rps
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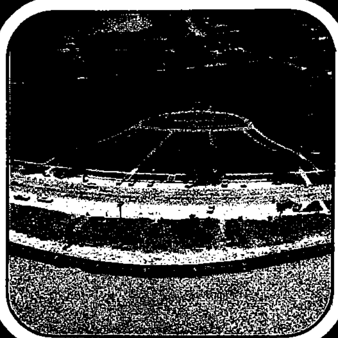

LAKE PONTCHARTRAIN, LA. AND VICINITY

LAKE PONTCHARTRAIN HIGH LEVEL PLAN

DESIGN MEMORANDUM NO. 13
GENERAL DESIGN

ORLEANS PARISH LAKEFRONT LEVEE WEST OF I.H.N.C.

IN TWO VOLUMES
VOLUME II

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
November, 1984

SERIAL NO. 66

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13 - GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF IHNC

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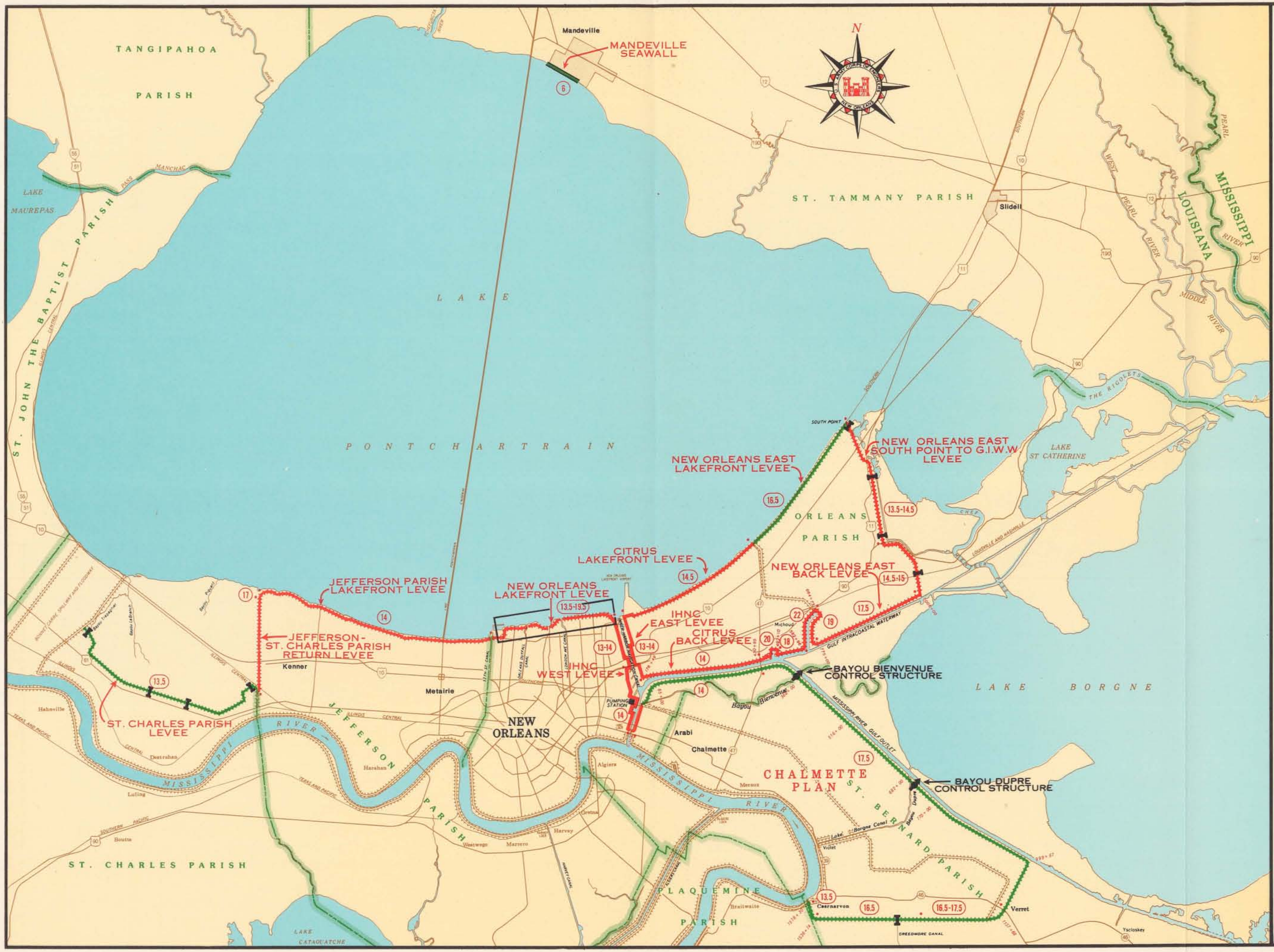
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13-GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF IHNC

PERTINENT DATA

Location of project	Southeastern Louisiana in Orleans Parish along south shore of Lake Pontchartrain from IHNC to Metairie Relief Canal
Datum Plane	National Geodetic Vertical Datum (NGVD)1/
Hydrologic data	
Temperature: Maximum monthly	90.6 degrees Fahrenheit
Minimum monthly	45.3 degrees Fahrenheit
Average annual	69.5 degrees Fahrenheit
Annual precipitation: Maximum	83.54 inches
Minimum	40.11 inches
Average	61.55 inches
Hydraulic design criteria-tidal	
Design hurricane-Standard Project Hurricane (SPH)	
Frequency	1 in 300 years
Central Pressure Index (CPI)	27.6 inches of mercury
Maximum 5-min. average wind speed	100 m.p.h.
Radius of maximum winds	30 miles
Average forward speed	6 knots
Stillwater level	11.5 feet
Levees	
Method of construction	Hauled, semi-compacted clay fill
Levee length (approx.)	4.36 miles (non-continuous)
Crown elevation (varies)	13.5' to 19.5'
Crown width	10 feet
Floodwalls (I and T)	
Floodwall length	1.25 miles (non-continuous)
Elevation (varies)	13.5' to 20.5'

1/ Elevations herein are in feet referred to National Geodetic Vertical Datum (NGVD) unless otherwise noted.



LEGEND

EXISTING IMPROVEMENTS

- LEVEE
- SEAWALL

AUTHORIZED IMPROVEMENTS

- NEW LEVEE
- ENLARGEMENT OF EXISTING LEVEE
- FLOODWALL IN EXISTING LEVEE
- SEAWALL STRENGTHENING
- DRAINAGE STRUCTURE
- STRUCTURE-NAVIGABLE
- PUMPING STATION
- (17) PROJECT GRADES
- 700 + 00 LEVEE STATION
- PARISH LINE
- STATE LINE
- LOCATION OF WORK COVERED IN THIS DOCUMENT

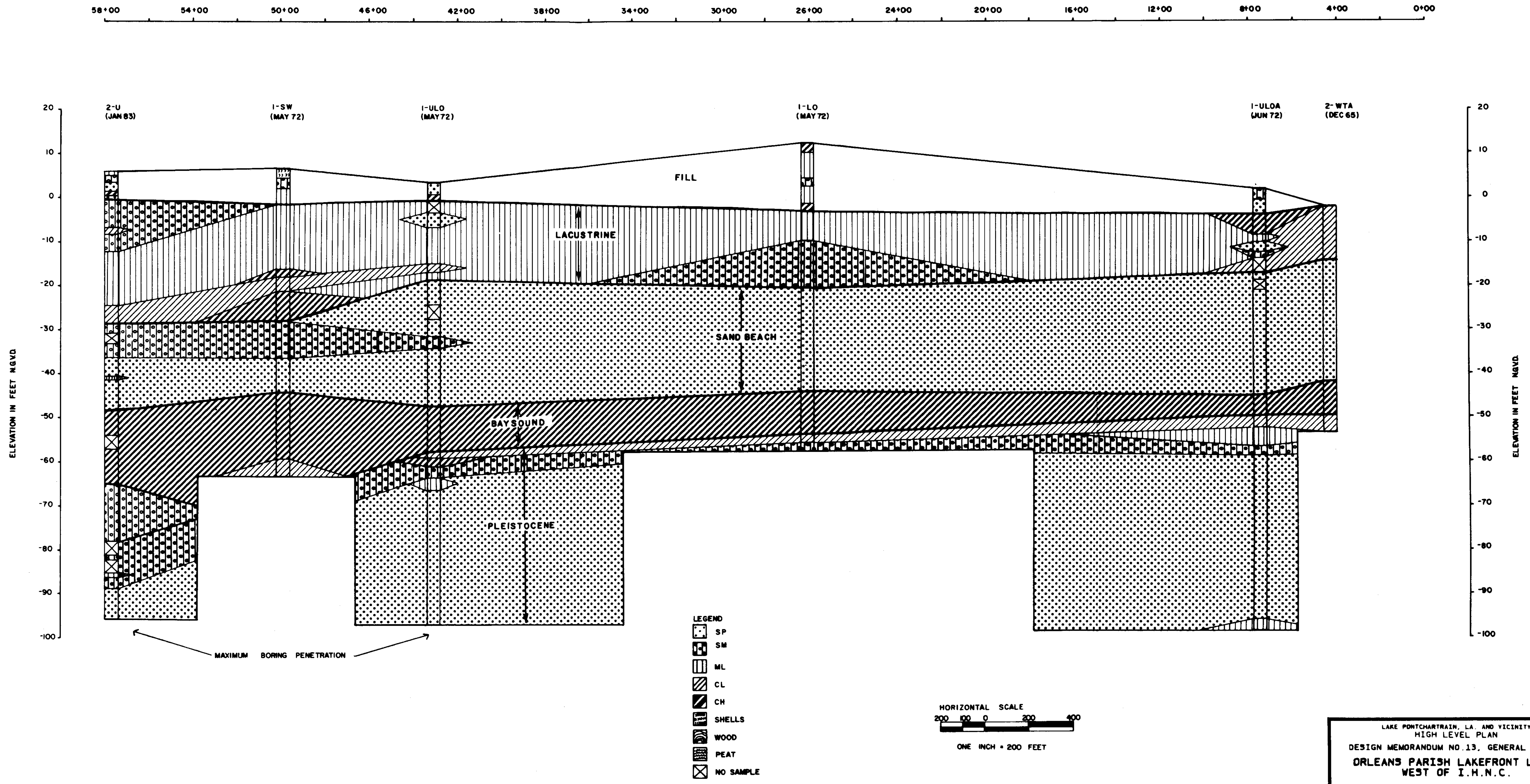
SCALE OF MILES
1 0 1 2 3 4 5

LAKE PONTCHARTRAIN, LA. AND VICINITY
HURRICANE PROTECTION

AUTHORIZED PLAN OF PROTECTION

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

FILE NO. H-4-29540



LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

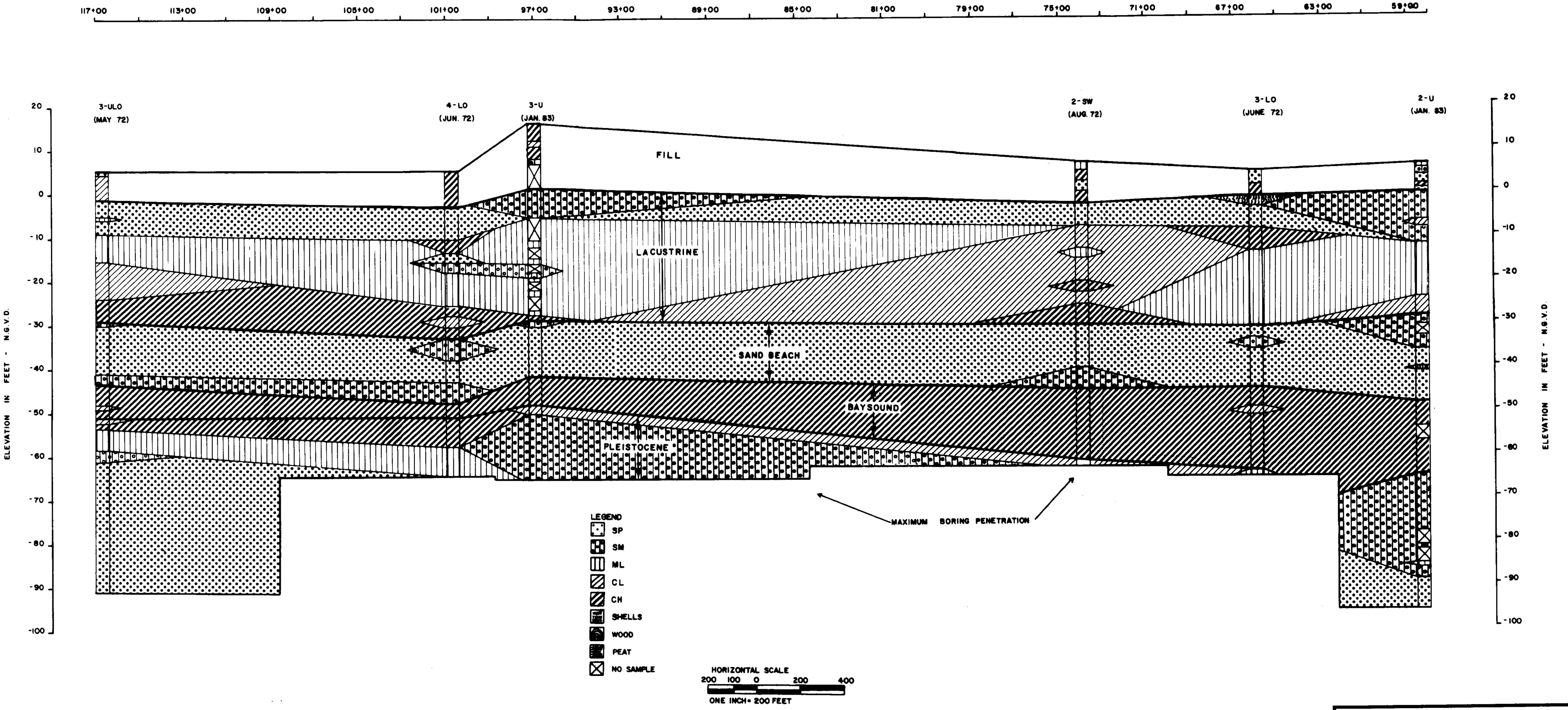
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN

ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

SOIL AND GEOLOGIC PROFILE
STA. 0+00 TO STA. 58+00 B/L

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

NOVEMBER 1984 FILE NO. H-2-29536



LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

DESIGN MEMORANDUM NO.13, GENERAL DESIGN

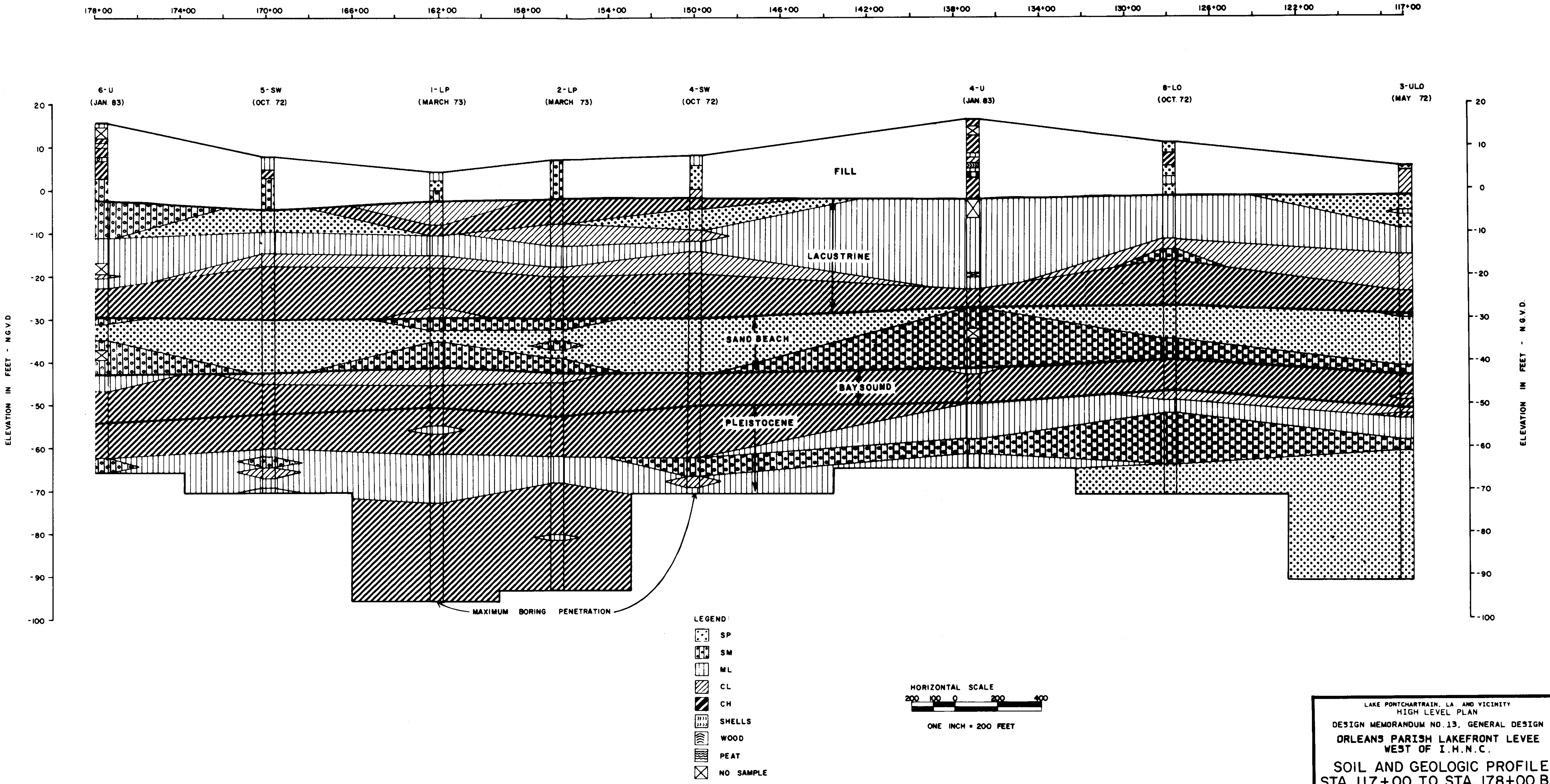
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

SOIL AND GEOLOGIC PROFILE
STA. 58+00 TO STA. 117+00 B/L

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

NOVEMBER 1984 FILE NO. H-2-29536

PLATE 60



LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

DESIGN MEMORANDUM NO. 13, GENERAL DESIGN

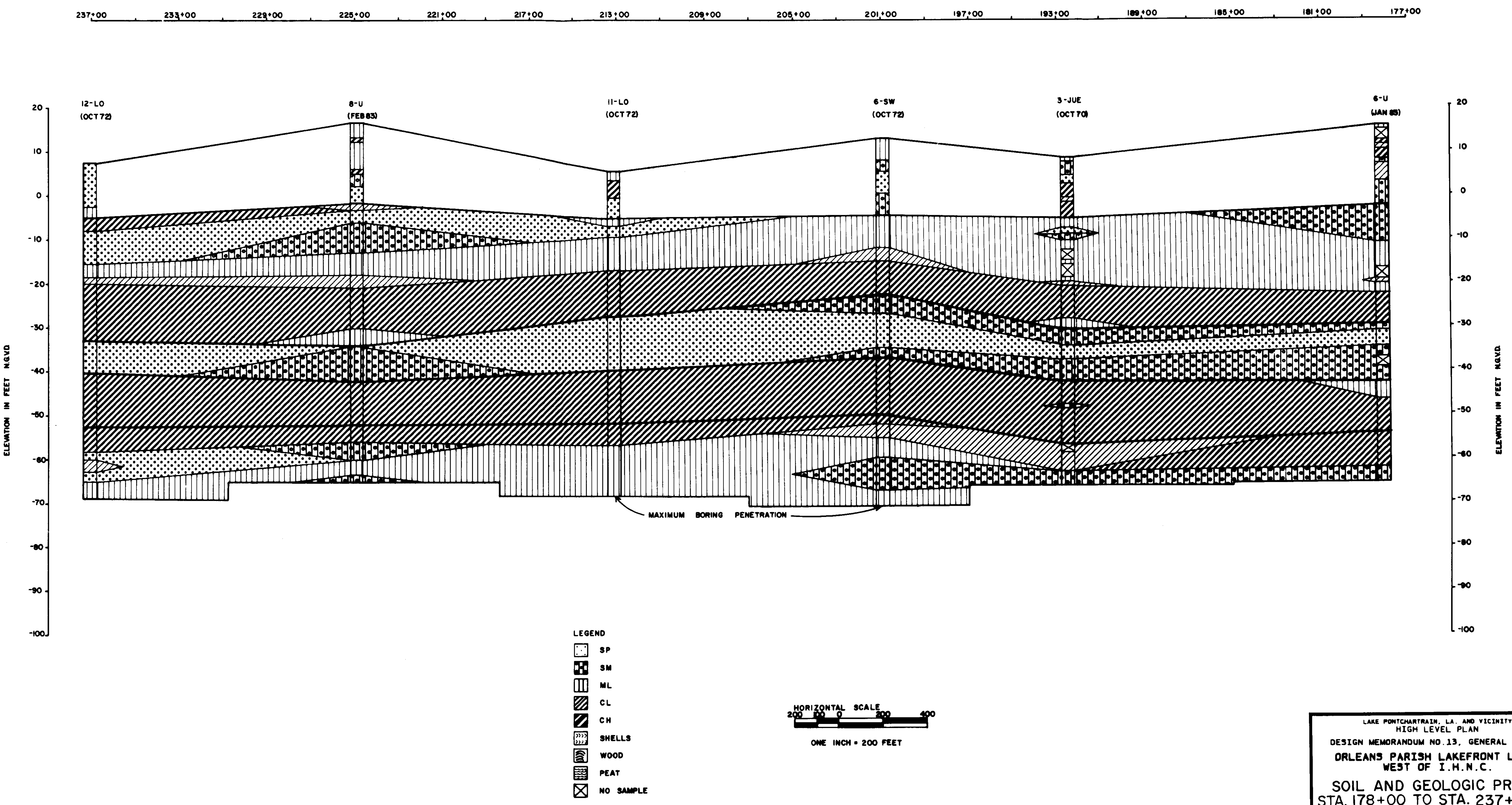
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

SOIL AND GEOLOGIC PROFILE
STA. 117+00 TO STA. 178+00 B/L

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

NOVEMBER 1984 FILE NO. H-2-29536

PLATE 61



LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

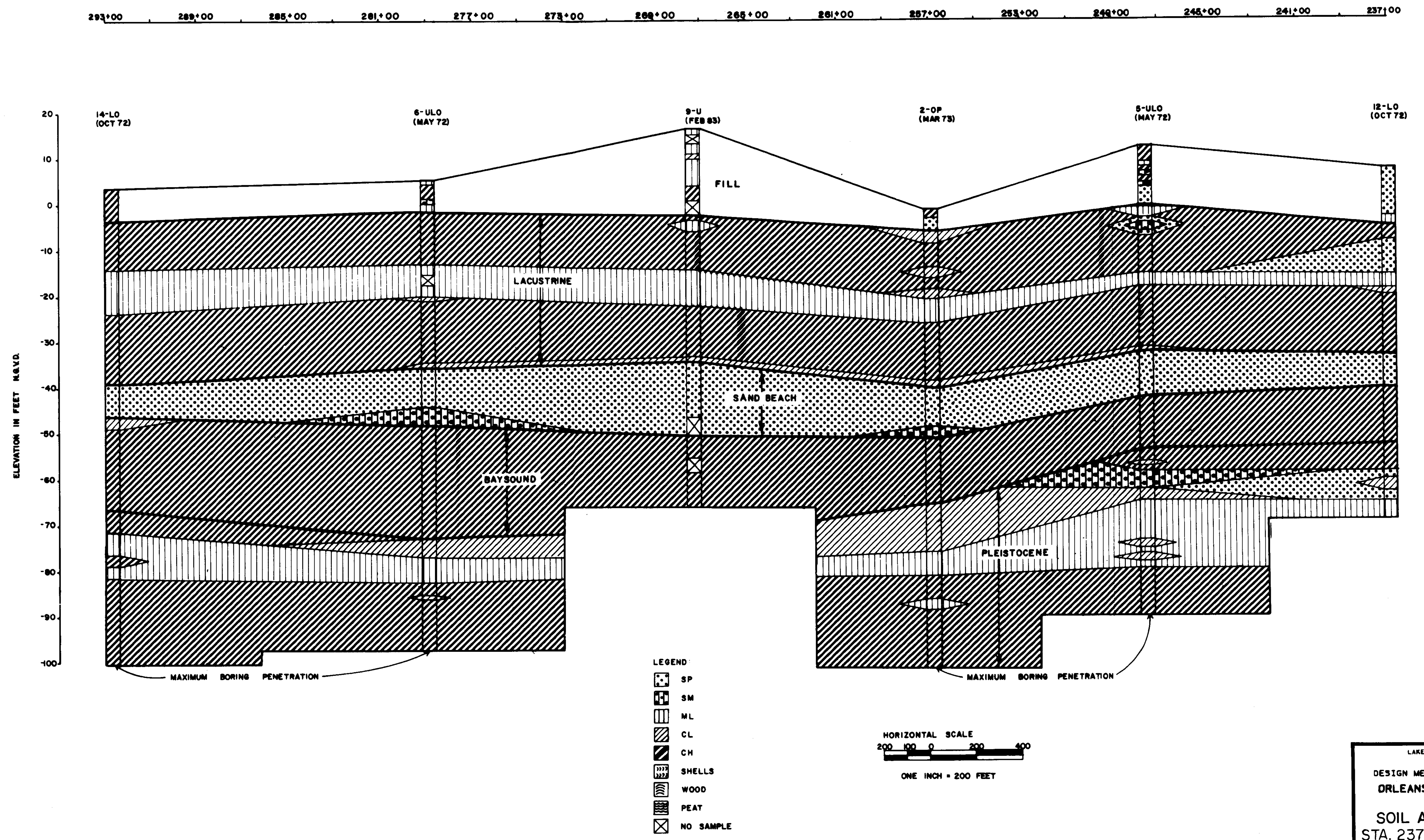
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN

ORLEANS PARISH LAKEFRONT LEVEE WEST OF I.H.N.C.

SOIL AND GEOLOGIC PROFILE STA. 178+00 TO STA. 237+00 B/L

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

NOVEMBER 1984 FILE NO. H-2-29536



LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

DESIGN MEMORANDUM NO. 13, GENERAL DESIGN

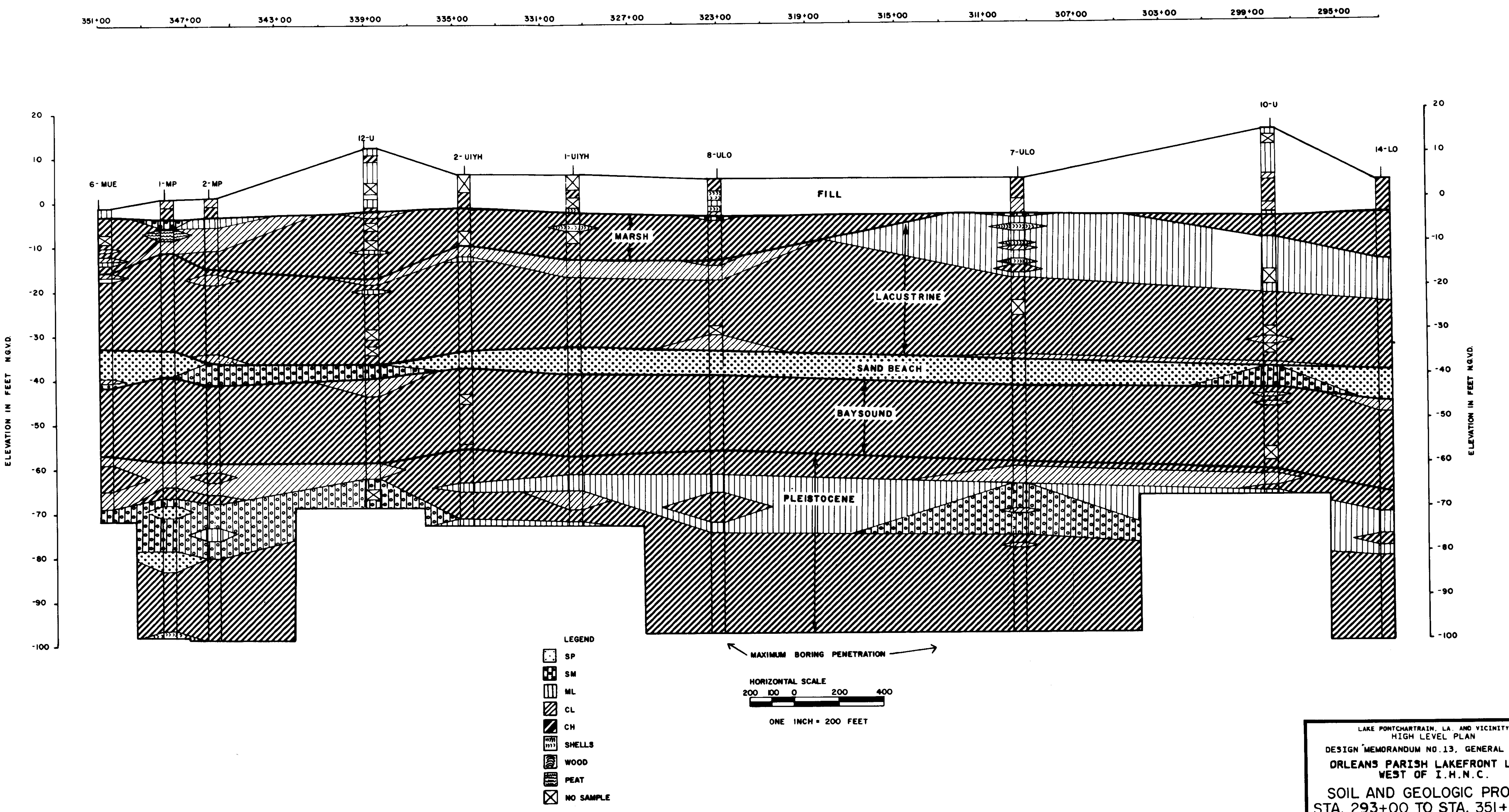
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

SOIL AND GEOLOGIC PROFILE
STA. 237+00 TO STA. 293+00 B/L

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

NOVEMBER 1984 FILE NO. H-2-29536

PLATE 63



LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

SOIL AND GEOLOGIC PROFILE
STA. 293+00 TO STA. 351+00 B/L

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

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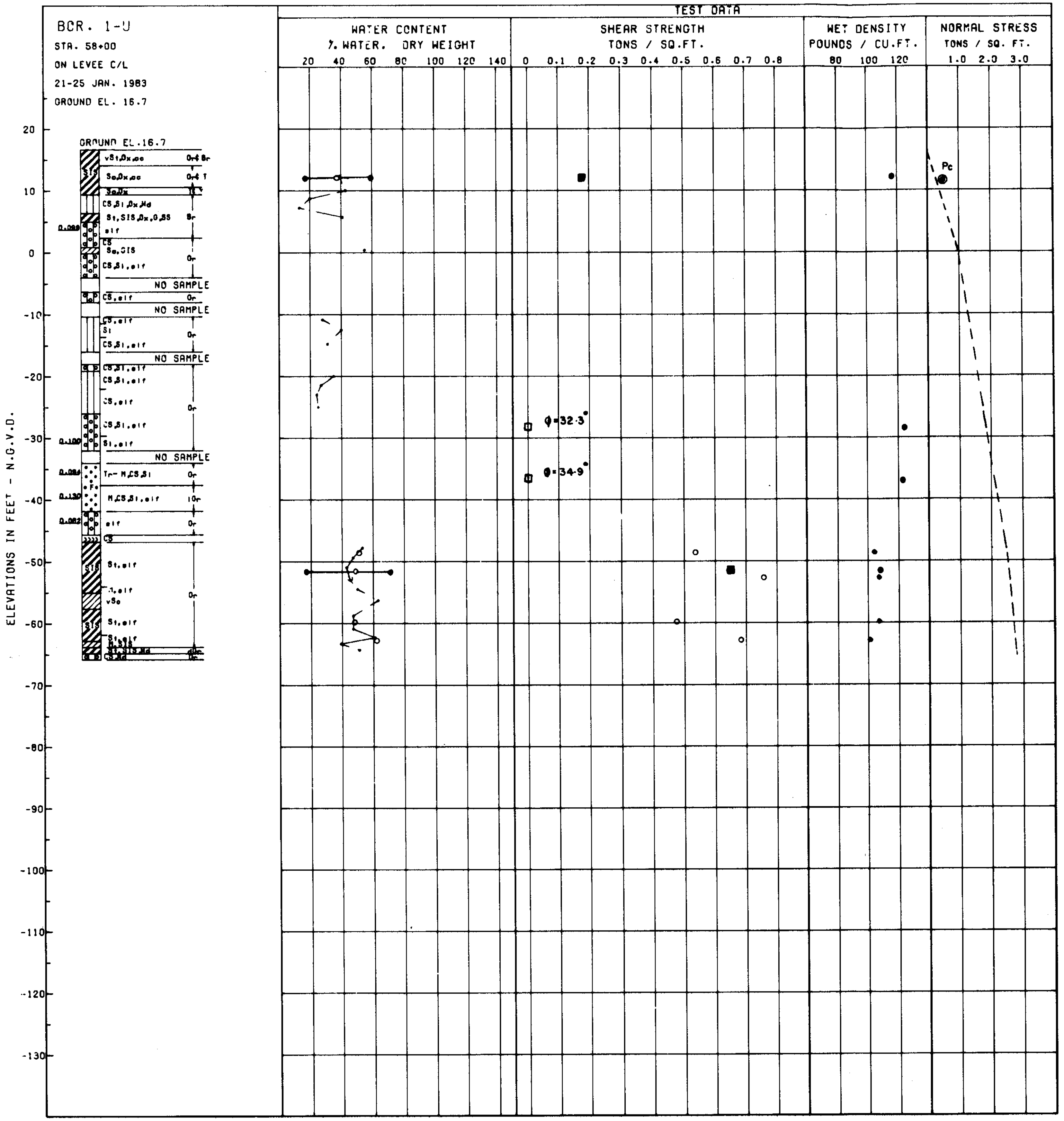
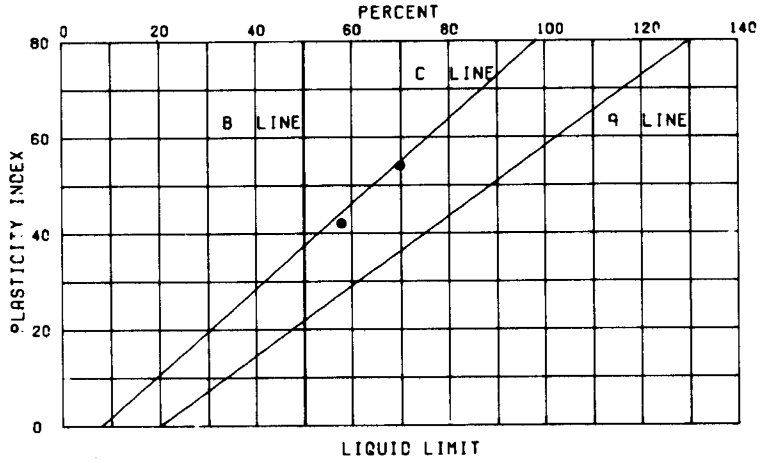
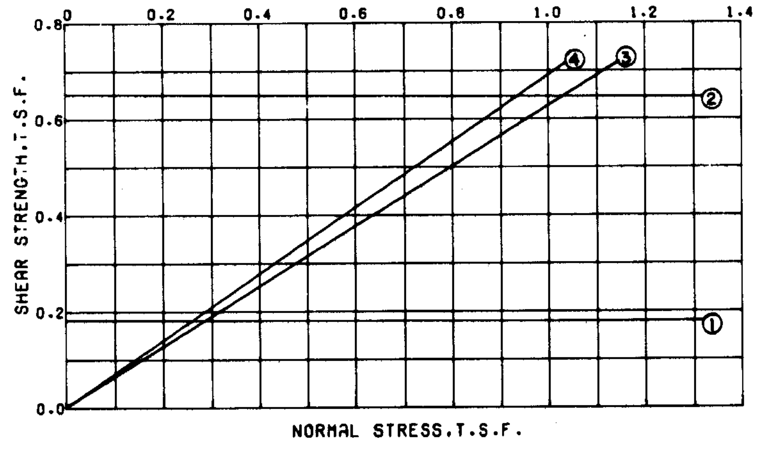


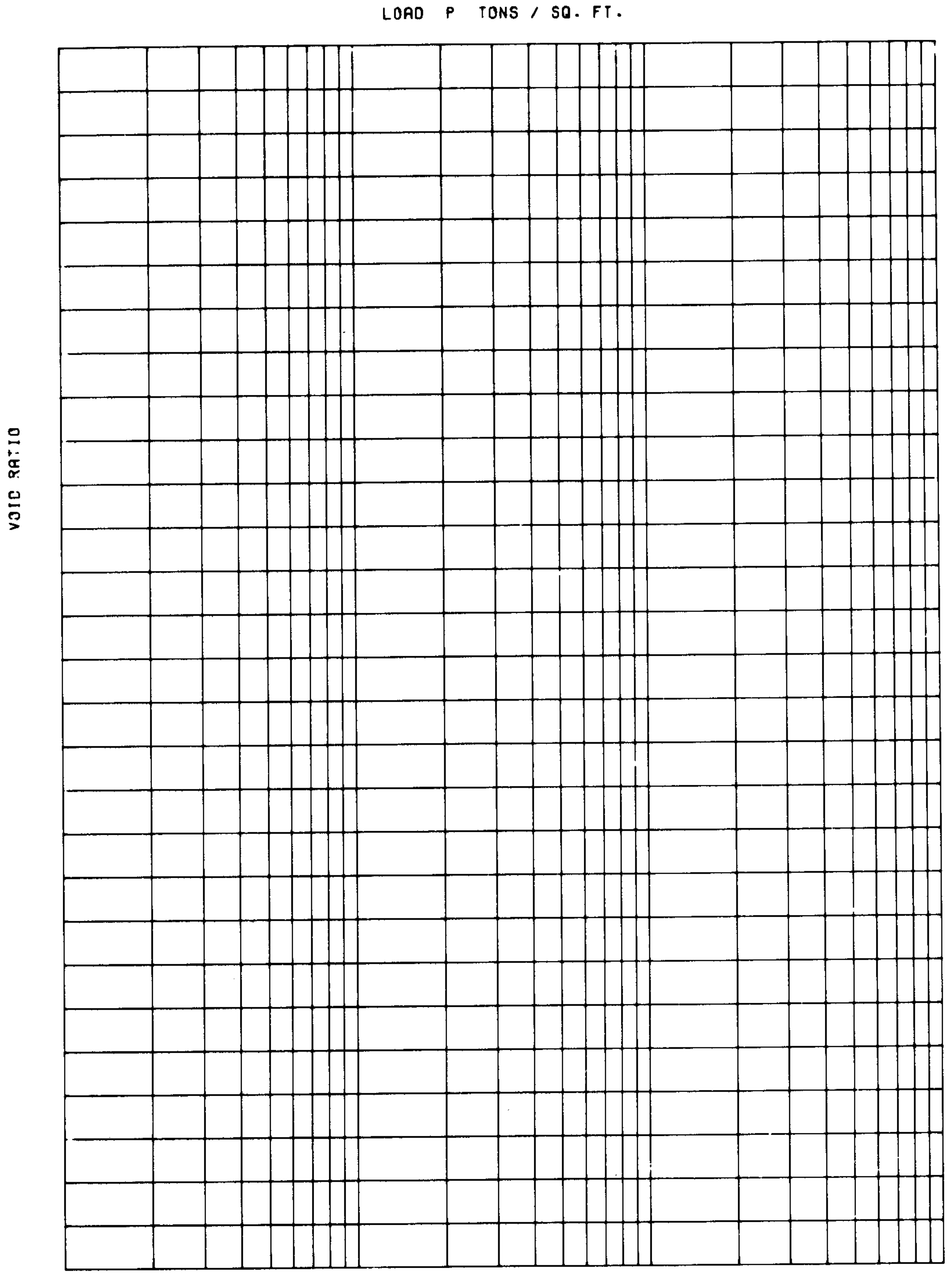


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	C - TSF	
1	+12.2	Q	0	0.18	CH
2	-51.7	Q	0	0.65	CH
3	-28.2	S	32.3	0	SP
4	-36.4	S	34.9	0	SP



CONSOLIDATION DATA

○ (UC) UNCONFINED COMPRESSION TEST
■ (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
- (R) CONSOLIDATED - UNDRAINED SHEAR TEST
⊡ (S) CONSOLIDATED - DRAINED SHEAR TEST

BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER

FOR SOIL BORING LEGEND SEE PLATE A

FOR LOCATION OF BORING SEE PLATE 2

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

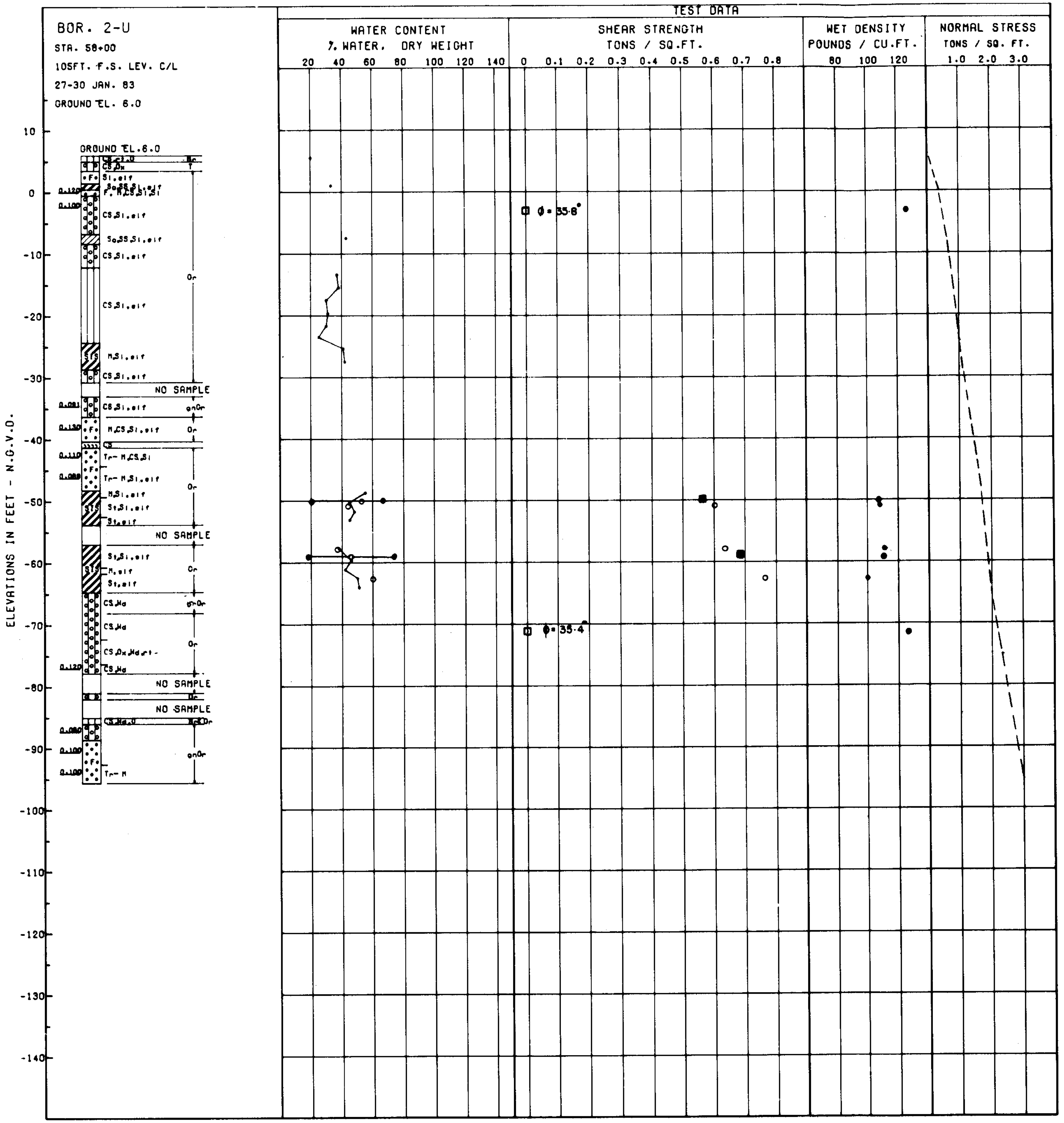
DESIGN MEMORANDUM NO.13, GENERAL DESIGN

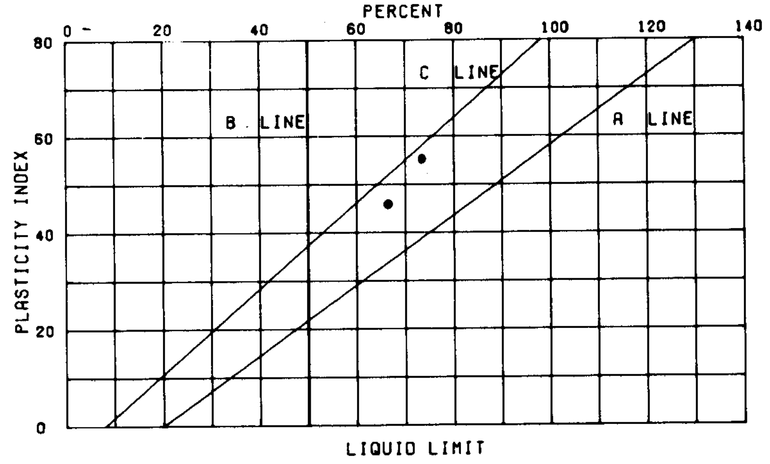
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING I-U

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

NOVEMBER 1984 FILE NO. H-2-29536





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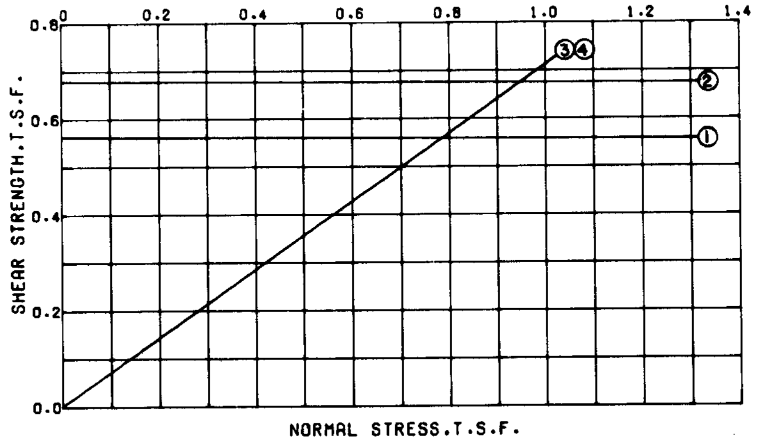
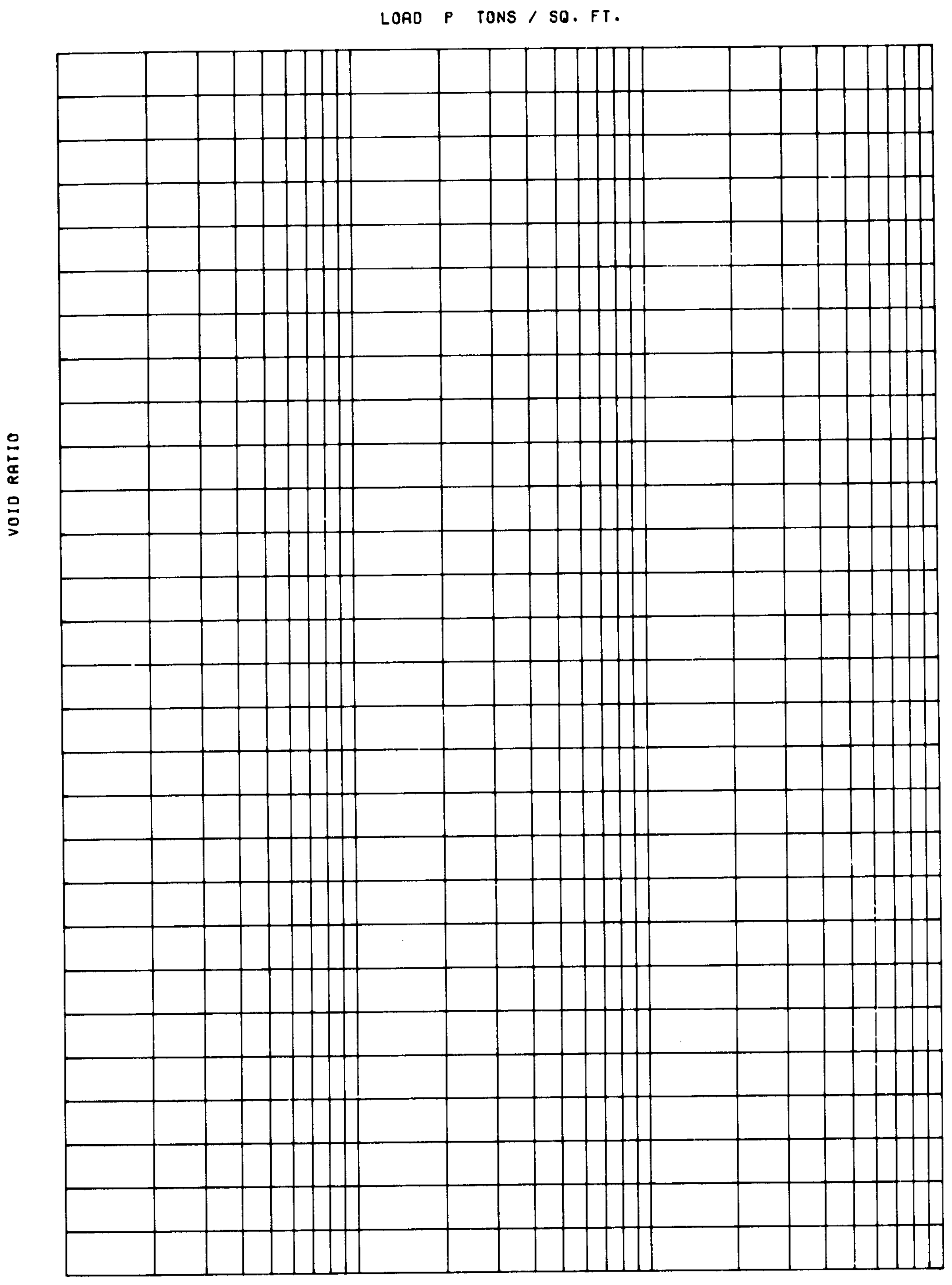


SHEAR STRENGTH DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	C - TSF	CLASS
1	-49.9	Q	0	0.56	CH
2	-58.9	Q	0	0.68	CH
3	-3.0	S	35.8	0	SP
4	-71.0	S	35.4	0	SM



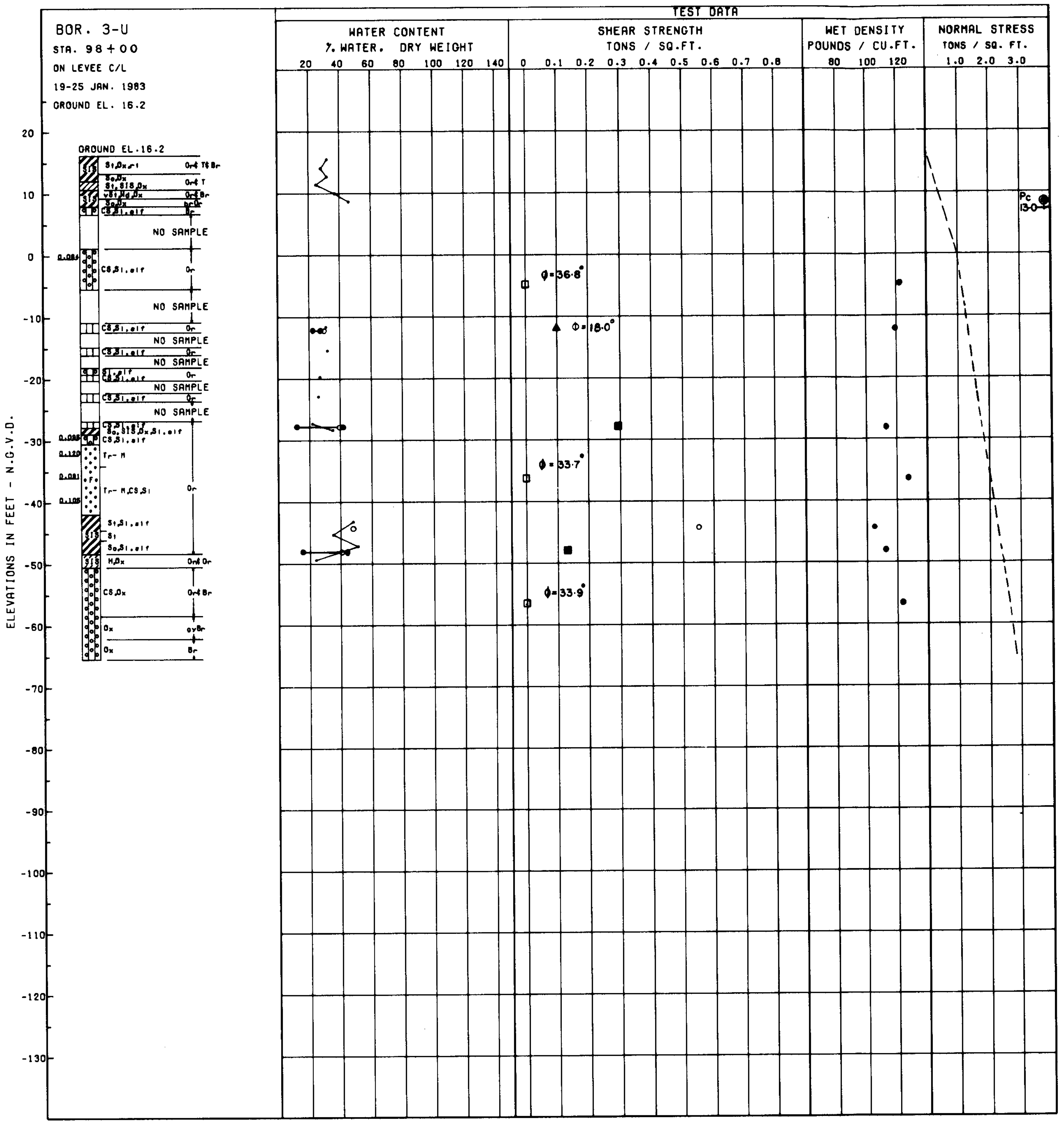
CONSOLIDATION DATA

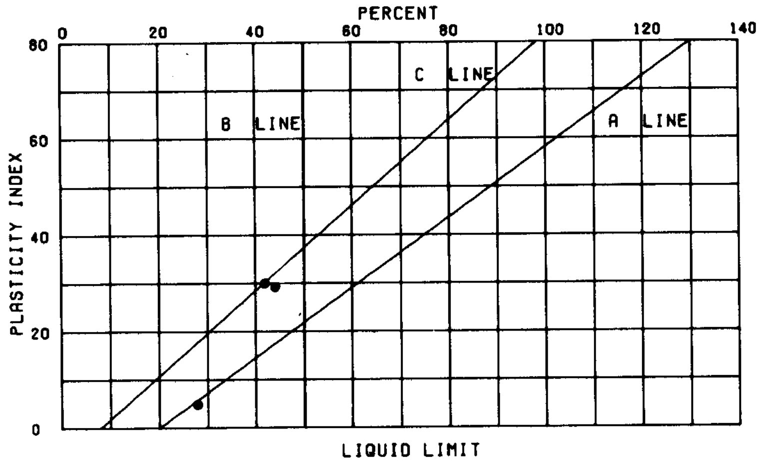
O- (UC) UNCONFINED COMPRESSION TEST
■- (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
- (R) CONSOLIDATED - UNDRAINED SHEAR TEST
⊡- (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORING SEE PLATE 2

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 2-U

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536





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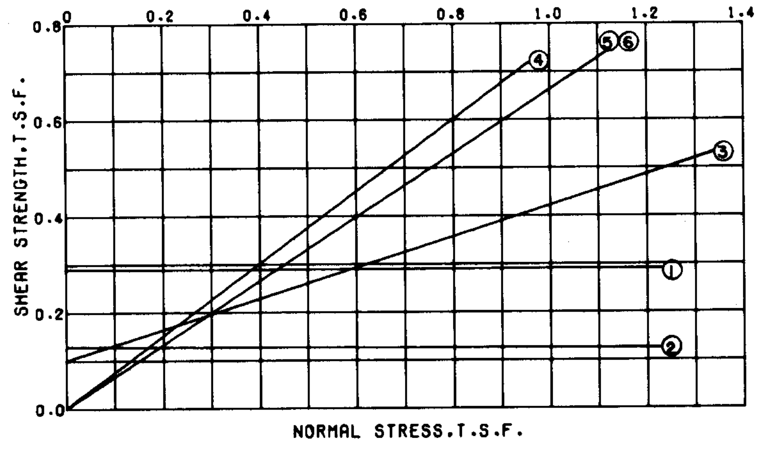
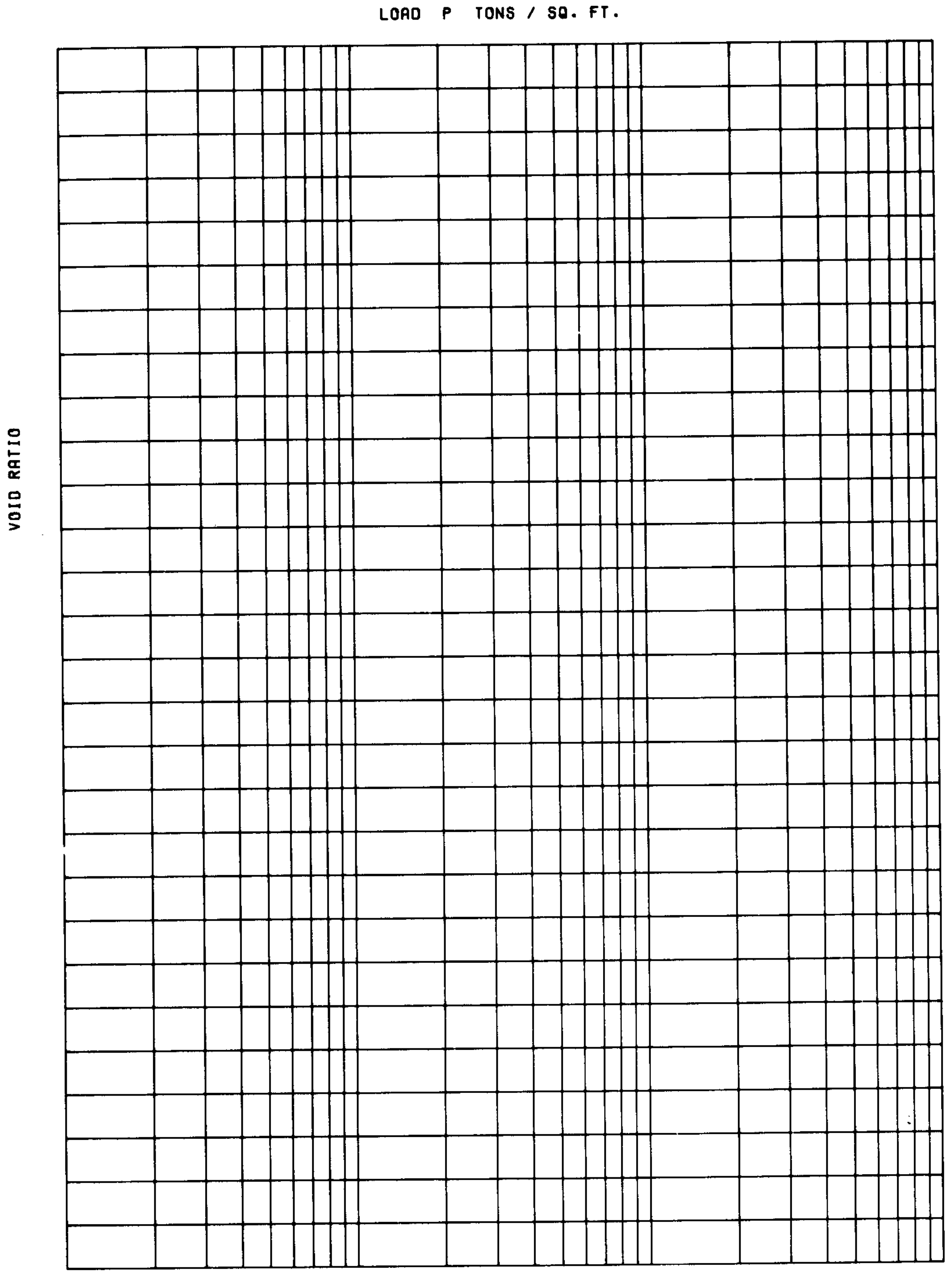


SHEAR STRENGTH DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	C - TSF	
1	-27.9	Q	0	0.29	CL
2	-47.9	Q	0	0.13	CL
3	-12.0	R	18.0	0.10	ML
4	-4.8	S	36.8	0	ML
5	-36.4	S	33.7	0	SP
6	-56.5	S	33.9	0	SM



CONSOLIDATION DATA

○- (UC) UNCONFINED COMPRESSION TEST
■- (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲- (R) CONSOLIDATED - UNDRAINED SHEAR TEST
⊡- (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORING SEE PLATE 3

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
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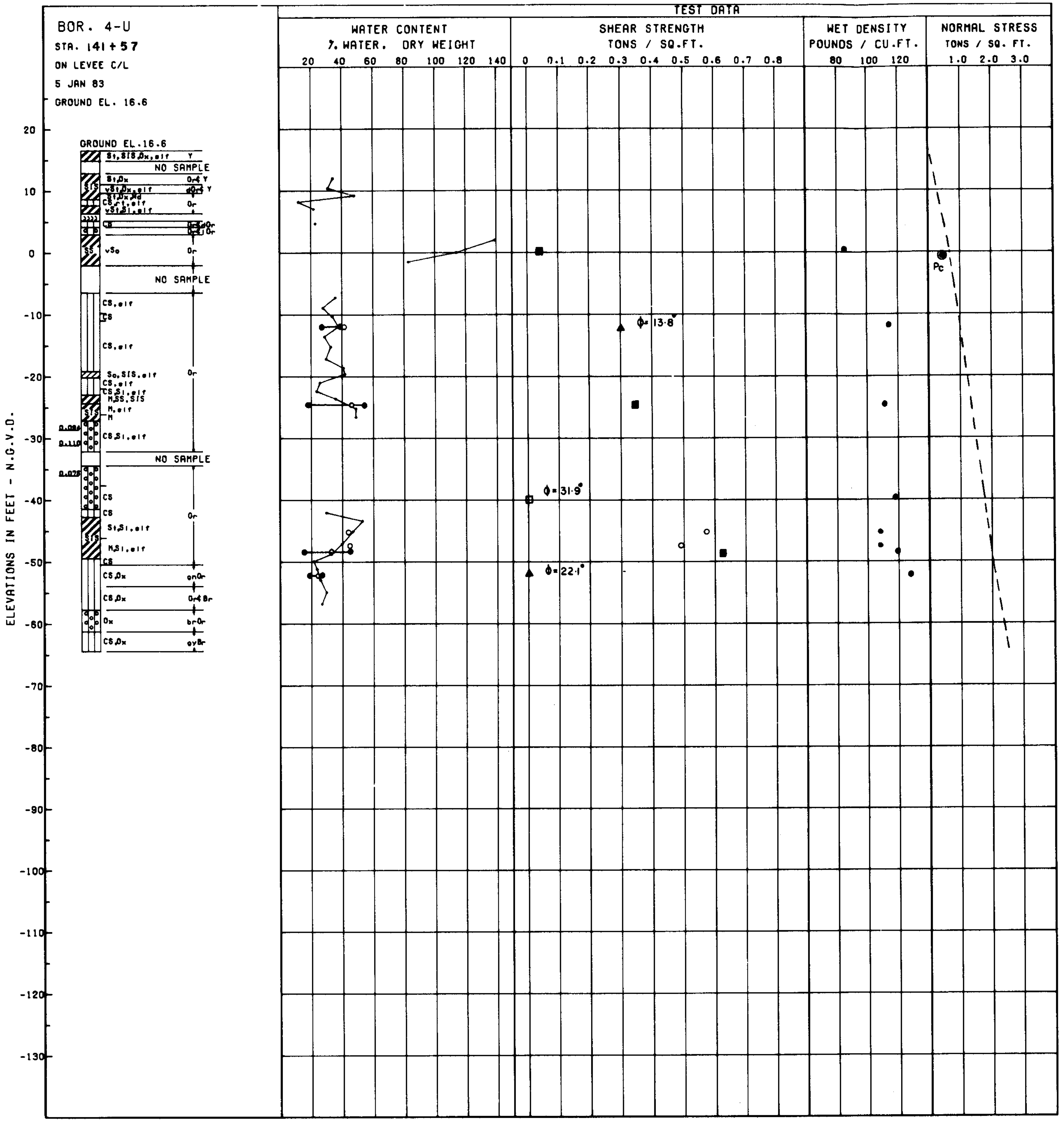
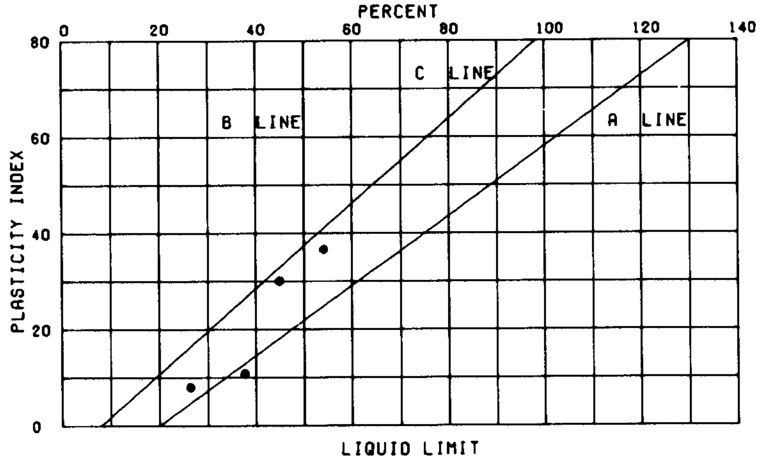
ORLEANS PARISH LAKEFRONT LEVEE WEST OF I.H.N.C.
UNDISTURBED BORING DATA
BORING 3-U
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536





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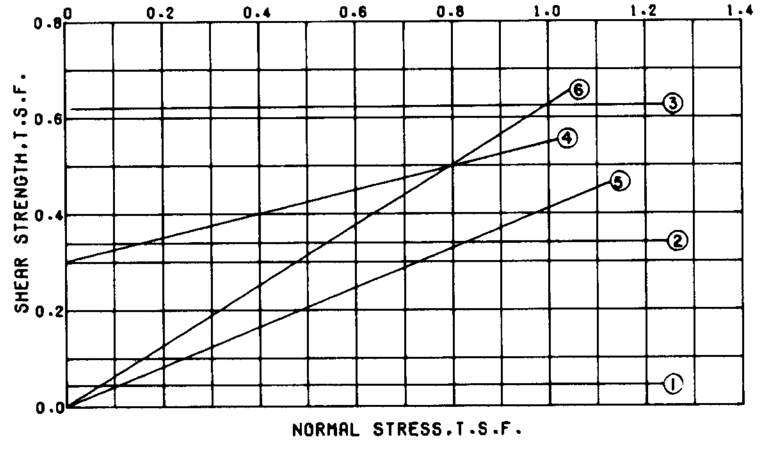
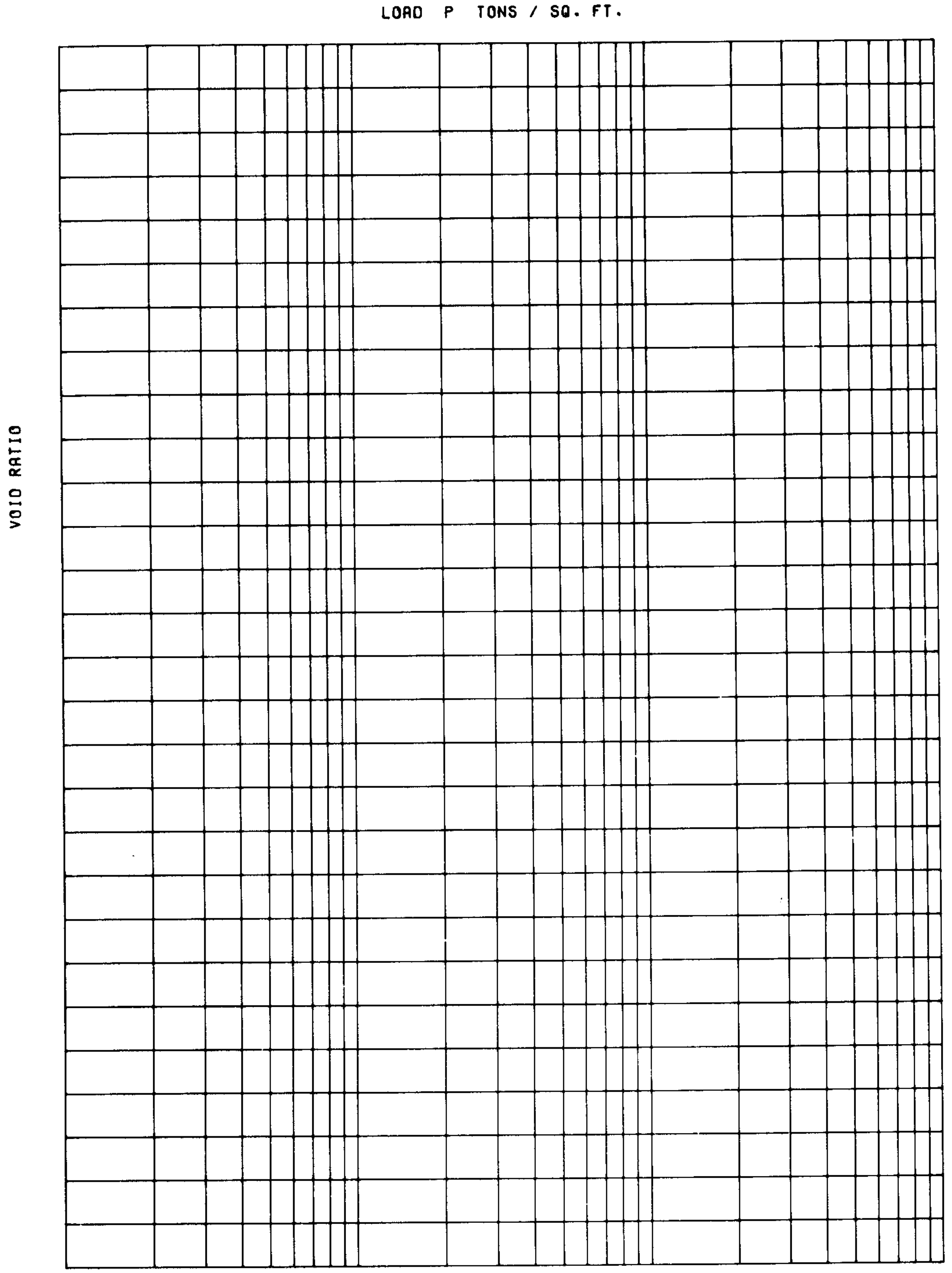


SHEAR STRENGTH DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	+0.3	Q	0	0.04	CH
2	-24.7	Q	0	0.34	CH
3	-48.4	Q	0	0.62	CL
4	-12.1	R	13.8	0.30	CL
5	-51.9	R	22.1	0	ML
6	-39.8	S	31.9	0	ML



CONSOLIDATION DATA

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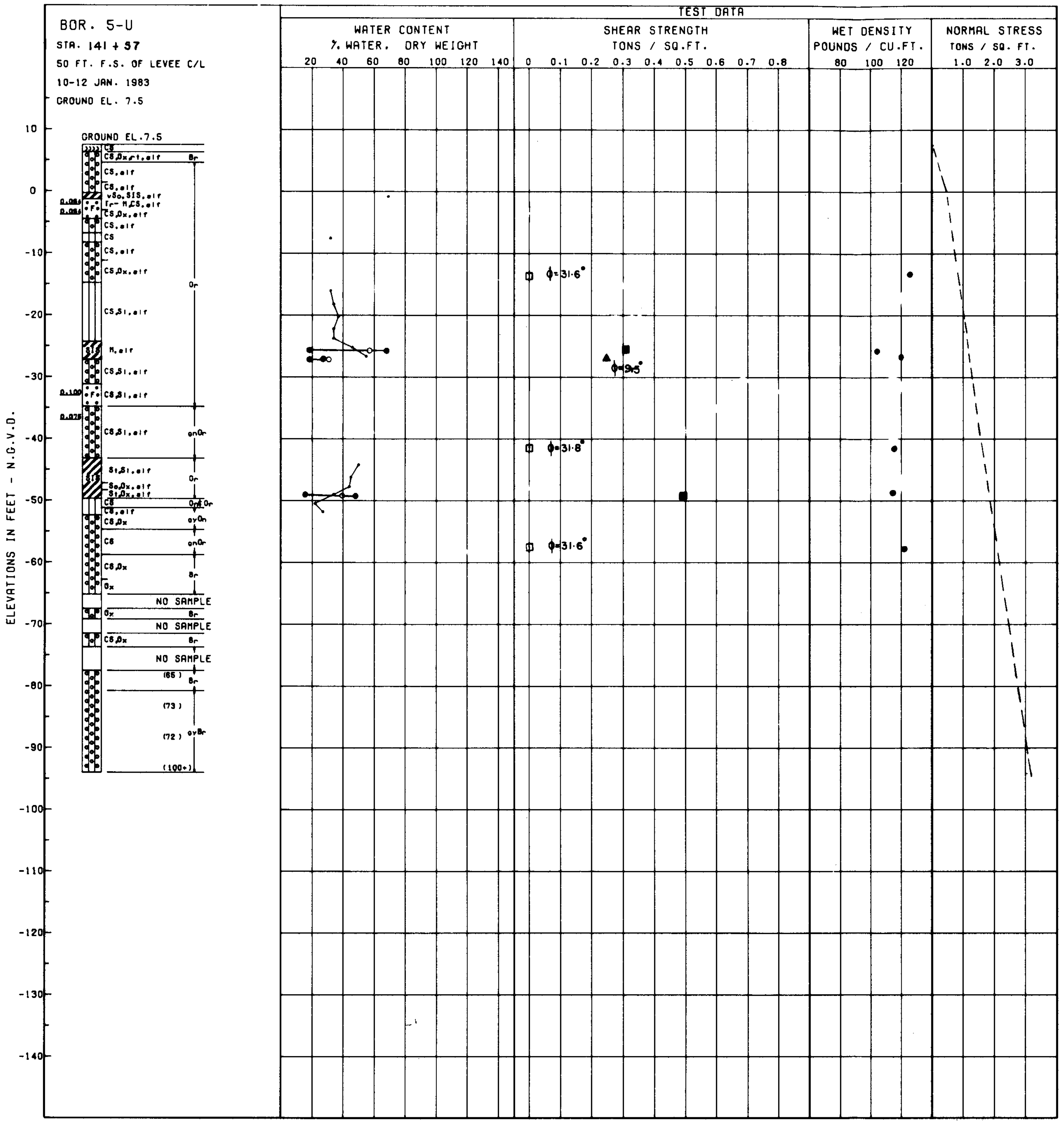
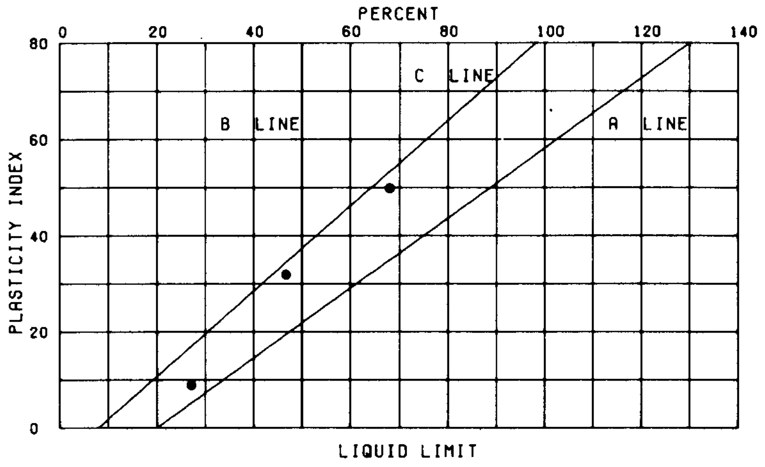
■- (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲- (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□- (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER
STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORING SEE PLATE 3

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 4-U

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536





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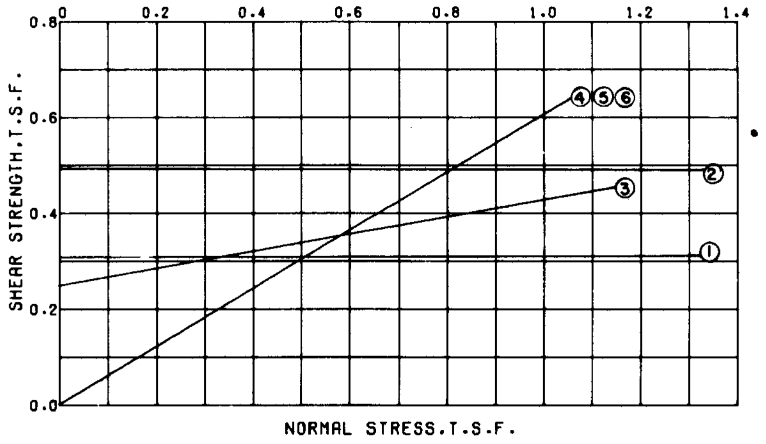
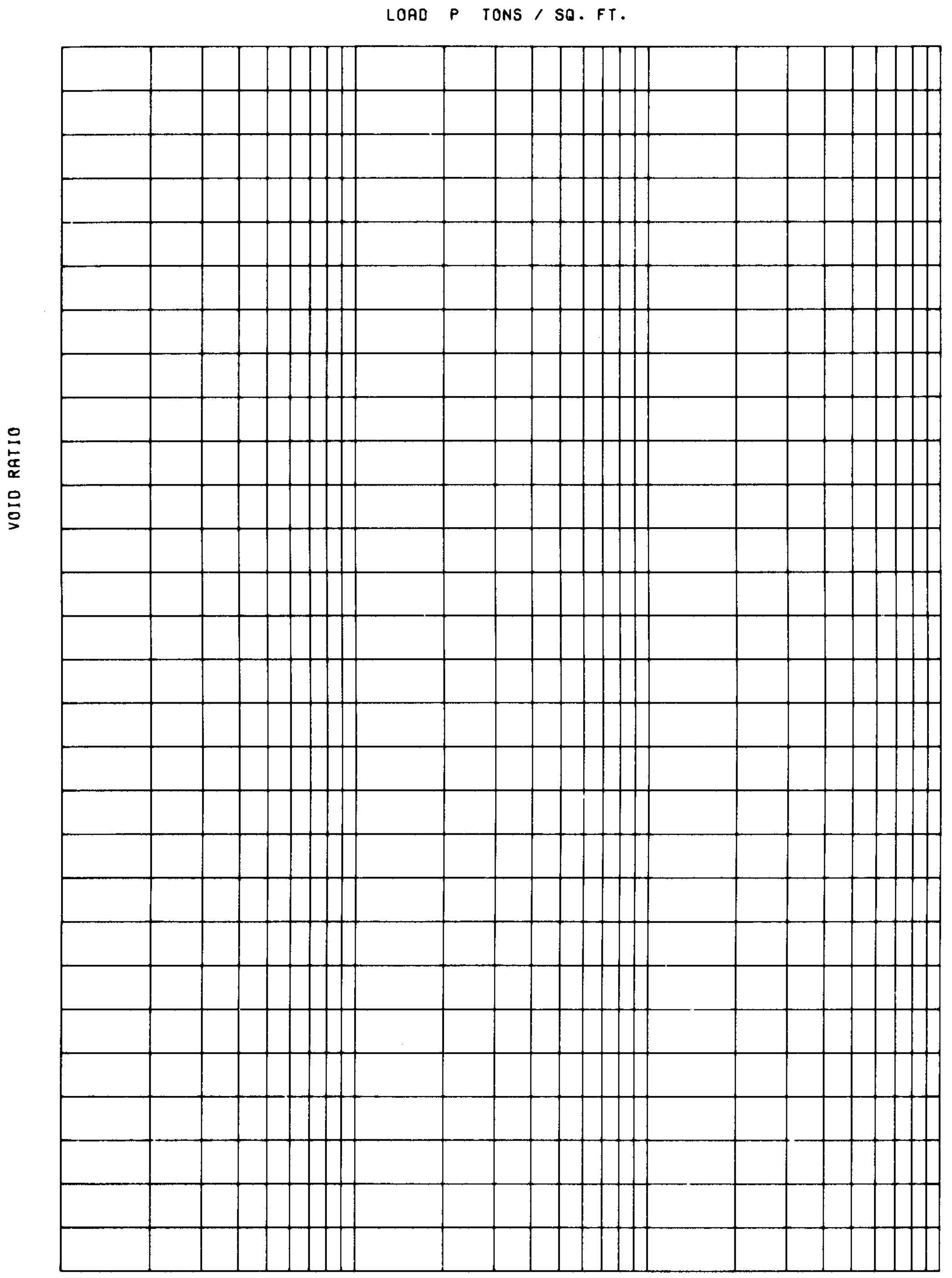


SHEAR STRENGTH DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	C - TSF	CLASS
1	-25.5	Q	0	0.31	CH
2	-48.9	Q	0	0.49	CL
3	-26.9	R	9.5	0.25	CL
4	-13.5	S	31.6	0	SP
5	-41.3	S	31.8	0	SM
6	-57.5	S	31.6	0	SM



CONSOLIDATION DATA

- (UC) UNCONFINED COMPRESSION TEST
■ (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ (S) CONSOLIDATED - DRAINED SHEAR TEST

BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER

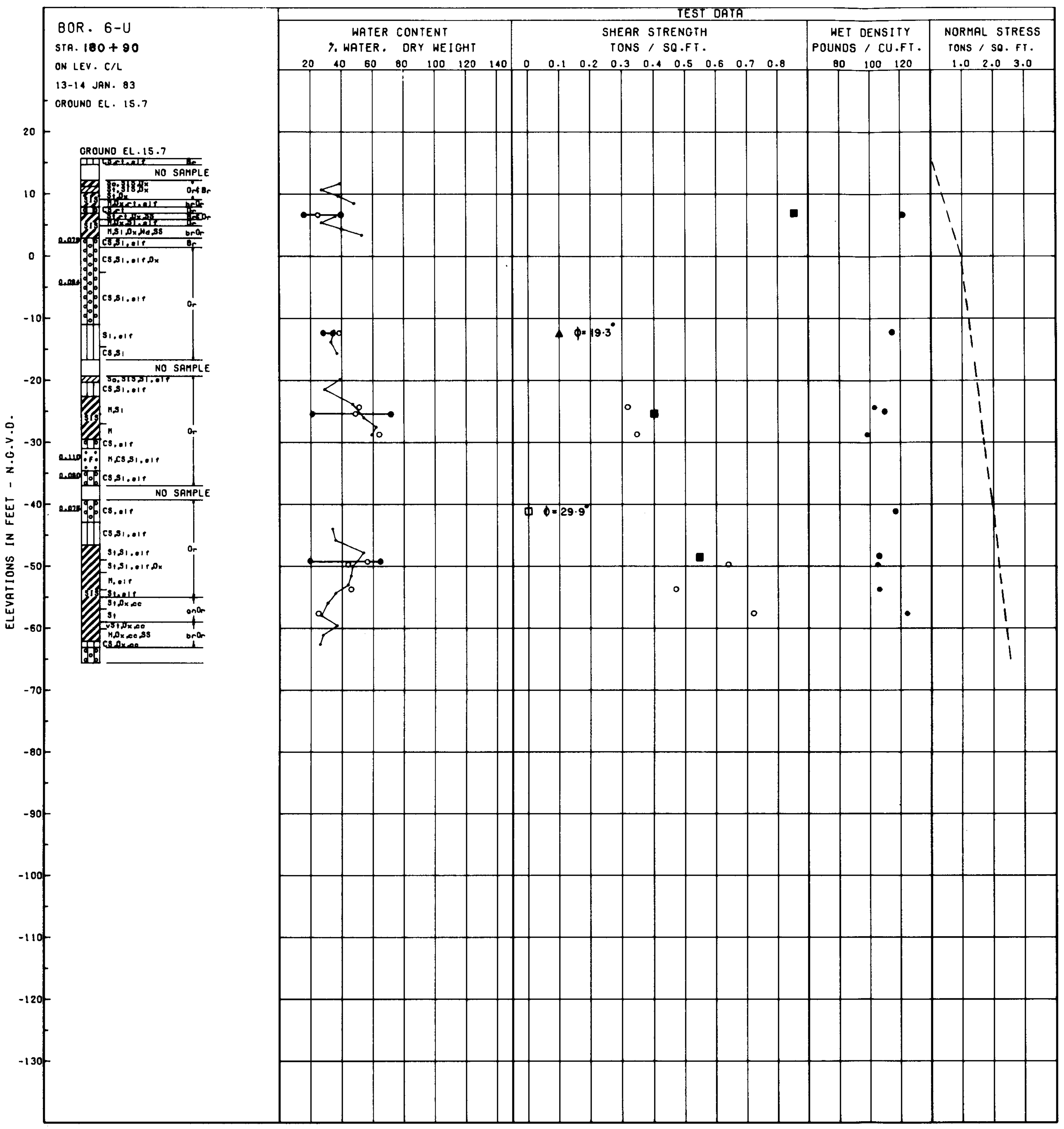
FOR SOIL BORING LEGEND SEE PLATE A

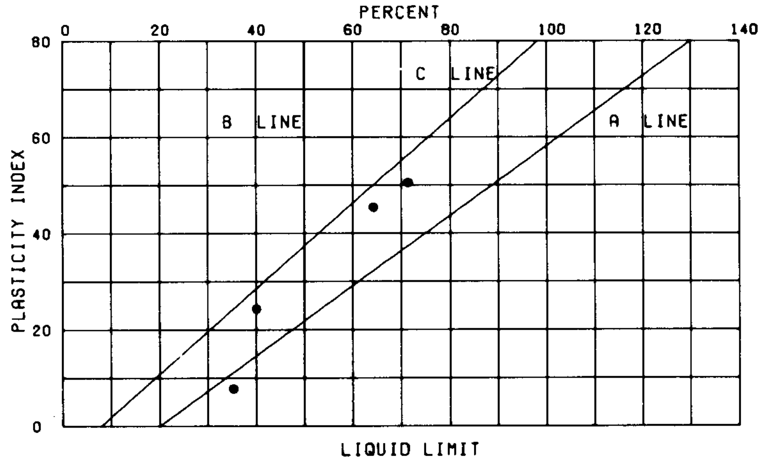
FOR LOCATION OF BORING SEE PLATE 3

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE WEST OF I.H.N.C.

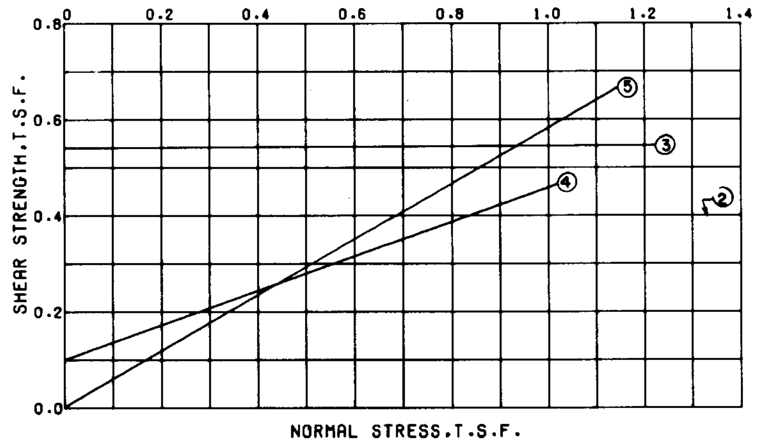
UNDISTURBED BORING DATA
BORING 5-U

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



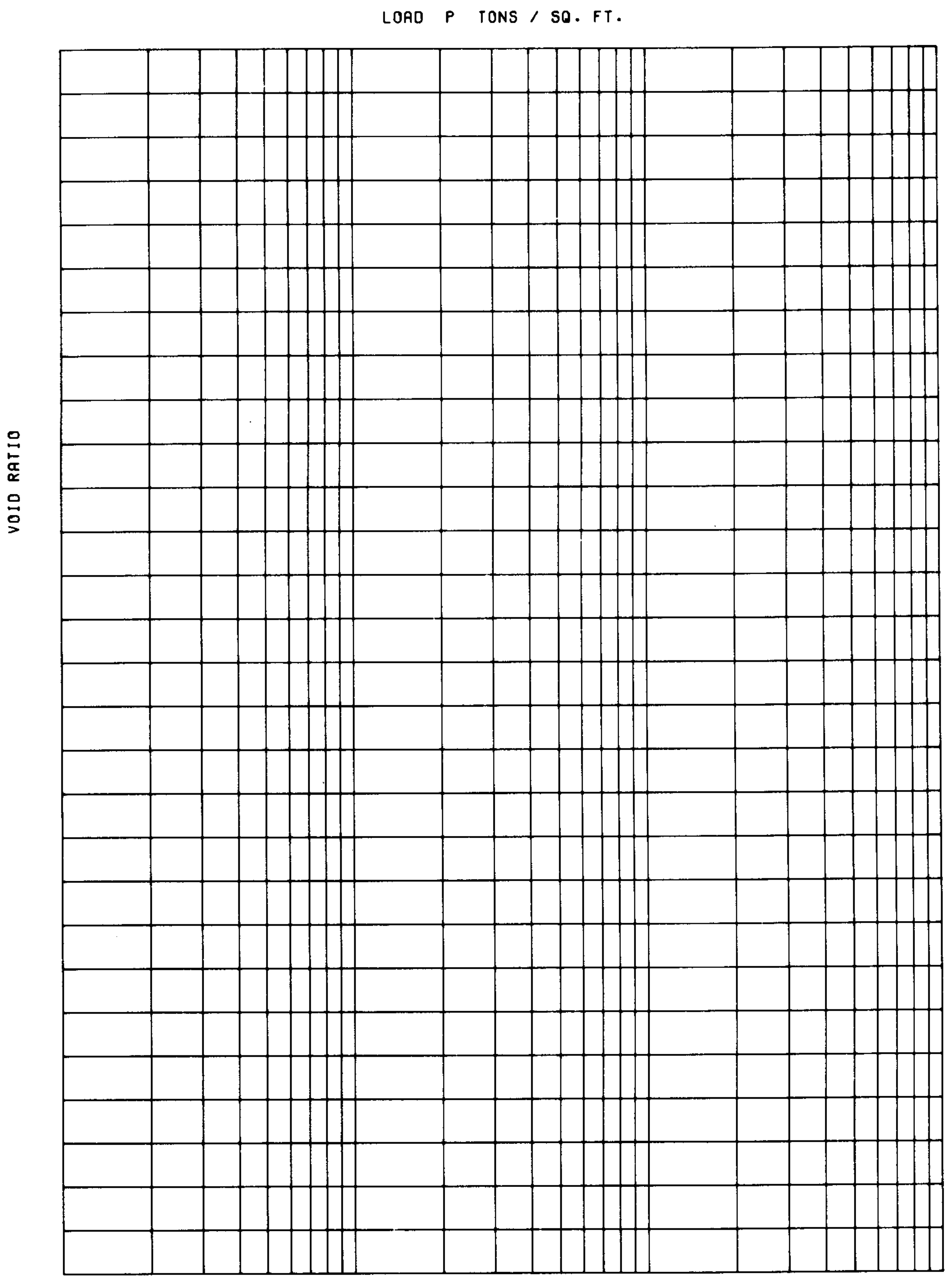


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	+6.7	Q	0	0.85	CL
2	-25.3	Q	0	0.40	CH
3	-48.7	Q	0	0.54	CH
4	-12.5	R	19.3	0.10	ML
5	-41.2	S	29.9	0	ML



CONSOLIDATION DATA

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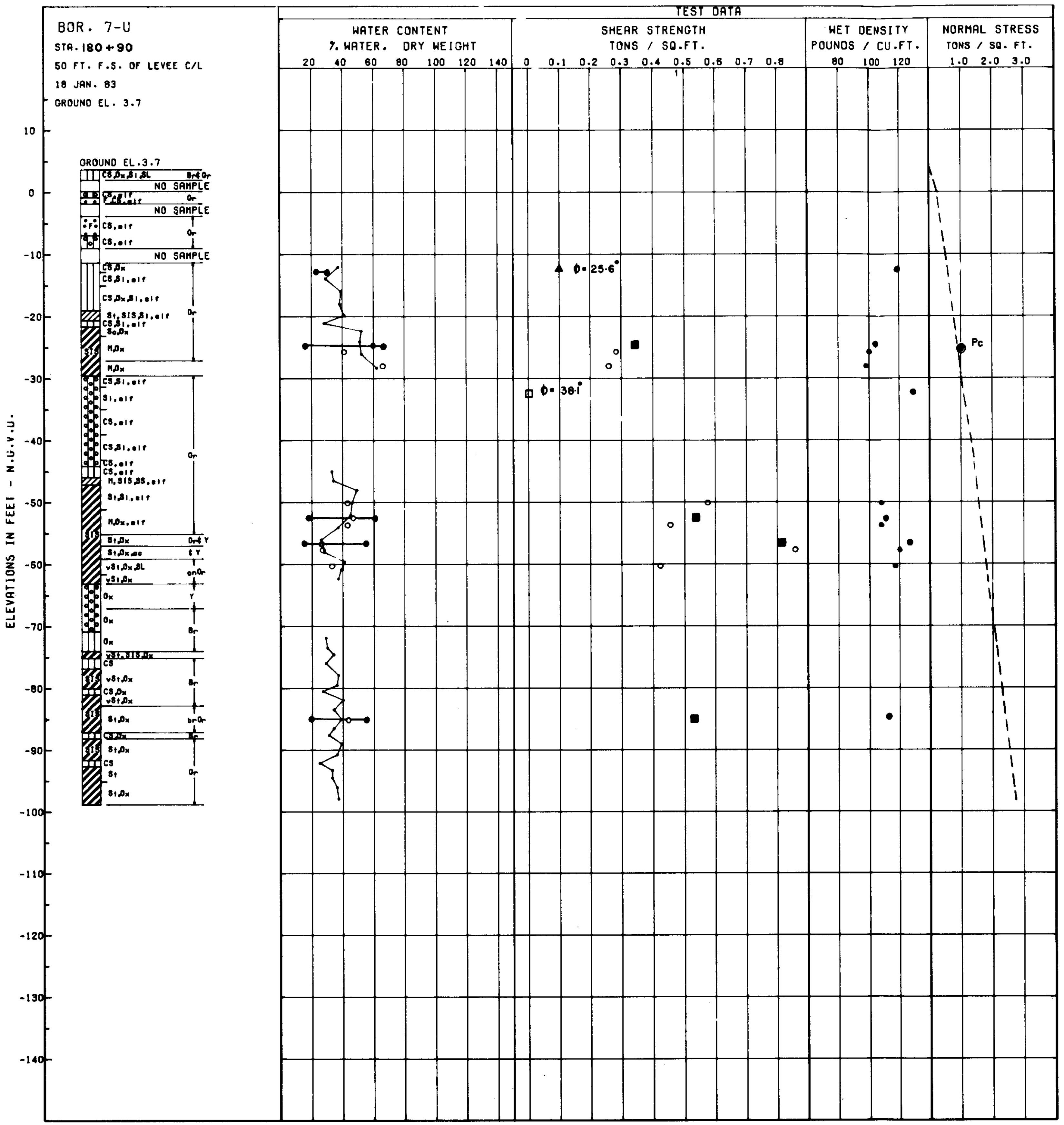
(Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
(R) CONSOLIDATED - UNDRAINED SHEAR TEST
(S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORING SEE PLATE 4

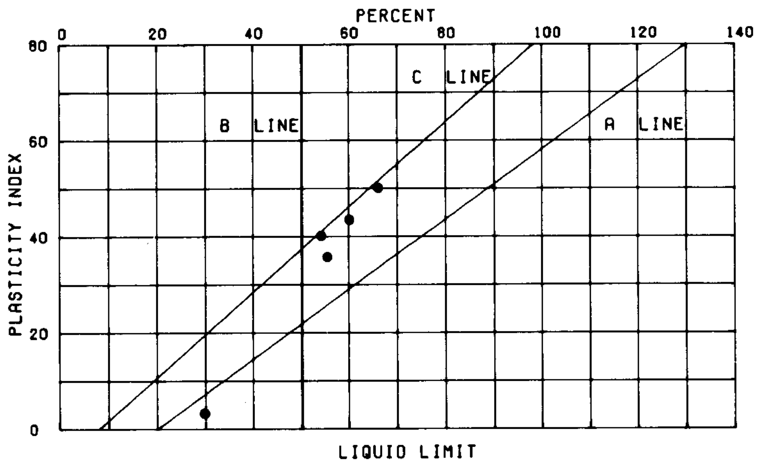
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 6-U

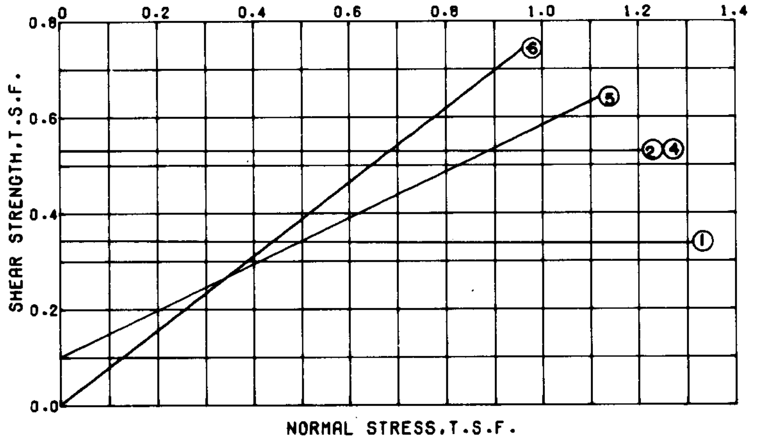
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 70



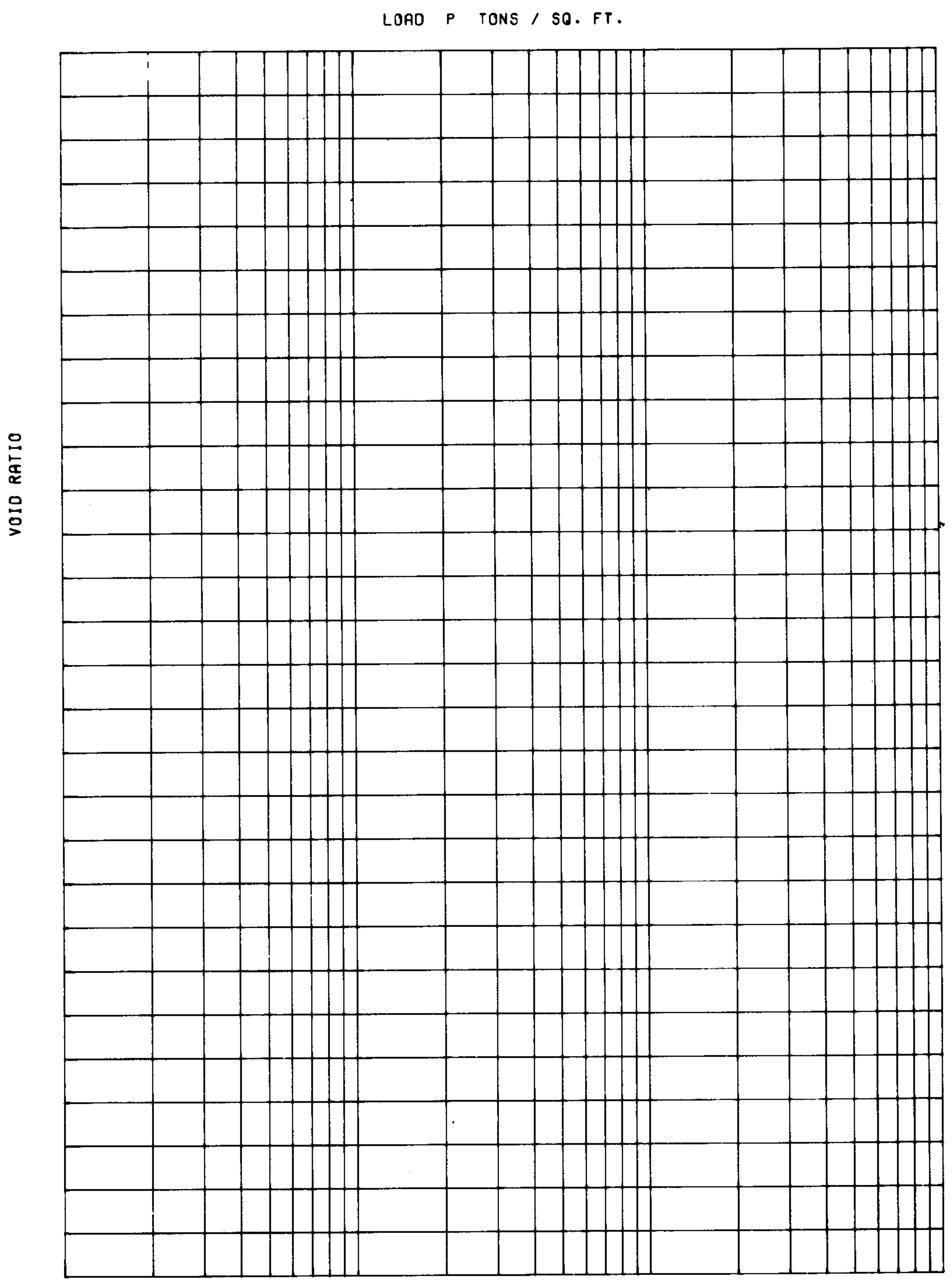


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-24.7	Q	0	0.34	CH
2	-52.7	Q	0	0.53	CH
3	-56.7	Q	0	0.81	CH
4	-84.8	Q	0	0.53	CH
5	-12.5	R	25.6	0.10	SM
6	-32.4	S	38.1	0	SM



CONSOLIDATION DATA

- (UC) UNCONFINED COMPRESSION TEST
- (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
- (R) CONSOLIDATED - UNDRAINED SHEAR TEST
- (S) CONSOLIDATED - DRAINED SHEAR TEST

BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER

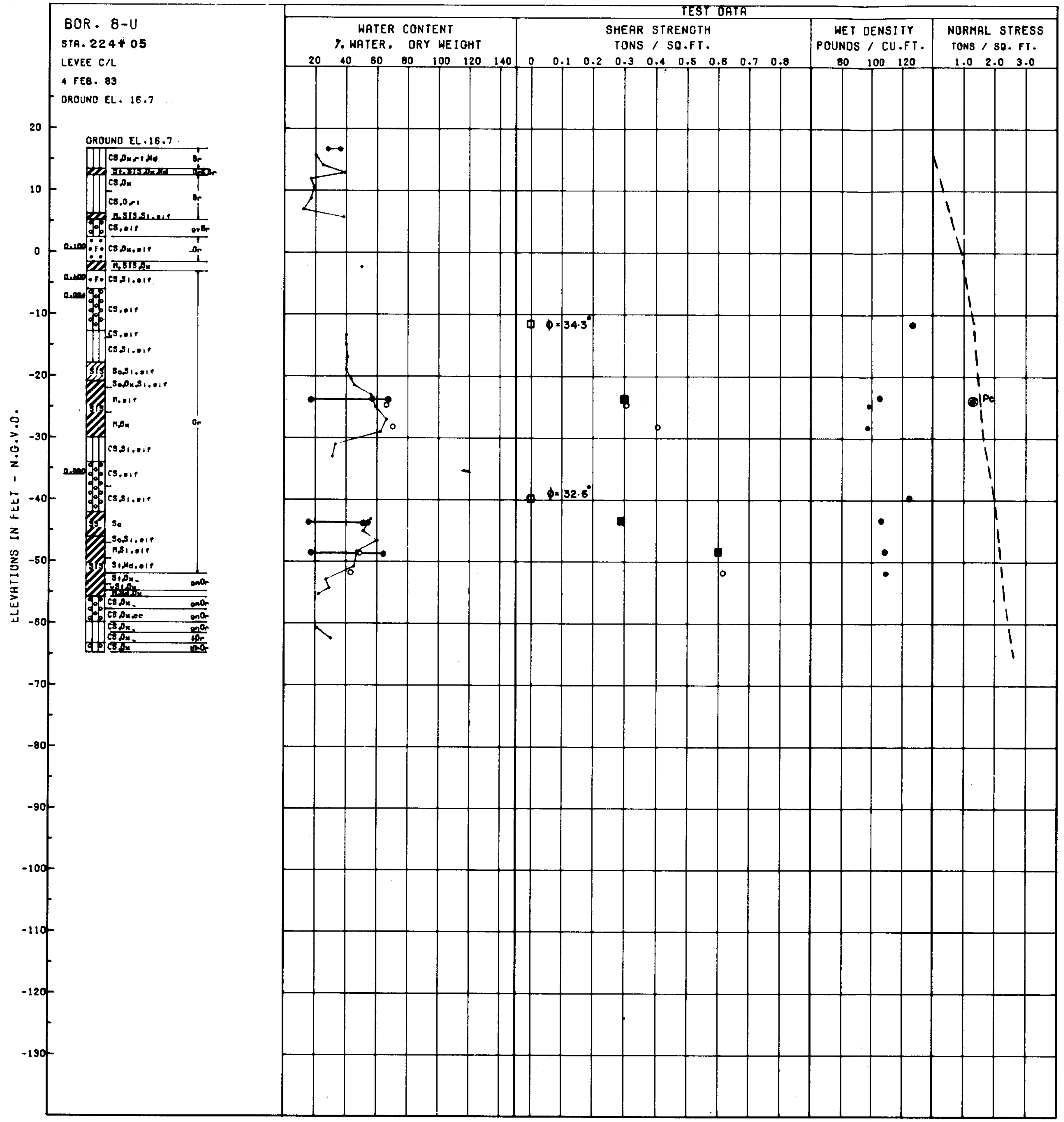
FOR SOIL BORING LEGEND SEE PLATE A

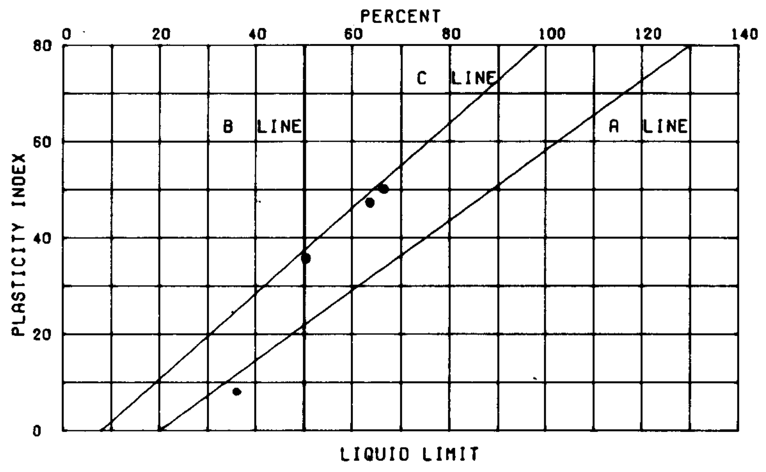
FOR LOCATION OF BORING SEE PLATE 4

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

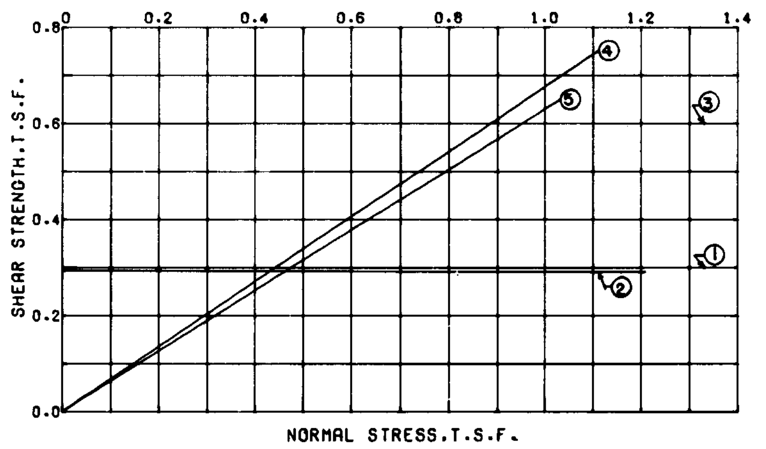
UNDISTURBED BORING DATA
BORING 7-U

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



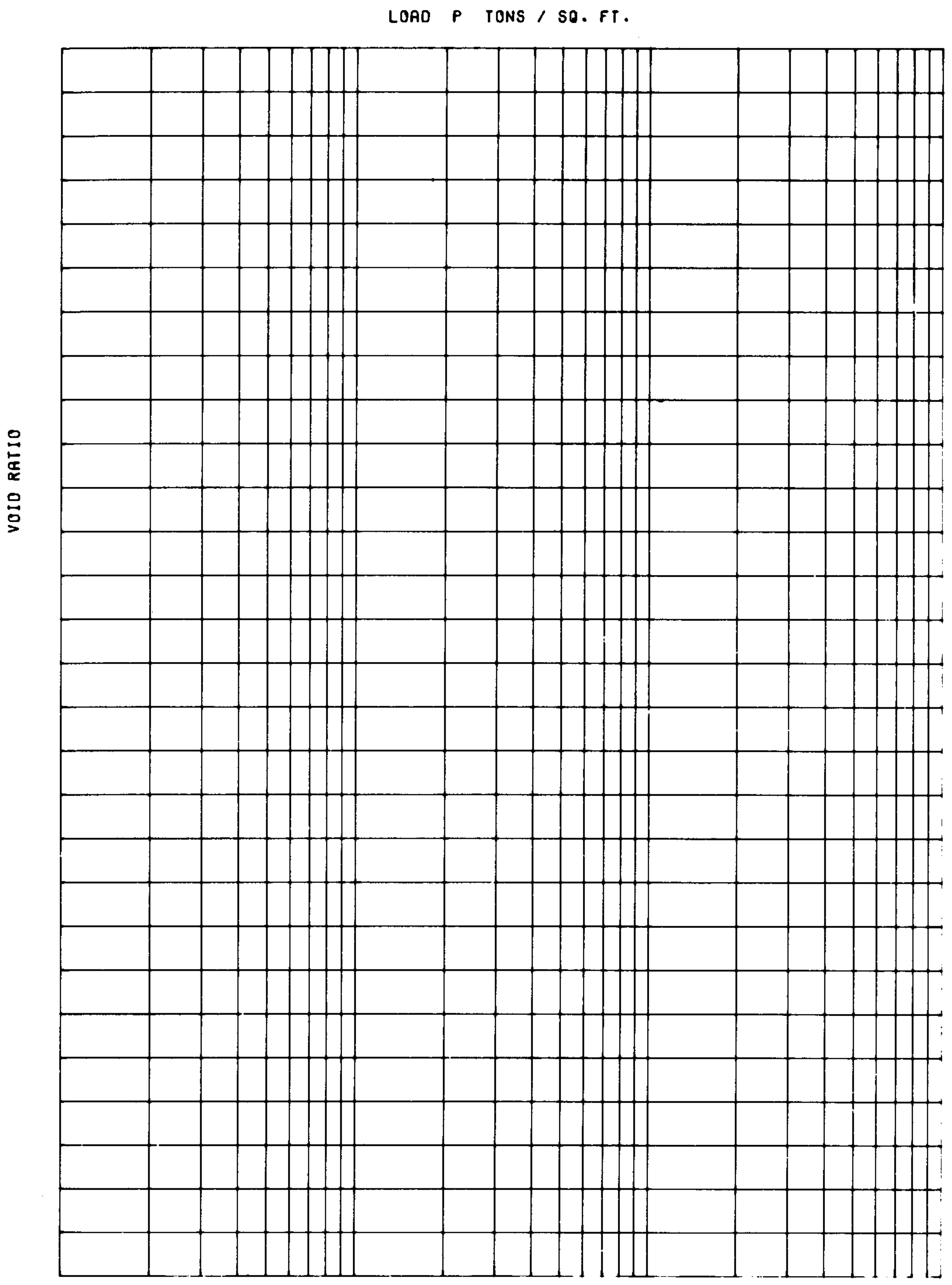


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-23.7	Q	0	0.30	CH
2	-43.6	Q	0	0.29	CH
3	-48.3	Q	0	0.60	CH
4	-11.6	S	34.3	0	ML
5	-39.7	S	32.6	0	SM



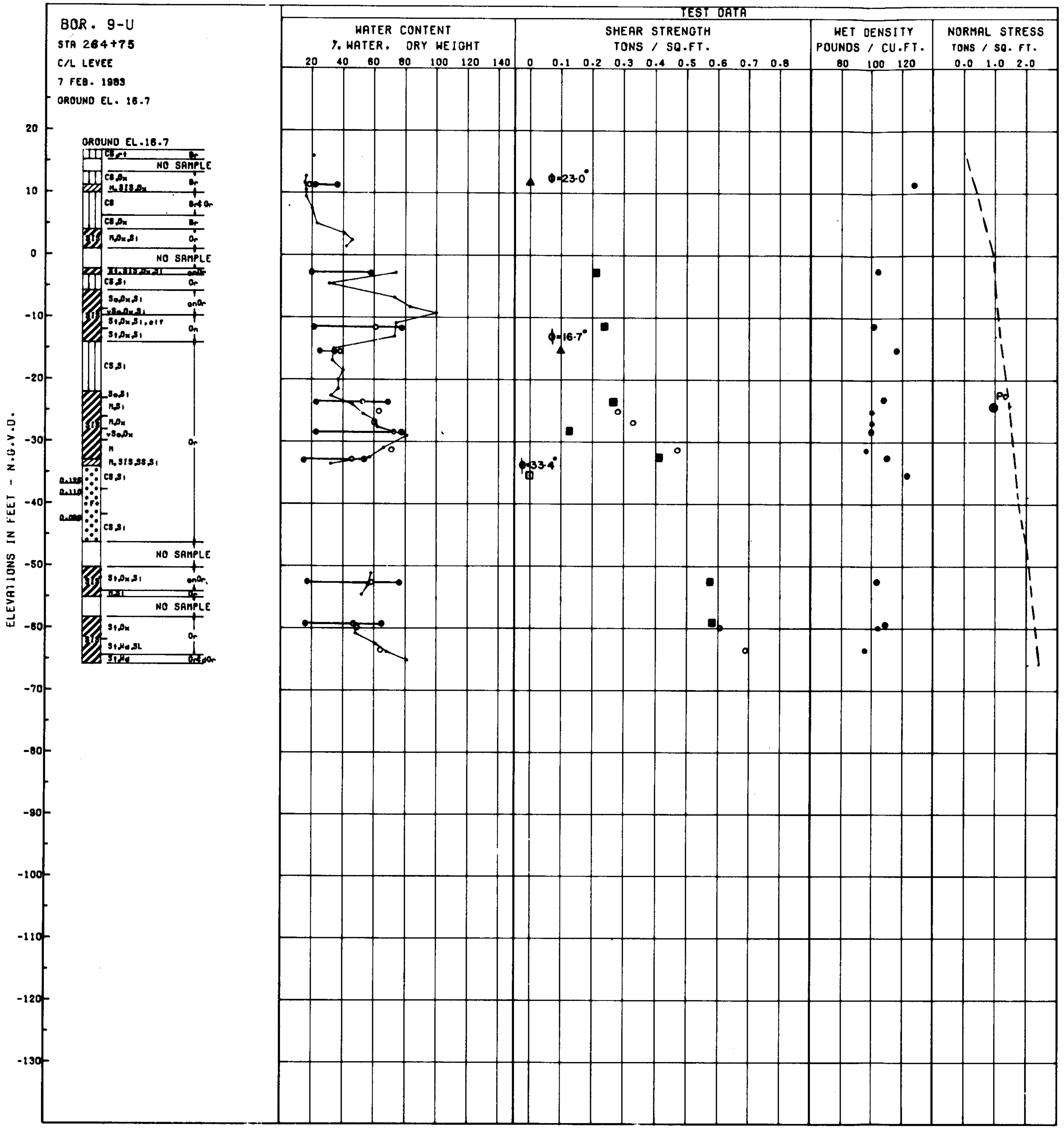
CONSOLIDATION DATA

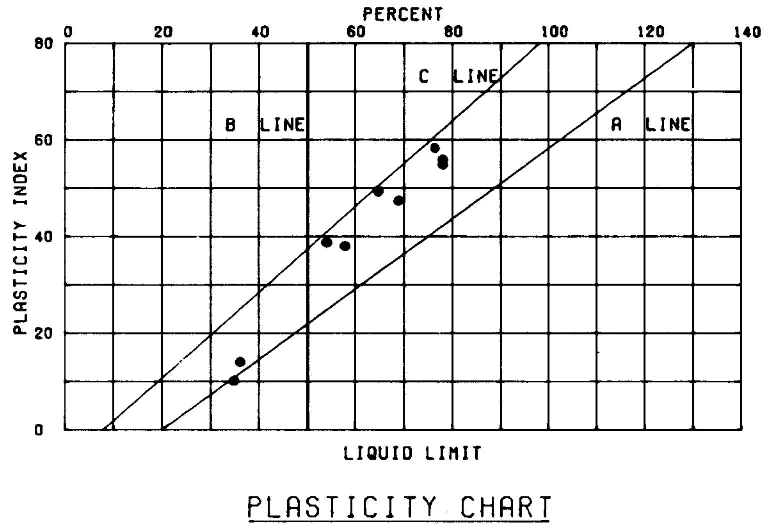
○ (UC) UNCONFINED COMPRESSION TEST
■ (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
- (R) CONSOLIDATED - UNDRAINED SHEAR TEST
⊡ (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORING SEE PLATE 5

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

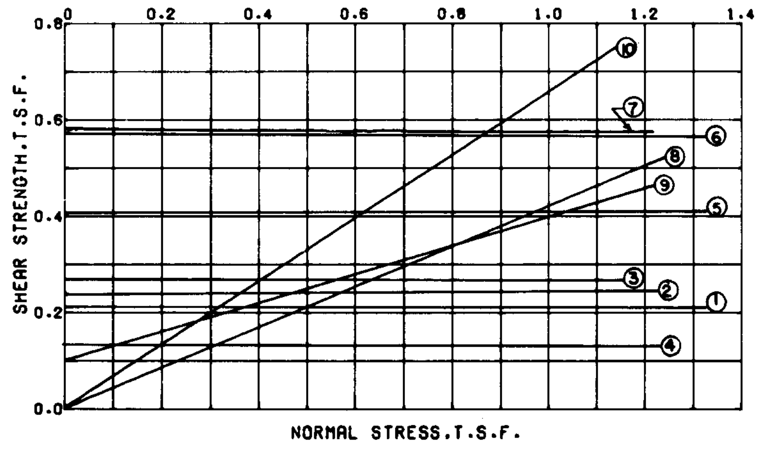
UNDISTURBED BORING DATA
BORING 8-U

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



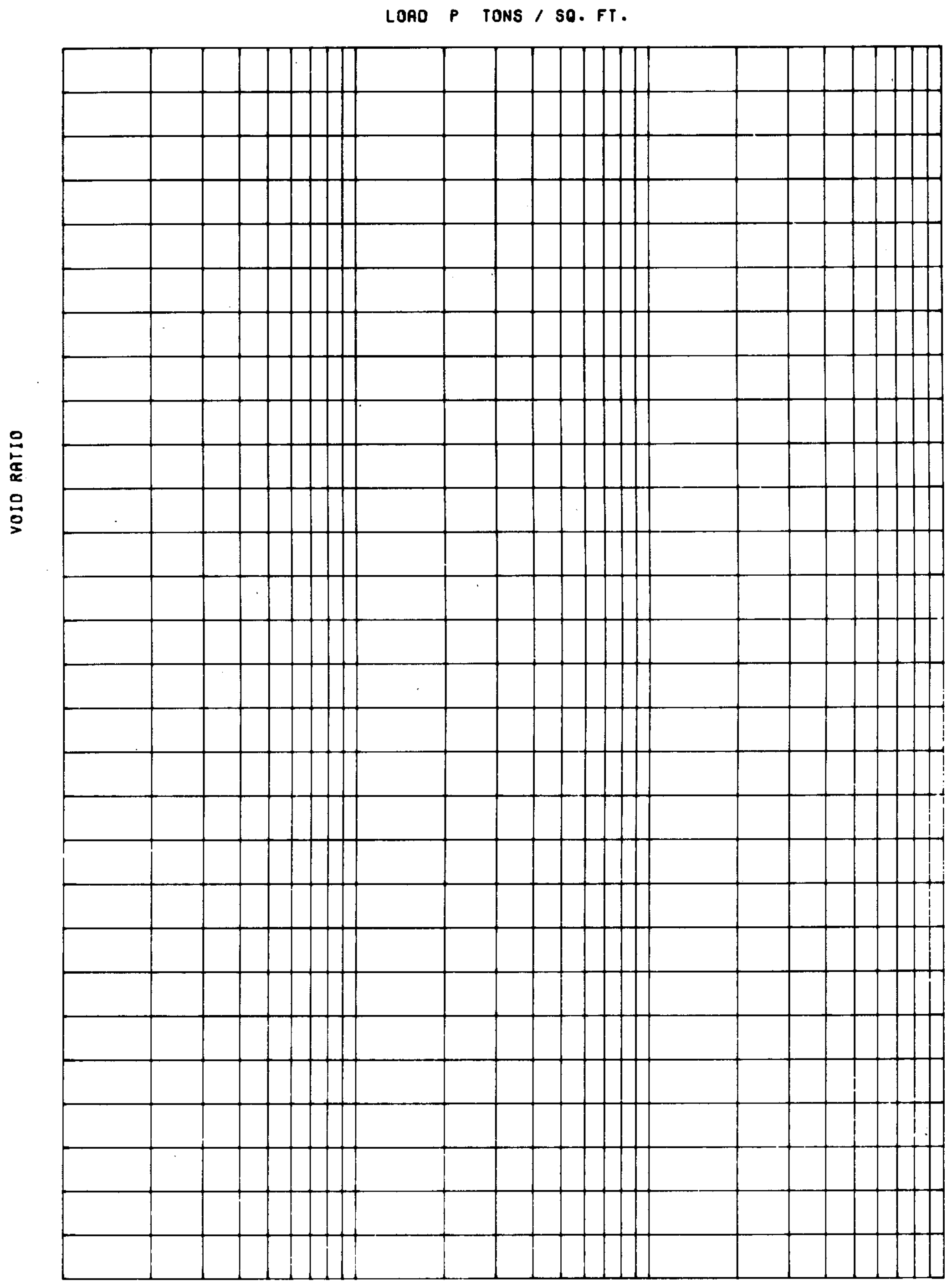


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	C - TSF	CLASS
1	-2·8	Q	0	0·21	CH
2	-11·4	Q	0	0·24	CH
3	-23·5	Q	0	0·27	CH
4	-28·3	Q	0	0·13	CH
5	-32·3	Q	0	0·41	CH
6	-52·5	Q	0	0·57	CH
7	-59·2	Q	0	0·58	CH
8	+11·6	R	23·0	0	CL
9	-15·4	R	16·7	0·10	ML
10	-35·5	S	33·4	0	SP



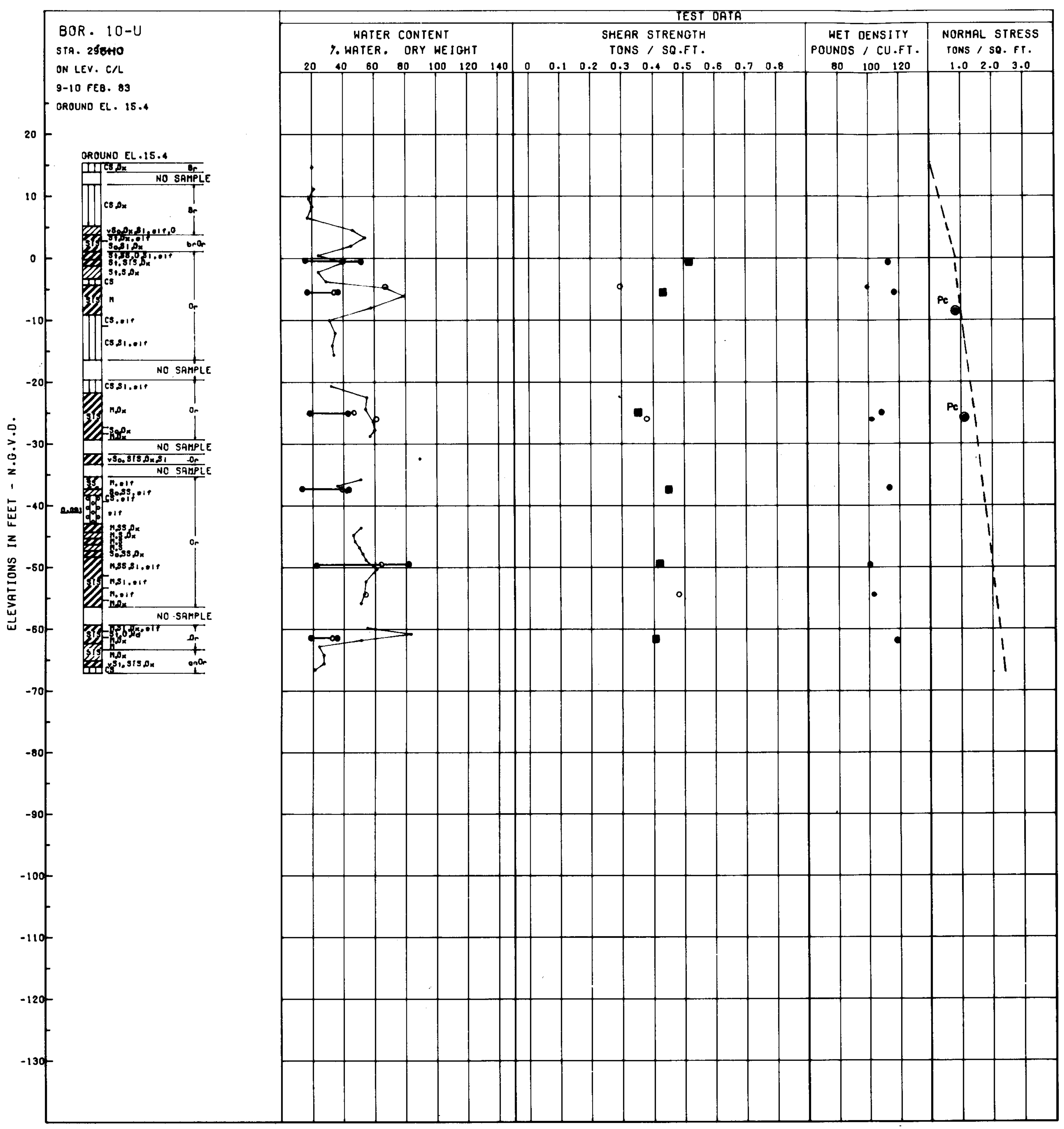
CONSOLIDATION DATA

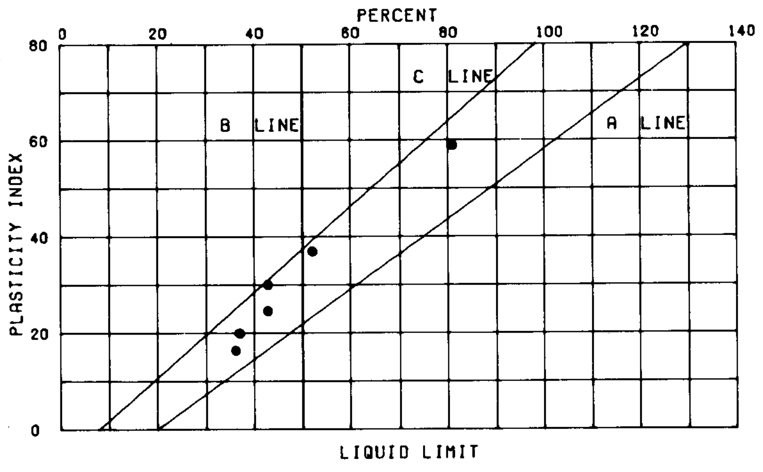
O- (UC) UNCONFINED COMPRESSION TEST
■- (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲- (R) CONSOLIDATED - UNDRAINED SHEAR TEST
⊡- (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORING SEE PLATE 6

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE WEST OF I.H.N.C.

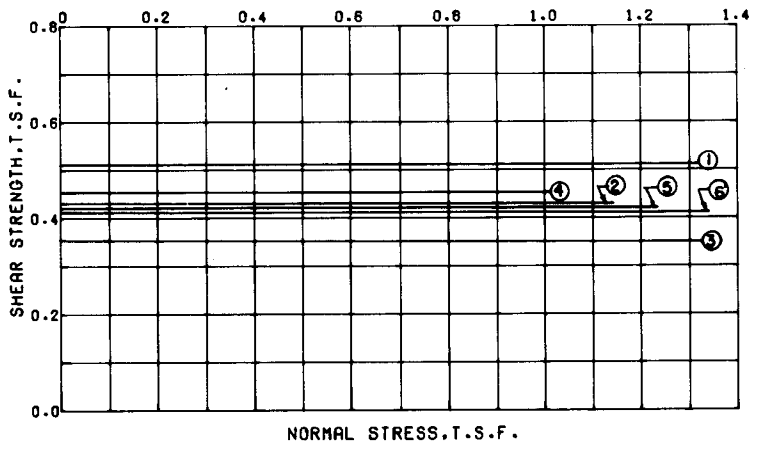
UNDISTURBED BORING DATA
BORING 9-U

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



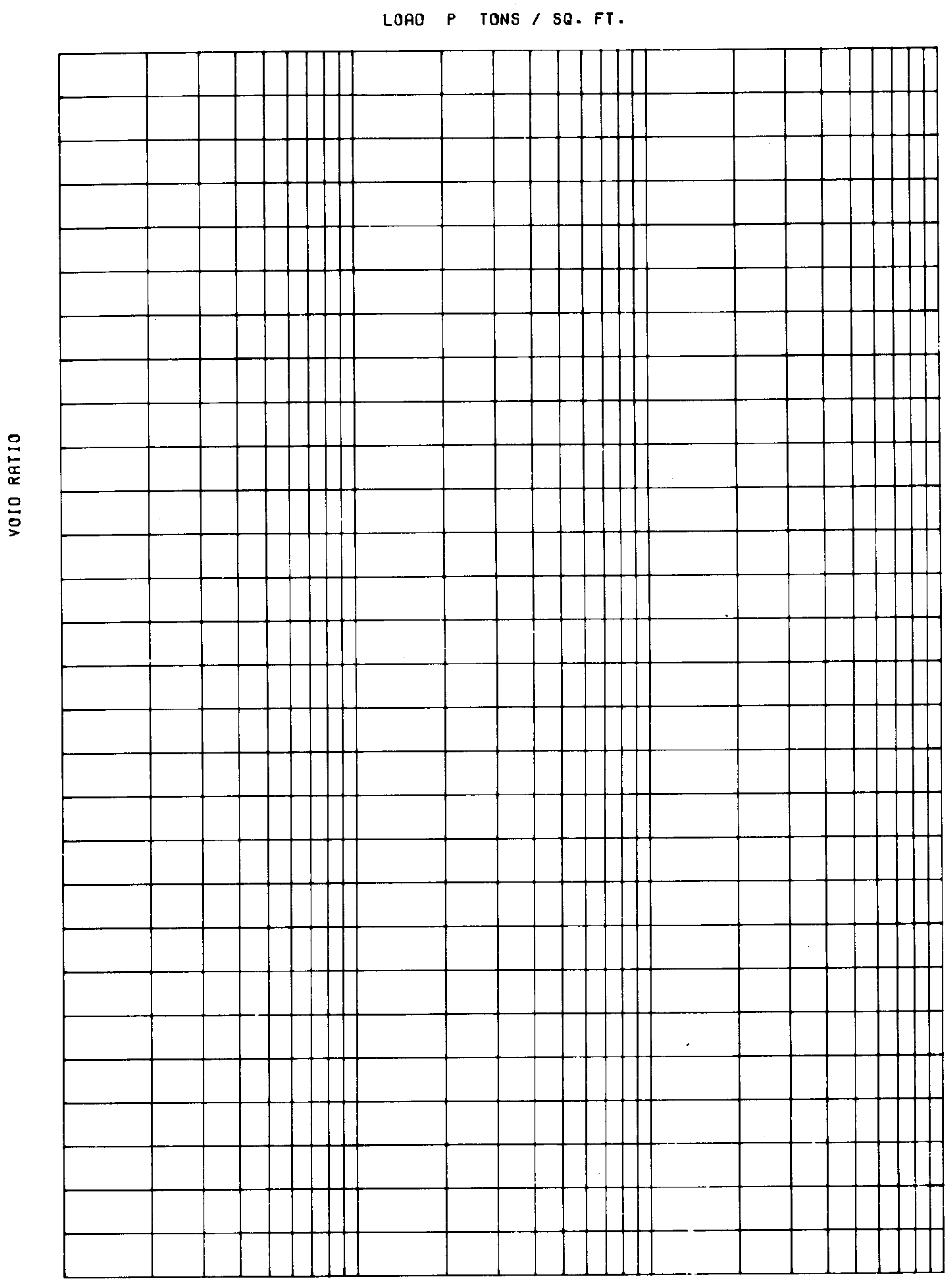


PLASTICITY CHART



SHEAR STRENGTH DATA

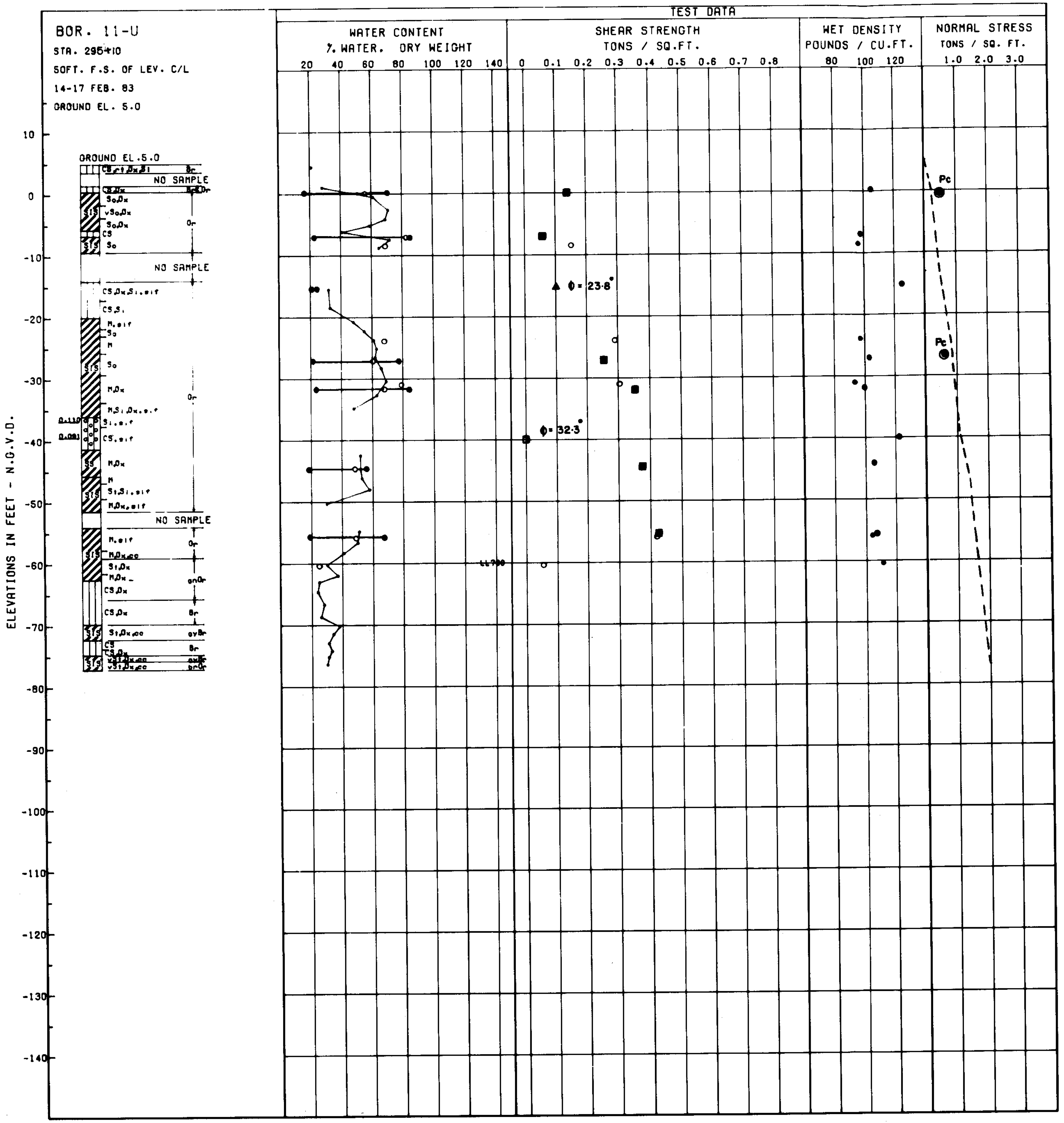
ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	C - TSF	
1	-0.5	Q	0	0.51	CH
2	-5.5	Q	0	0.43	CL
3	-24.8	Q	0	0.35	CL
4	-36.9	Q	0	0.45	CL
5	-49.6	Q	0	0.42	CH
6	-61.6	Q	0	0.41	CL

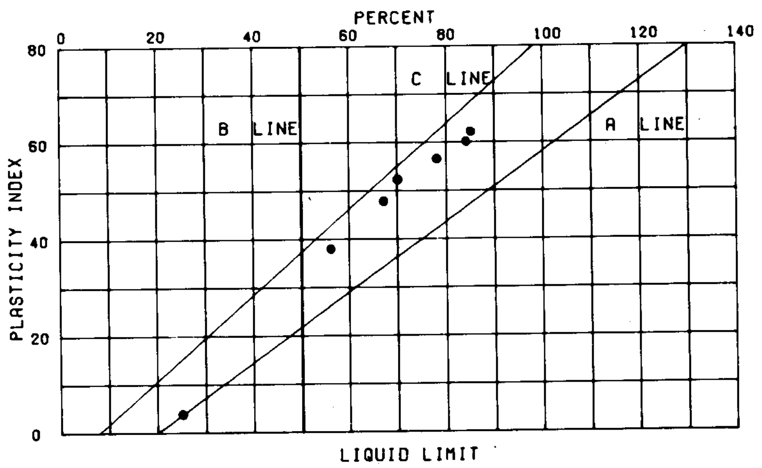


CONSOLIDATION DATA

O- (UC) UNCONFINED COMPRESSION TEST
■- (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
- (R) CONSOLIDATED - UNDRAINED SHEAR TEST
- (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORING SEE PLATE 7

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE WEST OF I.H.N.C.
UNDISTURBED BORING DATA
BORING 10-U
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536





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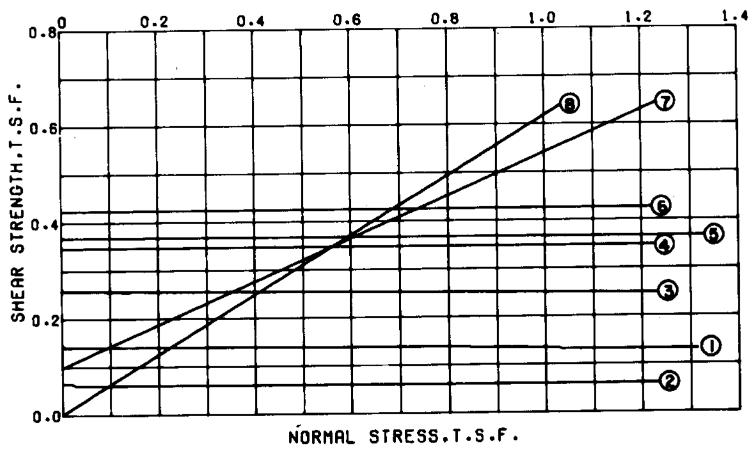
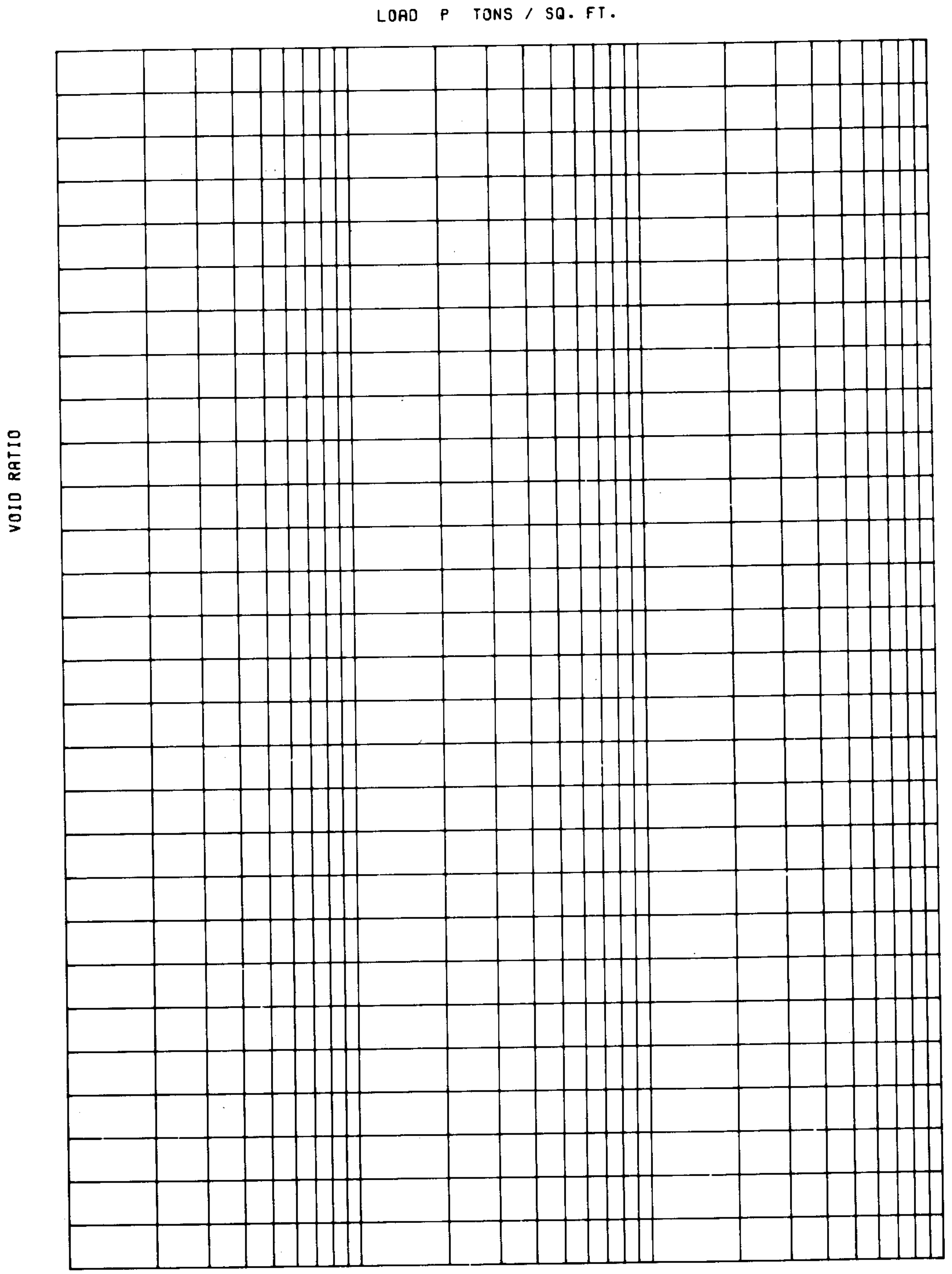


SHEAR STRENGTH DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	C - TSF	CLASS
1	+0.2	Q	0	0.14	CH
2	-7.0	Q	0	0.06	CH
3	-27.1	Q	0	0.25	CH
4	-32.0	Q	0	0.35	CH
5	-44.1	Q	0	0.37	CH
6	-55.3	Q	0	0.42	CH
7	-15.0	R	23.8	0.10	CL-ML
8	-40.0	S	32.3	0	SP



CONSOLIDATION DATA

O- (UC) UNCONFINED COMPRESSION TEST
■- (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲- (R) CONSOLIDATED - UNDRAINED SHEAR TEST
⊡- (S) CONSOLIDATED - DRAINED SHEAR TEST

BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER

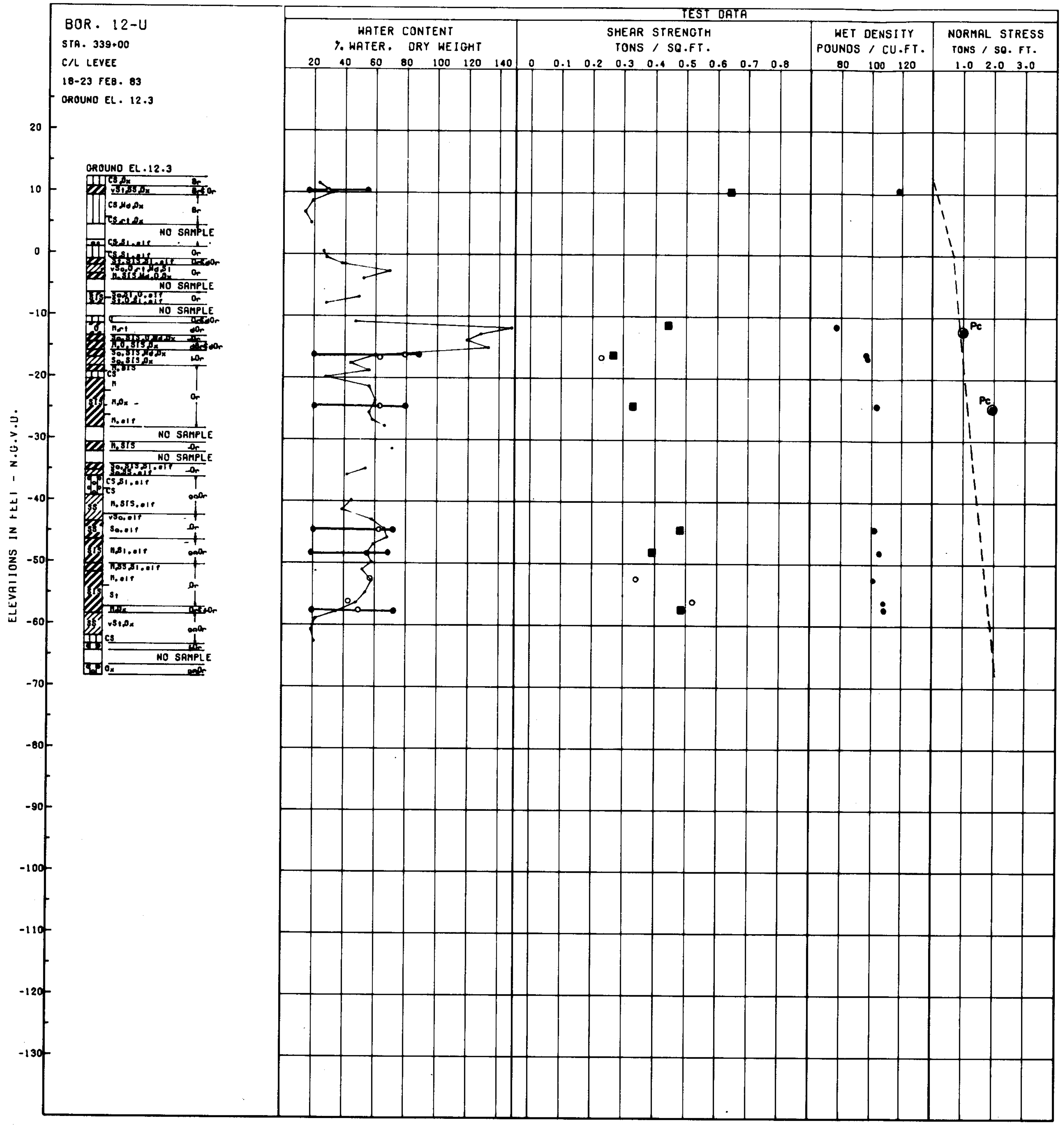
FOR SOIL BORING LEGEND SEE PLATE A

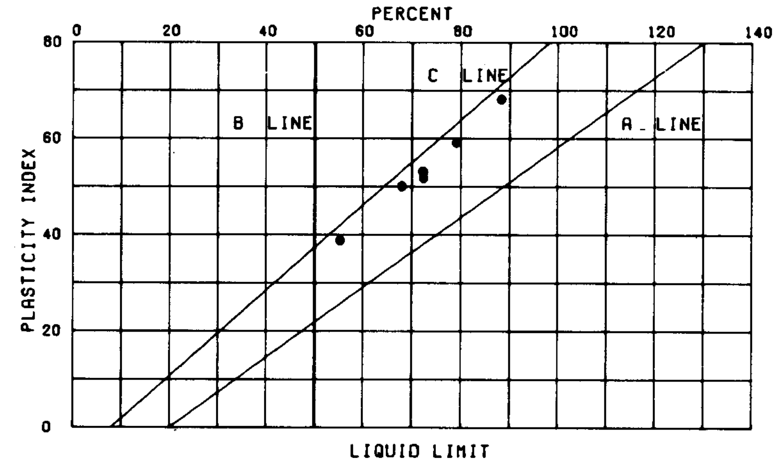
FOR LOCATION OF BORING SEE PLATE 7

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

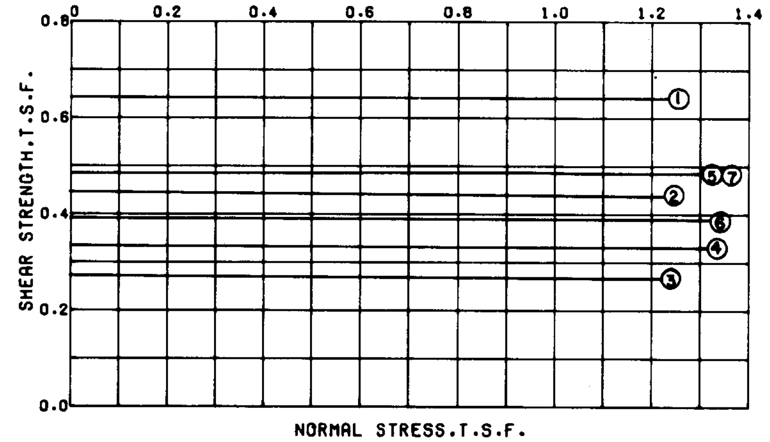
UNDISTURBED BORING DATA
BORING 11-U

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



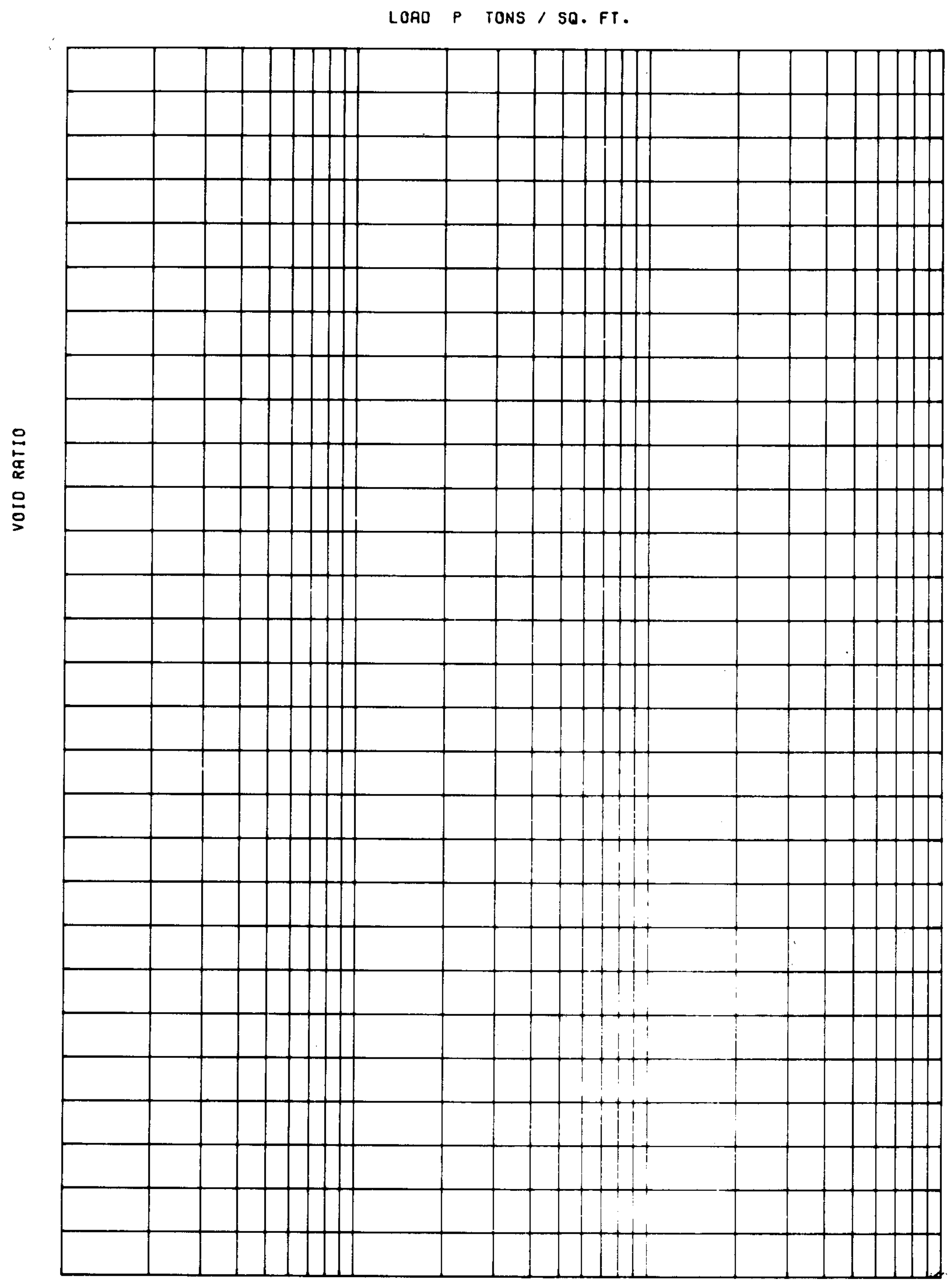


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	C - TSF	
1	+10·3	Q	0	0·64	CH
2	-11·8	Q	0	0·44	PT
3	-16·1	Q	0	0·27	CH
4	-24·3	Q	0	0·33	CH
5	-44·7	Q	0	0·48	CH
6	-48·1	Q	0	0·39	CH
7	-57·7	Q	0	0·48	CH



CONSOLIDATION DATA

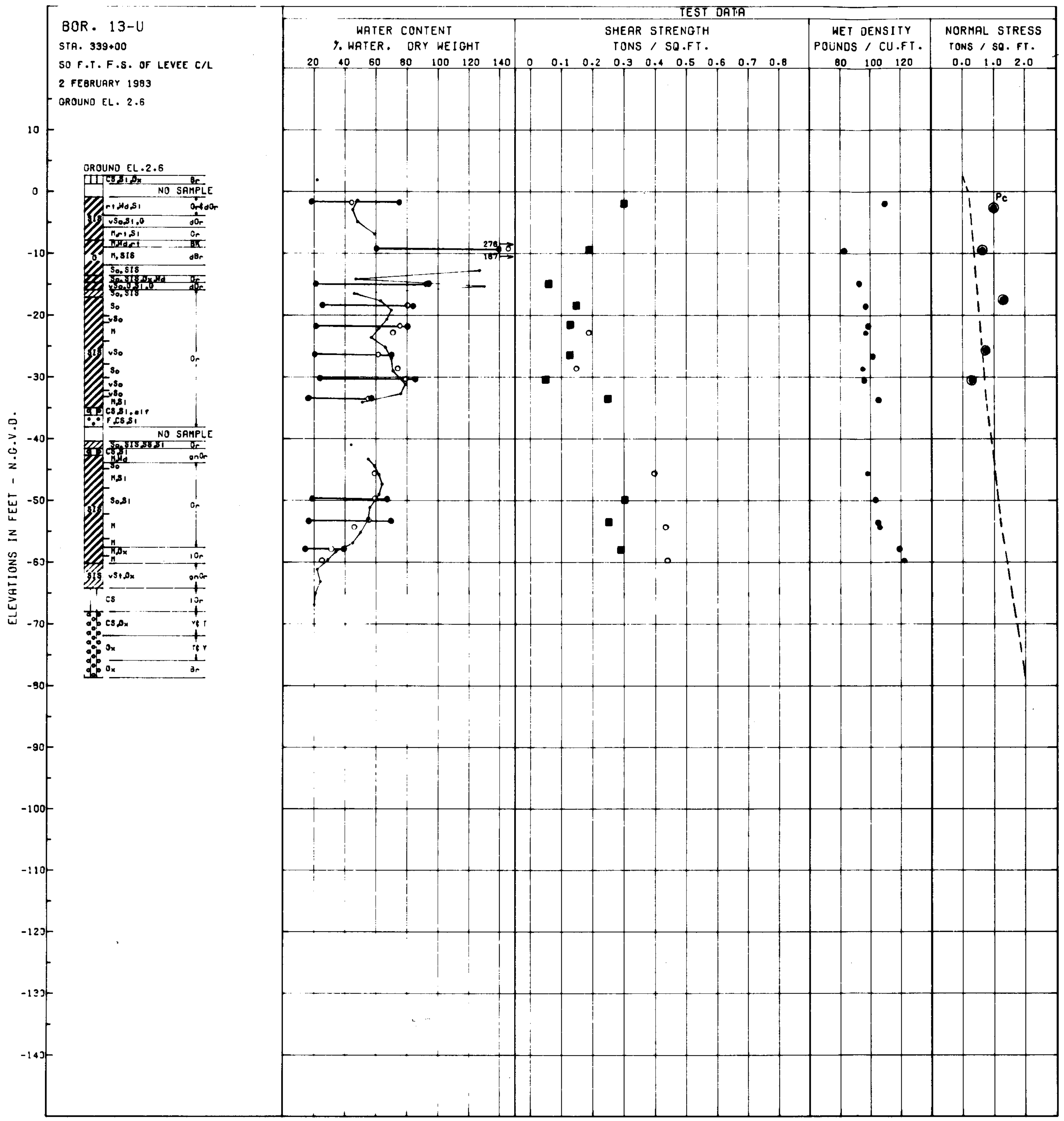
O- (UC) UNCONFINED COMPRESSION TEST
■- (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
- (R) CONSOLIDATED - UNDRAINED SHEAR TEST
- (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORING SEE PLATE 7

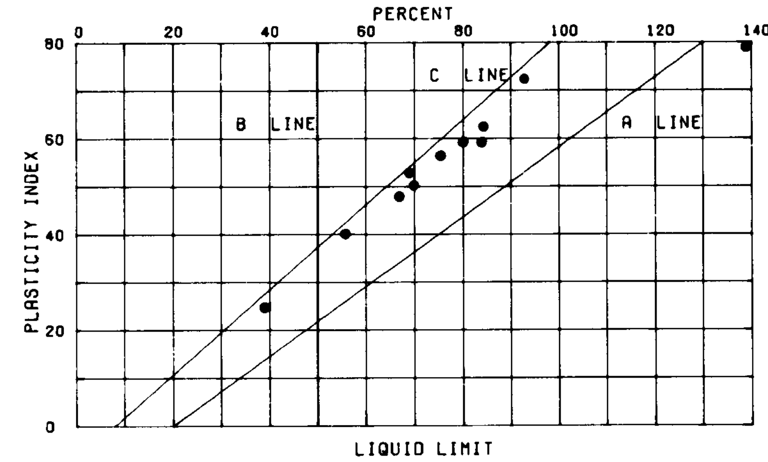
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 12-U

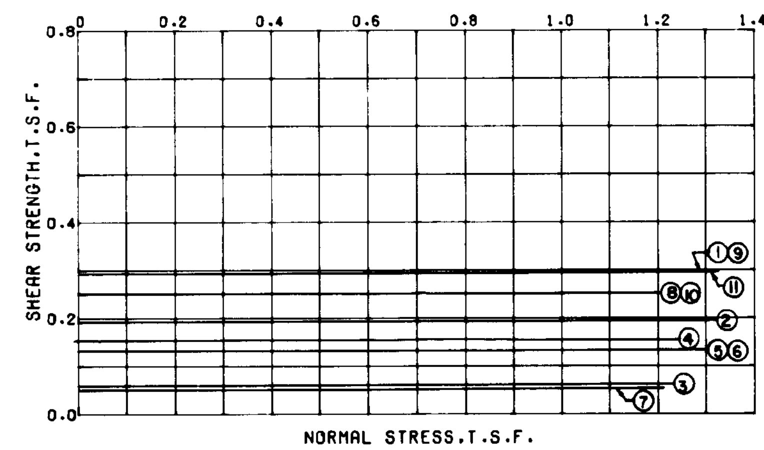
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 76



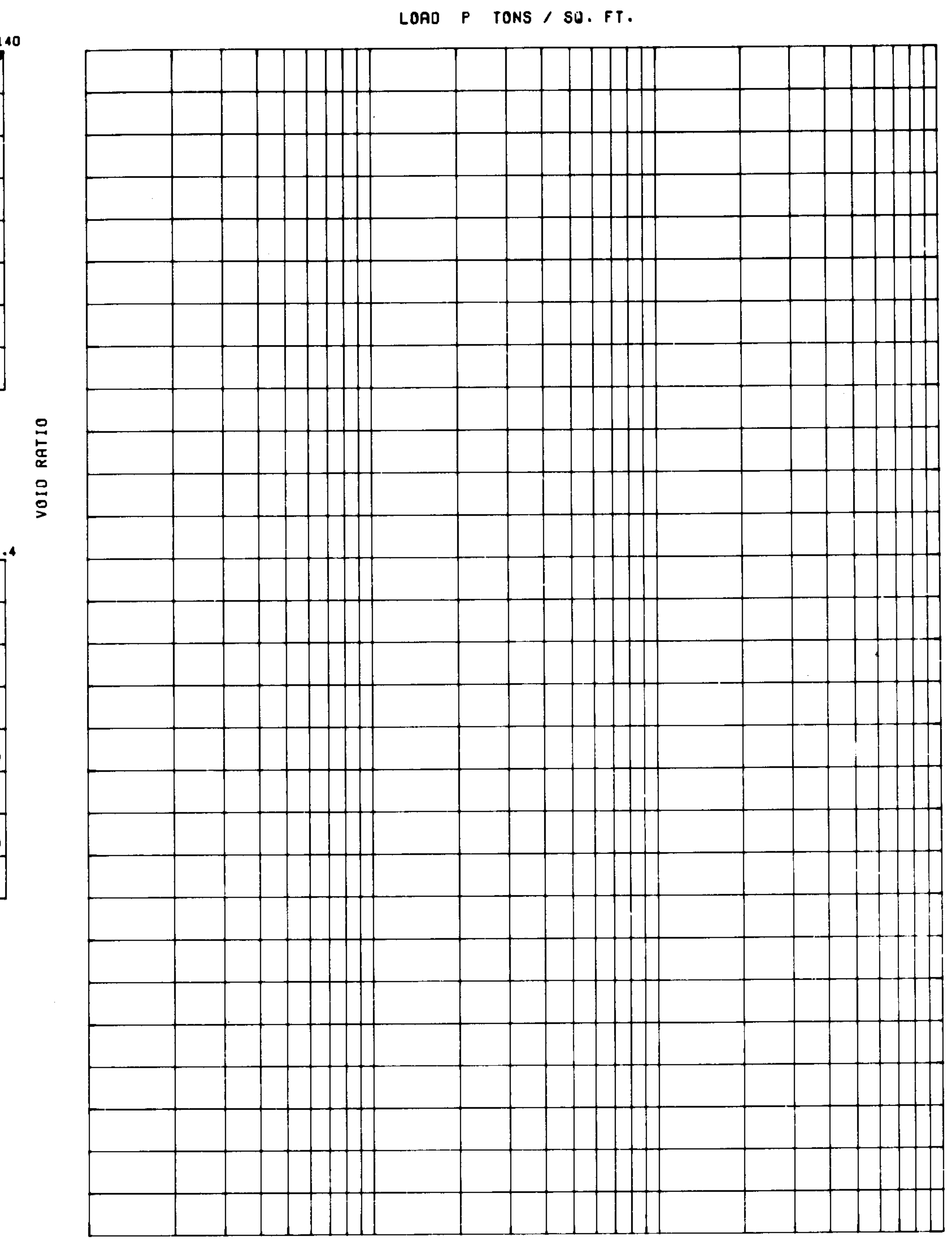


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	C - TSF	
1	-1.9	Q	0	0.30	CH
2	-9.2	Q	0	0.19	CH
3	-14.7	Q	0	0.06	CH
4	-18.3	Q	0	0.15	CH
5	-21.5	Q	0	0.13	CH
6	-26.4	Q	0	0.13	CH
7	-30.4	Q	0	0.05	CH
8	-33.6	Q	0	0.25	CH
9	-49.7	Q	0	0.30	CH
10	-53.6	Q	0	0.25	CH
11	-57.8	Q	0	0.29	CL



CONSOLIDATION DATA

O- (UC) UNCONFINED COMPRESSION TEST
■- (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
- (R) CONSOLIDATED - UNDRAINED SHEAR TEST
- (S) CONSOLIDATED - DRAINED SHEAR TEST

BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER

FOR SOIL BORING LEGEND SEE PLATE A

FOR LOCATION OF BORING SEE PLATE 7

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

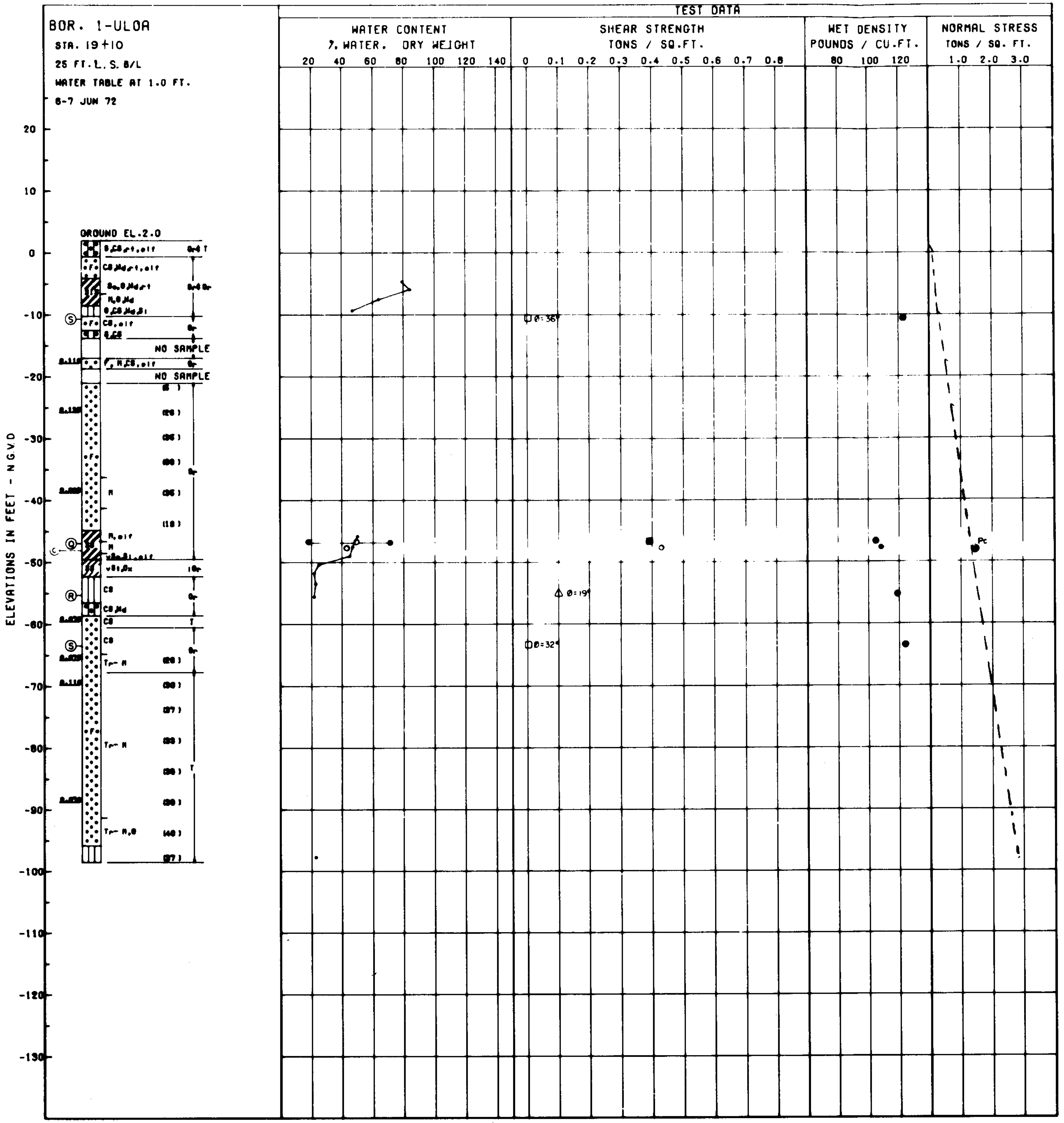
DESIGN MEMORANDUM NO.13, GENERAL DESIGN

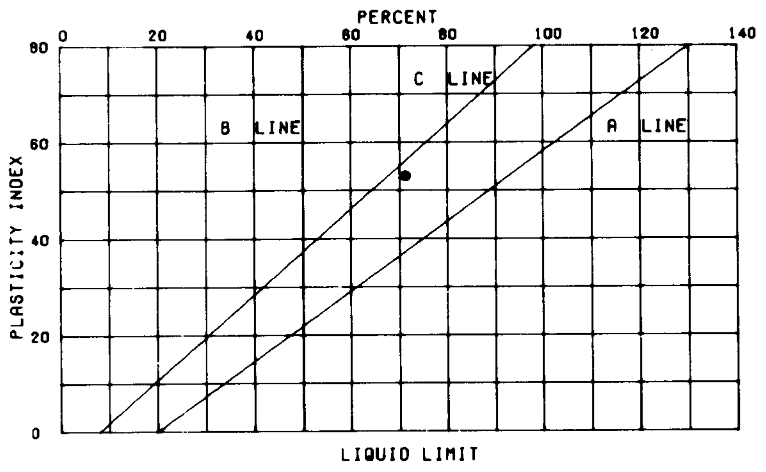
ORLEANS PARISH LAKEFRONT LEVEE WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 13-U

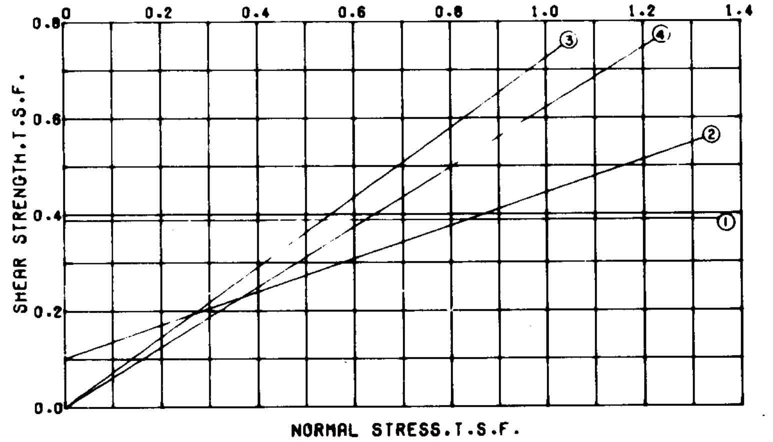
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

NOVEMBER 1984 FILE NO. H-2-29536



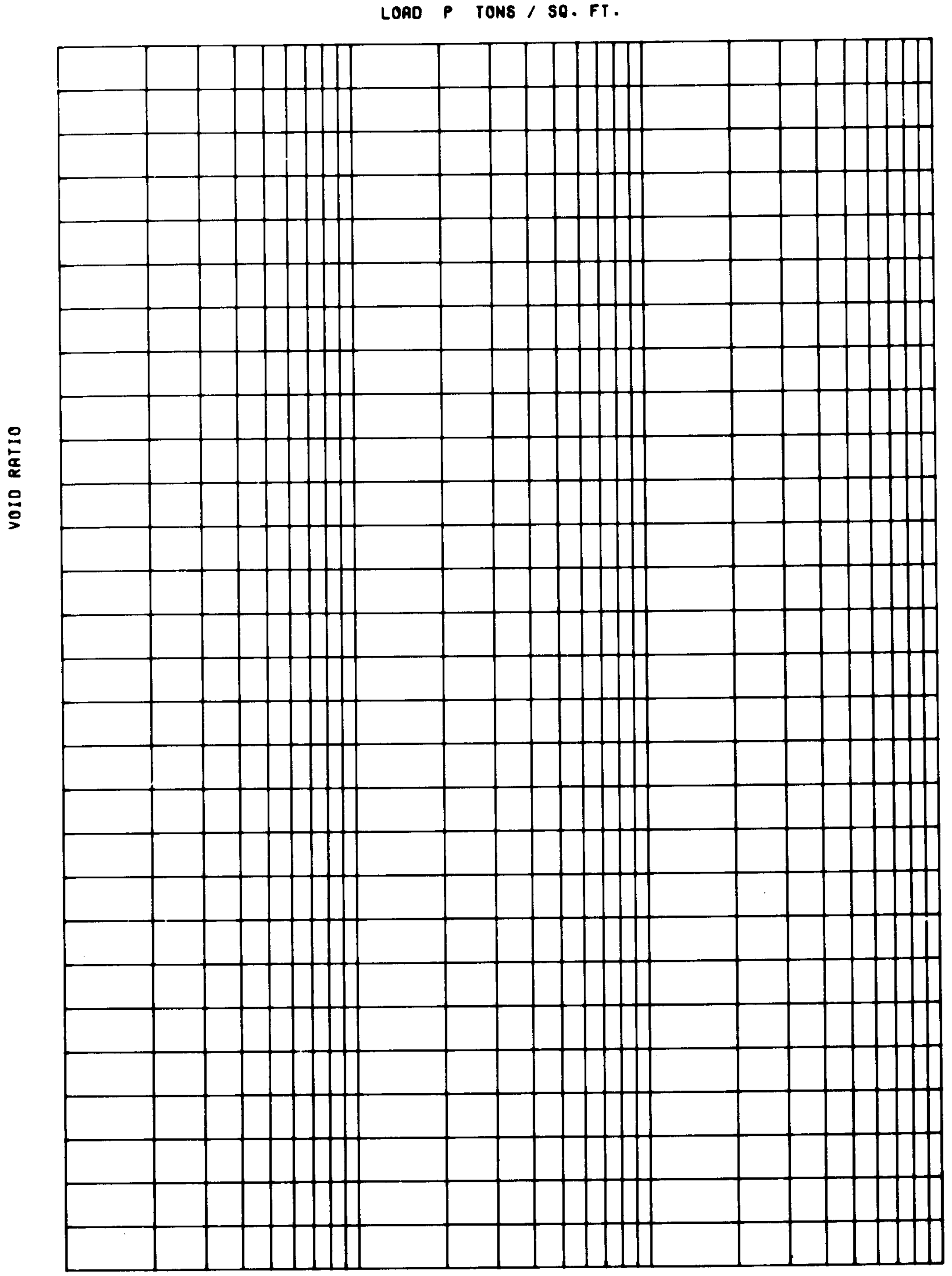


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-47.0	Q	0	0.39	GH
2	-55.2	R	19	0.10	ML
3	-10.5	S	36	0	SM
4	-63.6	S	32	0	SM



CONSOLIDATION DATA

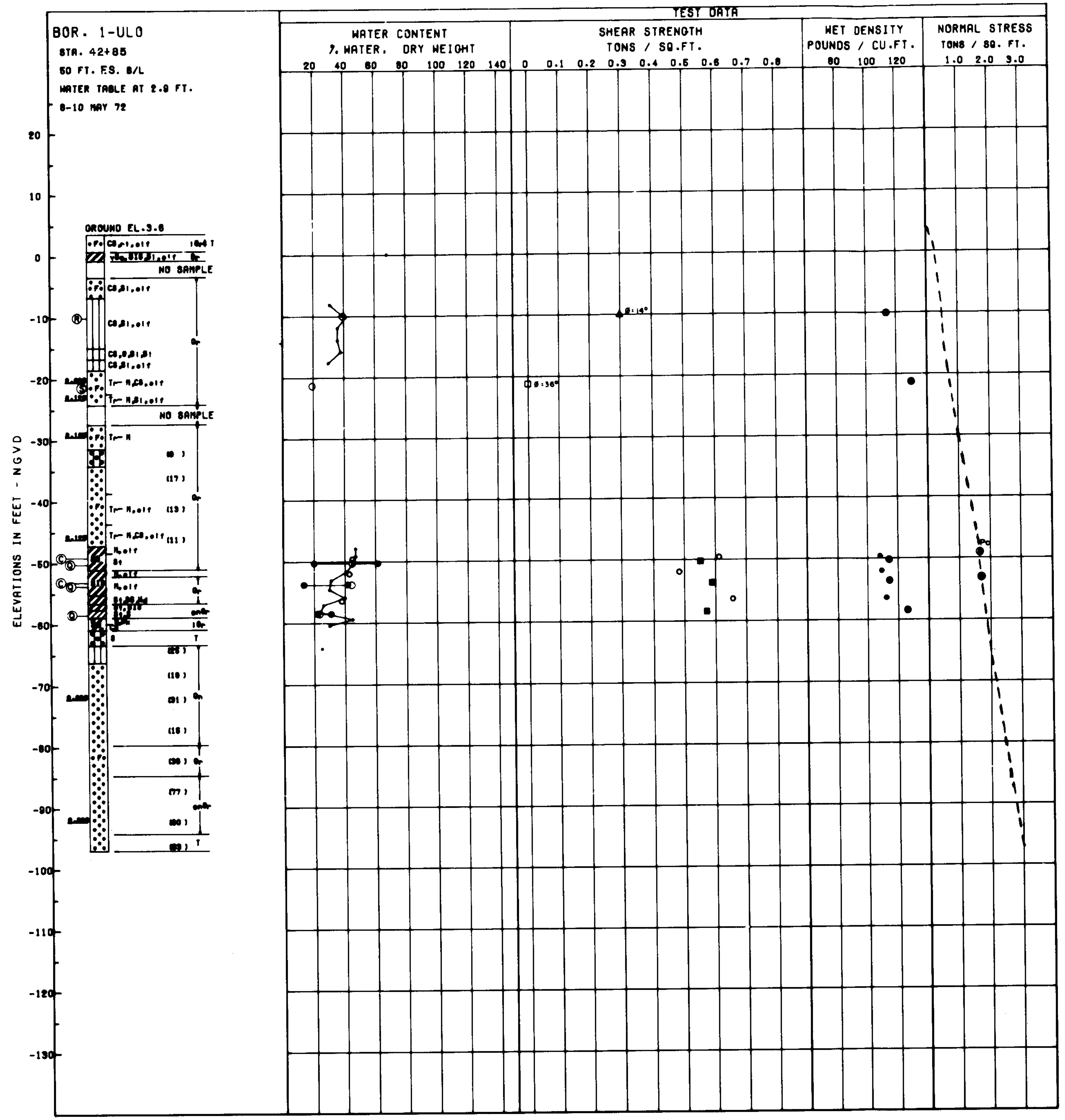
○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
△ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER
STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORINGS SEE PLATE 2

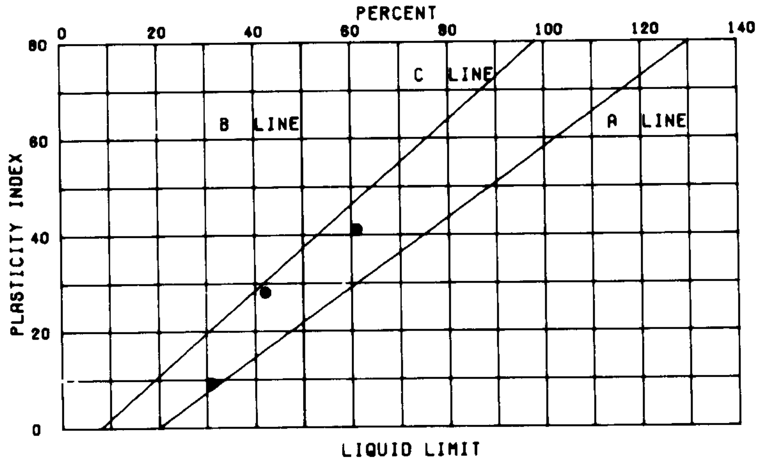
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 1-ULOA

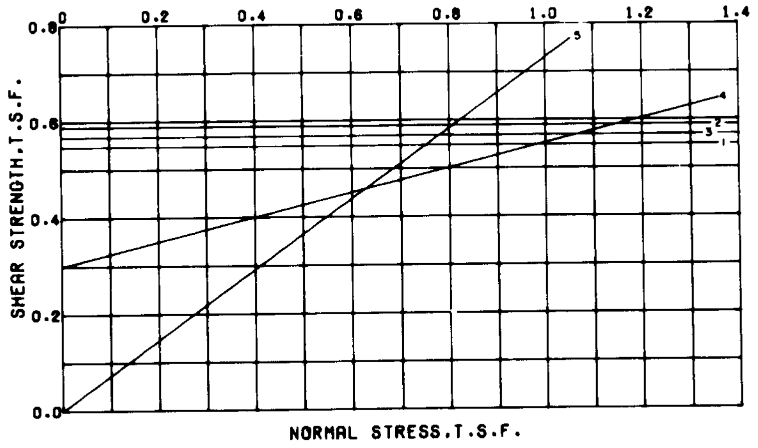
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 78





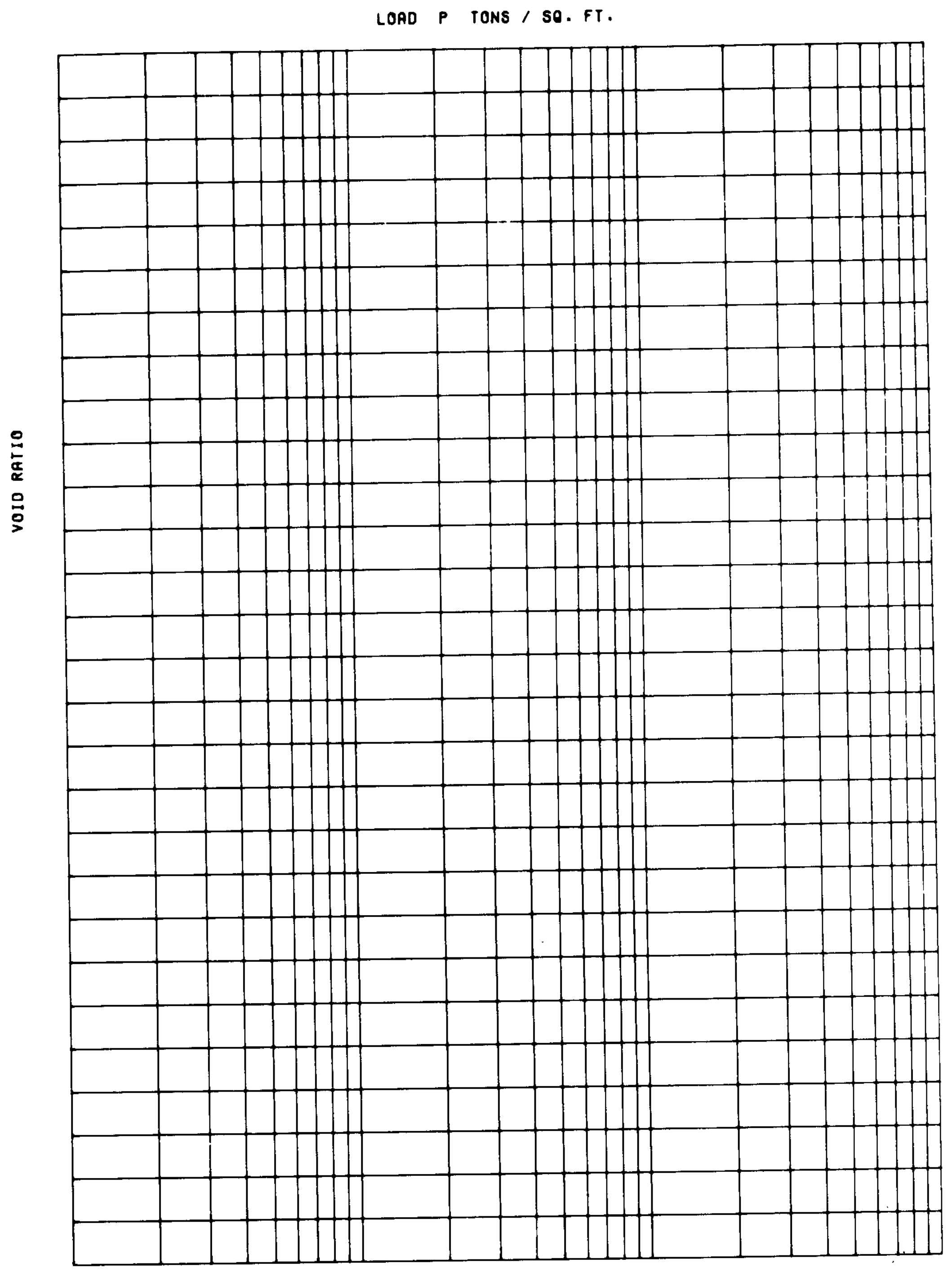
PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ°	STRENGTH C - TSF	CLASS
1	-50.2	Q	0	0.55	CH
2	-53.8	Q	0	0.59	CH
3	-58.5	Q	0	0.57	CL
*4	-10.0	R	14°	0.30	ML
5	-21.4	S	36°	0	SP

*BASED ON $(\sigma_1 - \sigma_3)$ AT MAXIMUM PORE PRESSURE



CONSOLIDATION DATA

○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED SHEAR TEST

BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER

FOR SOIL BORING LEGEND SEE PLATE A

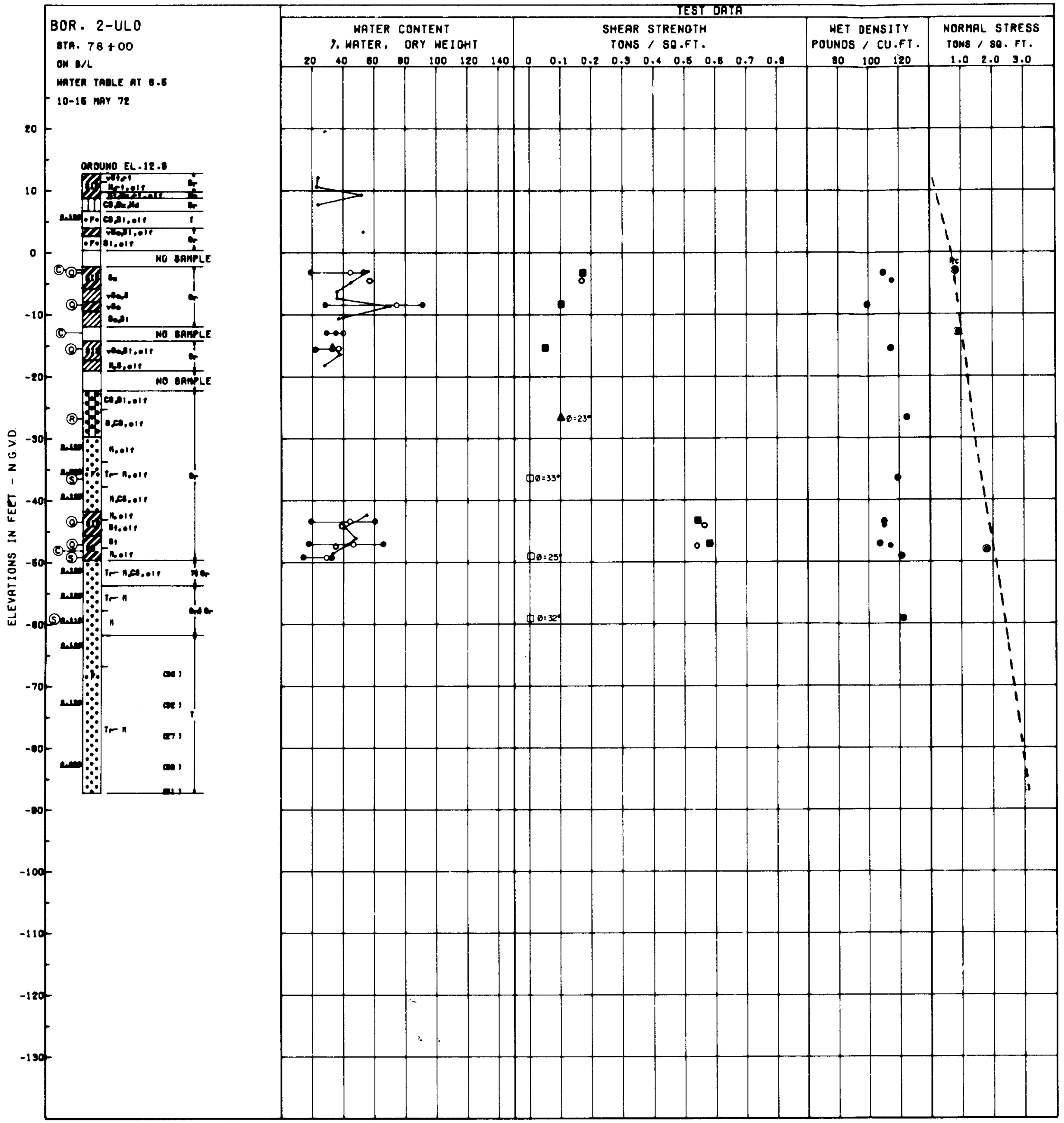
FOR LOCATION OF BORINGS SEE PLATE 2

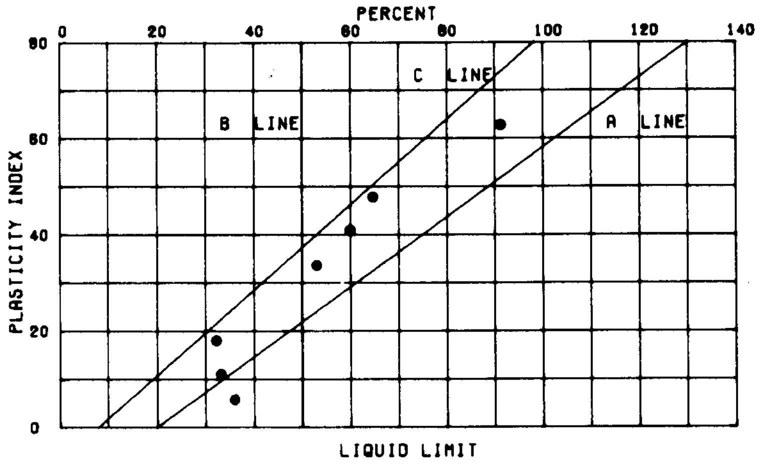
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 1-ULO

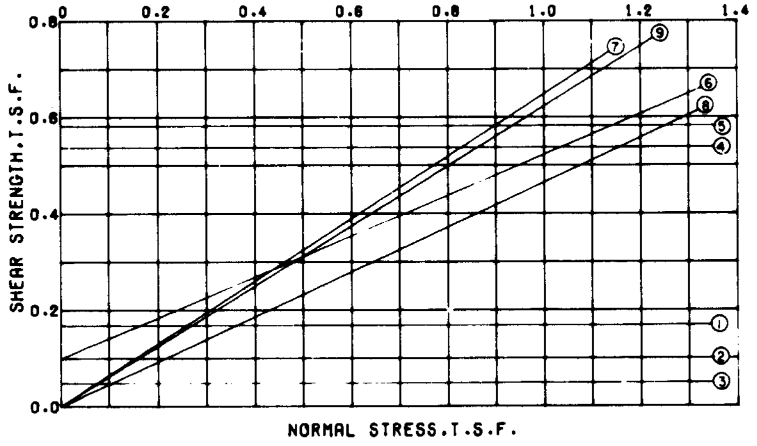
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 79



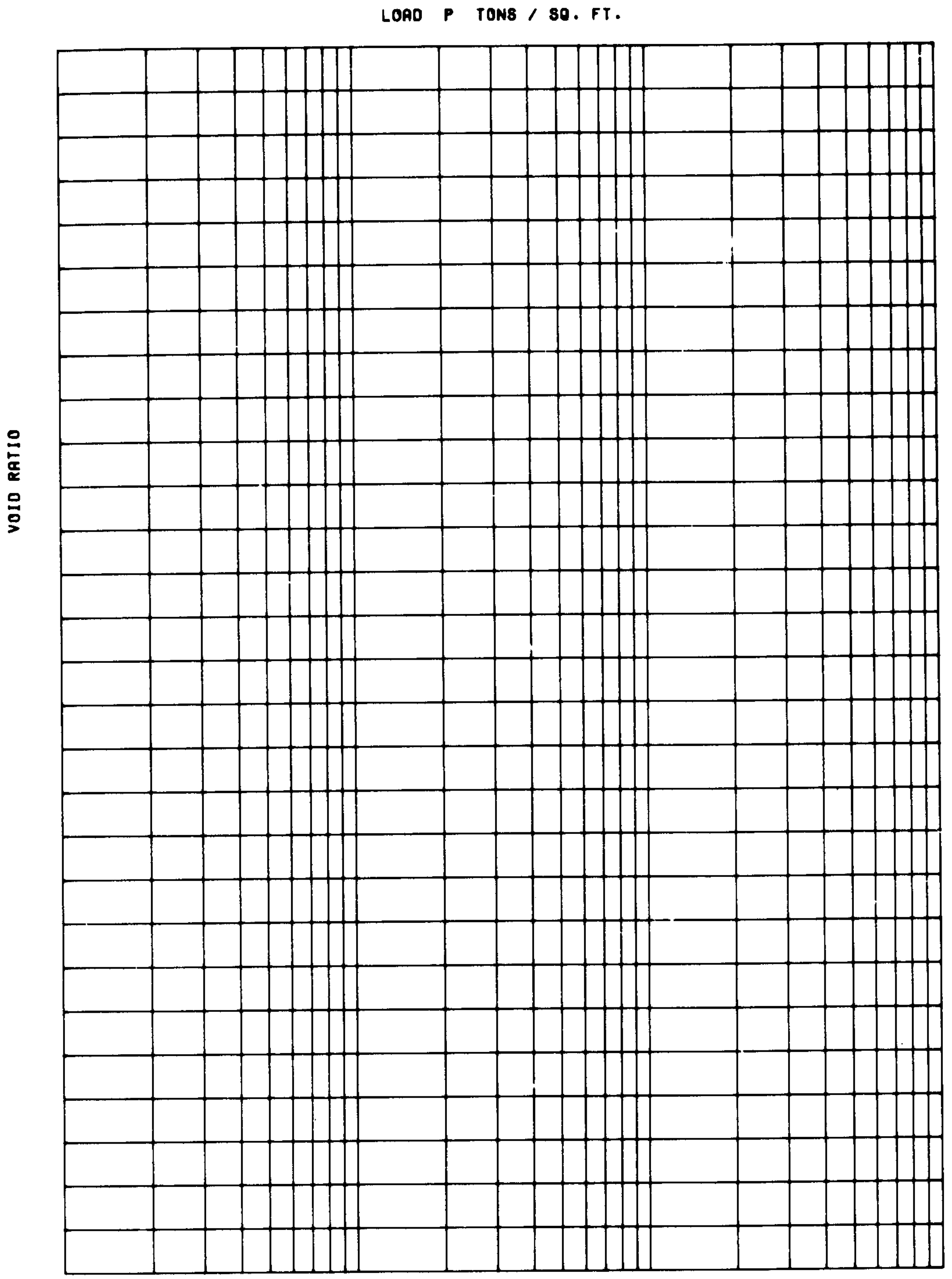


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	C - TSF	CLASS
1	-3.1	Q	0	0.17	CH
2	-8.3	Q	0	0.10	CH
3	-15.5	Q	0	0.05	CL
4	-43.4	Q	0	0.54	CH
5	-47.0	Q	0	0.58	CH
6	-26.7	R	23°	0.10	SP
7	-36.4	S	33°	0	SP
8	-49.0	S	25°	0	CL
9	-59.2	S	32°	0	SP



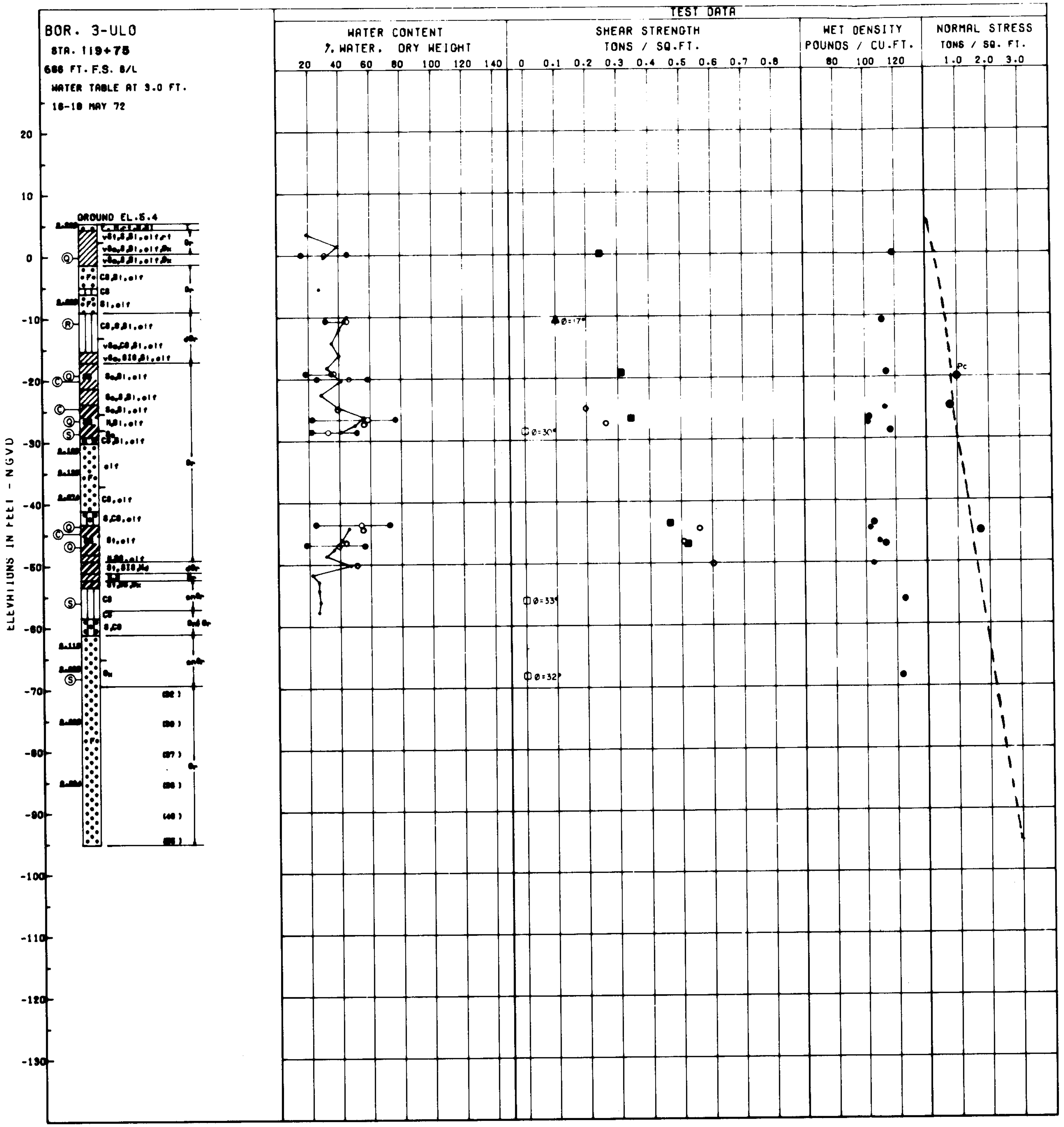
CONSOLIDATION DATA

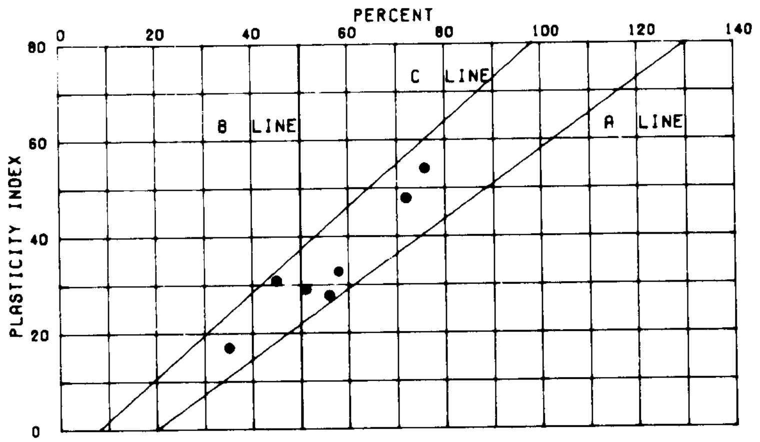
○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORINGS SEE PLATE 2

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

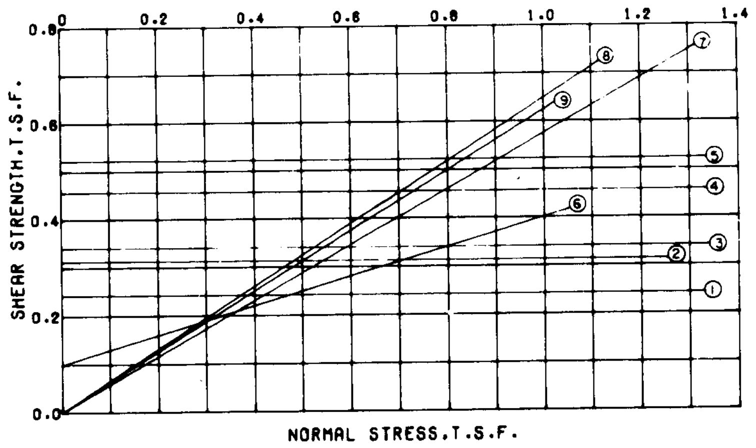
UNDISTURBED BORING DATA
BORING 2-ULO

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



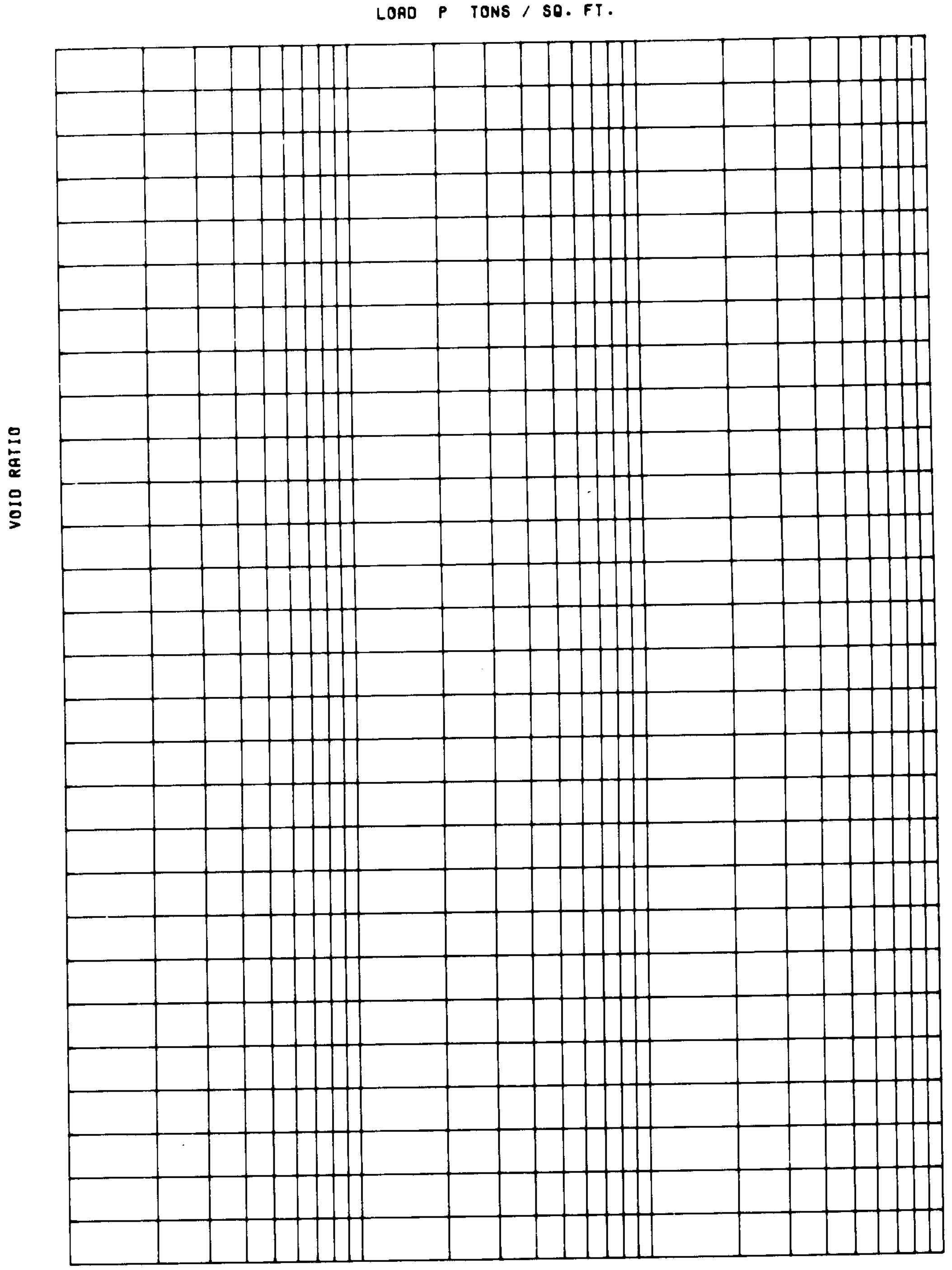


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	C - TSF	
·	0 0	Q	0	0 24	CL
2	-19 0	Q	0	0 31	CL
3	-26 5	Q	0	0 34	CH
4	-43 5	Q	0	0 46	CH
5	-46 9	Q	0	0.52	CH
6	-10 5	R	17°	0.10	ML
7	-28 5	S	30°	0	CH
8	-55 8	S	33°	0	SP
9	-68 2	S	32°	0	SP



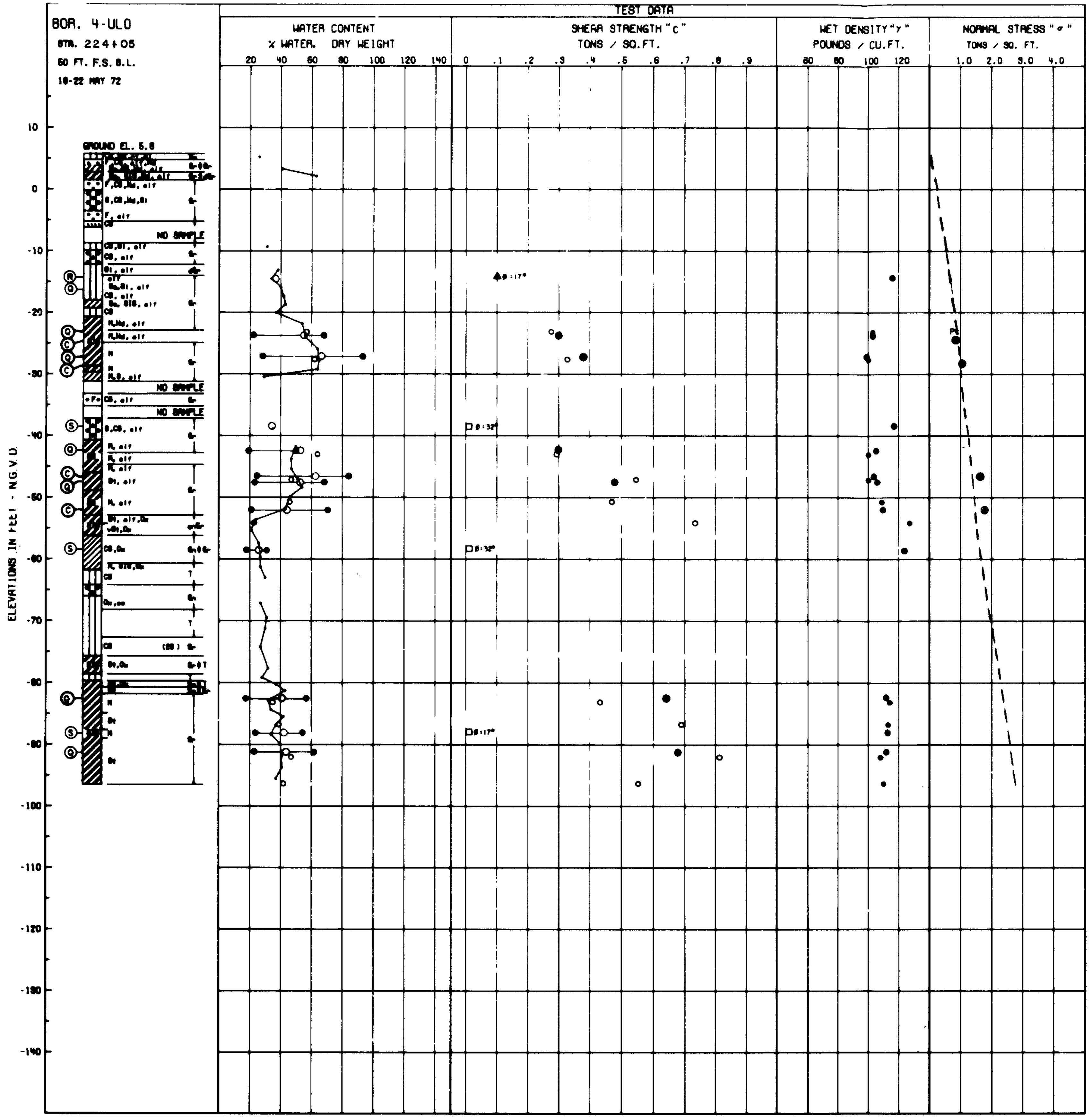
CONSOLIDATION DATA

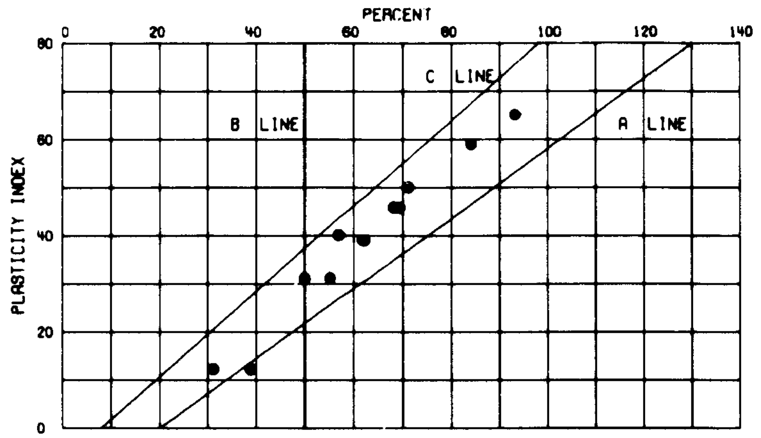
○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
◻ - (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORINGS SEE PLATE 3

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

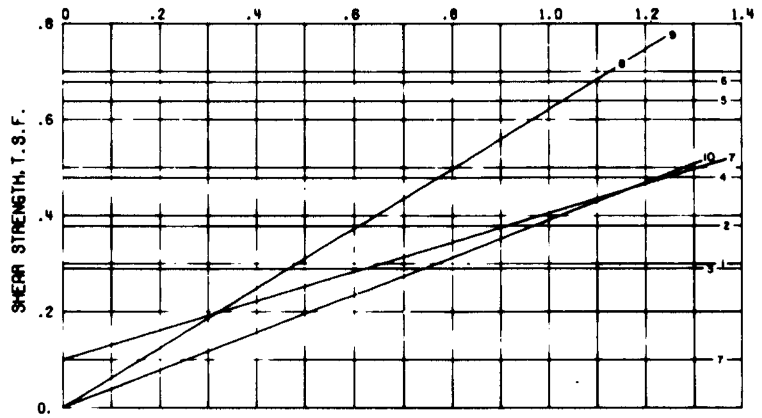
UNDISTURBED BORING DATA
BORING 3-ULO

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536





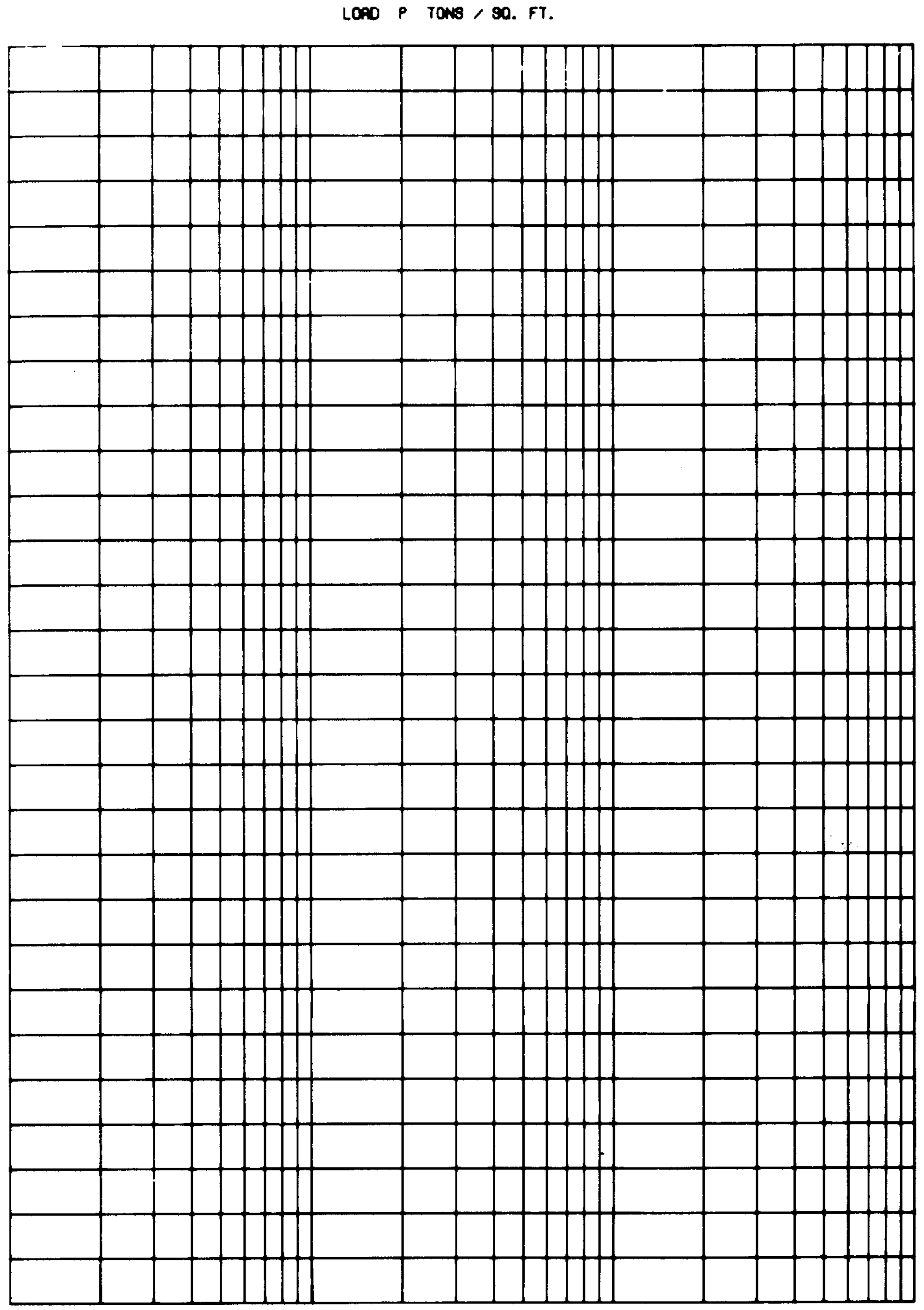
PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ°	C - TSF	CLASS
1	-23.1			0.30	
2	-27.2			0.38	
3	-42.3	Q	0	0.29	CH
4	-47.5			0.46	
5	-82.5			0.64	
6	-91.2			0.68	
*7	-14.5	R	17°	0.10	ML
8	-38.5		32°		SM
9	-56.3	S	32°	0	CL
10	-88.0		21.5°		CH

*BASED ON $(\sigma_1 - \sigma_3)$ AT MAXIMUM PORE PRESSURE



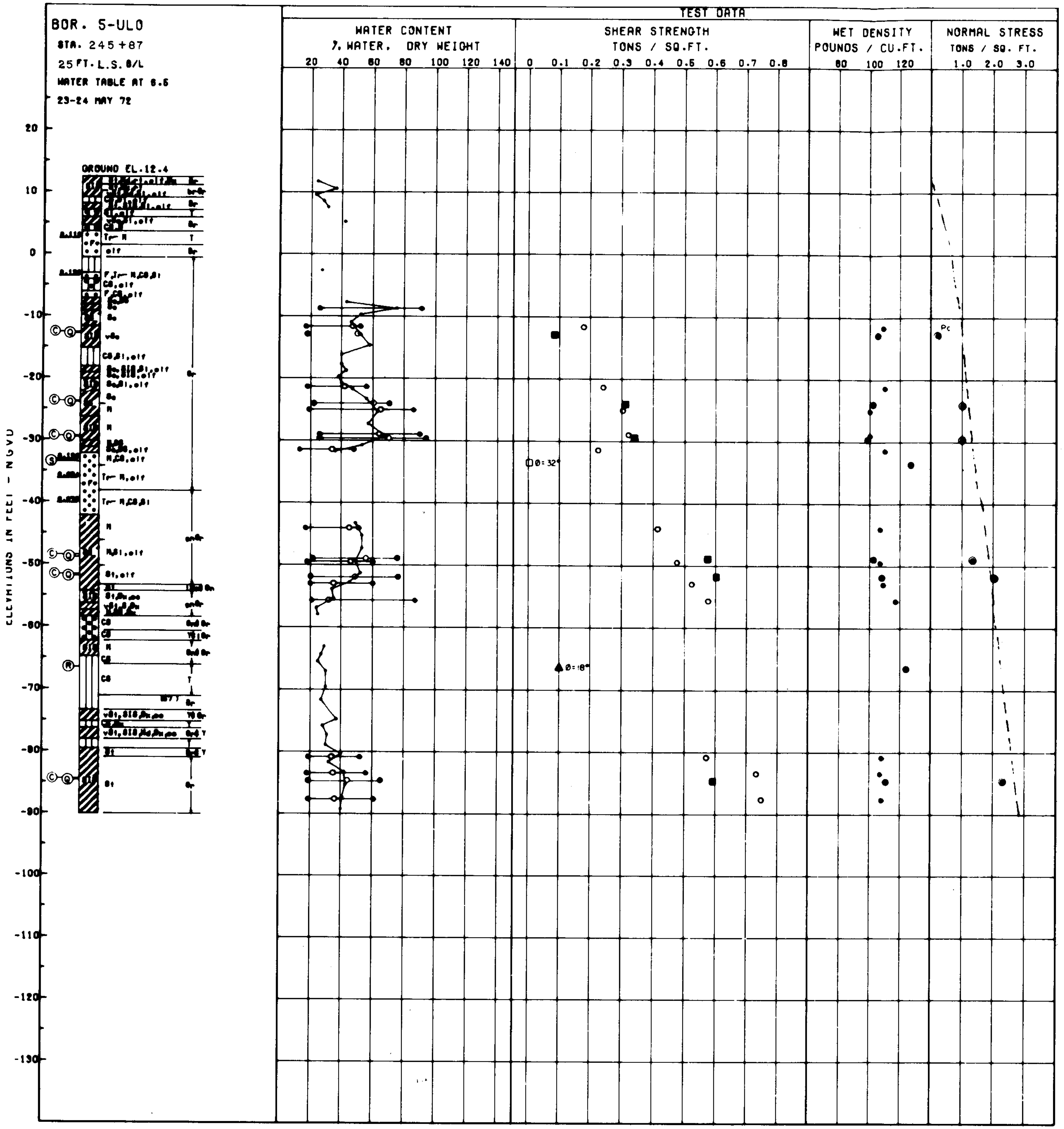
CONSOLIDATION DATA

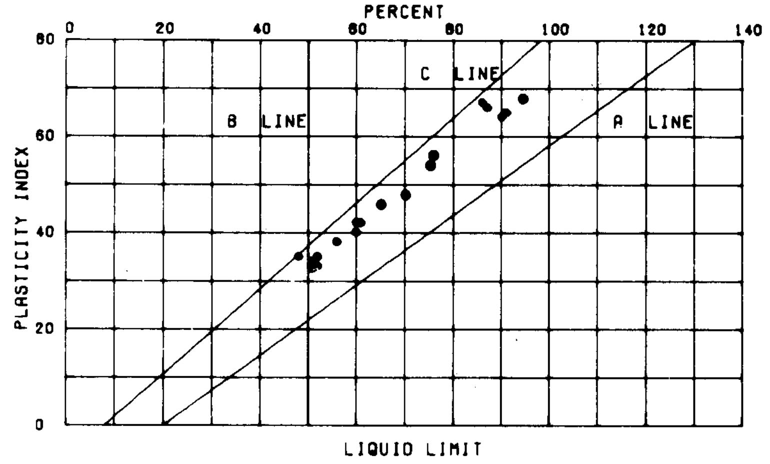
○ - (UC) UNCONFINED COMPRESSION TEST
● - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER
STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORINGS SEE PLATE
FOR GENERAL NOTES SEE PLATE
FOR DETAIL SHEAR STRENGTH DATA
SEE PLATE 5

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

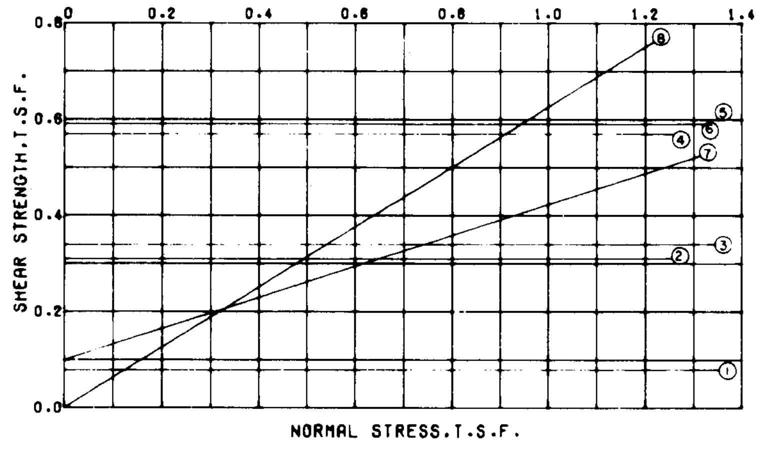
UNDISTURBED BORING DATA
BORING 4-ULO

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



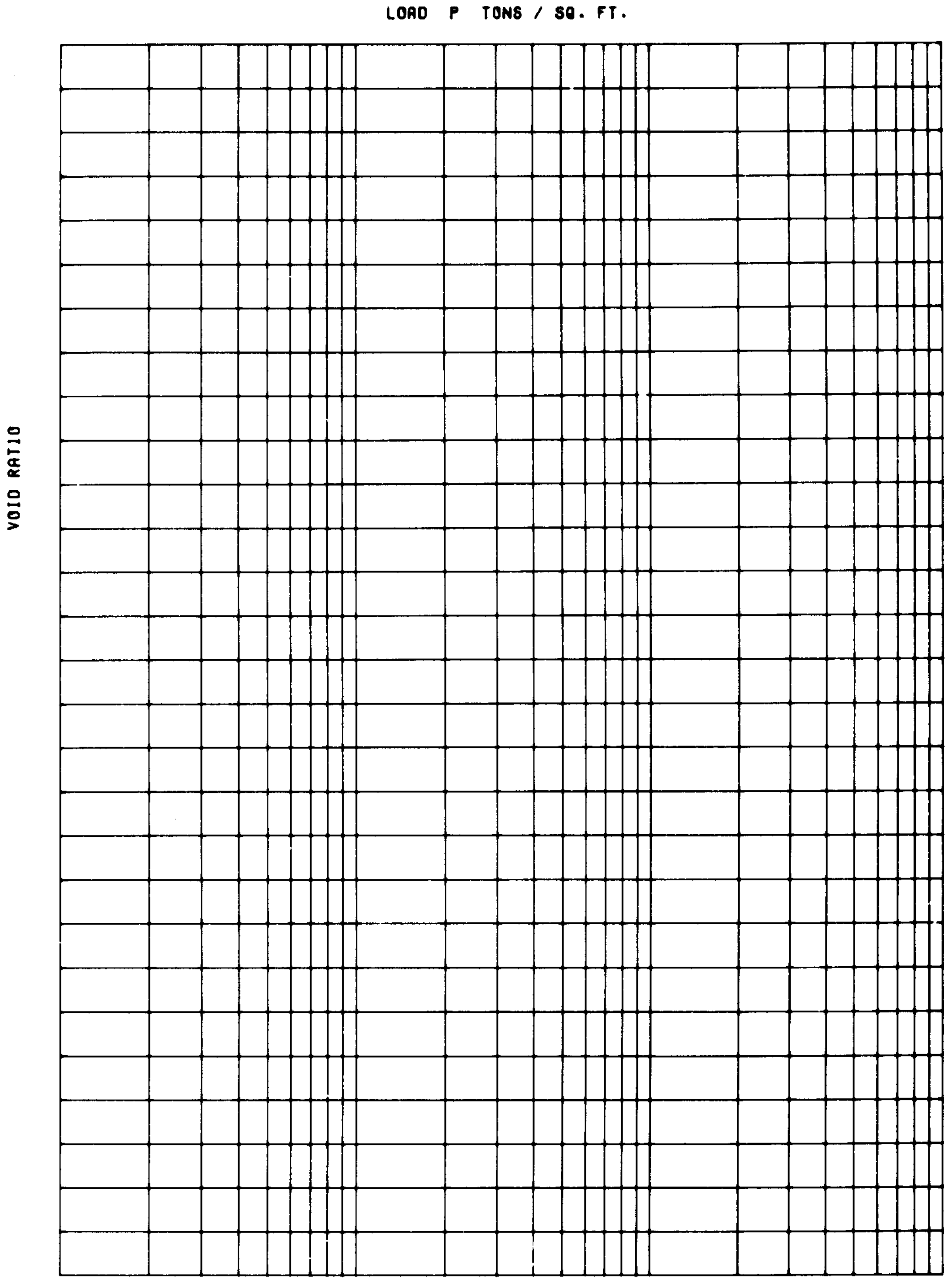


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	C - TSF	CLASS
1	-12.9	Q	0	0.08	CH
2	-24.0	Q	0	0.31	CH
3	-29.7	Q	0	0.34	CH
4	-48.9	Q	0	0.57	CH
5	-51.9	Q	0	0.60	CH
6	-84.7	Q	0	0.59	CH
7	-65.5	R	18°	0.10	SM
8	-33.5	S	32°	0	SM



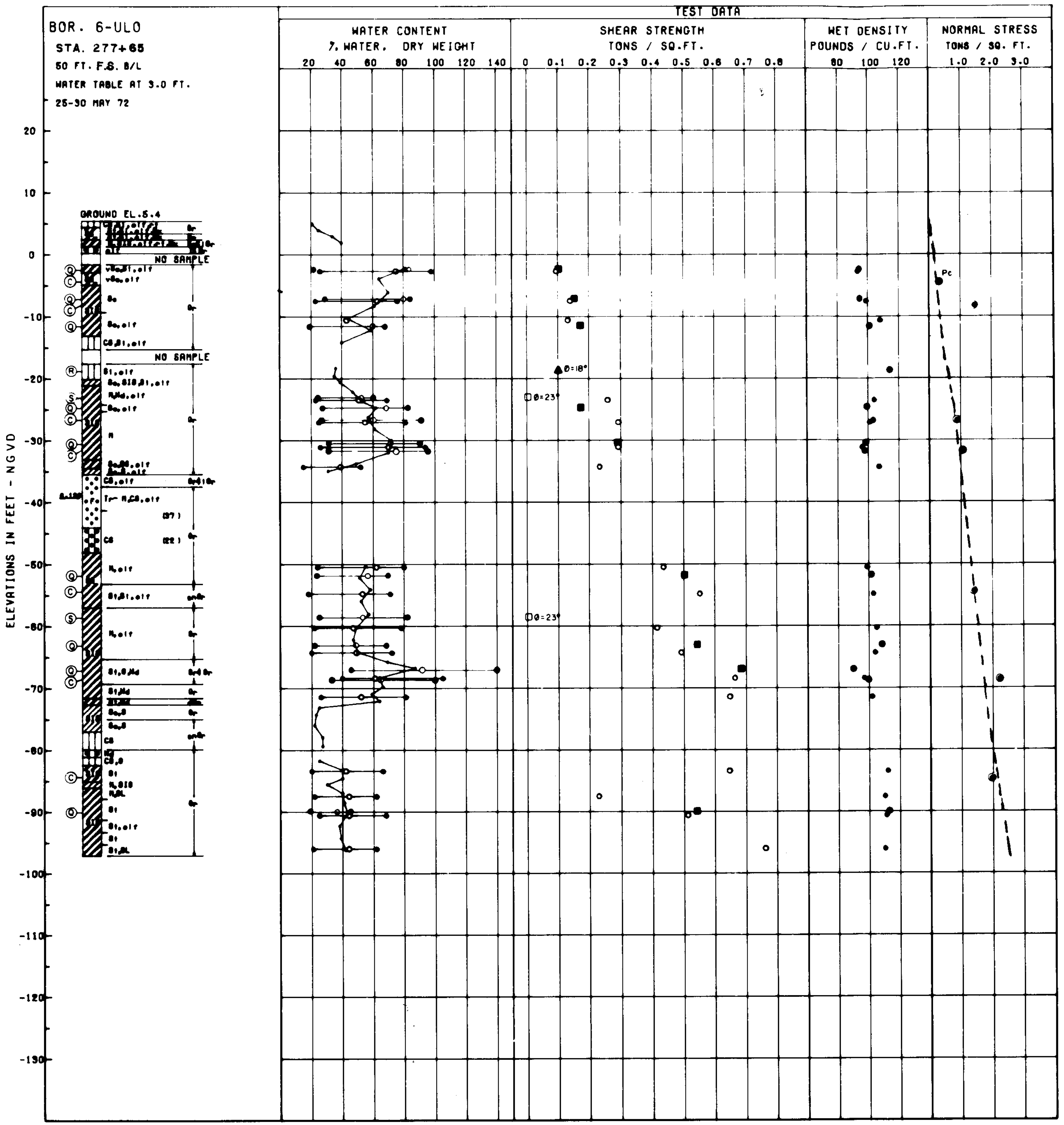
CONSOLIDATION DATA

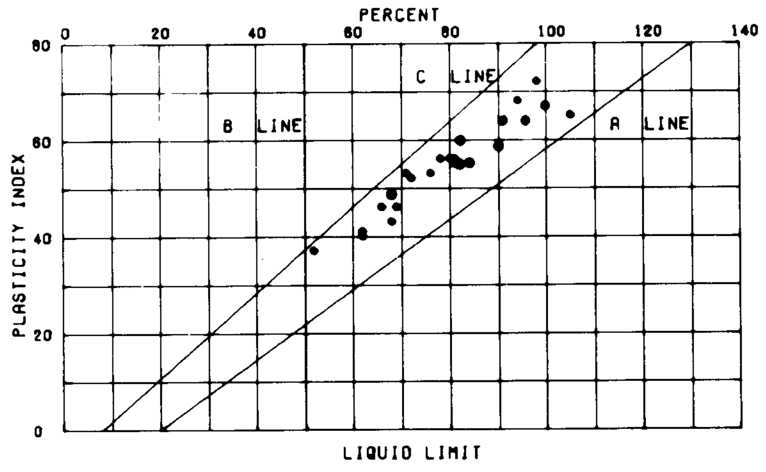
○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORINGS SEE PLATE 6

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 5-ULO

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536





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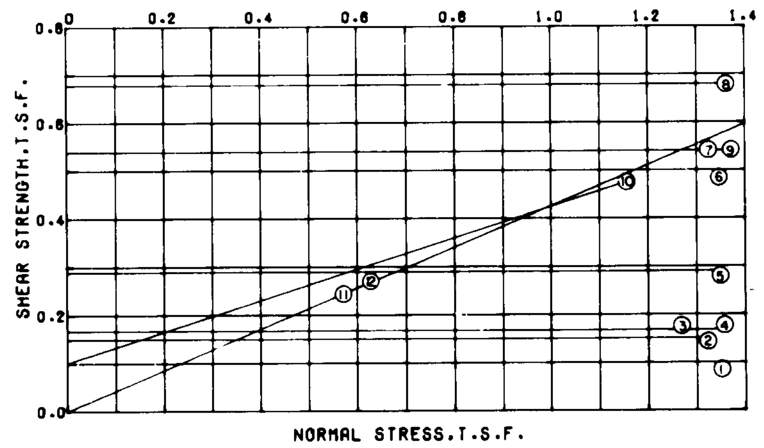
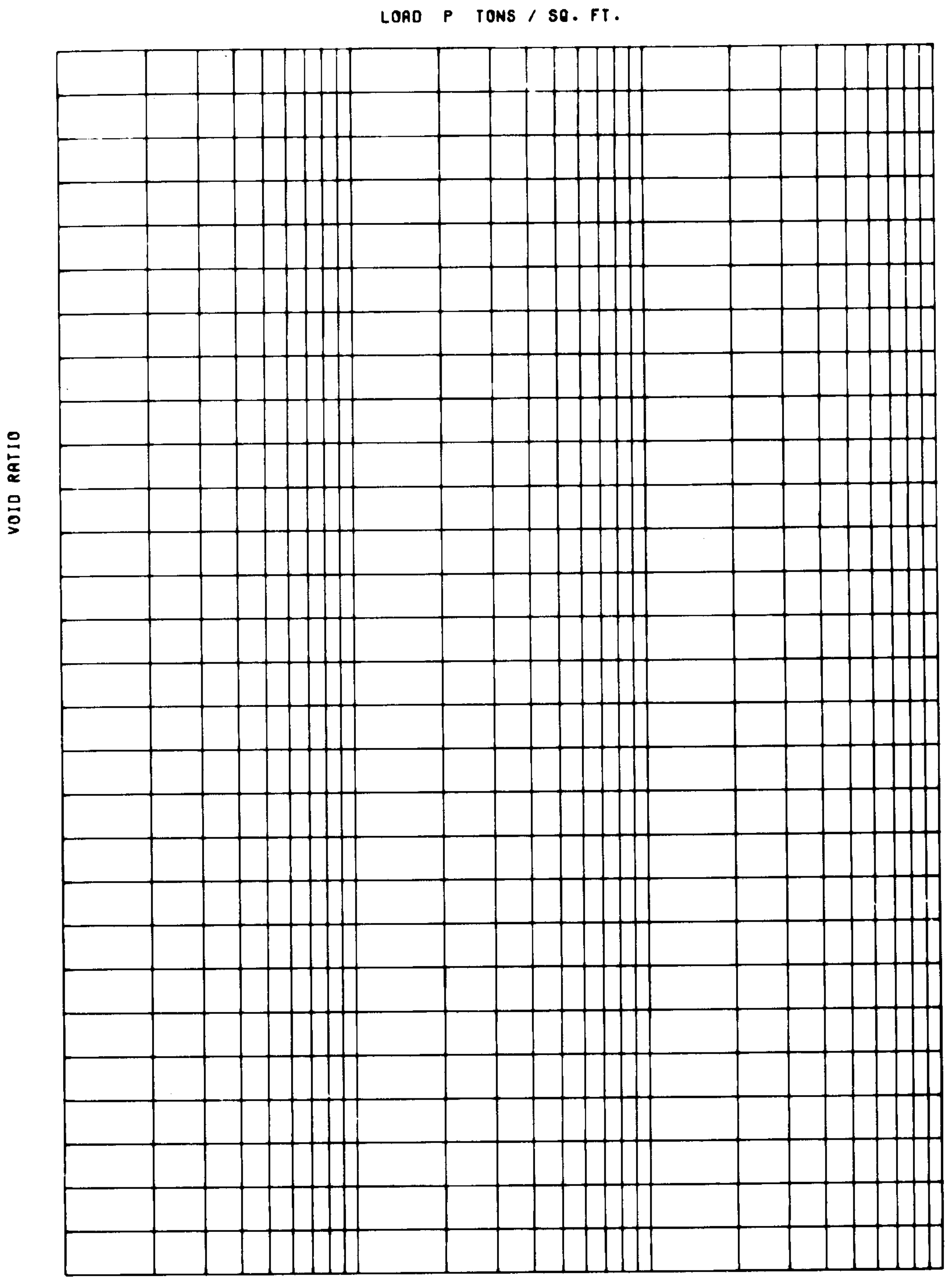


SHEAR STRENGTH DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	C - TSF	
1	-2.3	Q	0	0.10	CH
2	-7.0	Q	0	0.15	CH
3	-11.6	Q	0	0.17	CH
4	-24.8	Q	0	0.17	CH
5	-30.5	Q	0	0.29	CH
6	-51.9	Q	0	0.50	CH
7	-63.0	Q	0	0.54	CH
8	-67.0	Q	0	0.68	CH
9	-90.0	Q	0	0.54	CL
10	-18.7	R	18°	0.10	ML
11	-23.0	S	23°	0	CH
12	-58.5	S	23°	0	CH



CONSOLIDATION DATA

○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
◻ - (S) CONSOLIDATED - DRAINED SHEAR TEST

BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER

FOR SOIL BORING LEGEND SEE PLATE A

FOR LOCATION OF BORINGS SEE PLATE 6

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

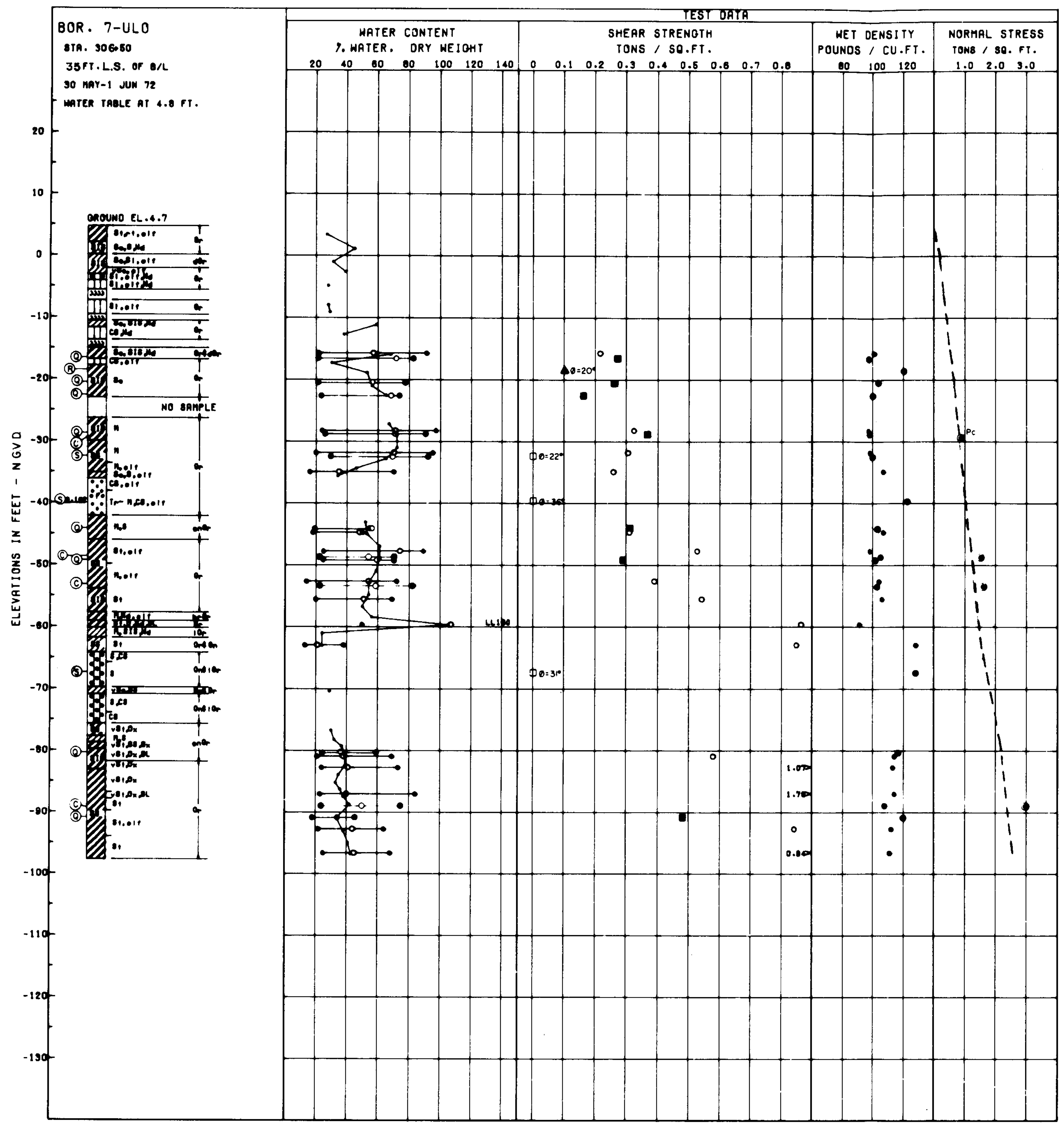
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN

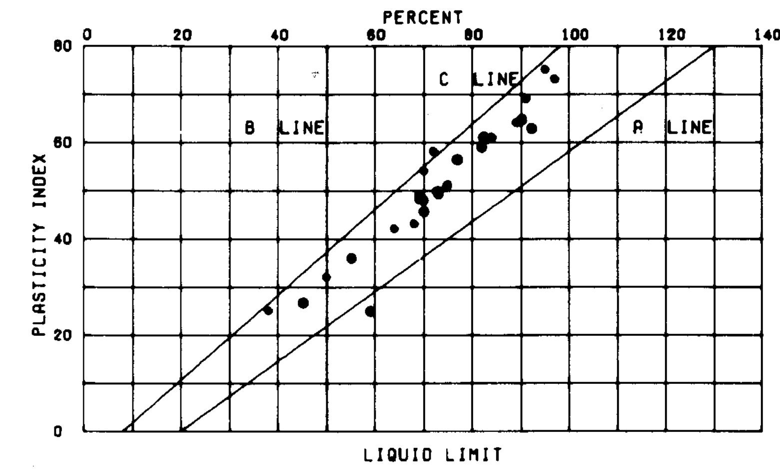
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 6-ULO

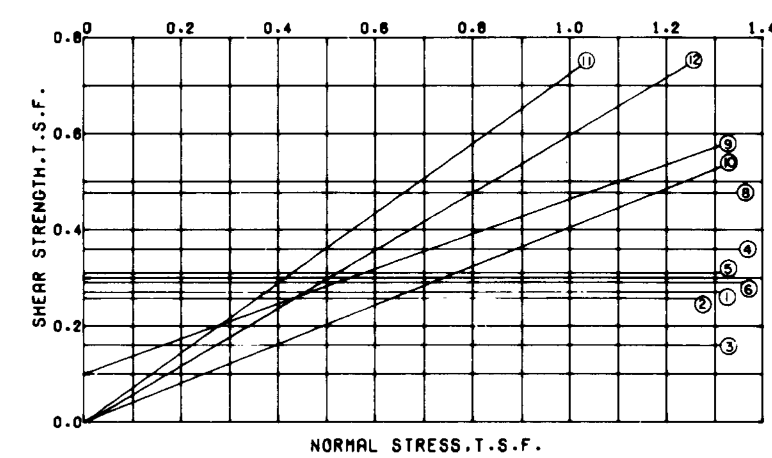
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

NOVEMBER 1984 FILE NO. H-2-29536



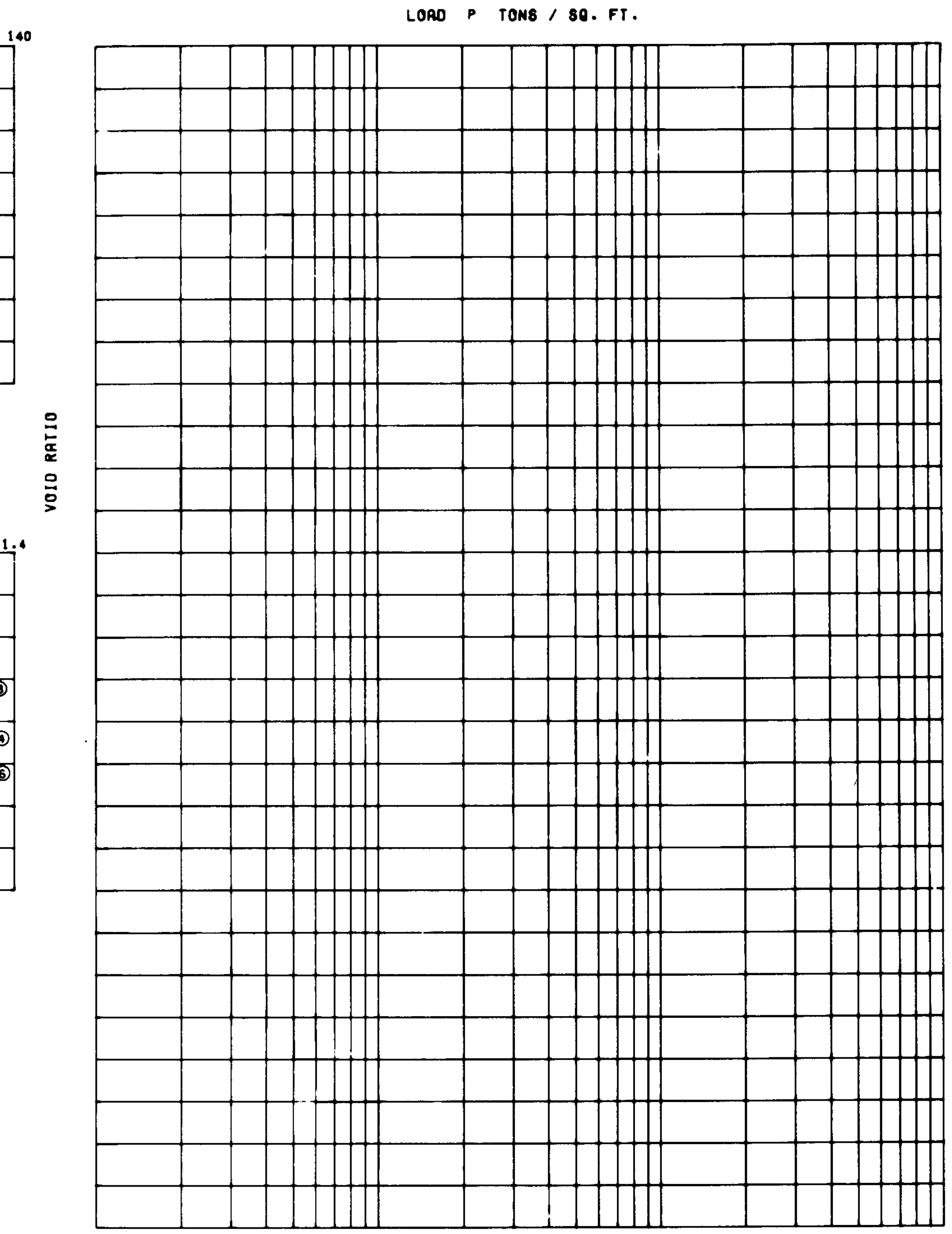


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	C - TSF	CLASS
1	-16.4	Q	0	0.27	CH
2	-20.5	Q	0	0.26	CH
3	-22.6	Q	0	0.16	CH
4	-28.7	Q	0	0.36	CH
5	-44.2	Q	0	0.31	CH
6	-49.2	Q	0	0.29	CH
7	-80.2	Q	0	0.93	CH
8	-90.8	Q	0	0.48	CL
9	-8.3	R	20	0.10	SM
10	-32.5	S	22	0	CH
11	-39.7	S	36	0	SM
12	-67.3	S	31	0	SM



CONSOLIDATION DATA

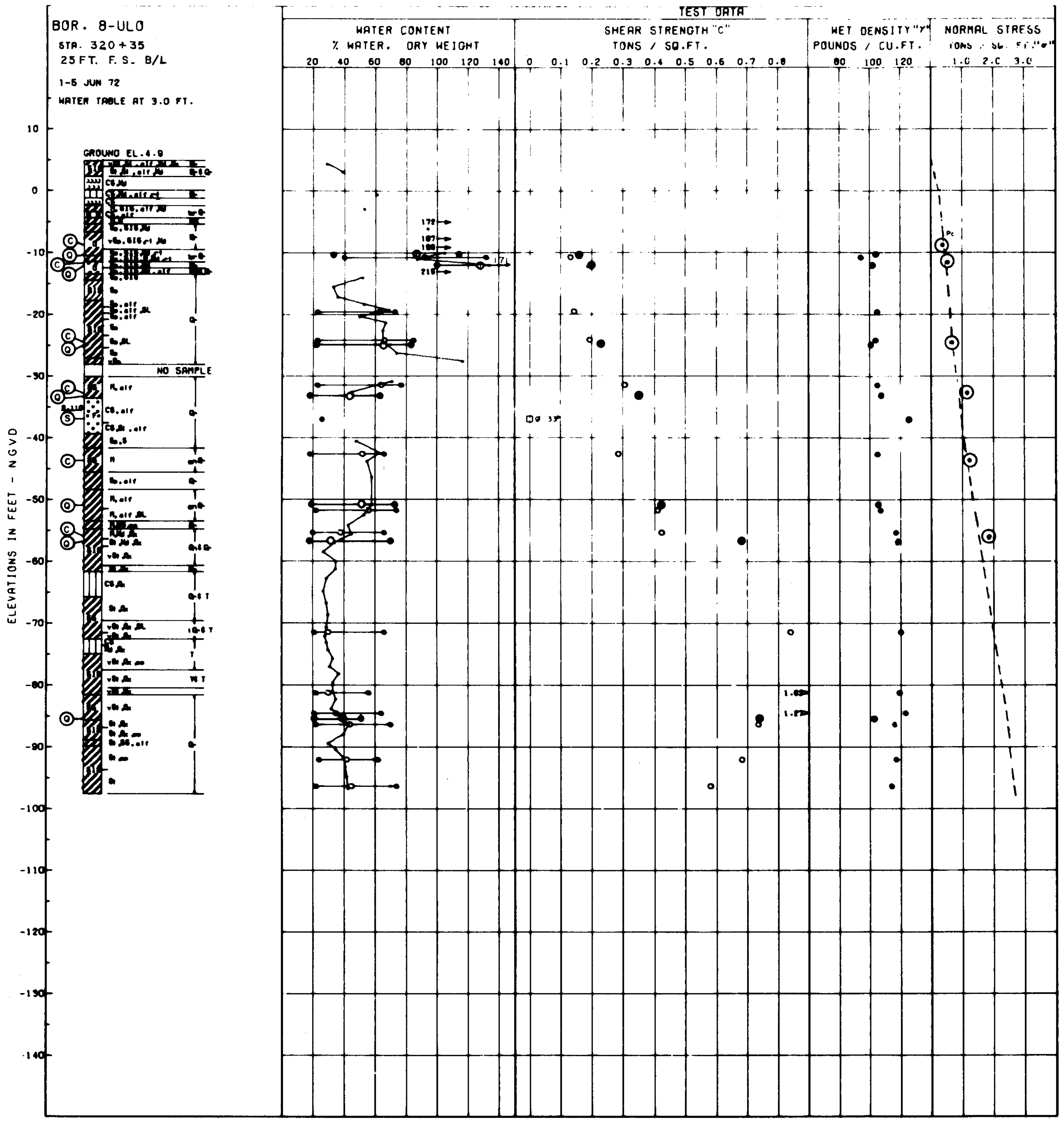
○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORINGS SEE PLATE 7

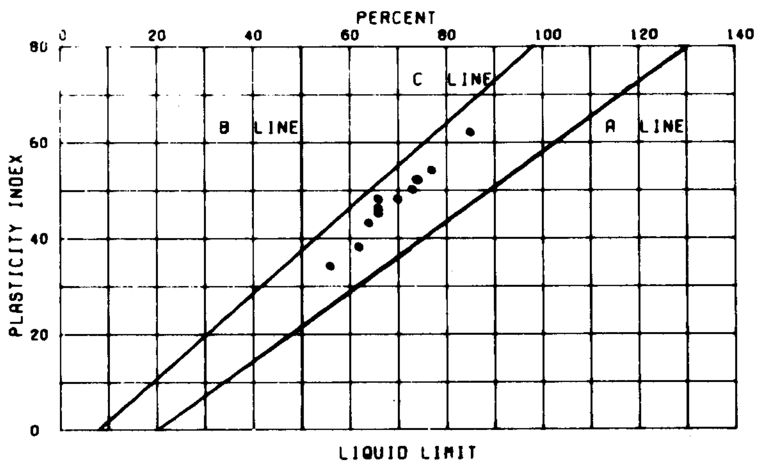
LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 7-ULO

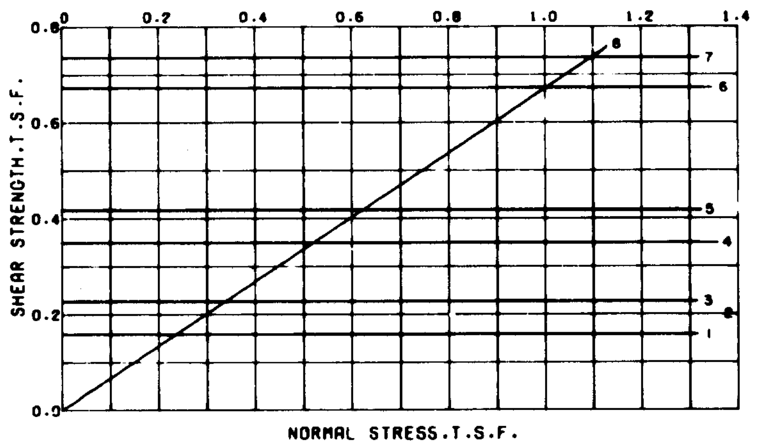
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 85



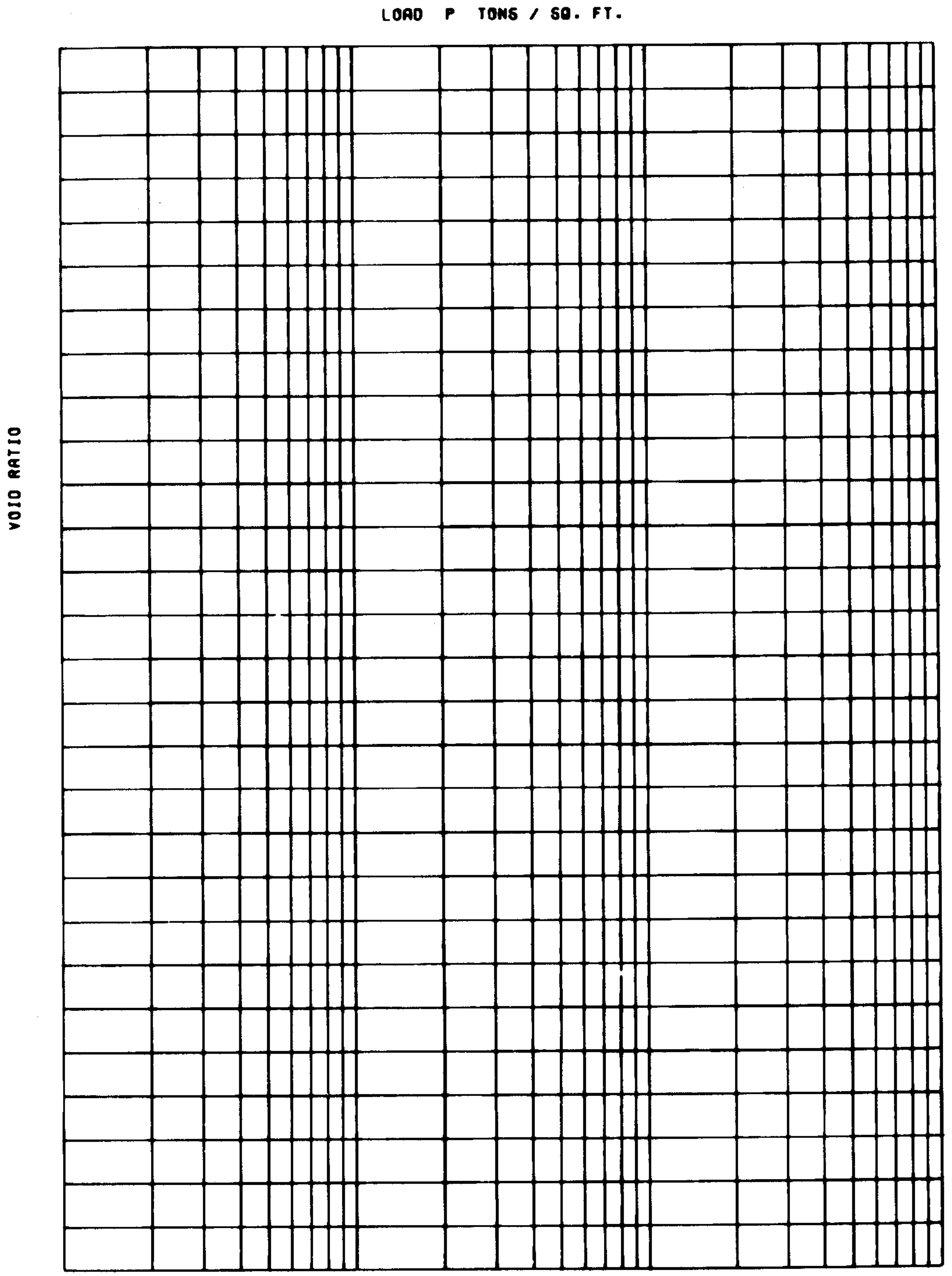


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ°	STRENGTH C - TSF	CLASS
1	-10.3	Q	0	0.16	CH
2	-12.0	Q	0	0.20	CH
3	-24.7	Q	0	0.23	CH
4	-33.0	Q	0	0.35	CH
5	-50.9	Q	0	0.42	CH
6	-56.8	Q	0	0.68	CH
7	-85.3	Q	0	0.74	CH
8	-37.0	S	33	0.0	SM



CONSOLIDATION DATA

○ - (UC) UNCONFINED COMPRESSION TEST
● - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED SHEAR TEST

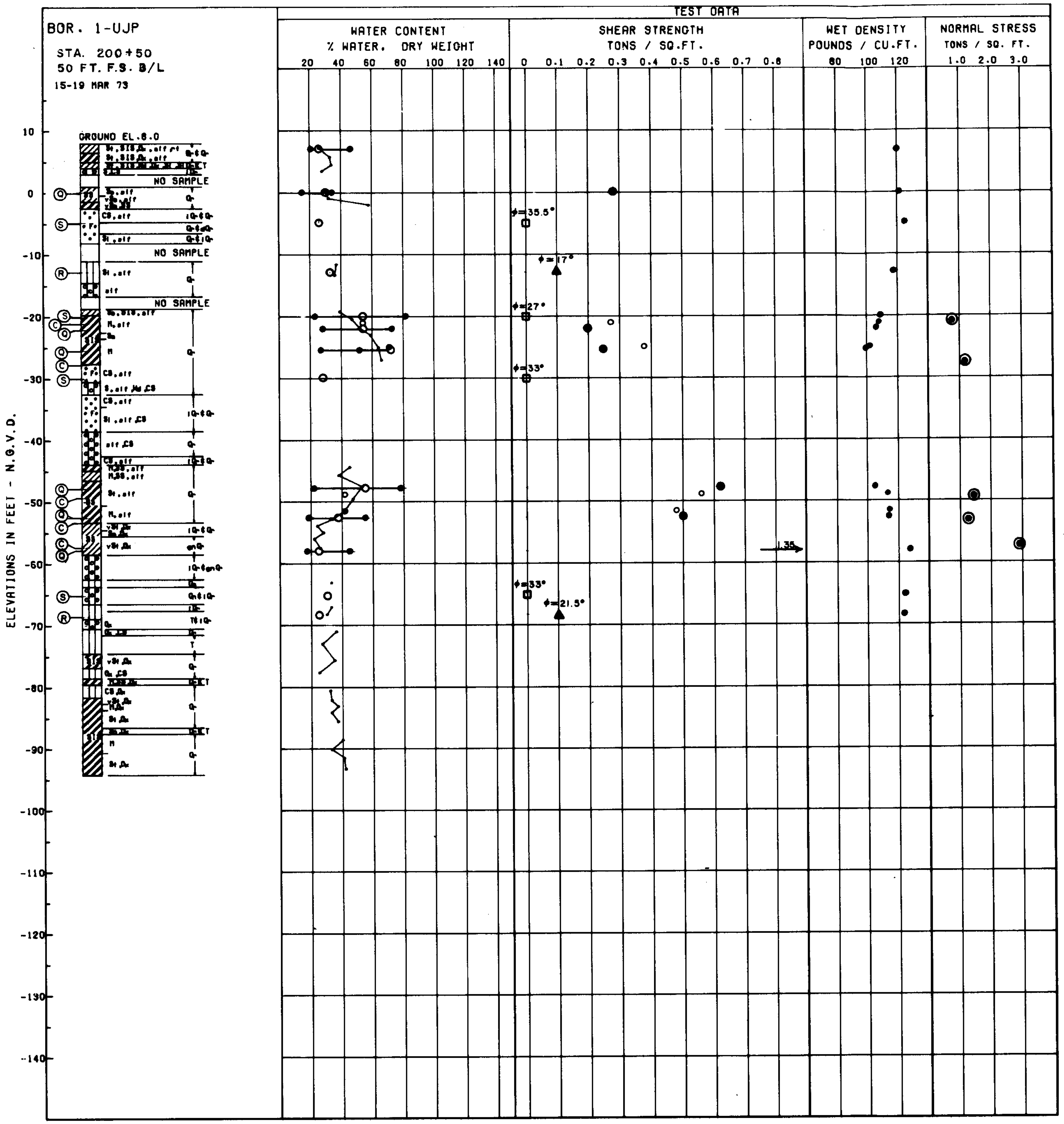
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORINGS SEE PLATE
FOR GENERAL NOTES SEE PLATE
FOR DETAIL SHEAR STRENGTH DATA SEE PLATE 7

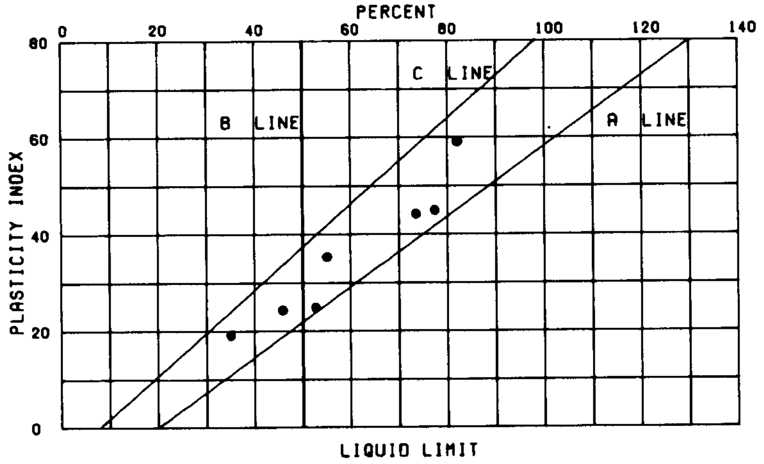
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 8-ULO

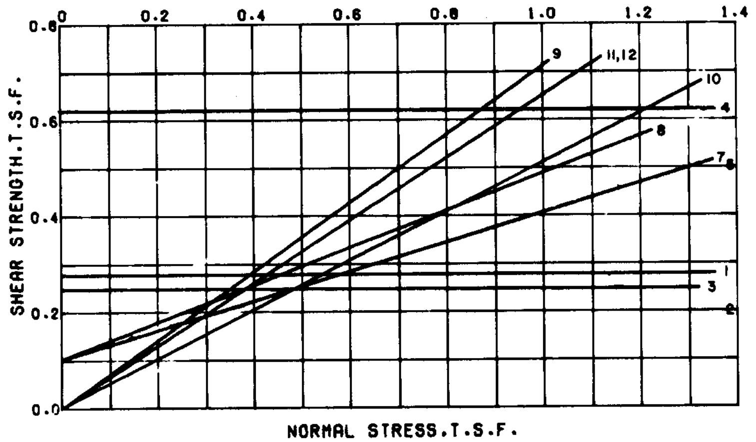
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 86



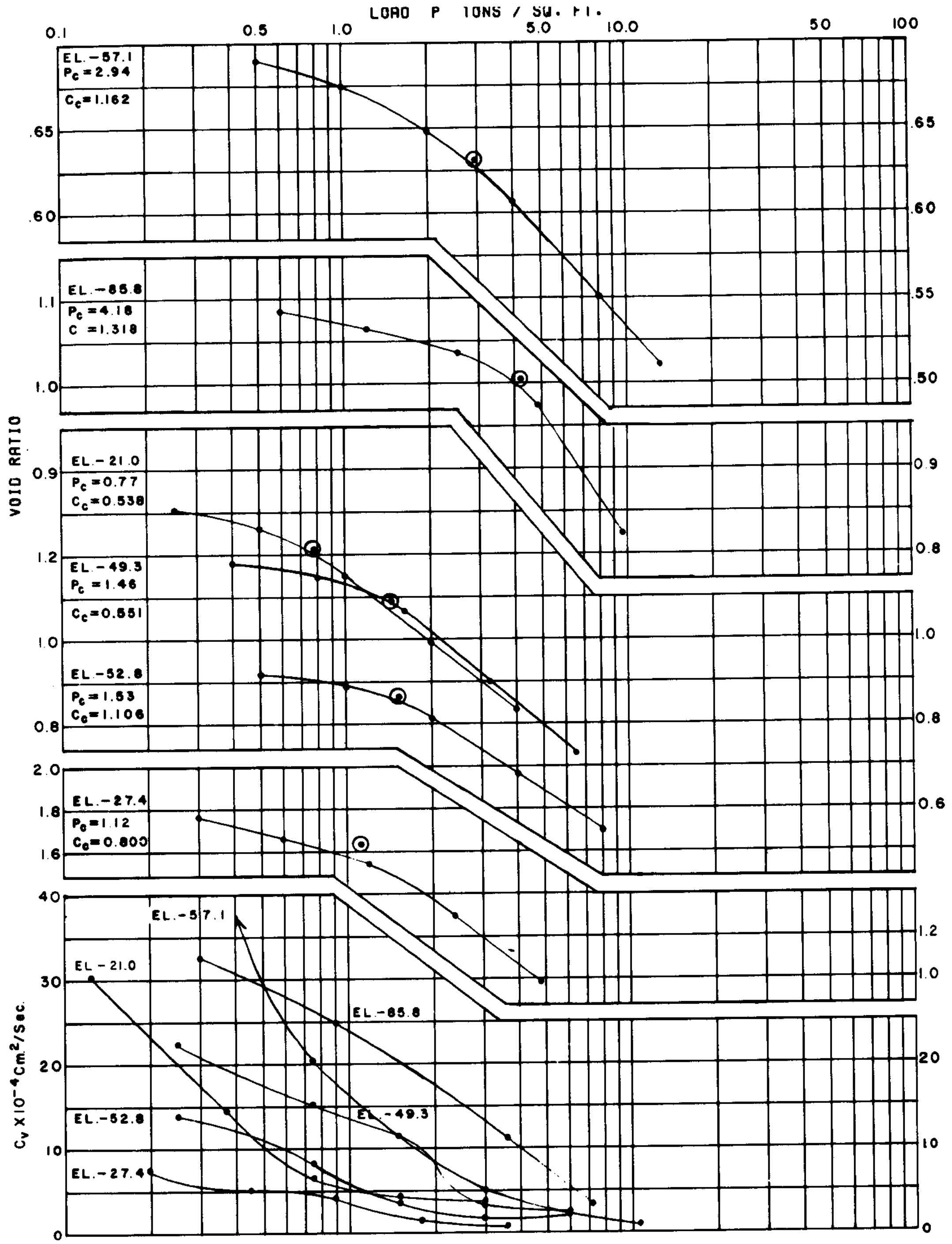


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ°	STRENGTH C - TSF	CLASS
1	0.0	Q	0	0.28	CL
2	-21.8		0	0.20	CH
3	-25.3		0	0.25	CH
4	-47.9		0	0.62	CH
5	-52.4		0	0.50	CH
6	-58.0		0	1.35	CH
7	-12.9	R	17	0.10	ML
8	-68.2		21.5	0.10	ML
9	-4.9	S	35.5	0.0	SM
10	-20.0		27	0.0	CH
11	-29.6		33	0.0	SM
12	-65.0		33	0.0	SM



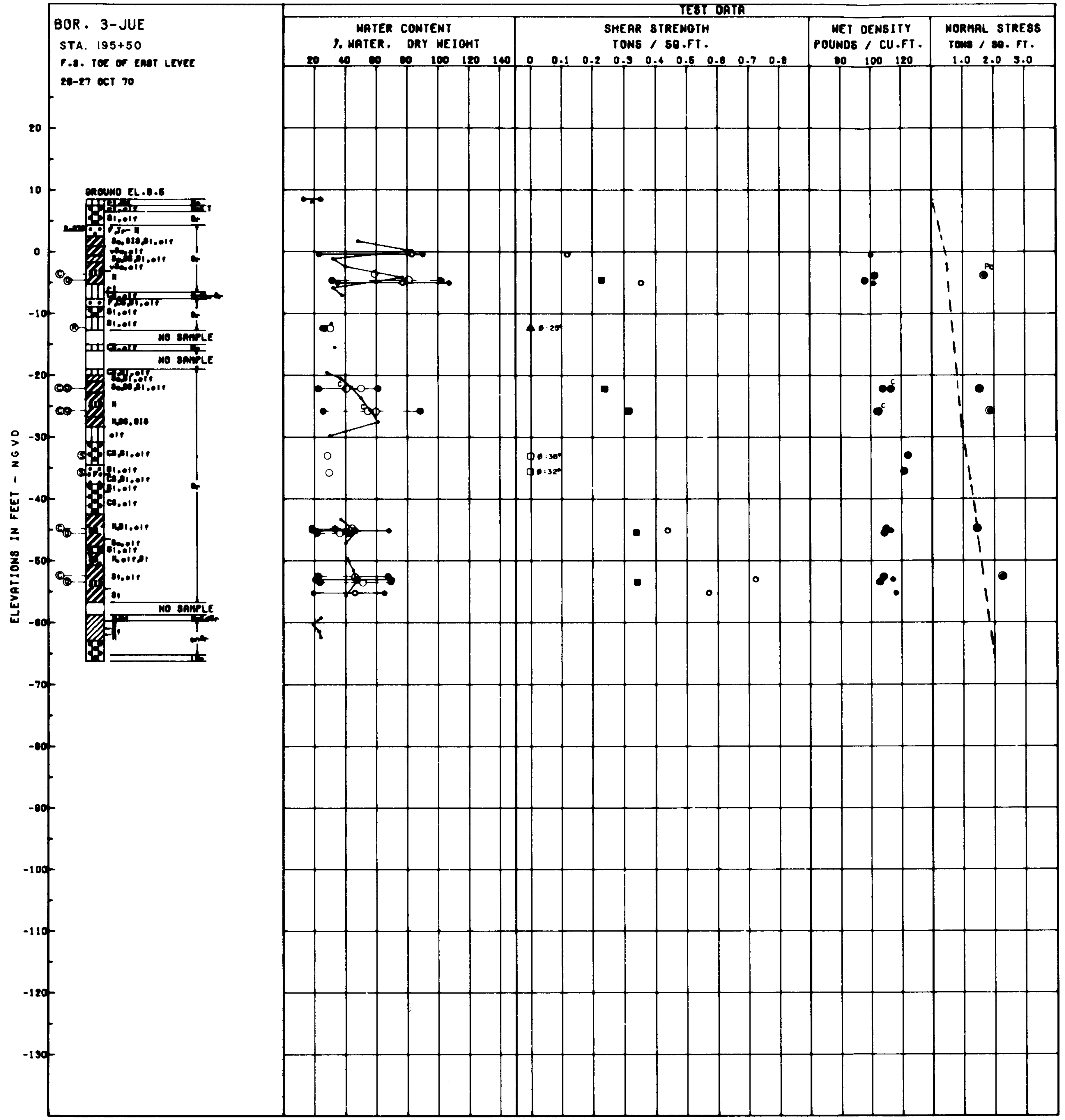
CONSOLIDATION DATA

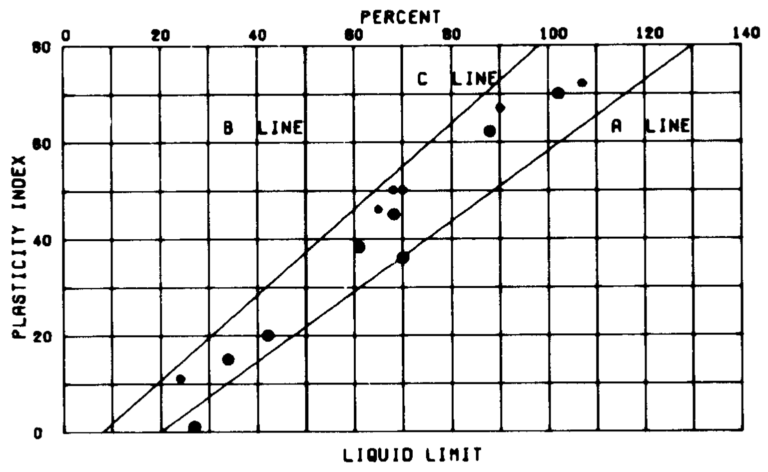
○ - (UC) UNCONFINED COMPRESSION TEST
● - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER
STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORINGS SEE PLATE 5

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

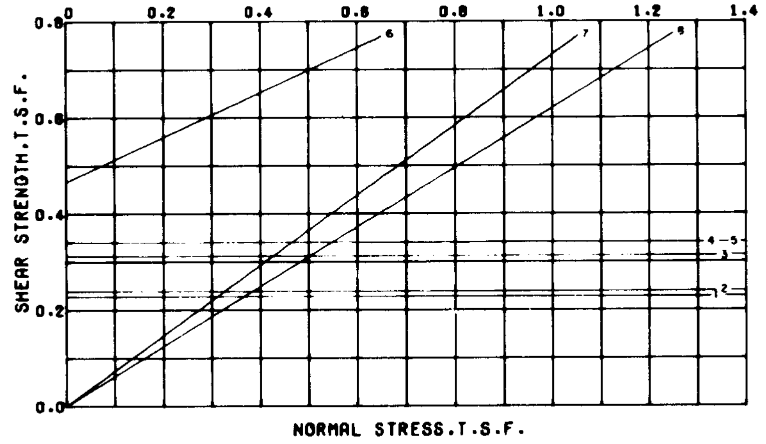
UNDISTURBED BORING DATA
BORING 1-UJP

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



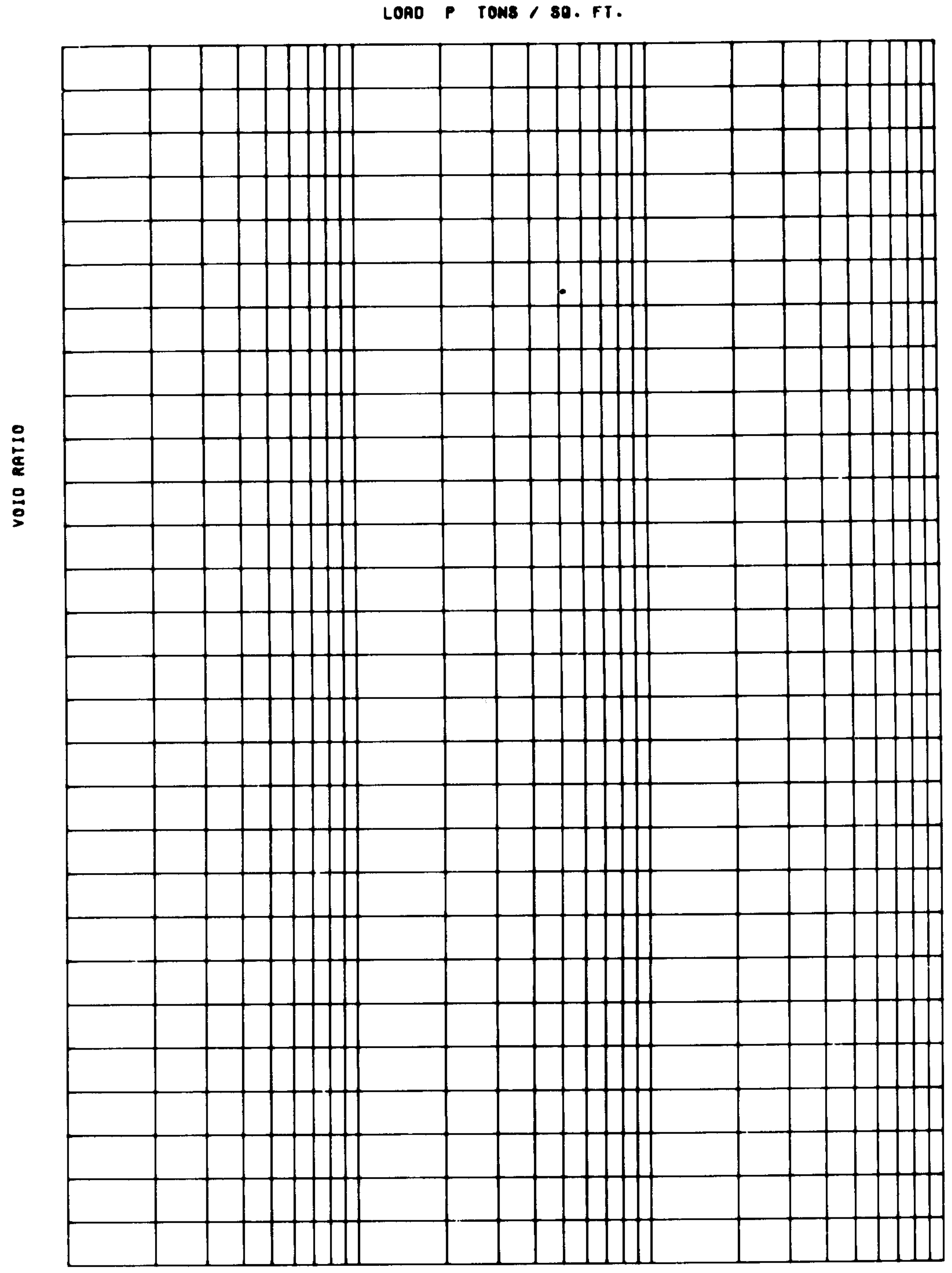


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	C - TSF	
1	-4.5			0.23	
2	-22.0			0.24	CH
3	-25.8	Q	0	0.31	
4	-45.5			0.34	CL
5	-53.4			0.34	CH
6	-12.3	R	25°	0.467	ML
7	-32.9	S	36°	0	SM
8	-35.6	S	32°	0	SM



CONSOLIDATION DATA

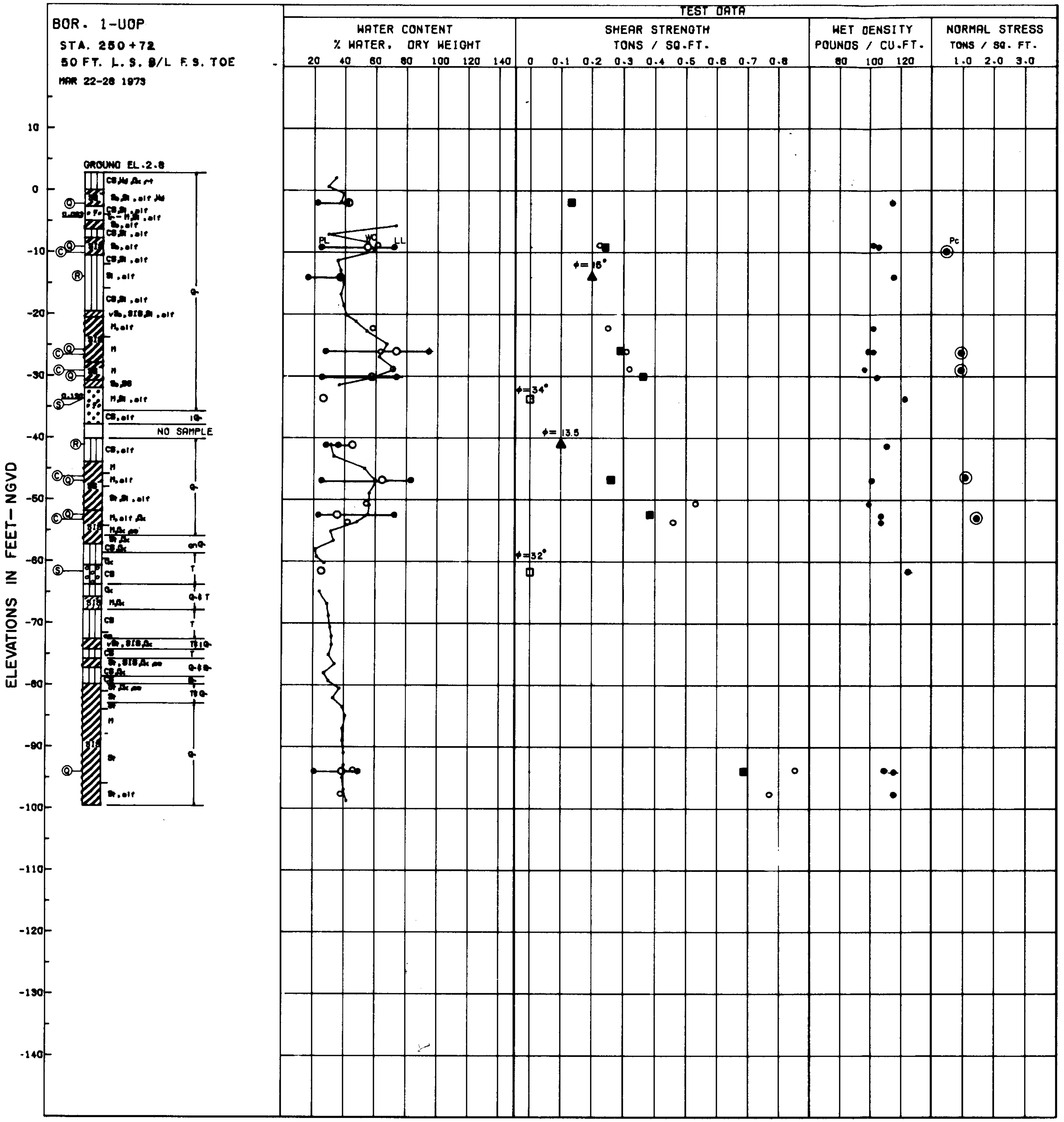
○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER
STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORINGS SEE PLATE 5

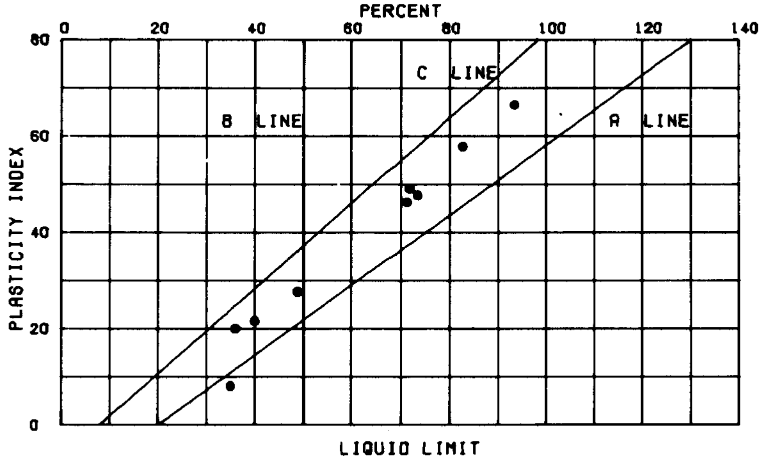
LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 3-JUE

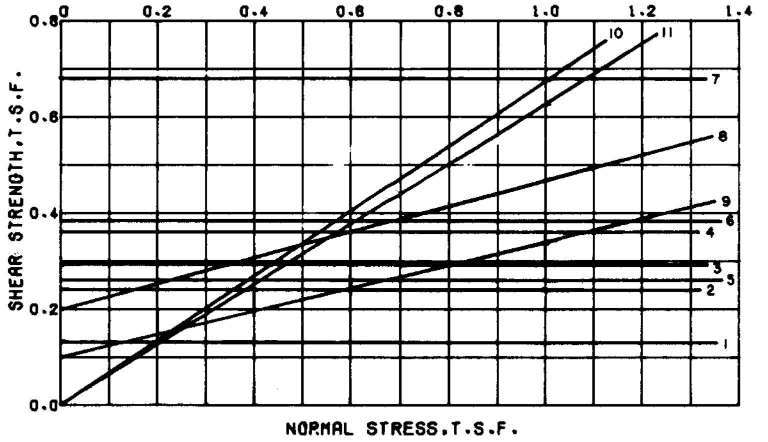
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 88



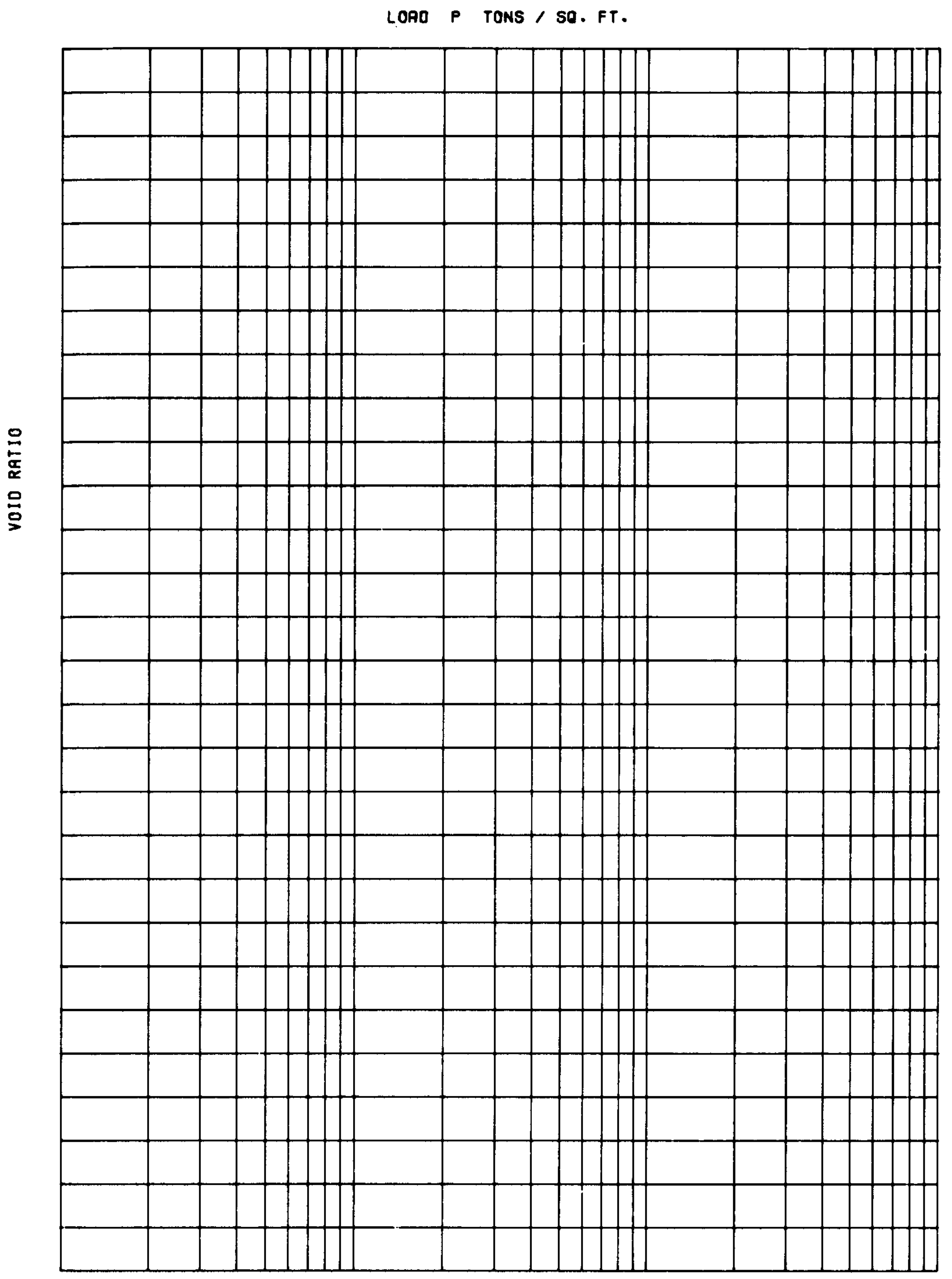


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ°	C - TSF	CLASS
1	-2.1	Q	0	0.13	CL
2	-9.2		0	0.24	CH
3	-26.9		0	0.29	CH
4	-30.1		0	0.36	CH
5	-47.0		0	0.26	CH
6	-52.6		0	0.38	CH
7	-94.1		0	0.68	CL
8	-14.0	R	15	0.20	CL
9	-41.2		13.5	0.10	ML
10	-33.6	S	34	0.0	SM
11	-61.8		32	0.0	SM



CONSOLIDATION DATA

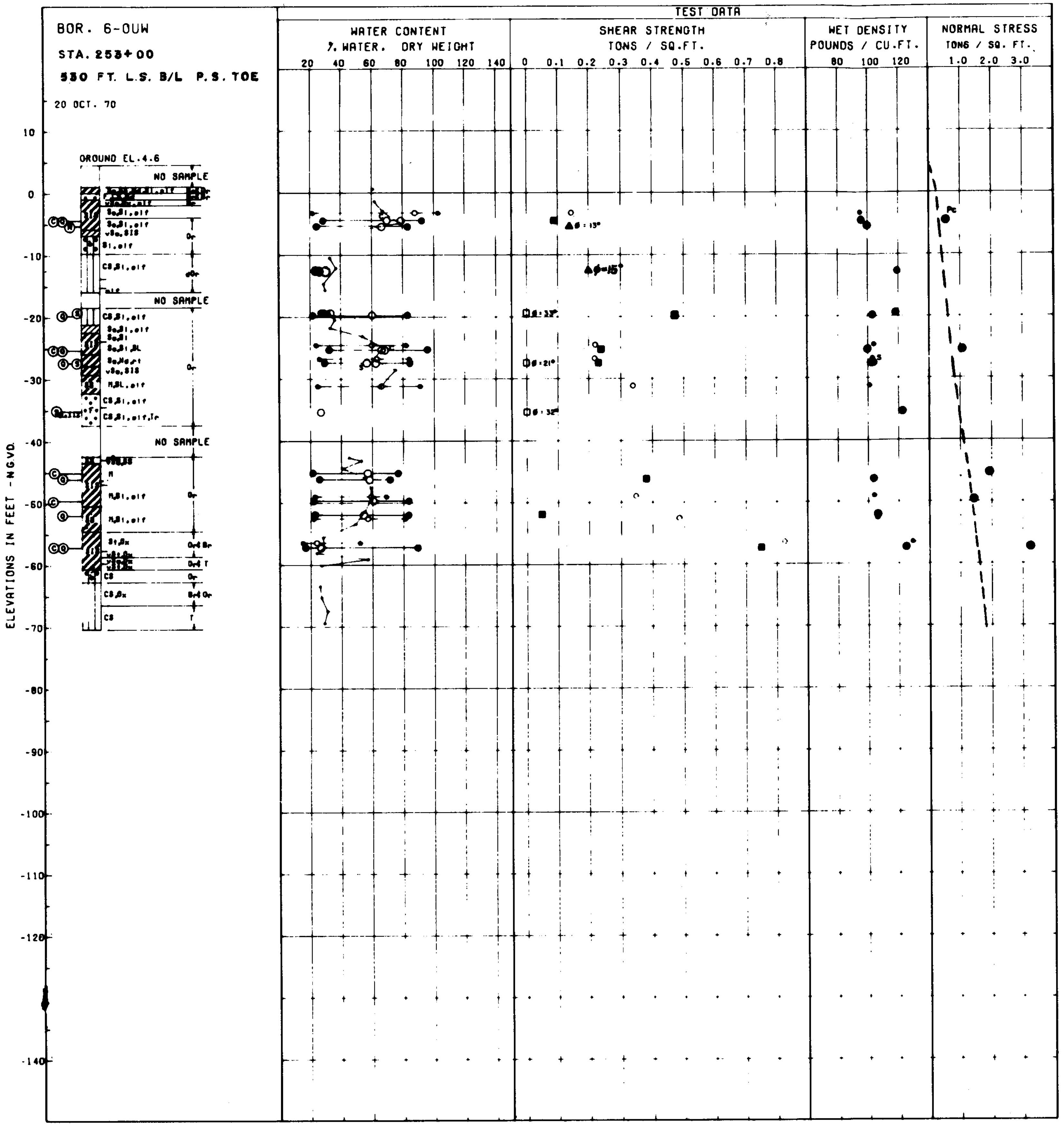
○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORINGS SEE PLATE 6

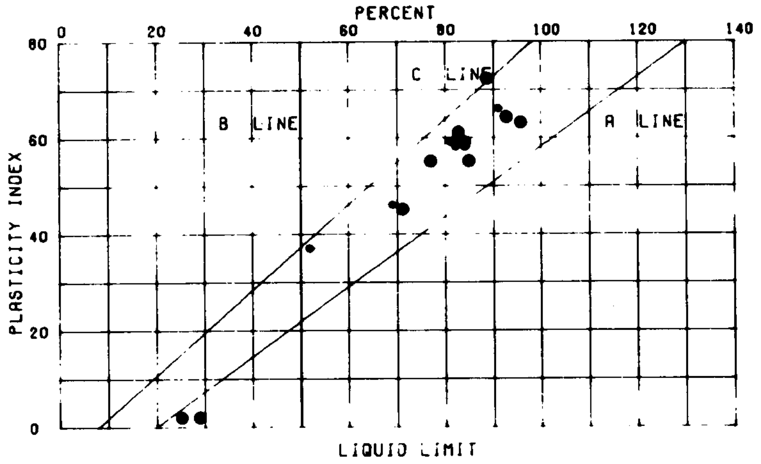
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 1-UOP

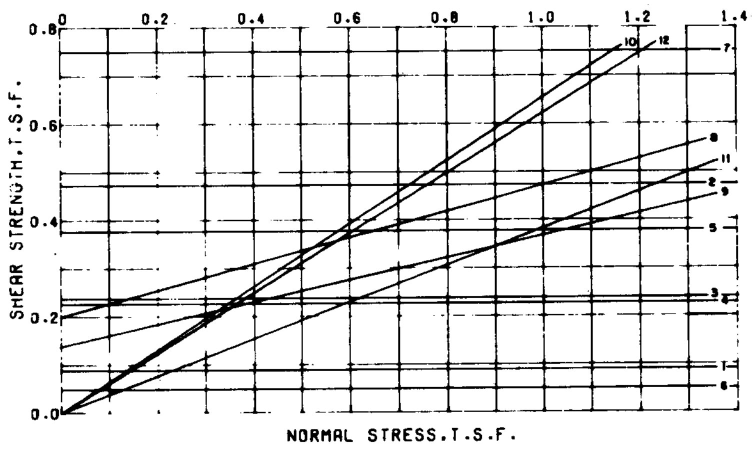
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 89



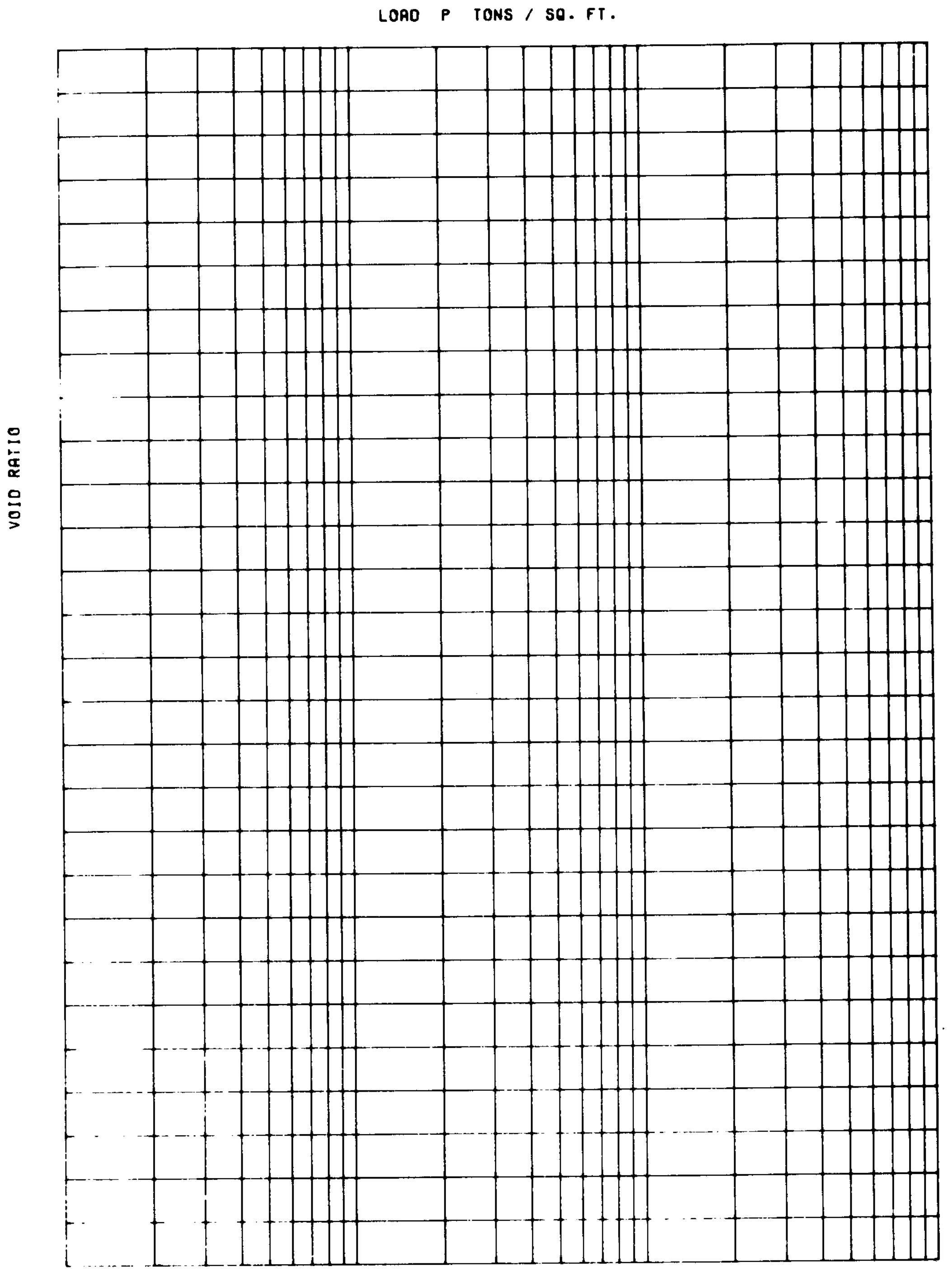


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH ϕ	STRENGTH c - TSF	CLASS
1	-4.4	Q	0	0.09	CH
2	-19.6	Q	0	0.478	CH
3	-25.2	Q	0	0.24	CH
4	-27.4	Q	0	0.23	CH
5	-46.0	Q	0	0.38	CH
6	-51.9	Q	0	0.05	CH
7	-57.1	Q	0	0.75	CH
8	-12.6	R	15°	0.20	ML
9	-5.2	R	13°	0.14	CH
10	-19.4	S	33°	0	ML
11	-27.4	S	21°	0	CH
12	-35.2	S	32°	0	SM



CONSOLIDATION DATA

○ (U) UNCONFINED COMPRESSION TEST
● (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ (R) CONSOLIDATED UNDRAINED SHEAR TEST
□ (S) CONSOLIDATED DRAINED SHEAR TEST

BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER

FOR SOIL BORING LEGEND SEE PLATE A

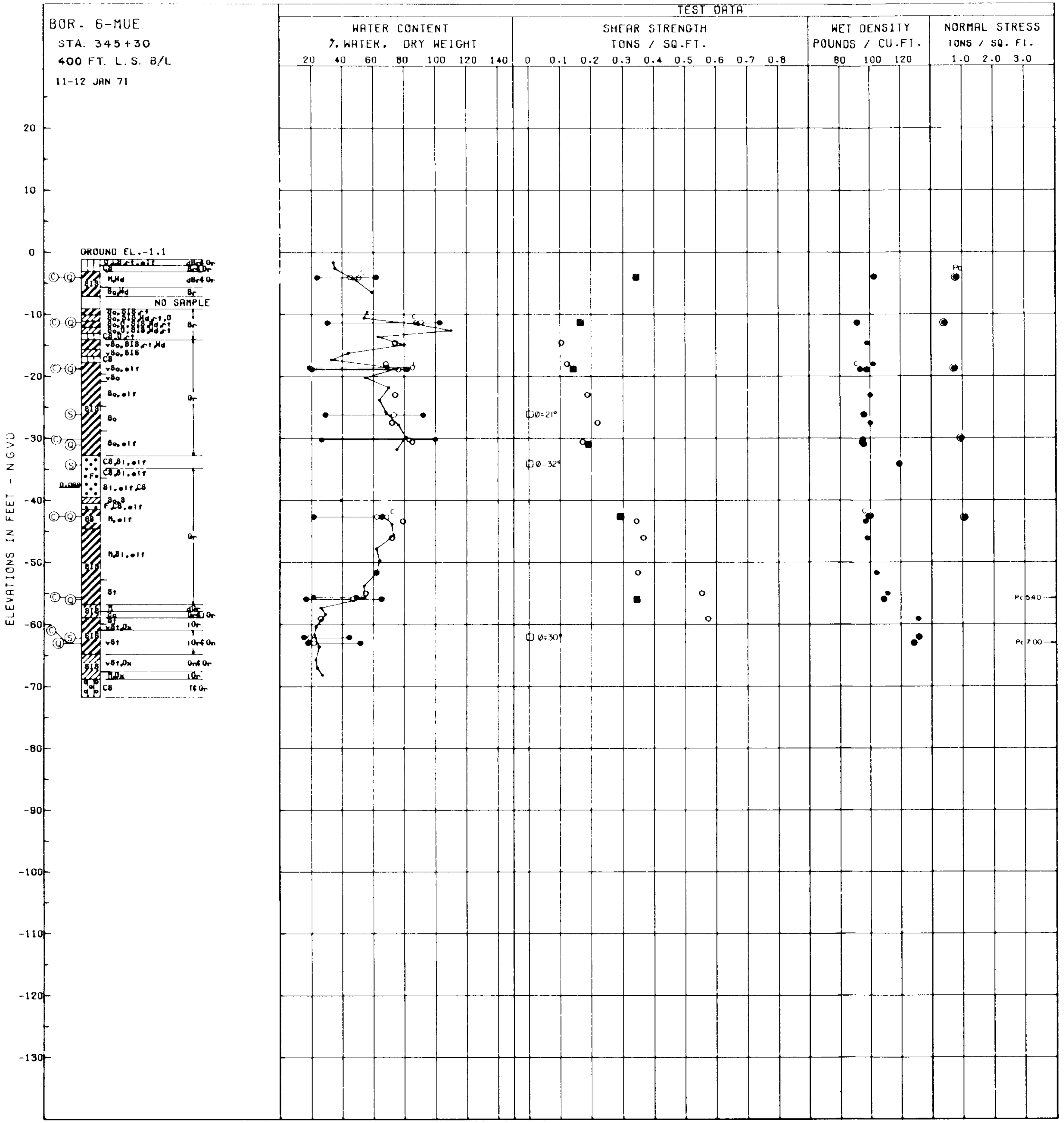
FOR LOCATION OF BORINGS SEE PLATE 6

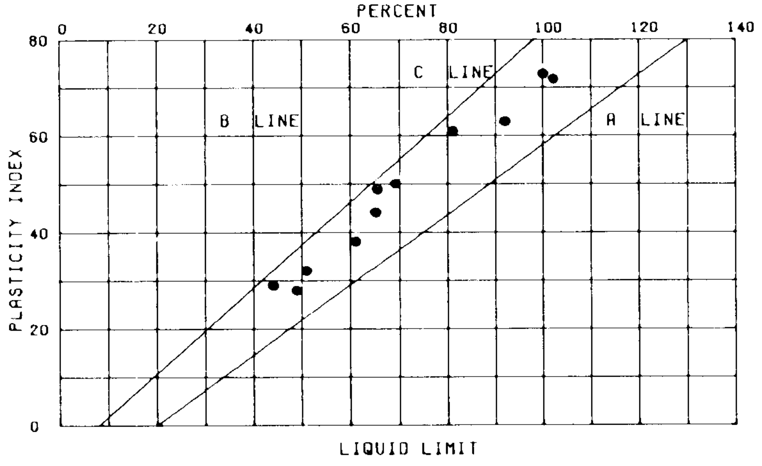
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 6-OUW

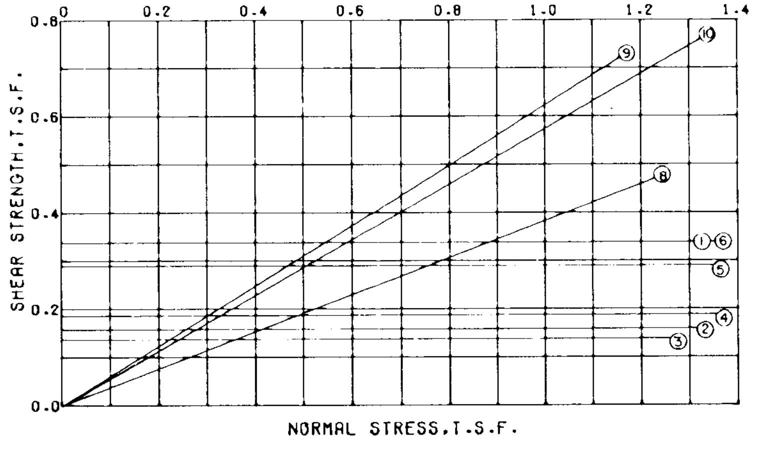
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 90



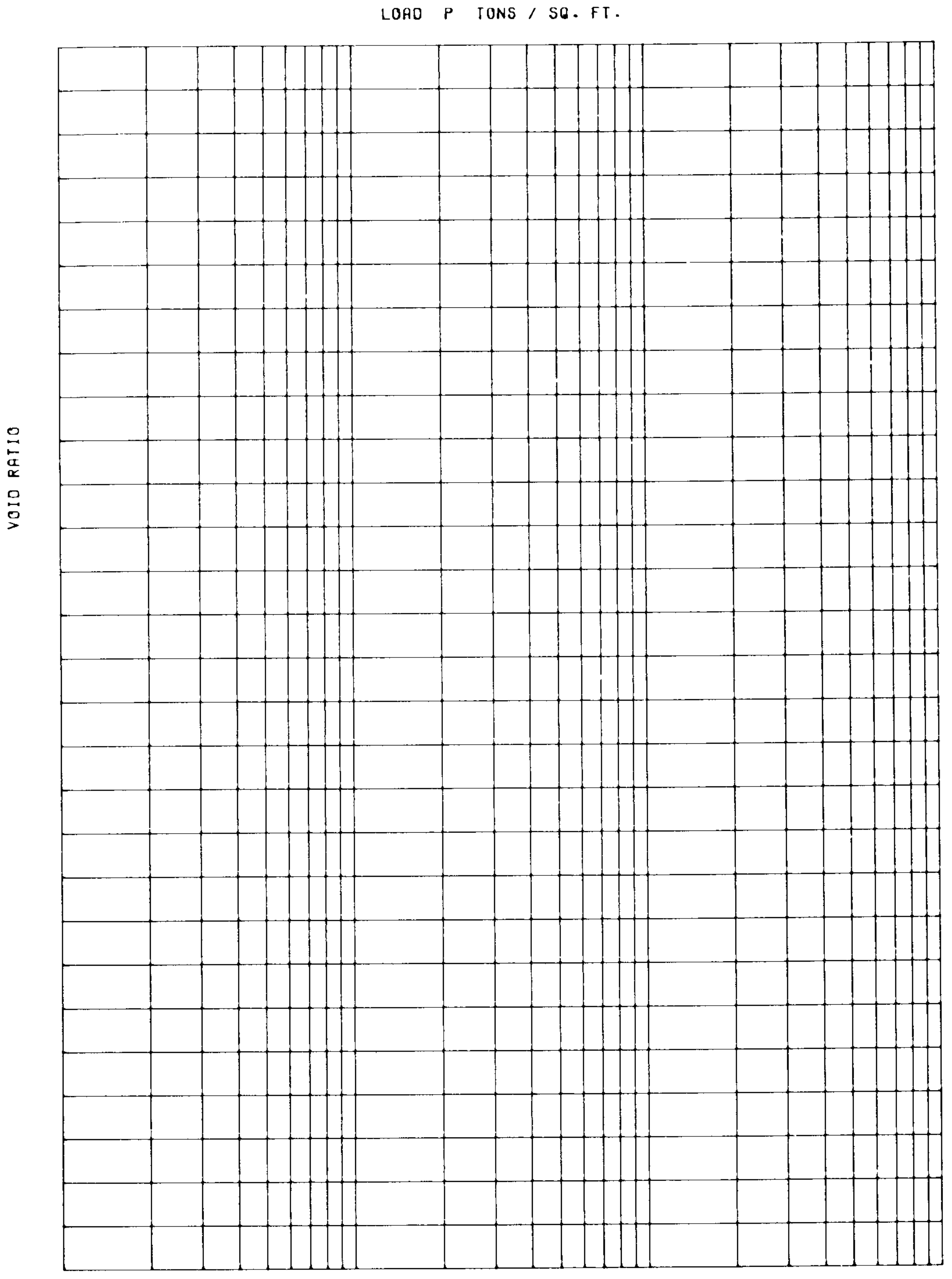


PLASTICITY CHART



SHEAR STRENGTH DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-3.9	Q	0	0.34	CH
2	-11.2	Q	0	0.16	CH
3	-18.9	Q	0	0.14	CH
4	-31.0	Q	0	0.19	CH
5	-42.7	Q	0	0.29	CH
6	-55.9	Q	0	0.34	CH
7	-62.9	Q	0	1.68	CH
8	-26.3	S	21°	0	CH
9	-34.3	S	32°	0	SP
10	-62.0	S	30°	0	CL



CONSOLIDATION DATA

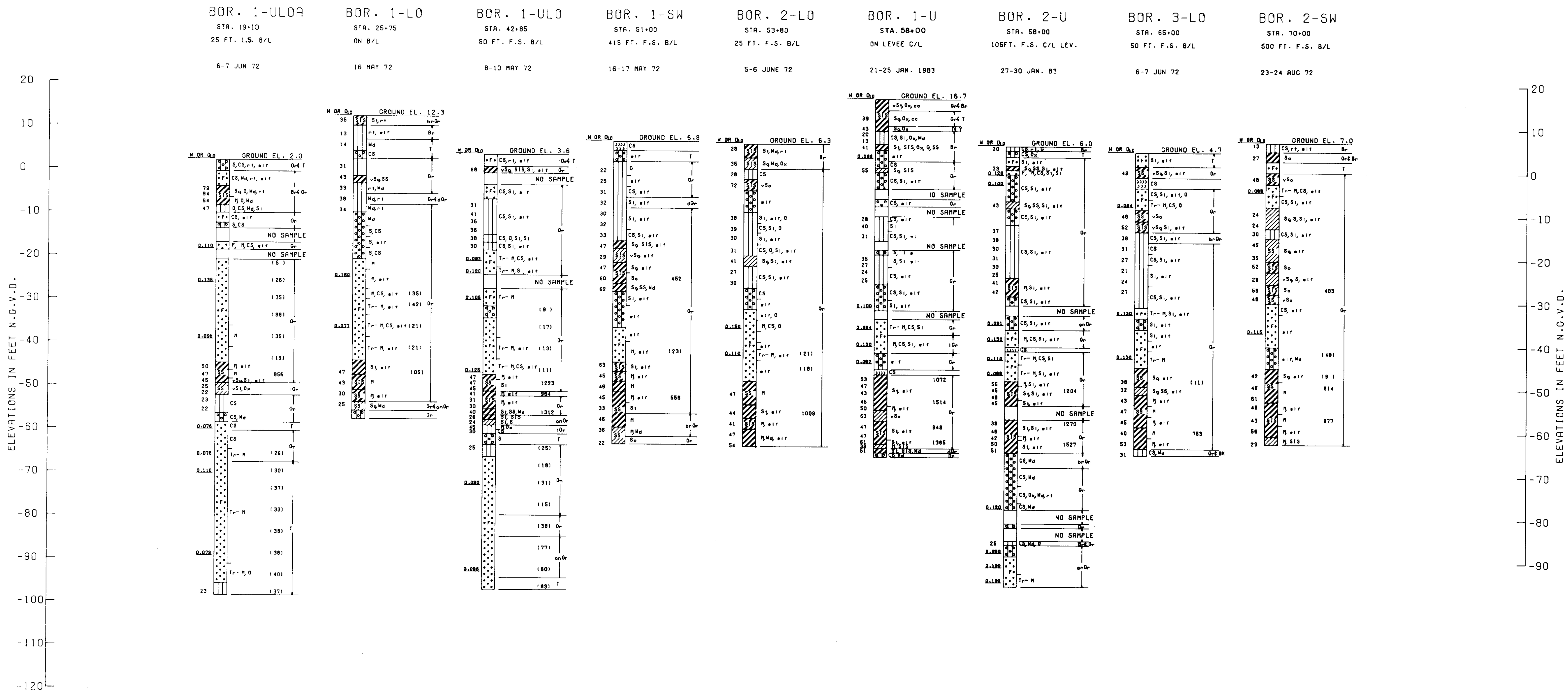
○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED SHEAR TEST
BORINGS WERE TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER
FOR SOIL BORING LEGEND SEE PLATE A
FOR LOCATION OF BORINGS SEE PLATE 7

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

UNDISTURBED BORING DATA
BORING 6-MUE

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 91



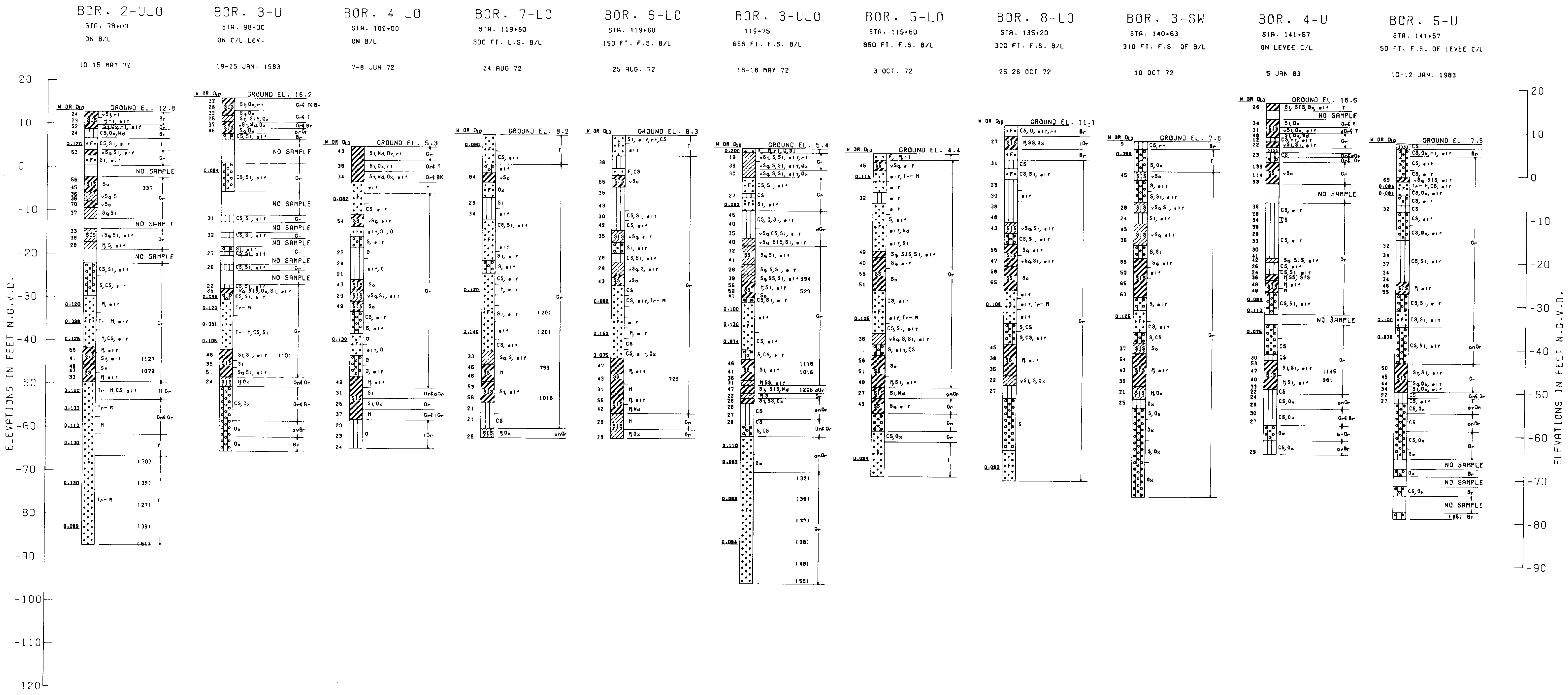
NOTES:
GENERAL TYPE BORINGS OBTAINED WITH 1-7/8 IN. I.D. X 29 INCH SAMPLER. UNDISTURBED BORINGS INDICATED BY THE LETTER "U" TAKEN WITH 5 IN. I.D. X 4 FOOT PISTON TYPE SAMPLER.

FOR BORING LOCATIONS SEE PLATE 2

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

GENERAL TYPE BORING LOGS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



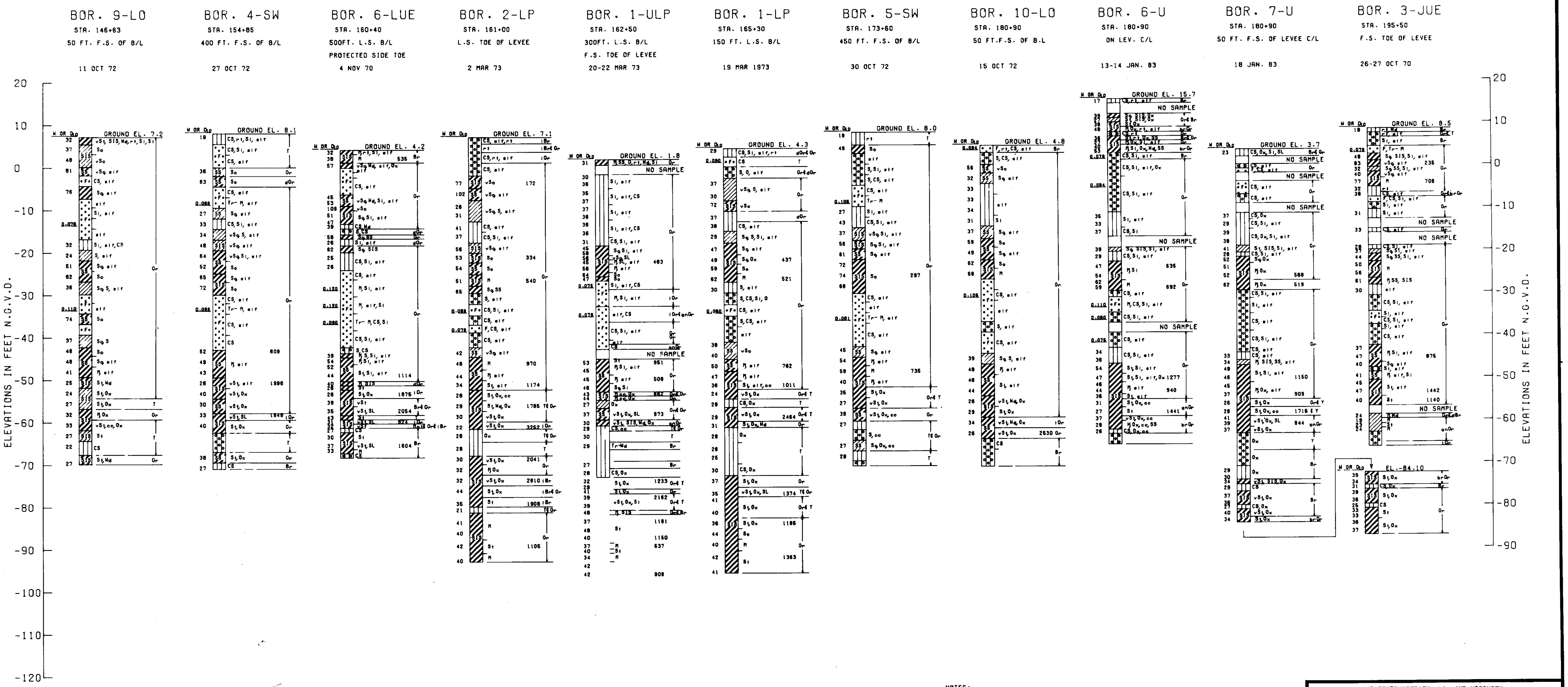
NOTES:
GENERAL TYPE BORINGS OBTAINED WITH 1-7/8 IN. I.D. X 29 INCH SAMPLER. UNDISTURBED BORINGS INDICATED BY THE LETTER "U" TAKEN WITH 5 IN. I.D. X 4 FOOT PISTON TYPE SAMPLER.

FOR BORING LOCATIONS SEE PLATE 3

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

GENERAL TYPE BORING LOGS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NOTES:
GENERAL TYPE BORINGS OBTAINED WITH 1-7/8 IN. I.D. X 29 INCH SAMPLER. UNDISTURBED BORINGS INDICATED BY THE LETTER "U" TAKEN WITH 5 IN. I.D. X 4 FOOT PISTON TYPE SAMPLER.

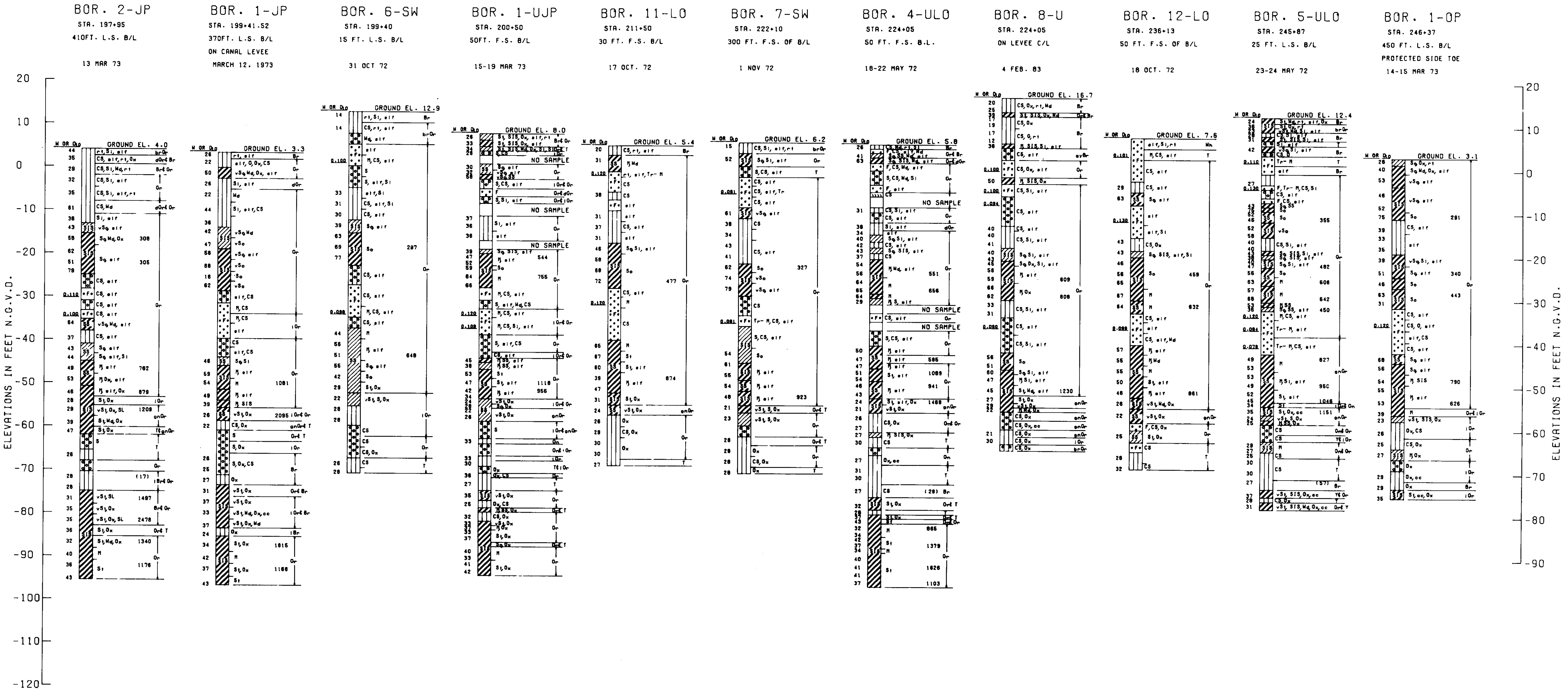
FOR BORING LOCATIONS SEE PLATE 4

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

GENERAL TYPE BORING LOGS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 94



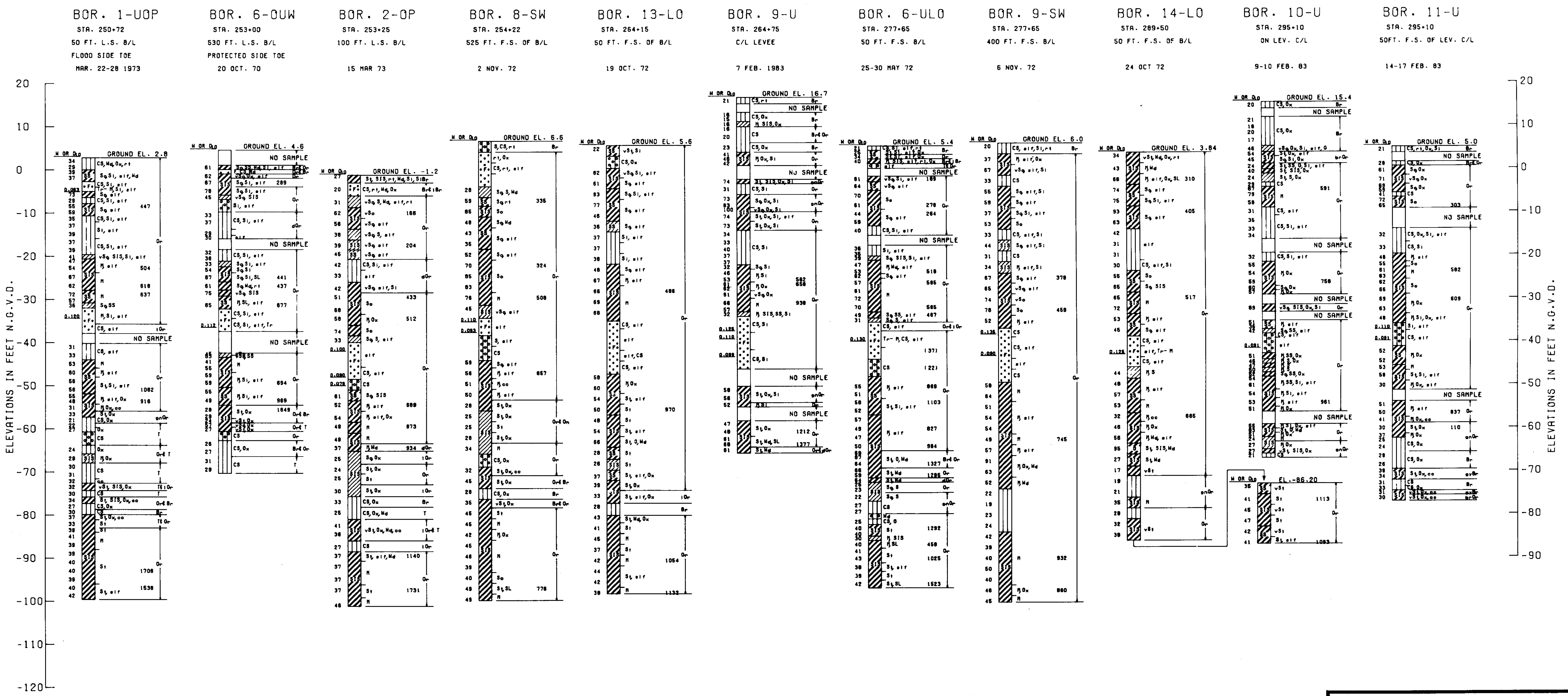
NOTES:
GENERAL TYPE BORINGS OBTAINED WITH 1-7/8 IN. I.D. X 29 INCH SAMPLER. UNDISTURBED BORINGS INDICATED BY THE LETTER "U" TAKEN WITH 5 IN. I.D. X 4 FOOT PISTON TYPE SAMPLER.

FOR BORING LOCATIONS SEE PLATE 5

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

GENERAL TYPE BORING LOGS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NOTES:
GENERAL TYPE BORINGS OBTAINED WITH 1-7/8 IN. I.D. X 29 INCH SAMPLER. UNDISTURBED BORINGS INDICATED BY THE LETTER "U" TAKEN WITH 5 IN. I.D. X 4 FOOT PISTON TYPE SAMPLER.

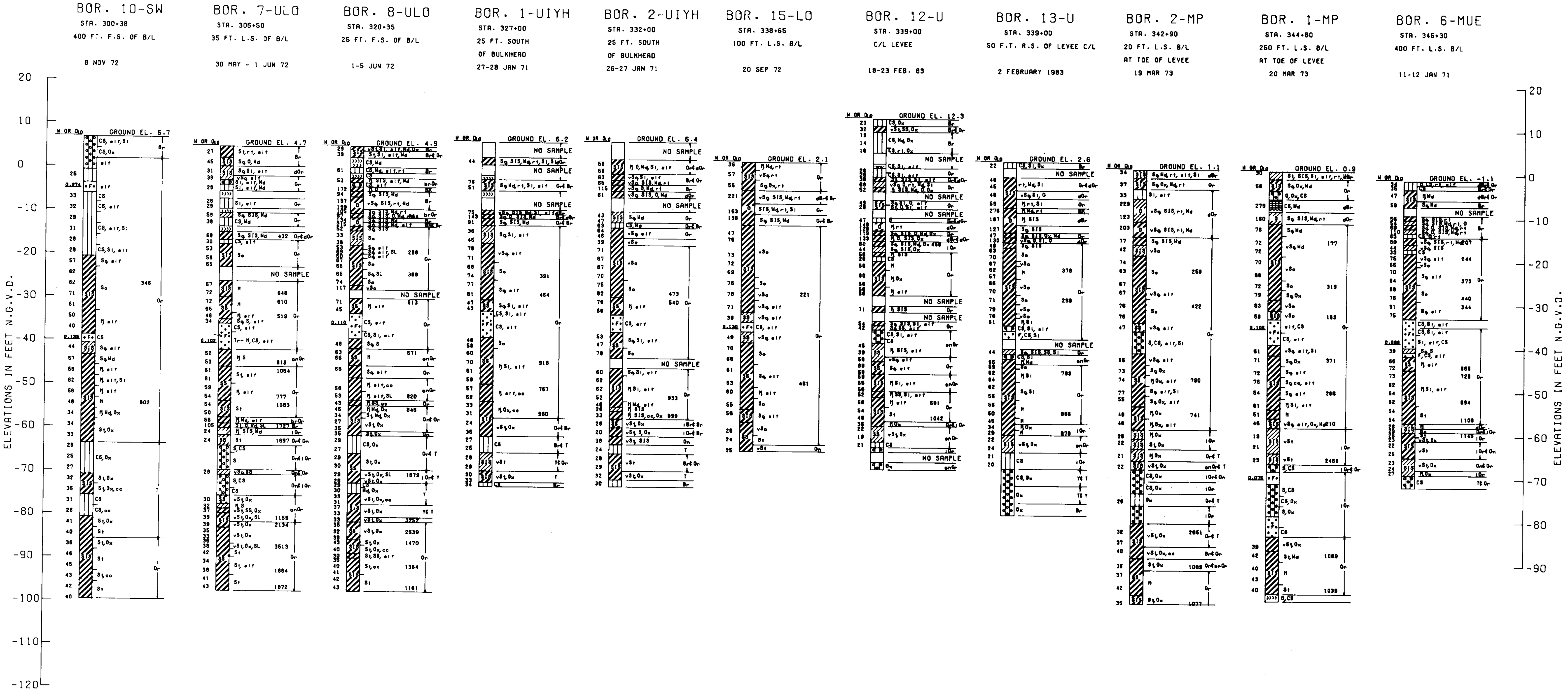
FOR BORING LOCATIONS SEE PLATE 6

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

GENERAL TYPE BORING LOGS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 96



NOTES:
GENERAL TYPE BORINGS OBTAINED WITH 1-7/8 IN. I.D. X 29 INCH SAMPLER. UNDISTURBED BORINGS INDICATED BY THE LETTER "U" TAKEN WITH 5 IN. I.D. X 4 FOOT PISTON TYPE SAMPLER.

FOR BORING LOCATIONS SEE PLATE 7

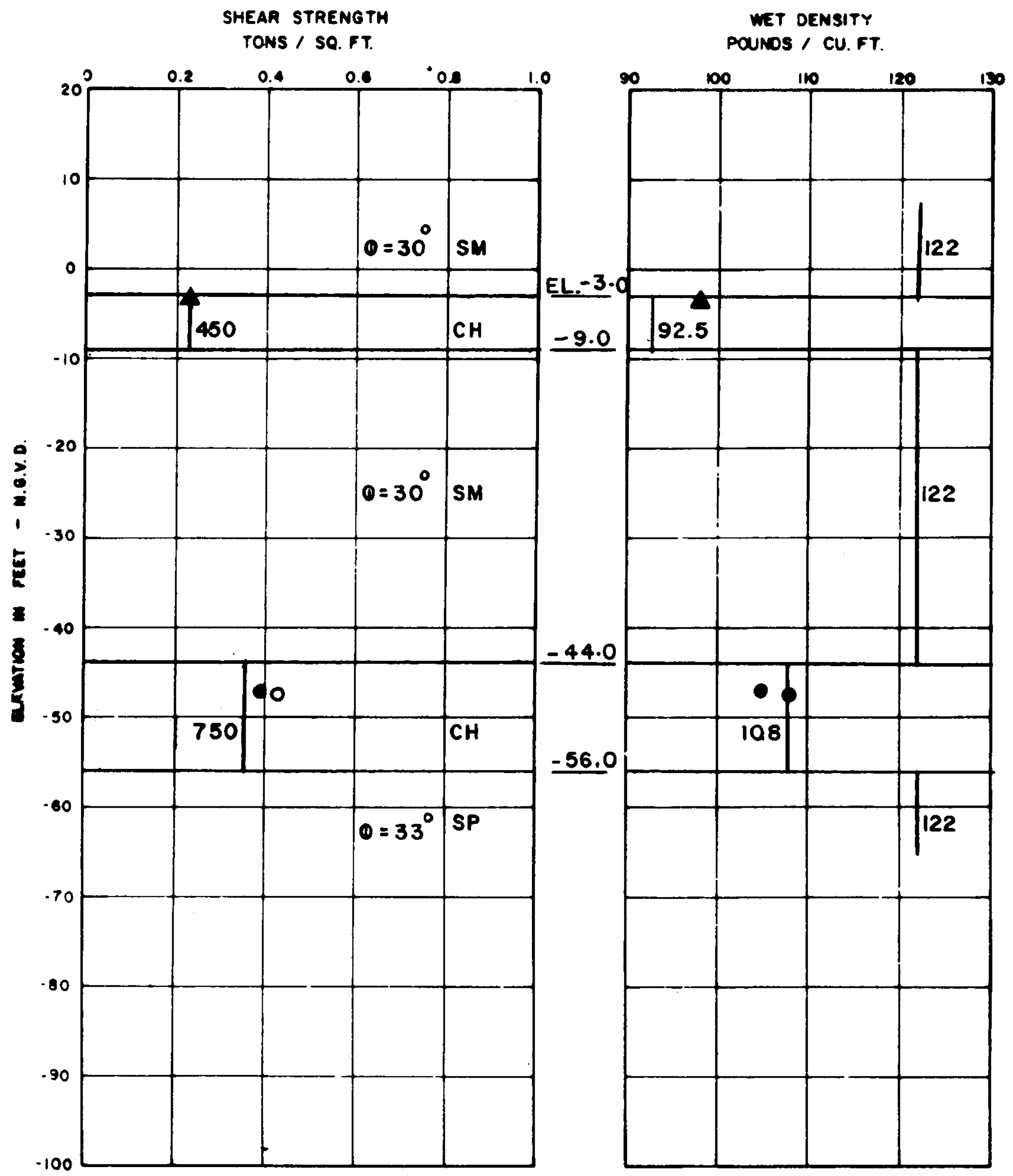
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

GENERAL TYPE BORING LOGS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 97

STA. 1+51.07 W/L TO STA. 14+31.42 W/L

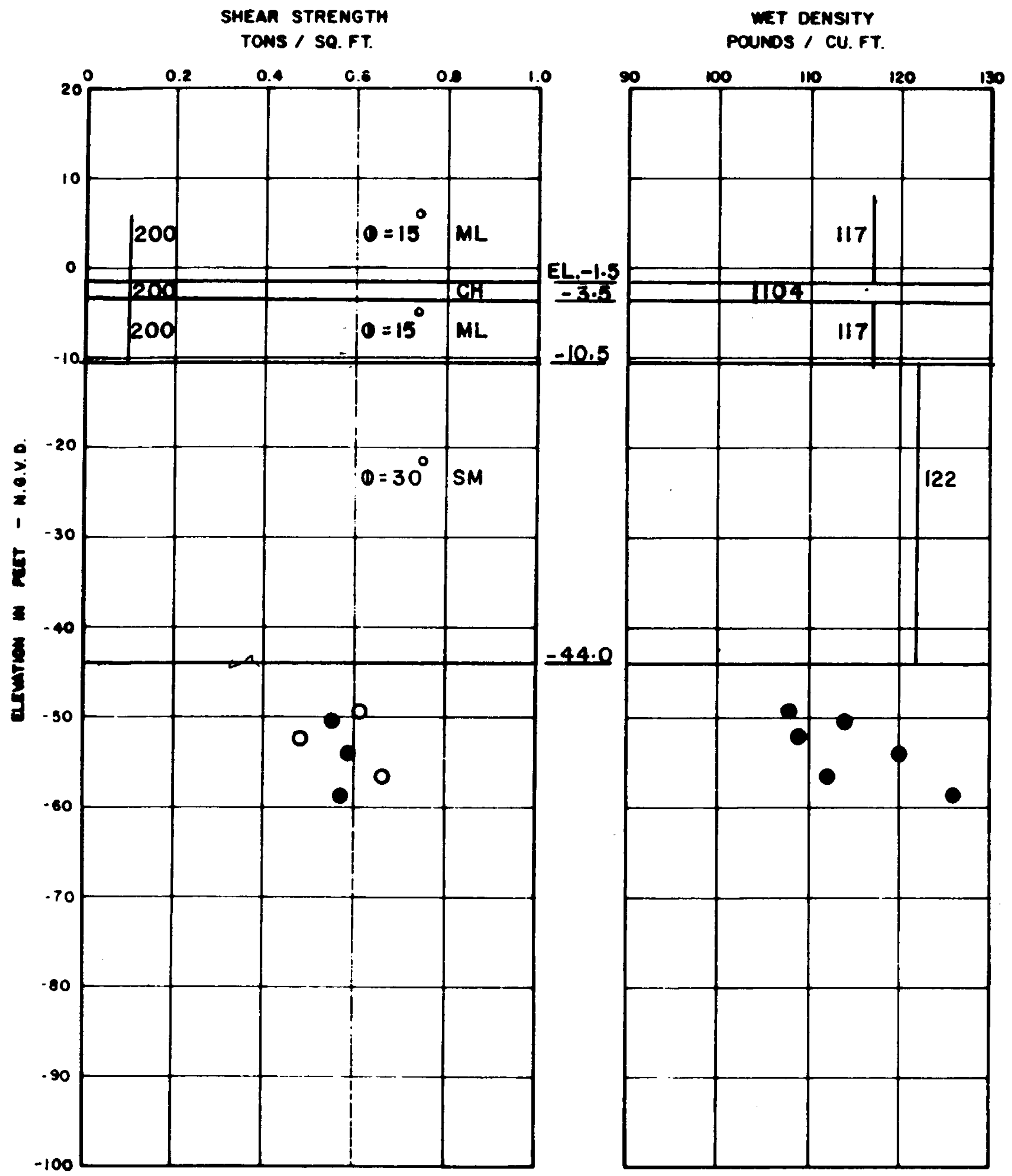


BORING LEGEND:
SHEAR STRENGTHS AND UNIT WEIGHTS
○ ● 1-ULOA
▲ 11-WU

GENERAL TYPE BORINGS ALSO USED FOR STRATIFICATION AND CLASSIFICATION ARE: 1-W, 2-WTA & 1-LO

NOTE:
1.) FOR DESIGN STRENGTHS AND UNIT WEIGHTS FROM STA. 0+00 W/L TO STA. 1+51.07 W/L REFER TO D.M. NO. 2, GENERAL SUPPLEMENT NO. 8, I.H.N.C. REMAINING LEVEES, PLATE III - 20. (STA. 31+00 TO STA. 41+01)

STA. 14+31.42 W/L TO STA. 42+33.93 B/L



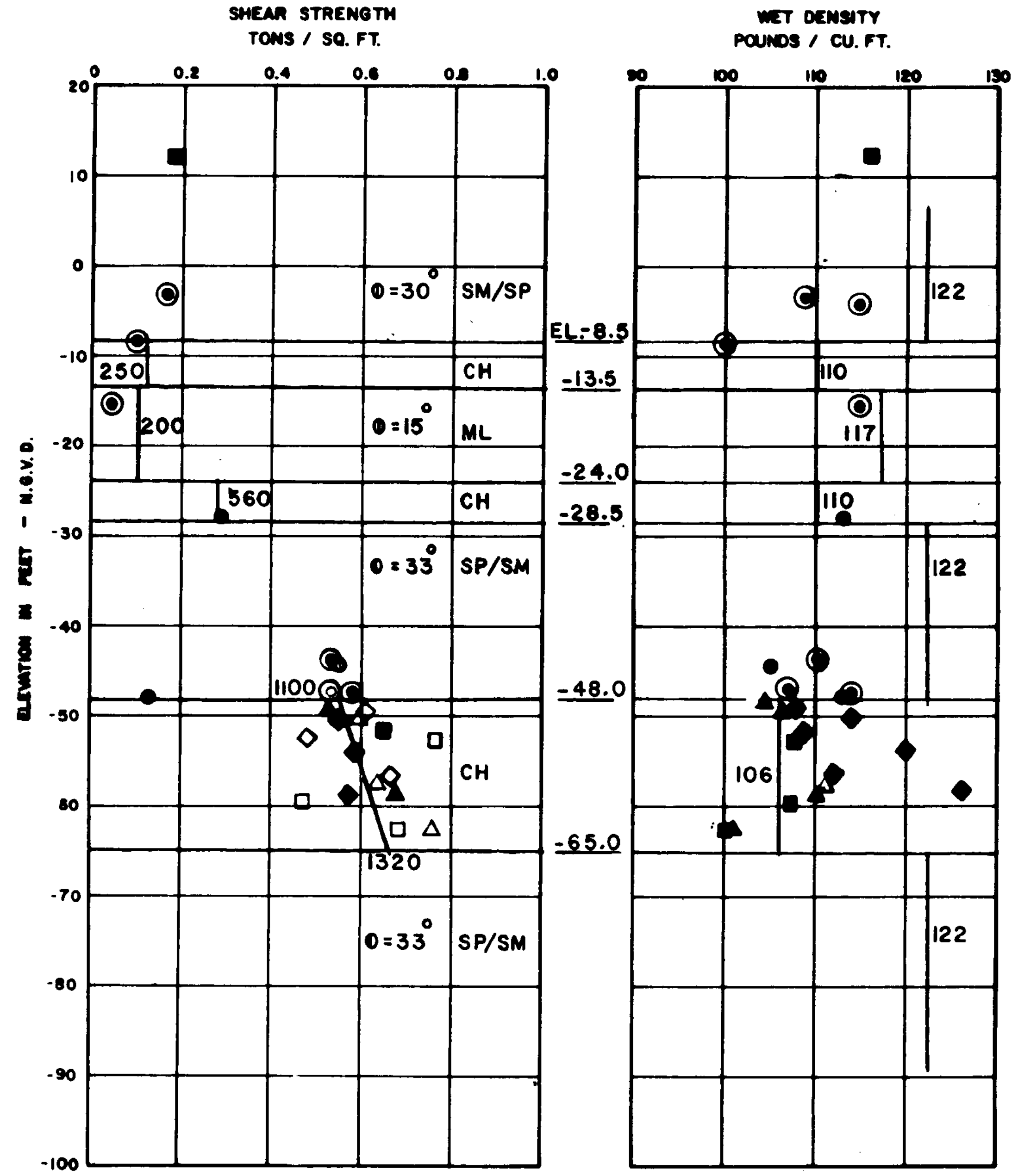
BORING LEGEND:
SHEAR STRENGTHS AND UNIT WEIGHTS
○ ● 1-ULO

GENERAL TYPE BORING ALSO USED FOR STRATIFICATION AND CLASSIFICATION IS: 1-LO

SOLID SYMBOLS INDICATE UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TESTS (Q-TESTS).

OPEN SYMBOLS INDICATE UNCONFINED COMPRESSION TESTS (UCT's).

STA. 42+33.93 B/L TO STA. 102+23.16 B/L



BORING LEGEND:
SHEAR STRENGTHS AND UNIT WEIGHTS
□ ■ 1-U   ○ ● 3-U   ◎ ◉ 2-ULO
△ ▲ 2-U   ◇ ◆ 1-ULO

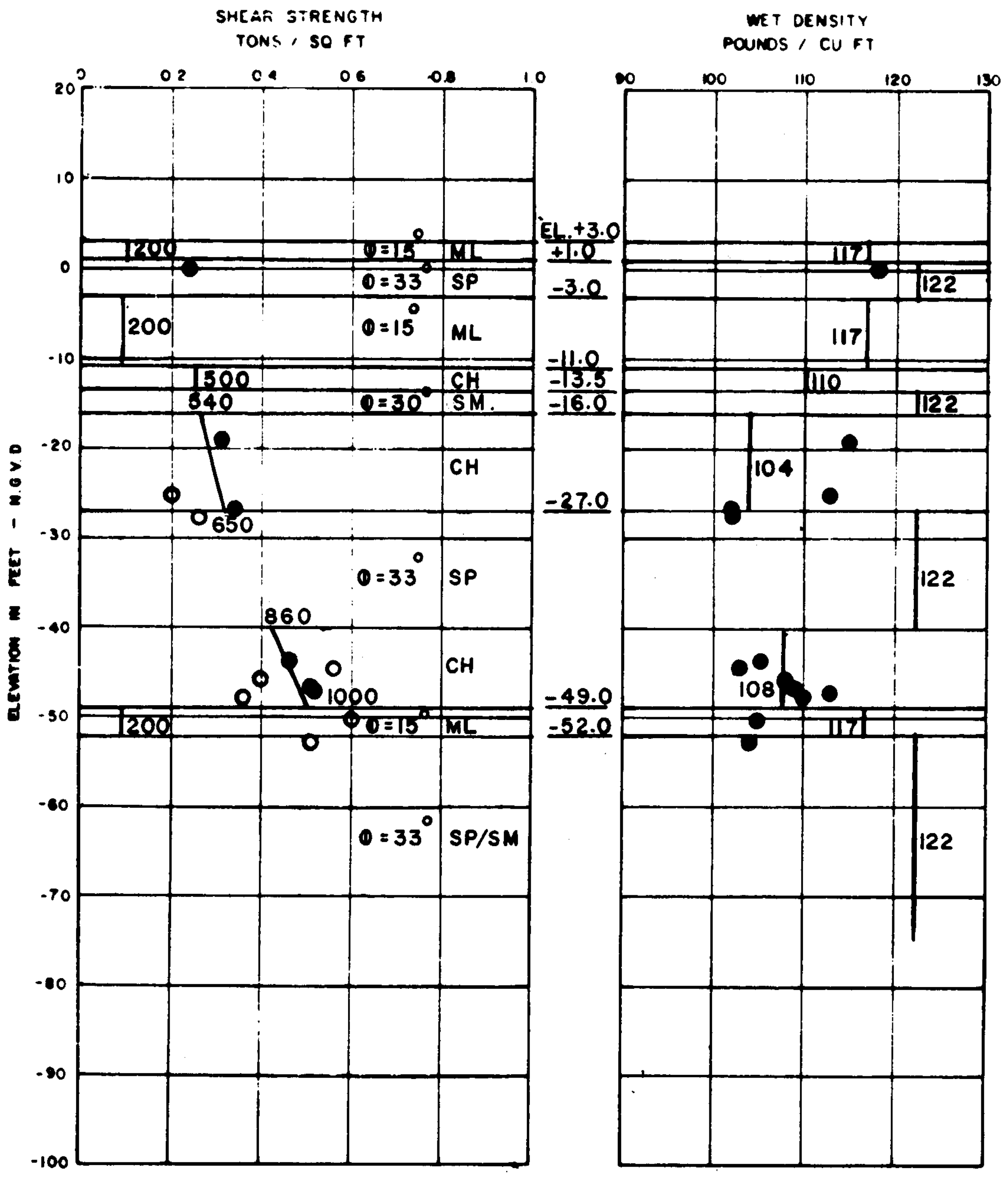
GENERAL TYPE BORINGS ALSO USED FOR STRATIFICATION AND CLASSIFICATION ARE: 2-LO, 3-LO & 4-LO

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

DESIGN SHEAR STRENGTHS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

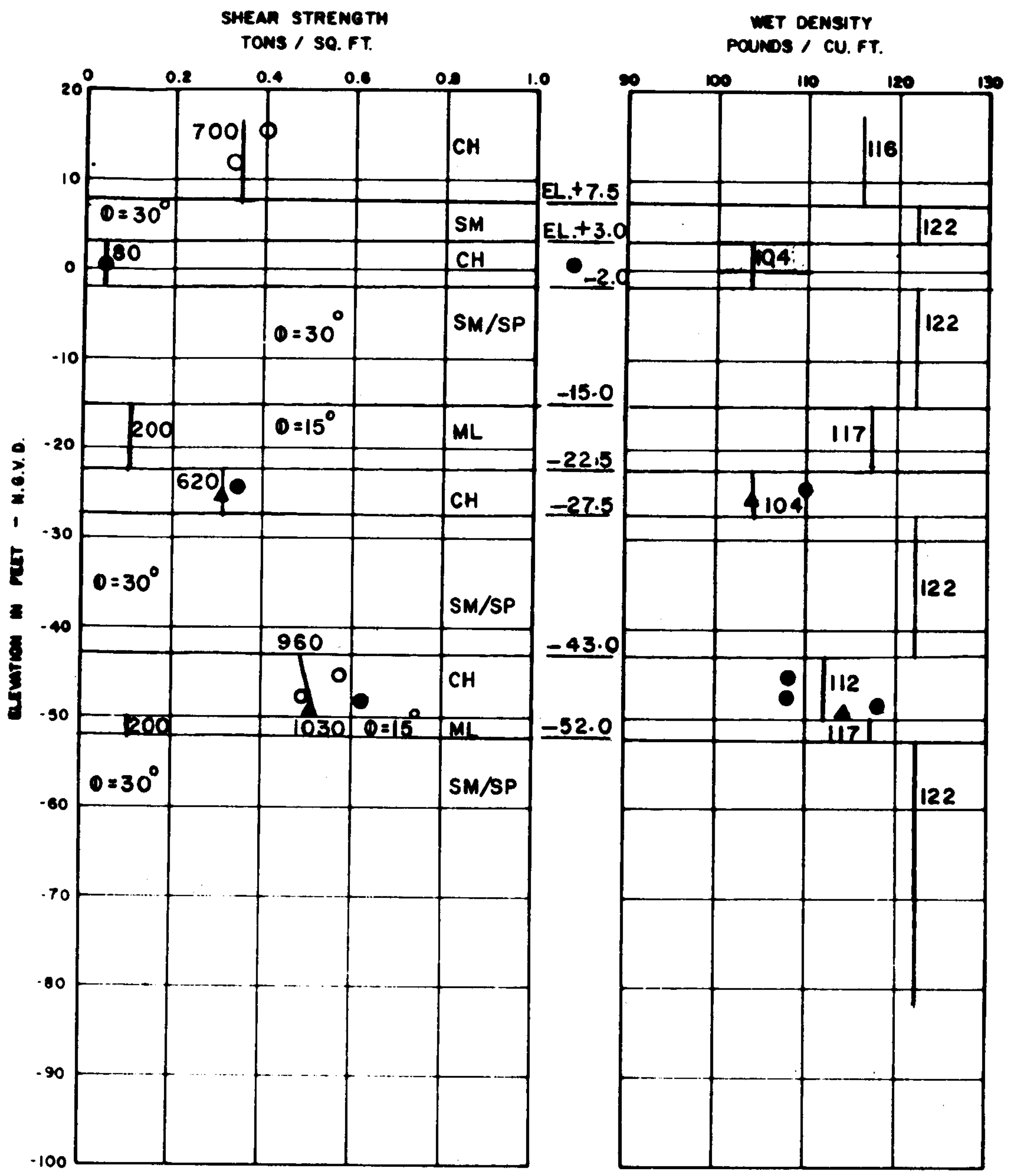
STA. 102+23.16 B/L TO STA. 136+13.19 B/L



BORING LEGEND:
SHEAR STRENGTHS AND UNIT WEIGHTS
○ ● 3-ULO

GENERAL TYPE BORINGS ALSO USED FOR STRATIFICATION AND CLASSIFICATION ARE: 6-LO & 7-LO

STA. 136+13.19 B/L TO STA. 161+00.18 B/L



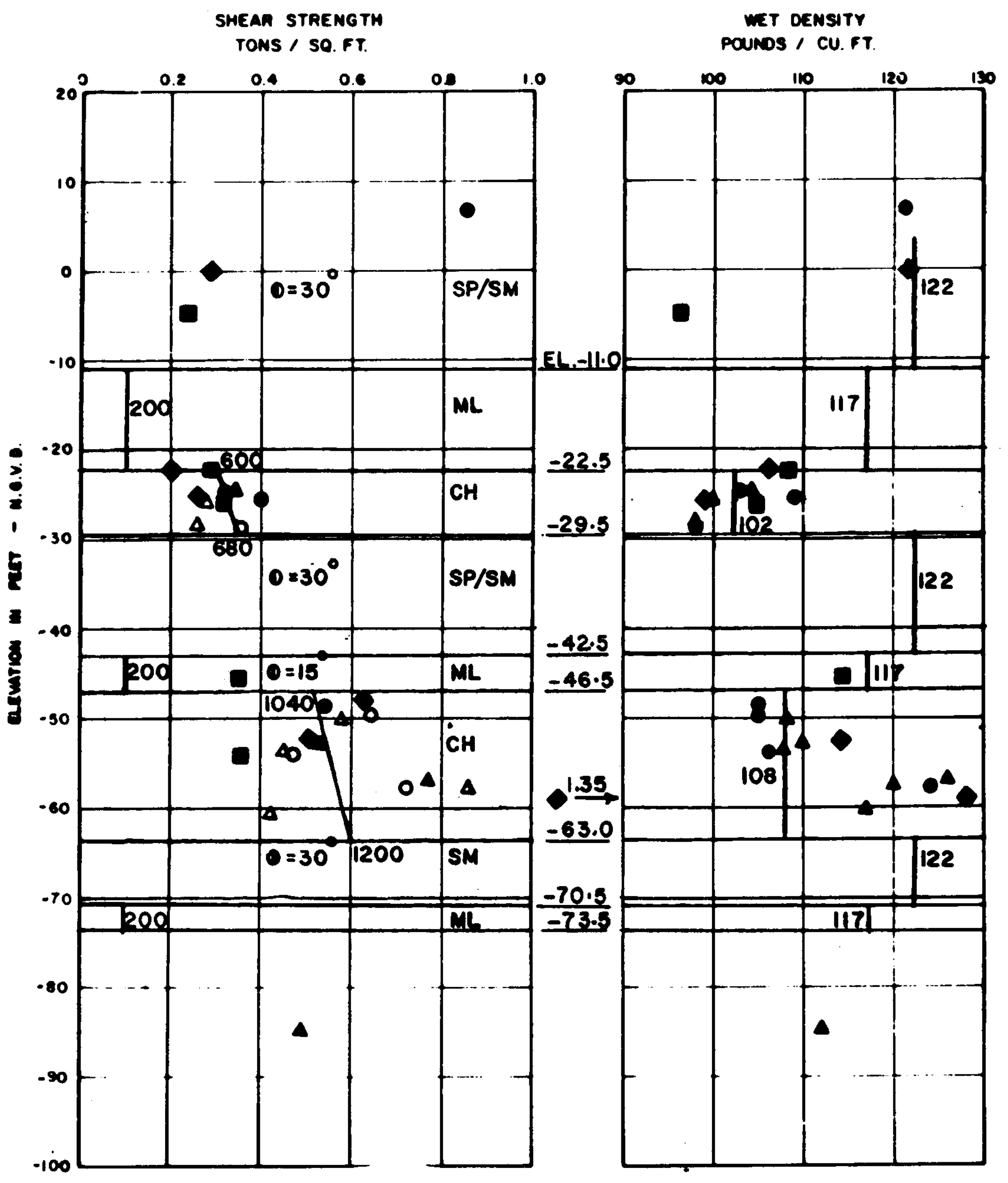
BORING LEGEND:
SHEAR STRENGTHS AND UNIT WEIGHTS
○ ● 4-U
▲ 5-U

GENERAL TYPE BORINGS ALSO USED FOR STRATIFICATION AND CLASSIFICATION ARE: 8-LO, 9-LO & 2-LP

SOLID SYMBOLS INDICATE UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TESTS (Q-TESTS).

OPEN SYMBOLS INDICATE UNCONFINED COMPRESSION TESTS (UCT's).

STA. 161+00.18 B/L TO STA. 196+91.33 B/L



BORING LEGEND:
SHEAR STRENGTHS AND UNIT WEIGHTS
○ ● 6-U ■ 3-JUE
△ ▲ 7-U ◆ 1-UJP

GENERAL TYPE BORINGS ALSO USED FOR STRATIFICATION AND CLASSIFICATION ARE: 1-LP, 2-LP & 10-LO

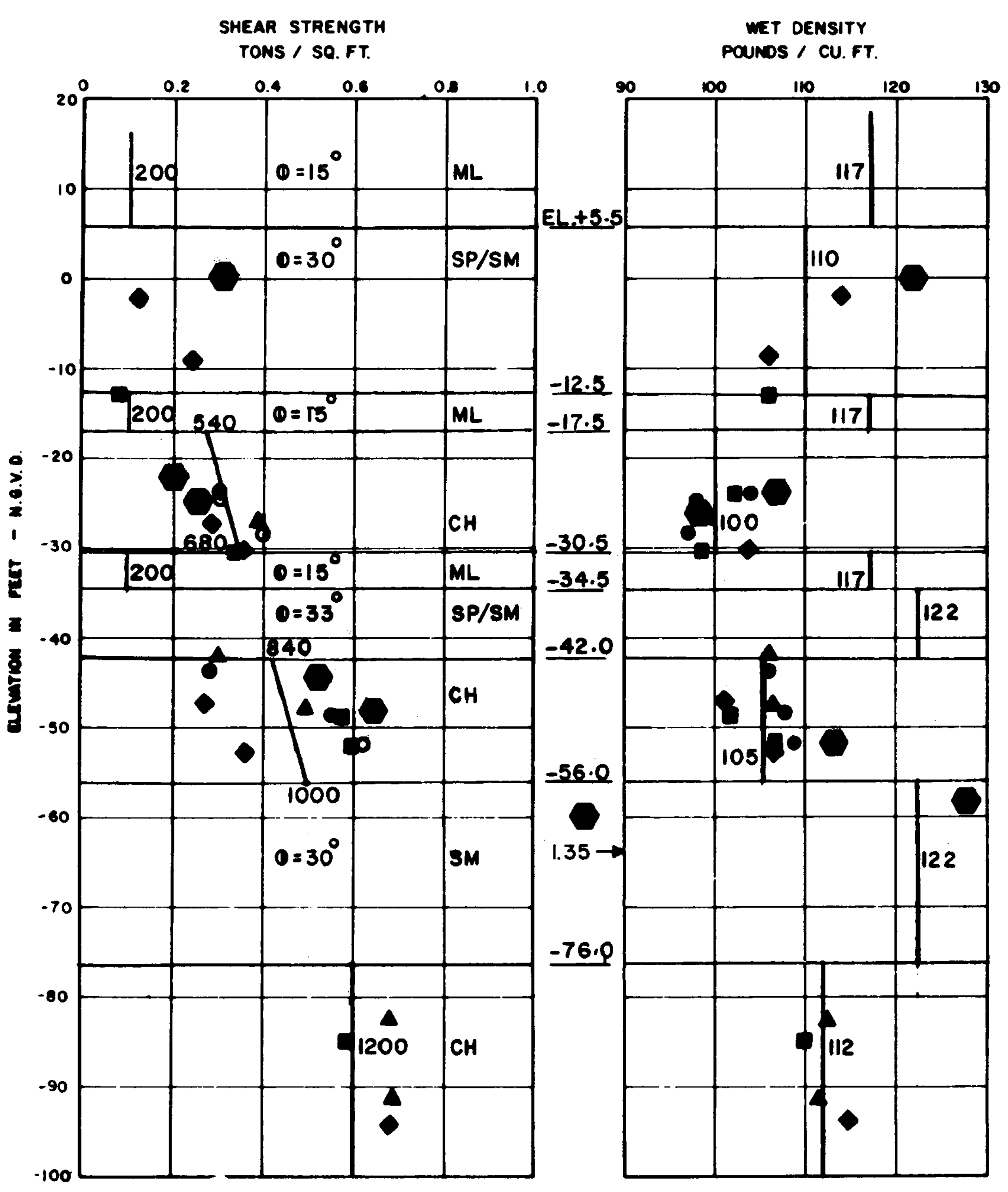
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

DESIGN SHEAR STRENGTHS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

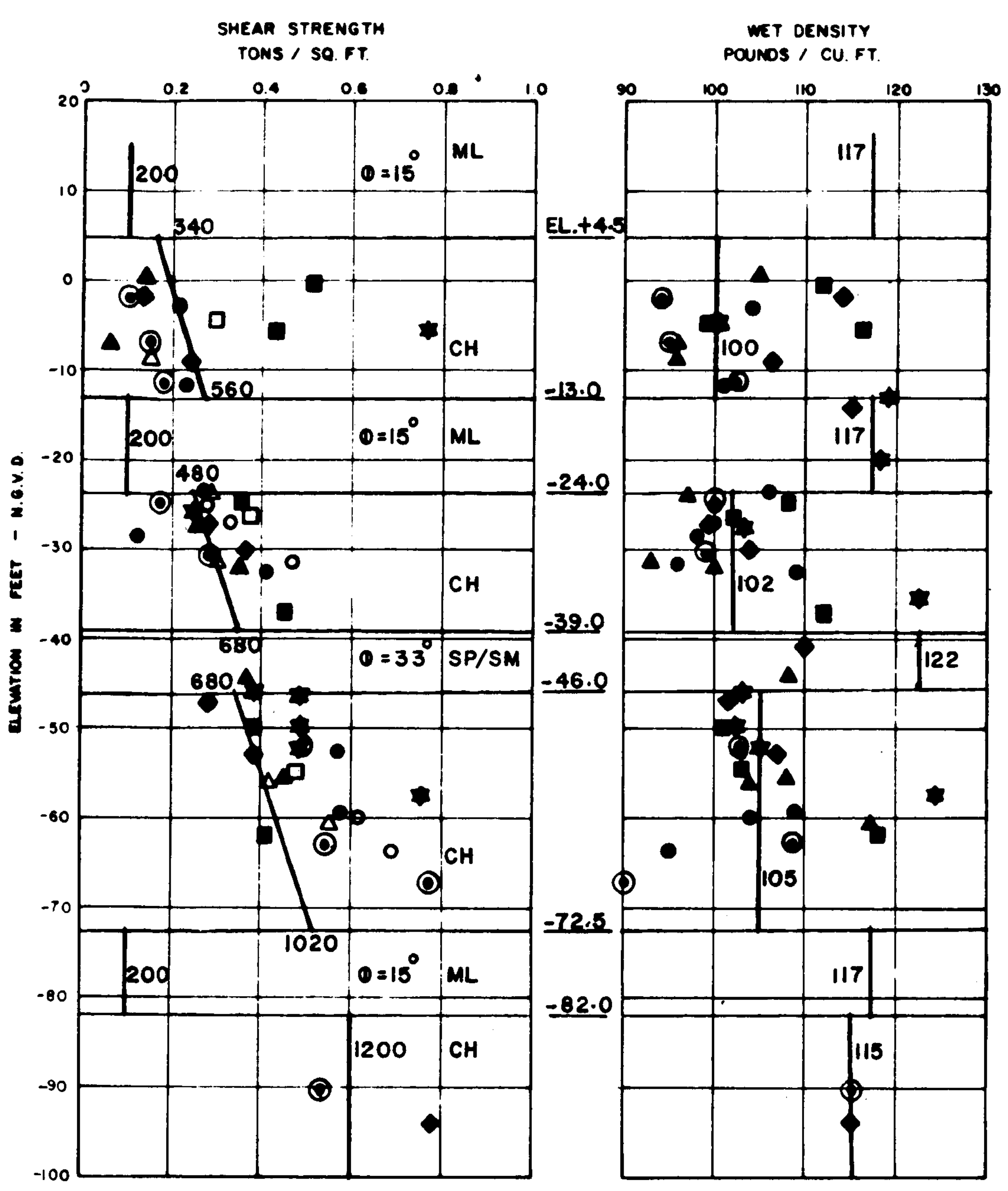
PLATE 99

STA. 199+41.52 B/L TO STA. 246+37.17 B/L



BORING LEGEND:
SHEAR STRENGTHS AND UNIT WEIGHTS
○ ● 8-U ■ 5-ULO
▲ 4-ULO ◆ 1-UOP ⬢ 1-UJP
GENERAL TYPE BORINGS ALSO USED FOR STRATIFICATION AND CLASSIFICATION ARE: 11-LO & 12-LO.

STA. 250+72.00 B/L TO STA. 303+51.39 B̊/L

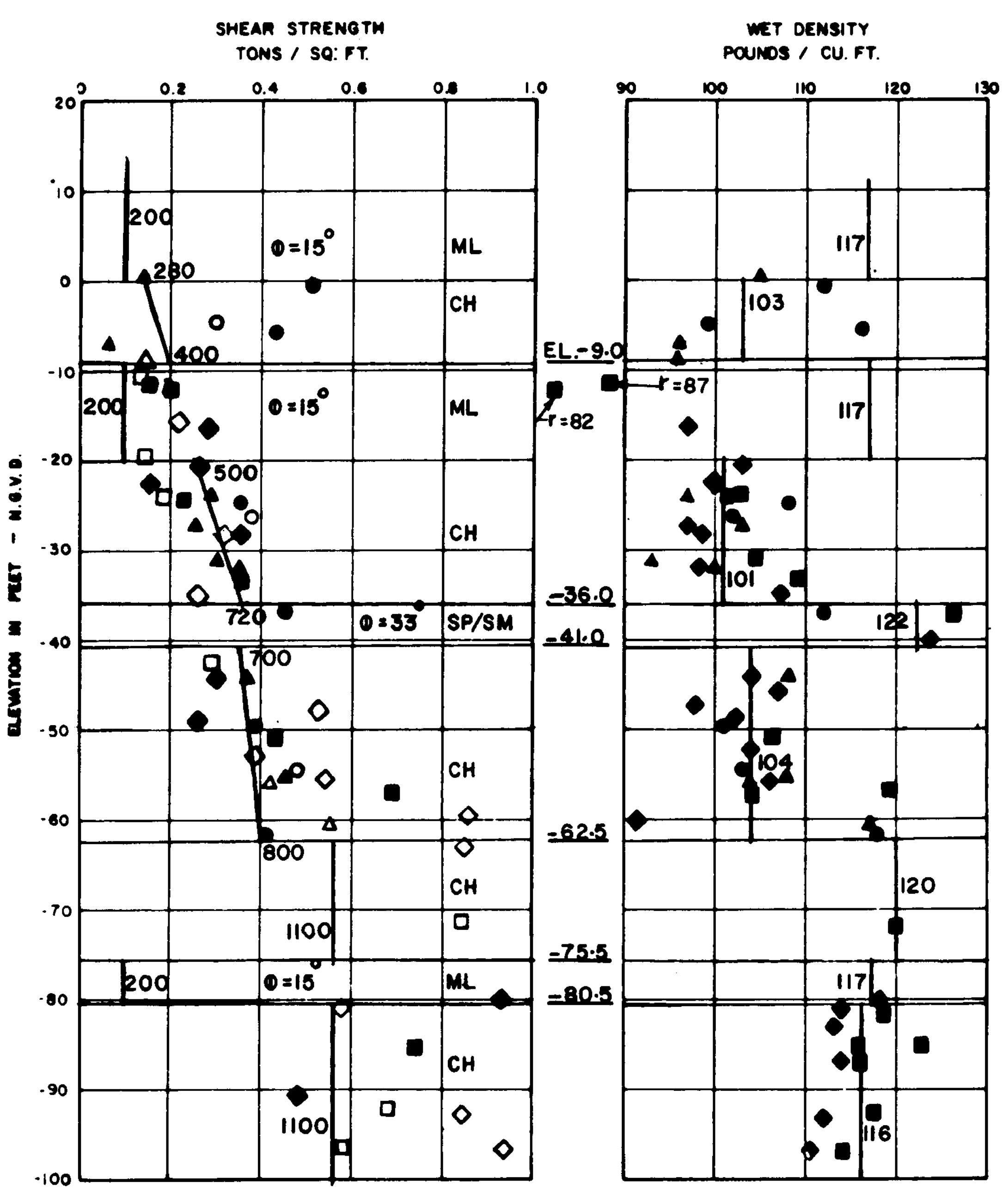


BORING LEGEND:
SHEAR STRENGTHS AND UNIT WEIGHTS
□ ■ 10-U ○ ● 9-U ◆ 1-UOP
△ ▲ 11-U ✱ 6-OUW ◎ 6-ULO
GENERAL TYPE BORINGS ALSO USED FOR STRATIFICATION AND CLASSIFICATION ARE: 2-OP, 13-LO & 14-LO

SOLID SYMBOLS INDICATE UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TESTS (Q-TESTS).

OPEN SYMBOLS INDICATE UNCONFINED COMPRESSION TESTS (UCT's).

STA. 303+51.39 B/L TO STA. 321+30.99 B/L



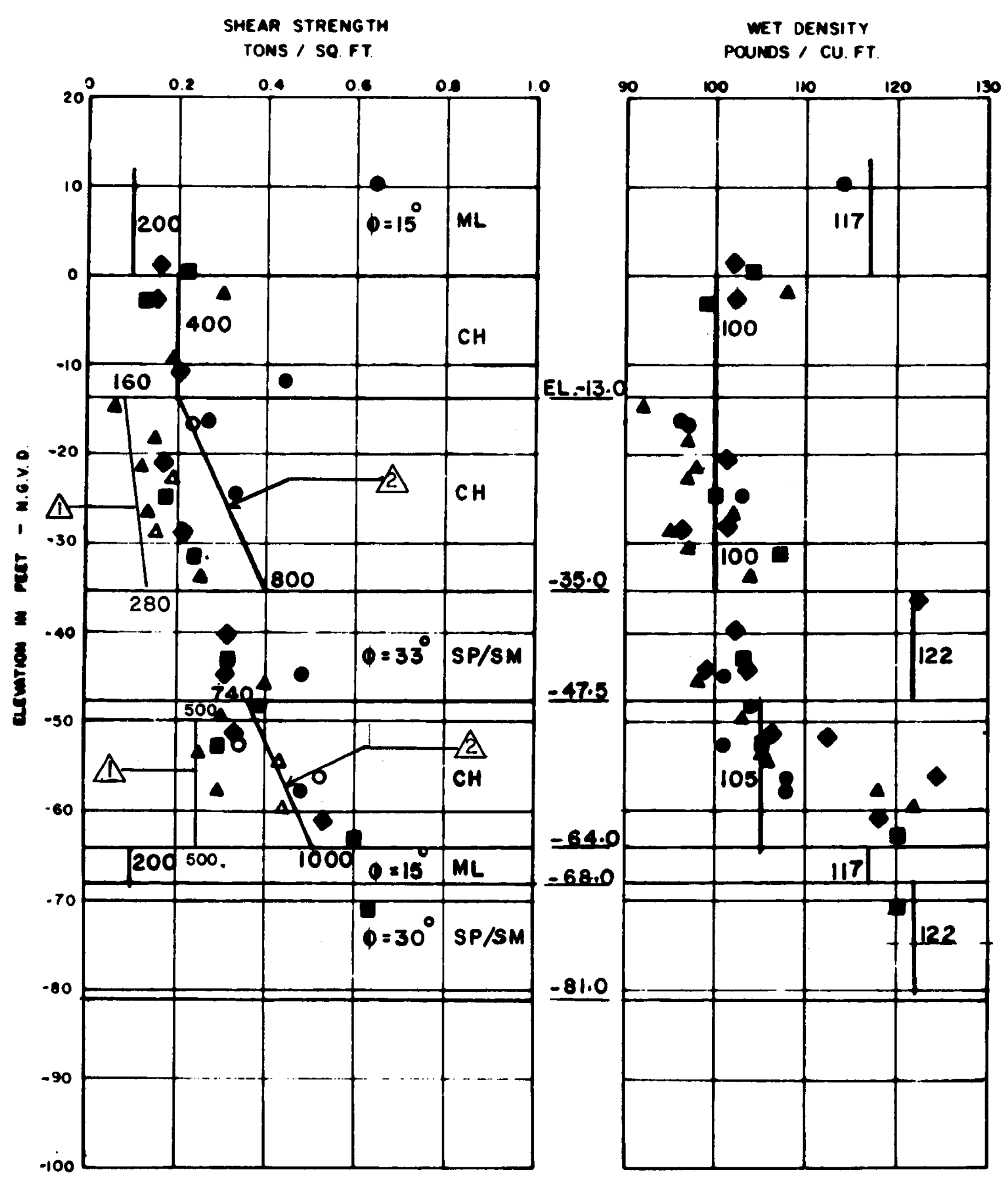
BORING LEGEND:
SHEAR STRENGTHS AND UNIT WEIGHTS
○ ● 10-U ◇ ◆ 7-ULO
△ ▲ 11-U □ ■ 8-ULO
GENERAL TYPE BORING ALSO USED FOR STRATIFICATION AND CLASSIFICATION IS: 10-SW

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

DESIGN SHEAR STRENGTHS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

STA. 321+30.99 B/L TO STA. 347+35.81 B/L



Notes:

1) SHEAR TREND ⚠2 IS BASED ON CENTERLINE BORINGS

2) SHEAR TREND ⚠1 IS BASED ON TOE BORINGS

BORING LEGEND:

SHEAR STRENGTHS AND UNIT WEIGHTS

○ ● 12-U ◆ 1-UIYH

△ ▲ 13-U ■ 2-UIYH

GENERAL TYPE BORINGS ALSO USED FOR STRATIFICATION AND CLASSIFICATION ARE: 15-LO, 1-MP, 2-MP & 6-MUE

SOLID SYMBOLS INDICATE UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TESTS (Q-TESTS).

OPEN SYMBOLS INDICATE UNCONFINED COMPRESSION TESTS (UCT's).

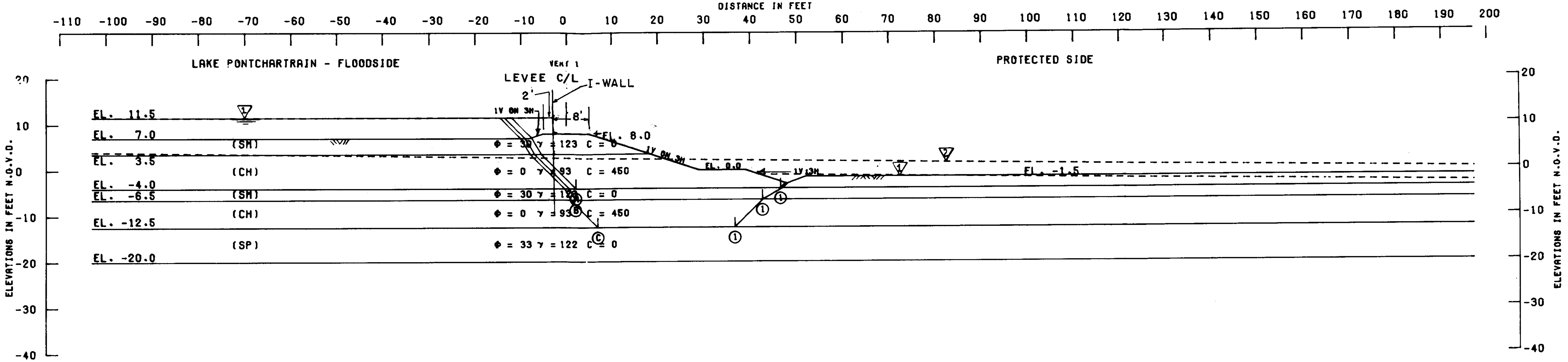
2

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

DESIGN SHEAR STRENGTHS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 101



ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 131
2. PIEZOMETRIC HEADLINE NO. 1 REPRESENTS UPPER SANDS. PIEZOMETRIC HEADLINE NO. 2 REPRESENTS LOWER SANDS.

ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
A 1	-4.0	7065	6064	1023	9742	80	14152	9662	1.460
B 1	-6.5	7958	9266	1959	13432	932	19183	12500	1.530
C 1	-12.5	13346	9888	7325	24472	6428	30558	18044	1.690

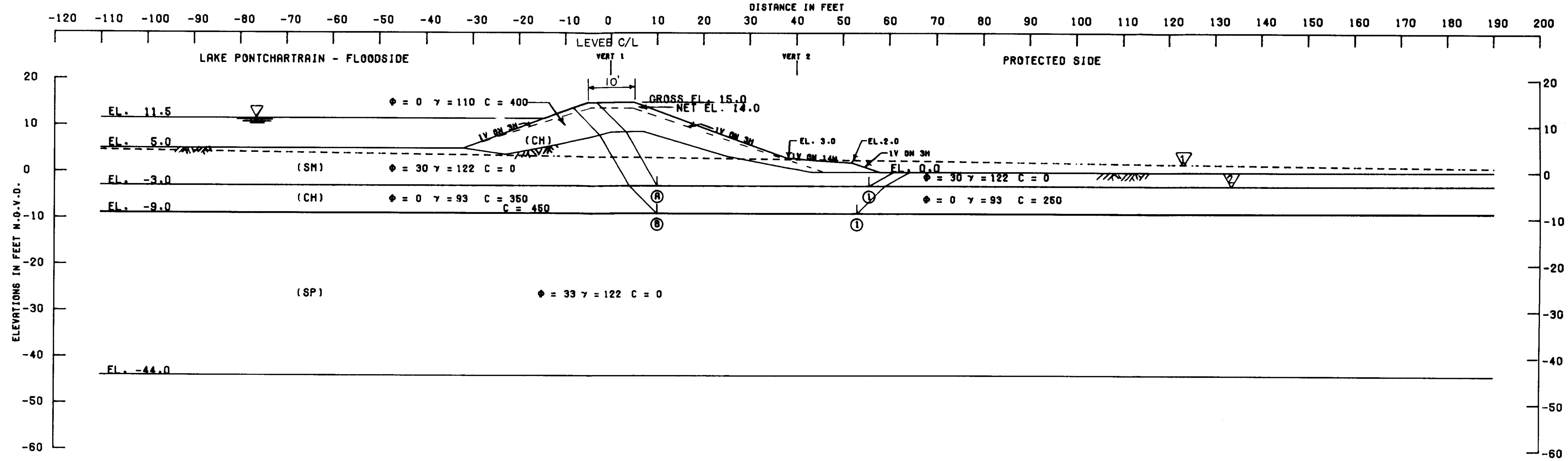
NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

FACTOR OF SAFETY = $\frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
I-WALL IN LEVEE
(Q) SHEAR STABILITY
STA. 0+00 TO STA. 1+13.57 W/L
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 102



ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
A 1	-3.0	15430	13645	1221	17741	611	30296	17130	1.770
B 1	-9.0	19273	12999	4098	32203	4868	36370	27335	1.330

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 98

2. PIEZOMETRIC HEADLINE NO. 1 REPRESENTS THE LOWER SANDS. PIEZOMETRIC HEADLINE NO. 2 REPRESENTS THE UPPER SANDS.

3. FROM W/L STA. 5+60 TO W/L STA. 5+70, THE NET ELEVATION VARIES FROM EL. 14 TO EL. 15

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

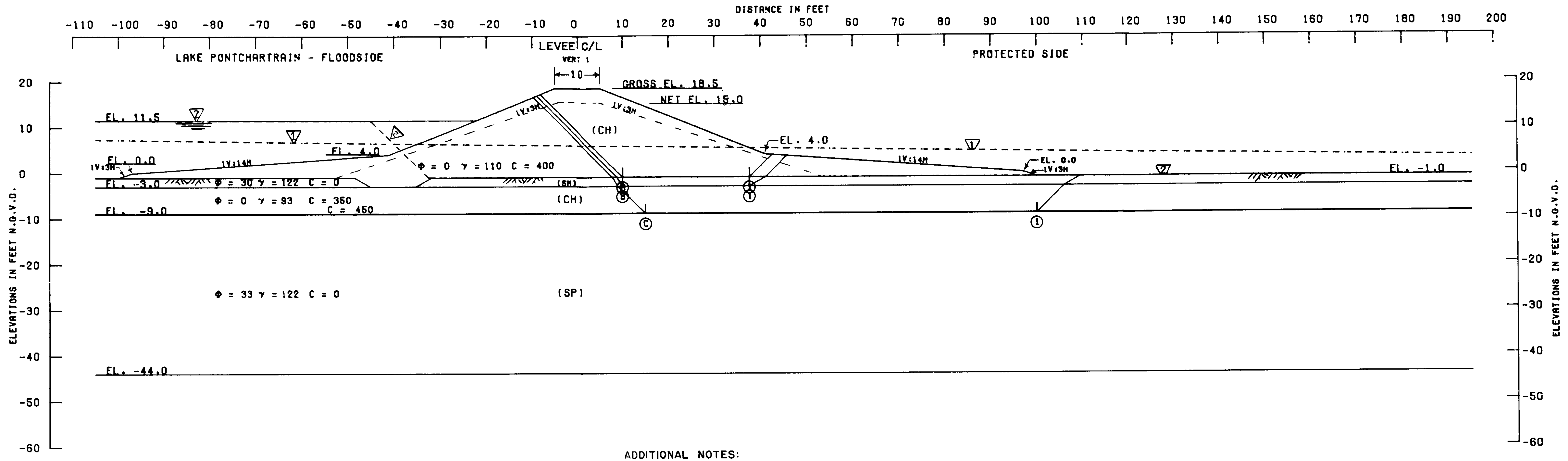
$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13. GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 2+49.51 TO STA. 5+60 W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 103



ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
(A) (1)	-1.0	14559	11049	3913	20035	1618	29521	18417	1.600
(B) (1)	-3.0	16970	12430	6457	24216	2769	35857	21447	1.670
(C) (1)	-9.0	21017	20686	4458	38393	3373	46161	35020	1.320

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 98
2. PIEZOMETRIC HEADLINE NO. 1 REPRESENTS THE LOWER SANDS. PIEZOMETRIC HEADLINE NO. 2 REPRESENTS THE UPPER SANDS.
3. FROM W/L STA. 7+07.87 TO W/L STA. 7+25.87, THE NET ELEVATION VARIES FROM EL.15 TO EL.9.

NOTES

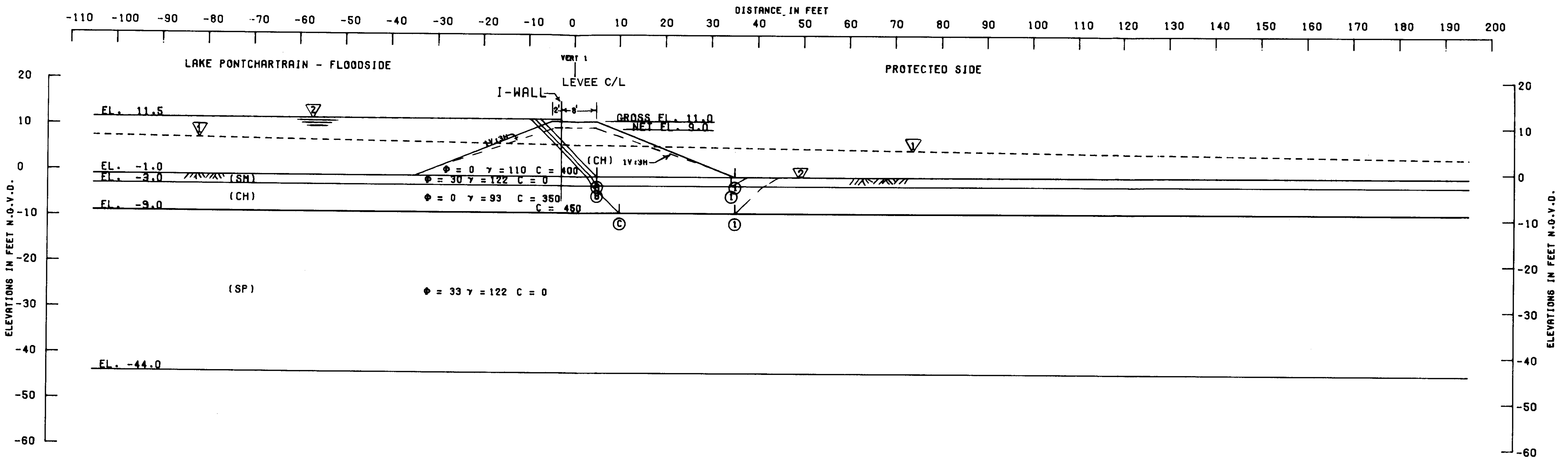
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 5+70 TO STA. 7+07.87 W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
Ⓐ ①	-1.0	9143	4933	0	8023	0	14076	8023	1.750
Ⓑ ①	-3.0	9718	6936	215	10902	252	16869	10650	1.580
Ⓒ ①	-9.0	13710	7325	4458	21381	3373	25493	18008	1.420

ADDITIONAL NOTES;

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORING SHOWN ON PLATE NO. 98

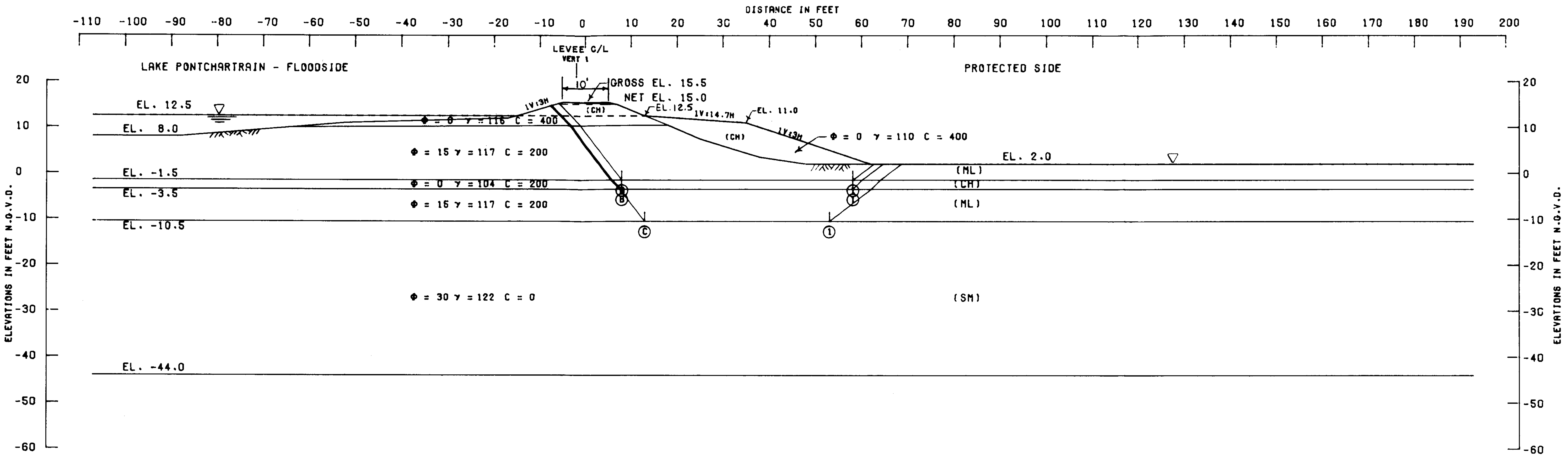
2. PIEZOMETRIC HEADLINE NO. 1 REPRESENTS THE LOWER SANDS. PIEZOMETRIC HEADLINE NO. 2 REPRESENTS THE UPPER SANDS.

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
I-WALL IN LEVEE
(Q) SHEAR STABILITY
STA. 7+25.87 TO STA. 7+62.87 W/L
STA. 8+08.87 TO STA. 8+53.90 W/L
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
Ⓐ ①	-1.5	11266	10019	2108	16608	931	23393	15677	1.490
Ⓑ ①	-3.5	11767	10019	2845	20702	2008	24631	18694	1.320
Ⓒ ①	-10.5	17204	19404	9115	37387	10071	45723	27316	1.670

ADDITIONAL NOTES:

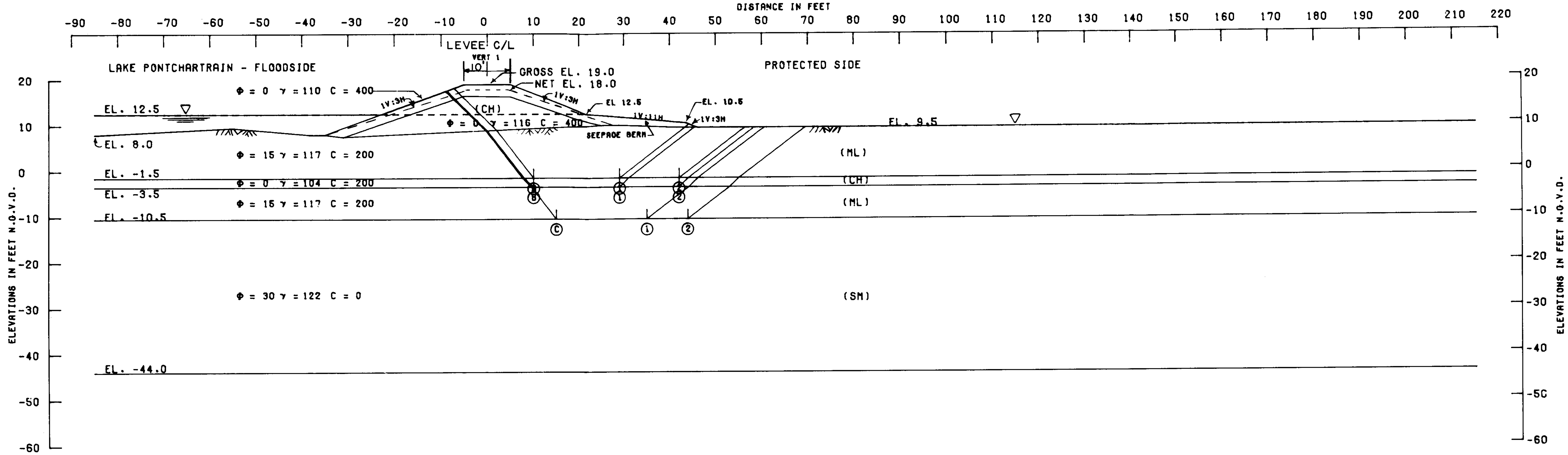
1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 98
2. FROM W/L STA. 14+40.23 TO W/L STA. 15+30.23, THE NET ELEVATION VARIES FROM EL. 15 TO EL. 18

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
LEVEE (Q) SHEAR STABILITY
STA. 14+31.42 TO STA. 14+40.23 W/L
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
A 1	-1.5	15493	3600	9263	23245	9154	28556	14091	2.030
A 2	-1.5	15493	6400	7932	23245	7318	29825	15927	1.870
B 1	-3.5	16063	3600	9644	28062	12121	29507	15941	1.850
B 2	-3.5	16063	6400	8693	28062	10153	31156	17909	1.740
C 1	-10.5	22301	10643	17099	46702	24312	50043	22390	2.240
C 2	-10.5	22301	15116	16679	46702	23266	54096	23436	2.310

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS FOR THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 98

NOTES

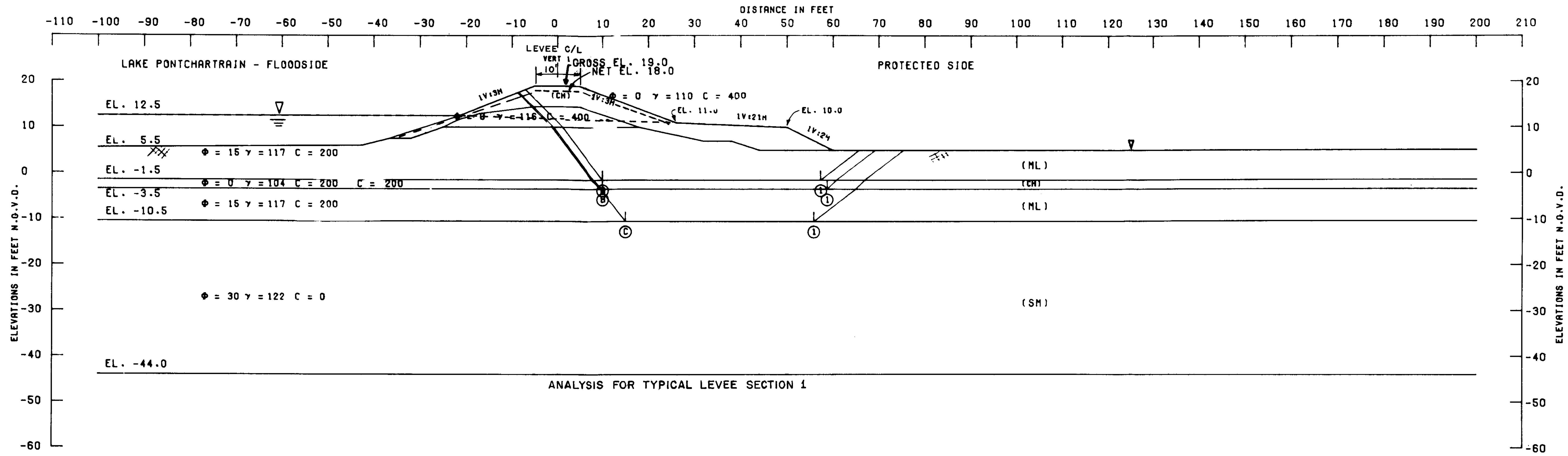
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 15+30.23 TO STA. 15+90.23W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 1

ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
Ⓐ ①	-1.5	15600	9456	4109	23103	2628	29165	20475	1.420
Ⓑ ①	-3.5	16119	9749	4992	27905	4244	30860	23661	1.300
Ⓒ ①	-10.5	22539	20700	11650	46545	14216	54889	32329	1.700

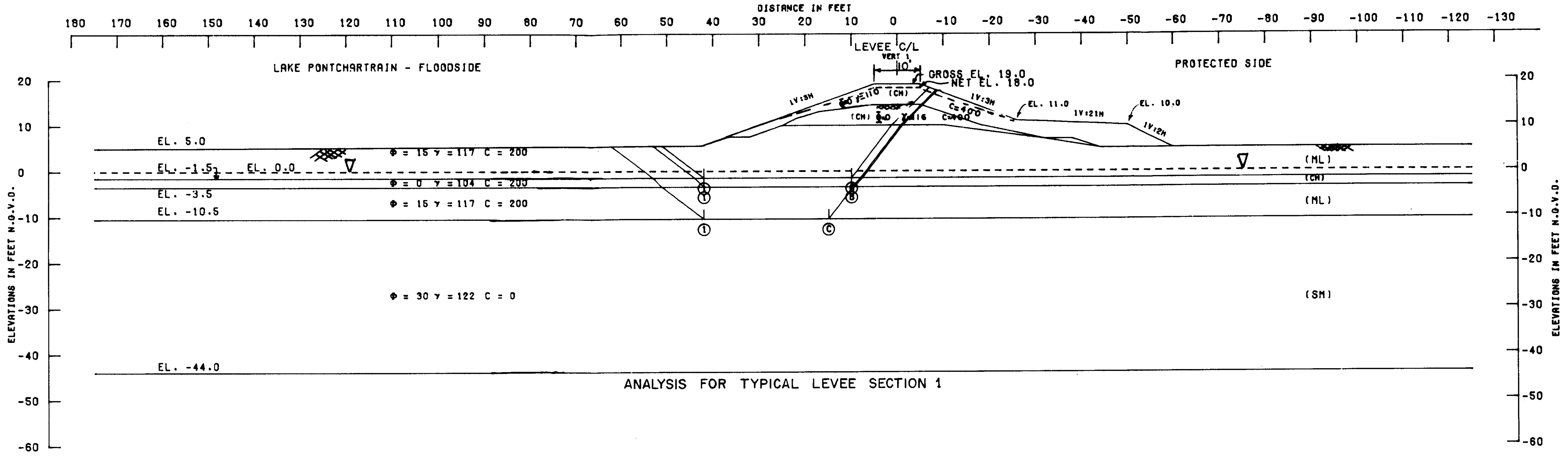
ADDITIONAL NOTES:
1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 98

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
LEVEE (Q) SHEAR STABILITY
STA. 29+25.54 TO STA. 42+10.00 B/L
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 1

ASSUMED FAILURE NO.	SURFACE	ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
A	1	-1.5	17797	6400	5579	23166	2858	29776	20308	1.470
B	1	-3.5	18330	6400	6368	27965	4698	31098	23267	1.340
C	1	-10.5	26887	18203	14857	46784	14704	59947	32080	1.870

ADDITIONAL NOTES:

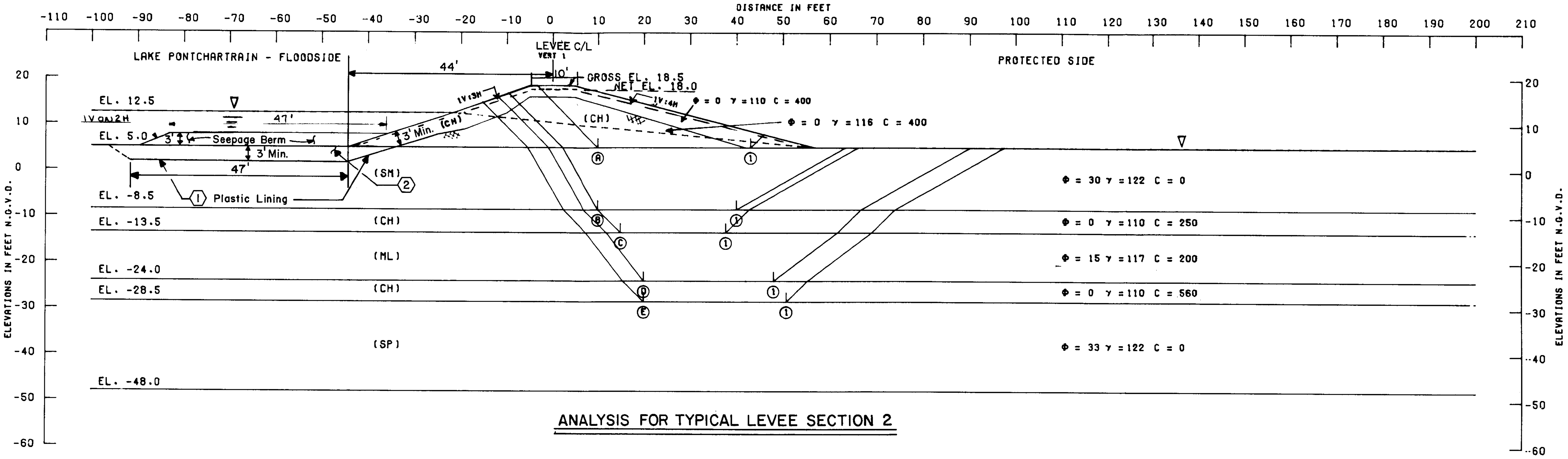
1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 98

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
LEVEE (Q) SHEAR STABILITY
STA. 29+25.54 TO STA. 42+10.0 B/L
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 2

ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
A 1	5.0	10680	11502	2307	9993	576	24489	9417	2.600
B 1	-8.5	23760	7500	14240	41114	13500	45500	27614	1.650
C 1	-13.5	26260	5675	15561	57340	24825	47496	32515	1.460
D 1	-24.0	38986	15680	28968	99910	51131	83634	48779	1.710
E 1	-28.5	43355	17248	33571	122124	67311	94174	54813	1.720

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 98

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

FACTOR OF SAFETY = $\frac{R_A + R_B + R_P}{D_A - D_P}$

Note:

1. The Plastic Lining Is An Alternative For The Seepage Berm. Three (3) Foot Minimum Cover Shall Be Placed Above Plastic Lining.

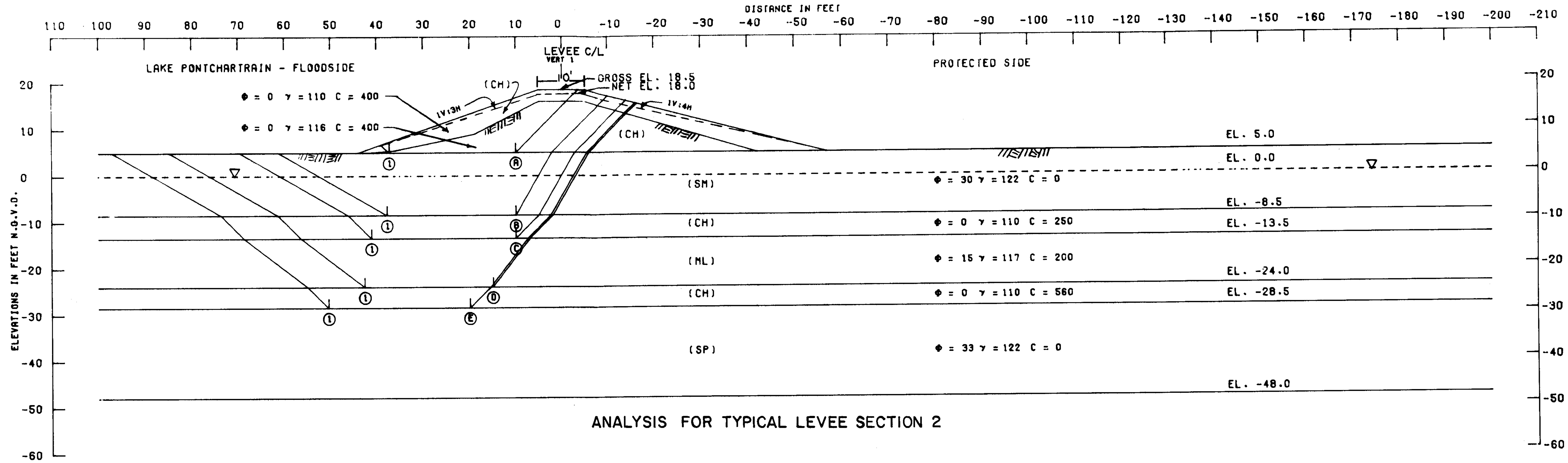
2. Material To Be Excavated And Backfilled To Natural Ground Elevation After Placement Of Lining.

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 42+60.00 TO STA. 78+55.24

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 110



ANALYSIS FOR TYPICAL LEVEE SECTION 2

ASSUMED FAILURE SURFACE			RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.		ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
A	1	5.0	10800	9511	1390	9870	224	21701	9646	2.250
B	1	-8.5	29031	6925	18593	41088	11555	54549	29533	1.850
C	1	-13.5	31302	7775	20217	57790	20886	59294	36904	1.610
D	1	-24.0	46722	15456	37731	100611	50272	99909	50239	1.990
E	1	-28.5	51767	17024	42751	121574	66771	111542	54803	2.040

ADDITIONAL NOTES:

1. STRATIFICATION, CLASSIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 98

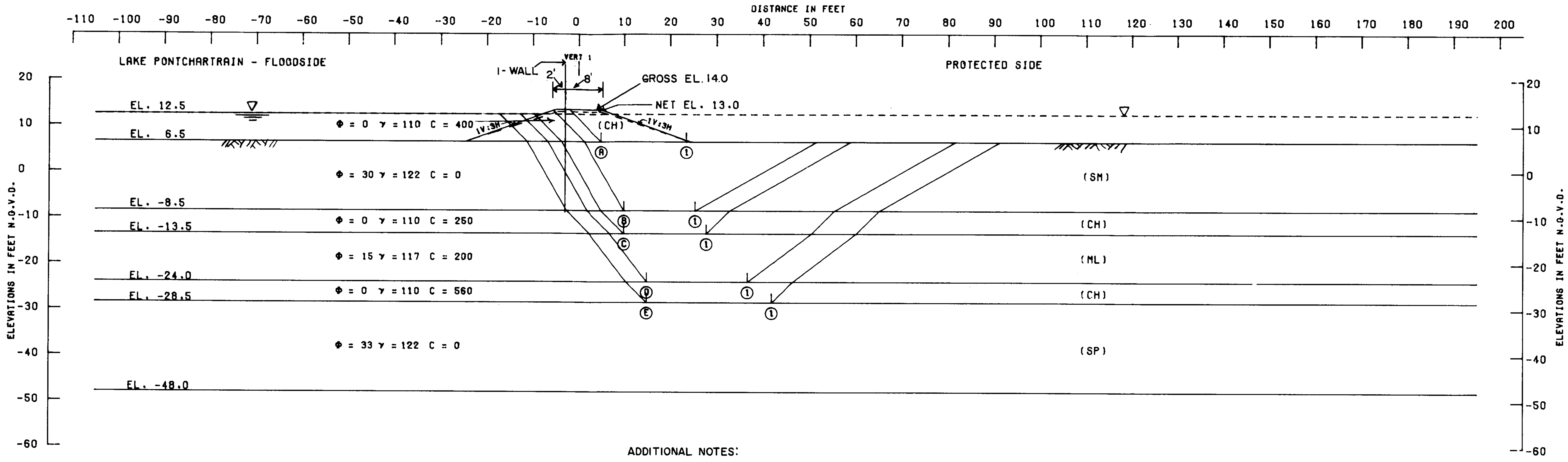
NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
LEVEE (Q) SHEAR STABILITY
STA. 42+60.00 TO STA. 78+55.24 B/L
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE III



ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
A 1	6.5	5600	2216	211	2694	5	8027	2689	2.990
B 1	-8.5	13300	3850	2137	27104	13724	19287	13380	1.440
C 1	-13.5	15317	4462	4637	41418	24249	24416	17169	1.420
D 1	-24.0	24631	12098	17744	78377	55688	54473	22689	2.400
E 1	-28.5	28763	15092	22784	98274	73039	66639	25235	2.640

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 98

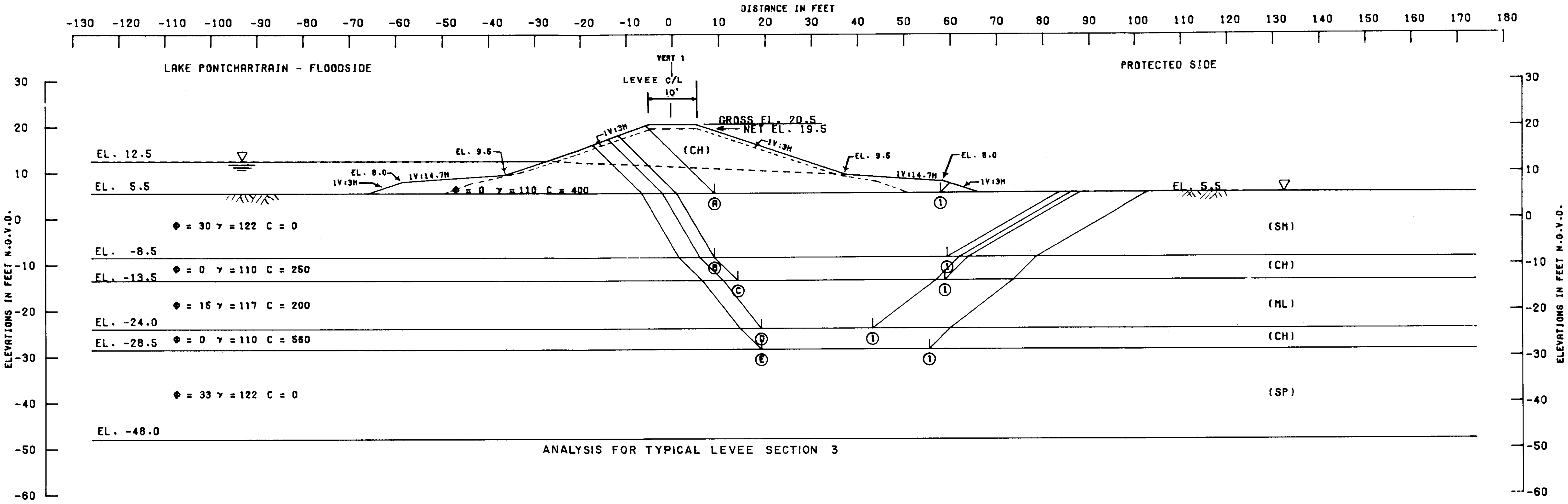
2. FROM W/L STA. 101+09 TO W/L STA. 103+65.42 THE I-WALL ELEVATION VARIES FROM EL. 17.5 TO 20.0.

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
I-WALL IN LEVEE
(Q) SHEAR STABILITY
STA. 101+09 TO 103+65.42 W/L
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 3

ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
A 1	5.5	11790	11081	1667	12060	308	24538	11752	2.090
B 1	-8.5	25799	12531	10658	45717	12456	48988	33261	1.470
C 1	-13.5	28299	11159	13592	62670	22820	53050	39850	1.330
D 1	-24.0	41130	13441	29805	106370	57025	84376	49345	1.710
E 1	-28.5	45725	20281	34530	129108	70637	100536	58471	1.720

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGTHS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 98

2. FROM B/L STA. 91+50 TO B/L STA. 94+60 THE NET LEVEE ELEVATION VARIES FROM EL. 19.5 TO EL. 17.0.

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

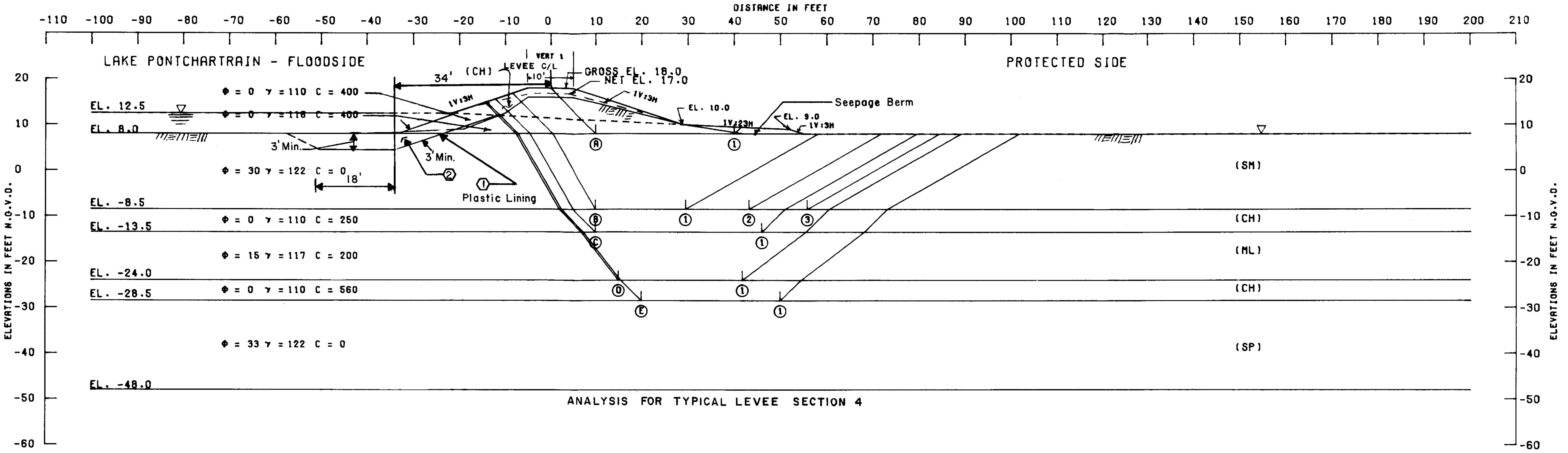
$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA.88+19.0 TO STA.91+50 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 113



ANALYSIS FOR TYPICAL LEVEE SECTION 4

ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
Ⓐ ①	8.0	8000	5349	116E	5212	122	14515	5090	2.850
Ⓑ ①	-8.5	22386	4875	18685	40120	18870	45946	21250	2.160
Ⓑ ②	-8.5	22386	8300	16292	40120	17367	46978	22753	2.060
Ⓑ ③	-8.5	22386	11450	16197	40120	16607	50033	23513	2.130
Ⓒ ①	-13.5	24269	9000	17941	56623	28839	51210	27784	1.840
Ⓓ ①	-24.0	36310	15008	35701	98953	62583	67019	36370	2.390
Ⓔ ①	-28.5	41446	16800	40214	120078	79974	98460	40104	2.460

Note:

① The Plastic Lining Is An Alternative For The Seepage Berm. Three (3) Foot Minimum Cover Shall Be Placed Above Plastic Lining.

② Material To Be Excavated And Backfilled To Natural Ground Elevation After Placement Of Lining.

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO.98

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

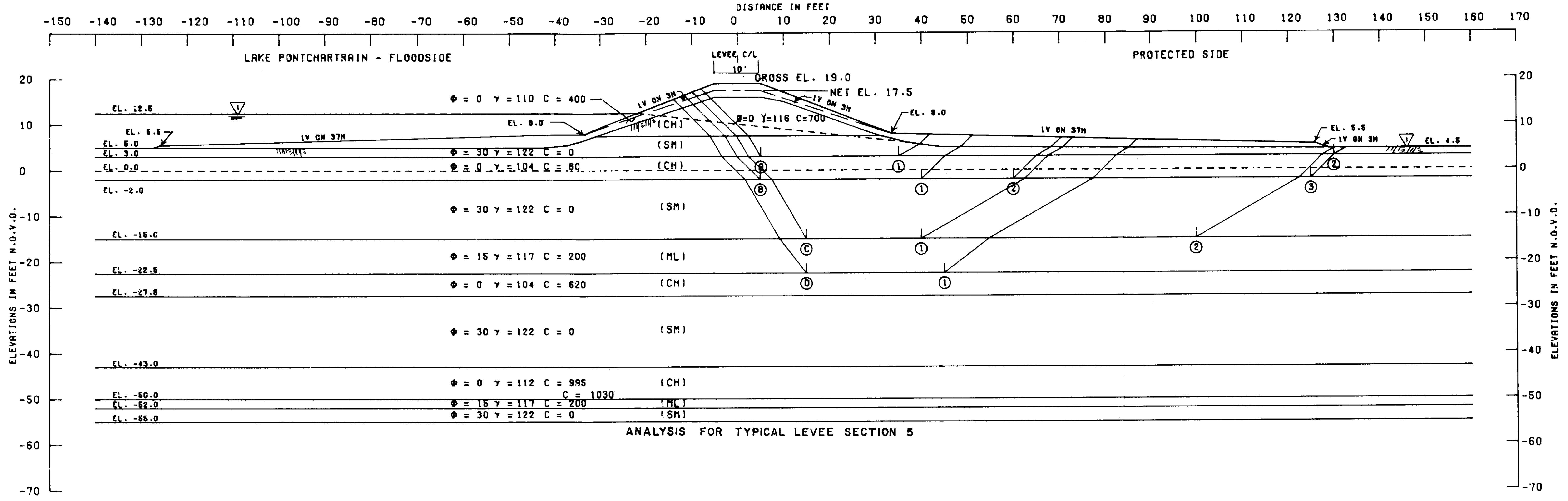
FACTOR OF SAFETY = $\frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 94+60 TO STA. 102+23.16 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 114



ANALYSIS FOR TYPICAL LEVEE SECTION 5

ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
A 1	3.0	17994	2400	3897	14387	1350	24291	13037	1.860
A 2	3.0	17994	10000	274	14387	137	28268	14250	1.980
B 1	-2.0	16933	2800	4477	23976	5235	24210	18741	1.290
B 2	-2.0	16933	4400	3855	23976	4661	25188	19315	1.300
B 3	-2.0	16933	9600	1074	23976	2628	27607	21348	1.290
C 1	-15.0	38418	18843	37654	62197	28437	94915	33760	2.810
C 2	-15.0	38418	57084	30228	62197	24361	125730	37836	3.320
D 1	-22.5	49508	18600	49877	94205	50474	117985	43731	2.700

ADDITIONAL NOTES

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS FOR THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 99
2. ▽ - ▽ = PH LINE USED IN STABILITY ANALYSIS

NOTES

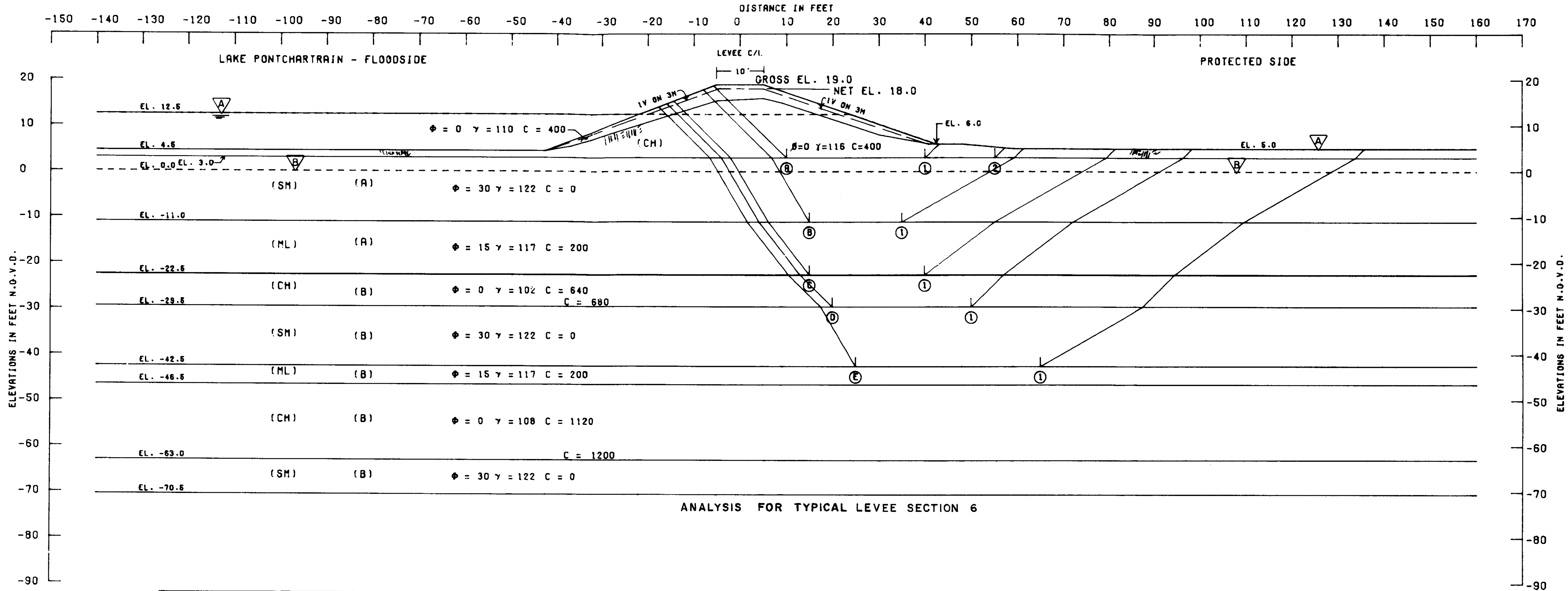
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 136+13.19 TO 159+70.0 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 6

Assumed Failure Surface No.		Elev.	Resisting Forces R_A	R_B	R_P	Driving Forces D_A	$-D_P$	Summation of Forces Resisting	Driving	Factor of Safety
A	1	3.0	12577	8462	2400	14063	641	23439	13422	1.750
A	2	3.0	12577	9812	1733	14063	297	24122	13766	1.750
B	1	-11.0	25171	11210	16845	48598	17303	53226	31295	1.700
C	1	-22.5	39159	15000	32395	95508	46758	86554	48750	1.780
D	1	-29.5	48063	20400	41235	129084	71400	109698	57684	1.900
E	1	-42.5	78122	41885	107367	204059	133277	227374	70782	3.210

ADDITIONAL NOTES

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS FOR THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 99
2. PH LINE A — A USED FOR UPLIFT PRESSURE IN THE (A) STRATUMS
3. PH LINE B — B USED FOR UPLIFT PRESSURE IN THE (B) STRATUMS

NOTES

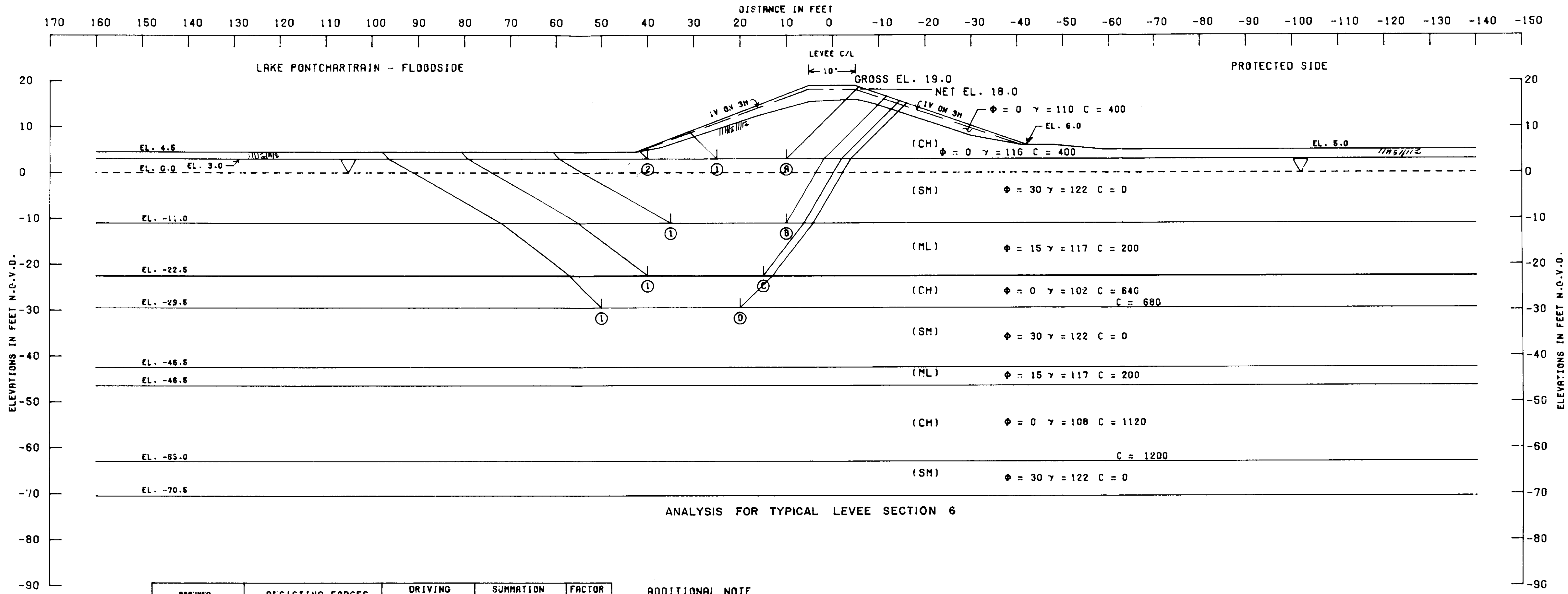
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 163+98.15 TO STA. 196+50.0 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 6

Assumed Failure No.		Surface Elev.	Resisting Forces R_A	Resisting Forces R_B	Resisting Forces R_P	Driving Forces D_A	Driving Forces $-D_P$	Summation of Forces Resisting	Summation of Forces Driving	Factor of Safety
A	1	3.0	12595	6000	4767	13987	2803	23362	11184	2.090
A	2	3.0	12595	10898	1423	13987	251	24916	13736	1.810
B	1	-11.0	32868	18930	23837	50076	15230	75635	34846	2.170
C	1	-22.5	50035	15000	40597	95404	44005	105632	51399	2.060
D	1	-29.5	59026	20400	49476	128803	68991	128902	59812	2.160

ADDITIONAL NOTE

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS FOR THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 99

NOTES

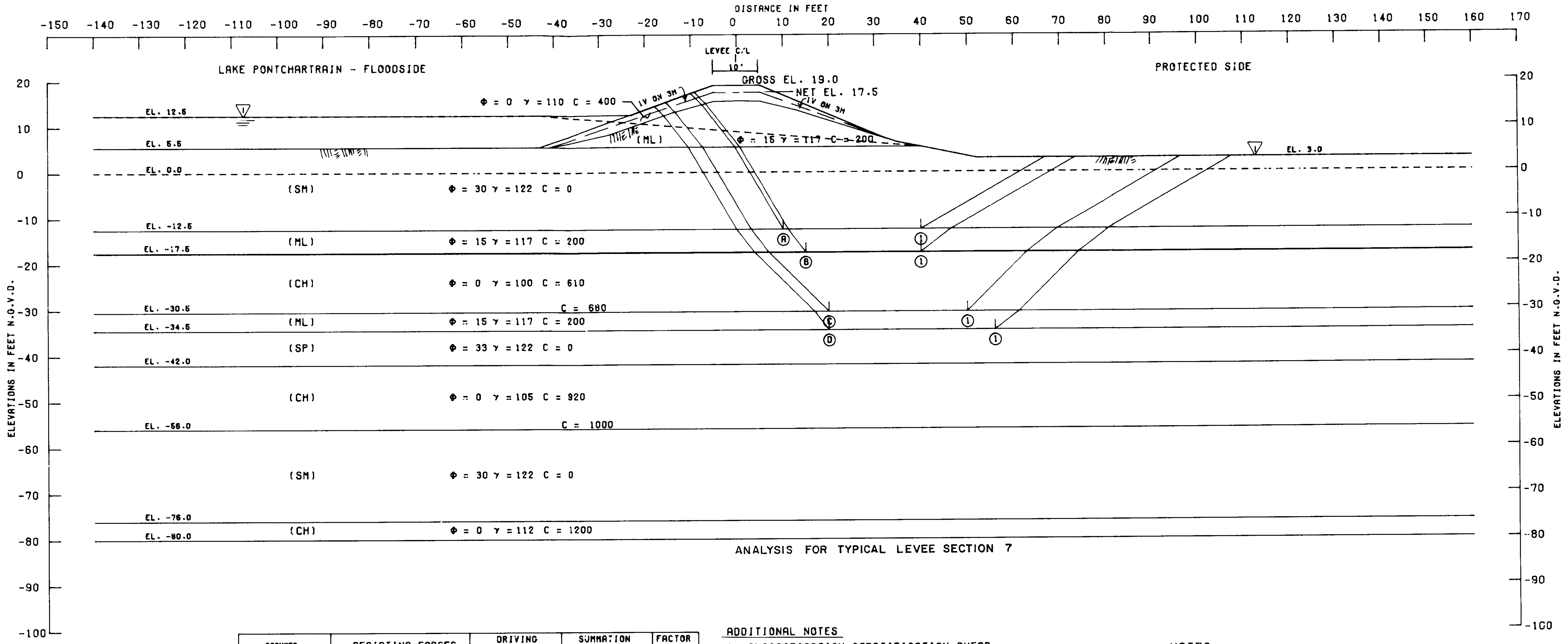
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA.163+98.15 B/L TO STA.196+50.00 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 7

ASSUMED FAILURE NO.		ASSUMED SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
A	1	-12.5	36460	22145	21630	56365	15698	80235	40667	1.970
B	1	-17.5	43428	13500	27703	74315	26887	84631	47428	1.780
C	1	-30.5	59028	20400	42346	134270	66259	121774	68011	1.790
D	1	-34.5	64198	31370	49958	155132	82248	145526	72884	2.000

ADDITIONAL NOTES

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS FOR THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 100
2. ∇ - ∇ = PH LINE USED FOR STABILITY ANALYSIS

NOTES

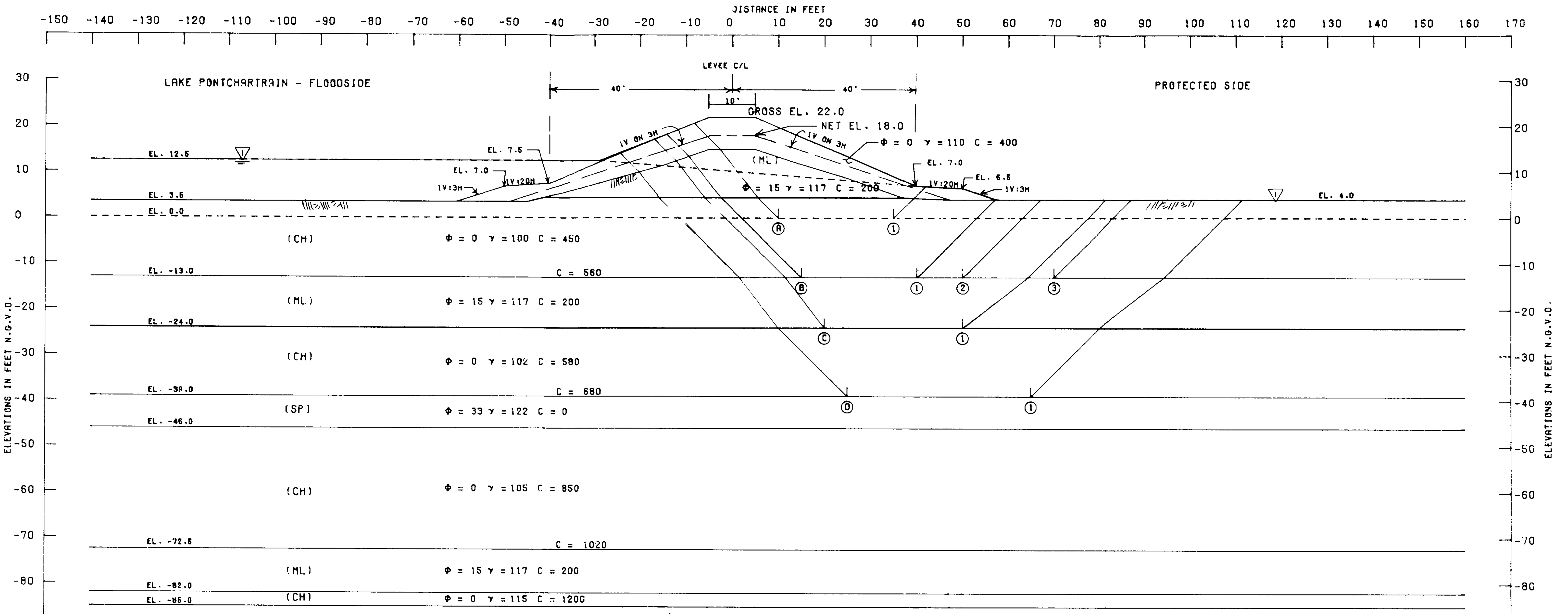
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 199+41.52 TO STA. 246+37.17 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 8

ASSUMED FAILURE NO.	ASSUMED SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
Ⓐ ①	0.0	17756	14000	5946	26281	3177	37701	23104	1.630
Ⓑ ①	-13.0	27476	13952	15400	62230	18488	56828	43742	1.300
Ⓑ ②	-13.0	27476	19137	15300	62230	15480	61913	46750	1.320
Ⓑ ③	-13.0	27476	28169	15300	62230	14449	70945	47781	1.480
Ⓒ ①	-24.0	41916	14400	30706	104112	41018	87021	63094	1.380
Ⓓ ①	-39.0	58115	27200	47534	179946	96505	132849	83441	1.590

ADDITIONAL NOTES

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS FOR THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 100
2. ▽-▽=PH LINE USED IN STABILITY ANALYSIS
3. FROM B/L STA. 288+49 TO B/L STA. 289+49 THE NET LEVEE ELEVATION VARIES FROM EL. 18.0 TO EL. 18.5.

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

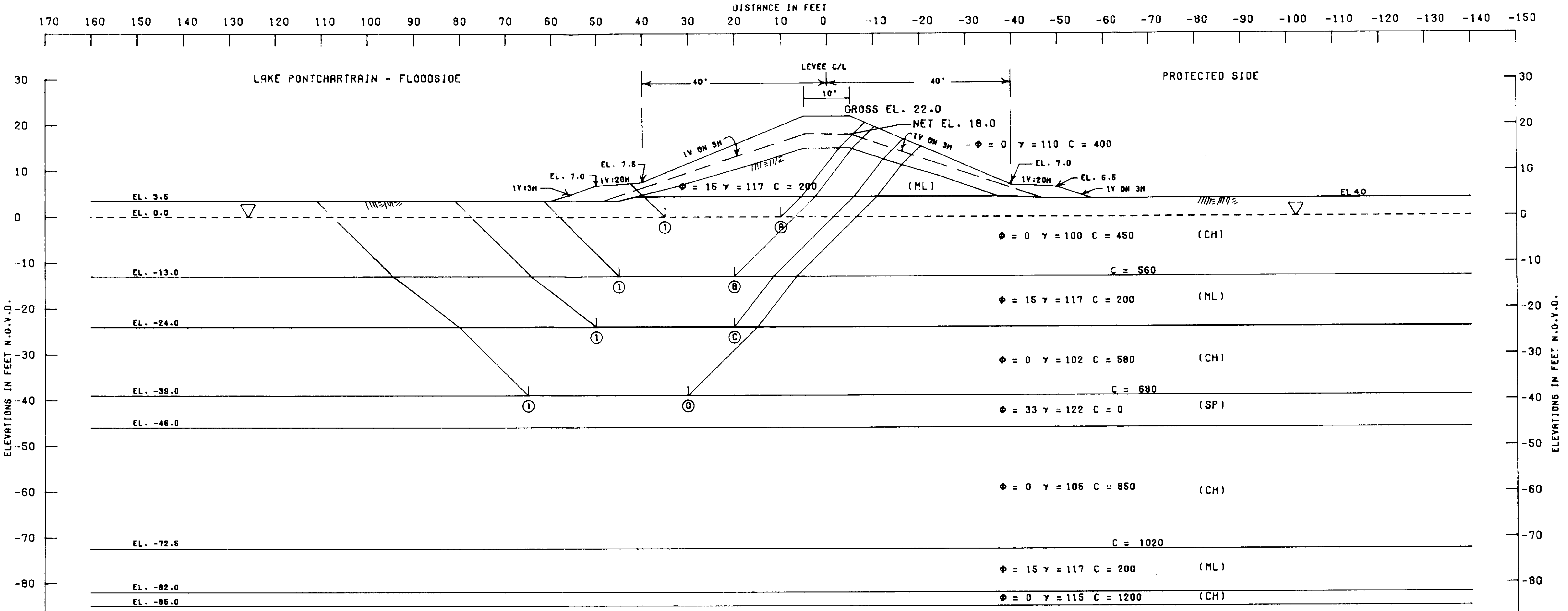
$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA.250+72.09B/L TO STA.288+49 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 119



ANALYSIS FOR TYPICAL LEVEE SECTION 8

ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
A 1	0.0	17730	14000	6276	26288	3566	38006	22722	1.670
B 1	-13.0	28729	13863	14850	61177	17336	57442	43841	1.310
C 1	-24.0	41853	14400	30292	104146	40231	86545	63915	1.350
D 1	-39.0	58559	23800	46700	178452	94369	129059	84083	1.530

ADDITIONAL NOTE

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGHTS AND UNIT WEIGHTS FOR THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 100

NOTES

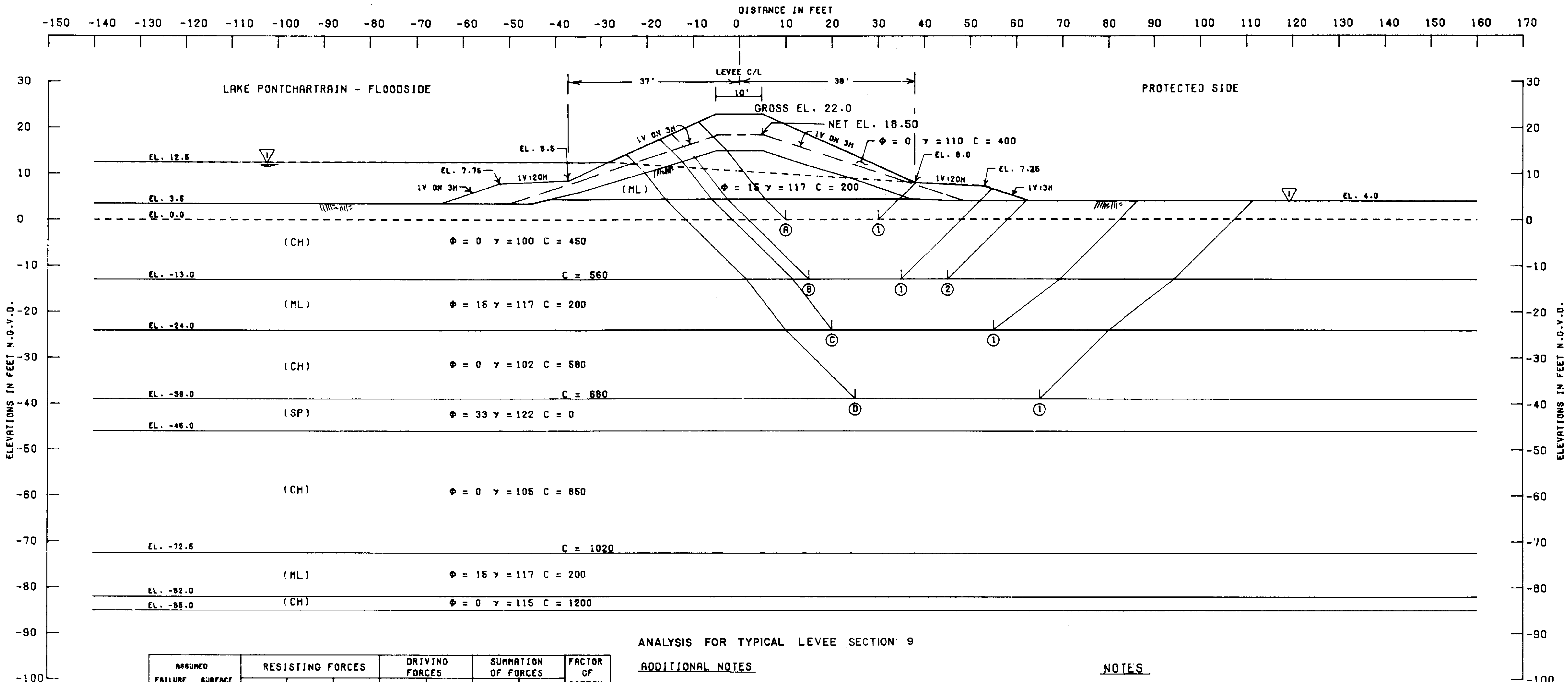
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

FACTOR OF SAFETY = $\frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13 GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 250+72.09B/L TO STA. 288+49B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
A 1	0.0	18712	11200	6867	28519	5041	36779	23478	1.570
B 1	-13.0	28199	11200	17449	65303	22096	56848	43207	1.320
B 2	-13.0	28199	16727	15450	65303	19217	60376	46086	1.310
C 1	-24.0	42846	16800	30744	107852	41071	90390	66781	1.350
D 1	-39.0	58798	27200	47534	184137	96505	133532	87632	1.520

ANALYSIS FOR TYPICAL LEVEE SECTION 9

ADDITIONAL NOTES

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS FOR THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 100
2. ▽ — ▽ = PH LINE USED IN STABILITY ANALYSIS

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

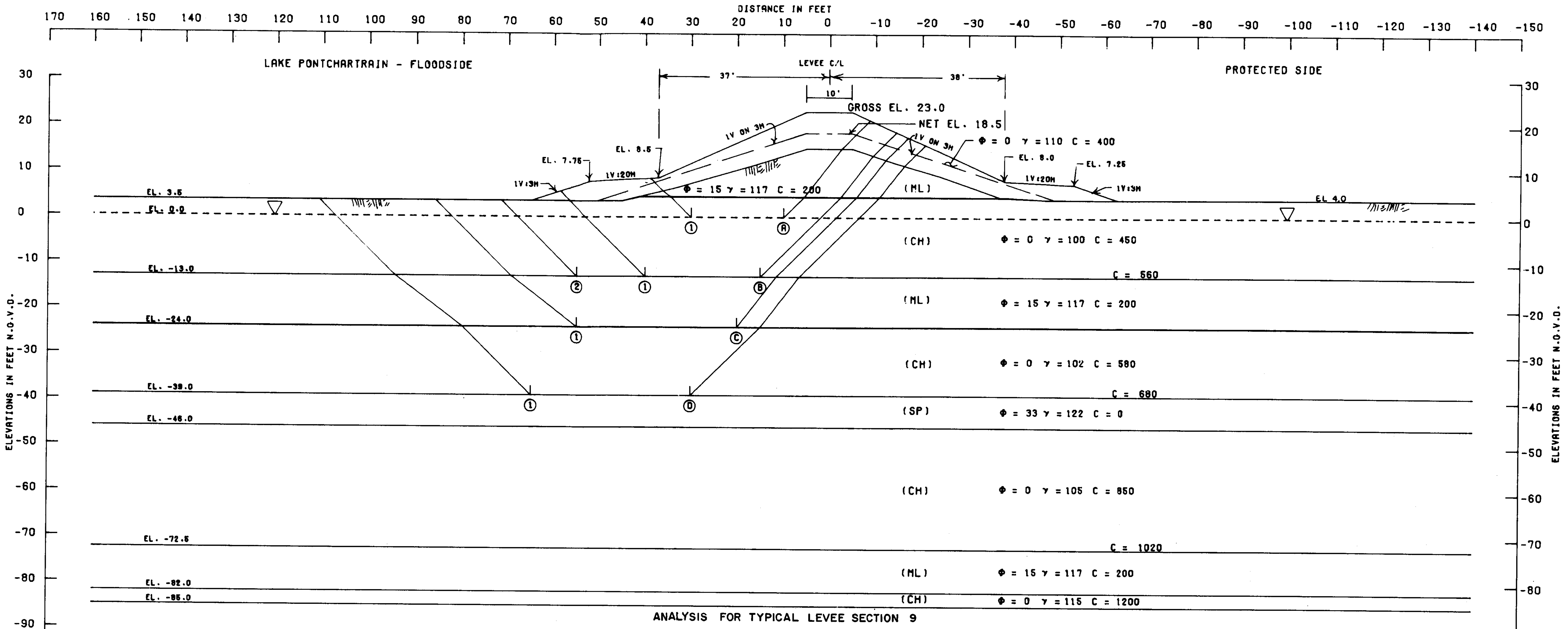
$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 289+49 TO STA. 303+51.39 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 121



ANALYSIS FOR TYPICAL LEVEE SECTION 9

ASSUMED FAILURE NO.	ASSUMED SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
A 1	0.0	18709	11200	7210	28521	5128	37119	23393	1.590
B 1	-13.0	28197	14000	16499	65305	21631	58696	43674	1.340
B 2	-13.0	28197	22288	14850	65305	15354	65335	49951	1.310
C 1	-24.0	42855	16800	30254	107865	40176	89909	67689	1.330
D 1	-39.0	59517	23800	46700	182682	94368	130017	88314	1.470

ADDITIONAL NOTE

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS FOR THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 100

NOTES

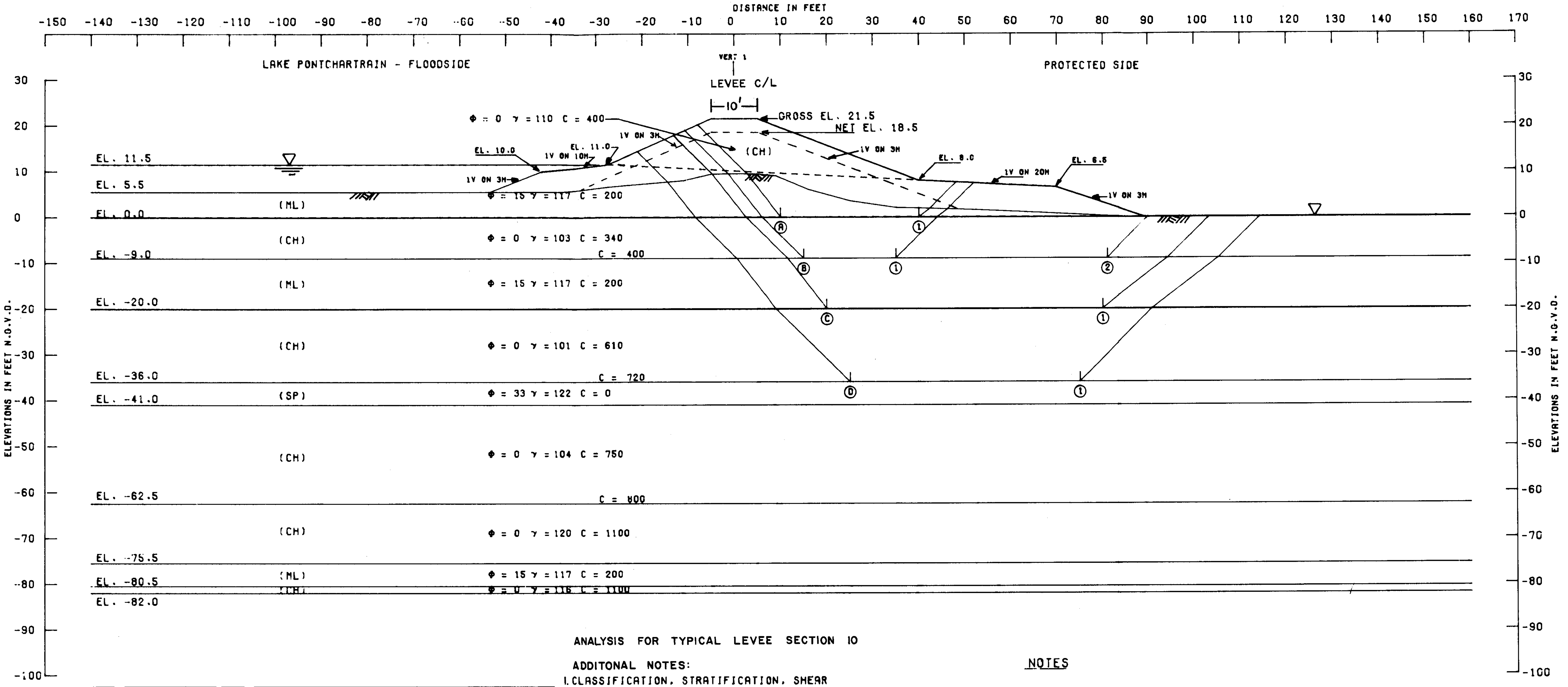
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 289+49 TO STA. 303+51.39 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 10

ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
Ⓐ ①	0.0	18487	8400	6543	24708	3335	33430	21373	1.560
Ⓑ ①	-9.0	23896	8000	12452	48398	15821	44348	32577	1.360
Ⓑ ②	-9.0	23896	26379	6108	48398	5434	56383	42964	1.310
Ⓒ ①	-20.0	38248	30000	17795	87211	22663	86043	64548	1.330
Ⓓ ①	-36.0	55754	36000	36443	164287	73556	128197	90731	1.410

ADDITONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 100
2. FROM B/L STA. 303 + 51.39 TO B/L STA. 305 + 41.96 THE GROSS ELEVATION VARIES FROM EL. 23.0 TO EL. 21.5.

NOTES

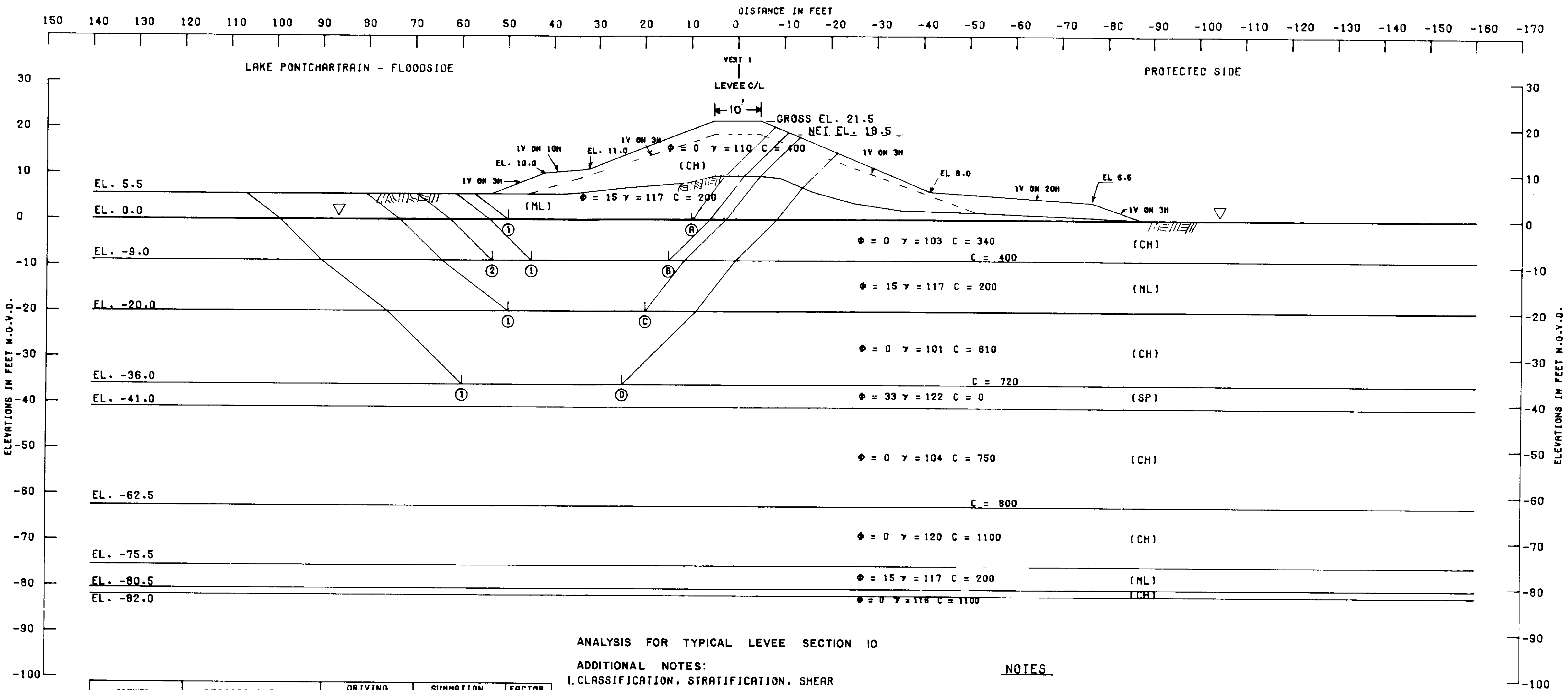
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 305+41.96 B/L TO STA. 305+46.96 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 10

ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
A 1	0.0	18515	11200	4244	24703	1972	33959	22731	1.490
B 1	-9.0	23960	12000	10211	48433	13286	46171	35147	1.310
B 2	-9.0	23960	15400	10211	48433	11732	49571	36701	1.350
C 1	-20.0	38376	15000	26132	87363	36288	79508	51075	1.560
D 1	-36.0	55949	25200	45488	164683	94731	126637	69952	1.810

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS, AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 100

NOTES

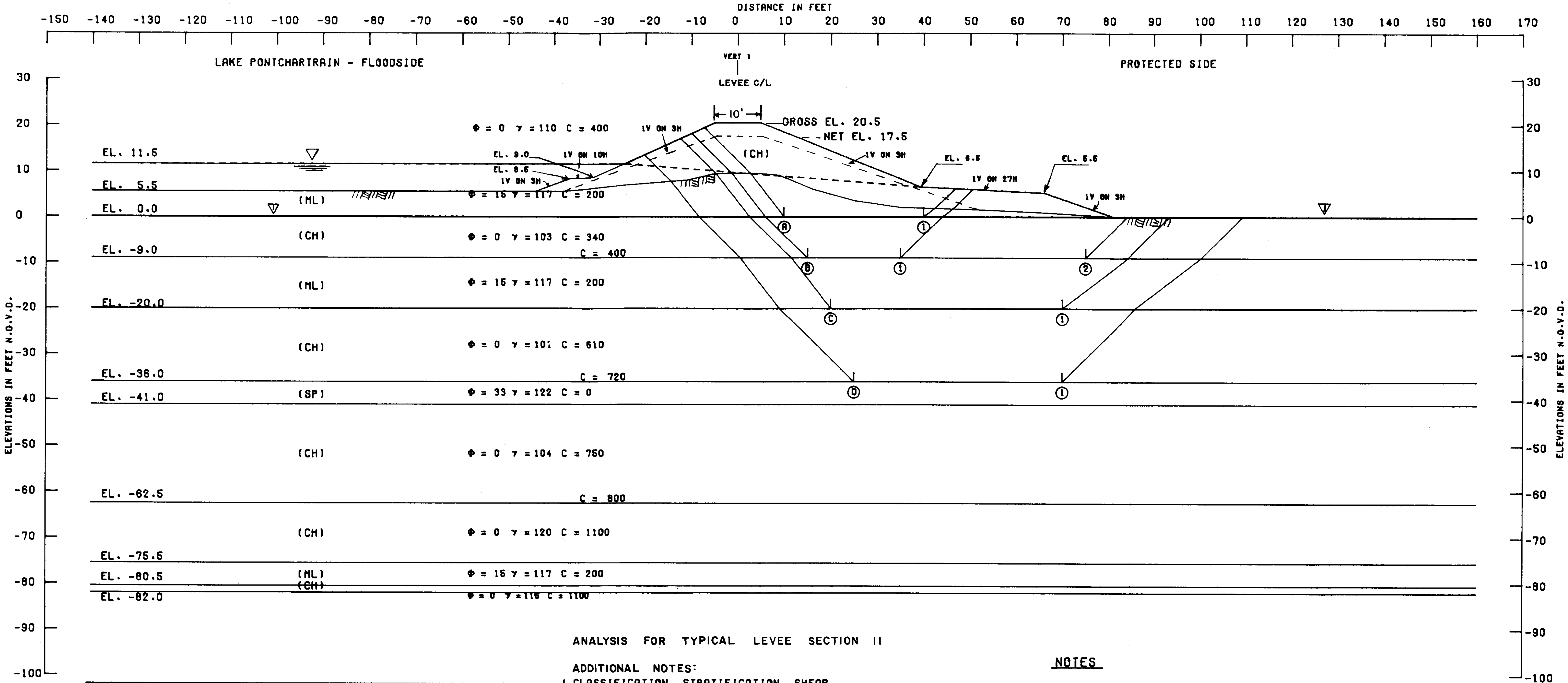
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 305 + 41.96 B/L

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION II

ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
Ⓐ ①	0.0	17470	8400	5180	22485	2189	31050	20296	1.530
Ⓑ ①	-9.0	22866	8000	11106	45226	13137	41972	32089	1.310
Ⓑ ②	-9.0	22866	23921	6108	45226	4865	52895	40361	1.310
Ⓒ ①	-20.0	36593	25000	18193	82718	23234	79786	59484	1.340
Ⓓ ①	-36.0	54163	32400	36443	158092	72127	123006	85965	1.430

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STREOTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 100
2. ∇ - ∇ = PM LINE USED IN STABILITY ANALYSIS
3. FROM B/L STA. 308 + 50 TO B/L STA. 310 + 50 THE NET ELEVATION VARIES FROM EL. 17.5 TO EL. 16.5.

NOTES

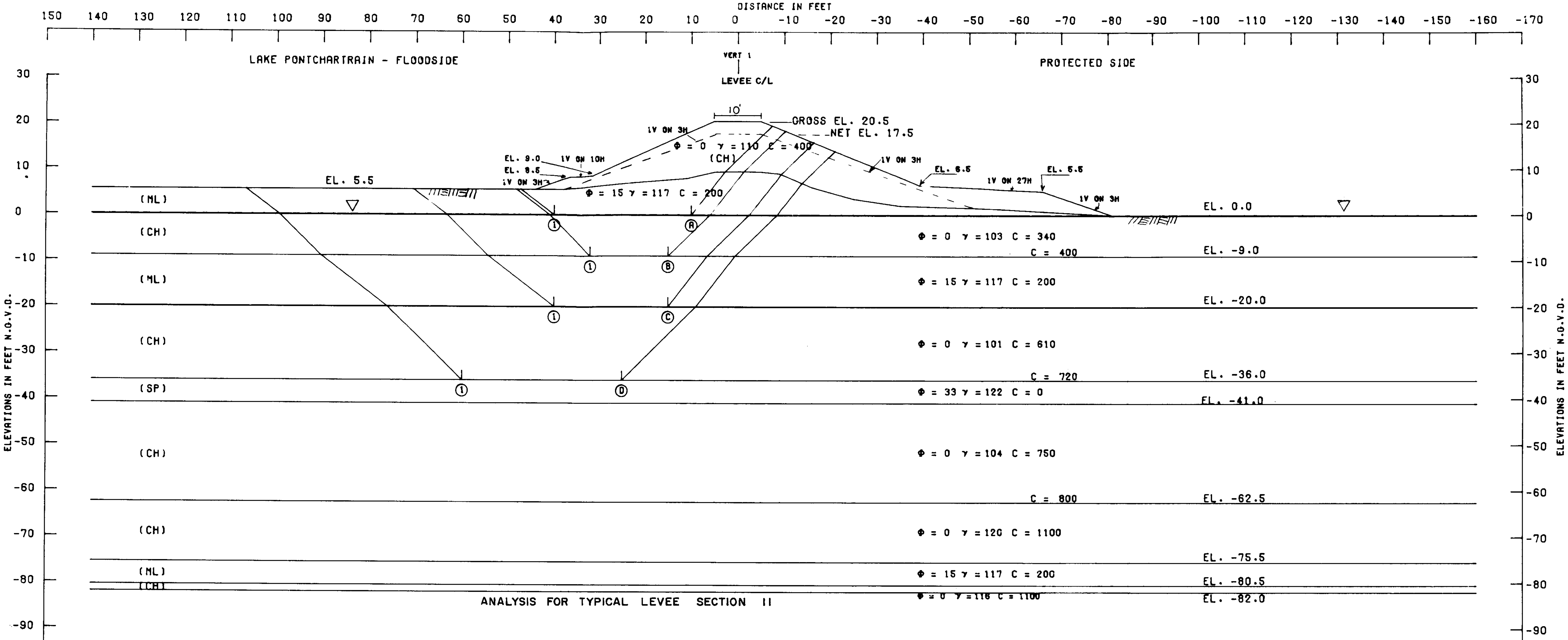
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 306 + 98.04 TO STA. 308 + 50 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION II

ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
A 1	0.0	17499	8400	4273	22404	2014	30172	20390	1.480
B 1	-9.0	23016	6800	10307	45049	14234	40123	30815	1.300
C 1	-20.0	36338	12500	26161	83801	36329	74999	47472	1.580
D 1	-36.0	54723	25200	45488	157941	94731	125411	63210	1.980

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS, AND UNIT WEIGHTS OF THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 100

NOTES

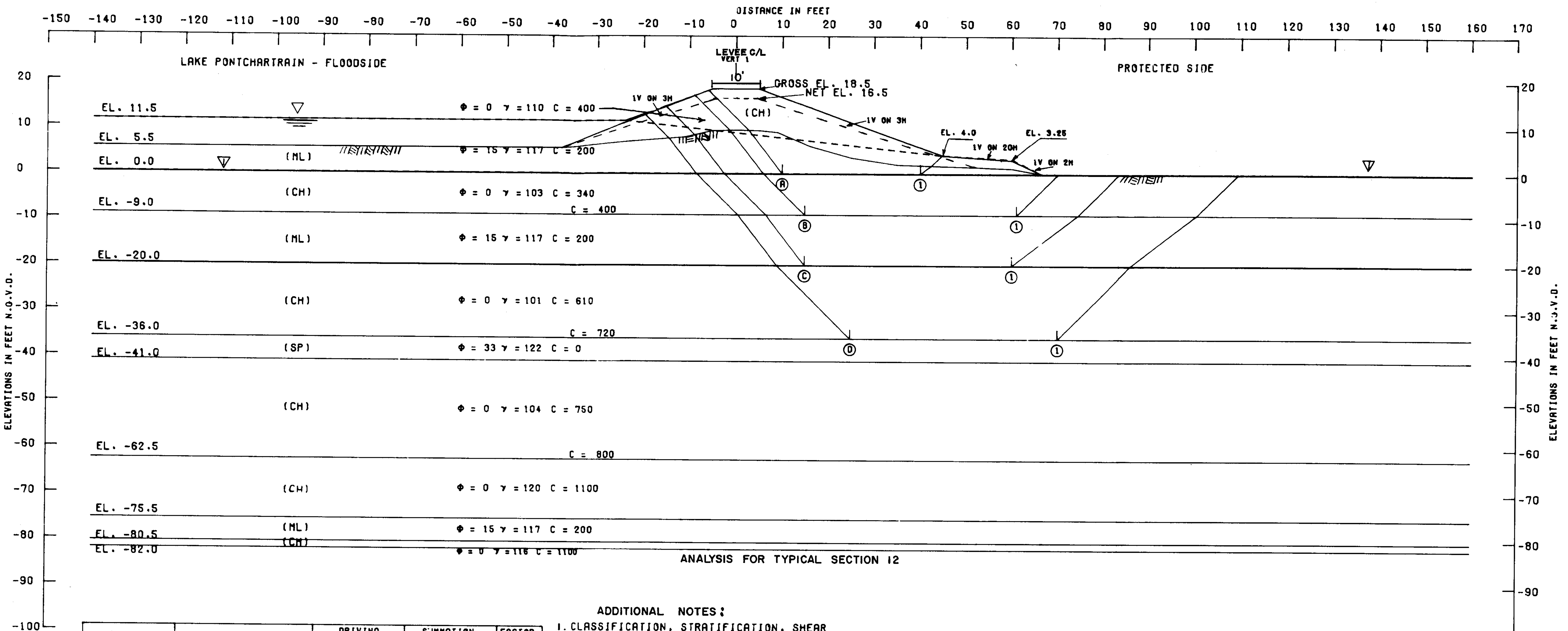
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 306+98.04 TO STA. 308+50 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL SECTION 12

ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
A 1	0.0	15588	8400	3424	18441	1303	27412	17138	1.600
B 1	-9.0	21056	18347	6108	39709	4957	45511	34752	1.310
C 1	-20.0	33784	22500	17533	76843	22288	73817	54555	1.350
D 1	-36.0	52114	32400	36443	149382	69797	120957	79585	1.520

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 100
2. ▽ - ▽ = PM LINE USED IN STABILITY ANALYSIS
3. FROM B/L STA. 311+00 TO B/L STA. 313+50 THE NET ELEVATION VARIES FROM EL. 16.5 TO EL. 14.5.

NOTES

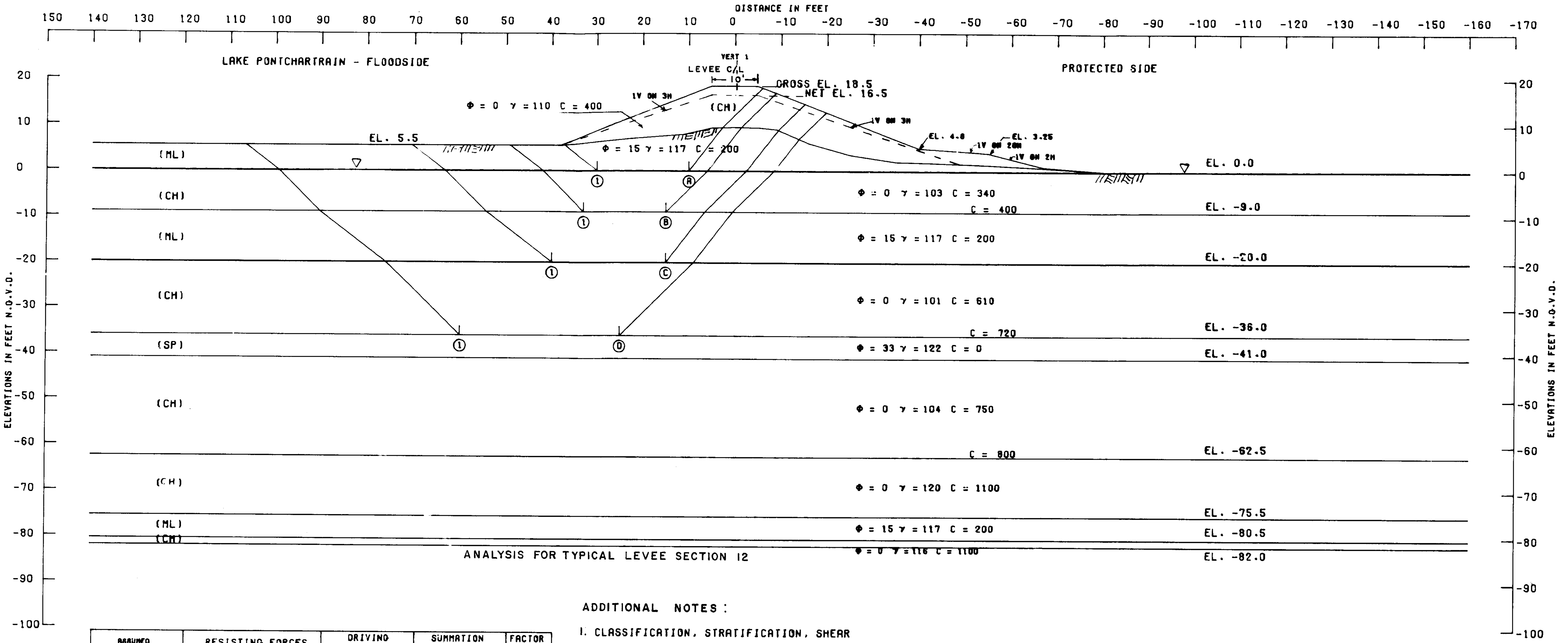
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 310+50 TO STA. 311+00 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 12

ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
A 1	0.0	15564	5600	5014	18371	2843	26178	15528	1.690
B 1	-9.0	21073	7200	10211	39533	12282	38484	27251	1.410
C 1	-20.0	33717	12500	25991	76620	36085	72208	40535	1.780
D 1	-36.0	52221	25200	45488	148726	94731	122909	53995	2.280

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL ARE BASED ON THE BORINGS SHOWN PLATE NO. 100

NOTES

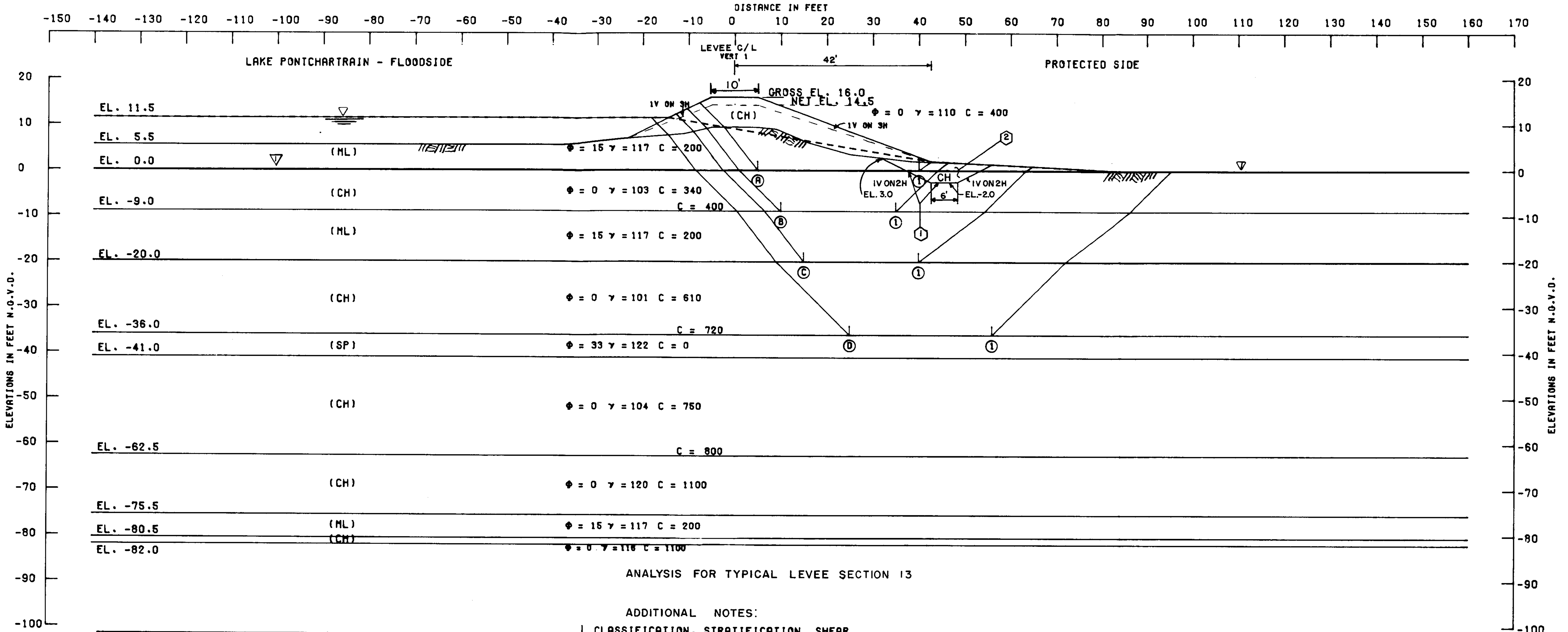
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

FACTOR OF SAFETY = $\frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 310+50 TO STA. 311+00 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ANALYSIS FOR TYPICAL LEVEE SECTION 13

ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
A 1	0.0	12075	9800	1312	14132	331	23187	13801	1.680
B 1	-9.0	17140	10000	7217	33349	7625	34357	25724	1.340
C 1	-20.0	29602	12500	19114	67083	25127	61216	41956	1.460
D 1	-36.0	47606	22320	36660	135042	71910	106586	63132	1.690

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 100

2. ▽–▽=PM LINE USED IN STABILITY ANALYSIS

(1) THE PLASTIC LINING IS AN ALTERNATIVE FOR A CLAY CUT-OFF. THREE (3) FOOT MINIMUM COVER SHALL BE PLACED ABOVE PLASTIC LINING.

(2) MATERIAL TO BE EXCAVATED AND BACKFILLED TO NATURAL GROUND ELEVATION. IF THE PLASTIC LINING ALTERNATIVE IS USED RANDOM FILL MATERIAL COULD BE USED.

NOTES

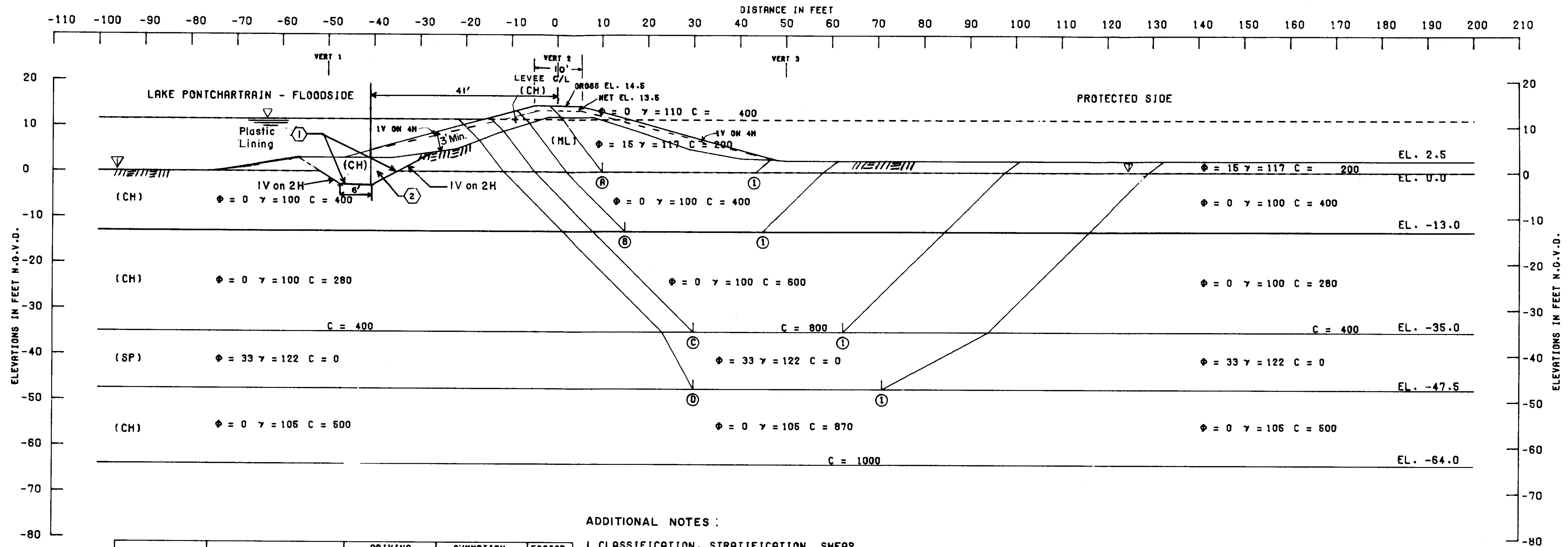
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 313+50 TO STA. 314+05 B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING	
Ⓐ ①	0.0	8600	9400	1862	11569	715	19862	10854	1.810
Ⓑ ①	-13.0	18795	7680	11703	40448	12870	38178	27578	1.380
Ⓒ ①	-35.0	38702	14599	23999	119925	71851	77300	48074	1.610
Ⓓ ①	-47.5	62991	22499	83106	187244	128786	168596	58458	2.880

Notes:

① The Plastic Lining Is An Alternative For A Clay Cut-off. Three (3) Foot Minimum Cover Shall Be Placed Above Plastic Lining.

② Material To Be Excavated And Backfilled To Natural Ground Elevation. If The Plastic Lining Alternative Is Used, Random Fill Material Could Be Used.

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL ARE BASED ON THE BORINGS SHOWN ON PLATE NO. 101

2. ▽ — ▽ = PM LINE USED IN STABILITY ANALYSIS

NOTES

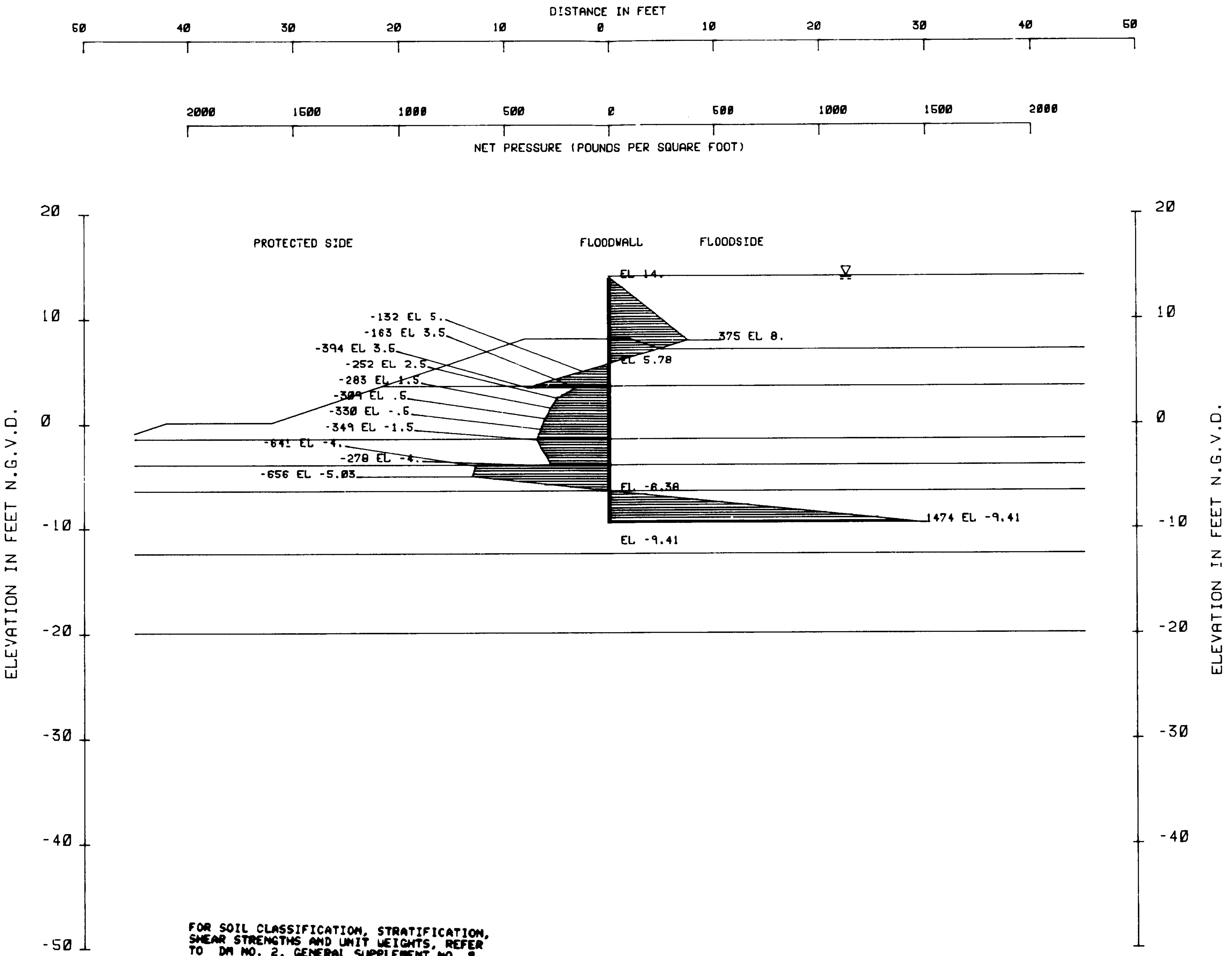
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

LEVEE (Q) SHEAR STABILITY
STA. 336 + 50.71 TO STA. 340+90B/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ELEVATION	PRESSURE
14.00	0.0
8.00	375.0
5.78	0.0
5.00	-132.6
3.50	-163.2
3.50	-394.1
2.50	-252.3
1.50	-283.8
0.50	-309.4
-0.50	-331.0
-1.50	-349.5
-4.00	-641.7
-4.00	-278.9
-5.03	-656.2
-6.38	0.0
-9.41	1474.8
-9.41	0.0

FOR SOIL CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS, REFER TO DM NO. 2, GENERAL SUPPLEMENT NO. 8, I.H.N.C. REMAINING LEVEES, PLATE III-20.

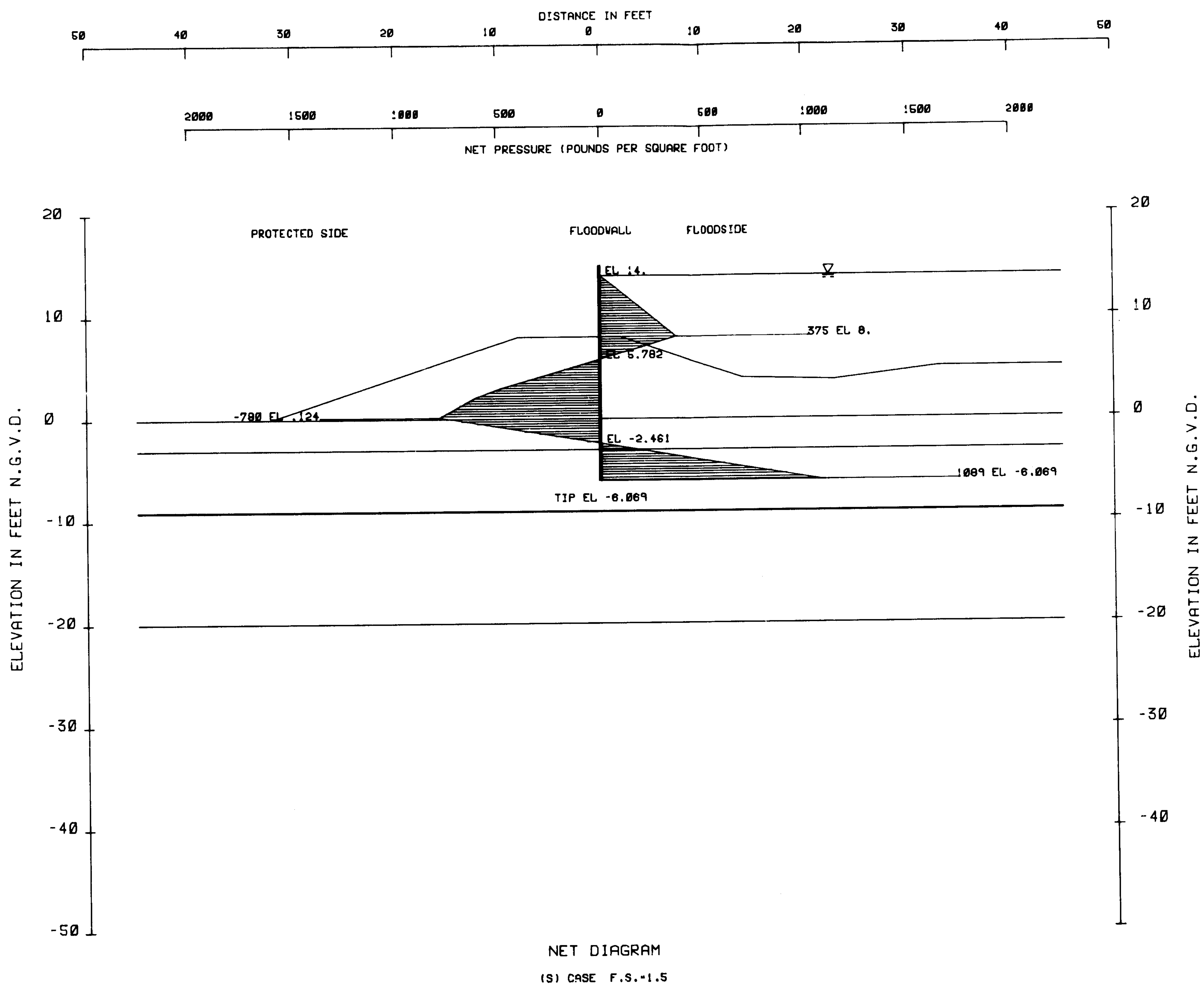
NET DIAGRAM

(S) CASE F.S.=1.5

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS
STA. 0+00 TO STA. 1+13.57 W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NET DIAGRAM

(S) CASE F.S.=1.5

ELEVATION	PRESSURE
14.00	0.0
8.00	375.0
5.78	0.0
5.00	-132.6
3.00	-401.3
2.00	-612.5
0.12	-780.3
-2.46	0.0
-6.07	1088.9
-6.07	0.0

S-CASE STRENGTHS USED:

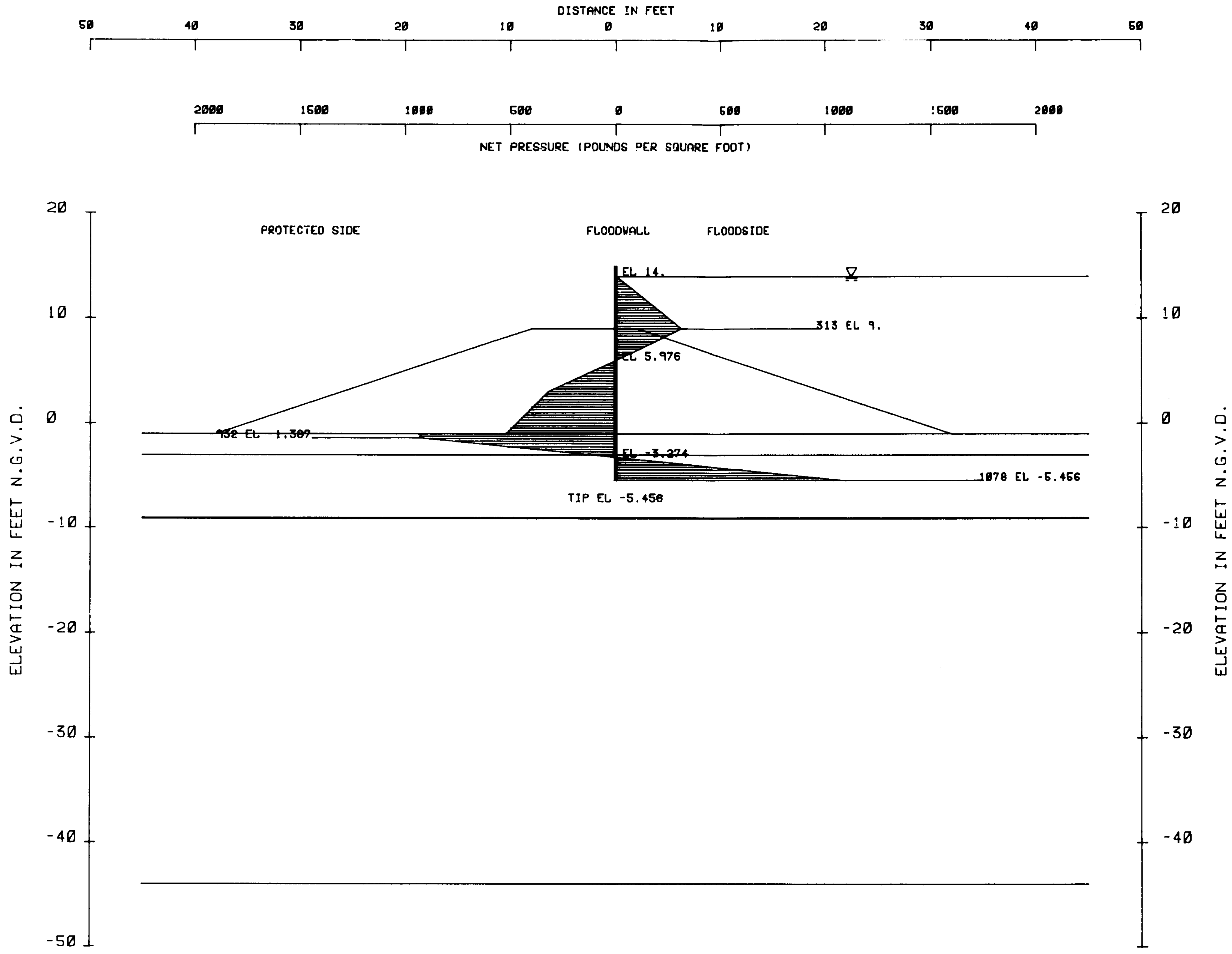
CH	Φ=23	C=0
ML	Φ=30	C=0
SM	Φ=30	C=0
SP	Φ=33	C=0

SEE PLATE 98 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS
STA. 1+58.57 TO STA. 2+54.51 W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NET DIAGRAM

(S) CASE F.S.=1.5

ELEVATION	PRESSURE
14.00	0.0
9.00	312.5
8.00	2.6
5.98	0.0
3.00	-321.8
-1.00	-521.9
-1.00	-923.1
-1.39	-932.2
-3.27	0.0
-5.46	1078.3
-5.46	0.0

S-CASE STRENGTHS USED:

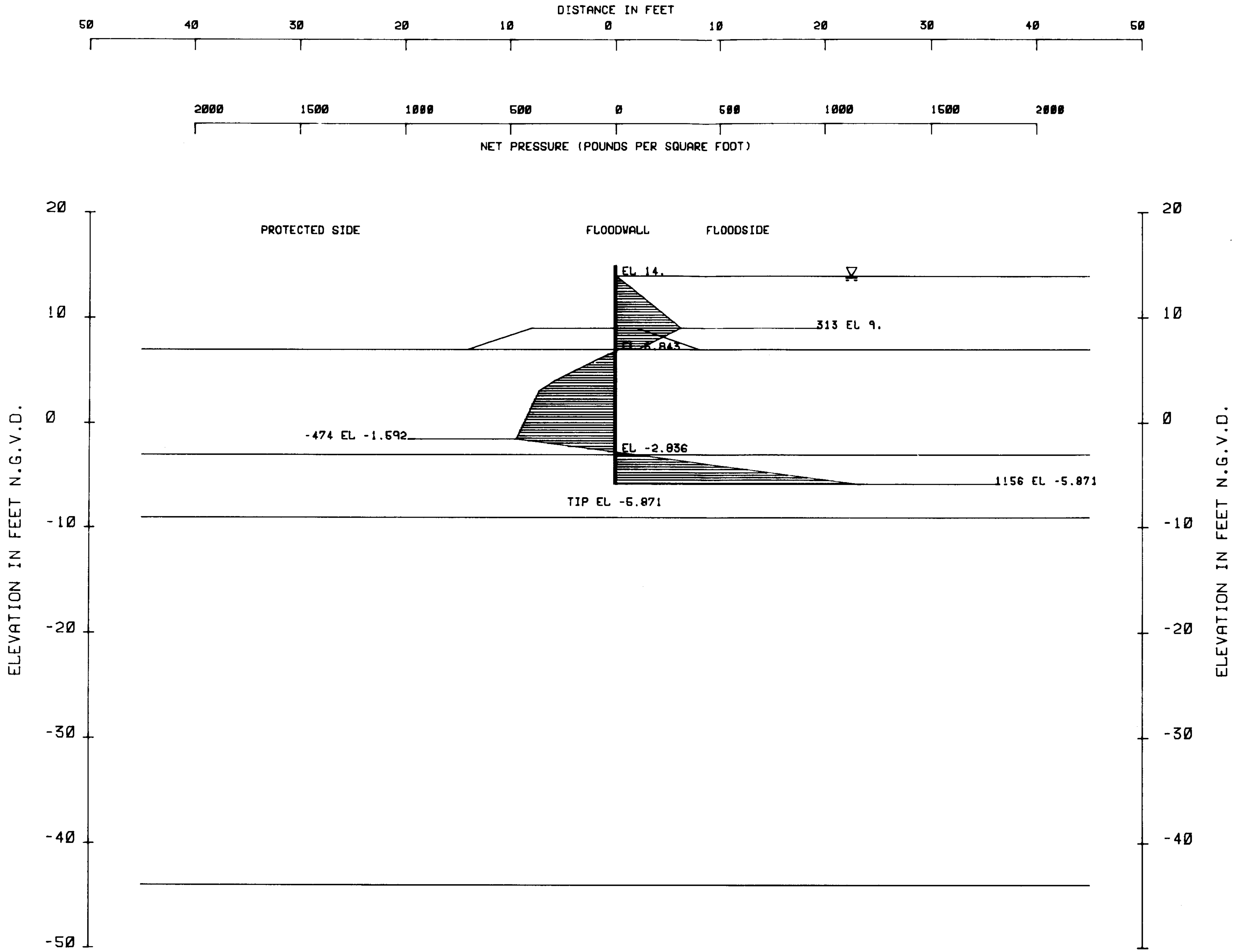
CH 0=23 C=0
ML 0=30 C=0
SM 0=30 C=0
SP 0=33 C=0

SEE PLATE 98 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS
STA.7+02.87 TO STA.7+62.87 W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NET DIAGRAM

(S) CASE F.S.=1.5

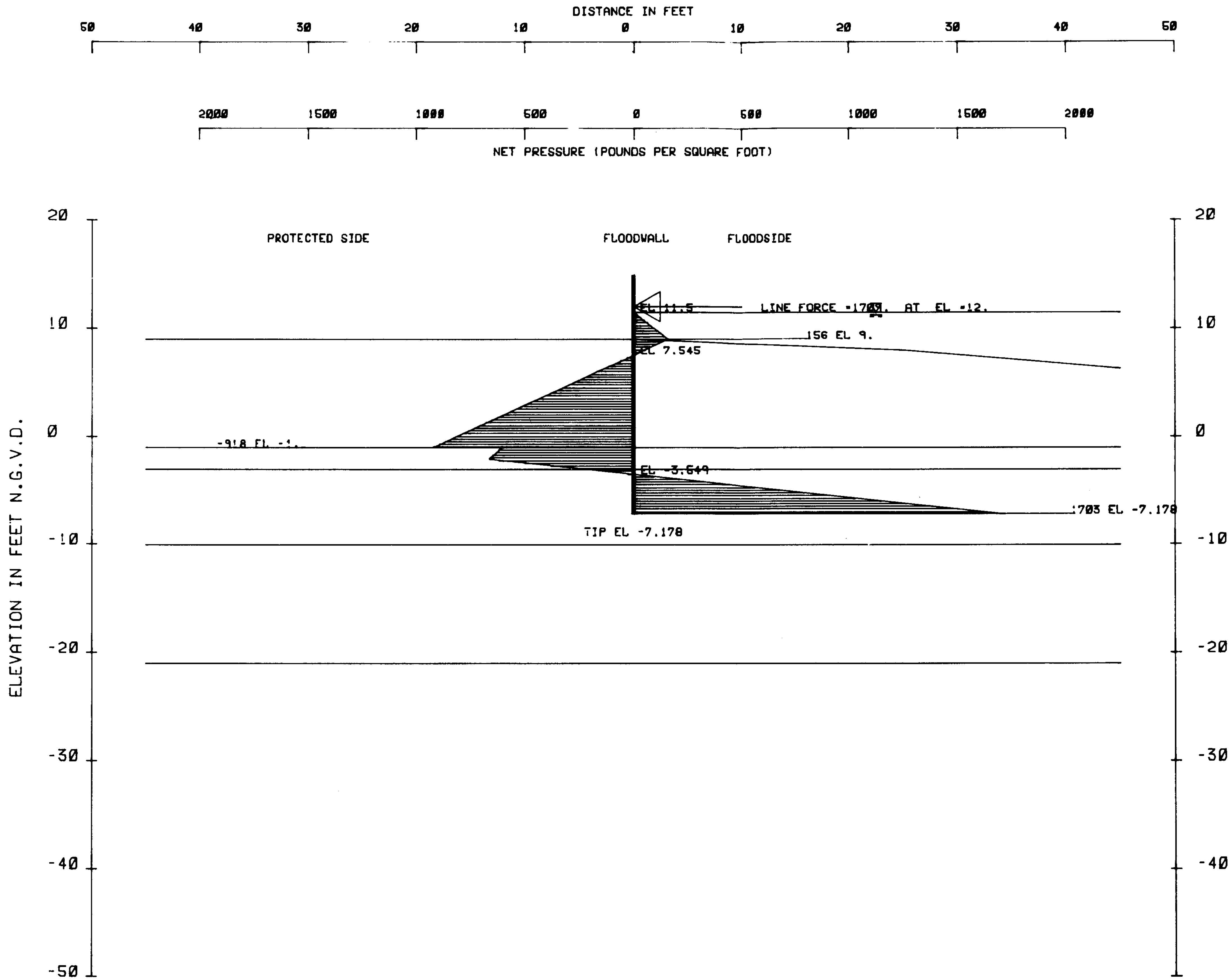
ELEVATION	PRESSURE
14.00	0.0
9.00	312.5
7.00	107.2
7.00	15.6
6.84	0.0
4.00	-288.2
3.00	-365.1
-1.59	-473.6
-2.84	0.0
-5.87	1155.7
-5.87	0.0

S-CASE STRENGTHS USED:

CH Ø=23 C=0
ML Ø=30 C=0
SM Ø=30 C=0
SP Ø=33 C=0

SEE PLATE 98 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
CANTILEVER SHEETPILE ANALYSIS
STA. 8+08.87 TO STA. 8+59.15 W/L
STA. 8+95.15 TO STA. 9+88.10 W/L
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NET DIAGRAM

(S) CASE F.S.=1.25

ELEVATION	PRESSURE
11.50	0.0
9.00	156.3
7.54	0.0
-1.00	-917.5
-1.00	-603.6
-2.13	-665.3
-3.55	0.0
-7.18	1703.1
-7.18	0.0

S-CASE STRENGTHS USED:

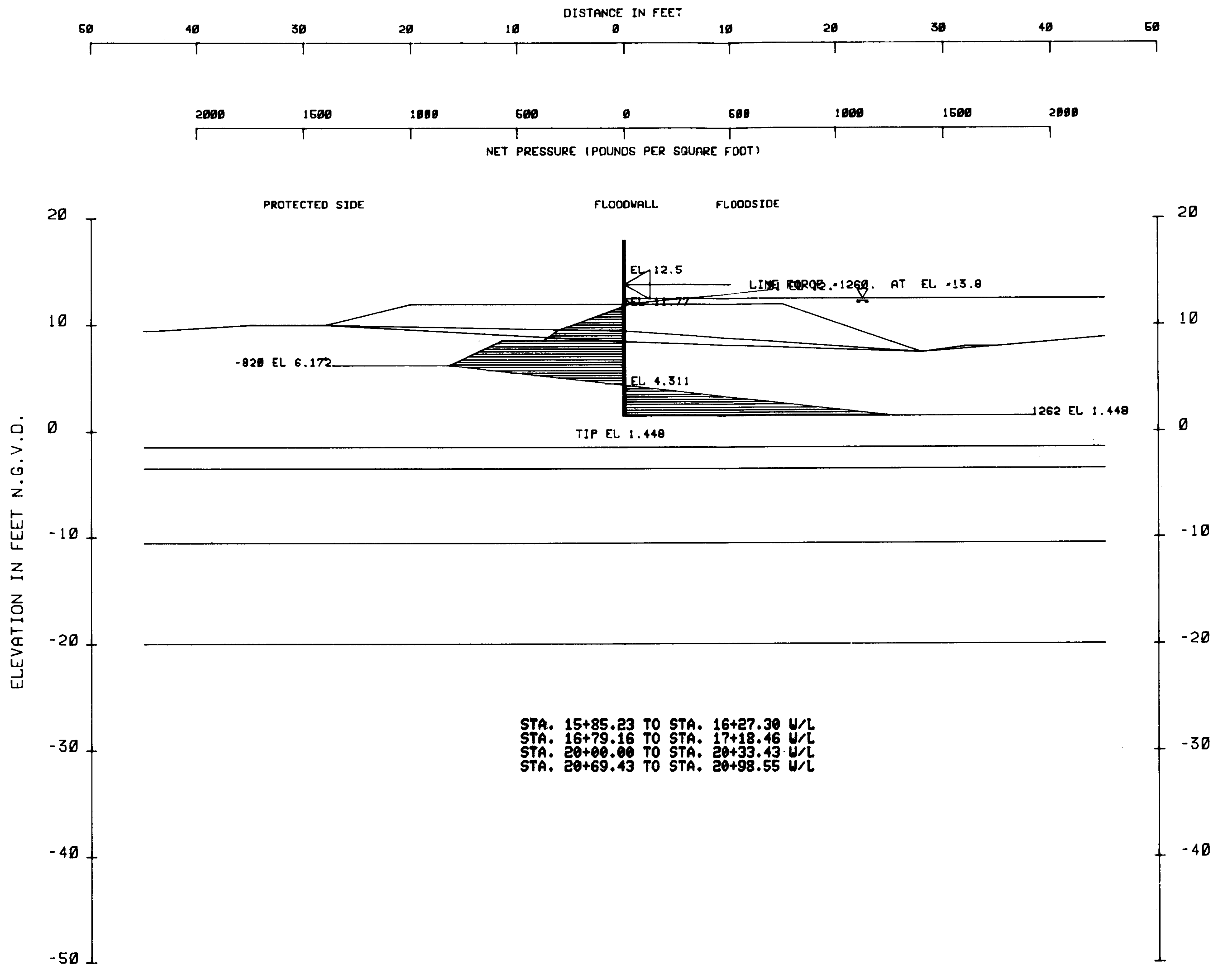
CH Ø=23 C=0
ML Ø=30 C=0
SM Ø=30 C=0
SP Ø=33 C=0

SEE PLATE 98 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS
STA.9+88.10 TO STA.14+31.42 W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ELEVATION	PRESSURE
12.50	0.0
12.00	31.3
11.77	0.0
9.50	-300.7
8.60	-392.4
8.50	-571.6
6.17	-820.1
4.31	0.0
1.45	1262.3
1.45	0.0

S-CASE STRENGTHS USED:

CH Ø=23 C=0
ML Ø=30 C=0
SM Ø=30 C=0
SP Ø=33 C=0

SEE PLATE 98 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

STA. 15+85.23 TO STA. 16+27.30 W/L
STA. 16+79.16 TO STA. 17+18.46 W/L
STA. 20+00.00 TO STA. 20+33.43 W/L
STA. 20+69.43 TO STA. 20+98.55 W/L

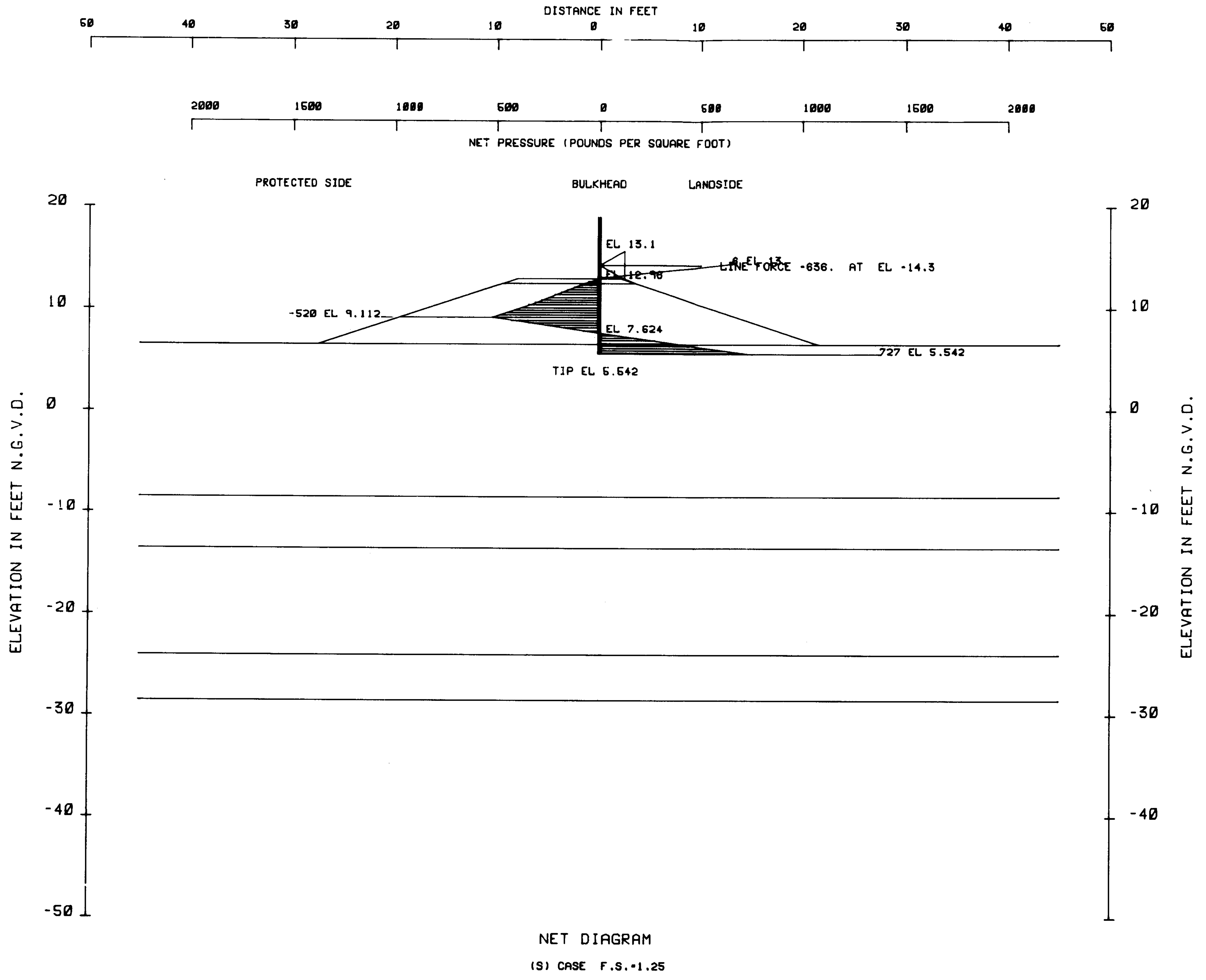
NET DIAGRAM

(S) CASE F.S.=1.25

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ELEVATION	PRESSURE
13.10	0.0
13.00	5.6
12.96	0.0
12.50	-73.3
10.50	-320.0
9.11	-519.8
7.82	0.0
6.64	726.8
5.54	0.0

S-CASE STRENGTHS USED:

CH θ=23 C=0
ML θ=30 C=0
SM θ=30 C=0
SP θ=33 C=0

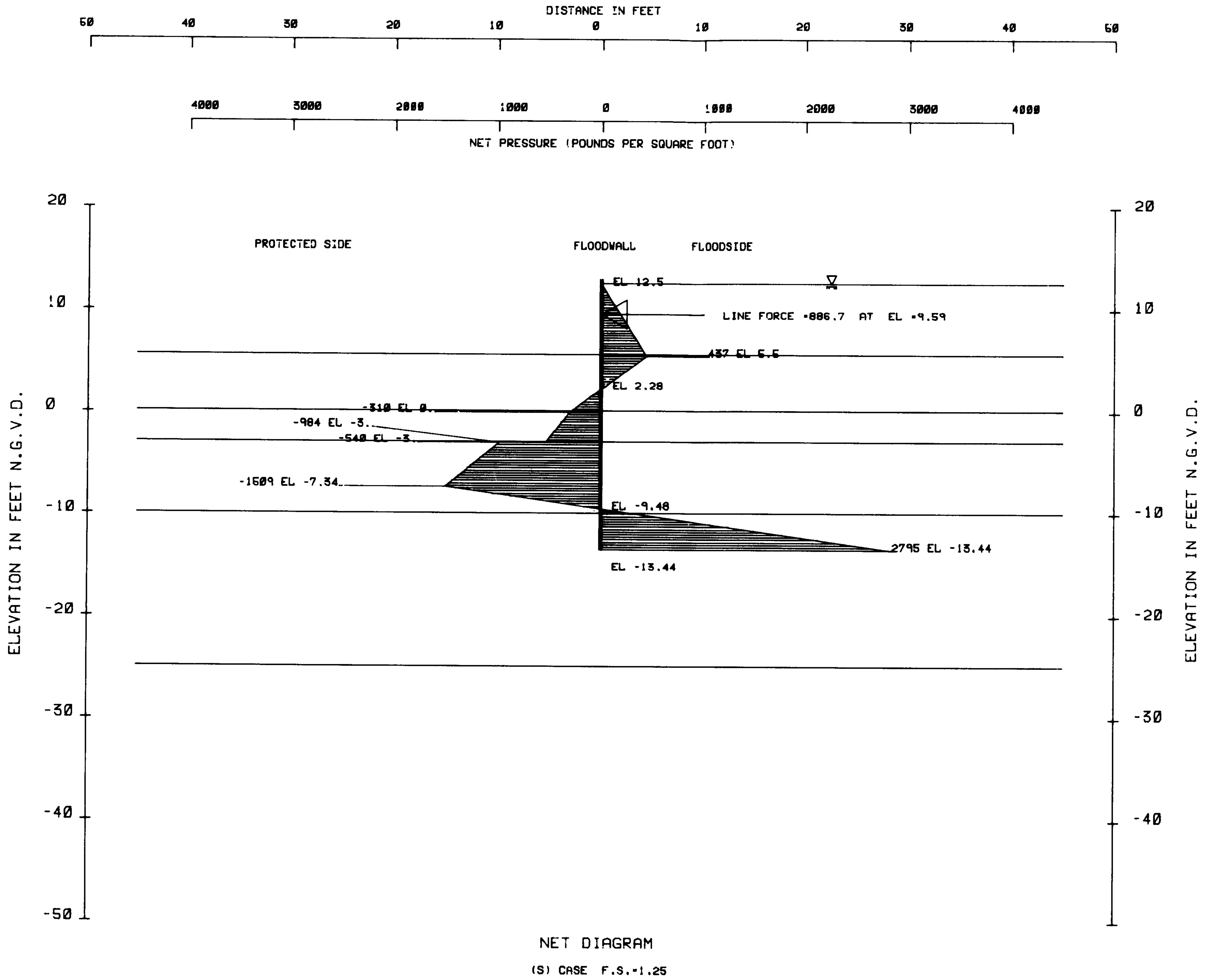
SEE PLATE 98 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

NET DIAGRAM

(S) CASE F.S.=1.25

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13; GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
CANTILEVER SHEETPILE ANALYSIS
STA.101+09.00 TO STA.103+75.42 W/L
STA.109+44.40 TO STA.109+68.40 W/L
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 137



NET DIAGRAM

(S) CASE F.S.=1.25

ELEVATION	PRESSURE
12.50	0.0
5.50	437.5
2.28	0.0
0.00	-310.4
-3.00	-984.4
-3.00	-540.7
-7.34	-1509.9
-9.48	0.0
-13.44	2795.3
-13.44	0.0

S-CASE STRENGTHS USED:

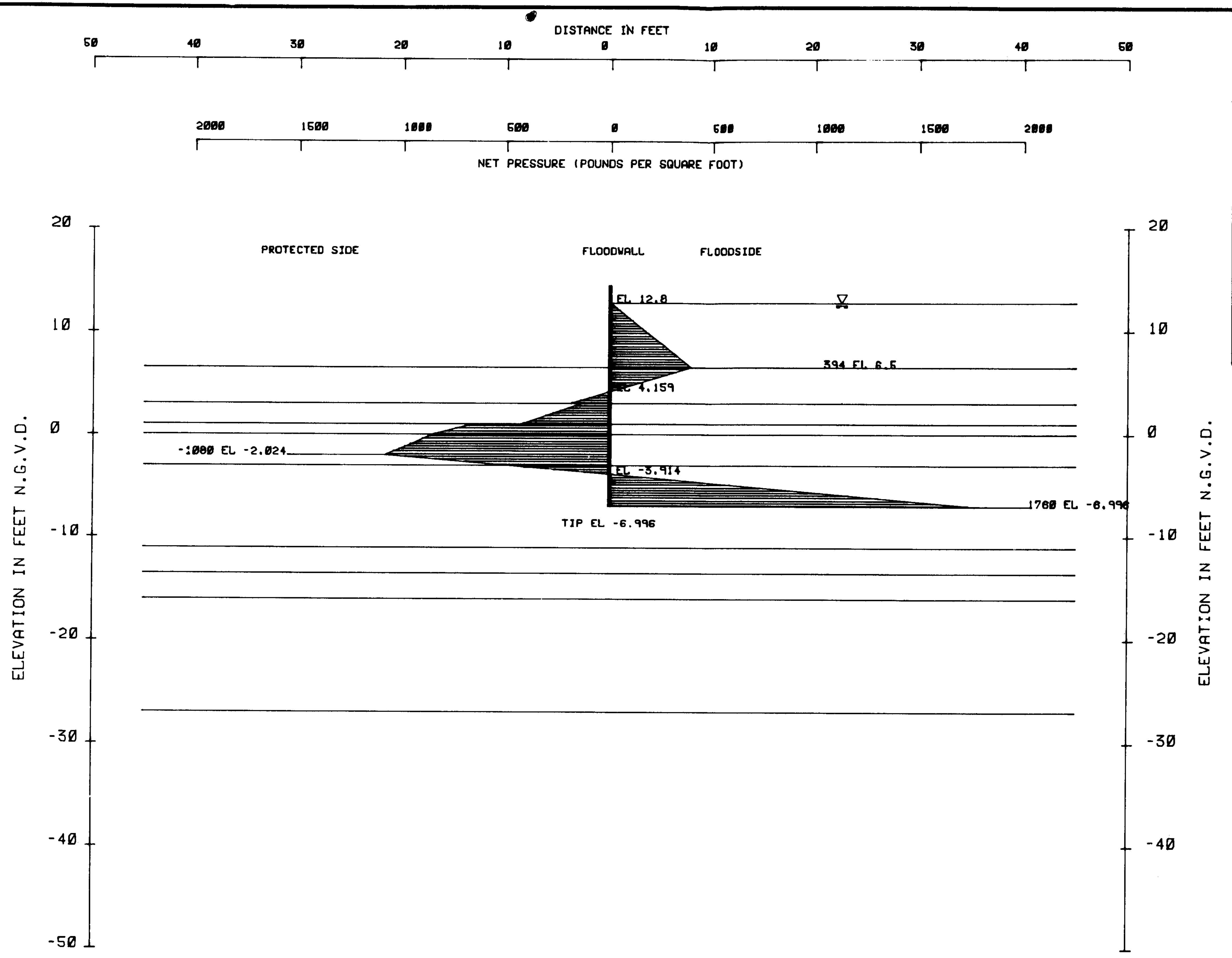
CH Φ=23 C=0
ML Φ=30 C=0
SM Φ=30 C=0
SP Φ=33 C=0

SEE PLATE 67 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS
STA.200+62.41 TO STA.204+58.21 W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NET DIAGRAM

(S) CASE F.S.=1.5

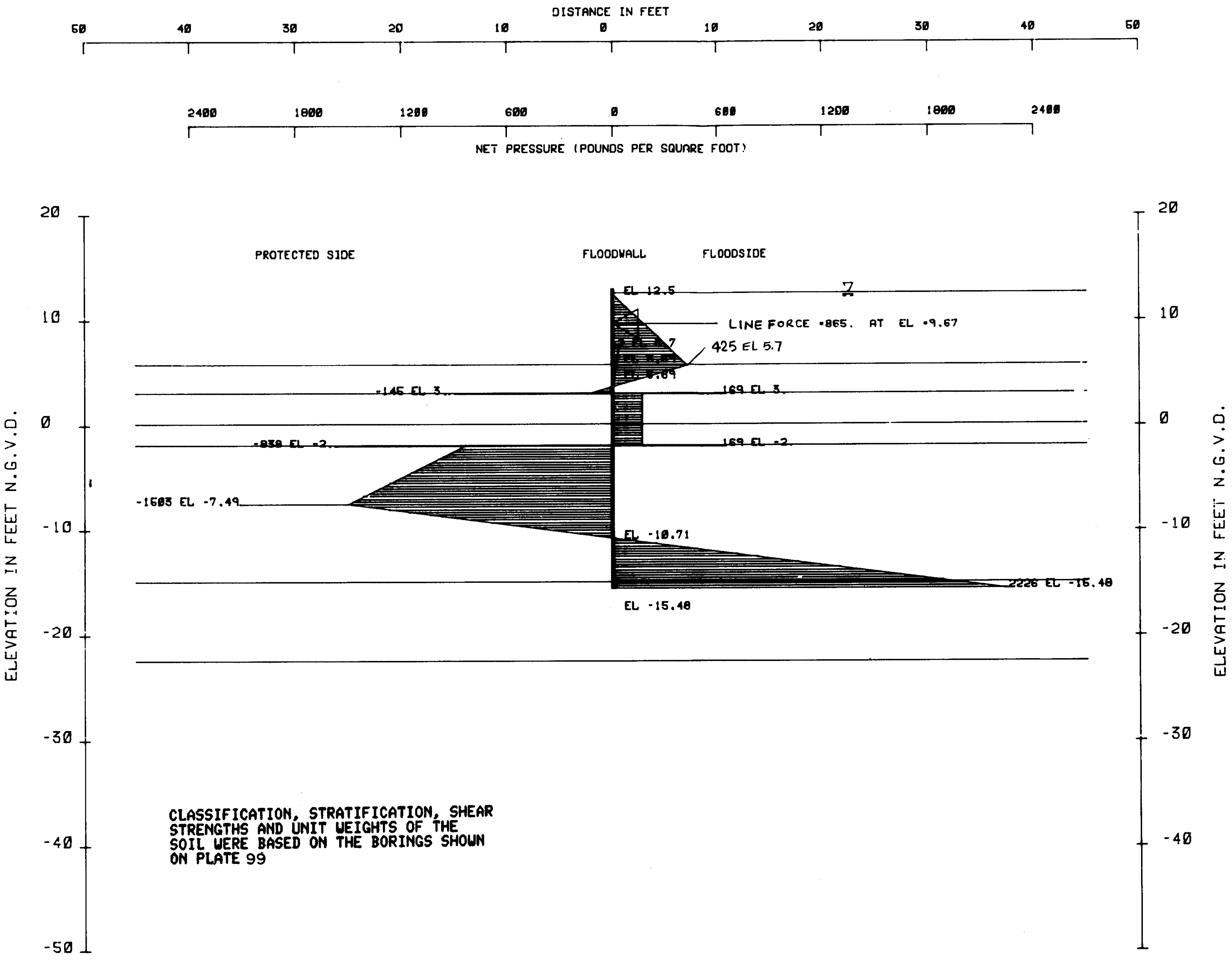
ELEVATION	PRESSURE
12.80	0.0
6.50	393.0
4.16	0.0
3.00	-195.1
3.00	-139.0
1.00	-420.4
1.00	-658.1
0.00	-852.0
-2.02	-1000.0
-3.91	0.0
-7.00	1760.1
-7.00	0.0

S-CASE STRENGTHS USED:

CH Ø=23 C=0
ML Ø=30 C=0
SM Ø=30 C=0
SP Ø=33 C=0

SEE PLATE 99 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
CANTILEVER SHEETPILE ANALYSIS
STA. 204+58.21 TO STA. 218+65.08 W/L
STA. 219+39.08 TO STA. 233+76.50 W/L
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NET DIAGRAM

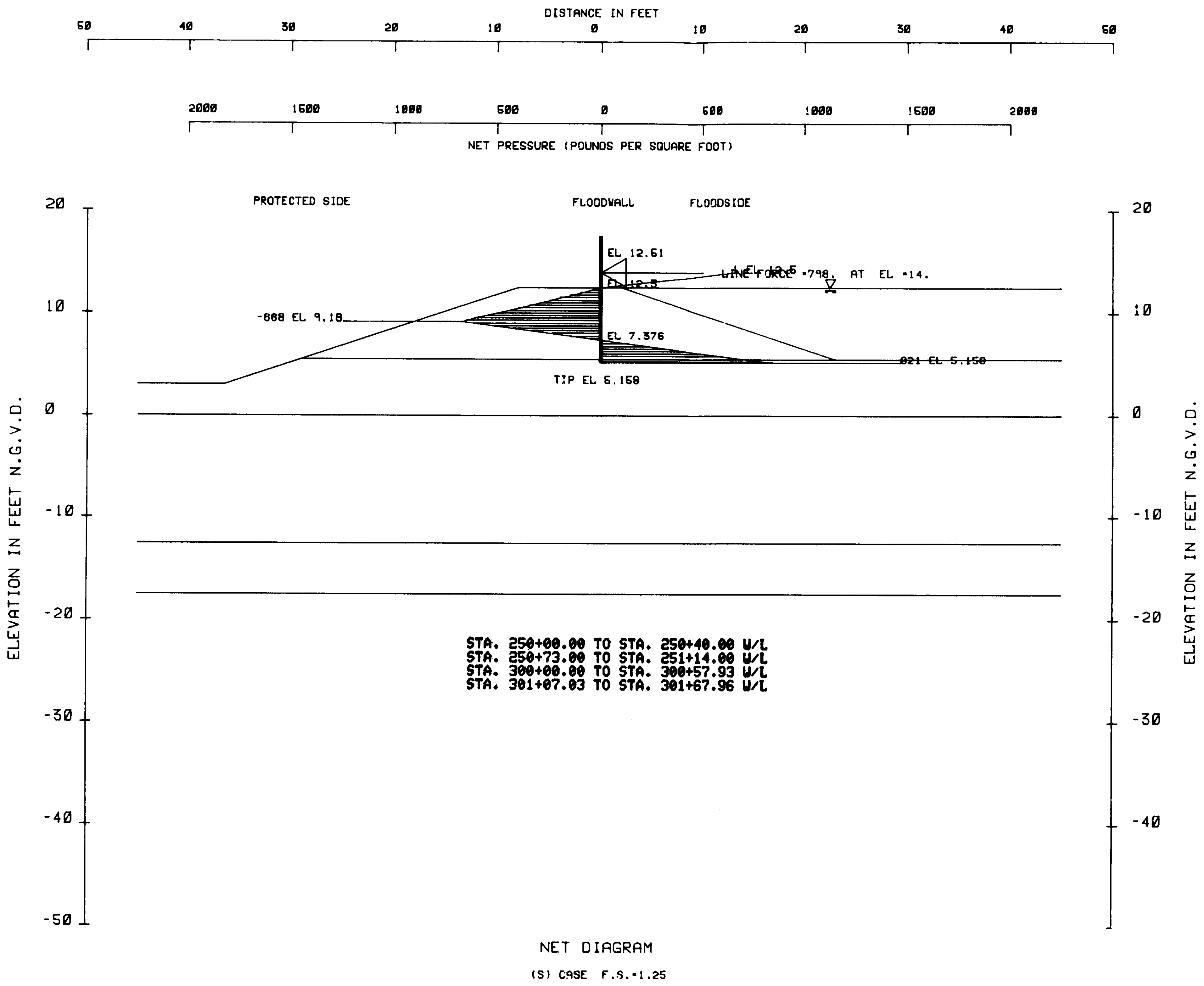
(Q) CASE F.S.=1.25

ELEVATION	PRESSURE
12.50	0.0
5.70	425.0
3.70	2.3
3.69	0.0
3.69	0.0
3.00	169.0
3.00	-145.6
-2.00	-838.7
-2.00	169.0
-7.49	-1503.1
-10.71	0.0
-15.48	2226.9
-15.48	0.0

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS
STA.233+76.50 TO STA.235+80.51W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ELEVATION	PRESSURE
12.61	0.0
12.60	0.6
12.50	0.0
9.50	-602.3
9.18	-667.7
7.38	0.0
5.16	821.0
5.16	0.0

S-CASE STRENGTHS USED:

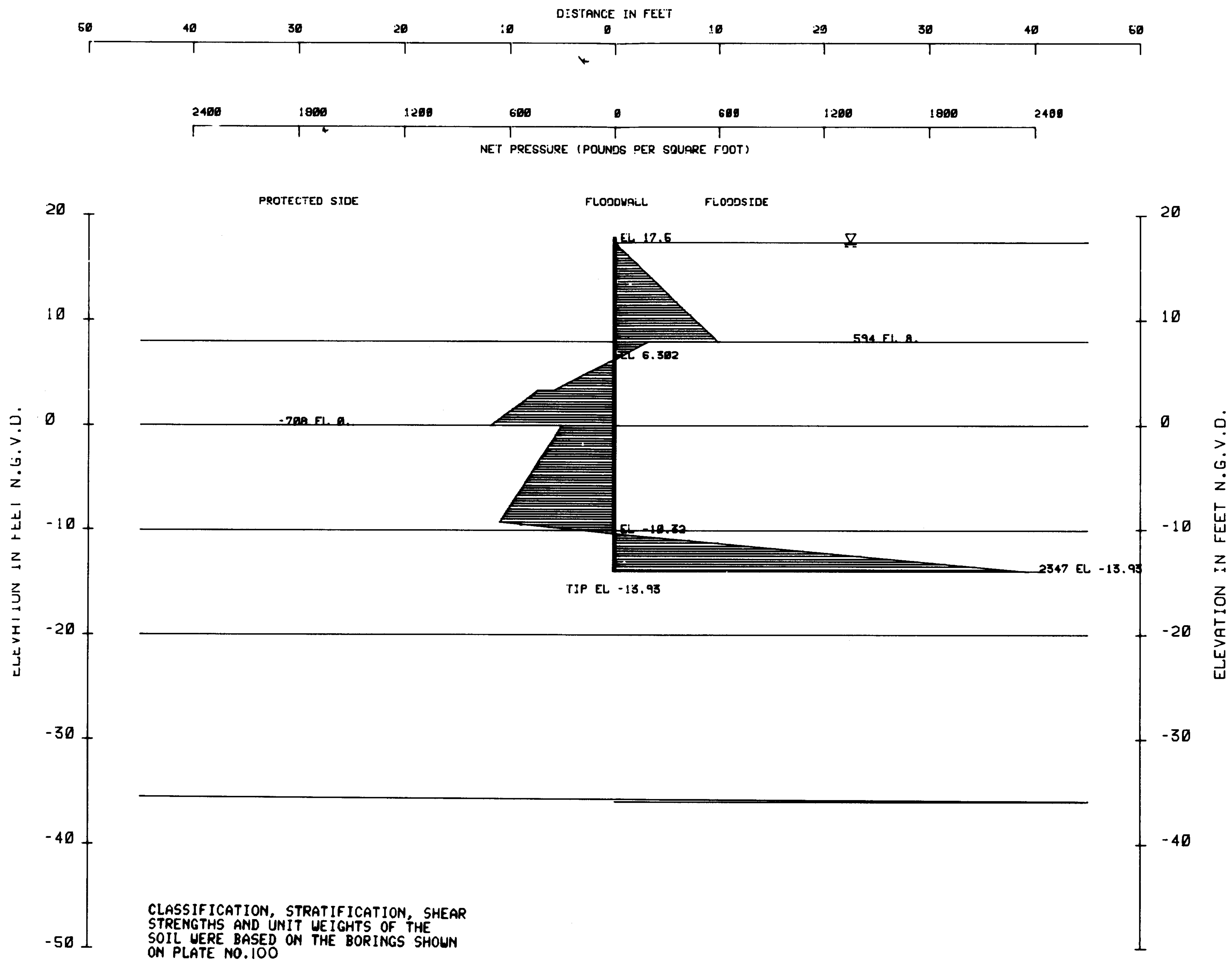
CH 0=23 C=0
ML 0=30 C=0
SM 0=30 C=0
SP 0=33 C=0

SEE PLATE 100 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



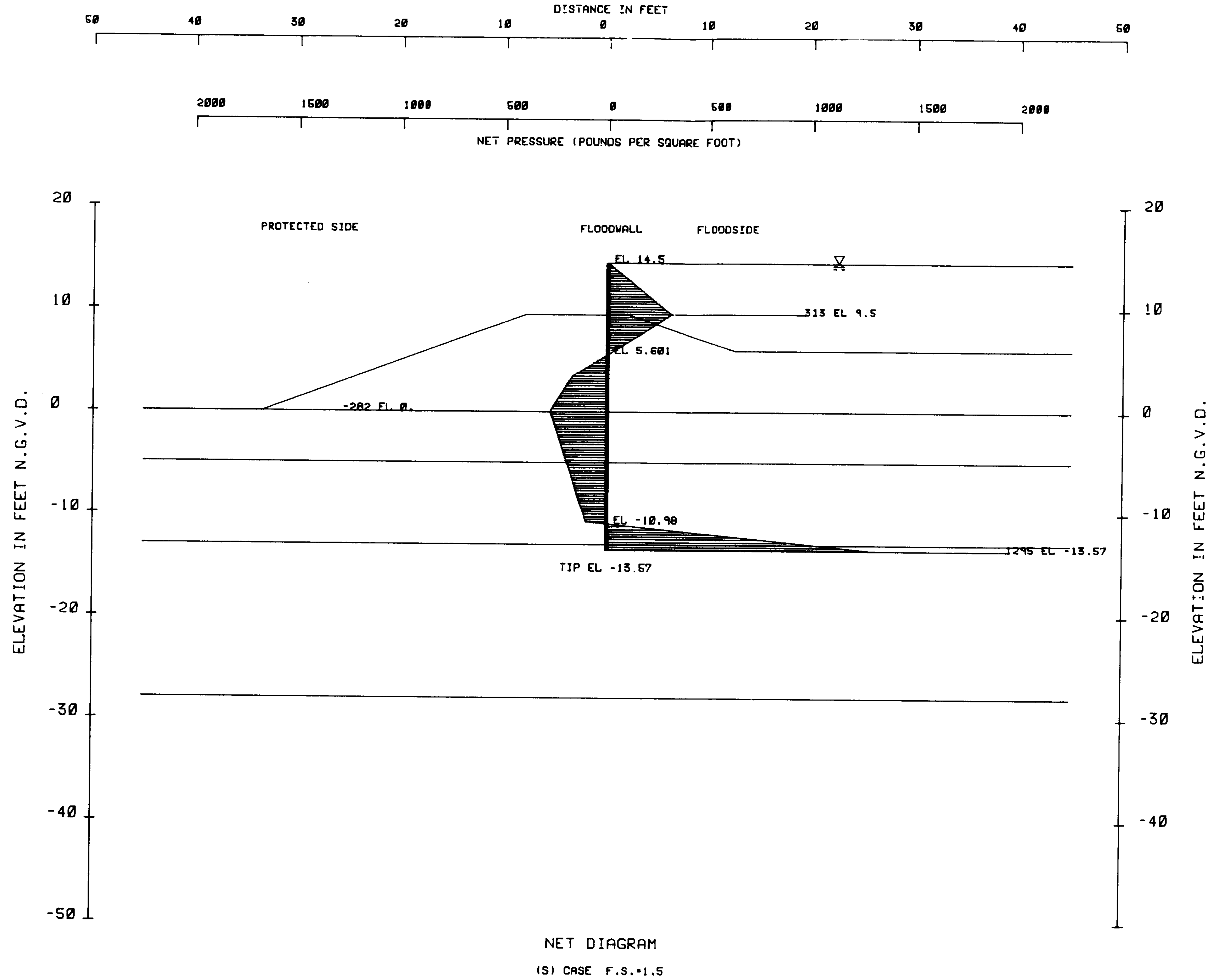
ELEVATION	PRESSURE
17.50	0.0
8.00	593.7
8.00	197.9
6.30	0.0
3.30	-350.1
3.30	-441.3
0.00	-708.3
0.00	-302.3
-9.30	-659.5
-10.32	0.0
-13.93	2347.1
-13.93	0.0

CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO.100

NET DIAGRAM

(Q) CASE F.S.=1.25

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
CANTILEVER SHEETPILE ANALYSIS
STA.350+00.00 TO STA.350+55.93 W/L
STA.351+05.03 TO STA.351+60.98 W/L
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NET DIAGRAM

(S) CASE F.S.=1.5

ELEVATION	PRESSURE
14.50	0.0
9.50	312.5
5.60	0.0
3.50	-172.9
0.00	-201.7
-10.77	-103.7
-10.98	0.0
-13.57	1295.0
-13.57	0.0

S-CASE STRENGTHS USED:

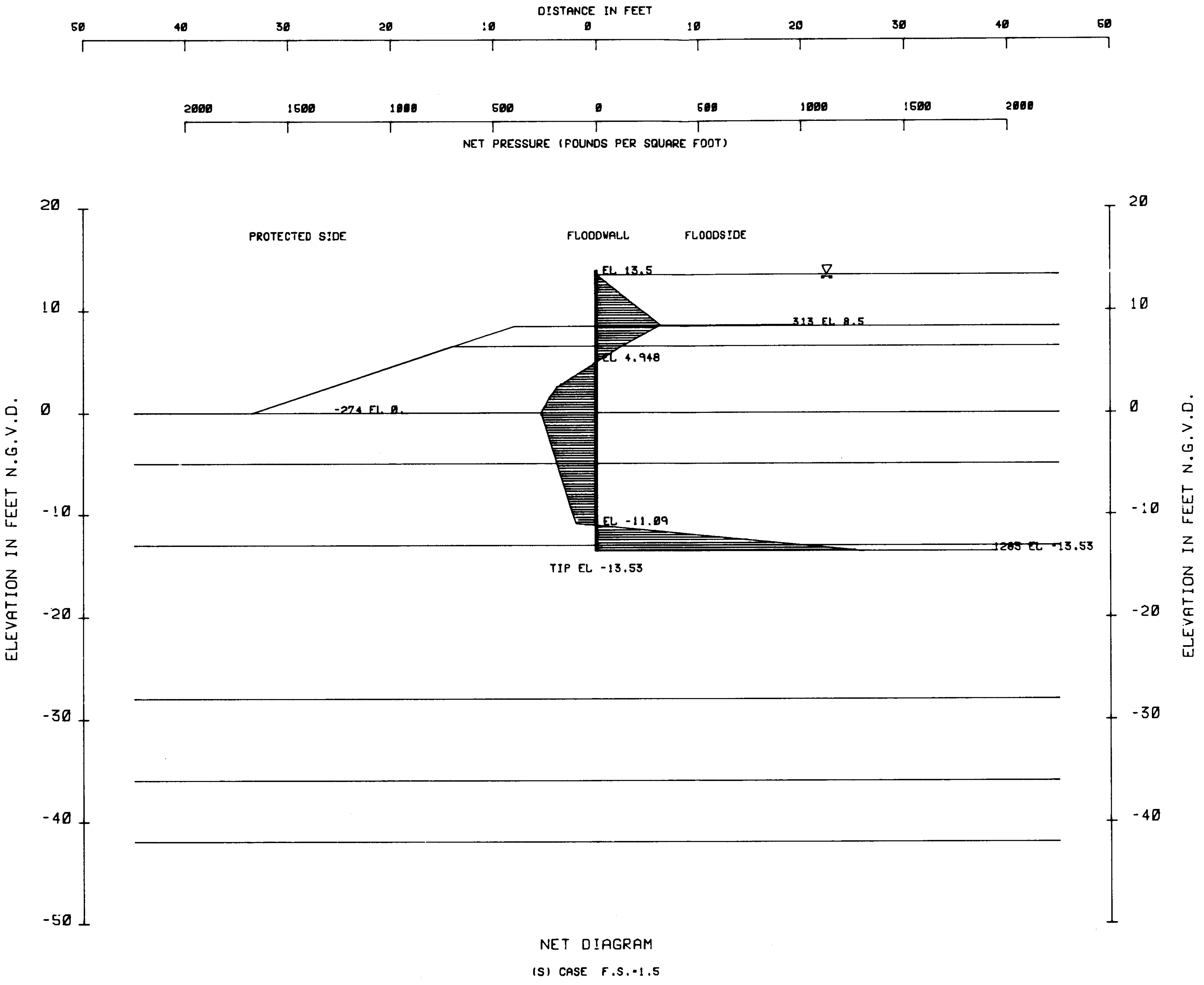
CH	Ø=23	C=0
ML	Ø=30	C=0
SM	Ø=30	C=0
SP	Ø=33	C=0

SEE PLATES 85,86 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13. GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS
STA. 400+00.00 TO STA. 401+13.22 W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NET DIAGRAM

(S) CASE F.S.=1.5

ELEVATION	PRESSURE
13.50	0.0
8.50	312.5
6.50	122.8
4.95	0.0
2.50	-193.7
0.00	-273.6
-10.90	-101.5
-11.09	0.0
-13.53	1283.4
-13.53	0.0

S-CASE STRENGTHS USED:

CH Ø=23 C=0
ML Ø=30 C=0
SM Ø=30 C=0
SP Ø=33 C=0

SEE PLATES 85,86 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN

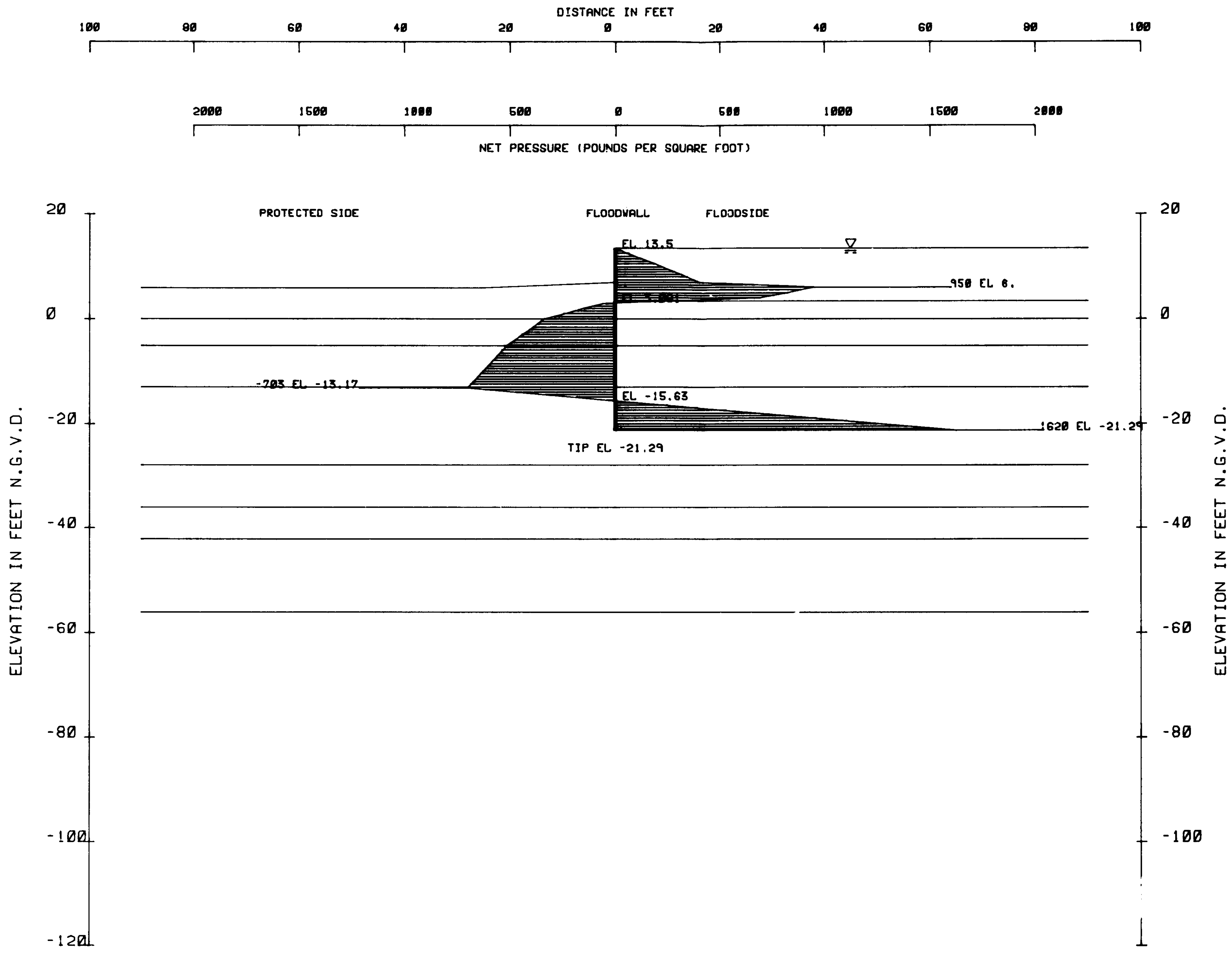
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN

ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS
STA.401+13.22 TO STA.402+18.22W/L

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

NOVEMBER 1984 FILE NO. H-2-29536



NET DIAGRAM

(S) CASE F.S.=1.5

ELEVATION	PRESSURE
13.50	0.0
7.00	406.3
6.00	949.6
4.00	690.2
3.00	0.0
3.00	-60.8
0.00	-339.8
-5.00	-512.0
-13.00	-694.4
-13.17	-702.7
-15.63	0.0
-21.29	1620.4
-21.29	0.0

S-CASE STRENGTHS USED:

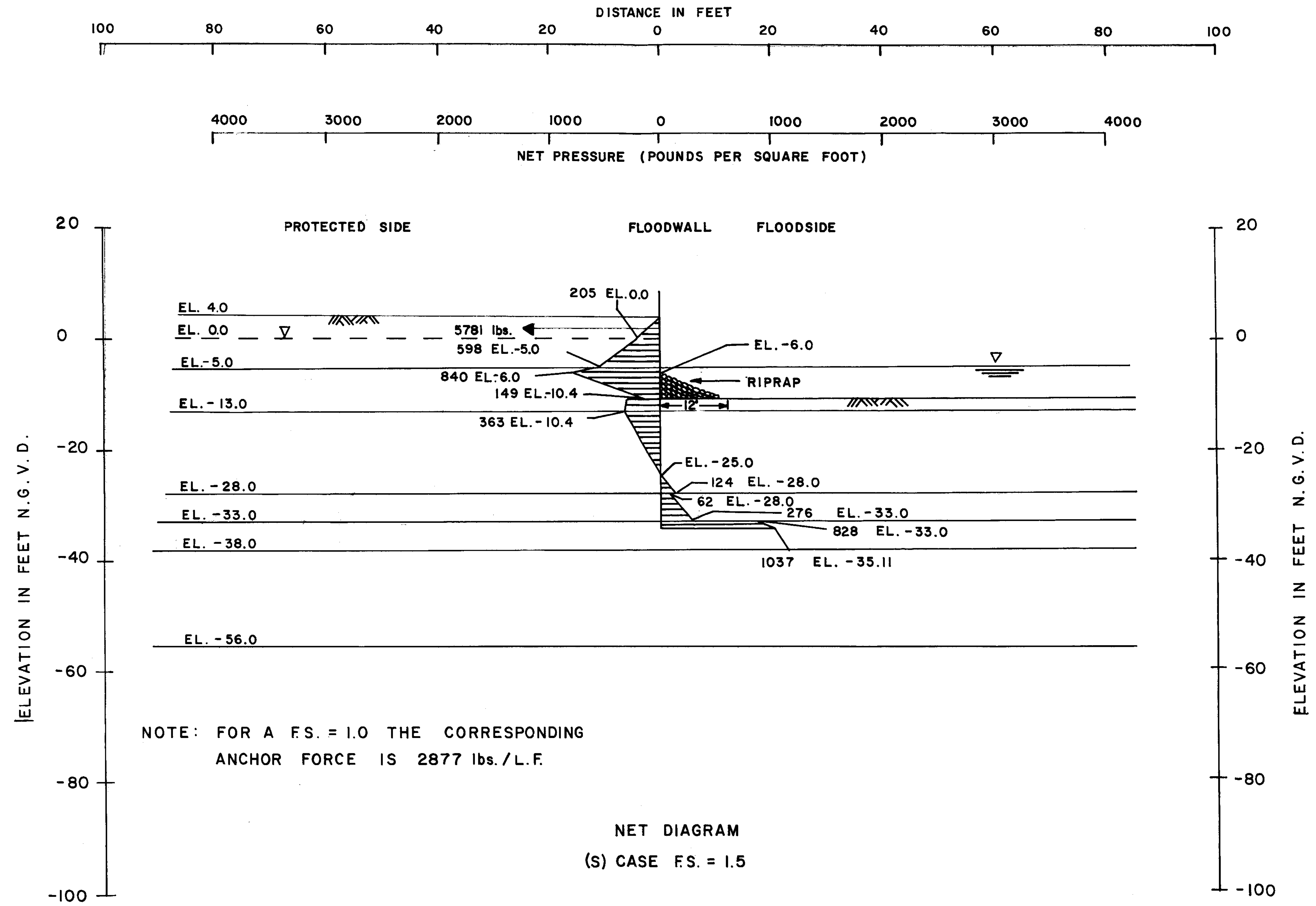
CH Ø=23 C=0
ML Ø=30 C=0
SM Ø=30 C=0
SP Ø=33 C=0

SEE PLATE 86 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS
STA.402+95.22 TO STA.404+16.06W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NOTE: FOR A F.S. = 1.0 THE CORRESPONDING ANCHOR FORCE IS 2877 lbs./L.F.

NET DIAGRAM

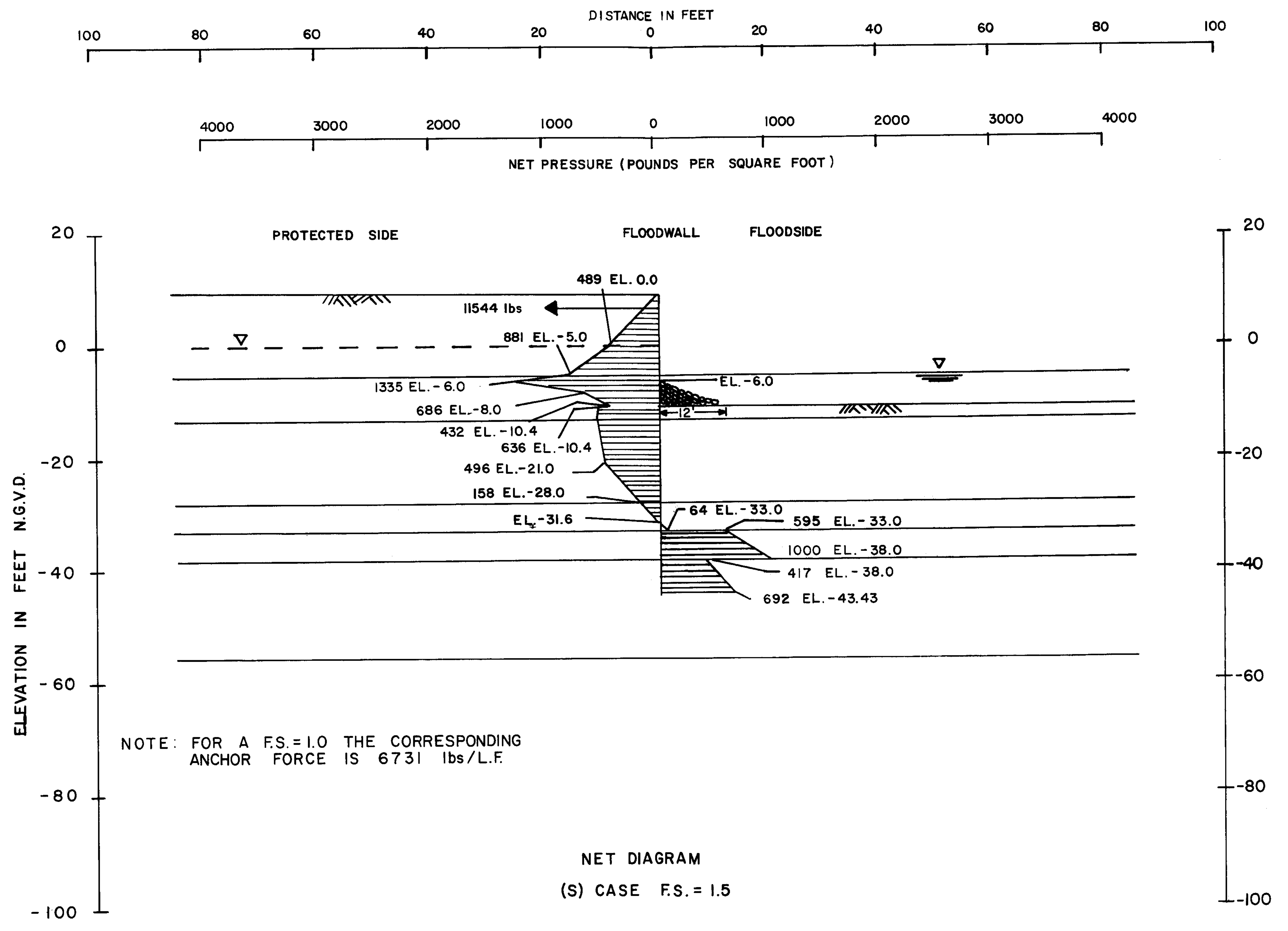
(S) CASE F.S. = 1.5

S-CASE STRENGTHS USED:

CH	O=23	C=0
ML	O=30	C=0
SM	O=30	C=0
SP	O=33	C=0

SEE PLATE 86 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO 13 GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
CANTILEVER SHEETPILE ANALYSIS
STA. 405+55.96 TO STA. 406+74.96 W/L
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS



S-CASE STRENGTHS USED:

CH	O=23	C=0
ML	O=30	C=0
SM	O=30	C=0
SP	O=33	C=0

SEE PLATE 86 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGTHS

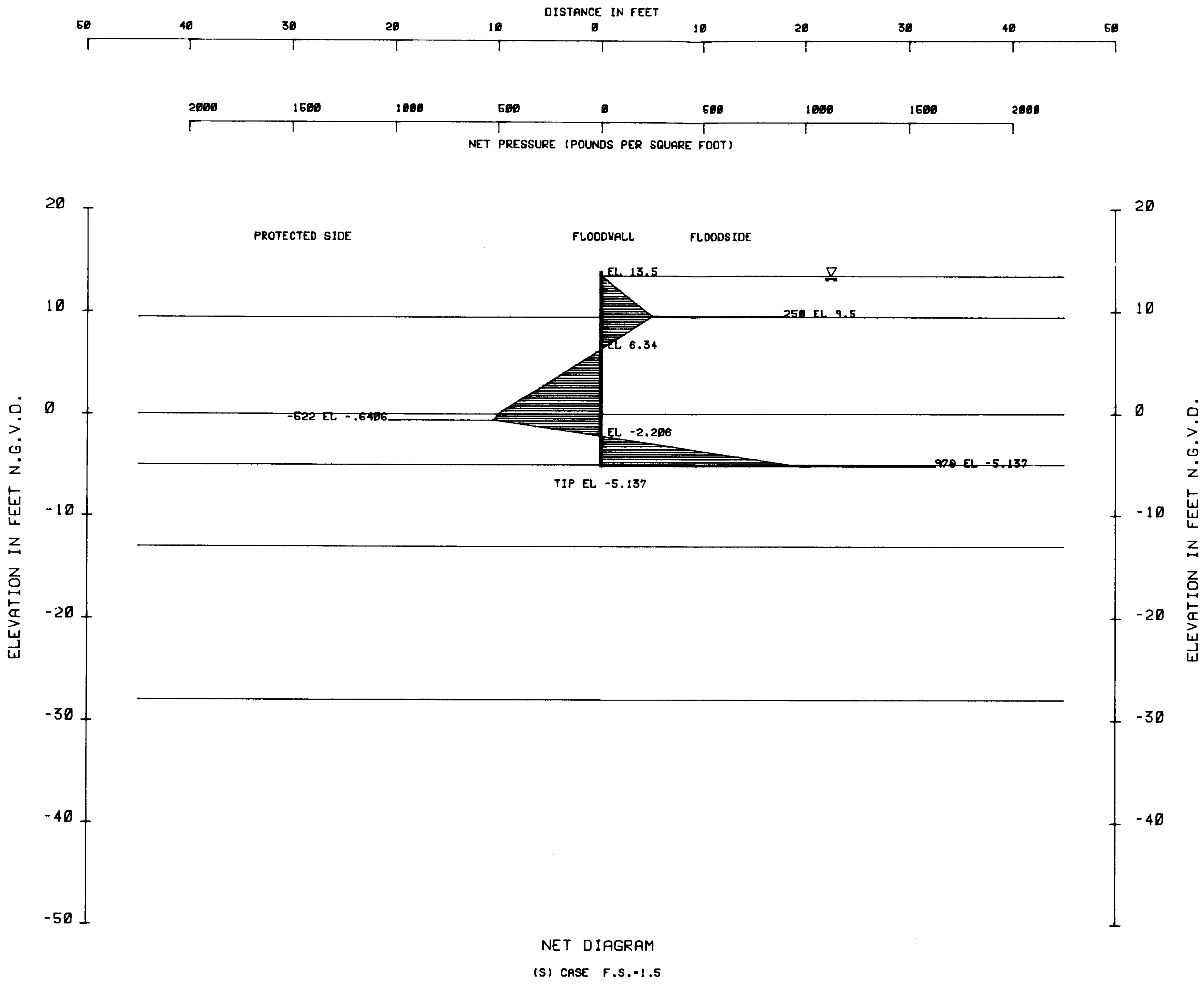
NOTE: FOR A F.S.=1.0 THE CORRESPONDING ANCHOR FORCE IS 6731 lbs/L.F.

NET DIAGRAM

(S) CASE F.S. = 1.5

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
CANTILEVER SHEETPILE ANALYSIS
STA. 405+55.96 TO STA. 406+74.96W/L
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
FILE NO. H-2-29536

PLATE 147



NET DIAGRAM

(S) CASE F.S.=1.5

ELEVATION	PRESSURE
13.50	0.0
9.50	250.0
6.34	0.0
0.00	-501.7
-0.64	-522.4
-2.21	0.0
-5.14	977.6
-5.14	0.0

S-CASE STRENGTHS USED:

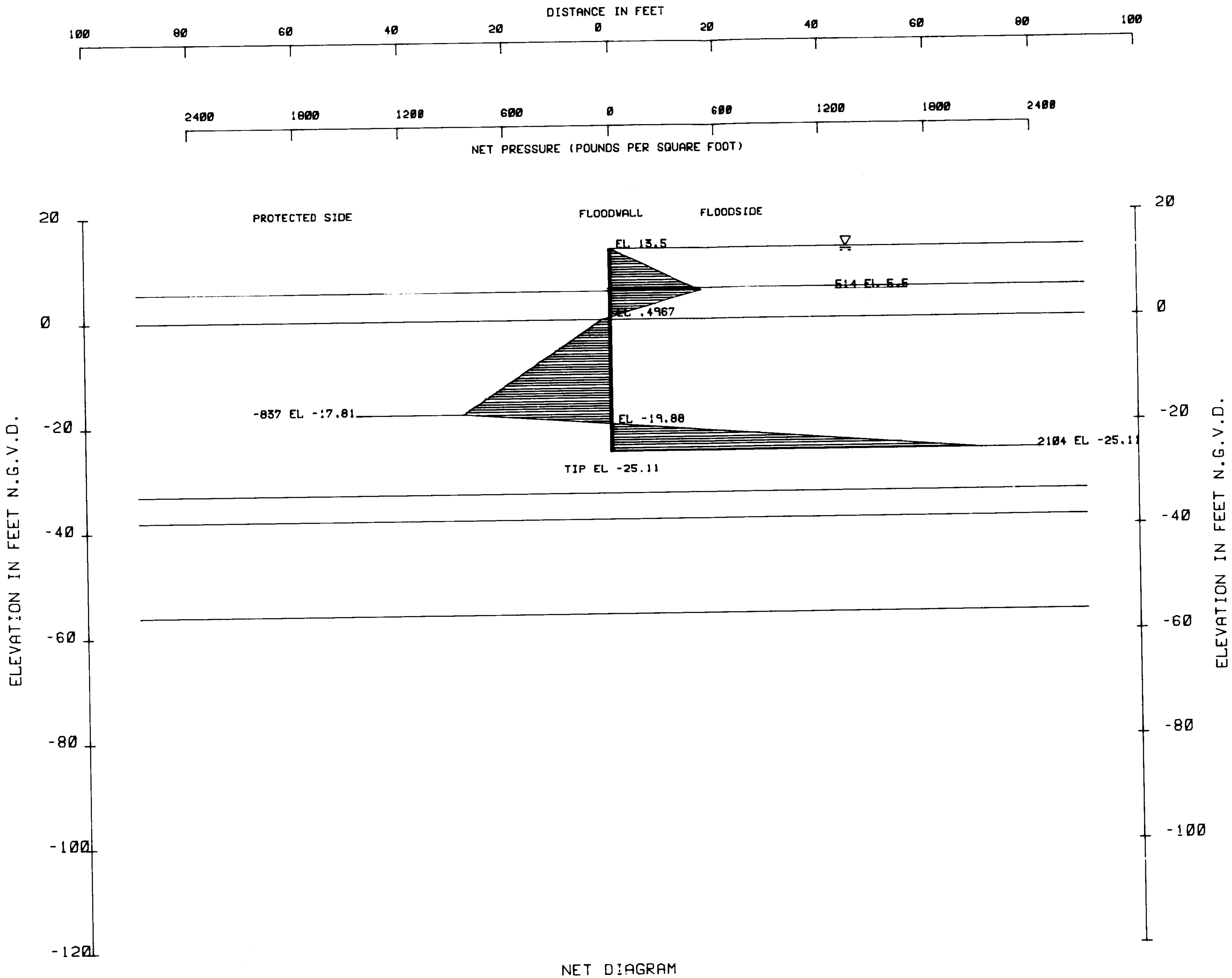
CH 0=23 C=0
ML 0=30 C=0
SM 0=30 C=0
SP 0=33 C=0

SEE PLATE 86 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS
STA.406+74.96 TO STA.406+94.00WL

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



NET DIAGRAM
(S) CASE F.S.=1.5

ELEVATION	PRESSURE
13.50	0.0
6.00	460.8
5.50	513.6
0.50	0.0
0.00	-51.0
-17.81	-836.5
-19.88	0.0
-25.11	2103.6
-25.11	0.0

S-CASE STRENGTHS USED:

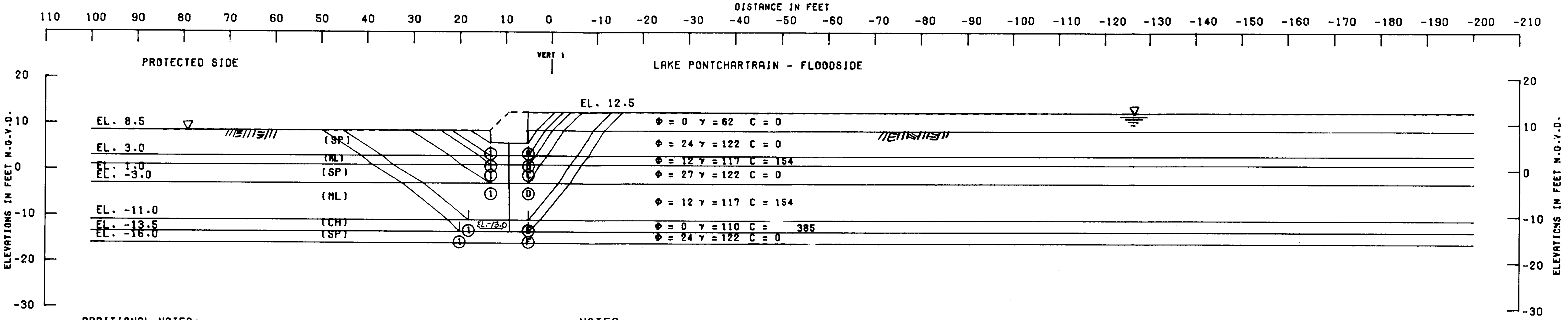
CH Φ=23 C=0
ML Φ=30 C=0
SM Φ=30 C=0
SP Φ=33 C=0

SEE PLATE 86 FOR SOIL CLASSIFICATION STRATIFICATION, AND UNIT WEIGHTS.

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

CANTILEVER SHEETPILE ANALYSIS
STA.407+38.00 TO STA.408+28.96 W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO.99

2. ANALYSIS WAS PERFORMED WITH A FACTOR OF SAFETY OF 1.3 INCORPORATED INTO THE SOIL PARAMETERS.

3. A DECREASING TOTAL $U_A - U_P$ INDICATES THAT NO UNBALANCED LOAD EXIST.

4. FOR GATES 1 THROUGH 5, GATES 8 THROUGH 12 AND THE T-WALLS FROM W/L STA. 103+75.42 TO W/L. STA. 109+44.40 AND W/L.STA. 408+54.56 TO W/L. STA. 411+08.06

NOTES

Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

FACTOR OF SAFETY = $\frac{R_A + R_B + R_P}{D_A - D_P}$

NO.	ELEV.	UA = DA - RA		UP = RB + RP + DP			UA	UP	UA - UP
		DA	RA	RB	RP	DP			
BASE	5.67	1619	107	0	302	478	1512	780	732
1	3.0	3632	473	15	1199	1836	3159	3049	110
2	1.0	5714	1241	134	2364	3408	4473	5906	-1433
3	-3.0	11300	2591	626	5919	8007	8703	14552	-5849
4	-11.0	28201	7021	4085	12566	22904	21180	39555	-18375
5	-13.5	35001	8964	5187	14491	29070	26037	48748	-22711

DEPTH OF SHEET PILE CALCULATION BASED ON LANE'S WEIGHTED CREEP RATIO:

LWCR = $\frac{\text{WEIGHTED CREEP DISTANCE}}{\text{HEAD}}$

LWCR = 7.0 FOR FINE SAND

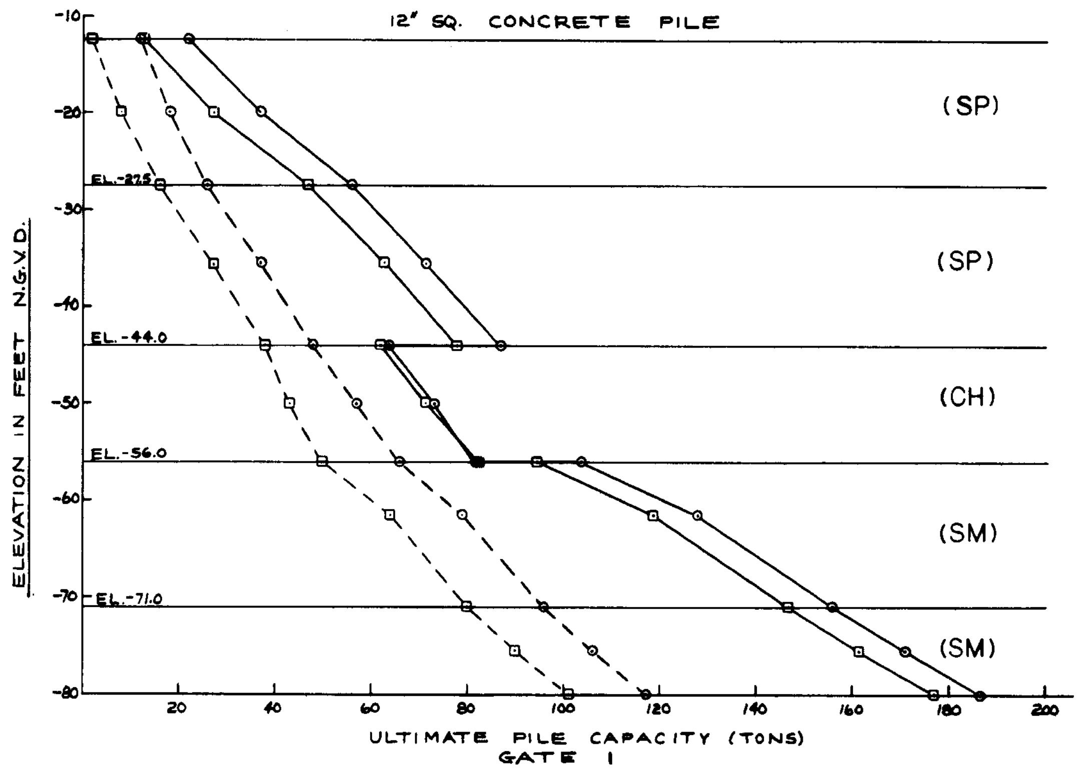
$7.0 = \frac{2d}{5.5}$ (d=depth of sheetpile below ground surface)

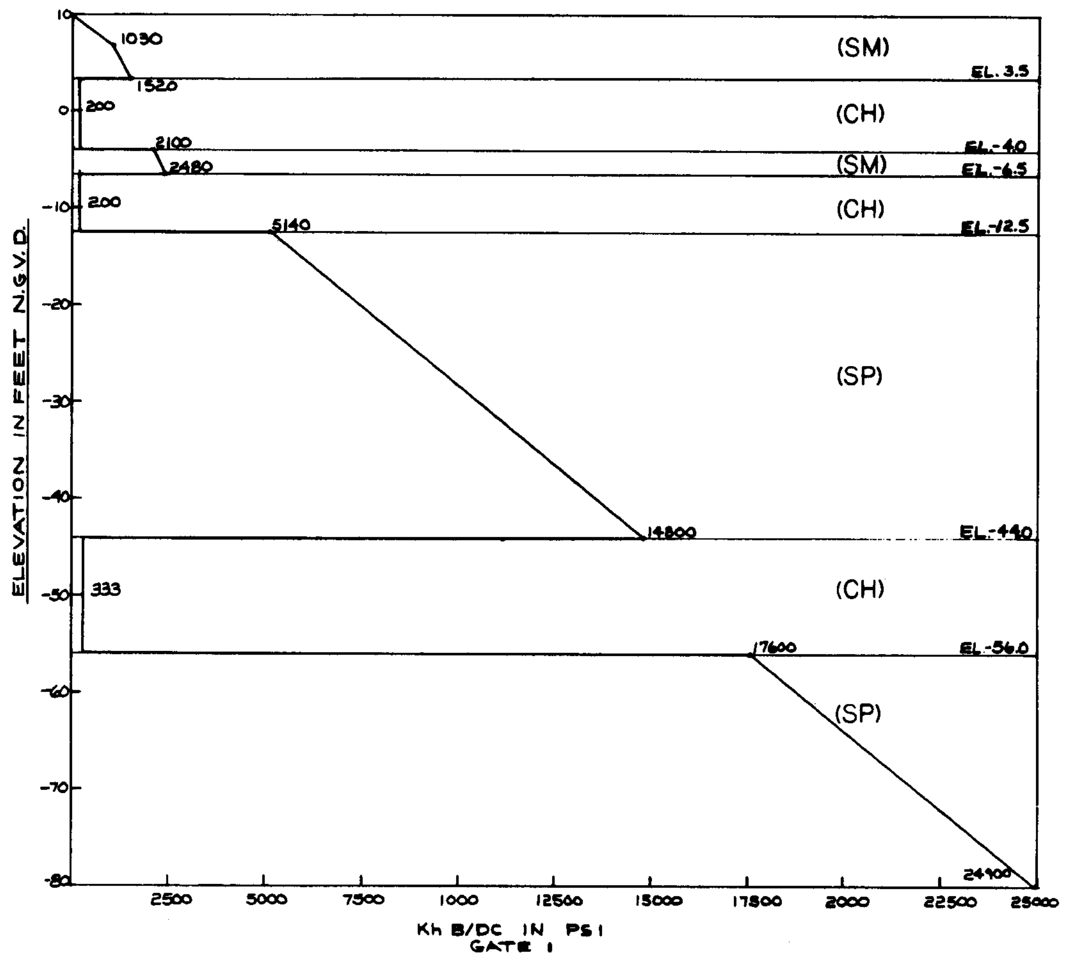
d = 19.25' (EL. -13.0)

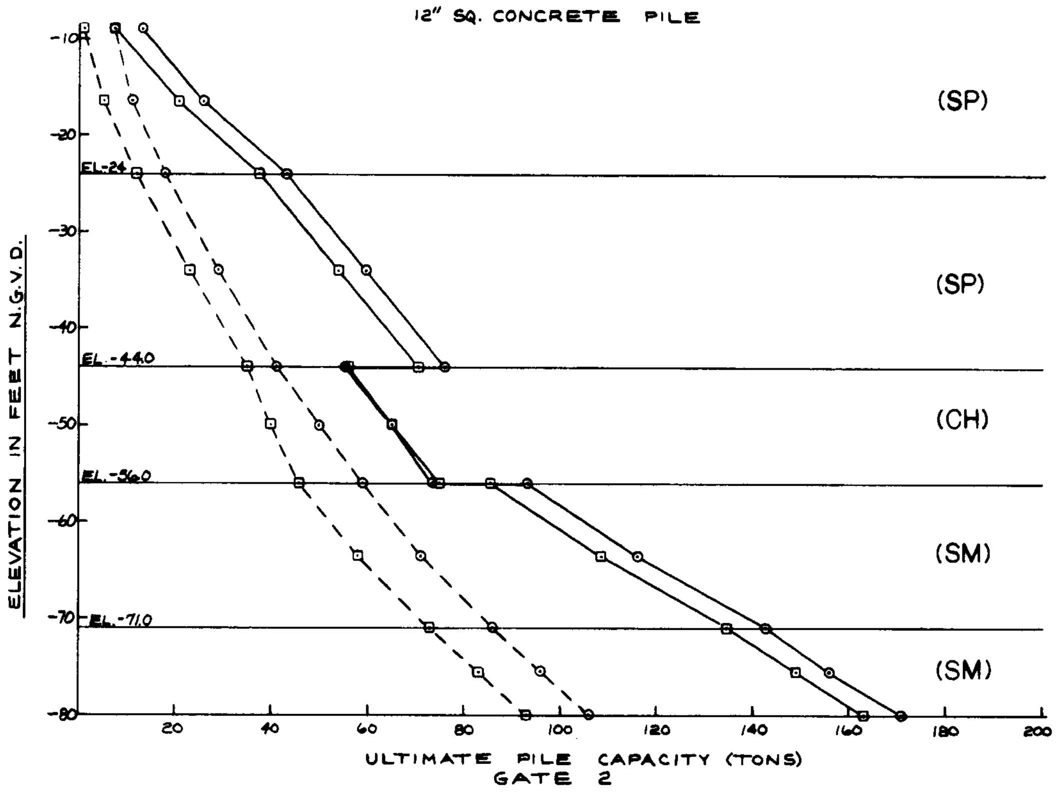
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

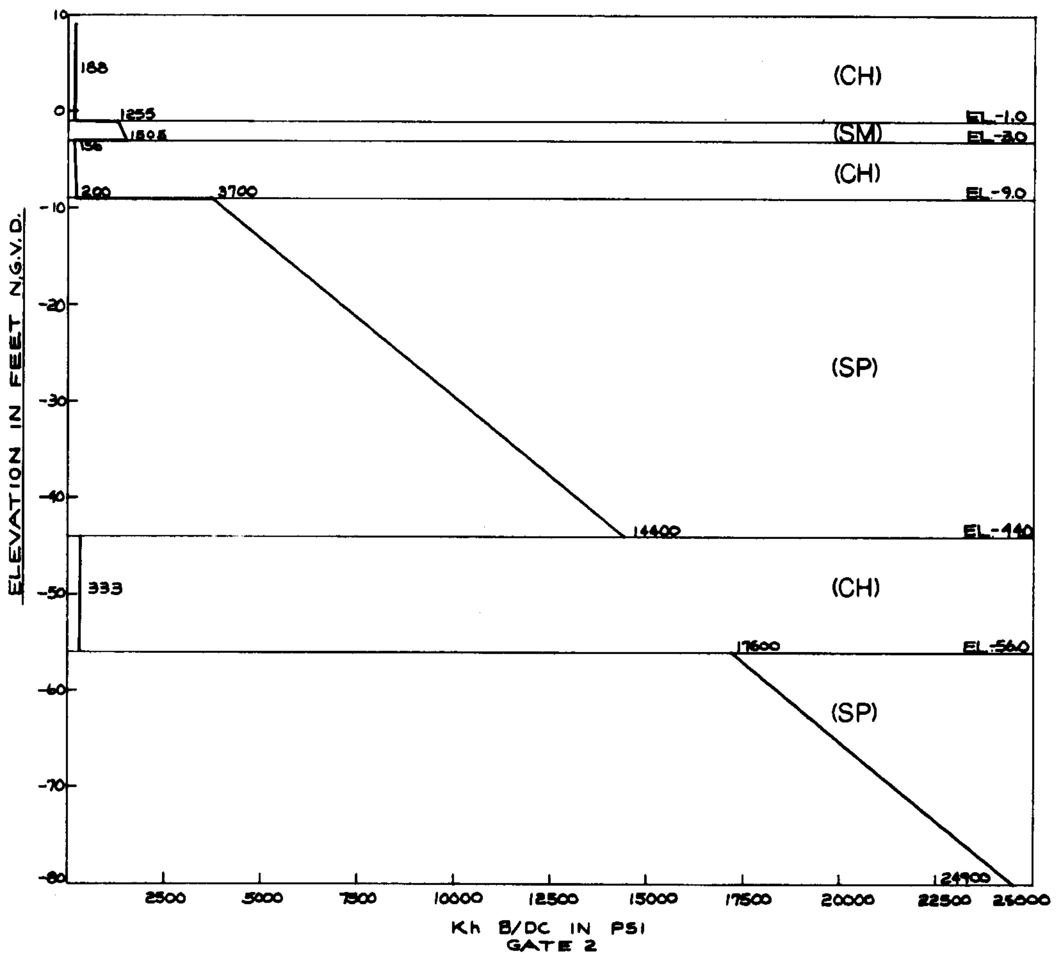
DEEP SEATED STABILITY ANALYSIS STA.218+65.08 TO STA.219+99.08 W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536









D	PILE SPACING IN DIRECTION OF LOADING
1.00	8B
0.85	7B
0.70	6B
0.56	5B
0.40	4B
0.25	3B
C	LOADING CONDITION
1.00	INITIAL LOADING
0.30	CYCLIC LOADING

□ = S-CASE
○ = Q-CASE
- - - TENSION
—— COMPRESSION

NOTES

K_h = K_1/B = (0.2222 qu/d)(C)(D) COHESIVE
= 0.4 = Factor of material properties
k_1 = Modulus of subgrade reaction (pci)
B_1 = Width or diameter of pile (in)
K_1 = 0.80 qu = k_1 B_1 (psi)
qu = 2 c = Unconfined compressive strength (psf)
C = Reduction for cyclic loading - not applicable
D = Group effect reduction factor
B = Width of pile measured at right angles to the direction of displacement (in)
K_h = (nh)(Z/B)(C)(D) COHESIONLESS
nh = Coefficient of horizontal subgrade reaction (pci)
Z = Depth below equivalent ground surface (in)

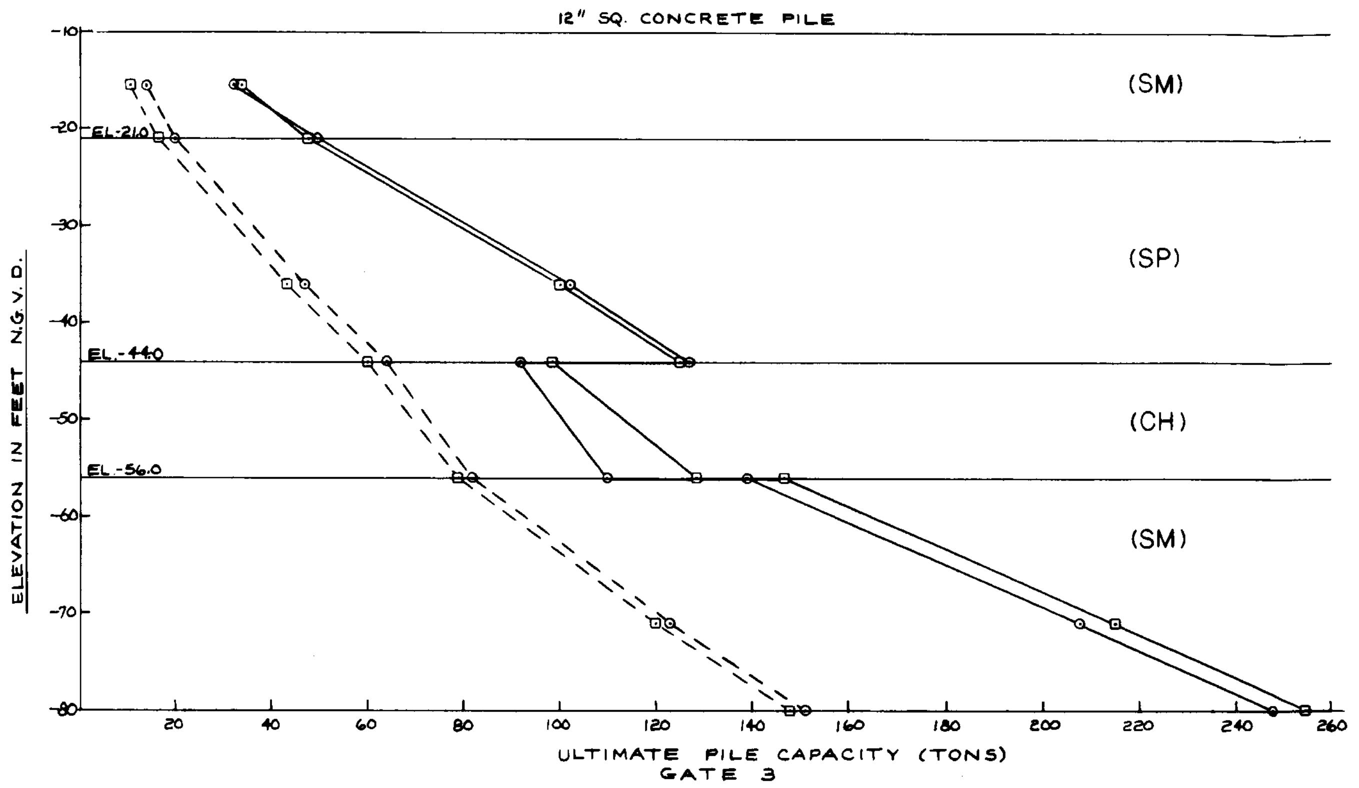
THE FACTOR SHOWN, (MODULUS OF HORIZONTAL SUBGRADE K_h TIMES THE PILE WIDTH IN INCHES (B), MEASURED AT RIGHT ANGLES TO THE DIRECTION OF DISPLACEMENT) MUST BE MODIFIED BY A REDUCTION FACTOR FOR THE EFFECT OF GROUP ACTION (D) AND A REDUCTION FACTOR FOR CYCLIC LOADING (C) EX: $K_h = \frac{222\,(C)(D)}{(B)}$

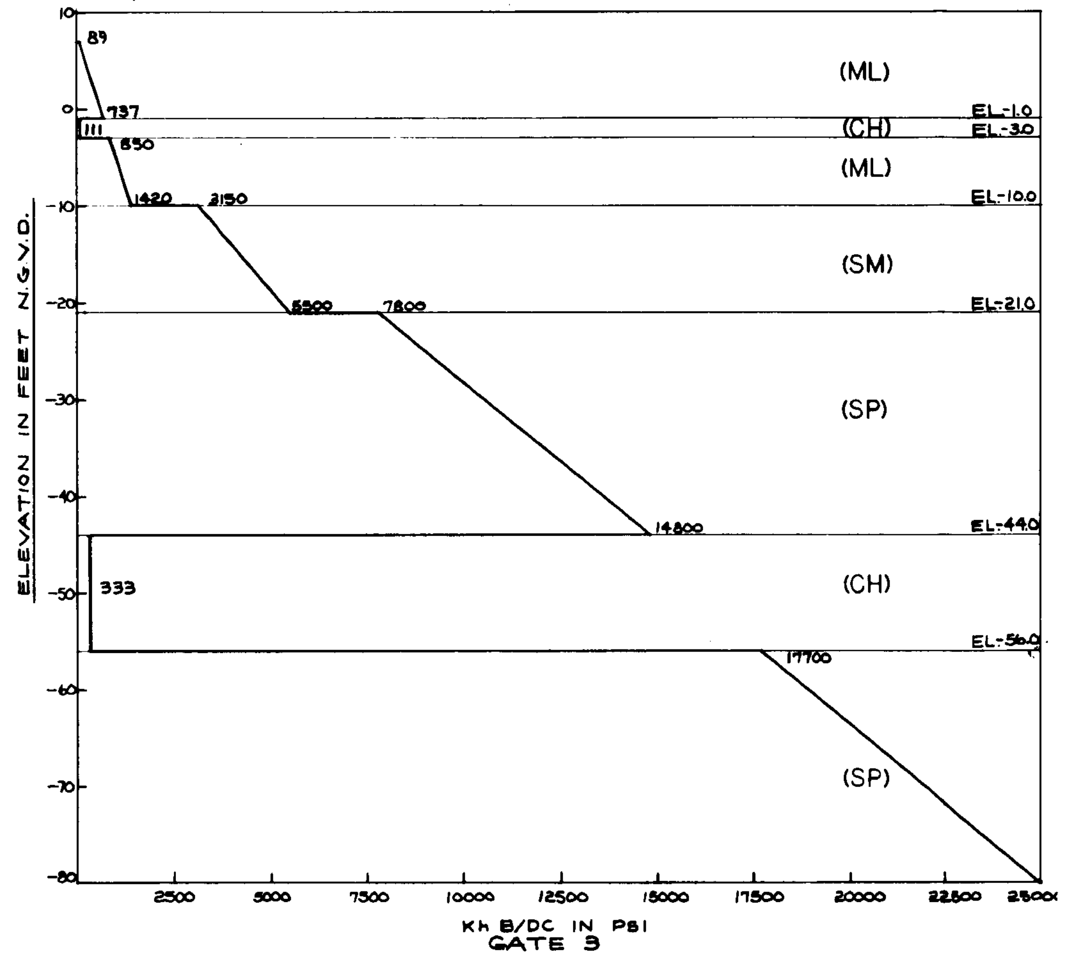
GENERAL NOTE:

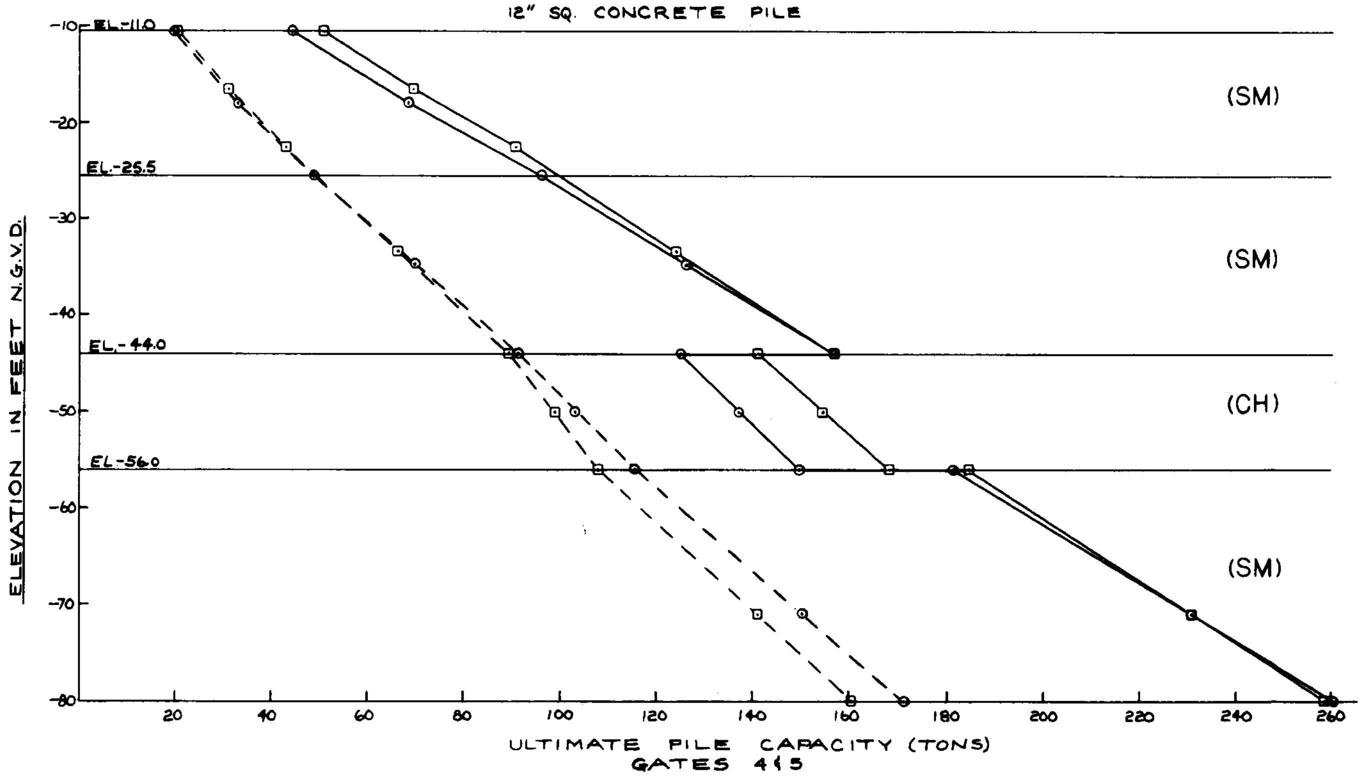
ALLOWABLE PILE CAPACITIES SHOULD BE DETERMINED BY INCORPORATING A FACTOR OF SAFETY EQUAL TO 2.0 WITH A PILE TEST, AND 3.0 WITHOUT A PILE TEST.

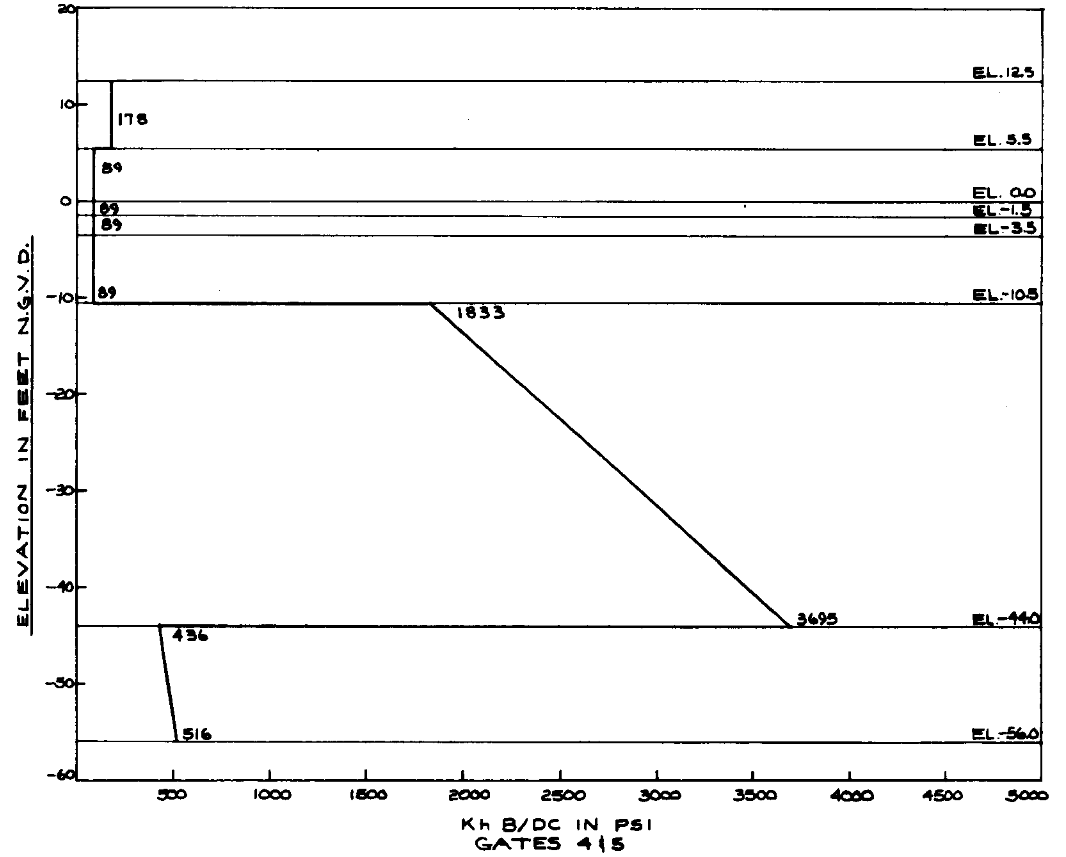
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
PILE CAPACITIES
AND
SUBGRADE MODULI
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 151









D	PILE SPACING IN DIRECTION OF LOADING
1.00	8B
0.85	7B
0.70	6B
0.55	5B
0.40	4B
0.25	3B
C	LOADING CONDITION
1.00	INITIAL LOADING
0.30	CYCLIC LOADING

NOTES

K_h : K_1/B = (0.2222 qu/d)(C)(D) COHESIVE

: 0.4 = Factor of material properties

k_1 : Modulus of subgrade reaction (pci)

B_1 : Width or diameter of pile (in)

K_1 : 0.80 qu = k_1 B_1 (psi)

qu : 2 c = Unconfined compressive strength (psf)

C : Reduction for cyclic loading - not applicable

D : Group effect reduction factor

B : Width of pile measured at right angles to the direction of displacement (in)

K_h : (nh)(Z/B)(C)(D) COHESIONLESS

nh : Coefficient of horizontal subgrade reaction (pci)

Z : Depth below equivalent ground surface (in)

□ = S-CASE
○ = Q-CASE
- - - TENSION
——— COMPRESSION

THE FACTOR SHOWN (MODULUS OF HORIZONTAL SUBGRADE K_h TIMES THE PILE WIDTH IN INCHES (B), MEASURED AT RIGHT ANGLES TO THE DIRECTION OF DISPLACEMENT) MUST BE MODIFIED BY A REDUCTION FACTOR FOR THE EFFECT OF GROUP ACTION (D) AND A REDUCTION FACTOR FOR CYCLIC LOADING (C) EX. $K_h = \frac{222\ (C)(D)}{(B)}$

FOR GENERAL NOTE SEE PLATE 151

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

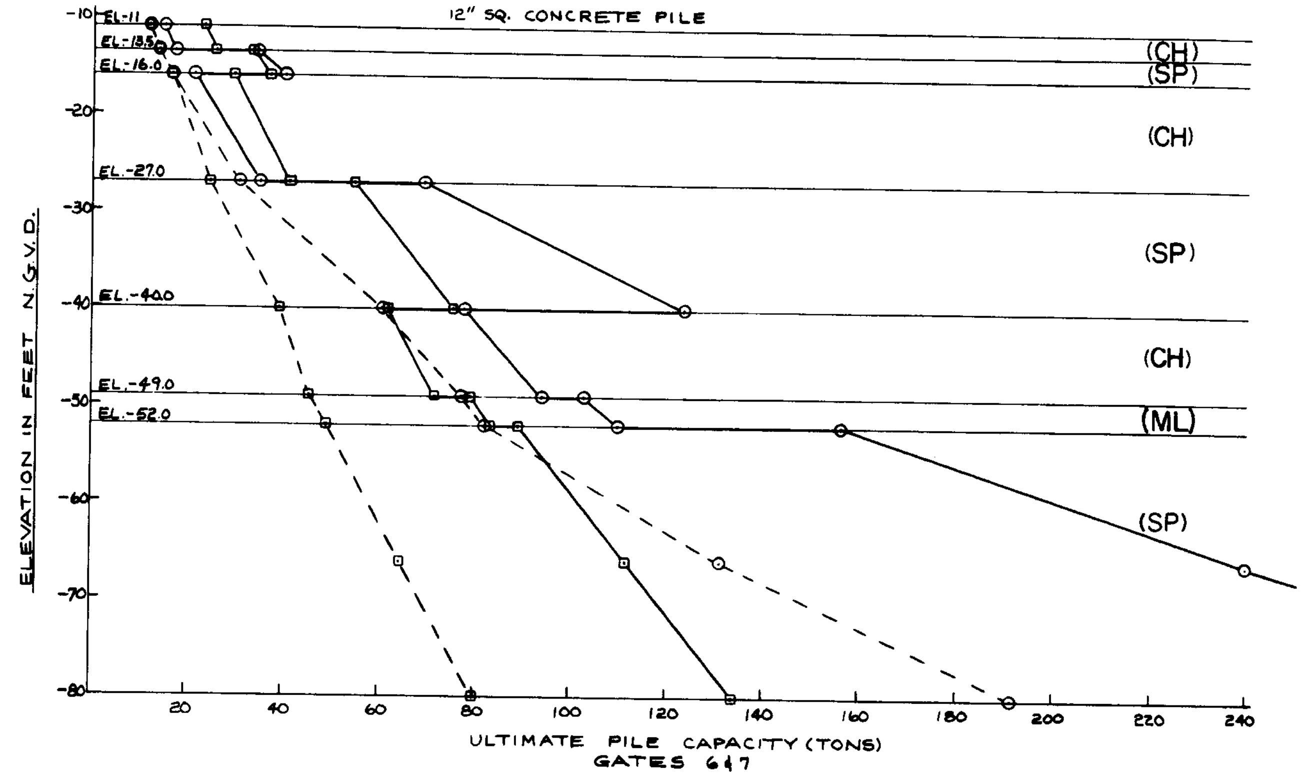
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN

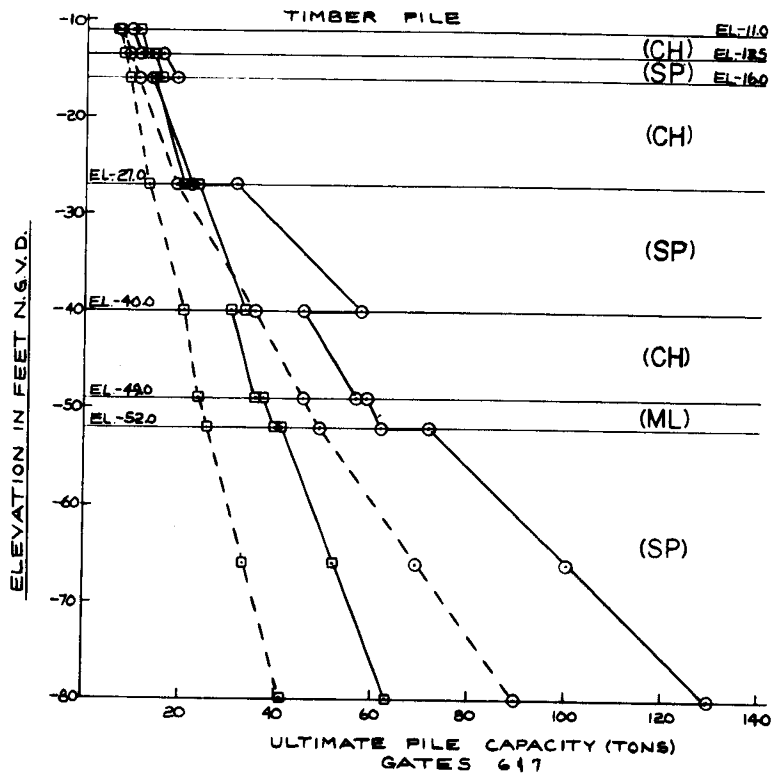
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
PILE CAPACITIES
AND
SUBGRADE MODULI

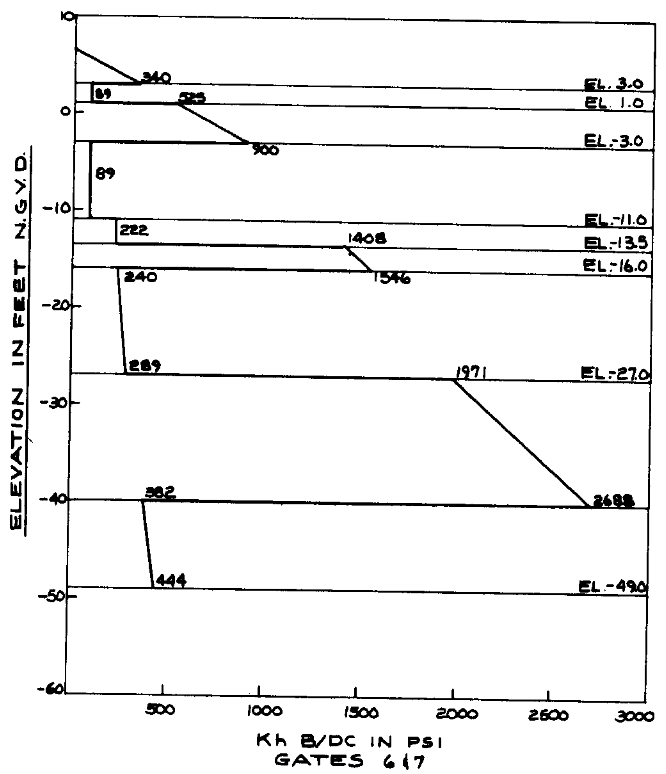
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

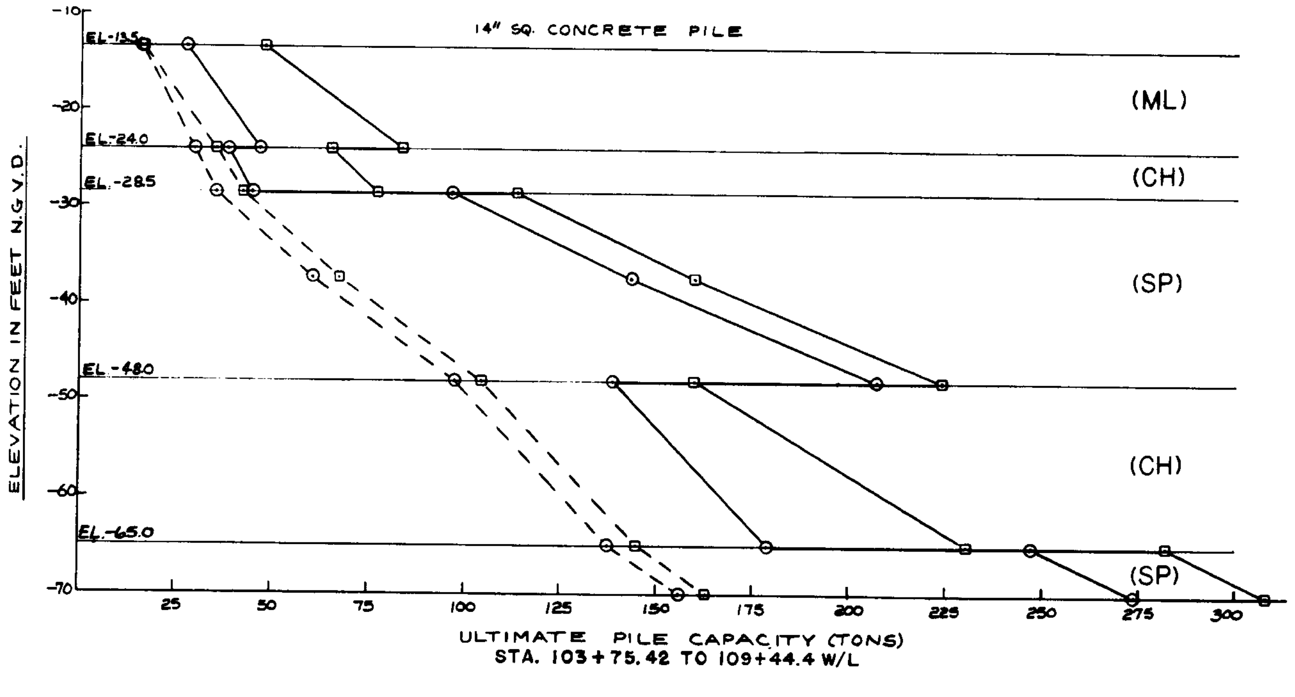
NOVEMBER 1984 FILE NO. H-2-29536

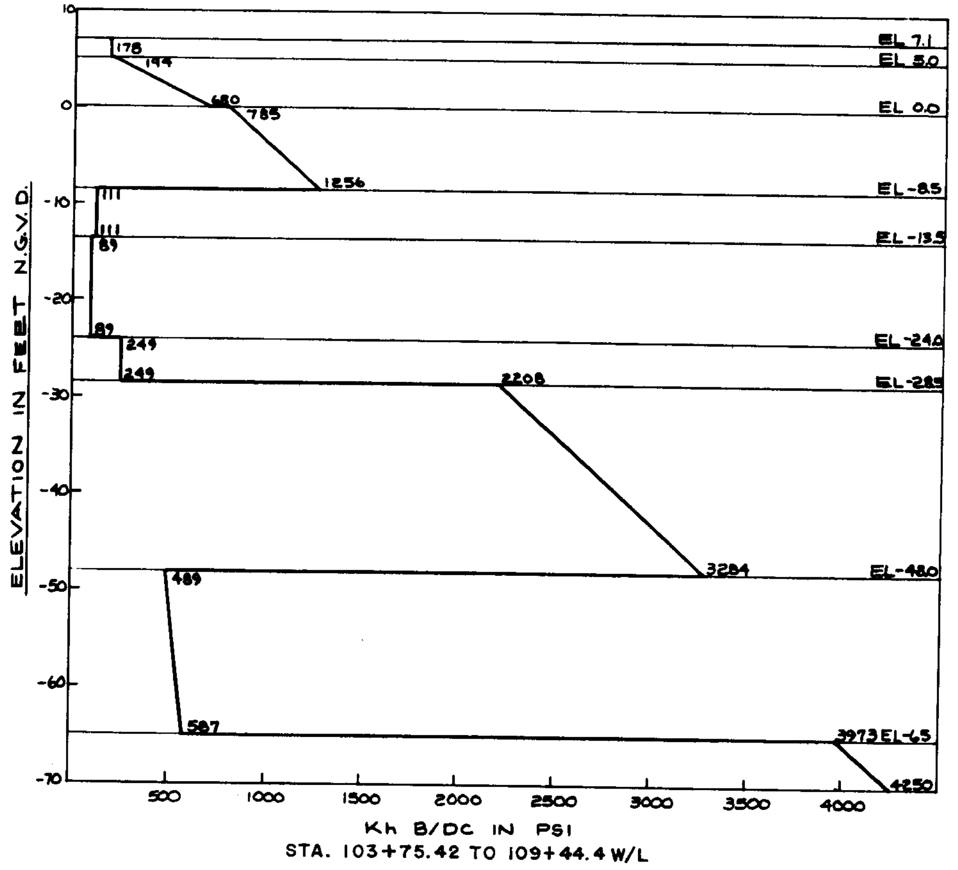
PLATE 152











D	PILE SPACING IN DIRECTION OF LOADING
1.00	8B
0.85	7B
0.70	6B
0.56	5B
0.40	4B
0.25	3B
C	**LOADING CONDITION**
1.00	INITIAL LOADING
0.30	CYCLIC LOADING

□ - S-CASE
○ - Q-CASE
- - - TENSION
——— COMPRESSION

NOTES

K_h = K_1/B = (0.2222 qu/d)(C)(D) COHESIVE
= 0.4 = Factor of material properties
k_1 = Modulus of subgrade reaction (pci)
B_1 = Width or diameter of pile (in)
K_1 = 0.80 qu = $k_1 B_1$ (psi)
qu = 2 c = Unconfined compressive strength (psf)
C = Reduction for cyclic loading - not applicable
D = Group effect reduction factor
B = Width of pile measured at right angles to the direction of displacement (in)
K_h = (nh)(Z/B)(C)(D) COHESIONLESS
nh = Coefficient of horizontal subgrade reaction (pci)
Z = Depth below equivalent ground surface (in)

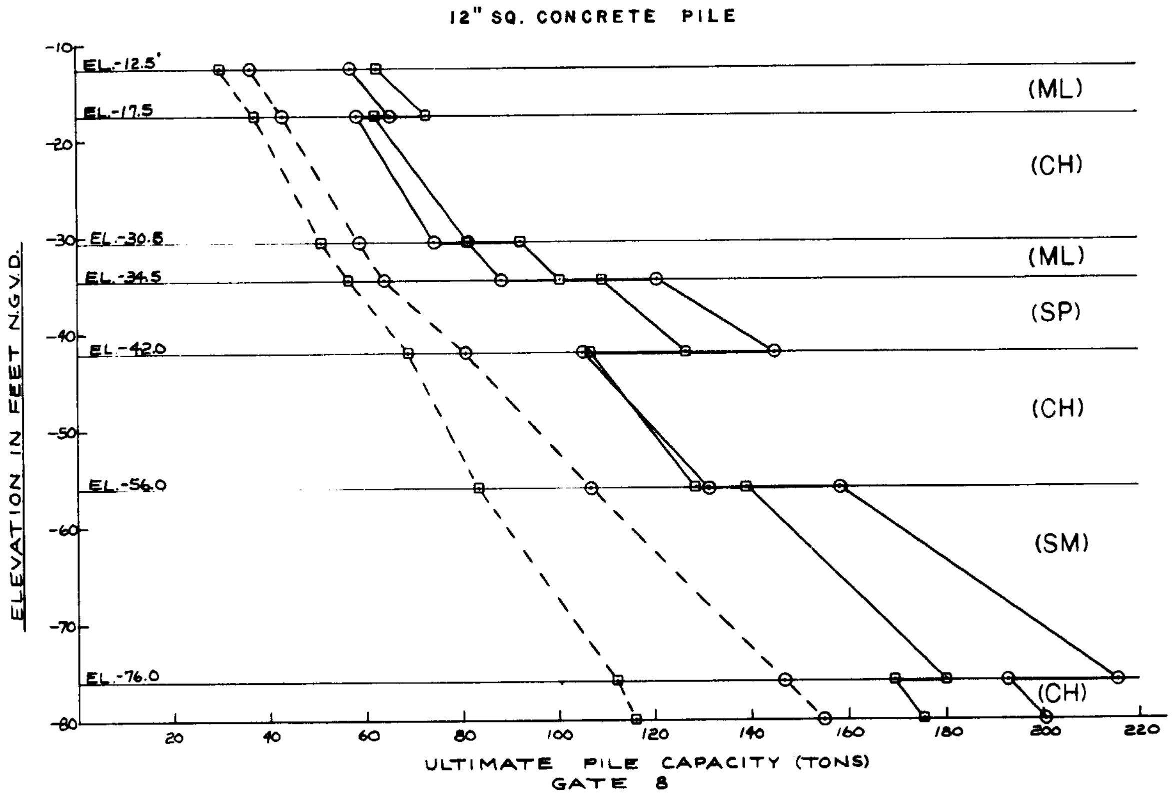
THE FACTOR SHOWN, (MODULUS OF HORIZONTAL SUBGRADE K_h TIMES THE PILE WIDTH IN INCHES (B), MEASURED AT RIGHT ANGLES TO THE DIRECTION OF DISPLACEMENT) MUST BE MODIFIED BY A REDUCTION FACTOR FOR THE EFFECT OF GROUP ACTION (D) AND A REDUCTION FACTOR FOR CYCLIC LOADING (C) EX.: $K_h = \frac{222\,(C)(D)}{(B)}$

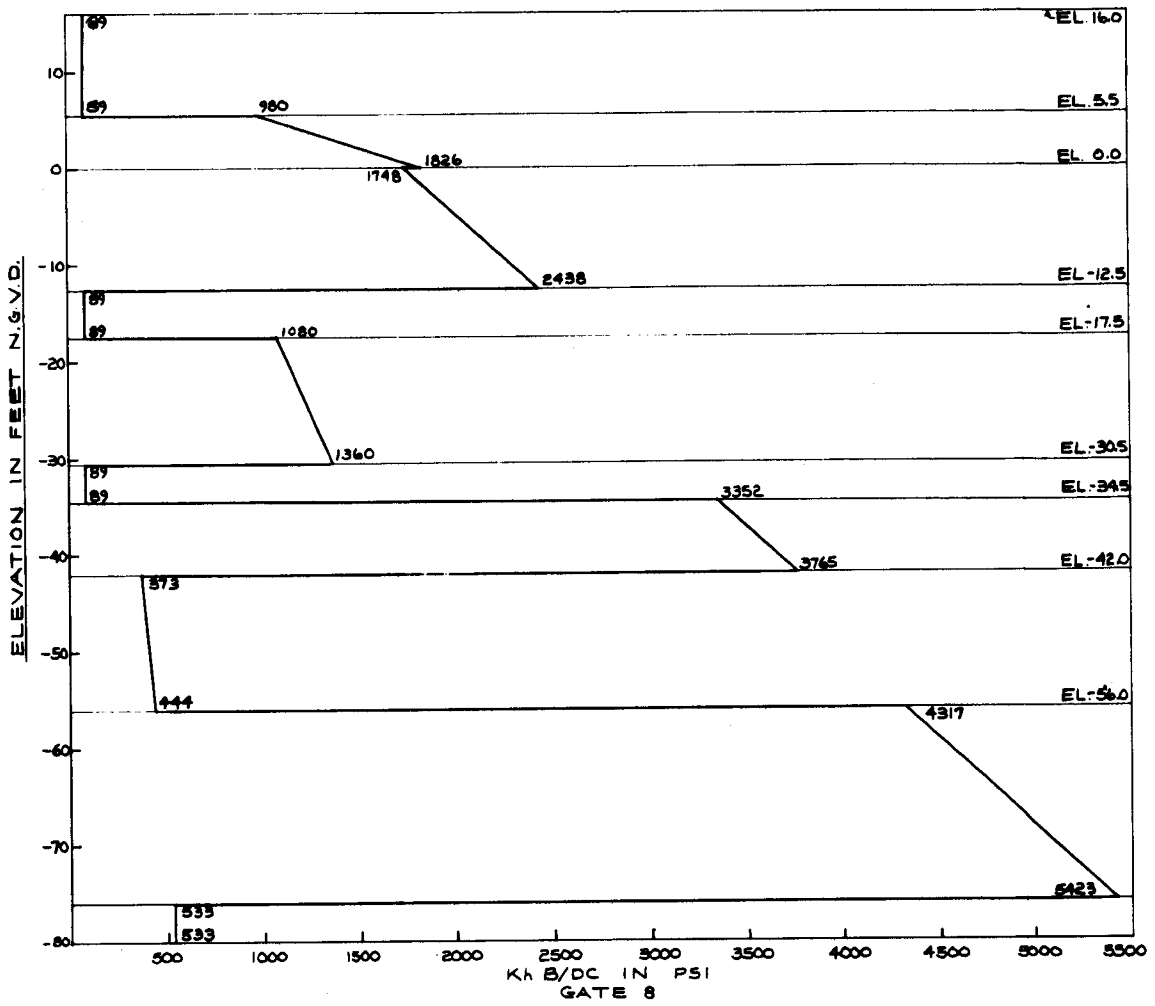
FOR GENERAL NOTE SEE PLATE 151

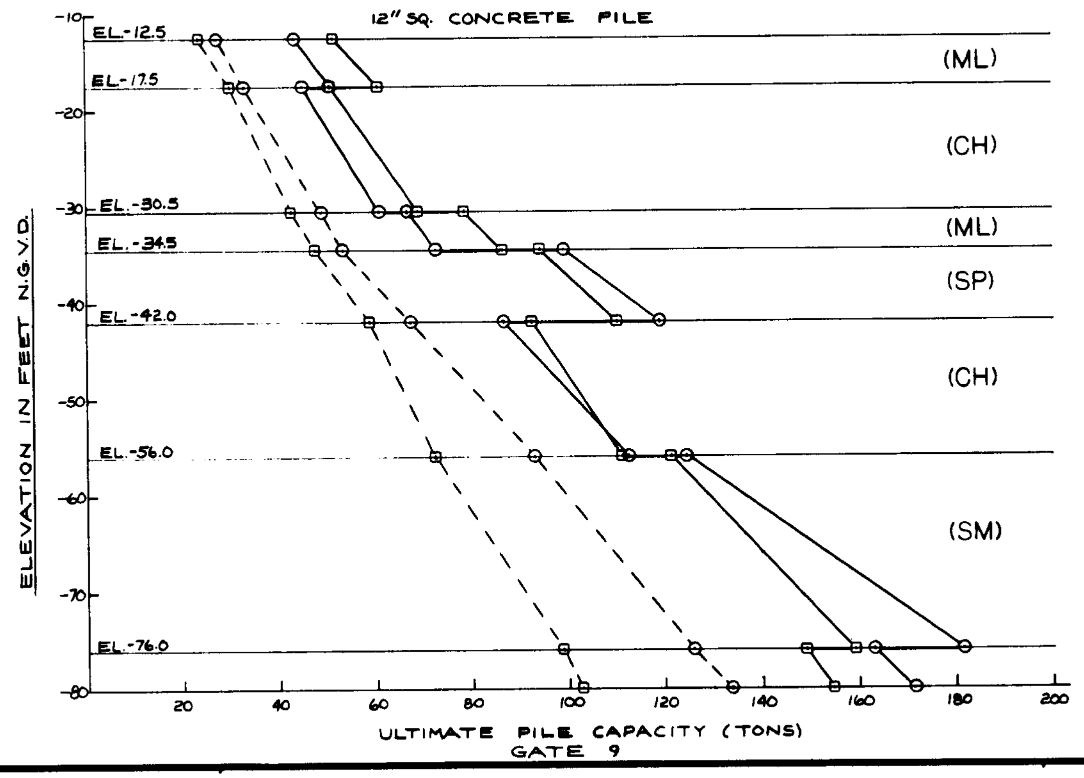
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN

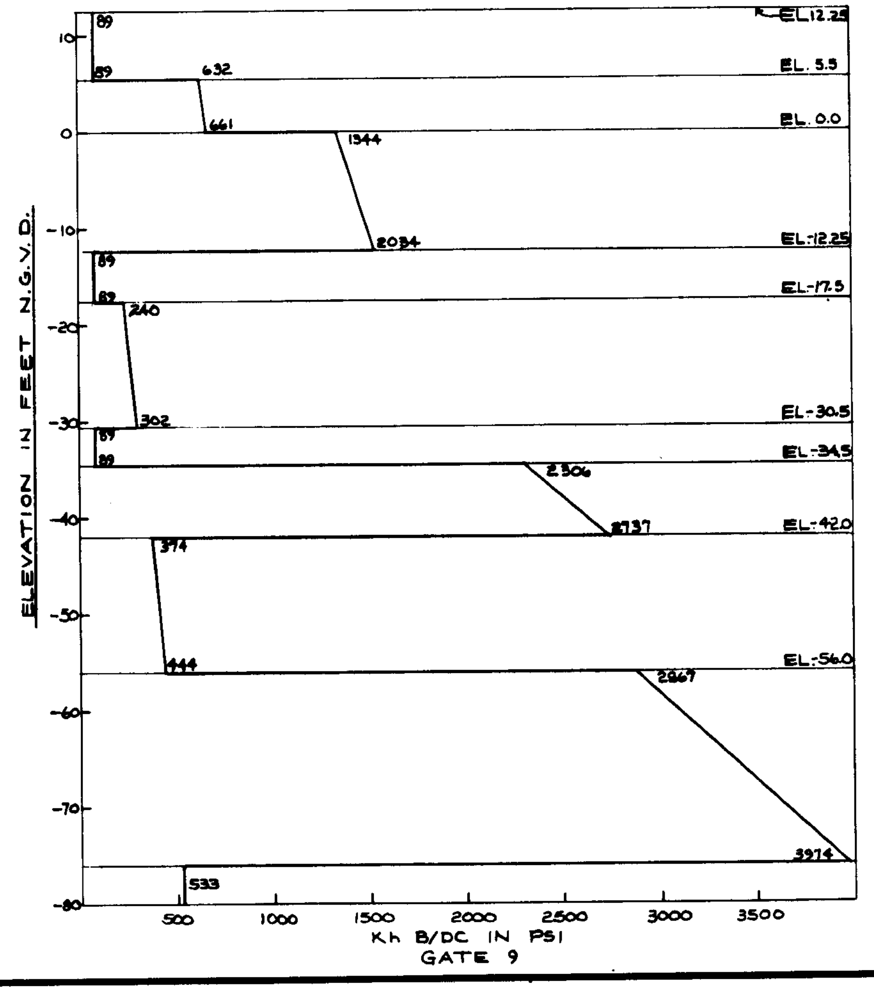
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
PILE CAPACITIES
AND
SUBGRADE MODULI

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536









D	PILE SPACING IN DIRECTION OF LOADING
1.00	8B
0.85	7B
0.70	6B
0.56	5B
0.40	4B
0.25	3B
C	LOADING CONDITION
1.00	INITIAL LOADING
0.50	CYCLIC LOADING

NOTES
K_h : K_i/B = (0.2222 qu/d)(C)(D) COHESIVE
: 0.4 = Factor of material properties
k_i : Modulus of subgrade reaction (pci)
B_i : Width or diameter of pile (in)
K_i : 0.80 qu = k_i B_i (psi)
qu : 2 c = Unconfined compressive strength (psf)
C : Reduction for cyclic loading – not applicable
D : Group effect reduction factor
B : Width of pile measured at right angles to the direction of displacement (in)
K_h : (nh)(Z/B)(C)(D) COHESIONLESS
nh : Coefficient of horizontal subgrade reaction (pci)
Z : Depth below equivalent ground surface (in)

□ = S-CASE
○ = Q-CASE
- - - TENSION
——— COMPRESSION

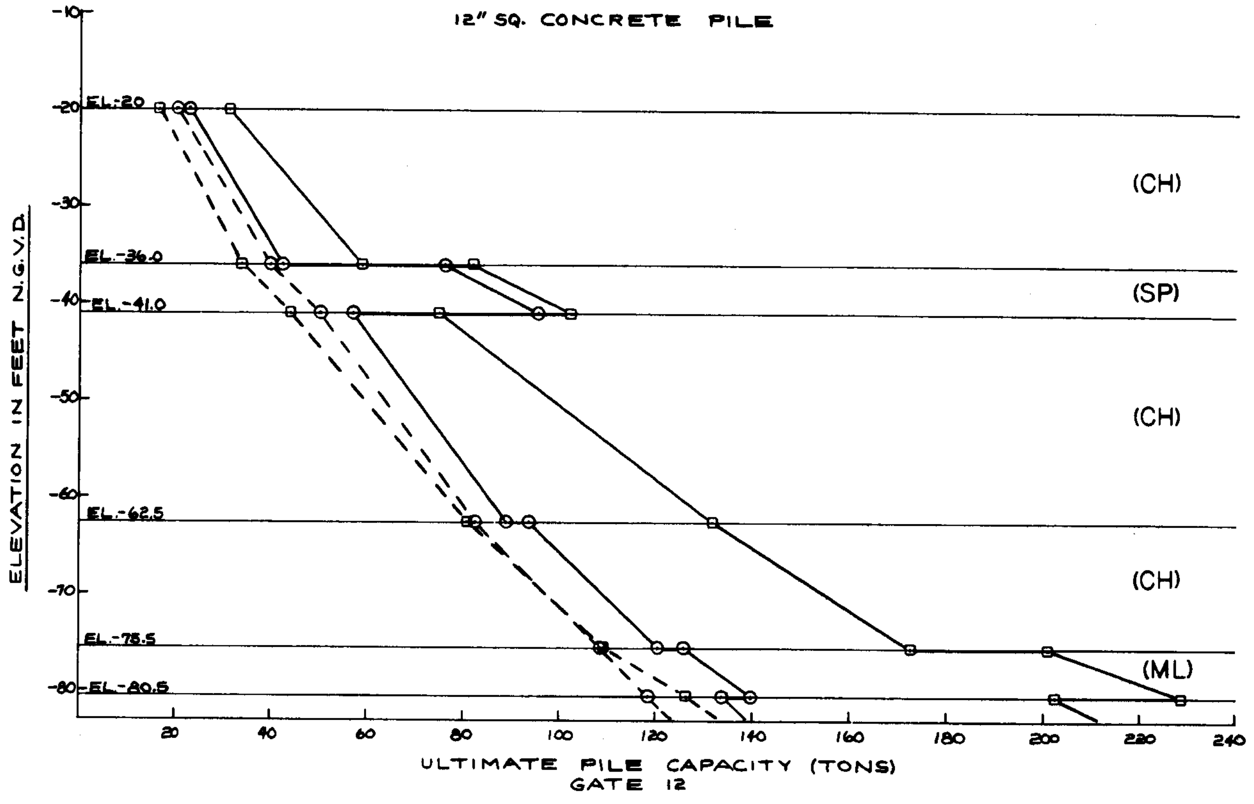
THE FACTOR SHOWN, (MODULUS OF HORIZONTAL SUBGRADE K_h TIMES THE PILE WIDTH IN INCHES (B), MEASURED AT RIGHT ANGLES TO THE DIRECTION OF DISPLACEMENT) MUST BE MODIFIED BY A REDUCTION FACTOR FOR THE EFFECT OF GROUP ACTION (D) AND A REDUCTION FACTOR FOR CYCLIC LOADING (C) EX.; $K_h = \frac{222\,(C)(D)}{(B)}$

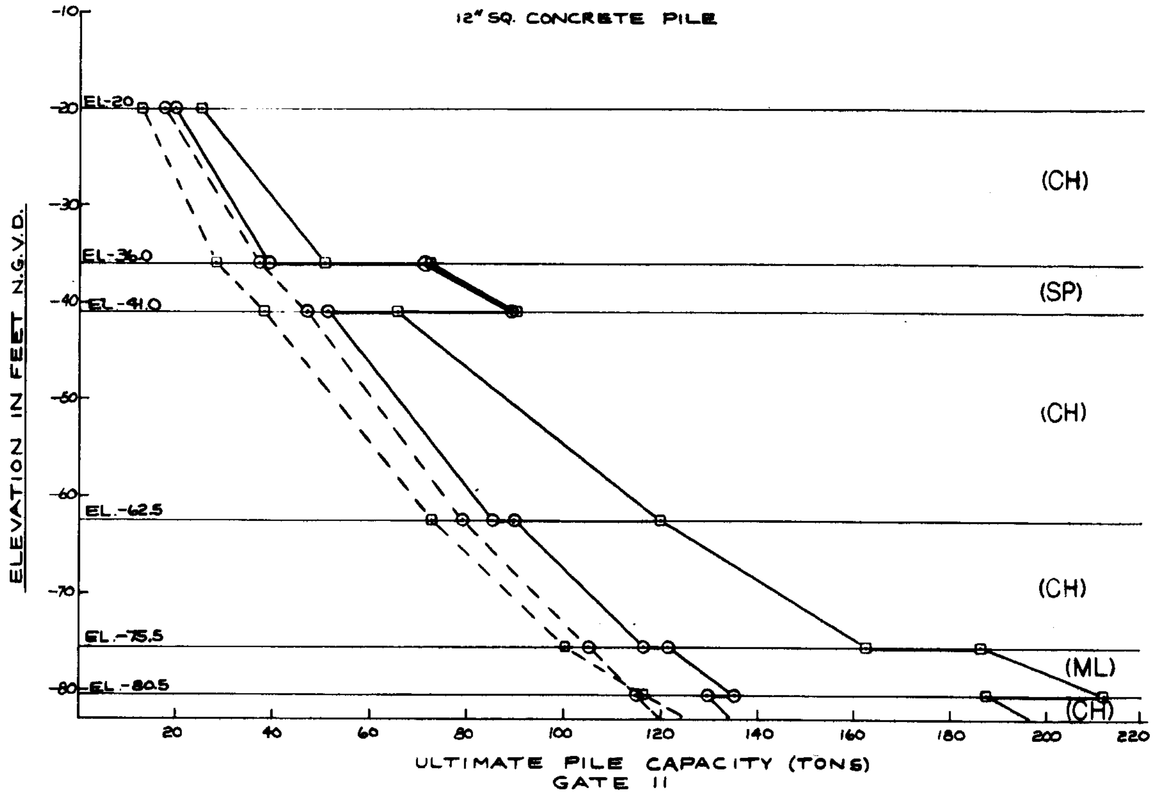
FOR GENERAL NOTE SEE PLATE 151

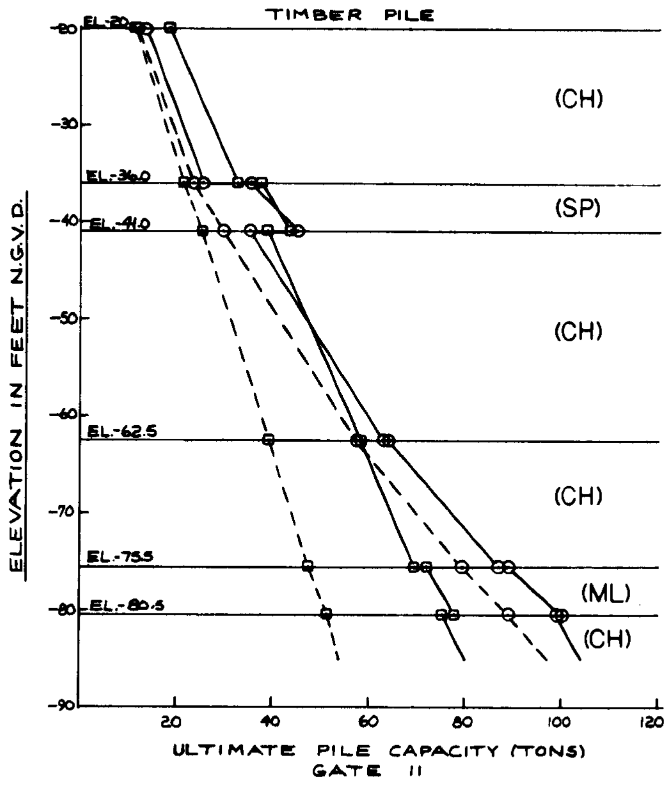
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN

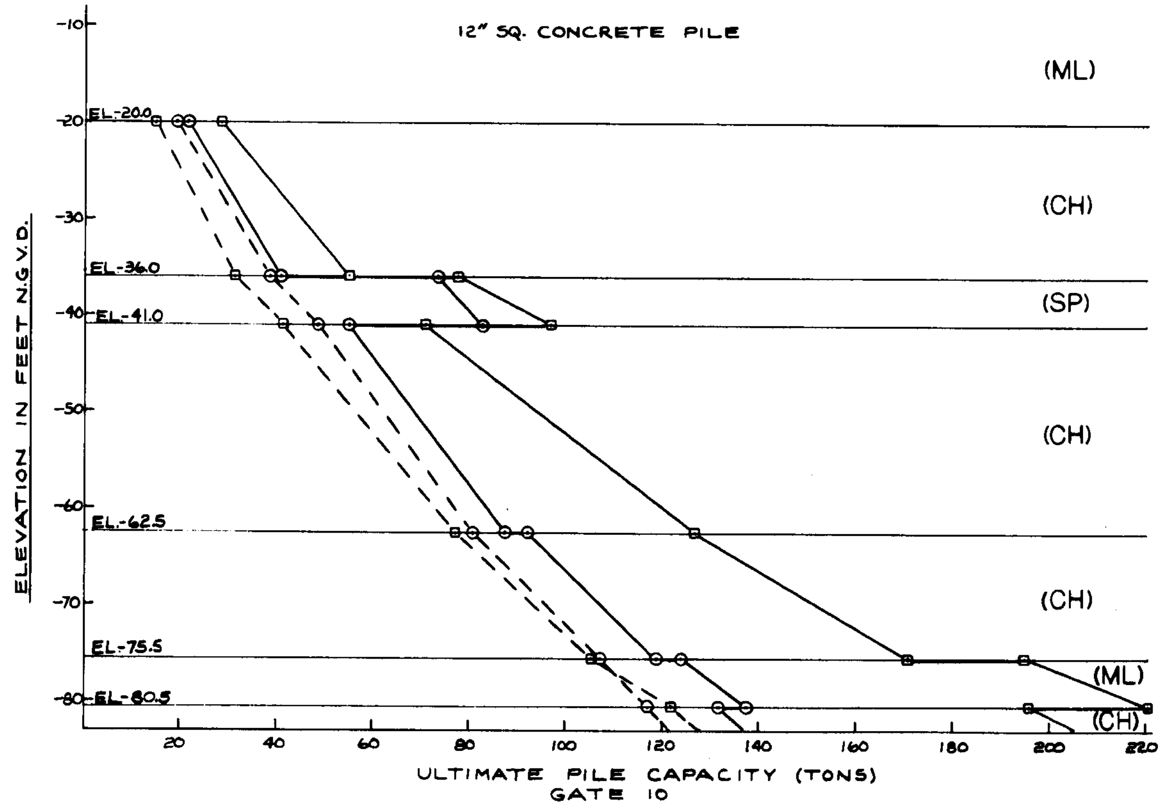
ORLEANS PARISH LAKEFRONT LEVEE WEST OF I.H.N.C. PILE CAPACITIES AND SUBGRADE MODULI

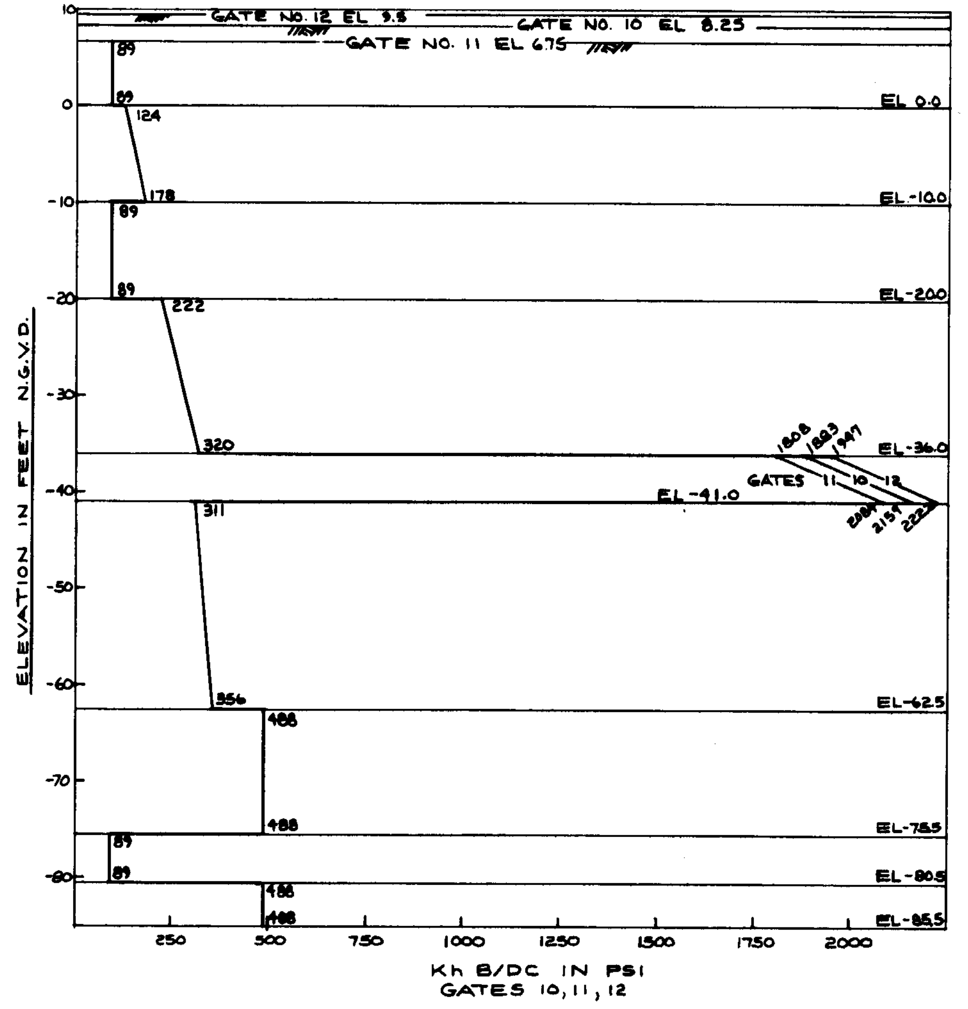
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536











D	PILE SPACING IN DIRECTION OF LOADING
1.00	8B
0.85	7B
0.70	6B
0.56	5B
0.40	4B
0.25	3B
C	LOADING CONDITION
1.00	INITIAL LOADING
0.30	CYCLIC LOADING

NOTES
- K_h = K_i/B = (0.2222 qu/d)(C)(D) COHESIVE
- = 0.4 = Factor of material properties
- k_i = Modulus of subgrade reaction (pci)
- B_i = Width or diameter of pile (in)
- K_i = 0.80 qu = k_i B_i (psi)
- qu = 2c = Unconfined compressive strength (psf)
- C = Reduction for cyclic loading – not applicable
- D = Group effect reduction factor
- B = Width of pile measured at right angles to the direction of displacement (in)
- K_h = (nh)(Z/B)(C)(D) COHESIONLESS
- nh = Coefficient of horizontal subgrade reaction (pci)
- Z = Depth below equivalent ground surface (in)

□ = S-CASE
○ = Q-CASE
- - - TENSION
——— COMPRESSION

THE FACTOR SHOWN, (MODULUS OF HORIZONTAL SUBGRADE K_h TIMES THE PILE WIDTH IN INCHES (B), MEASURED AT RIGHT ANGLES TO THE DIRECTION OF DISPLACEMENT) MUST BE MODIFIED BY A REDUCTION FACTOR FOR THE EFFECT OF GROUP ACTION (D) AND A REDUCTION FACTOR FOR CYCLIC LOADING (C) EX; $K_h = \frac{222\,(C)(D)}{(B)}$

FOR GENERAL NOTE SEE PLATE 151

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

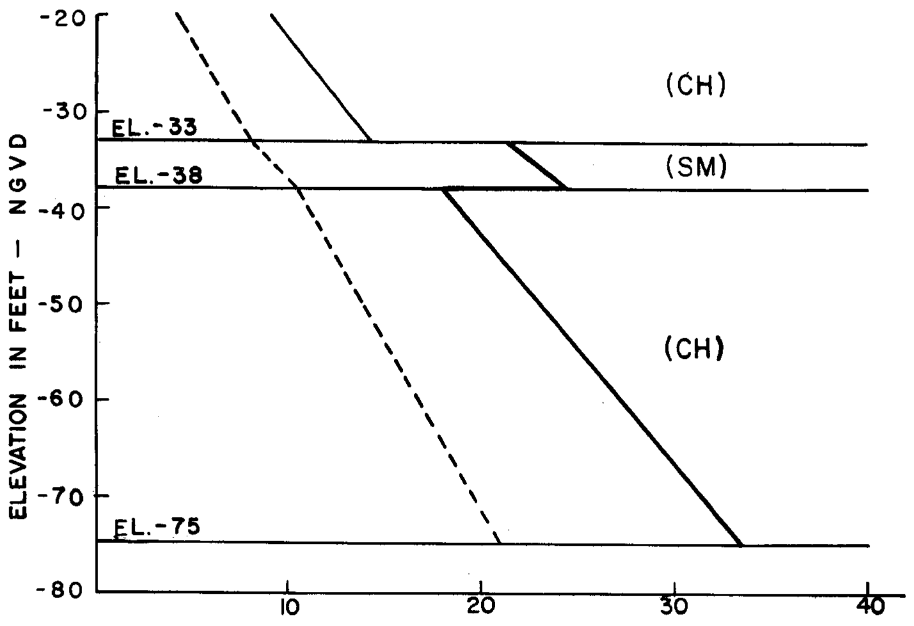
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN

ORLEANS PARISH LAKEFRONT LEVEE WEST OF I.H.N.C.

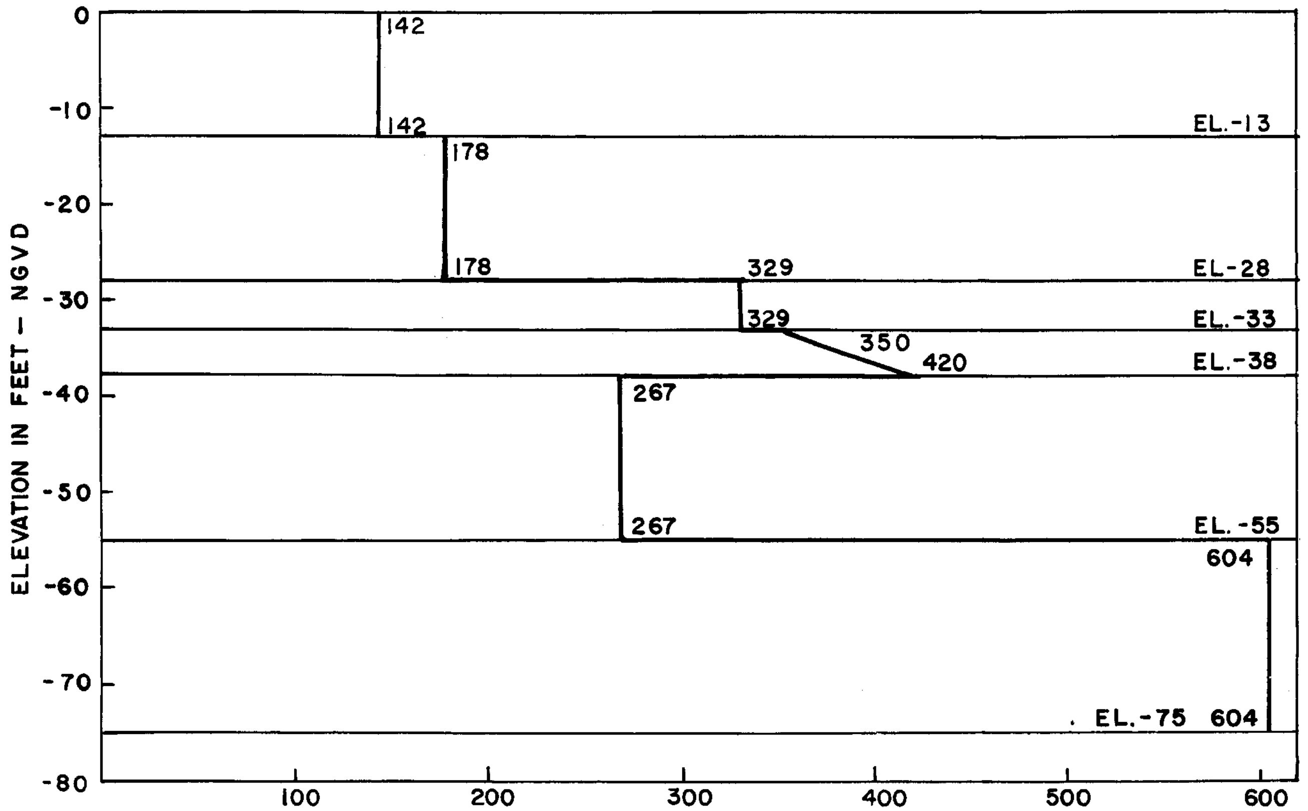
PILE CAPACITIES AND SUBGRADE MODULI

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

NOVEMBER 1984 FILE NO. H-2-29536



ULTIMATE PILE CAPACITY (TONS)
STA. 408 + 54.56 TO 411 + 08.06 W/L



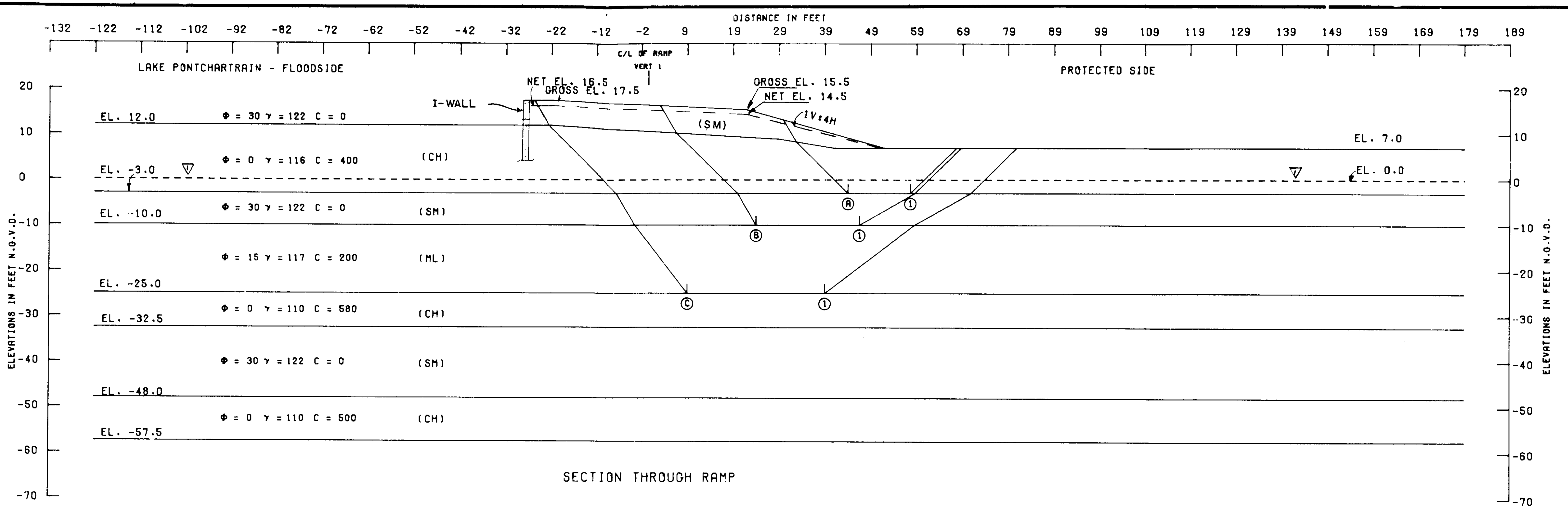
Kh B/DC IN PSI
STA. 408 + 54.56 TO 411 + 08.06 W/L

FOR ALL NOTES SEE PLATE 151

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

PILE CAPACITIES, SUBGRADE MODULI

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOV. 1984 FILE NO. H-2-29536



SECTION THROUGH RAMP

ASSUMED FAILURE NO.	SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
(A) (1)	-3.0	9934	5440	8000	12268	5800	23374	6468	3.610
(B) (1)	-10.0	22329	16326	25132	39735	17210	63787	22526	2.830
(C) (1)	-25.0	46782	17400	52743	103858	62518	116925	41340	2.830

ADDITIONAL NOTES:

1. CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE BORINGS SHOWN ON PLATE NO. 67

2. ∇ - ∇ PIEZOMETRIC HEAD LINE USED FOR STABILITY ANALYSIS.

NOTES

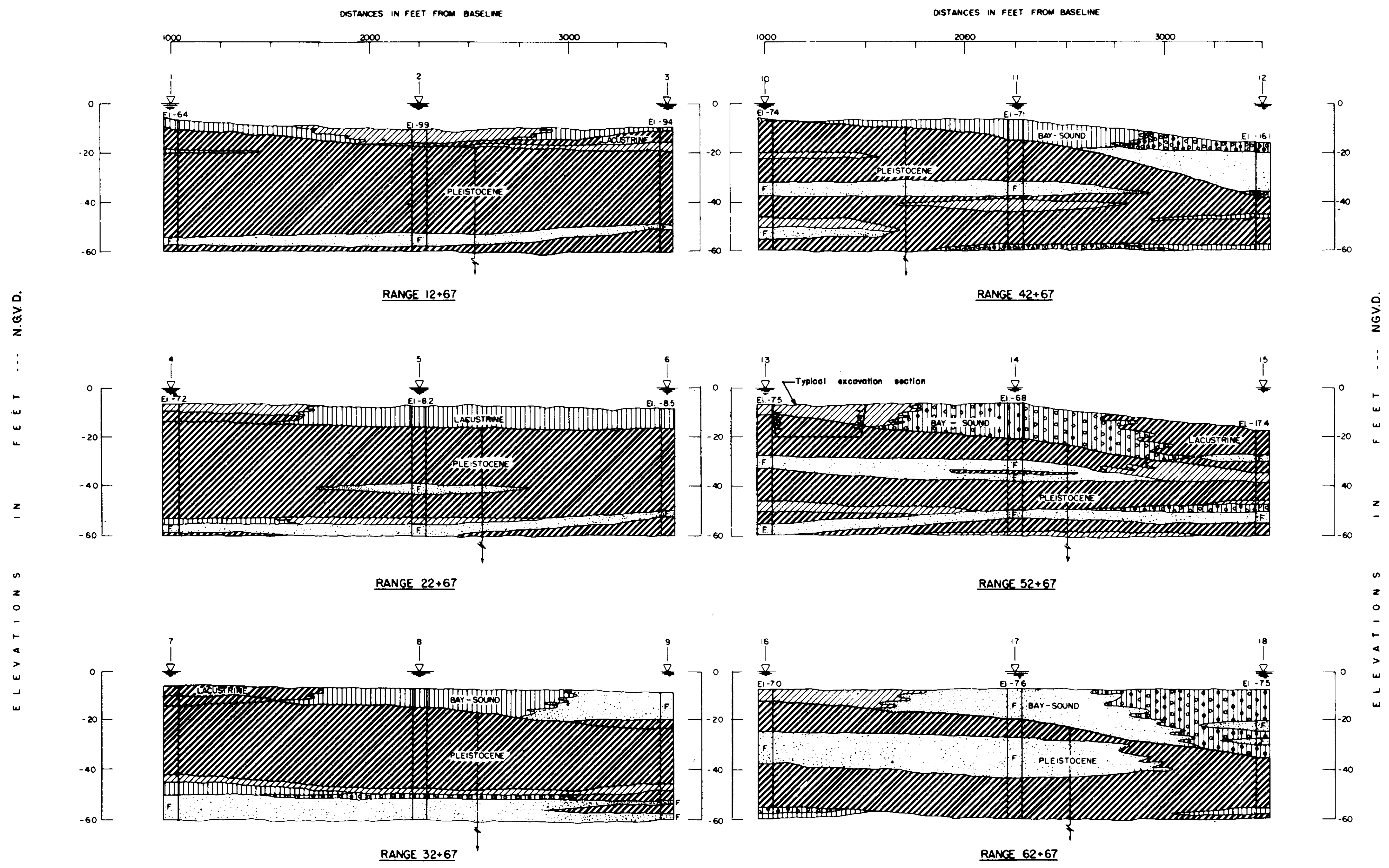
Φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
∇ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

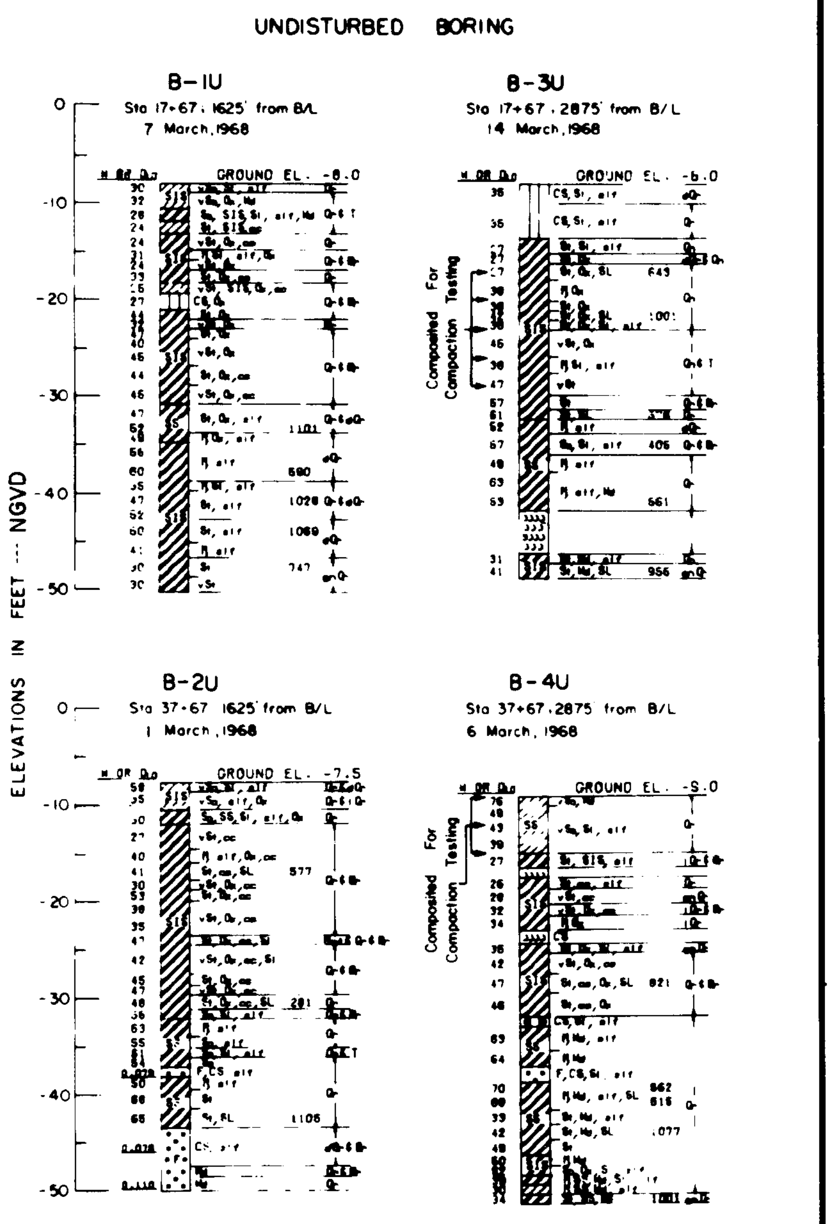
LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

RAMP (Q) SHEAR STABILITY
STA. 200+62.41 TO STA. 204+58.21 W/L

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536



SOIL BORING SECTIONS



LEGEND (Soil Boring Sections)

- CH - Fat Clay
- CL - Lean Clay
- ML - Silt
- SM - Silty Sand
- SP - Fine Sand

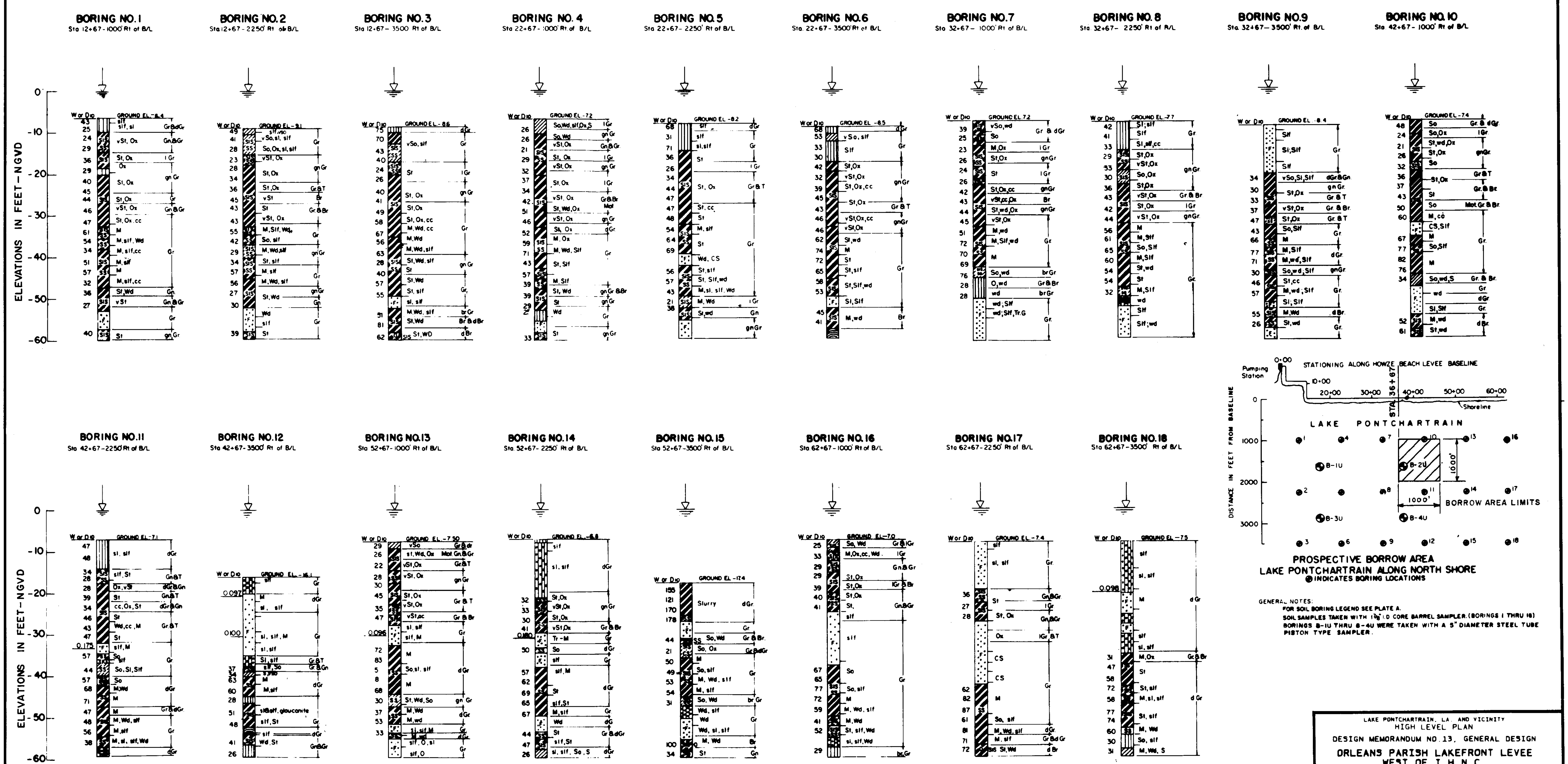
RECENT:
- Lacustrine - soft to very soft lean clay and fat clay with silty sand and sand, and with shell and shell fragments
- Bay-Sound - silt, silty sand and sand with shell and shell fragments

PLEISTOCENE - stiff to very stiff clays with layers and lenses silt and sand

Soil samples taken with 1 7/8 inch I.D. core barrel.
See PLATE A for soil boring legend
See PLATE for location of borings

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.
BORROW AREA
PIT AREA IN HOWZE BEACH
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE 158



LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF I.H.N.C.

BORROW AREA
PIT AREA IN HOWZE BEACH

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

UNIFIED SOIL CLASSIFICATION

MAJOR DIVISION		TYPE	LETTER SYMBOL	SYMBOL	TYPICAL NAMES
COARSE - GRAINED SOILS More than half of material is larger than No 200 sieve size	GRAVELS More than half of coarse fraction is larger than No 4 sieve size	CLEAN GRAVEL (Little or No Fines)	GW		GRAVEL, Well Graded, gravel-sand mixtures, little or no fines
			GP		GRAVEL, Poorly Graded, gravel-sand mixtures, little or no fines
		GRAVEL WITH FINES (Appreciable Amount of Fines)	GM		SILTY GRAVEL, gravel-sand-silt mixtures
			GC		CLAYEY GRAVEL, gravel-sand-clay mixtures
	SANDS More than half of coarse fraction is smaller than No 4 sieve size	CLEAN SAND (Little or No Fines)	SW		SAND, Well-Graded, gravelly sands
			SP		SAND, Poorly-Graded, gravelly sands
		SANDS WITH FINES (Appreciable Amount of Fines)	SM		SILTY SAND, sand-silt mixtures
			SC		CLAYEY SAND, sand-clay mixtures
FINE - GRAINED SOILS More than half the material is smaller than No. 200 sieve size		SILTS AND CLAYS (Liquid Limit < 50)	ML		SILT & very fine sand, silty or clayey fine sand or clayey silt with slight plasticity
			CL		LEAN CLAY; Sandy Clay; Silty Clay; of low to medium plasticity
			OL		ORGANIC SILTS and organic silty clays of low plasticity
		SILTS AND CLAYS (Liquid Limit > 50)	MH		SILT, fine sandy or silty soil with high plasticity
			CH		FAT CLAY, inorganic clay of high plasticity
			OH		ORGANIC CLAYS of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS			Pt		PEAT, and other highly organic soil
WOOD			Wd		WOOD
SHELLS			Sl		SHELLS
NO SAMPLE					

NOTE: Soils possessing characteristics of two groups are designated by combinations of group symbols

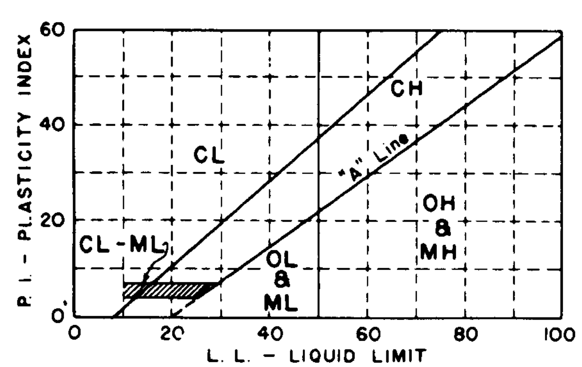
DESCRIPTIVE SYMBOLS

COLOR

COLOR	SYMBOL
TAN	T
YELLOW	Y
RED	R
BLACK	BK
GRAY	Gr
LIGHT GRAY	lGr
DARK GRAY	dGr
BROWN	Br
LIGHT BROWN	lBr
DARK BROWN	dBr
BROWNISH-GRAY	br Gr
GRAYISH-BROWN	gy Br
GREENISH-GRAY	gn Gr
GRAYISH-GREEN	gy Gn
GREEN	Gn
BLUE	Bl
BLUE-GREEN	Bl Gn
WHITE	Wh
MOTTLED	Mot

CONSISTENCY FOR COHESIVE SOILS

CONSISTENCY	COHESION IN LBS./SQ.FT. FROM UNCONFINED COMPRESSION TEST	SYMBOL
VERY SOFT	< 250	vSo
SOFT	250 - 500	So
MEDIUM	500 - 1000	M
STIFF	1000 - 2000	St
VERY STIFF	2000 - 4000	vSt
HARD	> 4000	H



PLASTICITY CHART

For classification of fine - grained soils

MODIFICATIONS

MODIFICATION	SYMBOL
Traces	Tr-
Fine	F
Medium	M
Coarse	C
Concretions	cc
Rootlets	rt
Lignite fragments	lg
Shale fragments	sh
Sandstone fragments	sds
Shell fragments	slf
Organic matter	O
Clay strata or lenses	CS
Silt strata or lenses	SIS
Sand strata or lenses	SS
Sandy	S
Gravelly	G
Boulders	B
Slickensides	SL
Wood	Wd
Oxidized	Ox

NOTES:

FIGURES TO LEFT OF BORING UNDER COLUMN "W OR D_{10}"

Are natural water contents in percent dry weight

When underlined denotes D_{10} size in mm *

FIGURES TO LEFT OF BORING UNDER COLUMNS "LL" AND "PL"

Are liquid and plastic limits, respectively

SYMBOLS TO LEFT OF BORING

▽ Ground-water surface and date observed

(C) Denotes location of consolidation test **

(S) Denotes location of consolidated-drained direct shear test **

(R) Denotes location of consolidated-undrained triaxial compression test **

(Q) Denotes location of unconsolidated-undrained triaxial compression test **

(T) Denotes location of sample subjected to consolidation test and each of the above three types of shear tests **

FW Denotes free water encountered in boring or sample

FIGURES TO RIGHT OF BORING

Are values of cohesion in lbs./sq.ft. from unconfined compression tests

In parenthesis are driving resistances in blows per foot determined with a standard split spoon sampler (1⅜" I.D., 2" O.D.) and a 140 lb. driving hammer with a 30" drop

Where underlined with a solid line denotes laboratory permeability in centimeters per second of undisturbed sample

Where underlined with a dashed line denotes laboratory permeability in centimeters per second of sample remoulded to the estimated natural void ratio

* The D_{10} size of a soil is the grain diameter in millimeters of which 10% of the soil is finer, and 90% coarser than size D_{10}.

**Results of these tests are available for inspection in the U.S. Army Engineer District Office, if these symbols appear beside the boring logs on the drawings.

GENERAL NOTES:

While the borings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local variations characteristic of the subsurface materials of the region are anticipated and, if encountered, such variations will not be considered as differing materially within the purview of clause 4 of the contract.

Ground-water elevations shown on the boring logs represent ground-water surfaces encountered on the dates shown. Absence of water surface data on certain borings implies that no ground-water data is available, but does not necessarily mean that ground water will not be encountered at the locations or within the vertical reaches of these borings.

Consistency of cohesive soils shown on the boring logs is based on driller's log and visual examination and is approximate, except within those vertical reaches of the borings where shear strengths from unconfined compression tests are shown.

REVISION	DATE	DESCRIPTION	BY
3	5-3-71	ADDED UPPER LIMIT LINE (PI=0.9(LL-8)) ON PLASTICITY CHART	LMVED-G LETTER DTD 29 APRIL 1971
2	6-8-64	SYMBOL FW, NOTE REVISED	ORAL FROM LMVGG 5 JUNE 1964
1	9-17-63	1ST PAR OF GENERAL NOTES REVISED	LMVD MULTIPLE LETTER, DATED 5 SEPT. 1963

SOIL BORING LEGEND

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
FILE NO. H-2-21800

LAKE PONTCHARTRAIN, LOUISIANA & VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13 GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF IHNC

APPENDIX A

HYDROLOGY AND HYDRAULICS

Lake Pontchartrain, Louisiana & Vicinity
High Level Plan
Design Memorandum No. 13 General Design
Orleans Parish Lakefront Levee
West of IHNC
Hydrology and Hydraulics

Appendix A

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TABLES OF CONTENTS (cont'd)

PLATES

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TABLES

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13 - GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF IHNC

APPENDIX A
HYDROLOGY AND HYDRAULICS

SECTION I - ANALYSIS

I-1. General. This appendix presents all hydrologic and hydraulic design criteria and analyses associated with the Orleans Parish Lakefront levee. The overall plan of improvement is described in detail in the main body of this memorandum and references to the main text are cited where appropriate.

I-2. Description. The project area is located in southeastern Louisiana within the city limits of New Orleans. The dominant topographic feature is Lake Pontchartrain, a shallow tidal basin approximately 640 square miles in area and 12 feet in depth. Lake Pontchartrain is connected to the Gulf of Mexico through the Rigolets and Chef Menteur Passes, Lake Borgne, and Mississippi and Chandeleur Sounds, and is connected with lesser Lake Maurepas to the west by Pass Manchac.

West of the IHNC, the city of New Orleans is almost completely developed. The area is relatively flat, even though elevations range from 13 feet n.g.v.d. (national geodetic vertical datum of 1929) near the Mississippi River Levee to -8 feet n.g.v.d. near the lake. Storm water drainage is accomplished by a network of subsurface drainage pipes and open canals which convey the water to 8 pumping stations located throughout this portion of the city. In the central city two pumping stations located on Broad Street pump their runoff to two other pumping stations which rehandle the storm water and discharge into Lake Pontchartrain. These inferior stations pump 4950 cfs and 3330 cfs, respectively, into the Metairie and Orleans Avenue Canals. Another of the city's pumping stations discharges 2360 cfs underneath the IHNC into Bayou Bienvenue. The fourth station located in the Metairie Canal between Orleans and Jefferson Parishes discharges 6650 cfs into Lake Pontchartrain. The fifth station at the New Basin Canal discharges 1000 cfs into a culvert through the Orleans lakefront levee near its western end at the Orleans Marina. The remaining three stations are situated on the London and Orleans Canals. These stations are located several miles inland of the Orleans Lakefront levee. Therefore the canals which carry their runoff are lined with the levees and floodwalls to provide protection from high lake stages to the surrounding populated areas. The levees tie into the Orleans lakefront levee alinement near the lakeshore. The pumping station on the Orleans canal discharges 2850 cfs into the lake via the canal. The London Canal receives runoff from two separate stations, one at the head of the canal and one at Prentiss Avenue, with a total capacity of 8350 cfs.

The new hurricane protection levee will not interfere with the operation of these pumping stations. The entire area is subject to periodic inundation from hurricane surges and rainfall flooding. The study area is depicted on Plate A-1.

I-3. Climatology.

a. Climate. The project area is located in a subtropical latitude having mild winters and hot, humid summers. During the summer, prevailing southerly winds produce conditions favorable for convective thundershowers. In the colder seasons, the area experiences frontal passages which produce squalls and sudden temperature drops. River fogs are prevalent in the winter and spring when the temperature of the Mississippi River is somewhat colder than the air temperature. Climatological data for the area are contained in monthly and annual publications by the U. S. Department of Commerce, Weather Bureau, titled "Climatological Data for Louisiana," and "Local Climatological Data, New Orleans, La." Table A-1 lists active meteorolgical stations in and adjacent to the study area. These stations are also shown on the map in Plate A-2.

TABLE A-1
METEOROLOGIC STATIONS

MAP INDEX NO. (PLATE 2)	PRECIPTATION AND TEMPERATURE STATIONS	LENGTH OF RECORD (YRS) Precipitation	Temperature
1	NEW ORLEANS - AUDUBON - PARK	92	92
2	NEW ORLEANS - MOISANT AIRPORT	28	92
3	RESERVE (NR)	80	80
4	SLIDELL	25	25
5	DONALDSONVILLE (NR)	92	93
6	LOUISIANA NATURE CENTER	2	2
7	PARADIS (NR)	67	27

TABLE A-1 (cont.)
METEOROLOGIC STATIONS

MAP INDEX NO. (PLATE 2)	PRECIPITATION AND TEMPERATURE STATIONS	LENGTH OF RECORD (YRS) Precipitation	Temperature
OMS	HAMMOND (NR)	85	86
OMS	ST. BERNARD (NR)	16	16
OMS	COVINGTON	88	88
OMS	CARVILLE (NR)	43	42
OMS	BATON ROUGE AIRPORT	113	93
	RECORDING PRECIPITATION STATIONS		
8	NEW ORLEANS ALGIERS	82	—
9	NEW ORLEANS DPS 14 - CITRUS	27	—
10	NEW ORLEANS WATER PLANT - DUBLIN	88	—
11	NEW ORLEANS DPS 5 - JOURDAN	48	—
12	NEW ORLEANS DPS 3 - LONDON	88	—
13	NEW ORLEANS DPS 6 - METAIRIE	33	—
14	GONZALES	4	—
	NON-RECORDING PRECIPITATION STATIONS		
15	NEW ORLEANS CITY HALL	4	—
OMS	BATON ROUGE CENTRAL	3	—
OMS	ABITA SPRINGS FIRE TOWER	9	—

LEGEND: NR NON-RECORDING
OMS - OFF MAP STATION

b. Temperature. New Orleans has temperature records extending as far back as 1871. From temperature normals over the period 1951-1980, the mean annual temperature is 69.5°F. Extremes over the period of record are 7°F and 102°F. The average temperature in summer is 82.4°F and in the winter is 55.3°F. Temperature normals (1951-1980) for the New Orleans gage at Audubon Park Station are shown in Table A-2. Station locations are provided on the map in Plate A-2.

TABLE A-2
MONTHLY TEMPERATURE (°F)
NEW ORLEANS AT AUDUBON PARK
30-YEAR NORMALS (1951-80)

MONTH	MEAN	MAXIMUM	MINIMUM
JAN	53.6	61.8	45.3
FEB	56.1	64.6	47.6
MAR	62.6	71.0	54.1
APR	69.8	78.3	61.2
MAY	76.0	84.2	67.7
JUN	81.3	89.4	73.2
JUL	83.0	90.6	75.3
AUG	82.8	90.3	75.3
SEP	79.8	87.0	72.6
OCT	70.8	79.5	62.1
NOV	61.6	70.1	53.1
DEC	56.2	64.5	47.8
ANNUAL	69.5		

EXTREME MINIMUM: 7°F, 13 February 1899
EXTREME MAXIMUM: 102°F, 30 June 1954 (also other dates)

c. Rainfall. Precipitation is generally heavy in two fairly definite rainy periods. Summer showers occur from about mid-June to mid-September, and heavy winter rains generally occur from mid-December to mid-March. The drainage area tributary to Lake Pontchartrain is served by 34 precipitation stations of the U. S. Weather Bureau, with perids of record ranging from 2 to 113 years. Based on the 30-year normals for the period 1951-1980 and from the U.S. Weather Bureau station New Orleans at Audubon, the annual normal preciptation is 61.6 inches, with variations of plus or minus 50 percent. Extreme monthly rainfalls exceeding 12 inches are not uncommon, and as much as 25 inches have been recorded in a single month. Average monthly normal rainfalls range from a normal 7.2 inches in July to a normal of 2.52 inches in October. Several stations have experienced calendar months in which no rainfall was recorded. Snow occurs infrequently in the area. An 8.2-inch snowfall occurred in New Orleans on 14-15 February 1895. The last measurable snowfall occurred on 31 December 1963 when 4.5 inches fell in New Orleans. Table A-3 gives the 30 year normals for the New Orleans at Audubon station along with the monthly maximum and minimum totals during the normal period. Location of the precipitation stations are shown on Plate A-2.

TABLE A-3
MONTHLY RAINFALL (INCHES)
NEW ORLEANS AT AUDUBON
30-YEAR NORMALS (1951-1980)

MONTH	NORMAL	MAXIMUM	MINIMUM
JAN	4.9	12.69	0.99
FEB	5.19	12.44	0.54
MAR	4.68	10.17	T
APR	4.68	20.24	0.58
MAY	5.06	12.61	0.62
JUN	5.39	16.98	0.39
JUL	7.17	20.30 a/	2.37
AUG	6.67	17.82	2.67
SEP	5.98	16.91	0.80
OCT	2.52	8.18	0.0 b/
NOV	4.01	10.15	0.49
DEC	5.30	8.93	1.40
ANNUAL	61.55	83.54 c/	40.11 d/

Legend: T - Trace
a/ - Jul 1959
b/ - Oct 1952, Oct 1963
c/ - 1961
d/ - 1968

d. Wind. The U. S. Weather Bureau anemometer coverage at Moisant Airport in Kenner, Louisiana, was installed in 1949. This anemometer provides the longest record available adjacent to the lake. Table A-4 shows the average monthly wind speeds and its resultant direction for the years 1966-1982. The average wind velocity over this period is 7.8 mph, but winds over 100 mph are experienced occasionally in hurricanes. The predominant wind directions are north-northeast from September through February and south-southeast from March through June. Plate A-3 is a wind rose for New Orleans at Moisant based on the period of record of 1949-1978. The frequency of wind speeds and direction from this wind rose is summarized in Table A-5.

I-4. Hydrologic Regimen.

a. General. The water level in Lake Pontchartrain is subject to variations from direct rainfall, tributary inflow, wind-driven water movements, and flow through the Rigolets and Chef Menteur passes and the Inner Harbor Navigation Canal caused by tidal variations originating in the Gulf of Mexico. Infrequently, lake level is influenced by diversion of Mississippi River floodflow through Bonnet Carre' Spillway. Combinations of these factors determine the salinity regimen in the lake. Locations and periods of record of hydrologic stations are shown in Table A-6.

b. Runoff and Streamflow. Runoff from the 4,700 square miles north and west of Lakes Pontchartrain and Maurepas, estimated to average five million acre-feet annually, drains into the lakes via the Amite, Tickfaw, Natalbany, Tangipahoa, and Tchefuncta Rivers, and Bayous Lacombe, Bonfouca, and Liberty. Streamflow records are available at six locations on these streams and four locations on Pearl River for the periods of record listed in Table A-7. New Orleans and adjacent parishes are drained by outfall canals that discharge directly into Lake Pontchartrain. Yearly fresh water inflow records show considerable variations, as shown in Table A-7.

TABLE A-4
WIND SUMMARIES, NEW ORLEANS AT MOISANT AIRPORT (1966-1982)
AVERAGE WIND SPEED

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1966	9.6	10.5	9.7	10.7	8.7	7.3	6.2	6.4	5.7	7.6	7.4	8.6	8.2
1967	8.3	9.5	9.0	9.3	9.1	6.8	6.2	5.9	7.0	7.4	8.0	9.8	8.0
1968	9.2	10.0	9.3	9.1	8.4	5.6	5.7	5.2	6.4	6.8	8.9	9.3	7.8
1969	9.7	9.8	10.0	8.6	7.3	7.2	6.5	6.8	6.8	9.7	8.0	9.1	8.3
1970	9.5	9.2	9.8	9.9	8.5	6.8	5.4	6.0	6.7	7.7	8.0	7.4	7.9
1971	8.4	9.8	9.8	8.5	7.9	5.3	5.7	5.0	6.5	4.8	8.0	8.7	7.4
1972	8.9	8.6	9.1	10.2	7.3	9.3	7.5	6.4	7.0	8.3	9.9	9.4	8.5
1973	9.6	10.2	12.0	11.5	10.0	6.7	6.7	6.3	7.9	7.0	9.6	11.4	9.1
1974	9.2	11.0	10.8	10.7	8.2	7.4	5.0	5.2	8.6	7.4	8.5	8.5	8.4
1975	9.4	8.6	11.0	10.0	7.4	6.5	6.5	4.9	6.3	6.4	8.0	7.8	7.7
1976	9.6	8.8	10.5	7.6	8.4	6.9	5.4	5.7	6.0	8.5	7.9	8.2	7.8
1977	9.8	8.5	8.5	7.3	5.7	5.3	4.4	5.5	5.4	6.6	8.1	8.8	7.0
1978	9.1	8.9	8.5	8.6	7.9	5.9	5.5	5.3	6.3	6.1	6.7	10.0	7.4
1979	10.5	9.0	9.3	8.0	7.2	6.5	6.7	4.4	8.0	6.7	8.1	6.3	7.6
1980	7.6	8.0	9.8	8.8	7.5	7.4	5.6	5.7	5.3	5.9	6.4	5.9	7.0
1981	7.6	8.3	7.7	7.3	7.8	6.9	5.7	4.8	5.7	7.0	7.3	8.6	7.1
1982	9.8	8.3	8.9	9.4	6.5	6.2	4.6	4.4	7.1	7.5	7.6	10.0	7.5
AVERAGE	9.2	9.2	9.6	9.1	7.9	6.7	5.8	5.5	6.6	7.1	8.0	8.7	7.8

TABLE A-4 (cont.)
WIND SUMMARIES, NEW ORLEANS AT MOISANT AIRPORT (1966-1982)
RESULTANT DIRECTION*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1966	02	04	07	16	07	07	23	15	02	03	03	05	05
1967	03	02	13	15	16	11	21	02	05	06	05	08	09
1968	03	35	12	16	15	19	12	05	06	04	04	06	07
1969	07	02	02	13	09	18	24	09	04	05	36	01	05
1970	03	03	08	17	10	21	20	12	08	03	32	06	09
1971	02	12	13	15	13	23	20	01	07	04	04	12	09
1972	07	07	12	15	04	20	14	34	12	06	02	06	08
1973	02	36	16	16	20	18	24	04	10	07	13	20	12
1974	12	24	16	13	16	16	25	13	05	06	06	16	12
1975	09	21	14	11	15	18	25	17	03	05	08	04	10
1976	04	19	15	15	15	13	25	01	04	02	02	02	07
1977	01	09	13	14	13	21	20	12	15	03	10	13	11
1978	01	01	28	15	16	12	19	11	08	03	08	07	07
1979	01	04	15	14	13	15	17	13	04	11	03	03	08
1980	06	06	09	20	15	22	27	13	09	04	02	02	08
1981	02	02	21	15	13	16	22	11	05	06	10	04	09
1982	11	01	12	10	13	22	21	21	06	06	06	10	NA

* Wind Direction - Numerals indicate tens of degrees clockwise from true north. 00 indicates calm, 09 east, 18 south, 27 west, 36 north. Resultant wind is the vector sum of wind directions and speed divided by number of observations.

NA - Not Available

TABLE A-5
WINDSPEED
NEW ORLEANS AT MOISANT AIRPORT
PERCENTAGE FREQUENCY (1949-1978)

SPEED GROUPS (MPH)

DIRECTION	0-3	4-13	14-19	20-25	26-32	32+	TOTAL
N	0.0	4.9	2.1	0.3	0.1	0.0	7.4
NNE	0.0	4.0	1.5	0.2	0.0	0.0	5.7
NE	0.0	5.0	1.6	0.2	0.0	0.0	6.8
ENE	0.0	4.9	1.4	0.1	0.0	0.0	6.4
E	0.0	4.3	1.0	0.1	0.0	0.0	5.4
ESE	0.0	3.6	0.7	0.1	0.0	0.0	4.4
SE	0.0	4.0	0.9	0.1	0.0	0.0	5.0
SSE	0.0	4.5	1.6	0.2	0.0	0.0	6.3
S	0.0	6.2	2.1	0.3	0.1	0.0	8.7
SSW	0.0	4.0	0.8	0.2	0.0	0.0	5.0
SW	0.0	3.0	0.4	0.0	0.0	0.0	3.4
WSW	0.0	2.1	0.4	0.0	0.0	0.0	2.5
W	0.0	2.4	0.5	0.1	0.0	0.0	3.0
WNW	0.0	2.0	0.5	0.1	0.0	0.0	2.6
NW	0.0	2.0	0.8	0.2	0.1	0.0	3.1
NNW	0.0	2.7	1.4	0.3	0.1	0.0	4.5
CALM	20.0	-	-	-	-	-	20.00
TOTAL	20.0	59.6	17.7	2.5	0.4	0.0	100.00

TABLE A-6
HYDROLOGIC STATIONS

MAP INDEX NO. (PLATE A-2)	STATION	PERIOD OF RECORD: TYPES OF WATER LEVEL GAGE	PERIOD OF RECORD: RECORDS AVAILABLE THRU 1982	STAGE EXTREMES (NGVD): MAXIMUM	STAGE EXTREMES (NGVD): DATE	STAGE EXTREMES (NGVD): MINIMUM	STAGE EXTREMES (NGVD): DATE
16	Amite River at Port Vincent	Auto Recorder and Staff	Gage Heights, Dec 1954 to Jun 1974 and Jun 1975 to date. Discharge, last observation - Apr 1980	12.87	Apr 77	-0.93	Mar 81
17	Amite River at French Settlement	Auto Recorder and Staff	Gage Heights, intermittent 1947-1951 and daily. Dec 1954 to date. Discharge, last observation - 8 in 1977	7.4	Apr 78	-1.5	Dec 54
18	Petite Amite River NR St. Paul	Auto Recorder and Staff	Gage Heights, intermittent Mar 1950 to May 1951 and daily Oct 1951 to date	4.72	Apr 73	-1.6	Dec 56
19	Reserve Canal near Lake Maurepas	Auto Recorder and Staff	Gage Heights, Jan 1979 to date	3.21	Sep 79	-1.14	Mar 81
20	Tickfaw River near Springfield	Auto Recorder and Staff	Gage Heights, May 1947 to date. Discharge, last observation - 7 in 1977	5.57	Apr 79	-1.43	Dec 54
21	Pass Manchac near Ponchatoula	Staff	Gage Heights, July 1955 to date	4.80	Apr 79	-2.0	Jan 61
22	Bayou Bonfouca at Slidell	Staff	Gage Heights, Aug 1962 to date	6.8 (affected by Hurricane)	Aug 69	-0.6	Feb 63
23	Lake Pontchartrain at Frenier	Auto Recorder and Staff	Gage Heights, Sep 1931 to Sep 1965 and Jan 1969 to date	12.09 * (watermark)	Sep 65	-2.1	Jan 38

* Caused by hurricane

TABLE A-6
HYDROLOGIC STATIONS
(cont'd)

MAP INDEX NO. (PLATE A-2)	STATION	PERIOD OF RECORD: TYPES OF WATER LEVEL GAGE	PERIOD OF RECORD: RECORDS AVAILABLE THRU 1982	STAGE EXTREMES (NGVD): MAXIMUM	DATE	MINIMUM	DATE
24	Lake Pontchartrain at Mandeville	Auto Recorder and Wire Weights	Gage Heights, Sep 1931 to date	6.95*	Sep 47	-2.25	Jan 38
25	Lake Pontchartrain at Midlake near New Orleans	Auto Recorder and Wire Weights	Gage Heights, Aug 1957 to date	5.53*	Sep 65	-1.28	Mar 65
26	Lake Pontchartrain at West End	Auto Recorder and Staff	Gage Heights, Sep 1931 to Nov 1946 and Mar 1949 to date	5.37*	Sep 65	-2.2	Jan 38
27	Lake Pontchartrain (Irish Bayou) near South Shore	Auto Recorder and Staff	Gage Heights, May 1949 to date	7.16*	Aug 69	-1.30	Jul 54
28	Rigolets near Lake Pontchartrain	Auto Recorder and Staff	Gage Heights, Sep 1931 to date	9.0*	Aug 69	-1.90	Jan 38
29	Lake Borgne at Rigolet	Auto Recorder and Staff	Gage Heights, Dec 1957 to Sep 1965 and Jul 1967 to date	12.25* (watermark)	Aug 69	-2.04	Feb 78
30	Chef Menteur Pass near Lake Borgne	Auto Recorder and Staff	Gage Heights, Apr-Jun 1945, Feb & Mar 1950, Jul 57-Sep 65 and Oct 67 to date. Discharge, 1937 and 1945	9.07*	Sep 65	-1.69	Feb 78

* Caused by hurricane

TABLE A-6
HYDROLOGIC STATIONS
(cont'd)

MAP INDEX NO. (PLATE A-2)	STATION	PERIOD OF RECORD: TYPE OF WATER LEVEL GAGE	PERIOD OF RECORD: RECORDS AVAILABLE THRU 1982	STAGE EXTREMES (NGVD): MAXIMUM	DATE	MINIMUM	DATE
31	Mississippi River - Gulf Outlet at Shell Beach	Auto Recorder and Staff	Gage Heights, Jun 1961 to date	11.06	Aug 69*	-2.7	Mar 65
32	Bayou Dupre at Floodgate (west)	Auto Recorder and Staff	Gage Heights, Aug 1975 to date	3.14	Apr 79	-1.94	Jan 79
33	Bayou Dupre at Floodgate (east)	Auto Recorder and Staff	Gage Heights, Aug 1975 to date	4.51	Jul 79**	-1.78	Feb 78
34	Bayou Bienvenue at Paris Road	Auto Recorder and wire height	Gage Heights, Dec 1974 to date	4.82	May 78	-1.78	Jan 77
35	Bayou Bienvenue at Floodgate (west)	Auto Recorder and Staff	Gage Heights, May 1975 to date	3.55*	Sep 77	-2.03**	May 78
36	Bayou Bienvenue at Floodgate (east)	Auto Recorder and Staff	Gage Heights, Dec 1974 to date	4.62	Jul 79	-1.89	Jan 79
37	Intracoastal Waterway near Paris Road Bridge	Auto Recorder and Staff	Gage Heights, Apr 1948 to date	10.04*	Sep 65	-2.19	Mar 65
38	Inner Harbor Navigation Canal near Seabrook Bridge	Auto Recorder and Staff	Gage Heights, Daily, Aug 1962 to date	6.47*	Aug 69	-1.53	Mar 65

* Caused by hurricane.
** From incomplete record.

TABLE A-6
HYDROLOGIC STATIONS
(cont'd)

MAP INDEX NO. (PLATE A-2)	STATION	PERIOD OF RECORD: TYPES OF WATER LEVEL GAGE	PERIOD OF RECORD: RECORDS AVAILABLE THRU 1982	STAGE EXTREME (NGVD): MAXIMUM	STAGE EXTREME (NGVD): DATE	STAGE EXTREME (NGVD): MINIMUM	STAGE EXTREME (NGVD): DATE
39	Inner Harbor Navigation Canal (IWW) at Florida Ave. Bridge	Auto Recorder and wire weight	Gage Heights, July 1944 to date	9.82*	Aug 69	-1.45	Jan 81
40	Inner Harbor Navigation Canal (IWW) at New Orleans	Staff	Gage Heights, May 1922 to date	10.61* (Highwater mark)	Sep 65	-1.85	Jan 75
41	Intracoastal Waterway at Harvey Lock	Wire Weight	Gage Heights, Jan 1925 to date	4.21	Apr 73	-1.28	Jan 40
42	Intracoastal Waterway at Algier's Lock	Auto Recorder and Wire Weight	Gage Heights, May 1956 to date	4.31	Apr 73	-1.64*	Sep 65

* Caused by hurricane

TABLE A-7
PERTINENT STREAMFLOW DATA (1938-1983)

INFLOW POINT	TOTAL DRAINAGE AREA MI^2	GAGED LOCATION*	GAGED DRAINAGE AREA MI^2	PERIOD OF RECORD	AVERAGE DISCHARGE (cfs)	MAXIMUM DISCHARGE RATE (cfs)	MAXIMUM DISCHARGE DATE	MINIMUM DISCHARGE RATE (cfs)	MINIMUM DISCHARGE DATE
Amite River	2,373	NR Denham Springs	1,280	9/38 to date	1,966	120,000	4/8/83 10/18/56	271	10/17/56
Tickfaw River	735	At Holden	247	10/40 to date	366	22,400	4/8/83	65	10/1-4/69
		Natalbany River At Baptist	79.5	8/43 to date	114	9,640	4/7/83	1.8	11/2-5/63
Tangipahoa River	885	At Robert	646	10/38 to date	1,129	86,000	4/8/83	245	10/30/68 thru 11/3/68
Tchefunta River	459	NR Folsom	95.5	1/43 to date	159	33,000	4/6/83	26	9/4/68 and 9/15/68
		Bogue Falaya At Covington	88.2	1964 to date	-	12,700**	4/8/83	-	-
Pearl River	8,689	At Bogalusa	6,573	10/38 to date	9,599	129,000	4/24/79	1,020	10/29/63 thru 11/1/63
		Bogue Chitto NR Bush	1,213	10/37 to date	1,916	131,700	4/8/83	366	10/22, 23, 26, 29/68
		At Pearl River	8,494	10/63-9/70 10/75 to date	9,470 (1964-70)	230,000	4/9/83	1,580	10/24/63 and 11/10/63
		Bogue Lusa Creek At Bogalusa	72.7	10/63 to date	116	15,000	4/7/83	5	10/27-28/67

* U.S. Geological Survey Gage Stations
** Previous Flood Discharge - 8,610 CFS 4/27/64

c. Stages, Salinities, Waves, and Tides.

(1) Lake stages.

(a) The Bonnet Carre' Spillway is operated as required during major high water seasons on the Mississippi River to divert flows through Lake Pontchartrain in order to insure that a stage of 20 feet on the Carrollton gage is not exceeded at New Orleans. Studies indicate that the operations of the spillway produced maximum increases in lake level of about 0.8 foot in 1937, 1.5 feet in 1945, 1.0 foot in 1950, and 0.7 foot in 1973 and again in 1979. The effects Bonnet Carre' operation on stages in Lake Pontchartrain were evaluated as part of a physical model study made by the U. S. Army Engineer Waterways Experiment Station in Vicksburg, Mississippi, in 1963 [1]. The report indicates that for the passage of flows at or near the design discharge of 250,000 cfs, the operation of the spillway would increase stages in Lake Pontchartrain by about 0.7 foot for average high water stages in Lake Borgne. An analysis of the effects of Bonnet Carre' on lake stages during the 1973 and 1979 operations indicates that these model results are generally valid.

(b) The maximum recorded stage in Lake Pontchartrain of 13.0 feet occurred at Frenier on 29 Septmeber 1915. The minimum of minus 2.2 feet occurred at New Orleans (West End) on 26-27 January 1938. The mean lake stage for the period from 1953 through 1971 was 1.2 feet.

(c) Maximum stages occur in Lake Pontchartrain during hurricane activity in the vicinity. A list of high stages recorded during hurricanes is presented in Table A-8.

TABLE A-8
MAXIMUM STAGES - LAKE PONTCHARTRAIN

LOCATION	DATE	STAGE - FT N.G.V.D	
Mandeville	20 Sep 1909	8.0	
West End	20 Sep 1909	6.2	
Frenier	20 Sep 1915	13.0	
West End	29 Sep 1915	6.0	
West End	19 Sep 1947	5.4	
Mandeville	19 Sep 1947	6.8	
New Orleans	4 Sep 1948	4.9	
Frenier	24 Sep 1956	6.8)	"Flossy"
Little Woods	24 Sep 1956	7.0)	
West End	24 Sep 1956	5.3)	
Mandeville	27 Jun 1957	4.1*	"Audrey"
Frenier	9 Aug 1957	3.3	"Bertha"
Frenier	18 Sep 1957	4.5	"Esther"
Mandeville	10 Sep 1961	5.5	"Carla"
Frenier	17 Sep 1963	4.0	"Cindy"
Mandeville	4 Oct 1964	6.4	"Hilda"
Frenier	10 Sep 1965	12.1	"Betsy"
Frenier	Aug 1969 (watermark)	4.6	"Camille"
Mandeville	18 Aug 1969	4.6	
West End	17 Aug 1969	5.2	
Irish Bayou	18 Aug 1969	7.2**	
Rigolets	18 Aug 1969	9.0**	
Shell Beach	17 Aug 1969	11.1**	
Mandeville	8 Sep 1974	5.0	"Carmen"
Frenier	8 Sep 1974	4.5	
West End	8 Sep 1974	5.2	
Frenier	5 Sep 1977	4.2	"Babe"
Little Woods	4 Sep 1977	4.5	

* Possibly higher, gage failed during storm.
** New record established.

(2) Salinities. Diluted saline gulf water enters Lake Pontchartrain from Lake Borgne via the Rigolets and Chef Menteur Pass and the Mississippi River - Gulf Outlet and Inner Harbor Navigation Canal in large quantities and mixes with the fresh water inflow. The salinity in the eastern portion of Lake Pontchartrain averages about 4.5 parts per thousand with a low of 01.1 part per thousand, and a high of 16.5 parts per thousand. The salinity in the western portion of the lake averages about 1.5 parts per thousand with a low of 0.05 part per thousand, and a high of 8.0 parts per thousand. Salinity is subject to considerable variation with respect to location, seasonal trends, and short-term fluctuations. More intensive data on salinities, tides, and currents in Lake Pontchartrain and vicinity are shown in U.S. Army Waterways Experiment Station Report of January 1982 entitled "Lake Pontchartrain and Vicinity Hurricane Protection Plan - Prototype Data Acquisition and Analysis." [2]

(3) Waves. In August 1957, two wave gages were installed on the east side of the Greater New Orleans Expressway Bridge, Station Ten at the north end, and Station Four on the south end. Both are approximately one-quarter mile from shore. In 1958, Station Nine was established at Frenier, with the gage on a tower approximately 1,200 feet from shore. Locations are shown on Plate A-2. Pertinent observed data are listed in Table A-9.

TABLE A-9
WAVE DATA

Station	Significant Waves: Range ft.	Significant Waves: Wind m.p.h	Maximum Waves: Height ft.	Maximum Waves: Date
4	0.1 to 4.9	30	8.3	9 October 1958
9	0.1 to 4.9	29	7.8	9 October 1958
10	0.1 to 5.3	40	9.0	10 May 1959

(4) Tides. The normal tide has general range of one-half foot in Lake Pontchartrain and is diurnal in nature. However, wind effects usually mask the daily ebb and flood variations. Because of the annual volume of freshwater inflow (estimated to average 5 million acre-feet), tides and storm surges, enormous volumes of water pass in both directions through the Rigolets, Chef Menteur Pass, Lake Borgne, Mississippi Sound, Inner Harbor Navigation Canal, and Mississippi River-Gulf Outlet. With so many variables operating on the several elements of the system, the current patterns are continually changing.

I-5. Description and Verification of Procedures.

a. Hurricane Memorandums. The Hydrometeorological Section (HMS), U. S. Weather Bureau, cooperated in the development of hurricane criteria for experienced and potential hurricanes in the study area. The HMS memorandums provided frequency data, isovel and rainfall patterns, pressure profiles, hurricane paths, and other parameters required for the hydraulic computations. Those relative to experienced hurricanes are based on reevaluation of historic meteorologic and hydrologic data. Those relative to potential hurricanes contain generalized estimates of hurricane parameters that are based on the latest research and concept of hurricane theory. Memorandums pertinent to the study area are listed in Section III, Bibliography.

b. Historical Storms used for Verifications. Three observed storms, with known parameters and effects, were used to establish and verify procedures and relationships for determining surge heights, wind tide levels (WTL's), inflow into Lake Pontchartrain, overtopping flows, and ultimately, flooding elevations that would result from synthetic hurricanes. These three storms occurred in September of 1915 (4) and September 1947 (5) are shown on Plates A-4 and A -5.

(1) The hurricane of 29 September 1915 had a central pressure index (CPI) of 27.87 inches, an average forward speed of 10 knots, and a maximum wind speed of 99 mph at a radius of 29 nautical miles. This hurricane approached the mainland from the south. At the Lake Borgne entrance to the Rigolets, a high water elevation of about 10 feet was experienced and the average elevation in Lake Pontchartrain rose to 6 feet. This storm was not used for verification of levee overtopping because the present lakefront levee system was not in existence in 1915.

(2) The 19 September 1947 hurricane had a CPI of 28.57 inches, an average forward speed of 16 knots, and a maximum windspeed of 72 mph at a radius of 33 nautical miles. The direction of approach of this hurricane was approximately from the east. In Lake Borgne, at the entrance to the Rigolets, the maximum water surface elevation was 10 feet and in Lake Pontchartrain, the maximum elevation was 5 feet. However, because of the rapid forward speed of this storm, the average water elevation in Lake Pontchartrain did not reach its maximum at the time that the winds were critical to the south shore. The step-type seawall was in place along the New Orleans lakefront during this storm, and a fairly reliable flood line of overtopping flows was available for verification.

(3) Tropical storm Esther occurred on 16 September 1957, and the resultant elevations were accurately registered by stage recording gages at many locations within the study area. These records were available for verification of routing procedures. This storm was not severe enough to cause flooding.

c. Synthetic storms. Computed flood elevations, resulting from synthetic storms, are necessary for frequency and design computations. Parameters for certain synthetic storms and methods for derivation of others were furnished by the U. S. Weather Bureau. The standard project hurricane (SPH) for the entire Louisiana coast was used for all locations in the study area with changes only in path and forward speed.

(1) SPH for the Louisiana coast was derived by the U. S. Weather Bureau from a study of 42 hurricanes that occurred in the region over a period of 57 years (6) SPH paths critical to different locations in the study area and isovel patterns at critical hours are shown on Plates A-6 and A-7. Based on subsequent studies of more recent hurricanes, the U. S. Weather Bureau has revised the SPH wind field patterns and other characteristics over the years. Wind field patterns were revised after Hurricane Betsy in 1965 to reflect the intensified wind

speeds (7), (8), (9). After Hurricane Camille in 1969, the Weather Service completely revised hurricane characteristics for the SPH, including the wind speeds, central pressure and radii. (10) In their latest publication (11) NOAA has expanded and generalized the latest SPH characteristics. For design of the Lake Pontchartrain and Vicinity Hurricane Protection Project High Level Plan, the SPH, as defined after Hurricane Betsy, was used. To assure that all the segments of the project would be compatible, SPH parameters have not been changed since construction began. Modifications and adjustments of these parameters subsequent to Hurricane Betsy have not significantly changed the characteristics of the SPH.

(a) The SPH for the Louisiana coastal region has a frequency of once in 100 years. The CPI that corresponds to this frequency is 27.6 inches. CPI probabilities are based on the following relationship. (12):

$$P = \frac{100 \quad (M-0.5)}{Y}$$

Where P = percent chance of occurrence per year
M = number of the event (rank)
Y = number of years of record

(b) Radius of maximum winds is an index of hurricane size. The average radius of 12 hurricanes occurring in the New Orleans area is 36 nautical miles. From relationships of CPI and radius of maximum winds of gulf coast hurricanes (12), a radius of 30 nautical miles is considered representative for an SPH having a CPI of 27.6 inches.

(c) Different forward speeds are necessary to produce SPH effects at various locations within the study area. In Lake Pontchartrain, the forward speed is a particularly critical factor and may be as important as the track itself. Sufficient time must elapse between the time of maximum elevation at the entrances to Chef Menteur Pass and the Rigolets and the time of maximum critical winds at the Lake Pontchartrain shore in question to allow for maximum inflow into the lake. The SPH for the south shore, patterned after the September 1915 hurricane, has an average forward speed of 6 knots. An average forward speed of 11 knots was used for the SPH along the west shore of Lake Borgne at the entrance to the passes into Lake Pontchartrain.

(d) Maximum theoretical gradient wind (12) is expressed as:

$$V = 73 \sqrt{P_n - P_0} - R\ (0.575\ f)$$

where V_{gx} = maximum gradient wind speed in miles per hour
P_n = asymptotic pressure in inches
P_0 = central pressure in inches
R = radius of maximum winds in nautical miles
f = coriolis parameter in units of hour $^{-1}$

The estimated wind speed (30 feet above ground level) (V_x) (13) in the region of highest speeds is obtained as follows:

$$V_x = 0.885\ V_{gx} + 0.5T$$

where T = forward speed in miles per hour.

From these relationships, a wind speed of approximately 100 mph was obtained.

(2) Other synthetic storms of different frequency and CPI are derived from SPH. Other CPI's for desired frequencies are obtained from the graph shown on Plate A-8. V_{gx}'s corresponding to any other CPI are determined similarly by use of the method described for the SPH. Variations in CPI's of historic storms were accomplished by the same procedure (12). Characteristics of synthetic storms and some historic storms are listed in Table A-10.

TABLE A-10
HURRICANE CHARACTERISTICS

Hurricane *	CPI inches	Radius of max. winds nautical miles	Forward speed knots	V_x m.p.h.
Sep 1915	27.87	29	10	99
Sep 1947	28.57	33	16	72
Sep 1956	28.76	30	10	80
Sep 1965	27.79	32	20	122
Track A PMH	26.90	30	6	114
Track A SPH	27.60	30	6	100
Track A Mod H	28.30	30	6	83
Track F PMH	26.90	30	11	114
Track F SPH	27.60	30	11	100
Track F Mod H	28.36	30	10	80

* Tracks are shown on Plate A-9.

d. Surges.

Maximum hurricane surge heights along the western shores of Lake Borgne at the entrances to Lake Pontchartrain were computed by use of a one dimensional steady-state wind tide formula. A detailed description of the formula and its verification is contained in Design Memorandum No. 1, Hydrology and Hydraulic Analysis, Part I-Chalmette (14).

e. Routing.

Since the major hurricane damage in the study area results from storm induced effects on Lake Pontchartrain, it was necessary to establish a method to determine the hydraulic regimen in the lake at any time during the hurricane occurrence. This procedure involves the construction of a stage hydrograph for Lake Borgne, and the simultaneous hourly calculations of flows through Lake Pontchartrain's natural inlet and outlet passes, tilt and stage-volume relationships in Lake Pontchartrain and Lake Maurepas, accumulated rainfall, and overflow from the lake to the land areas.

(1) Prerequisite to any routing is the choice of an actual or hypothetical hurricane of known or designated characteristics. It is then possible to develop surge heights for any point in Lake Borgne for selected storm. For routing purposes, Long Point, which is east of the mouth of the Rigolets, was selected as the critical point for a hydropgraph. The hydrograph for Long Point reflects stages at the mouths of both the Rigolets and Chef Menteur Pass. Construction of such a hydrograph of hourly stages at the mouth of the two passes was based on a method developed by R. O. Reid (15) that was modified by using the maximum surge elevation computed by the incremental setup method as the peak of the hydrograph for the critical period. A comparison of the rising portion of the hydrograph thus derived, with one obtained by computing surge elevations at hourly intervals, indicated agreement between the two methods. Final stages for the recession portion of the hydrograph could not be computed by the incremental setup method because of the offshore wind directions prevailing after the peak stage. The recession produced by Reid's method (15), obtained by rotating the hydrograph about the peak ordinate, indicated stages considerably lower than corresponding stages for the 1947 hurricane surge. The observed stages of the 1957 storm surge also indicated that the recession was somewhat slower at intermediate stages in Lake Borgne. It was therefore necessary to estimate the recession portion of the hydrograph to verify routing procedures. Storm surge hydrographs for Long Point for each storm investigated were determined by identical procedures.

(2) Storms tides flow in and out of Lake Pontchartrain through three major natural passes and an artificial canal. Rating tables, derived by reverse routing of observed storms, were developed for use in routing through the passes and canal. The elevation of Lake Borgne at Long Point was determined from the average of records obtained from automatic tide gage recorders located at the mouths of the passes and at Shell Beach. Elevations of Lake Pontchartrain were determined from records of the automatic tide gages located in Lake Pontchartrain at U. S. Highway 11 and at West End. Although there was a fairly consistent relationship between head and flow, there was no consistency when a parameter of stage was introduced.

(a) The combined rating of the Rigolets, Chef Menteur Pass, flow over U. S. Highway 90 in vicinity of the passes, and Inner Harbor Navigation Canal was based on the period 25 July to 11 August 1957, during which time a minor storm accompanied by moderate stages was experienced. The empirical relationship, $Q = 560H^{0.935}$ was derived from plots of the data, and used to compute a rating table.

(3) Storage tables for the range of stages were made for Lake Pontchartrain. The storage amounts include the volumes contained in the adjacent marsh areas when the stages exceed the surface elevations of these marshes.

(4) Cumulative amount of rainfall that is coincident with the storm significantly affects the lake elevations and hence the routing procedure. The amount of this rainfall was calculated by the methods described in U. S. Weather Bureau memorandums (16), (17), using a moderate rainfall that would be coincident with a tropical storm. For routing purposes, rainfall was considered as additional inflow into Lake Pontchartrain. The effect of cumulative rainfall is to raise the lake level.

(5) Stages, wind tide elevations, and waves induce flow over the shore protective structures. Adjustments were made in the routing procedure to account for the quantities that overtopped these structures.

(6) With the above-mentioned items resolved, the routing procedure was reduced to the successive approximation type problem in which the variable factors were manipulated until a condition of balance between flows and storages was obtained for the incremental time intervals. A typical routing computation is illustrated on Plate A-10. The 1947 and 1915 hurricanes were routed by this procedure. Routed average stages for Lake Pontchartrain were found to be in reasonable agreement with the observed average stages for the two hurricanes. The degree of agreement between the observed and computed stages that were obtained by use of the routing procedure verifies the methods and rating tables used. Observed and computed average stages for the 1947 and 1957 hurricanes are shown on Plates A-11 and A-12. All other hurricanes studied were routed using similar procedures. The resultant stage hydrograph for the SPH critical to the south shore of Lake Pontchartrain is shown on Plate A-13.

f. Wind tides. The storms under consideration are accompanied by strong winds. The effect of strong winds blowing over a shallow inclosed body of water, such as Lake Pontchartrain, is to drive large quantities of water ahead of the winds. It was necessary for purposes of routing and overflow computations to determine the windtide levels for Lake Pontchartrain. This was accomplished by dividing the lake into four or five segments that are roughly parallel to the wind directions, and by calculating setup and setdown for each of the segments. The average windspeed and average depth in each segment were determined from isovel and hydrographic charts for each wind tide computation. The storm isovel patterns were furnished by the U. S. Weather Bureau (18), (19). The computation of wind along each zone was based on the segmental integration method (20) and was calculated by use of the step-method formulas (21) that were modified as follows:

$$\text{Setup} = d_t \left(\sqrt{\frac{0.00266\, u^2\, FN + 1}{d_t^2}} - 1 \right)$$

$$\text{Setdown} = d_t \left(1 - \sqrt{\frac{1 - 0.0026 u^2\, FN}{d_t^2}} \right)$$

Where: Setup or setdown in feet is measured above or below mean water level (m.w.l.) of the surge in the lake.

d_t = av. depth of fetch in feet below m.w.l.
u = windspeed in m.p.h over fetch
F = fetch length in miles, node to shoreline
N = planform factor, equal generally to unity

(1) Graphs were constructed from the above formulas to determine setup and setdown quickly about any nodal elevation, Plate A-15. Volumes of water along the zones, represented by the setup and setdown with respect to a nodal elevation, were determined and the water surface profiles adjusted until the setup and setdown volumes balanced within 5 percent. Water surface contours were then drawn for several even-foot nodal elevations,

and the tilt and WTL's were determined from the contour sketch. In the routing of surges, pertinent wind tides and tilts for other nodal elevations were interpolated from the contour sketches for the even-foot nodes. Typical wind tide computations are illustrated on Plate A-15.

(2) In areas where wind tides are ponded in shallow areas to depths of 2 feet or less and these ponds are exposed to wave action, a superelevation of the water surface is experienced (22). This additional wave setup was computed by use of a proportional formula which related experienced wave height and setup at another location to computed wave height and setup, and then added to the ponding level obtained if unaffected by wave action. Along the Orleans Parish Lakefront west of the IHNC, the levee is located several hundred feet landward of the shoreline. In this reach the shoreline consists of a seawall with a crest elevation of about 8 feet n.g.v.d. for its entire length. Waves overtopping the seawall cause superelevation of the water surface in the shallow area between the seawall and the levee. Along the length of this levee the superelevation in the ponding area is 1 to 1.5 feet above the design still water level of 11.5 feet n.g.v.d. A typical sketch of the wave setup along this levee is shown in Plate A-19

(3) Maximum computed and observed setup elevations for the 1947 hurricane, were 4.9 feet and 5.4 feet at West End. Computed stages for the 1915 hurricane compared favorably with observed high water marks. Wind tide levels for all hurricanes studied were computed by applying the same methods and procedures described above. Maximum surge height contours in the Lake Borgne area and maximum WTL contours in the Lake Pontchartrain area were developed for the SPH. These contours are shown on Plate A-16. The contours represent the maximum elevations that would be experienced for the occurrence of a hurricane in the SPH catagory for the most critical storm path.

I-6. Frequency estimates.

a. Procedure.

(1) The area along the south shore of Lake Pontchartrain was used in developing a procedure for making frequency estimates since more historical hurricane data were available for this area than for any other location. The maximum WTL or stage for a specific area is a measure of the character of storm that produces it. In order to use data from early hurricanes which caused high wind tides along the south shore of Lake Pontchartrain, it was necessary to analyze meteorologic factors and to adjust the observed data to represent stages that would have occurred had presently existing protective works then

been in place. It was found that adjustments were required for the 1893 and 1901 hurricanes. Along the south shore of Lake Pontchartrain, determinations of maximum WTL's were from the adjusted historical data from the locus of points through which a representative WTL-frequency curve would pass in the low-stage, high-frequency region. Probabilities for historical data on the curve shown on Plate A-17 were calculated by means of the formula:

$$P = \frac{100 \quad (M-0.5)}{Y}$$

The WTL for the PMH, which has an infinite return period, establishes another limit for the frequency curve in the high-stage, low frequency region. However, because of the lack of historical data for the region of the curve between these two extremes, the synthetic WTL-frequency relationships were developed to show the shape of the curve in this region. In the process of formulating such relationships, it was necessary to correlate the following hurricane parameters: central pressure index, paths of approach, wind velocities, radii to maximum winds, and forward speeds of translation.

(2) Prior to 1900, information of record dealt primarily with loss of life and damage in the more densely populated areas, with practically no reference to water surface elevations caused by hurricanes. Only since 1900 has detailed information been available on flooding in coastal Louisiana and adjacent areas. Subsequent to the widely destructive September 1915 hurricane, Charles W. Oakey, Senior Drainage Engineer, Office of Public Roads and Rural Engineering, U. S. Department of Agriculture, made a thorough survey of the coastal areas between Biloxi, Mississippi, and Palacios, Texas. The 1915 investigation is the only known area-wide study containing reliable stages until the investigation of hurricane "Flossy", September 1956, was completed. The data indicate that there is no locality along the Louisiana coast which is more prone to hurricane attack than other localities.

(3) The first requirement in the development of synthetic frequency relationships for localities within the study area was to select representative critical hurricane paths of approach for the particular locale in question. For the passes into Lake Ponthchartrain, track F is the critical path for the design hurricane. For the south shore of Lake Pontchartrain, track A was selected to represent the hurricane situation that would produce critical conditions. These tracks are shown on Plate A-9.

(4) After hurricane paths were selected, surge heights and wind tides were developed, as described previously, for at least three

storms of different CPI values for each track. Each hurricane selected for the representative paths were assumed to have the same radius of maximum winds, the same forward speed of translation, and the same adjustment for any land effects. Only CPI's and wind velocities were adjusted to develop these three storms. Results of these computations for the New Orleans reach of Lake Pontchartrain are shown in Table A-11. Wind tide elevations for storms with other CPI values were obtained graphically by plotting the above data and reading from the resulting curves.

TABLE A-11

CENTRAL PRESSSURE INDEX VS. WIND TIDE LEVEL
LAKE PONTCHARTRAIN REACH - NEW ORLEANS

PATH A		PATH F	
Central pressure index (CPI) inches	Max. wind tide level n.g.v.d.	Central pressure index (CPI) inches	Max. wind tide level n.g.v.d.
26.9	12.7	27.6	7.7
27.6	11.2	27.87	6.6
28.5	8.2	28.57	4.8

(5) Hurricane characteristics of area-representative storms were developed in cooperation with U. S. Weather Bureau. This agency has made a generalized study of hurricane frequencies for a 400-mile zone along the central gulf coast, Zone B, from Cameron, La., to Pensacola, Fla., and has presented the results in a memorandum. (12) Frequencies for hurricane central pressure indexes that were presented in the report, as shown on Plate A-8, reflect the probability of hurricane recurrence from any direction in the midgulf coastal area. In order to establish frequencies for the localities under study, it was assumed that a hurricane whose track is perpendicular to the coast will ordinarily cause high tides and inundation for a distance of about 50 miles along the coast. Thus, the number of occurrences in the 50-mile subzone would be 12.5 percent of the number of occurrences in the 400-mile zone, provided that all hurricanes traveled in a direction normal to the coast. However, the usual hurricane track is oblique to the shoreline as shown in table 2 of the HMS memorandum. (12) The average projection along the coast of this 50-mile swath for the azimuths of 42 Zone B hurricanes is 80 miles. Since this is 1.6 times the width of the normal 50-mile strip affected by a hurricane, the probability of occurrence of any hurricane in the

50-mile subzone would be 1.6 times the 12.5 percent, or 20 percent of the probability for the entire midgulf Zone B. Thus, 20 percent of the Zone B frequencies shown on Plate A-8 was used to represent the CPI-frequencies in the 50-mile subzone that is critical for each study locality.

(6) The azimuths of tracks observed in the vicinity of landfall were divided into quadrants corresponding to the four cardinal points. In Zone B, 24 tracks were from the south, 14 from the east, 3 from the west, and 1 from the north. Hurricanes with tracks having major components from the south or east are more critical relative to WTL's within the study area than hurricanes from other directions. Approximately two-thirds of all experienced hurricanes have come from a southerly direction, whereas about one-third have come from the east. The average azimuth of tracks from the south are 180°. Tracks from the east had an average azimuth of 115°. Approximately these azimuths were used in computing WTL's. Further adjustment of the probability of occurrence was made by using two-thirds of the probability for WTL's computed for hurricanes approaching from the south and one-third of the probability for WTL's computed for hurricanes approaching from the east. The probabilities of equal stages for both groups of tracks were then added arithmetically to develop a curve representing a synthetic probability of recurrence of maximum wind tide levels for hurricanes from all directions. Table A-12 presents these computations and those of the previous paragraph for the New Orleans reach.

TABLE A-12

STAGE-FREQUENCY
SOUTH-SHORE - LAKE PONTHCHARTRAIN

CPI	ZONE B	New Orleans Reach 80-mi. subzone	WTL	PATH A Freq.* (67% Col. 3)	WTL	PATH F Freq. (33% Col. 3)
1	2	3	4	5	6	7
in.	occ/100	years	n.g.v.d.	occ/100 yrs.	ft. n.g.v.d	occ/100 - yrs.
27.6	1	0.2	11.5	0.13	8.0	0.07
27.8	2	0.4	10.9	0.27	7.0	0.13
28.1	5	1.0	9.8	0.67	6.1	0.33
28.3	10	2.0	9.1	1.34	5.6	0.66
28.6	20	4.0	8.0	2.68	4.9	1.32
29.0	40	8.0	6.5	5.36	4.1	2.64

$$\text{*Freq.} = \frac{100}{\text{Return period years}}$$

(7) Using the shape of the synthetic stage-frequency curve as a guide, it was then possible to complete a final curve for the New Orleans reach between the predetermined limits mentioned previously.

(8) Lack of historical data prevented the similar development of WTL-frequency relationships for other localities within the study area. For the remaining reaches, wind tide levels were calculated for Zone B hurricanes of different frequencies by using different combinations of critical paths and distribution of azimuths of incidence. It followed that a Zone B hurricane of a particular frequency would have the same recurrence period for any locale in the study area since all are within the same subzone. Therefore, the final stage - frequency curves for the remaining areas were developed by plotting the computed stages for several different Zone B hurricanes at the corresponding frequencies indicated for the south shore of Lake Pontchartarain. Only two-thirds of the hurricanes from the south or east are most critical relative to WTL's along the south shore of Lake Pontchartrain, while all of the hurricanes from the south or east are equally critical to the area affected by Lake Borgne. Therefore, the most critical WTL along the south shore of Lake Ponchartrain for a Zone B hurricane of given frequency occurs only two-thirds as often as the most critical WTL along the shores of Lake Borgne for the same hurricane.

b. Relationships. Based on the above described procedures, stage-frequency relatinships were established for the south shore of Lake Pontchartrain and the passes into Lake Pontchartrain from Lake Borgne. Stage-frequency curves are shown on Plate A-18.

I-7. Design Hurricane

a. Selection of the design hurricane. The standard project hurricane was selected as the design hurricane (Des H) due to the urban nature of the study area. A design hurricane of lesser intensity which would indicate a lower levee grade and an increased frequency would expose the protected areas to hazards to life and property that would be disastrous in event of the occurrence of a hurricane of the intensity and destructive capability of the standard project hurricane.

b. Characteristics. The characteristics of the Des H for the proposed plan of protection are identical to the standard project hurricane described in detail in paragraph 5. However, due to transposition of the regional SPH to the smaller study area the design hurricane would have a probability of recurrence of only once in about 300 years in the study area. The path of the Des H's was located successively to produce maximum hurricane tides along the entire length of the proposed structure. The Des H is a theoretical hurricane but ones of similar intensity have been experienced in the area. Table A-13 is a summary of the Des H characteristics.

TABLE A-13
DESIGN HURRICANE CHARACTERISTICS

Location	CPI (inches)	Max. winds (m.p.h)	Radius of max. winds (miles)	Forward speed (knots)	Direction of approach	Track (plate A-7)
Lake Pontchartrain						
South shore	27.6	100	30	6	South	A

c. Normal predicted tides. The average tidal range in Lake Pontchartrain is 0.5 foot. Lake Pontchartrain has an average elevation of about 1.0 foot. In determining the elevation of design surges and wind tide levels, the mean normal predicted tide was assumed to occur at the critical period.

d. Design tide. The hurricane tide is the maximum still water surface elevation experienced at a given location during the passage of a hurricane. It reflects the combined effects of the hurricane surge and wind tide. Design hurricane tides were computed for conditions reflecting the proposed protective works. The resulting elevations, which are identical to those for an SPH, are the same for existing or project conditions.

TABLE A-14
DATA USED TO DETERMINE WAVE CHARACTERISTICS
DESIGN HURRICANE

F	Length of fetch, miles	5
U	Windspeed, mph	83
SWL	Stillwater elevation, feet	11.5
d	Average depth of fetch, feet	24.4
d_t	Depth at toe of structure, feet	14.5

TABLE A-15
WAVE CHARACTERISTICS
DESIGN HURRICANE

H_s	Significant wave height, feet	7.8
T	Wave Period, seconds	7.3
L	Deepwater wave length, feet	273
d/L	Relative depth	.0894
H_s / H_0'	Shoaling coefficient	.9426
H_0'	Deepwater wave height, feet	8.2
H_0'/T	Wave Steepness	.154

e. Maximum runup and overflow.

(1) Hurricanes approaching on paths critical to the south shore of Lake Pontchartrain create conditions whereby shore protective structures are overtopped. It was necessary to calculate the magnitude of the heights of wave runup and quantities of this overflow by use of procedures to develop improved protective structure designs and to determine damages. This determination was divided into two significant parts for convenience of calculation, namely maximum runup and wave overtopping. Common factors which must be resolved in all types of calculations are the WTL, and the geometry and crown elevation of the protective structure.

(2) Wave runup on a protective structure depends upon the physical characteristics (i.e. configuration and surface roughness), the depth of water at the structure, and the wave characteristics. Computation of maximum runup was necessary in order to determine the heights to which existing shore protective structures would have to be raised to prevent all overflow for the significant wave accompanying the SPH. Wave runup was considered to be the ultimate height to which water in a wave ascended on the proposed slope of a protective structure. This condition occurred when the WTL was at a maximum, and was calculated by the interpolation of model study data developed by Saville (23), (24), (25) which relates runup (R/H_0'), wave steepness (H_0'/T_2), relative depth (d/H_0'), and structure slope. The technique for computing wave runup is explained in detail in the Shore Protection Manual (SPM). (26)

(3) Protective structures exposed to wave runup will be constructed to an elevation and cross-section that is sufficient to prevent all overtopping from the significant wave and waves smaller than the significant wave accompanying the SPH. Waves larger than the significant wave will be allowed to overtop the

protective structures; however, such overtopping will not endanger the security of the structure or cause material interior flooding. Where the levee is located several hundred feet from the lakeshore, the larger waves in the wave spectum are broken at the seawall. Only smaller waves and waves generated in the shallow ponding area between the levee and the seawall can impinge on the levee. These smaller waves cause the wave runup used to determine the height of the protective structures. Wave data, runup elevations, and required elevations of protective structures are shown in Table A-16.

TABLE A-16
WAVE RUNUP AND PROPOSED ELEVATION OF PROTECTIVE STRUCTURES
STANDARD PROJECT HURRICANE
ALONG NEW ORLEANS LAKEFRONT
WEST OF IHNC

LOCATION[1] STATIONS B/L (ft)	DEPTH (ft)	H (ft)	T (sec)	WTL ELEVATION (ft n.g.v.d.)	RUNUP (ft)	ELEVATION OF STRUCTURE (ft n.g.v.d)
19+00 to 28+80 (Seabrk. Fldwl.)	NA[2]	4.1	7.3	11.5	3.5	15.0
29+25.54 to 42+10	4.9	1.46	7.3	12.9	4.7	18.0
43+10 to 78+59.24	5.6	1.8	7.3	12.8	5.5	18.0
78+59.24 to 88+24 (Am. Std. Fldwl.)	24.4	7.8	7.3	11.5	8.5	20.0
88+24 to 94+60	24.4	7.8	7.3	11.5	8.2	19.5
94+60 to 102+23.16	4.6	1.33	7.3	12.9	4.0	17.0
136+13.19 to 159+70	4.9	1.48	7.3	12.8	4.7	17.5
163+98.15 to 196+50	5.6	1.8	7.3	12.8	5.5	18.0
199+41.52 to 246+37.17	4.9	1.48	7.3	12.8	4.7	17.5

TABLE A-16 (cont.)
WAVE RUNUP AND PROPOSED ELEVATION OF PROTECTIVE STRUCTURES
STANDARD PROJECT HURRICANE
ALONG NEW ORLEANS LAKEFRONT
WEST OF IHNC

LOCATION[1] STATIONS B/L (ft)	DEPTH (ft)	H (ft)	T (sec)	WTL ELEVATION (ft n.g.v.d.)	RUNUP (ft)	ELEVATION OF STRUCTURE (ft n.g.v.d.)
250+72.09 to 289+49	5.6	1.8	7.3	12.8	5.5	18.0
289+49 to 303+51.39	6.2	2.06	7.3	12.8	5.9	18.5
303+51.39 to 305+41.96	6.2	2.06	7.3	12.8	5.9	18.5

[1] Not included are gates, ramps, transitions and reaches of levee whose heights were determined by adding freeboard to the SWL.

[2] Wave heights were determined by a breakwater with crest elevation of 5.6 feet n.g.v.d.

f. Residual flooding. The procedures described in the SPM (26) are used to determine wave runup and wave overtopping for the significant wave that would be experienced during hurricane occurrences. However, 14 percent of the waves in a spectrum are higher than the significant wave and the maximum wave height to be expected is about 1.87 times the significant wave height. Thus a structure designed to prevent all overtopping by a significant wave would be overtopped by that portion of the spectrum that is higher than the significant wave. It was therefore necessary to assure that this residual overtopping would not produce flooding and subsequent damage to the extent that only partial protection was afforded to an area for the design hurricane. A determination of the residual overtopping was made for the Orleans Lakefront area and it was concluded that no material flooding results if the design cross-section is overtopped by waves higher than the significant wave. It was therefore concluded that the use of the significant wave runup would result in design grades for protective structrues that would permit residual flooding only to a negligible degree.

I-8. Levee Design Considerations.

Along the Orleans Lakefront west of the IHNC several types of protective structures are being proposed in this document to prevent storm surge flooding. These devices are enumerated in the following paragraphs:

a. The majority of the lakefront levee system consists of an earthen levee several hundred feet behind the shoreline. The heights of these earthen levees were determined as described previously. A typical cross-section is shown on Plate A-19. The reaches where earthen levees were not considered are described in detail in the following paragraphs.

b. Floodwalls are used at several locations in place of levees. These areas are: Seabrook, American Standard, Pontchartrain Beach and the Orleans Marina. The floodwall at Seabrook is several hundred feet behind a breakwater. The breakwater prohibits the larger waves and their runup from striking the floodwall and allows a reduction in design height to 15 feet n.g.v.d. in this reach. At American Standard the floodwall is within one hundred feet of the shoreline. While this location does not permit the wave setup characteristic of most of the Orleans Lakefront reach, it has the hazard of being directly exposed to the larger waves, including the significant wave, in the wave spectrum. Thus the design height of this floodwall is 20 feet (and the height of its adjacent levee 19.5 feet). The floodwall behind Pontchartrain Beach will not be exposed to wave activity because of the proposed construction between it and the lake. This wall was designed by adding freeboard to the stillwater level of 11.5 feet. This was also the case for the floodwall and levee at the Orleans Marina. Here again boats and other structures will dissipate the wave activity before it can reach the wall.

c. Gates are located at many places in the levee system where streets or other access is required. These gates are short in length, have sills higher than the average topography and are generally constructed on a berm of the levee. For these reasons the elevation of the gates are the same as the surrounding levee. Wave overtopping volumes over the gates are insignificant.

d. Ramps will be constructed at several locations where the roadway crosses the levee alinement. The ramps are of a very flat slope, approximately 3 to 5 percent and therefore, wave runup will be small. Thus the ramps can be built to elevation 14.5 feet n.g.v.d. which is lower than the levees.

SECTION II - INTERIOR DRAINAGE

II-1. Intercepted Drainage. The only runoff that will be intercepted by this levee work is that which will pond between the levee and the seawall. Currently a levee already exists along the proposed alinement. Rainfall and overtopping runoff is collected in catch basins and discharges into the lake via drainage culverts. Modifications to this system to accommodate the high level plan for the Orleans Parish Lakefront are not required.

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LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

VICINITY MAP

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

NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-1

LIMIT OF FLOODED AREA FOR STANDARD PROJECT HURRICANE
LIVINGSTON PARISH
ASCENSION PARISH
ST TAMMANY PARISH
TANGIPAHOA PARISH
LOUISIANA
MISSISSIPPI
LAKE MAUREPAS
LAKE PONTCHARTRAIN
ST JOHN THE BAPTIST PARISH
ST JAMES PARISH
ST CHARLES PARISH
JEFFERSON PARISH
ORLEANS PARISH
ST BERNARD PARISH
NEW ORLEANS
LAKE BORGNE
LAKE ST CATHERINE
MISSISSIPPI SOUND
MISSISSIPPI RIVER
GULF OUTLET
INNER HARBOR NAVIGATION CANAL
METAIRIE RELIEF OUTFALL CANAL
DWYER CANAL
LITTLE WOODS CANAL
NEW RIVER CANAL
PASS MANCHAC
BONNET CARRE SPILLWAY
GREATER NEW ORLEANS EXPRESSWAY BRIDGE
New Orleans International Airport (Moisant Field)
New Orleans Airport
LEGEND
Seawall
Spoil
Levee
METEOROLOGIC STATIONS
Recording preceptation
Recording precipitation and temperature
Non-recording precipitation
Non-recording precipitation and temperature
Recording anemometer
HYDROLOGIC STATIONS
Recording gage and staff
Staff gage only
Wire weight
Recording wave gage
Salinity
NOTE:
Figures adjacent to symbols refer to stations listed in tables A-4 thru 6
VICINITY MAP
SCALE OF MILES
GULF OF MEXICO
CHANDELEUR SOUND
BRETON SOUND
ALABAMA
Mobile
Biloxi
Gulfport
Bay St Louis
LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC
METEOROLOGIC AND HYDROLOGIC STATIONS
SCALES AS SHOWN
U S ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984
FILE NO H-2-29536

PLATE A-2

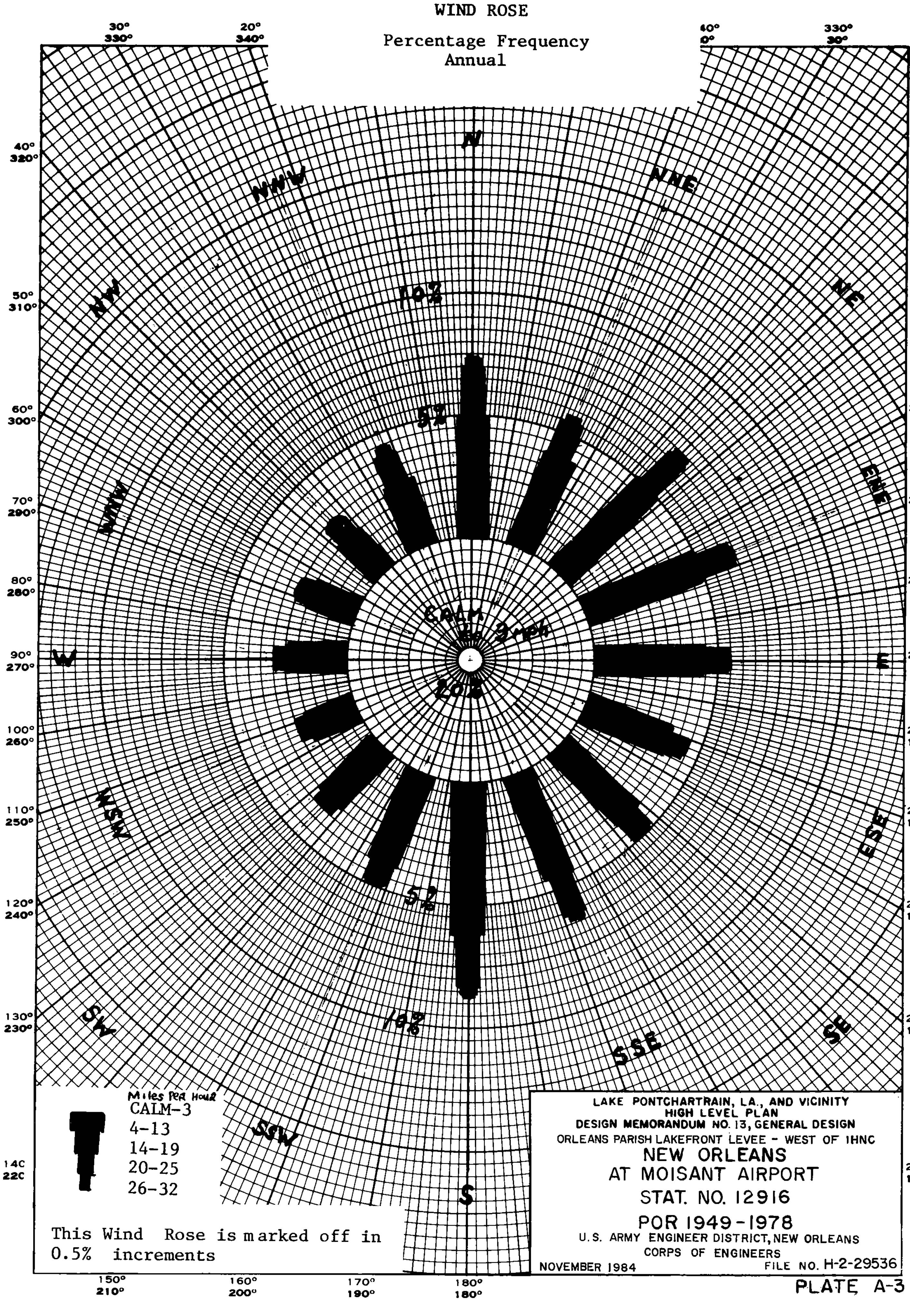
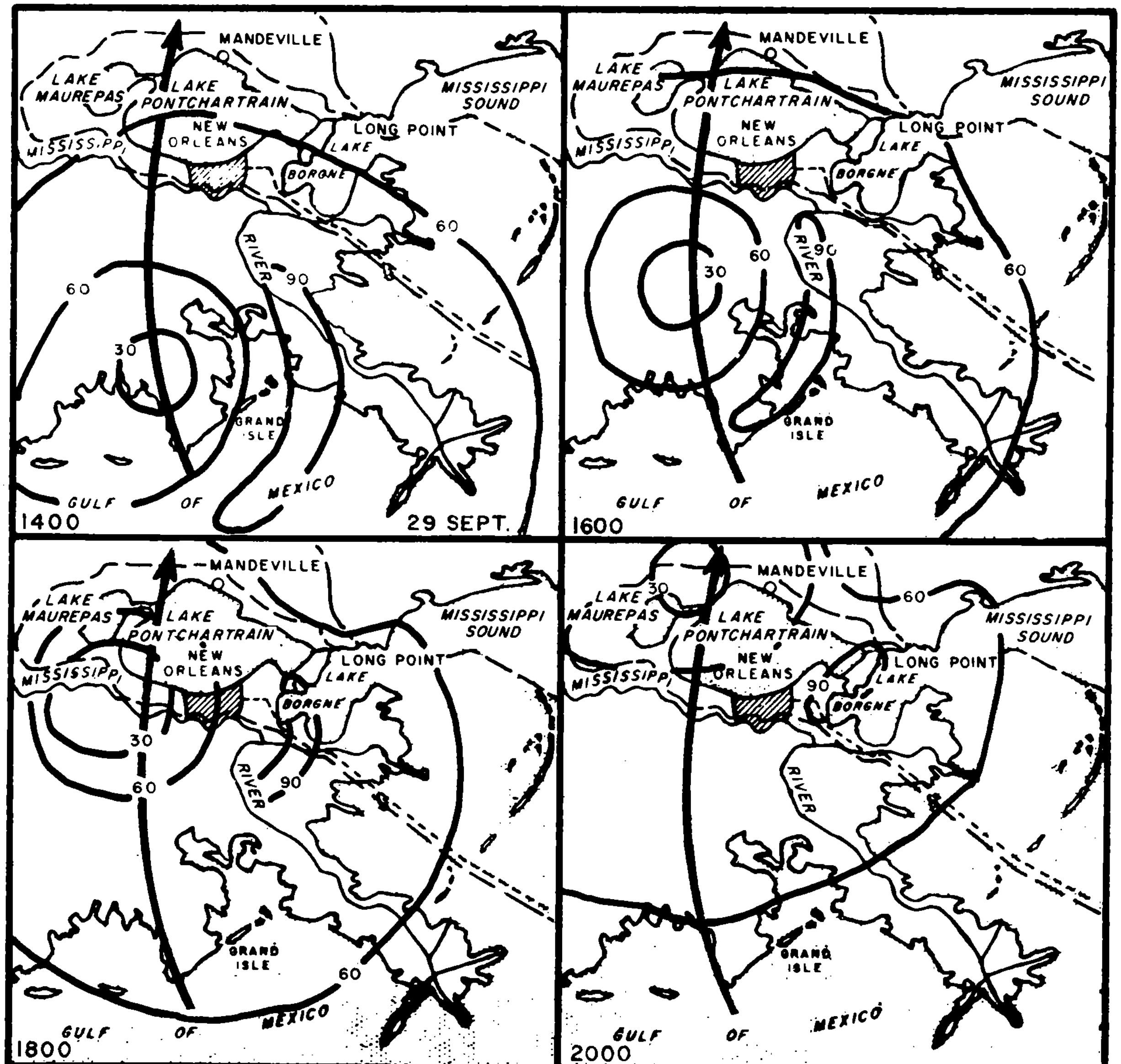
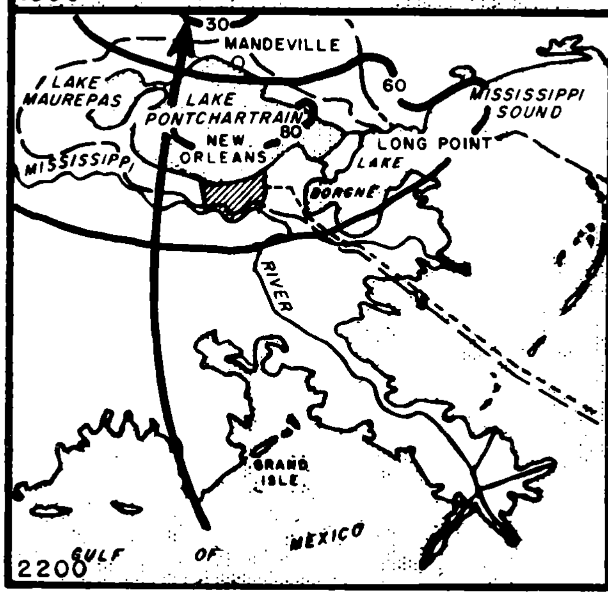

WIND ROSE
Percentage Frequency
Annual
N
NNW
NNE
NW
NE
WNW
ENE
W
E
WSW
ESE
SW
SE
SSW
SSE
S
10%
5%
CALM 0 - 3 mph
20%
Miles Per Hour
CALM-3
4-13
14-19
20-25
26-32
This Wind Rose is marked off in 0.5% increments
LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC
NEW ORLEANS
AT MOISANT AIRPORT
STAT. NO. 12916
POR 1949-1978
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984
FILE NO. H-2-29536

PLATE A-3





LEGEND

Study area

30 Average wind velocity

Hurricane path

LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

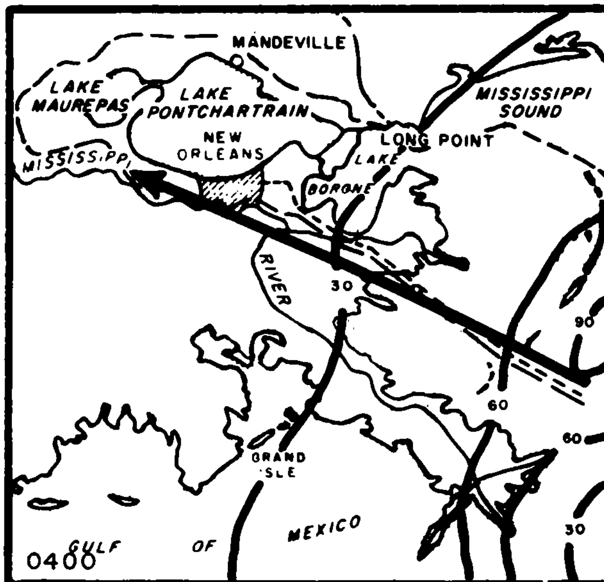
HURRICANE OF 28 SEPT. TO 1 OCT. 1915 ISOVEL PATTERNS

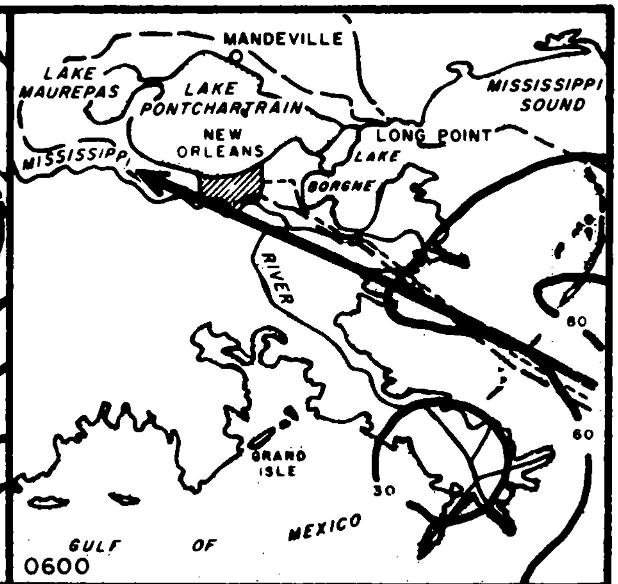
SCALE OF MILES
25 0 25 50

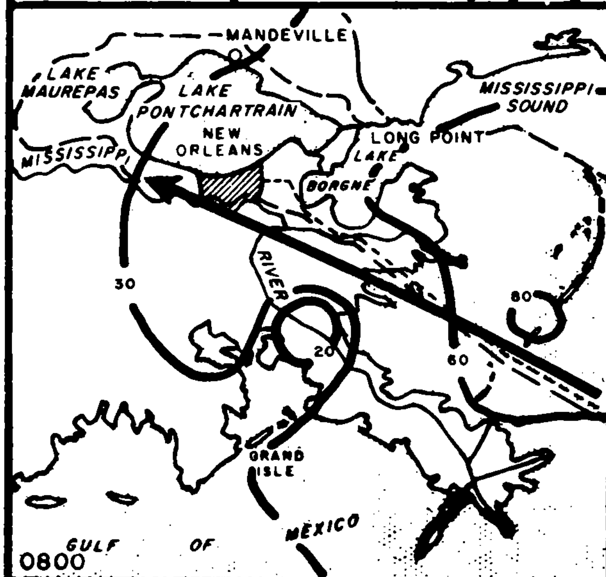
U S ARMY ENGINGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

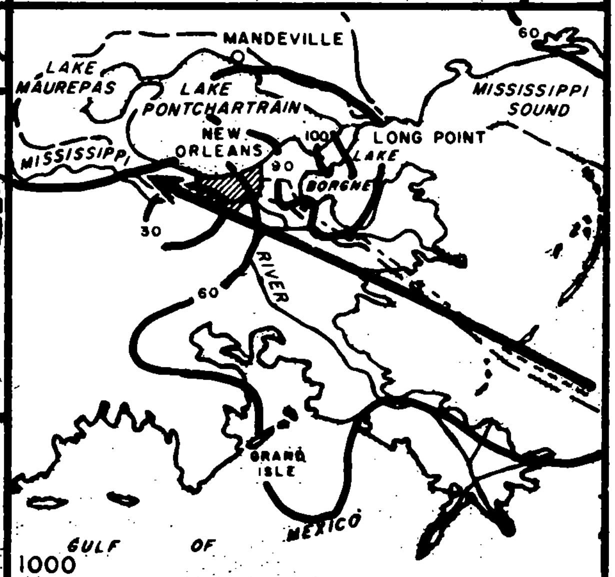
NOVEMBER 1984 FILE NO H-2-29536

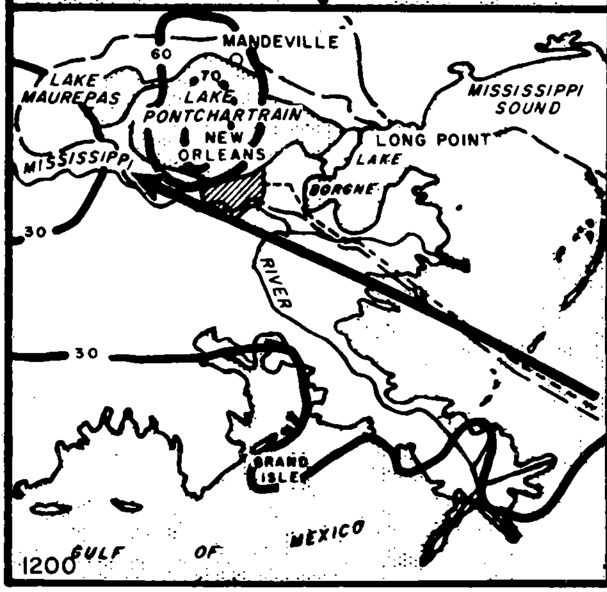
PLATE A-4











LEGEND

Study area

30 Average wind velocity

Hurricane path

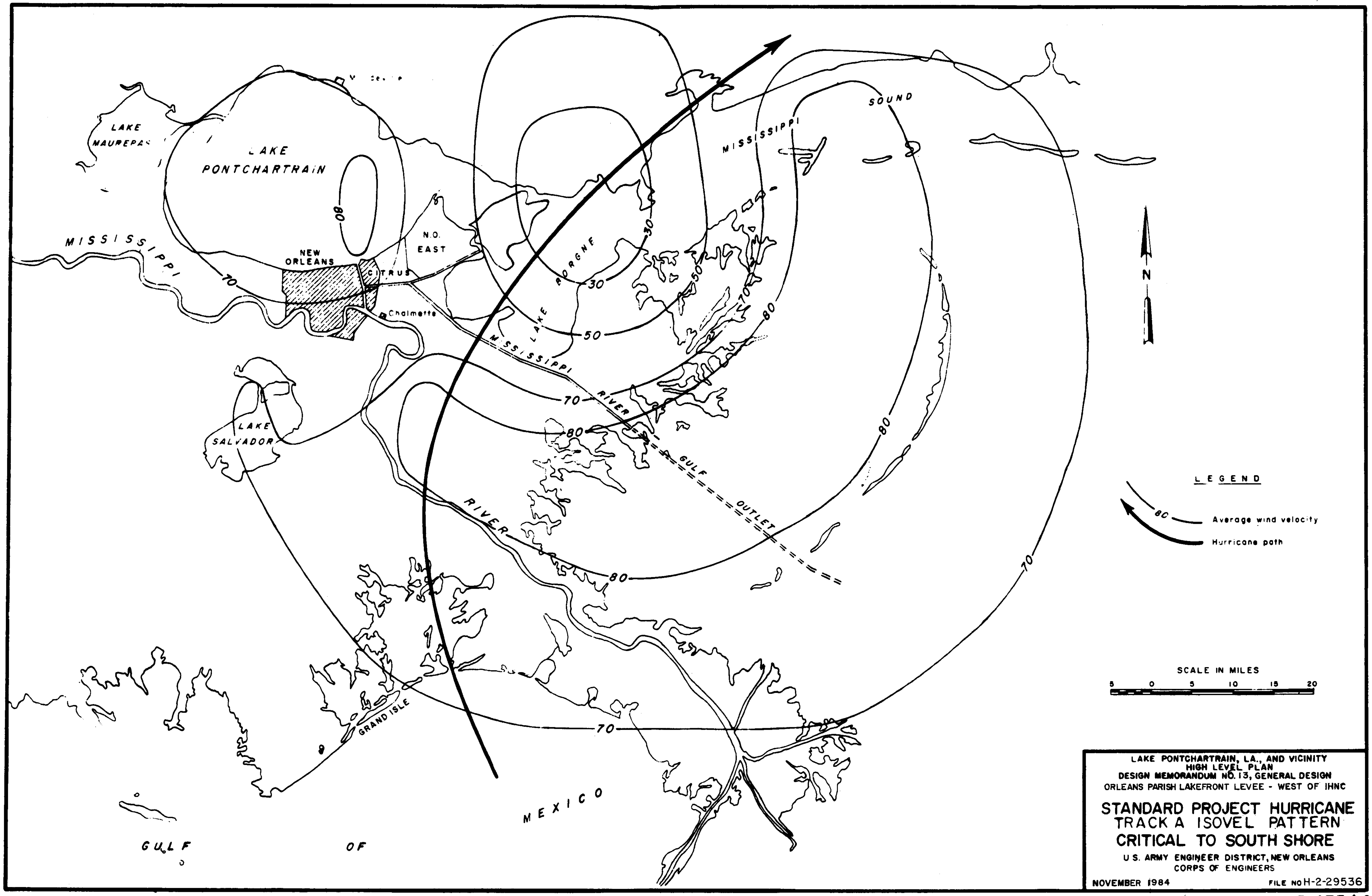
LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

HURRICANE OF 19 SEPT. 1947
ISOVEL PATTERNS

SCALE OF MILES
25 0 25 50

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

NOVEMBER 1984 FILE NO H-2-29536



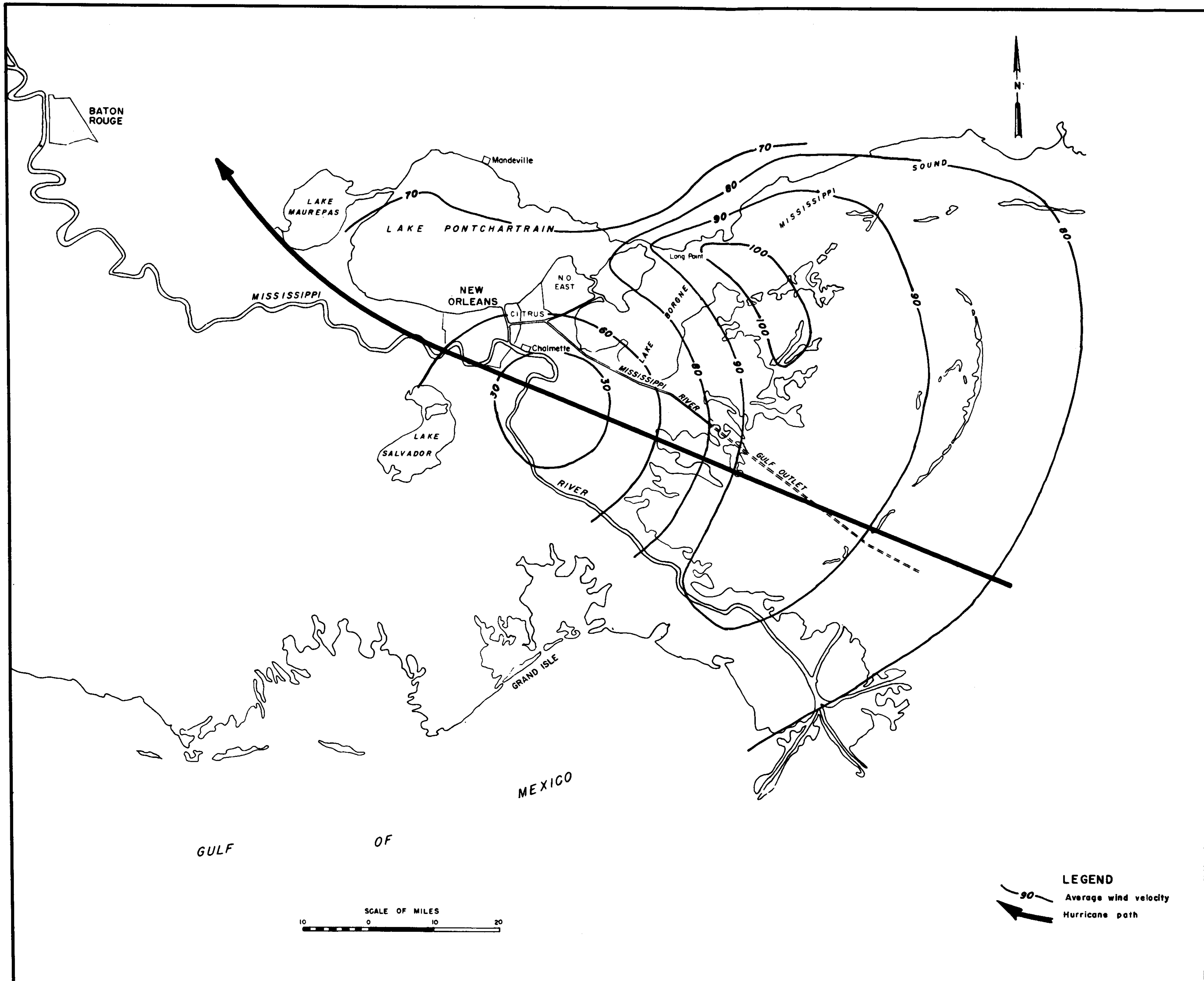
LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

STANDARD PROJECT HURRICANE
TRACK A ISOVEL PATTERN
CRITICAL TO SOUTH SHORE

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

NOVEMBER 1984 FILE NO H-2-29536

PLATE A-6



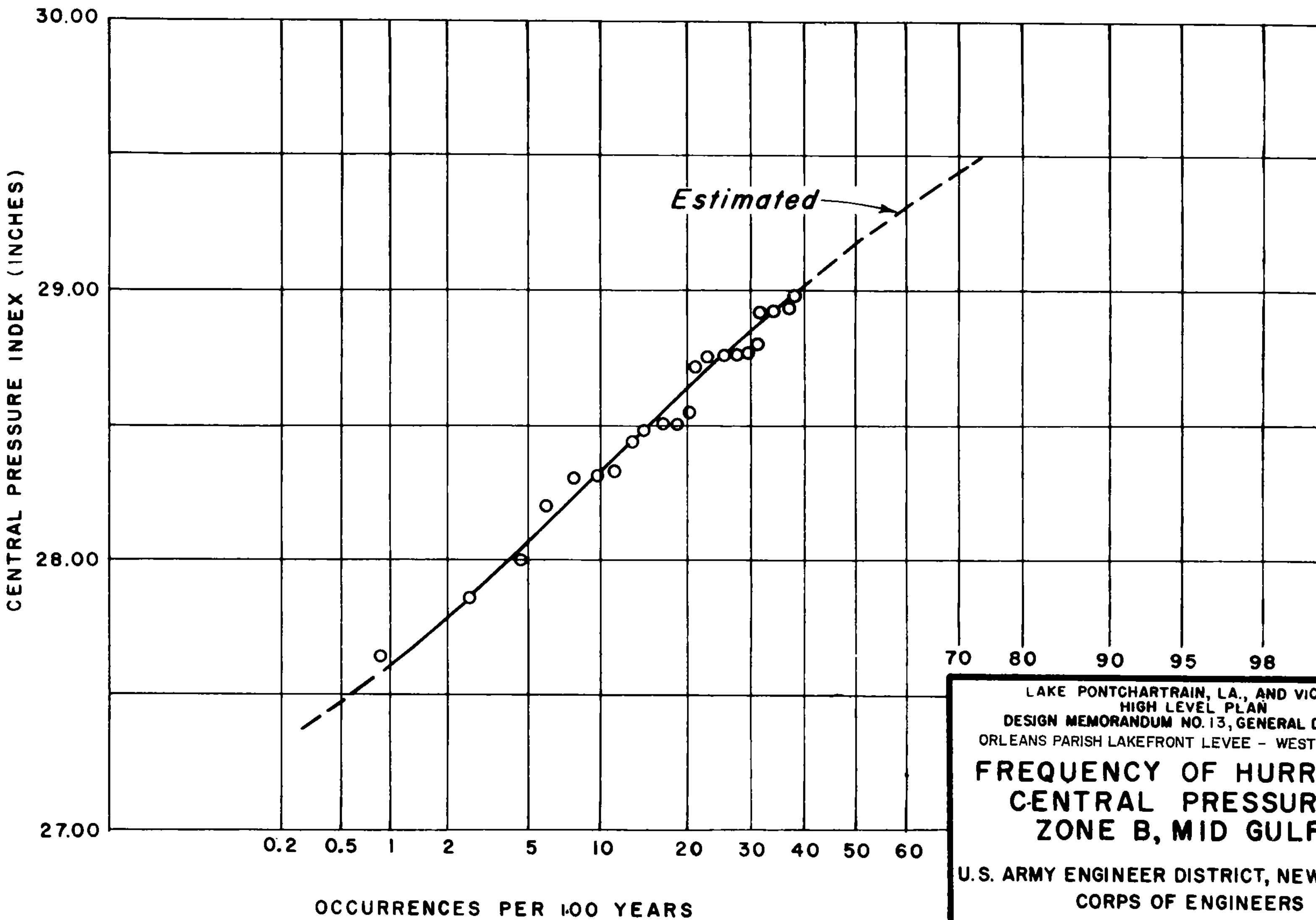
LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE – WEST OF IHNC

STANDARD PROJECT HURRICANE
ISOVEL PATTERN
TRACK F

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

NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-7



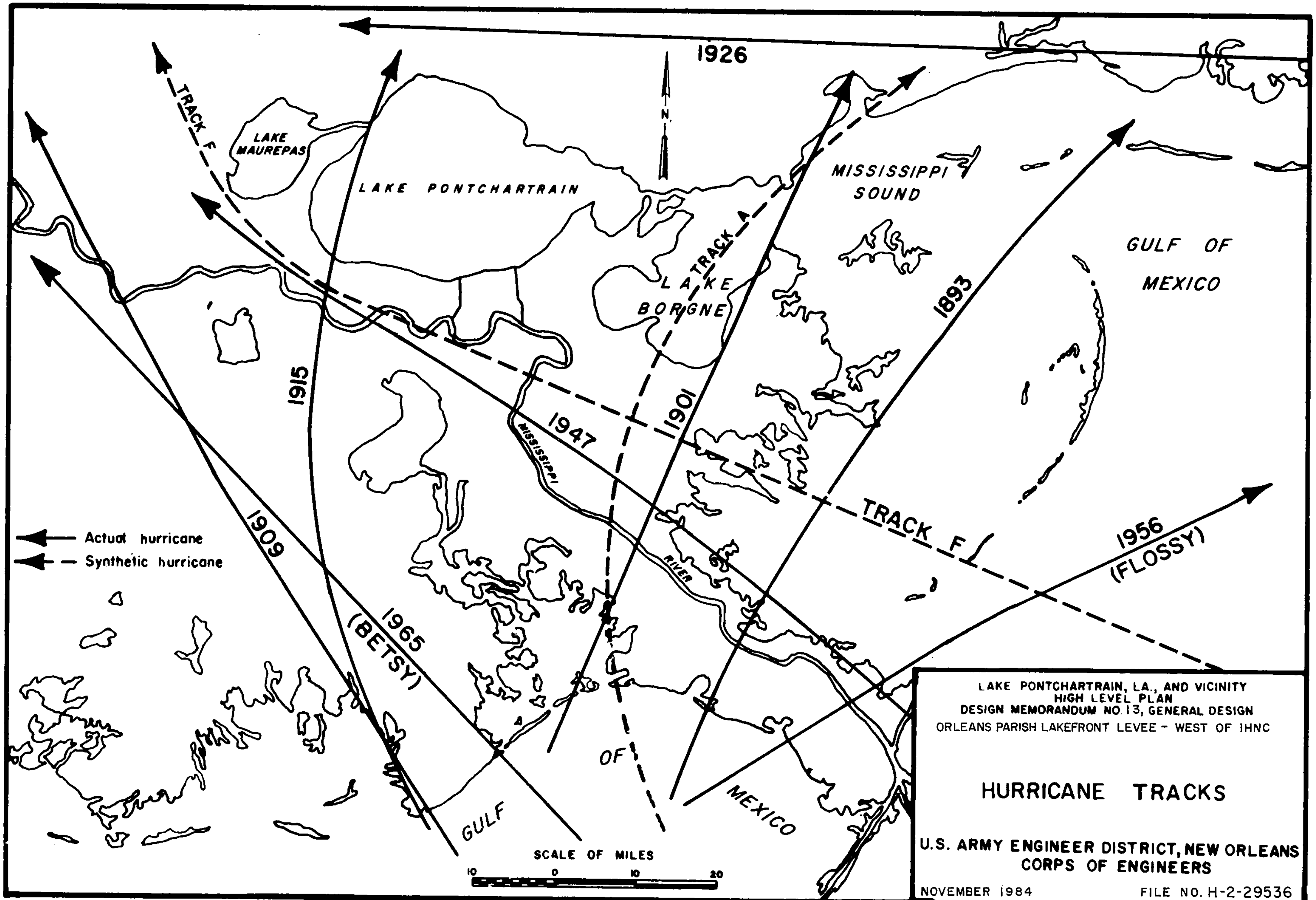
LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

FREQUENCY OF HURRICANE CENTRAL PRESSURES ZONE B, MID GULF

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

NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-8



LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

HURRICANE TRACKS

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

NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-9

	EL. IN LAKE BORGNE		EL. IN LAKE PONTCHARTRAIN			FLOW INTO LAKE PONTCHARTRAIN						L. PONT. STORAGE	
HOURS REFERENCED TO LANDFALL	EL. IN L. BORGNE	AV. OF (2)	AV. EL. IN L. PONT.	EL. AT HWY. 11	AV. OF (5)	HEAD BETWEEN L. BORGNE & L. PONT.	FLOW INTO L. PONT.	VOLUME OF FLOW FOR 2 HOURS	RAIN IN L. PONT.	VOLUME OF RAIN FOR 2 HOURS	TOTAL INFLOW INTO L. PONT.	STORAGE IN L. PONT. FOR EL. IN (4)	Δ STORAGE IN L. PONT.
(1)	(2) FEET N.G.V.D.	(3) FEET N.G.V.D.	(4) FEET N.G.V.D.	(5) FEET N.G.V.D.	(6) FEET N.G.V.D.	(7) FEET	(8) 1000 C.F.S.	(9) 1000 D.S.F.	(10) FEET	(11) 1000 D.S.F.	(12) 1000 D.S.F.	(13) 1000 D.S.F.	(14) 1000 D.S.F.
2	9.46		3.94	2.33					0.115			1970.6	
		9.86			1.21	8.65	4214.0	351.2		13.7	364.9		346.5
4	10.25		5.26	0.09					0.052			2317.1	
		9.91			1.62	8.29	4043.2	336.9		48.0	378.9		351.7
6	9.56		6.55	3.14					0.155			2668.8	
		9.11			4.55	4.56	2310.6	192.6		49.6	242.2		202.5
8	8.66		7.28	5.96					0.180			2871.8	
		7.43			7.43	0.00	0.0	0.0		21.0	21.0		-47.7
10	6.19		7.11	8.90					0.075			2823.6	

	OVERFLOW	FLOW INTO L. MAUREPAS	EL. IN LAKE MAUREPAS		VERIFICATION — STAGES IN PASS MANCHAC — L. PONT. SIDE		LAKE MAUREPAS SIDE				FLOW INTO LAKE MAUREPAS			STAGE IN LAKE MAUREPAS	
HOURS REFERENCED TO LANDFALL	FLOW OVER L. PONT. LEVEES FOR 2 HOUR	(12)-(14)-(15)	STORAGE IN L. MAUREPAS	AV. EL. IN L. MAUREPAS	EL. IN PASS MANCHAC	AV. OF (19)	TILT IN L. PONT.	TILT IN L. MAUREPAS	EL. IN PASS MANCHAC	AV. OF (23)	HEAD BETWEEN L. PONT. & L. MAUREPAS	FLOW INTO L. MAUREPAS	VOLUME OF FLOW FOR 2 HOURS	STORAGE IN L. MAUREPAS	EL. IN L. MAUREPAS
(1)	(15) 1000 D.S.F.	(16) 1000 D.S.F.	(17) 1000 D.S.F.	(18) FEET N.G.V.D.	(19) FEET N.G.V.D.	(20) FEET N.G.V.D.	(21) FEET	(22) FEET	(23) FEET N.G.V.D.	(24) FEET N.G.V.D.	(25) FEET	(26) 1000 C.F.S.	(27) 1000 D.S.F.	(28) 1000 D.S.F.	(29) FEET N.G.V.D.
2			225.1	1.12	3.54		1.21	0.24	1.00					226.2	1.13
	2.3	16.1				4.52				0.86	3.66	165.8	13.8		
4			241.2	1.27	5.50		5.41	1.08	0.73					240.0	1.26
	11.6	15.6				6.02				0.90	5.12	184.6	15.4		
6			256.8	1.41	6.55		3.41	0.68	1.07					255.4	1.40
	25.8	13.9				6.08				1.32	4.76	180.5	15.0		
8			270.7	1.58	5.61		-0.35	-0.07	1.57					270.4	1.53
	54.9	13.8				5.11				1.82	3.29	160.2	13.4		
10			284.5	1.65	4.61		-4.29	-0.86	2.08					283.8	1.64

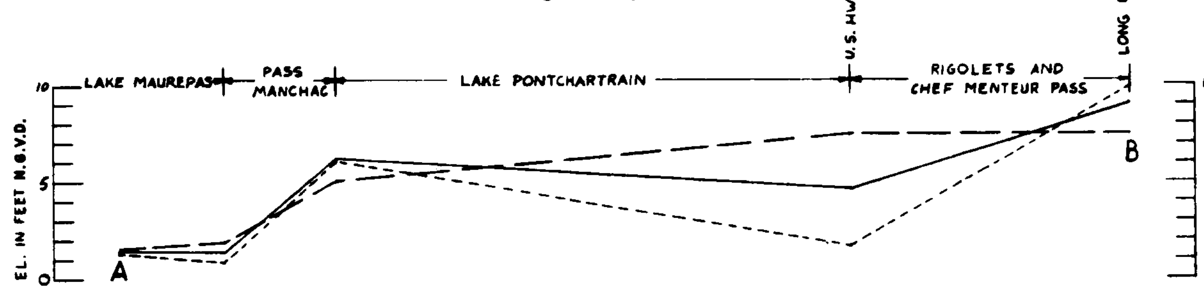
SAMPLE ROUTING

EXPLANATION:

COLUMN (2) FROM LAKE BORGNE HYDROGRAPH DERIVED BY THE METHOD DESCRIBED IN PARAGRAPH 1-5 (I) AND SHOWN ON PLATE A-13
(4) ASSUMED
(5) OBTAINED FROM WATER SURFACE CONTOURS DERIVED FROM WIND SETUP COMPUTATIONS FOR LAKE PONT., SAMPLE SHOWN ON PLATE A-15
(7) (3) - (6)
(8) FROM CHEF MENTEUR PASS AND RIGOLETS RATING CURVE SHOWN BELOW
(10) FROM RAINFALL ESTIMATES DESCRIBED IN PARAGRAPH 1-5E(A)
(12) (9) + (11)
(13) FROM LAKE PONT. STORAGE CURVE SHOWN BELOW FOR THE ELEVATION IN (4)

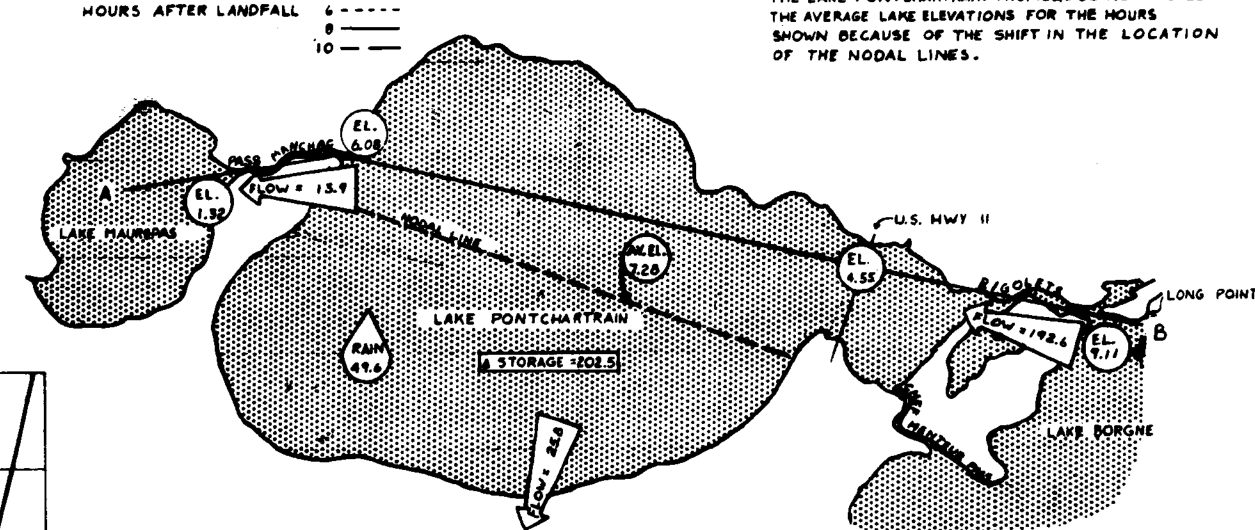
COLUMN (14) (13) - (13)
(15) BY THE PROCEDURES DESCRIBED IN PARAGRAPH 1-7E
(17) (16) + (17)
(18) CORRESPONDING ELEVATION FOR VOLUME IN (17) FROM LAKE MAUREPAS STORAGE CURVE SHOWN BELOW
(19) SAME AS EXPLANATION FOR (5)
(21) (19) - (5)
(22) 1/5 OF (21), ESTIMATED AS 1/5 OF THE TILT OF LAKE PONTCHARTRAIN SINCE LAKE MAUREPAS IS 1/5 AS WIDE.
(23) (18) - $\frac{(22)}{2}$
(25) (20) - (24)
(26) FROM PASS MANCHAC RATING CURVE SHOWN BELOW
(28) (17) + (27)
(29) CORRESPONDING ELEVATION FOR VOLUME IN (28) FROM LAKE MAUREPAS STORAGE CURVE SHOWN BELOW

WATER SURFACE PROFILES



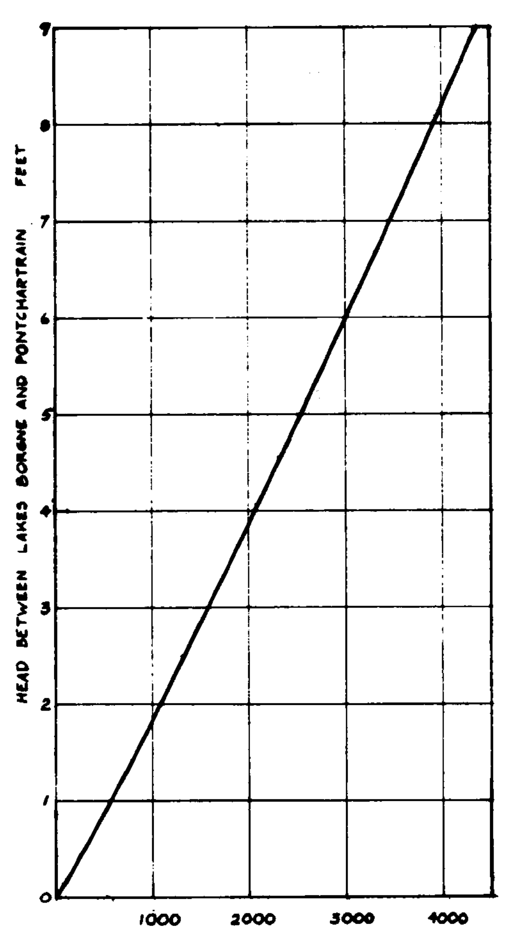
LEGEND:
HOURS AFTER LANDFALL 6 ------ 8 —— 10 — —

NOTE:
THE LAKE PONTCHARTRAIN PROFILES DO NOT REFLECT THE AVERAGE LAKE ELEVATIONS FOR THE HOURS SHOWN BECAUSE OF THE SHIFT IN THE LOCATION OF THE NODAL LINES.

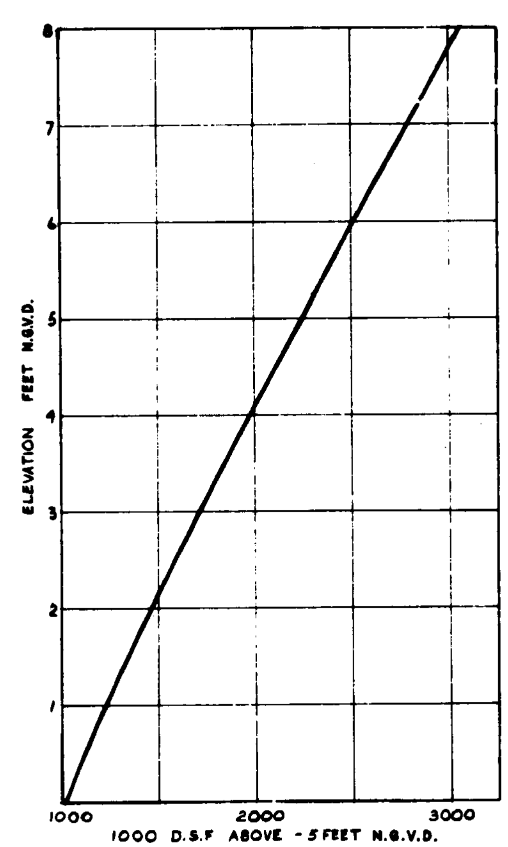


ROUTING DIAGRAM
6 TO 8 HOURS AFTER LANDFALL

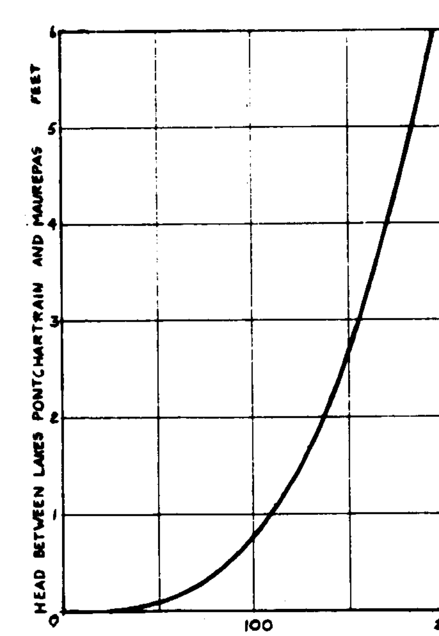
NOTE:
FLOW AND RAIN IN 1000 D.S.F.
ELEVATIONS IN FEET N.G.V.D



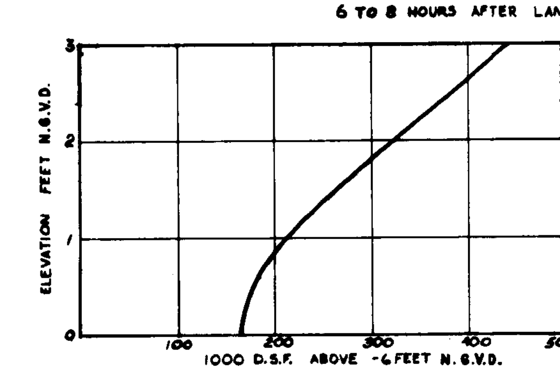
CHEF MENTEUR PASS & RIGOLETS FLOW



LAKE PONTCHARTRAIN STORAGE



PASS MANCHAC FLOW



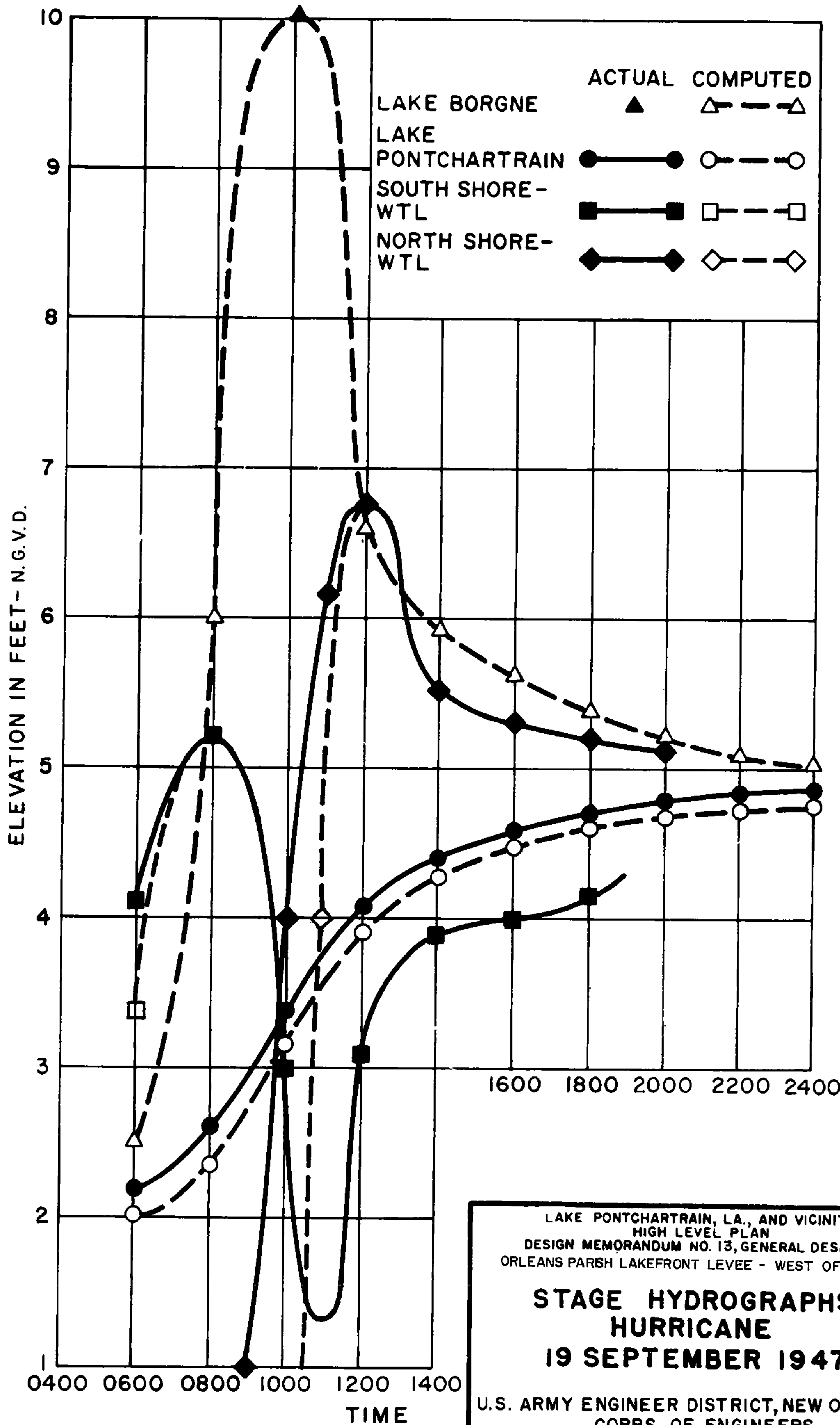
LAKE MAUREPAS STORAGE

LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE – WEST OF IHNC

LAKE PONTCHARTRAIN ROUTING

SCALE AS SHOWN
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS, LA.
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-10

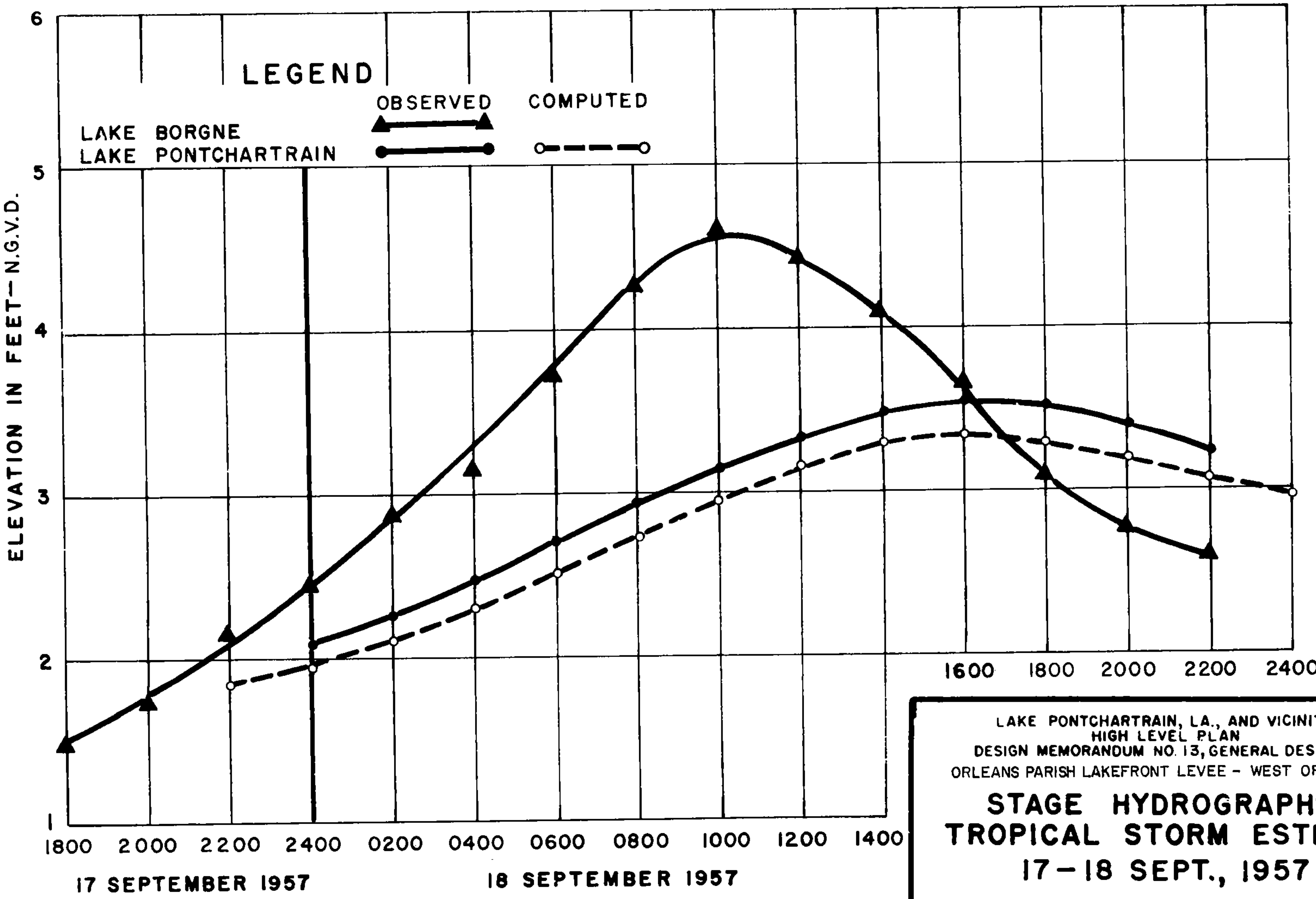


LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

STAGE HYDROGRAPHS HURRICANE 19 SEPTEMBER 1947

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

NOVEMBER 1984 FILE NO. H-2-29536



LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE – WEST OF IHNC

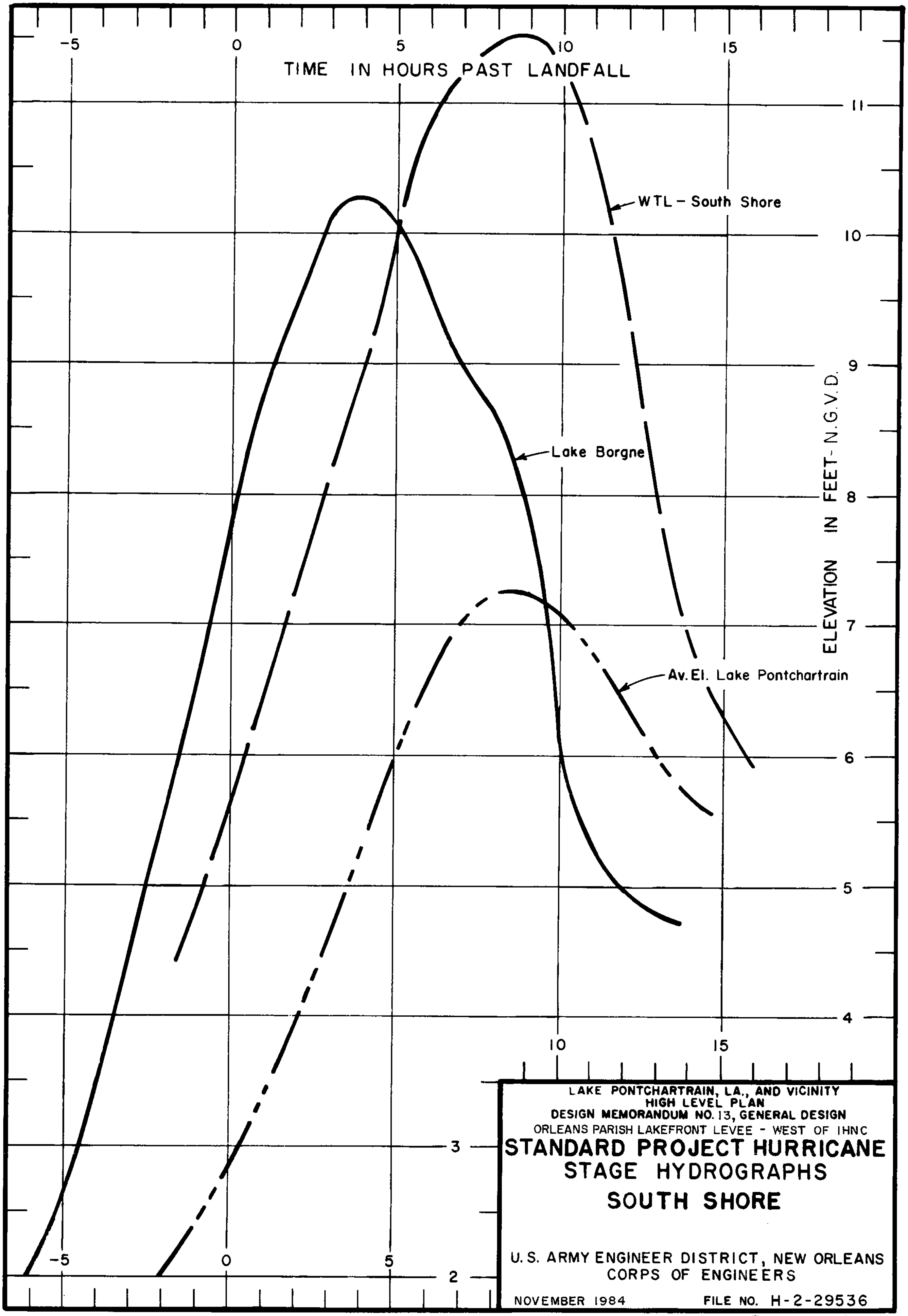
STAGE HYDROGRAPHS
TROPICAL STORM ESTHER
17 – 18 SEPT., 1957

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

NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-12

PLATE A-12



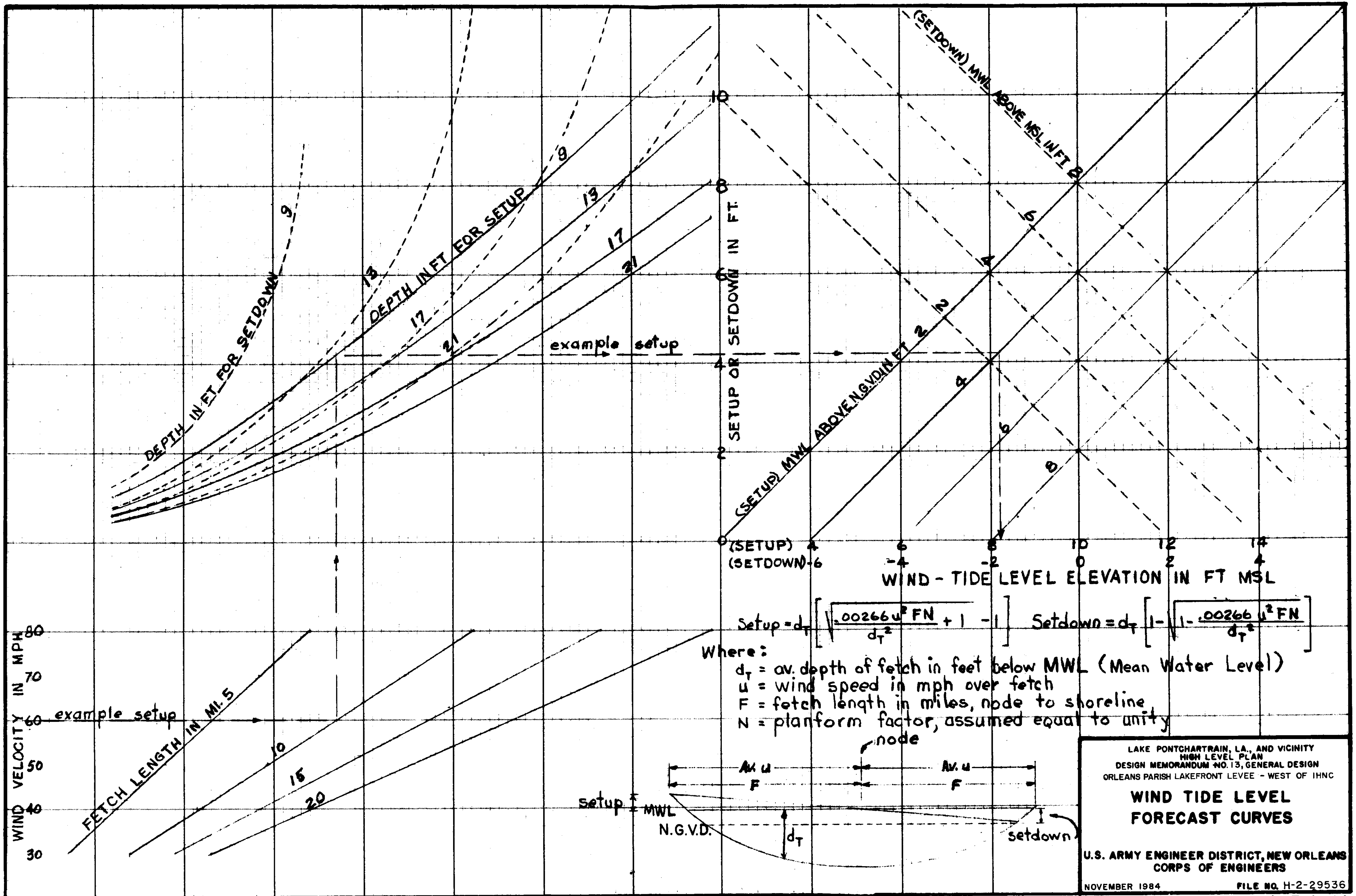
LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

STANDARD PROJECT HURRICANE
STAGE HYDROGRAPHS
SOUTH SHORE

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

NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-13



$$\text{Setup} = d_T\left[\sqrt{\frac{.00266\,u^2FN}{d_T^2}+1}-1\right] \qquad \text{Setdown} = d_T\left[1-\sqrt{1-\frac{.00266\,u^2FN}{d_T^2}}\right]$$

Where:
- d_T = av. depth of fetch in feet below MWL (Mean Water Level)
- u = wind speed in mph over fetch
- F = fetch length in miles, node to shoreline
- N = planform factor, assumed equal to unity

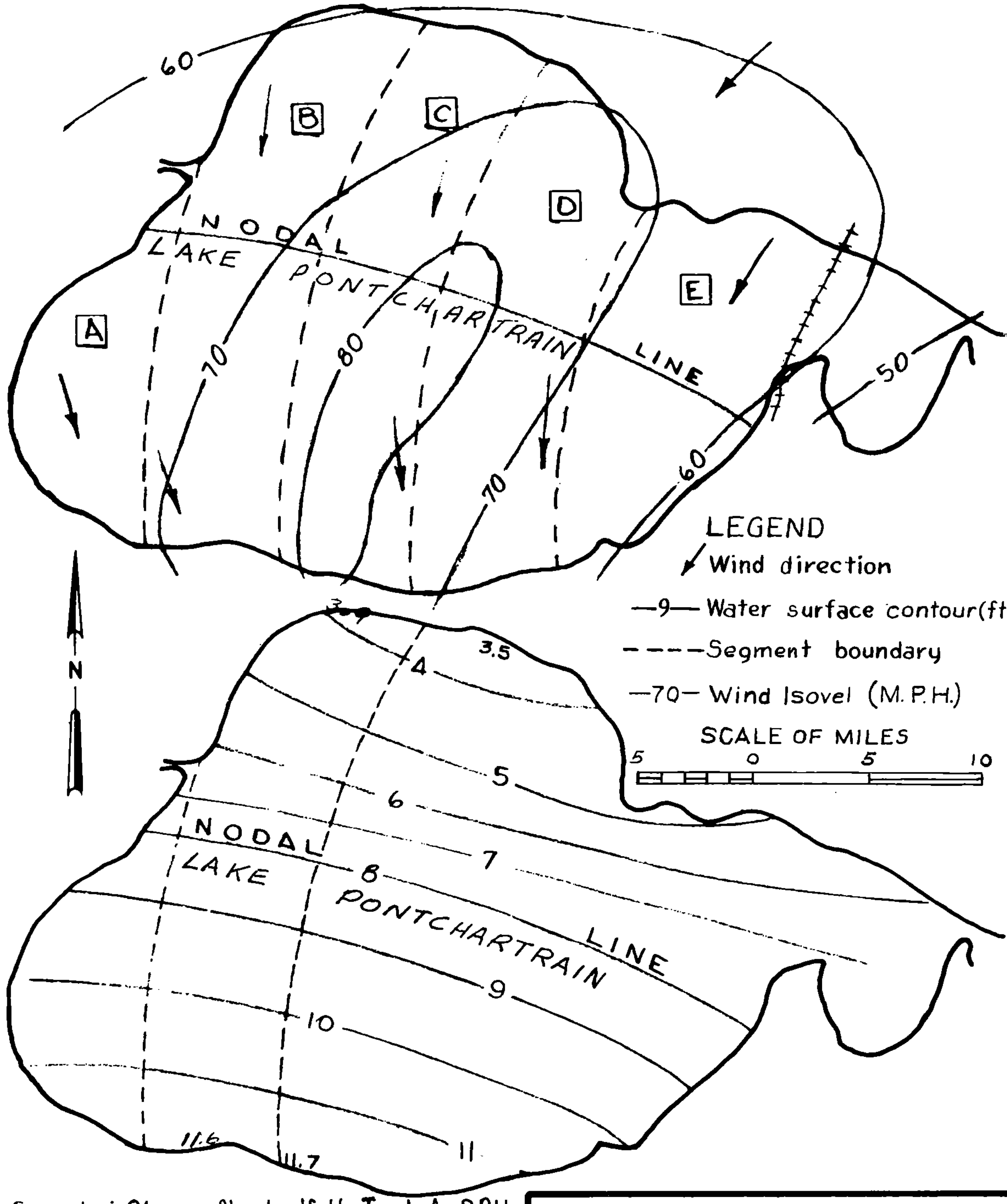
LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

WIND TIDE LEVEL FORECAST CURVES

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

NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-14



Sample: 8 hours after landfall - Track A-SPH

Setdown:

$$S = 19.2\left[1-\sqrt{1-\frac{0.00266(66)^2(12.5)(1.0)}{(19.2)^2}}\right] = -4.1$$

+8.0 = MWL
−4.1
+3.9 = WTL

Setup:

$$S = 20.5\left[\left(\sqrt{\frac{0.00266(70)^2(12.5)(1.0)}{(20.5)^2}+1}\right)-1\right] =$$

+3.6'
8.0 = MWL
+11.6' = WTL

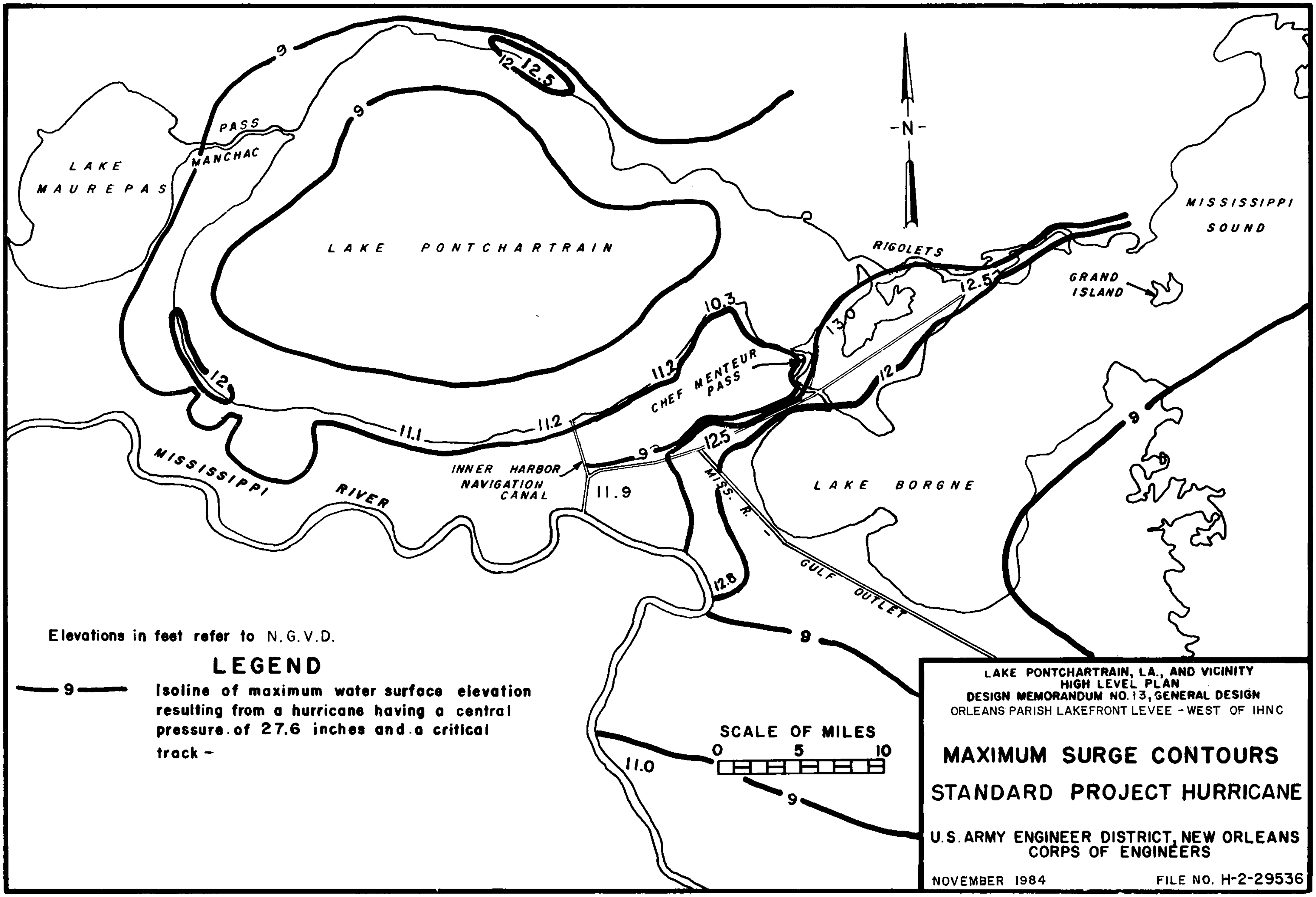
Interpolate with data for MWL = 6.0'
to obtain WTL's for routed MWL = +7.28'.

LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE – WEST OF IHNC

LAKE PONTCHARTRAIN TYPICAL WIND TIDE CONTOURS

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

NOVEMBER 1984 FILE NO. H-2-29536



Elevations in feet refer to N.G.V.D.

LEGEND

—— 9 —— Isoline of maximum water surface elevation resulting from a hurricane having a central pressure of 27.6 inches and a critical track -

LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

MAXIMUM SURGE CONTOURS
STANDARD PROJECT HURRICANE

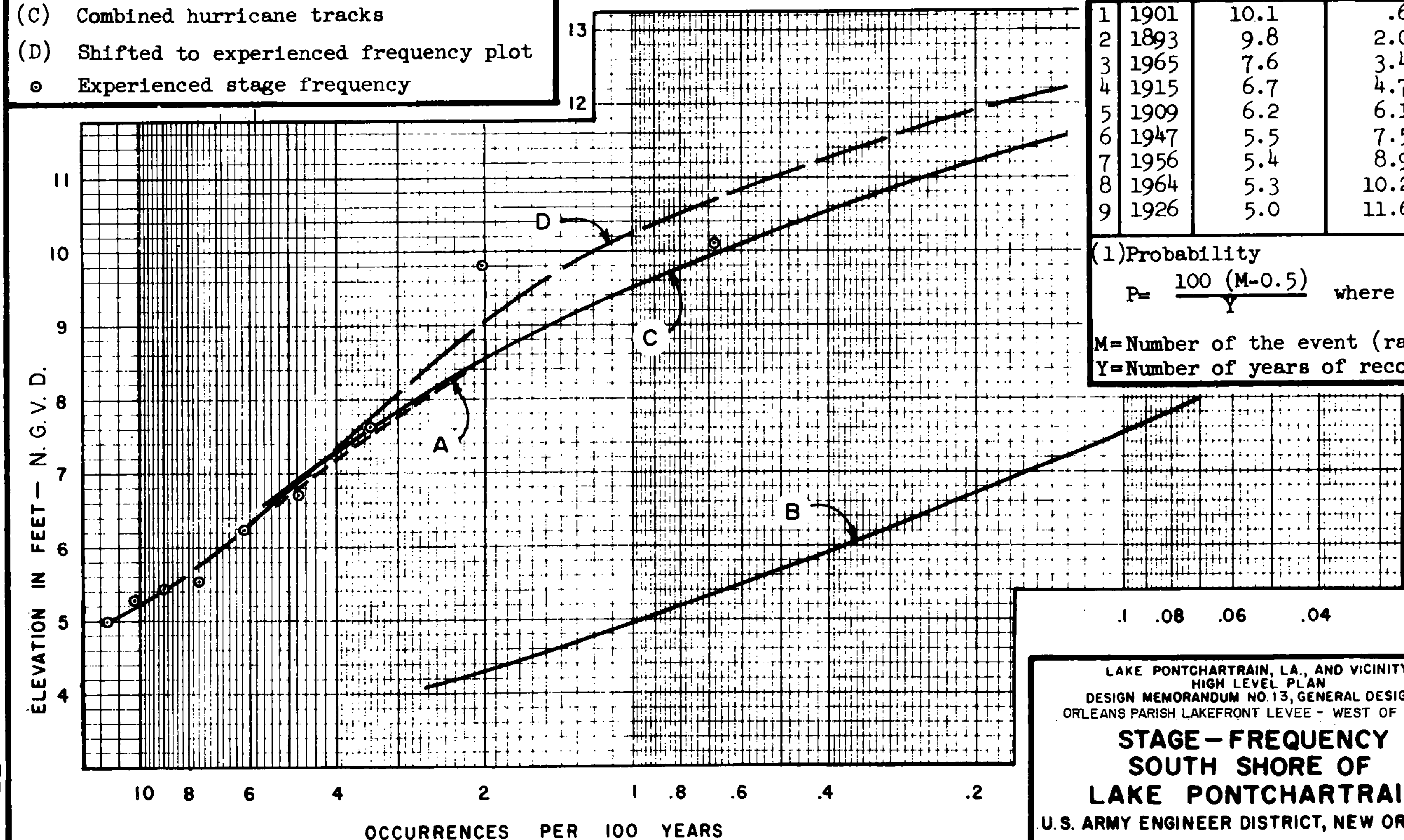
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-16

LEGEND

(A) Hurricane tracks from the south
(B) Hurricane tracks from the east
(C) Combined hurricane tracks
(D) Shifted to experienced frequency plot
⊙ Experienced stage frequency



FREQUENCY ANALYSIS

M	Years	Wind tide level (ft.)	(1) Probability
1	1901	10.1	.685
2	1893	9.8	2.05
3	1965	7.6	3.42
4	1915	6.7	4.79
5	1909	6.2	6.16
6	1947	5.5	7.53
7	1956	5.4	8.90
8	1964	5.3	10.27
9	1926	5.0	11.64

(1)Probability

$$P = \frac{100\ (M-0.5)}{Y} \quad \text{where}$$

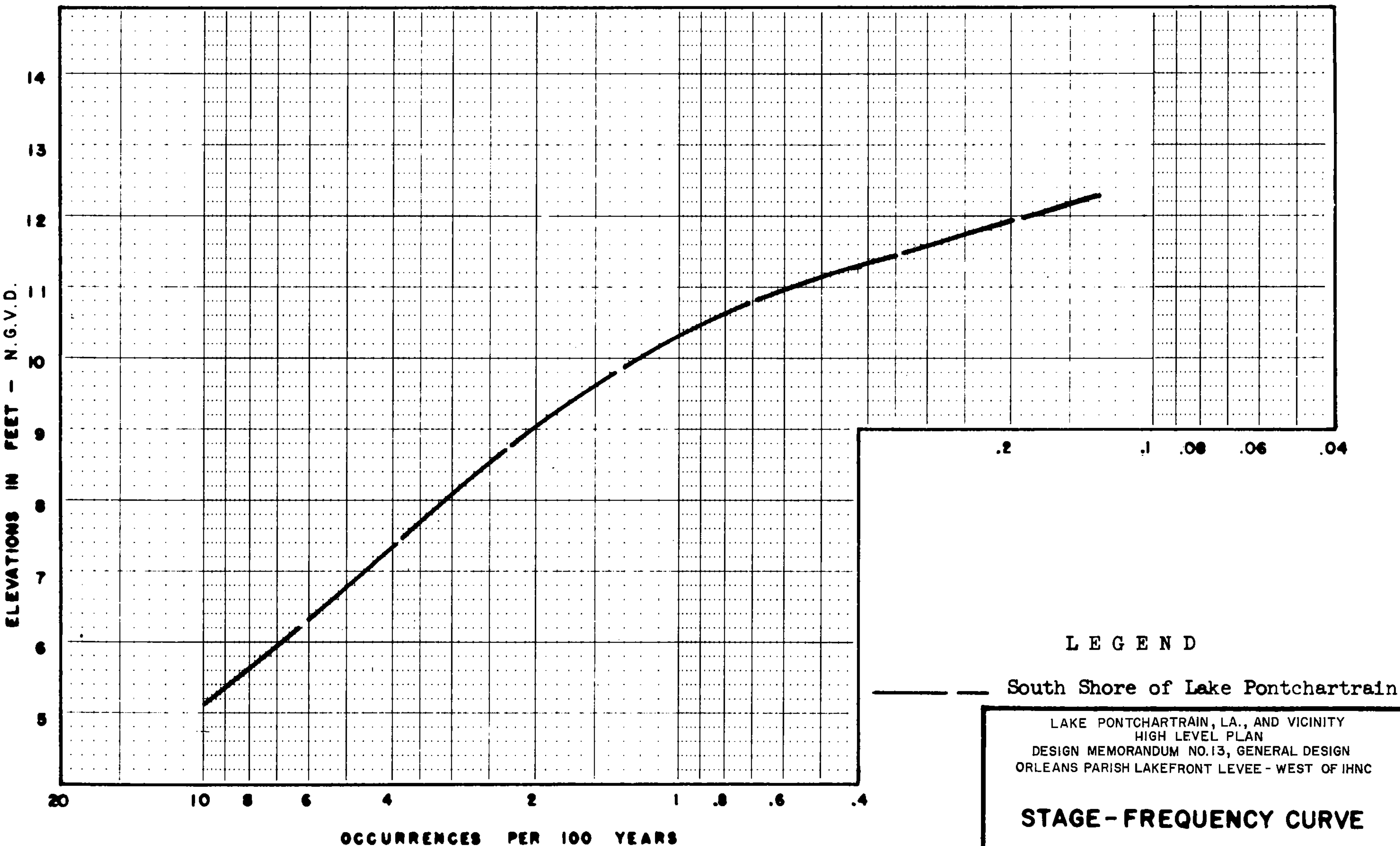
M=Number of the event (rank)
Y=Number of years of record(73)

LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

STAGE — FREQUENCY SOUTH SHORE OF LAKE PONTCHARTRAIN

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-17

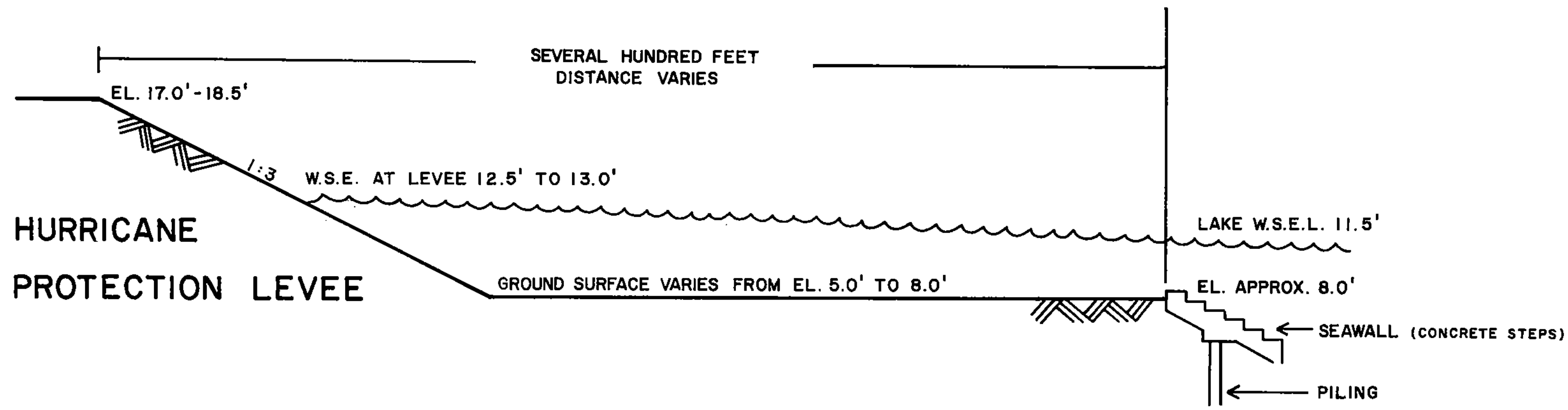


LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO.13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

STAGE-FREQUENCY CURVE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-18



LAKE PONTCHARTRAIN, LA., AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE - WEST OF IHNC

TYPICAL CROSS SECTION

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS, LA.
CORPS OF ENGINEERS
NOVEMBER 1984 FILE NO. H-2-29536

PLATE A-19

LAKE PONTCHARTRAIN, LOUISIANA & VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF IHNC

APPENDIX B

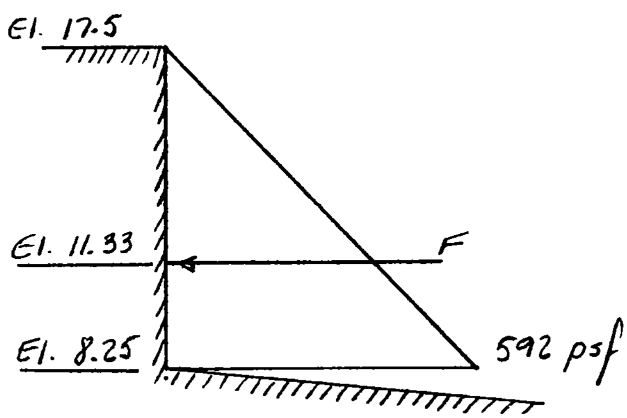
STRUCTURAL DESIGN CALCULATIONS
FOR TYPICAL
MITERED SWING GATE

DESIGN INFORMATION

Required clear opening = 38'-0"
Gate sill, El. 8.25' NGVD
Top of gate, El. 17.50' NGVD

Design water pressure diagram

SWL = 11.5' NGVD ⇐ HLP (SPH)



$d = 17.5 - 8.25 = 9.25$ ft

$F = \frac{wd^2}{2} = \frac{64(9.25)^2}{2}$

$F = 2738$ lb/ft.

$P_s = 64(9.25) = 592$ psf

$d_f = \frac{9.25}{3} = 3.08$ ft

WAVE FORCE

Group II loading ∴ can allow 33 1/3 % increase in allowable stresses or can use 75% of loads.

Miter Angle = 1 on 3

References:

1. EM 1110-1-2101 "Working Stresses for Structural Design"
2. AISCS - "Manual of Steel Construction", 8th Ed.
3. Appendix I, Misc. Paper K-75-9, COE, "Computer Aided Design of Horizontally Framed Miter Gates".

FIG 1

COMPONENTS OF THRUST

Note: Equations developed in Ref. 3.

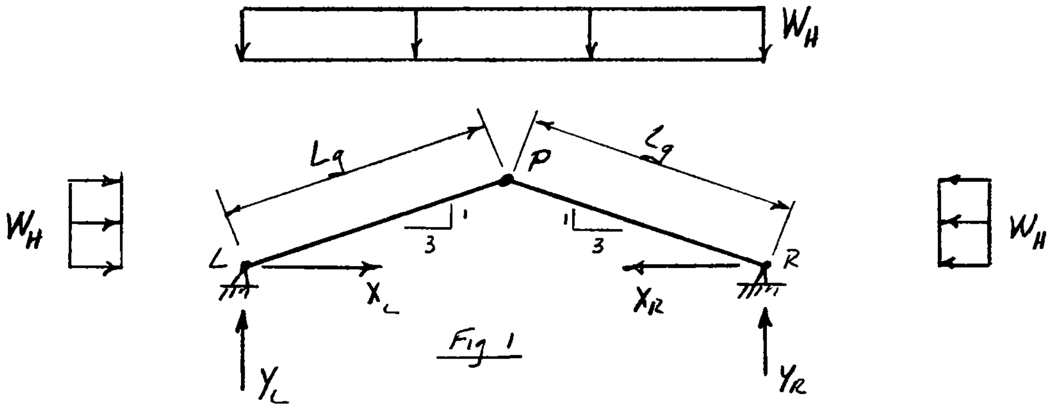


Fig 1

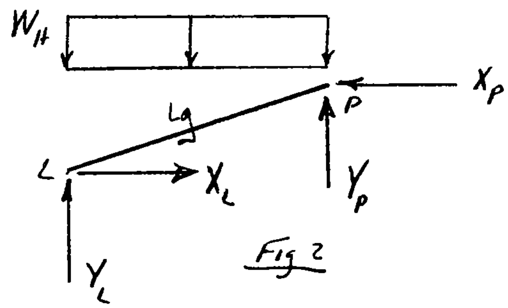


Fig 2

SINGLE LEAF
(MITERED POSITION)

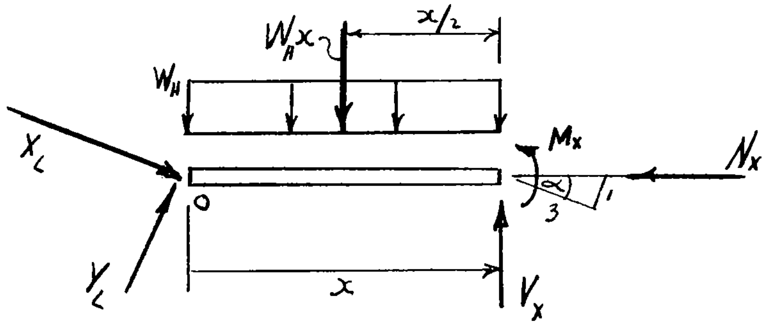


Fig 3

From Fig 1: $Y_L = Y_R$ (by symmetry)

$$Y_L = Y_R = \frac{3}{\sqrt{10}} W_H L_g$$

From Fig. 2:

$$X_L = \frac{2\sqrt{2}}{\sqrt{5}} W_H L_g$$

$$X_p = \frac{\sqrt{5}}{\sqrt{2}} W_H L_g \qquad Y_p = 0$$

$$T = \sqrt{X_L^2 + Y_L^2} = \frac{\sqrt{5}}{\sqrt{2}} W_H L_g$$

From Fig 3:

$$M_x = \left(\frac{W_H x}{2}\right)(L_g - x)$$

$$V_x = W_H \left(x - L_g/2\right)$$

$$N_x = \frac{3}{2} W_H L_g$$

$$P_x = \sqrt{N_x^2 + V_x^2} = W_H \sqrt{x^2 - x L_g + \frac{5}{2} L_g^2}$$

$$\text{eccentricity} = e_x = \frac{M_x}{N_x} = x(L_g - x)/3L_g$$

At the hinge end:

$$x = 0$$

$$V_x = W_H (x - L_g/2)$$

$$V_o = - W_H L_g/2$$

$$N_x = 3 W_H L_g/2$$

$$N_o = 3 W_H L_g/2$$

FIG 3

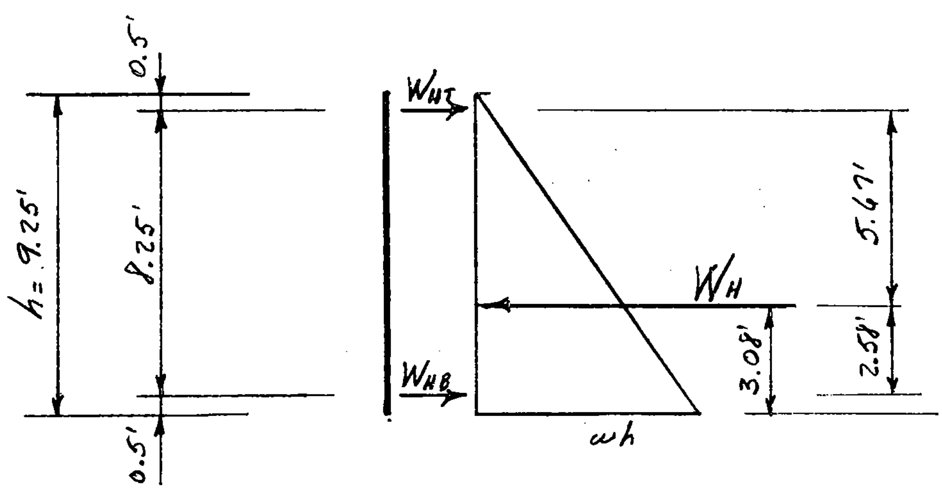
LAKE PONTCH. HURRICANE PROT. PROJ. 4 DES: JAR 19 OCT 83
MITERED SWING GATES AT TOPAZ ST. CKD: LT 31 OCT 83

$$L_g = \frac{\sqrt{10}}{3} L_o = \frac{\sqrt{10}}{3}(19') + 0.42' = 20.45'$$

(gate overlap with column.

Assumptions:

1) 2 - horizontal girders
2) Water load is carried by girders only, load transfered directly to hinges.



$$W_H = \frac{wh^2}{2} \times 75\% = 0.064(9.25)^2\left(\tfrac{1}{2}\right)(0.75) = 2.054\ ^{k}/_{1}$$

$$W_{HT} = 2.054\left(\frac{2.58}{8.25}\right) = 0.642\ ^{k}/_{1}$$

$$W_{HB} = 2.054\left(\frac{5.67}{8.25}\right) = 1.412\ ^{k}/_{1}$$

FIG 4

For Top Girder:

$$V_{OT} = \frac{W_{HT} L_g}{2} = \frac{0.642(20.45)}{2} = 6.564^k$$

$$N_{OT} = -\frac{3W_H L_g}{2} = -\frac{3(0.642)(20.45)}{2} = -19.693^k$$

$$T_{OT} = 20.758^k$$

$$M_{xT} = W_{HT} L_g^2/8 = \frac{0.642(20.45)^2}{8} = 33.561'^k$$

@ $x = L_g/2$

$$e_{xT} = \frac{M_{xT}}{N_{xT}} = \frac{33.561}{19.693} = 1.70'$$

@ $x = L_g/2$

For Bottom Girder:

$$V_{OB} = \frac{1.412}{0.642}(6.564) = 14.437^k$$

$$N_{OB} = -\frac{1.412}{0.642}(19.693) = -43.312^k$$

$$T_{OB} = 45.655$$

$$M_{xB} = \frac{1.412}{0.642}(33.561) = 73.813'^k$$

@ $x = L_g/2$

$$e_{xB} = \frac{M_{OB}}{N_{OB}} = 1.70'$$

@ $x = L_g/2$

FIG 5

Girder Design

1) Bottom Girder

For hydraulic structures $F_b = 20$ ksi ($F_y = 34$ ksi)

Required $S_x = \frac{M_x}{F_b} = \frac{73.813 \times 12}{20} \times 1.25 = 55.36 \text{ in}^3$

Accounts for axial load

Try W 18 x 40

$A = 11.8 \text{ in}^2$ $I_x = 612 \text{ in}^4$ $S_x = 68.4 \text{ in}^3$ $r_x = 7.21$ in

From Ref 2, Table C1.8.1, fig f, pg. 5-124

$K = 2$

$$\frac{K_x L_x}{r_x} = \frac{2(20.45)(12)}{7.21} = 68.07$$

From Ref 1, Para 11c.

for hydro. struc. $F_a = 0.83\,k_1 F_y$

when $\frac{KL}{r} < C_c$ where:

$$C_c = \sqrt{\frac{2\pi^2 E}{F_y}} \qquad k_1 = \frac{1 - \left[\frac{(KL/r)^2}{2C_c^2}\right]}{F.S.}$$

$$F.S. = \frac{5}{3} + \frac{3}{8}\frac{(KL/r)}{C_c} - \frac{(KL/r)^3}{8C_c^3}$$

$$C_c = \sqrt{\frac{2\pi^2(29 \times 10^6)}{36 \times 10^3}} = 126.1 > KL/r$$

$$F.S. = \frac{5}{3} + \frac{3}{8}\frac{(68.07)}{126.1} - \frac{(68.07)^3}{8(126.1)^3} = 1.85$$

$$K_1 = \frac{1 - \left[\frac{(68.07)^2}{2(126.1)^2}\right]}{1.85} = 0.46$$

$$F_a = 0.83(0.46)(36) = 13.74 \text{ ksi}$$

$$f_a = \frac{P}{A} = \frac{43.312}{11.8} = 3.67 \text{ ksi}$$

$$\frac{f_a}{F_a} = \frac{3.67}{13.74} = 0.27 > 0.15$$

$\therefore$ use

$$\frac{f_a}{F_a} + \frac{C_m f_b}{\left(1 - \frac{f_a}{K_4 F_e'}\right) F_b} \leq 1.0$$

[Ref 1, Para 11k(1)]

$$F_e' = \frac{149 \times 10^6}{\left(\frac{KL}{r}\right)^2} = \frac{149 \times 10^6}{(68.07)^2} \times \frac{1}{1000} = 32.16 \text{ ksi}$$

$$K_4 = 0.83 \quad \text{(hydro. struc.)}$$

$$C_m = 0.85$$

$$f_b = \frac{M}{S} = \frac{73.813(12)}{68.4} = 12.95 \text{ ksi}$$

$$0.27 + \frac{0.85(12.95)}{\left[1 - \frac{3.67}{(0.83)(32.16)}\right](20)} = 0.27 + 0.64 = 0.91 < 1.0$$

OK

USE W18x40

2) Top Girder

USE W18x40 to simplify gate fabrication

FIG. 7

LAKE PONTCH. HURRICANE PROT PROJ. 8 DES: JJR 25 OCT 83
MITERED SWING GATES AT TOPAZ ST. CHKD: LT 31 OCT 83

Skin Plate

USE PL 5/16"

$$I = \frac{bd^3}{12} = \frac{12(0.3125)^3}{12} = 0.0305 \text{ in}^4$$

$$S = \frac{2I}{d} = \frac{2(0.0305)}{0.3125} = 0.1952 \text{ in}^3$$

Max. Load = 64 psf x 8.75 ft = 560 lb/ft

Max Moment Allow. = SF_b = 0.1952 x 20,000 = 3904 in-lb

Max Allow. End Span:

$$M = \frac{wL^2}{10} = \frac{560 \times L^2 \times 12}{10} = 3904$$

$$L = 2.41 \text{ ft.}$$

Max Allow. Interior Span:

$$M = \frac{wL^2}{12} = \frac{560 \times L^2 \times 12}{12} = 3904$$

$$L = 2.64 \text{ ft.}$$

USE
- Int. Span: L = 2'-6" 7-spans
- End. Span: L = 1'-7 3/8" 2-spans

FIG 8

Check:

Interior Spans: $M = \dfrac{560(2.5)^2(12)}{12} = 3500$ in-lb

$f_b = \dfrac{3500}{0.1952} = 17{,}930$ psi $< 20{,}000$ psi OK

End Spans: $M = \dfrac{560(1.6146)^2(12)}{10} = 1752$ in-lb

$f_b = \dfrac{1752}{0.1952} = 8{,}975$ psi $< 20{,}000$ psi OK

CHECK STRESSES OF SKIN PLATE WITH PL 3/8 x 6" VERTICAL STIFFENERS

From pg 4

$R_T = 642$ lb/1

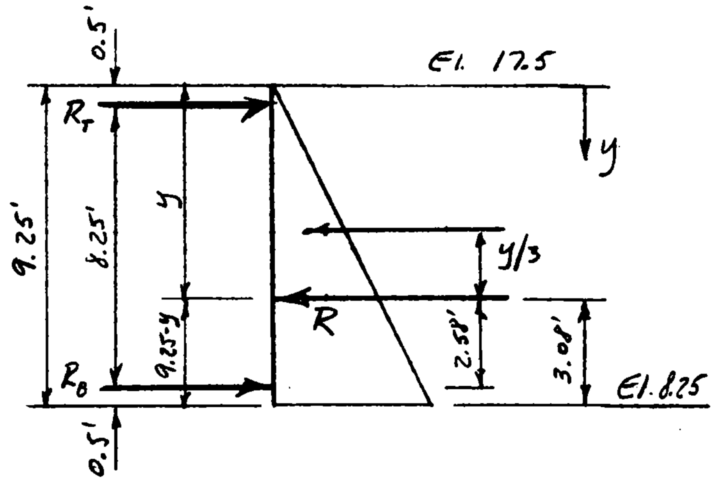
$R_B = 1412$ lb/1

Locate point of zero shear

$R_T - \frac{1}{2}(64)y^2 = 0$

$642 - \frac{1}{2}(64)y^2 = 0$

$y = 4.48'$

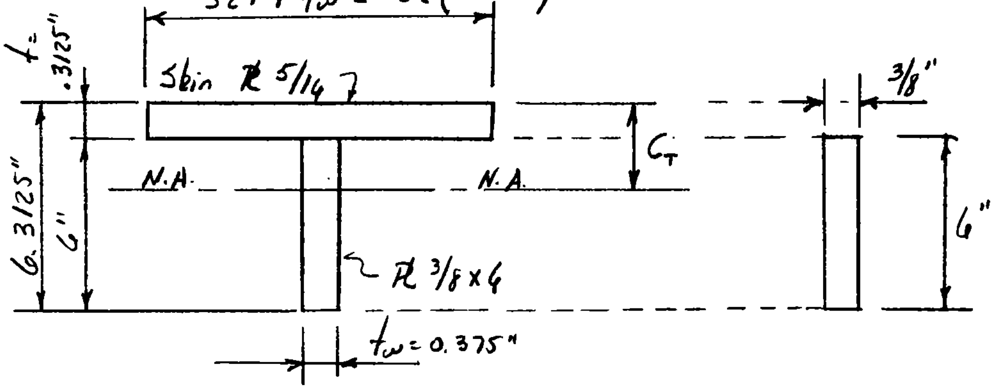


Max $M = 642 \times 4.48 - \frac{1}{2}(64)(4.48)^2\left(\frac{4.48}{3}\right)(75\%) = \underline{\underline{2157 \text{ ft-lb}}}$

LAKE PONTCH. HURRICANE PROT. PROJ. 10 DES: JAR 25 OCT 83
MITERED SWING GATES AT TOPAZ ST. CHKD: LT 31 OCT 83

Properties of 5/16 skin PL with PL 3/8 x 6 Vert. Stiffeners

$32t + t_w = 32(0.3125) + 0.375 = 10.375''$



PL	A	y	Ay	Ay²	I_o
10.375 x 0.3125	3.2422	0.1563	0.5066	0.08	—
6 x 0.375	2.2500	3.3125	7.4531	24.69	6.75
	5.4922	3.4688	7.9597	24.77	6.75

$$\bar{y} = \frac{7.9597}{5.4922} = 1.4493''$$

$$I = \Sigma I_o + \Sigma Ay^2 - \Sigma Ay\bar{y}$$
$$= 6.75 + 24.77 - 7.9597(1.4493) = 19.984 \text{ in}^4$$

$$S_{TOP} = \frac{19.984}{1.4493} = 13.7887 \text{ in}^3 \cong 13.79 \text{ in}^3$$

$$S_{BOTT.} = \frac{19.984}{4.8632} = 4.1092 \text{ in}^3 \cong 4.11 \text{ in}^3$$

$$f_{b_{TOP}} = \frac{M_{max}}{S_{TOP}} = \frac{2157\left(\frac{10.375}{12}\right) \times 12}{13.79} \cong \underline{\underline{1623 \text{ psi}}}$$

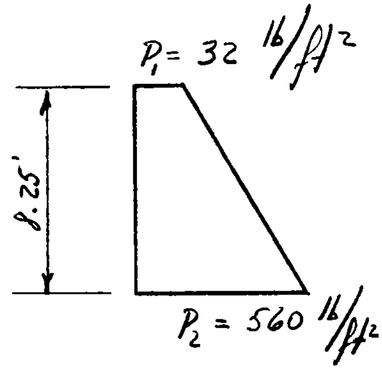
$$f_{b_{BOTT.}} = \frac{M_{max}}{S_{BOTT}} = \frac{2157\left(\frac{10.375}{12}\right) \times 12}{4.11} \cong \underline{\underline{5445 \text{ psi}}}$$

FIG 10

LAKE PONTCH. HURRICANE PROT. PROJ. 11 DES: JAN 25 OCT 83
MITERED SWING GATES AT TOPAZ ST. CHKD: LT 31 OCT 83

$m = 2.5'$
$h = 8.25'$
$E = 29 \times 10^6$ psi
$I = 19.984$ in^4

Properties of 5/16" Skin PL with PL 3/8" x 6"



Check Deflection

$$\Delta = \frac{5h^4 m}{768 EI}(P_1 + P_2)$$

$$= \frac{5(8.25 \times 12)^4 (2.5 \times 12)}{768 (29 \times 10^6)(19.984)} \left(\frac{32+560}{144}\right) = 0.133 \text{ in} < L/360 \text{ Ok}$$

$$\left(\frac{L}{360} = \frac{8.25 \times 12}{360} = 0.275 \text{ in}\right)$$

Check Biaxial Stresses of Skin PL

$$\frac{f_1^2 + f_1 f_2 + f_2^2}{F_y^2} \le (0.75)^2$$

$M = 2.157 \times 2.5 \times 12$
$= 64.71$ Kips·in

$$f_1 = \frac{M(\text{in. l})}{0.1952} = \frac{3.500}{0.1952} = 17.930$$

$$f_2 = \frac{64.71}{13.79} = 4.693$$

$f_1^2 = 321.485$ $\quad f_2^2 = 22.024$ $\quad f_1 f_2 = 84.145$

$$\frac{321.485 + 84.145 + 22.024}{(36)^2} = 0.33 < (0.75)^2 = 0.5625 \text{ Ok}$$

FIG 11

Check unsupported length

Top & Bottom Girders:

W18x40 $\quad b_f = 6.015"$ $\quad d/A_f = 5.67$ $\quad C_b = 1.0$

$\ell = 60"$ $\quad S_x = 68.4 \text{ in}^3$

(2 x int. spans)

$$\frac{2400\, b_f}{\sqrt{F_y}} = \frac{2400(6.015)}{\sqrt{36{,}000}} = 76.1 \text{ in} > \ell = 60 \text{ in.} \quad \text{OK}$$

$$\frac{20{,}000}{(d/A_f)F_y} = \frac{20{,}000}{(5.67)(36)} = 97.98 \text{ in} > 60 \text{ in} \quad \text{OK}$$

$$F_b = \frac{12\times10^3 C_b}{\ell(d/A_f)} = \frac{12{,}000(1.0)}{60(5.67)} = 35.27 \text{ ksi}$$

USE $F_b = 18$ ksi

Top Girder:

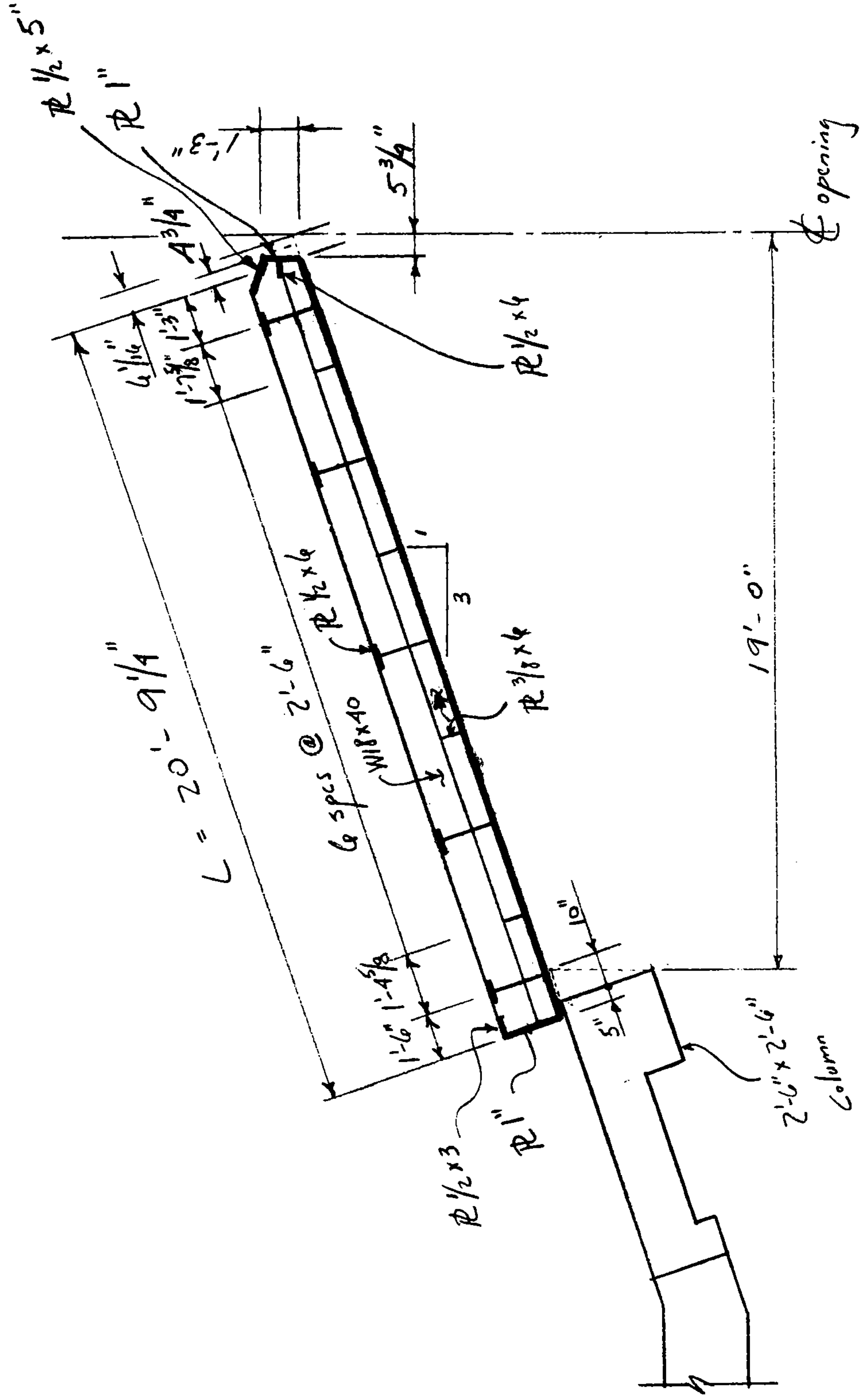
$$f_b = \frac{M}{S_x} = \frac{33.561 \times 12}{68.4} = 5.888 \text{ ksi} < 18 \text{ ksi} \quad \text{OK}$$

Bottom Girder:

$$f_b = \frac{M}{S_x} = \frac{73.813 \times 12}{68.4} = 12.95 \text{ ksi} < 18 \text{ ksi} \quad \text{OK}$$

USE W18X40 FOR TOP & BOTTOM GIRDERS

LAKE PONTCH. HURRICANE PROT. PROJ. 13 DES: JAR 26 OCT 83
MITERED SWING GATES AT TOPAZ ST. CHKD: LT 31 OCT 83



$$L = \frac{\sqrt{10}}{3}(19') + 10" + 5" - 6\tfrac{1}{16}" = \left(20' - \tfrac{5}{16}"\right) + 10" + 5" - 6\tfrac{1}{16}" = 20' - 9\tfrac{1}{4}"$$

GATE GEOMETRY

FIG 13

LAKE PONTCH. HURRICANE PROT. PROJ. M DES: JAR 27 OCT 83
MITERED SWING GATES AT TOPAZ ST. CHKD: LT 31 OCT 83

GATE WEIGHT (Single Leaf)

MEMBER	SIZE	No.	Wt/Ft. (Lb)	L (Ft)	Wt. (Lb)	Arm (in.)	Moment (Lb·in)
Top Girder	W18x40	1	40	21.0	840	9.31	7,820.4
Bottom Girder	W18x40	1	40	21.0	840	9.31	7,820.4
Skin Plate	PL 5/16 x 8.92'	1	114.18	20.75	2,369	0.16	379.0
Vert. Plate	PL 1/2 x 6	5	10.2	7.58	387	18.06	6,989.0
Vert. Plate	PL 1/2 x 17.5"	5	28.6	8.00	1,144	8.91	10,193.0
Vert Plate	PL 1/2 x 3	1	5.1	7.58	39	18.06	704.0
Vert. Plate	PL 1/2 x 5	1	8.51	8.92	76	17.31	1,315.6
Vert. Plate	PL 3/8 x 6	4	7.66	8.00	245	3.81	933.5
Vert PL, Hinge End	PL 1" x 18"	1	61.2	8.92	546	9.31	5,083.3
Vert. PL, Miter End	PL 1" x 15"	1	51.0	8.92	455	7.93	3,608.2
Vert. Plate	PL 1/2 x 6	1	10.2	8.00	82	6.31	517.4
Horiz. Plate	PL 3/8 x 6	1	7.66	20.5	157	3.31	519.7
Seal Angle	L 5x5x1/2	1	16.2	20.5	332	1.12	371.8
Bar, one side	1 3/4 x 1 3/4	1	10.42	8.92	93	-0.88	- 81.8
Bar, Top & Bott.	1 3/4 x 1 3/4	2	10.42	0.50	10	19.19	191.9
Jack Support PL	PL 3/4 x 8	1	20.4	1.42	29	9.31	270.0
Vert. M. End Seal PL	PL 1 x 6	1	20.4	8.6	175	9.80	1,715.0
Vert. M. End Seal PL	PL 1/2 x 3 3/4	2	6.38	8.6	110	9.80	539.0
STEEL GATE Wt. (Single Leaf)					7929	6.17"	48,944.4

Wt. Steel Members = 7929 Lb.
Add 10% for Misc. Items ≈ 793 Lb
(Welds, seals, bolts, etc.)

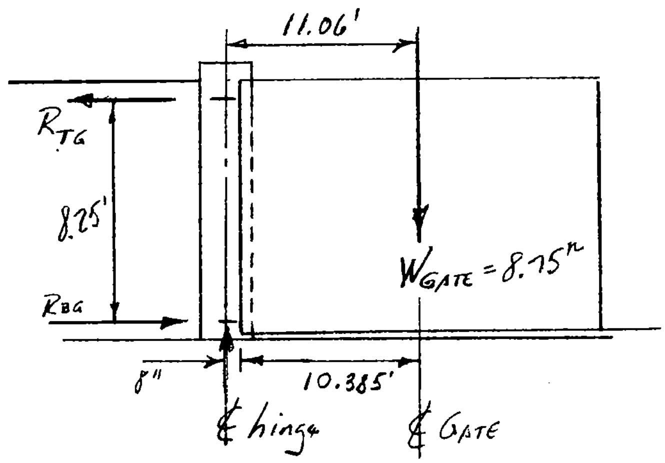
8,722 Lb

say 8.75 kips

FIG 14

LAKE PONTCH. HURRICANE PROT. PROJ. 15 DES.: JAK 27 OCT 83
MITERED SWING GATES AT TOPAZ ST. CHKD: LT 31 OCT 83

LOADS ON HINGES



Due to Gate Wt.:

$$-R_{TG} = R_{BG} = \frac{8.75^k \times 11.06'}{8.25'} = 11.73^k$$

ASSUMPTIONS:

1) Top hinge does not carry vertical loads
2) Bottom hinge takes the full weight of the steel gate.

Total Load on Hinges:

Top Hinge: Normal Loads $\quad R_T = R_{TG} + N_{OT} = 11.73 - 19.693 = \underline{\underline{-7.963^k}}$

due water load, see pg 5 of comps.

Top Hinge: Loads into paper's plane $\quad V_T = V_{OT} = \underline{\underline{6.564^k}}$

TOTAL HORIZ LOAD ON TOP HINGE $= T = \sqrt{(6.564)^2 + (7.963)^2} = \underline{\underline{10.320^k}}$

Bottom Hinge: Normal Loads $\quad R_B = R_{BG} + N_{OB} = 11.73 + 43.312 = \underline{\underline{55.042^k}}$

Bottom Hinge: Loads into paper's plane $\quad V_B = V_{OB} = \underline{\underline{14.437^k}}$

TOTAL HORIZ LOAD ON BOTTOM HINGE $= T = \sqrt{(14.437)^2 + (55.042)^2} = \underline{\underline{56.904^k}}$

TOTAL VERT. LOAD ON BOTTOM HINGE $= W_{GATE} = \underline{\underline{8.75 \text{ kips}}}$

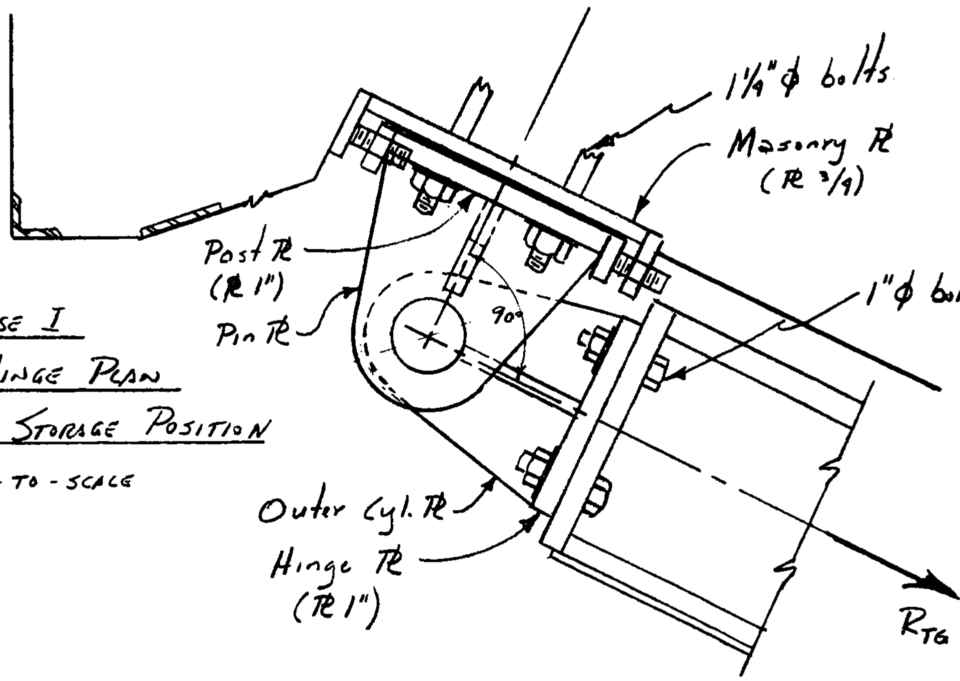
FIG. 15

Design Assumptions

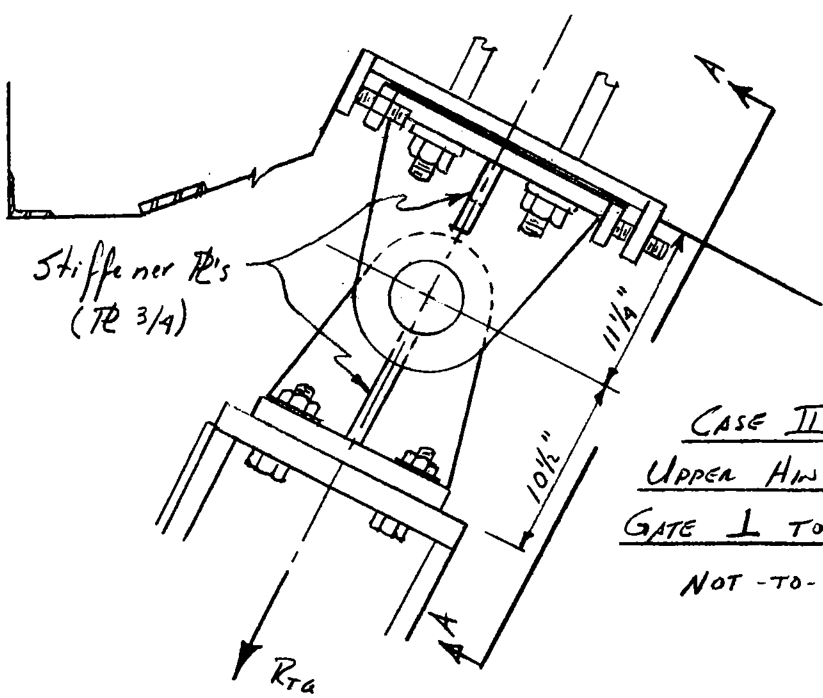
1. Upper Hinge carries no vertical load
2. From pg 15 of design comps. the loads on upper hinge are:
   a) Due water load $N_{OT} = 19.693^k$
      Due gate weight $R_{TG} = 11.73^k$
      Due water pressure $V_{OT} = 6.564^k$
      } Gate Closed
   b) Due gate weight $R_{TG} = 11.73^k$ } Gate Open
3. Design Upper Hinge for the following loads*
   $N_{OT} = 40^k$
   $V_{OT} = 15^k$
   $M_{OT} = 13^{'k}$
   } Gate closed & water load
   b) $R_T = 40^k$ } Gate open

   *Approximate loading for a 10'X25' gate, water to the top of the gate, no load reduction.

LAKE PONTCH HURRICANE PROT. PROJ. 17 DES: JAR 01 NOV 83
MITERED SWING GATES- UPPER HINGE DESIGN CHKD: FNB 18 JUN 84



CASE I
UPPER HINGE PLAN
GATE IN STORAGE POSITION
NOT-TO-SCALE

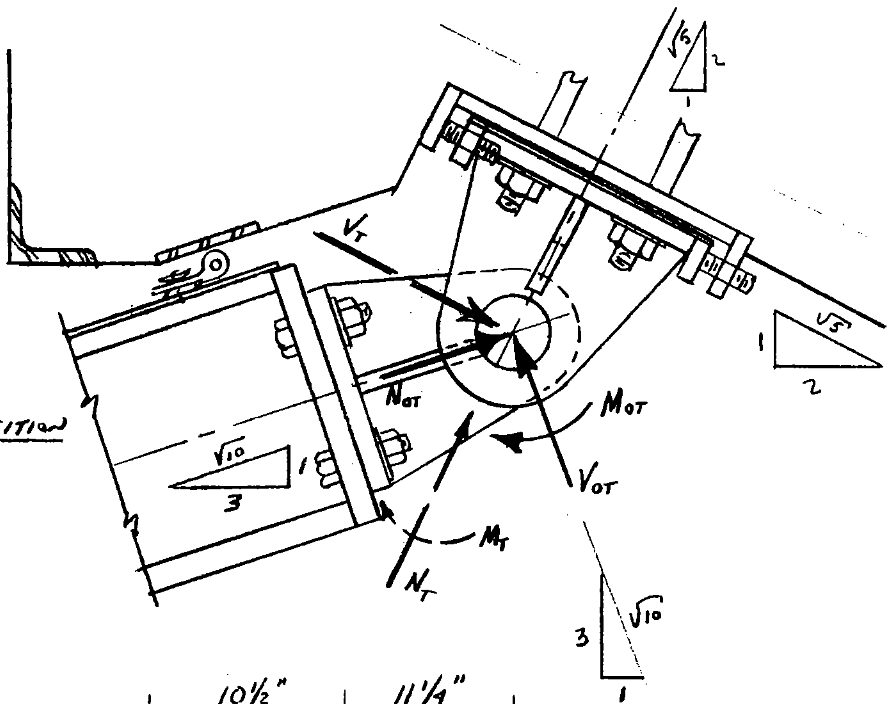


CASE II
UPPER HINGE PLAN
GATE ⊥ TO WALL
NOT-TO-SCALE

FIG 17

LAKE PONTCH. HURRICANE PROT. PROJ. 18 DES: ASR 01 Nov 83

MITERED SWING GATE – UPPER HINGE DESIGN CHKD: WB 18 JUN 84

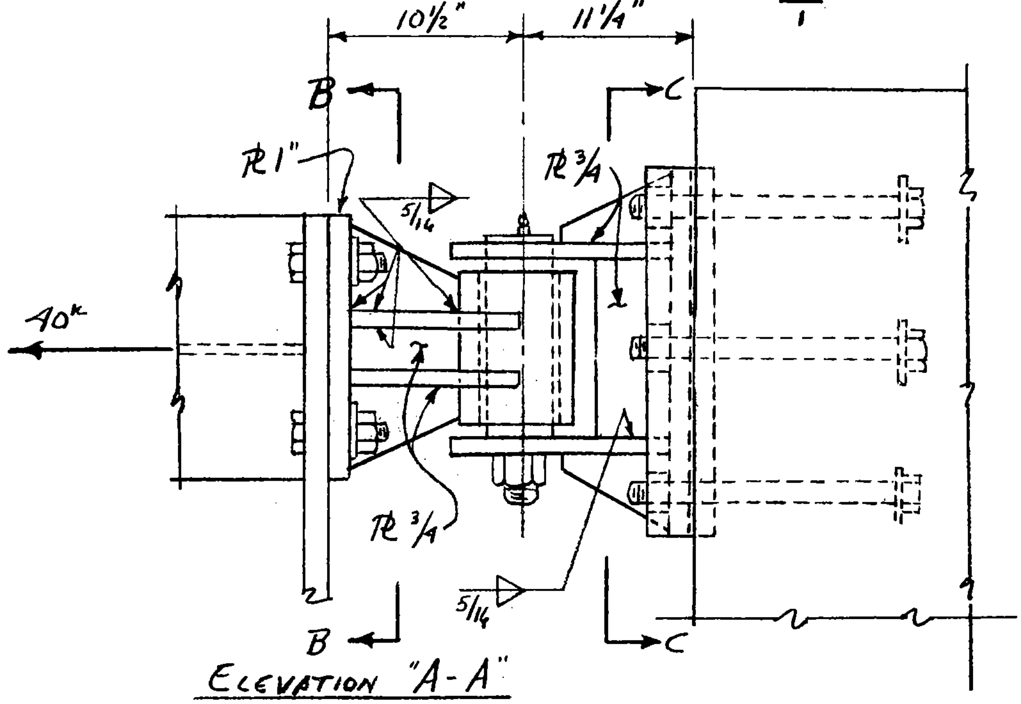


CASE III

UPPER HINGE PLAN

GATE IN MITERED POSITION

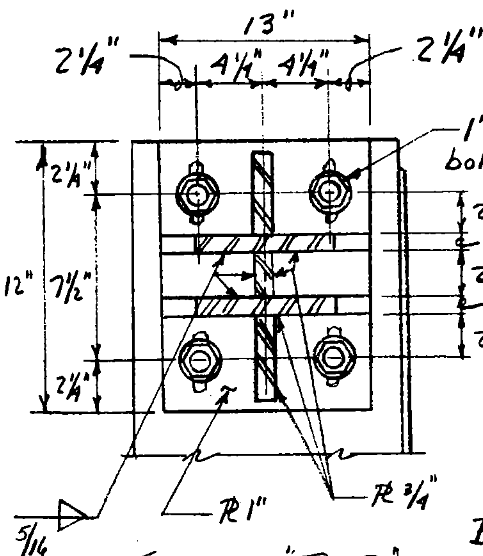
NOT-TO-SCALE



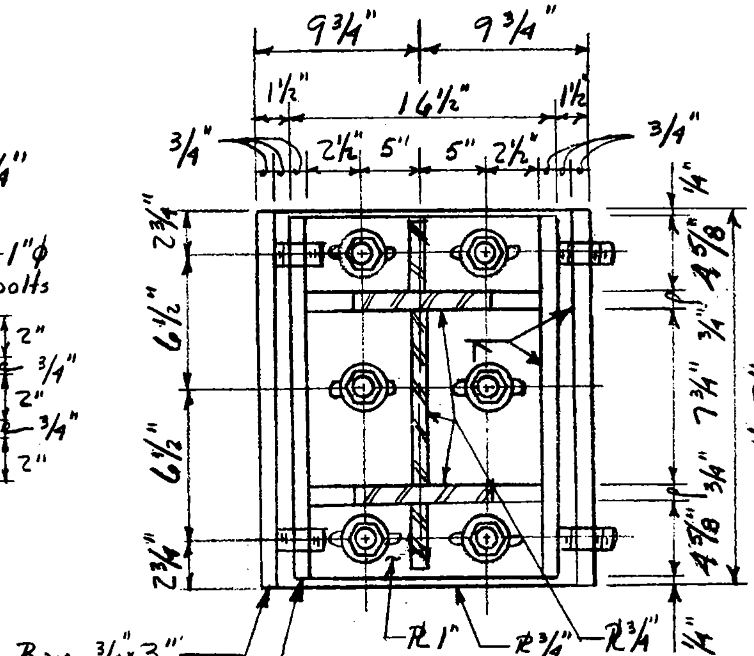
ELEVATION "A-A"

NOT TO SCALE

FIG 18



SECTION "B-B"
NOT-TO-SCALE



SECTION "C-C"
NOT-TO-SCALE

FOR CASE III :

$$M_T = M_{OT} = 13^{k} \cdot)$$

$$N_T = N_{OT} \sin 45^\circ + V_{OT} \sin 45^\circ = (40^k + 15^k)(.707) = 38.9^k$$

$$V_T = N_{OT} \cos 45^\circ - V_{OT} \cos 45^\circ = (40^k - 15^k)(.707) = 17.7^k$$

FIG 19

CHECK BOLTS - HINGE PL TO GATE END PL

Use: ASTM F-593, Group 2, Condition CW
316 Alloy.

$F_u = 100$ ksi (From ASTM)

$F_v = 0.17 F_u \times \frac{5}{6} = 0.17 \times 100 \times \frac{5}{6} = 14.17$ ksi AISC TABLE 1-D

$F_t = 0.33 F_u \times \frac{5}{6} = 0.33 \times 100 \times \frac{5}{6} = 27.50$ ksi AISC TABLE 1-B

$F_{t+v} = 0.43 F_u \times \frac{5}{6} - 1.8 f_v \leq 0.33 F_u \times \frac{5}{6}$ AISC TABLE 1.6.3

$= 0.43 \times 100 \times \frac{5}{6} - 1.8 f_v = 35.83 - 1.8 f_v \leq 27.50$ ksi

Try 1" ϕ bolts (4 ea.) $A_b = 0.7854 \text{ in}^2$

GATE OPEN, $\perp$ to WALL

$T = 40^k$ $f_t = \frac{40}{4(0.7854)} = 12.73$ ksi $< F_t$ OK

GATE CLOSED

$R_T = 40^k$ $V_T = 15^k$

$M = 15^k \times 10.5'' = 157.5$ k·in

$f_v = \frac{15}{4(0.7854)} = 4.77$ ksi $< F_v$ OK

$f_t = \frac{Mc}{I} = \frac{157.5 \times 4.25''}{2(2 \times 4.25^2)(0.7854)} = 11.80$ ksi $< F_t$ OK

$f_{t+v} = \sqrt{f_t^2 + f_v^2} = \sqrt{11.80^2 + 4.77^2} = 12.73$ ksi $< 35.83 - 1.8(4.77)$
$= 27.24$ ksi
< 27.50 max OK

FIG 20

HINGE PL

Design for Prying Action (AISC pg 4-88):
(Neglect Vertical stiffeners)

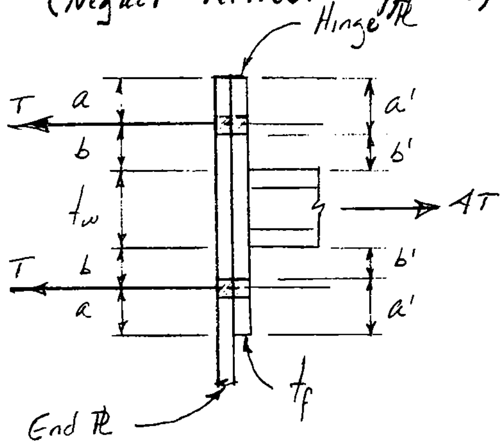


Plate width = 12.0 in
Plate length = 12.0 in

$p = 6.00$ in
$a = 2.25$ in $b = 2.00$ in
$a' = 2.75$ in $b' = 1.50$ in
$T = 10^k$/bolt

$a = 2.25'' \leq 1.25b = 2.5''$ ok

$d' = 1.0 + \frac{1}{16} = 1.0625''$

$\delta = 1 - \frac{d'}{p} = 1 - \frac{1.0625}{6.00} = 0.823$

try $t_f = 11/16''$

$M = p t_f^2 F_y/8 = 6.00\left(\frac{11}{16}\right)^2(36)\left(\frac{1}{8}\right) = 12.76$ k·in

$\alpha = (Tb/M - 1)/\delta = \left[\left(10 \times 2.0\right)/12.76) - 1\right]/0.823 = 0.689 < 1$

use $\alpha = 0.69$

$B_c = T\left[1 + \frac{\delta\alpha}{(1+\delta\alpha)}\left(b'/a'\right)\right] = 10\left[1 + \frac{0.823 \times 0.69}{(1+0.823\times0.69)}\left(\frac{1.50}{2.75}\right)\right]$

$B_c = 11.98$ k/bolt

Req'd $t_f = \left\{\frac{8 B_c a' b'}{p F_y[a' + \delta\alpha(a'+b')]}\right\}^{1/2} = \left\{\frac{8 \times 11.98 \times 2.75 \times 1.50}{6.00(36)[2.75+(0.823)(0.69)(2.75+1.5)]}\right\}^{1/2}$

$= 0.60$ in

USE $t_f = 1.0$ in

USE PL 1"x 9½" x 12"

FIG 21

CHECK WELDS – OUTER CYL. PL'S TO HINGE PL (Neglect vertical Stiffeners)

$A_w = 11.25 \times 2 + 10.5 \times 2 + 2 \times 2 = 47.5 \text{ in}^2$

$S_w = 2\left[\frac{11.25^2}{6} + \frac{10.5^2}{6}\right] = 78.94$ (neglect vertical welds)

Gate closed:

$f_v = \frac{P}{A} = \frac{15}{47.5} = 0.32 \text{ k/in}$

$f_b = \frac{M}{S} = \frac{15 \times 9.5}{78.94} = 1.81 \text{ k/in}$ ← (10½" – 1" PL)

* Reduction factor for hydraulic structures per EM 1110-1-2101

$f_w = \sqrt{f_v^2 + f_b^2} = \sqrt{0.32^2 + 1.81^2} = 1.84 \text{ k/in}$

Size of fillet weld Req'd $= 1.84 / (0.707)(21.0)\left(\frac{5}{6}\right)^* \cong 0.15 \text{ in}$

USE 5/16" fillet weld (E-70)

Gate open:

$T = 40^k$

Length of weld provided $= 11.25(2) + 10.5(2) + 2(2) = 47.5 \text{ in}$

Capacity of 5/16" fillet weld $= \frac{5}{16}(0.707)(21)\left(\frac{5}{6}\right) = 3.87 \text{ k/in}$

Total Capacity $= 3.87 \times 47.5 = 183.83^k > 40^k$ applied OK

Min. Weld for PL 1" = 5/16" OK AISC 1.17.2

Max Weld for PL 3/4" = 11/16 OK AISC 1.17.3

FIG: 22

OUTER CYLINDER PL's (PL's ") (Neglect Vertical Stiffeners)

For A36 steel, from EM 1110-1-2101 (for Hydraulic Struct).

$F_v = 12.00$ ksi $\quad F_p = 27.00$ ksi $\quad F_t = F_b = 18.00$ ksi

$$A_{PL's} = 2 \times 0.75 \times \tfrac{1}{2}(12 + 6.25) = 13.69 \text{ in}^2$$

$$S_W = \frac{2(0.75)\left[\tfrac{1}{2}(12.0+6.25)\right]^2}{6} = 20.82 \text{ in}^3$$

GATE CLOSED: COMP = 40^K, V = 15^K

$$f_p = \frac{40}{13.69} + \frac{15 \times 9.5}{20.82} = 11.57 \text{ ksi} < 27.00 \quad \text{OK}$$

$$f_v = \frac{15}{13.69} = 1.10 \text{ ksi} < 12.00 \text{ ksi} \quad \text{OK}$$

$$f_b = \frac{15 \times 9.5}{20.82} = 6.84 \text{ ksi} < 18.00 \text{ ksi} \quad \text{OK}$$

GATE OPEN: Tension = 40^K

$$f_t = \frac{40}{13.69} = 2.92 \text{ ksi} < 18.00 \text{ ksi} \quad \text{OK}$$

USE PL 3/4" (2 ea)

CHECK WELDS - OUTER CYL. PL's TO CYLINDER (MECH. TUBING)

Min fillet weld = 1/4" for PL 3/4"

Max fillet weld = 9/16 for t = 5/8 (Mech. Tubing)

$$\text{Length of weld} = 4\left[\tfrac{1}{2}(2\pi r)\right] = 4\pi r = 4\pi(3.125") = 39.27 \text{ in.}$$

$$f_v = \frac{P}{A} = \frac{15}{39.27} = 0.38 \text{ k/in} \qquad f_b = \frac{M}{S} = \frac{15 \times 9.5}{64.29} = 2.22 \text{ k/in}$$

$$S_W = \frac{4(9.82)^2}{6} = 64.29 \quad \text{(neglect vertical welds)}$$

$$f_W = \sqrt{0.38^2 + 2.22^2} = 2.25 \text{ k/in} < 3.87 \text{ k/in (capacity of 5/16" fillet weld)}$$

USE 5/16 fillet weld (E-70)

FIG 23

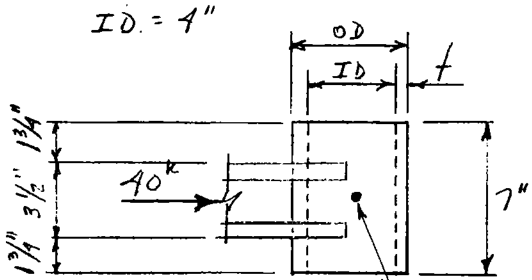
LAKE PONTCH. HURRICANE PROT. PROJ. 24 DES: LAR 02 NOV 83

MITERED SWING GATES – UPPER HINGE DESIGN CHKD: FNB 19 JUN 84

OUTER CYLINDER (MECHANICAL TUBING, ASTM A-519, GR. MT1020 CW)

OD = 5 1/4"

ID = 4"



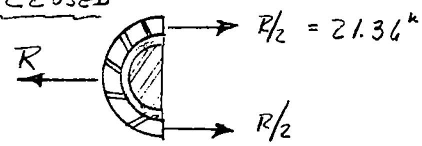
$R = \sqrt{40^2 + 15^2} = 42.72^k$

$t = 5/8"$, $F_y = 60$ ksi $F_u = 70$ ksi

$F_t = 0.5 F_y = 30$ ksi

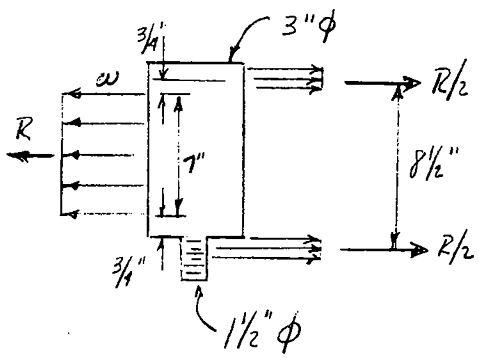
$f_t = \dfrac{\frac{42.72}{2}}{5/8 \times 7} = 3.49$ ksi $< F_t$ OK

LOADS WITH GATE CLOSED



HINGE PIN (BUSHING SHAFT A-276, Type 431)

$F_u = 125$ ksi $F_y = 95$ ksi



$R = 42.72^k$

$R/2 = 21.36^k$

$\omega = \dfrac{R}{7"} = \dfrac{42.72}{7} = 6.103$ K/in

CHECK SHEAR: pin in double shear

$A_v = \dfrac{\pi d^2}{4} = \dfrac{\pi(3)^2}{4} + \dfrac{\pi(1.5)^2}{4} = 8.84\ in^2$

$f_v = \dfrac{42.72}{8.84} = 4.83 < 0.33 F_y = 31.35$ ksi OK

CHECK BENDING:

$M = 21.36\left[0.75 + \dfrac{21.36}{2(6.103)}\right] = 53.4$ k·in $S = \dfrac{\pi d^3}{32} = \dfrac{\pi(3)^3}{32} = 2.65\ in^3$

$f_b = \dfrac{M}{S} = \dfrac{53.4}{2.65} = 20.15 < F_b = 0.5 F_y = 47.5$ ksi OK

CHECK BEARING

$f_{p_{TOP}} = \dfrac{21.36}{3(0.75)} = 9.49$ ksi $< 0.75 F_y = 71.25$ ksi OK

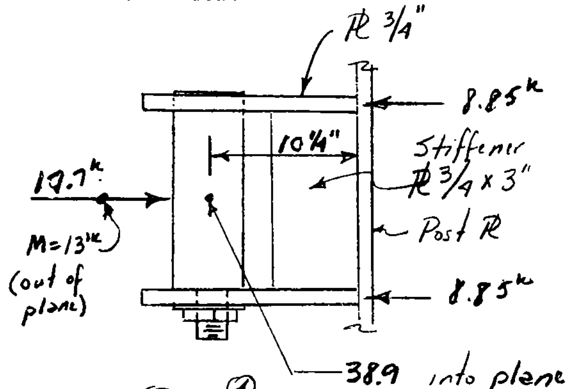
$f_{p_{BOTTOM}} = \dfrac{21.36}{1.5(0.75)} = 18.99$ ksi < 71.25 ksi OK

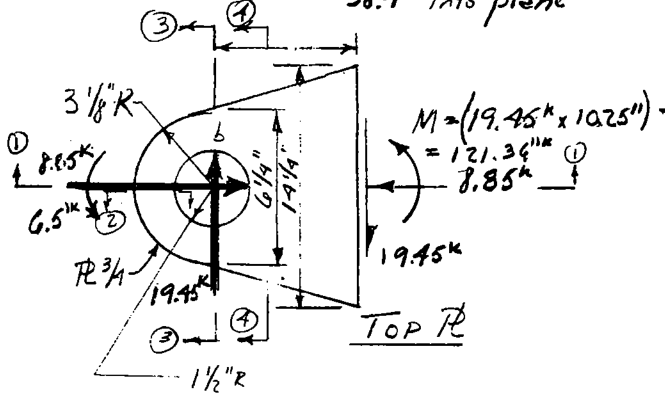
FIG 24

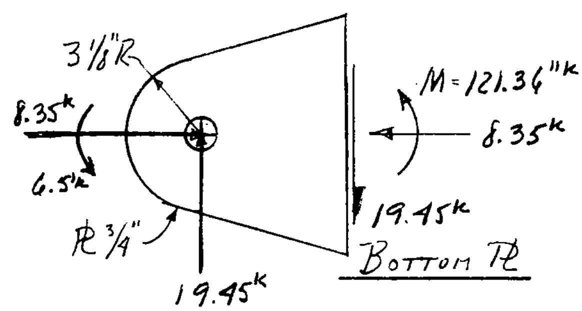
LAKE PONTCH. HURRICANE PROT. PROJ. 25 DES: JAR 03 Nov 83

MITERED SWING GATES – UPPER HINGE DESIGN CHKD: FNB 19 JUN 84

Pin PL's







Gate Closed

$F_v = 12.00$ ksi $F_p = 27.00$ ksi

$F_b = 18.00$ ksi $F_{t_{hole}} = 13.5$ ksi $(0.37 F_y)$

For Top PL:

$A = 0.75 \times \frac{1}{2}(6.25 + 14.25) = 7.69 \text{ in}^2$

$S = \dfrac{0.75\left[\frac{1}{2}(6.25+14.25)\right]^2}{6} = 13.13 \text{ in}^3$

$f_p = \dfrac{8.85}{7.69} + \dfrac{121.34}{13.13} = 10.39 \text{ ksi} < 27.00$ OK

$f_v = \dfrac{20}{7.69} = 2.60 \text{ ksi} < 12.00$ OK

$f_b = \dfrac{121.34}{13.13} = 9.24 \text{ ksi} < 18.00$ OK

Req'd $A_{①} = \dfrac{19.45}{13.5} = 1.44 \text{ in}^2$

Provided $A_{①} = 0.75 \times (11" + 3\frac{1}{8}" - 3") = 8.34 \text{ in}^2$ OK

AISC 1.14.5 $\dfrac{B}{t} = \dfrac{6.25}{.75} = 8.33 \approx 8$ say OK $t > \frac{1}{2}"$ OK

$\dfrac{b}{t} = \dfrac{1\frac{5}{8}}{\frac{3}{4}} = 2.17 < 8$ OK

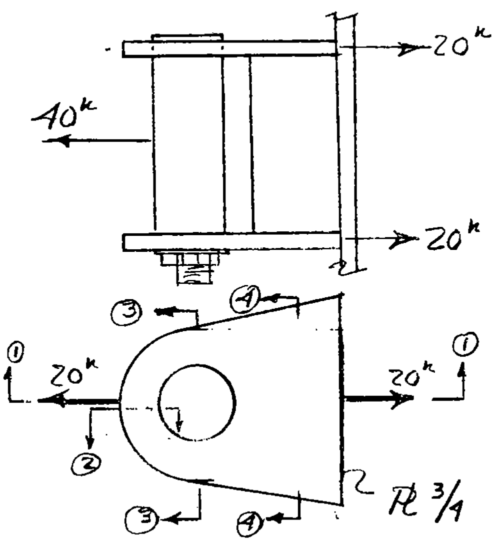
$A_2 = 0.5 A_{③} = \frac{3}{4} \times 1\frac{5}{8} = 1.22 \text{ in}^2 > \frac{2}{3} A_{1_{req'd}} = \frac{2}{3}(1.48) = 0.99 \text{ in}^2$ OK

For Bottom PL:

All areas required are exceeded. (See comps for top PL)
Thickness limitations are waived since pin is bolted to PL.
(AISC. 1.14.5)

FIG 25

Pin Pl's (cont'd)



Top Pl

Gate Open ⊥ to Wall

For Top Pl:

At pin hole (EM 1110-1-2101)

$F_{t③} = 0.37 F_y = 0.37(36) = 13.5$ ksi

$F_{t④} = 0.50 F_y = 18$ ksi

$\text{Req'd } A_④ = \dfrac{20}{F_{t4}} = \dfrac{20}{18} = 1.11 \text{ in}^2$

$\text{Prov'd } A_④ = \frac{1}{2}\left(6\frac{1}{4} + 14\frac{1}{4}\right) \times \frac{3}{4} = 7.69 \text{ in}^2$ OK

$\text{Req'd } A_③ = \dfrac{20}{F_{t③}} = \dfrac{20}{13.5} = 1.48 \text{ in}^2$

same

or

$\text{Req'd } A_③ = 1.33\, A_{4\,\text{req'd}} = 1.33 \times 1.11 = 1.48 \text{ in}^2$

$\text{Provided } A_③ = 2\left(1\frac{5}{8}\right)\left(\frac{3}{4}\right) = 2.44 \text{ in}^2$ OK

$A_② = 0.5\, A_③ = 1.22 \text{ in}^2 > \frac{2}{3}(1.48) = 0.99 \text{ in}^2$ OK

All other requirements of AISC 1.14.5 are satisfied (see analysis with gate closed)

For Bottom Pl:

All areas required are exceeded (see comps for top Pl)
Thickness limitations are waived since pin is bolted to Pl. (AISC 1.14.5)

FIG 26

CHECK WELDS - PIN PL'S TO POST PL

GATE OPEN, $\perp$ TO WALL: $T = 40^k$

Tension only, assume effective welds are only on top & bottom Pin PL's; then:

Length of weld $= 2(14\frac{1}{4}) + 2(13\frac{1}{2}) = 55.5$ in

$f_w = \frac{40}{55.5} = 0.72$ k/in

Capacity of 5/16" fillet weld $= \frac{5}{16}(0.707)(21.0)(\frac{5}{6}) = 3.87$ k/in

USE 5/16" fillet weld (E-70)

GATE CLOSED

$A_w = (14.25 + 13.5)(2) + (3 \times 4) + (7.75 \times 2) = 83$ in^2

$\bar{y} = \frac{(4)(3)(1.5)}{83} = 0.22$ in

$I_x = 2(14.25)(4.625)^2 + 2(13.5)(3.875)^2$ .. (neglect vertical welds)

$= 609.63 + 405.42 = 1015.05$

$I_y = \frac{1}{12}(1)(\overline{14.25}^3 + \overline{13.50}^3)(2)$

$= 892.34$

$J = I_x + I_y = 1015.05 + 892.34 = 1907.39$

$f_s = \frac{38.9}{83} = 0.47$ k/in

$f_b = \frac{38.9(10.03)(3.125)}{2087.58} = 0.64$ k/in

$f_r = \sqrt{f_s^2 + f_b^2} = \sqrt{\overline{0.47}^2 + \overline{0.64}^2} = 0.79$ k/in.

FIG 27

Capacity of 1" fillet weld $= 21.0 \times 0.707 \times \frac{5}{6} = 12.373$ k/in

Req'd size of fillet weld $= \frac{0.75}{12.373} = 0.061$ in

<u>USE 5/16" fillet weld (E-70)</u>

<u>ANCHOR BOLTS – POST PL TO COLUMN</u>

<u>GATE OPEN:</u> (⊥ to wall) Try 4 bolts; 1"φ

Tension per bolt $= T_{bolt} = \frac{40^k}{4} = 10$ k/bolt

$f_t = 10/0.7854 = 12.73$ ksi OK

<u>GATE IN STORAGE OR GATE CLOSED:</u> (Assume Post PL = 1" thick)

$M = 40^k \times 11.25'' = 450$ k·in (neglect M_T)

$V_{bolt} = \frac{40^k}{4_{bolts}} = 10$ k/bolt

$I_{bolt} = 2(2 \times \overline{2.75}^2) = 30.25$

$f_t = \frac{450 \times 2.75}{30.25} = 40.91$ ksi N.G.

$f_v = \frac{10}{0.7854} = 12.73$ ksi OK

ASTM F593, Group 2
Condition CW, 316 Alloy

From pg 20:
$F_u = 100$ ksi
$F_v = 14.17$ ksi
$F_t = 25.00$ ksi
$F_{t+v} = 35.83 - 1.8 f_v \leq 25.00$ ksi

Try 6 ea 1¼"φ bolts spaced as shown below:
use 1 5/16" x 2½" slotted holes (slotted horizontally)

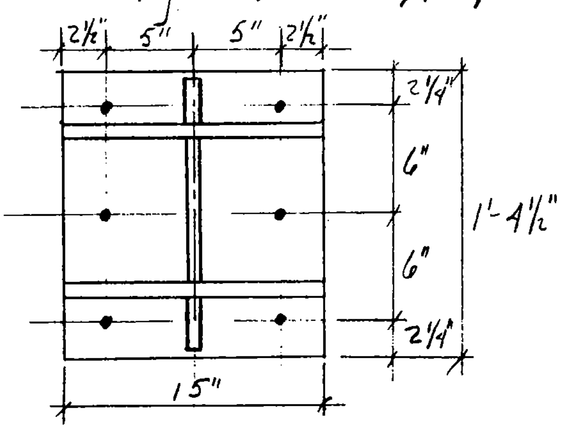


FIG 28

GATE OPEN , ⊥ to WALL

$$T_{bolt} = \frac{40}{6} = 6.67\ ^k/_{bolt}$$

$$f_t = \frac{6.67}{1.227} = 5.44\ ksi < F_t \quad OK$$

GATE CLOSED

$$M = 450\ k\cdot in$$

$$V_{bolt} = \frac{40}{6} = 6.67\ ^k/_{bolt}$$

$$f_v = \frac{6.67}{1.227} = 5.44\ ksi < F_v \quad OK$$

$$I_{bolts} = 2(3 \times \overline{5}^2) = 150$$

$$T_{bolt} = \frac{450 \times 5}{150} = 15.0\ ^k/_{bolt}$$

$$f_t = \frac{15.0}{1.227} = 12.22\ ksi < F_t \quad OK$$

$$f_{t+v} = \sqrt{\overline{12.22}^2 + \overline{5.44}^2} = 13.38\ ksi$$

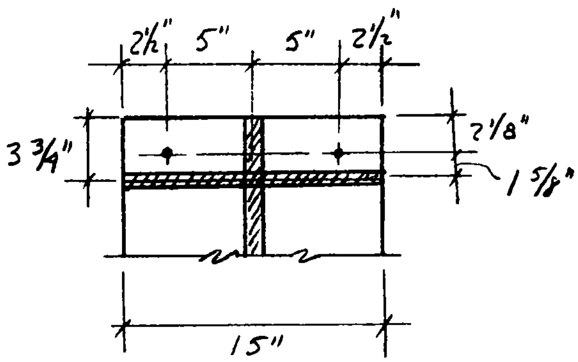
$$F_{t+v} = 35.83 - 1.8(5.44) = 26.04 > 25.00\ max$$

$$\therefore\ F_{t+v} = 25.00\ ksi > f_{t+v} = 13.38\ ksi \quad OK$$

USE 6 ea – 1¼"φ Bolts

FIG 29

POST ℞



$P_{bolt} = 15.0^k$

$M = 2 \times 15 \times 1.625 = 48.75$ k-in

$S_{PL} = \frac{bt^2}{6}$

$Req'd\ t = \sqrt{\frac{6M}{F_b\, b}} = \sqrt{\frac{6 \times 48.75}{18 \times 15}} = 1.04$ in

USE ℞ 1"

MASONRY ℞

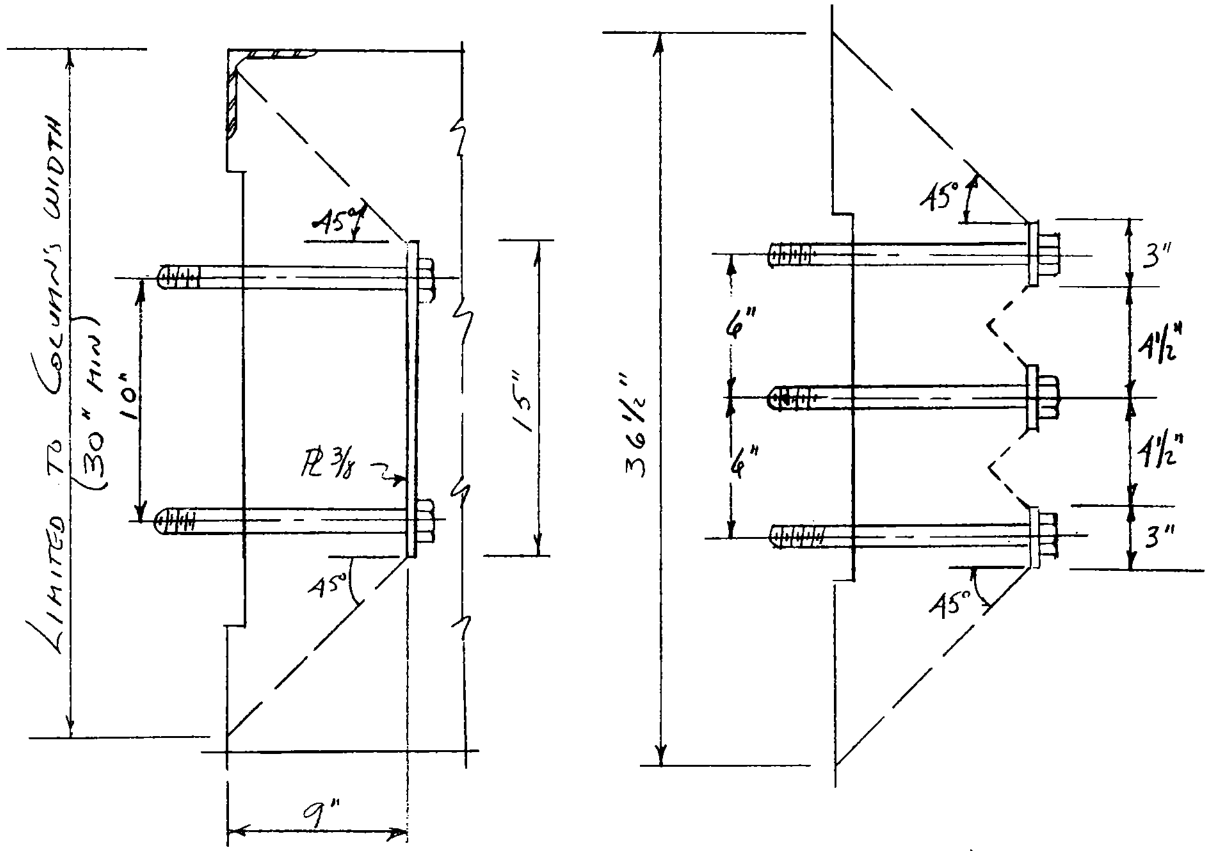
USE ℞ ¾"

(Plate in bearing only)

LAKE PONTCH. HURRICANE PROT PROJ. 31 DES: JAR 08 Nov 83
MITERED SWING GATES - UPPER HINGE DESIGN CHKD: FNB 19 JUN 84

CHECK BONDING OF ANCHOR BOLT'S ASSEMBLY TO COLUMN

$T = 40^k$



PLAN VIEW
NOT TO SCALE

ELEV VIEW
NOT TO SCALE

$A = 30 \times 36.5 = 1095 \text{ in}^2$

$f_t = \frac{40^k}{1095} = 0.04 \text{ ksi}$

Allow Tensile Stress $= 1.2\sqrt{f'_c} = 1.2\sqrt{3000} = 0.064$ ksi
(Plain Concrete)

Ok

FIG 31

DESIGN ASSUMPTIONS

1. Lower Hinge carries all vertical loads from Gate.
2. From pg 15 of design comps, the loads on lower hinge are:

a) Due water load $N_{OB} = 43.312^k$
Due gate weight (horiz. reaction) $R_{BG} = 11.73^k$
Due gate weight (vert. reaction) $W_G = 8.75^k$
Due water pressure $V_{OB} = 14.437^k$
} Gate Closed w/Water Load

b) Due gate weight (horiz. reaction) $R_{BG} = 11.73^k$
Due gate weight (vert. reaction) $W_G = 8.75^k$
} Gate Open

3. Design Lower Hinge for the following loads: *

a) $N_{OB} = 60^k$
$V_{OB} = 20^k$
$M_{OB} = 17.5^{'k}$
$R_{GB} = 15^k$
$W_G = 10^k$
} Gate Closed w/Water Load CASE III Governs design

b) $W_G = 10^k$
$R_B = 15^k$
} Gate Open — CASE I - GATE IN STORAGE; CASE II - GATE ⊥ TO COL.

* Approximate loading for: Water to the top of the gate, no load reduction.

FIG 32

Components of Loads Parallel & Perpendicular to wall:

$M_B = M_{OB} = \underline{17.5^{'k}}$

$N_B = N_{OB} \sin 45° + V_{OB} \sin 45° + R_{BG} \sin 45°$

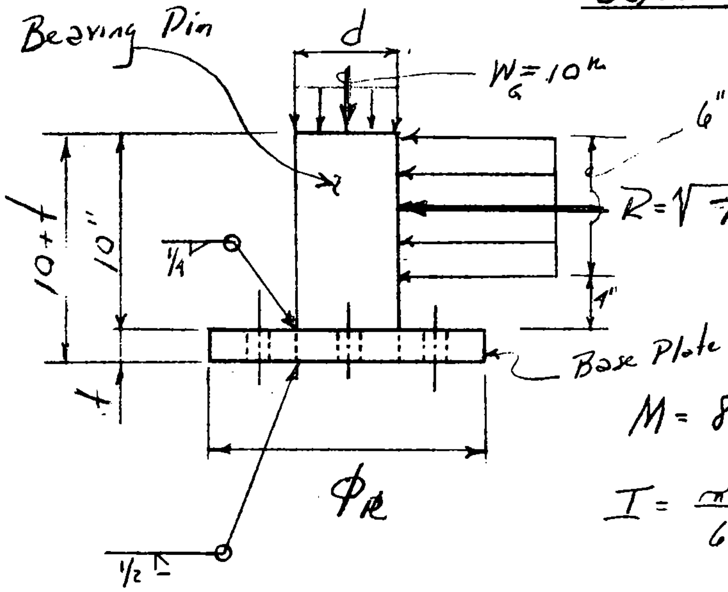
$= (60 + 20 + 15)(0.707) = 67.2^k$ $\underline{\text{say } 70^k}$

$V_B = N_{OB} \cos 45° - V_{OB} \cos 45° + R_{BG} \cos 45°$

$= (60 - 20 + 15)(0.707) = 38.9^k$ $\underline{\text{say } 40^k}$

$W_G = 10^k$

PEDESTAL DESIGN



BEARING PIN Try: 4½" ϕ Pin
A 276, Type 431

$d = 4.5$ in

Neglect M_{OB}

$M = 80.6(7") = 564.2$ k.in

$I = \frac{\pi d^4}{64} = \frac{\pi (4.5)^4}{64} = 20.13 \text{ in}^4$

$A = \frac{\pi d^2}{4} = \frac{\pi (4.5)^2}{4} = 15.9 \text{ in}^2$

$r = \sqrt{\frac{I}{A}} = \frac{d}{4} = \frac{4.5}{4} = 1.125$ in

$\frac{l}{r} = \frac{10}{1.125} = 8.89$

For A276, Type 431 steel:

$F_u = 125$ ksi

$F_y = 95$ ksi

FIG 33

LAKE PONTCH. HURRICANE PROT. PROJ. 34 DES: [initials] 22 DEC 83
MITERED SWING GATES - LOWER HINGE DESIGN CHKD: FNB 20 JUN 84

$$f_b = \frac{Mc}{I} = \frac{564.2(2.25)}{20.13} = 63.06 \text{ ksi} > F_b = 47.5 \text{ ksi}$$

N.G.

$$f_a = \frac{W}{A} = \frac{10}{15.9} = 0.63 \text{ ksi}$$

$$f_v = \frac{R}{A} = \frac{80.6}{15.9} = 5.07 \text{ ksi} < F_v = 31.35 \text{ ksi}$$

Try 6 ϕ Pin

$$I = \frac{\pi(6.0)^4}{64} = 63.62 \text{ in}^4 \qquad l/r = \frac{10}{1.50} = 6.67$$

$$A = \frac{\pi(6.00)^2}{4} = 28.27 \text{ in}^2$$

$$r = \frac{6.00}{4} = 1.50 \text{ in.}$$

$$f_b = \frac{564.2(3.0)}{63.62} = 26.60 \text{ ksi} < F_b = 47.5 \text{ ksi} \quad \text{OK}$$

$$f_v = \frac{80.6}{28.27} = 2.85 \text{ ksi} < F_v = 31.35 \text{ ksi} \quad \text{OK}$$

$$f_a = \frac{10}{28.27} = 0.35 \text{ ksi}$$

Determine F_a:

$$l = 10 \text{ in} \qquad K = 2.10 \qquad \frac{kl}{r} = 2.10(6.67) = 14.0$$

$$C_c = \sqrt{\frac{2\pi^2 E}{F_y}} = \sqrt{\frac{2(\pi^2)(29 \times 10^3)}{95}} = 77.6 > \frac{kl}{r}$$

$$K_1 = \frac{1 - \left[(Kl/r)^2 / 2C_c^2\right]}{\frac{5}{3} + \frac{3}{8}\frac{(Kl/r)}{C_c} - \frac{(Kl/r)^3}{8C_c^3}}$$

FIG 34

LAKE PONTCH HURRICANE PROT. PROJ. 35 DES: JAR 23 DEC 83

MITERED SWING GATES - LOWER HINGE DESIGN CHKD: FNB 20 JUN 84

$$K_1 = \frac{1 - \left[(14)^2 / 2(77.6)^2\right]}{\frac{5}{3} + \frac{3}{8}\frac{(14)}{(77.6)} - \frac{(14)^3}{8(77.6)^3}} = 0.57$$

$$F_a = 0.83\, K_1\, F_y = 0.83(0.57)(95) = 44.99 \text{ ksi} \gg f_a \quad \text{OK}$$

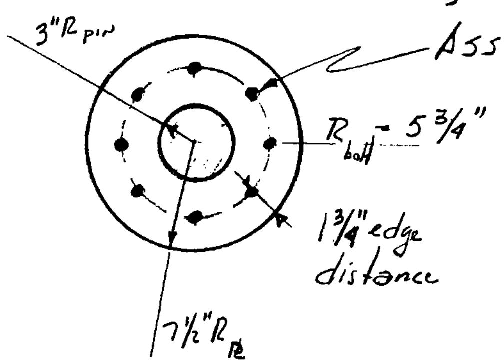
$$\frac{f_a}{F_a} = \frac{0.35}{44.99} = 0.01 < 0.15 \quad \text{then:}$$

$$\frac{f_a}{F_a} + \frac{f_b}{F_b} \le 1 \qquad 0.01 + \frac{26.60}{47.5} = 0.01 + 0.56 = 0.57 < 1 \quad \text{OK}$$

USE 6" ϕ S.S. BEARING PIN

BASE PLATE AND BOLTS

BOLTS Try 15" ϕ PL



Assume 8 ea. - 1 1/4" ϕ bolts

ASTM F593, Gr 2
316 Alloy, Cond. CW.

$A_b = 1.227 \text{ in}^2$

$F_u = 100$ ksi

$$F_v = 0.22\, F_u \times \frac{5}{6} = 0.22 \times 100 \times \frac{5}{6} = 18.33 \text{ ksi}$$

$$F_t = 0.33\, F_u \times \frac{5}{6} = 0.33 \times 100 \times \frac{5}{6} = 27.5 \text{ ksi}$$

$$F_{t+v} = 0.43\, F_u \times \frac{5}{6} - 1.4\, f_v \le 0.33\, F_u \times \frac{5}{6}$$

$$= 0.43 \times 100 \times \frac{5}{6} - 1.4\, f_v = 35.83 - 1.4\, f_v \le 27.5 \text{ ksi}$$

FIG 35

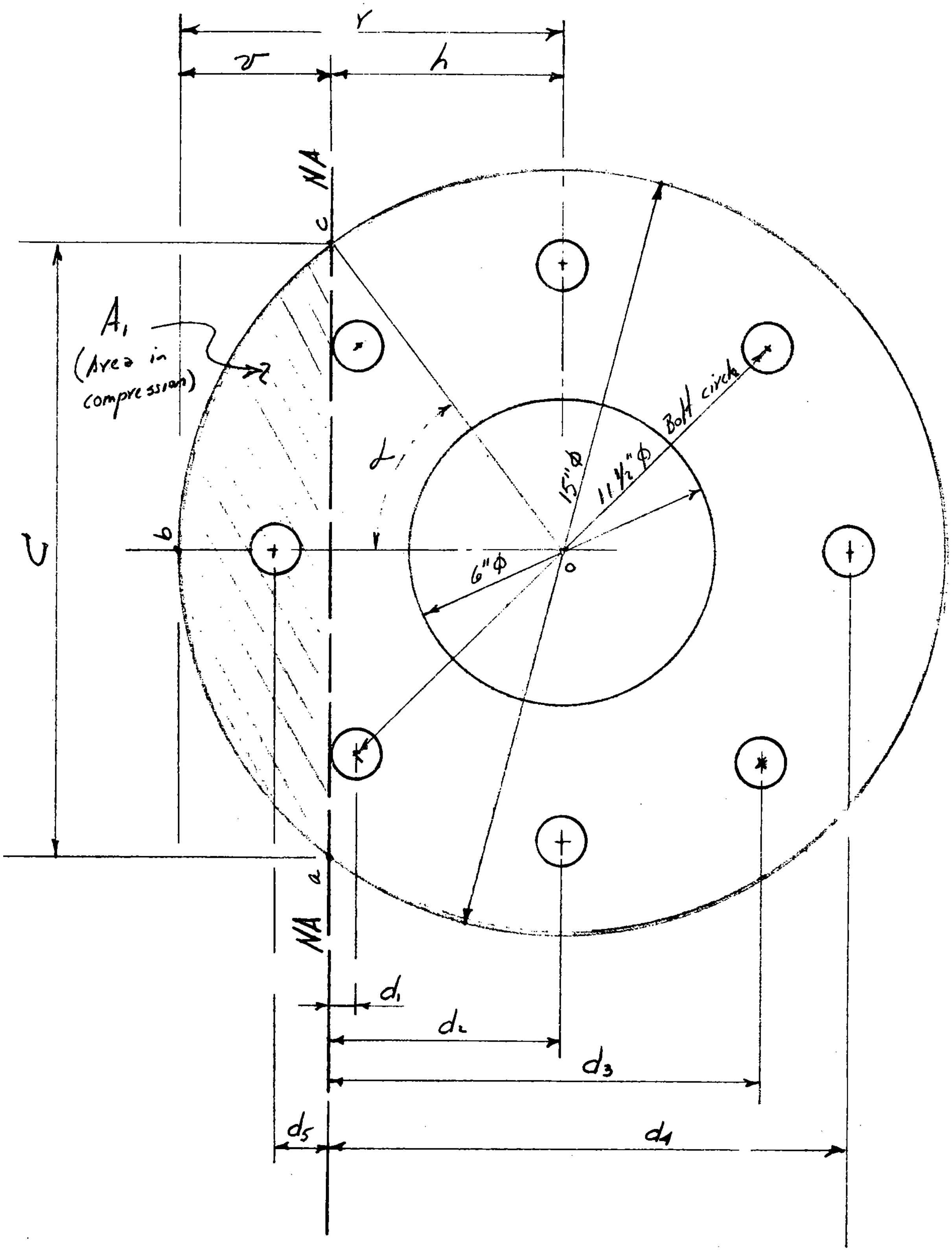

Y
v
h
NA
c
A_1
(Area in compression)
α
15"Φ
11½"Φ
Bolt circle
6"Φ
b
o
U
a
NA
d_1
d_2
d_3
d_5
d_4

FIG 36

$\frac{1}{2} C = r \sin \alpha \qquad \sin \alpha = \frac{C}{2r}$

$A_1 = r^2 (\alpha - \sin\alpha \cos\alpha)$

$h = r \cos \alpha \qquad v = r - h$

$x_c = \frac{2r}{3} \frac{\sin^3\alpha}{\alpha - \sin\alpha\cos\alpha} \qquad \bar{x} = x_c - h$

$\Sigma M_{NA} = 0 = A_1 \bar{x} - A_{bolt} \Sigma d_i$

Try $C = 12.3''$

$\sin \alpha = \frac{12.3}{2(7.5)} = 0.8200 \qquad \cos\alpha = 0.5724$

$\alpha = 55.0848° = 0.9614$ rad

$A_1 = \overline{7.5}^2 (0.9614 - \overbrace{0.8200 \times 0.5724}^{0.4694}) = 27.6774 \text{ in}^2$

$x_c = \frac{2(7.5)}{3} \left(\frac{\overline{0.8200}^3}{0.9614 - 0.4694} \right) = 5.6029''$

$h = 7.5(0.5724) = 4.2930'' \qquad v = 7.5 - 4.2930 = 3.2070''$

$\bar{x} = 5.6029 - 4.2930 = 1.3099''$

$\Sigma M_{NA} = 27.6774(1.3099) - 2(1.227)(0.2271 + 4.2930 + 8.3589 + \frac{1}{2} \times 10.0430)$

$= 36.2546 - 43.9278 = -7.6732$ NG

FIG 37

Try $C = 12.60''$

$$\sin\alpha = \frac{12.60}{2(7.5)} = 0.8400 \qquad \cos\alpha = 0.5426$$

$$\alpha = 57.1401^\circ = 0.9973 \text{ rad}$$

$$h = 7.5(0.5426) = 4.0695 \qquad v = 3.4305$$

$$A_1 = \overline{7.5}^2(0.9973 - 0.8400 \times 0.5426) = \overline{7.5}^2(0.5415) = 30.4603^{\square''}$$

$$x_c = \frac{2(7.5)}{3}\left(\frac{\overline{0.8400}^3}{0.5415}\right) = 5.4728 \text{ in.}$$

$$\bar{x} = 5.4728 - 4.0695 = 1.4033 \text{ in}$$

$$\Sigma M_{NA} = 30.4603(1.4033) - 2(1.227)\left[\cancel{0.0036}^{\,0} + 4.0695 + 8.1354 + \tfrac{1}{2}(9.8195)\right]$$

$$= 42.7449 - 41.9994$$

$$= 0.7455 \quad NG$$

Try $C = 12.5''$

$$\sin\alpha = \frac{12.5}{2(7.5)} = 0.8333 \qquad \cos\alpha = 0.5528$$

$$\alpha = 56.439^\circ = 0.9850 \text{ rad}$$

$$h = 7.5(0.5528) = 4.1460'' \qquad v = 3.3540''$$

$$A_1 = \overline{7.5}^2(0.9850 - 0.8333 \times 0.5528) = \overline{7.5}(0.5244) = 29.49^{\square''}$$

$$x_c = \frac{2(7.5)}{3}\left(\frac{\overline{0.8333}^3}{0.5244}\right) = 5.517''$$

$$\bar{x} = 5.517 - 4.146 = 1.371''$$

$$\Sigma M_{NA} = 29.49(1.371) - 2(1.227)\left[0.0801 + 4.1460 + 8.2119 + \tfrac{1}{2}(9.8960)\right]$$

$$= 40.4308 - 42.6452 = -2.2345 \quad NG$$

<u>Try $C = 12.55''$</u>

$$\sin\alpha = \frac{12.55}{2(7.5)} = 0.8367 \qquad \cos\alpha = 0.5477$$

$$\alpha = 56.7898° = 0.9912 \text{ rad}$$

$$h = 7.5(0.5477) = 4.1078 \qquad v = 3.3922$$

$$A_1 = \overline{7.5}^2(0.9912 - 0.8367 \times 0.5477) = \overline{7.5}^2(0.5329) = 29.9778 \square''$$

$$x_c = \frac{2(7.5)}{3}\left(\frac{\overline{0.8367}^3}{0.5329}\right) = 5.4958''$$

$$\bar{x} = 5.4958 - 4.1078 = 1.3880$$

$$\Sigma M_{NA} = 29.9778(1.3880) - 2(1.227)\left[0.0419 + 4.1078 + 8.1737 + \tfrac{1}{2}(9.8578)\right]$$

$$= 41.6092 - 42.3371 = -0.7279$$

Say OK

LAKE PONTCH. HURRICANE PROT. PROJ. 40 DES: JJH 3 JAN 84
MITERED SWING GATE - LOWER HINGE DESIGN CHKD: FNB 20 JUN 84

$$I_o = \frac{A_1 r^2}{4}\left[1 + \frac{2\sin^3\alpha\cos\alpha}{\alpha - \sin\alpha\cos\alpha}\right]$$

$$= \frac{29.9778(7.5)^2}{4}\left[1 + \frac{2(0.8367)^3(0.5477)}{0.5329}\right] = 929.1 \text{ in}^4$$

$$I_{NA} = I_o - A_1 x_c^2 + A_1 \bar{x}^2$$

$$= 929.1 - 29.9778(5.4958)^2 + 29.9778(1.3880)^2$$

$$= 929.1 - 905.4 + 57.7 = 81.4 \text{ in}^4$$

$$I_{SYST} = 81.4 + 2(1.227)\left[\overline{0.0419}^2 + \overline{4.1078}^2 + \overline{8.1737}^2\right]$$

$$+ (1.227)(\overline{9.8578}^2) =$$

$$= 81.4 + 205.4 + 119.2 = 406.0 \text{ in}^4$$

$$\boxed{I_{SYST} = 406.0 \text{ in}^4}$$

For bolts

$$f_v = \frac{80.6}{8(1.227)} = 8.21 \text{ ksi} < 18.33 \text{ ksi} \quad \text{OK}$$

$$f_{t+v} = \frac{Mc}{2I} + \sqrt{\left(\frac{Mc}{2I}\right)^2 + \left(\frac{R}{n_b A_b}\right)^2}$$

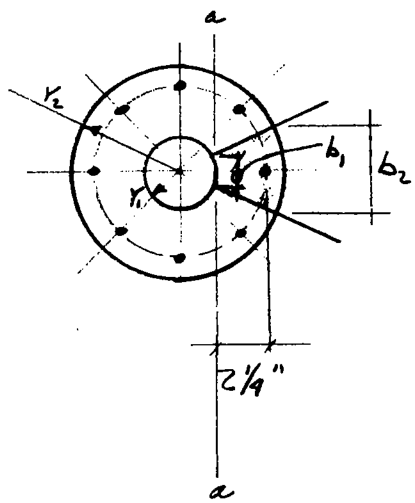
$$= \frac{564.2(9.8578)}{2(406.0)} + \sqrt{\left(\frac{564.2(9.8578)}{2(406.0)}\right)^2 + \left(\frac{80.6}{8(1.227)}\right)^2}$$

$$= 17.54 \text{ ksi} < 35.83 - 1.4(8.21) = 24.34 \text{ ksi} \quad \text{OK}$$

USE 8 ea - 1 1/4" ϕ Bolts

FIG 40

BASE PL



$$T_b = A_b f_{bolt} = 1.227(17.65) = 21.66^k$$

$$M_{@a} = 21.66\,(2.25'') = 48.74 \text{ k}\cdot\text{in}$$

$$b_2 = 2r_2 \sin\frac{45°}{2} = 2(7.5)(0.3827) = 5.74''$$

$$b_1 = 2r_1 \sin\frac{45°}{2} = 2(3.0)(0.3827) = 2.30''$$

$$S = \frac{bt^2}{6} = \frac{M}{F_b}$$

$$t = \sqrt{\frac{6M}{F_b b}} = \sqrt{\frac{6(48.74)}{33(4.02)}} = 1.48''$$

$$F_b = 0.6 F_y = 0.6 \times 55 = 33 \text{ ksi}$$

$$b_{avg} = \frac{b_1 + b_2}{2} = \frac{2.30 + 5.74}{2} = 4.02''$$

USE PL 2"

LAKE PONTCH. HURRICANE PROT. PROJ. 42 DES: [initials] 4 JAN 84
MITERED SWING GATES - LOWER HINGE DESIGN CHKD: FNB 20 JUN 84

MASONRY ℙ

Try octagonal ℙ with 22" across flats, analyse as circular plate with 22"ϕ

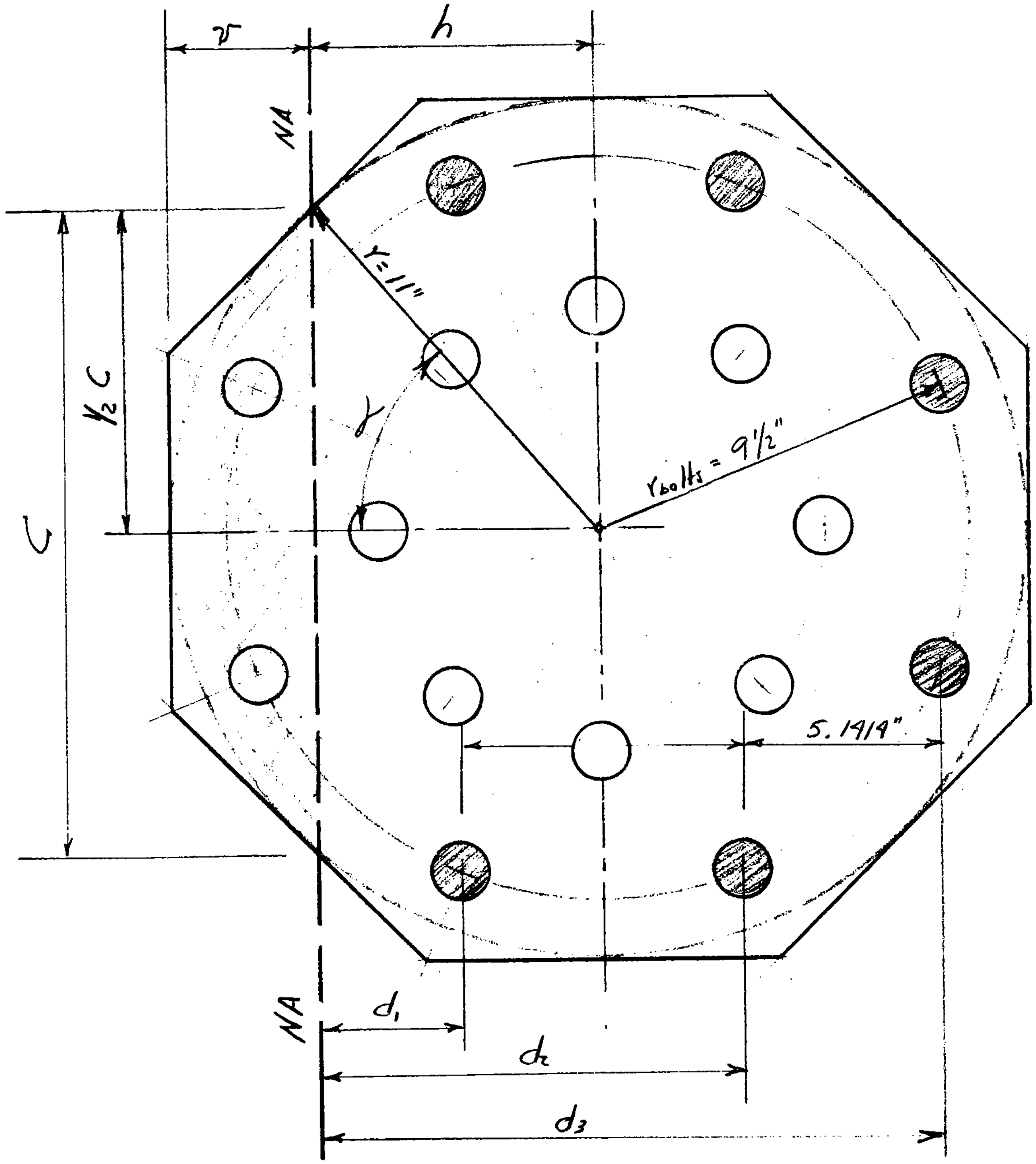


FIG 42

Try $C = 17''$

$$\sin\alpha = \frac{17}{2(11)} = 0.7727 \qquad \cos\alpha = 0.6347$$

$$\alpha = 50.5994^\circ = 0.8831 \text{ rad}$$

$\sin^3\alpha = 0.4614$ $\qquad \alpha - \sin\alpha\cos\alpha = 0.3926$

$\sin\alpha\cos\alpha = 0.4905$ $\qquad r^2 = 121$

$A_1 = 121(0.3926) = 47.5046$ $\qquad h = 11(0.6347) = 6.9817$

$v = 4.0183$

$$x_c = \frac{2}{3}(11)\left(\frac{0.4614}{0.3926}\right) = 8.6184$$

$\bar{x} = 1.6367$

$$\Sigma M_{NA} = 47.5046(1.6367) - 2(1.227)(3.3462 + 10.6172 + 15.7584)$$

$$= 77.7508 - 72.9378 = 4.8130 > 0 \quad NG$$

Try $C = 16.75''$

$$\sin\alpha = \frac{16.75}{2(11)} = 0.7614 \qquad \cos\alpha = 0.6483$$

$$\alpha = 49.5846^\circ = 0.8654 \text{ rad}$$

$\sin^3\alpha = 0.4413$ $\qquad \alpha - \sin\alpha\cos\alpha = 0.3718$

$\sin\alpha\cos\alpha = 0.4936$ $\qquad r^2 = 121$

$A_1 = 121(0.3718) = 44.9878$ $\qquad h = 11(0.6483) = 7.1313$

$v = 3.8684$

$$x_c = \frac{2}{3}(11)\left(\frac{0.4413}{0.3718}\right) = 8.7041 \qquad \bar{x} = 1.5728$$

$$\Sigma M_{NA} = 44.9878(1.5728) - 2(1.227)(3.4958 + 10.7668 + 15.9082)$$

$$= 70.7568 - 74.0391 = -3.2823 \neq 0 \quad NG$$

Try $C = 16.85''$

$$\sin\alpha = \frac{16.85}{2(11)} = 0.7659 \qquad \cos\alpha = 0.6429$$

$$\alpha = 49.9879° = 0.8725 \text{ rad}$$

$$\sin^3\alpha = 0.4493 \qquad \alpha - \sin\alpha\cos\alpha = 0.3801$$

$$\sin\alpha\cos\alpha = 0.4924 \qquad r^2 = 121$$

$$A_1 = 121(0.3801) = 45.9921 \qquad h = 11(0.6429) = 7.0719$$

$$v = 3.9281$$

$$x_c = \frac{2}{3}(11)\left(\frac{0.4493}{0.3801}\right) = 8.6684 \qquad \bar{x} = 1.5965$$

$$\Sigma M_{NA} = 45.9971(1.5965) - 2(1.227)(3.4364 + 10.7074 + 15.8488)$$

$$= 73.4344 - 73.6018 = -0.1674 \approx 0 \quad \text{OK}$$

$$I_o = \frac{45.9921(121)}{4}\left[1 + \frac{2(0.4493)(0.6429)}{0.3801}\right] \cong 3504 \text{ in}^4$$

$$I_{NA} = I_o - A_1 x_c^2 + A_1 \bar{x}^2$$

$$= 3504 - 45.9921(8.6684)^2 + 45.9921(1.5965)^2 \cong 167 \text{ in}^4$$

$$I_{SYST} = 167 + 2(1.227)\left(\overline{3.4364}^2 + \overline{10.7074}^2 + \overline{15.8488}^2\right)$$

$$\cong 1094 \text{ in}^4$$

For Bolts

$$f_v = \frac{80.6}{8(1.227)} = 8.21 \text{ ksi} < 18.33 \text{ ksi} \quad \text{OK}$$

$$f_{t+v} = \frac{Mc}{2I} + \sqrt{\left(\frac{Mc}{2I}\right)^2 + \left(\frac{R}{n_b A_b}\right)^2}$$

LAKE PONTCH. HURRICANE PROT. PROJ. 45 DES: AMR 4 JAN 84
MITERED SWING GATES - LOWER HINGE DESIGN CHKD: FNB 21 JUN 84

$$M = 80.6(9") \; 725.4 \; k \cdot in$$

$$\frac{Mc}{2I} = \frac{725.4(15.8488)}{2(1094)} = 5.2544$$

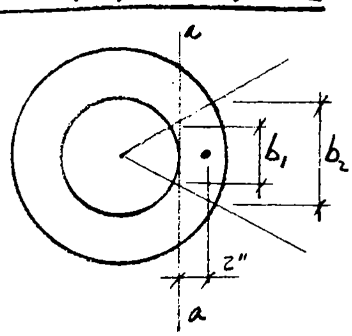
$$\left(\frac{Mc}{2I}\right)^2 = 27.61 \qquad \left[\frac{80.6}{8(1.227)}\right]^2 = 67.42$$

$$f_{t+v} = 5.2544 + \sqrt{27.61 + 67.42} =$$

$$= 5.2544 + 9.7484 = 15.0028 \; ksi < F_{t+v} \quad Ok$$

$$F_{t+v} = 35.83 - 1.8(8.21) = 21.05 \; ksi < 25.0 \; ksi$$

FOR MASONRY PL



$$T_b = A_b f_{bolt} = 1.227(15.0028) = 18.4084^k$$

$$\Sigma M_{@\,a\text{-}a} = 18.4084(2") \cong 36.82 \; k \cdot in$$

$$b_1 = 2(7.5) \sin \frac{45}{2} = 5.74"$$

$$b_2 = 2(11) \sin \frac{45}{2} = 8.42$$

$$b_{avg} = \frac{1}{2}(b_1 + b_2) = \frac{1}{2}(5.74 + 8.42) = 7.08 \; in$$

$$S = \frac{bt^2}{6} = \frac{M}{F_b}$$

$$t = \sqrt{\frac{6M}{F_b b}} = \sqrt{\frac{6(36.82)}{33(7.08)}} = 0.9724 \; in$$

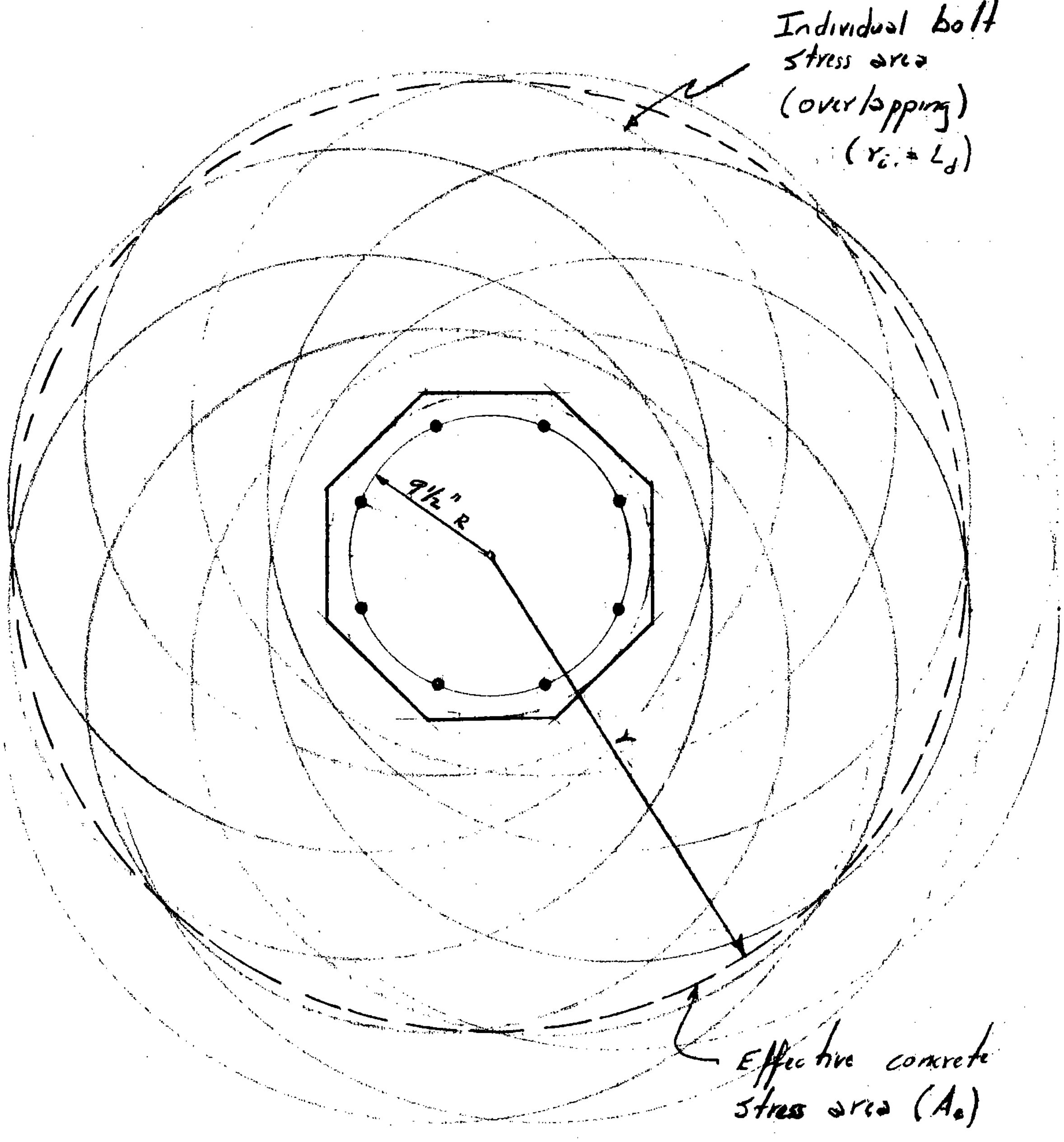
USE PL 1½"

FIG. 45

LAKE PONTCH. HURRICANE PROT. PROJ. 46 DES: ASK 4 JAN 84

MITERED SWING GATES - LOWER HINGE DESIGN CHKD: FNB 21 JUN 84

Lower Hinge - Anchor Bolts & Masonry R Design



REFERENCE:

"DESIGN OF HEADED ANCHOR BOLTS"
by SHIPP & HANINGER
ENGINEERING JOURNAL / AISC, VOL 20, No. 20

FIG 46

LAKE PONTCH. HURRICANE PROT. PROJ. 47 DES: [initials] 4 JAN 84
MITERED SWING GATES - LOWER HINGE DESIGN CHKD: FNB 21 JUN 84

Assume $L_d = 24$ in, then $r_e \cong 32.5$ in.

$$A_e = \pi r_e^2 = \pi(32.5)^2 \cong 3318 \text{ in}^2$$

$$f_{t_c} = \frac{15.0028\,(1.227)(8)}{3318} = 0.0444 \text{ ksi}$$

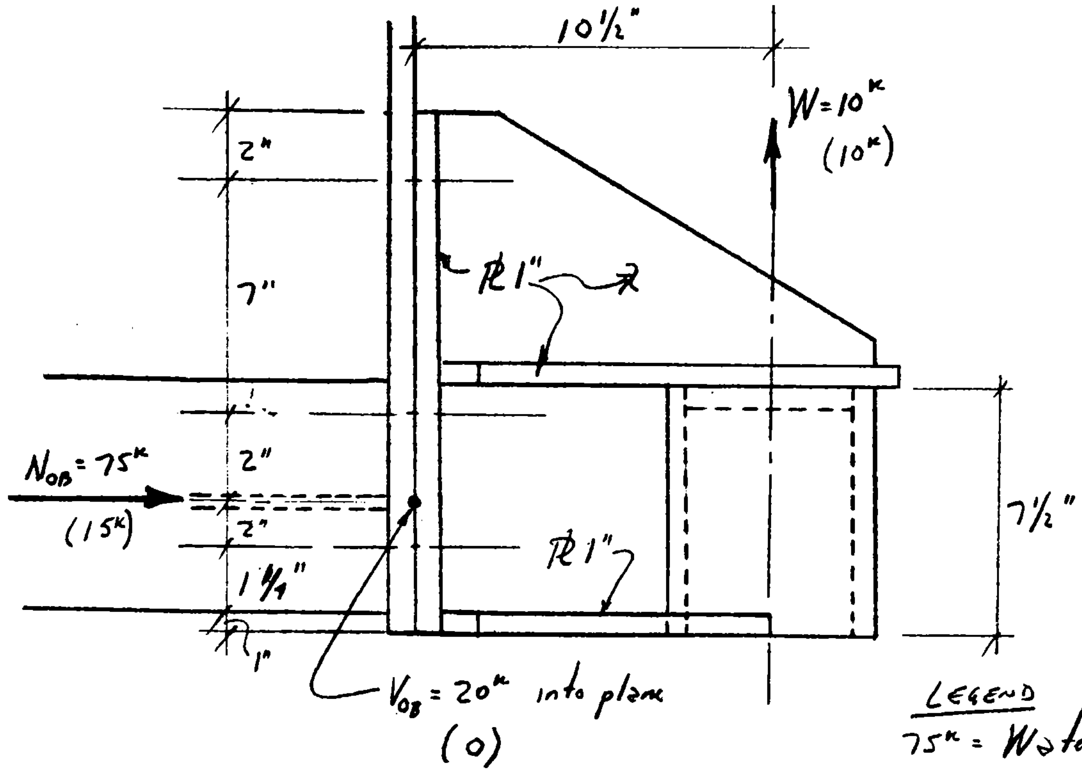
Allowable Tensile Stress of Plain Concrete:

$$f_t = 1.2\sqrt{f'_c} = 1.2\sqrt{3000} = 0.066 \text{ ksi} \quad \text{OK}$$

USE $l_d = 24''$

USE BOLTS: $1\frac{1}{4}''\ \phi \times 30''$ long ($6''$ projection)

LAKE PONTCH. HURRICANE PROT. PROJ. 48 DES: [illegible] 5 JAN 84
MITERED SWING GATES – LOWER HINGE DESIGN CHKD: FNB 21 JUN 84



LEGEND
75ᴷ = Water case
(15) = No water

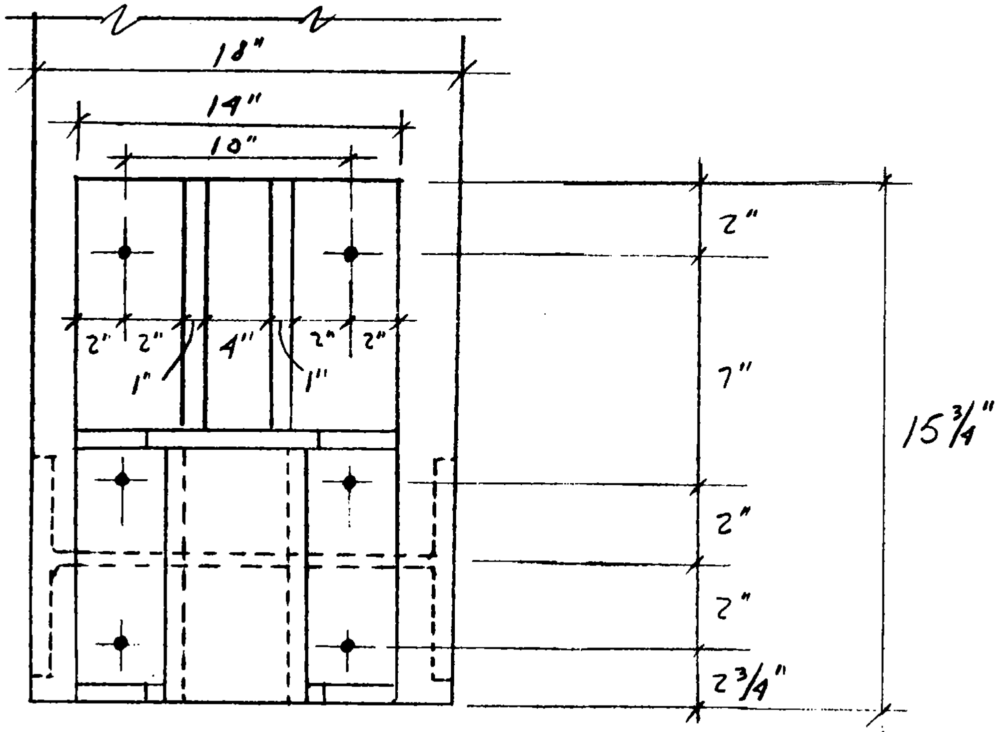
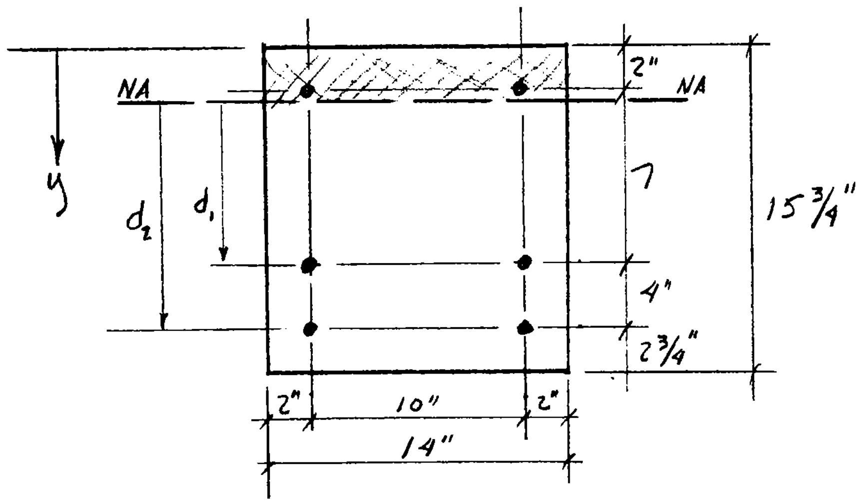


FIG 48

HINGE PL



CHECK BOLTS - HINGE PL TO GATE END PL

Assume 6 ea - 1" ϕ ASTM F593, Gr 1, Cond CW

From pg 20 of comps:

$F_u = 100$ ksi $\quad F_t = 27.5$ ksi

$F_v = 14.17$ ksi $\quad F_{t+v} = 35.83 - 1.8 f_v \le 27.5$ ksi

$A_b = 0.7854$ in^2

SHEAR:

$$V = \sqrt{V_{OB}^2 + W^2} = \sqrt{20^2 + 10^2} = 22.36^k$$

$$f_v = \frac{V}{n_b A_b} = \frac{22.36}{6\,(0.7854)} = 4.745 \text{ ksi} < F_v \quad \text{OK}$$

$$F_{t+v} = 35.83 - 1.8(4.745) = 27.29 \text{ ksi} < 27.5 \quad \text{OK}$$

Assume NA @ $y = 2.25''$

$$\Sigma M_{NA} = 2.25(14)(1.125) - 2(0.7854)(6.75 + 10.75)$$

$$= 35.4375 - 27.4890 = 7.9485 > 0 \quad NG.$$

Try NA @ $y = 2.0''$

$$\Sigma M_{NA} = 2.0(14)(1.0) - 2(0.7854)(7 + 11)$$

$$= 28.0 - 28.27 = -0.27 \approx 0 \quad \text{say ok}$$

$$I = \frac{14(2.0)^3}{3} + 2(0.7854)\left(\overline{7}^2 + \overline{11}^2\right) \cong 304.4 \text{ in}^4$$

$$M = 10^k(10.5'') = 105 \text{ k-in}$$

$$f_{t_{max}} = \frac{Mc}{2I} = \frac{105(11)}{2(304.4)} = 1.8972 \text{ ksi} \quad \text{ok}$$

$$f_{t+v} = \frac{Mc}{2I} + \sqrt{\left(\frac{Mc}{2I}\right)^2 + \left(\frac{R}{n_b A_b}\right)^2} = 1.8972 + \sqrt{\overline{1.8972}^2 + \overline{4.745}^2}$$

$$= 1.8972 + 5.1102 = 7.0074 \text{ ksi} < F_{t+v} \quad \text{ok}$$

<u>USE 6 ea 1" ϕ Bolts</u>

HINGE PL

$$F_p = 0.67F_y = 0.67(36) = 24.12 \text{ ksi}$$

$$f_p = \frac{75}{14 \times 15.75} = 0.3401 \text{ ksi} \quad \text{ok}$$

$$f_{v+t} = \frac{105(2)}{304.4} + \sqrt{\left(\frac{105 \times 2}{304.4}\right)^2 + \left(\frac{22.36}{2 \times 14}\right)^2} = 1.7452 \text{ ksi} \quad \text{ok}$$

Required t:

$$t_{req'd} = \sqrt{\frac{6M}{bF_b}} = \sqrt{\frac{6(105)}{14(18)\left(\frac{18}{1.7452}\right)}} = 0.4923 \text{ in.}$$

USE PL 1"

CHECK WELDS - OUTER CYL. PL'S TO HINGE PL

$$A_w = 13 + 2(12) + 11 + 6.5(2) = 61 \text{ in}^2 \quad \text{(Neglect upper stiffeners)}$$

$$S_w = \frac{\overline{13}^2}{6} + 2\left(\frac{\overline{12}^2}{6}\right) = 76.17 \text{ in}^3 \quad \text{(Neglect vertical welds)}$$

Gate Closed.

$$f_v = \frac{V}{A} = \frac{22.36}{61} = 0.3664 \text{ k/in}$$

$$f_b = \frac{M}{S} = \frac{22.36(9.5)}{76.17} = 2.7888 \text{ k/in}$$

$$f_w = \sqrt{f_v^2 + f_b^2} = \sqrt{0.3664^2 + 2.7888^2} = 2.8128 \text{ k/in}$$

Size of Fillet Weld Req'd:

$$= 2.8128 / (0.707)(21.0)\left(\tfrac{5}{6}\right) \cong 0.23 \text{ in}$$

USE 5/16 fillet weld (E-70)

OUTER CYLINDER PL's

$$A_{PLs} = 2(1)\left(\tfrac{1}{2}\right)(13'' + 9.25'') = 22.25 \text{ in}^2$$

$$S = \frac{2(1)\left[\frac{1}{2}(13 + 9.25)\right]^2}{6} = 41.26 \text{ in}^3$$

Gate Closed:

$$f_p = \frac{75}{22.25} + \frac{22.34}{41.24} = 3.913 \text{ ksi} < 27.0 \text{ (ok)}$$

$$f_v = \frac{22.34}{22.25} = 1.005 \text{ ksi} < 12.0 \text{ ksi (ok)}$$

$$f_b = \frac{22.34(9.5)}{41.26} = 5.148 \text{ ksi} < 18.0 \text{ ksi (ok)}$$

USE PL 1" (2 ea)

CHECK WELDS - OUTER CYL PL'S TO CYLINDER (MECH. TUBING)

Min. fillet weld = 5/16" for PL 1"
Max. fillet weld = 9/16" for $t = 5/8$" (Mech. Tubing)

Length of Weld = $\pi d_{OD} + 2\left(\frac{1}{2}\pi d_{OD}\right) = 2\pi d_{OD}$

$$= 2\pi(7.5) = 47.12 \text{ in.}$$

$$d_{OD} = 7\tfrac{1}{2}"$$

$$f_v = \frac{V}{A} = \frac{22.36}{47.12} = 0.4745 \text{ k/in} \approx 0.475 \text{ k/in}$$

Top PL weld — Bott. PL welds

$$f_b = \frac{M}{S_w} \qquad S_w = \frac{23.56^2}{6} + \frac{2(11.78)^2}{4} = 138.77 \text{ in}^3$$

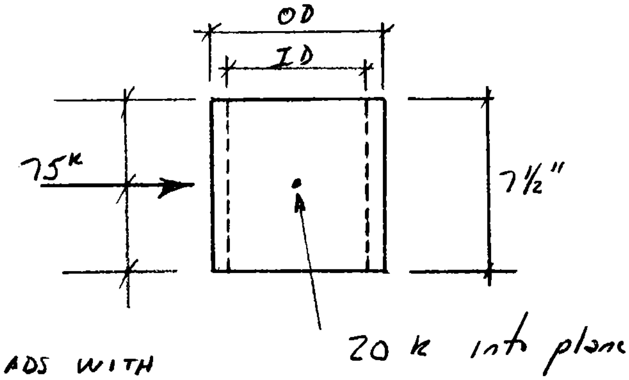
$$f_b = \frac{22.36(9.5)}{138.77} = 1.531 \text{ k/in}$$

$$f_w = \sqrt{0.475^2 + 1.531^2} = 1.603 \text{ k/in} < 3.87 \text{ k/in}$$

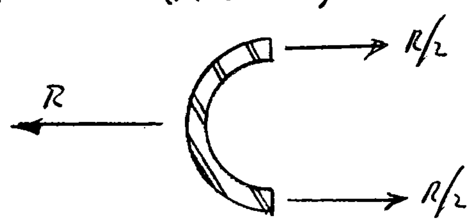
(Capacity of 5/16" fillet weld)

USE 5/16" fillet Weld (E-70)

OUTER CYLINDER



LOADS WITH GATE CLOSED (WATER CASE)



Assume Mechanical Tubing, ASTM A-519 Gr. MT1020 CW

$t = 5/8''$

$F_y = 60$ ksi $\quad F_u = 70$ ksi

$F_t = 0.5 F_y = 30$ ksi

$$R = \sqrt{75^2 + 20^2} = 77.621^k$$

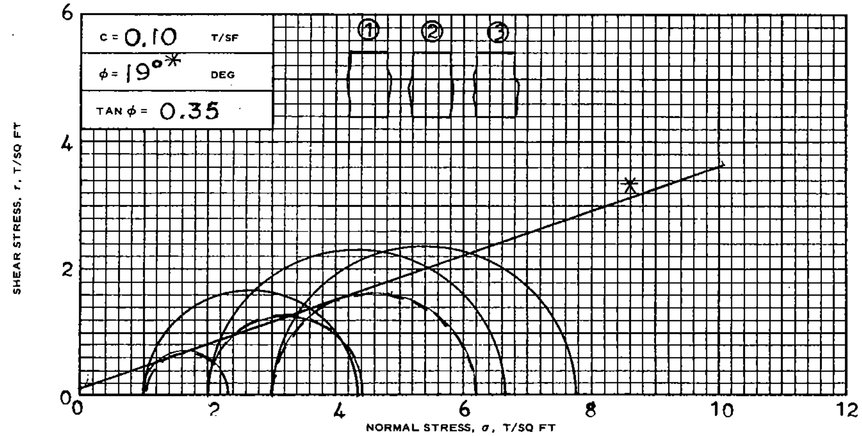
$$f_t = \frac{R/2}{A} = \frac{77.621/2}{5/8 \times 7\frac{1}{2}}$$

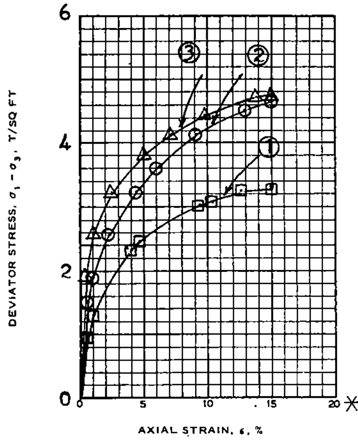
$\cong 8.28$ ksi OK

LAKE PONTCHARTRAIN, LOUISIANA & VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 13, GENERAL DESIGN
ORLEANS PARISH LAKEFRONT LEVEE
WEST OF IHNC

APPENDIX C

LABORATORY TEST DATA SHEETS (SOIL SAMPLES)





$\gamma sat. = 120$

SPECIMEN NO.		1	2	3	Avg.
INITIAL: WATER CONTENT, %	w_o	30.1	30.4	30.9	30.5
INITIAL: DRY DENSITY LB/CU FT	γd_o	91.9	91.8	91.2	
INITIAL: SATURATION, %	S_o	98.0	98.5	98.9	
INITIAL: VOID RATIO	e_o	0.827	0.830	0.841	
BEFORE SHEAR: WATER CONTENT, %	w_c	28.8	28.1	28.3	
BEFORE SHEAR: DRY DENSITY LB/CU FT	γd_c	93.0	93.8	94.5	
BEFORE SHEAR: SATURATION, %	S_c	96.1*	95.5*	98.0	
BEFORE SHEAR: VOID RATIO	e_c	0.806	0.791	0.777	
BEFORE SHEAR: FINAL BACK PRESSURE, T/SQ FT	u_o	5.04	5.04	5.04	
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1-\sigma_3)_{MAX}$	3.37	4.65	4.76	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN	t_f	124	124	123	
*$(\sigma_1-\sigma_3)$ AT MAX. PORE PRESSURE		1.3	2.4	3.2	
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 SANDY SILT(ML),gray;few silty clay laminations

LL — PL — PI — G_s 2.69 TYPE OF SPECIMEN UNDISTURBED TYPE OF TEST R

REMARKS: * Pore pressure response indicated 100% saturation See attached plot for effective values. Portion of sample allowed to drain before trimming

PROJECT LK.PONT.,LA& VIC.-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC,GDM #2,SUPP. #5

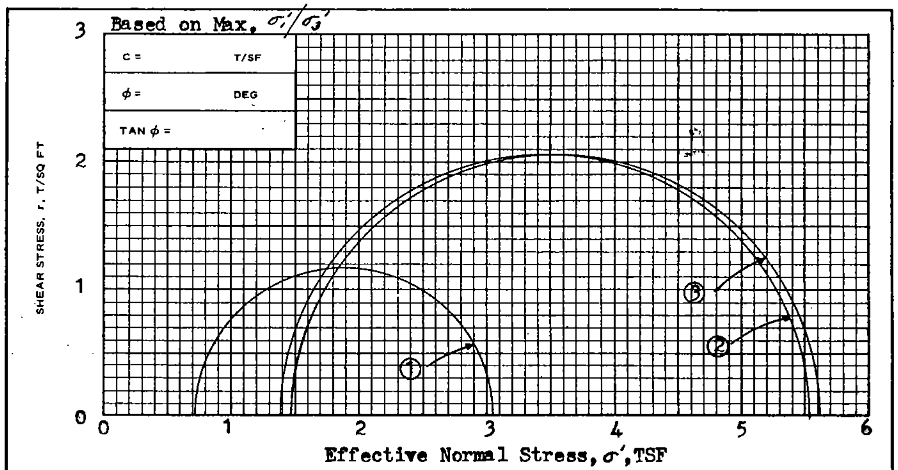
BORING NO. 1-ULOA SAMPLE NO. 15-C

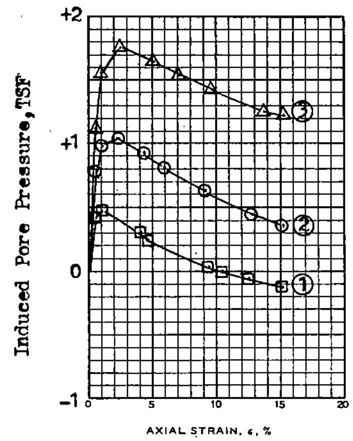
~~DEPTH~~/ELEV -55.2

LABORATORY USAEWES DATE 14 Nov.,1972

PJR TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





SPECIMEN NO.					
INITIAL: WATER CONTENT, %	w_o				
INITIAL: DRY DENSITY LB/CU FT	γd_o				
INITIAL: SATURATION, %	S_o				
INITIAL: VOID RATIO	e_o				
BEFORE SHEAR: WATER CONTENT, %	w_c				
BEFORE SHEAR: DRY DENSITY LB/CU FT	γd_c				
BEFORE SHEAR: SATURATION, %	S_c				
BEFORE SHEAR: VOID RATIO	e_c				
BEFORE SHEAR: FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3				
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 2.69 TYPE OF SPECIMEN TYPE OF TEST R

REMARKS:

PROJECT LK.PONT.,LA & VIC.-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC,GDM #2, SUPP. #5

BORING NO. 1-ULOA SAMPLE NO. 15-C

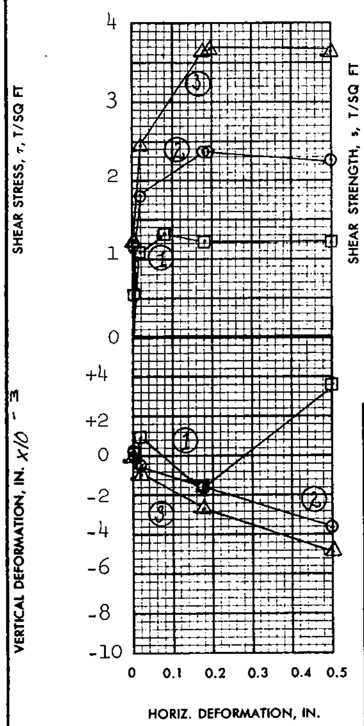
~~DEPTH~~/ELEV -55.2

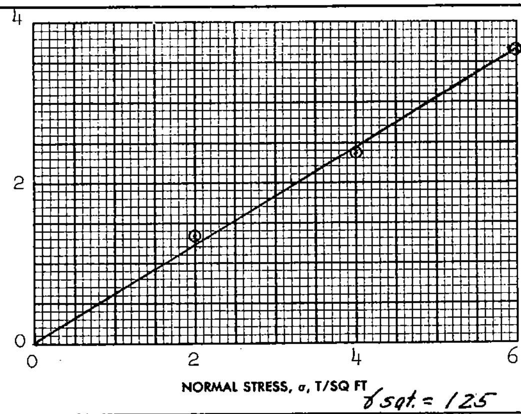
LABORATORY USAEWES DATE 14 Nov.,1972

Sheet 2 of 2

PJR TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





$\gamma sat. = 125$

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	27.8 %	27.0 %	27.9 %	27.6%
	VOID RATIO	e_o	0.748	0.647	0.696	
	SATURATION	S_o	98.9 %	100+ %	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	95.0	100.8	97.9	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	24.1%	23.6%	22.9 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.31	2.37	3.68	
ACTUAL TIME TO FAILURE, MIN		t_f	660	1320	1320	
RATE OF STRAIN, IN./MIN			.00016	.00016	.00016	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 32°

TAN ϕ' = 0.613

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE — 0.538 IN. THICK

CLASSIFICATION SILTY SAND(SM),greenish gray

LL – PL – PI – G_s 2.66

REMARKS

PROJECT LK. PONT. LA.& VIC.,-ORLEANS PARISH LK.FR. LEVEES,WEST OF IHNC, GDM #2, SUPP.# 5

AREA

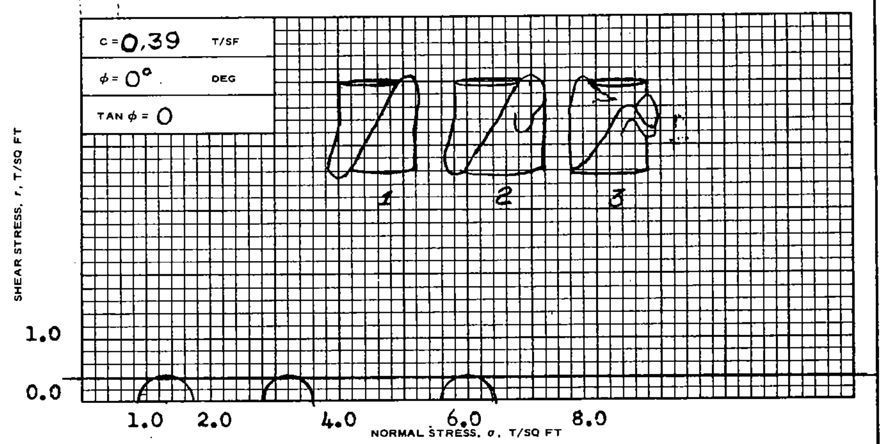
BORING NO. 1-ULOA SAMPLE NO. 17-D

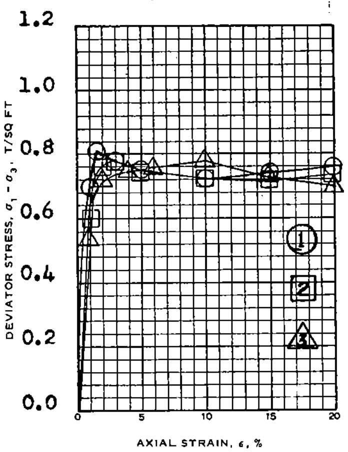
DEPTH / EL -63.6 DATE 21 Nov. 1972

RCH

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3





$\gamma sat. = 107$

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	45.98	55.97	46.47	49.5
	DRY DENSITY LB/CU FT	γd_o	72.70	67.79	71.18	
	SATURATION, %	S_o	94.87	100	92.40	
	VOID RATIO	e_o	1.297	1.463	1.346	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.9	2.8	5.6	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.807	0.741	0.776	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	2.63	11.01	35.40	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS M (Gr) CH3: lns SP; slf

LL 71 PL 18 PI 53 G_s 2.6755 TYPE OF SPECIMEN 5" Undis. TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic. Orleans Parish Lakefront Levees - West of IHNC

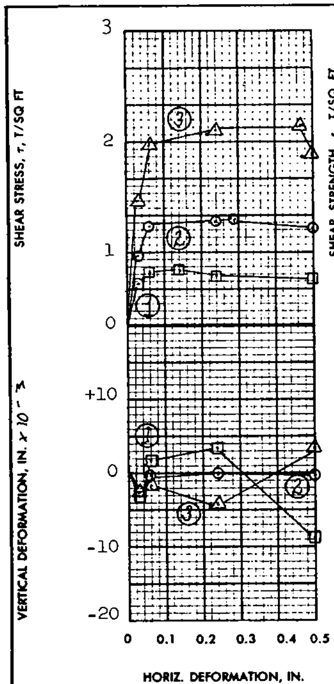
BORING NO. 1-ULOA SAMPLE NO. 13-C

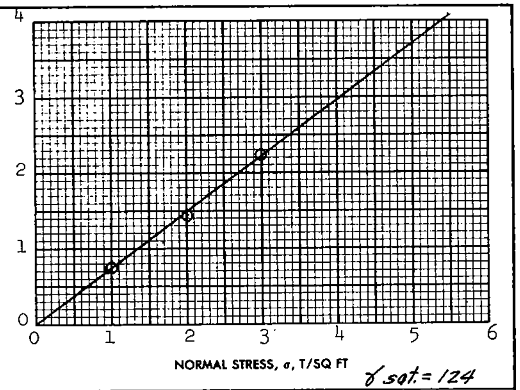
DEPTH/ELEV 49.0 / -47.0

LABORATORY NOD DATE 7 June 73

TSW **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





γ sat. = 124

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	25.2 %	24.6 %	27.1 %	25.6 %
	VOID RATIO	e_o	0.661	0.643	0.736	
	SATURATION	S_o	100+ %	100+ %	97.6%	%
	DRY DENSITY, LB/CU FT	γ_d	99.6	100.7	95.3	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	24.7 %	25.0%	25.5%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.75	1.42	2.21	
ACTUAL TIME TO FAILURE, MIN		t_f	780	1620	1140	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 36°

TAN ϕ' = 0.73

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE — 0.538 IN. THICK

CLASSIFICATION SILTY SAND(SM),dark gray;1/4" to 1/2" size shell fragments and 1/8"*

LL - PL - PI - G_s 2.65

REMARKS *dia. roots
Test specimens patched where roots and shells encountered.

PROJECT LK.PONT.LA.& VIC. ORLEANS PARISH LK.FR. LEVEES-WEST OF IHNC, GDM NO.2, SUPP. NO.5

AREA

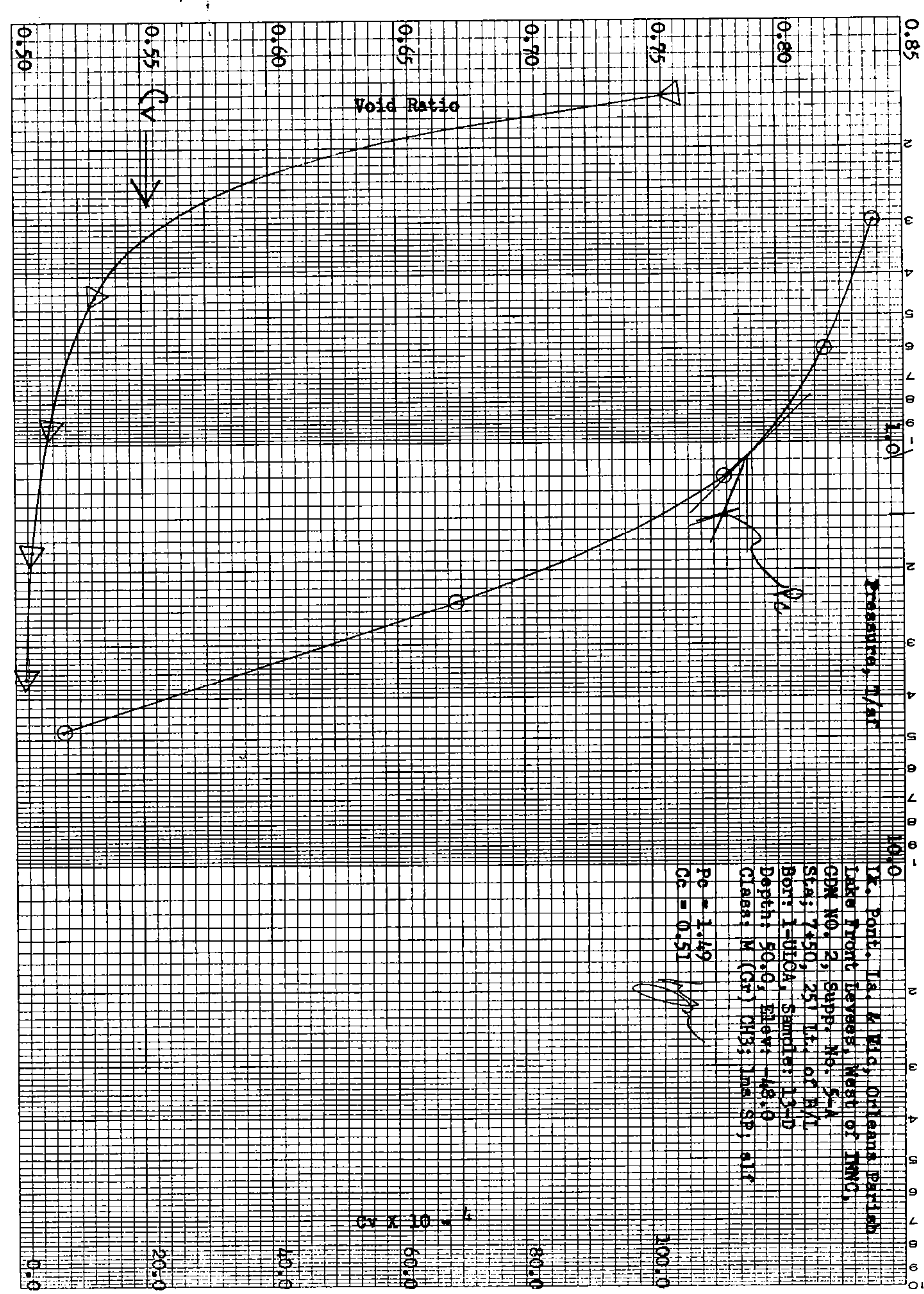
BORING NO. 1-ULOA — SAMPLE NO. 4-C

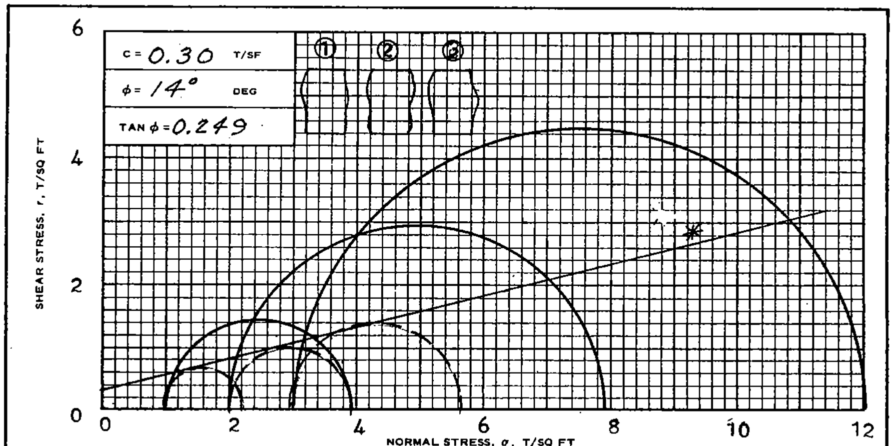
DEPTH/EL -10.5 — DATE 14 Nov. 1972

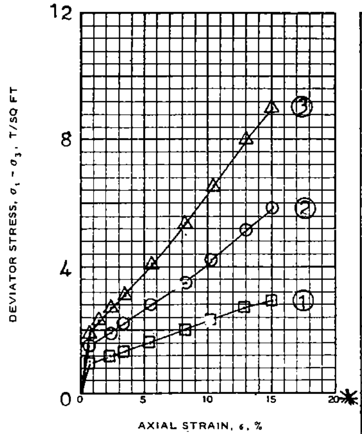
RCH

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF-214-945 PLATE IX-3







γ sat = 113

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	42.0	39.0	37.9	39.6
	DRY DENSITY LB/CU FT	γd_o	78.1	80.7	81.5	
	SATURATION, %	S_o	99.2	98.2	97.3	
	VOID RATIO	e_o	1.13	1.06	1.04	
BEFORE SHEAR	WATER CONTENT, %	w_c	36.7	34.2	33.4	
	DRY DENSITY LB/CU FT	γd_c	82.8	86.6	88.4	
	SATURATION, %	S_c	97.0*	98.7	100+	
	VOID RATIO	e_c	1.01	0.925	0.886	
	FINAL BACK PRESSURE, T/SQ FT	u_o	3.96	3.96	3.96	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.94	5.89	9.03	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	154	153	153	
* $(\sigma_1 - \sigma_3)$ AT MAX PORE PRESSURE			1.2	1.9	2.7	
INITIAL DIAMETER, IN.		D_o	1.39	1.39	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS CLAYEY SILT(ML), gray

LL - PL - PI - Gs 2.67 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST R

REMARKS: *Pore pressure response indicated 100% saturation. Portion of sample allowed to drain before trimming. See attached plot for effective values

PROJECT LK. PONT., LA. & VIC. - ORLEANS PARISH
LK. FRONT LEVEES, WEST OF IHNC, GDM#2, SUPP. #5

BORING NO. 1-ULO | SAMPLE NO. 4-D

~~DEPTH~~/ELEV -10.0

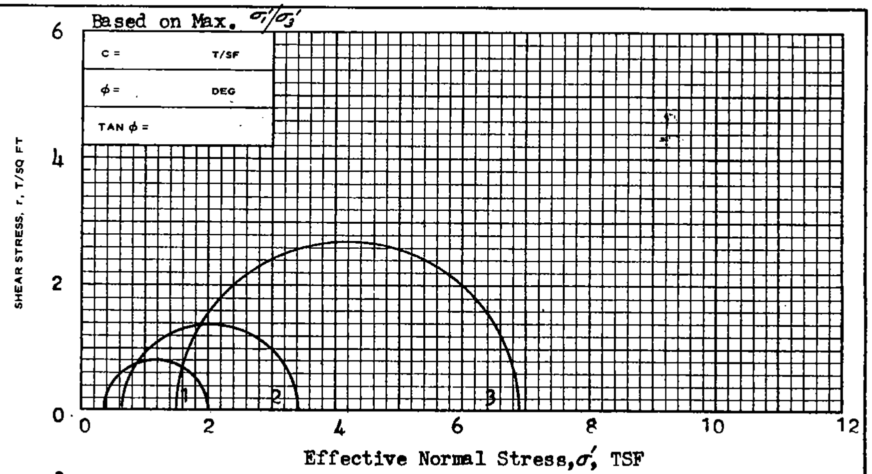
LABORATORY USAEWES | DATE 25 August, 1972

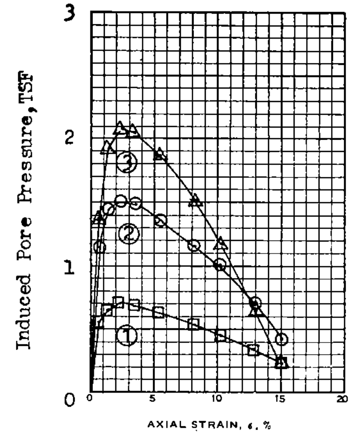
JAL TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Sheet 1 of 2

Based on Max. σ_1'/σ_3'





SPECIMEN NO.						
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3				
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$				
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f				
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o				
INITIAL HEIGHT, IN.		H_o				

CONTROLLED- TEST

DESCRIPTION OF SPECIMENS

LL PL PI Gs | TYPE OF SPECIMEN | TYPE OF TEST R

REMARKS:

PROJECT LK. PONT., LA. & VIC. - ORLEANS PARISH
LK. FRONT LEVEES, WEST OF IHNC, GDM#2, SUPP. #5

BORING NO. 1-ULO | SAMPLE NO. 4-D

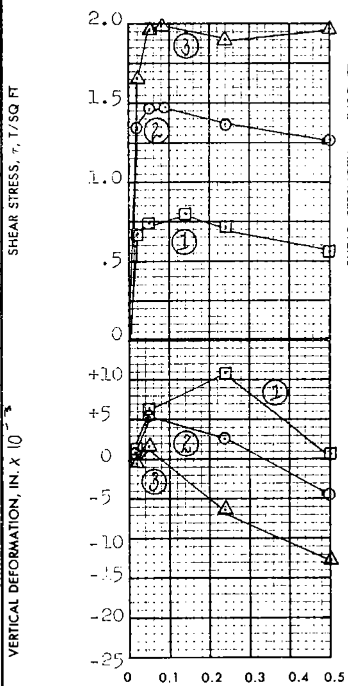
~~DEPTH~~/ELEV -10.0

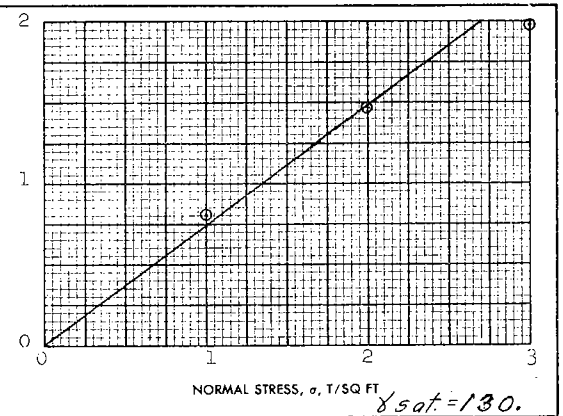
LABORATORY USAEWES | DATE 25 August, 1972

JAL TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Sheet 2 of 2





γsat = 130.

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	20.1%	19.6%	19.5%	19.7 %
	VOID RATIO	e_o	0.548	0.559	0.515	
	SATURATION	S_o	97.6%	93.3%	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	107.3	106.5	109.6	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	21.2 %	21.4%	20.8%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.80	1.47	1.98	
ACTUAL TIME TO FAILURE, MIN		t_f	840	540	510	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

φ' = 36°

TAN φ' = 0.73

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED	3.00 IN. SQUARE	0.538 IN. THICK	
CLASSIFICATION SAND(SP)gray;trace of clay			
LL -	PL -	PI -	G_s 2.66

REMARKS

PROJECT LK.PONT.,LA.&VIC.-ORLEANS PARISH LK.FRONT LEVEE,WEST OF IHNC,GDM#2,SUPP.#5

AREA

BORING NO. 1-ULO | SAMPLE NO. 7-C

~~DEPTH~~ EL -21.4 | DATE 25 Sept. 1972

RCH

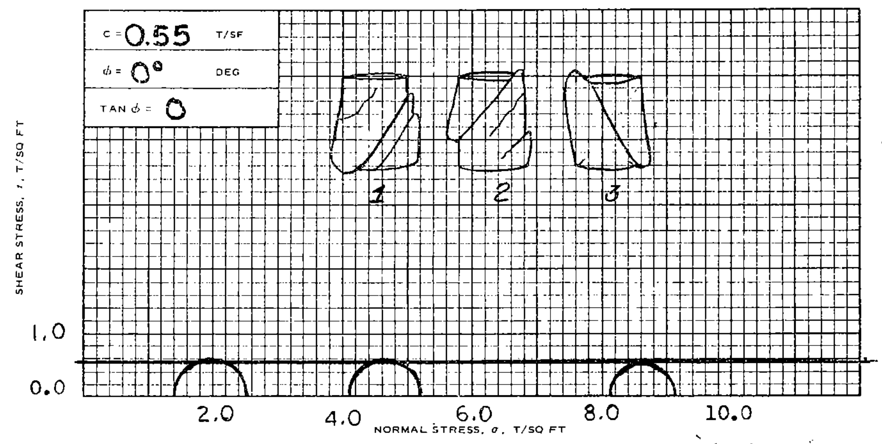
DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3

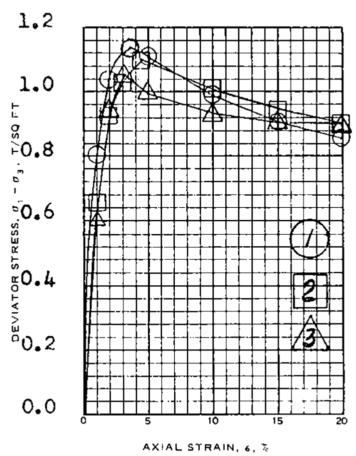
c = 0.55 T/SF

φ = 0° DEG

TAN φ = 0



γsat = 114



SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	43.93	45.13	44.93	44.7
	DRY DENSITY LB/CU FT	γ_{d_o}	79.42	78.21	78.68	
	SATURATION, %	S_o	100	100	100	
	VOID RATIO	e_o	1.103	1.135	1.123	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.4	4.1	8.1	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.138	1.101	1.054	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	5.68	16.44	11.38	
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS St (Gr) CH3: lns & ars SP

LL 61 | PL 20 | PI 41 | G_s 2.6763 | TYPE OF SPECIMEN 5" Undis. | TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.- Orleans Parish Lakefront Levee, West of IHNC

BORING NO. 1-ULO | SAMPLE NO. 14-D

DEPTH/ELEV 53.8 / -50.2

LABORATORY NOD | DATE 7 June 73

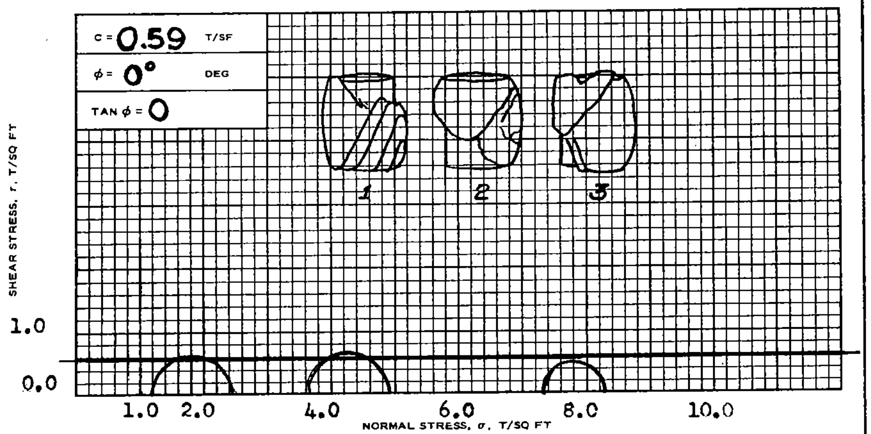
TJW TRIAXIAL COMPRESSION TEST REPORT

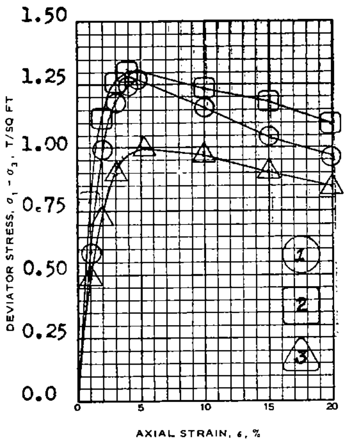
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

c = 0.59 T/SF

ϕ = 0° DEG

TAN ϕ = 0





$\gamma sat. = 114$

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	31.13	28.68	31.15	44.7
	DRY DENSITY LB/CU FT	γd_o	91.43	94.14	90.35	
	SATURATION, %	S_o	100	99.48	98.57	
	VOID RATIO	e_o	0.822	0.769	0.844	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_b				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.2	3.6	7.3	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.266	1.303	0.990	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	7.62	14.61	19.12	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS M (Gr) CL6: lns ML; slf; ars SP

LL 42 | PL 14 | PI 28 | G_s 2.6694 | TYPE OF SPECIMEN 5" Undis. | TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.-Orleans Parish Lakefront Levee West of IHNC

BORING NO. 1-ULO SAMPLE NO. 15-C

DEPTH/ELEV 57.5 / -53.8

LABORATORY NOD DATE 7 June 73

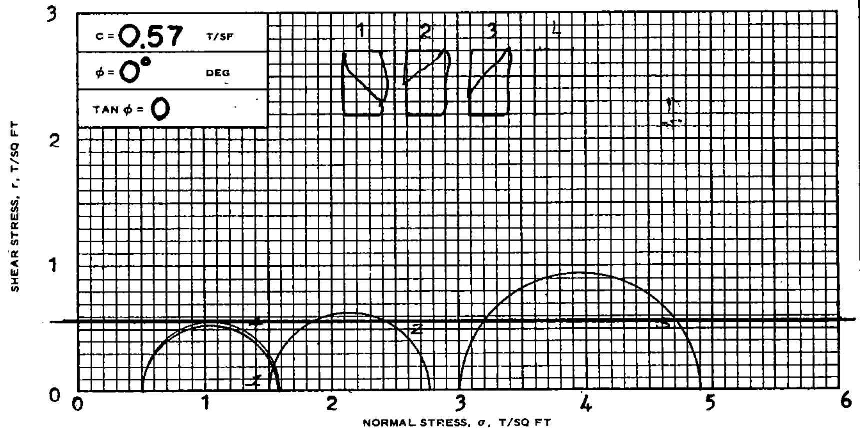
TRIAXIAL COMPRESSION TEST REPORT

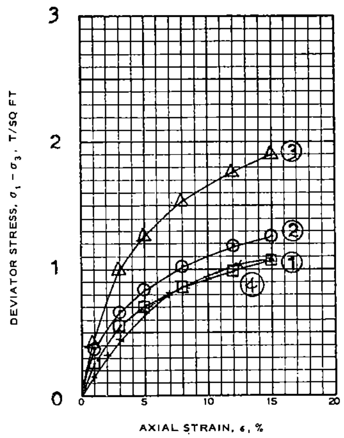
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

c = 0.57 T/SF

ϕ = 0° DEG

TAN ϕ = 0





$\gamma sat. = 126$

SPECIMEN NO.			1	2	3	4	Avg.
INITIAL	WATER CONTENT, %	w_o	24.7	23.8	22.7	~~23.5~~	23.7
	DRY DENSITY LB/CU FT	γd_o	100.4	101.2	103.7	~~103.1~~	
	SATURATION, %	S_o	99.4	97.7	99.2	~~100+~~	
	VOID RATIO	e_o	0.666	0.653	0.613	~~0.622~~	
BEFORE SHEAR	WATER CONTENT, %	w_c					
	DRY DENSITY LB/CU FT	γd_c					
	SATURATION, %	S_c					
	VOID RATIO	e_c					
	FINAL BACK PRESSURE, T/SQ FT	u_o					
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	0.5	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.07	1.27	1.90	1.08	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	31	22	25	51	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$					
INITIAL DIAMETER, IN.		D_o	1.39	1.40	1.39	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SANDY CLAY(CL),gray

LL 31 | PL 22 | PI 9 | G_s 2.68 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS:

PROJECT LK.PONT,LA.&VIC. ORLEANS PARISH LAKE FRONT LEVEES,WEST OF IHNC,GDM#2,SUPP. #5

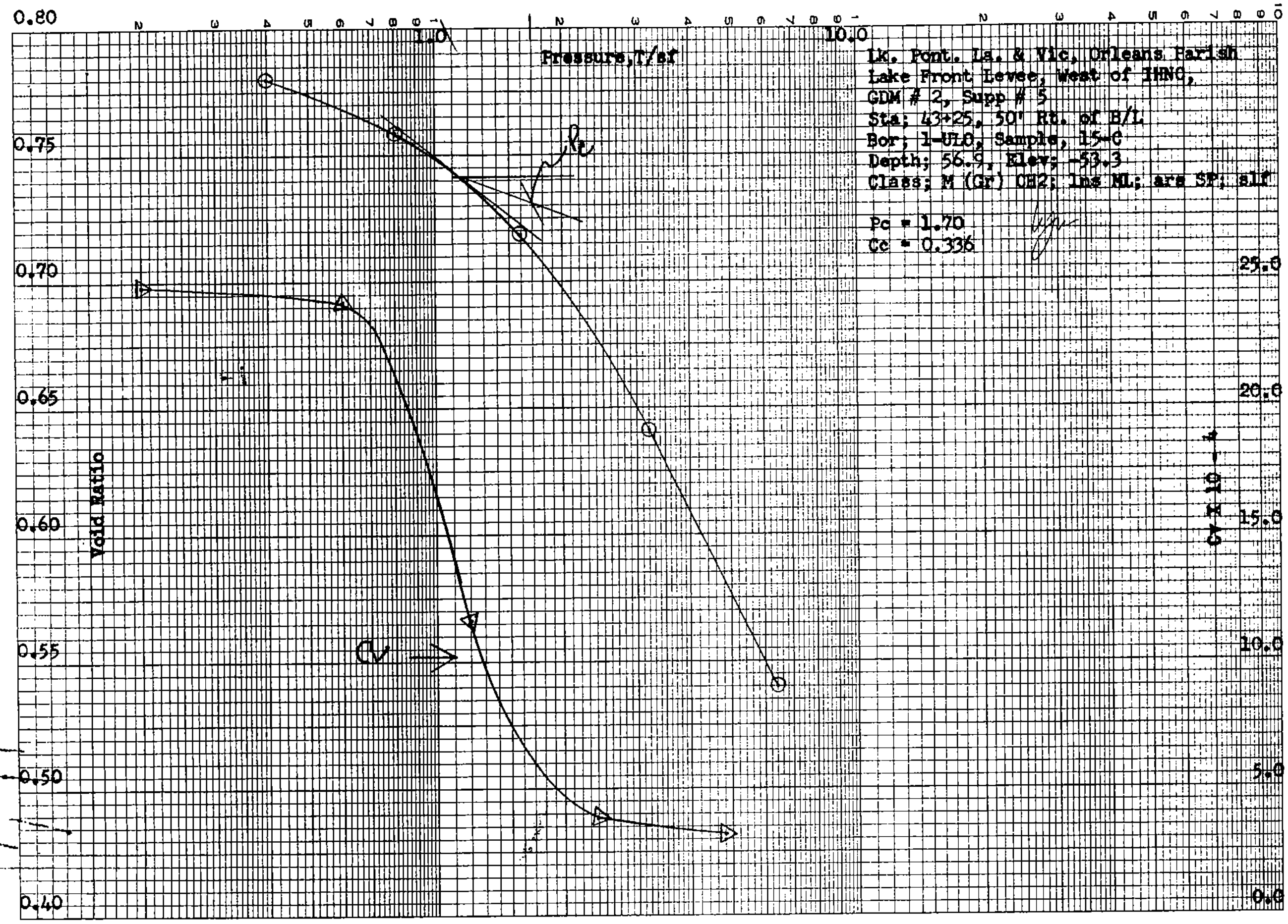
BORING NO. 1-ULO SAMPLE NO. 16-D

~~DEPTH~~/ELEV -58.5

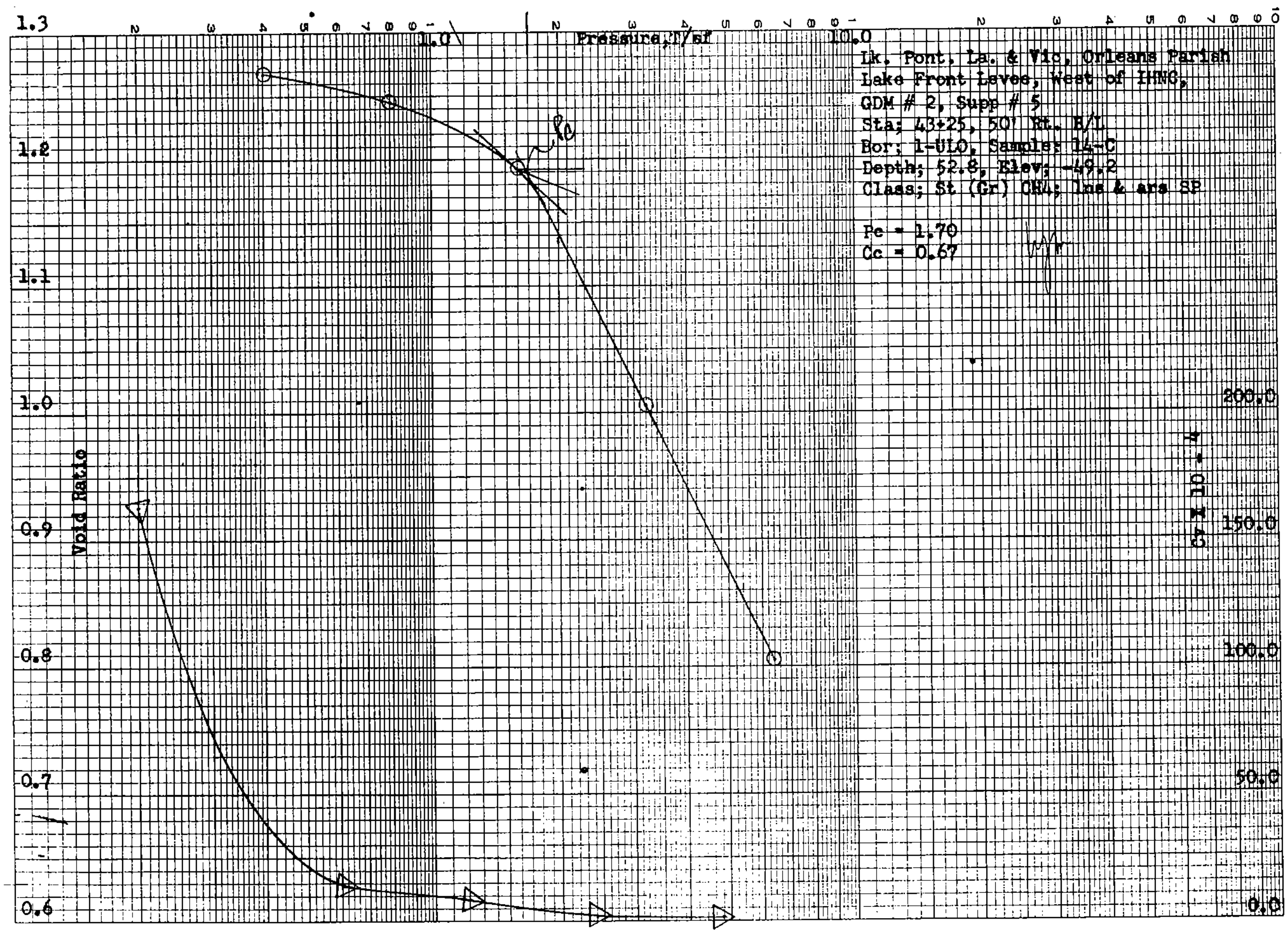
LABORATORY USAEWES DATE 21 Oct.,1972

GDM TRIAXIAL COMPRESSION TEST REPORT

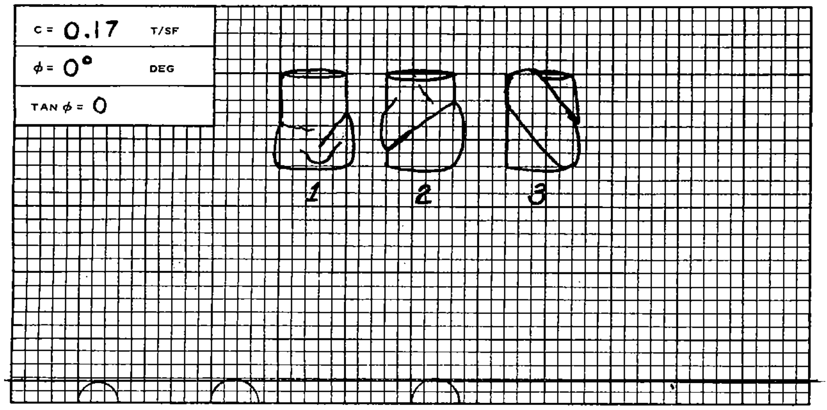
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

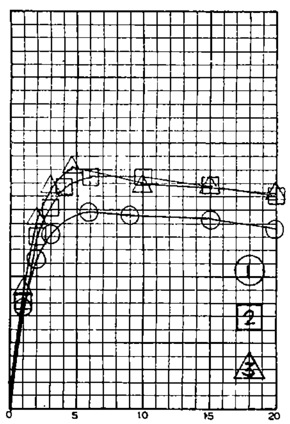

Pressure, T/sf
Void Ratio
Cv X 10 -4
Lk. Pont. La. & Vic, Orleans Parish
Lake Front Levee, West of IHNC,
GDM # 2, Supp # 5
Sta; 43+25, 50' Rt. of B/L
Bor; 1-ULO, Sample, 15-C
Depth; 56.9, Elev; -53.3
Class; M (Gr) CH2; lns ML; ars SP; slf
Pc = 1.70
Cc = 0.336
Pc
Cv
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.40
1.0
10.0
25.0
20.0
15.0
10.0
5.0
0.0

F


Pressure, T/sf
Void Ratio
Cv X 10 -4
Lk. Pont. La. & Vic, Orleans Parish
Lake Front Levee, West of IHNC,
GDM # 2, Supp # 5
Sta; 43+25, 50' Rt. B/L
Bor; 1-ULO, Sample; 14-C
Depth; 52.8, Elev; -49.2
Class; St (Gr) CH4; lns & ars SP
Pc = 1.70
Cc = 0.67
Pc
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
1.0
10.0
200.0
150.0
100.0
50.0
0.0

F





γsat = 110

SPECIMEN NO.		1	2	3	Avg.
INITIAL — WATER CONTENT, %	w_o	42.63	39.97	51.53	44.7
INITIAL — DRY DENSITY LB/CU FT	γd_o	77.60	79.24	69.57	
INITIAL — SATURATION, %	S_o	99.25	96.82	98.67	
INITIAL — VOID RATIO	e_o	1.146	1.102	1.394	
BEFORE SHEAR — WATER CONTENT, %	w_c				
BEFORE SHEAR — DRY DENSITY LB/CU FT	γd_c				
BEFORE SHEAR — SATURATION, %	S_c				
BEFORE SHEAR — VOID RATIO	e_c				
BEFORE SHEAR — FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1-\sigma_3)_{MAX}$	0.298	0.351	0.366	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN	t_f	9.19	14.19	7.24	
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1-\sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.	D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.	H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS So (Gr) CH2: lns & ars ML; SL.

LL 53 | PL 19 | PI 34 | Gs 2.6687 | TYPE OF SPECIMEN 5" Undis. | TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.-Orleans Parish Lakefront Levees-West of IHNC

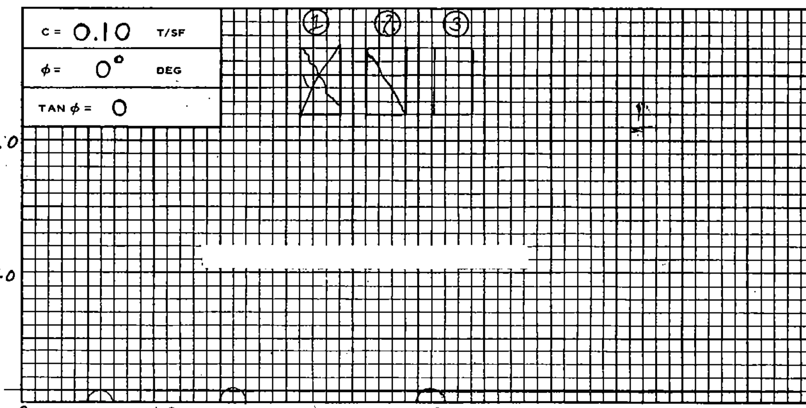
BORING NO. 2-ULO SAMPLE NO. 5-B

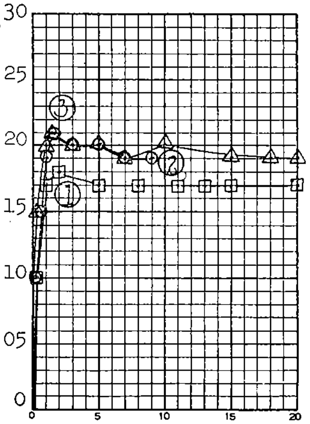
DEPTH/ELEV 15.9/ -3.1

LABORATORY NOD DATE 8 June 73

TJW TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





γsat = 100

SPECIMEN NO.		1	2	3	Avg.
INITIAL — WATER CONTENT, %	w_o	72.2	71.9	78.4	74.2
INITIAL — DRY DENSITY LB/CU FT	γd_o	58.4	58.3	54.8	
INITIAL — SATURATION, %	S_o	100+	100+	100+	
INITIAL — VOID RATIO	e_o	1.89	1.89	2.08	
BEFORE SHEAR — WATER CONTENT, %	w_c				
BEFORE SHEAR — DRY DENSITY LB/CU FT	γd_c				
BEFORE SHEAR — SATURATION, %	S_c				
BEFORE SHEAR — VOID RATIO	e_c				
BEFORE SHEAR — FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1-\sigma_3)_{MAX}$	0.18	0.21	0.21	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN	t_f	13	2	38	
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1-\sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.	D_o	1.38	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

LL 91 | PL 28 | PI 63 | Gs 2.70 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS:

PROJECT LK. PONT., LA.& VIC.,-ORLEANS PARISH LK. FR. LEVEES, WEST OF IHNC, GDM#2, SUPP. #5

BORING NO. 2-ULO SAMPLE NO. 6-C_2

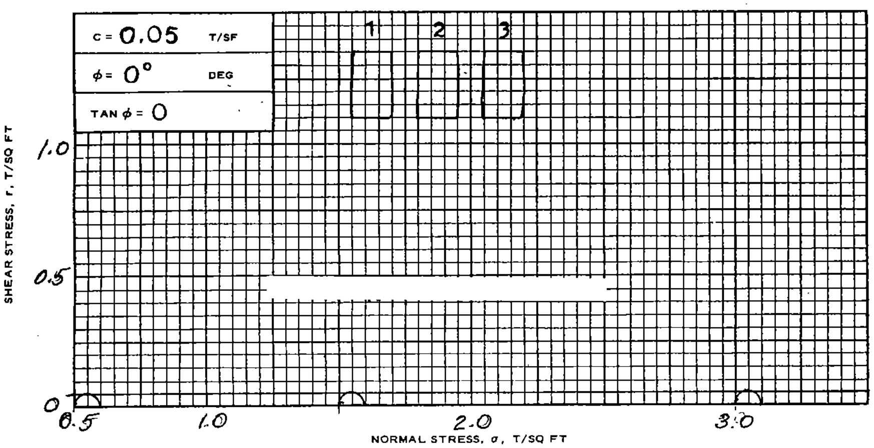
~~DEPTH~~/ELEV -8.3

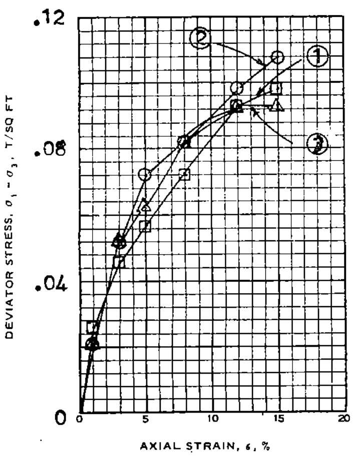
LABORATORY USAEWES DATE 25 October 1972

FAM TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c = 0.05 T/SF
ϕ = 0° DEG
TAN ϕ = 0





$\gamma_{sat} = 115$

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	38.9	36.0	38.7	37.9
	DRY DENSITY LB/CU FT	γd_o	82.4	85.9	81.5	
	SATURATION, %	S_o	100+	100+	99.0	
	VOID RATIO	e_o	1.02	0.933	1.04	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.10	0.11	0.09	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	60	55	42	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.38	1.38	1.38	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SILTY CLAY(CL),gray;1/4" seams of Clay(CL), and a few small shells

LL 33 | PL 22 | PI 11 | G_s 2.66 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: Limits and G_s tested on mixture of Silty Clay and Clay. Specimens slumped slightly during trimming.

PROJECT LK.PONT.,LA.&VIC. ORLEANS PARIS LAKE FRONT LEVEES,WEST OF IHNC,GDM#2, SUPP. #5

BORING NO. 2-ULO | SAMPLE NO. 8-C

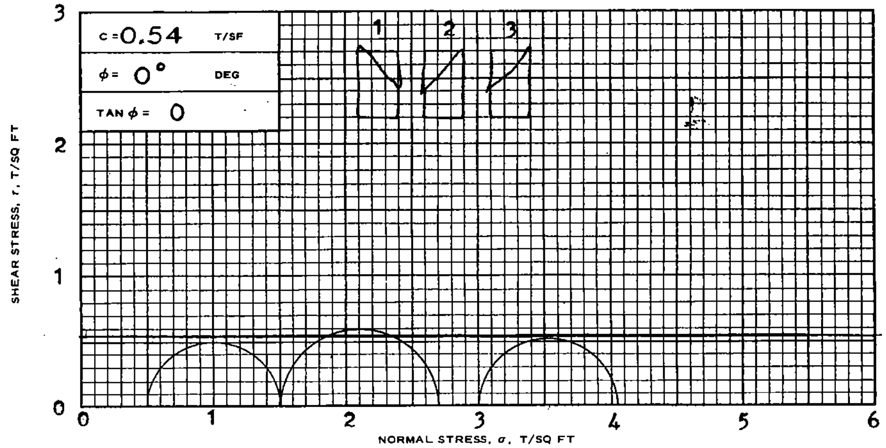
~~DEPTH~~/ELEV -15.5

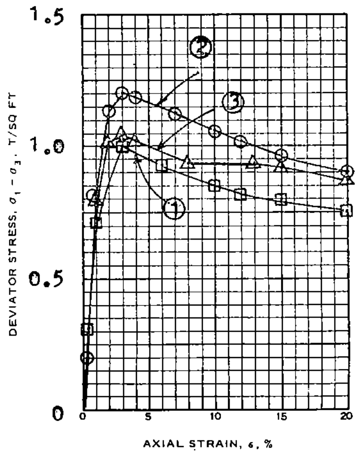
LABORATORY USAEWES | DATE 24 Oct.,1972

JMS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c = 0.54 T/SF
ϕ = 0° DEG
TAN ϕ = 0





$\gamma_{sat} = 110$

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	44.8	44.5	43.9	44.4
	DRY DENSITY LB/CU FT	γd_o	75.8	75.6	76.4	
	SATURATION, %	S_o	98.8	98.1	98.4	
	VOID RATIO	e_o	1.22	1.22	1.20	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.00	1.20	1.05	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	8	11	20	
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;traces of sand and silty sand seams

LL 60 | PL 19 | PI 41 | G_s 2.69 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS:

PROJECT LK.PONT.,LA.& VIC.-ORLEANS PARISH LK. FRONT LEVEES,WEST OF IHNC,GDM#2,SUPP.#5

BORING NO. 2-ULO | SAMPLE NO. 15-B

~~DEPTH~~/ELEV -43.4

LABORATORY USAEWES | DATE 25 October,1972

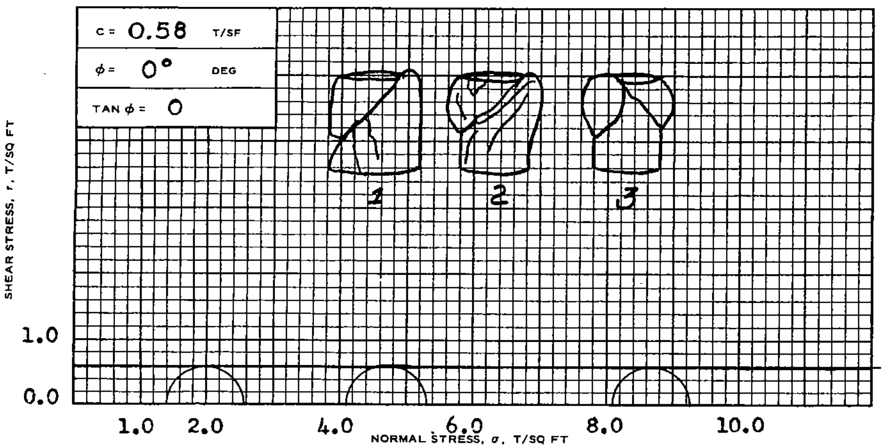
GDA TRIAXIAL COMPRESSION TEST REPORT

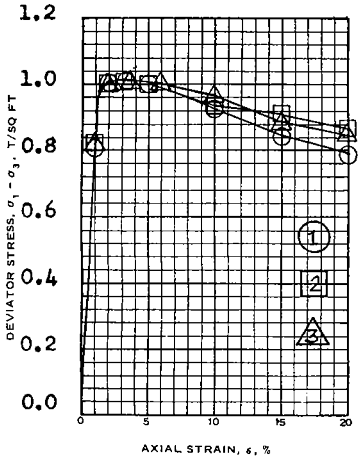
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c = 0.58 T/SF

ϕ = 0° DEG

TAN ϕ = 0





γ sat = 108

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	46.03	45.88	47.08	46.3
	DRY DENSITY LB/CU FT	γd_o	73.67	74.07	72.35	
	SATURATION, %	S_o	97.34	98.01	96.45	
	VOID RATIO	e_o	1.263	1.251	1.304	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.4	4.1	8.1	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.161	1.191	1.145	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	5.56	11.69	12.91	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS St (Gr) CH3: lns ars SP; org strks.

LL 65	PL 17	PI 48	G 2.6714	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.-Orleans Parish Lakefront Levees, West of IHNC

BORING NO. 2-ULO | SAMPLE NO. 16-B

DEPTH/ELEV 59.8/ -47.0

LABORATORY NOD | DATE 7June 73

TJW TRIAXIAL COMPRESSION TEST REPORT

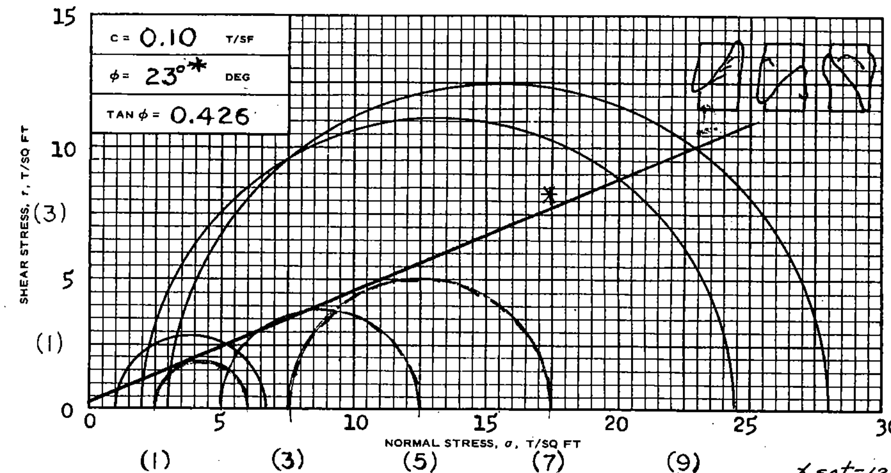
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

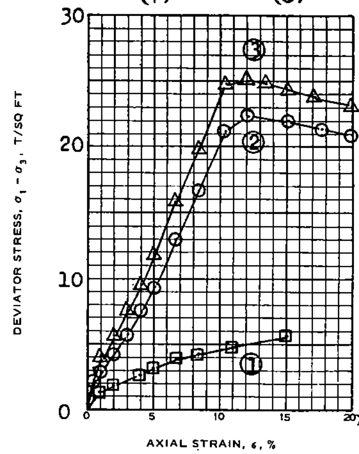
---

c = 0.10 T/SF

ϕ = 23°* DEG

TAN ϕ = 0.426





γ sat = 126

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	23.8	22.4	22.2	22.8
	DRY DENSITY LB/CU FT	γd_o	99.5	101.8	102.2	
	SATURATION, %	S_o	93.6	93.3	93.5	
	VOID RATIO	e_o	0.682	0.643	0.637	
BEFORE SHEAR	WATER CONTENT, %	w_c	22.5	22.0	22.2	
	DRY DENSITY LB/CU FT	γd_c	100.7	103.5	104.3	
	SATURATION, %	S_c	91.2*	95.6*	98.6	
	VOID RATIO	e_c	0.662	0.617	0.604	
	FINAL BACK PRESSURE, T/SQ FT	u_o	5.76	5.76	5.76	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	5.66	22.36	24.99	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	119	77	77	
* $(\sigma_1 - \sigma_3)$ AT MAX PORE PRESSURE			1.4	3.0	4.0	
INITIAL DIAMETER, IN.		D_o	1.40	1.41	1.41	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SAND (SP), gray; few 1/8" CLAY(CL) lenses

LL -	PL -	PI -	Gs 2.68	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST R

REMARKS: See attached plot for effective values.
*Pore Pressure response indicated 100% saturation. Portion of sample allowed to drain before trimming

Sheet 1 of 2

PROJECT LK. PONT., LA.& VIC-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC, GDM#2, SUPP. #5

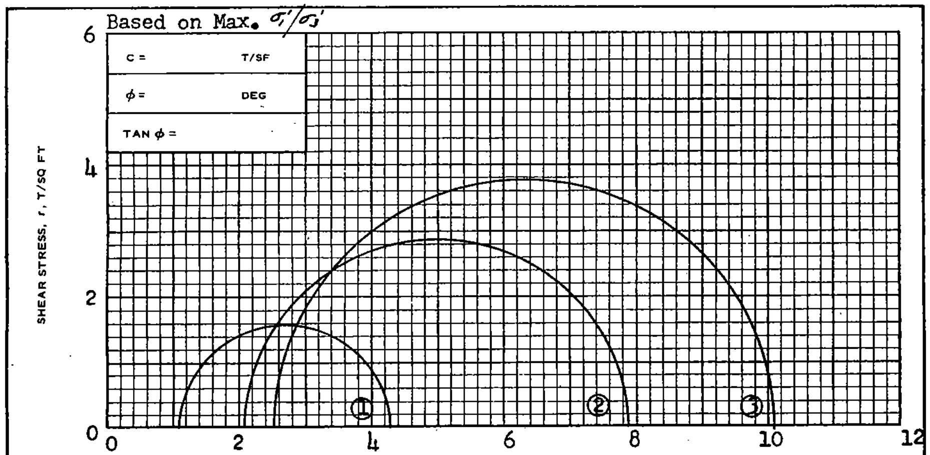
BORING NO. 2-ULO | SAMPLE NO. 11-A

ELEV -26.7

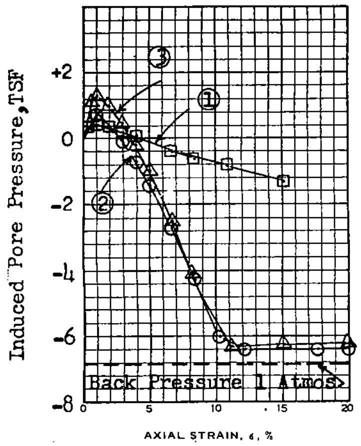
LABORATORY USAEWES | DATE 16 Jan., 1973

PJR TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)



γsat = 126



SPECIMEN NO.					
INITIAL: WATER CONTENT, %	w_o				
INITIAL: DRY DENSITY LB/CU FT	γ_{d_o}				
INITIAL: SATURATION, %	S_o				
INITIAL: VOID RATIO	e_o				
BEFORE SHEAR: WATER CONTENT, %	w_c				
BEFORE SHEAR: DRY DENSITY LB/CU FT	γ_{d_c}				
BEFORE SHEAR: SATURATION, %	S_c				
BEFORE SHEAR: VOID RATIO	e_c				
BEFORE SHEAR: FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3				
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.-ORLEANS PARISH LK FRONT LEVEES, WEST OF IHNC,GDM #2,SUPP. #5

BORING NO. 2-ULO SAMPLE NO. 11-A

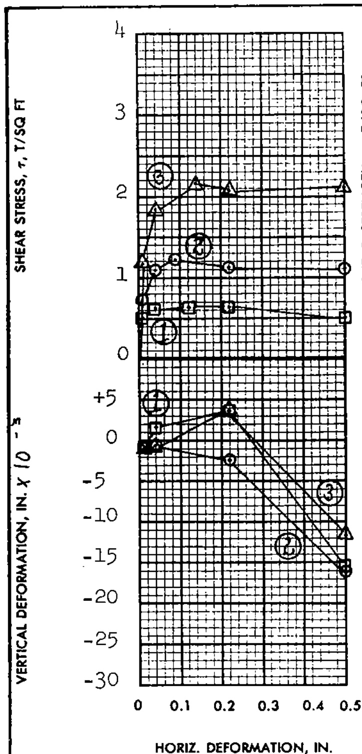
~~DEPTH~~ELEV -26.7

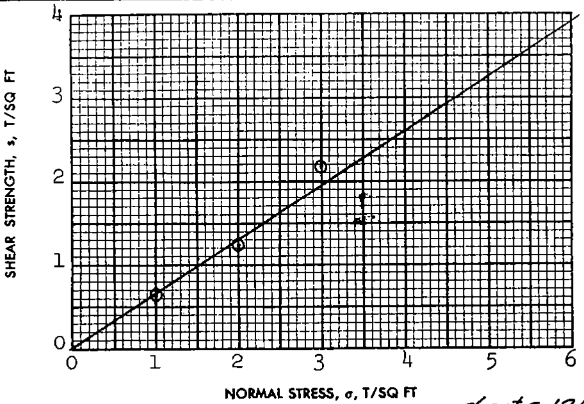
LABORATORY USAEWES DATE 16 Jan.,1973

Sheet 2 of 2

PJR TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





γsat = 120

SHEAR STRENGTH PARAMETERS

ϕ' = 33°

TAN ϕ' = 0.65

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.		1	2	3	Avg.
INITIAL: WATER CONTENT	w_o	30.2 %	33.3 %	36.7 %	33.4 %
INITIAL: VOID RATIO	e_o	0.807	0.845	0.894	
INITIAL: SATURATION	S_o	99.5%	100+ %	100+ %	%
INITIAL: DRY DENSITY, LB/CU FT	γ_d	91.9	90.0	87.7	
VOID RATIO AFTER CONSOLIDATION	e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN	t_{50}				
FINAL: WATER CONTENT	w_f	25.8 %	27.0 %	28.6 %	%
FINAL: VOID RATIO	e_f				
FINAL: SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT	σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT	τ_{max}	0.65	1.22	2.18	
ACTUAL TIME TO FAILURE, MIN	t_f	780	630	900	
RATE OF STRAIN, IN./MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT	τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.563 IN. THICK

CLASSIFICATION SAND(SP),gray;trace of clay(CH) and shell fragments

LL – PL – PI – G 2.66

REMARKS

PROJECT LK.PONT.,LA.&VIC.,-ORLEANS PARISH LK.FR. LEVEES, WEST OF IHNC, GDM NO.2, SUPP. NO.5.

AREA

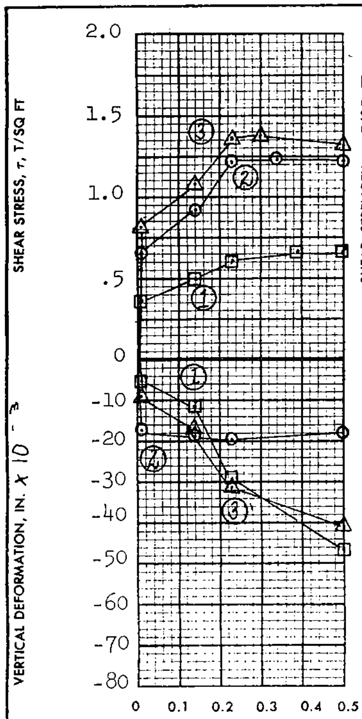
BORING NO. 2-ULO SAMPLE NO. 13-C

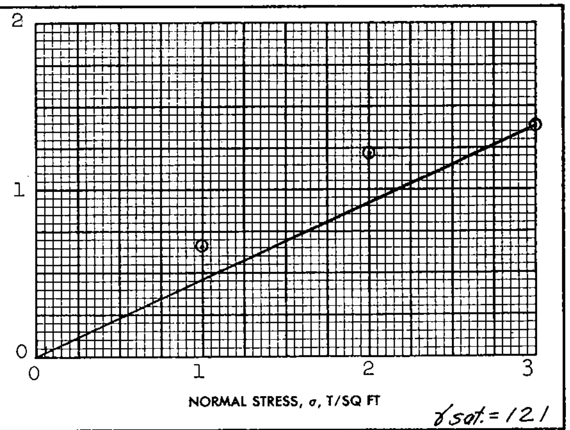
~~DEPTH~~ EL -36.4 DATE 28 Sept. 1972

BWG

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945





$\gamma sat. = 121$

SHEAR STRENGTH PARAMETERS

ϕ' = 25°

TAN ϕ' = 0.46

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

			1	2	3	Avg.
TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	29.7 %	30.4%	29.8%	30.0 %
	VOID RATIO	e_o	0.812	0.840	0.789	
	SATURATION	S_o	98.8%	97.7%	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	93.0	91.6	94.2	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	< 1	< 1	< 1	
FINAL	WATER CONTENT	w_f	27.2 %	25.6%	24.3 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.66	1.23	1.38	
ACTUAL TIME TO FAILURE, MIN		t_f	2160	1920	1680	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.538 IN. THICK

CLASSIFICATION ~~LEAN CLAY (CL)~~ CLAY CH, gray; pockets of fine sand and scattered shell *

LL 32 PL 14 PI 18 G_s 2.70

REMARKS *fragments

PROJECT LK. PONT. LA. & VIC. -ORLEANS PARISH LK. FR. LEVEES, GDM NO.2, SUPP. NO.5

AREA

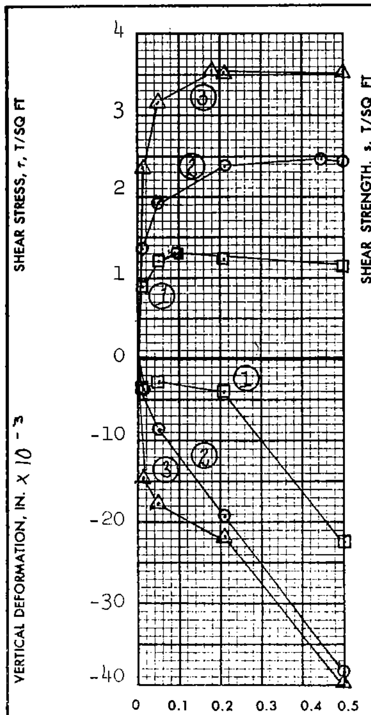
BORING NO. 2-ULO SAMPLE NO. 16-D

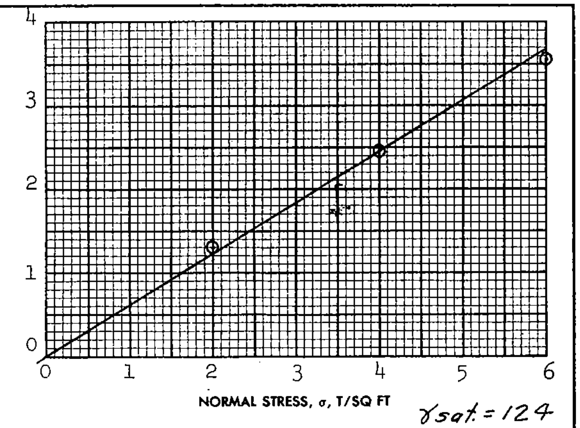
EL -49.0 DATE 3 October 1972

RCH

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3





$\gamma sat. = 124$

SHEAR STRENGTH PARAMETERS

ϕ' = 32°

TAN ϕ' = 0.615

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

			1	2	3	Avg.
TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	23.6 %	23.2 %	23.5%	23.4 %
	VOID RATIO	e_o	0.702	0.680	0.681	
	SATURATION	S_o	89.1 %	90.4%	91.4%	%
	DRY DENSITY, LB/CU FT	γ_d	97.2	98.5	98.4	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	25.4%	24.3%	23.3%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.30	2.46	3.55	
ACTUAL TIME TO FAILURE, MIN		t_f	630	2730	1140	
RATE OF STRAIN, IN./MIN			.00017	.00017	.00017	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.563 IN. THICK

CLASSIFICATION SAND(SP), light gray

LL _ PL _ PI _ G_s 2.65

REMARKS

PROJECT LK. PONT. LA. & VIC., -ORLEANS PARISH LAKE FR. LEVEES, WEST OF IHNC, GDM NO.2, SUPP. NO.5

AREA

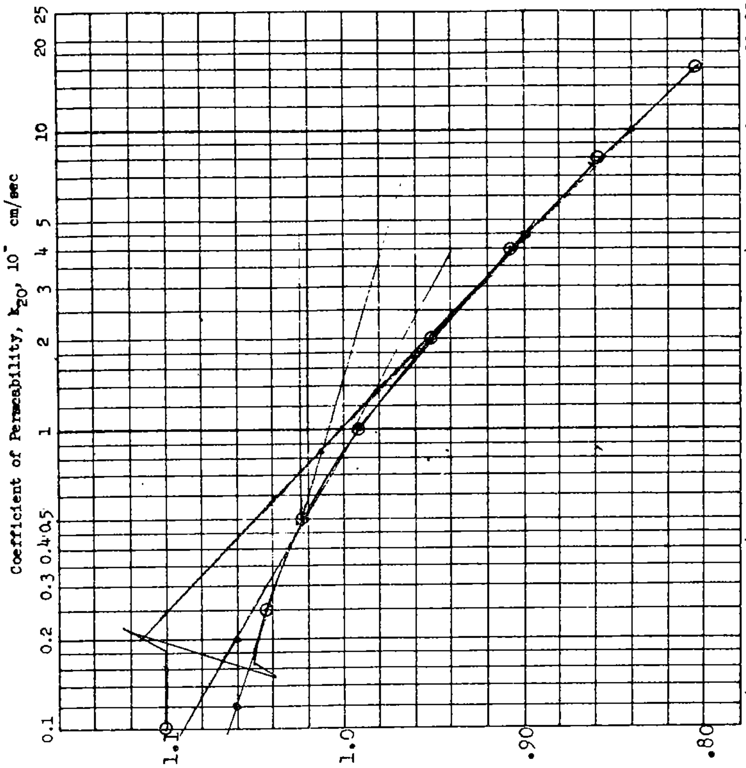
BORING NO. 2-ULO SAMPLE NO. 19-B

EL -59.2 DATE 2 October 1972

BWG

DIRECT SHEAR TEST REPORT

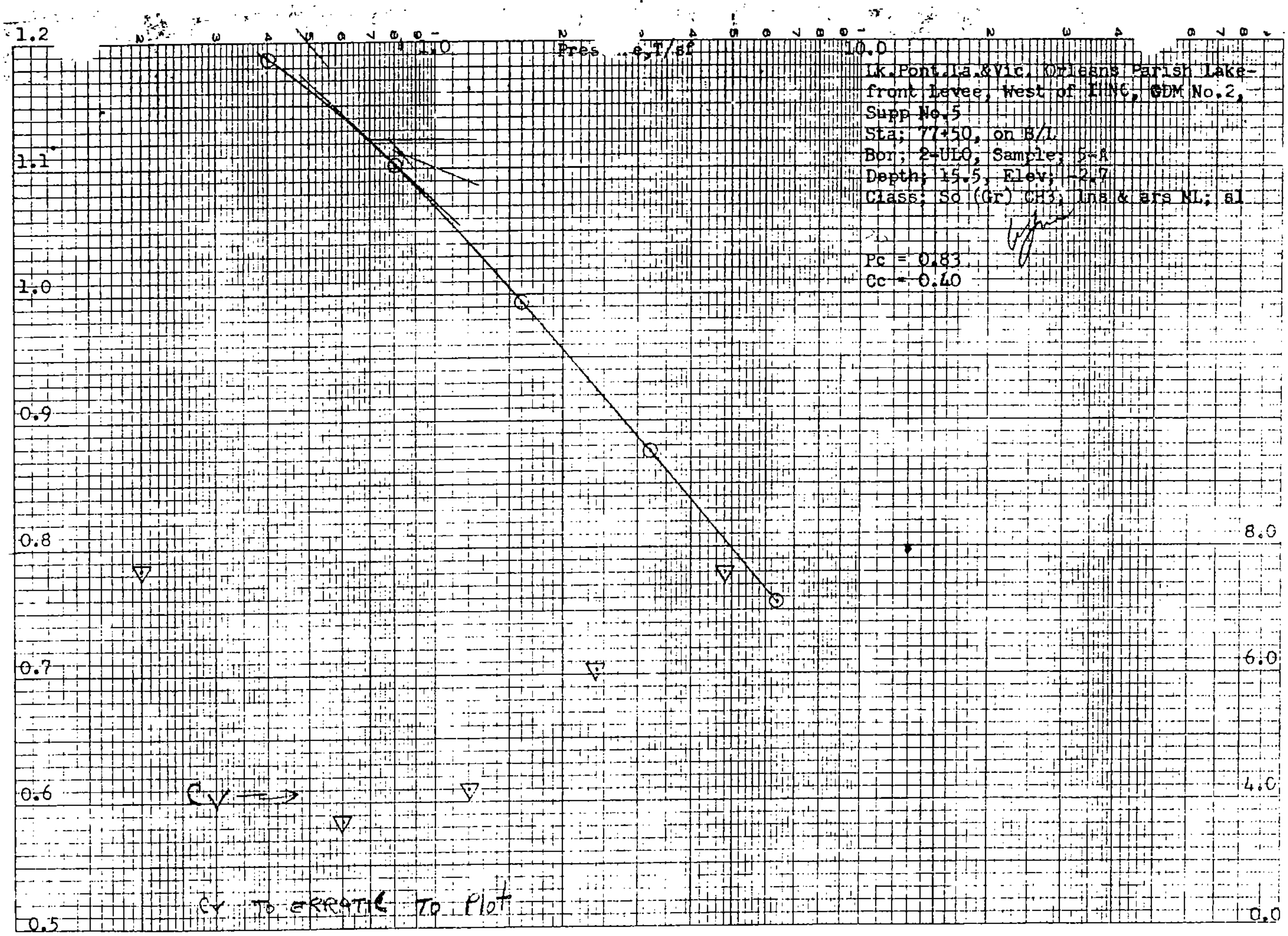
ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3

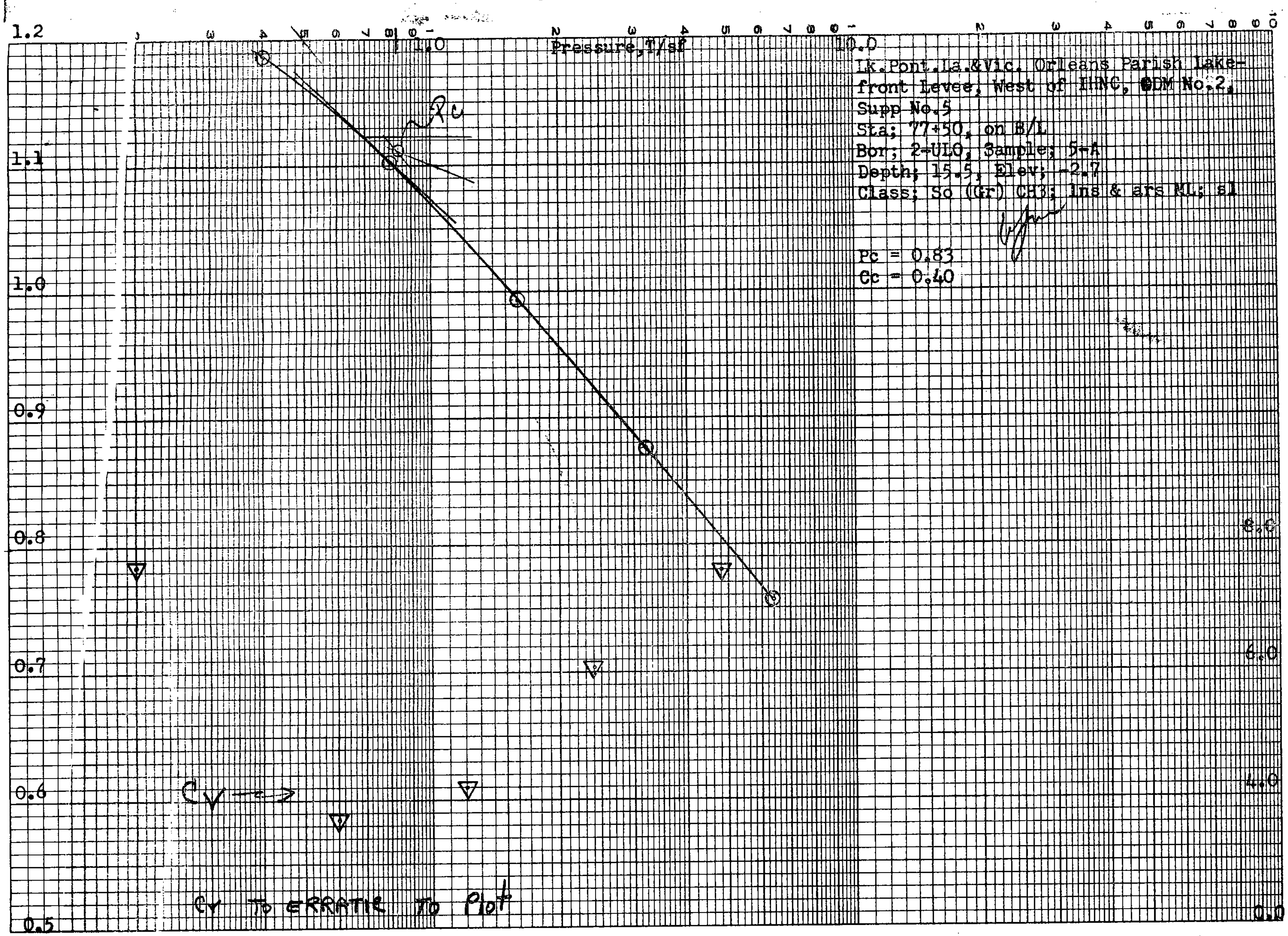


Type of Specimen UNDISTURBED		Before Test	After Test
Diam 4.25 in.	Ht 1.150 in.	Water Content, w_o 40.9 %	w_f %
Overburden Pressure, Po T/sq ft		Void Ratio, e_o 1.10	e_f
Preconsol. Pressure, Pc 0.85 T/sq ft		Saturation, S_o 99.0 %	S_f %
Compression Index, C_c = 0.186		Dry Density, γ_d 78.9 lb/ft³	
Classification SILT(ML), gray; fine*		k_{20} at e_o = × 10^{-} cm/sec	
LL 36	G_s 2.65	Project LK. PONT., LA.&VIC.-ORLEANS PARISH LK FT. LEVEES, WEST OF IHNC, GDM NO.2, SUPP. NO5	
PL 30	D_{10}	Area	
Remarks *sand and a few small shells		Boring No. 2-ULO	Sample No. 7-A
		Depth El -12.8	Date 27 Nov., 1972

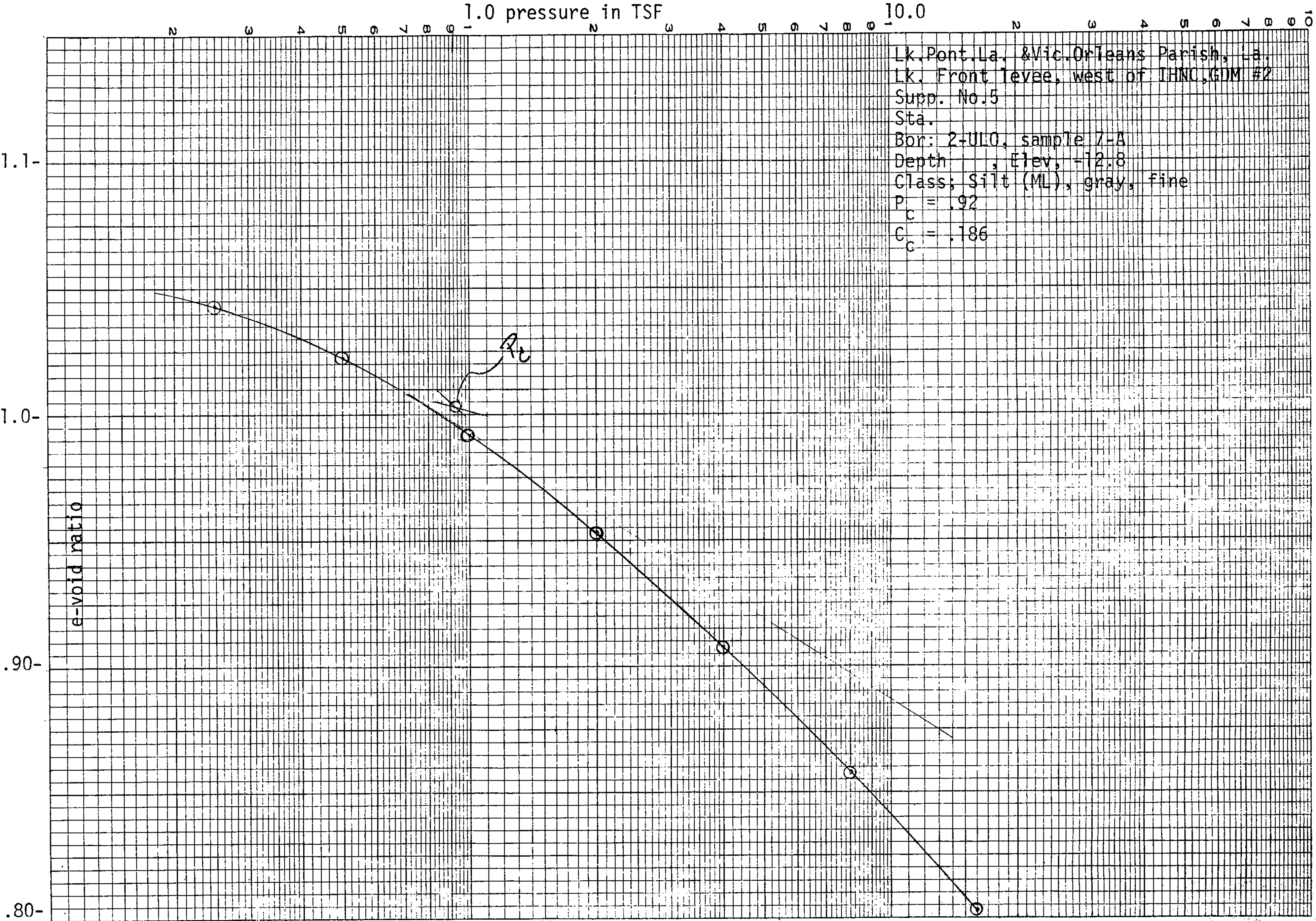
JAL CONSOLIDATION TEST REPORT

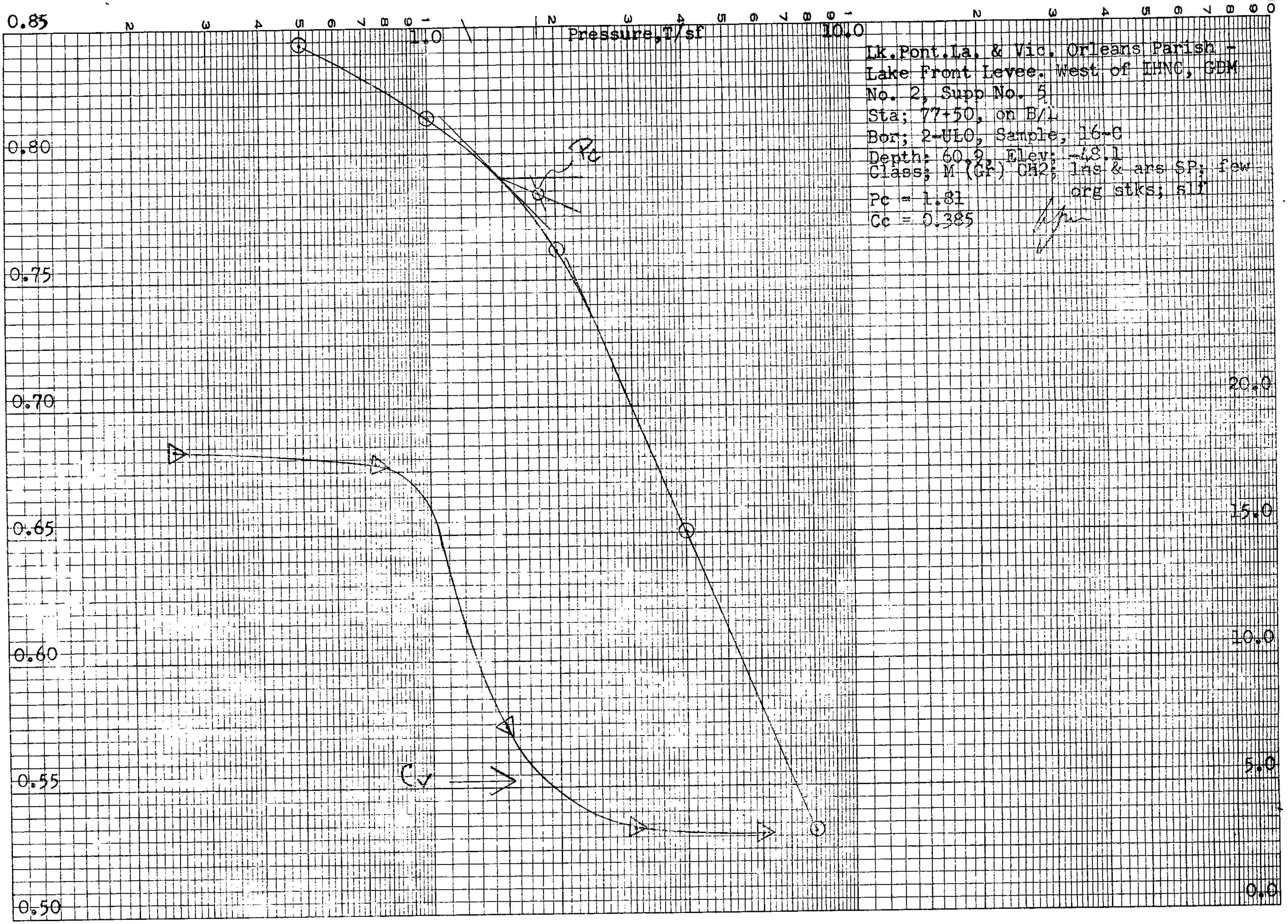
ENG FORM 2090 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)



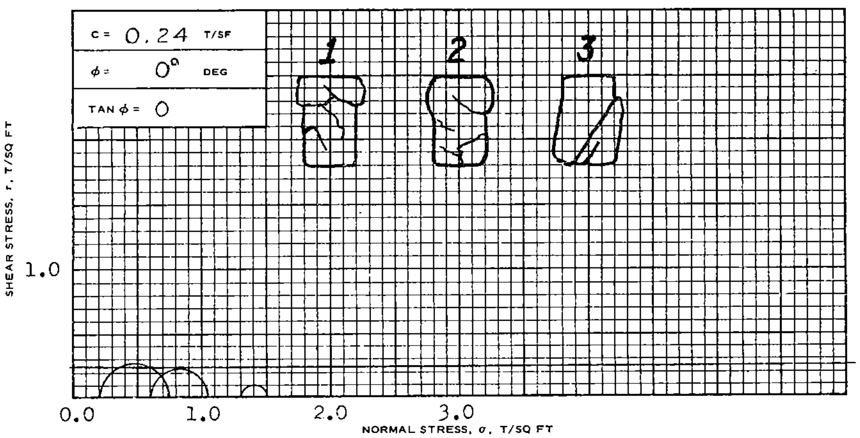

Pressure, T/sf
1.0
10.0
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
8.0
6.0
4.0
0.0
Lk. Pont. La. & Vic. Orleans Parish Lake-
front Levee, West of IHNC, GDM No. 2,
Supp No. 5
Sta; 77+50, on B/L
Bor; 2-ULO, Sample; 5-A
Depth; 15.5, Elev; -2.7
Class; So (Gr) CH3; lns & ars ML; sl
Pc = 0.83
Cc = 0.40
Pc
CV
CV TO ERRATIC TO Plot

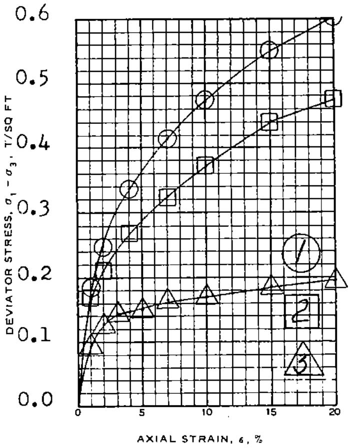
E


1.0 pressure in TSF
10.0
Lk.Pont.La. &Vic.Orleans Parish, La.
Lk. Front levee, west of IHNC,GDM #2
Supp. No.5
Sta.
Bor: 2-ULO, sample 7-A
Depth , Elev. -12.8
Class: Silt (ML), gray, fine
P_c = .92
C_c = .186
Pc
e-void ratio
1.1-
1.0-
.90-
.80-


Lk.Pont.La. & Vic. Orleans Parish -
Lake Front Levee. West of IHNC, GDM
No. 2, Supp No. 5
Sta; 77+50, on B/L
Bor; 2-ULO, Sample, 16-C
Depth; 60.9, Elev; -48.1
Class; M (Gr) CH2; lns & ars SP; few
org stks; slf
Pc = 1.81
Cc = 0.385
Pressure,T/sf
Pc
Cv
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
1.0
10.0
20.0
15.0
10.0
5.0
0.0

4





$\gamma_{sat} = 120$

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	27.15	27.80	37.17	30.7
	DRY DENSITY LB/CU FT	γd_o	94.14	93.28	84.91	
	SATURATION, %	S_o	94.36	94.58	100	
	VOID RATIO	e_o	0.767	0.784	0.960	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.2	0.6	1.3	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.55	0.44	0.19	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	24.88	24.53	24.53	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS VSo (Gr) CL6-S; sl & slf thru-out

LL 45 | PL 15 | PI 31 | Gs 2.6663 | TYPE OF SPECIMEN 5" Undis. | TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic. Orleans Parish
Lakefront Levee- West of IHNC

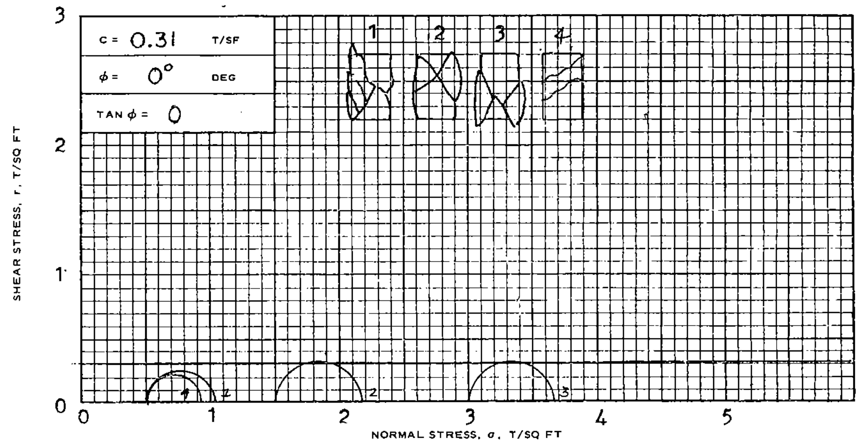
BORING NO. 3-ULO | SAMPLE NO. 2-C

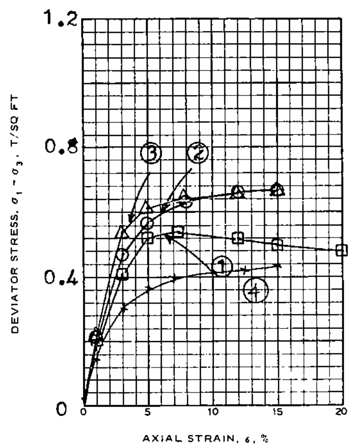
DEPTH/ELEV 5.4 / 0.0

LABORATORY NOD | DATE 11 Dec 72

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





$\gamma_{sat} = 115$

SPECIMEN NO.			1	2	3	4	Avg.
INITIAL	WATER CONTENT, %	w_o	43.4	31.7	31.2	41.7	37.0
	DRY DENSITY LB/CU FT	γd_o	76.8	88.9	90.3	78.3	
	SATURATION, %	S_o	99.0	96.7	98.5	98.5	
	VOID RATIO	e_o	1.17	0.8[illegible]	0.846	1.13	
BEFORE SHEAR	WATER CONTENT, %	w_c					
	DRY DENSITY LB/CU FT	γd_c					
	SATURATION, %	S_c					
	VOID RATIO	e_c					
	FINAL BACK PRESSURE, T/SQ FT	u_o					
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	0.5	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.54	0.67	0.66	0.43	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	16	75	32	35	
ULTIMATE 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	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS LEAN CLAY(CL),gray;few Sandy Silt lenses and few shells up to 1/2" size

LL 35 | PL 18 | PI 17 | Gs 2.67 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS:

PROJECT LK.PONT.,LA,& VIC.-ORLEANS PARISH
LK. FRONT LEVEES,WEST OF IHNC,GDM#2,SUPP#5

BORING NO. 3-ULO | SAMPLE NO. 7-B

~~DEPTH~~/ELEV -19.0

LABORATORY USAEWES | DATE 30 Oct.,1972

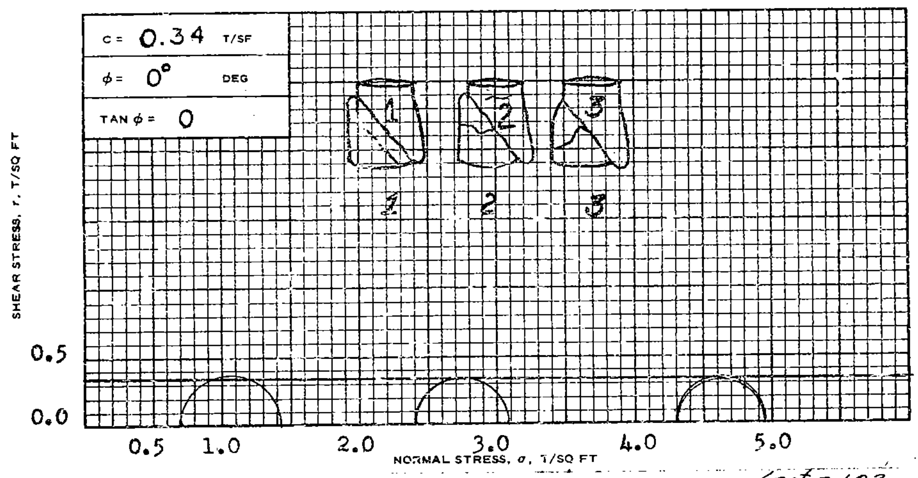
FAM TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

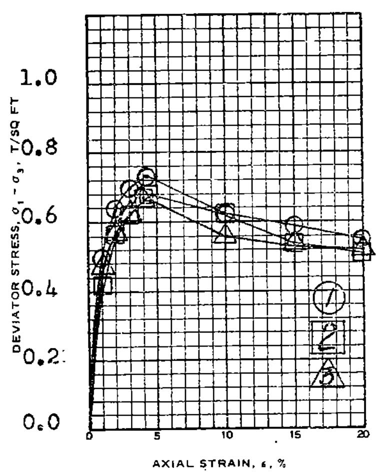
c = 0.34 T/SF

ϕ = 0° DEG

TAN ϕ = 0



γ sat. = 103



SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	59.26	59.42	57.40	58.7
	DRY DENSITY LB/CU FT	γd_o	64.01	64.11	65.56	
	SATURATION, %	S_o	99.14	99.65	99.88	
	VOID RATIO	e_o	1.584	1.581	1.524	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.7	2.4	4.3	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.731	0.675	0.651	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	6.65	16.44	14.81	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS M (Gr) CH4: lns lys & ars Sp; few lyrs ML; sl & slf. org strks.

LL 76	PL 22	PI 54	Gs 2.6512	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.-Orleans Parish Lakefront Levees, West of IHNC

BORING NO. 3-ULO SAMPLE NO. 9-B

DEPTH/ELEV 31.9 / -26.5

LABORATORY NOD DATE 8 June 73

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

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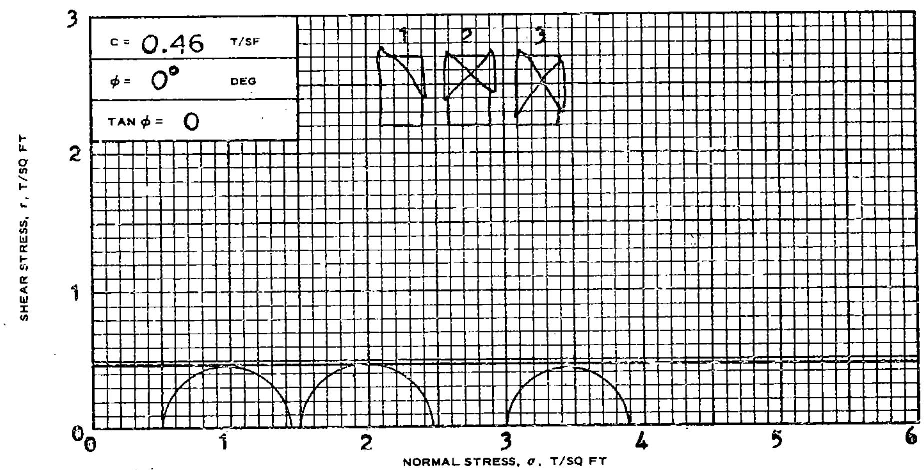
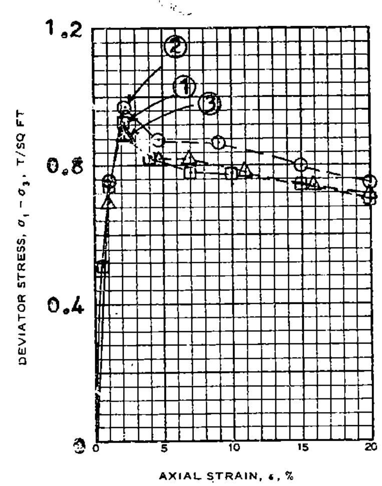
c = 0.46 T/SF

ϕ = 0° DEG

TAN ϕ = 0



γ sat. = 105



SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	55.9	52.4	55.4	54.6
	DRY DENSITY LB/CU FT	γd_o	67.5	69.5	67.2	
	SATURATION, %	S_o	100+	99.3	98.8	
	VOID RATIO	e_o	1.50	1.43	1.52	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.93	0.97	0.89	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	8	26	36	
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	3.06	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;trace of fine sand

LL 72	PL 24	PI 48	Gs 2.71	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS: Rate of Strain Increased

PROJECT LK.PONT.LA. & VIC.-ORLEANS PARISH LK. FRONT LEVEES,WEST OF IHNC, GDM #2, SUPP. #5

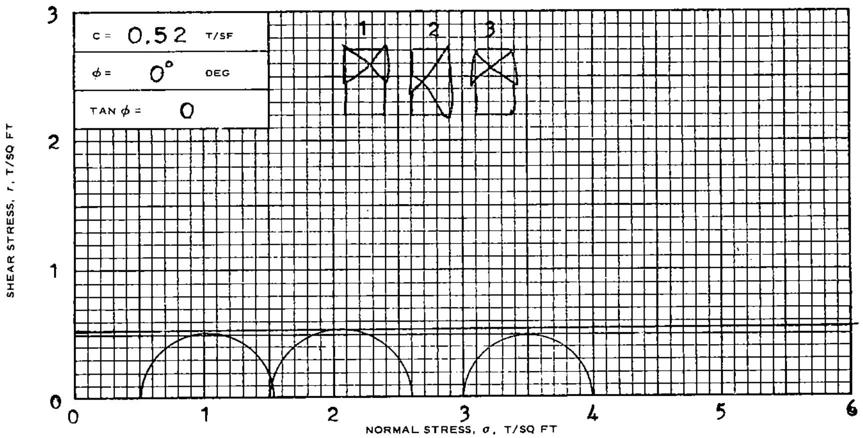
BORING NO. 3-ULO SAMPLE NO. 13-C

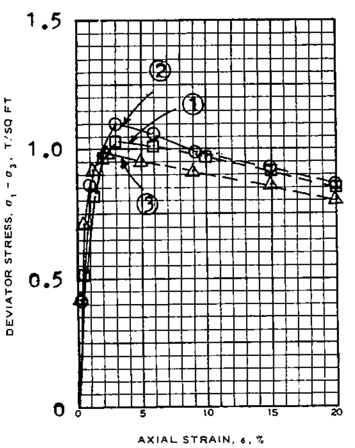
~~DEPTH~~/ELEV -43.5

LABORATORY USAEWES DATE 26 Oct.,1972

GDA TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





γsat = 113

SPECIMEN NO.		1	2	3	Avg.
INITIAL: WATER CONTENT, %	w_o	39.2	38.8	41.5	39.8
INITIAL: DRY DENSITY LB/CU FT	γd_o	81.4	81.7	78.8	
INITIAL: SATURATION, %	S_o	98.4	98.3	97.8	
INITIAL: VOID RATIO	e_o	1.08	1.07	1.15	
BEFORE SHEAR: WATER CONTENT, %	w_c				
BEFORE SHEAR: DRY DENSITY LB/CU FT	γd_c				
BEFORE SHEAR: SATURATION, %	S_c				
BEFORE SHEAR: VOID RATIO	e_c				
BEFORE SHEAR: FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	1.03	1.10	0.99	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	18	20	20	
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;1/16 silty sand seams

LL 56 | PL 18 | PI 38 | G_s 2.71 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: - - - Rate of strain increased

PROJECT LK.PONT.,LA.& VIC.-ORLFANS PARISH LK. FRONT LEVEFS,WFST OF IHNC,GDM#2,SUPP. #5

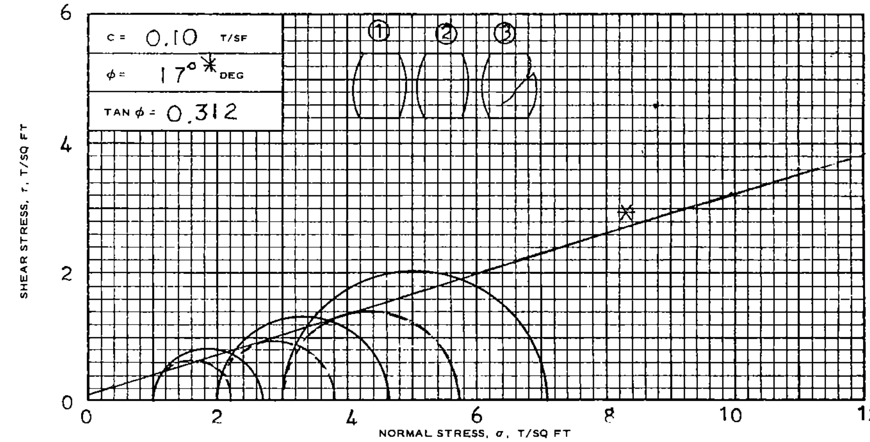
BORING NO. 3-ULO | SAMPLE NO. 14-B

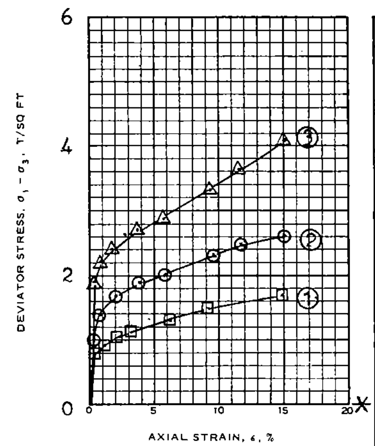
~~DEPTH~~/ELEV -46.9

LABORATORY USAEWES | DATE 27 Oct.,1972

GDA TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110–2–1906)





γsat = 111

SPECIMEN NO.		1	2	3	Avg.
INITIAL: WATER CONTENT, %	w_o	48.0	46.8	42.2	45.7
INITIAL: DRY DENSITY LB/CU FT	γd_o	74.6	75.3	79.3	
INITIAL: SATURATION, %	S_o	100+	100+	100+	
INITIAL: VOID RATIO	e_o	1.21	1.19	1.08	
BEFORE SHEAR: WATER CONTENT, %	w_c	37.9	34.5	34.0	
BEFORE SHEAR: DRY DENSITY LB/CU FT	γd_c	82.2	86.3	86.9	
BEFORE SHEAR: SATURATION, %	S_c	100	100	100	
BEFORE SHEAR: VOID RATIO	e_c	1.00	0.910	0.897	
BEFORE SHEAR: FINAL BACK PRESSURE, T/SQ FT	u_o	3.38	4.82	4.82	
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	1.68	2.63	4.09	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	104	103	104	
* $(\sigma_1 - \sigma_3)$ AT MAX PORE PRESSURE		1.2	1.8	2.7	
INITIAL DIAMETER, IN.	D_o	1.37	1.37	1.38	
INITIAL HEIGHT, IN.	H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SILT(ML),gray

LL 44 | PL 31 | PI 13 | G_s 2.64 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST R

REMARKS: See attached plot for effective values

PROJECT LK. PONT.,LA.& VIC., ORLFANS PARISH LK. FRONT LFVEE,WFST OF IHNC,GDM#2,SUPP.#5

BORING NO. 3-ULO | SAMPLE NO. 5-C

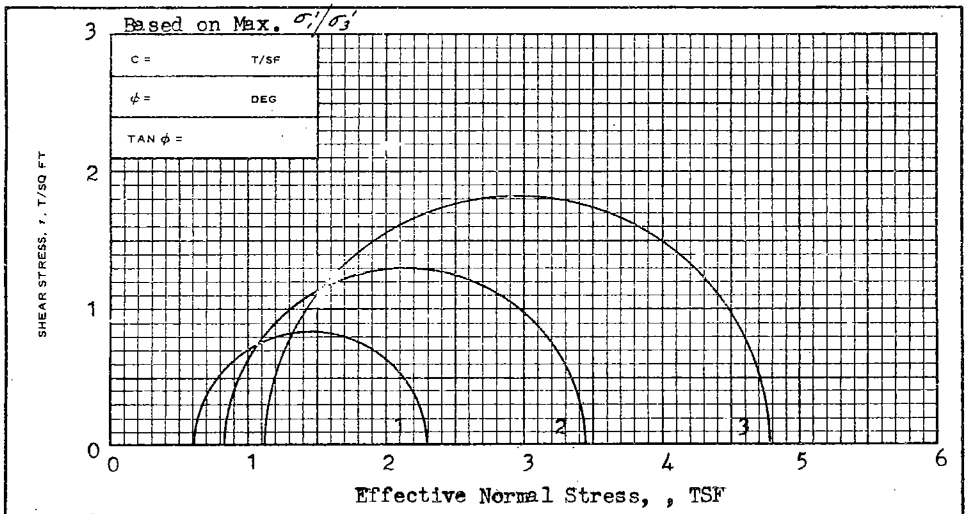
~~DEPTH~~/ELEV -10.5

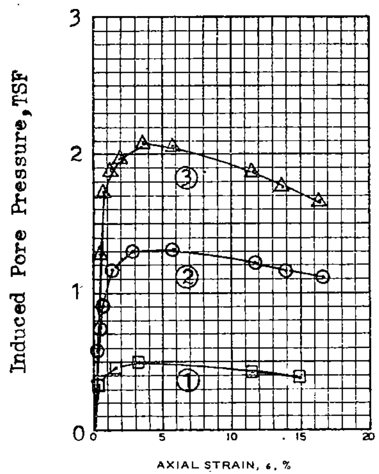
LABORATORY USAEWES | DATE 25 August,1972

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110–2–1906)

Sheet 1 of 2





SPECIMEN NO.						
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3				
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$				
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f				
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o				
INITIAL HEIGHT, IN.		H_o				

CONTROLLED- TEST

DESCRIPTION OF SPECIMENS

LL	PL	PI	Gs	TYPE OF SPECIMEN	TYPE OF TEST R

REMARKS:

PROJECT LK. PONT.,LA. & VIC.,-ORLEANS PARISH LK. FRONT LEVEE,WEST OF IHNC,GDM#2,SUPP.#5

BORING NO. 3-ULO | SAMPLE NO. 5-C

~~DEPTH~~/ELEV -10.5

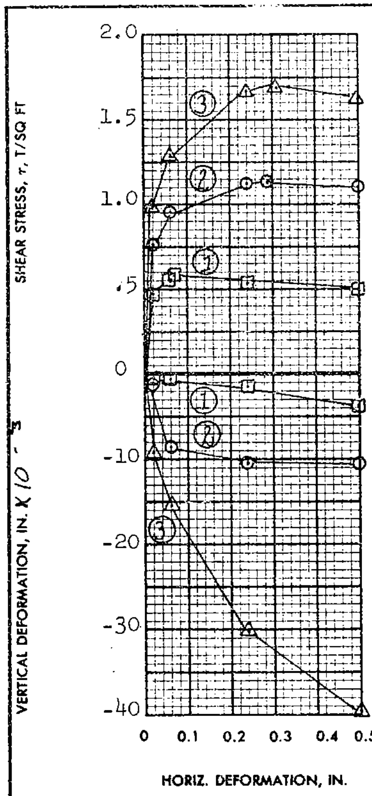
LABORATORY USAFWES | DATE 25 August,1972

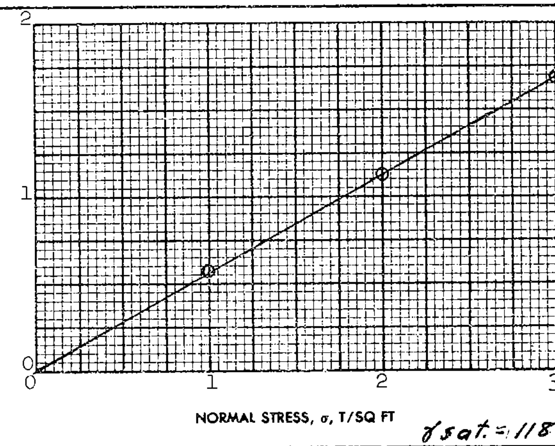
Sheet 2 of 2

TFS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Sheet 2 of 2





γsat.=118

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	31.4%	34.1%	32.9%	32.8%
	VOID RATIO	e_o	0.841	0.904	1.00	
	SATURATION	S_o	100+ %	100+%	88.5%	%
	DRY DENSITY, LB/CU FT	γ_d	91.2	88.2	83.9	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	< 1	< 1	< 1	
FINAL	WATER CONTENT	w_f	26.7%	26.0%	27.7%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.57	1.13	1.69	
ACTUAL TIME TO FAILURE, MIN		t_f	360	1620	1680	
RATE OF STRAIN, IN./MIN			.00019	.00019	.00019	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 30°

TAN ϕ' = 0.57

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED | 3.00 IN. SQUARE | 0.538 IN. THICK

CLASSIFICATION PLASTIC CLAY(CH),gray;numerous pockets of fine sand and a few*

LL 51 | PL 22 | PI 29 | G_s 2.69

REMARKS *shell fragments

PROJECT LK.PONT.LA.&VIC.,-ORLEANS PARISH LK.FRONT LEVEES, WEST OF IHNC NO.2,SUPP. NO.5

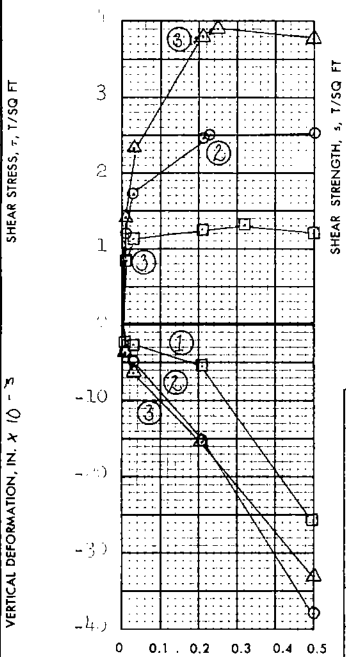
AREA

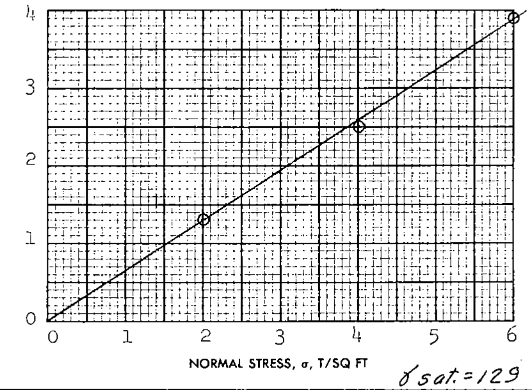
BORING NO. 3-ULO | SAMPLE NO. 9-D

~~DEPTH~~ EL -28.5 | DATE 28 Sept. 1972

RCH DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1968 OF-214-948





$\gamma sat. = 129$

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	23.2 %	23.9%	23.6%	26.6 %
	VOID RATIO	e_o	0.636	0.647	0.628	
	SATURATION	S_o	97.0%	98.2%	100 %	%
	DRY DENSITY, LB/CU FT	γ_d	101.5	100.8	102.0	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	25.3 %	24.6%	23.3%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.30	2.50	3.90	
ACTUAL TIME TO FAILURE, MIN		t_f	1830	1380	1470	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

$\phi' =$ 33°

TAN $\phi' =$ 0.65

$c' =$ 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE — 0.563 IN. THICK

CLASSIFICATION SAND(SP),light gray

LL — PL — PI — G_s 2.66

REMARKS

PROJECT LK.PONT.LA.,&VIC.-ORLEANS PARISH LK.FR. LEVEES, WEST OF IHNC,GDM NO.2,SUPP. NO.5

AREA

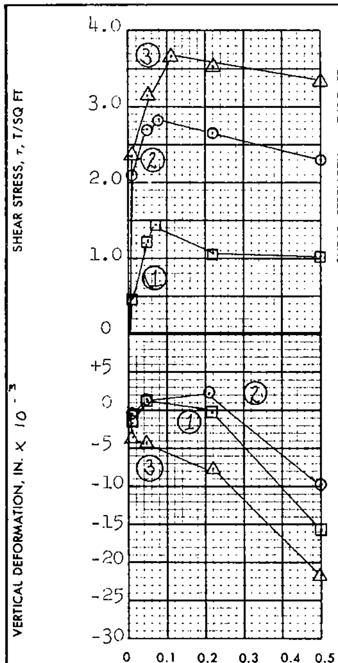
BORING NO. 3-ULO SAMPLE NO. 16-C

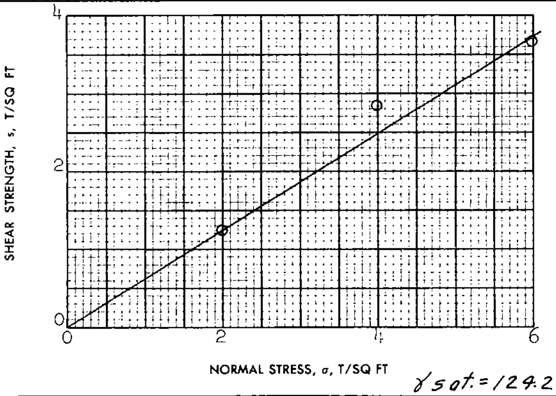
~~DEPTH~~ EL -55.8 DATE 4 October 1972

BWG

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1966 OF—214-945 PLATE IX-3





$\gamma sat. = 124.2$

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	25.1%	24.9%	24.4 %	24.8 %
	VOID RATIO	e_o	0.666	0.684	0.688	
	SATURATION	S_o	100+%	96.8%	94.3 %	%
	DRY DENSITY, LB/CU FT	γ_d	99.7	98.6	98.4	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	21.0%	21.7%	21.2%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.23	2.82	3.67	
ACTUAL TIME TO FAILURE, MIN		t_f	480	540	660	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

$\phi' =$ 32°

TAN $\phi' =$ 0.615

$c' =$ 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE — 0.538 IN. THICK

CLASSIFICATION SAND(SP),gray;trace of shell fragments

LL — PL — PI — G_s 2.66

REMARKS

PROJECT LK.PONT.LA.& VIC.-ORLEANS PARISH LK.FR. LEVEES, WEST OF IHNC, GDM NO.2, SUPP. NO.5

AREA

BORING NO. 3-ULO SAMPLE NO. 19-D

~~DEPTH~~ EL -68.2 DATE 3 October 1972

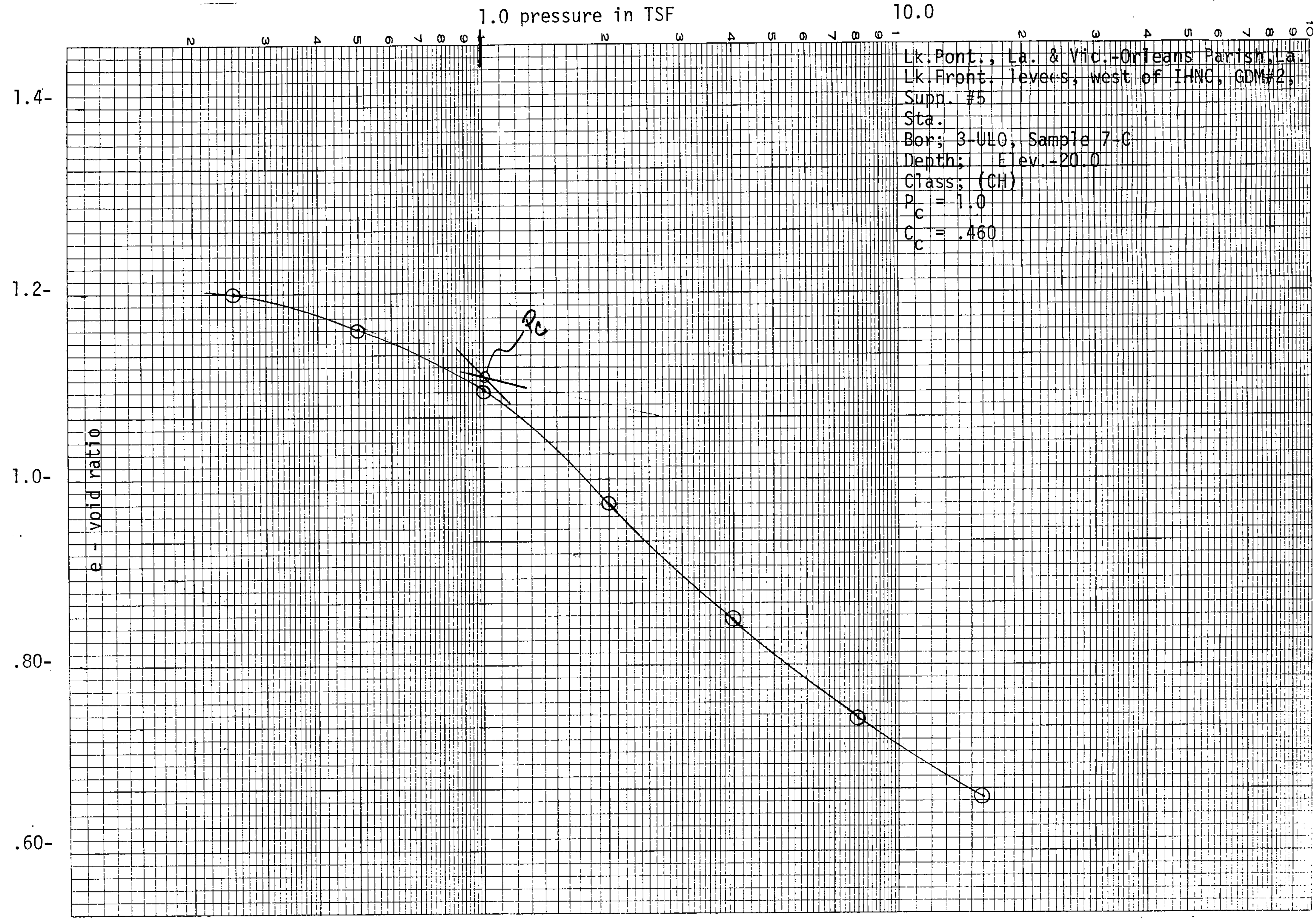
RCH

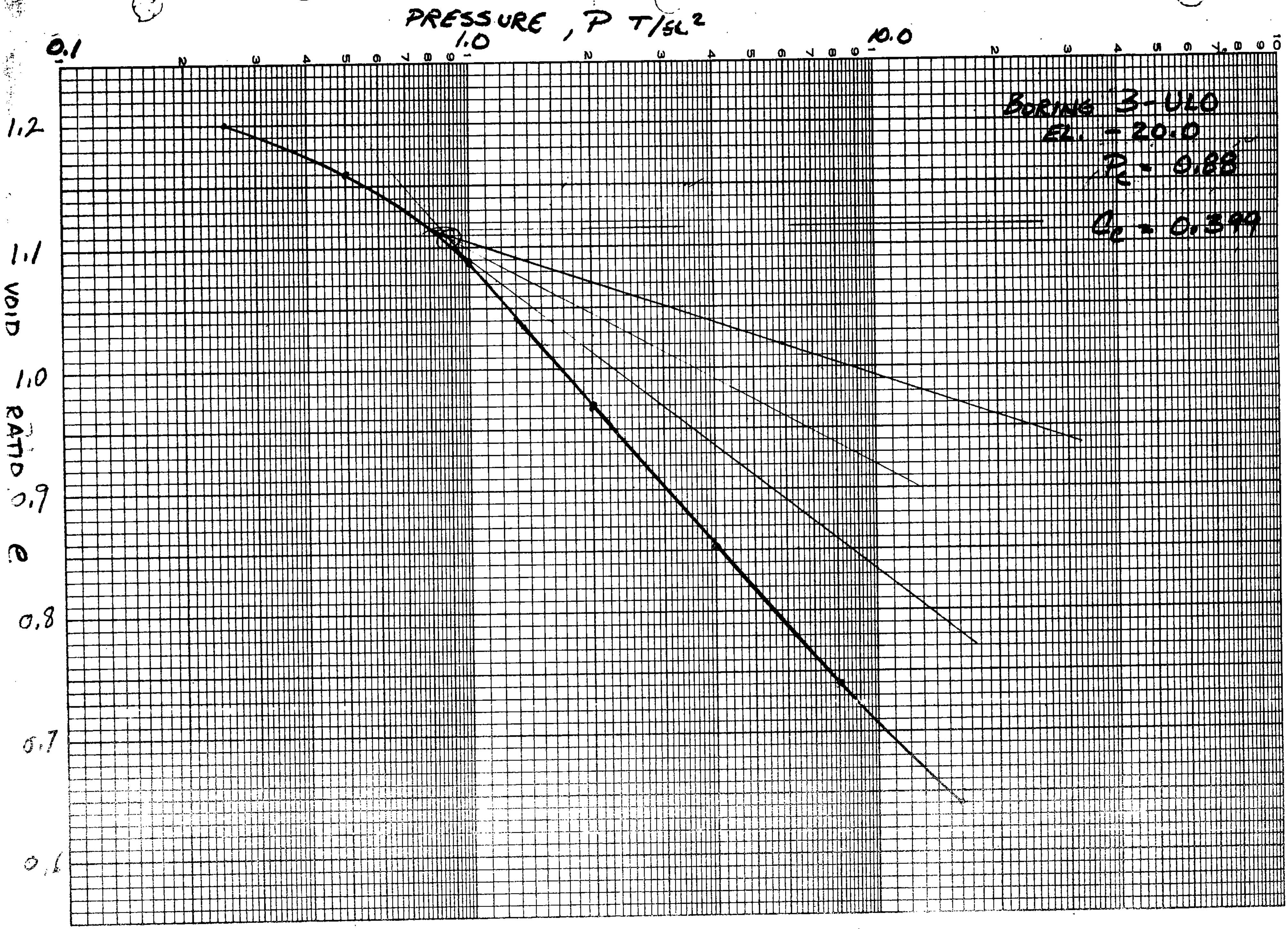
DIRECT SHEAR TEST REPORT

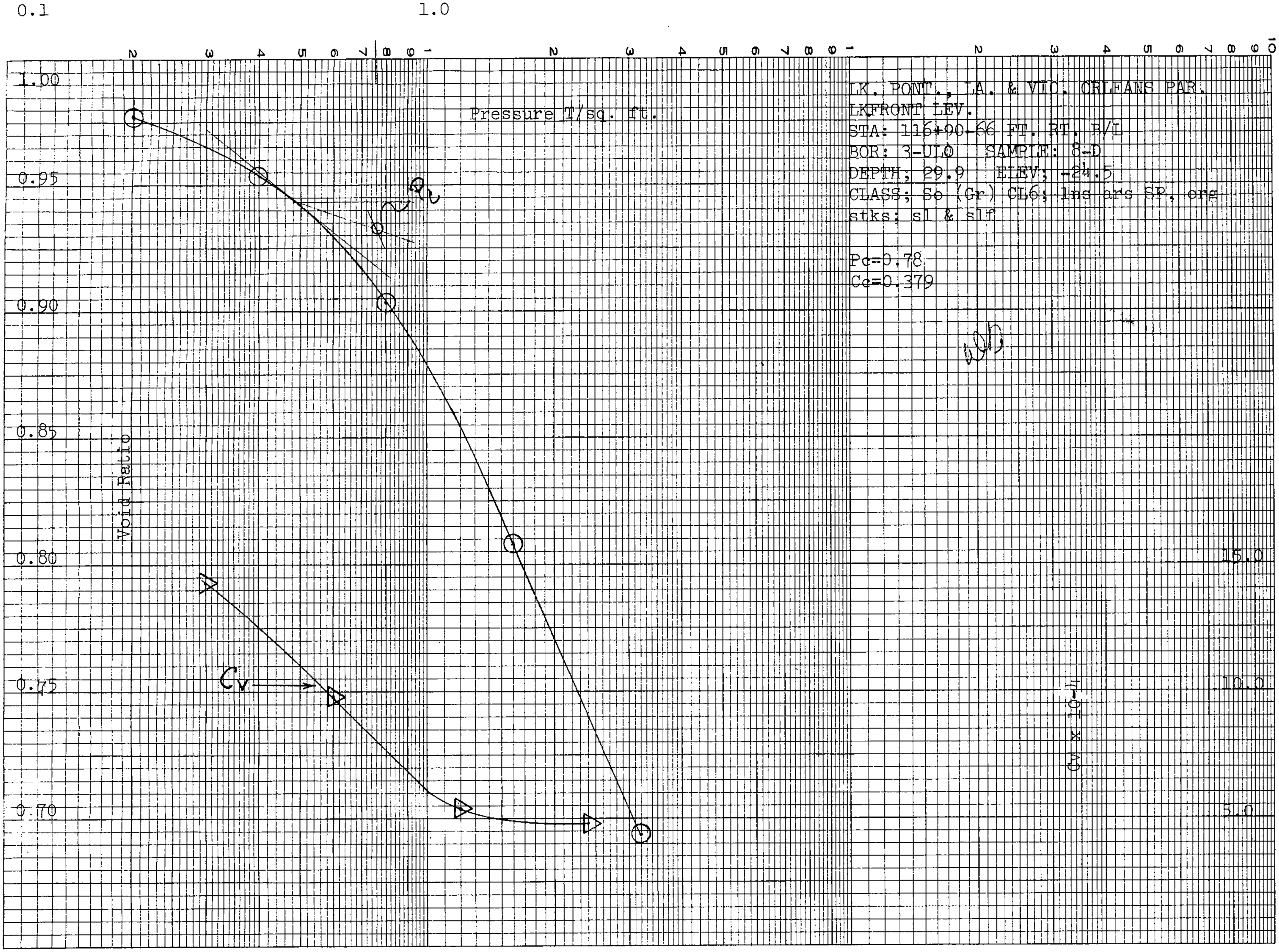
ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1966 OF—214-945 PLATE IX-3

NO. 340-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.



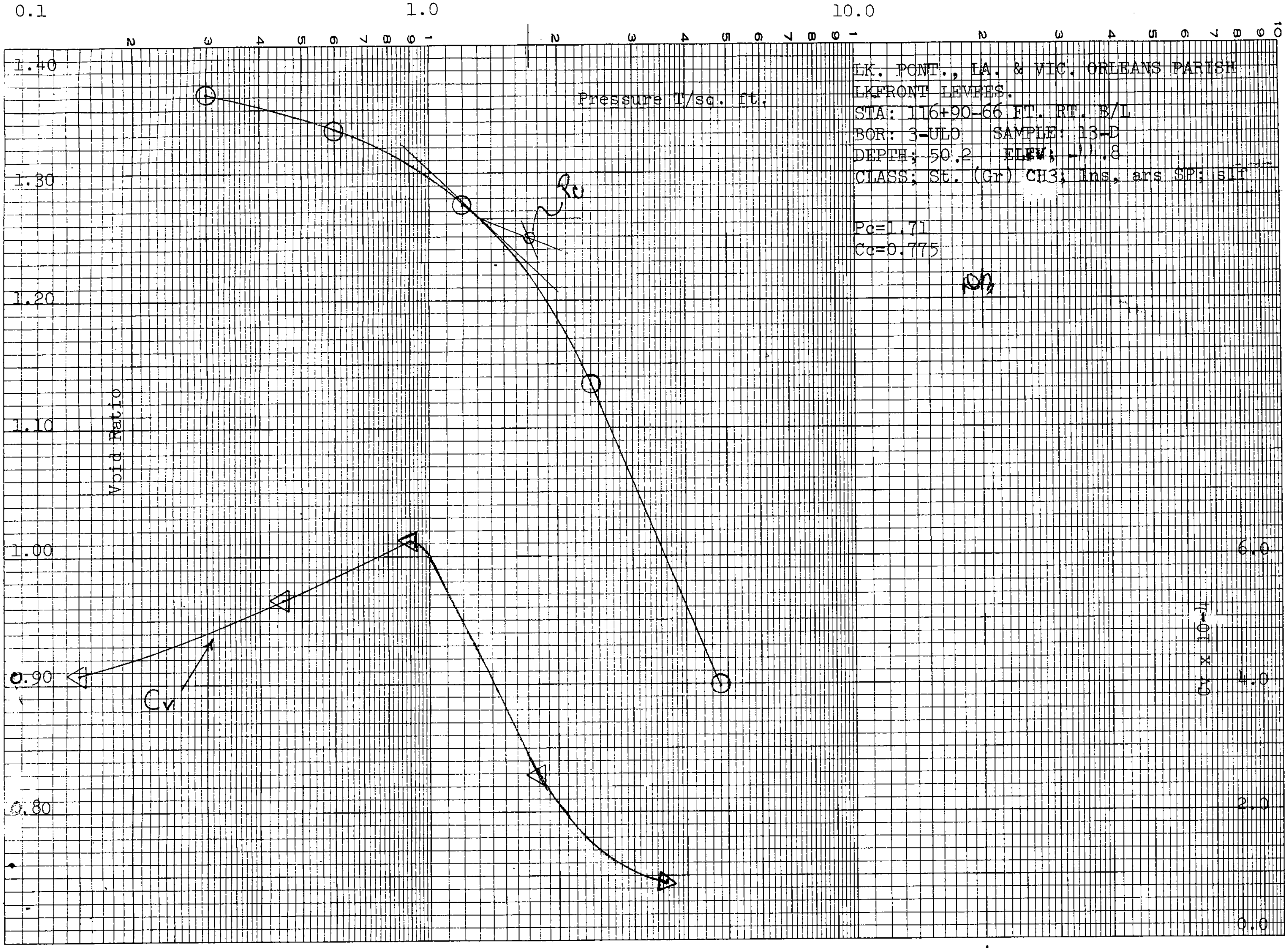

PRESSURE , P T/SL²
0.1
1.0
10.0
BORING 3-ULO
EL. -20.0
Pc = 0.88
Cc = 0.399
1.2
1.1
1.0
0.9
0.8
0.7
0.6
VOID RATIO e


0.1
1.0
Pressure T/sq. ft.
Void Ratio
1.00
0.95
0.90
0.85
0.80
0.75
0.70
15.0
10.0
5.0
Cv x 10-4
Pc
Cv
LK. PONT., LA. & VIC. ORLEANS PAR.
LKFRONT LEV.
STA: 116+90-66 FT. RT. B/L
BOR: 3-ULO SAMPLE: 8-D
DEPTH, 29.9 ELEV; -24.5
CLASS; So (Gr) CL6; lns ars SP, org
stks; sl & slf
Pc=0.78
Ce=0.379

TGW

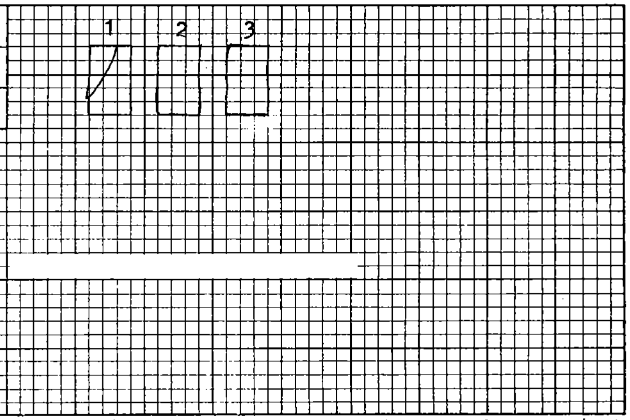
NO. 340-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER-INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.



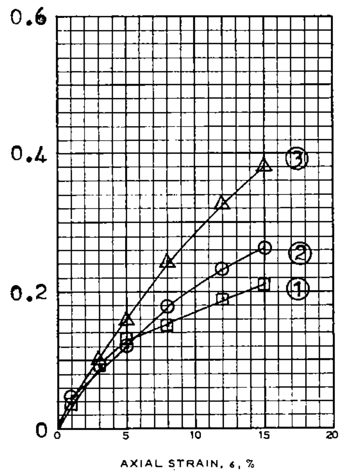
TGW

c = * T/SF
φ = DEG
TAN φ =



* Boring log changed from clay to silt based on this test.

$\gamma_{SAT} = 111$



SPECIMEN NO.		1	2	3	AVG
INITIAL – WATER CONTENT, %	w_o	42.2	39.9	38.1	40.1
INITIAL – DRY DENSITY LB/CU FT	γ_{d_o}	77.1	78.9	81.9	
INITIAL – SATURATION, %	S_o	97.6	96.5	98.4	
INITIAL – VOID RATIO	e_o	1.15	1.10	1.03	
BEFORE SHEAR – WATER CONTENT, %	w_c				
BEFORE SHEAR – DRY DENSITY LB/CU FT	γ_{d_c}				
BEFORE SHEAR – SATURATION, %	S_c				
BEFORE SHEAR – VOID RATIO	e_c				
BEFORE SHEAR – FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	0.21	0.26	0.38	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	33	35	40	
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 CLAYEY SILT(ML),gray;1/4" to 3/4" dia. shells

LL 39	PL 27	PI 12	Gs 2.66	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS: Specimens patched where shells removed. Specimens slumped slightly during trimming. Insufficient material for check test.

PROJECT LK. PONT., LA. & VIC.-ORLEANS PARISH LK FRONT LEVEES, WEST OF IHNC, GDM #2, SUPP. #5

BORING NO. 4-ULO SAMPLE NO. 6-D

~~DEPTH~~/ELEV -16.3

LABORATORY USAEWES DATE 27 Oct., 1972

JMS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

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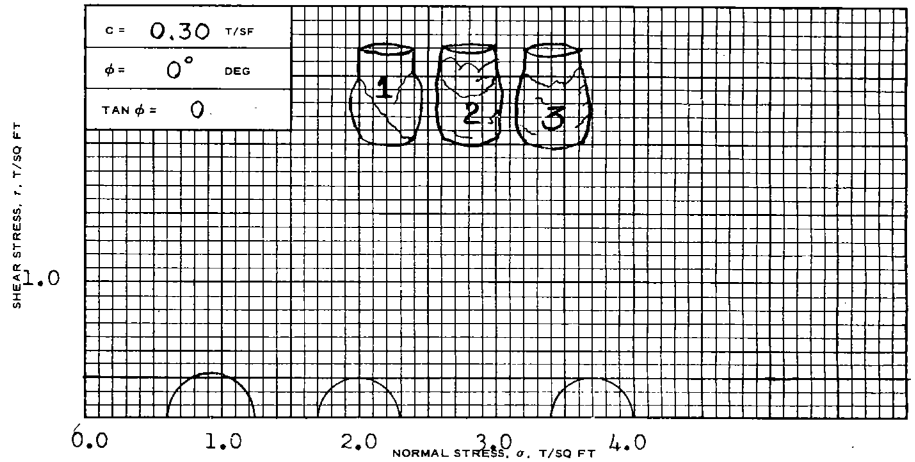
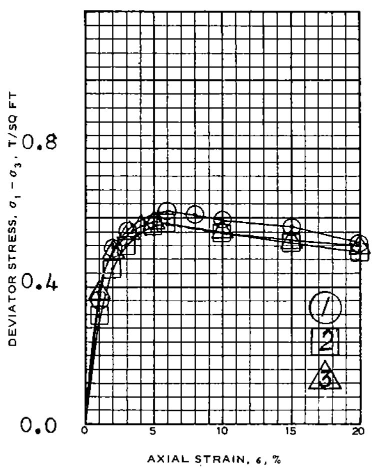
c = 0.30 T/SF
φ = 0° DEG
TAN φ = 0



$\gamma_{sat.} = 104$



SPECIMEN NO.		1	2	3	Avg.
INITIAL – WATER CONTENT, %	w_o	54.29	54.14	56.01	54.8
INITIAL – DRY DENSITY LB/CU FT	γ_{d_o}	67.44	67.70	65.91	
INITIAL – SATURATION, %	S_o	97.84	99.21	98.11	
INITIAL – VOID RATIO	e_o	1.461	1.452	1.518	
BEFORE SHEAR – WATER CONTENT, %	w_c				
BEFORE SHEAR – DRY DENSITY LB/CU FT	γ_{d_c}				
BEFORE SHEAR – SATURATION, %	S_c				
BEFORE SHEAR – VOID RATIO	e_c				
BEFORE SHEAR – FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	0.6	1.7	3.4	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	.63	.59	.59	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	9.42	22.97	19.14	
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.	D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.	H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS M(Gr) CH3; lns lys & ars ML; dw; slf.

LL 68	PL 22	PI 46	Gs 2.6598	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic. Orleans Parish Lakefront Levee - West of IHNC

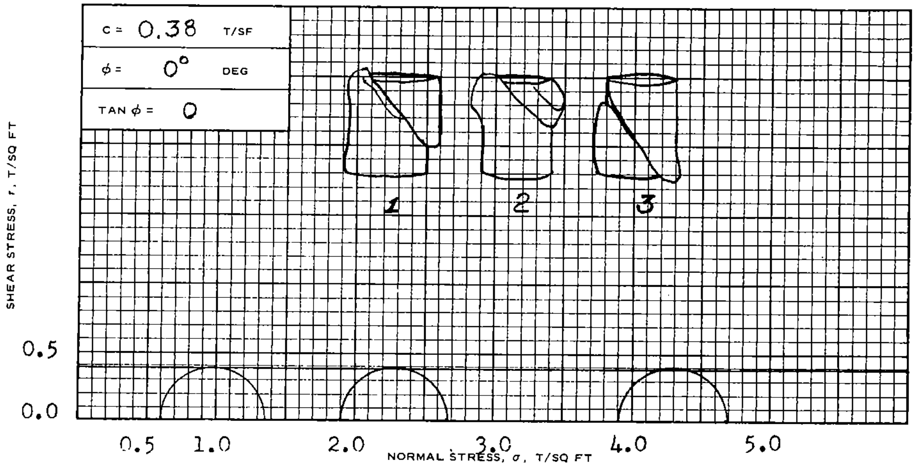
BORING NO. 4-ULO SAMPLE NO. 8-C

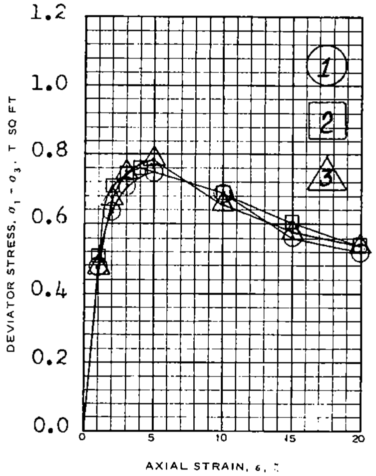
DEPTH/ELEV 29.4 / -23.6

LABORATORY NOD DATE DEC. 11, 1972

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





γsat. = 100

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	68.52	67.78	67.99	68.1
	DRY DENSITY LB/CU FT	γd_o	58.83	59.13	59.23	
	SATURATION, %	S_o	99.25	98.93	99.52	
	VOID RATIO	e_o	1.864	1.850	1.844	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.6	1.9	3.9	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.752	0.760	0.779	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	7.68	14.48	17.86	
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS M (Gr) CH4: lns & thin lys ML; org strks.

LL 93	PL 28	PI 65	Gs 2.7004	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

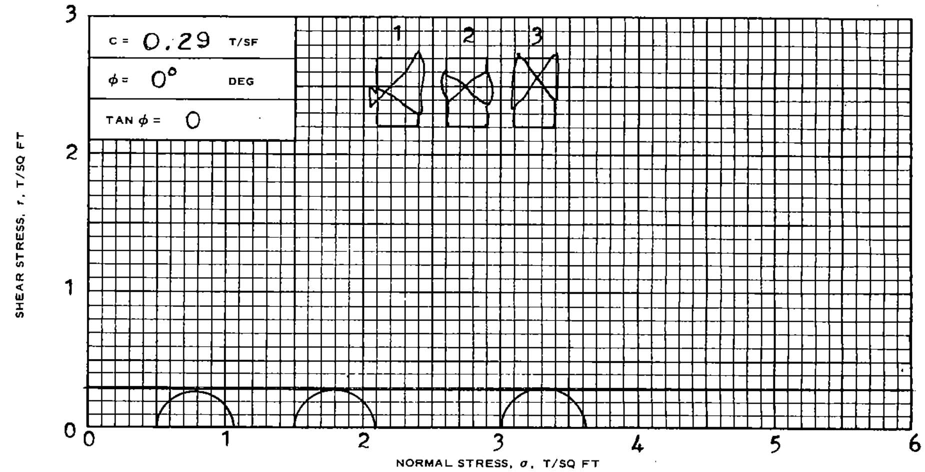
REMARKS:

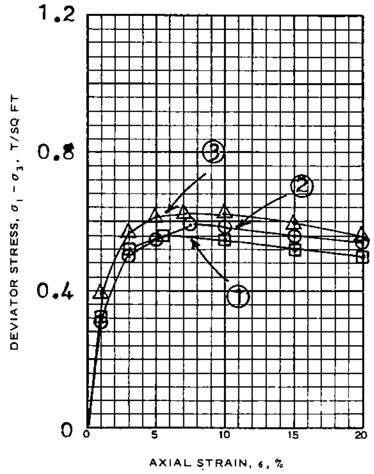
PROJECT Lk. Font. La. & Vic.-Orleans Parish
Lakefront Levees-West of IHNC

BORING NO. 4-ULO	SAMPLE NO. 9-C
DEPTH/ELEV 33.0 / -27.2	
LABORATORY NOD	DATE 11 June 73

RJW. TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





γsat. = 106

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	55.1	50.2	51.8	52.4
	DRY DENSITY LB/CU FT	γd_o	67.0	70.9	69.7	
	SATURATION, %	S_o	98.4	98.9	99.2	
	VOID RATIO	e_o	1.50	1.36	1.40	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.56	0.59	0.62	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	29	26	29	
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;1/16" to 3/8" Silty Sand seams

LL 50	PL 19	PI 31	Gs 2.68	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS:

PROJECT LK.PONT.,LA.& VIC.-ORLEANS PARISH LK
FRONT LEVEES,WEST OF IHNC,GDM #2,SUPP. #5

BORING NO. 4-ULO	SAMPLE NO. 13-B
~~DEPTH~~/ELEV -42.3	
LABORATORY USAEWES	DATE 27 Oct.,1972

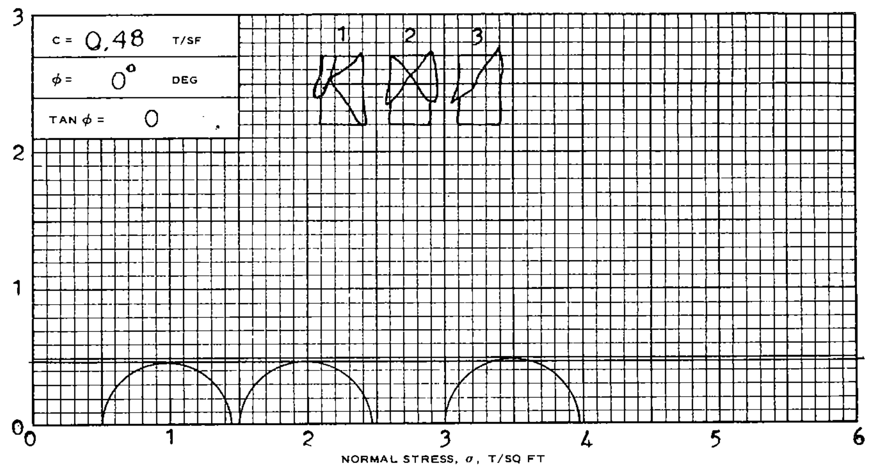
GDA TRIAXIAL COMPRESSION TEST REPORT

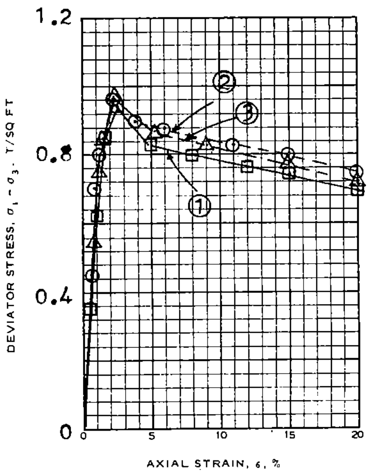
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c = 0.48 T/SF

ϕ = 0° DEG

TAN ϕ = 0





$\gamma sat. = 106$

SPECIMEN NO.		1	2	3	Avg.
INITIAL — WATER CONTENT, %	w_o	51.2	50.7	52.3	51.4
INITIAL — DRY DENSITY LB/CU FT	γd_o	69.9	70.4	69.4	
INITIAL — SATURATION, %	S_o	98.0	98.5	98.7	
INITIAL — VOID RATIO	e_o	1.41	1.39	1.43	
BEFORE SHEAR — WATER CONTENT, %	w_c				
BEFORE SHEAR — DRY DENSITY LB/CU FT	γd_c				
BEFORE SHEAR — SATURATION, %	S_c				
BEFORE SHEAR — VOID RATIO	e_c				
BEFORE SHEAR — FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	0.94	0.96	0.98	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	10	12	14	
ULTIMATE 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	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;1/16" to 1/4" dia. shells

LL 69 | PL 23 | PI 46 | Gs 2.70 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: --- Rate of strain increased

PROJECT LK.PONT.,LA.& VIC-ORLEANS PARISH LAKE FRONT LEVEES,WEST OF IHNC,GDM #2,SUPP. #5

BORING NO. 4-ULO | SAMPLE NO. 14-C

~~DEPTH~~/ELEV -47.5

LABORATORY USAEWES | DATE 30 October,1972

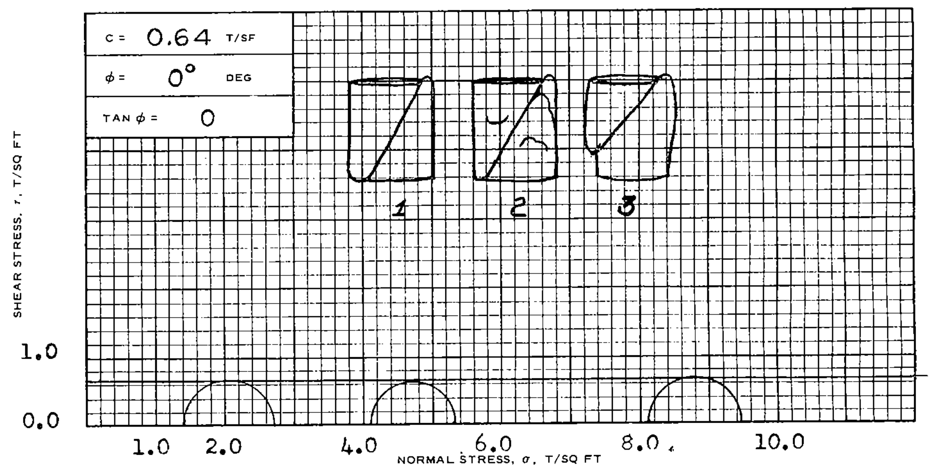
JMS TRIAXIAL COMPRESSION TEST REPORT

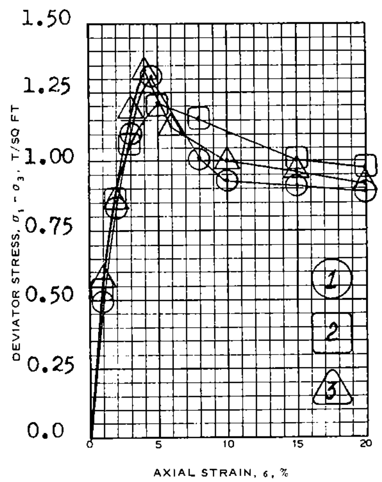
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c = 0.64 T/SF

ϕ = 0° DEG

TAN ϕ = 0





$\gamma sat. = 112$

SPECIMEN NO.		1	2	3	Avg.
INITIAL — WATER CONTENT, %	w_o	39.38	42.91	40.14	40.8
INITIAL — DRY DENSITY LB/CU FT	γd_o	80.52	78.17	80.73	
INITIAL — SATURATION, %	S_o	98.38	100	100	
INITIAL — VOID RATIO	e_o	1.068	1.131	1.063	
BEFORE SHEAR — WATER CONTENT, %	w_c				
BEFORE SHEAR — DRY DENSITY LB/CU FT	γd_c				
BEFORE SHEAR — SATURATION, %	S_c				
BEFORE SHEAR — VOID RATIO	e_c				
BEFORE SHEAR — FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	1.4	4.1	8.1	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	1.310	1.209	1.344	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	7.29	17.94	14.81	
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.	D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.	H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS M (Gr) CH2: lns lys & ars ML.

LL 57 | PL 17 | PI 40 | Gs 2.6689 | TYPE OF SPECIMEN 5" Undis. | TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.-Orleans Parish Lakefront Levees - West of IHNC

BORING NO. 4-ULO | SAMPLE NO. 23-B

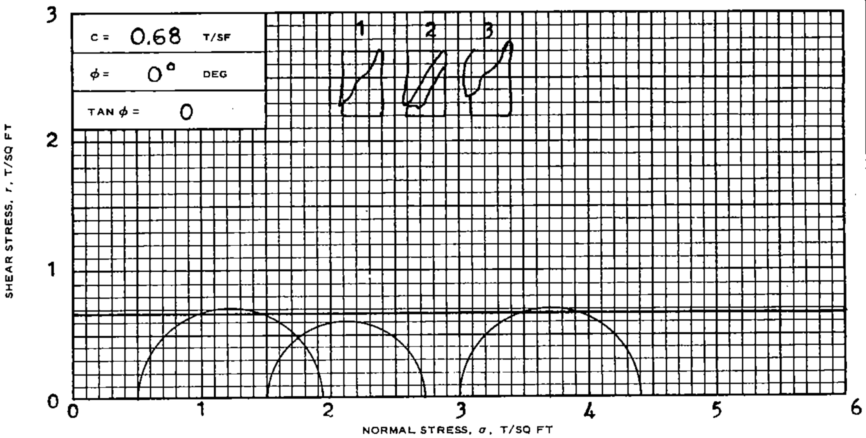
DEPTH/ELEV 88.3 / -82.5

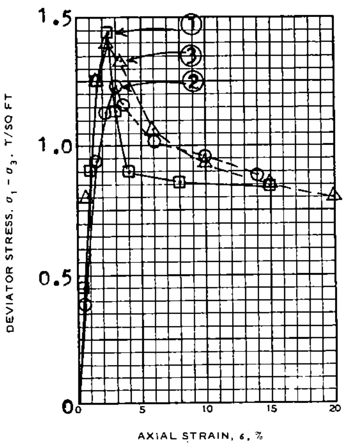
LABORATORY NOD | DATE 12 June 73

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

c = 0.68 T/SF
φ = 0° DEG
TAN φ = 0





γsat = 112

SPECIMEN NO.		1	2	3	Avg.
INITIAL: WATER CONTENT, %	w_o	44.0	42.2	43.7	43.3
DRY DENSITY LB/CU FT	γd_o	77.8	79.2	77.1	
SATURATION, %	S_o	100+	100+	98.6	
VOID RATIO	e_o	1.19	1.15	1.21	
BEFORE SHEAR: WATER CONTENT, %	w_c				
DRY DENSITY LB/CU FT	γd_c				
SATURATION, %	S_c				
VOID RATIO	e_c				
FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	1.44	1.23	1.40	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	•	17	12	
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.	D_o	1.40	1.41	1.40	
INITIAL HEIGHT, IN.	H_o	3.00	3.00	3.00	

CONTROLLED-Strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;silt lenses

LL 62 | PL 23 | PI 39 | Gs 2.73

TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: —— Rate of Strain Increased

PROJECT LK.PONT.,LA.& VIC.-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC,GDM #2,SUPP. #5

BORING NO. 4-ULO | SAMPLE NO. 25-C

~~DEPTH~~/ELEV -91.2

LABORATORY USAEWES | DATE 30 Oct.,1972

JMS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

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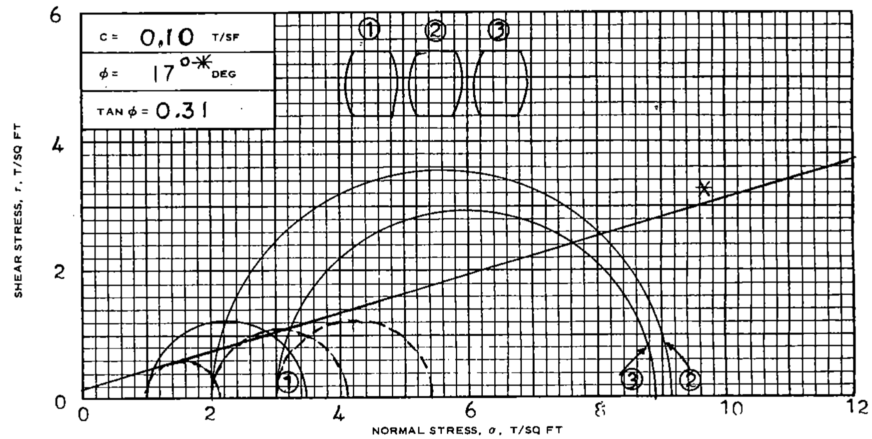
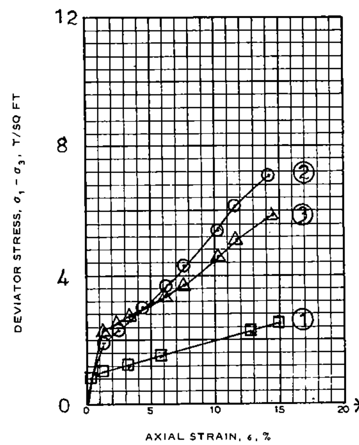
c = 0.10 T/SF
φ = 17°* DEG
TAN φ = 0.31





γsat = 116

SPECIMEN NO.		1	2	3	Avg.
INITIAL: WATER CONTENT, %	w_o	37.9	35.3	36.2	36.5
DRY DENSITY LB/CU FT	γd_o	83.7	86.5	84.6	
SATURATION, %	S_o	100+	100+	99.2	
VOID RATIO	e_o	0.999	0.934	0.978	
BEFORE SHEAR: WATER CONTENT, %	w_c	35.2	33.5	33.5	
DRY DENSITY LB/CU FT	γd_c	85.3	89.8	90.3	
SATURATION, %	S_c	98.2	100+	100+	
VOID RATIO	e_c	0.961	0.863	0.853	
FINAL BACK PRESSURE, T/SQ FT	u_o	3.38	4.10	4.82	
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	2.47	7.12	5.87	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	109	100	101	
* $(\sigma_1 - \sigma_3)$ AT MAX PORE PRESSURE		1.1	2.1	2.4	
INITIAL DIAMETER, IN.	D_o	1.38	1.38	1.38	
INITIAL HEIGHT, IN.	H_o	3.00	3.00	3.00	

CONTROLLED-Strain TEST

DESCRIPTION OF SPECIMENS SILT (ML), gray; numerous small shells

LL — | PL — | PI — | Gs 2.68

TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST 2.68

REMARKS: See attached plot for effective values
Portion of sample allowed to drain before trimming

PROJECT LK.PONT.,LA&VIC.-ORLEANS PARISH LK.FRONT LEVEE,WEST OF IHNC,GDM#2,SUPP.#5

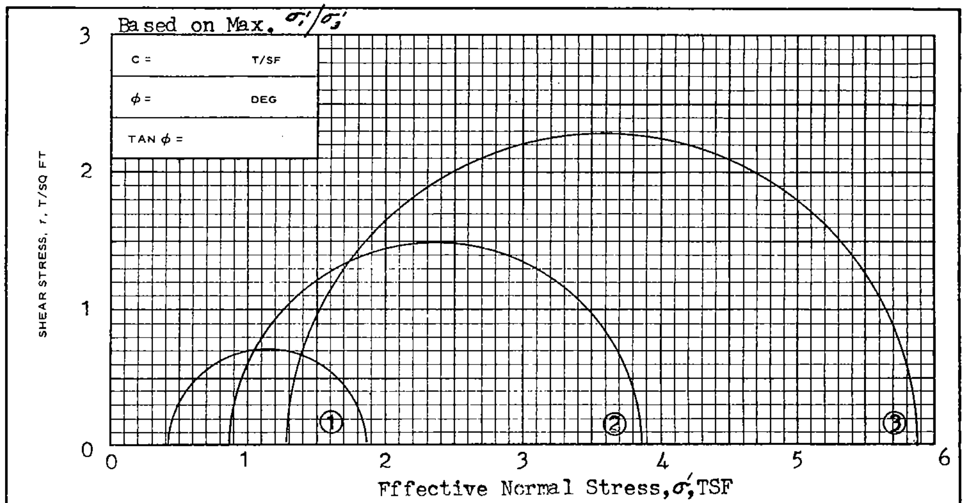
BORING NO. 4-ULO | SAMPLE NO. 6-B2

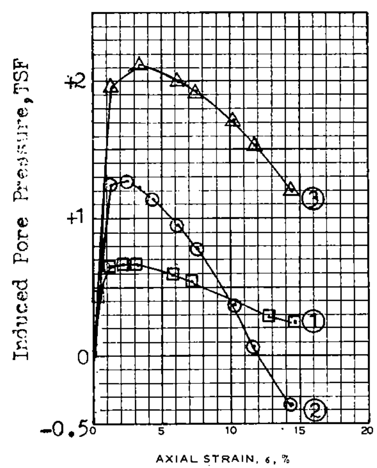
~~DEPTH~~/ELEV -14.5

LABORATORY USAEWES | DATE 25 August,1972

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





SPECIMEN NO.						
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3				
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$				
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f				
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o				
INITIAL HEIGHT, IN.		H_o				

CONTROLLED- TEST

DESCRIPTION OF SPECIMENS

LL	PL	PI	Gs	TYPE OF SPECIMEN	TYPE OF TEST R

REMARKS:

PROJECT LK. PONT., LA. & VIC.-ORLEAN PARISH LK. FRONT LEVEE, WEST OF IHNC, GDM#2, SUPP.#5

BORING NO. 4-ULO SAMPLE NO. 6-B2

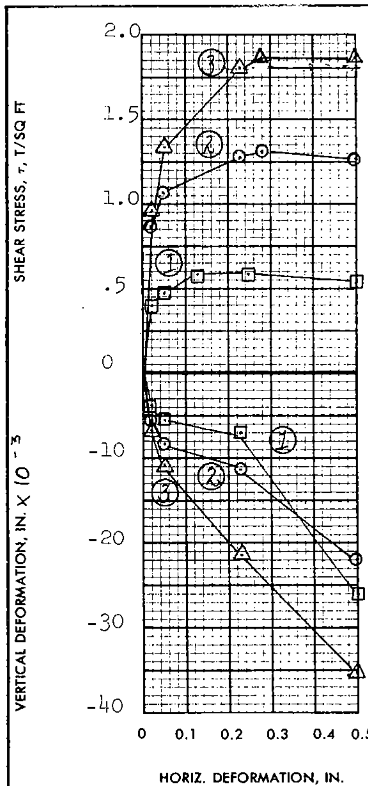
~~DEPTH~~/ELEV -14.5

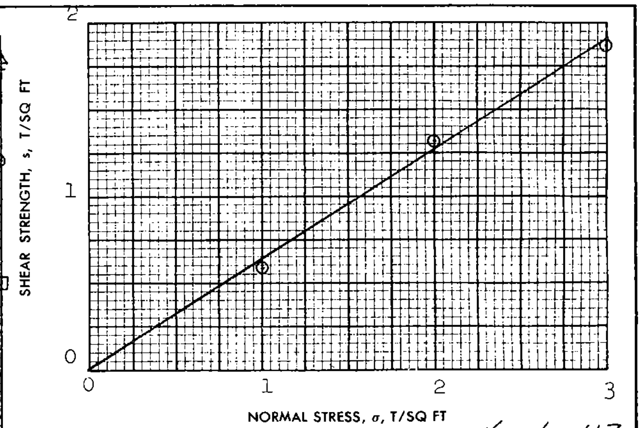
LABORATORY USAEWES DATE 25 August, 1972

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Sheet 2 of 2





$\gamma sat. = 117$

SHEAR STRENGTH PARAMETERS

ϕ' = 32°

TAN ϕ' = 0.63

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	34.4 %	33.2 %	32.8 %	33.5 %
	VOID RATIO	e_o	0.916	0.909	0.914	
	SATURATION	S_o	100+ %	97.5 %	95.8 %	%
	DRY DENSITY, LB/CU FT	γ_d	87.0	87.3	87.1	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	< 1	< 1	< 1	
FINAL	WATER CONTENT	w_f	29.2 %	28.9 %	29.6 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.58	1.31	1.87	
ACTUAL TIME TO FAILURE, MIN		t_f	1440	1590	1590	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.563 IN. THICK

CLASSIFICATION CLAYEY SAND (SC), gray; Clay (CH) lenses

LL —	PL —	PI —		Gs 2.67

REMARKS

PROJECT LK. PONT. LA. & VIC., -ORLEANS PARISH LAKE FR. LEVEES, WEST OF IHNC, GDM NO.2, SUPP. NO. 5

AREA

BORING NO. 4-ULO SAMPLE NO. 12-B

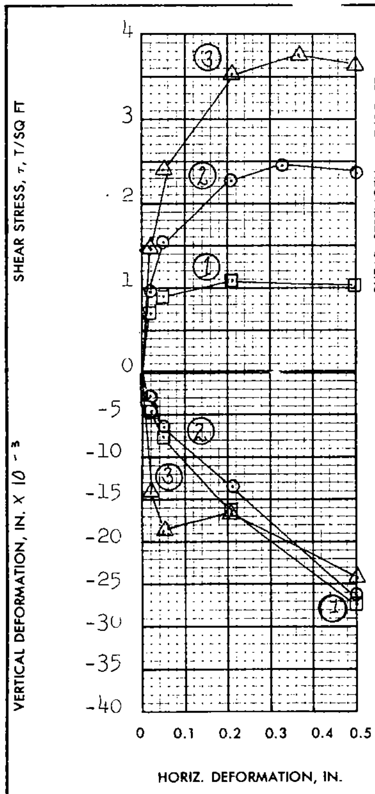
DEPTH/EL -38.5 DATE 5 Oct. 1972

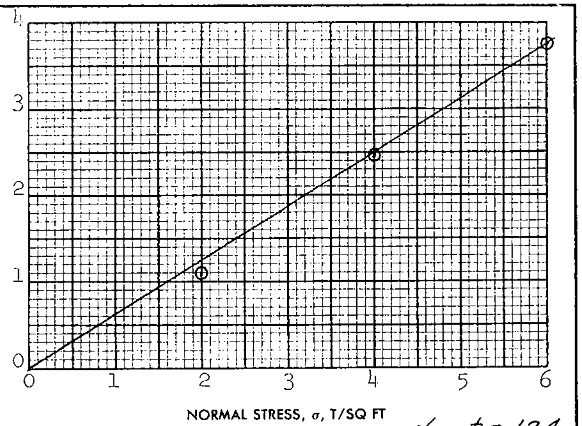
BWG

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945

PLATE IX-3





γ sat. = 124

SHEAR STRENGTH PARAMETERS

ϕ' = 32°

TAN ϕ' = 0.625

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	25.6%	27.4%	26.3%	26.4%
	VOID RATIO	e_o	0.656	0.702	0.700	
	SATURATION	S_o	100+%	100+%	99.6%	%
	DRY DENSITY, LB/CU FT	γ_d	99.9	97.2	97.3	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	2	2	4	
FINAL	WATER CONTENT	w_f	24.6%	25.5%	24.6%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.09	2.44	3.75	
ACTUAL TIME TO FAILURE, MIN		t_f	1320	1920	2100	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.538 IN. THICK

CLASSIFICATION SANDY CLAY(CL),gray;numerous 1/16" seams of fine sand

LL 31 PL 19 PI 12 G_s 2.65

REMARKS

PROJECT LK.PONT.LA.,&VIC.-ORLEANS PARISH LK.FR. LEVEES,WEST OF IHNC, GDM NO.2, SUPP. NO.5

AREA

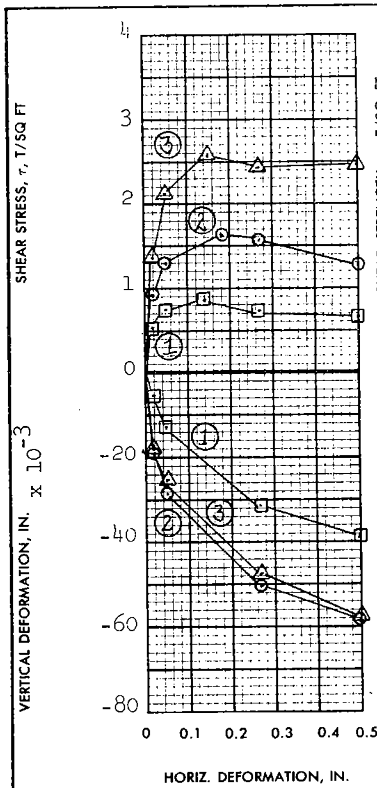
BORING NO. 4-ULO SAMPLE NO. 17-B

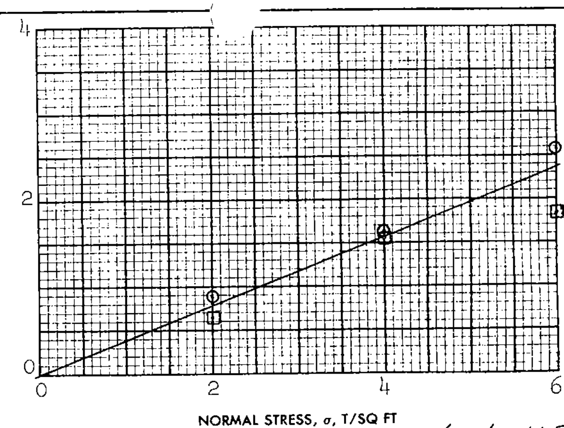
~~DEPTH~~ EL -58.3 DATE 5 October 1972

RCH

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3





γ sat. = 115

SHEAR STRENGTH PARAMETERS

ϕ' = 21.5°

TAN ϕ' = 0.394

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	34.9%	39.0%	41.7%	38.5%
	VOID RATIO	e_o	0.968	1.12	1.14	
	SATURATION	S_o	98.8%	95.4%	100+%	%
	DRY DENSITY, LB/CU FT	γ_d	86.9	80.7	80.1	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	1	2	1	
FINAL	WATER CONTENT	w_f	38.0%	44.7%	34.7%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.88	1.62	2.58	
ACTUAL TIME TO FAILURE, MIN		t_f	720	900	780	
RATE OF STRAIN, IN./MIN			.00022	.00022	.00022	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.620 IN. THICK

CLASSIFICATION PLASTIC CLAY(CH),gray;very few 1/16" seams of silty fine sand and*

LL 55 PL 24 PI 31 G_s 2.74

REMARKS ☐ Original test.
○ Rerun test.
*trace of shell fragments

PROJECT LK.PONT.LA.& VIC.-ORLEANS PARISH LK. FR. LEVEES, WEST OF IHNC, GDM NO.2,SUPP. NO.5

AREA

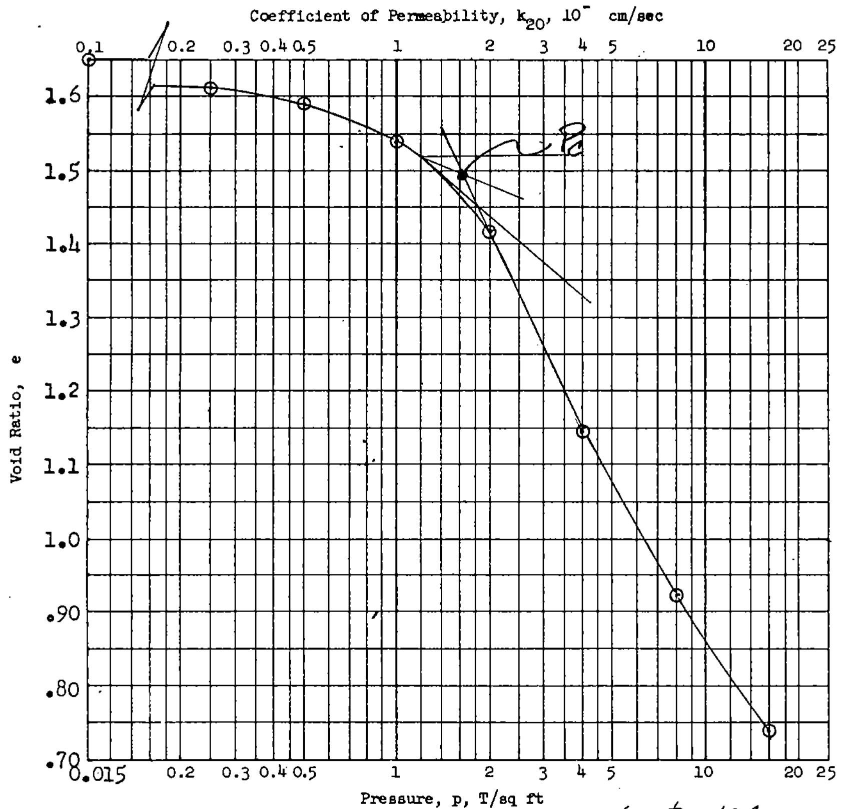
BORING NO. 4-ULO SAMPLE NO. 24-D

~~DEPTH~~ EL -88.0 DATE 18 January 1973

RCH

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3

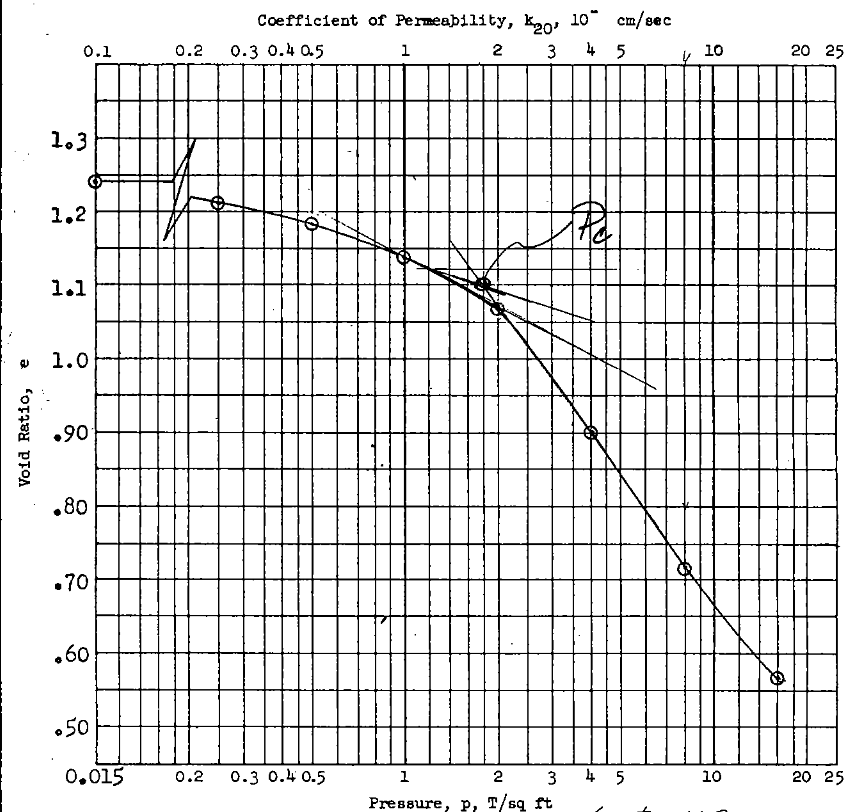


$\gamma sat. = 104$

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.137 in.	Water Content, w_o	62.4 %	w_f	%
Overburden Pressure, Po T/sq ft		Void Ratio, e_o	1.65	e_f	
Preconsol. Pressure, Pc 1.65 T/sq ft		Saturation, S_o	100+ %	S_f	%
Compression Index, C_c 0.84		Dry Density, γ_d	63.9 lb/ft^3		
Classification PLASTIC CLAY(CH)*		k_{20} at e_o = × 10^{-} cm/sec			

LL 84	G_s 2.71	Project LK. PONT., LA.& VIC-ORLEANS PARISH, LK. FRONT LEVEES, WEST OF IHNC, GDM NO.2, SUPP.#5
PL 25	D_{10}	Area
Remarks * gray; shell particles and a few sand pockets		Boring No. 4-ULO — Sample No. 14-B
		~~Depth~~ El -46.5 — Date 28 Nov., 1972
		JAL CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424

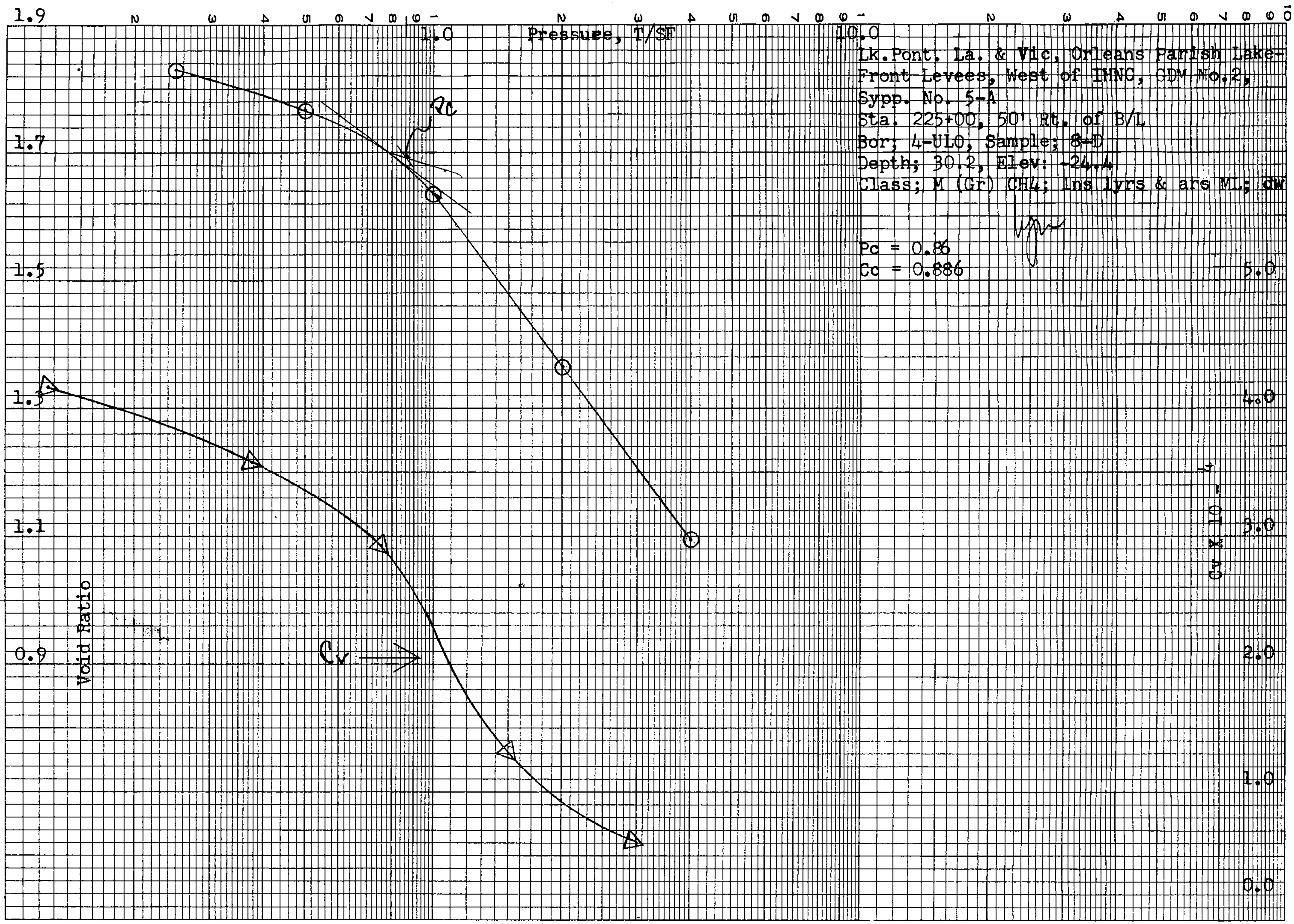


$\gamma sat. = 110$

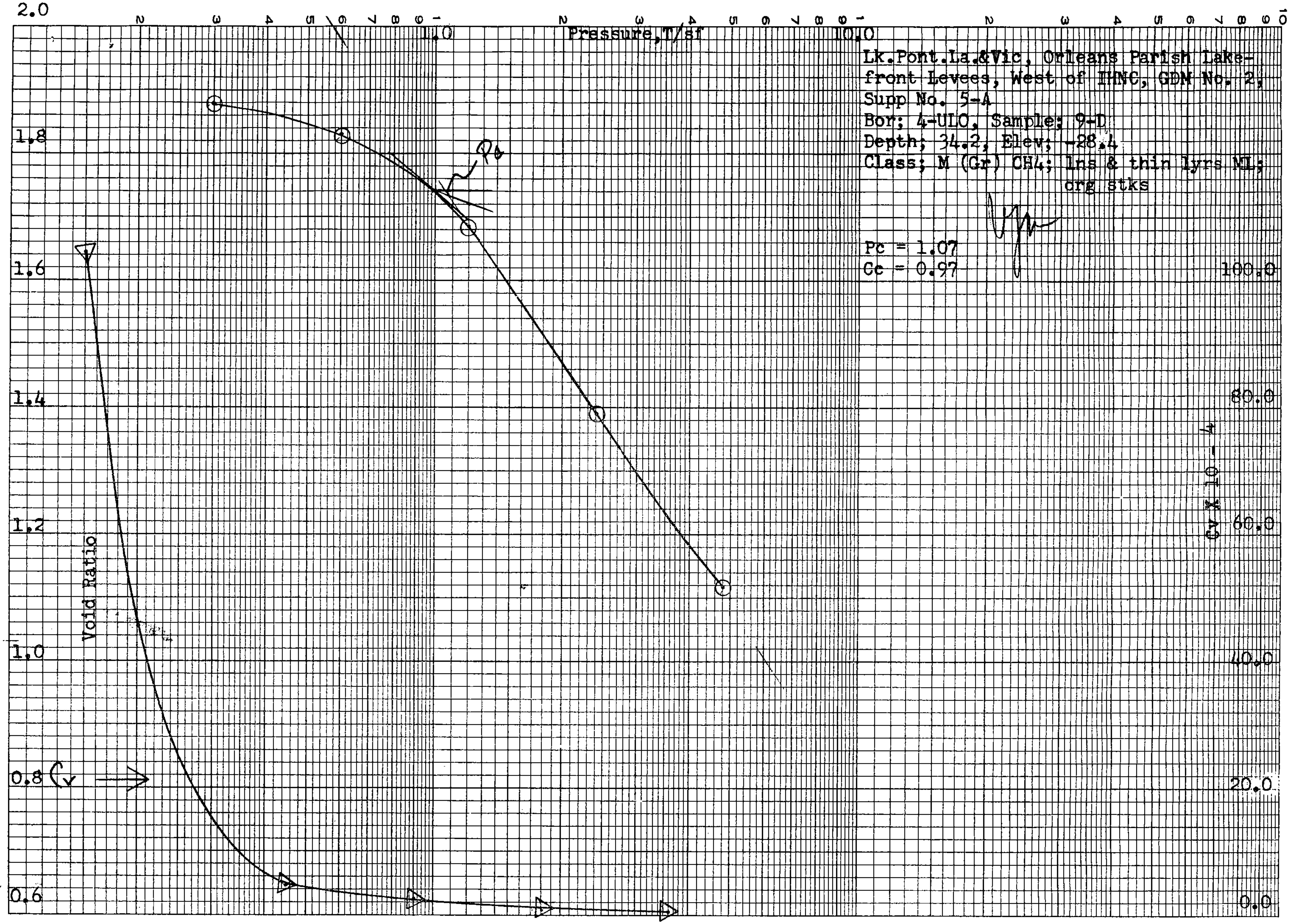
Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.148 in.	Water Content, w_o	44.6 %	w_f	%
Overburden Pressure, Po T/sq ft		Void Ratio, e_o	1.24	e_f	
Preconsol. Pressure, Pc 1.8 T/sq ft		Saturation, S_o	97.4 %	S_f	%
Compression Index, C_c 0.58		Dry Density, γ_d	75.5 lb/ft^3		
Classification PLASTIC CLAY(CH),*		k_{20} at e_o = × 10^{-} cm/sec			

LL 71	G_s 2.71	Project LK. PONT., LA.& VIC.-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC, GDM#2, SUPP. #5
PL 21	D_{10}	Area
Remarks * gray; shell fragments		Boring No. 4-ULO — Sample No. 15-D
		~~Depth~~ El -52.0 — Date 29 Nov., 1972
		JAL CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424


Pressure, T/SF
Void Ratio
Cv X 10^-4
1.9
1.7
1.5
1.3
1.1
0.9
1.0
10.0
5.0
4.0
3.0
2.0
1.0
0.0
Lk.Pont. La. & Vic, Orleans Parish Lake-
Front Levees, West of IHNC, GDM No.2,
Sypp. No. 5-A
Sta. 225+00, 50' Rt. of B/L
Bor; 4-ULO, Sample; 8-D
Depth; 30.2, Elev: -24.4
Class; M (Gr) CH4; Ins lyrs & ars ML; dW
Pc = 0.86
Cc = 0.886
Pc
Cv

4



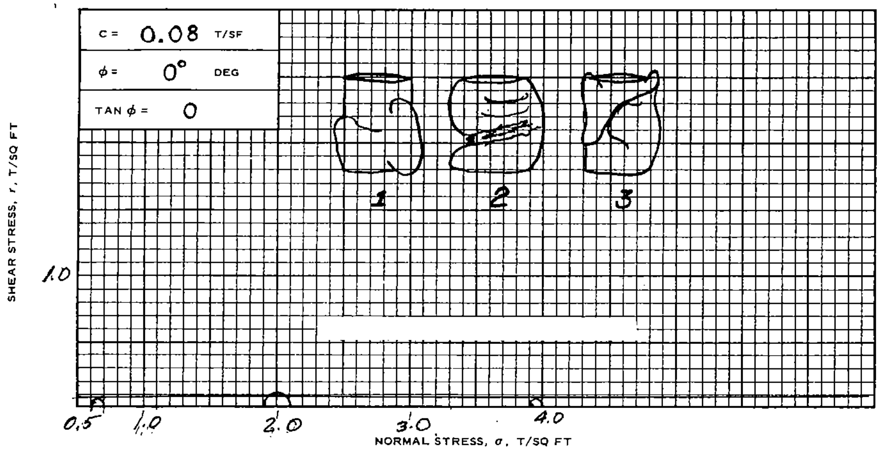
Pressure, T/sf
1.0
10.0
Void Ratio
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
C_v
100.0
80.0
60.0
40.0
20.0
0.0
Cv X 10 - 4
Lk. Pont. La. & Vic, Orleans Parish Lake-
front Levees, West of IHNC, GDM No. 2,
Supp No. 5-A
Bor; 4-ULO, Sample; 9-D
Depth; 34.2, Elev; -28.4
Class; M (Gr) CH4; lns & thin lyrs ML;
crg stks
Pc = 1.07
Cc = 0.97
Pc

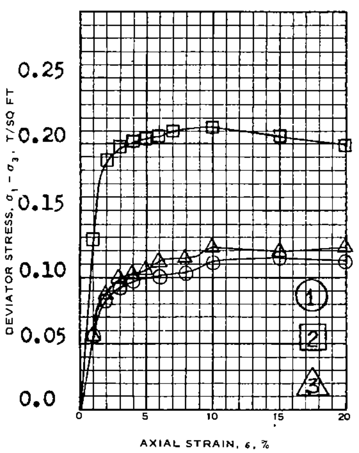
E

c = 0.08 T/SF

φ = 0° DEG

TAN φ = 0





γsat = 107

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	49.20	48.19	56.31	51.2
INITIAL	DRY DENSITY LB/CU FT	γ_{d_o}	71.08	72.90	66.20	
INITIAL	SATURATION, %	S_o	96.84	99.12	98.31	
INITIAL	VOID RATIO	e_o	1.374	1.314	1.549	
BEFORE SHEAR	WATER CONTENT, %	w_c				
BEFORE SHEAR	DRY DENSITY LB/CU FT	γ_{d_c}				
BEFORE SHEAR	SATURATION, %	S_c				
BEFORE SHEAR	VOID RATIO	e_c				
BEFORE SHEAR	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.6	1.9	3.9	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.115	0.214	0.122	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	23.76	15.84	15.91	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS vSo (Gr) CH2: few lns ML; spks dw; slurry

LL 51	PL 18	PI 33	Gs 2.7034	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.-Orleans Parish Lakefront Levees, West of IHNC

BORING NO. 5-ULO SAMPLE NO. 7-C

DEPTH/ELEV 25.3 / -12.9

LABORATORY NOD DATE 8 June 73

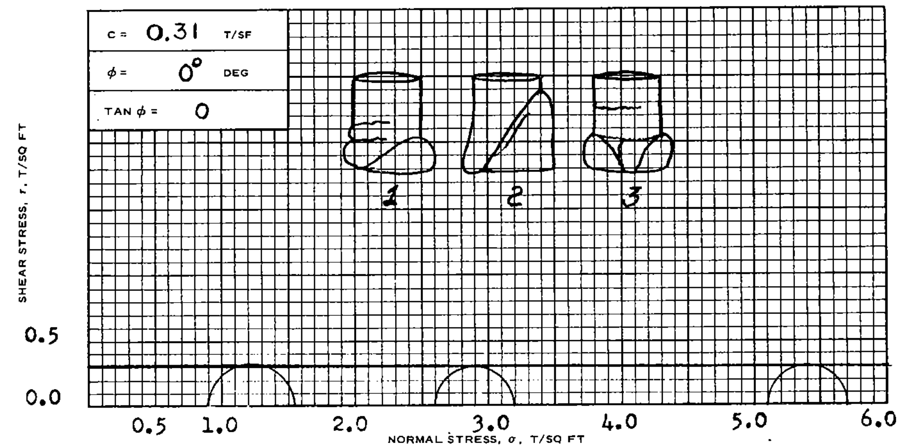
TRIAXIAL COMPRESSION TEST REPORT

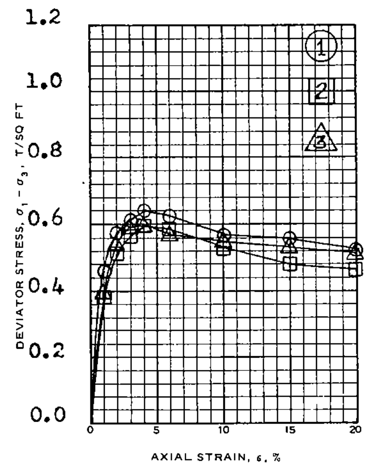
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

c = 0.31 T/SF

φ = 0° DEG

TAN φ = 0





γsat = 102

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	60.72	60.78	59.56	60.4
INITIAL	DRY DENSITY LB/CU FT	γ_{d_o}	63.37	63.47	64.23	
INITIAL	SATURATION, %	S_o	98.83	99.18	99.07	
INITIAL	VOID RATIO	e_o	1.659	1.655	1.623	
BEFORE SHEAR	WATER CONTENT, %	w_c				
BEFORE SHEAR	DRY DENSITY LB/CU FT	γ_{d_c}				
BEFORE SHEAR	SATURATION, %	S_c				
BEFORE SHEAR	VOID RATIO	e_c				
BEFORE SHEAR	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.9	2.6	5.1	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.641	0.597	0.597	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	6.36	14.22	14.04	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS So (Gr) CH3: lns & thin lys SM; org strks.

LL 70	PL 22	PI 48	Gs 2.6998	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.-Orleans Parish Lakefront Levees - West of IHNC

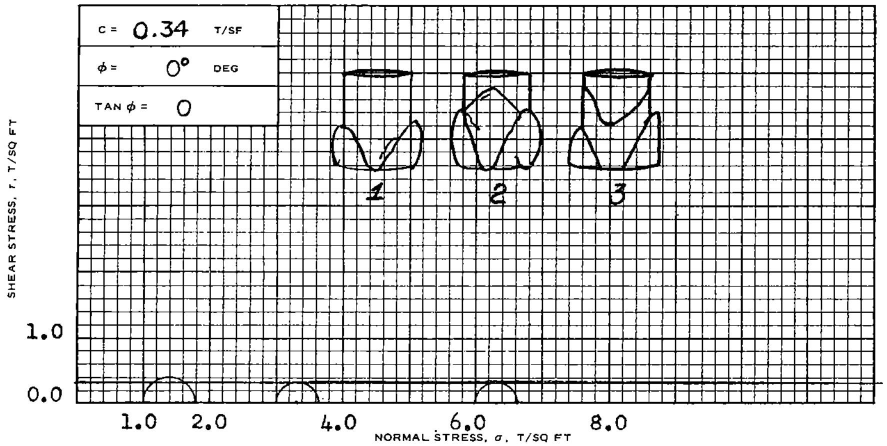
BORING NO. 5-ULO SAMPLE NO. 10-B

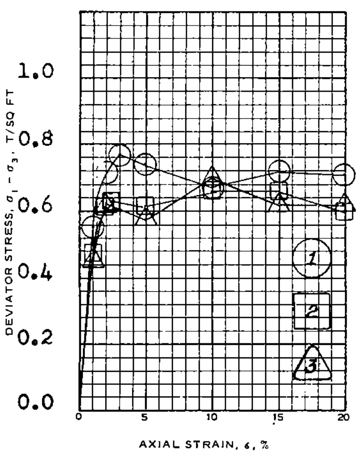
DEPTH/ELEV 36.4 / -24.0

LABORATORY NOD DATE 8 June 73

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





γsat. = 99

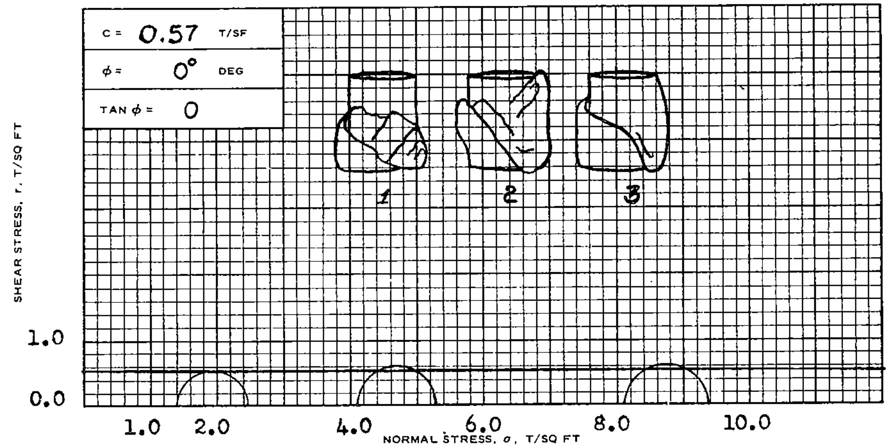
SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	69.40	70.63	71.21	70.4
	DRY DENSITY LB/CU FT	γd_o	58.47	57.72	57.37	
	SATURATION, %	S_o	99.56	99.35	99.26	
	VOID RATIO	e_o	1.882	1.920	1.937	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	3.0	6.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$		0.768	0.634	0.623	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	4.67	7.90	6.96	
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{ULT}$					
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

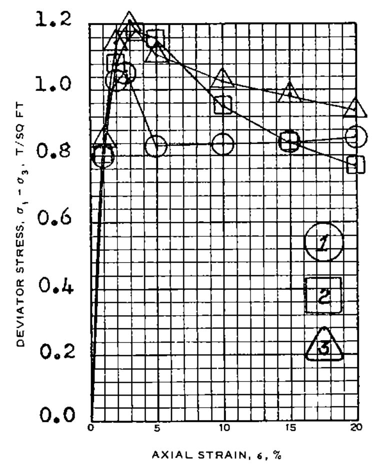
CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS M (Gr) CH4: Few thin lys. ML; spks dw; org strks.

LL 94	PL 26	PI 68	Gs 2.7007	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"
REMARKS:				PROJECT Lk. Pont. La. & Vic.-Orleans Parish Lakefront Levees - West of IHNC	
				BORING NO. 5-ULO	SAMPLE NO. 11-D
				DEPTH/ELEV 42.1 / -29.7	
				LABORATORY NOD	DATE 11 June 73
				TBW. TRIAXIAL COMPRESSION TEST REPORT	

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





γsat. = 104

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	58.39	55.79	53.38	55.9
	DRY DENSITY LB/CU FT	γd_o	63.84	65.84	67.05	
	SATURATION, %	S_o	96.51	96.98	95.64	
	VOID RATIO	e_o	1.624	1.544	1.498	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.4	4.1	8.1	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$		1.059	1.181	1.207	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	4.33	12.09	10.57	
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{ULT}$					
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS M (gnGr) CH3: lns & ars SP; sl & slf.

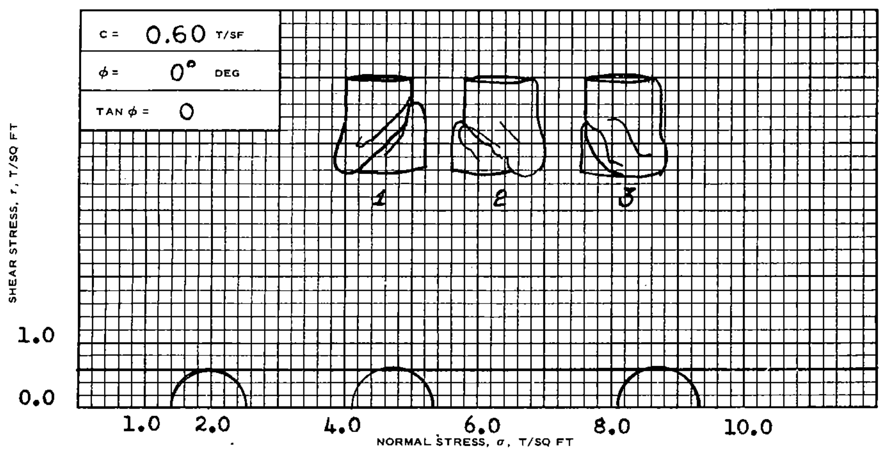
LL 75	PL 21	PI 54	Gs 2.6845	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"
REMARKS:				PROJECT Lk. Pont. La. & Vic.-Orleans Parish Lakefront Levees - West of IHNC	
				BORING NO. 5-ULO	SAMPLE NO. 16-C
				DEPTH/ELEV 61.3 / -48.9	
				LABORATORY NOD	DATE 11June 73
				TBW. TRIAXIAL COMPRESSION TEST REPORT	

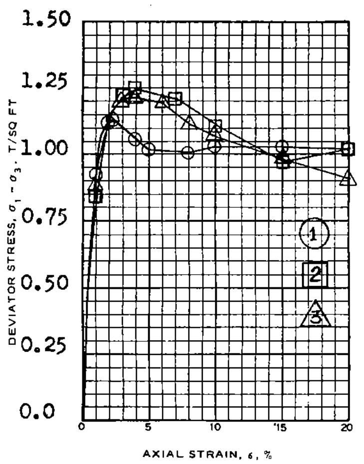
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

c = 0.60 T/SF

φ = 0° DEG

TAN φ = 0





γsat. = 108

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	47.00	50.32	49.54	49.0
	DRY DENSITY LB/CU FT	γd_o	73.72	70.87	71.49	
	SATURATION, %	S_o	98.72	98.64	98.58	
	VOID RATIO	e_o	1.285	1.377	1.357	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.4	4.1	8.1	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.133	1.249	1.221	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	2.54	13.39	14.10	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS St (gnGr) CH4: lns SP; slf

LL 76	PL 20	PI 56	Gs 2.6999	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk.Pont. La. & Vic .-Orleans Parish
Lakefront Levees - West of IHNC

BORING NO. 5-ULO	SAMPLE NO. 17-B
DEPTH/ELEV 64.3 / -51.9	
LABORATORY NOD	DATE 12 June 73

aeB

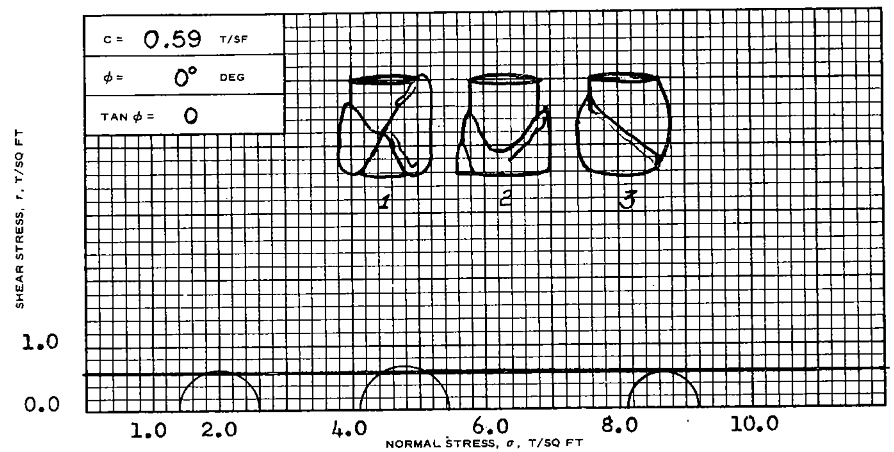
TJW TRIAXIAL COMPRESSION TEST REPORT

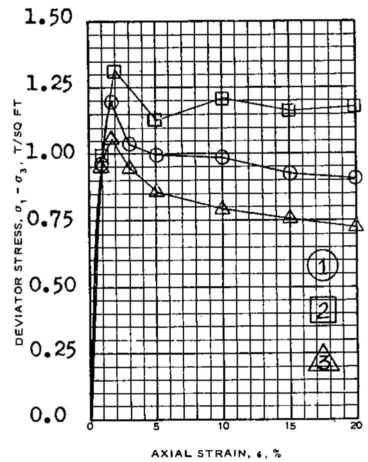
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

c = 0.59 T/SF

φ = 0° DEG

TAN φ = 0





γsat. = 111

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	44.64	43.92	43.97	44.2
	DRY DENSITY LB/CU FT	γd_o	75.74	76.88	76.91	
	SATURATION, %	S_o	98.49	99.60	99.78	
	VOID RATIO	e_o	1.223	1.190	1.189	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.4	4.1	8.1	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.194	1.316	1.055	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	2.89	7.11	6.29	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS St (Gr) CH3: lns & lys ML; spks dw; org strks.

LL 65	PL 19	PI 46	Gs 2.6977	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

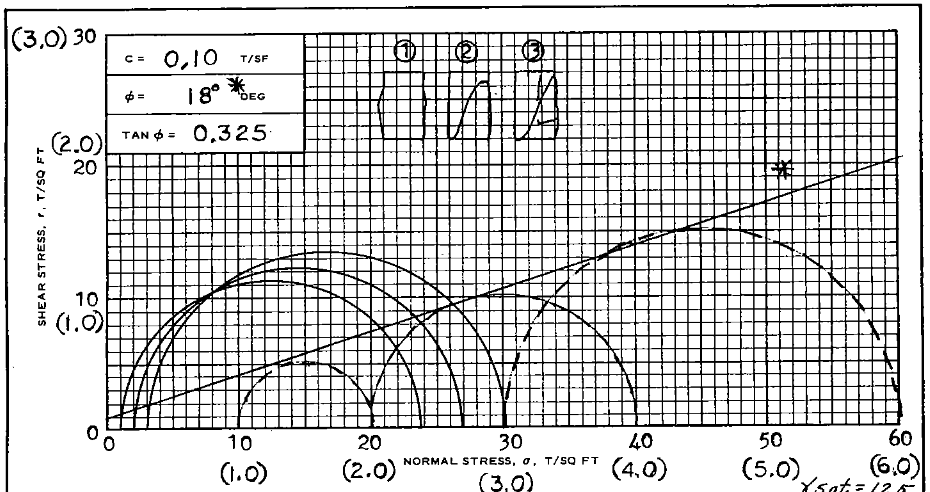
PROJECT Lk. Pont. La. & Vic.-Orleans Parish
Lakefront Levees - West of IHNC

BORING NO. 5-ULO	SAMPLE NO. 25-C
DEPTH/ELEV 97.1 / -84.7	
LABORATORY NOD	DATE 12 June 73

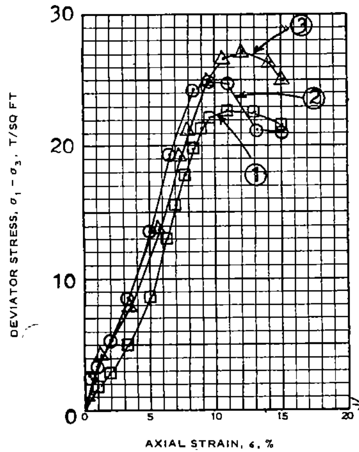
aeB

TJW. TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT



C =	0.10 T/SF
φ =	18° * DEG
TAN φ =	0.325



$\gamma_{sat} = 125$

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	25.2	24.9	24.7	24.9
INITIAL	DRY DENSITY LB/CU FT	γd_o	98.8	99.2	99.4	
INITIAL	SATURATION, %	S_o	97.5	97.2	96.8	
INITIAL	VOID RATIO	e_o	0.693	0.687	0.684	
BEFORE SHEAR	WATER CONTENT, %	w_c	26.0	25.4	25.4	
BEFORE SHEAR	DRY DENSITY LB/CU FT	γd_c	99.6	100.7	101.3	
BEFORE SHEAR	SATURATION, %	S_c	100+	100+	100+	
BEFORE SHEAR	VOID RATIO	e_c	0.679	0.661	0.651	
BEFORE SHEAR	FINAL BACK PRESSURE, T/SQ FT	u_o	4.32	4.32	4.32	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	22.77	24.87	27.23	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	95	38	36	
*$(\sigma_1 - \sigma_3)$ AT MAX. PORE PRESSURE			1.0	2.0	3.0	
INITIAL DIAMETER, IN.		D_o	1.40	1.41	1.41	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SILTY SAND(SM), tan

LL — PL — PI — G_s 2.68

REMARKS: See attached plot for effective values
Portion of sample allowed to drain before trimming

TYPE OF SPECIMEN UNDISTURBED TYPE OF TEST R

PROJECT LK. PONT., LA. & VIC.-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC, GDM #2, SUPP. #5

BORING NO. 5-ULO SAMPLE NO. 21-B

~~DEPTH~~/ELEV -65.5

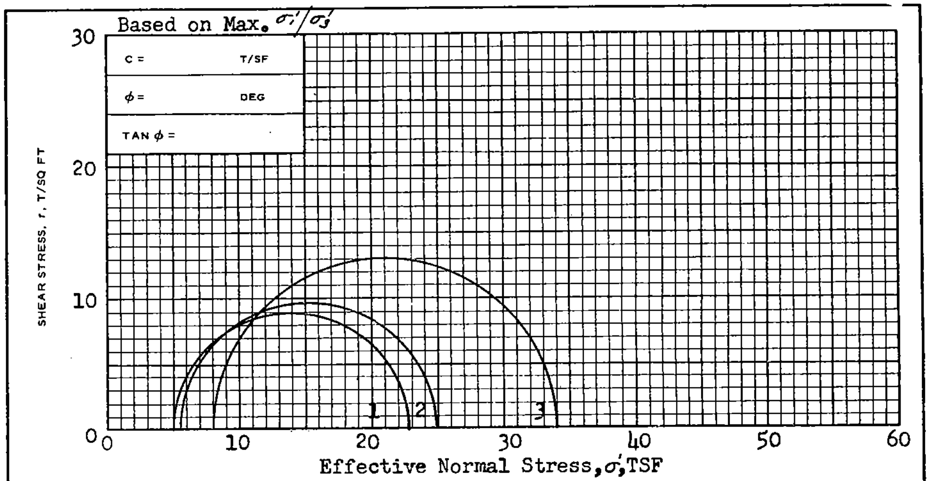
LABORATORY USAEWES DATE 27 Oct., 1972

PJR TRIAXIAL COMPRESSION TEST REPORT

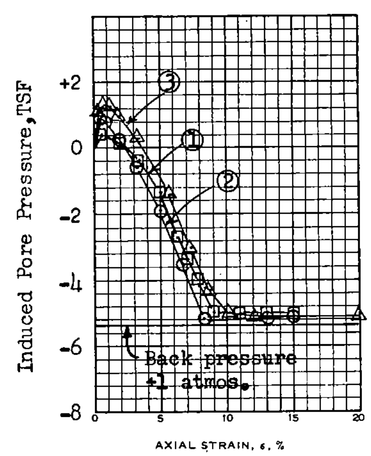
Sheet 1 of 2

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Based on Max. σ_1'/σ_3'



C =	T/SF
φ =	DEG
TAN φ =	



SPECIMEN NO.						
INITIAL	WATER CONTENT, %	w_o				
INITIAL	DRY DENSITY LB/CU FT	γd_o				
INITIAL	SATURATION, %	S_o				
INITIAL	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
BEFORE SHEAR	DRY DENSITY LB/CU FT	γd_c				
BEFORE SHEAR	SATURATION, %	S_c				
BEFORE SHEAR	VOID RATIO	e_c				
BEFORE SHEAR	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3				
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

REMARKS:

TYPE OF SPECIMEN TYPE OF TEST R

PROJECT LK. PONT., LA. & VIC.-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC, GDM #2, SUPP. #5

BORING NO. 5-ULO SAMPLE NO. 21-B

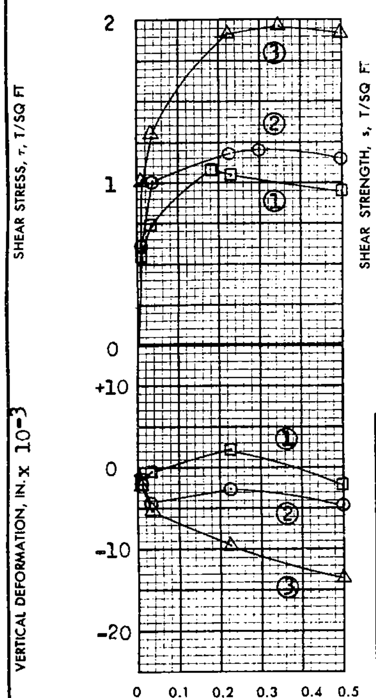
~~DEPTH~~/ELEV -65.5

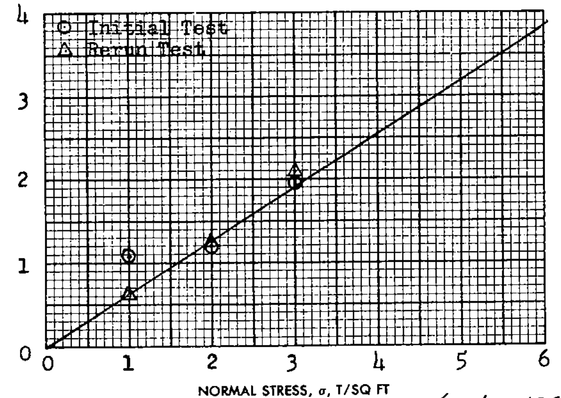
LABORATORY USAEWES DATE 27 Oct., 1972

PJR TRIAXIAL COMPRESSION TEST REPORT

Sheet 2 of 2

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





γsat. = 128

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	29.6 %	27.8 %	26.8 %	28.1 %
	VOID RATIO	e_o	0.729	0.679	0.600	
	SATURATION	S_o	100+ %	100+ %	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	96.4	99.3	104.2	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	23.6 %	25.4 %	25.1 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.08	1.20	1.96	
ACTUAL TIME TO FAILURE, MIN		t_f	1020	1620	1860	
RATE OF STRAIN, IN./MIN			.00019	.00019	.00019	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 32°

TAN ϕ' = 0.635

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE — 0.538 IN. THICK

CLASSIF. SILTY SAND (SM), gray; shell fragments

LL - | PL - | PI - | G_s 2.67

REMARKS See attached sheet for rerun data

PROJECT LK. PONT.,LA. & VIC.-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC, GDM #2, SUPP. #5

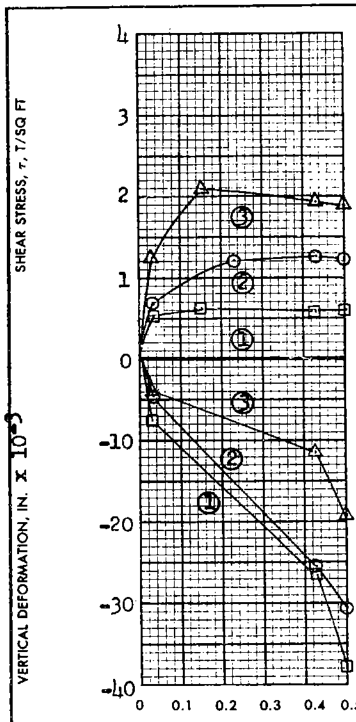
AREA

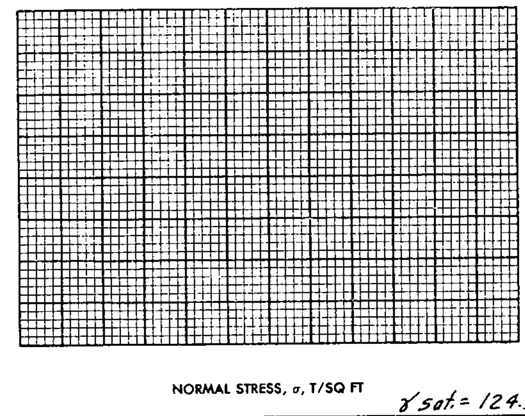
BORING NO. 5-ULO — SAMPLE NO. 12-D

~~DEPTH~~ EL -33.5 — DATE 29 Nov.,1972

RCH — DIRECT SHEAR TEST REPORT

Sheet 1 of 2





γsat. = 124.3

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	27.3 %	27.2 %	25.9 %	26.8 %
	VOID RATIO	e_o	0.680	0.753	0.684	
	SATURATION	S_o	100+ %	96.4 %	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	99.2	95.1	99.0	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	24.0 %	24.9 %	23.3 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.61	1.27	2.09	
ACTUAL TIME TO FAILURE, MIN		t_f	420	1080	420	
RATE OF STRAIN, IN./MIN			.00040	.00040	.00040	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' =

TAN ϕ' =

c' = T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE — 0.536 IN. THICK

CLASSIFICATION SILTY SAND (SM), gray; shell fragments

LL - | PL - | PI - | G_s 2.67

REMARKS Rerun test. See sheet 1 for Normal Stress vs Shear Strength plot

PROJECT LK. PONT.,LA. & VIC.-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC, GDM #2, SUPP. #5

AREA

BORING NO. 5-ULO — SAMPLE NO. 12-D

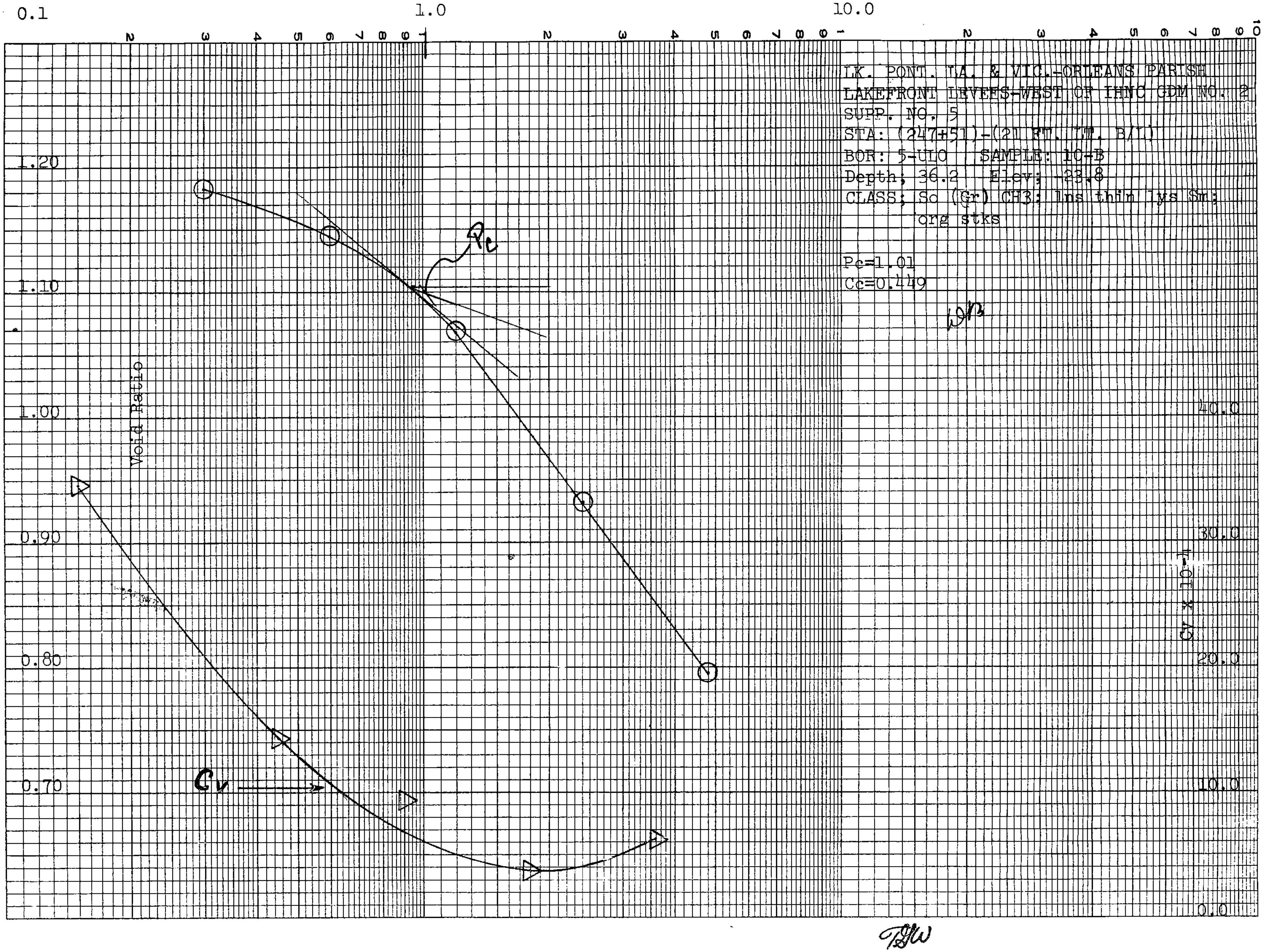
~~DEPTH~~ EL -33.5 — DATE 10 Jan.,1973

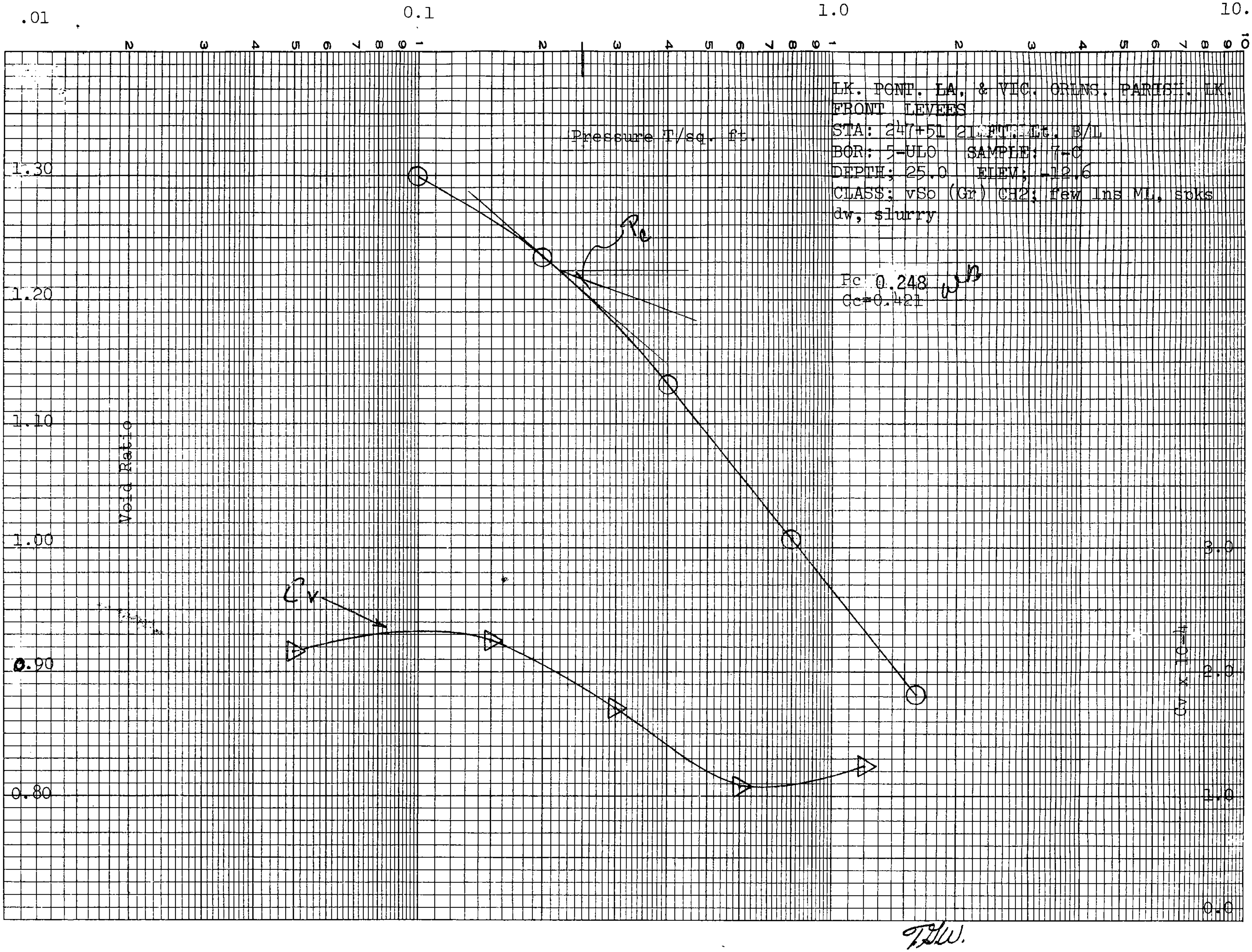
RCH — DIRECT SHEAR TEST REPORT

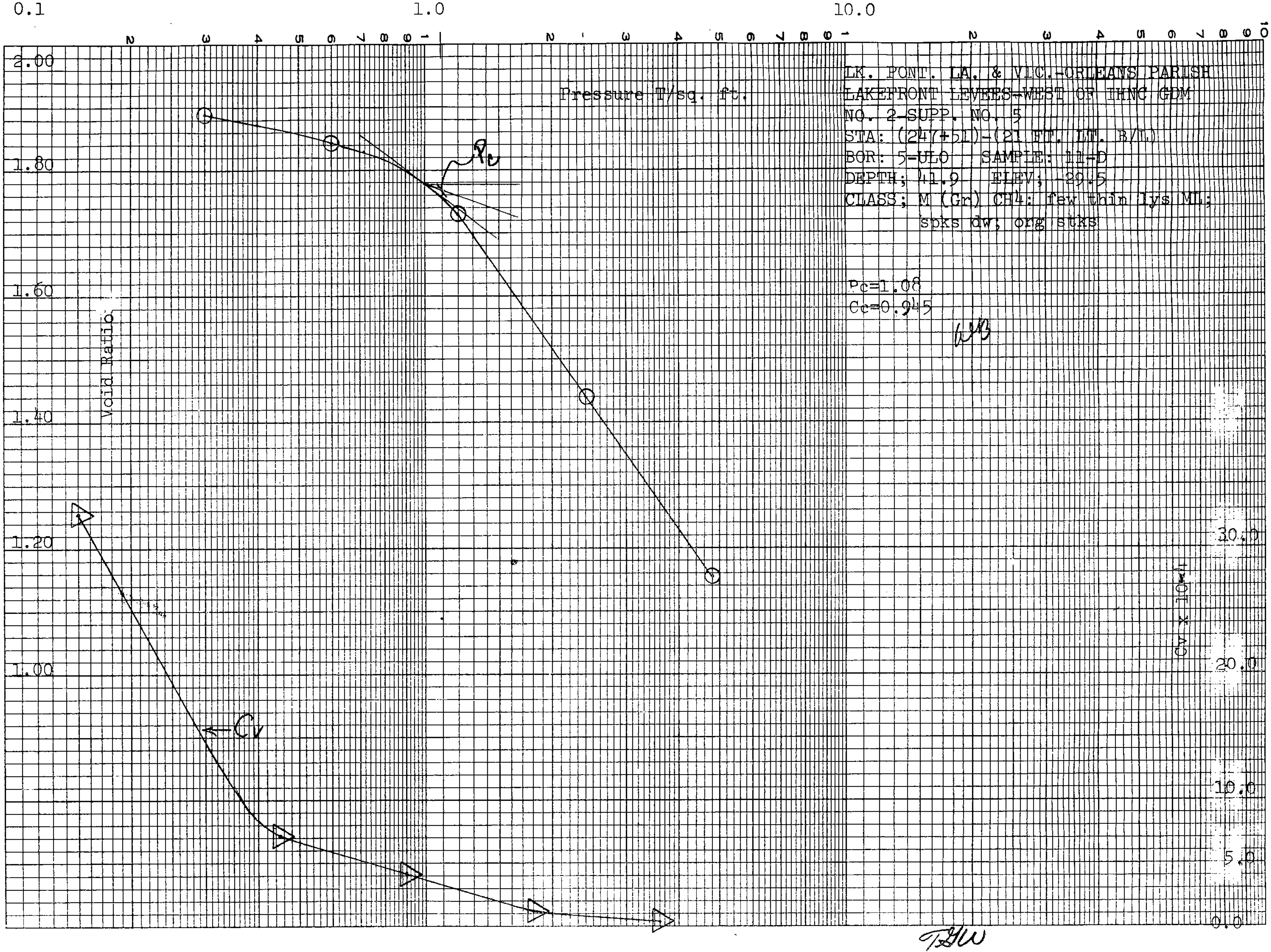
Sheet 2 of 2

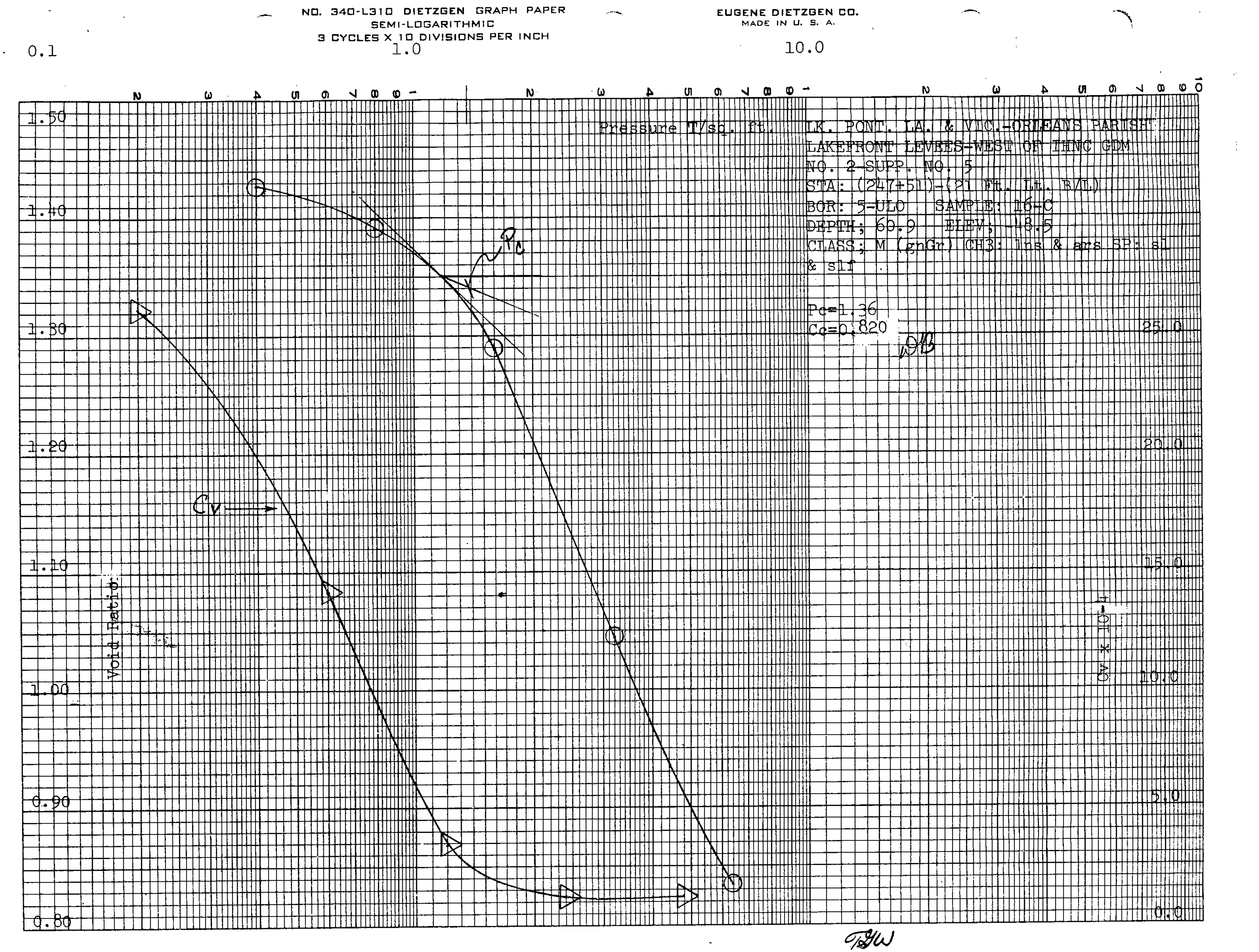
NO. 340-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

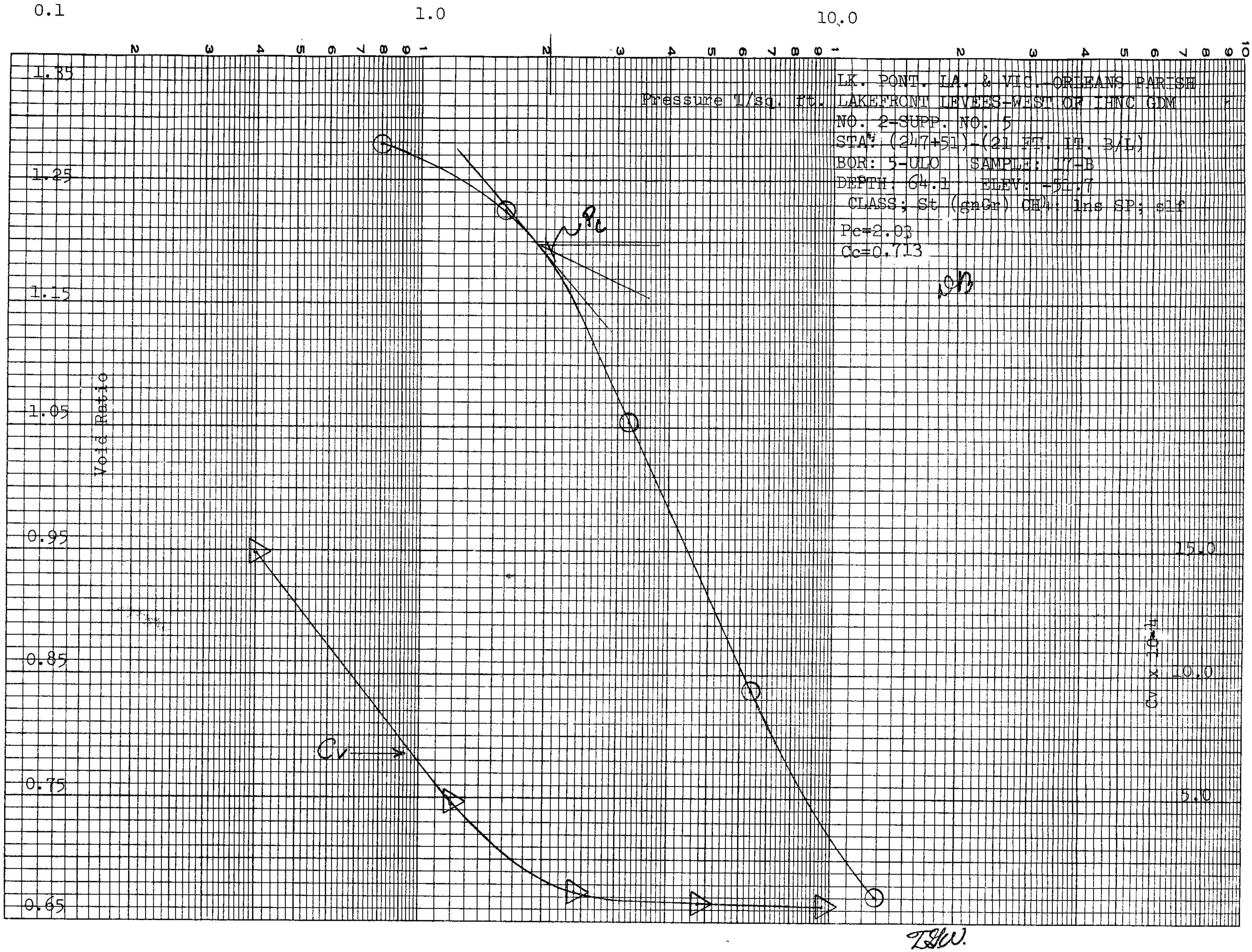
EUGENE DIETZGEN CO.
MADE IN U. S. A.




.01
0.1
1.0
10.0
Pressure T/sq. ft.
LK. PONT. LA. & VIC. ORLNS. PARISH. LK.
FRONT LEVEES
STA: 247+51 21 FT. Lt. B/L
BOR: 5-ULO SAMPLE: 7-C
DEPTH: 25.0 ELEV: -12.6
CLASS: vSo (Gr) CH2; few lns ML, spks
dw, slurry
Pc
Pc 0.248
Cc=0.421
Void Ratio
1.30
1.20
1.10
1.00
0.90
0.80
Cv
Cv x 10-4
3.0
2.0
1.0
0.0
TJW.

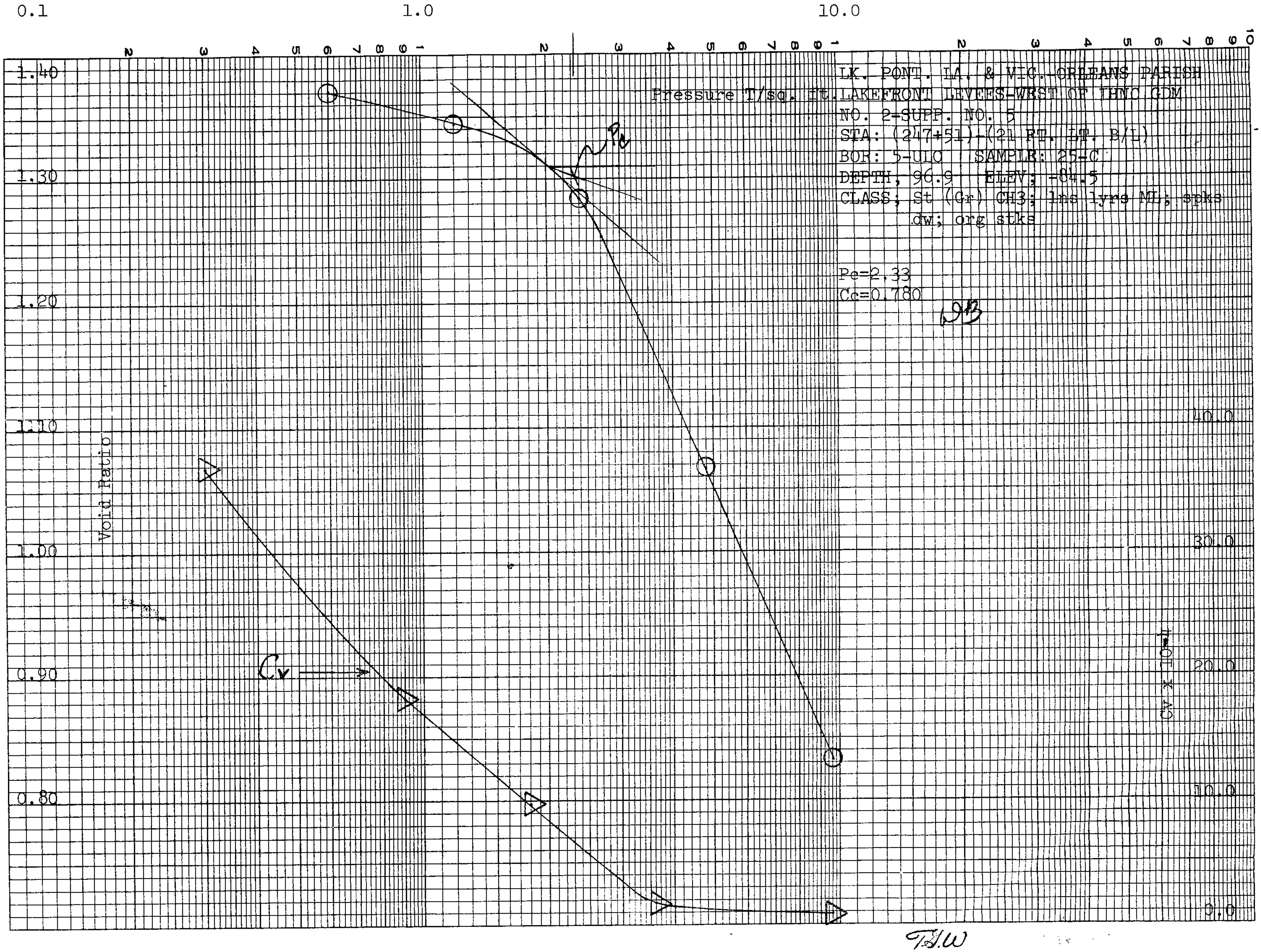

0.1
1.0
10.0
Pressure T/sq. ft.
Void Ratio
2.00
1.80
1.60
1.40
1.20
1.00
Cv x 10⁻⁴
30.0
20.0
10.0
5.0
0.0
Pc
Cv
LK. PONT. LA. & VIC.-ORLEANS PARISH
LAKEFRONT LEVEES-WEST OF IHNC GDM
NO. 2-SUPP. NO. 5
STA: (247+51)-(21 FT. LT. B/L)
BOR: 5-ULO SAMPLE: 11-D
DEPTH; 41.9 ELEV; -29.5
CLASS; M (Gr) CH; few thin lys ML;
spks dw; org stks
Pc=1.08
Cc=0.945
WB
TGW


NO. 340-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH
EUGENE DIETZGEN CO.
MADE IN U. S. A.
0.1
1.0
10.0
Pressure T/sq. ft.
LK. PONT. LA. & VIC.-ORLEANS PARISH
LAKEFRONT LEVEES-WEST OF IHNC GDM
NO. 2-SUPP. NO. 5
STA: (247+51)-(21 Ft. Lt. B/L)
BOR: 5-ULO SAMPLE: 16-C
DEPTH; 60.9 ELEV; -48.5
CLASS; M (gnGr) CH3: lns & ars SP: sl
& slf
Pc=1.36
Cc=0.820
Pc
Cv
Void Ratio
Cv x 10-4
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
25.0
20.0
15.0
10.0
5.0
0.0
TGW


0.1
1.0
10.0
Pressure T/sq. ft.
LK. PONT. LA. & VIC.-ORLEANS PARISH
LAKEFRONT LEVEES-WEST OF IHNC GDM
NO. 2-SUPP. NO. 5
STA: (247+51)-(21 FT. LT. B/L)
BOR: 5-ULO SAMPLE: 17-B
DEPTH: 64.1 ELEV: -51.7
CLASS: St (gnGr) CH: lns SP; slf
Pc=2.03
Cc=0.713
Pc
Void Ratio
1.35
1.25
1.15
1.05
0.95
0.85
0.75
0.65
Cv
Cv x 10-4
15.0
10.0
5.0
TGW.

NO. 340-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

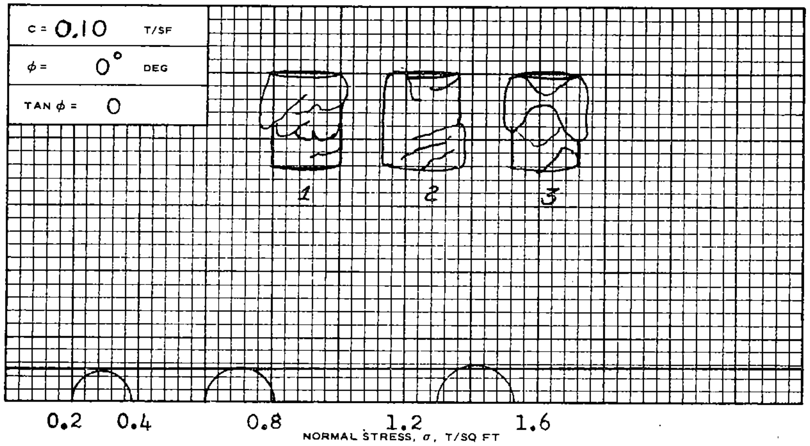
EUGENE DIETZGEN CO.
MADE IN U. S. A.

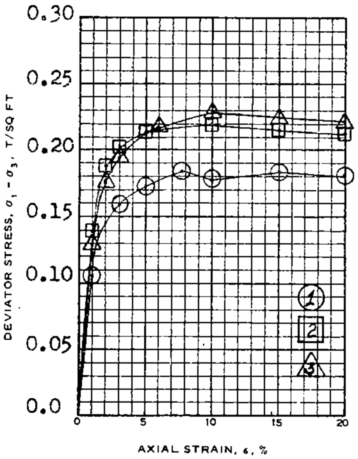


c = 0.10 T/SF

ϕ = 0° DEG

TAN ϕ = 0





$\gamma sat = 94$

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	80.70	86.00	84.78	83.8
	DRY DENSITY LB/CU FT	γd_o	52.49	50.26	50.84	
	SATURATION, %	S_o	99.00	99.09	99.23	
	VOID RATIO	e_o	2.180	2.321	2.283	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.2	0.6	1.3	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.183	0.214	0.229	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	12.71	37.21	37.21	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS vSo (Gr) CH4: few ars SP; sl; slf.

LL 82	PL 22	PI 60	Gs 2.6747	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic. - Orleans Parish
Lakefront Levees - West of IHNC

BORING NO. 6-ULO	SAMPLE NO. 3-B
DEPTH/ELEV 7.7 / -2.3	
LABORATORY NOD	DATE 13 June 73

LOB

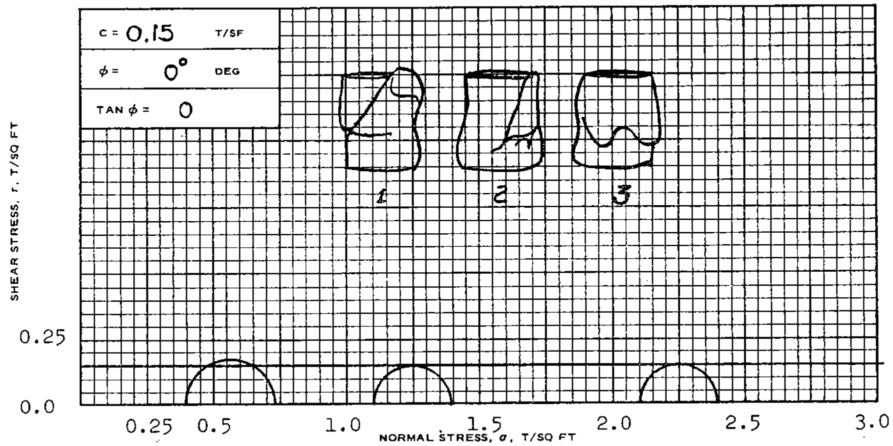
TBW TRIAXIAL COMPRESSION TEST REPORT

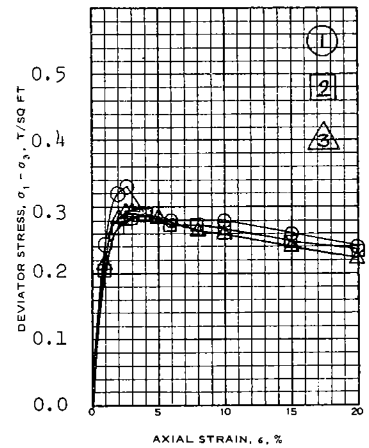
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

c = 0.15 T/SF

ϕ = 0° DEG

TAN ϕ = 0





$\gamma sat = 95$

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	83.29	80.39	77.29	80.3
	DRY DENSITY LB/CU FT	γd_o	51.23	52.30	53.88	
	SATURATION, %	S_o	98.57	98.05	98.47	
	VOID RATIO	e_o	2.264	2.197	2.103	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.4	1.1	2.1	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.330	0.289	0.293	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	4.27	12.97	8.53	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS So (Gr) CH4: lns ML.

LL 84	PL 29	PI 55	Gs 2.6796	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

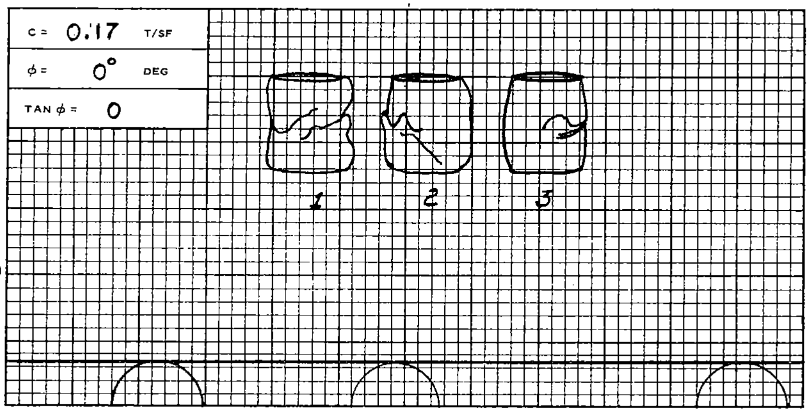
PROJECT Lk. Pont. La. & Vic.-Orleans Parish
Lakefront Levees - West of IHNC

BORING NO. 6-ULO	SAMPLE NO. 4-B
DEPTH/ELEV 12.4 / -7.0	
LABORATORY NOD	DATE 13 JUNE 73

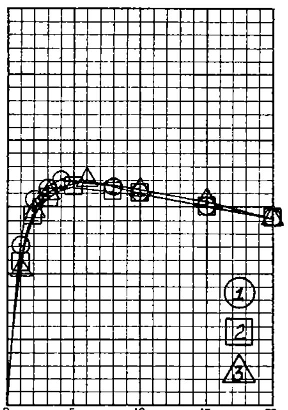
LOB

TBW TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT



$\gamma_{sat} = 102$



	SPECIMEN NO.		1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	61.03	60.42	60.17	60.5
	DRY DENSITY LB/CU FT	γd_o	63.33	63.48	63.69	
	SATURATION, %	S_o	99.91	99.28	99.37	
	VOID RATIO	e_o	1.631	1.625	1.617	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.4	1.3	2.6	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.342	0.328	0.340	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	6.14	17.78	21.33	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS So (Gr) CH3: lns & ars ML. org strks; slf.

LL 68	PL 19	PI 49	Gs 2.6704	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.-Orleans Parish Lakefront Levees - West of IHNC

BORING NO. 6-ULO | SAMPLE NO. 5-C

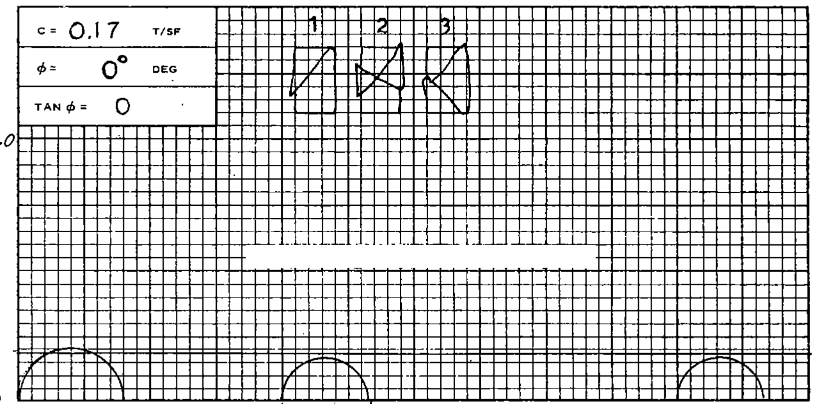
DEPTH/ELEV 17.0 / -11.6

LABORATORY NOD | DATE 12 June 73

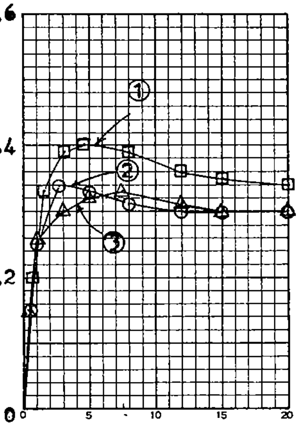
WB

BW. TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT



$\gamma_{sat} = 100$



	SPECIMEN NO.		1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	67.9	70.9	67.6	68.8
	DRY DENSITY LB/CU FT	γd_o	59.3	57.5	59.9	
	SATURATION, %	S_o	98.3	98.5	99.4	
	VOID RATIO	e_o	1.90	1.98	1.87	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.40	0.34	0.33	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	17	11	45	
ULTIMATE 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	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray

LL 82	PL 27	PI 55	Gs 2.75	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS:

PROJECT LK. PONT., LA.&VIC.-ORLEANS PARISH LAKEFRONT LEVEES, WEST OF IHNC, GDM#2, SUPP. #5

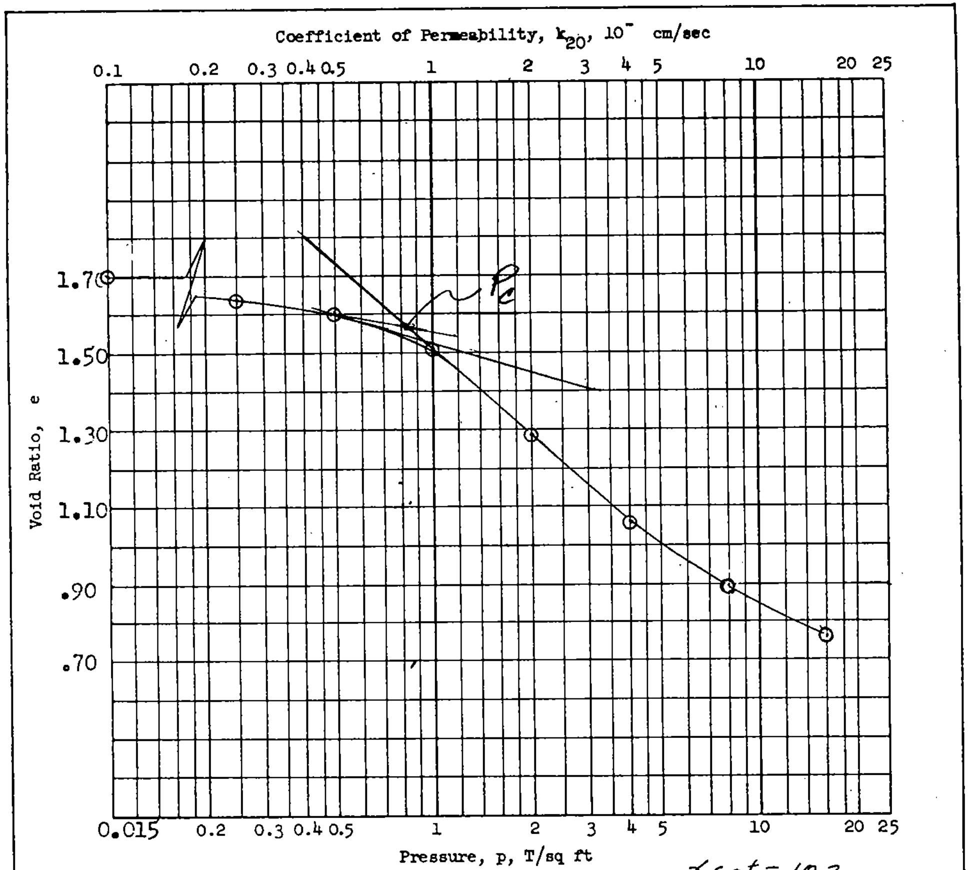
BORING NO. 6-ULO | SAMPLE NO. 8-D

~~DEPTH~~/ELEV -24.8

LABORATORY USAEWES | DATE 31 October, 1972

JMS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

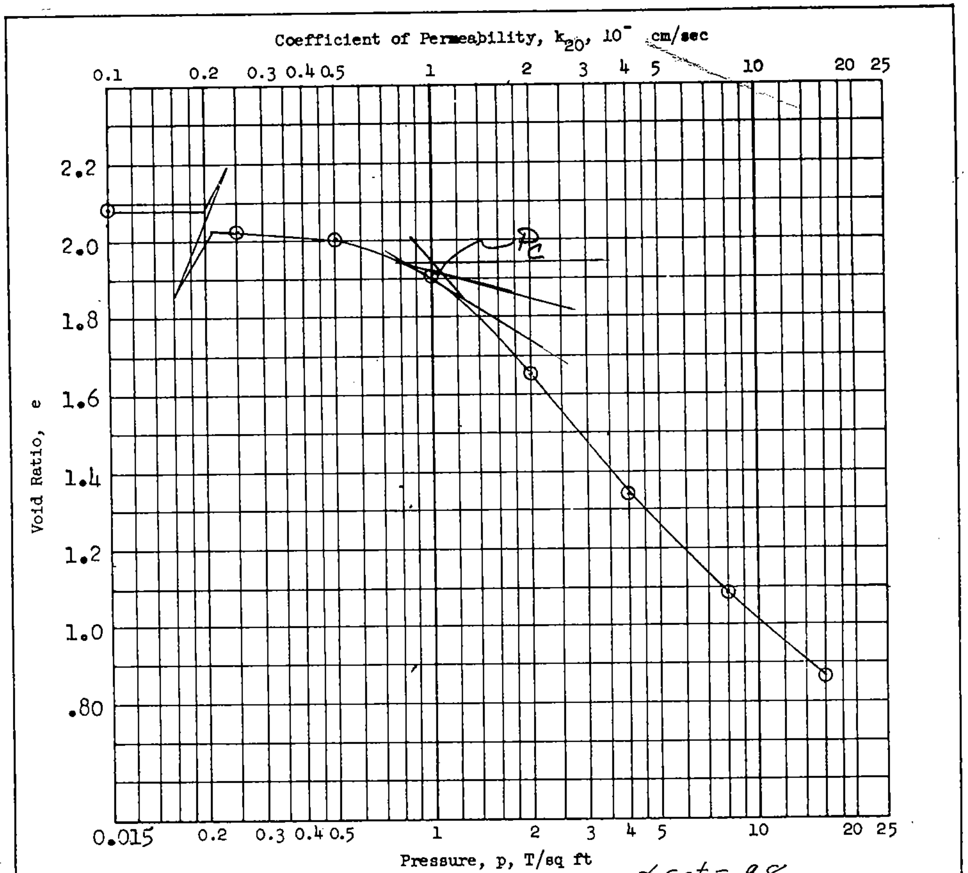


$\gamma sat. = 103$

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.152 in.	Water Content, w_o	60.3 %	w_f	%
Overburden Pressure, Po T/sq ft		Void Ratio, e_o	1.70	e_f	
Preconsol. Pressure, Pc = 0.89 T/sq ft		Saturation, S_o	97.4 %	S_f	%
Compression Index, C_c = 0.74		Dry Density, γ_d	63.4 lb/ft³		
Classification PLASTIC CLAY(CH)*;		k_{20} at e_o = × 10^{-} cm/sec			
LL 91	G_s 2.74	Project LK. PONT., LA.& VIC.-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC, GDM NO.2, SUPP.#5			
PL 27	D_{10}	Area			
Remarks * gray, few shell fragments		Boring No. 6-ULO		Sample No. 9-B	
		Depth El -26.7		Date 28 Nov., 1972	

JAL CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424

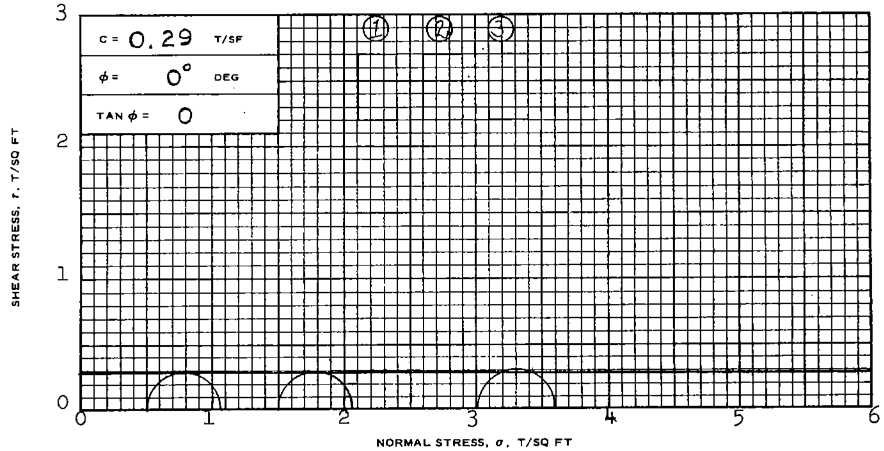


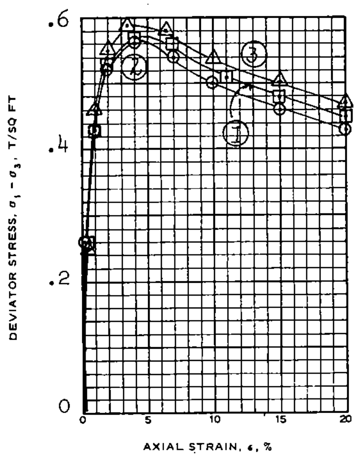
$\gamma sat. = 98$

Type of Specimen UNDISTURBED		Before Test		After Test	
Diam 4.25 in.	Ht 1.150 in.	Water Content, w_o	75.4 %	w_f	%
Overburden Pressure, Po T/sq ft		Void Ratio, e_o	2.08	e_f	
Preconsol. Pressure, Pc = 1.05 T/sq ft		Saturation, S_o	99.8 %	S_f	%
Compression Index, C_c = 1.02		Dry Density, γ_d	55.8 lb/ft³		
Classification PLASTIC CLAY(CH), gray		k_{20} at e_o = × 10^{-} cm/sec			
LL 96	G_s 2.75	Project LK. PONT., LA. & VIC.-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC, GDM#2, SUPP#5			
PL 32	D_{10}	Area			
Remarks		Boring No. 6-ULO		Sample No. 10-C	
		~~Depth~~ El -31.6		Date 28 Nov., 1972	

JAL CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424





γsat = 99

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	73.0	70.9	71.8	71.9
	DRY DENSITY LB/CU FT	γd_o	56.8	57.8	56.8	
	SATURATION, %	S_o	99.6	99.3	98.0	
	VOID RATIO	e_o	2.00	1.95	2.00	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.57	0.56	0.59	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	22	26	30	
ULTIMATE 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	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;one 1/16" silt seam

LL 90 | PL 31 | PI 59 | Gs 2.73 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS:

PROJECT LK. PONT.LA.&VIC.-ORLEANS PARISH LK. FR. LEVEES, WEST OF IHNC, GDM #2,SUPP.# 5

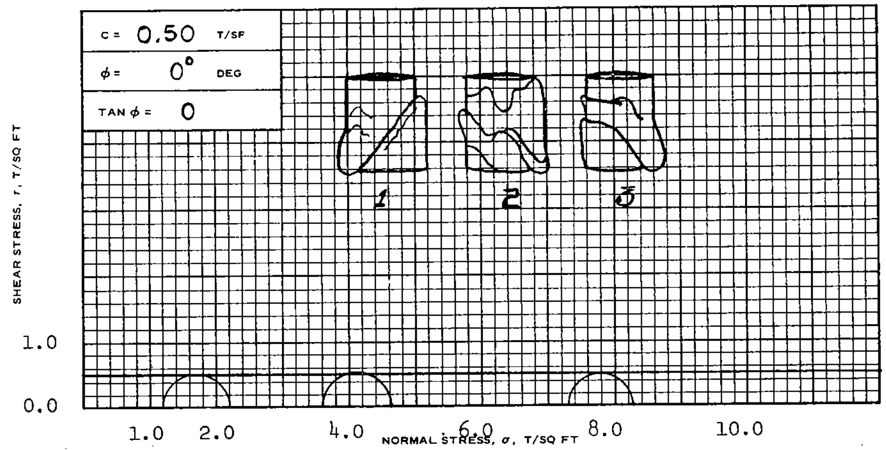
BORING NO. 6-ULO | SAMPLE NO. 10-B

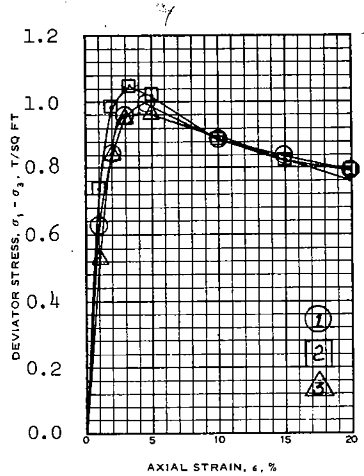
DEPTH/ELEV -30.5

LABORATORY USAEWES | DATE 7 Nov. 1972

GDA | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





γsat = 103

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	58.61	53.75	57.46	56.6
	DRY DENSITY LB/CU FT	γd_o	63.68	66.89	64.75	
	SATURATION, %	S_o	96.88	96.32	97.58	
	VOID RATIO	e_o	1.614	1.488	1.570	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.2	3.6	7.3	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.999	1.048	0.967	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	7.25	11.81	17.80	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS M (Gr) CH3: lns & thin lys ML; ars SP; slf

LL 69 | PL 23 | PI 46 | Gs 2.6670 | TYPE OF SPECIMEN 5" Undis. | TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.-Orleans Parish Lakefront Levees - West of IHNC

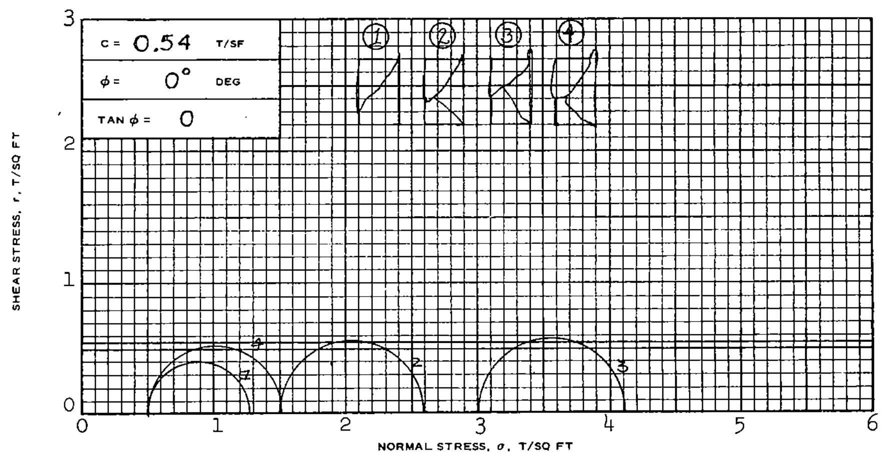
BORING NO. 6-ULO | SAMPLE NO. 15-C

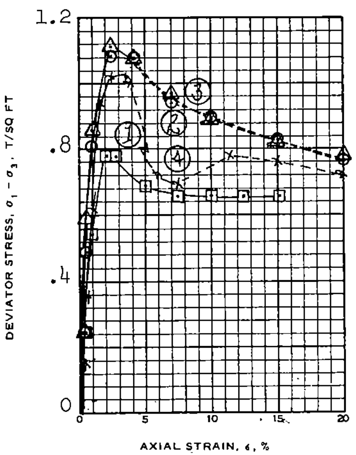
DEPTH/ELEV 57.3 / -51.9

LABORATORY NOD | DATE 13 June 73

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





γsat. = 109

SPECIMEN NO.			1	2	3	4	Avg.
INITIAL	WATER CONTENT, %	w_o	49.2	48.5	47.3	48.1	483
	DRY DENSITY LB/CU FT	γd_o	71.4	73.1	73.6	73.6	
	SATURATION, %	S_o	96.6	99.6	97.8	99.5	
	VOID RATIO	e_o	1.39	1.33	1.32	1.32	
BEFORE SHEAR	WATER CONTENT, %	w_c					
	DRY DENSITY LB/CU FT	γd_c					
	SATURATION, %	S_c					
	VOID RATIO	e_c					
	FINAL BACK PRESSURE, T/SQ FT	u_o					
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	0.5	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.78	1.09	1.11	1.02	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	7	16	21	14	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$					
INITIAL DIAMETER, IN.		D_o	1.41	1.41	1.41	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;1/16" to 1/8" size shells

LL 68 | PL 22 | PI 46 | Gs 2.73 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: --- Rate of strain increased .

PROJECT LK.PONT.LA.,&VIC.-ORLEANS PARISH LK. FR. LEVEES, WEST OF IHNC, GDM NO.2,SUPP.#5

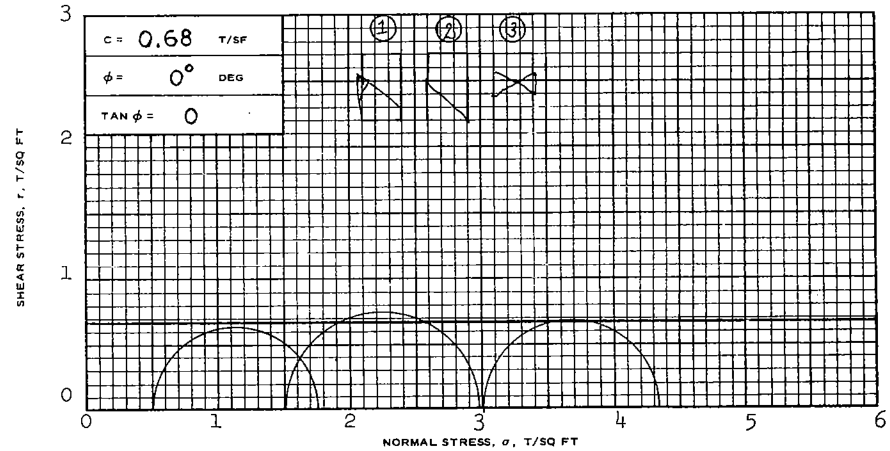
BORING NO. 6-ULO SAMPLE NO. 18-B

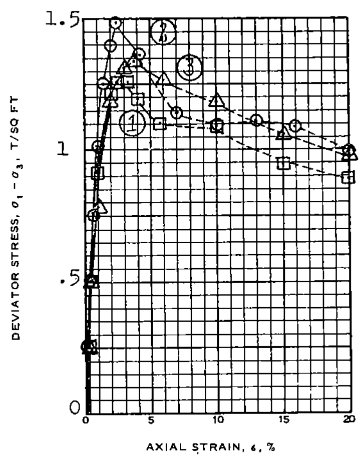
~~DEPTH~~/ELEV -63.0

LABORATORY USAEWES DATE 7 Nov. 1972

JMS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





γsat. = 90

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	90.3	94.0	89.6	91.3
	DRY DENSITY LB/CU FT	γd_o	46.8	45.6	47.2	
	SATURATION, %	S_o	96.9	97.1	97.0	
	VOID RATIO	e_o	2.33	2.42	2.31	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.26	1.48	1.34	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	12	21	33	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.39	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),brownish gray;finely divided organic matter

LL 141 | PL 45 | PI 96 | Gs 2.50 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: --- Increased rate of strain.

PROJECT LK.PONT.LA.&VIC.-OLREANS PARISH LK. FR. LEVEES, WEST OF IHNC,GDM #2,SUPP.#5

BORING NO. 6-ULO SAMPLE NO. 19-B

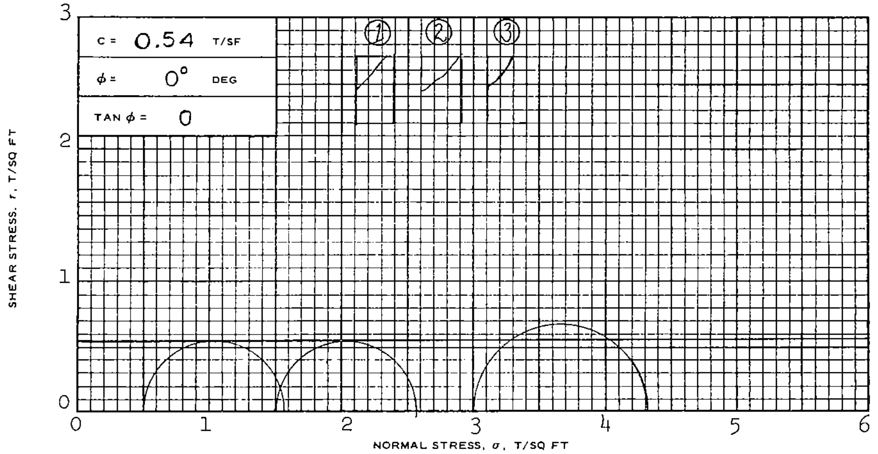
~~DEPTH~~/ELEV -67.0

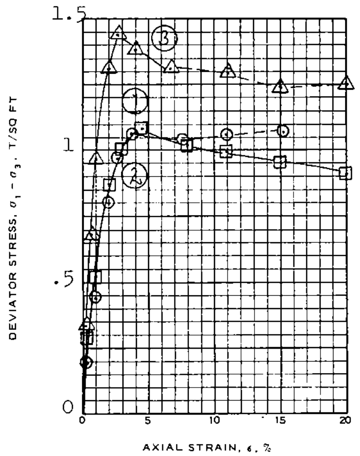
LABORATORY USAEWES DATE 8 Nov. 1972

GDA TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Test 1





γsat = 115

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	37.7	36.8	36.4	37.0
	DRY DENSITY LB/CU FT	γd_o	82.4	82.8	83.4	
	SATURATION, %	S_o	97.3	95.9	95.8	
	VOID RATIO	e_o	1.05	1.04	1.03	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	1.08	1.07	1.44	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN		t_f	16	12	14	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.42	1.42	1.42	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS LEAN CLAY(CL),gray;alternate layers of silt seams and clay seams

LL 45 | PL 19 | PI 26 | G_s 2.71

TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: --- Rate of strain increased.
Limits and G_s tested on silt and clay.

PROJECT LK.PONT.LA.&VIC.-ORLEANS PARISH LK. FR. LEVEES, WEST OF IHNC, GDM NO.2,SUPP.#5

BORING NO. 6-ULO | SAMPLE NO. 25-A

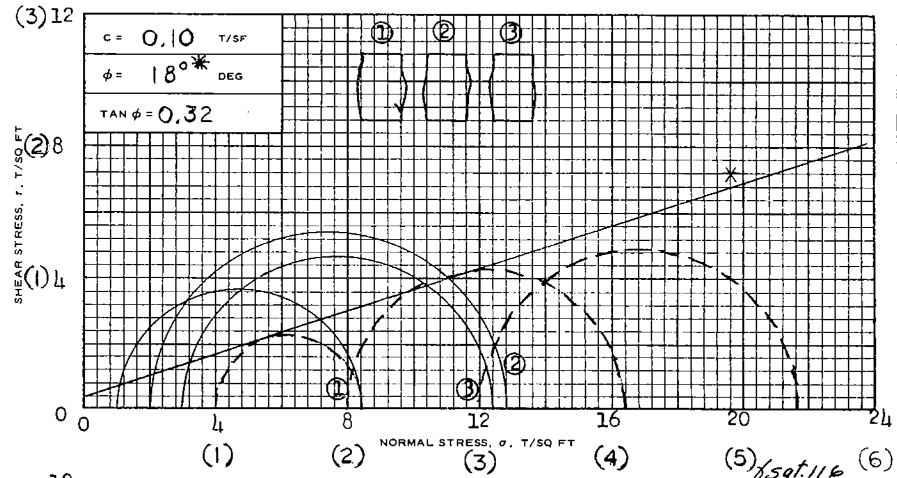
DEPTH/ELEV -90.0

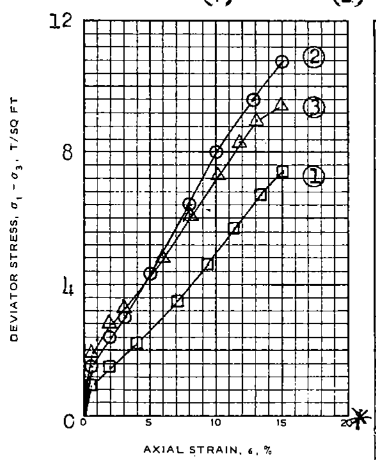
LABORATORY USAEWES | DATE 8 Nov. 1972

JMS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Test 2





γsat 116

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	33.3	32.7	33.6	33.2
	DRY DENSITY LB/CU FT	γd_o	85.6	86.4	85.5	
	SATURATION, %	S_o	93.5	93.6	94.1	
	VOID RATIO	e_o	0.954	0.936	0.957	
BEFORE SHEAR	WATER CONTENT, %	w_c	31.2	30.6	30.6	
	DRY DENSITY LB/CU FT	γd_c	88.0	88.3	89.7	
	SATURATION, %	S_c	92.8*	91.6*	94.8*	
	VOID RATIO	e_c	0.901	0.895	0.865	
	FINAL BACK PRESSURE, T/SQ FT	u_o	5.04	5.04	5.04	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	7.36	10.75	9.42	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN		t_f	156	115	98	
*$(\sigma_1-\sigma_3)$ AT MAX PORE PRESSURE			1.4	2.1	2.4	
INITIAL DIAMETER, IN.		D_o	1.41	1.41	1.41	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SILT(ML), dark gray; few small shells

LL - | PL - | PI - | G_s 2.68

TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST R

REMARKS: * Pore pressure response indicated 100% saturation
Portion of sample allowed to drain before trimming
See attached plot for effective values

PROJECT LK. PONT.,LA.& VIC.-ORLEANS PARISH LK. FRONT LEVEES,WEST OF IHNC, GDM NO.2,SUPP.#5

BORING NO. 6-ULO | SAMPLE NO. 7-B

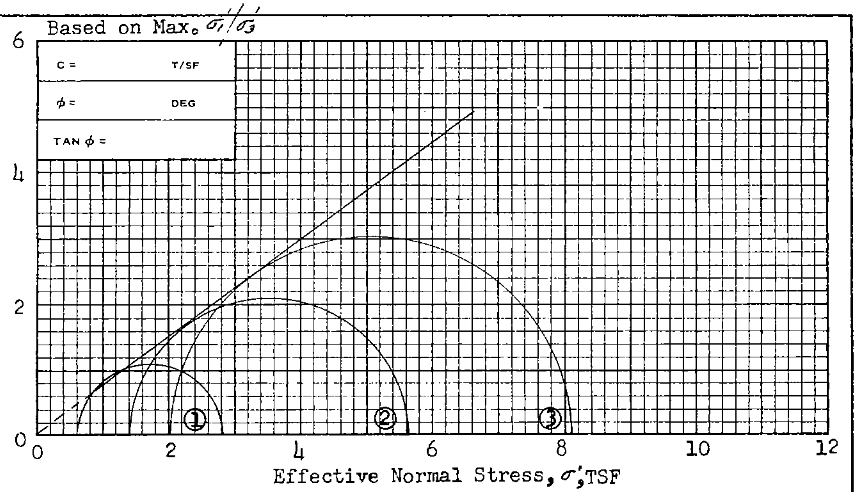
DEPTH/ELEV -18.7

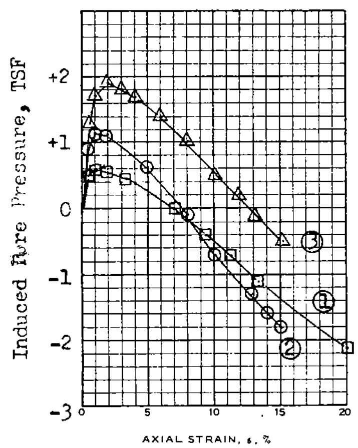
LABORATORY USAEWES | DATE 5 Feb., 1973

PJR TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Sheet 1 of 2





SPECIMEN NO.					
INITIAL	WATER CONTENT, % w_o				
	DRY DENSITY LB/CU FT γd_o				
	SATURATION, % S_o				
	VOID RATIO e_o				
BEFORE SHEAR	WATER CONTENT, % w_c				
	DRY DENSITY LB/CU FT γd_c				
	SATURATION, % S_c				
	VOID RATIO e_c				
	FINAL BACK PRESSURE, T/SQ FT u_o				
MINOR PRINCIPAL STRESS, T/SQ FT σ_3					
MAXIMUM DEVIATOR STRESS, T/SQ FT $(\sigma_1-\sigma_3)_{MAX}$					
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN t_f					
ULTIMATE DEVIATOR STRESS, T/SQ FT $(\sigma_1-\sigma_3)_{ULT}$					
INITIAL DIAMETER, IN. D_o					
INITIAL HEIGHT, IN. H_o					

CONTROLLED- TEST

DESCRIPTION OF SPECIMENS

LL	PL	PI	Gs	TYPE OF SPECIMEN	TYPE OF TEST

REMARKS:

PROJECT LK. PONT., LA.& VIC.-ORLEANS PARISH LK. FT. LEVEES, WEST OF IHNC, GDM #2, SUPP. #5

BORING NO. 6-ULO SAMPLE NO. 7-B

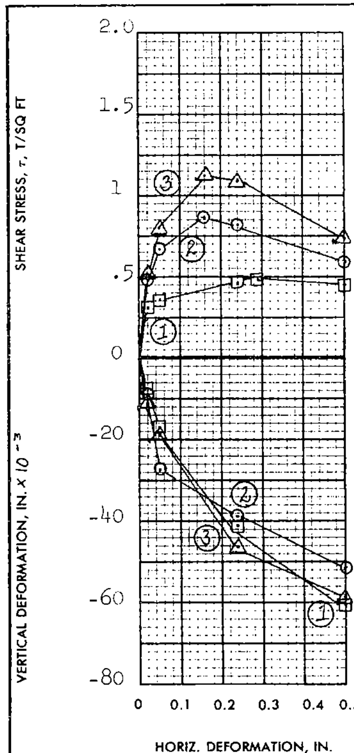
DEPTH/ELEV -18.7

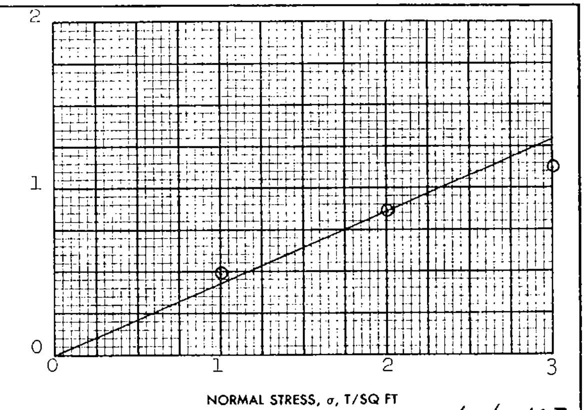
LABORATORY USAEWES DATE 5 Feb., 1973

PJR TRIAXIAL COMPRESSION TEST REPORT

Sheet 2 of 2

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





SHEAR STRENGTH PARAMETERS

ϕ' = 23°

TAN ϕ' = 0.43

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

γ_{sat} = 107

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	51.6 %	51.0%	55.3%	52.6%
	VOID RATIO	e_o	1.39	1.31	1.66	
	SATURATION	S_o	100+%	100+%	90.6%	%
	DRY DENSITY, LB/CU FT	γ_d	71.0	73.5	63.9	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	2	4	4	
FINAL	WATER CONTENT	w_f	41.6 %	34.6%	39.0%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.48	0.86	1.12	
ACTUAL TIME TO FAILURE, MIN		t_f	1620	930	930	
RATE OF STRAIN, IN./MIN			.00017	.00017	.00017	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 1&2=0.563, 3=0.621 IN. THICK

CLASSIFICATION PLASTIC CLAY(CH),gray;sandy silt lenses

LL 60 PL 24 PI 36 Gs 2.72

REMARKS

PROJECT LK.PONT.LA.&VIC.,-ORLEANS PARISH LK.FR. LEVEES,WEST OF IHNC, GDM #2,SUPP.NO. 5

AREA

BORING NO. 6-ULO SAMPLE NO. 8-B

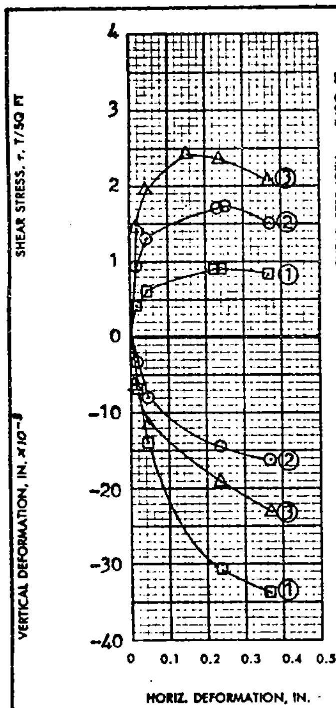
DEPTH/EL -23.0 DATE 19 October 1972

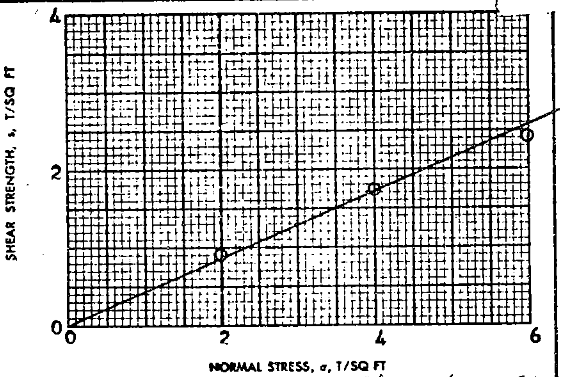
BWG

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945

PLATE IX-3





SHEAR STRENGTH PARAMETERS

ϕ' = 23°

TAN ϕ' = 0.432

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

			[illegible]	[illegible]	105.6	105.1
TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	54.1%	54.6%	52.8%	53.8 %
	VOID RATIO	e_o	1.51	1.51	1.48	
	SATURATION	S_o	97.1%	98.0%	96.7%	%
	DRY DENSITY, LB/CU FT	γ_d	67.3	67.3	68.3	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	7	6	4	
FINAL	WATER CONTENT	w_f	47.6%	41.5%	36.8%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.90	1.73	2.42	
ACTUAL TIME TO FAILURE, MIN		t_f	1260	1440	900	
RATE OF STRAIN, IN./MIN			.00013	.00013	.00013	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.538 IN. THICK

CLASSIFICATION PLASTIC CLAY(CH),gray;trace of shell fragments

LL 82 PL 25 PI 57 G_s 2.71

REMARKS

PROJECT LK.PONT.,LA.& VIC.- ORLEANS PARISH LAKE FRONT LEVEES,WEST OF IHNC,GDM#2, SUPP. #5

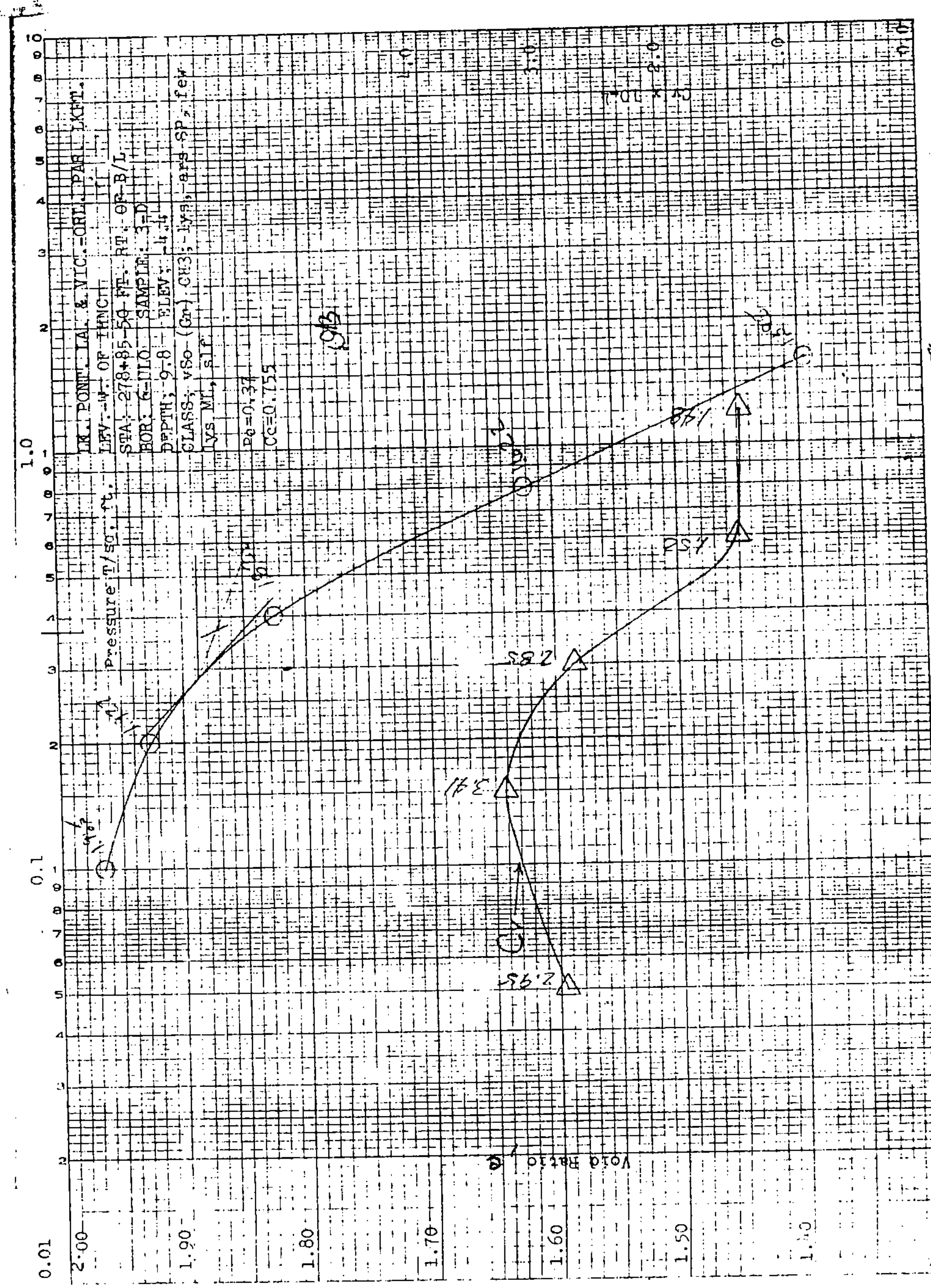
AREA

BORING NO. 6-ULO SAMPLE NO. 17-B

EL -58.5 DATE 12 October,1972

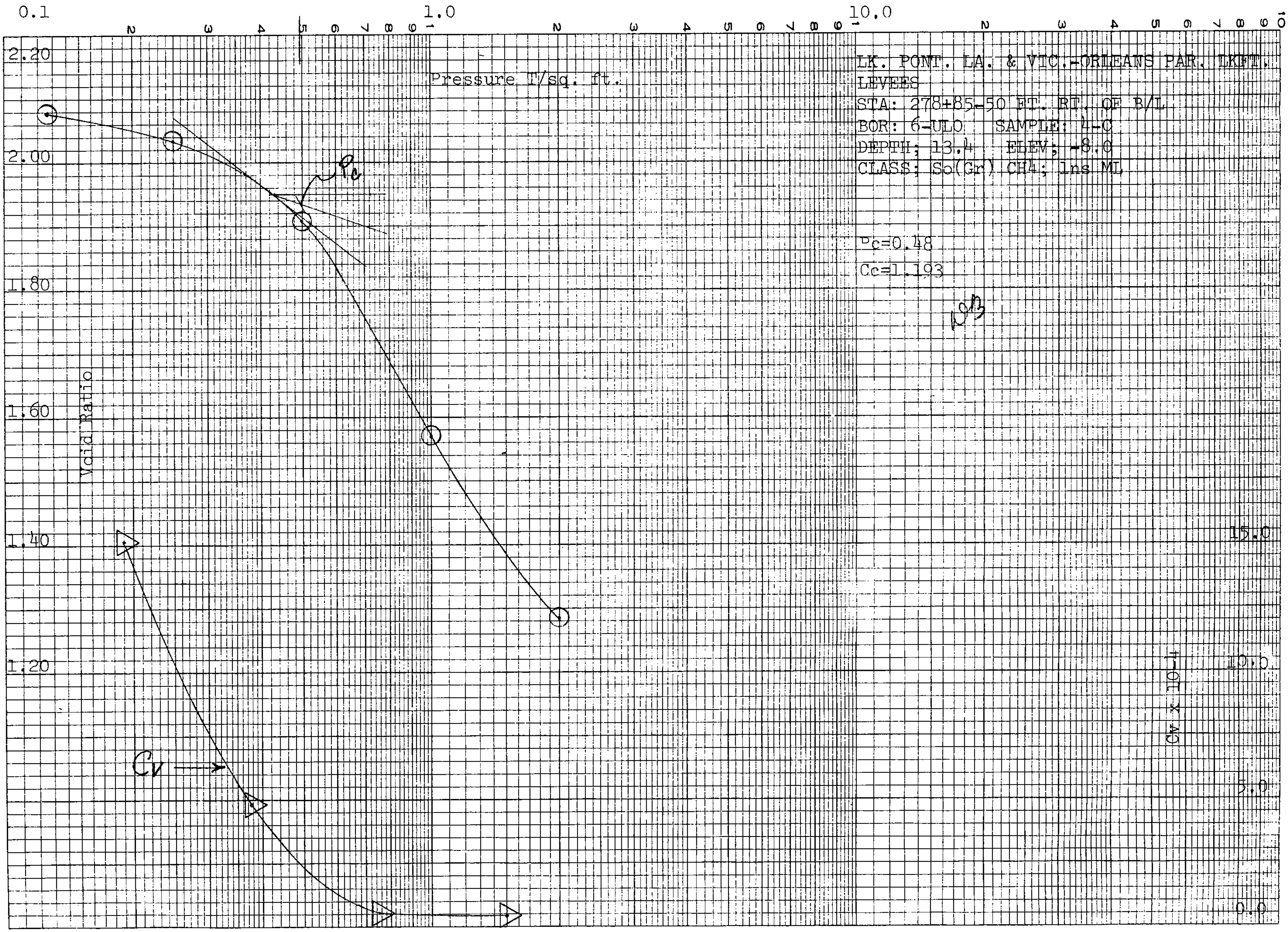
RCH DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)



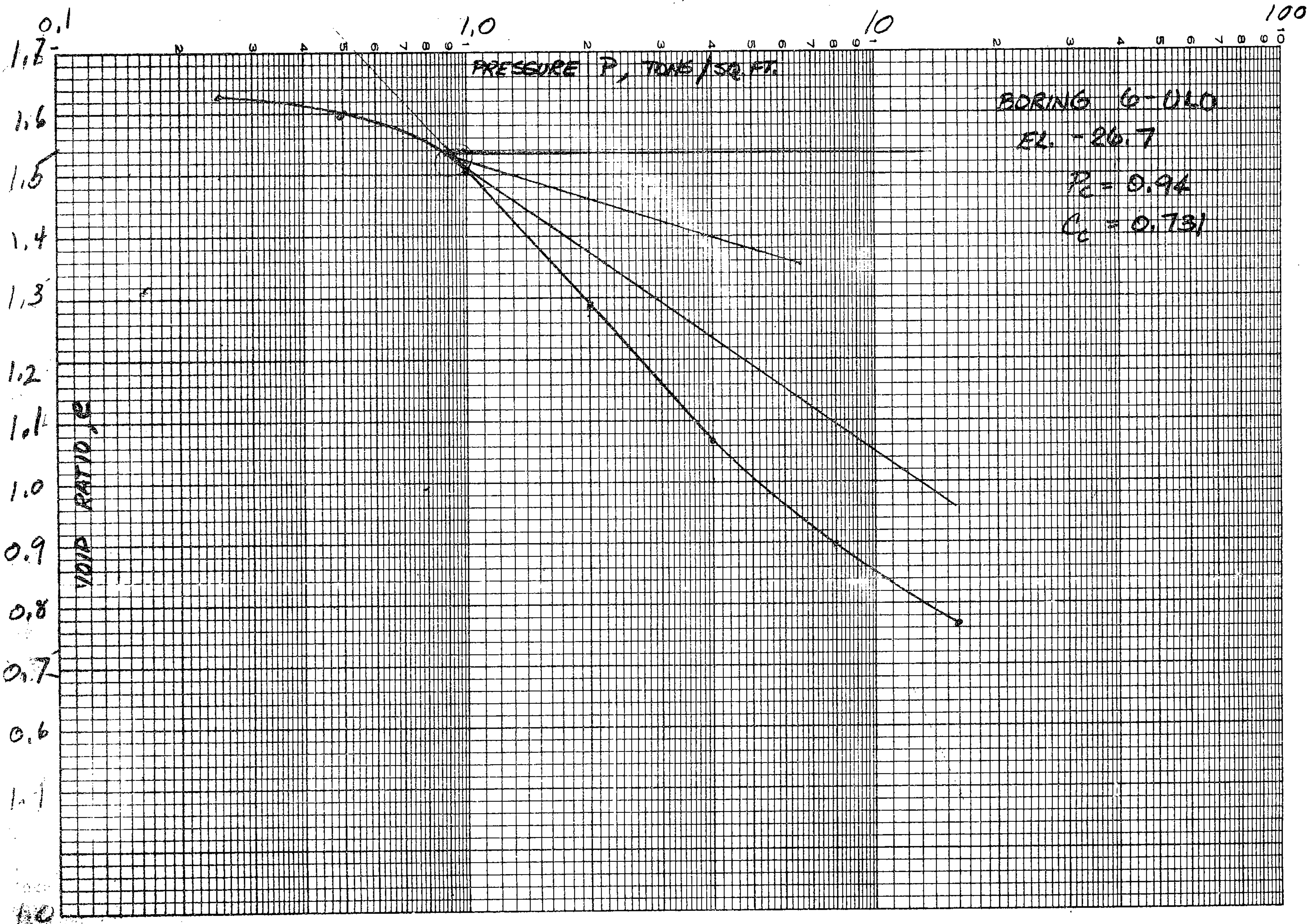
NO. 340-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.



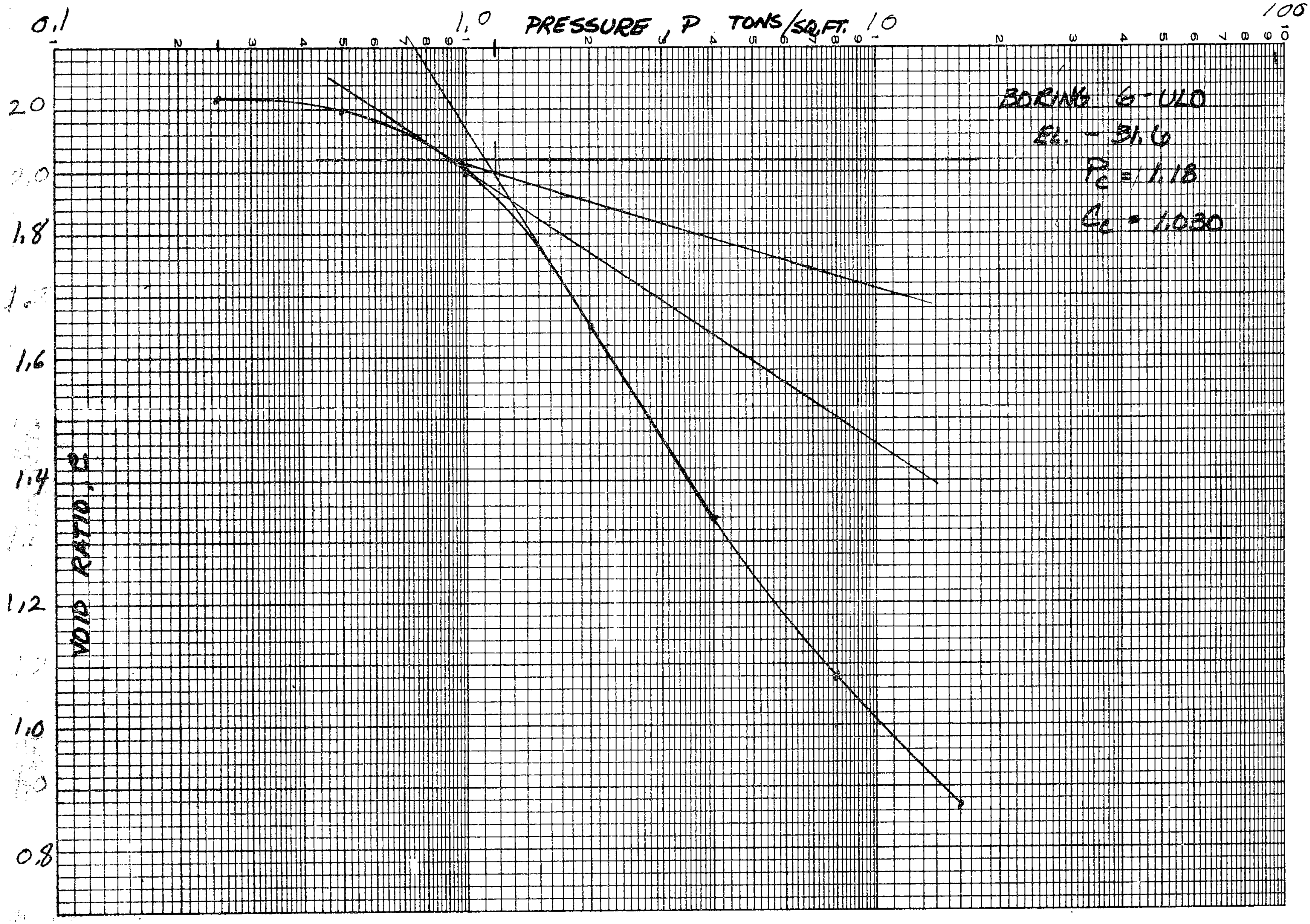
NO. 341-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC – 3 CYCLES X 70 DIVISIONS

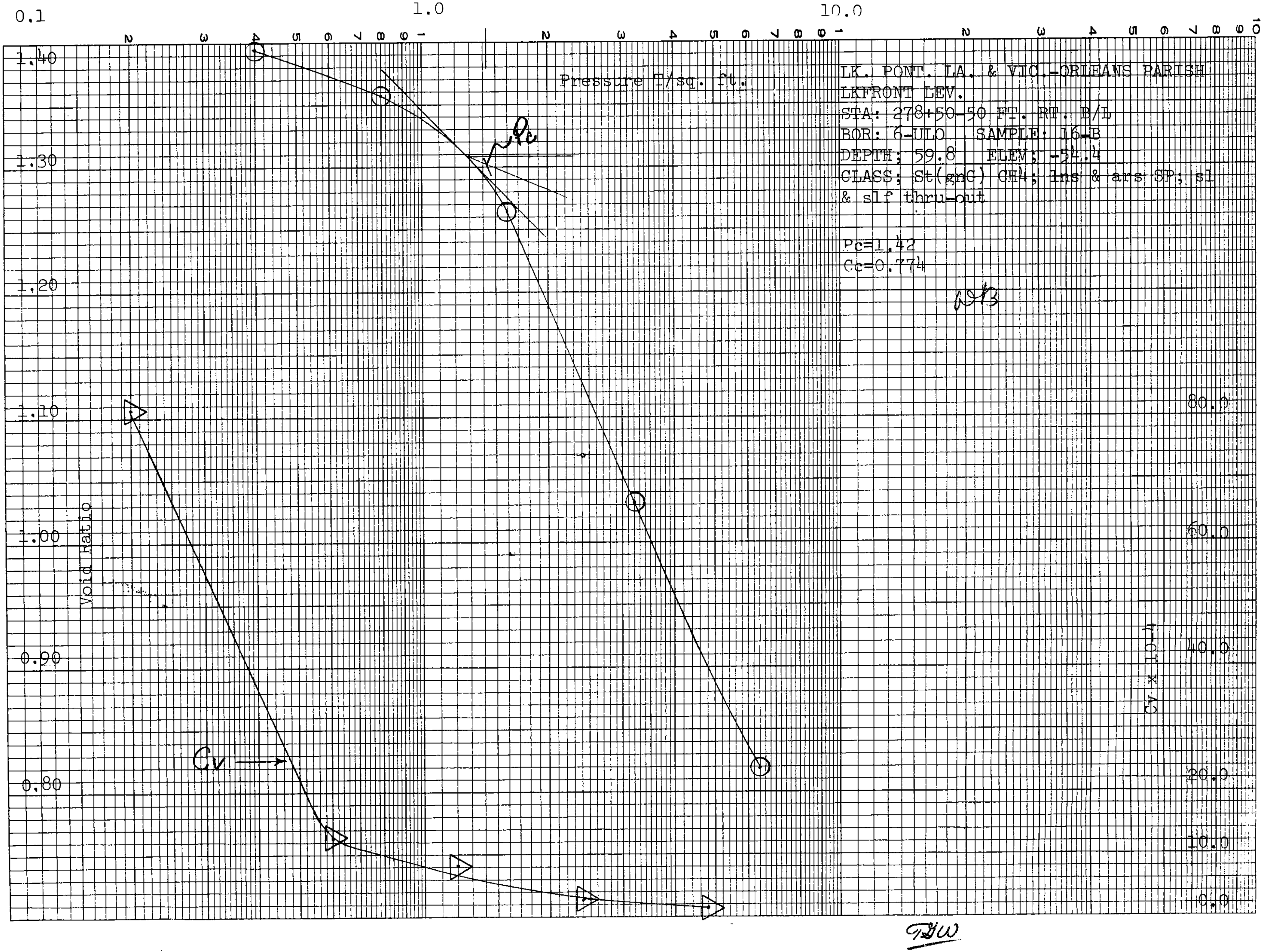
EUGENE DIETZGEN CO.
MADE IN U. S. A.

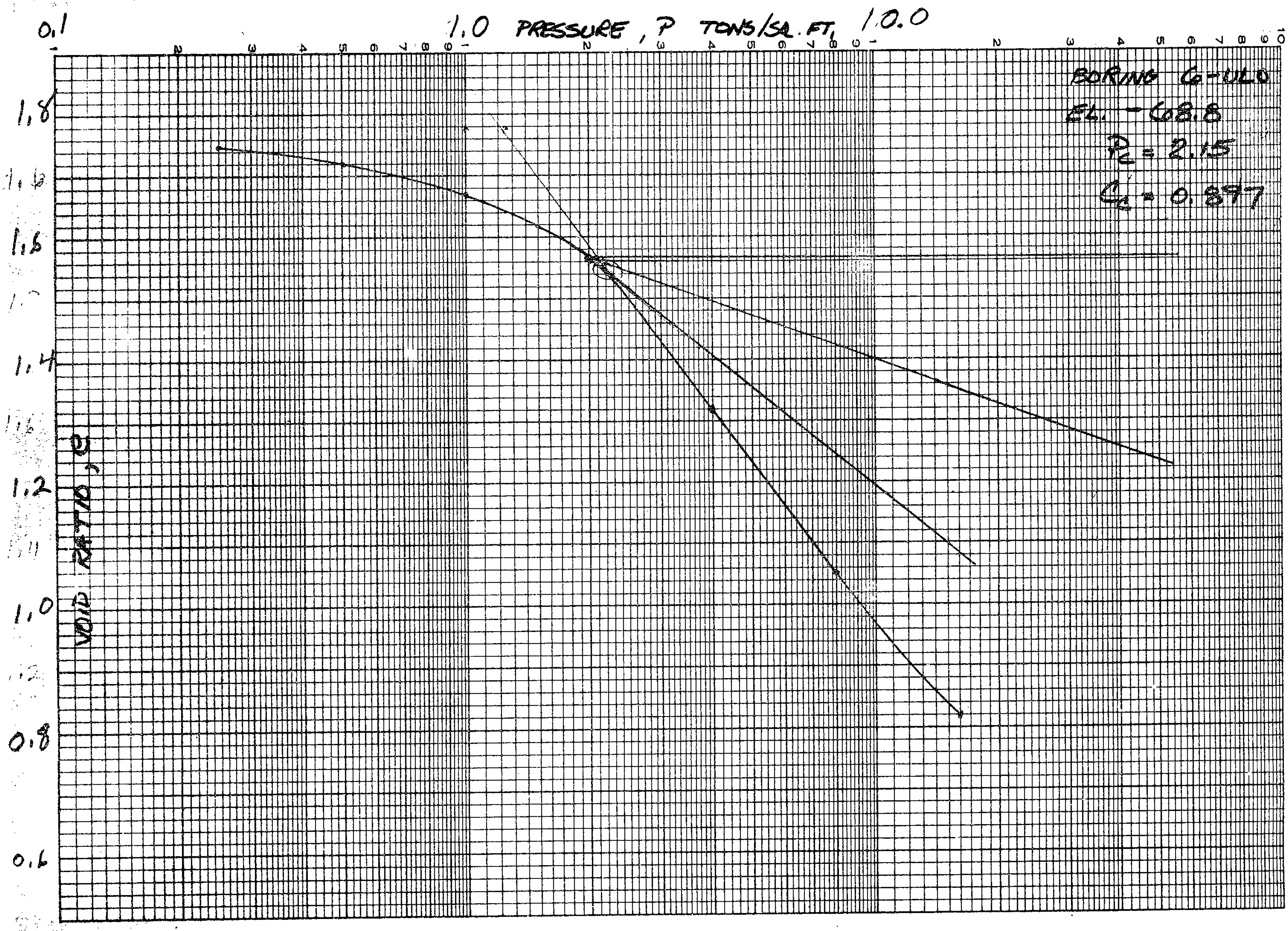


NO. 341-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC–3 CYCLES X 70 DIVISIONS

EUGENE DIETZGEN CO.
MADE IN U. S. A.

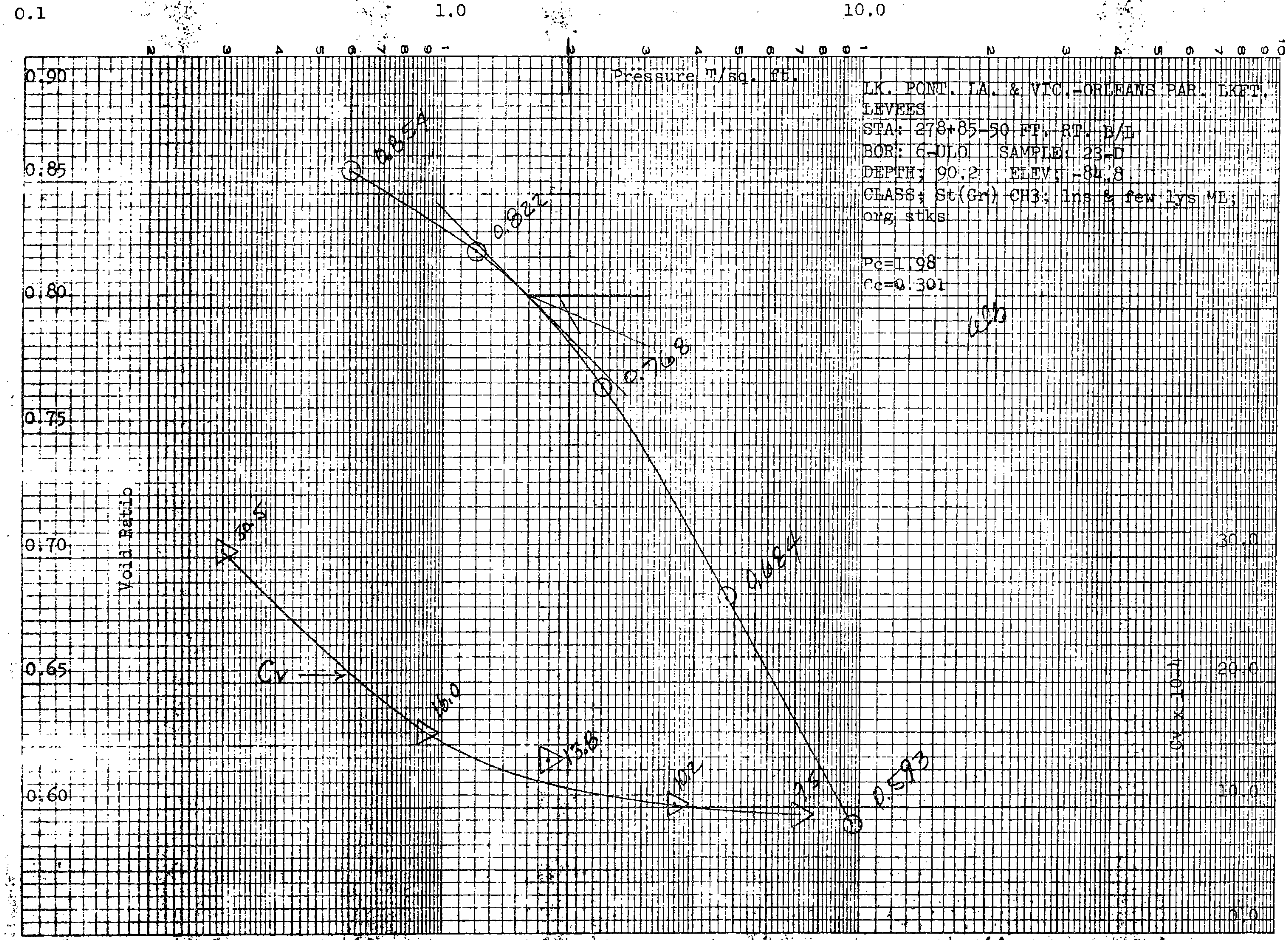



0.1
1.0
10.0
Pressure T/sq. ft.
Void Ratio
1.40
1.30
1.20
1.10
1.00
0.90
0.80
80.0
60.0
40.0
20.0
10.0
0.0
Cv x 10-4
Pc
Cv
LK. PONT. LA. & VIC.-ORLEANS PARISH
LKFRONT LEV.
STA: 278+50-50 FT. RT. B/L
BOR: 6-ULO SAMPLE: 16-B
DEPTH: 59.8 ELEV: -54.4
CLASS: St(gnC) CH4; lns & ars SP; sl
& slf thru-out
Pc=1.42
Cc=0.774
WB
TDW


0.1
1.0 PRESSURE, P TONS/SQ. FT. 10.0
BORING 6-UL0
EL. -68.8
P_c = 2.15
C_c = 0.897
VOID RATIO, e
1.8
1.6
1.4
1.2
1.0
0.8
0.6

NO. 340-L310 DIETZGEN GRAPH PAPER
SEMI LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.



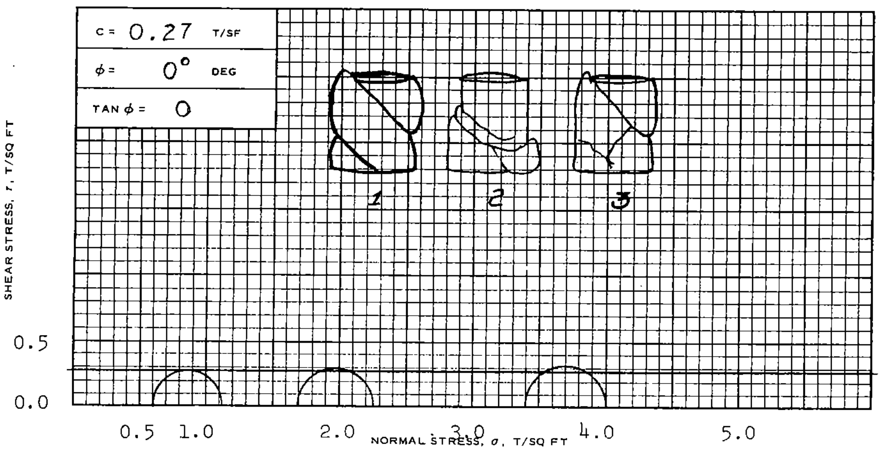
T340

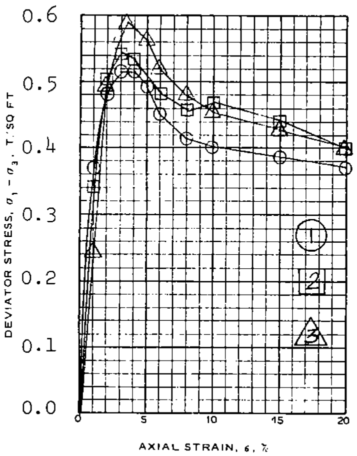
4

c = 0.27 T/SF

ϕ = 0° DEG

TAN ϕ = 0





$\gamma sat = 98$

	SPECIMEN NO.		1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	72.39	70.70	69.76	71.0
	DRY DENSITY LB/CU FT	γd_o	55.66	57.09	57.65	
	SATURATION, %	S_o	96.85	98.27	98.41	
	VOID RATIO	e_o	2.001	1.926	1.897	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.6	1.7	3.4	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.516	0.543	0.589	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	4.75	10.53	12.33	
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS So (Gr & dGr) CH4: lns & few lys ML; dw; org ars.

LL 82	PL 21	PI 61	Gs 2.6765	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic. - Orleans Parish

Lakefront Levees - West of IHNC

BORING NO. 7-ULO SAMPLE NO. 6-C

DEPTH/ELEV 21.1 / -16.4

LABORATORY NOD DATE 13 June 73

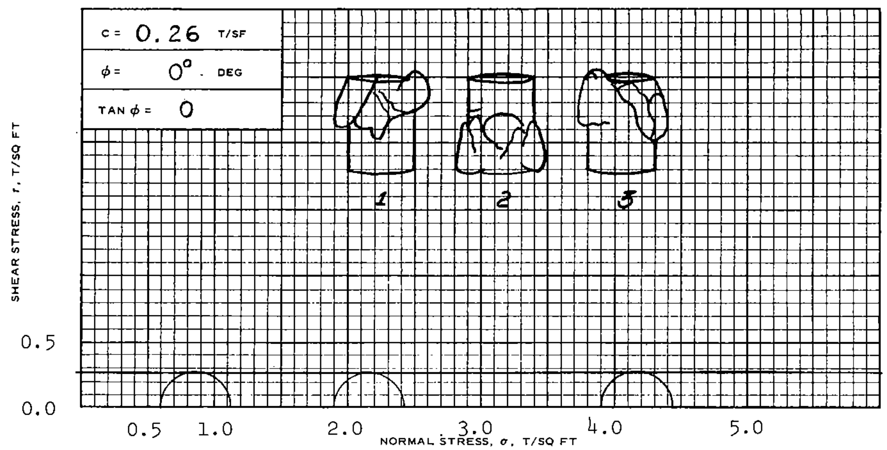
TBW **TRIAXIAL COMPRESSION TEST REPORT**

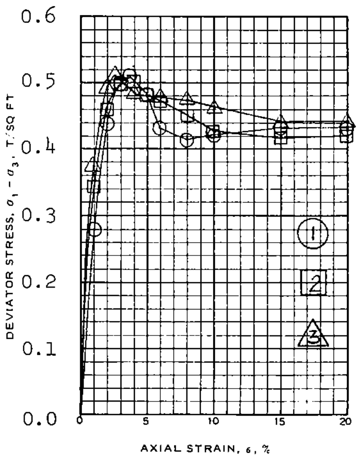
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

c = 0.26 T/SF

ϕ = 0° DEG

TAN ϕ = 0





$\gamma sat = 104$

	SPECIMEN NO.		1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	56.31	56.82	55.79	56.3
	DRY DENSITY LB/CU FT	γd_o	66.26	65.70	66.16	
	SATURATION, %	S_o	98.98	98.51	97.81	
	VOID RATIO	e_o	1.526	1.547	1.529	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.6	1.9	3.9	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.512	0.508	0.513	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	5.81	12.04	9.20	
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS So (Gr) CH3: lns lys & ars ML; org strks; few slf.

LL 77	PL 21	PI 56	Gs 2.6814	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.-Orleans Parish

Lakefront Levees - West of IHNC

BORING NO. 7-ULO SAMPLE NO. 7-C

DEPTH/ELEV 25.2 / -20.5

LABORATORY NOD DATE 13 June 73

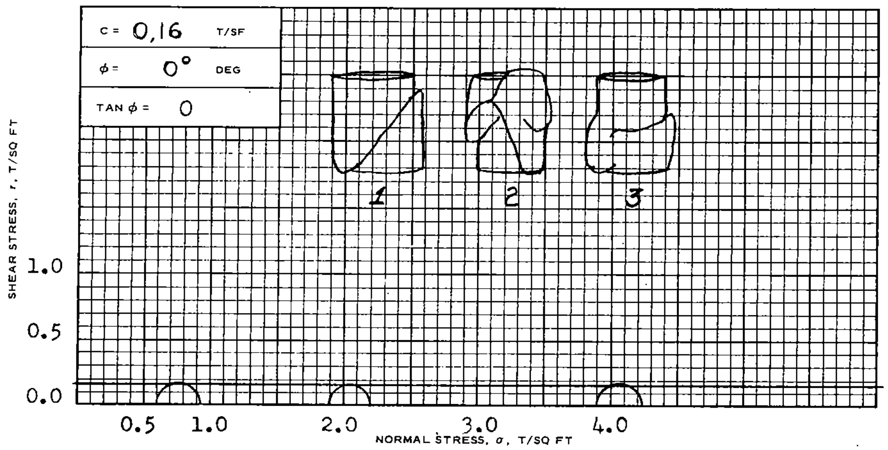
TBW **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

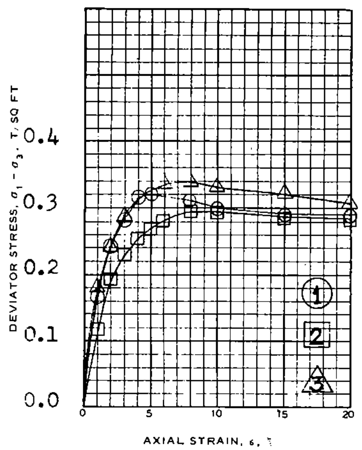
c = 0,16 T/SF

ϕ = 0° DEG

TAN ϕ = 0



$\gamma sat. = 100$



SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	68.13	69.52	67.36	68.3
	DRY DENSITY LB/CU FT	γd_o	59.37	58.75	59.84	
	SATURATION, %	S_o	100	100	100	
	VOID RATIO	e_o	1.805	1.835	1.783	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.6	1.9	3.9	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.322	0.297	0.338	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	7.78	28.19	28.57	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS So (Gr) CH4: lns & lys ML; spks dw; org strks.

LL 73	PL 23	PI 50	Gs 2.6686	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic.-Orleans Parish

Lakefront Levees - West of IHNC

BORING NO. 7-ULO SAMPLE NO. 8-A

DEPTH/ELEV 27.3 / -22.6

LABORATORY NOD DATE 12 June 73

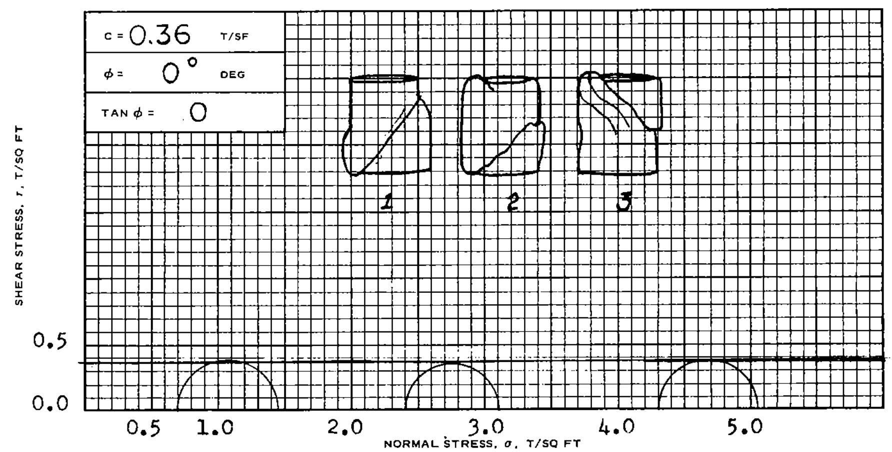
TJW. TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

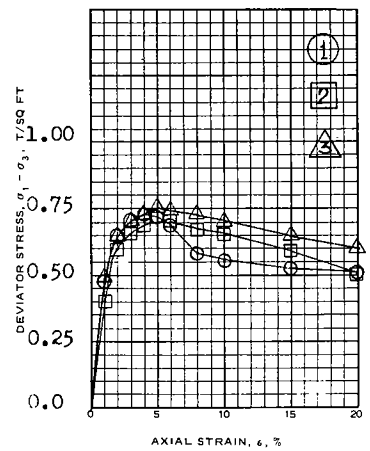
c = 0.36 T/SF

ϕ = 0° DEG

TAN ϕ = 0



$\gamma sat. = 98$



SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	71.03	70.58	70.26	70.6
	DRY DENSITY LB/CU FT	γd_o	57.05	57.19	57.42	
	SATURATION, %	S_o	98.46	98.18	98.35	
	VOID RATIO	e_o	1.938	1.931	1.919	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.7	2.4	4.3	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.733	0.704	0.752	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	6.45	21.52	17.78	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS M (Gr) CH4: few lns ML; org strks.

LL 90	PL 25	PI 65	Gs 2.6857	TYPE OF SPECIMEN 5" Undis.	TYPE OF TEST "Q"

REMARKS:

PROJECT Lk. Pont. La. & Vic. - Orleans Parish

Lakefront Levees - West of IHNC

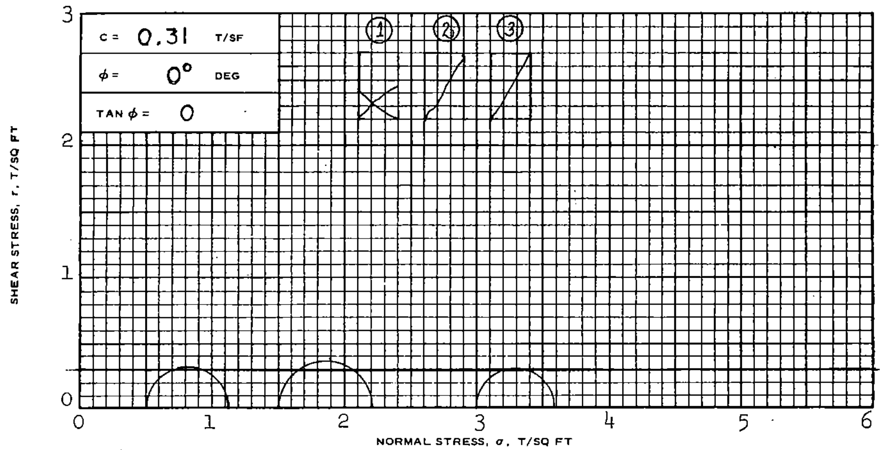
BORING NO. 7-ULO SAMPLE NO. 9-C

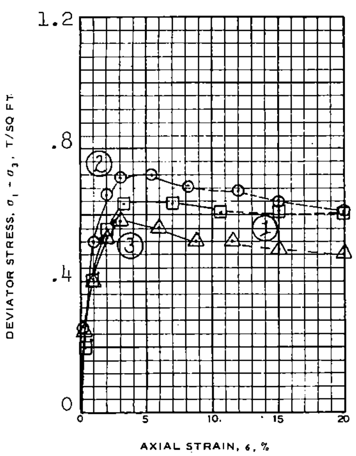
DEPTH/ELEV 33.4 /-28.7

LABORATORY NOD DATE 13 June 73

TJW TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





$\gamma_{sat.} = 104$

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	51.0	54.3	64.8	56.7
	DRY DENSITY LB/CU FT	γd_o	69.0	67.5	61.3	
	SATURATION, %	S_o	96.2	98.9	100+	
	VOID RATIO	e_o	1.41	1.46	1.71	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.61	0.72	052	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	19	50	18	
ULTIMATE 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	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;sand seams

LL 55 | PL 19 | PI 36 | Gs 2.66 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: --- Rate of strain increased.

PROJECT LK.PONT.LA.&VIC.-ORLEANS PARISH LK. FR. LEVEES, WEST OF IHNC, GDM #2, SUPP.#5

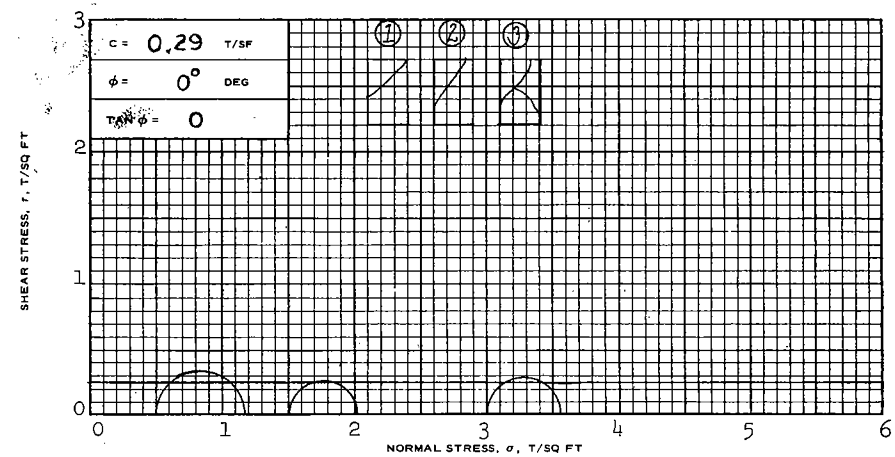
BORING NO. 7-ULO | SAMPLE NO. 13-D

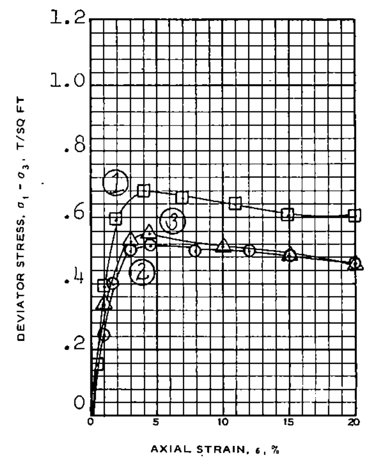
~~DEPTH~~/ELEV -44.2

LABORATORY USAEWES | DATE 8 Nov. 1972

GDA **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





$\gamma_{sat.} = 102$

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	58.1	58.3	61.4	59.3
	DRY DENSITY LB/CU FT	γd_o	64.6	63.8	62.5	
	SATURATION, %	S_o	97.2	97.4	97.3	
	VOID RATIO	e_o	1.62	1.65	1.71	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.68	0.51	0.55	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	10	17	18	
ULTIMATE 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	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;numerous shell fragments

LL 70 | PL 24 | PI 46 | Gs 2.71 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS:

PROJECT LK. PONT.LA.& VIC.-ORLEANS PARISH LK.FR. LEVEES,WEST OF IHNC,GDM #2,SUPP. #5

BORING NO. 7-ULO | SAMPLE NO. 14-D

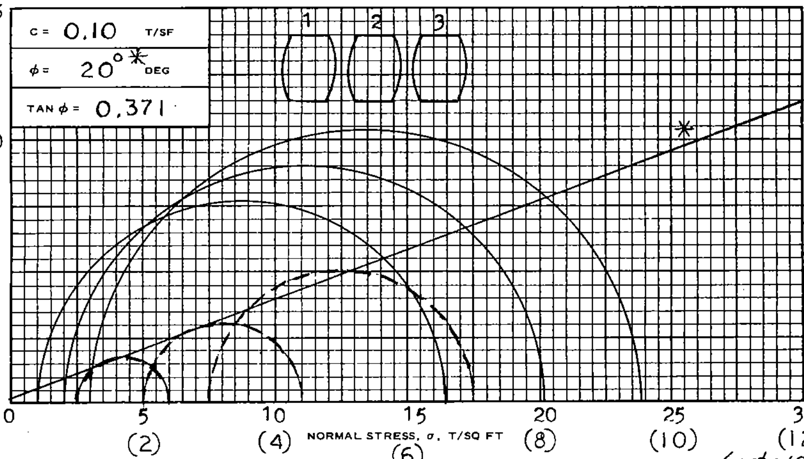
~~DEPTH~~/ELEV -49.2

LABORATORY USAEWES | DATE 9 Nov. 1972

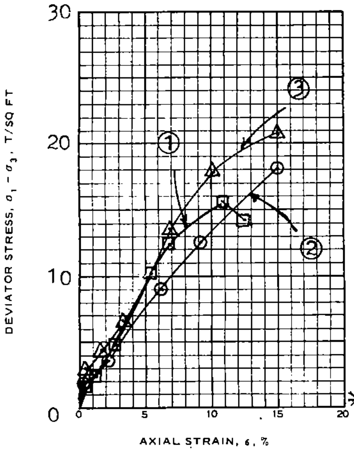
JMS **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Sheet 1 of 2



$\gamma_{sat} = 121$



SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	28.8	29.7	29.2	29.2
	DRY DENSITY LB/CU FT	γd_o	93.8	92.9	93.3	
	SATURATION, %	S_o	99.5	100+	99.6	
	VOID RATIO	e_o	0.770	0.788	0.780	
BEFORE SHEAR	WATER CONTENT, %	w_c	29.5	30.2	28.9	
	DRY DENSITY LB/CU FT	γd_c	95.3	95.3	96.3	
	SATURATION, %	S_c	100+	100+	100+	
	VOID RATIO	e_c	0.742	0.742	0.724	
	FINAL BACK PRESSURE, T/SQ FT	u_o	2.66	4.10	4.10	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	15.48	18.11	20.79	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	81	109	121	
* $(\sigma_1 - \sigma_3)$ AT MAX PORE PRESSURE			1.4	2.4	4.0	
INITIAL DIAMETER, IN.		D_o	1.40	1.39	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS ~~FINE~~ SAND ~~(SP)~~, gray; numerous small shells SILTY (SM)

LL -	PL -	PI -	Gs 2.66	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST R

REMARKS: See attached plot for effective values
Portion of sample allowed to drain before trimming

PROJECT LK.PONT., LA.&VIC.-ORLEANS PARISH LAKE FRONT LEVEES, WEST OF IHNC, GDM#2, SUPP. #5

BORING NO. 7-ULO SAMPLE NO. 4-C

~~DEPTH~~/ELEV -8.3

LABORATORY USAEWES DATE 25 Sept., 1972

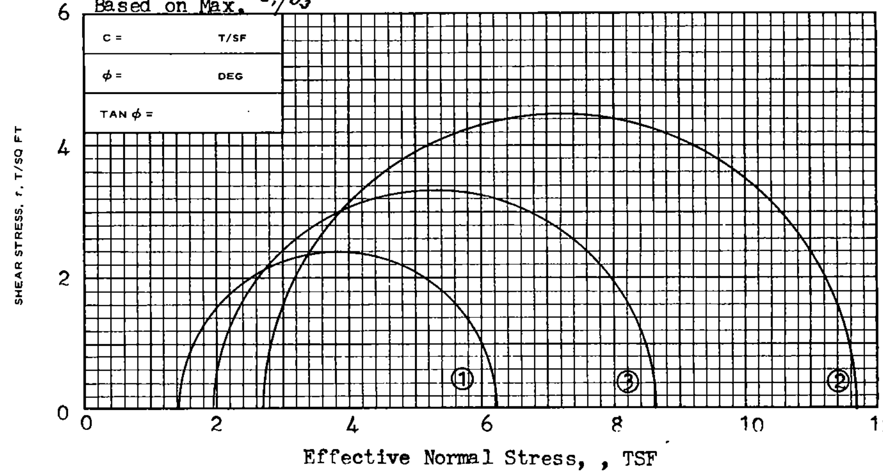
TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

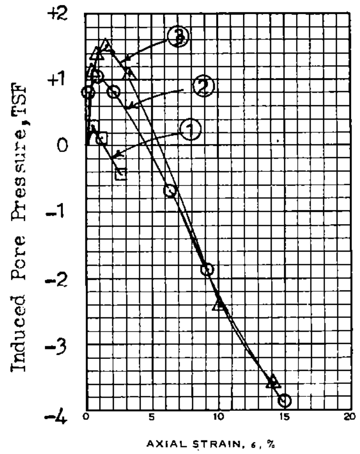
Sheet 1 of 2

Sheet 2 of 2

Based on Max. σ_1'/σ_3'



Effective Normal Stress, , TSF



SPECIMEN NO.						
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3				
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$				
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f				
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o				
INITIAL HEIGHT, IN.		H_o				

CONTROLLED- TEST

DESCRIPTION OF SPECIMENS

LL	PL	PI	Gs	TYPE OF SPECIMEN	TYPE OF TEST R

REMARKS: Pore pressure readings for test specimen no. 1 invalid after 2.5 percent strain because of equipment malfunction

PROJECT LK.PONT., LA.&VIC.-ORLEANS PARISH LAKE FRONT LEVEES, WEST OF IHNC, GDM#2, SUPP. #5

BORING NO. 7-ULO SAMPLE NO. 4-C

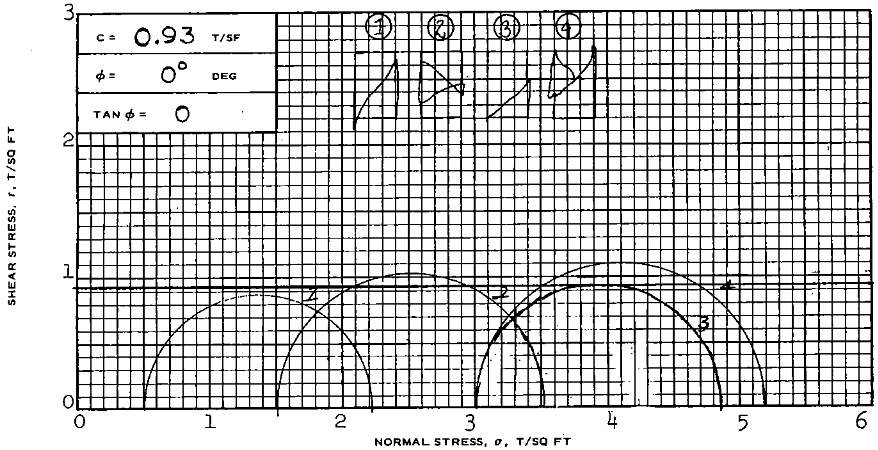
~~DEPTH~~/ELEV -8.3

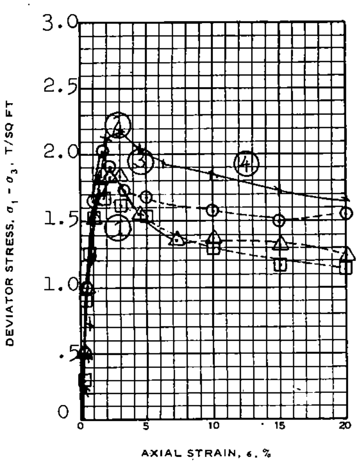
LABORATORY USAEWES DATE 25 Sept., 1972

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Sheet 2 of 2





γsat = 117

SPECIMEN NO.			1	2	3	4	
INITIAL	WATER CONTENT, %	w_o	36.4	36.4	37.2	35.1	Avg. 36.3
	DRY DENSITY LB/CU FT	γd_o	84.7	85.0	84.2	86.5	
	SATURATION, %	S_o	97.2	98.1	98.4	98.0	
	VOID RATIO	e_o	1.03	1.02	1.04	0.985	
BEFORE SHEAR	WATER CONTENT, %	w_c					
	DRY DENSITY LB/CU FT	γd_c					
	SATURATION, %	S_c					
	VOID RATIO	e_c					
	FINAL BACK PRESSURE, T/SQ FT	u_o					
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	1.72	2.02	1.85	2.19	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN		t_f	2	16	16	20	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ULT}$					
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.40	1.42	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	3.00	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;sand seams

LL 59	PL 24	PI 35	Gs 2.75	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS: --- Rate of strain increased.

PROJECT LK. PONT. LA.& VIC.-ORLEANS PARISH LK. FR. LEVEES, WEST OF IHNC, GDM #2, SUPP. #5

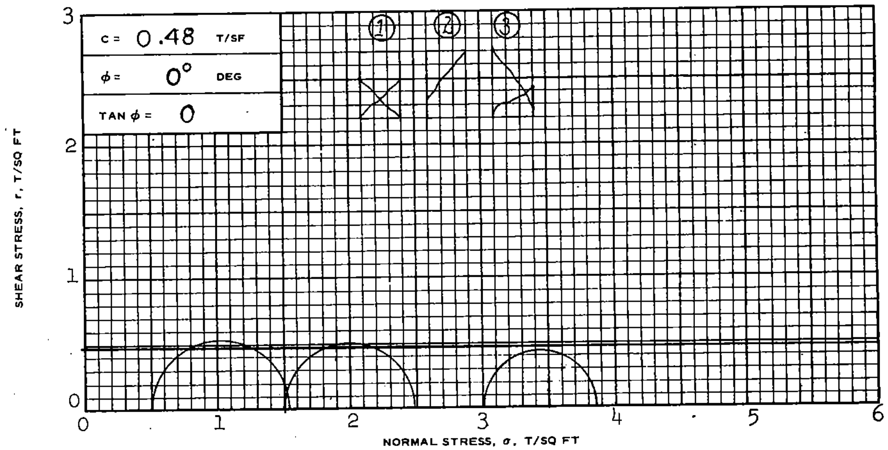
BORING NO. 7-ULO SAMPLE NO. 22-C

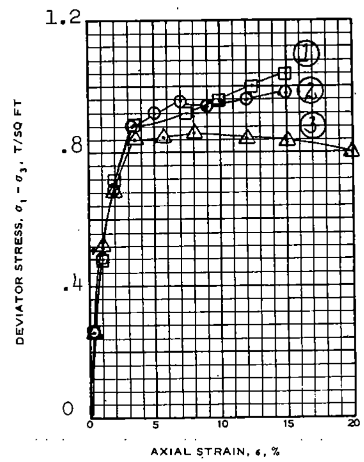
~~DEPTH~~/ELEV -80.2

LABORATORY USAEWES DATE 9 November 1972

GDA TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





γsat = 118

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	34.4	32.2	35.2	33.9
	DRY DENSITY LB/CU FT	γd_o	87.3	90.4	86.6	
	SATURATION, %	S_o	99.8	100+	100+	
	VOID RATIO	e_o	0.931	0.865	0.946	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	1.04	0.98	0.86	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN		t_f	23	71	34	
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 LEAN CLAY(CL),gray;3/8" diameter silty sand seams

LL 45	PL 18	PI 27	Gs 2.70	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS:

PROJECT LK. PONT. LA.& VIC.-ORLEANS PARISH LK. FR. LEVEE, WEST OF IHNC, GDM #2, SUPP. #5

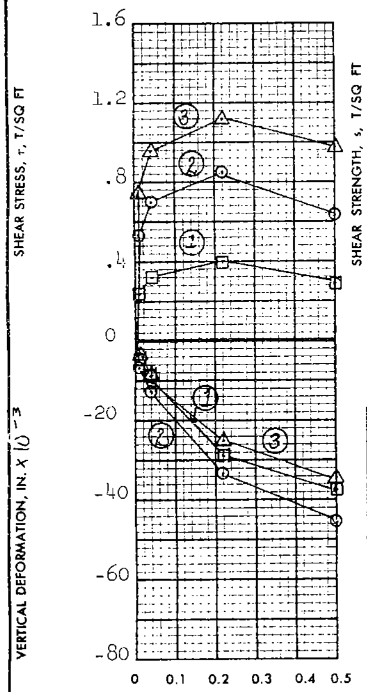
BORING NO. 7-ULO SAMPLE NO. 25-A

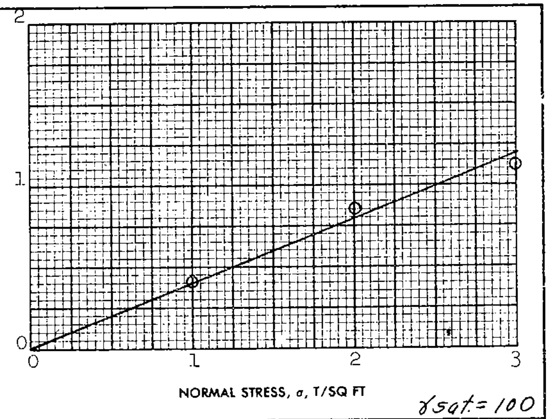
~~DEPTH~~/ELEV -90.8

LABORATORY USAEWES DATE 9 Nov. 1972

GDA TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





γsat. = 100

SHEAR STRENGTH PARAMETERS

φ' = 22°

TAN φ' = 0.40

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	72.4%	67.2%	67.9%	69.2%
	VOID RATIO	e_o	1.95	1.82	1.89	
	SATURATION	S_o	100+%	100+%	97.7%	%
	DRY DENSITY, LB/CU FT	γ_d	57.6	60.2	58.8	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	< 1	4	7	
FINAL	WATER CONTENT	w_f	58.7%	49.7%	41.4%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.40	0.85	1.12	
ACTUAL TIME TO FAILURE, MIN		t_f	1320	1320	1320	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE — 0.538 IN. THICK

CLASSIFICATION PLASTIC CLAY(CH),gray;trace of small shells

LL 92 — PL 29 — PI 63 — G_s 2.72

REMARKS

PROJECT LK.PONT.LA.,&VIC.-ORLEANS PARISH LK.FR. LEVEES, WEST OF IHNC, GDM # 2,SUPP. #5.

AREA

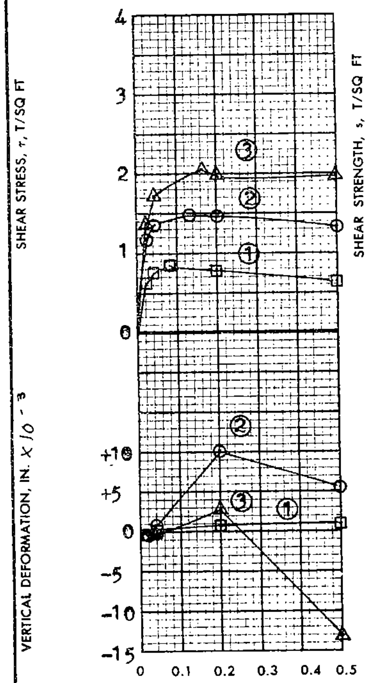
BORING NO. 7-ULO — SAMPLE NO. 10-C

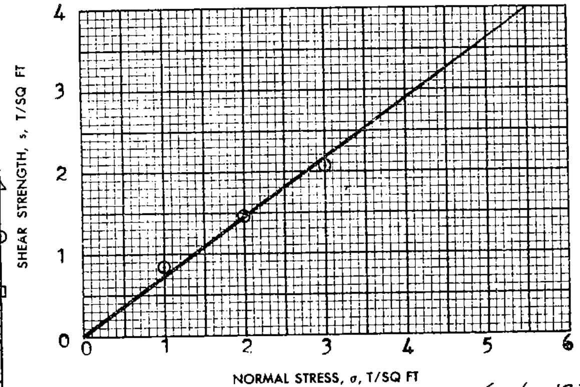
EL -32.5 — DATE 6 Nov. 1972

RCH

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3





γsat. = 123

SHEAR STRENGTH PARAMETERS

φ' = 36°

TAN φ' = 0.74

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	28.0%	26.3%	26.0%	26.8%
	VOID RATIO	e_o	0.703	0.730	0.716	
	SATURATION	S_o	100+%	95.8%	96.6%	%
	DRY DENSITY, LB/CU FT	γ_d	97.5	96.0	96.8	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	25.2%	23.9%	24.1%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.84	1.48	2.06	
ACTUAL TIME TO FAILURE, MIN		t_f	600	840	1020	
RATE OF STRAIN, IN./MIN			.00021	.00021	.00021	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE — 0.538 IN. THICK

CLASSIFICATION SILTY SAND(SM),gray;trace of shell fragments

LL - — PL - — PI - — G_s 2.66

REMARKS

PROJECT LK. PONT.,LA & VIC.-ORLEANS PARISH LK. FRONT LEVEES, WEST OF IHNC,GDM #2, SUPP. #5

AREA

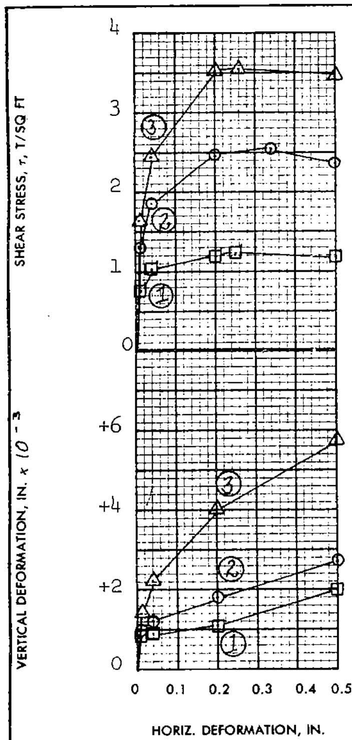
BORING NO. 7-ULO — SAMPLE NO. 12-B

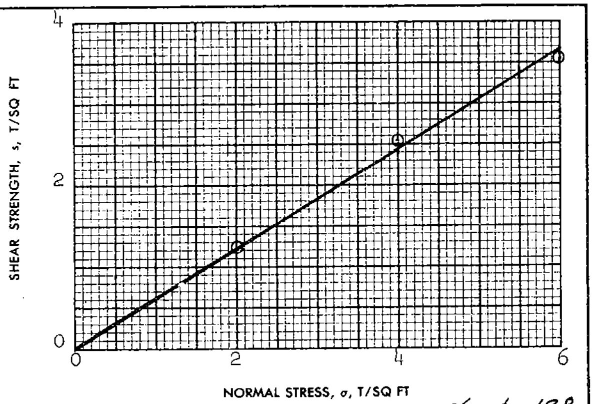
EL -39.7 — DATE 31 Oct.,1972

RCH

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3





$\gamma_{sat} = 128$

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	22.2%	22.8 %	22.0%	22.3 %
	VOID RATIO	e_o	0.601	0.598	0.598	
	SATURATION	S_o	99.0%	100+ %	98.6%	%
	DRY DENSITY, LB/CU FT	γ_d	104.5	104.7	104.7	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	23.0 %	23.2%	24.3%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.21	2.54	3.55	
ACTUAL TIME TO FAILURE, MIN		t_f	1500	1920	1560	
RATE OF STRAIN, IN./MIN			.00020	.00020	.00020	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 31°

TAN ϕ' = 0.605

c' = 0 T/SQ FT

[ ] CONTROLLED STRESS

[X] CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.538 IN. THICK

CLASSIFICATION SILTY SAND(SM),gray, trace of organic matter and shell fragments

LL	PL	PI		G_s 2.68

REMARKS

PROJECT LK.PONT.LA.&VIC.-ORLEANS PARISH LK.FR. LEVEES,WEST OF IHNC, GDM NO.2,SUPP.NO.5

AREA

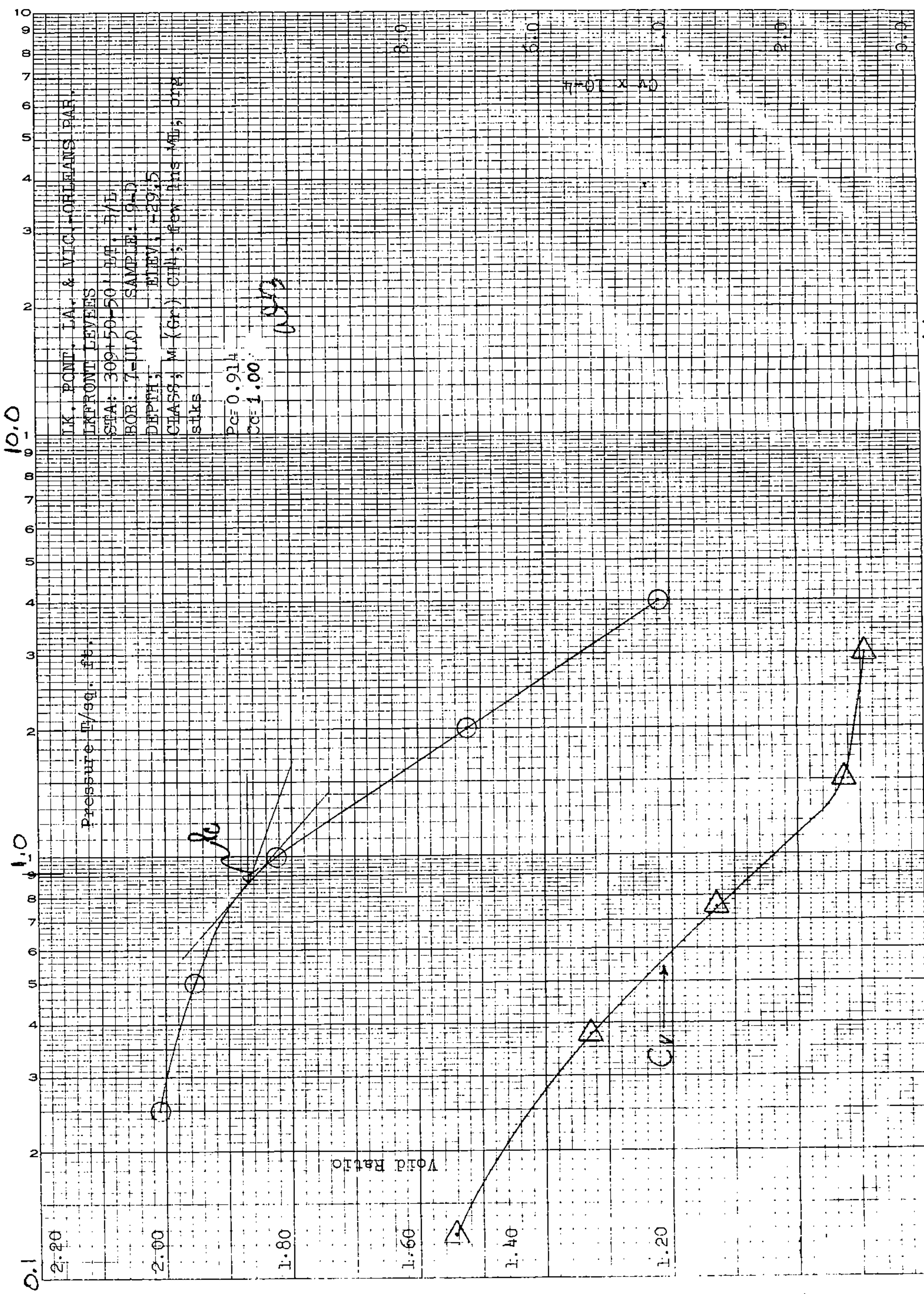
BORING NO. 7-ULO SAMPLE NO. 19-B

DEPTH/EL -67.3 DATE 7 Nov. 1972

RCH

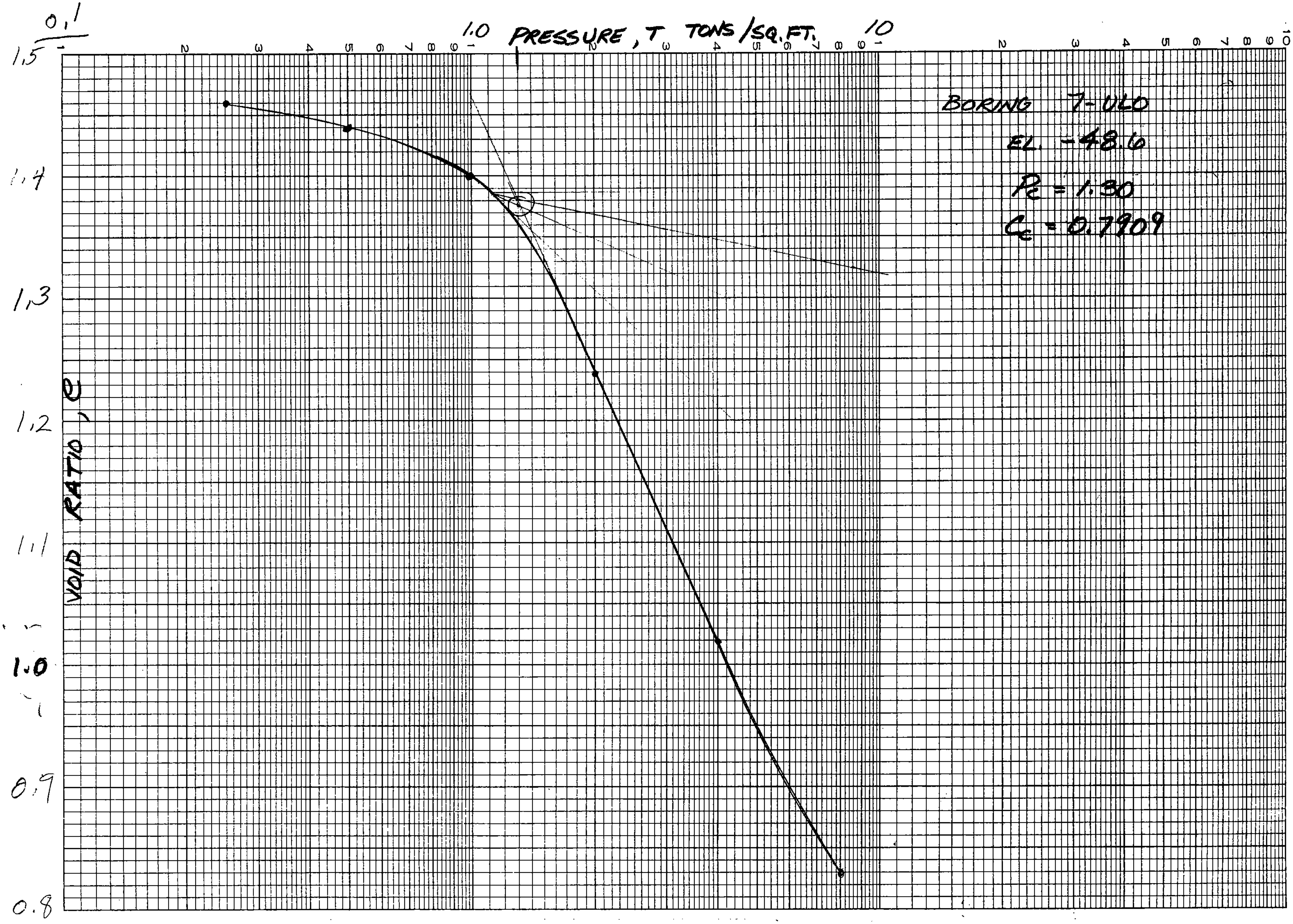
DIRECT SHEAR TEST REPORT

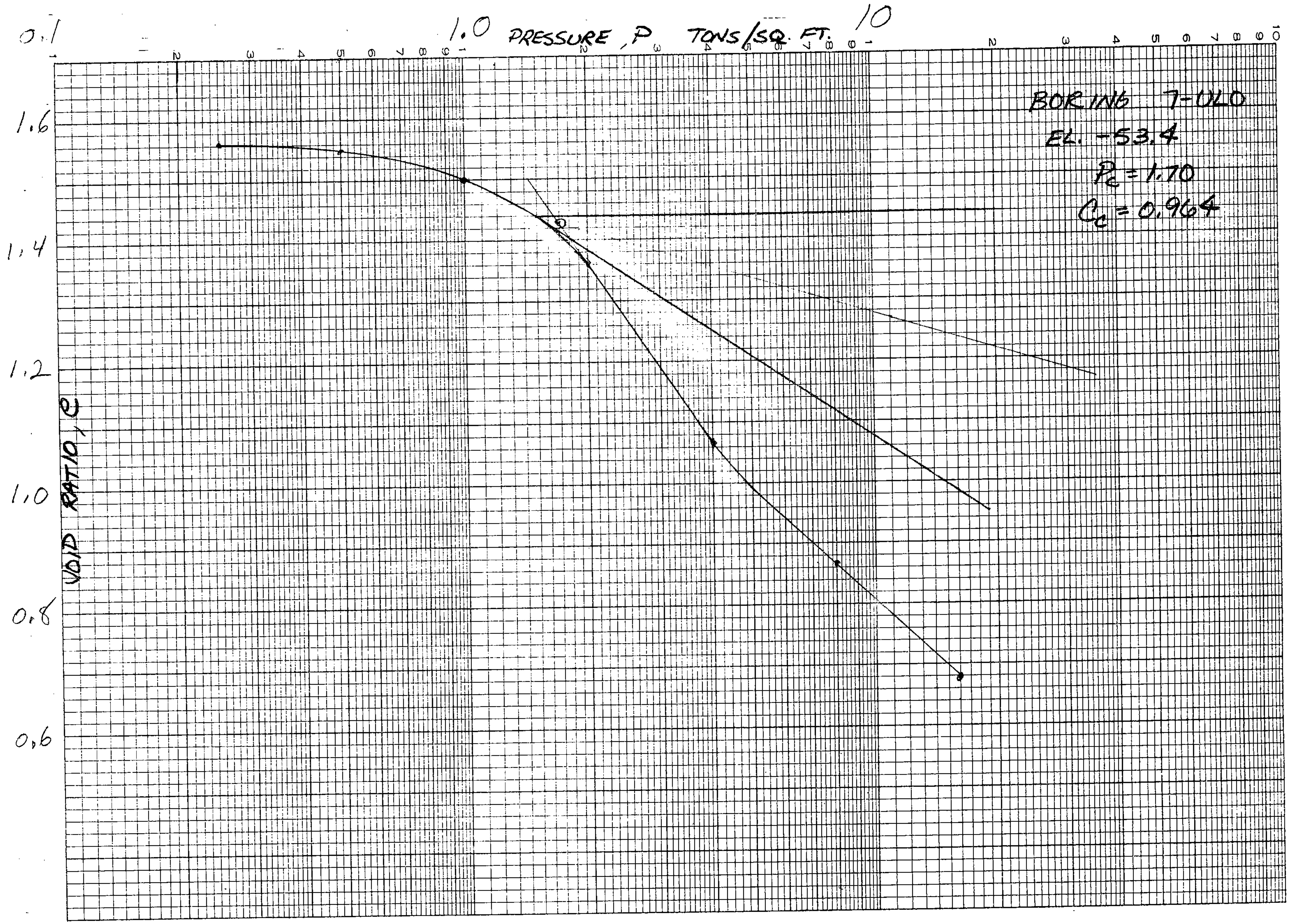
ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3



NO. 341-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC – 3 CYCLES X 70 DIVISIONS

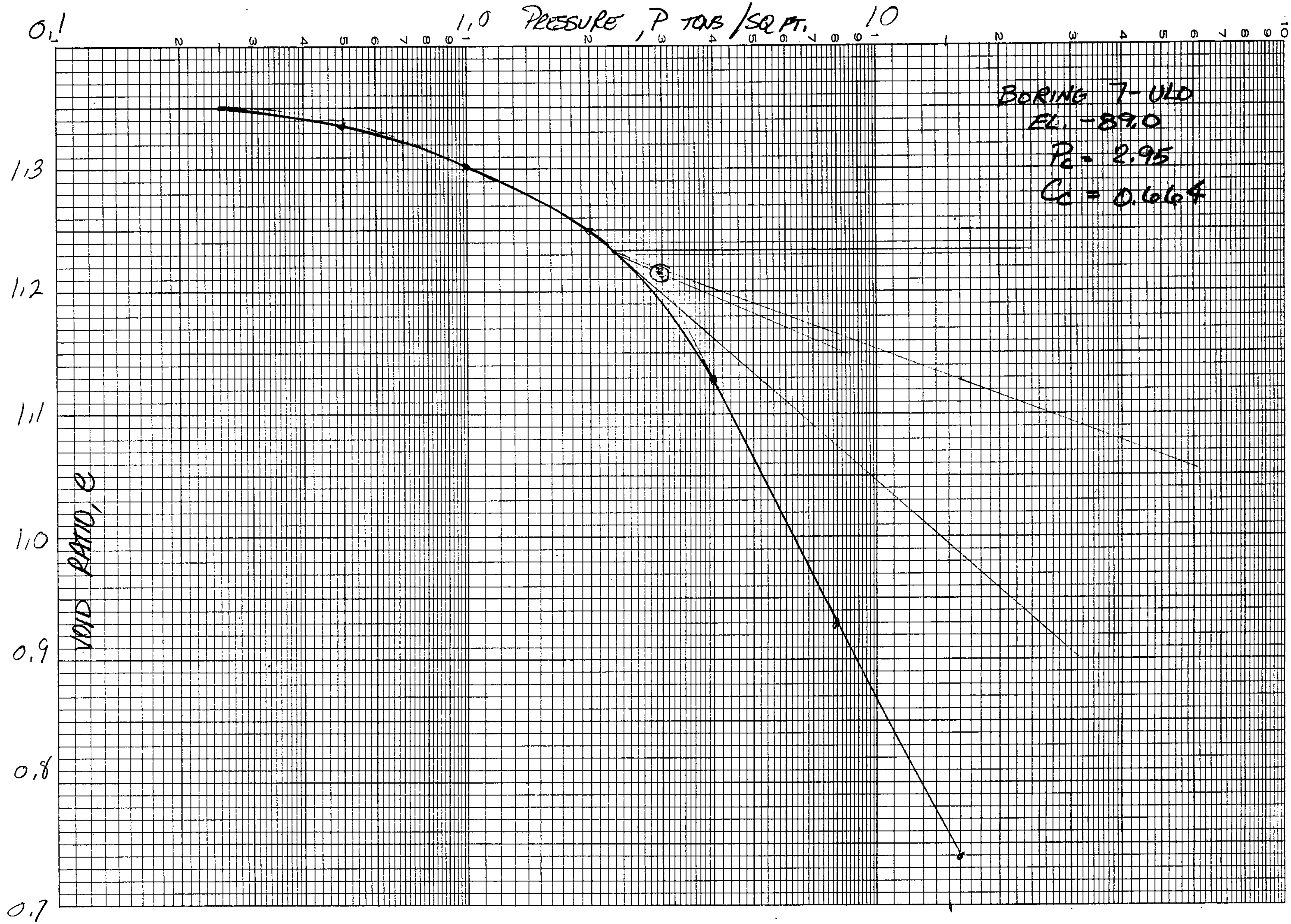
EUGENE DIETZGEN CO.
MADE IN U. S. A.

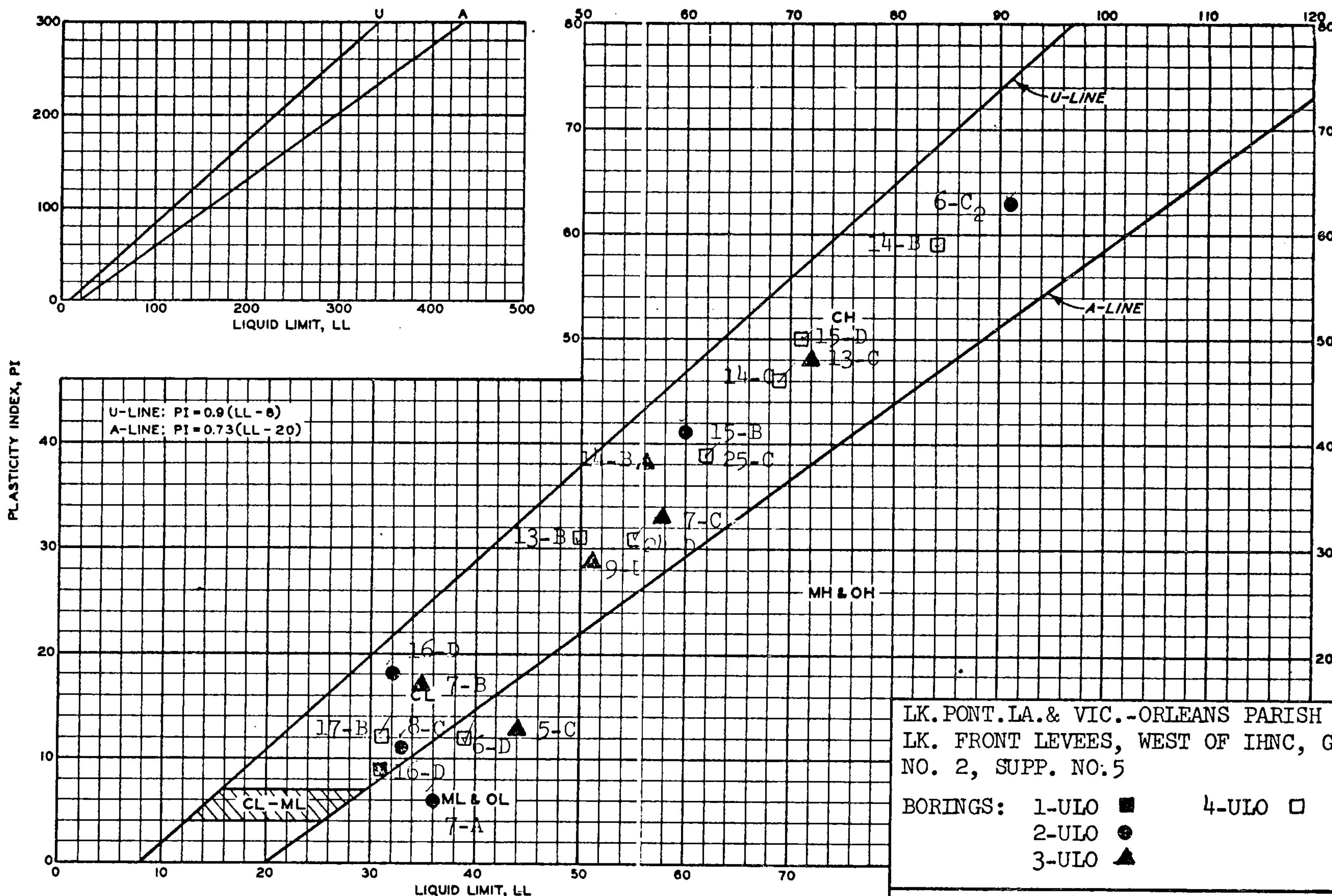



1.0 PRESSURE, P TONS/SQ. FT. 10
0.1
1.6
1.4
1.2
1.0
0.8
0.6
VOID RATIO, e
BORING 7-ULO
EL. -53.4
P_c = 1.70
C_c = 0.964

NO. 341-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC—3 CYCLES X 70 DIVISIONS

EUGENE DIETZGEN CO.
MADE IN U. S. A.





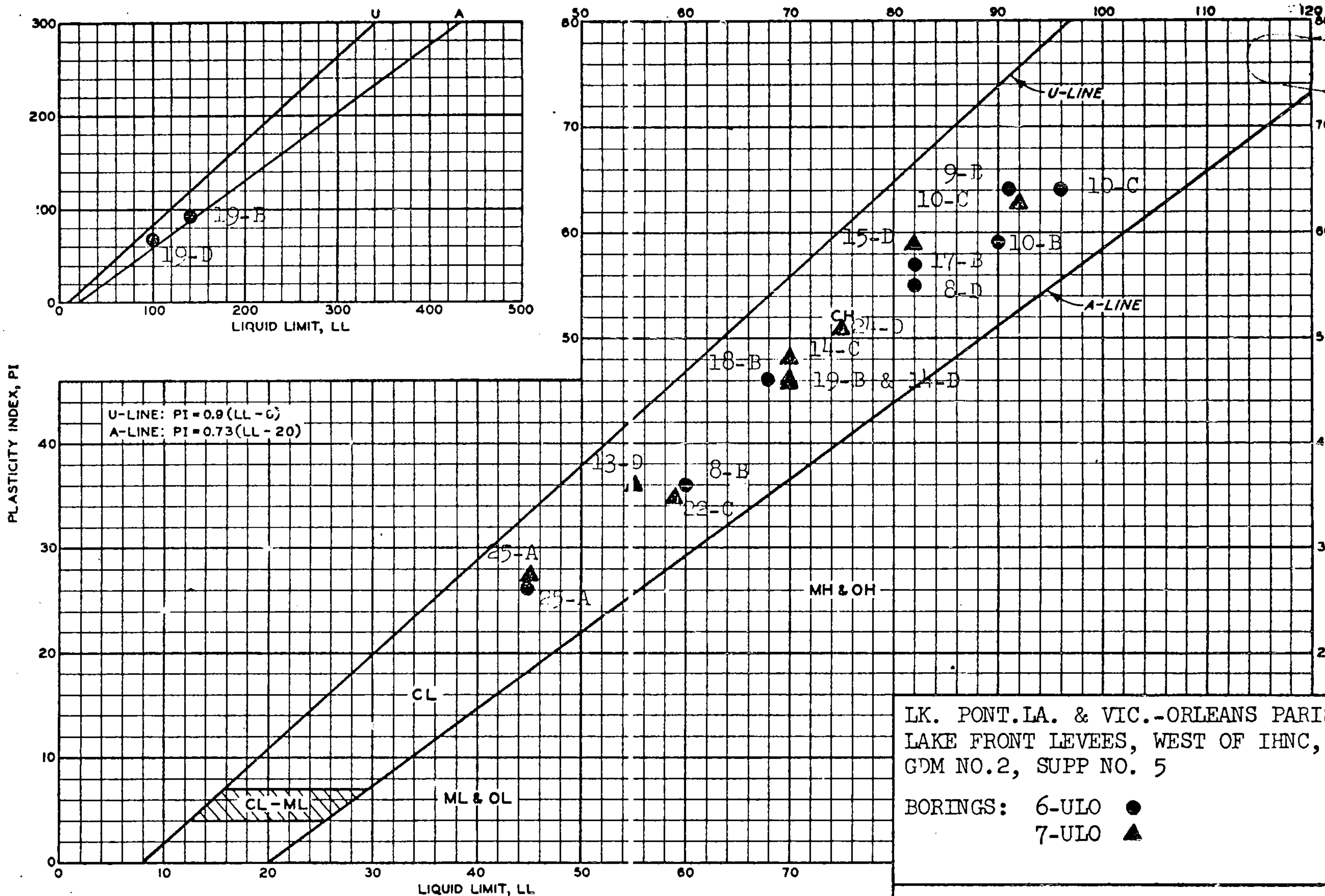
LK. PONT. LA. & VIC. - ORLEANS PARISH
LK. FRONT LEVEES, WEST OF IHNC, GDM
NO. 2, SUPP. NO. 5

BORINGS: 1-ULO ■ 2-ULO ● 3-ULO ▲ 4-ULO □

PLASTICITY CHART

ENG FORM JUNE 1970 4334

TRANSLUCENT

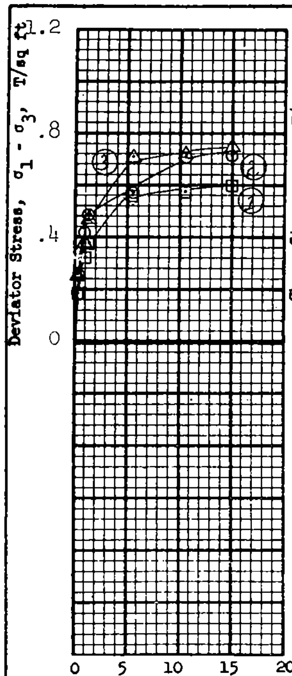


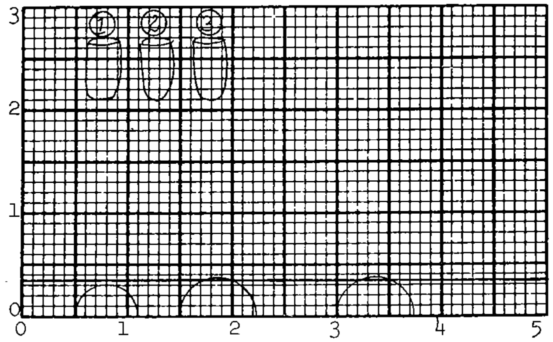
LK. PONT. LA. & VIC.-ORLEANS PARISH
LAKE FRONT LEVEES, WEST OF IHNC,
GDM NO.2, SUPP NO. 5

BORINGS: 6-ULO ●
7-ULO ▲

PLASTICITY CHART

ENG FORM 4334 JUNE 1970 TRANSLUCENT





γ_{SAT} = 102

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = .34 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	AVG.
Initial	Water content	w_o	46.4 %	44.8 %	46.3 %	45.83%
	Void ratio	e_o	1.30	1.23	1.23	
	Saturation	S_o	90.3 %	92.1 %	95.2 %	%
	Dry density, lb/cu ft	γ_d	68.7	70.8	70.7	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.60	0.72	0.74	
Time to failure, min		t_f	76	76	76	
Rate of strain, percent/min			0.197	0.197	0.197	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.39	1.40	1.39	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray, contains numerous rootlets and large*

LL 61 | PL 23 | PI 38 | | G_s 2.53

Remarks *decayed roots

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.#5)

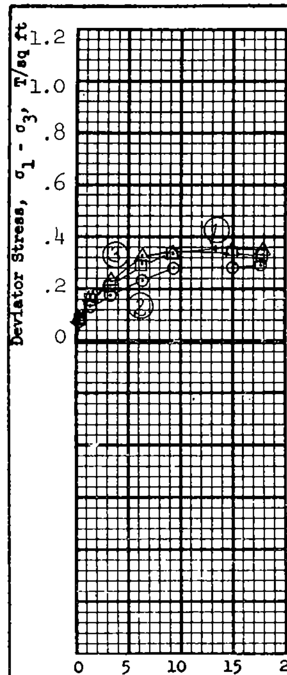
Boring No. 6-MUE | Sample No. 1-D

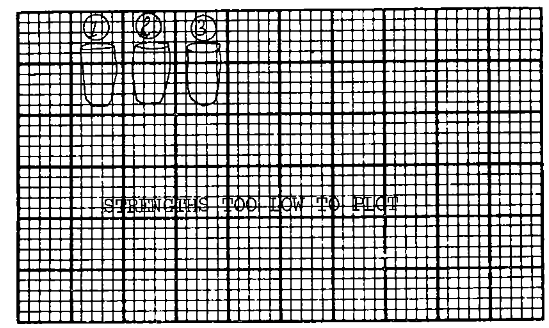
Depth El -3.9 | Date 8 March 1971

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE TRANSLUCENT

...ILS TEST SECTION





γ_{SAT} = 92

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = .16 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	AVG.
Initial	Water content	w_o	89.0 %	91.0 %	89.7 %	89.9%
	Void ratio	e_o	2.30	2.30	2.32	
	Saturation	S_o	99.1 %	100+ %	99.0 %	%
	Dry density, lb/cu ft	γ_d	48.4	48.5	48.1	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.34	0.28	0.35	
Time to failure, min		t_f	55	55	88	
Rate of strain, percent/min			0.170	0.170	0.170	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.39	1.39	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray,contains rootlets and decayed large roots

LL 102 | PL 30 | PI 72 | | G_s 2.56

Remarks ______

Project LK.PONT.LA.&VIC.-HURR. PROT.'71

ORLEANS PARISH L.F. LEVEE WEST OF IHNC,(OUT-

Area FALL CANALS)ALONG 17th ST.CANAL(GDM#2,SUPP.#5)

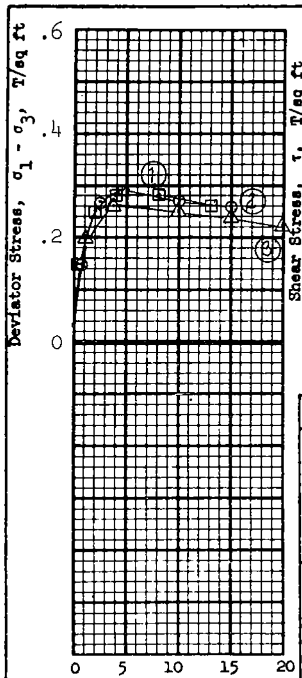
Boring No. 6-MUE | Sample No. 3-C

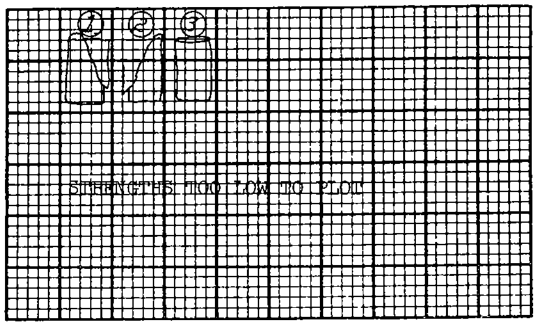
Depth El -11.2 | Date 8 March 1971

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE TRANSLUCENT

...TES SOILS TEST SE...





$\gamma_{SAT} = 98.$

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = .14 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	γ_d	55.1	56.3	55.3	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.28	0.29	0.26	
Time to failure, min		t_f	7	25	18	
Rate of strain, percent/min			0.542	0.192	0.196	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray, contains silt seams

LL 81 | PL 20 | PI 61 | | G_s 2.73

Remarks ______

Project LK. PONT. LA.&VIC.-HURR. PROT.'71(OUT-FALL CANALS)ALONG 17th ST. CANAL(GDM#2, SUPP.#5)

Area ORLEANS PARISH L.F. LEVEE WEST OF IHNC

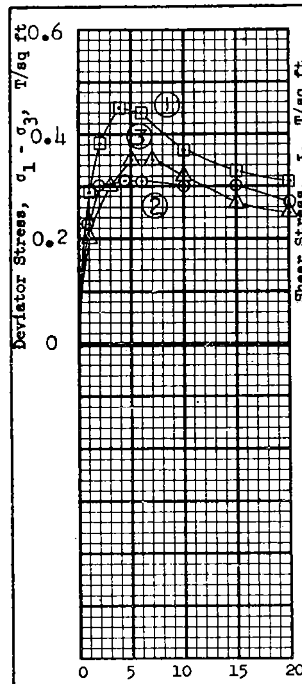
Boring No. 6-MUE | Sample No. 5-C

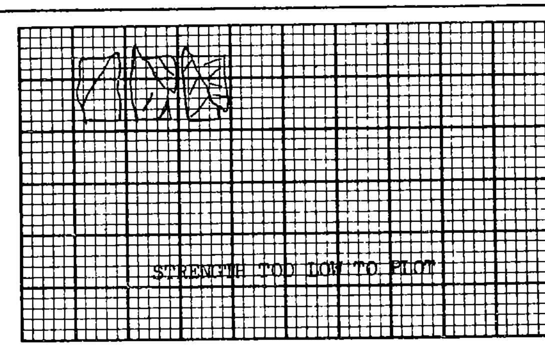
Depth / El -18.9 | Date 9 March 1971

OHR | **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM 2089, 1 JUN 65 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT





$\gamma_{SAT} = 96.$

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = .19 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 %	%
	Dry density, lb/cu ft	γ_d	53.4	53.3	54.2	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.45	0.31	0.35	
Time to failure, min		t_f	24	28	27	
Rate of strain, percent/min			0.155	0.160	0.185	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray

LL - | PL - | PI - | | G_s 2.74 From 8-E Con

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)

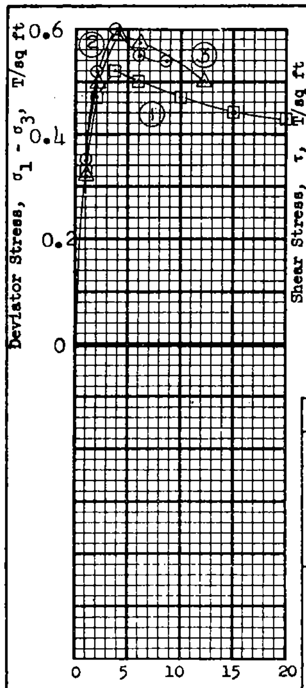
Boring No. 6-MUE | Sample No. 8-C

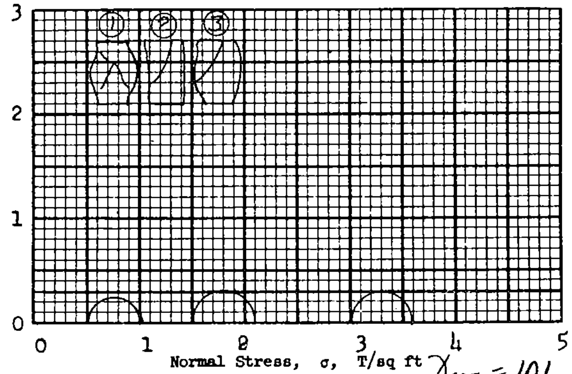
~~Depth~~ / El - 31.0 | Date 9 March,1971

FAM | **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM 2089, 1 JUN 65 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT





$\gamma_{SAT} = 101$

Test No.			1	2	3	AVG.
Initial	Water content	w_o	65.0 %	61.9 %	59.3 %	62.1 %
	Void ratio	e_o	1.76	1.69	1.60	
	Saturation	S_o	98.6 %	97.8 %	99.0 %	%
	Dry density, lb/cu ft	γ_d	60.4	61.9	64.2	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.52	0.60	0.59	
Time to failure, min		t_f	15	23	33	
Rate of strain, percent/min			0.253	0.164	0.120	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = .29 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

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

Area ORLEANS PARISH LK.FT.LEVEE,WEST OF IHNC,(OUTFALL CANALS)ALONG 17TH.ST. CANAL(GDM#2SUPP#5

Boring No. 6-MUE | Sample No. 11-C

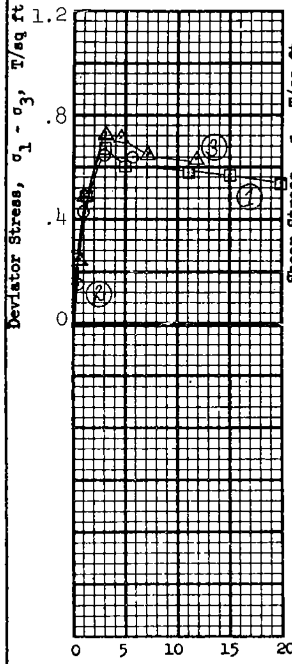
~~Depth~~ El - 42.7 | Date 10 March 1971

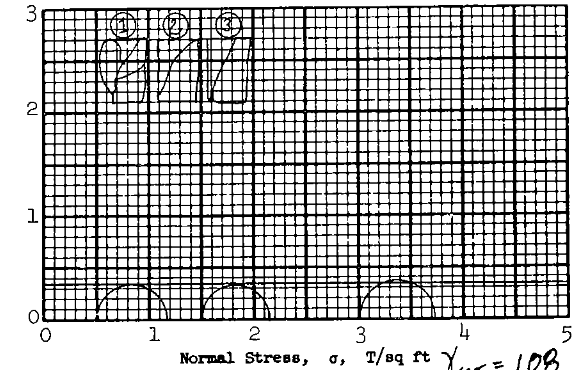
JMS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT

...ES SOILS TEST SECTION





$\gamma_{SAT} = 108$

Test No.			1	2	3	AVG.
Initial	Water content	w_o	48.6 %	45.9 %	46.3 %	46.9 %
	Void ratio	e_o	1.34	1.26	1.28	
	Saturation	S_o	98.3 %	98.7 %	98.0 %	%
	Dry density, lb/cu ft	γ_d	72.2	74.8	74.3	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.67	0.65	0.73	
Time to failure, min		t_f	16	30	27	
Rate of strain, percent/min			0.180	0.100	0.111	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.41	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = .34 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray

LL 65 | PL 16 | PI 49 | G_s 2.71

Remarks

Project LK. PONT.LA.&VIC.-HURR. PROT-'71

Area ORLEANS PARISH L.F. LEVEE WEST OF IHNC(OUTFALL CANALS)ALONG 17th ST.(GDM#2,SUPP.#5)

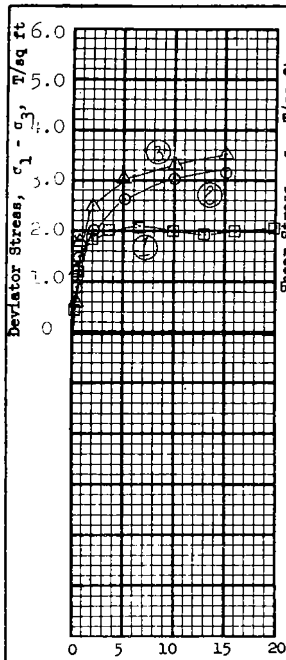
Boring No. 6-MUE | Sample No. 14-D

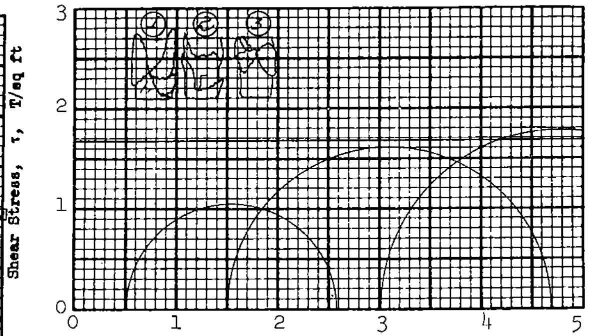
Depth El -55.9 | Date 9 March 1971

JMS TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT





$\gamma_{SAT} = 128$

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = 1.68 T/sq ft

Method of saturation ______

[ ] Controlled stress

[x] 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	γ_d	104.0	107.6	105.9	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	2.08	3.19	3.53	
Time to failure, min		t_f	42	68	30	
Rate of strain, percent/min			0.154	0.221	0.500	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

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,SUPP.#5)

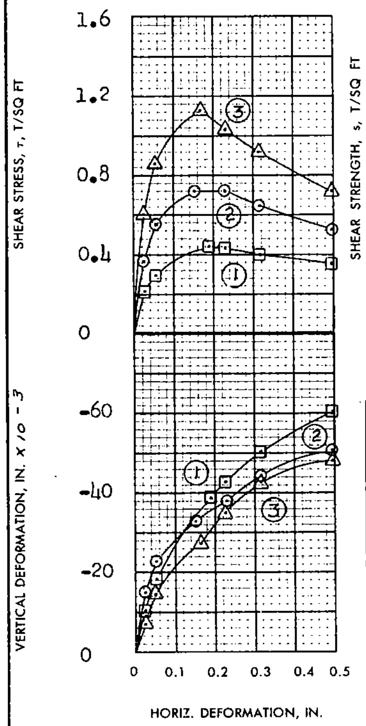
Boring No. 6-MUE | Sample No. 16-C

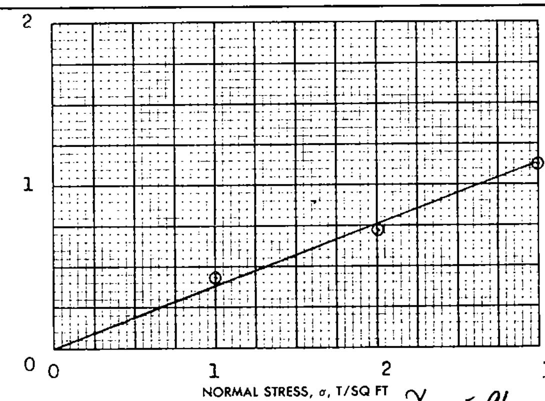
~~Depth~~ El -62.9 | Date 10 March 1971

OHR | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT





$\gamma_{SAT} = 96$

SHEAR STRENGTH PARAMETERS

ϕ' = 21°

TAN ϕ' = .392

c' = 0 T/SQ FT

[ ] CONTROLLED STRESS

[x] CONTROLLED STRAIN

TEST NO.			1	2	3	AVG
INITIAL	WATER CONTENT	w_o	70.6%	74.7 %	73.7 %	73.0%
	VOID RATIO	e_o	2.02	2.08	2.08	
	SATURATION	S_o	95.4 %	98.0 %	96.7%	%
	DRY DENSITY, LB/CU FT	γ_d	56.5	55.4	55.4	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	4	11	9	
FINAL	WATER CONTENT	w_f	57.4 %	49.4 %	44.6 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.44	0.72	1.13	
ACTUAL TIME TO FAILURE, MIN		t_f	1110	900	960	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED | 3.00 IN. SQUARE | 1= 0.550, 2&3= 0.625 IN. THICK

CLASSIFICATION PLASTIC CLAY(CH),dark gray, contains a trace of organic matter,*

LL 92 | PL 29 | PI 63 | G_s 2.73

REMARKS *slickensided

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

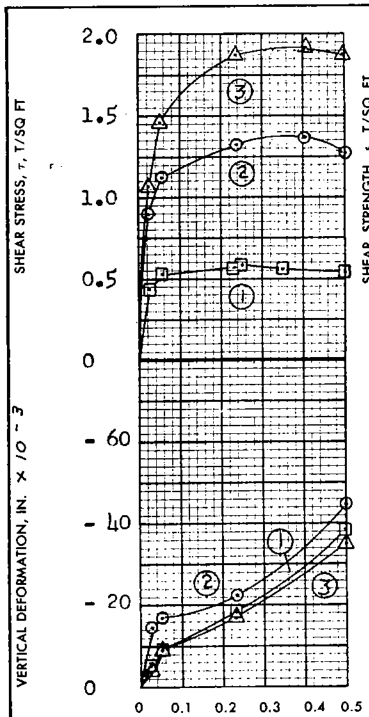
~~DEPTH~~ EL - 26.3 | DATE 10 March 1971

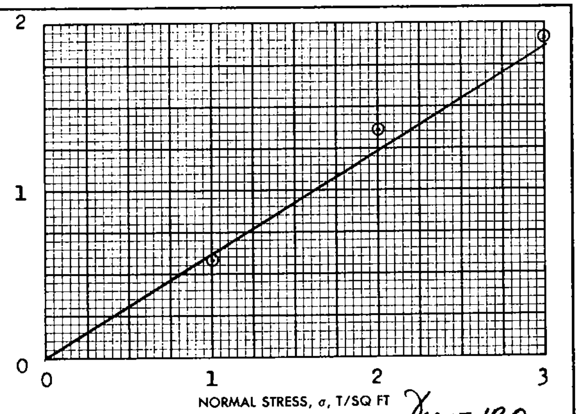
BWG/GDA | DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO 1966 OF-214-945

PLATE IX-3





$\gamma_{SAT} = 120$

TEST NO.			1	2	3	AVG.
INITIAL	WATER CONTENT	w_o	29.0 %	30.1 %	31.4 %	30.2 %
	VOID RATIO	e_o	0.817	0.819	0.820	
	SATURATION	S_o	95.1 %	98.5 %	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	92.1	92.0	91.9	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	29.4 %	27.4 %	26.6 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.58	1.36	1.92	
ACTUAL TIME TO FAILURE, MIN		t_f	1380	2190	2190	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 32°

TAN ϕ' = .633

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.550 IN. THICK

CLASSIFICATION SILTY SAND(SM),gray, contains CLAY(CH) lenses and shell fragments

LL - PL - PI - G_s 2.68

REMARKS

PROJECT LK.PONT.LA.,&VIC.-HURR.PROT.-1971

ORLEANS PARISH LK.FRNT. LEVEE,WEST OF IHNC

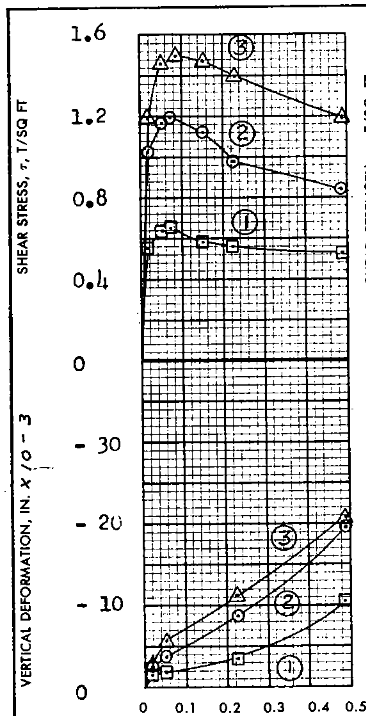
AREA (OUTFALL CANALS)ALONG 17th ST CANAL

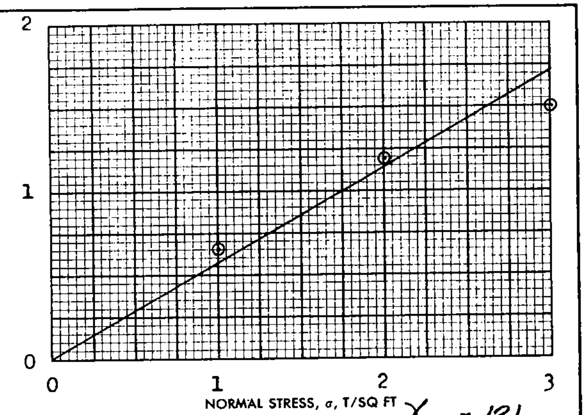
BORING NO. 6-MUE SAMPLE NO. 9-B

~~DEPTH~~ EL -34.3 DATE 22 March 1971

BWG **DIRECT SHEAR TEST REPORT**

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3





$\gamma_{SAT} = 131$

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 %	94.9 %	%
	DRY DENSITY, LB/CU FT	γ_d	110.1	110.9	110.1	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	1	1	2	
FINAL	WATER CONTENT	w_f	21.0 %	19.6 %	19.3 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.65	1.19	1.50	
ACTUAL TIME TO FAILURE, MIN		t_f	480	480	540	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 30°

TAN ϕ' = .581

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.540 IN. THICK

CLASSIFICATION SANDY CLAY(CL),gray, fissured

LL 44 PL 15 PI 29 G_s 2.71

REMARKS

PROJECT LK.PONT.LA.,&VIC.-HURR.PROT.-1971

ORLEANS PARISH LK.FT.LEVEE WEST OF IHNC(OUT-

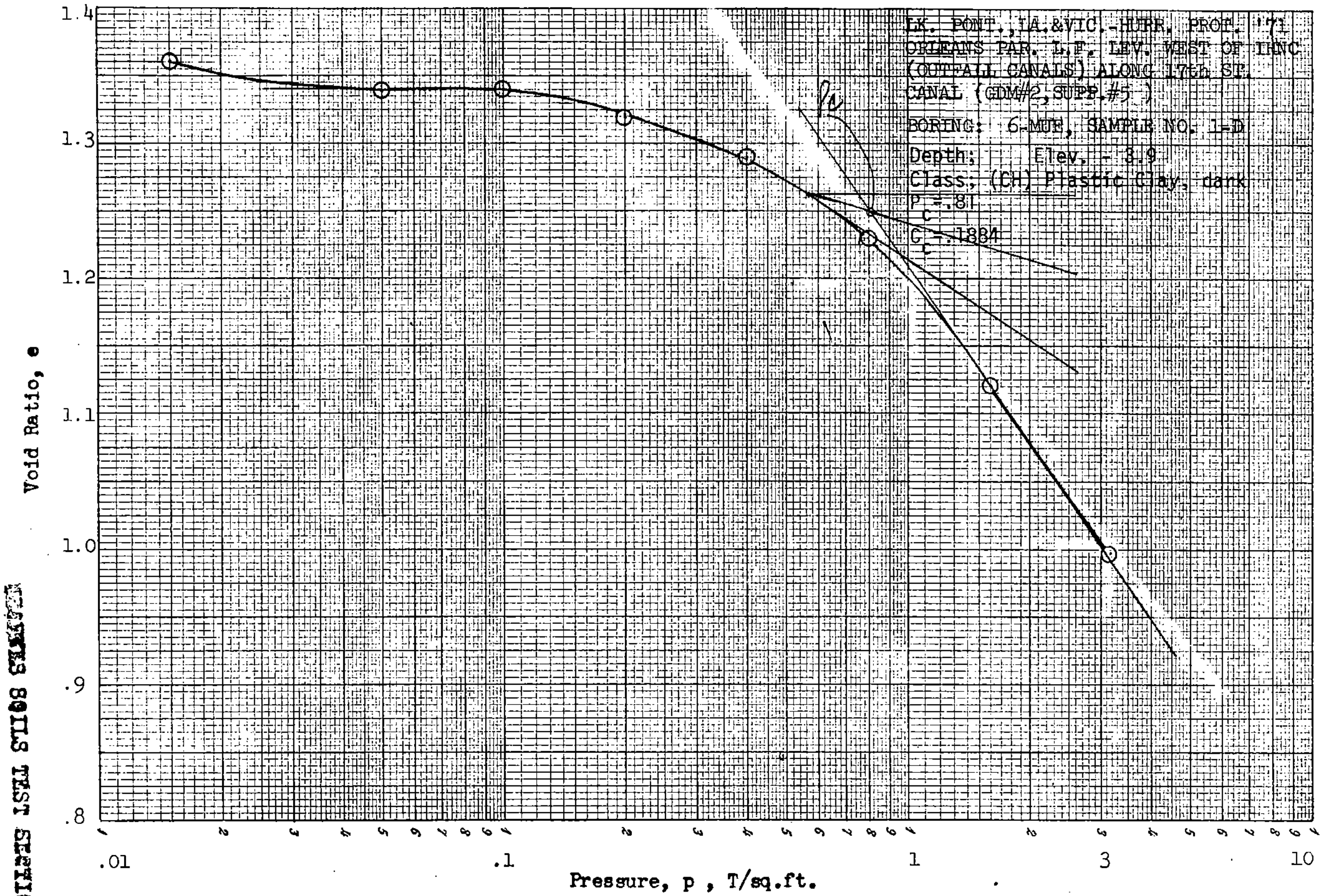
AREA FALL CANALS) ALONG 17THSTCANAL(GDM#2,SUPP#5)

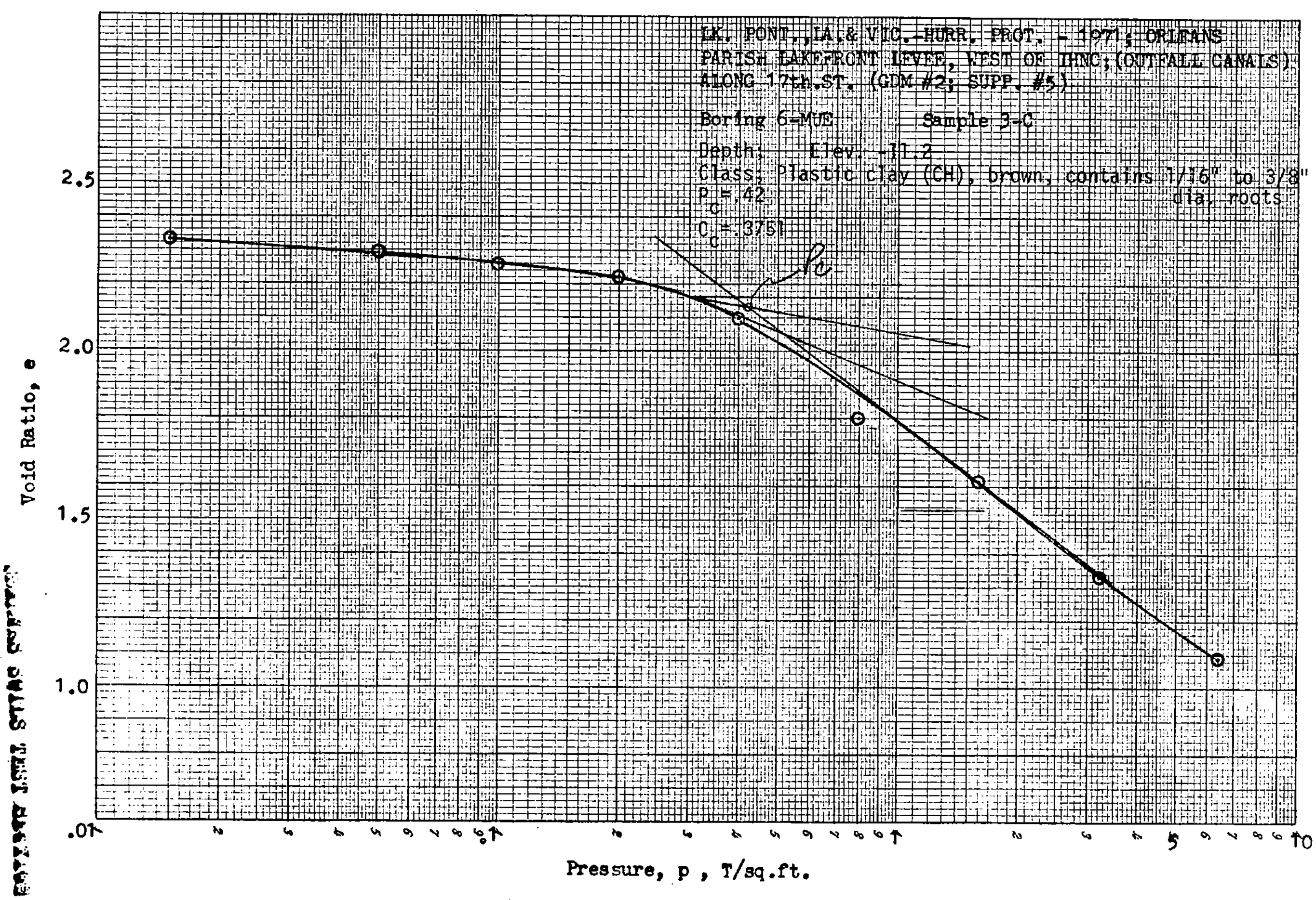
BORING NO. 6-MUE SAMPLE NO. 16-B

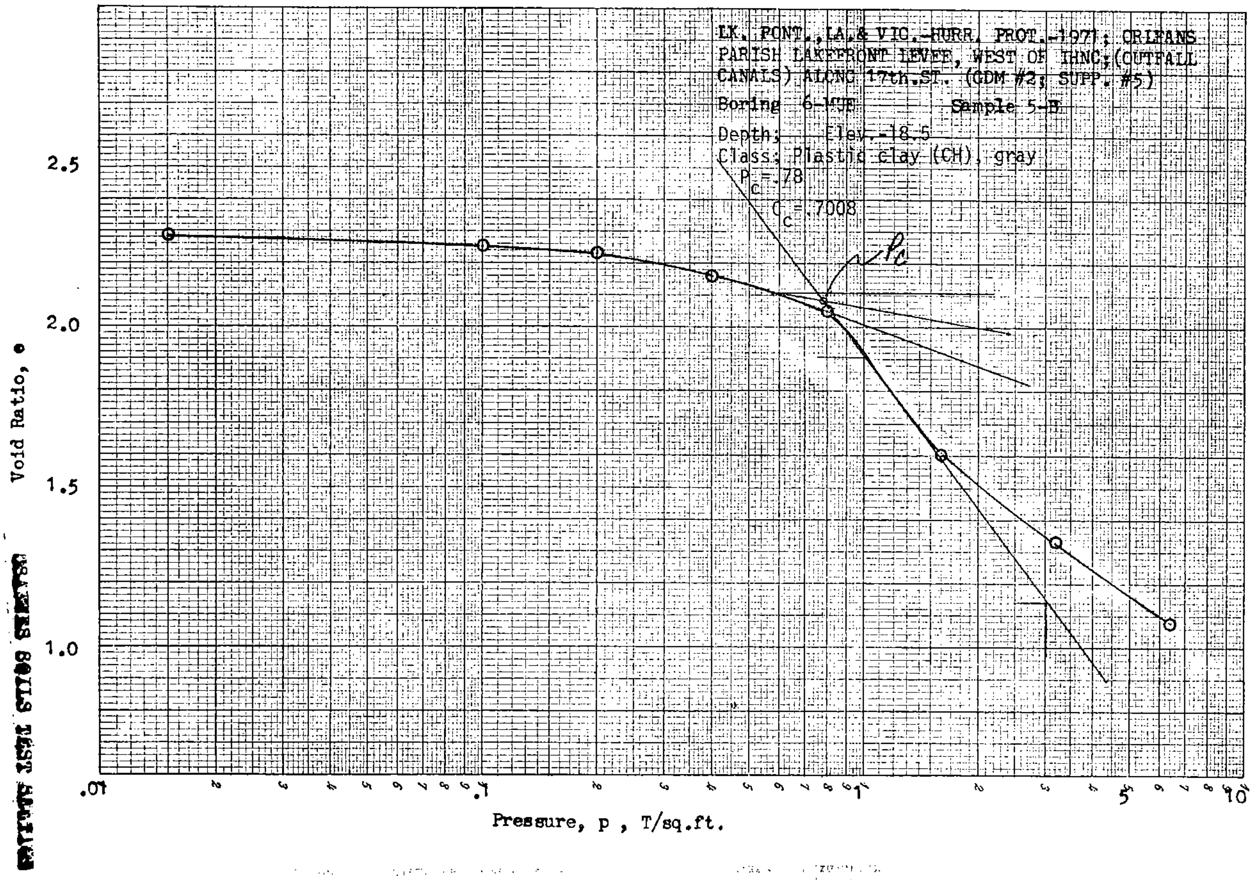
~~DEPTH~~ EL - 62.0 DATE 17 March 1971

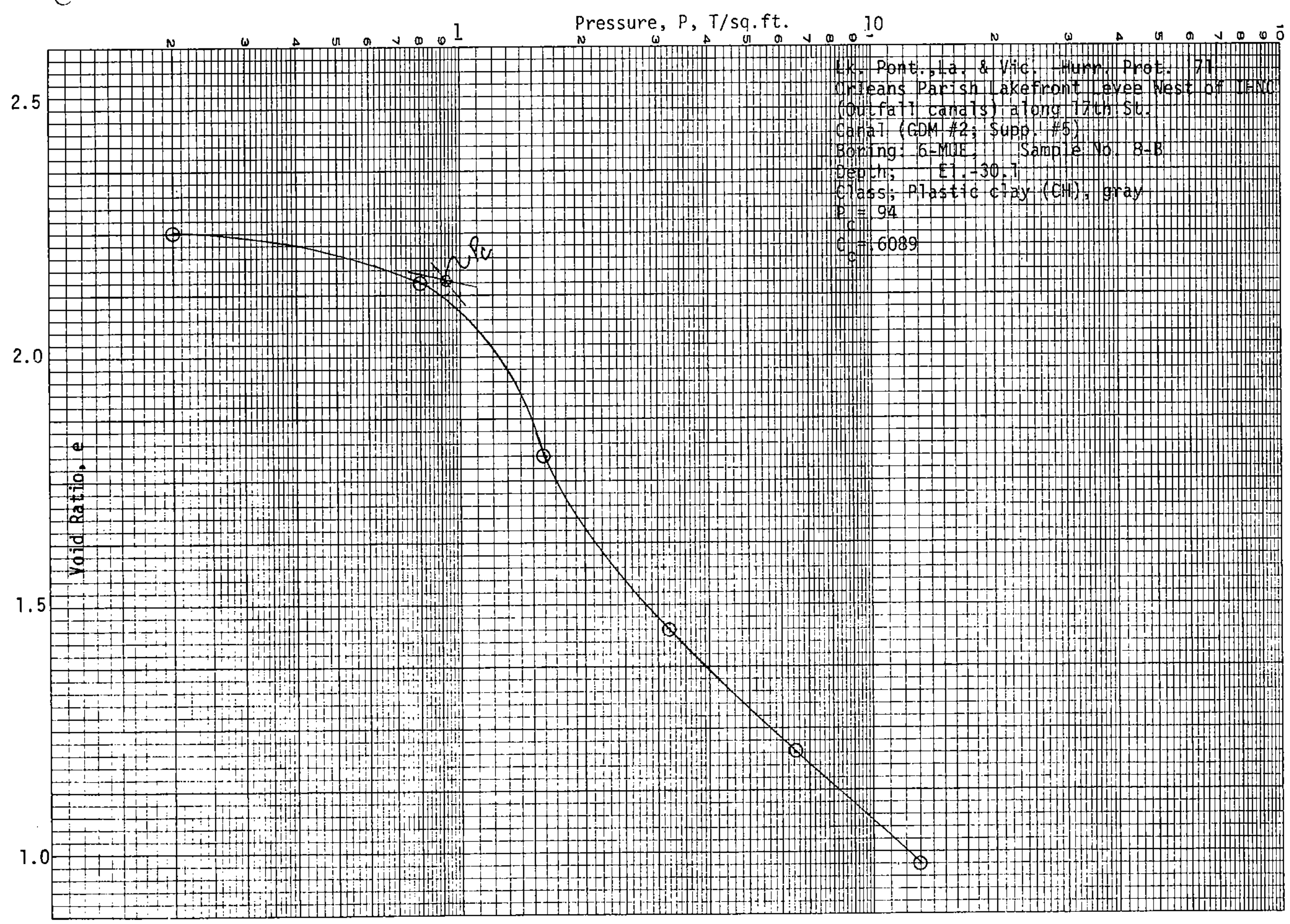
GDA **DIRECT SHEAR TEST REPORT**

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3

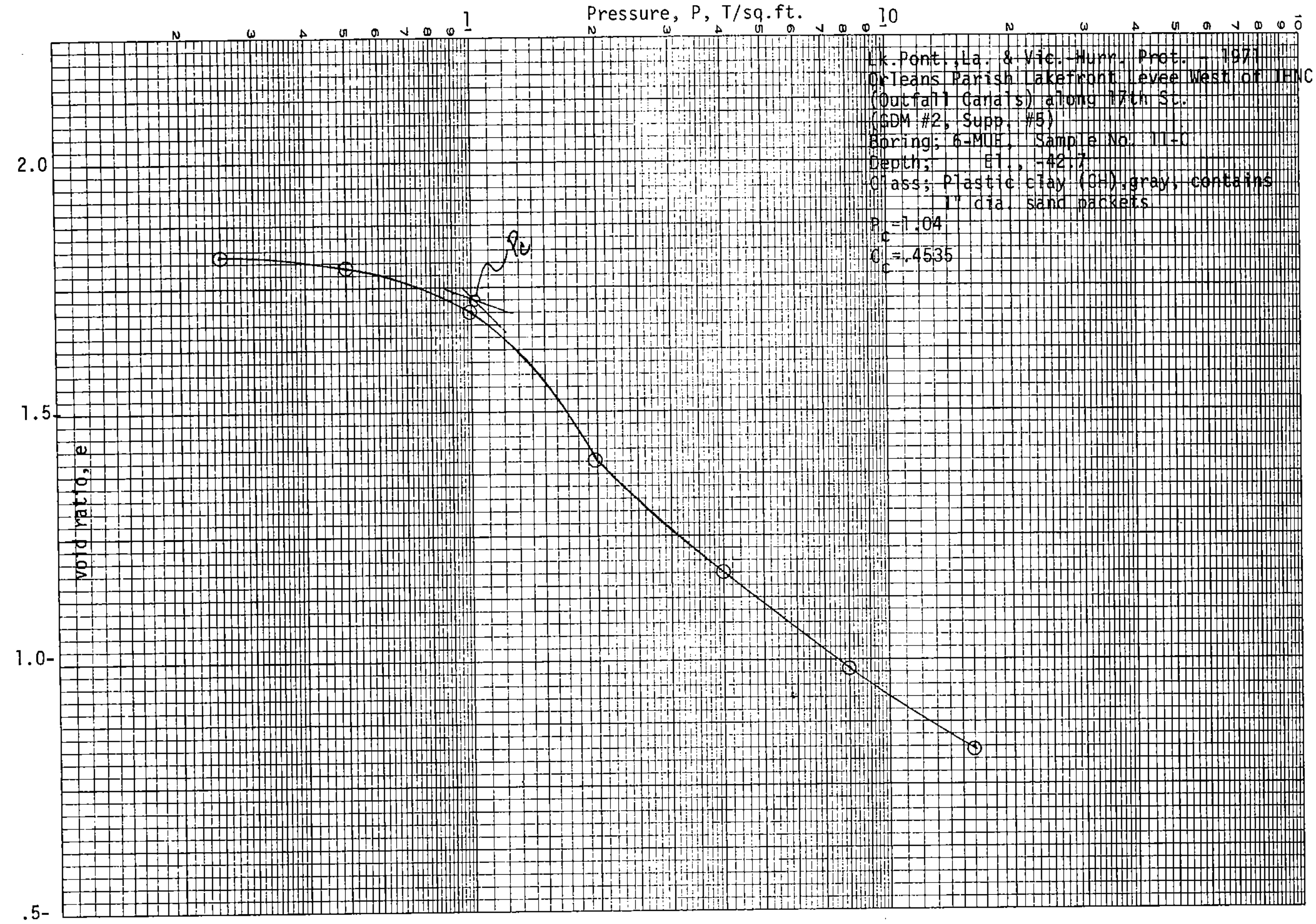

LK. PONT., LA.&VIC.-HURR. PROT. '71
ORLEANS PAR. L.F. LEV. WEST OF IHNC
(OUTFALL CANALS) ALONG 17th ST.
CANAL (GDM#2, SUPP.#5)
BORING: 6-MUE, SAMPLE NO. 1-D
Depth: Elev. - 3.9
Class: (CH) Plastic Clay, dark
P_c = .81
C_c = .1884
Pc
Void Ratio, e
Pressure, p , T/sq.ft.
1.4
1.3
1.2
1.1
1.0
.9
.8
.01
.1
1
3
10

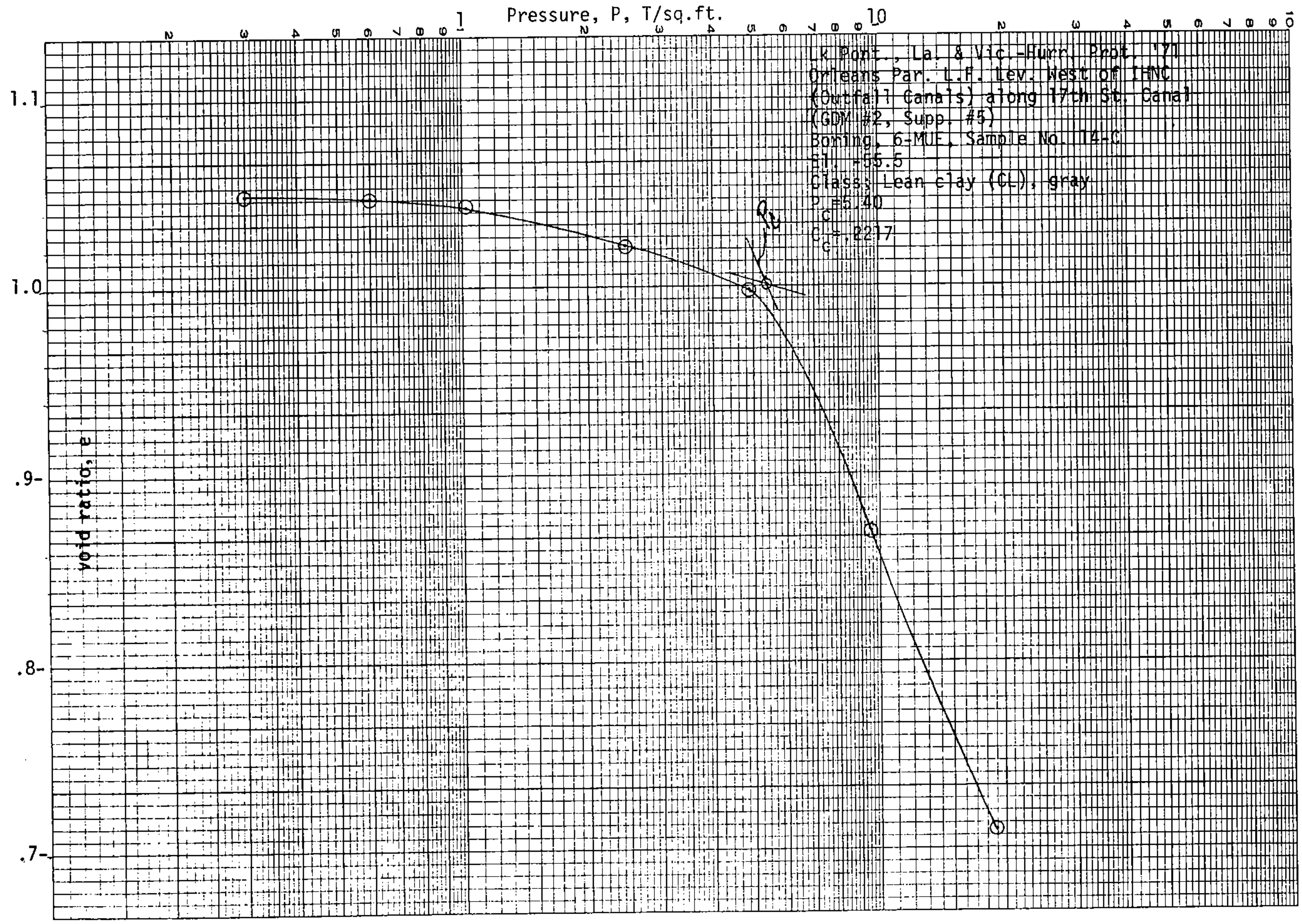

LK. PONT., LA.& VIC.-HURR. PROT. - 1971; ORLEANS
PARISH LAKEFRONT LEVEE, WEST OF IHNC; (OUTFALL CANALS)
ALONG 17th.ST. (GDM #2; SUPP. #5)
Boring 6-MUE Sample 3-C
Depth: Elev. -11.2
Class: Plastic clay (CH), brown, contains 1/16" to 3/8" dia. roots
P_c = .42
C_c = .3751
Pc
Void Ratio, e
Pressure, p , T/sq.ft.
2.5
2.0
1.5
1.0
.01
5
10

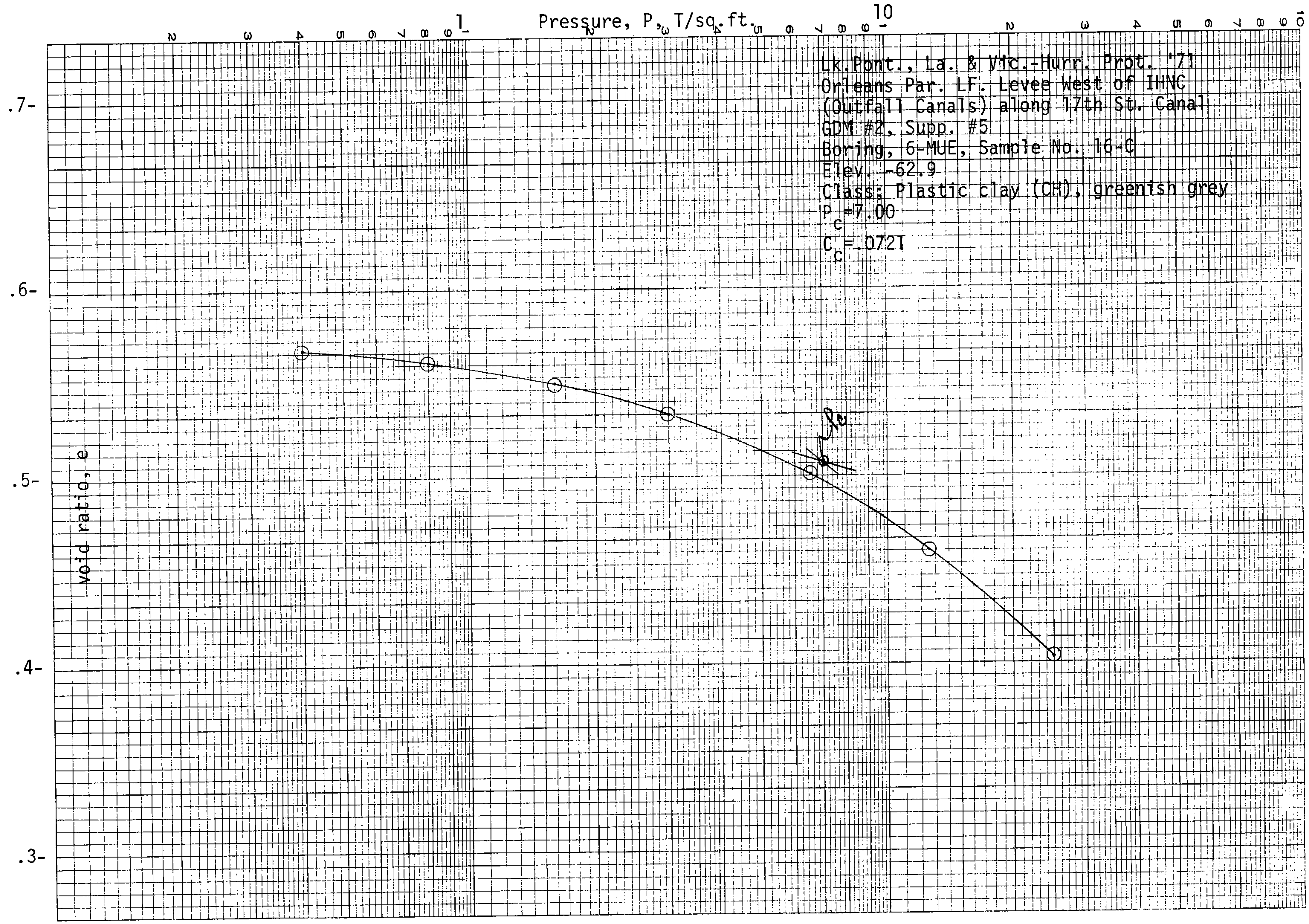

LK. PONT.,LA.& VIC.-HURR. PROT.-1971; ORLEANS PARISH LAKEFRONT LEVEE, WEST OF IHNC;(OUTFALL CANALS) ALONG 17th.ST. (GDM #2; SUPP. #5)
Boring 6-MUE Sample 5-B
Depth; Elev.-18.5
Class: Plastic clay (CH), gray
P_c = .78
C_c = .7008
P_c
Void Ratio, e
2.5
2.0
1.5
1.0
.01
.1
1
5
10
Pressure, p , T/sq.ft.

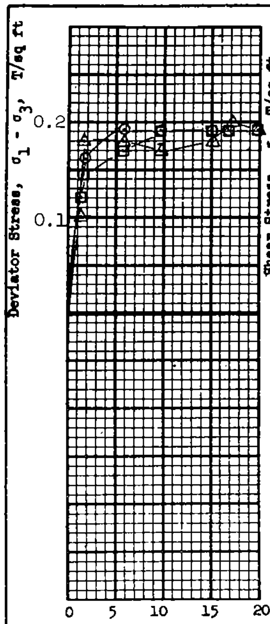

Pressure, P, T/sq.ft.
1
10
Lk. Pont.,La. & Vic. Hurr. Prot. '71
Orleans Parish Lakefront Levee West of IHNC
(Outfall canals) along 17th St.
Canal (GDM #2; Supp. #5)
Boring: 6-MUE, Sample No. 8-B
Depth; El.-30.1
Class; Plastic clay (CH), gray
P_c = .94
C_c = .6089
P_c
Void Ratio, e
2.5
2.0
1.5
1.0

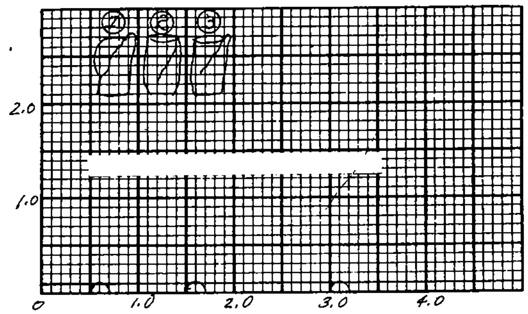
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH






Pressure, P, T/sq.ft.
1
10
void ratio, e
.7
.6
.5
.4
.3
Lk.Pont., La. & Vic.-Hurr. Prot. '71
Orleans Par. LF. Levee West of IHNC
(Outfall Canals) along 17th St. Canal
GDM #2, Supp. #5
Boring, 6-MUE, Sample No. 16-C
Elev. -62.9
Class: Plastic clay (CH), greenish grey
P c =7.00
C c =.0721
Pc





$\gamma_{sat.} = 96$

Test No.			1	2	3	Avg.
Initial	Water content	w_o	76.1 %	81.1 %	81.8%	79.7%
	Void ratio	e_o	2.04	2.22	2.25	
	Saturation	S_o	100+ %	98.6 %	98.2 %	%
	Dry density, lb/cu ft	γ_d	55.5	52.4	51.9	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.19	0.19	0.20	
Time to failure, min		t_f	75	37	128	
Rate of strain, percent/min			0.13	0.13	0.13	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0°

tan ϕ = 0

c = .09 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray, contains numerous shell fragments

LL 93	PL 29	PI 64		G_s 2.70

Remarks ______

Project LK. PONT. LA.&VIC-HURR. PROT. (70)

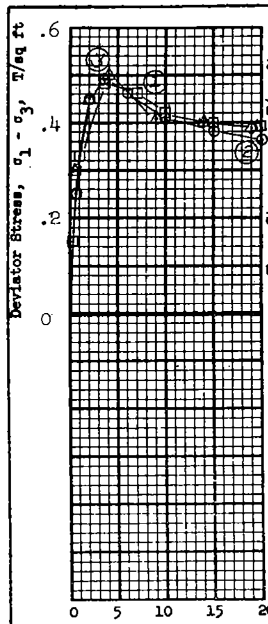
ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC,

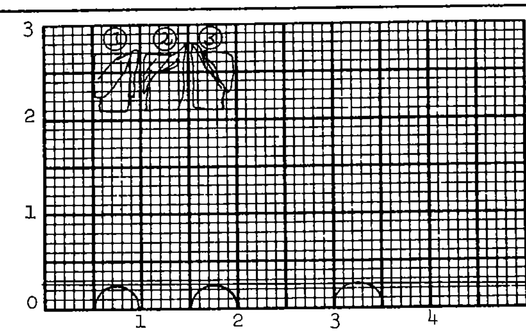
Area GDM NO.2 SUPP NO.5 (OUTFALL CANALS)

Boring No. 6-OUW | Sample No. 3-C

Depth El -4.4 | Date 30 Nov. 1970

TES TRIAXIAL COMPRESSION TEST REPORT





$\gamma_{sat.} = 100$

Test No.			1	2	3	Avg.
Initial	Water content	w_o	70.2 %	70.0 %	59.4 %	66.5 %
	Void ratio	e_o	192	1.90	1.93	
	Saturation	S_o	99.8 %	100+ %	84.0%	%
	Dry density, lb/cu ft	γ_d	58.3	58.7	58.2	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.48	0.49	0.50	
Time to failure, min		t_f	18	14	14	
Rate of strain, percent/min			0.19	0.25	0.28	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0°

tan ϕ = 0

c = .245 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray

LL 96	PL 33	PI 63		G_s 2.73

Remarks ______

Project LK. PONT. LA.& VIC.-HURR. PROT. (70)

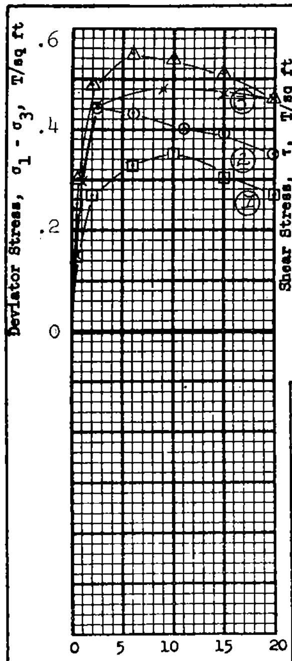
ORLEANS FARICH LAKEFRONT LEVEE WEST OF IHNC;

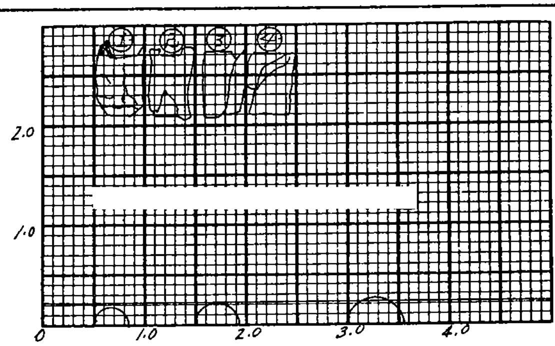
Area GDM NO. 2 SUPP NO. 5 (OUTFALL CANALS)

Boring No. 6-OUW | Sample No. 9-D

Depth El -25.2 | Date 1 Dec. 1970

FAM TRIAXIAL COMPRESSION TEST REPORT





γ sat. = 102

Test No.			1	2	3	4	Avg.
Initial	Water content	w_o	65.1 %	61.7 %	61.7 %	61.5 %	62.5
	Void ratio	e_o	1.80	1.66	1.66	1.64	
	Saturation	S_o	98.0 %	100+ %	100+ %	100+ %	
	Dry density, lb/cu ft	γ_d	60.4	63.6	63.7	64.0	
Before Shear	Water content	w_c	%	%	%	%	
	Void ratio	e_c					
	Saturation	S_c	%	%	%	%	
	Final back pressure, T/sq ft	u_o					
Final	Water content	w_f	%	%	%	%	
	Void ratio	e_f					
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	0.5	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.35	0.44	0.55	0.48	
Time to failure, min		t_f	53	10	24	75	
Rate of strain, percent/min			0.19	0.22	0.25	0.12	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$					
Initial diameter, in.		D_o	1.40	1.40	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = .2275 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray

LL 85 | PL 30 | PI 55 | G_s 2.71

Remarks ______

Project LK. PONT. LA.&VIC.-HURR. PROT. (70)
ORLEANS PARISH LAKE FRONT LEVEE WEST OF IHNC,

Area GDM NO.2, SUPP NO.5 (OUTFALL CANANLS)

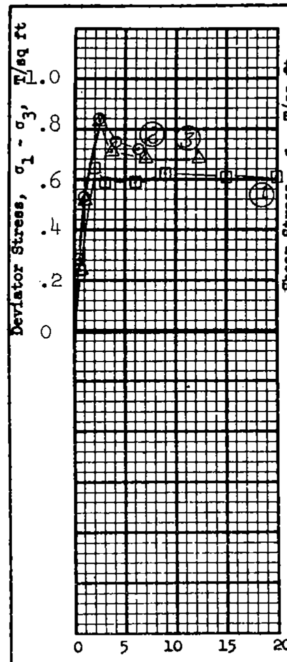
Boring No. 6-OUW | Sample No. 10-B

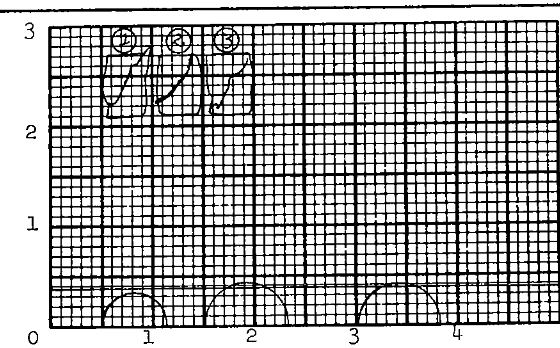
~~Depth~~ El -27.4 | Date 1 Dec. 1970

BCH | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE TRANSLUCENT

USAEWES SOILS TEST





γ sat. = 103

Test No.			1	2	3	Avg.
Initial	Water content	w_o	59.8 %	60.6 %	55.4 %	58.6 %
	Void ratio	e_o	1.63	1.64	1.48	
	Saturation	S_o	98.0 %	98.7 %	99.9 %	%
	Dry density, lb/cu ft	γ_d	63.5	63.1	67.2	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.64	0.84	0.83	
Time to failure, min		t_f	14	19	23	
Rate of strain, percent/min			0.14	0.12	0.11	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.42	1.42	1.42	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = .385 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray, contains scattered 1/8" to 1/4" dia.*

LL 71 | PL 26 | PI 45 | G_s 2.67

Remarks *pockets of silty sand

Project LK. PONT. LA.&VIC.-HURR. PROT.(70)
ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC;

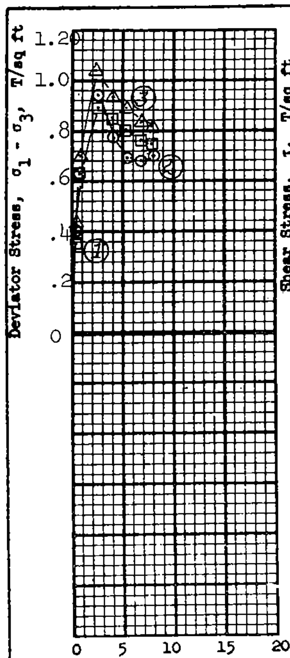
Area GDM NO. 2; SUPP. NO. 5 (OUTFALL CANALS)

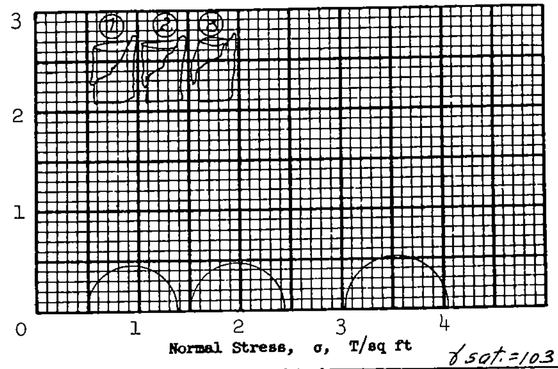
Boring No. 6-OUW | Sample No. 16-C

~~Depth~~ El - 46.0 | Date 1 Dec. 1970

JMS | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE TRANSLUCENT





$\gamma sat.=103$

Test No.			1	2	3	Avg.
Initial	Water content	w_o	58.6 %	62.3 %	59.5 %	60.1 %
	Void ratio	e_o	1.59	1.68	1.62	
	Saturation	S_o	99.5 %	100+ %	99.2 %	%
	Dry density, lb/cu ft	γ_d	65.1	62.9	64.5	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.89	0.94	1.04	✓
Time to failure, min		t_f	25	25	22	
Rate of strain, percent/min			0.10	0.10	0.10	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.39	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0°

tan ϕ = 0

c = .478 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

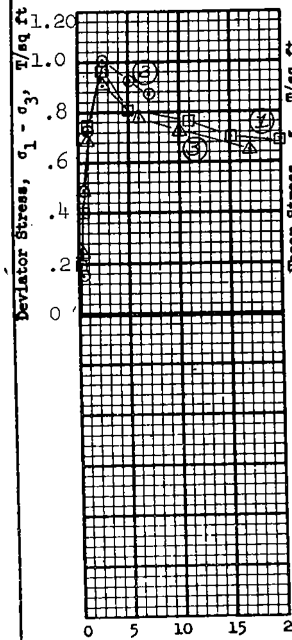
Type of test Q	Type of specimen UNDISTURBED	
Classification PLASTIC CLAY(CH), gray, contains scattered shell fragments		
LL 83	PL 22	PI 61	G_s 2.70

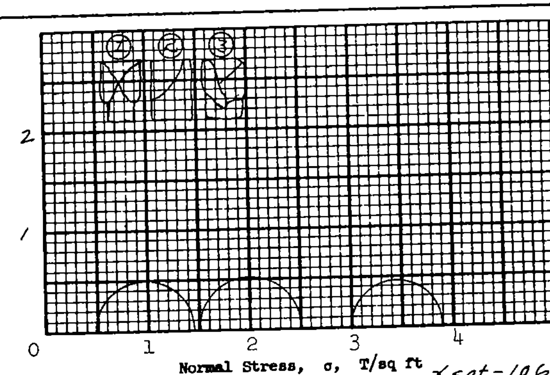
Remarks ______

Project LK. PONT. LA.&VIC.-HURR. PROT. (70)	
ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC;	
Area GDM NO 2, SUPP NO. 5 (OUTFALL CANALS)	
Boring No. 6-OUW	Sample No. 17-C
~~Depth~~ El -19.6	Date 1 Dec. 1970
TES	TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE TRANSLUCENT

USAEWES SOILS TEST SECTION





$\gamma sat.=106$

Test No.			1	2	3	Avg.
Initial	Water content	w_o	55.8 %	53.3 %	54.4 %	54.5 %
	Void ratio	e_o	1.53	1.47	1.51	
	Saturation	S_o	99.6 %	99.0 %	98.4 %	%
	Dry density, lb/cu ft	γ_d	67.3	68.9	67.9	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.96	1.00	0.90	
Time to failure, min		t_f	14	25	31	
Rate of strain, percent/min			0.18	0.10	0.08	✓
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.42	1.42	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0°

tan ϕ = 0

c = .06 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

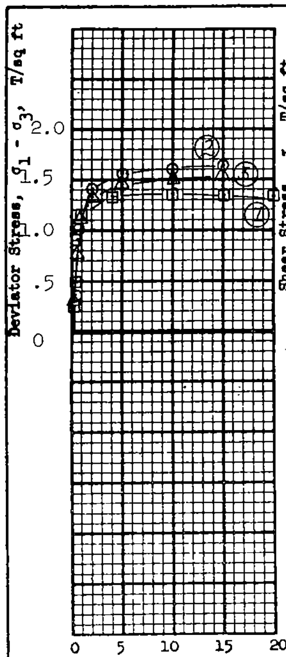
Type of test Q	Type of specimen UNDISTURBED		
Classification PLASTIC CLAY(CH), gray, contains 1/16" to 1/8" dia. shells			
LL 83	PL 23	PI 60	G_s 2.73

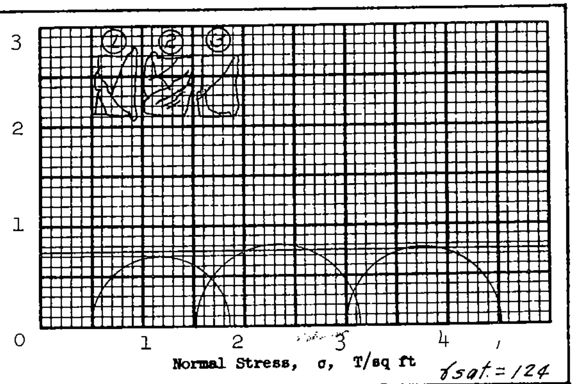
Remarks ______

Project LK. PONT. LA.&VIC.-HURR. PROT. (70)	
ORLEANS PARISH LAKE FRONT LEVEE WEST OF IHNC;	
Area GDM NO. 2, SUPP. NO.5 (OUTFALL CANALS)	
Boring No. 6-OUW	Sample No. 18-B
~~Depth~~ El -51.9	Date 2 Dec. 1970
JMS	TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE TRANSLUCENT

USAEWES SOILS TEST SECTION





$\gamma sat. = 124$

Test No.			1	2	3	Avg.
Initial	Water content	w_o	28.3 %	26.7 %	26.3 %	27.1 %
	Void ratio	e_o	0.765	0.729	0.717	
	Saturation	S_o	100+ %	99.6 %	99.4 %	%
	Dry density, lb/cu ft	γ_d	96.2	98.2	98.9	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.36	1.63	1.52	
Time to failure, min		t_f	42	48	31	
Rate of strain, percent/min			0.24	0.31	0.49	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.40	1.40	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0°

tan ϕ = 0

c = 0.75 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray and greenish tan

LL 89 | PL 17 | PI 72 | | G_s 2.72

Remarks

Project LK. PONT. LA.&VIC.-HURR. PROT.(70)

ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC.

Area GDM NO.2,SUPP. NO.5(OUTFALL CANALS)

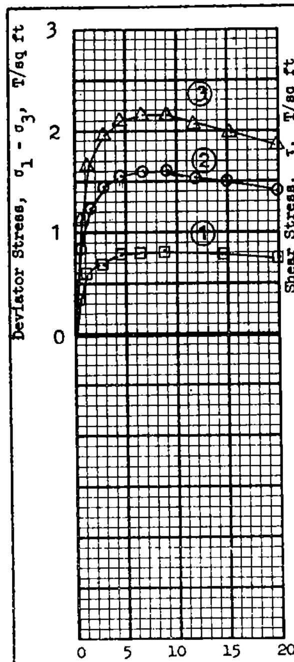
Boring No. 6-OUW | Sample No. 19-C

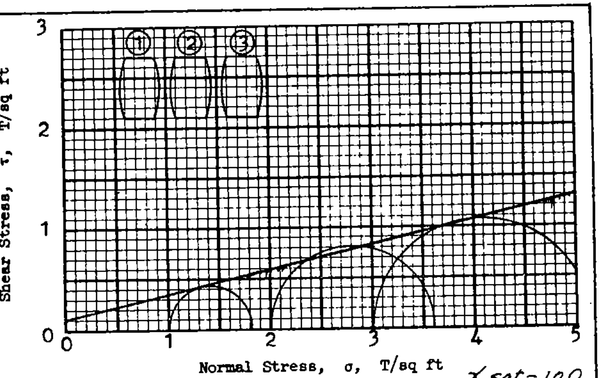
~~Depth~~ El -57.1 | Date 2 Dec. 1970

FAM | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT USAEWES SOILS TEST SECTION





$\gamma sat. = 100$

Test No.			1	2	3	Avg.
Initial	Water content	w_o	69.3 %	63.8 %	68.0 %	67.0 %
	Void ratio	e_o	1.91	1.74	1.88	
	Saturation	S_o	98.0 %	99.0 %	97.6 %	%
	Dry density, lb/cu ft	γ_d	58.0	61.5	58.6	
Before Shear	Water content	w_c	51.2 %	41.4 %	40.3 %	%
	Void ratio	e_c	1.34	1.03	1.02	
	Saturation	S_c	100+ %	100+ %	100+ %	%
	Final back pressure, PSI	u_o	78	78	78	
	Dry Density Lbs/cu.ft.	γ_d	72.1	83.1	83.6	
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	1.0	2.0	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.81	1.61	2.16	
Time to failure, min		t_f	148	131	96	
Rate of strain, percent/min			0.06	0.07	0.07	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.39	1.39	1.39	
Initial height, in.		H_o	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 13°

tan ϕ = 0.23

c = 0.14 T/sq ft

Method of saturation BP

☐ Controlled stress

☒ Controlled strain

Type of test R | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray, contains numerous 1/2" diameter shells

LL 84 | PL 25 | PI 59 | | G_s 2.70

Remarks

Project LK.PONT,LA. & VIC. - HURR. PROT. (70)

ORLEANS PARISH LAKEFRONT LEVEE WEST OF IHNC;

Area GDM #2; SUPP. #5 (OUTFALL CANALS)

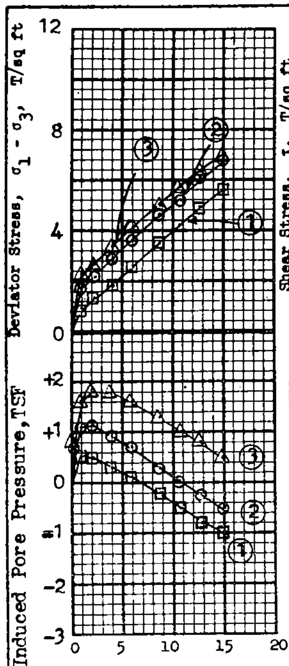
Boring No. 6-OUW | Sample No. 3-D

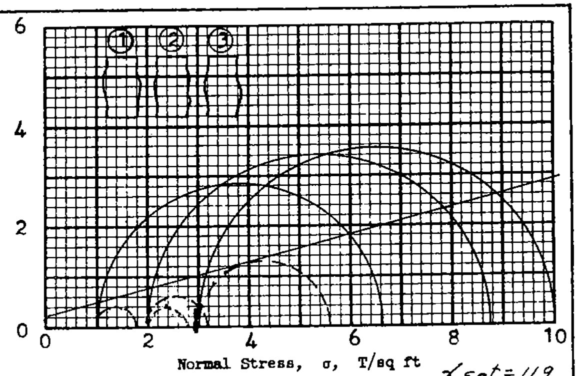
~~Depth~~ El -5.2 | Date 10 December,1970

TFS | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT USAEWES SOILS TEST SECTION





$\gamma_{sat} = 119$

Shear Strength Parameters

ϕ = 15 °

tan ϕ = 0.268

c = 0.200 T/sq ft

Method of saturation BP

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	30.4 %	31.2 %	31.0 %	30.9 %
	Void ratio	e_o	0.837	0.858	0.858	
	Saturation	S_o	97.7 %	97.8 %	97.2 %	%
	Dry density, lb/cu ft	γ_d	91.4	90.4	90.4	
Before Shear	Water content	w_c	29.5 %	29.9 %	29.0 %	%
	Void ratio	e_c	0.823	0.825	0.802	
	Saturation	S_c	96.4* %	97.5 %	97.3 %	%
	Final back pressure, PSI	u_o	80	80	80	
	Dry Density Lbs/cu.ft.	γ_d	92.1	92.0	93.2	
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	1.0	2.0	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	5.64	6.76	7.02	
Time to failure, min		t_f	273	273	273	
Rate of strain, percent/min			0.055	0.055	0.055	
$\sigma_1 - \sigma_3$ (AT MAX. PORE PRESSURE)			0.8	1.2	2.6	
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 R | Type of specimen UNDISTURBED

Classification SILT(ML), gray, contains shells up to 3/4" in size

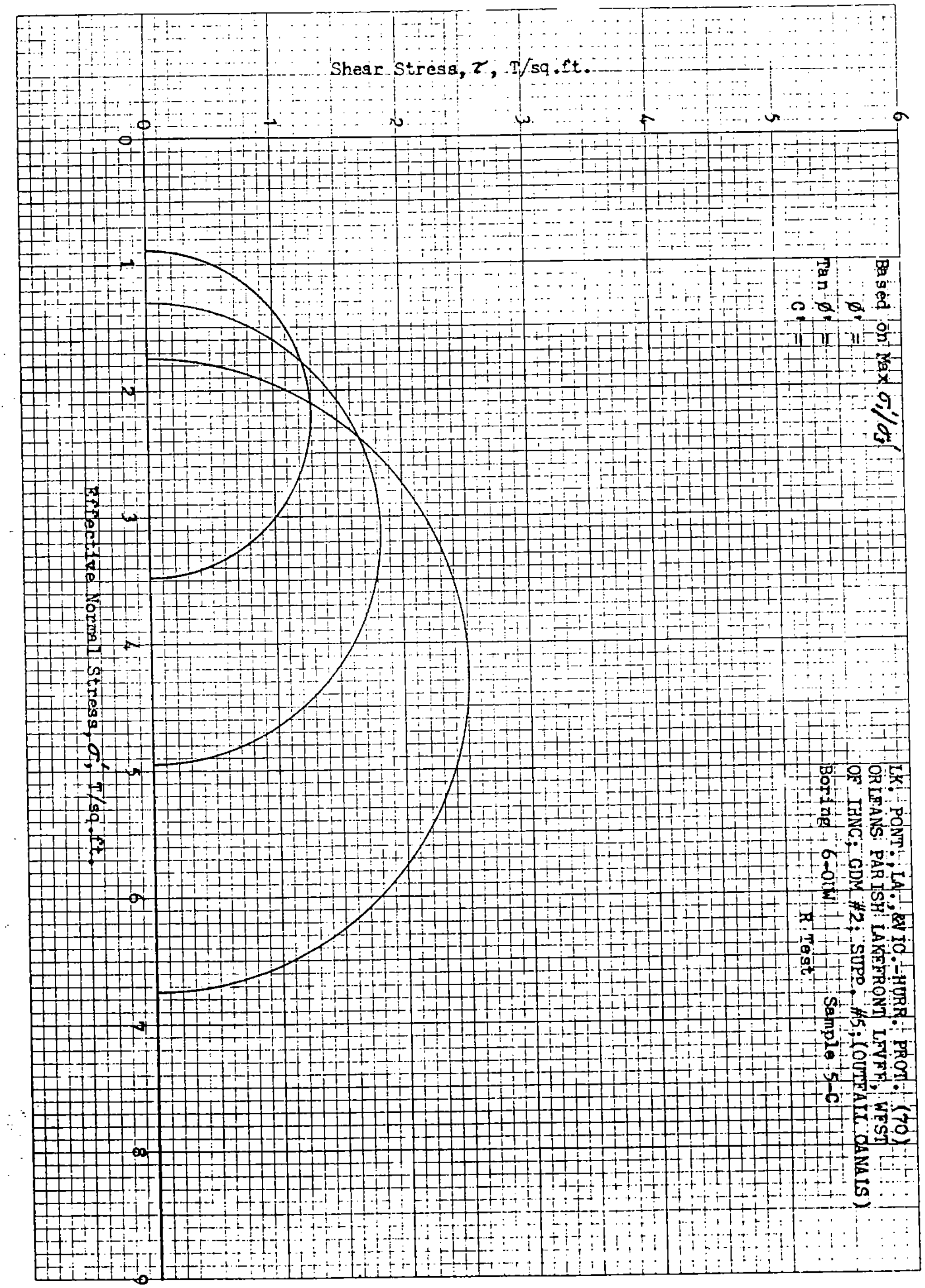
LL 25 | PL 23 | PI 2 | G_s 2.69

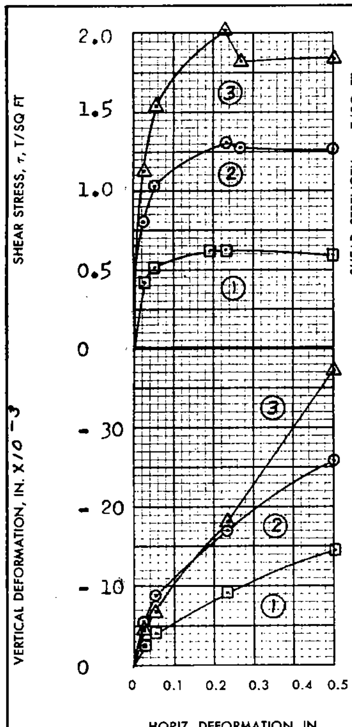
Remarks *Pore Pressure response indicated 100% saturation
See attached plot for effective values

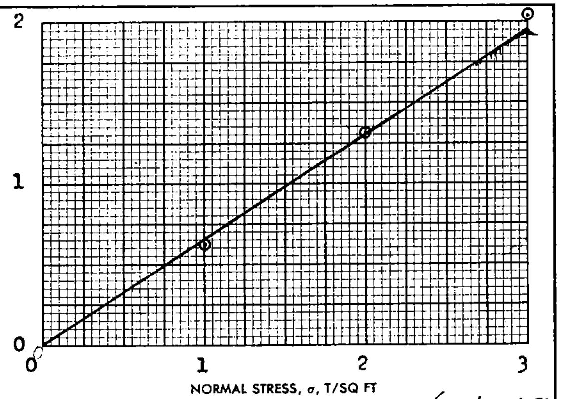
Project LK. PONT., LA. & VIC-HURR. PROT. (70)
ORLEANS PARISH LAKEFRONT LEVEE, WEST OF IHNC
Area GDM #2; SUPP. #5; (OUTFALL CANALS)
Boring No. 6-OUW | Sample No. 5-C
~~Depth~~ El 12.6 | Date 28 January, 1971
PJR | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT







$\gamma sat. = 118$

SHEAR STRENGTH PARAMETERS

ϕ' = 33°

TAN ϕ' = 0.649

c' = 0 T/SQ FT

☐ CONTROLLED STRESS
☒ CONTROLLED STRAIN

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	33.0 %	35.1 %	32.6 %	33.6 %
	VOID RATIO	e_o	0.881	0.940	0.883	
	SATURATION	S_o	100. %	99.7 %	87.0 %	%
	DRY DENSITY, LB/CU FT	γ_d	88.6	85.9	88.5	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	<1	<1	<1	
FINAL	WATER CONTENT	w_f	30.4 %	30.4 %	29.8 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.62	1.31	2.03	
ACTUAL TIME TO FAILURE, MIN		t_f	1140	1320	1320	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE, 1&2=0.550, 3=0.625 IN. THICK

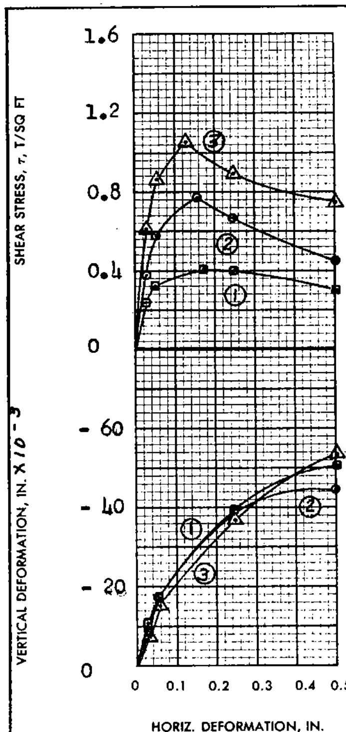
CLASSIFICATION SILT(ML), gray

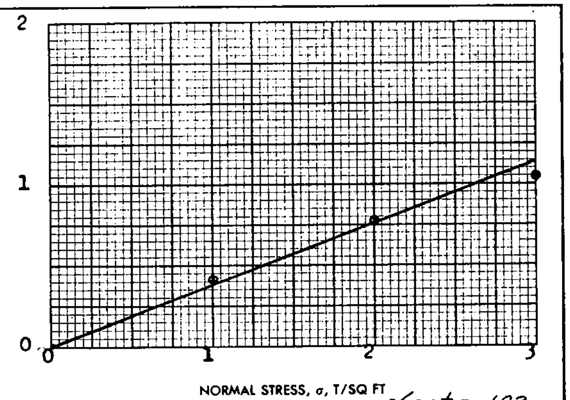
LL 29 | PL 27 | PI 2 | G_s 2.67

REMARKS

PROJECT LK. PONT. LA., & VIC. - HURR. PROT. (70)
ORLEANS PARISH LAKE FRONT LEVEE, WEST OF IHNC
AREA G.D.M. # 2, SUPP. # 5 (OUTFALL CANALS)
BORING NO. 6-OUW | SAMPLE NO. 8-B
~~DEPTH~~ EL - 19.4 | DATE 14 Dec. 1970
BWG — DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)
USAEWES SOILS TEST SECTION





$\gamma sat. = 103$

SHEAR STRENGTH PARAMETERS

ϕ' = 20.9°

TAN ϕ' = 0.382

c' = 0 T/SQ FT

☐ CONTROLLED STRESS
☒ CONTROLLED STRAIN

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	57.1 %	57.9 %	58.1 %	57.7 %
	VOID RATIO	e_o	1.59	1.61	1.63	
	SATURATION	S_o	97.3 %	97.5 %	96.6 %	%
	DRY DENSITY, LB/CU FT	γ_d	65.3	64.9	64.2	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	2	2	5	
FINAL	WATER CONTENT	w_f	52.2 %	46.8 %	43.3 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.41	0.77	1.05	
ACTUAL TIME TO FAILURE, MIN		t_f	960	870	720	
RATE OF STRAIN, IN./MIN			.00019	.00019	.00019	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE, 1&2=0.560, 3=0.625 IN. THICK

CLASSIFICATION PLASTIC CLAY(CH), gray

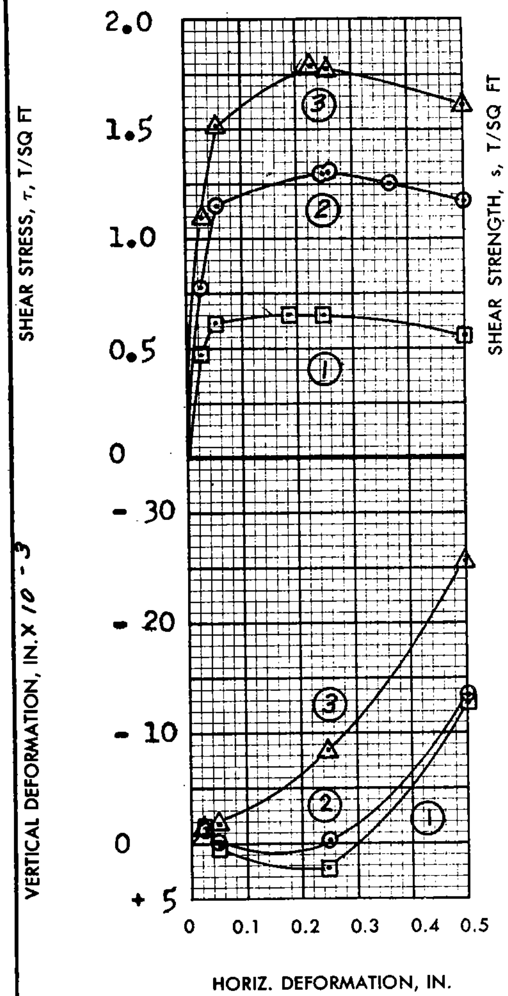
LL | PL | PI | G_s 2.71

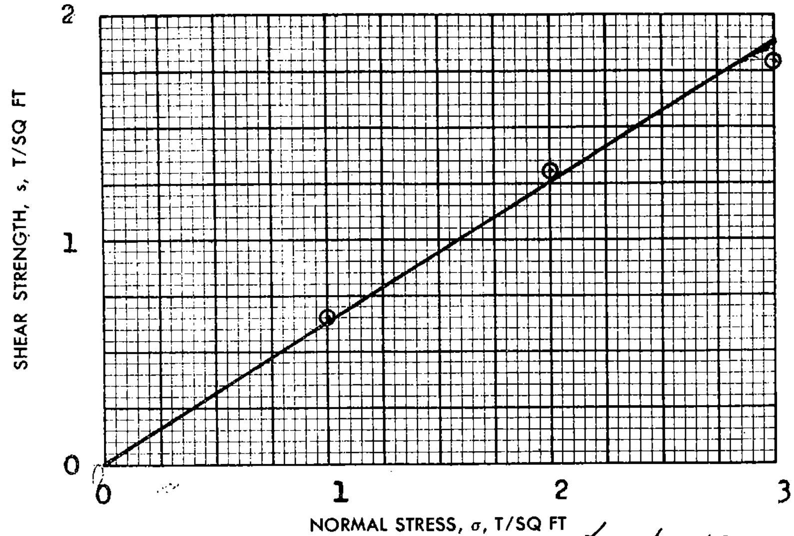
REMARKS

PROJECT LK. PONT. LA., & VIC. -HURR. PROT. (70)
ORLEANS PARISH LAKE FRONT LEVEE, WEST OF IHNC
AREA G.D.M. # 2, SUPP. # 5 (OUTFALL CANALS)
BORING NO. 6-OUW | SAMPLE NO. 10-B
~~DEPTH~~ EL - 27.4 | DATE 14 Dec. 1970
WJH — DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)
USAEWES SOILS TEST S...

PLATE IX-3





γsat. = 122

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	27.0 %	26.8 %	26.3 %	26.7 %
	VOID RATIO	e_o	0.752	0.746	0.741	
	SATURATION	S_o	95.5 %	95.6 %	94.4 %	%
	DRY DENSITY, LB/CU FT	γ_d	94.8	95.1	95.4	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	26.0 %	25.6 %	24.6 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.65	1.30	1.79	
ACTUAL TIME TO FAILURE, MIN		t_f	1020	1380	1200	
RATE OF STRAIN, IN./MIN			.00019	.00019	.00019	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 32.3°

TAN ϕ' = 0.632

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN	UNDISTURBED	3.00 IN. SQUARE	0.560 IN. THICK

CLASSIFICATION SILTY SAND(SM), gray, contains small shells

LL	PL	PI		G_s
-	-	-		2.66

REMARKS

PROJECT LK. PONT. LA., & VIC- HURR. PROT. (70)

ORLEANS PARISH LAKE FRONT LEVEE, WEST OF IHNC

AREA G.D.M. # 2, SUPP. # 5 (OUTFALL CANALS)

BORING NO. 6-OUW	SAMPLE NO. 13-B
~~DEPTH~~ EL - 35.2	DATE 15 Dec. 1970

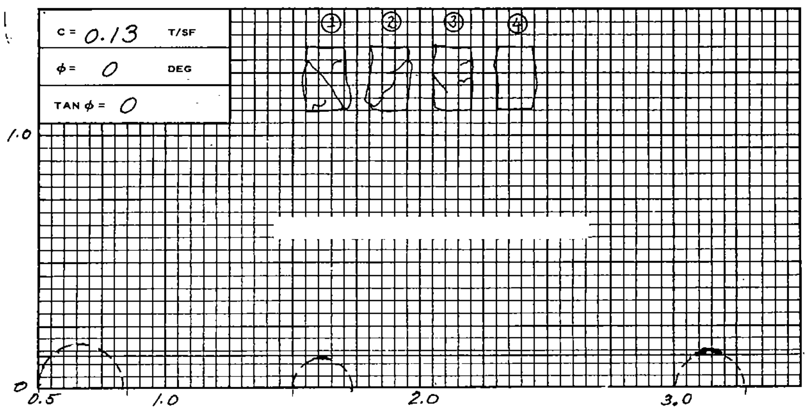
BWG USAEWES SOILS TEST SECTION

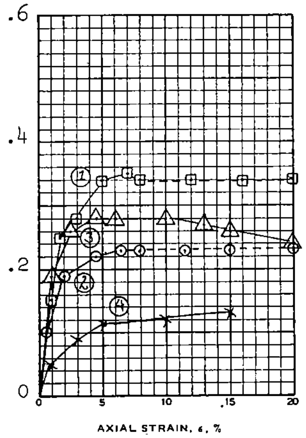
DIRECT SHEAR TEST REPORT

c = 0.13 T/SF

φ = 0 DEG

TAN φ = 0





sat. γ = 113.8

SPECIMEN NO.		1	2	3	4	
INITIAL: WATER CONTENT, %	w_o	36.1	43.6	43.6	40.8	Avg. 41.0
INITIAL: DRY DENSITY LB/CU FT	γd_o	85.8	78.8	78.5	80.0	
INITIAL: SATURATION, %	S_o	100+	100+	100+	100+	
INITIAL: VOID RATIO	e_o	0.950	1.12	1.13	1.09	
BEFORE SHEAR: WATER CONTENT, %	w_c					
BEFORE SHEAR: DRY DENSITY LB/CU FT	γd_c					
BEFORE SHEAR: SATURATION, %	S_c					
BEFORE SHEAR: VOID RATIO	e_c					
BEFORE SHEAR: FINAL BACK PRESSURE, T/SQ FT	u_o					
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	0.5	1.5	3.0	1.5	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	0.35	0.23	0.28	0.13	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	35	12	9	26	
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{ULT}$					
INITIAL DIAMETER, IN.	D_o	1.40	1.39	1.39	1.39	
INITIAL HEIGHT, IN.	H_o	3.00	3.00	3.00	3.00	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS LEAN CLAY(CL),gray;lenses and layers of sandy silt;a few shells

LL 40	PL 18	PI 22	Gs 2.68	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS: --- Rate of strain increased.

PROJECT LK.PONT.LA.&VIC.-HURR. PROT-ORLEANS PARISH OUTFALL CANALS-ORLEANS ST. CANAL

BORING NO. 1-UOP SAMPLE NO. 2-C

DEPTH/ELEV 4.9/-2.1

LABORATORY USAEWES DATE 17 August. 1973

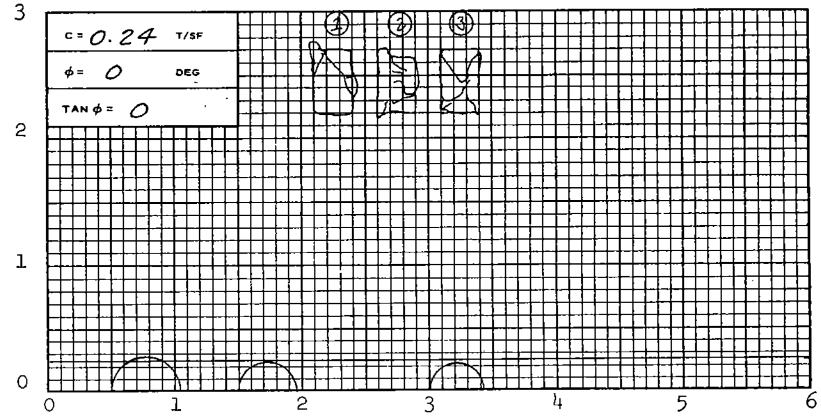
PJR **TRIAXIAL COMPRESSION TEST REPORT**

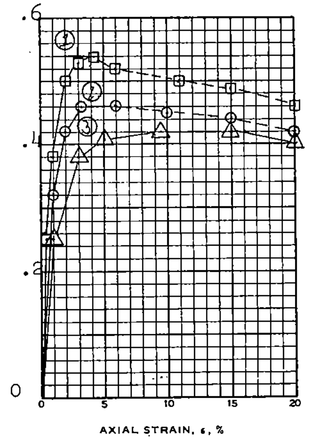
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c = 0.24 T/SF

φ = 0 DEG

TAN φ = 0





sat. γ = 106.2

SPECIMEN NO.		1	2	3	Avg.
INITIAL: WATER CONTENT, %	w_o	56.1	53.6	52.6	54.1
INITIAL: DRY DENSITY LB/CU FT	γd_o	67.5	69.1	69.9	
INITIAL: SATURATION, %	S_o	100+	99.2	99.4	
INITIAL: VOID RATIO	e_o				
BEFORE SHEAR: WATER CONTENT, %	w_c				
BEFORE SHEAR: DRY DENSITY LB/CU FT	γd_c				
BEFORE SHEAR: SATURATION, %	S_c				
BEFORE SHEAR: VOID RATIO	e_c				
BEFORE SHEAR: FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	0.54	0.46	0.42	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	10	8	24	
ULTIMATE 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	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;silt lenses;approx. 1/16" thick;a few shell fragments

LL 71	PL 24	PI 47	Gs 2.74	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS: --- Rate of strain increased.

PROJECT LK.PONT.LA.&VIC.-HURR. PROT-ORLEANS PARISH OUTFALL CANALS-ORLEANS ST. CANAL

BORING NO. 1-UOP SAMPLE NO. 4-B

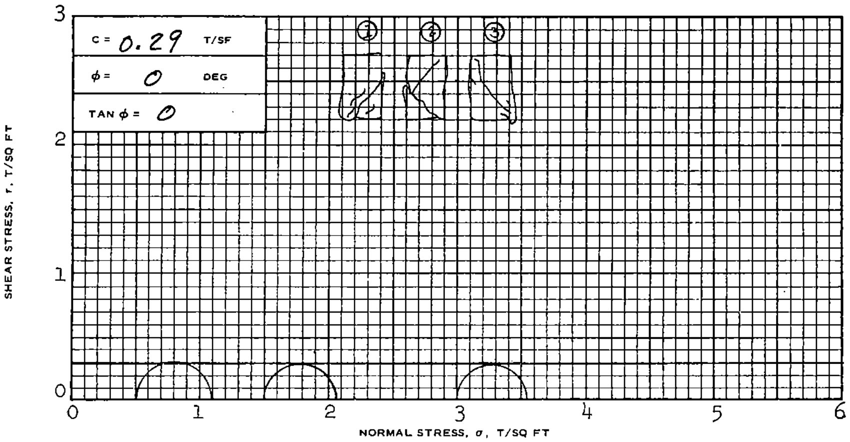
DEPTH/ELEV 12.0/-9.2

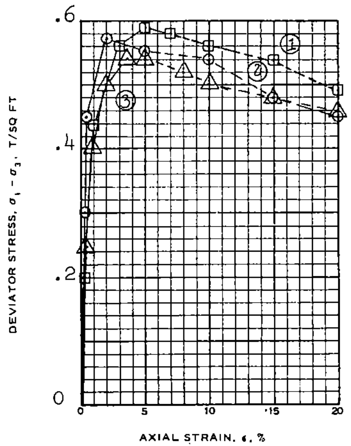
LABORATORY USAEWES DATE 17 August 1973

PJR **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Triaxial Compression Test Report — Boring 1-UOP, Sample 8-D





sat. γ = 98.8

	SPECIMEN NO.		1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	73.3	73.1	73.6	73.3
	DRY DENSITY LB/CU FT	γd_o	56.8	57.4	56.7	
	SATURATION, %	S_o	99.8	100+	100+	
	VOID RATIO	e_o	2.02	1.99	2.03	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	0.59	0.57	0.54	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN		t_f	14	6	14	
ULTIMATE 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	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray

LL 94 | PL 27 | PI 67 | Gs 2.75 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: --- Rate of strain increased.

PROJECT LK.PONT.LA.&VIC-HURR.PROT-ORLEANS PARISH OUTFALL CANALS-ORLEANS ST.CANAL

BORING NO. 1-UOP | SAMPLE NO. 8-D

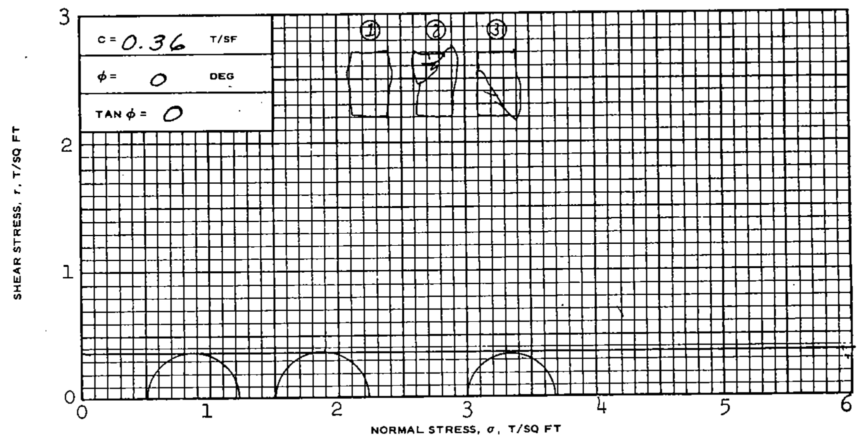
DEPTH/ELEV 29.7/-26.9

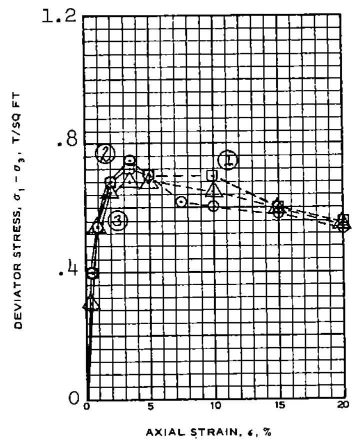
LABORATORY USAEWES | DATE 18 August 1973

PJR **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT *(EM 1110-2-1906)*

Triaxial Compression Test Report — Boring 1-UOP, Sample 9-C





sat. γ = 104.1

	SPECIMEN NO.		1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	54.9	57.3	58.1	56.8
	DRY DENSITY LB/CU FT	γd_o	67.3	65.9	65.4	
	SATURATION, %	S_o	98.2	100+	98.8	
	VOID RATIO	e_o	1.52	1.52	1.60	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	0.72	0.74	0.68	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN		t_f	10	10	10	
ULTIMATE 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	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;a few small sand lenses

LL 73 | PL 25 | PI 48 | Gs 2.72 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: --- Rate of strain increased.

PROJECT LK.PONT.LA.&VIC.-HURR. PROT.-ORLEANS PARISH OUTFALL CANALS-ORLEANS ST.CANAL

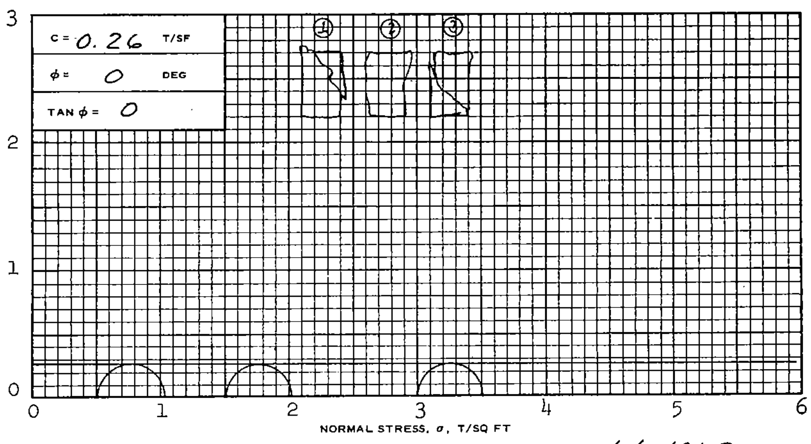
BORING NO. 1-UOP | SAMPLE NO. 9-C

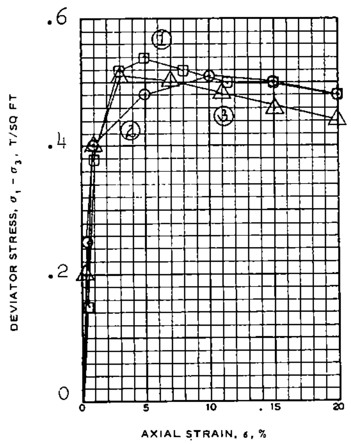
DEPTH/ELEV 32.9/-30.1

LABORATORY USAEWES | DATE 18 August 1973

PJR **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT *(EM 1110-2-1906)*





Sat. γ = 101.2

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	62.3	62.4	68.3	64.3
	DRY DENSITY LB/CU FT	γ_{d_o}	62.6	62.2	59.1	
	SATURATION, %	S_o	98.9	97.9	99.2	
	VOID RATIO	e_o	1.72	1.74	1.88	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.54	0.51	0.51	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	15	37	8	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.39	1.40	1.40	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH);gray;small shells

LL 83 PL 25 PI 58 Gs 2.73

TYPE OF SPECIMEN UNDISTURBED TYPE OF TEST Q

REMARKS:

PROJECT LK.PONT.LA.&VIC-HURR.PROT-ORLEANS PARISH OUTFALL CANALS-ORLEANS ST.CANAL

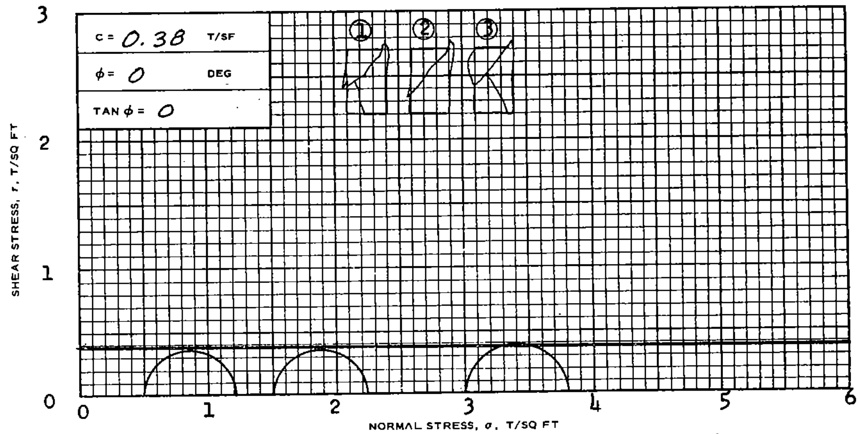
BORING NO. 1-UOP SAMPLE NO. 13-D

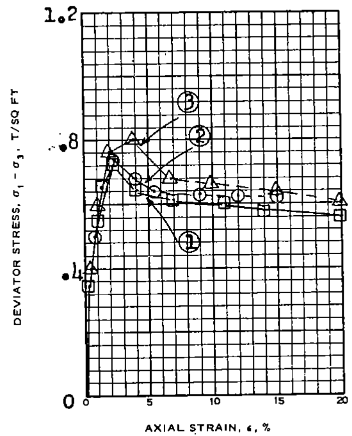
DEPTH/ELEV 49.8/-47.0

LABORATORY USAEWES DATE 25 August 1973

WJH TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





Sat. γ = 106.9

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	52.8	51.7	51.3	34.8
	DRY DENSITY LB/CU FT	γ_{d_o}	69.6	70.3	70.8	
	SATURATION, %	S_o	99.7	99.0	99.7	
	VOID RATIO	e_o	1.44	1.42	1.40	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.72	0.74	0.80	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	9	13	23	
ULTIMATE 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	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray

LL 72 PL 23 PI 49 Gs 2.72

TYPE OF SPECIMEN UNDISTURBED TYPE OF TEST Q

REMARKS: —— Rate of strain increased

PROJECT LK.PONT.LA.&VIC.-HURR.PROT.-ORLEANS PARISH OUTFALL CANALS, ORLEANS ST. CANAL

BORING NO. 1-UOP SAMPLE NO. 15A

DEPTH/ELEV 55.4/-52.6

LABORATORY USAEWES DATE 28 August,1973

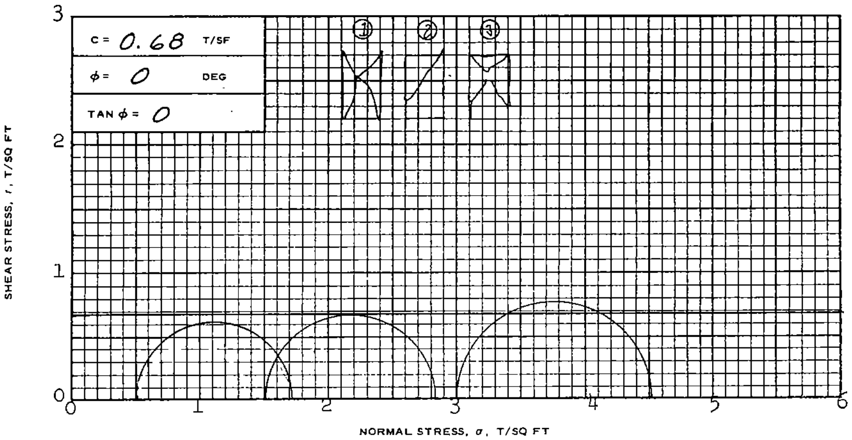
JMS TRIAXIAL COMPRESSION TEST REPORT

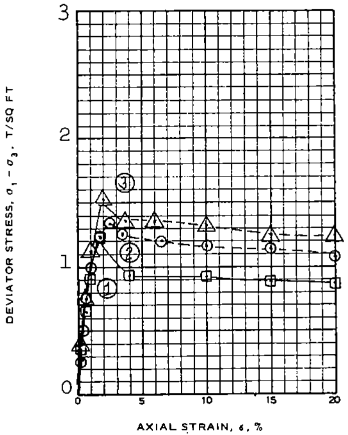
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c = 0.68 T/SF

ϕ = 0 DEG

TAN ϕ = 0





sat.γ = 114.6

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	39.5	38.0	38.5	38.7
	DRY DENSITY LB/CU FT	γd_o	81.1	82.7	82.4	
	SATURATION, %	S_o	97.5	97.3	97.7	
	VOID RATIO	e_o	1.11	1.07	1.08	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.22	1.34	1.52	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	70	20	16	
ULTIMATE 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	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS LEAN CLAY(CL),gray;1/8" to 1/4" thick seams of silt

LL 49 | PL 21 | PI 28 | Gs 2.74 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: Rate of strain increased.

PROJECT LK.PONT.LA.&VIC.-HURR. PROT-ORLEANS PARISH OUTFALL CANALS-ORLEANS ST.CANAL

BORING NO. 1-UOP | SAMPLE NO. 25-C

DEPTH/ELEV 96.9/-94.1

LABORATORY USAEWES | DATE 29 August 1973

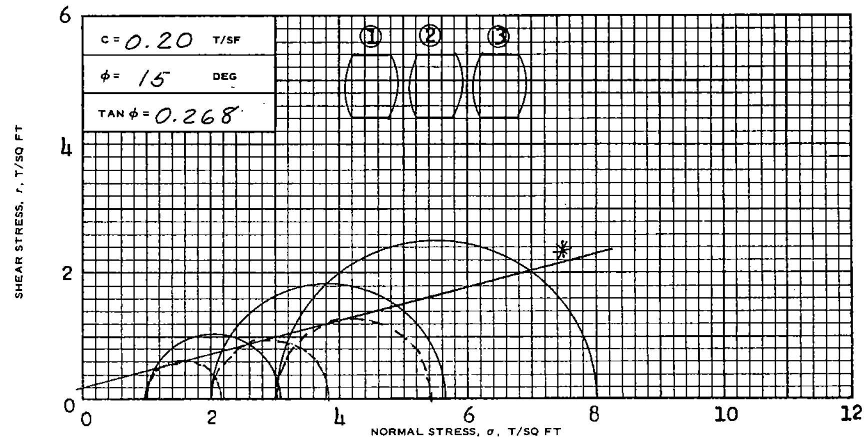
JMS TRIAXIAL COMPRESSION TEST REPORT

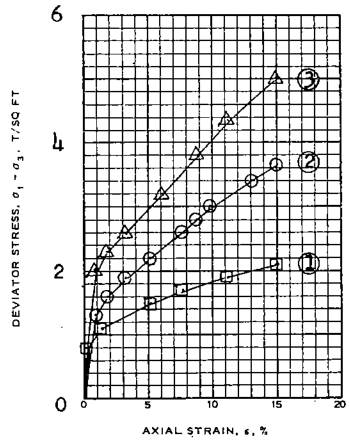
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c = 0.20 T/SF

ϕ = 15 DEG

TAN ϕ = 0.268





sat.γ = 115.0

SPECIMEN NO.			1	2	3	Avg.
INITIAL	WATER CONTENT, %	w_o	37.7	36.6	35.9	36.7
	DRY DENSITY LB/CU FT	γd_o	83.0	84.3	85.0	
	SATURATION, %	S_o	100+	100+	100+	
	VOID RATIO	e_o	1.00	0.970	0.953	
BEFORE SHEAR	WATER CONTENT, %	w_c	35.8	34.0	33.0	
	DRY DENSITY LB/CU FT	γd_c	86.0	89.2	90.8	
	SATURATION, %	S_c	100+	100+	100+	
	VOID RATIO	e_c	0.931	0.862	0.829	
	FINAL BACK PRESSURE, T/SQ FT	u_o	4.82	4.82	4.82	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.09	3.65	5.01	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	62	61	61	
*$(\sigma_1 - \sigma_3)$ at max. Pore Pressure			1.18	1.82	2.5	
INITIAL DIAMETER, IN.		D_o	1.38	1.38	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SILTY CLAY(CL), gray; numerous shells up to 1"; sand layers

LL 36 | PL 16 | PI 20 | Gs 2.66 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST R

REMARKS: See attached plot for effective values
Portion of sample allowed to drain before trimming

PROJECT LK. PONT.,LA.&VIC.-HURR.PROT.,ORLEANS PARISH, OUTFALL CANALS-ORLEANS ST. CANAL

BORING NO. 1-UOP | SAMPLE NO. 5-C

DEPTH/ELEV 16.8/-14.0

LABORATORY USAEWES | DATE 4 August,1973

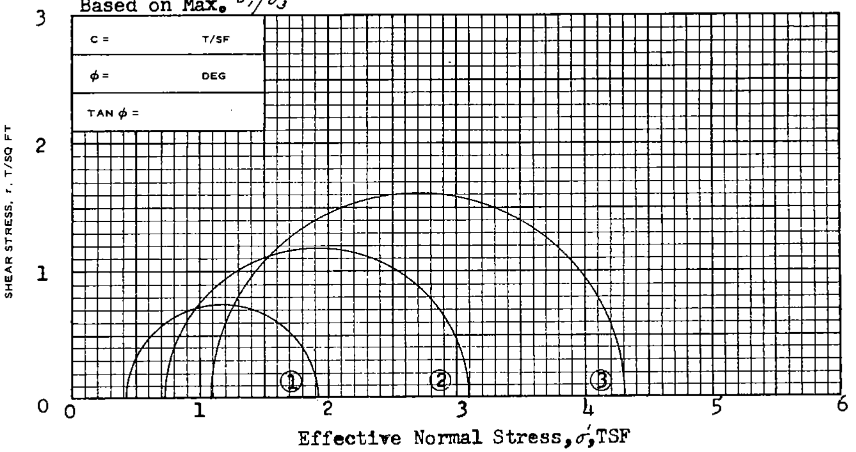
Sheet 1 of 2

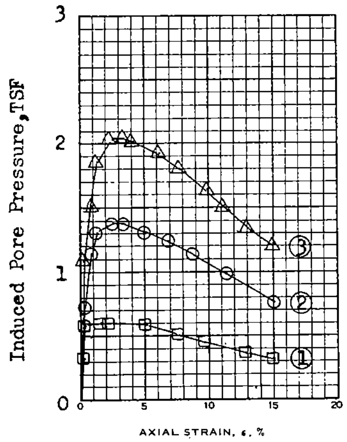
TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Based on Max. σ_1'/σ_3'

c =		T/SF
ϕ =		DEG
TAN ϕ =		





SPECIMEN NO.					
INITIAL: WATER CONTENT, %	w_o				
DRY DENSITY LB/CU FT	γd_o				
SATURATION, %	S_o				
VOID RATIO	e_o				
BEFORE SHEAR: WATER CONTENT, %	w_c				
DRY DENSITY LB/CU FT	γd_c				
SATURATION, %	S_c				
VOID RATIO	e_c				
FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3				
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$				
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f				
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.	D_o				
INITIAL HEIGHT, IN.	H_o				

CONTROLLED- TEST

DESCRIPTION OF SPECIMENS

LL | PL | PI | Gs

TYPE OF SPECIMEN | TYPE OF TEST

REMARKS:

PROJECT LK. PONT., LA.& VIC.-HURR. PROT.ORLEANS PARISH OUTFALL CANALS-ORLEANS ST. CANAL

BORING NO. 1-UOP | SAMPLE NO. 5-C

DEPTH/ELEV 16.8/-14.0

LABORATORY USAEWES | DATE 4 August,1973

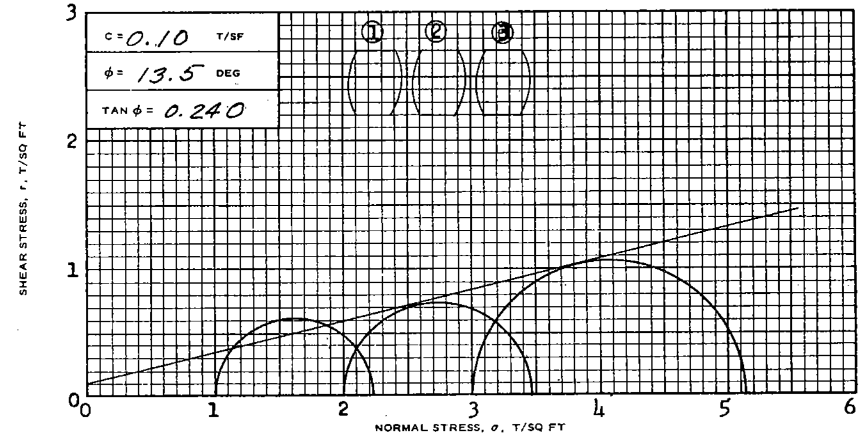
Sheet 2 of 2

TES TRIAXIAL COMPRESSION TEST REPORT

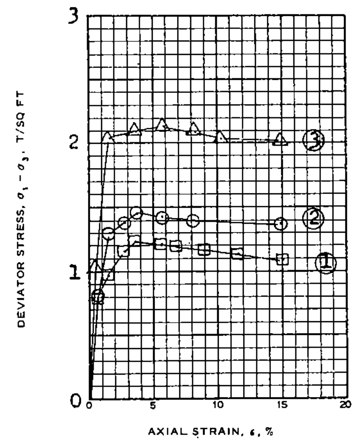
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

---

c = 0.10		T/SF
ϕ = 13.5		DEG
TAN ϕ = 0.240		



sat. γ = 110.5



SPECIMEN NO.		1	2	3	Avg.
INITIAL: WATER CONTENT, %	w_o	43.5	46.6	43.6	44.6
DRY DENSITY LB/CU FT	γd_o	77.4	74.6	77.4	
SATURATION, %	S_o	100+	100+	100+	
VOID RATIO	e_o	1.15	1.24	1.15	
BEFORE SHEAR: WATER CONTENT, %	w_c	38.6	37.8	31.2	
DRY DENSITY LB/CU FT	γd_c	81.7	83.1	88.8	
SATURATION, %	S_c	99.0	100+	95.0	
VOID RATIO	e_c	1.04	1.01	0.877	
FINAL BACK PRESSURE, T/SQ FT	u_o	5.54	5.54	5.54	
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	1.23	1.47	2.14	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	14	14	22	
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 CLAYEY SANDY SILT(ML),gray

LL 35 | PL 27 | PI 8 | Gs 2.67

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-ORLEANS ST. CANAL

BORING NO. 1-UOP | SAMPLE NO. 12-B

DEPTH/~~ELEV~~ 44.0/41.2

LABORATORY USAEWES | DATE 4 August,1973

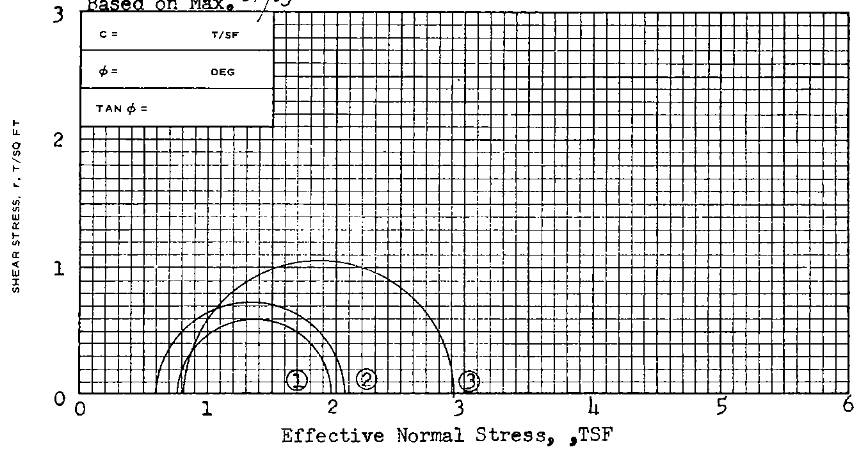
Sheet 1 of 2

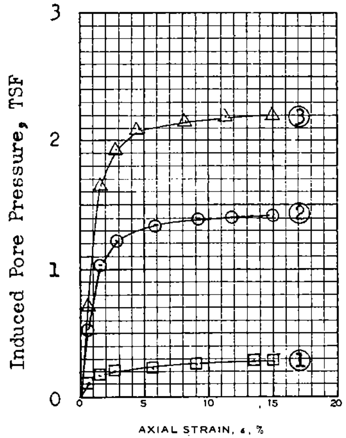
TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Based on Max. σ_1'/σ_3'

c =	T/SF
ϕ =	DEG
TAN ϕ =	





SPECIMEN NO.						
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3				
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$				
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN		t_f				
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o				
INITIAL HEIGHT, IN.		H_o				

CONTROLLED- TEST

DESCRIPTION OF SPECIMENS

LL	PL	PI	Gs	TYPE OF SPECIMEN	TYPE OF TEST

REMARKS:

PROJECT LK.PONT.,LA.&VIC.-HURR.PROT.ORLEANS PARISH,OUTFALL CANALS-ORLEANS ST. CANAL

BORING NO. 1-UOP SAMPLE NO. 12-B

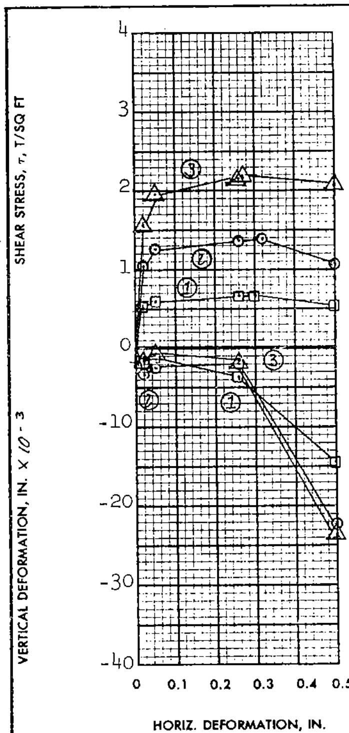
DEPTH 44.0/41.2

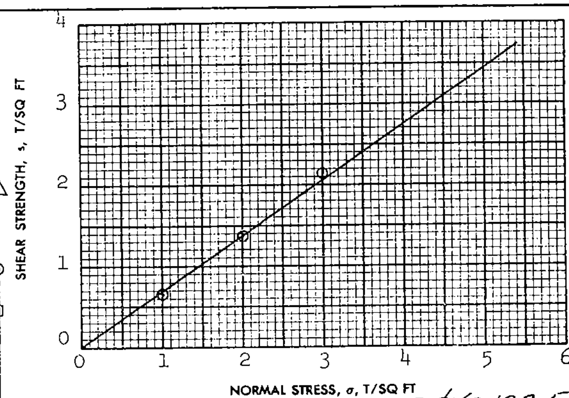
LABORATORY USAEWES DATE 4 August 1973

Sheet 2 of 2

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





Sat γ = 122.5

SHEAR STRENGTH PARAMETERS

ϕ' = 34°

TAN ϕ' = 0.674

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	26.1 %	25.9 %	26.2 %	26.1 %
	VOID RATIO	e_o	0.733	0.733	0.740	
	SATURATION	S_o	95.1%	94.3%	94.5 %	%
	DRY DENSITY, LB/CU FT	γ_d	96.2	96.2	95.8	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	23.0%	23.4%	24.3 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.67	1.39	2.15	
ACTUAL TIME TO FAILURE, MIN		t_f	1560	1680	1380	
RATE OF STRAIN, IN./MIN			.00019	.00019	.00019	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.620 IN. THICK

CLASSIFICATION SILTY SAND(SM),gray;shells approx. 1/16" diam

LL -	PL -	PI -		G_s 2.67

REMARKS

PROJECT LK.PONT.LA.&VIC-HURR. PROT-ORLEANS PARISH OUTFALL CANALS-ORLEANS ST. CANAL

AREA

BORING NO. 1-UOP SAMPLE NO. 10-C

DEPTH EL 36.4/-33.6 DATE 4 Sept. 1973

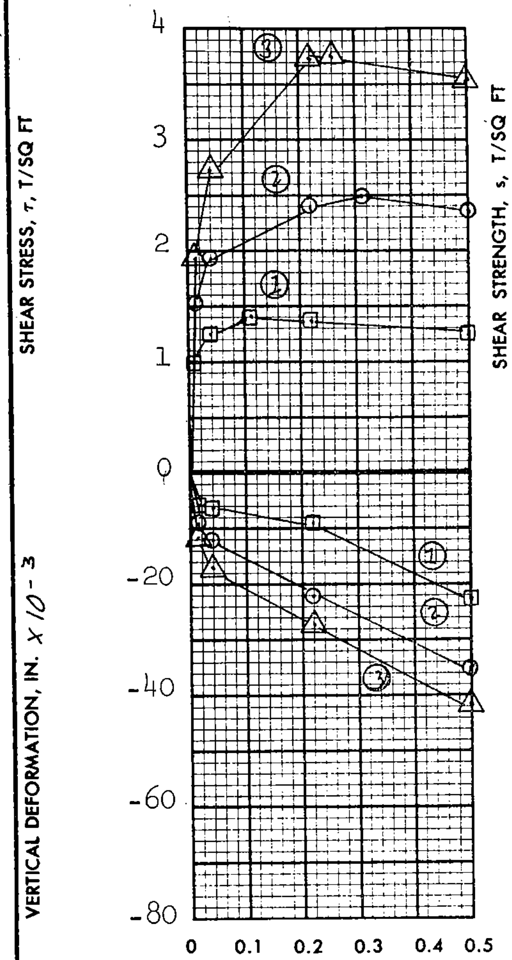
RCH

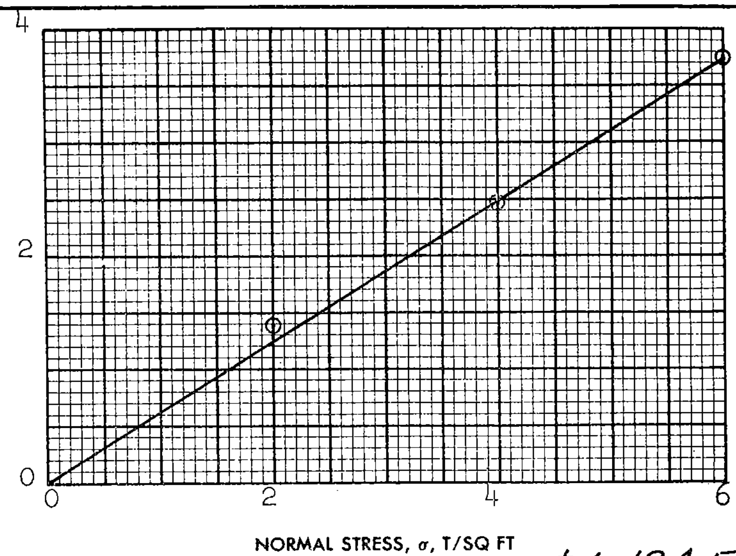
DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO : 1966 OF-214-945

PLATE IX-3





sat. γ = 124.5

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	24.8 %	25.1 %	25.1 %	25.0%
	VOID RATIO	e_o	0.703	0.713	0.711	
	SATURATION	S_o	95.2 %	95.0 %	95.3 %	%
	DRY DENSITY, LB/CU FT	γ_d	99.0	98.4	98.5	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	23.3	23.6	21.9	
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.40	2.49	3.74	
ACTUAL TIME TO FAILURE, MIN		t_f	660	1800	1500	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 32°

TAN ϕ' = 0.625

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED		3.01 IN. SQUARE	0.620 IN. THICK
CLASSIFICATION SILTY SAND(SM),tannish gray			
LL –	PL –	PI –	G_s 2.70

REMARKS

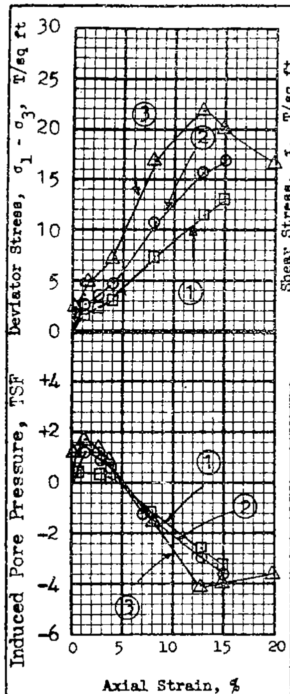
PROJECT LK. PONT. LA.&VIC-HURR. PROT-ORLEANS PARISH OUTFALL CANALS-ORLEANS ST. CANAL

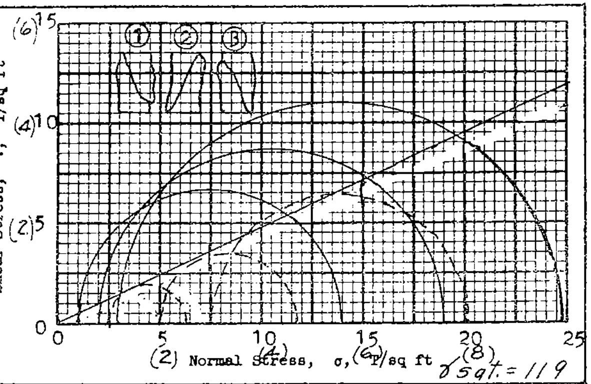
AREA

BORING NO. 1-UOP SAMPLE NO. 17-C

DEPTH / EL 64.6/-61.8 DATE 5 Sept. 1973

RCH **DIRECT SHEAR TEST REPORT**





Shear Strength Parameters

ϕ = 25 °

tan ϕ = 0.467

c = 0 T/sq ft

Method of saturation BP

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	32.0 %	31.0 %	30.2 %	31.1 %
	Void ratio	e_o	0.862	0.834	0.826	
	Saturation	S_o	99.1 %	99.2 %	97.6 %	%
	Dry density, lb/cu ft	γ_d	89.5	90.9	91.3	
Before Shear	Water content	w_c	30.8 %	29.0 %	29.2 %	%
	Void ratio	e_c	0.824	0.777	0.781	
	Saturation	S_c	99.8 %	99.6 %	99.8 %	%
	Final back pressure, PSI	u_o	60	60	60	
	Dry Density Lbs/cu.ft.	γ_d	91.4	93.8	93.6	
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	1.0	2.0	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	12.93	16.99	21.89	
Time to failure, min		t_f	125	125	108	
Rate of strain, percent/min			0.12	0.12	0.12	
$(\sigma_1-\sigma_3)$ at max.pore pres			1.50	2.70	5.00	
Initial diameter, in.		D_o	1.40	1.41	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	

Type of test R | Type of specimen UNDISTURBED

Classification CLAYEY SILT(ML),gray, contains fine sand and shells

LL 27 | PL 26 | PI 1 | G_s 2.67

Remarks Portion of sample allowed to drain before trimming
See attached plot for effective values

Sheet 1 of 2

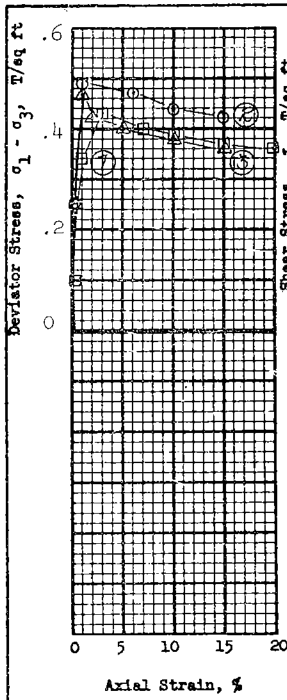
Project LK. PONT.,LA., & VIC.- HURR. PROT.
ORLEANS PARISH LAKFFRONT LEVFE, WEST OF IHNC;

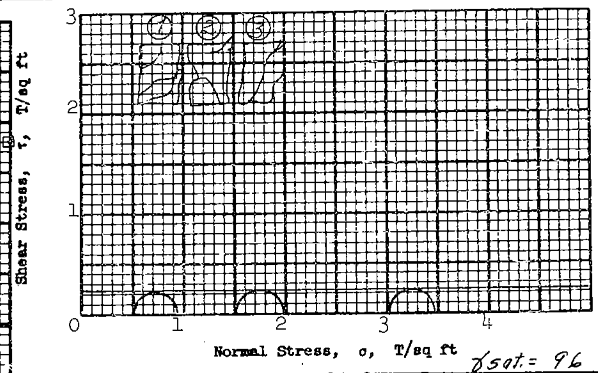
Area GDM #2; SUPP. #5, OURFALL CANALS

Boring No. 3-JUE | Sample No. 7-B

~~Depth~~ El -12.3 | Date 17 December,1970

JAL — TRIAXIAL COMPRESSION TEST REPORT





Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = .232 T/sq ft

Method of saturation

☐ Controlled stress

☒ Controlled strain

Test No.			1	2	3	Avg.
Initial	Water content	w_o	79.3 %	82.7 %	82.7 %	81.6 %
	Void ratio	e_o	2.09	2.24	2.24	
	Saturation	S_o	100+ %	100 + %	100 + %	%
	Dry density, lb/cu ft	γ_d	54.7	52.2	52.2	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.43	0.49	0.47	
Time to failure, min		t_f	19	42	56	
Rate of strain, percent/min			0.16	0.24	0.18	
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

LL 102 | PL 32 | PI 70 | G_s 2.71

Remarks

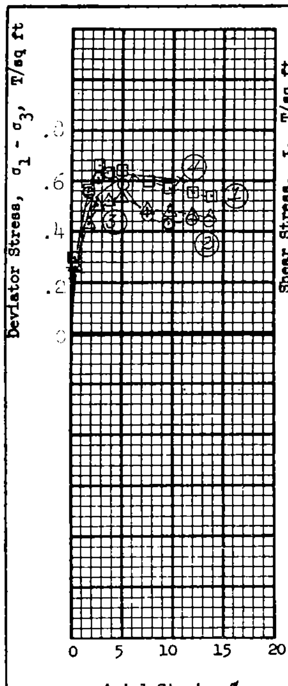
Project LK. PONT., LA. & VIC., HURR. PROT.,
ORLEANS PARISH LK. FRONT LEVEE, WEST OF IHNC;

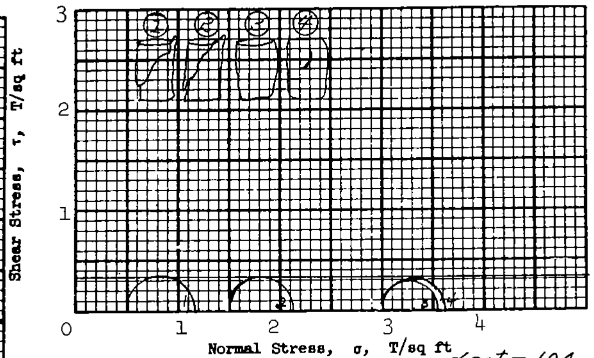
Area GDM No2, SUPP. NO.5, (OUTFALL CANALS)

Boring No. 3 JUE | Sample No. 5-B

~~Depth~~ El -4.5 | Date 3 Dec. 1970

BCH — TRIAXIAL COMPRESSION TEST REPORT





$\gamma sat. = 104$

Shear Strength Parameters

ϕ = 0°

tan ϕ = 0

c = .31 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

	Test No.		1	2	3	4	Avg.
Initial	Water content	w_o	60.4 %	61.7 %	58.0 %	59.7 %	60.0
	Void ratio	e_o	1.64	1.67	1.57	1.62	
	Saturation	S_o	100+ %	100+ %	100+ %	100+ %	
	Dry density, lb/cu ft	γ_d	64.4	63.6	66.0	64.8	
Before Shear	Water content	w_c	%	%	%	%	
	Void ratio	e_c					
	Saturation	S_c	%	%	%	%	
	Final back pressure, T/sq ft	u_o					
Final	Water content	w_f	%	%	%	%	
	Void ratio	e_f					
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.66	0.63	0.53	0.62	
Time to failure, min		t_f	34	39	56	35	
Rate of strain, percent/min			0.08	0.09	0.09	0.17	
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 Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH), gray, contains silt seams

LL 88 | PL 26 | PI 62 | G_s 2.72

Remarks

Project LK. PONT., LA.&VIC., HURR. PROT. ORLEANS PARISH LK. FRONT LEVEE WEST OF IHNC;

Area GDM NO.2, SUPP NO. 5, OUTFALL CANALS

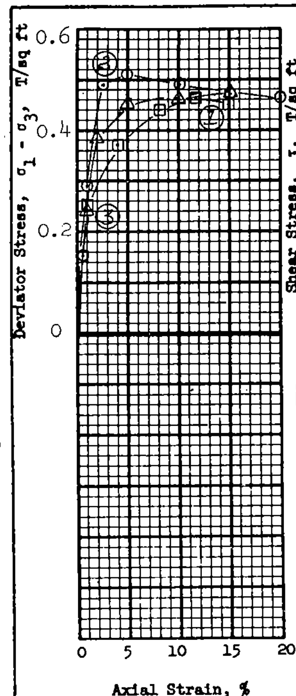
Boring No. 3-JUE | Sample No. 10-D

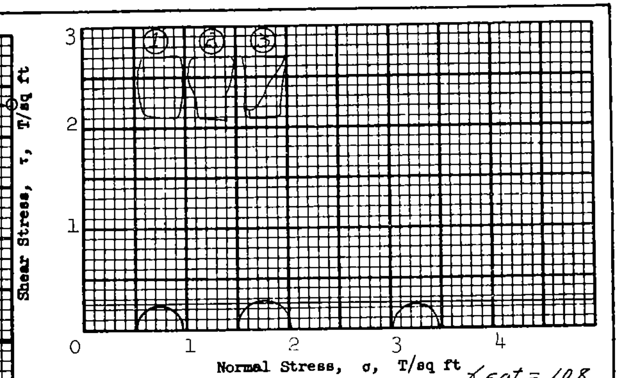
Depth El -25.8 | Date 3 Dec. 1970

TES | **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT





$\gamma sat. = 108$

Shear Strength Parameters

ϕ = 0°

tan ϕ = 0

c = .240 T/sq ft

Method of saturation ________

☐ Controlled stress

☒ Controlled strain

	Test No.		1	2	3	Avg.
Initial	Water content	w_o	50.4 %	52.2 %	49.6 %	50.7 %
	Void ratio	e_o	1.37	1.42	1.37	
	Saturation	S_o	100+ %	100 %	98.5 %	%
	Dry density, lb/cu ft	γ_d	71.8	70.2	71.8	
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.46	0.51	0.47	
Time to failure, min		t_f	55	25	103	
Rate of strain, percent/min			0.21	0.20	0.15	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.41	1.42	1.42	
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 61 | PL 23 | PI 38 | G_s 2.72

Remarks Specimen no.3 contained a few 1/4" diameter pockets of sand

Project LK. PONT., LA&VIC., HURR. PROT., ORLEANS PARISH LK. FRONT LEVEE WEST OF IHNC,

Area GDM NO. 2, SUPP NO.5, OUTFALL CANALS

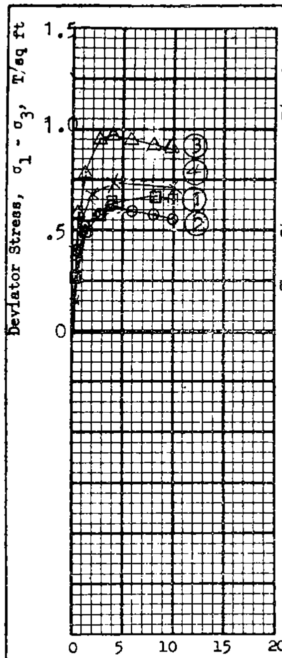
Boring No. 3-JUE | Sample No. 9-D

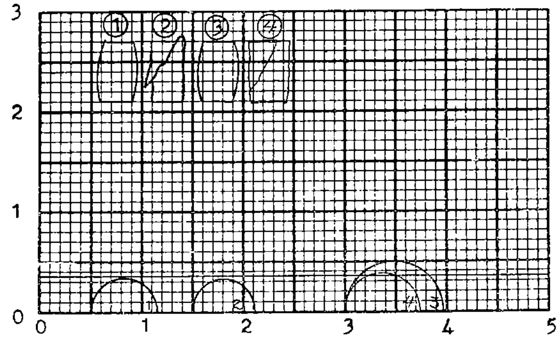
Depth El -22.0 | Date 3 Dec. 1970

JMS | **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT





$\gamma sat.=106$

Test No.			1	2	3	4	Avg.
Initial	Water content	w_o	52.6 %	53.7 %	45.3 %	49.8 %	52.0
	Void ratio	e_o	1.43	1.49	1.23	1.35	
	Saturation	S_o	99.3 %	97.3 %	99.4 %	99.6 %	
	Dry density, lb/cu ft	γ_d	69.3	67.7	75.6	71.6	
Before Shear	Water content	w_c	%	%	%	%	
	Void ratio	e_c					
	Saturation	S_c	%	%	%	%	
	Final back pressure, T/sq ft	u_o					
Final	Water content	w_f	%	%	%	%	
	Void ratio	e_f					
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	3.0	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.66	0.62	0.97	0.74	
Time to failure, min		t_f	137	67	67	25	
Rate of strain, percent/min			0.06	0.06	0.06	0.16	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$					
Initial diameter, in.		D_o	1.41	1.41	1.41	1.40	
Initial height, in.		H_o	3.00	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0 °

tan ϕ = 0

c = .34 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification PLASTIC CLAY(CH),gray, contains scattered silt pockets and*

LL 70 | PL 24 | PI 36 | G_s 2.70

Remarks numerous shell fragments

Project LK. PONT.,LA., & VIC.; HURR.PROT; ORLEANS PARISH LAKEFRONT LEVEE, WEST OF IHNC

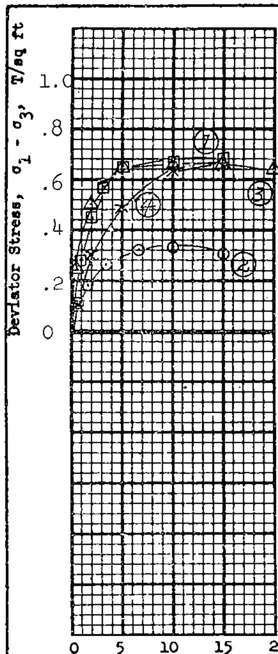
Area GDM #2, SUPP. #5, (OUTFALL CANALS)

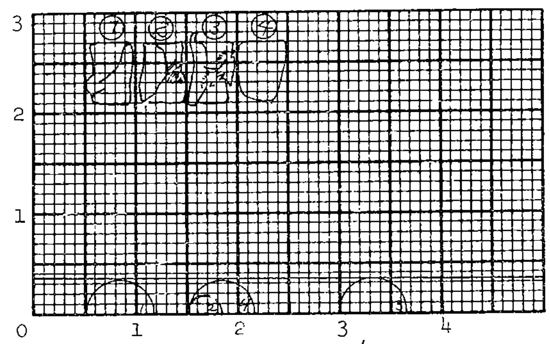
Boring No. 3-JUE | Sample No. 18-D

El -53.4 | Date 4 Dec.,1970

TFS | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE TRANSLUCENT USAEWES SOILS TEST SECTION





$\gamma sat.=109$

Test No.			1	2	3	4	Avg.
Initial	Water content	w_o	41.4 %	44.4 %	42.5 %	37.3 %	37.1
	Void ratio	e_o	1.12	1.22	1.15	1.06	
	Saturation	S_o	98.7 %	97.2 %	98.7 %	94.0 %	
	Dry density, lb/cu ft	γ_d	78.5	75.2	77.6	80.9	
Before Shear	Water content	w_c	%	%	%	%	
	Void ratio	e_c					
	Saturation	S_c	%	%	%	%	
	Final back pressure, T/sq ft	u_o					
Final	Water content	w_f	%	%	%	%	
	Void ratio	e_f					
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	1.5	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	0.68	0.33	0.66	0.67	
Time to failure, min		t_f	125	62	45	70	
Rate of strain, percent/min			0.12	0.12	0.22	0.21	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$					
Initial diameter, in.		D_o	1.41	1.41	1.40	1.41	
Initial height, in.		H_o	3.00	3.00	3.00	3.00	

Shear Strength Parameters

ϕ = 0°

tan ϕ = 0

c = .34 T/sq ft

Method of saturation ______

☐ Controlled stress

☒ Controlled strain

Type of test Q | Type of specimen UNDISTURBED

Classification LEAN CLAY(CL),gray, contains numerous sand pockets and shell*

LL 42 | PL 22 | PI 20 | G_s 2.67

Remarks *fragments

Project LK. PONT.,LA.&VIC. HURR. PROT. ORLEANS PARISH LK. FRONT LEVEE, WEST OF IHNC

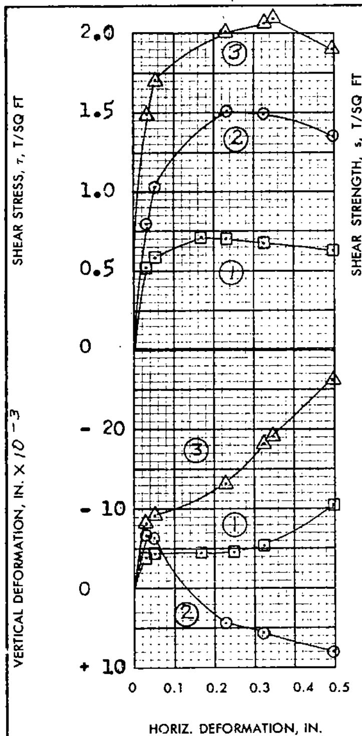
Area GDM NO. 2,SUPP NO.5OUTFALL CANALS

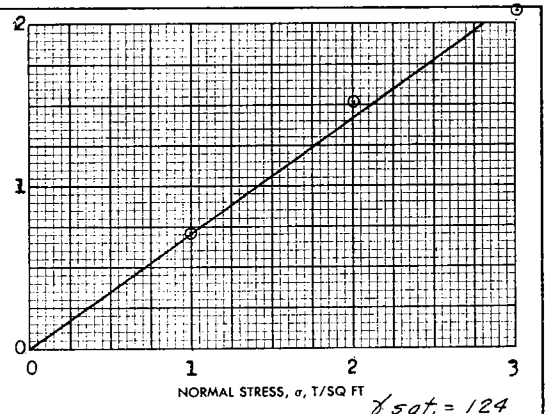
Boring No. 3-JUE | Sample No. 16-D

Depth El -45.5 | Date 15 Dec. 1970

JMS | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE TRANSLUCENT USAEWES SOILS TEST SECTION





γ sat. = 124

SHEAR STRENGTH PARAMETERS

ϕ' = 35.7°

TAN ϕ' = .719

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	28.2 %	27.3 %	31.6 %	29.0 %
	VOID RATIO	e_o	0.718	0.706	0.781	
	SATURATION	S_o	100+ %	100+ %	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	97.0	97.7	93.6	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	26.0 %	26.3 %	26.7 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.71	1.51	2.08	
ACTUAL TIME TO FAILURE, MIN		t_f	990	1320	1920	
RATE OF STRAIN, IN./MIN			.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.550 IN. THICK

CLASSIFICATION SILTY SAND(SM), gray, contains 1/4" diameter shells

LL - PL - PI - G_s 2.67

REMARKS

PROJECT LK. PONT.LA.,& VIC.,HURR.PROT. ORLEANS PARISH LAKE FRONT LEVEE, WEST OF IHNC,

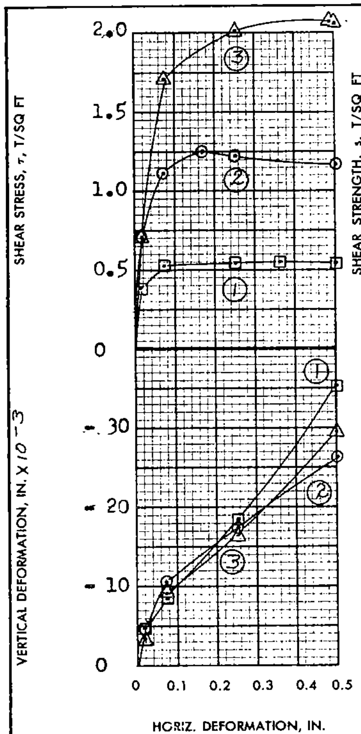
AREA G.D.M. # 2, SUPP. # 5, OUTFALL CANALS

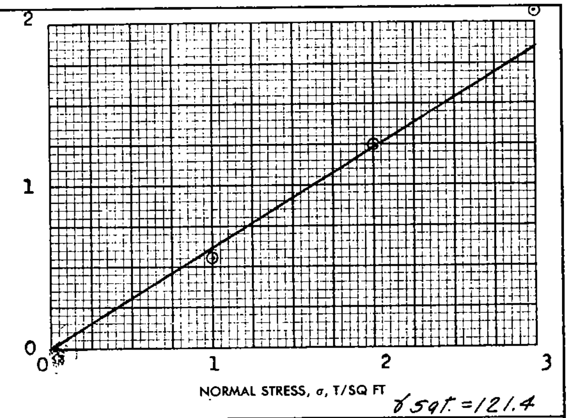
BORING NO. 3-JUE SAMPLE NO. 13-C

~~DEPTH~~ EL - 32.9 DATE 21 Dec. 1970

BWG DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3





γ sat. = 121.4

SHEAR STRENGTH PARAMETERS

ϕ' = 31.8°

TAN ϕ' = .621

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	Avg.
INITIAL	WATER CONTENT	w_o	27.7 %	31.4 %	29.3 %	29.5 %
	VOID RATIO	e_o	0.769	0.819	0.778	
	SATURATION	S_o	96.5 %	100+ %	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	94.6	92.0	94.1	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	26.9 %	27.2 %	22.5 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.55	1.25	2.06	
ACTUAL TIME TO FAILURE, MIN		t_f	1950	930	2640	
RATE OF STRAIN, IN./MIN			.00019	.00019	.00019	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.550 IN. THICK

CLASSIFICATION SILTY SAND(SM), gray, contains shells and shell fragments and 1/4"*

LL - PL - PI - G_s 2.68

REMARKS *thick clay lenses

Unable to perfrom check test-sample exhausted

PROJECT LK.PONT.LA.,& VIC.- HURR. PROT. ORLEANS PARISH LAKE FRONT LEVEE, WEST OF IHNC, GDM # 2,

AREA SUPP. # 5, (OUTFALL CANALS)

BORING NO. 3-JUE SAMPLE NO. 14-B1

~~DEPTH~~ EL - 35.6 DATE 22 Dec. 1970

BWG DIRECT SHEAR TEST REPORT

USAEWES SOILS TEST SECTION

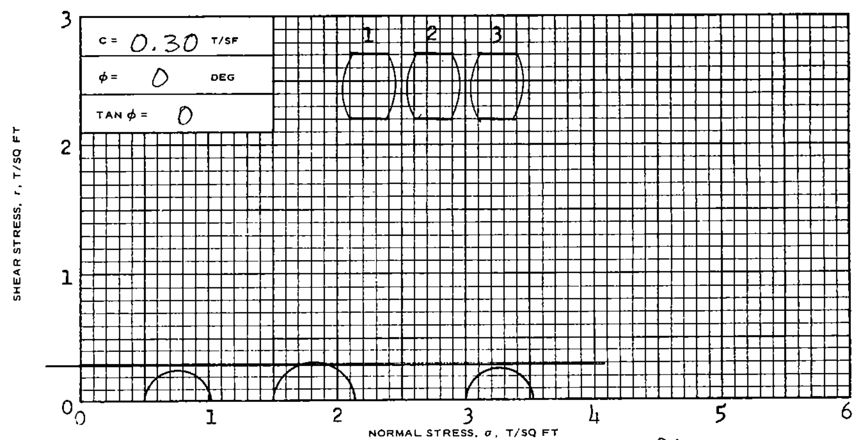
ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3

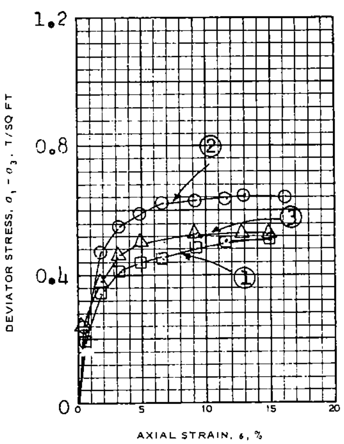
Triaxial Compression Test Report — Sample 3-B

c = 0.30 T/SF

φ = 0 DEG

TAN φ = 0





$\gamma_{SAT} = 121$

SPECIMEN NO.			1	2	3	AVG.
INITIAL	WATER CONTENT, %	w_o	31.6	29.7	30.3	30.5
	DRY DENSITY LB/CU FT	γd_o	92.0	93.7	93.2	
	SATURATION, %	S_o	100+	100+	100+	
	VOID RATIO	e_o	0.819	0.786	0.795	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.51	0.64	0.53	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	46	40	40	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.38	1.38	1.38	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SANDY CLAY(CL),gray

LL 34 | PL 15 | PI 19 | Gs 2.68 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS:

PROJECT LK. PONT.,LA.& VIC.-HURR. PROT.(73)
ORLEANS PARISH OUTFALL CANALS,GDM#2,SUPP.#5-C

BORING NO. 1-UJP | SAMPLE NO. 3-B

DEPTH/ELEV 8.0/0.0

LABORATORY USAEWES | DATE 16 April,1973

TES TRIAXIAL COMPRESSION TEST REPORT

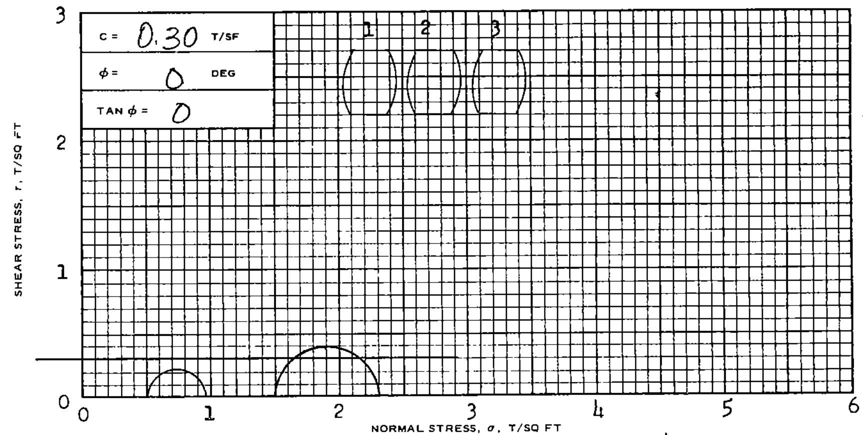
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

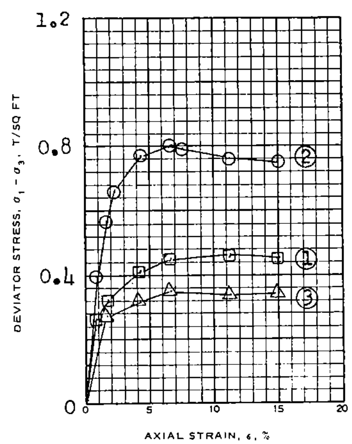
Triaxial Compression Test Report — Sample 8-D

c = 0.30 T/SF

φ = 0 DEG

TAN φ = 0





$\gamma_{SAT} = 105$

SPECIMEN NO.			1	2	3	AVG.
INITIAL	WATER CONTENT, %	w_o	59.6	46.5	57.0	54.4
	DRY DENSITY LB/CU FT	γd_o	65.0	73.2	66.4	
	SATURATION, %	S_o	100+	96.2	99.6	
	VOID RATIO	e_o	1.60	1.31	1.55	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.46	0.80	0.35	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	24	14	14	
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;fine sand pockets approx. 1/2" in dia

LL 73 | PL 28 | PI 45 | Gs 2.71 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS: Strength too low to plot on test 3
Test specimen 2 contained silt pocket through entire specimen

PROJECT LK. PONT.,LA.& VIC.-HURR. PROT.(73)
ORLEANS PARISH OUTFALL CANALS,GDM#2,SUPP.#5-C

BORING NO. 1-UJP | SAMPLE NO. 8-D

DEPTH/ELEV 29.8/21.8

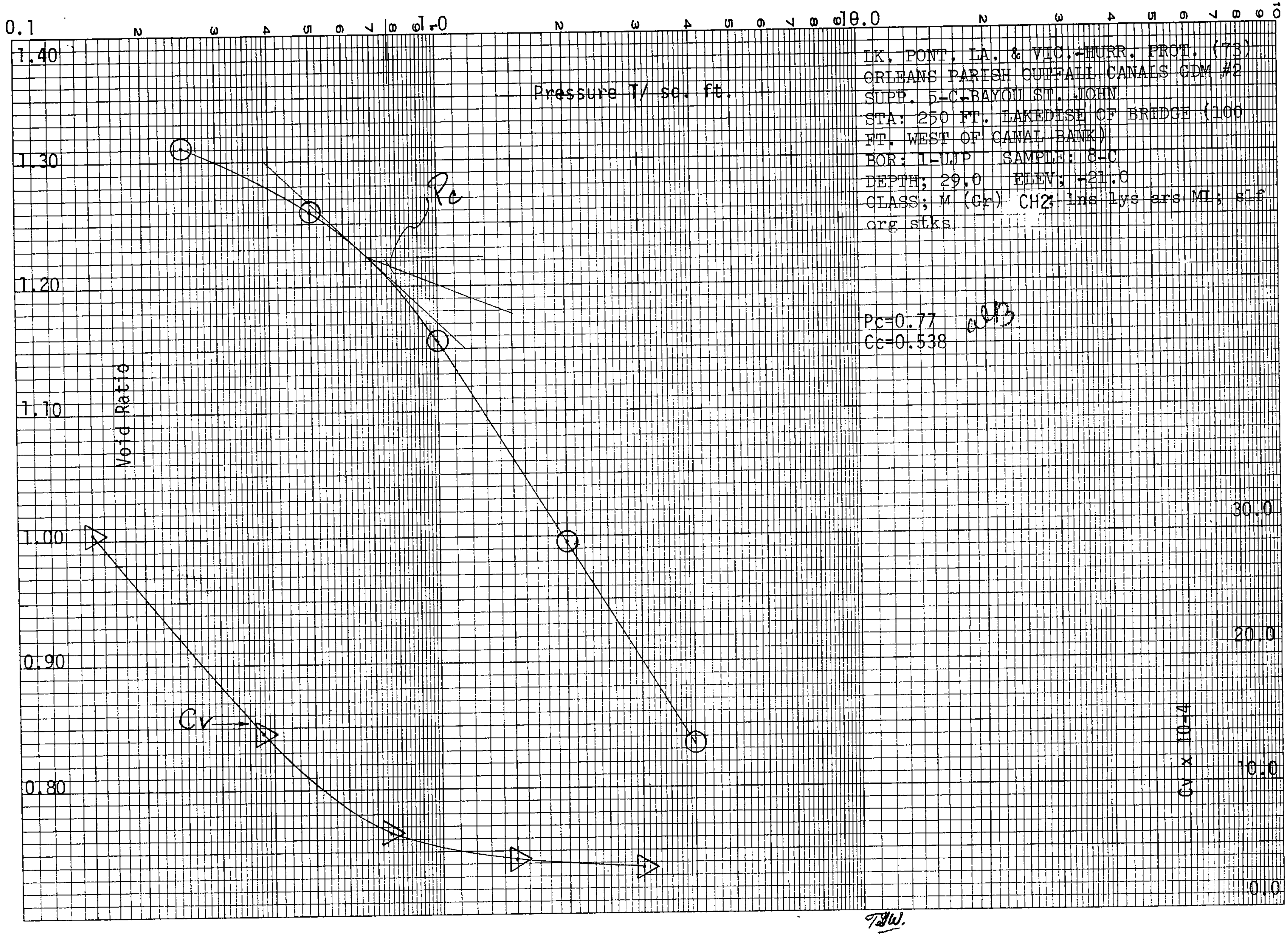
LABORATORY USAEWES | DATE 16 April,1973

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

NO. 340-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

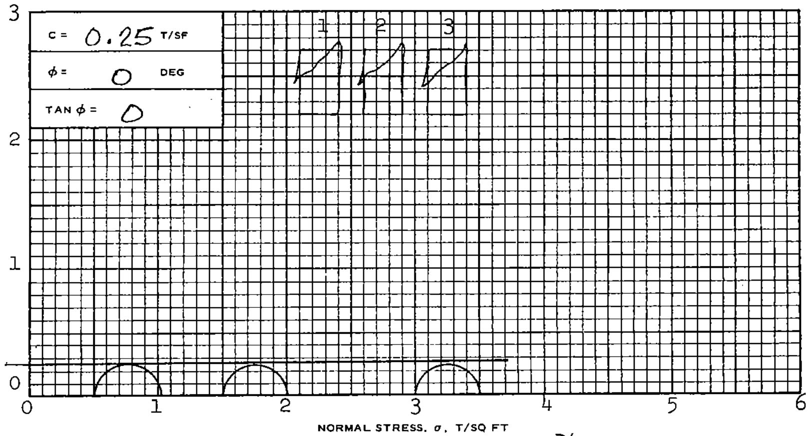
EUGENE DIETZGEN CO.
MADE IN U. S. A.

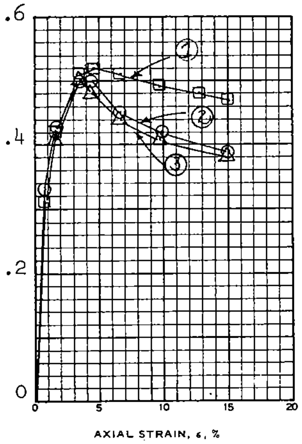


c = 0.25 T/SF

ϕ = 0 DEG

TAN ϕ = 0





$\gamma_{SAT.} = 99$

SPECIMEN NO.			1	2	3	AVG.
INITIAL	WATER CONTENT, %	w_o	68.5	73.5	73.4	71.8
	DRY DENSITY LB/CU FT	γd_o	59.3	57.2	57.1	
	SATURATION, %	S_o	100+	100+	100+	
	VOID RATIO	e_o	1.86	1.97	1.97	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.52	0.50	0.50	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	10	7	7	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.39	1.38	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;silt seams

LL 52 | PL 27 | PI 25 | Gs 2.72

TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS:

PROJECT LK.PONT.LA.&VIC.-HURR.PROT(73)ORLEANS PARISH OUTFALL CANALS-GDM#2-SUPP 5-C

BORING NO. 1-UJP | SAMPLE NO. 9-D

DEPTH/ELEV 33.3/-25.3

LABORATORY USAEWES | DATE 29 March 1973

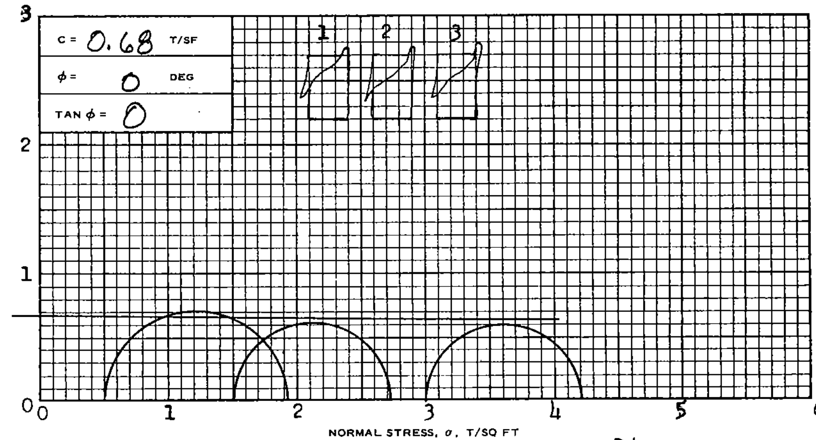
TES TRIAXIAL COMPRESSION TEST REPORT

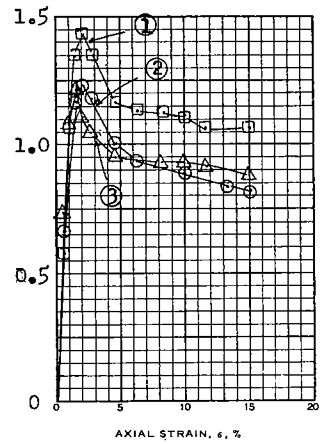
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c = 0.68 T/SF

ϕ = 0 DEG

TAN ϕ = 0





$\gamma_{SAT} = 105$

SPECIMEN NO.			1	2	3	AVG
INITIAL	WATER CONTENT, %	w_o	52.2	55.3	58.6	55.4
	DRY DENSITY LB/CU FT	γd_o	69.8	67.5	65.0	
	SATURATION, %	S_o	100+	100+	100+	
	VOID RATIO	e_o	1.41	1.50	1.59	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.43	1.23	1.21	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	5	5	3	
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;scattered small shells

LL 78 | PL 22 | PI 56 | Gs 2.70

TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS:

PROJECT LK. PONT.,LA & VIC.-HURR. PROT.(73) ORLEANS PARISH OUTFALL CANALS,GDM#2-SUPP.#5-C

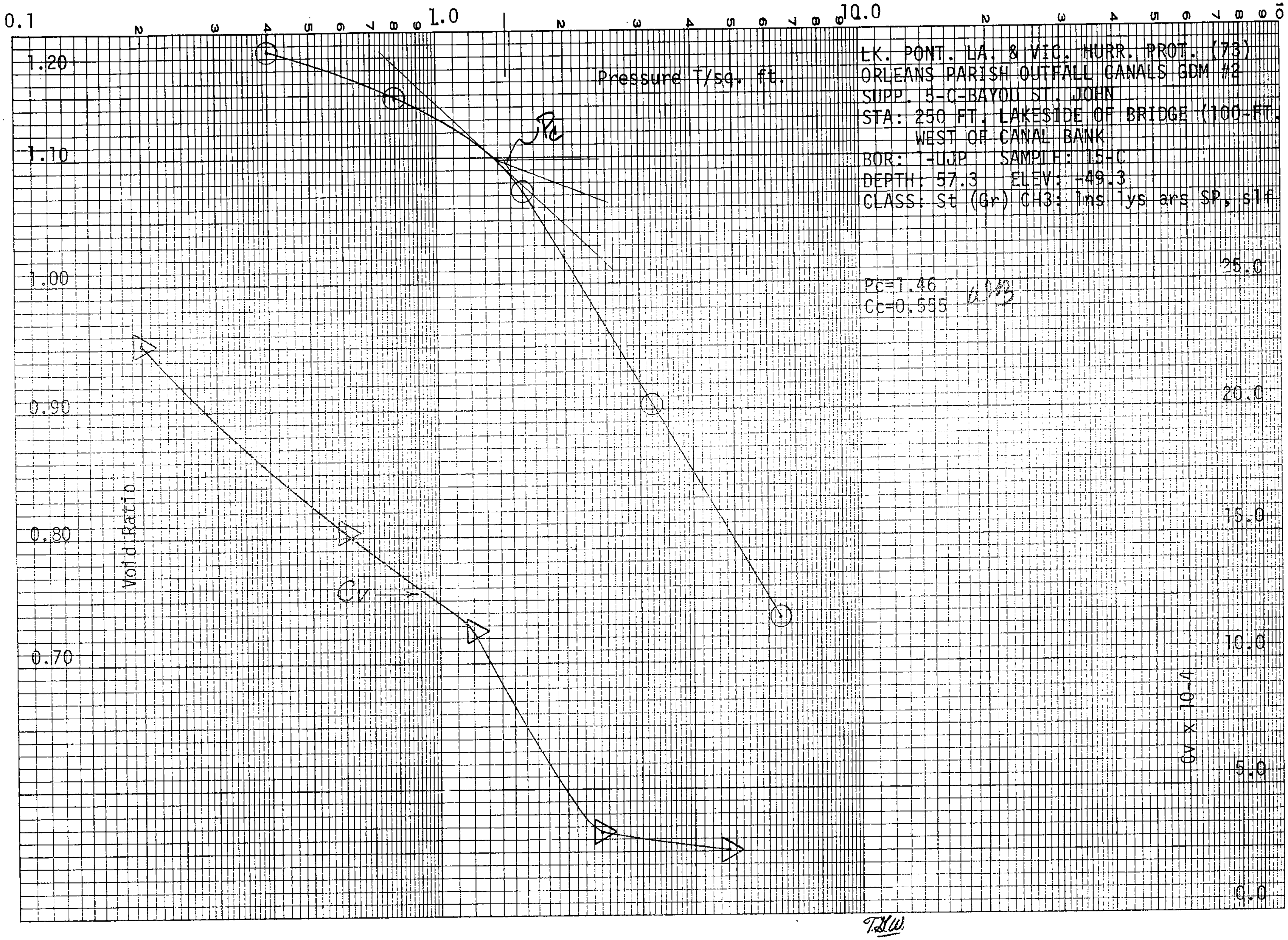
BORING NO. 1-UJP | SAMPLE NO. 15-B

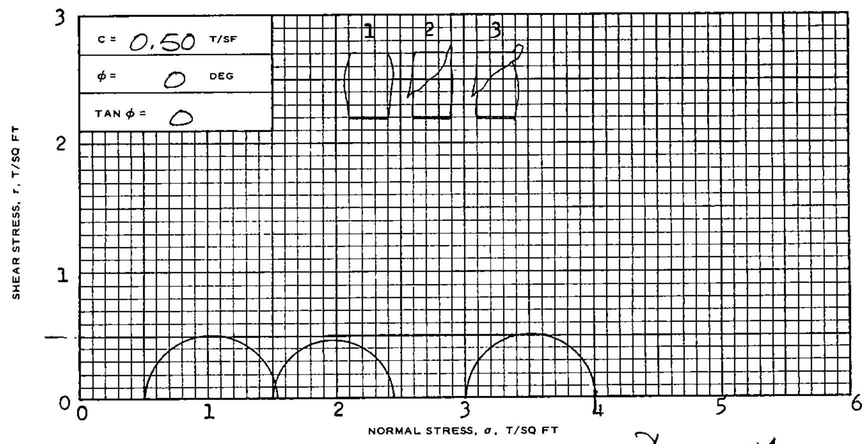
DEPTH/ELEV 55.9/-47.9

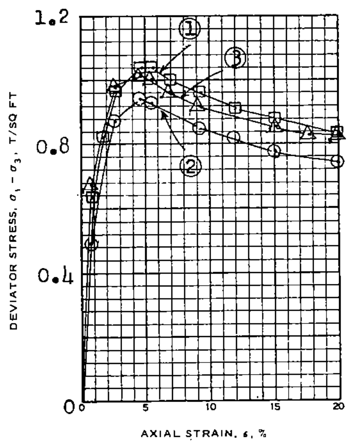
LABORATORY USAEWES | DATE 16 April,1973

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)


LK. PONT. LA. & VIC. HURR. PROT. (73)
ORLEANS PARISH OUTFALL CANALS GDM #2
SUPP. 5-C-BAYOU ST. JOHN
STA: 250 FT. LAKESIDE OF BRIDGE (100-FT.
WEST OF CANAL BANK
BOR: 1-UJP SAMPLE: 15-C
DEPTH: 57.3 ELEV: -49.3
CLASS: St (Gr) CH3: lns lys ars SP, slf
Pc=1.46
Cc=0.555
Pressure T/sq. ft.
Void Ratio
Cv x 10-4
Pc
Cv
0.1
1.0
10.0
1.20
1.10
1.00
0.90
0.80
0.70
25.0
20.0
15.0
10.0
5.0
0.0
TBW





$\gamma_{SAT.} = 114$

SPECIMEN NO.			1	2	3	AVG.
INITIAL	WATER CONTENT, %	w_o	37.0	39.6	38.0	38.2
	DRY DENSITY LB/CU FT	γd_o	82.9	81.1	83.0	
	SATURATION, %	S_o	96.8	99.0	99.4	
	VOID RATIO	e_o	1.03	1.08	1.03	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.04	0.94	1.01	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	12	12	12	
ULTIMATE 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	

CONTROLLED- Strain TEST

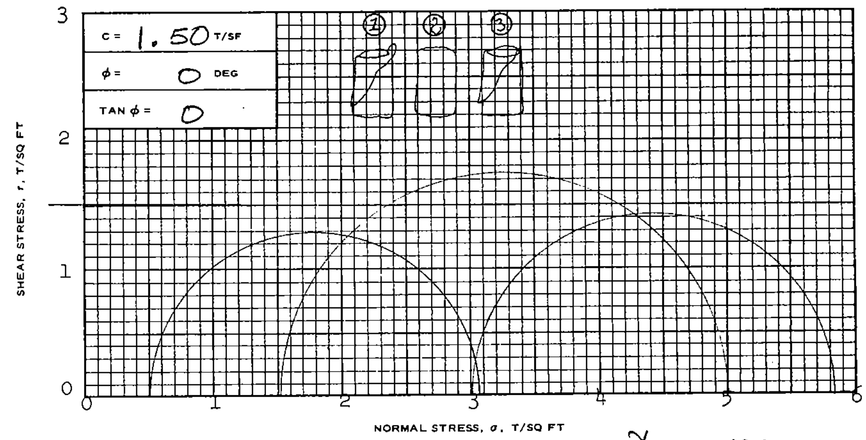
DESCRIPTION OF SPECIMENS PLASTIC CLAY(CH),gray;silt lenses and scattered shell fragments

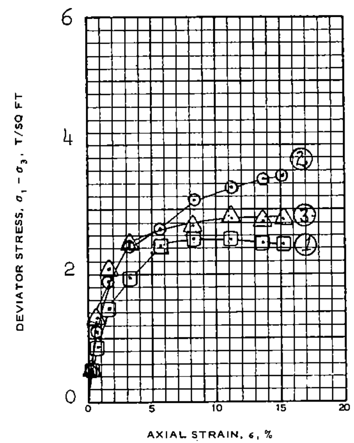
LL 55	PL 19	PI 36	Gs 2.70	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS:

PROJECT LK. PONT.,LA.&VIC.-HURR. PROT.(73)
ORLEANS PARISH OUTFALL CANALS-GDM#2,SUPP.5-C
BORING NO. 1-UJP SAMPLE NO. 16-B
DEPTH/ELEV 60.4/-52.4
LABORATORY USAEWES DATE 17 April,1973
TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





$\gamma_{SAT} = 127$

SPECIMEN NO.			1	2	3	AVG.
INITIAL	WATER CONTENT, %	w_o	22.4	27.7	23.7	24.6
	DRY DENSITY LB/CU FT	γd_o	102.8	102.3	101.2	
	SATURATION, %	S_o	95.7	100+	100+	
	VOID RATIO	e_o	0.627	0.636	0.654	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.57	3.50	2.83	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	22	39	29	
ULTIMATE 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	

CONTROLLED- strain TEST

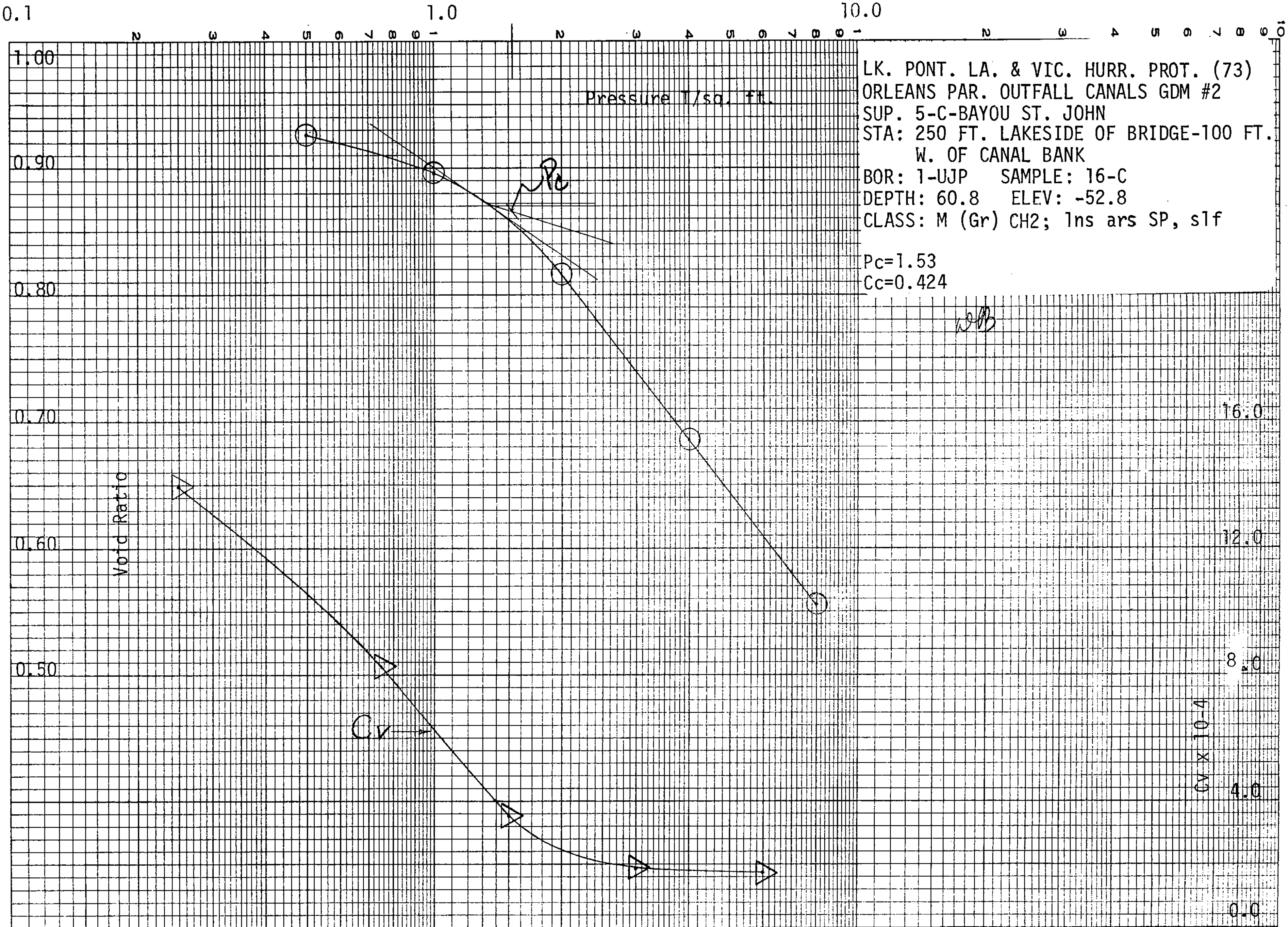
DESCRIPTION OF SPECIMENS SANDY CLAY(CL),gray and tan

LL 45	PL 18	PI 27	Gs 2.68	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST Q

REMARKS:

PROJECT LK.PONT.LA.& VIC.-HURR. PROT.(73)
ORLEANS PARISH OUTFALL CANALS-GDM#2
BORING NO. 1-UJP SAMPLE NO. 17-D
DEPTH/ELEV 66.0/-58.0
LABORATORY USAEWES DATE 17 April 1973
TES TRIAXIAL COMPRESSION TEST REPORT

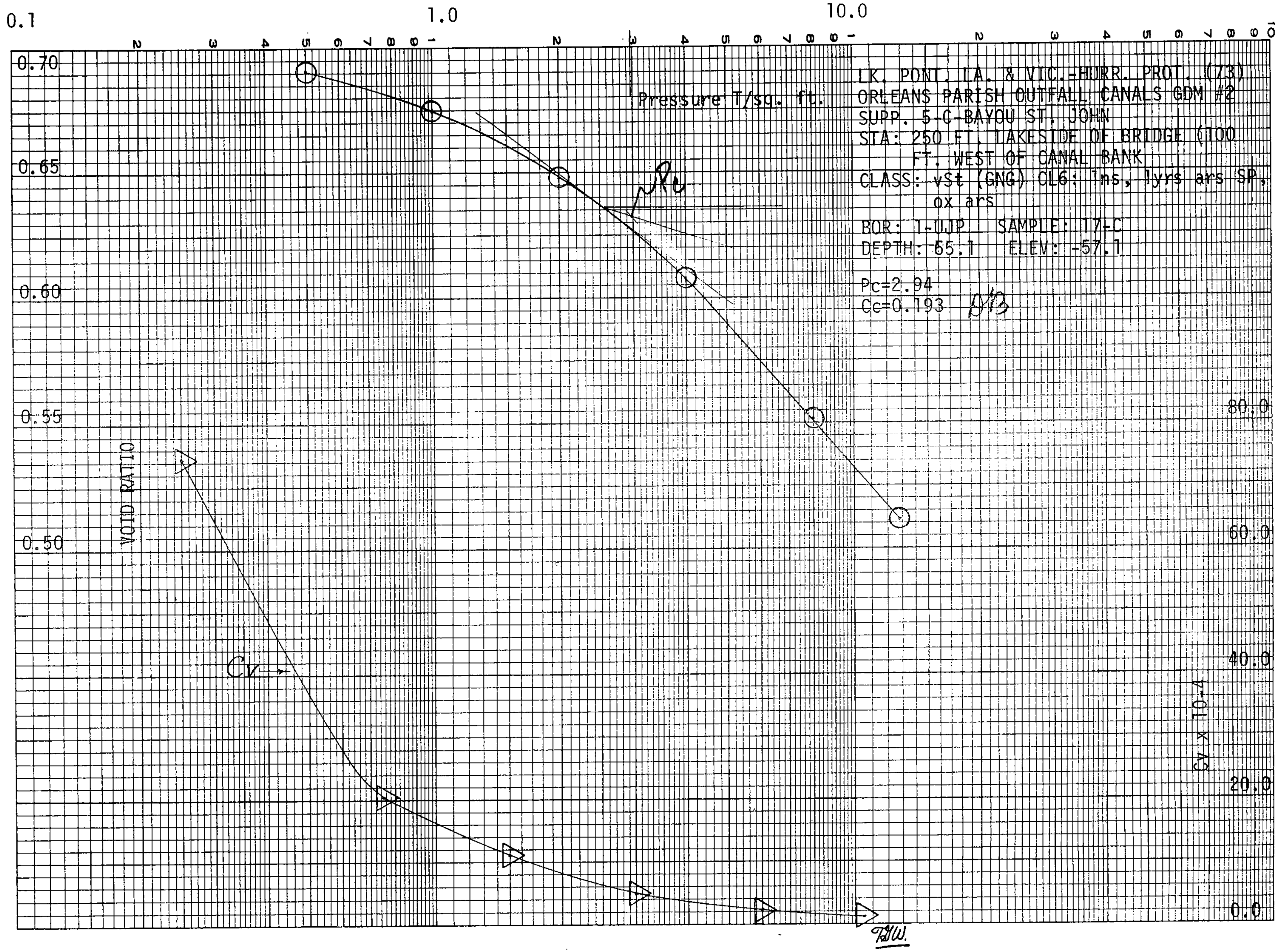
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)


LK. PONT. LA. & VIC. HURR. PROT. (73)
ORLEANS PAR. OUTFALL CANALS GDM #2
SUP. 5-C-BAYOU ST. JOHN
STA: 250 FT. LAKESIDE OF BRIDGE-100 FT.
W. OF CANAL BANK
BOR: 1-UJP SAMPLE: 16-C
DEPTH: 60.8 ELEV: -52.8
CLASS: M (Gr) CH2; lns ars SP, slf
Pc=1.53
Cc=0.424
Pressure T/sq. ft.
Void Ratio
Cv x 10-4
Pc
Cv
0.1
1.0
10.0
1.00
0.90
0.80
0.70
0.60
0.50
0.0
4.0
8.0
12.0
16.0

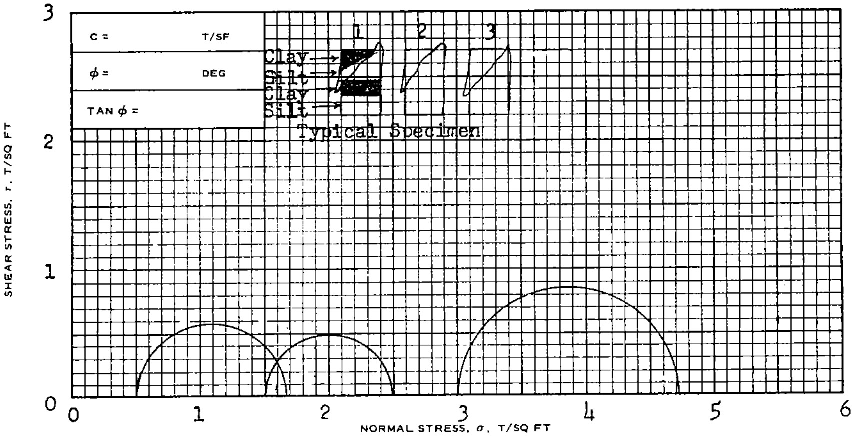
TJW

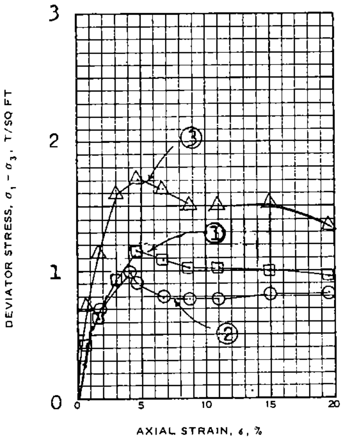
NO. 340-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.



DISREGARD THIS TEST





SPECIMEN NO.		1	2	3	
INITIAL — WATER CONTENT, %	w_o	37.8	40.1	36.4	
INITIAL — DRY DENSITY LB/CU FT	γd_o	83.0	80.6	84.9	
INITIAL — SATURATION, %	S_o	98.5	98.8	99.3	
INITIAL — VOID RATIO	e_o	1.04	1.10	0.993	
BEFORE SHEAR — WATER CONTENT, %	w_c				
BEFORE SHEAR — DRY DENSITY LB/CU FT	γd_c				
BEFORE SHEAR — SATURATION, %	S_c				
BEFORE SHEAR — VOID RATIO	e_c				
BEFORE SHEAR — FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	0.5	1.5	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	1.16	0.98	1.71	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	10	9	10	
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.	D_o	1.40	1.39	1.40	
INITIAL HEIGHT, IN.	H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Alternate layers of CLAY(CH) and SILT(ML),tan

LL 56 | PL 22 | PI 34 | G_s 2.71

TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS:

PROJECT LK. PONT.,LA.& VIC.-HURR. PROT.(73)
ORLEANS PARISH OUTFALL CANALS,GDM#2,SUPP.#5-C

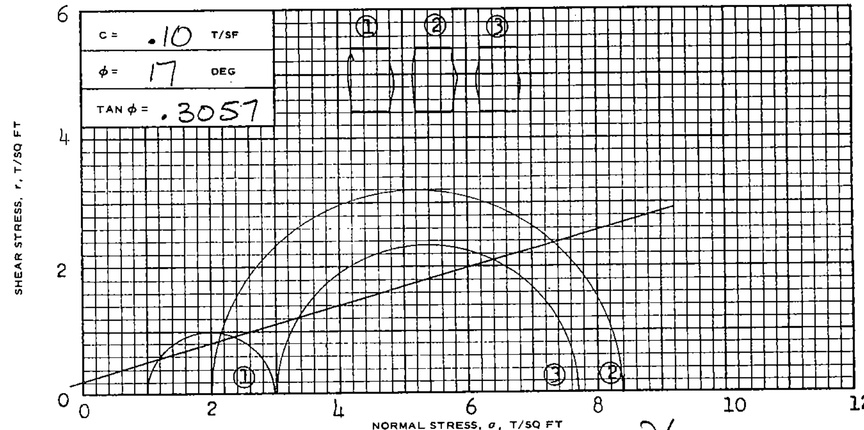
BORING NO. 1-UJP | SAMPLE NO. 24-C

DEPTH/ELEV 92.8/-84.8

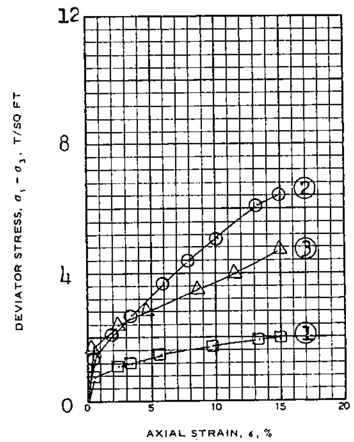
LABORATORY USAEWES | DATE 17 April,1973

TES — TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)



γ_{SAT} = 117



SPECIMEN NO.		1	2	3	AVG.
INITIAL — WATER CONTENT, %	w_o	36.1	27.3	35.8	33.1
INITIAL — DRY DENSITY LB/CU FT	γd_o	84.4	94.5	84.1	
INITIAL — SATURATION, %	S_o	98.5	95.0	97.0	
INITIAL — VOID RATIO	e_o	0.982	0.770	0.989	
BEFORE SHEAR — WATER CONTENT, %	w_c	33.6	25.9	30.9	
BEFORE SHEAR — DRY DENSITY LB/CU FT	γd_c	86.6	96.6	91.0	
BEFORE SHEAR — SATURATION, %	S_c	96.6*	94.8*	98.8	
BEFORE SHEAR — VOID RATIO	e_c	0.932	0.732	0.838	
BEFORE SHEAR — FINAL BACK PRESSURE, T/SQ FT	u_o	5.76	5.76	5.76	
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	1.96	6.38	4.69	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	99	99	102	
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.	D_o	1.39	1.40	1.39	
INITIAL HEIGHT, IN.	H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SILT(ML),gray;few 1/16" thick silty clay layers and a few 3/4" size shells

LL - | PL - | PI - | G_s 2.68

TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST R

REMARKS: See attached plot for effective values.
* Pore pressure response indicated 100% saturation.
Portion of sample allowed to drain before trimming

PROJECT LK. PONT.,LA&VIC.-HURR. PROT.(73)
ORLEANS PARISH OUTFALL CANAL-GDM#2,SUPP.#5-C

BORING NO. 1-UJP | SAMPLE NO. 6-C

DEPTH/ELEV 20.9/-12.9

LABORATORY USAEWES | DATE 5 April,1973

PJR — TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

Sheet 1 of 2

NO. 340-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
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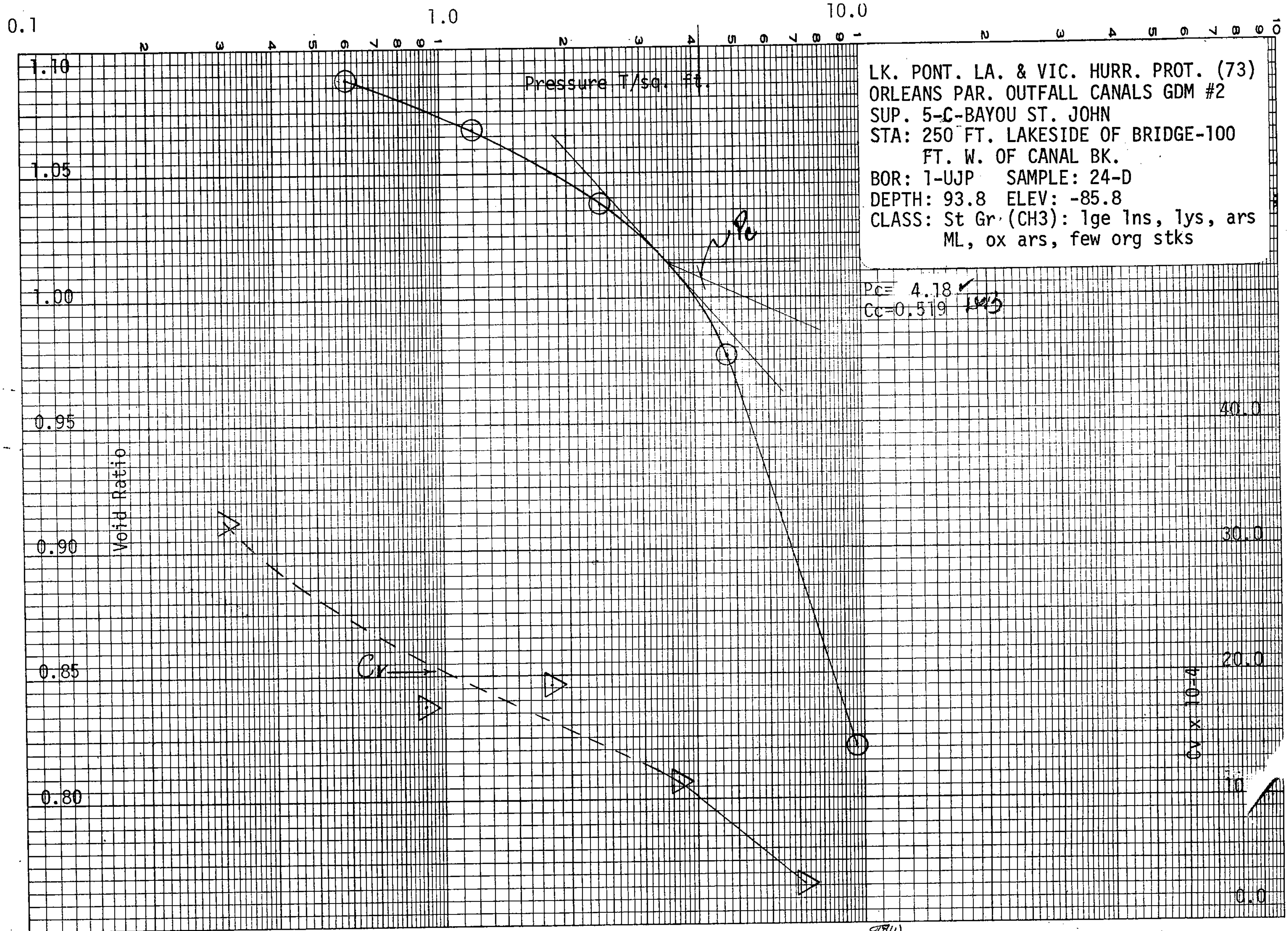
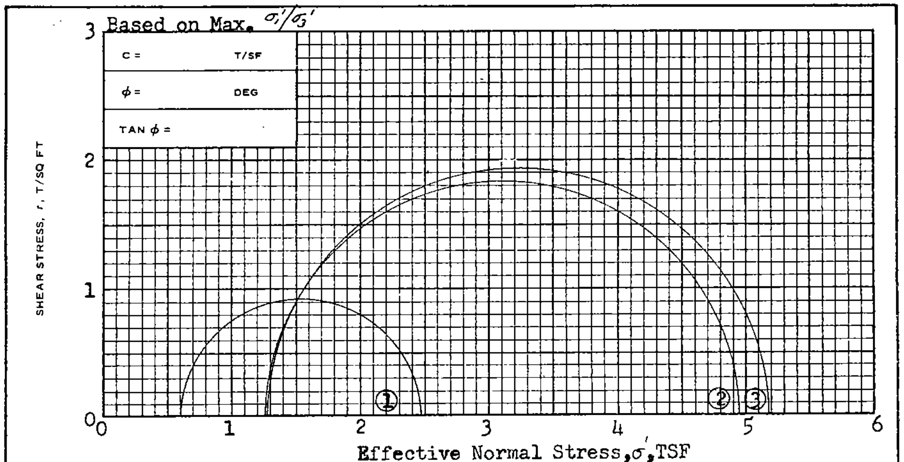
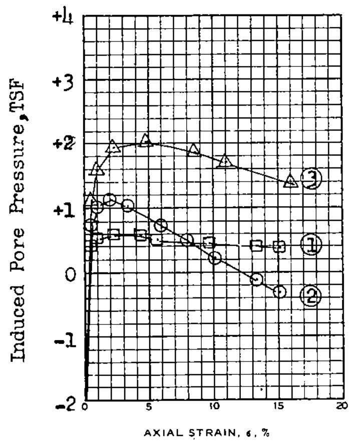


LK. PONT. LA. & VIC. HURR. PROT. (73)
ORLEANS PAR. OUTFALL CANALS GDM #2
SUP. 5-C-BAYOU ST. JOHN
STA: 250 FT. LAKESIDE OF BRIDGE-100
FT. W. OF CANAL BK.
BOR: 1-UJP SAMPLE: 24-D
DEPTH: 93.8 ELEV: -85.8
CLASS: St Gr (CH3): lge lns, lys, ars
ML, ox ars, few org stks

Pc= 4.18
Cc=0.519

TBW





SPECIMEN NO.					
INITIAL — WATER CONTENT, %	w_o				
INITIAL — DRY DENSITY LB/CU FT	γd_o				
INITIAL — SATURATION, %	S_o				
INITIAL — VOID RATIO	e_o				
BEFORE SHEAR — WATER CONTENT, %	w_c				
BEFORE SHEAR — DRY DENSITY LB/CU FT	γd_c				
BEFORE SHEAR — SATURATION, %	S_c				
BEFORE SHEAR — VOID RATIO	e_c				
BEFORE SHEAR — FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3				
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 CANAL-GDM#2, SUPP. #5-C

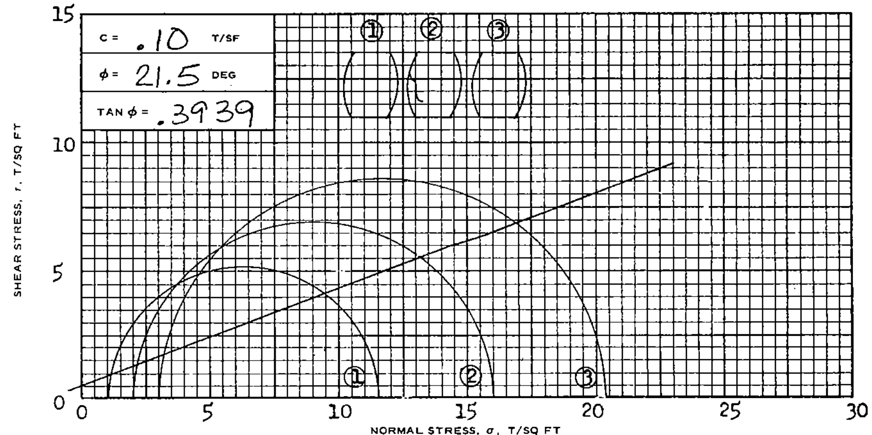
BORING NO. 1-UJP | SAMPLE NO. 6-C

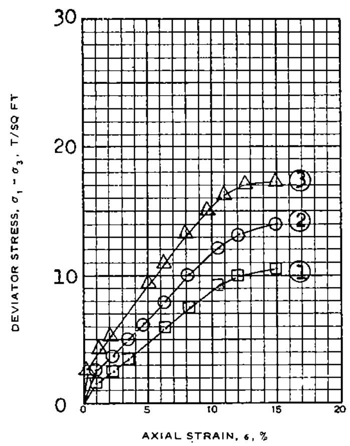
DEPTH/ELEV 20.9/-12.9

LABORATORY USAEWES | DATE 5 April, 1973

Sheet 2 of 2 | PJR | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 | PREVIOUS EDITION IS OBSOLETE | TRANSLUCENT | (EM 1110-2-1906)





$\gamma_{SAT.} = 123.5$

SPECIMEN NO.		1	2	3	AVG.
INITIAL — WATER CONTENT, %	w_o	25.1	24.5	24.4	24.7
INITIAL — DRY DENSITY LB/CU FT	γd_o	96.8	98.4	97.6	
INITIAL — SATURATION, %	S_o	92.8	94.2	92.0	
INITIAL — VOID RATIO	e_o	0.722	0.694	0.708	
BEFORE SHEAR — WATER CONTENT, %	w_c	26.5	25.7	25.4	
BEFORE SHEAR — DRY DENSITY LB/CU FT	γd_c	98.3	100.8	99.1	
BEFORE SHEAR — SATURATION, %	S_c	100+	100+	99.4	
BEFORE SHEAR — VOID RATIO	e_c	0.696	0.654	0.682	
BEFORE SHEAR — FINAL BACK PRESSURE, T/SQ FT	u_o	4.03	4.03	4.03	
MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$	10.52	14.02	17.26	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN	t_f	48	48	50	
ULTIMATE DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.	D_o	1.40	1.39	1.40	
INITIAL HEIGHT, IN.	H_o	3.00	3.00	3.00	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS SANDY SILT(ML), light gray

LL - | PL - | PI - | G_s 2.67 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST R

REMARKS: See attached plot for effective values

Portion of Sample allowed to drain before trimming

PROJECT LK. PONT., LA. & VIC-HURR. PROT. (73)

ORLEANS PARISH OUTFALL CANALS-GDM#2, SUPP. 5-C

BORING NO. 1-UJP | SAMPLE NO. 2 0-B

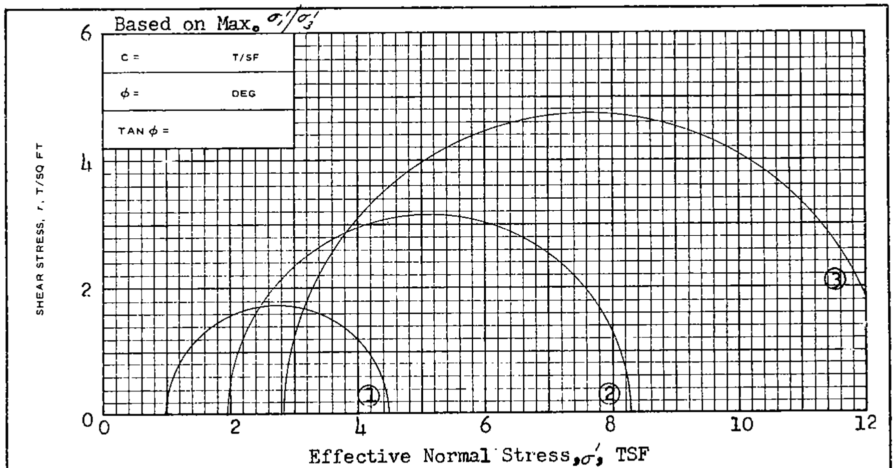
DEPTH/ELEV 76.2/-68.2

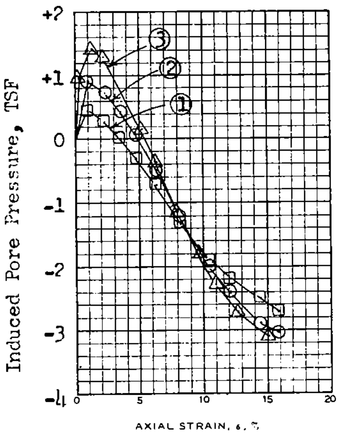
LABORATORY USAEWES | DATE 11 April, 1973

Sheet 1 of 2 | TES | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 | PREVIOUS EDITION IS OBSOLETE | TRANSLUCENT | (EM 1110-2-1906)

TRIAXIAL COMPRESSION TEST REPORT





SPECIMEN NO.						
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3				
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$				
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f				
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o				
INITIAL HEIGHT, IN.		H_o				

CONTROLLED- TEST

DESCRIPTION OF SPECIMENS

LL	PL	PI	Gs	TYPE OF SPECIMEN	TYPE OF TEST

REMARKS:

PROJECT LK. PONT., LA.&VIC.-HURR.PROT.(73) ORLEANS PARISH OUTFALL CANALS-GDM#2,SUPP.5-C

BORING NO. 1-UJP | SAMPLE NO. 20-B

DEPTH/ELEV 76.2/-68.2

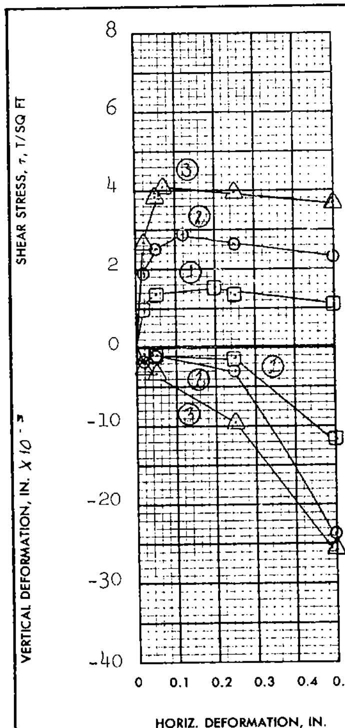
LABORATORY USAEWES | DATE 11 April,1973

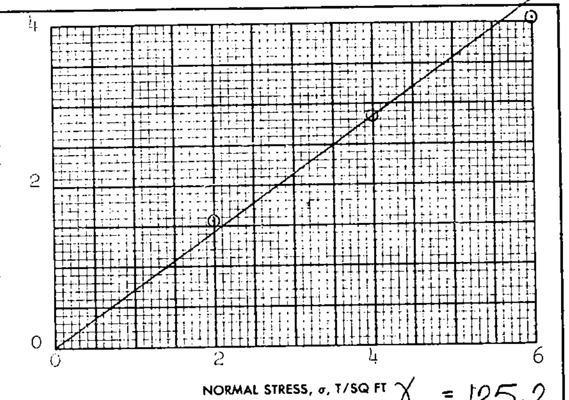
Sheet 2 of 2

TES TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

DIRECT SHEAR TEST REPORT





γ_{SAT} = 125.2

SHEAR STRENGTH PARAMETERS

ϕ' = 35.5

TAN ϕ' = .7133

c' = — T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	AVG.
INITIAL	WATER CONTENT	w_o	25.6%	25.6%	27.0 %	26.1%
	VOID RATIO	e_o	0.687	0.645	0.704	
	SATURATION	S_o	99.5%	100+ %	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	98.8	101.3	97.8	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	24.6%	23.6%	24.0%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.58	2.86	4.08	
ACTUAL TIME TO FAILURE, MIN		t_f	1080	720	480	
RATE OF STRAIN, IN./MIN			.00020	.00020	.00020	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.620 IN. THICK

CLASSIFICATION SILTY SAND(SM),gray;trace of shell approx. 1/4" diam

LL - | PL - | PI - | G. 2.67

REMARKS

PROJECT LK.PONT.LA.&VIC.-HURR.PROT.(73) ORLEANS PARISH OUTFALL CANALS -GDM#2-SUPP.5-C

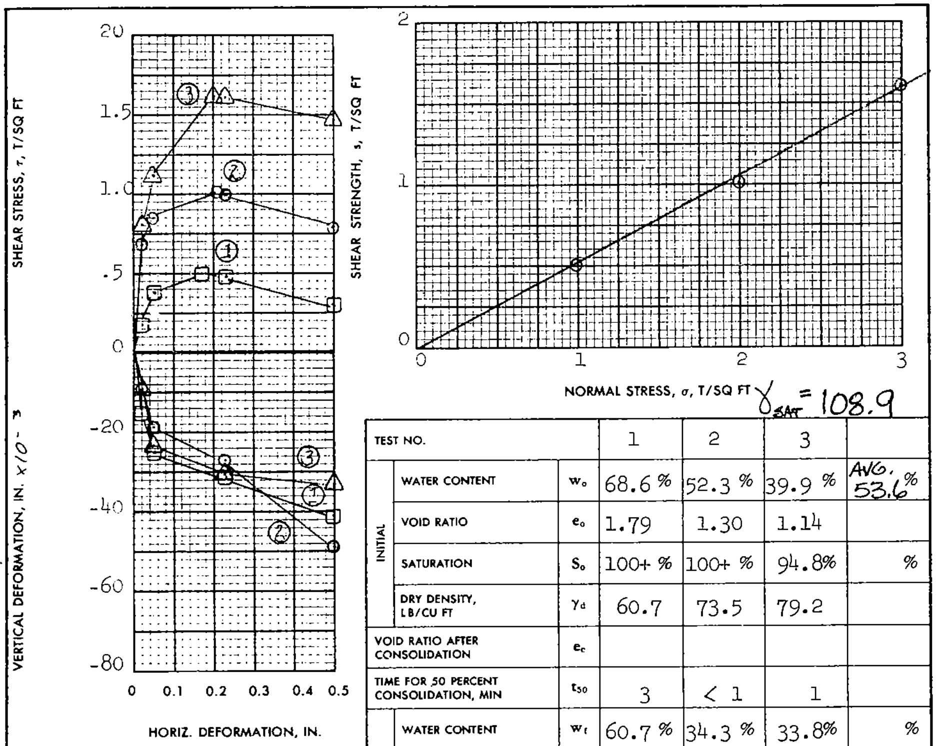
AREA

BORING NO. 1-UJP | SAMPLE NO 4-C

DEPTH EL 12.9/-4.9 | DATE 3 April 1973

RCH DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1966 OF-214-945



$\gamma_{SAT} = 108.9$

SHEAR STRENGTH PARAMETERS

$\phi' =$ 27°

TAN ϕ' = .5095

c' = ——— T/SQ FT

☐ CONTROLLED STRESS
☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	68.6 %	52.3 %	39.9 %	AVG. 53.6 %
	VOID RATIO	e_o	1.79	1.30	1.14	
	SATURATION	S_o	100+ %	100+ %	94.8%	%
	DRY DENSITY, LB/CU FT	γ_d	60.7	73.5	79.2	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}	3	< 1	1	
FINAL	WATER CONTENT	w_f	60.7 %	34.3 %	33.8%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	0.50	1.01	1.62	
ACTUAL TIME TO FAILURE, MIN		t_f	960	1140	1140	
RATE OF STRAIN, IN./MIN			.00019	.00019	.00019	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED | 3.00 IN. SQUARE | 0.620 IN. THICK

CLASSIFICATION PLASTIC CLAY(CH),dark gray;fine sand pockets;slickensided

LL 82 | PL 23 | PI 59 | G_s 2.71

REMARKS

PROJECT LK. PONT. LA. &VIC.-HURR. PROT(73)ORLEANS PARISH OUTFALL CANALS-GDM#2-SUPP.5-C

AREA

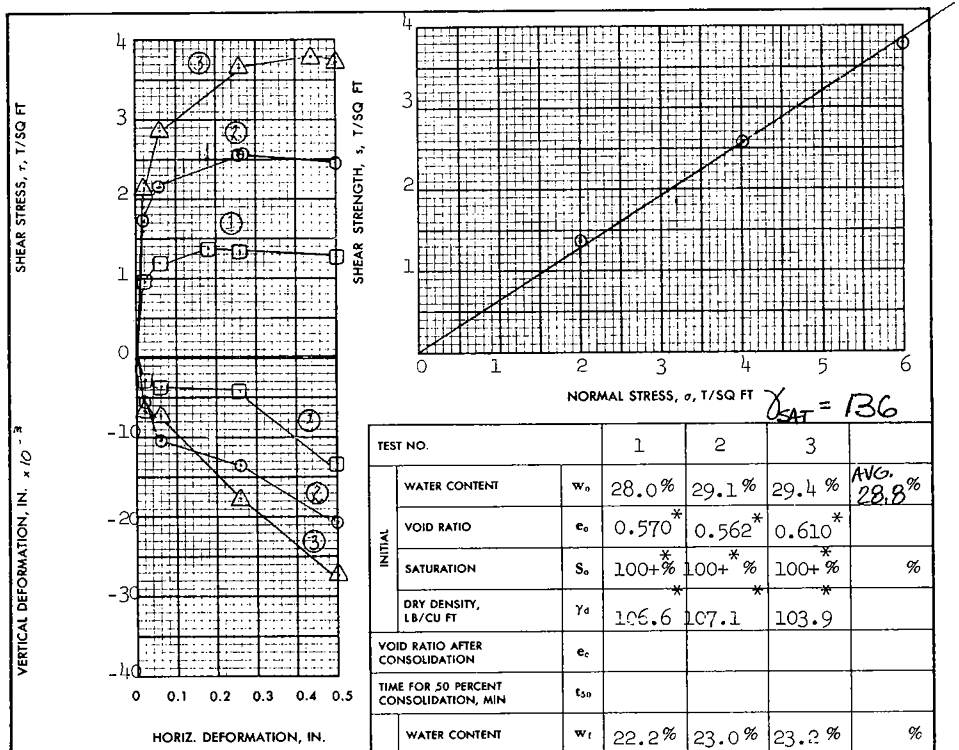
BORING NO. 1-UJP | SAMPLE NO. 8-B

DEPTH/EL 28.0/-20.0 | DATE 4 April 1973

RCH

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3



$\gamma_{SAT} = 136$

SHEAR STRENGTH PARAMETERS

$\phi' =$ 33°

TAN ϕ' = .6494

c' = ——— T/SQ FT

☐ CONTROLLED STRESS
☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	28.0%	29.1%	29.4 %	AVG. 28.8%
	VOID RATIO	e_o	0.570*	0.562*	0.610*	
	SATURATION	S_o	100+*%	100+*%	100+*%	%
	DRY DENSITY, LB/CU FT	γ_d	106.6*	107.1*	103.9*	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	22.2%	23.0%	23.2 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.37	2.56	3.80	
ACTUAL TIME TO FAILURE, MIN		t_f	960	1380	2160	
RATE OF STRAIN, IN./MIN			.00021	.00021	.00021	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN UNDISTURBED | 3.00 IN. SQUARE | 0.620 IN. THICK

CLASSIFICATION SILTY SAND(SM),dark gray;shell fragments

LL - | PL - | PI - | G_s 2.68

REMARKS * Specimen data based on estimated weights of solids.

PROJECT LK. PONT. LA. &VIC.-HURR. PROT.(73)ORLEANS PARISH OUTFALL CANALS-GDM#2-SUPP.5-C

AREA

BORING NO. 1-UJP | SAMPLE NO. 10-D

DEPTH/EL 37.6/-29.6 | DATE 5 April 1973

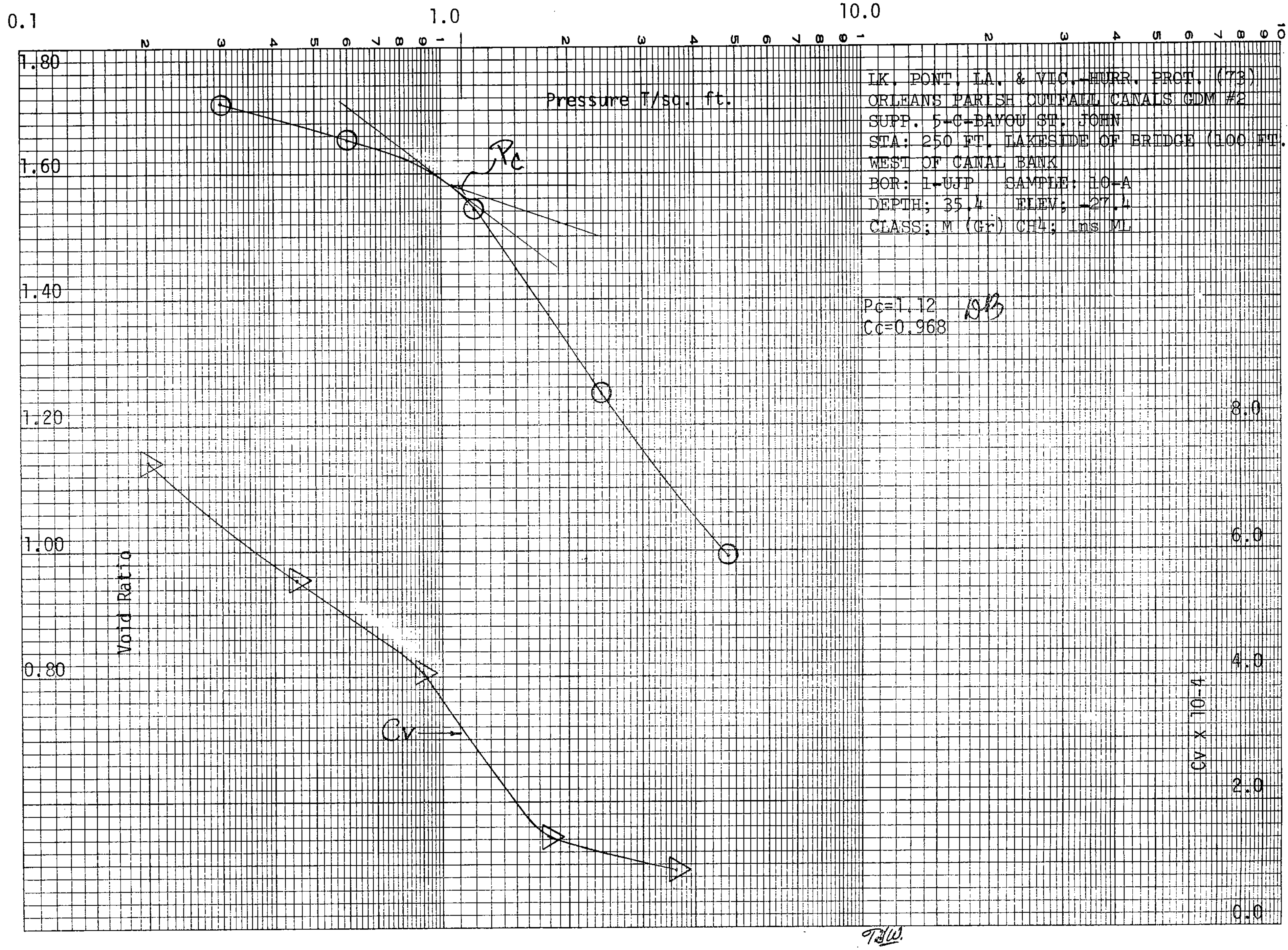
RCH

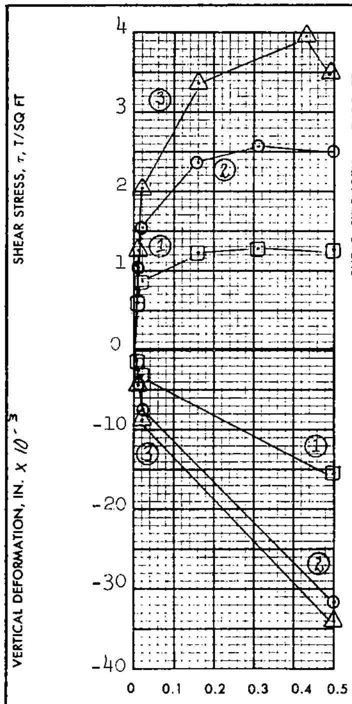
DIRECT SHEAR TEST REPORT

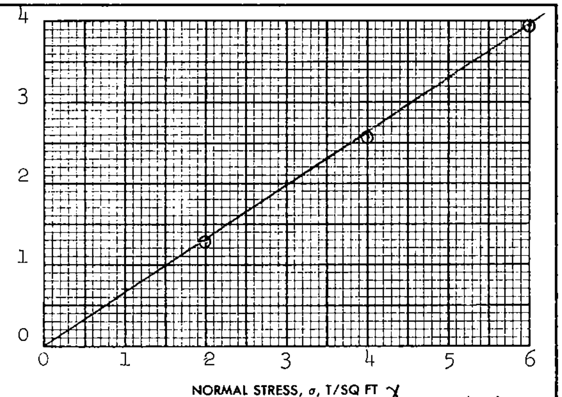
ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3

NO. 340-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.







$\gamma_{SAT.} = 124$

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	29.8%	31.1%	30.3%	AVG. 30.4%
	VOID RATIO	e_o	0.746	0.774	0.743	
	SATURATION	S_o	100+ %	100+ %	100+ %	%
	DRY DENSITY, LB/CU FT	γ_d	95.8	94.3	96.0	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	26.1%	25.5%	25.0%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	2.0	4.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.29	2.58	3.97	
ACTUAL TIME TO FAILURE, MIN		t_f	2340	2340	3120	
RATE OF STRAIN, IN./MIN			.00014	.00014	.00014	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 33°

TAN ϕ' = .6494

c' = ______ T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED — 3.00 IN. SQUARE — 0.620 IN. THICK

CLASSIFICATION SILTY SAND(SM),greenish gray

LL - | PL - | PI - | G_s 2.68

REMARKS

PROJECT LK.PONT.LA.&VIC.-HURR.PROT(73)ORLEANS PARISH OUTFALL CANALS-GDM#2-SUPP 5-C

AREA

BORING NO. 1-UJP — SAMPLE NO. 19-C

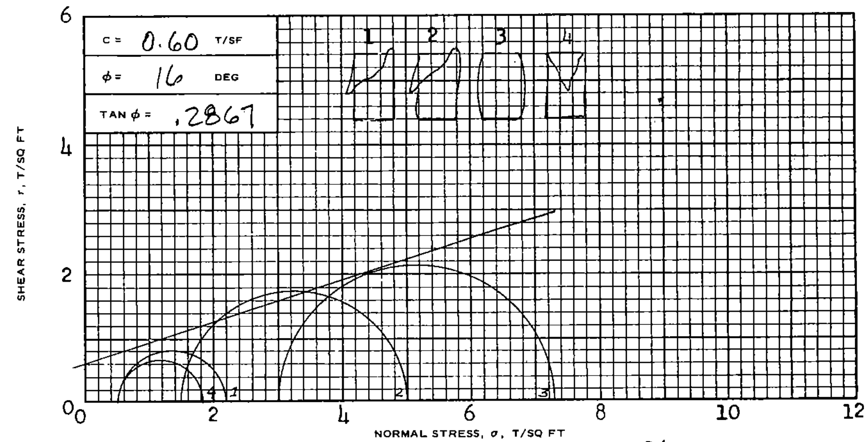
DEPTH/EL 73.0/-65.0 — DATE 6 April 1973

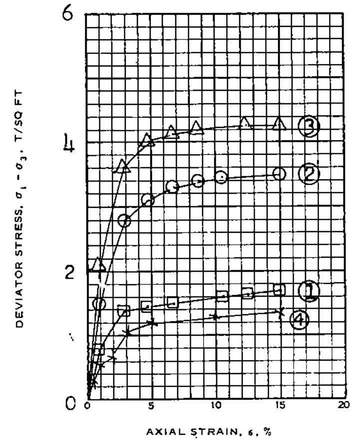
RCH

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 OF—214-945 PLATE IX-3

DISREGARD THIS TEST





$\gamma_{SAT.} = 121$

SPECIMEN NO.		AVG.		1	2	3	4
INITIAL	WATER CONTENT, %	25.8	w_o	26.1	24.4	26.5	26.0
	DRY DENSITY LB/CU FT		γd_o	92.8	95.3	96.4	91.8
	SATURATION, %		S_o	88.4	87.8	98.0	83.6
	VOID RATIO		e_o	0.782	0.737	0.716	0.843
BEFORE SHEAR	WATER CONTENT, %		w_c				
	DRY DENSITY LB/CU FT		γd_c				
	SATURATION, %		S_c				
	VOID RATIO		e_c				
	FINAL BACK PRESSURE, T/SQ FT		u_o				
MINOR PRINCIPAL STRESS, T/SQ FT			σ_3	0.5	1.5	3.0	0.5
MAXIMUM DEVIATOR STRESS, T/SQ FT			$(\sigma_1 - \sigma_3)_{MAX}$	1.70	3.49	4.28	1.34
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN			t_f	46	46	46	55
ULTIMATE DEVIATOR STRESS, T/SQ FT			$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.			D_o	1.39	1.38	1.39	1.39
INITIAL HEIGHT, IN.			H_o	3.00	3.00	3.00	3.00

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS LEAN CLAY(CL),gray;scattered gravel to 1/2"

LL 46 | PL 21 | PI 25 | G_s 2.65 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST Q

REMARKS:

PROJECT LK. PONT.,LA & VIC.-HURR. PROT. (73) ORLEANS PARISH OUTFALL CANAL,GDM#2,SUPP.5-C

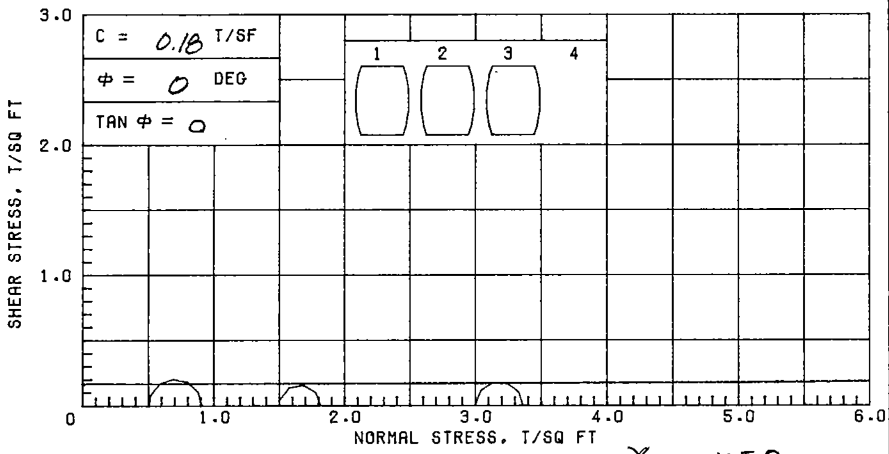
BORING NO. 1-UJP — SAMPLE NO. 1-B

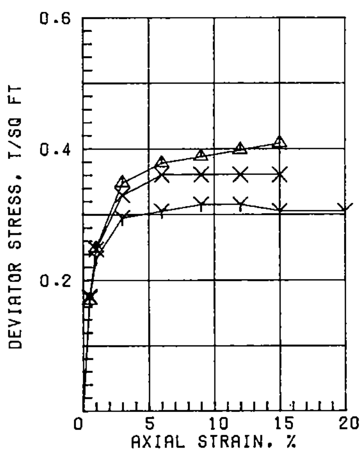
DEPTH/ELEV 0.8/7.2

LABORATORY USAEWES — DATE 16 April,1973

TES — TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





γsat = 115.9

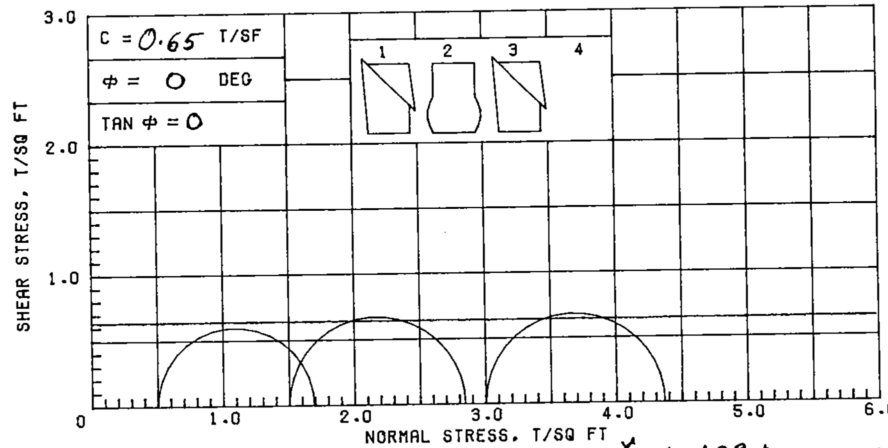
SPECIMEN NO.		△1	Y2	X3	4 AVG.
INITIAL	WATER CONTENT, %	33.1	36.1	37.7	35.6
	DRY DENSITY, PCF	87.0	84.6	83.4	85.0
	SATURATION, %	95.4	98.2	99.8	97.8
	VOID RATIO	0.937	0.992	1.020	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	
MAX. DEV. STRESS, TSF		0.41	0.32	0.36	
TIME TO FAILURE, MIN.		36	21	14	
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.40	1.39	1.38	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

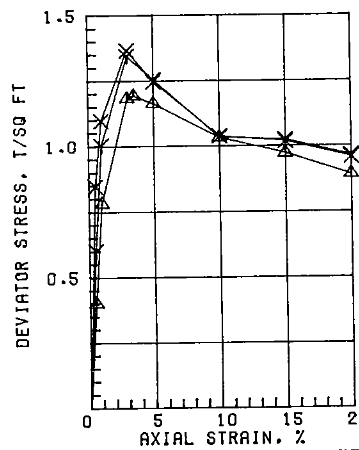
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 58	PL 16	PI 42	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	
	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
	BORING NO. 1-U — SAMPLE NO. 2-B
	DEPTH/ELEV 4.5/+12.2 — TECH. LRC
	LABORATORY USAE WES — DATE 14 JUN 83
	TRIAXIAL COMPRESSION TEST REPORT





γsat = 109.1

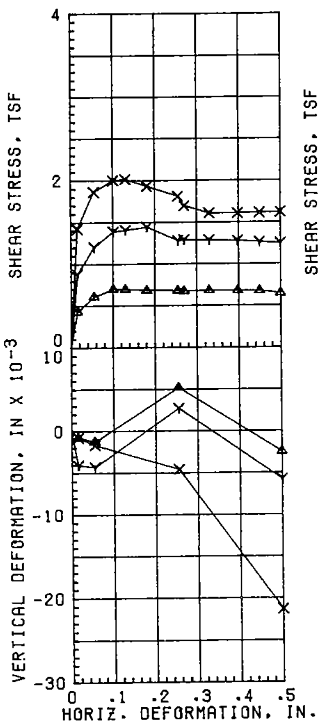
SPECIMEN NO.		△1	Y2	X3	4 AVG.
INITIAL	WATER CONTENT, %	49.1	46.5	47.3	47.6
	DRY DENSITY, PCF	72.6	75.1	74.0	73.9
	SATURATION, %	100+	100+	99.9	100
	VOID RATIO	1.322	1.244	1.278	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	
MAX. DEV. STRESS, TSF		1.19	1.34	1.37	
TIME TO FAILURE, MIN.		9	7	13	
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

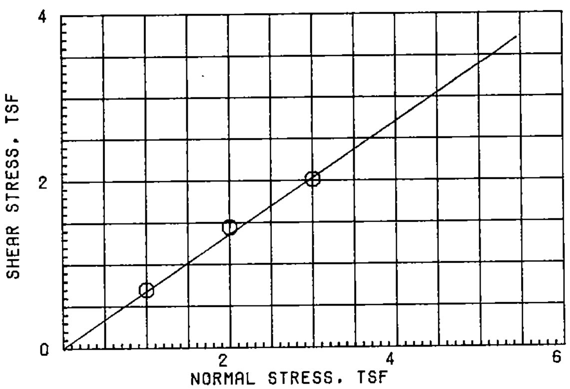
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 70	PL 16	PI 54	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	
	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
	BORING NO. 1-U — SAMPLE NO. 18-B
	DEPTH/ELEV 68.4/-51.7 — TECH. TES
	LABORATORY USAE WES — DATE 13 JUN 83
	TRIAXIAL COMPRESSION TEST REPORT





ϕ = 34.9°

TAN ϕ = 0.698

C = 0

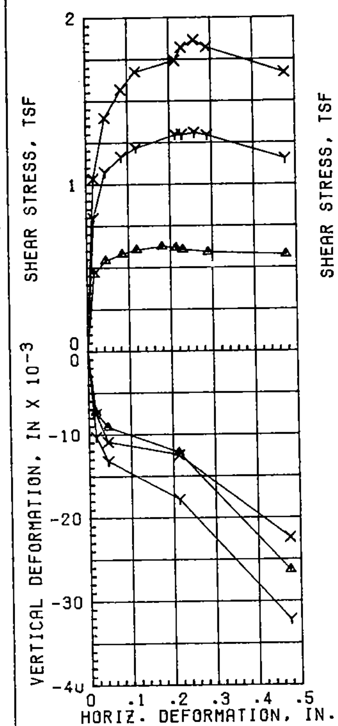
γ_{sat} = 124.4

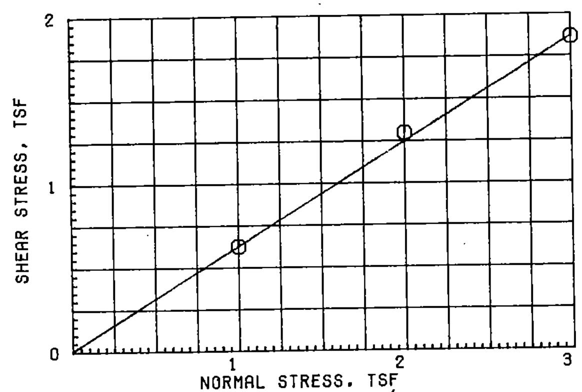
TEST NO.		1 ▲	2 Y	3 X	AVG.
INITIAL	WATER CONTENT, %	23.4	22.7	23.0	23.0
	VOID RATIO	0.676	0.698	0.639	
	SATURATION, %	92.2	86.6	95.9	91.6
	DRY DENSITY, PCF	99.1	97.7	101.3	99.4
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	23.0	20.9	22.1	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.70	1.44	2.01	
TIME TO FAILURE, MIN		555	994	714	
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; SHELLS		

LL	PL	PI		GS 2.66 (EST)

REMARKS:	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)	
	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 1-U	SAMPLE 14-C
	DEPTH/ELEV 53.1/-36.4	DATE 13 OCT 83
	DIRECT SHEAR TEST REPORT	





ϕ = 32.3

TAN ϕ = 0.632

C = 0

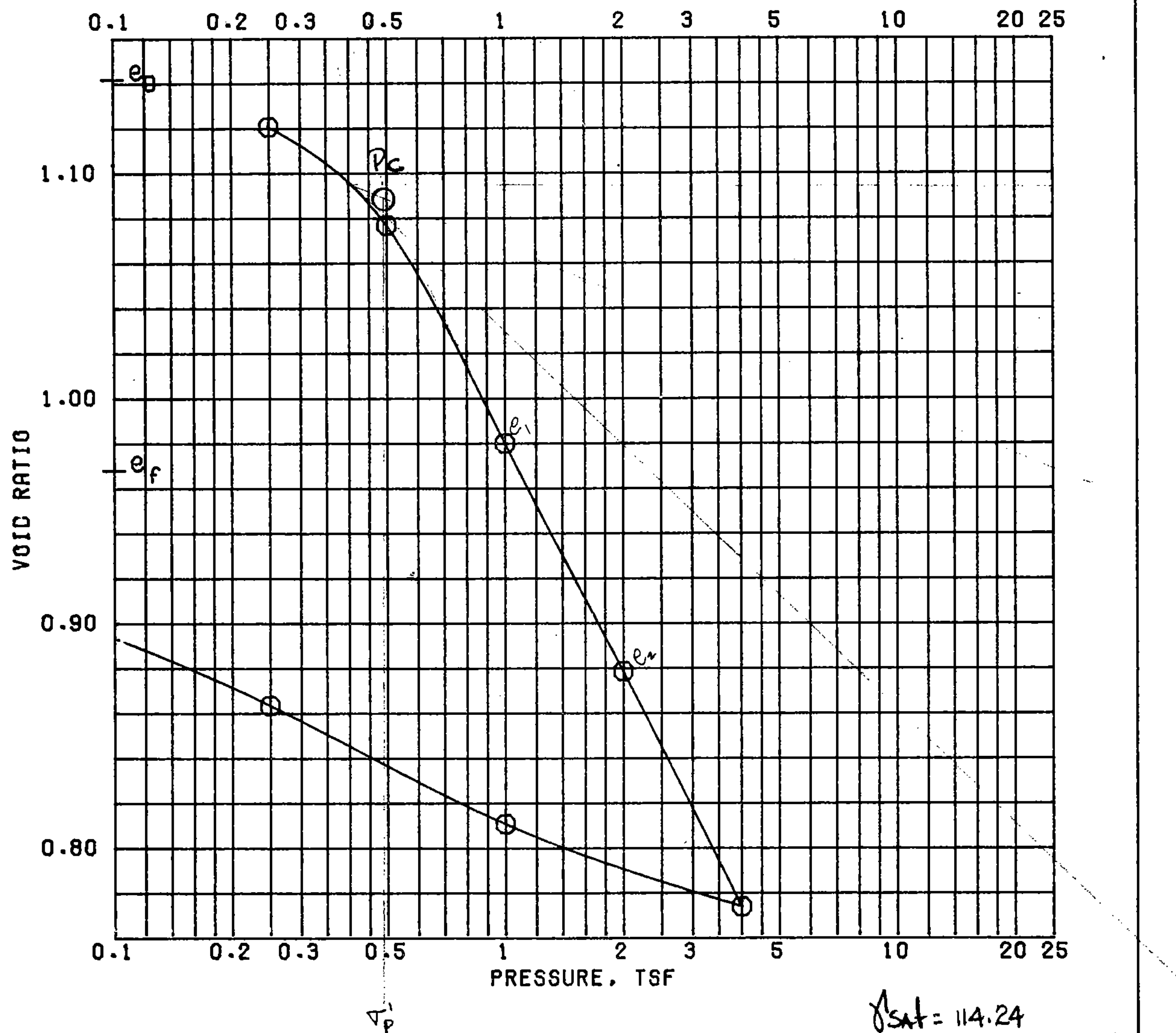
γ_{sat} = 125.2

TEST NO.		1 ▲	2 Y	3 X	AVG.
INITIAL	WATER CONTENT, %	24.6	24.9	25.3	24.9
	VOID RATIO	0.652	0.659	0.659	
	SATURATION, %	100 +	100 +	100 +	100
	DRY DENSITY, PCF	100.5	100.0	100.1	100.2
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	21.7	21.9	22.1	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.63	1.30	1.86	
TIME TO FAILURE, MIN		1045	1242	1509	
RATE OF STRAIN, IN/MIN		.00017	.00017	.00017	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED	3.00 IN. SQUARE	0.744 IN. THICK
CLASSIFICATION SAND (SP), GRAY		

LL	PL	PI		GS 2.66 (EST)

REMARKS:	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)	
	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 1-U	SAMPLE 12-C
	DEPTH/ELEV 44.9/-28.2	DATE 05 OCT 83
	DIRECT SHEAR TEST REPORT	

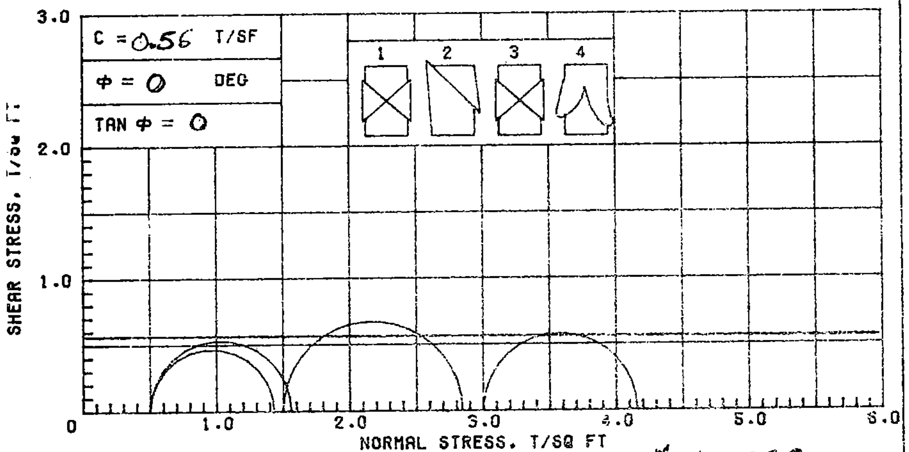


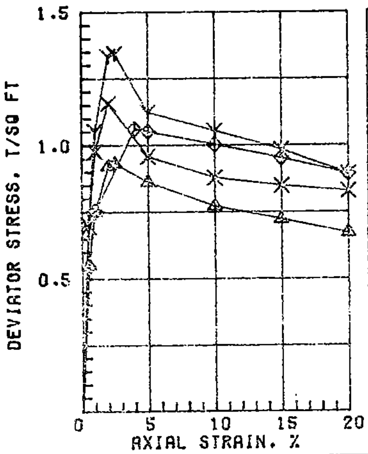
γ_{SAT} = 114.24

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	39.4	35.2
PRECONSOL. PRESSURE, TSF	0.48	DRY DENSITY, PCF	78.7	85.7
COMPRESSION INDEX	0.33	SATURATION, %	93.1	98.3
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.141	0.967
DIA. IN 4.44	HT. IN 1.123	BACK PRESSURE, TSF		
CLASSIFICATION PLASTIC CLAY (CH), BROWN; CONCRETIONS				
LL	PL	PI	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)	
GS 2.70 (EST)	D_{10}	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC		
REMARKS		BORING NO. 1-U	SAMPLE NO. 2-B	
		DEPTH/ELEV 5.0/+11.7	DATE 10 AUG 83	

CONSOLIDATION TEST REPORT

SHEET 1 OF 10





γsat = 106.8

	SPECIMEN NO.	△1	Y2	X3	◇4	AVG.
INITIAL	WATER CONTENT, %	56.7	45.9	53.1	51.8	51.9
	DRY DENSITY, PCF	66.5	75.1	69.2	69.9	70.2
	SATURATION, %	99.7	99.5	99.8	99.1	99.5
	VOID RATIO	1.535	1.246	1.437	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	0.5	
	MAX. DEV. STRESS, TSF	0.93	1.34	1.16	1.06	
	TIME TO FAILURE, MIN.	10	11	10	24	
	RATE OF STRAIN INCR.%				5	
	INITIAL DIAMETER, IN.	1.40	1.40	1.40	1.41	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SILT POCKETS

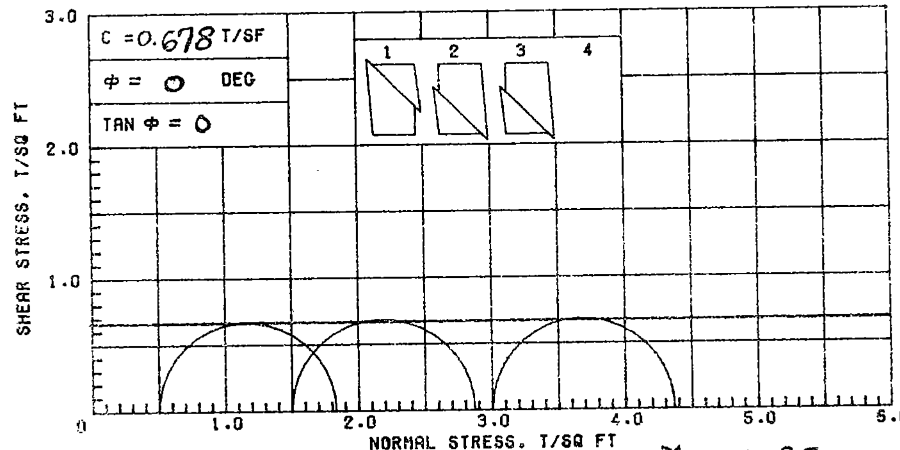
LL 66	PL 20	PI 46	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

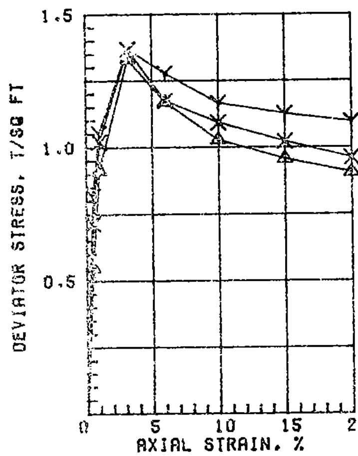
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 2-U	SAMPLE NO. 15-B
DEPTH/ELEV 55.9/-49.9	TECH. TES
LABORATORY USAE WES	DATE 14 JUN 83

TRIAXIAL COMPRESSION TEST REPORT





γsat = 109.7

	SPECIMEN NO.	△1	Y2	X3	4 AVG.
INITIAL	WATER CONTENT, %	45.3	44.5	46.0	45.3
	DRY DENSITY, PCF	74.9	75.9	74.6	75.1
	SATURATION, %	97.9	98.4	98.7	98.3
	VOID RATIO	1.249	1.221	1.258	
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	1.33	1.37	1.37	
	TIME TO FAILURE, MIN.	8	8	9	
	RATE OF STRAIN INCR.%	5	5	5	
	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

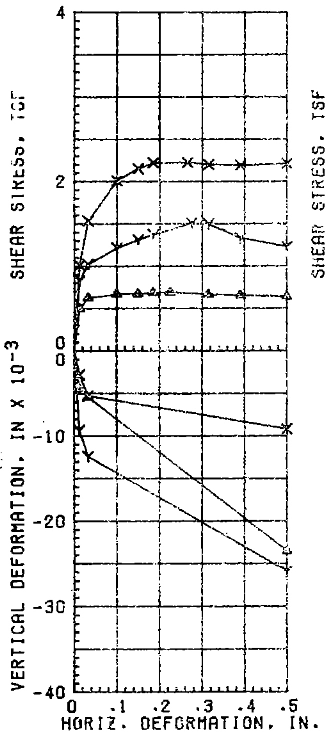
LL 73	PL 18	PI 55	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

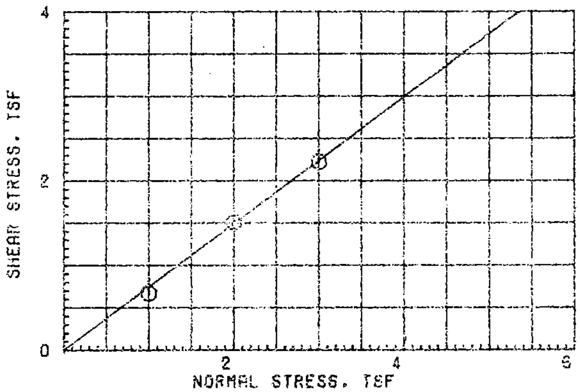
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 2-U	SAMPLE NO. 17-C
DEPTH/ELEV 64.9/-58.9	TECH. LRC
LABORATORY USAE WES	DATE 16 JUN 83

TRIAXIAL COMPRESSION TEST REPORT





ϕ = 35.8

TAN ϕ = 0.721

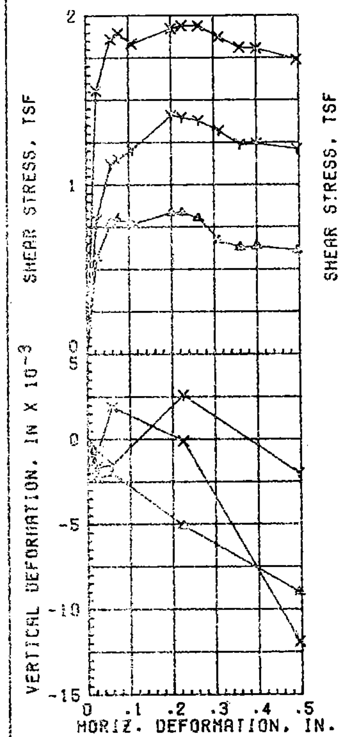
C = 0

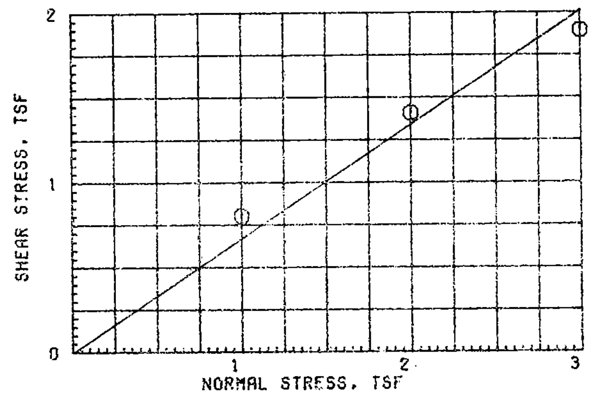
γ_{sat} = 126.0

	TEST NO.	1 △	2 Y	3 X	AVG.
INITIAL	WATER CONTENT, %	20.9	19.6	20.0	20.2
	VOID RATIO	0.634	0.633	0.623	
	SATURATION, %	87.7	82.4	85.2	85.1
	DRY DENSITY, PCF	101.6	101.7	102.2	101.8
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	23.1	21.6	21.4	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.67	1.51	2.22	
TIME TO FAILURE, MIN		550	1513	1458	
RATE OF STRAIN, IN/MIN		.00018	.00016	.00018	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED			3.00 IN. SQUARE	0.744 IN. THICK
CLASSIFICATION SAND (SP), GRAY; SHELLS				
LL	PL	PI		GS 2.66 (EST)
REMARKS:			PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)	
			ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
			BORING NO. 2-U	SAMPLE 14-C
			DEPTH/ELEV 9.0/-3.0	DATE 08 OCT 83

DIRECT SHEAR TEST REPORT





ϕ = 35.4°

TAN ϕ = 0.711

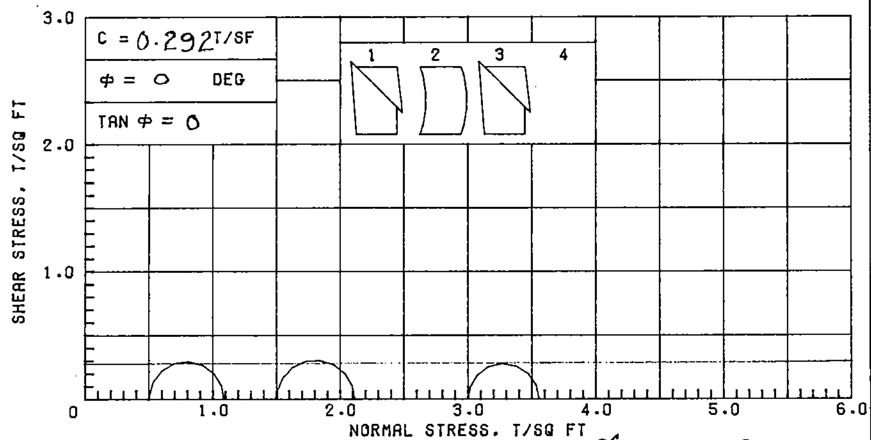
C = 0

γ_{sat} = 126.0

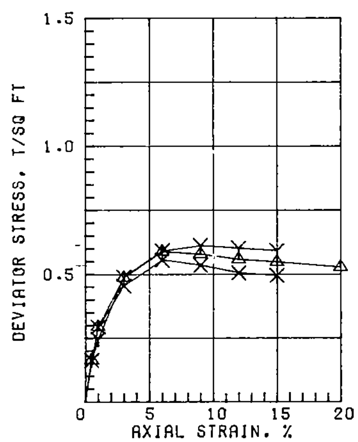
	TEST NO.	1 △	2 Y	3 X	AVG
INITIAL	WATER CONTENT, %	21.6	21.2	21.3	21.4
	VOID RATIO	0.549	0.640	0.624	
	SATURATION, %	88.9	88.6	91.2	89.6
	DRY DENSITY, PCF	101.0	101.6	102.6	101.7
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	20.3	19.9	19.8	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.80	1.41	1.89	
TIME TO FAILURE, MIN		424	1115	424	
RATE OF STRAIN, IN/MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED			3.00 IN. SQUARE	0.553 IN. THICK
CLASSIFICATION SILTY SAND (SM), GRAY				
LL	PL	PI		GS 2.67 (EST)
REMARKS:			PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)	
			ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
			BORING NO. 2-U	SAMPLE 20-C
			DEPTH/ELEV 77.0/-71.0	DATE 21 NOV 83

DIRECT SHEAR TEST REPORT



γ_{sat} = 113.5



	SPECIMEN NO.	△1	Y2	X3	AVG. 4
INITIAL	WATER CONTENT, %	39.8	36.9	42.3	39.7
	DRY DENSITY, PCF	80.5	84.0	78.6	81.0
	SATURATION, %	98.3	98.9	99.9	99.0
	VOID RATIO	1.093	1.007	1.143	
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	0.59	0.61	0.55	
	TIME TO FAILURE, MIN.	16	13	9	
	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: CLAY (CL), GRAY; FINE SAND LENSES

LL 42	PL 12	PI 30	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

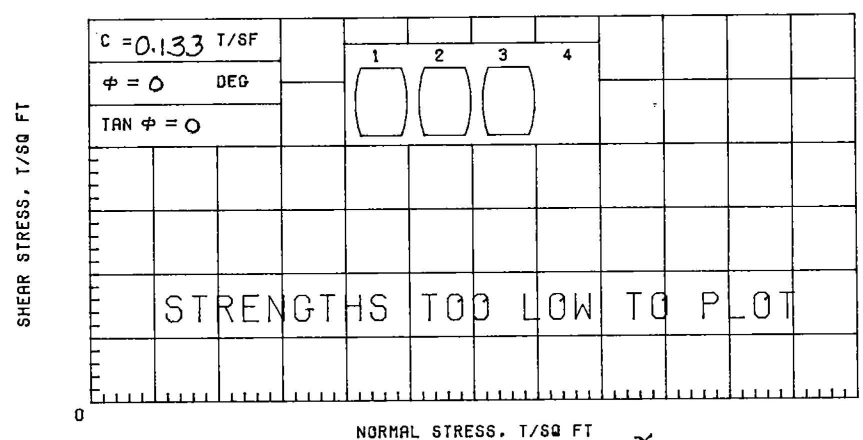
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83

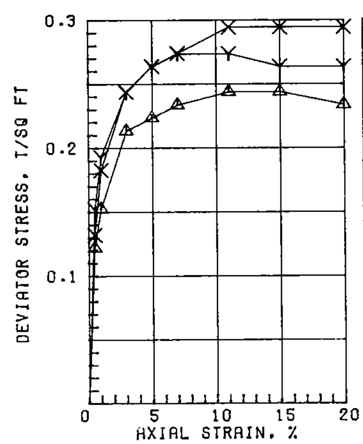
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 3-U	SAMPLE NO. 12-B
DEPTH/ELEV 44.1/-27.9	TECH. LRC
LABORATORY USAE WES	DATE 17 JUN 83

TRIAXIAL COMPRESSION TEST REPORT



γ_{sat} = 112.8



	SPECIMEN NO.	△1	Y2	X3	AVG. 4
INITIAL	WATER CONTENT, %	40.2	39.9	39.8	40.0
	DRY DENSITY, PCF	80.0	79.9	80.0	80.0
	SATURATION, %	98.1	97.2	97.2	97.5
	VOID RATIO	1.106	1.109	1.106	
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	0.24	0.27	0.29	
	TIME TO FAILURE, MIN.	46	28	46	
	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: CLAY (CL), GRAY; SILT POCKETS; SHELL PARTICLES

LL 44	PL 15	PI 29	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

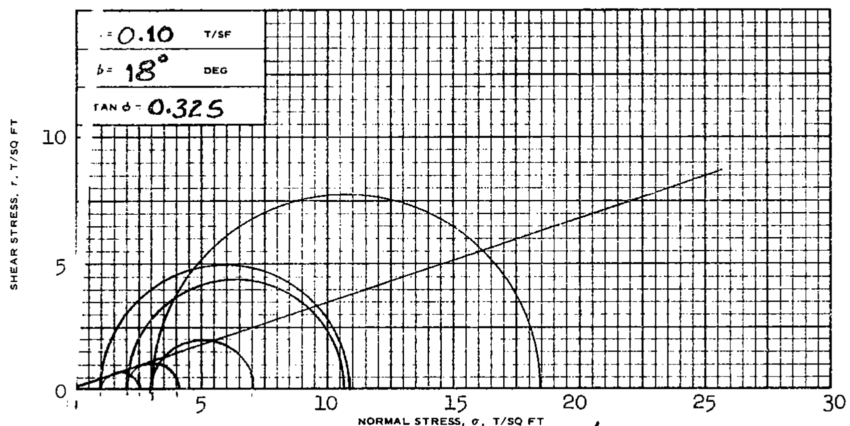
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83

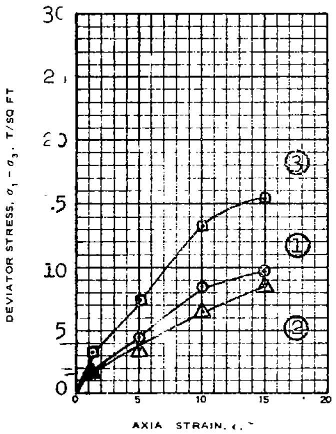
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 3-U	SAMPLE NO. 17-B
DEPTH/ELEV 64.1/-47.9	TECH. TES
LABORATORY USAE WES	DATE 16 JUN 83

TRIAXIAL COMPRESSION TEST REPORT



$\gamma_{sat} = 120.0$



SPECIMEN NO.			1	2	3	AVG.
INITIAL	WATER CONTENT, %	w_o	29.4	29.7	30.4	29.8
	DRY DENSITY LB/CU FT	γd_o	92.7	92.5	91.8	92.3
	SATURATION, %	S_o	98.9	99.4	99.9	99.4
	VOID RATIO	e_o	0.791	0.795	0.809	
BEFORE SHEAR	WATER CONTENT, %	w_c	29.6	29.0	28.5	
	DRY DENSITY LB/CU FT	γd_c	94.4	95.0	93.6	
	SATURATION, %	S_c	100+	100+	98.0	
	VOID RATIO	e_c	0.760	0.748	0.773	
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.20	7.20	7.20	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	9.96	8.61	15.44	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	536	536	536	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	1.5	2.0	4.0	
INITIAL DIAMETER, IN.		D_o	1.40	1.37	1.43	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS CLAYEY SILT (ML), GRAY: SHELL PARTICLES

LL 28 | PL 23 | PI 5 | Gs 2.66(EST) | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST $\overline{R}$

REMARKS:

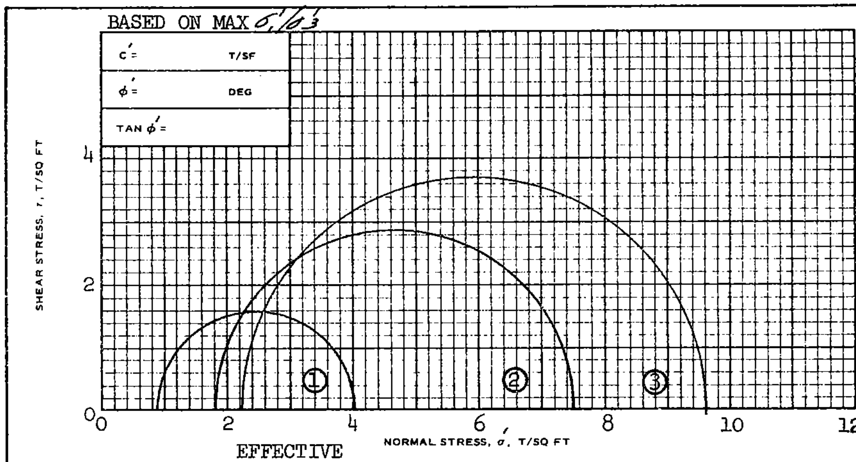
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
BORING NO. 3-U | SAMPLE NO. 8-B
DEPTH/ELEV 28.2/-12.0
LABORATORY USAEWES | DATE 10 NOV 1983

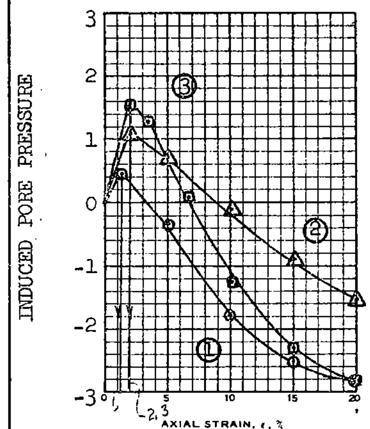
SHEET 1 OF 2 | PJR **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 O - 375-356

BASED ON MAX σ_1'/σ_3'





SPECIMEN NO.			1	2	3
INITIAL	WATER CONTENT, %	w_o			
	DRY DENSITY LB/CU FT	γd_o			
	SATURATION, %	S_o			
	VOID RATIO	e_o			
BEFORE SHEAR	WATER CONTENT, %	w_c			
	DRY DENSITY LB/CU FT	γd_c			
	SATURATION, %	S_c			
	VOID RATIO	e_c			
	FINAL BACK PRESSURE, T/SQ FT	u_o			
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.90	1.81	2.26
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	3.12	5.67	7.36
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

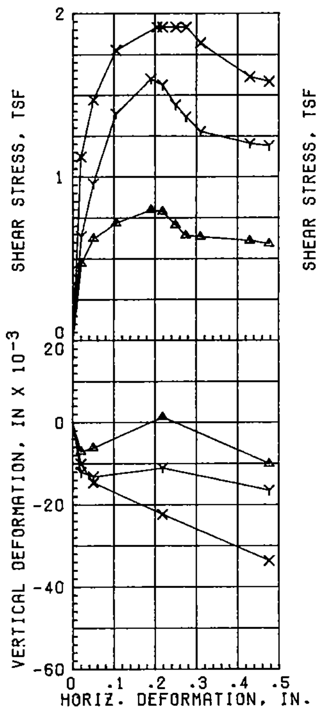
REMARKS:

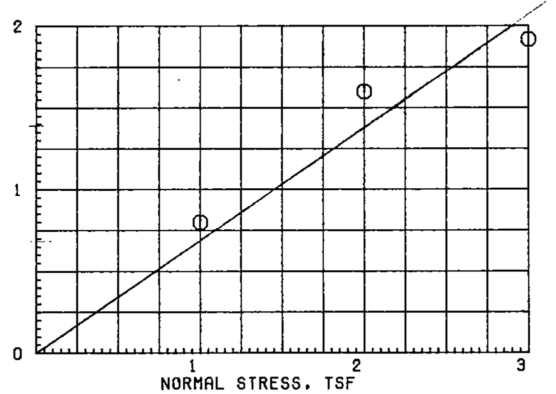
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
BORING NO. 3-U | SAMPLE NO. 8-B
DEPTH/ELEV 28.2/-12.0
LABORATORY USAEWES | DATE 10 NOV 1983

SHEET 2 OF 2 | PJR **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 O - 375-356





ϕ = 36.8

TAN ϕ = 0.748

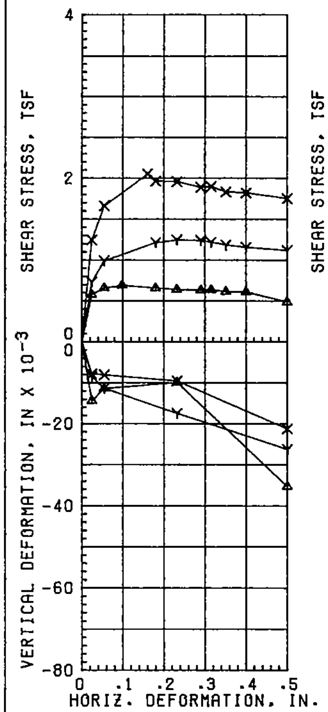
C = 0

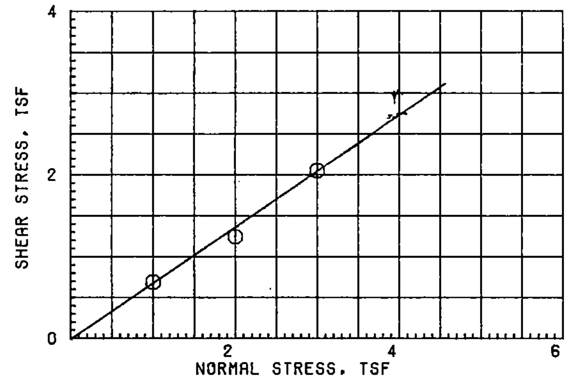
γ_{sat} = 123.2

	TEST NO.	1 ▲	2 Y	3 X	AVG.
INITIAL	WATER CONTENT, %	25.7	30.7	26.0	27.5
	VOID RATIO	0.695	0.766	0.711	
	SATURATION, %	98.5	100 +	97.1	98.5
	DRY DENSITY, PCF	97.9	94.0	97.0	96.3
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL., MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	27.3	26.3	29.7	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.80	1.60	1.92	
TIME TO FAILURE, MIN		1099	1099	1180	
RATE OF STRAIN, IN/MIN		.00017	.00017	.00017	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED	3.00 IN. SQUARE	0.744 IN. THICK
CLASSIFICATION SANDY SILT (ML), GRAY		
LL / PL / PI	GS 2.66 (EST)	
REMARKS:	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 3-U	SAMPLE 6-C
	DEPTH/ELEV 21.0/-4.8	DATE 10 OCT 83

DIRECT SHEAR TEST REPORT





ϕ = 33.7

TAN ϕ = 0.667

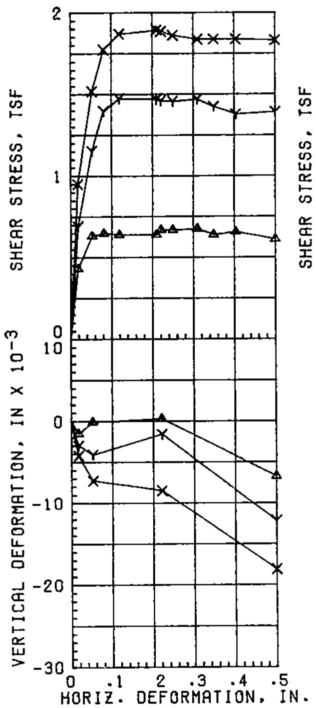
C = 0

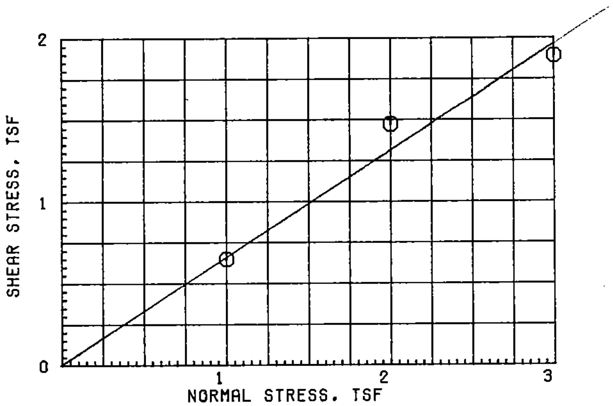
γ_{sat} = 127.8

	TEST NO.	1 ▲	2 Y	3 X	AVG
INITIAL	WATER CONTENT, %	21.8	21.8	20.6	21.4
	VOID RATIO	0.597	0.581	0.574	
	SATURATION, %	97.3	99.7	95.5	97.5
	DRY DENSITY, PCF	103.9	105.0	105.5	104.8
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL., MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	24.8	24.3	19.3	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.69	1.25	2.05	
TIME TO FAILURE, MIN		538	1270	878	
RATE OF STRAIN, IN/MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED	3.00 IN. SQUARE	0.744 IN. THICK
CLASSIFICATION SAND (SP), GRAY		
LL / PL / PI	GS 2.66 (EST)	
REMARKS:	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 3-U	SAMPLE 14-C
	DEPTH/ELEV 52.6/-36.4	DATE 12 OCT 83

DIRECT SHEAR TEST REPORT





$\gamma_{sat} = 124.2$

	TEST NO.	1 ▵	2 Y	3 X	AVG.
INITIAL	WATER CONTENT, %	24.8	26.2	24.2	25.1
	VOID RATIO	0.686	0.694	0.658	
	SATURATION, %	96.4	100 +	97.8	98.1
	DRY DENSITY, PCF	98.5	98.0	100.1	98.9
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	23.3	22.6	22.4	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.65	1.47	1.89	
TIME TO FAILURE, MIN		443	650	1148	
RATE OF STRAIN, IN/MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, TSF					

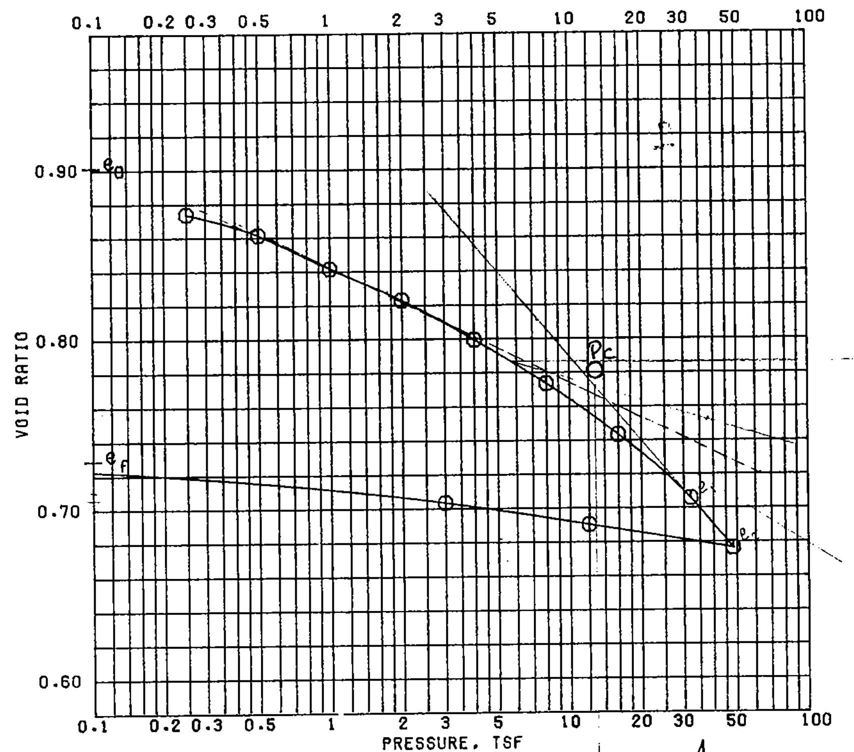
$\phi = 33.9°$

$\tan \phi = 0.672$

$c = 0$

TYPE SPECIMEN UNDISTURBED			3.00 IN. SQUARE	0.553 IN. THICK
CLASSIFICATION SILTY SAND (SM), GRAY				
LL	PL	PI		GS 2.66 (EST)
REMARKS:			PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)	
			ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
			BORING NO. 3-U	SAMPLE 19-C
			DEPTH/ELEV 72.7/-56.5	DATE 13 OCT 83

DIRECT SHEAR TEST REPORT



σ'_p γ_{sat} 114.1

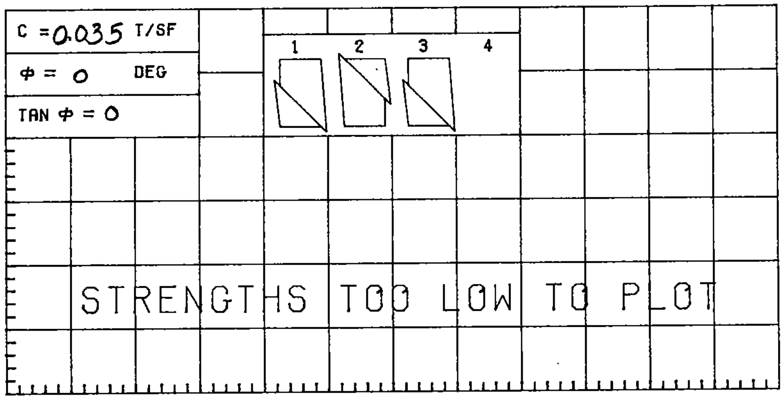
			BEFORE TEST	AFTER TEST	AVG
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	16.5	21.9	19.2
PRECONSOL. PRESSURE, TSF	13.0	DRY DENSITY, PCF	87.7	96.5	92.1
COMPRESSION INDEX	0.23	SATURATION, %	48.9	80.4	
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	0.901	0.728	
DIA. IN 4.44	HT. IN 1.133	BACK PRESSURE, TSF			
CLASSIFICATION SILTY SAND (SM), GRAY; SHELL PARTICLES					
LL / PL / PI		PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)			
GS 2.67 (EST)	D_{10}	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC			
REMARKS		BORING NO. 3-U	SAMPLE NO. 3-C		
		DEPTH/ELEV 7.9/+8.3	DATE 23 JUN 83		

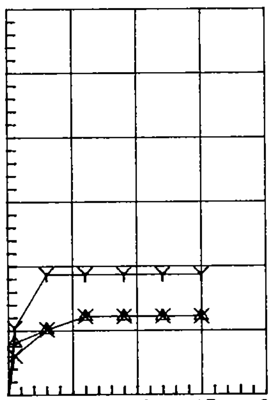
CONSOLIDATION TEST REPORT

C = 0.035 T/SF

φ = 0 DEG

TAN φ = 0





γ_{sat} = 84.0

		Δ1	Y2	X3	4 AVG.
	SPECIMEN NO.	Δ1	Y2	X3	4
INITIAL	WATER CONTENT, %	146.4	143.6	141.6	143.9
	DRY DENSITY, PCF	33.5	34.6	34.6	34.2
	SATURATION, %	98.0	100.0	98.8	98.9
	VOID RATIO	4.032	3.878	3.870	
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	0.06	0.09	0.06	
	TIME TO FAILURE, MIN.	16	4	8	
	RATE OF STRAIN INCR.%				
	INITIAL DIAMETER, IN.	1.39	1.37	1.39	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 119	PL 30	PI 89	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

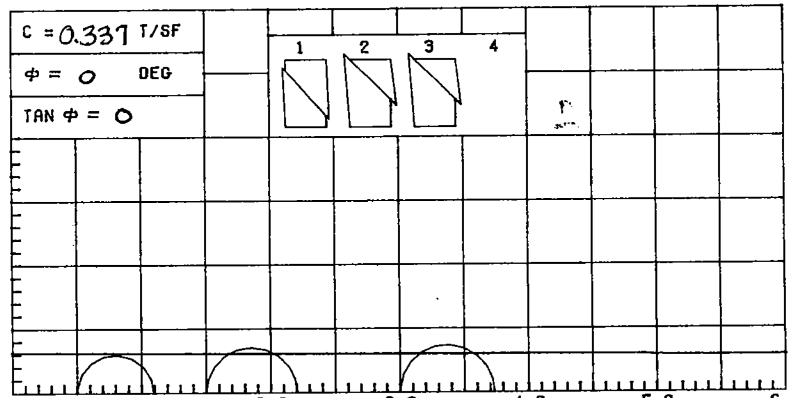
BORING NO. 4-U	SAMPLE NO. 5-B
DEPTH/ELEV 16.3/+0.3	TECH. LRC
LABORATORY USAE WES	DATE 20 JUN 83

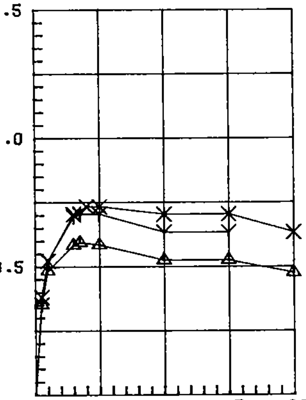
TRIAXIAL COMPRESSION TEST REPORT

C = 0.337 T/SF

φ = 0 DEG

TAN φ = 0





γ_{sat} = 110.7

		Δ1	Y2	X3	4 AVG.
	SPECIMEN NO.	Δ1	Y2	X3	4
INITIAL	WATER CONTENT, %	50.0	43.2	41.2	44.8
	DRY DENSITY, PCF	72.0	77.7	79.3	76.3
	SATURATION, %	100+	99.7	98.9	99.5
	VOID RATIO	1.341	1.170	1.125	
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	0.59	0.70	0.73	
	TIME TO FAILURE, MIN.	22	12	15	
	RATE OF STRAIN INCR.%				
	INITIAL DIAMETER, IN.	1.39	1.40	1.40	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SILT POCKETS

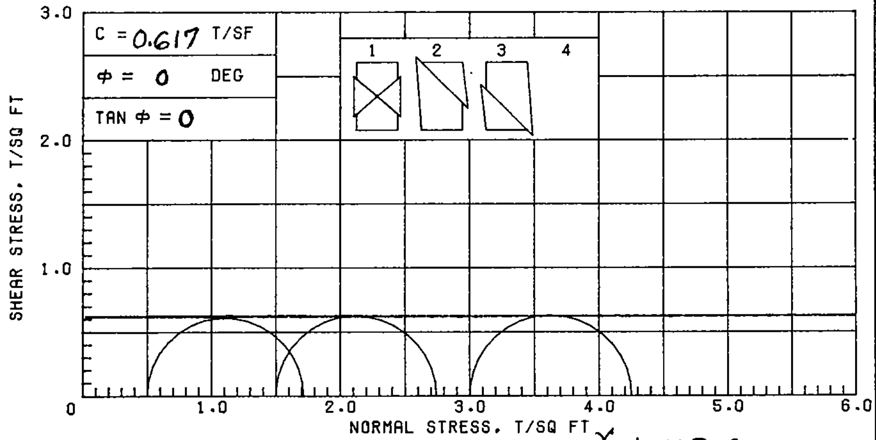
LL 54	PL 17	PI 37	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

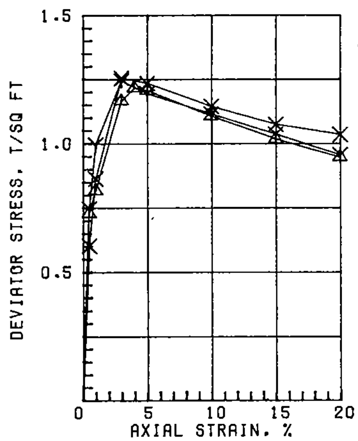
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 4-U	SAMPLE NO. 11-C
DEPTH/ELEV 41.3/-24.7	TECH. TES
LABORATORY USAE WES	DATE 20 JUN 83

TRIAXIAL COMPRESSION TEST REPORT





$\gamma_{sat} = 118.6$

SPECIMEN NO.		△1	Y2	X3	4
					AVG.
INITIAL	WATER CONTENT, %	31.6	33.0	31.4	32.0
	DRY DENSITY, PCF	89.9	87.1	90.7	89.2
	SATURATION, %	97.6	95.3	98.8	97.2
	VOID RATIO	0.874	0.935	0.858	
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		1.21	1.24	1.25	
TIME TO FAILURE, MIN.		14	11	11	
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

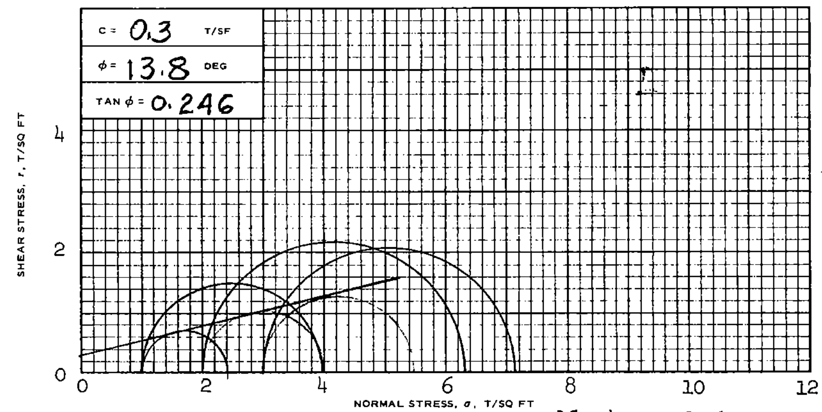
DESCRIPTION OF SPECIMENS: CLAY (CL), GRAY; SILT POCKETS; SHELL PARTICLES

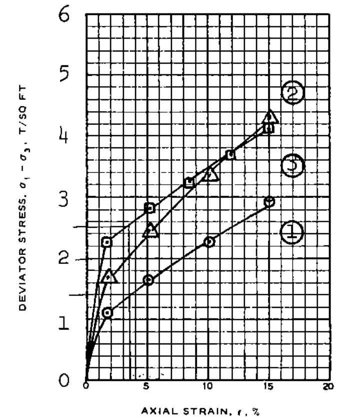
LL 45	PL 15	PI 30	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83	
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
BORING NO. 4-U	SAMPLE NO. 17-C
DEPTH/ELEV 65.0/-48.4	TECH. TES
LABORATORY USAE WES	DATE 20 JUN 83

TRIAXIAL COMPRESSION TEST REPORT





$\gamma_{sat} = 112.7$

SPECIMEN NO.			1	2	3	AVG.
INITIAL	WATER CONTENT, %	w_o	39.0	38.8	41.1	39.6
	DRY DENSITY LB/CU FT	γ_{d_o}	80.8	80.8	79.5	80.4
	SATURATION, %	S_o	98.0	97.5	100+	98.5
	VOID RATIO	e_o	1.062	1.063	1.096	
BEFORE SHEAR	WATER CONTENT, %	w_c	38.1	36.4	37.1	
	DRY DENSITY LB/CU FT	γ_{d_c}	82.7	83.9	84.5	
	SATURATION, %	S_c	100+	98.6	100+	
	VOID RATIO	e_c	1.015	0.986	0.973	
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.20	7.20	7.20	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.95	4.30	4.11	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	454	454	454	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	1.4	2.0	2.5	
INITIAL DIAMETER, IN.		D_o	1.39	1.39	1.38	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS CLAYEY SILT (ML), GRAY; SHELL PARTICLES

LL 38	PL 27	PI 11	G 2.67 (EST)	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST R

REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
BORING NO. 4-U	SAMPLE NO. 8-C
DEPTH/ELEV 28.7/-12.1	
LABORATORY USAEWES	DATE 7 NOV 1983

SHEET 1 OF 2

PJR

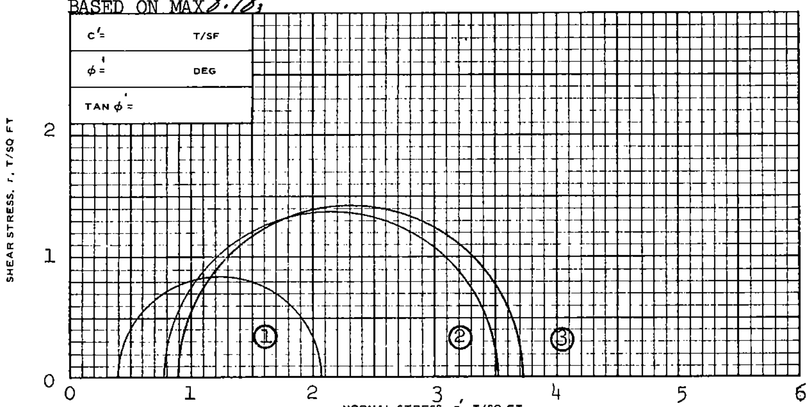
TRIAXIAL COMPRESSION TEST REPORT

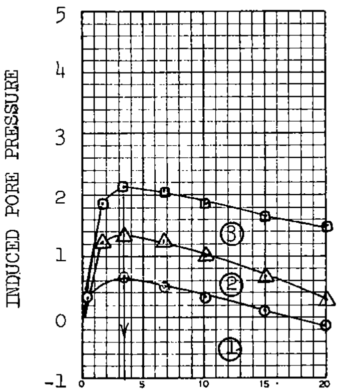
ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 0 - 375-356

BASED ON MAX $\bar{\sigma}_1/\bar{\sigma}_3$

c' =		T/SF
φ' =		DEG
TAN φ' =		





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.39	0.78	0.89	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.66	2.72	2.81	
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. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 4-U SAMPLE NO. 8-C

DEPTH/ELEV 28.7/-12.1

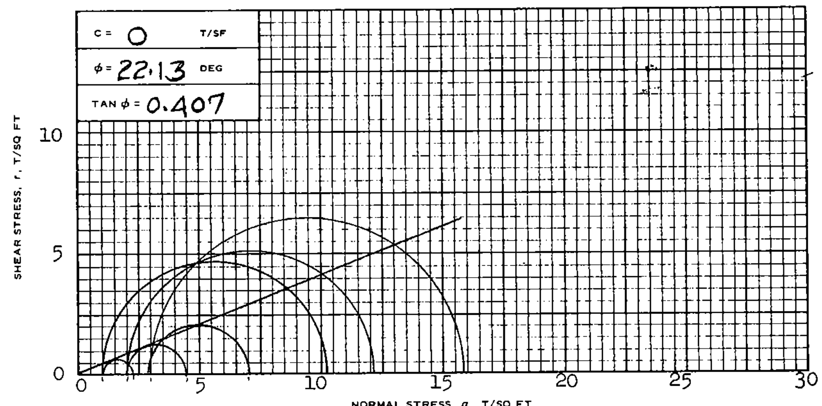
LABORATORY USAEWES DATE 7 NOV 1983

SHEET 2 OF 2 PJR **TRIAXIAL COMPRESSION TEST REPORT**

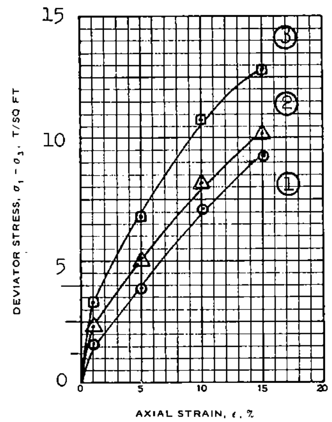
ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 O - 375-356

c =	0	T/SF
φ =	22.13	DEG
TAN φ =	0.407	



$\gamma_{sat} = 126.5$



SPECIMEN NO.			1	2	3	AVG
INITIAL	WATER CONTENT, %	w_o	23.6	24.4	23.3	23.8
	DRY DENSITY LB/CU FT	γd_o	102.1	101.2	103.4	102.2
	SATURATION, %	S_o	99.6	100+	100+	99.9
	VOID RATIO	e_o	0.632	0.647	0.612	
BEFORE SHEAR	WATER CONTENT, %	w_c	25.3	25.4	23.6	
	DRY DENSITY LB/CU FT	γd_c	104.3	104.2	105.7	
	SATURATION, %	S_c	100+	100+	100+	
	VOID RATIO	e_c	0.599	0.600	0.578	
	FINAL BACK PRESSURE, T/SQ FT	u_o	5.76	5.76	5.76	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	9.26	10.05	12.87	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	1071	1071	1071	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	1.25	2.5	4.0	
INITIAL DIAMETER, IN.		D_o	1.39	1.39	1.36	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS SILTY CLAY (CL), GRAY

LL	PL	PI	G_s	TYPE OF SPECIMEN	TYPE OF TEST
26	18	8	2.67 (EST)	UNDISTURBED	$\bar{R}$

REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 4-U SAMPLE NO. 18-C

DEPTH/ELEV 68.5/-51.9

LABORATORY USAEWES DATE 8 NOV 1983

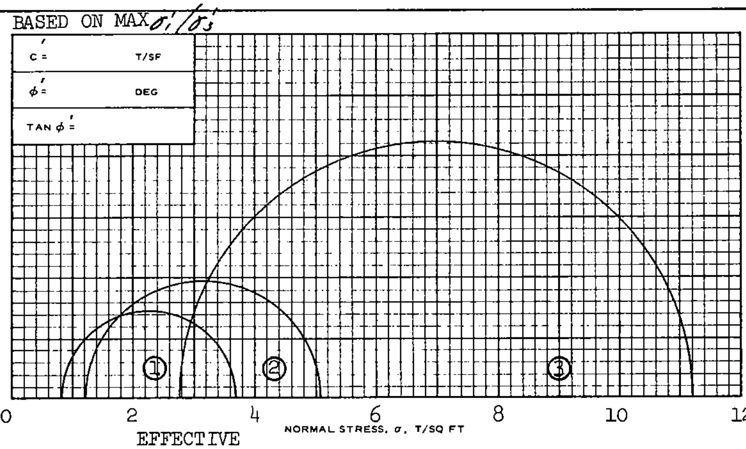
SHEET 1 OF 2 JMS **TRIAXIAL COMPRESSION TEST REPORT**

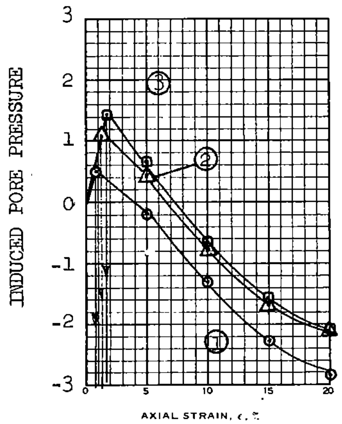
ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 O - 375-356

BASED ON MAX σ_1'/σ_3'

c' =	T/SF
ϕ' =	DEG
TAN ϕ' =	





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.82	1.21	2.76	
MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{MAX}$		2.91	3.88	8.44	
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. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 4-U SAMPLE NO. 18-C

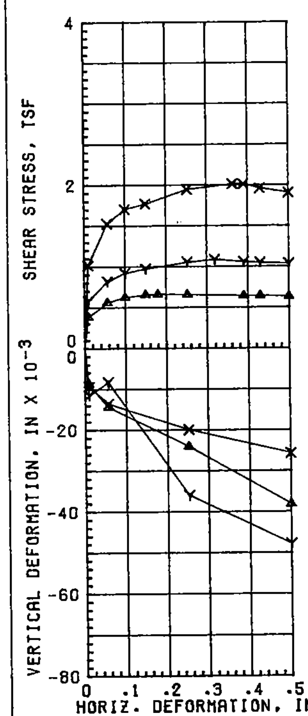
DEPTH/ELEV 68.5/-51.9

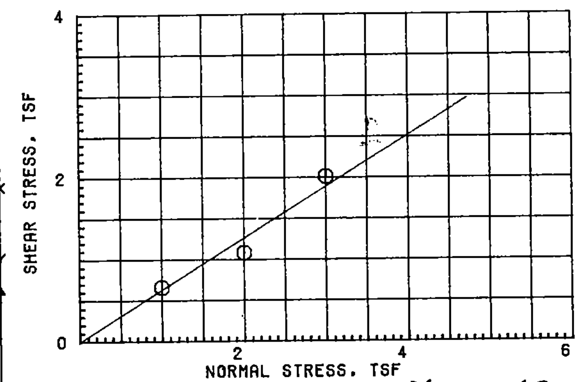
LABORATORY USAEWES DATE 8 NOV 1983

SHEET 2 OF 2 JMS **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 O - 375-356





$\gamma_{sat} = 117.9$

ϕ = 31.9

TAN ϕ = 0.622

C = 0

	TEST NO.	1 ▲	2 Y	3 X	AVG.
INITIAL	WATER CONTENT, %	35.2	32.5	30.9	32.9
	VOID RATIO	0.925	0.879	0.853	
	SATURATION, %	100 +	98.8	96.7	98.5
	DRY DENSITY, PCF	86.6	88.7	89.9	88.4
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	29.4	26.7	29.6	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.66	1.08	2.01	
TIME TO FAILURE, MIN		912	1615	1838	
RATE OF STRAIN, IN/MIN		.00020	.00020	.00020	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.744 IN. THICK

CLASSIFICATION SANDY SILT (ML), GRAY

LL	PL	PI		GS 2.67 (EST)

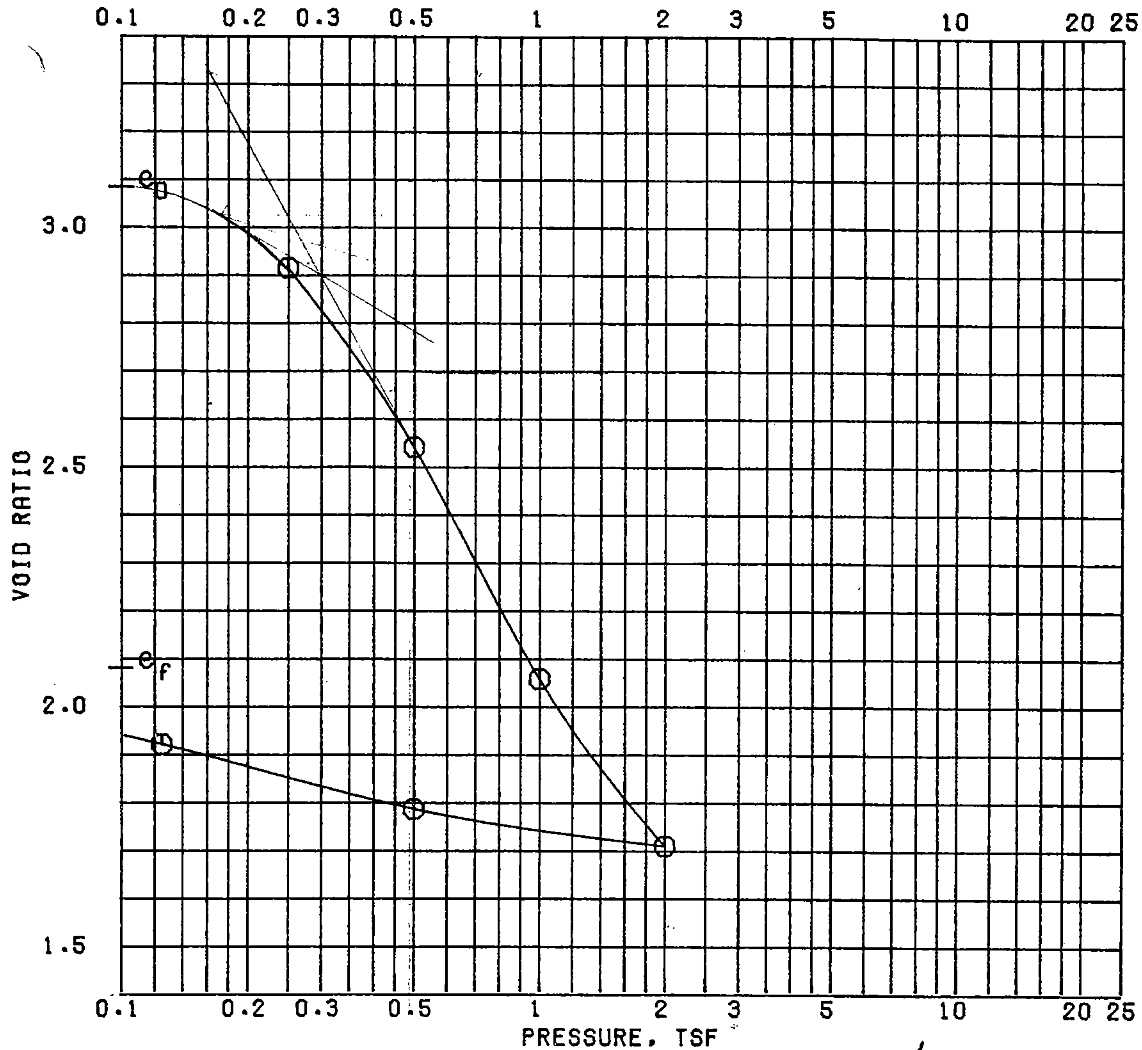
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 4-U SAMPLE 15-C

DEPTH/ELEV 56.4/-39.8 DATE 13 OCT 83

DIRECT SHEAR TEST REPORT



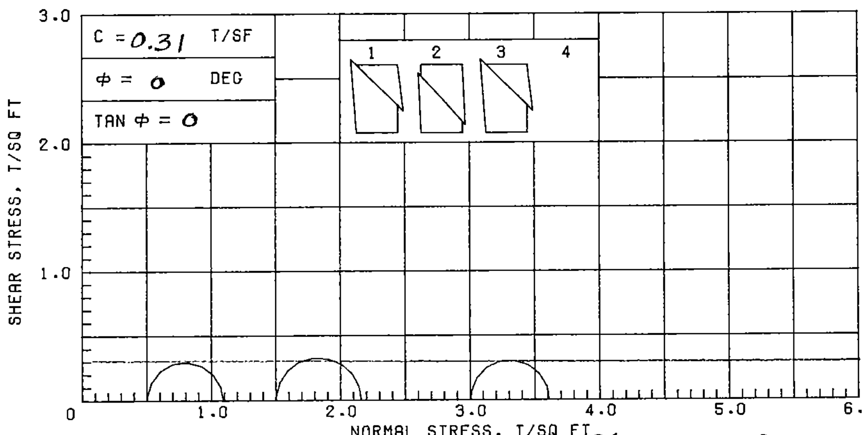
γ_{SAT}= 93.86

σ'_p

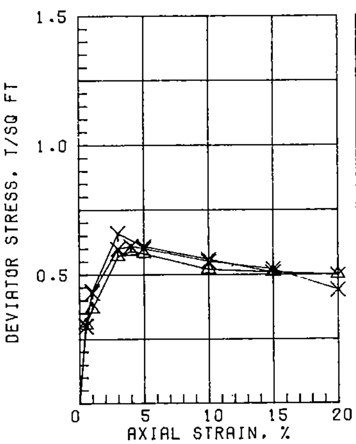
				BEFORE TEST	AFTER TEST	AVG
OVERBURDEN PRESSURE, TSF			WATER CONTENT, %	109.4	75.0	92.2
PRECONSOL. PRESSURE, TSF			DRY DENSITY, PCF	41.3	54.8	48.05
COMPRESSION INDEX ?	1.44		SATURATION, %	95.9	97.5	96.70
TYPE SPECIMEN	UNDISTURBED		VOID RATIO	3.080	2.078	
DIA. IN 4.44	HT. IN 1.133		BACK PRESSURE, TSF			

CLASSIFICATION PLASTIC CLAY (CH), GRAY			
LL 106	PL 27	PI 79	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)
GS 2.70 (EST)	D_{10}		ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
REMARKS			BORING NO. 4-U / SAMPLE NO. 5-C
			DEPTH/ELEV 17.4/-0.8 / DATE 24 JUN 83

CONSOLIDATION TEST REPORT



γ_{sat} = 104.2



SPECIMEN NO.		△1	Y2	X3	4 (Avg.)
INITIAL	WATER CONTENT, %	55.2	55.7	59.6	56.8
	DRY DENSITY, PCF	67.4	67.0	64.4	66.3
	SATURATION, %	99.4	99.3	99.6	99.4
	VOID RATIO	1.500	1.514	1.616	
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		0.59	0.66	0.61	
TIME TO FAILURE, MIN.		10	4	19	
RATE OF STRAIN INCR,%			5	6	
INITIAL DIAMETER, IN.		1.39	1.39	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; FINE SAND POCKETS

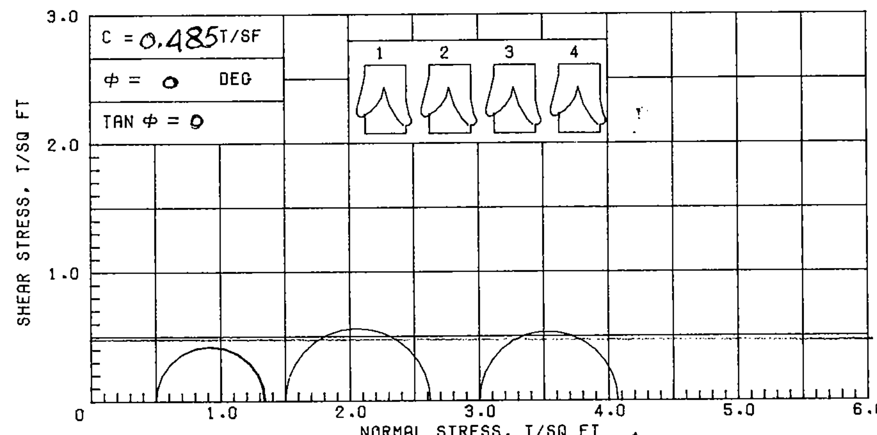
LL 68	PL 18	PI 50	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

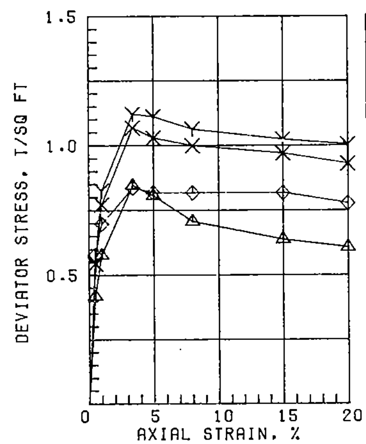
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 5-U	SAMPLE NO. 9-C
DEPTH/ELEV 33.0/-25.5	TECH. LRC
LABORATORY USAE WES	DATE 20 JUN 83

TRIAXIAL COMPRESSION TEST REPORT



γ_{sat} = 114.2



SPECIMEN NO.		△1	Y2	X3	◇4	
INITIAL	WATER CONTENT, %	41.0	36.1	37.2	39.8	38.5
	DRY DENSITY, PCF	80.0	84.2	83.5	80.9	82.2
	SATURATION, %	100+	97.2	98.6	99.3	98.8
	VOID RATIO	1.107	1.003	1.018	1.082	
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		0.85	1.12	1.07	0.84	
TIME TO FAILURE, MIN.		8	19	27	32	
RATE OF STRAIN INCR,%			8	5	4	
INITIAL DIAMETER, IN.		1.40	1.41	1.41	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: CLAY (CL), DARK GRAY

LL 47	PL 15	PI 32	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

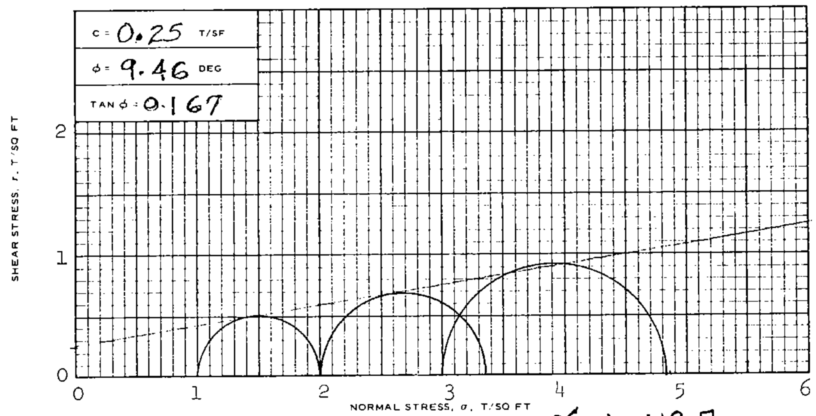
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 5-U	SAMPLE NO. 15-B
DEPTH/ELEV 56.4/-48.9	TECH. PJR
LABORATORY USAE WES	DATE 21 JUN 83

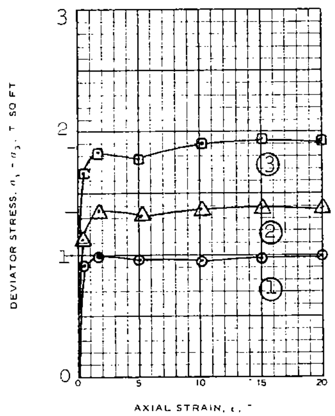
TRIAXIAL COMPRESSION TEST REPORT

Sheet 1 of 2

c = 0.25 T/SF
φ = 9.46 DEG
TAN φ = 0.167



γsat = 119.7



		SPECIMEN NO.		1	2	3	AVG.
INITIAL	WATER CONTENT, %		w_o	31.1	31.0	31.5	31.2
	DRY DENSITY LB/CU FT		γd_o	92.1	89.6	90.6	90.8
	SATURATION, %		S_o	100+	94.9	98.8	97.9
	VOID RATIO		e_o	0.830	0.882	0.861	
BEFORE SHEAR	WATER CONTENT, %		w_c	29.2	28.1	27.2	
	DRY DENSITY LB/CU FT		γd_c	95.9	93.9	96.4	
	SATURATION, %		S_c	100+	94.7*	98.1	
	VOID RATIO		e_c	0.757	0.801	0.749	
	FINAL BACK PRESSURE, T/SQ FT		u_o	5.76	5.76	5.76	
MINOR PRINCIPAL STRESS, T/SQ FT			σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$		1.00	1.36	1.83	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN			t_f	106	113	106	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$		[illegible]	1.35	1.85	
INITIAL DIAMETER, IN.			D_o	1.36	1.37	1.36	
INITIAL HEIGHT, IN.			H_o	3.00	3.00	3.00	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS SANDY CLAY (CL), GRAY

LL 27 | PL 18 | PI 9 | Gs 2.70 (EST) | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST $\bar{R}$

REMARKS: *PORE PRESSURE RESPONSE INDICATED 100% SATURATION

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 5-U | SAMPLE NO. 7-B

DEPTH/ELEV 24.4/-26.9

LABORATORY USAEWES | DATE 4 NOV 1983

SHEET 1 OF 2 | JMS | **TRIAXIAL COMPRESSION TEST REPORT**

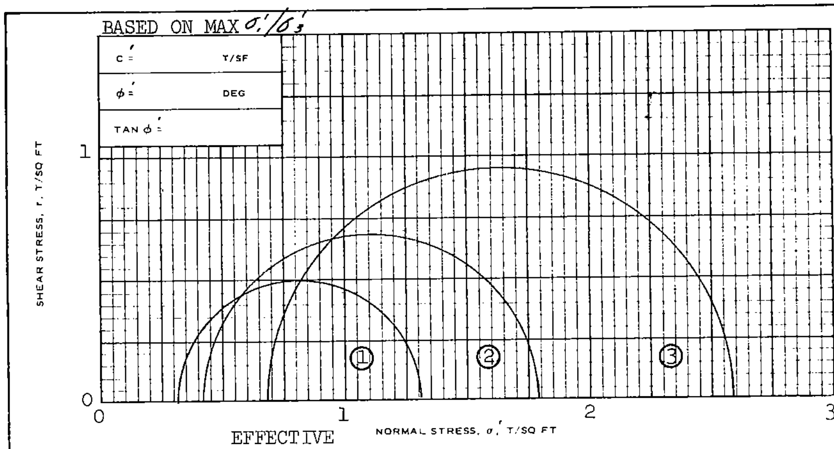
ENG FORM NO. 2089
REV JUNE 1970

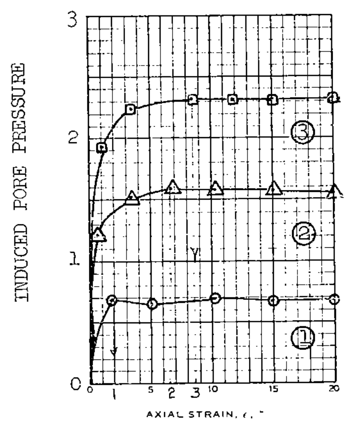
GPO : 1982 O - 375-356

Sheet 2 of 2

BASED ON MAX σ'1/σ'3

c' =	T/SF
φ' =	DEG
TAN φ' =	





		SPECIMEN NO.		1	2	3	
INITIAL	WATER CONTENT, %		w_o				
	DRY DENSITY LB/CU FT		γd_o				
	SATURATION, %		S_o				
	VOID RATIO		e_o				
BEFORE SHEAR	WATER CONTENT, %		w_c				
	DRY DENSITY LB/CU FT		γd_c				
	SATURATION, %		S_c				
	VOID RATIO		e_c				
	FINAL BACK PRESSURE, T/SQ FT		u_o				
MINOR PRINCIPAL STRESS, T/SQ FT			σ_3	0.32	0.42	0.68	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$		1.00	1.38	1.91	
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. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 5-U | SAMPLE NO. 7-B

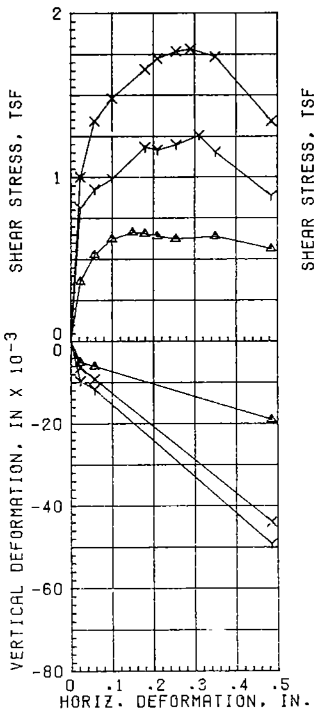
DEPTH/ELEV 24.4/-26.9

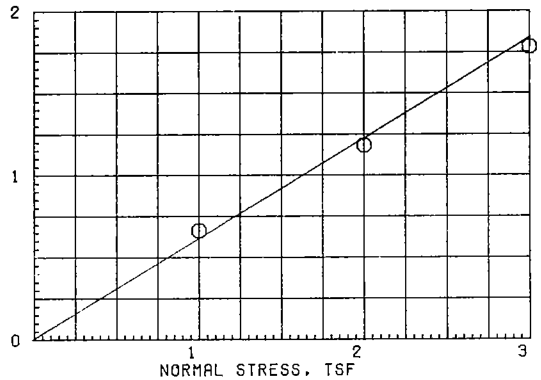
LABORATORY USAEWES | DATE 4 NOV 1983

SHEET 2 OF 2 | JMS | **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 O - 375-356





ϕ = 31.6

TAN ϕ = 0.615

C = ______

γ_{sat} = 124.9

	TEST NO.	1 △	2 Y	3 X	AVG
INITAL	WATER CONTENT, %	23.9	24.3	24.2	24.1
	VOID RATIO	0.652	0.667	0.656	
	SATURATION, %	97.4	96.9	98.0	97.4
	DRY DENSITY, PCF	100.5	99.6	100.3	100.1
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	25.7	25.7	25.6	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.66	1.18	1.78	
TIME TO FAILURE, MIN		853	1024	1650	
RATE OF STRAIN, IN/MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED | 3.00 IN. SQUARE | 0.744 IN. THICK

CLASSIFICATION SAND (SP), GRAY; WITH SILT

LL | PL | PI | | GS 2.66 (EST)

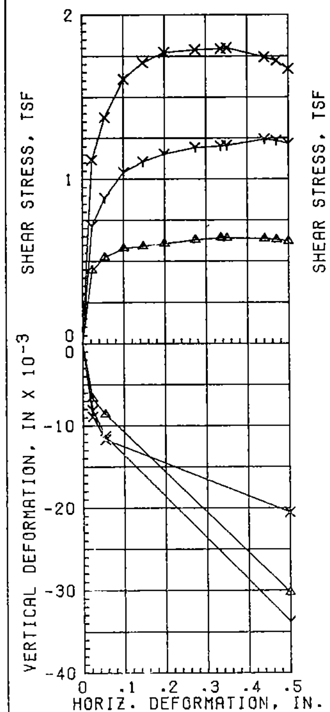
REMARKS:

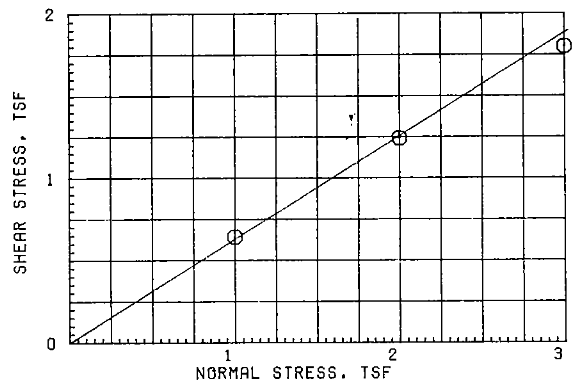
PROJECT LK. PONT. LA. & VIC-HURR. PROT. PLAN
ORLEANS LAKEFRONT LEVEE-WEST TO IHNC

BORING NO. 5-U | SAMPLE 6-C

DEPTH/ELEV 21.0/-13.5 | DATE 15 OCT 83

DIRECT SHEAR TEST REPORT





ϕ = 31.80

TAN ϕ = 0.62

C = 0

γ_{sat} = 115.3

	TEST NO.	1 △	2 Y	3 X	AVG.
INITAL	WATER CONTENT, %	31.8	33.1	32.9	32.6
	VOID RATIO	0.955	0.964	0.951	
	SATURATION, %	88.5	91.3	92.1	90.6
	DRY DENSITY, PCF	84.9	84.5	85.1	84.8
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	25.6	26.5	25.5	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.64	1.24	1.80	
TIME TO FAILURE, MIN		1845	2428	1928	
RATE OF STRAIN, IN/MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED | 3.00 IN. SQUARE | 0.553 IN. THICK

CLASSIFICATION SILTY SAND (SM), GRAY

LL | PL | PI | | GS 2.66 (EST)

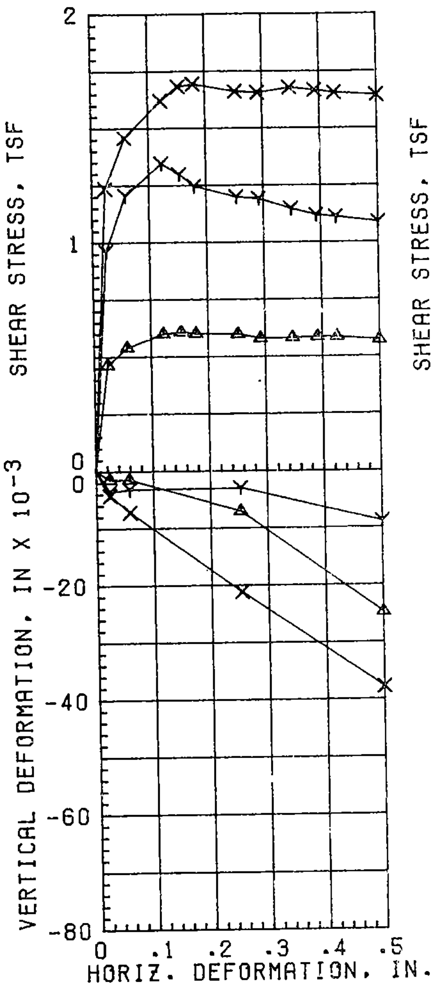
REMARKS:

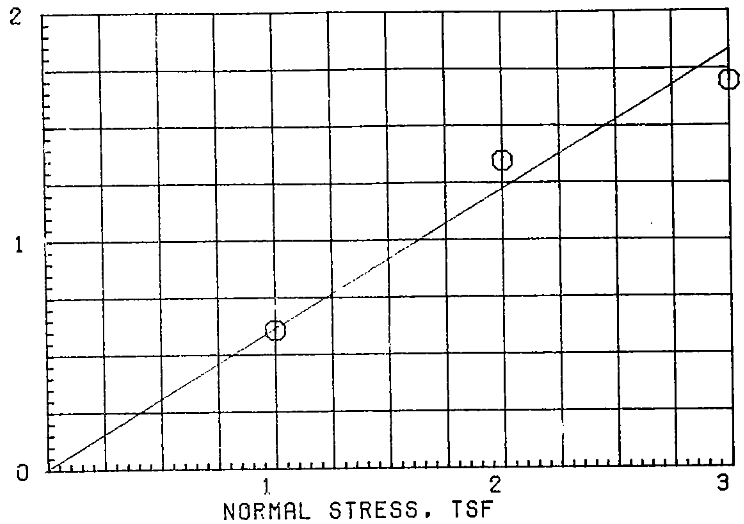
PROJECT LK. PONT. LA. & VIC-HURR. PROT. PLAN
ORLEANS LAKEFRONT LEVEE-WEST TO IHNC

BORING NO. 5-U | SAMPLE 13-C

DEPTH/ELEV 48.8/-41.3 | DATE 15 OCT 83

DIRECT SHEAR TEST REPORT





ϕ = 31.6

TAN ϕ = 0.615

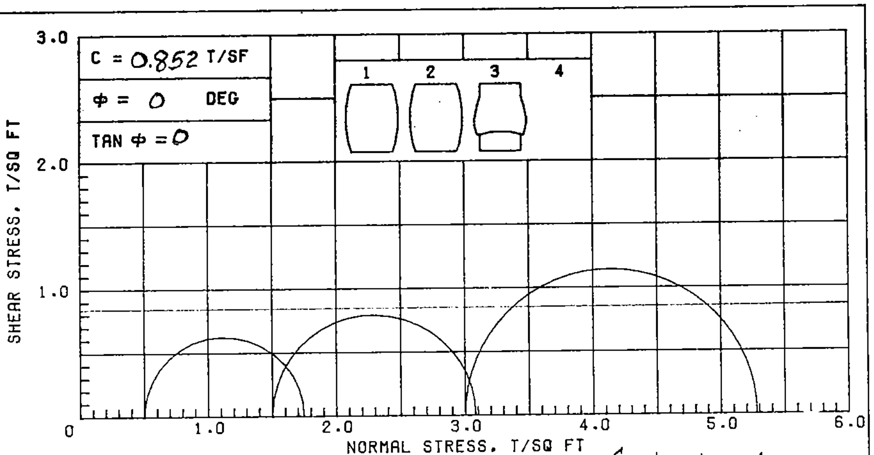
C = 0

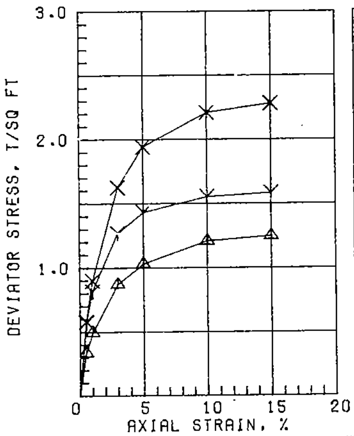
γ_{sat} = 122.0

	TEST NO.	1 △	2 Y	3 X	AVG
INITAL	WATER CONTENT, %	27.1	26.9	25.9	26.6
INITAL	VOID RATIO	0.717	0.741	0.748	
INITAL	SATURATION, %	100 +	96.4	92.2	96.2
INITAL	DRY DENSITY, PCF	96.7	95.3	94.9	95.6
	VOID RATIO AFTER CONSOL				
	FIFTY PERCENT CONSOL, MIN	< 1	< 1	< 1	
FINAL	WATER CONTENT, %	22.8	24.2	22.3	
FINAL	VOID RATIO				
FINAL	SATURATION, %				
	NORMAL STRESS, TSF	1.0	2.0	3.0	
	MAXIMUM SHEAR STRESS, TSF	0.61	1.35	1.69	
	TIME TO FAILURE, MIN	840	670	983	
	RATE OF STRAIN, IN/MIN	.00018	.00018	.00018	
	ULTIMATE SHEAR STRESS, TSF				

TYPE SPECIMEN UNDISTURBED		3.00 IN. SQUARE	0.553 IN. THICK	
CLASSIFICATION SILTY SAND (SM), GRAY				
LL	PL	PI		GS 2.66 (EST)
REMARKS:	PROJECT LK. PONT. LA. & VIC-HURR. PROT. PLAN ORLEANS LAKEFRONT LEVEE-WEST TO IHNC			
	BORING NO. 5-U		SAMPLE 17-C	
	DEPTH/ELEV 65.0/-57.5		DATE 17 OCT 83	

DIRECT SHEAR TEST REPORT





γsat = 121.4

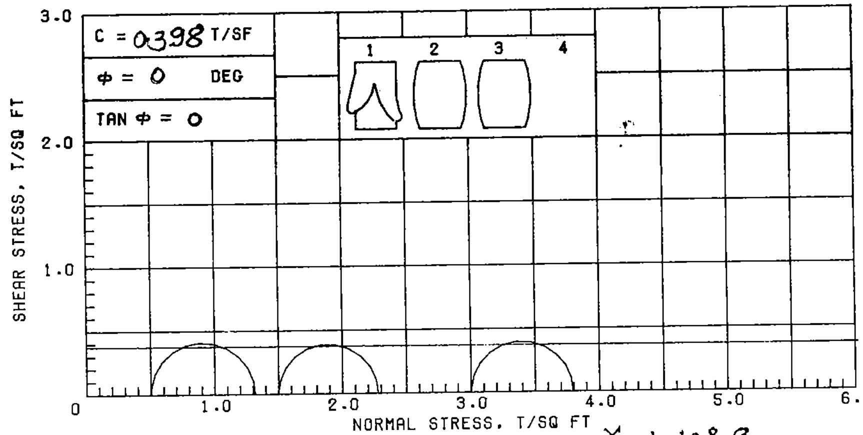
SPECIMEN NO.		△1	Y2	X3	4 AVG.
INITIAL	WATER CONTENT, %	23.4	25.3	26.3	25.0
	DRY DENSITY, PCF	96.2	94.1	90.1	93.5
	SATURATION, %	83.9	86.3	81.6	83.9
	VOID RATIO	0.753	0.791	0.870	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	
MAX. DEV. STRESS, TSF		1.25	1.58	2.28	
TIME TO FAILURE, MIN.		63	40	82	
RATE OF STRAIN INCR.,%					
INITIAL DIAMETER, IN.		1.41	1.39	1.39	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

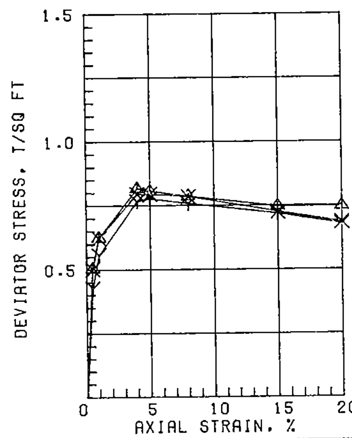
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: CLAY (CL), GRAY; FINE SAND SEAMS; FRIABLE

LL 40	PL 16	PI 24	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	
	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
	BORING NO. 6-U — SAMPLE NO. 3-C
	DEPTH/ELEV 9.0/+6.7 — TECH. PJR
	LABORATORY USAE WES — DATE 21 JUN 83
	TRIAXIAL COMPRESSION TEST REPORT





γsat = 108.8

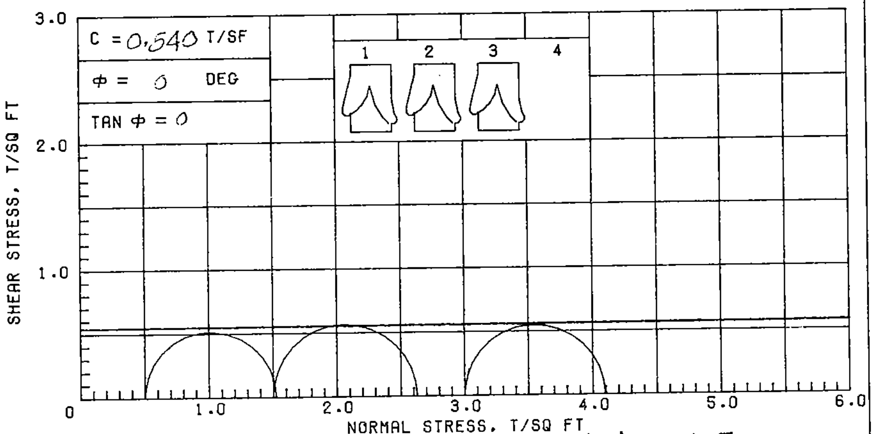
SPECIMEN NO.		△1	Y2	X3	4 AVG.
INITIAL	WATER CONTENT, %	44.8	46.8	52.1	47.9
	DRY DENSITY, PCF	74.9	73.9	70.9	73.2
	SATURATION, %	96.7	98.7	100+	98.5
	VOID RATIO	1.251	1.280	1.379	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	
MAX. DEV. STRESS, TSF		0.82	0.78	0.79	
TIME TO FAILURE, MIN.		8	38	36	
RATE OF STRAIN INCR.,%			8	5	
INITIAL DIAMETER, IN.		1.39	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

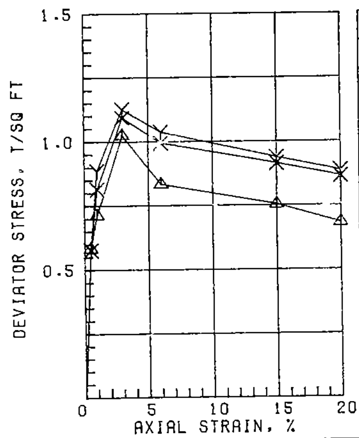
DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; FINE SAND LENSES

LL 71	PL 21	PI 50	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	
	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
	BORING NO. 6-U — SAMPLE NO. 11-C
	DEPTH/ELEV 41.0/-25.3 — TECH. PJR
	LABORATORY USAE WES — DATE 22 JUN 83
	TRIAXIAL COMPRESSION TEST REPORT



$\gamma_{sat} = 104.7$



		SPECIMEN NO.	△1	Y2	X3	4
INITIAL		WATER CONTENT, %	60.1	55.4	51.6	55.7
		DRY DENSITY, PCF	64.3	67.1	69.7	67.0
		SATURATION, %	100+	98.9	98.1	99.0
		VOID RATIO	1.622	1.513	1.420	
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	1.02	1.13	1.09	
		TIME TO FAILURE, MIN.	5	22	30	
		RATE OF STRAIN INCR.,%		6	8	
		INITIAL DIAMETER, IN.	1.40	1.40	1.40	
		INITIAL HEIGHT, IN.	5.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SHELL PARTICLES

LL 64	PL 19	PI 45	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

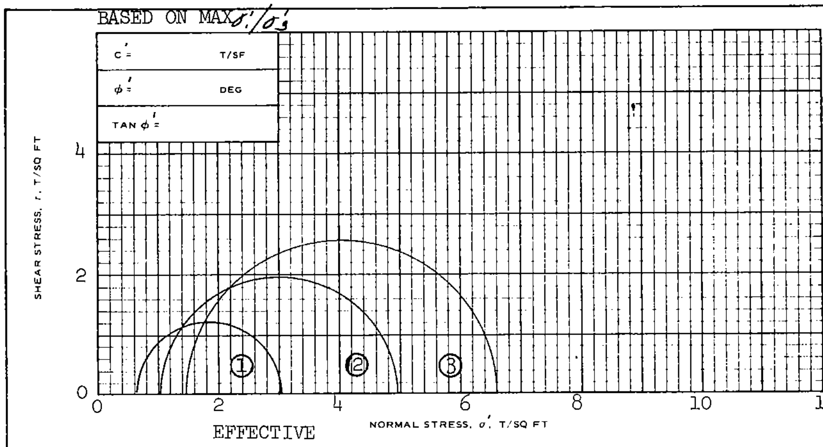
REMARKS:

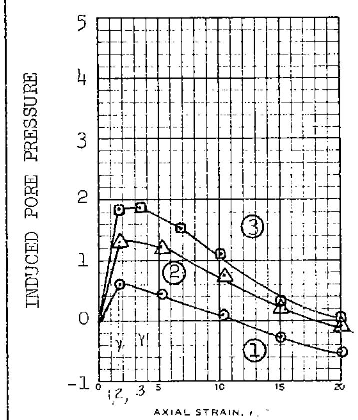
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 6-U	SAMPLE NO. 17-B
DEPTH/ELEV 64.4/-48.7	TECH. PJR
LABORATORY USAE WES	DATE 22 JUN 83

TRIAXIAL COMPRESSION TEST REPORT

BASED ON MAX σ_1'/σ_3'





	SPECIMEN NO.		1	2	3	
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
	MINOR PRINCIPAL STRESS, T/SQ FT	σ_3	0.66	1.03	1.45	
	MAXIMUM DEVIATOR STRESS, T/SQ FT	$(\sigma_1 - \sigma_3)_{max}$	2.36	3.92	5.14	
	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. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

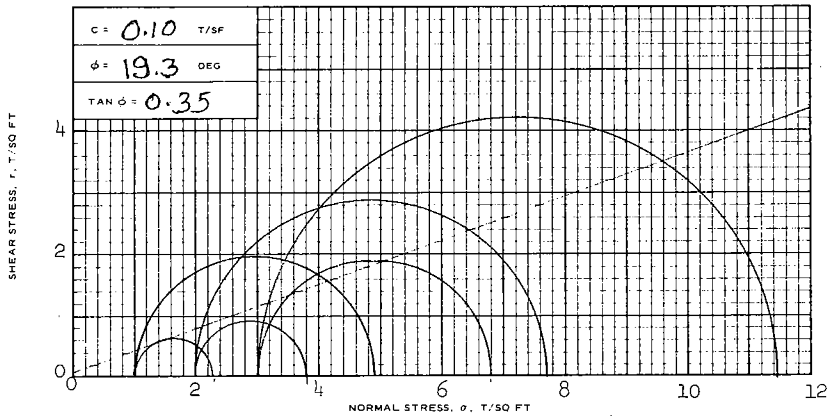
BORING NO. 6-U	SAMPLE NO. 8-B
DEPTH/ELEV 28.2/-12.5	
LABORATORY USAEWES	DATE 17 NOV 1983

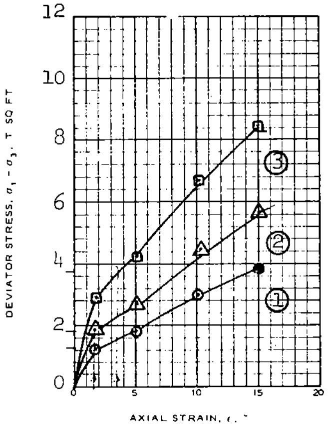
SHEET 2 OF 2

PJR TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 O - 375-356





γ_{sat} = 114.0

SPECIMEN NO.			1	2	3	AVG
INITIAL	WATER CONTENT, %	w_o	37.4	38.1	37.4	37.6
	DRY DENSITY LB/CU FT	γ_{d_o}	82.9	82.4	82.9	82.7
	SATURATION, %	S_o	99.1	99.7	99.1	99.3
	VOID RATIO	e_o	1.004	1.016	1.004	
BEFORE SHEAR	WATER CONTENT, %	w_c	35.8	35.1	33.9	
	DRY DENSITY LB/CU FT	γ_{d_c}	86.7	90.0	90.2	
	SATURATION, %	S_c	100+	100+	100+	
	VOID RATIO	e_c	0.915	0.844	0.840	
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.20	7.20	7.20	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	3.94	5.68	8.42	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_1	484	484	484	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	1.3	1.8	3.8	
INITIAL DIAMETER, IN.		D_o	1.38	1.38	1.38	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS SANDY SILT (ML), DARK GRAY; SHELL PARTICLES

LL 35 | PL 28 | PI 7 | Gs 2.66(EST) | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST $\bar{R}$

REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)

ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 6-U | SAMPLE NO. 8-B

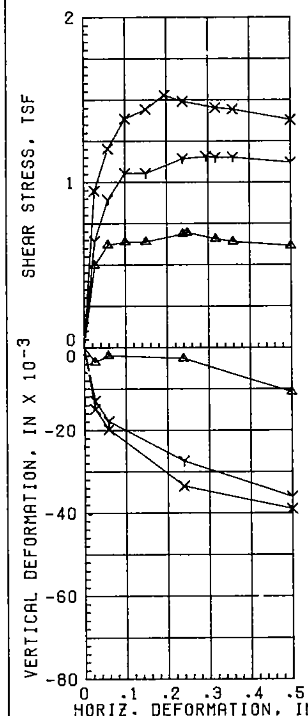
DEPTH/ELEV 28.2/-12.5

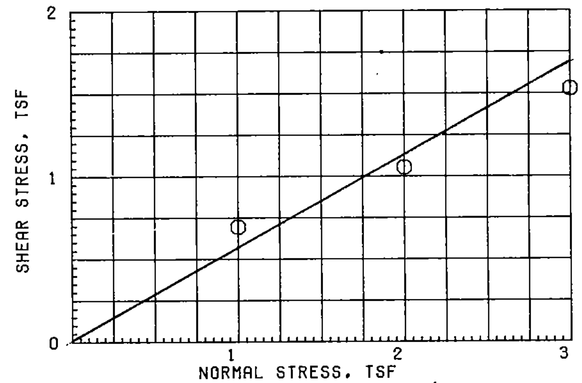
LABORATORY USAEWES | DATE 17 NOV 1983

SHEET 1 OF 2 | PJR **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 O - 375-356





φ = 29.9°

TAN φ = 0.575

C = —

γ_{sat} = 115.7

	TEST NO.	1 ▲	2 Y	3 X	AVG.
INITIAL	WATER CONTENT, %	34.1	34.1	32.1	33.4
	VOID RATIO	0.952	0.968	0.930	
	SATURATION, %	95.7	94.0	92.2	94.0
	DRY DENSITY, PCF	85.3	84.7	86.3	85.4
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	27.5	32.1	32.9	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.69	1.05	1.53	
TIME TO FAILURE, MIN		1283	513	1001	
RATE OF STRAIN, IN/MIN		.00019	.00019	.00019	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED | 3.00 IN. SQUARE | 0.744 IN. THICK

CLASSIFICATION SILT (ML), GRAY; TRACE OF SAND & CLAY

LL | PL | PI | GS 2.67 (EST)

REMARKS:

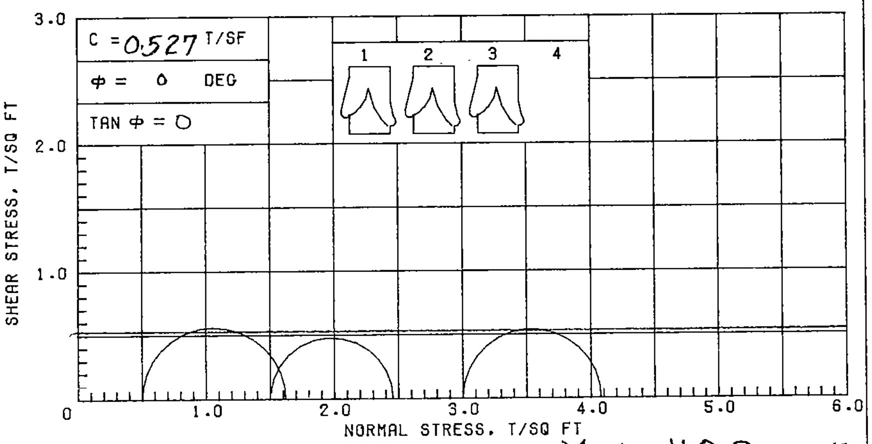
PROJECT LK. PONT. LA. & VIC-HURR. PROT. PLAN

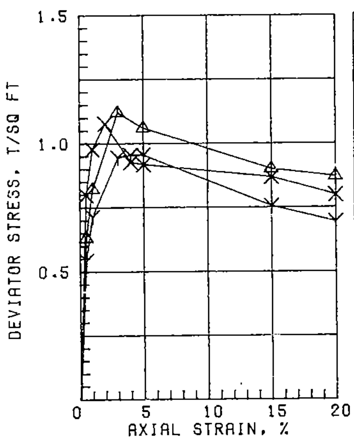
ORLEANS LAKEFRONT LEVEE-WEST TO IHNC

BORING NO. 6-U | SAMPLE 15-C

DEPTH/ELEV 56.9/-41.2 | DATE 17 OCT 83

DIRECT SHEAR TEST REPORT





γsat = 110.0 AVG.

		SPECIMEN NO.	△1	Y2	X3	4
INITIAL		WATER CONTENT, %	44.1	48.6	46.2	46.3
		DRY DENSITY, PCF	77.1	73.5	75.0	75.2
		SATURATION, %	100+	100+	100+	100
		VOID RATIO	1.185	1.292	1.246	
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			1.12	0.96	1.08	
TIME TO FAILURE, MIN.			6	42	20	
RATE OF STRAIN INCR.%				5	5	
INITIAL DIAMETER, IN.			1.40	1.40	1.40	
INITIAL HEIGHT, IN.			3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

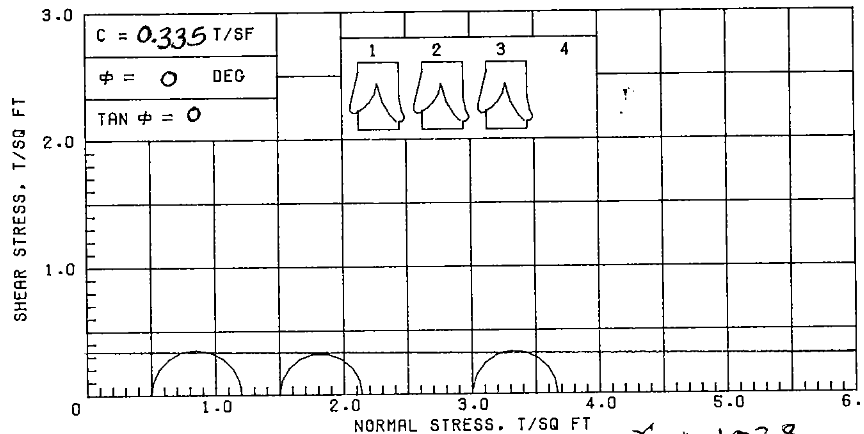
DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SHELL PARTICLES

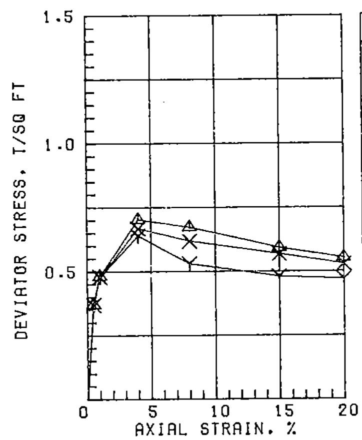
LL 60	PL 17	PI 43	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
BORING NO. 7-U	SAMPLE NO. 15-B
DEPTH/ELEV 56.4/-52.7	TECH. PJR
LABORATORY USAE WES	DATE 23 JUN 83

TRIAXIAL COMPRESSION TEST REPORT





γsat = 103.8

		SPECIMEN NO.	△1	Y2	X3	4
INITIAL		WATER CONTENT, %	60.5	60.3	56.9	59.2
		DRY DENSITY, PCF	64.6	64.7	66.2	65.2
		SATURATION, %	100+	100+	99.3	100
		VOID RATIO	1.609	1.606	1.547	
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			0.70	0.64	0.67	
TIME TO FAILURE, MIN.			7	15	20	
RATE OF STRAIN INCR.%				8	8	
INITIAL DIAMETER, IN.			1.40	1.40	1.40	
INITIAL HEIGHT, IN.			3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

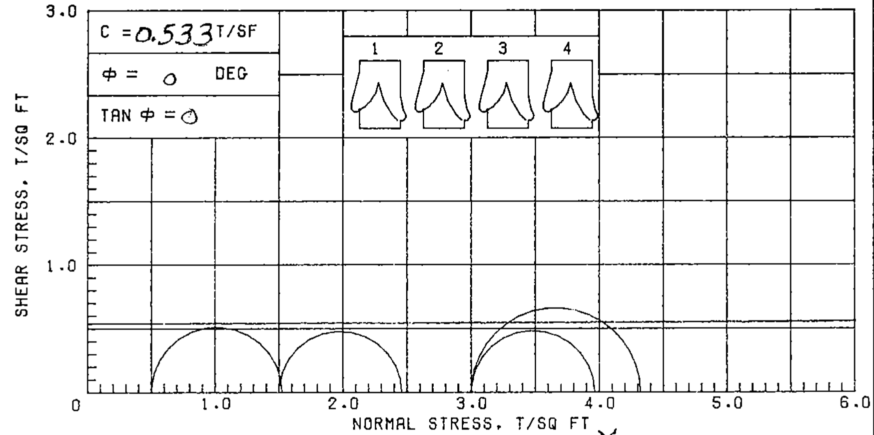
DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 66	PL 16	PI 50	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

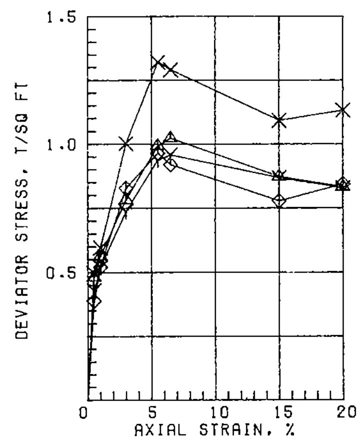
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
BORING NO. 7-U	SAMPLE NO. 8-B
DEPTH/ELEV 28.4/-24.7	TECH. PJR
LABORATORY USAE WES	DATE 23 JUN 83

TRIAXIAL COMPRESSION TEST REPORT



$\gamma_{sat} = 112.1$



SPECIMEN NO.		△1	Y2	X3	◇4	AVG
INITIAL	WATER CONTENT, %	44.4	43.5	40.2	44.6	43.2
	DRY DENSITY, PCF	77.7	78.1	80.2	77.3	78.3
	SATURATION, %	100+	100+	98.6	100+	100
	VOID RATIO	1.170	1.158	1.101	1.179	
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		1.02	0.96	1.32	0.96	
TIME TO FAILURE, MIN.		22	15	17	41	
RATE OF STRAIN INCR.%					6	
INITIAL DIAMETER, IN.		1.40	1.40	1.40	1.39	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), BROWN; SILT LENSES

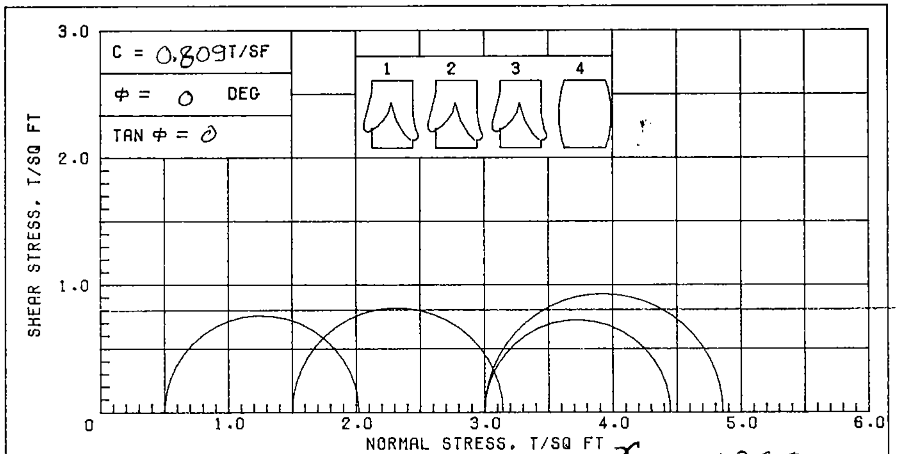
LL 55	PL 19	PI 36	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

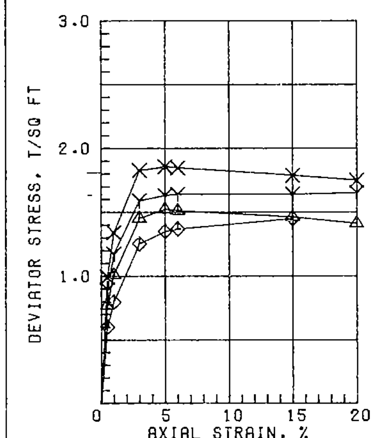
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 7-U	SAMPLE NO. 23-B
DEPTH/ELEV 88.5/-84.8	TECH. PJR
LABORATORY USAE WES	DATE 24 JUN 83

TRIAXIAL COMPRESSION TEST REPORT



$\gamma_{sat} = 126.0$



SPECIMEN NO.		△1	Y2	X3	◇4	AVG
INITIAL	WATER CONTENT, %	25.2	24.3	23.9	25.4	24.7
	DRY DENSITY, PCF	100.5	101.3	101.6	100.3	100.9
	SATURATION, %	100+	98.9	98.0	100+	99.2
	VOID RATIO	0.677	0.663	0.658	0.680	
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		1.52	1.64	1.86	1.45	
TIME TO FAILURE, MIN.		11	31	24	45	
RATE OF STRAIN INCR.%			9			
INITIAL DIAMETER, IN.		1.40	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 54	PL 14	PI 40	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

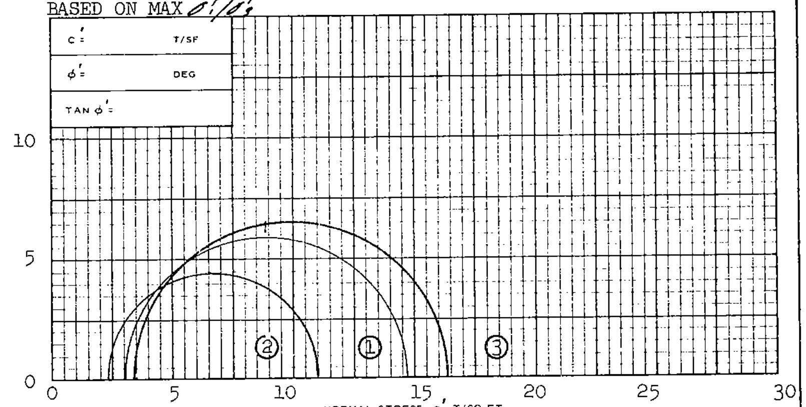
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

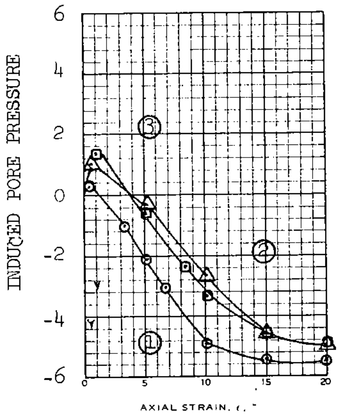
BORING NO. 7-U	SAMPLE NO. 16-B
DEPTH/ELEV 60.4/-56.7	TECH. PJR
LABORATORY USAE WES	DATE 24 JUN 83

TRIAXIAL COMPRESSION TEST REPORT

BASED ON MAX σ_1'/σ_3'

c' =		T/SF
ϕ' =		DEG
TAN ϕ' =		





SPECIMEN NO.			1	2	3
INITIAL	WATER CONTENT, %	w_o			
	DRY DENSITY LB/CU FT	γd_o			
	SATURATION, %	S_o			
	VOID RATIO	e_o			
BEFORE SHEAR	WATER CONTENT, %	w_c			
	DRY DENSITY LB/CU FT	γd_c			
	SATURATION, %	S_c			
	VOID RATIO	e_c			
	FINAL BACK PRESSURE, T/SQ FT	u_o			
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	3.04	2.35	3.43
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	11.74	8.61	12.99
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.(83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 7-U SAMPLE NO. 5-B

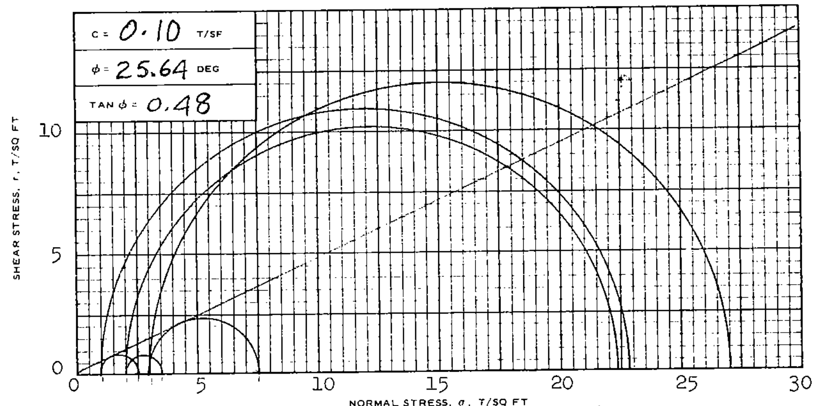
DEPTH/ELEV 16.2/-12.5

LABORATORY USAEWES DATE 9 NOV 1983

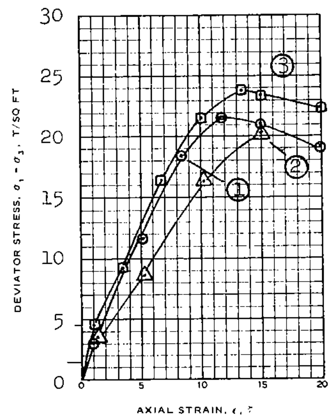
SHEET 2 OF 2 JMS **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089 REV JUNE 1970 GPO : 1982 O - 375-356

c =	0.10	T/SF
ϕ =	25.64	DEG
TAN ϕ =	0.48	



$\gamma_{sat} = 119.2$



SPECIMEN NO.			1	2	3	AVG.
INITIAL	WATER CONTENT, %	w_o	29.7	31.4	30.2	30.4
	DRY DENSITY LB/CU FT	γd_o	91.2	89.7	91.5	90.8
	SATURATION, %	S_o	95.7	97.7	98.1	97.2
	VOID RATIO	e_o	0.829	0.858	0.822	
BEFORE SHEAR	WATER CONTENT, %	w_c	33.4	33.8	33.4	
	DRY DENSITY LB/CU FT	γd_c	92.2	91.6	93.8	
	SATURATION, %	S_c	100+	100+	100+	
	VOID RATIO	e_c	0.807	0.821	0.777	
	FINAL BACK PRESSURE, T/SQ FT	u_o	5.76	5.76	5.76	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	21.78	20.39	23.99	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN		t_f	787	1000	893	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ULT}$	1.5	1.5	4.5	
INITIAL DIAMETER, IN.		D_o	1.39	1.38	1.38	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS SILTY SAND (SM), GRAY

LL 30 | PL 27 | PI 3 | Gs 2.67 (EST) | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST $\bar{R}$

REMARKS:

PROJECT LK. PONT. LA. & VIC- HURR. PROT.(83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

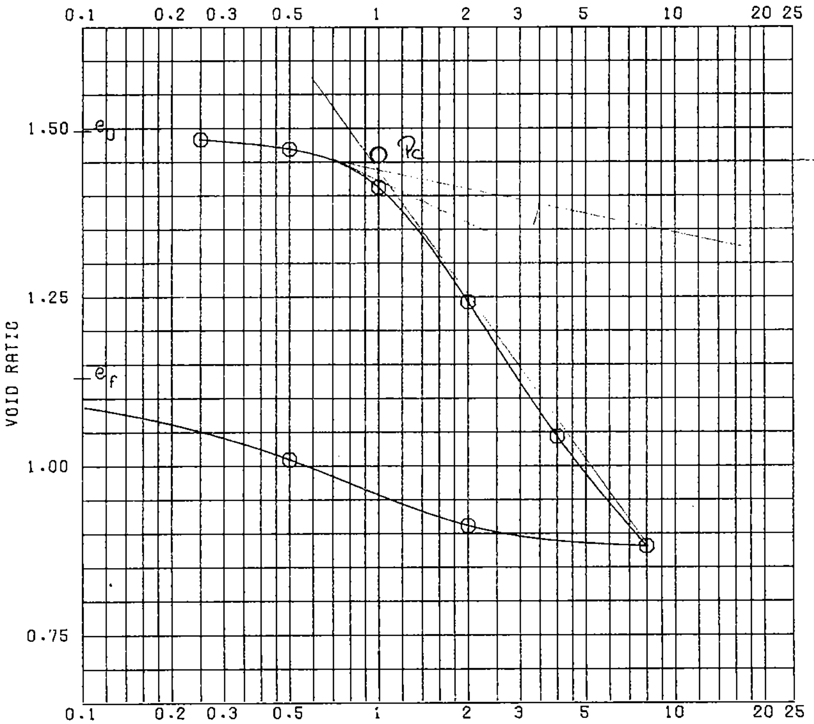
BORING NO. 7-U SAMPLE NO. 5-B

DEPTH/ELEV 16.2/-12.5

LABORATORY USAEWES DATE 9 NOV 1983

SHEET 1 OF 2 JMS **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089 REV JUNE 1970 GPO : 1982 O - 375-356

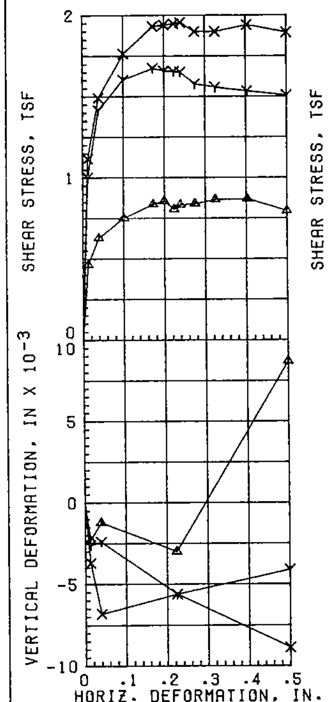


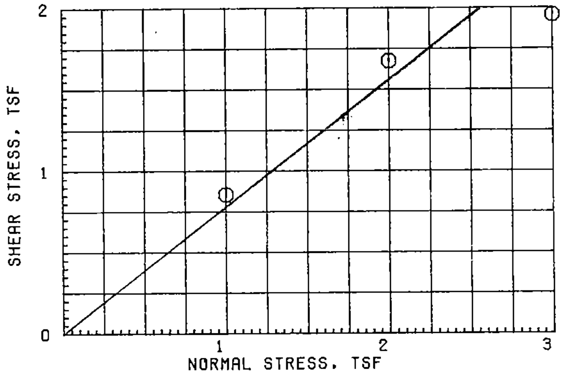
			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	58.3	42.2
PRECONSOL. PRESSURE, TSF	1.0	DRY DENSITY, PCF	67.6	79.2
COMPRESSION INDEX	1.58	SATURATION, %	100 +	100 +
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.495	1.129
DIA. IN 4.44	HT. IN 1.122	BACK PRESSURE, TSF		

CLASSIFICATION PLASTIC CLAY (CH), GRAY; SILT LENSES			
LL 60	PL 19	PI 41	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)
GS 2.70 (EST)	D_{10}		ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
REMARKS			BORING NO. 7-U / SAMPLE NO. 8-C
			DEPTH/ELEV 28.9/-25.2 / DATE 07 JUL 83

CONSOLIDATION TEST REPORT

SHEET 1 OF 11





ϕ = 38.1

TAN ϕ = 0.784

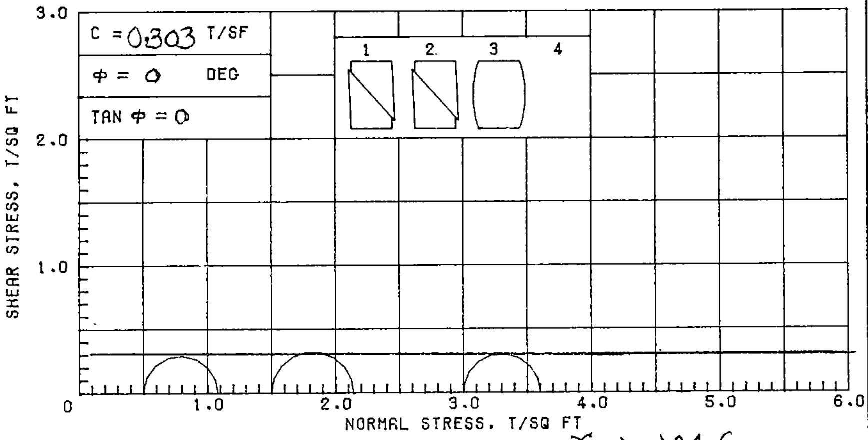
C = –

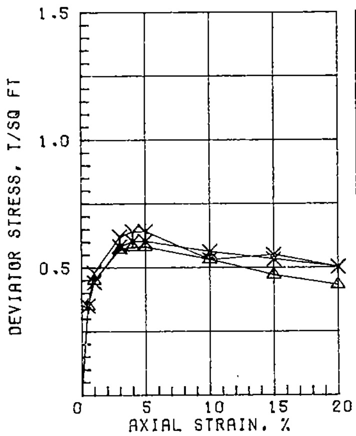
$\gamma_{sat} = 128.4$

	TEST NO.	1 △	2 Y	3 X	AVG.
INITIAL	WATER CONTENT, %	24.0	25.3	24.4	24.6
	VOID RATIO	0.611	0.615	0.605	
	SATURATION, %	100 +	100 +	100 +	100
	DRY DENSITY, PCF	103.0	102.8	103.4	103.1
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	22.1	23.0	23.0	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.86	1.68	1.96	
TIME TO FAILURE, MIN		1099	950	1318	
RATE OF STRAIN, IN/MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED		3.00 IN. SQUARE		0.553 IN. THICK
CLASSIFICATION SILTY SAND (SM), GRAY; WITH SHELLS				
LL	PL	PI		GS 2.66 (EST)
REMARKS;		PROJECT LK. PONT. LA. & VIC-HURR. PROT. PLAN		
		ORLEANS LAKEFRONT LEVEE-WEST TO IHNC		
		BORING NO. 7-U	SAMPLE 10-B	
		DEPTH/ELEV 36.1/-32.4	DATE 18 OCT 83	

DIRECT SHEAR TEST REPORT





$\gamma_{sat} = 104.6$

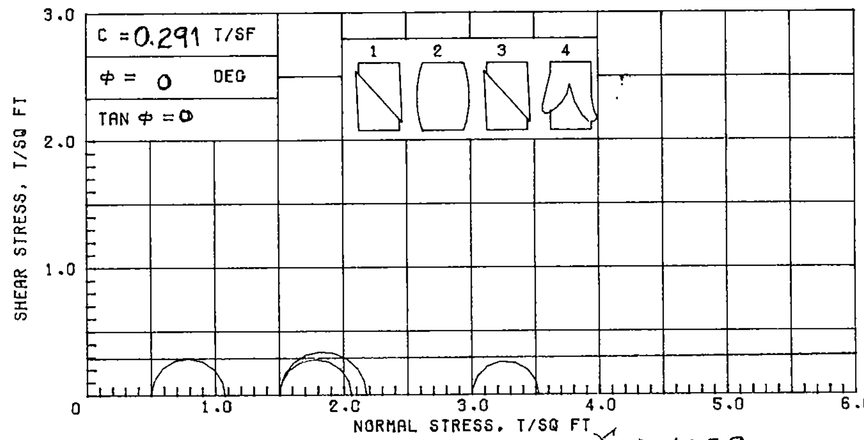
SPECIMEN NO.		Δ1	Y2	X3	4
					AVG.
INITIAL	WATER CONTENT, %	57.2	56.9	57.8	57.3
	DRY DENSITY, PCF	66.6	66.7	66.2	66.5
	SATURATION, %	100+	100+	100+	100
	VOID RATIO	1.531	1.526	1.546	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	
MAX. DEV. STRESS, TSF		0.58	0.64	0.60	
TIME TO FAILURE, MIN.		14	15	14	
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

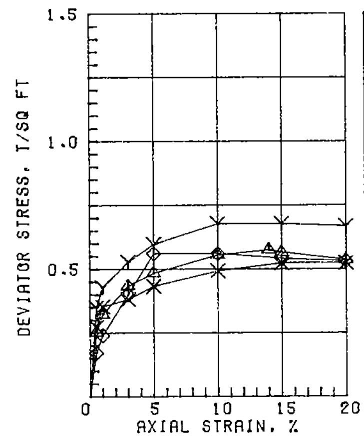
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; SILT POCKETS

LL 67	PL 17	PI 50	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 8-U	SAMPLE NO. 11-B
	DEPTH/ELEV 40.4/-23.7	TECH. TES
	LABORATORY USAE WES	DATE 22 JUN 83
	TRIAXIAL COMPRESSION TEST REPORT	





$\gamma_{sat} = 105.8$

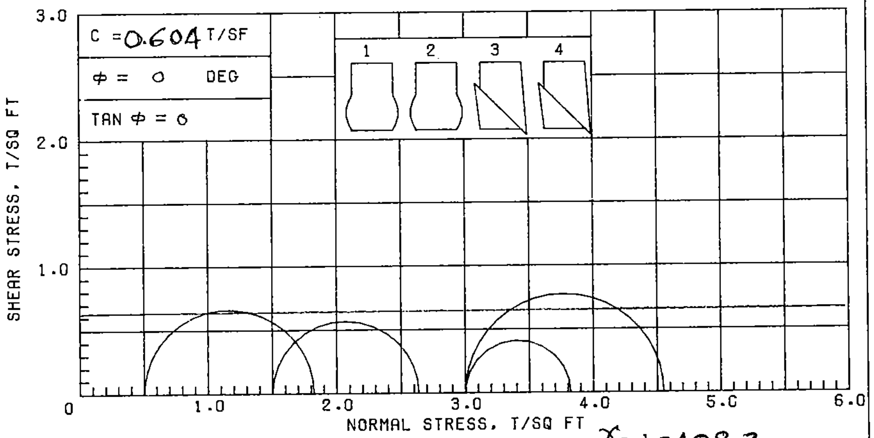
SPECIMEN NO.		Δ1	Y2	X3	Φ4	AVG.
INITIAL	WATER CONTENT, %	49.7	50.7	54.9	55.9	52.8
	DRY DENSITY, PCF	70.2	69.7	67.3	67.0	68.6
	SATURATION, %	95.8	96.4	98.4	99.5	97.5
	VOID RATIO	1.401	1.420	1.506	1.516	
BEFORE SHEAR	WATER CONTENT, %					
	DRY DENSITY, PCF					
	SATURATION, %					
	VOID RATIO					
	BACK PRESS., TSF					
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	1.5	
MAX. DEV. STRESS, TSF		0.57	0.68	0.52	0.56	
TIME TO FAILURE, MIN.		59	40	60	11	
RATE OF STRAIN INCR.%						
INITIAL DIAMETER, IN.		1.39	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

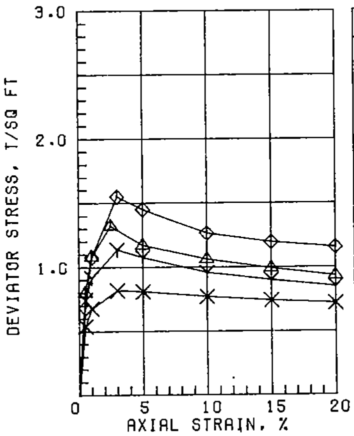
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; SILT LAYERS TO 1/2";
SILT SEAMS AND LENSES

LL 51	PL 15	PI 36	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 8-U	SAMPLE NO. 16-B
	DEPTH/ELEV 60.3/-43.6	TECH. TES
	LABORATORY USAE WES	DATE 23 JUN 83
	TRIAXIAL COMPRESSION TEST REPORT	





γsat = 108.3

SPECIMEN NO.		△1	Y2	X3	◇4	AVG.
INITIAL	WATER CONTENT, %	46.0	48.9	50.6	46.9	48.1
	DRY DENSITY, PCF	74.6	72.3	70.6	73.1	72.7
	SATURATION, %	98.7	99.1	98.5	96.9	98.3
	VOID RATIO	1.259	1.332	1.387	1.306	
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		1.32	1.14	0.82	1.55	
TIME TO FAILURE, MIN.		10	12	15	6	
RATE OF STRAIN INCR.%						
INITIAL DIAMETER, IN.		1.40	1.40	1.40	1.41	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SILT LENSES

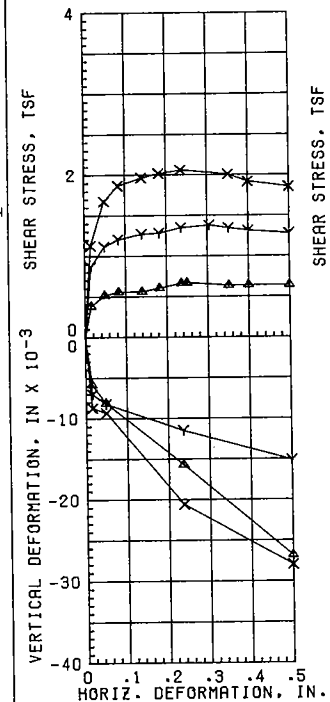
LL 64	PL 17	PI 47	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

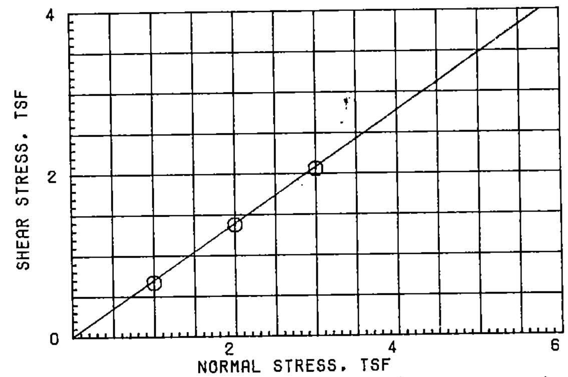
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 8-U	SAMPLE NO. 17-C
DEPTH/ELEV 65.0/-48.3	TECH. TES
LABORATORY USAE WES	DATE 23 JUN 83

TRIAXIAL COMPRESSION TEST REPORT





Φ = 34.30°

TAN Φ = 0.682

C = 0

γsat = 126.7

TEST NO.		1 ▲	2 Y	3 X	AVG.
INITIAL	WATER CONTENT, %	23.8	22.6	23.3	23.2
	VOID RATIO	0.635	0.618	0.616	
	SATURATION, %	100 +	97.5	100 +	99.2
	DRY DENSITY, PCF	101.9	103.0	103.1	102.7
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	23.0	22.1	22.1	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.67	1.38	2.06	
TIME TO FAILURE, MIN		1319	1609	1245	
RATE OF STRAIN, IN/MIN		.00019	.00019	.00019	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED | 3.00 IN. SQUARE | 0.744 IN. THICK

CLASSIFICATION SANDY SILT (ML), GRAY; TRACE OF CLAY

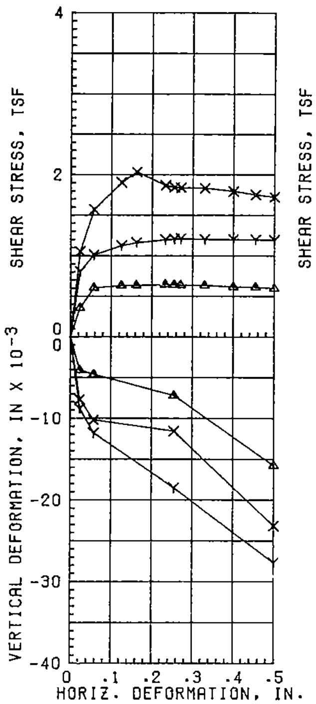
LL	PL	PI		GS 2.67 (EST)

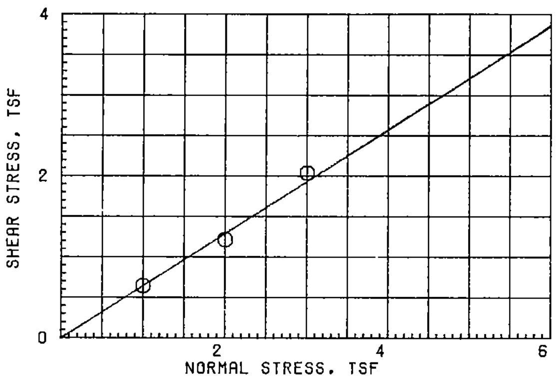
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. PLAN
ORLEANS LAKEFRONT LEVEE-WEST TO IHNC

BORING NO. 8-U	SAMPLE 8-B
DEPTH/ELEV 28.3/-11.6	DATE 18 OCT 83

DIRECT SHEAR TEST REPORT





ϕ = 32.6°

TAN ϕ = 0.64

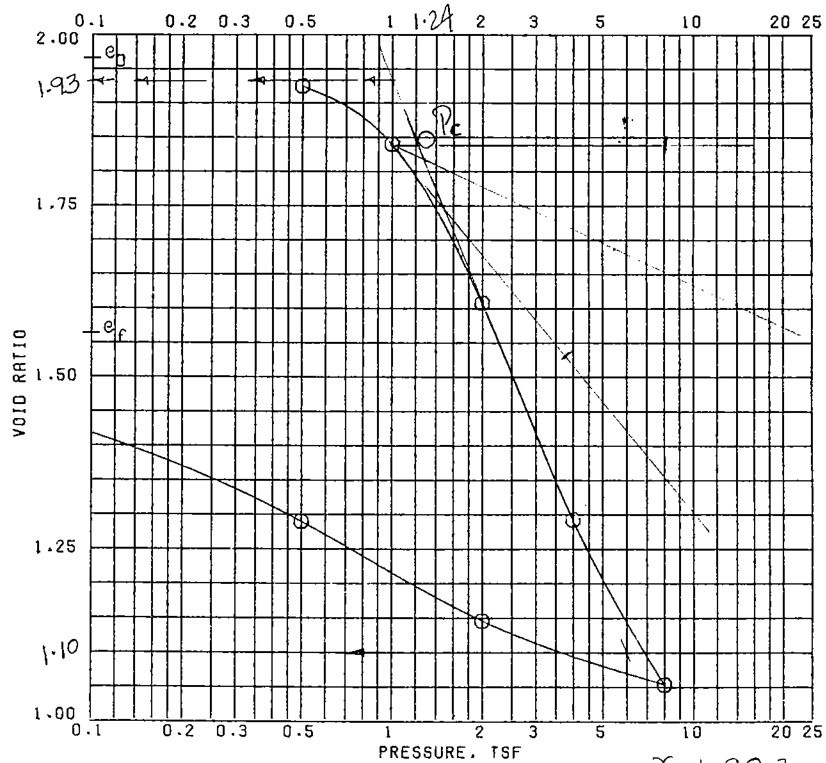
C = 0

γsat=124.6

	TEST NO.	1 ▵	2 Y	3 ×	AVG
INITIAL	WATER CONTENT, %	28.7	29.9	29.9	29.5
	VOID RATIO	0.738	0.746	0.694	
	SATURATION, %	100 +	100 +	100 +	100
	DRY DENSITY, PCF	95.5	95.1	98.0	96.2
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	24.8	26.4	24.1	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.64	1.21	2.03	
TIME TO FAILURE, MIN		1280	1488	890	
RATE OF STRAIN, IN/MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED			3.00 IN. SQUARE	0.553 IN. THICK	
CLASSIFICATION SILTY SAND (SM), GRAY; WITH SHELLS					
LL	PL	PI		GS 2.66 (EST)	
REMARKS;			PROJECT LK. PONT. LA. & VIC-HURR. PROT. PLAN		
			ORLEANS LAKEFRONT LEVEE-WEST TO IHNC		
			BORING NO. 8-U	SAMPLE 15-B	
			DEPTH/ELEV 56.4/-39.7	DATE 19 OCT 83	

DIRECT SHEAR TEST REPORT



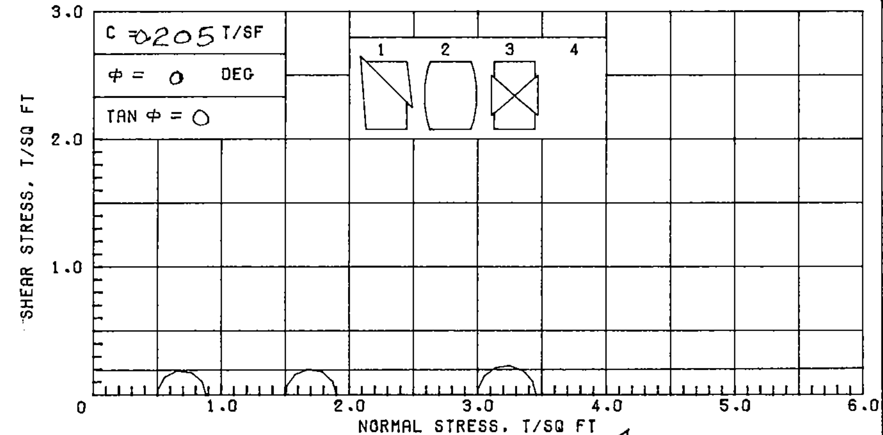
γsat=98.3

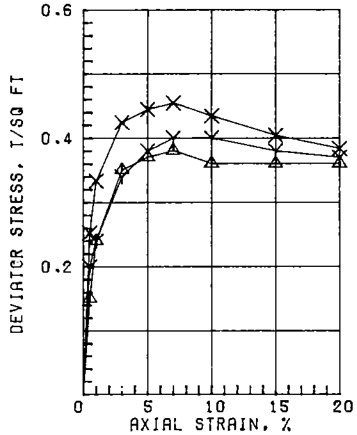
			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	71.3	58.1
PRECONSOL. PRESSURE, TSF	1.24	DRY DENSITY, PCF	56.9	65.8
COMPRESSION INDEX	1.07	SATURATION, %	98.0	100 +
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.964	1.562
DIA. IN 4.44	HT. IN 1.126	BACK PRESSURE, TSF		

CLASSIFICATION PLASTIC CLAY (CH), GRAY				
LL 77	PL 23	PI 54	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
GS 2.70 (EST)	D_{10}		ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
REMARKS			BORING NO. 8-U	SAMPLE NO. 11-C
ELEV. -24.2			DEPTH/ELEV 40.9/-24.2	DATE 08 JUL 83
Pc = 1.24				
Cc = 1.07				

CONSOLIDATION TEST REPORT

SHEET 1 OF 10





γsat = 104.3

	SPECIMEN NO.	Δ1	Y2	X3	4 AVG.
INITIAL	WATER CONTENT, %	56.2	50.7	66.4	57.8
	DRY DENSITY, PCF	66.5	70.2	60.8	65.8
	SATURATION, %	98.7	97.8	100+	98.8
	VOID RATIO	1.537	1.400	1.771	
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	0.38	0.40	0.45	
	TIME TO FAILURE, MIN.	28	29	30	
	RATE OF STRAIN INCR.%				
	INITIAL DIAMETER, IN.	1.40	1.40	1.39	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SILT POCKETS; SHELL PARTICLES

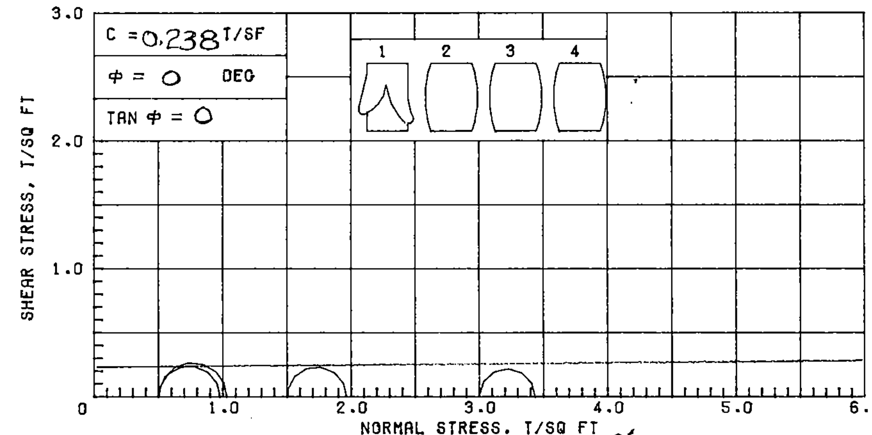
LL 58	PL 20	PI 38	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

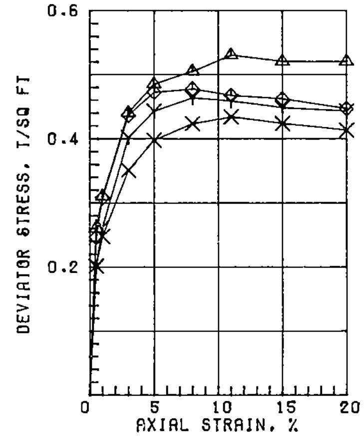
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 9-U	SAMPLE NO. 6-A
DEPTH/ELEV 19.5/-2.8	TECH. TES
LABORATORY USAE WES	DATE 23 JUN 83

TRIAXIAL COMPRESSION TEST REPORT





γsat = 100.9

	SPECIMEN NO.	Δ1	Y2	X3	◊4	AVG.
INITIAL	WATER CONTENT, %	56.1	60.7	64.1	62.9	61.0
	DRY DENSITY, PCF	63.2	61.0	59.7	60.2	61.0
	SATURATION, %	90.9	92.9	94.8	94.4	93.3
	VOID RATIO	1.666	1.763	1.826	1.798	
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	0.53	0.46	0.43	0.48	
	TIME TO FAILURE, MIN.	19	19	45	17	
	RATE OF STRAIN INCR.%					
	INITIAL DIAMETER, IN.	1.40	1.38	1.38	1.38	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; FINE SAND LENSES; SHELL PARTICLES

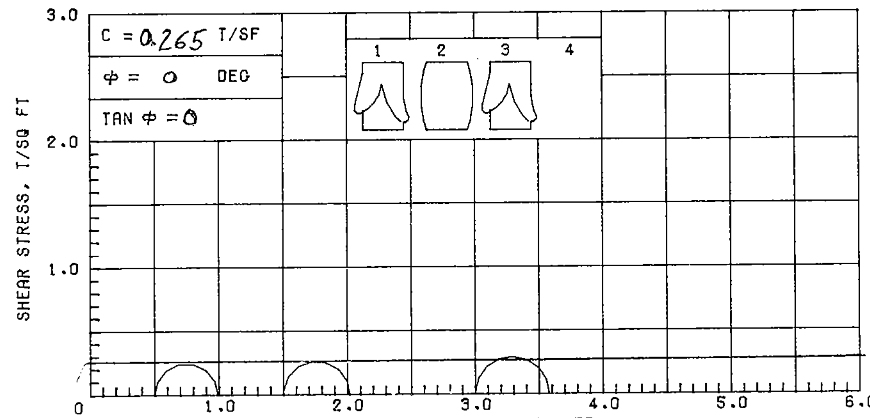
LL 78	PL 22	PI 56	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

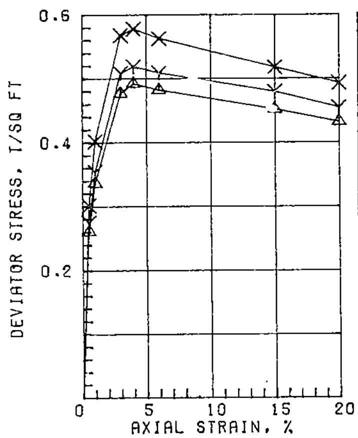
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 9-U	SAMPLE NO. 8-B
DEPTH/ELEV 28.1/-11.4	TECH. PJR
LABORATORY USAE WES	DATE 27 JUN 83

TRIAXIAL COMPRESSION TEST REPORT



γ_{sat} = 106.5



SPECIMEN NO.		Δ1	Y2	X3	4 (AVG.)
INITIAL	WATER CONTENT, %	54.0	52.8	52.7	53.2
	DRY DENSITY, PCF	69.1	69.6	69.9	69.5
	SATURATION, %	100+	100+	100+	100
	VOID RATIO	1.438	1.421	1.412	
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		0.49	0.52	0.58	
TIME TO FAILURE, MIN.		7	17	23	
RATE OF STRAIN INCR,%			6	7	
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SHELL PARTICLES

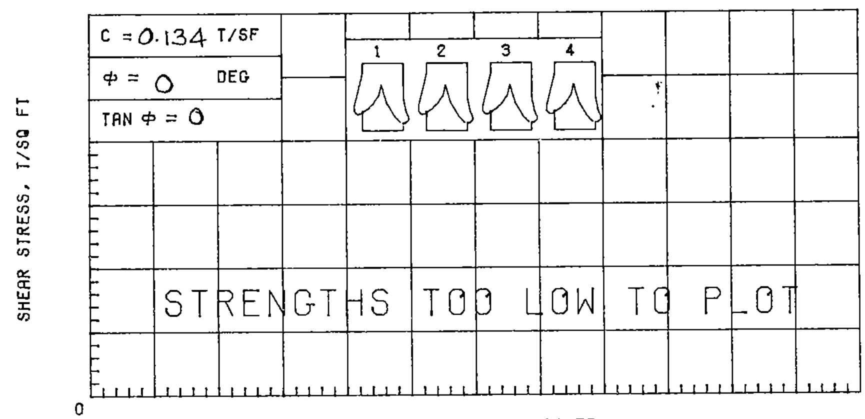
LL 69	PL 22	PI 47	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

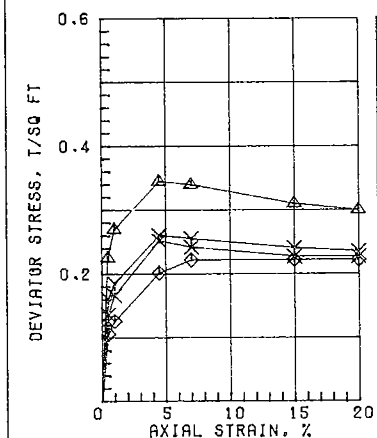
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 9-U	SAMPLE NO. 11-B
DEPTH/ELEV 40.2/-23.5	TECH. PJR
LABORATORY USAE WES	DATE 27 JUN 83

TRIAXIAL COMPRESSION TEST REPORT



γ_{sat} = 99.1



SPECIMEN NO.		Δ1	Y2	X3	Φ4	AVG.
INITIAL	WATER CONTENT, %	72.8	73.0	73.6	72.4	73.0
	DRY DENSITY, PCF	57.3	57.2	57.0	57.5	57.3
	SATURATION, %	100+	100+	100+	100+	
	VOID RATIO	1.942	1.946	1.955	1.934	
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		0.34	0.26	0.25	0.22	
TIME TO FAILURE, MIN.		8	23	16	25	
RATE OF STRAIN INCR,%			7			
INITIAL DIAMETER, IN.		1.40	1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), DARK GRAY

LL 78	PL 23	PI 55	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

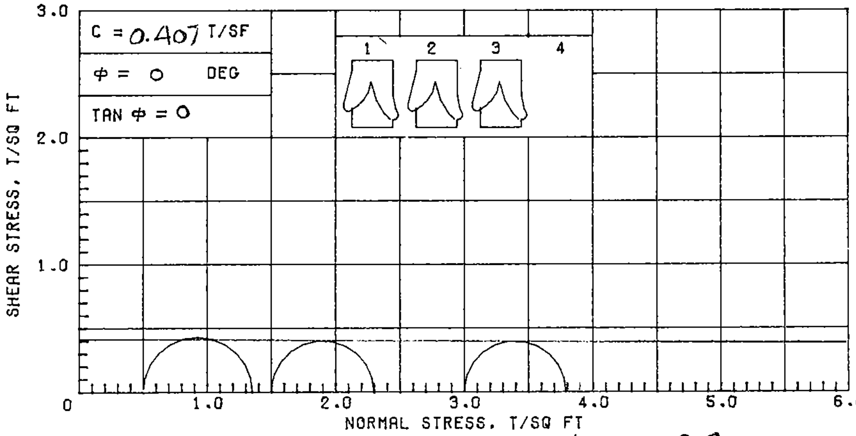
BORING NO. 9-U	SAMPLE NO. 12-C
DEPTH/ELEV 45.0/-28.3	TECH. PJR
LABORATORY USAE WES	DATE 28 JUN 83

TRIAXIAL COMPRESSION TEST REPORT

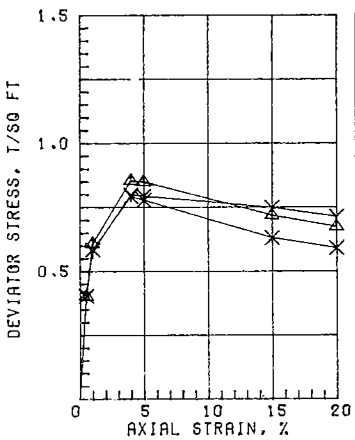
C = 0.407 T/SF

φ = 0 DEG

TAN φ = 0



γ_{sat} = 108.8



	SPECIMEN NO.	Δ1	Y2	X3	4 (AVG.)
INITIAL	WATER CONTENT, %	45.6	42.4	51.0	46.3
	DRY DENSITY, PCF	73.9	75.7	70.8	73.5
	SATURATION, %	96.1	93.4	99.8	96.4
	VOID RATIO	1.281	1.225	1.379	
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	0.85	0.80	0.79	
	TIME TO FAILURE, MIN.	8	36	17	
	RATE OF STRAIN INCR,%		5	6	
	INITIAL DIAMETER, IN.	1.40	1.40	1.39	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 54	PL 15	PI 39	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

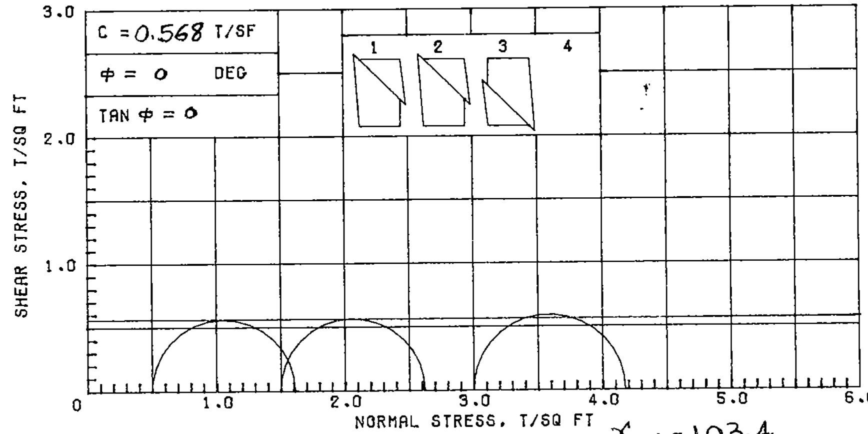
BORING NO. 9-U	SAMPLE NO. 13-C
DEPTH/ELEV 49.0/-32.3	TECH. PJR
LABORATORY USAE WES	DATE 28 JUN 83

TRIAXIAL COMPRESSION TEST REPORT

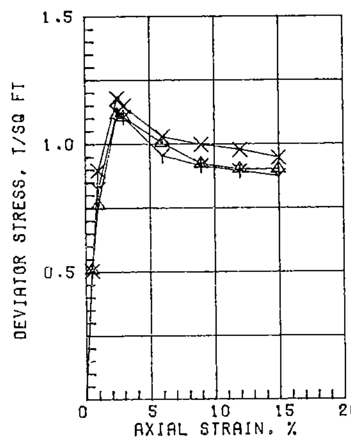
C = 0.568 T/SF

φ = 0 DEG

TAN φ = 0



γ_{sat} = 103.4



	SPECIMEN NO.	Δ1	Y2	X3	4
INITIAL	WATER CONTENT, %	57.4	58.2	56.9	57.5
	DRY DENSITY, PCF	65.5	64.8	65.1	65.1
	SATURATION, %	98.6	98.1	96.8	97.8
	VOID RATIO	1.572	1.602	1.588	
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	1.11	1.12	1.18	
	TIME TO FAILURE, MIN.	6	6	8	
	RATE OF STRAIN INCR,%	4	4	4	
	INITIAL DIAMETER, IN.	1.39	1.40	1.40	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SHELL PARTICLES

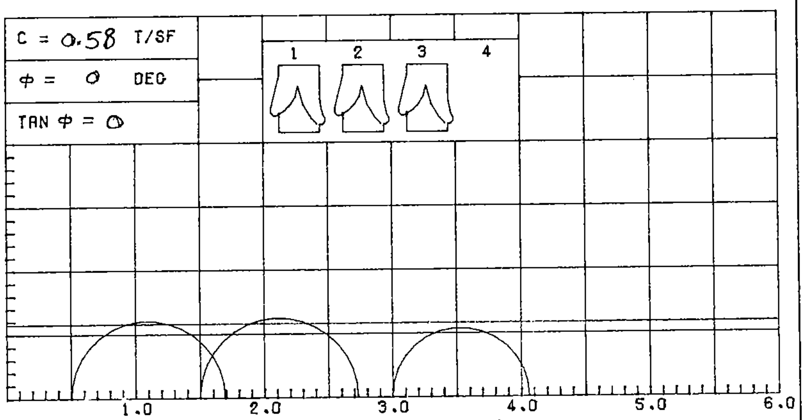
LL 76	PL 18	PI 58	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

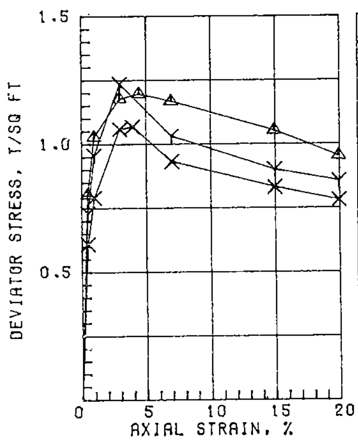
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 9-U	SAMPLE NO. 18-C
DEPTH/ELEV 69.2/-52.5	TECH. LRC
LABORATORY USAE WES	DATE 23 JUN 83

TRIAXIAL COMPRESSION TEST REPORT



$\gamma_{sat} = 109.4$



SPECIMEN NO.		△1	Y2	X3	4 (AVG.)
INITIAL	WATER CONTENT, %	46.0	46.3	48.5	46.9
	DRY DENSITY, PCF	75.0	74.8	73.3	74.4
	SATURATION, %	99.5	99.8	100+	99.8
	VOID RATIO	1.248	1.252	1.301	
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		1.19	1.23	1.06	
TIME TO FAILURE, MIN.		10	15	25	
RATE OF STRAIN INCR.%			7	8	
INITIAL DIAMETER, IN.		1.40	1.40	1.39	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

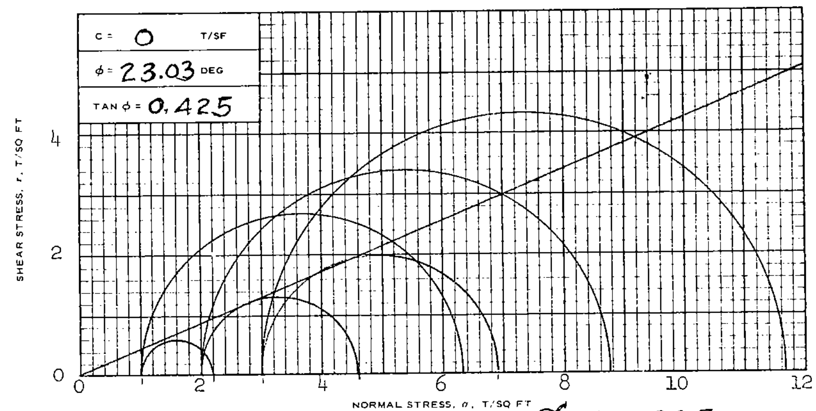
LL 65 | PL 16 | PI 49 | GS 2.70 (ESTIMATED) | UNDISTURBED SPECIMEN | Q TEST

REMARKS:

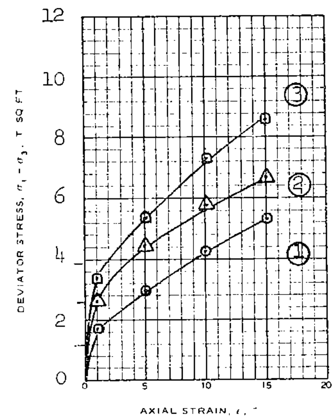
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 9-U | SAMPLE NO. 20-B
DEPTH/ELEV 75.9/-59.2 | TECH. PJR
LABORATORY USAE WES | DATE 29 JUN 83

TRIAXIAL COMPRESSION TEST REPORT



$\gamma_{sat} = 126.7$



SPECIMEN NO.			1	2	3	AVG.
INITIAL	WATER CONTENT, %	w_o	17.1	18.5	18.3	18.0
	DRY DENSITY LB/CU FT	γ_{d_o}	101.3	101.3	103.8	102.1
	SATURATION, %	S_o	69.5	75.3	79.2	74.7
	VOID RATIO	e_o	0.664	0.664	0.624	
BEFORE SHEAR	WATER CONTENT, %	w_c	25.8	25.3	24.2	
	DRY DENSITY LB/CU FT	γ_{d_c}	102.8	103.8	107.4	
	SATURATION, %	S_c	100+	100+	100+	
	VOID RATIO	e_c	0.639	0.624	0.570	
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.20	7.20	7.20	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	5.32	6.77	8.67	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN		t_f	1071	1071	1071	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ULT}$	1.2	2.6	3.9	
INITIAL DIAMETER, IN.		D_o	1.38	1.40	1.39	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS SILTY CLAY (CL), BROWN

LL 36 | PL 22 | PI 14 | GS 2.70(EST) | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST R

REMARKS:

PROJECT LK. PONT. LA.& VIC.-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 9-U | SAMPLE NO. 2-C
DEPTH/ELEV 5.1/11.6
LABORATORY USAEWES | DATE 9 NOV 1983

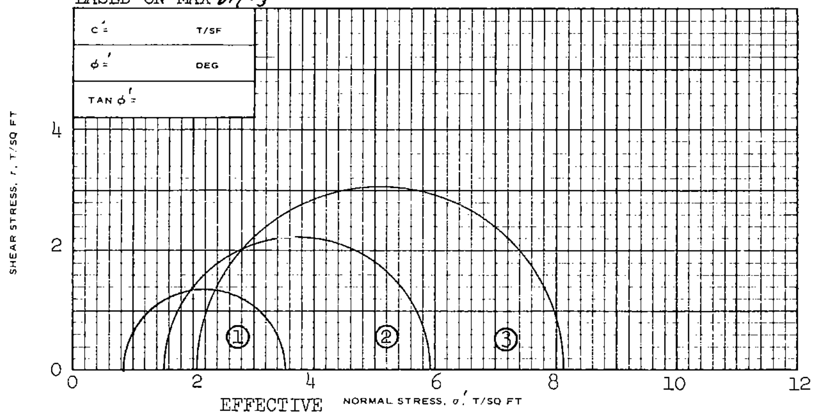
SHEET 1 OF 2 | JMS | TRIAXIAL COMPRESSION TEST REPORT

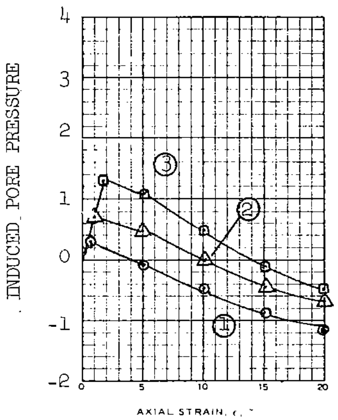
ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 0 - 375-356

BASED ON MAX σ_1'/σ_3'

c' =		T/SF
ϕ' =		DEG
TAN ϕ' =		





SPECIMEN NO.			1	2	3
INITIAL	WATER CONTENT, %	w_o			
	DRY DENSITY LB/CU FT	γ_{d_o}			
	SATURATION, %	S_o			
	VOID RATIO	e_o			
BEFORE SHEAR	WATER CONTENT, %	w_c			
	DRY DENSITY LB/CU FT	γ_{d_c}			
	SATURATION, %	S_c			
	VOID RATIO	e_c			
	FINAL BACK PRESSURE, T/SQ FT	u_o			
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.86	1.53	2.06
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	2.65	4.42	6.04
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. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 9-U SAMPLE NO. 2-C

DEPTH/ELEV 5.1/11.6

LABORATORY USAEWES DATE 9 NOV 1983

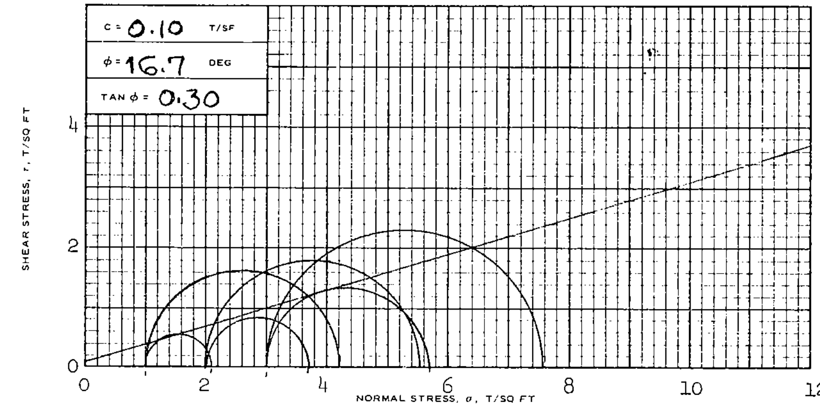
SHEET 2 OF 2 JMS **TRIAXIAL COMPRESSION TEST REPORT**

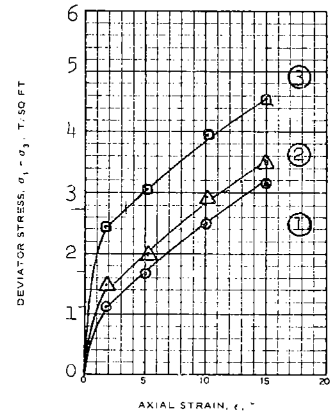
ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 O - 375-356

---

c =	0.10	T/SF
ϕ =	16.7	DEG
TAN ϕ =	0.30	





γ_{sat} = 115.7

SPECIMEN NO.			1	2	3	AVG.
INITIAL	WATER CONTENT, %	w_o	35.8	38.3	38.7	37.6
	DRY DENSITY LB/CU FT	γ_{d_o}	85.3	83.7	83.4	84.1
	SATURATION, %	S_o	100+	100+	100+	
	VOID RATIO	e_o	0.947	0.983	0.991	
BEFORE SHEAR	WATER CONTENT, %	w_c	34.6	34.7	33.6	
	DRY DENSITY LB/CU FT	γ_{d_c}	86.8	88.0	88.9	
	SATURATION, %	S_c	100+	100+	100+	
	VOID RATIO	e_c	0.912	0.887	0.869	
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.20	7.20	7.20	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	3.19	3.55	4.59	
TIME TO $(\sigma_1-\sigma_3)_{MAX}$, MIN		t_f	484	484	484	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ULT}$	1.1	1.7	2.7	
INITIAL DIAMETER, IN.		D_o	1.38	1.36	1.37	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS CLAYEY SILT (ML), GRAY; SHELL PARTICLES

LL	PL	PI	Gs	TYPE OF SPECIMEN	TYPE OF TEST
35	25	10	2.66(EST)	UNDISTURBED	R

REMARKS:

PROJECT LK. PONT. LA. & VIC.-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 9-U SAMPLE NO. 9-B

DEPTH/ELEV 32.1/-15.4

LABORATORY USAEWES DATE 12 NOV 1983

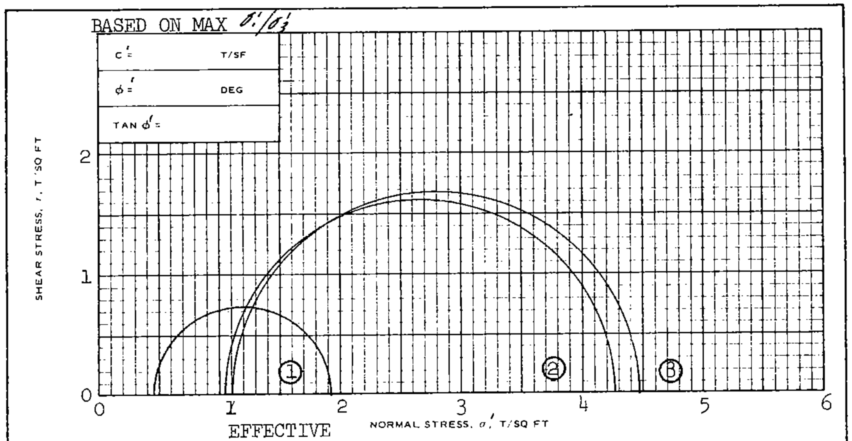
SHEET 1 OF 2 PJR **TRIAXIAL COMPRESSION TEST REPORT**

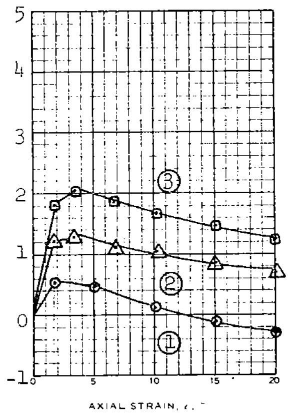
ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 O - 375-356

BASED ON MAX σ_1'/σ_3'

$c' =$	T/SF
$\phi' =$	DEG
TAN $\phi' =$	





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.45	1.05	1.11	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{MAX}$	1.47	3.21	3.37	
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. (83)
ORLEANS LAKEFRONT LEVEE - WEST OF IHNC

BORING NO. 9-U SAMPLE NO. 9-B

DEPTH/ELEV 32.1/-15.4

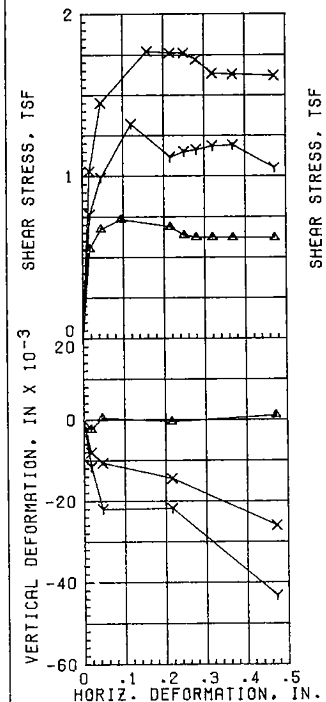
LABORATORY USAEWES DATE 12 NOV 1983

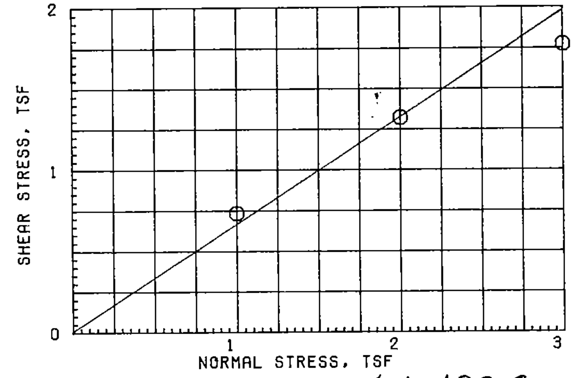
SHEET 2 OF 2

PJR **TRIAXIAL COMPRESSION TEST REPORT**

ENG FORM NO. 2089
REV JUNE 1970

GPO : 1982 0 - 375-356





$\gamma_{sat} = 122.8$

$\phi = 33.4°$

TAN $\phi = 0.659$

C = 0

	TEST NO.	1 △	2 Y	3 X	AVG
INITIAL	WATER CONTENT, %	24.6	25.5	25.9	25.3
	VOID RATIO	0.711	0.712	0.724	
	SATURATION, %	92.2	95.3	95.2	94.2
	DRY DENSITY, PCF	97.0	97.0	96.3	96.7
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	25.5	25.4	26.6	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.73	1.32	1.77	
TIME TO FAILURE, MIN		556	702	936	
RATE OF STRAIN, IN/MIN		.00017	.00017	.00017	
ULTIMATE SHEAR STRESS, TSF					

TYPE SPECIMEN UNDISTURBED 3.00 IN. SQUARE 0.744 IN. THICK

CLASSIFICATION SAND (SP), GRAY; WITH SILT

LL	PL	PI		GS 2.66 (EST)

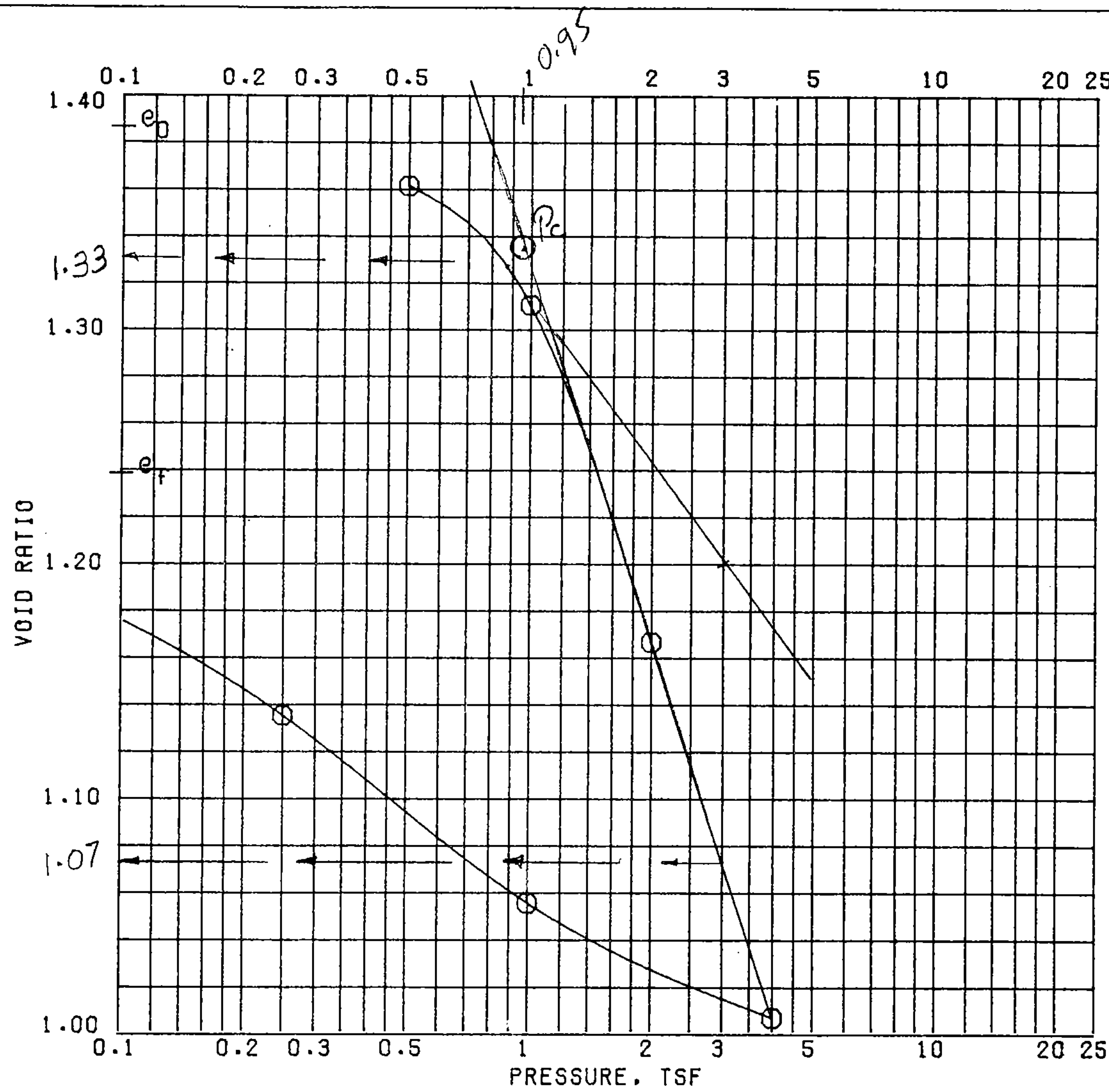
REMARKS;

PROJECT LK. PONT. LA. & VIC-HURR. PROT. PLAN
ORLEANS LAKEFRONT LEVEE-WEST TO IHNC

BORING NO. 9-U SAMPLE 14-B

DEPTH/ELEV 52.2/-35.5 DATE 19 OCT 83

DIRECT SHEAR TEST REPORT

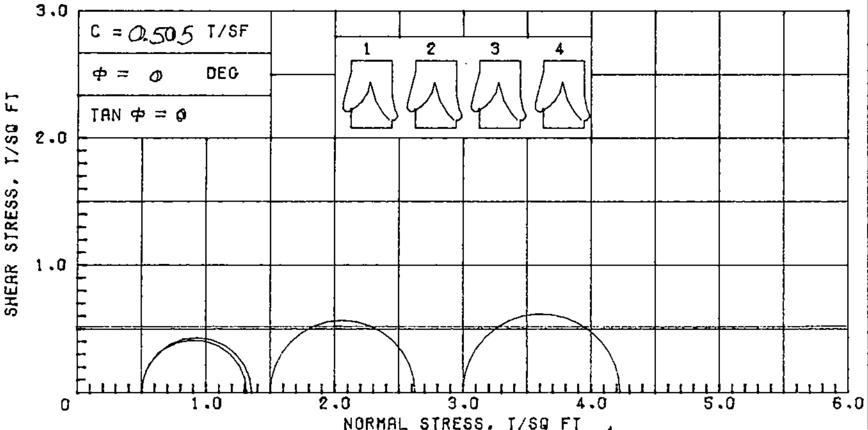


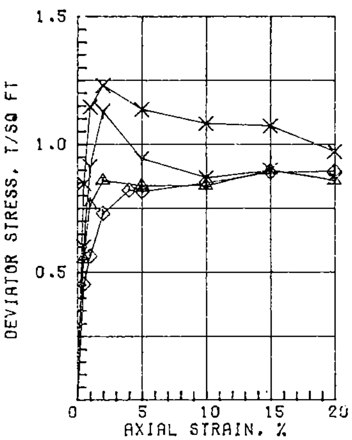
$\frac{1.33-1.07}{\log 3 - \log 1} = \frac{0.26}{0.477} = 0.55$

$\gamma_{sat} = 106.8$

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	48.9	45.0
PRECONSOL. PRESSURE, TSF	0.95	DRY DENSITY, PCF	70.6	75.3
COMPRESSION INDEX	0.55	SATURATION, %	95.3	98.1
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.386	1.238
DIA. IN 4.44	HT. IN 1.134	BACK PRESSURE, TSF		
CLASSIFICATION PLASTIC CLAY (CH), GRAY				
LL 57 / PL 19 / PI 38		PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)		
GS 2.70 (EST)	D_{10}	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC		
REMARKS ELEV. -24.3		BORING NO. 9-U	SAMPLE NO. 11-C	
Pc = 0.95		DEPTH/ELEV 41.0/-24.3	DATE 14 JUL 83	
Cc = 0.55		CONSOLIDATION TEST REPORT		

SHEET 1 OF 9





γsat = 112.4

	SPECIMEN NO.	△1	Y2	X3	◇4	AVG.
INITIAL	WATER CONTENT, %	40.2	40.4	37.8	41.4	40.0
	DRY DENSITY, PCF	79.3	79.0	80.6	78.1	79.3
	SATURATION, %	96.4	96.2	93.5	96.5	95.7
	VOID RATIO	1.125	1.134	1.092	1.158	
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	0.86	1.13	1.23	0.82	
	TIME TO FAILURE, MIN.	4	15	15	30	
	RATE OF STRAIN INCR.%		6	4	6	
	INITIAL DIAMETER, IN.	1.40	1.40	1.40	1.40	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), DARK GRAY

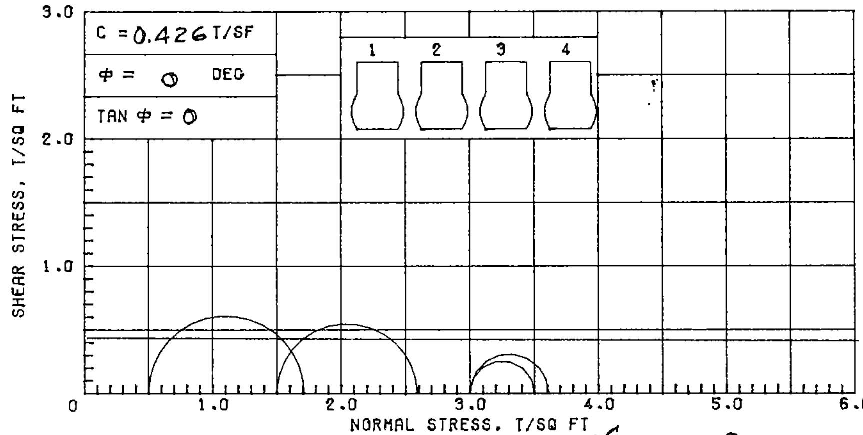
LL 52	PL 16	PI 36	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

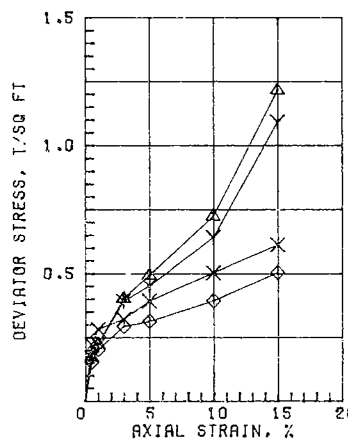
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 10-U	SAMPLE NO. 5-8
DEPTH/ELEV 15.9/-0.5	TECH. PJR
LABORATORY USAE WES	DATE 30 JUN 83

TRIAXIAL COMPRESSION TEST REPORT





γsat = 116.8

	SPECIMEN NO.	△1	Y2	X3	◇4	AVG.
INITIAL	WATER CONTENT, %	39.3	33.8	36.0	35.7	34.7
	DRY DENSITY, PCF	87.4	87.5	85.2	85.0	86.3
	SATURATION, %	96.9	98.6	99.4	98.1	98.3
	VOID RATIO	0.928	0.926	0.978	0.983	
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	1.21	1.09	0.61	0.50	
	TIME TO FAILURE, MIN.	30	30	30	30	
	RATE OF STRAIN INCR.%					
	INITIAL DIAMETER, IN.	1.40	1.40	1.40	1.40	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: CLAY (CL), GRAY

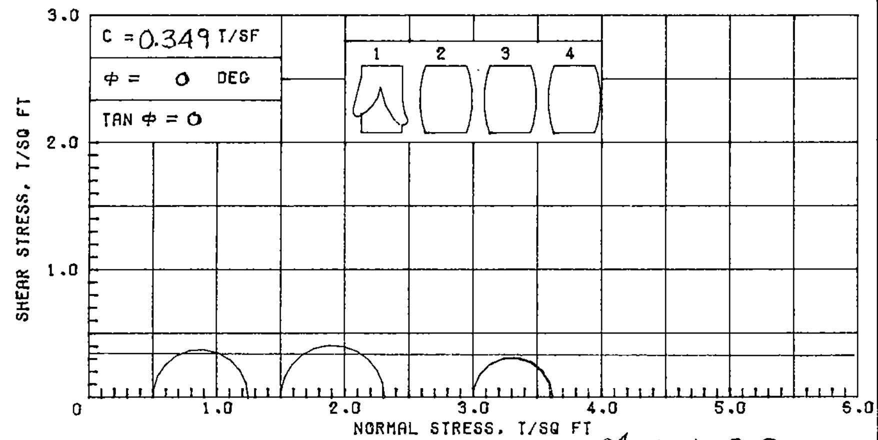
LL 37	PL 17	PI 20	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

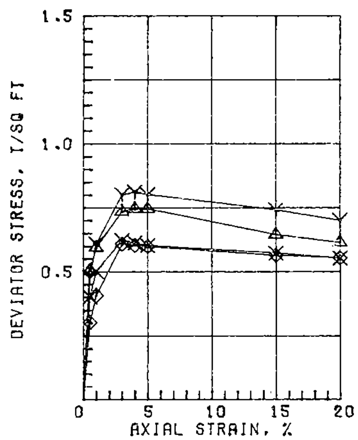
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 10-U	SAMPLE NO. 6-C
DEPTH/ELEV 20.9/-5.5	TECH. KOC
LABORATORY USAE WES	DATE 28 JUN 83

TRIAXIAL COMPRESSION TEST REPORT





$\gamma_{sat} = 108.8$

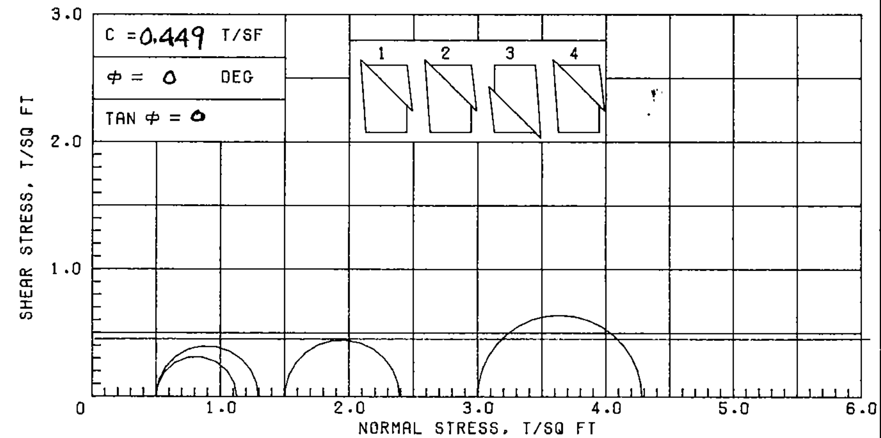
SPECIMEN NO.		△1	Y2	X3	◇4	AVG.
INITIAL	WATER CONTENT, %	48.3	45.6	46.9	48.4	47.3
	DRY DENSITY, PCF	73.2	74.0	74.0	73.2	73.6
	SATURATION, %	100+	96.3	99.1	100+	98.9
	VOID RATIO	1.301	1.279	1.278	1.303	
BEFORE SHEAR	WATER CONTENT, %					
	DRY DENSITY, PCF					
	SATURATION, %					
	VOID RATIO					
	BACK PRESS., TSF					
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	3.0	
MAX. DEV. STRESS, TSF		0.75	0.81	0.62	0.61	
TIME TO FAILURE, MIN.		10	18	18	15	
RATE OF STRAIN INCR.%			8	5	6	
INITIAL DIAMETER, IN.		1.39	1.39	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

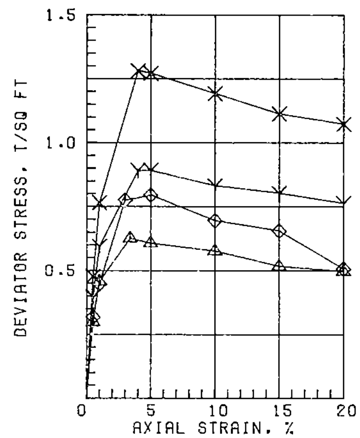
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: CLAY (CL), GRAY; SILT LENSES

LL 43	PL 18	PI 25	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 10-U	SAMPLE NO. 11-B
	DEPTH/ELEV 40.2/-24.8	TECH. PJR
	LABORATORY USAE WES	DATE 30 JUN 83
	TRIAXIAL COMPRESSION TEST REPORT	





$\gamma_{sat} = 112.7$

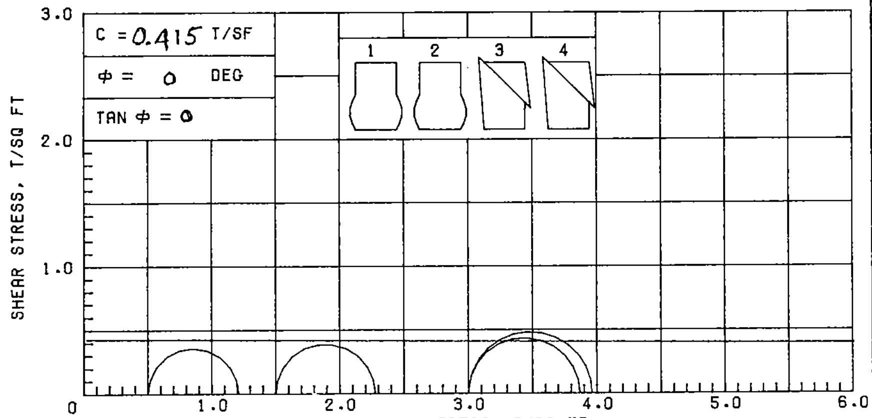
SPECIMEN NO.		△1	Y2	X3	◇4	AVG.
INITIAL	WATER CONTENT, %	43.0	34.4	34.5	42.1	38.5
	DRY DENSITY, PCF	75.5	84.0	81.9	77.8	79.8
	SATURATION, %	94.5	92.6	88.4	97.6	93.3
	VOID RATIO	1.224	1.000	1.050	1.160	
BEFORE SHEAR	WATER CONTENT, %					
	DRY DENSITY, PCF					
	SATURATION, %					
	VOID RATIO					
	BACK PRESS., TSF					
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	0.5	
MAX. DEV. STRESS, TSF		0.63	0.89	1.28	0.79	
TIME TO FAILURE, MIN.		7	8	8	10	
RATE OF STRAIN INCR.%						
INITIAL DIAMETER, IN.		1.40	1.41	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

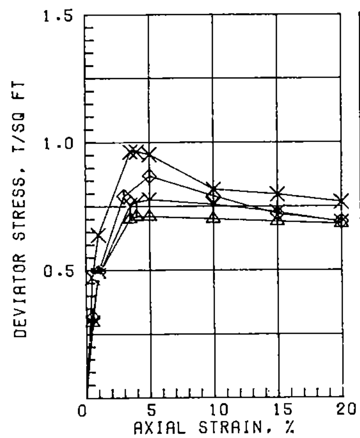
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: SANDY CLAY (CL), GRAY; SILT POCKETS; SHELL PARTICLES

LL 43	PL 13	PI 30	GS 2.69 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
LIMITS ON MIXTURE OF MATERIAL.	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 10-U	SAMPLE NO. 14-B
	DEPTH/ELEV 52.3/-36.9	TECH. KOC
	LABORATORY USAE WES	DATE 28 JUN 83
	TRIAXIAL COMPRESSION TEST REPORT	





γsat = 101.3

SPECIMEN NO.		△1	Y2	X3	◇4	AVG.
INITIAL	WATER CONTENT, %	64.7	62.4	64.2	63.4	63.7
	DRY DENSITY, PCF	59.9	63.0	61.8	61.2	61.5
	SATURATION, %	96.2	100+	100+	97.5	98.4
	VOID RATIO	1.816	1.677	1.729	1.755	
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		0.71	0.78	0.96	0.87	
TIME TO FAILURE, MIN.		8	10	7	10	
RATE OF STRAIN INCR,%						
INITIAL DIAMETER, IN.		1.41	1.41	1.41	1.41	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SHELL PARTICLES

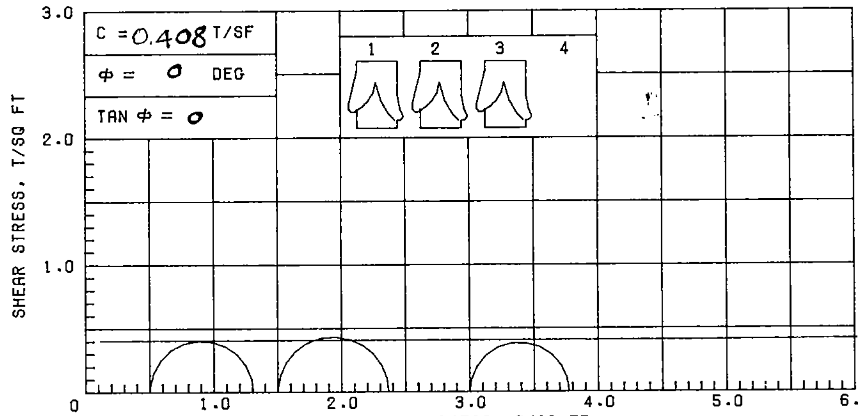
LL 81	PL 22	PI 59	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

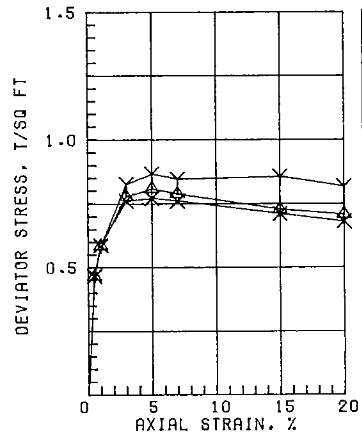
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 10-U	SAMPLE NO. 17-C
DEPTH/ELEV 65.0/-49.6	TECH. KOC
LABORATORY USAE WES	DATE 29 JUN 83

TRIAXIAL COMPRESSION TEST REPORT





γsat = 117.7

SPECIMEN NO.		△1	Y2	X3	4 AVG.
INITIAL	WATER CONTENT, %	32.8	33.0	34.1	33.3
	DRY DENSITY, PCF	88.2	87.9	87.1	87.7
	SATURATION, %	97.2	97.0	98.4	97.5
	VOID RATIO	0.911	0.918	0.936	
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		0.81	0.87	0.77	
TIME TO FAILURE, MIN.		13	29	22	
RATE OF STRAIN INCR,%			7		
INITIAL DIAMETER, IN.		1.39	1.39	1.39	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: CLAY (CL), GRAY

LL 36	PL 19	PI 17	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

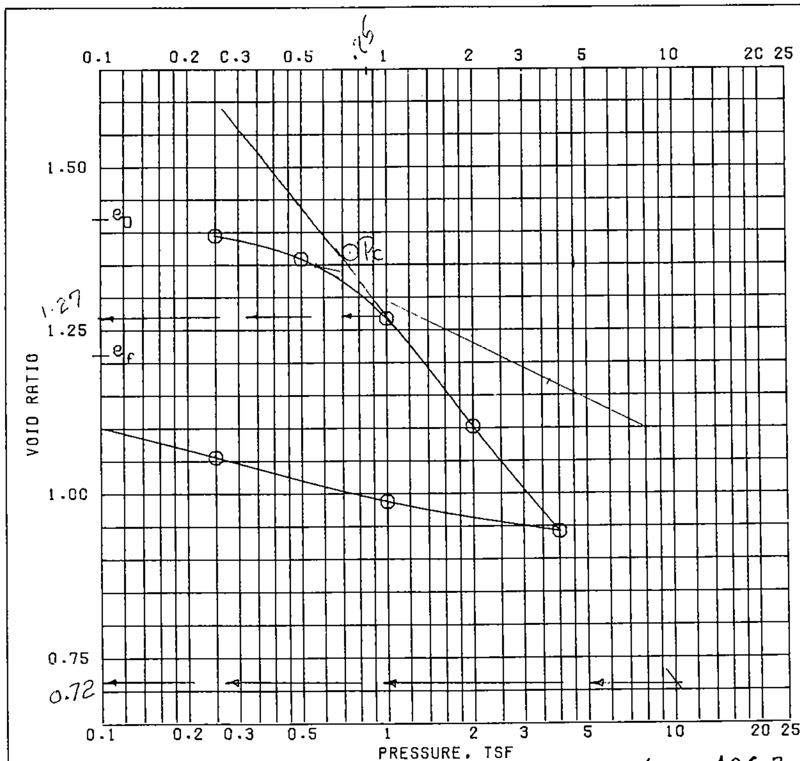
REMARKS;

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 10-U	SAMPLE NO. 20-C
DEPTH/ELEV 77.0/-61.6	TECH. PJR
LABORATORY USAE WES	DATE 01 JUL 83

TRIAXIAL COMPRESSION TEST REPORT

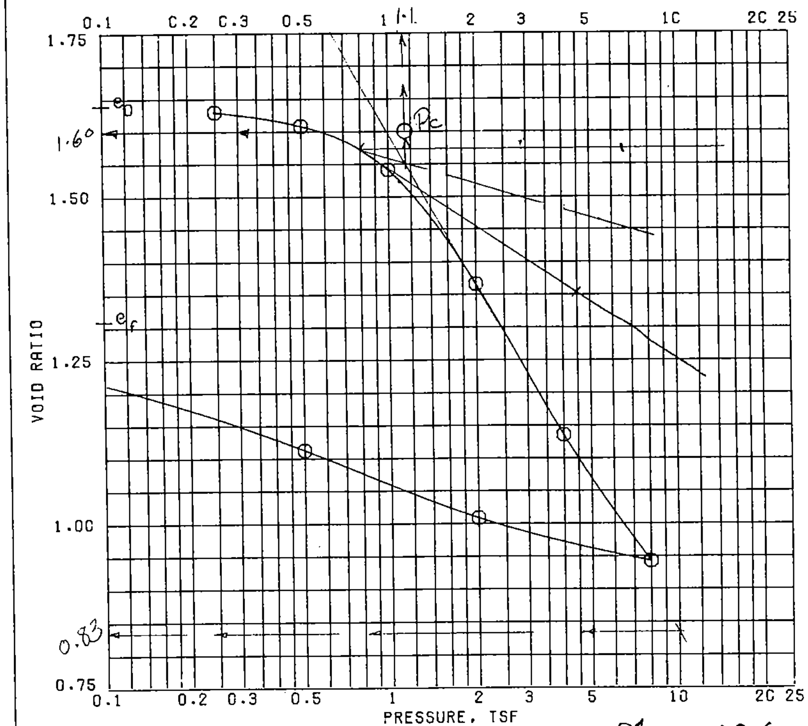
$\frac{1.27 - 0.72}{\log 10 - \log 1} = 0.55$



$\gamma_{sat} = 106.3$

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	50.8	43.5
PRECONSOL. PRESSURE, TSF	0.85	DRY DENSITY, PCF	69.7	76.3
COMPRESSION INDEX	0.55	SATURATION, %	96.7	96.9
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.419	1.210
DIA. IN 4.44	HT. IN 1.133	BACK PRESSURE, TSF		
CLASSIFICATION PLASTIC CLAY (CH), GRAY				
LL 65 PL 20 PI 45		PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC		
GS 2.70 (EST)	D_{10}			
REMARKS ELEV. -8.5		BORING NO. 10-U	SAMPLE NO. 7-8	
Pc = 0.85		DEPTH/ELEV 23.9/-8.5	DATE 15 JUL 83	
Cc = 0.55		CONSOLIDATION TEST REPORT		

SHEET 1 OF 10

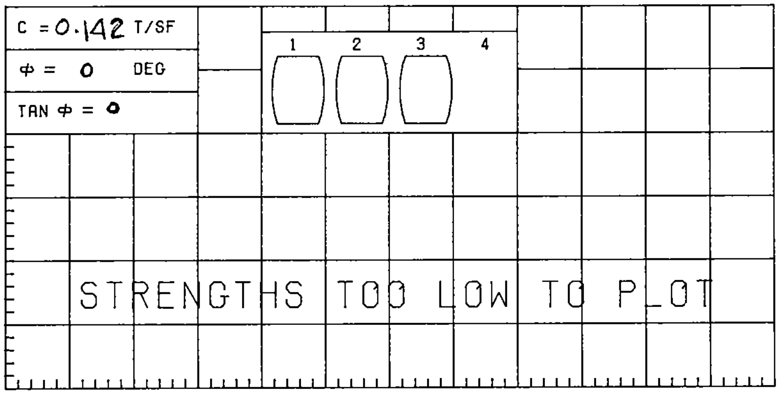


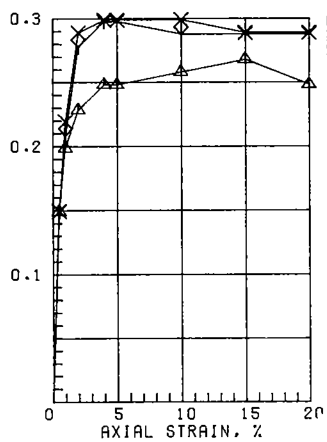
$\gamma_{sat} = 102.6$

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	59.9	48.8
PRECONSOL. PRESSURE, TSF	1.1	DRY DENSITY, PCF	63.9	73.1
COMPRESSION INDEX	0.77	SATURATION, %	98.8	100 +
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.638	1.307
DIA. IN 4.44	HT. IN 1.125	BACK PRESSURE, TSF		
CLASSIFICATION PLASTIC CLAY (CH), GRAY; SILT LAYERS TO 1/2"				
LL 51 PL 19 PI 32		PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)		
GS 2.70 (EST)	D_{10}	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC		
REMARKS ELEV. -25.5		BORING NO. 10-U	SAMPLE NO. 11-C	
Pc = 1.1		DEPTH/ELEV 40.9/-25.5	DATE 19 JUL 83	
Cc = 0.77		CONSOLIDATION TEST REPORT		

SHEET 1 OF 11

C = 0.142 T/SF
φ = 0 DEG
TAN φ = 0





γsat=104.9

SPECIMEN NO.		Δ1	Y2	X3	4	AVG.
INITIAL	WATER CONTENT, %	54.3	54.0	58.4		55.6
	DRY DENSITY, PCF	68.0	68.8	65.5		67.4
	SATURATION, %	99.3	100+	100+		99.8
	VOID RATIO	1.477	1.450	1.573		
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		0.25	0.30	0.30		
TIME TO FAILURE, MIN.		8	8	8		
RATE OF STRAIN INCR.%						
INITIAL DIAMETER, IN.		1.41	1.41	1.40		
INITIAL HEIGHT, IN.		3.00	3.00	3.00		

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SILT POCKETS

LL 70	PL 18	PI 52	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

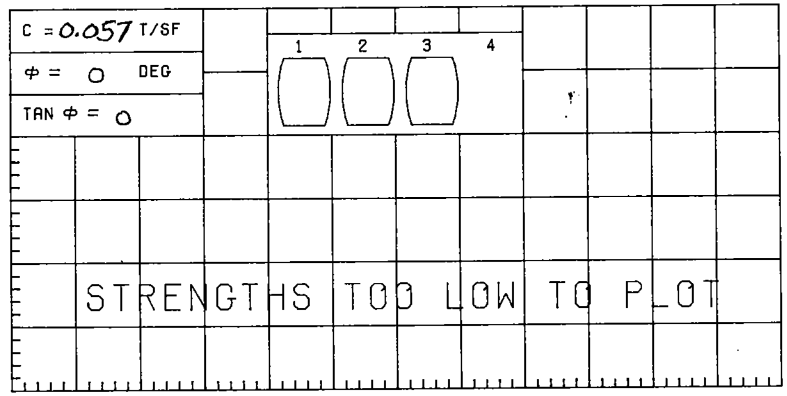
REMARKS:
LIMITS ON MIXTURE OF MATERIAL.

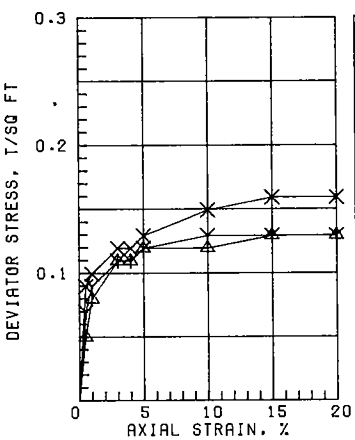
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 11-U	SAMPLE NO. 2-B
DEPTH/ELEV 4.8/+0.2	TECH. KOC
LABORATORY USAE WES	DATE 15 JUL 83

TRIAXIAL COMPRESSION TEST REPORT

C = 0.057 T/SF
φ = 0 DEG
TAN φ = 0





γsat=96.8

SPECIMEN NO.		Δ1	Y2	X3	4 AVG
INITIAL	WATER CONTENT, %	83.2	83.5	81.5	82.7
	DRY DENSITY, PCF	52.8	52.7	53.4	53.0
	SATURATION, %	100+	100+	100+	100
	VOID RATIO	2.190	2.197	2.156	
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		0.11	0.11	0.12	
TIME TO FAILURE, MIN.		6	6	6	
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

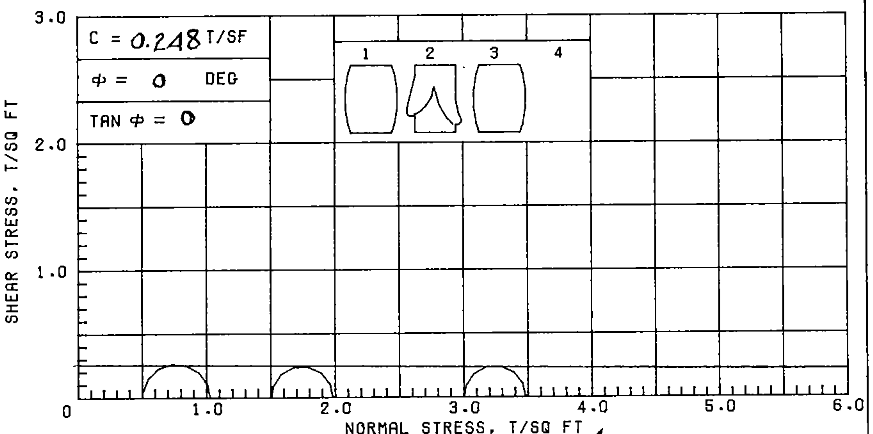
LL 85	PL 23	PI 62	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

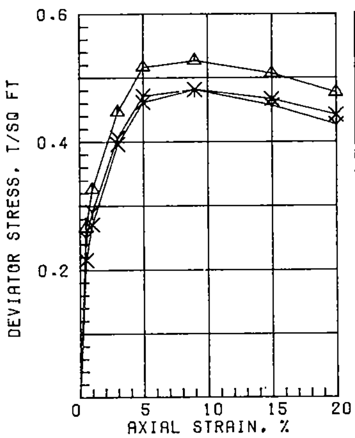
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 11-U	SAMPLE NO. 4-B
DEPTH/ELEV 12.0/-7.0	TECH. KOC
LABORATORY USAE WES	DATE 29 JUN 83

TRIAXIAL COMPRESSION TEST REPORT



γsat = 102.8



SPECIMEN NO.		Δ1	Y2	X3	4 AVG.
INITIAL	WATER CONTENT, %	61.2	61.3	61.2	61.2
	DRY DENSITY, PCF	63.8	63.7	63.8	63.8
	SATURATION, %	100+	100+	100+	100
	VOID RATIO	1.643	1.646	1.641	
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		0.53	0.48	0.48	
TIME TO FAILURE, MIN.		18	25	32	
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

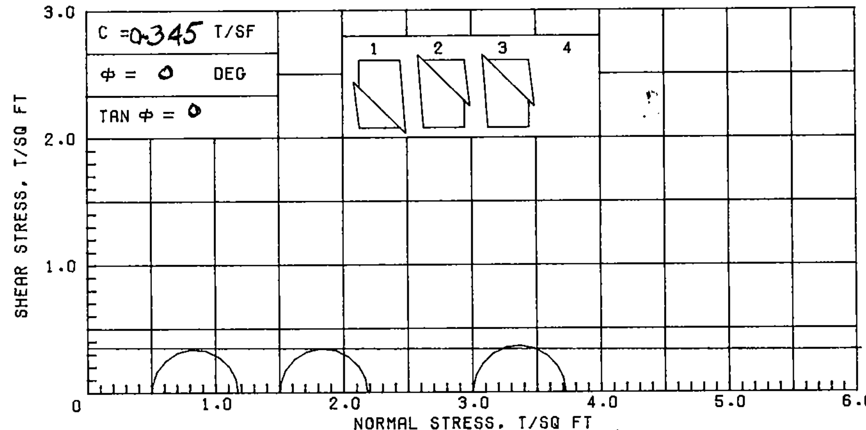
DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SILT LENSES

LL 78	PL 22	PI 56	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

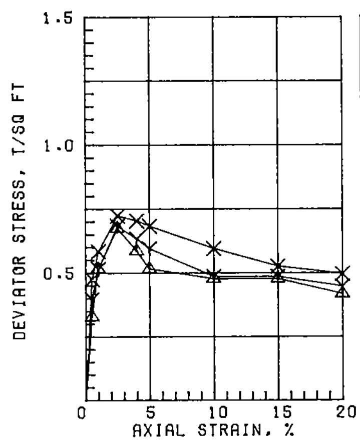
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
BORING NO. 11-U	SAMPLE NO. 9-B
DEPTH/ELEV 32.1/-27.1	TECH. PJR
LABORATORY USAE WES	DATE 08 JUL 83

TRIAXIAL COMPRESSION TEST REPORT



γsat = 100.2



SPECIMEN NO.		Δ1	Y2	X3	4 AVG
INITIAL	WATER CONTENT, %	71.6	65.9	66.7	68.1
	DRY DENSITY, PCF	58.0	60.8	60.0	59.6
	SATURATION, %	100+	100+	99.6	99.9
	VOID RATIO	1.907	1.774	1.808	
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		0.67	0.68	0.72	
TIME TO FAILURE, MIN.		5	14	15	
RATE OF STRAIN INCR.%			6	6	
INITIAL DIAMETER, IN.		1.41	1.41	1.41	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 84	PL 24	PI 60	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

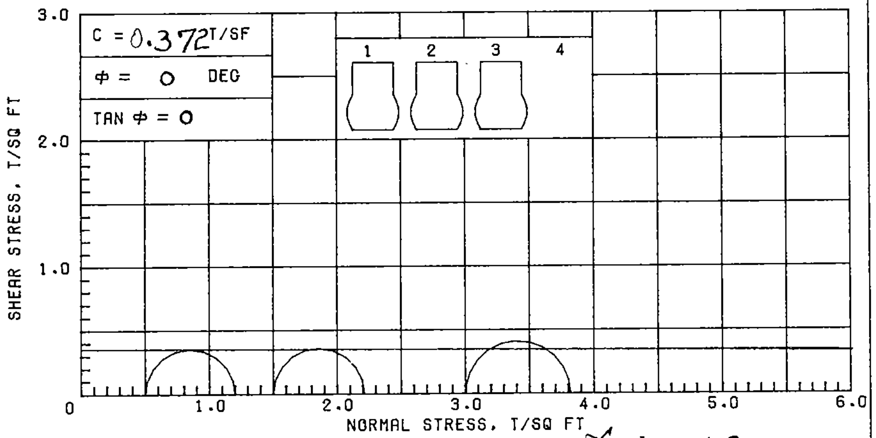
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
BORING NO. 11-U	SAMPLE NO. 10-C
DEPTH/ELEV 37.0/-32.0	TECH. KOC
LABORATORY USAE WES	DATE 30 JUN 83

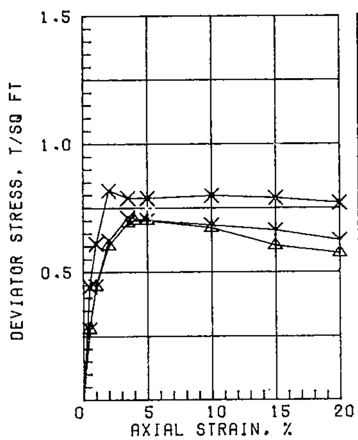
TRIAXIAL COMPRESSION TEST REPORT

C = 0.372 T/SF

φ = 0 DEG

TAN φ = 0





γ_{sat} = 106.8

	SPECIMEN NO.	△1	Y2	X3	4 (AVG.)
INITIAL	WATER CONTENT, %	47.9	51.4	46.1	48.5
	DRY DENSITY, PCF	70.6	68.1	72.5	70.4
	SATURATION, %	93.2	94.0	94.0	93.7
	VOID RATIO	1.388	1.477	1.324	
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	0.70	0.71	0.82	
	TIME TO FAILURE, MIN.	8	7	4	
	RATE OF STRAIN INCR,%				
	INITIAL DIAMETER, IN.	1.41	1.41	1.41	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SILT POCKETS

LL 56	PL 19	PI 37	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS: LIMITS ON MIXTURE OF MATERIAL.

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

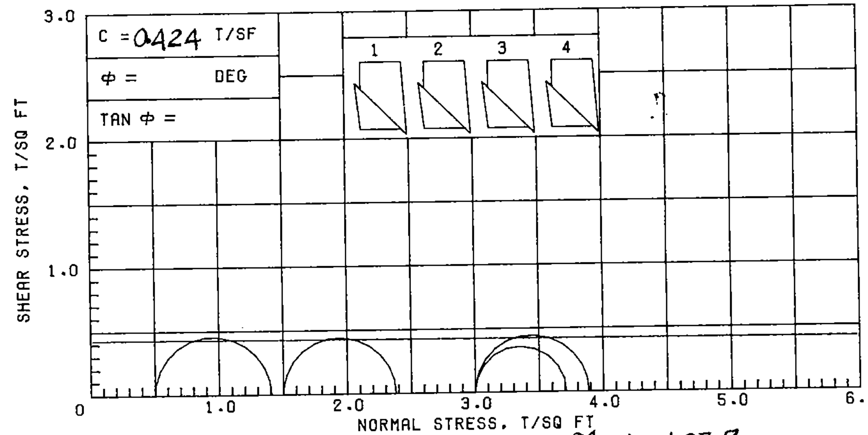
BORING NO. 11-U	SAMPLE NO. 13-C
DEPTH/ELEV 49.1/-44.1	TECH. KOC
LABORATORY USAE WES	DATE 03 JUN 83

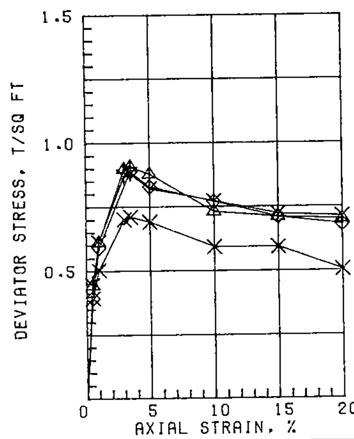
TRIAXIAL COMPRESSION TEST REPORT

C = 0.424 T/SF

φ = DEG

TAN φ =





γ_{sat} = 107.8

	SPECIMEN NO.	△1	Y2	X3	◇4	AVG.
INITIAL	WATER CONTENT, %	46.7	51.8	48.4	47.7	48.7
	DRY DENSITY, PCF	72.3	70.2	72.4	73.1	72.0
	SATURATION, %	94.7	99.9	98.5	98.5	97.9
	VOID RATIO	1.332	1.400	1.327	1.307	
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	0.91	0.88	0.71	0.89	
	TIME TO FAILURE, MIN.	7	21	22	21	
	RATE OF STRAIN INCR,%		6	6	6	
	INITIAL DIAMETER, IN.	1.41	1.41	1.41	1.41	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 67	PL 19	PI 48	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 11-U	SAMPLE NO. 16-B
DEPTH/ELEV 60.3/-55.3	TECH. KOC
LABORATORY USAE WES	DATE 01 JUL 83

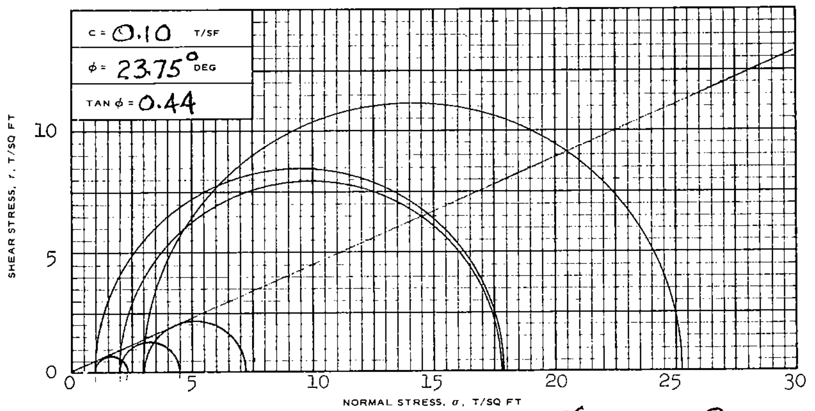
TRIAXIAL COMPRESSION TEST REPORT

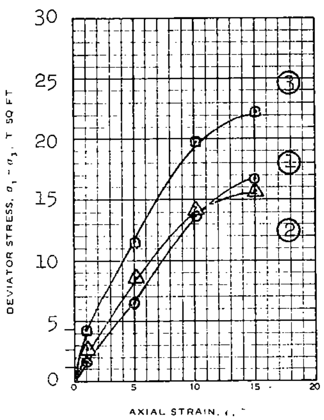
Sheet 1 of 2

c = 0.10 T/SF

ϕ = 23.75° DEG

TAN ϕ = 0.44





γ_{sat} = 124.8

SPECIMEN NO.			1	2	3	AVG.
INITIAL	WATER CONTENT, %	w_o	25.4	24.2	23.6	24.4
	DRY DENSITY LB/CU FT	γd_o	98.6	99.2	101.2	99.7
	SATURATION, %	S_o	98.2	95.0	97.3	96.8
	VOID RATIO	e_o	0.691	0.680	0.648	
BEFORE SHEAR	WATER CONTENT, %	w_c	27.5	26.1	25.5	
	DRY DENSITY LB/CU FT	γd_c	100.2	101.0	103.3	
	SATURATION, %	S_c	100+	100+	100+	
	VOID RATIO	e_c	0.663	0.650	0.613	
	FINAL BACK PRESSURE, T/SQ FT	u_o	5.76	5.76	5.76	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.0	2.0	3.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	16.93	15.85	22.18	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	227	227	227	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	1.3	2.6	4.3	
INITIAL DIAMETER, IN.		D_o	1.43	1.42	1.43	
INITIAL HEIGHT, IN.		H_o	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS CLAYEY SILT (CL-ML), GRAY; FINE SAND POCKETS

LL 25 | PL 21 | PI 4 | Gs 2.67 (EST) | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST R

REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)

ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 11-U | SAMPLE NO. 6-B

DEPTH/ELEV 20.0/-15.0

LABORATORY USAEWES | DATE 15 NOV 1983

SHEET 1 OF 2 | JMS | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970

GPO : 1982 O - 375-356

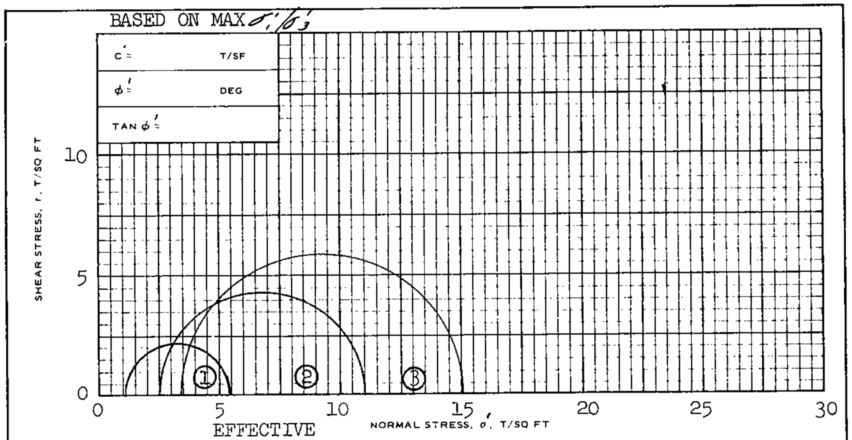
Sheet 2 of 2

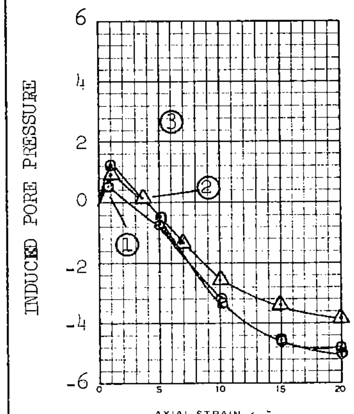
BASED ON MAX σ_1'/σ_3'

c' = T/SF

ϕ' = DEG

TAN ϕ' =





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o				
	DRY DENSITY LB/CU FT	γd_o				
	SATURATION, %	S_o				
	VOID RATIO	e_o				
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.09	2.50	3.46	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	4.37	8.54	11.56	
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. (83)

ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 11-U | SAMPLE NO. 6-B

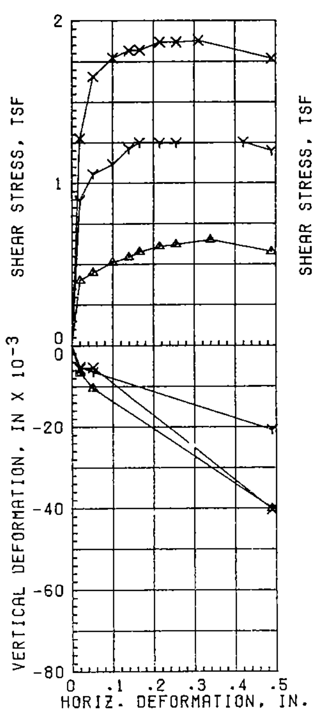
DEPTH/ELEV 20.0/-15.0

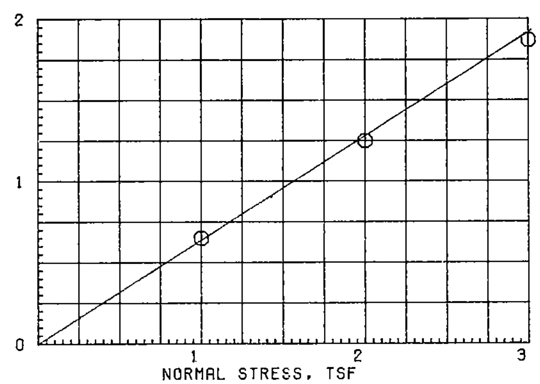
LABORATORY USAEWES | DATE 15 NOV 1983

SHEET 2 OF 2 | JMS | TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970

GPO : 1982 O - 375-356





$\gamma_{sat} = 121.7$

TEST NO.		1 △	2 Y	3 X	AVG.
INITIAL	WATER CONTENT, %	24.8	25.3	24.8	25.0
	VOID RATIO	0.738	0.757	0.747	
	SATURATION, %	89.5	89.0	88.4	89.0
	DRY DENSITY, PCF	95.5	94.5	95.0	95.0
VOID RATIO AFTER CONSOL					
FIFTY PERCENT CONSOL, MIN		< 1	< 1	< 1	
FINAL	WATER CONTENT, %	26.5	26.6	26.4	
	VOID RATIO				
	SATURATION, %				
NORMAL STRESS, TSF		1.0	2.0	3.0	
MAXIMUM SHEAR STRESS, TSF		0.65	1.25	1.87	
TIME TO FAILURE, MIN		1917	936	1212	
RATE OF STRAIN, IN/MIN		.00018	.00018	.00018	
ULTIMATE SHEAR STRESS, TSF					

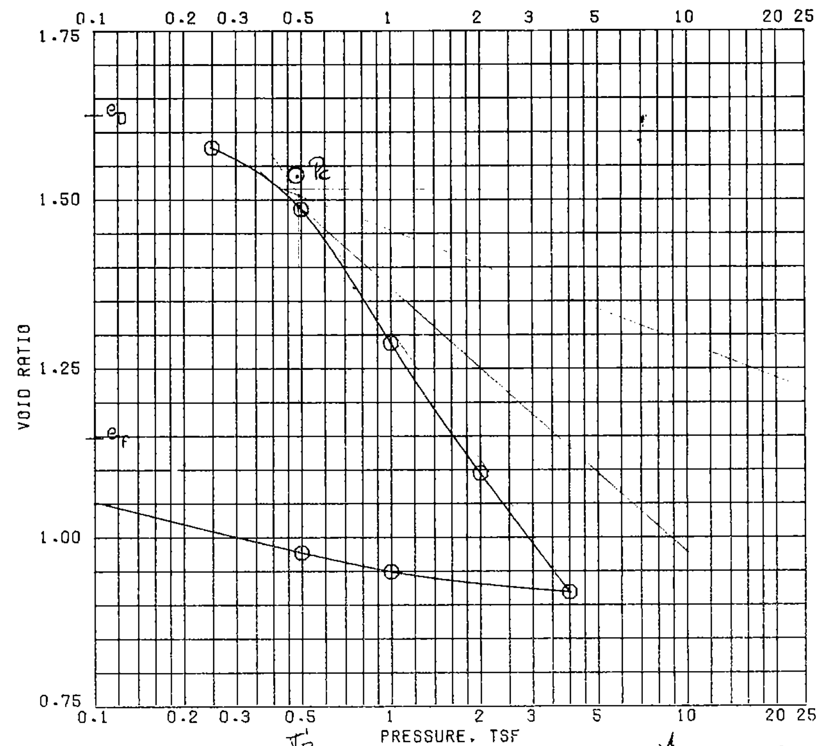
$\phi = 32.3°$

TAN ϕ = 0.632

C = –

TYPE SPECIMEN UNDISTURBED			3.00 IN. SQUARE	0.744 IN. THICK
CLASSIFICATION SAND (SP), GRAY; WITH SILT				
LL	PL	PI		GS 2.66 (EST)
REMARKS:	PROJECT LK. PONT. LA. & VIC-HURR. PROT. PLAN			
	ORLEANS LAKEFRONT LEVEE-WEST TO IHNC			
	BORING NO. 11-U		SAMPLE 12-C	
	DEPTH/ELEV 45.0/-40.0		DATE 22 OCT 83	

DIRECT SHEAR TEST REPORT

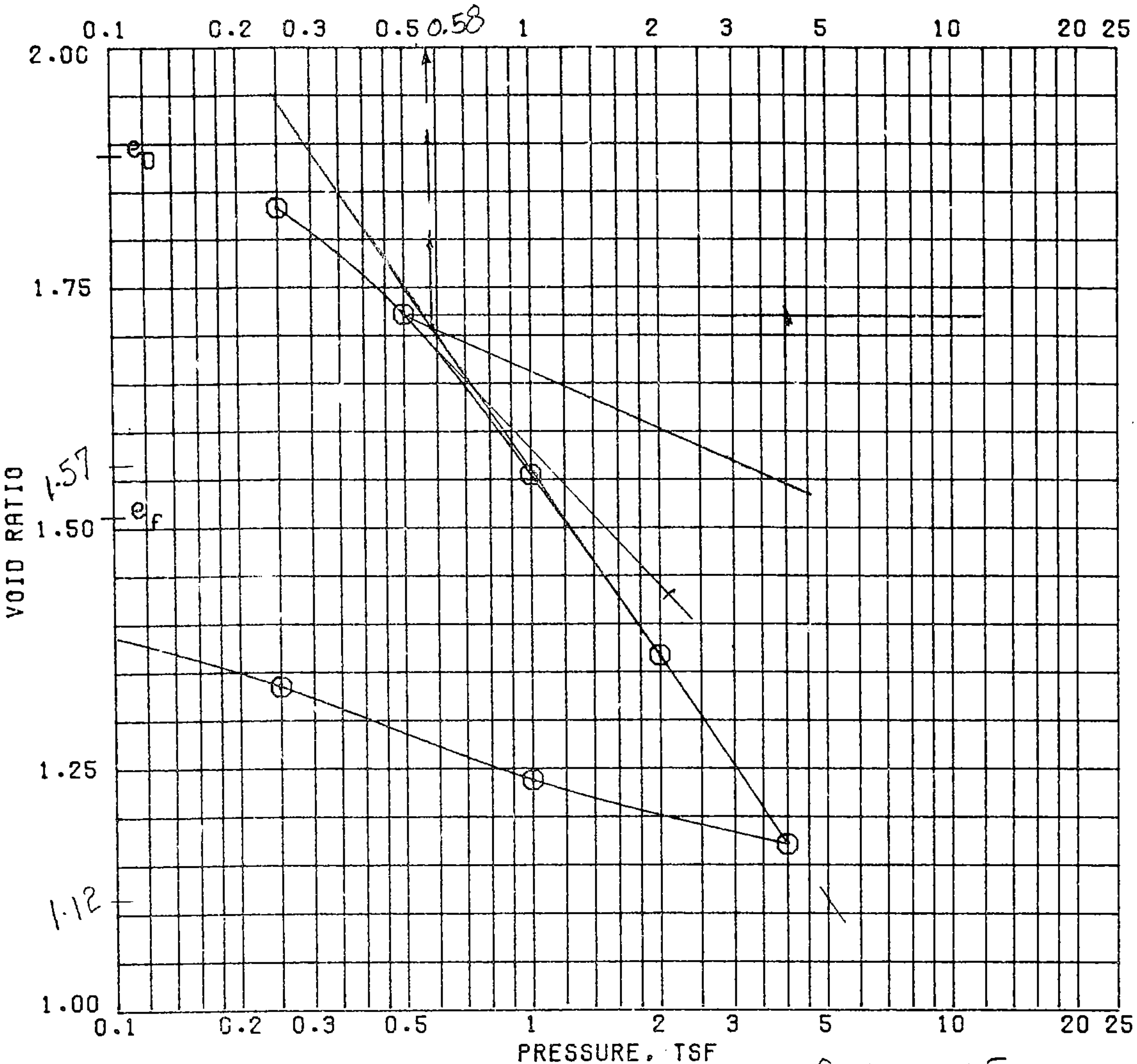


$\gamma_{SAT} = 108.10$

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	58.1	41.2
PRECONSOL. PRESSURE, TSF	0.48	DRY DENSITY, PCF	64.3	78.6
COMPRESSION INDEX	1.68	SATURATION, %	96.6	97.1
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.623	1.145
DIA. IN 4.44	HT. IN 1.128	BACK PRESSURE, TSF		
CLASSIFICATION PLASTIC CLAY (CH), GRAY				
LL 70	PL 18 / PI 52	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)		
GS 2.70 (EST)	D_{10}	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC		
REMARKS		BORING NO. 11-U	SAMPLE NO. 2-C	
		DEPTH/ELEV 5.5/-0.5	DATE 20 JUL 83	

CONSOLIDATION TEST REPORT

SHEET 1 OF 10

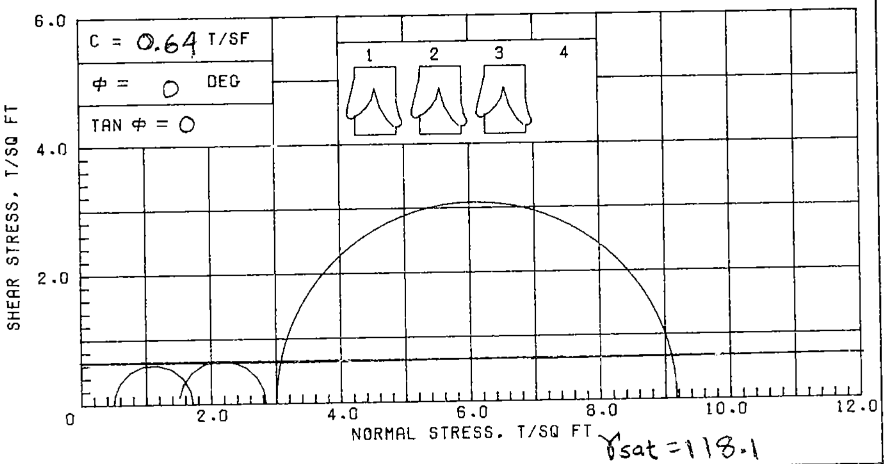


$\frac{1.57-1.12}{\log 5-\log 1}=0.64$

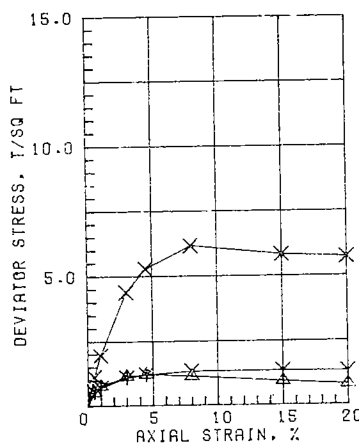
$\gamma_{sat}=104.5$

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	78.9	55.3
PRECONSOL. PRESSURE, TSF	0.58	DRY DENSITY, PCF	58.4	67.2
COMPRESSION INDEX	0.64	SATURATION, %	100 +	98.9
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.886	1.510
DIA. IN 4.44	HT. IN 1.132	BACK PRESSURE, TSF		
CLASSIFICATION PLASTIC CLAY (CH), GRAY; SILT LENSES				
LL 82 / PL 22 / PI 60		PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)		
GS 2.70 (EST)	D_{10}	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC		
REMARKS ELEV. -26.7		BORING NO. 11-U	SAMPLE NO. 9-B	
$P_c = 0.58$		DEPTH/ELEV 31.7/-26.7	DATE 16 AUG 83	
$c_c = 0.64$		CONSOLIDATION TEST REPORT		

SHEET 1 OF 10



γsat = 118.1



	SPECIMEN NO.	△1	Y2	X3	4
INITIAL	WATER CONTENT, %	27.4	30.8	14.8	29.1
	DRY DENSITY, PCF	89.4	87.1	99.3	88.3
	SATURATION, %	83.6	89.0	57.3	86.3
	VOID RATIO	0.885	0.934	0.698	
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		1.22	1.34	6.17	
TIME TO FAILURE, MIN.		9	45	24	
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.42	1.42	1.41	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

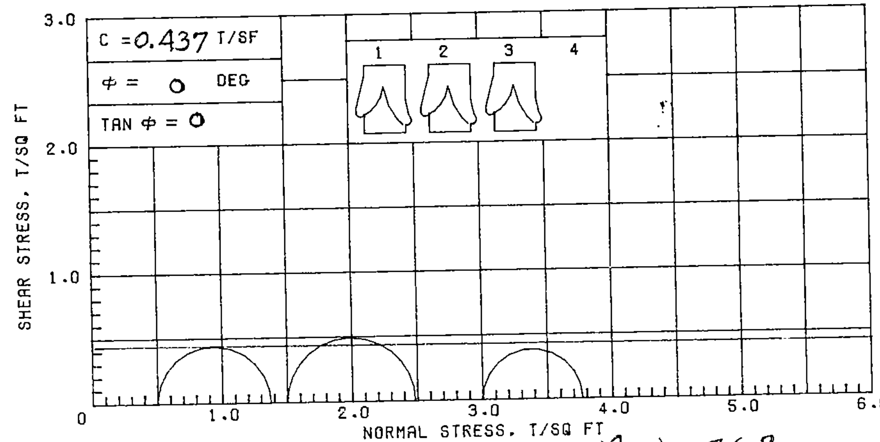
DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; FINE SAND POCKETS

LL 55	PL 16	PI 39	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

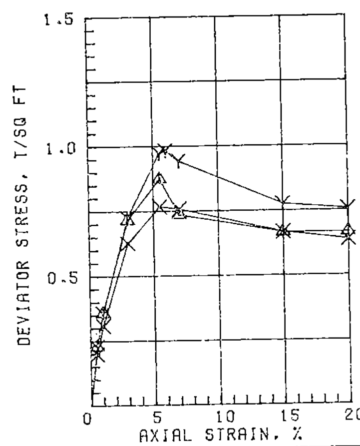
REMARKS: INSUFFICIENT MATERIAL FOR CHECK TEST.

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
BORING NO. 12-U	SAMPLE NO. 1-C
DEPTH/ELEV 2.0/+10.3	TECH. PJR
LABORATORY USAE WES	DATE 05 JUL 83

TRIAXIAL COMPRESSION TEST REPORT



γsat = 76.9



	SPECIMEN NO.	△1	Y2	X3	4
INITIAL	WATER CONTENT, %	187.8	182.7	181.1	183.9
	DRY DENSITY, PCF	26.7	27.2	27.3	27.1
	SATURATION, %	100+	100+	100+	100
	VOID RATIO	2.979	2.902	2.893	
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		0.87	0.98	0.77	
TIME TO FAILURE, MIN.		11	18	21	
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PEAT (PT), DARK BROWN

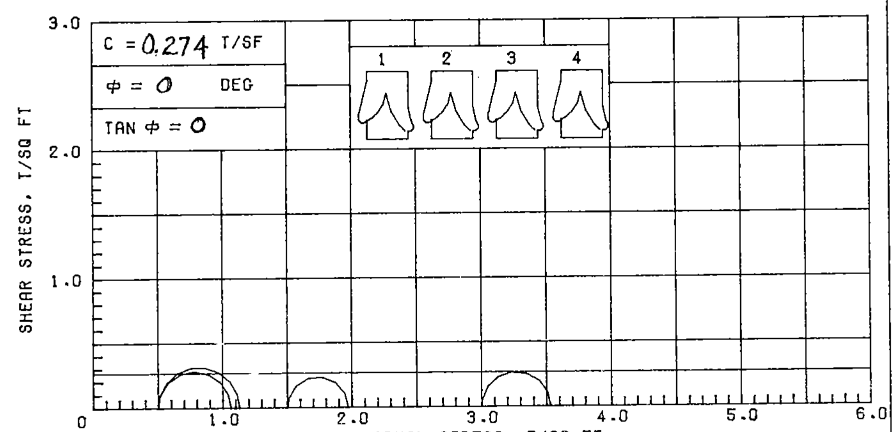
LL 235	PL 96	PI 139	GS 1.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

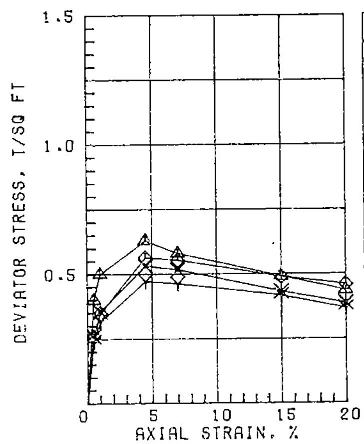
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83) ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
BORING NO. 12-U	SAMPLE NO. 7-B
DEPTH/ELEV 24.1/-11.8	TECH. PJR
LABORATORY USAE WES	DATE 05 JUL 83

TRIAXIAL COMPRESSION TEST REPORT

C = 0.274 T/SF
φ = 0 DEG
TAN φ = 0



γsat = 96.3



		SPECIMEN NO.	△1	Y2	X3	◇4	AVG.
INITIAL		WATER CONTENT, %	78.5	78.9	79.8	77.4	78.7
		DRY DENSITY, PCF	53.7	53.8	53.2	54.2	53.7
		SATURATION, %	99.0	99.9	99.3	98.9	99.3
		VOID RATIO	2.140	2.132	2.169	2.113	
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			0.63	0.47	0.53	0.56	
TIME TO FAILURE, MIN.			9	19	16	30	
RATE OF STRAIN INCR,%				7		9	
INITIAL DIAMETER, IN.			1.40	1.40	1.40	1.40	
INITIAL HEIGHT, IN.			3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 88	PL 20	PI 68	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

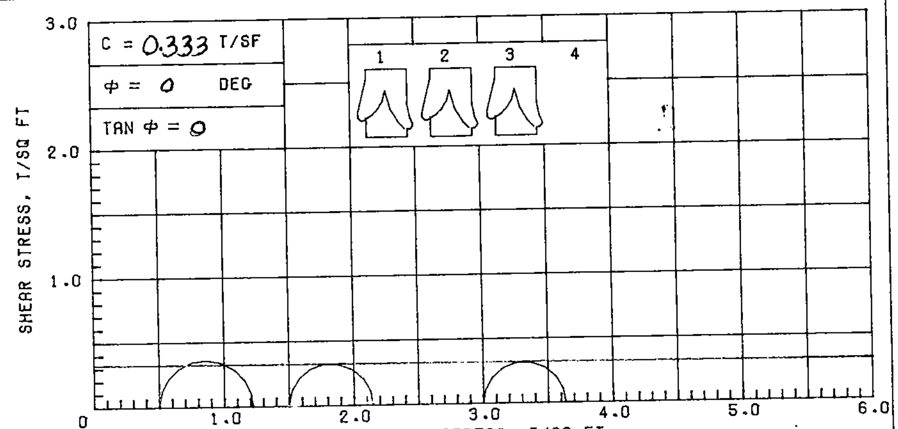
REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

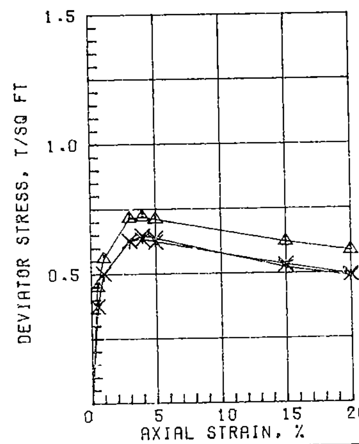
BORING NO. 12-U	SAMPLE NO. 8-C
DEPTH/ELEV 20.4/-16.1	TECH. PJR
LABORATORY USAE WES	DATE 06 JUL 83

TRIAXIAL COMPRESSION TEST REPORT

C = 0.333 T/SF
φ = 0 DEG
TAN φ = 0



γsat = 102.7



		SPECIMEN NO.	△1	Y2	X3	4 AVG.
INITIAL		WATER CONTENT, %	62.7	63.5	62.9	63.0
		DRY DENSITY, PCF	63.2	62.8	63.0	63.0
		SATURATION, %	100+	100+	100+	
		VOID RATIO	1.668	1.682	1.674	
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			0.72	0.65	0.63	
TIME TO FAILURE, MIN.			8	20	18	
RATE OF STRAIN INCR,%				5	10	
INITIAL DIAMETER, IN.			1.40	1.40	1.40	
INITIAL HEIGHT, IN.			3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SILT LENSES

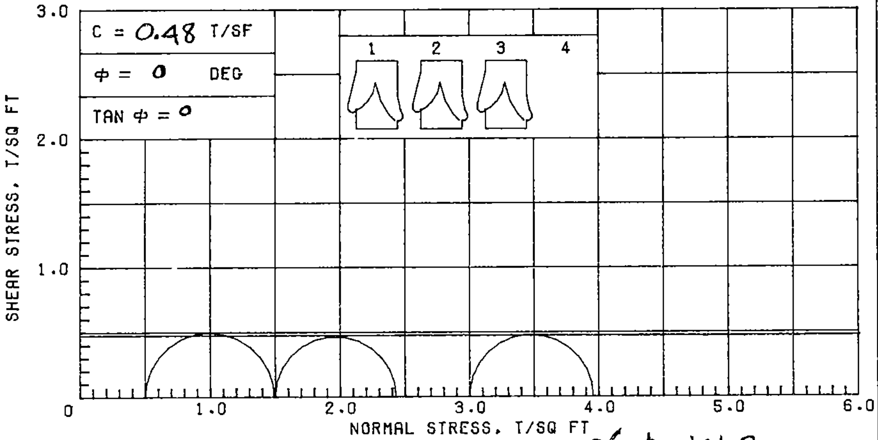
LL 79	PL 20	PI 59	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

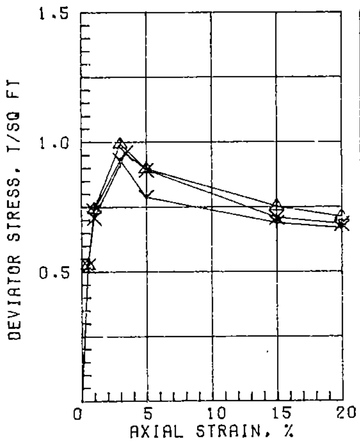
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 12-U	SAMPLE NO. 10-C
DEPTH/ELEV 36.6/-24.3	TECH. PJR
LABORATORY USAE WES	DATE 07 JUL 83

TRIAXIAL COMPRESSION TEST REPORT



$\gamma_{sat} = 101.3$



SPECIMEN NO.		Δ1	Y2	X3	4
INITIAL	WATER CONTENT, %	65.4	62.5	62.4	63.4
	DRY DENSITY, PCF	60.8	62.1	62.1	61.7
	SATURATION, %	99.5	98.4	98.4	98.8
	VOID RATIO	1.774	1.715	1.713	
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		0.99	0.93	0.96	
TIME TO FAILURE, MIN.		13	18	20	
RATE OF STRAIN INCR.%		6	6	6	
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY

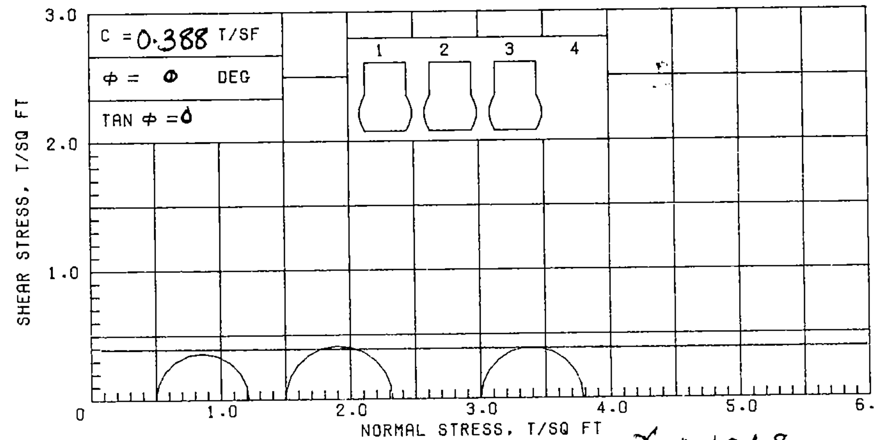
LL 72	PL 20	PI 52	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;

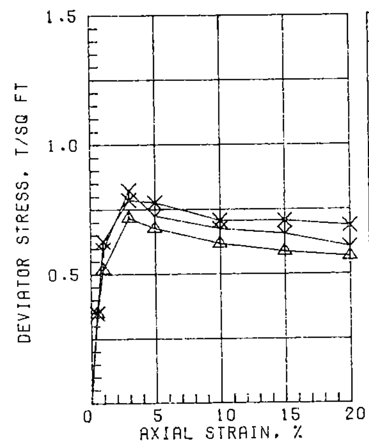
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 12-U	SAMPLE NO. 15-C
DEPTH/ELEV 57.0/-44.7	TECH. PJR
LABORATORY USAE WES	DATE 07 JUL 83

TRIAXIAL COMPRESSION TEST REPORT



$\gamma_{sat} = 104.8$



SPECIMEN NO.		Δ1	Y2	X3	4 (AVG)
INITIAL	WATER CONTENT, %	57.7	52.8	55.1	55.2
	DRY DENSITY, PCF	65.6	69.3	67.0	67.3
	SATURATION, %	99.2	99.6	98.1	99.0
	VOID RATIO	1.570	1.431	1.517	
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		0.72	0.82	0.79	
TIME TO FAILURE, MIN.		6	6	6	
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.40	1.41	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; SHELL PARTICLES

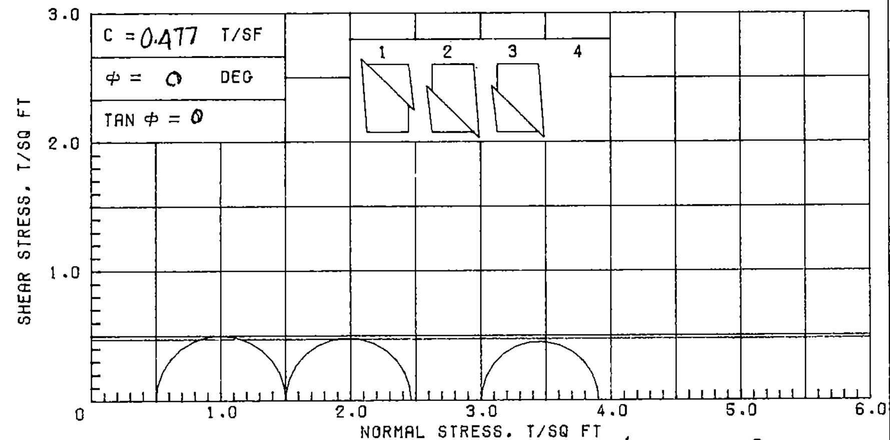
LL 68	PL 18	PI 50	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;

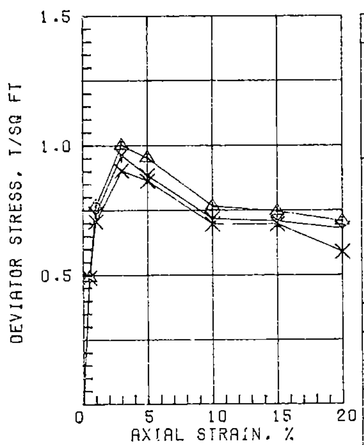
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 12-U	SAMPLE NO. 16-B
DEPTH/ELEV 60.4/-48.1	TECH. KOC
LABORATORY USAE WES	DATE 05 JUL 83

TRIAXIAL COMPRESSION TEST REPORT



$\gamma sat = 108.0$ AVG.



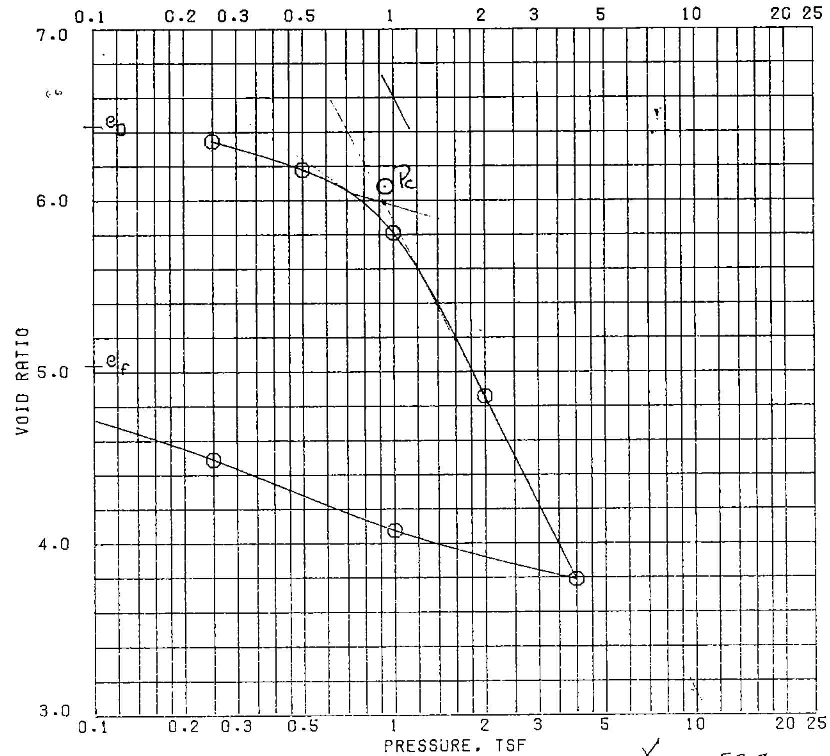
	SPECIMEN NO.	△1	Y2	X3	4
INITIAL	WATER CONTENT, %	48.3	49.6	48.7	48.9
	DRY DENSITY, PCF	72.6	71.5	72.8	72.3
	SATURATION, %	98.6	98.7	99.9	99.1
	VOID RATIO	1.323	1.357	1.317	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
	MIN PRIN. STRESS, TSF	0.5	1.5	3.0	
	MAX. DEV. STRESS, TSF	1.00	0.96	0.90	
	TIME TO FAILURE, MIN.	6	19	19	
	RATE OF STRAIN INCR,%		6	6	
	INITIAL DIAMETER, IN.	1.41	1.41	1.41	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 72	PL 19	PI 53	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 12-U	SAMPLE NO. 18-C
	DEPTH/ELEV 70.0/-57.7	TECH. KOC
	LABORATORY USAE WES	DATE 05 JUL 83
	TRIAXIAL COMPRESSION TEST REPORT	



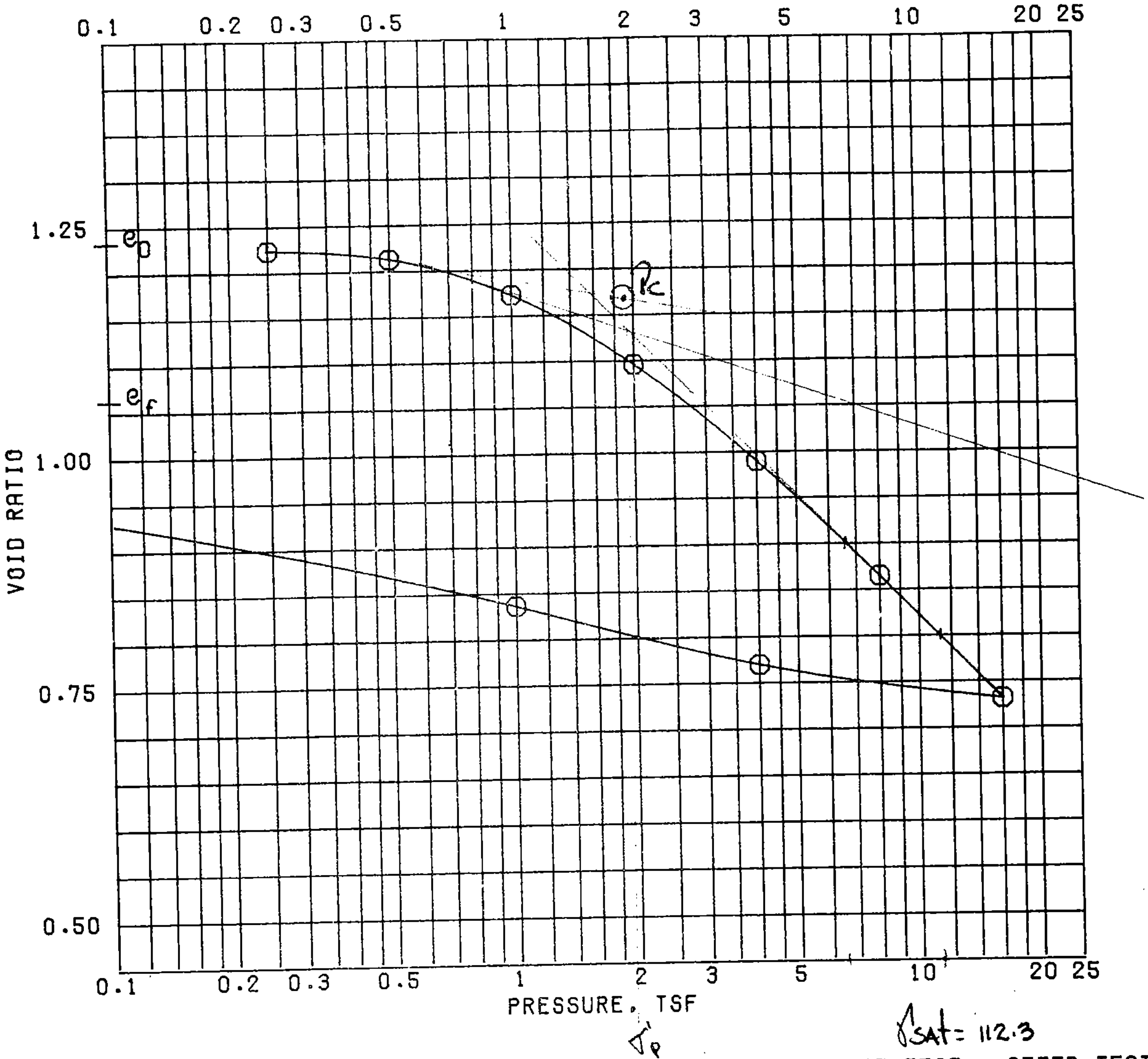
$\gamma_{SAT} = 53.7$

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	220.6	187.2
PRECONSOL. PRESSURE, TSF	0.93	DRY DENSITY, PCF	22.7	26.0
COMPRESSION INDEX	2.80	SATURATION, %	92.6	100 +
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	6.428	5.030
DIA. IN 4.44	HT. IN 1.123	BACK PRESSURE, TSF		

CLASSIFICATION PLASTIC CLAY (CH), DARK BROWN

LL 305	PL 85	PI 220	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)
GS 2.70 (EST)	D_{10}		ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
REMARKS			BORING NO. 12-U / SAMPLE NO. 7-C
			DEPTH/ELEV 24.6/-12.3 / DATE 26 JUL 83
			CONSOLIDATION TEST REPORT

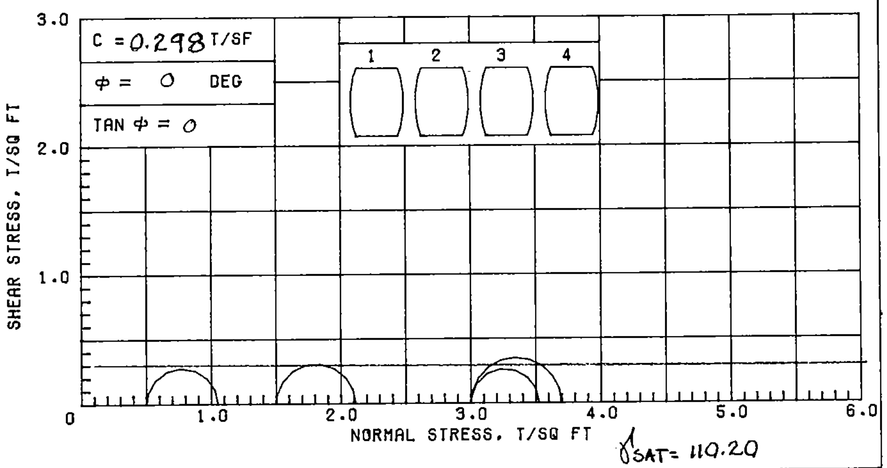
SHEET 1 OF 10



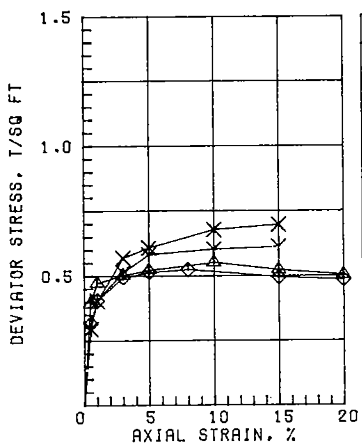
$\gamma_{SAT} = 112.3$

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	46.0	36.4
PRECONSOL. PRESSURE, TSF	1.92	DRY DENSITY, PCF	75.5	81.8
COMPRESSION INDEX	0.33	SATURATION, %	100 +	92.7
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.231	1.061
DIA. IN 4.44	HT. IN 1.141	BACK PRESSURE, TSF		

CLASSIFICATION PLASTIC CLAY (CH), GRAY; SILT LENSES			
LL 70	PL 19	PI 51	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)
GS 2.70 (EST)	D_{10}		ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
REMARKS			BORING NO. 12-U / SAMPLE NO. 10-C
			DEPTH/ELEV 37.0/-24.7 / DATE 19 AUG 83
			CONSOLIDATION TEST REPORT



$\gamma_{SAT} = 110.20$



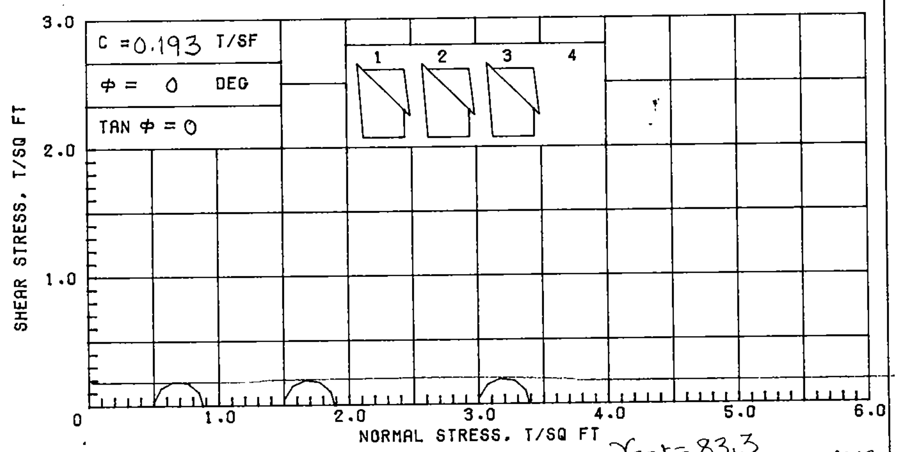
SPECIMEN NO.		△1	Y2	X3	◇4	AVG
INITIAL	WATER CONTENT, %	39.5	47.3	40.9	47.4	43.8
	DRY DENSITY, PCF	77.6	73.4	78.5	72.8	75.6
	SATURATION, %	90.9	98.4	96.2	97.2	95.7
	VOID RATIO	1.174	1.298	1.148	1.316	
BEFORE SHEAR	WATER CONTENT, %					
	DRY DENSITY, PCF					
	SATURATION, %					
	VOID RATIO					
	BACK PRESS., TSF					
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	3.0	
MAX. DEV. STRESS, TSF		0.55	0.61	0.70	0.52	
TIME TO FAILURE, MIN.		20	30	30	2	
RATE OF STRAIN INCR.,%						
INITIAL DIAMETER, IN.		1.41	1.41	1.41	1.41	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

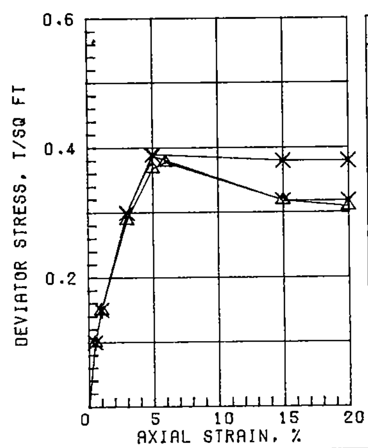
DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; ORGANIC MATERIAL

LL 75	PL 19	PI 56	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 13-U	SAMPLE NO. 2-B
	DEPTH/ELEV 4.5/-1.9	TECH. KOC
	LABORATORY USAE WES	DATE 13 JUL 83
	TRIAXIAL COMPRESSION TEST REPORT	



$\gamma_{sat} = 83.3$



SPECIMEN NO.		△1	Y2	X3	4 AVG.
INITIAL	WATER CONTENT, %	136.9	142.9	156.1	145.3
	DRY DENSITY, PCF	34.5	33.5	31.0	33.0
	SATURATION, %	95.2	95.6	95.0	95.3
	VOID RATIO	3.883	4.035	4.436	
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		0.38	0.39	0.39	
TIME TO FAILURE, MIN.		12	10	10	
RATE OF STRAIN INCR.,%					
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), DARK BROWN

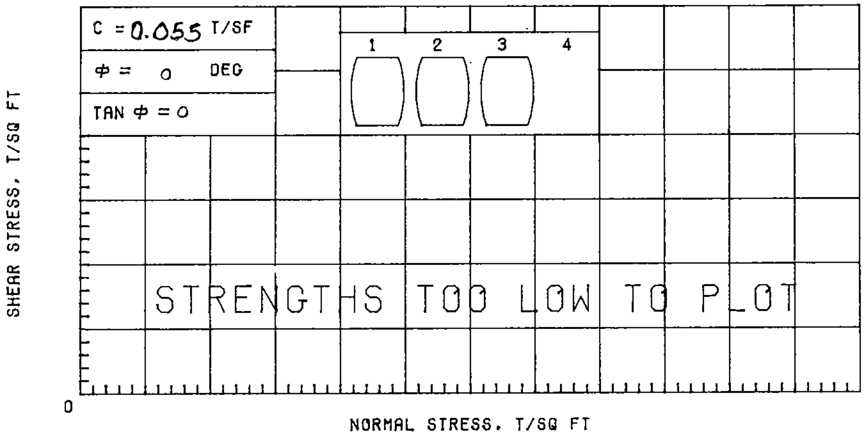
LL 139	PL 60	PI 79	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

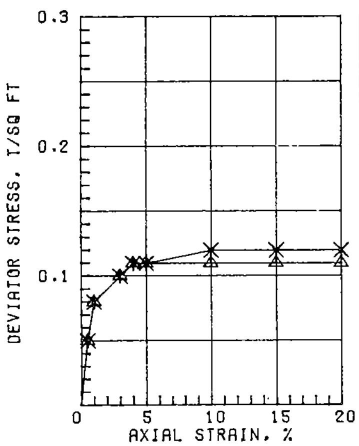
REMARKS:	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 13-U	SAMPLE NO. 4-B
	DEPTH/ELEV 11.8/-9.2	TECH. KOC
	LABORATORY USAE WES	DATE 13 JUL 83
	TRIAXIAL COMPRESSION TEST REPORT	

C = 0.055 T/SF

φ = 0 DEG

TAN φ = 0





γsat = 92.7

SPECIMEN NO.		△1	Y2	X3	4 AVG.
INITIAL	WATER CONTENT, %	92.2	89.3	95.0	92.2
	DRY DENSITY, PCF	48.3	49.2	46.9	48.1
	SATURATION, %	100+	99.3	98.9	99.4
	VOID RATIO	2.489	2.428	2.594	
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		0.11	0.11	0.11	
TIME TO FAILURE, MIN.		8	8	8	
RATE OF STRAIN INCR,%					
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 93	PL 21	PI 72	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

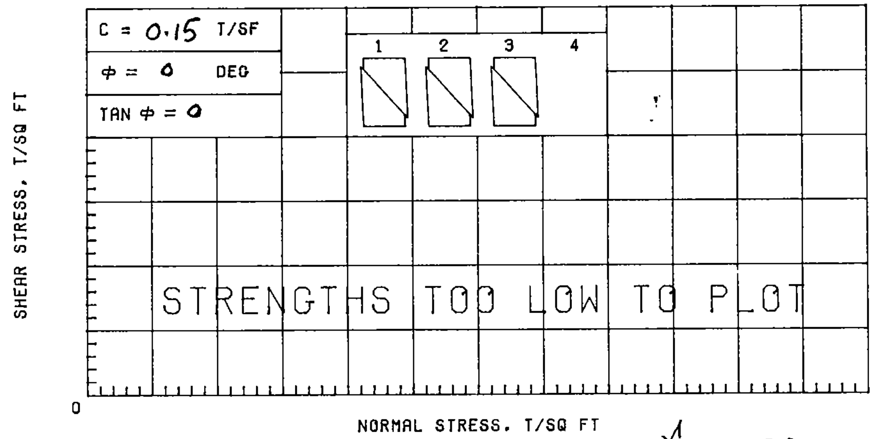
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
BORING NO. 13-U	SAMPLE NO. 5-C
DEPTH/ELEV 17.3/-14.7	TECH. KOC
LABORATORY USAE WES	DATE 12 JUL 83

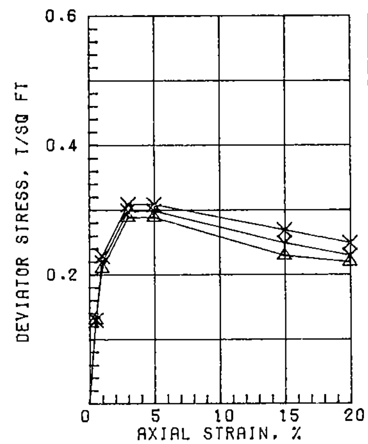
TRIAXIAL COMPRESSION TEST REPORT

C = 0.15 T/SF

φ = 0 DEG

TAN φ = 0





γSAT = 97.2

SPECIMEN NO.		△1	Y2	X3	4
INITIAL	WATER CONTENT, %	80.5	80.0	80.3	
	DRY DENSITY, PCF	53.8	54.1	53.9	
	SATURATION, %	100+	100+	100+	
	VOID RATIO	2.132	2.118	2.127	
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		0.29	0.30	0.31	
TIME TO FAILURE, MIN.		6	6	6	
RATE OF STRAIN INCR,%					
INITIAL DIAMETER, IN.		1.41	1.41	1.41	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

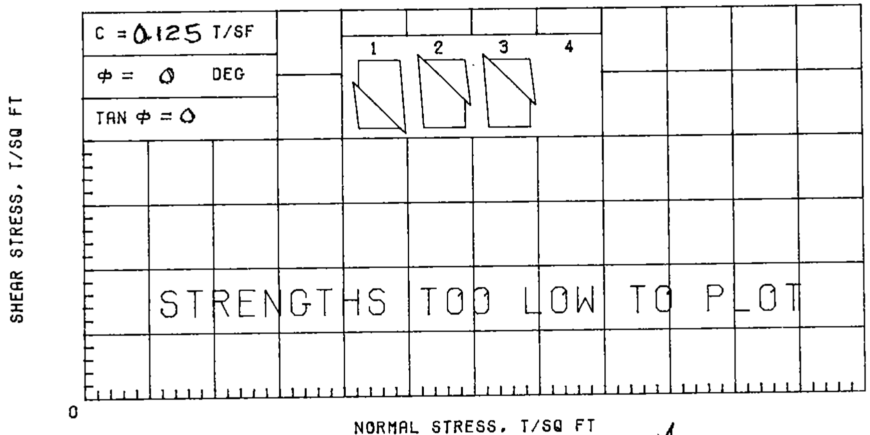
DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

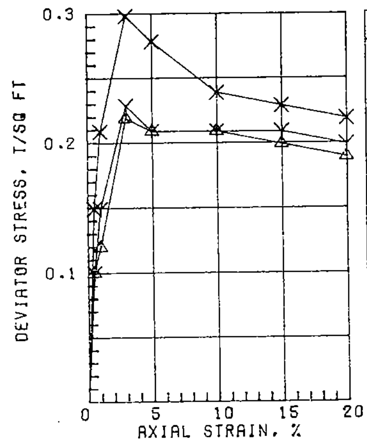
LL 84	PL 25	PI 59	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
BORING NO. 13-U	SAMPLE NO. 6-C
DEPTH/ELEV 20.9/-18.3	TECH. KOC
LABORATORY USAE WES	DATE 06 JUL 83

TRIAXIAL COMPRESSION TEST REPORT





γ_{SAT} = 98.6

	SPECIMEN NO.	Δ1	Y2	X3	4
INITIAL	WATER CONTENT, %	73.4	75.0	75.5	
	DRY DENSITY, PCF	56.9	56.5	56.0	
	SATURATION, %	100+	100+	100+	
	VOID RATIO	1.960	1.982	2.008	
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	0.23	0.30	
TIME TO FAILURE, MIN.		6	6	6	
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.41	1.41	1.41	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY

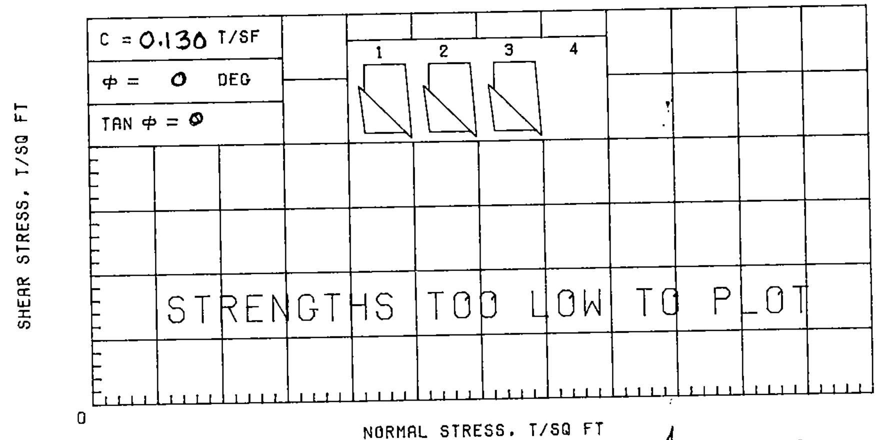
LL 80	PL 21	PI 59	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

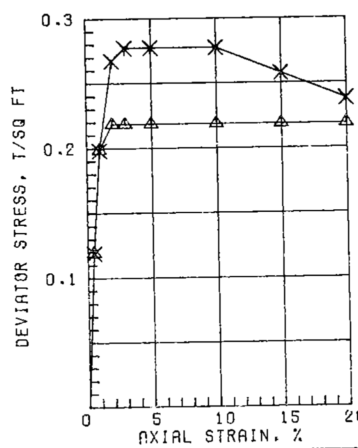
REMARKS;

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 13-U	SAMPLE NO. 7-B
DEPTH/ELEV 24.1/-21.5	TECH. KOC
LABORATORY USAE WES	DATE 07 JUL 83

TRIAXIAL COMPRESSION TEST REPORT





γ_{SAT} = 102.2

	SPECIMEN NO.	Δ1	Y2	X3	4
INITIAL	WATER CONTENT, %	62.5	60.5	63.8	
	DRY DENSITY, PCF	62.2	63.3	62.7	
	SATURATION, %	98.6	98.3	100+	
	VOID RATIO	1.712	1.662	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		0.22	0.28	0.28	
TIME TO FAILURE, MIN.		4	6	6	
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.41	1.41	1.41	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY

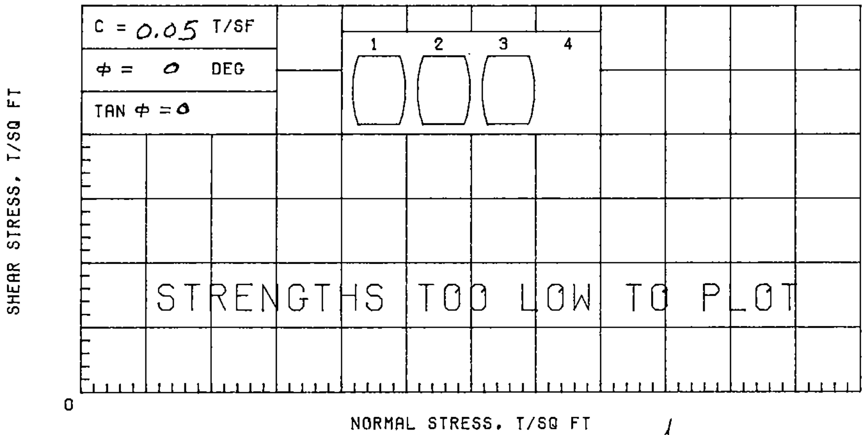
LL 70	PL 20	PI 50	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

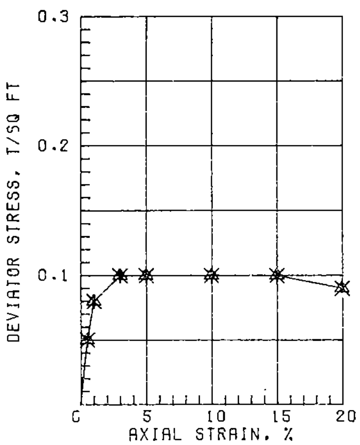
REMARKS;

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 13-U	SAMPLE NO. 8-C
DEPTH/ELEV 29.0/-26.4	TECH. KOC
LABORATORY USAE WES	DATE 07 JUL 83

TRIAXIAL COMPRESSION TEST REPORT





$\gamma_{SAT} = 96.2$

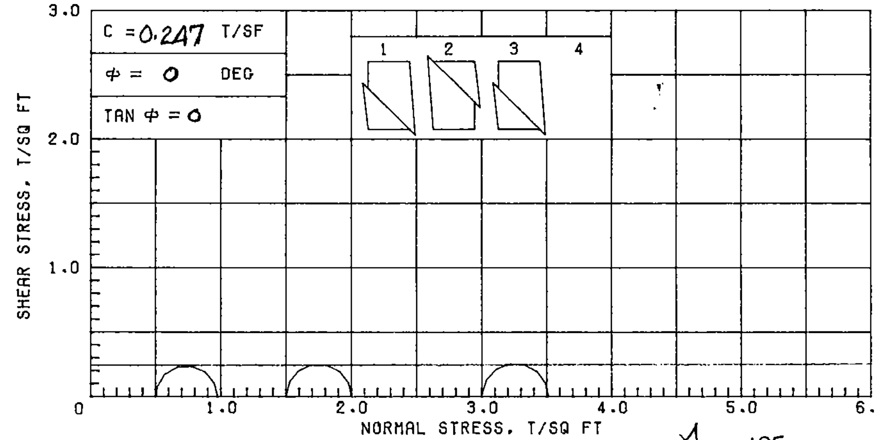
	SPECIMEN NO.	Δ1	Y2	X3	4
INITIAL	WATER CONTENT, %	80.4	79.4	78.5	
	DRY DENSITY, PCF	52.7	53.1	54.4	
	SATURATION, %	98.6	98.7	100+	
	VOID RATIO	2.201	2.172	2.100	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
	MIN PRIN. STRESS, TSF	0.5	1.5	3.0	
	MAX. DEV. STRESS, TSF	0.10	0.10	0.10	
	TIME TO FAILURE, MIN.	6	6	6	
	RATE OF STRAIN INCR.,%				
	INITIAL DIAMETER, IN.	1.41	1.41	1.41	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

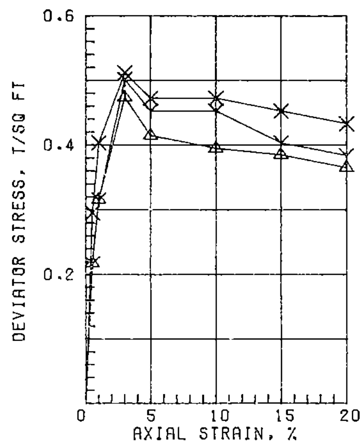
CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY

LL 85	PL 23	PI 62	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 13-U	SAMPLE NO. 9-C
	DEPTH/ELEV 33.0/-30.4	TECH. KOC
	LABORATORY USAE WES	DATE 12 JUL 83
	TRIAXIAL COMPRESSION TEST REPORT	





$\gamma_{SAT} = 105$

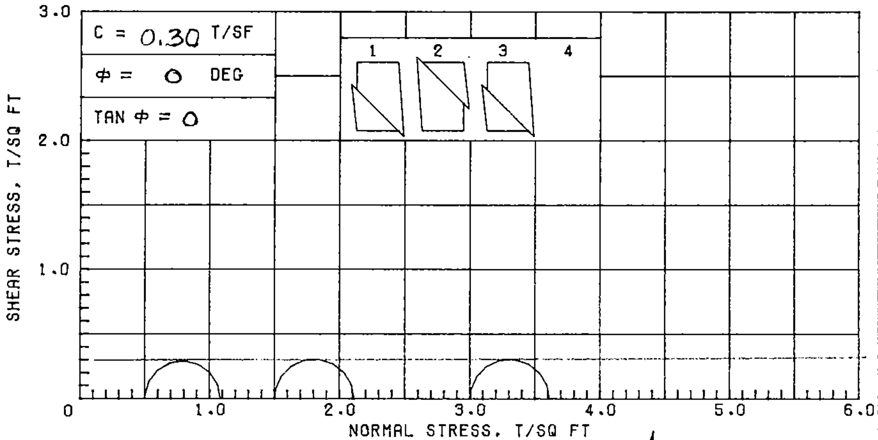
	SPECIMEN NO.	Δ1	Y2	X3	4
INITIAL	WATER CONTENT, %	54.7	52.6	53.3	53.5
	DRY DENSITY, PCF	66.4	68.2	67.8	67.5
	SATURATION, %	96.0	96.4	96.8	96.4
	VOID RATIO	1.539	1.473	1.486	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
	MIN PRIN. STRESS, TSF	0.5	1.5	3.0	
	MAX. DEV. STRESS, TSF	0.47	0.50	0.51	
	TIME TO FAILURE, MIN.	6	6	6	
	RATE OF STRAIN INCR.,%				
	INITIAL DIAMETER, IN.	1.41	1.41	1.41	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

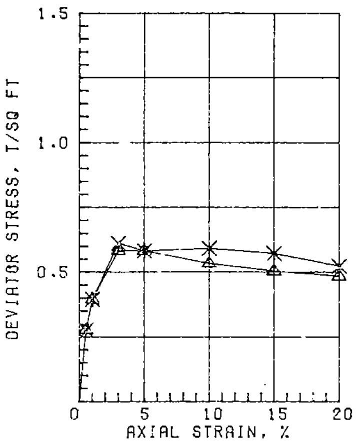
DESCRIPTION OF SPECIMENS; PLASTIC CLAY (CH), GRAY; FINE SAND POCKETS;
SHELL PARTICLES

LL 56	PL 16	PI 40	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS;	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
LIMITS ON MIXTURE OF MATERIAL.	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 13-U	SAMPLE NO. 10-B
	DEPTH/ELEV 36.2/-33.6	TECH. KOC
	LABORATORY USAE WES	DATE 08 JUL 83
	TRIAXIAL COMPRESSION TEST REPORT	



γ_{SAT} = 103.40



	SPECIMEN NO.	△1	Y2	X3	4
INITIAL	WATER CONTENT, %	59.6	56.7	60.4	
	DRY DENSITY, PCF	64.6	65.9	64.3	
	SATURATION, %	99.9	98.3	100+	
	VOID RATIO	1.611	1.557	1.622	
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	0.58	0.61	0.61	
	TIME TO FAILURE, MIN.	6	19	19	
	RATE OF STRAIN INCR.%		6	6	
	INITIAL DIAMETER, IN.	1.41	1.41	1.41	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY; SHELL PARTICLES

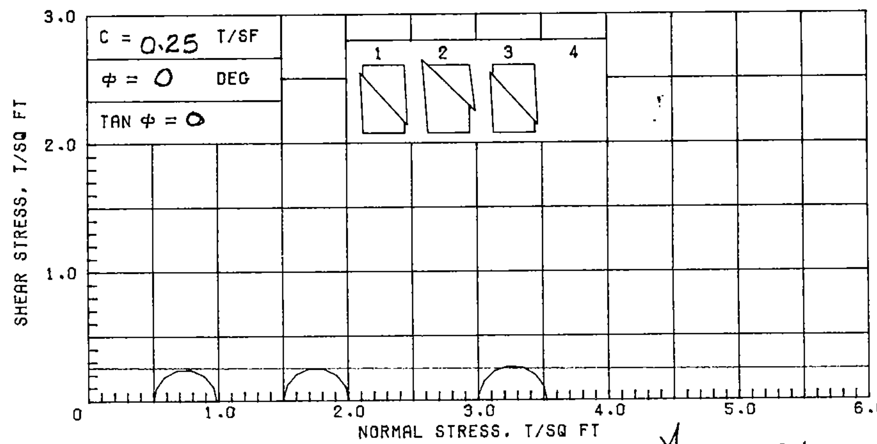
LL 67	PL 19	PI 48	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

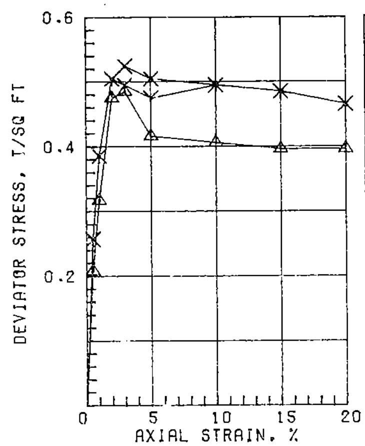
PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

BORING NO. 13-U	SAMPLE NO. 14-B
DEPTH/ELEV 52.3/-49.7	TECH. KOC
LABORATORY USAE WES	DATE 08 JUL 83

TRIAXIAL COMPRESSION TEST REPORT



γ_{SAT} = 105.4



	SPECIMEN NO.	△1	Y2	X3	4
INITIAL	WATER CONTENT, %	55.8	55.6	54.8	
	DRY DENSITY, PCF	67.7	68.1	67.3	
	SATURATION, %	100+	100+	98.4	
	VOID RATIO	1.489	1.477	1.503	
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	0.48	0.50	0.52	
	TIME TO FAILURE, MIN.	6	12	19	
	RATE OF STRAIN INCR.%		6	6	
	INITIAL DIAMETER, IN.	1.41	1.41	1.41	
	INITIAL HEIGHT, IN.	3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: PLASTIC CLAY (CH), GRAY

LL 69	PL 16	PI 53	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)
ORLEANS LAKEFRONT LEVEE-WEST OF IHNC

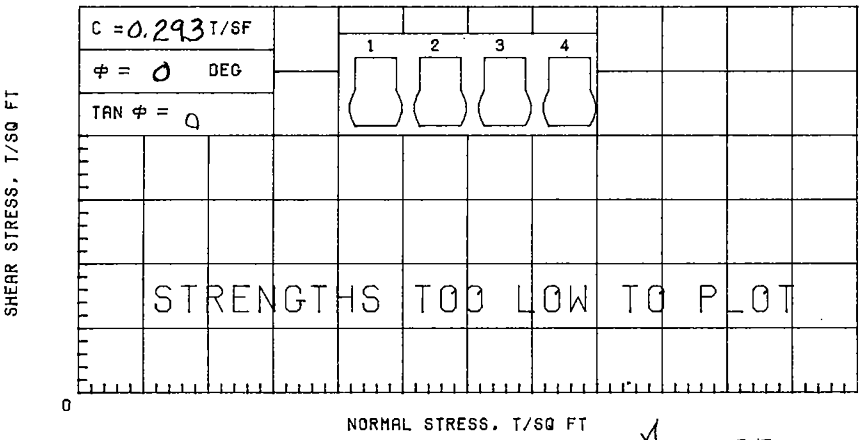
BORING NO. 13-U	SAMPLE NO. 15-B
DEPTH/ELEV 56.2/-53.6	TECH. KOC
LABORATORY USAE WES	DATE 11 JUL 83

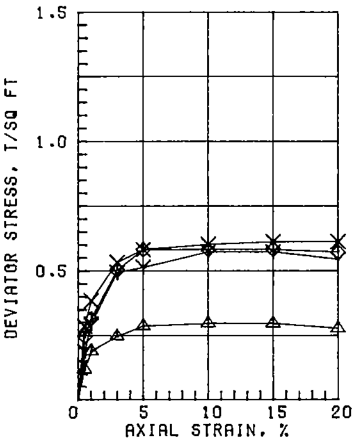
TRIAXIAL COMPRESSION TEST REPORT

C = 0.293 T/SF

φ = 0 DEG

TAN φ = 0





γSAT = 118.8

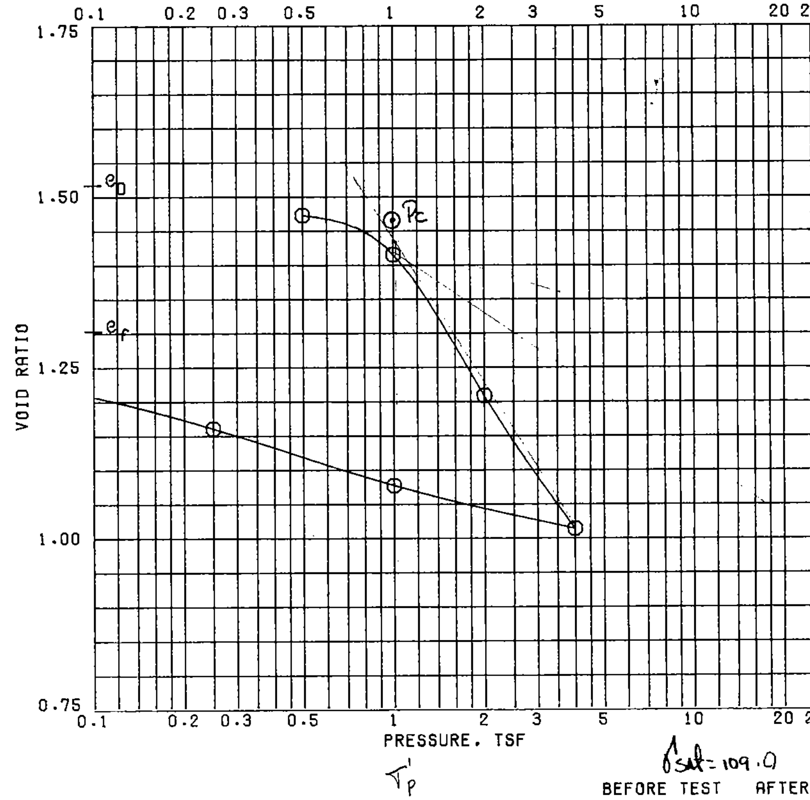
SPECIMEN NO.		△1	Y2	X3	◇4
INITIAL	WATER CONTENT, %	37.2	29.4	31.0	28.0
	DRY DENSITY, PCF	83.2	91.4	89.7	93.9
	SATURATION, %	97.9	94.0	95.3	95.0
	VOID RATIO	1.026	0.844	0.878	0.795
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESS., TSF				
MIN PRIN. STRESS, TSF		0.5	1.5	3.0	0.5
MAX. DEV. STRESS, TSF		0.30	0.57	0.61	0.58
TIME TO FAILURE, MIN.		20	20	30	10
RATE OF STRAIN INCR.%					
INITIAL DIAMETER, IN.		1.41	1.41	1.41	1.41
INITIAL HEIGHT, IN.		3.00	3.00	3.00	3.00

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: CLAY (CL), GRAY

LL 39	PL 14	PI 25	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	PROJECT LK. PONT. LA. & VIC-HURR. PROT. (83)	
	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC	
	BORING NO. 13-U	SAMPLE NO. 16-B
	DEPTH/ELEV 60.4/-57.8	TECH. KOC
	LABORATORY USAE WES	DATE 11 JUL 83
	TRIAXIAL COMPRESSION TEST REPORT	



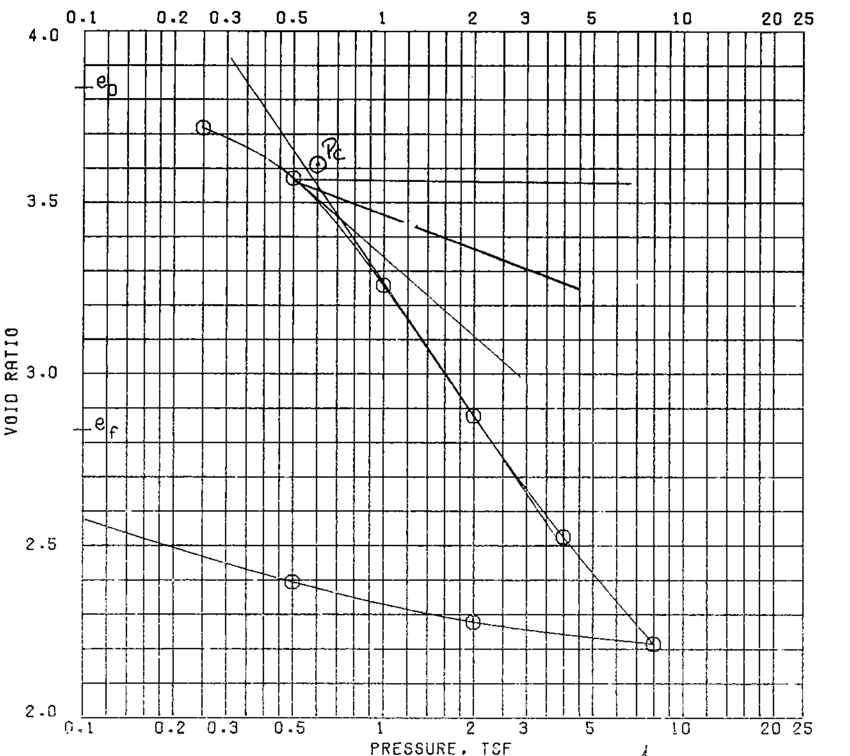
γsat = 109.0

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	60.4	49.2
PRECONSOL. PRESSURE, TSF	1.0	DRY DENSITY, PCF	67.0	73.2
COMPRESSION INDEX	0.88	SATURATION, %	100 +	100 +
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.516	1.301
DIA. IN 4.44	HT. IN 1.121	BACK PRESSURE, TSF		

CLASSIFICATION PLASTIC CLAY (CH), GRAY; ROOTLETS;SHELL PARTICLES

LL 70	PL 20	PI 50	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)
GS 2.70 (EST)	D_{10}		ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
REMARKS			BORING NO. 13-U / SAMPLE NO. 2-B
			DEPTH/ELEV 5.0/-2.4 / DATE 19 AUG 83
			CONSOLIDATION TEST REPORT

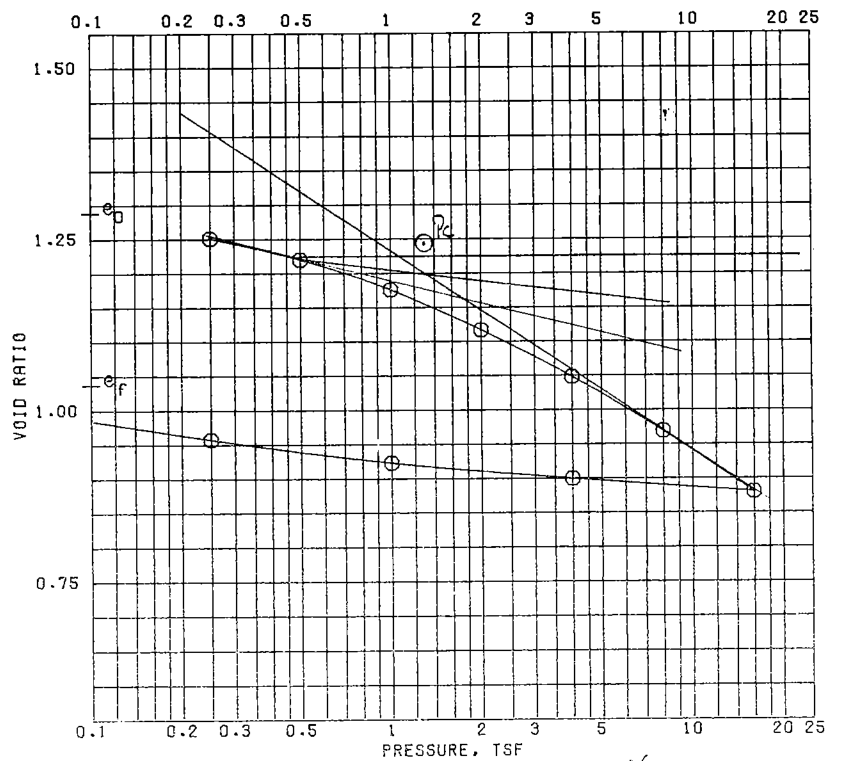
SHEET 1 OF 9



			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	290.6	236.8
PRECONSOL. PRESSURE, TSF	0.60	DRY DENSITY, PCF	22.0	27.7
COMPRESSION INDEX	1.24	SATURATION, %	100 +	100 +
TYPE SPECIMEN UNDISTURBED		VOID RATIO	3.832	2.834
DIA. IN 4.44	HT. IN 1.135	BACK PRESSURE, TSF		
CLASSIFICATION PEAT (PT), BROWN; FINE SAND SEAMS				
LL 149 | PL 74 | PI 75		PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)		
GS 1.70 (EST)	D_{10}	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC		
REMARKS		BORING NO. 13-U	SAMPLE NO. 4-B	
		DEPTH/ELEV 12.3/-9.7	DATE 23 AUG 83	

CONSOLIDATION TEST REPORT

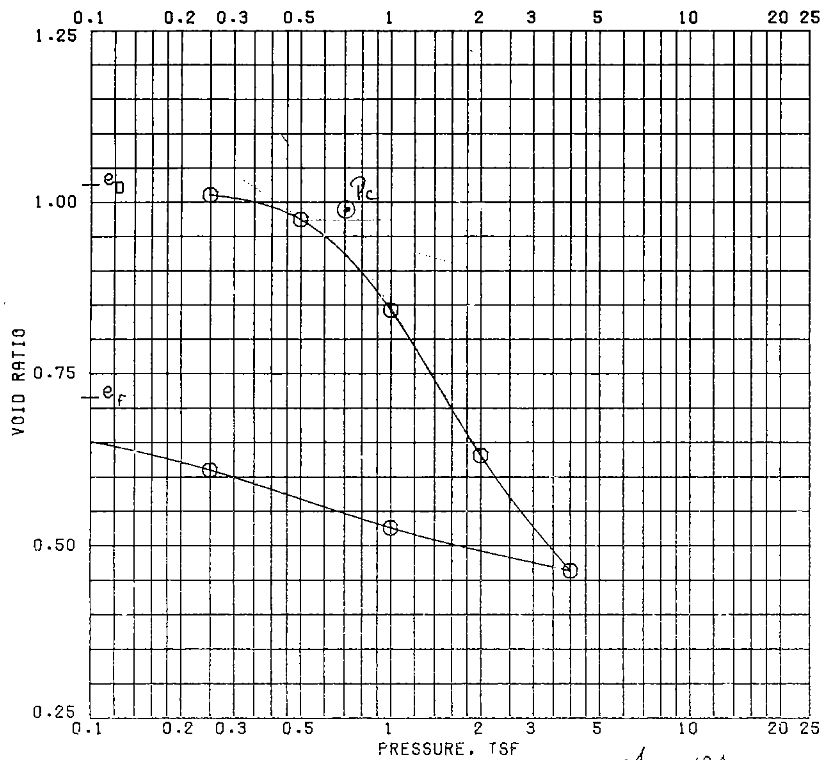
SHEET 1 OF 11



			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	55.0	21.5
PRECONSOL. PRESSURE, TSF	1.3	DRY DENSITY, PCF	73.7	82.8
COMPRESSION INDEX	0.29	SATURATION, %	100 +	56.0
TYPE SPECIMEN UNDISTURBED		VOID RATIO	1.287	1.035
DIA. IN 4.44	HT. IN 1.117	BACK PRESSURE, TSF		
CLASSIFICATION PLASTIC CLAY (CH), GRAY; SILT LENSES & POCKETS				
LL 62 | PL 19 | PI 43		PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)		
GS 2.7U (EST)	D_{10}	ORLEANS LAKEFRONT LEVEE-WEST OF IHNC		
REMARKS BEFORE/AFTER TEST DATA		BORING NO. 13-U	SAMPLE NO. 6-B	
ERRONEOUS		DEPTH/ELEV 19.9/-17.3	DATE 02 AUG 83	

CONSOLIDATION TEST REPORT

SHEET 1 OF 13



$\gamma_{SAT} = 124$

			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	44.0	28.4
PRECONSOL. PRESSURE, TSF	0.7	DRY DENSITY, PCF	83.3	98.4
COMPRESSION INDEX	0.71	SATURATION, %	100 +	100 +
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	1.024	0.714
DIA. IN 4.44	HT. IN 1.125	BACK PRESSURE, TSF		

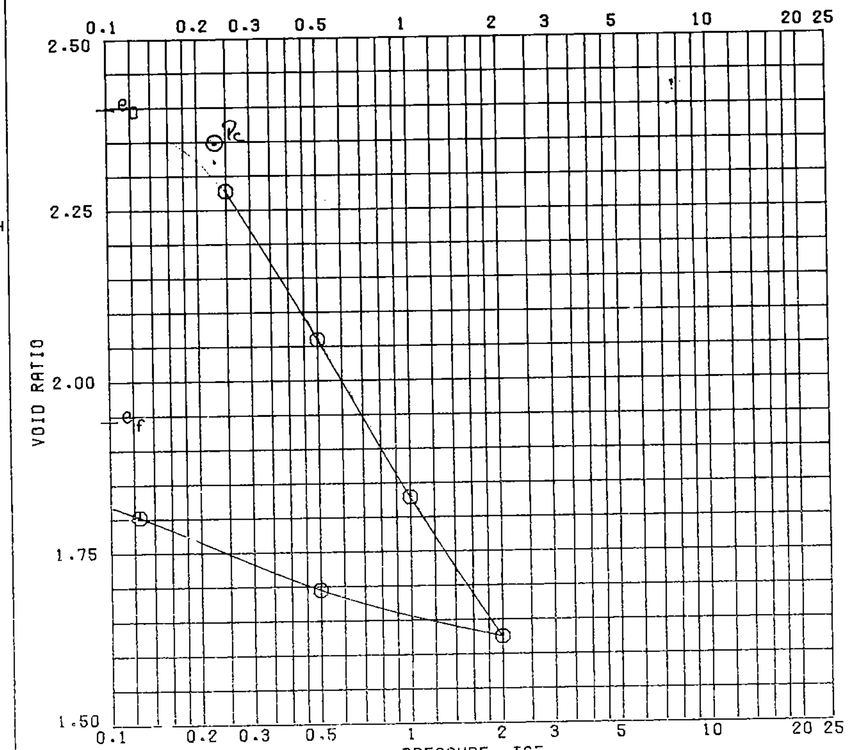
AVG
36.20
90.85

CLASSIFICATION PLASTIC CLAY (CH), GRAY

LL 78	PL 22	PI 56	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)
GS 2.70 (EST)	D_{10}		ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
REMARKS			BORING NO. 13-U / SAMPLE NO. 8-B
			DEPTH/ELEV 28.0/-25.4 / DATE 03 AUG 83

CONSOLIDATION TEST REPORT

SHEET 1 OF 10



$\gamma_{SAT} = 93.6$

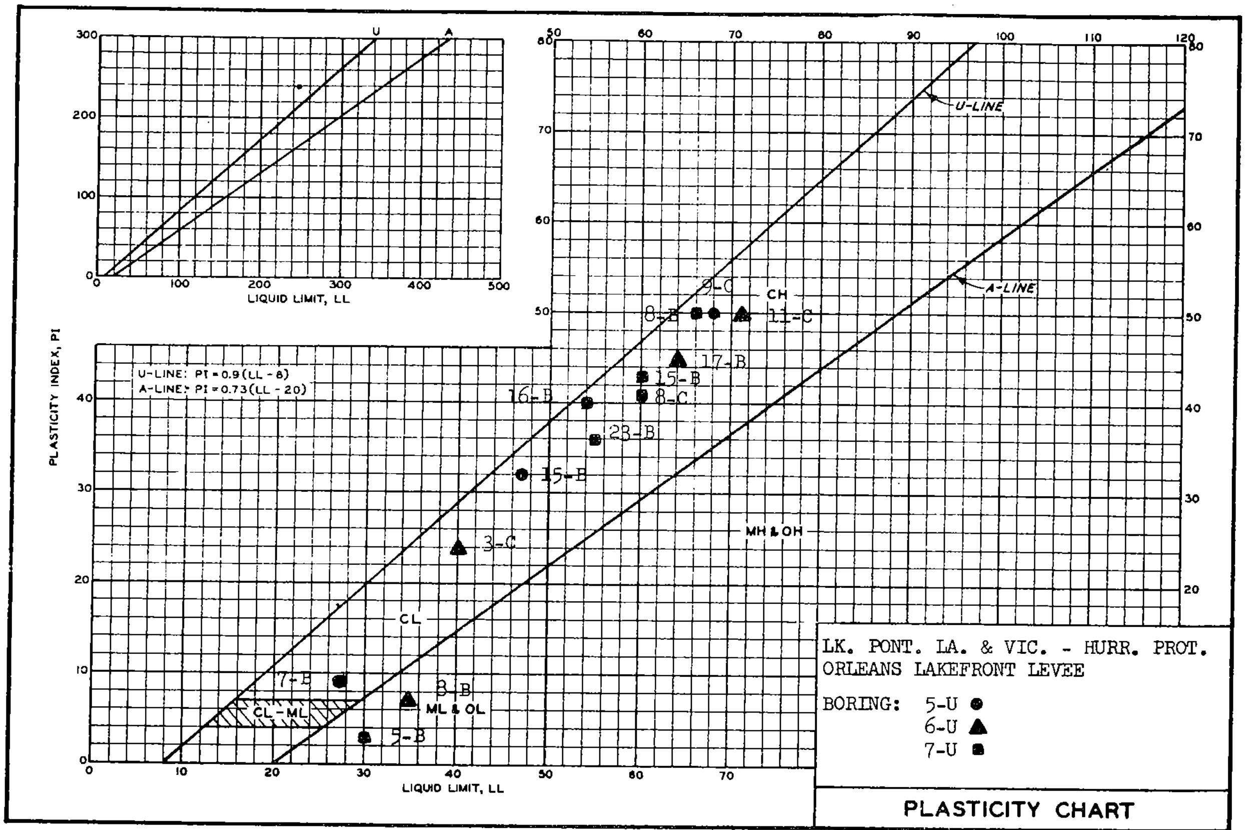
			BEFORE TEST	AFTER TEST
OVERBURDEN PRESSURE, TSF		WATER CONTENT, %	85.2	69.7
PRECONSOL. PRESSURE, TSF	0.23	DRY DENSITY, PCF	49.6	57.3
COMPRESSION INDEX	0.76	SATURATION, %	96.0	97.0
TYPE SPECIMEN	UNDISTURBED	VOID RATIO	2.397	1.941
DIA. IN 4.44	HT. IN 1.129	BACK PRESSURE, TSF		

CLASSIFICATION PLASTIC CLAY (CH), GRAY

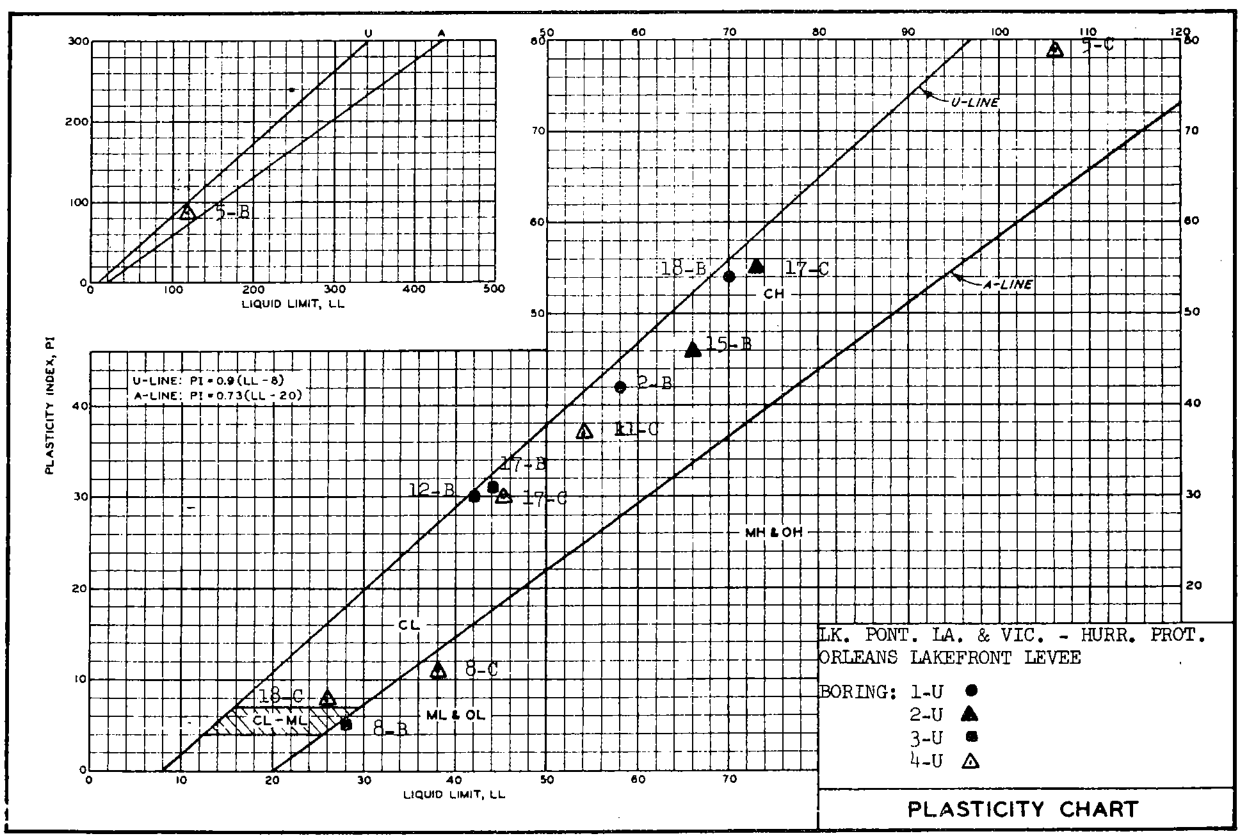
LL 90	PL 26	PI 64	PROJECT LK. PONT. LA. & VIC-HURR. PROT.(83)
GS 2.70 (EST)	D_{10}		ORLEANS LAKEFRONT LEVEE-WEST OF IHNC
REMARKS			BORING NO. 13-U / SAMPLE NO. 9-C
			DEPTH/ELEV 33.5/-30.5 / DATE 31 AUG 83

CONSOLIDATION TEST REPORT

SHEET 1 OF 9



ENG FORM
JUN 70 **4334** (EM 1110-2-1906) TRANSLUCENT



ENG FORM
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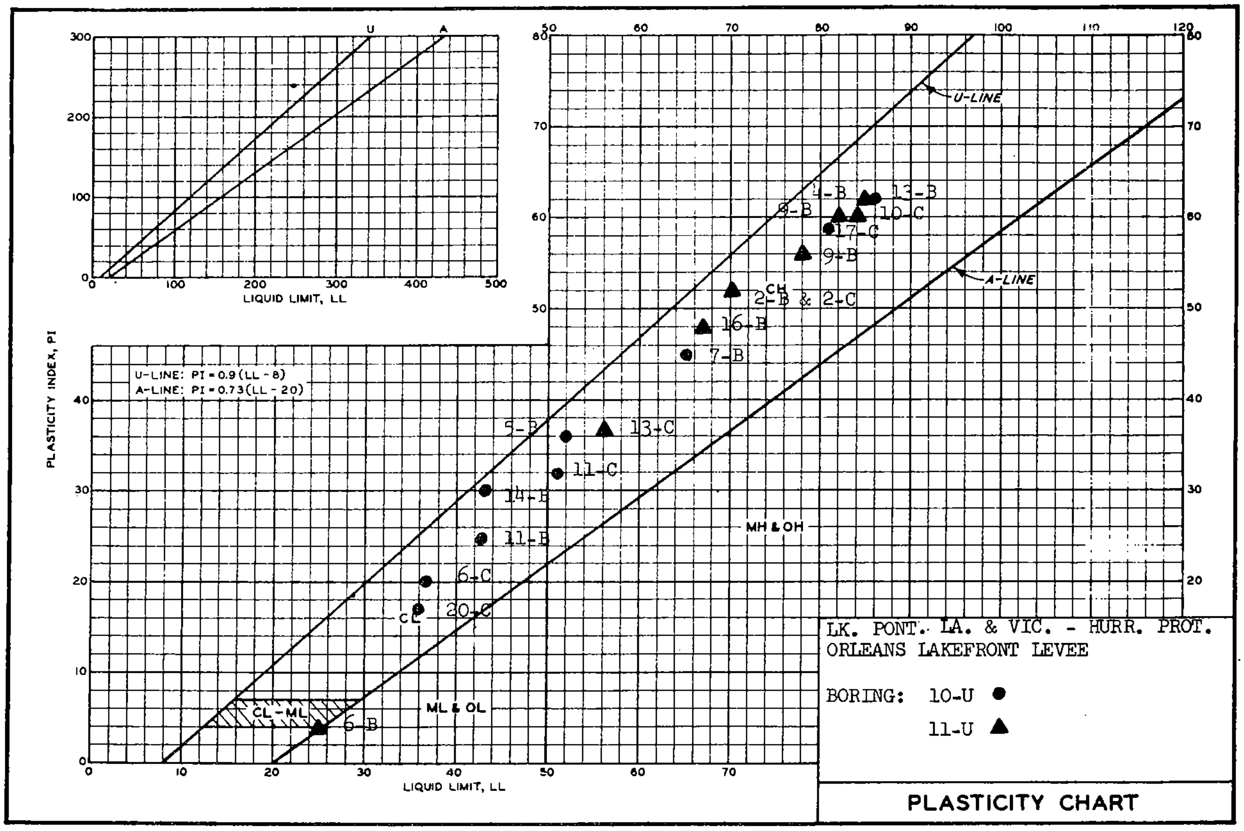

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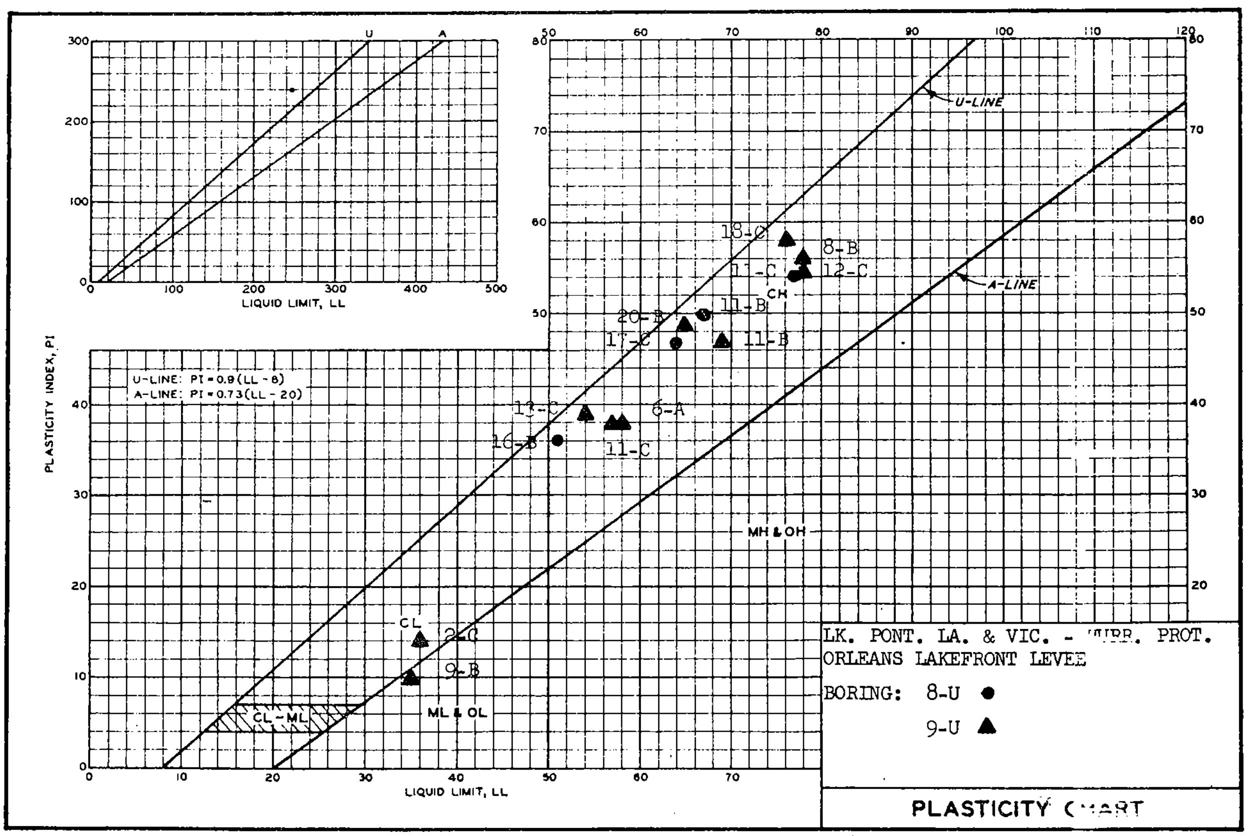

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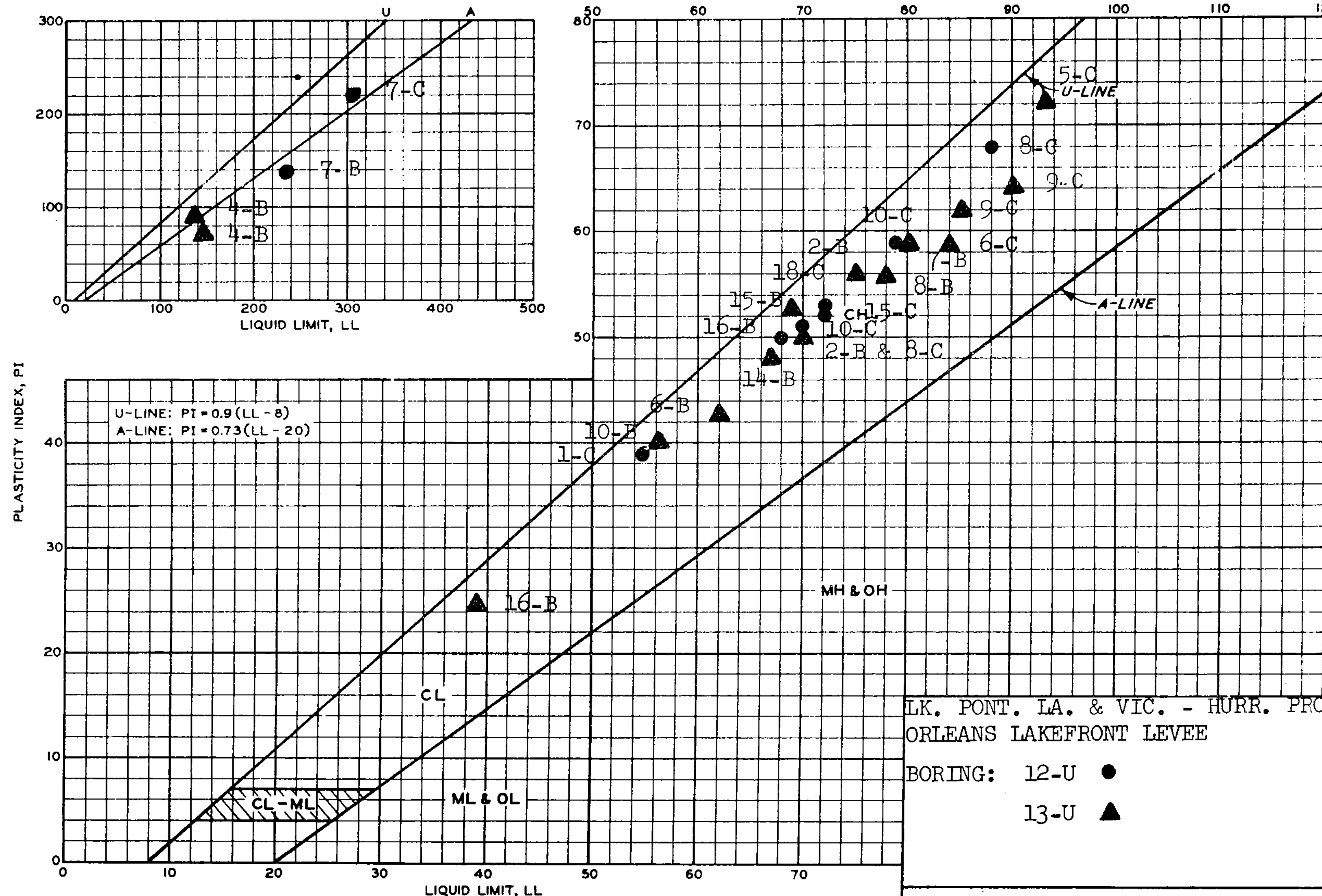

LK. PONT. LA. & VIC. - HURR. PROT.
ORLEANS LAKEFRONT LEVEE

BORING: 12-U ●

13-U ▲

PLASTICITY CHART

ENG FORM JUN 70 **4334** (EM 1110-2-1906) TRANSLUCENT