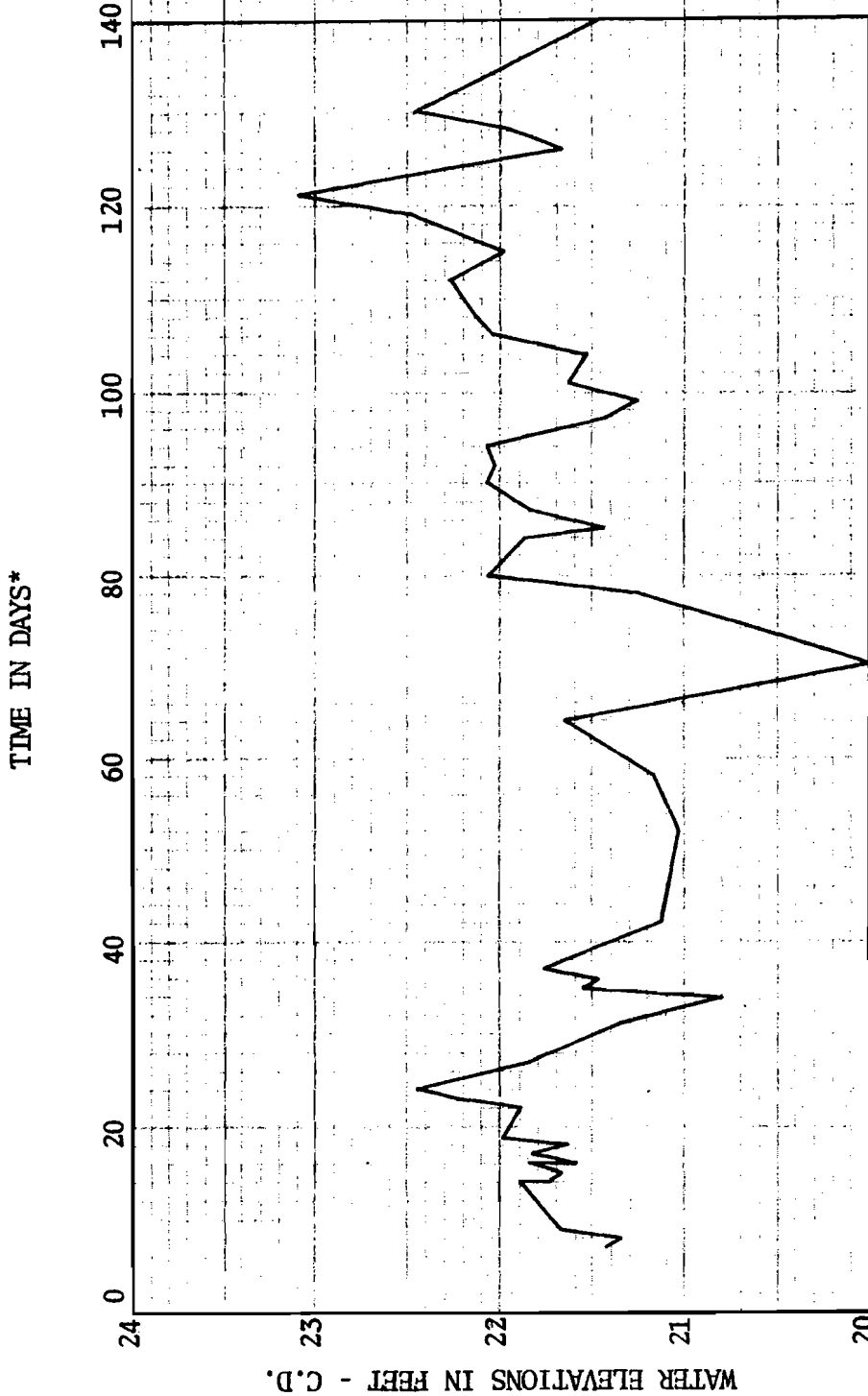
RAINFALL

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. 20





\*Start (Day 0) = 4 December 1984

WATER LEVEL IN CANAL

WATER ELEVATIONS IN FEET - C.D.  
 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**

J. BRES EUSTIS  
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**EUSTIS ENGINEERING COMPANY**

**SOIL AND FOUNDATION CONSULTANTS**

**BORINGS • TESTS • ANALYSES**

3011 28<sup>TH</sup> STREET  
METAIRIE, LOUISIANA 70002  
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METAIRIE, LOUISIANA 70011  
PHONE (504) 834-0157

12 January 1984

**OFFICERS**

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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.

| <u>No.</u> | <u>Station</u> | <u>Offset</u>       | <u>Elevations - Cairo Datum</u> |                         |
|------------|----------------|---------------------|---------------------------------|-------------------------|
|            |                |                     | <u>Ground Surface</u>           | <u>Bottom of Screen</u> |
| P-1        | 642+77         | C 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.

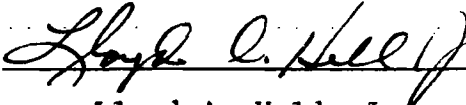
- 1) The water elevation in the piezometers was not affected by the water level in the canal because the surface of the underlying sand has become intermixed with fines to some depth below design grade (el 4.0 C.D.). This layer of contaminated sand acts as a seal preventing the water in the canal from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

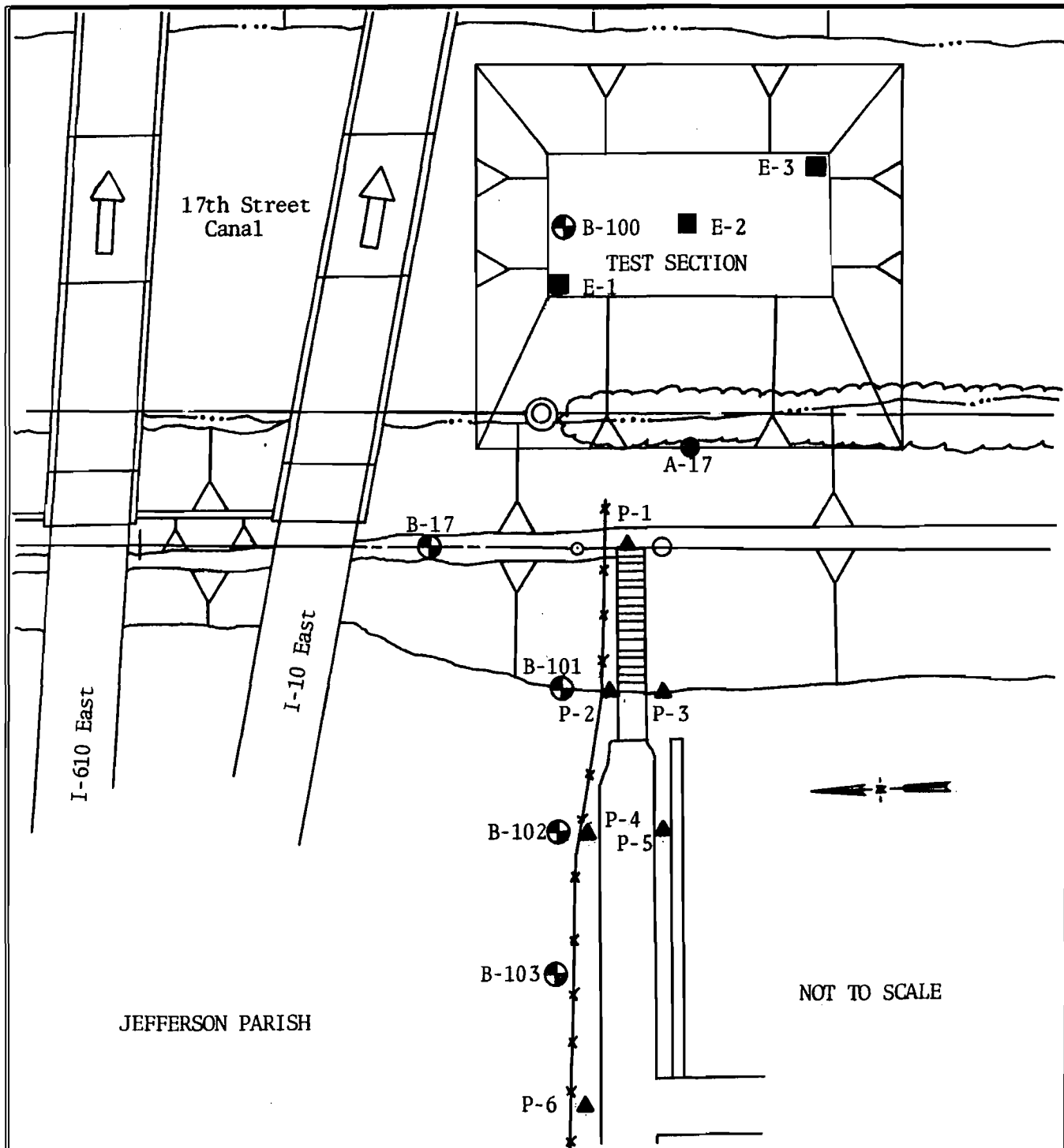
EUSTIS ENGINEERING COMPANY

By   
Lloyd A. Held, Jr.

L. J. Napolitano:kdl

Enclosures



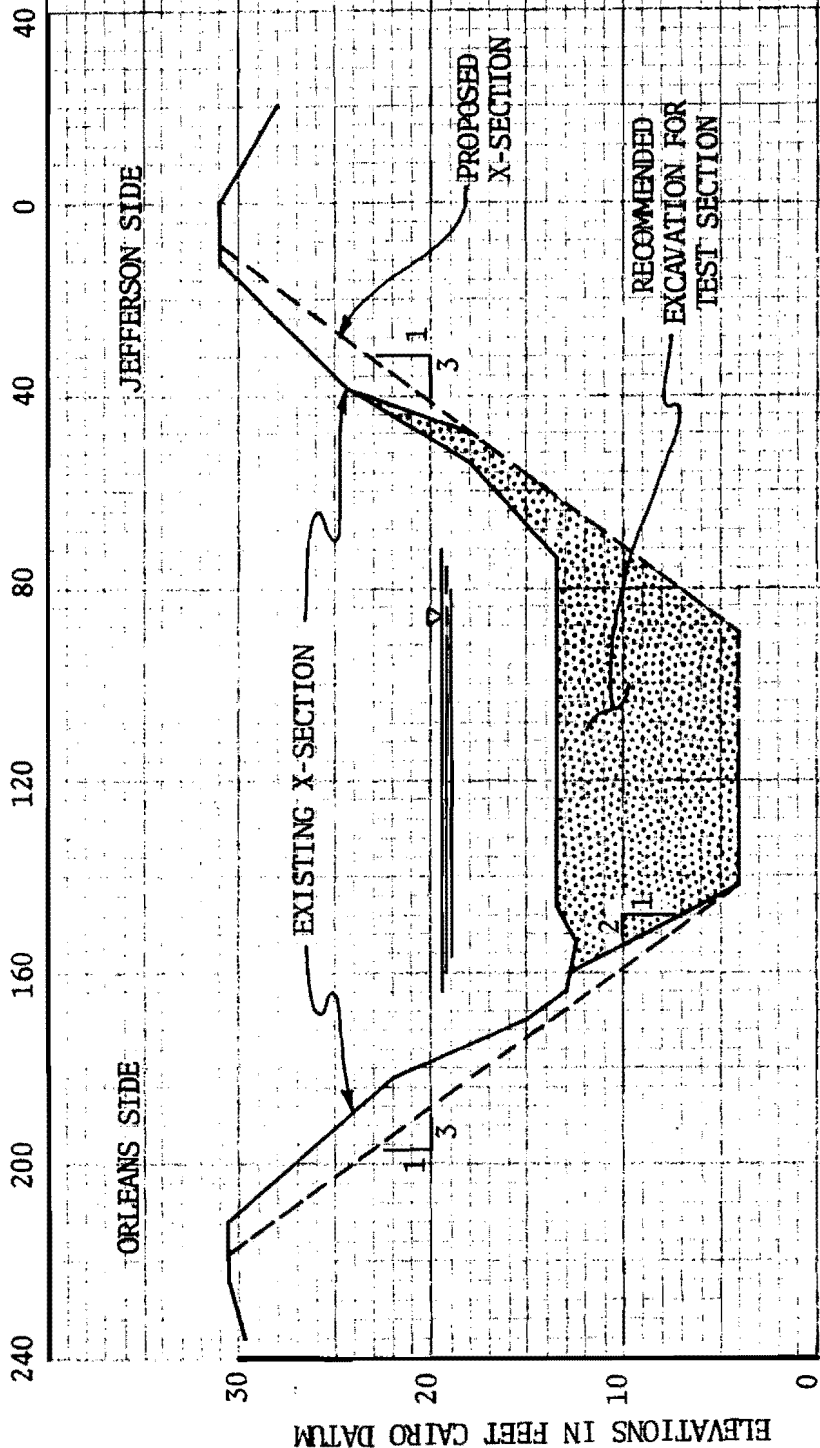


Piezometric Data-Test Section  
 Sewerage and Water Board of New Orleans  
 Metairie Relief Canal  
 Station 617+50 to Station 663+00  
 Orleans and Jefferson Parishes, Louisiana

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

Enc. 1

DISTANCE FROM BASELINE IN FEET



STA. 643 + 00

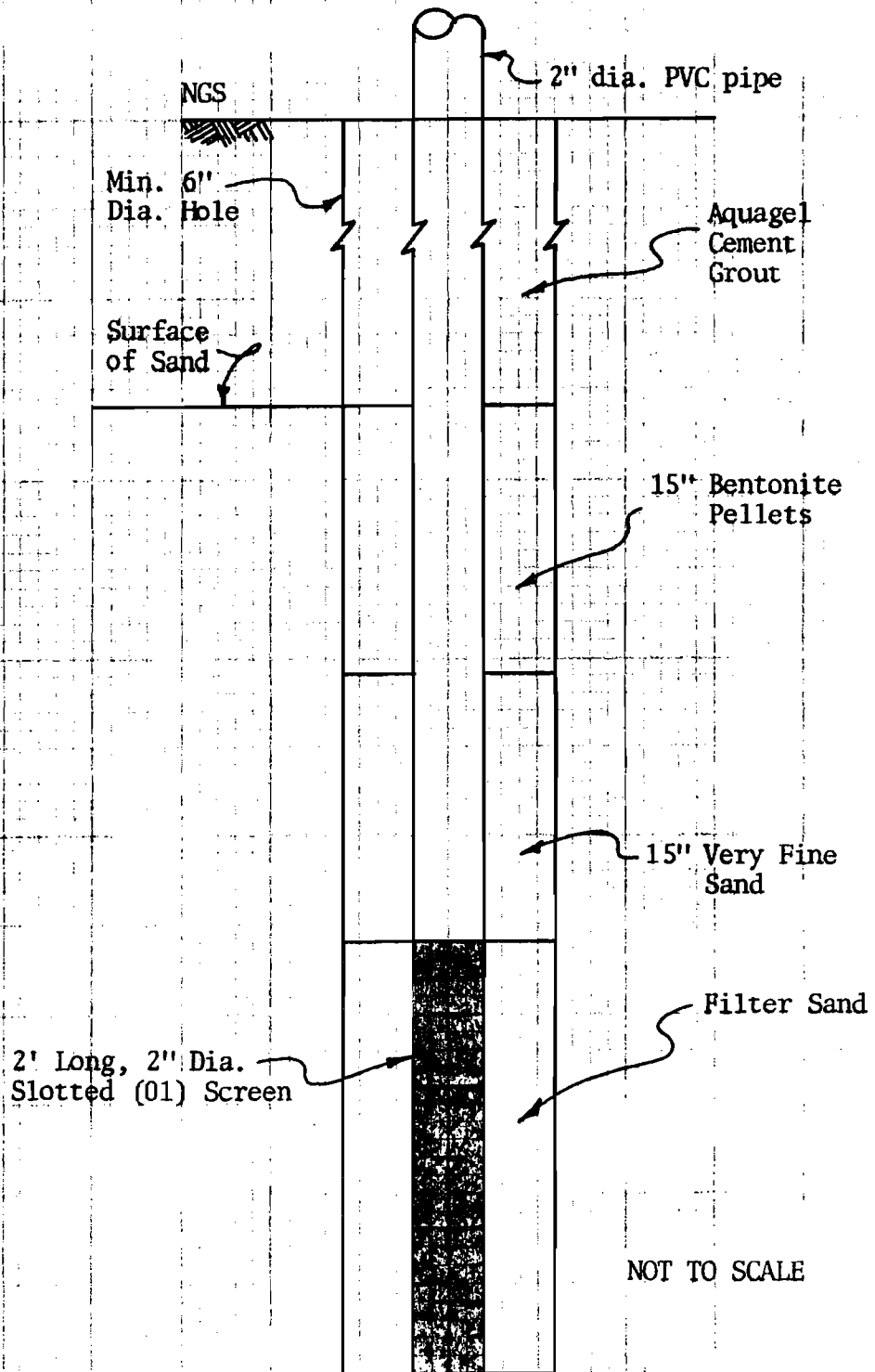
NOTES: BOTTOM WIDTH OF TEST SECTION ALONG CENTERLINE OF CANAL TO BE 100 FEET (BETWEEN APPROXIMATELY STATIONS 642 + 50 AND 643 + 50). SIDE SLOPES TO BE 1 VERTICAL ON 2 HORIZONTAL.

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

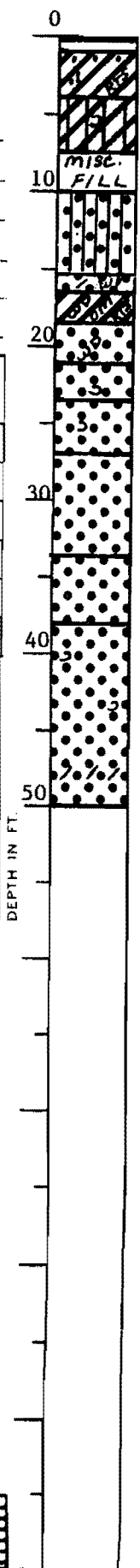
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 3

**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 |      | 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  | Medium stiff gray & tan clay w/sand<br>lenses, pockets & roots        |                            |       |
| 2          | 5.0                 | 5.5  | 4.0                | 7.5  | Stiff gray & tan silty clay w/shell<br>fragments                      |                            |       |
| 3          | 8.0                 | 8.5  | 7.5                | 10.0 | Miscellaneous fill (clay, sandy clay,<br>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<br>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<br>fragments & clay layers             | 5                          | 12    |
| 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.

CLAY      SILT      SAND      HUMUS

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

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

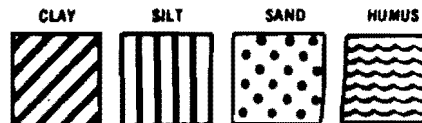
Name of Project: Sewerage and Water Board of New Orleans  
Metairie Relief Canal, Station 617+50 to Station 663+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                    | *STANDARD PENETRATION TEST |
|------------|---------------------|------|--------------------|------|--|----------------------------|
|            | From                | To   | From               | To   |  |                            |
|            |                     |      |                    |      | 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 E 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. |                            |
|            |                     |      |                    |      |  |                            |
|            |                     |      |                    |      |  |                            |

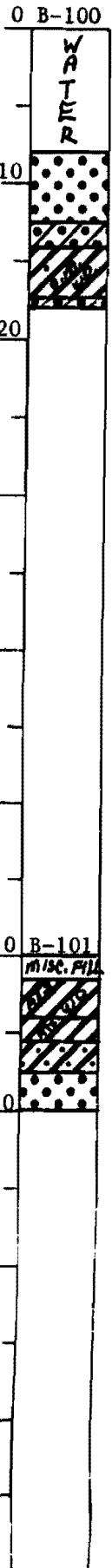
\* Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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. 642+50.

Predominant type shown heavy. Modifying type shown light.

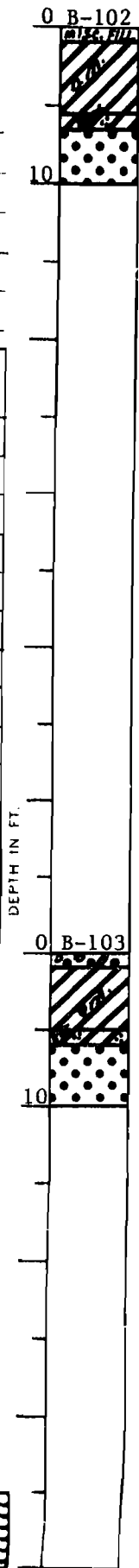


**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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

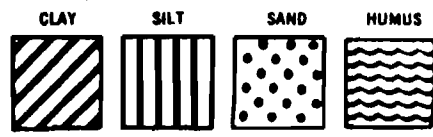
Boring No. \_\_\_\_\_ Soil Technician G. Hardee Date 7 May 1982  
 Ground Elev. \_\_\_\_\_ Datum Cairo Gr. Water Depth \_\_\_\_\_

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |
|------------|---------------------|------|--------------------|------|---|----------------------------|
|            | From                | To   | From               | To   |   |                            |
|            |                     |      |                    |      | 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. split spoon 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. split spoon 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. 642+50.



Predominant type shown heavy. Modifying type shown light.



**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

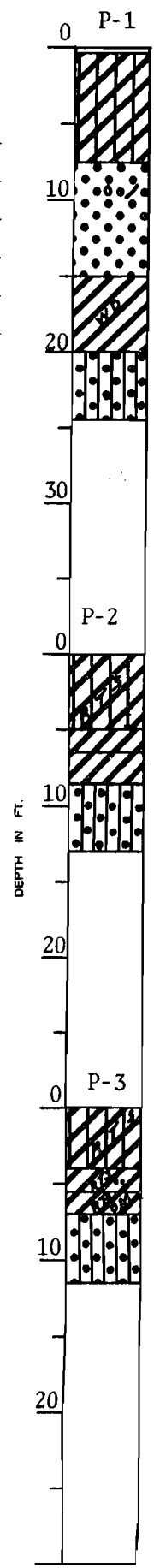
Orleans and Jefferson Parishes, Louisiana

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 \_\_\_\_\_

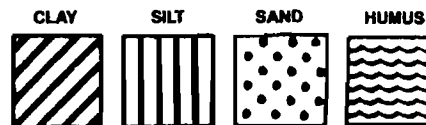
| Sample No. | SAMPLE Depth -- Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                       | *STANDARD PENETRATION TEST |
|------------|----------------------|------|--------------------|------|---|----------------------------|
|            | From                 | To   | From               | To   |   |                            |
|            |                      |      |                    |      | 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                       |                            |



\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. split spoon 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. split spoon 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: \_\_\_\_\_



Predominant type shown heavy. Modifying type shown light.



**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

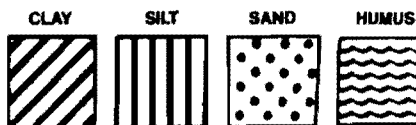
Ground Elev. See Text Datum \_\_\_\_\_ Gr. Water Depth \_\_\_\_\_

| Sample No.        | SAMPLE Depth - Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | STANDARD PENETRATION TEST |
|-------------------|---------------------|------|--------------------|------|---|---------------------------|
|                   | From                | To   | From               | To   |   |                           |
| <b>BORING P-4</b> |                     |      |                    |      |   |                           |
| 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                           |                           |
| <b>BORING P-5</b> |                     |      |                    |      |   |                           |
| 1                 | 1.5                 | 2.0  | 0.0                | 3.5  | Medium stiff to stiff brown & gray clay<br>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  |                           |
| <b>BORING P-6</b> |                     |      |                    |      |   |                           |
| 1                 | 1.5                 | 2.0  | 0.0                | 3.0  | Stiff brown & gray clay w/fine sand &<br>shells                 |                           |
| 2                 | 3.5                 | 4.0  | 3.0                | 5.5  | Soft gray sandy clay w/shells & clayey<br>sand layers           |                           |
| 3                 | 6.5                 | 7.0  | 5.5                | 10.0 | Very loose gray clayey sand w/shells<br>& clay pockets          |                           |
| 4                 | 11.0                | 11.5 | 10.0               | 14.5 | Loose gray fine sand  |                           |

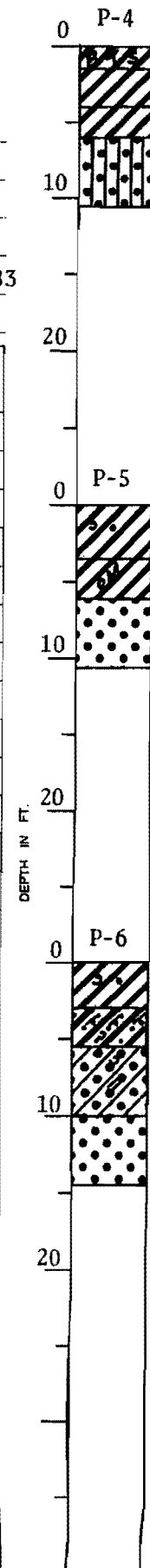
\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. split spoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. split spoon sampler 1 ft. after seating 6 in.

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Remarks: \_\_\_\_\_



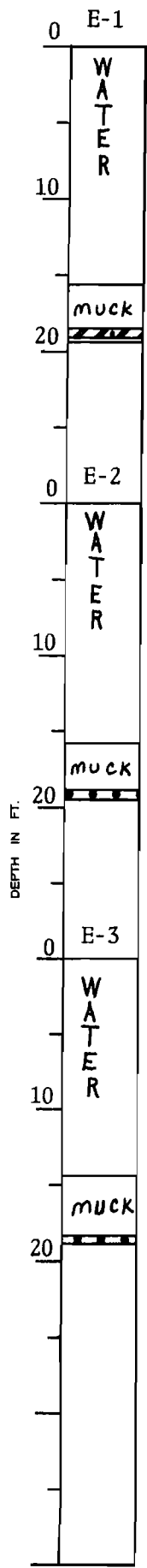
Predominant type shown heavy. Modifying type shown light.



**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

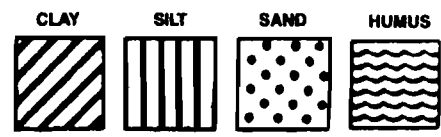
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 617+50 to Station 663+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana  
 Boring No. \_\_\_\_\_ Soil Technician A. J. Mayeux Date 19 December 1983  
 Ground Elev. \_\_\_\_\_ Datum C.D. Gr. Water Depth 22.55

| Sample No. | SAMPLE Depth - Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION       | *STANDARD PENETRATION TEST |
|------------|---------------------|------|--------------------|------|-----------------------------|----------------------------|
|            | From                | To   | From               | To   |                             |                            |
|            |                     |      |                    |      | <u>BORING E-1</u>           |                            |
|            |                     |      | 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 |                            |
|            |                     |      |                    |      | <u>BORING E-2</u>           |                            |
|            |                     |      | 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 |                            |
|            |                     |      |                    |      | <u>BORING E-3</u>           |                            |
|            |                     |      | 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 |                            |

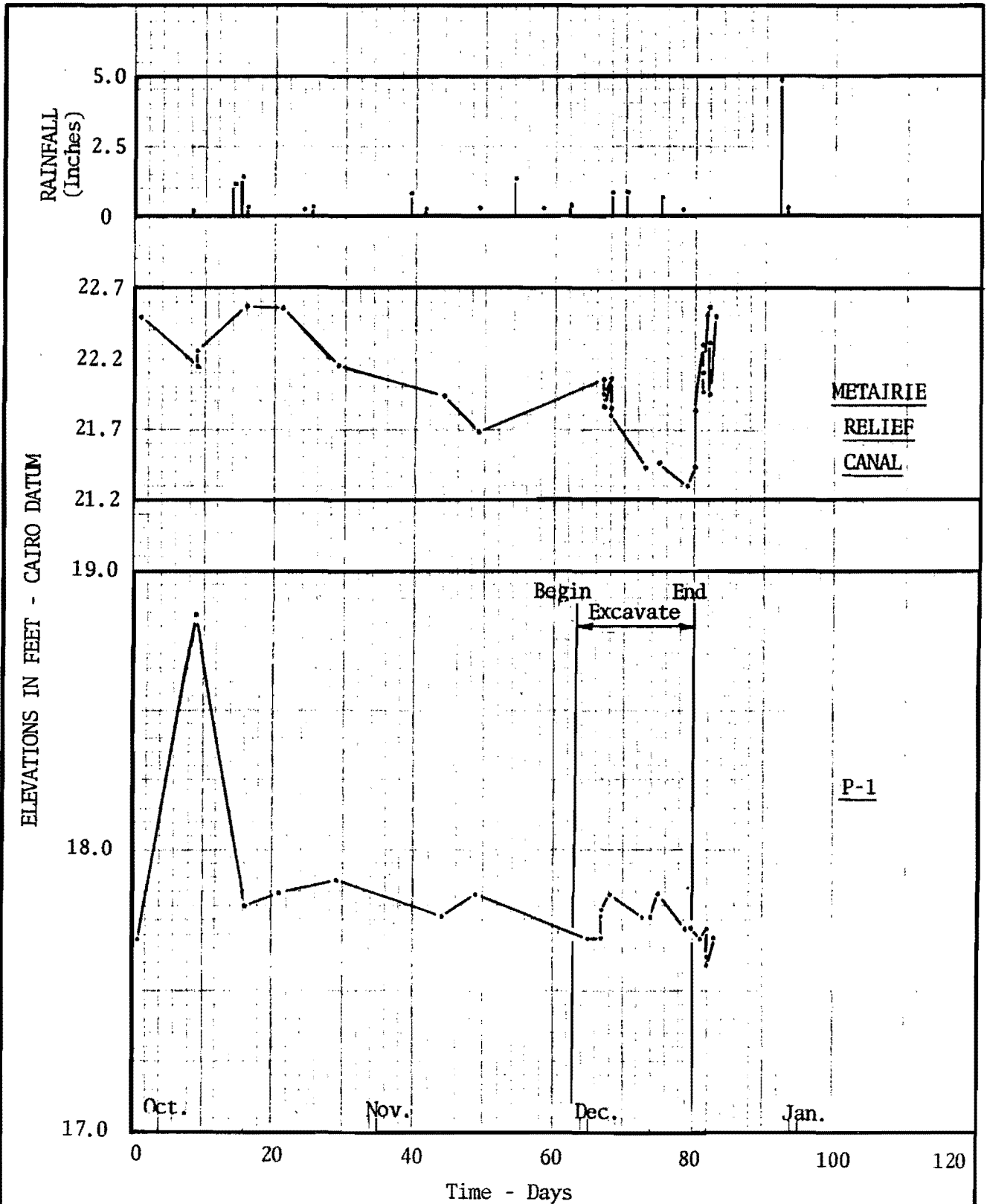


\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.  
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Remarks: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

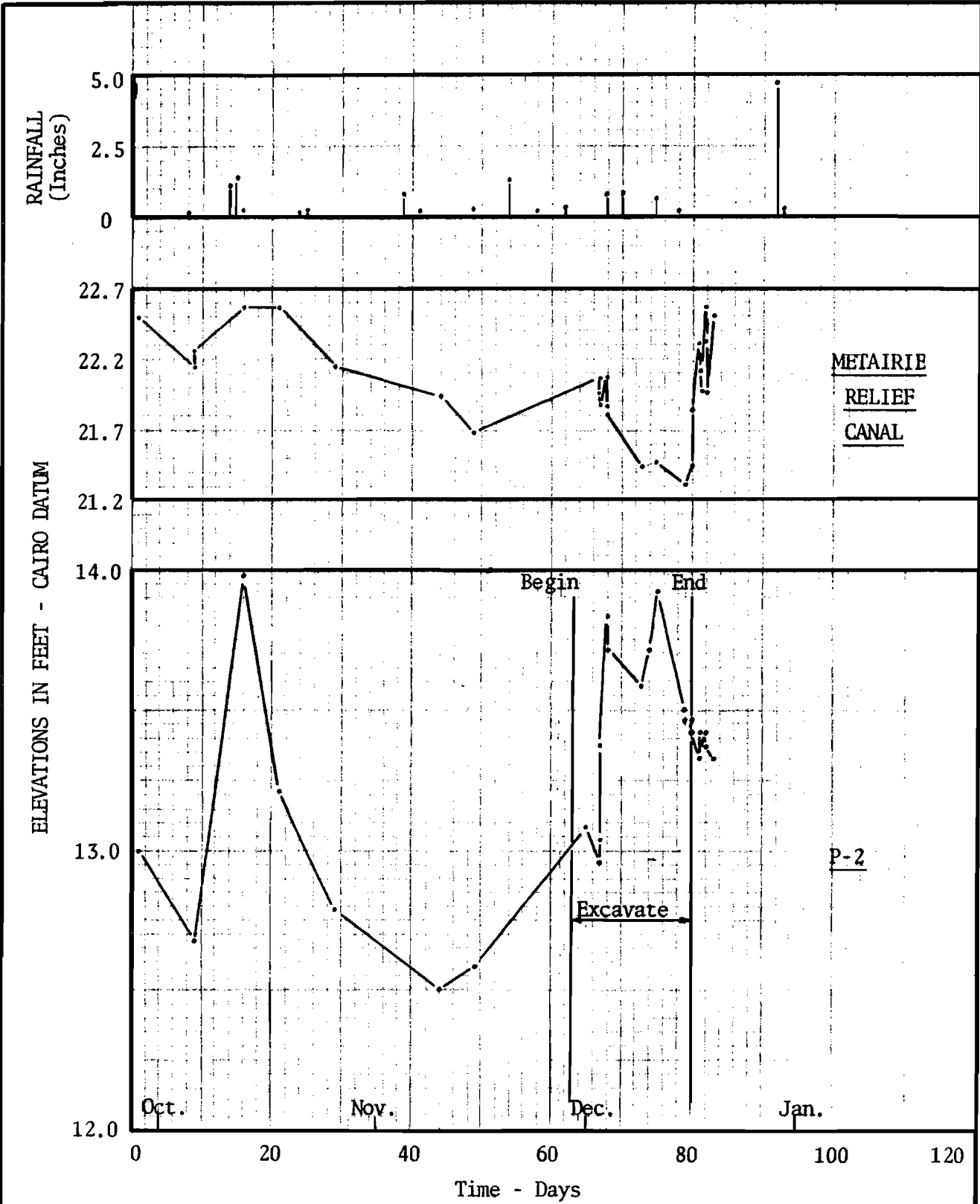


Predominant type shown heavy. Modifying type shown light.



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

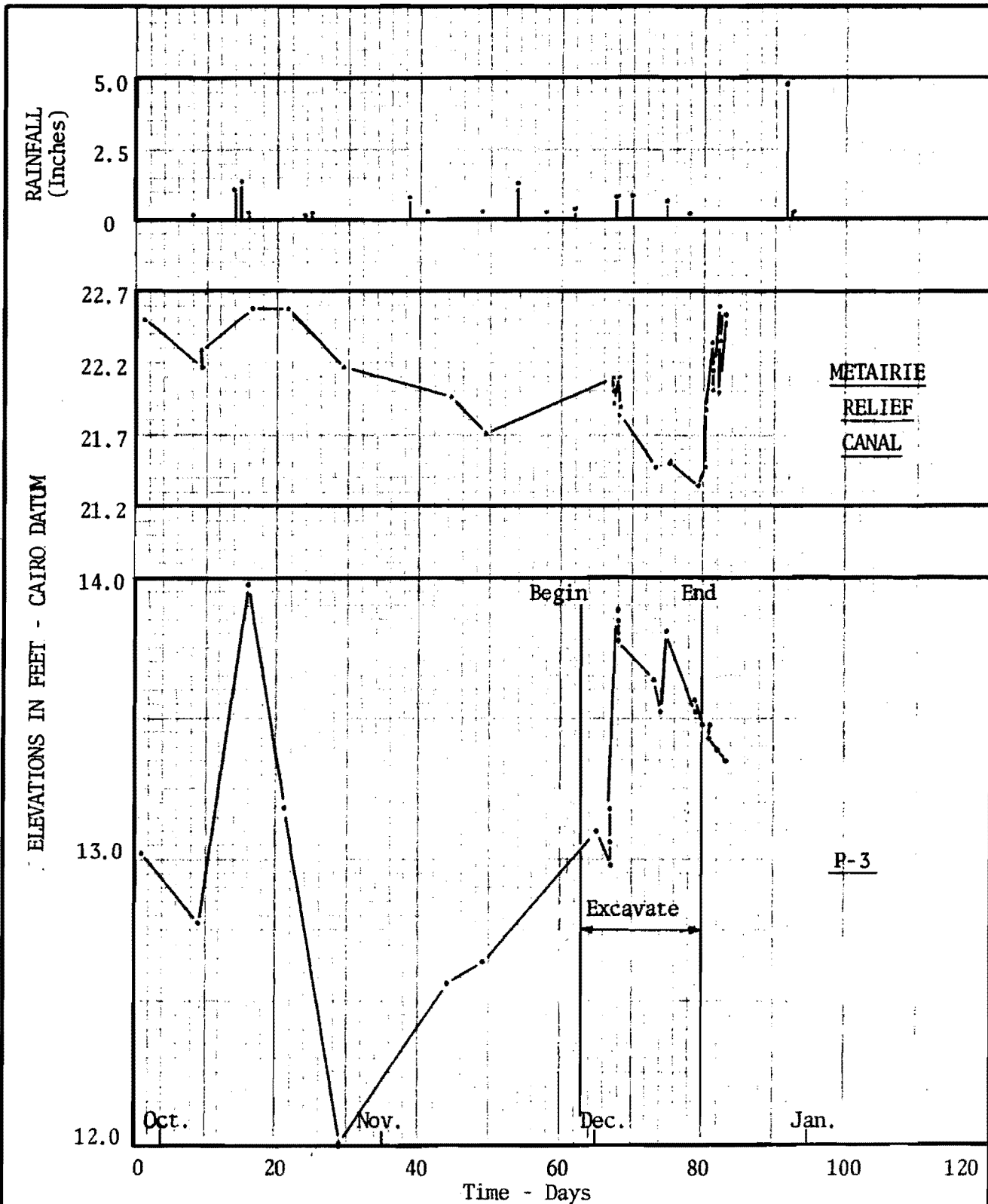
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana



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

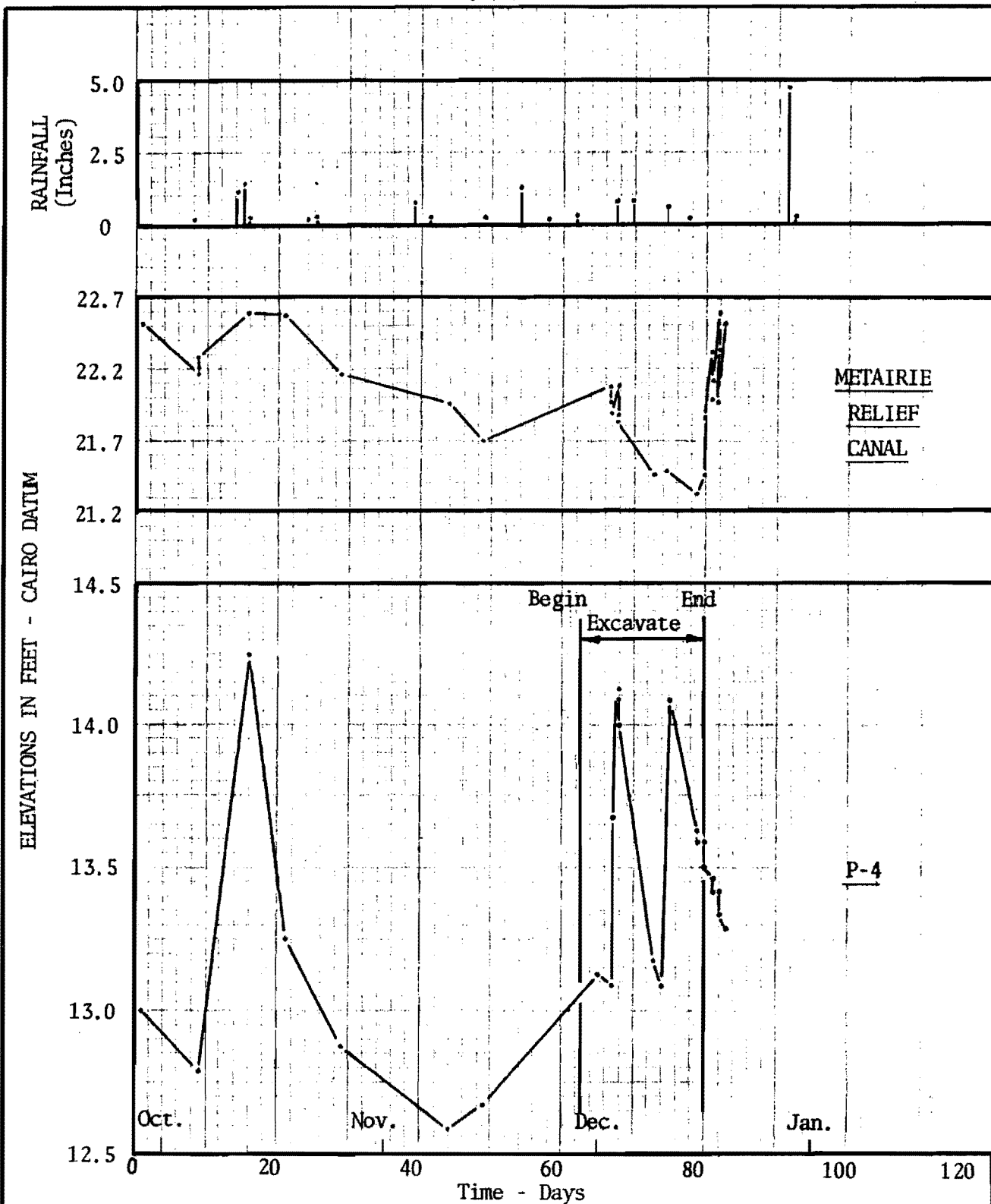
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 12



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

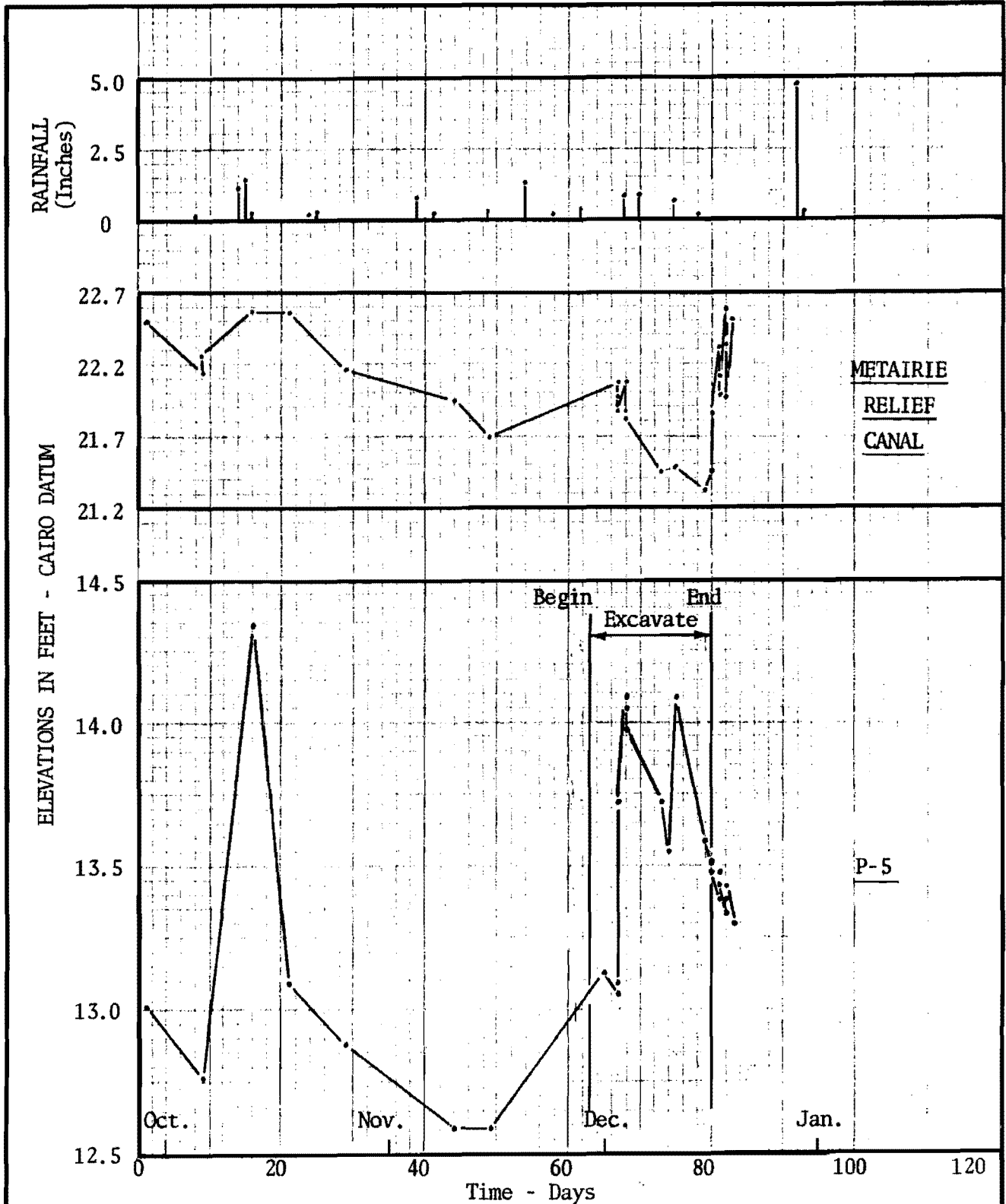
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana



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

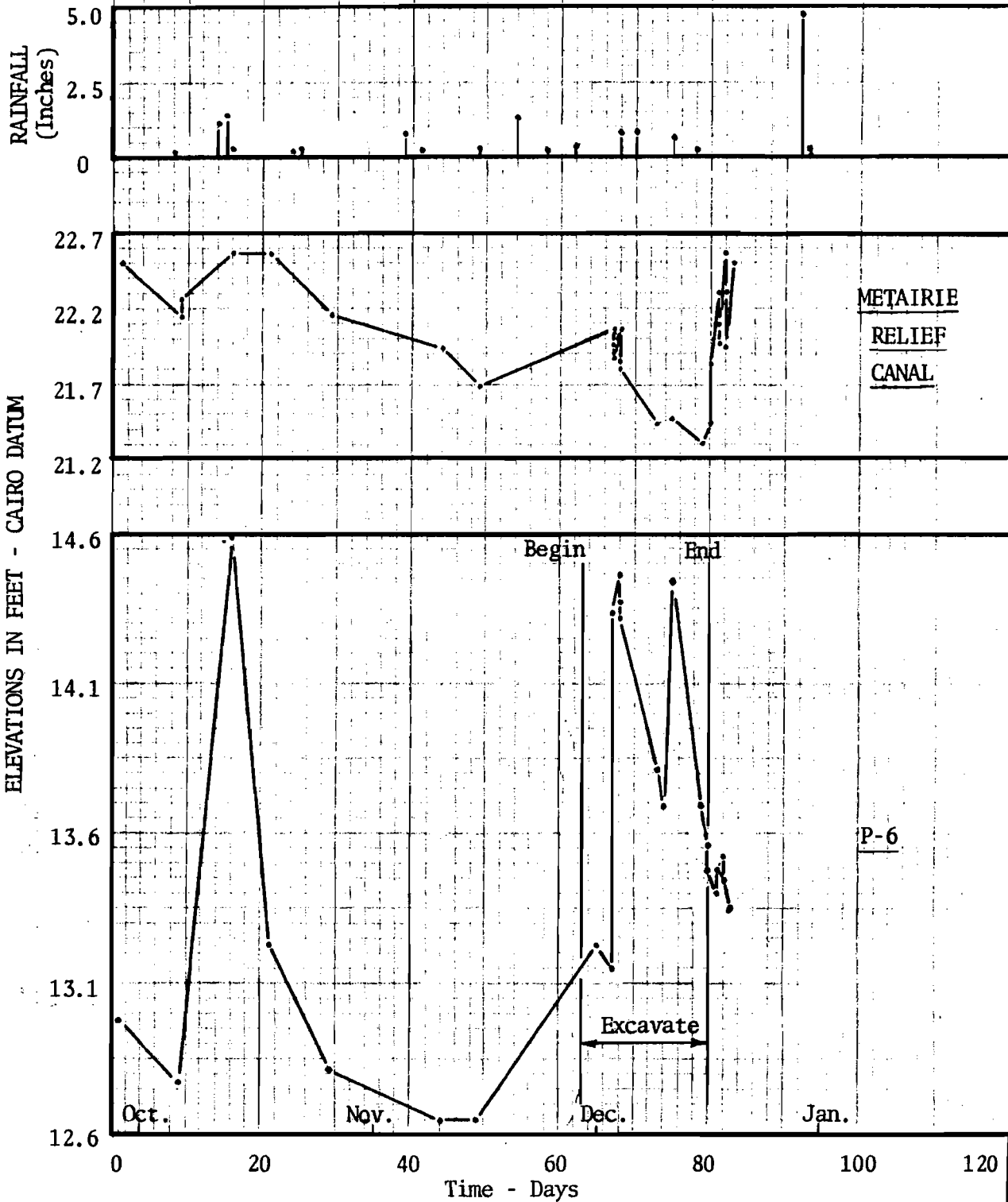
For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

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



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



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**SOIL AND FOUNDATION CONSULTANTS**

**BORINGS • TESTS • ANALYSES**

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23 August 1982

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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

---

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  $2 \times 10^{-4}$  to  $200 \times 10^{-4}$  cm/sec.

13. The landside clay cover consists primarily of soft to medium stiff clay with a coefficient of permeability (k) ranging between  $3.6 \times 10^{-8}$  to  $7.2 \times 10^{-7}$  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.

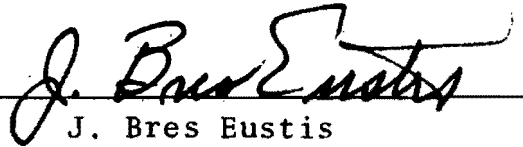
30. Pressure relief wells have been successfully used for similar conditions and are considered to be an acceptable alternate method. The initial cost may be less than sheetpiling or a dry bottom seal. However, periodic inspection is necessary because wells may become clogged and must be flushed to remain 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.

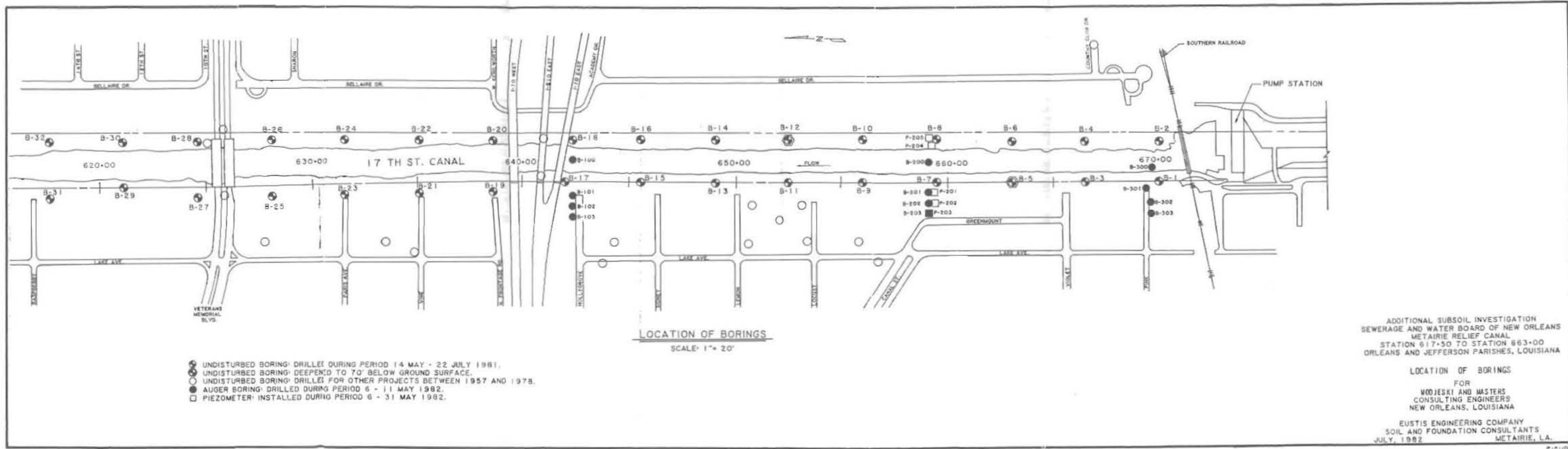
EUSTIS ENGINEERING COMPANY

By

  
J. Bres Eustis

L. J. Napolitano:bh





- UNDISTURBED BORING DRILLED DURING PERIOD 14 MAY - 22 JULY 1981.
- ⊙ UNDISTURBED BORING DEEPEMED 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.

LOCATION OF BORINGS  
SCALE: 1" = 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

LOCATION OF BORINGS  
FOR  
WODJESKI AND MASTERS  
CONSULTING ENGINEERS  
NEW ORLEANS, LOUISIANA

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

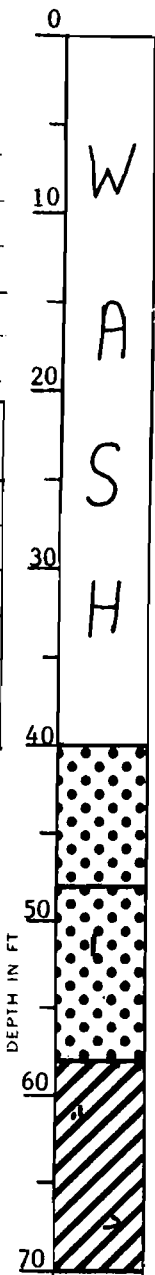
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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

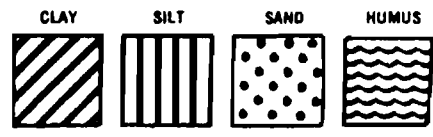
Boring No. 5A Soil Technician George Hardee Date 5 May 1982  
 Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth \_\_\_\_\_

| Sample No. | SAMPLE Depth -- Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                          | *STANDARD PENETRATION TEST |       |
|------------|----------------------|------|--------------------|------|--|----------------------------|-------|
|            | From                 | To   | From               | To   |  |                            |       |
|            |                      |      | 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  |                            |       |
|            |                      |      |                    |      |  |                            |       |
|            |                      |      |                    |      |  |                            |       |
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|            |                      |      |                    |      |  |                            |       |
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|            |                      |      |                    |      |  |                            |       |



\*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 west side of  
canal @ Sta. 663+00 in crown of levee.



Predominant type shown heavy. Modifying type shown light.

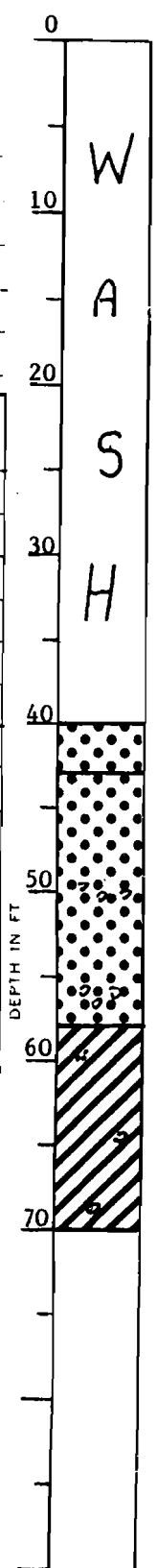
Fig. 2

**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

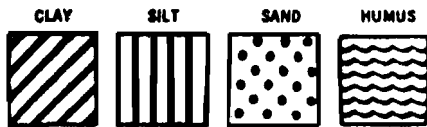
Boring No. 12A Soil Technician George Hardee Date 6 May 1982  
 Ground Elev. 30.5 (Est.) Datum Cairo Gr. Water Depth \_\_\_\_\_

| 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<br>& small clay     | 13                         | 41     |
| 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<br>& shell fragments | 1                          | 3      |
| 6          | 63.5                | 64.0 |                    |      | Ditto  |                            |        |
| 7          | 68.5                | 69.0 |                    | 70.0 | Ditto  |                            |        |
|            |                     |      |                    |      |  |                            |        |
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|            |                     |      |                    |      |  |                            |        |
|            |                     |      |                    |      |  |                            |        |



\* Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. split spoon 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. split spoon 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 east side of  
canal @ Sta. 652+50 in crown of levee.

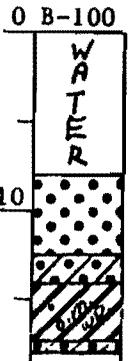


Predominant type shown heavy. Modifying type shown light.

Fig. 3

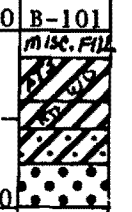
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA

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 \_\_\_\_\_

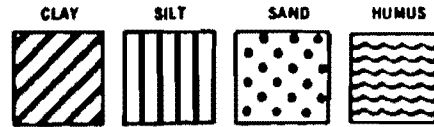


| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                    | *STANDARD PENETRATION TEST |
|------------|---------------------|------|--------------------|------|--|----------------------------|
|            | From                | To   | From               | To   |  |                            |
|            |                     |      |                    |      | 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 E 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. |                            |

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. splitpoon 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. splitpoon 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. 642+50.

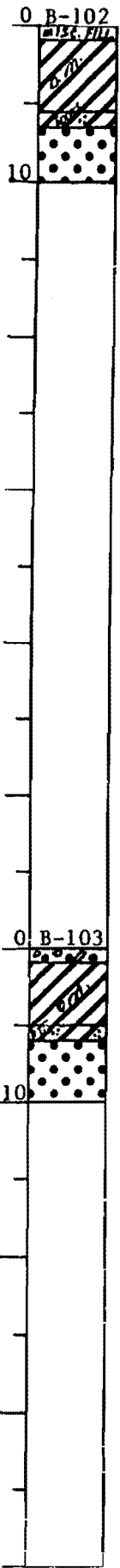
Predominant type shown heavy. Modifying type shown light.

Fig. 4

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

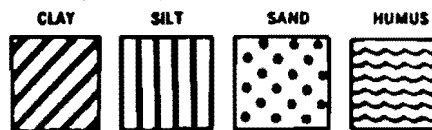
Name of Project: Sewerage and Water Board of New Orleans  
Metairie Relief Canal, Station 617+50 to Station 663+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana  
 Boring No. \_\_\_\_\_ Soil Technician G. Hardee Date 7 May 1982  
 Ground Elev. \_\_\_\_\_ Datum Cairo Gr. Water Depth \_\_\_\_\_

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |
|------------|---------------------|------|--------------------|------|---|----------------------------|
|            | From                | To   | From               | To   |   |                            |
|            |                     |      |                    |      | <u>BORING 102 (Ground Surface @ el. 18.6)</u>                   |                            |
|            |                     |      | 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.  |                            |
|            |                     |      |                    |      |   |                            |
|            |                     |      |                    |      | <u>BORING 103 (Ground Surface @ el. 18.4)</u>                   |                            |
|            |                     |      | 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. 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. 642+50.

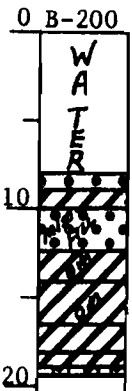


Predominant type shown heavy. Modifying type shown light.

Fig. 5

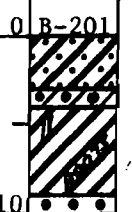
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

Name of Project: Sewerage 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 \_\_\_\_\_



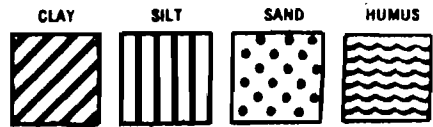
| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                       | *STANDARD PENETRATION TEST |
|------------|---------------------|------|--------------------|------|---|----------------------------|
|            | From                | To   | From               | To   |   |                            |
|            |                     |      |                    |      | <b>BORING 200</b> (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 E of canal.                       |                            |
|            |                     |      |                    |      |   |                            |
|            |                     |      |                    |      | <b>BORING 201</b> (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.    |                            |

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: Borings located @ Sta. 659+30.



Predominant type shown heavy. Modifying type shown light.

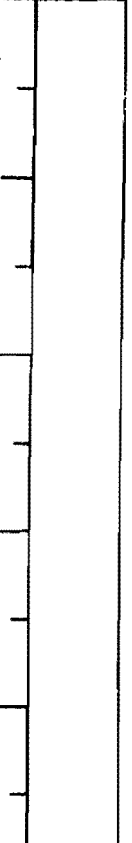
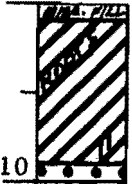
Fig. 6

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

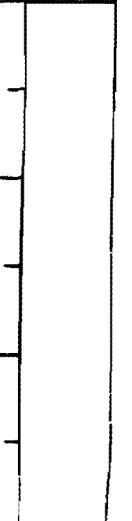
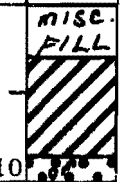
Name of Project: Sewerage and Water Board of New Orleans  
Metairie Relief Canal, Station 617+50 to Station 663+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana  
 Boring No. \_\_\_\_\_ Soil Technician G. Hardee Date 6 May 1982  
 Ground Elev. \_\_\_\_\_ Datum Cairo Gr. Water Depth \_\_\_\_\_

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |
|------------|---------------------|------|--------------------|------|---|----------------------------|
|            | From                | To   | From               | To   |   |                            |
|            |                     |      |                    |      | 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. |                            |

0 B-202

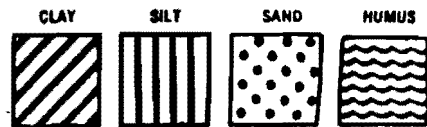


0 B-203



\*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. 7

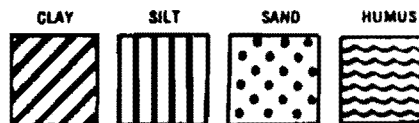
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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. 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. 669+80.



Predominant type shown heavy. Modifying type shown light.

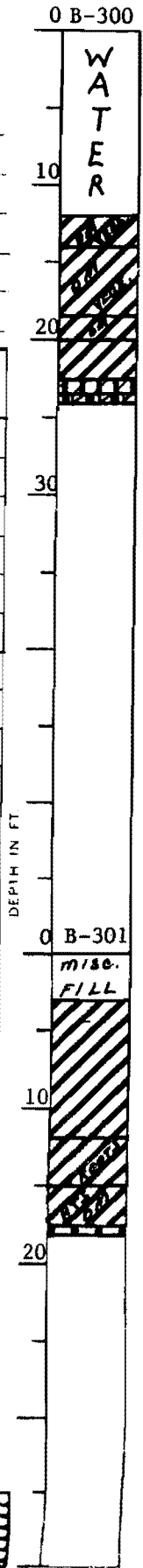


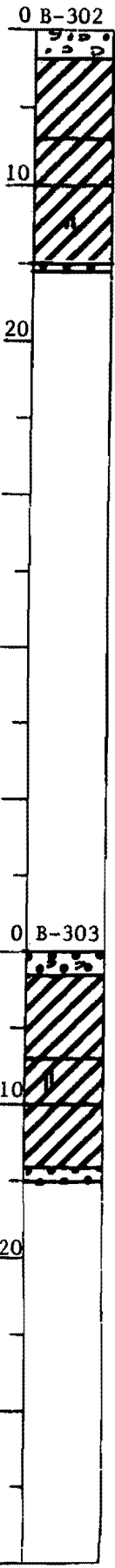
Fig. 8



**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

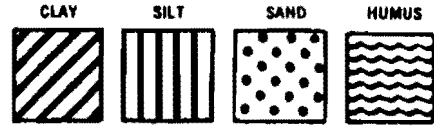
Name of Project: Sewerage and Water Board of New Orleans  
Metairie Relief Canal, Station 617+50 to Station 663+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana  
 Boring No. \_\_\_\_\_ Soil Technician G. Hardee Date 6 & 7 May 1982  
 Ground Elev. \_\_\_\_\_ Datum Cairo Gr. Water Depth \_\_\_\_\_

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |
|------------|---------------------|------|--------------------|------|---|----------------------------|
|            | From                | To   | From               | To   |   |                            |
|            |                     |      |                    |      | 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. split spoon 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. split spoon 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. 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

BORING 7

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification                       | Moisture<br>Content Percent |       | Density<br>Lb/cu ft |       | Coefficient of<br>Permeability<br>in cm/sec |
|--------------------|---------------------|--------------------------------------|-----------------------------|-------|---------------------|-------|---|
|                    |                     |                                      | Initial                     | Final | Dry                 | Wet   |   |
| 8                  | 19.5                | Medium stiff gray sandy clay w/roots | 26.3                        | 28.4  | 95.9                | 121.2 | $7.2 \times 10^{-7}$                        |

BORING 12

|   |      |  |      |      |      |       |                      |
|---|------|--|------|------|------|-------|----------------------|
| 5 | 18.0 | Very soft gray & tan clay w/sand pockets & roots | 37.4 | 37.9 | 81.1 | 111.4 | $3.6 \times 10^{-8}$ |
|---|------|--|------|------|------|-------|----------------------|

BORING 14

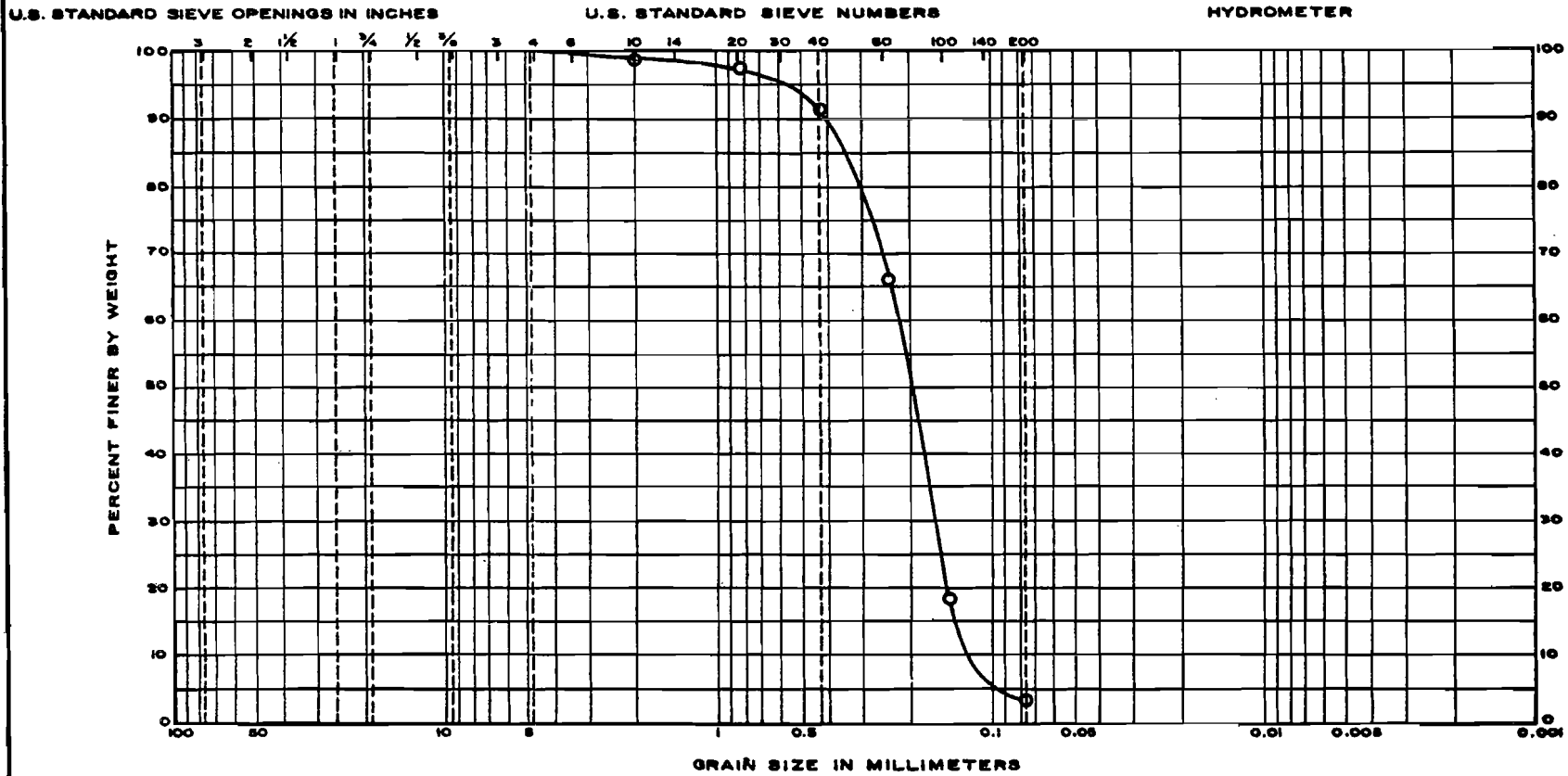
|   |      |   |      |      |      |       |                      |
|---|------|---|------|------|------|-------|----------------------|
| 5 | 14.0 | Very soft gray clay w/sand pockets, wood & organic matter | 49.3 | 51.1 | 69.3 | 103.4 | $4.1 \times 10^{-8}$ |
|---|------|---|------|------|------|-------|----------------------|

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 | $3.5 \times 10^{-7}$ |
|---|------|--|------|------|------|-------|----------------------|

BORING 29

|   |      |                             |      |      |      |      |                      |
|---|------|-----------------------------|------|------|------|------|----------------------|
| 5 | 14.0 | Very soft gray clay w/roots | 67.0 | 71.3 | 59.0 | 98.4 | $9.4 \times 10^{-8}$ |
|---|------|-----------------------------|------|------|------|------|----------------------|



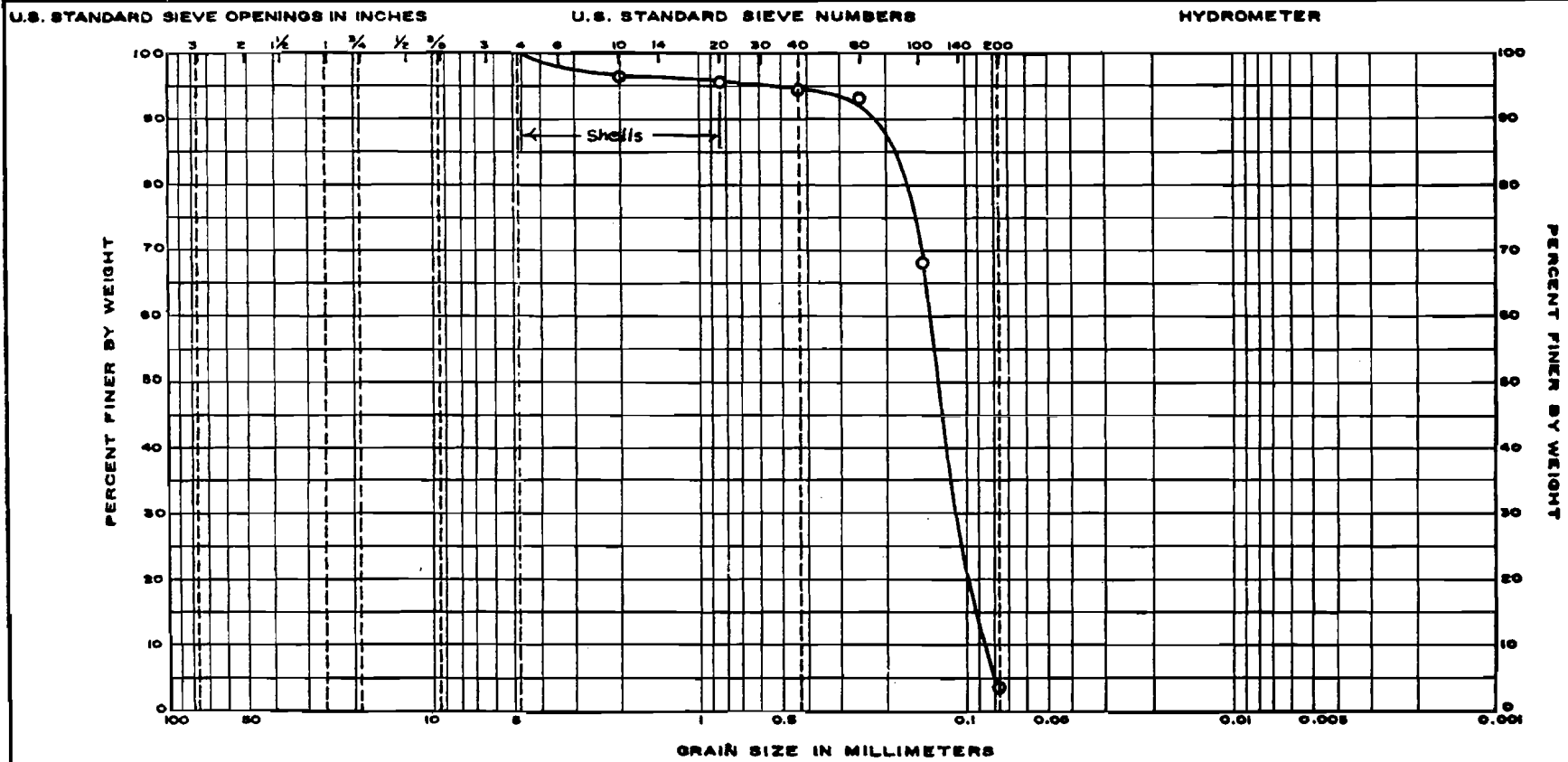
|         |        |        |        |        |      |              |  |      |
|---------|--------|--------|--------|--------|------|--------------|--|------|
| UNIFIED | GRAVEL |        | SAND   |        |      | SILT OR CLAY |  |      |
|         | COARSE | FINE   | COARSE | MEDIUM | FINE |              |  |      |
| 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 |  |              |      |

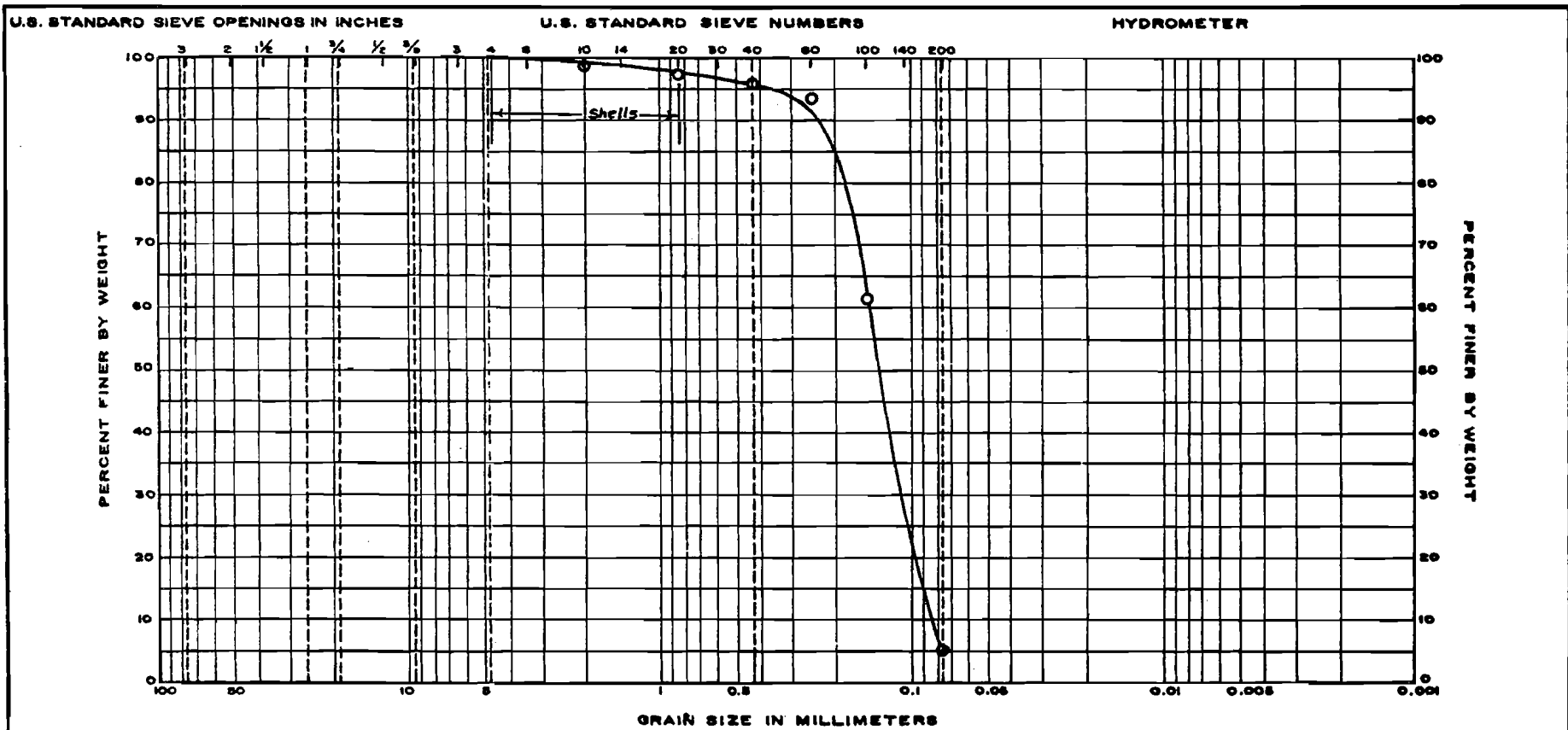
**GRAIN SIZE ANALYSIS**

| 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  
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. 12



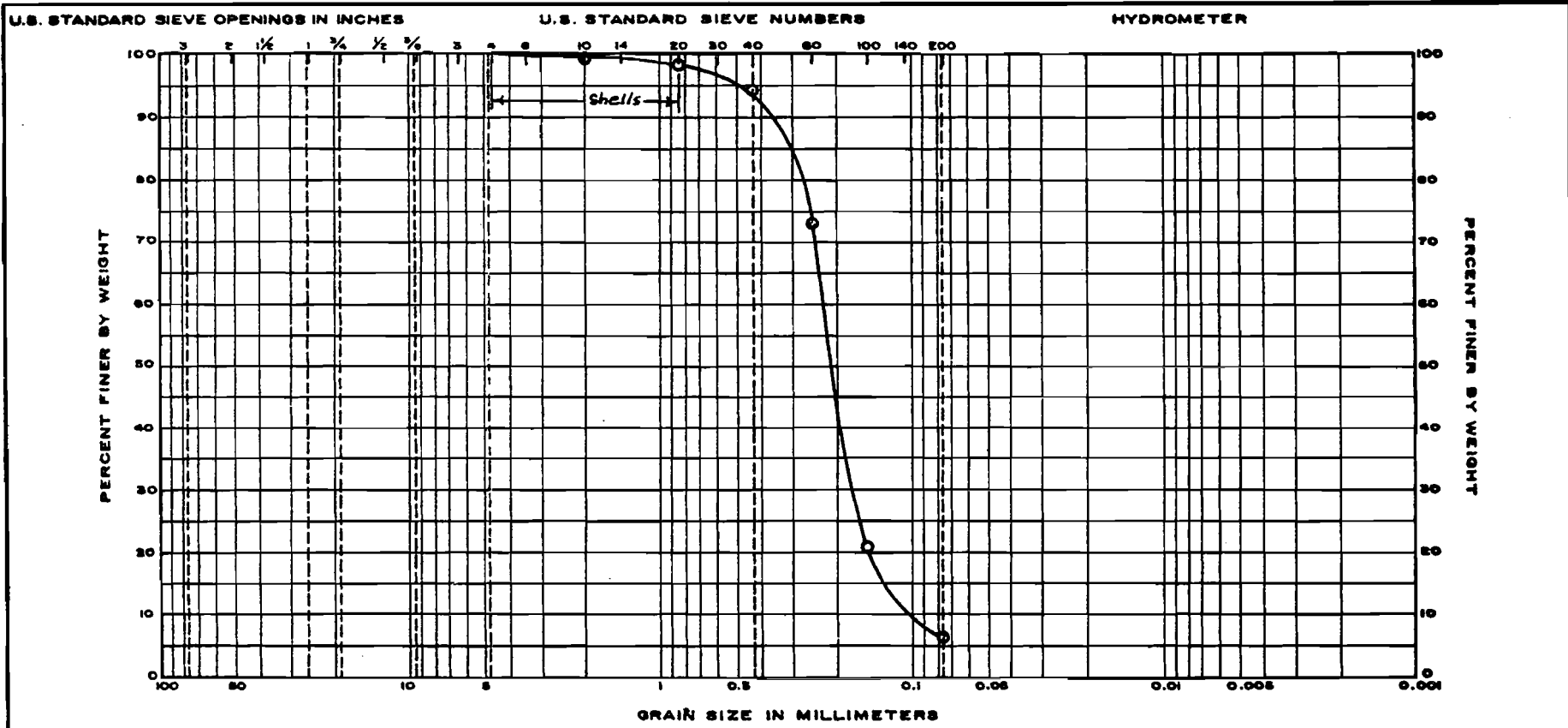


|         |        |        |        |        |      |  |              |      |
|---------|--------|--------|--------|--------|------|--|--------------|------|
| UNIFIED | GRAVEL |        |        | SAND   |      |  | SILT OR CLAY |      |
|         | COARSE | FINE   | COARSE | MEDIUM | FINE |  |              |      |
| 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 |    |  | PROJECT |
|-----------|------------|------------|--------------|-----------------------|------------------|----|--|---------|
|           |            |            |              |                       | LL               | PL | PI   |         |
|           | 16         | 11         | 38.5         |                       |                  |    | 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. 14



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

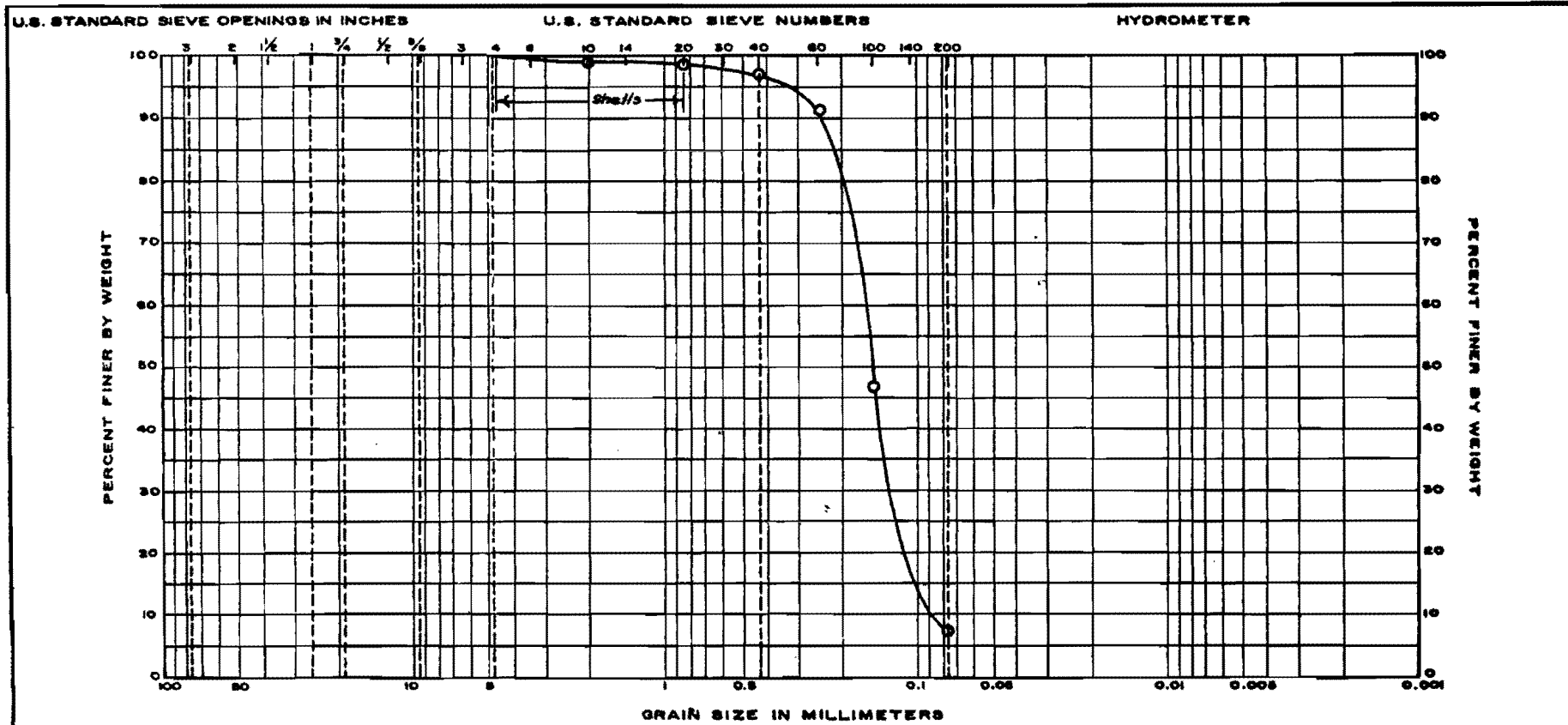
**GRAIN SIZE ANALYSIS**

| CURVE NO. | BORING NO. | SAMPLE NO. | DEPTH IN FT. | NATURAL WATER CONTENT | ATTERBERG LIMITS |    |  | PROJECT |
|-----------|------------|------------|--------------|-----------------------|------------------|----|--|---------|
|           |            |            |              |                       | LL               | PL | PI   |         |
|           | 20         | 8          | 28.5         |                       |                  |    | Sewerage & Water Board of New Orleans<br>Metairie Relief Canal<br>Station 617+50 to Station 663+00<br>Orleans and Jefferson Parishes, Louisiana<br>For: Modjeski and Masters<br>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 |    |  | PROJECT |
|-----------|------------|------------|--------------|-----------------------|------------------|----|--|---------|
|           |            |            |              |                       | LL               | PL | PI   |         |
|           | 29         | 9          | 26.0         |                       |                  |    | 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  
 M.F. TAIRIF  
 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.

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

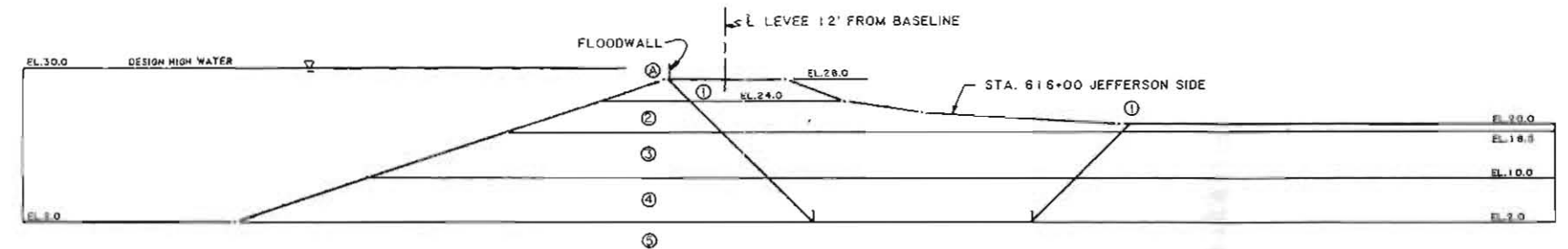
PIEZOMETER READINGS

| <u>Date of Reading</u> | <u>Elevation of Water Surface - Cairo Datum</u> |              |              |              |              |               |
|------------------------|---|--------------|--------------|--------------|--------------|---------------|
|                        | <u>P 201</u>                                    | <u>P 202</u> | <u>P 203</u> | <u>P 204</u> | <u>P 205</u> | <u>Canal*</u> |
| 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         | **            |

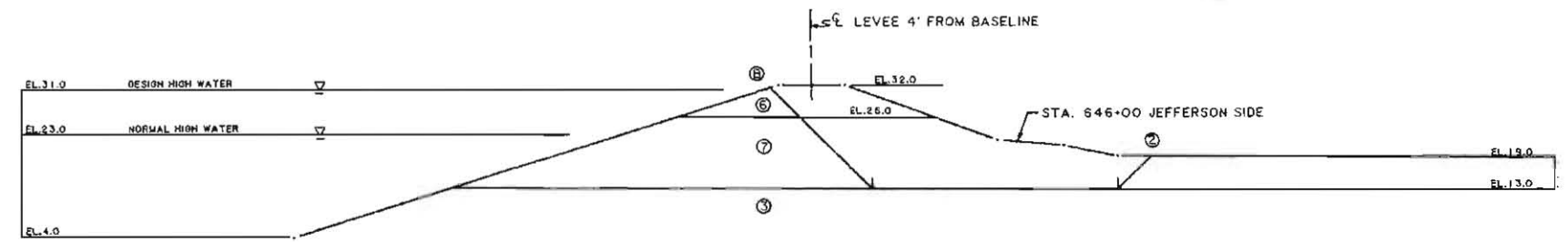
\*Benchmark set at water's edge on west side near Sta. 659+50. Elevation of red line on stake is 23.5.

\*\*Stake uprooted.

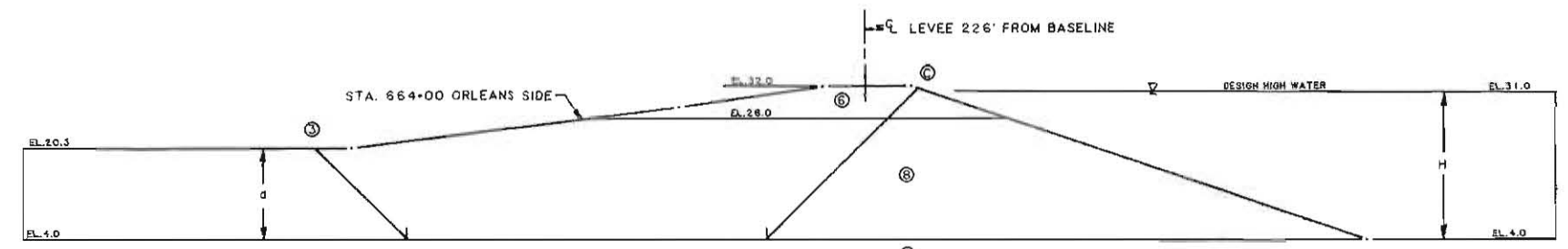
Fig. 19



LAKE PONTCHARTRAIN TO STA. 617+50



STA. 617+50 TO STA. 663+00



STA. 663+00 TO PUMP STATION

SOIL PARAMETERS

| ST. No. | $\gamma$ PCF | $\phi$ DEG. | CA PSF | CRB 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 No. | EL.  | DRIVING FORCE |       |            | RESISTING FORCE |       |       |            | FACTOR OF SAFETY |
|------------------|------|---------------|-------|------------|-----------------|-------|-------|------------|------------------|
|                  |      | DA            | DP    | $\Sigma D$ | RA              | Rb*   | RP    | $\Sigma R$ |                  |
| 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

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

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.

$\gamma$  = 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.

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**EUSTIS ENGINEERING COMPANY**

**SOIL AND FOUNDATION CONSULTANTS**

**BORINGS • TESTS • ANALYSES**

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2 November 1981

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LLOYD A. HELD, JR.

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.

---

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.

| <u>Location Within Reach I</u> | <u>Maximum Elevation of Levee<br/>Crown for Factor of Safety = 1.3</u> |
|--------------------------------|--|
| 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.

| <u>Location Within Reach I</u> | <u>Tip Elevation<br/>of Sheetpiles<br/>C.D.</u> | <u>Maximum<br/>Bending<br/>Moment Ft-Kips</u> |
|--------------------------------|---|---|
| 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

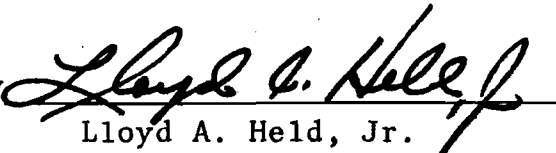


and miscellaneous materials, these soils should be placed and compacted in accordance with Corps of Engineers Standard Specifications for Semi-Compacted Levees. Soil obtained from the excavation of the canal bottom and slopes should not be used for backfill material.

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

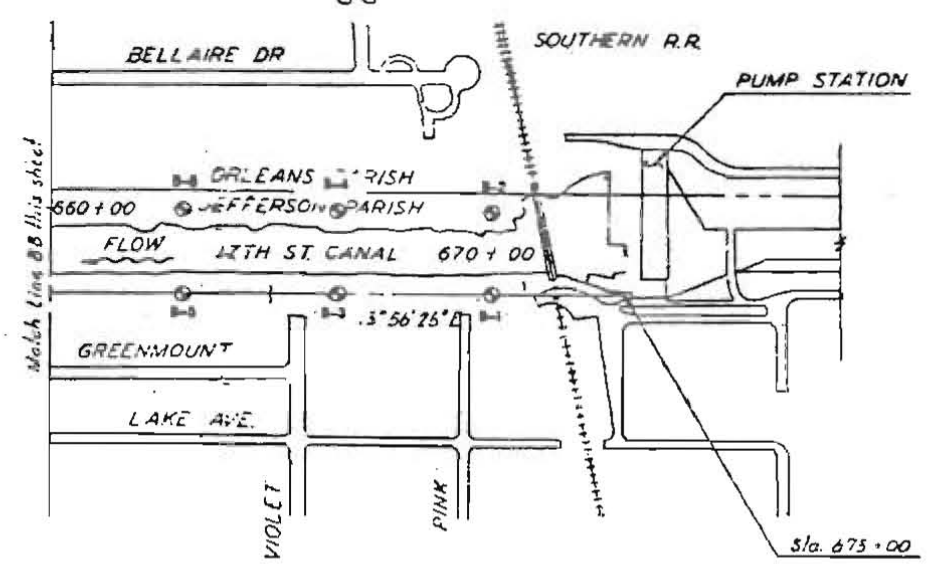
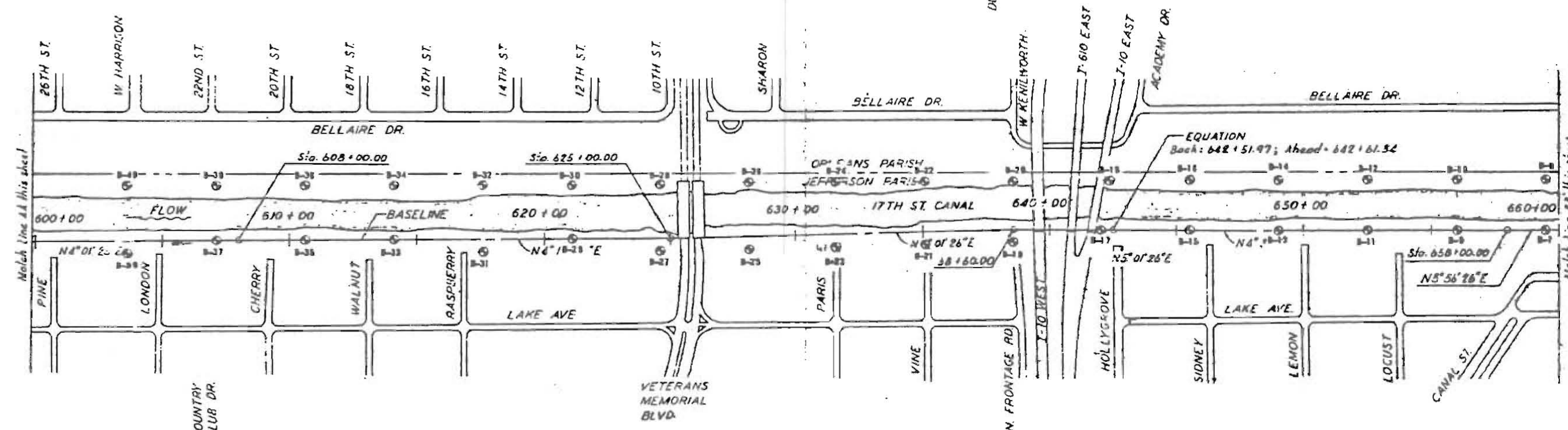
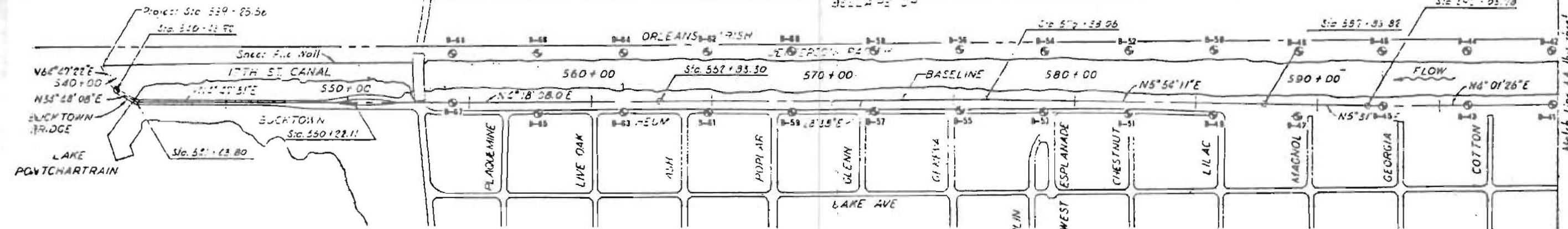
By   
Lloyd A. Held, Jr.

L. J. Napolitano:bh

**NOTES**

LOCATION PLAN REPRODUCED FROM FURNISHED DRAWING.

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



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

LOCATION OF BORINGS

FOR  
HOBBS AND WATERS, INC.  
CONSULTING ENGINEERS  
NEW ORLEANS, LOUISIANA

COYNE ENGINEERING COMPANY  
SITE AND FOUNDATION CONSULTANTS  
AUGUST, 1981 METAYRIS, LA.

FIGURE 1

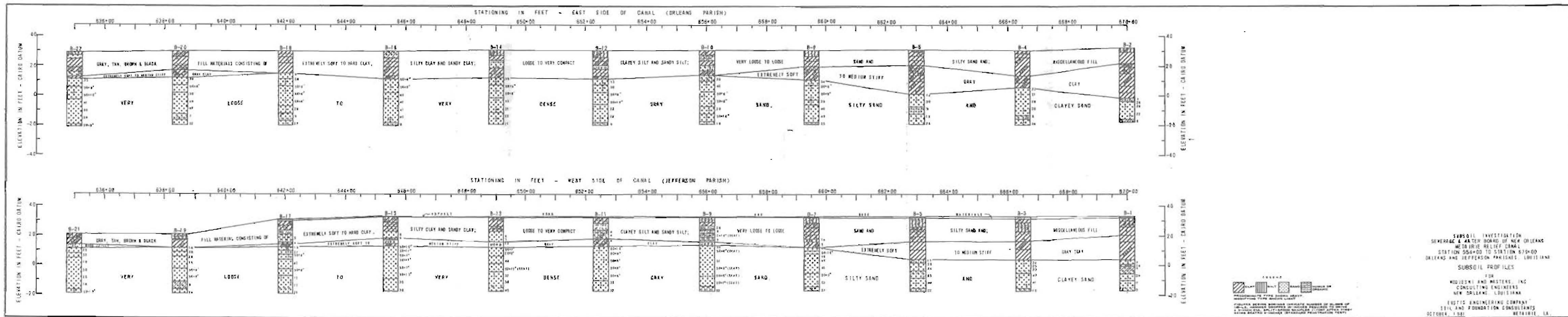


FIGURE 7

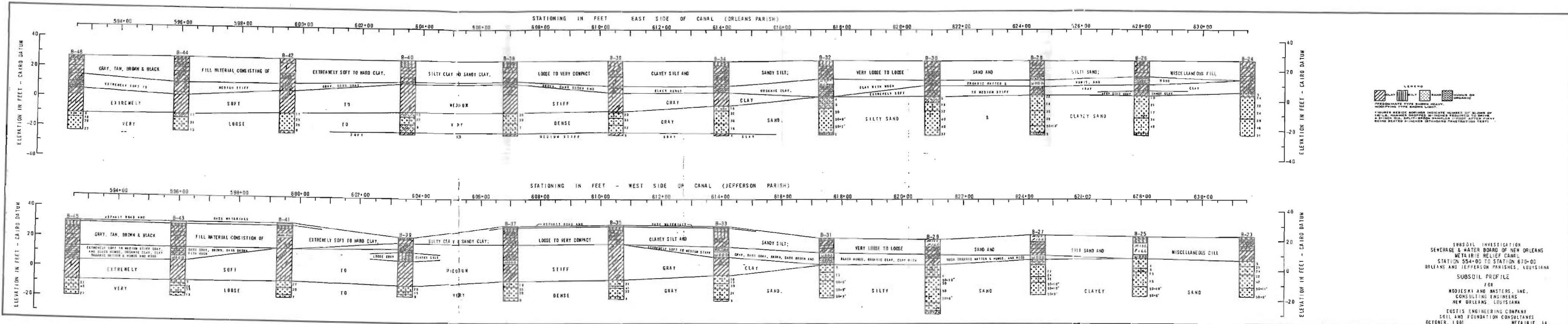
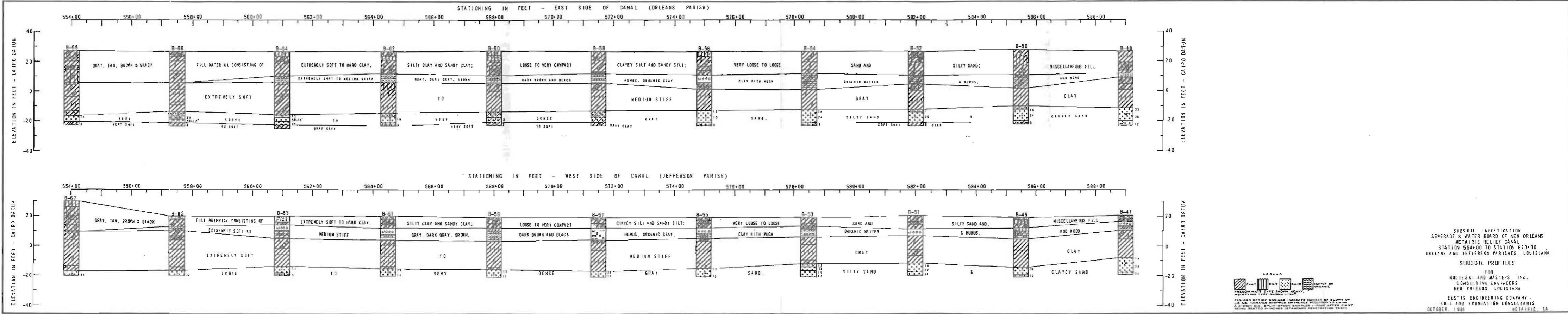


FIGURE 3



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  
MODRESKI AND MASTERS, INC.  
CONSULTING ENGINEERS  
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY  
SOIL AND FOUNDATION CONSULTANTS

OCTOBER 1981 METAIRIE, LA

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

Sheet 1 of 2

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

| Boring<br>No. | Station No.                 | Estimated<br>Ground Surface<br>Elev. in Feet<br>(Cairo Datum) | Depth of<br>Boring<br>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

Sheet 2 of 2

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

| Boring<br>No. | Station No.                 | Estimated<br>Ground Surface<br>Elev. in Feet<br>(Cairo Datum) | Depth of<br>Boring<br>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.

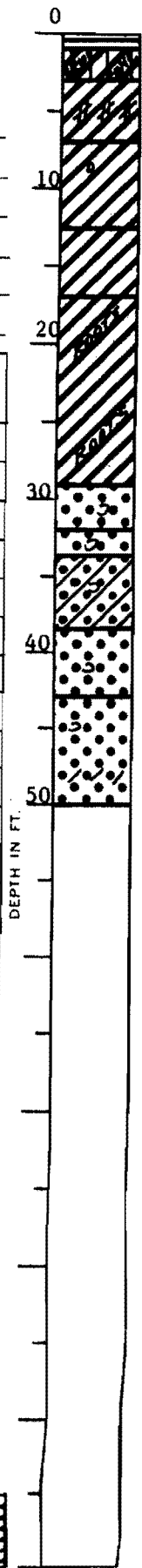
Fig. 5  
(Sheet #2)



**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

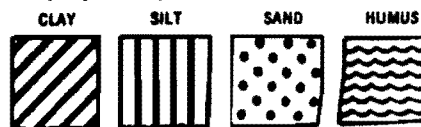
| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|---|---------------------------|----|
|            | From                | To   | From               | 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 fragments                      | 3                         | 14 |
| 10         | 33.5                | 35.0 | 33.5               | 38.5 | Loose gray clayey sand w/shell fragments                      | 1                         | 4  |
| 11         | 38.5                | 40.0 | 38.5               | 43.0 | Medium dense gray sand w/shell fragments                      | 5                         | 24 |
| 12         | 43.5                | 45.0 | 43.0               |      | Loose gray sand w/shell fragments & clay layers               | 2                         | 7  |
| 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

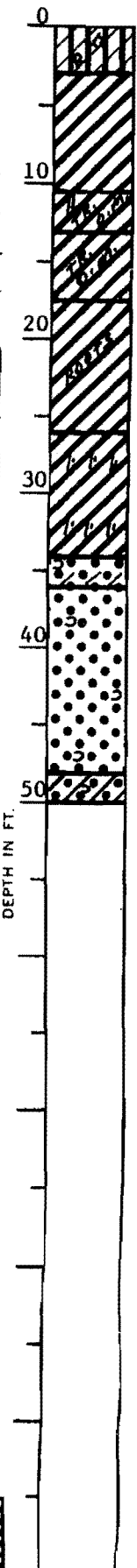
Orleans and Jefferson Parishes, Louisiana

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

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

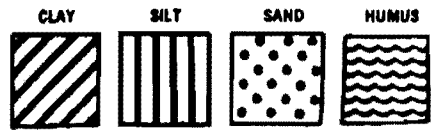
Ground Elev. 32.5 (Est.) Datum Cairo Gr. Water Depth See Text

| 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 & clay layers         | 2                          | 7  |
| 10         | 36.0                | 37.5 | 36.0               |      | Medium dense gray sand w/shell fragments                | 3                          | 26 |
| 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 fragments                | 2                          | 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.

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



Predominant type shown heavy. Modifying type shown light.

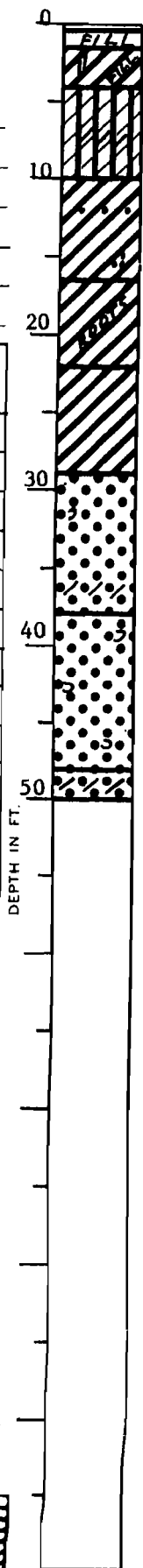
Fig. 7

**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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                      | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
|            |                     |      | 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<br>pockets & some fill |                            |    |
| 2          | 5.0                 | 5.5  | 4.0                |      | Medium compact brown & gray clayey silt<br>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<br>lenses              |                            |    |
| 5          | 14.0                | 14.5 |                    | 16.5 | Medium stiff gray & tan clay w/sand<br>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<br>fragments & clay layers  | 3                          | 24 |
| 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.

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

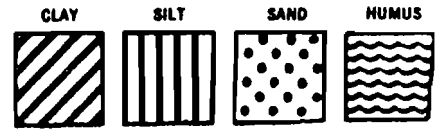
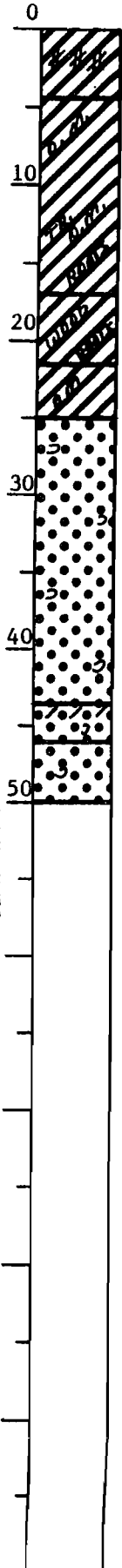


Fig. 8

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

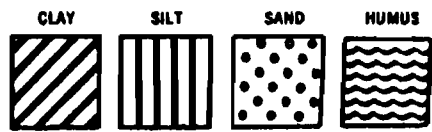
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 4 Soil Technician A. J. Mayeux Date 20 June 1981  
 Ground Elev. 30.5 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                             | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|---|----------------------------|----|
|            | From                | To   | From               | To   |   |                            |    |
| 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.

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



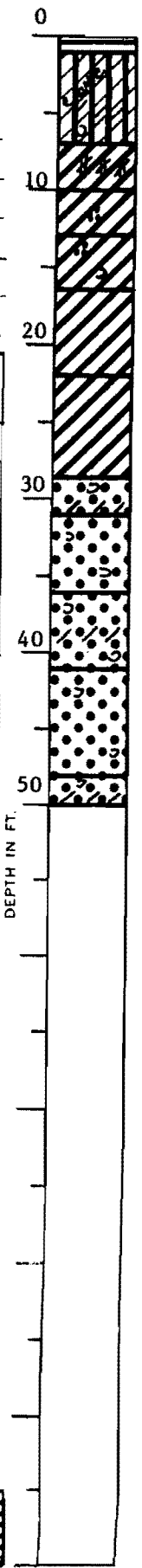
Predominant type shown heavy. Modifying type shown light.

Fig. 9

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

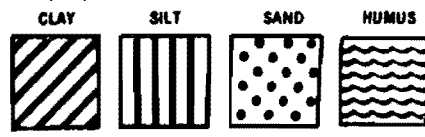
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 5 Soil Technician A. J. Mayeux Date 25 May 1981  
 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<br>& 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<br>& clay layers    | 4                          | 17 |
| 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<br>w/clay layers    | 7                          | 23 |
| 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<br>& clay layers    | 5                          | 22 |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |



\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitpoon 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. splitpoon 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.

Sewerage & Water Board of New Orleans

Name of Project: Metairie Relief Canal, Station 554+00 to Station 670+00

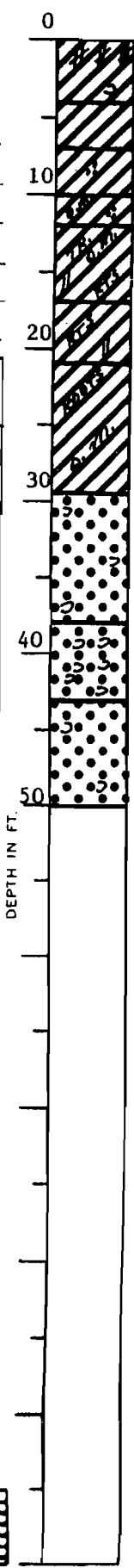
Orleans and Jefferson Parishes, Louisiana

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

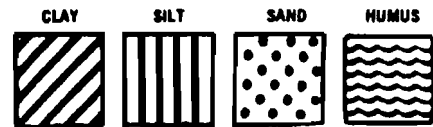
Boring No. 6 Soil Technician A. J. Mayeux Date 19 June 1981

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. split spoon 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. split spoon 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. 663+00 in crown of levee.

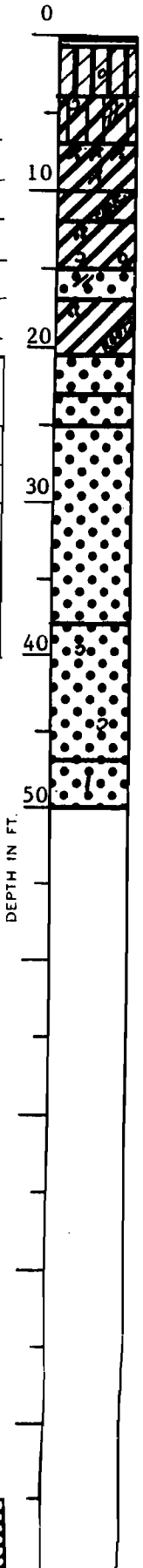
Predominant type shown heavy. Modifying type shown light.

Fig. 11

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

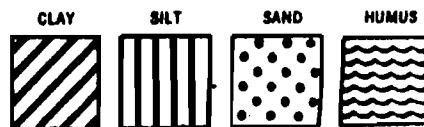
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 7 Soil Technician George Hardee Date 28 May 1981  
 Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                       | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|---|----------------------------|--------|
|            | From                | To   | From               | To   |   |                            |        |
|            |                     |      | 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 pockets                 | 1                          | 14     |
| 7          | 17.5                | 19.0 | 17.0               |      | Medium stiff gray & tan clay w/sand pockets & roots         | 1                          | 5      |
| 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. 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. 659+50 in crown of levee.



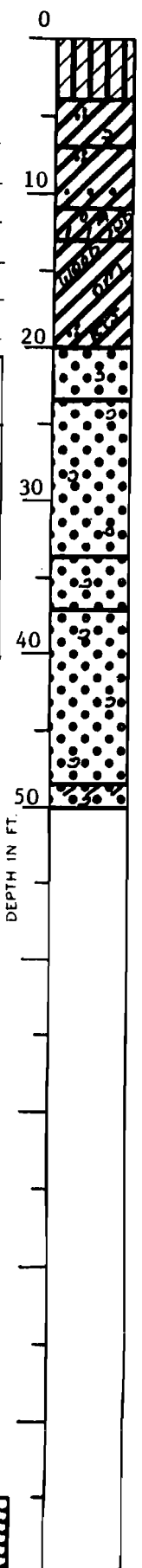
Predominant type shown heavy. Modifying type shown light.

Fig. 12

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

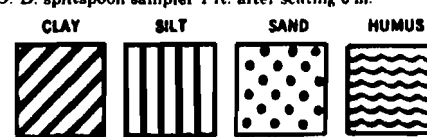
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 8 Soil Technician A. J. Mayeux Date 20 June 1981  
 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<br>& 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,<br>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<br>fragments             | 2                          | 35    |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |



\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. split spoon 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. split spoon 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. 659+50 in crown of levee.

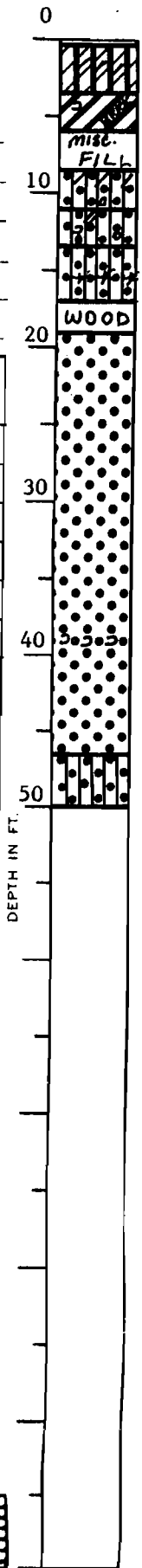


Predominant type shown heavy. Modifying type shown light. Fig. 13

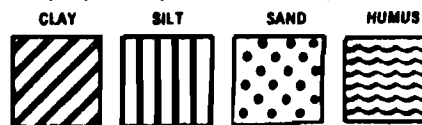
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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. 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. 656+00 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

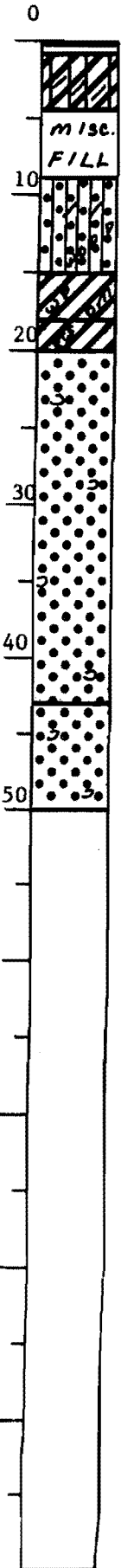
Fig. 14





**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. 11 Soil Technician A. J. Mayeux Date 25 May 1981  
 Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth See Text

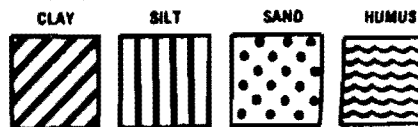


| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                 | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|---|----------------------------|--------|
|            | From                | To   | From               | To   |   |                            |        |
|            |                     |      | 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.

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.

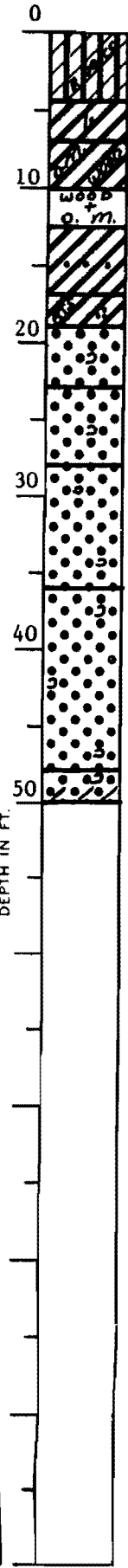
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana

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

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

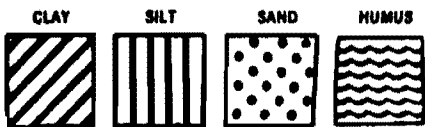
Ground Elev. 30.5 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                               | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|---|----------------------------|--------|
|            | From                | To   | From               | To   |   |                            |        |
| 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<br>pockets        |                            |        |
| 3          | 8.0                 | 9.0  | 7.0                | 10.0 | Soft dark gray clay w/organic matter &<br>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 &<br>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 &<br>clay layers  | 2                          | 9      |



\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitpoon 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. splitpoon 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. 652+50 in crown of levee.



Predominant type shown heavy. Modifying type shown light.

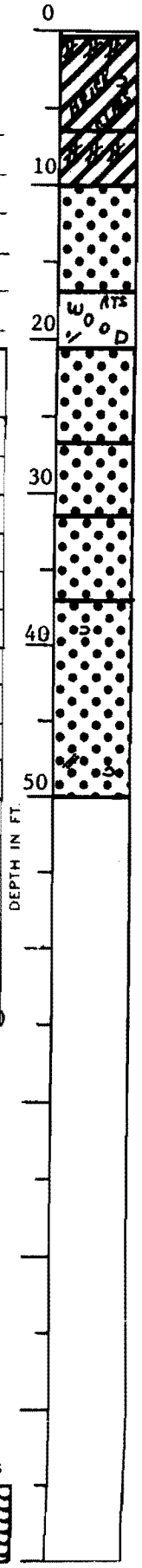
Fig. 17

**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

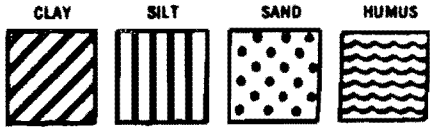
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 13 Soil Technician R. Courtiade Date 25 May 1981  
 Ground Elev. 33 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |           |
|------------|---------------------|------|--------------------|------|---|----------------------------|-----------|
|            | From                | To   | From               | To   |   |                            |           |
|            |                     |      | 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 fragments                    | 17                         | 45        |



\*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.

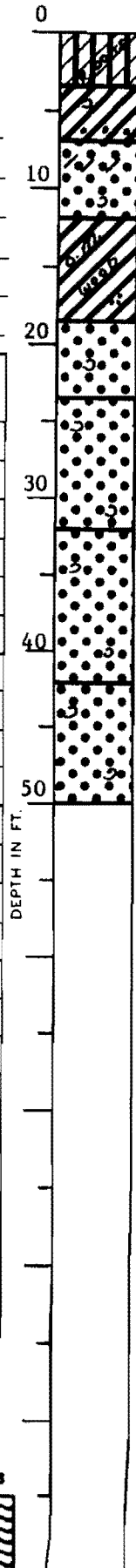
Predominant type shown heavy. Modifying type shown light.

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

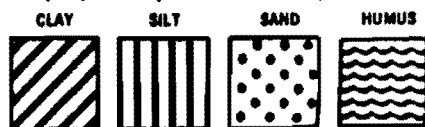
| Sample No. | SAMPLE Depth -- Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION  | *STANDARD PENETRATION TEST |       |
|------------|----------------------|------|--------------------|------|--|----------------------------|-------|
|            | From                 | To   | From               | To   |  |                            |       |
| 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 fragments                       | 5                          | 22    |
| 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. splitpoon 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. splitpoon 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.



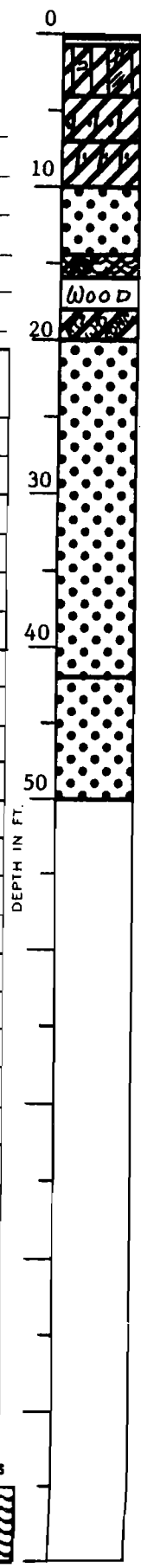
Predominant type shown heavy. Modifying type shown light.

Fig. 19

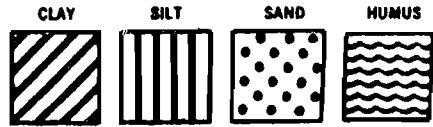
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|---|----------------------------|--------|
|            | From                | To   | From               | To   |   |                            |        |
|            |                     |      | 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,<br>clayey silt & clay pockets |                            |        |
| 2          | 4.5                 | 5.5  | 4.0                | 7.0  | Medium stiff gray & brown clay w/sandy<br>silt layers                 |                            |        |
| 3          | 7.5                 | 8.5  | 7.0                | 10.0 | Stiff gray & brown clay w/silty sand<br>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<br>w/roots & humus pockets        | 2                          | 4      |
|            |                     |      | 16.0               | 18.0 | Wood  |                            |        |
| 7          | 19.5                | 20.0 | 18.0               | 20.0 | Medium stiff gray clay w/roots, wood &<br>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. splitpoon 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. splitpoon 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.

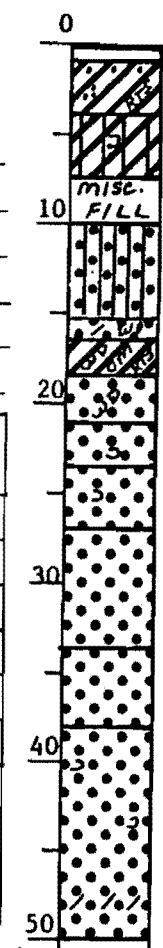
Fig. 20



**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE LA.

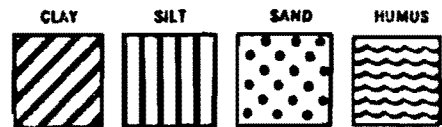
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 17 Soil Technician A. J. Mayeux Date 26 May 1981  
 Ground Elev. 31 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth - Feet |      | 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  | Medium stiff gray & tan clay w/sand<br>lenses, pockets & roots        |                            |       |
| 2          | 5.0                 | 5.5  | 4.0                | 7.5  | Stiff gray & tan silty clay w/shell<br>fragments                      |                            |       |
| 3          | 8.0                 | 8.5  | 7.5                | 10.0 | Miscellaneous fill (clay, sandy clay,<br>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<br>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<br>fragments & clay layers             | 5                          | 12    |
| 13         | 43.5                | 45.0 |                    |      | Ditto   | 6                          | 17    |
| 14         | 48.5                | 50.0 |                    | 50.0 | Ditto   | 7                          | 22    |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |



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. 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

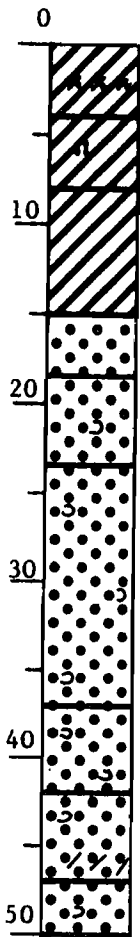
Orleans and Jefferson Parishes, Louisiana

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

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

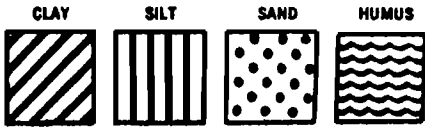
Ground Elev. 30 (Est.) Datum Cairo Gr. Water Depth 2 July 1981

| 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.

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



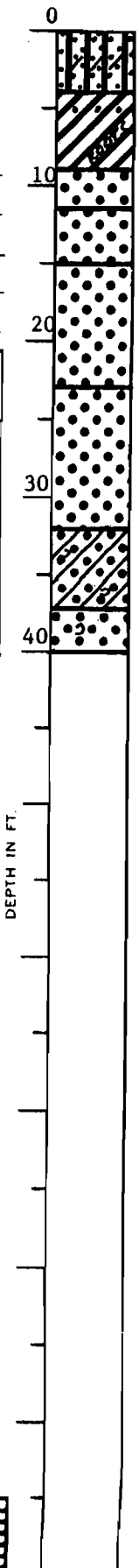
Predomnant type shown heavy. Modifying type shown light.

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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                              | *STANDARD PENETRATION TEST |       |
|------------|---------------------|------|--------------------|------|--|----------------------------|-------|
|            | From                | To   | From               | To   |  |                            |       |
| 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    |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
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|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |
|            |                     |      |                    |      |  |                            |       |



\* 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. 638+50 near toe of levee.

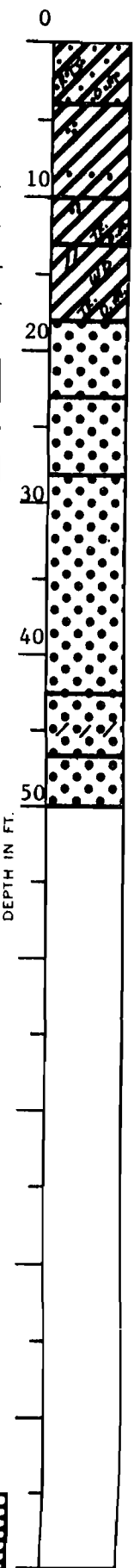
Predominant type shown heavy. Modifying type shown light.

Fig. 24

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

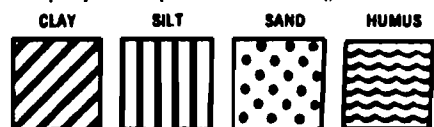
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 20 Soil Technician A. J. Mayeux Date 6 July 1981  
 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<br>& 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<br>& trace of organic matter  |                            |       |
| 5          | 14.0                | 15.0 | 13.0               | 18.0 | Very soft gray clay w/silt pockets,<br>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    |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |
|            |                     |      |                    |      |   |                            |       |



\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. split spoon 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. split spoon 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.

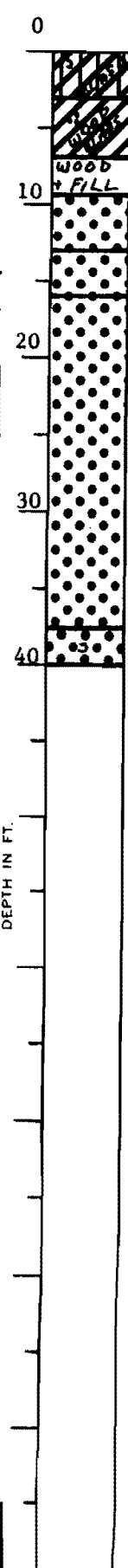


Predominant type shown heavy. Modifying type shown light. Fig. 25

**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

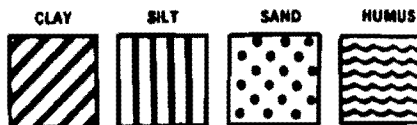
| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                             | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|---|----------------------------|--------|
|            | From                | To   | From               | To   |   |                            |        |
| 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" |



\* Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitpoon 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. splitpoon 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. 635+00 near toe of levee.



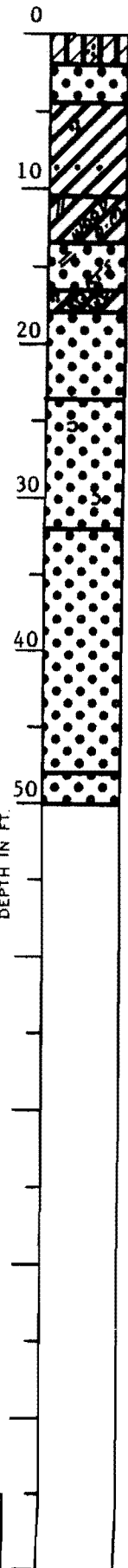
Predominant type shown heavy. Modifying type shown light.

Fig. 26

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

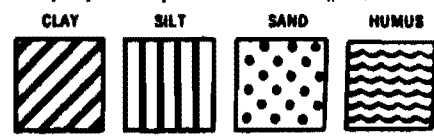
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 22 Soil Technician A. J. Mayeux Date 6 July 1981  
 Ground Elev. 29 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                   | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|---|----------------------------|--------|
|            | From                | To   | From               | To   |   |                            |        |
|            |                     |      | 0.0                | 2.0  | Very compact tan clayey silt w/sand<br>pockets          |                            |        |
|            |                     |      | 2.0                | 4.5  | Medium dense tan sand                                   |                            |        |
| 1          | 5.0                 | 5.5  | 4.5                |      | Medium stiff gray & tan clay w/sand<br>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 &<br>organic matter |                            |        |
| 4          | 14.0                | 14.5 | 13.5               | 16.5 | Very loose gray sand w/clay pockets &<br>roots          |                            |        |
| 5          | 17.0                | 17.5 | 16.5               | 18.0 | Very soft gray clay w/roots, wood &<br>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.



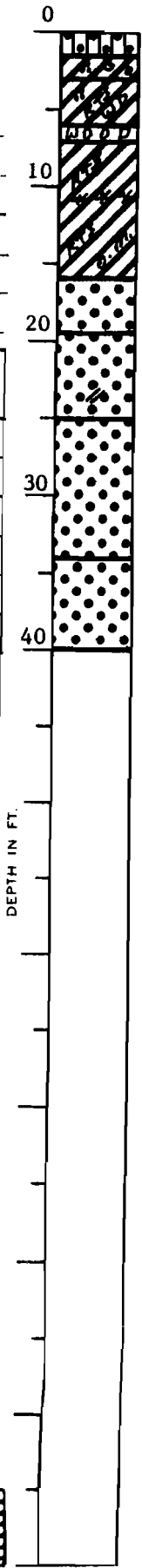
Predominant type shown heavy. Modifying type shown light.

Fig. 27

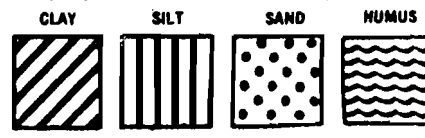
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|---|----------------------------|--------|
|            | From                | To   | From               | To   |   |                            |        |
|            |                     |      | 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<br>pockets, shells & gravel | 8                          | 16     |
| 2          | 5.5                 | 6.0  | 3.0                | 6.0  | Medium stiff gray & tan clay w/sand<br>pockets, roots & wood  |                            |        |
|            |                     |      | 6.0                | 7.0  | Wood  |                            |        |
| 3          | 7.5                 | 8.5  | 7.0                |      | Very soft gray clay w/roots & organic<br>clay layers          |                            |        |
| 4          | 10.5                | 11.5 |                    | 16.0 | Very soft gray clay w/roots & organic<br>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. splitpoon 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. splitpoon 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.

**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

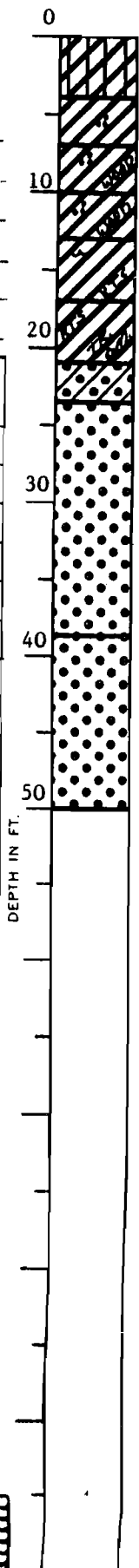
Orleans and Jefferson Parishes, Louisiana

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

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

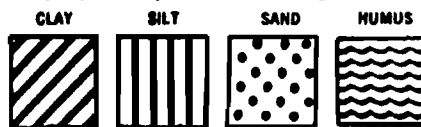
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

| 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.

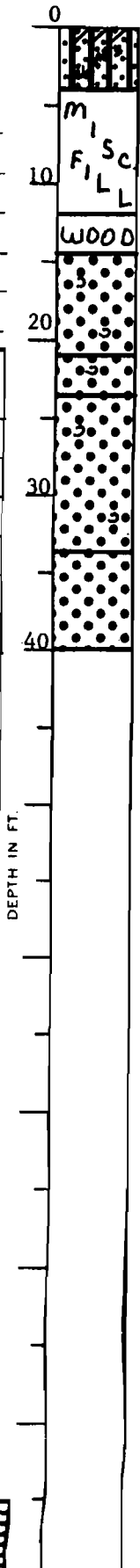
Predominant type shown heavy. Modifying type shown light.

Fig. 29

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

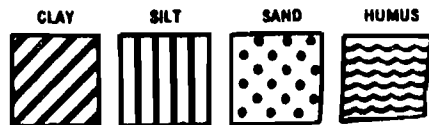
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 25 Soil Technician A. J. Mayeux Date 27 May 1981  
 Ground Elev. 23 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|---|----------------------------|--------|
|            | From                | To   | From               | To   |   |                            |        |
| 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 fragments                        | 3                          | 15     |
| 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.

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



Predominant type shown heavy. Modifying type shown light.

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

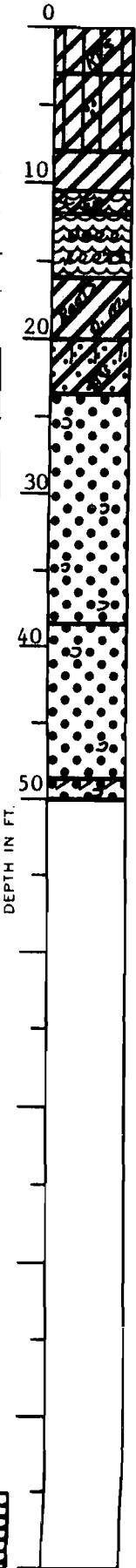
Orleans and Jefferson Parishes, Louisiana

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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                    | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
| 1          | 2.0                 | 2.5  | 0.0                | 3.0  | Medium stiff gray & brown silty clay<br>w/roots          |                            |    |
| 2          | 5.0                 | 5.5  | 3.0                | 8.0  | Medium stiff gray & tan silty clay<br>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<br>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<br>matter               |                            |    |
| 7          | 22.0                | 22.5 | 20.0               | 23.5 | Very soft gray sandy clay w/silty sand<br>layers & roots |                            |    |
| 8          | 23.5                | 25.0 | 23.5               |      | Medium dense gray sand w/shell<br>fragments              | 5                          | 19 |
| 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<br>fragments       |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
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|            |                     |      |                    |      |  |                            |    |

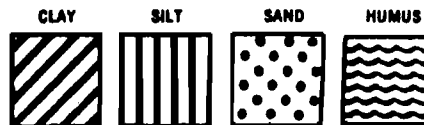


\* Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

**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.

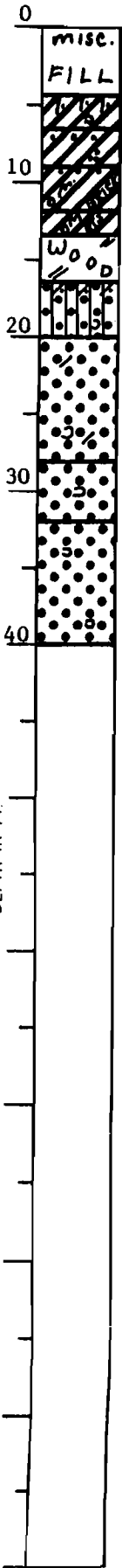


Predominant type shown heavy. Modifying type shown light.

Fig. 31

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

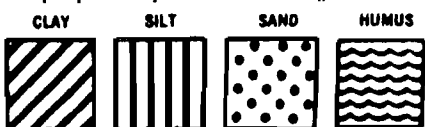
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 27 Soil Technician Robert Waldron Date 14 May 1981  
 Ground Elev. 24 (Est.) Datum Cairo Gr. Water Depth See Text



| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|---|----------------------------|--------|
|            | From                | To   | From               | To   |   |                            |        |
| 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, & shell fragments           | 6                          | 24     |
| 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.

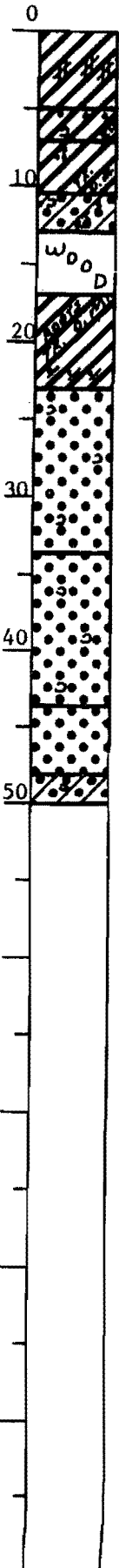
Remarks: Boring located on Westside of canal @ Sta. No. 624+50 near toe of levee.



**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

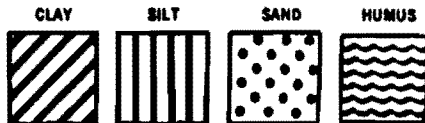
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 28 Soil Technician A. J. Mayeux Date 8 July 1981  
 Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|---|----------------------------|--------|
|            | From                | To   | From               | To   |   |                            |        |
| 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 fragments                            | 8                          | 22     |
| 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 fragments                            | 2                          | 5      |



\*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.

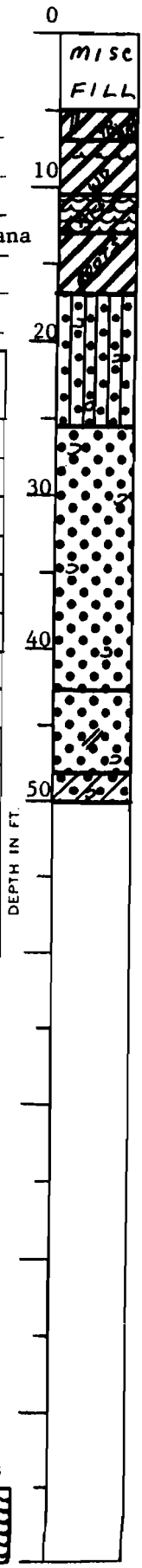
Predominant type shown heavy. Modifying type shown light.

Fig. 33

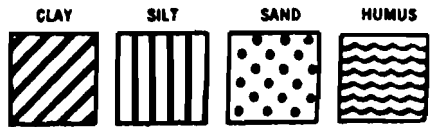
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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<br>(Sand, shells & roots)       |                            |        |
| 2          | 5.0                 | 5.5  | 5.0                | 7.0  | Very stiff gray & tan clay w/silt<br>pockets & trace of organic matter |                            |        |
| 3          | 8.0                 | 8.5  | 7.0                | 10.5 | Medium stiff gray clay w/humus layers<br>& 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<br>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<br>& shell fragments             |                            |        |
| 14         | 48.5                | 49.0 | 48.0               | 50.0 | Medium dense gray clayey sand w/shell<br>fragments                     |                            |        |



\* Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitpoon 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. splitpoon 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. 621+00 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

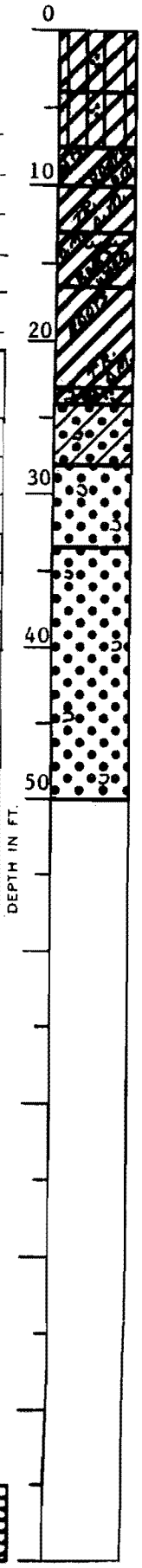
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana

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

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

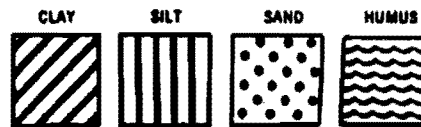
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

| 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<br>w/sand pockets            |                            |    |
| 2          | 5.0                 | 5.5  | 4.0                | 7.5  | Very soft gray & brown silty clay<br>w/sand pockets               |                            |    |
| 3          | 8.0                 | 8.5  | 7.5                | 10.0 | Soft gray clay w/wood, roots &<br>organic matter                  |                            |    |
| 4          | 11.0                | 11.5 | 10.0               | 13.0 | Very soft dark gray clay w/trace of<br>organic matter             |                            |    |
| 5          | 14.0                | 14.5 | 13.0               | 16.5 | Extremely soft gray clay w/organic<br>matter, humus, roots & wood |                            |    |
| 6          | 19.0                | 19.5 | 16.5               | 23.0 | Soft gray clay w/roots & trace of<br>organic matter               |                            |    |
| 7          | 23.0                | 23.5 | 23.0               | 24.0 | Very soft gray clay w/shell fragments,<br>sand pockets & roots    |                            |    |
| 8          | 24.5                | 26.0 | 24.0               | 28.0 | Loose gray clayey sand w/shell<br>fragments                       | 2                          | 6  |
| 9          | 28.5                | 30.0 | 28.0               | 33.5 | Medium dense gray sand w/shell<br>fragments                       | 4                          | 16 |
| 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. split spoon 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. split spoon 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.

**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

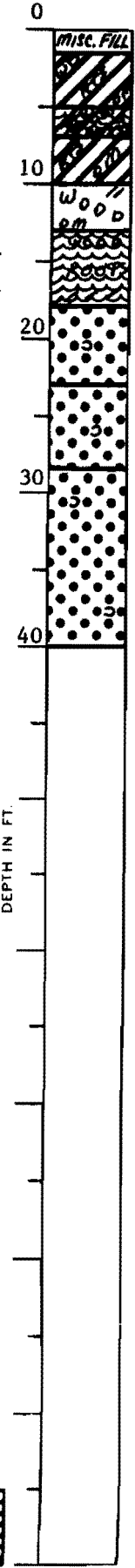
Orleans and Jefferson Parishes, Louisiana

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

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

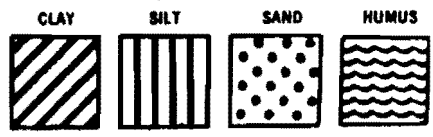
Ground Elev. 22 (Est.) Datum Cairo Gr. Water Depth See Text

| 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. split spoon 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. split spoon 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.



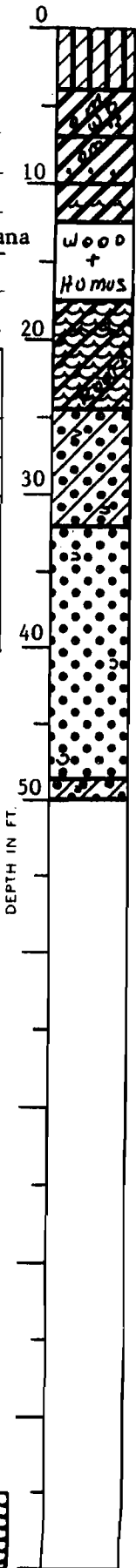
Predominant type shown heavy. Modifying type shown light.

Fig. 36

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

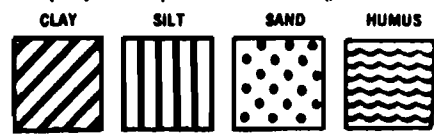
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 32 Soil Technician S. Porta Date 9 July 1981  
 Ground Elev. 27.5 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |       |
|------------|---------------------|------|--------------------|------|---|----------------------------|-------|
|            | From                | To   | From               | To   |   |                            |       |
| 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.



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

Predominant type shown heavy. Modifying type shown light.

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

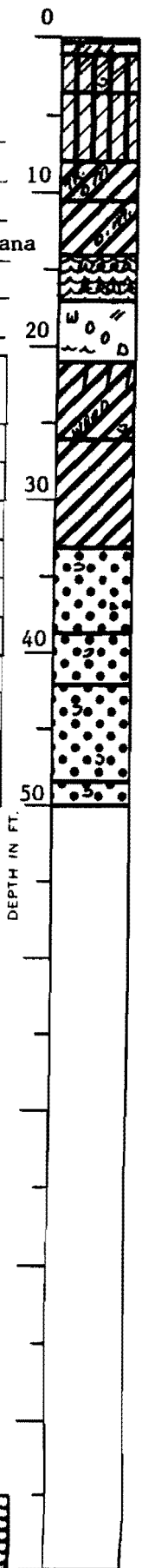
Orleans and Jefferson Parishes, Louisiana

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

Boring No. 33 Soil Technician A. J. Mayeux Date 27 May 1981

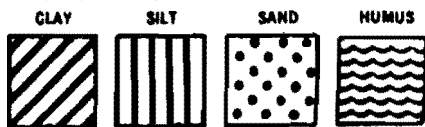
Ground Elev. 30 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | 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                | 3.5  | Medium compact gray & brown clayey silt<br>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<br>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 &<br>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 &<br>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.

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



Predominant type shown heavy. Modifying type shown light.

Fig. 38



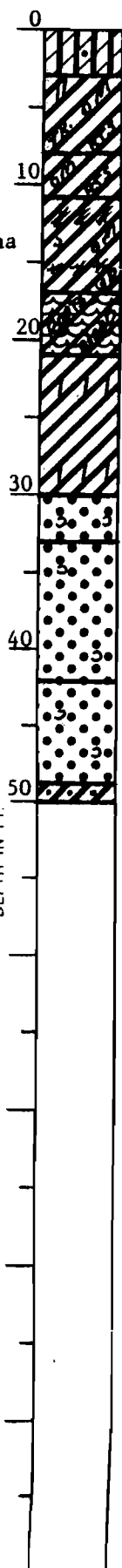
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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

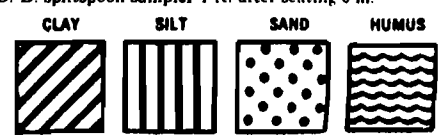
Boring No. 34 Soil Technician S. Porta Date 9 July 1981  
 Ground Elev. 27 (Est.) Datum Calro Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION  | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
| 1          | 2.5                 | 3.0  | 0.0                | 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  |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
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|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |



\*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. 614+00 in crown of levee.



Predominant type shown heavy. Modifying type shown light. Fig. 39

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

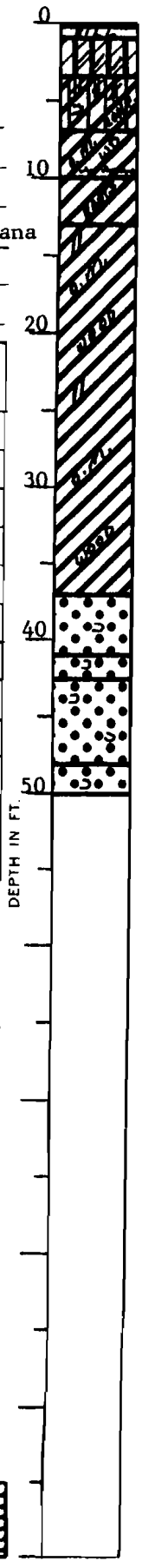
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana

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

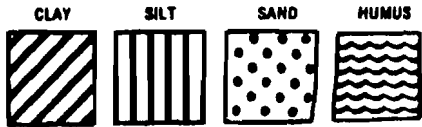
Boring No. 35 Soil Technician A. J. Mayeux Date 28 May 1981

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

| Sample No. | SAMPLE Depth — Feet |      | 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                | 3.5  | 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.



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

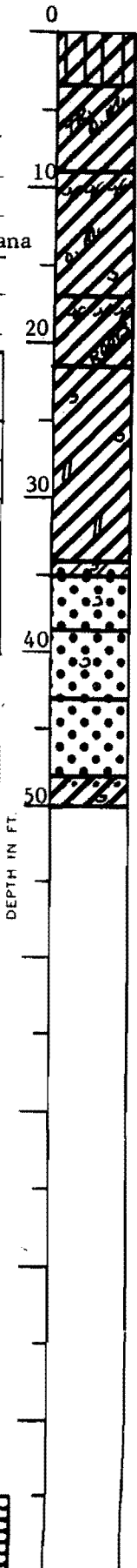
Predominant type shown heavy. Modifying type shown light.

Fig. 40

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

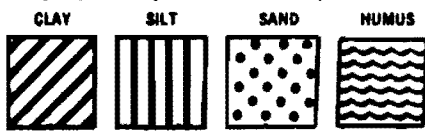
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 36 Soil Technician A. J. Mayeux Date 20 July 1981  
 Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                             | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|---|----------------------------|----|
|            | From                | To   | From               | To   |   |                            |    |
| 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          | 4                          | 20 |
| 10         | 35.0                | 36.5 | 35.0               | 38.5 | Medium dense gray sand w/shell fragments          | 8                          | 33 |
| 11         | 38.5                | 40.0 | 38.5               | 43.0 | Dense gray sand w/shell fragments                 | 8                          | 12 |
| 12         | 43.5                | 45.0 | 43.0               | 48.0 | Medium dense gray sand                            | 2                          | 5  |
| 13         | 48.5                | 50.0 | 48.0               | 50.0 | Soft gray clay w/sand 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 Eastside of canal  
@ Sta. No. 610+50 in crown of levee.



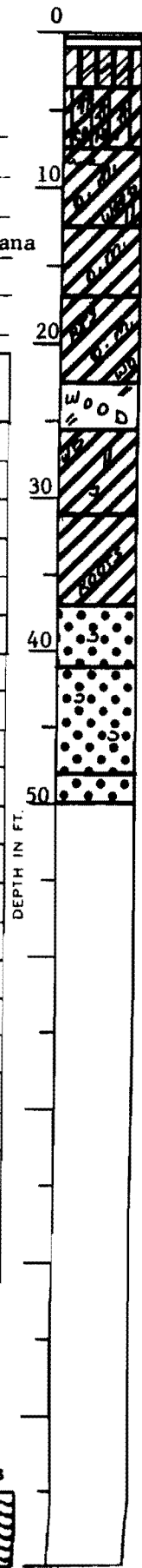
Predominant type shown heavy. Modifying type shown light.

Fig. 41

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

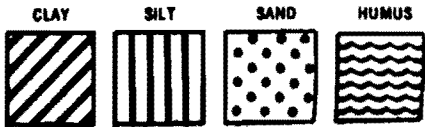
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 37 Soil Technician A. J. Mayeux Date 28 May 1981  
 Ground Elev. 30 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | 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                | 3.5  | 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.

Remarks: Boring located on Westside of canal  
@ Sta. No. 607+00 in crown of levee.

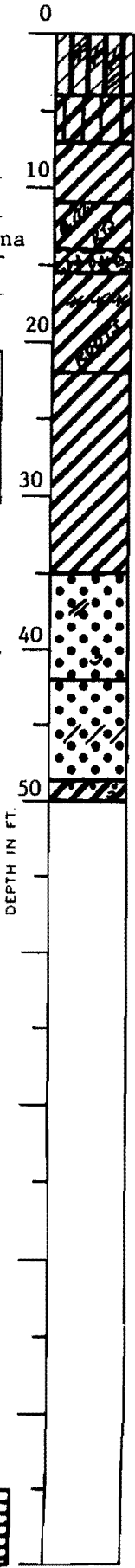


Predominant type shown heavy. Modifying type shown light.

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

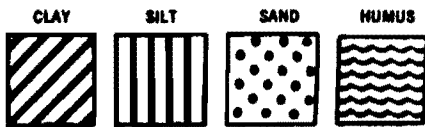
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 38 Soil Technician S. Porta Date 10 July 1981  
 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 & shells                   | 7                          | 30 |
| 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           |                            |    |
|            |                      |      |                    |      |  |                            |    |
|            |                      |      |                    |      |  |                            |    |
|            |                      |      |                    |      |  |                            |    |
|            |                      |      |                    |      |  |                            |    |
|            |                      |      |                    |      |  |                            |    |
|            |                      |      |                    |      |  |                            |    |
|            |                      |      |                    |      |  |                            |    |
|            |                      |      |                    |      |  |                            |    |
|            |                      |      |                    |      |  |                            |    |
|            |                      |      |                    |      |  |                            |    |
|            |                      |      |                    |      |  |                            |    |
|            |                      |      |                    |      |  |                            |    |



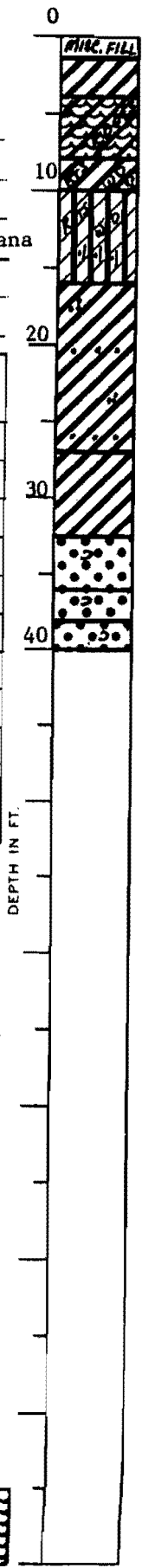
\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. split spoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. split spoon sampler 1 ft. after seating 6 in. WHILE 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. 607+00 in crown of levee.



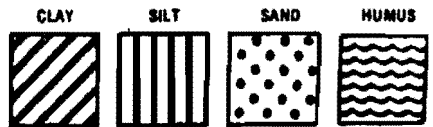
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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 layee.

Predominant type shown heavy. Modifying type shown light.

**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

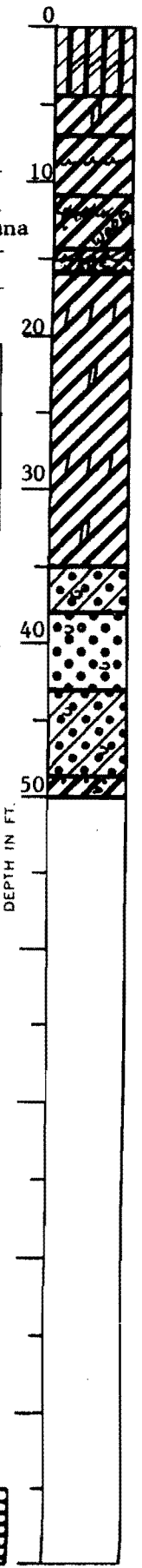
Orleans and Jefferson Parishes, Louisiana

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

Boring No. 40 Soil Technician S. Porta Date 10 July 1981

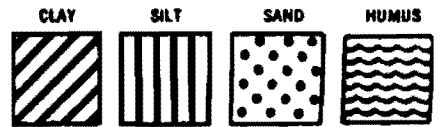
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

| 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. split spoon 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. split spoon 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 Eastside of canal  
@ Sta. No. 603+50 in crown of levee.

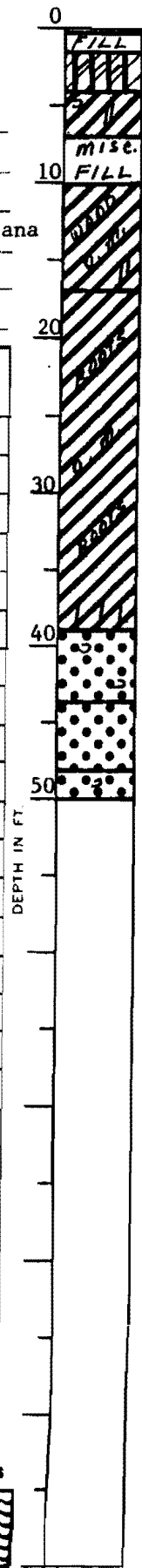


Predominant type shown heavy. Modifying type shown light. Fig. 45

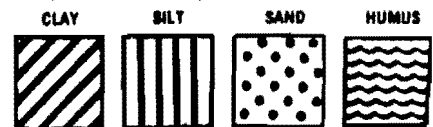
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                  | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
|            |                     |      | 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.



Remarks: Boring located on Westside of canal  
@ Sta. No. 599+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.



**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

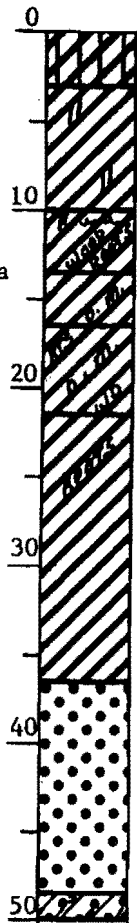
Orleans and Jefferson Parishes, Louisiana

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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                  | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
| 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 fragments & clay layers | 6                          | 6  |

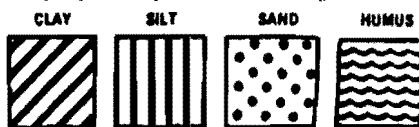


\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

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.

Remarks: Boring located Eastside of canal

@ Sta. No. 599+50 in crown of levee.

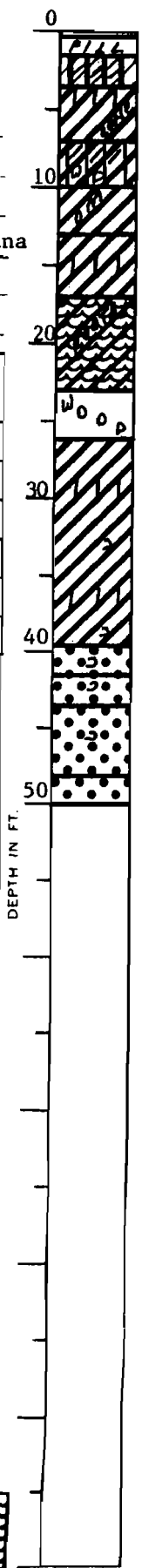


Predominant type shown heavy. Modifying type shown light.

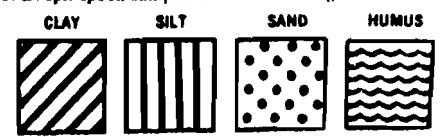
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                               | *STANDARD PENETRATION TEST |    |
|------------|----------------------|------|--------------------|------|---|----------------------------|----|
|            | From                 | To   | From               | To   |   |                            |    |
|            |                      |      | 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.



Remarks: Boring located Westside of canal  
@ Sta. No. 596+00 in crown of levee.

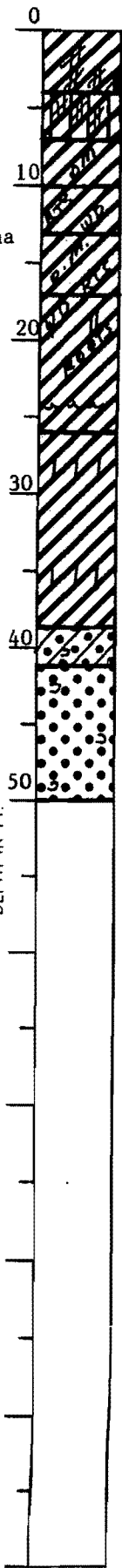
Predominant type shown heavy. Modifying type shown light.

Fig. 48

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

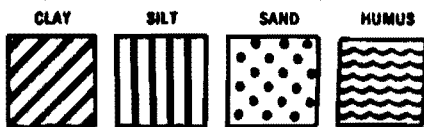
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 44 Soil Technician A. J. Mayeux Date 20 & 21 July 1981  
 Ground Elev. 27.5 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                      | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
| 1          | 2.0                 | 3.0  | 0.0                | 4.0  | Stiff brown & gray clay w/clayey silt<br>pockets & lenses  |                            |    |
| 2          | 5.0                 | 6.0  | 4.0                | 7.0  | Medium stiff gray & tan silty clay<br>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 &<br>roots             |                            |    |
| 7          | 24.0                | 25.0 |                    | 26.0 | Soft gray clay w/silt pockets, humus<br>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<br>fragments         | 4                          | 17 |
| 11         | 43.5                | 45.0 | 41.0               |      | Medium dense gray sand w/shell<br>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.

Remarks: Boring located Eastside of canal  
@ Sta. No. 596+00 in crown of levee.



Predominant type shown heavy. Modifying type shown light. 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

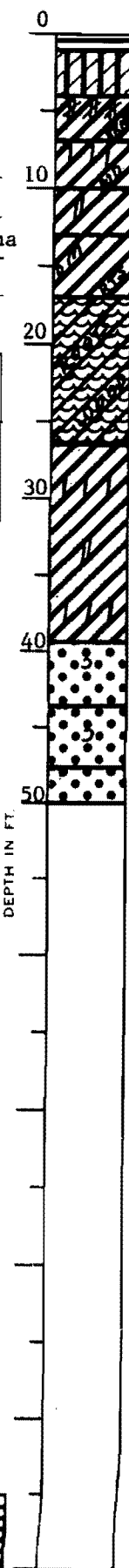
Orleans and Jefferson Parishes, Louisiana

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

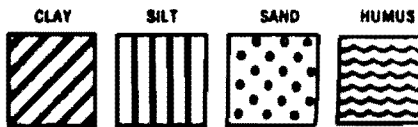
Boring No. 45 Soil Technician A. J. Mayeux Date 29 May 1981

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 fragments                            | 6                          | 23 |
| 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.



Remarks: Boring located Westside of canal

@ Sta. No. 592+50 in crown of levee.

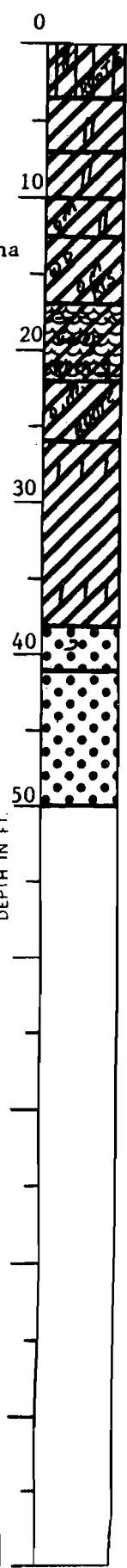
Predominant type shown heavy. Modifying type shown light.

Fig. 50

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

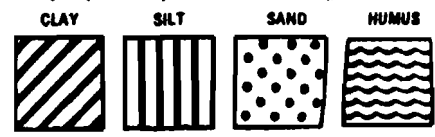
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 46 Soil Technician A. J. Mayeux Date 13 July 1981  
 Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|---|----------------------------|----|
|            | From                | To   | From               | To   |   |                            |    |
| 1          | 2.0                 | 2.5  | 0.0                | 3.5  | Medium stiff brown & gray silty clay<br>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<br>pockets                        |                            |    |
| 4          | 11.0                | 11.5 | 10.0               | 12.5 | Medium stiff gray clay w/organic matter<br>& silt pockets             |                            |    |
| 5          | 14.0                | 14.5 | 12.5               | 17.0 | Very soft gray clay w/wood, organic<br>matter & roots                 |                            |    |
| 6          | 19.0                | 19.5 | 17.0               | 22.0 | Soft gray organic clay w/humus layers,<br>wood & roots                |                            |    |
| 7          | 24.0                | 24.5 | 22.0               | 26.0 | Very soft gray clay w/organic matter &<br>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.

Remarks: Boring located Eastside of canal  
@ Sta. No. 592+50 in crown of levee.



Predominant type shown heavy. Modifying type shown light. 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 |      | 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  | 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.

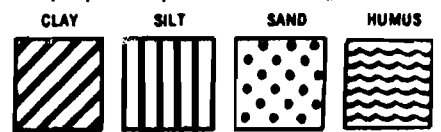
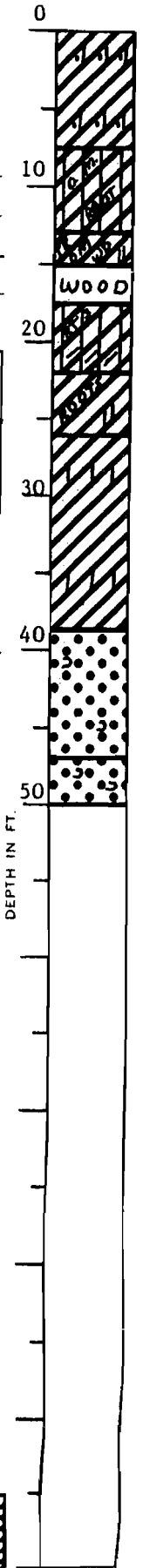


Fig. 52

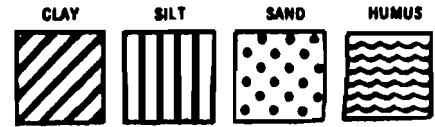
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION  | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
| 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. split spoon 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. split spoon 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. 589+00 in crown of levee.

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

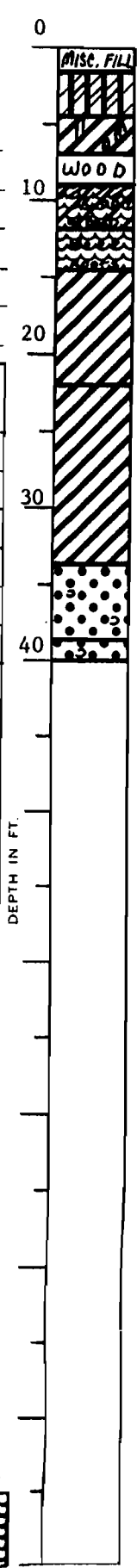
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana

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

Boring No. 49 Soil Technician A. J. Mayeux Date 17 June 1981

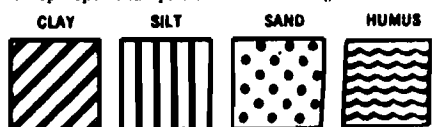
Ground Elev. 19.5 (Est.) Datum Cairo Gr. Water Depth See Text

| 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 |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
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|            |                     |      |                    |      |   |                            |    |



\* Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitpoon 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. splitpoon 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

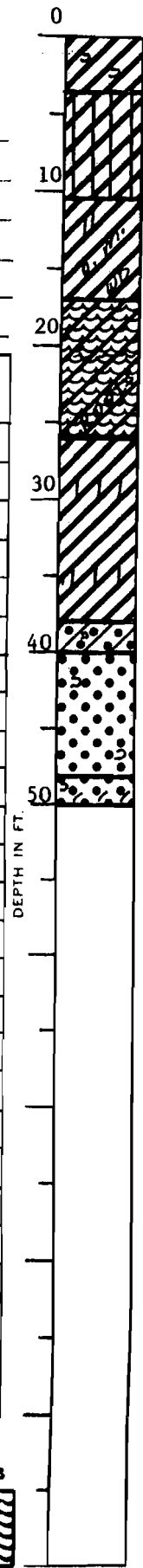


**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

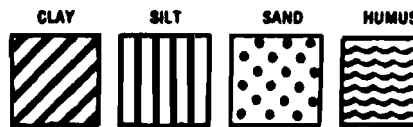
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana

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 & clay layers      | 4                          | 9  |



\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitpoon 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. splitpoon 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.

**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

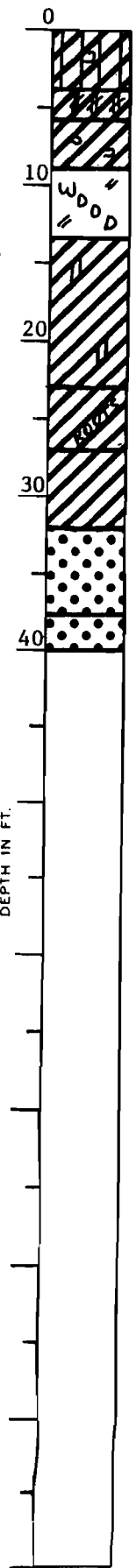
Orleans and Jefferson Parishes, Louisiana

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

Boring No. 51 Soil Technician Jack Pratt Date 16 June 1981

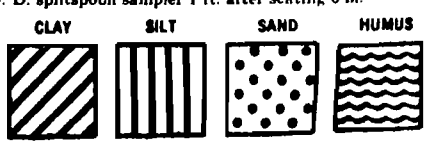
Ground Elev. 20.5 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
| 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 |
|            |                     |      |                    |      |  |                            |    |
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|            |                     |      |                    |      |  |                            |    |



\* 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.

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

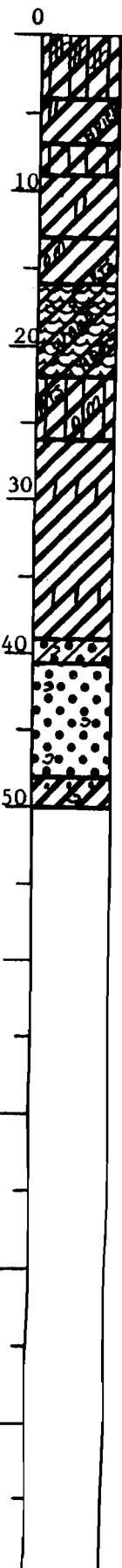
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana

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

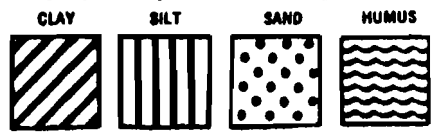
Boring No. 52 Soil Technician A. J. Mayeux Date 21 July 1981

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

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                 | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|---|----------------------------|----|
|            | From                | To   | From               | To   |   |                            |    |
| 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 fragments              | 2                          | 7  |
| 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 fragments        | 2                          | 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.



Remarks: Boring located on Eastside of canal @ Sta.

No. 582+00 in crown of levee.

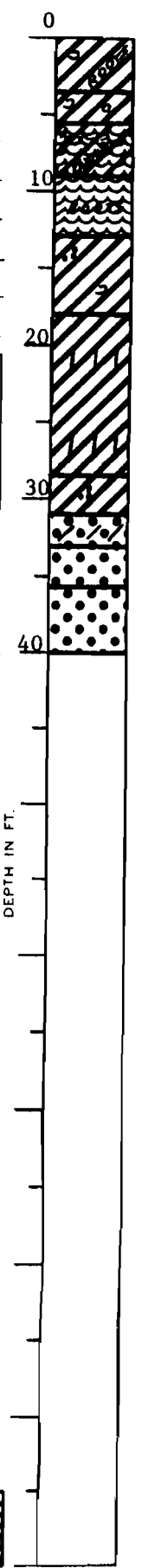
Predominant type shown heavy. Modifying type shown light.

Fig. 57

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.



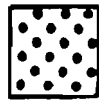

Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 53 Soil Technician Jack Pratt Date 16 June 1981  
 Ground Elev. 19 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth - Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
| 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 |
|            |                     |      |                    |      |  |                            |    |
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\*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. 578+50 near toe of levee.

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

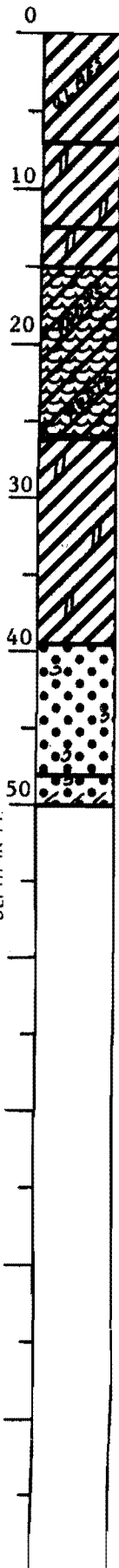
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana

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

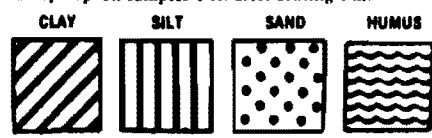
| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                              | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
| 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<br>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<br>& clay layers | 4                          | 9  |
|            |                     |      |                    |      |  |                            |    |
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\* Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitpoon 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. splitpoon 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.



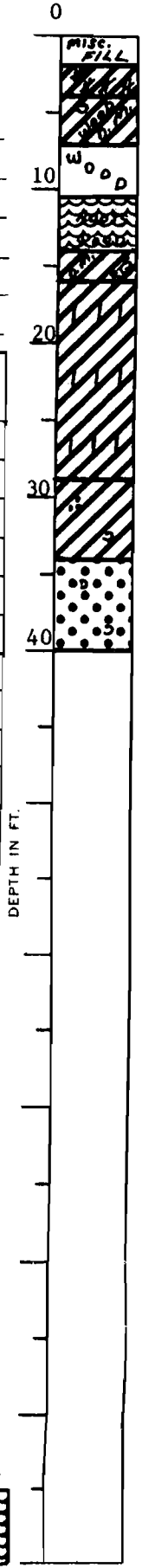
Predominant type shown heavy. Modifying type shows light.

Fig. 59

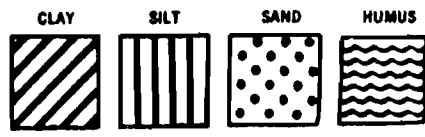
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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<br>pockets & layers |                            |    |
| 2          | 5.0                 | 6.0  | 4.0                | 7.0  | Very soft gray clay w/shells, wood &<br>organic matter   |                            |    |
|            |                     |      | 7.0                | 10.5 | Wood w/roots, organic matter, humus &<br>clay            |                            |    |
| 3          | 11.0                | 12.0 | 10.5               | 14.0 | Very soft dark brown humus, w/roots &<br>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<br>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 |
|            |                     |      |                    |      |  |                            |    |
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\* 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.



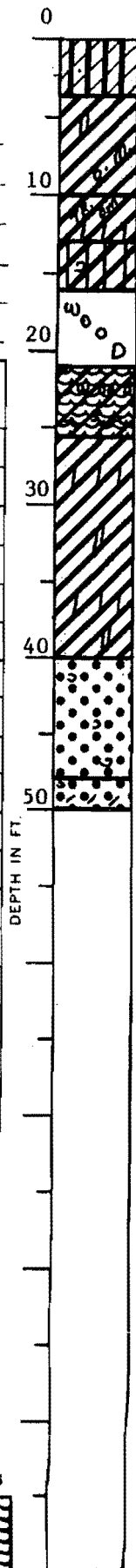
Remarks: Boring located on Westside of canal @ Sta.  
No. 575+00 near toe of levee.

Fig. 60

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

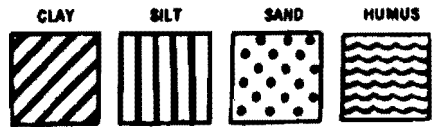
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 56 Soil Technician A. J. Mayeux Date 15 July 1981  
 Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION  | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
| 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 & clay layers              | 7                          | 8  |



\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. split spoon 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. split spoon 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. 575+00 in crown of levee.



Predominant type shown heavy. Modifying type shown light.

Fig. 61

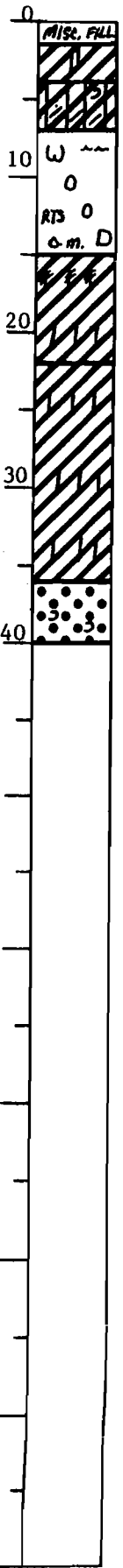
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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

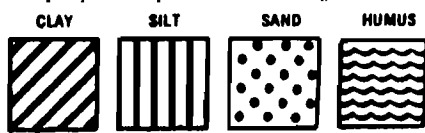
Boring No. 57 Soil Technician A. J. Mayeux Date 17 June 1981

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 fragments    | 6                          | 22 |
| 9          | 38.5                | 40.0 |                    | 40.0 | Ditto                                       | 4                          | 11 |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
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|            |                     |      |                    |      |   |                            |    |

\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. split spoon 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. split spoon 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. 571+50 near toe of levee.



**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

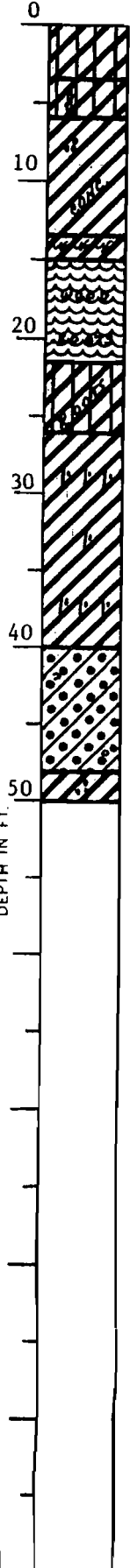
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00

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

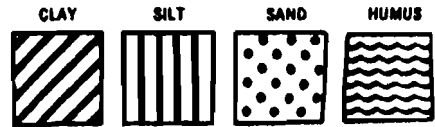
Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text



| Sample No. | SAMPLE Depth - Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |
|------------|---------------------|------|--------------------|------|---|----------------------------|
|            | From                | To   | From               | To   |   |                            |
| 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                                   |                            |
|            |                     |      |                    |      |   |                            |
|            |                     |      |                    |      |   |                            |
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|            |                     |      |                    |      |   |                            |
|            |                     |      |                    |      |   |                            |

\*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. 571+50 in crown of levee.



Predominant type shown heavy. Modifying type shown light.

Fig. 63

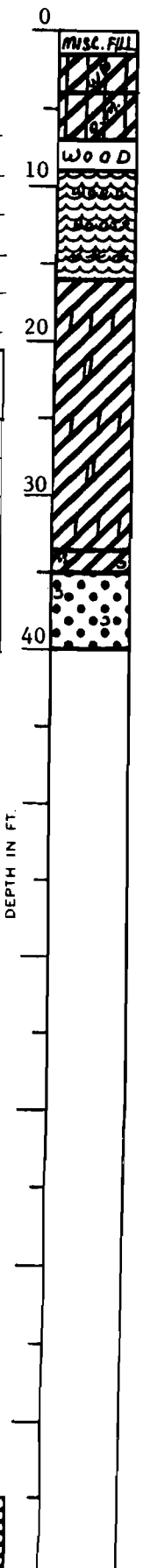
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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

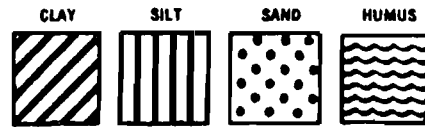
For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana

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<br>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 &<br>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<br>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 |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
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|            |                     |      |                    |      |  |                            |    |
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|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |



\* Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitpoon 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. splitpoon 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

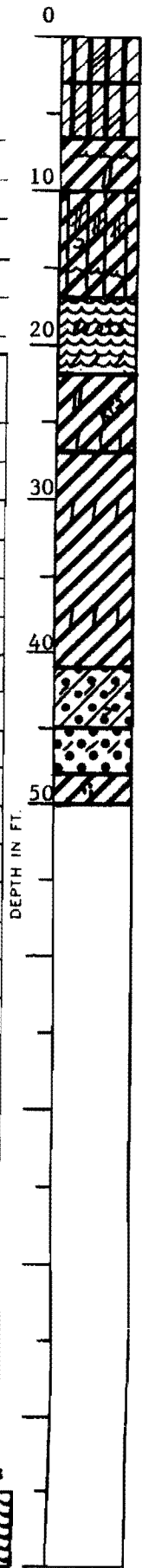
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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

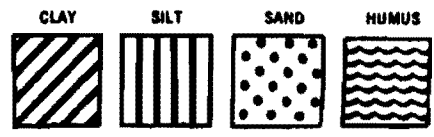
Boring No. 60 Soil Technician Jack Pratt Date 22 July 1981  
 Ground Elev. 27.5 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth - Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                       | *STANDARD PENETRATION TEST |   |
|------------|---------------------|------|--------------------|------|---|----------------------------|---|
|            | From                | To   | From               | To   |   |                            |   |
| 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. 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. 568+00 in crown of levee.



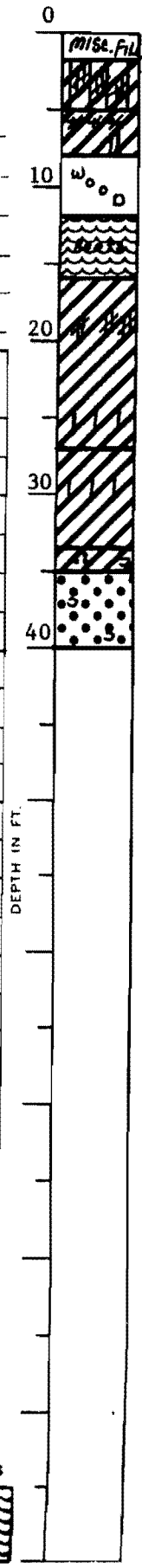
Predominant type shown heavy. Modifying type shown light.

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 fragments                 | 4                          | 20 |
| 9          | 38.5                | 40.0 |                    | 40.0 | Ditto  | 3                          | 14 |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |
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|            |                     |      |                    |      |  |                            |    |
|            |                     |      |                    |      |  |                            |    |



\*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. 564+50 near toe of levee.

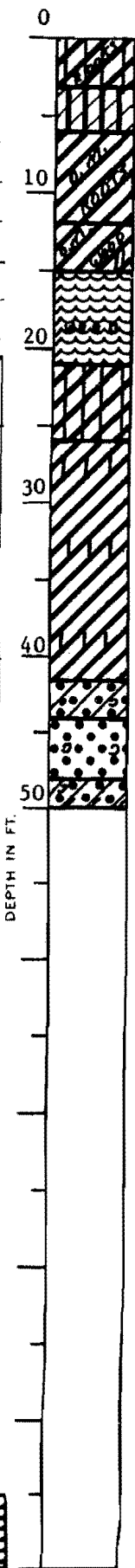
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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

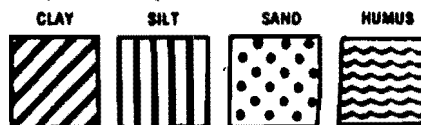
Boring No. 62 Soil Technician A. J. Mayeux Date 16 July 1981  
 Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

| 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 fragments                     | 5                          | 16 |
| 13         | 48.5                | 50.0 | 48.0               | 50.0 | Loose gray clayey sand w/shell fragments & clay layers       | 2                          | 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.

Remarks: Boring located on Eastside of canal @ Sta.



No. 564+50 in crown of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 67

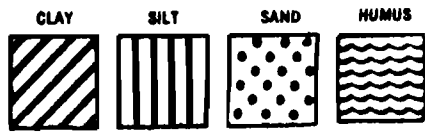
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|---|----------------------------|----|
|            | From                | To   | From               | To   |   |                            |    |
|            |                     |      | 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 fragments                        | 4                          | 18 |
| 7          | 38.5                | 40.0 | 38.0               | 40.0 | Loose gray sand w/shell fragments & layers                      | 1                          | 5  |



\*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. 561+00 near toe of levee.

Predominant type shown heavy. Modifying type shown light.

Fig. 68

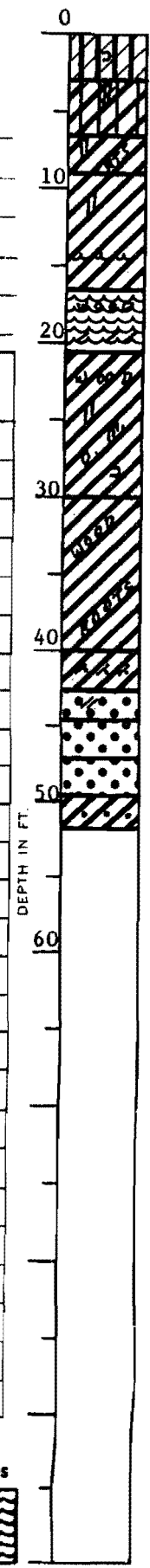
**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

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

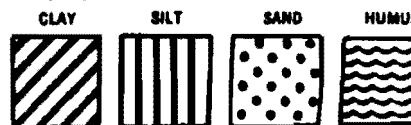
Boring No. 64 Soil Technician A. J. Mayeux Date 15 July 1981  
 Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION  | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|--|----------------------------|--------|
|            | From                | To   | From               | To   |  |                            |        |
| 1          | 1.5                 | 2.0  | 0.0                | 3.0  | Medium compact gray & tan clayey silt<br>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. 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. 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.

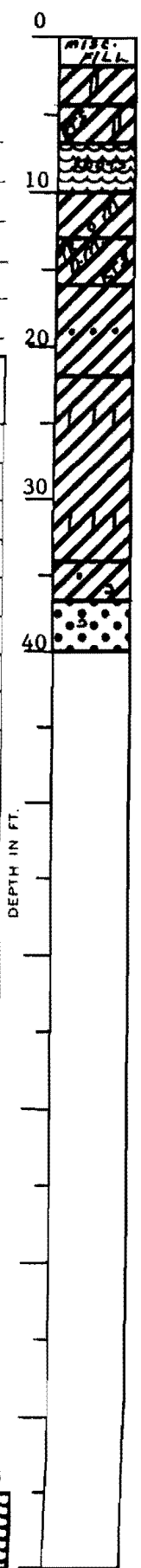
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana

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

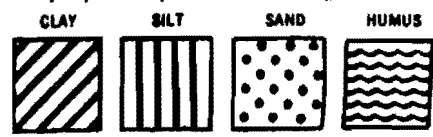
Boring No. 65 Soil Technician A. J. Mayeux Date 18 June 1981

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

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                 | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|---|----------------------------|----|
|            | From                | To   | From               | To   |   |                            |    |
|            |                     |      | 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 |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |
|            |                     |      |                    |      |   |                            |    |



\*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. 557+50 near toe of levee.

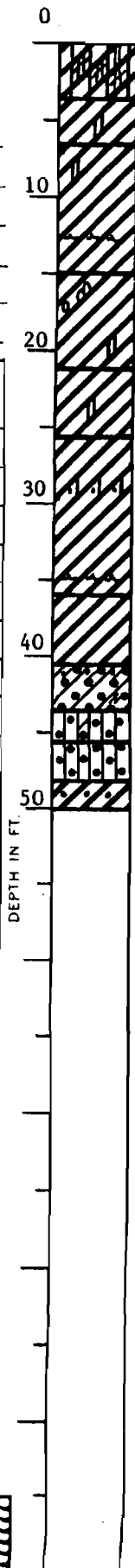
Predominant type shown heavy. Modifying type shown light.



**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

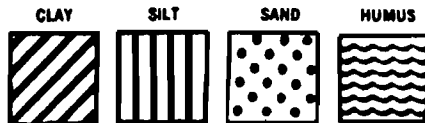
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 66 Soil Technician A. J. Mayeux Date 15 July 1981  
 Ground Elev. 27 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |        |
|------------|---------------------|------|--------------------|------|---|----------------------------|--------|
|            | From                | To   | From               | To   |   |                            |        |
| 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. 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. 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.

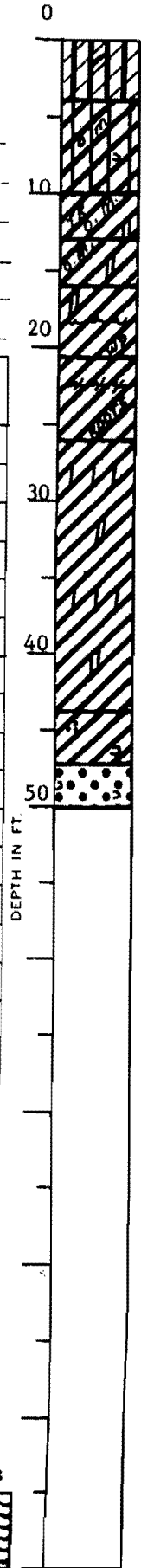
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana

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

Boring No. 67 Soil Technician A. J. Mayeux Date 18 June 1981

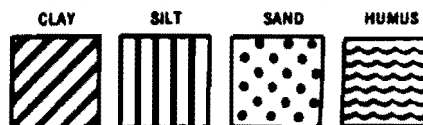
Ground Elev. 30 (Est.) Datum Cairo Gr. Water Depth See Text

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION                                   | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|---|----------------------------|----|
|            | From                | To   | From               | To   |   |                            |    |
| 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.

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

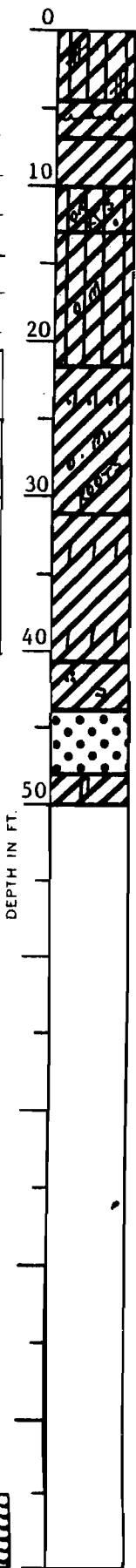
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana

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

Boring No. 68 Soil Technician Jack Pratt Date 22 July 1981

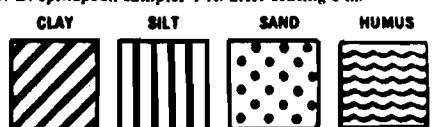
Ground Elev. 27.5 (Est.) Datum Cairo Gr. Water Depth See Text

| 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.

Remarks: Boring located on Eastside of canal @ Sta. No. 554+00 in crown of levee.



Predominant type shown heavy. Modifying type shown light.

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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Stiff brown & gray silty<br>clay w/brick fragments<br>& concretions | 26.4                        | 94.3                | 119.2 | 3105*   |
| 2                  | 5.0                 | Stiff brown & gray clay<br>w/clayey silt layers                     | 21.0                        | 99.1                | 119.9 | 2585*   |
| 3                  | 8.0                 | Medium stiff gray & tan<br>clay w/gravel                            | 27.1                        | 94.0                | 119.5 | 1965  |
| 4                  | 11.0                | Medium stiff gray & tan<br>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<br>clay w/roots                             | 37.5                        | 81.9                | 112.6 | 1570  |
| 7                  | 24.0                | Medium stiff gray & tan<br>clay                                     | 36.5                        | 84.3                | 115.0 | 1610*   |

BORING 2

|   |      |   |      |       |       |       |
|---|------|---|------|-------|-------|-------|
| 1 | 2.0  | Medium compact brown clayey<br>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<br>pockets & trace of<br>organic matter | 39.6 | 77.5  | 108.2 | 625   |
| 5 | 14.0 | Stiff gray clay w/trace of<br>organic matter                  | 30.3 | 91.8  | 119.6 | 2120  |
| 6 | 19.0 | Medium stiff gray & tan<br>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<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Medium stiff gray & tan<br>clay w/silt pockets &<br>lenses  | 27.7                        | 95.0                | 121.3 | 1825  |
| 2                  | 5.0                 | Medium compact brown & gray<br>clayey silt w/clay<br>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<br>clay w/sand lenses               | 28.9                        | 88.4                | 114.0 | 1795*   |
| 5                  | 14.0                | Medium stiff gray & tan<br>clay w/sand pockets              | 34.0                        | 85.6                | 114.7 | 1255  |
| 6                  | 19.0                | Medium stiff gray & tan<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |   |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 1                  | 2.0                 | Medium stiff gray & tan<br>clay w/clayey silt<br>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<br>of organic matter             | 56.9                        | 60.2                | 94.5  | 885*  | 104                 | 30 | 74 |
| 5                  | 14.0                | Soft gray clay w/trace<br>of organic matter &<br>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<br>matter                      | 66.3                        | 59.4                | 98.7  | 885*  | 117                 | 37 | 80 |

BORING 5

|   |      |   |      |       |       |       |  |  |  |
|---|------|---|------|-------|-------|-------|--|--|--|
| 1 | 2.0  | Compact brown clayey<br>silt w/concretions                      | 19.9 | ----  | ----  | ----  |  |  |  |
| 2 | 5.0  | Compact brown clayey<br>silt w/clay layers &<br>shell fragments | 19.5 | 99.5  | 118.9 | 2110* |  |  |  |
| 3 | 8.0  | Medium stiff gray & tan<br>clay w/clayey silt<br>layers         | 33.1 | 86.8  | 115.4 | 1830  |  |  |  |
| 4 | 11.0 | Stiff gray & tan clay<br>w/sand pockets                         | 19.6 | 104.1 | 124.5 | 2275* |  |  |  |
| 5 | 14.0 | Medium stiff gray &<br>tan clay w/sand<br>pockets & shells      | 41.4 | 75.7  | 107.0 | 1405* |  |  |  |
| 6 | 19.0 | Medium stiff gray & tan<br>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

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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |   |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 1                  | 2.0                 | Stiff gray & brown clay<br>w/clayey silt layers<br>& 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<br>w/sand pockets  | 48.5                        | 72.9                | 108.2 | 955*  |                     |    |    |
| 4                  | 11.0                | Soft gray clay with<br>organic matter & sand<br>pockets                         | 51.4                        | 68.8                | 104.2 | 575   |                     |    |    |
| 5                  | 14.0                | Very soft gray clay with<br>trace of organic<br>matter, silt pockets<br>& roots | 66.4                        | 61.0                | 101.6 | 435   |                     |    |    |
| 6                  | 19.0                | Medium stiff gray & tan<br>clay w/silt pockets                                  | 39.9                        | 82.0                | 114.8 | 1270  |                     |    |    |
| 7                  | 24.0                | Medium stiff gray clay<br>w/roots & organic<br>matter                           | 70.4                        | 57.8                | 98.5  | 1185  |                     |    |    |

BORING 7

|   |      |   |      |       |       |       |    |    |    |
|---|------|---|------|-------|-------|-------|----|----|----|
| 1 | 1.5  | Medium compact brown<br>clayey silt w/gravel                            | 19.3 | 97.4  | 116.2 | 1860* | 40 | 21 | 19 |
| 2 | 4.5  | Stiff brown silty clay<br>w/clayey silt<br>pockets & shell<br>fragments | 18.3 | 108.6 | 128.4 | 3675* |    |    |    |
| 3 | 7.5  | Medium stiff tan & gray<br>clay w/clayey sand<br>layers & pockets       | 32.7 | 87.6  | 116.2 | 1320* |    |    |    |
| 4 | 10.5 | Medium stiff gray & tan<br>clay w/concretions                           | 40.5 | 79.6  | 111.9 | 1755* | 89 | 24 | 65 |
| 5 | 13.5 | Soft tan & gray clay<br>w/sand pockets, shells<br>& gravel              | 42.0 | 77.7  | 110.4 | 490   |    |    |    |
| 8 | 19.5 | Medium stiff gray &<br>tan clay w/sand<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 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

|   |      |  |      |      |       |       |
|---|------|--|------|------|-------|-------|
| 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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Medium stiff brown & gray<br>clay w/clayey silt<br>pockets                      | 30.6                        | 84.4                | 110.2 | 1575*   |
| 2                  | 5.0                 | Very loose gray & tan silty<br>sand w/clay pockets, lenses<br>& shell fragments | 17.3                        | 96.3                | 113.0 | 235*  |
| 3                  | 8.0                 | Very soft gray & tan clay<br>w/many sand layers &<br>pockets                    | 22.6                        | 90.3                | 110.7 | 260*  |
| 4                  | 11.0                | Loose tan & gray fine sand<br>w/clay layers & shell<br>fragments                | 30.6                        | ----                | ----  | ----  |
| 5                  | 14.0                | Medium stiff gray clay w/sand<br>pockets, roots & organic<br>matter             | 34.0                        | 84.9                | 113.7 | 1010  |

BORING 11

|   |      |  |      |       |       |       |
|---|------|--|------|-------|-------|-------|
| 1 | 2.0  | Stiff gray & tan silty<br>clay w/clay layers           | 21.6 | 102.3 | 124.4 | 3750* |
| 2 | 8.0  | Miscellaneous fill (Brick,<br>glass, sand & some clay) | 23.3 | ----  | ----  | ----  |
| 5 | 15.0 | Soft gray clay w/wood &<br>organic matter              | 50.7 | ----  | ----  | ----  |
| 6 | 19.0 | Medium stiff gray & tan<br>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

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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification                                      | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Medium compact brown clayey<br>silt w/roots         | 22.0                        | 89.2                | 108.9 | 1995*   |
| 2                  | 5.0                 | Soft gray & tan clay w/silty<br>sand pockets        | 25.5                        | 86.3                | 108.4 | 785*  |
| 3                  | 8.0                 | Soft dark gray clay w/organic<br>matter             | 63.2                        | 58.0                | 94.6  | 610*  |
| 4                  | 14.0                | Very soft gray clay w/sand<br>layers                | 45.3                        | 71.6                | 104.1 | 400*  |
| 5                  | 18.0                | Very soft gray & tan clay<br>w/sand pockets & roots | 55.9                        | 69.1                | 107.8 | ----  |

BORING 13

|   |     |  |      |      |       |       |
|---|-----|--|------|------|-------|-------|
| 1 | 2.0 | Stiff gray & tan clay with<br>clayey silt layers,<br>brick & shell fragments | 22.6 | 99.4 | 121.9 | 2985* |
| 2 | 5.0 | Stiff gray & tan clay with<br>shells, brick fragments &<br>glass             | 32.4 | ---- | ----  | ----  |
| 3 | 8.0 | Stiff gray & tan clay w/clayey<br>silt lenses                                | 22.7 | 99.3 | 121.9 | 2945* |

BORING 14

|   |      |   |      |      |       |       |
|---|------|---|------|------|-------|-------|
| 1 | 2.0  | Medium compact gray & brown<br>clayey silt w/roots                      | 19.8 | 97.1 | 116.3 | 1415* |
| 2 | 5.0  | Medium stiff gray & brown<br>clay w/shell fragments<br>& sand layers    | 31.7 | ---- | ----  | ----  |
| 3 | 8.0  | Loose gray & tan fine sand<br>w/clay layers & shell<br>fragments        | 23.0 | 95.8 | 117.9 | 745*  |
| 5 | 14.0 | Very soft gray clay w/sand<br>pockets, decayed wood &<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |     |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|----|-----|
|                    |                     |   |                             | Dry                 | Wet   |   | LL                  | PL | 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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Medium stiff gray & tan clay<br>w/sand lenses, pockets &<br>roots | 27.8                        | 90.7                | 115.9 | 1650  |
| 2                  | 5.0                 | Stiff gray & tan silty clay<br>w/shell fragments                  | 17.5                        | ----                | ----  | ----  |
| 6                  | 17.5                | Medium stiff gray clay with<br>organic matter & roots             | 59.1                        | 63.9                | 101.7 | 1110  |

BORING 18

|   |      |   |      |      |       |      |
|---|------|---|------|------|-------|------|
| 1 | 2.0  | Soft dark gray clay w/clayey<br>sand layers | 16.7 | 93.3 | 108.9 | 655* |
| 2 | 5.0  | Soft gray & tan clay w/sand<br>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

|   |     |   |      |      |       |       |
|---|-----|---|------|------|-------|-------|
| 1 | 2.0 | Compact brown & gray sandy<br>silt w/clay layers      | 12.5 | ---- | ----  | ----  |
| 2 | 5.0 | Medium stiff gray & tan clay<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |  |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 1                  | 2.0                 | Stiff brown & gray<br>sandy clay with<br>decayed roots &<br>organic matter | 19.3                        | 94.5                | 112.8 | 2910*   |                     |    |    |
| 2                  | 5.0                 | Soft gray & tan clay<br>w/sand layers &<br>pockets                         | 36.2                        | 80.1                | 109.0 | 815*  | 63                  | 21 | 42 |
| 3                  | 8.0                 | Soft gray & tan clay<br>w/sand pockets                                     | 35.4                        | 80.1                | 108.4 | 530*  |                     |    |    |
| 4                  | 11.0                | Soft dark gray clay<br>w/many sand pockets<br>& trace of organic<br>matter | 33.0                        | 83.5                | 111.1 | 840*  |                     |    |    |
| 5                  | 14.0                | Very soft gray clay<br>w/silt pockets &<br>trace of organic<br>matter      | 49.6                        | 69.8                | 104.4 | 385   | 60                  | 22 | 38 |

BORING 21

|   |     |   |      |       |       |        |  |  |  |
|---|-----|---|------|-------|-------|--------|--|--|--|
| 1 | 2.0 | Hard tan & gray silty<br>clay w/shells & glass      | 11.7 | 102.1 | 114.1 | 13660* |  |  |  |
| 2 | 5.0 | Hard brown & gray clay<br>w/sand pockets &<br>glass | 13.6 | ----  | ----  | ----   |  |  |  |

\*Unconsolidated-Undrained Triaxial Compression Test - One Specimen.  
Confined at the approximate overburden pressure.

Fig. 83

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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |  |                             | Dry                 | Wet   |   | LL                  | PL | 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

|   |      |  |      |      |      |      |    |    |    |
|---|------|--|------|------|------|------|----|----|----|
| 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

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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Stiff brown silty clay                                    | 20.4                        | 97.9                | 117.9 | 2495*   |
| 2                  | 5.0                 | Medium stiff dark gray<br>clay w/sand pockets             | 26.1                        | 82.6                | 104.2 | 1990*   |
| 3                  | 8.0                 | Soft dark gray clay w/sand<br>pockets & decayed wood      | 41.7                        | 76.4                | 108.3 | 900   |
| 4                  | 11.0                | Very soft dark gray clay w/sand<br>pockets & decayed wood | 59.1                        | 61.7                | 98.2  | 400   |
| 5                  | 14.0                | Soft gray clay w/humus pockets<br>& roots                 | 115.3                       | ----                | ----  | ----  |
| 6                  | 19.0                | Soft gray clay w/roots & trace<br>of organic matter       | 72.1                        | 56.6                | 97.5  | 590   |

BORING 25

|   |     |  |      |      |       |       |
|---|-----|--|------|------|-------|-------|
| 1 | 2.0 | Very compact gray & tan<br>sandy silt w/clay<br>layers & glass | 16.2 | 95.1 | 110.5 | 7010* |
|---|-----|--|------|------|-------|-------|

BORING 26

|   |      |  |       |       |       |       |
|---|------|--|-------|-------|-------|-------|
| 1 | 2.0  | Medium stiff gray & brown<br>silty clay w/roots                  | 25.5  | 90.3  | 113.3 | 1540* |
| 2 | 5.0  | Medium stiff gray & tan<br>silty clay w/sand<br>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<br>w/humus pockets & decayed<br>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 &<br>organic matter                       | 130.7 | 35.8  | 82.6  | 720   |
| 7 | 22.0 | Very soft gray sandy clay<br>w/silty sand layers &<br>roots      | 23.3  | 103.5 | 127.6 | 405   |

\*Unconsolidated-Undrained Triaxial Compression Test - One Specimen.  
Confined at the approximate overburden pressure.

Fig. 85

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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |   |                             | Dry                 | Wet   |   | 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

|   |      |  |      |       |       |       |    |    |    |
|---|------|--|------|-------|-------|-------|----|----|----|
| 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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 2                  | 5.0                 | Very stiff gray & tan clay<br>w/silt pockets & trace<br>of organic matter | 36.1                        | 80.3                | 109.3 | 4600  |
| 4                  | 11.0                | Very soft gray organic clay<br>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<br>w/shell fragments                           | 24.3                        | 103.5               | 128.7 | 205   |

BORING 30

|   |      |   |      |      |       |      |
|---|------|---|------|------|-------|------|
| 1 | 2.0  | Medium stiff gray & brown<br>silty clay w/sand<br>pockets | 22.0 | 95.9 | 117.0 | 1130 |
| 2 | 5.0  | Very soft gray & brown silty<br>clay w/sand pockets       | 34.0 | 78.1 | 104.6 | 340* |
| 3 | 8.0  | Soft gray clay w/organic<br>matter & roots                | 52.0 | 65.3 | 99.3  | 640* |
| 4 | 11.0 | Very soft dark gray clay<br>w/trace of organic<br>matter  | 67.7 | 57.4 | 96.2  | 470  |
| 5 | 14.0 | Extremely soft gray clay<br>w/organic matter & wood       | 97.6 | 45.7 | 90.2  | 185  |
| 6 | 19.0 | Soft gray clay w/roots &<br>trace of organic matter       | 59.5 | 63.1 | 100.6 | 605  |
| 7 | 23.0 | Very soft gray clay w/sand<br>pockets & roots             | 36.6 | 82.8 | 113.1 | 435  |

\*Unconsolidated-Undrained Triaxial Compression Test - One Specimen.  
Confined at the approximate overburden pressure.

Fig. 87

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 31

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |     |     |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|-----|-----|
|                    |                     |   |                             | Dry                 | Wet   |   | LL                  | PL  | 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

|   |      |  |       |      |      |      |  |  |  |
|---|------|--|-------|------|------|------|--|--|--|
| 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.

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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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|
|                    |                     |  |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Medium compact gray & brown<br>clayey silt w/clay layers<br>& shells | 18.8                        | ----                | ----  | ----  |
| 2                  | 5.0                 | Very compact brown & gray<br>clayey silt                             | 16.2                        | 108.0               | 125.5 | 4415*   |
| 3                  | 8.0                 | Medium stiff gray clay<br>w/trace of organic matter                  | 43.8                        | 72.2                | 103.8 | 1815  |
| 4                  | 11.0                | Soft gray clay w/organic<br>matter                                   | 50.9                        | 68.0                | 102.5 | 825*  |
| 5                  | 14.0                | Medium stiff dark brown<br>humus w/roots                             | 250.2                       | 19.1                | 66.9  | 1720*   |
| 6                  | 24.0                | Soft gray clay w/silt<br>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

|   |      |   |       |      |       |      |
|---|------|---|-------|------|-------|------|
| 1 | 2.5  | Compact brown clayey silt<br>w/trace of sand                                  | 16.0  | ---- | ----  | ---- |
| 2 | 5.5  | Soft gray & tan clay with<br>silt pockets, trace of<br>organic matter & roots | 43.7  | 76.0 | 109.2 | 990  |
| 3 | 8.5  | Soft gray clay w/organic<br>matter & roots                                    | 64.1  | 60.0 | 98.4  | 735  |
| 4 | 11.5 | Soft gray clay w/silty<br>clay layers, shells &<br>organic matter             | 40.9  | 77.5 | 109.2 | 670  |
| 5 | 14.5 | Soft gray clay w/organic<br>clay layers & roots                               | 76.9  | 51.2 | 90.6  | 795  |
| 6 | 19.5 | Soft gray organic clay<br>w/roots & decayey wood                              | 166.8 | 28.6 | 76.3  | 665  |
| 7 | 24.5 | Soft gray clay w/silt<br>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

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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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |   |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 1                  | 2.0                 | Very compact brown clayey silt w/clay layers                            | 17.9                        | 100.7               | 118.8 | $\phi=24^\circ$                                   | 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

|   |      |  |      |       |       |        |     |    |     |
|---|------|--|------|-------|-------|--------|-----|----|-----|
| 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.

$\phi$  = Angle of internal friction;  
c = Cohesion in lb per sq ft.

Fig. 90

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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 37

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Compact brown & tan clayey<br>silt w/clay layers  | 17.7                        | 105.0               | 123.6 | $\phi=11^\circ c=1010^{**}$                       |
| 2                  | 5.0                 | Very stiff brown & gray<br>silty clay w/clayey silt<br>layers & concretions             | 18.5                        | ----                | ----  | ----  |
| 3                  | 8.0                 | Soft brown & gray clay<br>w/silt pockets, organic<br>matter, roots & trace<br>of shells | 45.0                        | 66.3                | 96.2  | 925*  |
| 4                  | 11.0                | Soft gray clay w/silt<br>pockets & organic matter                                       | 40.7                        | 74.4                | 104.7 | 945   |
| 5                  | 14.0                | Soft gray clay w/organic<br>matter  | 60.1                        | 62.9                | 100.6 | 545   |
| 6                  | 19.0                | Soft gray clay w/organic<br>matter & roots  | 95.6                        | ----                | ----  | ----  |
| 7                  | 29.0                | Soft gray clay w/silt<br>pockets & shell<br>fragments                                   | 53.6                        | ----                | ----  | ----  |
| 8                  | 34.0                | Very soft gray clay<br>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.  
 $\phi$  = Angle of internal friction;  
c = Cohesion in lb per sq ft.

Fig. 91

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 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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification                                     | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|
|                    |                     |  |                             | Dry                 | Wet   |   |
| 1                  | 2.5                 | Very compact gray clayey<br>silt w/clay pockets    | 22.4                        | 99.5                | 121.8 | 4125*   |
| 2                  | 5.5                 | Medium stiff gray silty<br>clay                    | 48.9                        | ----                | ----  | ----  |
| 3                  | 8.5                 | Soft gray & tan clay                               | 52.1                        | 69.8                | 106.2 | 905   |
| 4                  | 11.5                | Very soft gray clay<br>w/roots & organic<br>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<br>w/roots & organic<br>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<br>layers, lenses & shells   | 52.2                        | 68.4                | 104.1 | 745   |

\*Unconsolidated-Undrained Triaxial Compression Test - One Specimen.  
 Confined at the approximate overburden pressure.

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SUMMARY OF LABORATORY TEST RESULTS

BORING 39

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |   |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 1                  | 2.0                 | Stiff gray & brown clay                                 | 44.2                        | 73.2                | 105.5 | 3350*   |                     |    |    |
| 2                  | 5.0                 | Soft dark brown organic<br>clay w/roots                 | 113.1                       | ----                | ----  | ----  |                     |    |    |
| 3                  | 8.0                 | Soft gray clay w/many<br>sand pockets                   | 32.6                        | 88.1                | 116.8 | 530   |                     |    |    |
| 4                  | 10.0                | Loose gray clayey silt<br>w/sandy silt layers &<br>wood | 29.0                        | ----                | ----  | ----  | 32                  | 25 | 7  |
| 5                  | 13.0                | Loose gray clayey silt<br>w/roots & trace of<br>sand    | 27.0                        | 89.6                | 113.9 | 995*  |                     |    |    |
| 6                  | 18.0                | Soft gray clay w/silt<br>lenses & pockets               | 44.5                        | 74.6                | 107.8 | 705   |                     |    |    |
| 7                  | 23.0                | Soft gray clay w/silt<br>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.

Fig. 93

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Station 554+00 to Station 670+00  
Orleans and Jefferson Parishes, Louisiana

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SUMMARY OF LABORATORY TEST RESULTS

BORING 40

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|
|                    |                     |  |                             | Dry                 | Wet   |   |
| 2                  | 2.5                 | Very compact brown clayey<br>silt w/clay lenses                    | 20.3                        | 103.3               | 124.3 | 6670*   |
| 3                  | 5.5                 | Medium stiff gray & tan<br>clay w/silt pockets                     | 46.8                        | 66.7                | 98.0  | 1185  |
| 4                  | 8.5                 | Soft gray & tan clay with<br>humus layers                          | 73.8                        | 52.7                | 91.6  | 780*  |
| 5                  | 11.5                | Very soft gray clay with<br>organic clay layers                    | 90.3                        | 46.2                | 88.0  | 460   |
| 6                  | 14.5                | Medium stiff brown organic<br>clay w/roots                         | 181.6                       | 25.6                | 72.2  | 1300  |
| 8                  | 24.5                | Very soft gray clay with<br>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<br>clay w/sand lenses &<br>shell fragments | 58.5                        | 63.6                | 100.8 | 1510  |

BORING 41

|   |      |   |       |       |       |                            |
|---|------|---|-------|-------|-------|----------------------------|
| 1 | 2.0  | Very compact brown & gray<br>clayey silt w/clay<br>layers   | 22.8  | 101.1 | 122.1 | $\phi=22^\circ c=655^{**}$ |
| 2 | 5.0  | Very stiff tan & gray clay<br>w/silt pockets & shells       | 23.3  | ----  | ----  | ----                       |
| 3 | 11.0 | Stiff gray clay w/silt<br>pockets & organic<br>matter       | 30.4  | 86.0  | 112.1 | 2005*                      |
| 4 | 14.0 | Medium stiff gray clay<br>w/silt lenses, pockets &<br>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<br>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<br>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.  
 $\phi$  = Angle of internal friction; c = Cohesion in lb per sq ft.

Fig. 94



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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 42

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification                                       | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|
|                    |                     |  |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Soft brown silty clay                                | 21.9                        | 95.6                | 116.5 | 765*  |
| 2                  | 5.0                 | Very soft gray & tan clay<br>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<br>& roots             | 48.3                        | 71.2                | 105.6 | 830   |
| 5                  | 14.0                | Soft gray clay w/organic<br>matter                   | 66.2                        | 58.1                | 96.5  | 530   |
| 6                  | 19.0                | Extremely soft gray clay<br>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

|   |      |   |       |       |       |                             |
|---|------|---|-------|-------|-------|-----------------------------|
| 1 | 2.0  | Compact brown clayey silt<br>w/clay lenses                  | 17.6  | 108.3 | 127.4 | $\phi=17^\circ c=1600^{**}$ |
| 2 | 5.0  | Stiff gray & tan clay w/silt<br>lenses & concretions        | 21.1  | ----  | ----  | ----                        |
| 3 | 8.0  | Stiff gray silty clay with<br>clay layers & decayed<br>wood | 34.9  | 79.0  | 106.5 | 2015*                       |
| 4 | 11.0 | Medium stiff gray clay with<br>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<br>clay w/roots                   | 186.2 | ----  | ----  | ----                        |
| 7 | 29.0 | Very soft gray clay w/silt<br>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.

$\phi$  = Angle of internal friction;

c = Cohesion in lb per sq ft.

Fig. 95

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 44

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |   |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 1                  | 2.0                 | Stiff brown & gray clay<br>w/clayey silt pockets<br>& lenses  | 23.9                        | 95.4                | 118.2 | 2575*   |                     |    |    |
| 2                  | 5.0                 | Medium stiff gray & tan<br>silty clay w/clayey<br>silt layers | 39.8                        | 70.6                | 98.7  | 1165*   |                     |    |    |
| 3                  | 8.0                 | Soft gray clay with<br>organic matter                         | 53.6                        | 64.7                | 99.3  | 760*  |                     |    |    |
| 4                  | 11.0                | Medium stiff gray clay<br>w/roots                             | 47.1                        | 71.9                | 105.7 | 1810*   |                     |    |    |
| 5                  | 14.0                | Soft gray clay w/organic<br>matter & roots                    | 65.5                        | 58.3                | 96.5  | 550   |                     |    |    |
| 6                  | 19.0                | Soft gray clay w/silt<br>pockets & roots                      | 57.9                        | 63.6                | 100.4 | 550   |                     |    |    |
| 7                  | 24.0                | Soft gray clay w/silt<br>pockets & humus layers               | 57.9                        | 62.1                | 98.1  | 560   |                     |    |    |
| 8                  | 29.0                | Soft gray clay w/silt<br>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

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 45

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Compact brown clayey silt   | 17.9                        | 101.6               | 119.8 | 2655*   |
| 2                  | 5.0                 | Medium stiff gray & tan clay<br>w/clayey silt layers &<br>brick fragments | 21.6                        | ----                | ----  | ----  |
| 3                  | 8.0                 | Stiff gray clay w/silt<br>lenses & decayed wood                           | 38.8                        | 74.7                | 103.7 | 2025  |
| 4                  | 11.0                | Medium stiff gray & tan<br>clay w/silt pockets                            | 35.7                        | 84.8                | 115.0 | 1405  |
| 5                  | 14.0                | Soft gray clay w/organic<br>matter & roots                                | 64.7                        | 59.3                | 97.7  | 905   |
| 6                  | 19.0                | Soft dark brown organic<br>clay w/many roots                              | 153.7                       | ----                | ----  | ----  |
| 7                  | 24.0                | Soft dark gray organic<br>clay w/roots                                    | 207.1                       | 23.3                | 71.6  | 895   |
| 8                  | 29.0                | Soft gray clay w/silt<br>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<br>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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 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 46

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|
|                    |                     |  |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Medium stiff brown & gray<br>silty clay w/clayey silt<br>pockets & roots | 27.0                        | 93.0                | 118.2 | 1415*   |
| 2                  | 5.0                 | Soft gray & tan clay w/silt<br>pockets                                   | 40.5                        | 73.8                | 103.6 | 975*  |
| 3                  | 8.0                 | Medium stiff gray & tan<br>clay w/silt pockets                           | 44.9                        | 71.2                | 103.2 | 1650*   |
| 4                  | 11.0                | Medium stiff gray clay<br>w/silt pockets & organic<br>matter             | 106.7                       | 40.4                | 83.6  | 1900  |
| 5                  | 14.0                | Very soft gray clay w/roots<br>& organic matter                          | 114.8                       | 39.7                | 85.3  | 470   |
| 6                  | 19.0                | Soft gray organic clay<br>w/humus layers & roots                         | 192.3                       | ----                | ----  | ----  |
| 7                  | 24.0                | Very soft gray clay with<br>roots & organic matter                       | 64.7                        | 58.4                | 96.2  | 355   |
| 8                  | 29.0                | Soft gray clay w/silt<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Denisty<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |  |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 1                  | 2.0                 | Stiff gray silty clay<br>w/shells, organic<br>matter & cinders | 32.3                        | 83.5                | 110.5 | 2540*   |                     |    |    |
| 2                  | 8.0                 | Very soft dark brown<br>humus w/roots                          | 282.6                       | 18.0                | 69.0  | 375   |                     |    |    |
| 3                  | 11.0                | Very soft gray clay<br>w/silt pockets &<br>roots               | 60.3                        | 62.4                | 100.0 | 300   | 58                  | 21 | 37 |
| 4                  | 14.0                | Very soft gray clay<br>w/silt pockets &<br>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

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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 48

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|
|                    |                     |  |                             | Dry                 | Wet   |   |
| 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

|   |      |   |       |      |       |       |
|---|------|---|-------|------|-------|-------|
| 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

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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 50

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|
|                    |                     |  |                             | Dry                 | Wet   |   |
| 2                  | 5.0                 | Medium stiff gray & brown<br>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,<br>organic matter & decayed<br>wood | 66.5                        | 59.3                | 98.7  | 520   |
| 6                  | 19.0                | Soft gray organic clay with<br>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<br>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<br>shells                              | 28.7                        | 90.1                | 115.9 | 600*  |

BORING 51

|   |      |  |      |      |       |      |
|---|------|--|------|------|-------|------|
| 1 | 2.0  | Medium stiff gray silty<br>clay w/shell fragments          | 17.3 | ---- | ----  | ---- |
| 2 | 5.0  | Medium stiff gray clay<br>w/clayey silt layers &<br>lenses | 26.6 | ---- | ----  | ---- |
| 3 | 8.0  | Very soft gray clay w/many<br>shells                       | 31.2 | ---- | ----  | ---- |
| 4 | 14.0 | Very soft gray clay w/silt<br>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

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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 52

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |  |                             | Dry                 | Wet   |   | LL                  | PL | 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



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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 53

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Stiff gray & tan clay w/shells<br>& roots                       | 29.6                        | 81.8                | 106.0 | 2310*   |
| 2                  | 5.0                 | Medium stiff gray & tan clay<br>w/shells & gravel               | 24.8                        | ----                | ----  | ----  |
| 3                  | 8.0                 | Soft dark gray organic clay<br>w/humus layers & decayed<br>wood | 267.7                       | ----                | ----  | ----  |
| 4                  | 11.0                | Very soft dark brown humus<br>w/roots                           | 334.0                       | 15.5                | 67.5  | 470   |
| 5                  | 14.0                | Very soft gray clay w/sand<br>pockets & shell fragments         | 42.7                        | 77.0                | 109.9 | 260   |
| 6                  | 19.0                | Very soft gray clay w/silt<br>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<br>pockets                           | 56.1                        | 65.3                | 102.0 | 655   |

BORING 54

|    |      |  |       |      |       |       |
|----|------|--|-------|------|-------|-------|
| 2  | 5.0  | Stiff gray & tan clay<br>w/glass               | 30.1  | 87.6 | 113.9 | 2445* |
| 4  | 11.0 | Medium stiff gray clay<br>w/silt pockets       | 35.6  | 84.0 | 113.9 | 1025  |
| 5  | 14.0 | Soft gray clay w/silt pockets<br>& roots       | 46.0  | 74.2 | 108.3 | 805   |
| 6  | 19.0 | Very soft brown & gray<br>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

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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 55

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |   |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 1                  | 2.0                 | Medium stiff gray<br>clay w/clayey silt<br>pockets    | 29.4                        | 93.3                | 120.7 | 1385*   |                     |    |    |
| 2                  | 5.0                 | Very soft gray clay<br>w/shells & organic<br>matter   | 36.4                        | ----                | ----  | ----  | 59                  | 25 | 34 |
| 3                  | 11.0                | Very soft dark brown<br>humus w/decayed<br>roots      | 277.4                       | 18.7                | 70.5  | 475*  |                     |    |    |
| 4                  | 14.0                | Soft gray clay with<br>organic matter &<br>roots      | 98.1                        | 43.8                | 86.8  | 705   |                     |    |    |
| 5                  | 18.0                | Soft gray clay with<br>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<br>pockets & shell<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |  |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 2                  | 5.0                 | Soft gray & brown<br>clay w/silt<br>pockets                  | 32.4                        | 77.9                | 103.1 | 785*  |                     |    |    |
| 4                  | 11.0                | Soft gray clay w/silt<br>lenses & trace of<br>organic matter | 49.2                        | 71.0                | 106.0 | 610   |                     |    |    |
| 5                  | 14.0                | Soft gray silty clay<br>w/shell fragments                    | 34.1                        | 85.3                | 114.4 | 665   |                     |    |    |
| 7                  | 24.0                | Medium stiff gray &<br>black organic clay<br>w/humus layers  | 243.3                       | 20.3                | 69.6  | 1120  |                     |    |    |
| 8                  | 29.0                | Soft gray clay with<br>silt lenses                           | 55.5                        | 66.3                | 103.1 | 590   |                     |    |    |
| 10                 | 39.0                | Soft gray clay w/silt<br>pockets                             | 65.2                        | 60.2                | 99.5  | 630   |                     |    |    |

BORING 57

|   |      |   |      |      |       |      |    |    |    |
|---|------|---|------|------|-------|------|----|----|----|
| 1 | 2.0  | Stiff gray & tan clay<br>w/silt pockets           | 27.4 | 93.2 | 118.7 | 3540 |    |    |    |
| 2 | 5.0  | Soft gray silty clay<br>w/clay layers &<br>shells | 27.2 | ---- | ----  | ---- |    |    |    |
| 3 | 15.0 | Very soft gray clay<br>w/silty clay layers        | 56.8 | 65.3 | 102.4 | 340  |    |    |    |
| 4 | 19.0 | Very soft gray clay<br>w/silt lenses              | 62.7 | 61.6 | 100.2 | 395  | 71 | 27 | 44 |
| 5 | 24.0 | Soft gray clay with<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 2                  | 5.0                 | Very stiff gray silty clay<br>w/large clayey silt<br>pockets    | 18.9                        | 89.2                | 106.1 | 7100*   |
| 4                  | 11.0                | Soft gray & tan clay w/sand<br>pockets & concretions            | 46.4                        | 72.9                | 106.8 | 800   |
| 5                  | 14.0                | Soft black & gray clay with<br>organic clay layers &<br>pockets | 97.6                        | 44.6                | 88.1  | 565   |
| 6                  | 19.0                | Soft brown humus w/roots &<br>wood                              | 337.5                       | 15.2                | 66.6  | 620   |
| 7                  | 24.0                | Very soft gray silty clay<br>w/roots                            | 41.2                        | 76.2                | 107.7 | 365   |
| 8                  | 29.0                | Soft gray clay w/silty sand<br>lenses                           | 68.2                        | 58.2                | 97.9  | 625   |
| 10                 | 39.0                | Soft gray clay w/silty sand<br>pockets                          | 69.6                        | 57.1                | 96.9  | 950   |
| 11                 | 44.0                | Very loose gray clayey sand<br>w/shell fragments                | 33.3                        | 86.9                | 115.9 | 305*  |
| 12                 | 49.0                | Soft gray clay w/sand<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Medium stiff green & tan silty<br>clay w/decayed wood | 26.6                        | 94.0                | 119.0 | 1145*   |
| 2                  | 5.0                 | Soft gray silty clay w/organic<br>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<br>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<br>& 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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |   |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 1                  | 2.0                 | Medium compact gray<br>& tan clayey silt<br>w/clay pockets        | 24.8                        | 90.8                | 113.3 | 1260*   |                     |    |    |
| 2                  | 5.0                 | Medium compact brown<br>& tan clayey silt<br>w/clay layers        | 22.2                        | 96.8                | 118.3 | 1120*   |                     |    |    |
| 3                  | 8.0                 | Medium stiff gray clay<br>w/silt pockets &<br>humus layers        | 55.7                        | 59.2                | 92.2  | 1275*   |                     |    |    |
| 4                  | 11.0                | Soft gray silty clay<br>w/clayey silt lenses<br>& trace of shells | 38.8                        | 81.0                | 112.5 | 830*  | 43                  | 20 | 23 |
| 6                  | 19.0                | Very soft dark brown<br>humus w/roots                             | 405.1                       | 12.9                | 65.2  | ----  |                     |    |    |
| 7                  | 24.0                | Very soft gray clay<br>w/silt pockets,<br>lenses & roots          | 57.5                        | 64.0                | 100.8 | 400   |                     |    |    |
| 8                  | 29.0                | Soft gray clay with<br>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<br>sand w/clay<br>layers & shell<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Medium stiff gray silty clay<br>w/clayey silt layers        | 22.6                        | 98.2                | 120.5 | 1685*   |
| 2                  | 5.0                 | Very soft gray clay w/organic<br>clay layers & silt pockets | 66.4                        | 56.2                | 93.4  | 385*  |
| 3                  | 14.0                | Very soft dark brown humus<br>w/roots                       | 294.7                       | 17.1                | 67.6  | 400   |
| 4                  | 19.0                | Very soft gray clay w/clayey<br>silt layers                 | 50.4                        | 70.0                | 105.2 | 450   |
| 5                  | 24.0                | Very soft gray clay w/silt<br>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<br>& shell fragments          | 36.4                        | 80.5                | 109.8 | ----  |

BORING 62

|    |      |   |       |      |       |       |
|----|------|---|-------|------|-------|-------|
| 1  | 2.0  | Stiff brown & gray silty<br>clay w/roots                                      | 22.6  | 98.0 | 120.1 | 3770* |
| 3  | 8.0  | Soft gray clay w/roots<br>& organic matter                                    | 51.3  | 59.2 | 89.6  | 765*  |
| 5  | 14.0 | Medium stiff gray clay with<br>silt pockets, decayed<br>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<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |      | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |     |
|--------------------|---------------------|---|-----------------------------|---------------------|------|---|---------------------|----|-----|
|                    |                     |   |                             | Dry                 | Wet  |   | LL                  | PL | 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

|    |      |   |       |      |       |       |  |  |  |
|----|------|---|-------|------|-------|-------|--|--|--|
| 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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|
|                    |                     |  |                             | Dry                 | Wet   |   |
| 1                  | 3.0                 | Stiff gray clay w/silt<br>pockets                        | 31.9                        | 89.3                | 117.8 | 2540  |
| 2                  | 5.0                 | Soft gray clay w/roots &<br>silt pockets                 | 42.5                        | 78.2                | 111.5 | 715   |
| 3                  | 8.0                 | Extremely soft dark brown<br>humus w/roots               | 294.0                       | 17.9                | 70.7  | 175   |
| 4                  | 11.0                | Very soft gray clay with<br>organic matter               | 116.5                       | 39.6                | 85.8  | 475   |
| 5                  | 14.0                | Very soft gray clay w/roots<br>& trace of organic matter | 74.7                        | 56.0                | 97.8  | 325   |
| 6                  | 19.0                | Very soft gray clay w/sand<br>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<br>sand & shell fragments      | 65.0                        | 59.7                | 98.5  | 850   |

BORING 66

|    |      |  |      |      |       |      |
|----|------|--|------|------|-------|------|
| 2  | 5.0  | Stiff brown & gray clay<br>w/silt pockets                    | 32.1 | 86.2 | 113.8 | 3165 |
| 4  | 11.0 | Medium stiff gray clay<br>w/humus layers & silt<br>pockets   | 44.2 | 75.7 | 109.1 | 1025 |
| 6  | 18.5 | Soft gray clay w/organic<br>matter & silt pockets            | 96.2 | 43.4 | 85.2  | 950  |
| 7  | 23.5 | Very soft gray clay with<br>silt pockets & organic<br>matter | 73.9 | 54.7 | 95.2  | 335  |
| 8  | 28.5 | Very soft gray clay w/sandy<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|
|                    |                     |  |                             | Dry                 | Wet   |   |
| 2                  | 8.0                 | Medium stiff gray silty clay<br>w/organic matter & shells  | 25.0                        | ----                | ----  | ----  |
| 3                  | 11.0                | Soft gray clay w/silt pockets<br>& trace of organic matter | 42.9                        | 79.1                | 113.0 | 845   |
| 4                  | 14.0                | Medium stiff gray clay w/silt<br>pockets & organic matter  | 39.7                        | 78.7                | 110.0 | 1080  |
| 5                  | 19.0                | Soft gray clay w/silt pockets,<br>humus layers & wood      | 59.8                        | 62.7                | 100.2 | 695   |
| 6                  | 24.0                | Very soft gray clay w/organic<br>clay layers & roots       | 59.2                        | 64.8                | 103.1 | 355   |
| 7                  | 29.0                | Soft gray clay w/silt<br>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<br>pockets & shell fragments    | 35.0                        | 82.1                | 110.9 | 735   |

Fig. 112

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

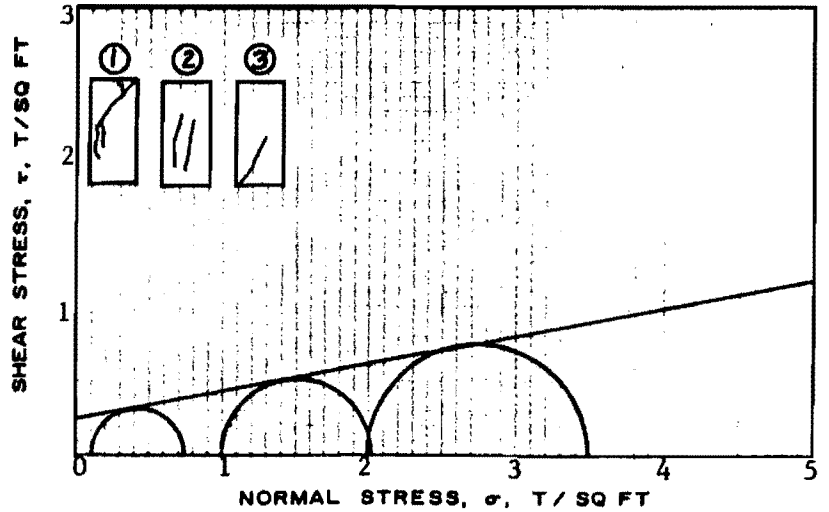
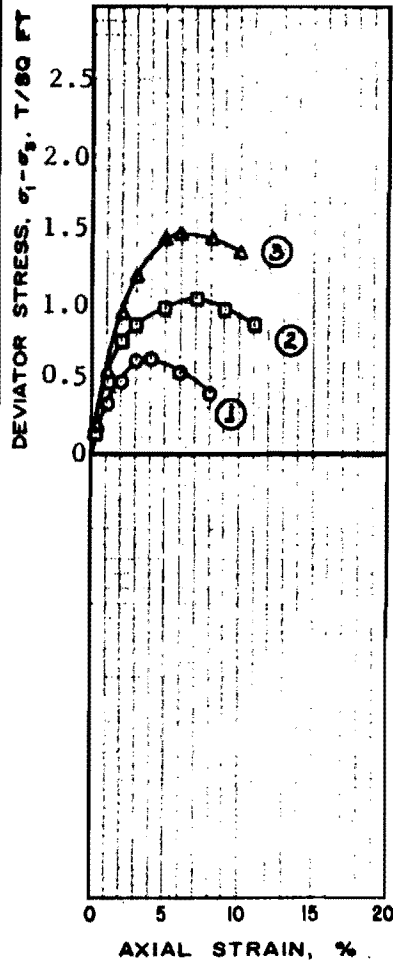
SUMMARY OF LABORATORY TEST RESULTS

BORING 68

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |  |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 1                  | 2.0                 | Very stiff brown silty<br>clay w/clayey silt<br>pockets                      | 21.2                        | 104.5               | 126.7 | 5150*   |                     |    |    |
| 2                  | 5.0                 | Medium stiff gray &<br>black clay w/humus<br>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<br>w/organic matter,<br>decayed wood &<br>trace of sand | 78.5                        | 49.3                | 88.0  | 995*  |                     |    |    |
| 5                  | 14.0                | Medium stiff gray silty<br>clay w/organic matter                             | 45.2                        | 70.4                | 102.2 | 1595*   | 38                  | 18 | 20 |
| 7                  | 24.0                | Very soft gray clay<br>w/sandy silt lenses,<br>roots & organic<br>matter     | 92.0                        | 43.6                | 83.7  | 485*  |                     |    |    |
| 9                  | 33.0                | Soft gray clay w/silt<br>lenses  | 56.2                        | 65.9                | 103.0 | 680   | 69                  | 17 | 52 |
| 11                 | 42.5                | Soft gray clay w/many<br>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



**SHEAR STRENGTH PARAMETERS**

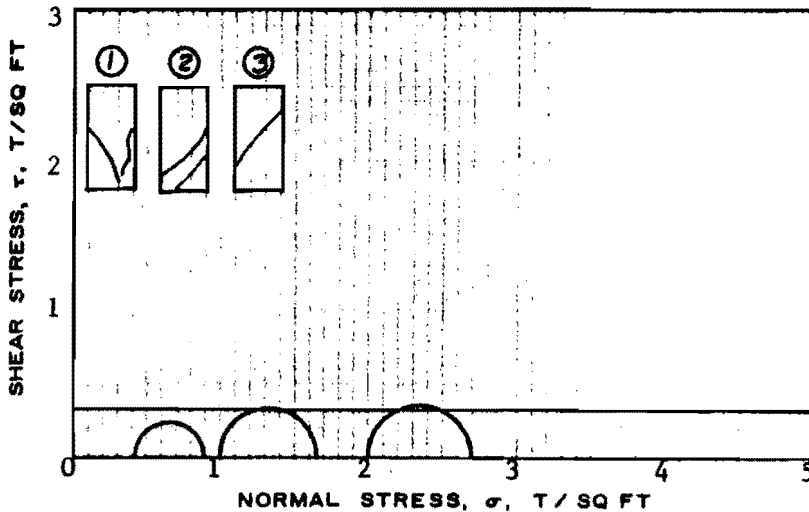
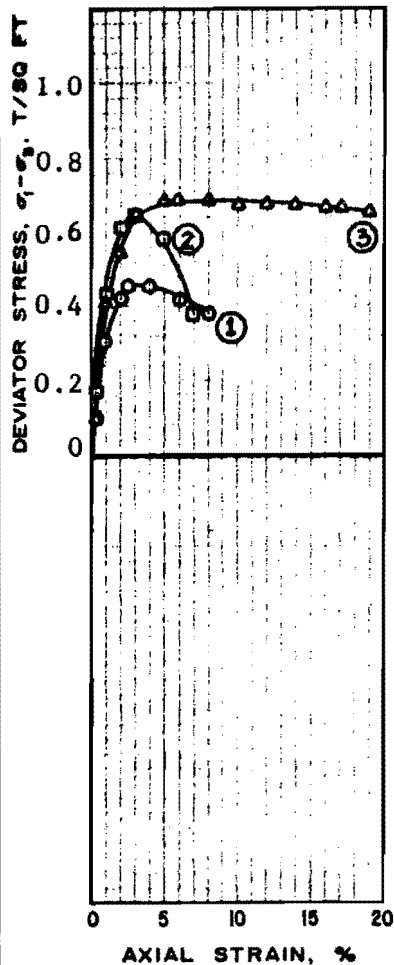
$\phi = 10^\circ$   
 $\tan \phi = 0.176$   
 $c = 0.253$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 89.2  | 84.7  | 83.7 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |       |       |      |
|  | VOID RATIO $e_o$                   |       |       |      |
|  | SATURATION % $S_o$                 |       |       |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

|  |    |   |                   |
|--|----|---|-------------------|
| TYPE OF TEST 'UU   |    | TYPE OF SPECIMEN Undisturbed                  |                   |
| CLASSIFICATION Medium stiff gray & tan clay w/thick clayey silt layers |    |   |                   |
| LL   | PL | PI  | $\rho_s$ 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 |
| <b>TRIAXIAL COMPRESSION TEST REPORT</b>                                |    |   |                   |



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 $\tan \phi =$   
 $c = 0.32$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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       $e_c$  2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

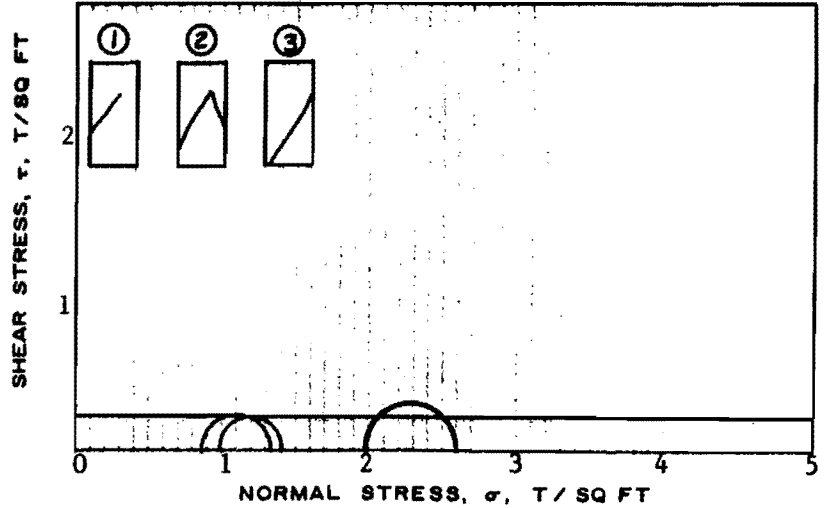
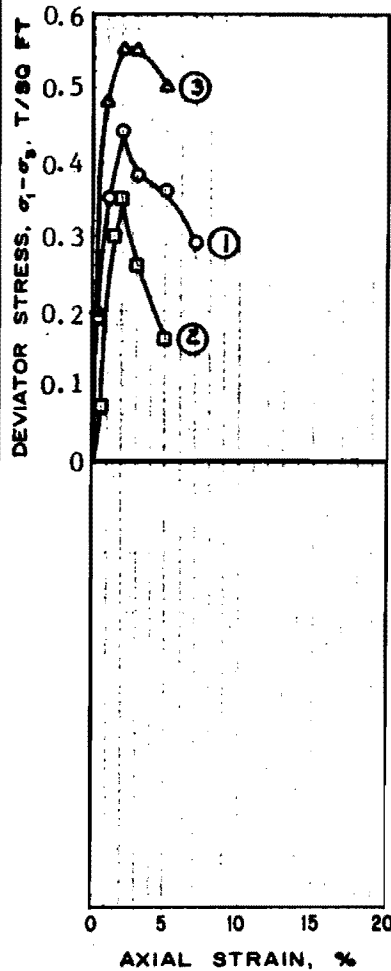
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 $\tan \phi =$   
 $c = 0.22$  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 $\gamma_o$   | 59.4 | 60.9 | 59.7 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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**  $q_c$  **2.74**

REMARKS Shear values were taken from large scale plot.

PROJECT **Sewerage & Water Board of New Orleans**

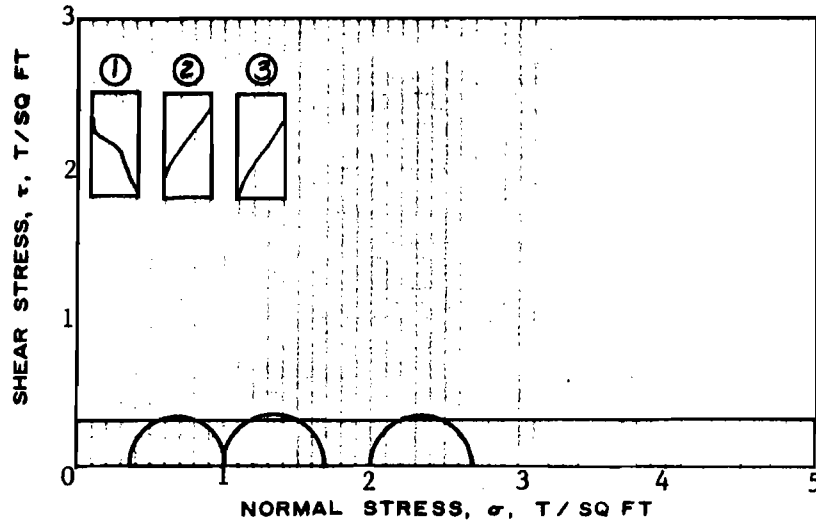
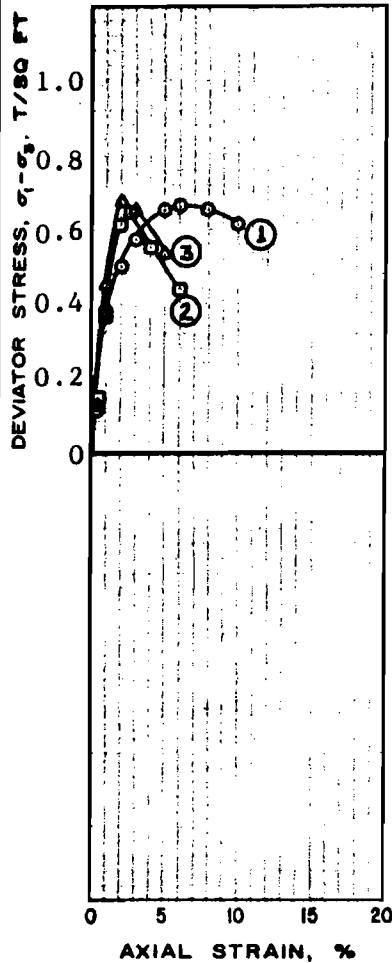
**Metairie Relief Canal**

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.33$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 87.6  | 80.3 | 81.0 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |       |      |      |
|  | VOID RATIO $e_o$                   |       |      |      |
|  | SATURATION % $S_o$                 |       |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium stiff tan & gray clay w/clayey sand layers & pockets

LL      PL      PI       $e_o$  2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

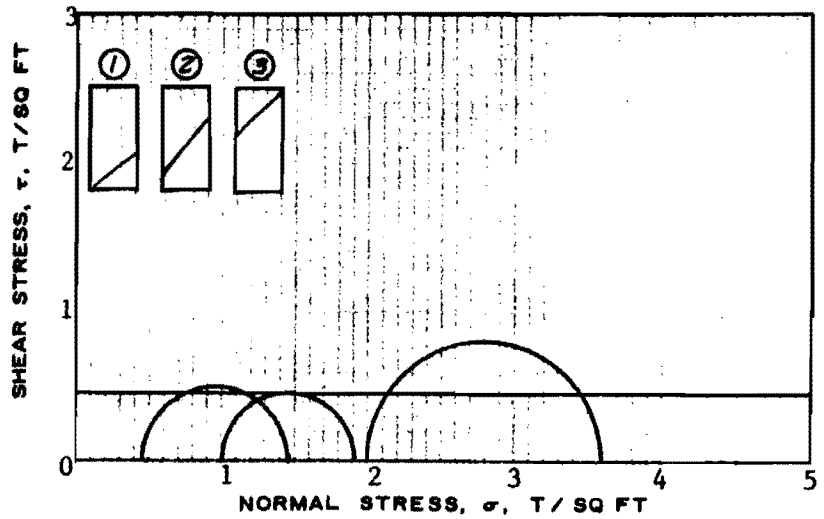
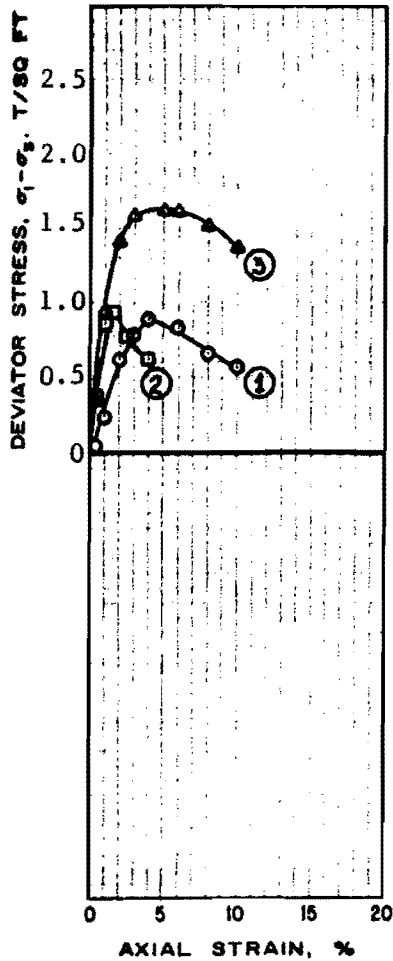
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 TAN  $\phi =$   
 $c = 0.46$  T/SQ FT

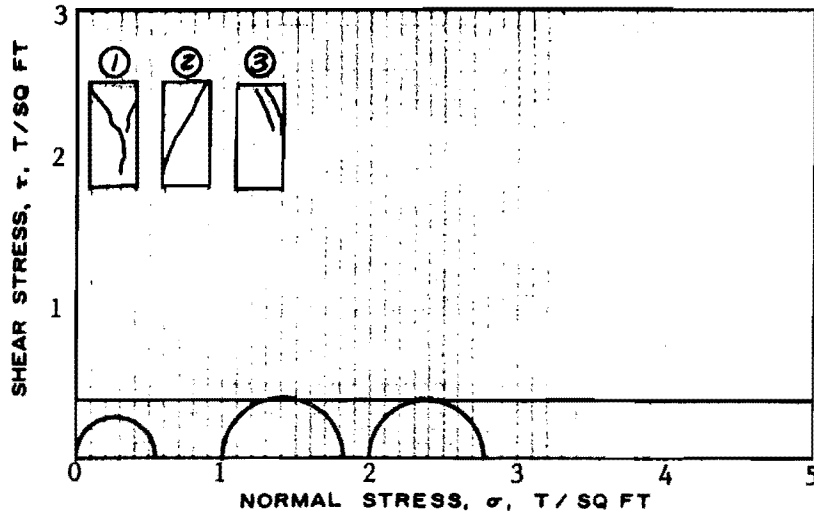
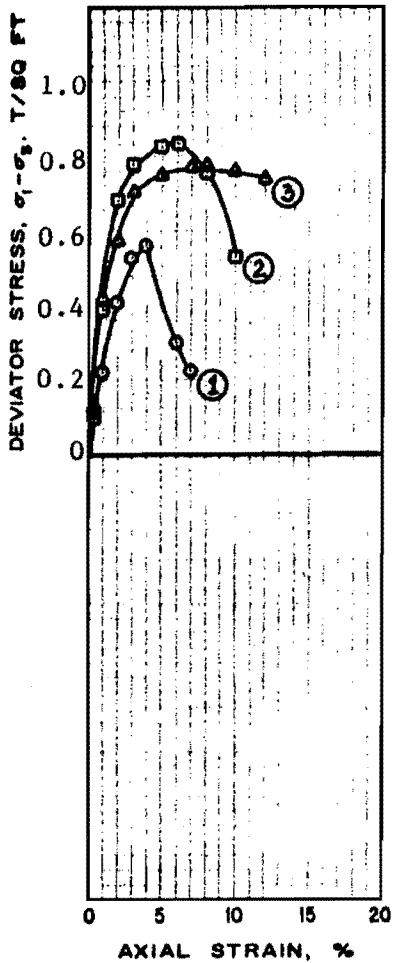
METHOD OF SATURATION \_\_\_\_\_

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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  |

|  |                              |  |                  |
|--|------------------------------|--|------------------|
| TYPE OF TEST UU  | TYPE OF SPECIMEN Undisturbed |  |                  |
| CLASSIFICATION Medium stiff gray & tan clay w/silt & concretions |                              |  |                  |
| LL 89  | PL 24                        | PI 65  | $a_c$ 2.74       |
| REMARKS Shear values were taken from large scale plot.           |                              | PROJECT Sewerage & Water Board of New Orleans<br>Metairie Relief Canal |                  |
|  |                              | AREA Stat. 554+00 to Sta. 670+00                                       |                  |
|  |                              | BORING NO. 7   | SAMPLE NO. 4     |
|  |                              | DEPTH 10.5'  | DATE 4 June 1981 |
| <b>TRIAxIAL COMPRESSION TEST REPORT</b>                          |                              |  |                  |





**SHEAR STRENGTH PARAMETERS**

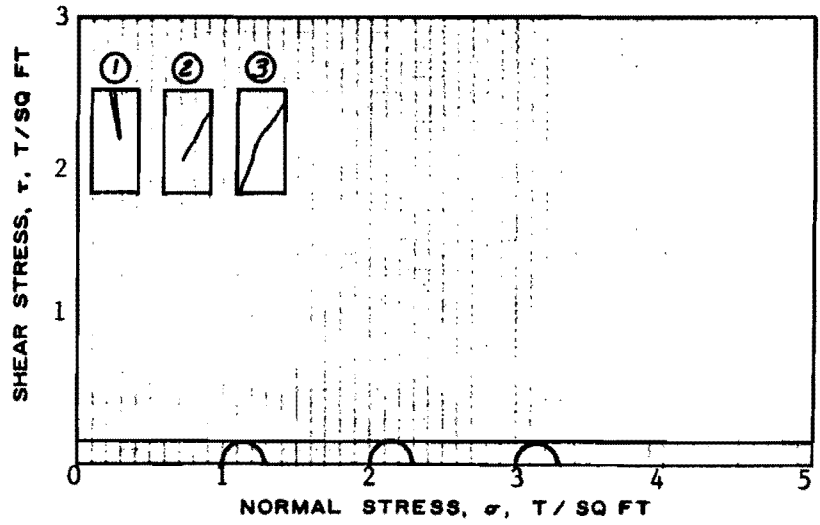
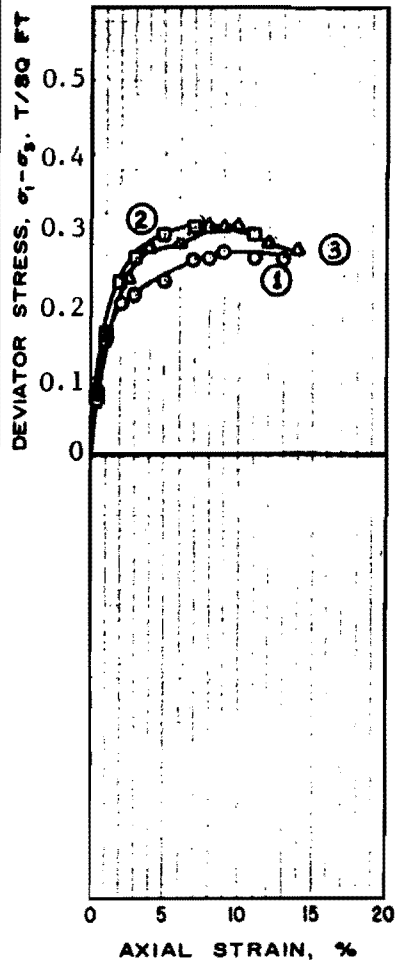
$\phi = 0$   
 $\tan \phi = 0.39$   
 $c = \text{---} \text{ T/SQ FT}$

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 $\gamma_d$   | 82.0 | 83.9 | 81.0 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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   | $e_s$ 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 |
| <b>TRIAxIAL COMPRESSION TEST REPORT</b>                            |                              |   |                  |



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.15$  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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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       $q_u$  2.70

REMARKS Shear values were taken from large scale plot.

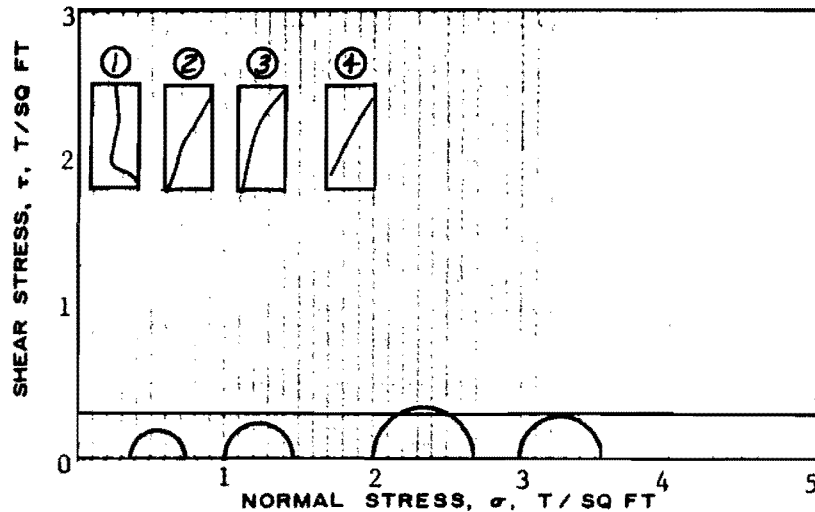
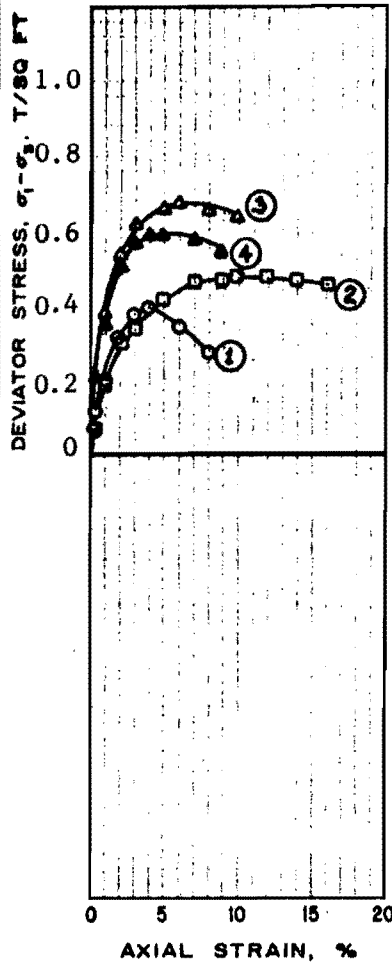
PROJECT Sewerage & Water Board of New Orleans  
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.30$  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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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       $q_c$  2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

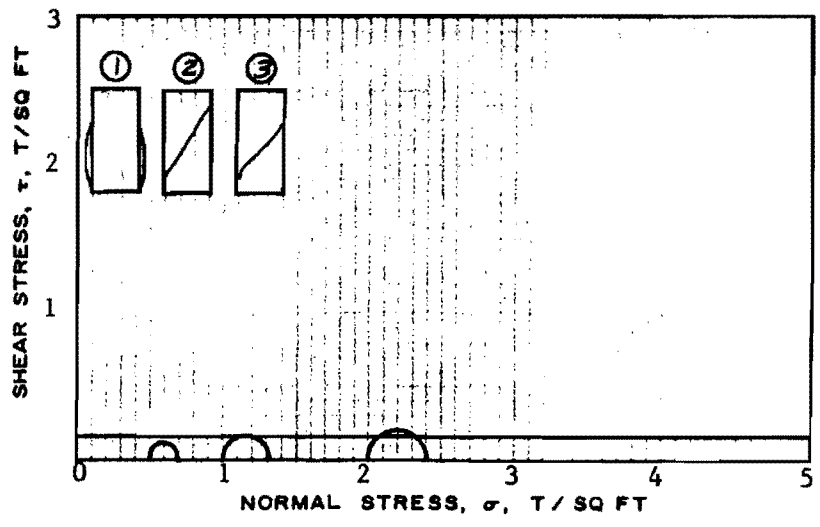
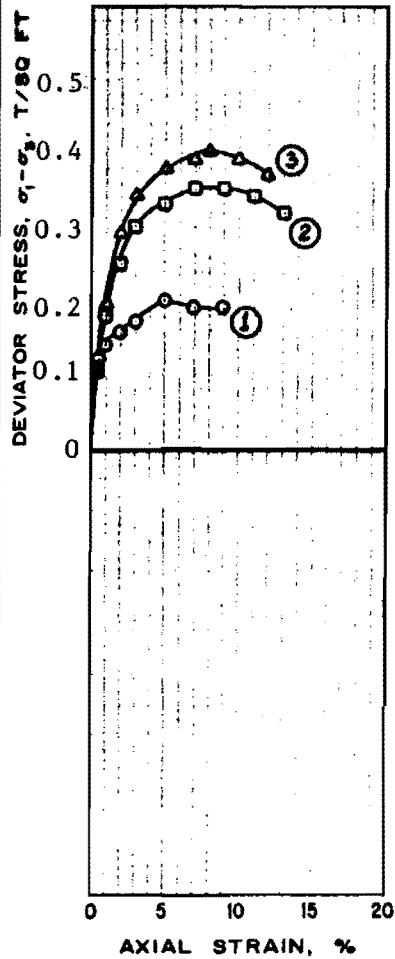
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 TAN  $\phi =$   
 $c = 0.18$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| TEST NO.   |                                    | 1    | 2    | 3    |
|--|------------------------------------|------|------|------|
| INITIAL  | WATER CONTENT % $w_o$              | 45.3 | 56.2 | 58.9 |
|  | VOID RATIO $e_o$                   | 1.35 | 1.56 | 1.64 |
|  | SATURATION % $S_o$                 | 90   | 98   | 97   |
|  | DRY DENSITY, LB/CU FT $\gamma_d$   | 71.6 | 65.9 | 63.9 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | FINAL BACK PRESSURE, T/SQ FT $u_o$ |      |      |      |
| FINAL  | WATER CONTENT % $w_f$              | 45.3 | 56.2 | 58.9 |
|  | VOID RATIO $e_f$                   | 1.35 | 1.56 | 1.64 |
| MINOR PRINCIPAL STRESS, T/SQ FT $\sigma_3$                 |                                    | 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 |

TYPE OF TEST **UU** TYPE OF SPECIMEN **Undisturbed**

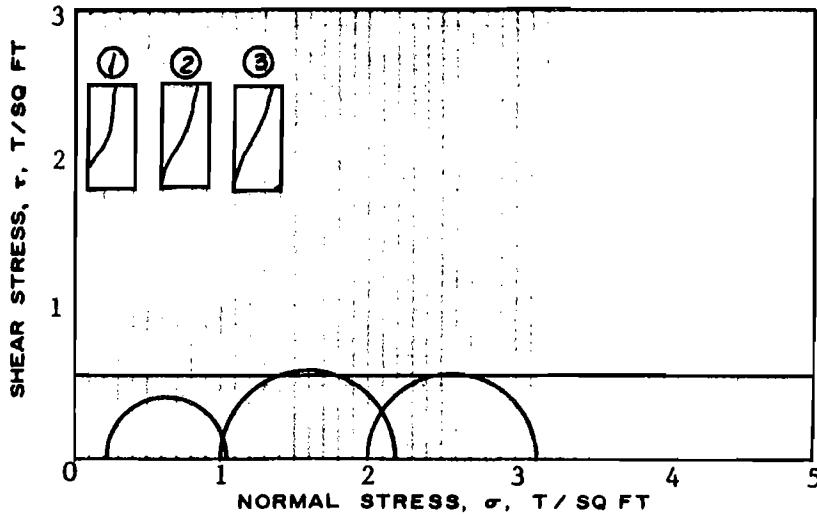
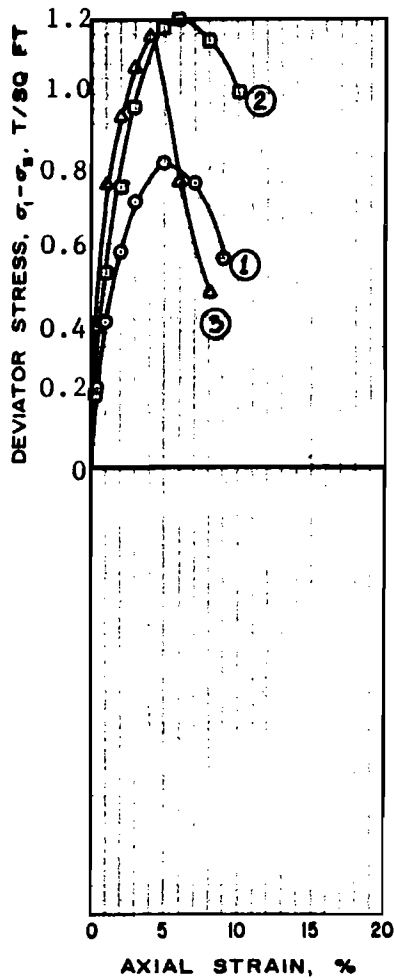
CLASSIFICATION **Soft gray clay w/sand layers**

LL \_\_\_\_\_ PL \_\_\_\_\_ PI \_\_\_\_\_  $e_o$  **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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.58$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 96.3  | 96.1  | 94.0  |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |       |       |       |
|  | VOID RATIO $e_o$                   |       |       |       |
|  | SATURATION % $S_o$                 |       |       |       |
|  | 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 $\sigma_3$                 |                                    | 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  |

TYPE OF TEST UU TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium stiff brown & gray clay w/sandy silt layers, lenses, shells & brick

LL PL PI  $e_o$  2.74

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

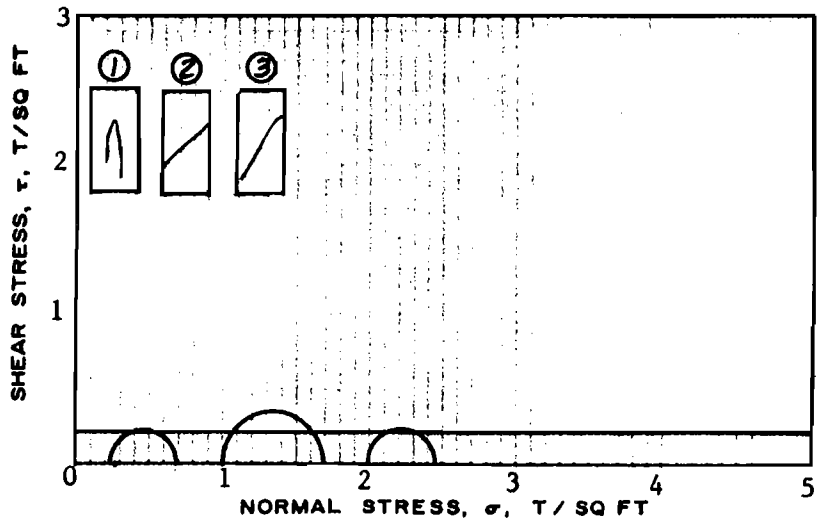
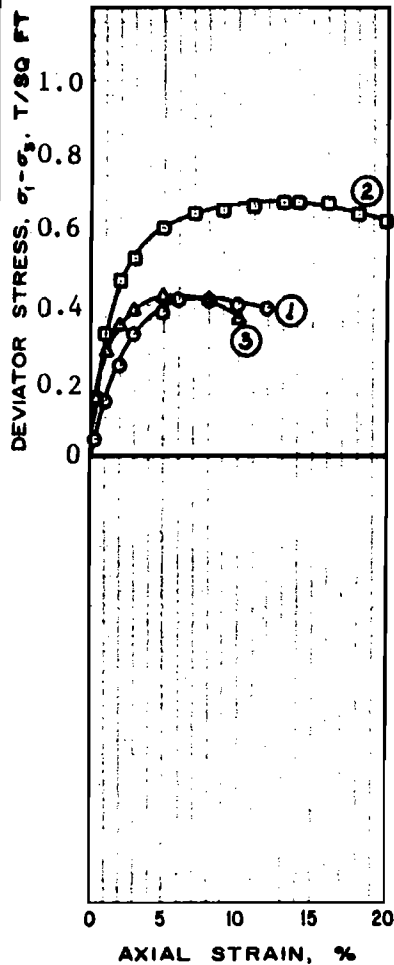
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

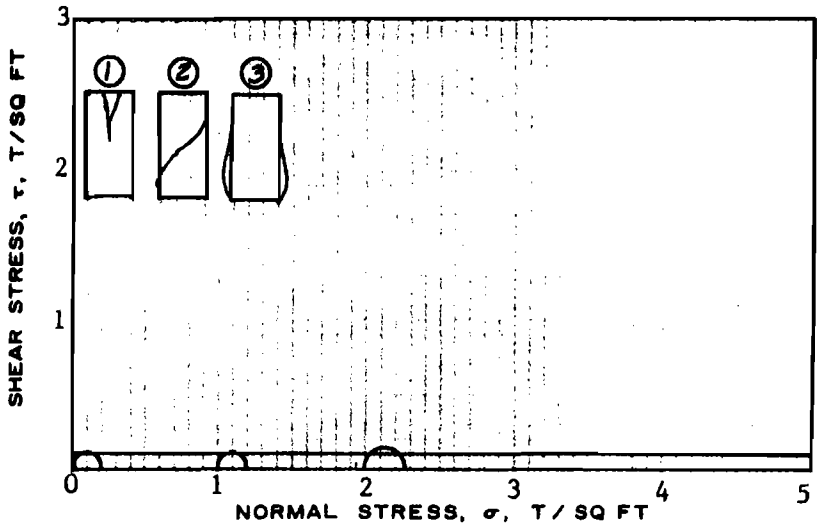
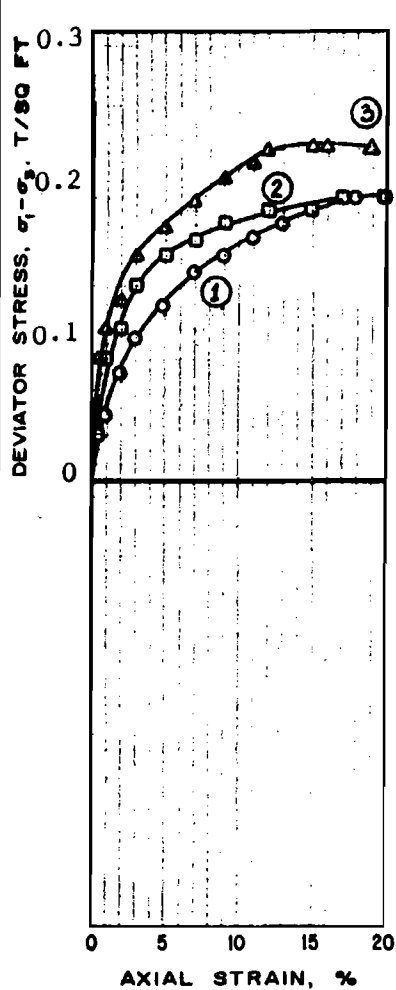
$\phi = 0$   
 $\tan \phi = 0$   
 $c = 0.21$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 80.1 | 82.9 | 82.6 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

|   |   |                     |            |
|---|---|---------------------|------------|
| TYPE OF TEST UU   | TYPE OF SPECIMEN Undisturbed                  |                     |            |
| CLASSIFICATION Soft gray & tan clay w/sand layers & pockets |   |                     |            |
| LL 63   | PL 21   | PI 42               | $e_o$ 2.70 |
| REMARKS   | 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 |            |
| <b>TRIAxIAL COMPRESSION TEST REPORT</b>                     |   |                     |            |



**SHEAR STRENGTH PARAMETERS**  
 $\phi = 0$   
 $c = 0.11$  T/SQ FT

METHOD OF SATURATION \_\_\_\_\_

CONTROLLED STRESS  
 CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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 |

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       $q_c$  2.70

REMARKS Shear values were taken from large scale plot.

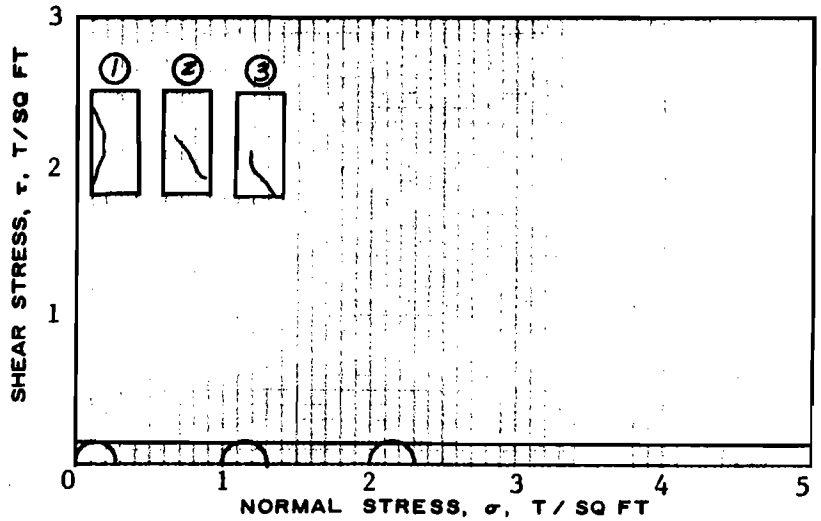
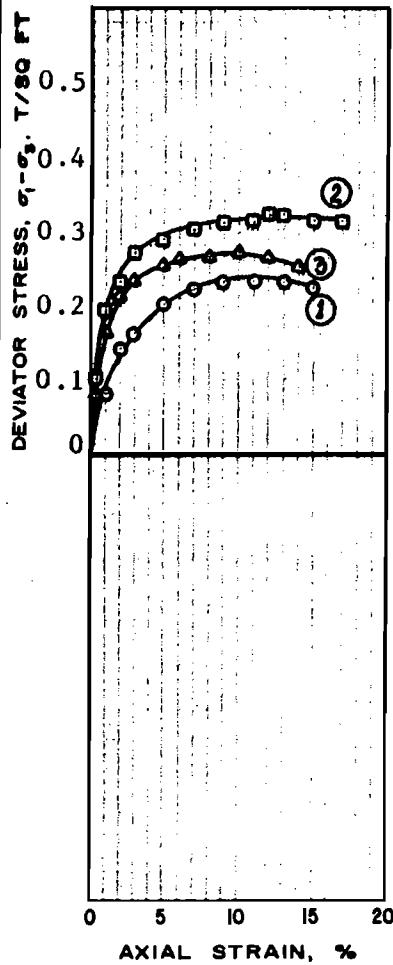
PROJECT Sewerage & Water Board of New Orleans  
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.14$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| TEST NO.   |                                    | 1    | 2    | 3    |
|--|------------------------------------|------|------|------|
| INITIAL  | WATER CONTENT % $w_o$              | 86.5 | 88.4 | 92.8 |
|  | VOID RATIO $e_o$                   | 2.46 | 2.32 | 2.45 |
|  | SATURATION % $S_o$                 | 93   | 100  | 100  |
|  | DRY DENSITY, LB/CU FT $\gamma_d$   | 47.7 | 49.9 | 47.9 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | FINAL BACK PRESSURE, T/SQ FT $u_o$ |      |      |      |
| FINAL  | WATER CONTENT % $w_f$              | 86.5 | 88.4 | 92.8 |
|  | VOID RATIO $e_f$                   | 2.46 | 2.32 | 2.45 |
| MINOR PRINCIPAL STRESS, T/SQ FT $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/many roots

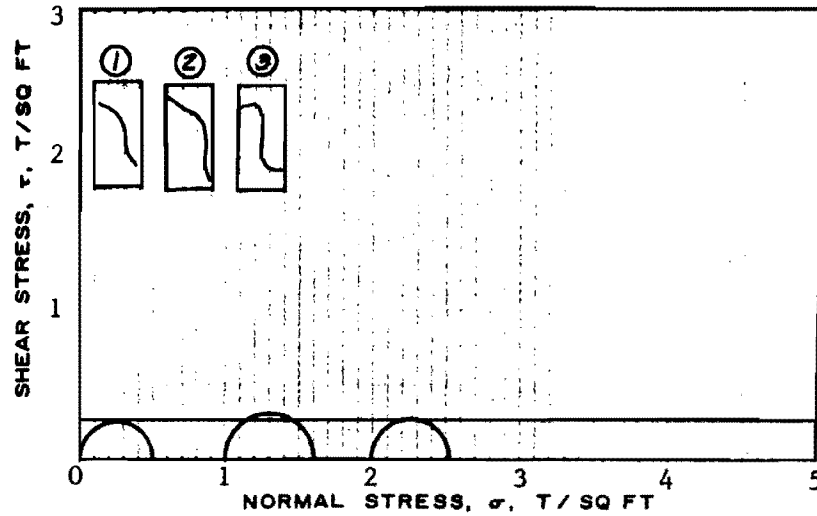
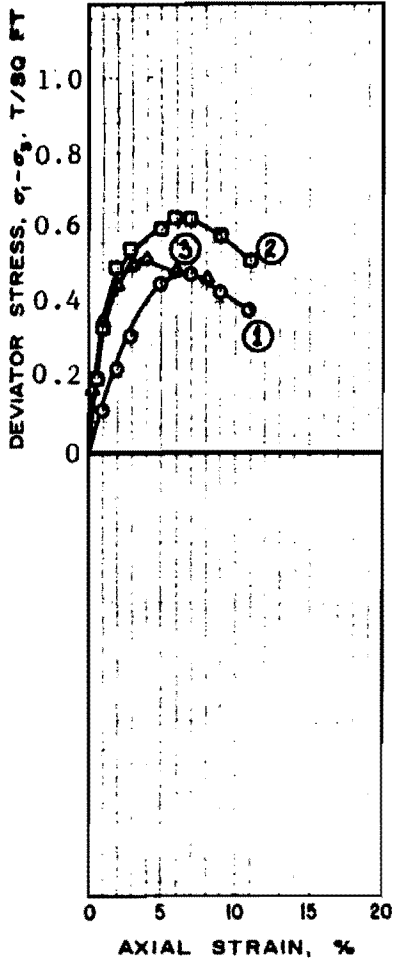
LL      PL      PI       $e_o$  2.65

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**





**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 $\tan \phi = 0$   
 $c = 0.26$  T/SQ FT

METHOD OF SATURATION \_\_\_\_\_

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 84.6  | 88.2  | 73.2 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |       |       |      |
|  | VOID RATIO $e_o$                   |       |       |      |
|  | SATURATION % $S_o$                 |       |       |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

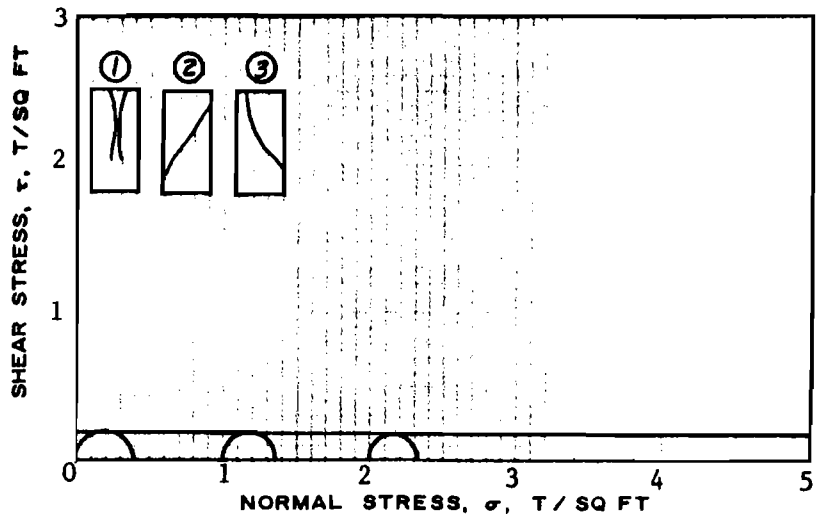
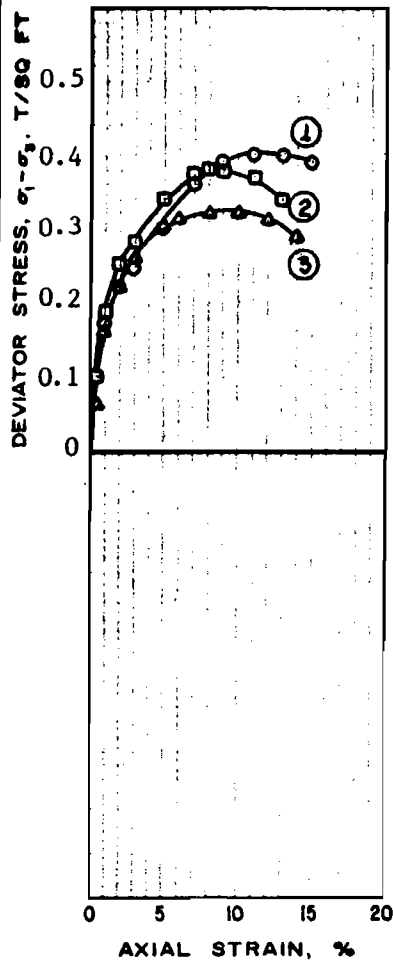
CLASSIFICATION Medium stiff gray & tan clay w/sand pockets & trace of organic matter

LL 58      PL 18      PI 40       $q_c$  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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

TAN  $\phi =$

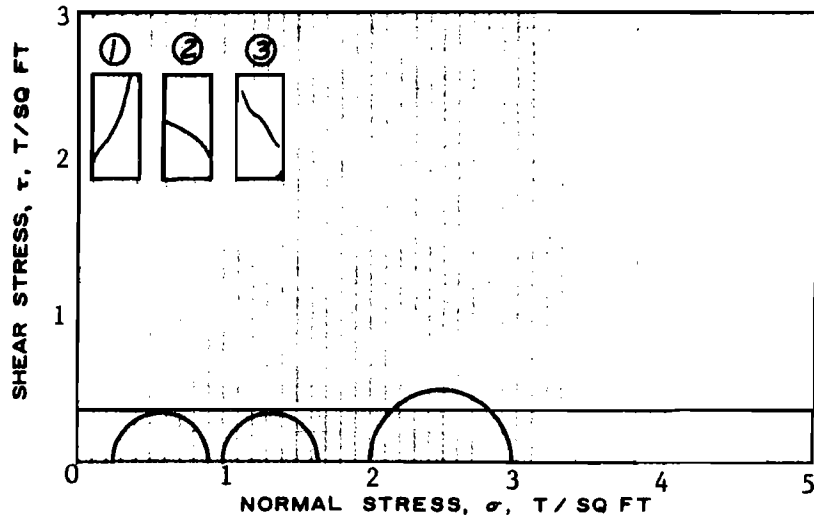
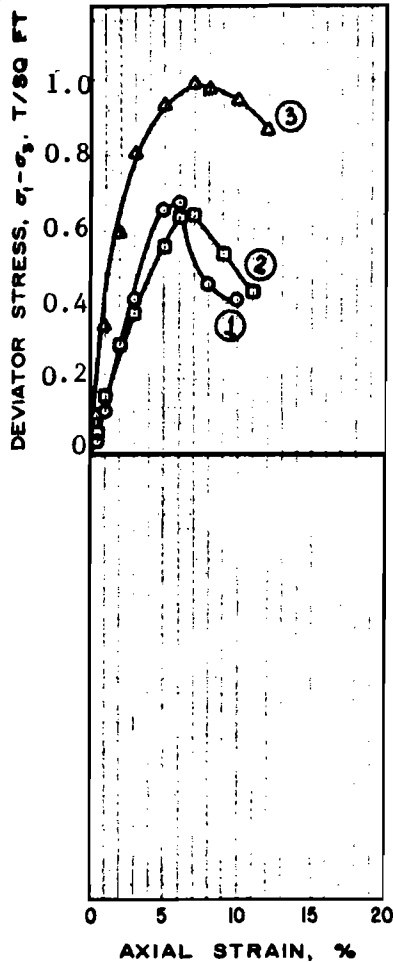
$c = 0.19$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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 |

|   |   |                     |               |
|---|---|---------------------|---------------|
| TYPE OF TEST UU   | TYPE OF SPECIMEN Undisturbed                  |                     |               |
| CLASSIFICATION Soft gray clay w/roots & trace of organic matter |   |                     |               |
| LL 83   | PL 24   | PI 59               | $\rho_s$ 2.70 |
| REMARKS<br>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 |               |
| <b>TRIAxIAL COMPRESSION TEST REPORT</b>                         |   |                     |               |



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.34$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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  |

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

$e_c$  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

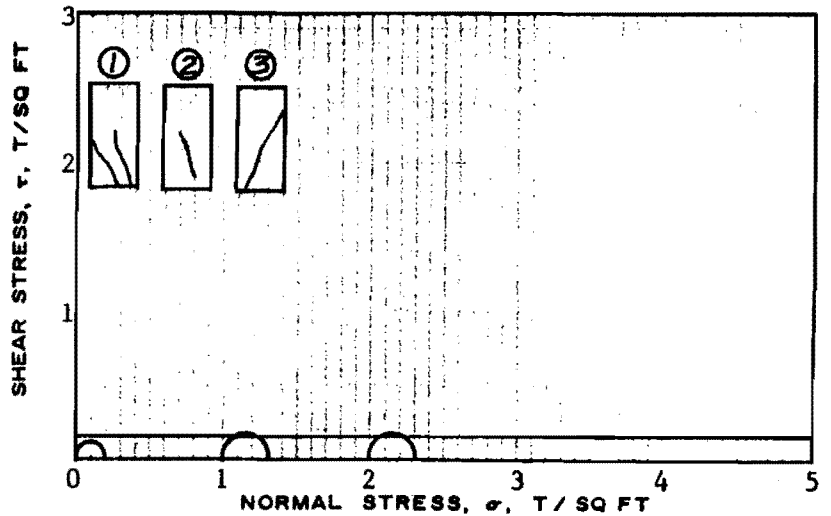
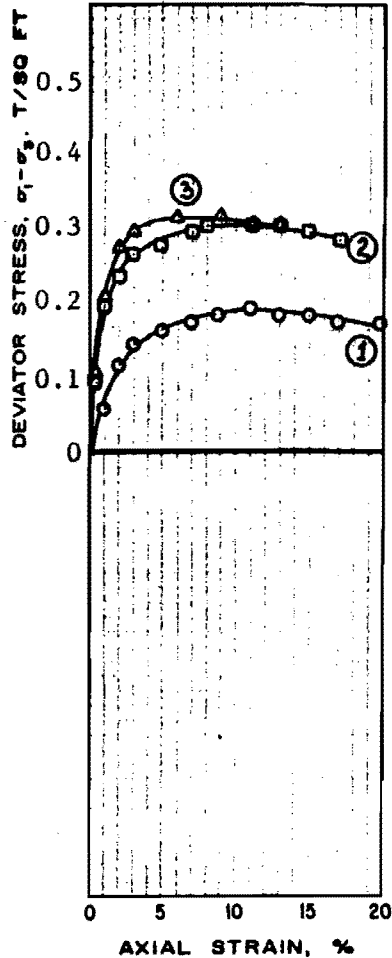
BORING NO. 31

SAMPLE NO. 2

DEPTH 5.0'

DATE 20 August 1981

**TRIAxIAL COMPRESSION TEST REPORT**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 TAN  $\phi =$   
 $c = 0.15$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 51.0 | 53.1 | 56.0 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/roots & organic matter

LL      PL      PI       $q_c$  2.65

REMARKS Shear values were taken from large scale plot.

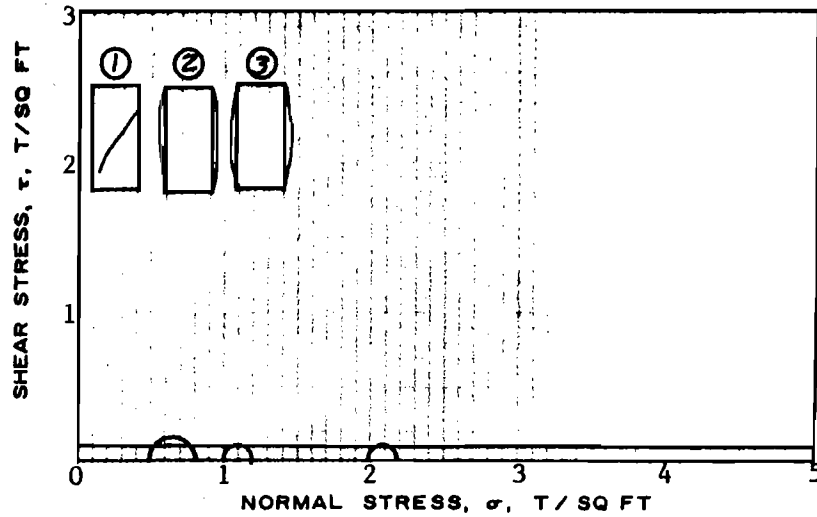
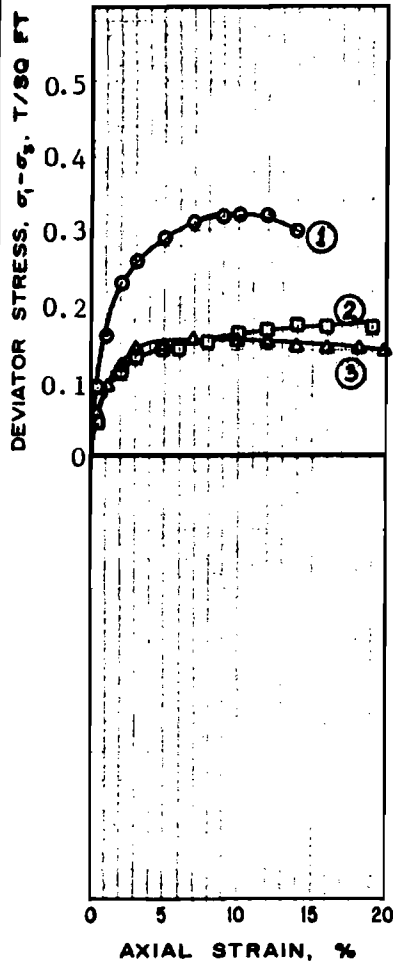
PROJECT Sewerage & Water Board of New Orleans  
 Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi =$  \_\_\_\_\_

$\tan \phi =$  \_\_\_\_\_

0.09

$c =$  \_\_\_\_\_ 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 $\gamma_d$   | 65.2 | 51.4 | 47.9 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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  $e_o$  2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

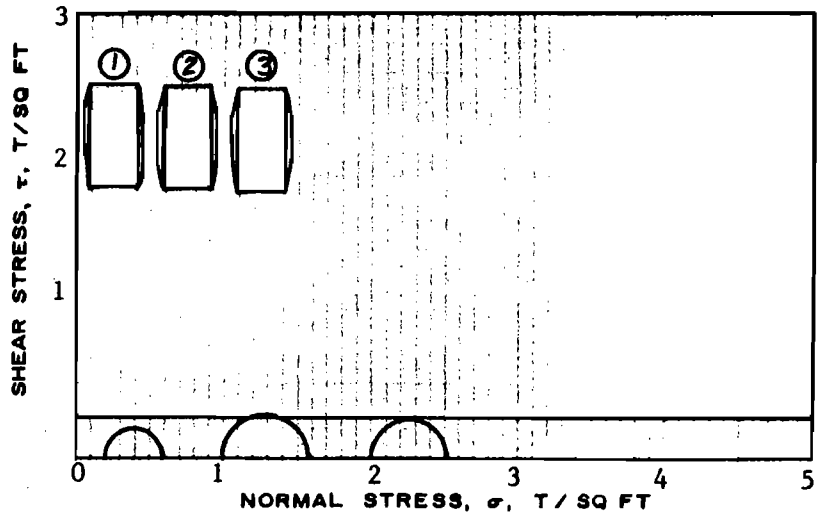
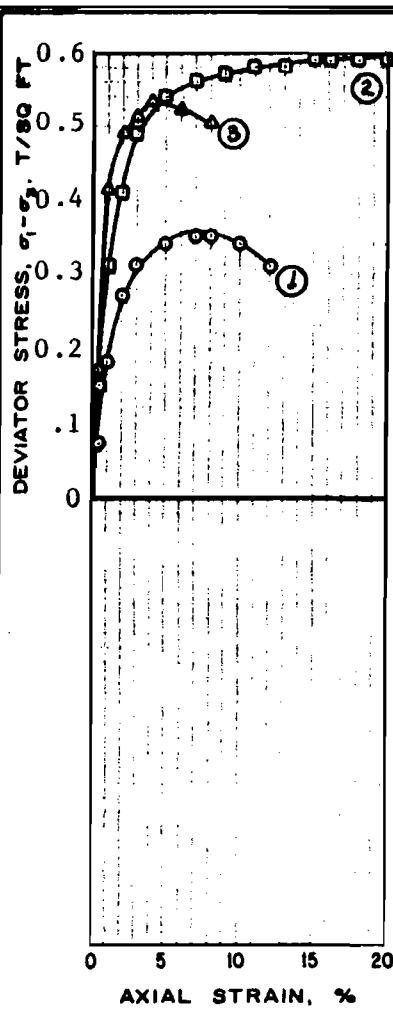
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

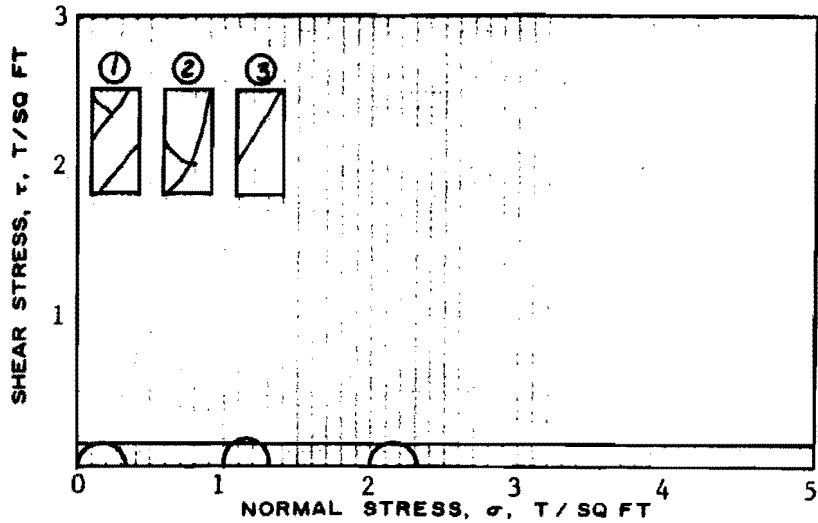
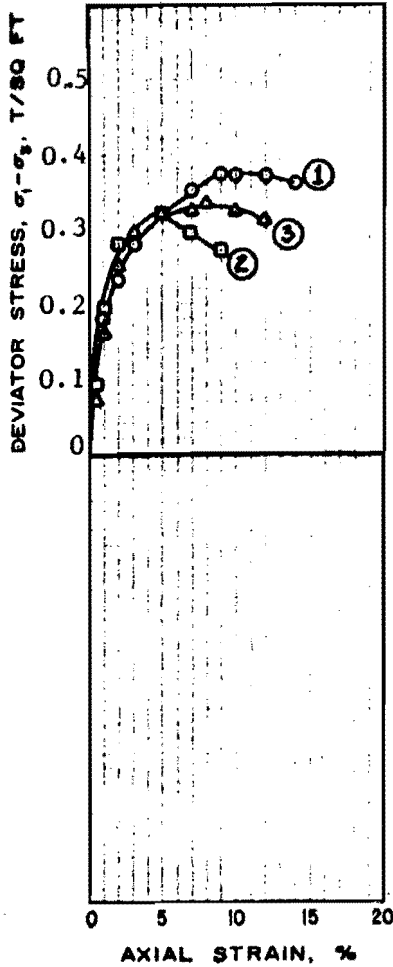
$\phi = 0$   
 TAN  $\phi =$  \_\_\_\_\_  
 $c = 0.27$  T/SQ FT

METHOD OF SATURATION \_\_\_\_\_

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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 |

|  |                              |  |                     |
|--|------------------------------|--|---------------------|
| TYPE OF TEST UU  | TYPE OF SPECIMEN Undisturbed |  |                     |
| CLASSIFICATION Medium stiff gray & tan clay w/silt & trace of organic matter |                              |  |                     |
| LL   | PL                           | PI   | $q_s$ 2.74          |
| REMARKS Shear values were taken from large scale plot.                       |                              | PROJECT Sewerage & Water Board of New Orleans<br>Metairie Relief Canal |                     |
|  |                              | AREA Sta. 554+00 to Sta. 670+00  |                     |
|  |                              | BORING NO. 36  | SAMPLE NO. 2        |
|  |                              | DEPTH 5.0'   | DATE 20 August 1981 |
| <b>TRIAxIAL COMPRESSION TEST REPORT</b>                                      |                              |  |                     |



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

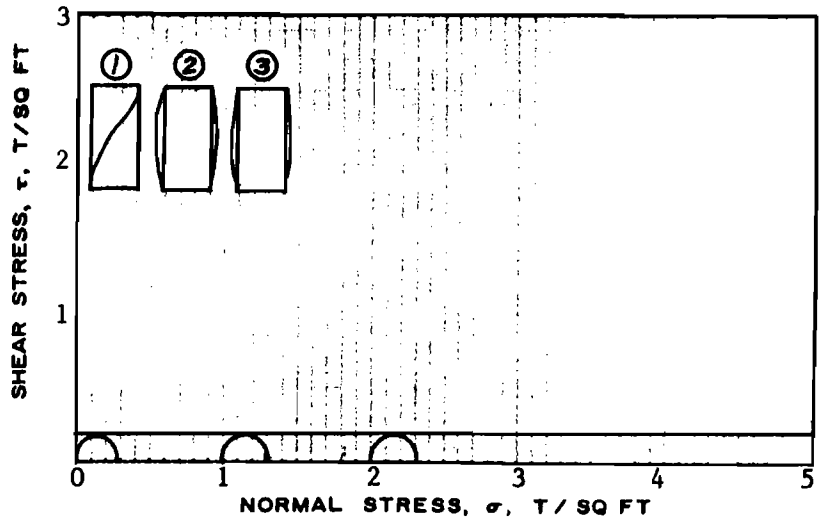
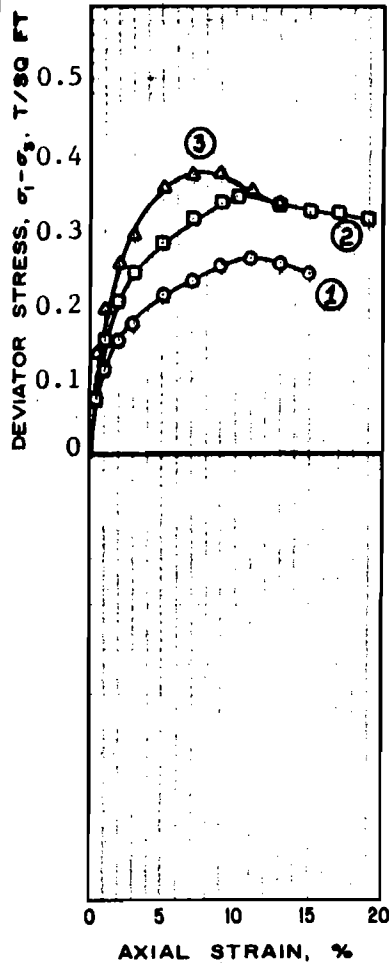
$c = 0.17$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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/GU FT $\gamma_d$   | 57.7 | 55.1 | 58.3 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

|   |  |                  |             |                |            |
|---|--|------------------|-------------|----------------|------------|
| TYPE OF TEST                            | UU   | TYPE OF SPECIMEN | Undisturbed |                |            |
| CLASSIFICATION                          | Soft gray clay w/organic clay layers           |                  |             |                |            |
| LL                                      | 102  | PL               | 27          | PI             | 75         |
|   |  |                  |             |                | $q_u$ 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 |            |
| <b>TRIAxIAL COMPRESSION TEST REPORT</b> |  |                  |             |                |            |



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 TAN  $\phi =$  \_\_\_\_\_  
 $c = 0.17$  T/SQ FT

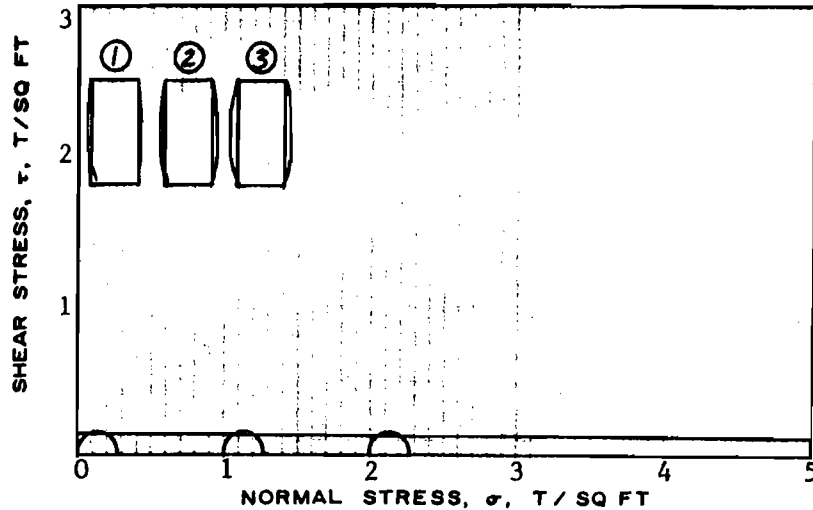
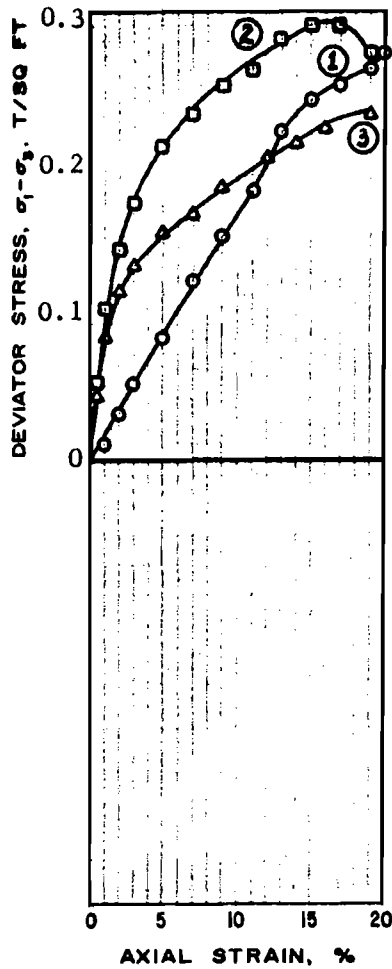
METHOD OF SATURATION \_\_\_\_\_

- 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 $\gamma_d$   | 66.6 | 68.6 | 69.4 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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   | $a_c$ 2.74          |
| REMARKS Shear values were taken from large scale plot. |                              | PROJECT Sewerage & Water Board of New Orleans<br>Metairie Relief Canal |                     |
|  |                              | AREA Sta. 554+00 to Sta. 670+00  |                     |
|  |                              | BORING NO. 36  | SAMPLE NO. 7        |
|  |                              | DEPTH 24.0'  | DATE 20 August 1981 |
| <b>TRIAxIAL COMPRESSION TEST REPORT</b>                |                              |  |                     |





**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 $\tan \phi =$   
 $c = 0.13$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 88.1  | 86.8  | 84.3  |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |       |       |       |
|  | VOID RATIO $e_o$                   |       |       |       |
|  | SATURATION % $S_o$                 |       |       |       |
|  | 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 $\sigma_3$                 |                                    | 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  |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

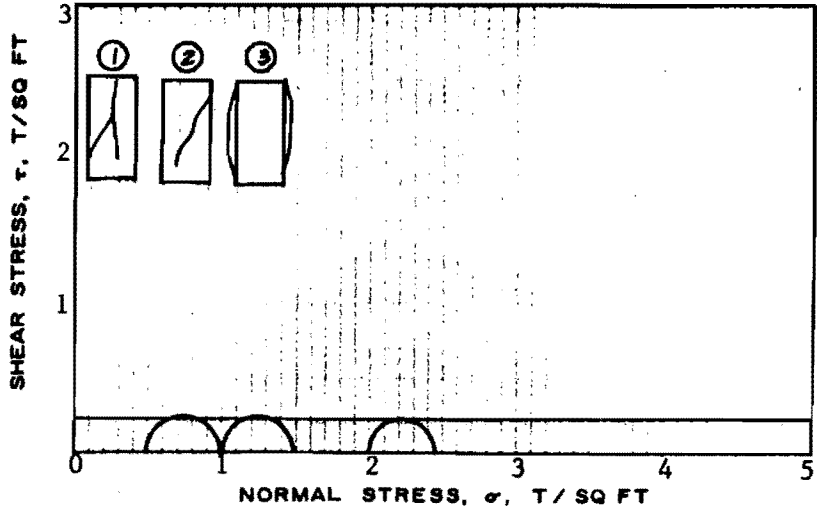
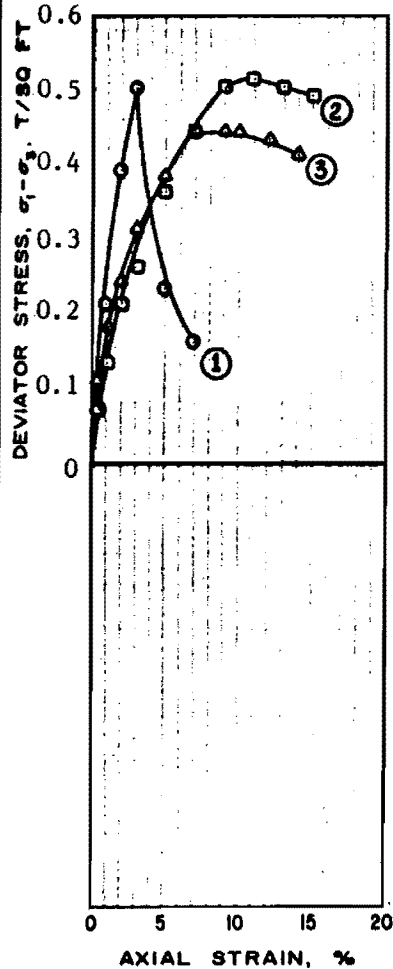
CLASSIFICATION Soft gray clay w/clayey silt layers & roots

LL      PL      PI       $a_s$  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**



**SHEAR STRENGTH PARAMETERS**  
 $\phi = 0$   
 $\tan \phi =$   
 $c = 0.25$  T/SQ FT

METHOD OF SATURATION \_\_\_\_\_

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 89.6  | 82.4 | 84.0 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |       |      |      |
|  | VOID RATIO $e_o$                   |       |      |      |
|  | SATURATION % $S_o$                 |       |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Loose gray clayey silt w/roots

LL      PL      PI       $e_o$  2.70

REMARKS Shear values were taken from large scale plot.

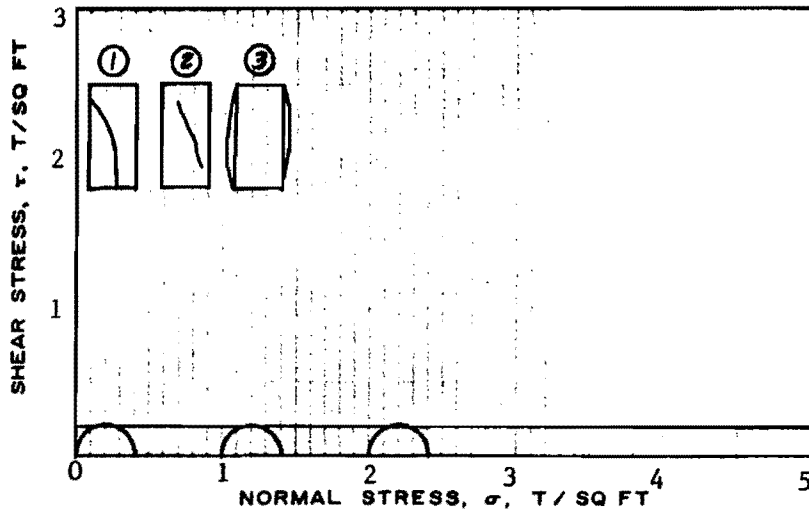
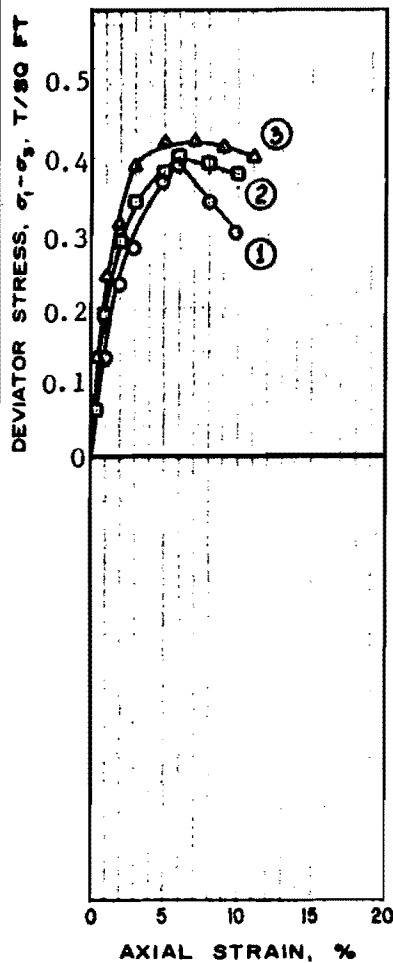
PROJECT Sewerage & Water Board of New Orleans  
 Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.20$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/silt lenses

LL 63      PL 20      PI 43       $e_o$  2.74

REMARKS Shear values were taken from large scale plot.

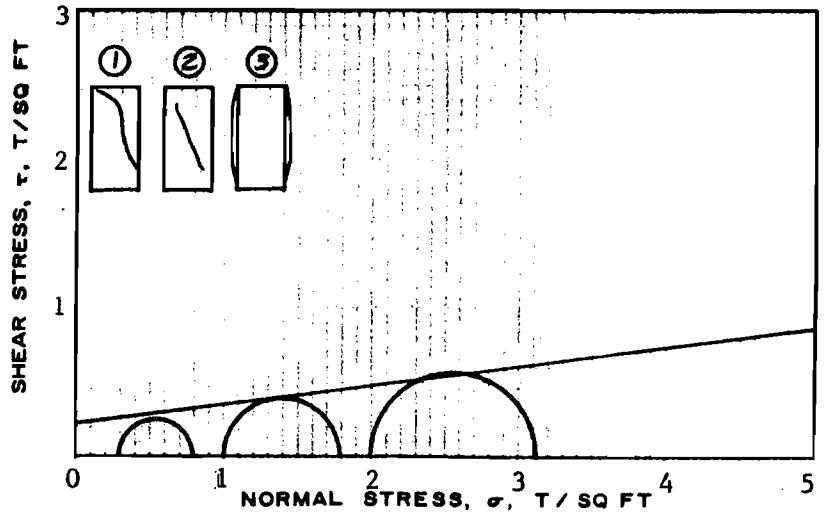
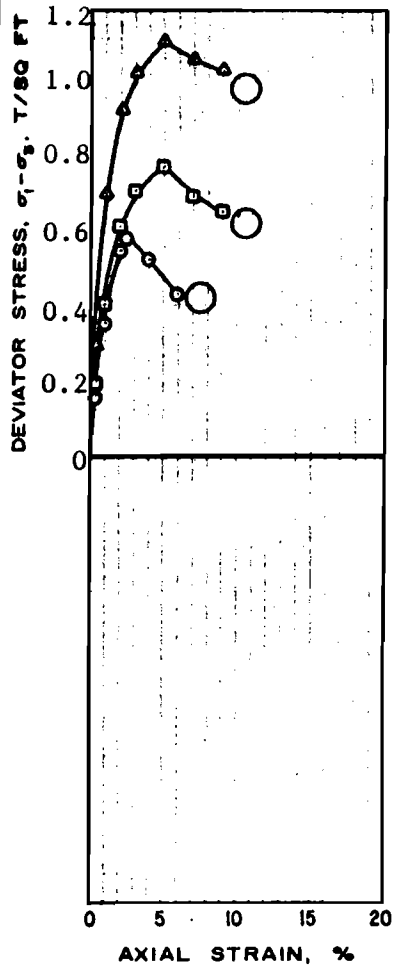
PROJECT Sewerage & Water Board of New Orleans  
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

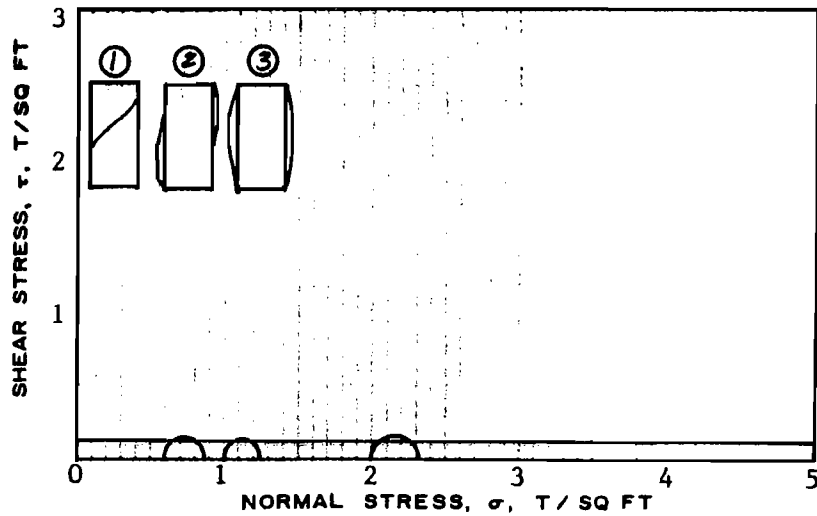
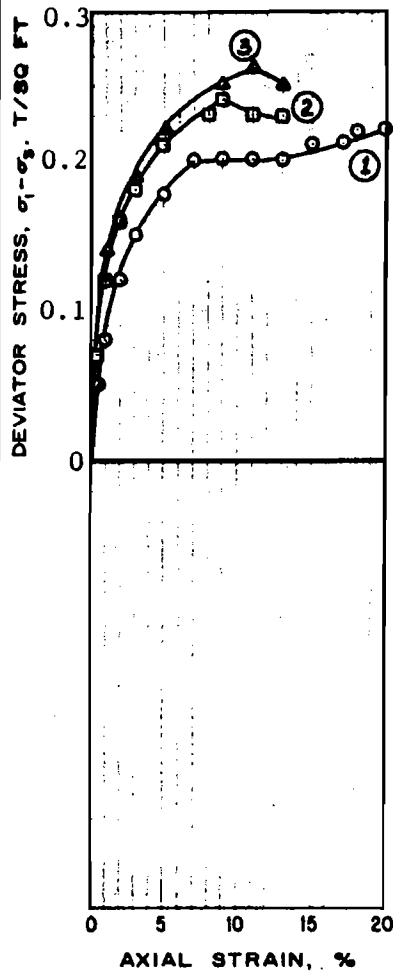
$\phi = 7^\circ$   
 $\tan \phi = 0.123$   
 $c = 0.23$  T/SQ FT

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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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   | $e_o$ 2.70          |
| REMARKS Shear values were taken from large scale plot.         |                              | PROJECT Sewerage & Water Board of New Orleans<br>Metairie Relief Canal |                     |
|  |                              | AREA Sta. 554+00 to Sta. 670+00  |                     |
|  |                              | BORING NO. 44  | SAMPLE NO. 2        |
|  |                              | DEPTH 5.0'   | DATE 20 August 1981 |
| <b>TRIAxIAL COMPRESSION TEST REPORT</b>                        |                              |  |                     |



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 $c = 0.12$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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 |

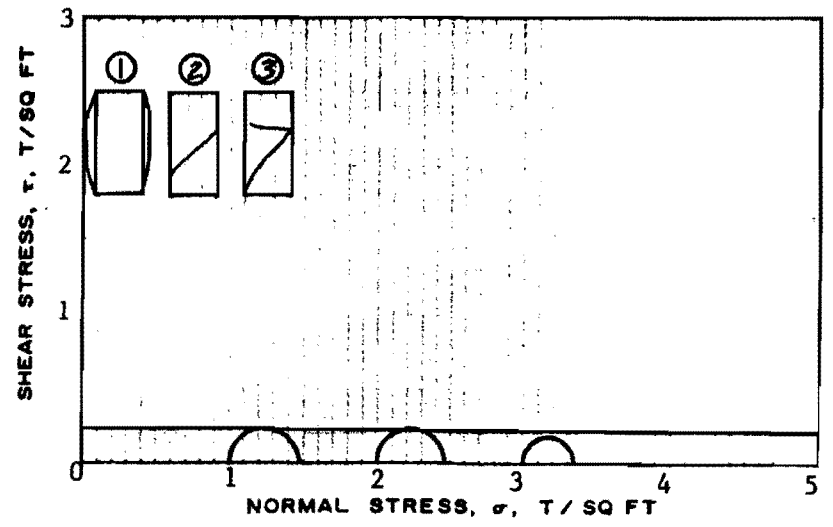
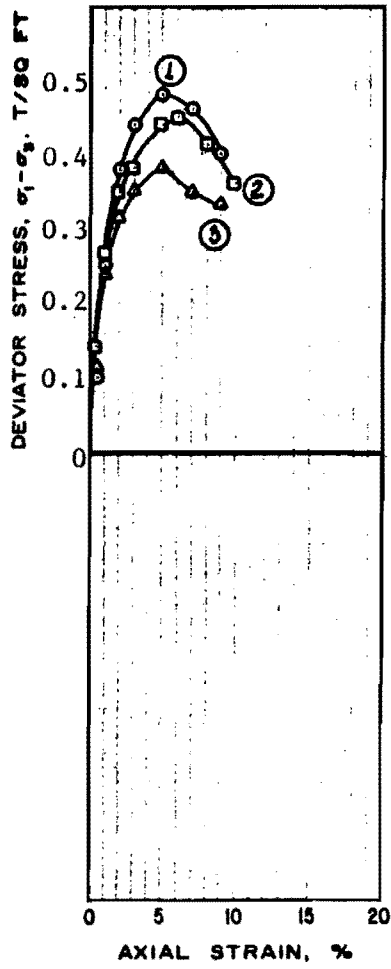
TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Very soft gray clay w/silt pockets & roots

LL      PL      PI       $\rho_s$  2.70

|   |   |                     |
|---|---|---------------------|
| REMARKS<br>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**



**SHEAR STRENGTH PARAMETERS**  
 $\phi = 0$   
 $\tan \phi =$   
 $c = 0.22$  T/SQ FT

METHOD OF SATURATION \_\_\_\_\_

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$                           | 57.7 | 57.9 | 57.9 |
| BEFORE SHEAR | WATER CONTENT % $w_o$                                      |      |      |      |
|              | VOID RATIO $e_o$   |      |      |      |
|              | SATURATION % $S_o$   |      |      |      |
| FINAL        | FINAL BACK PRESSURE, T/SQ FT $u_o$                         |      |      |      |
|              | 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 $\sigma_3$                 | 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 |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

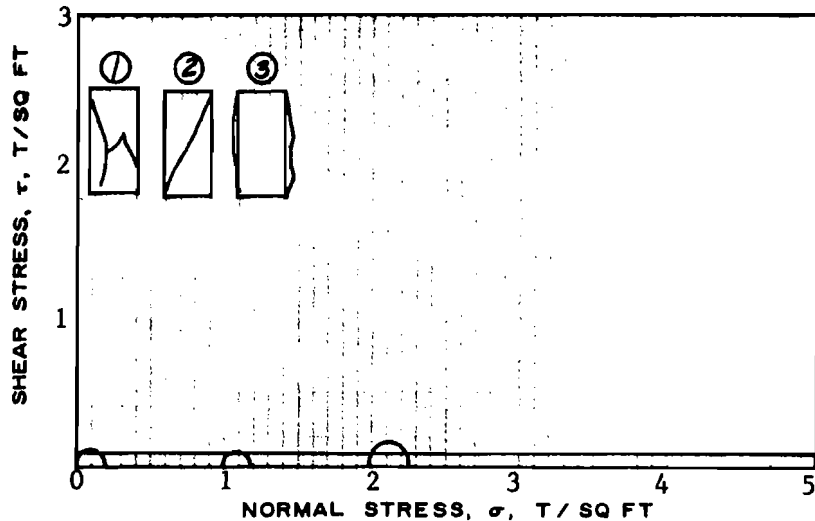
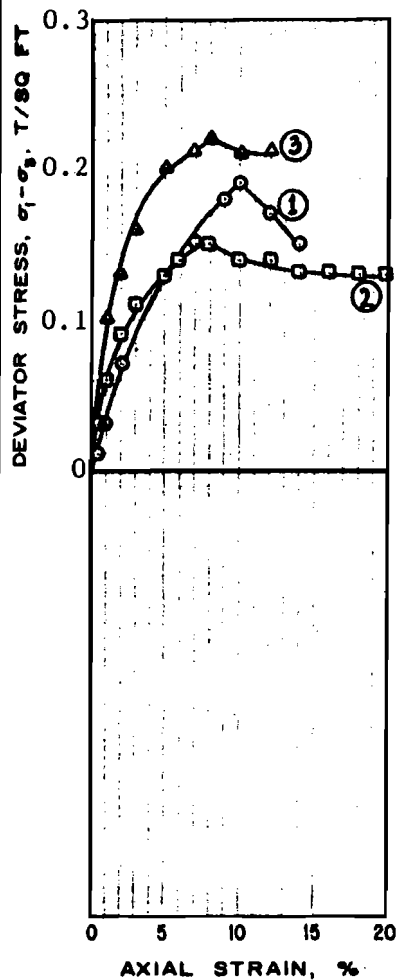
CLASSIFICATION Soft gray clay

LL      PL      PI       $e_o$  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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.09$  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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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

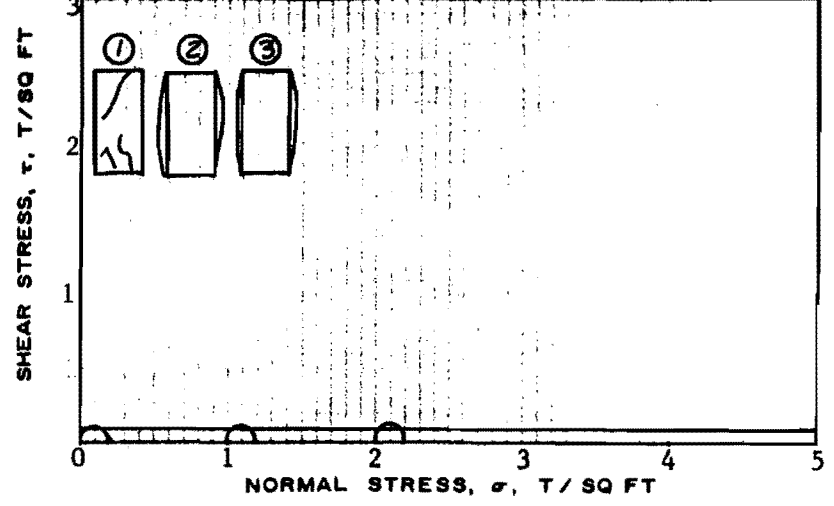
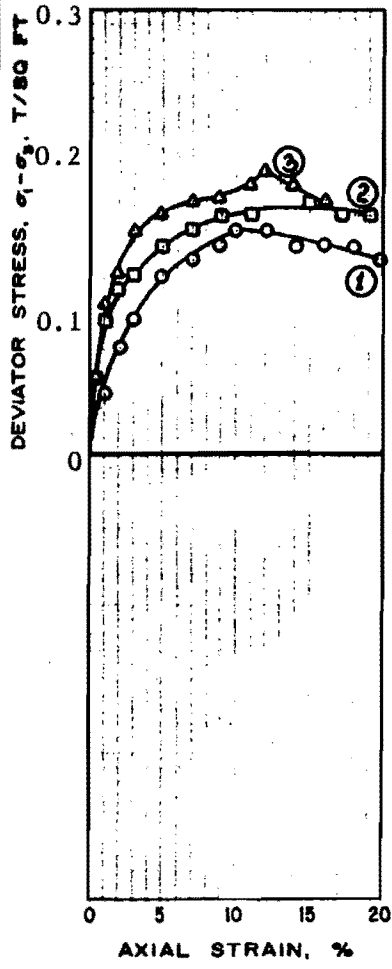
CLASSIFICATION Very soft dark brown humus w/roots

LL      PL      PI       $w_p$  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**



**SHEAR STRENGTH PARAMETERS**  
 $\phi = 0$   
 $\tan \phi =$   
 $c = 0.09$  T/SQ FT

METHOD OF SATURATION \_\_\_\_\_

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 62.4 | 64.0 | 64.3 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Very soft gray clay w/silt pockets & roots

LL 58      PL 21      PI 37       $q_c$  2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans  
 Metairie Relief Canal

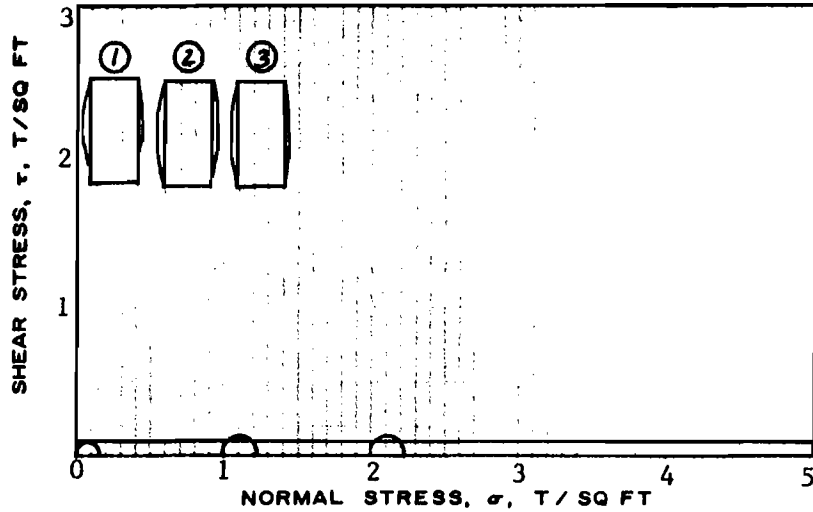
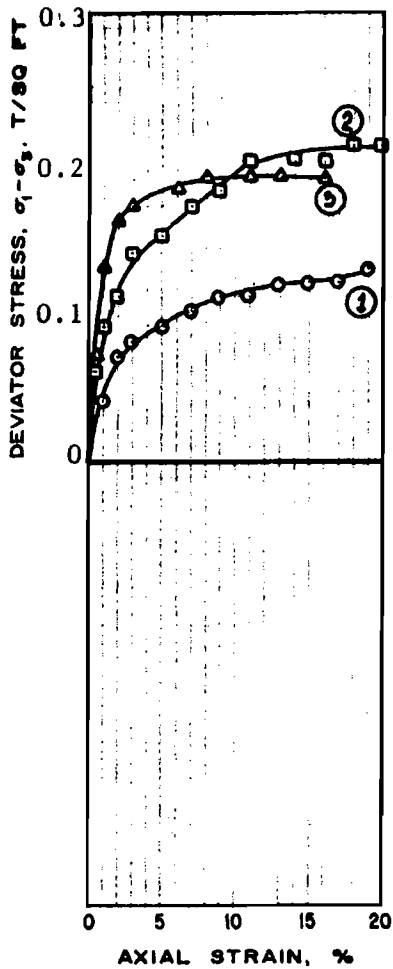
AREA Sta. 554+00 to Sta. 670+00

BORING NO. 47      SAMPLE NO. 3

DEPTH 11.0'      DATE 20 August 1981

**TRIAxIAL COMPRESSION TEST REPORT**





**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.10$  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 $\gamma_d$   | 57.1 | 58.8 | 55.4 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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  $e_o$  2.74

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

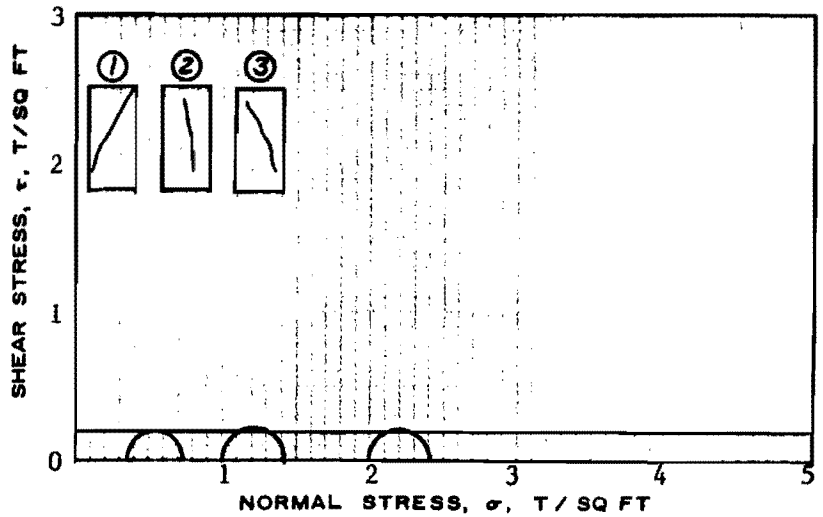
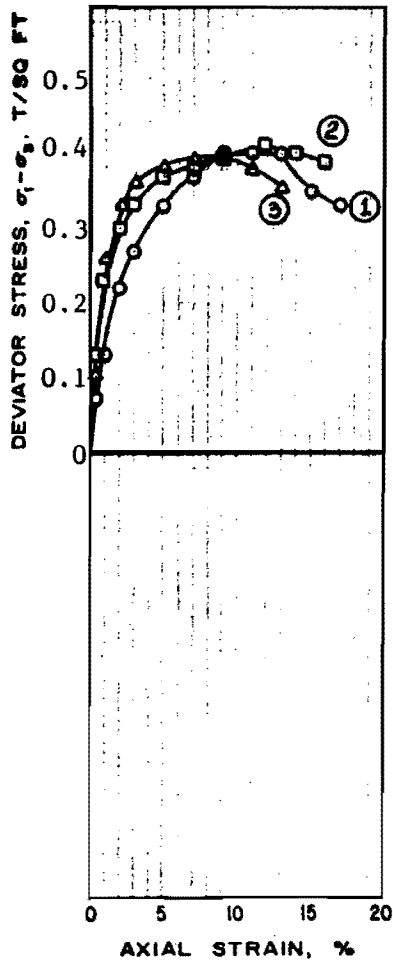
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 TAN  $\phi =$   
 $c = 0.20$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 94.1  | 86.9  | 86.8  |
| BEFORE SHEAR   | WATER CONTENT % $w_c$              |       |       |       |
|  | VOID RATIO $e_o$                   |       |       |       |
|  | 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 $\sigma_3$                 |                                    | 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  |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION      Soft gray & tan silty clay

LL 47      PL 16      PI 31       $w_L$  2.70

REMARKS      Shear values were taken from large scale plot.

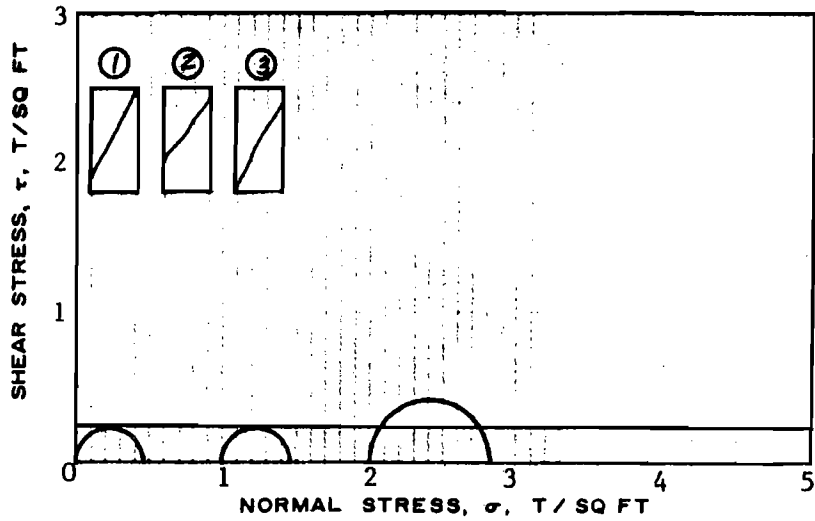
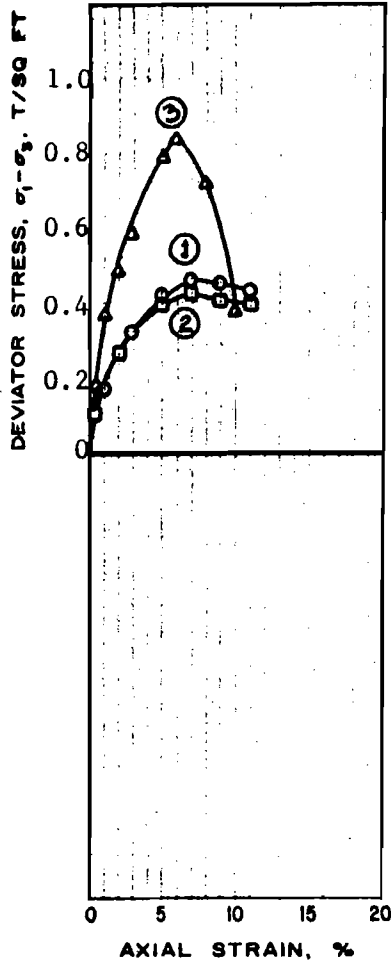
PROJECT      Sewerage & Water Board of New Orleans  
 Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.23$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| TEST NO.   |                                    | 1     | 2     | 3     |
|--|------------------------------------|-------|-------|-------|
| INITIAL  | WATER CONTENT % $w_o$              | 147.0 | 149.0 | 244.7 |
|  | VOID RATIO $e_o$                   | 4.27  | 4.34  | 6.97  |
|  | SATURATION % $S_o$                 | 90    | 89    | 91    |
|  | DRY DENSITY, LB/CU FT $\gamma_d$   | 30.8  | 30.4  | 20.3  |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |       |       |       |
|  | VOID RATIO $e_o$                   |       |       |       |
|  | SATURATION % $S_o$                 |       |       |       |
|  | FINAL BACK PRESSURE, T/SQ FT $u_o$ |       |       |       |
| FINAL  | WATER CONTENT % $w_f$              | 147.0 | 149.0 | 244.7 |
|  | VOID RATIO $e_f$                   | 4.27  | 4.34  | 6.97  |
| MINOR PRINCIPAL STRESS, T/SQ FT $\sigma_3$                 |                                    | 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       $e_o$  2.60

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

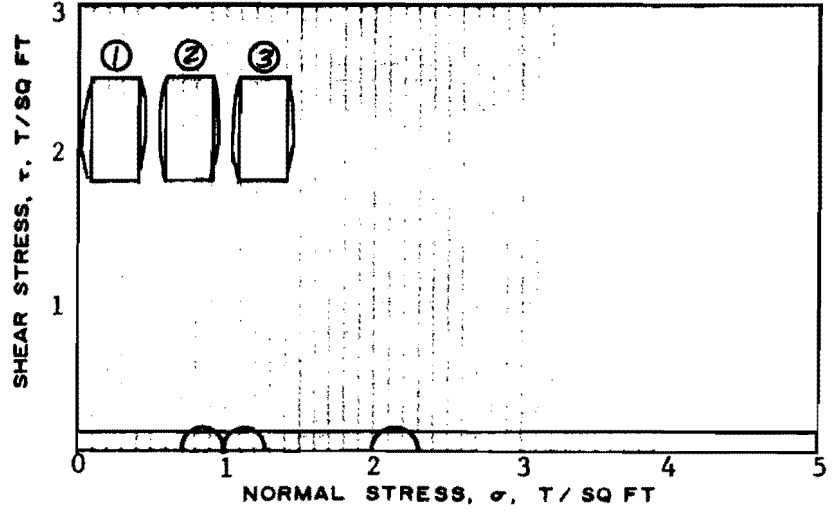
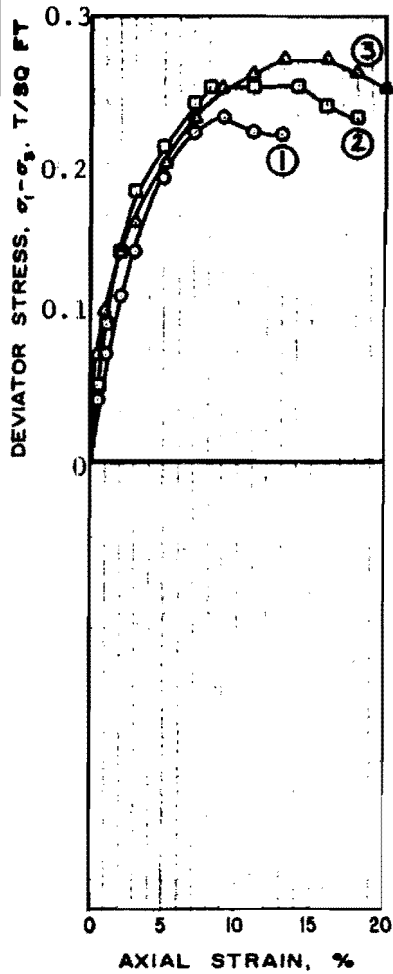
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

0.13

$c =$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU TYPE OF SPECIMEN Undisturbed

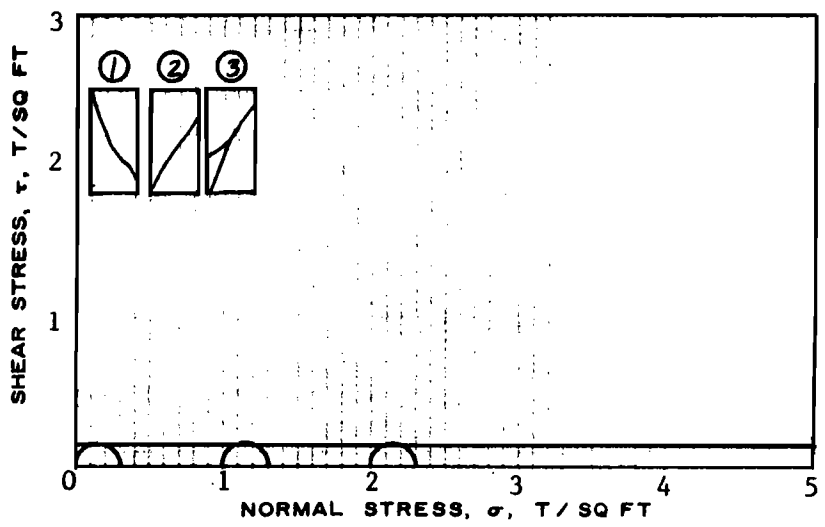
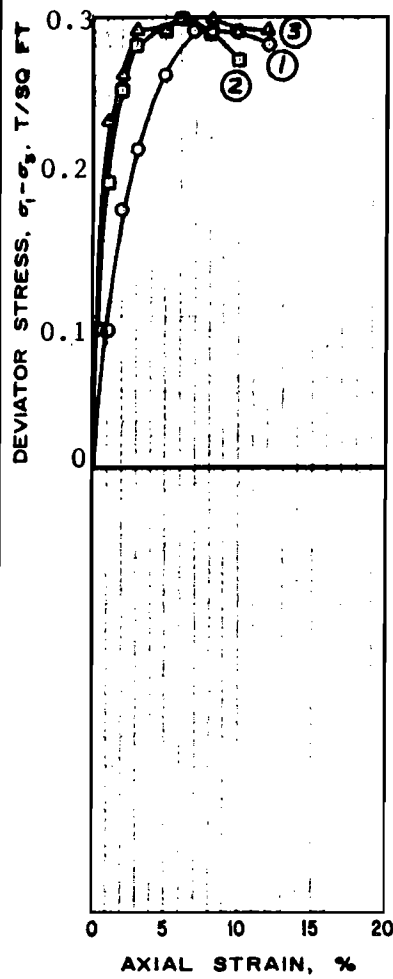
CLASSIFICATION Soft gray silty clay w/roots

LL 48 PL 22 PI 26  $\rho_s$  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. 7  
DEPTH 24.0' DATE 20 August 1981

**TRIAXIAL COMPRESSION TEST REPORT**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 $\tan \phi =$   
 $c = 0.15$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 58.3 | 57.6 | 59.0 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU TYPE OF SPECIMEN Undisturbed

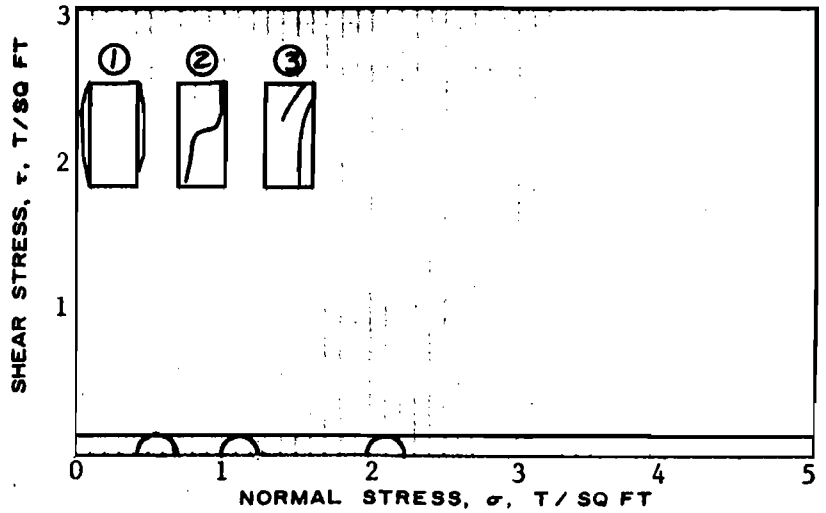
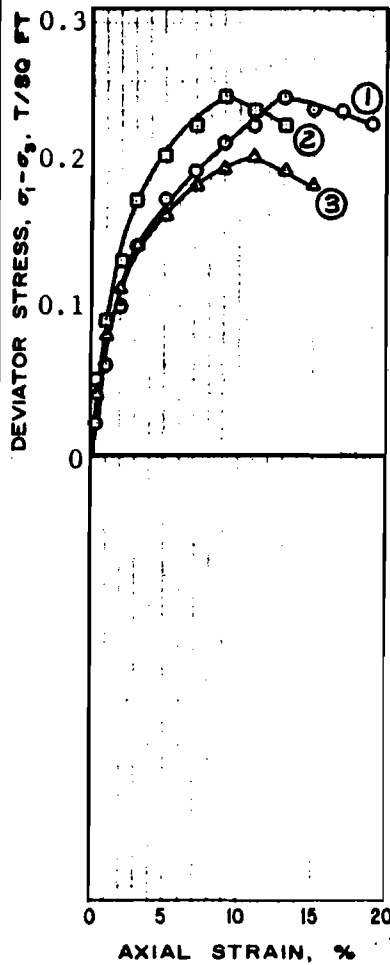
CLASSIFICATION Soft gray clay

LL PL PI  $e_s$  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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.12$  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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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

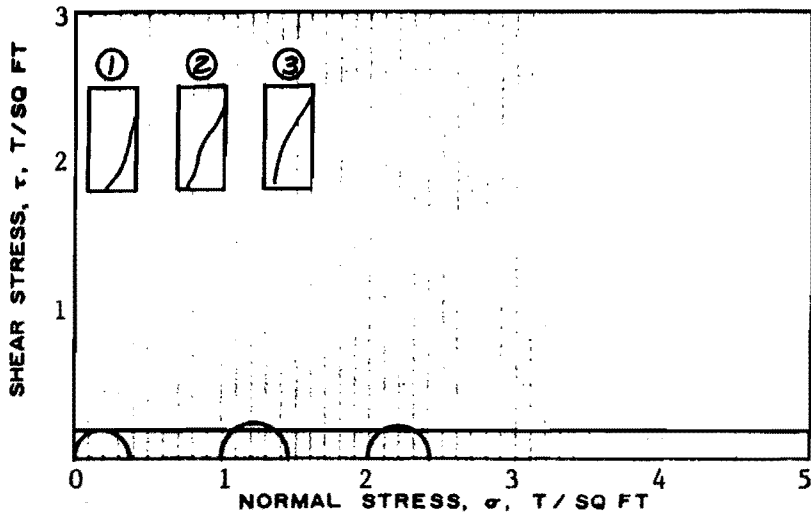
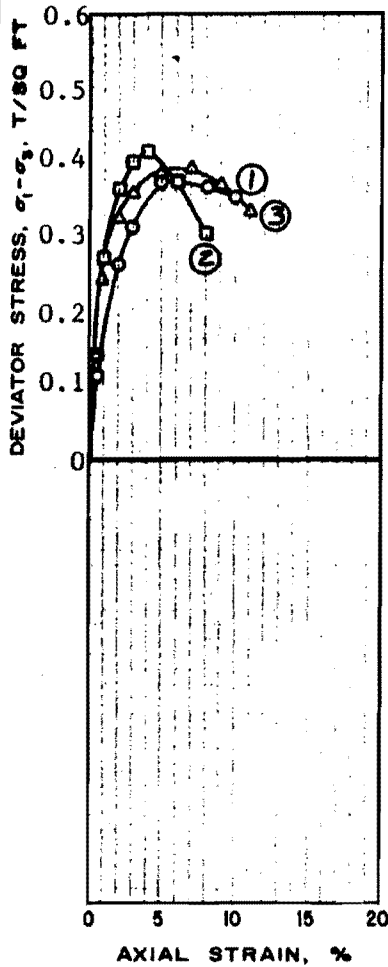
CLASSIFICATION Very soft dark brown humus w/decayed roots

LL \_\_\_\_\_ PL \_\_\_\_\_ PI \_\_\_\_\_  $q_c$  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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.20$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 61.4 | 61.7 | 60.9 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray clay w/silt lenses

LL 75      PL 24      PI 51       $e_o$  2.74

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

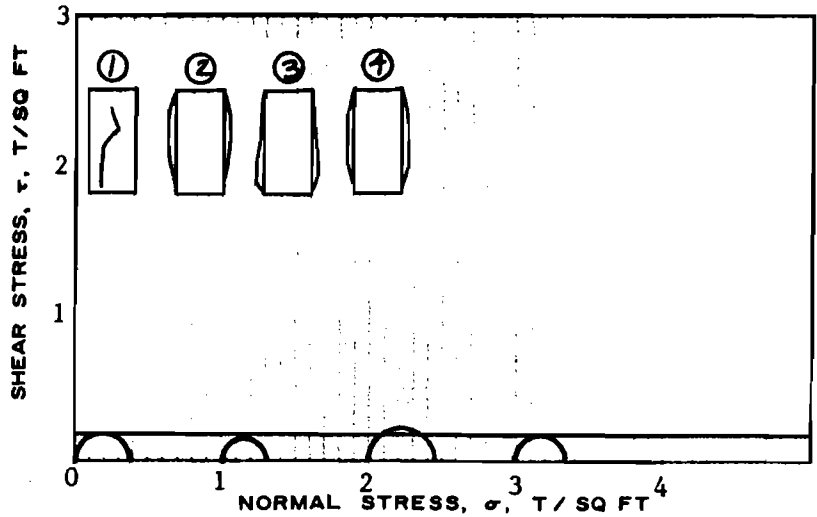
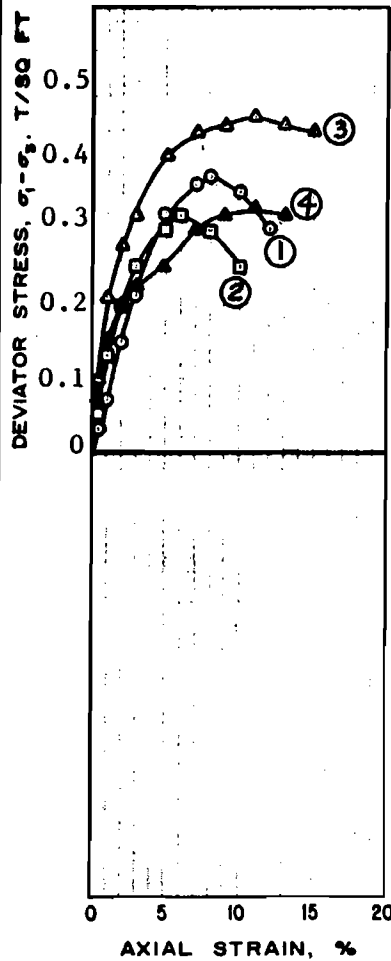
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

TAN  $\phi =$

$c = 0.185$  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  |
|  | VOID RATIO $e_o$                   | 0.985 | 0.853 | 1.13 | 0.945 |
|  | SATURATION % $S_o$                 | 93    | 93    | 97   | 88    |
|  | DRY DENSITY, LB/CU FT $\gamma_d$   | 84.9  | 90.9  | 79.0 | 86.6  |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |       |       |      |       |
|  | VOID RATIO $e_o$                   |       |       |      |       |
|  | SATURATION % $S_o$                 |       |       |      |       |
|  | FINAL BACK PRESSURE, T/SQ FT $u_o$ |       |       |      |       |
| FINAL  | WATER CONTENT % $w_f$              | 34.0  | 29.5  | 40.7 | 30.9  |
|  | VOID RATIO $e_f$                   | 0.985 | 0.853 | 1.13 | 0.945 |
| MINOR PRINCIPAL STRESS, T/SQ FT $\sigma_3$                 |                                    | 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

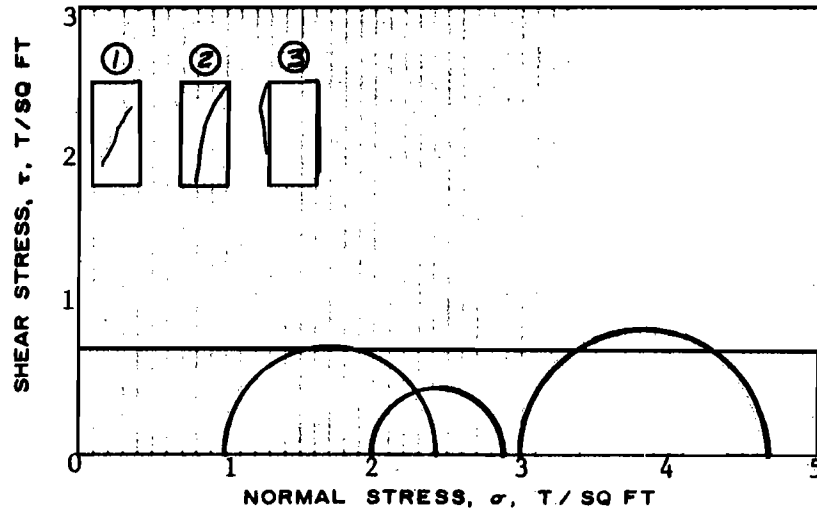
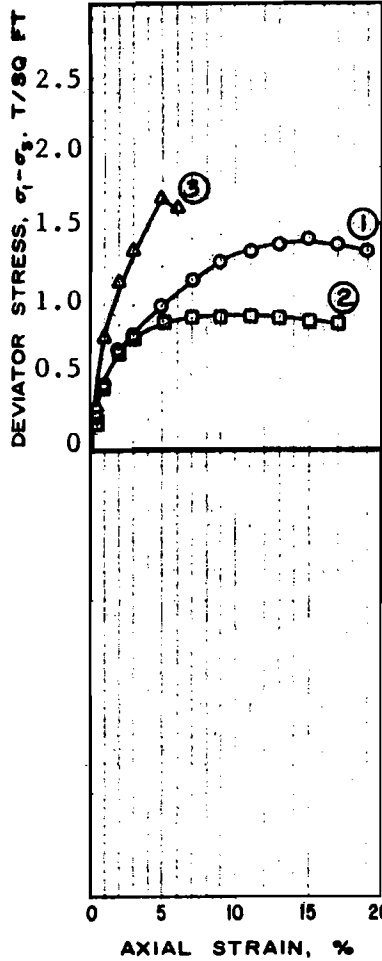
LL      PL      PI       $\alpha_s$  2.70

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**





**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

TAN  $\phi =$

$c = 0.70$  T/SQ FT

**METHOD OF SATURATION**

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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  |

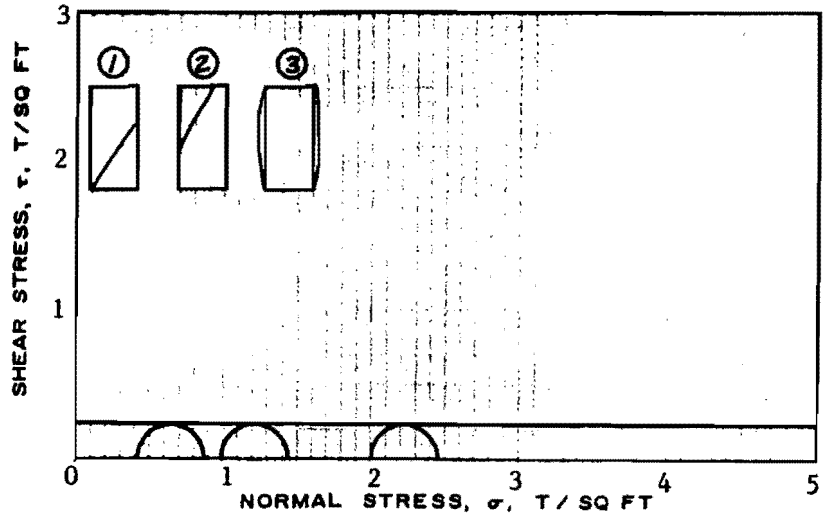
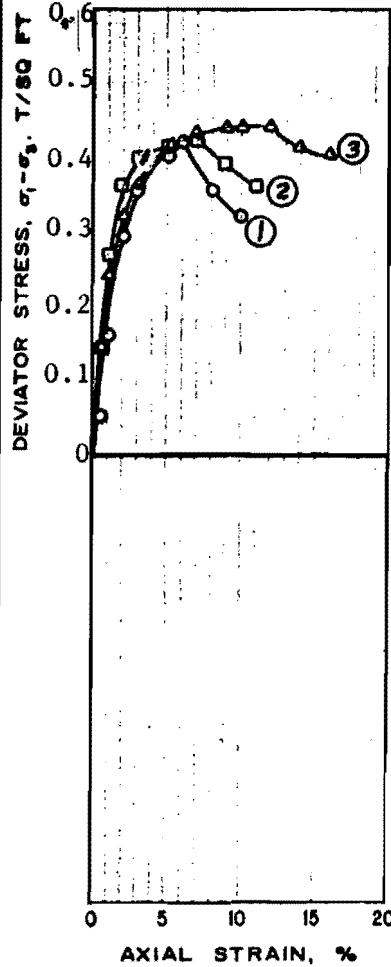
TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium compact gray & brown clayey silt w/roots

LL      PL      PI       $a_p$  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 |
|  | <b>TRIAXIAL COMPRESSION TEST REPORT</b>       |                     |

60/4



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.21$  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 $\gamma_d$   | 81.0 | 79.6 | 76.5 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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

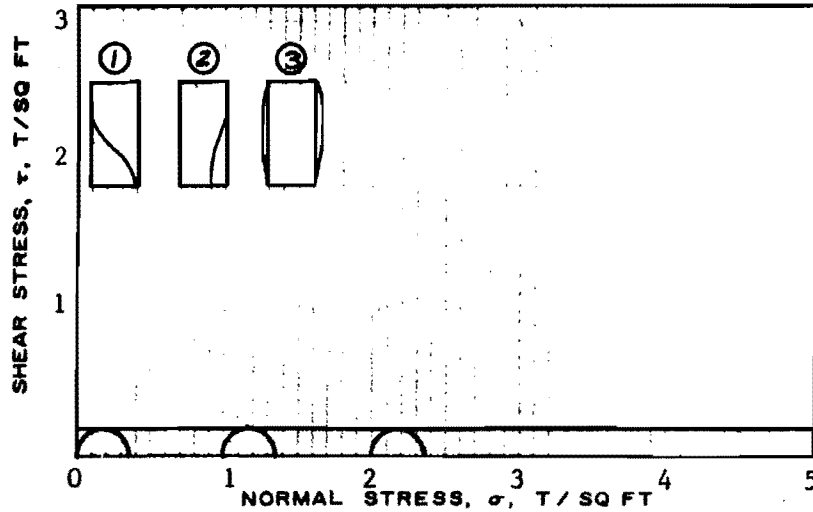
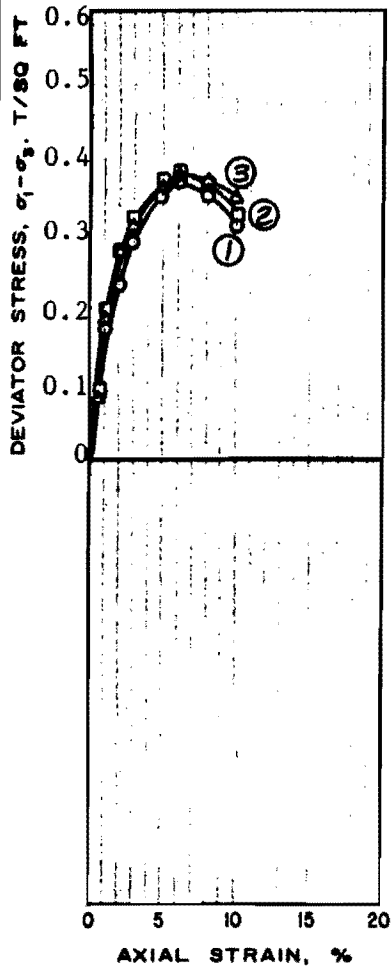
CLASSIFICATION Soft gray silty clay w/sandy silt layers & lenses

LL 43      PL 20      PI 23       $q_c$  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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.19$  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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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 |

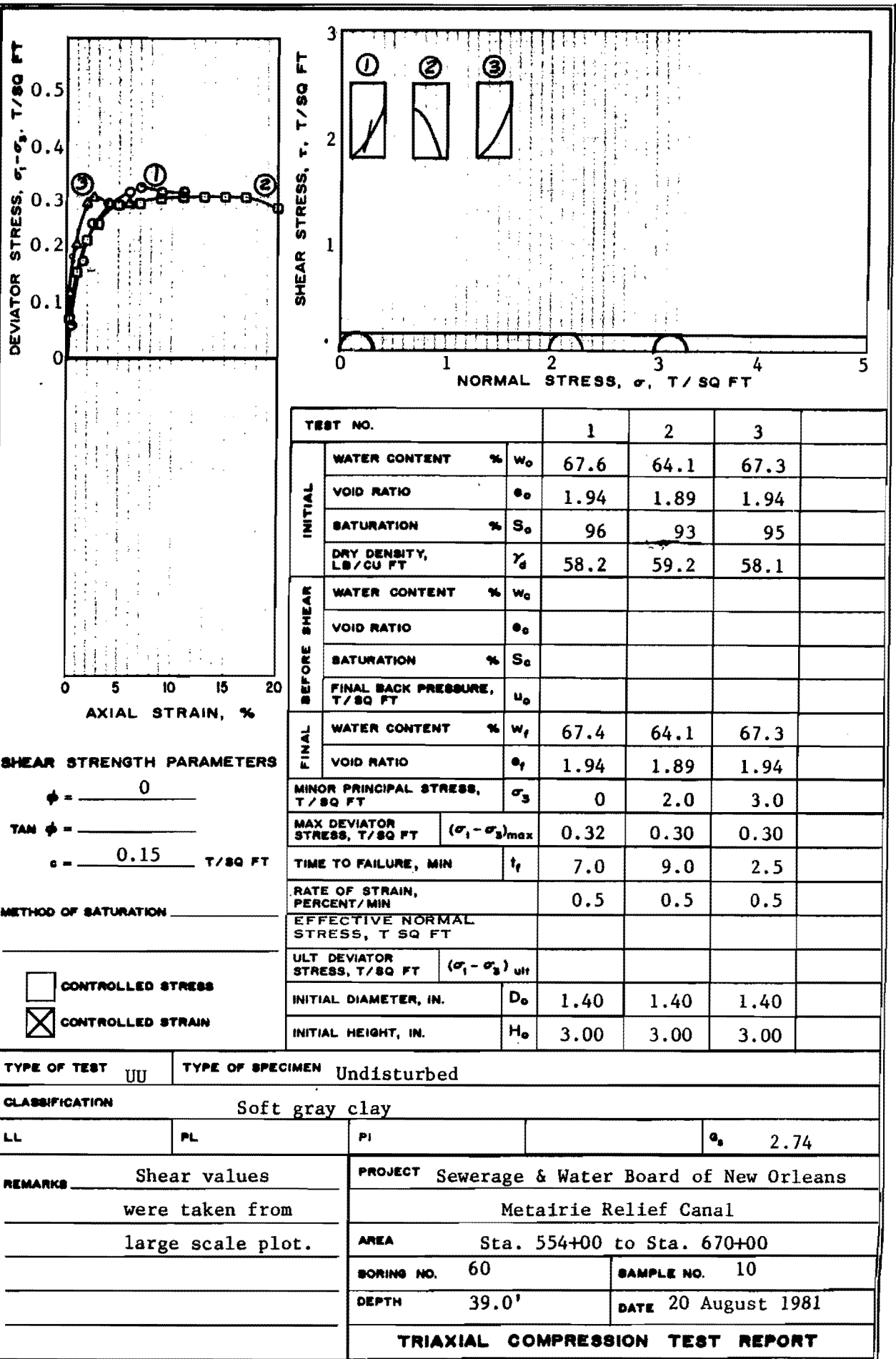
TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

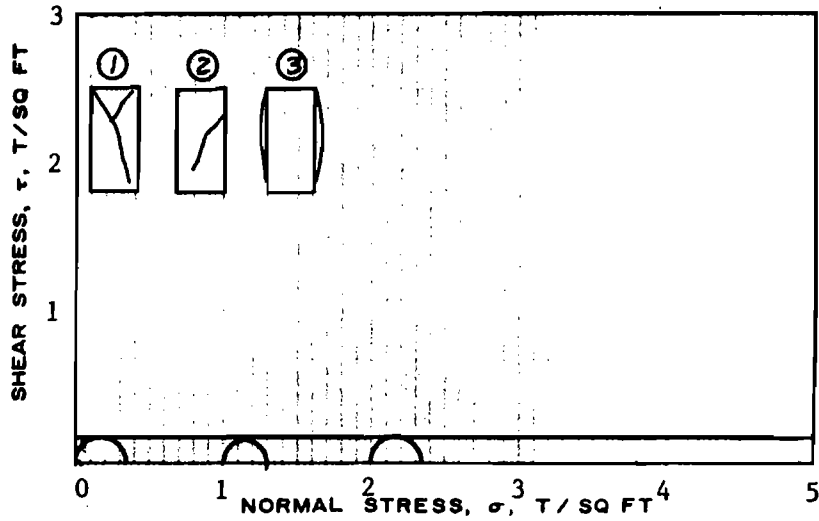
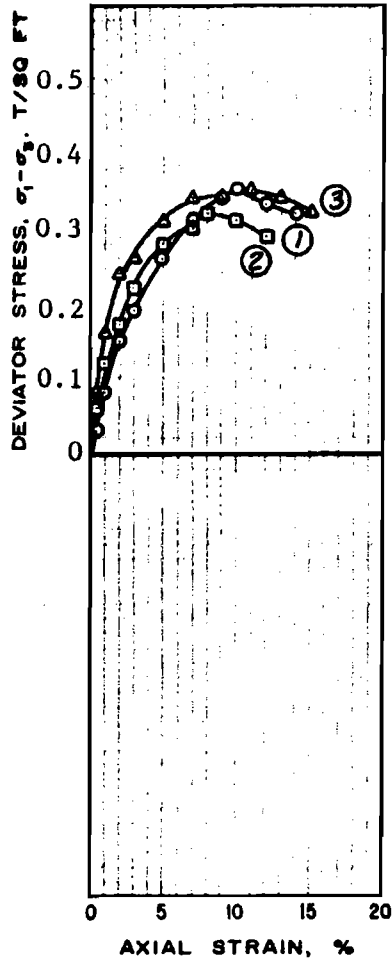
CLASSIFICATION Soft gray clay w/silt lenses

LL 66      PL 20      PI 46       $\rho_s$  2.74

|   |            |                                       |            |                |
|---|------------|---------------------------------------|------------|----------------|
| REMARKS<br>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**





**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 $\tan \phi =$   
 $c = 0.18$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 31.8  | 32.3  | 33.6  |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |       |       |       |
|  | VOID RATIO $e_o$                   |       |       |       |
|  | SATURATION % $S_o$                 |       |       |       |
|  | 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 $\sigma_3$                 |                                    | 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  |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Soft gray & black organic clay w/humus

LL 210      PL 77      PI 133       $q_u$  2.60

REMARKS Shear values were taken from large scale plot.

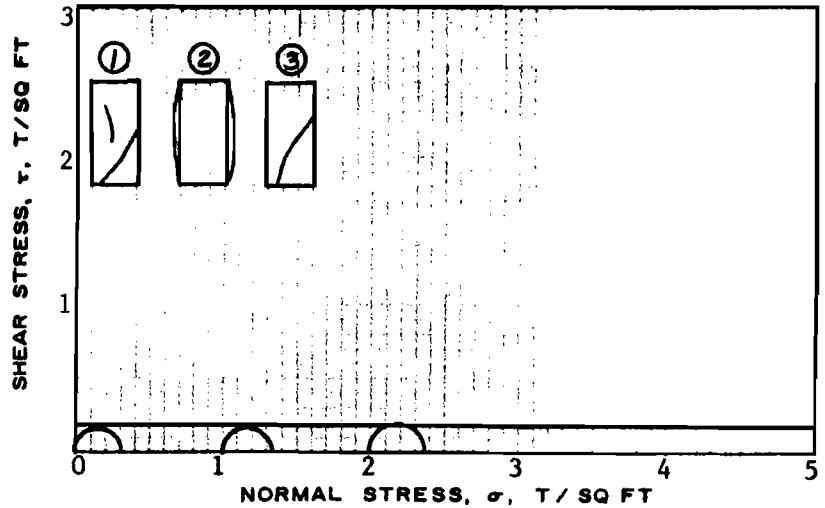
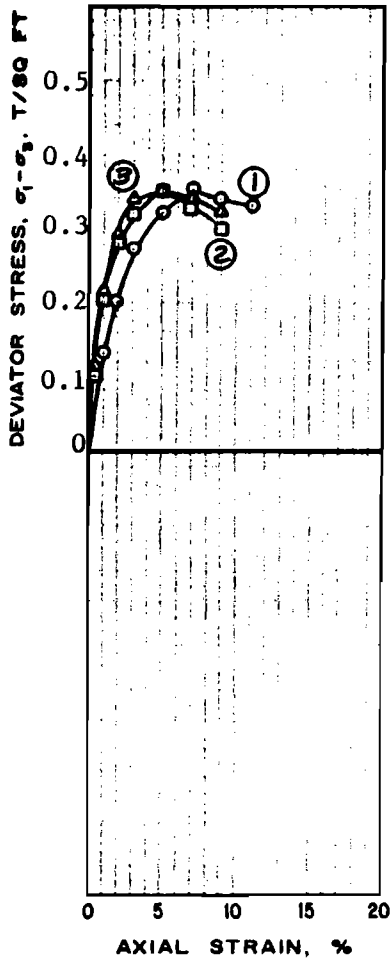
PROJECT Sewerage & Water Board of New Orleans  
 Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

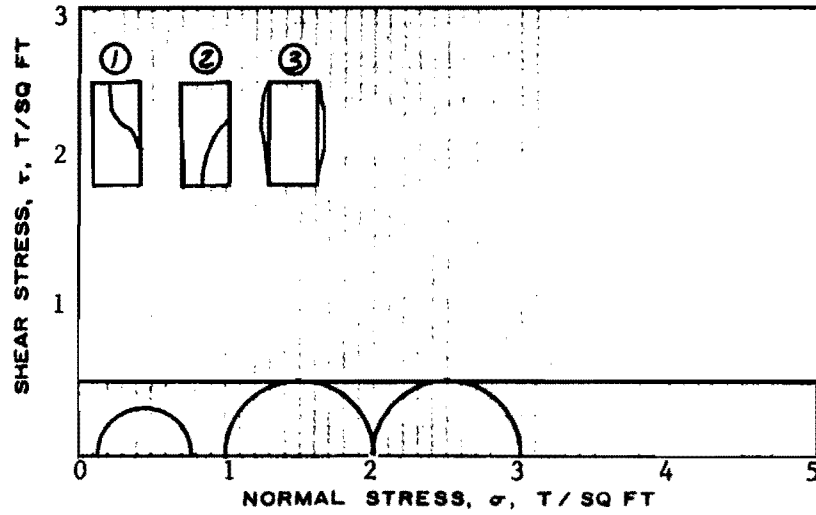
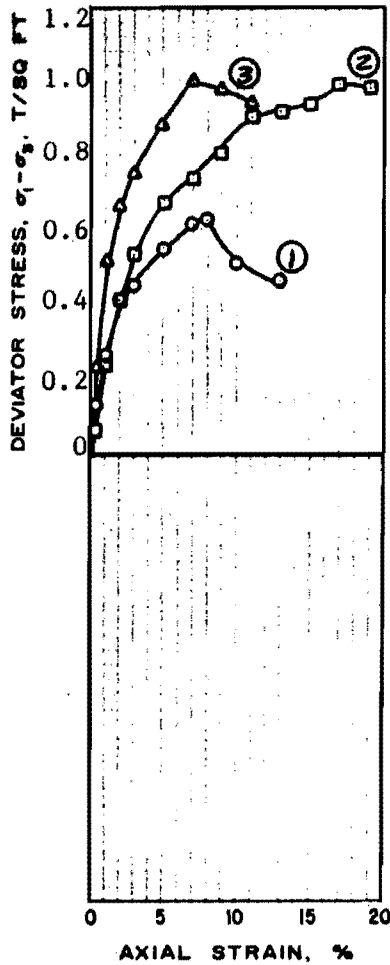
$\phi = 0$   
 TAN  $\phi =$  \_\_\_\_\_  
 $c = 0.18$  T/SQ FT

METHOD OF SATURATION \_\_\_\_\_

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 60.9 | 60.2 | 60.3 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

|  |    |                                       |             |                  |
|--|----|---------------------------------------|-------------|------------------|
| TYPE OF TEST                                   | UU | TYPE OF SPECIMEN                      | Undisturbed |                  |
| CLASSIFICATION                                 |    |                                       |             |                  |
| Soft gray clay                                 |    |                                       |             |                  |
| LL   | 78 | PL                                    | 23          | PI 55 $e_s$ 2.74 |
| REMARKS  |    | PROJECT                               |             |                  |
| Shear values were taken from large scale plot. |    | Sewerage & Water Board of New Orleans |             |                  |
|  |    | Metairie Relief Canal                 |             |                  |
|  |    | AREA                                  |             |                  |
|  |    | Sta. 554+00 to Sta. 670+00            |             |                  |
|  |    | BORING NO.                            | 63          | SAMPLE NO.       |
|  |    | DEPTH                                 | 23.0'       | DATE             |
|  |    |                                       |             | 20 August 1981   |
| <b>TRIAxIAL COMPRESSION TEST REPORT</b>        |    |                                       |             |                  |



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

TAN  $\phi =$

$c = 0.50$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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  |

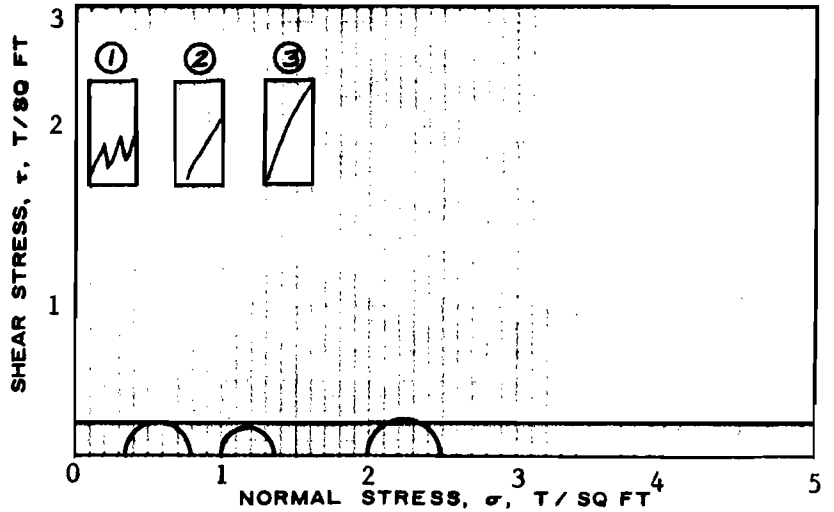
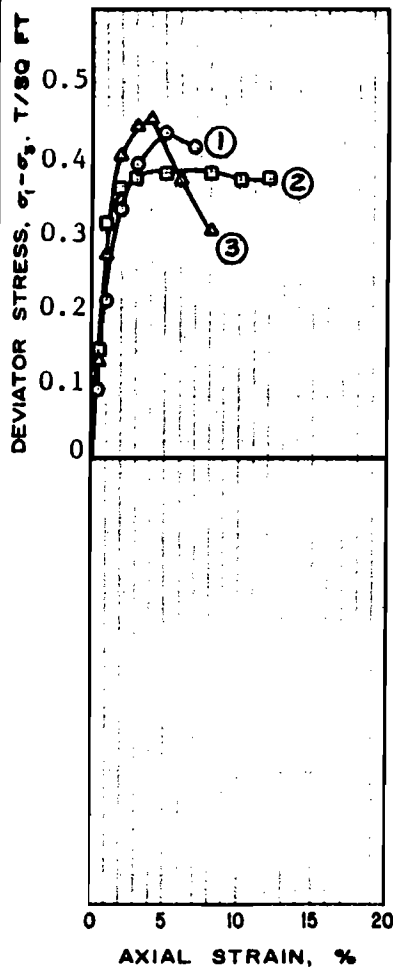
TYPE OF TEST UU TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium stiff gray & black clay w/silt pockets & trace of organic matter

LL 96 PL 28 PI 68  $e_o$  2.70

|   |            |                                       |            |                |
|---|------------|---------------------------------------|------------|----------------|
| REMARKS<br>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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 TAN  $\phi =$   
 $c = 0.22$  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 $\gamma_d$   | 71.5 | 69.3 | 68.6 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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

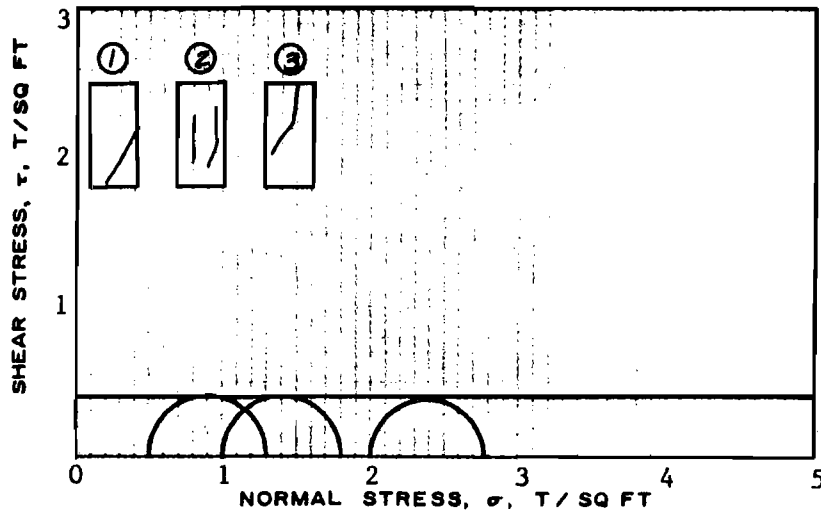
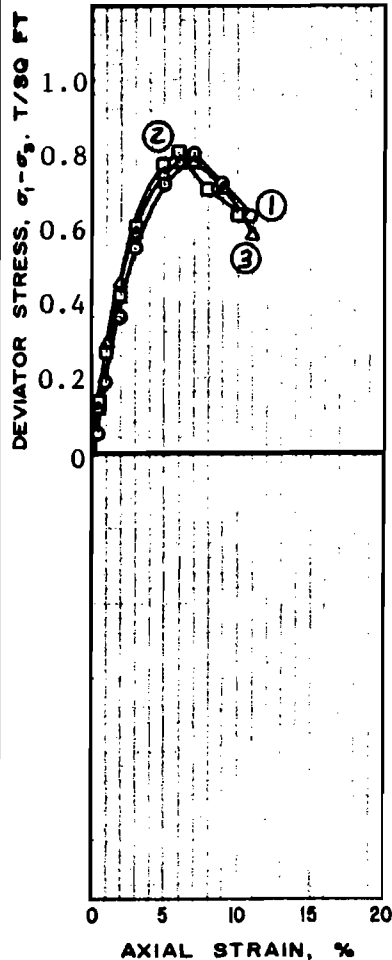
LL \_\_\_\_\_ PL \_\_\_\_\_ PI \_\_\_\_\_  $e_s$  2.74

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**





**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 $\tan \phi =$   
 $c = 0.40$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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 |

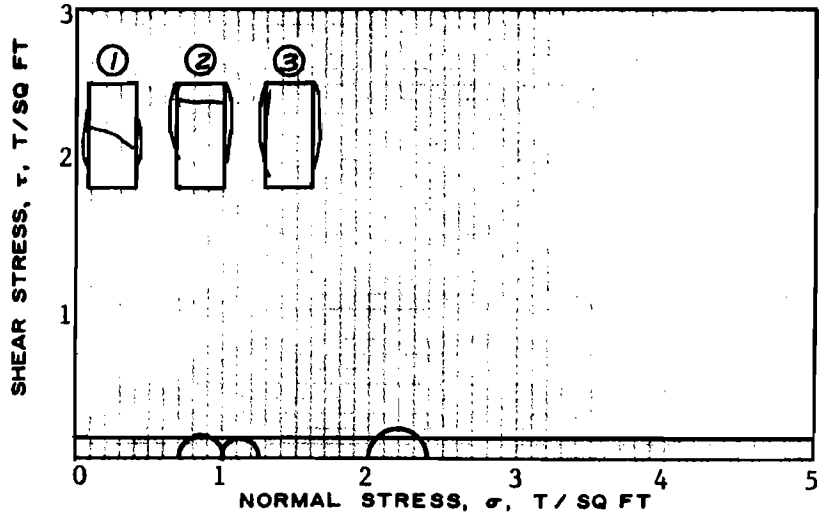
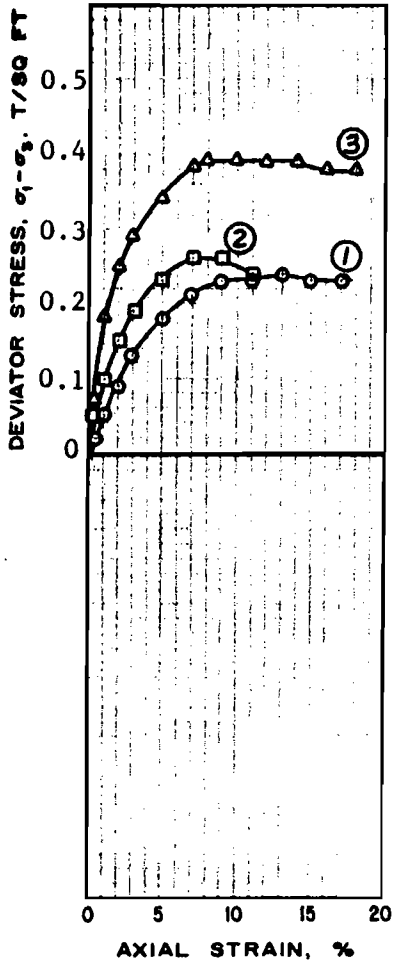
TYPE OF TEST **UU** TYPE OF SPECIMEN **Undisturbed**

CLASSIFICATION **Medium stiff gray silty clay w/trace or organic matter**

LL **38** PL **18** PI **20**  $q_c$  **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**



**SHEAR STRENGTH PARAMETERS**

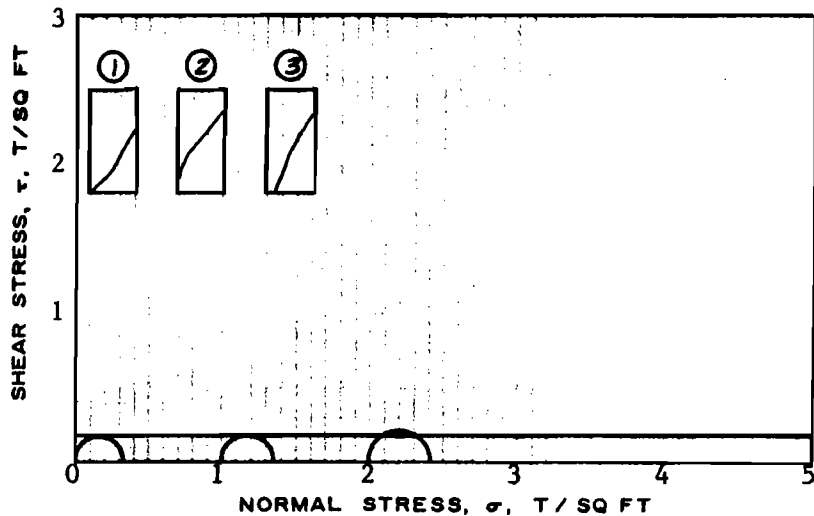
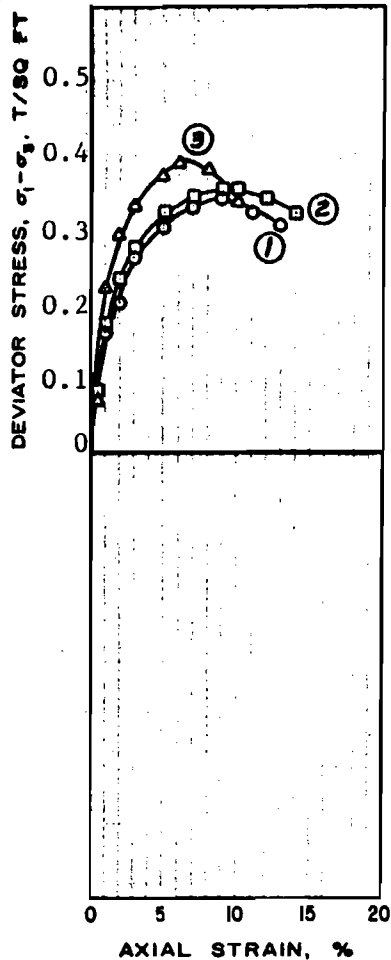
$\phi = 0$   
 TAN  $\phi =$   
 $c = 0.13$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 43.6 | 44.3 | 35.7  |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |       |
|  | VOID RATIO $e_o$                   |      |      |       |
|  | SATURATION % $S_o$                 |      |      |       |
|  | 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 $\sigma_3$                 |                                    | 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  |

|  |  |                     |            |
|--|--|---------------------|------------|
| TYPE OF TEST UU  | TYPE OF SPECIMEN Undisturbed   |                     |            |
| CLASSIFICATION Soft gray clay w/sandy silt lenses, roots & trace of organic matter |  |                     |            |
| LL   | PL   | PI                  | $e_s$ 2.65 |
| REMARKS Shear values were taken from large scale plot.                             | PROJECT Sewerage & Water Board of New Orleans<br>Metairie Relief Canal |                     |            |
|  | AREA Sta. 554+00 to Sta. 670+00  |                     |            |
|  | BORING NO. 68  | SAMPLE NO. 7        |            |
|  | DEPTH 24.0'  | DATE 20 August 1981 |            |
| <b>TRIAxIAL COMPRESSION TEST REPORT</b>  |  |                     |            |



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.18$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 65.9 | 69.4 | 67.4 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

CLASSIFICATION      Soft gray clay w/silt lenses

LL 69      PL 17      PI 52       $e_o$  2.74

REMARKS      Shear values were taken from large scale plot.

PROJECT      Sewerage & Water Board of New Orleans

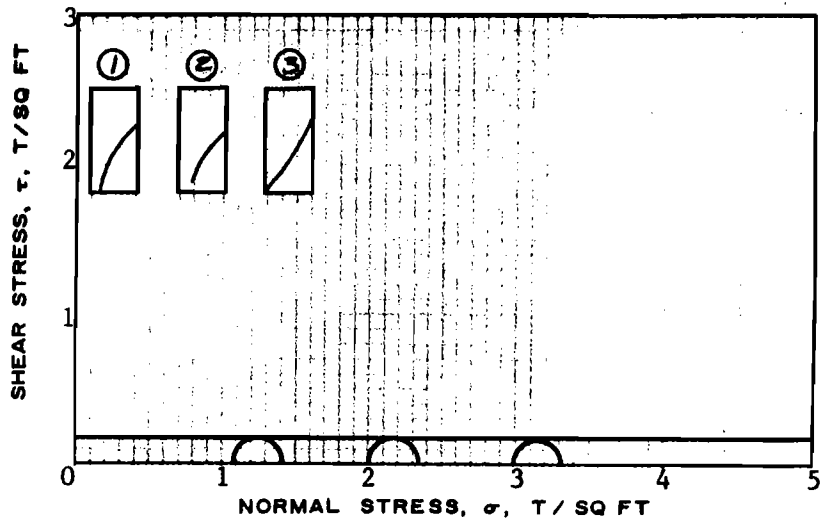
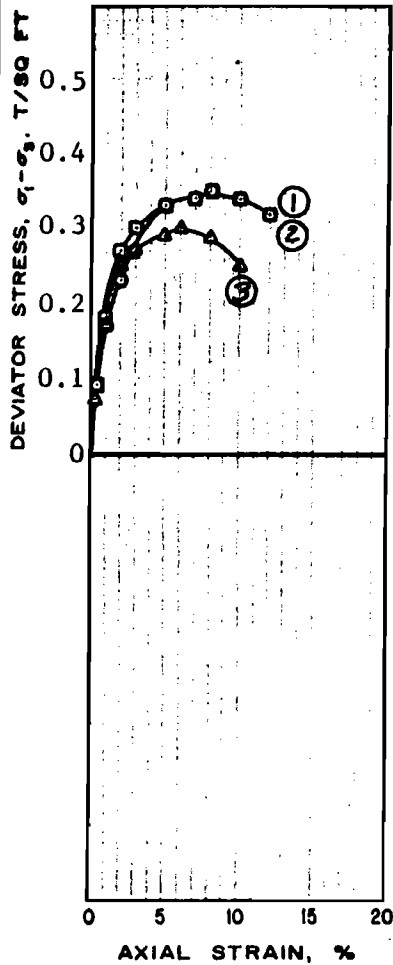
                    Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 $\tan \phi = 0$   
 $c = 0.18$  T/SQ FT

METHOD OF SATURATION \_\_\_\_\_

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$  | 57.1 | 56.0 | 56.6 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU      TYPE OF SPECIMEN Undisturbed

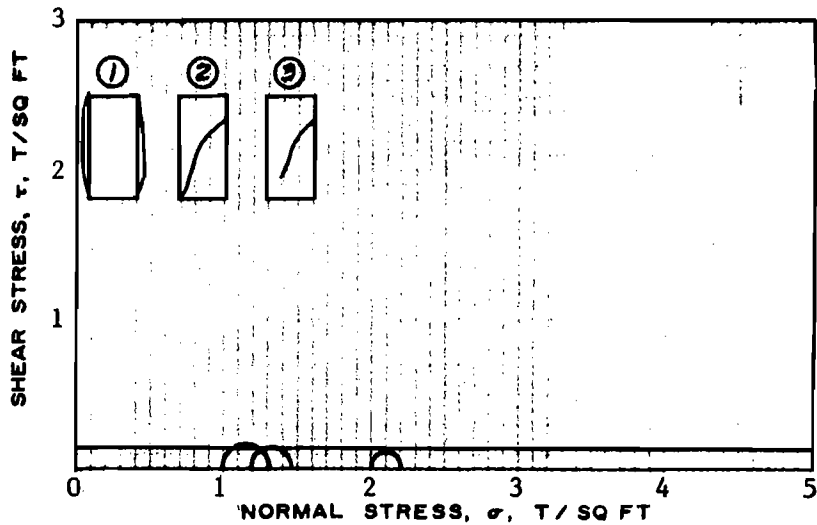
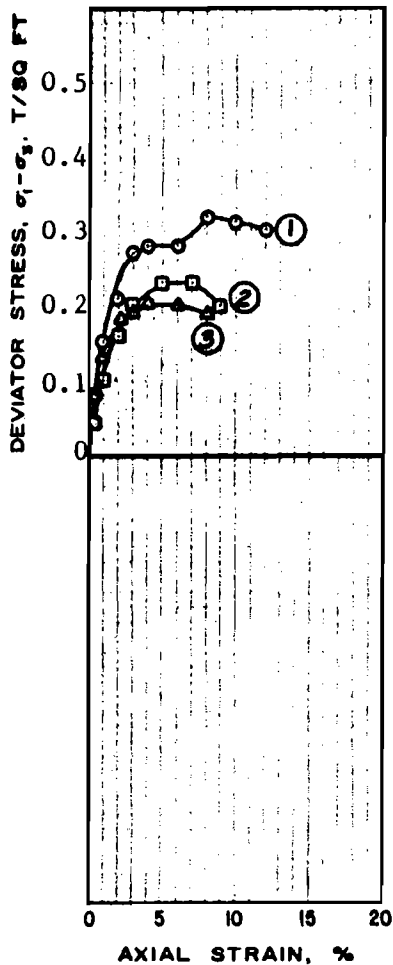
CLASSIFICATION Very soft gray clay w/silt lenses

LL \_\_\_\_\_ PL \_\_\_\_\_ PI \_\_\_\_\_  $e_o$  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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.12$  T/SQ FT

METHOD OF SATURATION

CONTROLLED STRESS

CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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 |

TYPE OF TEST UU TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Very soft gray clay w/many sand pockets & shells

LL PL PI  $e_s$  2.70

REMARKS Shear values were taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

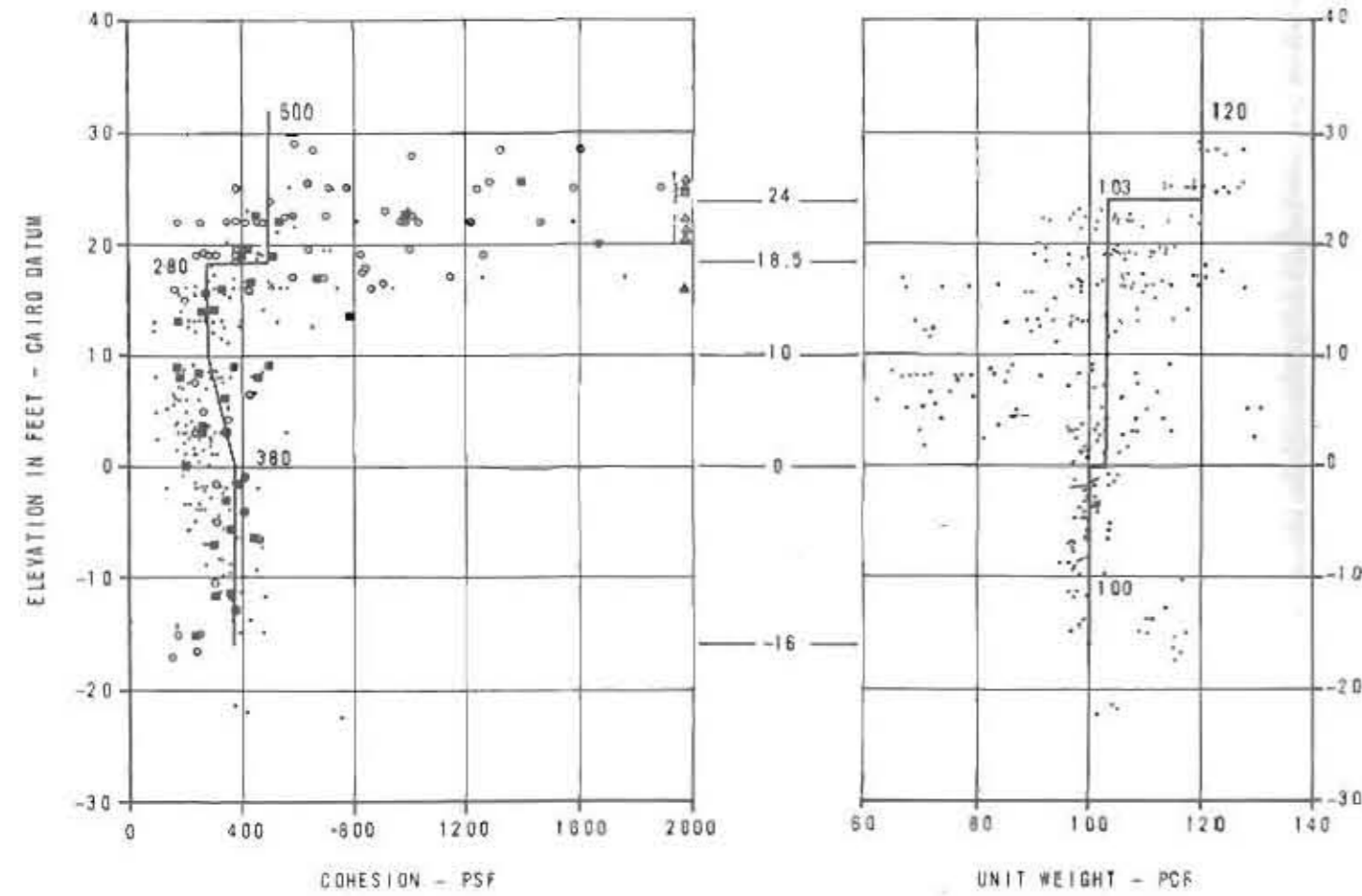
Metairie Relief Canal

AREA Sta. 554+00 to Sta. 670+00

BORING NO. 68 SAMPLE NO. 11

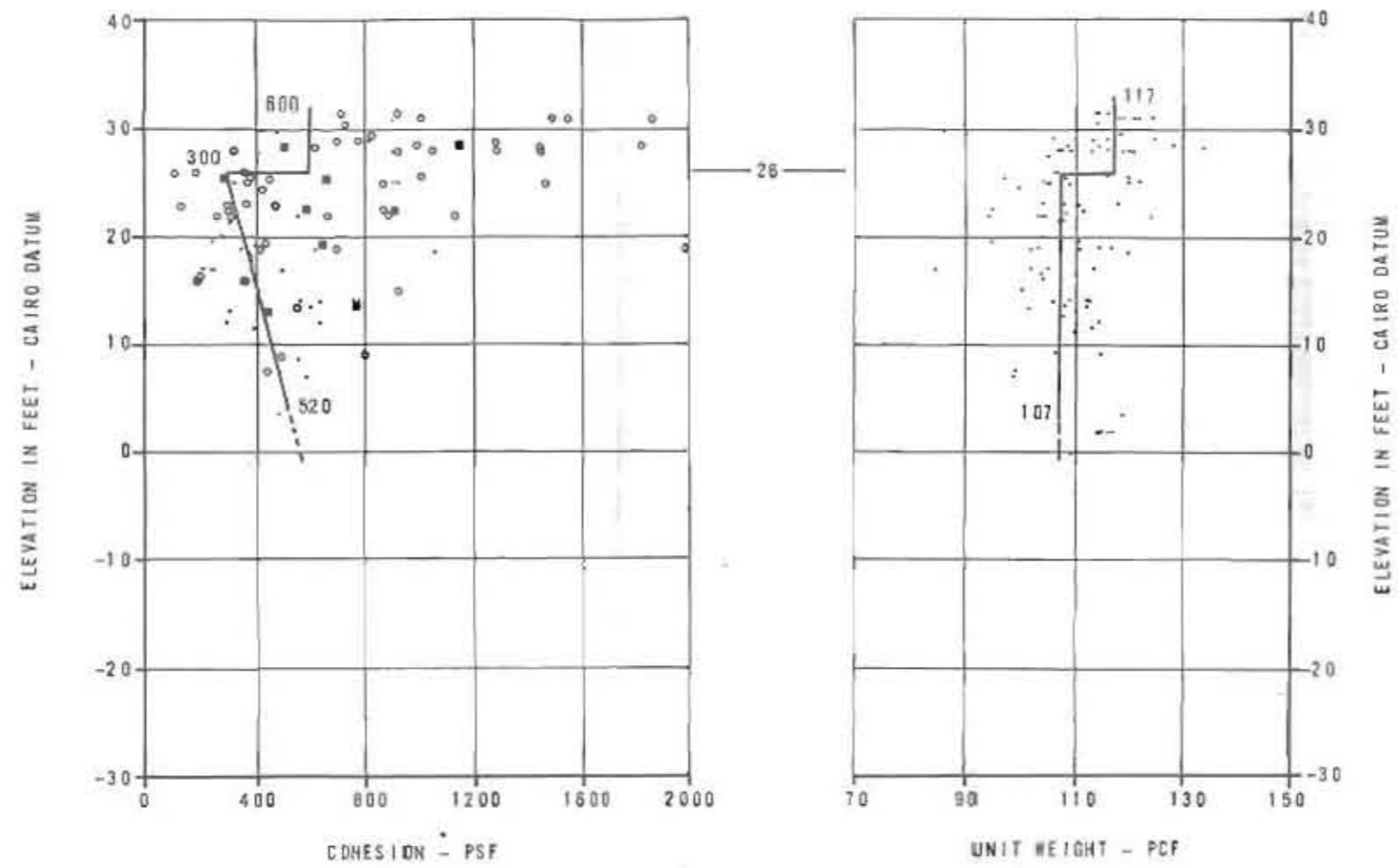
DEPTH 42.5' DATE 20 August 1981

**TRIAXIAL COMPRESSION TEST REPORT**



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:

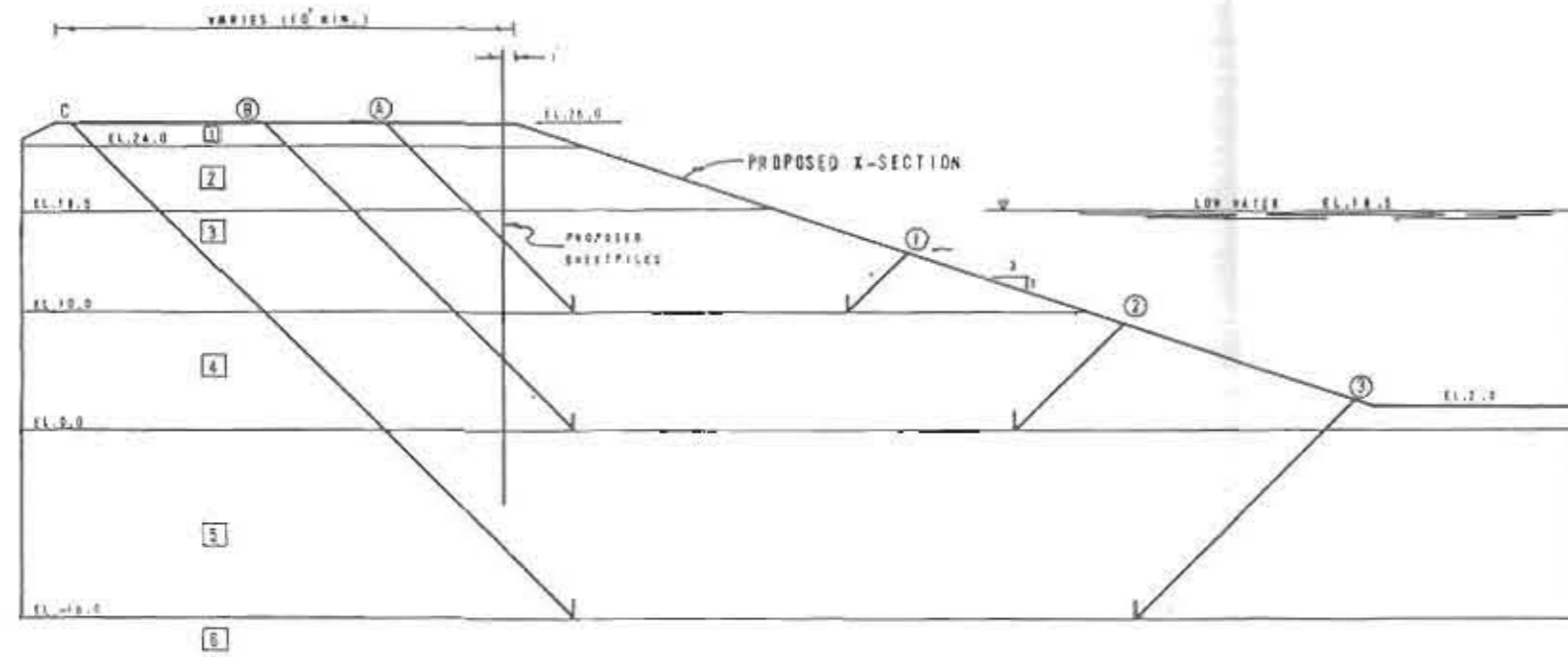
- ① AN "S" STRENGTH OF  $C = 0$ ;  $\phi = 23^\circ$  WAS ASSIGNED TO ALL CLAY SOILS.
- ② A "O" AND "S" STRENGTH OF  $C = 0$ ;  $\phi = 30^\circ$  WAS ASSIGNED TO ALL SANDS.

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

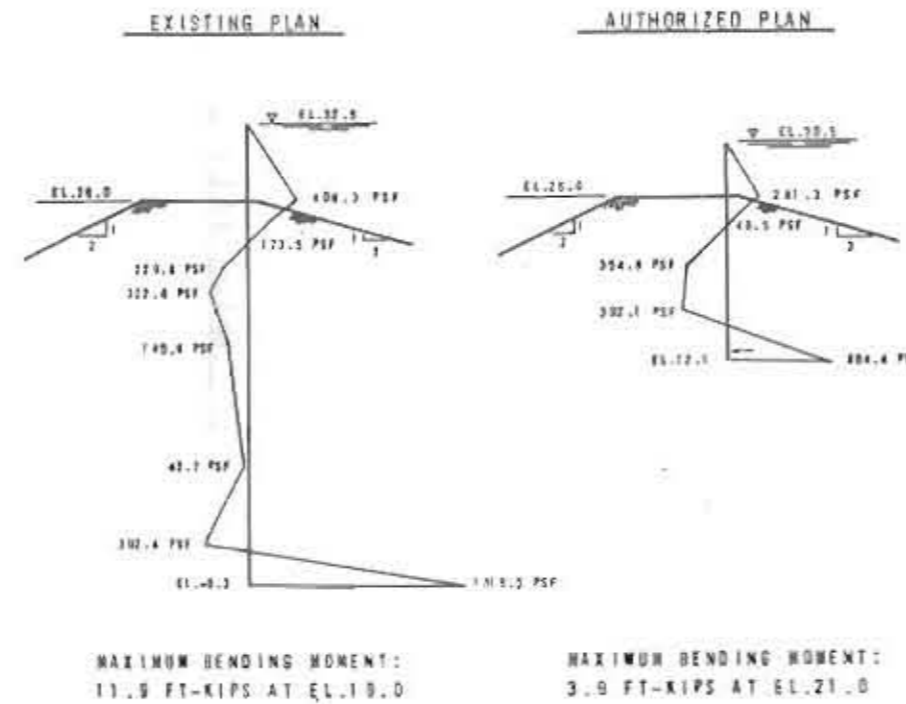
FOR  
WODJESKI AND MASTERS, INC.  
CONSULTING ENGINEERS  
NEW ORLEANS, LOUISIANA  
EUSTIS ENGINEERING COMPANY  
SOIL AND FOUNDATION CONSULTANTS  
OCTOBER, 1981 METAIRIE, LA.

SLOPE STABILITY ANALYSIS



| SLIP SURFACE NUMBER | EL.   | DRIVING          |                  |       | RESISTING        |                  |                  |       | FACTOR OF SAFETY = R / ∑D |
|---------------------|-------|------------------|------------------|-------|------------------|------------------|------------------|-------|---------------------------|
|                     |       | + D <sub>v</sub> | - D <sub>v</sub> | = D   | + R <sub>v</sub> | + R <sub>h</sub> | + R <sub>p</sub> | = R   |                           |
| A 1                 | 10.0  | 10959            | 882              | 12260 | 12260            | 8440             | 2800             | 21500 | 2.99                      |
| B 2                 | 0.0   | 24558            | 2212             | 22346 | 18860            | 14060            | 5940             | 38860 | 1.74                      |
| C 3                 | -16.0 | 54723            | 9222             | 45901 | 31020            | 17860            | 13910            | 62690 | 1.38                      |

FLOODWALL ANALYSIS



- NOTES: 1) A FACTOR OF SAFETY OF 1.3 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 18 FEET WAS ASSUMED.

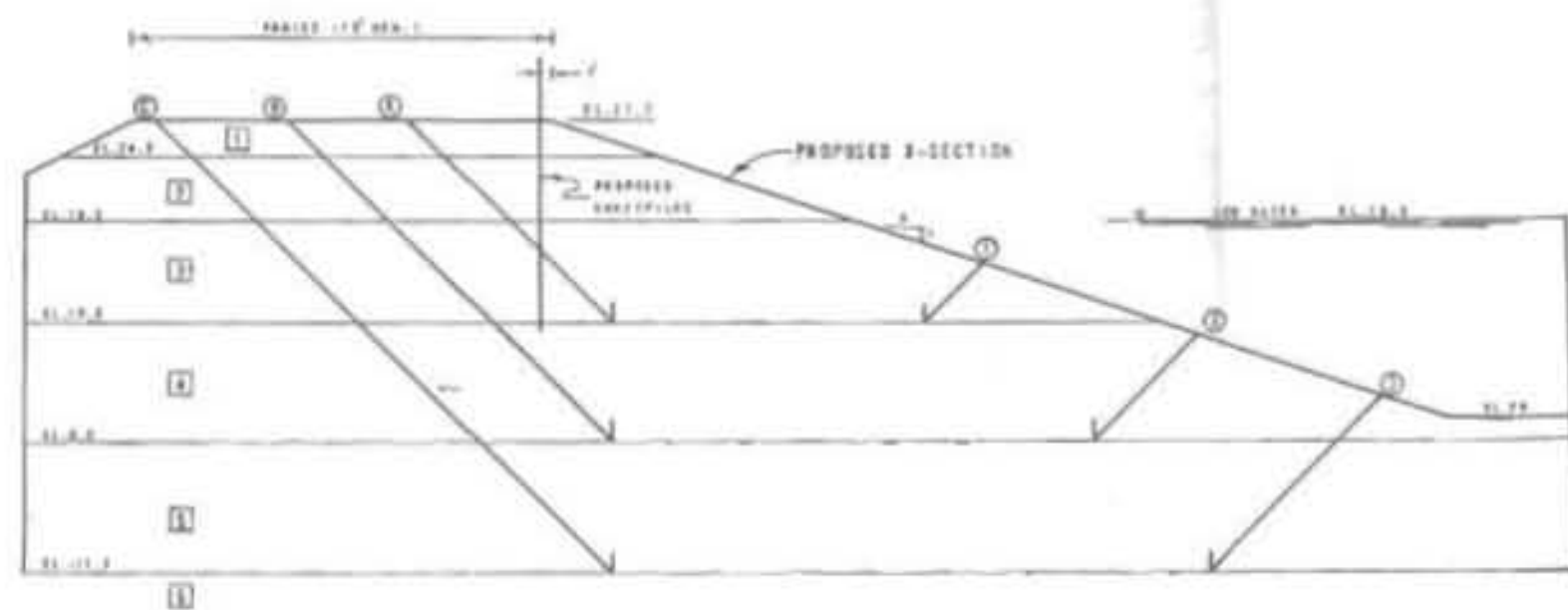
SOIL PARAMETERS

| ST. NO. | δ   | ESTIMATED SHEAR STRENGTH |                |      |      |
|---------|-----|--------------------------|----------------|------|------|
|         |     | C <sub>v</sub>           | C <sub>u</sub> | φ    | φ    |
|         | PCF | PSF                      | PSF            | DEG. | DEG. |
| 1       | 120 | 500                      | 500            | 0    | 23   |
| 2       | 103 | 580                      | 500            | 0    | 23   |
| 3       | 41  | 260                      | 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.

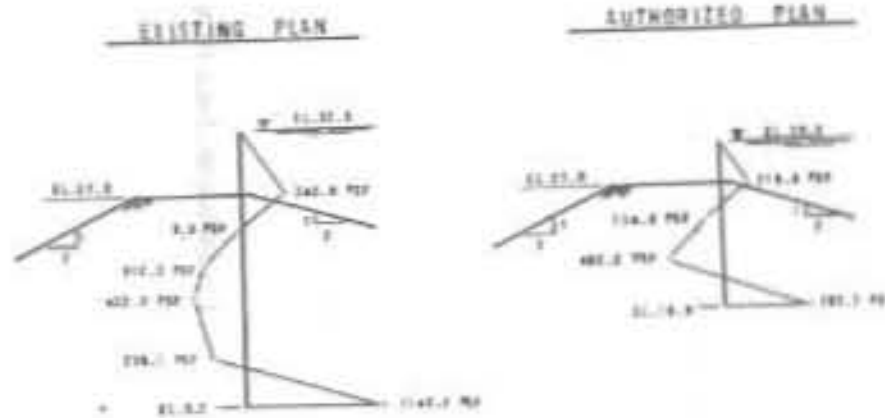
SUBSOIL INVESTIGATION  
 SEWERAGE & WATER BOARD OF NEW ORLEANS  
 METAIRIE RELIEF CANAL  
 STATION 554+00 TO STATION 670+00  
 ORLEANS AND JEFFERSON PARISHES, LOUISIANA  
 STABILITY & FLOODWALL ANALYSIS  
 STATION 554+00 TO STATION 589+00  
 FOR  
 MODJESKI AND MASTERS, INC.  
 CONSULTING ENGINEERS  
 NEW ORLEANS, LOUISIANA  
 EUSTIS ENGINEERING COMPANY  
 SOIL AND FOUNDATION CONSULTANTS  
 OCTOBER, 1991  
 METAIRIE, LA.

SLOPE STABILITY ANALYSIS



| SLIP SURFACE NUMBER | E.L.  | DRIVING          |                  |       | RESISTING        |                  |                  |       | FACTOR OF SAFETY = R/D |
|---------------------|-------|------------------|------------------|-------|------------------|------------------|------------------|-------|------------------------|
|                     |       | + D <sub>v</sub> | - D <sub>v</sub> | = D   | + R <sub>v</sub> | + R <sub>h</sub> | + R <sub>s</sub> | = R   |                        |
| A                   | 13.0  | 12540            | 882              | 12258 | 13200            | 7200             | 2800             | 23340 | 7.55                   |
| B                   | 8.0   | 27738            | 2212             | 25526 | 19800            | 15200            | 5840             | 41800 | 1.61                   |
| C                   | -11.0 | 48008            | 5882             | 42815 | 20220            | 19000            | 10832            | 58055 | 1.38                   |

FLOODWALL ANALYSIS



MAXIMUM BENDING MOMENT:  
8.8 FT-KIPS AT EL. 21.0

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 CRUSTLE 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

| ST NO | Z   | ESTIMATED SHEAR STRENGTH |                 |     |     |
|-------|-----|--------------------------|-----------------|-----|-----|
|       |     | C <sub>v</sub>           | C <sub>uh</sub> | φ   | φ'  |
| FT    | PEF | PEF                      | PEF             | DEG | DEG |
| 1     | 120 | 300                      | 500             | 0   | 23  |
| 2     | 180 | 300                      | 500             | 0   | 23  |
| 3     | 41  | 300                      | 200             | 0   | 13  |
| 4     | 41  | 320                      | 200             | 0   | 23  |
| 5     | 40  | 300                      | 200             | 0   | 23  |
| 6     | 80  | 0                        | 0               | 30  | 30  |

NOTE: ELEVATIONS REFER TO CHINA DATUM.

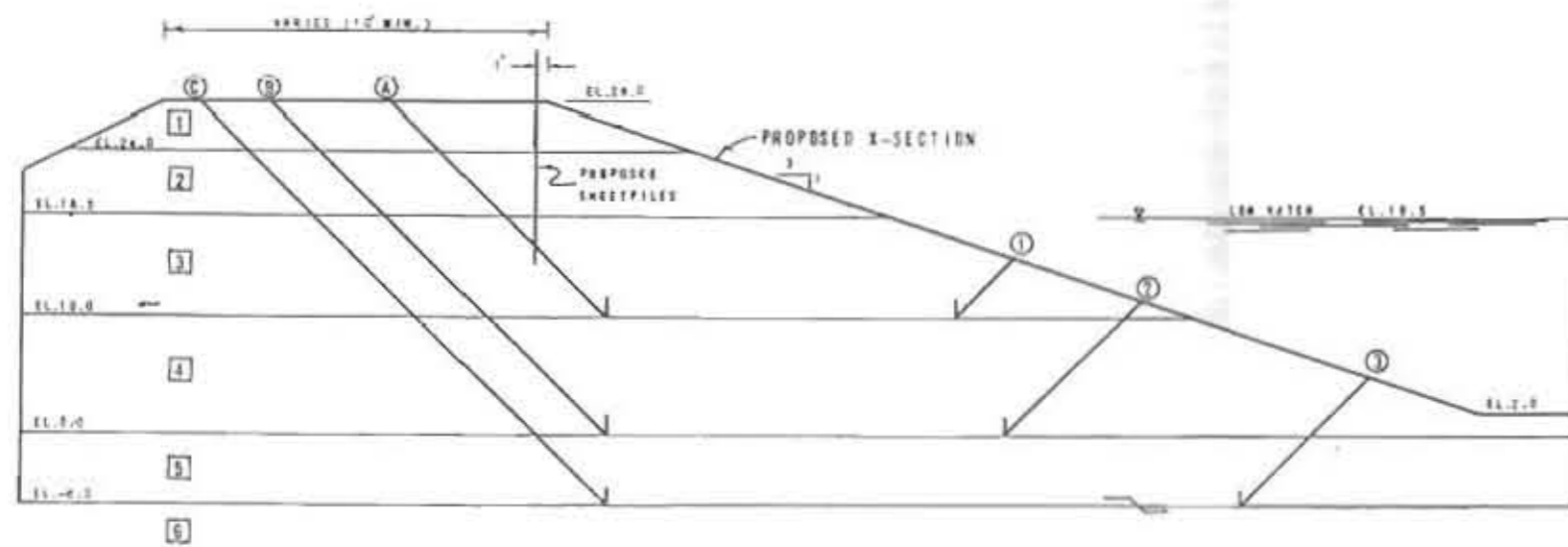
SOIL INVESTIGATION  
SEWERAGE & WATER BOARD OF NEW ORLEANS  
METairie RELIEF CANAL  
STATION 554+00 TO STATION 870+00  
ORLEANS AND JEFFERSON PARISHES, LOUISIANA  
STABILITY & FLOODWALL ANALYSIS  
STATION 580+00 TO STATION 814+00

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

EUSTIS ENGINEERING CORP.  
SOIL AND FOUNDATION CONSULTANTS  
OCTOBER, 1981  
METairie, LA.

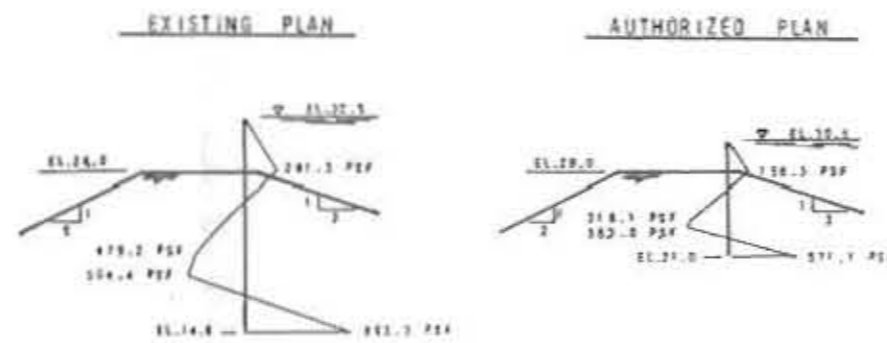


SLOPE STABILITY ANALYSIS



| SLIP SURFACE NUMBER | E.L.  | DRIVING          |                  |       | RESISTING        |                  |                  |       | FACTOR OF SAFETY (M/D) |
|---------------------|-------|------------------|------------------|-------|------------------|------------------|------------------|-------|------------------------|
|                     |       | + D <sub>1</sub> | - D <sub>2</sub> | M/D   | + R <sub>1</sub> | + R <sub>2</sub> | + R <sub>3</sub> | M/R   |                        |
| A 1                 | 10.0  | 15039            | 882              | 14357 | 14260            | 8120             | 2880             | 25180 | 1.75                   |
| B 2                 | 0.0   | 31040            | 3612             | 27428 | 20860            | 12540            | 7440             | 40840 | 1.49                   |
| C 3                 | - 6.0 | 42592            | 1955             | 40637 | 23420            | 23400            | 8210             | 55125 | 1.38                   |

FLOODWALL ANALYSIS



MAXIMUM BENDING MOMENT:  
3.7 FT-KIPS AT EL. 23.0

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

| ST<br>N° | γ<br>PCF | ESTIMATED SHEAR STRENGTH |                       |           |           |
|----------|----------|--------------------------|-----------------------|-----------|-----------|
|          |          | C <sub>v</sub><br>PSF    | C <sub>u</sub><br>PSF | φ<br>DEG. | φ<br>DEG. |
| 1        | 120      | 500                      | 500                   | 0         | 23        |
| 2        | 100      | 500                      | 500                   | 0         | 23        |
| 3        | 41       | 280                      | 280                   | 0         | 23        |
| 4        | 41       | 330                      | 330                   | 0         | 23        |
| 5        | 40       | 300                      | 300                   | 0         | 23        |
| 6        | 80       | 0                        | 0                     | 30        | 30        |

NOTE: ELEVATIONS REFER TO CAIRO DATUM.

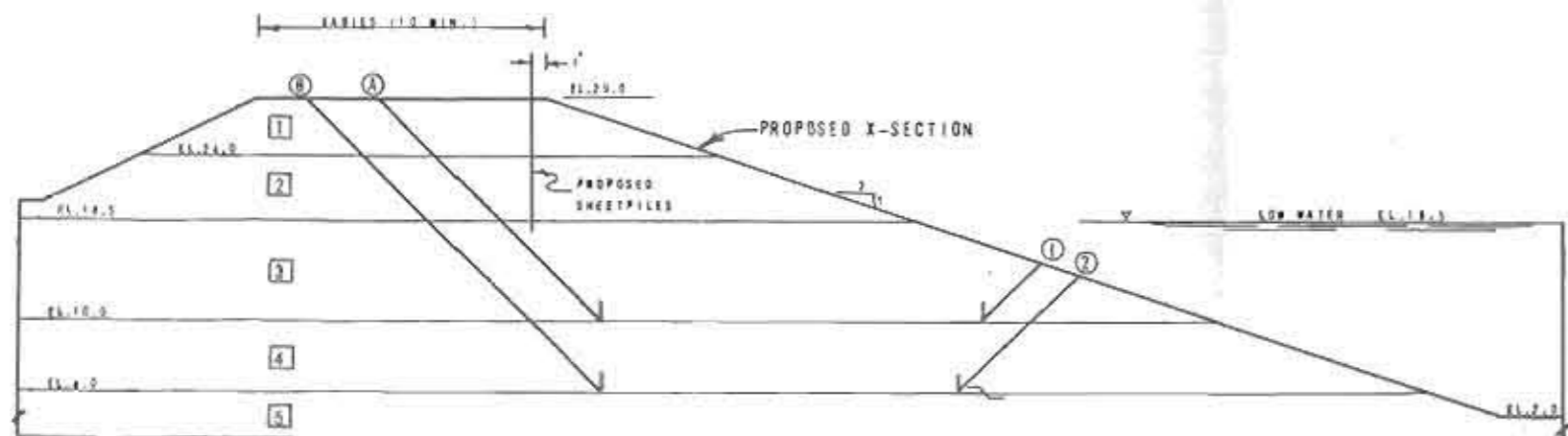
SUBSOIL INVESTIGATION  
SEWERAGE & WATER BOARD OF NEW ORLEANS  
METAIRIE RELIEF CANAL  
STATION 554+00 TO STATION 670+00  
ORLEANS AND JEFFERSON PARISHES, LOUISIANA

STABILITY & FLOODWALL ANALYSIS  
STATION 614+00 TO STATION 625+00

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

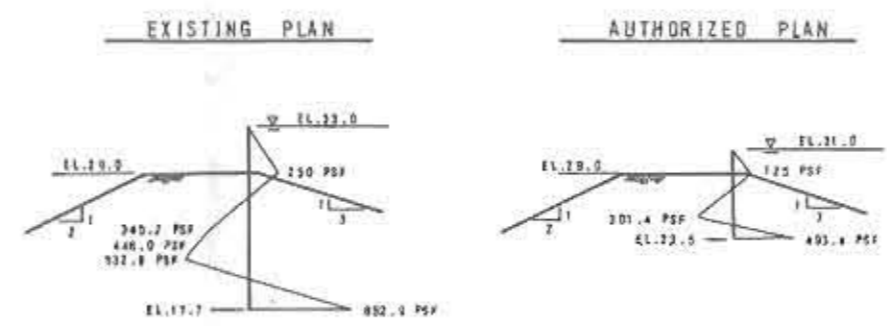
EUSTIS ENGINEERING COMPANY  
SOIL AND FOUNDATION CONSULTANTS  
OCTOBER, 1981 METAIRIE, LA.

SLOPE STABILITY ANALYSIS



| SLIP SURFACE NUMBER | EL.  | DRIVING          |                  |       | RESISTING        |                  |                  |       | FACTOR OF SAFETY = R/D |
|---------------------|------|------------------|------------------|-------|------------------|------------------|------------------|-------|------------------------|
|                     |      | + D <sub>1</sub> | - D <sub>2</sub> | = D   | + R <sub>1</sub> | + R <sub>2</sub> | + R <sub>3</sub> | = R   |                        |
| A 1                 | 10.0 | 17260            | 682              | 18573 | 13260            | 8960             | 2800             | 27020 | 1.69                   |
| B 2                 | 4.0  | 27067            | 2730             | 24357 | 18980            | 10200            | 5000             | 35140 | 1.44                   |

FLOODWALL ANALYSIS



MAXIMUM BENDING MOMENT: 2.6 FT-KIPS AT EL. 25.0  
 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

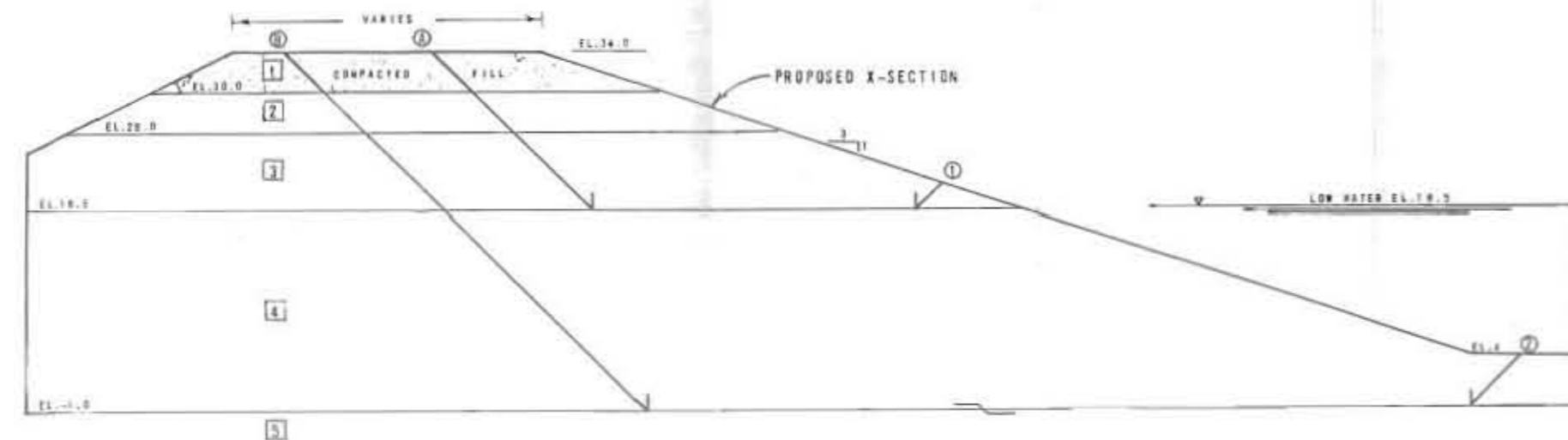
| ST. NO.        | γ   | ESTIMATED SHEAR STRENGTH |                | φ    | φ    |
|----------------|-----|--------------------------|----------------|------|------|
|                |     | C <sub>v</sub>           | C <sub>u</sub> |      |      |
| H <sup>a</sup> | PCF | PSF                      | PSF            | DEG. | DEG. |
| 1              | 120 | 500                      | 500            | 0    | 23   |
| 2              | 103 | 500                      | 500            | 0    | 23   |
| 3              | 41  | 200                      | 200            | 0    | 23   |
| 4              | 41  | 310                      | 340            | 0    | 23   |
| 5              | 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 625+00 TO STATION 635+00

FOR  
 WODJESKI AND WASTERS, INC.  
 CONSULTING ENGINEERS  
 NEW ORLEANS, LOUISIANA  
 EUSTIS ENGINEERING COMPANY  
 SOIL AND FOUNDATION CONSULTANTS  
 OCTOBER, 1981 METAIRIE, LA.

SLOPE STABILITY ANALYSIS



| SLIP SURFACE NO. | EL.   | DRIVING FORCE  |                |       | RESISTING FORCE |                |                |       | FACTOR OF SAFETY<br>= R / D |
|------------------|-------|----------------|----------------|-------|-----------------|----------------|----------------|-------|-----------------------------|
|                  |       | D <sub>1</sub> | D <sub>2</sub> | = D   | R <sub>1</sub>  | R <sub>2</sub> | R <sub>3</sub> | = R   |                             |
| 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

| ST. NO. | γ<br>PCF | "C"                   |                       | "φ"                    |                        |
|---------|----------|-----------------------|-----------------------|------------------------|------------------------|
|         |          | C <sub>v</sub><br>PSF | C <sub>u</sub><br>PSF | φ <sub>v</sub><br>DEG. | φ <sub>s</sub><br>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.

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EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

BORINGS • TESTS • ANALYSES

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METAIRIE, LOUISIANA 70002

P. O. BOX 8708  
METAIRIE, LOUISIANA 70011

PHONE (504) 834-0167

27 October 1981

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LLOYD A. HELD, JR.

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.

---

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<br>Feet | Minimum<br>Pile Size | Approx.<br>Pile Tip<br>Elevation<br>C.D. | Estimated Allowable<br>Horizontal Load Capacity<br>In Tons<br>Factor of Safety = 2 |                |
|---------------------|----------------------|--|--|----------------|
|                     |                      |  | <u>Compression</u>   | <u>Tension</u> |
| 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.

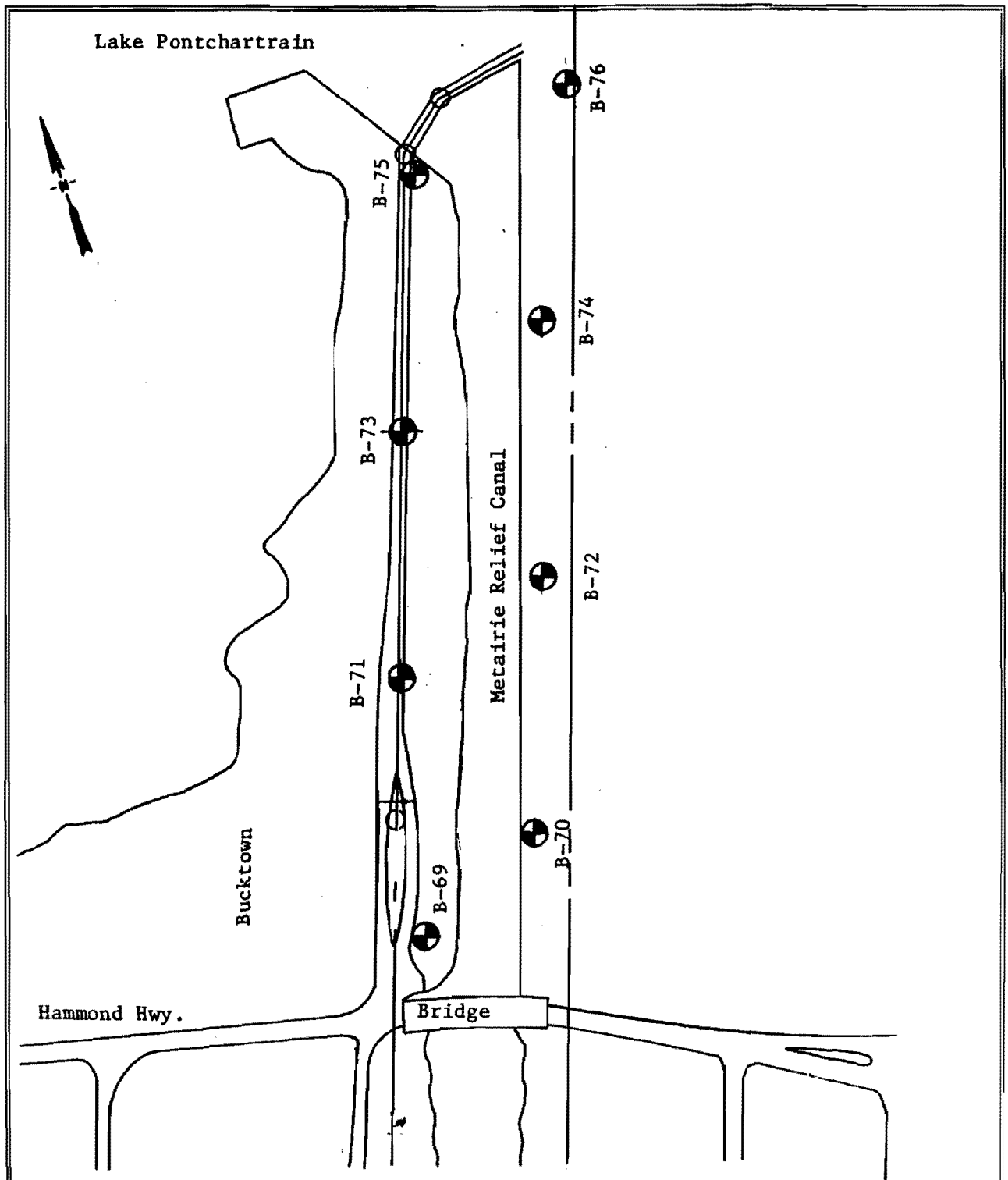
EUSTIS ENGINEERING COMPANY

By

  
Lloyd A. Held, Jr.

L. J. Napolitano:bh

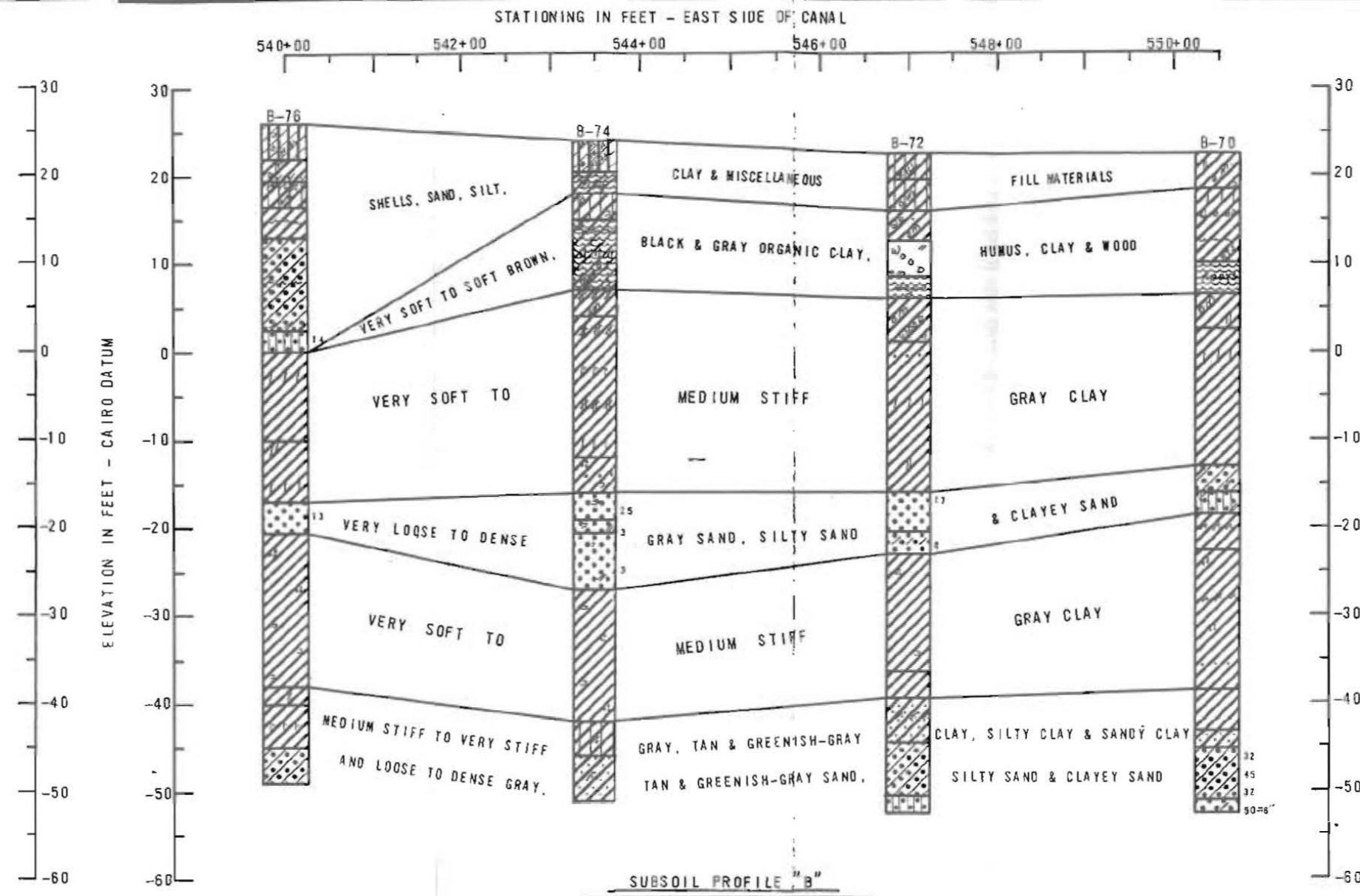
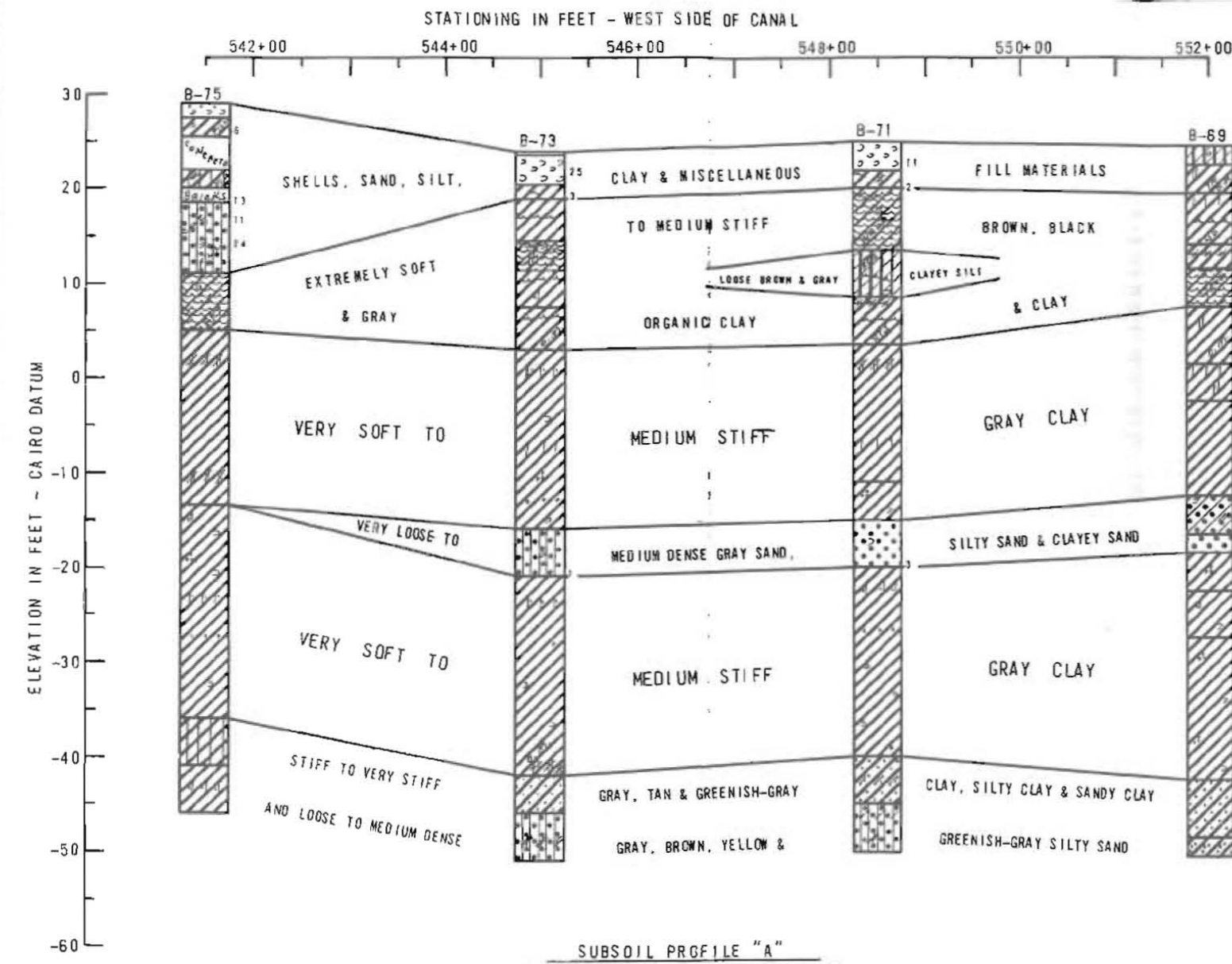




Subsoil Investigation  
 Sewerage & Water Board of New Orleans  
 Metairie Relief Canal  
 Station 539+00 to Station 554+00  
 Jefferson and Orleans Parishes, Louisiana

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

Fig. 1



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

CLAY SILT SAND HUMUS OR ORGANIC

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 4-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.

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

Sheet 1 of 2

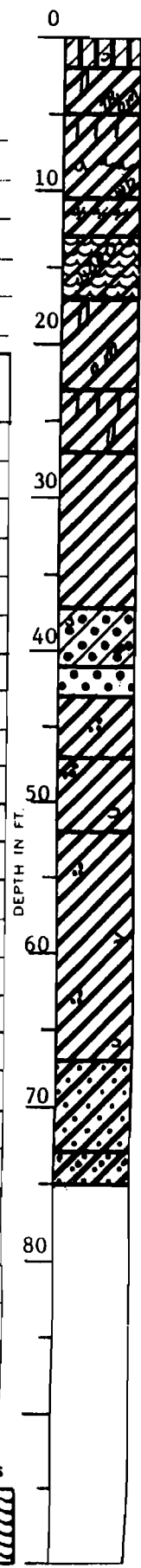
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 539+00 to Station 554+00  
Jefferson and Orleans Parishes, Louisiana

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

Boring No. 69 Soil Technician Jack Pratt Date 17 July 1981

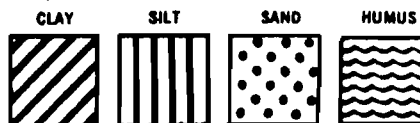
Ground Elev. 24.5 (Est.) Datum Cairo Gr. Water Depth \_\_\_\_\_

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|---|----------------------------|----|
|            | From                | To   | From               | To   |   |                            |    |
| 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.

Remarks: Boring located on Westside of canal @ Sta. No. 552+00.



Predominant type shown heavy. Modifying type shown light.

Fig. 3 (Sheet #1)



**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. 70 Soil Technician R. Courtiade Date 16 July 1981

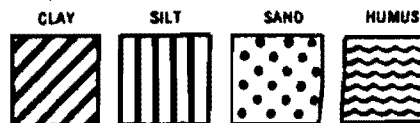
Ground Elev. 22.5 (Est.) Datum Cairo Gr. Water Depth \_\_\_\_\_

| Sample No. | SAMPLE Depth — Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |  |
|------------|---------------------|------|--------------------|------|---|----------------------------|--|
|            | From                | To   | From               | To   |   |                            |  |
| 1          | 2.0                 | 2.5  | 0.0                | 4.0  | Medium stiff gray clay w/silt pockets,<br>organic matter & shells     |                            |  |
| 2          | 5.0                 | 5.5  | 4.0                |      | Very soft gray clay w/silt lenses &<br>wood layers                    |                            |  |
| 3          | 8.0                 | 8.5  |                    |      | Ditto   |                            |  |
| 4          | 11.0                | 11.5 |                    | 12.5 | Very soft gray clay w/humus layers &<br>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<br>& 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 &<br>shell fragments               |                            |  |
| 11         | 38.5                | 40.0 | 38.5               | 41.0 | Dense gray silty sand w/clay traces &<br>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<br>pockets & clayey sand layers |                            |  |
| 14         | 53.5                | 54.0 |                    |      | Soft to medium stiff gray clay w/sand<br>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.

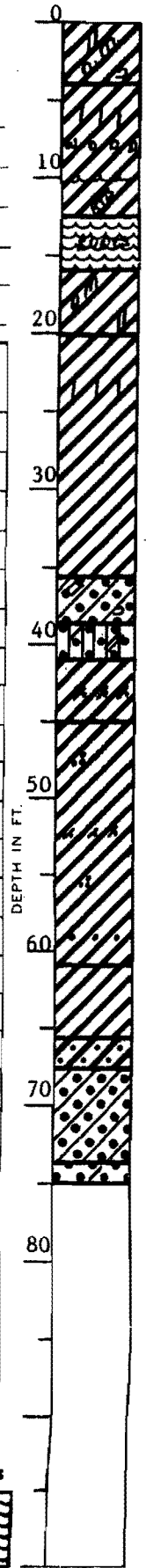


Fig. 4  
 (Continued)



**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. 71 Soil Technician A. Croal, Jr. Date 30 July 1981

Ground Elev. 25.0 (Est.) Datum Cairo Gr. Water Depth \_\_\_\_\_

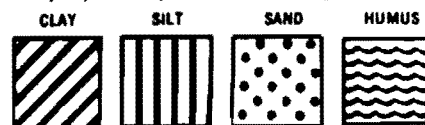
| Sample No. | SAMPLE Depth - Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|---|----------------------------|----|
|            | From                | To   | From               | To   |   |                            |    |
| 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<br>pockets                                       | 2                          | 2  |
| 3          | 7.5                 | 8.5  | 5.0                | 11.5 | Medium stiff gray & black organic<br>clay w/humus, clay pockets & wood                |                            |    |
| 4          | 13.5                | 14.5 | 11.5               | 16.5 | Loose brown & gray clayey silt w/roots,<br>humus & clam shells                        |                            |    |
| 5          | 18.0                | 19.0 | 16.5               | 21.5 | Soft dark gray clay w/organic clay,<br>& humus layers & roots                         |                            |    |
| 6          | 23.0                | 24.0 | 21.5               |      | Soft gray clay w/clayey silt lenses &<br>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<br>pockets & shell fragments                   |                            |    |
| 10         | 42.5                | 43.5 | 40.0               |      | Very loose gray fine sand w/few shell<br>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<br>silt, fine sand lenses & shell<br>fragments |                            |    |
| 13         | 53.0                | 54.0 |                    |      | Soft to medium stiff gray clay w/shell<br>fragments                                   |                            |    |
| 14         | 58.0                | 59.0 |                    | 65.0 | Soft to medium stiff gray clay w/trace<br>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.  
**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 at Westside of canal @ Sta.

No. 548+50.



Predominant type shown heavy. Modifying type shown light.

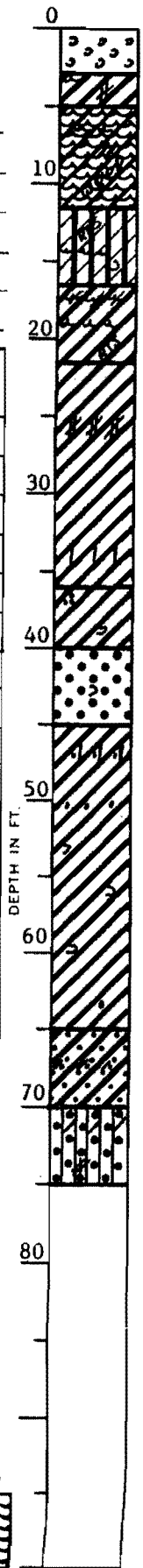


Fig. 5  
(Sheet #1)





**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

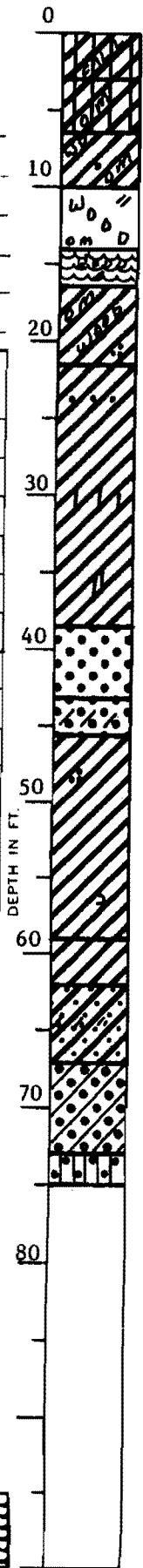
Jefferson and Orleans Parishes, Louisiana

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

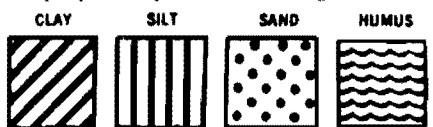
Boring No. 72 Soil Technician A. J. Mayeux Date 18 July 1981

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   |                           |    |



\*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. 547+00.

Predominant type shown heavy. Modifying type shown light.

Fig. 6

**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

Sheet 1 of 2

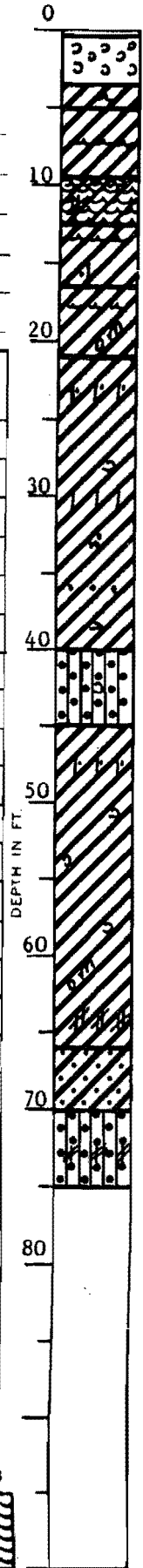
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 539+00 to Station 554+00  
Jefferson and Orleans Parishes, Louisiana

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

Boring No. 73 Soil Technician A. Croal, Jr. Date 29 July 1981

Ground Elev. 24.0 (Est.) Datum Cairo Gr. Water Depth \_\_\_\_\_

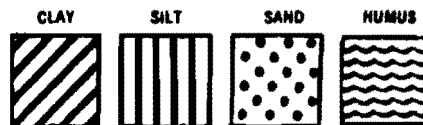
| Sample No. | SAMPLE Depth -- Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |    |
|------------|----------------------|------|--------------------|------|---|----------------------------|----|
|            | From                 | To   | From               | 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.  
 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.



Predominant type shown heavy. Modifying type shown light.

Fig. 7  
(Sheet #1)



**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. 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 |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION  | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|--|----------------------------|----|
|            | From                | To   | From               | To   |  |                            |    |
| 1          | 1.5                 | 2.5  | 0.0                | 3.5  | Medium compact brown & gray clayey silt<br>w/silty sand layers, organic matter,<br>concretions & shells (Fill) |                            |    |
| 2          | 4.5                 | 5.5  | 3.5                | 6.0  | Medium stiff black & gray organic clay<br>w/clay & silty sand pockets, layers &<br>concretions (Fill)          |                            |    |
| 3          | 7.5                 | 8.5  | 6.0                | 9.0  | Soft gray silty clay w/silty sand<br>pockets & shell fragments   |                            |    |
| 4          | 13.5                | 14.5 | 9.0                | 17.0 | Very soft black & gray organic clay<br>w/humus & sandy silt layers, wood &<br>shells                           |                            |    |
| 5          | 18.0                | 19.0 | 17.0               | 20.0 | Soft gray clay w/clayey silt lenses,<br>layers & organic matter  |                            |    |
| 6          | 23.0                | 24.0 | 20.0               |      | Soft gray clay w/clayey silt & silty<br>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<br>pockets, layers & shell fragments  |                            |    |
| 10         | 41.0                | 42.5 | 40.0               | 43.0 | Medium dense gray fine sand w/shell<br>fragments   | 7                          | 25 |
| 11         | 43.5                | 45.0 | 43.0               | 44.5 | Loose gray fine sand w/shell fragments<br>& clay pockets   | 3                          | 3  |
| 12         | 48.0                | 49.0 | 44.5               | 51.0 | Very loose gray fine sand w/shell<br>fragments & clay pockets  | 3                          | 3  |

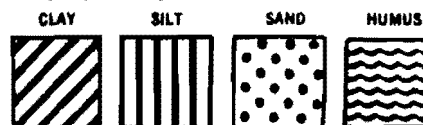
(Continued)

\*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitpoon 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. splitpoon 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.

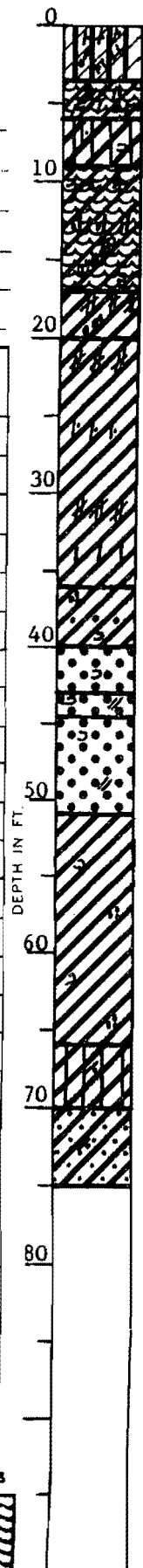


Fig. 8  
(Sheet #1)



**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

Sheet 1 of 2

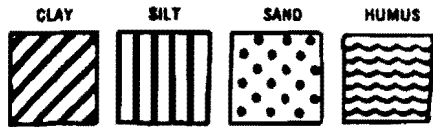
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 539+00 to Station 554+00  
Jefferson and Orleans Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 75 Soil Technician A. Croal, Jr. Date 28 July 1981  
 Ground Elev. 29.0 (Est.) Datum Cairo Gr. Water Depth \_\_\_\_\_

| Sample No. | SAMPLE Depth - Feet |      | DEPTH STRATUM Feet |      | VISUAL CLASSIFICATION   | *STANDARD PENETRATION TEST |    |
|------------|---------------------|------|--------------------|------|---|----------------------------|----|
|            | From                | To   | From               | To   |   |                            |    |
| 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 concrete fragments & shells (Fill)                    | 12                         | 24 |
| 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.

Remarks: Boring located on the Westside of canal @  
Sta. No. 541+50.



Predominant type shown heavy. Modifying type shown light.

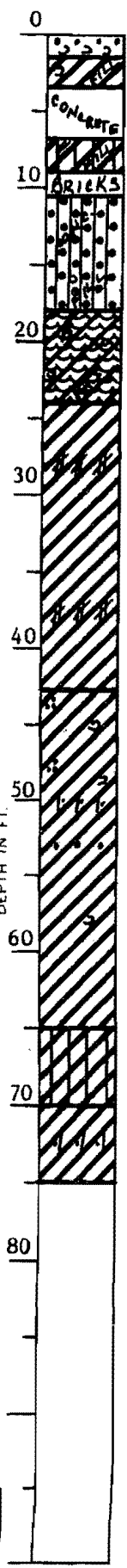


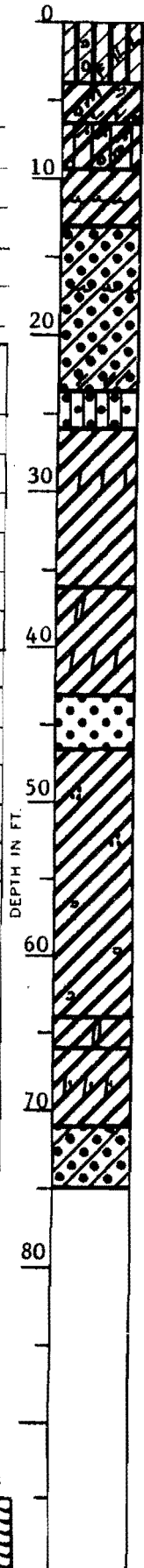
Fig. 9 (Sheet #1)



**LOG OF BORING**  
**EUSTIS ENGINEERING COMPANY**  
 SOIL AND FOUNDATION CONSULTANTS  
 METAIRIE, LA.

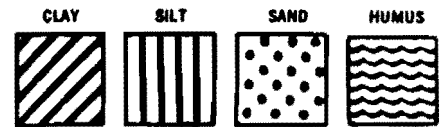
Name of Project: Sewerage & Water Board of New Orleans  
Metairie Relief Canal, Station 539+00 to Station 554+00  
Jefferson and Orleans Parishes, Louisiana  
 For: Modjeski and Masters, Inc., Consulting Engineers, New Orleans, Louisiana  
 Boring No. 76 Soil Technician Jack Pratt Date 24 July 1981  
 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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|
|                    |                     |  |                             | Dry                 | Wet   |   |
| 1                  | 0.5                 | Loose gray & tan clayey silt<br>w/many shells                            | 10.7                        | ----                | ----  | ----  |
| 2                  | 3.5                 | Medium stiff gray clay with<br>silt pockets & trace of<br>organic matter | 37.4                        | 82.8                | 113.7 | 1105  |
| 3                  | 5.5                 | Very soft gray clay w/humus<br>pockets & wood                            | 70.8                        | 55.6                | 94.9  | 440   |
| 4                  | 8.0                 | Very soft gray clay w/humus<br>lenses, silt lenses &<br>wood             | 60.9                        | 61.9                | 99.7  | 420   |
| 5                  | 11.0                | Extremely soft gray clay<br>w/organic clay layers                        | 84.2                        | 49.2                | 90.6  | 230   |
| 6                  | 14.0                | Soft brown organic clay with<br>decayed wood                             | 172.4                       | 27.0                | 73.4  | 840   |
| 7                  | 19.0                | Soft gray clay w/silt pockets<br>& much organic matter                   | 129.2                       | 36.0                | 82.5  | 530   |
| 8                  | 24.0                | Very soft gray clay w/silt<br>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<br>clay pockets & shell<br>fragments         | 28.2                        | 90.7                | 116.3 | 610*  |
| 14                 | 48.5                | Very soft gray clay w/sand<br>pockets & shells                           | 40.6                        | 77.7                | 109.2 | 355   |
| 15                 | 54.0                | Soft gray clay w/shell<br>fragments & sand pockets                       | 72.5                        | 55.6                | 95.9  | 785*  |
| 17                 | 64.0                | Medium stiff gray clay w/sand<br>pockets & trace of organic<br>matter    | 49.5                        | 70.2                | 105.0 | 1115  |
| 19                 | 69.0                | Stiff greenish-gray sandy<br>clay  | 19.7                        | 106.6               | 127.6 | 3225  |

\*Unconsolidated-Undrained Triaxial Compression Test - One Specimen.  
Confined at the approximate overburden pressure.

Fig. 11

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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |   |                             | Dry                 | Wet   |   | LL                  | PL | PI |
| 3                  | 7.5                 | Medium stiff gray &<br>black organic clay<br>w/humus layers           | 241.4                       | 20.2                | 69.1  | 1115  |                     |    |    |
| 4                  | 13.5                | Loose brown & gray<br>clayey silt with<br>humus & many clam<br>shells | 53.9                        | 63.9                | 98.2  | 475*  |                     |    |    |
| 5                  | 18.0                | Soft dark gray clay<br>w/organic matter &<br>roots                    | 105.7                       | 41.0                | 84.2  | 665   |                     |    |    |
| 6                  | 23.0                | Soft gray clay with<br>clayey silt layers<br>& pockets                | 68.8                        | 59.3                | 100.1 | 640   | 75                  | 21 | 54 |
| 7                  | 28.0                | Soft gray clay w/silt<br>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<br>w/sand pockets &<br>shell fragments         | 63.4                        | 62.0                | 101.3 | 1230  | 83                  | 19 | 64 |
| 12                 | 48.0                | Soft gray clay w/sand<br>lenses & pockets                             | 63.3                        | 61.7                | 100.8 | 995*  |                     |    |    |
| 13                 | 53.0                | Soft gray clay w/shell<br>fragments                                   | 62.6                        | 61.4                | 100.0 | 1000  |                     |    |    |
| 14                 | 58.0                | Medium stiff gray clay<br>w/trace of sand                             | 55.6                        | 67.9                | 105.7 | 1145  | 75                  | 18 | 57 |
| 15                 | 68.0                | Stiff greenish-gray<br>sandy clay w/clayey<br>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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Medium stiff gray silty clay<br>w/brick fragments, shells<br>& gravel | 25.6                        | ----                | ----  | ----  |
| 2                  | 5.0                 | Medium stiff gray silty clay<br>w/organic matter                      | 29.2                        | ----                | ----  | ----  |
| 3                  | 8.0                 | Soft gray clay w/sand layers,<br>lenses & organic matter              | 66.5                        | 57.2                | 95.3  | 525*  |
| 5                  | 19.0                | Very soft gray clay w/sand<br>pockets & trace of organic<br>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<br>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<br>w/clayey sand pockets                 | 20.0                        | 106.5               | 127.8 | 1555  |
| 15                 | 69.0                | Loose greenish-gray clayey<br>sand                                    | 20.0                        | 101.5               | 121.8 | 875*  |

\*Unconsolidated-Undrained Triaxial Compression Test - One Specimen.  
 Confined at the approximate overburden pressure.

Fig. 14

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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification                                  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 3                  | 8.0                 | Very soft dark gray clay<br>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<br>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<br>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<br>sand pockets & shells | 45.0                        | 74.4                | 107.9 | 575*  |
| 13                 | 48.5                | Medium stiff gray clay w/silty<br>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<br>clay          | 20.3                        | 105.3               | 126.7 | 4685  |

\*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 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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft | Atterberg<br>Limits |    |    |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|---------------------|----|----|
|                    |                     |   |                             | Dry                 | Wet   |   | LL                  | PL | 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

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

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification   | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|--|-----------------------------|---------------------|-------|---|
|                    |                     |  |                             | Dry                 | Wet   |   |
| 7                  | 23.5                | Very soft dark gray & brown<br>organic clay w/humus layers,<br>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<br>fragments  | 59.7                        | 62.5                | 99.9  | 855   |
| 13                 | 52.0                | Medium stiff gray clay w/sand<br>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<br>lenses   | 26.9                        | 93.9                | 119.1 | 2370*   |

\*Unconsolidated-Undrained Triaxial Compression Test - One Specimen.  
 Confined at the approximate overburden pressure.

Fig. 17

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

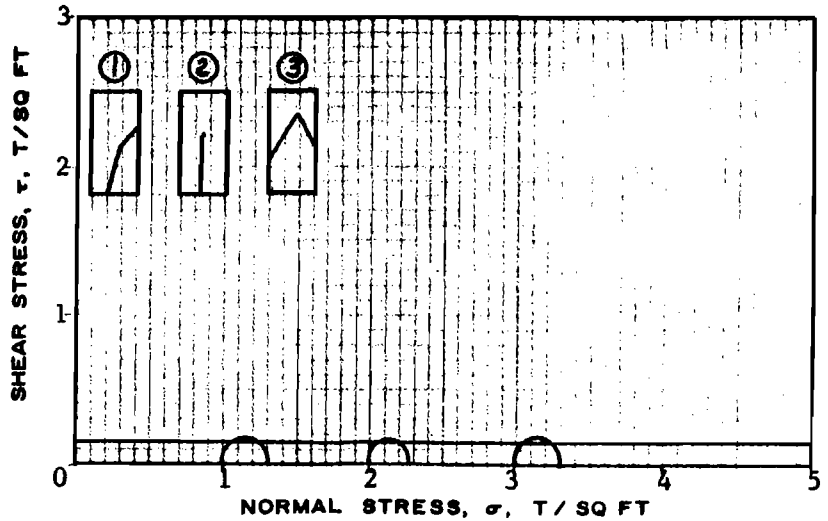
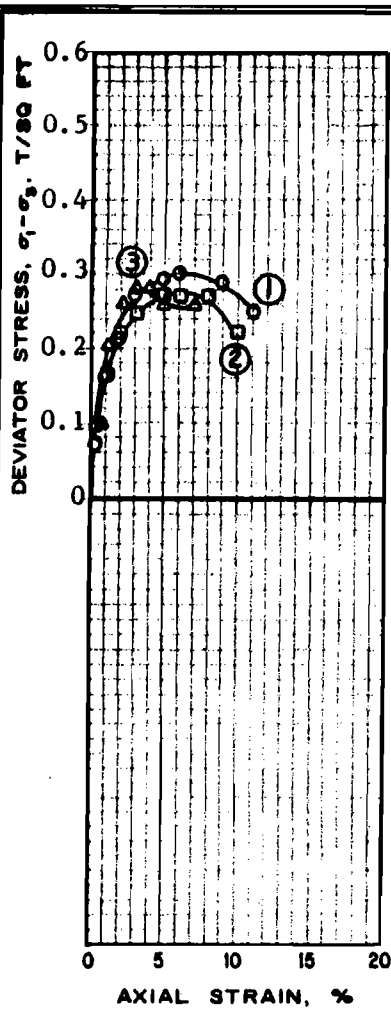
BORING 76

| Sam-<br>ple<br>No. | Depth<br>in<br>Feet | Classification  | Water<br>Content<br>Percent | Density<br>Lb/cu ft |       | Unconfined<br>Compressive<br>Strength<br>Lb/sq ft |
|--------------------|---------------------|---|-----------------------------|---------------------|-------|---|
|                    |                     |   |                             | Dry                 | Wet   |   |
| 1                  | 2.0                 | Compact gray & brown clayey<br>silt w/gravel & many shell<br>pockets    | 13.4                        | ----                | ----  | ----  |
| 2                  | 5.0                 | Soft gray clay w/sandy clay<br>layers, organic matter &<br>decayed wood | 68.9                        | 56.9                | 96.1  | 545   |
| 3                  | 8.0                 | Soft gray silty clay w/clayey<br>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<br>humus layers                             | 46.3                        | 71.0                | 103.8 | 635*  |
| 6                  | 19.0                | Loose gray clayey sand w/clay<br>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<br>pockets & lenses                       | 68.4                        | 58.6                | 98.5  | 1160  |
| 12                 | 49.0                | Medium stiff gray clay w/sand<br>pockets                                | 66.6                        | 59.0                | 98.2  | 1160  |
| 13                 | 54.0                | Medium stiff gray clay w/shell<br>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<br>w/silt pockets                        | 31.2                        | 91.1                | 119.6 | 2265  |
| 17                 | 73.0                | Medium dense tan & gray clayey<br>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**

$\phi = 0$   
 TAN  $\phi =$   
 $c = 0.16$  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 $\gamma_d$   | 72.1 | 66.3 | 73.6 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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

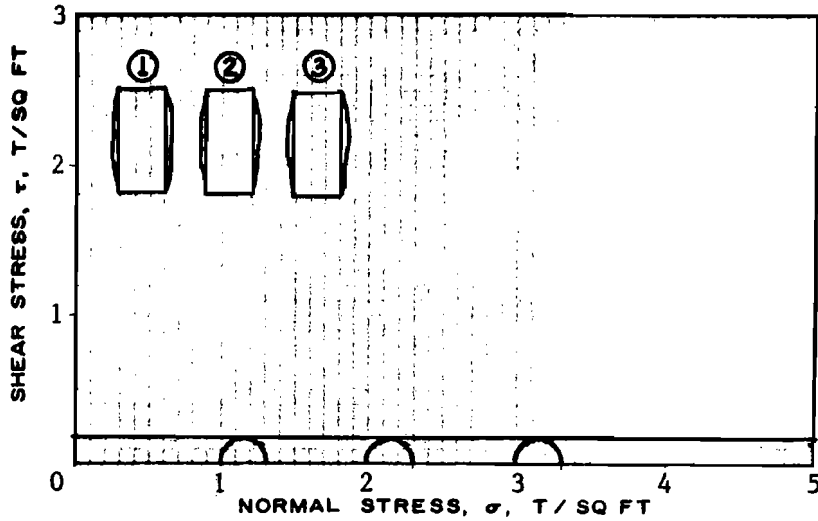
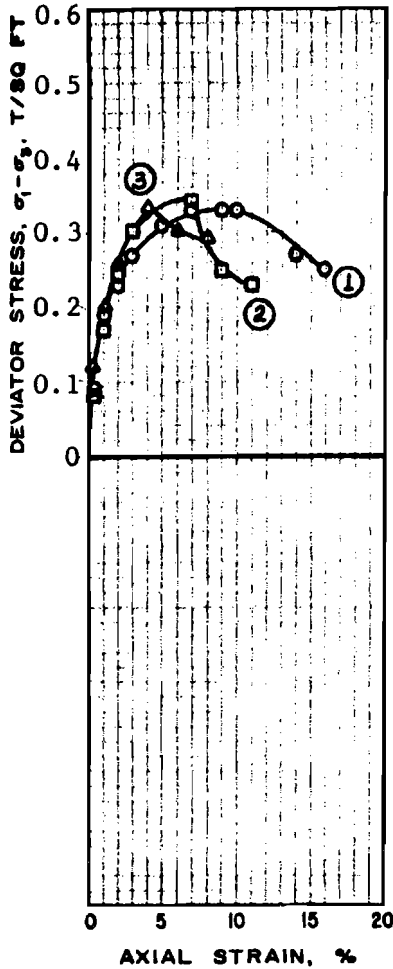
CLASSIFICATION Soft gray clay w/clayey silt layers

LL 75      PL 21      PI 54       $e_o$  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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.20$  T/SQ FT

METHOD OF SATURATION

CONTROLLED STRESS

CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$ |                                    | 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       $e_o$  2.74 Est.

REMARKS Shear values taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

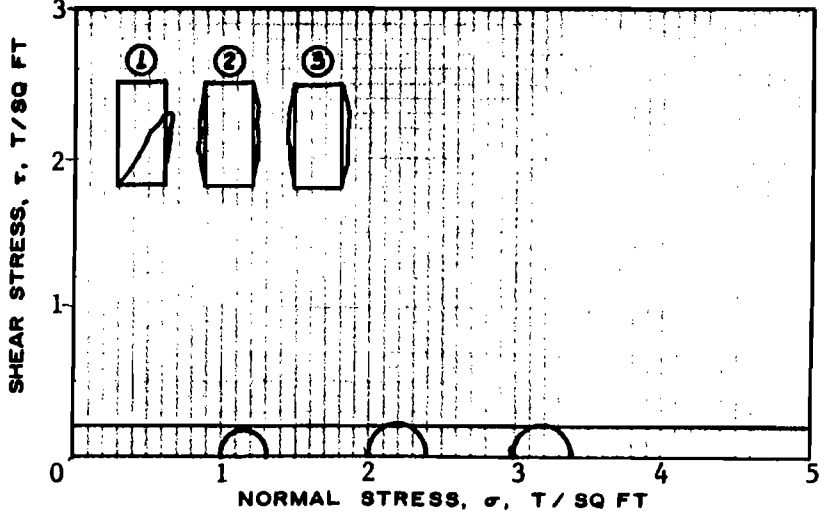
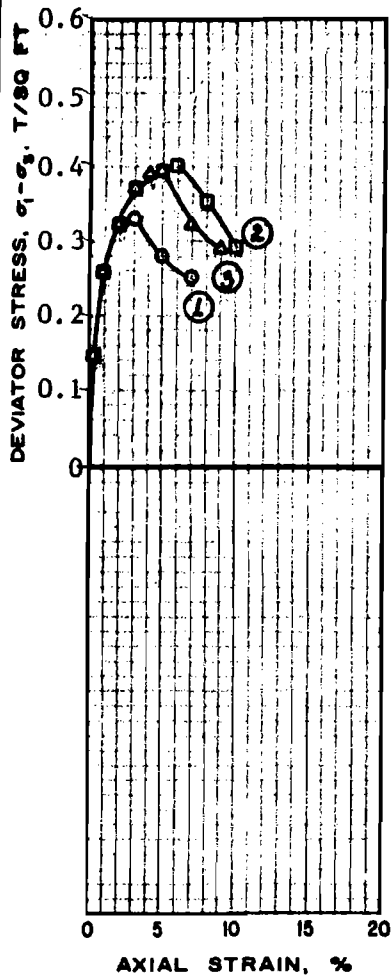
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$   
 TAN  $\phi =$  \_\_\_\_\_  
 $c = 0.21$  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 $\gamma_d$   | 56.5 | 59.0 | 60.4 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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

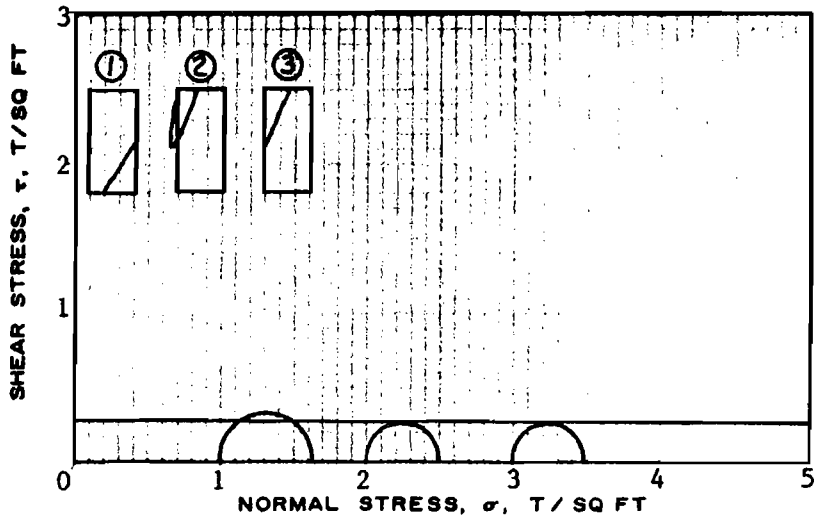
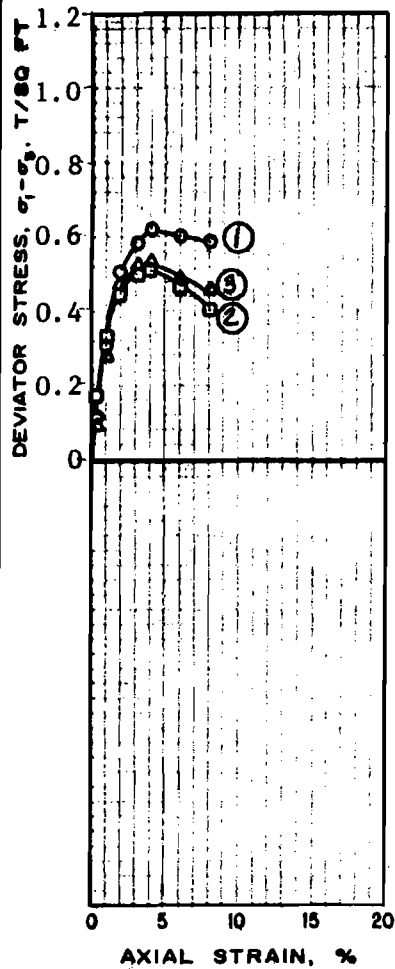
CLASSIFICATION Soft gray clay

LL \_\_\_\_\_ PL \_\_\_\_\_ PI \_\_\_\_\_  $e_s$  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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

Tan  $\phi =$

$c = 0.27$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| TEST NO.   |                                    | 1    | 2    | 3    |
|--|------------------------------------|------|------|------|
| INITIAL  | WATER CONTENT % $w_o$              | 64.8 | 72.8 | 72.5 |
|  | VOID RATIO $e_o$                   | 1.83 | 2.10 | 2.09 |
|  | SATURATION % $S_o$                 | 97   | 95   | 95   |
|  | DRY DENSITY, LB/CU FT $\gamma_d$   | 60.3 | 55.1 | 55.4 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_c$                 |      |      |      |
|  | FINAL BACK PRESSURE, T/SQ FT $u_o$ |      |      |      |
| FINAL  | WATER CONTENT % $w_f$              | 64.8 | 72.8 | 72.5 |
|  | VOID RATIO $e_f$                   | 1.83 | 2.10 | 2.09 |
| MINOR PRINCIPAL STRESS, T/SQ FT $\sigma_3$                 |                                    | 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 |

TYPE OF TEST Q(UU) TYPE OF SPECIMEN Undisturbed

CLASSIFICATION Medium stiff clay w/sand pockets & shell fragments

LL 83 PL 19 PI 64  $a_v$  2.74 Est.

REMARKS Shear values taken from large scale plot.

PROJECT Sewerage & Water Board of New Orleans

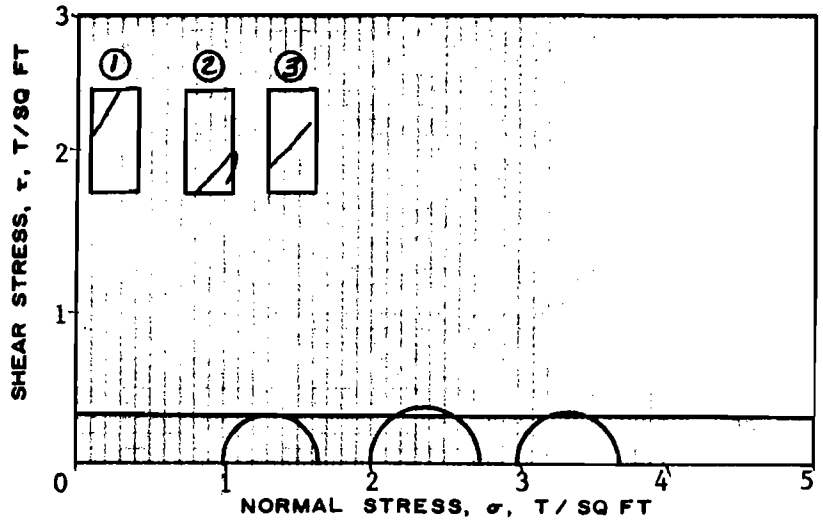
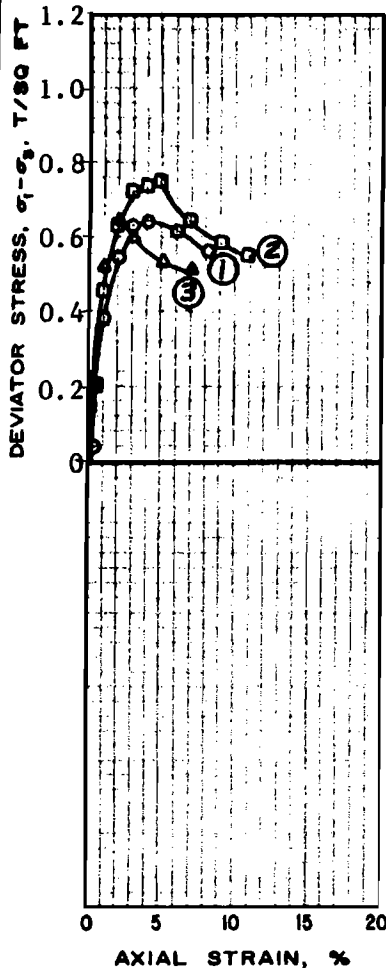
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

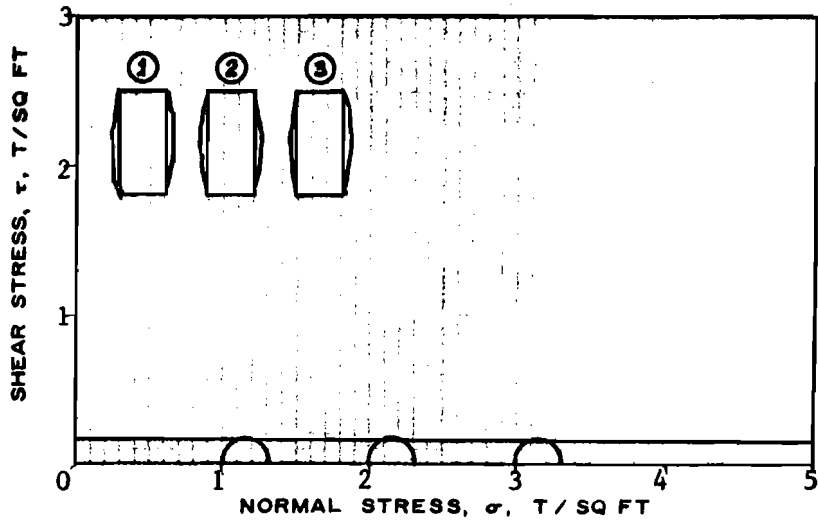
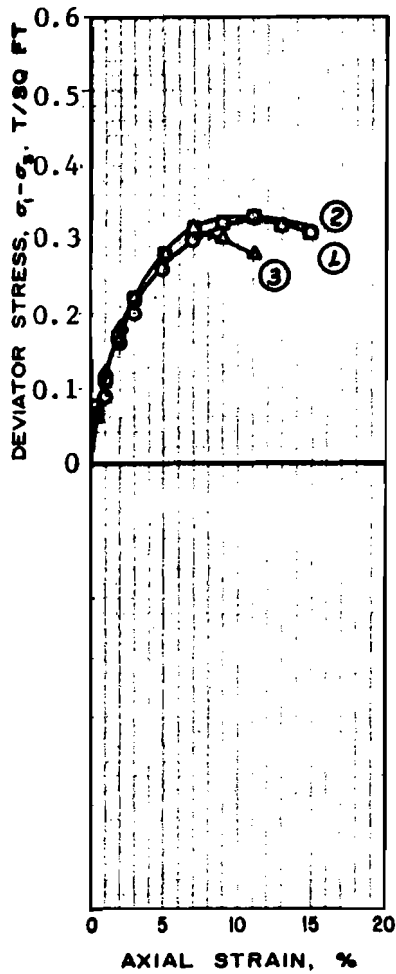
$\phi = 0$   
 $\tan \phi =$   
 $c = 0.32$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 65.8 | 69.8 | 70.7 |
| BEFORE SHEAR   | WATER CONTENT % $w_o$              |      |      |      |
|  | VOID RATIO $e_o$                   |      |      |      |
|  | SATURATION % $S_o$                 |      |      |      |
|  | 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 $\sigma_3$                 |                                    | 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 |

|   |   |                    |                      |
|---|---|--------------------|----------------------|
| TYPE OF TEST $Q(UU)$                    | TYPE OF SPECIMEN Undisturbed                  |                    |                      |
| CLASSIFICATION                          | Medium stiff clay w/trace of sand             |                    |                      |
| LL 75                                   | PL 18   | PI 57              | $\omega_c$ 2.74 Est. |
| REMARKS                                 | 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 |                      |
| <b>TRIAxIAL COMPRESSION TEST REPORT</b> |   |                    |                      |



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

Tan  $\phi =$

$c = 0.16$  T/SQ FT

METHOD OF SATURATION

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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 |

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  $e_o$  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

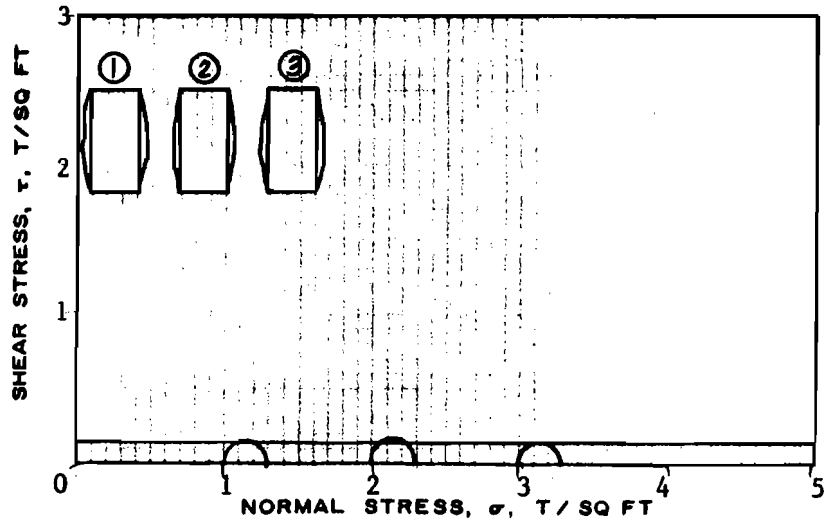
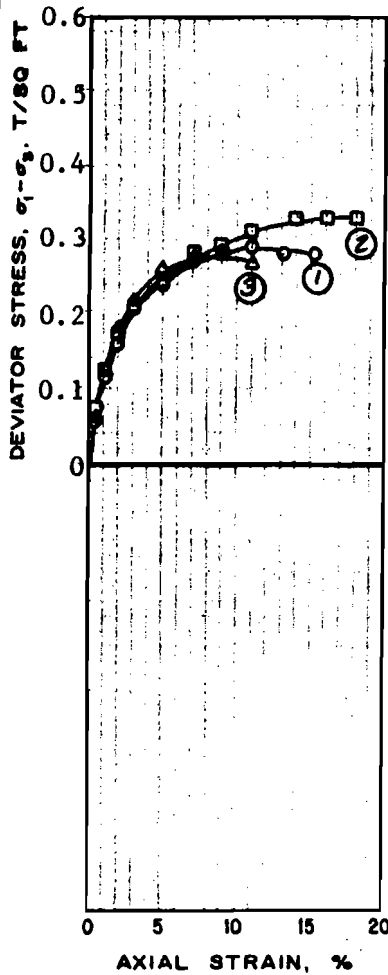
BORING NO. 74

SAMPLE NO. 4

DEPTH 13.5'

DATE 1 September 1981

**TRIAxIAL COMPRESSION TEST REPORT**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

TAN  $\phi =$

$c = 0.15$  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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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  $w_p$  2.74 Est.

REMARKS Shear values taken from large scale plot.

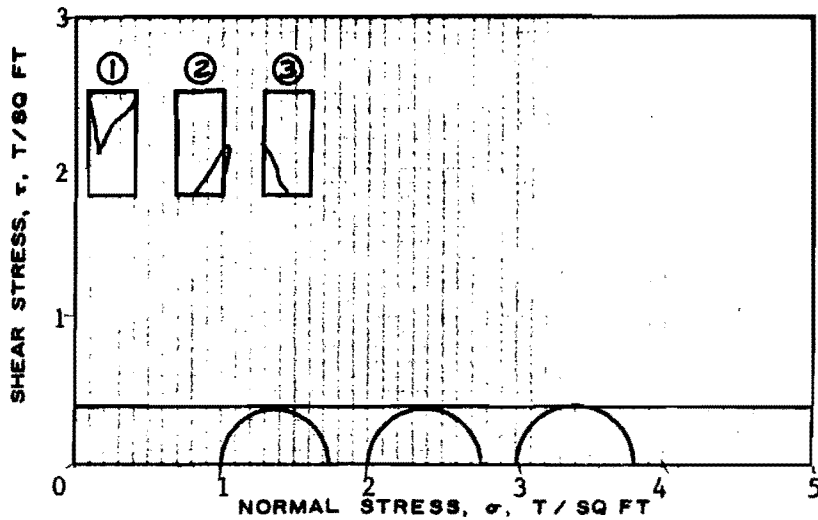
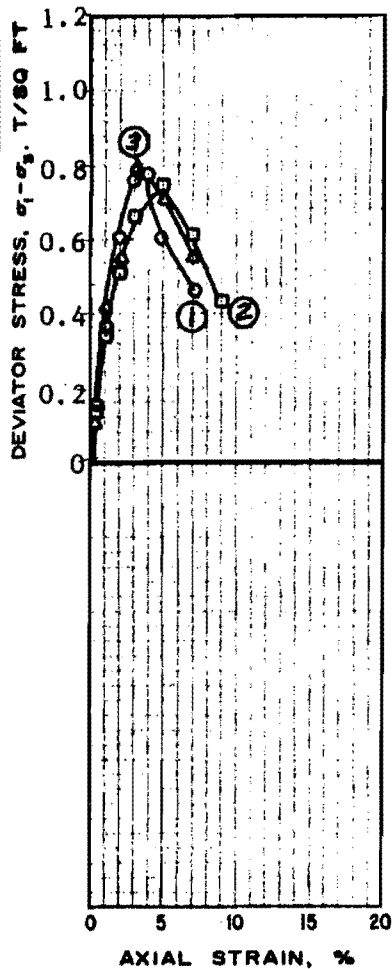
PROJECT Sewerage & Water Board of New Orleans  
Metairie Relief Canal

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**



**SHEAR STRENGTH PARAMETERS**

$\phi = 0$

$\tan \phi =$

$c = 0.39$  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 $\gamma_d$   | 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 $\sigma_3$                 |                                    | 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  $w_p$  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**



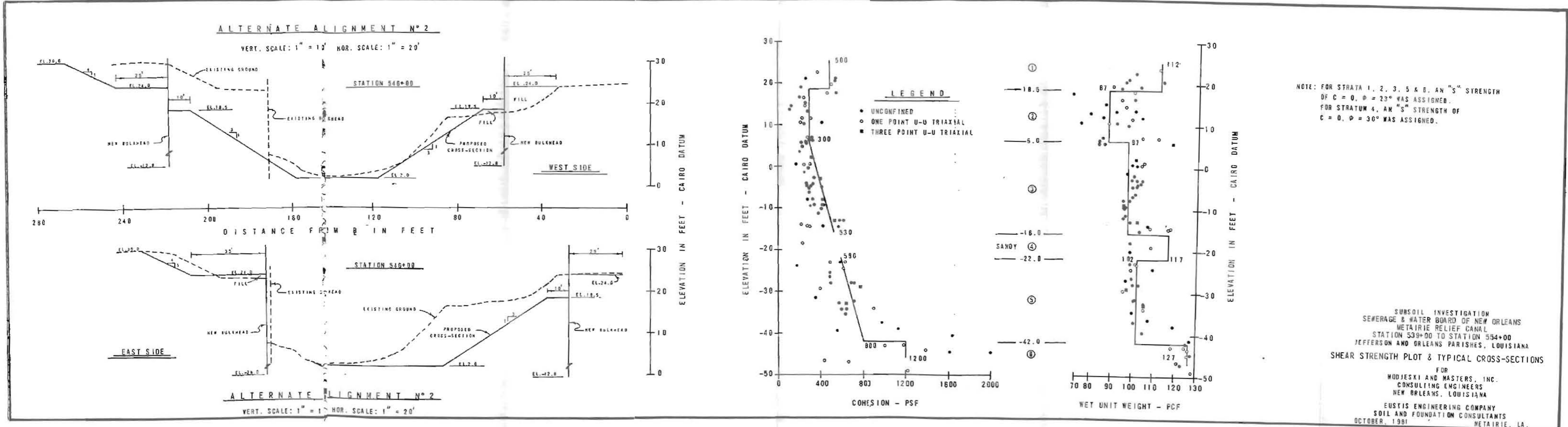
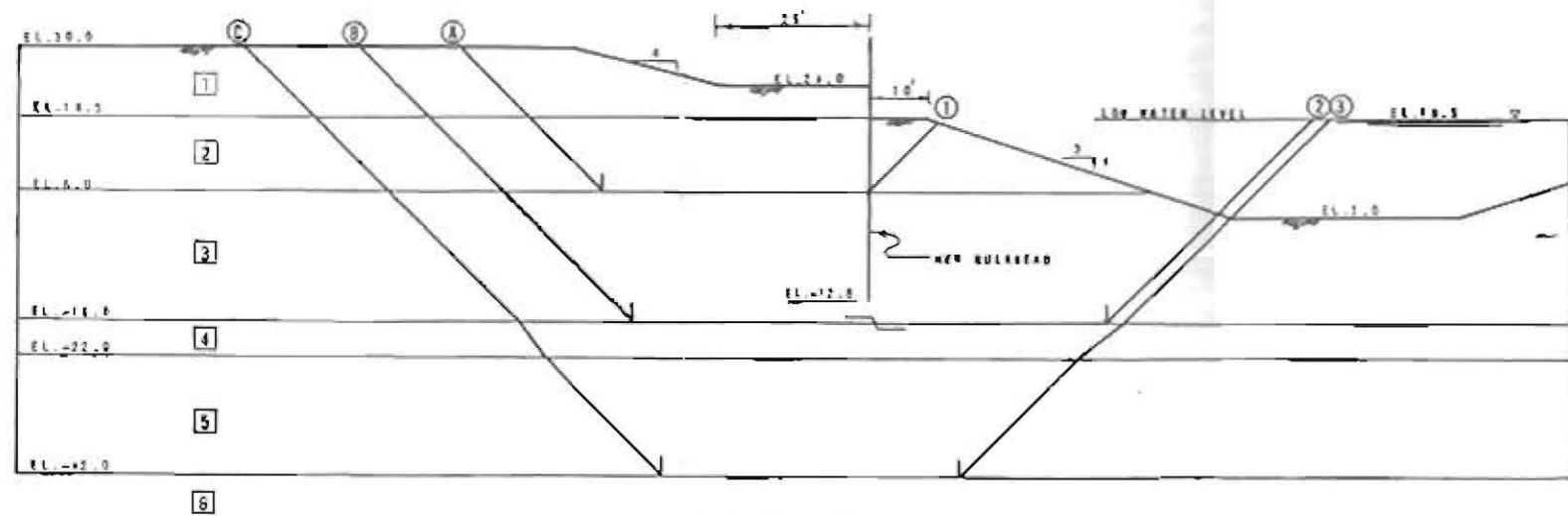


FIGURE 27

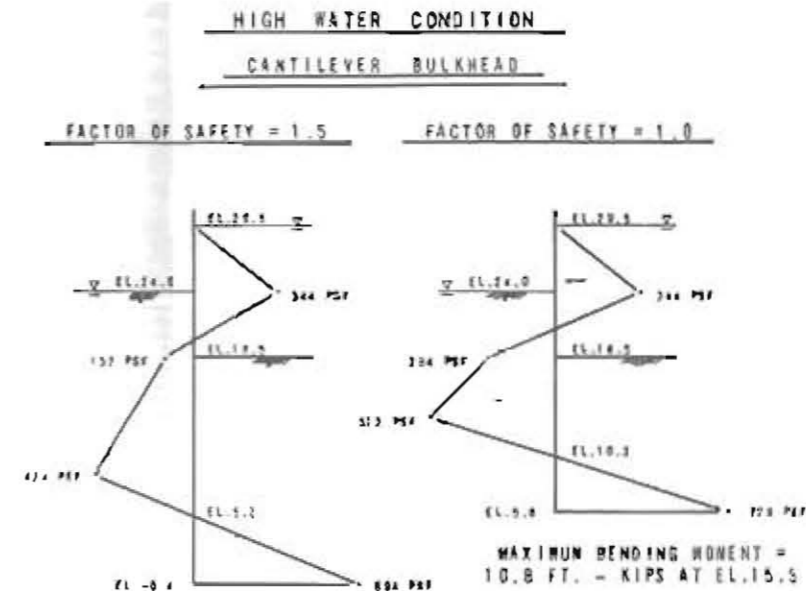
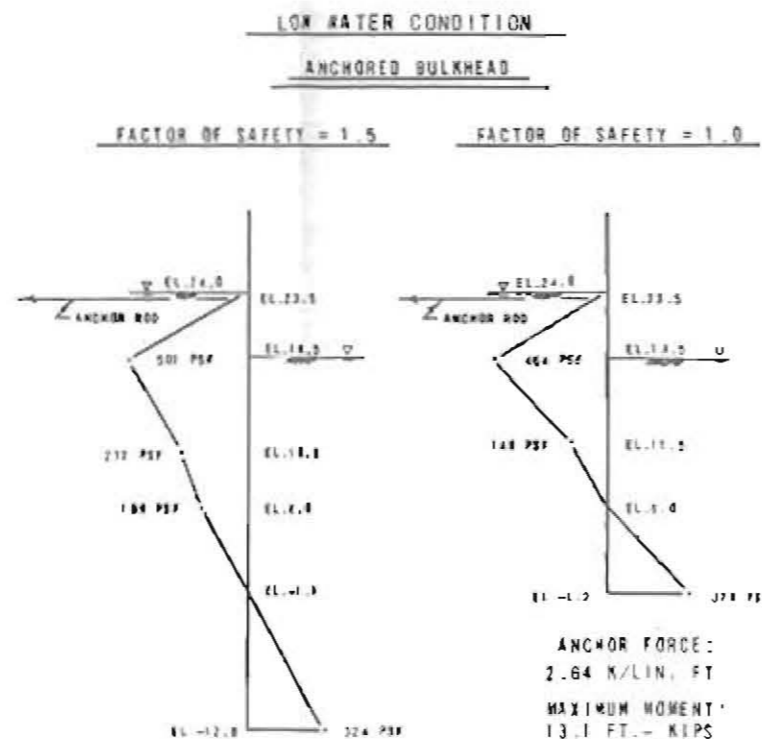
TYPICAL CROSS-SECTION -- EAST SIDE (ALT. ALIGNMENT N#1) & WEST SIDE (ALT. ALIGNMENT N#1 & 2)



SCALE: 1" = 20'

STABILITY ANALYSIS

| SLIP SURFACE | NO. | E.L. | DRIVING FORCE |              |            | RESISTING FORCE |       |            | F.S. |
|--------------|-----|------|---------------|--------------|------------|-----------------|-------|------------|------|
|              |     |      | $\Sigma U_x$  | $\Sigma U_y$ | $\Sigma W$ | $R_x$           | $R_y$ | $\Sigma R$ |      |
| A-1          | 0   | 0    | 25117         | 2240         | 22477      | 15600           | 13200 | 3125       | 1.32 |
| B-2          | -18 | 0    | 37149         | 2473         | 39622      | 21250           | 23314 | 15300      | 1.54 |
| C-2          | -42 | 0    | 143227        | 42130        | 185357     | 22158           | 24200 | 60088      | 1.69 |

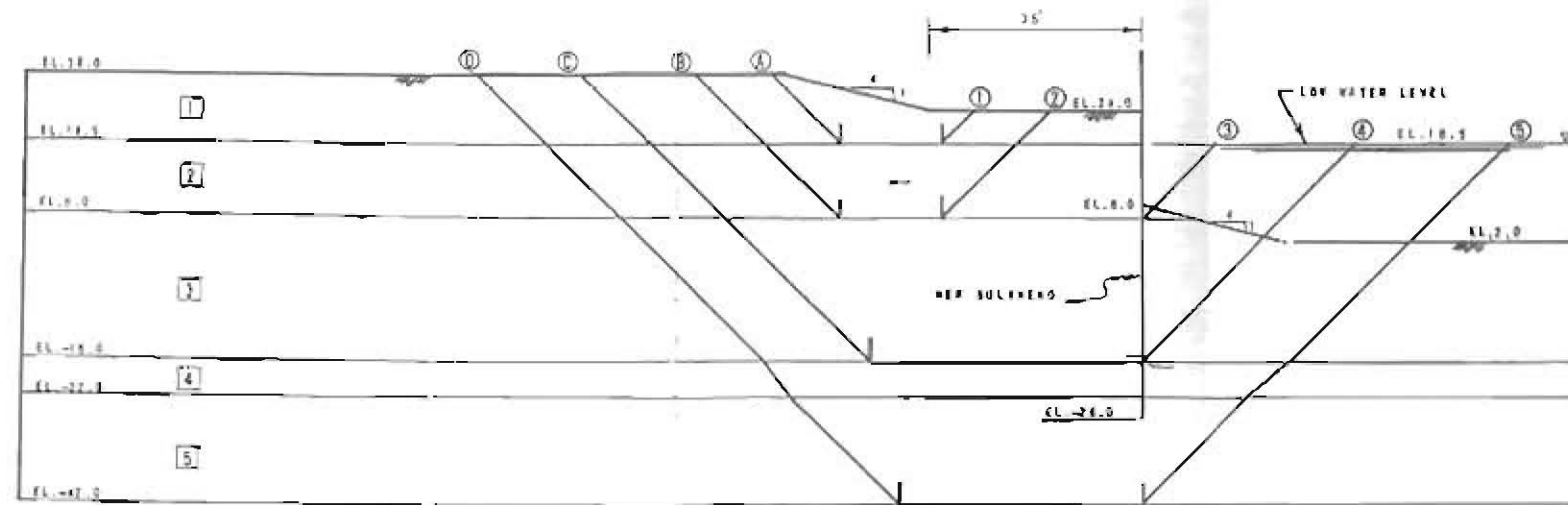


NOTES

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.

TYPICAL CROSS - SECTION -- EAST SIDE (ALT. ALIGNMENT N° 2)



SCALE: 1" = 20'

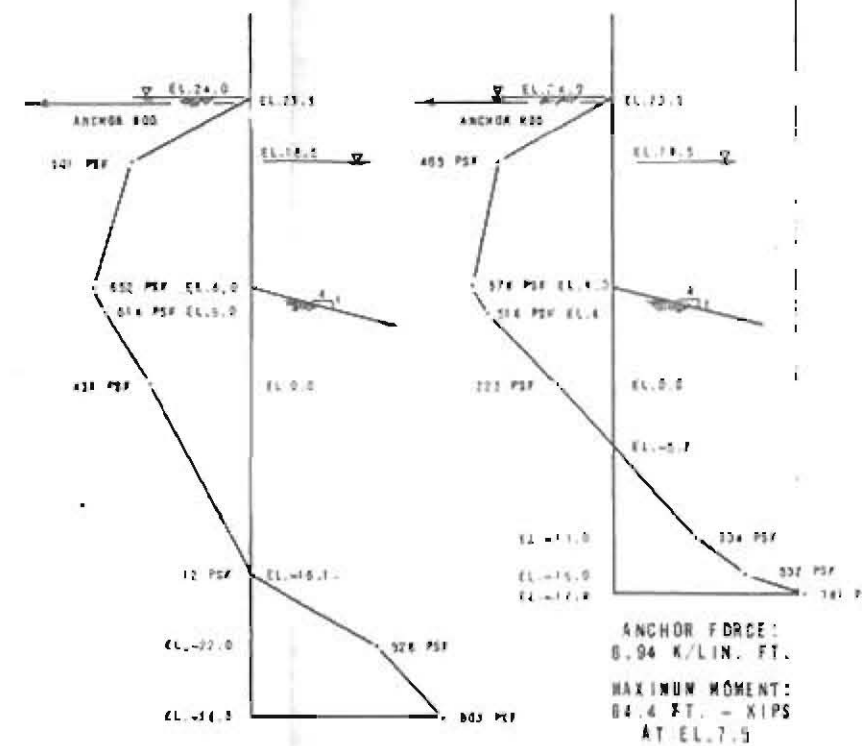
STABILITY ANALYSIS

| SLIP SURFACE | NO    | EL.    | DRIVING FORCE |        |             | RESISTING FORCE |       |            | FACTOR OF SAFETY |
|--------------|-------|--------|---------------|--------|-------------|-----------------|-------|------------|------------------|
|              |       |        | $D_v$         | $-D_h$ | $\Sigma MD$ | $R_1$           | $R_2$ | $\Sigma R$ |                  |
| S-1          | 18.5  | 8.559  | 1378          | 5833   | 11500       | 8500            | 4825  | 24838      | 4.43             |
| S-2          | 8.0   | 25923  | 10083         | 14884  | 18000       | 9186            | 13238 | 30337      | 2.45             |
| S-3          | 8.0   | 28453  | 105           | 14844  | 18000       | 15000           | 580   | 34588      | 1.40             |
| C-4          | -18.0 | 67434  | 8049          | 30448  | 33280       | 33850           | 15835 | 17048      | 1.30             |
| D-5          | -42.0 | 142333 | 40123         | 192334 | 33138       | 32000           | 48738 | 15434      | 1.31             |

LOW WATER CONDITION

ANCHORED BULKHEAD

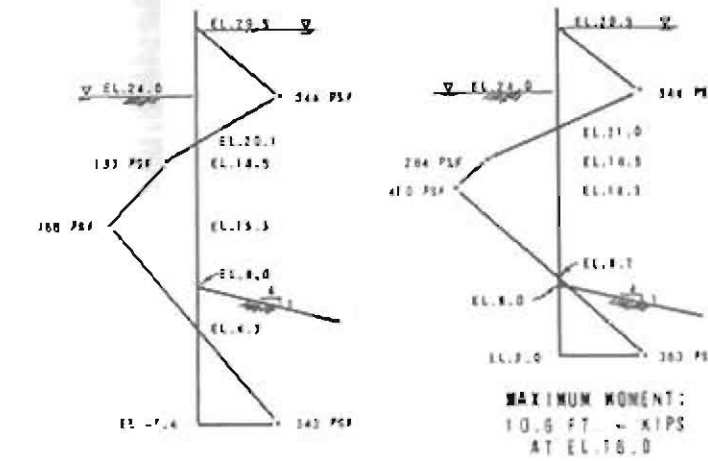
FACTOR OF SAFETY = 1.5      FACTOR OF SAFETY = 1.0



HIGH WATER CONDITION

CANTILEVER BULKHEAD

FACTOR OF SAFETY = 1.5      FACTOR OF SAFETY = 1.0



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.

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ENGINEERS, PLANNERS, ENVIRONMENTAL SCIENTISTS

4176 CANAL STREET

NEW ORLEANS, LOUISIANA 70119-5994

(504) 486-5901

P. O. BOX 19087-NEW ORLEANS, LA. 70179

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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:

| MONOLITH | DESIGN LOAD |           | REQUIRED<br>ULTIMATE LOAD |           | MIN.<br>SAFETY FACTOR |         |
|----------|-------------|-----------|---------------------------|-----------|-----------------------|---------|
|          | 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<br>OR<br>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.

BURK AND ASSOCIATES, INC.

Mr. Ronald Ventola  
November 13, 1984  
Page 2

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,

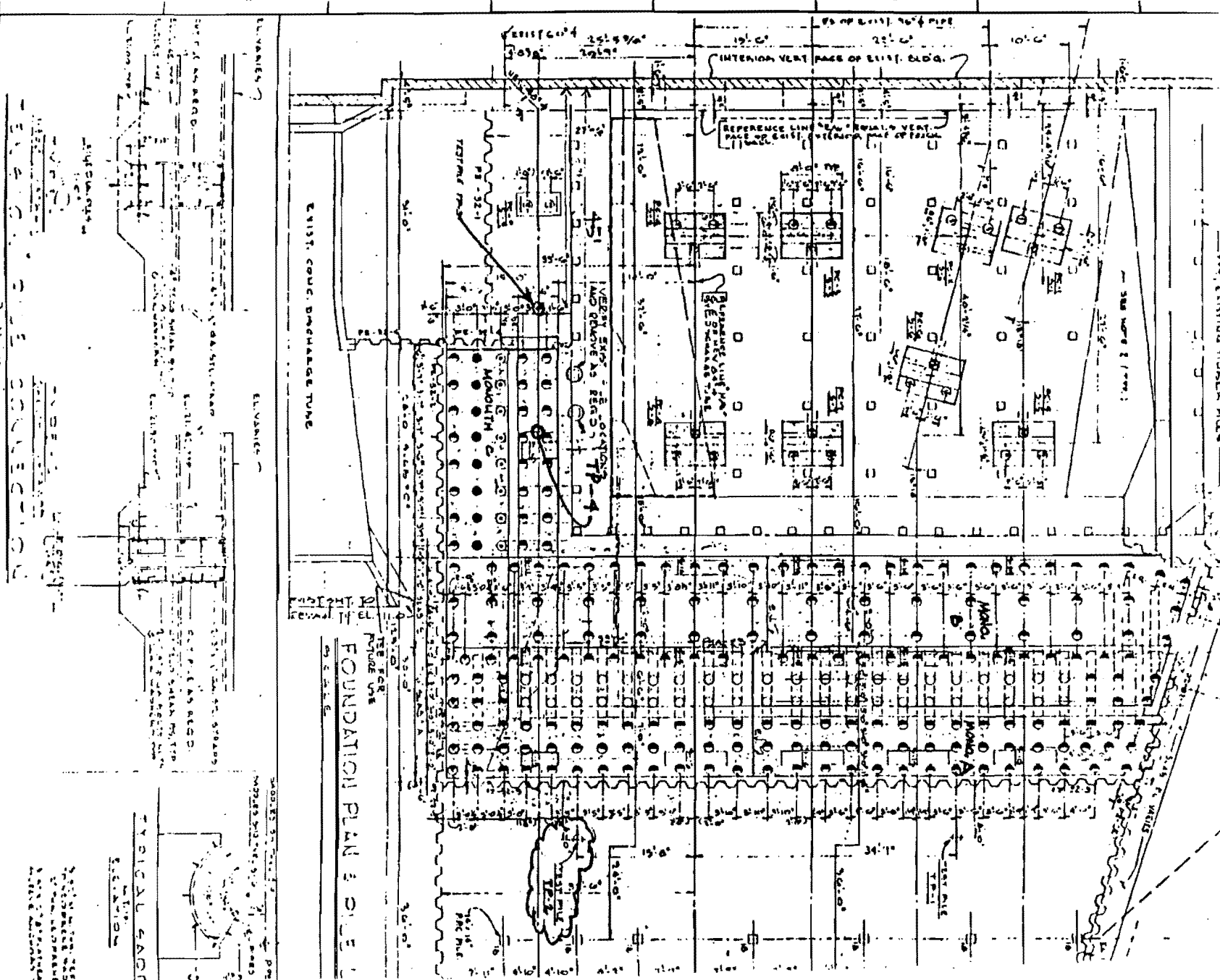
BURK AND ASSOCIATES, INC.  
Engineers, Planners and  
Environmental Scientists



Deborah Ducote Keller, P.E.  
Project Engineer

DDK/ptb  
Enclosures

cc: Mr. G. Joseph Sullivan, S&WBNO  
Mr. G. Romero, COE



FOUNDATION PLAN & SHEET

ELEVATION  
 ELEVATION  
 TYPICAL SAND  
 ELEVATION  
 TYPICAL SAND  
 ELEVATION  
 TYPICAL SAND  
 ELEVATION

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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. Chifical  
Chief Field Engineer

GAC/JJN:1b

cc: Mr. G. J. Sullivan



# 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.



PAGE 4  
PUMPING STATION NO. 6  
DNO-7153

FOUNDATION PILE -- (CONTINUED)

| <u>TIME</u> | <u>CUMULATIVE</u><br><u>HOURS</u> | <u>LOAD APPLIED</u><br><u>TONS</u>     | <u>SETTLEMENT</u><br><u>INCHES</u> | <u>REMARKS</u> |
|-------------|-----------------------------------|--|------------------------------------|----------------|
|             |                                   | 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  |

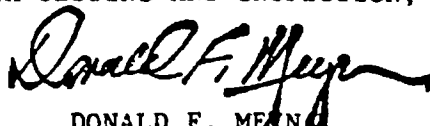
The above test was conducted in accordance with the City of New Orleans Building Code, Article 2805, Method 1, Forty-eight (48.0) hour hold procedure.

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. MEYN  
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.

PAGE 3  
 PUMPING STATION NO. 6  
 DNO-7153

LOAD TO FAILURE -- (CONTINUED)

| <u>TIME</u> | <u>CUMULATIVE<br/>HOURS</u> | <u>LOAD APPLIED<br/>TONS</u> | <u>SETTLEMENT<br/>INCHES</u> | <u>REMARKS</u> |
|-------------|-----------------------------|------------------------------|------------------------------|----------------|
|             | 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.

PAGE 4  
PUMPING STATION NO. 6  
DNO-7153

LOAD TO FAILURE -- (CONTINUED)

Field Book No. 107  
Supervisor: 4.0 hours

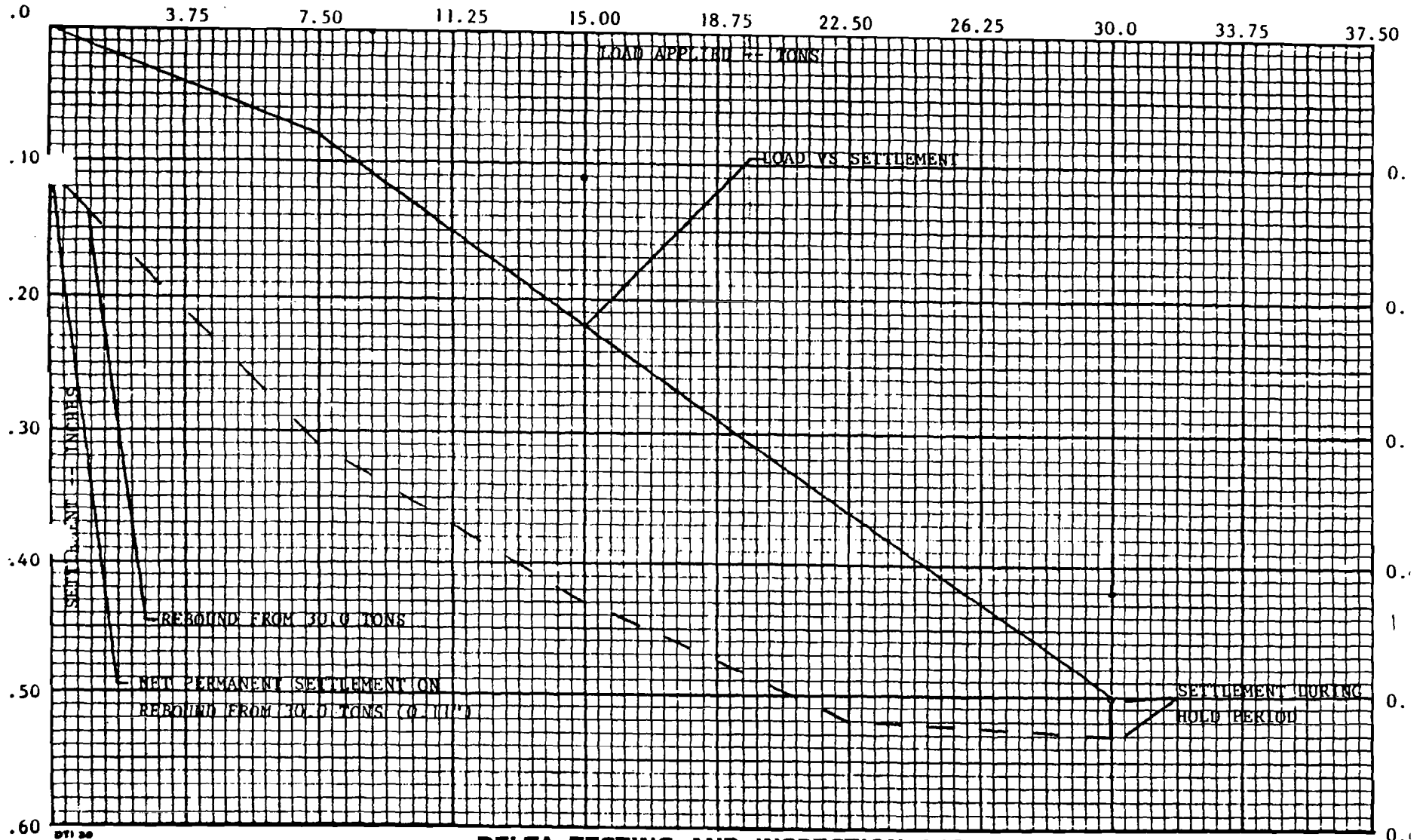
Burk and Associates called our office on October 11, 1984 and directed us to go out on Friday, October 12, 1984 and push the pile down until the pile would sustain forty (40.0) tons. Once forty tons is established and sustained to hold forty tons in accordance with the original Load Procedure.

(CONTINUED)

PROJECT  
 CONSULTING ENGINEER  
 GENERAL CONTRACTOR  
 PILE DRIVING CONTRACTOR

ASTM D-25 UNTREATED ROUND TIMBER X 16.75'  
 TIP ELEVATION : PUMPING STATION NO. 6  
 : BURK AND ASSOCIATES  
 : ATLAS CONSTRUCTION CO., INC.  
 : ATLAS CONSTRUCTION CO., INC.

DNO-7153  
 TEST PILE NO. 2  
 -16.75' TIP ELEVATION  
 DATE TEST PILE DRIVEN: 9-27-8  
 DATE TEST PILE LOADED: 10-09-8



FOUNDATION PILE -- (CONTINUED)

| <u>TIME</u>                              | <u>CUMULATIVE<br/>HOURS</u> | <u>LOAD APPLIED<br/>TONS</u> | <u>SETTLEMENT<br/>INCHES</u> | <u>REMARKS</u>          |
|--|-----------------------------|------------------------------|------------------------------|-------------------------|
|  | 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 --<br>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<br>hour hold |
|  | 41:31                       | 30.00                        | 0.53                         | 12:01AM --<br>10-11-84  |
|  | 56:00                       | 30.00                        | 0.53                         | End hold<br>period      |

PAGE 2  
PUMPING STATION NO. 6  
DNO-7153

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.

| <u>TIME</u> | <u>CUMULATIVE<br/>HOURS</u> | <u>LOAD APPLIED<br/>TONS</u> | <u>SETTLEMENT<br/>INCHES</u> | <u>REMARKS</u>  |
|-------------|-----------------------------|------------------------------|------------------------------|-----------------|
|             | 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                         |                 |



# 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

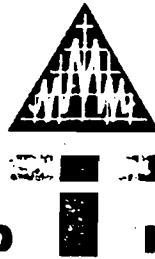
|                                  |                                |                    |                           |                       |
|----------------------------------|--------------------------------|--------------------|---------------------------|-----------------------|
| PROJECT<br>Pumping Station No. 6 | CONTRACTOR<br>Atlas Const. Co. | ARCHITECT<br>----- | ENGINEER<br>Burk & Assoc. | ORDER NO.<br>DND-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   | ↓        | 2     | 3      |       |  |  |  |  |  |  |  |  |  |  |  |  |  |                        |  |         |  |         |  |
| 2   | ↓        | 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    |        |       |  |  |  |  |  |  |  |  |  |  |  |  |  |                        |  |         |  |         |  |
| 3   | 16       | 12    |        |       |  |  |  |  |  |  |  |  |  |  |  |  |  |                        |  |         |  |         |  |
| * 4                                       | 17@7"    | 20@7" |        |       |  |  |  |  |  |  |  |  |  |  |  |  |  |                        |  |         |  |         |  |
| * -15                                     | 25       | 22    |        |       |  |  |  |  |  |  |  |  |  |  |  |  |  |                        |  |         |  |         |  |
| * -16                                     |          | 50    |        |       |  |  |  |  |  |  |  |  |  |  |  |  |  |                        |  |         |  |         |  |
| * -17                                     |          | 41@9" |        |       |  |  |  |  |  |  |  |  |  |  |  |  |  |                        |  |         |  |         |  |
| ALL PILES LOGGED FROM ELEVATION OF +23.00 |          |       |        |       |  |  |  |  |  |  |  |  |  |  |  |  |  |                        |  |         |  |         |  |
|   |          |       |        |       |  |  |  |  |  |  |  |  |  |  |  |  |  | SUPERVISOR: G. Mansour |  | 1:00 am |  | 3:00 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 3:00 pm  
 TRAVEL TIME: N/A  
 MILEAGE: N/A



# 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.



PAGE 2  
PUMPING STATION NO. 6  
DNO-7153

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.

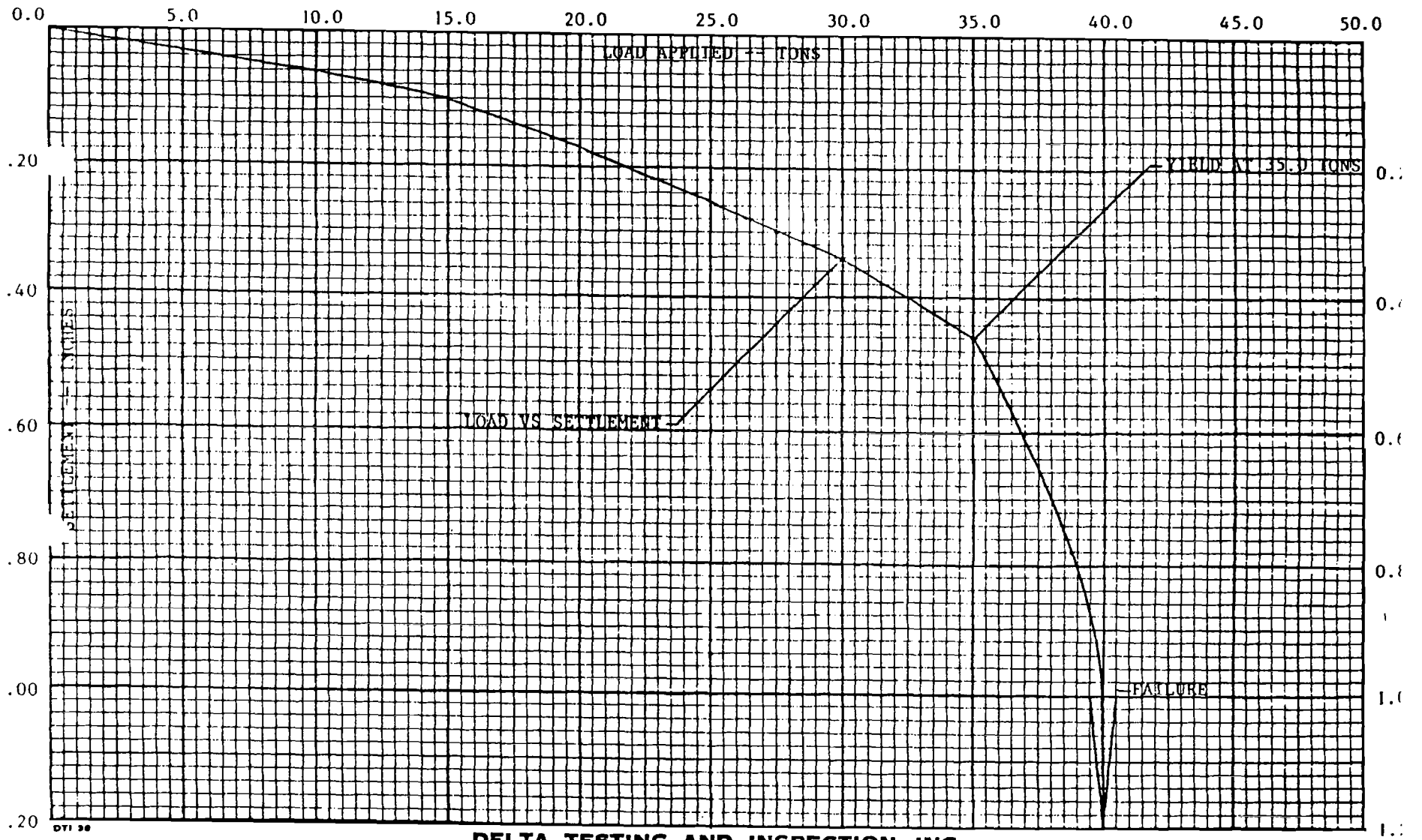
Each increment and decrement was held for one hour free of movement before applying the next increment.

| <u>TIME</u> | <u>CUMULATIVE</u><br><u>HOURS</u> | <u>LOAD APPLIED</u><br><u>TONS</u> | <u>SETTLEMENT</u><br><u>INCHES</u> | <u>REMARKS</u>  |
|-------------|-----------------------------------|------------------------------------|------------------------------------|-----------------|
|             | 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

TEST PILE NO. 4  
-15.5' TIP ELEVATION  
DATE TEST PILE DRIVEN: 9-28-84  
DATE TEST PILE LOADED: 10-09-84

PROJECT : PUMPING STATION NO. 6  
CONSULTING ENGINEER : BURK AND ASSOCIATES  
GENERAL CONTRACTOR : ATLAS CONSTRUCTION CO., INC.  
PILE DRIVINE CONTRACTOR : ATLAS CONSTRUCTION CO., INC.



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.

| <u>TIME</u>                                    | <u>CUMULATIVE HOURS</u> | <u>LOAD APPLIED TONS</u> | <u>SETTLEMENT INCHES</u> | <u>REMARKS</u>       |
|--|-------------------------|--------------------------|--------------------------|----------------------|
|  | 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,<br>10-13-84 |

PAGE 7  
PUMPING STATION NO. 6  
DNO-7153

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.



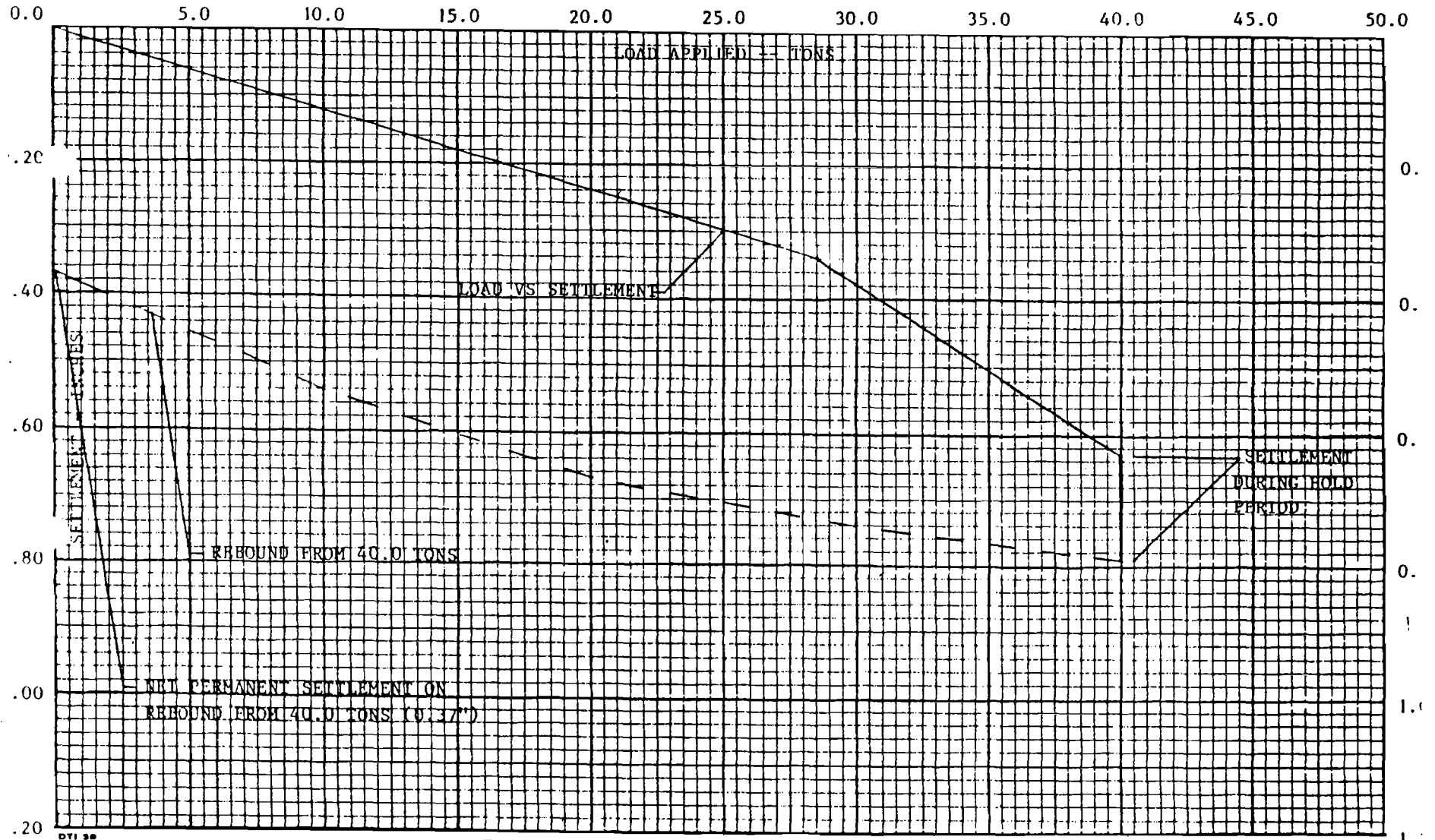
DONALD F. MEYER  
President

DJI/DFM/jb  
10-17-84  
Attachments  
1-Sewerage & Water Board of N.O.  
1-Burk and Associates, Inc.  
1-Atlas Construction Co., Inc.

PROJECT  
CONSULTING ENGINEER  
GENERAL CONTRACTOR  
PILE DRIVING CONTRACTOR

ASTM D-25 UNTREATED ROUND TIMBER PILE X -15.5'  
TIP ELEVATION  
: PUMPING STATION NO. 6  
: BURK AND ASSOCIATES  
: ATLAS CONSTRUCTION CO., INC.  
: 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.



# DELTA TESTING AND INSPECTION, INC.

P. O. BOX 19172 • NEW ORLEANS, LA. 70179 • PHONE 488-5595

TEST PILE REPORT NO. 3

SHEET 1 OF 1

DTI 34

## PILE DRIVING RECORD

DATE: 9-28-84

|                                  |                                |                    |                           |                       |
|----------------------------------|--------------------------------|--------------------|---------------------------|-----------------------|
| PROJECT<br>Pumping Station No. 6 | CONTRACTOR<br>Atlas Const. Co. | ARCHITECT<br>----- | ENGINEER<br>Burk & Assoc. | ORDER NO.<br>DND-7153 |
|----------------------------------|--------------------------------|--------------------|---------------------------|-----------------------|

### NUMBER OF BLOWS

| PILE NO.   | TP4   | NUMBER OF BLOWS |        |   |  |  |  |  |  |  |  |  |  |
|--|-------|-----------------|--------|---|--|--|--|--|--|--|--|--|--|
|  |       | 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. These 24 blows account for 19 feet of timber.                           |  |  |  |  |  |  |  |  |  |
|  | 4     | 6               |        |   |  |  |  |  |  |  |  |  |  |
|  | 3     | 5               |        |   |  |  |  |  |  |  |  |  |  |
|  | 2     | 5               |        |   |  |  |  |  |  |  |  |  |  |
|  | 1     | 6               |        |   |  |  |  |  |  |  |  |  |  |
|  | 0     | 7               | ←      | Pile was driven to this point without jetting. Jetting procedure was used from this elevation down to elevation of -12.00 |  |  |  |  |  |  |  |  |  |
|  | -1    | 30              |        |   |  |  |  |  |  |  |  |  |  |
|  | 2     | 60              |        |   |  |  |  |  |  |  |  |  |  |
|  | 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. 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 to 9:00 am pm

TRAVEL TIME: N/A

MILEAGE: N/A



# DELTA TESTING AND INSPECTION, INC.

P. O. BOX 19172 • NEW ORLEANS, LA. 70179 • PHONE 486-5595

TEST PILE REPORT NO. 3

SHEET 1 OF 1

DTI 34

## PILE DRIVING RECORD

DATE: 9-28-84

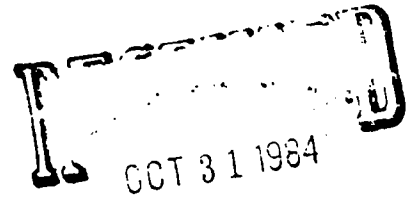
|                                  |                                |                    |                           |                       |
|----------------------------------|--------------------------------|--------------------|---------------------------|-----------------------|
| PROJECT<br>Pumping Station No. 6 | CONTRACTOR<br>Atlas Const. Co. | ARCHITECT<br>----- | ENGINEER<br>Burk & Assoc. | ORDER NO.<br>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. These 24 blows account for 19 feet of timber.                           |  |  |  |  |  |  |  |  |  |
| 4  | 6      |                 |   |  |  |  |  |  |  |  |  |  |
| 3  | 5      |                 |   |  |  |  |  |  |  |  |  |  |
| 2  | 5      |                 |   |  |  |  |  |  |  |  |  |  |
| 1  | 6      |                 |   |  |  |  |  |  |  |  |  |  |
| 0  | 7      | ←               | Pile was driven to this point without jetting. Jetting procedure was used from this elevation down to elevation of -12.00 |  |  |  |  |  |  |  |  |  |
| -1   | 30     |                 |   |  |  |  |  |  |  |  |  |  |
| 2  | 60     |                 |   |  |  |  |  |  |  |  |  |  |
| 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. Naelsen   |  |  |  |  |  |  |  |  |  |
| ALL PILES WERE LOGGED FROM AN ELEVATION OF 28.00 |        |                 |   |  |  |  |  |  |  |  |  |  |

TIP ELEVATION PENETRATION IN FEET

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 to 9:00 am pm  
 TRAVEL TIME: N/A  
 MILEAGE: N/A



**BURK & ASSOCIATES**

PUMPING STATION NO. 6  
FLOODWALL CONSTRUCTION  
PHASE I -- CONTRACT NO: 5103  
NEW ORLEANS, LOUISIANA  
TENSION TEST PILE PROGRAM





# 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.

PAGE 2  
PUMPING STATION NO. 6  
DNO-7153

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.

| <u>TIME</u> | <u>CUMULATIVE</u><br><u>HOURS</u> | <u>LOAD APPLIED</u><br><u>TONS</u> | <u>UPLIFT</u><br><u>INCHES</u> | <u>REMARKS</u> |
|-------------|-----------------------------------|------------------------------------|--------------------------------|----------------|
|             | 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)

| <u>TIME CUMULATIVE</u><br><u>HOURS</u> | <u>LOAD APPLIED</u><br><u>TONS</u> | <u>UPLIFT</u><br><u>INCHES</u> | <u>REMARKS</u>                           |
|--|------------------------------------|--------------------------------|--|
| 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<br>hour hold<br>8PM, 10-23-84 |
| 9:30                                   | "                                  | "                              |  |
| 9:45                                   | "                                  | "                              |  |
| 10:00                                  | 20.50                              | 0.30                           |  |



# 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<br>Pumping Station No. 6 | CONTRACTOR<br>Atlas Const. Co. | ARCHITECT<br>----- | ENGINEER<br>Burk & Assoc. | ORDER NO.<br>DNO-7153 |
|----------------------------------|--------------------------------|--------------------|---------------------------|-----------------------|

NUMBER OF BLOWS

| TIP ELEVATION PENETRATION IN FEET | 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                                       |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | 9   |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | 8   |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | 7   |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | 6   |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | +5  |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | 4   |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | 3   |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | 2   |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | 1   |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | 0   |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | -1  |       |       |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | 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    |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | 3   | 16    | 12    |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | * 4                                       | 17@7" | 20@7" |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | * -15                                     | 25    | 22    |        |  |  |  |  |  |  |            |  |  |  |  |            |  |  |  |  |  |
|                                   | * -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  
 SURVEY: N/A



# DELTA TESTING AND INSPECTION, INC.

P. O. BOX 19172 • NEW ORLEANS, LA. 70179 • PHONE 488-5595

TEST PILE REPORT NO. 2

SHEET 2 OF 2

DTI 34

## PILE DRIVING RECORD

DATE: 9-27-84

|                                  |                                |                    |                          |                       |
|----------------------------------|--------------------------------|--------------------|--------------------------|-----------------------|
| PROJECT<br>Pumping Station No. 6 | CONTRACTOR<br>Atlas Const. Co. | ARCHITECT<br>----- | ENGINEER<br>Burk & Assc. | ORDER NO.<br>DNO-7153 |
|----------------------------------|--------------------------------|--------------------|--------------------------|-----------------------|

| TIP ELEVATION<br>PENETRATION IN FEET | 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                                    | 116@5"          |               |  |  |  |  |  |  |  |  |
| -5                                   | 108             |               |  |  |  |  |  |  |  |  |
| 6                                    | 117             |               |  |  |  |  |  |  |  |  |
| 7                                    |                 |               |  |  |  |  |  |  |  |  |
| 8                                    |                 |               |  |  |  |  |  |  |  |  |
| 9                                    |                 |               |  |  |  |  |  |  |  |  |
| -10                                  |                 |               |  |  |  |  |  |  |  |  |
| 1                                    |                 |               |  |  |  |  |  |  |  |  |
| 2                                    |                 |               |  |  |  |  |  |  |  |  |
| 3                                    |                 |               |  |  |  |  |  |  |  |  |
| 4                                    |                 |               |  |  |  |  |  |  |  |  |
| -15                                  |                 |               |  |  |  |  |  |  |  |  |

Pile logged from this point, pile is southeast reaction pile for I.P. 1



These blow counts were at the direction of Mr. Louis Napolitano of Eustis Engineering

SUPERVISOR: G. Mansour 1:00 am/pm 3:00 am/pm

REMARKS 1. TYPE HAMMER: Vulcan No. 1 (15,000 lbs.)

INSPECTOR: Chris Schroeder

2. TYPE PILE: S.Y.P. Class B untreated round timber pile.

WORK TIME: 1:00 am/pm 3:00 am/pm

3. DWG NO.:

TRAVEL TIME: N/A  
UNLESS N/A

DESCRIPTION

: FOUNDATION PILE -- TENSION TEST ON S.Y.P.  
ASTM D-25 UNTREATED ROUND TIMBER X -16.75'  
TIP ELEVATION

DNO-7153

REPORT NO. 5

PROJECT

: PUMPING STATION NO. 6

TEST PILE NO. 2

-16.75' TIP ELEVATION

CONSULTING ENGINEER

: BURK AND ASSOCIATES

DATE TEST PILE DRIVEN: 9-27-84

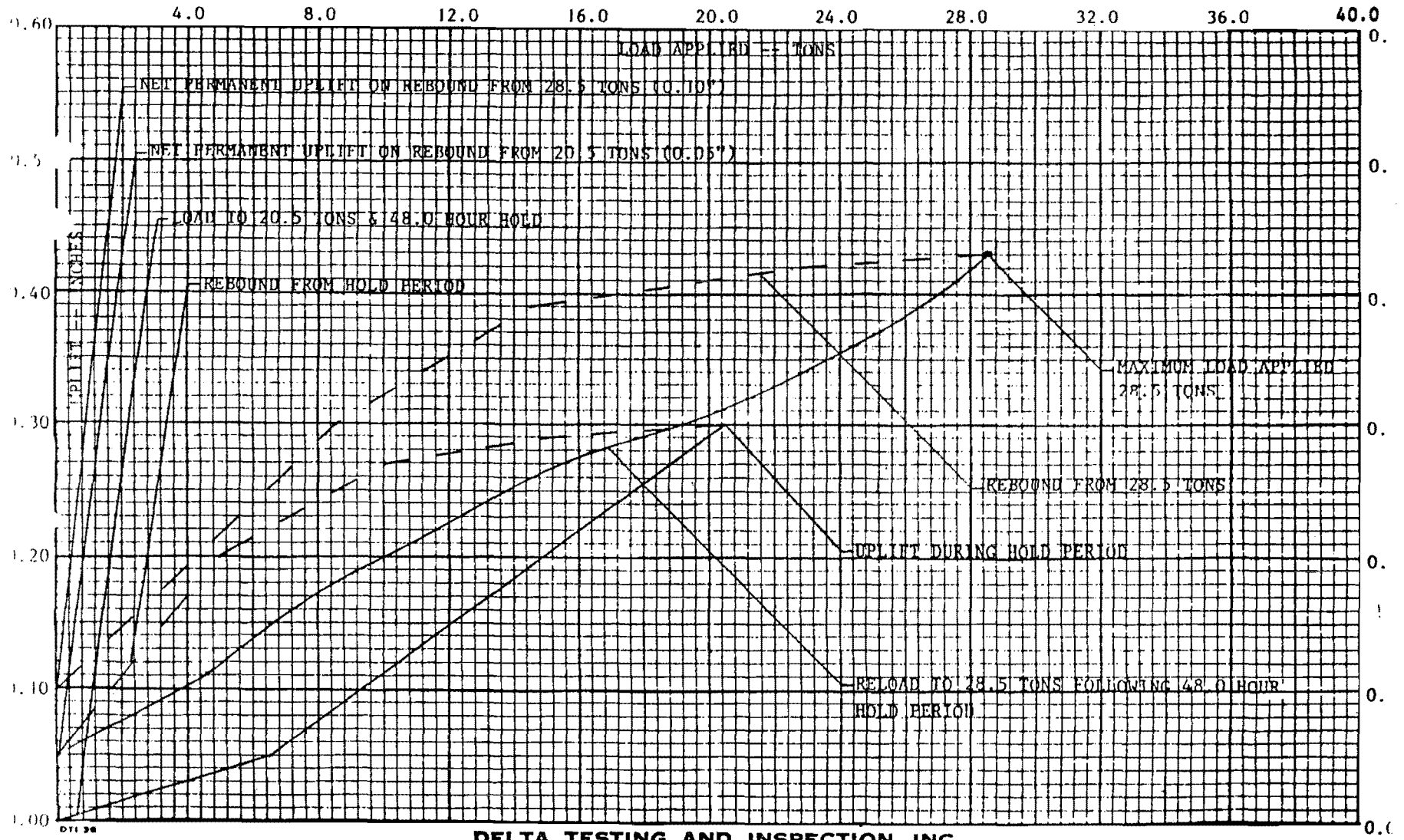
GENERAL CONTRACTOR

: ATLAS CONSTRUCTION CO., INC.

DATE TEST PILE LOADED: 10-23-84

PILE DRIVING CONTRACTOR

: ATLAS CONSTRUCTION CO., INC.



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.

| <u>TIME</u> | <u>CUMULATIVE HOURS</u> | <u>LOAD APPLIED TONS</u>                    | <u>UPLIFT INCHES</u> | <u>REMARKS</u>                         |
|-------------|-------------------------|---|----------------------|--|
|             |                         | RESTART 48.0 HOUR HOLD                      |                      |  |
|             | 11:30                   | 20.50                                       | 0.30                 | 11:30PM,<br>10-23-84                   |
|             | 12:01                   | 20.50                                       | 0.30                 | 12:01AM,<br>10-24-84                   |
|             | 35:30                   | 20.50                                       | 0.30                 | End 1st 24.0<br>hour hold              |
|             |                         | START FINAL 24.0 HOUR HOLD FREE OF MOVEMENT |                      |  |
|             | 35:30                   | 20.50                                       | 0.30                 | 11:30PM,<br>10-24-84                   |
|             | 36:01                   | 20.50                                       | 0.30                 | 12:01AM,<br>10-25-84                   |
|             | 59:30                   | 20.50                                       | 0.30                 | End final 24.0<br>hours<br>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                 |  |

PAGE 5  
 PUMPING STATION NO. 6  
 DNO-7153

LOAD TO FAILURE -- (CONTINUED)

| <u>TIME</u> | <u>CUMULATIVE<br/>HOURS</u> | <u>LOAD APPLIED<br/>TONS</u> | <u>UPLIFT<br/>INCHES</u> | <u>REMARKS</u> |
|-------------|-----------------------------|------------------------------|--------------------------|----------------|
|             | 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)

| <u>TIME</u> | <u>CUMULATIVE<br/>HOURS</u> | <u>LOAD APPLIED<br/>TONS</u> | <u>UPLIFT<br/>INCHES</u> | <u>REMARKS</u>  |
|-------------|-----------------------------|------------------------------|--------------------------|---|
|             | 66:30                       | 20.50                        | 0.32                     | 10th increment<br>Start each<br>increment 1.0<br>hour free of<br>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 |               |

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PUMPING STATION NO. 6  
DNO-7153

LOAD TO FAILURE -- (CONTINUED)

| <u>TIME</u> | <u>CUMULATIVE</u><br><u>HOURS</u> | <u>LOAD APPLIED</u><br><u>TONS</u> | <u>UPLIFT</u><br><u>INCHES</u> | <u>REMARKS</u> |
|-------------|-----------------------------------|------------------------------------|--------------------------------|----------------|
|             | 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  
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) 832-5600

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



# 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 1/4 hour between decrements.

CONCRETE PRESTRESS TEST PILE  
TIME FROM DRIVING TO LOADING - 7 DAYS

| <u>CUMULATIVE<br/>TIME HOURS</u> | <u>APPLIED<br/>LOAD TONS</u> | <u>SETTLEMENT<br/>INCHES</u> | <u>REMARKS</u>     |
|----------------------------------|------------------------------|------------------------------|--------------------|
| 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                             | "                            | "                            | "                  |

Pumping Station #6 - Improvements  
August 25, 1986  
Page 5

| <u>CUMULATIVE<br/>TIME HOURS</u> | <u>APPLIED<br/>LOAD TONS</u> | <u>SETTLEMENT<br/>INCHES</u> | <u>REMARKS</u>                                 |
|----------------------------------|------------------------------|------------------------------|--|
| 52:00                            | "                            | "                            | 48 Hour Hold                                   |
| 53:00                            | "                            | "                            | (Continued)                                    |
| 54:00                            | "                            | "                            | "  |
| 55:00                            | 30.00                        | 0.06                         | Test Discontinued<br>As Hold Period<br>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<br>(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. Cronin,  
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: 8-19-56

|                             |                                  |                       |                                      |                        |
|-----------------------------|----------------------------------|-----------------------|--------------------------------------|------------------------|
| NO. OF<br><i>PILE NO. 6</i> | CONTRACTOR<br><i>M/M's Const</i> | ARCHITECT<br><i>—</i> | ENGINEER<br><i>Burns &amp; Assoc</i> | DATE<br><i>8-19-56</i> |
|-----------------------------|----------------------------------|-----------------------|--------------------------------------|------------------------|

### NUMBER OF BLOWS

| FOOTING NO. | Pile # |      | Pile # |      | Pile # |      | Pile # |      | Pile # |      | Pile # |      |
|-------------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|
|             | Top    | Butt | Top    | Butt | Top    | Butt | Top    | Butt | Top    | Butt | Top    | Butt |

**EQUIPMENT:** CONVENTIONAL CRAWLER TYPE CRANE WITH SWINGING LEADS AND A CENMCO 4.5" AIR HAMMER RATED TO DELIVER 17,500 FOOT POUNDS PER BLOW AND A 6" FISH TAIL BIT WAS USED TO PREDRILL 35 FEET BEFORE DRIVING.

**MATERIAL:** CYLE 12" x 12" CONCRETE PILE 36' 3" IN LENGTH AND TWO 60" H" PILES USED AS REACTOR PILES

**ELEVATION:** TIP PENETRATION IS RELATIVE TO GROUND ELEVATION

Test Date 8-19-56





# GULF SOUTH LABORATORIES, INC.

383 LAKE AVENUE

METAIRIE, LOUISIANA 70005

(504) 832-5900

## PILE DRIVING RECORD

Date 8-10-71

Report No.

PROJECT

PUMPING STATION

CONTRACTOR

ATLAS CRANE

ARCHITECT

ENGINEER

Don H. Assoc

ORDER NO.

GSL 20071

### NUMBER OF BLOWS

| FOOTING NO          | NUMBER OF BLOWS |        |        |        |        |        |        |        |        |        |        |
|---------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                     | TEST            | Pile # | Pile # | Pile # | Pile # | Pile # | Pile # | Pile # | Pile # | Pile # | Pile # |
| PENETRATION IN FEET | Top 12"x12"     | Top    | Top    | Top    | Top    | Top    | Top    | Top    | Top    | Top    | Top    |
|                     | Bottom 12"x12"  | Bottom | Bottom | Bottom | Bottom | Bottom | Bottom | Bottom | Bottom | Bottom | Bottom |
|                     | Length 56'-3"   | Length | Length | Length | Length | Length | Length | Length | Length | Length | Length |
| 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                   | 23              |        |        |        |        |        |        |        |        |        |        |
| 45                  | 19              |        |        |        |        |        |        |        |        |        |        |
| 6                   | 18              |        |        |        |        |        |        |        |        |        |        |
| 7                   | 18              |        |        |        |        |        |        |        |        |        |        |
| 8                   | 16              |        |        |        |        |        |        |        |        |        |        |
| 9                   | 18              |        |        |        |        |        |        |        |        |        |        |
| 50                  | 11              |        |        |        |        |        |        |        |        |        |        |
| 1                   | 9               |        |        |        |        |        |        |        |        |        |        |
| 2                   | 10              |        |        |        |        |        |        |        |        |        |        |
| 3                   |                 |        |        |        |        |        |        |        |        |        |        |
| 4                   |                 |        |        |        |        |        |        |        |        |        |        |
| 55                  |                 |        |        |        |        |        |        |        |        |        |        |

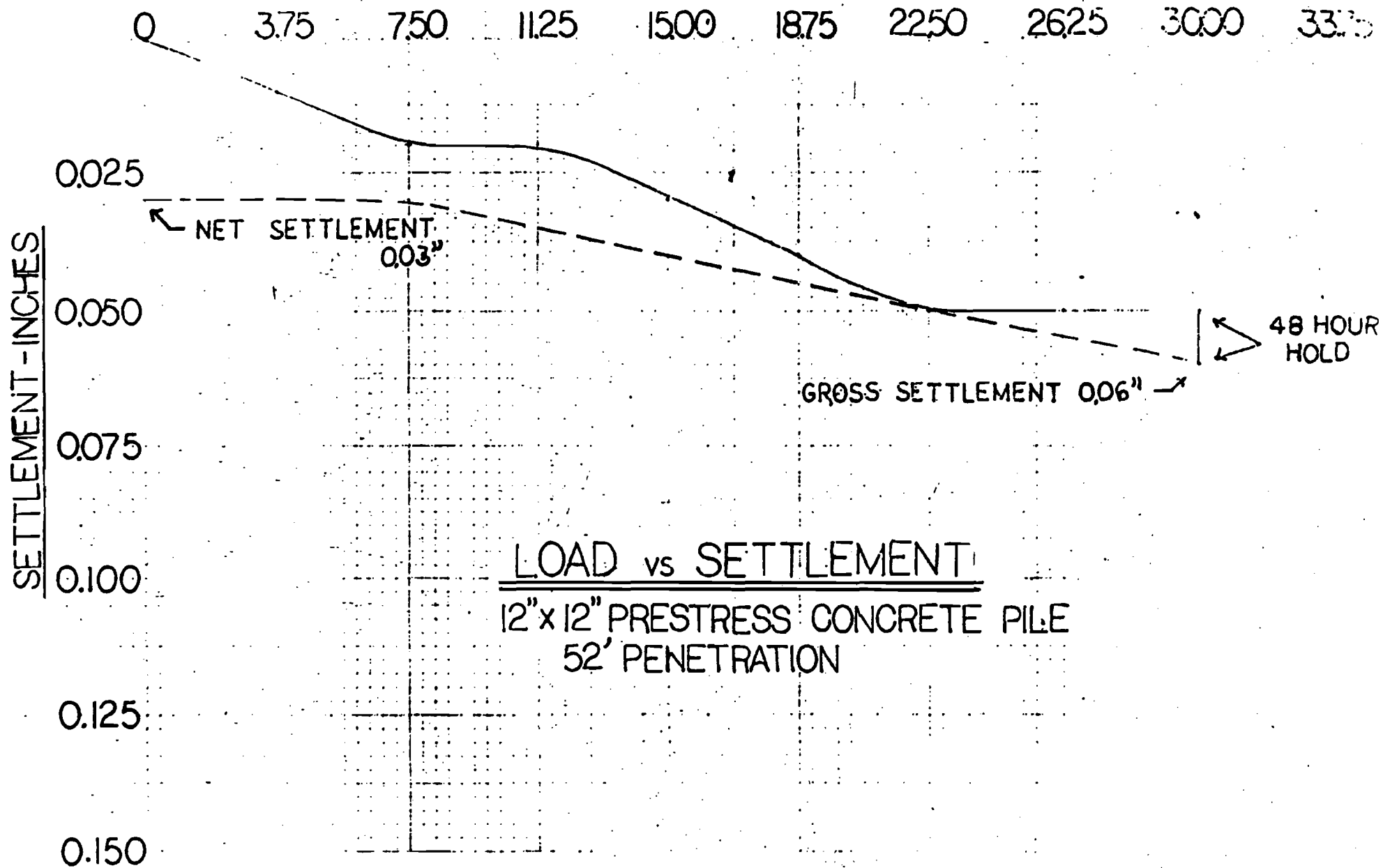
\* Note  
PILE WAS PREDRILLED 35'  
NO WASH

Pumping Station #6 - Improvements  
 August 25, 1986  
 Page 4

| <u>CUMULATIVE<br/>TIME HOURS</u> | <u>APPLIED<br/>LOAD TONS</u> | <u>SETTLEMENT<br/>INCHES</u> | <u>REMARKS</u> |
|----------------------------------|------------------------------|------------------------------|----------------|
| 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                            | "                            | "                            | "              |

APPLIED LOAD - TONS

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



# GULF SOUTH LABORATORIES, INC.

383 LAKE AVENUE

METAIRIE, LOUISIANA 70005

(504) 832-5900

AUGUST 27, 1986      GSI 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

---

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  
Connaco 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 pres-  
sure gauge. The jack was  
interposed between the top of

Pumping Station #6 - Improvements  
 August 27, 1986  
 Page 3

| <u>CUMULATIVE<br/>TIME HOURS</u> | <u>APPLIED<br/>LOAD TONS</u> | <u>SETTLEMENT<br/>INCHES</u> | <u>REMARKS</u>     |
|----------------------------------|------------------------------|------------------------------|--------------------|
| 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      |

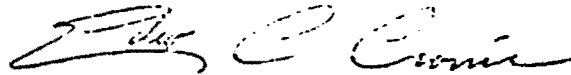
\*Test discontinued as test pile failed.

TECHNICIAN(S): J. Alchin, & R. Veazey

REMARKS : Test results presented herein  
 are for your information and  
 evaluation.

Pumping Station #6 - Improvements  
August 27, 1986  
Page 4

Respectfully submitted,  
GULF SOUTH LABORATORIES, INC.

A handwritten signature in cursive script, appearing to read "Edward C. Cronin".

---

Edward C. Cronin,  
President

ECC/dah

cc: Burk & Assoc.  
cc: Atlas Const. Co., Inc.



# GULF SOUTH LABORATORIES, INC.

383 LAKE AVENUE

METAIRIE, LOUISIANA 70005

(504) 832-5900

Report No.

## PILE DRIVING RECORD

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<br>IN FEET | Pile #                | Pile #                | Pile #                | Pile #                | Pile #                | Pile #                | Pile #                | Pile #                | Pile #                | Pile #                |
|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|                        | Tip<br>Blow<br>Length | Tip<br>Blow<br>Length | Tip<br>Blow<br>Length | Tip<br>Blow<br>Length | Tip<br>Blow<br>Length | Tip<br>Blow<br>Length | Tip<br>Blow<br>Length | Tip<br>Blow<br>Length | Tip<br>Blow<br>Length | Tip<br>Blow<br>Length |

MATERIAL : A TWO PIECE H-PILE 12X53, 73' IN LENGTH, USED AS A TEST PILE.

EQUIPMENT : CONVENTIONAL CRAWLER TYPE CRANE WITH SWINGING LEADS + A COMIMACO 65 AIR HAMMER RATED TO DELIVER 19,500 FT/LBS OF ENERGY PER BLOW.

ELEVATION & PENETRATION IS RELATIVE TO TOP OF 18" Ø CASING.

NOTE : DRIVING OF TEST PILE REQUIRED TWO DAYS.

F. ESTEVEZ / R. WATSON

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# GULF SOUTH LABORATORIES, INC.

383 LAKE AVENUE

METAIRIE, LOUISIANA 70005

(504) 832-5900

## PILE DRIVING RECORD

Report No.

PROJECT

Dumping Sta. No. 6

Atlas Const.

Burk & Assoc. 2297-1

### NUMBER OF BLOWS

| FOOTING NO            | NUMBER OF BLOWS                                |                       |                       |                       |                       |                       |                       |                       |                       |                       |
|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|                       | Pile # TP7<br>Tip HP 12"<br>Butt<br>Length 73' | Pile #                | Pile #                | Pile #                | Pile #                | Pile #                | Pile #                | Pile #                | Pile #                | Pile #                |
| PLNTRATION<br>IN FEET | Tip<br>Butt<br>Length                          | Tip<br>Butt<br>Length | Tip<br>Butt<br>Length | Tip<br>Butt<br>Length | Tip<br>Butt<br>Length | Tip<br>Butt<br>Length | Tip<br>Butt<br>Length | Tip<br>Butt<br>Length | Tip<br>Butt<br>Length | Tip<br>Butt<br>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  |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| 60                    | 5  |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| 1                     | 8  |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| 2                     | 16 *   |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| 3                     | 8  |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| 4                     | 7  |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| 65                    | 6  |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| 6                     | 6  |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| 7                     | 6  |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| 8                     | 7  |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| 9                     | 3 @ 4"   |                       |                       |                       |                       |                       |                       |                       |                       |                       |
| 70                    |  |                       |                       |                       |                       |                       |                       |                       |                       |                       |

NOTE SECOND SECTION WELDED ON @ THIS POINT.

Herold Watson, K.E. Estvez

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**

| <u>CUMULATIVE TIME HOURS</u> | <u>APPLIED LOAD TONS</u> | <u>SETTLEMENT INCHES</u> | <u>REMARKS</u>     |
|------------------------------|--------------------------|--------------------------|--------------------|
| 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                     | "                  |

Pumping Station #6 - Improvements  
 August 27, 1986  
 Page 3

| <u>CUMULATIVE<br/>TIME HOURS</u> | <u>APPLIED<br/>LOAD TONS</u> | <u>SETTLEMENT<br/>INCHES</u> | <u>REMARKS</u>     |
|----------------------------------|------------------------------|------------------------------|--------------------|
| 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.

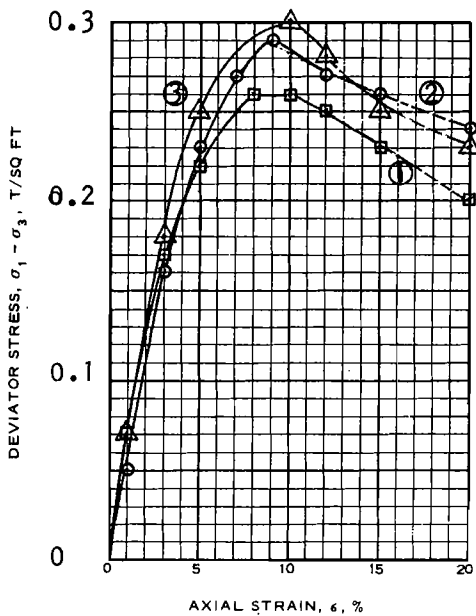
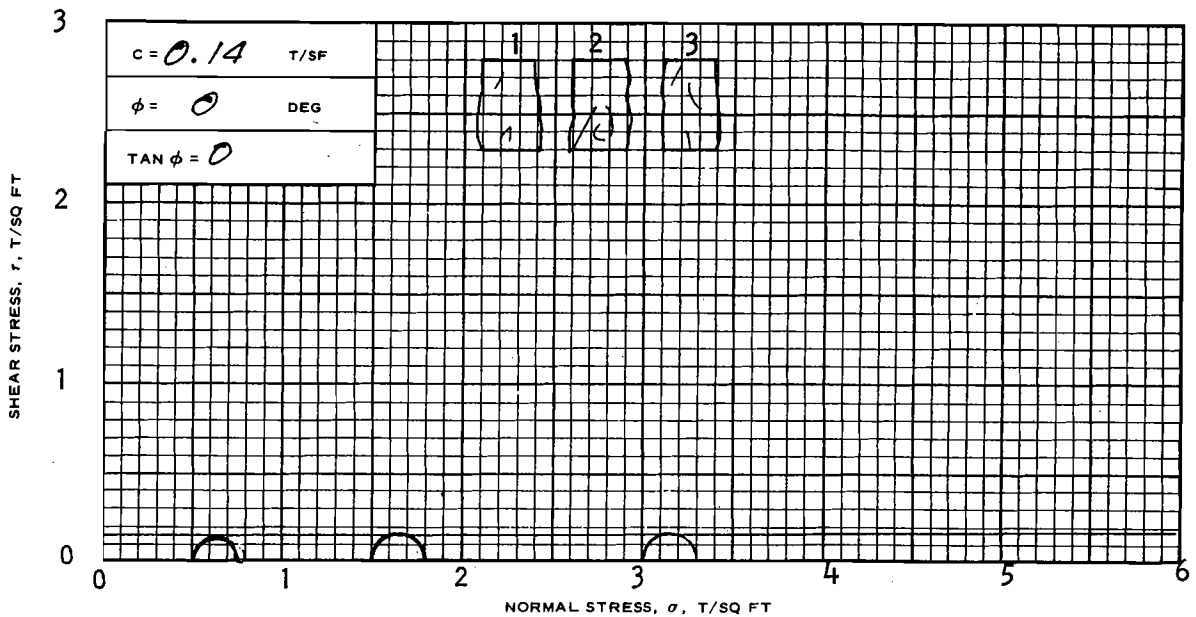
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY  
HIGH LEVEL PLAN

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

APPENDIX F

CORPS OF ENGINEERS  
SOILS TESTS DATA SHEETS

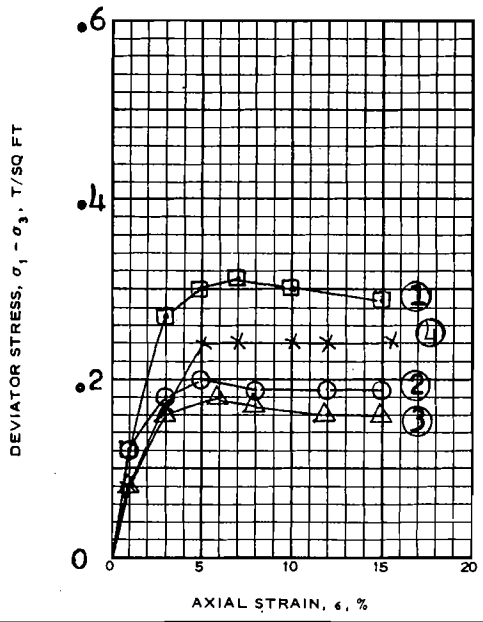
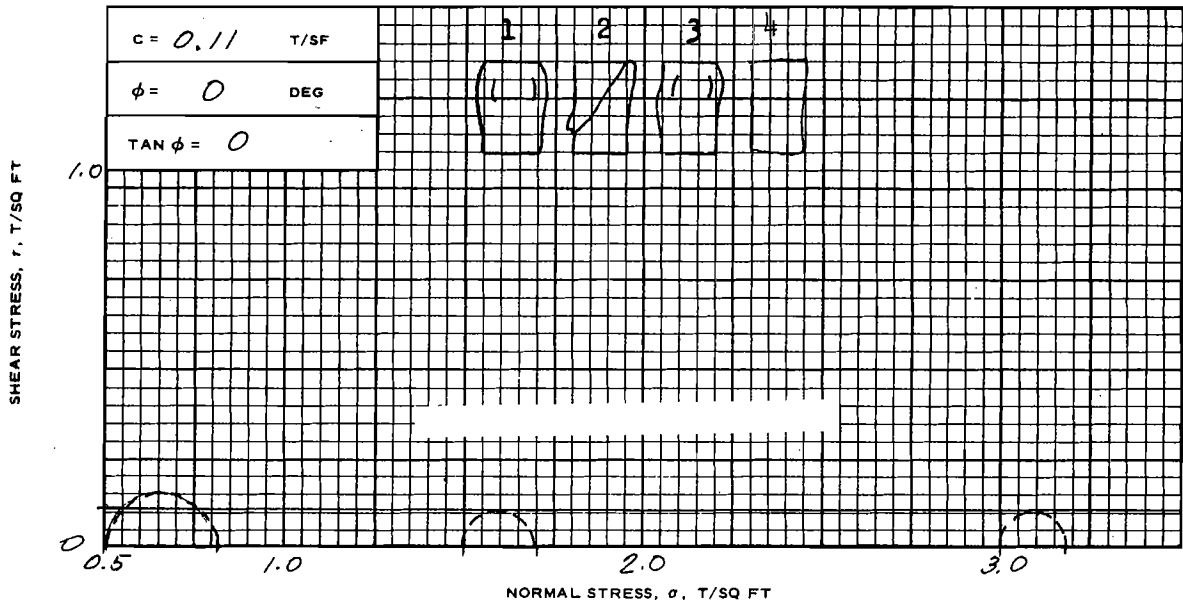
APPENDIX F  
VOLUME II



sat.  $\gamma = 74.6$

| SPECIMEN NO. |   | 1                             | 2     | 3     | Avg.  |
|--------------|---|-------------------------------|-------|-------|-------|
| INITIAL      | WATER CONTENT, %                            | $w_o$ 229.9                   | 250.4 | 241.0 | 240.4 |
|              | DRY DENSITY LB/CU FT                        | $\gamma_{d_o}$ 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                        | $\gamma_{d_c}$                |       |       |       |
|              | SATURATION, %                               | $s_c$                         |       |       |       |
|              | VOID RATIO                                  | $e_c$                         |       |       |       |
|              | FINAL BACK PRESSURE, T/SQ FT                | $u_o$                         |       |       |       |
|              | MINOR PRINCIPAL STRESS, T/SQ FT             | $\sigma_3$                    | 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-<br><b>Strain</b>                                 | TEST   |                          |         |
| DESCRIPTION OF SPECIMENS <b>ORGANIC CLAY(OH), dark brown</b> |        |                          |         |
| LL 270   | PL 110 | PI 160                   | Gs 2.29 |
| TYPE OF SPECIMEN <b>UNDISTURBED</b>                          |        | TYPE OF TEST <b>Q</b>    |         |
| REMARKS: <b>Rate of strain increased</b>                     |        |                          |         |
| PROJECT <b>LK. PONT., LA. &amp; VIC.-HURR. PROT.</b>         |        |                          |         |
| ORLEANS PARISH OUTFALL CANALS-17th. ST. CANAL                |        |                          |         |
| BORING NO. <b>1-UMP</b>                                      |        | SAMPLE NO. <b>4-D</b>    |         |
| DEPTH/ELEV <b>13.7/-10.6</b>                                 |        |                          |         |
| LABORATORY <b>USAEWES</b>                                    |        | DATE <b>26 July 1973</b> |         |
| RAA TRIAXIAL COMPRESSION TEST REPORT                         |        |                          |         |



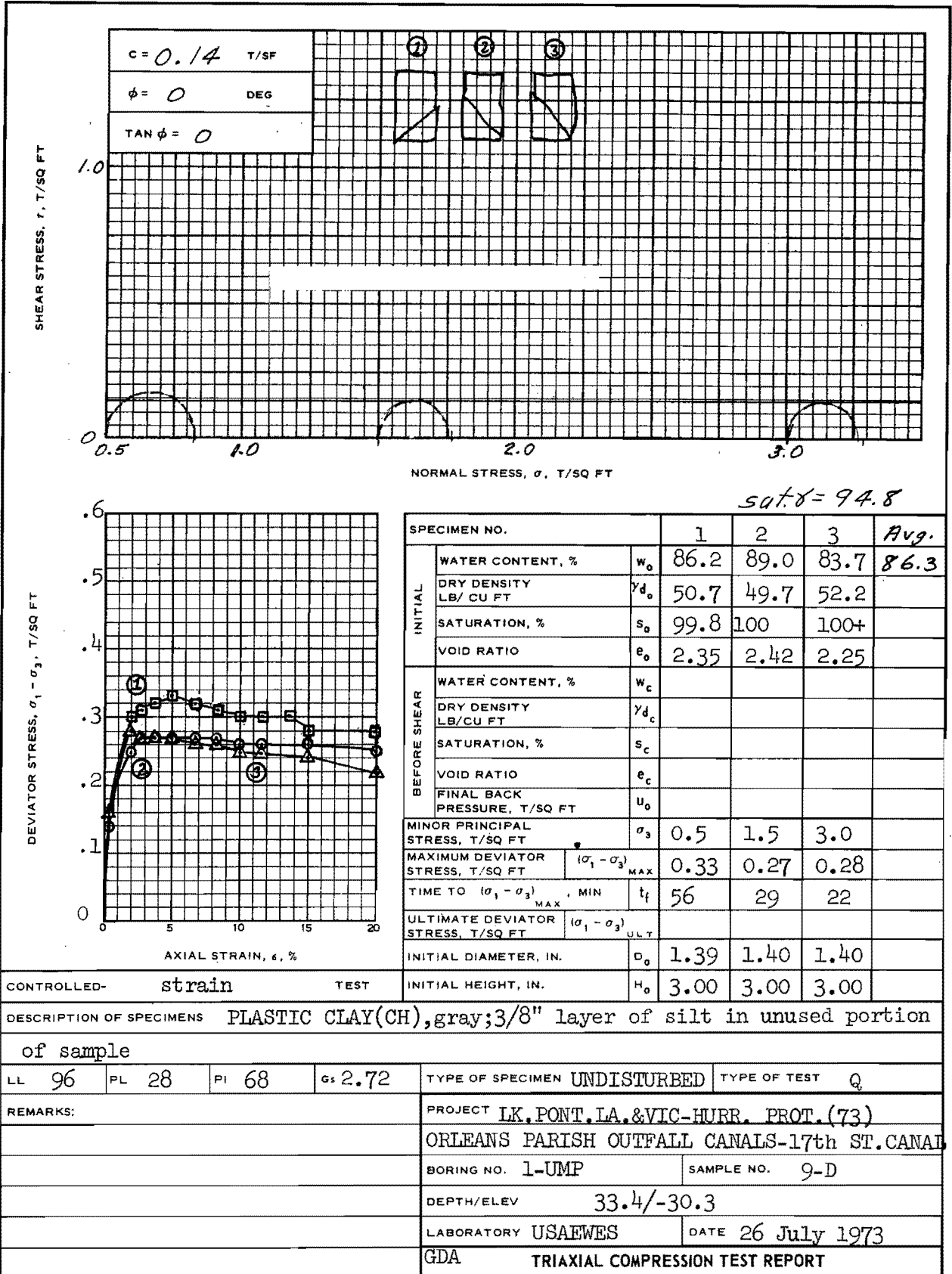
$50.8 = 103.4$

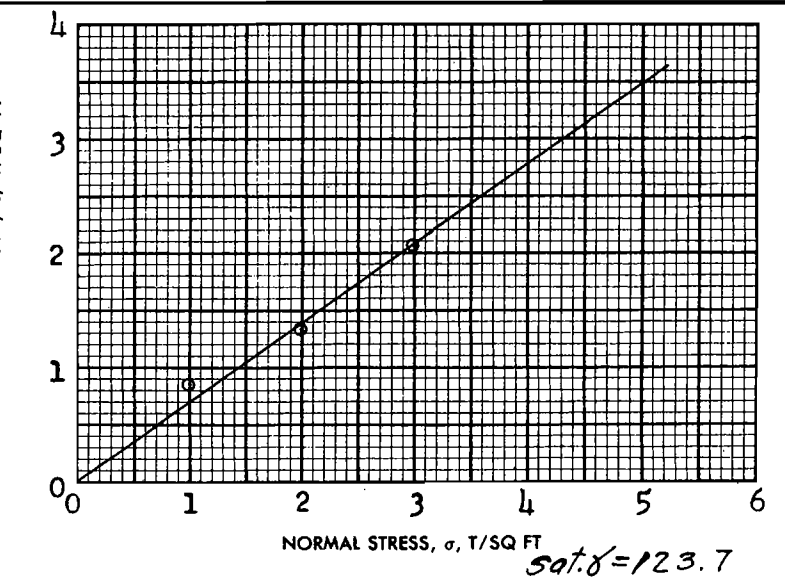
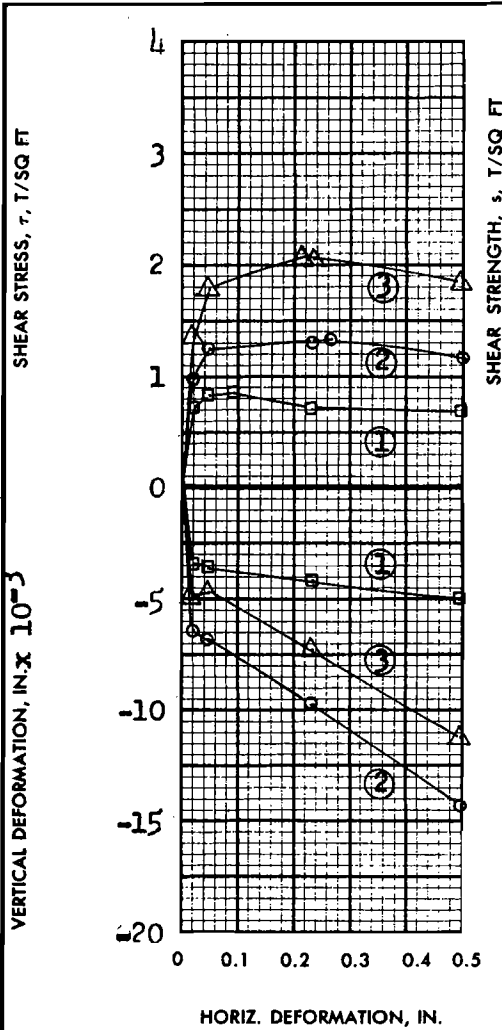
| SPECIMEN NO.                                |                       | 1                             | 2    | 3    | 4    | Avg. |
|---|-----------------------|-------------------------------|------|------|------|------|
| INITIAL                                     | WATER CONTENT, %      | $w_o$ 60.0                    | 61.9 | 59.9 | 59.6 | 60.4 |
|   | DRY DENSITY LB/ CU FT | $\gamma_{d_o}$ 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 | $\gamma_{d_c}$                |      |      |      |      |
|   | SATURATION, %         | $s_c$                         |      |      |      |      |
|   | VOID RATIO            | $e_c$                         |      |      |      |      |
| FINAL BACK PRESSURE, T/SQ FT                |                       | $u_o$                         |      |      |      |      |
| MINOR PRINCIPAL STRESS, T/SQ FT             |                       | $\sigma_3$                    | 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 <b>UNDISTURBED</b>                      | TYPE OF TEST <b>Q</b>     |
| REMARKS: |       |       |         | PROJECT <b>LK. PONT., LA. &amp; VIC.-HURR. PROT.(73)</b> |                           |
|          |       |       |         | ORLEANS PARISH OUTFALL CANALS- <b>17th. ST. CANAL</b>    |                           |
|          |       |       |         | BORING NO. <b>1-JMP</b>                                  | SAMPLE NO. <b>7-C</b>     |
|          |       |       |         | DEPTH/ELEV <b>24.9/-21.8</b>                             |                           |
|          |       |       |         | LABORATORY <b>USA EWES</b>                               | DATE <b>27 July, 1973</b> |
|          |       |       |         | <b>WP TRIAXIAL COMPRESSION TEST REPORT</b>               |                           |





**SHEAR STRENGTH PARAMETERS**

$\phi' = 34^\circ$

$\tan \phi' = 0.69$

$c' = 0$  T/SQ FT

CONTROLLED STRESS

CONTROLLED STRAIN

| 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 | $\gamma_d$ 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                 |                       | $\sigma$        | 1.0    | 2.0    | 3.0    |
| MAXIMUM SHEAR STRESS, T/SQ FT          |                       | $\tau_{max}$    | 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         |                       | $\tau_{ult}$    |        |        |        |

TYPE OF SPECIMEN **UNDISTURBED** 3.01 IN. SQUARE    0.620 IN. THICK

CLASSIFICATION **SILTY SAND(SM), gray; shells**

LL -    PL -    PI -    G<sub>s</sub> 2.68

REMARKS \_\_\_\_\_

PROJECT **LK. PONT., LA. & VIC. - HURR. PROT. (73)**

**ORLEANS PARISH OUTFALL CANALS - 17th ST CANAL**

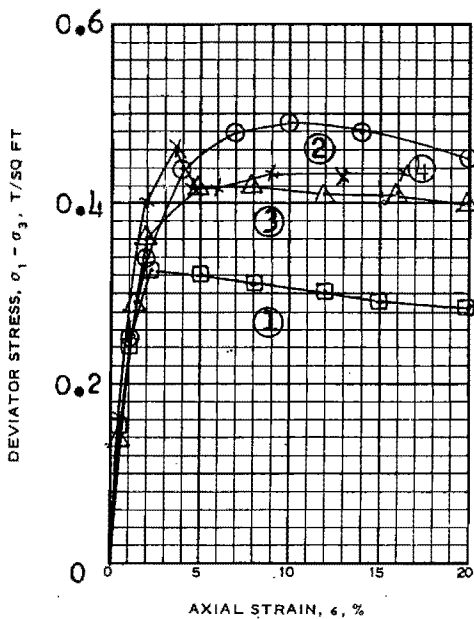
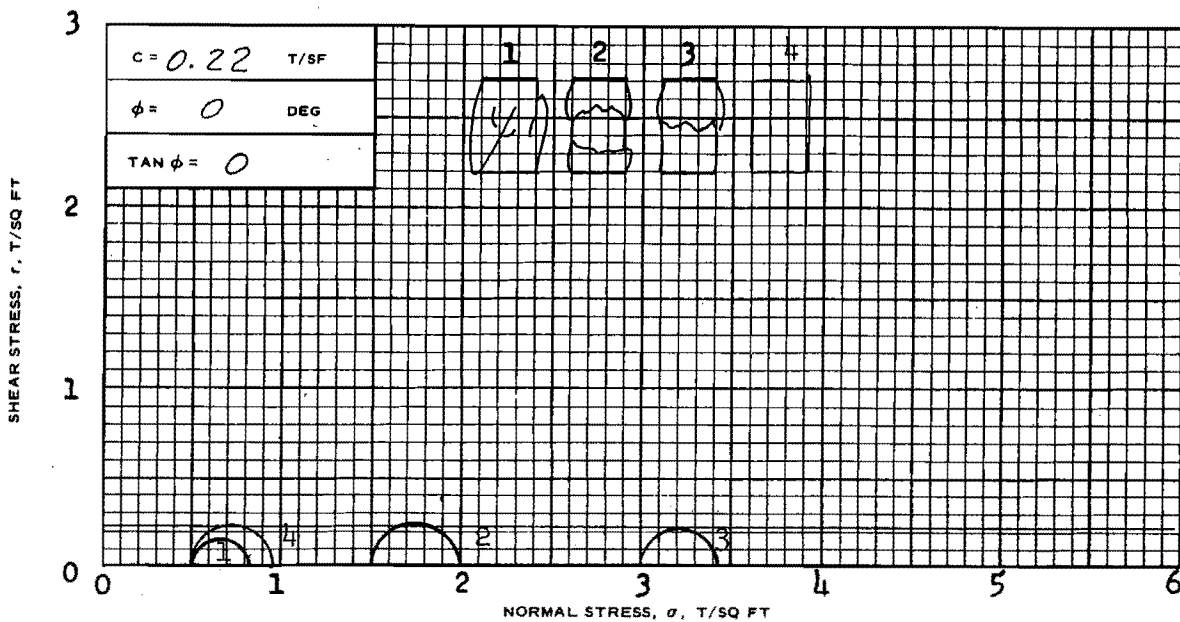
AREA \_\_\_\_\_

BORING NO. **1-UMP**    SAMPLE NO. **11-C**

DEPTH EL **40.9/-37.8**    DATE **25 August, 1973**

**RCH                      DIRECT SHEAR TEST REPORT**





sat.  $\gamma = 103.0$

| 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         | $\gamma_{d_o}$ 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         | $\gamma_{d_c}$      |      |      |      |      |
|   | SATURATION, %                 | $s_c$               |      |      |      |      |
|   | VOID RATIO                    | $e_c$               |      |      |      |      |
|   | FINAL BACK PRESSURE, T/SQ FT  | $u_o$               |      |      |      |      |
| MINOR PRINCIPAL STRESS, T/SQ FT             | $\sigma_3$                    | 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 |      |

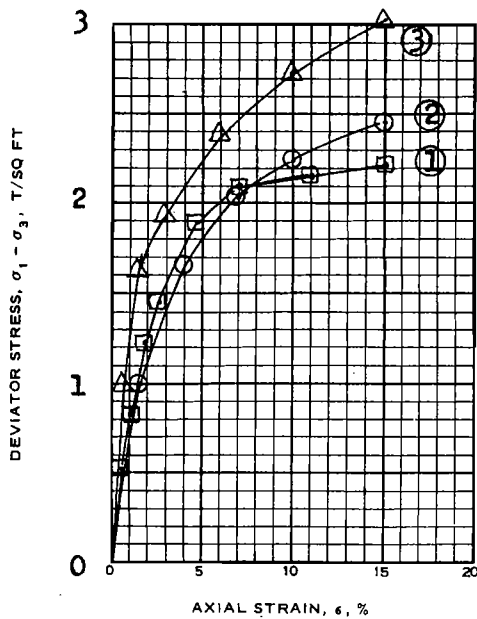
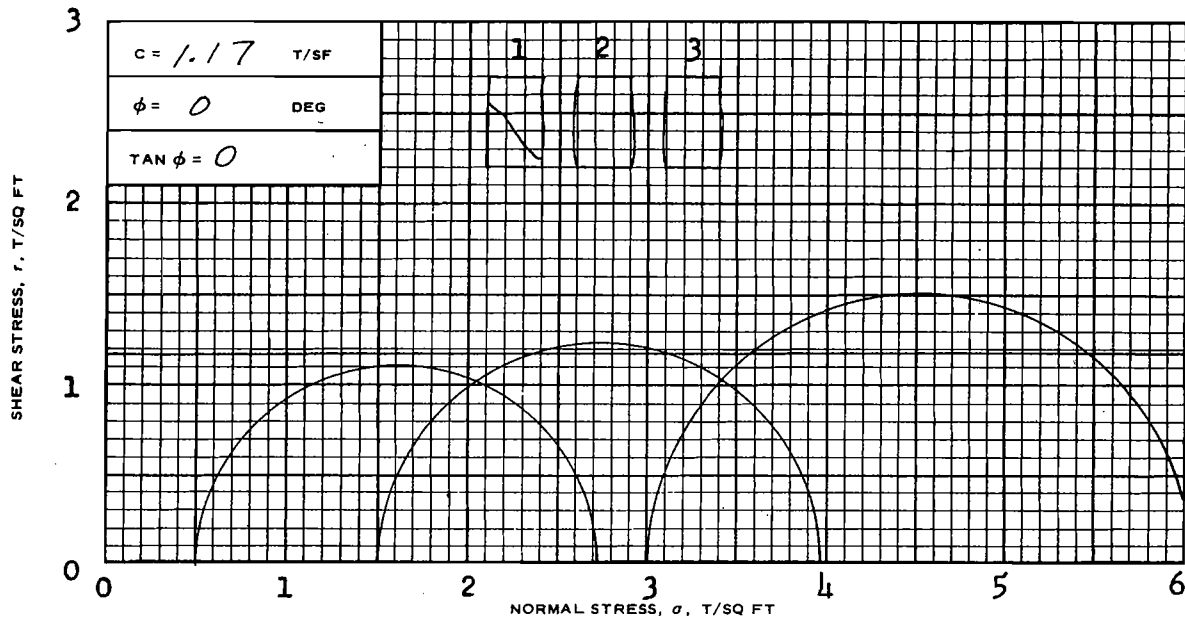
CONTROLLED- **Strain** TEST

DESCRIPTION OF SPECIMENS **PLASTIC CLAY(CH), gray; shell fragments**

LL **70** PL **23** PI **47**  $G_s$  **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**



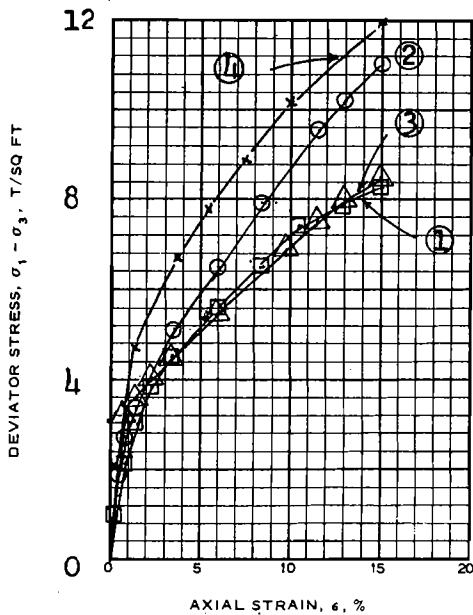
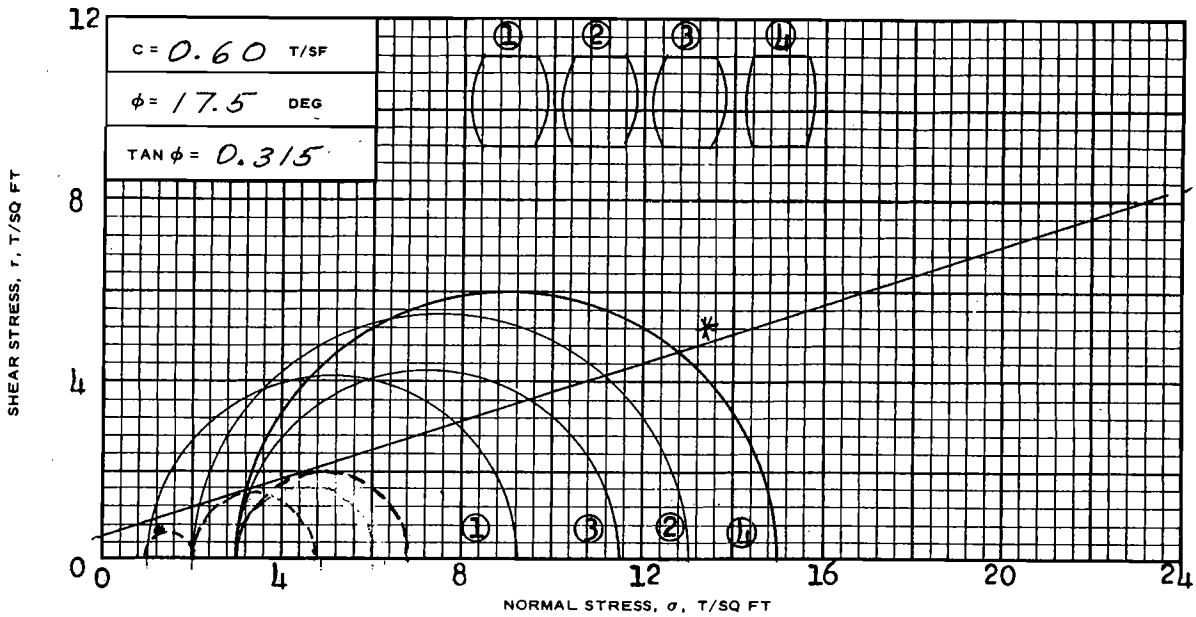
sat.  $\gamma = 131.4$

| SPECIMEN NO.                                |                               | 1                    | 2     | 3     | Avg. |
|---|-------------------------------|----------------------|-------|-------|------|
| INITIAL                                     | WATER CONTENT, %              | $w_o$ 18.7           | 18.8  | 18.5  | 18.7 |
|   | DRY DENSITY LB/ CU FT         | $\gamma_{d_o}$ 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         | $\gamma_{d_c}$       |       |       |      |
|   | SATURATION, %                 | $s_c$                |       |       |      |
|   | VOID RATIO                    | $e_c$                |       |       |      |
|   | FINAL BACK PRESSURE, T/SQ FT  | $u_o$                |       |       |      |
| MINOR PRINCIPAL STRESS, T/SQ FT             | $\sigma_3$                    | 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  |      |
| CONTROLLED- <b>Strain</b> TEST              | INITIAL HEIGHT, IN.           | $H_o$ 3.00           | 3.00  | 3.00  |      |

DESCRIPTION OF SPECIMENS **LEAN CLAY(CL)**, light greenish gray; numerous silt pockets

LL **45** PL **15** PI **30**  $G_s$  **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**



*sat.  $\gamma = 128.2$*

| SPECIMEN NO.                                |  | 1                    | 2     | 3     | 4     | Avg. |
|---|--|----------------------|-------|-------|-------|------|
| INITIAL                                     | WATER CONTENT, %                                       | $w_o$ 22.8           | 21.2  | 21.3  | 22.6  | 22.0 |
|   | DRY DENSITY LB/ CU FT                                  | $\gamma_{d_o}$ 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                                  | $\gamma_{d_c}$ 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             | $\sigma_3$   | 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   |      |
|   | $*(\sigma_1 - \sigma_3) \text{ at max. pore pressure}$ | 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  $G_s$  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**

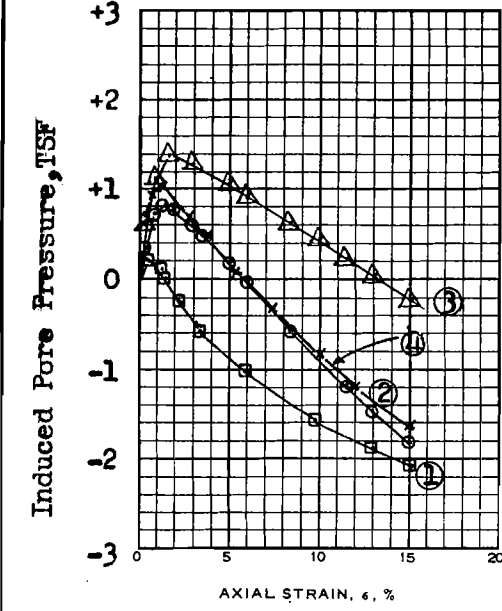
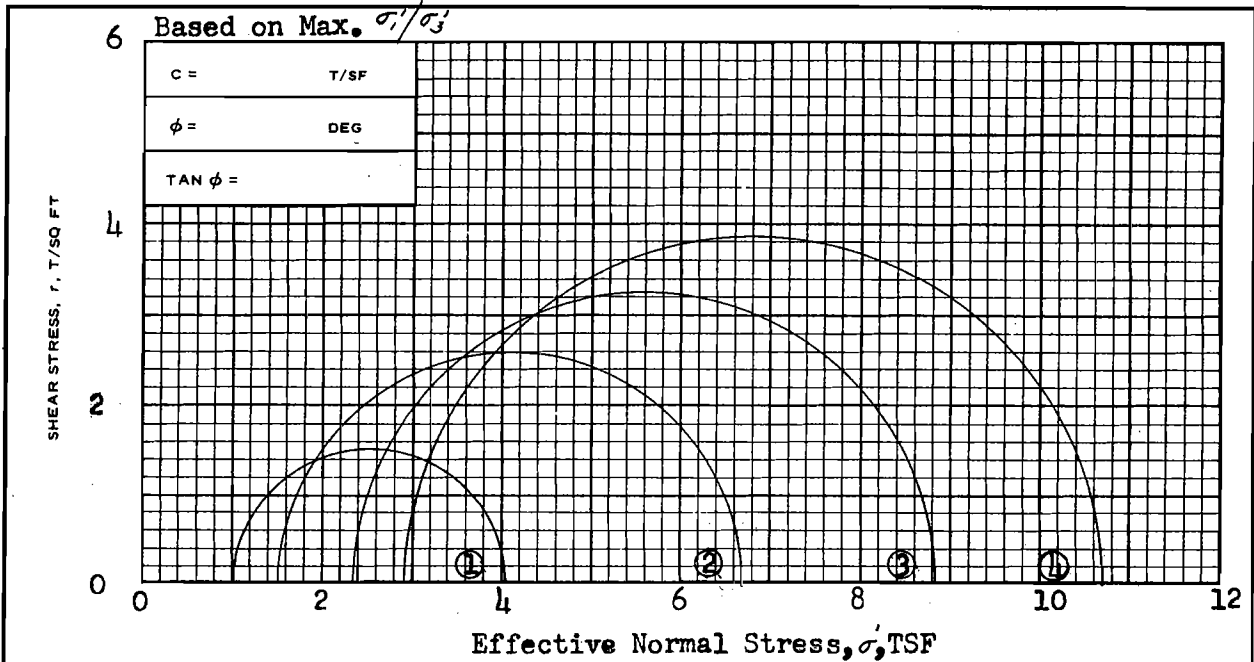
BORING NO. **1-UMP** SAMPLE NO. **17-D**

DEPTH/ELEV **65.8/-62.7**

LABORATORY **USAEWES** DATE **7 July, 1973**

Sheet 1 of 2

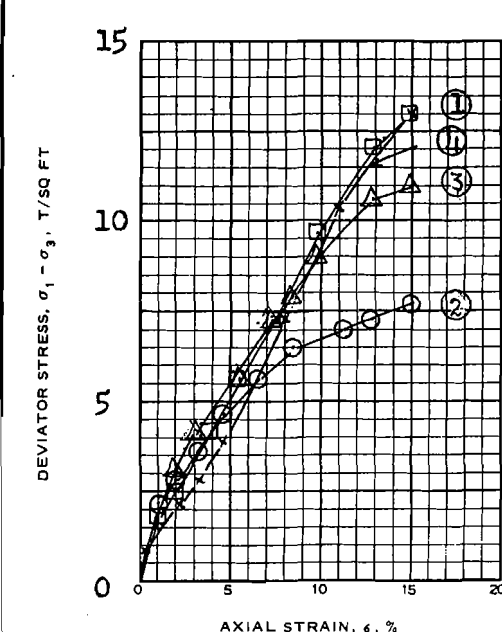
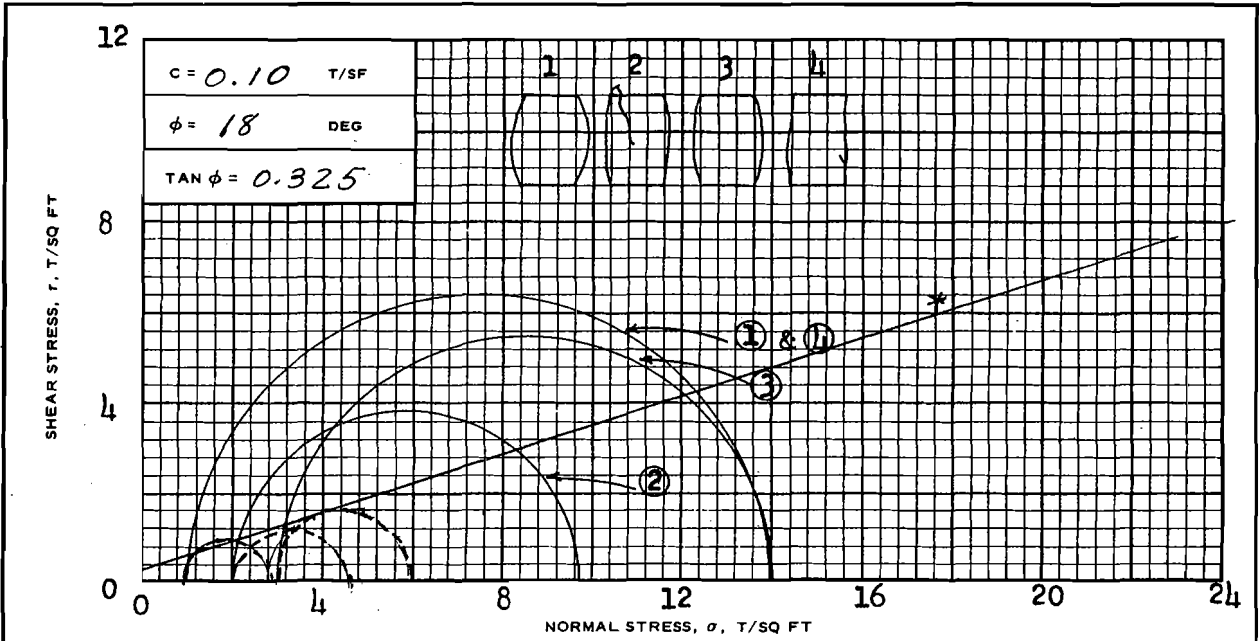
TES TRIAXIAL COMPRESSION TEST REPORT



|   |                       |                               |  |  |  |
|---|-----------------------|-------------------------------|--|--|--|
| SPECIMEN NO.                                |                       |                               |  |  |  |
| INITIAL                                     | WATER CONTENT, %      | $w_o$                         |  |  |  |
|   | DRY DENSITY LB/ CU FT | $\gamma_{d_o}$                |  |  |  |
|   | SATURATION, %         | $s_o$                         |  |  |  |
|   | VOID RATIO            | $e_o$                         |  |  |  |
| BEFORE SHEAR                                | WATER CONTENT, %      | $w_c$                         |  |  |  |
|   | DRY DENSITY LB/ CU FT | $\gamma_{d_c}$                |  |  |  |
|   | SATURATION, %         | $s_c$                         |  |  |  |
|   | VOID RATIO            | $e_c$                         |  |  |  |
| FINAL BACK PRESSURE, T/SQ FT                |                       | $u_o$                         |  |  |  |
| MINOR PRINCIPAL STRESS, T/SQ FT             |                       | $\sigma_3$                    |  |  |  |
| 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             |                   |

F8

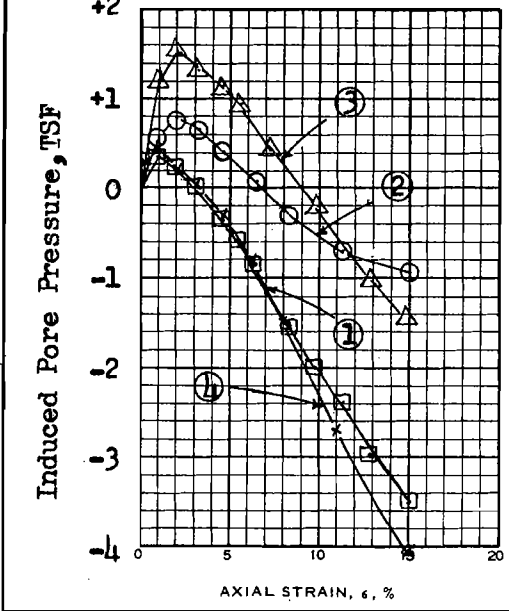
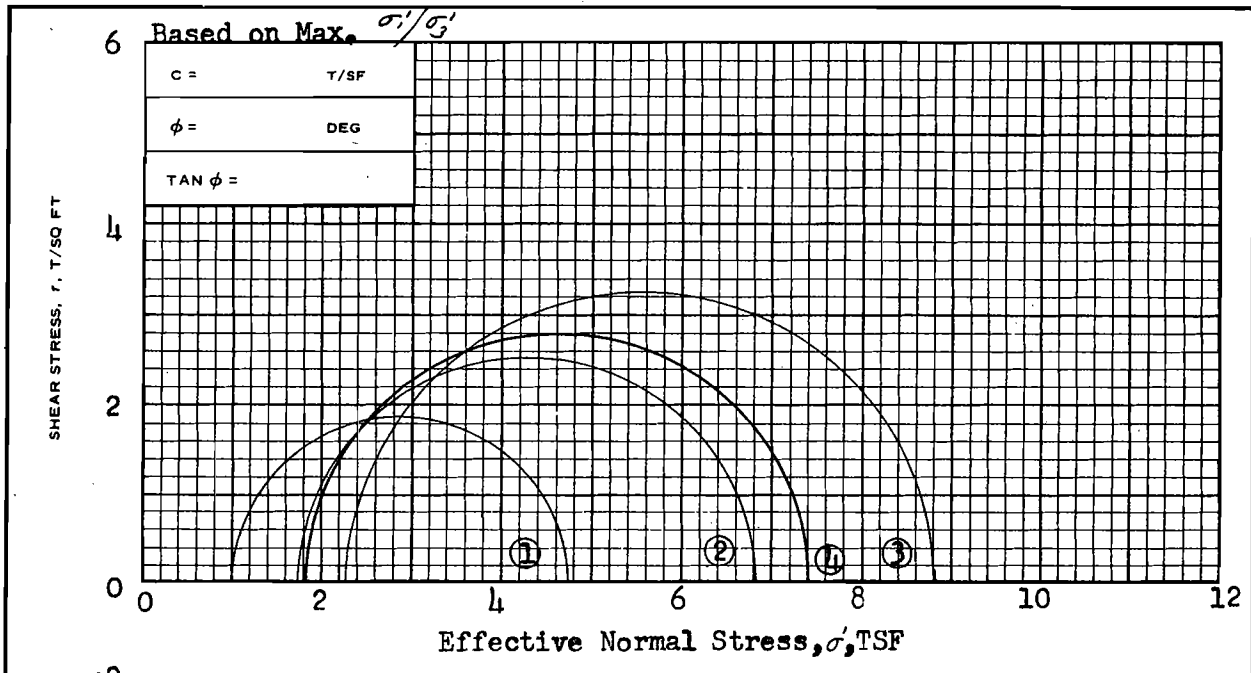


| SPECIMEN NO.                                    |                      | 1                                   | 2     | 3     | 4     | Avg. |
|---|----------------------|-------------------------------------|-------|-------|-------|------|
| INITIAL   | WATER CONTENT, %     | $w_o$ 23.6                          | 23.3  | 23.8  | 23.4  | 23.5 |
|   | DRY DENSITY LB/CU FT | $\gamma_{d_o}$ 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 | $\gamma_{d_c}$ 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                 |                      | $\sigma_3$ 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 - | $G_s$ 2.67 | TYPE OF SPECIMEN <b>UNDISTURBED</b>                    | TYPE OF TEST <b>R</b> |
| REMARKS: See attached plot for effective values    |      |      |            | PROJECT <b>LK. PONT., LA&amp;VIC.-HURR. PROT. (73)</b> |                       |
| Portion of sample allowed to drain before trimming |      |      |            | BORING NO. <b>1-UMP</b> SAMPLE NO. <b>19-D</b>         |                       |
| Sheet 1 of 2                                       |      |      |            | DEPTH/ELEV <b>73.4/-70.3</b>                           |                       |
|  |      |      |            | LABORATORY <b>USAEWES</b> DATE <b>23 July, 1973</b>    |                       |
| <b>TES TRIAXIAL COMPRESSION TEST REPORT</b>        |      |      |            |  |                       |

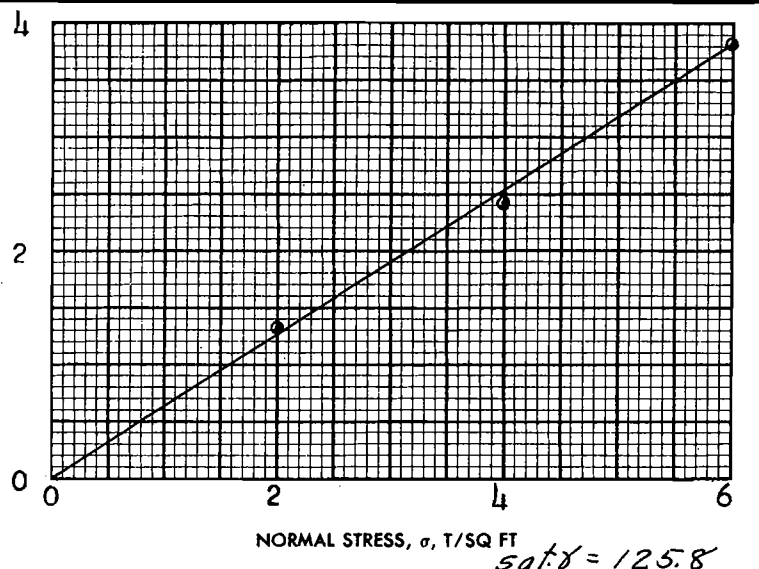
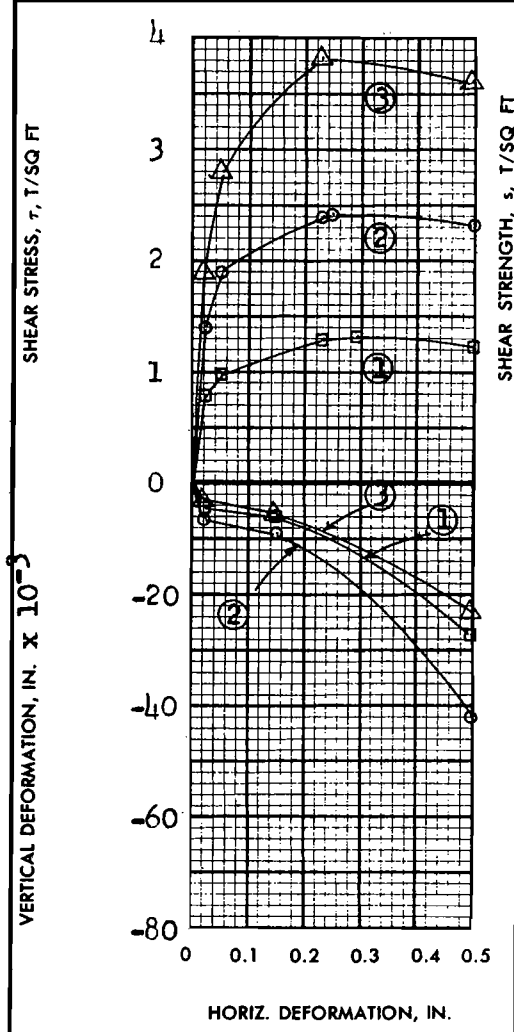


|   |                       |                               |  |  |
|---|-----------------------|-------------------------------|--|--|
| SPECIMEN NO.                                |                       |                               |  |  |
| INITIAL                                     | WATER CONTENT, %      | $w_o$                         |  |  |
|   | DRY DENSITY LB/ CU FT | $\gamma_{d_o}$                |  |  |
|   | SATURATION, %         | $s_o$                         |  |  |
|   | VOID RATIO            | $e_o$                         |  |  |
| BEFORE SHEAR                                | WATER CONTENT, %      | $w_c$                         |  |  |
|   | DRY DENSITY LB/ CU FT | $\gamma_{d_c}$                |  |  |
|   | SATURATION, %         | $s_c$                         |  |  |
|   | VOID RATIO            | $e_c$                         |  |  |
| FINAL BACK PRESSURE, T/SQ FT                |                       | $u_o$                         |  |  |
| MINOR PRINCIPAL STRESS, T/SQ FT             |                       | $\sigma_3$                    |  |  |
| 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 | $G_s$ | 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   |                    |



**SHEAR STRENGTH PARAMETERS**

$\phi' = 32^\circ$

$\tan \phi' = 0.63$

$c' = 0$  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% |
|  | VOID RATIO            | $e_o$ 0.642       | 0.660  | 0.673  |       |
|  | SATURATION            | $S_o$ 100+%       | 92.6%  | 94.0%  | %     |
|  | DRY DENSITY, LB/CU FT | $\gamma_d$ 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%  | %     |
|  | VOID RATIO            | $e_f$             |        |        |       |
|  | SATURATION            | $S_f$             | %      | %      | %     |
| NORMAL STRESS, T/SQ FT                 |                       | $\sigma$ 2.0      | 4.0    | 6.0    |       |
| MAXIMUM SHEAR STRESS, T/SQ FT          |                       | $\tau_{max}$ 1.31 | 2.43   | 3.83   |       |
| ACTUAL TIME TO FAILURE, MIN            |                       | $t_f$ 1650        | 1110   | 1320   |       |
| RATE OF STRAIN, IN./MIN                |                       | .00018            | .00018 | .00018 |       |
| ULTIMATE SHEAR STRESS, T/SQ FT         |                       | $\tau_{ult}$      |        |        |       |

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 \_\_\_\_\_

PROJECT **LK. PONT., LA. & VIC.- HURR. PROT.(73)**

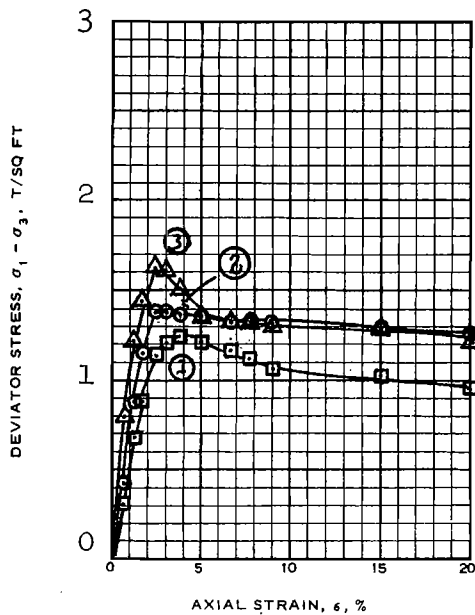
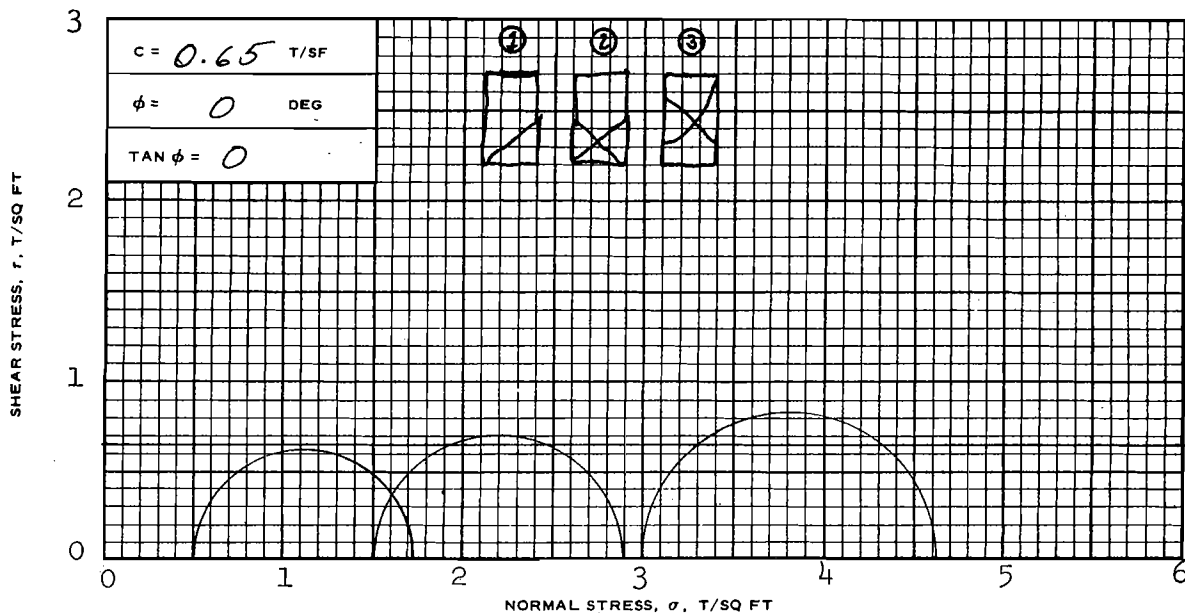
**ORLEANS PARISH OUTFALL CANALS - 17th. ST. CANAL**

AREA \_\_\_\_\_

BORING NO. **1-UMP**    SAMPLE NO. **20-C**

DEPTH **76.9/-73.8**    DATE **25 August, 1973**

BWG **DIRECT SHEAR TEST REPORT**



*sat.  $\delta = 116.1$*

| SPECIMEN NO.                                |                      | 1                             | 2    | 3    | Avg. |
|---|----------------------|-------------------------------|------|------|------|
| INITIAL                                     | WATER CONTENT, %     | $w_o$ 35.4                    | 34.3 | 35.9 | 35.2 |
|   | DRY DENSITY LB/CU FT | $\gamma_{d_o}$ 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 | $\gamma_{d_c}$                |      |      |      |
|   | SATURATION, %        | $s_c$                         |      |      |      |
|   | VOID RATIO           | $e_c$                         |      |      |      |
| FINAL BACK PRESSURE, T/SQ FT                |                      | $u_o$                         |      |      |      |
| MINOR PRINCIPAL STRESS, T/SQ FT             |                      | $\sigma_3$                    | 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 I.K. PONT. LA. & VIC-HURR. PROT. (73)

ORLEANS PARISH OUTFALL CANALS-17th ST. CANAL

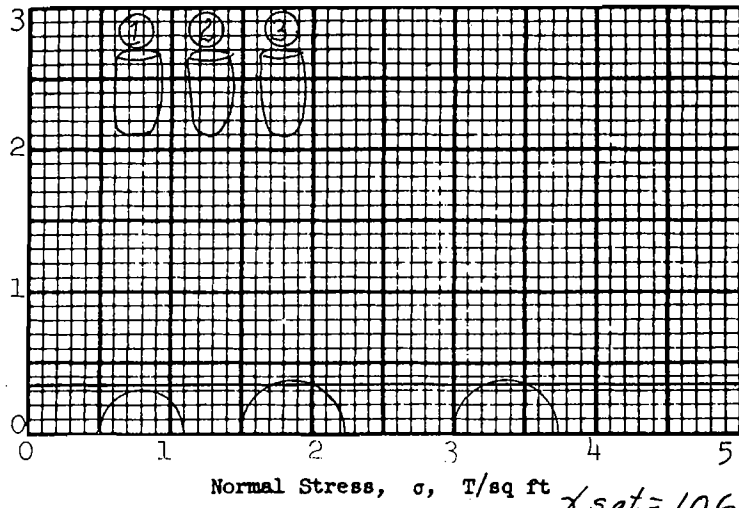
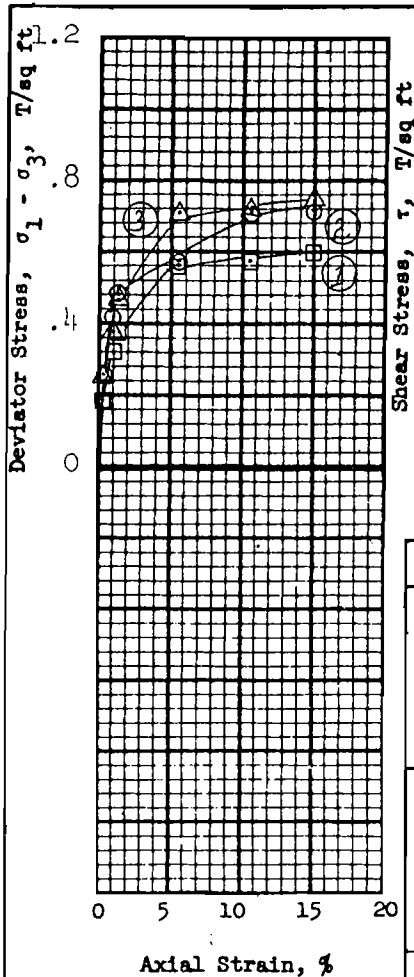
BORING NO. 1-UMP SAMPLE NO. 24-D

DEPTH/ELEV 93.3/-90.2

LABORATORY USAEWES DATE 27 July 1973

GDA TRIAXIAL COMPRESSION TEST REPORT





**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.34 \text{ T/sq ft}$

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         | $\gamma_d$ 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 | $\sigma_3$                    | 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

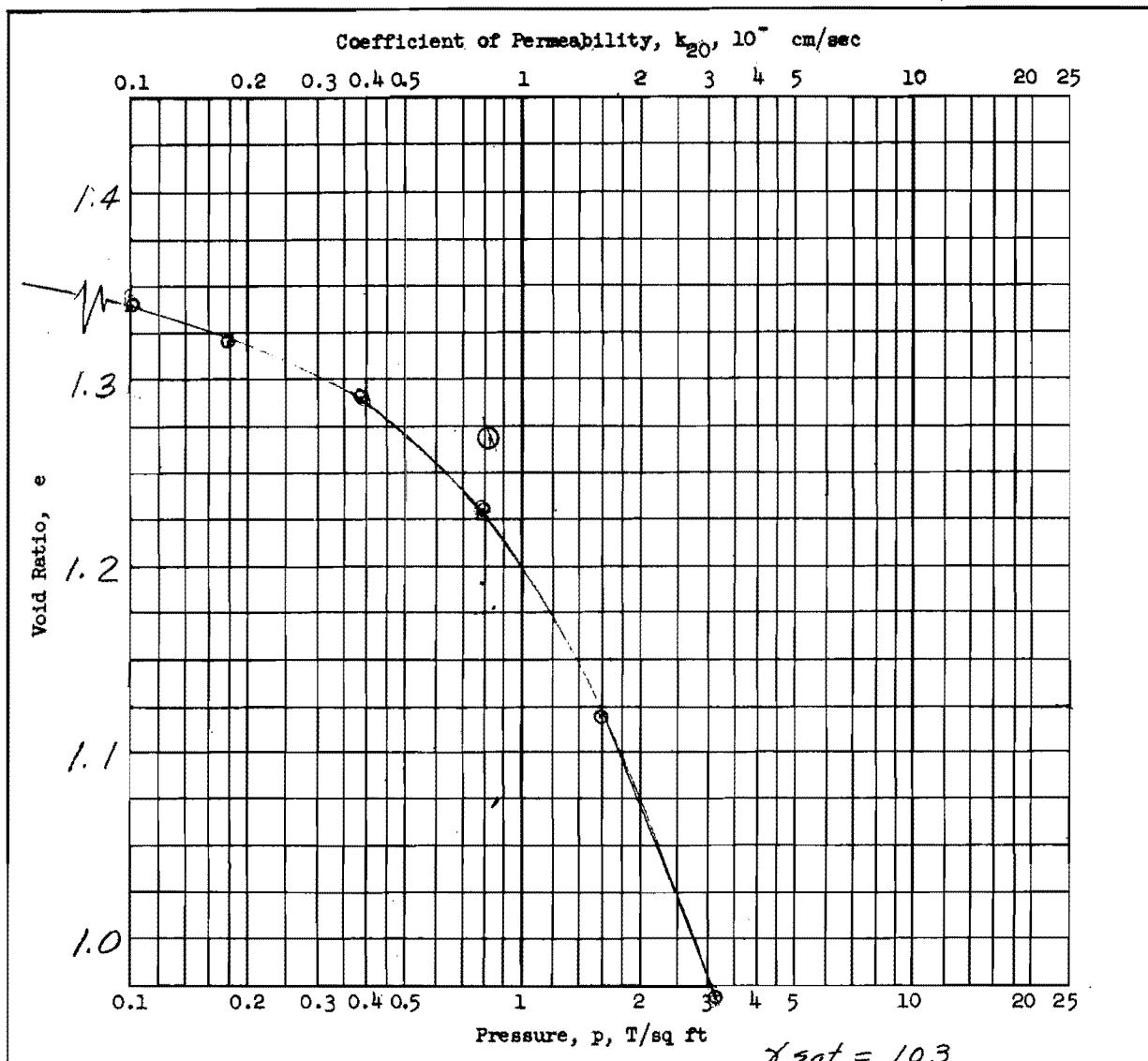
ORLEANS PARISH L.F. LEVEE WEST OF IHNC(OUT-

Area FALL CANALS)ALONG 17th ST.CANAL(GDM#2SUPP.#

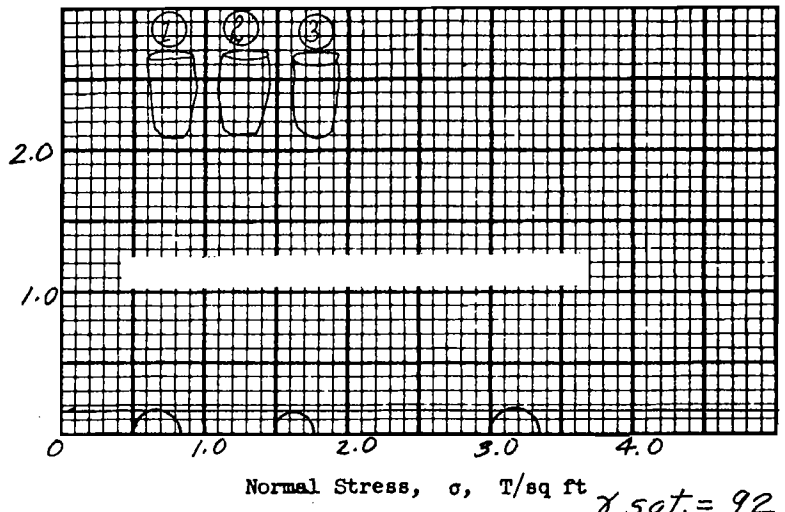
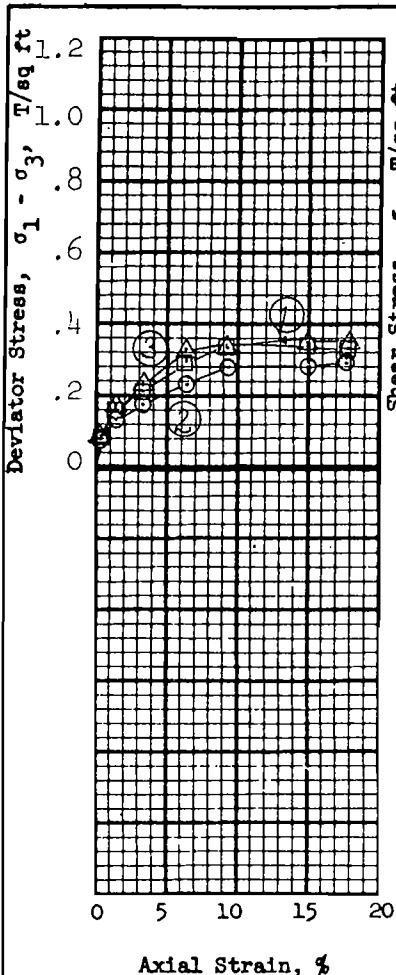
Boring No. 6-MUE      Sample No. 1-D

Depth El -3.9      Date 8 March 1971

TES      TRIAXIAL COMPRESSION TEST REPORT



| 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, $\gamma_d$ | 66.9 lb/ft <sup>3</sup> |  |         |            |               |
| Classification             | PLASTIC CLAY(CH), dark*                       | $k_{20}$ at $e_o =$     |                         | $\times 10^{-7}$ cm/sec                            |         |            |               |
| LL                         | -   | $G_s$                   | 2.53                    | Project LK. PONT., LA. & VIC. - HURR. PORT. '71    |         |            |               |
| PL                         | -   | $D_{10}$                |                         | ORLEANS PAR. L.F. LEV. WEST OF IHNC (OUTFALL       |         |            |               |
| Remarks                    | See attached pressure versus void ratio curve |                         |                         | 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 |
|                            |   |                         |                         | <b>CONSOLIDATION TEST REPORT</b>                   |         |            |               |



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.16 \text{ T/sq ft}$

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         | $\gamma_d$ 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 | $\sigma_3$                    | 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   |        |

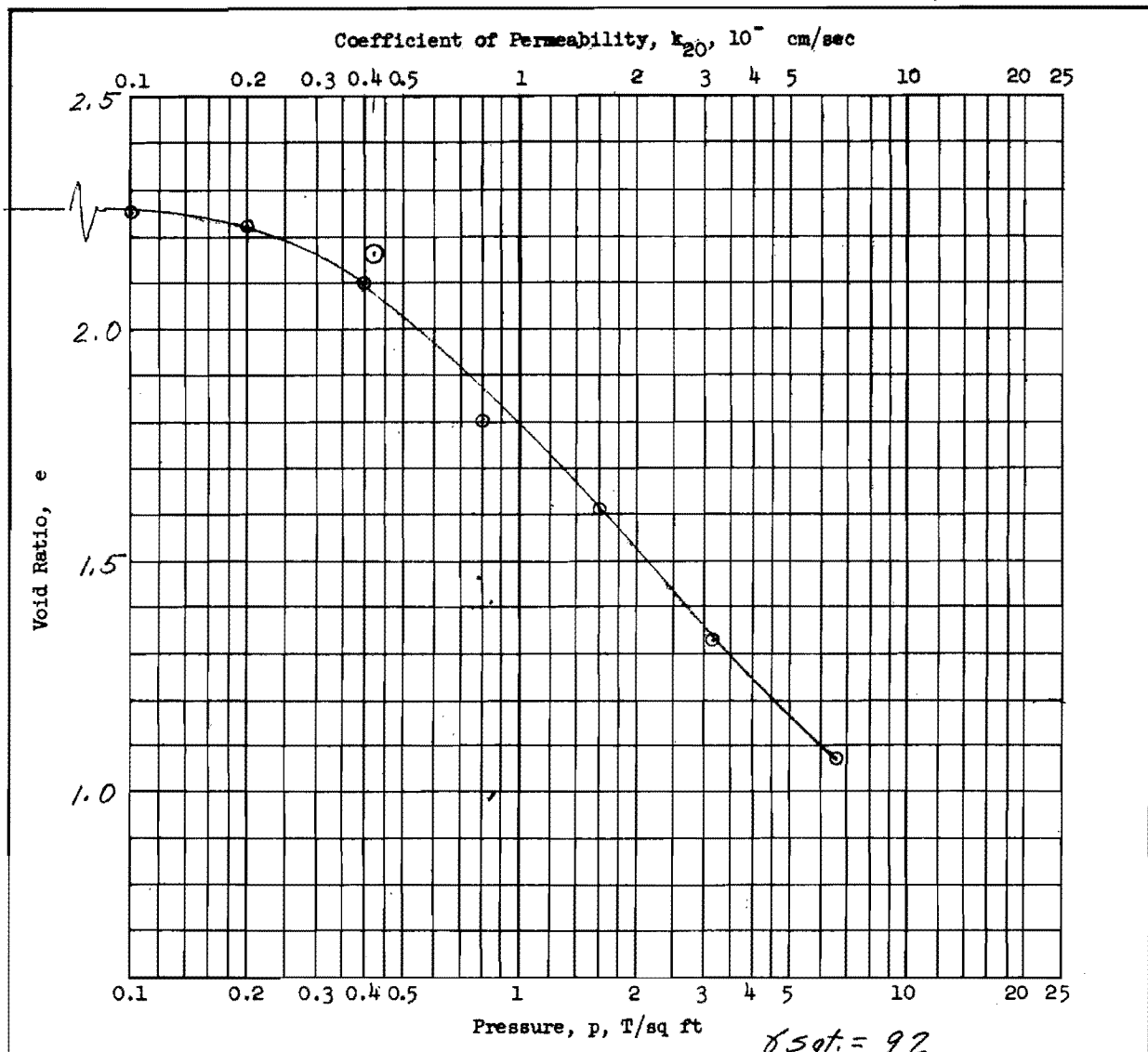
Type of test Q      Type of specimen      UNDISTURBED

Classification PLASTIC CLAY(CH), gray, contains rootlets and decayed large roots

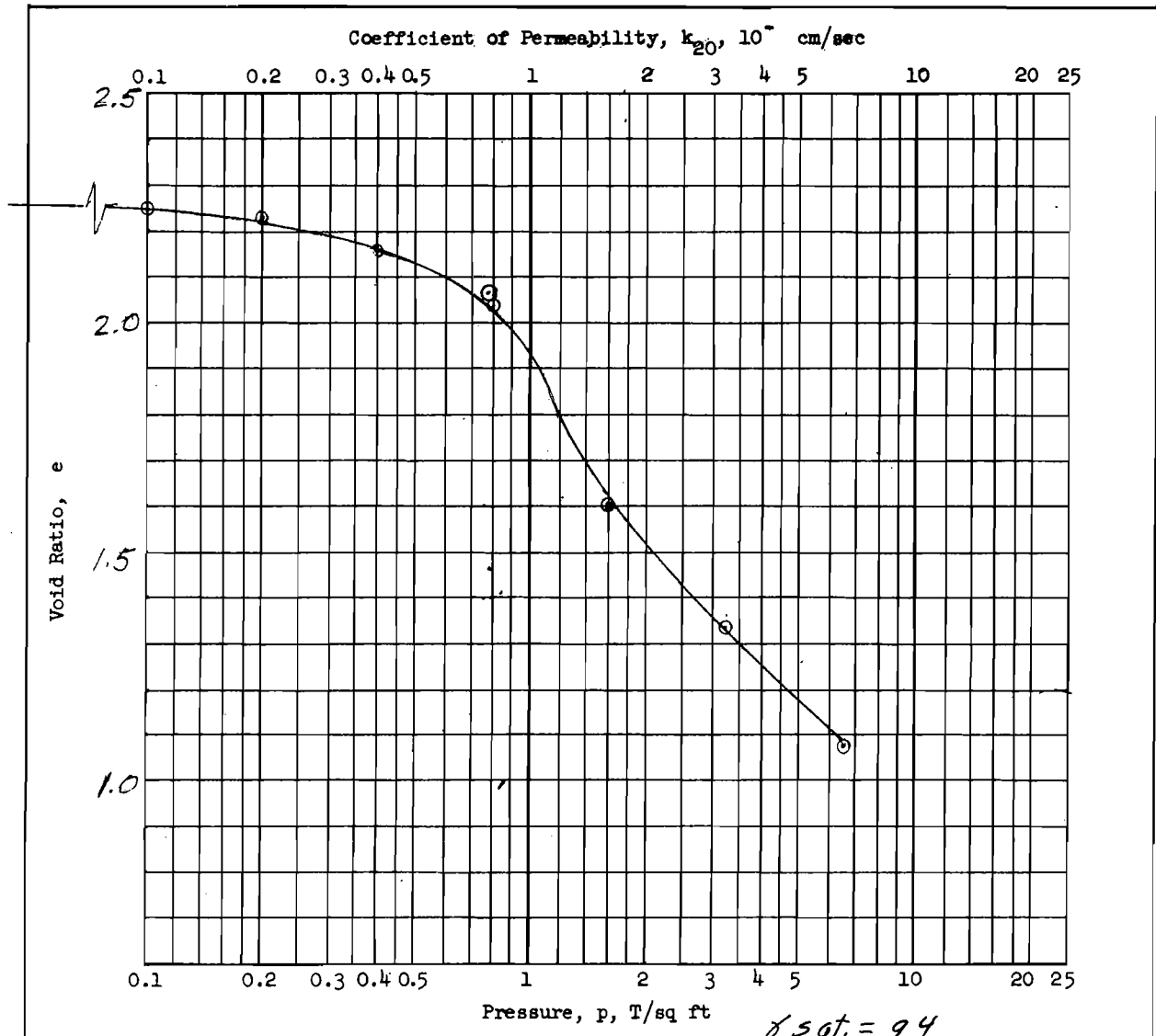
LL 102      PL 30      PI 72       $G_s$  2.56

Remarks \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

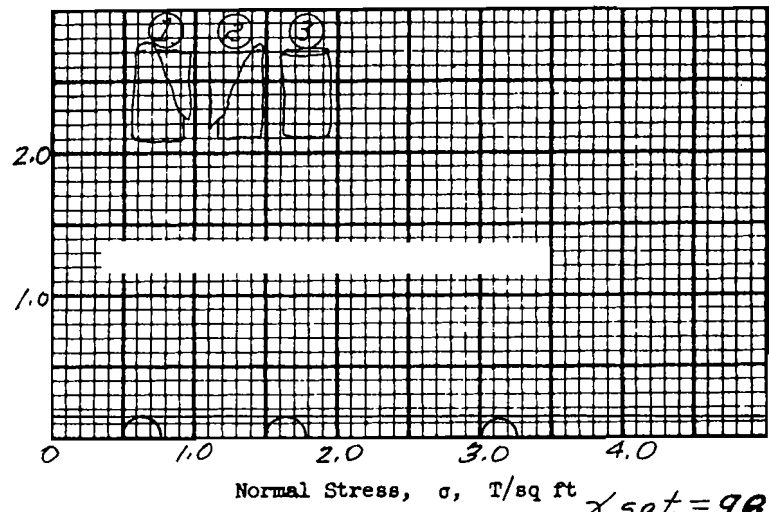
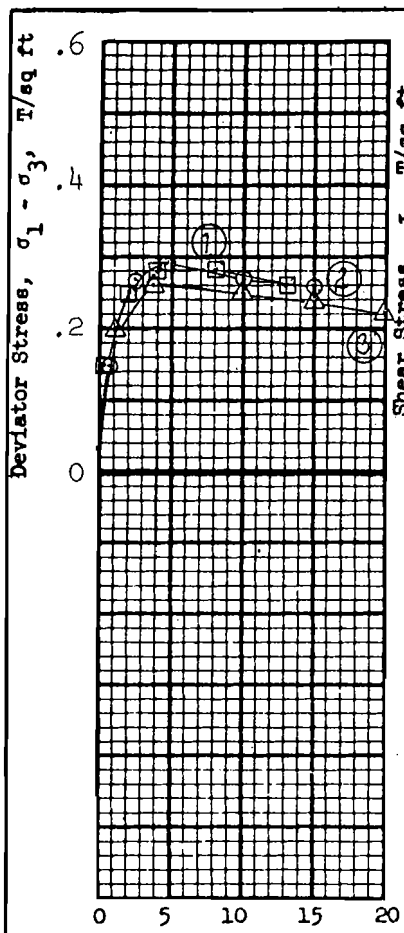
Project LK.PONT.IA.&VIC.-HURR. PROF.'71  
 ORLEANS PARISH L.F. LEVEE WEST OF IHNC, (OUT-  
 Area FALL CANALS) ALONG 17th ST. CANAL (GDM#2, SUPP.# 5)  
 Boring No. 6-MUE      Sample No. 3-C  
 Depth -11.2      Date 8 March 1971  
 TES      TRIAXIAL COMPRESSION TEST REPORT



|  |   |   |                         |            |   |
|--|---|---|-------------------------|------------|---|
| Type of Specimen <b>UNDISTURBED</b>                        |   | 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, $C_c$                                   | .375  | Dry Density, $\gamma_d$                                 | 48.0 lb/ft <sup>3</sup> |            |   |
| Classification <b>PLASTIC CLAY(CH),*</b>                   | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec |   |                         |            |   |
| LL -   | $G_s$ 2.56 From Q                           | Project <b>LK.PONT., LA. &amp; VIC.-HURR. PROT. '71</b> |                         |            |   |
| PL -   | $D_{10}$                                    | ORLFANS PARISH LAKEFRONT LEVEE, WEST OF IHNC            |                         |            |   |
| Remarks See attached plot for pressure vs void ratio curve |   | (OUTFALL CANALS) ALONG 17th. ST. (GDM#2; SUPP.#5)       |                         |            |   |
|  |   | Boring No. 6-MUE  | Sample No. 3-C          |            |   |
| *brown, contains 1/16" to 3/8" dia. roots                  |   | Depth El -11.2  | Date 16 March, 1971     |            |   |
|  |   | <b>JDB CONSOLIDATION TEST REPORT</b>                    |                         |            |   |



|  |              |  |                         |            |   |
|--|--------------|--|-------------------------|------------|---|
| Type of Specimen <b>UNDISTURBED</b>                |              | 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, $\gamma_d$  | 51.0 lb/ft <sup>3</sup> |            |   |
| Classification <b>PLASTIC CLAY(CH),*</b>           |              | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec  |                         |            |   |
| LL 69  | $G_s$ 2.68   | Project LK.PONT., LA. & VIC. - HURR. PROT. - 1971  |                         |            |   |
| PL 19  | $D_{10}$     |  |                         |            |   |
| * Remarks gray                                     |              | ORLFANS PARISH LAKEFRONT LEVEE WEST OF IHNC<br>(OUTFALL CANALS) ALONG 17th. ST. (GDM#2; SUPP.#5) |                         |            |   |
| See attached plot for pressure vs void ratio curve |              |  |                         |            |   |
|  |              | Boring No. 6-MUE   | Sample No. 5-B          |            |   |
|  |              | Depth El -18.5   | Date 17 March, 1971     |            |   |
| <b>JDB CONSOLIDATION TEST REPORT</b>               |              |  |                         |            |   |



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.14 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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   |        |

Type of test  Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH), gray, contains silt seams

LL 81 PL 20 PI 61  $G_s$  2.73

Remarks \_\_\_\_\_

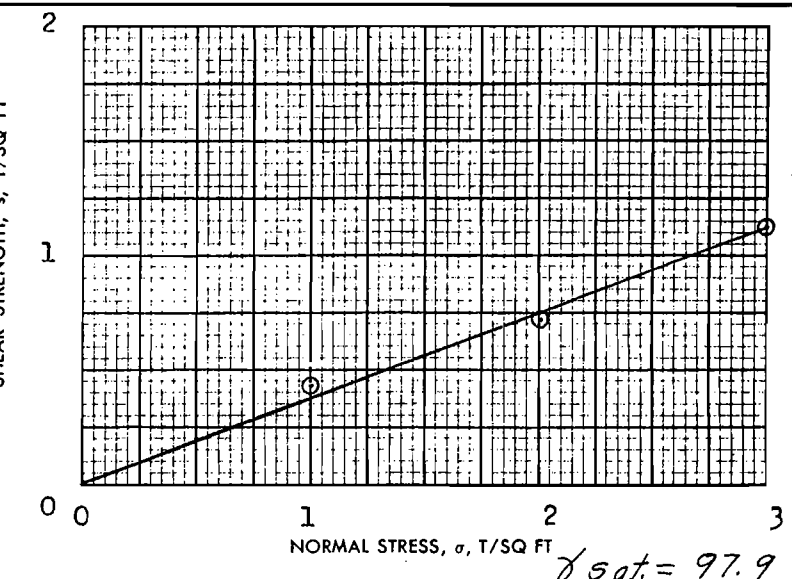
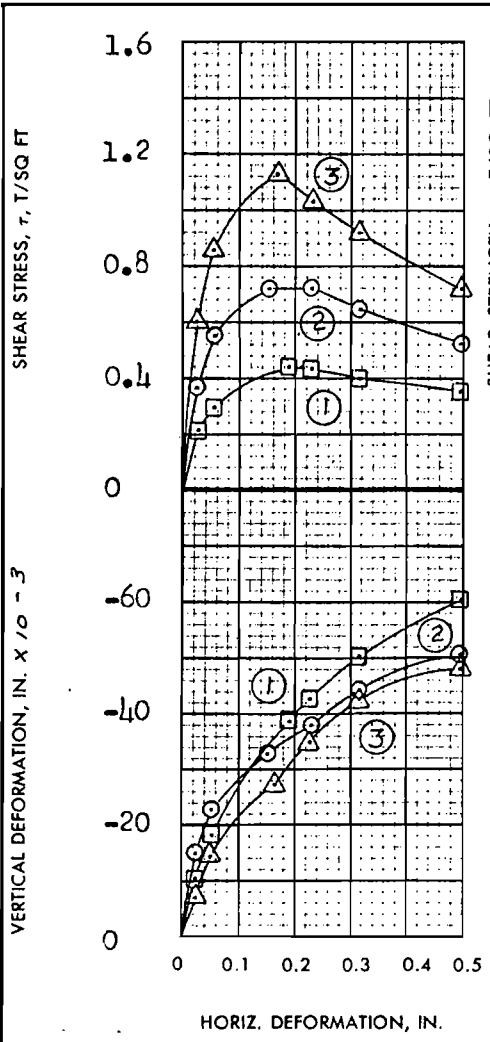
Project I.K. PONT. LA. & VIC. - HURR. PROT. '71 (OUT-FALL CANALS) ALONG 17th ST. CANAL (GDM#2, SUPP.#5)

Area ORLEANS PARISH L.F. LEVEE WEST OF IHNC

Boring No. 6-MUE Sample No. 5-C

Depth E1 -18.9 Date 9 March 1971

F 17 OHR TRIAXIAL COMPRESSION TEST REPORT



SHEAR STRENGTH PARAMETERS

$\phi' = 21^\circ$

$\text{TAN } \phi' = 0.383$

$c' = 0$  T/SQ FT

CONTROLLED STRESS  
 CONTROLLED STRAIN

| TEST NO.                               | 1                   | 2      | 3      | Avg.  |
|--|---------------------|--------|--------|-------|
| WATER CONTENT                          | $w_o = 70.6\%$      | 74.7%  | 73.7%  | 73.0% |
| VOID RATIO                             | 2.02                | 2.08   | 2.08   |       |
| SATURATION                             | $S_o = 95.4\%$      | 98.0%  | 96.7%  | %     |
| DRY DENSITY, LB/CU FT                  | $\gamma_d = 56.5$   | 55.4   | 55.4   |       |
| VOID RATIO AFTER CONSOLIDATION         | $e_r$               |        |        |       |
| TIME FOR 50 PERCENT CONSOLIDATION, MIN | $t_{50} = 4$        | 11     | 9      |       |
| WATER CONTENT                          | $w_f = 57.4\%$      | 49.4%  | 44.6%  | %     |
| VOID RATIO                             | $e_f$               |        |        |       |
| SATURATION                             | $S_f = \%$          | %      | %      | %     |
| NORMAL STRESS, T/SQ FT                 | $\sigma = 1.0$      | 2.0    | 3.0    |       |
| MAXIMUM SHEAR STRESS, T/SQ FT          | $\tau_{max} = 0.44$ | 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         | $\tau_{ult}$        |        |        |       |

TYPE OF SPECIMEN: **UNDISTURBED**      3.00 IN. SQUARE       $l = 0.550$  IN THICK  
 $2\&3 = 0.625$

CLASSIFICATION: **PLASTIC CLAY(CH), dark gray, contains a trace of organic matter,\***

LL 92      PL 29      PI 63       $G_s = 2.73$

REMARKS: \*slickensided

F 18

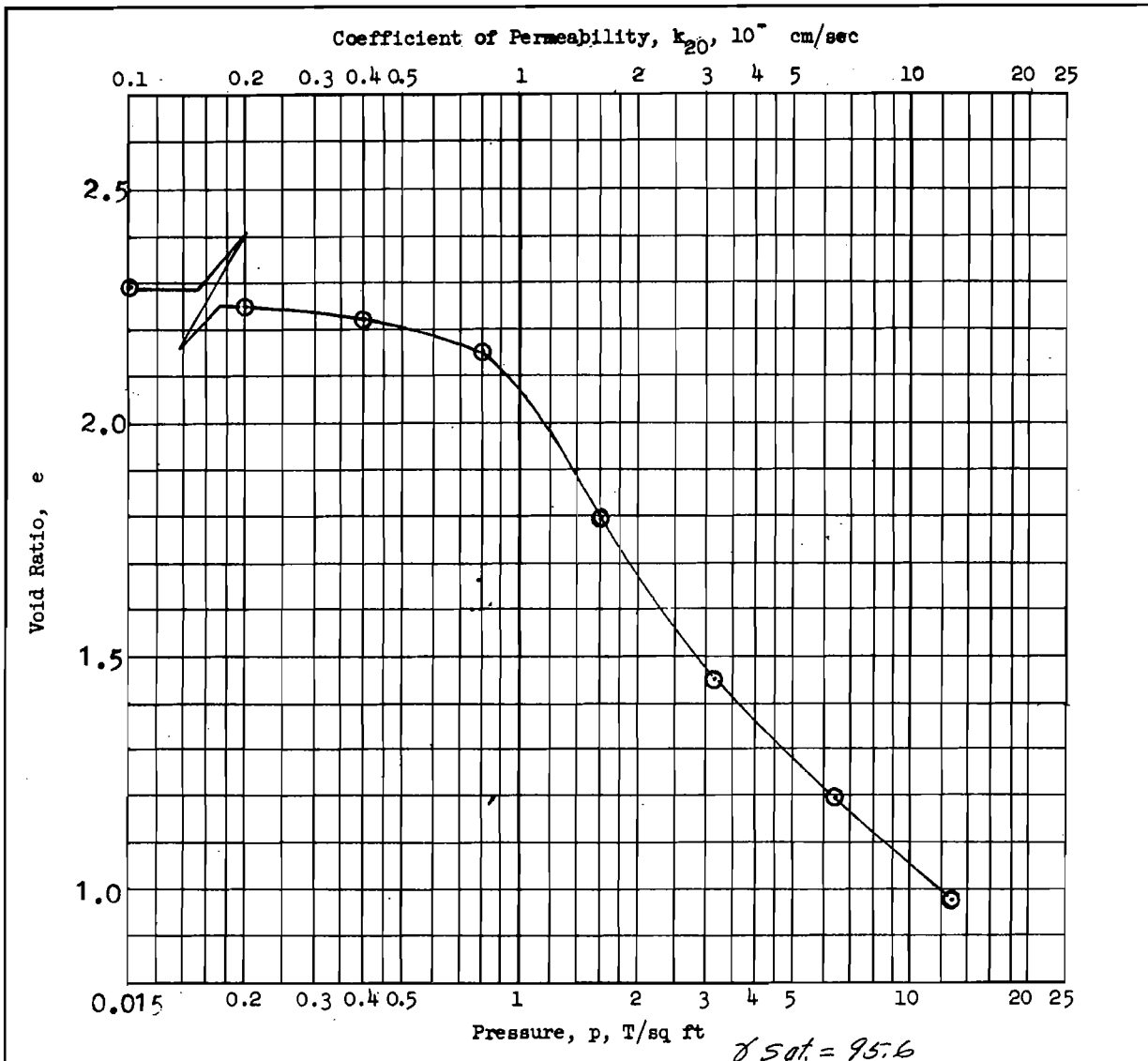
PROJECT: **LK. PONT. LA., & VIC. - HURR. PROT. - 1971**

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

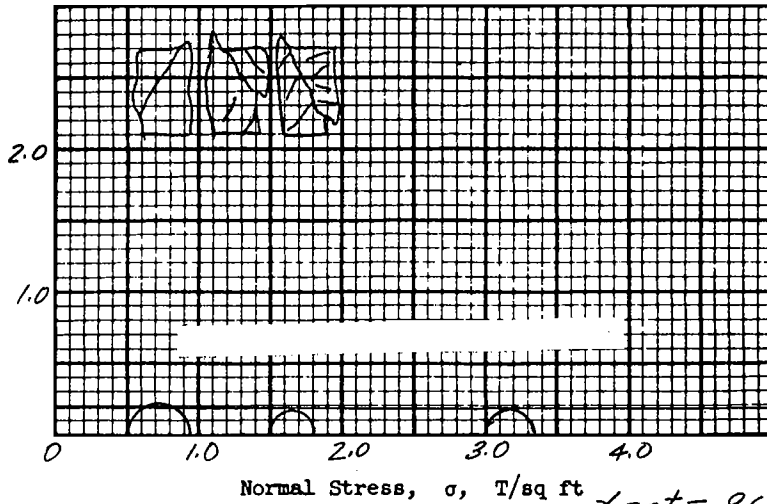
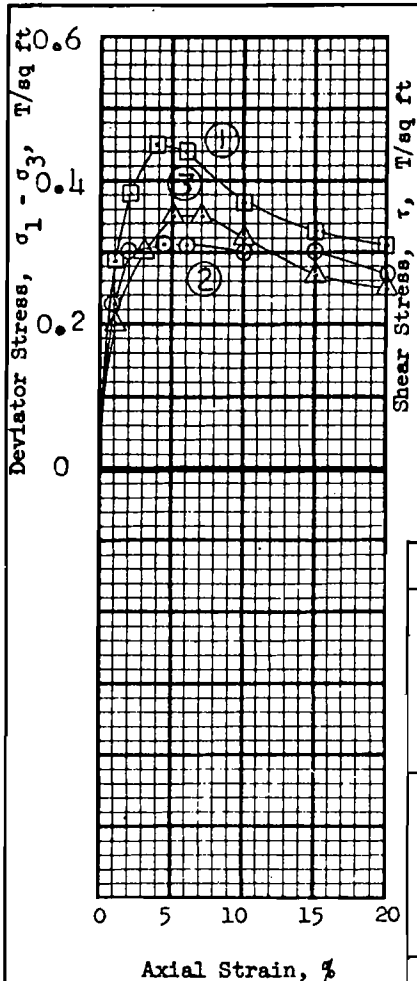
DEPTH-EL - 26.3      DATE 10 March 1971

BWG/GDA      **DIRECT SHEAR TEST REPORT**



|   |                     |  |                                |            |   |
|---|---------------------|--|--------------------------------|------------|---|
| Type of Specimen <b>UNDISTURBED</b>     |                     | Before Test  |                                | After Test |   |
| Diam <b>4.25</b> in.                    | Ht <b>1.160</b> in. | Water Content, $w_o$   | <b>83.2</b> %                  | $w_f$      | % |
| Overburden Pressure, $p_o$              | T/sq ft             | Void Ratio, $e_o$  | <b>2.28</b>                    | $e_f$      |   |
| Preconsol. Pressure, $p_c$              | <b>.94</b> T/sq ft  | Saturation, $S_o$  | <b>100</b> %                   | $S_f$      | % |
| Compression Index, $C_c$                | <b>.6089</b>        | Dry Density, $\gamma_d$  | <b>52.2</b> lb/ft <sup>3</sup> |            |   |
| Classification <b>PLASTIC CLAY(CH)*</b> |                     | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec  |                                |            |   |
| LL <b>100</b>                           | $G_s$ <b>2.74</b>   | Project <b>LK.PONT., LA. &amp; VIC. - HURR. PROT. '71</b>  |                                |            |   |
| PL <b>27</b>                            | $D_{10}$            |  |                                |            |   |
| Remarks <b>* gray</b>                   |                     | ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC<br>(OUTFALL CANALS) ALONG 17th. ST. (GDM #2; SUPP. #5) |                                |            |   |
|   |                     | Boring No. <b>6-MUE</b>  | Sample No. <b>8-B</b>          |            |   |
|   |                     | Depth-El <b>-30.1</b>  | Date <b>17 March, 1971</b>     |            |   |
| <b>JDB CONSOLIDATION TEST REPORT</b>    |                     |  |                                |            |   |





**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.19 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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 % | %      |
| Before Shear | Dry density, lb/cu ft   | $\gamma_d$ 53.4 | 53.3   | 54.2   |        |
|              | Water content   | $w_c$           | %      | %      | %      |
|              | Void ratio  | $e_c$           |        |        |        |
|              | Saturation  | $s_c$           | %      | %      | %      |
| Final        | Final back pressure, T/sq ft  | $u_o$           |        |        |        |
|              | Water content   | $w_f$           | %      | %      | %      |
|              | Void ratio  | $e_f$           |        |        |        |
|              | Minor principal stress, T/sq ft                                       | $\sigma_3$ 0.5  | 1.5    | 3.0    |        |
|              | Max deviator stress, T/sq ft ( $\sigma_1 - \sigma_3$ ) <sub>max</sub> | 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 ( $\sigma_1 - \sigma_3$ ) <sub>ult</sub> |                 |        |        |        |
|              | 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**

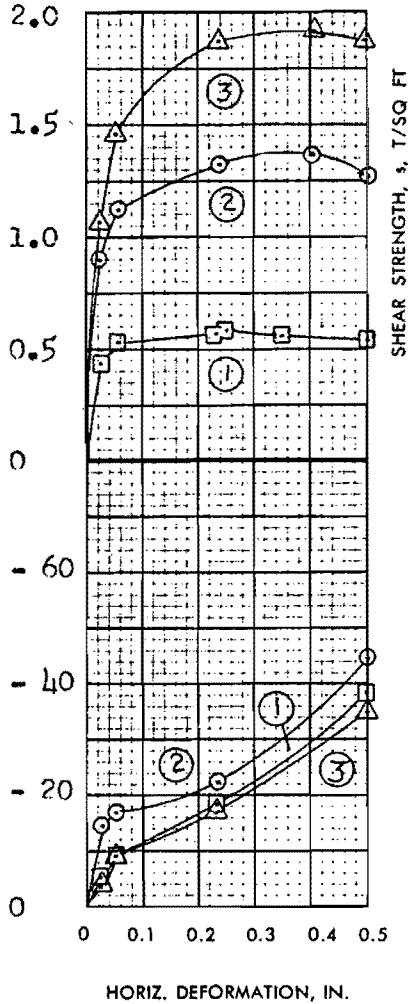
LL -      PL -      PI -       $G_s$  2.74 From 8-B Co:

Remarks \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Project **LK. PONT. LA. & VIC. - HURR. PROT. - 1971**  
**ORLEANS PARISH LK. FT. LEVEE, WEST OF IHNC, (OUT-**  
**Area FALL CANALS) ALONG 17th ST. CANAL (GDM#2, SUPP.#**  
 Boring No. **6-MUE**      Sample No. **8-C**  
 -Depth- **- 31.0**      Date **9 March, 1971**  
**FAM      TRIAXIAL COMPRESSION TEST REPORT**

SHEAR STRESS,  $\tau$ , T/SQ FT

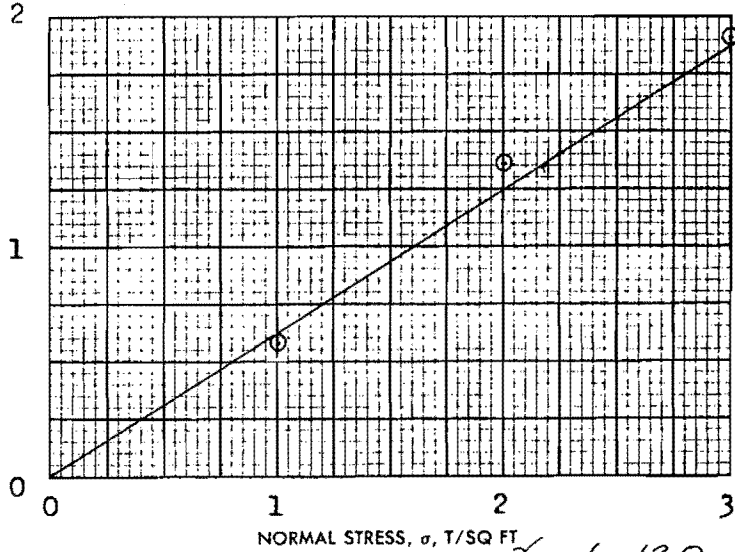
VERTICAL DEFORMATION, IN.  $\times 10^{-3}$



**SHEAR STRENGTH PARAMETERS**

$\phi' = 32^\circ$   
 $\tan \phi' = 0.625$   
 $c' = 0$  T/SQ FT

- CONTROLLED STRESS
- CONTROLLED STRAIN



| 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 | $\gamma_d$ 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                 |                       | $\sigma$ 1.0      | 2.0    | 3.0    |        |
| MAXIMUM SHEAR STRESS, T/SQ FT          |                       | $\tau_{max}$ 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         |                       | $\tau_{ult}$      |        |        |        |

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 \_\_\_\_\_

PROJECT **LK. PONT. LA., & VIC. - HURR. PROT. - 1971**

**ORLEANS PARISH LK. FRNT. LEVEE, WEST OF IHNC**

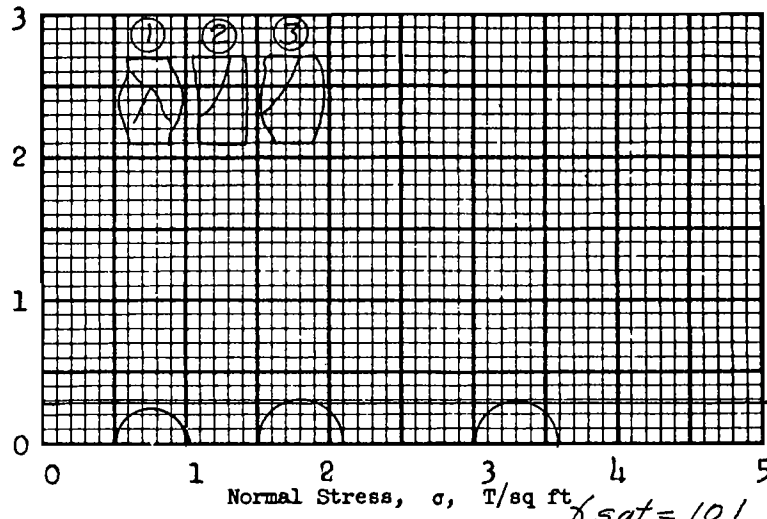
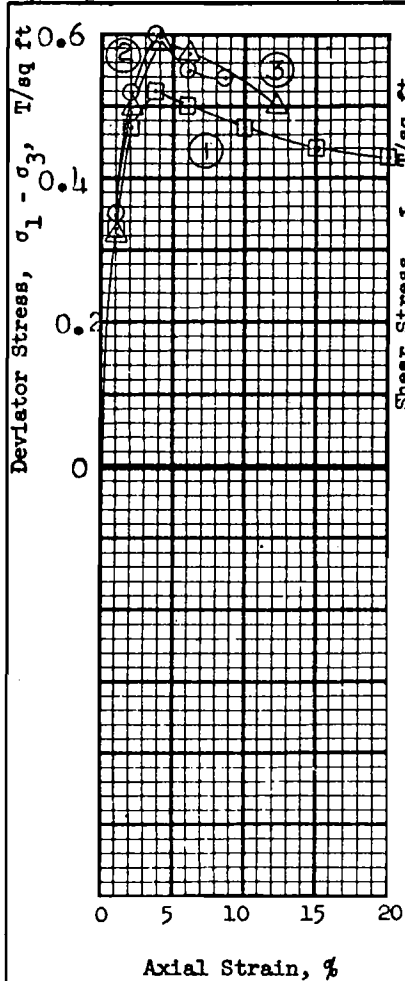
AREA **(OUTFALL CANALS) ALONG 17th ST CANAL**

BORING NO. **6-MUE** SAMPLE NO. **9-R**

DEPTH-EL **-34.3** DATE **22 March 1971**

F21

**BWG DIRECT SHEAR TEST REPORT**



**Shear Strength Parameters**

$\phi = \underline{0}^\circ$

$\tan \phi = \underline{0}$

$c = \underline{0.29} \text{ T/sq ft}$

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         | $\gamma_d$ 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 | $\sigma_3$                    | 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)

Project LK.PONT.LA., & VIC.-HURR.PROT.-1971

ORLEANS PARISH LK.FT.LEVEE, WEST OF IHNC, (OUT\*

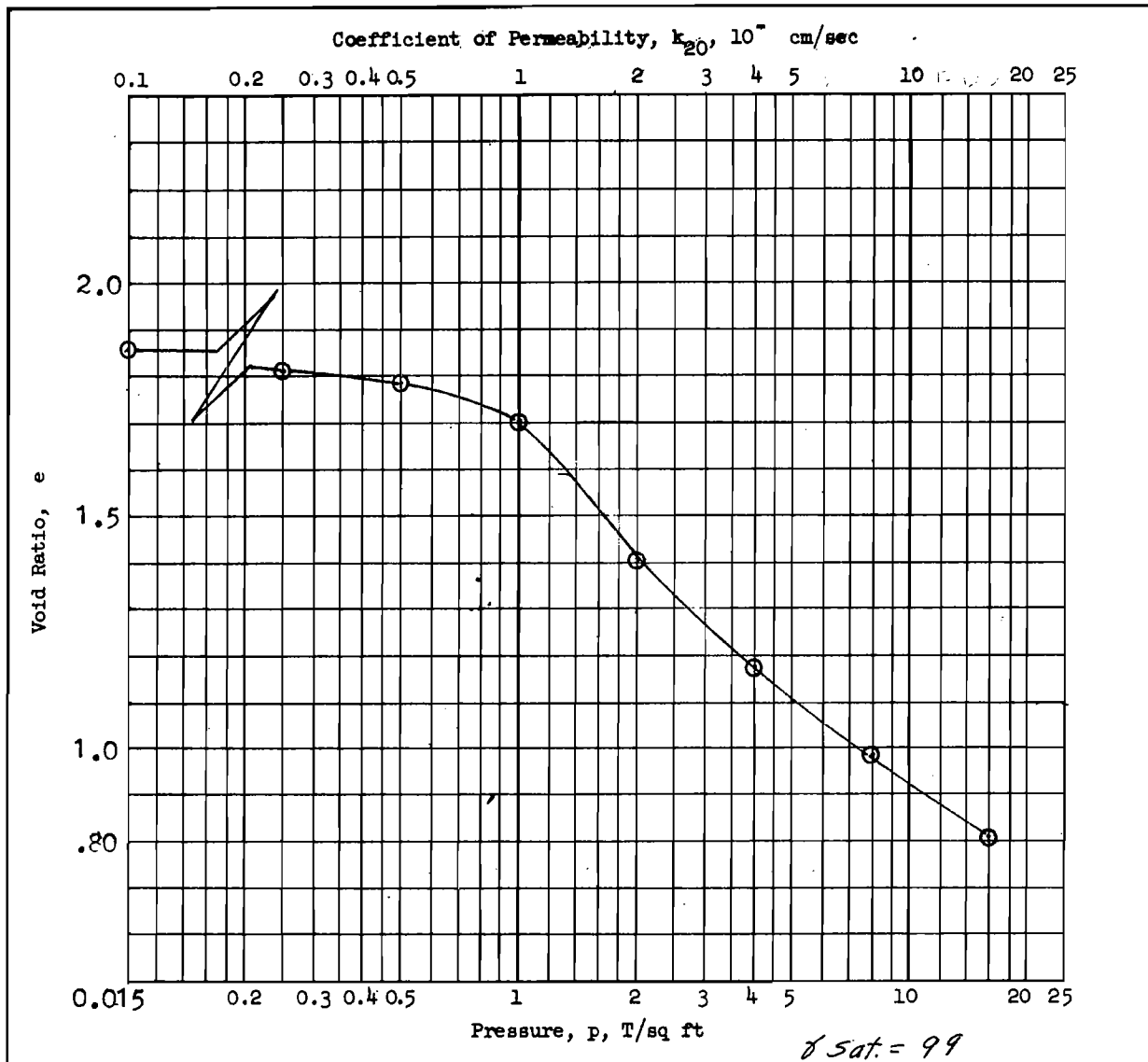
Area FALL CANALS) ALONG 17TH.ST. CANAL (GDM#2SU

Boring No. 6-MJE Sample No. 11-C

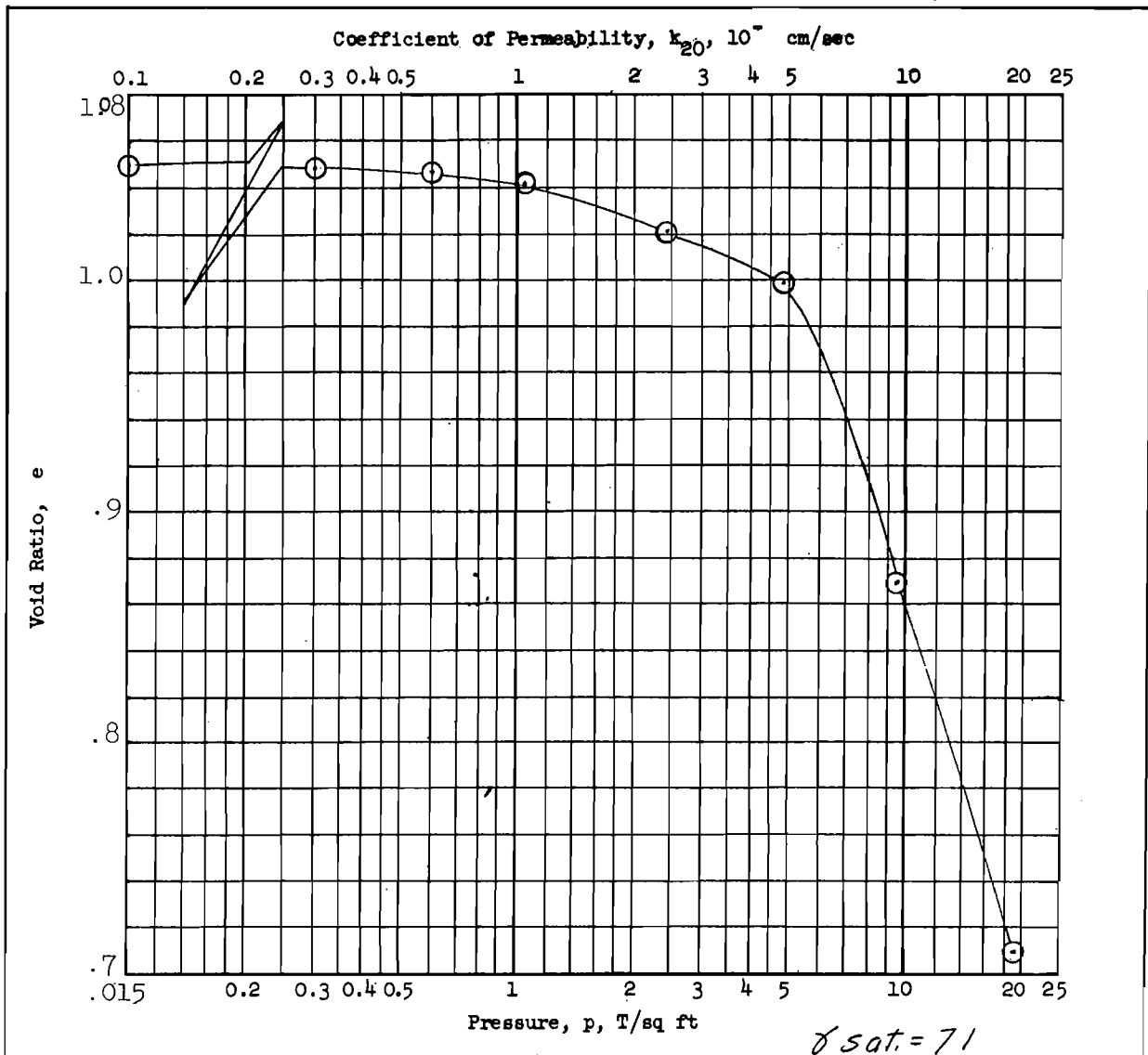
Depth E1 - 12.7 Date 10 March 1971

F22

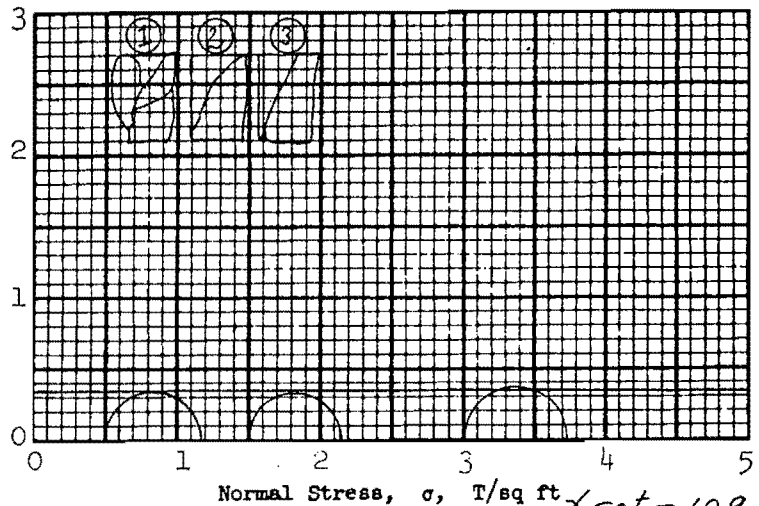
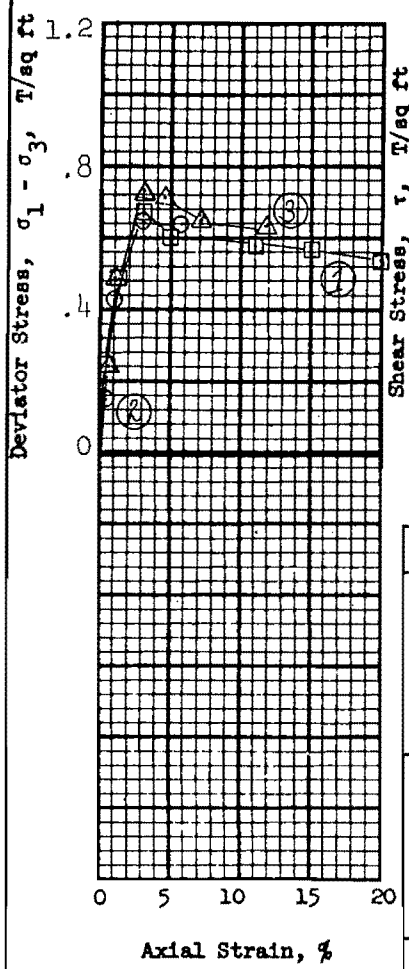
JMS TRIAXIAL COMPRESSION TEST REPORT



|   |                   |   |                         |            |                |
|---|-------------------|---|-------------------------|------------|----------------|
| Type of Specimen <b>UNDISTURBED</b>           |                   | 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, $\gamma_d$   | 58.2 lb/ft <sup>3</sup> |            |                |
| Classification <b>PLASTIC CLAY(CH),*</b>      |                   | $k_{20}$ at $e_o =$   | $\times 10^{-7}$ cm/sec |            |                |
| LL -  | $G_s$ 2.67 From Q | Project LK.FONT., LA. & VIC.-HURR. PROT.-1971<br>ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC<br>(OUTFALL CANALS) ALONG 17th. ST. (GDM#2, SUPP.#5) |                         |            |                |
| PL -  | $D_{10}$          |   |                         |            |                |
| * Remarks gray, contains 1" dia. sand pockets |                   | Boring No.  | 6-MUE                   | Sample No. | 11-C           |
|   |                   | Depth-<br>El  | -42.7                   | Date       | 17 March, 1971 |
| <b>JDB CONSOLIDATION TEST REPORT</b>          |                   |   |                         |            |                |



|   |              |  |                         |                    |   |
|---|--------------|--|-------------------------|--------------------|---|
| 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, $\gamma_d$                            | 68.0 lb/ft <sup>3</sup> |                    |   |
| Classification LEAN CLAY (CL), gray     |              | $k_{20}$ at $e_o$ = $\times 10^{-7}$ cm/sec        |                         |                    |   |
| LL 49                                   | $G_s$ 2.76   | Project LK. PONT., LA. & VIC. - HURR. PROT. '71    |                         |                    |   |
| PL 21                                   | $D_{10}$     | ORLEANS PAR. L.F. LEV. WEST OF IHNC (OUTFALL       |                         |                    |   |
| Remarks                                 |              | 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 |   |
| <b>CONSOLIDATION TEST REPORT</b>        |              |  |                         |                    |   |



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.34 \text{ T/sq ft}$

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         | $\gamma_d$ 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 | $\sigma_3$                    | 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

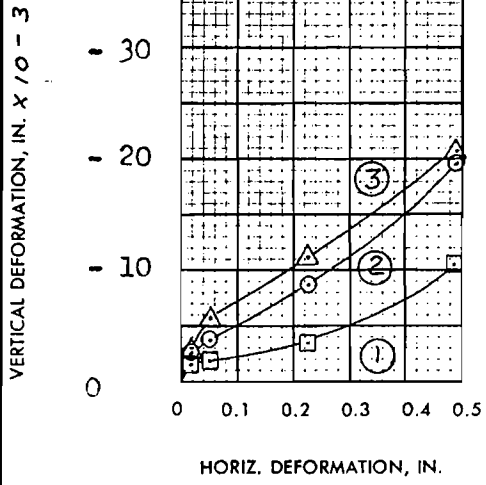
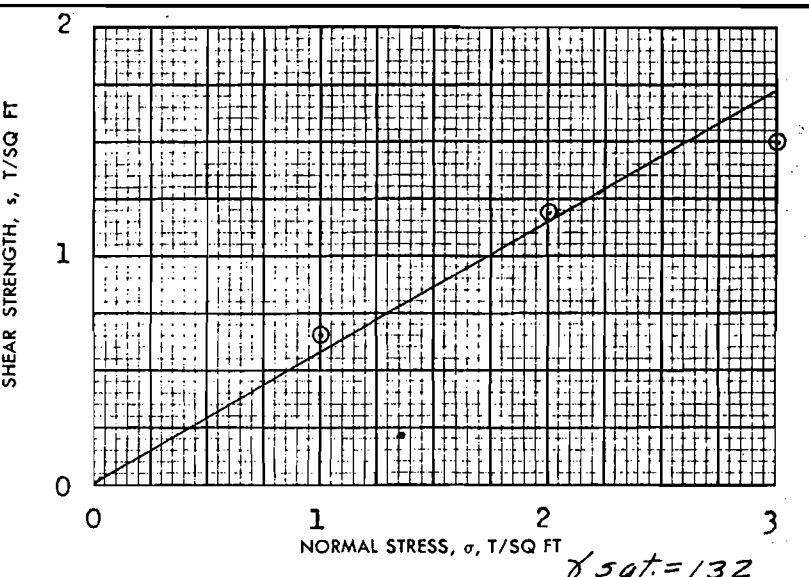
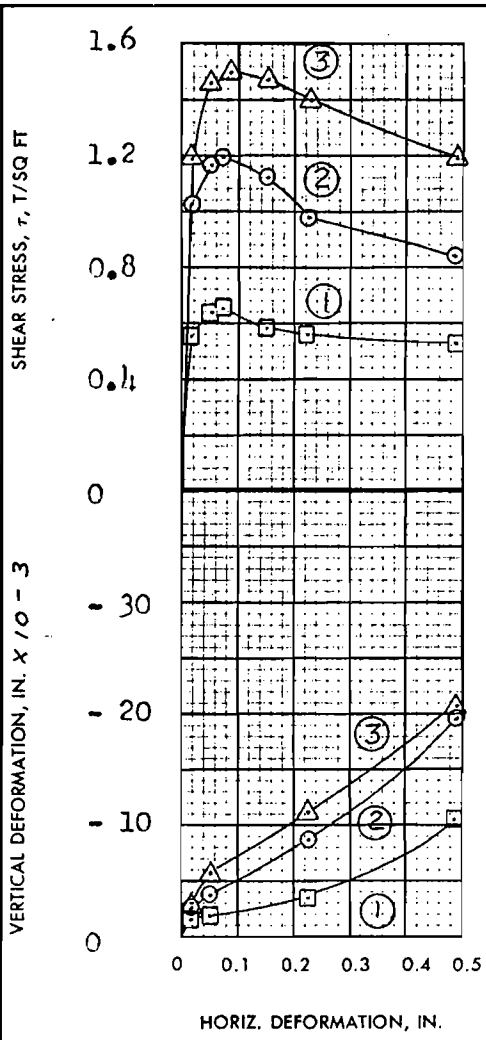
ORLEANS PARISH L.F. LEVEE WEST OF IHNC (OUT-AREA FALL CANALS) ALONG 17th ST. (GDM#2, SUPP.#5)

Boring No. 6-MUE Sample No. 14-D

Depth E1 -55.9 Date 9 March 1971

JMS TRIAXIAL COMPRESSION TEST REPORT

F25



**SHEAR STRENGTH PARAMETERS**

$\phi' = 30^\circ$

$\tan \phi' = 0.577$

$c' = 0$  T/SQ FT

CONTROLLED STRESS

CONTROLLED STRAIN

| TEST NO.                               |                       | 1                | 2      | 3      | Avg.   |
|--|-----------------------|------------------|--------|--------|--------|
| INITIAL                                | WATER CONTENT         | $w_o$ 19.0%      | 18.9%  | 18.8%  | 18.9%  |
|  | VOID RATIO            | $e_o$ 0.537      | 0.525  | 0.537  |        |
|  | SATURATION            | $S_o$ 95.9%      | 97.6%  | 91.9%  | %      |
|  | DRY DENSITY, LB/CU FT | $\gamma_d$ 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%  | %      |
|  | VOID RATIO            | $e_f$            |        |        |        |
|  | SATURATION            | $S_f$            | %      | %      | %      |
| NORMAL STRESS, T/SQ FT                 |                       | $\sigma$         | 1.0    | 2.0    | 3.0    |
| MAXIMUM SHEAR STRESS, T/SQ FT          |                       | $\tau_{max}$     | 0.65   | 1.19   | 1.50   |
| ACTUAL TIME TO FAILURE, MIN            |                       | $t_f$            | 180    | 180    | 540    |
| RATE OF STRAIN, IN./MIN                |                       |                  | .00018 | .00018 | .00018 |
| ULTIMATE SHEAR STRESS, T/SQ FT         |                       | $\tau_{ult}$     |        |        |        |

TYPE OF SPECIMEN **UNDISTURBED** 3.00 IN. SQUARE 0.540 IN. THICK

CLASSIFICATION **SANDY CLAY(CL), gray, fissured**

LL 44 PL 15 PI 29  $G_c$  2.71

REMARKS \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

F26

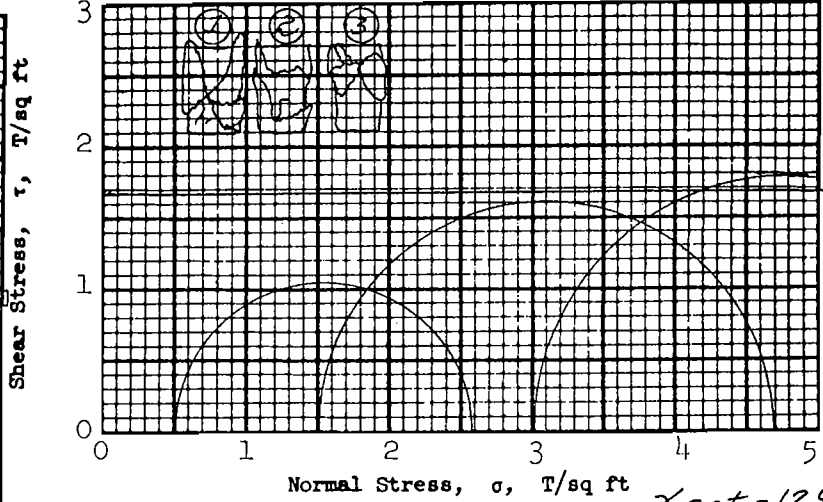
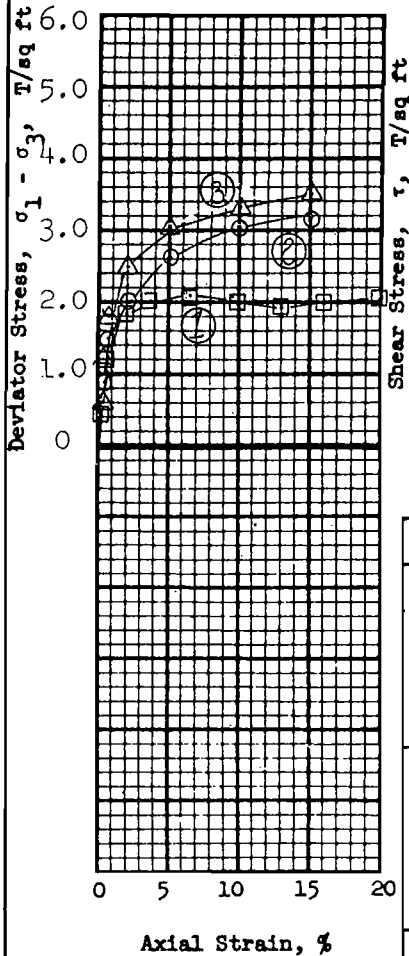
PROJECT **LK. PONT. LA., & VIC. - HURR. PROT. - 1971**

**ORLEANS PARISH LK. FT. LEVEE WEST OF THNC (OUT-AREA FALL CANALS) ALONG 17TH ST CANAL (CDM#2, SUPP#5)**

BORING NO. **6-MUE** SAMPLE NO. **16-B**

DEPTH - **62.0** DATE **17 March 1971**

GDA **DIRECT SHEAR TEST REPORT**



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 1.68 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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   |        |

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

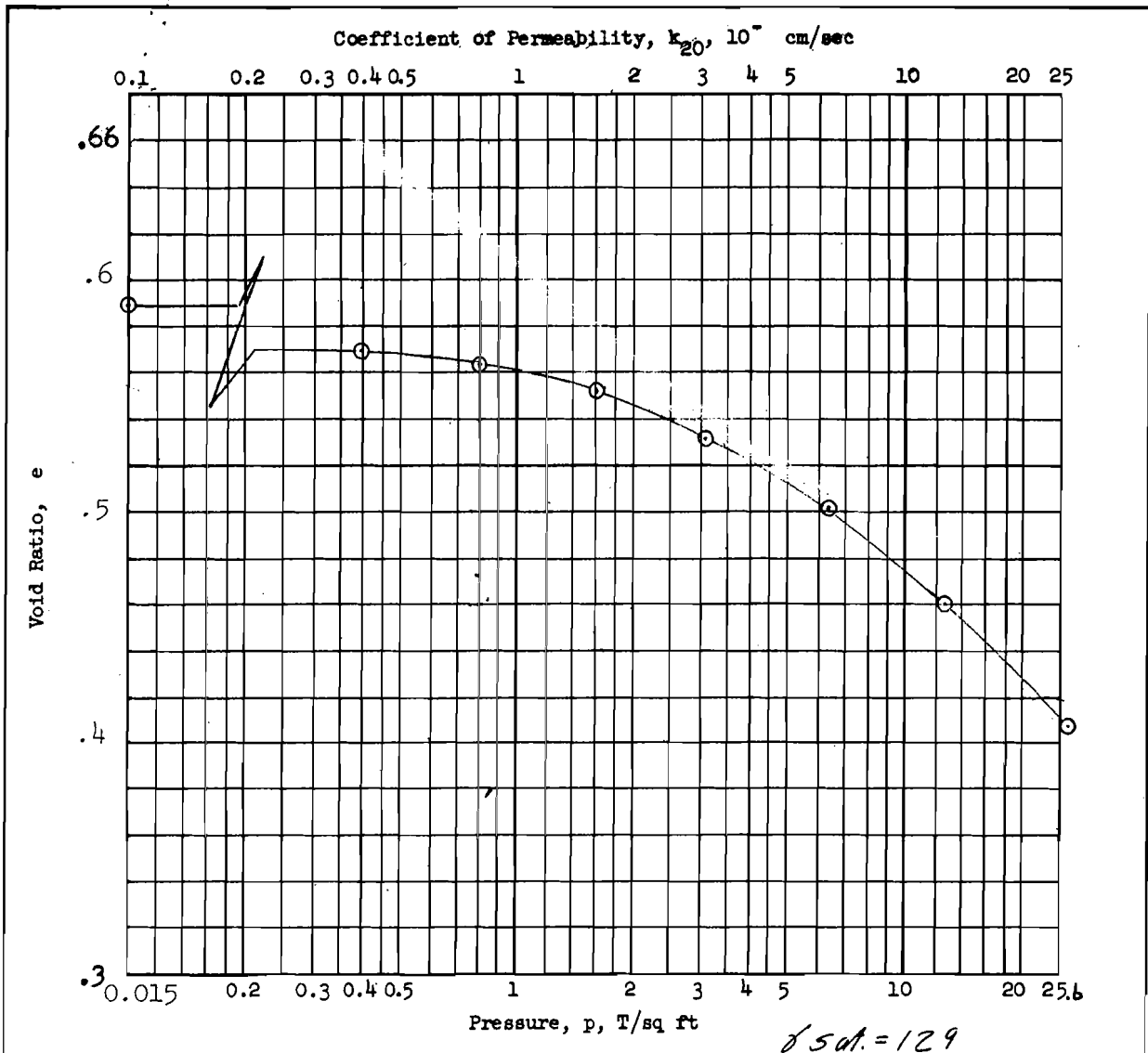
Remarks Insufficient material to perform check test

Project LK.PONT.LA.&VIC.-HURR. PROT.-'71  
 ORLEANS PARISH L.F. LEVEE WEST OF IHNC(OUT-  
 Area FALL CANALS)ALONG 17thST. CANAL(GDM#2,SUEP.#  
 Boring No. 6-MUE Sample No. 16-C  
 Depth -62.9 Date 10 March 1971  
 E1

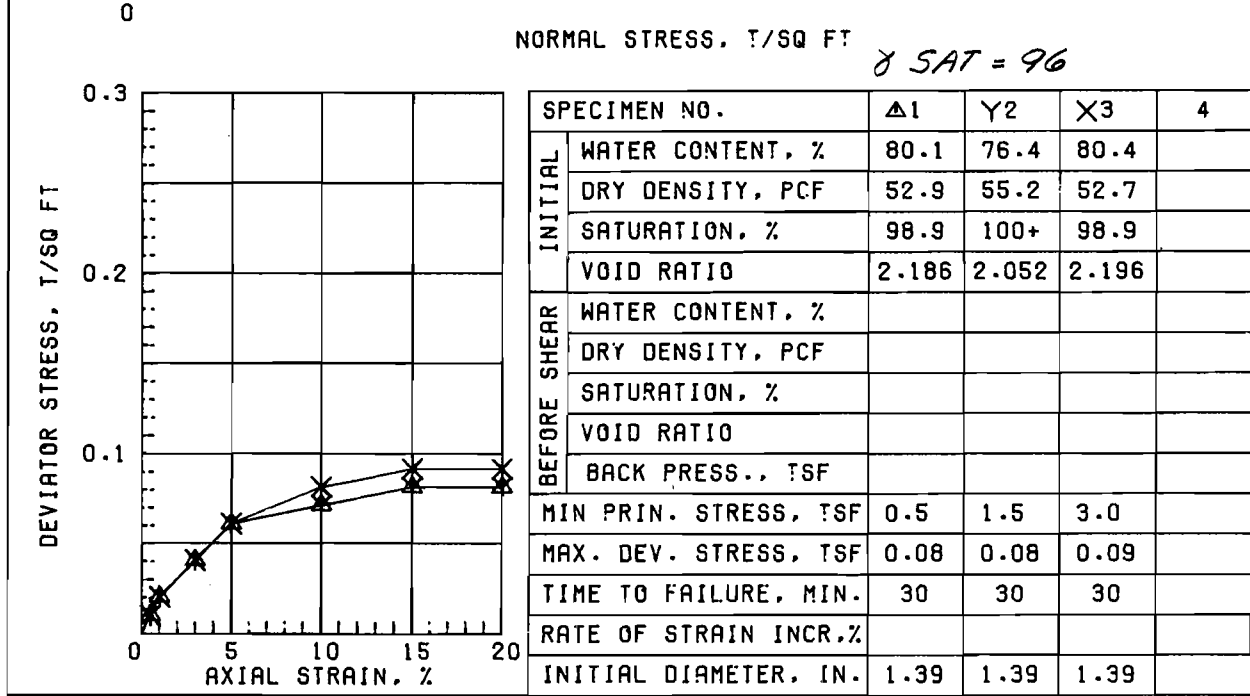
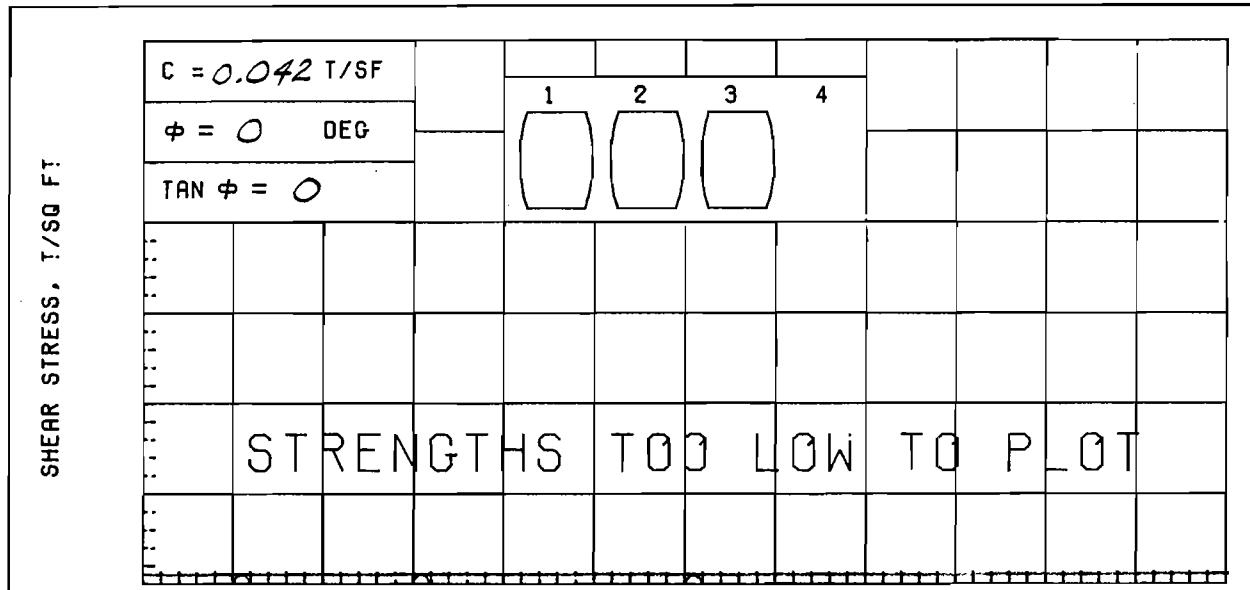
F27

OHR TRIAXIAL COMPRESSION TEST REPORT



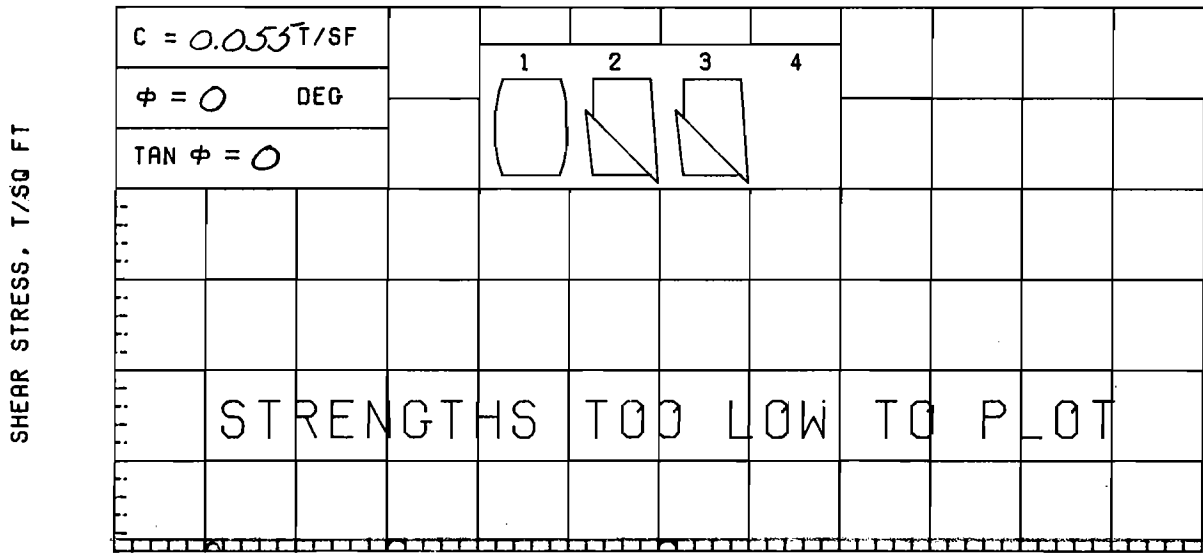


|  |                              |   |                          |            |   |
|--|------------------------------|---|--------------------------|------------|---|
| Type of Specimen <b>UNDISTURBED</b>      |                              | Before Test                                     |                          | 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, $\gamma_d$                         | 105.9 lb/ft <sup>3</sup> |            |   |
| Classification <b>PLASTIC CLAY(CH),*</b> |                              | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec     |                          |            |   |
| LL -                                     | $G_s$ 2.70 <sup>From Q</sup> | 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                              |                          |            |   |
| <b>CONSOLIDATION TEST REPORT</b>         |                              |   |                          |            |   |

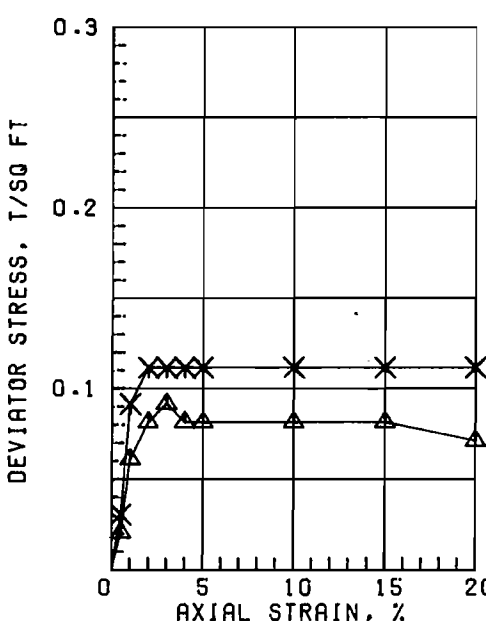


AVG.  
79.0

|   |        |       |                                    |                      |        |
|---|--------|-------|------------------------------------|----------------------|--------|
| 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                  |        |       |                                    |                      |        |



NORMAL STRESS, T/SQ FT

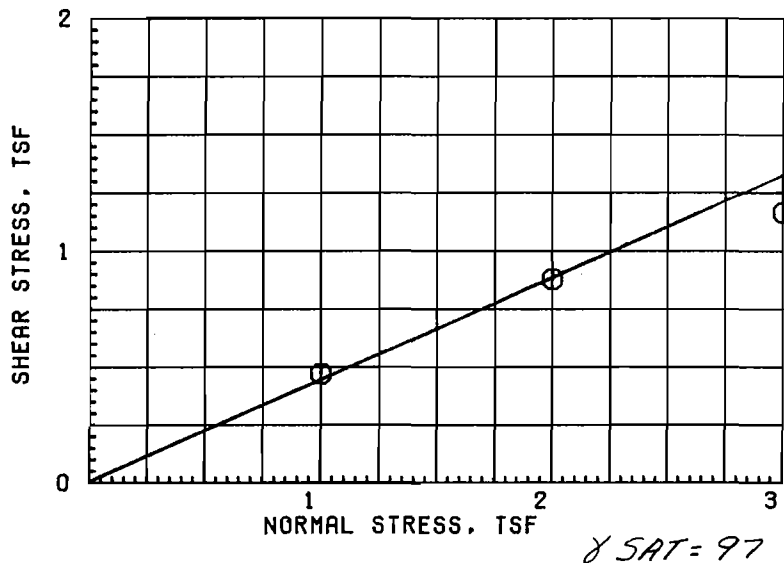
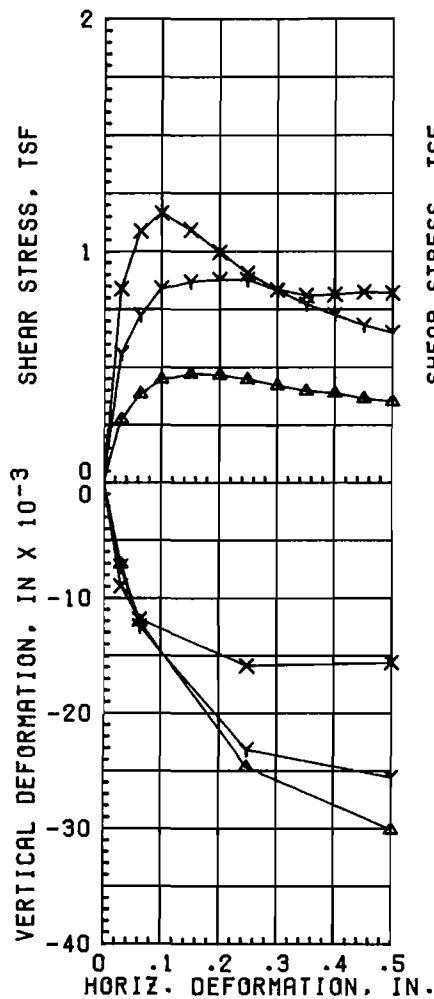


$\delta SAT = 97$

| SPECIMEN NO. |                        | $\Delta 1$ | $\Upsilon 2$ | $\times 3$ | 4 |
|--------------|------------------------|------------|--------------|------------|---|
| INITIAL      | WATER CONTENT, %       | 77.3       | 77.4         | 76.4       |   |
|              | 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       |   |

AVG.  
77.0

|  |       |                                    |   |
|--|-------|------------------------------------|---|
| 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                               |       |                                    |   |



$\phi = 24^\circ$   
 $\tan \phi = 0.445$   
 $c = 0$

| TEST NO.                   |                  | 1 $\Delta$ | 2 $\gamma$ | 3 $\times$ | AVG. |
|----------------------------|------------------|------------|------------|------------|------|
| INITIAL                    | 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 |                  |            |            |            |      |

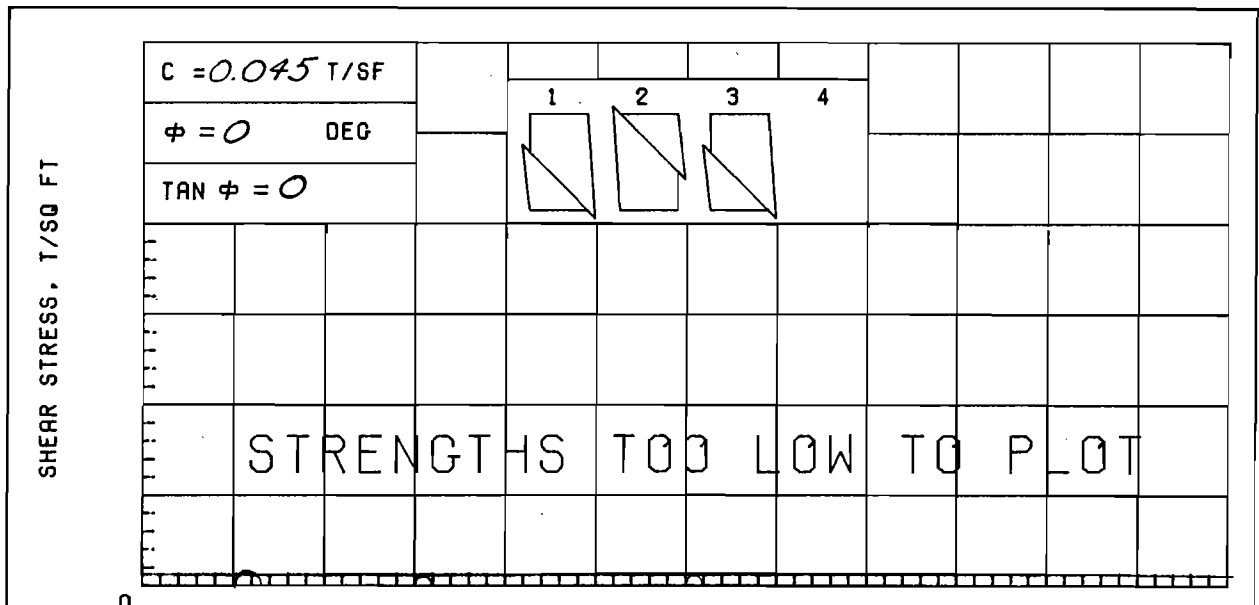
TYPE SPECIMEN UNDISTURBED      3.00 IN. SQUARE      0.744 IN. THICK

CLASSIFICATION PLASTIC CLAY (CH), GRAY

LL      PL      PI      GS 2.70 (EST)

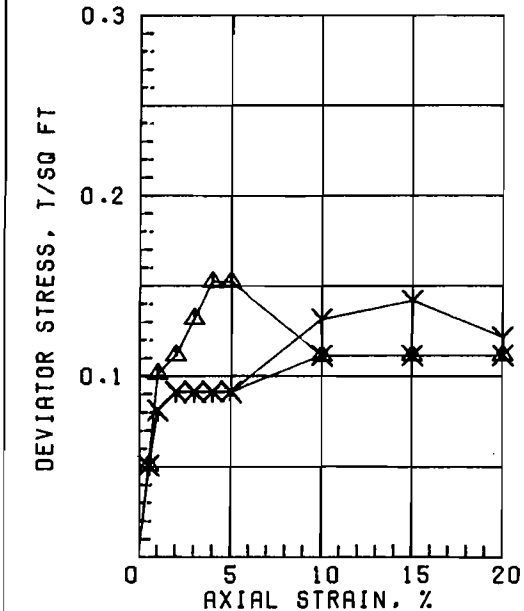
REMARKS: PROJECT LK PONT LA & VIC HURR PROT  
 ORLEANS PARISH OUTFALL CANALS  
 BORING NO. 1MUG      SAMPLE 3-C  
 DEPTH/ELEV 10.1/-17.3      DATE 28 JUL 86

DIRECT SHEAR TEST REPORT



NORMAL STRESS, T/SQ FT

$\gamma_{SAT} = 94$

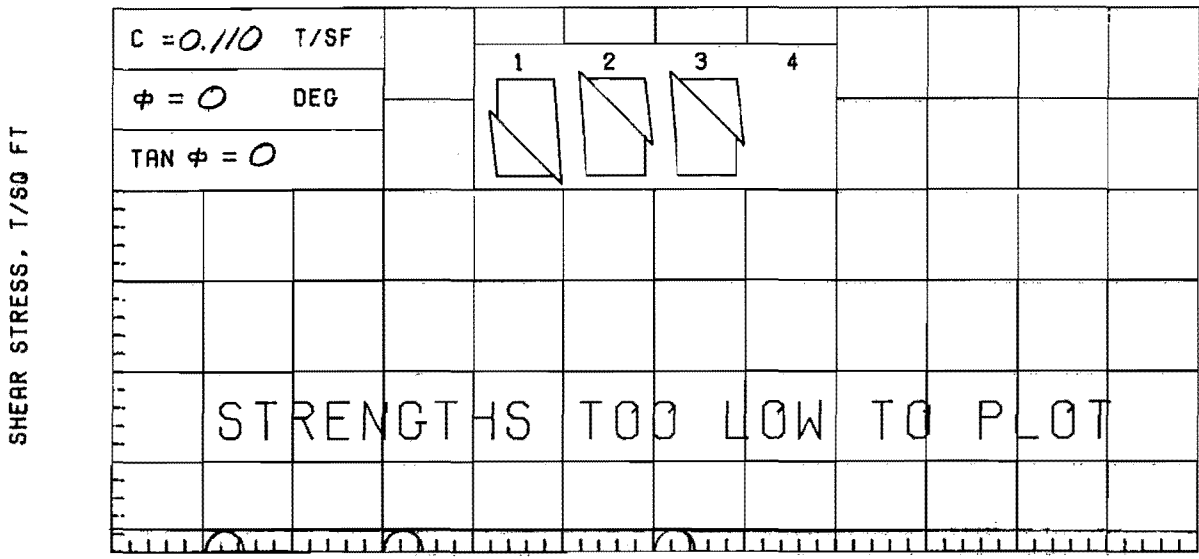


| SPECIMEN NO.           |                  | $\Delta 1$ | Y2    | X3    | 4 | AVG. |
|------------------------|------------------|------------|-------|-------|---|------|
| INITIAL                | WATER CONTENT, % | 87.8       | 88.4  | 85.4  |   | 87.2 |
|                        | DRY DENSITY, PCF | 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  |       |   |      |

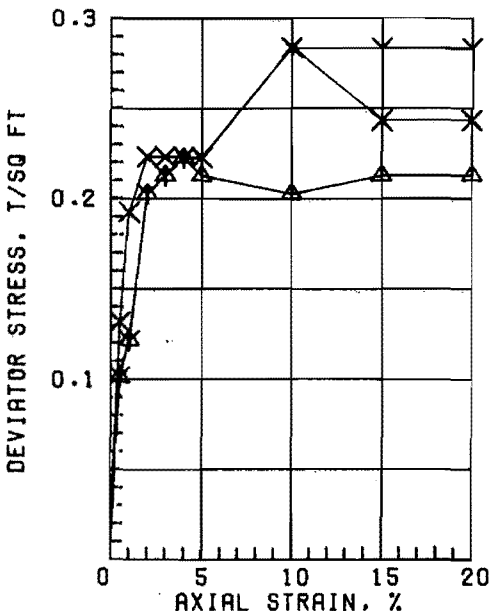
CONTROLLED-STRAIN TEST

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 |       |       |                                    |                      |        |



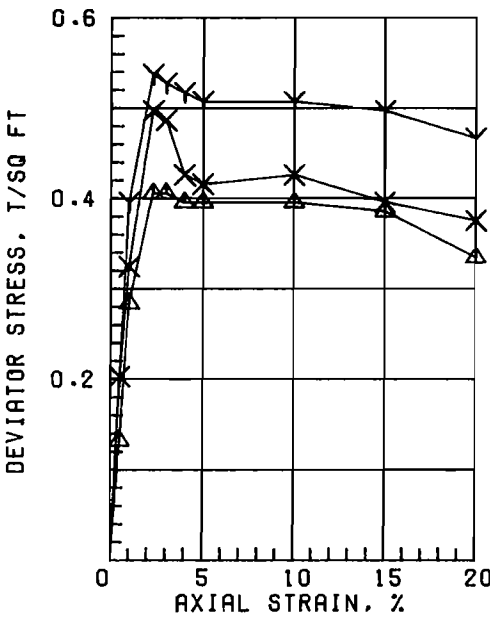
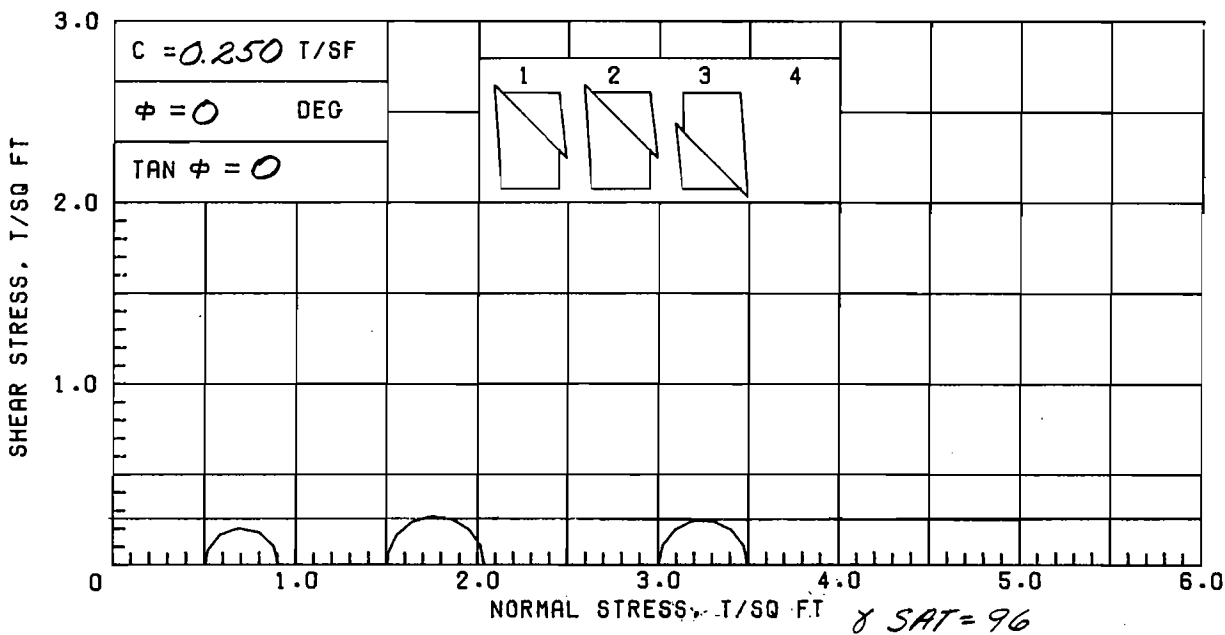
NORMAL STRESS, T/SQ FT  $\gamma_{SAT} = 105$



| SPECIMEN NO.           |                  | $\Delta 1$ | Y2    | X3    | 4 |
|------------------------|------------------|------------|-------|-------|---|
| INITIAL                | WATER CONTENT, % | 49.8       | 48.3  | 59.3  |   |
|                        | DRY DENSITY, PCF | 69.3       | 71.3  | 63.9  |   |
|                        | SATURATION, %    | 93.9       | 95.6  | 97.7  |   |
|                        | VOID RATIO       | 1.432      | 1.365 | 1.639 |   |
| 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  |                  | 0.22       | 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

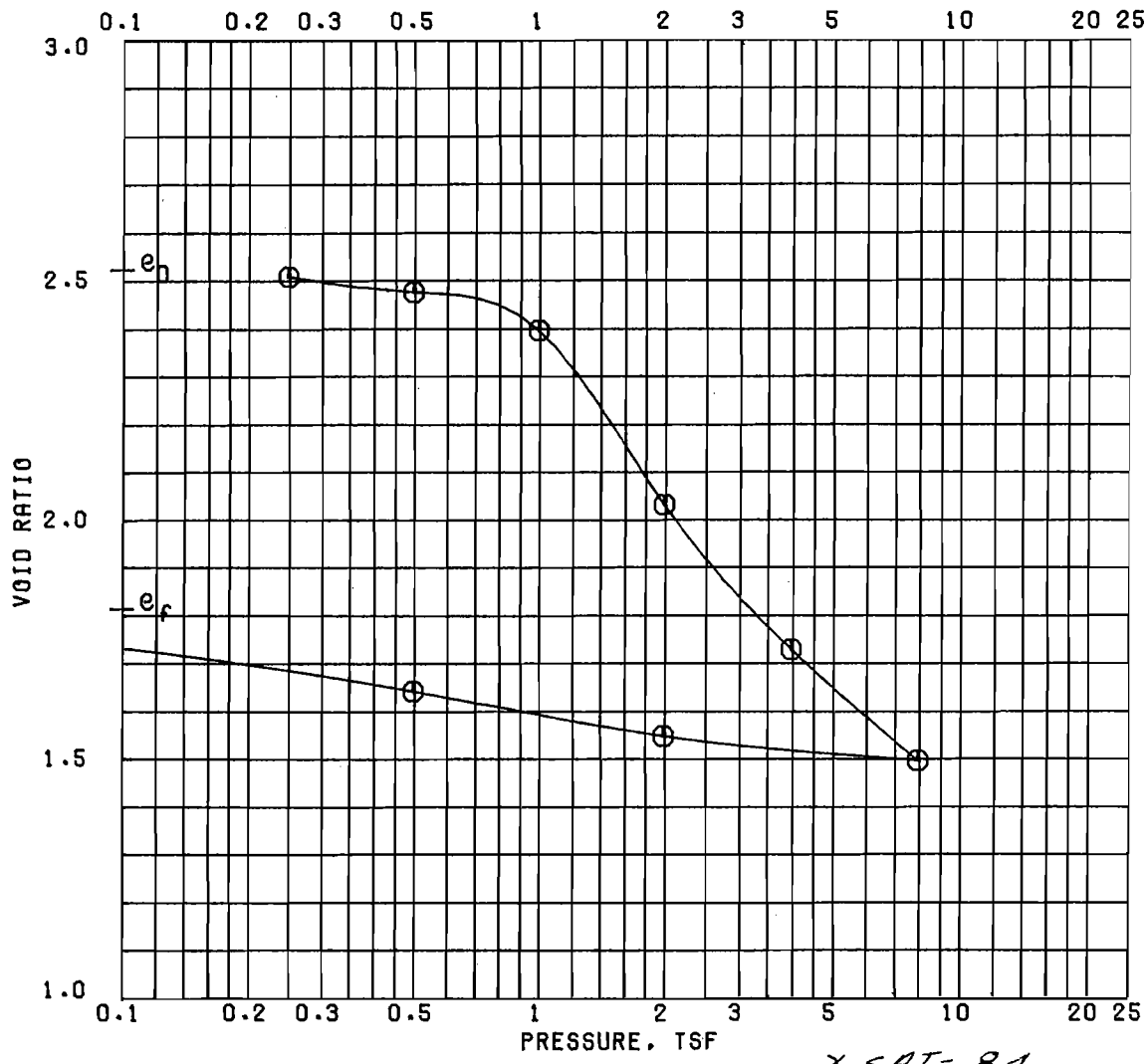
|  |       |       |                                    |                      |        |
|--|-------|-------|------------------------------------|----------------------|--------|
| CONTROLLED-STRAIN TEST   |       |       |                                    |                      |        |
| DESCRIPTION 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                                 |       |       |                                    |                      |        |



| SPECIMEN NO. |                        | Δ1    | 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  |   |
| BEFORE SHEAR | VOID RATIO             | 2.095 | 2.202 | 2.138 |   |
|              | 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                                       |       |                                    |                     |                             |

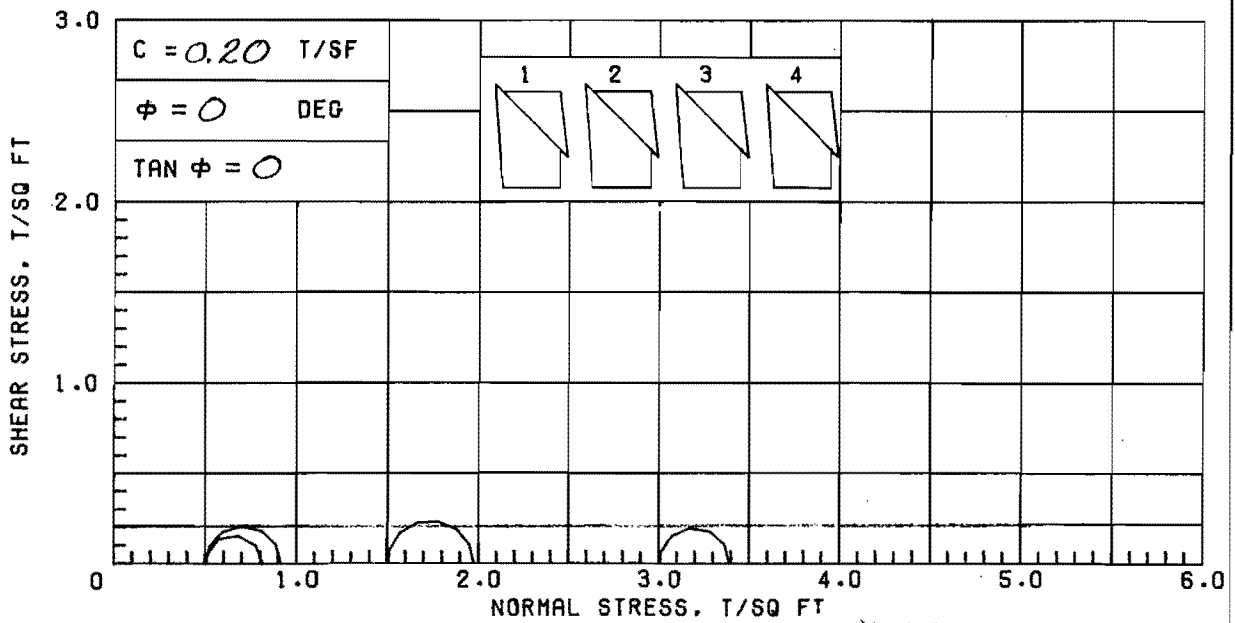


$\gamma_{SAT} = 84$

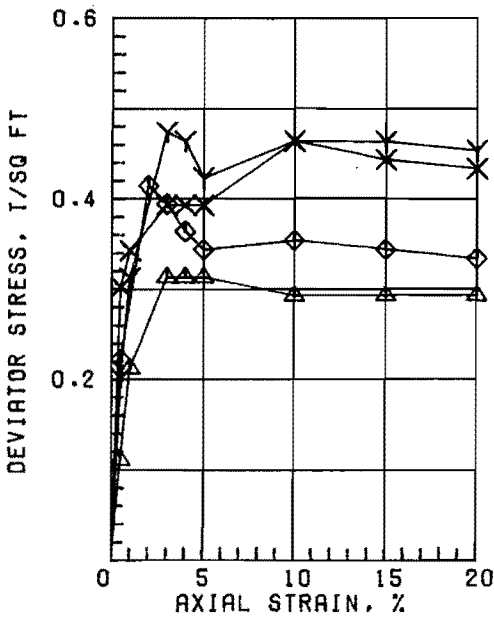
BEFORE TEST      AFTER TEST

|   |                 |                       |                                    |       |
|---|-----------------|-----------------------|------------------------------------|-------|
| 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 <sub>10</sub> |                       | 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                               |                 |                       |                                    |       |





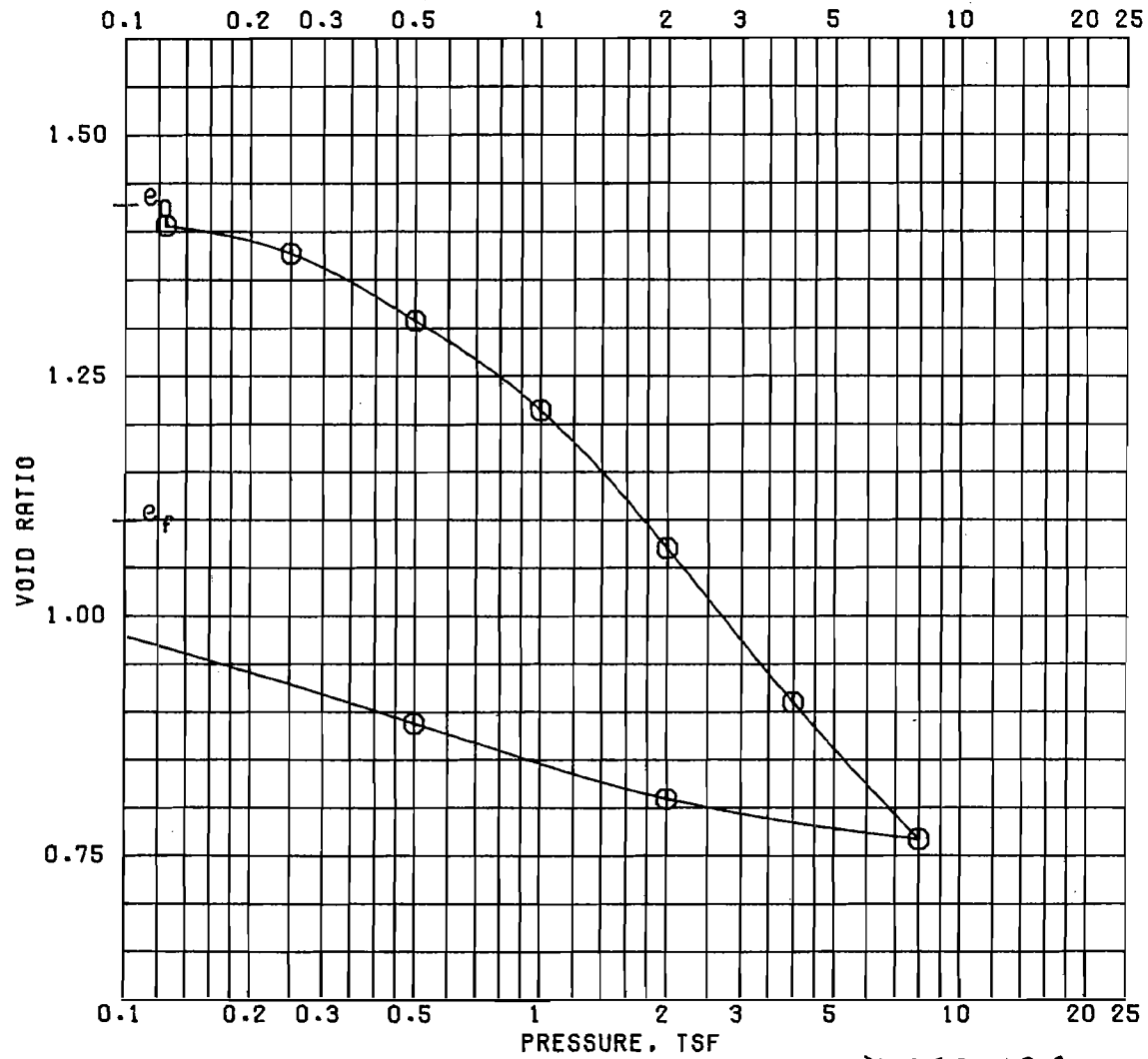
*γ SAT = 100*



| SPECIMEN NO.           |                  | Δ1    | Υ2    | 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

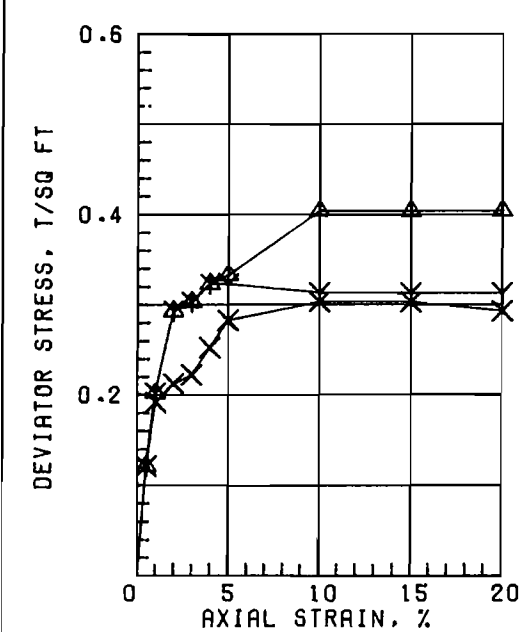
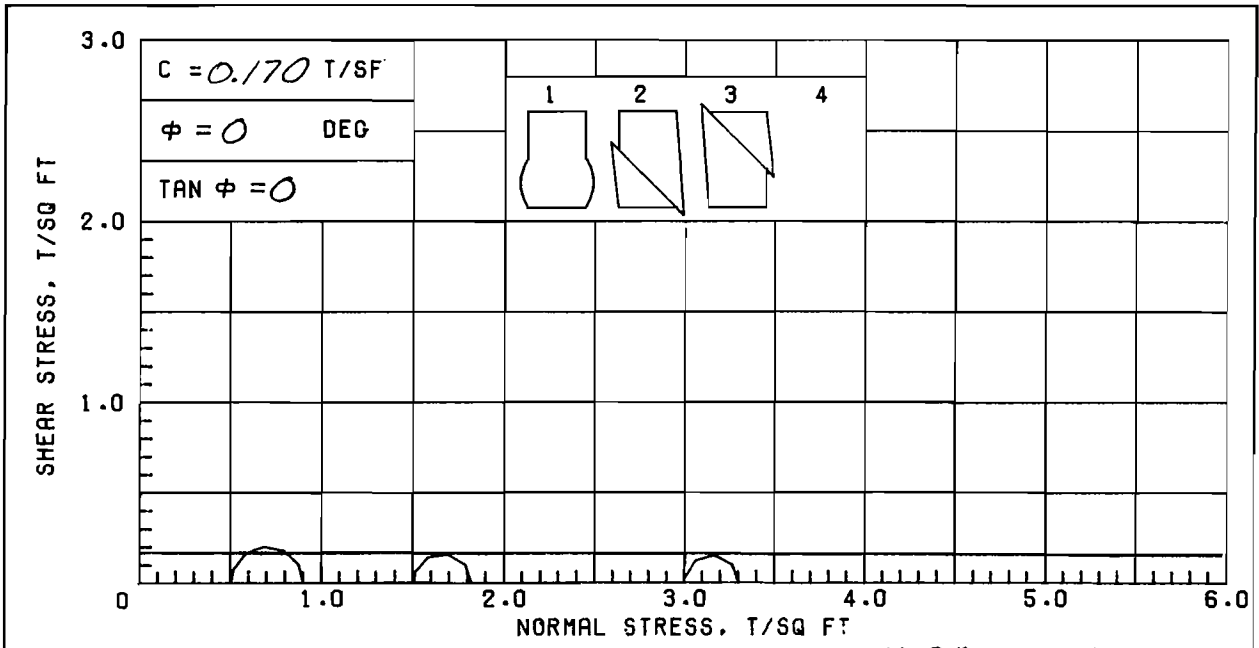
|  |       |       |                                    |                      |        |
|--|-------|-------|------------------------------------|----------------------|--------|
| CONTROLLED-STRAIN TEST   |       |       |                                    |                      |        |
| DESCRIPTION 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                                   |       |       |                                    |                      |        |



$\gamma_{SAT} = 106$

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 <sub>10</sub>         |                    | 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 |                         |                    |                                    |       |



$\gamma_{SAT} = 104$

AVG.  
54.7

| 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  |   |

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

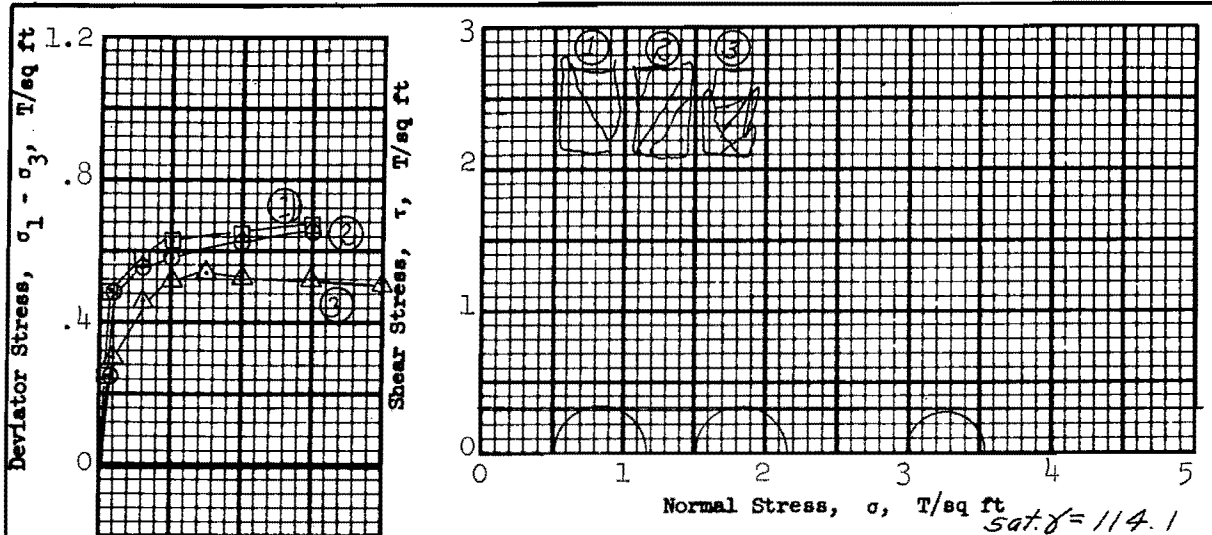
ORLEANS PARISH OUTFALL CANALS

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



| 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        | $\gamma_d$ 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                                       |                              | $\sigma_3$      | 0.5    | 1.5    | 3.0    |
| Max deviator stress, T/sq ft ( $\sigma_1 - \sigma_3$ ) <sub>max</sub> |                              |                 | 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 ( $\sigma_1 - \sigma_3$ ) <sub>ult</sub> |                              |                 |        |        |        |
| Initial diameter, in.   |                              | $D_o$           | 1.41   | 1.41   | 1.40   |
| Initial height, in.   |                              | $H_o$           | 3.00   | 3.00   | 3.00   |

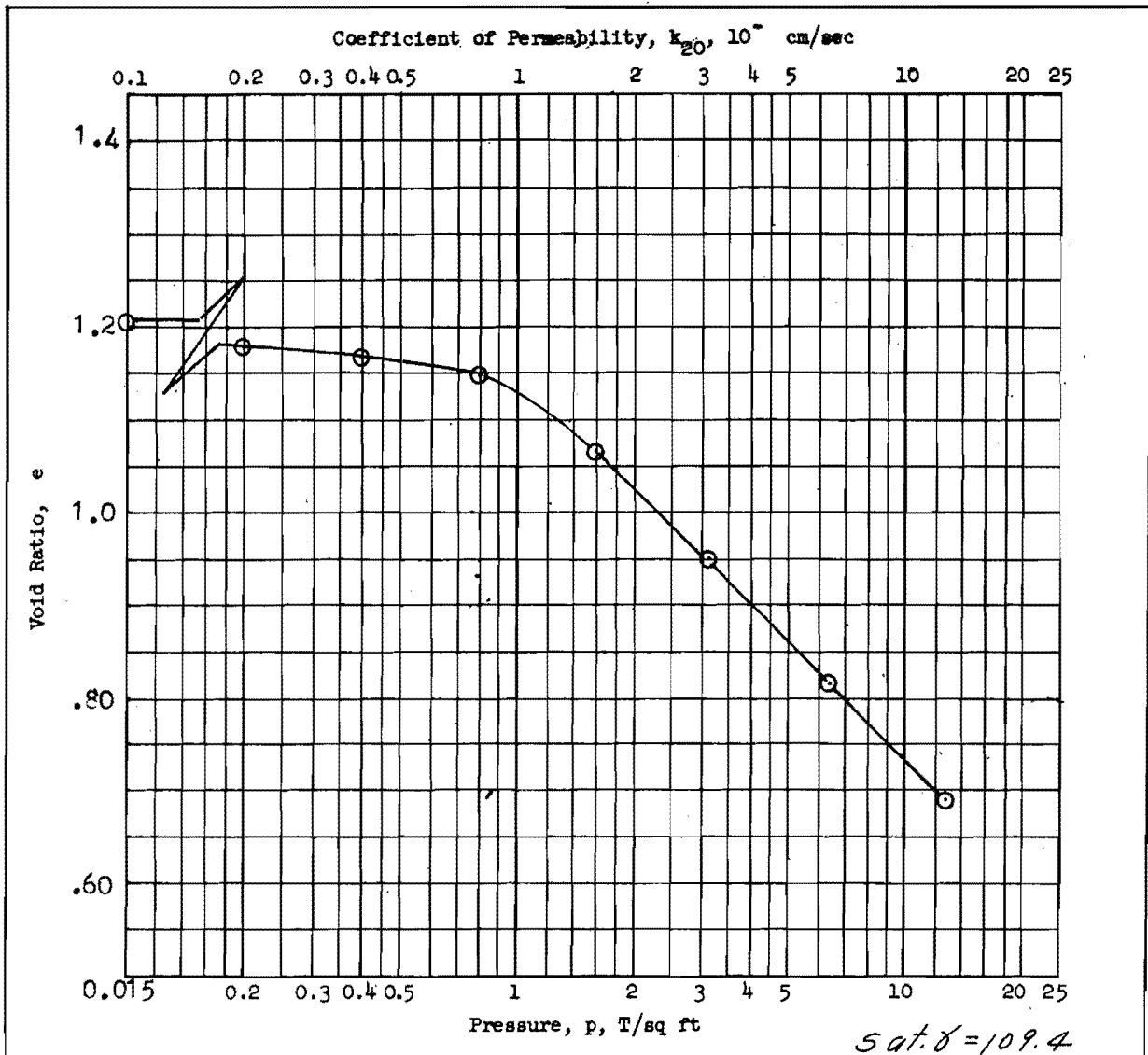
**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.31$  T/sq ft

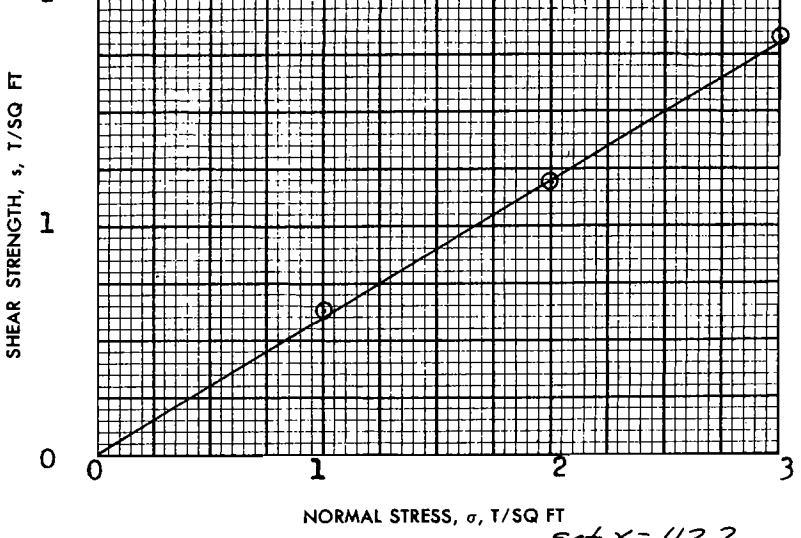
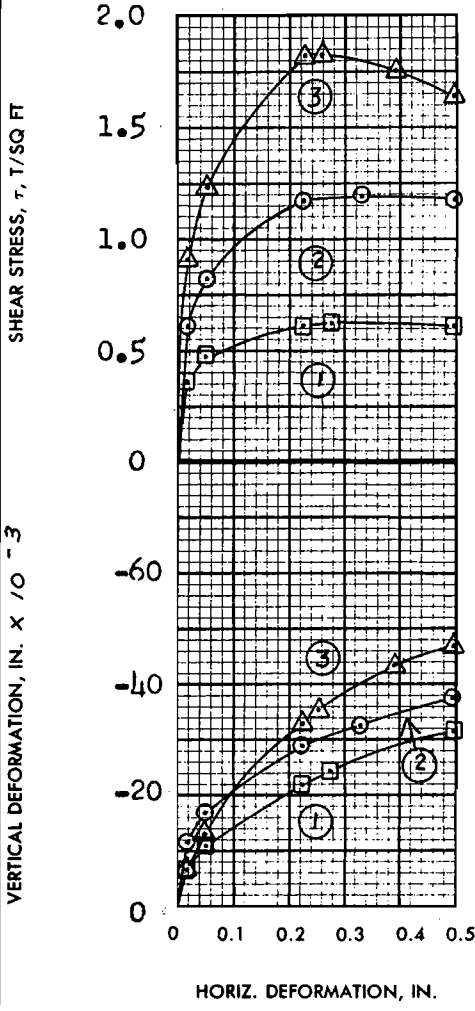
Method of saturation \_\_\_\_\_

- 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 <sub>s</sub> 2.66 |
| Remarks   | Project L.K. 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                        |  |                |                     |



|   |                   |  |                         |            |   |
|---|-------------------|--|-------------------------|------------|---|
| 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, $\gamma_d$  | 75.3 lb/ft <sup>3</sup> |            |   |
| Classification PLASTIC CLAY(CH)*        |                   | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec  |                         |            |   |
| LL -                                    | $G_s$ 2.66 From Q | Project LK. PONT., LA., & VIC.-HURR. PROT.-'71   |                         |            |   |
| PL -                                    | $D_{10}$          |  |                         |            |   |
| * Remarks gray, contains small roots    |                   | ORLEANS PARISH LAKEFRONT LEVVE, 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      |            |   |
| <b>JDB CONSOLIDATION TEST REPORT</b>    |                   |  |                         |            |   |



SHEAR STRENGTH PARAMETERS

$\phi' = 31^\circ$

$\text{TAN } \phi' = 0.595$

$c' = 0$  T/SQ FT

CONTROLLED STRESS

CONTROLLED STRAIN

| 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 | $\gamma_d$ 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                 |                       | $\sigma$        | 1.0    | 2.0    | 3.0    |
| MAXIMUM SHEAR STRESS, T/SQ FT          |                       | $\tau_{max}$    | 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         |                       | $\tau_{ult}$    |        |        |        |

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 \_\_\_\_\_

PROJECT **LK. PONT. LA., & VIC. - HURR. PROT. - 1971**

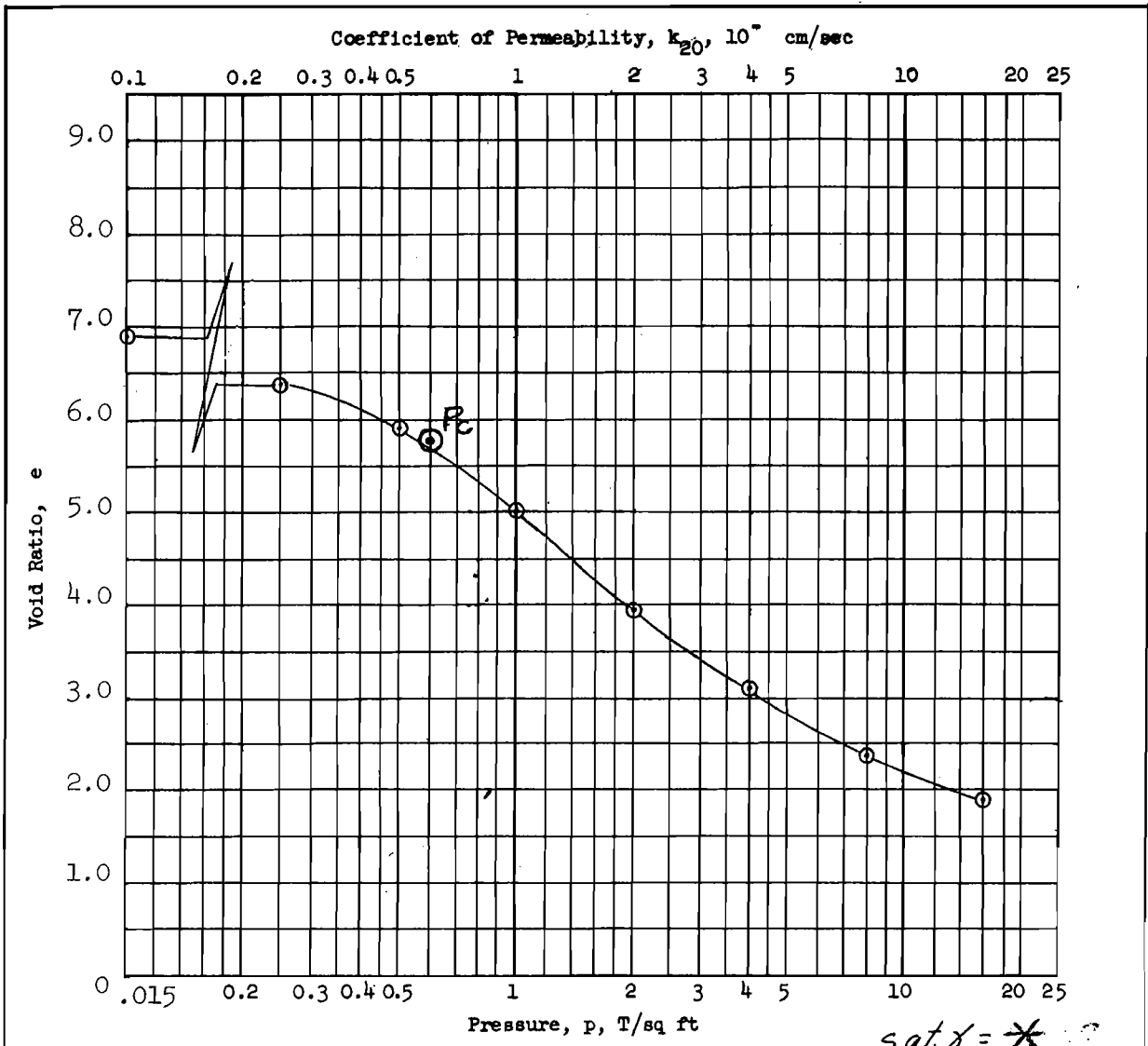
**ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC**

**AREA (OUTFALL CANALS) ALONG 17th ST. CANAL**

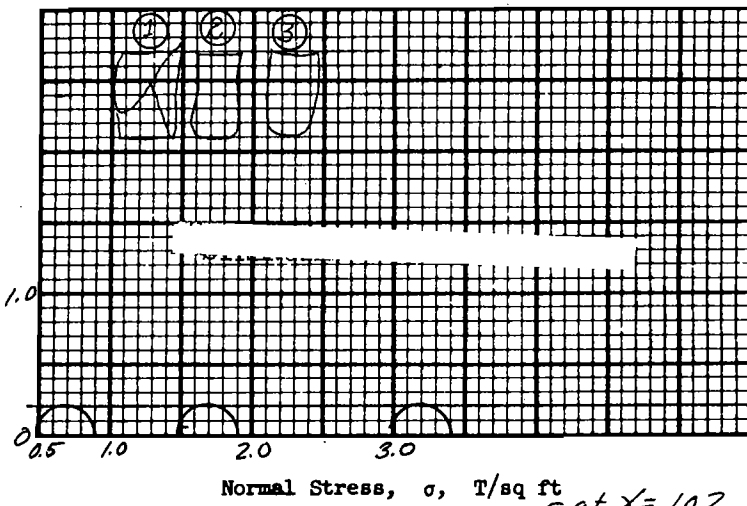
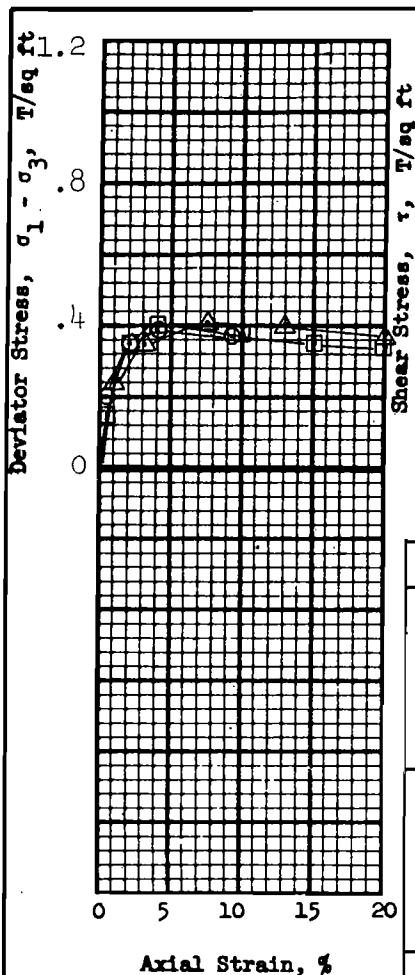
BORING NO. **5-MUW** SAMPLE NO. **5-C**

DEPTH-EL **- 8.0** DATE **8 March 1971**

**F41** **BWG** **DIRECT SHEAR TEST REPORT**



|  |              |   |                          |                    |   |
|--|--------------|---|--------------------------|--------------------|---|
| Type of Specimen <b>UNDISTURBED</b>  |              | 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, $\gamma_d$                                 | 102.8 lb/ft <sup>3</sup> |                    |   |
| Classification <b>PLASTIC CLAY(CH),*</b>   |              | $k_{20}$ at $e_o =$ $\times 10^{-7}$ 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" dia. roots, highly organic<br>*calculated sat $\delta$ is unreasonable |              | Area FALL CANALS) ALONG 17th ST. CANAL (GDM#2, SUPP.#5) |                          | Boring No. 5-MUW   |   |
|  |              |   |                          | Sample No. 6-C     |   |
|  |              | Depth-El -11.6  |                          | Date 10 March 1971 |   |
| <b>CONSOLIDATION TEST REPORT</b>   |              |   |                          |                    |   |



**Shear Strength Parameters**

$\phi = 0^\circ$

$\tan \phi = 0$

$c = 0.20 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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   |        |

Type of test Q      Type of specimen      UNDISTURBED

Classification      PLASTIC CLAY(CH), gray, contains silt lenses

LL 78      PL 21      PI 57       $G_s$  2.71

Remarks \_\_\_\_\_

Project LK. PONT., LA. & VIC. - HURR. PROT-71

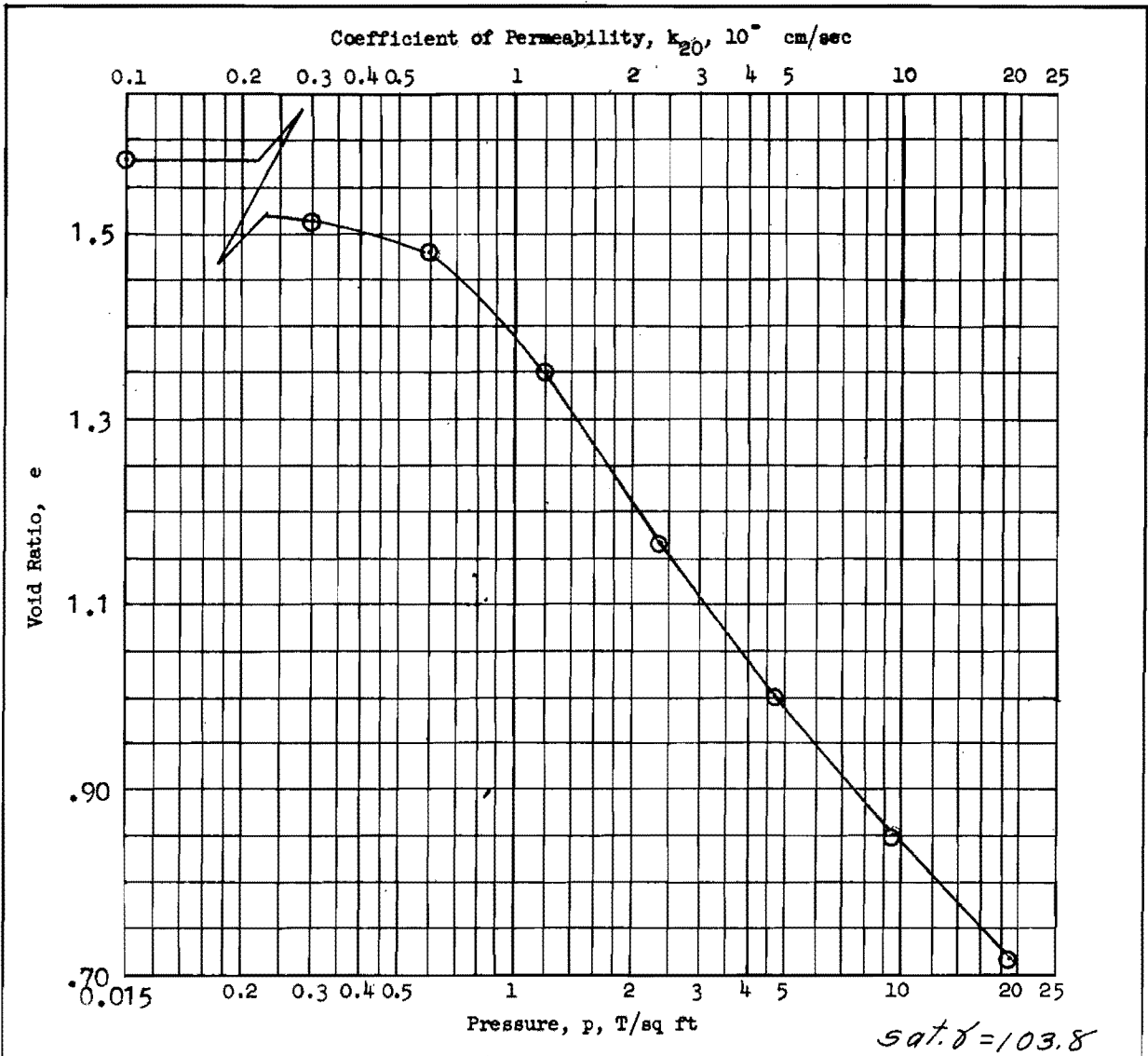
ORLEANS PARISH LK.F. LEVEE WEST OF IHNC (OUT-AREA FALL CANALS) ALONG 17th St. CANAL (GDM #2 SUPP. # 5)

Boring No. 5-MUW      Sample No. 9-B

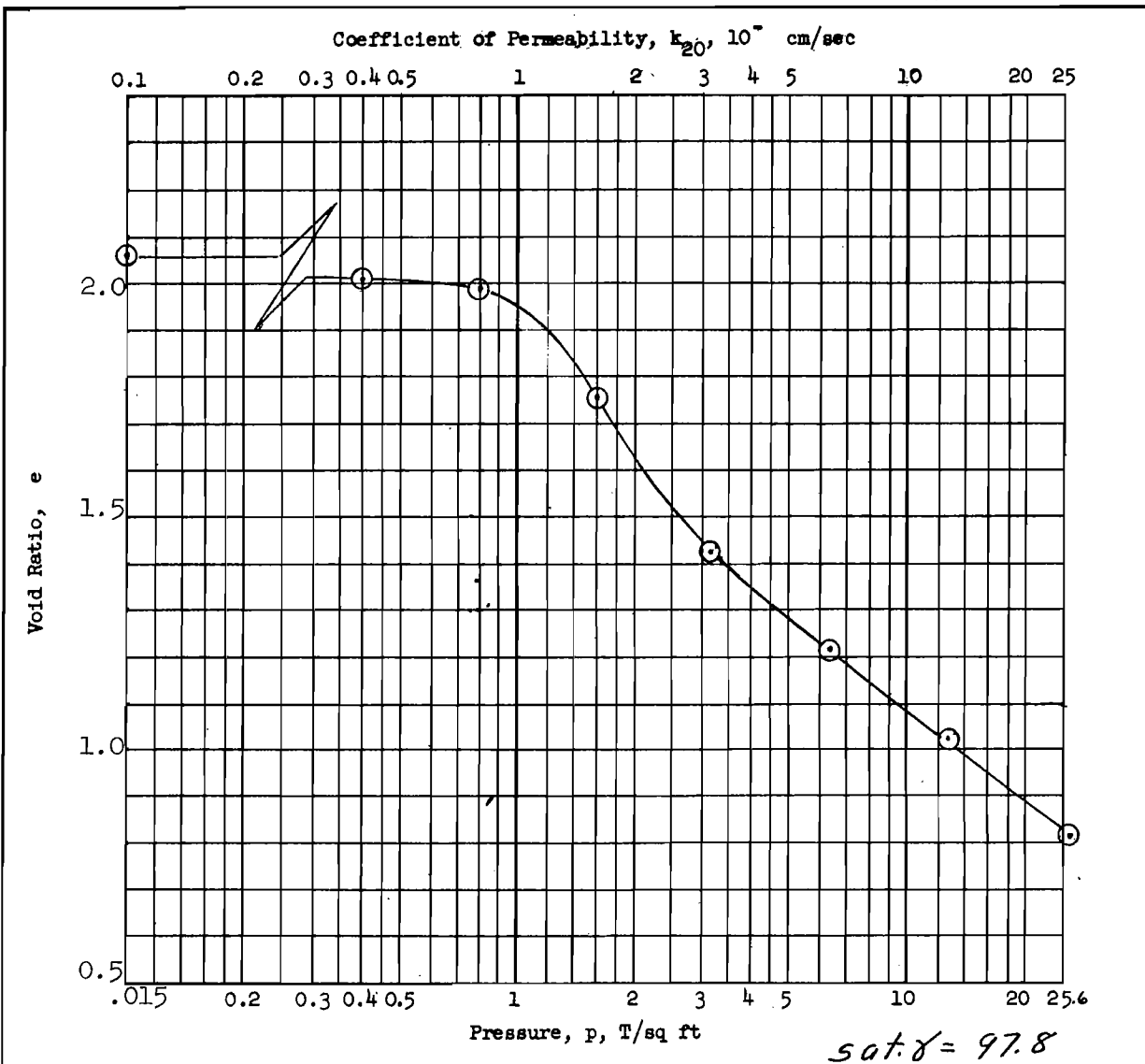
Depth El -23.1      Date 8 March 1971

JMS      TRIAXIAL COMPRESSION TEST REPORT

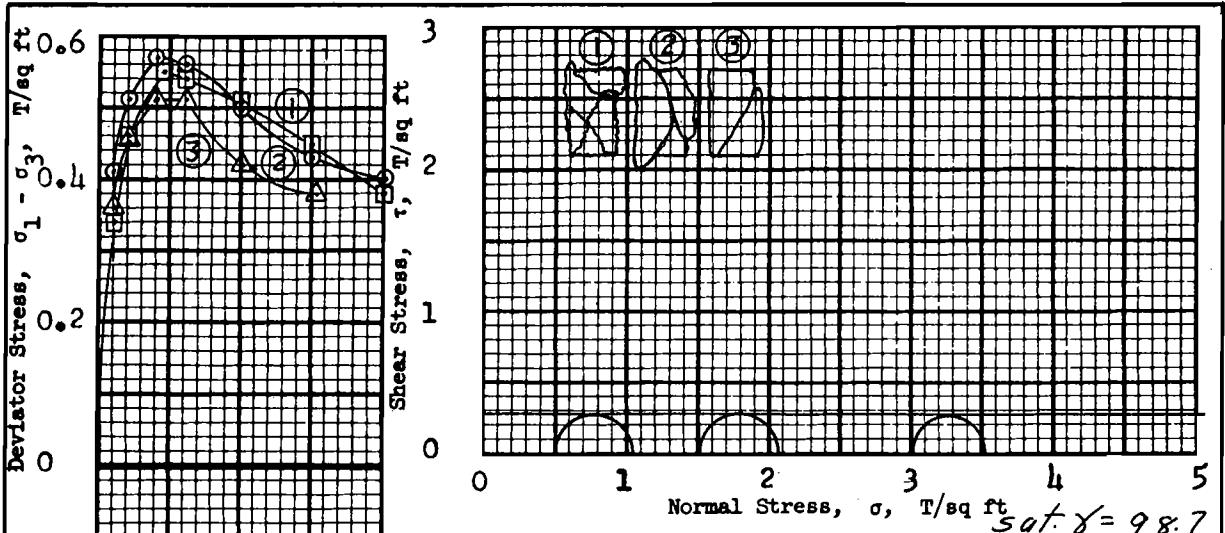




|  |                   |                         |                         |  |        |                |   |
|--|-------------------|-------------------------|-------------------------|--|--------|----------------|---|
| Type of Specimen                             |                   | UNDISTURBED             |                         | 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, $\gamma_d$ | 65.5 lb/ft <sup>3</sup> |  |        |                |   |
| Classification                               | PLASTIC CLAY(CH)* | $k_{20}$ at $e_o =$     |                         | $\times 10^{-7}$ cm/sec                                |        |                |   |
| LL   | -                 | $G_s$                   | 2.71 From Q             | Project LK. PONT., LA. & VIC. - HURR. PROT. - '71      |        |                |   |
| PL   | -                 | $D_{10}$                |                         | ORLEANS PARISH LAKEFRONT LEVEE, WEST OF IHNC           |        |                |   |
| * Remarks gray, contains a 1/8" silt stratum |                   |                         |                         | (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 |   |
| <b>JDB CONSOLIDATION TEST REPORT</b>         |                   |                         |                         |  |        |                |   |



|                                   |              |   |                         |            |   |
|-----------------------------------|--------------|---|-------------------------|------------|---|
| 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, $\gamma_d$   | 55.8 lb/ft <sup>3</sup> |            |   |
| Classification PLASTIC CLAY(CH),* |              | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec   |                         |            |   |
| LL 95                             | $G_s$ 2.73   | Project LK. PONT., LA. & VIC. - HURR. PROT. '71<br>ORLEANS PAR. L.F. LEV. WEST OF IHNC (OUTFALL<br>Area CANALS) ALONG 17th ST. CANAL (GDM#2, SUPP.#5) |                         |            |   |
| PL 24                             | $D_{10}$     |   |                         |            |   |
| Remarks *gray                     |              | Boring No. 5-MUW  | Sample No. 11-B         |            |   |
|                                   |              | Depth El -30.9  | Date 12 March 1971      |            |   |
| <b>CONSOLIDATION TEST REPORT</b>  |              |   |                         |            |   |



**Shear Strength Parameters**

$\phi = \underline{0}^\circ$   
 $\tan \phi = \underline{0}$   
 $c = \underline{0.27} \text{ T/sq ft}$

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         | $\gamma_d$ 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 | $\sigma_3$                    | 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 **LI-B**

Remarks \_\_\_\_\_

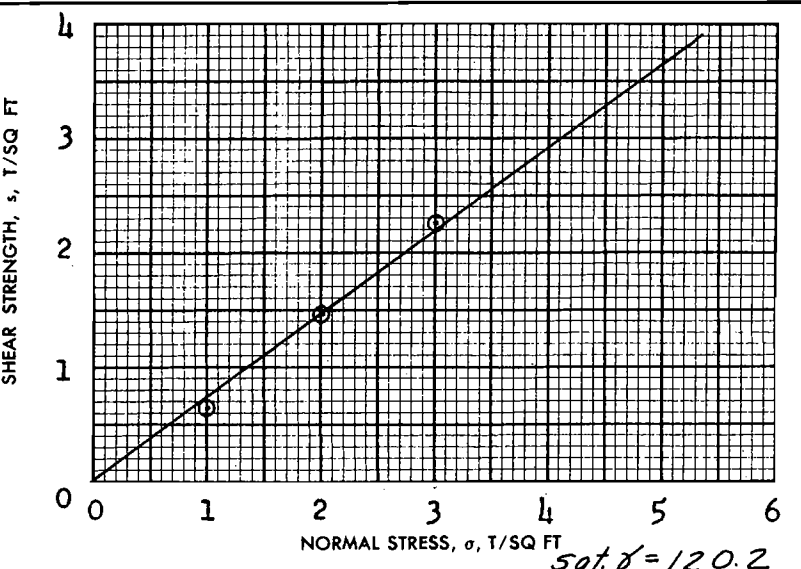
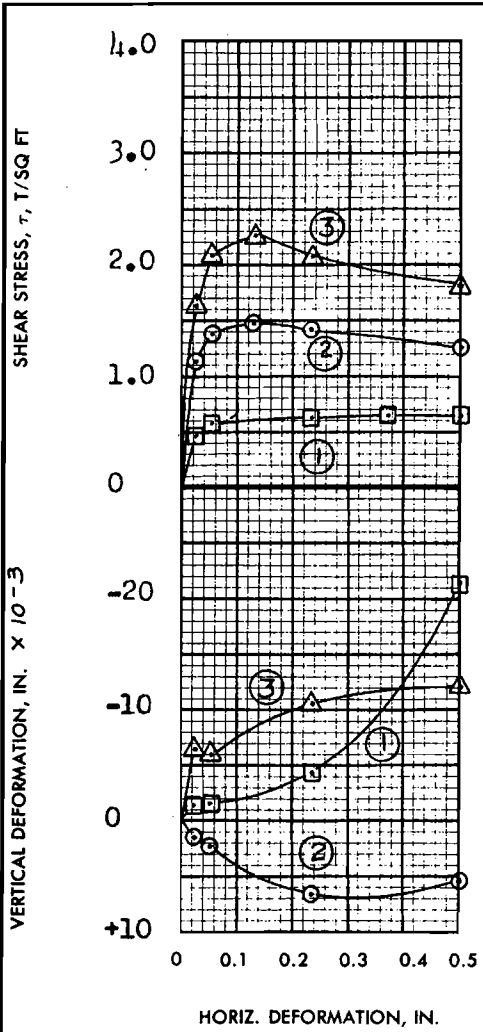
Project **LK.PONT.LA., & VIC.-HURR.PROT-1971**

**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**



**SHEAR STRENGTH PARAMETERS**

$\phi' = 36^\circ$

$\text{TAN } \phi' = 0.740$

$c' = 0$  T/SQ FT

CONTROLLED STRESS

CONTROLLED STRAIN

| 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 $\gamma_d$ | 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 $\sigma$                 |                                  | 1.0    | 2.0    | 3.0    |        |
| MAXIMUM SHEAR STRESS, T/SQ FT $\tau_{max}$      |                                  | 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 $\tau_{ult}$     |                                  |        |        |        |        |

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<sub>s</sub> 2.67

REMARKS      PROJECT **LK. PONT. LA., & VIC. - HURR. PROT - 1971**

     **ORLEANS PARISH L.F. LEVEE WEST OF IHNC (OUT-**

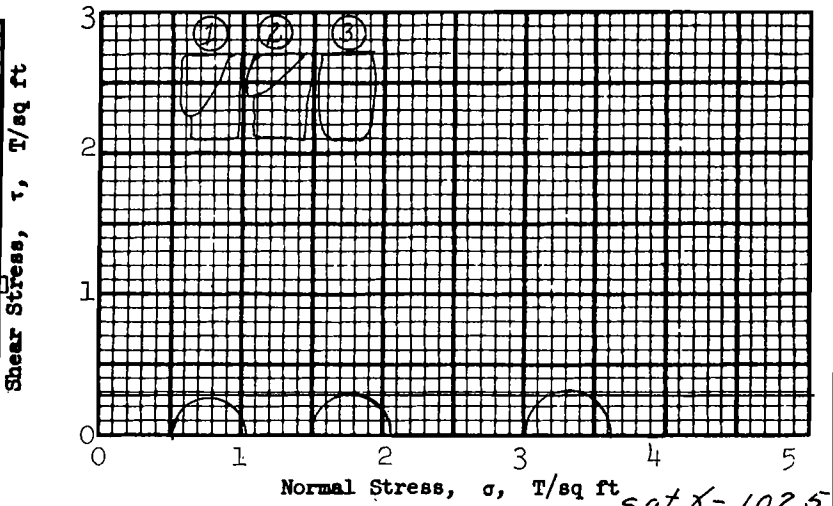
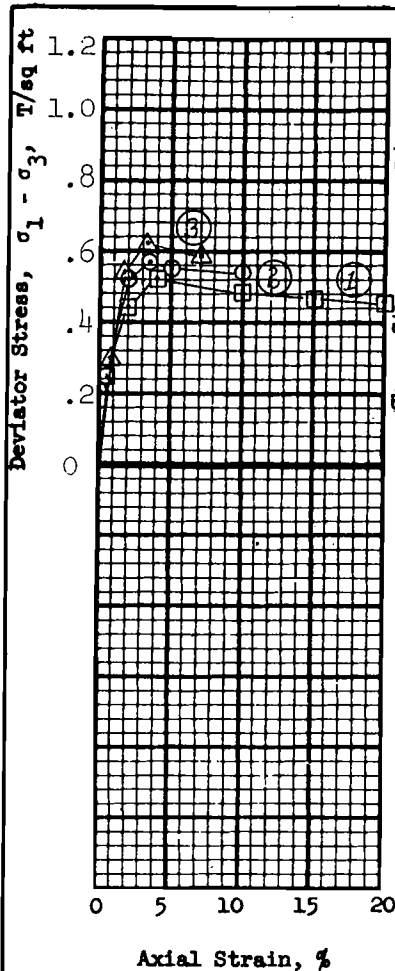
     **AREA FALL CANALS) ALONG 17th ST. CANAL (GDM#2**

BORING NO. **5-MUW** SAMPLE NO. **13-B SUPP.#5)**

DEPTH **- 39.1** DATE **9 March 1971**

F47

**BWG DIRECT SHEAR TEST REPORT**



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.28 \text{ T/sq ft}$

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         | $\gamma_d$ 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 | $\sigma_3$                    | 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  $Q_c$       Type of specimen      UNDISTURBED

Classification PLASTIC CLAY(CH), gray, contains sand and shell fragments

LL 64      PL 22      PI 42       $G_s$  2.69

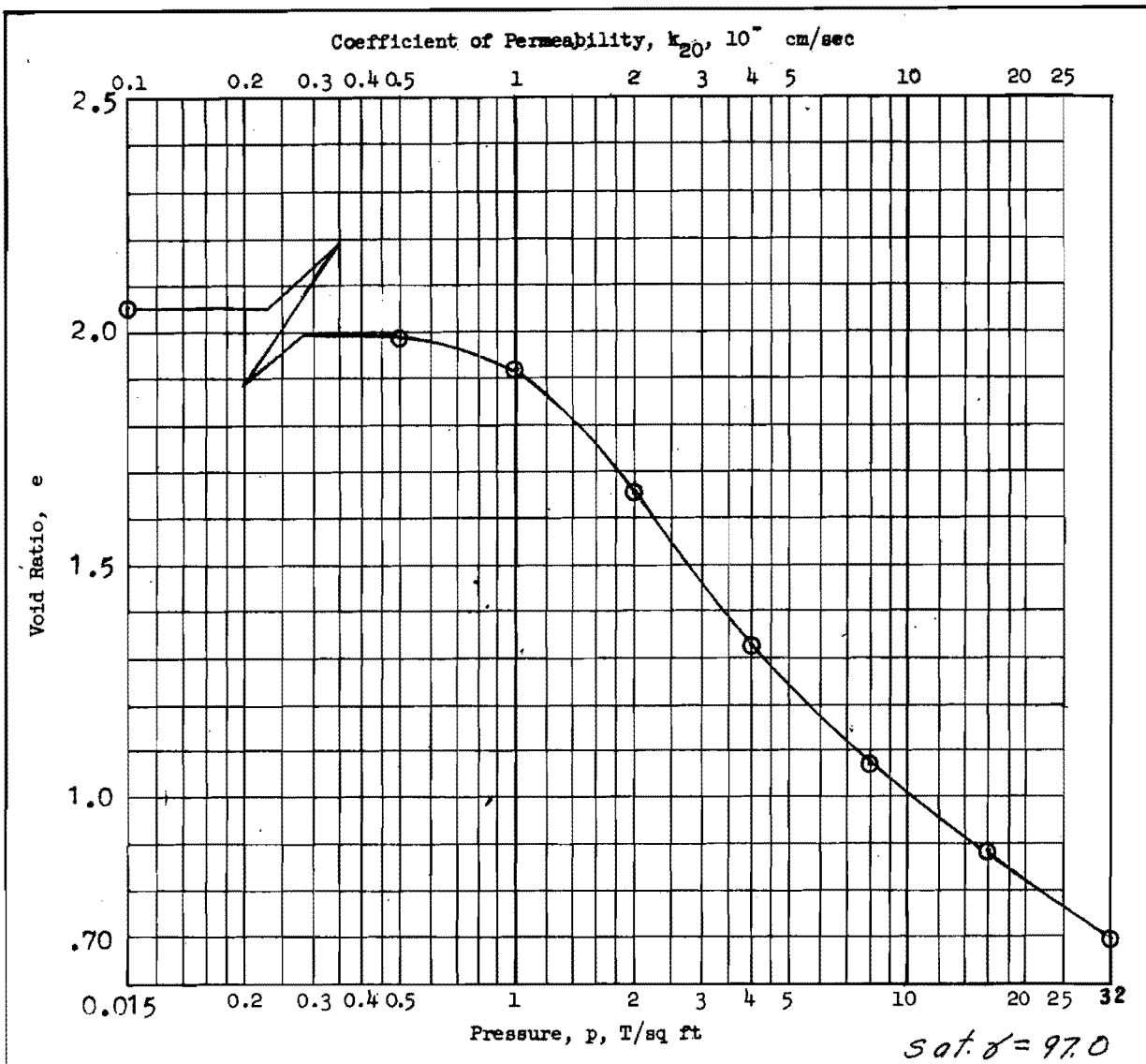
Remarks \_\_\_\_\_

Project LK. PONT. LA. & VIC. - HURR. PROT. '71 OR-LEANS 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 -50.9      Date 8 March 1971

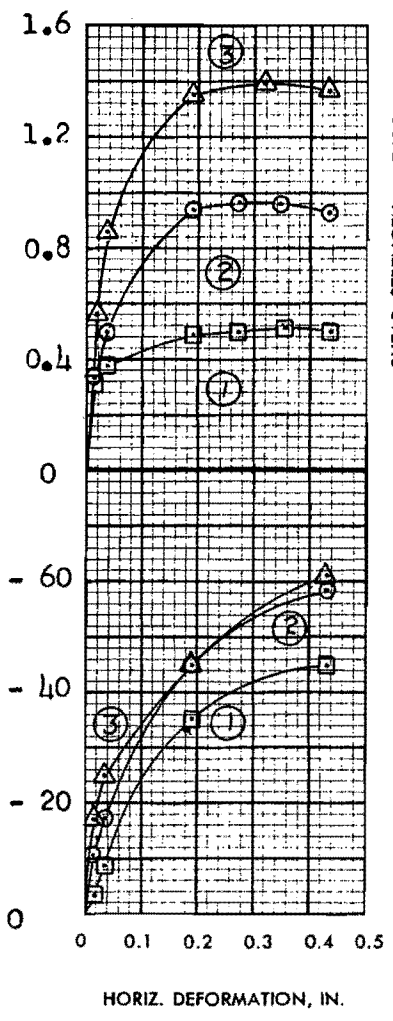
JMS      TRIAXIAL COMPRESSION TEST REPORT



|  |                   |  |                         |            |   |
|--|-------------------|--|-------------------------|------------|---|
| Type of Specimen <b>UNDISTURBED</b>                  |                   | 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, $\gamma_d$  | 55.0 lb/ft <sup>3</sup> |            |   |
| Classification <b>PLASTIC CLAY(CH),*</b>             |                   | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec  |                         |            |   |
| LL -   | $G_s$ 2.69 From Q | Project LK. PONT., LA. & VIC. - HURR. PROT. '71;<br>ORLFANS PARISH LAKEFRONT LEVEE WEST OF IHNC<br>(OUTFALL CANALS) ALONG 17th ST. CANAL (GDM#2; SUP.#5) |                         |            |   |
| PL -   | $D_{10}$          |  |                         |            |   |
| * Remarks grayish-green, contains small sand pockets |                   | Boring No. 5-MUW   | Sample No. 16-B         |            |   |
|  |                   | Depth El -50.9   | Date 15 March, 1971     |            |   |
| <b>JDB CONSOLIDATION TEST REPORT</b>                 |                   |  |                         |            |   |

SHEAR STRESS,  $\tau$ , T/SQ FT

VERTICAL DEFORMATION, IN.  $\times 10^{-3}$



**SHEAR STRENGTH PARAMETERS**

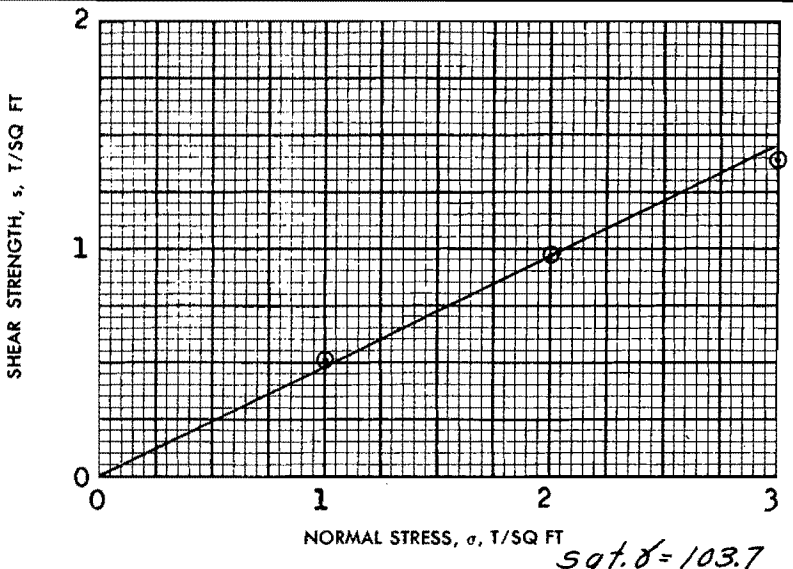
$\phi' = 26^\circ$

$\tan \phi' = 0.485$

$c' = 0$  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 | $\gamma_d$ 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                 |                       | $\sigma$        | 1.0    | 2.0    | 3.0    |
| MAXIMUM SHEAR STRESS, T/SQ FT          |                       | $\tau_{max}$    | 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         |                       | $\tau_{ult}$    |        |        |        |

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 \_\_\_\_\_

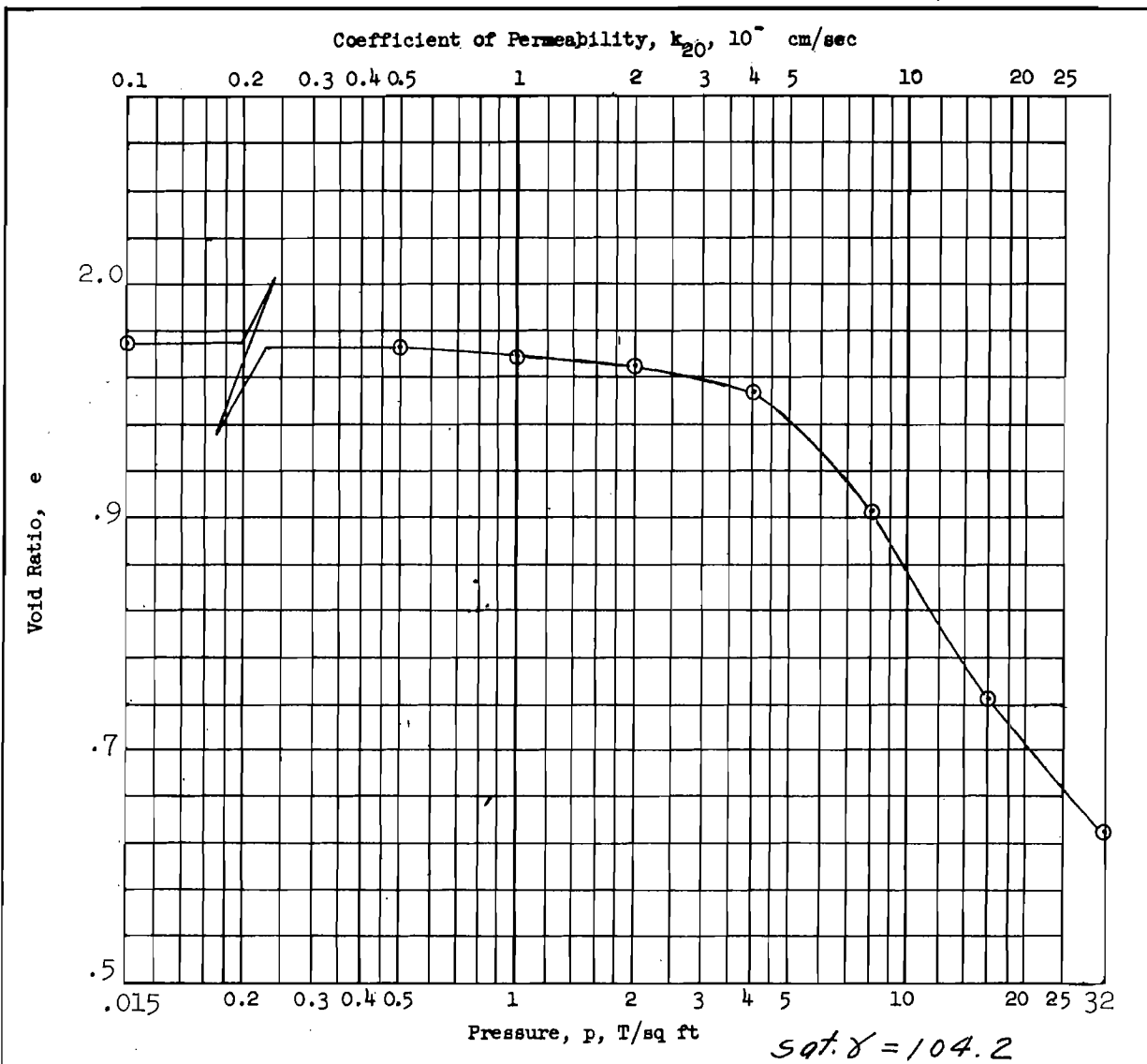
PROJECT **LK. PONT. LA., & VIC. - HURR. PROT. - 1971**

**ORLEANS PARISH LK. FT. LEVEE, WEST OF IHNC (OUT-AREA FALL CANALS) ALONG 17th ST. CANAL (GDM#2, SUPP#5)**

BORING NO. **5-MUW** SAMPLE NO. **17-C**

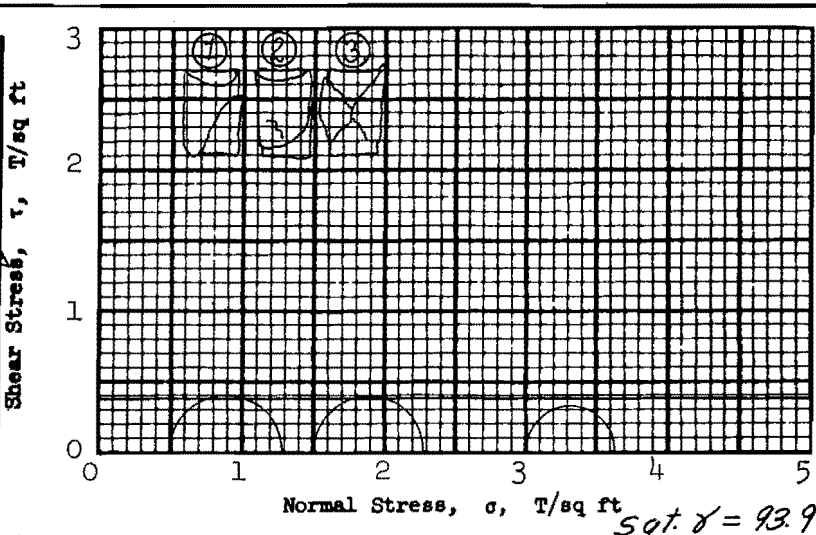
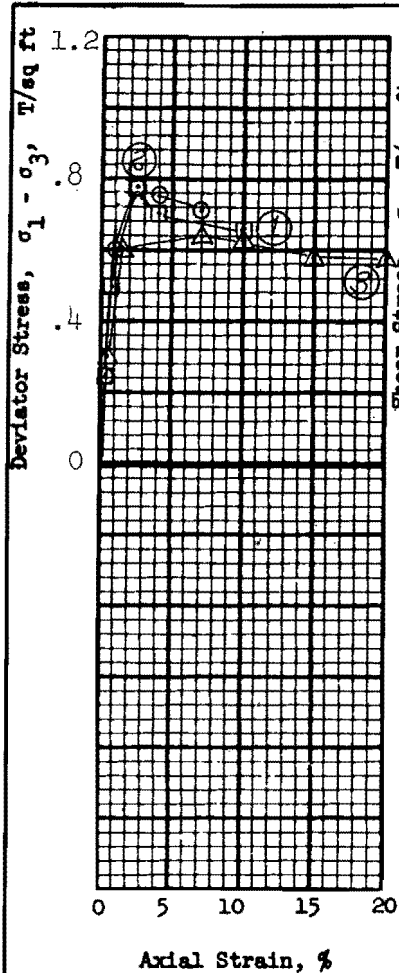
DEPTH - **56.0** DATE **10 March, 1971**

**GDA DIRECT SHEAR TEST REPORT**



|                                  |          |  |                         |   |               |            |   |
|----------------------------------|----------|--|-------------------------|---|---------------|------------|---|
| 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, $\gamma_d$                            | 66.0 lb/ft <sup>3</sup> |   |               |            |   |
| Classification PLASTIC CLAY(CH)* |          | $k_{20}$ at $e_o =$                                |                         | $\times 10^{-7}$ 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) |                         |   |               |            |   |
| * $p_c$ & $C_c$ NOT FIGURED      |          | Boring No.   | 5-MJW                   | Sample No.                                      | 18-C          |            |   |
| BECAUSE SCALE ON ABOVE           |          | Depth  | -60.2                   | Date  | 15 March 1971 |            |   |
| PLOT IN ERROR                    |          | <b>CONSOLIDATION TEST REPORT</b>                   |                         |   |               |            |   |





**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.37 \text{ T/sq ft}$

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         | $\gamma_d$ 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 | $\sigma_3$                    | 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., IA. & VIC. - HURR. PROT. - '71

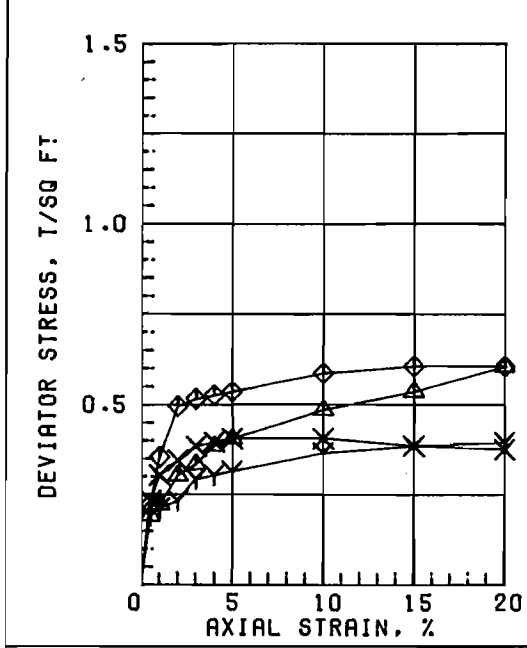
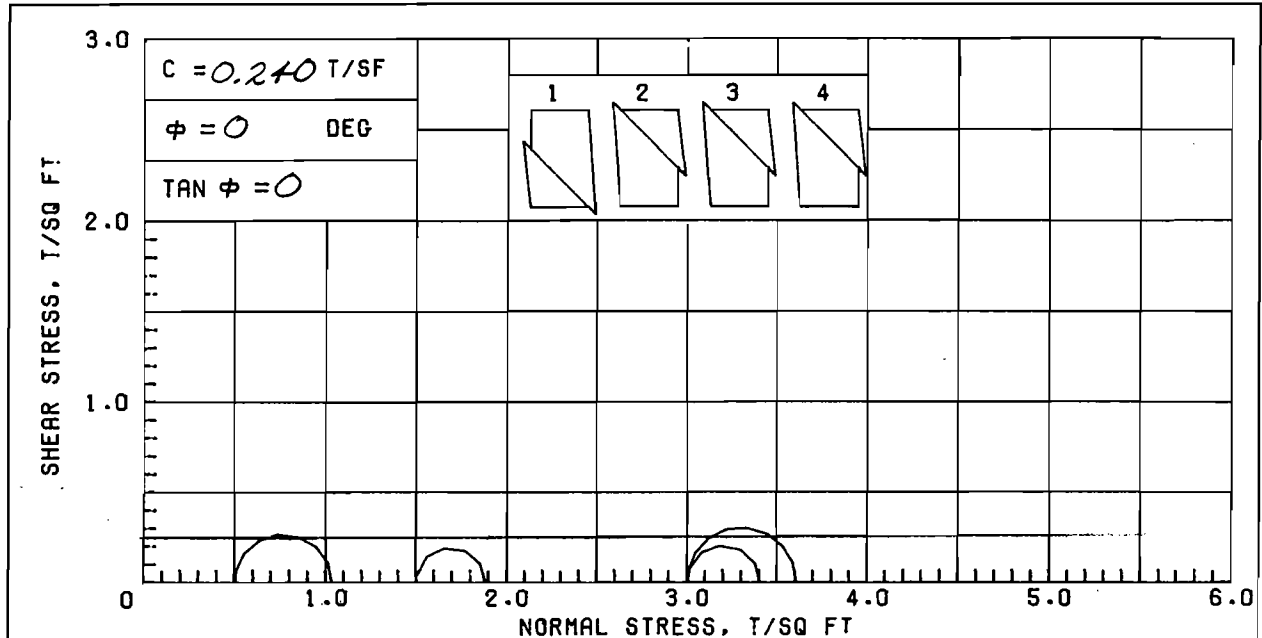
ORLEANS PARISH L.F. LEVEE WEST OF IHNC (OUT-

Area FALL CANALS) ALONG 17th ST. CANAL (GDM#2, SUPP.#

Boring No. 5-MJW      Sample No. 18-D      5)

Depth E1 -60.6      Date 8 March 1971

OHR      TRIAXIAL COMPRESSION TEST REPORT

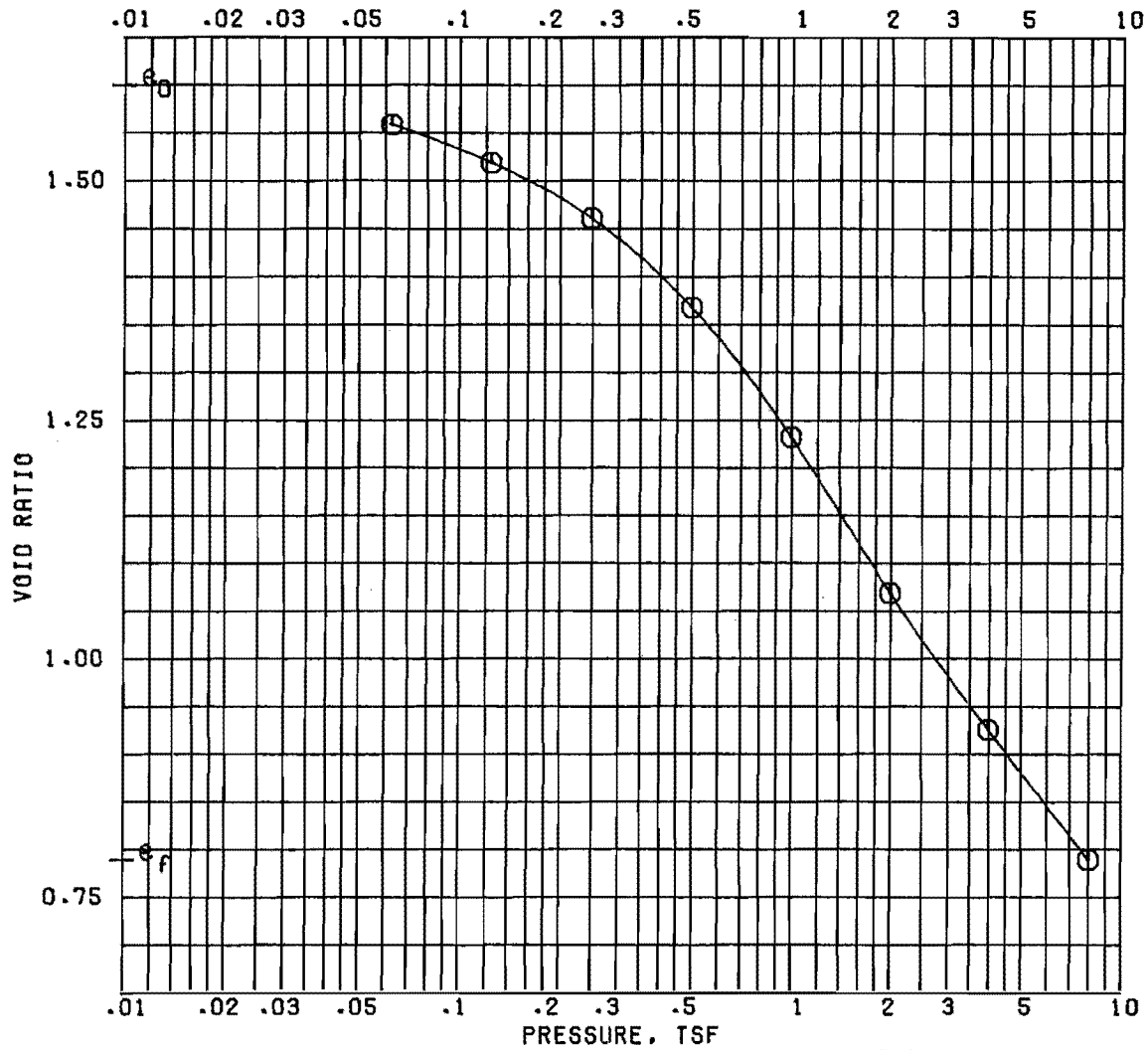


*γ SAT = 109*

| SPECIMEN NO. |                        | Δ1    | Y2    | X3    | ◇4    |
|--------------|------------------------|-------|-------|-------|-------|
| INITIAL      | WATER CONTENT, %       | 44.6  | 47.1  | 47.7  | 44.1  |
|              | DRY DENSITY, PCF       | 76.2  | 72.8  | 71.2  | 73.2  |
|              | SATURATION, %          | 99.4  | 96.7  | 94.3  | 91.5  |
|              | VOID RATIO             | 1.212 | 1.315 | 1.366 | 1.302 |
| 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  | 0.53  | 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

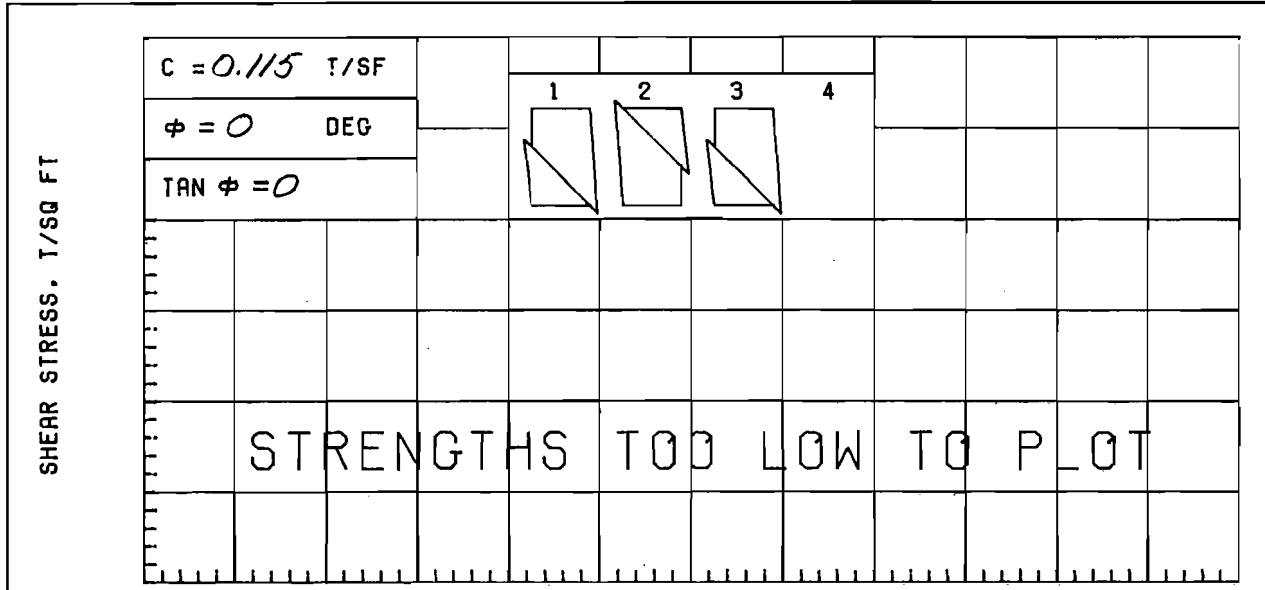
|   |    |    |                                    |                      |        |
|---|----|----|------------------------------------|----------------------|--------|
| CONTROLLED-STRAIN TEST  |    |    |                                    |                      |        |
| DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), BROWN; SILT LENSES & POCKETS |    |    |                                    |                      |        |
| LI.   | 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  |    |    |                                    |                      |        |



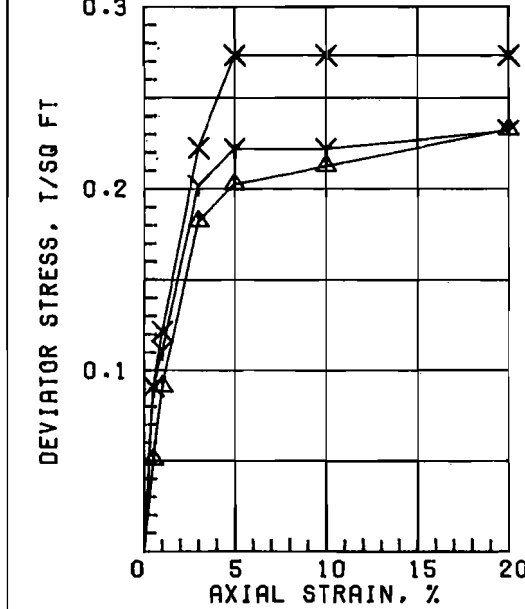
*δ SAT = 106*

BEFORE TEST      AFTER TEST

|   |                 |                      |                                    |                |                |
|---|-----------------|----------------------|------------------------------------|----------------|----------------|
| OVERBURDEN PRESSURE, TSF                    |                 | WATER CONTENT, %     |                                    | 62.8           | 29.8           |
| PRECONSOL. PRESSURE, TSF                    |                 | <i>0.31</i>          | 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 <sub>10</sub> |                      | 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                   |                 |                      |                                    |                |                |



SHEAR STRESS, T/SQ FT  
 0  
 NORMAL STRESS, T/SQ FT  
 $\gamma_{SAT} = 105$



| SPECIMEN NO.           |                  | Δ1    | 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  |       |   |

AVG. 53.8

CONTROLLED-STRAIN TEST INITIAL HEIGHT, IN. 3.00 3.00 3.00

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

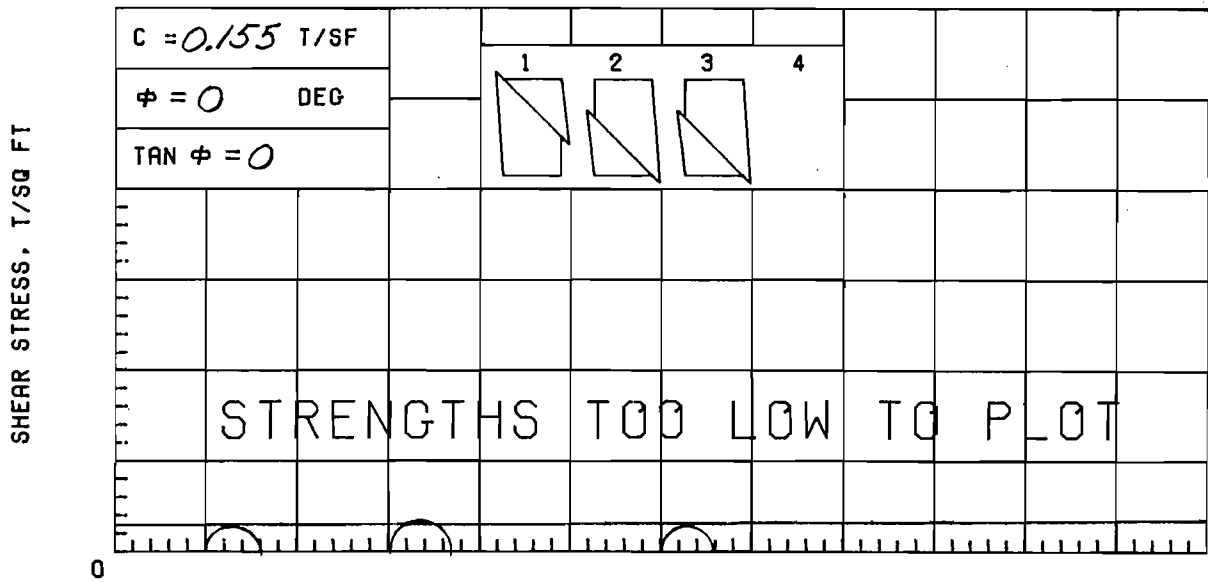
ORLEANS PARISH OUTFALL CANALS

BORING NO. 2-MUG      SAMPLE NO. 4-C

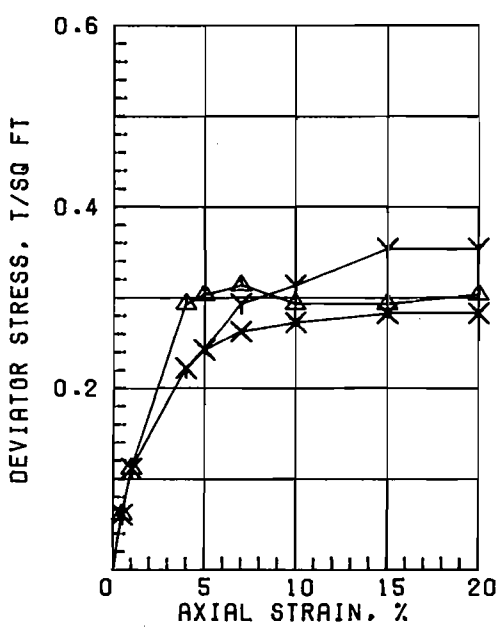
DEPTH/ELEV 12.4/-5.3      TECH. KOC

LABORATORY USAE WES      DATE 22 AUG 86.

TRIAXIAL COMPRESSION TEST REPORT



NORMAL STRESS, T/SQ FT  $\gamma_{SAT} = 81$

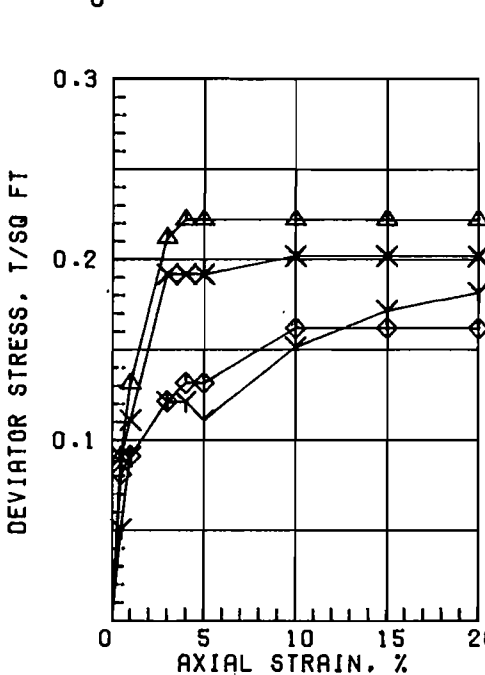
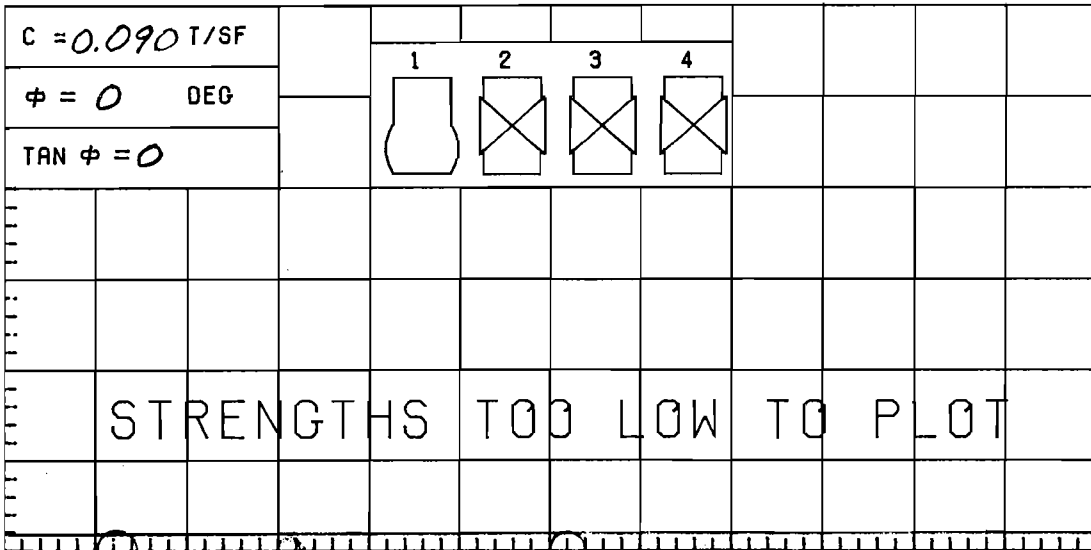


| SPECIMEN NO. |                        | Δ1    | Y2    | X3    | 4 |
|--------------|------------------------|-------|-------|-------|---|
| INITIAL      | WATER CONTENT, %       | 206.7 | 157.3 | 139.7 |   |
|              | DRY DENSITY, PCF       | 24.0  | 29.5  | 33.9  |   |
|              | SATURATION, %          | 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                         |       |        |                                    |                      |        |

SHEAR STRESS, T/SQ FT

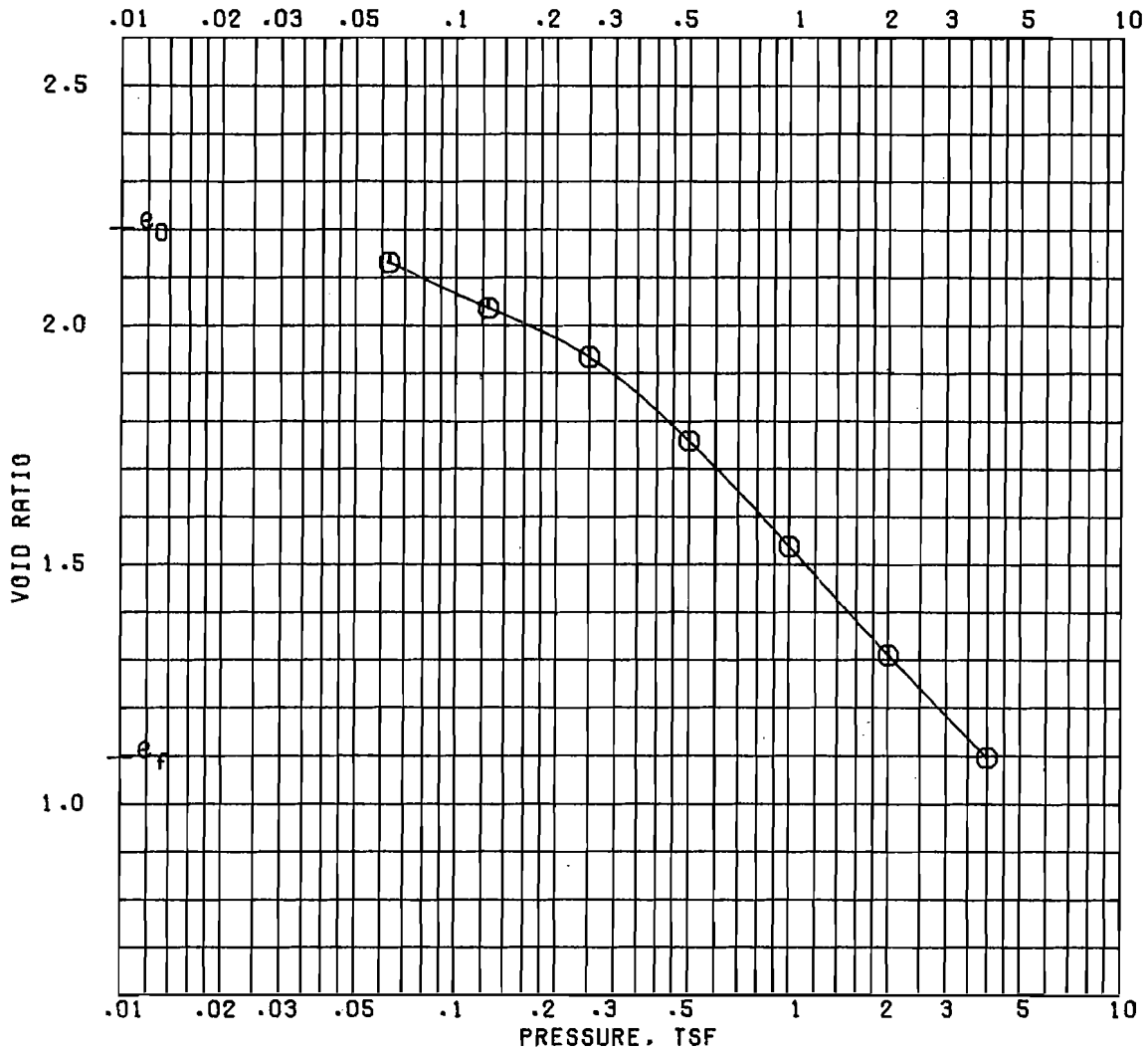


$\gamma_{SAT} = 104$

| SPECIMEN NO.           | Δ1               | 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

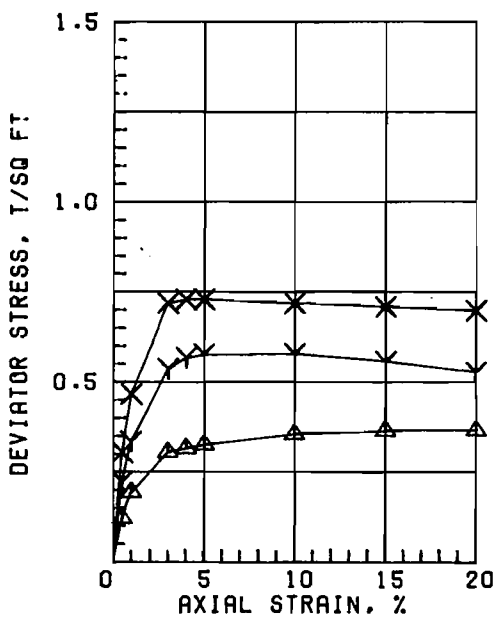
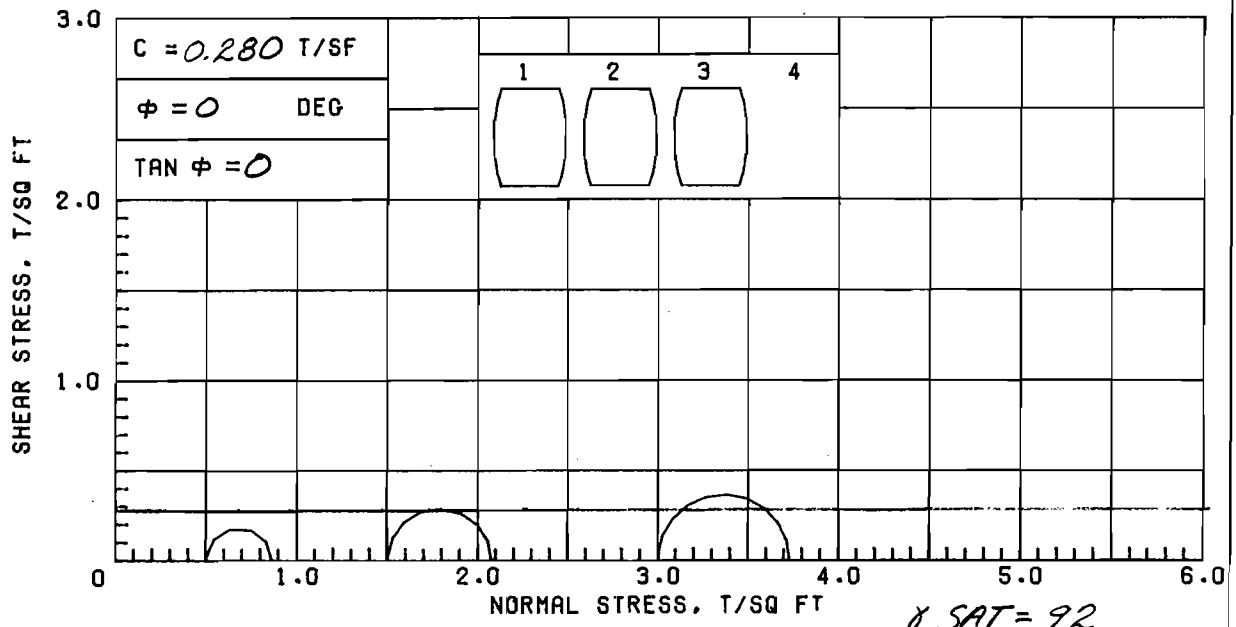
|  |       |       |                                    |                      |        |
|--|-------|-------|------------------------------------|----------------------|--------|
| CONTROLLED-STRAIN TEST   |       |       |                                    |                      |        |
| DESCRIPTION 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                                 |       |       |                                    |                      |        |



$\gamma_{SAT} = 96$

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 <sub>10</sub>  | 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                   |             |                  |                                    |                    |                |       |

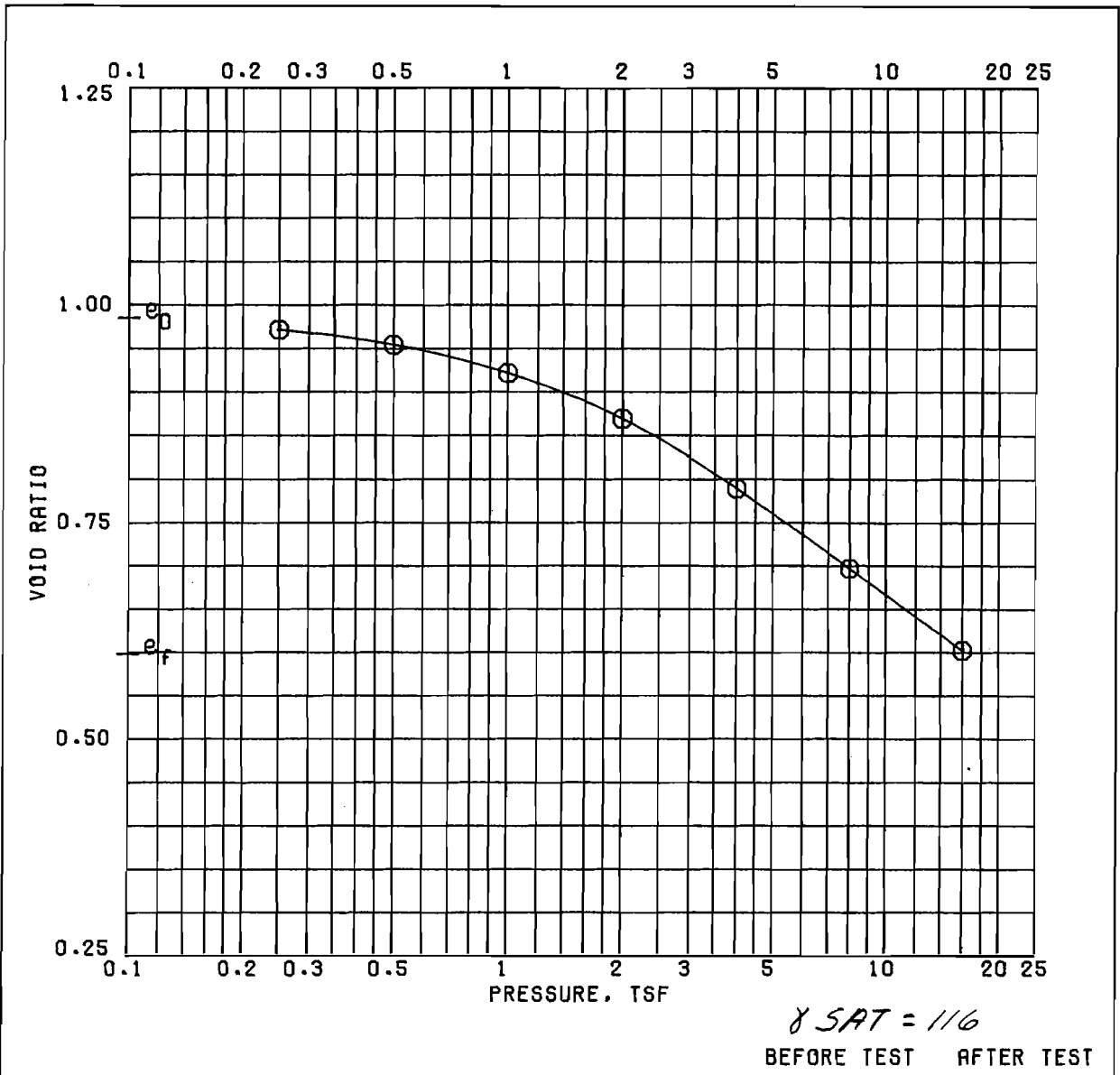


| SPECIMEN NO.           |                        | Δ1                  | Y2    | X3    | 4    |
|------------------------|------------------------|---------------------|-------|-------|------|
| INITIAL                | WATER CONTENT, %       | 79.9                | 80.0  | 75.7  |      |
|                        | 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  |      |
| CONTROLLED-STRAIN TEST |                        | INITIAL HEIGHT, IN. | 3.00  | 3.00  | 3.00 |

AVG.  
78.5

|  |       |       |                                    |                      |        |
|--|-------|-------|------------------------------------|----------------------|--------|
| 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                         |       |       |                                    |                      |        |

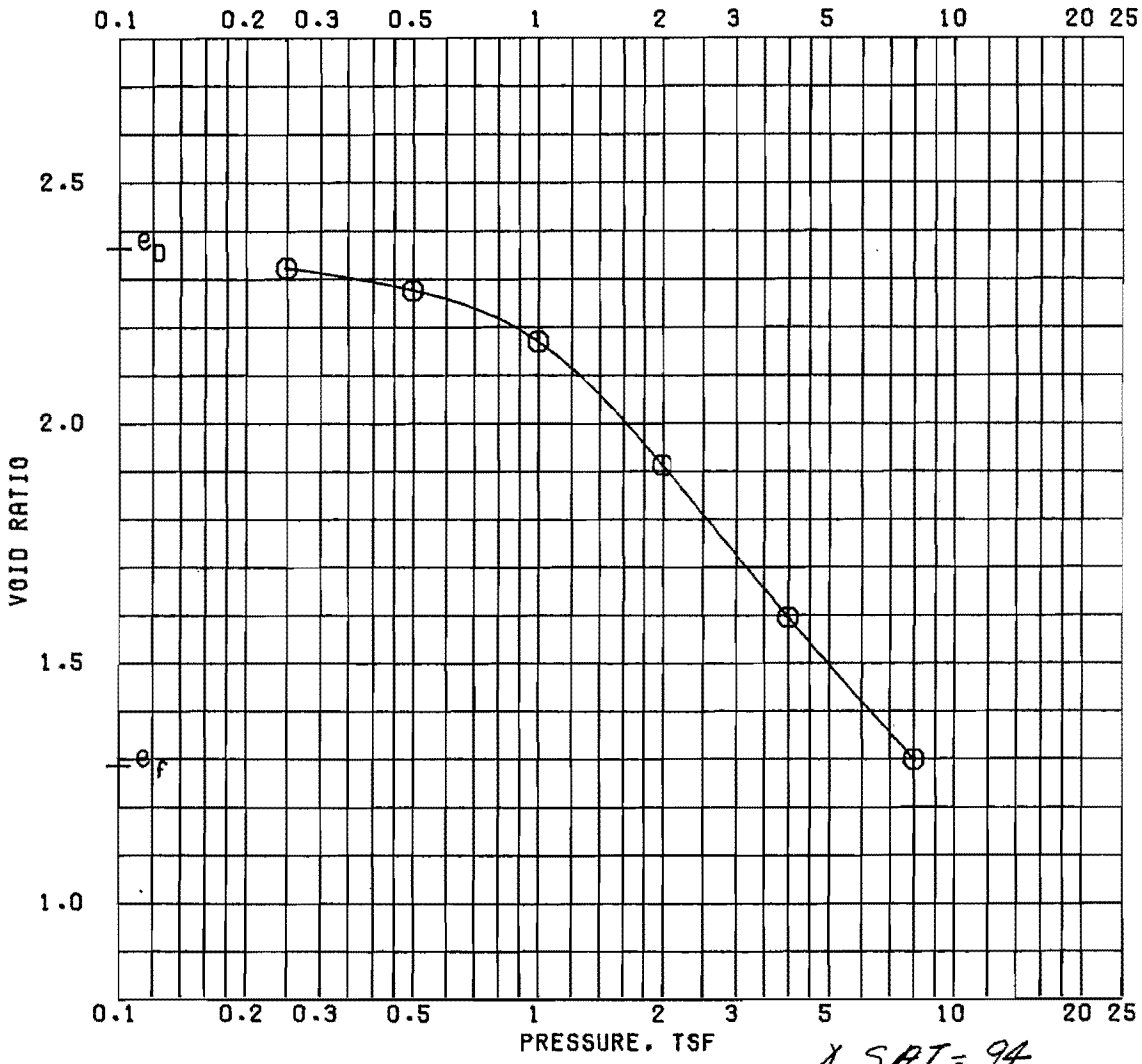




$\gamma_{SAT} = 116$

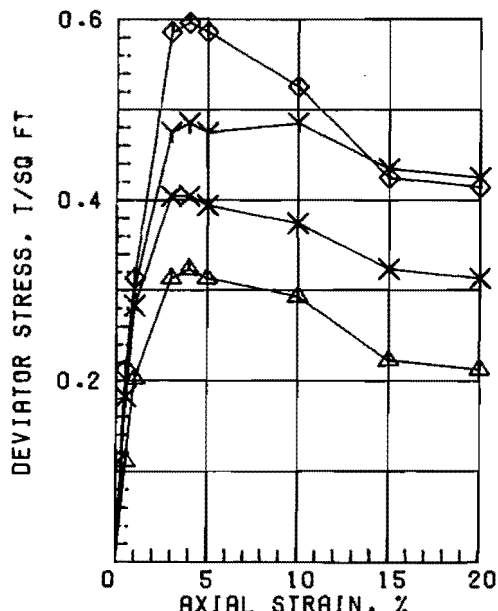
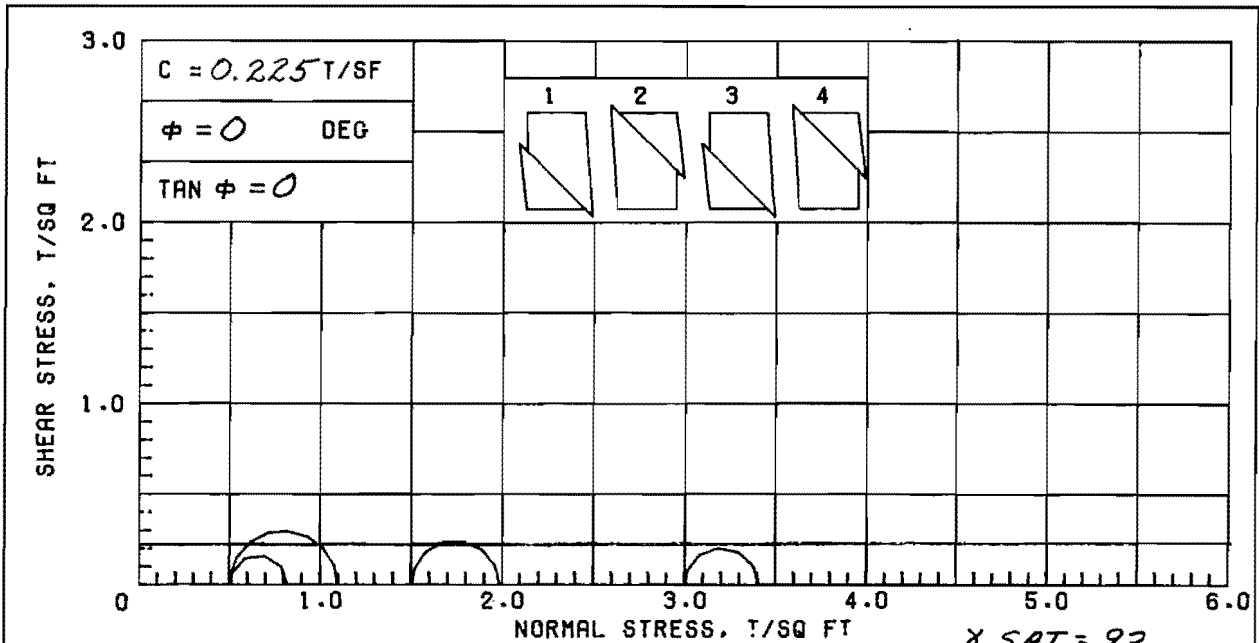
BEFORE TEST      AFTER TEST

|                           |   |                    |                                    |       |
|---------------------------|---|--------------------|------------------------------------|-------|
| 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 <sub>10</sub>                           |                    | 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 |   |                    |                                    |       |



*SAT = 94*

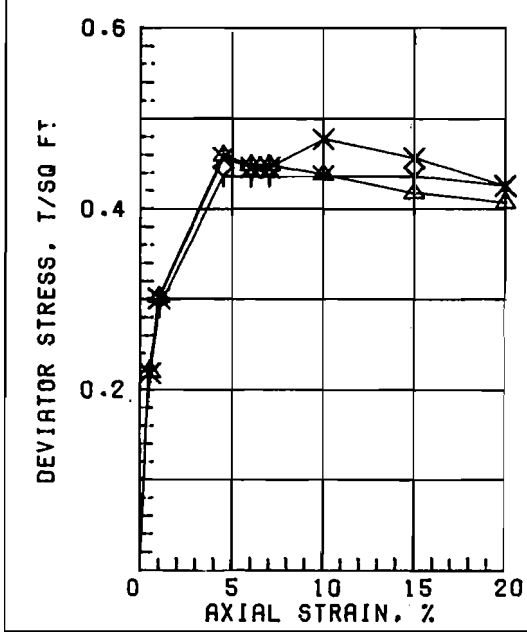
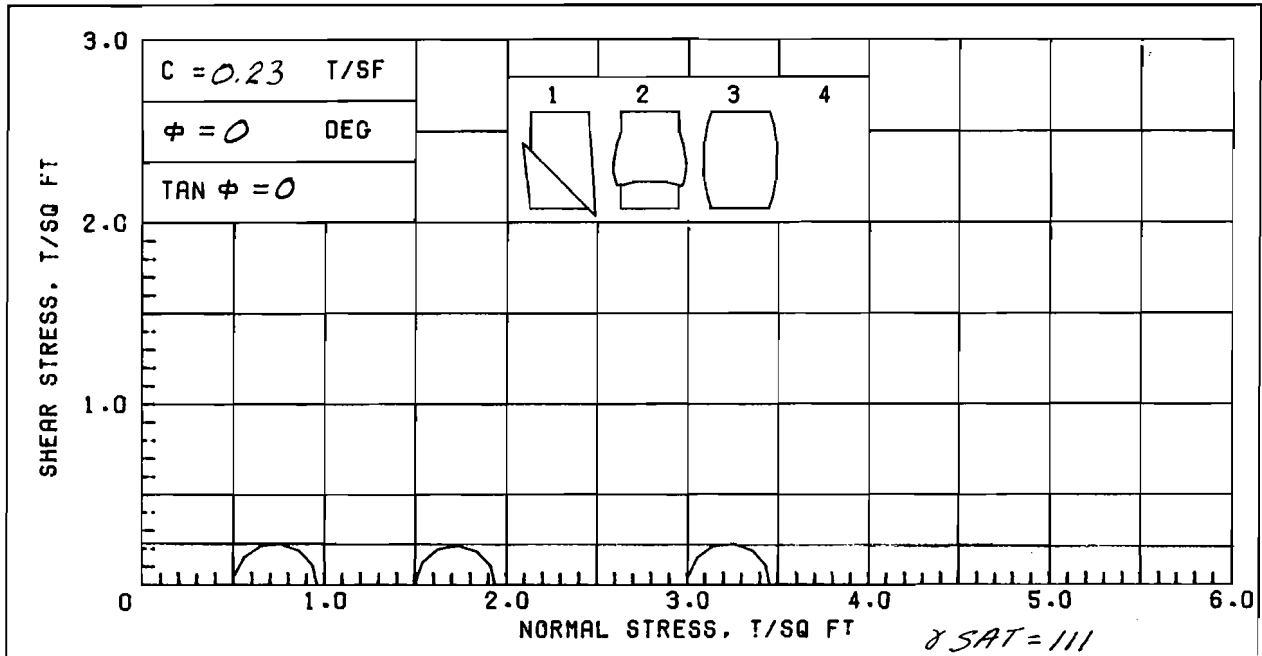
|  |                 | BEFORE TEST          | AFTER TEST                         |
|--|-----------------|----------------------|------------------------------------|
| OVERBURDEN PRESSURE, TSF                         |                 | 82.6                 | 50.2                               |
| PRECONSOL. PRESSURE, TSF                         | 1.34            | 50.2                 | 73.8                               |
| COMPRESSION INDEX                                |                 | 94.4                 | 100 +                              |
| TYPE SPECIMEN                                    | UNDISTURBED     | VOID RATIO           | 2.360                              |
| 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 <sub>10</sub> |                      | 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                        |                 |                      |                                    |



| SPECIMEN NO.           |                  | Δ1    | Υ2    | X3    | ◇4    |
|------------------------|------------------|-------|-------|-------|-------|
| INITIAL                | WATER CONTENT, % | 90.5  | 89.4  | 87.9  | 82.1  |
|                        | 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  |

AVG.  
87.5

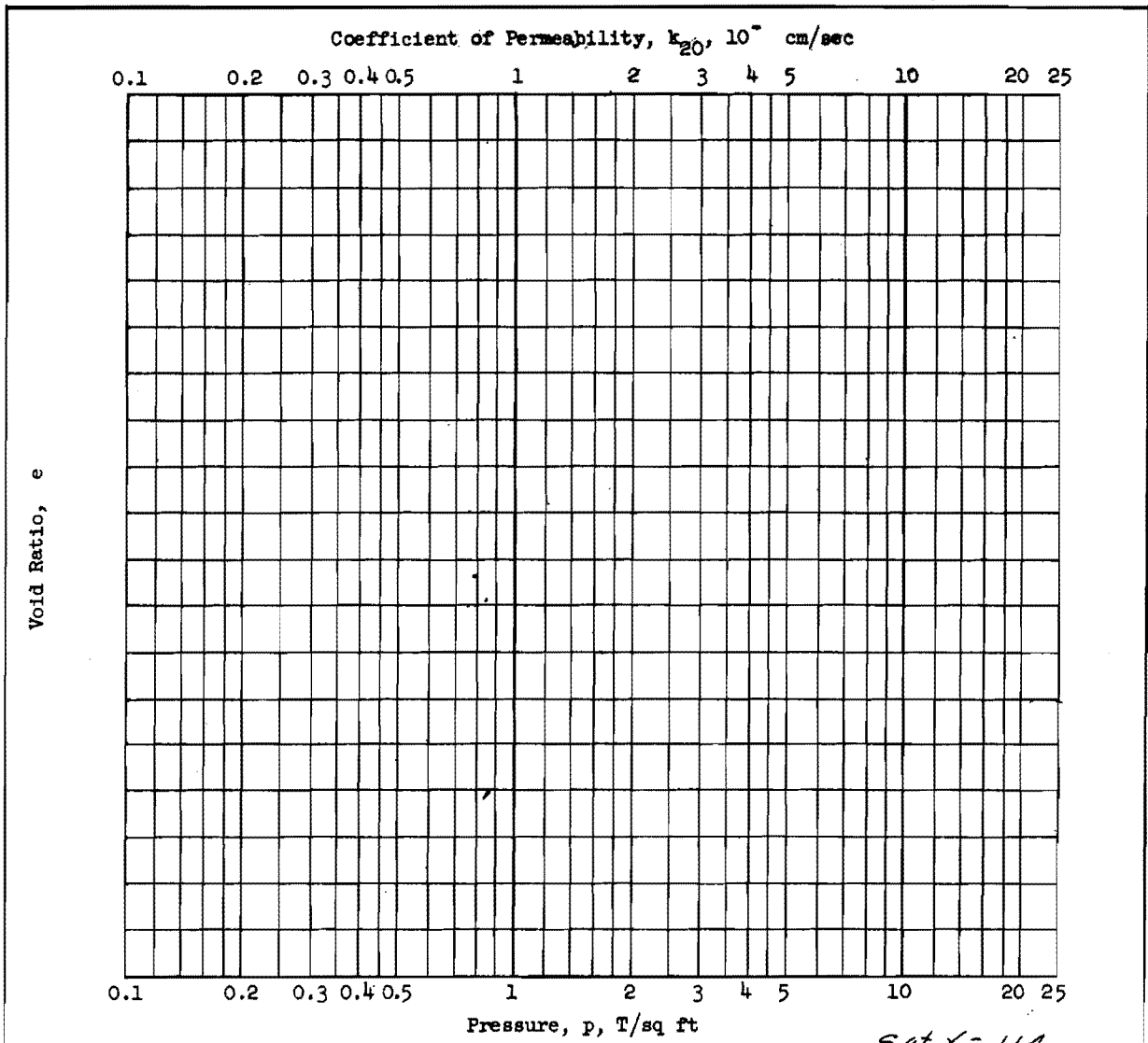
|   |       |       |                                    |                      |        |
|---|-------|-------|------------------------------------|----------------------|--------|
| CONTROLLED-STRAIN TEST  |       |       |                                    |                      |        |
| DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; DECAYED WOOD |       |       |                                    |                      |        |
| LI. 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                                |       |       |                                    |                      |        |



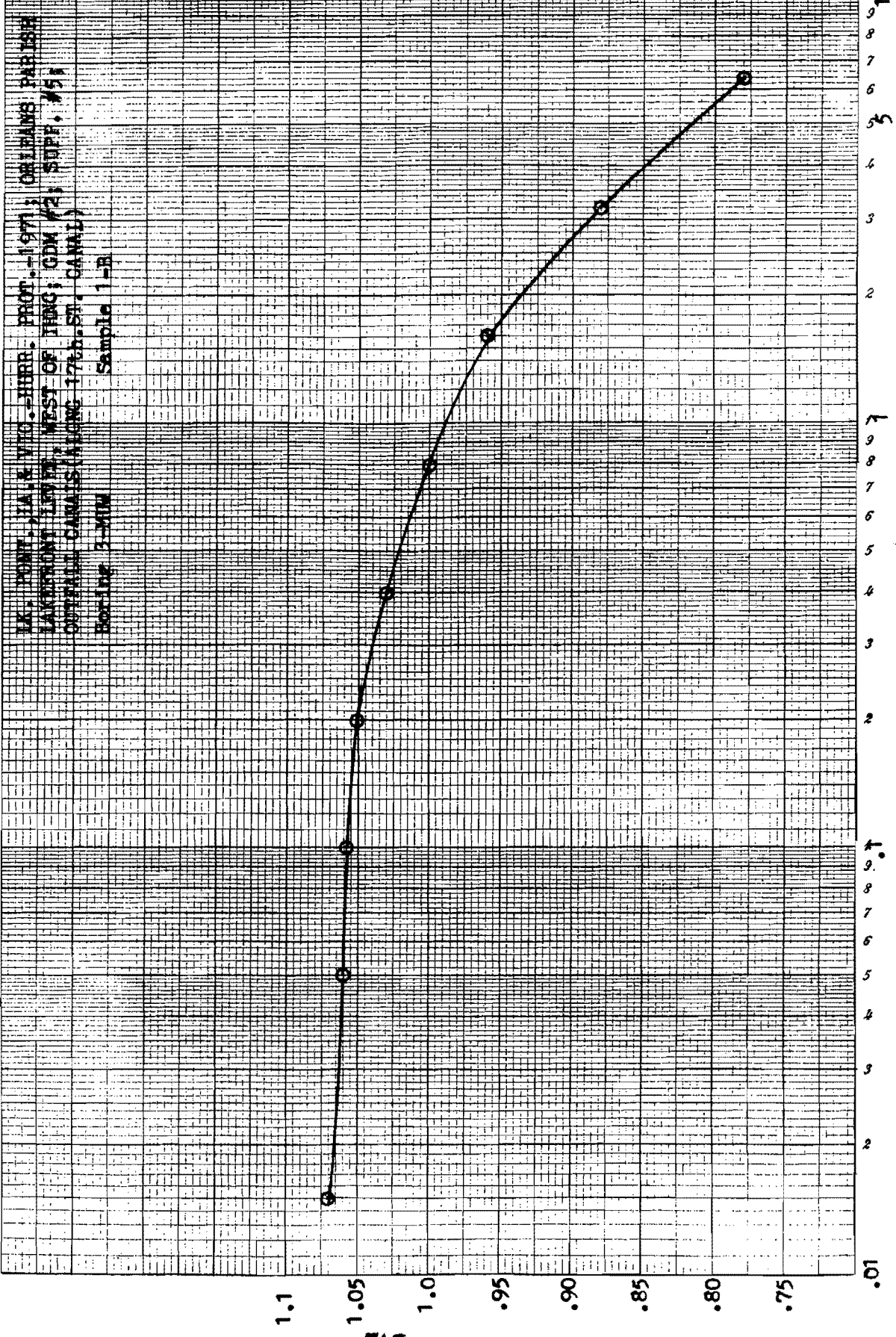
| SPECIMEN NO. |                        | Δ1    | Y2    | X3    | 4 |
|--------------|------------------------|-------|-------|-------|---|
| INITIAL      | WATER CONTENT, %       | 45.8  | 43.9  | 40.4  |   |
|              | DRY DENSITY, PCF       | 75.1  | 76.8  | 79.6  |   |
|              | SATURATION, %          | 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                                   |       |       |                                    |                      |        |

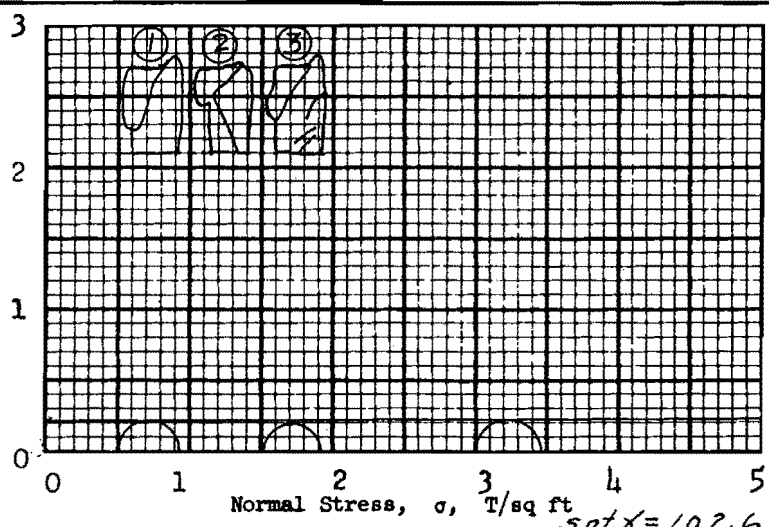
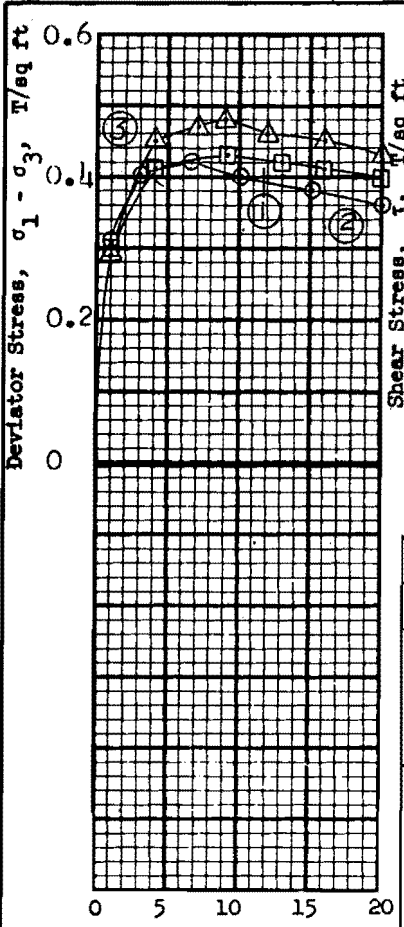


| Type of Specimen           |  | UNDISTURBED             |                         | Before Test                          |   | After Test |                |
|----------------------------|--|-------------------------|-------------------------|--------------------------------------|---|------------|----------------|
| 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, $\gamma_d$ | 81.8 lb/ft <sup>3</sup> |                                      |   |            |                |
| Classification             | PLASTIC CLAY(CH),*                                       | $k_{20}$ at $e_o =$     |                         | $\times 10^{-7}$ cm/sec              |   |            |                |
| LL                         | 51   | $G_s$                   | 2.59                    | From Un-                             | Project LK. PONT., LA. & VIC. - HURR. PROT. - 1971<br>ORLEANS PARISH LK. FT. LEVEE, WEST OF IHNC;<br>GDM#2; SUPP.#5 (ALONG 17th. ST. CANAL) |            |                |
| PL                         | 23   | $D_{10}$                |                         | dist.                                |   |            |                |
| Remarks                    | *brown, contains organic matter and zones of clayey silt |                         |                         | Boring No.                           | 3-MUW   | Sample No. | 1-B            |
|                            | See attached plot for pressure vs void ratio curve       |                         |                         | Depth                                | -3.2  | Date       | 29 March, 1971 |
|                            |  |                         |                         | <b>JDB CONSOLIDATION TEST REPORT</b> |   |            |                |



F65  
 Void Ratio, e

Pressure, p, T/sq.ft.



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.22 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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 % | %      |
| Before Shear | Dry density, lb/cu ft   | $\gamma_d$ 65.1 | 63.1   | 63.0   |        |
|              | Water content   | $w_c$ %         | %      | %      | %      |
|              | Void ratio  | $e_c$           |        |        |        |
|              | Saturation  | $S_c$ %         | %      | %      | %      |
| Final        | Final back pressure, T/sq ft  | $u_o$           |        |        |        |
|              | Water content   | $w_f$ %         | %      | %      | %      |
|              | Void ratio  | $e_f$           |        |        |        |
|              | Minor principal stress, T/sq ft                                       | $\sigma_3$ 0.5  | 1.5    | 3.0    |        |
|              | Max deviator stress, T/sq ft ( $\sigma_1 - \sigma_3$ ) <sub>max</sub> | 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 ( $\sigma_1 - \sigma_3$ ) <sub>ult</sub> |                 |        |        |        |
|              | Initial diameter, in.   | $D_o$ 1.41      | 1.40   | 1.41   |        |
|              | Initial height, in.   | $H_o$ 3.00      | 3.00   | 3.00   |        |

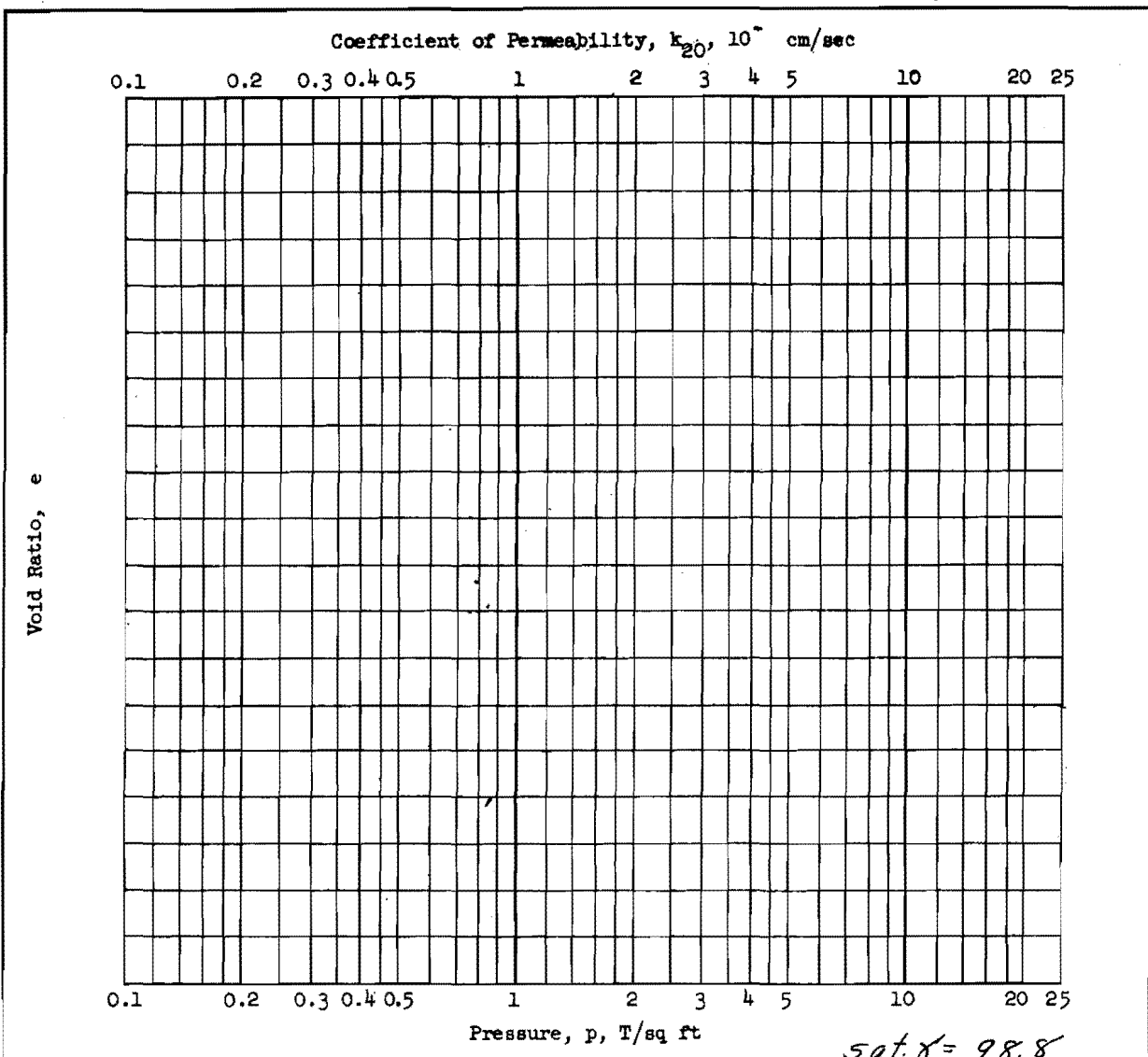
Type of test  Type of specimen **UNDISTURBED**

Classification **PLASTIC CLAY(CH), gray, contains numerous rootlets**

LL 105      PL 33      PI 72       $G_s$  2.69 From Un-

Remarks \_\_\_\_\_  
 Project LK.PONT.LA., & VIC. -HURR.PROT.-1971 dist.  
 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 - 6.7      Date 11 March, 1971  
 El \_\_\_\_\_

FAM TRIAXIAL COMPRESSION TEST REPORT

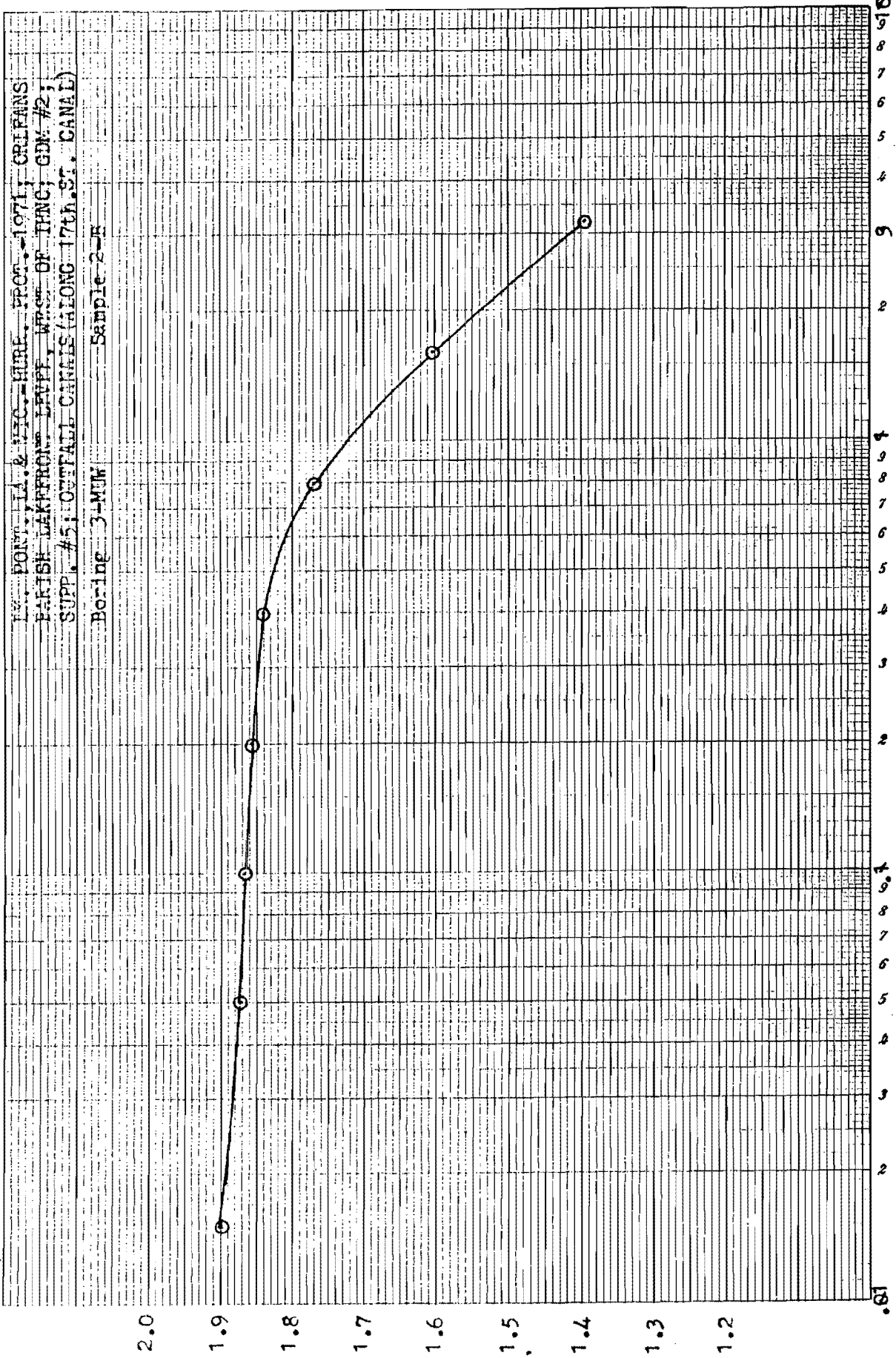


| Type of Specimen                  |              | UNDISTURBED             |                              | Before Test  |        | After Test |               |
|-----------------------------------|--------------|-------------------------|------------------------------|--|--------|------------|---------------|
| 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, $\gamma_d$ | 57.9 lb/ft <sup>3</sup>      |  |        |            |               |
| Classification PLASTIC CLAY (CH)* |              |                         |                              | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec            |        |            |               |
| LL                                | 105          | $G_s$                   | 2.69 <sup>From</sup> Undist. | Project LK. PONT., LA. & VIC. - HURR. PROT. - 1971     |        |            |               |
| PL                                | 33           | $D_{10}$                |                              | ORLFANS 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  | -6.7   | Date       | 6 April, 1971 |
| and roots                         |              |                         |                              | JDB CONSOLIDATION TEST REPORT                          |        |            |               |



PONTIAC & WTC. HURF. PROJ. 1971, ORLEANS  
 PARISH DEPARTMENT LEVEE, W. OF IHNC, GDM #2;  
 SUPPL. #5; OUTFALL CANALS (ALONG 17th ST. CANAL)

Boring 3-MUM Sample 2-E



Pressure, p, T/sq.ft.

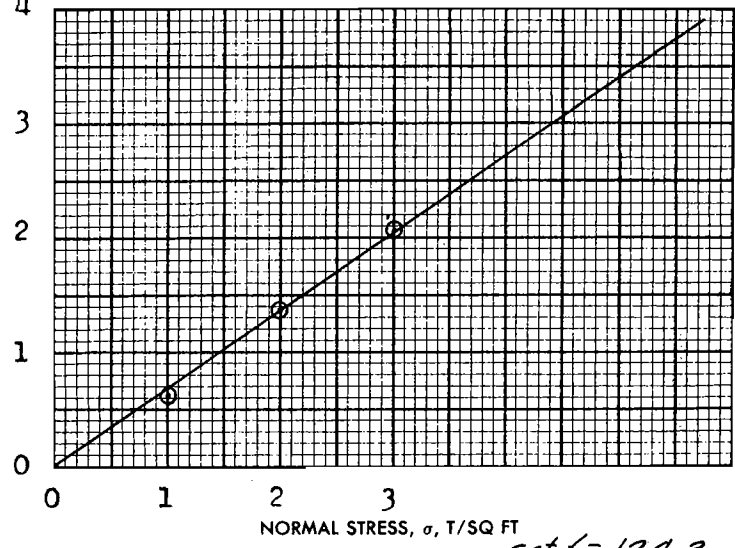
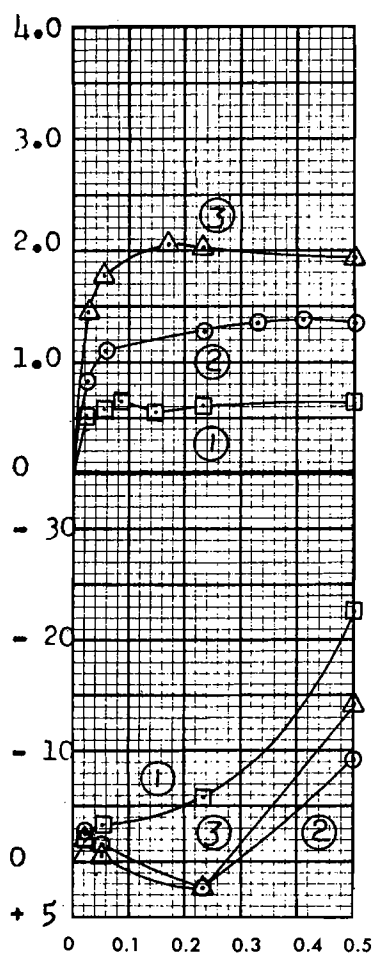
Void Ratio, e

SHEAR STRESS,  $\tau$ , T/SQ FT

SHEAR STRENGTH,  $s$ , T/SQ FT

VERTICAL DEFORMATION, IN.  $\times 10^{-3}$

HORIZ. DEFORMATION, IN.



**SHEAR STRENGTH PARAMETERS**

$\phi' = 35^\circ$

$\text{TAN } \phi' = 0.690$

$c' = 0$  T/SQ FT

CONTROLLED STRESS

CONTROLLED STRAIN

| 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 | $\gamma_d$ 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                 |                       | $\sigma$ 1.0      | 2.0    | 3.0    |        |
| MAXIMUM SHEAR STRESS, T/SQ FT          |                       | $\tau_{max}$ 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         |                       | $\tau_{ult}$      |        |        |        |

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

PROJECT **LK. PONT. LA., & VIC. - HURR. PROT. - 1971**

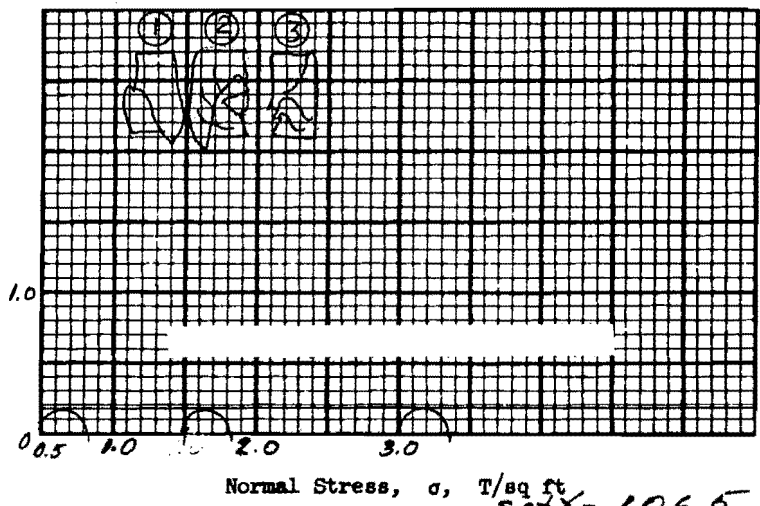
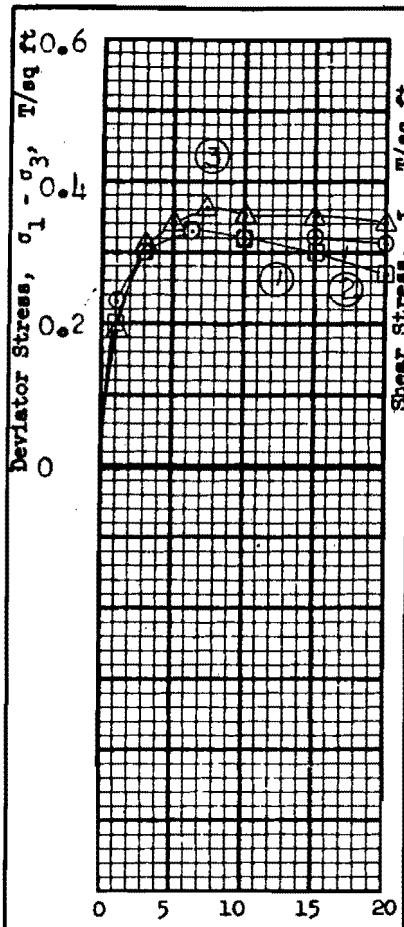
**ORLEANS PARISH LK. FRNT. LEVEE, WEST OF IHNC,**

AREA **GDM # 2, SUPP. # 5 OUTFALL CANALS**

BORING NO. **3-MUW** SAMPLE NO. **3-A**

DEPTH - **10.4** DATE **29 April 1971**

**F 69** **BWG** **DIRECT SHEAR TEST REPORT**



**Shear Strength Parameters**

$\phi = 0^\circ$

$\tan \phi = 0$

$c = 0.17 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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   |        |

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.-L.KFRNT.**

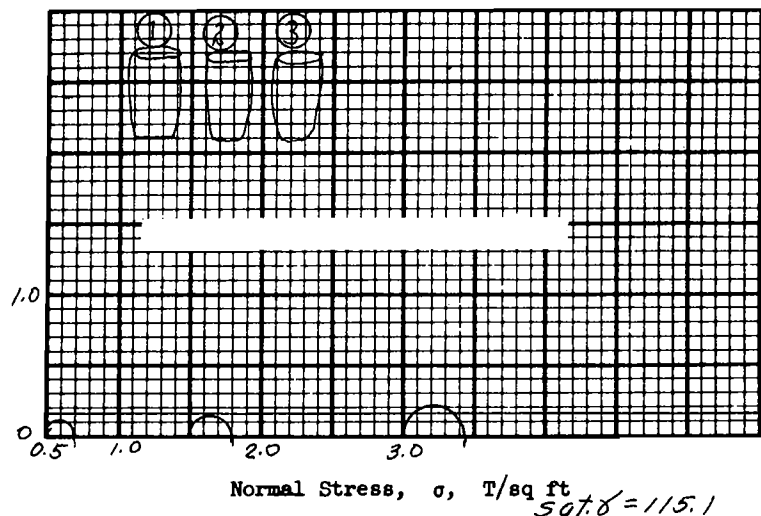
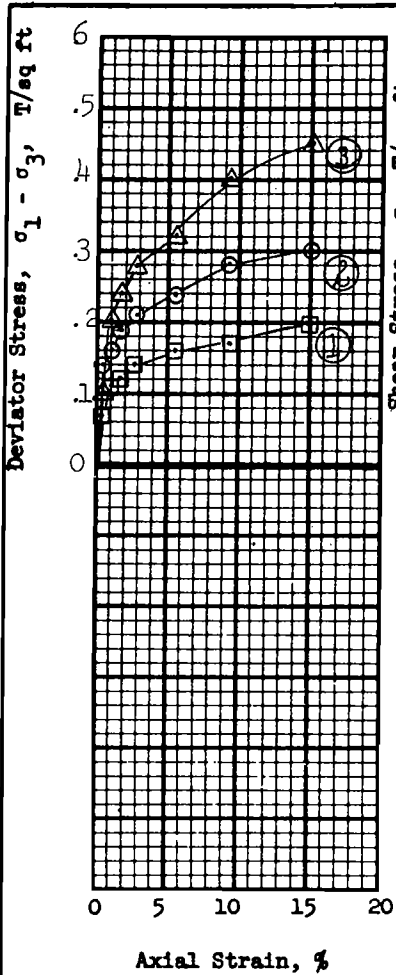
LEV., WEST OF IHNC-GDM #2, SUPP.#5, OUTFALL

Area **CANALS (ALONG 17th ST. CANAL) 1971**

Boring No. **4-MUE** Sample No. **2-B**

Depth- **- 7.5** Date **22 March 1971**

FAM TRIAXIAL COMPRESSION TEST REPORT



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.16 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| Test No.                        |                               | 1               | 2      | 3      | Avg.   |
|---------------------------------|-------------------------------|-----------------|--------|--------|--------|
| Initial                         | Water content                 | $w_o$ 40.4 %    | 36.0 % | 30.7 % | 36.7 % |
|                                 | Void ratio                    | $e_o$ 1.08      | 1.02   | 0.867  |        |
|                                 | Saturation                    | $S_o$ 99.9 %    | 94.2 % | 94.5 % | %      |
|                                 | Dry density, lb/cu ft         | $\gamma_d$ 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 | $\sigma_3$                    | 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**

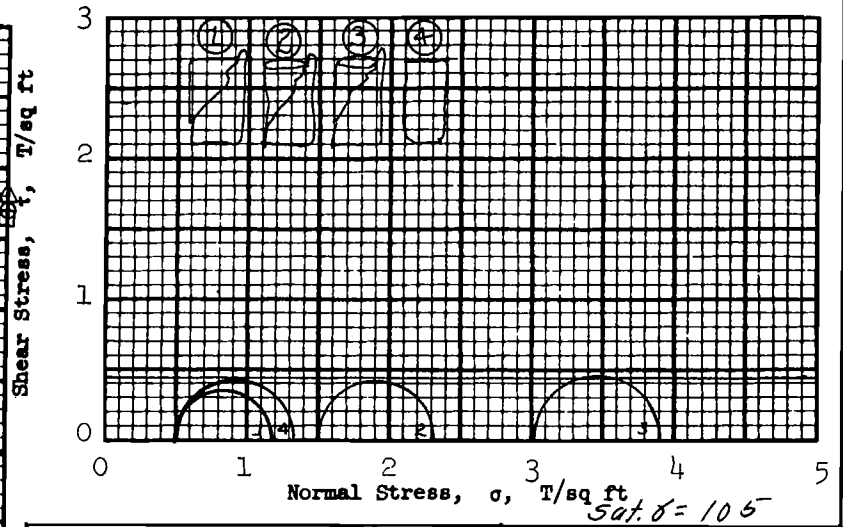
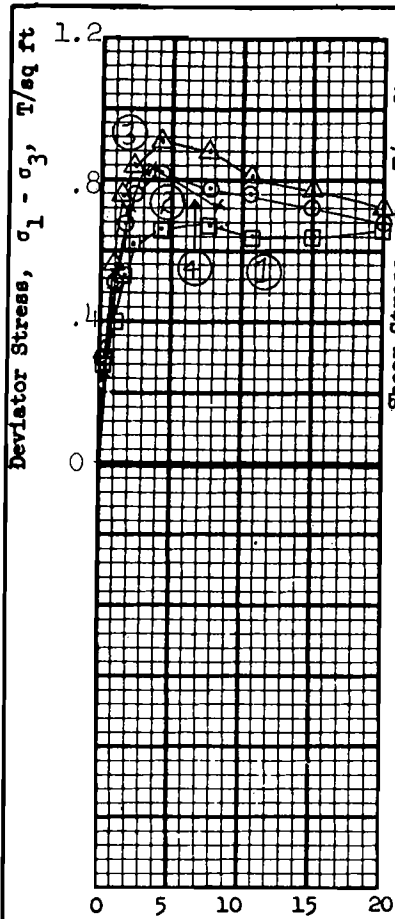
LL **55** PL **17** PI **38**  $G_s$  **2.67**

Remarks Insufficient material for check test

Project **LK. PONT., LA. & VIC. - HURR. PROT. - ORLEANS**  
 PAR. **LK. FRNT. 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 **-15.4** Date **22 March 1971**

**F71** **TES TRIAXIAL COMPRESSION TEST REPORT**



**Shear Strength Parameters**

$\phi = 0^\circ$

$\tan \phi = 0$

$c = 0.43 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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   |      |

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

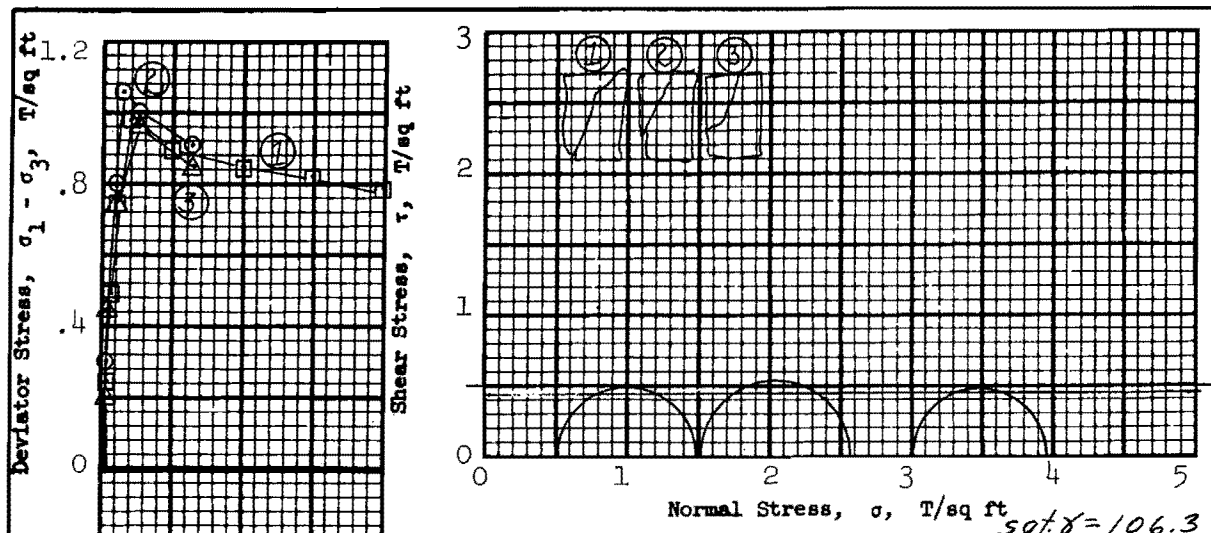
PAR.LKFRNT.LEV., WEST OF IHNC-GDM#2, SUPP.#5,

Area OUTFALL CANALS (ALONG 17th ST. CANAL) 1971

Boring No. 4-MUE      Sample No. 11-D

Depth -49.5      Date 23 March 1971

TES      TRIAXIAL COMPRESSION TEST REPORT



| Test No.                     | 1      | 2      | 3      | Avg.   |
|------------------------------|--------|--------|--------|--------|
| Water content                | 50.8 % | 51.1 % | 52.4 % | 51.4 % |
| Void ratio                   | 1.44   | 1.42   | 1.44   |        |
| Saturation                   | 95.6 % | 97.5 % | 98.6 % | %      |
| Dry density, lb/cu ft        | 69.3   | 69.9   | 69.3   |        |
| Water content                | %      | %      | %      | %      |
| Void ratio                   |        |        |        |        |
| Saturation                   | %      | %      | %      | %      |
| Final back pressure, T/sq ft |        |        |        |        |
| Water content                | %      | %      | %      | %      |
| Void ratio                   |        |        |        |        |

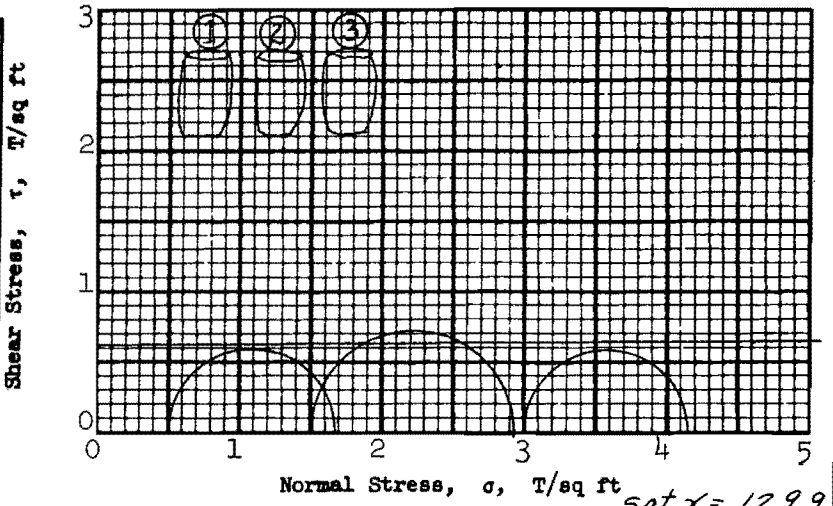
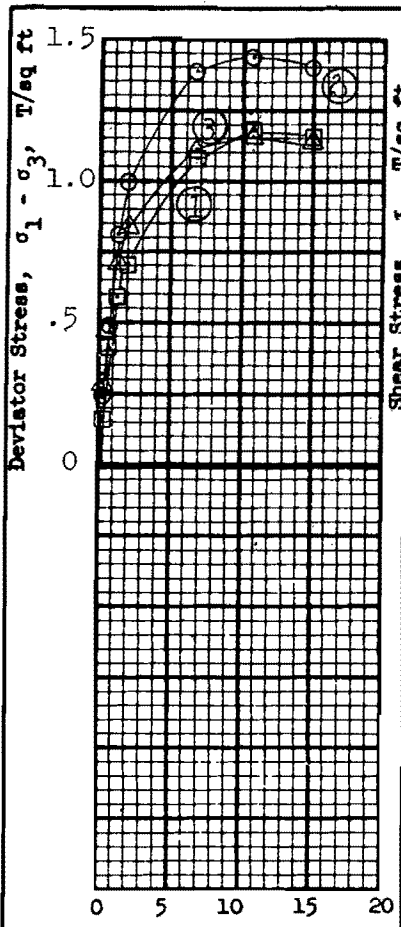
$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.50 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

Controlled stress  
 Controlled strain

|                                 |                               |       |       |       |  |
|---------------------------------|-------------------------------|-------|-------|-------|--|
| Minor principal stress, T/sq ft | $\sigma_3$                    | 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.           | $D_0$                         | 1.40  | 1.40  | 1.40  |  |
| Initial height, in.             | $H_0$                         | 3.00  | 3.00  | 3.00  |  |

|                                      |   |                  |               |
|--------------------------------------|---|------------------|---------------|
| 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 17th ST. CANAL) 1971             |                  |               |
| Boring No.                           | 4-MUE   | Sample No.       | 13-C          |
| Depth                                | -56.6   | Date             | 22 March 1971 |
| TES TRIAXIAL COMPRESSION TEST REPORT |   |                  |               |



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.63 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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   |        |

Type of test Q      Type of specimen      UNDISTURBED

Classification      SILTY CLAY(CL), gray, crumbly

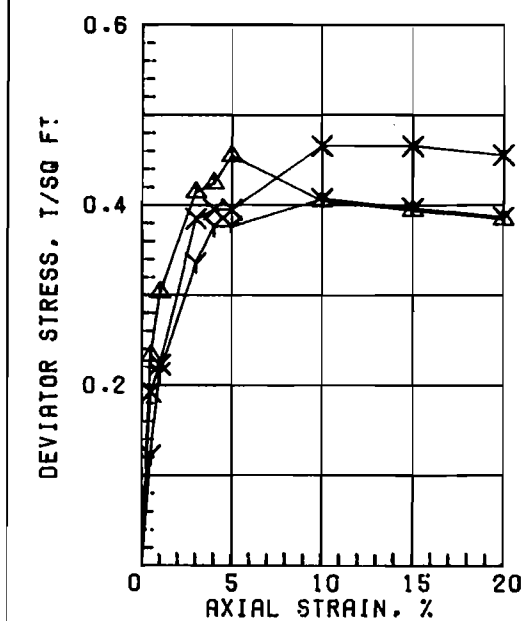
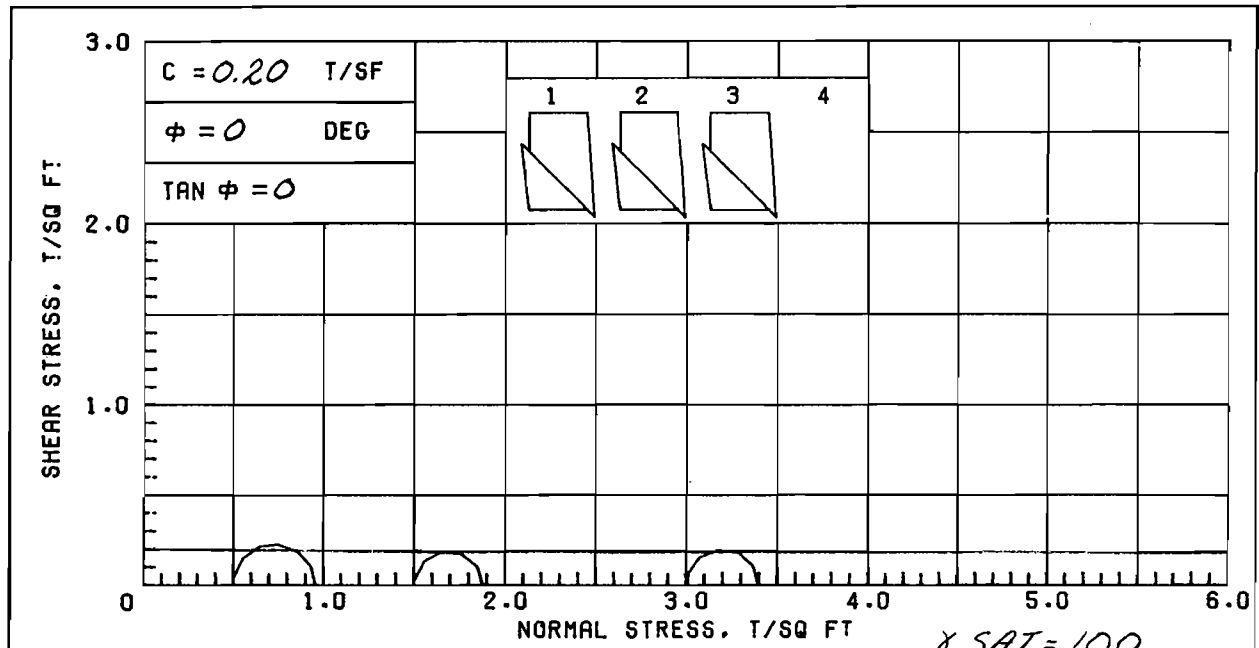
LL 23      PL 13      PI 10       $G_s$  2.69

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 -64.4      Date 22 March 1971  
 ET

YES      TRIAXIAL COMPRESSION TEST REPORT

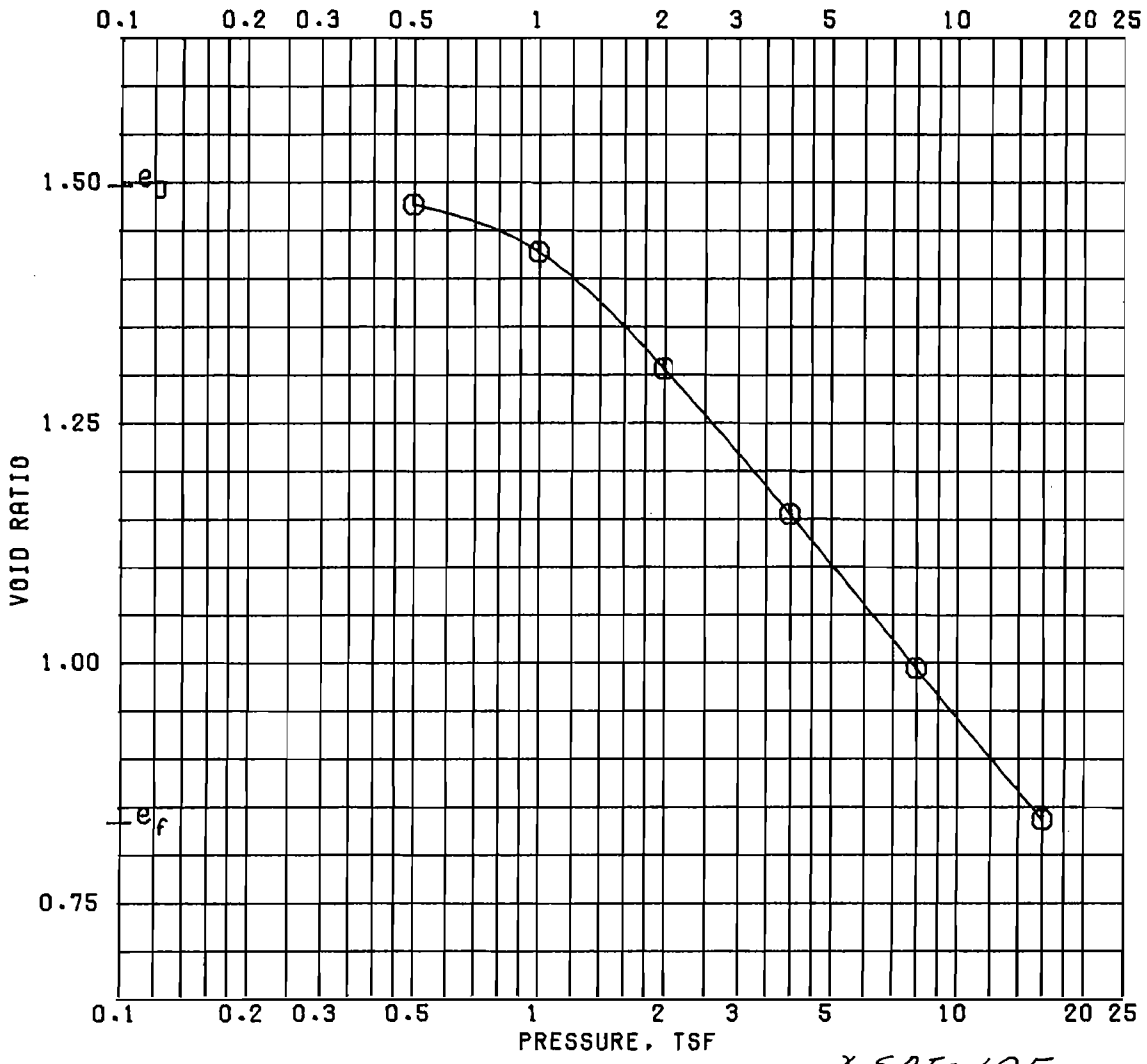


| SPECIMEN NO.           |                  | Δ1                  | Y2    | X3    | 4    |
|------------------------|------------------|---------------------|-------|-------|------|
| INITIAL                | WATER CONTENT, % | 59.8                | 78.4  | 61.5  |      |
|                        | DRY 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  |      |
| CONTROLLED-STRAIN TEST |                  | INITIAL HEIGHT, IN. | 3.00  | 3.00  | 3.00 |

AVG.  
66.6

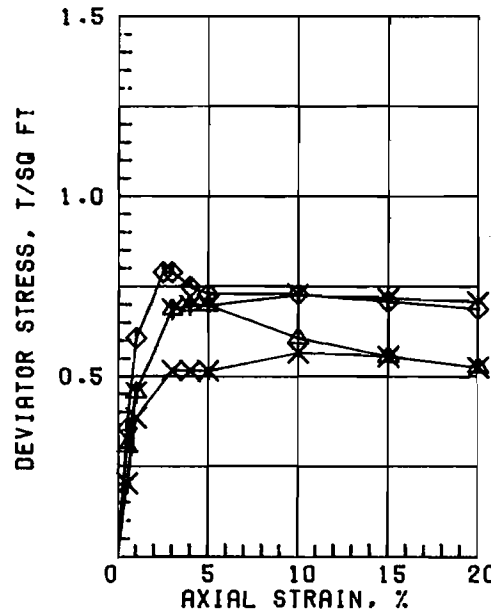
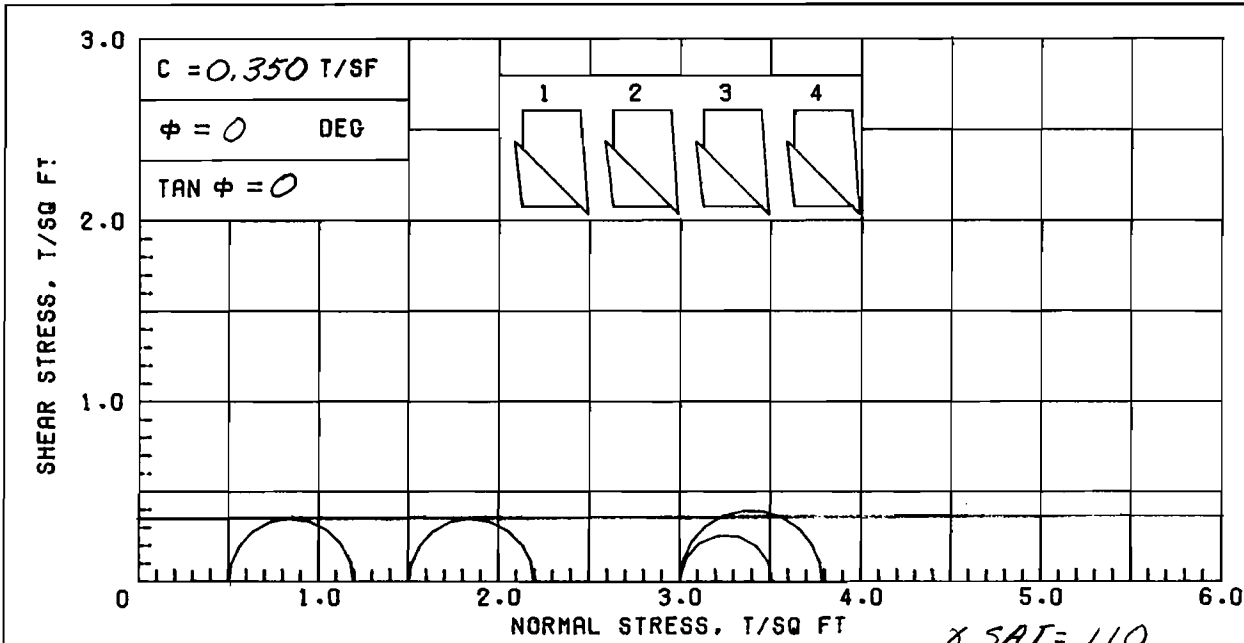
|  |       |       |                                    |                      |        |
|--|-------|-------|------------------------------------|----------------------|--------|
| DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; DECAYED ROOTS |       |       |                                    |                      |        |
| 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

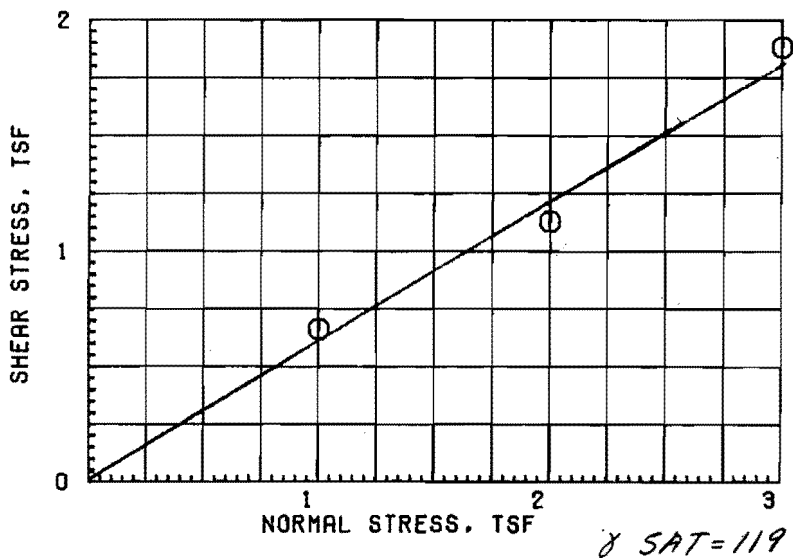
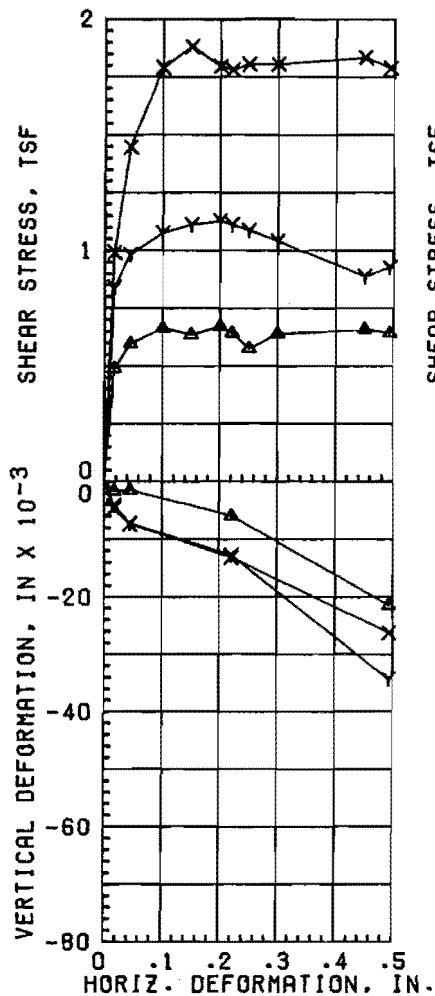
|   |                 |                      |                                    |                |                |
|---|-----------------|----------------------|------------------------------------|----------------|----------------|
| OVERBURDEN PRESSURE, TSF                    |                 | 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 <sub>10</sub> |                      | ORLEANS PARISH OUTFALL CANALS      |                |                |
| REMARKS                                     |                 | BORING NO. 4-MUG     |                                    | SAMPLE NO. 7-D |                |
|   |                 | DEPTH/ELEV 17.5/-4.7 |                                    | DATE 02 AUG 86 |                |
| <b>CONSOLIDATION TEST REPORT</b>            |                 |                      |                                    |                |                |



| SPECIMEN NO.           |                  | Δ1    | Y2    | X3    | ◇4    |
|------------------------|------------------|-------|-------|-------|-------|
| INITIAL                | WATER CONTENT, % | 42.3  | 40.0  | 48.3  | 50.0  |
|                        | 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  |

AVG.  
45.2

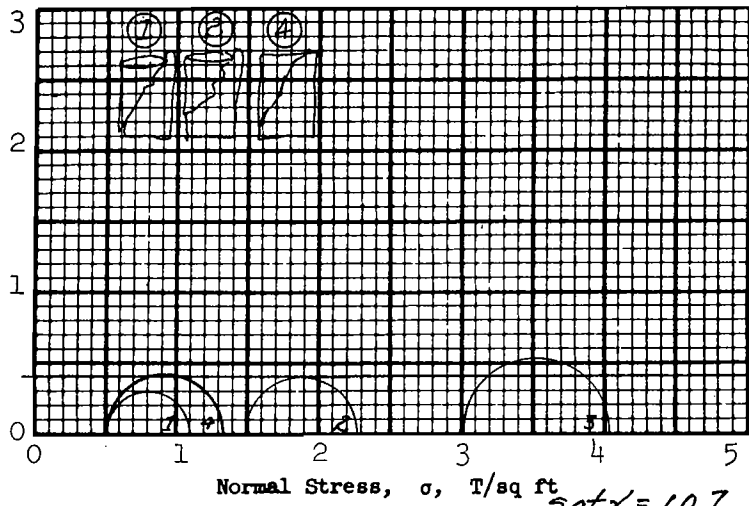
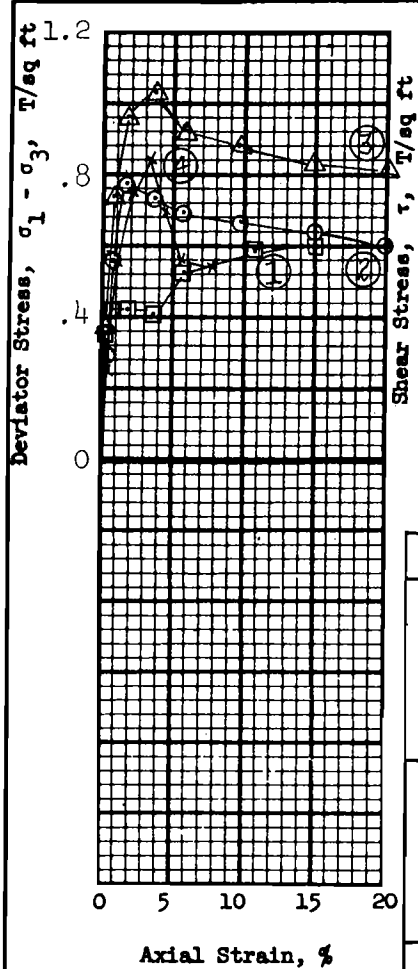
|   |       |       |                                    |                      |        |
|---|-------|-------|------------------------------------|----------------------|--------|
| CONTROLLED-STRAIN TEST  |       |       |                                    |                      |        |
| DESCRIPTION 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                                |       |       |                                    |                      |        |



$\phi = 31^\circ$   
 $\tan \phi = 0.601$   
 $c = 0$

|                            |                  | TEST NO. | 1 $\Delta$ | 2 $\gamma$ | 3 $\times$ | AVG  |
|----------------------------|------------------|----------|------------|------------|------------|------|
| INITIAL                    | WATER CONTENT, % |          | 21.4       | 20.6       | 21.6       | 21.2 |
|                            | VOID RATIO       |          | 0.896      | 0.773      | 0.813      |      |
|                            | SATURATION, %    |          | 63.4       | 70.6       | 70.4       |      |
|                            | 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       |      |
|                            | VOID RATIO       |          |            |            |            |      |
|                            | 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 |                  |          |            |            |            |      |

|   |    |                                    |                 |
|---|----|------------------------------------|-----------------|
| 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                        |    |                                    |                 |



**Shear Strength Parameters**

$\phi = 0^\circ$

$\tan \phi = 0$

$c = 0.40 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| Test No.                        |                               | 1               | 2      | 3      | 4      |
|---------------------------------|-------------------------------|-----------------|--------|--------|--------|
| Initial                         | Water content                 | $w_o$ 45.8 %    | 51.5 % | 49.4 % | 46.6 % |
|                                 | 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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   |

Avg. 48.3

Type of test Q Type of specimen UNDISTURBED

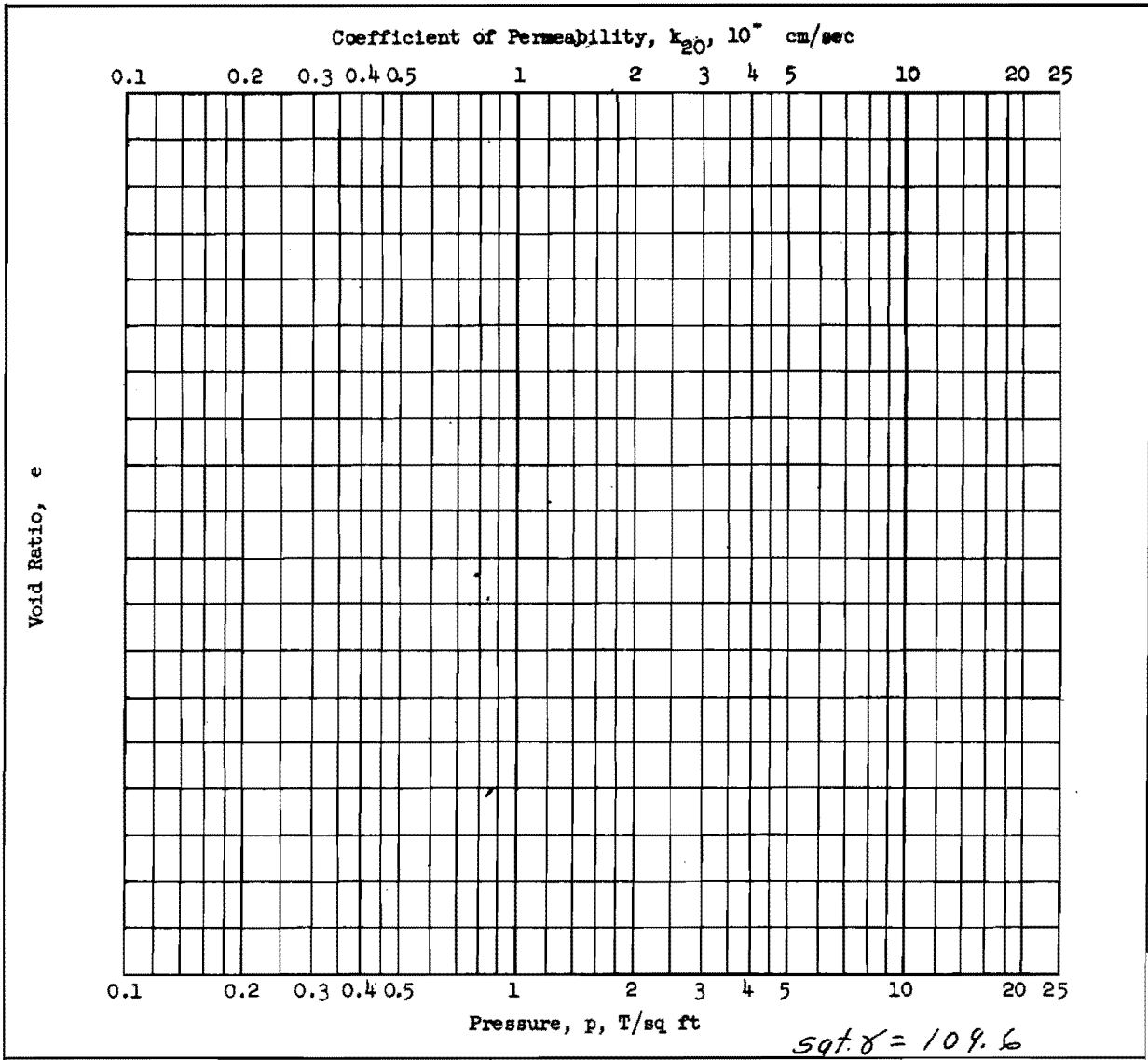
Classification PLASTIC CLAY(CH), gray, slickensided, contains small concretions

LL 90 PL 25 PI 65  $G_s$  2.71

Remarks \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

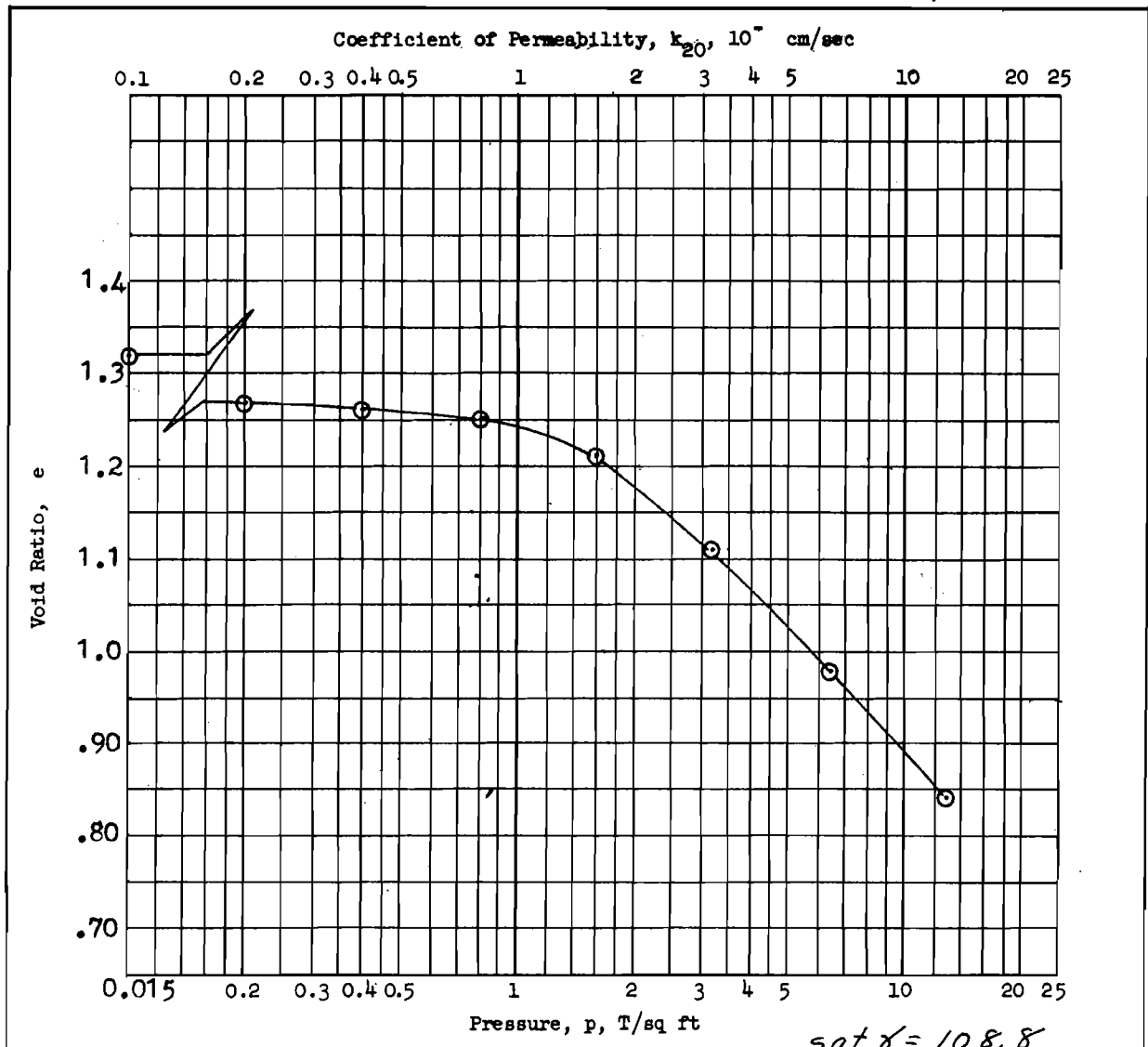
Project LK. PONT. LA. & VIC. (71) ORLEANS PARISH  
LK. FR. LEVEE, WEST OF IHNC, GDM#2, SUPP.#5,  
 Area OUTFALL CANALS  
 Boring No. 2-MUE Sample No. 3-A  
 Depth 2.5 Date 9 March 1971

TES TRIAXIAL COMPRESSION TEST REPORT

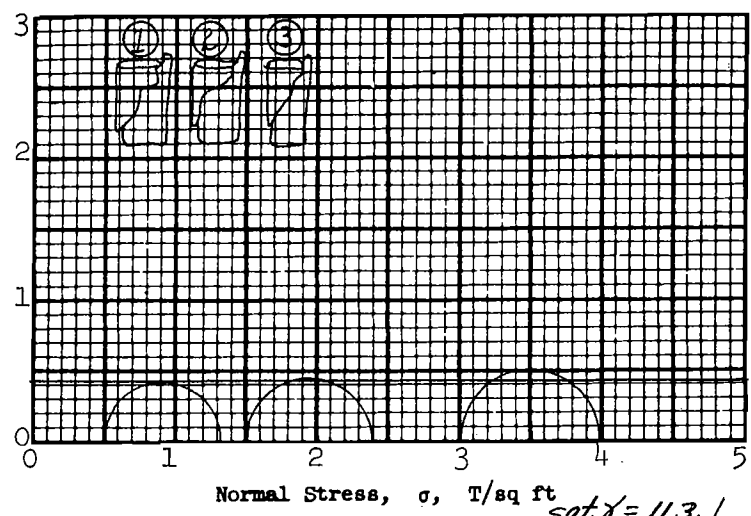
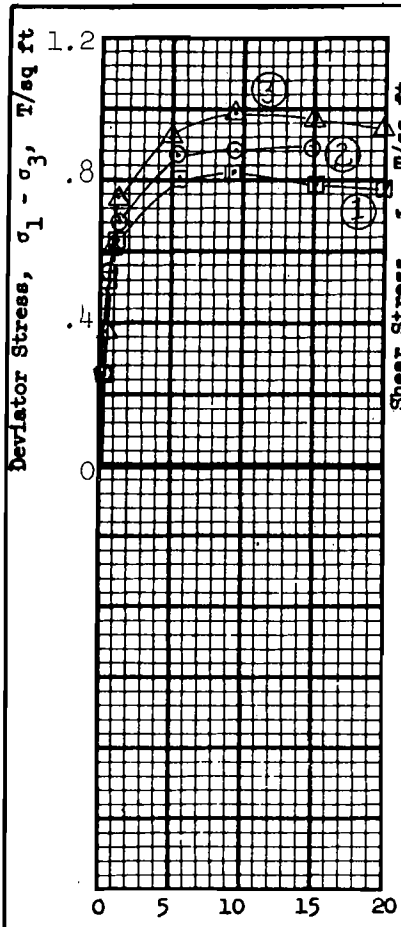


|  |                     |  |                                |            |   |
|--|---------------------|--|--------------------------------|------------|---|
| Type of Specimen <b>UNDISTURBED</b>                |                     | Before Test  |                                | After Test |   |
| Diam <b>4.25</b> in.                               | Ht <b>1.153</b> in. | Water Content, $w_o$   | <b>46.8</b> %                  | $w_f$      | % |
| Overburden Pressure, $P_o$ T/sq ft                 |                     | Void Ratio, $e_o$  | <b>1.28</b>                    | $e_f$      |   |
| Preconsol. Pressure, $P_c$ <b>1.38</b> T/sq ft     |                     | Saturation, $S_o$  | <b>99.3</b> %                  | $S_f$      | % |
| Compression Index, $C_c$ <b>0.43</b>               |                     | Dry Density, $\gamma_d$  | <b>74.5</b> lb/ft <sup>3</sup> |            |   |
| Classification <b>PLASTIC CLAY(CH)*</b>            |                     | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec  |                                |            |   |
| LL <b>64</b>                                       | $G_s$ <b>2.72</b>   | Project <b>LK. PONT., LA. &amp; VIC. ('71); ORLEANS</b><br><b>PARISH LAKEFRONT LEVEE, WEST OF IHNC;</b><br><b>GDM #2; SUPP. #5; OUTFALL CANALS</b> |                                |            |   |
| PL <b>18</b>                                       | $D_{10}$            |  |                                |            |   |
| *<br>Remarks <b>tan and gray, fissured</b>         |                     |  |                                |            |   |
| See attached plot for pressure vs void ratio curve |                     | Boring No. <b>2-MUE</b>  | Sample No. <b>3-B</b>          |            |   |
|  |                     | Depth El <b>+1.6</b>   | Date <b>30 March, 1971</b>     |            |   |
| <b>JDB CONSOLIDATION TEST REPORT</b>               |                     |  |                                |            |   |





| 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, $\gamma_d$ | 73.3 lb/ft <sup>3</sup> |  |        |            |                |
| Classification                       | PLASTIC CLAY (CH), * | $k_{20}$ at $e_o =$     |                         | $\times 10^{-7}$ 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;        |        |            |                |
| *<br>Remarks mottled tan and gray,   |                      |                         |                         | GDM #2; SUPP. #5; OUTFALL CANALS             |        |            |                |
| contains $\frac{1}{2}$ " dia. roots  |                      |                         |                         | Boring No.                                   | 2-MUE  | Sample No. | 5-C            |
|                                      |                      |                         |                         | Depth<br>El                                  | -6.9   | Date       | 24 March, 1971 |
| <b>JDB CONSOLIDATION TEST REPORT</b> |                      |                         |                         |  |        |            |                |



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.42 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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   |        |

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.**

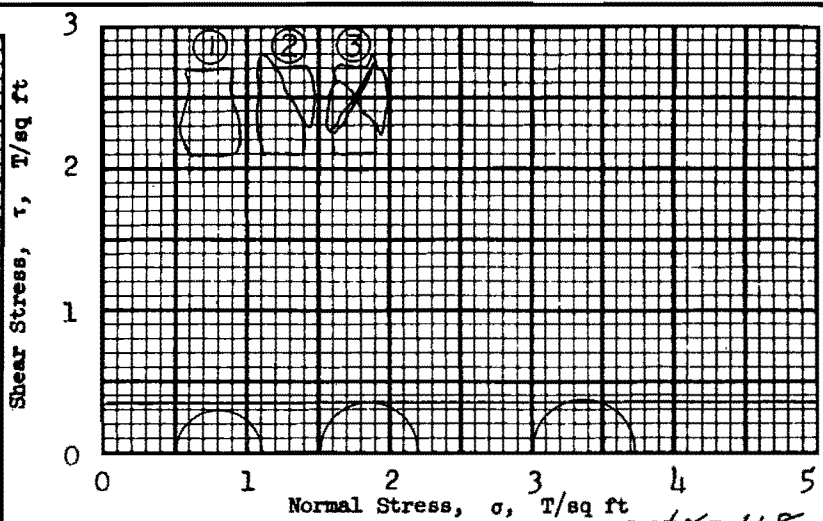
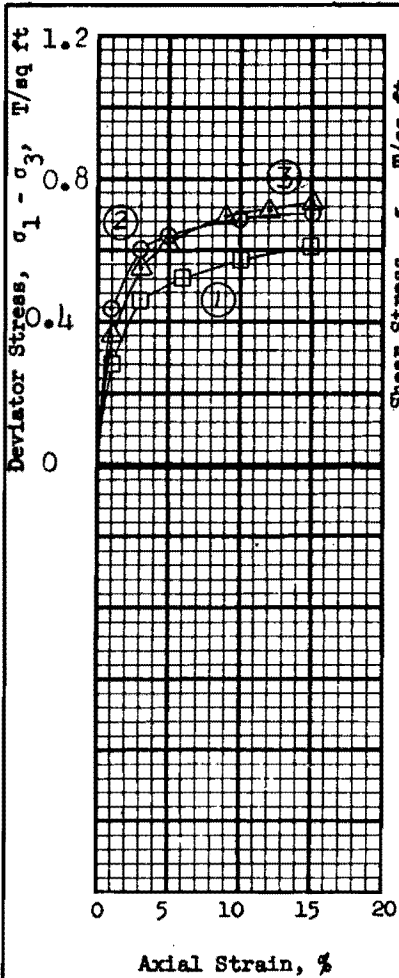
Area# **5, OUTFALL CANALS**

Boring No. **2-MUE** Sample No. **5-D**

Depth **-7.4** Date **9 March 1971**

TES **TRIAXIAL COMPRESSION TEST REPORT**





**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.36 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| Test No.                        |                               | 1               | 2      | 3      | Avg.   |
|---------------------------------|-------------------------------|-----------------|--------|--------|--------|
| Initial                         | Water content                 | $w_o$ 33.1 %    | 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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           | 0.116  | 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   |        |

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**

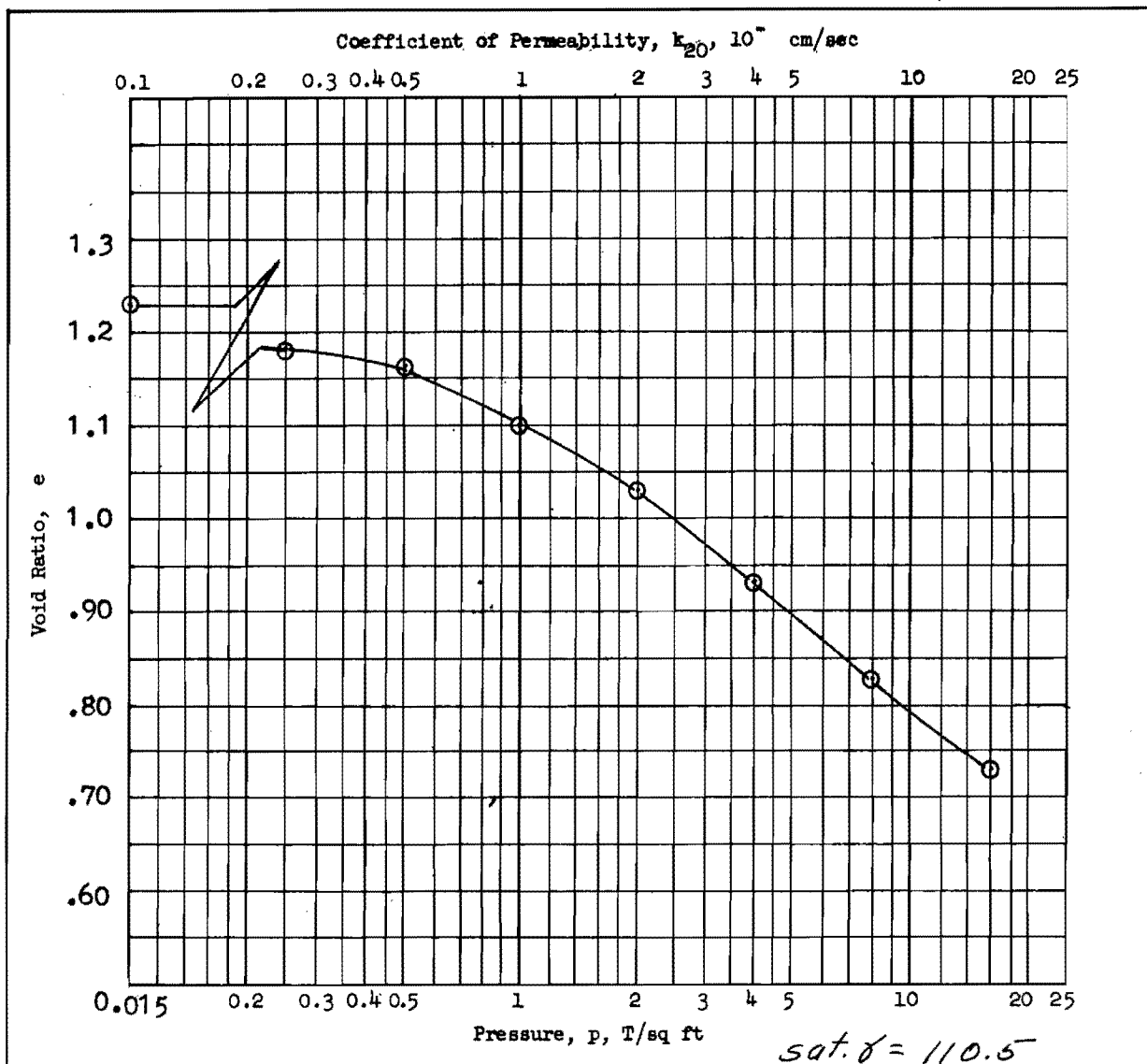
**LAKEFRONT LEVEE, WEST OF IHNC, GDM#2, SUPP.#5,**

Area **OUTFALL CANALS.**

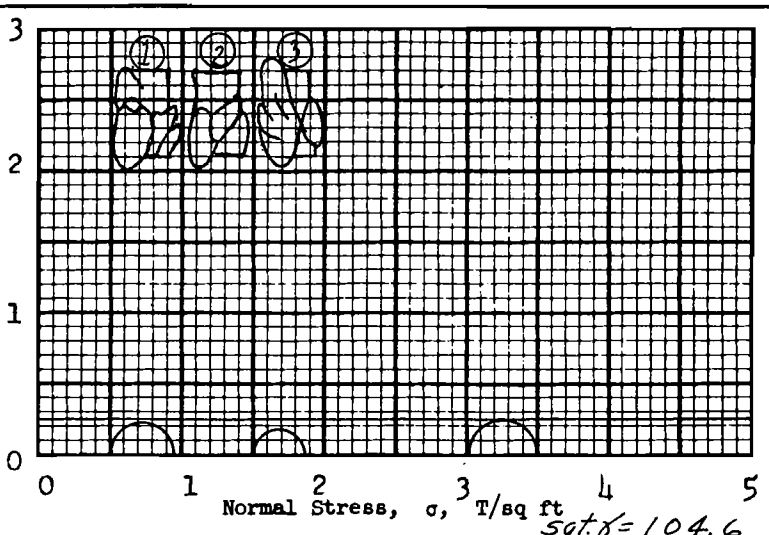
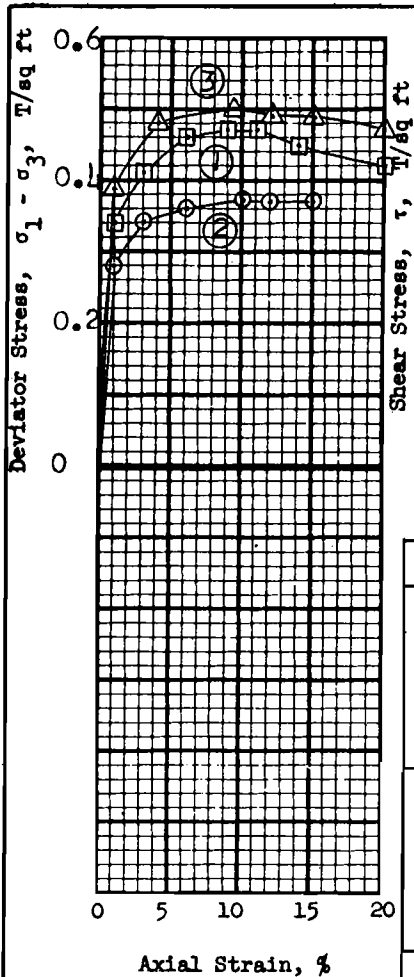
Boring No. **2-MUE**      Sample No. **6-B**

Depth **- 10.0**      Date **10 March, 1971**

FAM      TRIAXIAL COMPRESSION TEST REPORT



|   |                   |   |                         |            |   |
|---|-------------------|---|-------------------------|------------|---|
| Type of Specimen <b>UNDISTURBED</b>                         |                   | 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, $p_c$ 0.9 T/sq ft                      |                   | Saturation, $S_o$   | 95.4 %                  | $S_f$      | % |
| Compression Index, $C_c$ 0.35                               |                   | Dry Density, $\gamma_d$   | 76.0 lb/ft <sup>3</sup> |            |   |
| Classification <b>SILTY CLAY (CL), *</b>                    |                   | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec   |                         |            |   |
| LL -  | $G_s$ 2.72 From Q | Project LK. PONT., LA. VIC. ('71); ORLEANS<br>PARISH LAKEFRONT LEVEE, WEST OF IHNC; GDM #2;<br>SUPP. #5, OUTFALL CANALS |                         |            |   |
| PL -  | $D_{10}$          |   |                         |            |   |
| *<br>Remarks <b>gray, contains pockets<br/>of clay (CH)</b> |                   | Boring No. 2-MUE  | Sample No. 6-B          |            |   |
|   |                   | Depth -10.0<br>El   | Date 26 March, 1971     |            |   |
| <b>JDB CONSOLIDATION TEST REPORT</b>                        |                   |   |                         |            |   |



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.24 \text{ T/sq ft}$   
 Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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   |        |

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**

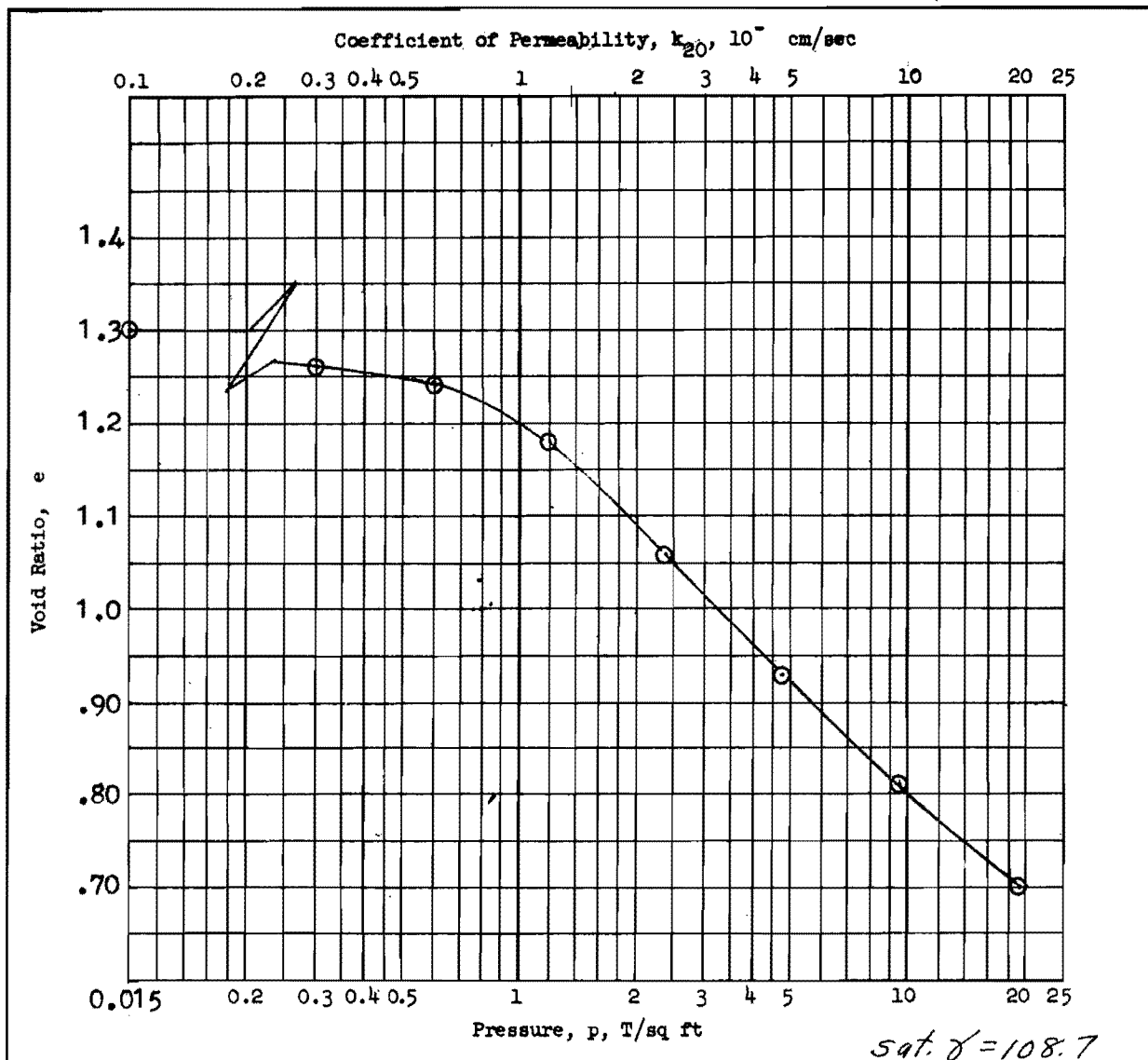
**LK. FT. LEVEE, WEST OF IHNC, GDM#2, SUPP. # 5,**

Area **OUTFALL CANALS**

Boring No. **2-MUE** | Sample No. **6-D**

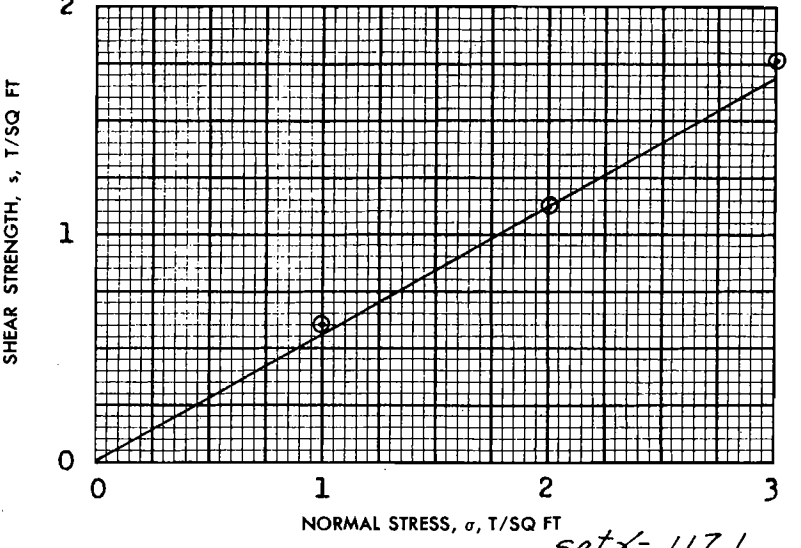
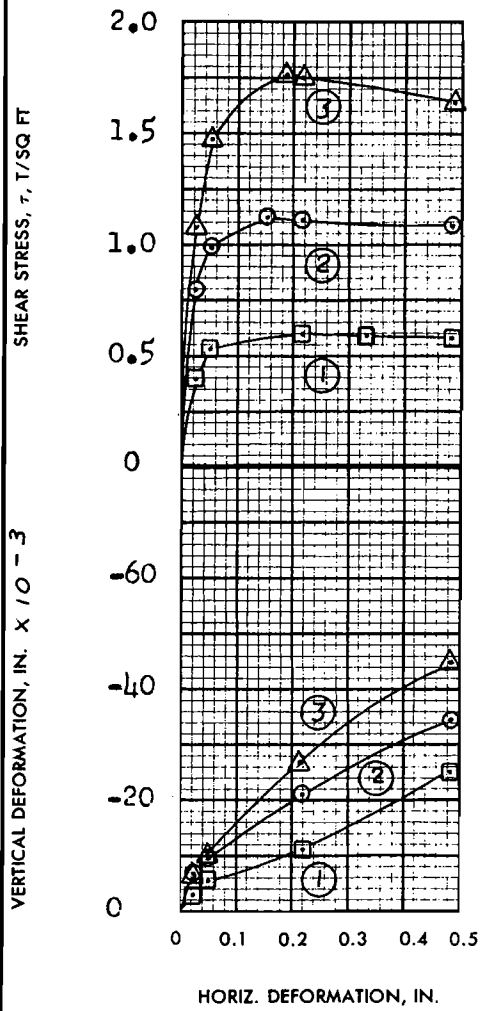
Depth **- 11.8** | Date **11 March, 1971**

OHR TRIAXIAL COMPRESSION TEST REPORT



sat.  $\gamma = 108.7$

|                                      |              |  |                         |            |   |
|--------------------------------------|--------------|--|-------------------------|------------|---|
| Type of Specimen <b>UNDISTURBED</b>  |              | 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, $\gamma_d$                      | 73.4 lb/ft <sup>3</sup> |            |   |
| Classification Alternating 1/16" *   |              | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec  |                         |            |   |
| LL 50                                | $G_s$ 2.71   | Project LK. PONT., LA. & VIC. ('71); ORLEANS |                         |            |   |
| PL 18                                | $D_{10}$     | PARISH LAKEFRONT LEVEE, WEST OF IHNC;        |                         |            |   |
| * Remarks strata of PLASTIC CLAY     |              | GDM #2; SUPP. #5; OUTFALL CANALS             |                         |            |   |
| (CH) and SILT (ML), gray             |              | Boring No. 2-MUE                             | Sample No. 8-D          |            |   |
|                                      |              | Depth El -19.8                               | Date 26 March, 1971     |            |   |
| <b>JDB CONSOLIDATION TEST REPORT</b> |              |  |                         |            |   |



**SHEAR STRENGTH PARAMETERS**

$\phi' = 30^\circ$

$\tan \phi' = 0.560$

$c' = 0$  T/SQ FT

CONTROLLED STRESS

CONTROLLED STRAIN

| 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 $\gamma_d$ | 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 $\sigma$                 |                                  | 1.0    | 2.0    | 3.0    |       |
| MAXIMUM SHEAR STRESS, T/SQ FT $\tau_{max}$      |                                  | 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 $\tau_{ult}$     |                                  |        |        |        |       |

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 \_\_\_\_\_

PROJECT **LK. PONT. LA. & VIC. (71) ORLEANS PARISH LAKE-FRONT LEVEE, WEST OF IHNC, GDM # 2, SUPP. # 5,**

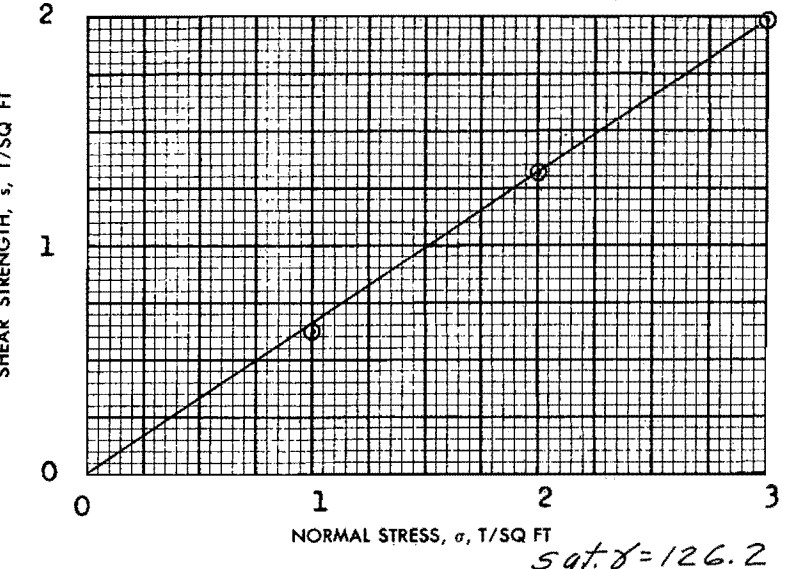
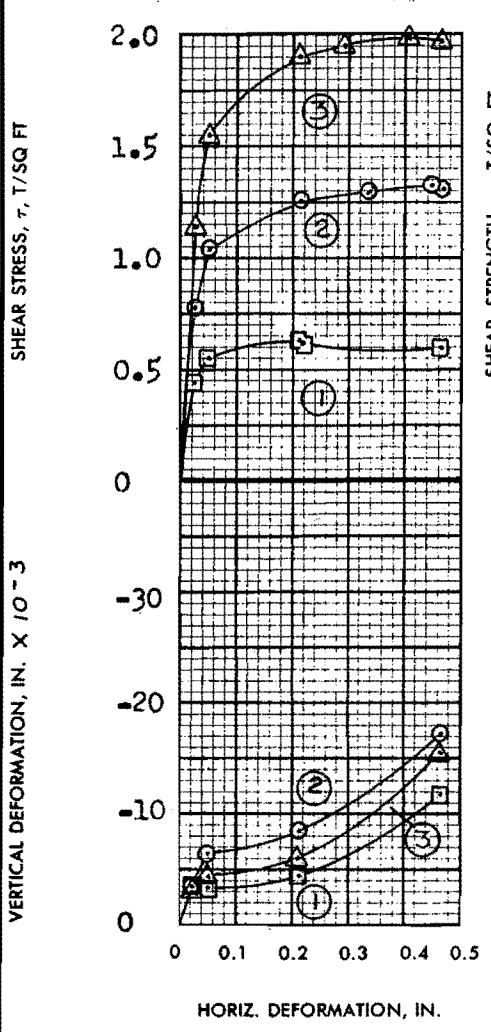
AREA **OUTFALL CANALS**

BORING NO. **2-MUE** SAMPLE NO. **9-D**

DEPTH EL **- 23.8** DATE **22 March 1971**

F 88

**DIRECT SHEAR TEST REPORT**



**SHEAR STRENGTH PARAMETERS**

$\phi' = 33^\circ$

$\text{TAN } \phi' = 0.660$

$c = 0$  T/SQ FT

CONTROLLED STRESS

CONTROLLED STRAIN

| 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 $\gamma_d$ | 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 $\sigma$                 |                                  | 1.0    | 2.0    | 3.0    |        |
| MAXIMUM SHEAR STRESS, T/SQ FT $\tau_{max}$      |                                  | 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 $\tau_{ult}$     |                                  |        |        |        |        |

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 \_\_\_\_\_

PROJECT **LK. PONT. LA., & VIC. (71) ORLEANS PARISH**

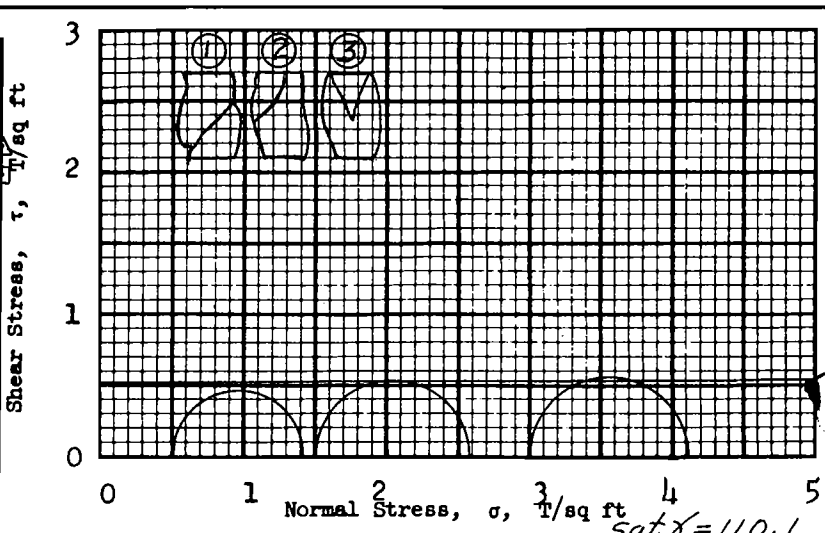
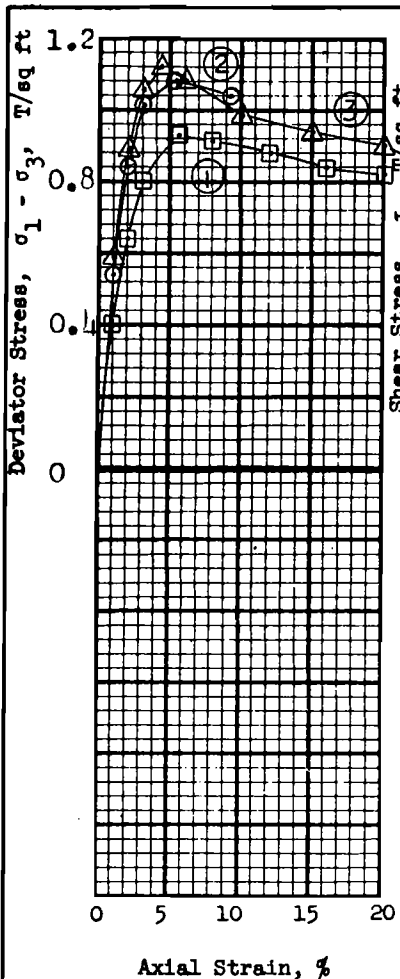
**LKFRNT. LEVEE, WEST OF IHNC, GDM # 2, SUPP. # 5,**

AREA **OUT FALL CANALS**

BORING NO. **2-MUE**      SAMPLE NO. **13-D**

DEPTH **- 40.0**      DATE **23 March 1971**

**F89**      **GDA DIRECT SHEAR TEST REPORT**



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.52 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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**

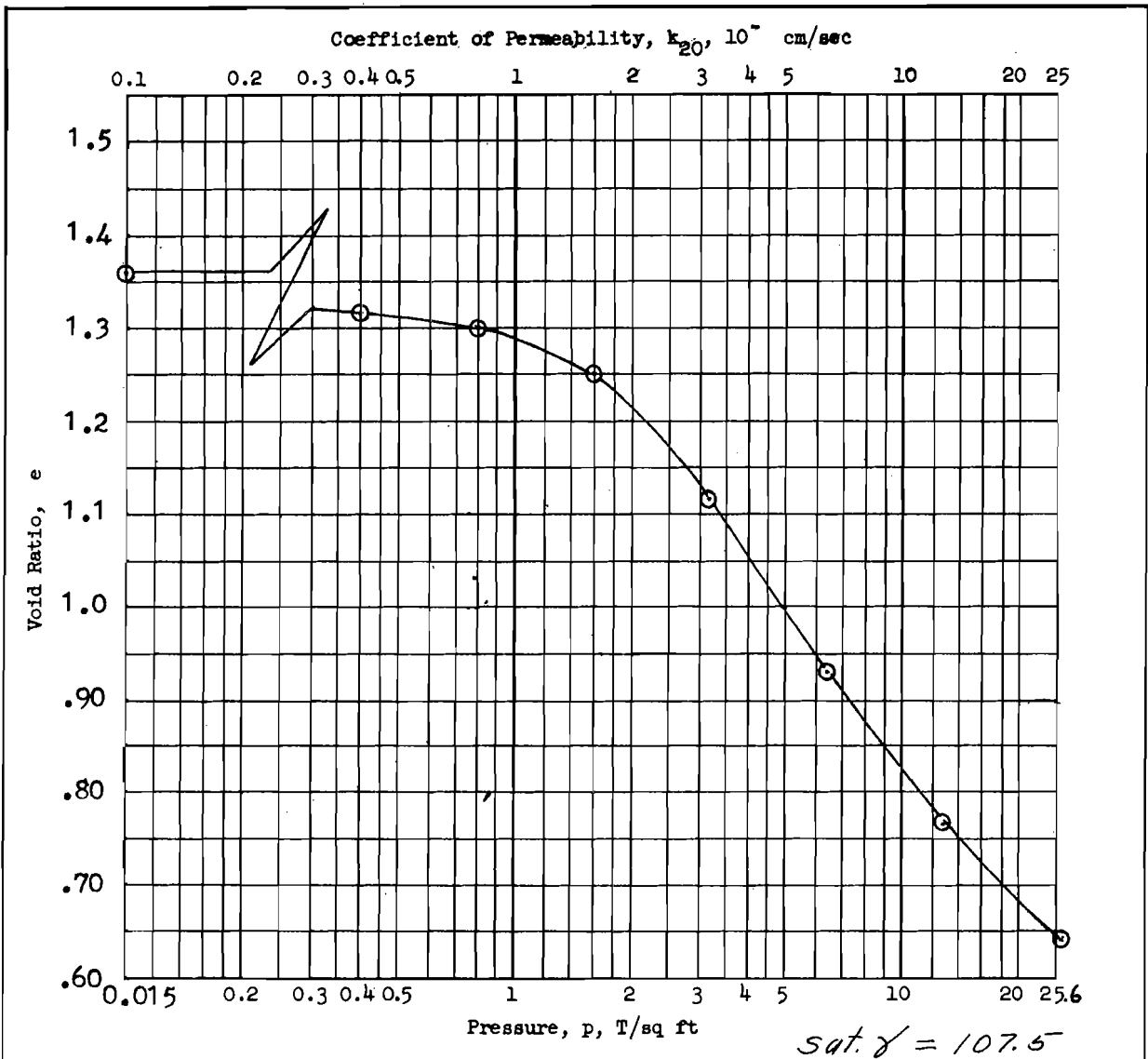
**LAKEFRONT LEVEE, WEST OF IHNG, GDM # 2, SUPP.**

Area **# 5, OUTFALL CANALS**

Boring No. **2-MUE**      Sample No. **16-A**

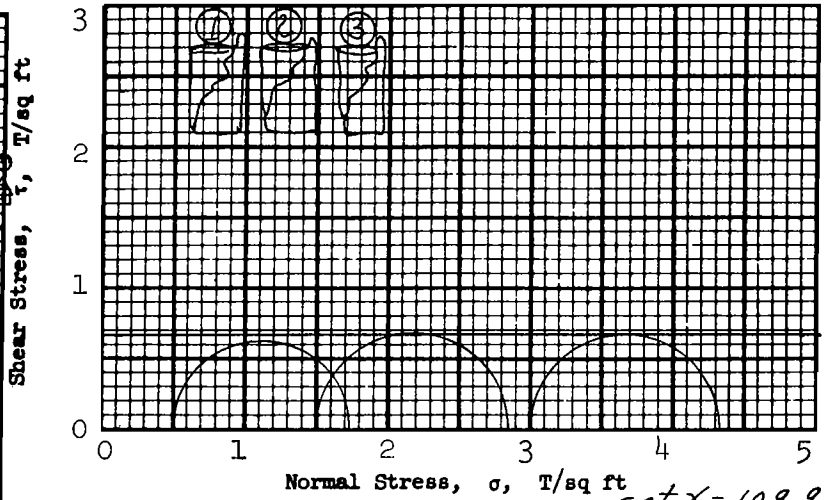
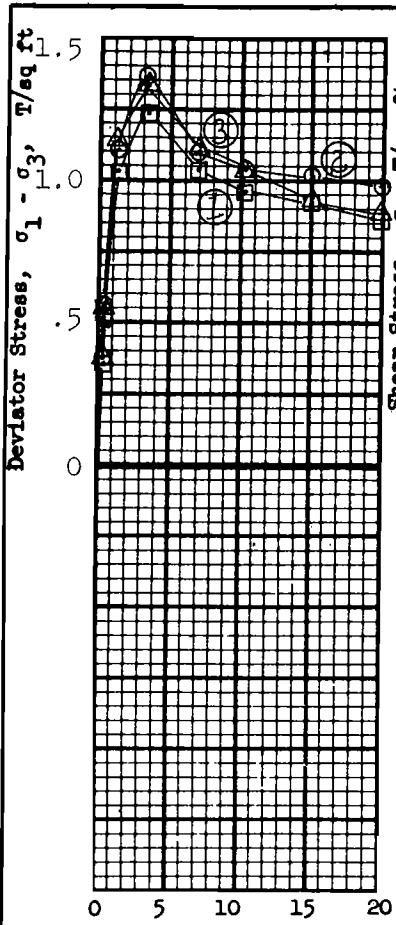
Depth **- 49.3**      Date **11 March, 1971**

**JMS TRIAXIAL COMPRESSION TEST REPORT**



|  |   |   |                         |            |   |
|--|---|---|-------------------------|------------|---|
| Type of Specimen <b>UNDISTURBED</b>      |   | 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, $\gamma_d$                       | 71.5 lb/ft <sup>3</sup> |            |   |
| Classification <b>PLASTIC CLAY (CH)*</b> | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec |   |                         |            |   |
| LL -                                     | $G_s$ 2.71 From Q                           | Project LK. PONT., LA. & VIC. - (171) ORLEANS |                         |            |   |
| PL -                                     | $D_{10}$                                    | PARISH LAKEFRONT LEVEE, WEST OF IHNC, GDM #2, |                         |            |   |
| *<br>Remarks grayish-green, contains     |   | SUPP. #5, OUTFALL CANALS                      |                         |            |   |
| small shell fragments                    |   | Boring No. 2-MUE                              | Sample No. 16-A         |            |   |
|  |   | Depth -<br>El -49.3                           | Date 26 March, 1971     |            |   |
| <b>JDB CONSOLIDATION TEST REPORT</b>     |   |   |                         |            |   |





**Shear Strength Parameters**

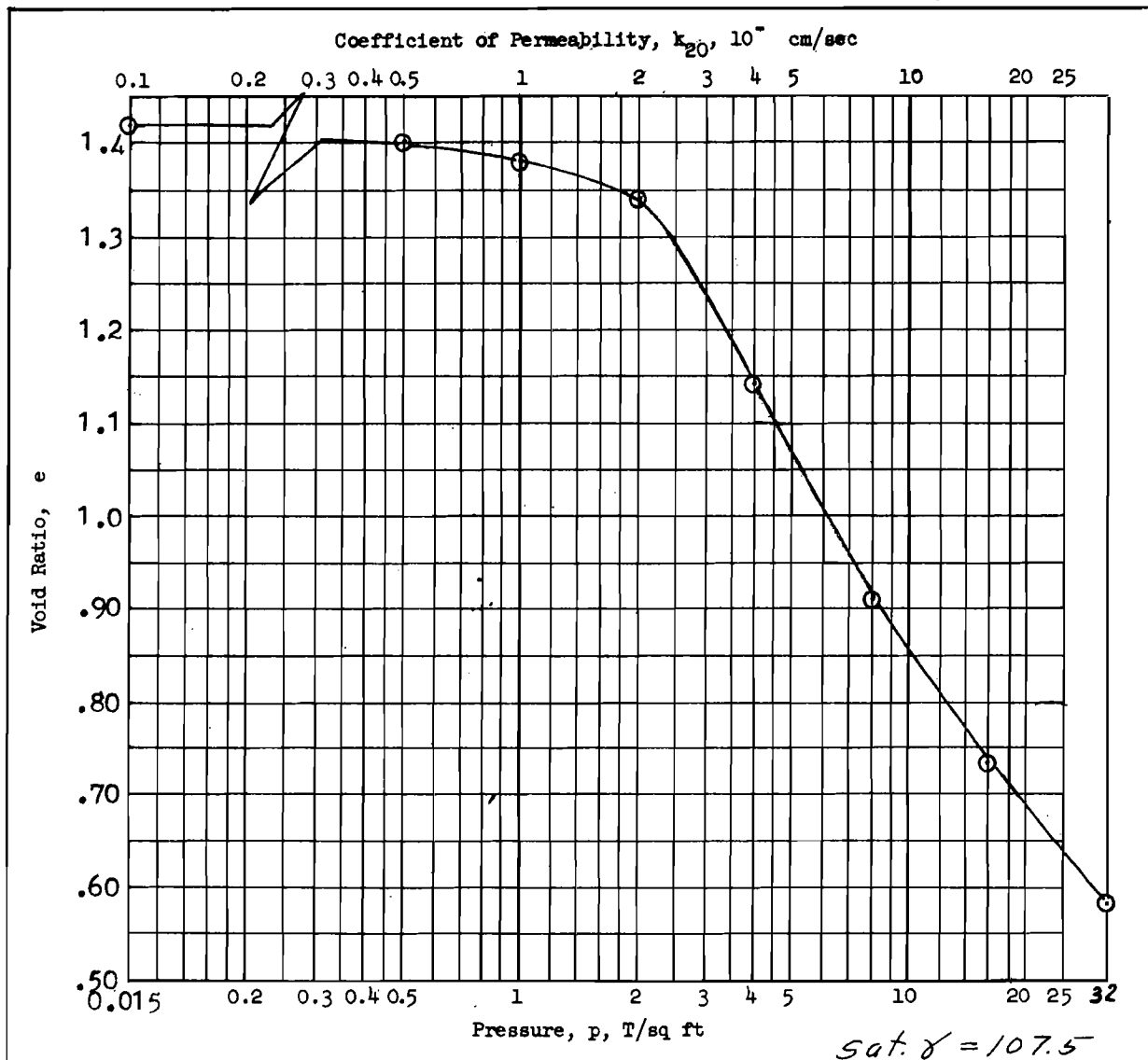
$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.67 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

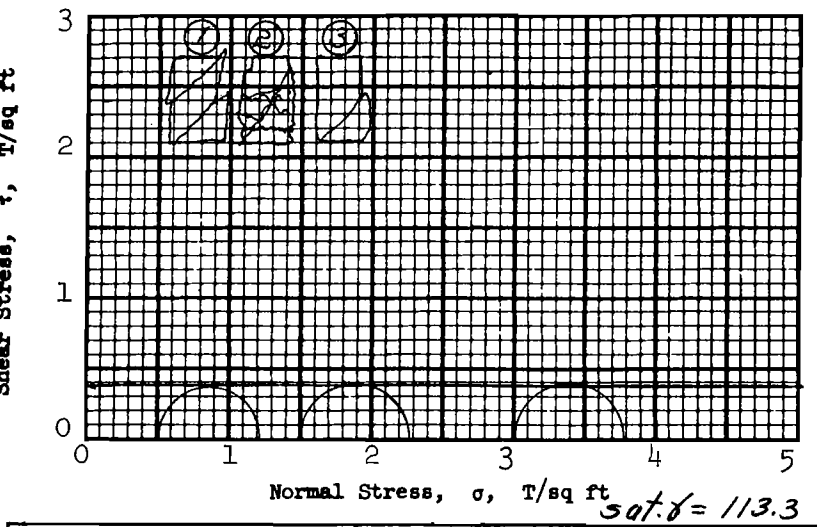
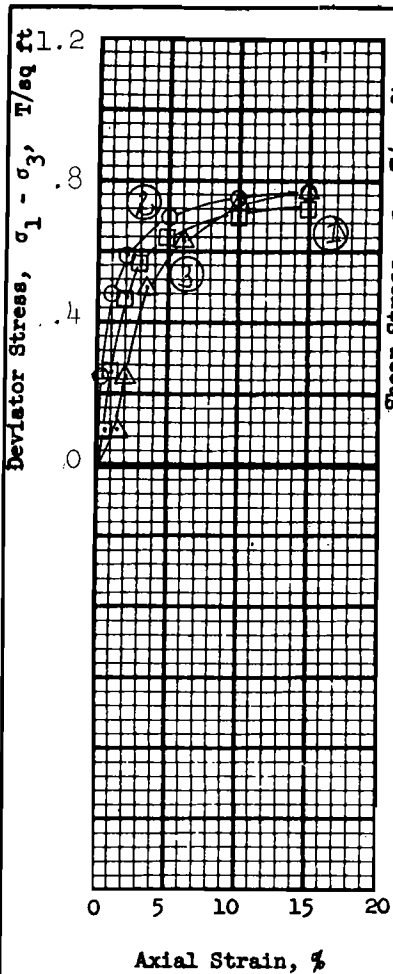
| Test No.                        |                               | 1               | 2      | 3      | Avg.   |
|---------------------------------|-------------------------------|-----------------|--------|--------|--------|
| Initial                         | Water content                 | $w_o$ 46.6 %    | 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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  | -62.2            | Date        | 11 March 1971 |
|                | TES TRIAXIAL COMPRESSION TEST REPORT                         |                  |             |               |



*sat.  $\gamma = 107.5$*

|   |                   |  |                         |            |   |
|---|-------------------|--|-------------------------|------------|---|
| Type of Specimen <b>UNDISTURBED</b>       |                   | 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, $\gamma_d$                      | 70.8 lb/ft <sup>3</sup> |            |   |
| Classification <b>PLASTIC CLAY (CH) *</b> |                   | $k_{20}$ at $e_o =$ $\times 10^{-7}$ cm/sec  |                         |            |   |
| LL -                                      | $G_s$ 2.75 From Q | Project LK. PONT., LA. & VIC. ('71); ORLEANS |                         |            |   |
| PL -                                      | $D_{10}$          | PARISH LAKEFRONT LEVEE, WEST OF IHNC;        |                         |            |   |
| *<br>Remarks <b>gray</b>                  |                   | GDM #2; SUPP. #5; OUTFALL CANALS             |                         |            |   |
|   |                   | Boring No. 2-MUE                             | Sample No. 19-B         |            |   |
|   |                   | Depth-<br>El -62.2                           | Date 29 March, 1971     |            |   |
| <b>JDB CONSOLIDATION TEST REPORT</b>      |                   |  |                         |            |   |



**Shear Strength Parameters**

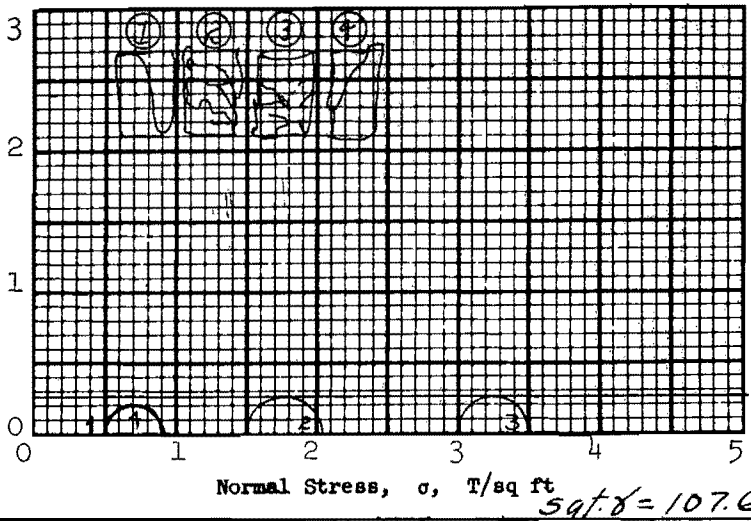
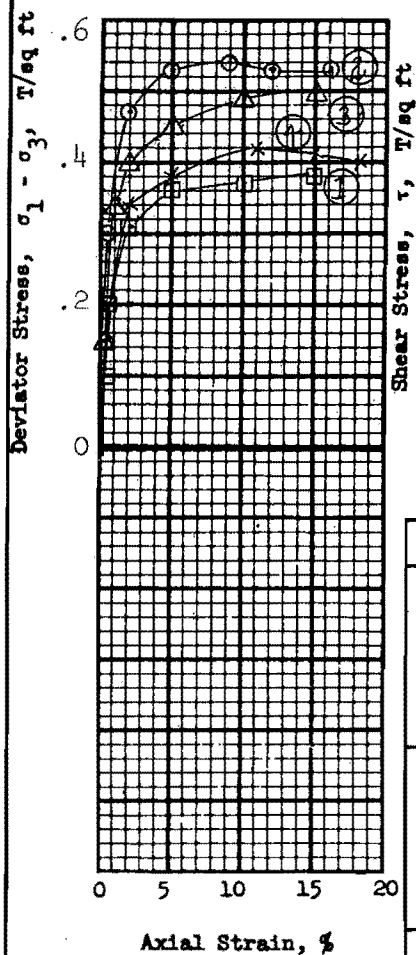
$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.38$  T/sq ft

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        | $\gamma_d$ 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                                       |                              | $\sigma_3$ 0.5  | 1.5    | 3.0    |        |
| Max deviator stress, T/sq ft ( $\sigma_1 - \sigma_3$ ) <sub>max</sub> |                              | 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 ( $\sigma_1 - \sigma_3$ ) <sub>ult</sub> |                              |                 |        |        |        |
| 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 <sub>s</sub> 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                                   |                              |   |                     |



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.24 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| Test No.     |   | 1               | 2      | 3      | 4      | Avg. |
|--------------|---|-----------------|--------|--------|--------|------|
| Initial      | Water content   | $w_o$ 48.9 %    | 45.2 % | 46.6 % | 52.4 % | 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   | $\gamma_d$ 71.7 | 74.7   | 73.1   | 67.6   |      |
| Before Shear | Water content   | $w_c$ %         | %      | %      | %      |      |
|              | Void ratio  | $e_c$           |        |        |        |      |
|              | Saturation  | $S_c$ %         | %      | %      | %      |      |
| Final        | Final back pressure, T/sq ft  | $u_o$           |        |        |        |      |
|              | Water content   | $w_f$ %         | %      | %      | %      |      |
|              | Void ratio  | $e_f$           |        |        |        |      |
|              | Minor principal stress, T/sq ft                                       | $\sigma_3$ 0.5  | 1.5    | 3.0    | 0.5    |      |
|              | Max deviator stress, T/sq ft ( $\sigma_1 - \sigma_3$ ) <sub>max</sub> | 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 ( $\sigma_1 - \sigma_3$ ) <sub>ult</sub> |                 |        |        |        |      |
|              | 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   |      |

Type of test Q Type of specimen UNDISTURBED

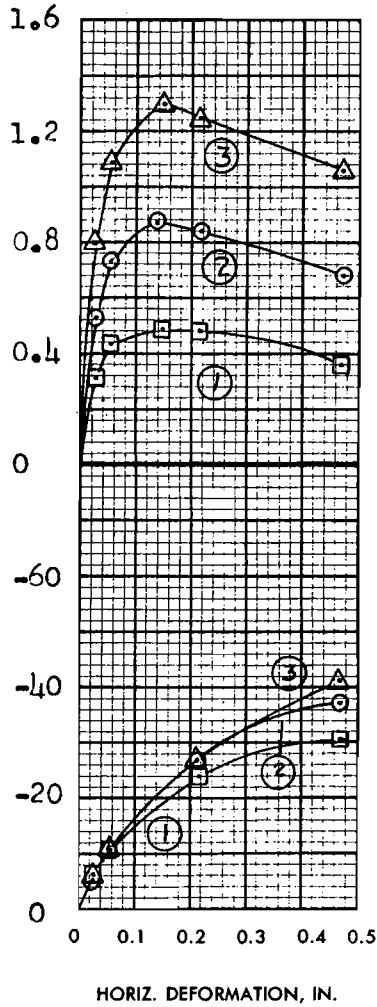
Classification PLASTIC CLAY(CH), gray, contains rootlets and organic matter\*

LL 86 PL 21 PI 65  $G_s$  2.70

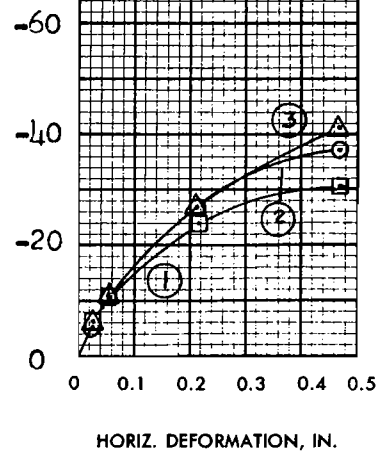
Remarks \*slickensided  
 Strength of test specimen \_\_\_\_\_  
#1 too low to plot  
 \_\_\_\_\_  
 \_\_\_\_\_

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 E1 -4.0 Date 23 March 1971  
 OHR TRIAXIAL COMPRESSION TEST REPORT

SHEAR STRESS,  $\tau$ , T/SQ FT



VERTICAL DEFORMATION, IN. X 10<sup>-3</sup>

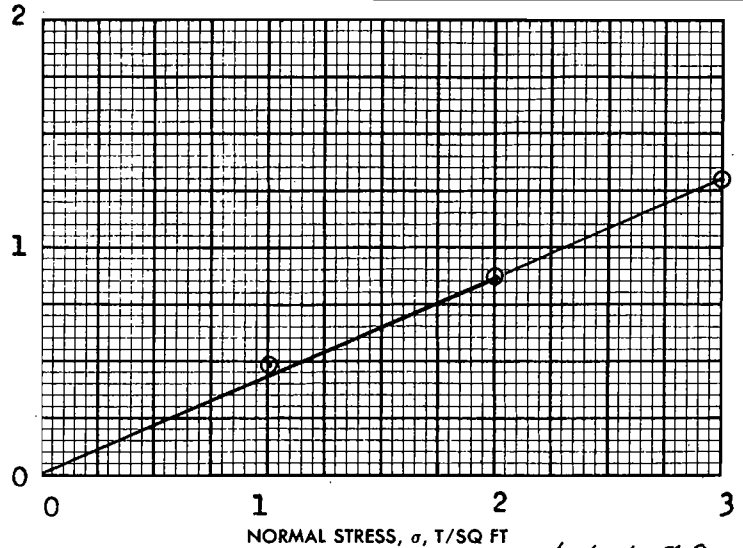


**SHEAR STRENGTH PARAMETERS**

$\phi' = 24^\circ$   
 $\tan \phi' = 0.435$   
 $c' = 0$  T/SQ FT

- CONTROLLED STRESS
- CONTROLLED STRAIN

SHEAR STRENGTH,  $s$ , T/SQ FT



| 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 | $\gamma_d$ 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                 |                       | $\sigma$        | 1.0    | 2.0    | 3.0    |
| MAXIMUM SHEAR STRESS, T/SQ FT          |                       | $\tau_{max}$    | 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         |                       | $\tau_{ult}$    |        |        |        |

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 \_\_\_\_\_

PROJECT **LK. PONT. LA., & VIC. - HURR. PROT. - ORLEANS**

PARISH **LKFRNT. LEV., WEST OF IHNC-GDM # 2, SUPP.**

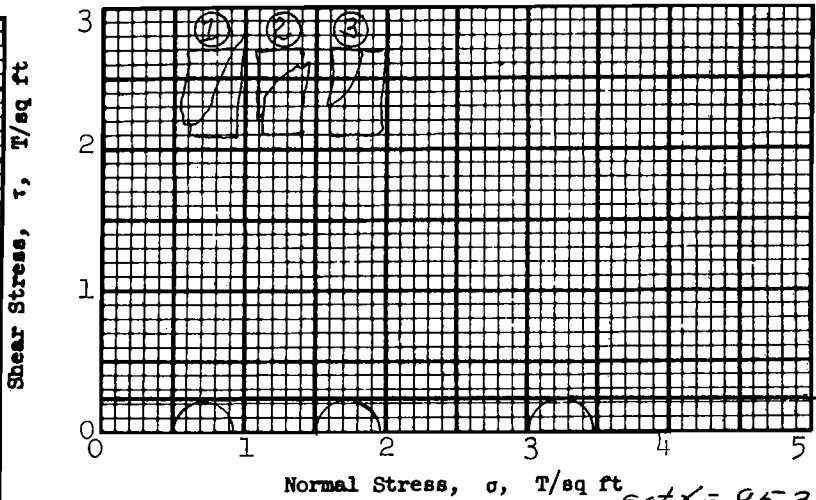
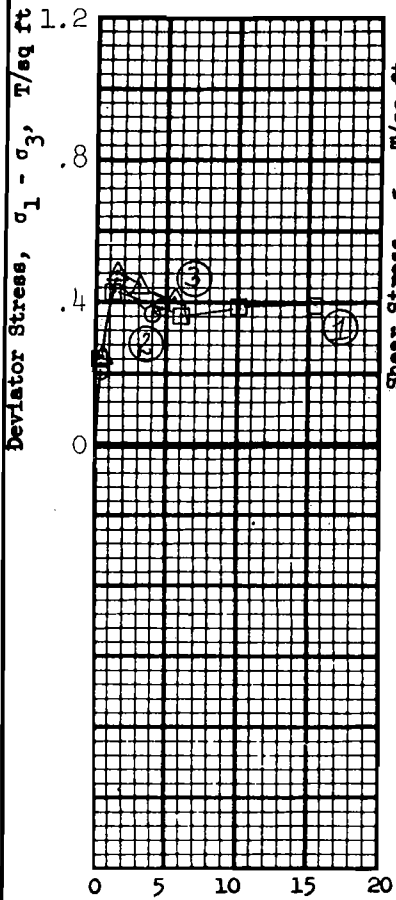
AREA **# 5, OUTFALL CANALS (ALONG 17th ST. CANAL) 1971**

BORING NO. **1-MUW** SAMPLE NO. **3-D**

DEPTH-EL **- 4.8** DATE **25 March 1971**

GDA **DIRECT SHEAR TEST REPORT**

F96



**Shear Strength Parameters**

$\phi = \frac{0}{0}^\circ$   
 $\tan \phi = \frac{0}{0}$   
 $c = \frac{0.23}{1} \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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        | $\gamma_d$ 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                                       |                              | $\sigma_3$ 0.5  | 1.5    | 3.0    |        |
| Max deviator stress, T/sq ft ( $\sigma_1 - \sigma_3$ ) <sub>max</sub> |                              | 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 ( $\sigma_1 - \sigma_3$ ) <sub>ult</sub> |                              |                 |        |        |        |
| 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 UNDIS TURBED

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

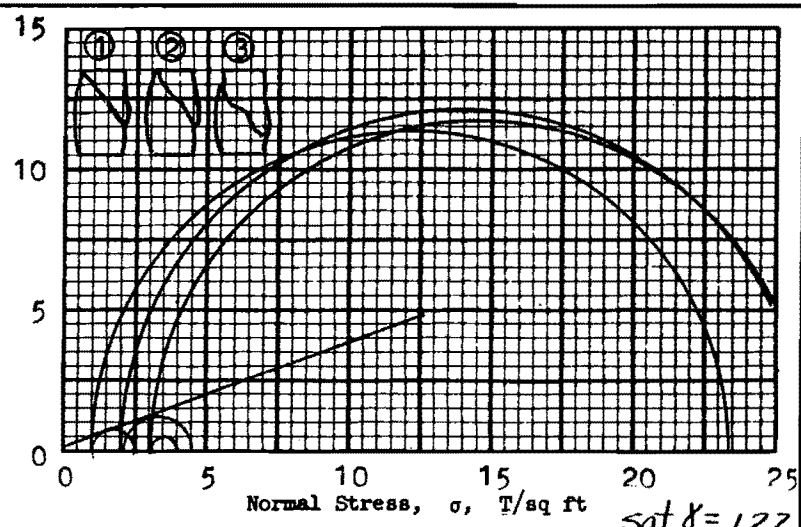
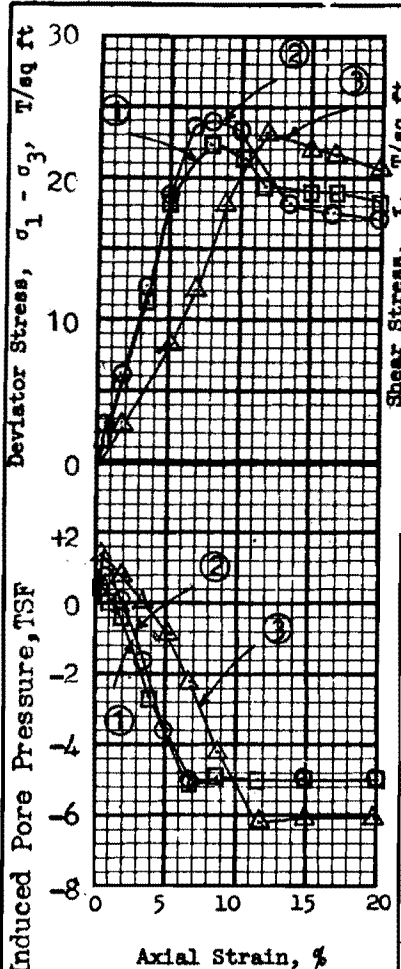
PAR. LKFRNT. LEV., WEST OF IHNC-GDM #2, SUPP. #5,

Area OUTFALL CANALS (ALONG 17th ST. CANAL) 1971

Boring No. 1-MUW      Sample No. 5-D

Depth -13.0      Date 23 March 1971

JMS TRIAXIAL COMPRESSION TEST REPORT



**Shear Strength Parameters**

$\phi = 21^\circ$

$\tan \phi = .384$

$c = .1 \text{ T/sq ft}$

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 % | %      |
| Before Shear | Dry density, lb/cu ft                                      | $\gamma_d$ 94.5 | 94.5   | 95.6   |        |
|              | 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.                                     | $\gamma_d$ 96.3 | 95.8   | 98.9   |        |
|              | Void ratio   | $e_f$           |        |        |        |
|              | Minor principal stress, T/sq ft                            | $\sigma_3$ 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 IHNG; GDM#2; SUPP.#5; OUTFALL CANALS (ALONG 17th. ST CANAL) '71

Boring No. 1-MUW Sample No. 10-D

Depth -33.0 Date 31 March, 1971

Sheet 1 of 2 JAL TRIAXIAL COMPRESSION TEST REPORT

Based on Max  $\sigma_1/\sigma_3$

$\phi =$

$\tan \phi =$

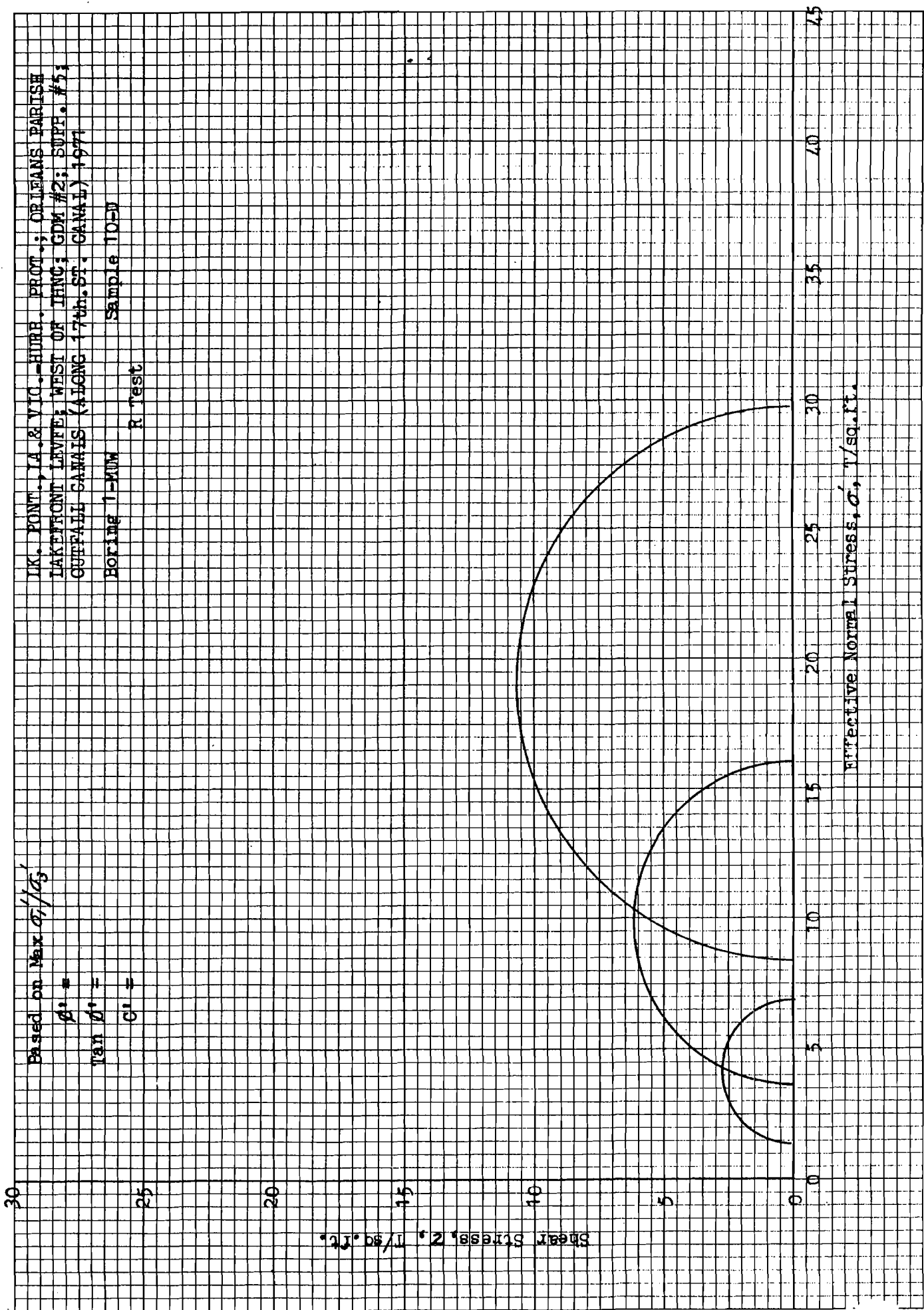
$c =$

IK. POINT, LA. & VIC. - HURB. PROT.; ORLEANS PARISH  
LAKEFRONT LEVEE; WEST OF JING; GDM #2; SUPP. #5;  
GULFALL CANALS (ALONG 17th. ST. CANAL) 1971

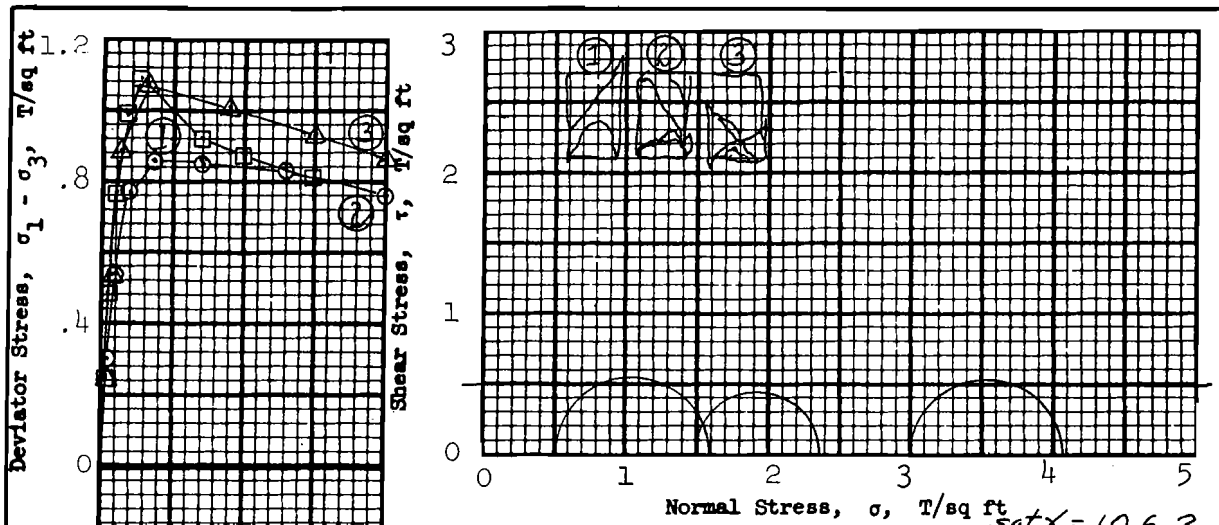
Boring 1-BUM

Sample 10-D

R test







**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.50 \text{ T/sq ft}$

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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  |       |

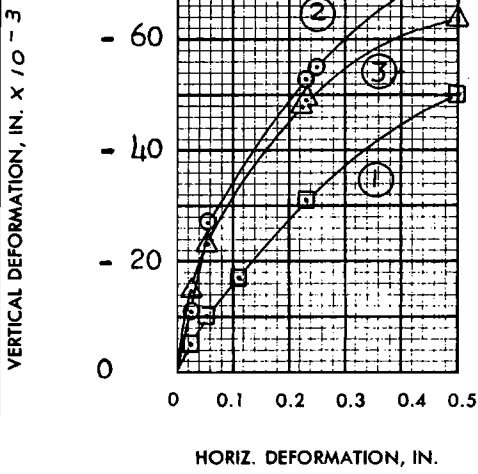
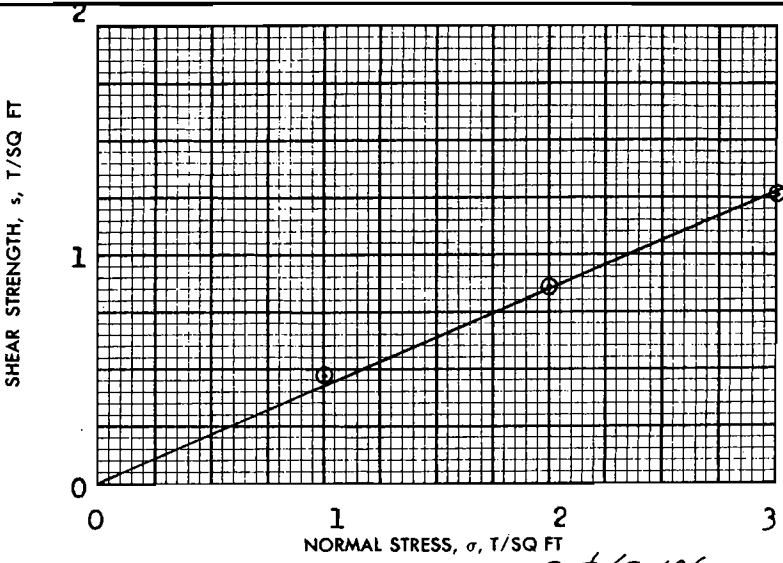
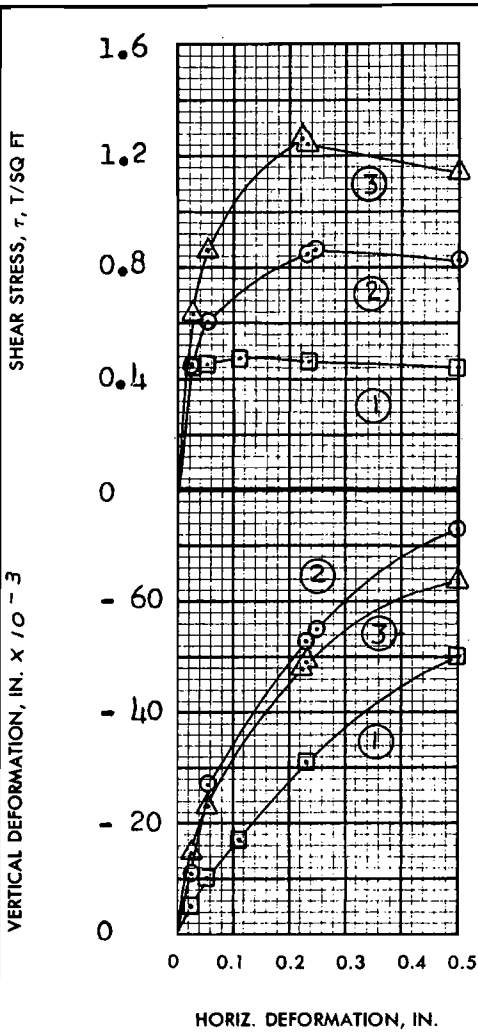
Type of test  $Q$       Type of specimen      **UNDISTURBED**

Classification **PLASTIC CIA Y(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 -56.2   | Date 23 March 1971 |
| E1<br>FAM <b>TRIAxIAL COMPRESSION TEST REPORT</b> |   |                    |

2000000 88100 1000 1000 1000



**SHEAR STRENGTH PARAMETERS**

$\phi' = 23^\circ$   
 $\tan \phi' = 0.430$   
 $c' = 0$  T/SQ FT

- CONTROLLED STRESS
- CONTROLLED STRAIN

| 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 | $\gamma_d = 69.3$   | $69.4$   | $69.0$   |          |
| 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                 |                       | $\sigma = 1.0$      | $2.0$    | $3.0$    |          |
| MAXIMUM SHEAR STRESS, T/SQ FT          |                       | $\tau_{max} = 0.47$ | $0.86$   | $1.26$   |          |
| ACTUAL TIME TO FAILURE, MIN            |                       | $t_f = 660$         | $1410$   | $1260$   |          |
| RATE OF STRAIN, IN./MIN                |                       | $.00018$            | $.00018$ | $.00018$ |          |
| ULTIMATE SHEAR STRESS, T/SQ FT         |                       | $\tau_{ult}$        |          |          |          |

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 \_\_\_\_\_

PROJECT **LK. PONT. LA., & VIC-HURR. PROT.-ORLEANS**

PARISH **LKFRNT. LEV., WEST OF IHNC-GDM#2, SUPP.#5,**

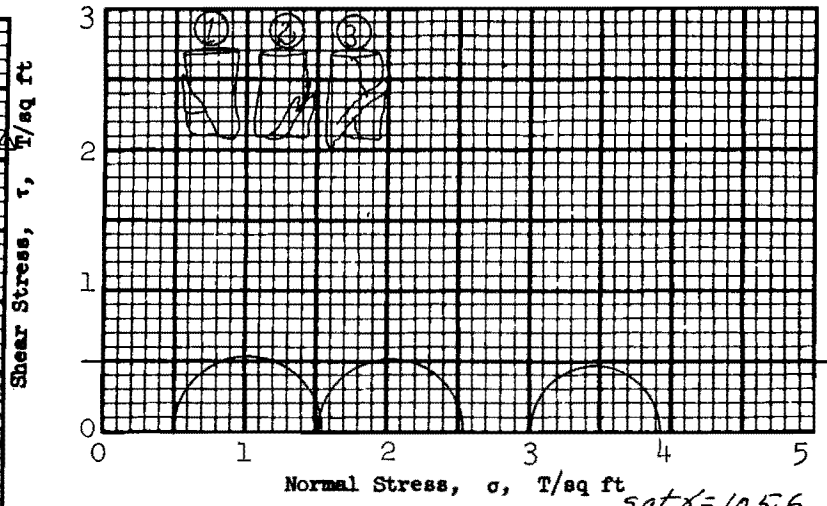
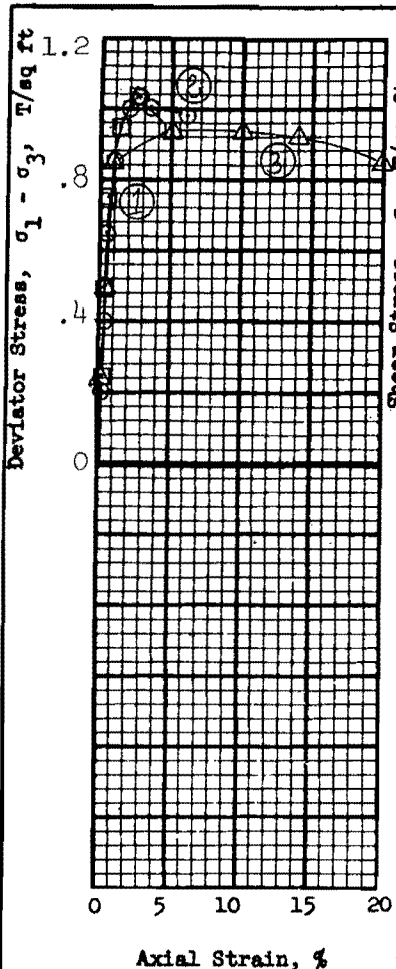
AREA **OUTFALL CANALS (ALONG 17th ST. CANAL) 1971**

BORING NO. **1-MUW** SAMPLE NO. **17-B**

DEPTH-EL **- 59.3** DATE **25 March 1971**

F 101

**BWG DIRECT SHEAR TEST REPORT**



**Shear Strength Parameters**

$\phi = 0^\circ$   
 $\tan \phi = 0$   
 $c = 0.50$  T/sq ft

Method of saturation \_\_\_\_\_

- Controlled stress
- Controlled strain

| 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         | $\gamma_d$ 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 | $\sigma_3$                    | 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   |        |

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 -61.2      Date 24 March 1971

OHR      TRIAXIAL COMPRESSION TEST REPORT