Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project

17th Street Canal
Analysis of Existing Conditions

New Orleans District Engineering Division
May 11, 2007

US Army Corps
of Engineers®

EXECUTIVE SUMMARY

This report provides the background, data and detailed hydraulic and geotechnical analyses of the existing condition of levees and floodwalls on the 17th Street Outfall Canal. The data and results presented here been reviewed in accordance with the Corps' Independent Technical Review process.

The evaluation of levees and floodwalls was accomplished using post-Hurricane Katrina design criteria with the input from the Interagency Performance Evaluation Taskforce (IPET), USACE Mississippi Valley Division Headquarters, Task Force Guardian, and engineers at St. Louis, St. Paul and New Orleans Districts.

Geotechnical analysis for slope stability is based on the Method of Planes. Current changes in slope stability design methodology will be applied to future geotechnical work; however these changes will be evaluated on the 17th Street Canal and addressed via future determination on its effect on the stated safe water elevation.

When the gates of the Interim Closure Structure are open, the water surface profile of the canal is controlled by (1) the elevation of water in Lake Pontchartrain and (2) the volume of water pumped into the canal from three municipal drainage pump stations.

Detailed geotechnical field investigations, laboratory tests and calculations reveal that the existing walls and embankment are adequate with the current operational safe water elevation of 6.0.

The governing safe water elevation on the east (Orleans Parish) side of the canal is 6.3 for a reach of approximately 400 feet near the Interstate 10 Bridge. The governing safe water elevation on the west (Jefferson Parish) side of the canal is 7.3 for a reach of approximately 430 feet in the vicinity of Rosebud Street.

Graphs of the governing safe water elevations overlain with the hydraulic grade line illustrate that the existing walls and embankment are sufficient for elevations greater than 6.0 at many locations. As a result, the analysis shows the canal can convey outflow from events up to and including a lake stage of 3.0 with all pumps operating at the theoretical maximum capacity of 10,500 cubic feet per second.

A thorough post-hurricane examination of the floodwalls reveals no evidence of distress or damage of the floodwall on either side of the canal.

The results of this analysis will help engineers and planners look for opportunities and actions that can improve the operational condition of the canal. The results will also be used to update the 17th Street Canal Operations Manual to reflect current conditions.

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FOREWORD

The US Army Corps of Engineers and the New Orleans District continue efforts to restore, repair and improve the hurricane and storm damage reduction system in coastal Louisiana. The Chief of Engineering Division, New Orleans District, directed the preparation of this analysis of the present condition of the 17th Street Outfall Canal at the request of local officials in Orleans and Jefferson Parishes.

The goal of this analysis is to provide a snapshot of the current condition and capacities of canal levees and floodwalls in light of post-Hurricane Katrina design criteria using the Method of Planes. Engineers and local leaders are concerned with identifying the most vulnerable components of the system and implementing measures to address them.

It is important to note that the canal is no longer part of the frontline hurricane and storm damage reduction system. With the construction of the interim closure structure and plans to provide permanent gates and pump stations where the canal discharges into Lake Pontchartrain, the Corps has removed the 17th Street Outfall Canal levees and floodwalls from the critical first line of defense from storm surges. The canal's only purpose now is to convey urban runoff from upstream pump stations to the lake; it will not be required to withstand storm surges. Still, valid reasons to be cautious remain.

The design methods and criteria presented in this report should not be considered the final authority for engineers and planners working to assure the reliability of the 17th Street Outfall Canal. As new information is continuously discovered and design techniques always evolve, designers are encouraged to consult with appropriate subject matter experts for updates and improvements to the procedures and criteria presented herein.

BACKGROUND

Objective

The purpose of this analysis is to determine safe operational water levels within the 17th Street Outfall Canal under current conditions.

For the vast majority of the time, the Interim Closure Structure will remain open and water will gravity flow from pump stations to where the canal discharges into Lake Pontchartrain. With water flowing roughly 2.4 miles from the southern-most pump station to the point of discharge at the north end, water elevations will vary along this route.

This report presents the expected hydraulic gradient under pump conditions and the currently understood capacity of the canal levee and floodwalls on each side of the canal. Engineers and planners should be able to use the information provided to make informed decisions regarding the risk, and perhaps identify opportunities for reducing risk, due to storm water flows in the canal.

The report includes the accumulation of months of geotechnical investigations, including subsurface explorations, laboratory analyses, field tests and thorough engineering examinations and studies.

Work presented herein has been thoroughly reviewed by engineers outside the New Orleans District for technical accuracy.

Study Area

The area of study is the 17th Street Outfall Canal, one of three historical Outfall Canals that were incorporated into the Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project. The three canals (17th Street Canal, London Avenue Canal, and Orleans Avenue Canal) are located on the south side of Lake Pontchartrain. They run parallel to each other and are generally oriented in the north-south direction.

The Outfall Canals are designed to transport storm water drainage from the major urbanized areas of Orleans and Jefferson Parishes on the east bank of the Mississippi River to Lake Pontchartrain. The canal banks were designed to provide lateral parallel protection from tidal inundation via the lake-canal connection.

The 17th Street Canal is located in Jefferson Parish immediately west of the Orleans Parish boundary line. The canal extends approximately 12,605 feet from Pump Station No. 6 near Interstate 10 to the canal's terminus at Lake Pontchartrain. The I-type floodwall which provides parallel protection along the entire length of the canal varies in elevation. An overview of the canal is shown in Figure 1.

Permanent Pump Stations

The 17th Street Canal receives discharge from Pump Station No. 6 and the I-10 pump station in Orleans Parish, and the Canal Street Pump Station in Jefferson Parish. The total combined design discharge capacity of these three pump stations is 10,500 cubic feet per second (cfs). Runoff from approximately 11,700 acres drains into the 17th Street Canal. Orleans Parish comprises 82 percent of this drainage area.

Located at the southern end of the canal is Pump Station No. 6 (DPS6), a municipal drainage pump station in operation since 1899. The station is designed with a total capacity of 9,480 cfs, although actual capacity varies depending on operating conditions. There are 15 pumps including two 1,100 cfs pumps and five 1,000 cfs pumps. A pump station status report dated December 12, 2006 reported one pump out of service and a net operational capacity of 9,390 cfs. DPS6 is operated by the Sewerage and Water Board of New Orleans (SWBNO) and serves parts of Orleans and Jefferson Parishes.

The Interstate 10 pump station (DPSI10) is the most recently constructed pump station in the area. It provides drainage to the problematic underpass where the interstate highway dips under a railroad bridge. The station is located near the underpass and discharges through a set of pipes at grade to the 17th Street Canal just south of the bridges where the interstate crosses the canal. DPSI10 is operated by SWBNO and consists of four pumps with a combined design operational capacity of 860 cfs. Three of the pumps are designed to move 250 cfs each. A status report dated December 12, 2006 reported this station fully operational.

The Canal Street pump station (DPSCS), located in Jefferson Parish, has a design capacity of 160 cfs. It consists of four vertical pumps each with a rated capacity of 40 cfs. The station is located at the intersection of Canal Street in Metairie (not to be confused with the more famous Canal Street in New Orleans) and the 17th Street Canal, about 1,230 feet downstream of DPS6. A pump station status report dated December 12, 2006 reported this station fully operational. DPSCS is maintained and operated by Jefferson Parish Drainage Department.

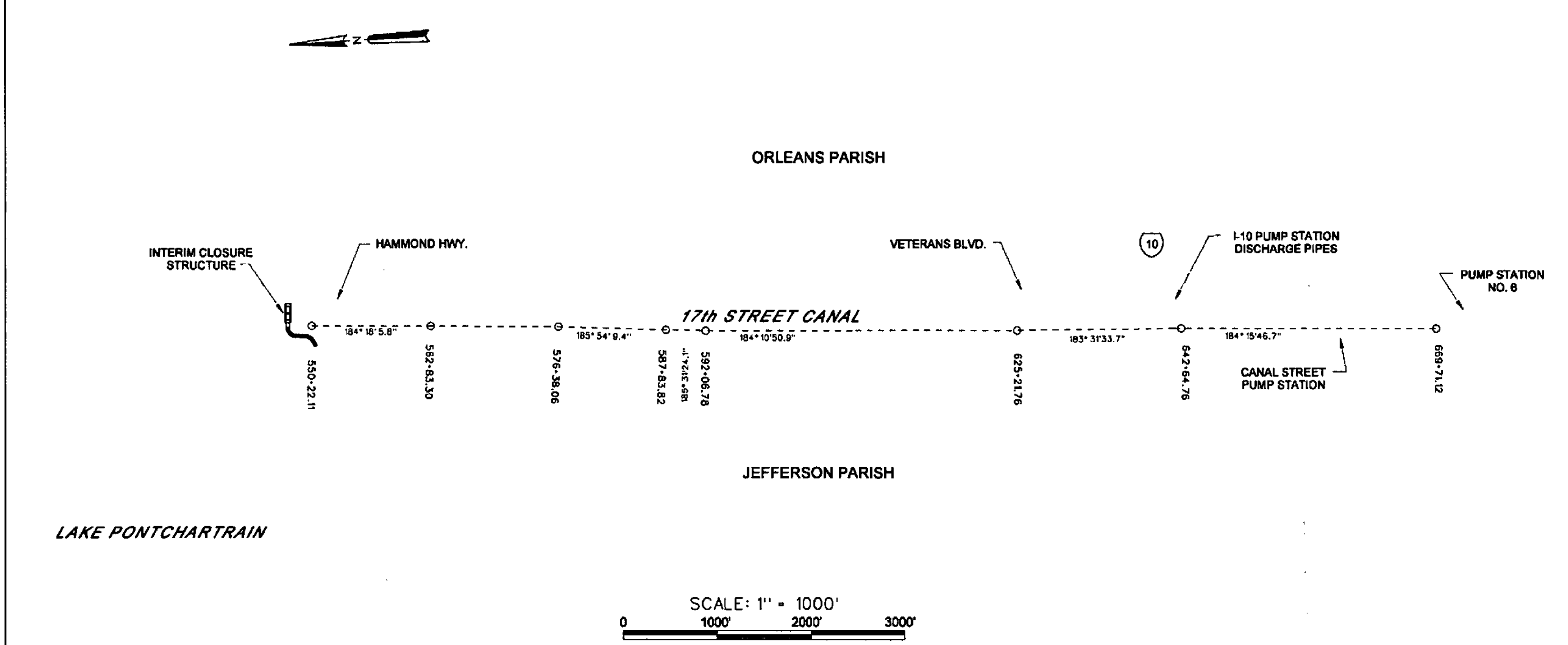


Figure 1: 17th Street Canal Study Area

It should be remembered that design pump capacities stated here represent optimal operation under ideal conditions. The actual quantity of water moved by any pump in the real world varies and can be severely reduced for a variety of reasons, including but not limited to: pumping against higher head pressures, limitations to flow of water arriving at the pump intakes, and reduction or loss of power to the pumps.

Levees and Floodwalls

The canal levees and floodwalls were constructed over several decades as a result of private and government projects intended to improve drainage and prevent storm surge intrusion. These structures stand on both sides of the canal. They tie to DPS6 at the southern end of the canal and merge with lakefront levees at Lake Pontchartrain.

From DPS6 to the area near the Interstate 10 Bridge over the canal, a length of approximately 3,167 feet, the canal's sides are formed by an earthen levee with a wall constructed on top of the canal embankment. The wall adds approximately 4 feet to the height of protection. Recent surveys measured the top of wall elevations at 13.3 NAVD88 (2004.65) for most of this section. The canal is approximately 220 feet wide measured from face to face of the constructed floodwall along most of its length.

From the Interstate 10 Bridge to the Veterans Boulevard Bridge, a length of approximately 1,438 feet, the canal's sides are formed by an earthen levee with a wall constructed at the top of the canal embankment. The wall raises the overall height of protection by about 5 feet. Recent surveys show the top of wall elevation at 12.8 NAVD88 (2004.65) for most of this section. The canal is approximately 200 feet wide measured from face to face of the constructed floodwall along most of this length.

From the Veterans Boulevard Bridge to the canal's terminus at Lake Pontchartrain, a length of approximately 8,000 feet, the canal's sides are formed by an earthen levee with a wall constructed on top of the canal embankment. The wall adds approximately 8.5 feet to the height of the protection. The top of wall elevation through most of this section ranges from 11.9 to 12.6 NAVD88 (2004.65) according to recent surveys. The canal is approximately 200 feet wide measured from face to face of the constructed floodwall along most of this length.

Damage during Hurricane Katrina

Approximately 453 linear feet of floodwall and levee was breached during Hurricane Katrina. The repaired section consists of 694 linear feet of T-wall founded on steel H-piles. The new wall is located on the east side of the canal just south of the bridge at Hammond Highway near Lake Pontchartrain. The repaired section includes a sheet pile cutoff wall to a minimum depth of (-)55.0 NAVD88 (2004.65).

Several field investigations have uncovered no evidence of distress other than at the breach noted above. This included a visual inspection conducted soon after Hurricane Katrina by the Metairie consulting firm of Linfield, Hunter and Junius. After their inspection team had walked both sides of the 17th Street Canal floodwalls, the only item of concern noted in their report of November 21, 2005 was the presence of trees and vegetation growing close to the levee.

There were media reports in early 2006 that floodwalls on the Jefferson Parish side of the canal appeared to be leaning. Again, field investigators were dispatched and found no evidence of distress in the floodwalls. It is likely the reports of leaning were the result of mistaking the slight jogs of the floodwall alignment as evidence of damage. Design documents for the floodwall show that the wall is not laid out in a perfectly straight line. The wall turns at four locations on the Jefferson Parish side between Lake Pontchartrain and Veterans Boulevard, rotating almost 2 degrees to the west and then back again.

Interim Closure Structure

In 2006, the Corps constructed a gated Interim Closure Structure near the confluence of each canal with Lake Pontchartrain. These steel structures have a series of panel gates that will be open under normal conditions and closed during rising Lake Pontchartrain tide or impending tropical storm activity. These "interim" gates are intended to serve until permanent gates and pump stations, already authorized by Congress, are designed and constructed.

The 17th Street Canal Structure consists of 11 vertical lift gates approximately 12 feet wide by 27 feet in height. In the event the Interim Closure Structure must be closed, the canal will become a detention pond with three pump stations and rainfall contributing water and the Interim Closure Structure Pump Station evacuating water. The completed pump array will include 12 60-inch pumps.

As of March 16, 2007, the reported drainage capacity of the Interim Closure Structure was 4,060 cfs. The target design capacity for the completed structure is 7,600 cfs.

Operational Scenarios

Water levels in the outfall canal are affected by two components: pumps and tides. When the gates of the Interim Closure Structure are open to Lake Pontchartrain, water levels in the canal will, at a minimum, match the water level of the lake. As water is discharged into the canal by each of the three drainage pump stations along its length, water levels in the immediate area of the pump stations will rise and gradually flow toward the lower water levels at Lake Pontchartrain.

The Interim Closure Structure is designed to block the entrance of high tides driven by tropical storm events. The decision to close the gates is dependent on a variety of operational and safety requirements driven primarily by predicted storm stage, observed stages, and wind speed at the gates. In general, the gates would be closed when the predicted stage in Lake Pontchartrain is expected to approach or exceed elevation 6 NAVD88 (2004.65). With such a forecast of high water, the gates would be closed several hours ahead of the tropical storm landfall in accordance with the Operations Manual for the Interim Closure Structure.

Reviewing the meteorological history of Lake Pontchartrain, it is observed that only three storm events have occurred in the past 75 years that would have triggered closing the gates as they are currently operated.

Data Collection

Dozens of soil samples were collected throughout the study area and subjected to soil laboratory testing. This included 47 continuous undisturbed 5-inch diameter borings taken in the levee centerline, at the levee toe and in the canal. The field exploration also utilized geoprobes and piezometers. Soil sample details and test results are included in the Geotechnical Analysis section of this report.

Engineers collected and reevaluated historical soil data for use in this report as well, including soil profiles developed for Design Memorandum No. 20 General Design dated March 1990.

REPORT OF FINDINGS

Hydraulic Investigation

Water surface profiles were computed using HEC-RAS, a computer program developed by the Corps of Engineers Hydrologic Engineering Center (HEC) as a River Analysis System (RAS) tool. This widely-used program models the hydraulics of open channel flows such as rivers and canals.

The numerical model for the canal was created using cross sectional data obtained from multi-beam surveys collected in March 2006. Surveys of the bridge sections and channel cross sections beneath the bridges were performed in December 2006. All survey data imported into the hydraulic model is referenced to NAVD88 datum using Corps of Engineers validated staff gages established on the epoch date 2004.65.

The HEC-RAS model was calibrated using gauge readings collected during a rainfall event on December 30, 2006. More details of the modeling and calibration are included in the Hydraulic Analysis section of this report.

The hydraulic modeling effort consisted of modeling nine different discharge pump configurations, which are representative of the range of pump discharges into the 17th Street Outfall Canal. The nominal discharges ranged from 1,840 cfs to the full pump capacity of 10,500 cfs as summarized in Table 1.

With the gates of the Interim Closure Structure open, water level in the canal is directly related to the tide in Lake Pontchartrain. Thus, in addition to the nine discharge scenarios noted above, modeling included six scenarios for the lake stage. The modeled boundary conditions of lake stages included 0 to 5 feet NAVD88 (2004.65) at 1-foot increments.

Geotechnical Investigation

The ability of levees and floodwalls to safely withstand loading was examined in several ways. The examination included assessment of stability at both high and low water levels: examining the possibility of failure away from the canal with high water and into the channel at low water. The analysis also included checks for global stability, local stability, seepage under the levee and other tests as detailed in the Geotechnical Analysis section of this report.

The design parameters and criteria used in this report were developed with the input of members of Task Force Guardian, the Interagency Performance Evaluation Taskforce (IPET), USACE Mississippi Valley Division Headquarters, and engineers at St. Louis and New Orleans Districts. All of the results presented in this report were calculated using the Method of Planes slope stability analysis.

As this report was being finalized, HQ USACE updated the slope stability design criteria for hurricane protection system embankments. The new guidance directs use of the Spencer Method, which is the slope stability design technique used by IPET to analyze levees for their study and which was used to establish the initial safe water elevations in all three outfall canals. A reevaluation of the critical sections of the 17th Street Canal will be conducted using the new criteria and adjustments to the safe water elevation may be required.

The west side of the canal was divided into 18 design reaches, numbered 0 to 17, and the east side was divided into 16 reaches, numbered 18 to 31. Reaches were designated according to the location of new borings, physical boundaries, ground surface profiles or depth to the buried beach sand layer. Stationing used for tracking locations along the canal follows the baseline stations established for prior projects. The interim closure structure is located at about Station 547+75, and DPS6 is at about Station 673+00.

TABLE 1. Summary of Modeled Pumping Discharge Scenarios

PUMPING SCENARIO		ACTIVE PUMPS (TOTAL DISCHARGE)		
Scenario Number	Canal Nominal Discharge (cfs)	Pump Station No. 6	Canal St. Pump Station	I-10 Pump Station
1	10,500	2-90 cfs 4-250 cfs 2-550 cfs 5-1000 cfs 2-1100 cfs (9480 cfs)	4-40 cfs (160 cfs)	1-110 cfs 3-250 cfs (860 cfs)
2	9,500	2-90 cfs 4-250 cfs 2-550 cfs 4-1000 cfs 2-1100 cfs (8480 cfs)	4-40 cfs (160 cfs)	1-110 cfs 3-250 cfs (860 cfs)
3	8,500	2-90 cfs 4-250 cfs 2-550 cfs 3-1000 cfs 2-1100 cfs (7480 cfs)	4-40 cfs (160 cfs)	1-110 cfs 3-250 cfs (860 cfs)
4	7,500	2-90 cfs 4-250 cfs 2-550 cfs 2-1000 cfs 2-1100 cfs (6480 cfs)	4-40 cfs (160 cfs)	1-110 cfs 3-250 cfs (860 cfs)
5	6,500	2-90 cfs 4-250 cfs 2-550 cfs 1-1000 cfs 2-1100 cfs (5480 cfs)	4-40 cfs (160 cfs)	1-110 cfs 3-250 cfs (860 cfs)
6	5,400	2-90 cfs 4-250 cfs 2-550 cfs 1-1000 cfs 1-1100 cfs (4380 cfs)	4-40 cfs (160 cfs)	1-110 cfs 3-250 cfs (860 cfs)
7	4,050	2-90 cfs 3-250 cfs 2-550 cfs 1-1000 cfs (3030 cfs)	4-40 cfs (160 cfs)	1-110 cfs 3-250 cfs (860 cfs)
8	2,700	2-90 cfs 2-250 cfs 1-1000 cfs (1680 cfs)	4-40 cfs (160 cfs)	1-110 cfs 3-250 cfs (860 cfs)
9	1,840	2-90 cfs 2-250 cfs 1-1000 cfs [illegible]	4-40 cfs (160 cfs)	(0 cfs)

Allowable Water Elevations

The results of multiple evaluations are summarized in Tables 2 and 3. The values represent the safe water elevation for the various reaches evaluated geotechnically. The lowest elevation in each reach becomes the site-specific safe water elevation, or the Governing Elevation. The Governing Elevations along the length of the canal vary by location as can be seen graphically in Figures 2 and 3.

It is important to remember that the Governing Elevation is not the point at which the levee and wall fails; rather, it represents the maximum elevation which still satisfies the required factors of safety.

Figures 2 and 3 show the calculated hydraulic grade line overlain with the governing safe water elevations for the Jefferson and Orleans sides of the canal, respectively. The governing safe water elevation varies along the length of the canal, but remains constant under all hydraulic conditions. The hydraulic grade line varies according to the lake stage and the quantity of drainage water being pumped into the canal.

While modeling included nine different pump scenarios and six lake stages for a total 54 possible hydraulic grade lines, the one shown in the figures is derived from a lake stage of 3.0 and pumping at the theoretical maximum capacity with all pumps on of 10,500 cubic feet per second. Lake Pontchartrain only infrequently reaches a stage of 3.0, and a nominal discharge of 10,500 cfs is a rare and unusual event. While this scenario does not represent the most severe modeled, it illustrates the capacity of the existing canal to withstand even an extreme situation.

Complete results for all 54 hydraulic grade lines are tabulated by Lake Stage and pumping scenario starting on page 26 of this report.

It should also be noted that under the selected scenario, the operational safe water elevation is exceeded in the vicinity of DPS6. However, the graph also illustrates the location of the governing safe water elevation, so that more informed decisions can be made regarding the ongoing operation of the canal and efforts to improve its safety and efficiency.

BLE 2: Summary of Governing Conditions, 17th Street Canal, West Side (Jefferson Parish)

›ach	Station Range	Safe Water Elevation			GENERAL LOCATION
		Global Stability[1]	Seepage[2]	Wall Stability[3]	
0	Closure Structure to 552+21.5	13	13	8.5	
1	578+22.5 - 579+97.5	7.5	13	8.7	NEAR W ESPLANADE
2	554+50 - 558+50	11	13	9.3	
3	558+50 - 562+50	10.5	13	9.3	
4	562+50 - 564+50	13	13	9.8	
5	564+50 - 566+50	11.2	13	9.8	
6	566+50 - 571+45	11	13	8.7	
7	571+45 - 575+45	8.5	13	8.6	NEAR GENEVA ST
8	575+45 - 578+22.5	9	13	8.7	
9	579+97.5 - 582+60	9	13	8.5	
10	582+60 - 585+55	11.8	13	8.5	
11	585+55 - 588+70	12	13	8.5	
12	588+70 - 593+00	7.5	13	7.3	NEAR ROSEBUD ST
13	593+00 - 596+05	8	13	9.2	BETWEEN GEORGIA CT AND COTTON ST
14	596+05 - 617+00	11.8	13	9.2	
15	617+00 - 624+88	13	11.5	9.4	
	Veterans Bridge				
15	626+73 - 635+00	13	11.5	9.4	
16	635+00 - 638+94	10	8.6	13.8	
	I-10 Bridges				
16	642+64 - 658+00	10	8.6	13.8	
17	658+00 - 673+00	12.6	14	13.8	

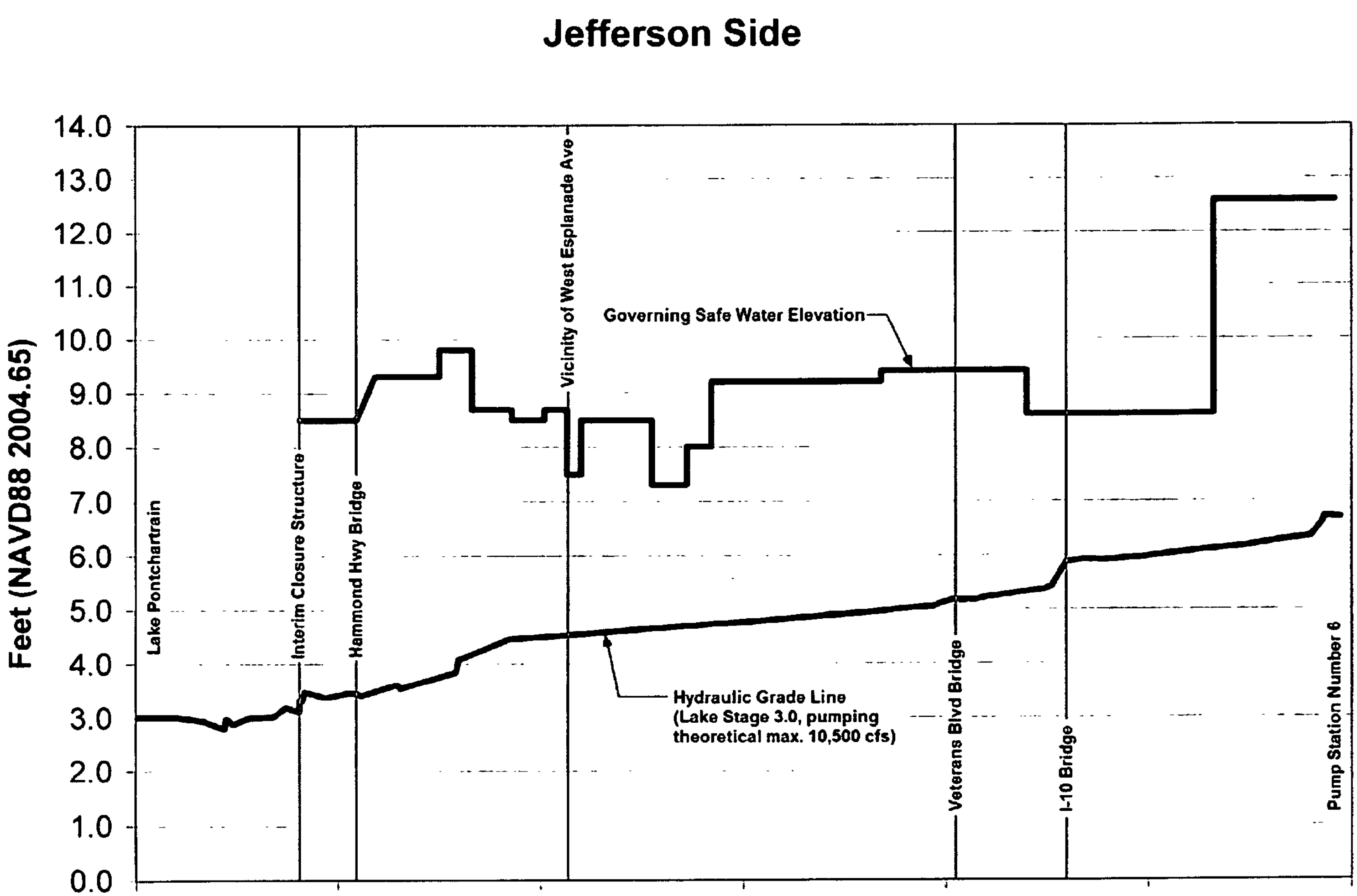
es:
ligh water global stability is a Method of Planes stability analysis of the embankment toward the protected side.
;eepage analysis assumes permeability through the canal.
ligh water wall stability is governed by either the penetration-to-head ratio (3-to-1 ratio of floodwall stickup to sheet pile penetration below ınd surface) or CWALSHT stability analyses of the wall only toward the protected side.
'levations shown in NAVD88 (2004.65).

BLE 3: Summary of Governing Conditions, 17th Street Canal, East Side (Orleans Parish)

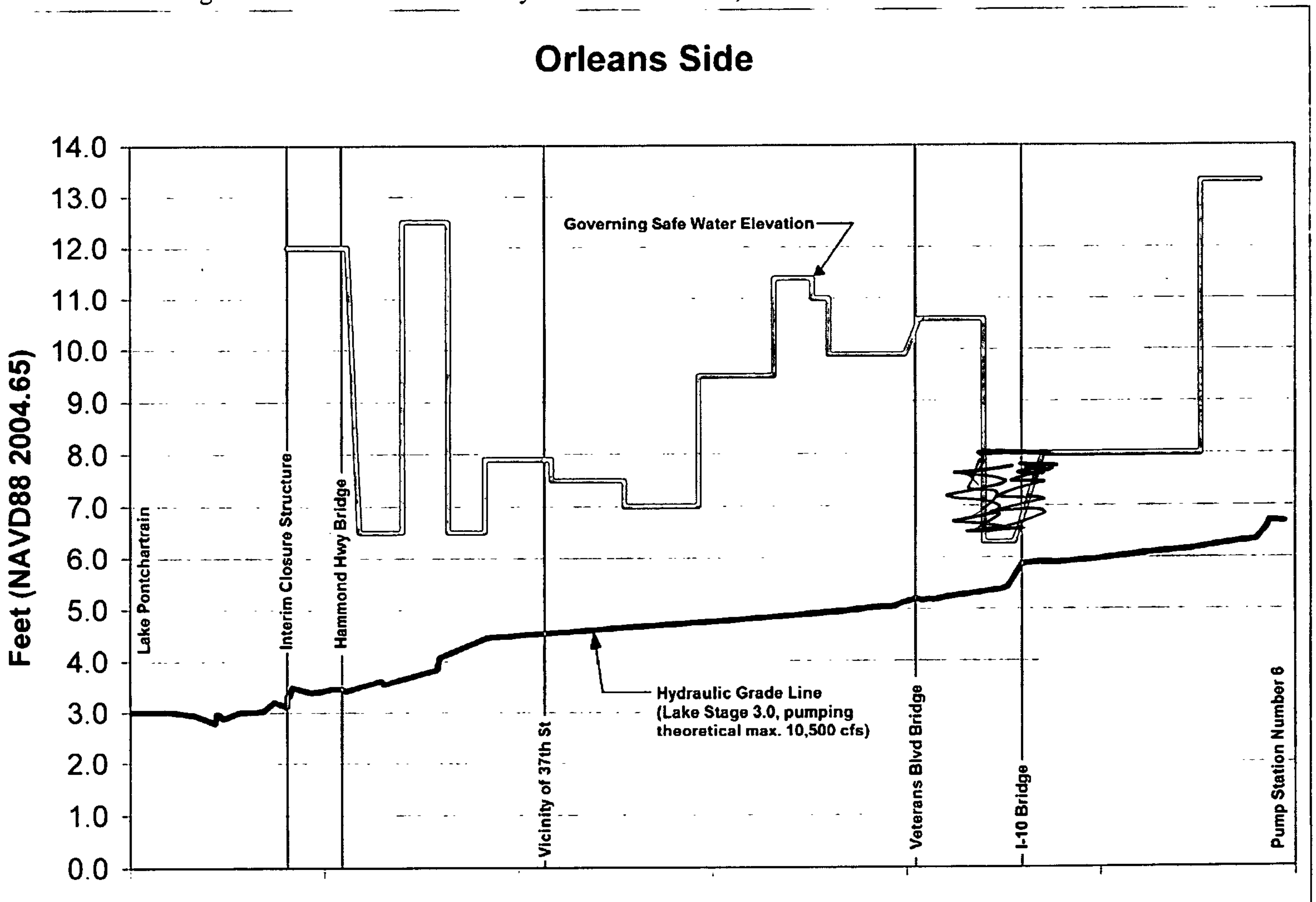
›ach	Station Range	Safe Water Elevation			GENERAL LOCATION
		Global Stability[1]	Seepage[2]	Wall Stability[3]	
18	Closure Structure to 553+00	12.8	13	12	
19	554+50 - 560+10	6.5	13	11.5	NEAR HAMMOND HWY
20	560+10 - 566+00	12.5	12.5	NA	INCLUDES REPAIRED BREACH LOCATION
21	566+00 - 570+73	6.5	13	9.8	AT 40TH STREET
22	570+73 - 579+27	7.9	13	9.8	
23	579+27 - 588+67	7.5	13	10	
24	588+67 - 598+24	7	13	10	
25	598+24 - 608+00	9.5	13	10	
26	608+00 - 612+92	12.8	13	11.4	
›6A	612+92 to 615+03	13	13	11	
›6B	615+03 to 617+81	12.9	13	9.9	
27	617+81 -624+88	9.9	13	11.2	
	Veterans Bridge				
28	626+73 to 635+00	12.8	11.4	10.6	
29	635+00 to 638+94	6.3	9	12.6	BETWEEN SHARON DR. AND WEST KENILWORTH ST
	I-10 Bridges				
30	642+64 to 662+87	10.4	8	13.8	
31	662+87 to 670+63	14	14	13.3	

es:
ligh water global stability is a Method of Planes stability analysis of the embankment toward the protected side.
›eepage analysis assumes permeability through the canal.
ligh water wall stability is governed by either the penetration-to-head ratio (3-to-1 ratio of floodwall stickup to sheet pile penetration below ınd surface) or CWALSHT stability analyses of the wall only toward the protected side.
-levations shown in NAVD88 (2004.65).

;URE 2: Governing Safe Water Elevation and Hydraulic Grade Line, Jefferson Side



URE 3: Governing Safe Water Elevation and Hydraulic Grade Line, Orleans Side



HYDRAULIC ANALYSIS

1. History

The 17th Street Outfall canal has served as one of the major drainage canals for the city of New Orleans and a portion of Jefferson Parish since it was dug in 1871. The original canal was fed by gravity drainage and was only 50 feet wide extending a length of about 3.0 miles. As the area developed the first portion of Pumping Station No. 6 was built in 1898. The capacity of the station was 1,000 cfs. Increasing development and the need for additional drainage for the protected area necessitated increases in station capacity. The station was expanded and more pumps were added on May 1914, May 1929, July 1967, again in1986, until the current total existing nominal capacity of the pumping station of 9,480 cfs. The pumping station has 15 pumps; two at 1,100 cfs, five at 1,000 cfs, two at 550 cfs, four at 250 cfs, and two at 90 cfs. The canal accepts precipitation runoff from approximately 11,700 acres (18 square miles) of highly urbanized drainage area. Of the drainage area, 82 percent lies in Orleans Parish with the remainder in adjoining Jefferson Parish.

In addition to Pump Station No. 6, two other pumping stations discharge into the 17th St. Outfall Canal. The Canal Street Pumping Station on the west bank in Jefferson Parish is located approximately 1,230 feet downstream of Pump Station No. 6, and the I-10 Pumping Station which discharges into the canal from the east bank in Orleans Parish at the south side of where Interstate Hwy 10 Bridge crosses the canal in New Orleans.

The Canal Street Pumping Station has an existing nominal capacity of 160 cfs; with four 40 cfs pumps. The I-10 Pumping Station has an existing nominal capacity of 860 cfs; with three 250 cfs pumps and one 110 cfs pump. The canal has over the years been enlarged and deepened to accommodate the increased pump capacity. The canal has average bottom and top widths of 40 feet and 200 feet, respectively. The average invert elevation varies approximately -18 ft NAVD88 (2004.65) at the pumping station to approximately –15 ft NAVD88 (2004.65) at Lake Pontchartrain.

2. Conveyance Characteristics

Outfall Canals such as the 17th Street canal are considered under two broad classifications: rapid flow and tranquil flow. The distinction between rapid and tranquil flow involves critical depth. In the case of the Outfall Canal the channel slopes are mild and critical depth is not achieved, thus flow is tranquil. The characteristics of tranquil flow in the Outfall Canal are subcritical velocities with Froude numbers less than 1 ($F < 1$) and invert slopes less than critical slope ($So < Sc$).

Since it is directly proportional to the discharge, Q, the conveyance of a channel section, K, is a measure of the carrying capacity of the channel section.

$$Q = KS^{1/2}$$

Where,

$K = (1.49/n)\ AR^{2/3}$
S = the slope of the water surface
n = the Manning coefficient of roughness
A = the cross-sectional area of flow
R = the hydraulic radius (=A/P)
P = wetted perimeter of cross-section

The Outfall Canal has a relatively large conveyance with mild water surface slopes and less than critical velocities. Width to depth ratios are also somewhat large varying between 10 and 15.

3. Numerical Modeling

Water surface profiles were computed using HEC-RAS steady state computer model Version 3.1.3. The cross section data was obtained from multi-beam surveys taken by the Army Corps of Engineers St. Louis District Motor Vessel Boyer in March of 2006. Surveys of the bridge sections and channel cross sections beneath the bridges were performed by Chustz Surveying Inc in December 2006. All survey data imported into the hydraulic model is referenced to NAVD88 datum using Corps of Engineers validated staff gages established on the epoch date 2004.65.

Values for Manning's "n" were as follows:

n= 0.020	main channel
n= 0.025	channel overbank

The HEC-RAS model was calibrated to a 30 December 2006 event. The calibration results are summarized in Table 4. The discharges at the pump stations were as follows:

DPS6	5,256 cfs
Canal St. PS	80 cfs
I-10 PS	100 cfs

The bridge contraction/expansion coefficients were set to 0.1 and 0.3 respectively. The table below lists the stages computed by the HEC-RAS model as well as the stages observed at the gage sites listed. The locations of the gages are listed in the Water Surface Elevation Tables.

TABLE 4. Calibration of numerical model to December 2006 rainfall event

Canal Stage In feet, NAVD88 (2004.65)		
Location	**Observed**	**Computed**
PS #6	2.76	3.15
Lemon	2.73	2.77
I-10	2.69	2.65
Cherry	2.46	2.38
Georgia	2.44	2.25
Geneva	2.48	2.19
ICS Canal-Side	1.76	1.71
ICS Lake-Side	1.58	1.60

4. Scenarios Modeled To Date

The hydraulic modeling effort consisted of modeling nine different discharge pump configurations, which are representative of the range of pump discharges into the 17th St. Outfall Canal. The nominal discharges were; 1840 cfs, 2700 cfs, 4050 cfs, 5400 cfs, 6500 cfs, 7500 cfs, 8500 cfs, 9500 cfs, and a full pump capacity of 10500 cubic feet per second.

Each discharge was modeled with outfall boundary conditions of lake stages at 0, 1, 2, 3, 4, and 5 feet NAVD88 (2004.65). The active pumps for each nominal discharge are shown in Table 1.

5. Water Surface Elevation Tables

Calculated water surface elevations are summarized in the tables which follow. The tables are organized by lake stage and nominal discharge from the canal.

17th Street Canal Analysis of Existing Conditions
Hydraulic Grade Line

otes: 8-May-07

All elevations in feet NAVD88 (2004.65)
All Interim Closure Structure Gates Open
See "Summary of Modeled Pumping Discharge Scenarios" table for pump configurations.

Water Surface Elevation with Lake Stage 0.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
ump Station No. 6	673+66	5.6	5.0	4.3	3.5	2.9	2.2	1.3	0.6	0.4
	671+81	5.6	5.0	4.3	3.5	2.9	2.2	1.3	0.6	0.4
R Bridge	671+67									
	671+41	5.6	4.9	4.3	3.5	2.9	2.2	1.3	0.6	0.4
	670+03	5.3	4.7	4.0	3.3	2.7	2.0	1.3	0.6	0.3
	667+53	5.2	4.6	4.0	3.2	2.6	2.0	1.2	0.6	0.3
anal St. Pump Station	661+53	5.0	4.4	3.8	3.0	2.5	1.9	1.1	0.6	0.3
emon gage	655+53	4.9	4.3	3.7	2.9	2.4	1.8	1.1	0.5	0.3
	649+53	4.8	4.2	3.5	2.8	2.3	1.7	1.0	0.5	0.2
	644+53	4.7	4.1	3.5	2.7	2.2	1.7	1.0	0.5	0.2
10 Pump Station	642+08	4.7	4.1	3.5	2.8	2.2	1.7	1.0	0.5	0.2
	640+00	4.7	4.1	3.5	2.7	2.2	1.6	1.0	0.5	0.2
10 Bridge	639+90									
	638+07	4.3	3.8	3.2	2.7	2.2	1.6	1.0	0.5	0.2
	637+22	4.2	3.7	3.2	2.7	2.2	1.6	1.0	0.5	0.2
	630+37	4.0	3.5	3.0	2.5	2.0	1.5	0.9	0.5	0.2
	628+57	3.9	3.4	2.9	2.4	2.0	1.5	0.9	0.4	0.2
	627+85	3.9	3.4	2.9	2.5	2.0	1.5	0.9	0.4	0.2
	626+99	3.9	3.4	2.9	2.4	2.0	1.4	0.9	0.4	0.2
	626+31	3.9	3.5	3.0	2.5	2.0	1.5	0.9	0.4	0.2
eterans Bridge	626+21									

Water Surface Elevation with Lake Stage 0.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	624+46	3.8	3.4	2.9	2.4	1.9	1.4	0.9	0.4	0.2
	623+54	3.8	3.3	2.8	2.3	1.9	1.4	0.8	0.4	0.2
	621+00	3.7	3.3	2.8	2.3	1.9	1.4	0.8	0.4	0.2
	617+07	3.6	3.2	2.7	2.2	1.8	1.3	0.8	0.4	0.2
:herry gage	611+07	3.5	3.1	2.6	2.2	1.7	1.3	0.8	0.4	0.2
	605+07	3.4	3.0	2.5	2.1	1.7	1.2	0.7	0.4	0.2
	601+07	3.3	2.9	2.5	2.0	1.6	1.2	0.7	0.3	0.2
	595+07	3.3	2.8	2.4	2.0	1.6	1.1	0.7	0.3	0.2
;eorgia gage	589+07	3.2	2.7	2.3	1.9	1.5	1.1	0.6	0.3	0.2
	583+07	3.1	2.6	2.2	1.8	1.4	1.0	0.6	0.3	0.1
;eneva gage	577+07	3.0	2.6	2.2	1.8	1.4	1.0	0.6	0.3	0.1
	571+07	2.9	2.5	2.1	1.7	1.3	1.0	0.6	0.3	0.1
	565+07	2.2	1.9	1.5	1.2	1.0	0.7	0.4	0.2	0.1
	564+86	2.2	1.9	1.5	1.2	0.9	0.7	0.4	0.2	0.1
	564+54	1.8	1.6	1.3	1.0	0.8	0.6	0.3	0.2	0.1
	559+07	1.3	1.1	0.9	0.7	0.5	0.4	0.2	0.1	0.1
	557+68	1.0	0.9	0.7	0.6	0.4	0.3	0.2	0.1	0.0
	557+36	1.1	1.0	0.8	0.6	0.5	0.3	0.2	0.1	0.0
	552+77	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.0
;ammond Hwy Bridge	552+27									
	551+12	0.8	0.7	0.6	0.4	0.3	0.2	0.1	0.1	0.0
	549+44	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.0
	548+29	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.0
	545+86	0.9	0.7	0.6	0.5	0.3	0.2	0.1	0.1	0.0
:S - Canal Side	545+56	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.0
ıterim Closure Structure	545+26									
	545+16	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0
	545+07	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0

Water Surface Elevation with Lake Stage 0.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	543+59	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0
	542+19	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	541+27	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
:S - Lake Side	539+57	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	539+11	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	537+06	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0
	536+42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	536+22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	536+01	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	0.0	0.0
	533+41	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
	531+01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	530+01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	529+01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	528+01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	521+51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	517+01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	512+51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	508+01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	503+51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	499+01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	494+51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	490+01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	485+51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ake Pontchartrain	481+01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

17th Street Canal Analysis of Existing Conditions
Hydraulic Grade Line

!otes: 8-May-07

. All elevations in feet NAVD88 (2004.65)
. All Interim Closure Structure Gates Open
. See "Summary of Modeled Pumping Discharge Scenarios" table for pump configurations.

Water Surface Elevation with Lake Stage 1.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
'ump Station No. 6	673+66	5.9	5.2	4.6	3.9	3.3	2.7	2.0	1.5	1.3
	671+81	5.9	5.3	4.6	3.9	3.3	2.7	2.0	1.5	1.3
:R Bridge	671+67									
	671+41	5.9	5.2	4.6	3.9	3.3	2.7	2.0	1.5	1.3
	670+03	5.6	5.0	4.4	3.7	3.1	2.6	2.0	1.5	1.3
	667+53	5.5	4.9	4.3	3.6	3.1	2.5	1.9	1.5	1.2
;anal St. Pump Station	661+53	5.3	4.7	4.2	3.5	3.0	2.4	1.9	1.4	1.2
emon gage	655+53	5.2	4.6	4.1	3.4	2.9	2.4	1.8	1.4	1.2
	649+53	5.1	4.5	4.0	3.3	2.8	2.3	1.8	1.4	1.2
	644+53	5.0	4.4	3.9	3.2	2.8	2.3	1.8	1.4	1.2
10 Pump Station	642+08	5.0	4.5	3.9	3.2	2.8	2.3	1.8	1.4	1.2
	640+00	5.0	4.4	3.9	3.2	2.7	2.3	1.8	1.4	1.2
10 Bridge	639+90									
	638+07	4.6	4.1	3.6	3.2	2.7	2.3	1.8	1.4	1.2
	637+22	4.5	4.0	3.6	3.1	2.7	2.2	1.7	1.4	1.2
	630+37	4.3	3.9	3.4	3.0	2.6	2.2	1.7	1.3	1.2
	628+57	4.2	3.8	3.4	2.9	2.5	2.1	1.7	1.3	1.2
	627+85	4.3	3.8	3.4	3.0	2.5	2.1	1.7	1.3	1.2
	626+99	4.2	3.8	3.4	2.9	2.5	2.1	1.7	1.3	1.2
	626+31	4.3	3.8	3.4	3.0	2.6	2.1	1.7	1.3	1.2
'eterans Bridge	626+21									

Water Surface Elevation with Lake Stage 1.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	624+46	4.2	3.7	3.3	2.9	2.5	2.1	1.7	1.3	1.2
	623+54	4.1	3.7	3.3	2.9	2.5	2.1	1.6	1.3	1.1
	621+00	4.1	3.7	3.3	2.8	2.5	2.1	1.6	1.3	1.1
	617+07	4.0	3.6	3.2	2.8	2.4	2.0	1.6	1.3	1.1
:herry gage	611+07	3.9	3.5	3.1	2.7	2.3	2.0	1.6	1.3	1.1
	605+07	3.8	3.4	3.0	2.6	2.3	1.9	1.5	1.3	1.1
	601+07	3.7	3.3	3.0	2.6	2.3	1.9	1.5	1.3	1.1
	595+07	3.6	3.3	2.9	2.5	2.2	1.9	1.5	1.3	1.1
;eorgia gage	589+07	3.6	3.2	2.8	2.5	2.2	1.8	1.5	1.2	1.1
	583+07	3.5	3.1	2.8	2.4	2.1	1.8	1.5	1.2	1.1
;eneva gage	577+07	3.4	3.0	2.7	2.4	2.1	1.7	1.4	1.2	1.1
	571+07	3.3	3.0	2.6	2.3	2.0	1.7	1.4	1.2	1.1
	565+07	2.7	2.5	2.2	1.9	1.7	1.5	1.3	1.2	1.1
	564+86	2.7	2.4	2.2	1.9	1.7	1.5	1.3	1.1	1.1
	564+54	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.1	1.1
	559+07	2.0	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0
	557+68	1.8	1.7	1.6	1.4	1.3	1.2	1.1	1.1	1.0
	557+36	1.9	1.8	1.6	1.5	1.4	1.2	1.1	1.1	1.0
	552+77	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.1	1.0
;ammond Hwy Bridge	552+27									
	551+12	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0
	549+44	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.1	1.0
	548+29	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.1	1.0
	545+86	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0
:S - Canal Side	545+56	1.5	1.4	1.3	1.2	1.2	1.1	1.1	1.1	1.0
ıterim Closure Structure	545+26									
	545+16	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.0

Water Surface Elevation with Lake Stage 1.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	545+07	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.0
	543+59	1.3	1.3	1.2	1.2	1.1	1.1	1.1	1.0	1.0
	542+19	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0
	541+27	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0
;S - Lake Side	539+57	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	539+11	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	537+06	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0
	536+42	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	536+22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	536+01	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0
	533+41	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	531+01	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	530+01	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	529+01	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	528+01	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	521+51	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	517+01	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	512+51	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	508+01	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	503+51	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	499+01	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	494+51	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	490+01	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	485+51	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
ake Pontchartrain	481+01	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

17th Street Canal Analysis of Existing Conditions
Hydraulic Grade Line

lotes:

8-May-07

. All elevations in feet NAVD88 (2004.65)
. All Interim Closure Structure Gates Open
. See "Summary of Modeled Pumping Discharge Scenarios" table for pump configurations.

Water Surface Elevation with Lake Stage 2.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
ump Station No. 6	673+66	6.3	5.6	5.0	4.5	4.0	3.4	2.8	2.4	2.2
	671+81	6.3	5.6	5.1	4.5	4.0	3.4	2.8	2.4	2.2
:R Bridge	671+67									
	671+41	6.2	5.6	5.0	4.5	4.0	3.4	2.8	2.4	2.2
	670+03	5.9	5.4	4.8	4.3	3.8	3.3	2.7	2.3	2.2
	667+53	5.9	5.3	4.8	4.3	3.8	3.2	2.7	2.3	2.2
anal St. Pump Station	661+53	5.7	5.2	4.7	4.2	3.7	3.2	2.7	2.3	2.2
emon gage	655+53	5.6	5.1	4.6	4.1	3.6	3.1	2.7	2.3	2.2
	649+53	5.5	5.0	4.5	4.0	3.6	3.1	2.6	2.3	2.1
	644+53	5.4	4.9	4.4	4.0	3.5	3.0	2.6	2.3	2.1
10 Pump Station	642+08	5.4	4.9	4.4	4.0	3.5	3.0	2.6	2.3	2.1
	640+00	5.4	4.9	4.4	3.9	3.5	3.0	2.6	2.3	2.1
10 Bridge	639+90									
	638+07	5.0	4.5	4.1	3.7	3.4	3.0	2.6	2.3	2.1
	637+22	4.9	4.5	4.1	3.7	3.3	3.0	2.6	2.3	2.1
	630+37	4.7	4.3	4.0	3.6	3.2	2.9	2.5	2.3	2.1
	628+57	4.7	4.3	3.9	3.6	3.2	2.9	2.5	2.2	2.1
	627+85	4.7	4.3	3.9	3.6	3.2	2.9	2.5	2.2	2.1
	626+99	4.7	4.3	3.9	3.5	3.2	2.9	2.5	2.2	2.1
	626+31	4.7	4.3	3.9	3.6	3.2	2.9	2.5	2.2	2.1
'eterans Bridge	626+21									

Water Surface Elevation with Lake Stage 2.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	624+46	4.6	4.2	3.9	3.5	3.2	2.8	2.5	2.2	2.1
	623+54	4.5	4.2	3.8	3.5	3.1	2.8	2.5	2.2	2.1
	621+00	4.5	4.1	3.8	3.5	3.1	2.8	2.5	2.2	2.1
	617+07	4.4	4.1	3.7	3.4	3.1	2.8	2.5	2.2	2.1
herry gage	611+07	4.3	4.0	3.7	3.3	3.0	2.7	2.4	2.2	2.1
	605+07	4.3	3.9	3.6	3.3	3.0	2.7	2.4	2.2	2.1
	601+07	4.2	3.9	3.6	3.3	3.0	2.7	2.4	2.2	2.1
	595+07	4.1	3.8	3.5	3.2	2.9	2.7	2.4	2.2	2.1
eorgia gage	589+07	4.1	3.7	3.4	3.2	2.9	2.6	2.4	2.2	2.1
	583+07	4.0	3.7	3.4	3.1	2.8	2.6	2.4	2.2	2.1
eneva gage	577+07	3.9	3.6	3.3	3.1	2.8	2.6	2.3	2.2	2.1
	571+07	3.8	3.5	3.3	3.0	2.8	2.6	2.3	2.2	2.1
	565+07	3.4	3.1	2.9	2.7	2.6	2.4	2.2	2.1	2.1
	564+86	3.4	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2.1
	564+54	3.1	2.9	2.7	2.6	2.4	2.3	2.2	2.1	2.0
	559+07	2.8	2.6	2.5	2.4	2.3	2.2	2.1	2.1	2.0
	557+68	2.7	2.5	2.4	2.3	2.3	2.2	2.1	2.1	2.0
	557+36	2.8	2.6	2.5	2.4	2.3	2.2	2.1	2.1	2.0
	552+77	2.5	2.4	2.3	2.3	2.2	2.1	2.1	2.0	2.0
ammond Hwy Bridge	552+27									
	551+12	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.0	2.0
	549+44	2.5	2.4	2.3	2.3	2.2	2.1	2.1	2.0	2.0
	548+29	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.0	2.0
	545+86	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.0	2.0
S - Canal Side	545+56	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.0	2.0
terim Closure Structure	545+26									
	545+16	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0

Water Surface Elevation with Lake Stage 2.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	545+07	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0
	543+59	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0
	542+19	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	541+27	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
;S - Lake Side	539+57	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	539+11	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	537+06	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0
	536+42	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	536+22	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	536+01	1.8	1.8	1.9	1.9	1.9	1.9	2.0	2.0	2.0
	533+41	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	531+01	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	530+01	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	529+01	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	528+01	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	521+51	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	517+01	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	512+51	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	508+01	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	503+51	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	499+01	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	494+51	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	490+01	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	485+51	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ake Pontchartrain	481+01	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

17th Street Canal Analysis of Existing Conditions
Hydraulic Grade Line

8-May-07

!otes:
. All elevations in feet NAVD88 (2004.65)
. All Interim Closure Structure Gates Open
. See "Summary of Modeled Pumping Discharge Scenarios" table for pump configurations.

Water Surface Elevation with Lake Stage 3.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
ump Station No. 6	673+66	6.7	6.1	5.6	5.1	4.6	4.1	3.7	3.3	3.2
	671+81	6.7	6.2	5.6	5.1	4.6	4.2	3.7	3.3	3.2
:R Bridge	671+67									
	671+41	6.6	6.1	5.6	5.1	4.6	4.1	3.7	3.3	3.2
	670+03	6.3	5.9	5.4	4.9	4.5	4.1	3.6	3.3	3.1
	667+53	6.3	5.8	5.3	4.9	4.5	4.0	3.6	3.3	3.1
;anal St. Pump Station	661+53	6.2	5.7	5.2	4.8	4.4	4.0	3.6	3.3	3.1
.emon gage	655+53	6.1	5.6	5.2	4.7	4.3	4.0	3.6	3.2	3.1
	649+53	6.0	5.5	5.1	4.7	4.3	3.9	3.5	3.2	3.1
	644+53	5.9	5.5	5.0	4.6	4.2	3.9	3.5	3.2	3.1
·10 Pump Station	642+08	5.9	5.5	5.0	4.6	4.2	3.9	3.5	3.2	3.1
	640+00	5.9	5.4	5.0	4.6	4.2	3.9	3.5	3.2	3.1
10 Bridge	639+90									
	638+07	5.4	5.1	4.7	4.4	4.1	3.8	3.5	3.2	3.1
	637+22	5.4	5.0	4.7	4.4	4.1	3.8	3.5	3.2	3.1
	630+37	5.2	4.9	4.6	4.3	4.0	3.7	3.4	3.2	3.1
	628+57	5.2	4.9	4.5	4.2	3.9	3.7	3.4	3.2	3.1
	627+85	5.2	4.9	4.5	4.2	3.9	3.7	3.4	3.2	3.1
	626+99	5.2	4.8	4.5	4.2	3.9	3.7	3.4	3.2	3.1
	626+31	5.2	4.9	4.5	4.2	4.0	3.7	3.4	3.2	3.1
'eterans Bridge	626+21									

Water Surface Elevation with Lake Stage 3.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	624+46	5.1	4.8	4.5	4.2	3.9	3.7	3.4	3.2	3.1
	623+54	5.1	4.7	4.4	4.2	3.9	3.6	3.4	3.2	3.1
	621+00	5.0	4.7	4.4	4.2	3.9	3.6	3.4	3.2	3.1
	617+07	5.0	4.7	4.4	4.1	3.8	3.6	3.4	3.2	3.1
:herry gage	611+07	4.9	4.6	4.3	4.1	3.8	3.6	3.3	3.2	3.1
	605+07	4.8	4.5	4.3	4.0	3.8	3.5	3.3	3.2	3.1
	601+07	4.8	4.5	4.2	4.0	3.7	3.5	3.3	3.1	3.1
	595+07	4.7	4.5	4.2	3.9	3.7	3.5	3.3	3.1	3.1
;eorgia gage	589+07	4.7	4.4	4.1	3.9	3.7	3.5	3.3	3.1	3.1
	583+07	4.6	4.3	4.1	3.9	3.7	3.5	3.3	3.1	3.1
;eneva gage	577+07	4.5	4.3	4.0	3.8	3.6	3.4	3.3	3.1	3.1
	571+07	4.5	4.2	4.0	3.8	3.6	3.4	3.3	3.1	3.1
	565+07	4.1	3.9	3.7	3.6	3.4	3.3	3.2	3.1	3.0
	564+86	4.1	3.9	3.7	3.6	3.4	3.3	3.2	3.1	3.0
	564+54	3.8	3.7	3.6	3.4	3.3	3.2	3.1	3.1	3.0
	559+07	3.6	3.5	3.4	3.3	3.2	3.2	3.1	3.1	3.0
	557+68	3.5	3.4	3.3	3.3	3.2	3.1	3.1	3.0	3.0
	557+36	3.6	3.5	3.4	3.3	3.2	3.2	3.1	3.1	3.0
	552+77	3.4	3.3	3.3	3.2	3.1	3.1	3.1	3.0	3.0
;ammond Hwy Bridge	552+27									
	551+12	3.5	3.4	3.3	3.2	3.2	3.1	3.1	3.0	3.0
	549+44	3.4	3.3	3.3	3.2	3.1	3.1	3.1	3.0	3.0
	548+29	3.4	3.3	3.2	3.2	3.1	3.1	3.1	3.0	3.0
	545+86	3.5	3.4	3.3	3.2	3.2	3.1	3.1	3.0	3.0
:S - Canal Side	545+56	3.3	3.3	3.2	3.2	3.1	3.1	3.1	3.0	3.0
ıterim Closure Structure	545+26									
	545+16	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0

Water Surface Elevation with Lake Stage 3.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	545+07	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0
	543+59	3.2	3.2	3.1	3.1	3.1	3.1	3.0	3.0	3.0
	542+19	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	541+27	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
;S - Lake Side	539+57	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	539+11	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	537+06	2.9	2.9	2.9	2.9	3.0	3.0	3.0	3.0	3.0
	536+42	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	536+22	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	536+01	2.8	2.8	2.9	2.9	2.9	3.0	3.0	3.0	3.0
	533+41	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	531+01	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	530+01	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	529+01	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	528+01	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	521+51	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	517+01	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	512+51	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	508+01	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	503+51	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	499+01	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	494+51	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	490+01	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	485+51	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
ake Pontchartrain	481+01	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

17th Street Canal Analysis of Existing Conditions
Hydraulic Grade Line

8-May-07

lotes:
. All elevations in feet NAVD88 (2004.65)
.. All Interim Closure Structure Gates Open
. See "Summary of Modeled Pumping Discharge Scenarios" table for pump configurations.

Water Surface Elevation with Lake Stage 4.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
ump Station No. 6	673+66	7.2	6.7	6.2	5.7	5.3	5.0	4.6	4.3	4.1
	671+81	7.3	6.7	6.2	5.7	5.3	5.0	4.6	4.3	4.1
R Bridge	671+67									
	671+41	7.1	6.6	6.2	5.7	5.3	4.9	4.6	4.2	4.1
	670+03	6.9	6.4	6.0	5.6	5.2	4.9	4.5	4.2	4.1
	667+53	6.9	6.4	6.0	5.6	5.2	4.9	4.5	4.2	4.1
anal St. Pump Station	661+53	6.8	6.3	5.9	5.5	5.2	4.8	4.5	4.2	4.1
emon gage	655+53	6.7	6.2	5.8	5.4	5.1	4.8	4.5	4.2	4.1
	649+53	6.6	6.1	5.8	5.4	5.1	4.8	4.5	4.2	4.1
	644+53	6.5	6.1	5.7	5.4	5.0	4.7	4.4	4.2	4.1
10 Pump Station	642+08	6.5	6.1	5.7	5.4	5.0	4.7	4.4	4.2	4.1
	640+00	6.5	6.1	5.7	5.3	5.0	4.7	4.4	4.2	4.1
10 Bridge	639+90									
	638+07	6.0	5.7	5.4	5.1	4.9	4.6	4.4	4.2	4.1
	637+22	6.0	5.7	5.4	5.1	4.8	4.6	4.4	4.2	4.1
	630+37	5.9	5.6	5.3	5.0	4.8	4.6	4.3	4.2	4.1
	628+57	5.8	5.5	5.2	5.0	4.8	4.5	4.3	4.2	4.1
	627+85	5.8	5.5	5.2	5.0	4.8	4.5	4.3	4.2	4.1
	626+99	5.8	5.5	5.2	5.0	4.8	4.5	4.3	4.2	4.1
	626+31	5.8	5.5	5.3	5.0	4.8	4.5	4.3	4.2	4.1
'eterans Bridge	626+21									

Water Surface Elevation with Lake Stage 4.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	624+46	5.7	5.5	5.2	4.9	4.7	4.5	4.3	4.1	4.1
	623+54	5.7	5.4	5.2	4.9	4.7	4.5	4.3	4.1	4.1
	621+00	5.7	5.4	5.2	4.9	4.7	4.5	4.3	4.1	4.1
	617+07	5.6	5.4	5.1	4.9	4.7	4.5	4.3	4.1	4.1
herry gage	611+07	5.6	5.3	5.1	4.8	4.6	4.5	4.3	4.1	4.1
	605+07	5.5	5.3	5.0	4.8	4.6	4.4	4.3	4.1	4.1
	601+07	5.5	5.2	5.0	4.8	4.6	4.4	4.3	4.1	4.1
	595+07	5.4	5.2	5.0	4.7	4.6	4.4	4.2	4.1	4.1
ieorgia gage	589+07	5.4	5.1	4.9	4.7	4.6	4.4	4.2	4.1	4.1
	583+07	5.3	5.1	4.9	4.7	4.5	4.4	4.2	4.1	4.1
ieneva gage	577+07	5.2	5.0	4.8	4.6	4.5	4.4	4.2	4.1	4.1
	571+07	5.2	5.0	4.8	4.6	4.5	4.3	4.2	4.1	4.1
	565+07	4.9	4.7	4.6	4.4	4.3	4.2	4.1	4.1	4.0
	564+86	4.9	4.7	4.6	4.4	4.3	4.2	4.1	4.1	4.0
	564+54	4.7	4.5	4.4	4.3	4.3	4.2	4.1	4.1	4.0
	559+07	4.5	4.4	4.3	4.2	4.2	4.1	4.1	4.0	4.0
	557+68	4.4	4.4	4.3	4.2	4.2	4.1	4.1	4.0	4.0
	557+36	4.5	4.4	4.3	4.2	4.2	4.1	4.1	4.0	4.0
	552+77	4.4	4.3	4.2	4.2	4.1	4.1	4.1	4.0	4.0
ammond Hwy Bridge	552+27									
	551+12	4.4	4.3	4.3	4.2	4.1	4.1	4.1	4.0	4.0
	549+44	4.3	4.3	4.2	4.2	4.1	4.1	4.1	4.0	4.0
	548+29	4.3	4.3	4.2	4.1	4.1	4.1	4.1	4.0	4.0
	545+86	4.4	4.3	4.3	4.2	4.2	4.1	4.1	4.0	4.0
:S - Canal Side	545+56	4.3	4.2	4.2	4.1	4.1	4.1	4.1	4.0	4.0
iterim Closure Structure	545+26									
	545+16	4.1	4.1	4.1	4.0	4.0	4.0	4.0	4.0	4.0

Water Surface Elevation with Lake Stage 4.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	545+07	4.1	4.1	4.1	4.1	4.0	4.0	4.0	4.0	4.0
	543+59	4.2	4.1	4.1	4.1	4.1	4.0	4.0	4.0	4.0
	542+19	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	541+27	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
;S - Lake Side	539+57	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	539+11	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	537+06	3.9	3.9	3.9	4.0	4.0	4.0	4.0	4.0	4.0
	536+42	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	536+22	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	536+01	3.8	3.9	3.9	3.9	3.9	4.0	4.0	4.0	4.0
	533+41	3.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	531+01	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	530+01	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	529+01	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	528+01	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	521+51	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	517+01	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	512+51	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	508+01	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	503+51	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	499+01	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	494+51	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	490+01	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	485+51	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
ake Pontchartrain	481+01	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0

17th Street Canal Analysis of Existing Conditions
Hydraulic Grade Line

!otes: 8-May-07

. All elevations in feet NAVD88 (2004.65)
. All Interim Closure Structure Gates Open
. See "Summary of Modeled Pumping Discharge Scenarios" table for pump configurations.

Water Surface Elevation with Lake Stage 5.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
'ump Station No. 6	673+66	7.9	7.4	6.9	6.5	6.2	5.8	5.5	5.2	5.1
	671+81	7.9	7.4	7.0	6.5	6.2	5.8	5.5	5.2	5.1
:R Bridge	671+67									
	671+41	7.7	7.3	6.9	6.5	6.1	5.8	5.5	5.2	5.1
	670+03	7.6	7.1	6.7	6.4	6.0	5.7	5.4	5.2	5.1
	667+53	7.5	7.1	6.7	6.4	6.0	5.7	5.4	5.2	5.1
;anal St. Pump Station	661+53	7.4	7.0	6.6	6.3	6.0	5.7	5.4	5.2	5.1
emon gage	655+53	7.4	6.9	6.6	6.3	5.9	5.7	5.4	5.2	5.1
	649+53	7.3	6.9	6.5	6.2	5.9	5.6	5.4	5.2	5.1
	644+53	7.2	6.8	6.5	6.2	5.9	5.6	5.4	5.2	5.1
10 Pump Station	642+08	7.2	6.8	6.5	6.2	5.9	5.6	5.4	5.2	5.1
	640+00	7.2	6.8	6.5	6.2	5.9	5.6	5.4	5.2	5.1
10 Bridge	639+90									
	638+07	6.7	6.4	6.2	5.9	5.7	5.5	5.3	5.1	5.1
	637+22	6.7	6.4	6.1	5.9	5.7	5.5	5.3	5.1	5.1
	630+37	6.6	6.3	6.1	5.8	5.6	5.5	5.3	5.1	5.1
	628+57	6.5	6.3	6.0	5.8	5.6	5.4	5.3	5.1	5.1
	627+85	6.5	6.3	6.0	5.8	5.6	5.4	5.3	5.1	5.1
	626+99	6.5	6.3	6.0	5.8	5.6	5.4	5.3	5.1	5.1
	626+31	6.6	6.3	6.0	5.8	5.6	5.4	5.3	5.1	5.1
'eterans Bridge	626+21									

Water Surface Elevation with Lake Stage 5.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	624+46	6.4	6.2	6.0	5.8	5.6	5.4	5.3	5.1	5.1
	623+54	6.4	6.2	5.9	5.7	5.6	5.4	5.2	5.1	5.1
	621+00	6.4	6.1	5.9	5.7	5.6	5.4	5.2	5.1	5.1
	617+07	6.3	6.1	5.9	5.7	5.5	5.4	5.2	5.1	5.1
herry gage	611+07	6.3	6.1	5.9	5.7	5.5	5.4	5.2	5.1	5.1
	605+07	6.2	6.0	5.8	5.7	5.5	5.4	5.2	5.1	5.1
	601+07	6.2	6.0	5.8	5.6	5.5	5.3	5.2	5.1	5.1
	595+07	6.2	6.0	5.8	5.6	5.5	5.3	5.2	5.1	5.1
eorgia gage	589+07	6.1	5.9	5.7	5.6	5.4	5.3	5.2	5.1	5.0
	583+07	6.1	5.9	5.7	5.6	5.4	5.3	5.2	5.1	5.0
eneva gage	577+07	6.0	5.8	5.7	5.5	5.4	5.3	5.2	5.1	5.0
	571+07	6.0	5.8	5.6	5.5	5.4	5.3	5.2	5.1	5.0
	565+07	5.7	5.6	5.5	5.4	5.3	5.2	5.1	5.1	5.0
	564+86	5.7	5.6	5.5	5.4	5.3	5.2	5.1	5.1	5.0
	564+54	5.5	5.4	5.3	5.3	5.2	5.2	5.1	5.0	5.0
	559+07	5.4	5.3	5.3	5.2	5.2	5.1	5.1	5.0	5.0
	557+68	5.4	5.3	5.2	5.2	5.1	5.1	5.1	5.0	5.0
	557+36	5.4	5.4	5.3	5.2	5.2	5.1	5.1	5.0	5.0
	552+77	5.3	5.2	5.2	5.1	5.1	5.1	5.1	5.0	5.0
ammond Hwy Bridge	552+27									
	551+12	5.3	5.3	5.2	5.2	5.1	5.1	5.1	5.0	5.0
	549+44	5.3	5.2	5.2	5.1	5.1	5.1	5.1	5.0	5.0
	548+29	5.3	5.2	5.2	5.1	5.1	5.1	5.1	5.0	5.0
	545+86	5.4	5.3	5.2	5.2	5.1	5.1	5.1	5.0	5.0
S - Canal Side	545+56	5.2	5.2	5.1	5.1	5.1	5.1	5.1	5.0	5.0
terim Closure Structure	545+26									
	545+16	5.1	5.1	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Water Surface Elevation with Lake Stage 5.0

ANDMARK	STA.	CANAL NOMINAL DISCHARGE								
		10500 cfs	9500 cfs	8500 cfs	7500 cfs	6500 cfs	5400 cfs	4050 cfs	2700 cfs	1840 cfs
	545+07	5.1	5.1	5.1	5.0	5.0	5.0	5.0	5.0	5.0
	543+59	5.1	5.1	5.1	5.1	5.1	5.0	5.0	5.0	5.0
	542+19	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	541+27	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
;S - Lake Side	539+57	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	539+11	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	537+06	4.9	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	536+42	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	536+22	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	536+01	4.8	4.9	4.9	4.9	4.9	5.0	5.0	5.0	5.0
	533+41	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	531+01	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	530+01	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	529+01	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	528+01	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	521+51	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	517+01	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	512+51	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	508+01	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	503+51	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	499+01	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	494+51	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	490+01	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	485+51	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
ake Pontchartrain	481+01	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

GEOTECHNICAL ANALYSIS

1. GEOLOGY

a. General. The study area is an area of low relief ranging from near sea level to approximately -5 feet* in elevation. The entire study area is overlain by a thick layer of fill material except for the borings taken in the canal where the material at the surface consists of intergraded swamp and marsh deposits or the breakwater area where the material at the surface consists of lacustrine deposits (see Plates 6 and 7). The fill material ranges in thickness from just over 2 feet on the southern end of the study area and gradually thickens to 13 feet near Lake Pontchartrain. Lacustrine deposits in the breakwater area consist of silt with occasional shell fragments, average 2.5 feet thick, and range from -9 to -12 feet in elevation. Older lacustrine deposits underlie a layer of swamp and marsh deposits at this site (see Plate 7). Intergraded swamp and marsh deposits underlie the fill material and lacustrine deposits in the breakwater area. Marsh deposits consist of soft to very soft, organic, fat clay with high moisture content and occasional lenses and layers of soft to very soft, lean clay and peat. Swamp deposits consist of very soft to medium, organic, fat clay with high to moderate moisture content, wood, and occasional lenses and layers of soft to very soft, lean clay and peat. Swamp and marsh deposits average 10 feet thick and range in elevation from -4 to -28 feet. In the breakwater area swamp and marsh deposits average 3 feet thick and range in elevation from -1 to -4 feet. Lacustrine deposits underlie the swamp and marsh deposits and consist of soft to very soft, fat clay interbedded with occasional lenses of silty sand, silt, lenses and layers of soft to very soft lean clay, shells, and shell fragments. These deposits average 18 feet thick and range in elevation from -12 to -41 feet. The lacustrine deposits are thickest near the closure structure and breakwater areas and thin considerably on the south end of the eastbank profiles (see Plates 10 and 11). Beach deposits underlie the lacustrine deposits and consist of interbedded sand and silty sand with occasional shell fragments, lenses and layers of clayey sand, and rare lenses of very soft to stiff, fat clay and soft to very soft, lean clay. Beach deposits average 10 feet thick and range in elevation from -25 to -53 feet. Beach deposits gradually thicken toward the south end of the study area where these deposits reach 33 feet thick and range in elevation from -15 to -48 feet (see Plates 10 and 11). Bay-sound deposits underlie beach deposits and consist of interbedded, very soft to medium to occasionally stiff, fat clay with shell fragments and occasional lenses of sand, silt, and soft to medium, lean clay. Where the borings penetrate completely through bay-sound deposits, these deposits average 21 feet thick and range in elevation from -38 to -78. Pleistocene deposits underlie bay-sound deposits and consist of interbedded, stiff to very stiff, highly oxidized, fat and lean clays, silt, silty sand, and sand with occasional layers and lenses of clayey sand and shells. The surface of the Pleistocene deposits averages -62 feet in elevation and these deposits extend to an unknown depth. The profile south of I-10 differs only in that swamp deposits underlie the fill with beach deposits underlying the swamp deposits. The fill at this site averages 3 feet thick. The swamp deposits consist of organic, soft to stiff, fat clay of high to moderate moisture content, average 4 feet thick, and range in elevation from -4 to -10 feet. The surface of the beach deposits averages -10 feet in elevation and extends to an unknown depth. None of the borings taken for this study at this site penetrate completely through the beach deposits, but these deposits are estimated to be 35 feet thick. Beach deposits consist of sand with occasional shells and shell fragments. According to other sources, bay-sound deposits underlie the beach deposits and Pleistocene deposits underlie bay-sound deposits. The surface of the Pleistocene deposits is estimated at -65 feet in elevation at this site. Ground water is at or near the surface in this area. Deeper aquifers provide water for some industrial uses, but the 1,200 foot aquifer may contain too much salt for most uses. Long-term relative subsidence rates average approximately 0.5 ft/century in the study area. Future eustatic sea level rise is currently estimated to contribute an additional 1.3 ft/century to the relative subsidence rates (IPCC, 2001). Combined, the relative subsidence rate is estimated to be 1.8 feet over the next 100 years.

* All elevations are NAVD 88 (2004.65).

2. FOUNDATION INVESTIGATION AND ANALYSIS

a. General. This section includes the soils investigations and analysis for the existing I-type floodwalls in levees.

b. Field Exploration. Forty seven continuous undisturbed 5-inch diameter soil borings (Plate 16 to Plate 63) were made outside the limits of the breach area south of Hammond Highway. Borings 1-MKCU to 23-MKCU and boring 6-MKCU-R were taken in the levee centerline. Borings 1-MKTU to 23-MKTU were taken at the levee toe. Boring 24-MKTU was taken across Orpheum Ave in a vacant lot. Seventeen undisturbed borings were taken in the breach or canal between the breach and the lake. Borings B-8, B-9 and B-10 were taken in the canal between Hammond Highway and the lake in 2005. Borings B-8, B-9 and B-10 are undisturbed 3-inch diameter borings. Borings B-1(2006) through B-4(2006) were taken between Hammond Highway and the closure structure in 2006. Borings B-1(2005) to B-5(2005) were taken in the canal at the breach. Boring B-1 (2005), B-3(2005) and B-5(2005) are undisturbed five inch diameter borings. Borings B-6, B-7, B-12 and B-13(2005) were taken from the breach to Hammond Highway on the land side and are undisturbed five inch diameter borings. Two five-inch undisturbed borings 1-MKGU and 2-MKGU were taken near the closure gate. Two undisturbed 5-inch diameter borings 1-MKBU and 2-MKBU were taken in the lake north of the closure structure. Four borings B-5, B-6, B-7 and B-8 were taken in the canal north of the closure structure in 2006.

Twenty two geoprobes were taken. Geoprobes 1-MKG to 12-MKG (Plate 64) were taken at the Jefferson Parish levee land side toe between B/L Station 643+90.4 to B/L Station

650+30.76 and geoprobes 13-MKG to 18-MKG (Plate 64) were taken between B/L Station 654+65.77 to B/L Station 657+29.1. Geoprobes 8GC-17, 9GC-17, 10GC-17 and 11GC-17 (Plate 65) were taken in the canal centerline between B/L Station 654+98.63 to B/L Station 657+83.86. Pictures of the geoprobe samples are shown in the Appendix A. Seven geoprobes were taken at the east levee toe between B/L Stations 621+50 to 624+00 (Plate 66). The geoprobes were taken to determine the depth to the beach sand. The locations of the undisturbed borings and geoprobes are shown on Plate 2 to Plate 5. Borings 1-MKBU, 2-MKBU, 1-MKGU and 2-MKGU were not incorporated in the analyses of the floodwalls along the 17th St Canal but are included in the geological profiles and are shown Appendix A.

Seven piezometers (Table 6) were installed at five locations along the canal in the buried beach sand. Two of the piezometers were installed in peat layers. Piezometer locations are shown in Appendix A. These piezometers were monitored manually from January 19th 2006 to June 2006. Canal water level readings were taken from a gage located at the breach. From June 2006, five of the piezometers had level loggers installed and a level logger was placed in the canal to obtain continuous readings of the piezometers and canal water level (Plates 171 to 175). The level loggers were adjusted for barometric pressure. Thirty-two piezometers were installed for the Field Permeability Pump test that was performed on the Orleans Parish side. The piezometers were installed on both the Jefferson and Orleans Parish side of the canal. The piezometers installed for the Field Permeability Pump test were capped after the Field Permeability Pump test completion. Appendix A includes information on the Field Permeability Pump test piezometers locations.

c. Laboratory Tests. All samples obtained from borings were visually classified. Water content determinations were made on all cohesive soil samples. Unconfined compression (UC) shear tests, laboratory vane and Atterberg tests were made on selected samples of cohesive soils. Grain size analyses were made on selected samples of granular soils. Water content determinations, (UC) test results and the D10 determined from grain size analysis are shown adjacent to the logs on the boring profiles presented on Plate 16 to Plate 63. Unconsolidated – Undrained (Q), Consolidated Undrained (R) Consolidated Drained (S) shear tests and Consolidation (C) tests were made on representative soil samples. These tests are summarized on the boring logs shown on Plate 16 to Plate 63. Direct Simple Shear (DSS) tests were completed March 2007 and test results are shown in Appendix A. Table 7 is excerpted from a paper by Thomas L. Brandon, Noah D. Vroman and J. Michael Duncan "Evaluation of 17th St. Canal DSS data", and is shown in Appendix A. The individual shear strength data sheets are shown in Appendix A.

d. Design Shear Strength Parameters. Design shear strength parameters are shown either on the individual borings on Plates 16 to Plate 44 and Plates 49 to Plate 63 or are shown on Design Parameters' Plates 67 to Plate 73. Between the closure structure and Hammond Highway the design shear strength parameters from Design Memorandum No. 20 General Design Orleans Parish Jefferson Parish 17th St Outfall Canal (Metairie Relief) dated March 1990 were used. The shear strength parameters in Design Memorandum No. 20 included different values for centerline and toe strength in this area. Design shear strength parameters for the interior of the canal between the closure structure and Hammond Highway are shown on Plate 67 (west side canal), 68 (centerline of canal) and 69 (east side of canal). Between Hammond Highway and B/L Station 617+00 on the Jefferson Parish side the centerline and toe shear strength parameters are shown on borings 1-MKCU to 14-MKCU and 1-MKTU to 14-MKTU. Boring 24-MKTU shear strength parameters represent the conditions beyond the protected side levee toe. Between B/L Station 617+00 to approximately Station 670+00 (beginning of flood protection at Pumping Station No. 6.) on the Jefferson Parish side, the borings used from Design Memorandum No. 20 General Design were used along with borings 16-MKCU and 16-MKTU to determine the shear strength parameters (Plate 70). The borings were divided between centerline and toe borings and the elevations of the tests were adjusted 1.5 ft lower to account for the difference between the NGVD datum elevations that the original GDM borings were shown and NAVD88 2004.65 datum now being used. On the Orleans Parish side between Hammond Highway and the breach shear strength parameters for the centerline and levee toe are shown on Plates 71 and 72 incorporating the borings from the GDM and borings taken in 2005 after the breach.

The design strength parameters used for design of the T-wall at the breach are shown on the stability analysis Plate 94. Between the south end of the breach and Veterans Blvd on the Orleans Parish side of the canal, the design shear strength parameters are shown on the individual boring logs 17-MKCU to 23-MKCU for the centerline shear strength parameters and 17-MKTU to 23-MKTU for the levee toe shear strength parameters. Between Veterans Blvd and Station 670+00 (approximate beginning of Pumping Station No. 6 flood protection) Orleans Parish side the borings used from Design Memorandum No. 20 General Design were used along with borings 15-MKCU and 15-MKTU to determine the shear strength parameters (Plate 73). The borings were divided between centerline and toe borings and the elevations of the tests were adjusted 1.5 ft lower to account for the difference between the NGVD datum elevations that the original GDM borings were taken and NAVD88 2004.65 datum now being used.

Plotted on the individual boring logs for comparison purpose is su/p ratio of .24 using OCR=1.0. The OCR is greater than 1.0 in the desiccated soils but since the su/p ratio is being shown for comparison purposes no OCR was calculated in the desiccated soils. The basis of the design shear strengths in the clay soils in the report are Unconsolidated Undrained (UU) shear strength tests with Unconfined compression tests used to indicate trends. Failure is taken at the point of maximum axial stress for the Unconsolidated Undrained (UU) tests. For large strains a strain criterion of 15% was used according to EM 1110-2-1902 pages D-13 and D-14: "The ASTM Standard for Unconsolidated – Undrained shear tests suggest that the stress at 15 percent axial strain should be taken as the stress at failure if no peak is reached prior to that point (ASTM 1999)." The failure envelope for the three point (UU) tests were drawn so that the data from two-thirds of the tests lie at or above the failure envelope. The failure envelope for four tests (an additional test due to maximum axial stresses varying significantly from the two previous tests) varies so that the data from half the tests may lie at or above the failure envelope. Linear regression was used to determine the shear strengths. One point (UU)-tests were taken in borings in the canal between Hammond Highway and the closure structure (these boring logs and testing were taken by the soil mixing contractor) and for the reaches on the Orleans Parish and Jefferson side between Veterans Blvd and Pumping Station No. 6. The tests are identified as one point (UU) tests on the shear strength design plates. The shear strength design line in the clay soils shown on the individual boring logs and the design reaches is drawn to fit the data such that two-thirds of the tests lie above the design strength line and 1/3 below the design strength line however for some layers the shear strength design line may have 50% of the tests above and below the design strength line such as when four tests are in the layer. There are also some layers such as found in 23-MKCU a centerline levee boring that all the test data are below the design strength line. The shear test data for layer -17 to -20 are all in lean clay (CL6 < 50% clay) which shows increasing failure stress with increasing confining stress. The shear strength data for the corresponding toe boring 23-MKTU is higher (180 psf versus 175 psf) than the centerline test data between El. -17 NAVD and El. -20 NAVD. The design strength line for 23-MKCU is above the test data between El. -17 NAVD and El. -20 NAVD but below the toe strength test data and below the su/p ratio of .24 used by IPET at the 17th St Canal breach. A ground water elevation of -3.0 NAVD was used to determine the effective vertical stress. The groundwater elevation of -3.0 NAVD is considered to be conservative based on consolidation test data and piezometer data and will result in a lower shear strength based on using an undrained strength ratio. The shear strength parameters used in the buried beach sand are based on Design Memorandum No. 20 General Design and is conservative when compared to the values used by IPET (35° by IPET versus 30° in DM No. 20 General Design) The saturated unit weights were generally determined from either the median value or higher. All UU and UCT values were plotted on the borings or shear strength design plots. Boring 1-MKTU had an UU test at El. -31.8 NAVD that had lenses and areas of sands and shell fragments. The lenses and areas of sand give inaccurate shear strengths from UU tests. Boring 2-MKCU had an UU test at El. -63 NAVD that was in a CL-6 (Less than 50% clay. See Plate A for Soil Boring Legend and Appendix A for definition of CL-6). UU tests in low percentage clay test samples do not give accurate shear strengths indicative of the 0.08 undrained stress ratio for the UU test at El. -63 NAVD, boring 2-MKCU. Boring 2-MKTU had UU tests at El. -9.9 in a Peat and El. -18 in a CH that were lower than the design shear strength line and near the .24 undrained stress ratio shear strength line. A normal stress based on the maximum past pressure from two consolidation tests was plotted on the boring. Using the stress history from the consolidation test data a su/p line of .24 was constructed. A ground water elevation of -3.0 which is conservative was used. The UU test data at El. -9.9 and El. -18 are significantly below the su/p line based on the consolidation test data. Boring 6-MKCU had an UU test at El. -20.2 that was below the design shear strength line. The paper by Thomas L. Brandon, Noah D. Vroman and J. Michael Duncan, "Evaluation of 17th St Canal DSS data" estimated an undrained stress ratio of .27 by SHANSEP procedure between El. -20 and -37.5 which is higher than the UU test and higher than the design shear strengths used. Borings 6-MKCU UU test at El. -63.2, su/p of less than 0.1, 8-MKCU UU test at El. -64.3, su/p of less than .15 and 10-MKCU UU test at El. -57.2, su/p less than 0.1 had shear strengths considerably below the design strength line. Sample disturbance may have caused the low shear strength which according to Ladd and Foott, "New Design Procedure for Stability in Soft Clays"1, may result "in a decrease in su, the reduction typically ranging from 20% to 50% of the "perfect sample" strength." Boring 9-MKCU had a UU test at El. -26.3 that was below the design shear strength line. A paper by Thomas L. Brandon, Noah D. Vroman and J. Michael Duncan, "Evaluation of 17th St Canal DSS data" estimated an undrained stress ratio of .245 by SHANSEP procedure between El. -20 and -33 for boring 9-MKCU which is higher than the shear strengths used. The Recompression Method (Bjerrum, 1973) shows higher shear strength than the design shear strength shown on the boring. According to the authors "...if the soil deposit is normally consolidated and the correct shear strength is measured, this method could be used to determine the undrained strength ratio at the specimen depth, and this ratio could be used to determine the undrained shear strengths at other depths where the value of the OCR is the same." According to IPET the soil is normally deposited between El. -20 and El. -33 in and around the breach. Boring 9-MKCU had a UU test at El. -49.6 that was below the design shear strength line. The test sample contained areas and lenses of sand. Boring 9-MKTU had a UU test at El. -29.6 that was below the design shear strength line. The test sample contained lenses of sand. Of the four specimens tested at the same elevation the failure stresses for the samples were 224, 280, 857 and 893 psf. Two of the failure stresses are below the shear strength line of 250 psf and two of the failure stresses are above 250 psf. Boring 10-MKCU had a UU test at El. -57.2 that was below the design shear strength line and below the su/p line (su/p <.09). Sample disturbance may have caused the low shear strength which according to Ladd and Foott, "New Design Procedure for Stability in Soft Clays", may result "in a decrease in su, the reduction typically ranging from 20% to 50% of the "perfect sample" strength." *Reference: Ladd, C.C. and Foott, R. (1974) "New Design Procedure for Stability in Soft Clays", Journal Geotech. Engrg., Div., ASCE , 100(7) 763-786*

Boring 10-MKCU had a UU test at El. -61.2 that was below the design shear strength line and below the su/p line. The sample had slickenside. Boring 13-MKCU had a UU test at El. -12.6 that was below the design shear strength line and below the su/p line of .24. A paper by Thomas L. Brandon, Noah D. Vroman and J. Michael Duncan, "Evaluation of 17th St Canal DSS data" estimated an undrained stress ratio of .29 by SHANSEP procedure which is shown between El. -3 and -31 NAVD for boring 13-MKCU. Boring 13-MKCU had a UU test at El. -23.7 that was below the design shear strength line. The sample had slickenside. Boring 22-MKCU had an UU test at El. -44.9 NAVD that had lenses and areas of sands and shell fragments. The lenses and areas of sand give inaccurate shear strengths from UU tests. Boring 23-MKCU had an UU test at El. -53.3 NAVD (su/p =.14) that had areas of sands and shell fragments. The areas of sand give inaccurate shear strengths from UU tests. Plate 73 UU test between El. 1 and -1.0 has a shear strength of 114 psf based on four specimens tested at the same elevation. The test shown is in a CH2 (0 to 20% sand, 40 to 50% clay, the balance is silt). Neither the moisture contents for the four samples tested (26, 28.7, 35.1 and 36.1) nor the void ratios' (0.936, 1.07, 1.134 and 1.14) indicate very soft clay. The test was taken in fill material. The four samples had peak failure stresses of 188, 221, 486 and 591 psf.

e. Safe Water Elevation. Unlike a design report which presents a levee-I-wall design section which has an adequate Factor of Safety for the design water elevation, the report analyzes sections of the canal identifying the safe water elevation for the different analyses (underseepage, I-wall in levee stability [no gap and gap analysis], CWALSHT and penetration to head ratio). The safe water elevation for I-wall in levee stability may be higher in some reaches than underseepage but underseepage will limit the overall governing safe water elevation.

f. Piezometers and Ground water elevation.

(1) Plots of piezometer readings (SSP-1A, SSP-1B, SSP-2A, SSP-2B, SSP-3, SSP-5 and SSP-6) versus canal water level are shown in Appendix A. Just south of the breach piezometer SSP-1A is tipped in a peat in the Orleans parish levee centerline. Water continued to seep in the breach area after the sheet pile cofferdam was installed. Tests on salt content and chlorine level were done to compare the water seeping in the breach with the water from the canal during and after the sheet pile cofferdam were installed. The tests indicated that the seepage was from the canal. The piezometer readings have varied between El. -3 to -5 NAVD88. Additional tests done on the groundwater in piezometer SSP-1A tipped in a peat layer indicate that the water is not from the canal. Tests were also done during rainfall events of the seepage in the breach. The tests showed the salt content were less than canal water readings but higher than the readings in the peat layer.

(2) Piezometer SSP-2A is located at the Jefferson Parish side of the canal at the protected side levee toe. SSP-2A is tipped in a peat. The piezometer readings have varied between El. -5 to -6 NAVD88. Piezometer SSP-2A is surface mounted and it has been observed by personnel collecting the piezometer data that puddles were forming at the top of the piezometer but these spikes only occurred in June, July and August. It is possible that water entered the piezometers causing the spike in piezometer readings.

(3) Piezometer SSP-1B is tipped in the beach sand in the levee centerline south of the breach. The piezometer readings have varied between El. -6 NAVD and El. -7 NAVD. Piezometer SSP-2B is tipped in the beach sand at the Jefferson Parish side of the canal at the protected side levee toe. The piezometer readings have varied between El. -5 and El. -6 NAVD except for some spikes up to El. -3.0 NAVD. Piezometer SSP-2B is surface mounted and it has been observed by personnel collecting the piezometer data that puddles were forming at the top of the piezometer but these spikes only occurred in June, July and August.

(4) SSP-3 is located south of I-10 at the Orleans Parish side of the canal protected side levee toe. The piezometer is tipped in the beach sand. The piezometer readings have varied between El. -7 and El. -8 NAVD between January and July 2007.

(5) SSP-5 is located at the Jefferson Parish protected side levee toe between I-10 and Pumping Station No.6. The piezometer readings vary between El. -8 and El. -9 NAVD.

(6) SSP-6 is located at the Orleans Parish flood side levee crown. The piezometer is tipped in the beach sand. The piezometer readings vary between El. -7 and El -8 NAVD. Piezometers SSP-1A, SSP-1B, SSP-2A, SSP-2B and SSP-5 have level loggers that continuously record water levels in the peat and beach sand. The maximum recorded

canal water elevation from June 12th 2006 to December 9th 2006 has been El. 3.7 NAVD.

g. Underseepage. A pumping test was performed in March 2006 to determine the permeability of the beach sand aquifer. The final, design value of $150 \times 10^{-4}\ cm/sec$ was computed. Appendix A includes details on the pump test.

(1) Design Criteria. The underseepage analyses and assumptions made about the permeability of the aquifer and blankets, leakage potential of the top blanket, and other aspects were completed according to the methods and guidance in Mississippi Valley Division Regulation, DIVR 1110-1-400, Section 8, Part 6, Landside Seepage Berms for Mississippi River Levees. Other supporting information is obtained from the Mississippi River Valley levee studies outlined in TM-3-424, Investigation of Underseepage and Its Control, Lower Mississippi River; TM-3-430, Investigation of Underseepage Mississippi River Levees, Alton to Gale, Illinois, and EM-1110-2-1914, Design, Construction, and Maintenance of Relief Wells. Additional insights into design criteria were obtained from ETL-1110-2-569 Design Guidance for Levee Underseepage. The following design criteria were developed during a joint telephone conversation between TFG, IPET, MVD, CEMVS and CEMVN on 8 December, 2005 to define the DIVR-1110-1-400 Division Regulation.

1. Positive underseepage protection (landside seepage berms, relief wells, or cutoffs) shall be designed when the calculated landside toe gradient (without berms, wells or cutoffs) falls below a factor of safety of 1.6 with respect to the allowable gradient.

2. Seepage berms shall be designed to provide a factor of safety of 2.8 at the levee toe and 1.60 at the berm toe. Minimum berm thickness is 5-feet at the levee toe and minimum berm width is four times the differential head on the levee. An overbuild of 25% is applied to the berm thickness.

3. Relief wells shall be designed to provide a minimum factor of safety of 1.60 midway between the wells.

A. Seepage Analysis Design Parameters and Criteria.

(1) Aquifer Permeability: $150 \times 10^{-4}\ cm/sec$.

(2) Effective Entrance Conditions. In these analyses, the 17th St outfall canal is assumed to be directly connected to the underlying coarse-grained aquifer and is the source of any underseepage issues at the landside levee toes. The choice of entrance distance has a significant impact on the calculated landside toe gradients and the effective entrance distance is impacted by the depth of penetration of the canal into the aquifer and the soil conditions existent on the bottom of the canal.

outfall canals penetrate the aquifer to a very small degree. Also, canal centerline borings presented in the DMs define thicknesses of organic clay and vegetation (ranging from zero to 10-feet) existent in the canal bottoms at the time of the DMs. The recent surveys show accretions on the canal bottom, (data could be created by false echoes emanating from suspended sediments just above the canal bottom). In this analyses, where the canal bottom was sandy or the exploration identified only vegetation, or only 'soft black muck', or less than two feet of clayey material; an entrance distance of 250-feet was applied. Where the exploration identified more than two feet of clayey material in the bottom of the canal, the suitable X1 distance from Table 1 of DIVR 1110-1-400, Section 8, Part 6, Landside Seepage Berms for Mississippi River Levees was used. Table 1 of DIVR 1110-1-400 prescribes an X1 value of 600 feet for riverside blankets with less than 5-feet of clay. In these analyses, an X1 value of 500-feet was used for those reaches where the clay thickness in the canal was 2 to 3.5 feet thick. The values of effective entrance distance in Table 1 of DIVR 1110-1-400, assumes that the channel that fully penetrates the aquifer riverside of the levee and that there is an efficient hydraulic connection between the channel and the aquifer. It is recognized that since the outfall canals do not fully penetrate the aquifer riverside of the levee, the use of these X1 values will be conservative.

(3) Landside Blanket Thickness. In this method of analyses, the landside blanket thickness yields the greatest impact on the computed landside toe gradients. When at all possible, landside toe borings on the protected side were used to determine the blanket thicknesses 'zbl' and 'zt' because the toe boring provides a direct measurement of the blanket thickness. Substantial numbers of landside (protected side) toe borings were available only at the 17th Street west levees. Where toe borings were unavailable, the blanket thickness was inferred from levee centerline borings. In these instances, two methods were used to estimate the blanket thickness. The first method used the scaled thickness of 'artificial fill' shown on the geologic profiles. The field log for that boring was scrutinized, and any materials above that depth was ignored. Clays and silts remaining below the 'artificial fill' were considered as blanket material.

Another method was applied to centerline borings that included surveyed elevations at the top of the field-boring log. From this log, the elevation of the top of aquifer was determined. The blanket thickness was determined to be the difference between the top of aquifer and the landside ground surface elevations. In both cases, any wood and/or humus layers identified in the field boring logs were ignored in the blanket thickness computations.

(2) Geology and Topographic information. Geologic stratigraphic profiles, field logs, and laboratory testing information necessary to complete the analyses were obtained from the geotechnical and geological sections of Design Memorandum No. 20, 17th Street Outfall Canal, Volumes I and II, dated March 1990. New borings and geoprobes were also incorporated. Topographic information (height and width of levees, depth and width of canals, landside ground surface elevations, etc.) was obtained from surveys and aerial

imagery completed in 2005 and 2006. A water-based scanning survey over the entire length of 17th St outfall canal was reviewed . Additional surveys were performed every 25 ft on the east and west side of the 17th St Outfall Canal between B/L Station 644+00 to 650+00 and B/L Station 654+90 to B/L Station 657+40. See Appendix A for survey data. The "As Built Plans" of The Board of Levee Commissioners of the East Jefferson Levee District Contract 92-1 "17th St Canal West Side Levee Improvements" dated March 1992 shows a varying canal bottom between El. -18.5 NGVD at Hammond Highway to Veterans Blvd, El. -17.5 NGVD from Veterans Blvd. to I-10 and El. -16 to -17 NGVD from I-10 to the railroad bridge.

(3) Sedimentation. The post Katrina surveys show that the accretion has occurred in the canal. Between I-10 and the railroad bridge the lowest canal bottom elevation is El. -10 NAVD or over 7 ft. of sedimentation according to post Katrina surveys. Between Veterans Blvd and I-10 the canal bottom elevation is El. -14 to -18 NAVD or between .5 to 3 feet of sedimentation according to post Katrina surveys. Between the B/L Station 583+00 and Veterans Blvd the canal bottom elevation is El. -15 NAVD or higher about 4 feet of sedimentation according to post Katrina surveys. Between Hammond Highway Bridge and Station 583+00 the canal bottom is between El. -17.5 NAVD and El. -19.5 NAVD (at one location 120 ft south of Hammond the bottom elevation is -20.0 NAVD) about .5 ft to 2.5 ft of sedimentation. Since the surveys were taken 18-inches of riprap has been placed on the canal bottom from Hammond Highway to the south end of the breach.

(4) Results of Analyses. An Excel spreadsheet was used to complete all calculations. The calculated seepage gradients at the landside levee toe are shown for the maximum safe water elevation on Table 5. The most critical location for seepage on the 17th St Outfall canal is shared by opposite locations on the Orleans Parish side and Jefferson Parish side between B/L Station 644+00 to B/L Station 650+00 and B/L Station 654+90 to B/L station 657+40 due to thin landside blankets in borings B9 (West) and B10 (East).

h. I-Wall Levee Global Slope Stability. Global stability of the I-wall/levee was determined by the Method of Planes analysis (see Appendix A) for a minimum factor of safety of 1.3 (See EM1110-2-1913, Design and Construction of Levees, Table 6-1. Minimum Factors of Safety – Levee Slope Stability, Design Condition, End of Construction, Landside Slope Analyzed, Shear Strength, Q, Minimum Factor of Safety = 1.3) with respect to the design shear strength. Method of Planes varies the shear strength and unit weight linearly between horizontal points. Centerline shear strengths were assigned to a location at the levee crown. Toe strengths were assigned a location at the flood side toe and land side toe. The flood side toe was assumed to be near the waters edge. The design reaches along the Jefferson Parish side of the canal was divided according to new borings, physical boundaries, ground surface profiles or depth to the buried beach sand layer. Safe water elevation was determined for each design reach by raising the water elevation until a minimum global stability factor of safety of 1.3 was obtained. Plates 74 to 91 show the maximum safe water elevation on the Jefferson Parish side for global stability. Plates 92 to 105 show the maximum safe water elevation on the Orleans Parish side for global stability. Plates 106 to 123 show the maximum safe water elevation for the gap (tension crack on the flood side of the I-wall) on the Jefferson Parish side. Plates 124 to 138 show the maximum safe water elevation for the gap (tension crack on the flood side of the I-wall) on the Orleans Parish side.

The CWALSHT program was used to determine the tension crack depth by both the fixed and sweep methods utilizing a FS of 1.0. The deeper/lower elevation from the two analyses was used. If the crack ends only a few feet above the tip, then assume crack extends to tip. If the computed CWALSHT crack depth is above the sheet pile tip, compare the hydro-static water pressure to the at-rest lateral earth pressure ($\gamma_w \gamma_h$ vs. $\gamma_s h_s K_0$; where γ_s is the saturated unit weight of soil) and assume the crack will propagate to a point of equivalence. The crack may be assumed to be deeper for the seepage analyses but shall be limited in depth to a point no deeper than the sheet pile tip. For global stability, full hydrostatic head shall be used to the depth of the crack at the face of the I-wall (flood side). Protected side piezometric conditions used for stability analysis shall be based on seepage evaluation as described in paragraph g. For a full clay foundation, remove all soil above the tension crack tip on the flood side of the wall and check failure mechanisms in the vicinity of the tip at locations above and below the sheet pile tip for failure surfaces that are the most critical. Failure surfaces with lower factors of safety may exist if weaker layers are present near the sheet pile tip. Plates 139 to 170 show the flood side analysis based on a low water elevation of -2.0 NAVD (Except for Plate 158 which is the breach repairs. The breach repair section was checked for a low water elevation of -3.0 NAVD disregarding the sheet pile cutoff wall. The F.S. with water at El. -2.0 is greater than 1.3). The piezometric headline in the buried beach sand used in the slope stability analyses was elevation -3.0 NAVD for areas where the clay blanket was sufficient to preclude a connection between the canal and the buried beach sand layer. The piezometric surface in the beach sand used in the slope stability analyses for Reach 15, 16, 17, 27, 28, 29, 30 and 31 was based on DIVR 1110-1-400. Gap analyses are shown for reaches 16, 29 and 30 though the safe water elevation is not allowed to go above the levee crown thereby not allowing a gap to form and seepage to enter at the floodwall. Some of the toe borings on the Jefferson Parish side of the canal taken in 2006 had shear strengths that were higher than the centerline levee toe borings taken in 2006 below El. -20. The reasons may be due to (1) Orpheum Ave which parallels the levee and paved parking lots south of West Esplanade (2) the present flood wall is located on the flood side slope of the pre 1992 flood wall. The distance from the pre 1992 levee centerline to the present levee centerline varies. The pre 1992 levee is shown as El. 9.0 NGVD. A 1967 Preliminary Subsoils Investigation done for the Pontchartrain Levee District under direction of Department of Public Works State of Louisiana shows the levee crown varying from El. 9.5 MSL to El. 12.5 MSL (at south end of canal). USACE 1957 plans show a levee enlargement on the Jefferson Parish side to El 9.5 MSL with a levee crown 20 ft wide south of Hammond Highway. The 2006 toe borings were inside the 1957 levee section. There was no boring information 50 ft away from the existing levee toe except for boring 24-MKTU located in a vacant lot approximately 35 feet (varies) from the existing toe borings. Using an undrained strength ratio of .24 required the stress history at a location 50 feet from the existing toe borings. The following procedure was used in lieu of estimating the stress history of the soil 50 below El. -20 was used for the additional boring if the existing toe boring had higher shear strengths below El. -20. (2) The existing toe shear strength was assumed to apply to the edge of Orpheum Ave than vary linearly from the edge of Orpheum Ave to a point 50 feet from the existing levee toe. On the Orleans parish side all the toe borings had shear strengths that were equal or less than the centerline shear strengths below the elevation of desiccation. Method of Planes analysis requires the input of the cohesion at each stratum boundary and at the center of each stratum.

Spencer Procedure. Stability analyses were also performed by IPET/ERDC using the computer program UTEXAS4 Spencer's procedure. Spencer's procedure assumes all side forces have the same inclination and all requirements for static equilibrium are satisfied. IPET/ERDC performed analyses using Spencer's procedure at the breach and in areas adjoining the breach and on the west side of the canal opposite the breach. Those analyses are shown in the IPET report. A draft paper on the gap analysis (tension crack analysis) done by Thomas L. Brandon, Stephen G. Wright and J. Michael Duncan shows that at the breach the F.S. = 0.98 for the gap (tension crack) analysis with water at El. 10.0 NAVD88.

i. Cantilever I-Wall Stability. Cantilever I-wall stability was analyzed in accordance with the draft Hurricane Flood Protection Criteria dated 20 April 2006, shown in Appendix A.

General Design Guidance.

(1) Applicable Computer Software:
CE Sheet Pile Wall Design/Analysis Program, "CWALSHT"

(2) I-Wall Sheet Piling Tip Penetration

a. Use the CWALSHT program to determine the required tip by the fixed surface wedge method or Coulomb earth pressure coefficient method and the sweep search method with factors of safety applied to both active and passive soil parameters. The deeper computed tip elevation shall be used for design. The sweep method may not run for all cases. If the sweep method does not reach equilibrium, base the tip elevation on the fixed surface wedge method or Coulomb earth pressure coefficient method. No wall friction or adhesion was used in the determination of active or passive earth pressures.

Factor-of-Safety with Load Cases - (CWALSHT program determines depth of tension crack)

"Q" – shear strengths

1. FOS = 1.5; Water to Safe water elevation (SWE)

2. FOS = 1.5; Low Water for the Standard Project Hurricane bulkhead analysis if applicable

"S" – shear strengths (Consolidated drained strengths)

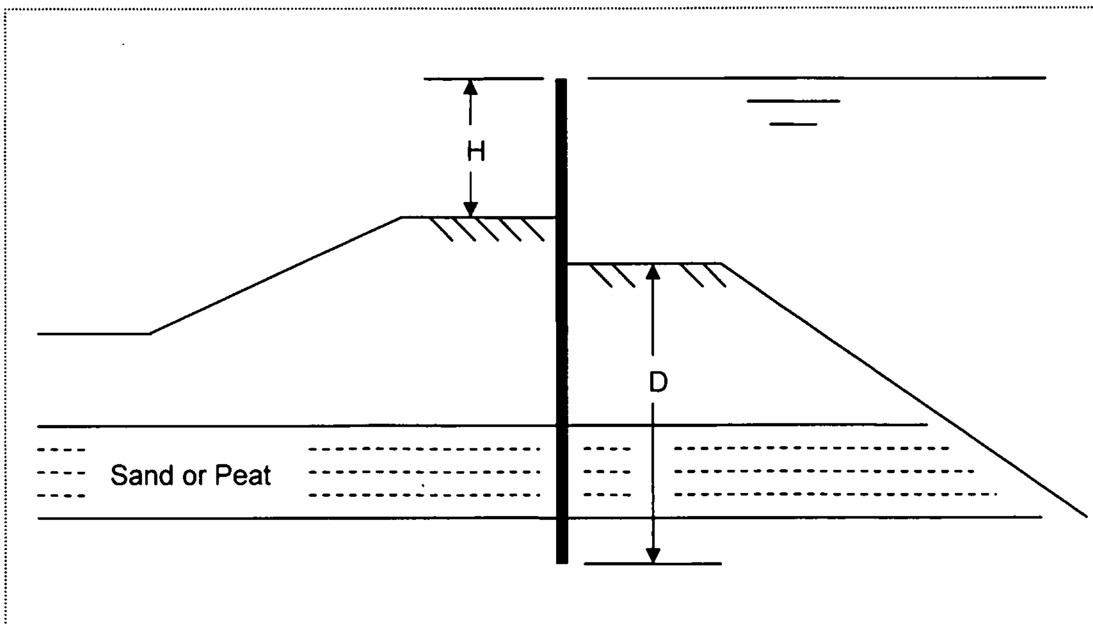
3. FOS =1.5; Normal low water (not SPH low water bulkhead analysis) if applicable

b. Minimum Tip Penetration. In some cases, especially Q-case penetrations derived for low heads, the theoretical required penetration could be minimal. In order to ensure adequate penetration to account for unknown variations in ground surface elevations and soil, the embedded depth (D) of the sheet pile shall be the greatest penetration of:

1. Three times the exposed height (H) on the protected side of the wall. The embedment of wall shall be based on the lower ground elevation against the wall as shown on the figure below. In the case shown, the lowest ground surface against the wall is on the flood side.

2. Ten feet below the lower ground elevation.

3. Additional depth determined by engineering judgment such selecting appropriate loading cases, penetration to head ratios and stickup ratios, and for extending sheet piling through very shallow sand or peat layers.



c. Seepage Analysis. The I-wall was analyzed for seepage erosion (piping). Analysis was based on water to the safe water elevation. This analysis can be performed by various methods such as flow nets, Harr's method of fragments, or finite element methods. The seepage analysis shall consider the tension crack which will shorten the seepage path. When the levee and foundation are constructed entirely of clay, the potential for developing a steady state seepage condition is negligible and need not be checked. If an aquifer is present close to the sheet pile tip (within about 5 ft as per general guidance), or if the sheet pile penetrates the aquifer, a standard seepage analysis as per DIVR-1110-1-400 should be used to design the seepage resistance of the embankment. In this case, the vertical distance between the tip and the aquifer would be considered to be the flood side blanket thickness. The head at the levee toe can then be calculated using DIVR-1100-1-400 to check for exit gradient and heave. Site specific exploration was performed for 17th St canal. North of Veterans Blvd. seven geoprobes were taken on 50 foot centers and the top of the sand stratum was well-defined. Seepage analysis as per DIVR-1110-1-400 was used to determine the seepage resistance for the shortened seepage path for the potential gap at the wall and with a two foot clay blanket in place. Seepage analysis should be checked in accordance with the applicable portions of EM 1110-2-1901.

d. Heave Analysis. The safety factor for a total weight analysis is 1.2. The tension crack shall be considered in this analysis. For tension cracks to the sheet pile tip elevation, the pressure at the sheet pile tip should be based on the full hydrostatic head.

e. Deflections. In accordance with the Draft criteria, deflections will be considered to be satisfactory when the exposed I-wall heights are limited to 6 feet.

j. Floodwall Inspection. Visual inspections were performed after Katrina on the levees and floodwalls along the 17th St Outfall Canal by USACE personnel. Two reports were made. The first report was for the entire hurricane inspection system and included the 17th St Canal. The second report was made specifically on the 17th St Canal and is included in Appendix A. Since those reports were made the vegetation in the interior of the canal has been removed. Subsequently the interior of the canal along the Jefferson side floodwall opposite of the breach has been inspected. The inspection showed no visual distress to the floodwall. The Orleans Levee District informed our office that a landowner requested permission to remove a bomb shelter located near the levee toe at Bellaire Dr. (pictures shown in Appendix A). We recommended that the landowner obtain a registered engineer and submit a plan to remove the bomb shelter. We recommend that surveys be periodically made of the interior of the canal. Most of the canal bottom of the 17th St canal has shown accretion since the excavation of the canal bottom. Between I-10 and Veterans Blvd is the only area that has shown little or no sedimentation.

Table 2.
17th Street Canal
Analysis of Existing Conditions
SUMMARY OF GOVERNING CONDITIONS
JEFFERSON SIDE

Station Range	Global Stability[1]	Seepage[2]	Wall Stability[3]	GENERAL LOCATION
	Safe Water Elevation	Safe Water Elevation	Safe Water Elevation	
Closure Structure to 552+21.5	13	13	8.5	
578+22.5 - 579+97.5	7.5	13	8.7	NEAR W ESPLANADE
554+50 - 558+50	11	13	9.3	
558+50 - 562+50	10.5	13	9.3	
562+50 - 564+50	13	13	9.8	
564+50 - 566+50	11.2	13	9.8	
566+50 - 571+45	11	13	8.7	
571+45 - 575+45	8.5	13	8.6	NEAR GENEVA ST
575+45 - 578+22.5	9	13	8.7	
579+97.5 - 582+60	9	13	8.5	
582+60 - 585+55	11.8	13	8.5	
585+55 - 588+70	12	13	8.5	
588+70 - 593+00	7.5	13	7.3	NEAR ROSEBUD ST
593+00 - 596+05	8	13	9.2	BETWEEN GEORGIA CT AND COTTON ST
596+05 - 617+00	11.8	13	9.2	
617+00 - 624+88	13	11.5	9.4	
Veterans Bridge				
626+73 - 635+00	13	11.5	9.4	
635+00 - 638+94	10	8.6	13.8	
I-10 Bridges				
642+64 - 658+00	10	8.6	13.8	
658+00 - 673+00	12.6	14	13.8	

vater global stability is a Method of Planes stability analysis of the embankment toward the protected side.

ıge analysis assumes permeability through the canal.

water wall stability was governed by either the penetration to head ratio (3 to 1 ratio of floodwall stickup to sheet pile penetration below ground or CWALSHT stability analyses of the wall only toward the protected side.

ıtions shown represent NAVD88

TABLE 3
17th Street Canal
Analysis of Existing Conditions
SUMMARY OF ANALYSES
ORLEANS SIDE

Wall Stability Analyses (CWALSHT)									Penetration to Head Analyses			
Reach	Station Range	Boring used	Station of Boring	Top Elevation *	Tip Elevation	Safe Water Elev for Stability (Q)	Factor of Safety for Low Water (Q)	Factor of Safety for Low Water (S)	Protected Side Ground Elev	Low Side Elev	Water Elevation	Resulting Pen to Head Ratio
18	Closure Structure to 553+00	See Table 3	See Table 3	13	-33.7	12	1.5	1.5	8	5	12.4	3
19	554+50 - 560+10	See Table 1	See Table 1	13	-18.5	13	1.5	1.5	5.5	-0.5	11.5	3
20	560+10 - 566+00	See T-wall Plate	See T-wall Plate	13	T-Wall	NA	NA	NA	NA	NA	NA	NA
21	566+00 - 570+73	23-MKCU	567+31.64	13	-18.5	13	1.5	1.5	4	-1	9.8	3
22	570+73 - 579+27	22-MKCU	574+14.12	13	-18.5	13	1.5	1.5	4	-1	9.8	3
23	579+27 - 588+67	17-MKCU	584+39.91	13.2	-18.5	13.2	1.5	1.5	4	-0.5	10	3
24	588+67 - 598+24	18-MKCU	592+95.23	13	-18.5	13	1.5	1.5	4	-0.5	10	3
25	598+24 - 608+00	19-MKCU	603+52.15	13	-18.5	13	1.5	1.5	4	-0.5	10	3
26	608+00 - 612+92	20-MKCU	612+46.98	13	-18.5	13	1.5	1.5	4.5	2	11.4	3
26A	612+92 to 615+03	20-MKCU	612+46.98	13	-17.5	13	1.5	1.45	4.5	2	11	3
26B	615+03 to 617+81	20-MKCU	612+46.98	13	-14	13	1.5	1.3	4.5	2	9.9	3
27	617+81 -624+88	21-MKCU	623+07.97	12.8	-14	12.8	1.5	1.5	5.5	3	11.2	3
	VETERANS BRIDGE											
28	626+73 to 634+09	See Table 2	See Table 2	12.8	-12.2	12.4	1.5	1.5	5.5	3	10.6	3
29	634+09 to 638+94	See Table 2	See Table 2	14.1	-5.2	14.1	1.5	1.35	9	5.5	12.6	3
	I-10 BRIDGES											
30	642+64 to 662+87	See Table 2	See Table 2	13.8	-3.2	13.8	1.5	1.5	10	10	13.8	3
31	662+87 to 670+63	See Table 2	See Table 2	14	-4.2	14	1.5	1.5	8.9	8.9	13.3	3

Minimal driving load on sheet
* Top elevation shown is for design purposes. Actual top elevation of the wall varies from EL 12.2 to 14.3

Global Stability Analyses (Method of Planes)						Low Water	High Water Elevation		
Reach	Station Range	Centerline Boring Used	Toe Boring Used	Station of Centerline Boring	Station of Toe Boring	Critical Factor of Safety	Normal Analysis	Tension Crack Analysis	Seepage
18	Closure Structure to 553+00	See Table 3	See Table 3	See Table 3	See Table 3	1.31	12.8	12.8	13
19	554+50 - 560+10	See Table 1	See Table 1	See Table 1	See Table 1	1.55	6.5	8.2	13
20	560+10 - 566+00	T-wall	T-wall	T-wall	T-wall	>1.3	12.5	12.5	12.5
21	566+00 - 570+73	23-MKCU	23-MKTU	567+31.64	566+50.72	1.83	7.5	6.5	13
22	570+73 - 579+27	22-MKCU	22-MKTU	574+14.12	574+40.74	2.38	9.0	7.9	13
23	579+27 - 588+67	17-MKCU	17-MKTU	584+39.91	584+88.61	1.73	7.5	7.8	13
24	588+67 - 598+24	18-MKCU	18-MKTU	592+95.23	593+21.94	1.80	7.0	7	13
25	598+24 - 608+00	19-MKCU	19-MKTU	603+52.15	603+19.11	1.78	10.5	9.5	13
26	608+00 - 612+92	20-MKCU	20-MKTU	612+46.98	612+03.2	2.29	13.0	12.8	13
26A	612+92 to 615+03	20-MKCU	20-MKTU	612+46.98	612+03.2	2.29	13.0	13	13
26B	615+03 to 617+81	20-MKCU	20-MKTU	612+46.98	612+03.2	2.29	13.0	12.9	13
27	617+81 -624+88	21-MKCU	21-MKCU	623+07.97	623+55.08	2.03	11.0	9.9	13
	VETERANS BRIDGE								
28	626+73 to 635+00	See Table 2	See Table 2	See Table 2	See Table 2	1.62	12.8	12.8	11.4
29	635+00 to 638+94	See Table 2	See Table 2	See Table 2	See Table 2	1.60	14.0	6.3	9
	I-10 BRIDGES								
30	642+64 to 662+87	See Table 2	See Table 2	See Table 2	See Table 2	1.44	13.8	10.4	8
31	662+87 to 670+63	See Table 2	See Table 2	See Table 2	See Table 2	1.32	14.0	14	14

Table 1. Borings Used from STA 554+50 to 560+10	
Centerline Boring	Toe Boring
60	6-MUE
62	B-6
64	B-7
66	B-12
68	B-13

Table 2. Borings Used from STA 626+73 to 670+63	
Centerline Boring	Toe Boring
2	
4	
6	
8	
10	
12	
18	
20	
22	
24	4-MUE
15-MKCU	15-MKTU

Table 3. Borings Used from Closure Structure to 553+00	
Centerline Boring	Toe Boring
12-U	1-UMP
-------	13-U

TABLE 4
17th Street Canal
Analysis of Existing Conditions
SUMMARY OF GOVERNING CONDITIONS
ORLEANS SIDE

Station Range	Global Stability[1]	Seepage[2]	Wall Stability[3]	GENERAL LOCATION
	Safe Water Elevation	Elevation	Elevation	
Closure Structure to 553+00	12.8	13	12	
554+50 - 560+10	6.5	13	11.5	NEAR HAMMOND HWY
560+10 - 566+00	12.5	12.5	NA	INCLUDES REPAIRED BREACH LOCATION
566+00 - 570+73	6.5	13	9.8	AT 40TH STREET
570+73 - 579+27	7.9	13	9.8	
579+27 - 588+67	7.5	13	10	
588+67 - 598+24	7	13	10	
598+24 - 608+00	9.5	13	10	
608+00 - 612+92	12.8	13	11.4	
612+92 to 615+03	13	13	11	
615+03 to 617+81	12.9	13	9.9	
617+81 -624+88	9.9	13	11.2	
VETERANS BRIDGE				
626+73 to 635+00	12.8	11.4	10.6	
635+00 to 638+94	6.3	9	12.6	BETWEEN SHARON DR. AND W. KENILWORTH ST
I-10 BRIDGES				
642+64 to 662+87	10.4	8	13.8	
662+87 to 670+63	14	14	13.3	

water global stability is a Method of Planes stability analysis of the embankment toward the protected side.

›age analysis assumes permeability through the canal.

water wall stability was governed by either the penetration to head ratio (3 to 1 ratio of floodwall stickup to sheet pile penetration below surface) or CWALSHT stability analyses of the wall only toward the protected side.

·ations shown represent NAVD88

Table 5.
SEEPAGE MAXIMUM SAFE WATER ELEVATION

Notes	
Action Level FoS:	2
FoS @ Levee-Toe w/Seep Berm In-Place:	3
FoS @ Berm-Toe w/Seep Berm In-Place:	2
Unit Weight of SemiPervious Berm Mat'l:	##

Levee Reach		100-yr NAVD	Levee	Landside Conditions								Aquifer		Length Flowpath						Gradients		Safe Water Elevation			
m	To	Flood Ele	L2	z_{bl}	USCS	k_{bl} *10^{-4} cm/s	z_t	L3	LS GSE	TW	γ-sat	D	k_f *10^{-4} cm/s	c_f	c_r	comp x1	des x1	x3	S	i-crit	i-allow	H_{tot}	h_0	i_0	Notes
st																(Comp)	(Design)								
.60	665.10	14.00	124	15	CL	1.59	15	0	-3.00	-3.00	107.00	25	150	0.005323825	-	-	600	188	724	0.71	0.45	17.0	3.50	0.23	
.10	661.50	14.00	124	15	CL	1.59	15	0	-3.00	-3.00	107.00	25	150	0.005323825	-	-	600	188	724	0.71	0.45	17.0	3.50	0.23	
.50	660.00	14.00	124	15	CL	1.59	15	0	-3.00	-3.00	107.00	35	150	0.004499453	-	-	600	222	724	0.71	0.45	17.0	3.99	0.27	
.00	660.00	11.00	124	7	CL	3.12	7	0	-3.00	-3.00	107.00	35	150	0.009207953	-	-	250	109	374	0.71	0.45	14.0	3.15	0.45	
.75	659.75	8.00	76	7	CL	3.12	7	0	-3.00	-3.00	107.00	35	150	0.009207953	-	-	250	109	326	0.71	0.45	11.0	2.75	0.39	
.75	657.75	8.00	85	8	CL	2.90	8	0	-2.00	-2.00	107.00	35	150	0.008304187	-	-	250	120	335	0.71	0.45	10.0	2.64	0.33	
.50	657.50	8.00	82	4.1	CL	3.80	4.1	0	-1.90	-1.90	107.00	35	150	0.013287218	-	-	250	75	332	0.71	0.45	9.9	1.83	0.45	
.25	657.50	8.00	84	4	CL	3.83	4	0	-2.00	-2.00	107.00	35	150	0.013496208	-	-	250	74	334	0.71	0.45	10.0	1.82	0.45	
.00	657.00	8.00	73	4.5	CL	3.70	4.5	0	-1.50	-1.50	107.00	35	150	0.012517332	-	-	250	80	323	0.71	0.45	9.5	1.88	0.42	
.75	656.75	8.00	73	4.5	CL	3.70	4.5	0	-1.50	-1.50	107.00	35	150	0.012517332	-	-	250	80	323	0.71	0.45	9.5	1.88	0.42	
.50	no toe data																								
.25	no toe data																								
.00	656.00	8.00	80	5	CL	3.58	5	0	-1.00	-1.00	107.00	35	150	0.011678715	-	-	250	86	330	0.71	0.45	9.0	1.85	0.37	
.75	655.75	8.00	82	4.5	CL	3.70	4.5	0	-1.50	-1.50	107.00	35	150	0.012517332	-	-	250	80	332	0.71	0.45	9.5	1.84	0.41	
.25	655.25	8.00	136	4	CL	3.83	4	0	-2.00	-2.00	107.00	35	150	0.013496208	-	-	250	74	386	0.71	0.45	10.0	1.61	0.40	
.25	655.25	8.00	85	5	CL	3.58	5	0	-1.00	-1.00	107.00	35	150	0.011678715	-	-	250	86	335	0.71	0.45	9.0	1.83	0.37	
.00	655.00	8.00	80	5	CL	3.58	5	0	-1.00	-1.00	107.00	35	150	0.011678715	-	-	250	86	330	0.71	0.45	9.0	1.85	0.37	
.00	655.00	8.00	90	4	CL	3.83	4	0	-2.00	-2.00	107.00	35	150	0.013496208	-	-	250	74	340	0.71	0.45	10.0	1.79	0.45	
.00	655.00	8.00	80	5	CL	3.58	5	0	-1.00	-1.00	107.00	35	150	0.011678715	-	-	250	86	330	0.71	0.45	9.0	1.85	0.37	
.75	654.75	8.00	79	4.9	CL	3.60	4.9	0	-1.10	-1.10	107.00	35	150	0.011836926	-	-	250	84	329	0.71	0.45	9.1	1.86	0.38	
										-3.00															
.50	642.40	10.30	100	7.00	CL	3.12	7.00	0	-3.00	-3.00	107.00	35	150	0.009207953	-	-	250	109	350	0.71	0.45	13.3	3.15	0.45	
.40	640.00	8.45	100	5.00	CL	3.58	5.00	0	-3.00	-3.00	107.00	35	150	0.011678715	-	-	250	86	350	0.71	0.45	11.5	2.25	0.45	
.65	644.65	9.40	96	5.00	CL	3.58	5.00	0	-2.00	-2.00	107.00	35	150	0.011678715	-	-	250	86	346	0.71	0.45	11.4	2.26	0.45	
.15	644.15	9.80	118	5.00	CL	3.58	5.00	0	-2.00	-2.00	107.00	35	150	0.011678715	-	-	250	86	368	0.71	0.45	11.8	2.23	0.45	
.65	643.65	9.80	116	5.00	CL	3.58	5.00	0	-2.00	-2.00	107.00	35	150	0.011678715	-	-	250	86	366	0.71	0.45	11.8	2.24	0.45	
.15	643.15	11.30	96	5.90	CL	3.37	5.90	0	-1.00	-1.00	107.00	35	150	0.010426207	-	-	250	96	346	0.71	0.45	12.3	2.67	0.45	
+19	638+19	10.00	100	6.50	CL	3.23	6.50	0	-3.00	-3.00	107.00	35	150	0.009727195	-	-	250	103	350	0.71	0.45	13.0	2.95	0.45	
+19	638+19	11.00	137	6.50	CL	3.23	6.50	0	-3.00	-3.00	107.00	35	150	0.009727195	-	-	250	103	387	0.71	0.45	14.0	2.94	0.45	
.69	637.69	9.00	142	5.50	CL	3.46	5.50	0	-4.00	-4.00	107.00	35	150	0.010948205	-	-	250	91	392	0.71	0.45	13.0	2.46	0.45	
.69	637.69	12.00	96	9.50	CL	2.58	9.50	0	0.00	0.00	107.00	35	150	0.007196003	-	-	250	139	346	0.71	0.45	12.0	3.44	0.36	
.19	637.19	9.00	140	5.50	CL	3.46	5.50	0	-4.00	-4.00	107.00	35	150	0.010948205	-	-	250	91	390	0.71	0.45	13.0	2.47	0.45	
.19	633.69	11.40	94	7.50	CL	3.01	7.50	0	-2.00	-2.00	107.00	35	150	0.008736059	-	-	250	114	344	0.71	0.45	13.4	3.35	0.45	
.69	632.00	11.76	70	10.50	CL	2.38	10.50	0	-4.00	-4.00	105.00	25	150	0.007781215	-	-	250	129	320	0.68	0.43	15.8	4.52	0.43	
.00	629.50	11.76	70	10.50	CL	2.38	10.50	0	-4.00	-4.00	105.00	25	150	0.007781215	-	-	250	129	320	0.68	0.43	15.8	4.52	0.43	
.50	626.00	14.00	60	9	CL	2.69	9	0	-4.00	-4.00	105.00	25	150	0.008919558	-	-	1300	112	1360	0.68	0.43	18.0	1.37	0.15	Peat in Side of Canal
.00	622.50	12.20	72	11	CL	2.29	11	0	-4.00	-4.00	105.00	25	150	0.007447432	-	-	250	134	322	0.68	0.43	16.2	4.77	0.43	
.00	622.50	13.00	72	11	CL	2.29	11	0	-4.00	-4.00	105.00	25	150	0.007447432	-	-	1300	134	1372	0.68	0.43	17.0	1.52	0.14	Peat in Side of Canal
.50	621.30	13.00	50	13.9	CL	1.77	13.9	0	-4.00	-4.00	105.00	25	150	0.005829952	-	-	1300	172	1350	0.68	0.43	17.0	1.92	0.14	Peat in Side of Canal
.30	618.90	13.00	50	14.5	CL	1.67	14.5	0	-4.00	-4.00	103.00	20	150	0.006202799	-	-	1300	161	1350	0.65	0.41	17.0	1.81	0.13	

Levee Reach		100-yr NAVD	Levee	Landside Conditions								Aquifer		Length Flowpath						Gradients		Safe Water Elevation			
om	To	Flood Ele	L2	z_{bl}	USCS	k_{bl}*10^{-4} cm/s	z_t	L3	LS GSE	TW	γ-sat	D	k_f*10^{-4} cm/s	c_l	c_r	comp x1	des x1	x3	S	i-crit	i-allow	H_{tot}	h_o	i_o	Notes
.90	611.10	13.00	50	17.5	CL	1.23	17.5	0	-4.00	-4.00	103.00	15	150	0.005586946	-	-	1300	179	1350	0.65	0.41	17.0	1.99	0.11	
.10	606.80	13.00	50	24	CL	0.53	24	0	-4.00	-4.00	103.00	15	150	0.003118345	-	-	1300	321	1350	0.65	0.41	17.0	3.26	0.14	
.80	598.30	13.00	50	24	CL	0.53	24	0	-4.00	-4.00	103.00	15	150	0.003118345	-	-	1300	321	1350	0.65	0.41	17.0	3.26	0.14	
.30	594.60	13.00	54	29	CL	0.23	29	0	-4.00	-4.00	103.00	15	150	0.001857366	-	-	1300	538	1354	0.65	0.41	17.0	4.84	0.17	
.60	578.50	13.00	54	26	CL	0.38	26	0	-5.00	-5.00	103.00	15	150	0.002548336	-	-	1300	392	1354	0.65	0.41	18.0	4.04	0.16	
.50	568.00	13.00	65	22.2	CL	0.68	22.2	0	-5.00	-5.00	103.00	10	150	0.00453385	-	-	1300	221	1365	0.65	0.41	18.0	2.50	0.11	Peat in Side of Canal
.00	558.00	13.00	53	24.2	CL	0.51	24.2	0	-5.00	-5.00	103.00	10	150	0.003744851	-	-	1300	267	1353	0.65	0.41	18.0	2.97	0.12	Peat in Side of Canal
.00	550.00	13.00	65	26	CL	0.38	26	0	-5.00	-5.00	103.00	10	150	0.003121062	-	-	1300	320	1365	0.65	0.41	18.0	3.42	0.13	
.00	548.00	13.00	65	26	CL	0.38	26	0	0.00	0.00	100.00	10	150	0.003121062	-	-	1300	320	1365	0.60	0.38	13.0	2.47	0.10	
.00	Closure Gate at Station 548+00																								
est																									
.60	661.00	14.00	72	12.5	CL	2.01	12.5	0	-0.50	-0.50	107.00	20	150	0.007324935	-	-	600	137	672	0.71	0.45	14.5	2.45	0.20	
.00	657.40	14.00	90	2.5	CL	4.21	2.5	0	-0.50	-0.50	107.00	30	150	0.019340344	-	-	600	52	690	0.71	0.45	14.5	1.01	0.40	
.40	654.90	10.50	110	6	CL	3.34	6	0	-2.90	-2.90	107.00	30	150	0.011128708	-	-	250	90	360	0.71	0.45	13.4	2.68	0.45	
.90	650.00	9.30	100	5	CL	3.58	5	0	-3.00	-3.00	107.00	30	150	0.012614454	-	-	250	79	350	0.71	0.45	12.3	2.27	0.45	
.00	648.50	9.80	96	6	CL	3.34	6	0	-3.40	-3.40	107.00	30	150	0.011128708	-	-	250	90	346	0.71	0.45	13.2	2.72	0.45	
.50	646.25	11.20	106	7	CL	3.12	7	0	-3.10	-3.10	107.00	30	150	0.009945726	-	-	250	101	356	0.71	0.45	14.3	3.15	0.45	
.25	645+50	10.00	106	5	CL	3.58	5	0	-2.40	-2.40	107.00	30	150	0.012614454	-	-	250	79	356	0.71	0.45	12.4	2.26	0.45	
.50	645.25	9.70	106	5	CL	3.58	5	0	-2.70	-2.70	107.00	30	150	0.012614454	-	-	250	79	356	0.71	0.45	12.4	2.26	0.45	
.25	645.00	9.10	106	5	CL	3.58	5	0	-3.30	-3.30	107.00	30	150	0.012614454	-	-	250	79	356	0.71	0.45	12.4	2.26	0.45	
.00	644.25	9.90	100	5	CL	3.58	5	0	-2.40	-2.40	107.00	30	150	0.012614454	-	-	250	79	350	0.71	0.45	12.3	2.27	0.45	
.25	644.00	9.50	100	5	CL	3.58	5	0	-2.70	-2.70	107.00	30	150	0.012614454	-	-	250	79	350	0.71	0.45	12.2	2.25	0.45	
.00	640.70	8.62	80	5	CL	3.58	5	0	-3.00	-3.00	107.00	30	150	0.012614454	-	-	250	79	330	0.71	0.45	11.6	2.25	0.45	
.70	637.00	10.50	76	6	CL	3.34	6	0	-2.00	-2.00	107.00	30	150	0.011128708	-	-	250	90	326	0.71	0.45	12.5	2.70	0.45	
.00	633.00	11.49	100	7	CL	3.12	7	0	-2.00	-2.00	105.00	30	150	0.009945726	-	-	250	101	350	0.68	0.43	13.5	3.01	0.43	
.00	629.60	13.50	80	13.5	CL	1.84	13.5	0	-2.00	-2.00	105.00	25	150	0.006026526	-	-	250	166	330	0.68	0.43	15.5	5.19	0.38	
.60	626.50	13.50	84	4	CL	3.83	4	0	-3.00	-3.00	105.00	25	150	0.015968928	-	-	1300	63	1384	0.68	0.43	16.5	0.71	0.18	
.50	624.60	13.50	85	9	CL	2.69	9	0	-3.00	-3.00	105.00	25	150	0.008919558	-	-	1300	112	1385	0.68	0.43	16.5	1.24	0.14	
.60	623.20	13.50	60	10	CL	2.48	10	0	0.00	0.00	105.00	25	150	0.00813601	-	-	1300	123	1360	0.68	0.43	13.5	1.12	0.11	
.20	620.30	13.00	60	11	CL	2.29	11	0	0.00	0.00	105.00	20	150	0.008326482	-	-	1300	120	1360	0.68	0.43	13.0	1.05	0.10	
.30	617.50	13.00	60	8 5	CL	2.79	8.5	0	0.00	0.00	105.00	30	150	0.008540025	-	-	1300	117	1360	0.68	0.43	13.0	1.03	0.12	
.50	614.20	13.00	60	8	CL	2.90	8	0	-2.00	-2.00	80.00	20	150	0.010985407	-	-	1300	91	1360	0.28	0.18	15.0	0.94	0.12	Peat Blanket and In Side of Canal
.20	610.10	13.00	80	18	CL	1.16	18	0	-2.00	-2.00	95.00	20	150	0.004639404	-	-	1300	216	1380	0.52	0.33	15.0	2.03	0.11	
.10	606.40	13.00	68	27	CL	0.32	27	0	-2.00	-2.00	103.00	20	150	0.001987305	-	-	1300	503	1368	0.65	0.41	15.0	4.03	0.15	
.40	604.90	13.00	50	27	CL	0.32	27	0	-3.00	-3.00	103.00	15	150	0.002294743	-	-	1300	436	1350	0.65	0.41	16.0	3.90	0.14	
.90	601.40	13.00	50	25	CL	0.45	25	0	-3.00	-3.00	103.00	15	150	0.002823079	-	-	1300	354	1350	0.65	0.41	16.0	3.33	0.13	
									-3.00	-3.00															
.40	600.20	13.00	50	25	CL	0.45	25	0	-3.00	-3.00	103.00	15	150	0.002823079	-	-	1300	354	1350	0.65	0.41	16.0	3.33	0.13	
.20	596.10	13.00	86	25	CL	0.45	25	0	-3.00	-3.00	103.00	15	150	0.002823079	-	-	1300	354	1386	0.65	0.41	16.0	3.26	0.13	
.10	592.70	13.00	86	23	CL	0.61	23	0	-3.00	-3.00	103.00	15	150	0.003434128	-	-	1300	291	1386	0.65	0.41	16.0	2.78	0.12	
.70	585.00	13.00	65	8	CL	2.90	8	0	-2.00	-2.00	103.00	15	150	0.012684855	-	-	1300	79	1365	0.65	0.41	15.0	0.82	0.10	
.00	575.00	13.00	76	4	CL	3.83	4	0	-2.00	-2.00	80.00	15	150	0.020615798	-	-	1300	49	1376	0.28	0.18	15.0	0.51	0.13	Peat Blanket and In Side of Canal
									-2.00																
.00	565.00	13.00	65	10	CL	2.48	10	0	-2.00	-2.00	80.00	10	150	0.012864162	-	-	1300	78	1365	0.28	0.18	15.0	0.81	0.08	Peat Blanket and In Side of Canal
.00	561.00	13.00	65	5	CL	3.58	5	0	-2.00	-2.00	103.00	10	150	0.021848875	-	-	1300	46	1365	0.65	0.41	15.0	0.49	0.10	Peat Blanket and In Side of Canal
.00	555.00	13.00	65	7	CL	3.12	7	0	-2.00	-2.00	103.00	10	150	0.017226502	-	-	1300	58	1365	0.65	0.41	15.0	0.61	0.09	Peat Blanket and In Side of Canal
.00	548.00	13.00	65	12	CL	2.10	12	0	-2.00	-2.00	103.00	10	150	0.01080612	-	-	1300	93	1365	0.65	0.41	15.0	0.95	0.08	Peat Blanket and In Side of Canal
.00	Closure Gate at Station 548+00																								

17th Street Canal
Piezometers
(Not installed for Pump test)

Name	Piezometer location	Piezometer tip depth NAVD88 (2004.65)	Layer being Monitored
SSP-1A	South of breach	-41.4	Sand
SSP-1B	South of Breach	-14.2	Peat
SSP-2A	At toe across from south side of breach	-42.4	Sand
SSP-2B	At toe across from south side of breach	-15.9	Peat
SSP-3	South of I-610 East Side of canal at toe	-20.8	Sand
SSP-5	West side of canal at toe near Canal St.	-21.6	Sand
SSP-6	South of I-610 east side of canal on flood side	-10.5	Sand

Table 7 DSS Test Results for 17th Street Canal

g	Sample No.	Centerline or Toe	Description	Field σ'v (psf)	Spec. No.	Lab σ'vc (psf)	S_u/σ_v'	OCR Field	OCR lab	Normalizes	Remarks
:U-R	2c	CL	So Gr CH w/ ars & lns ML, sif	1369	1	1375	N/A	1.0	1.0	N/A	Erratic Stress-strain or pore pressure-strai
				1369	2	2060	0.27	1.0	1.0	Yes	Meets Shansep Crtieria
				1369	3	2760	0.27	1.0	1.0	Yes	Meets Shansep Crtieria
U	5b	Toe	So Gr CL w/ sif, rt	725	1	570	N/A	1.0	1.3	N/A	Stress too low
				725	2	1140	0.32	1.0	1.0	No	OCR correct, but does not normalize
				725	3	1750	0.27	1.0	1.0	No	OCR correct, but does not normalize
:U	8b	CL	So Gr CL6 w/wd, sif	1324	1	1380	0.34	1.0	1.0	N/A	Recompression Method
				1324	2	2050	0.32	1.0	1.0	Yes	Undrained strength ratio anomalously high
				1324	3	2765	0.32	1.0	1.0	Yes	Undrained strength ratio anomalously high
:U	9b	CL	M Gr CH w/ lns ML	1637	1	1410	N/A	1.2	1.4	N/A	Stress too low
				1637	2	2210	0.24	1.2	1.0	Yes	Normalizes, but low OCR
				1637	3	3005	0.25	1.2	1.0	Yes	Normalizes, but low OCR
:CU	5d	CL	So Gr & DGr CH w/ lys ML	1125	1	1155	0.62	1.2	1.0	N/A	Recompression Method
				1125	2	1745	N/A	1.2	1.0	No	Erratic Stress-strain or pore pressure-str
				1125	3	2355	0.38	1.2	1.0	No	Does not normalize, and OCR too low
:CU	6d	CL	So Gr CH w/ wd & rt	1264	1	1325	0.33	1.1	1.0	N/A	Recompression Method
				1264	2	2070	0.27	1.1	1.0	Yes	Normalizes, but low OCR
				1264	3	2735	0.27	1.1	1.0	Yes	Normalizes, but low OCR
:CU	7d	CL	So Gr CH w/ lns & lys ML	1538	1	1385	N/A	1.0	1.1	N/A	Stress too low
				1538	2	2165	0.31	1.0	1.0	No	OCR correct, but does not normalize
				1538	3	2875	0.27	1.0	1.0	No	OCR correct, but does not normalize
:TU	7d	Toe	So Gr Ch4 w/ lns ML	862	1	945	0.41	1.2	1.1	N/A	Recompression Method
				862	2	1415	0.29	1.2	1.0	No	Does not normalize, and OCR too low
				862	3	1870	0.32	1.2	1.0	No	Does not normalize, and OCR too low
:CU	11b	CL	M Gr CH w/ SL	1988	1	1895	0.36	1.1	1.2	N/A	Recompression Method
				1988	2	2905	0.25	1.1	1.0	Yes	Normalizes, but low OCR
				1988	3	3800	0.23	1.1	1.0	Yes	Normalizes, but low OCR
:TU	10b	Toe	M GrCH w/ ars ML	1145	1	1135	0.46	1.4	1.4	N/A	Recompression Method
				1145	2	1760	0.36	1.4	1.0	No	Does not normalize, and OCR too low
				1145	3	2290	0.28	1.4	1.0	No	Erratic Stress-strain or pore pressure-str

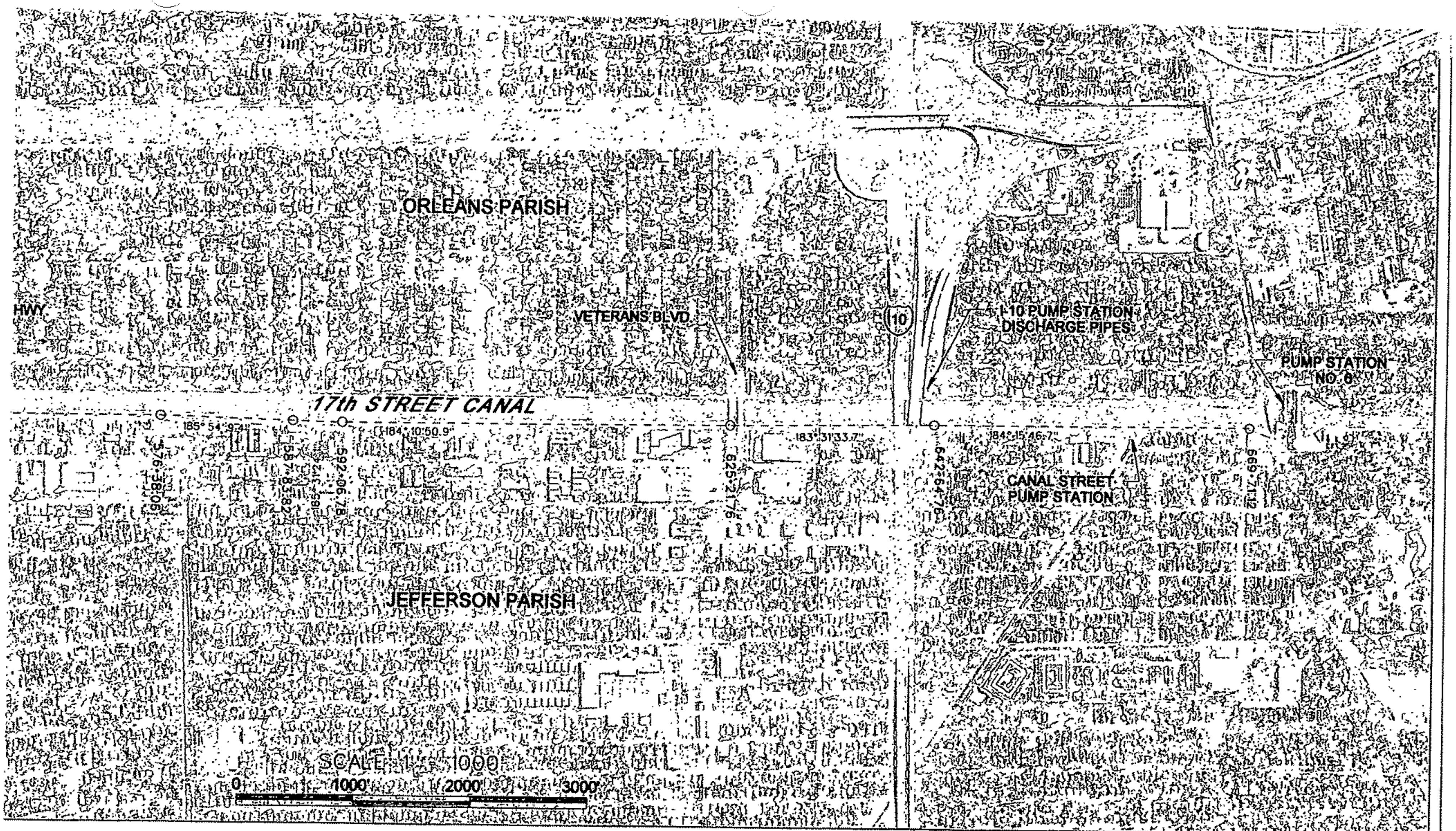
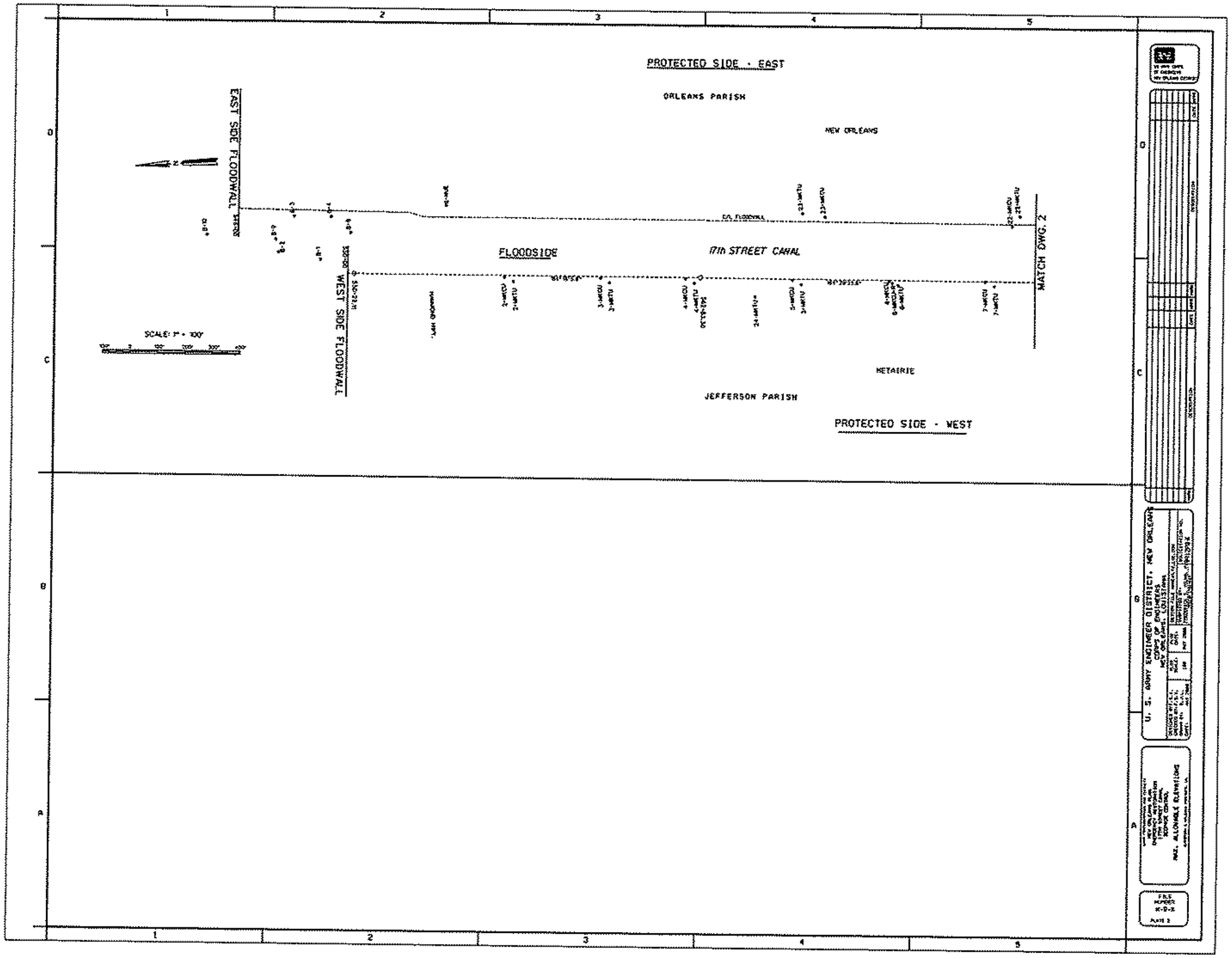
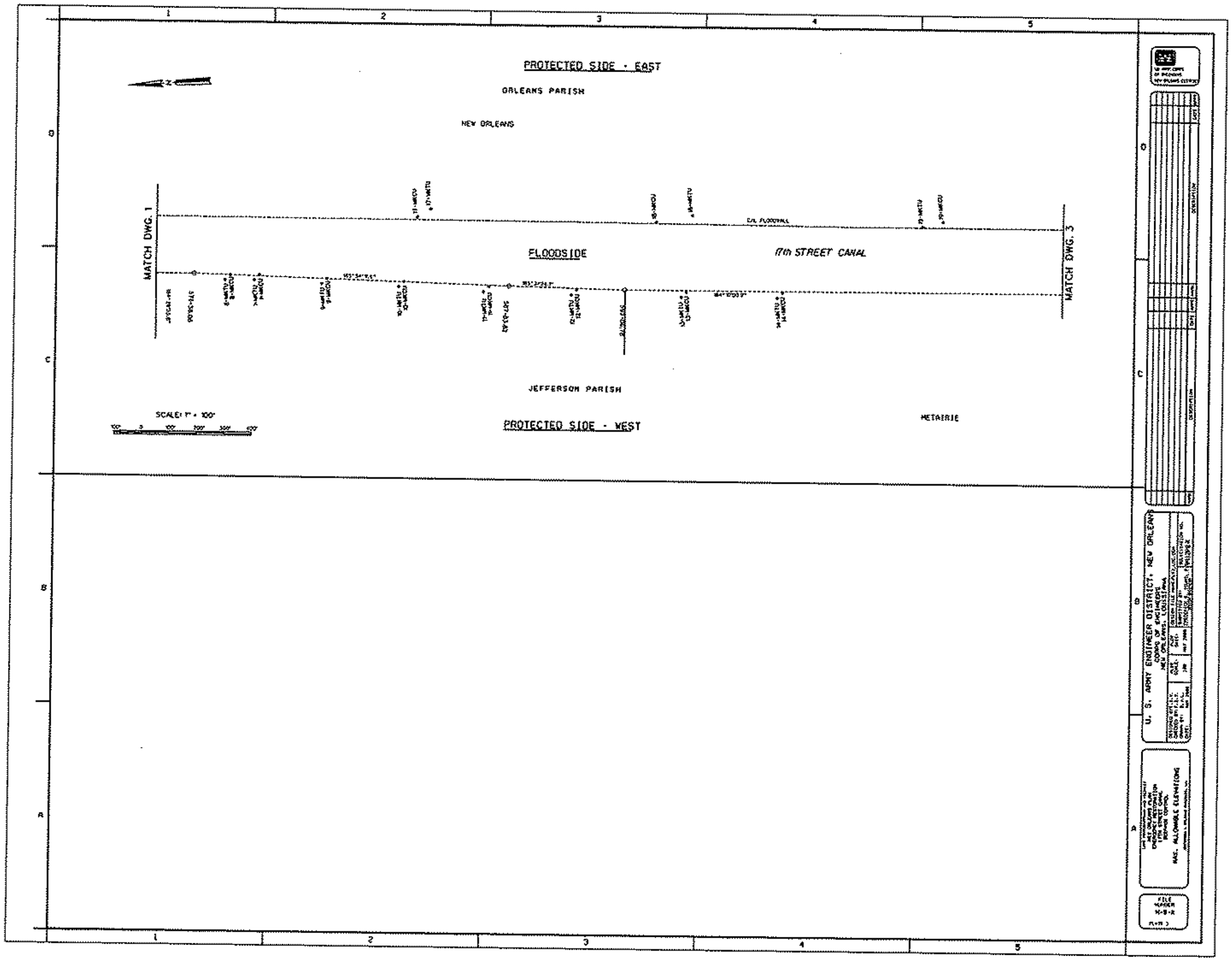
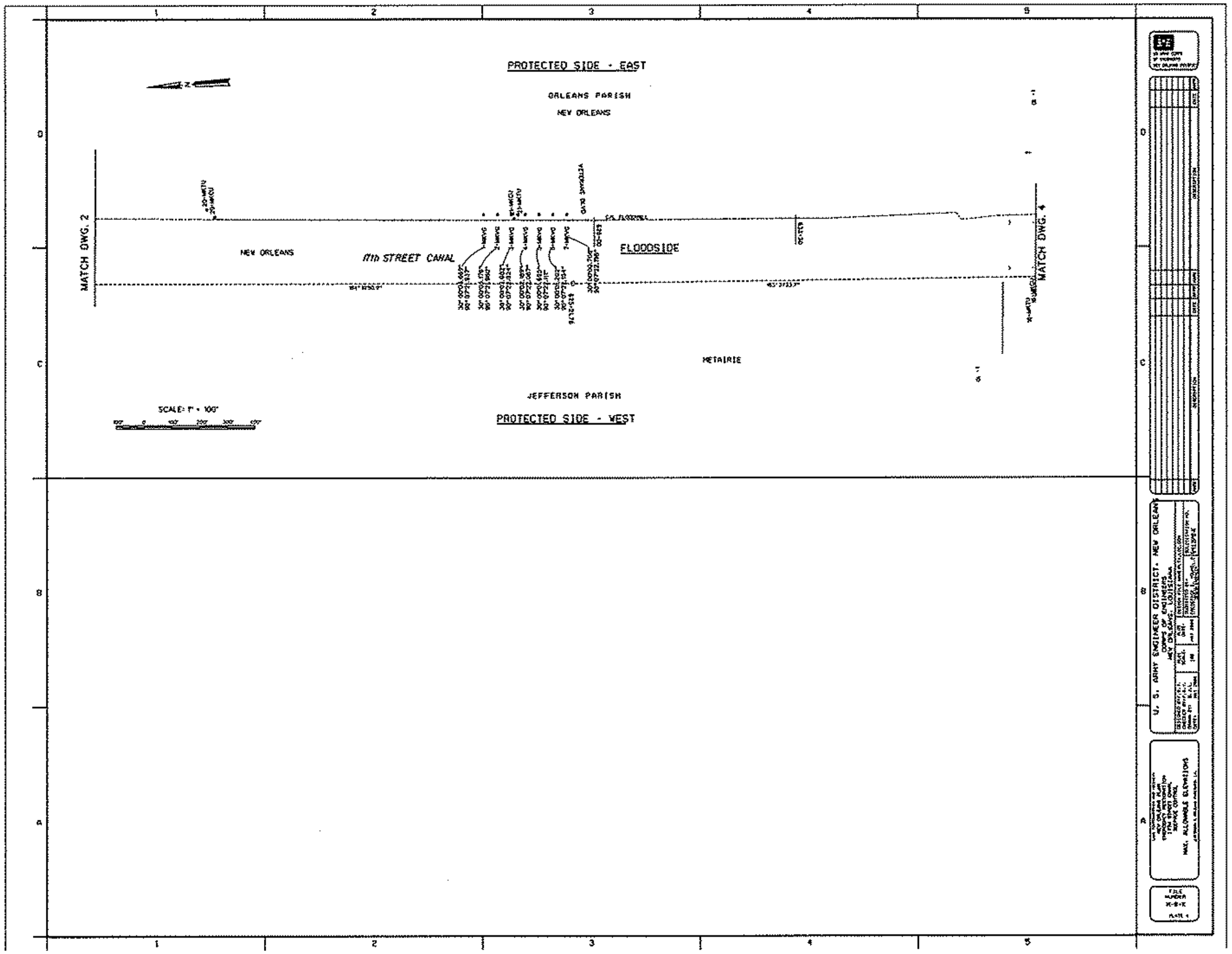
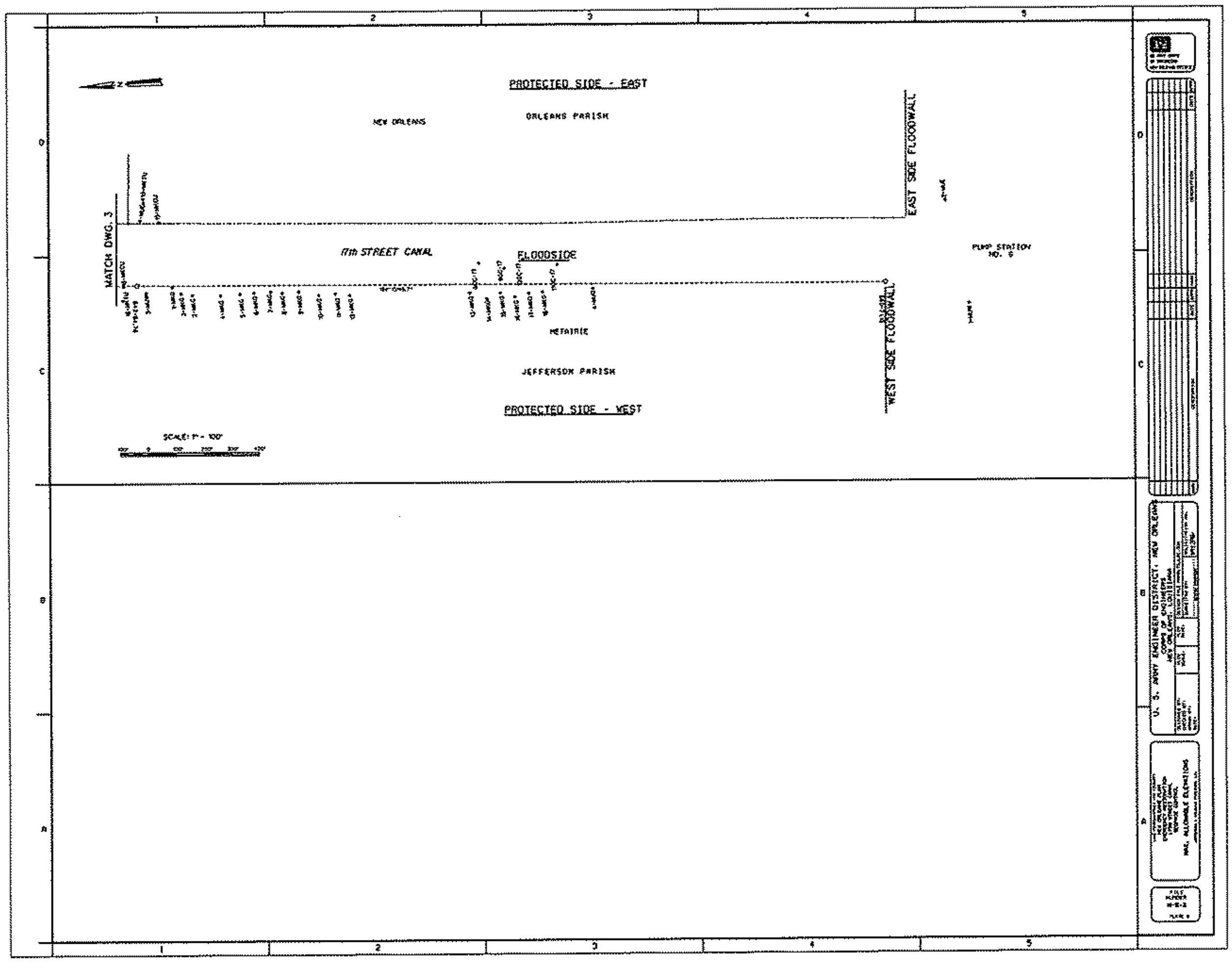


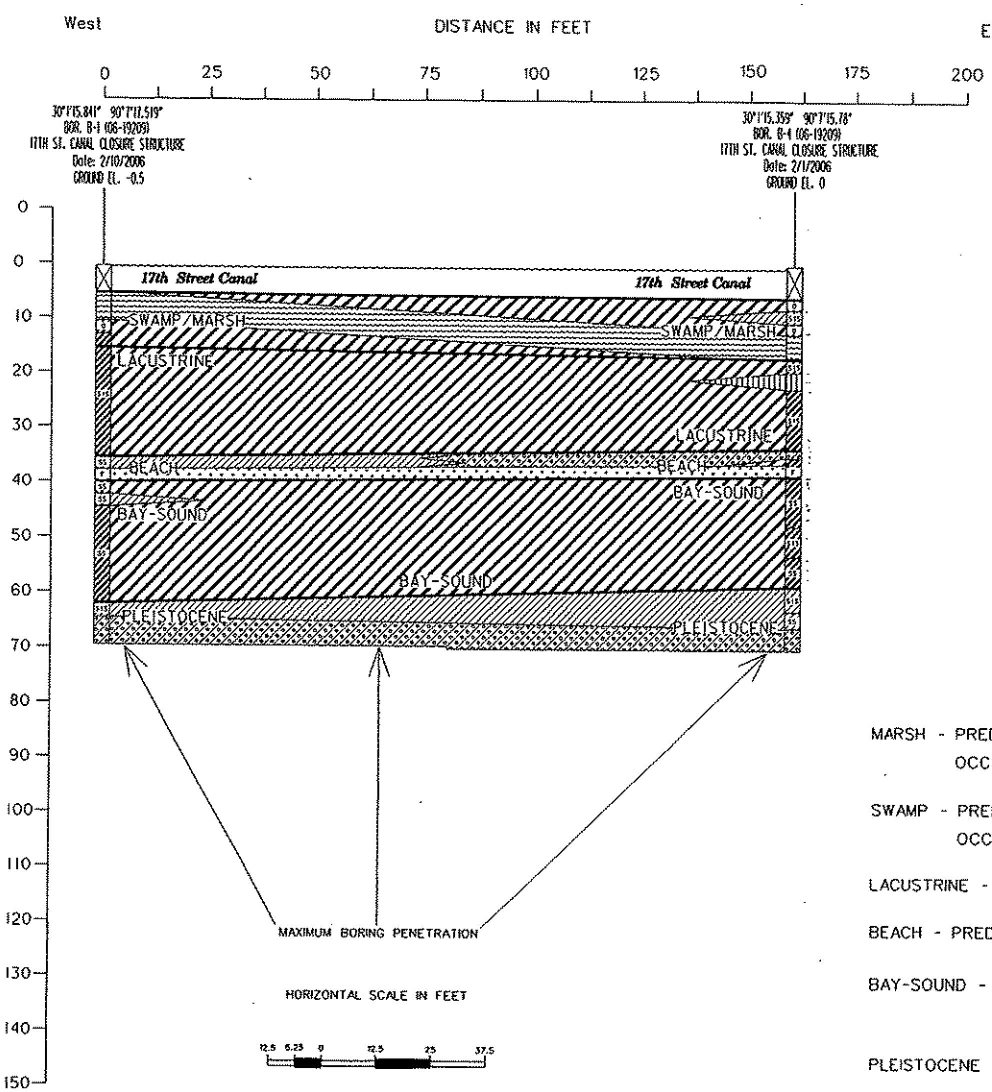
Figure 1: 17th Street Canal Study Area


PROTECTED SIDE - EAST
ORLEANS PARISH
NEW ORLEANS
EAST SIDE FLOODWALL
FLOODSIDE
17th STREET CANAL
MATCH DWG. 2
WEST SIDE FLOODWALL
SCALE: 1" = 100'
METAIRIE
JEFFERSON PARISH
PROTECTED SIDE - WEST
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
MAX. ALLOWABLE ELEVATIONS


PROTECTED SIDE - EAST
ORLEANS PARISH
NEW ORLEANS
MATCH DWG. 1
FLOODSIDE
17th STREET CANAL
C/L FLOODWALL
MATCH DWG. 3
JEFFERSON PARISH
METAIRIE
PROTECTED SIDE - WEST
SCALE: 1" = 100'
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
NEW ORLEANS PLAN
EMERGENCY RESTORATION
17TH STREET CANAL
MAX. ALLOWABLE ELEVATIONS
FILE NUMBER


PROTECTED SIDE - EAST
ORLEANS PARISH
NEW ORLEANS
MATCH DWG. 2
NEW ORLEANS
17th STREET CANAL
FLOODSIDE
MATCH DWG. 4
METAIRIE
JEFFERSON PARISH
PROTECTED SIDE - WEST
SCALE: 1" = 100'
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
MAX. ALLOWABLE ELEVATIONS


PROTECTED SIDE - EAST
NEW ORLEANS
ORLEANS PARISH
EAST SIDE FLOODWALL
MATCH DWG. 3
17th STREET CANAL
FLOODSIDE
PUMP STATION NO. 6
WEST SIDE FLOODWALL
METAIRIE
JEFFERSON PARISH
PROTECTED SIDE - WEST
SCALE: 1" = 100'
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA



SOIL LEGEND

- CH - FAT CLAY
- CL - LEAN CLAY
- PT - PEAT
- ML - SILT
- SC - CLAYEY SAND
- SP - SAND POORLY-GRADED
- NO SAMPLE

MARSH - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS

SWAMP - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS AND WOOD

LACUSTRINE - CLAYS AND SILT WITH SOME SAND AND OCCASIONAL SHELL FRAGMENTS

BEACH - PREDOMINANTLY SANDS AND SILTY SANDS WITH SHELL FRAGMENTS

BAY-SOUND - PREDOMINANTLY CLAYS WITH SOME SILTS AND SILTY SANDS AND OCCASIONAL SHELLS

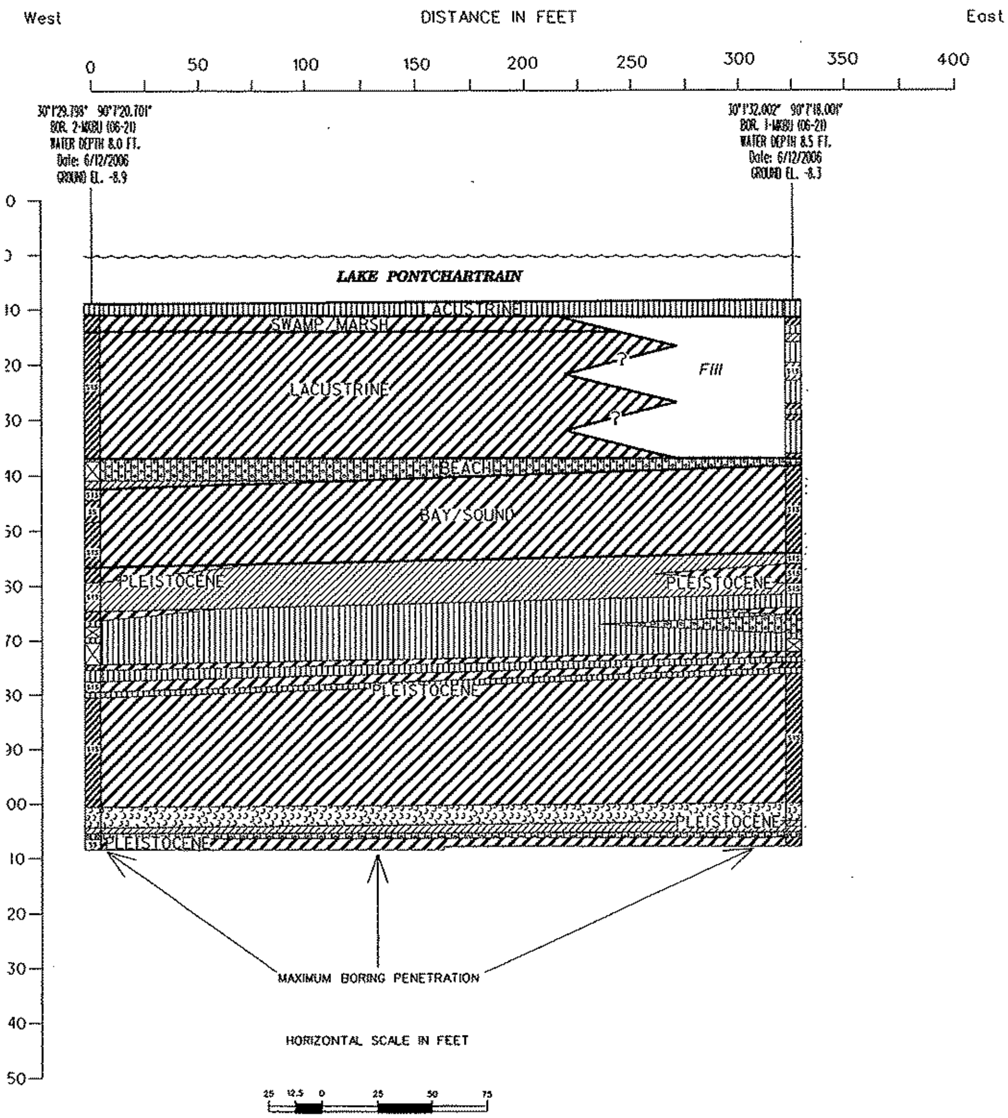
PLEISTOCENE - STIFF TO VERY STIFF OXIDIZED CLAYS INTERBEDDED WITH LAYERS AND LENSES OF SILTS AND SANDS

LAKE PONTCHARTRAIN AND VICINITY
17TH STREET OUTFALL CANAL
STRUCTURE AREA ACROSS CANAL

SOIL AND GEOLOGIC PROFILE

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

DESIGNED BY: T. CREASY
DRAWN BY: T. CREASY
CHECKED BY: D. BRITSCH
PLOT SCALE: 1 : 10
PLOT DATE:
DATE: 04 MAY 2007
CADD FILE: PLT06GEOL.dgn
FILE NO.



SOIL LEGEND

- CH - FAT CLAY
- CL - LEAN CLAY
- ML - SILT
- SM - SILTY SAND
- SI - SHELLS
- NO SAMPLE

LACUSTRINE - CLAYS AND SILT WITH SOME SAND AND OCCASIONAL SHELL FRAGMENTS

SWAMP - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS AND WOOD

MARSH - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS

BEACH - PREDOMINANTLY SANDS AND SILTY SANDS WITH SHELL FRAGMENTS

BAY-SOUND - PREDOMINANTLY CLAYS WITH SOME SILTS AND SILTY SANDS AND OCCASIONAL SHELLS

PLEISTOCENE - STIFF TO VERY STIFF OXIDIZED CLAYS INTERBEDDED WITH LAYERS AND LENSES OF SILTS AND SANDS

LAKE PONTCHARTRAIN AND VICINITY
17TH STREET OUTFALL CANAL
BREAKWATER AREA

SOIL AND GEOLOGIC PROFILE

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

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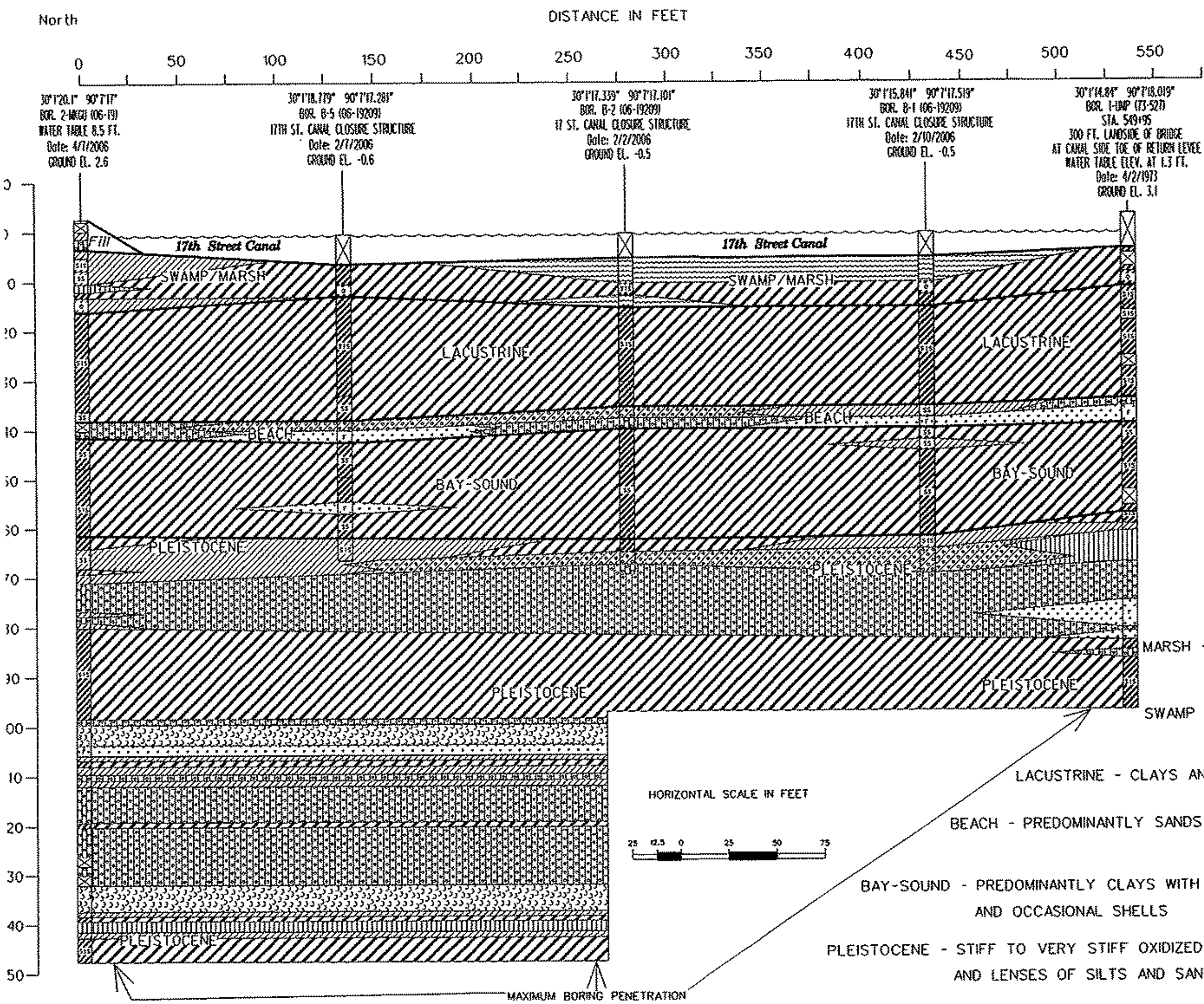
PLATE 7



SOIL LEGEND

- CH - FAT CLAY
- CL - LEAN CLAY
- PT - PEAT
- ML - SILT
- SC - CLAYEY SAND
- SM - SILTY SAND
- SP - SAND POORLY-GRADED
- SI - SHELLS
- NO SAMPLE

The parameters for defining SP and SM have changed over the past few years. (As per MVD directive) Therefore, SM in recent borings may be equivalent to SP in the older borings.

MARSH - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS

SWAMP - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS AND WOOD

LACUSTRINE - CLAYS AND SILT WITH SOME SAND AND OCCASIONAL SHELL FRAGMENTS

BEACH - PREDOMINANTLY SANDS AND SILTY SANDS WITH SHELL FRAGMENTS

BAY-SOUND - PREDOMINANTLY CLAYS WITH SOME SILTS AND SILTY SANDS AND OCCASIONAL SHELLS

PLEISTOCENE - STIFF TO VERY STIFF OXIDIZED CLAYS INTERBEDDED WITH LAYERS AND LENSES OF SILTS AND SANDS

LAKE PONTCHARTRAIN AND VICINITY
17TH STREET OUTFALL CANAL
STRUCTURE AREA - WESTBANK

SOIL AND GEOLOGIC PROFILE

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

DESIGNED BY: T. CREASY
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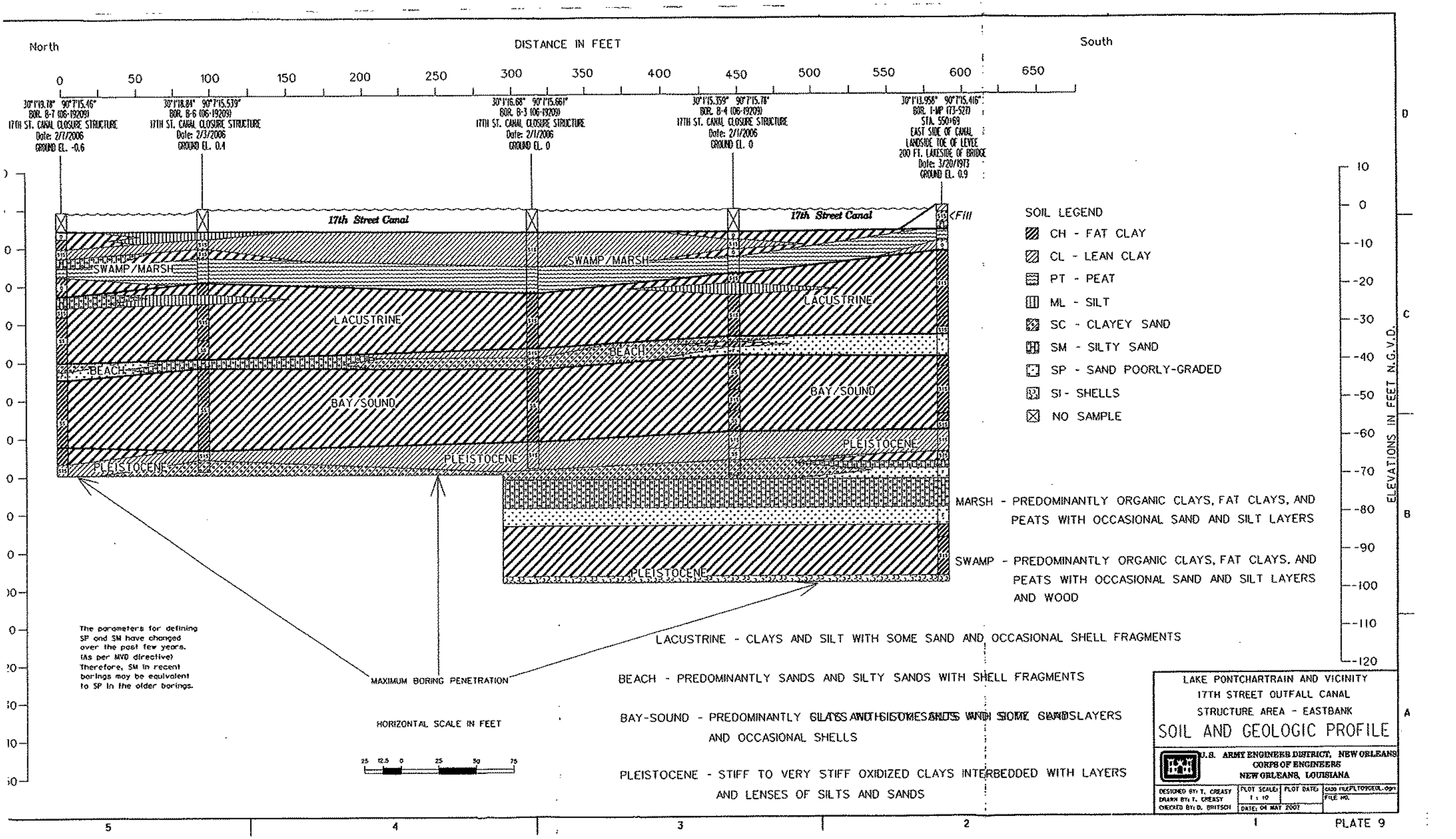
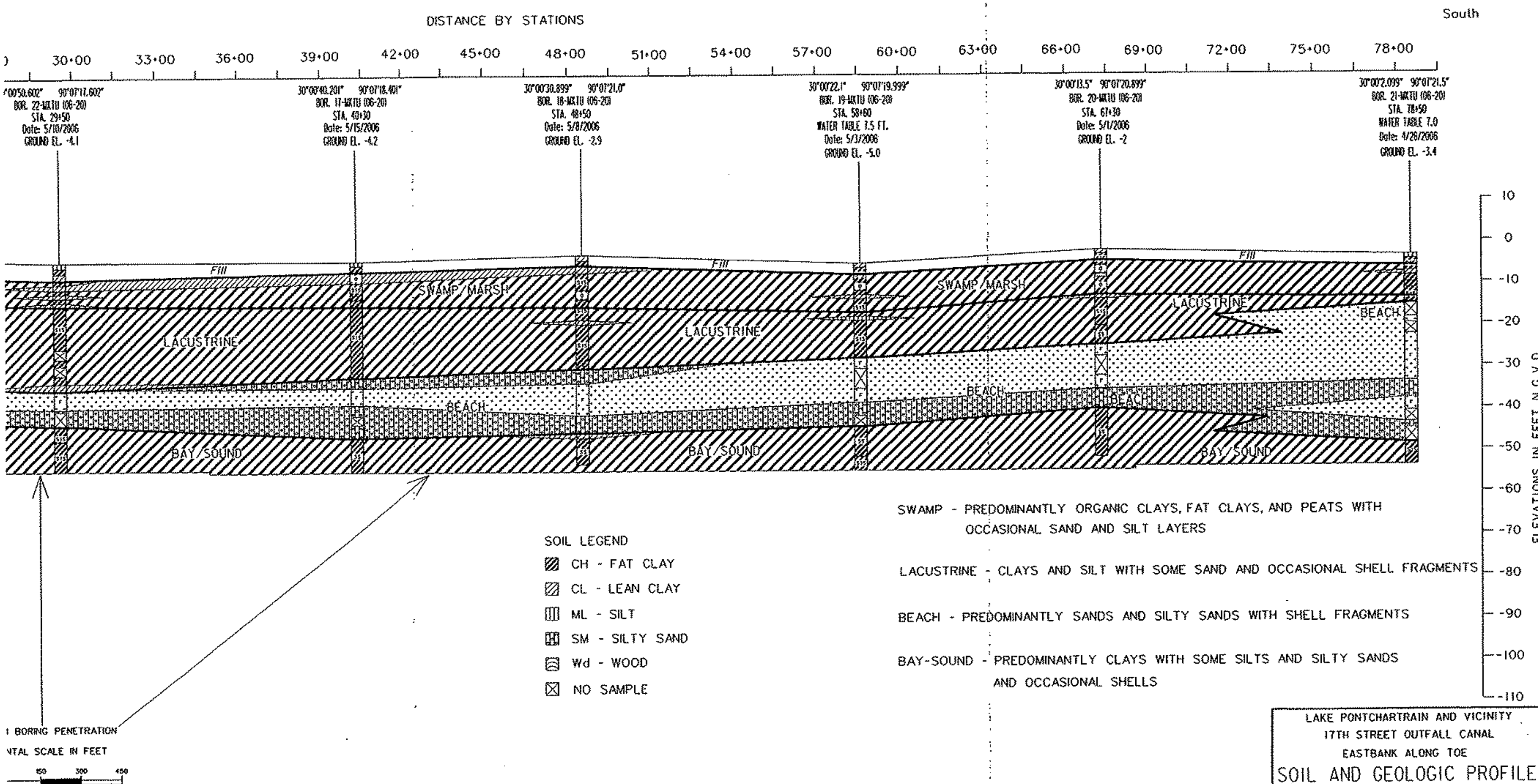
CHECKED BY: D. BRITSCH
PLOT SCALE: 1 : 10
DATE: 04 MAY 2007

PLATE 8


North
DISTANCE IN FEET
South
0 50 100 150 200 250 300 350 400 450 500 550 600 650
30°1'19.78" 90°7'15.46"
BOR. B-7 (06-19209)
17TH ST. CANAL CLOSURE STRUCTURE
Date: 2/7/2006
GROUND EL. -0.6
30°1'18.84" 90°7'15.539"
BOR. B-6 (06-19209)
17TH ST. CANAL CLOSURE STRUCTURE
Date: 2/3/2006
GROUND EL. 0.4
30°1'16.68" 90°7'15.661"
BOR. B-3 (06-19209)
17TH ST. CANAL CLOSURE STRUCTURE
Date: 2/1/2006
GROUND EL. 0
30°1'15.359" 90°7'15.78"
BOR. B-4 (06-19209)
17TH ST. CANAL CLOSURE STRUCTURE
Date: 2/1/2006
GROUND EL. 0
30°1'13.956" 90°7'15.416"
BOR. 1-MP (73-527)
STA. 550+69
EAST SIDE OF CANAL
LANDSIDE TOE OF LEVEE
200 FT. LAKESIDE OF BRIDGE
Date: 3/20/1973
GROUND EL. 0.9
17th Street Canal
17th Street Canal
Fill
SWAMP/MARSH
SWAMP/MARSH
LACUSTRINE
LACUSTRINE
BEACH
BEACH
BAY/SOUND
BAY/SOUND
PLEISTOCENE
PLEISTOCENE
PLEISTOCENE
PLEISTOCENE
SOIL LEGEND
CH - FAT CLAY
CL - LEAN CLAY
PT - PEAT
ML - SILT
SC - CLAYEY SAND
SM - SILTY SAND
SP - SAND POORLY-GRADED
SI - SHELLS
NO SAMPLE
ELEVATIONS IN FEET N.G.V.D.
10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120
MARSH - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS
SWAMP - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS AND WOOD
LACUSTRINE - CLAYS AND SILT WITH SOME SAND AND OCCASIONAL SHELL FRAGMENTS
BEACH - PREDOMINANTLY SANDS AND SILTY SANDS WITH SHELL FRAGMENTS
BAY-SOUND - PREDOMINANTLY CLAYS WITH SOME SAND LAYERS AND OCCASIONAL SHELLS
PLEISTOCENE - STIFF TO VERY STIFF OXIDIZED CLAYS INTERBEDDED WITH LAYERS AND LENSES OF SILTS AND SANDS
The parameters for defining SP and SM have changed over the past few years. (As per MVD directive) Therefore, SM in recent borings may be equivalent to SP in the older borings.
MAXIMUM BORING PENETRATION
HORIZONTAL SCALE IN FEET
25 12.5 0 25 50 75
LAKE PONTCHARTRAIN AND VICINITY
17TH STREET OUTFALL CANAL
STRUCTURE AREA - EASTBANK
SOIL AND GEOLOGIC PROFILE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
DESIGNED BY: T. CREASY
DRAWN BY: T. CREASY
CHECKED BY: D. BRITSCH
PLOT SCALE: 1:10
PLOT DATE:
DATE: 04 MAY 2007
FILE NO.
PLATE 9



SOIL LEGEND

- CH - FAT CLAY
- CL - LEAN CLAY
- ML - SILT
- SM - SILTY SAND
- Wd - WOOD
- NO SAMPLE

SWAMP - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS

LACUSTRINE - CLAYS AND SILT WITH SOME SAND AND OCCASIONAL SHELL FRAGMENTS

BEACH - PREDOMINANTLY SANDS AND SILTY SANDS WITH SHELL FRAGMENTS

BAY-SOUND - PREDOMINANTLY CLAYS WITH SOME SILTS AND SILTY SANDS AND OCCASIONAL SHELLS

LAKE PONTCHARTRAIN AND VICINITY
17TH STREET OUTFALL CANAL
EASTBANK ALONG TOE

SOIL AND GEOLOGIC PROFILE

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

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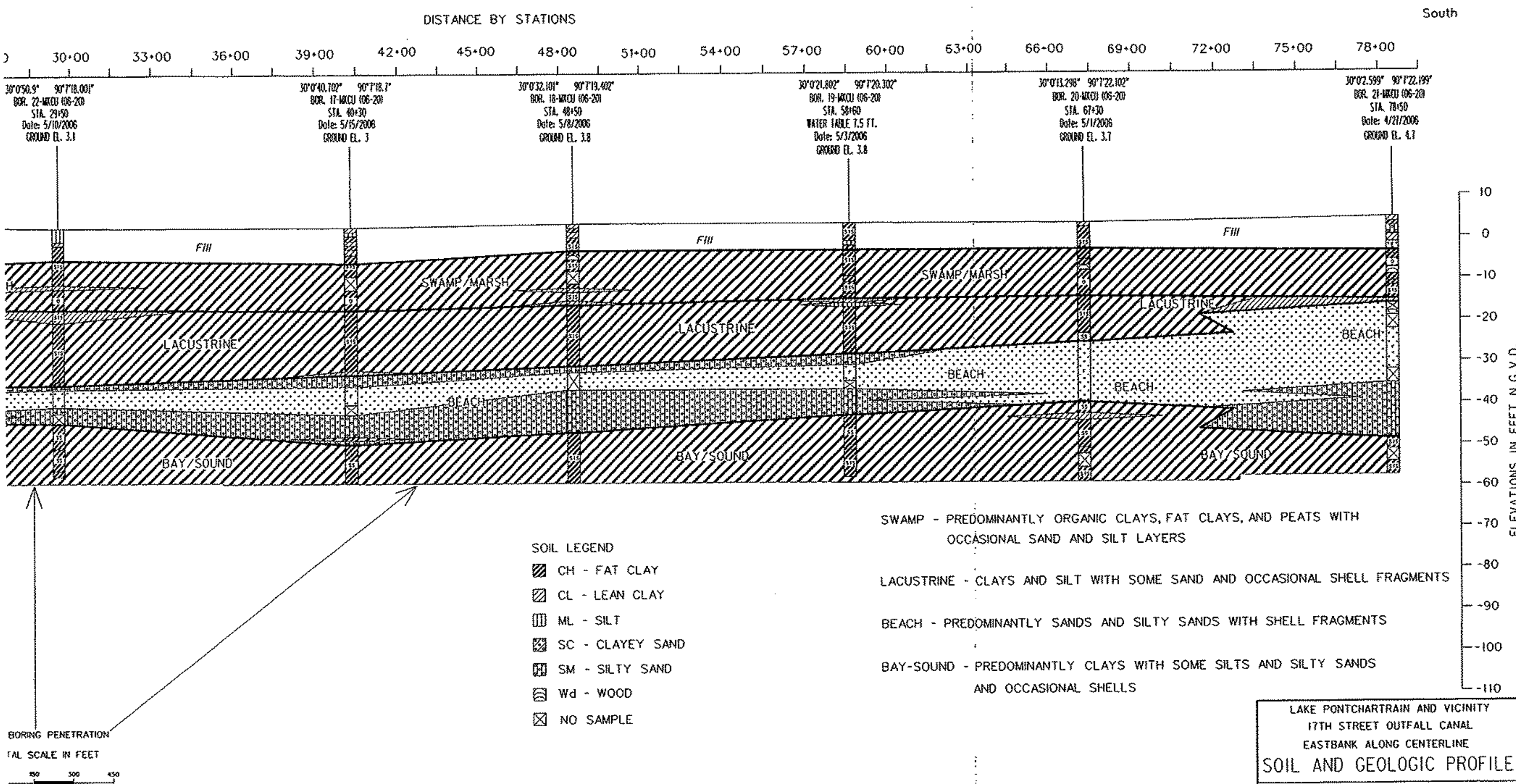
CHECKED BY: D. BRITSCH
PLOT SCALE: 1 : 10
PLOT DATE:
DATE: 04 MAY 2007
FILE NO.

PLATE 10



SWAMP - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS

LACUSTRINE - CLAYS AND SILT WITH SOME SAND AND OCCASIONAL SHELL FRAGMENTS

BEACH - PREDOMINANTLY SANDS AND SILTY SANDS WITH SHELL FRAGMENTS

BAY-SOUND - PREDOMINANTLY CLAYS WITH SOME SILTS AND SILTY SANDS AND OCCASIONAL SHELLS

SOIL LEGEND

- CH - FAT CLAY
- CL - LEAN CLAY
- ML - SILT
- SC - CLAYEY SAND
- SM - SILTY SAND
- Wd - WOOD
- NO SAMPLE

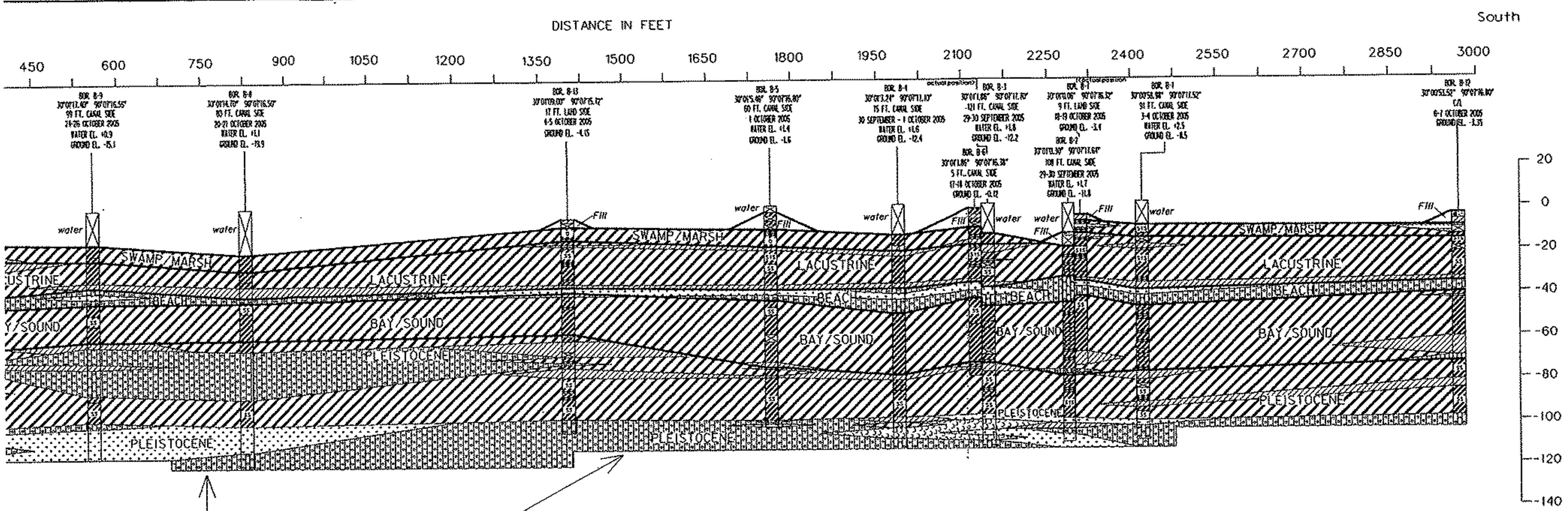
LAKE PONTCHARTRAIN AND VICINITY
17TH STREET OUTFALL CANAL
EASTBANK ALONG CENTERLINE

SOIL AND GEOLOGIC PROFILE

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

DESIGNED BY: T. CREASY DRAWN BY: T. CREASY CHECKED BY: D. BRITSCH	PLOT SCALE: 1 : 10	PLOT DATE:	CADD FILE: PLT1GEOL.dgn
	DATE: 04 MAY 2007		FILE NO.

PLATE



MAXIMUM BORING PENETRATION

HORIZONTAL SCALE IN FEET

75 37.5 0 75 150 225

SWAMP-MARSH - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS

LACUSTRINE - CLAYS AND SILT WITH SOME SAND AND OCCASIONAL SHELL FRAGMENTS

BEACH - PREDOMINANTLY SANDS AND SILTY SANDS WITH SHELL FRAGMENTS

BAY-SOUND - PREDOMINANTLY CLAYS WITH SOME SILTS AND SILTY SANDS AND OCCASIONAL SHELLS

PLEISTOCENE - STIFF TO VERY STIFF OXIDIZED CLAYS INTERBEDDED WITH LAYERS AND LENSES OF SILTS AND SANDS

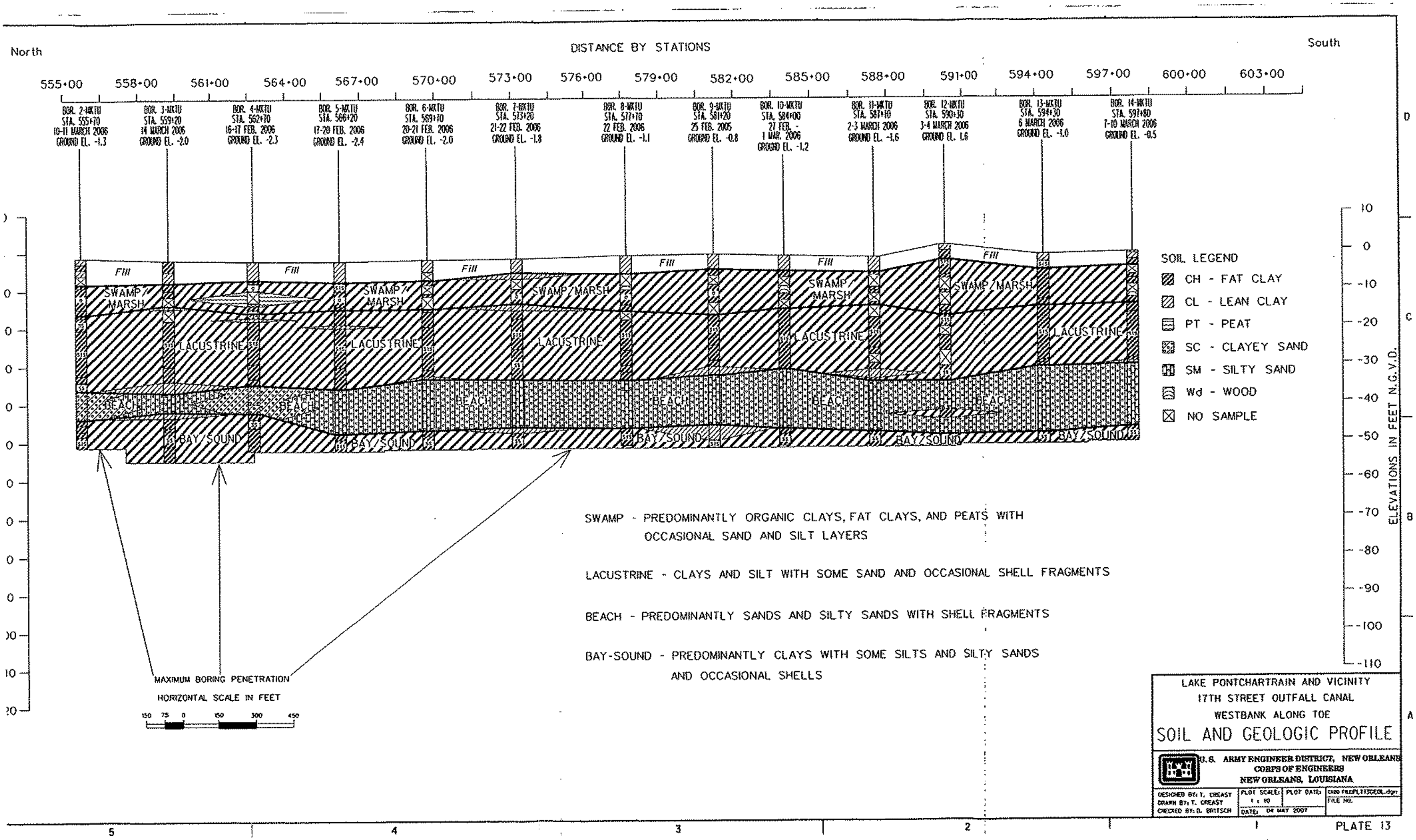
LAKE PONTCHARTRAIN AND VICINITY
17TH STREET CANAL
VICINITY OF BREACH

SOIL AND GEOLOGIC PROFILE

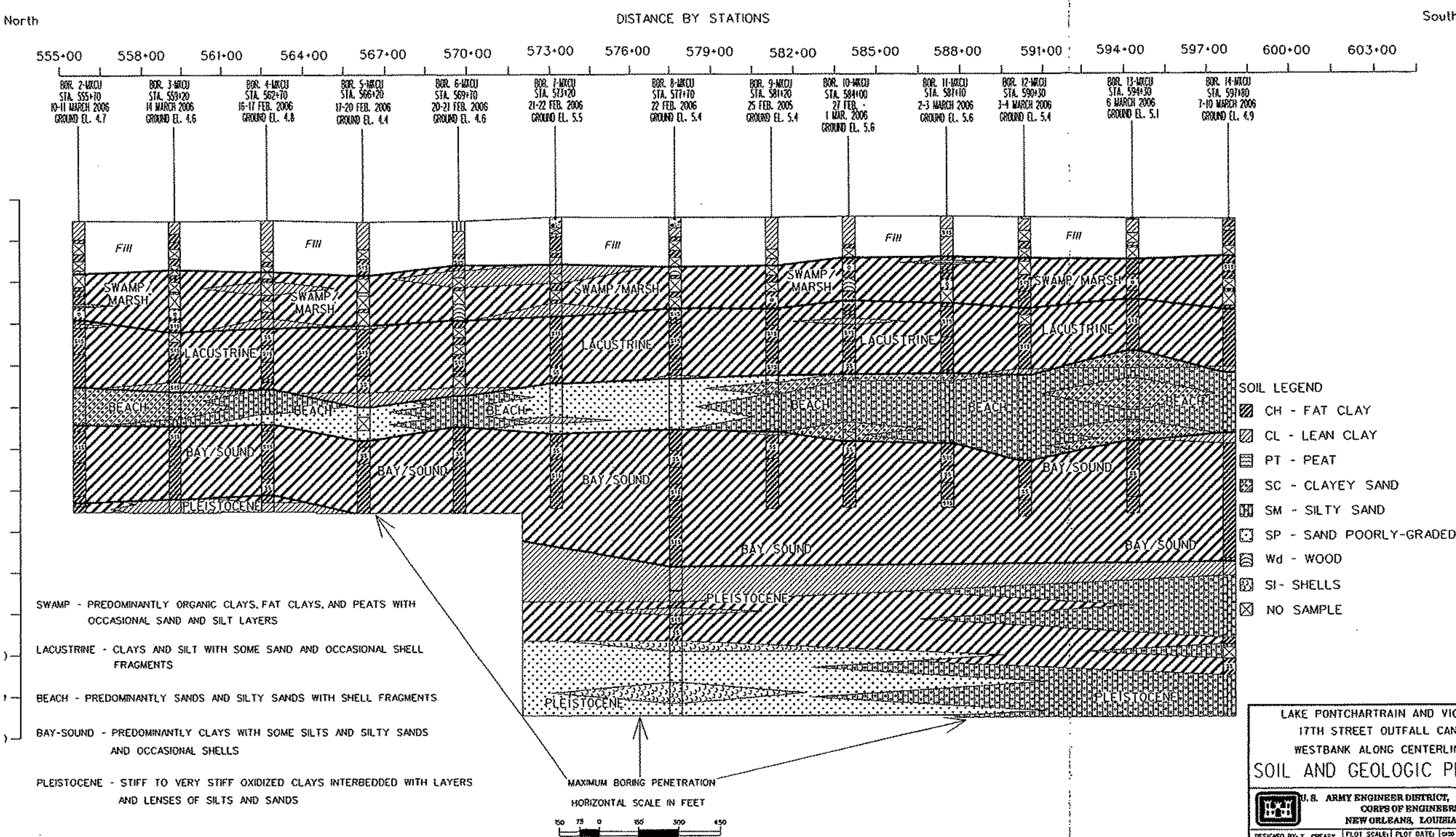
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: T. CREASY
DRAWN BY: T. CREASY
CHECKED BY: O. BRITSCH
PLOT SCALE: 1 : 20
DATE: 04 MAY 2007

PLATE 12



North
DISTANCE BY STATIONS
South
555+00
558+00
561+00
564+00
567+00
570+00
573+00
576+00
579+00
582+00
585+00
588+00
591+00
594+00
597+00
600+00
603+00
BOR. 2-MXTU STA. 555+70 10-11 MARCH 2006 GROUND EL. -1.3
BOR. 3-MXTU STA. 559+20 14 MARCH 2006 GROUND EL. -2.0
BOR. 4-MXTU STA. 562+70 16-17 FEB. 2006 GROUND EL. -2.3
BOR. 5-MXTU STA. 566+20 17-20 FEB. 2006 GROUND EL. -2.4
BOR. 6-MXTU STA. 569+10 20-21 FEB. 2006 GROUND EL. -2.0
BOR. 7-MXTU STA. 573+20 21-22 FEB. 2006 GROUND EL. -1.8
BOR. 8-MXTU STA. 577+10 22 FEB. 2006 GROUND EL. -1.1
BOR. 9-MXTU STA. 581+20 25 FEB. 2005 GROUND EL. -0.8
BOR. 10-MXTU STA. 584+00 27 FEB. - 1 MAR. 2006 GROUND EL. -1.2
BOR. 11-MXTU STA. 587+10 2-3 MARCH 2006 GROUND EL. -1.6
BOR. 12-MXTU STA. 590+30 3-4 MARCH 2006 GROUND EL. 1.6
BOR. 13-MXTU STA. 594+30 6 MARCH 2006 GROUND EL. -1.0
BOR. 14-MXTU STA. 597+80 7-10 MARCH 2006 GROUND EL. -0.5
Fill
SWAMP/MARSH
LACUSTRINE
BEACH
BAY/SOUND
SOIL LEGEND
CH - FAT CLAY
CL - LEAN CLAY
PT - PEAT
SC - CLAYEY SAND
SM - SILTY SAND
Wd - WOOD
NO SAMPLE
ELEVATIONS IN FEET N.G.V.D.
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
SWAMP - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS
LACUSTRINE - CLAYS AND SILT WITH SOME SAND AND OCCASIONAL SHELL FRAGMENTS
BEACH - PREDOMINANTLY SANDS AND SILTY SANDS WITH SHELL FRAGMENTS
BAY-SOUND - PREDOMINANTLY CLAYS WITH SOME SILTS AND SILTY SANDS AND OCCASIONAL SHELLS
MAXIMUM BORING PENETRATION
HORIZONTAL SCALE IN FEET
150 75 0 150 300 450
LAKE PONTCHARTRAIN AND VICINITY
17TH STREET OUTFALL CANAL
WESTBANK ALONG TOE
SOIL AND GEOLOGIC PROFILE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
DESIGNED BY: T. CREASY
DRAWN BY: T. CREASY
CHECKED BY: D. BRITSCH
PLOT SCALE: 1:10
DATE: 04 MAY 2007
PLATE 13



SWAMP - PREDOMINANTLY ORGANIC CLAYS, FAT CLAYS, AND PEATS WITH OCCASIONAL SAND AND SILT LAYERS

LACUSTRINE - CLAYS AND SILT WITH SOME SAND AND OCCASIONAL SHELL FRAGMENTS

BEACH - PREDOMINANTLY SANDS AND SILTY SANDS WITH SHELL FRAGMENTS

BAY-SOUND - PREDOMINANTLY CLAYS WITH SOME SILTS AND SILTY SANDS AND OCCASIONAL SHELLS

PLEISTOCENE - STIFF TO VERY STIFF OXIDIZED CLAYS INTERBEDDED WITH LAYERS AND LENSES OF SILTS AND SANDS

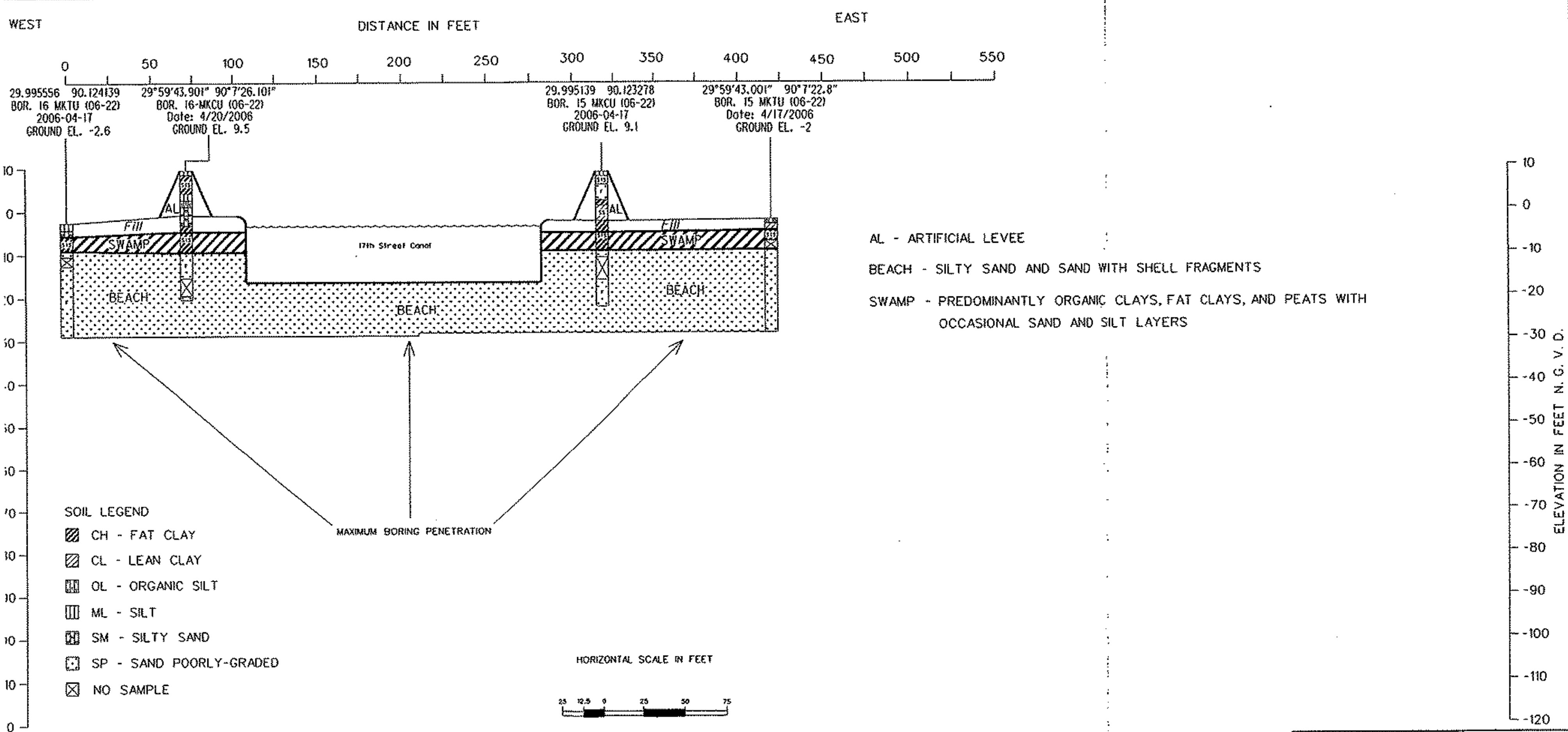
LAKE PONTCHARTRAIN AND VICINITY
17TH STREET OUTFALL CANAL
WESTBANK ALONG CENTERLINE

SOIL AND GEOLOGIC PROFILE

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

DESIGNED BY: T. CREASY
DRAWN BY: T. CREASY
CHECKED BY: D. BRITSCH
PLOT SCALE: 1 : 10
PLOT DATE:
DATE: 04 MAY 2007
FILE NO.

PLATE 14



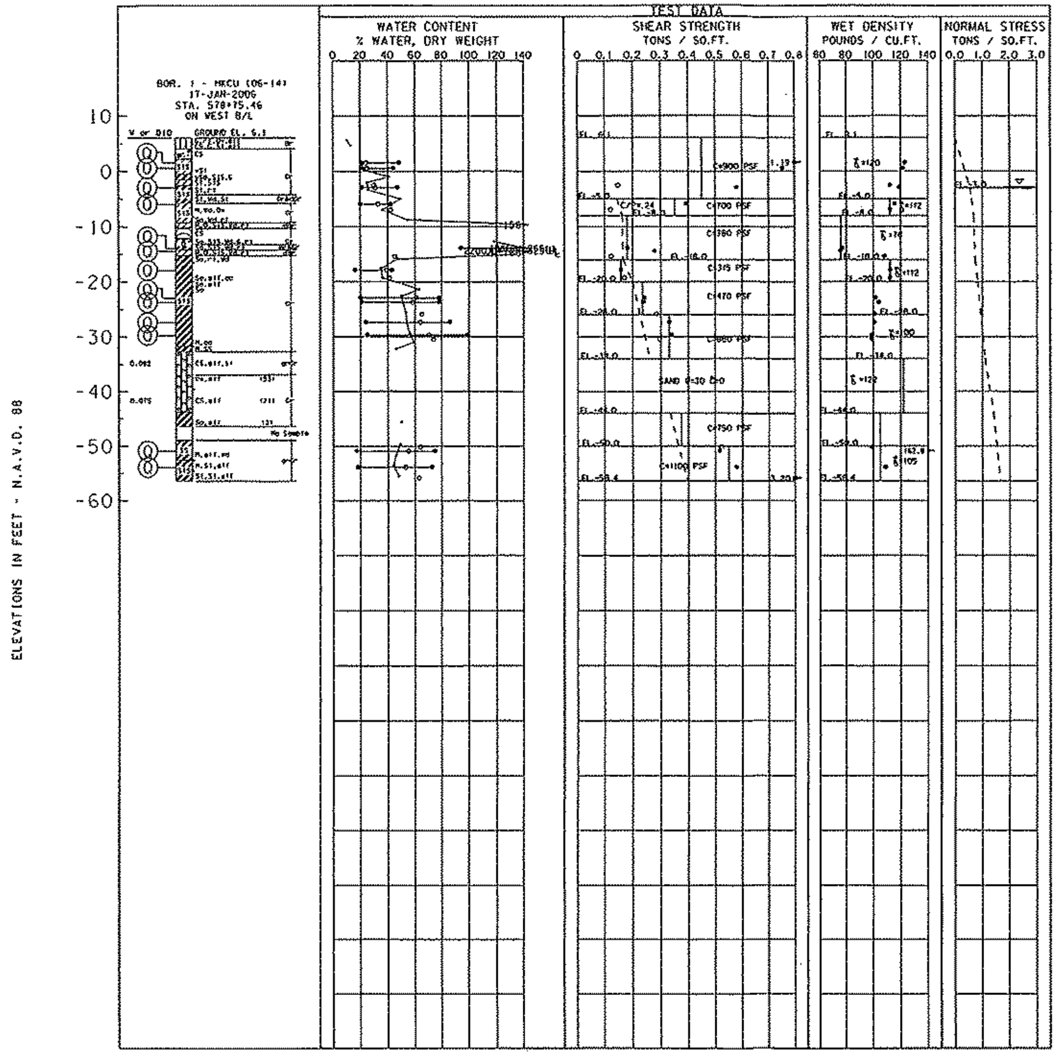
17th Street Canal
South of I-10

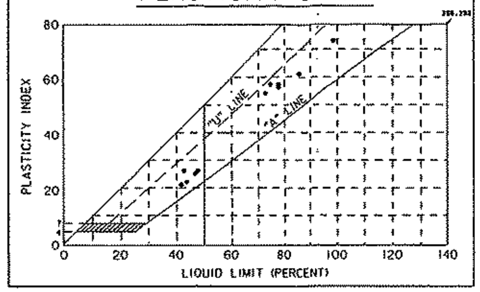
SOIL AND GEOLOGIC PROFILE

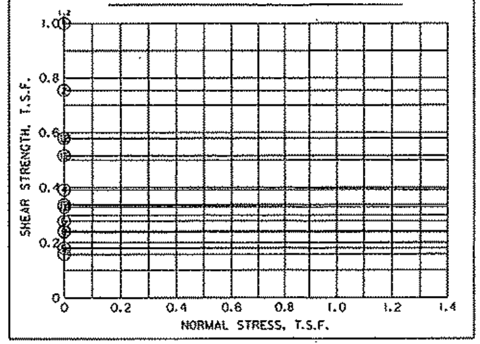
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DATE: 04 MAY 2007

PLATE 15







TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS
1	1.6	Q	0.0	1.194	CL
2	0.6	Q	0.0	0.754	CL
3	-2.9	Q	0.0	0.579	CL
4	-5.9	Q	0.0	0.392	CL
5	-13.9	Q	0.0	0.181	PT
6	-14.4	Q	0.0	0.279	PT
7	-17.9	Q	0.0	0.158	CL
8	-22.9	Q	0.0	0.242	CH
9	-23.7	Q	0.0	0.238	CH
10	-27.4	Q	0.0	0.330	CH
11	-29.7	Q	0.0	0.338	CH
12	-50.9	Q	0.0	0.516	CH
13	-53.9	Q	0.0	0.579	CH

NOTES

- o - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊡ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ω_P — ω_N — ω_L ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

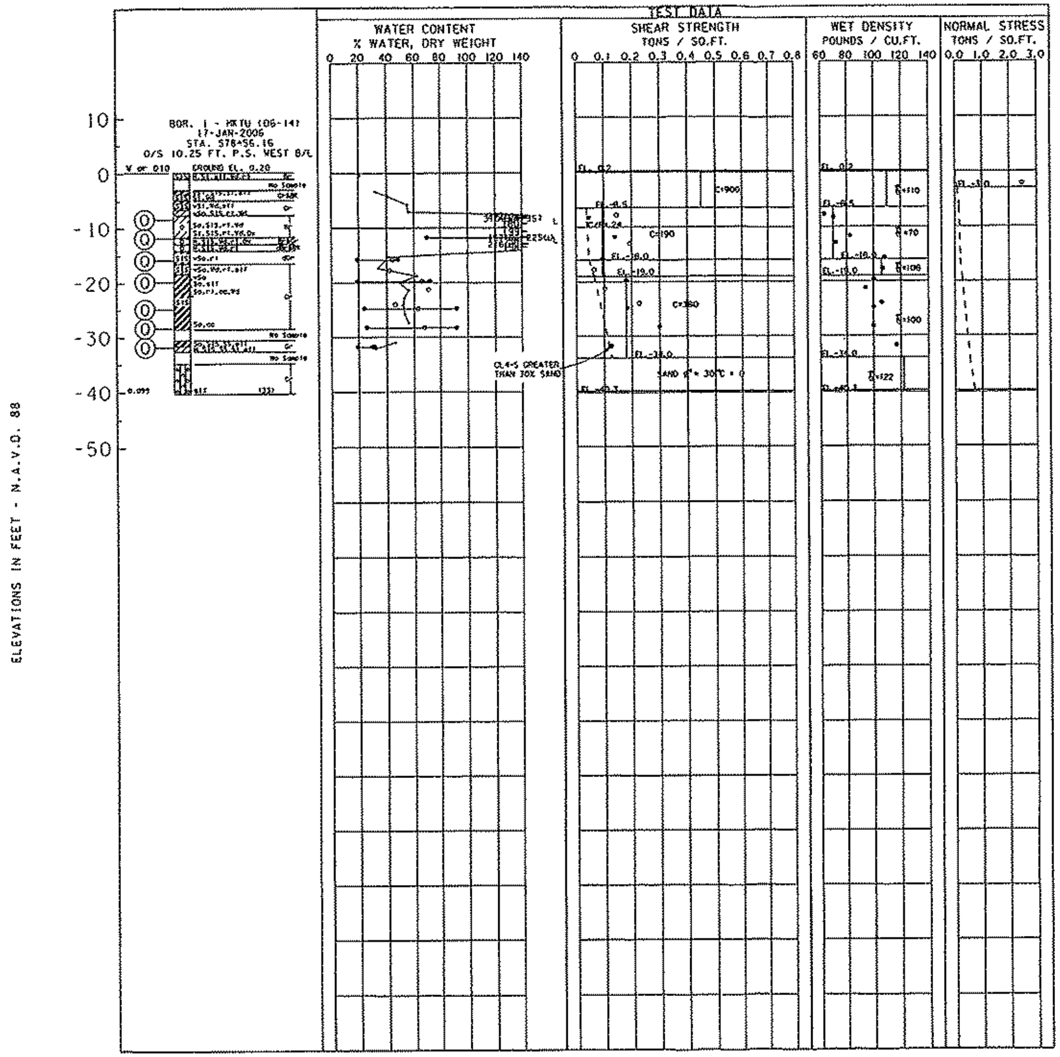
LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING I-MKCU

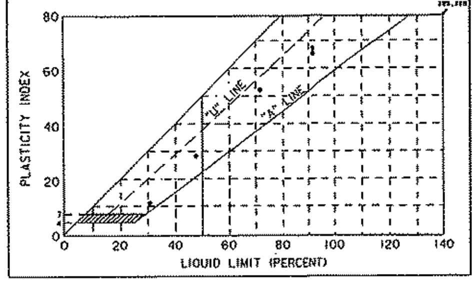
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: G. BROWN	PLOT SCALE: 20:1	PLOT DATE: 03-MAY-2007	CADD FILE:
DRAWN BY: G. BROWN			FILE NO.
CHECKED BY: F.J.V.	DATE: MAY 2007		

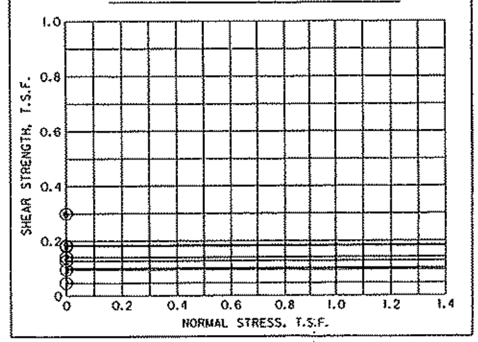
PLATE 16



PLASTICITY CHART



SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	c - TSF	
1	-8.3	Q	0.0	0.046	PT
2	-11.8	Q	0.0	0.141	PT
3	-15.8	Q	0.0	0.095	CL
4	-19.8	Q	0.0	0.181	CH
5	-24.8	Q	0.0	0.184	CH
6	-28.3	Q	0.0	0.300	CH
7	-31.8	Q	0.0	0.127	CL

NOTES

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

ω_P — ω_N — ω_L ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

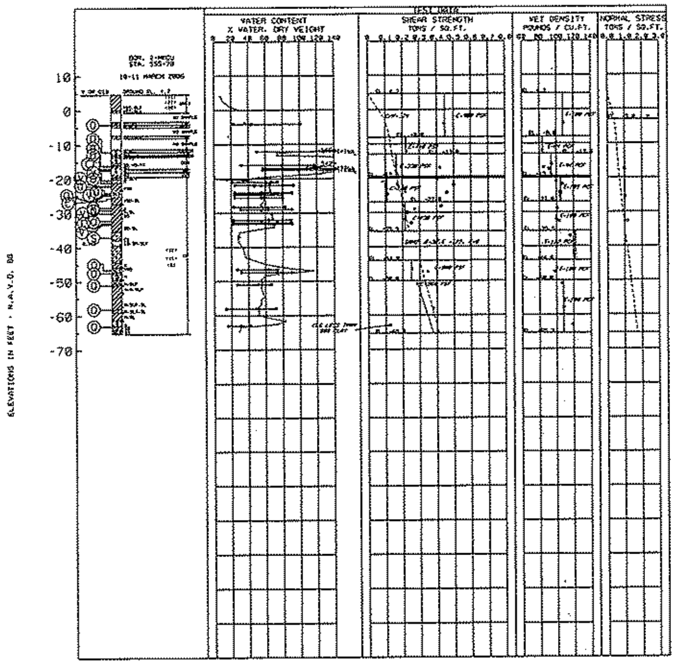
LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 1-MKTU

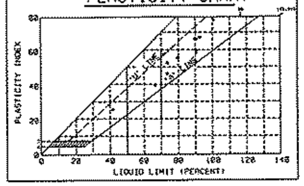
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: C. BROWN DRAWN BY: C. BROWN CHECKED BY: F.J.V.	PLOT SCALE: 20:1	PLOT DATE: 05-MAY-2007	CADD FILE:
	DATE: MAY 2007		FILE NO.

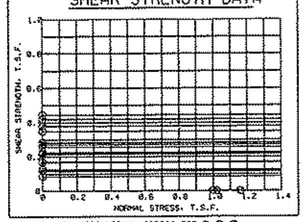
BOR. 2-MKCU
STA. 555+70
10-11 MARCH 2006



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR ⊕ ⊕ ⊕

NOTES

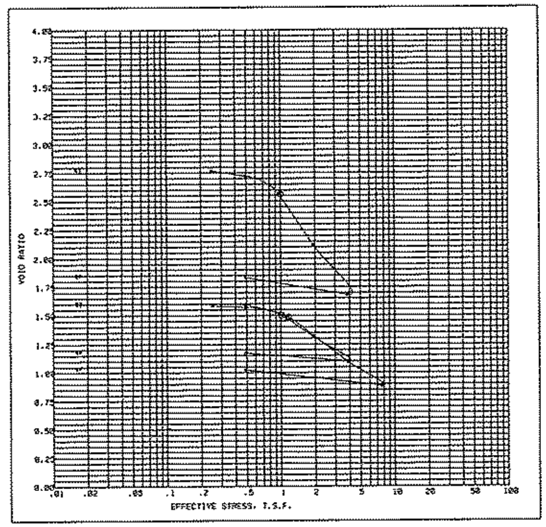
- ○ - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ● - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- □ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ωp ωN ωL ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-4.1	Q	0.0	0.444	CH
2	-12.1	Q	0.0	0.326	CH
3	-16.1	Q	0.0	0.167	CH
4	-17.8	Q	0.0	0.421	CH
5	-21.8	Q	0.0	0.093	CH
6	-22.9	Q	0.0	0.178	CH
7	-24.1	Q	0.0	0.217	CH
8	-24.8	Q	0.0	0.115	CH
9	-25.8	Q	0.0	0.222	CH
10	-32.1	Q	0.0	0.218	CH
11	-32.8	S	32.0	0.000	SC
12	-46.6	Q	0.0	0.257	CH
13	-47.5	Q	0.0	0.348	CH
14	-51.8	Q	0.0	0.284	CH
15	-58.1	Q	0.0	0.319	CH
16	-63.0	Q	0.0	0.125	CL
17	-17.5	C	0.0	0.000	CH
18	-25.6	C	0.0	0.160	CH
19	-32.7	C	0.0	0.408	CH
20	-28.3	V	0.0	0.494	CL
21	-32.1	V	0.0	0.309	CH
22	-26.3	V	0.0	0.451	CH
23	-28.2	V	0.0	0.426	CH
24	-28.8	V	0.0	0.225	CH
25	-32.2	V	0.0	0.272	CH

**(V) VANE SHEAR TEST

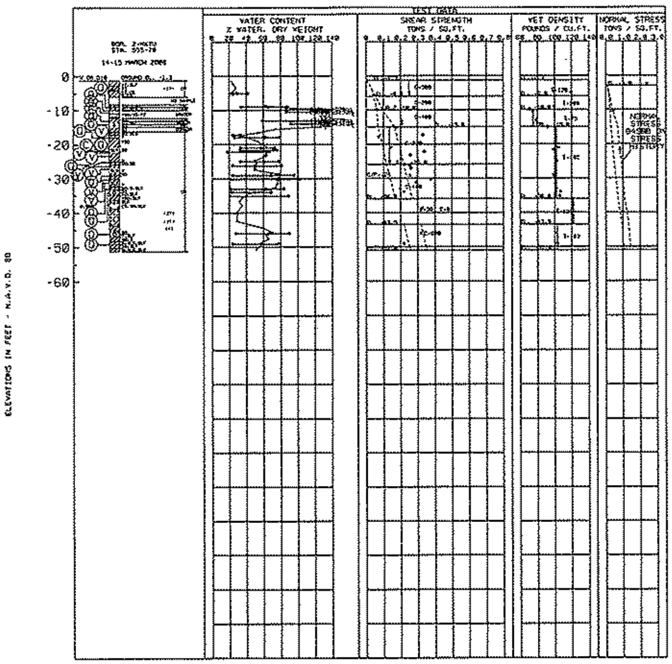


17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

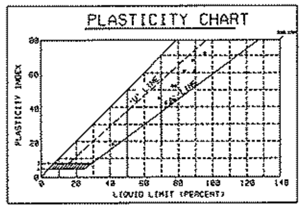
BORING 2-MKCU

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

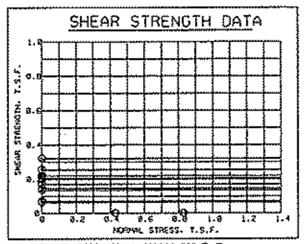
PLATE 18



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR ⓑ-ⓓ

NOTES

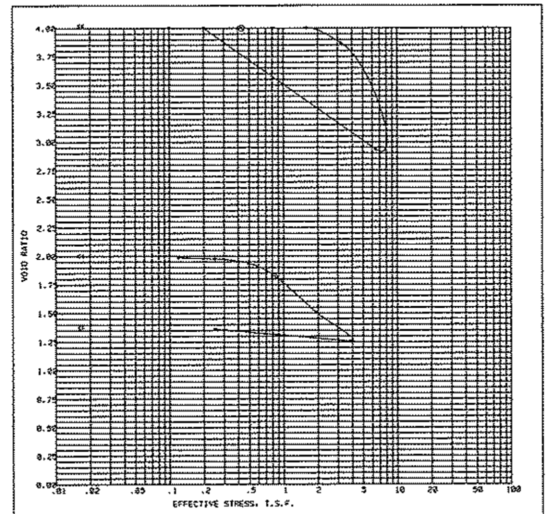
- ◇ - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊙ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ωp ωn ωL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-5.1	Q	0.0	0.252	CL
2	-9.1	Q	0.0	0.120	CH
3	-9.9	Q	0.0	0.162	PT
4	-12.1	Q	0.0	0.207	CH
5	-11.8	Q	0.0	0.207	CH
6	-19.0	Q	0.0	0.072	CH
7	-21.1	Q	0.0	0.146	CH
8	-23.1	Q	0.0	0.128	CH
9	-29.1	Q	0.0	0.256	CH
10	-33.1	Q	0.0	0.195	CH
11	-31.0	Q	0.0	0.219	CH
12	-48.1	Q	0.0	0.321	CH
13	-45.1	Q	0.0	0.220	CH
14	-10.6	C	0.0	0.080	CH
15	-21.8	C	0.0	0.400	CH
16	-17.3	V	0.0	0.231	CL
17	-22.3	V	0.0	0.379	CH
18	-22.2	V	0.0	0.252	CH
19	-28.3	V	0.0	0.323	CH
20	-27.1	V	0.0	0.260	CH
21	-38.2	V	0.0	0.275	CH
22	-31.1	V	0.0	0.243	CH

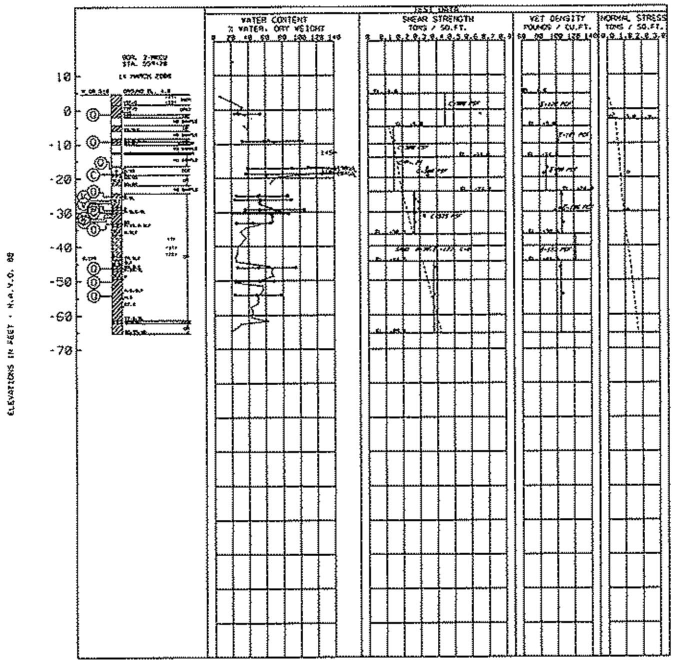
V MINI VANE SHEAR TEST



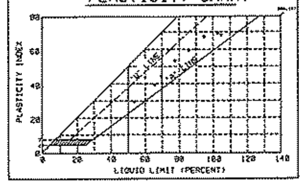
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 2-MKTU

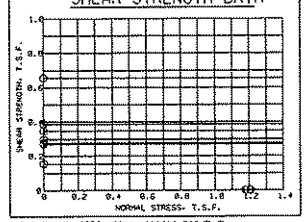
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR ⊕ ⊕

NOTES

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

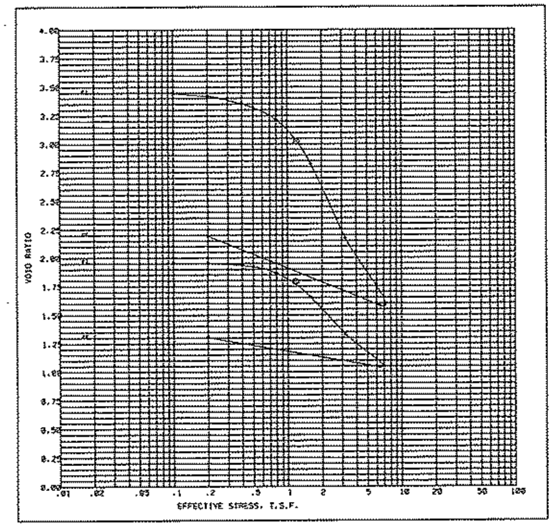
ω_P ω_N ω_L ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-1.2	Q	0.0	0.656	CH
2	-5.2	Q	0.0	0.154	CH
3	-17.2	Q	0.0	0.347	CH
4	-25.2	Q	0.0	0.269	CH
5	-29.2	Q	0.0	0.237	CH
6	-33.2	Q	0.0	0.273	CH
7	-44.2	Q	0.0	0.288	CH
8	-30.2	Q	0.0	0.508	CH
9	-34.2	Q	0.0	0.284	CH
10	-18.8	C	0.0	0.485	CH
11	-25.8	C	0.0	0.809	CH
12	-28.5	T	0.0	0.273	CH
13	-27.2	V	0.0	0.246	CH
14	-30.2	V	0.0	0.271	CH
15	-31.2	V	0.0	0.327	CH

* MINI VANE SHEAR TEST

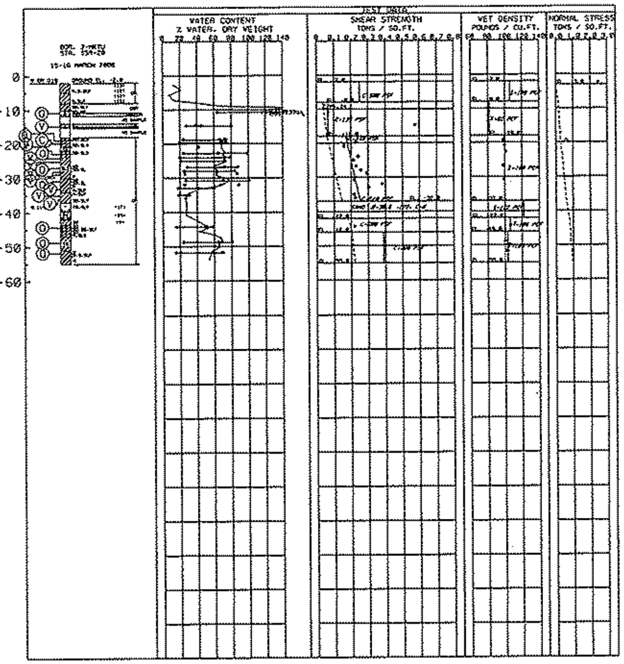


LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

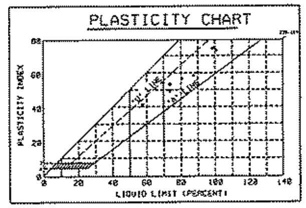
BORING 3-MKCU

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

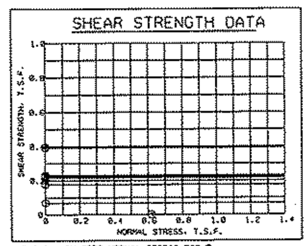
PLATE 20



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR ⊕

NOTES

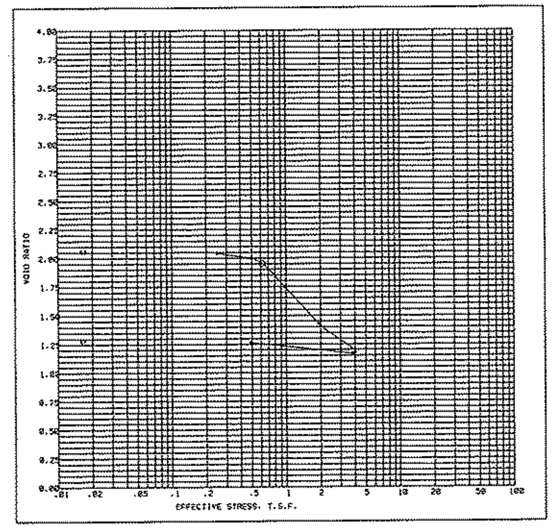
- ○ - (UC) UNCONFINED COMPRESSION TEST
- ✱ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- □ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ωP ωN ωL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-10.0	Q	0.0	0.460	CH
2	-18.0	Q	0.0	0.177	CH
3	-22.0	Q	0.0	0.280	CH
4	-26.0	Q	0.0	0.231	CH
5	-28.0	Q	0.0	0.218	CH
6	-44.2	Q	0.0	0.223	CH
7	-48.7	Q	0.0	0.351	CH
8	-51.0	Q	0.0	0.270	CH
9	-19.5	C	0.0	0.400	CH
10	-15.0	V	0.0	0.276	CH
11	-19.0	V	0.0	0.229	CH
12	-24.0	V	0.0	0.263	CH
13	-25.0	V	0.0	0.215	CH
14	-29.0	V	0.0	0.237	CH
15	-28.0	V	0.0	0.242	CH
16	-32.0	V	0.0	0.393	CH
17	-37.0	V	0.0	0.383	CH
18	-25.0	V	0.0	0.218	CL
19	-25.0	V	0.0	0.223	CL

*(V) VANE SHEAR TEST

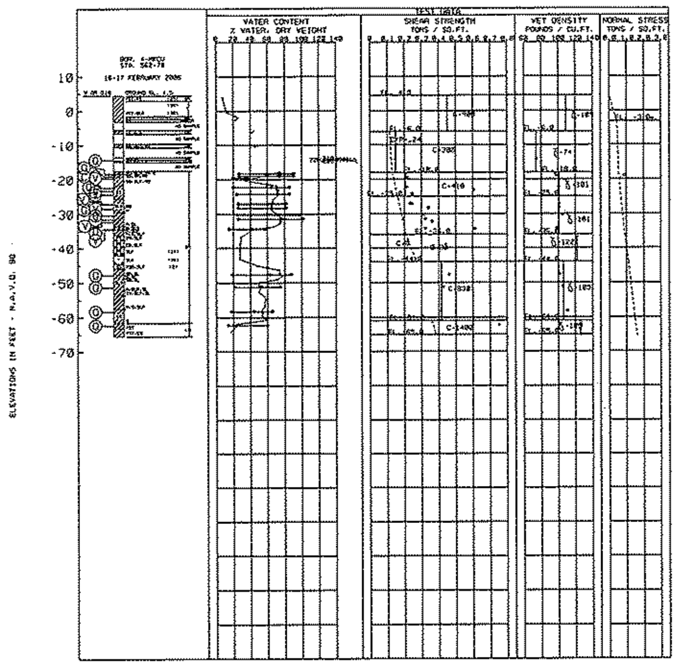


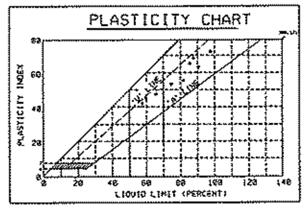
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

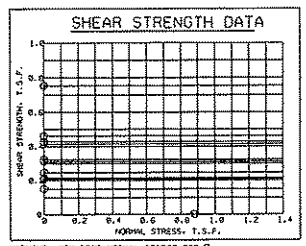
BORING 3-MKTU

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

PLATE 21







WARNING: NON-ZERO NORMAL STRESS FOR ⊙

NOTES

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

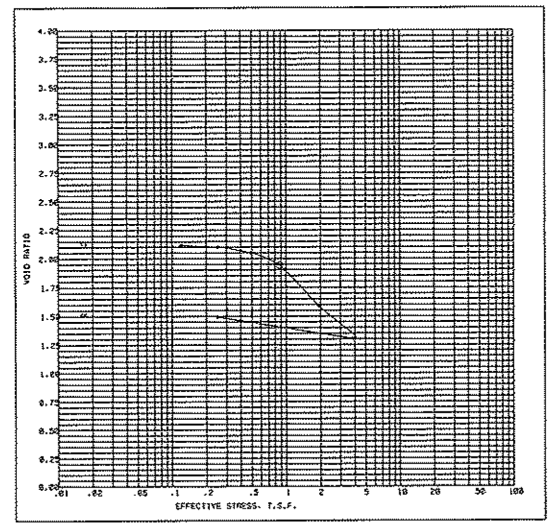
ω_p — ω_x — ω_L ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-14.2	Q	0.0	0.138	PT
2	-19.2	Q	0.0	0.209	CH
3	-22.2	Q	0.0	0.215	CH
4	-27.2	Q	0.0	0.247	CH
5	-32.2	Q	0.0	0.212	CH
6	-35.2	Q	0.0	0.322	CH
7	-47.2	Q	0.0	0.462	CH
8	-51.2	Q	0.0	0.422	CH
9	-58.2	Q	0.0	0.435	CH
10	-62.2	Q	0.0	0.732	CH
11	-19.8	C	0.0	0.880	CH
12	-19.5	Y	0.0	0.215	CL
13	-22.2	Y	0.0	0.684	CH
14	-24.2	Y	0.0	0.246	CH
15	-27.8	Y	0.0	0.236	CH
16	-28.3	Y	0.0	0.341	CH
17	-31.5	Y	0.0	0.274	CH
18	-33.2	Y	0.0	0.262	CH
19	-31.5	Y	0.0	0.312	CH

* MINI VANE SHEAR TEST

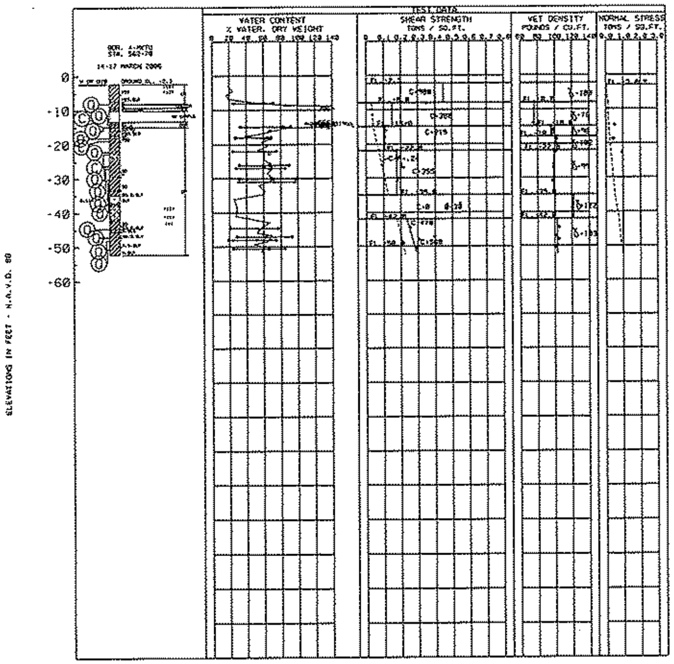


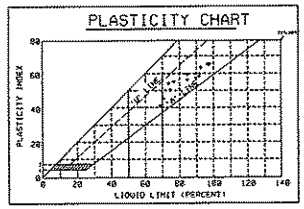
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

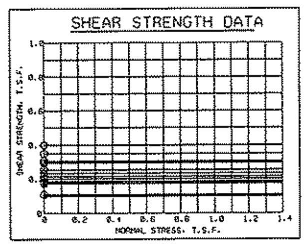
BORING 4-MKCU

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

DESIGNED BY: BROWN
DRAWN BY: BROWN
CHECKED BY: J.Y.
PLOT SCALE: 20:1
PLOT DATE:
FILE NO.
DATE:







NOTES

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

Wp Wn WL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.

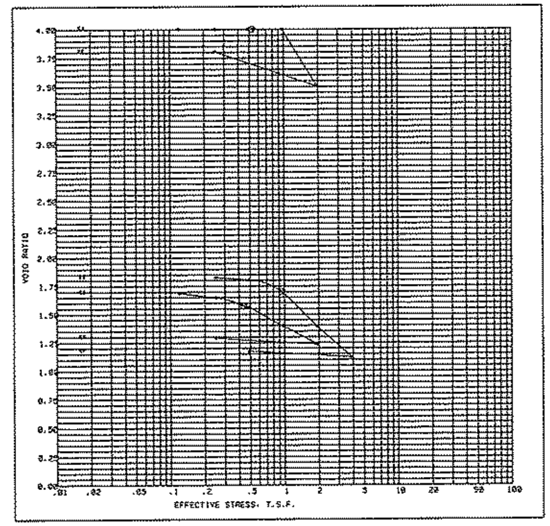
FOR SOIL BORING LEGEND SEE PLATE A.

FOR LOCATION OF BORINGS SEE PLATE 2.

FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-8.1	Q	0.0	0.245	CH
2	-14.1	Q	0.0	0.221	CH
3	-15.0	Q	0.0	0.188	CH
4	-18.1	Q	0.0	0.188	CH
5	-22.1	Q	0.0	0.173	CH
6	-26.1	Q	0.0	0.284	CH
7	-27.0	Q	0.0	0.215	CH
8	-30.1	Q	0.0	0.188	CH
9	-31.8	Q	0.0	0.179	CH
10	-41.8	Q	0.0	0.226	CH
11	-47.1	Q	0.0	0.293	CH
12	-49.8	Q	0.0	0.298	CH
13	-50.8	Q	0.0	0.291	CH
14	-15.8	S	0.0	0.000	CH
15	-18.5	S	0.0	0.000	CH
16	-22.8	S	0.0	0.000	CH



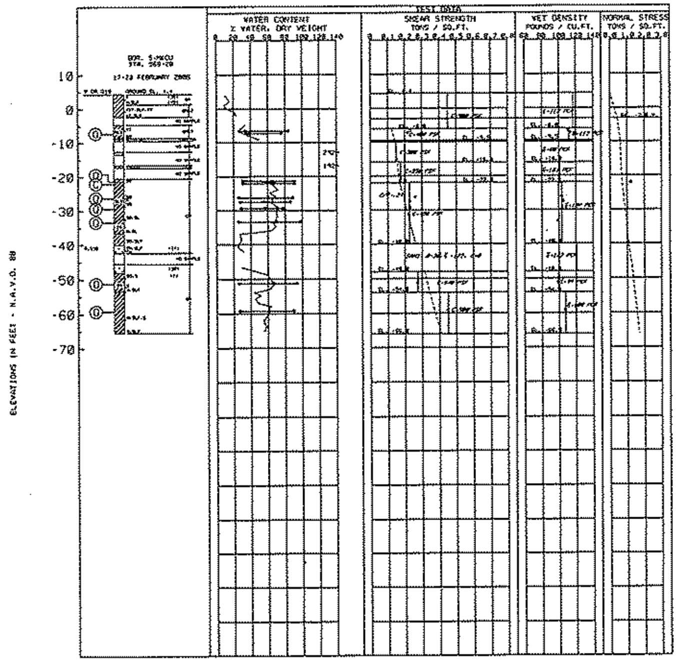
LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 4-MKTU

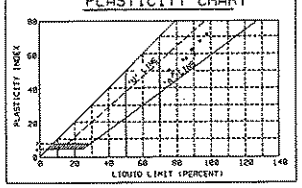
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: L. BROWN | DRAWN BY: L. BROWN | CHECKED BY: J.Y. | DATE: MAY 2007

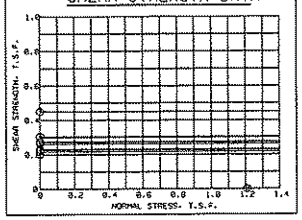
PLATE 23



PLASTICITY CHART



SHEAR STRENGTH DATA



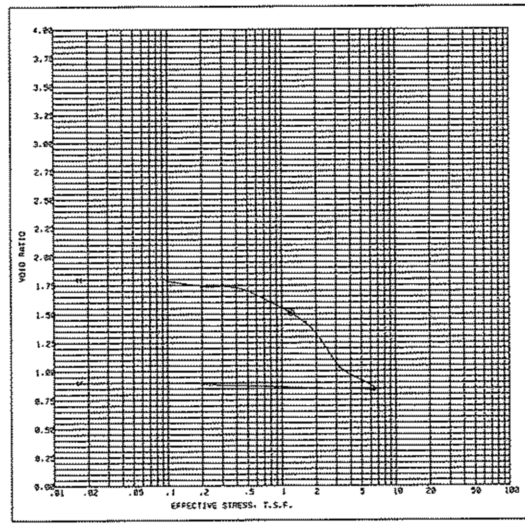
NOTES

○ - (UC) UNCONFINED COMPRESSION TEST
● - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
◻ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
ω_P ω_N ω_L ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

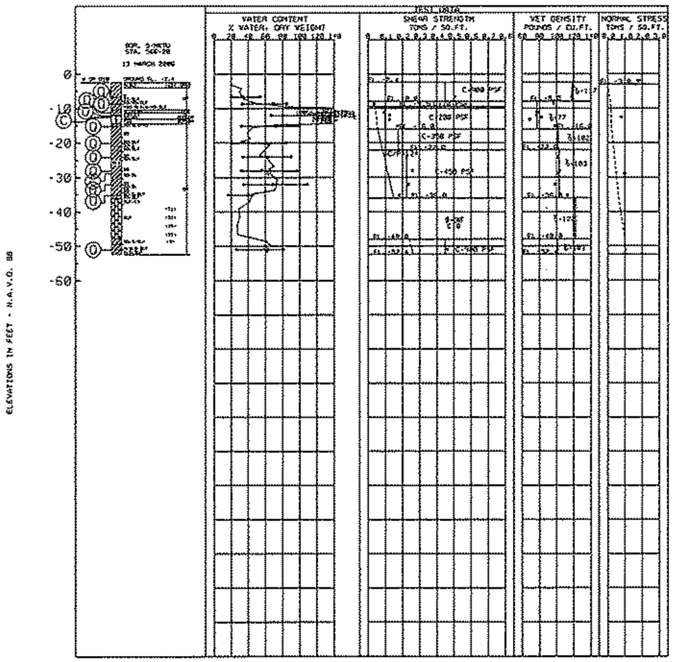
ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-7.2	Q	0.0	0.219	CH
2	-21.4	Q	0.0	0.281	CH
3	-26.3	Q	0.0	0.262	CH
4	-29.4	Q	0.0	0.221	CH
5	-33.4	Q	0.0	0.225	CH
6	-51.2	Q	0.0	0.273	CH
7	-59.3	Q	0.0	0.450	CH
8	-22.1	S	0.0	0.180	CH

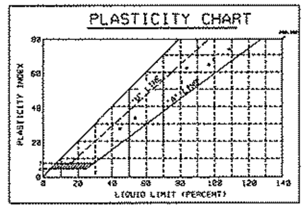


BORING 5-MKCU

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

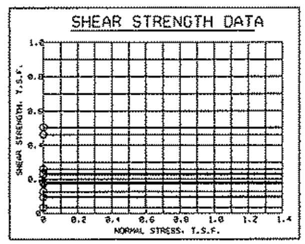
PLATE 24

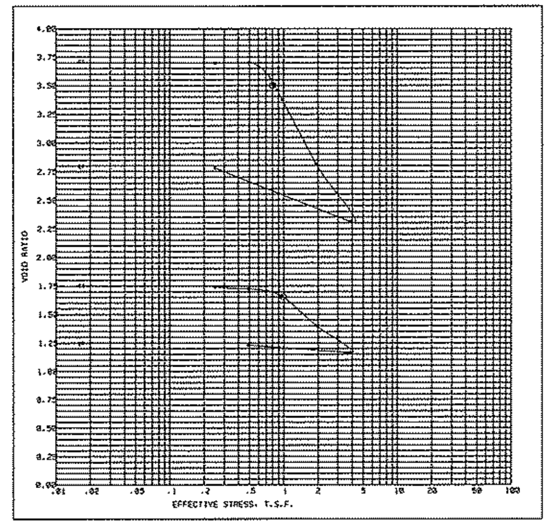




TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-8.7	Q	0.0	0.325	CH
2	-9.7	Q	0.0	0.034	CH
3	-11.2	Q	0.0	0.093	PT
4	-17.1	Q	0.0	0.127	CH
5	-19.2	Q	0.0	0.123	CH
6	-20.1	Q	0.0	0.177	CH
7	-24.1	Q	0.0	0.227	CH
8	-28.1	Q	0.0	0.223	CH
9	-32.1	Q	0.0	0.225	CH
10	-35.2	Q	0.0	0.183	CL
11	-31.8	Q	0.0	0.452	CH
12	-12.6	S	0.0	0.000	CH
13	-20.3	S	0.0	0.000	CH





NOTES

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

ω_p — ω_N — ω_L ATTERBERG LIMITS

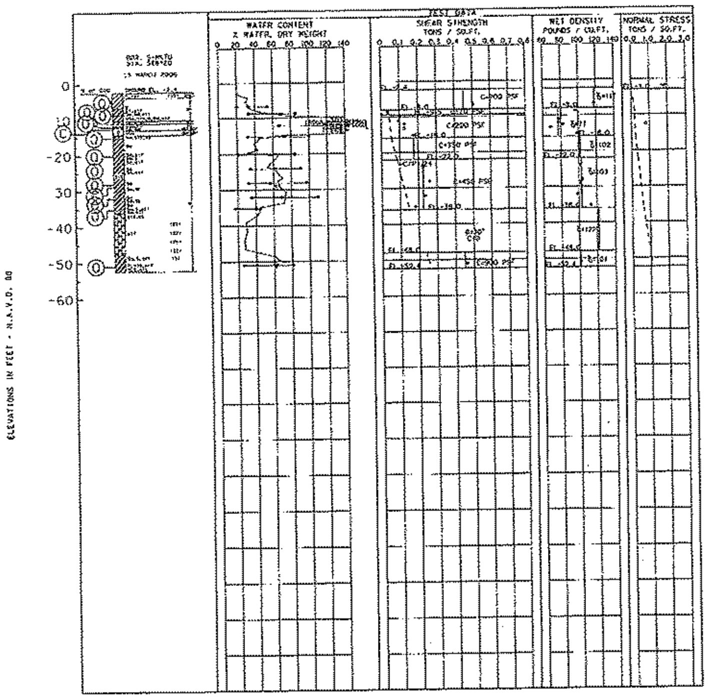
BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

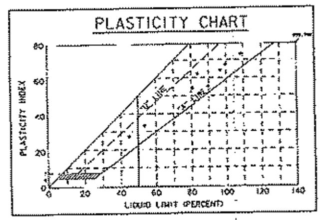
[illegible]
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

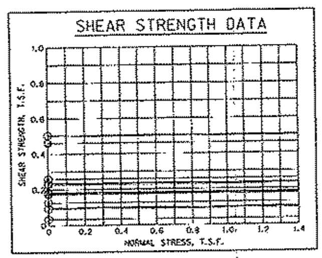
BORING 5-MKTU

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

DESIGNED BY: [illegible] | PLOT SCALE: [illegible] | PLOT DATE: [illegible] | DATE: [illegible]







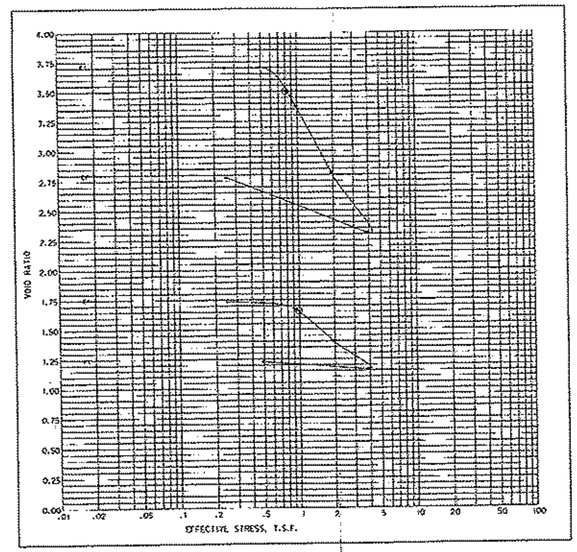
NOTES

- O - (UC) UNCONFINED COMPRESSION TEST
- ✱ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊖ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- PL — W — LL ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

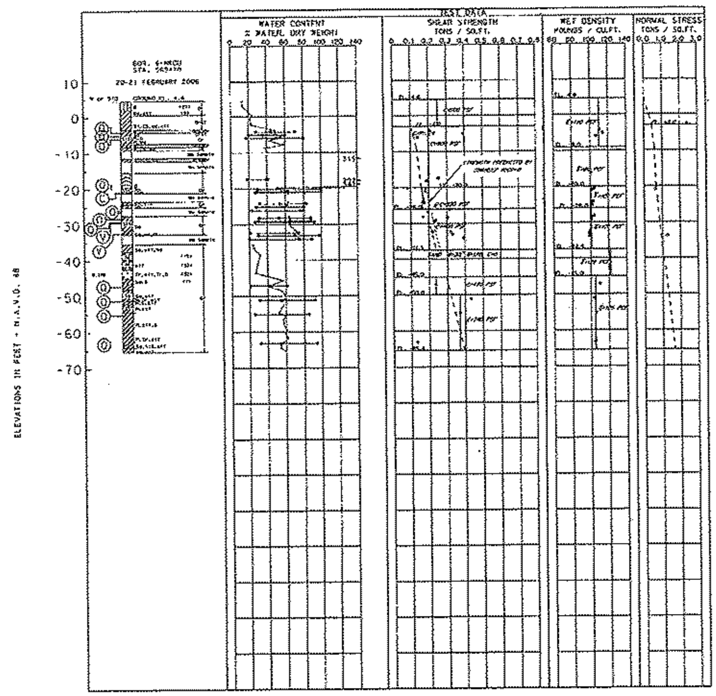
ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	C, TSF	
1.	-6.7	Q	0.0	0.206	CH
2.	-8.7	Q	0.0	0.234	CH
3.	-11.2	Q	0.0	0.073	PT
4.	-12.1	Q	0.0	0.127	CH
5.	-15.2	Q	0.0	0.133	CH
6.	-20.1	Q	0.0	0.177	CH
7.	-24.1	Q	0.0	0.221	CH
8.	-28.1	Q	0.0	0.259	CH
9.	-37.1	Q	0.0	0.235	CH
10.	-35.2	Q	0.0	0.193	CL
11.	-51.9	Q	0.0	0.462	CH
12.	-17.5	S	0.0	0.000	CH
13.	-28.9	S	0.0	0.000	CH



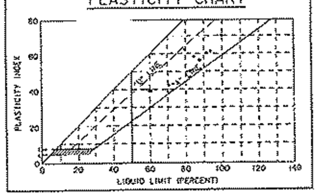
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 5-MKTU

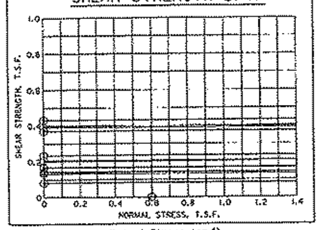
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA



PLASTICITY CHART



SHEAR STRENGTH DATA



Warning: non-zero Normal Stress for 4)

NOTES

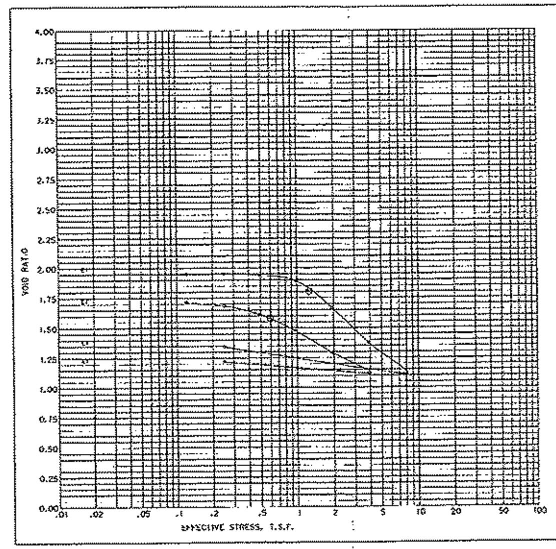
- ○ - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊖ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ωp ωN ωL ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-1.2	Q	0.0	0.291	CH
2	-5.1	Q	0.0	0.371	CH
3	-6.0	Q	0.0	0.142	CH
4	-20.2	Q	0.0	0.092	CH
5	-26.2	Q	0.0	0.161	CH
6	-28.2	Q	0.0	0.168	CH
7	-47.2	Q	0.0	0.235	CH
8	-51.2	Q	0.0	0.432	CH
9	-55.2	Q	0.0	0.370	CH
10	-63.2	Q	0.0	0.132	CH
11	-20.9	C	0.0	0.000	CH
12	-24.4	V	0.0	0.237	CH
13	-32.4	V	0.0	0.218	CH
*15	-16.7	Q	0.0	0.722	CH
*16	-21.1	Q	0.0	0.142	CH
*17	-25.1	Q	0.0	0.236	CH
*18	-29.1	Q	0.0	0.238	CH
*19	-53.1	Q	0.0	0.331	CH
*20	-51.8	C	0.0	0.000	CH
*21	-17.4	V	0.0	0.153	CL
*22	-19.2	V	0.0	0.190	CH
*23	-26.1	V	0.0	0.317	CH
*24	-35.2	V	0.0	0.394	CH

+MINI VANE SHEAR TEST
*SAMPLES FROM BORING 6-MKCU-A DRILLED NEXT TO 6-MKCU

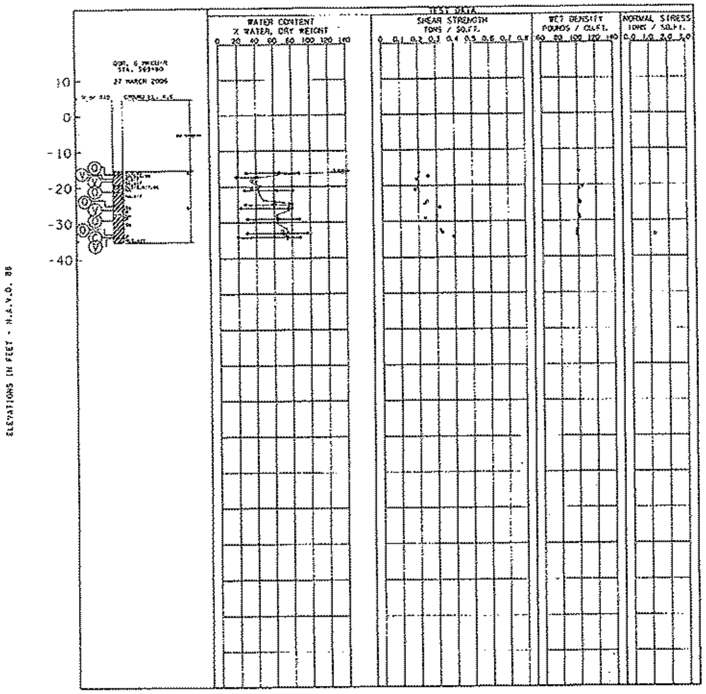


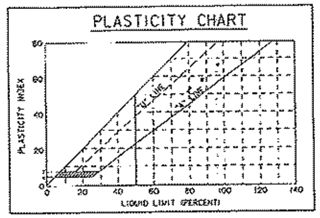
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

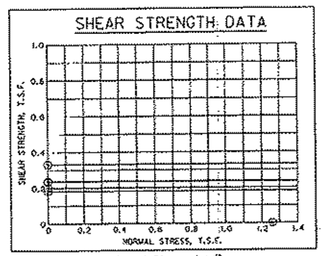
BORING 6-MKCU

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

PLATE 28







Warning: non-zero Normal Stress for ⑩

NOTES

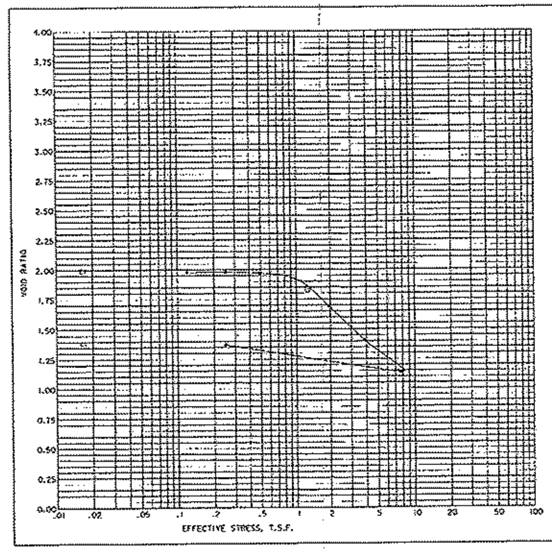
○ - (UC) UNCONFINED COMPRESSION TEST
✱ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
PL — WN — LL ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-16.2	Q	0.0	0.221	CH
2	-21.1	Q	0.0	0.182	CH
3	-20.1	Q	0.0	0.235	CH
4	-23.1	Q	0.0	0.235	CH
5	-22.1	Q	0.0	0.261	CH
6	-33.8	S	0.0	0.009	CH
7	-17.4	V	0.0	0.255	CL
8	-18.2	V	0.0	0.190	CH
9	-26.1	V	0.0	0.317	CH
10	-34.7	V	0.0	0.324	CH

*MINI VANE SHEAR TEST

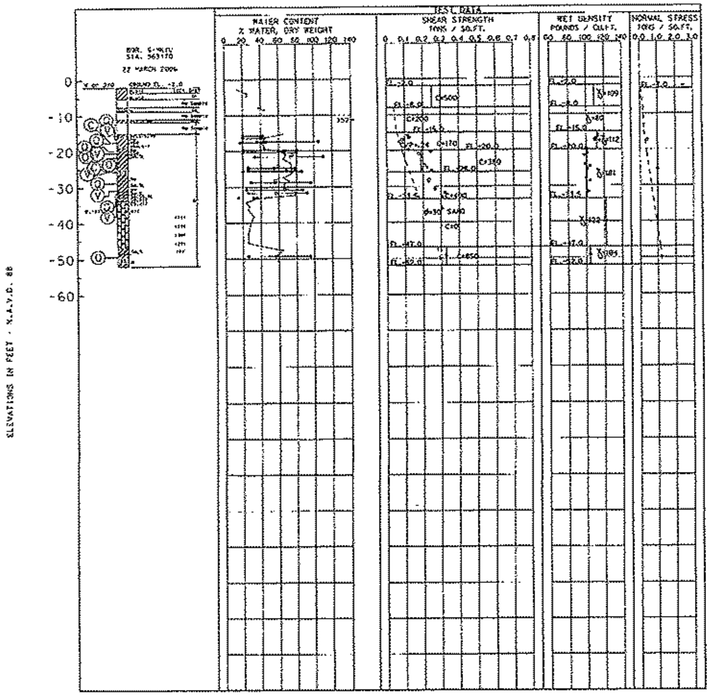


LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

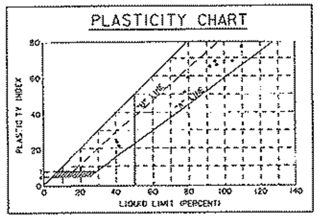
BORING 6-MKCU-R

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

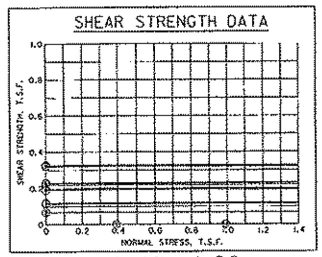
PLATE 27



PLASTICITY CHART



SHEAR STRENGTH DATA



Warning: non-zero Normal Stress for ⑬ ⑭

NOTES

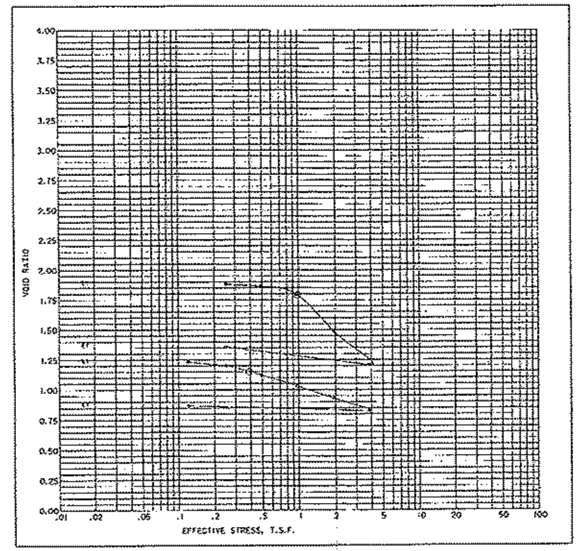
- ○ - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊕ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ωp ωn ωL ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	C - TSF	CLASS
1	-15.8	Q	0.0	0.115	CL
2	-16.5	Q	0.0	0.257	CL
3	-19.8	Q	0.0	0.119	CH
4	-21.6	Q	0.0	0.192	CH
5	-24.7	Q	0.0	0.221	CH
6	-28.3	Q	0.0	0.232	CH
7	-31.2	Q	0.0	0.321	CH
8	-43.3	Q	0.0	0.323	CH
9	-17.4	C	0.0	0.202	CL
10	-25.4	C	0.0	0.002	CH
11	-16.5	V	0.0	0.121	CL
12	-20.4	V	0.0	0.243	CH
13	-25.7	V	0.0	0.264	CH
14	-30.8	V	0.0	0.287	CH
15	-33.0	V	0.0	0.206	CL

* MINI VANE SHEAR TEST

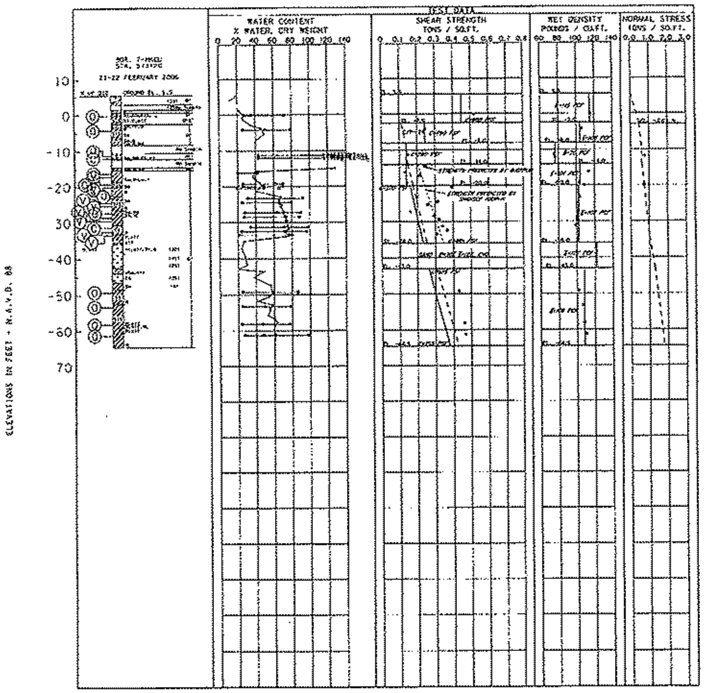


LAKE PONTCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

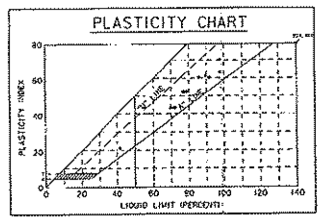
BORING 6-MKTU

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

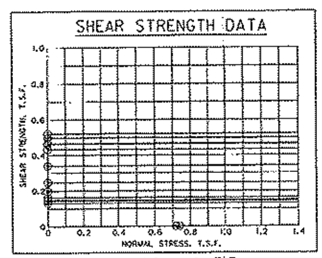
PLATE 28



PLASTICITY CHART



SHEAR STRENGTH DATA

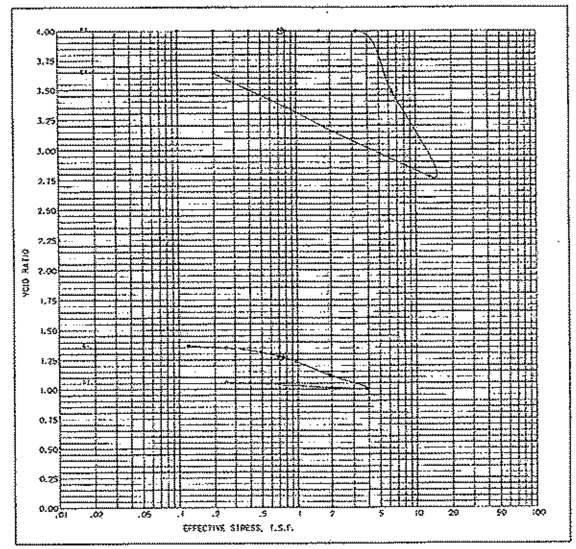


Warning: non-zero Normal Stress for

TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-0.2	Q	0.0	0.522	CH
2	-6.2	Q	0.0	0.216	CH
3	-11.3	Q	0.0	0.148	CH
4	-16.2	Q	0.0	0.151	CL
5	-19.3	Q	0.0	0.142	CH
6	-23.3	Q	0.0	0.139	CH
7	-27.3	Q	0.0	0.152	CH
8	-31.3	Q	0.0	0.340	CH
9	-49.3	Q	0.0	0.432	CH
10	-53.3	Q	0.0	0.498	CH
11	-58.2	Q	0.0	0.562	CH
12	-61.3	Q	0.0	0.467	CH
13	-12.0	S	0.0	0.000	CH
14	-20.0	S	0.0	0.000	CH
15	-17.2	V	0.0	0.215	CL
16	-20.3	V	0.0	0.294	CL
17	-24.5	V	0.0	0.317	CH
18	-25.5	V	0.0	0.260	CH
19	-28.5	V	0.0	0.235	CH
20	-29.5	V	0.0	0.320	CH
21	-32.5	V	0.0	0.365	CH
22	-35.5	V	0.0	0.306	CH

* MINI VANE SHEAR TEST



NOTES

O - (U) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
⊠ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
ωP ωN ωL ATTERBERG LIMITS

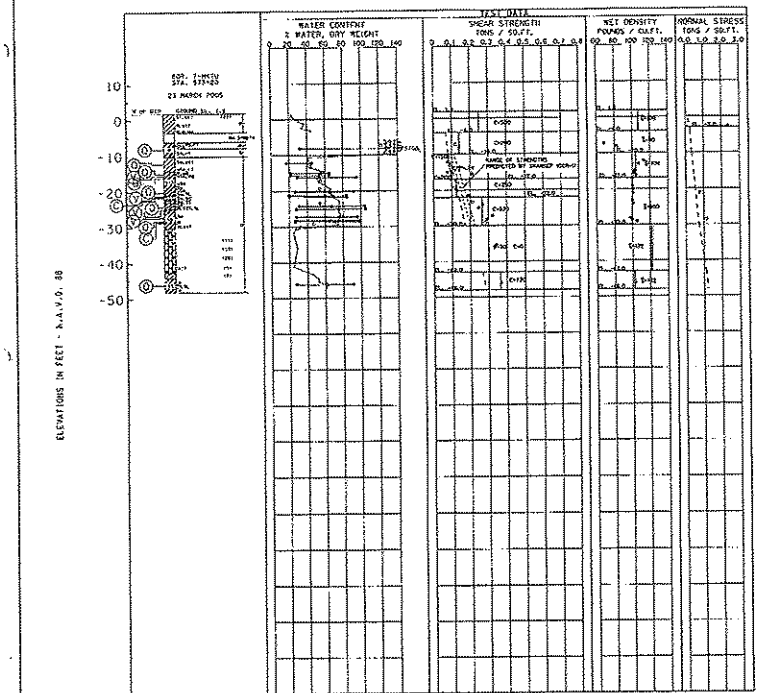
BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

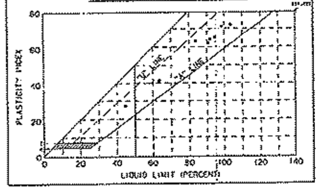
BORING 7-MKCU

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

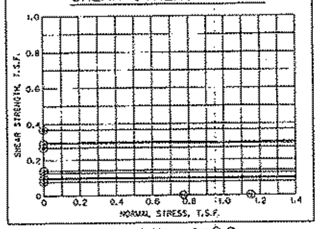
PLATE 29



PLASTICITY CHART



SHEAR STRENGTH DATA



Warning: non-zero Normal Stress for ⑨ ⑩

NOTES

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

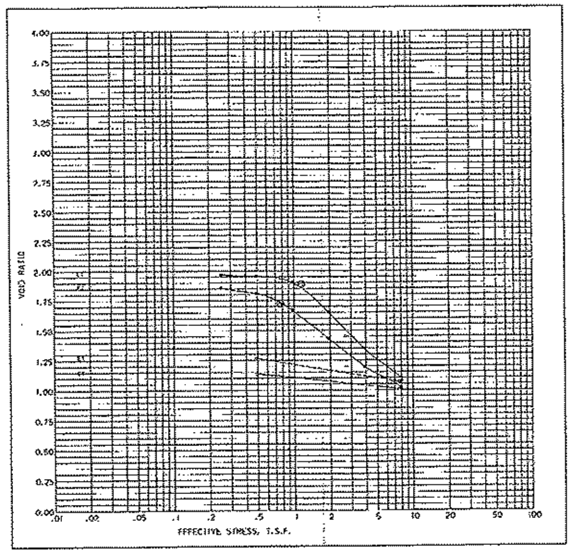
ω_p — ω_N — ω_L ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-8.2	Q	0.0	0.141	CH
2	-12.2	Q	0.0	0.077	SL
3	-15.0	Q	0.0	0.035	CH
4	-16.7	Q	0.0	0.093	CL
5	-20.2	Q	0.0	0.127	CH
6	-24.2	Q	0.0	0.265	CH
7	-28.2	Q	0.0	0.232	CH
8	-46.2	Q	0.0	0.368	CH
9	-23.6	C	0.0	0.000	CH
10	-21.2	C	0.0	0.000	CH
11	-15.6	V	0.0	0.201	CH
12	-21.6	V	0.0	0.130	CH
13	-25.0	V	0.0	0.245	CH
14	-22.2	V	0.0	0.374	CH

*MINI VANE SHEAR TEST



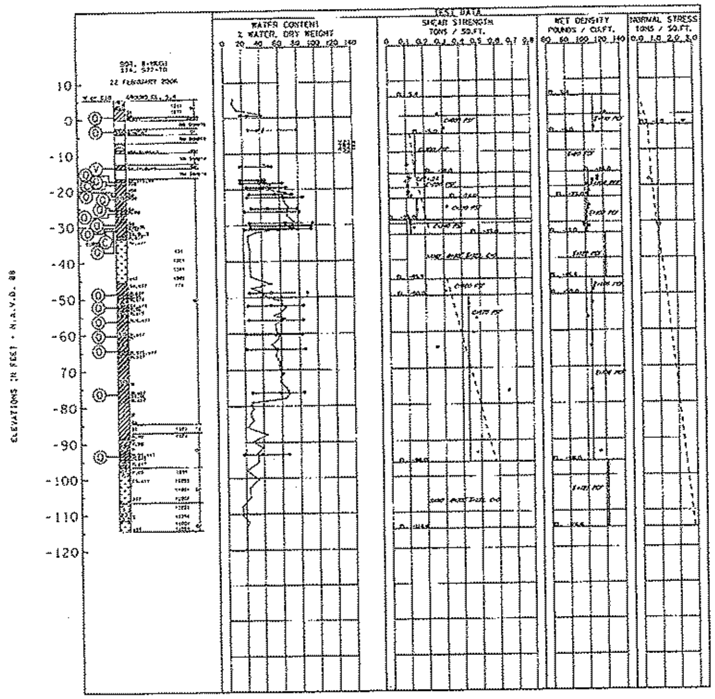
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 7-MKTU

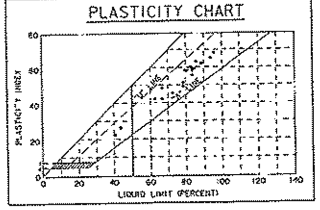
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: G. BROWN
DRAWN BY: G. BROWN
CHECKED BY: S.A.T.
PLOT SCALE: NON
PLOT DATE: 04-MAY-2007
DATE: DEC 2007
FILE NO.

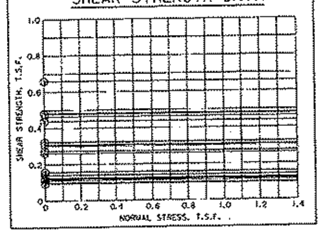
PLATE 30



PLASTICITY CHART



SHEAR STRENGTH DATA



NOTES

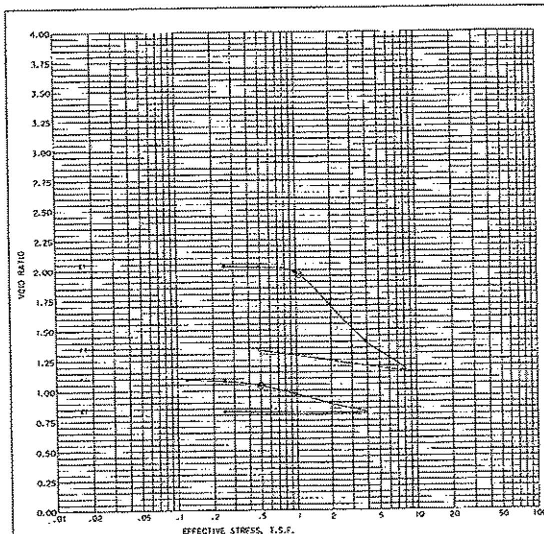
- O - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ◊ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ω_P — ω_N — ω_L ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE D_*	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	2.6	Q	0.0	0.423	CL
2	-3.4	Q	0.0	0.397	CH
3	-11.3	Q	0.0	0.095	CH
4	-21.4	Q	0.0	0.111	CH
5	-23.4	Q	0.0	0.324	CH
6	-29.5	Q	0.0	0.110	CH
7	-48.8	Q	0.0	0.304	CH
8	-52.3	Q	0.0	0.435	CH
9	-56.1	Q	0.0	0.102	CH
10	-60.2	Q	0.0	0.554	CH
11	-64.3	Q	0.0	0.260	CH
12	-76.5	Q	0.0	0.658	CH
13	-93.6	Q	0.0	0.438	CH
14	17.4	Q	0.0	0.119	CL
15	-27.1	Q	0.0	0.126	CH
16	-26.3	Q	0.0	0.158	CH
17	20.3	Q	0.0	0.170	CH
18	-31.7	Q	0.0	0.180	CH
19	31.0	C	0.0	0.000	CH
20	-18.2	C	0.0	0.050	CL
21	-13.6	Y	0.0	0.102	CH

* MINI VANE SHEAR TEST

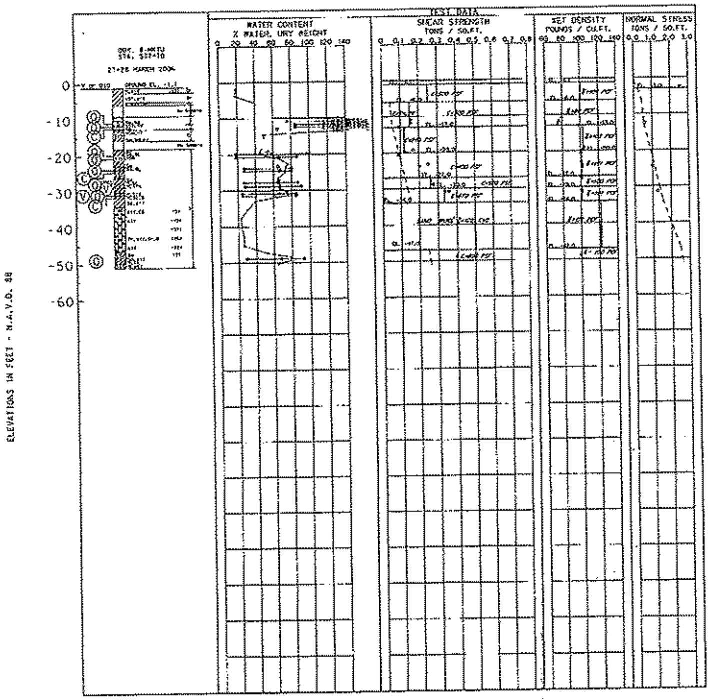


LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

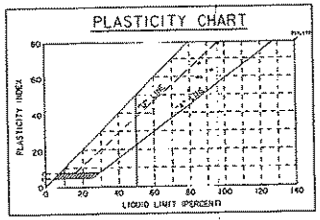
BORING 8-MKCU

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

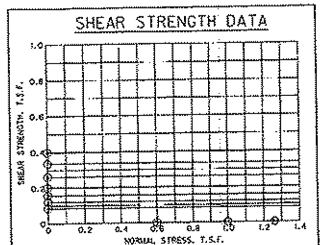
DESIGNED BY: G. BROWN
DRAWN BY: G. BROWN
CHECKED BY: F.L.A.
PLOT SCALE: 1:1
PLOT DATE: 05-MAY-2007
DATE: MAY-2007



PLASTICITY CHART



SHEAR STRENGTH DATA



Warning: non-zero Normal Stress for ⑧ ⑨ ⑩

NOTES

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

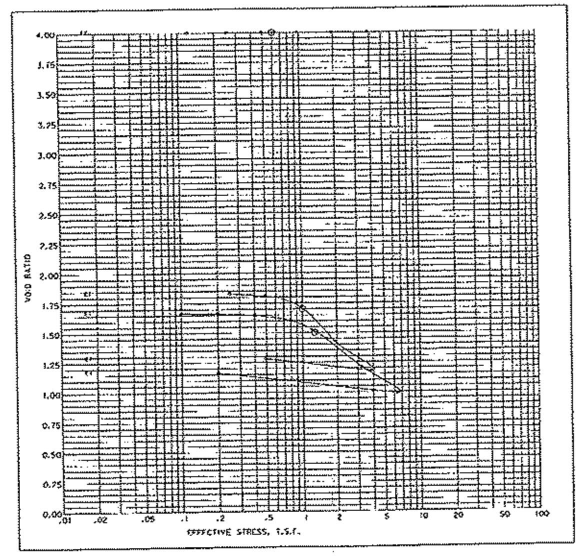
ωp ωn ωL ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-10.9	Q	0.0	0.154	CH
2	-11.8	Q	0.0	0.151	PT
3	-15.6	Q	0.0	0.121	OH
4	-20.7	Q	0.0	0.052	CH
5	-23.4	Q	0.0	0.273	CH
6	-27.4	Q	0.0	0.262	CH
7	-30.9	Q	0.0	0.322	CH
8	-48.3	Q	0.0	0.394	CH
9	-12.5	C	0.0	0.000	PT
10	-24.5	C	0.0	0.000	CH
11	-31.5	C	0.0	0.000	CH
12	-28.9	V	0.0	0.274	CH
13	-30.9	V	0.0	0.359	CH

*MINI VANE SHEAR TEST

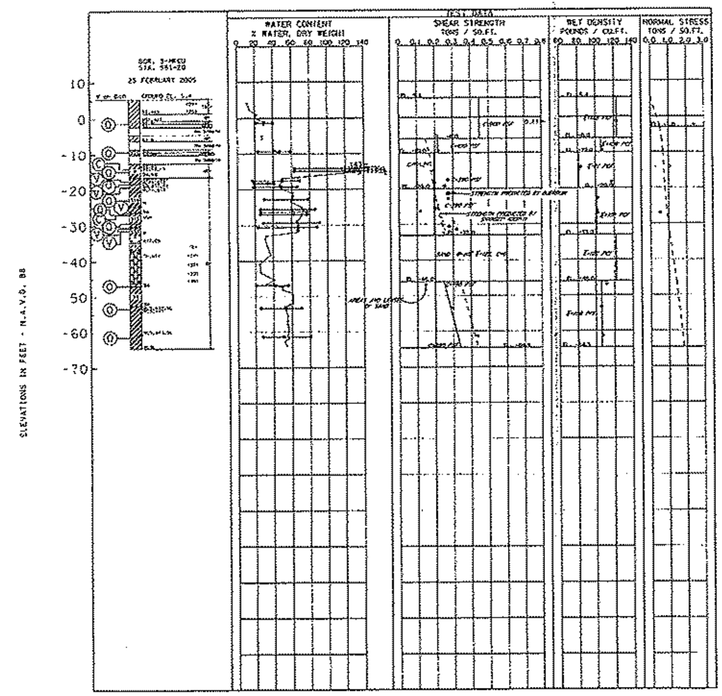


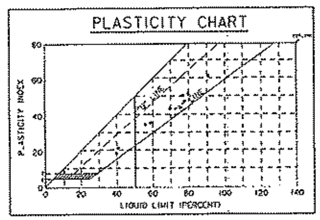
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

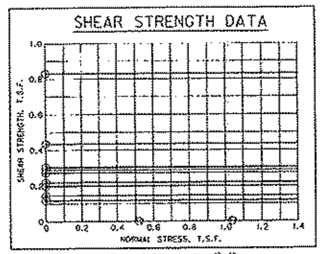
BORING 8-MKTU

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

PLATE 32







Warning: non-zero Normal Stress for ①, ①

NOTES

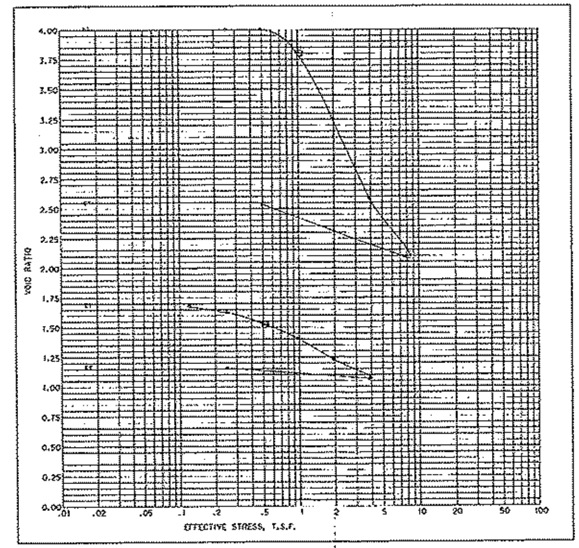
○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
ωp ωn ωL ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH φ	STRENGTH c TSF	CLASS
1	-1.5	Q	0.0	0.622	CL
2	-9.4	Q	0.0	0.219	CH
3	-14.0	Q	0.0	0.196	CH
4	-18.3	Q	0.0	0.191	CL
5	-22.8	Q	0.0	0.215	CH
6	-26.3	Q	0.0	0.118	CH
7	-29.4	Q	0.0	0.204	CH
8	-45.9	Q	0.0	0.185	CH
9	-53.6	Q	0.0	0.219	CH
10	-61.6	Q	0.0	0.434	CH
11	-14.1	S	0.0	0.060	CH
12	-22.0	S	0.0	0.092	CH
13	-53.6	V	0.0	0.271	CH
14	-19.3	V	0.0	0.253	CH
15	-25.6	V	0.0	0.201	CH
16	-30.6	V	0.0	0.278	CH
17	-31.4	V	0.0	0.321	CH

*POINT VANE SHEAR TEST

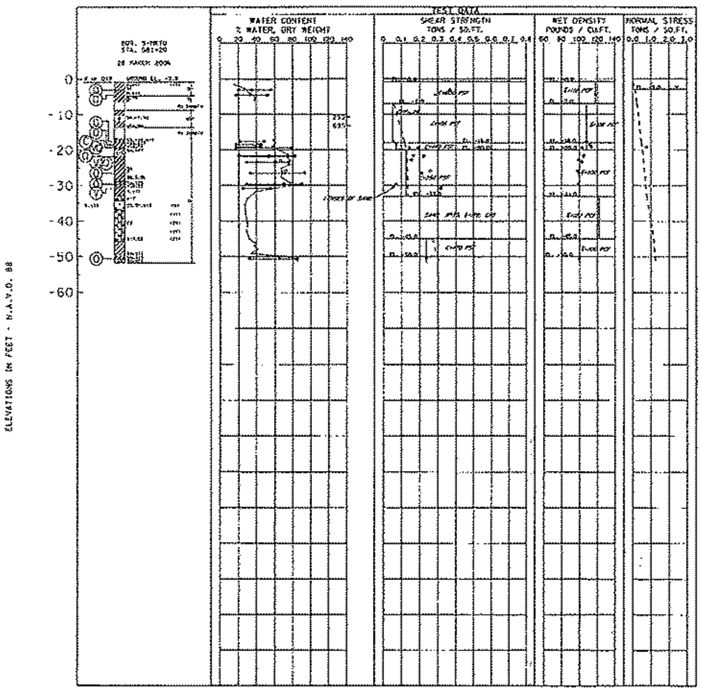


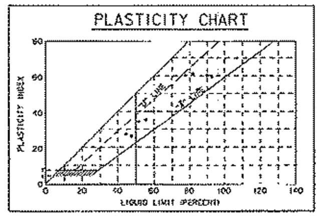
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

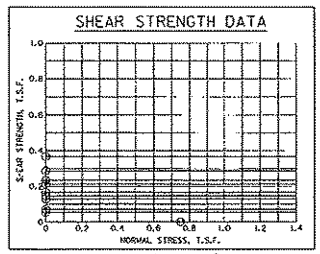
BORING 9-MKCU

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

PLATE 33







Warning: non-zero Normal Stress for ○

NOTES

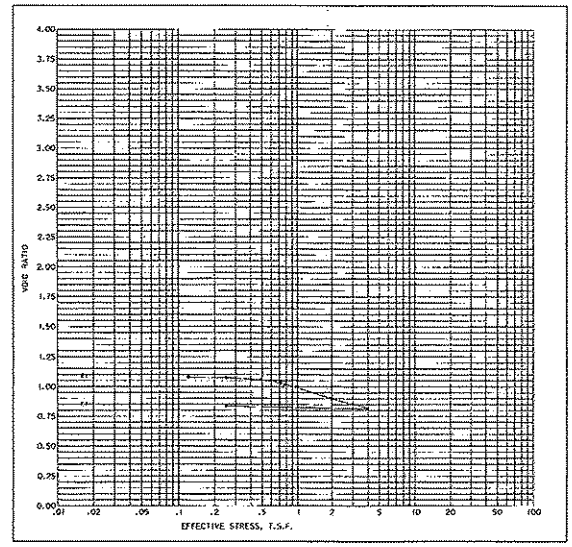
○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
⊖ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 3.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	3.1	Q	0.0	0.282	CH
2	-6.6	Q	0.0	0.287	CH
3	-13.6	Q	0.0	0.014	CL
4	-18.5	Q	0.0	0.011	CL
5	-19.4	Q	6.0	0.145	OH
6	-21.6	Q	0.0	0.166	CH
7	-23.4	Q	0.0	0.126	CH
8	-29.5	Q	0.0	0.212	CH
9	-29.6	Q	0.0	0.070	CH
10	-30.6	Q	0.0	0.225	CH
11	-13.2	S	0.0	0.000	CL
12	-19.4	V	0.0	0.133	CH
13	-21.6	V	0.0	0.222	CH
14	-30.8	V	0.0	0.316	CH

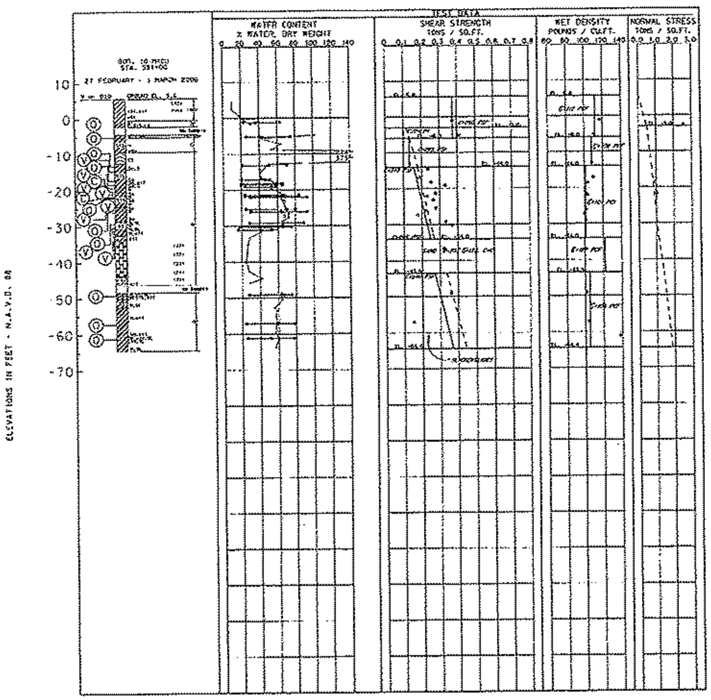
* MINI VANE SHEAR TEST



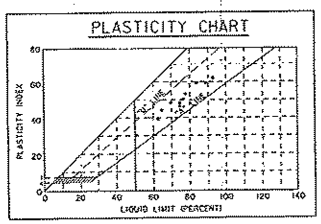
LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 9-MKTU

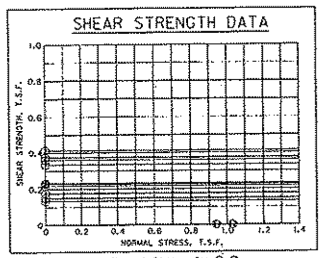
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA



PLASTICITY CHART



SHEAR STRENGTH DATA



Warning: non-zero Normal Stress for Q, Q

NOTES

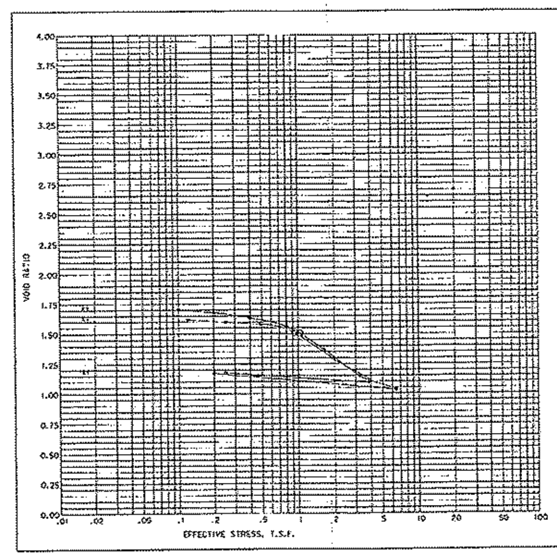
○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
ω_p ω_n ω_L ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 3.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH φ	STRENGTH C + TSF	CLASS
1	-1.2	Q	0.0	0.312	CH
2	-5.2	Q	0.0	0.413	CH
3	-13.2	Q	0.0	0.215	CH
4	-17.2	Q	0.0	0.131	CH
5	-22.1	Q	0.0	0.279	CH
6	-25.1	Q	0.0	0.219	CH
7	-29.2	Q	0.0	0.224	CH
8	-45.2	Q	0.0	0.361	CH
9	-57.2	Q	0.0	0.150	CH
10	-61.2	Q	0.0	0.232	CL
11	-18.7	C	0.0	0.000	CH
12	-21.8	C	0.0	0.000	CH
13	-14.6	V	0.0	0.236	CH
14	-18.3	V	0.0	0.253	CH
15	-19.2	V	0.0	0.331	CH
16	-21.4	V	0.0	0.238	CH
17	-23.7	V	0.0	0.254	CH
18	-25.4	V	0.0	0.278	CH
19	-30.3	V	0.0	0.349	CH
20	-31.7	V	0.0	0.324	CH

*MINI VANE SHEAR TEST



LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 10-MKCU

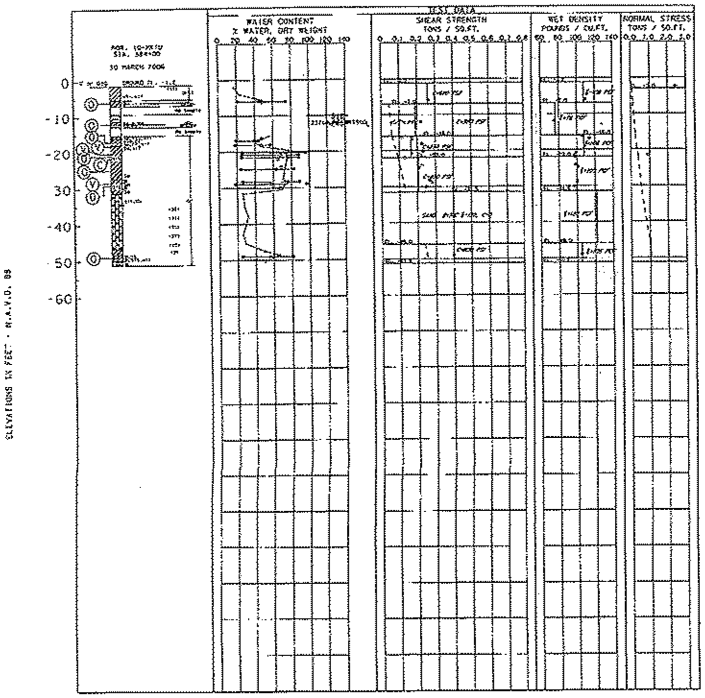
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: G. BROWN
DRAWN BY: G. BROWN
CHECKED BY: F.A.K.

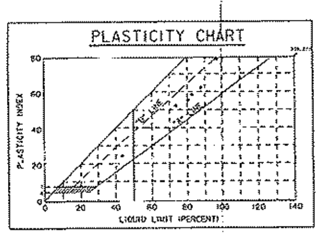
PLOT SCALE: 2:1
PLOT DATE: 07-MAY-2007
DATE: MAY-2007
FILE NO.

PLATE 35

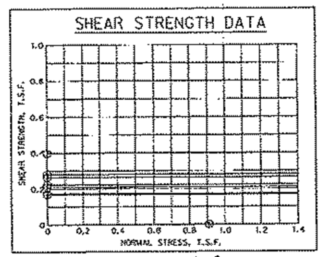
ELEVATIONS IN FEET - N.A.V.D. 88



PLASTICITY CHART



SHEAR STRENGTH DATA



Warning: non-zero Normal Stress for ⓪

NOTES

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

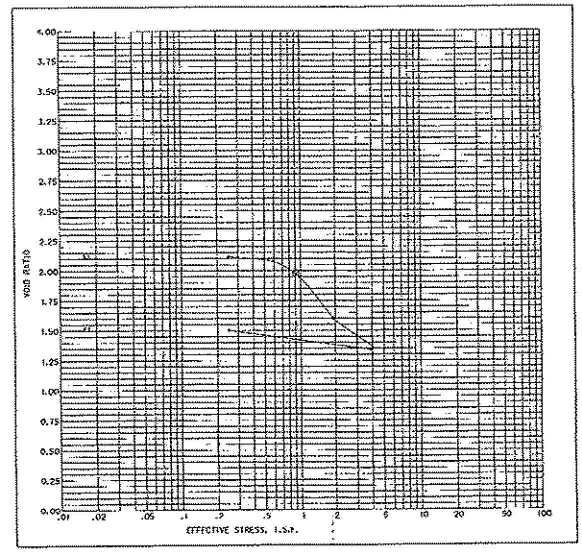
ω_p ω_N ω_L ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-6.0	Q	0.0	0.254	CH
2	-12.0	Q	0.0	0.222	PT
3	-16.5	Q	0.0	0.172	CL
4	-20.3	Q	0.0	0.163	CH
5	-25.2	Q	0.0	0.210	CH
6	-28.8	Q	0.0	0.241	CH
7	-49.0	Q	0.0	0.398	CH
8	-21.6	C	0.0	0.000	CH
9	-18.1	V	0.0	0.225	CH
10	-20.3	V	0.0	0.238	CH
11	-28.3	V	0.0	0.267	CH

*MINI VANE SHEAR TEST

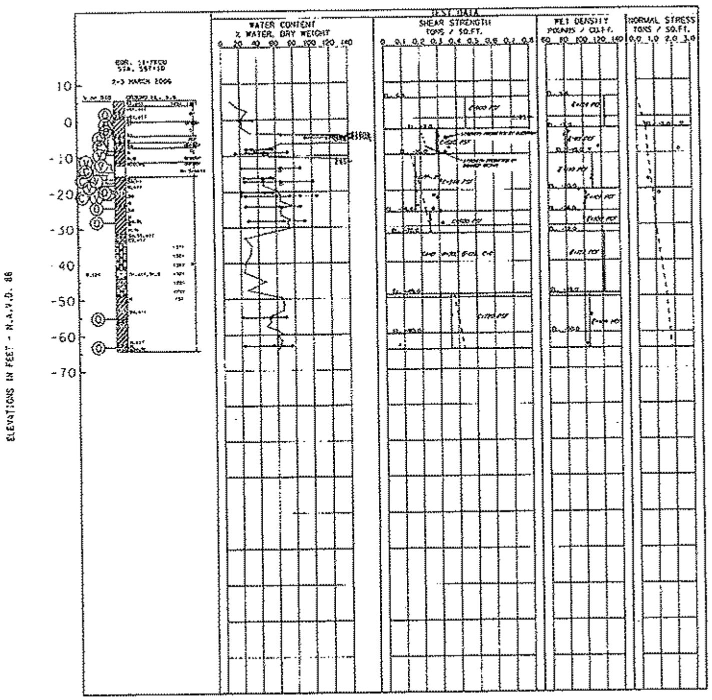


LAKE PONTCHARTRAIN LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

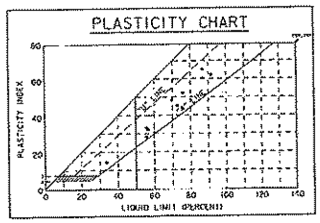
BORING 10-MKTU

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

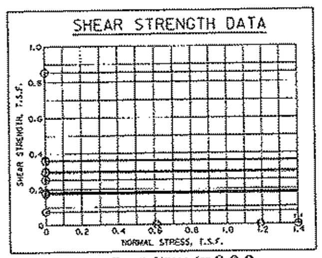
PLATE 36



PLASTICITY CHART



SHEAR STRENGTH DATA



Warning: non-zero Normal Stress for ①, ②, ③

NOTES

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

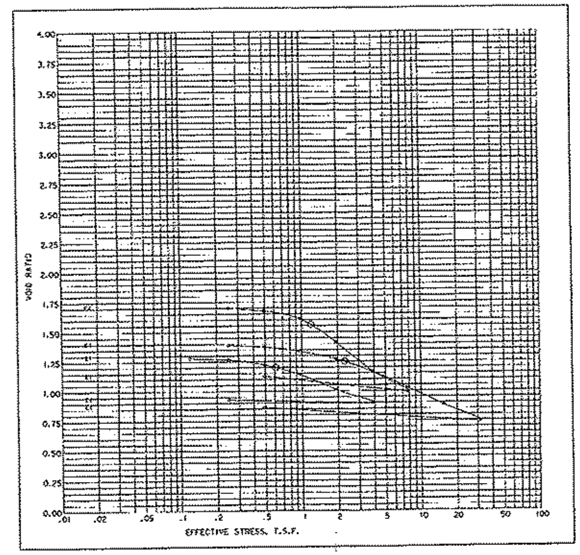
Wp Wn WL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 3.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-0.2	Q	0.0	0.458	CL
2	-4.2	Q	0.0	0.232	CH
3	-5.3	Q	0.0	0.391	CH
4	-8.2	Q	0.0	0.352	CH
5	-16.2	Q	0.0	0.111	CH
6	-20.2	Q	0.0	0.176	CH
7	-24.2	Q	0.0	0.185	CH
8	-29.2	Q	0.0	0.253	CH
9	-55.2	Q	0.0	0.363	CH
10	-63.2	Q	0.0	0.074	CH
11	-2.1	C	0.0	0.000	CH
12	-17.2	C	0.0	0.000	CH
13	-21.2	C	0.0	0.000	CH
14	-5.4	Y	0.0	0.331	CH
15	-17.4	Y	0.0	0.310	CH
16	-21.4	Y	0.0	0.311	CH
17	-22.8	Y	0.0	0.274	CH
18	-25.2	Y	0.0	0.267	CH
19	-25.9	Y	0.0	0.359	CH
20	-29.2	Y	0.0	0.320	CH

Y=MINI VANE SHEAR TEST

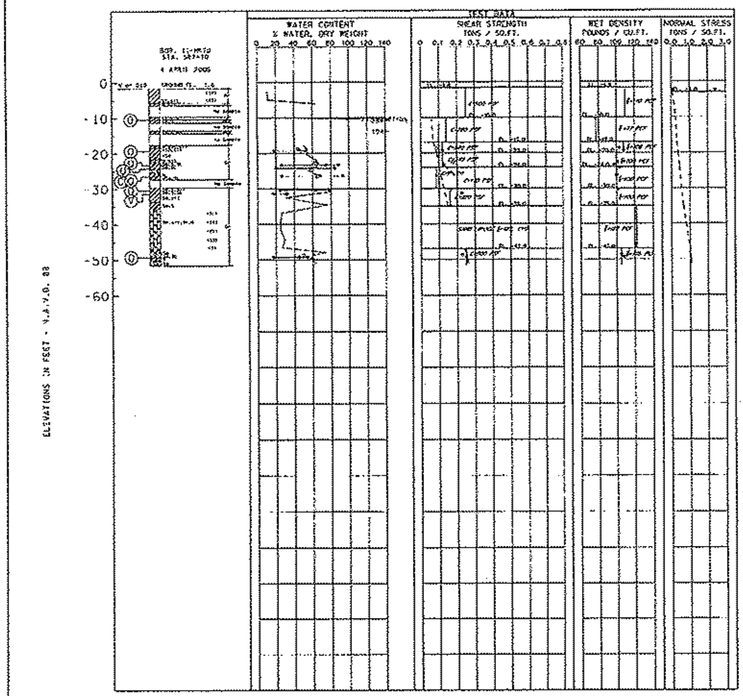


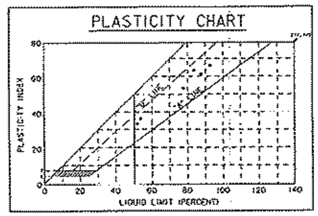
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

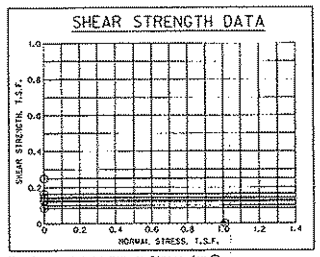
BORING 11-MKCU

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

PLATE 37







Warning: non-zero Normal Stress for ⑥

NOTES

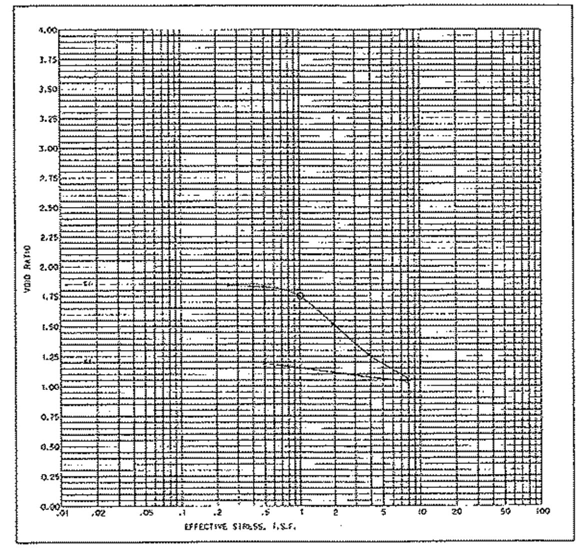
- ○ - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊡ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ωp ωn ωL ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-10.4	Q	0.0	0.131	CH
2	-19.3	Q	0.0	0.121	CH
3	-23.3	Q	0.0	0.124	CH
4	-24.2	Q	0.0	0.145	CH
5	-25.4	Q	0.0	0.055	CH
6	-29.4	Q	0.0	0.151	CH
7	-49.3	Q	0.0	0.250	CH
8	-25.4	C	0.0	0.020	CH
9	-31.4	V	0.0	0.203	CH

*MINI VANE SHEAR TEST

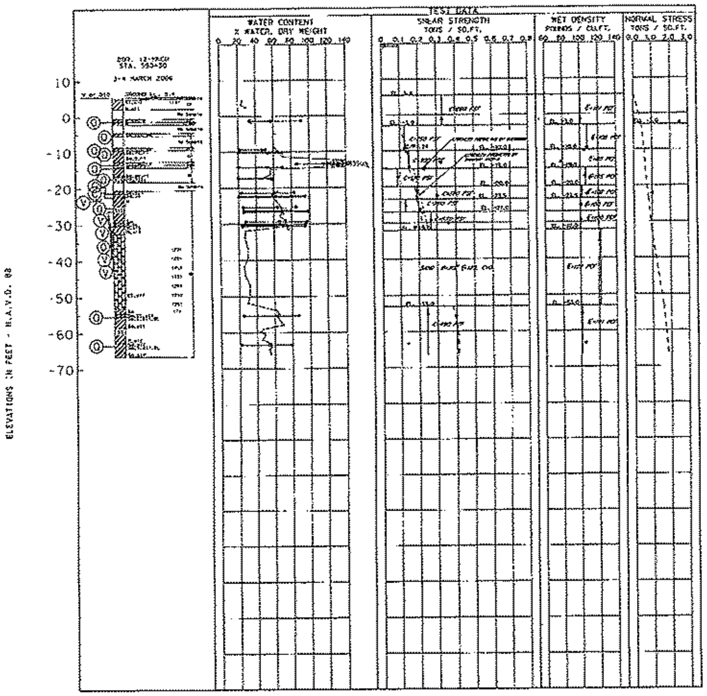


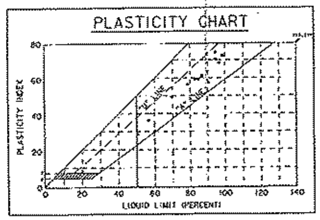
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

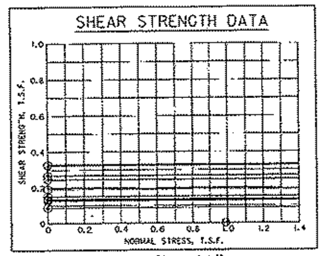
BORING 11-MKTU

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

PLATE 38







Warning: non-zero Normal Stress for Q

NOTES

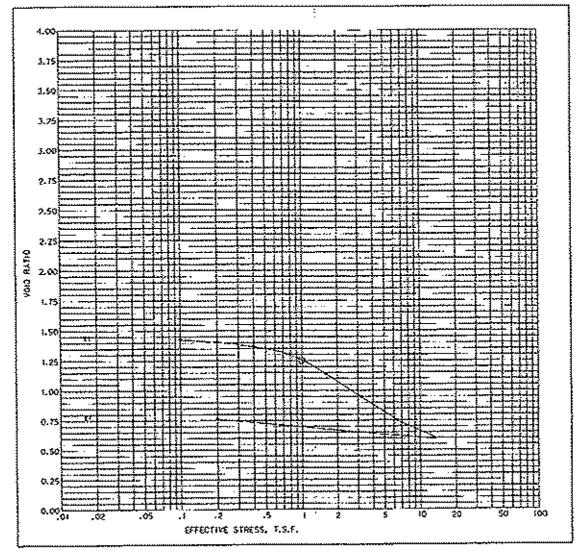
- O - (UC) UNCONFINED COMPRESSION TEST
- ● - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- □ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ω_p ω_n ω_L ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 3.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH c - tsf	CLASS
1	-1.4	Q	0.2	0.230	CH
2	-9.4	Q	0.2	0.327	[illegible]
3	-10.3	Q	0.2	0.137	CH
4	-13.4	Q	0.0	0.324	[illegible]
5	-14.3	Q	0.0	0.182	CH
6	-15.8	Q	0.0	0.083	CH
7	-21.4	Q	0.0	0.302	CH
8	-25.4	Q	0.0	0.231	CH
9	-29.4	Q	0.0	0.258	CH
10	-55.8	Q	0.0	0.244	CH
11	-63.4	Q	0.0	0.157	CH
12	-27.3	C	0.0	0.000	CH
13	-22.6	V	0.0	0.322	CH
14	-26.3	V	0.0	0.208	CH
15	-27.2	V	0.0	0.272	CH
16	-30.4	V	0.0	0.357	CH
17	-21.3	V	0.0	0.380	CL

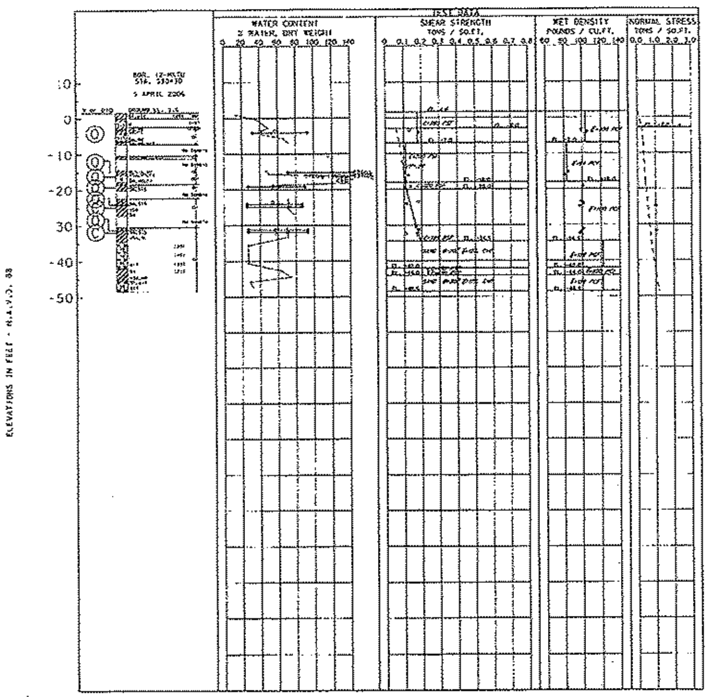
*MINI VANE SHEAR TEST



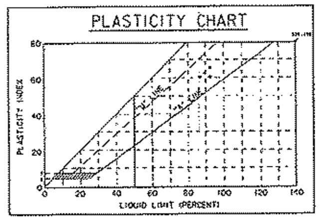
LAKE PONTCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 12-MKCU

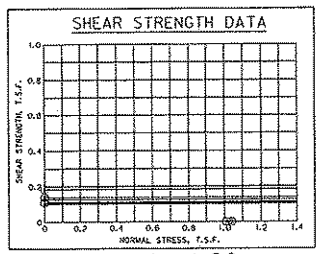
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA



PLASTICITY CHART



SHEAR STRENGTH DATA



Warnings: non-zero Normal Stress for ⑦, ⑧

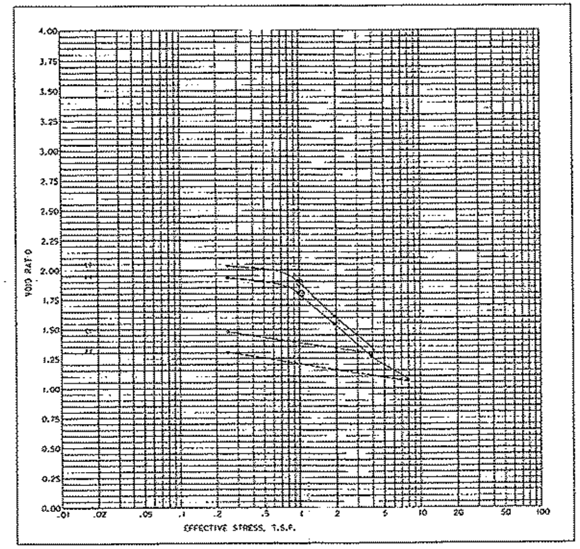
NOTES

○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
◇ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
Wp — WN — WL ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c TSF	CLASS
1	-4.1	Q	0.0	0.181	CH
2	-15.2	Q	0.0	0.195	CH
3	-16.1	Q	0.0	0.126	CH
4	-19.2	Q	0.0	0.131	CH
5	-24.1	Q	0.0	0.113	CH
6	-31.2	Q	0.0	0.114	CH
7	-24.4	C	0.0	0.000	CH
8	31.8	C	0.0	0.000	CH

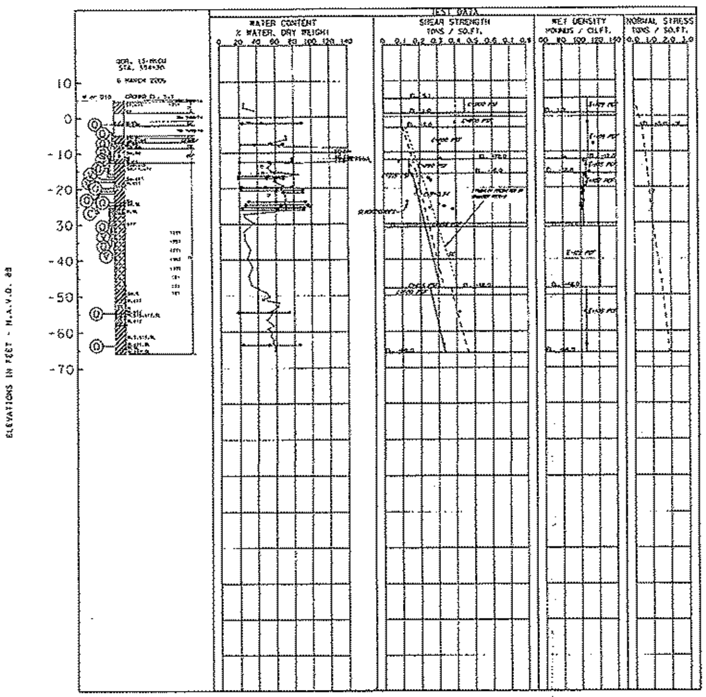


LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

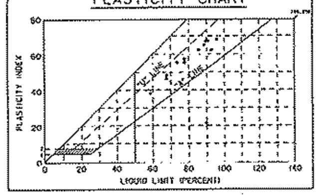
BORING 12-MKTU

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

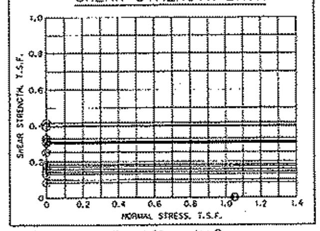
PLATE 40



PLASTICITY CHART



SHEAR STRENGTH DATA



Warning: non-zero Normal Stress for Q

NOTES

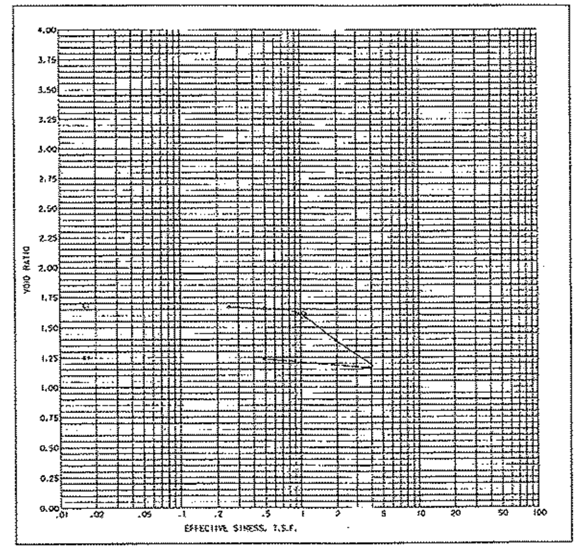
Q - (UC) UNCONFINED COMPRESSION TEST
★ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
A - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
S - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
ωp ωn ωl ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 3.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-1.7	Q	0.0	0.255	CH
2	-7.7	Q	0.0	0.309	CL
3	-11.7	Q	0.0	0.212	CH
4	-12.6	Q	0.0	0.046	CL
5	-15.1	Q	0.0	0.145	CH
6	-16.6	Q	0.0	0.158	CH
7	-19.7	Q	0.0	0.114	CH
8	-20.6	Q	0.0	0.184	CH
9	-23.1	Q	0.0	0.131	CH
10	-24.6	Q	0.0	0.204	CH
11	-25.5	Q	0.0	0.252	CH
12	-54.1	Q	0.0	0.416	CH
13	-63.6	Q	0.0	0.326	CH
14	-21.2	C	0.0	0.000	CH
15	-12.2	Y	0.0	0.243	CH
16	-17.3	Y	0.0	0.257	CH
17	-25.2	Y	0.0	0.334	CH
18	-26.0	Y	0.0	0.393	CH

*MINI VANE SHEAR TEST

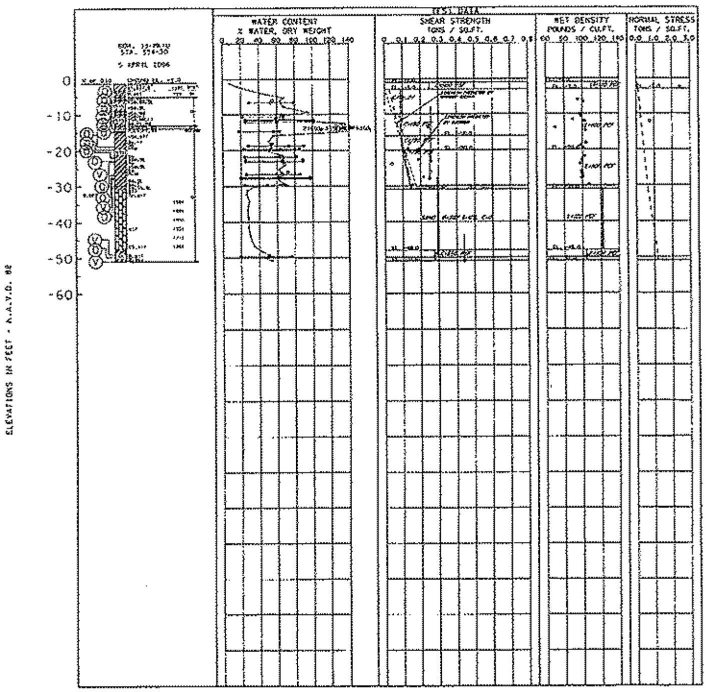


LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

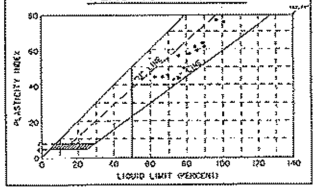
BORING 13-MKCU

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

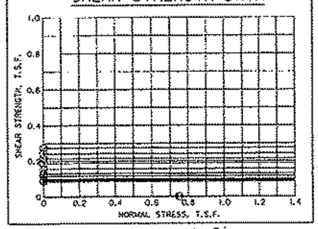
PLATE 41



PLASTICITY CHART



SHEAR STRENGTH DATA



Warning: non-zero Normal Stress for ⊕

NOTES

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

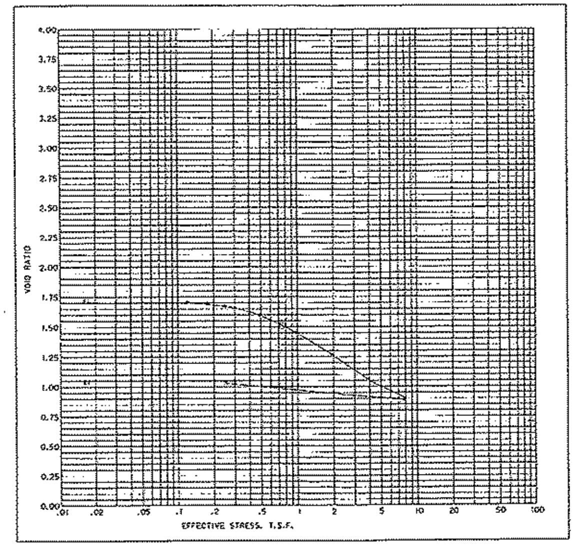
PL — WN — LL ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-6.7	Q	0.0	0.022	CH
2	-10.1	Q	0.0	0.082	CH
3	-12.5	Q	0.0	0.016	CH
4	-15.8	Q	0.0	0.213	PT
5	-16.7	Q	0.0	0.035	CH
6	-18.1	Q	0.0	0.095	CH
7	-19.6	Q	0.0	0.179	CH
8	-21.8	Q	0.0	0.116	CH
9	-22.1	Q	0.0	0.198	CH
10	-26.1	Q	0.0	0.139	CH
11	-27.5	Q	0.0	0.235	CH
12	-29.8	Q	0.0	0.156	CH
13	-49.7	Q	0.0	0.275	CH
14	-52.1	Q	0.0	0.000	CH
15	-23.2	V	0.0	0.257	CH
16	-28.0	V	0.0	0.250	CH
17	-49.0	V	0.0	0.272	CH
18	-51.0	V	0.0	0.440	CH

*[illegible] VANE SHEAR TEST

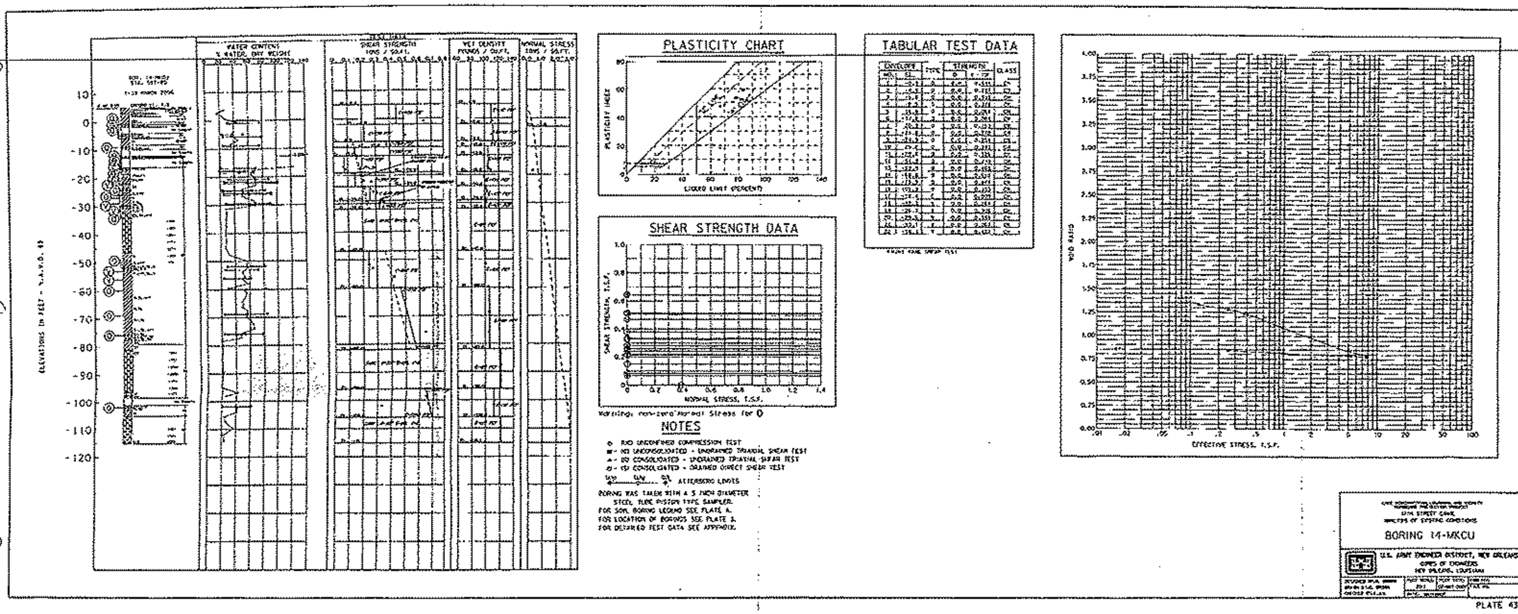


LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 13-MKTU

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

PLATE 42



ELEVATIONS IN FEET - N.A.V.D. 88
WATER CONTENTS
% WATER, DRY WEIGHT
TEST DATA
SHEAR STRENGTH
TONS / SQ.FT.
WET DENSITY
POUNDS / CU.FT.
NORMAL STRESS
TONS / SQ.FT.
PLASTICITY CHART
PLASTICITY INDEX
LIQUID LIMIT (PERCENT)
SHEAR STRENGTH DATA
SHEAR STRENGTH, T.S.F.
NORMAL STRESS, T.S.F.
TABULAR TEST DATA
VOID RATIO
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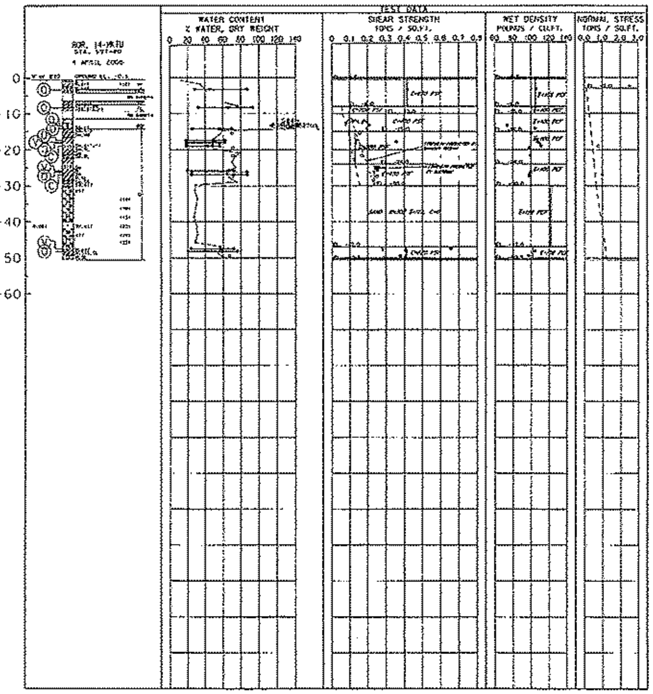
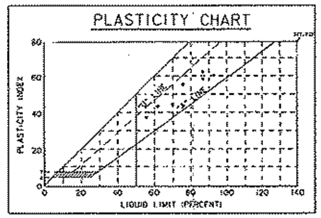
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
PLATE 43

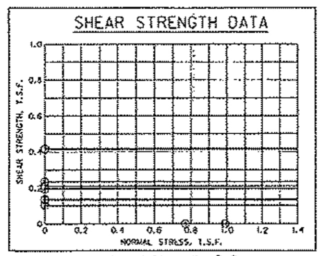
ELEVATIONS IN FEET - N.A.V.D. 88



PLASTICITY CHART



SHEAR STRENGTH DATA



Warning: non-zero Normal Stress for ⑨, ⑩

NOTES

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

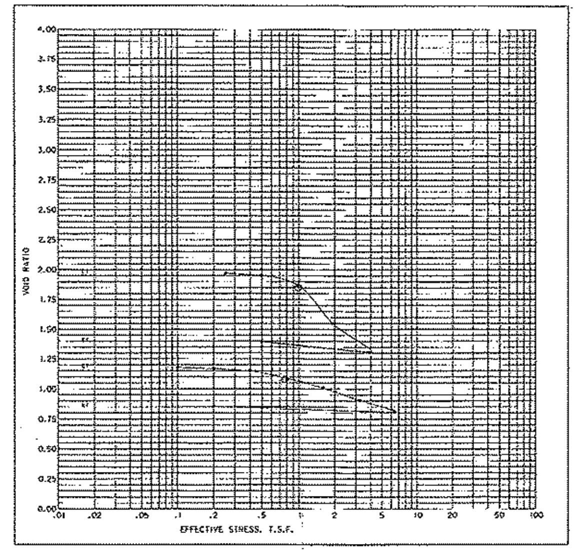
PL, LL, W% ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 2.
FOR LOCATION OF BORINGS SEE PLATE 3.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH ϕ	STRENGTH c - TSF	CLASS
1	-3.1	Q	0.0	0.418	CH
2	-8.3	Q	0.0	0.104	CH
3	-15.3	Q	0.0	0.210	CH
4	-14.7	Q	0.0	0.195	CH
5	-18.1	Q	0.0	0.133	CH
6	-26.7	Q	0.0	0.215	CH
7	-48.7	Q	0.0	0.412	CH
8	-17.2	Q	0.0	0.133	CH
9	-18.9	C	0.0	0.002	CH
10	-26.2	C	0.0	0.002	CH
11	-17.8	V	0.0	0.246	CH
12	-25.8	V	0.0	0.253	CH
13	-47.5	V	0.0	0.657	CH

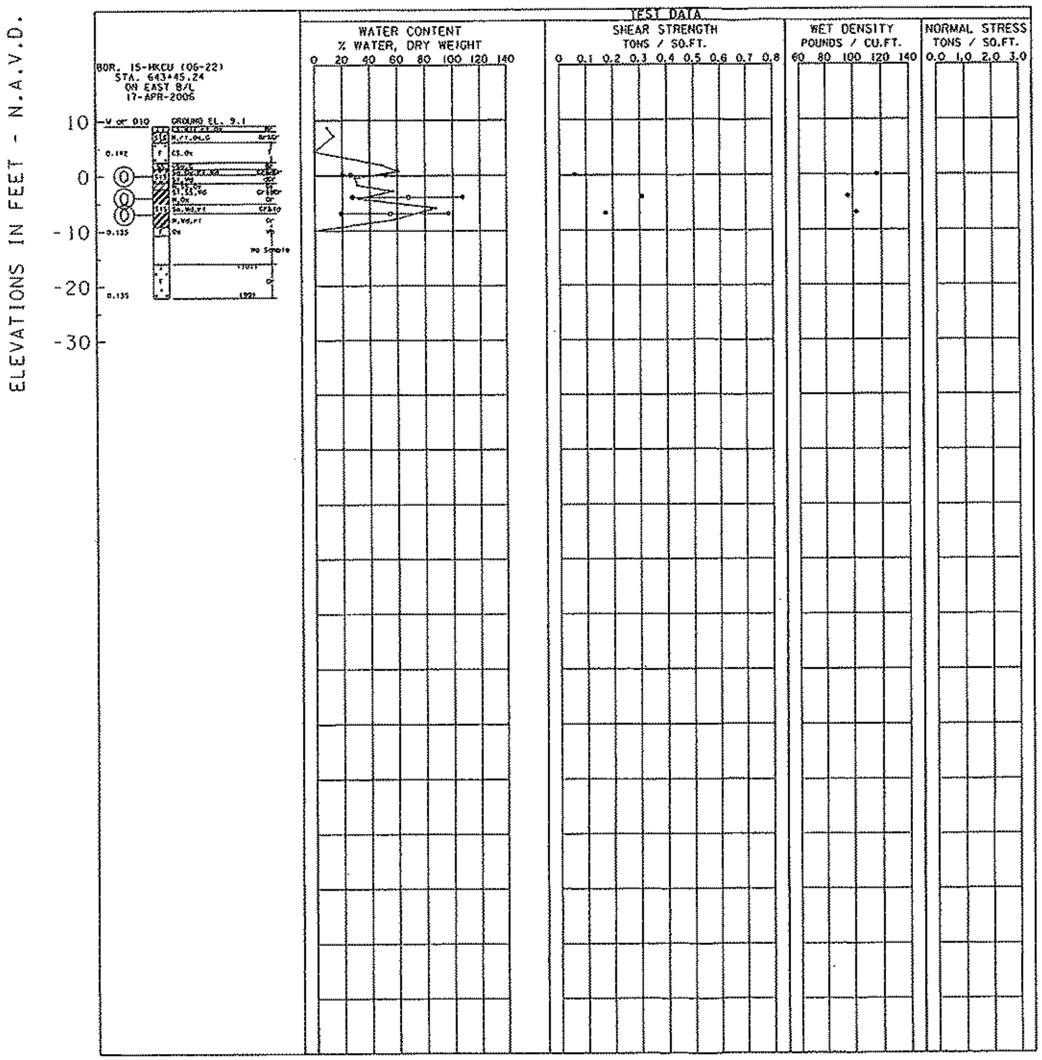
*MINI VANE SHEAR TEST

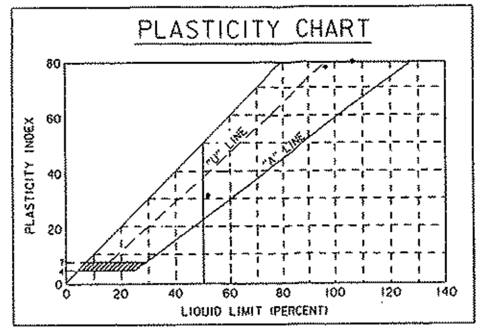


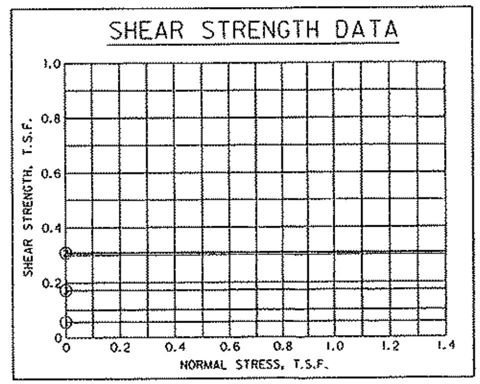
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 14-MKTU

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







TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	0.1	Q	0.0	0.057	CH
2	-3.9	Q	0.0	0.308	CH
3	-6.9	Q	0.0	0.173	CH

NOTES

○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
⊡ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
ω_P ω_N ω_L ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

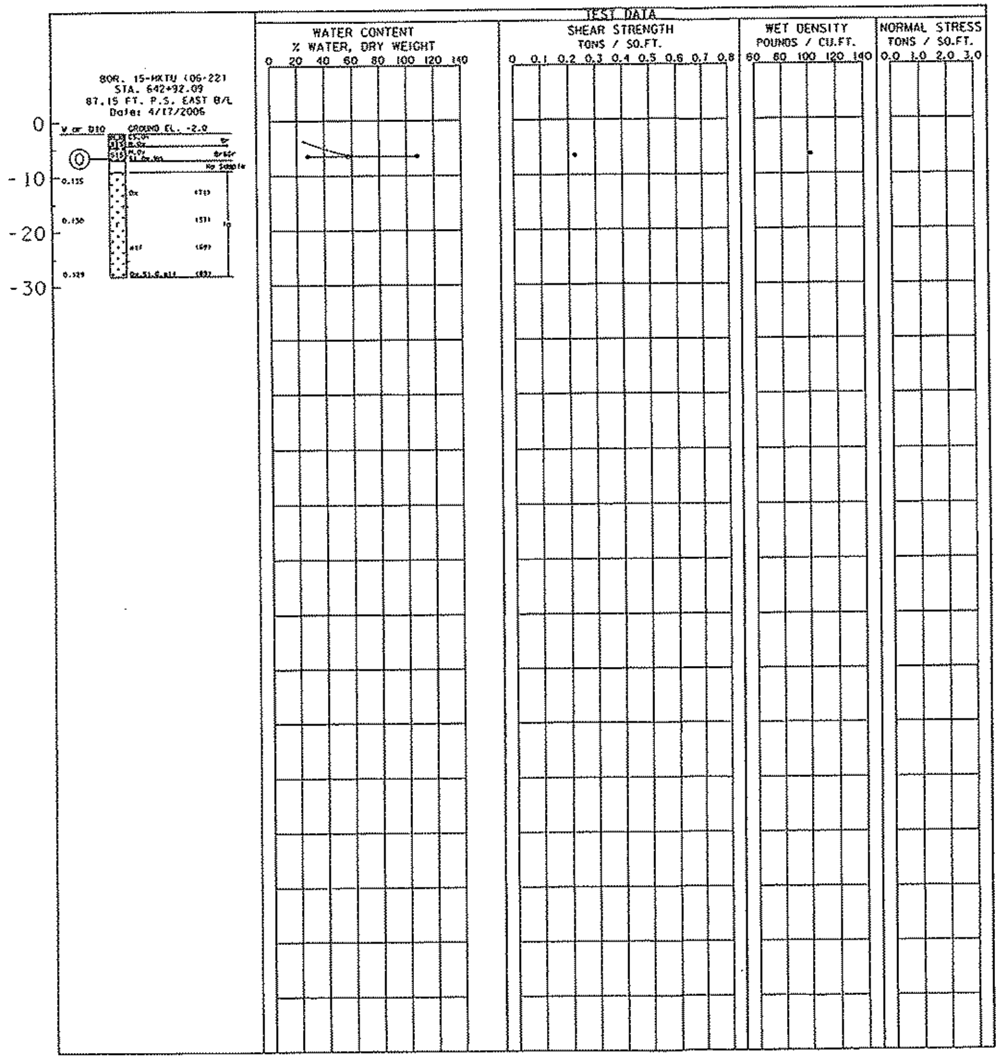
LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

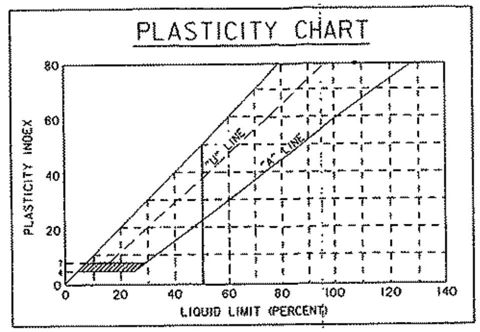
BORING 15-MKCU

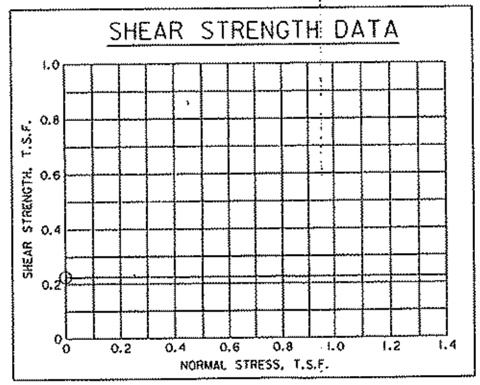
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: G. BROWN | PLOT SCALE: 20:1 | PLOT DATE: 03-MAY-2007 | CADD FILE:
DRAWN BY: G. BROWN | FILE NO.
CHECKED BY: F.J.V. | DATE: MAY-2007

PLATE 45







TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-6.3	O	0.0	0.225	CH

NOTES

- O - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊡ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ω_P ω_N ω_L ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

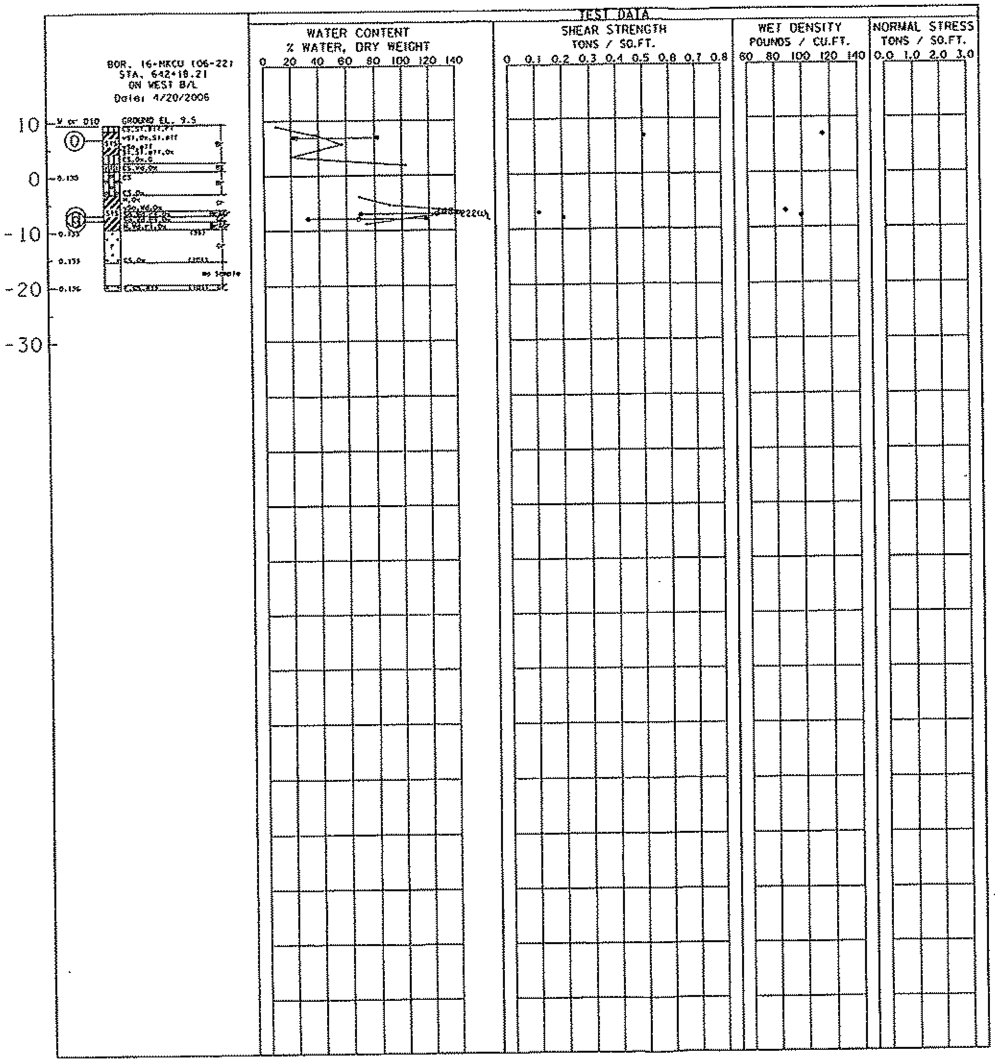
LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 15-MKTU

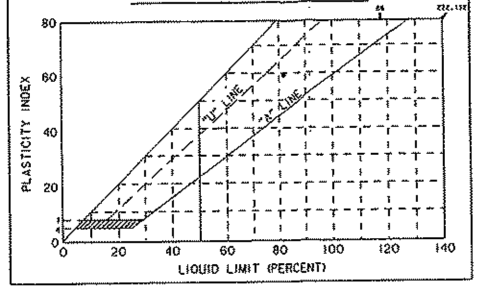
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: G. BROWN	PLOT SCALE: 20:1	PLOT DATE: 03-MAY-2007	CADD FILE:
DRAWN BY: G. BROWN			FILE NO.
CHECKED BY: F.J.V.	DATE: MAY-2007		

PLATE 46



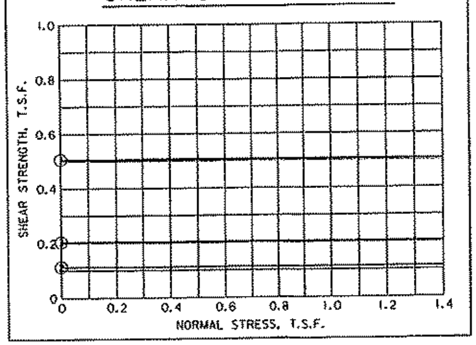
PLASTICITY CHART



TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	6.9	Q	0.0	0.506	CH
2	-7.0	Q	0.0	0.113	CH
3	-7.9	Q	0.0	0.204	CH

SHEAR STRENGTH DATA



NOTES

O - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
ω_P — ω_N — ω_L ATTERBERG LIMITS

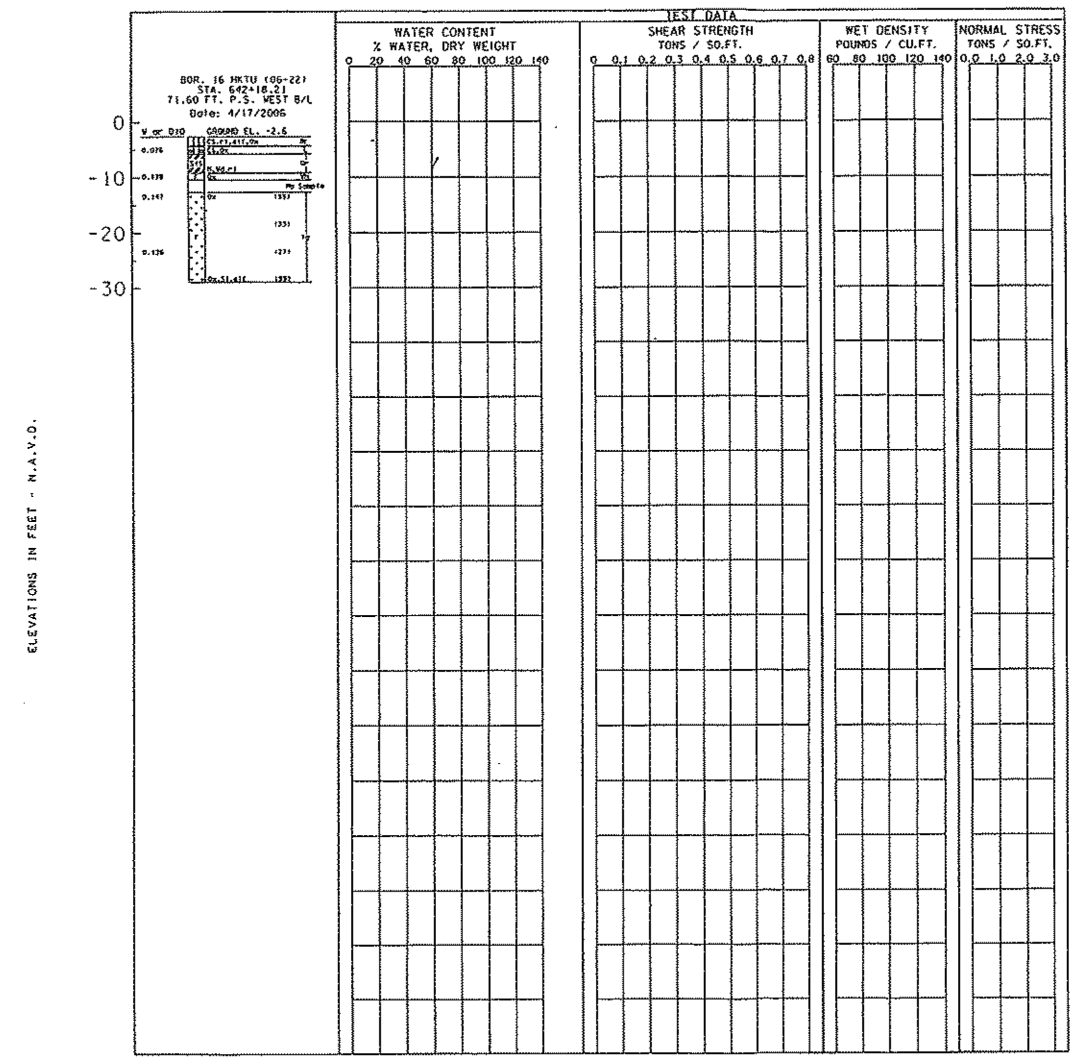
BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLATE 5.
FOR DETAILED TEST DATA SEE APPENDIX.

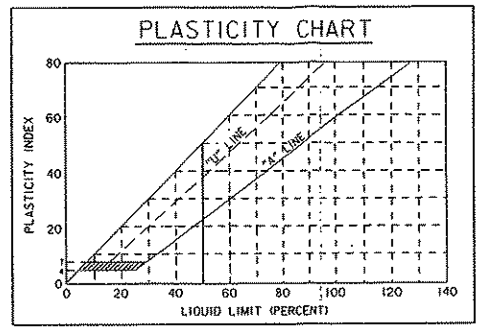
LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

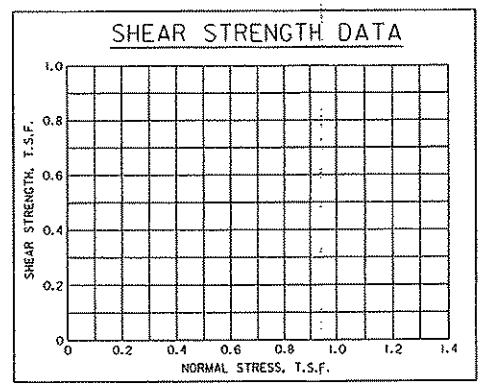
BORING 16-MKCU

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

DESIGNED BY: G. BROWN	PLOT SCALE: 20:1	PLOT DATE: 04-MAY-2007	CADD FILE:
DRAWN BY: G. BROWN			FILE NO.
CHECKED BY: F.J.V.	DATE: MAY-2007		







TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS

NOTES

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

ω_P — ω_N — ω_L ATTERBERG LIMITS

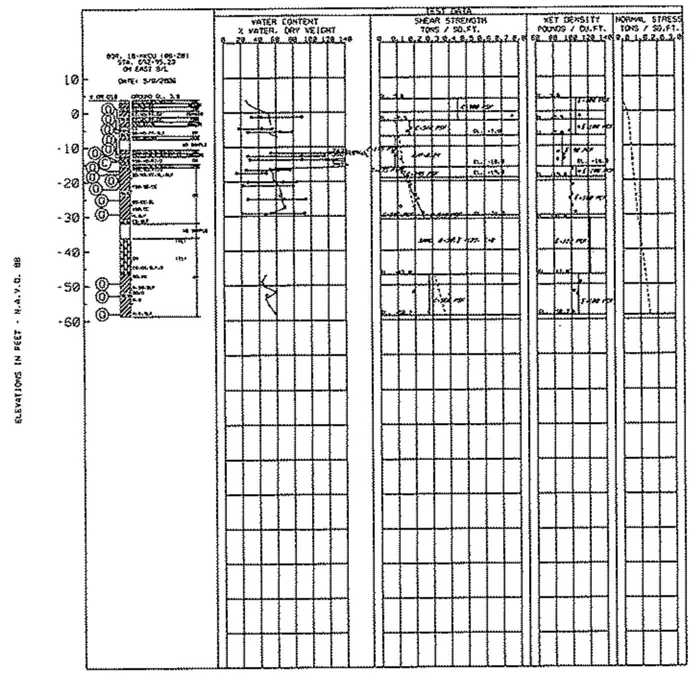
BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLATE 5.
FOR DETAILED TEST DATA SEE APPENDIX.

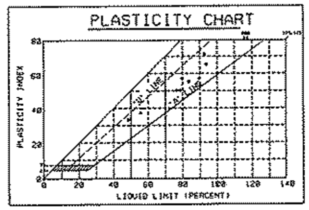
LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

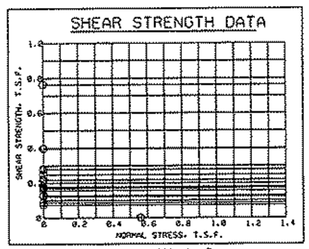
BORING 16-MKTU

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

DESIGNED BY: G. BROWN
DRAWN BY: G. BROWN
CHECKED BY: F.J.V.
PLOT SCALE: 20:1
PLOT DATE: 04-MAY-2007
DATE: MAY-2007
CADD FILE:
FILE NO.







WARNING: NON-ZERO NORMAL STRESS FOR ⊖

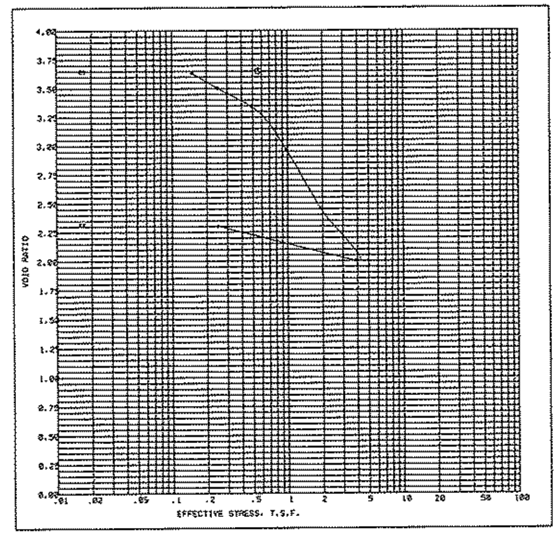
NOTES

- o - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ◻ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ω_P — ω_N — ω_L ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-1.1	Q	0.0	0.252	CH
2	-4.7	Q	0.0	0.172	CH
3	-5.7	Q	0.0	0.152	CH
4	-11.8	Q	0.0	0.074	CH
5	-12.7	Q	0.0	0.098	CH
6	-12.7	Q	0.0	0.122	CH
7	-16.7	Q	0.0	0.128	CH
8	-17.6	Q	0.0	0.126	CL
9	-22.2	Q	0.0	0.129	CH
10	-21.2	Q	0.0	0.176	CH
11	-27.2	Q	0.0	0.214	CH
12	-29.2	Q	0.0	0.243	CH
13	-49.2	Q	0.0	0.292	CH
14	-52.0	Q	0.0	0.296	CH
15	-54.8	Q	0.0	0.277	CH
16	-15.8	C	0.0	0.000	CH

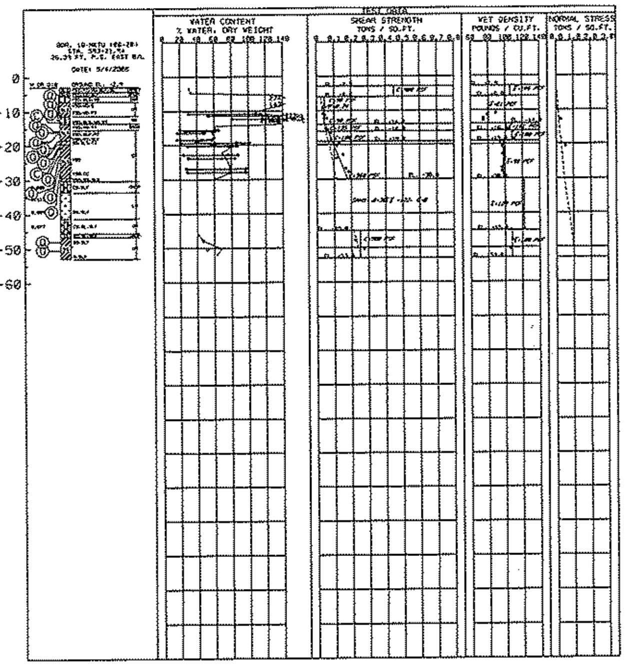


LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

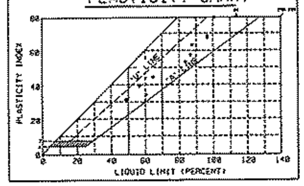
BORING 18-MKCU

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

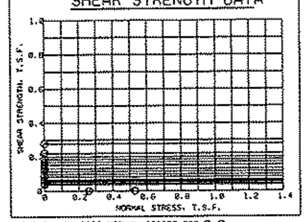
PLATE 51



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR ⊕ ⊖

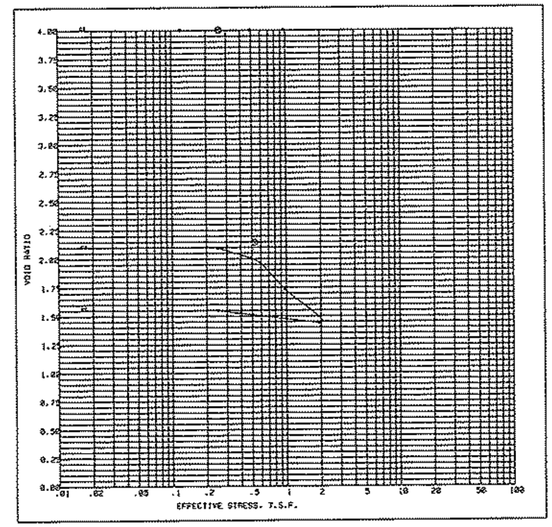
NOTES

- ○ - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊕ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ωp ωn ωL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 3.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-10.9	Q	0.0	0.037	CH
2	-11.4	Q	0.0	0.045	CH
3	-12.6	Q	0.0	0.058	CH
4	-13.9	Q	0.0	0.027	CH
5	-15.0	Q	0.0	0.067	CH
6	-16.5	Q	0.0	0.084	CL
7	-18.3	Q	0.0	0.084	CH
8	-19.4	Q	0.0	0.131	CH
9	-20.3	Q	0.0	0.117	CH
10	-22.3	Q	0.0	0.124	CH
11	-22.9	Q	0.0	0.116	CH
12	-26.9	Q	0.0	0.170	CH
13	-23.9	Q	0.0	0.195	CH
14	-47.9	Q	0.0	0.222	CH
15	-58.4	Q	0.0	0.272	CH
16	-12.9	S	0.0	0.000	CH
17	-20.7	S	0.0	0.000	CH

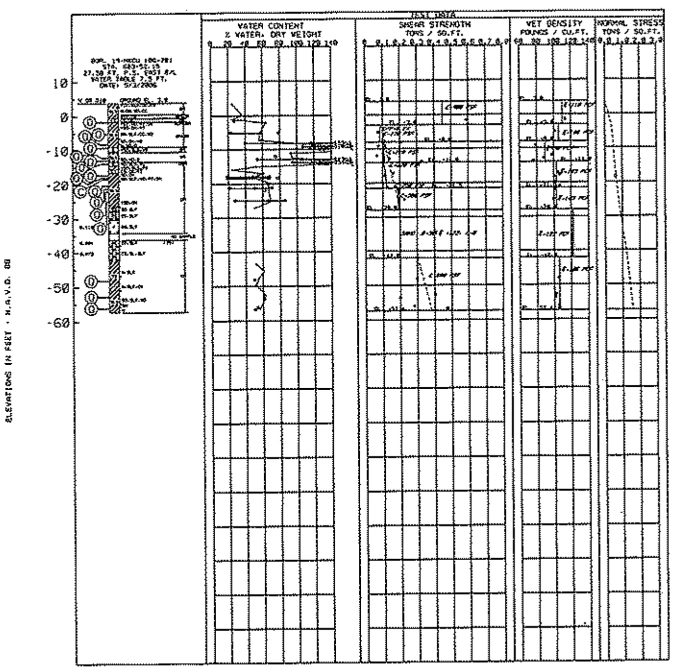


LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

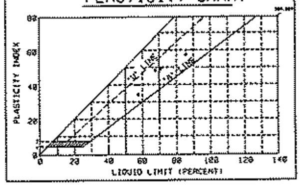
BORING 18-MKTU

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

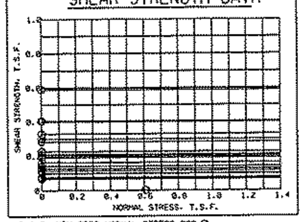
PLATE 52



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR Q

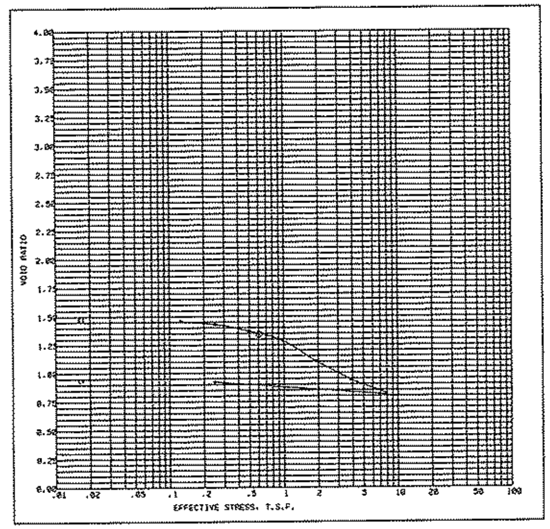
NOTES

- O - (UC) UNCONFINED COMPRESSION TEST
- ✱ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊡ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ω_P ω_N ω_L ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 3.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-1.6	Q	0.0	0.390	CL
2	-3.1	Q	0.0	0.874	CH
3	-8.2	Q	0.0	0.229	CH
4	-9.2	Q	0.0	0.877	CH
5	-12.0	Q	0.0	0.447	CH
6	-12.9	Q	0.0	0.141	CH
7	-13.8	Q	0.0	0.329	CH
8	-17.2	Q	0.0	0.163	CH
9	-17.5	Q	0.0	0.116	CH
10	-20.2	Q	0.0	0.182	CH
11	-21.2	Q	0.0	0.127	CH
12	-22.8	Q	0.0	0.151	CH
13	-25.8	Q	0.0	0.226	CH
14	-48.2	Q	0.0	0.280	CH
15	-52.8	Q	0.0	0.484	CH
16	-56.2	Q	0.0	0.282	CH
17	-18.4	C	0.0	0.109	CH

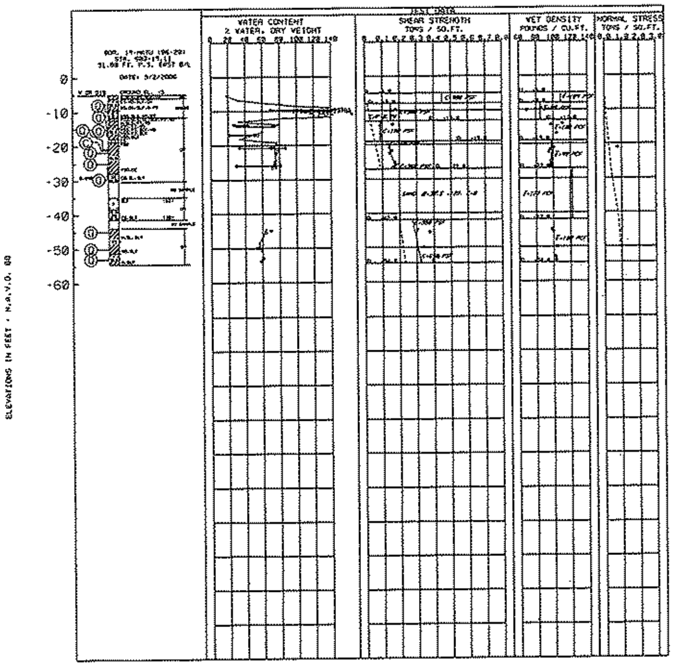


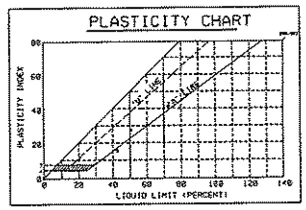
LAKE PONTCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

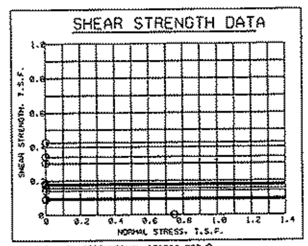
BORING 19-MKCU

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

PLATE 53







WARNING: NON-ZERO NORMAL STRESS FOR ⊙

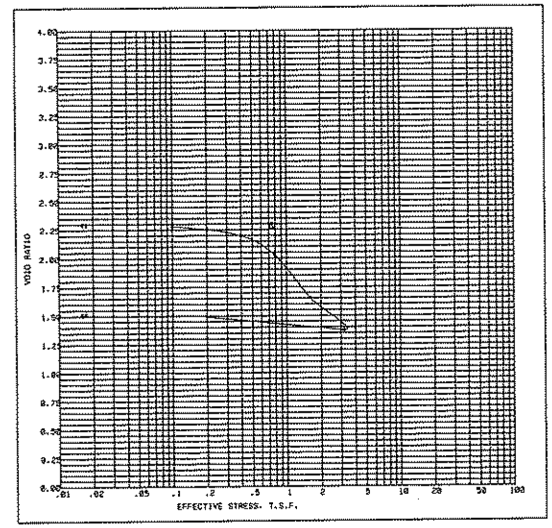
NOTES

o - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
ω_P — ω_N — ω_L ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

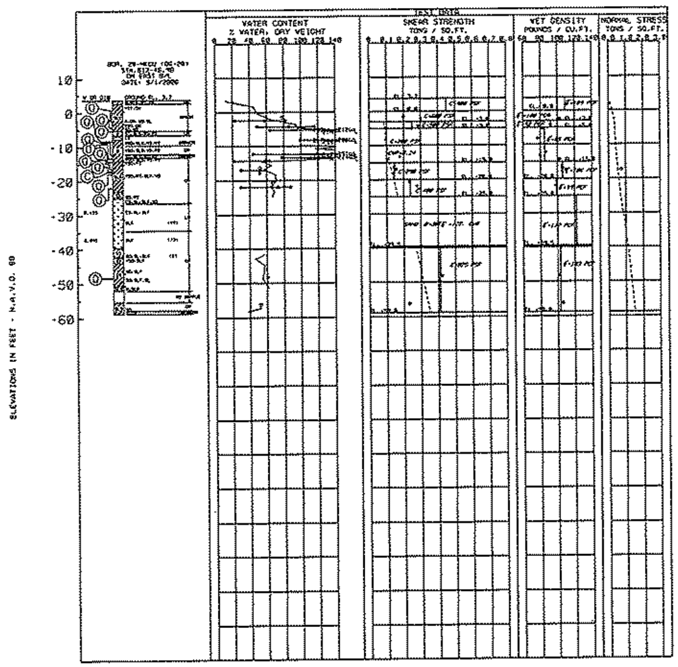
ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-5.7	Q	0.0	0.173	CH
2	-11.3	Q	0.0	0.095	CH
3	-17.0	Q	0.0	0.051	CH
4	-20.3	Q	0.0	0.142	CH
5	-21.7	Q	0.0	0.128	CH
6	-25.0	Q	0.0	0.173	CH
7	-25.5	Q	0.0	0.155	CH
8	-53.0	Q	0.0	0.284	CH
9	-50.0	Q	0.0	0.251	CH
10	-33.0	Q	0.0	0.423	CH
11	-21.7	C	0.0	0.000	CH



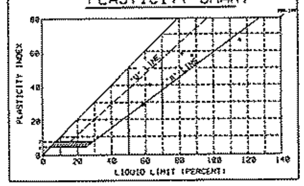
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 19-MKTU

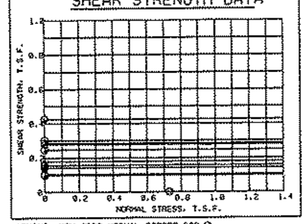
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR Q

NOTES

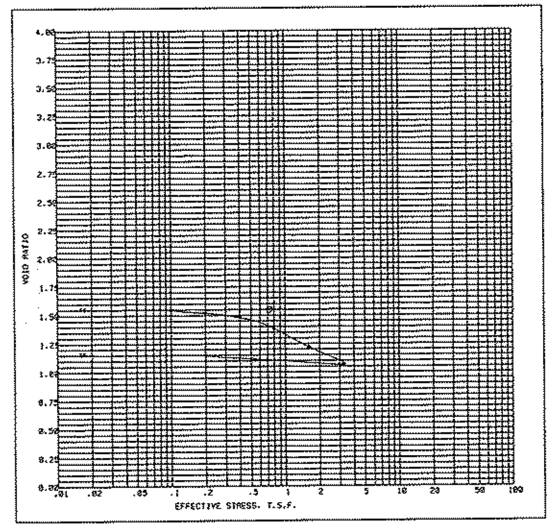
- ○ - (UC) UNCONFINED COMPRESSION TEST
- ● - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊖ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST

Wp — Wn — WL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLATE 4.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Ø	STRENGTH C - TSF	CLASS
1	-2.5	Q	0.0	0.201	CH
2	-4.3	Q	0.0	0.207	CH
3	-5.3	Q	0.0	0.247	CH
4	-8.3	Q	0.0	0.097	CH
5	-12.3	Q	0.0	0.142	CH
6	-13.3	Q	0.0	0.179	CH
7	-14.3	Q	0.0	0.185	CH
8	-16.3	Q	0.0	0.145	CH
9	-17.8	Q	0.0	0.159	CH
10	-17.9	Q	0.0	0.113	CH
11	-22.8	Q	0.0	0.278	CH
12	-40.3	Q	0.0	0.425	CH
13	-17.4	C	0.0	0.030	CH

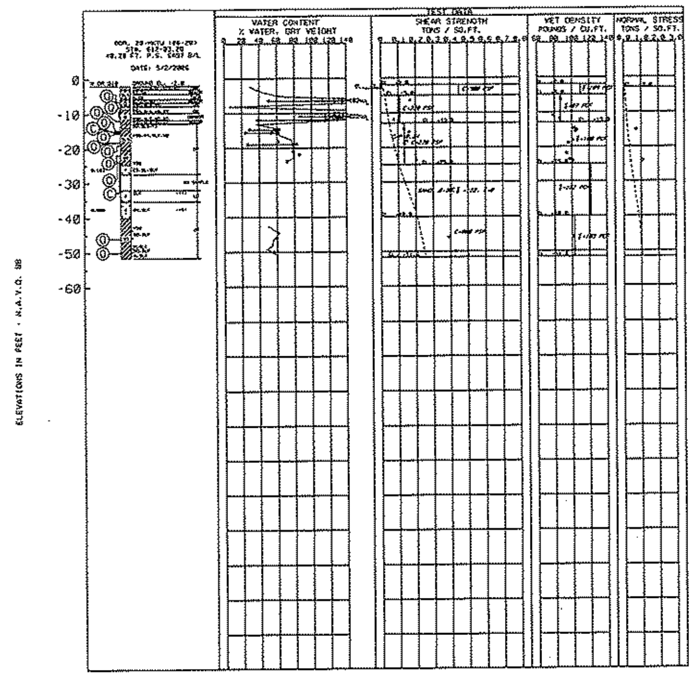


LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

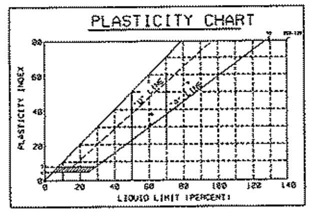
BORING 20-MKCU

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

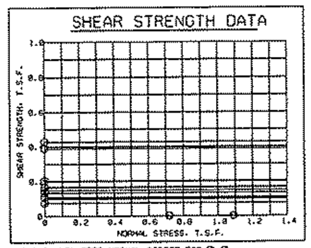
PLATE 55



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR Q, O

NOTES

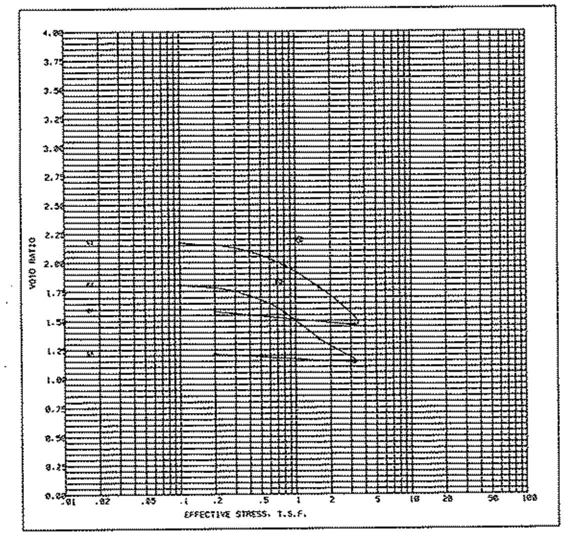
O - (UC) UNCONFINED COMPRESSION TEST
● - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
⊖ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST

Wp Wn WL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 4.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-6.3	Q	0.0	0.153	CH
2	-11.6	Q	0.0	0.118	PT
3	-12.4	Q	0.0	0.026	CH
4	-14.7	Q	0.0	0.133	CH
5	-15.6	Q	0.0	0.164	CH
6	-18.2	Q	0.0	0.154	CH
7	-19.8	Q	0.0	0.126	CH
8	-22.0	Q	0.0	0.175	CH
9	-23.8	Q	0.0	0.295	CH
10	-45.8	Q	0.0	0.388	CH
11	-54.0	Q	0.0	0.427	CH
12	-15.1	C	0.0	0.008	CH
13	-24.2	C	0.0	0.004	CH

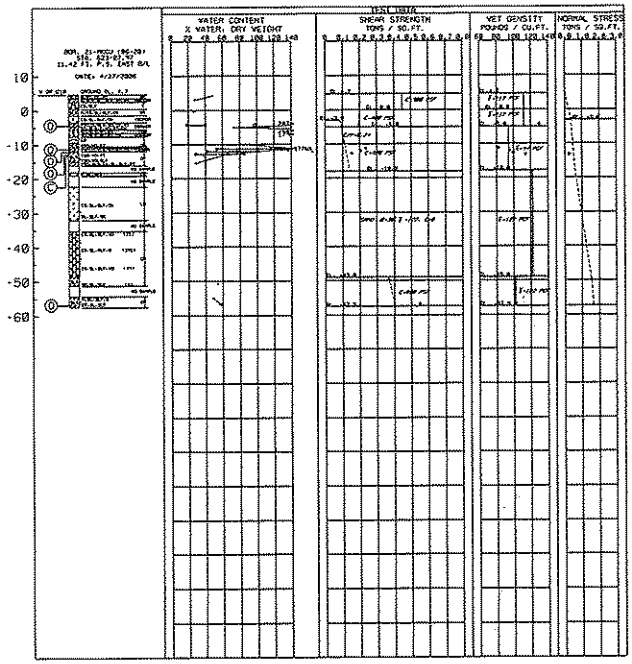


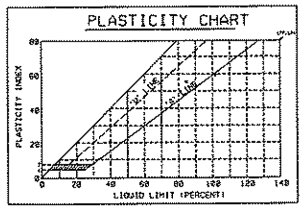
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

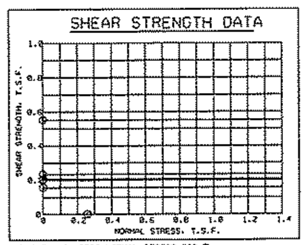
BORING 20-MKTU

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

PLATE 56







WARNING: NON-ZERO NORMAL STRESS FOR ©

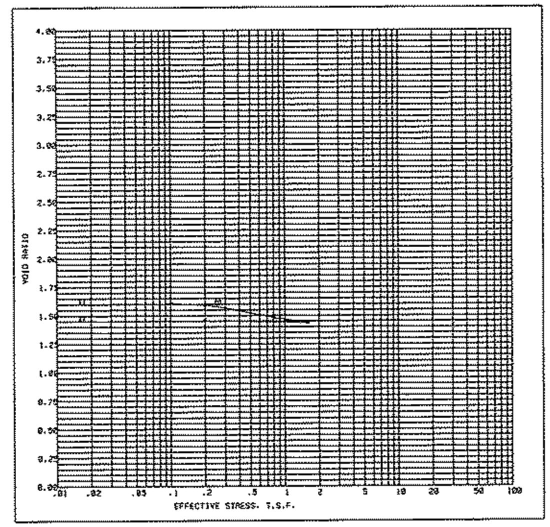
NOTES

- ○ - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- □ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- WP — WN — LL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER.
STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 4.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-5.3	Q	0.0	0.150	CL
2	-11.2	Q	0.0	0.272	CH
3	-12.1	Q	0.0	0.287	CH
4	-12.5	Q	0.0	0.133	CH
5	-16.8	Q	0.0	0.221	CH
6	-12.3	C	0.0	0.150	CH

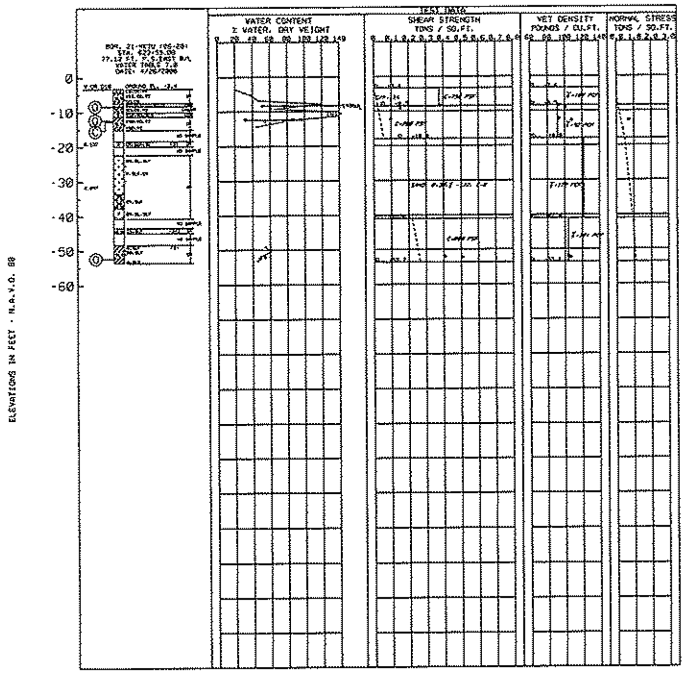


LAKE PONTCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

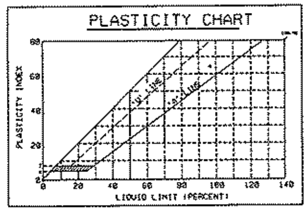
BORING 21-MKCU

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

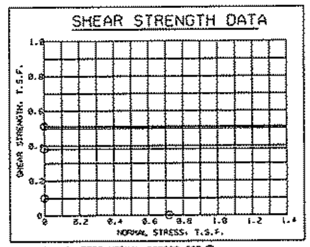
PLATE 57



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR ⊕

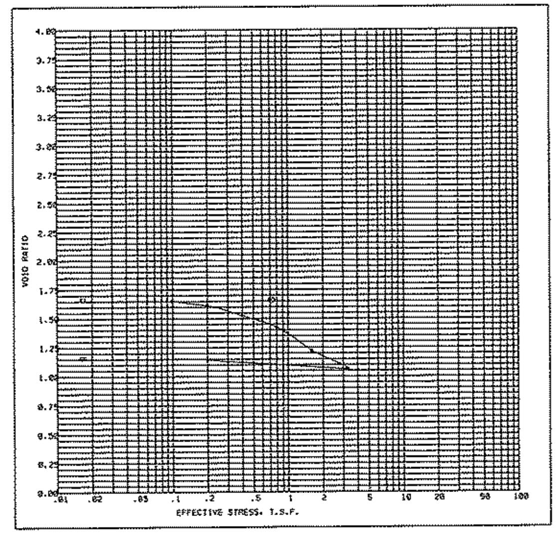
NOTES

○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
□ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
ωp ωn ωL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLATE 4.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-9.4	Q	0.0	0.381	CH
2	-17.4	Q	0.0	0.935	CH
3	-52.4	Q	0.0	0.511	CH
4	-12.9	C	0.0	0.008	CH



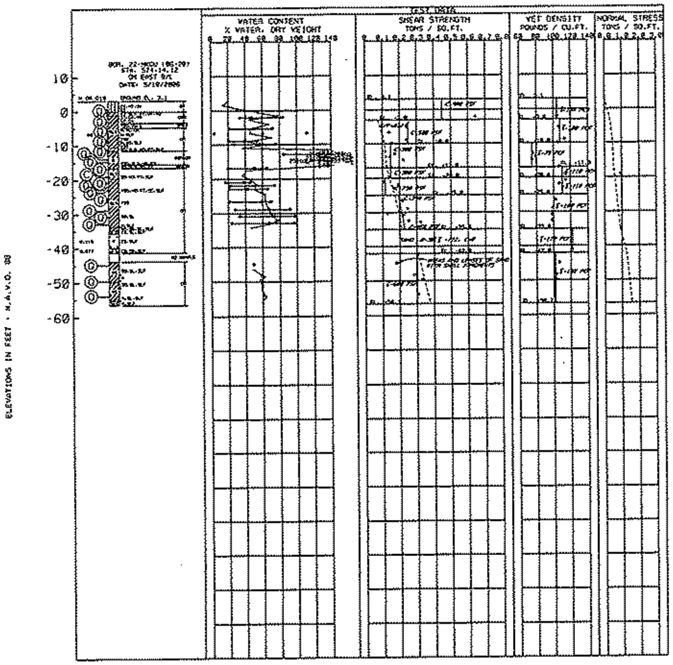
LAKE PONTCHARTRAIN LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 21-MKTU

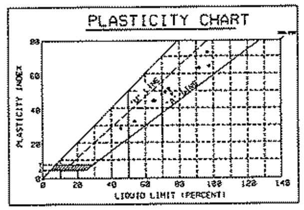
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: S. BROWN
DRAWN BY: D. BROWN
CHECKED BY: A. A.Y.

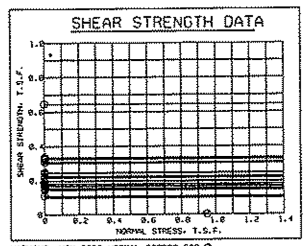
PLATE 58



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR ⊖

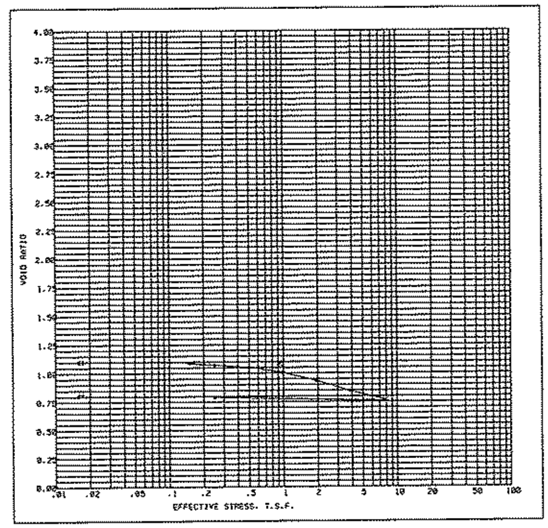
NOTES

- ○ - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ● - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- □ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ωP ωN ωL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-2.1	Q	0.0	0.542	CH
2	-5.3	Q	0.0	0.247	CH
3	-9.9	Q	0.0	0.244	CL
4	-9.9	Q	0.0	0.138	CH
5	-12.9	Q	0.0	0.172	CH
6	-17.9	Q	0.0	0.115	CH
7	-16.7	Q	0.0	0.224	CH
8	-15.5	Q	0.0	0.132	CH
9	-20.9	Q	0.0	0.198	CL
10	-21.9	Q	0.0	0.193	CH
11	-22.9	Q	0.0	0.167	CH
12	-25.6	Q	0.0	0.216	CH
13	-28.4	Q	0.0	0.247	CH
14	-30.4	Q	0.0	0.220	CH
15	-32.4	Q	0.0	0.224	CH
16	-44.3	Q	0.0	0.152	CH
17	-49.6	Q	0.0	0.224	CH
18	-52.9	Q	0.0	0.200	CH
19	-19.1	C	0.0	0.000	CH

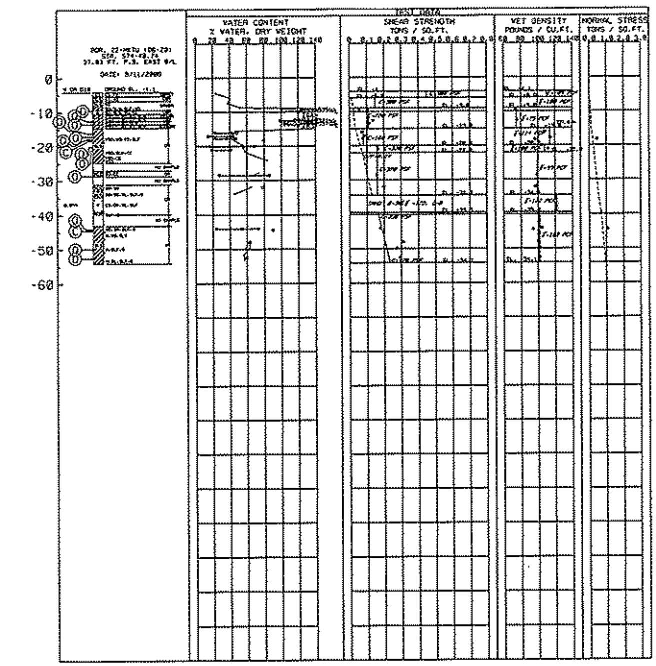


LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

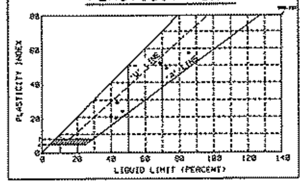
BORING 22-MKCU

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

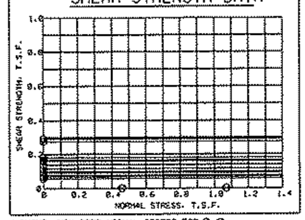
PLATE 59



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR Q, R

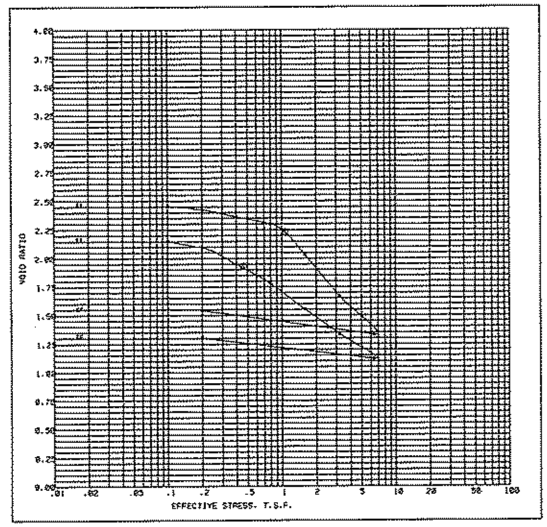
NOTES

- O - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ◆ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ω_P ω_N ω_L ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

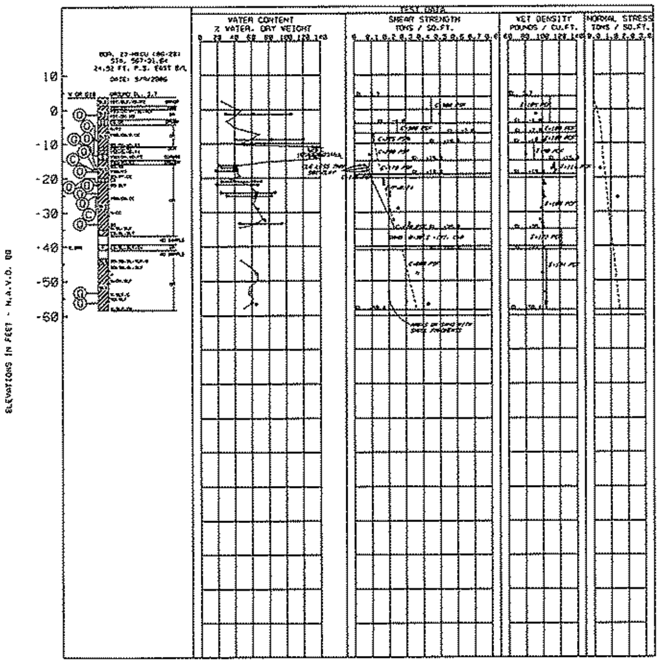
ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-9.3	Q	0.0	0.076	CH
2	-12.9	Q	0.0	0.120	CH
3	-12.5	Q	0.0	0.116	CH
4	-16.1	Q	0.0	0.079	CL
5	-17.1	Q	0.0	0.052	CL
6	-17.9	Q	0.0	0.024	CL
7	-20.1	Q	0.0	0.161	CH
8	-21.1	Q	0.0	0.167	CL
9	-28.6	Q	0.0	0.189	CH
10	-45.1	Q	0.0	0.179	CH
11	-49.9	Q	0.0	0.275	CH
12	-52.6	Q	0.0	0.292	CH
13	-18.3	C	0.0	0.000	CH
14	-40.9	C	0.0	0.000	CH

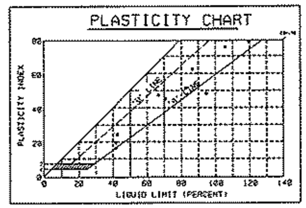


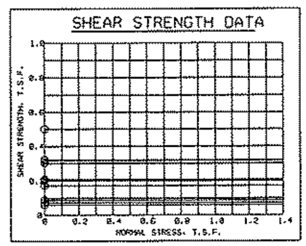
BORING 22-MKTU

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

PLATE 60

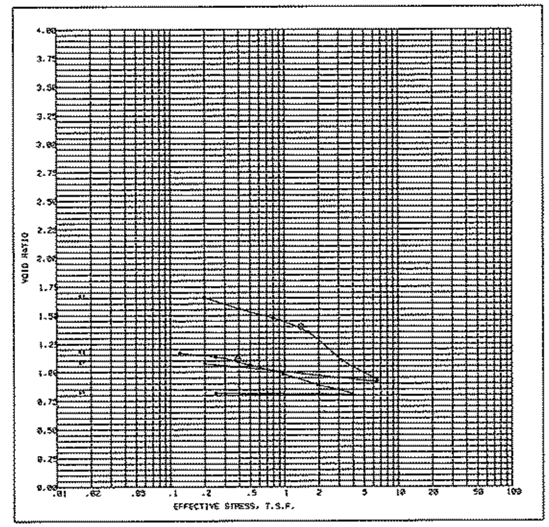






TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-1.3	Q	0.0	0.300	CH
2	-8.8	Q	0.0	0.210	CH
3	-12.3	Q	0.0	0.900	CH
4	-16.3	Q	0.0	0.090	CH
5	-17.8	Q	0.0	0.074	CL
6	-17.9	Q	0.0	0.074	CL
7	-21.8	Q	0.0	0.172	CH
8	-21.9	Q	0.0	0.172	CH
9	-24.3	Q	0.0	0.287	CH
10	-25.2	Q	0.0	0.203	CH
11	-32.3	Q	0.0	0.321	CH
12	-53.3	Q	0.0	0.230	CH
13	-55.2	Q	0.0	0.283	CH
14	-17.6	C	0.0	0.080	CL
15	-21.1	C	0.0	0.080	CH



NOTES

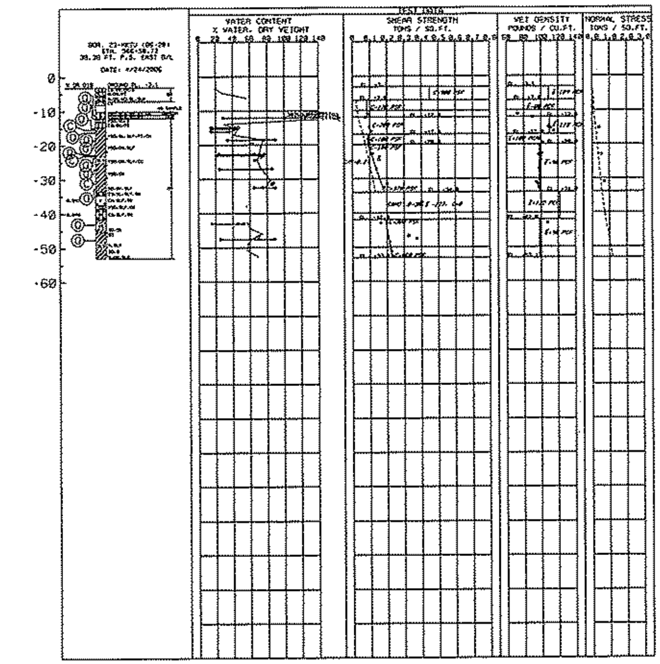
- ○ - (UC) UNCONFINED COMPRESSION TEST
- ● - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- □ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- WP WN WL ATTERBERG LIMITS

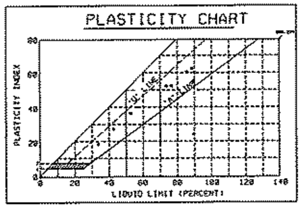
BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

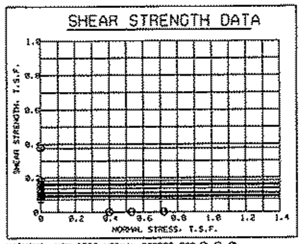
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 23-MKCU

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







WARNING: NON-ZERO NORMAL STRESS FOR ⑩ ⑭ ⑮

NOTES

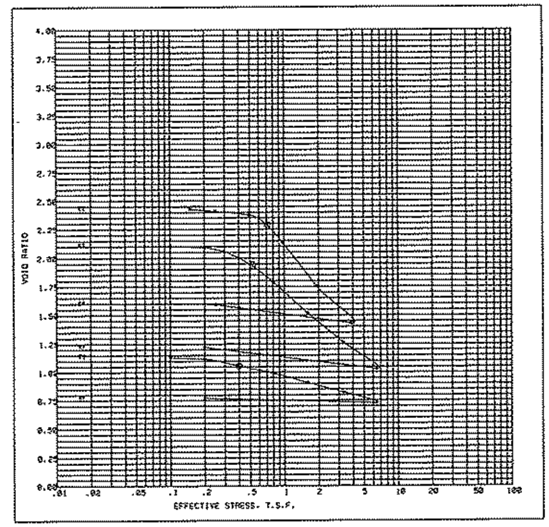
- ○ - (UC) UNCONFINED COMPRESSION TEST
- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊕ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST

Wp — Wn — WL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-11.1	Q	0.0	0.650	CH
2	-13.1	Q	0.0	0.074	CH
3	-14.9	Q	0.0	0.073	CH
4	-16.1	Q	0.0	0.118	CL
5	-18.8	Q	0.0	0.092	CH
6	-19.6	Q	0.0	0.095	CH
7	-22.7	Q	0.0	0.118	CH
8	-23.6	Q	0.0	0.137	CH
9	-27.1	Q	0.0	0.128	CH
10	-32.6	Q	0.0	0.123	CH
11	-43.1	Q	0.0	0.164	CH
12	-47.6	Q	0.0	0.225	CH
13	-13.3	S	0.0	0.030	CL
14	-22.1	S	0.0	0.028	CH
15	-31.1	S	0.0	0.000	CH

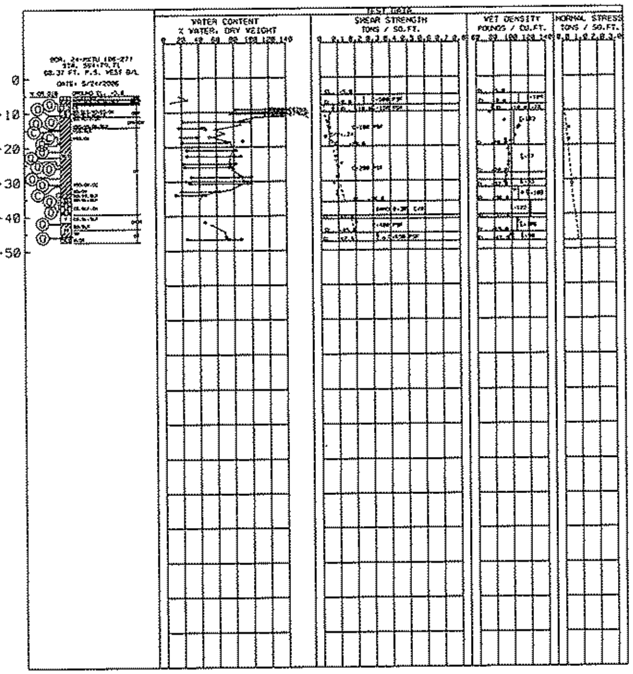


LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

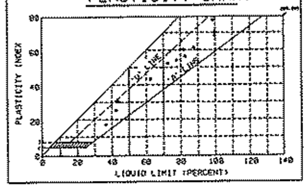
BORING 23-MKTU

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

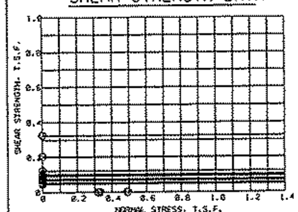
PLATE 62



PLASTICITY CHART



SHEAR STRENGTH DATA



WARNING: NON-ZERO NORMAL STRESS FOR

NOTES

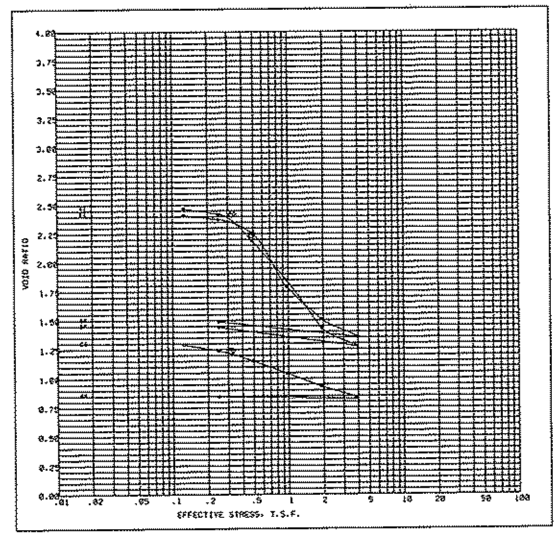
- ○ - (UC) UNCONFINED COMPRESSION TEST
- ● - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ☆ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST

Wp — Wn — WL ATTERBERG LIMITS

BORING WAS 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.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH φ	STRENGTH C - TSF	CLASS
1	-9.2	Q	0.0	0.074	CH
2	-10.3	Q	0.0	0.057	CH
3	-12.0	Q	0.0	0.145	CH
4	-14.6	Q	0.0	0.057	CL
5	-18.9	Q	0.0	0.060	CH
6	-21.5	Q	0.0	0.057	CH
7	-22.0	Q	0.0	0.094	CH
8	-25.0	Q	0.0	0.122	CH
9	-25.5	Q	0.0	0.102	CH
10	-28.0	Q	0.0	0.095	CH
11	-29.6	Q	0.0	0.077	CH
12	-33.0	Q	0.0	0.079	CH
13	-34.0	Q	0.0	0.076	CL
14	-41.5	Q	0.0	0.255	CL
15	-46.8	Q	0.0	0.227	CH
16	-15.8	C	0.0	0.000	CL
17	-18.4	C	0.0	0.000	CH
18	-21.1	C	0.0	0.000	CH

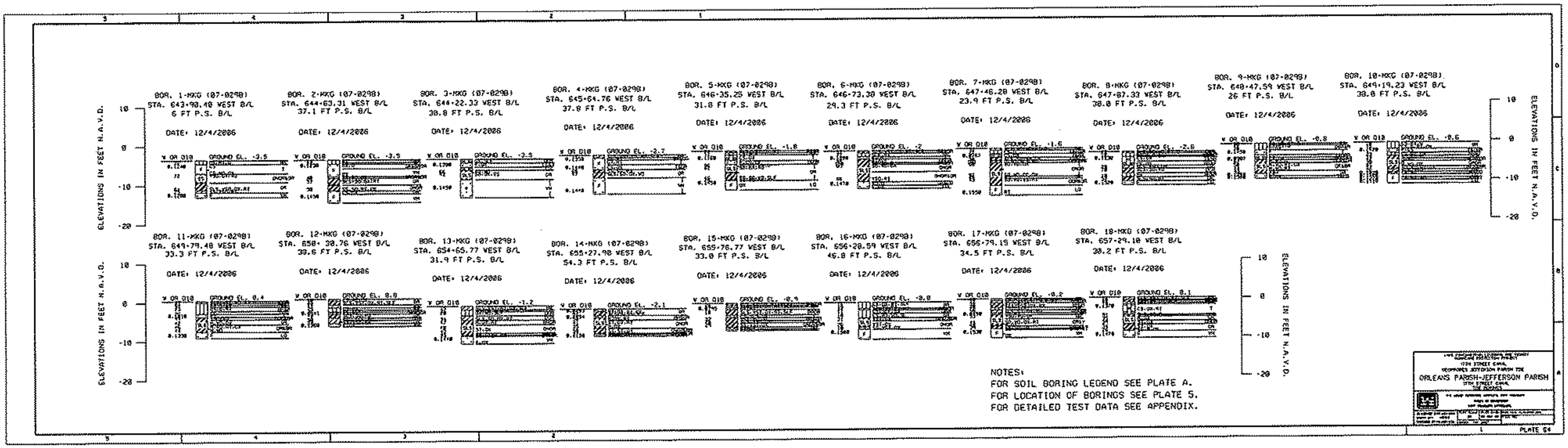


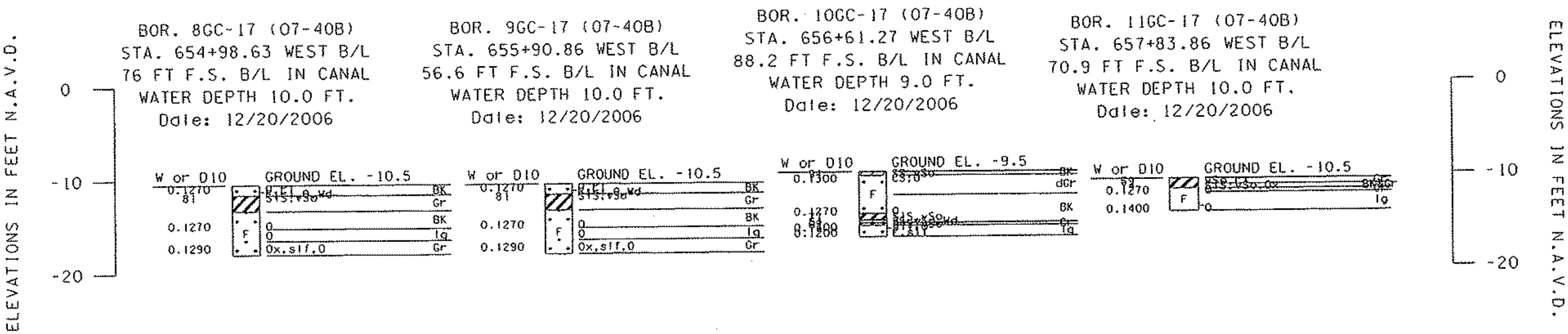
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

BORING 24-MKTU

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

PLATE 63


ELEVATIONS IN FEET N.A.V.D.
BOR. 1-MKG (07-0298) STA. 643+90.40 WEST B/L 6 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -3.5
BOR. 2-MKG (07-0298) STA. 644+63.31 WEST B/L 37.1 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -3.5
BOR. 3-MKG (07-0298) STA. 644+22.33 WEST B/L 30.8 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -3.5
BOR. 4-MKG (07-0298) STA. 645+64.76 WEST B/L 37.0 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -2.7
BOR. 5-MKG (07-0298) STA. 646+35.25 WEST B/L 31.8 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -1.8
BOR. 6-MKG (07-0298) STA. 646+73.30 WEST B/L 29.3 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -2
BOR. 7-MKG (07-0298) STA. 647+46.20 WEST B/L 23.9 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -1.6
BOR. 8-MKG (07-0298) STA. 647+87.33 WEST B/L 30.0 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -2.6
BOR. 9-MKG (07-0298) STA. 648+47.59 WEST B/L 26 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -0.8
BOR. 10-MKG (07-0298) STA. 649+19.23 WEST B/L 30.0 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -0.6
BOR. 11-MKG (07-0298) STA. 649+79.48 WEST B/L 33.3 FT P.S. B/L DATE: 12/4/2006 GROUND EL. 0.4
BOR. 12-MKG (07-0298) STA. 650+ 30.76 WEST B/L 33.6 FT P.S. B/L DATE: 12/4/2006 GROUND EL. 0.0
BOR. 13-MKG (07-0298) STA. 654+65.77 WEST B/L 31.9 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -1.2
BOR. 14-MKG (07-0298) STA. 655+27.98 WEST B/L 54.3 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -2.1
BOR. 15-MKG (07-0298) STA. 655+76.77 WEST B/L 33.0 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -0.9
BOR. 16-MKG (07-0298) STA. 656+28.59 WEST B/L 46.8 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -0.0
BOR. 17-MKG (07-0298) STA. 656+79.15 WEST B/L 34.5 FT P.S. B/L DATE: 12/4/2006 GROUND EL. -0.2
BOR. 18-MKG (07-0298) STA. 657+29.10 WEST B/L 30.2 FT P.S. B/L DATE: 12/4/2006 GROUND EL. 0.1
NOTES:
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLATE 5.
FOR DETAILED TEST DATA SEE APPENDIX.
ORLEANS PARISH-JEFFERSON PARISH
PLATE 64



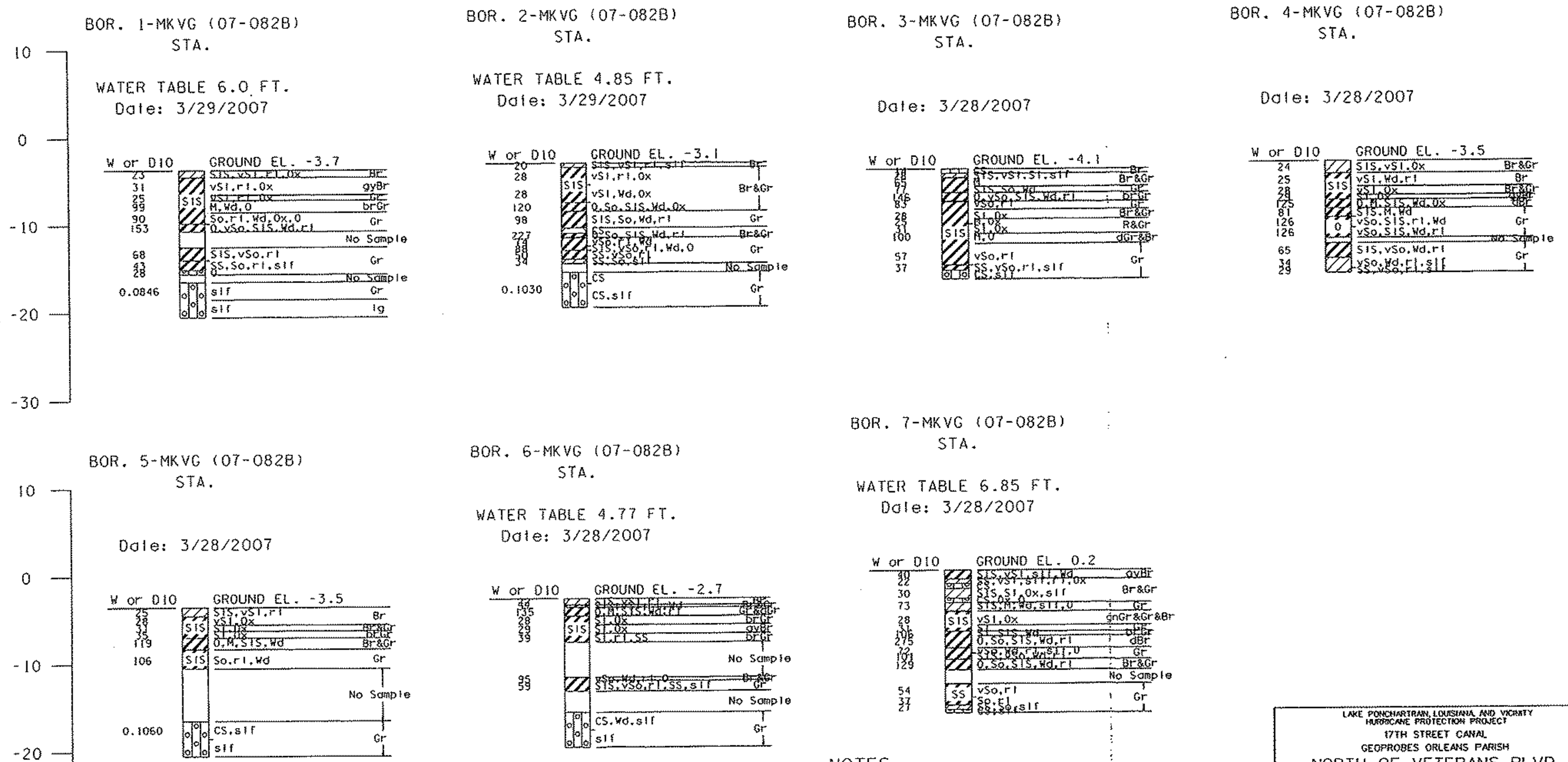
NOTES:
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLATE 5.
FOR DETAILED TEST DATA SEE APPENDIX.

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
GEOPROBES CANAL STATION 654+70 TO 657+90 WEST SIDE
GEOPROBE BORINGS JEFFERSON SIDE
ORLEANS PARISH-JEFFERSON PARISH
TAKEN IN CANAL

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

DESIGNED BY: X.X.	PLOT SCALE: 20	PLOT DATE: 04 MAY 07	CADD FILE:
DRAWN BY: X.X.			FILE NO.
CHECKED BY: F.V./ C.R.	DATE: MAY 2007		

PLATE 65

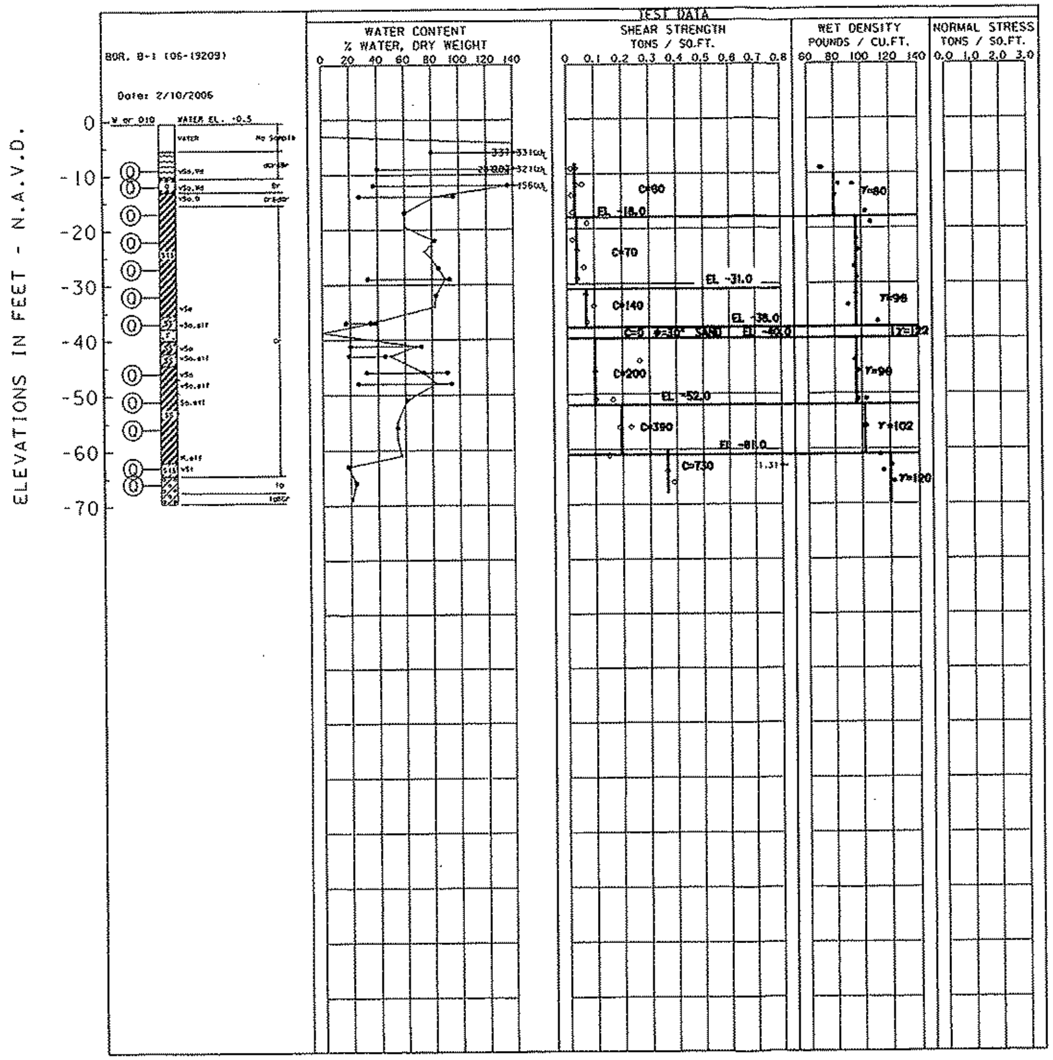


NOTES:
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLATE 4.
FOR DETAILED TEST DATA SEE APPENDIX.

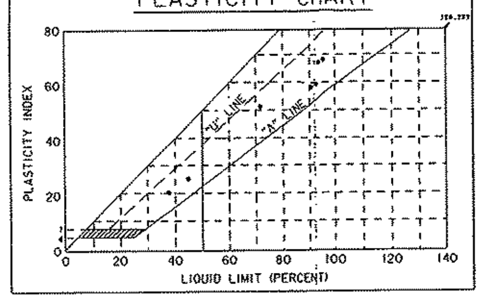
LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
GEOPROBES ORLEANS PARISH
NORTH OF VETERANS BLVD
PROTECTED SIDE
LEVEE TOE

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

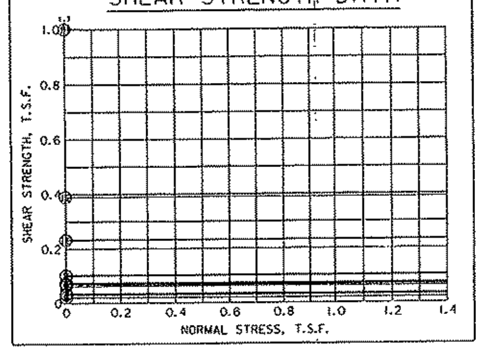
DESIGNED BY: F.V. DRAWN BY: V.M. CHECKED BY: F.V./ C.R.
PLOT SCALE: 10 PLOT DATE: 04 MAY 07 DATE: MAY 2007



PLASTICITY CHART



SHEAR STRENGTH DATA



NOTES

- ● - UNIT WEIGHT
- ○ - (UC) UNCONFINED COMPRESSION TEST
- 1 POINT ○-◇ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ⊡ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
- ω_P — ω_N — ω_L ATTERBERG LIMITS

FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

BOR B-1

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-9.0	Q	0.0	0.032	PT
2	-12.0	Q	0.0	0.035	OH
3	-17.0	Q	0.0	0.021	CH
4	-22.0	Q	0.0	0.021	CH
5	-27.0	Q	0.0	0.063	CH
6	-32.0	Q	0.0	0.068	CH
7	-37.0	Q	0.0	0.073	CL
8	-46.0	Q	0.0	0.101	CH
9	-51.0	Q	0.0	0.103	CH
10	-56.0	Q	0.0	0.232	CH
11	-63.0	Q	0.0	1.314	CL
12	-66.0	Q	0.0	0.390	SC

TABULAR TEST DATA

BOR B-2

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-9.0	Q	0.0	0.017	PT
2	-12.0	Q	0.0	0.056	CH
3	-14.0	Q	0.0	0.017	PT
4	-19.0	Q	0.0	0.073	CH
5	-24.0	Q	0.0	0.037	CH
6	-29.0	Q	0.0	0.037	CH
7	-34.0	Q	0.0	0.097	CH
8	-44.0	Q	0.0	0.264	CH
9	-51.0	Q	0.0	0.164	CH
10	-56.0	Q	0.0	0.189	CH
11	-61.1	Q	0.0	0.149	CH
12	-64.0	Q	0.0	0.365	CH

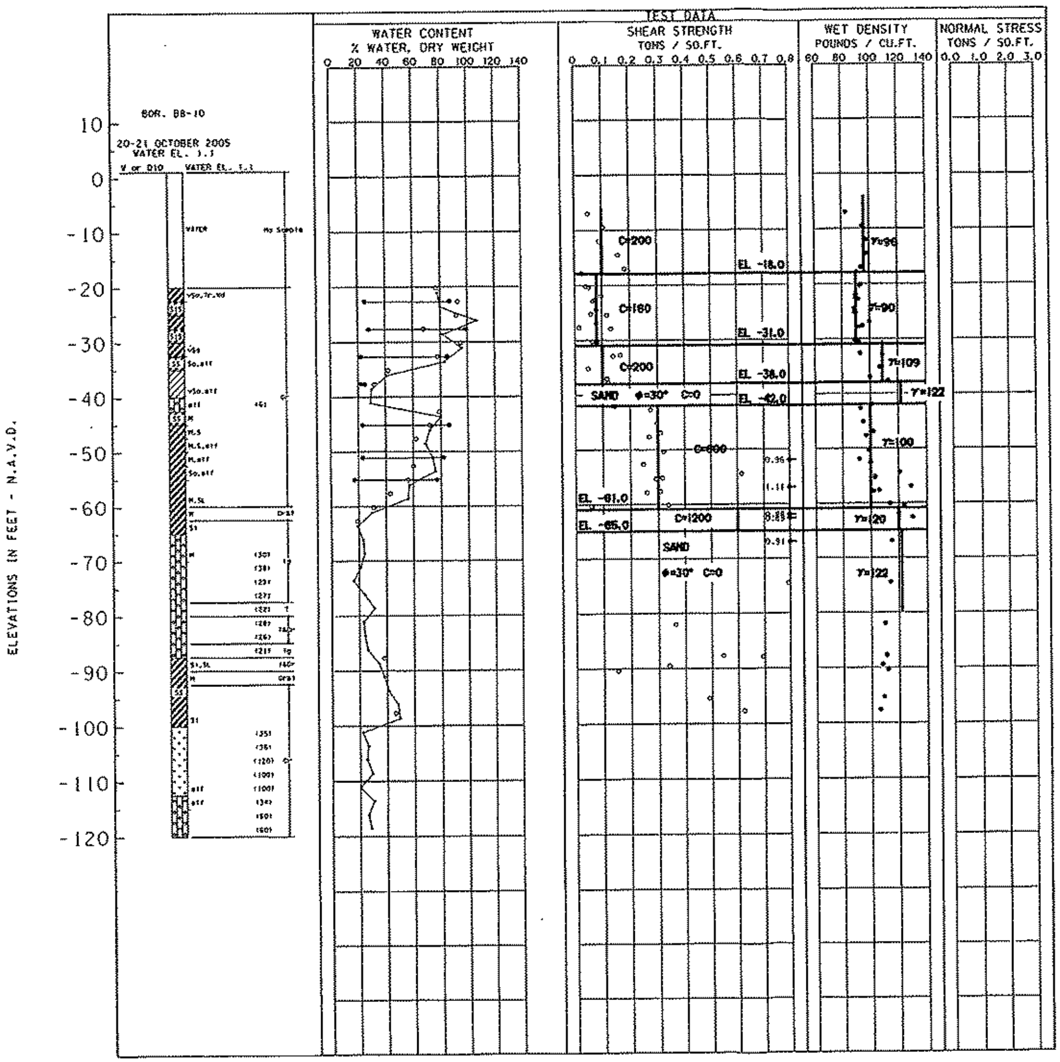
LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
BORINGS IN CANAL

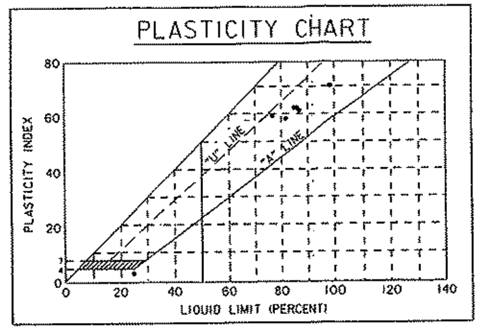
BORINGS 1 & 2

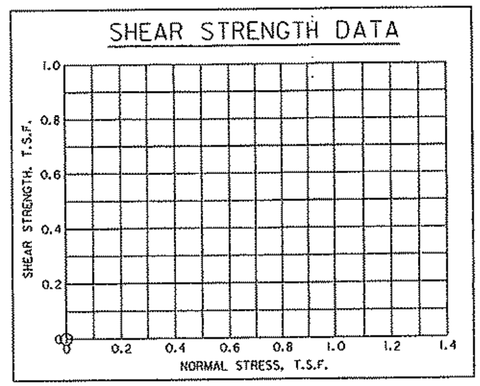
STRENGTH LINES
BETWEEN HAMMOND HWY. & CLOSURE STRUCTURE

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

DESIGNED BY: YOUROVICH | DRAWN BY: WOODS | CHECKED BY: YOUROVICH | PLOT SCALE: 20 | PLOT DATE: 04 MAY 07 | DATE: MAY 2007 | FILE NO.







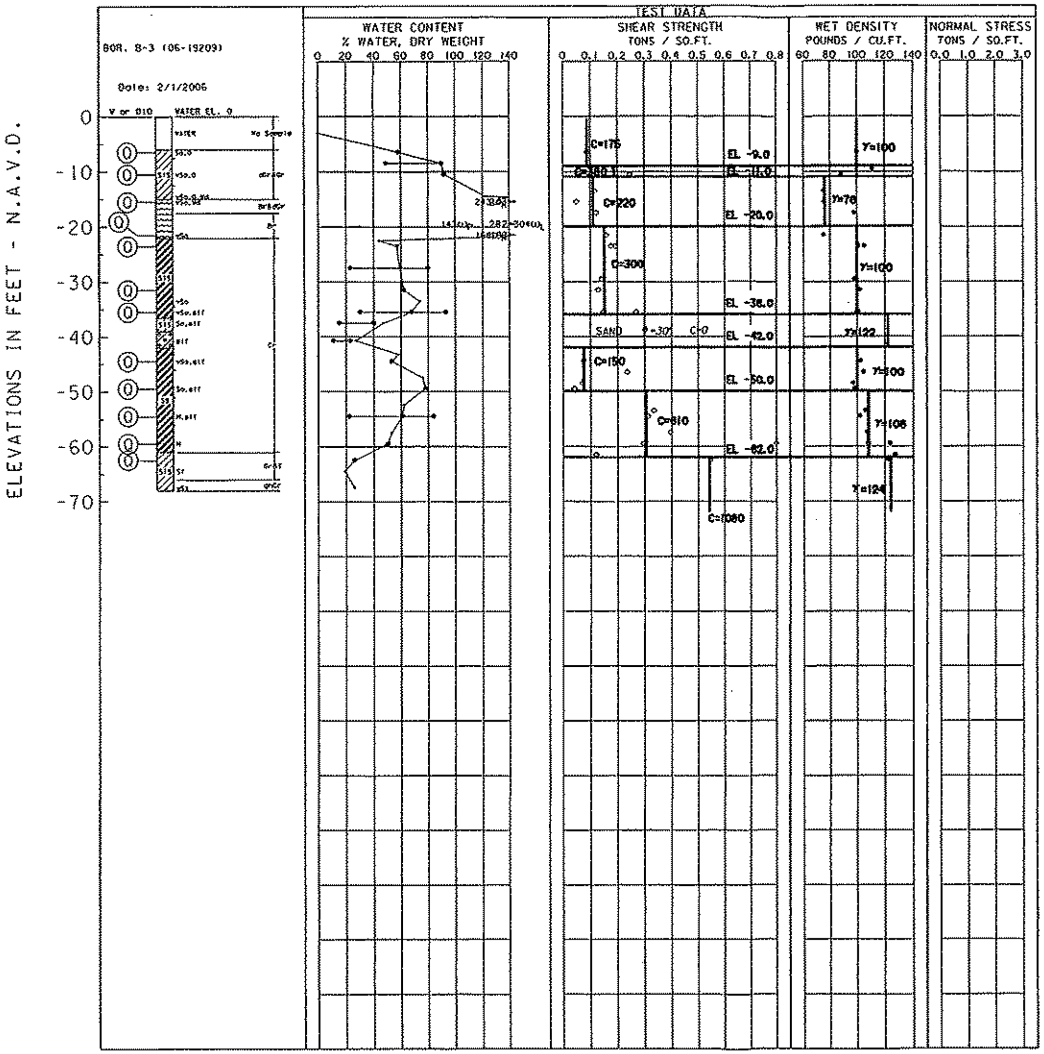
NOTES

○ - (UC) UNCONFINED COMPRESSION TEST
■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
⊡ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
ω_P ω_N ω_L ATTERBERG LIMITS

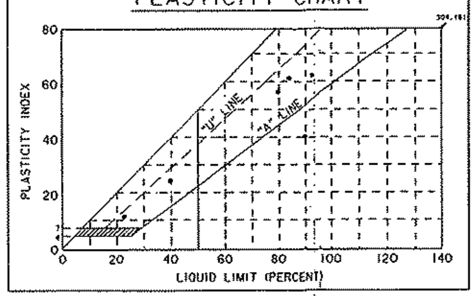
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
C/L CANAL
BORINGS B8 THRU B10
STRENGTH LINES
CLOSURE GATE TO HAMMOND HIGHWAY
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

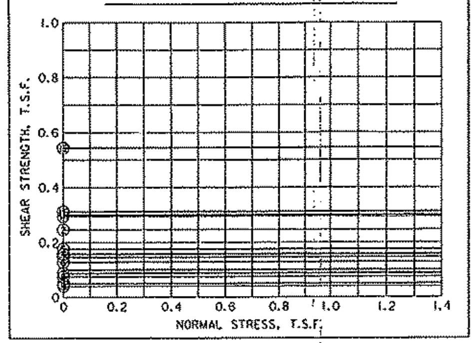
PLATE 68



PLASTICITY CHART



SHEAR STRENGTH DATA



NOTES

- UNIT WEIGHT
- (UC) UNCONFINED COMPRESSION TEST
1 POINT - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST

ω_P ω_N ω_L ATTERBERG LIMITS

FOR SOIL BORING LEGEND SEE PLATE 4.
FOR LOCATION OF BORINGS SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

TABULAR TEST DATA

BOR B-3

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-6.5	Q	0.0	0.089	CL
2	-10.5	Q	0.0	0.246	CL
3	-15.5	Q	0.0	0.050	PT
4	-21.5	Q	0.0	0.158	PT
5	-23.5	Q	0.0	0.176	CH
6	-31.5	Q	0.0	0.128	CH
7	-35.5	Q	0.0	0.147	CH
8	-44.5	Q	0.0	0.075	CH
9	-49.5	Q	0.0	0.041	CH
10	-54.5	Q	0.0	0.313	CH
11	-59.5	Q	0.0	0.295	CH
12	-62.5	Q	0.0	0.544	CL

TABULAR TEST DATA

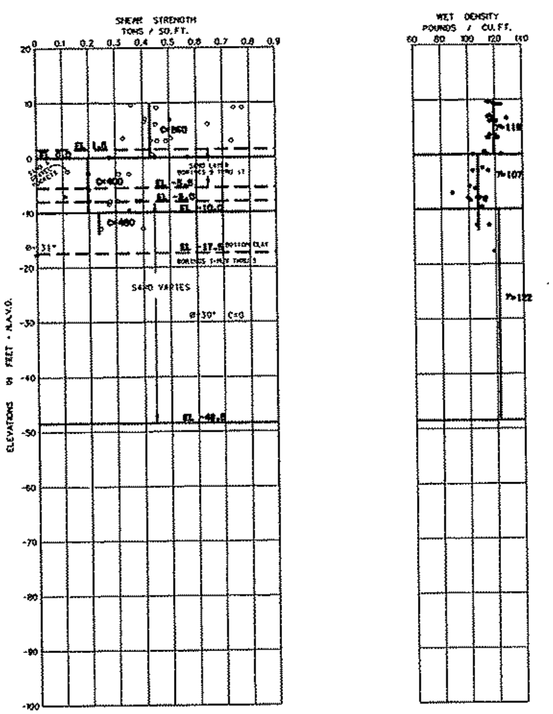
BOR B-4

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-9.5	Q	0.0	0.190	CL
2	-13.5	Q	0.0	0.115	PT
3	-17.5	Q	0.0	0.121	CH
4	-23.5	Q	0.0	0.192	CH
5	-29.5	Q	0.0	0.140	CH
6	-35.5	Q	0.0	0.268	CH
7	-46.5	Q	0.0	0.234	CH
8	-48.5	Q	0.0	0.071	CH
9	-53.5	Q	0.0	0.334	CH
10	-57.5	Q	0.0	0.396	CH
11	-59.5	Q	0.0	0.799	CL
12	-61.5	Q	0.0	0.119	CL

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
BORINGS IN CANAL EAST SIDE
BORINGS 3 & 4
STRENGTH LINES
BETWEEN HAMMOND HWY. & CLOSURE STRUCTURE

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

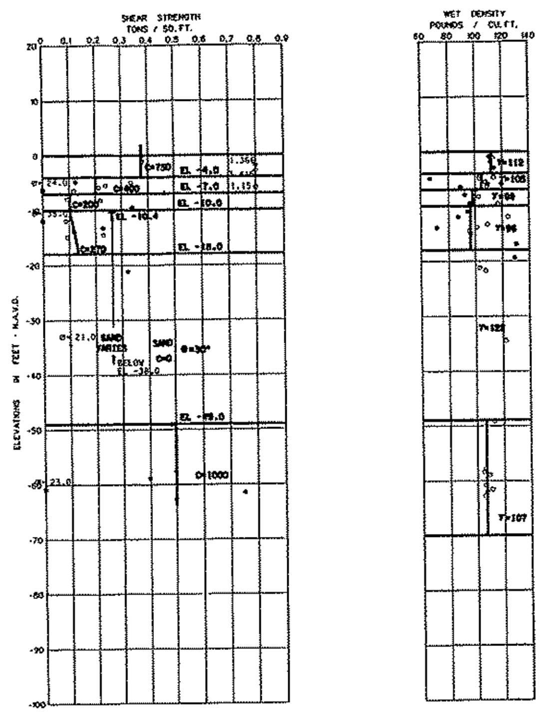
DESIGNED BY: VOJKOVICH | DRAWN BY: WOODS | CHECKED BY: VOJKOVICH | PLOT SCALE: 20 | PLOT DATE: 04 MAY 07 | DATE: MAY 2007



BORINGS WEST SIDE CENTERLINE (JEFFERSON SIDE) 16-MKCU, 4-MUG, 1, 3, 5, 7, 9, 11, 13, 15, & 17

B/L STATION 673+00 TO B/L STATION 600+00

NOTES:
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS 16-MKCU & 4-MUG SEE PLATE 5.
FOR DETAILED TEST DATA SEE APPENDIX.



BORINGS WEST SIDE TOE (JEFFERSON SIDE) 1-MUW, 3-MUW, 19, 21, 23, 25, 27, 29, & 31

B/L STATION 673+00 TO B/L STATION 600+00

NOTES:
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS 1-MUW & 3-MUW SEE PLATE 5.
FOR DETAILED TEST DATA SEE APPENDIX.

O - (UC) UNCONFINED COMPRESSION TEST
3 PT Q - ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
⊡ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
1 PT Q - ◇ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
1 PT Q - □ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
⊕ - UNIT WEIGHT

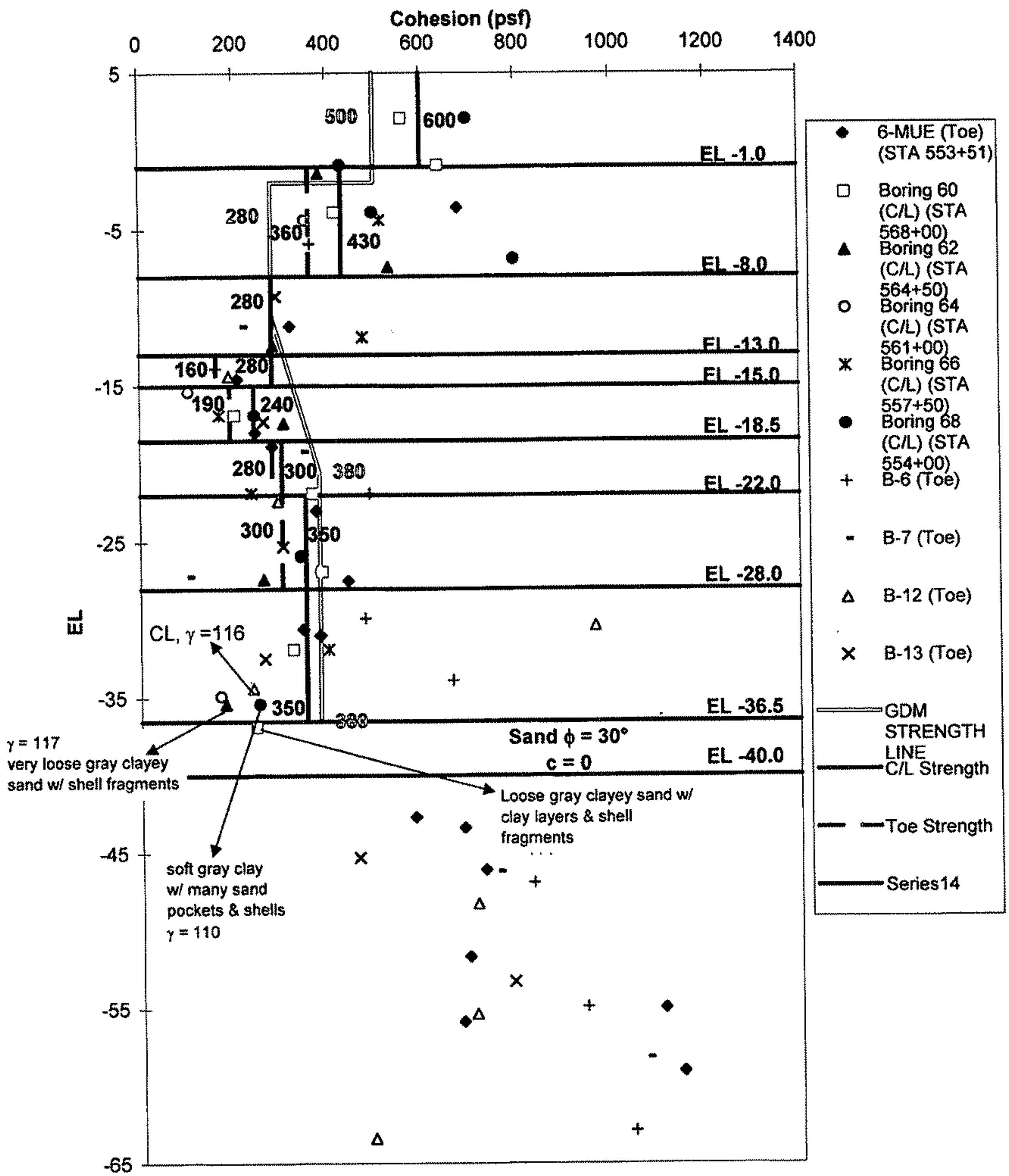
LAKE PONTCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
B/L STATION 673+00 TO B/L STATION 600+00
JEFFERSON SIDE BORINGS
STRENGTH LINES
WESTSIDE CENTERLINE & TOE

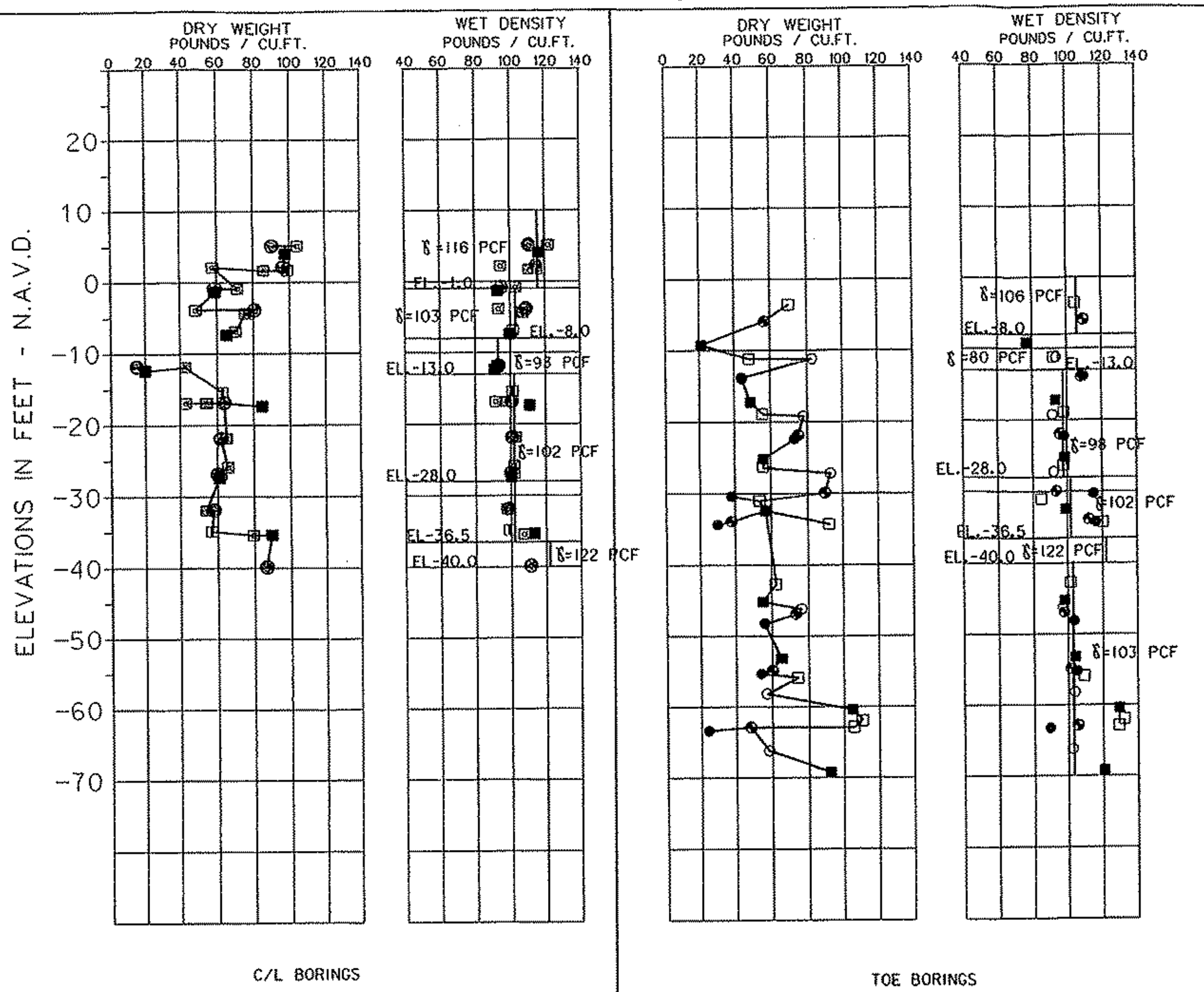
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: VOJKOVICH DRAWN BY: WOODS CHECKED BY: VOJKOVICH	PLOT SCALE: 20 DATE: MAY 2007	PLOT DATE: 04 MAY 07 FILE NO.

PLATE 70

17th Street Canal (Orleans)
Design Shear Strength - Hammond Highway to Breach





NOTES:
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORING 6-MUE SEE PLATE 2.
FOR DETAILED TEST DATA SEE APPENDIX.

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

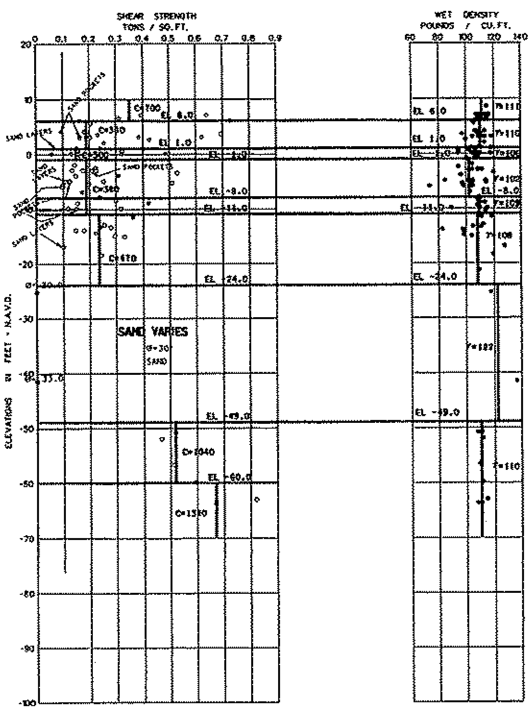
SOIL DESIGN PARAMETERS

HAMMOND HIGHWAY TO BREACH
ORLEANS SIDE

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

DESIGNED BY: F.V.	PLOT SCALE: 20	PLOT DATE: 04 APR 07	CADD FILE: plt72unit_weight.dgn
DRAWN BY: G.B.			FILE NO.
CHECKED BY: F.V./ C.R.	DATE: MAY 2007		

PLATE 72

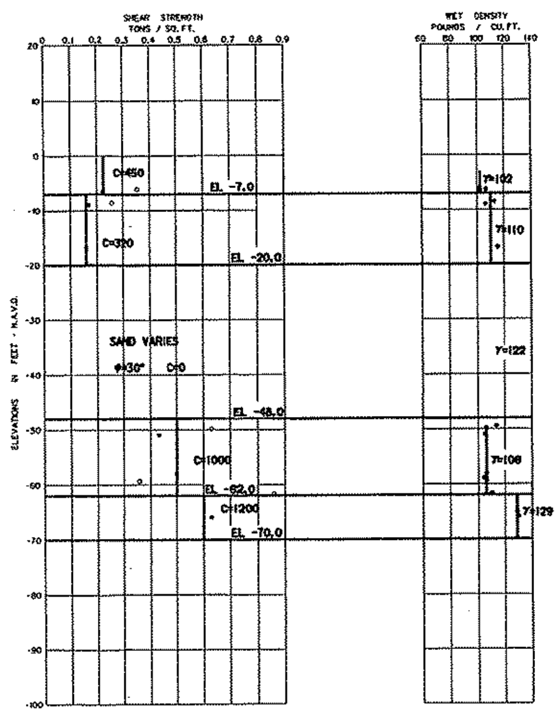


BORINGS 2-MUE,15-MKCU,B-2,B-4,B-6,B-8,B-10,B-12,B-14,B-19,B-18,B-20,B-22,B-24,B-26

STA. 626+00 TO 670+00

EAST SIDE CENTERLINE (ORLEANS SIDE)

NOTES:
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS 2-MUE & 15-MKCU SEE PLATE 5.
FOR DETAILED TEST DATA SEE APPENDIX.



BORINGS 15-MKTU, & 4-MUE

STA. 626+00 TO 670+00

EAST SIDE TOE (ORLEANS SIDE)

NOTES:
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS 15-MKTU & 4-MUE SEE PLATE 5.
FOR DETAILED TEST DATA SEE APPENDIX.

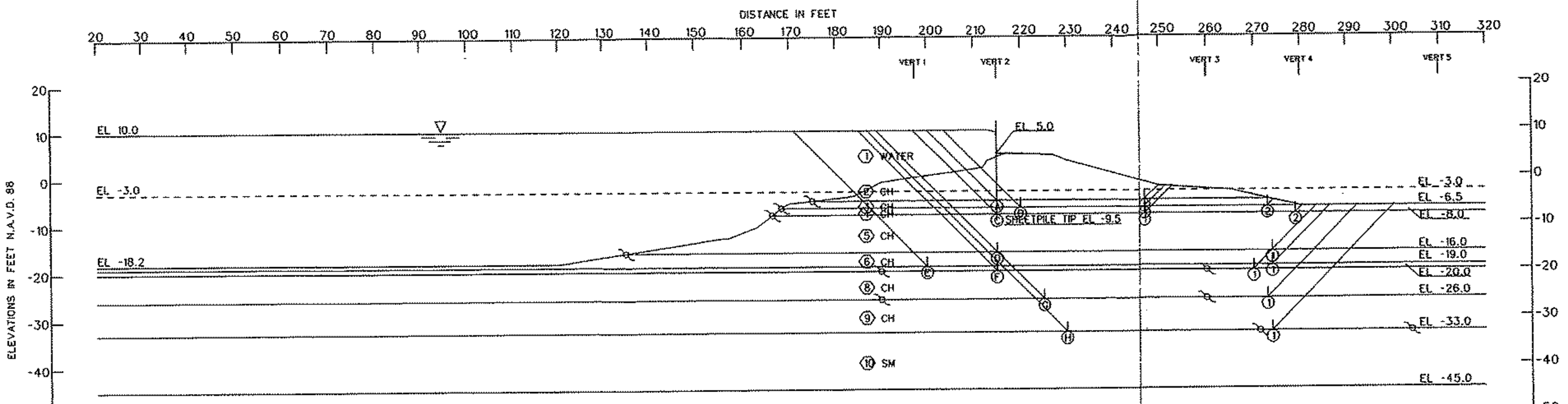
○ - (UC) UNCONFINED COMPRESSION TEST
3 PT Q - ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
⊡ - (S) CONSOLIDATED - DRAINED DIRECT SHEAR TEST
1 PT Q - ◇ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
⊕ - UNIT WEIGHT

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
B/L STATION 626+00 TO B/L STATION 670+00
ORLEANS SIDE BORINGS
STRENGTH LINES
EAST SIDE CENTERLINE & TOE

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

DESIGNED BY: VOJKOVICH	PLOT SCALE: 20	PLOT DATE: 26 APR 07	CADD FILE
DRAWN BY: WOODS	DATE: APR 2007		FILE NO.
CHECKED BY: VOJKOVICH			

Plate 73



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	-5.0	11712	24677	5399	8548	646	41788	7902	5.29
Ⓑ ①	-6.5	14664	13238	7767	10017	1268	35669	8749	4.08
Ⓑ ②	-6.5	14664	19135	2235	10017	112	36034	9905	3.64
Ⓒ ①	-8.0	15241	9586	8605	12908	2089	33432	10819	3.09
Ⓒ ②	-8.0	15241	15985	570	12908	92	31796	12816	2.48
Ⓓ ①	-16.0	18245	14022	3610	27681	3609	35877	24072	1.49
Ⓔ ①	-19.0	9898	17944	4750	30701	5919	32592	24782	1.32
Ⓕ ①	-20.0	18979	18788	5470	36813	7647	43237	29166	1.48
Ⓖ ①	-26.0	26181	18777	9790	53969	14694	54748	39275	1.39
Ⓗ ①	-33.0	33566	18785	14494	77774	28044	66845	49730	1.34

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

- ○ -- STRATUM NUMBER
- ⬡ -- WEDGE NUMBER
- ⌀ -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F. CENTER OF STRATUM					C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM					FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	
①	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
②	CH	110	120	110	110	109	900	900	900	900	500	900	900	900	900	500	0
③	CH	110	112	110	110	109	900	700	900	900	500	900	700	900	900	500	0
④	CH	70	112	70	70	70	190	700	190	190	190	190	700	190	190	190	0
⑤	CH	70	76	70	70	70	190	360	190	190	190	190	360	190	190	190	0
⑥	CH	70	112	70	70	70	190	315	190	190	190	190	315	190	190	190	0
⑦	CH	106	112	106	106	100	360	315	360	360	200	360	315	360	360	200	0
⑧	CH	100	100	100	100	100	360	470	360	360	200	360	470	360	360	200	0
⑨	CH	100	100	100	100	100	360	660	360	360	200	360	660	360	360	200	0
⑩	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

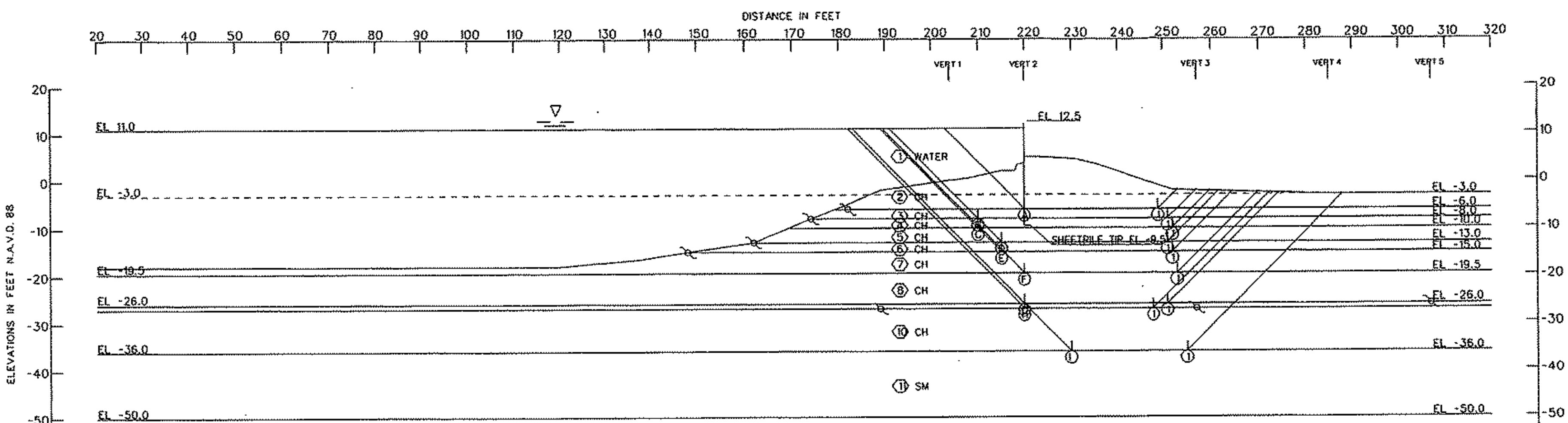
SLOPE STABILITY ANALYSIS

HIGH WATER CONDITIONS
REACH 1

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

DESIGNED BY: F.V. | DRAWN BY: D.R. | CHECKED BY: F.V./C.R. | PLOT SCALE: 20 | PLOT DATE: 29 JAN 07 | DATE: JAN 2007 | CADD FILE: | FILE NO.

PLATE: 75



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
Ⓐ ①	-6.0	12053	18141	4487	10672	1114	34681	9558	3.63
Ⓑ ①	-8.0	7744	14173	5204	13141	2079	27121	11062	2.45
Ⓒ ①	-10.0	7938	14409	5620	16498	3552	27967	12946	2.16
Ⓓ ①	-13.0	11507	12844	7787	22493	6476	32138	16017	2.01
Ⓔ ①	-15.0	11875	11333	9197	26689	8709	32405	17980	1.80
Ⓕ ①	-19.5	14944	7996	11511	37984	15092	34451	22892	1.50
Ⓖ ①	-26.0	16034	7469	14815	57032	28066	38318	28966	1.32
Ⓗ ①	-27.0	16379	8067	15556	60328	30923	40002	29405	1.36
Ⓘ ①	-36.0	24139	10294	22540	93242	55475	56973	37767	1.51

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	C - UNIT COHESION - P.S.F. CENTER OF STRATUM VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	BOTTOM OF STRATUM VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	FRICTION ANGLE DEGREES
1	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
2	CH	120	108	120	120	109	500	900	500	500	500	500	900	500	500	500	0
3	CH	100	108	100	100	100	200	900	200	200	200	200	900	200	200	200	0
4	CH	100	84	100	100	100	200	440	200	200	200	200	440	200	200	200	0
5	CH	75	84	75	75	75	400	440	400	400	400	400	440	400	400	400	0
6	CH	75	94	75	75	75	400	330	400	400	400	400	330	400	400	400	0
7	CH	102	94	102	102	102	270	330	270	270	200	270	330	270	270	200	0
8	CH	102	105	102	102	102	270	220	270	270	200	270	220	270	270	200	0
9	CH	102	105	102	102	102	400	220	400	400	200	400	220	400	400	200	0
10	CH	102	100	102	102	102	400	430	400	400	200	400	430	400	400	200	0
11	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

NOTES

- ⬡ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- ⌀ -- CROSSOVER POINT
- 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

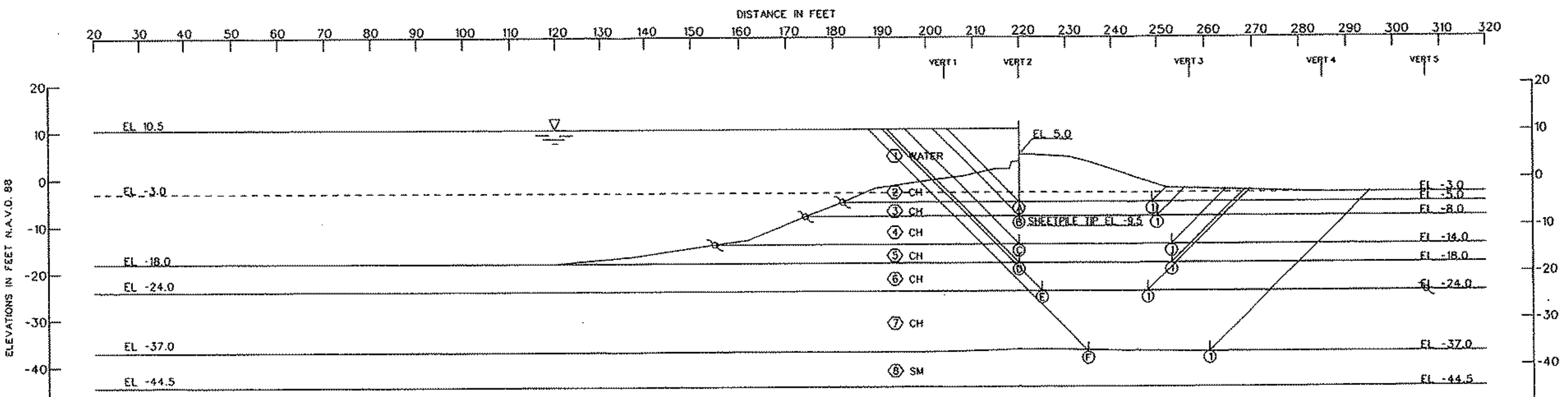
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS
REACH 2

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

DESIGNED BY: F.V. | DRAWN BY: D.R. | CHECKED BY: F.V./C.R. | PLOT SCALE: 20 | PLOT DATE: 29 JAN 07 | DATE: JAN 2007 | FILE NO.

PLATE: 76



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	-5.0	10861	10973	3421	8972	641	25255	8331	3.03
Ⓑ ①	-8.0	11073	6993	5863	13359	1956	23929	11403	2.10
Ⓒ ①	-14.0	11947	7472	7291	24429	6901	26710	17528	1.52
Ⓓ ①	-18.0	12526	7472	8271	33421	11879	28269	21542	1.31
Ⓔ ①	-24.0	15773	7864	12480	49626	22715	36117	26911	1.34
Ⓕ ①	-37.0	28451	13423	23856	95822	55182	65730	40640	1.62

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F. CENTER OF STRATUM					C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM					FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	
①	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
②	CH	105	120	105	105	105	500	900	500	500	500	500	900	500	500	500	0
③	CH	105	101	105	105	105	500	300	500	500	500	500	300	500	500	500	0
④	CH	82	101	82	82	82	135	300	135	135	135	135	300	135	135	135	0
⑤	CH	82	88	82	82	82	135	300	135	135	135	135	300	135	135	135	0
⑥	CH	100	88	100	100	100	367	300	367	367	200	394	300	394	394	200	0
⑦	CH	100	106	100	100	100	452	535	452	452	200	510	535	510	510	200	0
⑧	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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

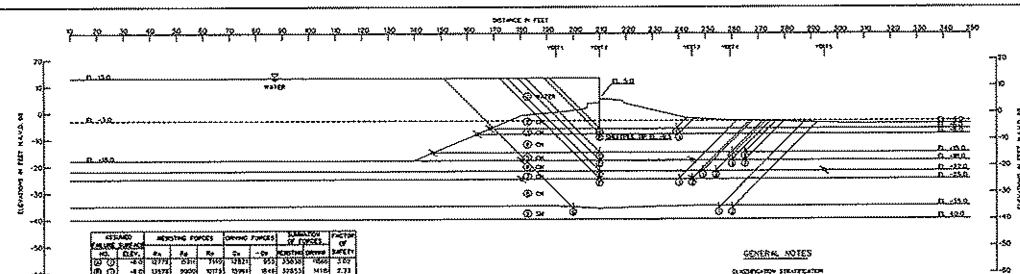
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS
REACH 3

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

DESIGNED BY: F.V. DRAWN BY: D.R. CHECKED BY: F.V./ C.R. | PLOT SCALE: 20 | PLOT DATE: 29 JUN 07 | DATE: JAN 2007 | FILE NO.

PLATE: 77



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	
[illegible] (1)	-8.0	12778	10511	7149	12821	955	33038	11866	3.02
[illegible] (2)	-8.0	13678	9000	10173	15961	1846	32853	14116	2.33
[illegible] (1)	-15.0	17635	12237	11641	29136	6434	41513	22703	1.83
[illegible] (2)	-15.0	17635	13512	10949	29136	6299	41096	22837	1.83
[illegible] (1)	-18.0	19363	12237	12512	35648	9557	44111	25991	1.70
[illegible] (2)	-18.0	19363	13312	11635	35648	9597	44510	26151	1.70
[illegible] (1)	-22.0	22397	11737	15222	46093	16477	49415	29616	1.67
[illegible] (2)	-22.0	22397	12872	14510	46093	16117	49779	28876	1.66
[illegible] (1)	-25.0	24283	11553	18206	54871	23003	54062	31868	1.70
[illegible] (2)	-25.0	24283	13347	17498	54871	22419	55128	32452	1.70
[illegible] (1)	-35.0	21876	25539	22790	92884	49293	69560	43623	1.60
[illegible] (2)	-36.0	21878	27294	21027	92888	48853	70197	44035	1.59

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F. CENTER OF STRATUM					C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM					FRICTION ANGLE DEGREES
		VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	
(1)	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
(2)	CH	100	100	100	100	100	900	900	900	900	500	900	900	900	900	500	0
(3)	CH	100	74	100	100	100	900	300	900	900	500	900	300	900	900	500	0
(4)	CH	75	74	75	75	75	500	300	500	300	500	300	300	300	300	300	0
(5)	CH	95	74	95	95	95	215	300	215	215	215	215	300	215	215	215	0
(6)	CH	102	92	102	102	102	215	430	215	215	215	215	430	215	215	215	0
(7)	CH	99	92	99	99	99	355	430	355	355	215	355	430	355	355	215	0
(8)	CH	99	92	99	99	99	355	500	355	355	215	355	600	355	355	215	0
(9)	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
⊠ -- CROSSOVER POINT
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

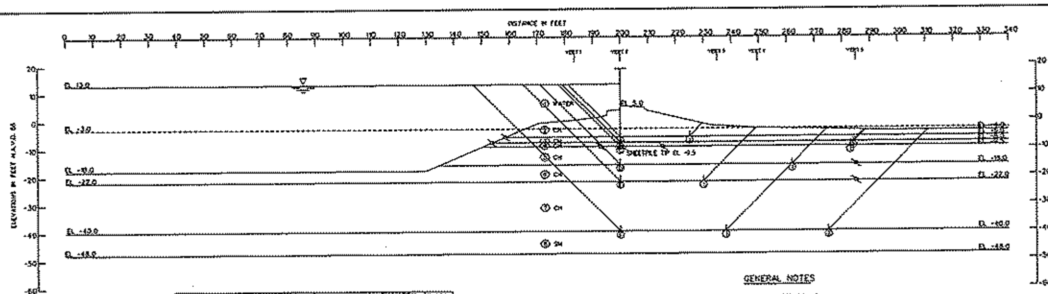
FACTOR OF SAFETY = $\frac{R_A + R_B + R_P}{D_A - D_P}$

SLOPE STABILITY ANALYSIS

PLATE: 78

INPUT DATA FILENAME: J4A

PLATE 78 - J4A1.DGN 3/27/2009 10:25:17 AM



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	
[illegible]	[illegible]	-6.0	12778	14468	8415	13193	1584	35659	11609	3.07
[illegible]	[illegible]	-8.0	16056	11654	4102	16353	538	29812	15815	1.91
[illegible]	[illegible]	-9.5	15121	10574	4501	19334	1709	30245	17645	1.71
[illegible]	[illegible]	-16.0	17992	14150	8504	33512	7767	40646	25745	1.58
[illegible]	[illegible]	-22.0	21289	10500	16060	49644	19042	47849	30602	1.56
[illegible]	[illegible]	-40.0	30786	17300	28423	118433	66238	78509	52195	1.46
[illegible]	[illegible]	-40.0	30786	31460	15663	118433	61295	78909	57136	1.38

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F.										FRICTION ANGLE DEGREES
							CENTER OF STRATUM					BOTTOM OF STRATUM					
		VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	
1	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
2	CH	117	117	117	117	109	900	900	900	900	500	900	900	900	900	500	0
3	CH	117	113	117	117	109	900	400	900	900	500	900	400	900	900	500	0
4	CH	77	113	77	77	77	70	400	70	70	70	70	400	70	70	70	0
5	CH	77	80	77	77	77	200	300	200	200	200	200	300	200	200	200	0
6	CH	102	101	102	102	102	350	350	350	350	200	350	350	350	350	200	0
7	CH	103	104	103	103	102	450	450	450	450	200	450	450	450	450	200	0
8	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

SEE TABLE 1.11 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

17th STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS

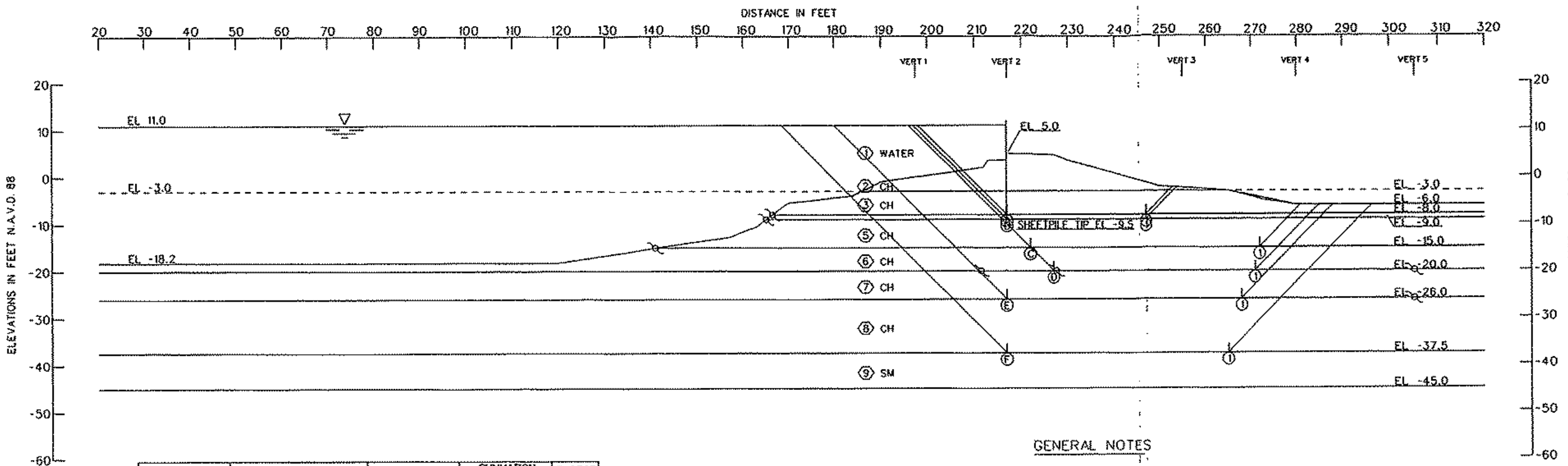
PLATE: 79

INPUT DATA FILENAME: JP5

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.



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	8508	10579	5667	13824	2085	24754	11739	2.11
Ⓑ ①	-9.0	9227	10579	6238	15506	2764	26044	12742	2.04
Ⓒ ①	-15.0	13864	12865	5920	26325	4339	32649	21986	1.48
Ⓓ ①	-20.0	17469	10862	7920	37349	9810	36251	27539	1.32
Ⓔ ①	-26.0	18768	18430	12480	56143	20310	49678	35833	1.39
Ⓕ ①	-37.5	23480	19200	21680	98825	50112	64360	48713	1.32

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F. CENTER OF STRATUM					BOTTOM OF STRATUM					FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	
①	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
②	CH	109	110	110	110	110	500	500	500	500	500	500	500	500	500	500	0
③	CH	109	110	110	110	110	500	400	500	500	500	500	400	500	500	500	0
④	CH	80	110	80	80	80	280	400	280	280	280	280	400	280	280	280	0
⑤	CH	80	80	80	80	80	280	400	280	280	280	280	400	280	280	280	0
⑥	CH	112	80	112	112	112	200	400	200	200	200	200	400	200	200	200	0
⑦	CH	100	101	100	100	100	380	330	380	380	200	380	330	380	380	200	0
⑧	CH	100	101	100	100	100	400	400	400	400	200	400	400	400	400	200	0
⑨	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A + D_P}$

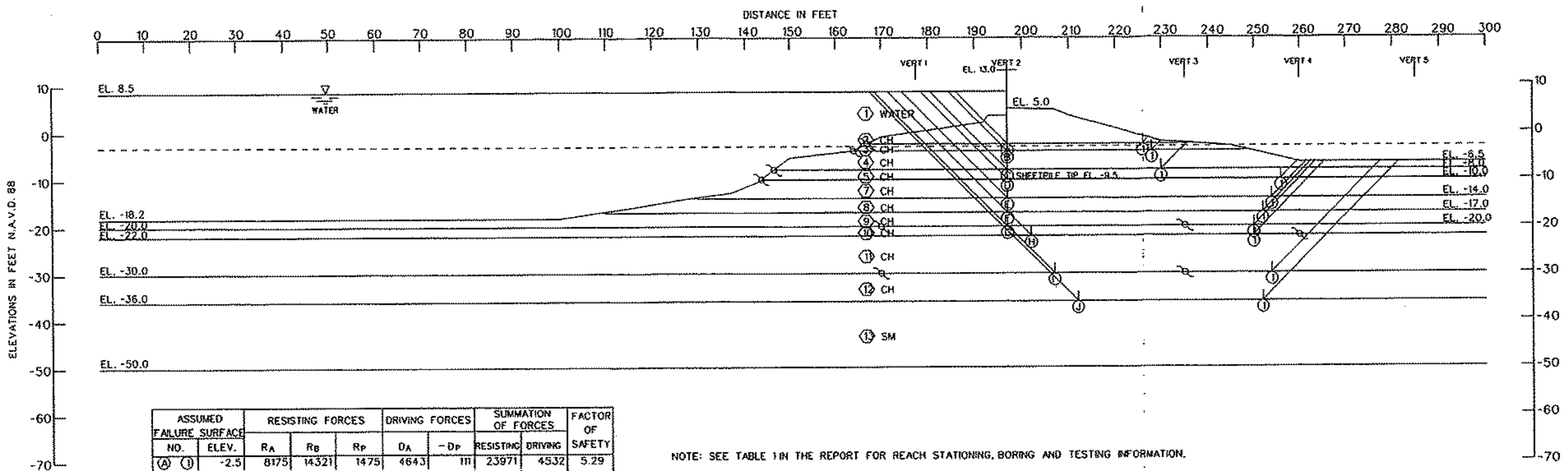
LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

SLOPE STABILITY ANALYSIS

HIGH WATER CONDITIONS
REACH 6

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

DESIGNED BY: F.V.	PLOT SCALE: 20	PLOT DATE: 29 JAN 07	CWD FILE
DRAWN BY: D.R.	DATE: JAN 2007		FILE NO.
CHECKED BY: F.V./ C.R.			



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	-2.5	8175	14321	1475	4643	111	23971	4532	5.29
Ⓑ ①	-4.0	8701	12534	2050	6141	278	23285	5863	3.97
Ⓒ ①	-8.0	11025	9240	4019	11172	1628	24284	9544	2.54
Ⓓ ①	-10.0	11319	11320	2013	14193	637	24652	13556	1.82
Ⓔ ①	-14.0	11960	12084	3269	21035	2778	27313	18257	1.50
Ⓕ ①	-17.0	12431	12520	4403	27019	5595	29354	21424	1.37
Ⓖ ①	-20.0	12928	13820	5903	33895	9406	32651	24489	1.33
Ⓗ ①	-22.0	15387	13261	6903	39276	12222	35551	27054	1.31
Ⓘ ①	-30.0	20627	21660	11262	63918	26888	53549	37030	1.45
Ⓙ ①	-36.0	25810	19128	14575	86088	42797	59513	43291	1.37

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F. CENTER OF STRATUM					C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM					FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	
1	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
2	CH	109	115	109	109	109	500	900	500	500	500	500	900	500	500	500	0
3	CH	109	104	109	109	109	500	490	500	500	500	500	490	500	500	500	0
4	CH	80	104	80	80	80	280	490	280	280	280	280	490	280	280	280	0
5	CH	80	76	80	80	80	280	280	280	280	280	280	280	280	280	280	0
6	CH	104	76	104	104	104	150	280	150	150	150	150	280	150	150	150	0
7	CH	104	76	104	104	104	164	280	164	164	164	178	280	178	178	178	0
8	CH	104	104	104	104	104	189	280	189	189	189	200	280	200	200	200	0
9	CH	100	104	100	100	100	250	280	250	250	250	250	280	250	250	250	0
10	CH	100	102	100	100	100	250	329	250	250	250	250	338	250	250	250	0
11	CH	100	102	100	100	100	530	375	530	250	250	530	411	530	250	250	0
12	CH	100	102	100	100	100	530	438	530	250	250	530	465	530	250	250	0
13	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- ∽ -- CROSSOVER POINT
- 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

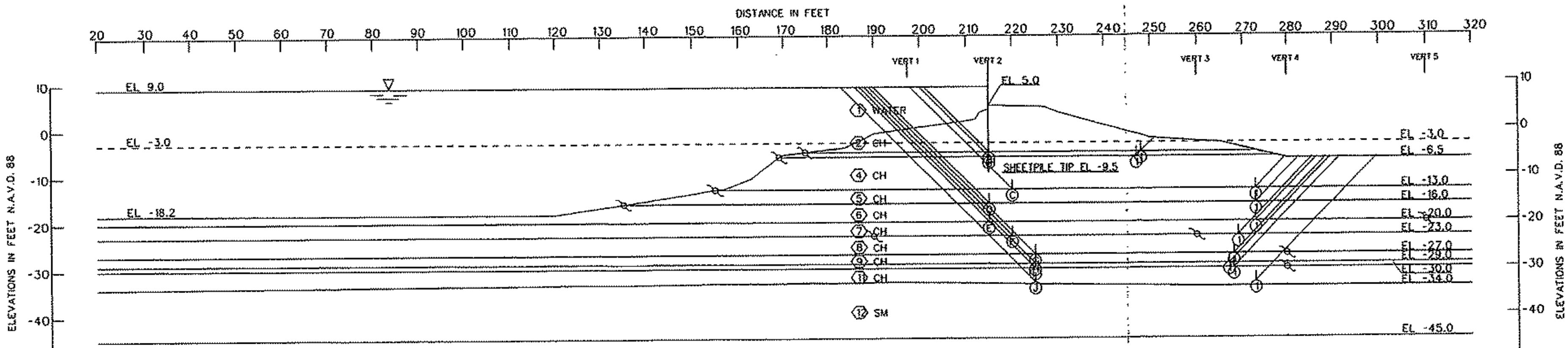
FACTOR OF SAFETY $= \dfrac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS
REACH 7

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

DESIGNED BY: F.Y. DRAWN BY: O.N. CHECKED BY: F.Y./C.R. | PLOT SCALE: 20 | PLOT DATE: 04 MAY 07 | DATE: MAY 2007

PLATE: 81



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	-5.0	7566	12320	3074	7417	548	22960	6869	3.34
Ⓑ ①	-6.0	7962	9600	3963	8637	1001	21525	7636	2.82
Ⓒ ①	-13.0	11786	13787	3957	18954	2211	29530	16743	1.76
Ⓓ ①	-16.0	12218	13470	5340	24999	4236	31028	20763	1.49
Ⓔ ①	-20.0	13312	13470	7260	33910	8376	34042	25534	1.33
Ⓕ ①	-23.0	15035	16400	9660	41445	13392	41095	28053	1.46
Ⓖ ①	-27.0	17843	15975	12860	53033	20651	46678	32382	1.44
Ⓗ ①	-29.0	18834	17882	14748	59545	25049	51464	34496	1.49
Ⓘ ①	-30.0	19215	18357	15638	62957	26946	53210	36011	1.48
Ⓙ ①	-33.0	20731	25166	17877	73792	33039	63774	40753	1.56

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F. CENTER OF STRATUM					C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM					FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	
1	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
2	CH	109	110	109	109	109	500	600	500	500	500	500	600	500	500	500	0
3	CH	109	80	109	109	109	500	300	500	500	500	500	300	500	500	500	0
4	CH	80	80	80	80	80	300	300	300	300	300	300	300	300	300	300	0
5	CH	103	80	103	103	103	240	300	240	240	240	240	300	240	240	240	0
6	CH	103	104	103	103	103	240	220	240	240	200	240	220	240	240	200	0
7	CH	101	104	101	101	101	400	220	400	400	200	400	220	400	400	200	0
8	CH	101	102	101	101	101	400	310	400	400	200	400	310	400	400	200	0
9	CH	100	102	100	101	101	520	310	520	400	200	520	310	520	400	200	0
10	CH	100	102	100	101	101	520	240	520	400	200	520	240	520	400	200	0
11	CH	100	102	100	101	101	670	240	670	400	200	670	240	670	400	200	0
12	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

NOTES

- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- ∫ -- CROSSOVER POINT
- 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 PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

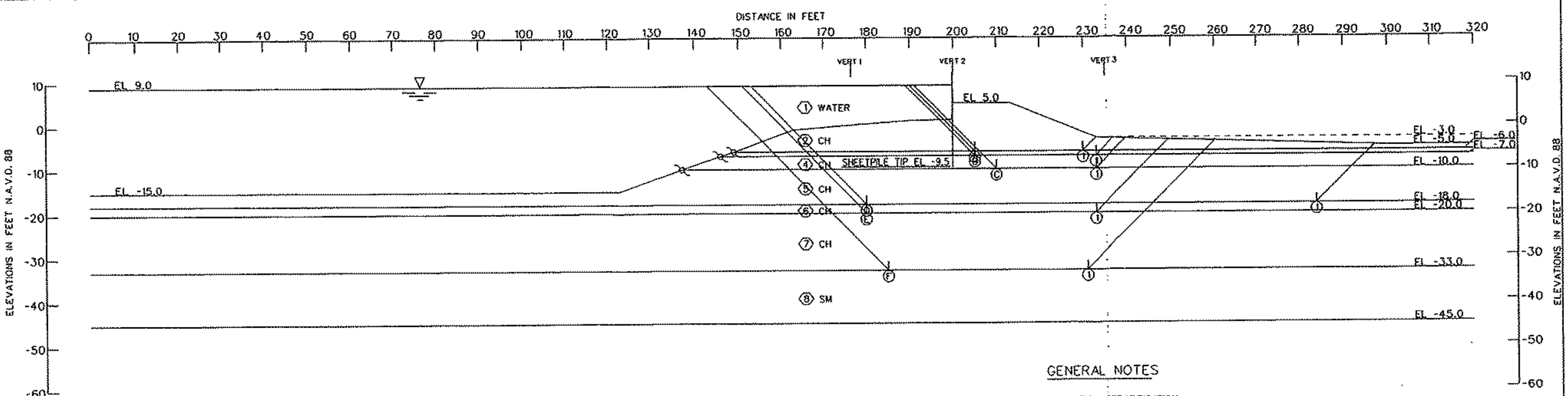
SLOPE STABILITY ANALYSIS

HIGH WATER CONDITIONS
REACH B

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

DESIGNED BY: F.V.	PLOT SCALE: 20	PLOT DATE: 29 JAN 07	CADD FILE:
DRAWN BY: D.R.			FILE NO.
CHECKED BY: T.Y./C.A.	DATE: JAN 2007		

PLATE: 82



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	-6.0	12749	12876	3780	8501	746	29405	7755	3.79
Ⓑ ①	-7.0	13735	7100	4646	9925	917	25481	9008	2.83
Ⓒ ①	-10.0	15697	4943	5214	14694	2762	25854	11932	2.17
Ⓓ ①	-18.0	9511	19182	4814	30790	9801	33507	20989	1.60
Ⓔ ①	-20.0	9563	14653	7107	35971	15697	31323	20274	1.55
Ⓕ ①	-33.0	13750	15348	13196	79483	47796	42294	31687	1.33

See Table 1 in the Report for reach stationing, boring and testing information.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	118	123	118	600	900	600	600	900	600	0
③	CH	118	106	118	600	430	600	600	430	600	0
④	CH	108	106	108	105	430	105	105	430	105	0
⑤	CH	108	81	108	105	390	105	105	390	105	0
⑥	CH	108	81	108	140	390	140	140	390	140	0
⑦	CH	100	101	100	250	390	250	250	390	250	0
⑧	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
-- CROSSOVER POINT
ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
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A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT REFERS TO PASSIVE WEDGE

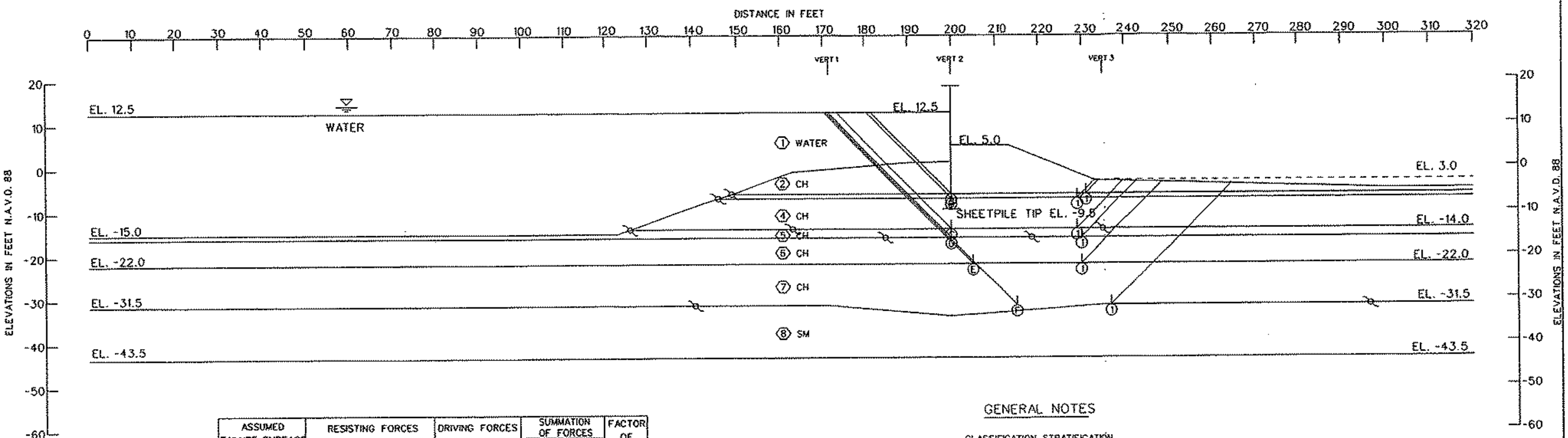
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONTCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS
REACH 9

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

DESIGNED BY: F.V. | DRAWN BY: B.R. | CHECKED BY: F.V./C.R. | PLOT SCALE: 20 | PLOT DATE: 29 JAN 07 | DATE: JAN 2007

PLATE: 83



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
Ⓐ ①	-6.0	10198	11716	3188	11940	572	25102	11368	2.21
Ⓑ ①	-7.0	10592	9067	4218	13496	1214	23877	12282	1.94
Ⓒ ①	-14.0	13338	9067	9154	27227	6080	31559	21147	1.49
Ⓓ ①	-16.0	14387	10308	10670	32026	7927	35365	24099	1.47
Ⓔ ①	-22.0	18535	8925	14495	47719	16354	41955	31365	1.34
Ⓕ ①	-31.5	26832	9668	21960	78873	36112	58460	42761	1.37

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT. 1	VERT. 2	VERT. 3	C - UNIT COHESION - P.S.F. CENTER OF STRATUM VERT. 1	VERT. 2	VERT. 3	BOTTOM OF STRATUM VERT. 1	VERT. 2	VERT. 3	FRICTION ANGLE DEGREES
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	108	112	108	520	750	520	520	750	520	0
③	CH	108	108	108	520	265	520	520	265	520	0
④	CH	76	108	76	380	265	380	380	265	380	0
⑤	CH	76	101	76	380	319	380	380	328	380	0
⑥	CH	108	101	108	330	356	330	330	384	330	0
⑦	CH	100	101	100	420	440	420	420	495	420	0
⑧	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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

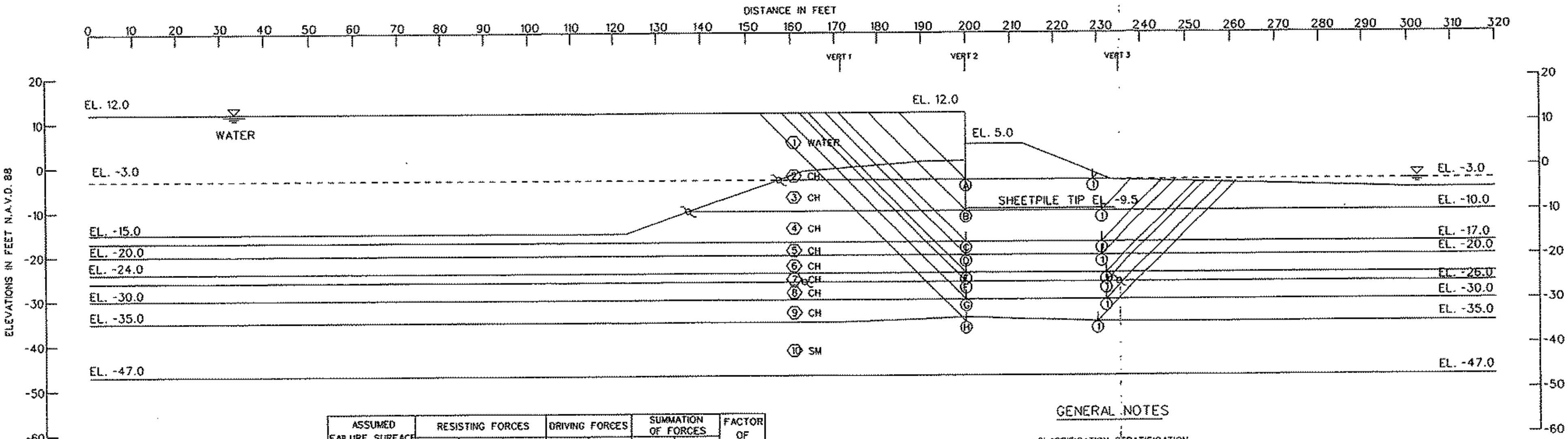
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS
REACH 10

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

DESIGNED BY: F.V. | DRAWN BY: E.D. | CHECKED BY: F.V./C.R. | PLOT SCALE: 22 | PLOT DATE: 29 JAN 07 | DATE: JAN 2007 | FILE NO.

PLATE: 84



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	7203	15859	1282	7560	102	24344	7458	3.26
B	1	-10.0	14069	9716	6873	17883	2732	30658	15151	2.02
C	1	-17.0	17050	9167	10584	32928	10618	36801	22310	1.65
D	1	-20.0	18307	9167	11968	41048	15582	39442	25466	1.55
E	1	-24.0	19938	8393	13723	53433	23538	42054	29895	1.41
F	1	-26.0	20724	8393	14361	60291	28148	43478	32143	1.35
G	1	-30.0	23388	11172	15642	75248	38522	50202	36726	1.37
H	1	-35.0	26697	12685	18808	96208	54003	58190	42205	1.38

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	110	124	110	500	900	500	500	900	500	0
3	CH	110	82	110	500	580	500	500	580	500	0
4	CH	110	110	110	280	340	280	280	340	280	0
5	CH	110	110	110	240	340	240	240	340	240	0
6	CH	100	110	100	240	340	240	240	340	240	0
7	CH	100	110	100	170	340	170	170	340	170	0
8	CH	100	100	100	170	500	170	170	500	170	0
9	CH	100	100	100	320	500	320	320	500	320	0
10	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- ⌀ -- CROSSOVER POINT
- 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

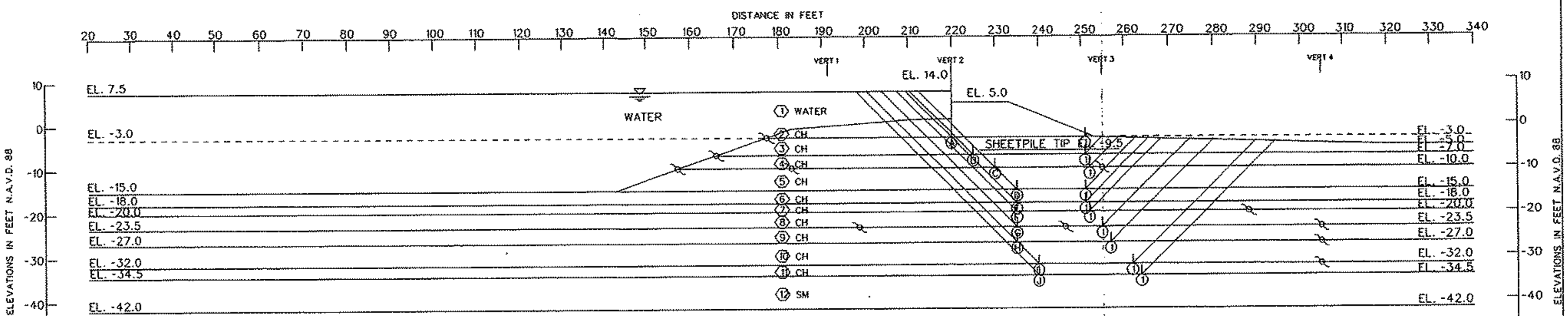
FACTOR OF SAFETY $= \dfrac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS
REACH 11

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

DESIGNED BY: F.V. DRAWN BY: R.B. CHECKED BY: F.V./ C.P.	PLOT SCALE: 20	PLOT DATE: 29 JAN 07	CADD FILE:
	DATE: JAN 2007		FILE NO.

PLATE: 85



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	-3.0	5278	9260	447	3791	24	14985	3767	3.98
Ⓑ ①	-7.0	7468	6099	2788	7884	910	16355	6974	2.35
Ⓒ ①	-10.0	9064	5104	4082	12054	2431	18250	9623	1.90
Ⓓ ①	-15.0	11778	3246	6225	20695	6796	21249	13899	1.53
Ⓔ ①	-18.0	12718	3246	7427	27023	10339	23391	16684	1.40
Ⓕ ①	-20.0	13239	3461	8255	31746	13020	24955	18726	1.33
Ⓖ ①	-23.5	15295	5596	9800	41022	18615	30691	22407	1.37
Ⓗ ①	-27.0	16858	6367	11573	51531	25442	34798	26089	1.33
Ⓘ ①	-32.0	21143	8296	14225	67535	36998	43664	30537	1.43
Ⓙ ①	-34.5	23179	9556	15617	77010	43676	48352	33334	1.45

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.				C - UNIT COHESION - P.S.F. CENTER OF STRATUM				C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM				FRICTION ANGLE DEGREES
		VERT.1	VERT.2	VERT.3	VERT.4	VERT.1	VERT.2	VERT.3	VERT.4	VERT.1	VERT.2	VERT.3	VERT.4	
①	WATER	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0
②	CH	104	101	104	104	360	660	360	360	360	660	360	360	0
③	CH	104	108	104	104	360	250	360	360	360	250	360	360	0
④	CH	84	108	84	84	220	250	220	220	220	250	220	220	0
⑤	CH	84	80	84	84	220	300	220	220	220	300	220	220	0
⑥	CH	84	105	84	84	220	170	220	220	220	170	220	220	0
⑦	CH	100	105	100	100	220	170	220	220	220	170	220	220	0
⑧	CH	100	102	100	100	240	380	240	200	260	380	260	200	0
⑨	CH	100	100	100	100	280	260	280	200	300	260	300	200	0
⑩	CH	100	100	100	100	327	530	327	200	355	530	355	200	0
⑪	CH	100	100	100	100	370	530	370	200	385	530	385	200	0
⑫	SM	122	122	122	122	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

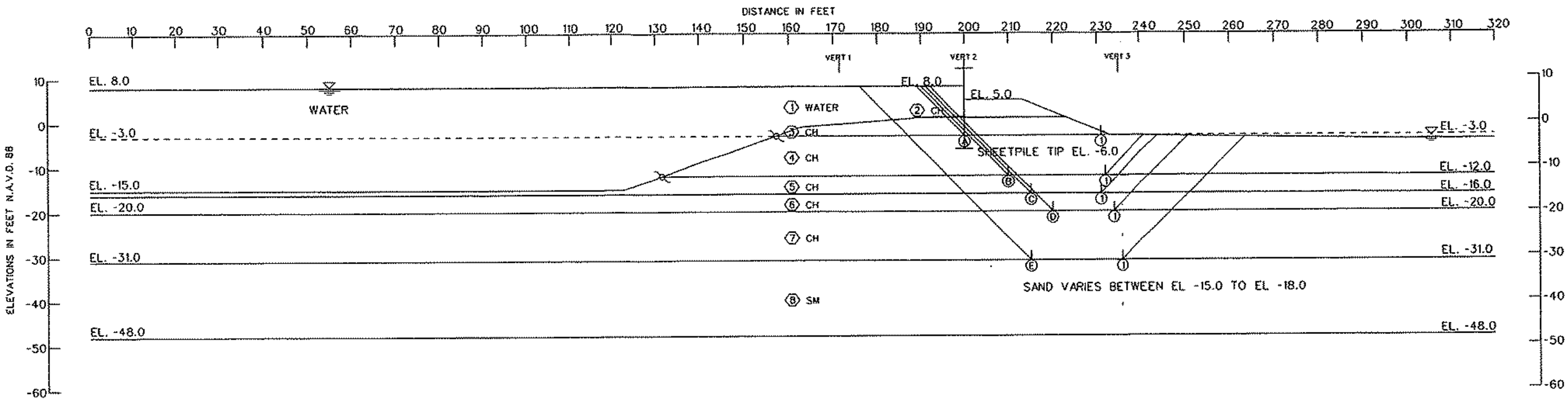
- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- -- CROSSOVER POINT
- ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
- C -- UNIT COHESION, P.S.F.
- ▽ -- STATIC WATER SURFACE
- D -- HORIZONTAL DRIVING FORCE IN POUNDS
- R -- HORIZONTAL RESISTING FORCE IN POUNDS
- A -- AS A SUBSCRIPT REFERS TO ACTIVE WEDGE
- B -- 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 PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS
REACH 12

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

PLATE: 86



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	-3.0	4971	9777	0	4197	0	14748	4197	3.51
Ⓑ ①	-12.0	11619	4824	3203	16404	4101	19646	12303	1.60
Ⓒ ①	-16.0	13620	3538	4677	24426	8469	21835	15957	1.37
Ⓓ ①	-20.0	15581	2574	6186	33132	14396	24341	18736	1.30
Ⓔ ①	-31.0	22723	8193	11295	69758	38335	42211	31423	1.34

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	110	109	110	500	900	500	500	900	500	0
③	CH	110	109	110	500	600	500	500	600	500	0
④	CH	100	109	100	180	400	180	180	400	180	0
⑤	CH	100	105	100	180	300	180	180	300	180	0
⑥	CH	100	103	100	190	334	190	190	352	190	0
⑦	CH	100	103	100	240	404	240	290	455	290	0
⑧	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

- ⬡ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- ✗ -- CROSSOVER POINT
- 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

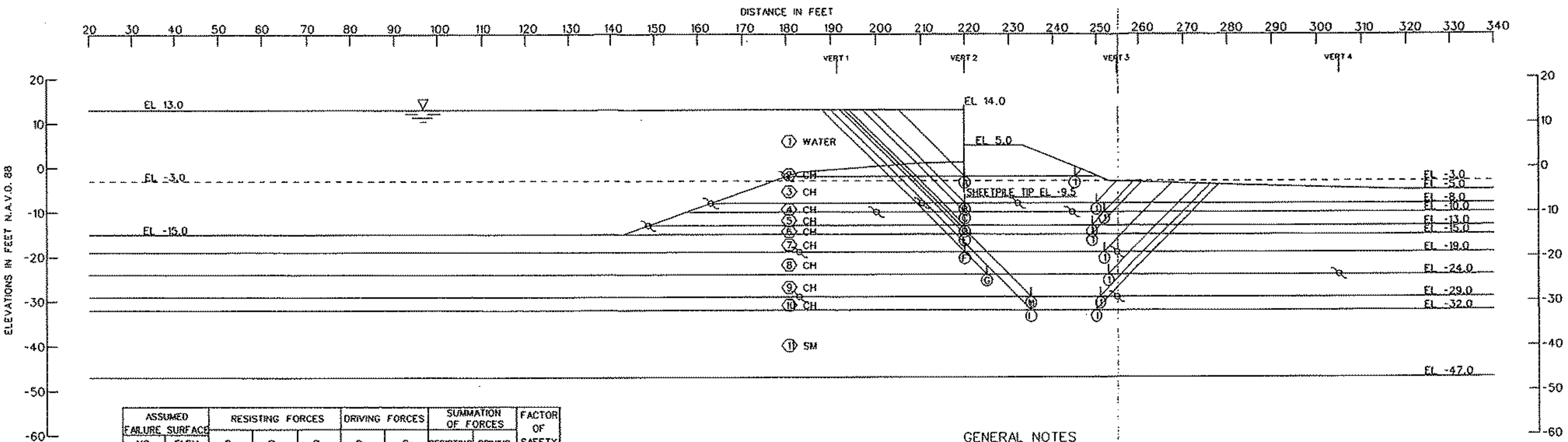
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS
REACH 13

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

DESIGNED BY: T.V. DRAWN BY: K.O. CHECKED BY: T.V./C.R. PLOT SCALE: PLOT DATE: 19 APRIL 07 DATE: APRIL 2007

PLATE: 87



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	-2.0	5658	14323	2669	7262	184	22650	7078	3.20
Ⓑ ①	-8.0	10994	13614	7918	15756	1502	32526	14254	2.28
Ⓒ ①	-10.0	14103	10517	8849	19457	2532	33469	16925	1.98
Ⓓ ①	-13.0	15803	7354	11172	25770	5498	34329	20272	1.69
Ⓔ ①	-15.0	16395	5672	12316	30472	7708	34383	22764	1.51
Ⓕ ①	-19.0	17720	6409	13743	41056	12800	37872	28256	1.34
Ⓖ ①	-24.0	20691	7792	15587	55289	21780	44070	33509	1.32
Ⓗ ①	-29.0	25528	7739	19885	70341	33532	53152	36809	1.44
Ⓘ ①	-32.0	29049	8014	22494	82424	41805	59557	40619	1.47

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.				C - UNIT COHESION - P.S.F. CENTER OF STRATUM				BOTTOM OF STRATUM				FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	
①	WATER	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0
②	CH	105	110	105	100	830	900	830	500	830	900	830	500	0
③	CH	105	112	105	100	830	430	830	500	830	430	830	500	0
④	CH	100	110	100	100	200	760	200	200	200	760	200	200	0
⑤	CH	100	105	100	100	400	300	400	300	400	300	400	300	0
⑥	CH	100	105	100	100	400	150	400	300	400	150	400	300	0
⑦	CH	100	105	100	100	260	150	260	200	260	150	260	200	0
⑧	CH	100	100	100	100	260	300	260	200	260	300	260	200	0
⑨	CH	100	102	100	100	470	510	470	200	470	510	470	200	0
⑩	CH	100	102	100	100	470	650	470	200	470	650	470	200	0
⑪	SM	122	122	122	122	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- σ -- CROSSOVER POINT
- 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 PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS
REACH 14

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

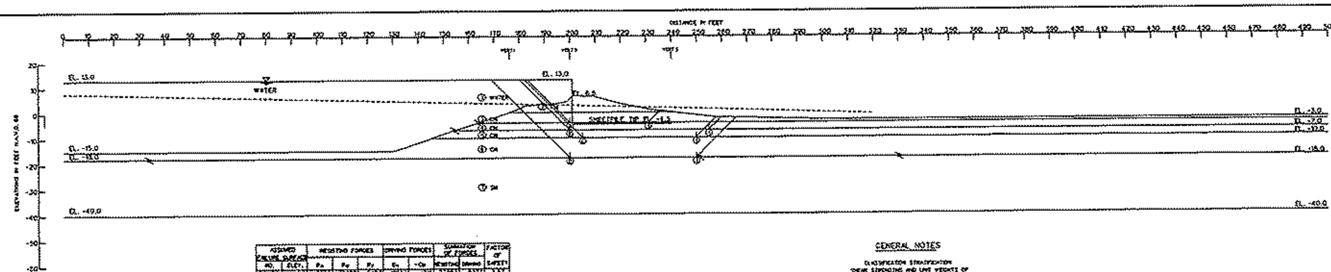
DESIGNED BY: F.V. DRAWN BY: O.R. CHECKED BY: F.V./ C.R.	PLOT SCALE: 20	PLOT DATE: 29 JAN 07	CADD FILE:
	DATE: JAN 2007		FILE NO.

PLATE: 88

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.



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	9060	12400	6453	10833	1318	27853	9377	2.97
B 1	-7.0	9363	15000	5400	15438	1427	31762	14010	2.27
C 1	-10.0	13733	12062	6600	20359	3840	32397	16525	1.96
D 1	-15.0	15005	17690	10214	40790	13554	45316	27037	1.74

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C = UNIT COHESION = P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	102	112	112	250	400	250	250	400	250	0
3	CH	112	107	112	250	400	250	250	400	250	0
4	CH	105	107	105	600	400	600	600	400	600	0
5	CH	98	107	98	200	400	200	200	400	200	0
6	CH	95	107	96	225	450	225	270	450	270	0
7	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- ⌀ -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

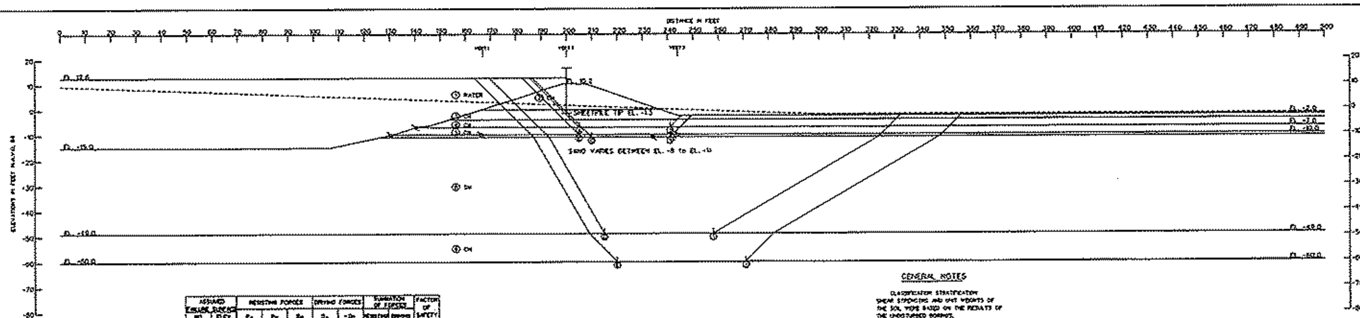
SLOPE STABILITY ANALYSIS

PLATE-89

INPUT DATA FILENAME: [illegible]

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	9060	12400	6453	10833	1318	27853	9377	2.97
B 1	-7.0	9363	15000	5400	15438	1427	31762	14010	2.27
C 1	-10.0	13733	12062	6600	20359	3840	32397	16525	1.96
D 1	-18.0	15001	17693	10214	40551	13554	44914	27037	1.76

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C = UNIT COHESION = P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	112	112	112	250	400	250	250	400	250	0
3	CH	112	107	112	250	400	250	250	400	250	0
4	CH	105	107	105	600	400	600	600	400	600	0
5	CH	98	107	98	200	400	200	200	400	200	0
6	CH	95	107	96	225	450	225	270	450	270	0
7	SM	122	122	122	0	0	0	0	0	0	30



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
① ①	-7.5	18515	10434	6656	15467	1277	35705	17463	1.37
② ①	-10.5	15953	10817	5994	24753	3071	34364	21682	1.60
③ ①	-11.0	22100	10715	6361	26357	3994	39173	22963	1.71
④ ①	-49.0	184414	43000	102367	202578	125072	234847	77447	3.09
⑤ ①	-60.0	105257	51000	136434	183351	102142	292715	91209	3.21

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT. 1	VERT. 2	VERT. 3	C = UNIT COHESION - P.S.F. CENTER OF STRATUM VERT. 1	VERT. 2	VERT. 3	BOTTOM OF STRATUM VERT. 1	VERT. 2	VERT. 3	FRICTION ANGLE DEGREES
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CL	112	112	112	250	850	250	250	850	250	0
③	CH	110	107	112	750	500	750	750	500	750	0
④	CH	107	107	105	400	500	400	400	400	400	0
⑤	CL	97	107	98	200	400	200	200	400	200	0
⑥	CH	95	107	95	200	480	200	200	480	200	0
⑦	CH	95	107	95	225	450	225	220	480	220	0
⑧	SM	122	122	122	0	0	0	0	0	0	30
⑨	CH	107	107	107	1000	1000	1000	1000	1000	1000	0
⑩	CH	107	107	107	1000	1000	1000	1000	1000	1000	0

GENERAL NOTES

CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

○ -- STRATUM NUMBER
◇ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS

PLATE: 90

INPUT DATA FILENAME: JP9645

GENERAL NOTES:

CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND ADDED DATA PLANES.

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

PLATE 90 - JP9645.DGN 2/27/2007 10:08:14 AM

GENERAL NOTES

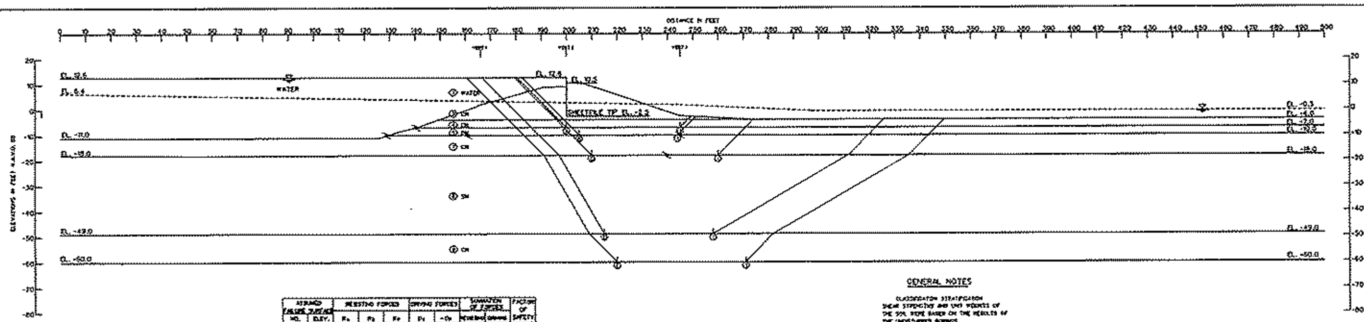
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

O -- STRATUM NUMBER
◇ -- WEDGE NUMBER
-- CROSSOVER POINT
φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
W -- 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 = $\frac{R_A + R_B + R_P}{D_A - D_P}$



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	-7.0	21330	12500	6317	19594	1945	33647	17648	2.22
◇ ①	-10.0	24507	11353	5330	25348	2894	41330	22472	1.85
◇ ①	-18.0	30143	16473	7353	45997	10371	52270	36626	1.43
◇ ①	-49.0	91027	43000	78470	200072	119363	203497	88527	2.30
◇ ①	-60.0	102219	51000	102760	280934	174364	255977	106594	2.40

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					TOP OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	112	112	112	750	860	750	750	860	750	0
③	CH	112	107	112	750	600	750	750	600	750	0
④	CH	103	107	103	400	400	400	400	400	400	0
⑤	CH	95	107	95	200	400	200	200	400	200	0
⑥	CH	95	107	95	200	450	200	200	450	200	0
⑦	CH	95	107	95	225	450	225	270	450	270	0
⑧	SM	122	122	122	0	0	0	0	0	0	30
⑨	CH	107	107	107	1000	1000	1000	1000	1000	1000	0
⑩	CH	107	107	107	1000	1000	1000	1000	1000	1000	0

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

O -- STRATUM NUMBER
◇ -- WEDGE NUMBER
-- CROSSOVER POINT
φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
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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 = $\frac{R_A + R_B + R_P}{D_A - D_P}$

See Table 1 in the Report for reach stationing, boring and testing information.

SLOPE STABILITY ANALYSIS

PLATE: 91

INPUT DATA FILENAME: ph9565

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

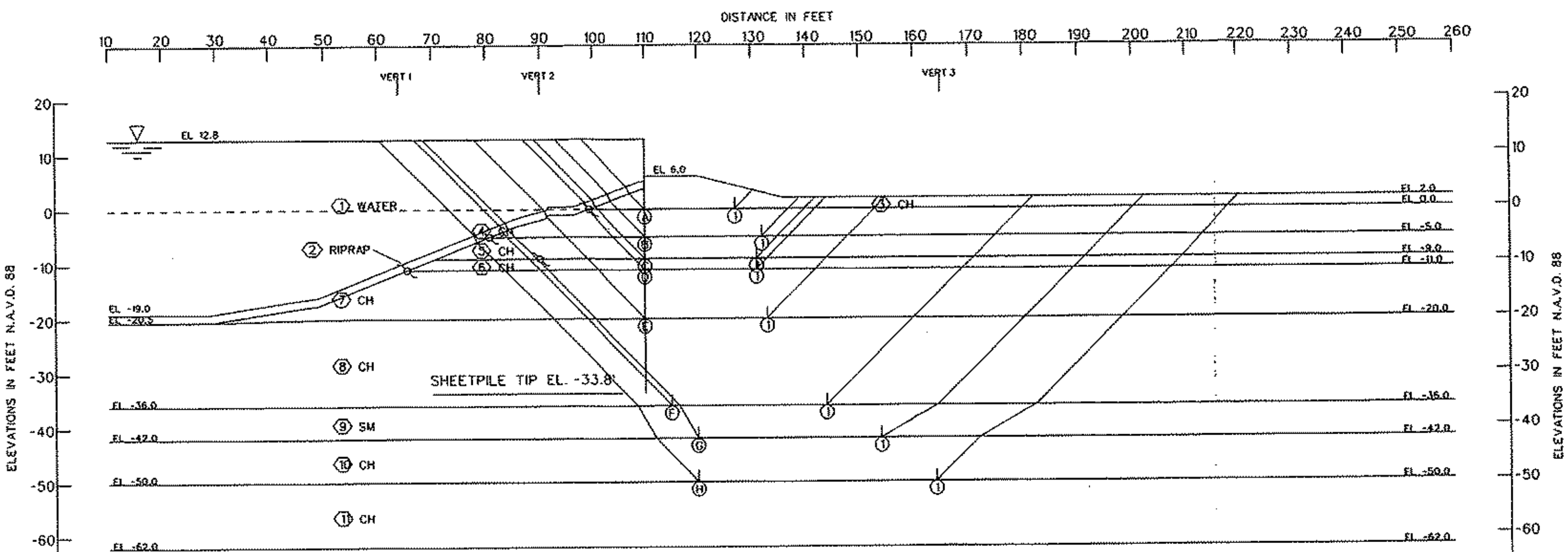
NOTES

φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
W -- 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 = $\frac{R_A + R_B + R_P}{D_A - D_P}$

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	-7.0	21330	12000	4317	19594	1045	33647	17648	2.22
◇ ①	-10.0	24507	11353	3330	25348	2894	41330	22472	1.65
◇ ①	-18.0	30143	16473	7353	45997	10371	52270	36926	1.43
◇ ①	-49.0	91027	43000	78470	200072	119363	203497	88527	2.30
◇ ①	-60.0	102219	51000	102760	280934	174364	255977	106594	2.40

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					TOP OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	112	112	112	750	860	750	750	860	750	0
③	CH	112	107	112	750	600	750	750	600	750	0
④	CH	103	107	103	400	400	400	400	400	400	0
⑤	CH	95	107	95	200	400	200	200	400	200	0
⑥	CH	95	107	95	200	450	200	200	450	200	0
⑦	CH	95	107	95	225	450	225	270	450	270	0
⑧	SM	122	122	122	0	0	0	0	0	0	30
⑨	CH	107	107	107	1000	1000	1000	1000	1000	1000	0
⑩	CH	107	107	107	1000	1000	1000	1000	1000	1000	0



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	3476	8500	3399	5733	794	15375	4939	3.11
(B) (1)	-5.0	7236	6160	7000	11884	2790	20396	9094	2.24
(C) (1)	-9.0	8484	5880	9240	18378	6593	23604	11785	2.00
(D) (1)	-11.0	9108	5880	10360	22150	9033	25348	13117	1.93
(E) (1)	-20.0	12839	6440	15400	43816	24743	34679	19073	1.82
(F) (1)	-36.0	20796	9860	26280	100454	72938	56936	27516	2.07
(G) (1)	-42.0	29993	17000	47261	128120	98053	94254	30067	3.13
(H) (1)	-50.0	36539	22000	55020	171787	137668	113559	34119	3.33

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. CENTER OF STRATUM			BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	RIPRAP	132	132	132	0	0	0	0	0	0	40
3	CH	110	110	110	500	500	500	500	500	500	0
4	CH	100	100	100	175	500	500	175	500	500	0
5	CH	76	100	100	175	280	280	175	280	280	0
6	CH	76	100	100	380	280	280	380	280	280	0
7	CH	100	100	100	150	280	280	150	280	280	0
8	CH	100	100	100	300	340	340	300	340	340	0
9	SM	122	122	122	0	0	0	0	0	0	30
10	CH	100	100	100	150	485	485	150	500	500	0
11	CH	108	100	100	610	595	595	610	690	690	0

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 3 in the Report for reach stationing, boring and testing information

NOTES

- O -- STRATUM NUMBER
- O -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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

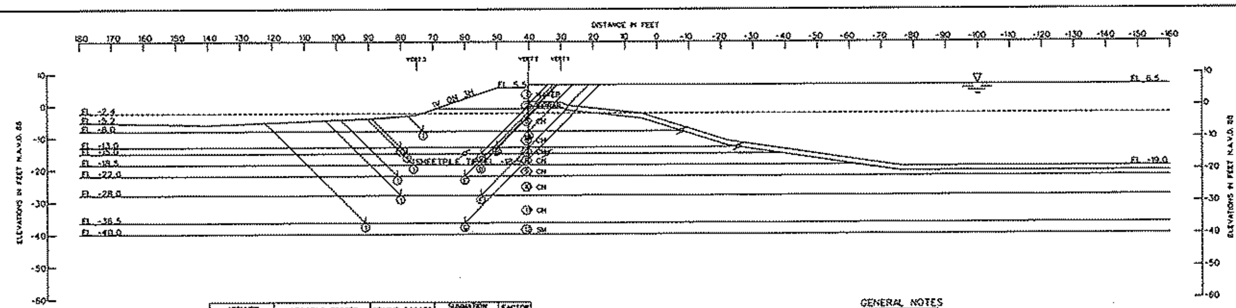
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS
REACH 1B

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

DESIGNED BY: C.R. DRAWN BY: C.R./R.D. CHECKED BY: T.Y. | TEST SCALE: 20 | PLOT DATE: 29 MAR 07 | DATE: MAR 2007 | FILE NO.

PLATE: 92



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	
[illegible]	-8.0	6661	9240	3455	8592	1365	13556	7327	2.67
[illegible]	-13.0	10099	5871	3665	17939	4281	21635	13678	1.58
[illegible]	-15.0	11179	4341	6505	21944	6235	21845	15689	1.39
[illegible]	-18.5	12523	4276	7567	29484	10594	24466	18890	1.30
[illegible]	-22.0	14513	5944	9305	37487	15327	29860	22160	1.35
[illegible]	-28.0	17051	7786	12772	56134	27116	37639	29018	1.30
[illegible]	-35.5	22925	10550	18208	66768	48029	51683	38739	1.33

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. CENTER OF STRATUM			C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	RIPRAP	132	132	132	0	0	0	0	0	0	40
3	CH	110	110	110	400	400	400	400	400	400	0
4	CH	116	116	116	600	600	600	600	600	600	0
5	CH	106	103	106	350	450	350	350	450	350	0
6	CH	80	93	80	280	280	280	280	280	280	0
7	CH	98	102	98	150	280	150	150	280	150	0
8	CH	98	102	98	190	240	190	190	240	190	0
9	CH	98	102	98	280	300	280	280	300	280	0
10	CH	98	102	98	300	350	300	300	350	300	0
11	CH	102	102	102	350	350	350	350	350	350	0
12	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

SEE TABLE 3 IN REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
-- CROSSOVER POINT
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

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

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

SLOPE STABILITY ANALYSIS

HIGH WATER CONDITIONS

PLATE: 93

INPUT DATA FILENAME: HW19

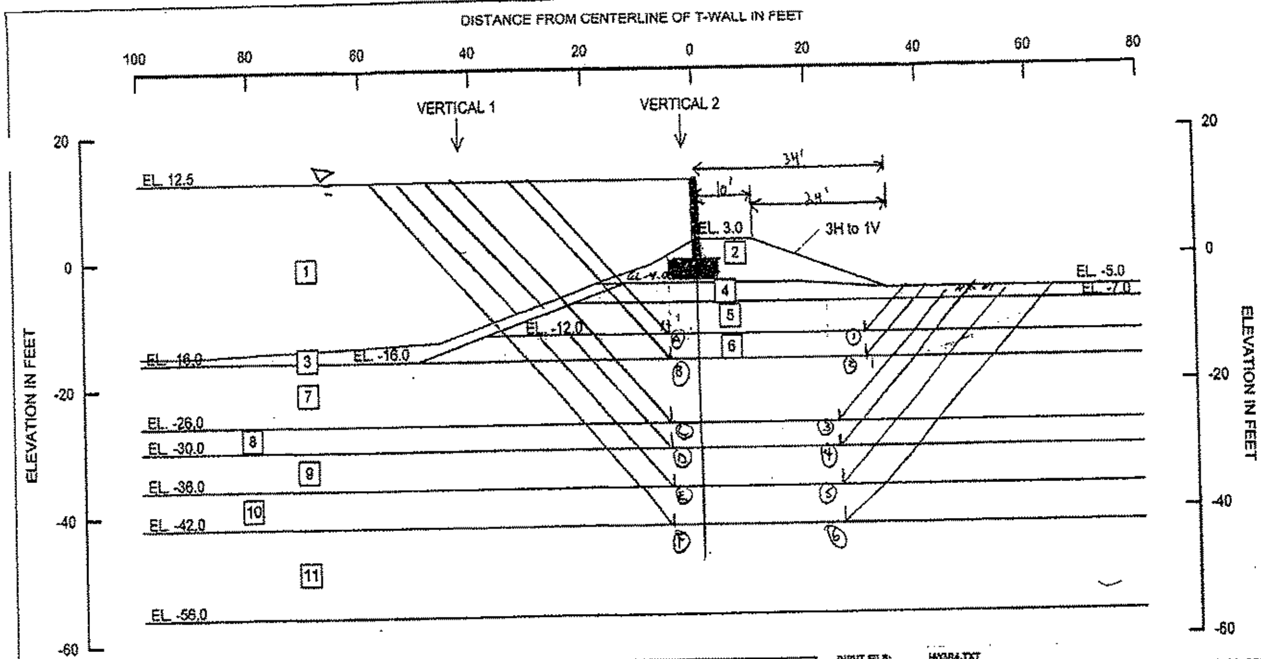
GENERAL NOTES:
CLASSIFICATION, STRATIFICATION, SHEAR STRENGTH AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS. SEE BORING DATA PLATES.

NOTES

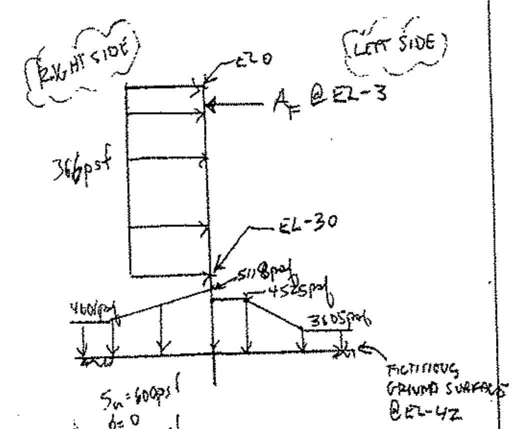
ϕ -- ANGLE OF INTERNAL FRICTION DEGREES
C -- UNIT COHESION, P.S.F.
-- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE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

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

HWSR4PLOT.GRF
HWSR4.TXT (UPLIFT)



ANCHORED SHEETPILE WALL ANALYSIS USING CWALSHT PROGRAM



S_u = 600 psf
ϕ = 0
γ = 100 pcf
$F_w = \frac{1}{2}\gamma_w H^2 = \frac{1}{2}(62.4)(12.5-0)^2$

INPUT FILE: HW5R4.TXT
T-WALL WITH 34-FT RIGHT-OF-WAY STABILITY BERM
COMPUTED BY JJH 20 DEC 2005

Failure Surface No.	Elev	Resisting Forces (lb/ft) RA	RB	RP	Driving Forces (lb/ft) DA	DP	FS	Sum of Forces (lb/ft) ΣR	ΣR/1.5	ΣD	ΣD - ΣR/1.5	Free Water, FW (lb/ft)	Unbalanced Load (lb/ft)
A-1	-12	4979	5250	3100	21068	2624	0.72	13229	10178	18432	8256	4875	3381
B-2	-16	5051	7000	4700	26984	5604	0.72	16781	12865	23180	10296	4875	6420
C-3	-26	7634	7489	9700	54835	21649	0.75	24823	19096	33187	14092	4875	9217
D-4	-30	9046	7490	11700	87720	30148	0.76	28236	21722	37672	15550	4875	10975
E-5	-36	12636	11978	16550	89917	45748	0.93	41114	31626	44159	12549	4875	7668
F-6	-42	16762	17976	26981	116530	64654	1.19	61691	47455	51878	4421	4875	-454

UNIFORM PRESSURE DIST.

$\frac{10,975}{30-0} \cong 366$ psf

SOIL NO.	DESCRIPTION	FRICTION ANGLE IN DEGREES	VERTICAL 1 UNIT WEIGHT IN PCF	VERTICAL 1 COHESION IN PSF AVG.	VERTICAL 1 COHESION IN PSF BASE	VERTICAL 2 UNIT WEIGHT IN PCF	VERTICAL 2 COHESION IN PSF AVG.	VERTICAL 2 COHESION IN PSF BASE
1	DESCRIPTION	0	62	0	0	62	0	0
2	DESCRIPTION	0	115	400	400	115	400	400
3	DESCRIPTION	30	130	0	0	130	0	0
4	DESCRIPTION	0	115	400	400	115	400	400
5	DESCRIPTION	0	75	150	150	75	150	150
6	DESCRIPTION	0	95	200	200	95	200	200
7	DESCRIPTION	0	112	150	150	95	250	250
8	DESCRIPTION	0	93	160	160	95	250	250
9	DESCRIPTION	0	93	200	200	95	400	400
10	DESCRIPTION	25	120	0	0	120	0	0
11	DESCRIPTION	0	101	400	400	100	600	600

← SHEAR STRENGTH PER COE DIRECTION

Determine Elevation where Unbalanced Load is Equal to Zero

$\frac{7668+454}{42-36} = 1354$

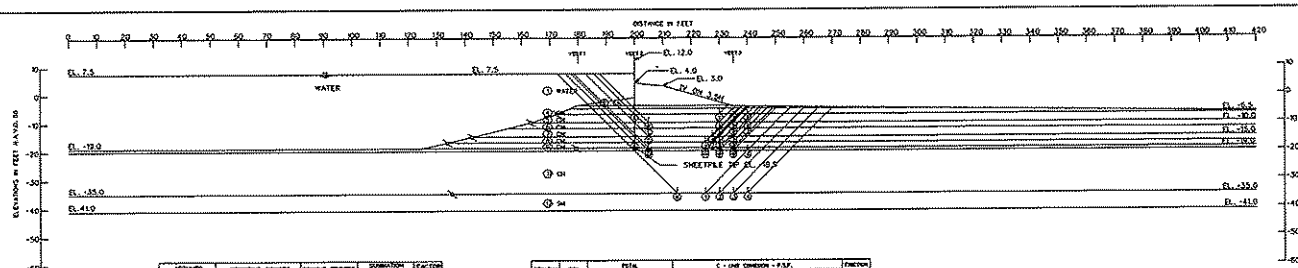
7668/1354 = 5.66' Say 6'

∴ EL-36-6 = EL-42

FACTOR OF SAFETY	M_{max} (K-ft/ft)	REQD TIP	A_F @ EL-3 (K)
1.0	—	—	7.8
1.5	62.4 @ EL-21.7	~~EL-47.2~~ El-55	—

JJH 12/20/2005

EUSTIS ENGINEERING COMPANY, INC. GEOTECHNICAL ENGINEERING & CQC SERVICES 3011 28TH STREET METAIRIE, LOUISIANA	REV	DATE	DESCRIPTION	REV	DATE	DESCRIPTION	ANALYSIS OF T-WALL 17TH STREET CANAL	DRAWN BY: J.J.H.	DATE: 20 DEC 2005
								CHECKED BY: C.L.S.	FIGURE / DRAWING NO.
								SCALE: AS SHOWN	G-1
								FILE: HW5R4PLOT.GRF	



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	
[illegible] 1	-7.0	7003	6043	4271	7054	725	17317	6329	2.74
[illegible] 2	-7.0	7003	6912	3375	7054	387	17291	6667	2.59
[illegible] 3	-7.0	7003	7752	3265	7054	368	18020	6686	2.70
[illegible] 1	-10.0	8581	4625	4573	10627	1790	17779	8837	2.01
[illegible] 2	-10.0	8581	5466	4329	10627	1369	18490	9258	2.00
[illegible] 3	-10.0	8581	6336	4319	10627	1330	19236	9297	2.07
[illegible] 1	-12.0	9125	4525	5194	13833	3196	18834	10637	1.77
[illegible] 2	-12.0	9125	5466	4985	13833	2751	19576	11082	1.77
[illegible] 3	-12.0	9125	6336	4854	13833	2698	20315	11135	1.82
[illegible] 1	-15.0	9784	4192	6288	15993	3245	20265	12748	1.59
[illegible] 2	-15.0	9784	4888	6213	15993	3712	20885	12281	1.56
[illegible] 3	-15.0	9784	5879	6095	15993	3248	21581	12745	1.57
[illegible] 1	-17.0	9078	4420	7078	22644	9197	20576	13447	1.53
[illegible] 2	-17.0	9078	4867	7007	22644	8453	20952	14191	1.48
[illegible] 3	-17.0	9078	5314	6954	22644	7927	21346	14717	1.45
[illegible] 4	-17.0	9078	6213	6834	22644	7456	22145	15188	1.46
[illegible] 1	-19.0	10390	3543	7732	27230	11545	21665	15685	1.41
[illegible] 2	-19.0	10390	4438	7633	27230	10563	22461	16667	1.35
[illegible] 3	-19.0	10390	5336	7530	27230	10078	23256	17152	1.36
[illegible] 1	-20.0	10550	3749	8073	29541	13521	22372	16220	1.38
[illegible] 2	-20.0	10550	4662	7975	29541	12033	23187	17505	1.32
[illegible] 3	-20.0	10550	5557	7666	29541	11533	23985	18007	1.33
[illegible] 4	-20.0	10550	6467	7757	29541	11631	24776	18110	1.37
[illegible] 1	-35.0	18957	4205	16302	75727	47040	39452	28687	1.38
[illegible] 2	-35.0	18957	6211	16106	75727	45620	41274	30107	1.37
[illegible] 3	-35.0	18957	8157	15995	75727	45040	43109	30687	1.40
[illegible] 4	-35.0	18957	10072	15884	75727	44832	44913	30895	1.45

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	100	100	100	900	900	900	900	900	900	0
3	CH	100	100	100	900	500	900	900	500	900	0
4	CH	100	100	100	500	500	500	500	500	500	0
5	CH	80	100	80	170	225	170	170	225	170	0
6	CH	80	80	80	170	200	170	170	200	170	0
7	CH	110	80	110	200	200	200	200	200	200	0
8	CH	110	114	110	200	175	200	200	175	200	0
9	CH	100	114	100	180	175	180	180	175	180	0
10	CH	100	122	100	180	184	180	180	193	180	0
11	CH	95	100	95	282	122	282	383	422	383	0
12	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 3 in the Report for reach stationing, boring and testing information.

NOTES

- O -- STRATUM NUMBER
- O -- WEDGE NUMBER
- Ø -- CROSSOVER POINT
- 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

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

SLOPE STABILITY ANALYSIS

17TH STREET CANAL

ANALYSIS OF EXISTING CONDITIONS

HIGH WATER CONDITIONS

PLATE: 95

INPUT DATA FILENAME: 023

GENERAL NOTES:

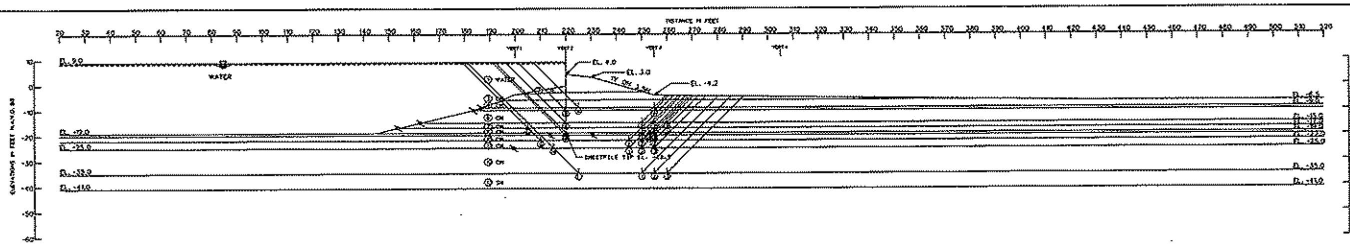
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS. SEE BORING DATA PLATES.

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

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

PLATE 95 - e23.DGN 3/27/2008 10:57:16 AM



ASSUMED FAILURE SURFACE NO.	ASSUMED FAILURE 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
[illegible]	-9.0	9462	[illegible]	4316	10700	1711	24484	9537	2.57
[illegible]	-12.5	9575	9100	2205	10641	1670	23230	9091	2.55
[illegible]	-15.0	11407	7200	7412	21271	5853	26069	15378	1.70
[illegible]	-15.0	11407	8250	7737	21229	5364	27414	15840	1.68
[illegible]	-15.0	11407	8850	5995	21229	5312	27772	15917	1.71
[illegible]	-17.0	13427	10910	8030	23450	7927	24356	15523	1.57
[illegible]	-17.5	13427	9782	7701	23455	7461	21890	15995	1.56
[illegible]	-17.0	13427	12582	7464	23433	7376	23457	16085	1.58
[illegible]	-19.0	12580	7260	8582	29356	10433	28362	18683	1.50
[illegible]	-19.0	12580	7731	8357	29338	10082	28658	19256	1.49
[illegible]	-19.0	12580	8050	8247	29338	9983	28877	19355	1.49
[illegible]	-20.0	12830	6837	8857	31607	9887	28014	19722	1.42
[illegible]	-20.0	12830	7349	8626	31609	9575	28805	20034	1.43
[illegible]	-20.0	12830	7677	8520	31609	11414	29027	20195	1.44
[illegible]	-22.0	7779	9073	10373	35068	15305	27150	19763	1.43
[illegible]	-22.0	7779	10533	9934	35066	15083	28327	19983	1.42
[illegible]	-22.0	7779	12150	9490	35068	14600	29628	20468	1.45
[illegible]	-25.0	10796	7750	11654	43715	21831	29800	21884	1.36
[illegible]	-25.0	10798	8964	11655	43745	20645	31176	23098	1.35
[illegible]	-25.0	10798	10934	10434	43745	20138	32455	23608	1.36
[illegible]	-33.0	18696	9750	17498	77855	43535	43944	32400	1.42
[illegible]	-33.0	18695	11400	16936	77853	43941	47030	33044	1.42
[illegible]	-33.0	18696	12970	16373	77853	43723	48045	33292	1.44

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT. 1	VERT. 2	VERT. 3	VERT. 4	C - UNIT COHESION - P.S.F. TOP OF STRATUM VERT. 1	VERT. 2	VERT. 3	VERT. 4	BOTTOM OF STRATUM VERT. 1	VERT. 2	VERT. 3	VERT. 4	FRICTION ANGLE DEGREES
1	WATER	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0
2	CH	105	105	105	105	900	850	900	500	900	900	900	500	0
3	CH	105	105	105	105	900	500	900	500	900	500	900	500	0
4	CH	100	100	100	100	300	500	300	300	300	500	300	300	0
5	CH	75	100	75	75	220	300	220	220	220	300	220	220	0
6	CH	75	75	75	75	220	300	220	220	220	300	220	220	0
7	CH	114	75	114	114	150	300	150	150	150	300	150	150	0
8	CH	114	152	114	114	150	300	150	150	150	300	150	150	0
9	CH	114	150	114	114	150	300	150	150	150	300	150	150	0
10	CH	100	100	100	100	320	230	320	220	320	230	320	220	0
11	CH	99	100	99	99	320	230	320	220	320	230	320	220	0
12	CH	99	100	99	99	320	425	320	220	370	650	320	220	0
13	SM	122	122	122	122	0	0	0	0	0	0	0	0	30

See Table 3 in the Report for reach stationing, boring and testing information.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THOSE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
□ -- WEDGE NUMBER
-- CROSSOVER POINT
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 = $\frac{R_A + R_B + R_P}{D_A - D_P}$

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS

PLATE: 96

INPUT DATA FILENAME 022

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

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

GENERAL NOTES

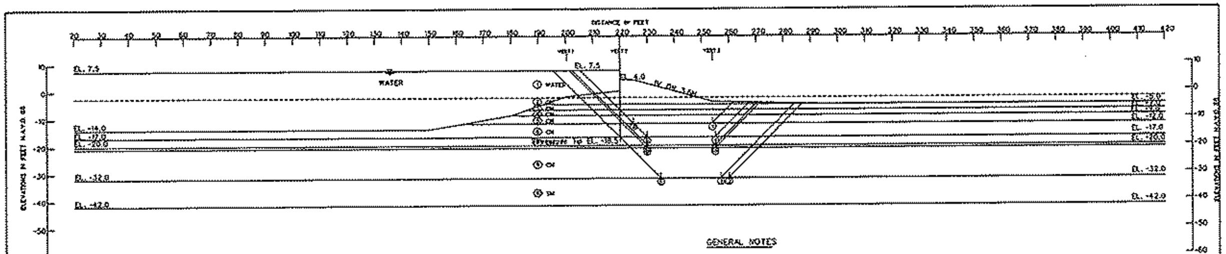
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$



ASSUMED FAILURE SURFACE NO.		ASSUMED FAILURE SURFACE ELEV.	RESISTING FORCES R_A	R_B	R_P	DRIVING FORCES D_A	$-D_P$	SUMMATION OF FORCES RESISTING	DRIVING	FACTOR OF SAFETY
[illegible]	[illegible]	-13.0	15591	6593	8757	13200	3010	22444	12793	1.84
[illegible]	[illegible]	-17.0	13506	6010	7250	24376	7685	24766	16691	1.48
[illegible]	[illegible]	-20.0	14915	4851	7961	31055	11671	27727	19384	1.43
[illegible]	[illegible]	-21.0	15363	4934	8218	33466	13195	28515	20271	1.41
[illegible]	[illegible]	-32.0	22478	5682	11631	65574	36237	39781	29337	1.36
[illegible]	[illegible]	-32.0	22478	6312	11493	65574	36022	40283	29534	1.36

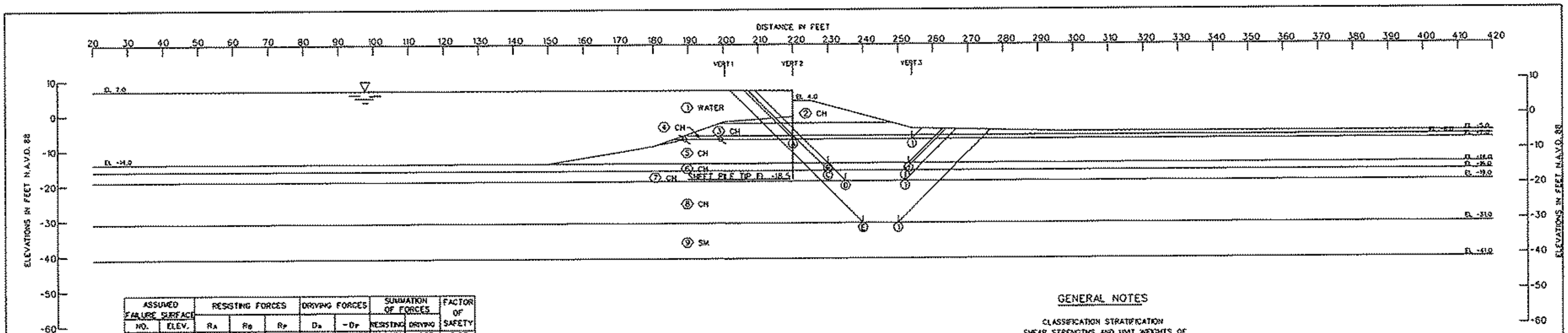
STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT.1	VERT.2	VERT.3	C - UNIT COHESION - P.S.F. CENTER OF STRATUM VERT.1	VERT.2	VERT.3	BOTTOM OF STRATUM VERT.1	VERT.2	VERT.3	FRICTION ANGLE DEGREES
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	102	122	105	900	900	900	900	900	900	0
3	CH	100	105	105	900	320	900	900	320	900	0
4	CH	75	100	75	120	320	120	120	320	120	0
5	CH	75	80	80	120	230	120	120	230	120	0
6	CH	100	80	100	125	230	125	135	230	135	0
7	CH	100	105	100	140	280	140	150	280	150	0
8	CH	100	105	100	150	280	150	155	280	155	0
9	CH	100	100	100	150	410	150	210	410	210	0
10	SM	122	122	122	0	0	0	0	0	0	30

See Table 3 in the Report for reach stationing, boring and testing information.

17th STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS

PLATE: 97

INPUT DATA FILENAME: D307



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	-7.0	8315	4505	3651	5809	458	14471	6351	2.28
Ⓑ ①	-14.0	8565	2789	4654	16791	4700	15808	12091	1.31
Ⓒ ①	-16.0	9194	3306	5156	20476	6785	17656	13691	1.29
Ⓓ ①	-19.0	10341	3664	5962	25829	10586	19967	15243	1.31
Ⓔ ①	-31.0	19466	4010	12004	58350	34859	35480	23491	1.51

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. CENTER OF STRATUM			C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	106	106	105	900	900	900	900	900	900	0
③	CH	106	106	106	900	340	900	900	340	900	0
④	CH	90	90	90	90	340	90	90	340	90	0
⑤	CH	90	90	90	90	175	90	90	175	90	0
⑥	CH	101	90	101	135	175	135	135	175	135	0
⑦	CH	108	106	108	155	265	155	180	295	180	0
⑧	CH	98	100	98	270	405	270	360	515	360	0
⑨	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 3 in the Report for reach stationing, boring and testing information.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

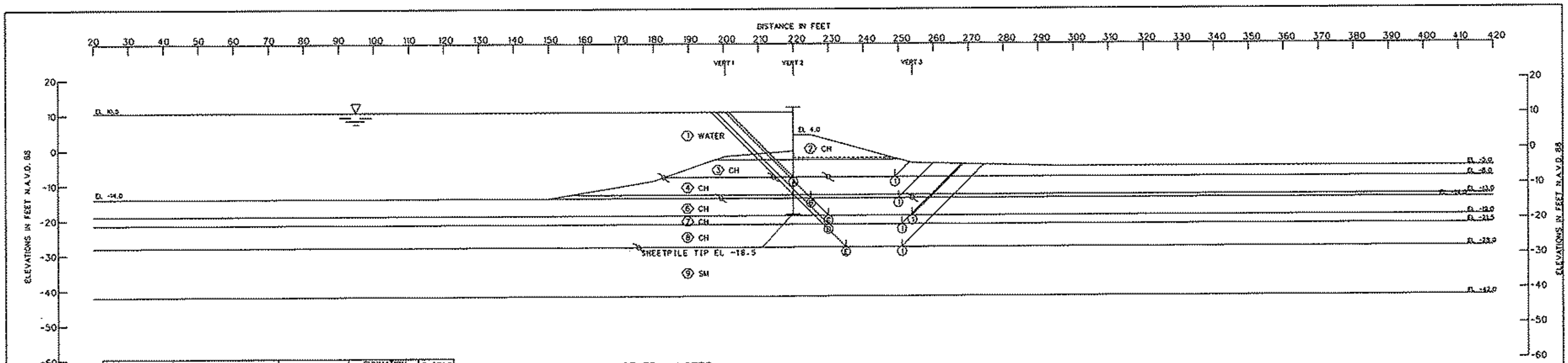
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

SLOPE STABILITY ANALYSIS

HIGH WATER CONDITIONS
REACH 24

PLATE: 98

INPUT DATA FILENAME: OH18



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	6125	5635	7065	11507	1232	18826	10275	1.83
Ⓑ ①	-14.0	8561	4985	10292	21349	5230	23838	16119	1.48
Ⓒ ①	-19.0	10751	4828	11717	31626	10788	27296	20838	1.31
Ⓓ ①	-21.5	12690	5757	13106	38245	14910	31553	23335	1.35
Ⓔ ①	-28.0	17876	5864	17060	56327	27799	40800	28528	1.43

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	109	110	109	900	900	900	900	900	900	0
③	CH	109	106	109	900	170	900	900	170	900	0
④	CH	85	106	95	300	170	300	300	170	300	0
⑤	CH	100	90	100	180	220	180	180	220	180	0
⑥	CH	100	90	100	180	230	180	180	240	180	0
⑦	CH	100	90	100	275	245	275	290	250	290	0
⑧	CH	98	103	98	325	380	325	360	380	360	0
⑨	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ○ -- STRATUM NUMBER
- ◇ -- WEDGE NUMBER
- ⌿ -- CROSSOVER POINT
- 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

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

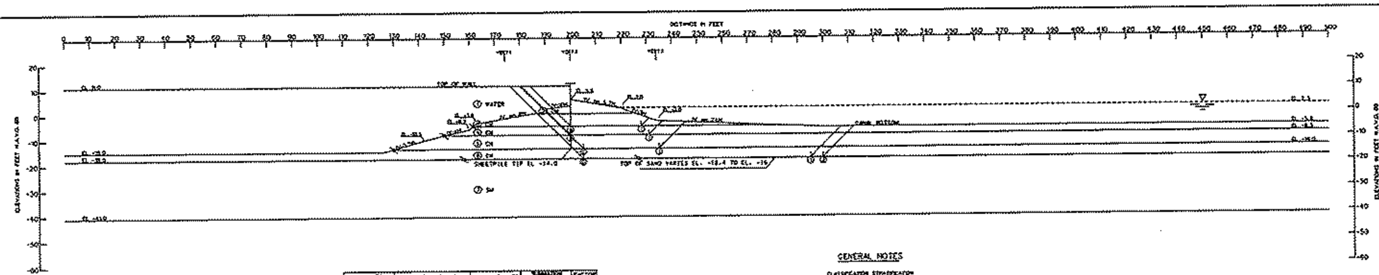
NOTE: SEE TABLE 3 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS
REACH 23

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

PLATE: 99

INPUT DATA FILENAME: OH19



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	
③ ①	-3.6	8742	10237	4218	8553	427	21366	8733	2.46
③ ①	-8.5	10056	9373	8007	14573	1852	27944	12421	2.14
③ ①	-14.0	14061	6473	9710	19063	3836	33251	15427	1.75
③ ①	-18.0	16533	9990	7850	33223	7134	34367	26089	1.32
③ ②	-18.0	16533	9966	7850	33223	7081	34347	25143	1.31

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C = UNIT COHESION - P.S.F. CENTER OF STRATUM			BOTTOM OF STRATUM			FRICTION ANGLE (DEGREES)
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	105	112	100	250	900	250	250	900	250	0
③	CH	105	112	105	250	450	250	250	450	250	0
④	CH	105	95	100	250	400	250	250	400	250	0
⑤	CH	92	95	92	200	500	200	200	500	200	0
⑥	CH	92	96	92	200	600	200	200	600	200	0
⑦	SM	122	122	122	0	0	0	0	0	0	30

NOTE: SEE TABLE 3 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

GENERAL NOTES

CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
◇ -- WEDGE NUMBER
-- CROSSOVER POINT
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 = $\frac{R_A + R_B + R_P}{D_A - D_P}$

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
HIGH WATER CONDITIONS

PLATE: 101

INPUT DATA FILENAME: 021

GENERAL NOTES

CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

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

GENERAL NOTES

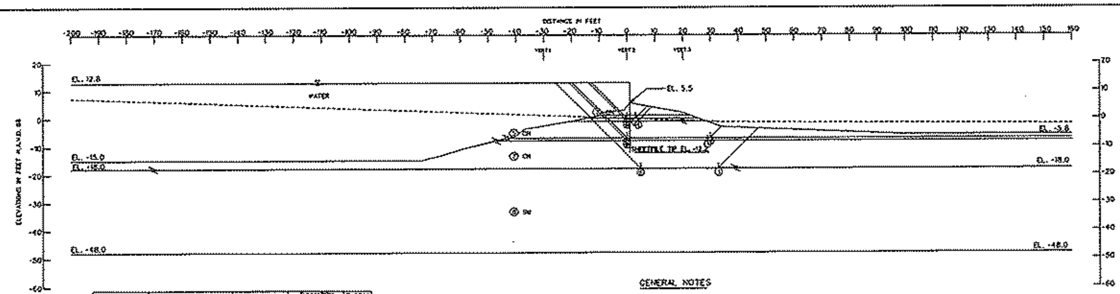
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- STRATUM NUMBER
- WEDGE NUMBER
- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$



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	
[illegible]	-.5	6550	900	3432	5329	1220	5882	4109	1.43
[illegible]	-1.0	2336	1260	3563	8301	1633	7203	4668	1.54
[illegible]	-7.0	6470	10200	3600	14135	1089	20470	13106	1.56
[illegible]	-9.0	7137	9880	4240	15546	1799	21257	14135	1.50
[illegible]	-18.0	14028	9297	10127	36688	11568	33452	23120	1.35

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. CENTER OF STRATUM			BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	110	110	110	380	380	380	380	380	380	0
3	CH	106	106	106	300	300	300	300	300	300	0
4	CH	102	106	102	450	300	450	450	300	450	0
5	CH	102	102	102	450	380	450	450	380	450	0
6	CH	110	102	110	320	380	320	320	380	320	0
7	CH	110	106	110	320	380	320	320	380	320	0
8	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 3 in the Report for reach stationing, boring and testing information.

NOTES

- STRATUM NUMBER
- WEDGE NUMBER
- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

17TH STREET CANAL

SLOPE STABILITY ANALYSIS

PLATE: 102

INPUT DATA FILENAME: 178

01-MAY-07

GENERAL NOTES:

NOTES

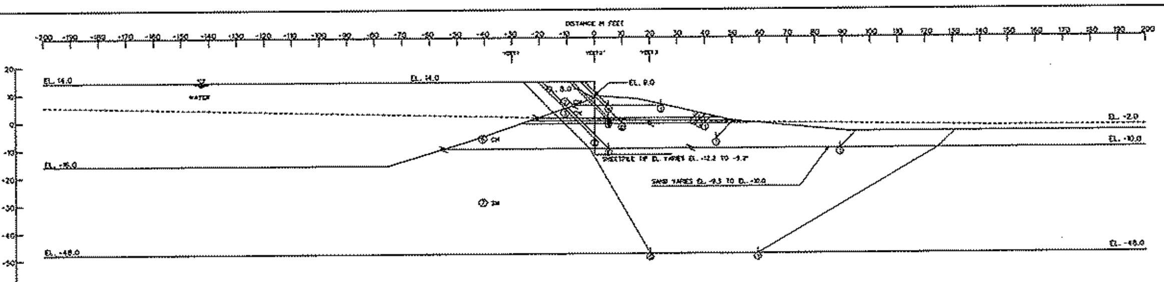
φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
-- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE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

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

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	
[illegible]	-.5	6550	900	3432	5329	1220	5882	4109	1.43
[illegible]	-1.0	2336	1260	3563	8301	1633	7203	4668	1.54
[illegible]	-7.0	6470	10200	3600	14135	1089	20470	13106	1.56
[illegible]	-9.0	7137	9880	4240	15546	1799	21257	14135	1.50
[illegible]	-18.0	14028	9297	10127	36688	11568	33452	23120	1.35

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. CENTER OF STRATUM			BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	110	110	110	380	380	380	380	380	380	0
3	CH	106	106	106	300	300	300	300	300	300	0
4	CH	102	106	102	450	300	450	450	300	450	0
5	CH	102	102	102	450	380	450	450	380	450	0
6	CH	110	102	110	320	380	320	320	380	320	0
7	CH	110	106	110	320	380	320	320	380	320	0
8	SM	122	122	122	0	0	0	0	0	0	30

PLATE 102-P.DGN 3/25/2009 10:29:33 AM



GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- O -- STRATUM NUMBER
- O -- WEDGE NUMBER
- X -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

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	
[illegible]	5.5	4749	7220	516	833	0	12485	833	15.18
[illegible]	1.0	6339	9300	1367	4955	218	17006	4737	3.59
[illegible]	.0	6584	9900	1542	6135	336	18026	5799	3.11
[illegible]	-1.0	9662	13125	2018	5847	474	24805	5373	4.62
[illegible]	-6.5	8107	19100	5810	16759	2591	33017	14168	2.33
[illegible]	-10.0	11003	24090	5400	22930	1880	40493	21050	1.92
[illegible]	-48.0	71517	66339	102067	185420	118226	240000	65194	3.47

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	111	111	111	700	700	700	700	700	700	0
3	CH	110	110	110	350	350	350	350	350	350	0
4	CH	105	105	105	300	300	300	300	300	300	0
5	CH	102	105	102	450	500	450	450	500	450	0
6	CH	102	102	102	450	350	450	450	350	450	0
7	SM	122	122	122	0	0	0	0	0	0	30
8	SM	122	122	122	0	0	0	0	0	0	30

See Table 3 in the Report for reach stationing, boring and testing information.

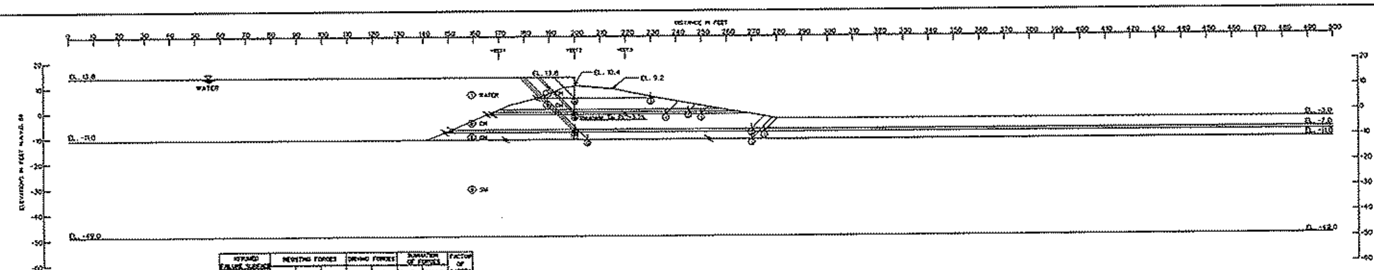
17TH STREET CANAL
SLOPE STABILITY ANALYSIS

PLATE: 103

INPUT DATA FILENAME: ...

01-MAY-07

PLATE 103 - ... 10:29:29 AM



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	
[illegible]	3.3	5905	9400	714	2633	17	16017	2616	[illegible]
[illegible]	-1.0	8285	15000	2231	8570	568	25537	8002	2.90
[illegible]	.0	7790	13500	2077	9086	379	23377	7537	3.09
[illegible]	-1.0	7971	14700	3832	9362	1654	26503	7708	3.44
[illegible]	-7.0	10336	23000	4542	19000	1542	37878	17458	2.17
[illegible]	-8.0	10779	24600	4475	20990	1690	39730	19300	2.06
[illegible]	-11.0	13635	20485	6583	27169	4348	40707	22821	1.78

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. TOP OF STRATUM			BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	11	11	11	700	700	700	700	700	700	0
3	CH	110	110	110	350	350	350	350	350	350	0
4	CH	105	105	105	300	300	300	300	300	300	0
5	CH	102	105	102	450	300	450	450	300	450	0
6	CH	102	102	102	450	350	450	450	350	450	0
7	CH	110	102	110	320	380	320	320	380	320	0
8	CH	110	102	110	320	380	320	320	380	320	0
9	SM	122	122	122	0	0	0	0	0	0	30

See Table 3 in the Report for reach stationing, boring and testing information.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- ⌿ -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

SLOPE STABILITY ANALYSIS

PLATE: 104

INPUT DATA FILENAME: [illegible]

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
⌿ -- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

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	
[illegible]	3.3	5905	9400	714	2633	17	16017	2616	[illegible]
[illegible]	-1.0	8285	15000	2231	8570	568	25537	8002	2.90
[illegible]	.0	7790	13500	2077	9086	379	23377	7537	3.09
[illegible]	-1.0	7971	14700	3832	9362	1654	26503	7708	3.44
[illegible]	-7.0	10336	23000	4542	19000	1542	37878	17458	2.17
[illegible]	-8.0	10779	24600	4475	20990	1690	39730	19300	2.06
[illegible]	-11.0	13635	20485	6583	27169	4348	40707	22821	1.78

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. TOP OF STRATUM			BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	11	11	11	700	700	700	700	700	700	0
3	CH	110	110	110	350	350	350	350	350	350	0
4	CH	105	105	105	300	300	300	300	300	300	0
5	CH	102	105	102	450	300	450	450	300	450	0
6	CH	102	102	102	450	350	450	450	350	450	0
7	CH	110	102	110	320	380	320	320	380	320	0
8	CH	110	102	110	320	380	320	320	380	320	0
9	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

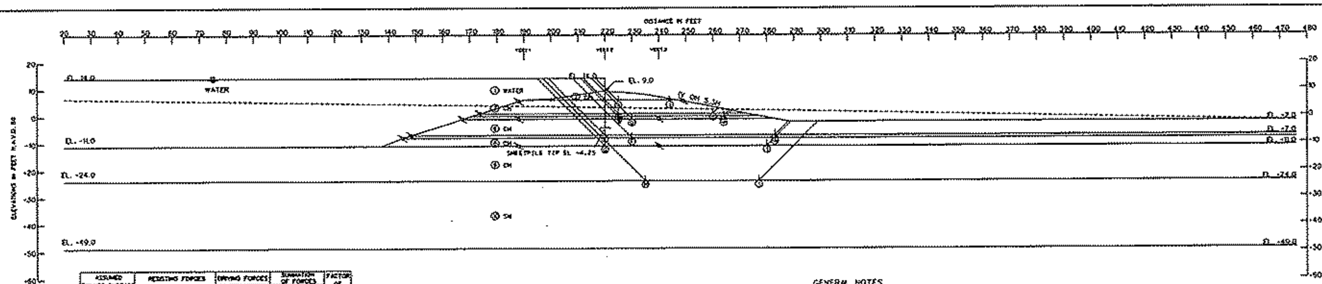
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

O -- STRATUM NUMBER
◇ -- WEDGE NUMBER
-- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$



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	①	5.5	6749	13300	1053	1058	37	19103	1049	18.22
②	②	1.0	7877	10500	1539	5359	269	19916	5090	3.91
③	③	.0	8295	11700	1523	6600	320	21518	6280	3.43
④	③	-1.0	9423	14925	2300	6230	607	26648	5628	4.73
⑤	③	-7.0	11414	20760	4500	19122	1521	36674	17601	2.08
⑥	③	-8.0	13900	17110	3140	18318	2066	34150	16432	2.20
⑦	③	-11.0	13544	19800	7060	27648	4828	40704	22822	1.78
⑧	④	-24.0	24713	13334	15360	83753	27033	53627	36723	1.46

NOTE: SEE TABLE 3 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	111	111	111	700	700	700	700	700	700	0
③	CH	110	110	110	350	350	350	350	350	350	0
④	CH	105	105	105	300	300	300	300	300	300	0
⑤	CH	103	105	103	450	300	450	450	300	450	0
⑥	CH	122	122	122	450	350	450	450	350	450	0
⑦	CH	110	122	110	320	350	320	320	350	320	0
⑧	CH	110	105	110	320	350	320	320	550	320	0
⑨	CH	110	105	110	320	470	320	320	470	320	0
⑩	SM	122	122	122	0	0	0	0	0	0	30

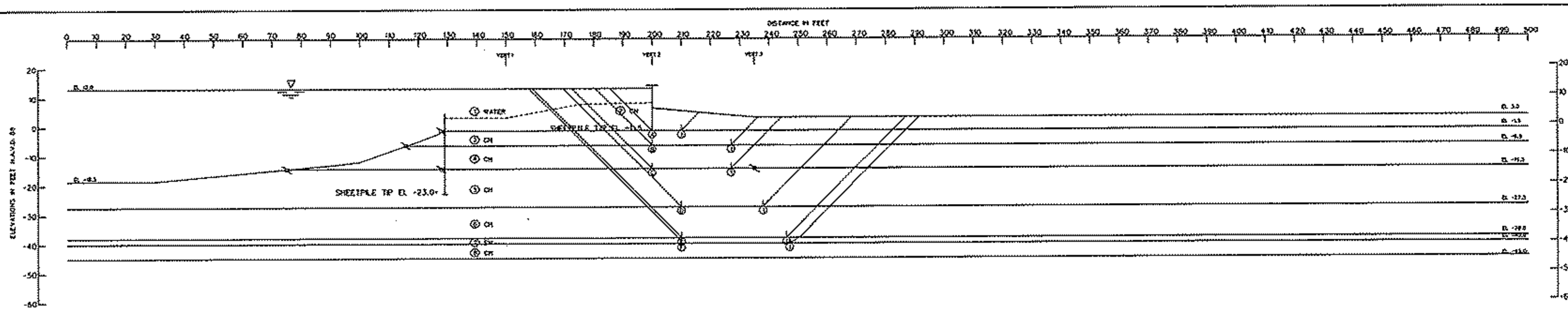
SLOPE STABILITY ANALYSIS

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

PLATE: 105

INPUT DATA FILENAME: 15124

PLATE 105-531241.dgn 3/27/2009 10:30:57 AM



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	
[illegible]	-1.5	0	5000	6208	6893	2312	11208	4581	2.45
[illegible]	-5.5	5119	9550	9500	12721	5159	24169	7562	3.20
[illegible]	-14.5	11344	9550	14199	27199	16177	35093	11022	3.18
[illegible]	-27.3	23649	10697	21260	63914	47102	55606	16812	3.31
[illegible]	-38.0	36119	17480	28400	106168	84691	81999	21477	3.82
[illegible]	-40.0	38490	19454	34807	115373	93145	92751	22228	4.17

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	110	110	110	500	500	500	500	500	500	0
3	CH	100	100	100	500	500	500	500	500	500	0
4	CH	95	100	95	280	400	280	280	400	280	0
5	CH	100	100	100	280	500	280	280	600	280	0
6	CH	100	100	100	340	570	340	400	745	400	0
7	SM	122	122	122	0	0	0	0	0	0	30
8	CH	124	124	124	440	500	440	550	800	440	0

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
-- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

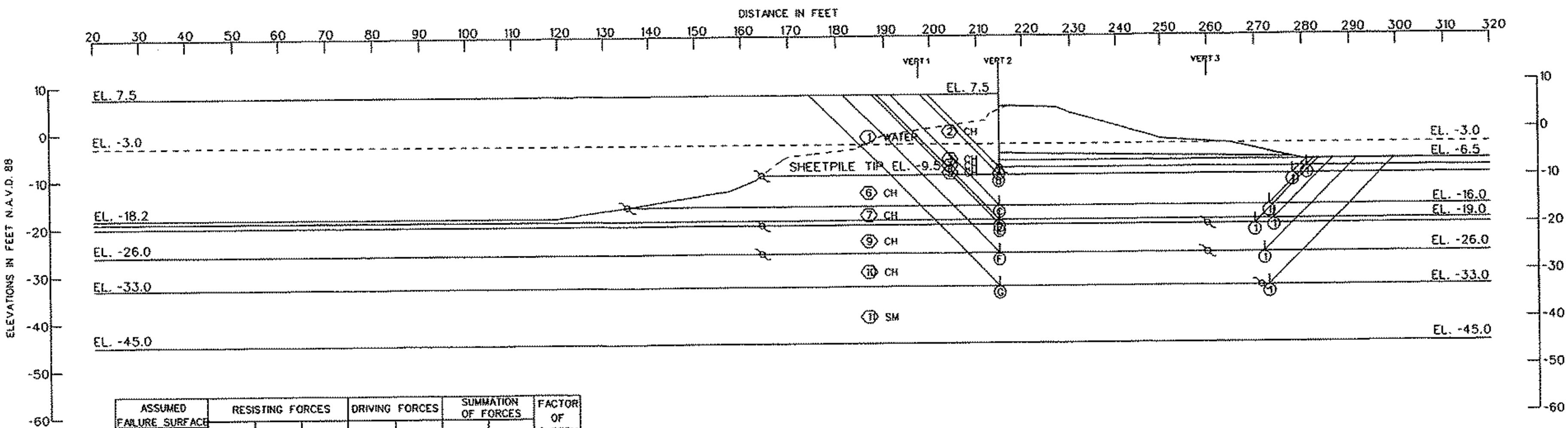
GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS

PLATE: 106



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	6	16759	570	7507	79	17335	7428	2.33
Ⓑ ①	-9.5	0	15868	1140	9031	366	17008	8665	1.96
Ⓒ ①	-16.0	3784	13864	3610	18136	3770	21258	14366	1.48
Ⓓ ①	-19.0	5327	14054	4750	23767	5919	24131	17848	1.35
Ⓔ ①	-20.0	5824	18820	5470	25827	7647	30114	18180	1.66
Ⓕ ①	-26.0	10447	23042	9790	39839	14880	43279	24959	1.73
Ⓖ ①	-33.0	17645	27674	14830	59829	28211	60149	31618	1.90

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	110	120	110	900	900	900	900	900	900	0
③	CH	110	112	110	900	700	900	900	700	900	0
④	CH	70	112	70	190	700	190	190	700	190	0
⑤	CH	70	76	70	190	360	190	190	360	190	0
⑥	CH	70	112	70	190	315	190	190	315	190	0
⑦	CH	70	112	70	190	315	190	190	315	190	0
⑧	CH	106	112	106	360	315	360	360	315	360	0
⑨	CH	100	100	100	360	470	360	360	470	360	0
⑩	CH	100	100	100	360	660	360	360	660	360	0
⑪	SM	122	122	122	0	0	0	0	0	0	30

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

⬡ -- STRATUM NUMBER
○ -- WEDGE NUMBER
-- CROSSOVER POINT
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

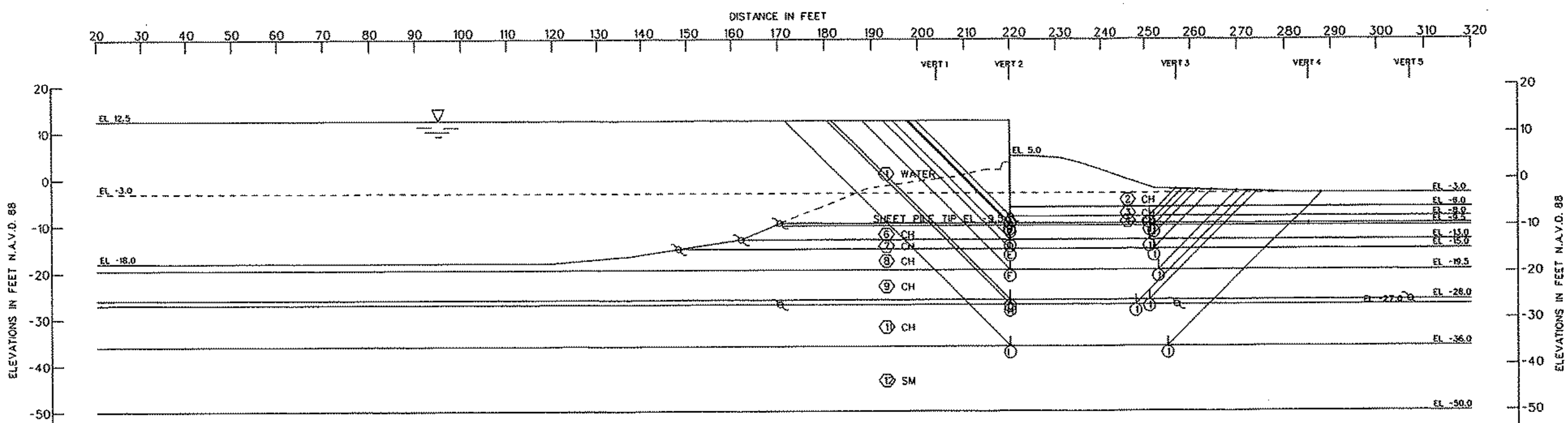
$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 1

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

DESIGNED BY: F.V.
DRAWN BY: K.B.
CHECKED BY: F.V./ C.R.
PLOT SCALE: 20
PLOT DATE: 30 MAR 07
DATE: MAR 2007
CAD FILE:
FILE NO.

PLATE: 107



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	-3	11211	5204	13133	2079	16412	11054	1.48
Ⓑ ①	-9.5	0	10567	5625	15125	3178	16192	11947	1.36
Ⓒ ①	-10.0	436	10758	5620	15825	3552	16814	12273	1.37
Ⓓ ①	-13.0	3009	11139	7787	20453	6476	21935	13977	1.57
Ⓔ ①	-15.0	4286	9730	9197	23972	8709	23213	15263	1.52
Ⓕ ①	-19.5	7124	7996	11511	33230	15092	26631	18138	1.47
Ⓖ ①	-26.0	9819	7469	14815	50119	28066	32103	22053	1.46
Ⓗ ①	-27.0	10280	8067	15556	53103	30923	33903	22180	1.53
Ⓘ ①	-36.0	18270	14553	22540	84454	55475	55363	28979	1.91

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F. CENTER OF STRATUM					BOTTOM OF STRATUM					FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	
1	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
2	CH	120	108	120	120	109	500	900	500	500	500	500	900	500	500	500	0
3	CH	100	108	100	100	100	200	900	200	200	200	200	900	200	200	200	0
4	CH	100	84	100	100	100	200	440	200	200	200	200	440	200	200	200	0
5	CH	100	84	100	100	100	200	440	200	200	200	200	440	200	200	200	0
6	CH	75	84	75	75	75	400	440	400	400	400	400	440	400	400	400	0
7	CH	75	94	75	75	75	400	330	400	400	400	400	330	400	400	400	0
8	CH	102	94	102	102	102	270	330	270	270	200	270	330	270	270	200	0
9	CH	102	105	102	102	102	270	220	270	270	200	270	220	270	270	200	0
10	CH	102	105	102	102	102	400	220	400	400	200	400	220	400	400	200	0
11	CH	102	100	102	102	102	400	430	400	400	200	400	430	400	400	200	0
12	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

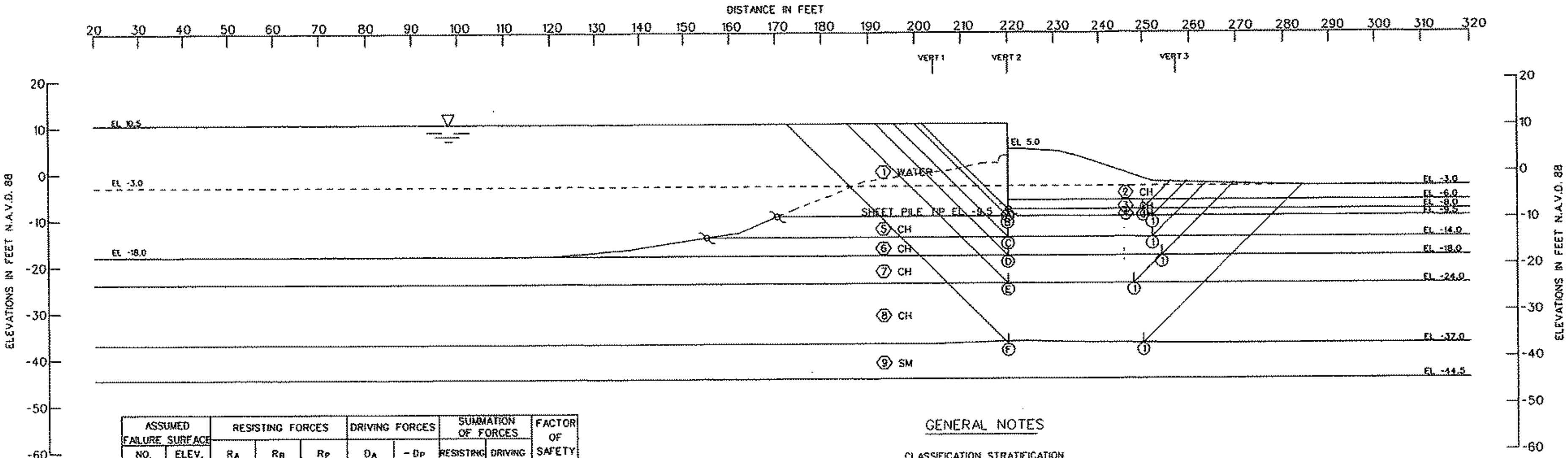
- ⬡ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- -- CROSSOVER POINT
- ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
- C -- UNIT COHESION, P.S.F.
- ∇ -- STATIC WATER SURFACE
- D -- HORIZONTAL DRIVING FORCE IN POUNDS
- R -- HORIZONTAL RESISTING FORCE IN POUNDS
- A -- AS A SUBSCRIPT REFERS TO ACTIVE WEDGE
- B -- 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 PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 2
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: F.Y.	PLOT SCALE: 20	PLOT DATE: 20 MAR 07	DWG FILE:
DRAWN BY: C.R.			FILE NO.
CHECKED BY: F.Y.	DATE: JAN 2007		

PLATE: 108



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	41	6995	6009	10693	1962	13045	8731	1.49
Ⓑ ①	-9.5	0	7347	6187	12500	2859	13534	9641	1.40
Ⓒ ①	-14.0	2491	7317	7377	19122	6964	17185	12158	1.41
Ⓓ ①	-18.0	4355	7622	8206	26547	11815	20183	14732	1.37
Ⓔ ①	-24.0	7541	10266	12577	40168	22735	30384	17433	1.74
Ⓕ ①	-37.0	19732	15746	23915	81720	56302	59393	25418	2.34

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	105	120	105	500	900	500	500	900	500	0
③	CH	105	101	105	500	300	500	500	300	500	0
④	CH	82	101	82	135	300	135	135	300	135	0
⑤	CH	82	101	82	135	300	135	135	300	135	0
⑥	CH	82	88	82	135	300	135	135	300	135	0
⑦	CH	100	88	100	367	350	367	394	350	394	0
⑧	CH	100	106	100	452	535	452	510	535	510	0
⑨	SM	122	122	122	0	0	0	0	0	0	30

NOTES

See Table 1 in the Report for reach stationing, boring and testing information.

- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- ⌀ -- CROSSOVER POINT
- 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

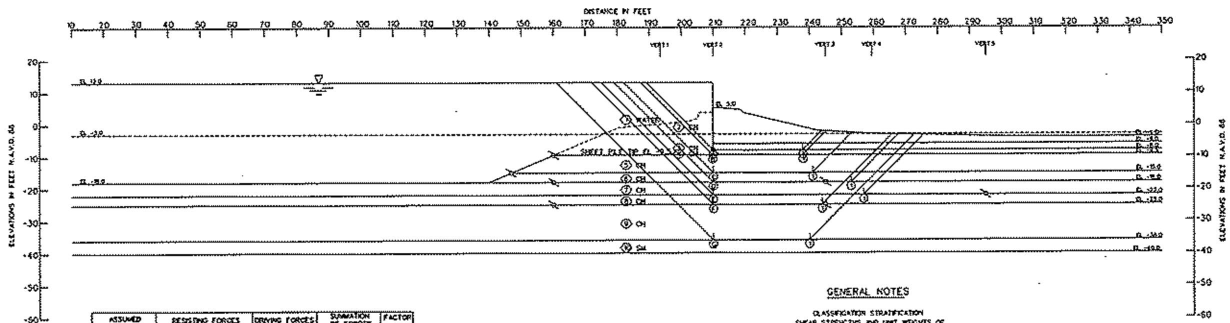
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 3

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

DESIGNED BY: F.Y. | DRAWN BY: C.R. | CHECKED BY: F.Y. | PLOT SCALE: 20 | PLOT DATE: 20 MAR 07 | DATE: JAN 2007

PLATE: 109



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)	-8.0	103	8400	10238	13779	2048	18741	11731	1.60
(B) (1)	-9.5	0	8461	11091	15820	3006	19552	12814	1.53
(C) (1)	-15.0	3300	8133	13849	24651	7516	25282	17165	1.47
(D) (1)	-18.0	5054	10732	13502	30471	10182	29268	20289	1.44
(E) (1)	-22.0	8021	13517	14095	39497	15944	35633	23553	1.51
(F) (1)	-25.0	10075	13032	17645	47378	22523	40752	24855	1.64
(G) (1)	-36.0	19971	14849	24450	84324	51095	59270	33229	1.78

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F. CENTER OF STRATUM					C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM					FRICTION ANGLE DEGREES
		VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	
1	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
2	CH	100	109	100	100	100	900	900	900	900	500	900	900	900	900	500	0
3	CH	100	74	100	100	100	900	300	900	900	500	900	300	900	900	500	0
4	CH	76	74	76	76	76	300	300	300	300	300	300	300	300	300	300	0
5	CH	76	74	76	76	76	300	300	300	300	300	300	300	300	300	300	0
6	CH	96	74	96	96	96	215	300	215	215	215	215	300	215	215	215	0
7	CH	102	101	102	102	102	215	430	215	215	215	215	430	215	215	215	0
8	CH	99	101	99	99	99	355	430	355	355	215	355	430	355	355	215	0
9	CH	99	101	99	99	99	355	600	355	355	215	355	600	355	355	215	0
10	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
ø -- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS

PLATE: 110

INPUT DATA FILENAME: TJP4

GENERAL NOTES:
CLASSIFICATION, STRATIFICATION, SHEAR STRENGTH AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS. SEE BORING DATA PLATES.

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

GENERAL NOTES

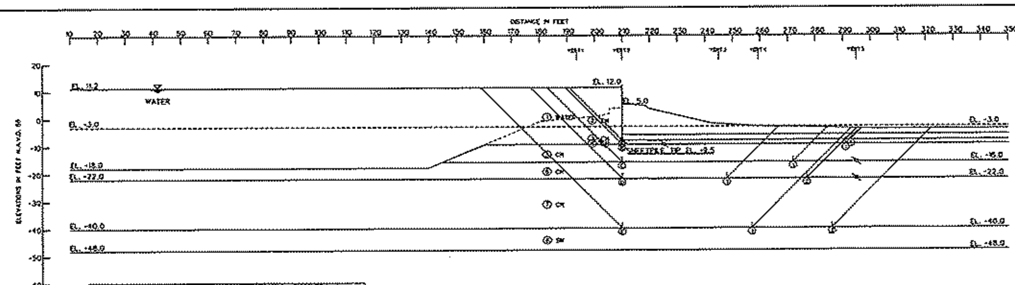
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
◇ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
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: SEE TABLE 1-H IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

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	①	-3.0	7	11583	4172	11499	950	15762	10549	1.49
②	①	-9.5	6	10664	4414	13370	1742	15106	11628	1.30
③	③	-16.0	3644	14150	8304	22456	7787	26295	15683	1.68
④	④	-22.0	7371	13300	15168	34115	16013	35839	18102	1.95
⑤	⑦	-22.0	7371	22603	10321	34115	15865	40495	20250	2.00
⑥	①	-40.0	23000	21150	25210	95187	64749	69360	31438	2.21
⑦	⑦	-40.0	23000	31727	16410	96187	61210	71137	34977	2.03

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F.										FRICTION ANGLE DEGREES
							CENTER OF STRATUM					BOTTOM OF STRATUM					
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	
①	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
②	CH	117	117	117	117	109	900	900	900	900	500	900	900	900	900	500	0
③	CH	117	113	117	117	109	900	500	900	900	500	900	400	900	900	500	0
④	CH	77	113	77	77	77	70	500	70	70	70	70	400	70	70	70	0
⑤	CH	77	80	77	77	77	200	500	200	200	200	200	350	200	200	200	0
⑥	CH	102	93	102	102	100	350	350	350	350	200	350	350	350	350	200	0
⑦	CH	103	104	103	103	100	450	450	450	450	200	450	450	450	450	200	0
⑧	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
◇ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
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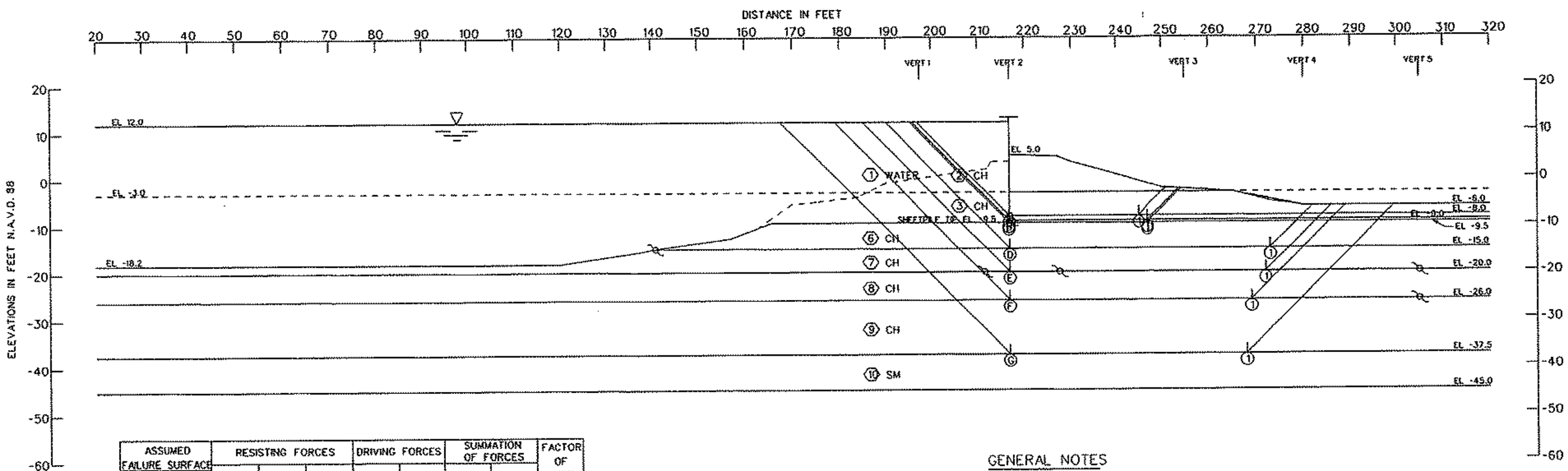
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT REFERS TO PASSIVE WEDGE

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

17TH STREET CANAL
SLOPE STABILITY ANALYSIS

PLATE: 111

INPUT DATA FILENAME: T.PS



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	0	10003	5740	12498	2354	15743	10144	1.55
Ⓑ ①	-9.0	-23	10660	6238	13779	2764	16875	11015	1.53
Ⓒ ①	-9.5	0	10660	6522	14445	3132	17182	11313	1.52
Ⓓ ①	-15.0	4214	15000	5920	23059	4192	25134	18867	1.33
Ⓔ ①	-20.0	7619	14427	7920	33029	9639	29966	23390	1.28
Ⓕ ①	-26.0	10650	18810	12480	48217	20066	41940	28151	1.49
Ⓖ ①	-37.5	18686	20400	21464	88260	49232	60550	39028	1.55

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F. CENTER OF STRATUM					C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM					FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	
①	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
②	CH	109	110	110	110	110	500	500	500	500	500	500	500	500	500	500	0
③	CH	109	110	110	110	110	500	400	500	500	500	500	400	500	500	500	0
④	CH	80	110	80	80	80	280	400	280	280	280	280	400	280	280	280	0
⑤	CH	80	80	80	80	80	280	400	280	280	280	280	400	280	280	280	0
⑥	CH	80	80	80	80	80	280	400	280	280	280	280	400	280	280	280	0
⑦	CH	112	80	112	112	112	200	400	200	200	200	200	400	200	200	200	0
⑧	CH	100	101	100	100	100	380	330	380	380	200	380	330	380	380	200	0
⑨	CH	100	101	100	100	100	400	400	400	400	200	400	400	400	400	200	0
⑩	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- ✗ -- CROSSOVER POINT
- ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
- C -- UNIT COHESION, P.S.F.
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- B -- AS A SUBSCRIPT REFERS TO CENTRAL BLOCK
- P -- AS A SUBSCRIPT REFERS TO PASSIVE WEDGE

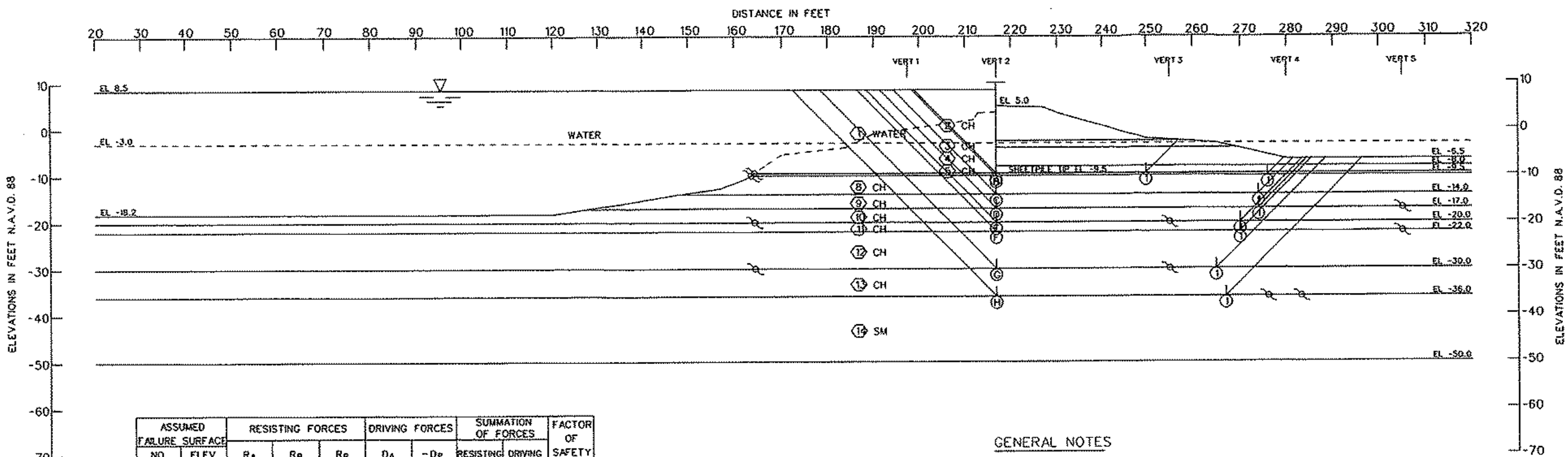
FACTOR OF SAFETY $= \dfrac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 6

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

DESIGNED BY: F.V. DRAWN BY: C.R. CHECKED BY: F.Y. PLOT SCALE: 20 PLOT DATE: 21 MAR 07 DATE: JAN 2007

PLATE: 112



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	-9.5	0	9268	4677	10127	2456	14016	7671	1.82
Ⓑ ①	-10.0	280	11348	2013	10699	637	13641	10062	1.36
Ⓒ ①	-14.0	2420	12112	3272	15984	2778	17804	13206	1.35
Ⓓ ①	-17.0	3912	12948	4406	20916	5334	21256	15582	1.36
Ⓔ ①	-20.0	5351	13848	5906	26836	9404	25105	17432	1.44
Ⓕ ①	-22.0	6479	14956	6906	31326	12220	28341	19106	1.48
Ⓖ ①	-30.0	12193	23221	15386	53551	28712	50800	24839	2.05
Ⓗ ①	-36.0	18031	25313	21676	74610	43793	65020	30817	2.11

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F. CENTER OF STRATUM					C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM					FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	
①	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
②	CH	109	115	109	109	109	500	900	500	500	500	500	900	500	500	500	0
③	CH	109	104	109	109	109	500	490	500	500	500	500	490	500	500	500	0
④	CH	80	104	80	80	80	280	490	280	280	280	280	490	280	280	280	0
⑤	CH	80	76	80	80	80	280	280	280	280	280	280	280	280	280	280	0
⑥	CH	80	76	80	80	80	280	280	280	280	280	280	280	280	280	280	0
⑦	CH	104	76	104	104	104	150	280	150	150	150	150	280	150	150	150	0
⑧	CH	104	76	104	104	104	164	280	164	164	164	178	280	178	178	178	0
⑨	CH	104	104	104	104	104	189	280	189	189	189	200	280	200	200	200	0
⑩	CH	100	104	100	100	100	250	280	250	250	200	250	280	250	250	200	0
⑪	CH	100	102	100	100	100	250	329	250	250	200	250	338	250	250	200	0
⑫	CH	100	102	100	100	100	530	375	530	530	200	530	41	530	530	200	0
⑬	CH	100	102	100	100	100	530	438	530	530	200	530	465	530	530	200	0
⑭	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

⬡ -- STRATUM NUMBER
○ -- WEDGE NUMBER
-- CROSSOVER POINT
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 $= \dfrac{R_A + R_B + R_P}{D_A - D_P}$

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

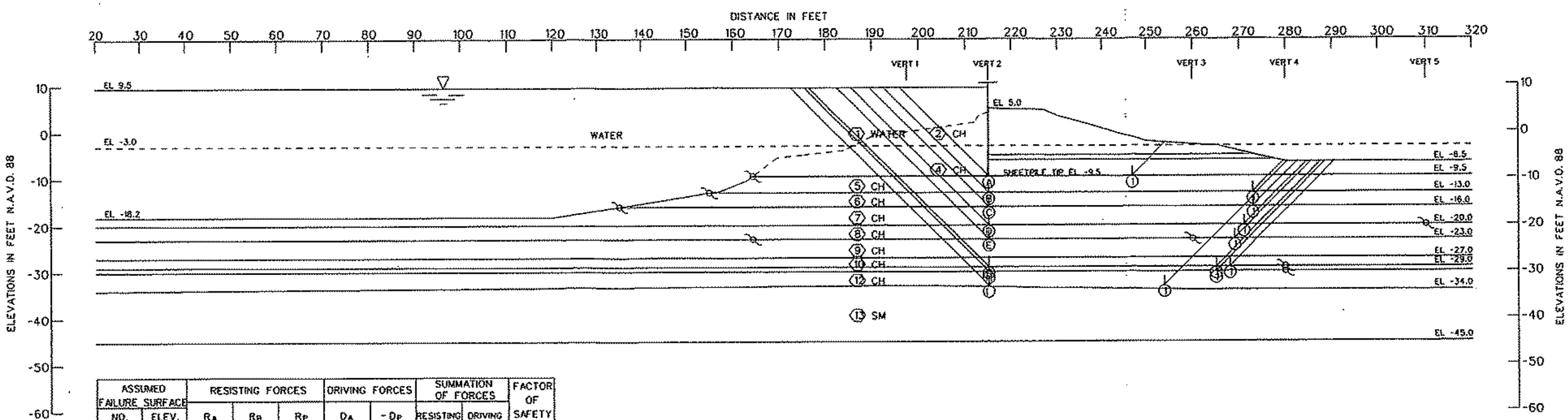
SLOPE STABILITY ANALYSIS

TENSION CRACK CONDITIONS
REACH 7

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

DESIGNED BY: F.V. DRAWN BY: C.R. CHECKED BY: F.V.	PLOT SCALE: 20	PLOT DATE: 21 MAR 07	CAD FILE:
	DATE: JAN 2007		FILE NO.

PLATE: 113



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	-9.5	0	9600	5824	11290	2929	15184	8361	1.84
Ⓑ ①	-13.0	2100	15270	3957	15965	2211	21327	13754	1.55
Ⓒ ①	-16.0	3869	13470	5340	20736	4236	22679	16500	1.37
Ⓓ ①	-20.0	5565	12990	7260	28452	8743	25815	19709	1.31
Ⓔ ①	-23.0	6943	17550	9660	35370	13392	34153	21978	1.55
Ⓕ ①	-29.0	11150	19175	14460	52083	24749	44785	27314	1.64
Ⓖ ①	-29.0	11178	19625	14796	52062	25730	45599	26332	1.73
Ⓗ ①	-30.0	11813	19625	15746	55212	27928	47184	27284	1.73
Ⓘ ①	-33.0	14009	16628	19692	65281	39568	50329	25713	1.96

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.					C - UNIT COHESION - P.S.F. CENTER OF STRATUM					C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM					FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	
①	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
②	CH	109	110	109	109	109	500	600	500	500	500	500	600	500	500	500	0
③	CH	109	80	109	109	109	500	300	500	500	500	500	300	500	500	500	0
④	CH	80	80	80	80	80	300	300	300	300	300	300	300	300	300	300	0
⑤	CH	80	80	80	80	80	300	300	300	300	300	300	300	300	300	300	0
⑥	CH	103	80	103	103	103	240	300	240	240	240	240	300	240	240	240	0
⑦	CH	103	104	103	103	103	240	220	240	240	200	240	220	240	240	200	0
⑧	CH	101	104	101	101	101	400	220	400	400	200	400	220	400	400	200	0
⑨	CH	101	102	101	101	101	400	310	400	400	200	400	310	400	400	200	0
⑩	CH	100	102	100	101	101	520	310	520	400	200	520	310	520	400	200	0
⑪	CH	100	102	100	101	101	520	240	520	400	200	520	240	520	400	200	0
⑫	CH	100	102	100	101	101	670	240	670	400	200	670	240	670	400	200	0
⑬	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

◇-- STRATUM NUMBER
○-- WEDGE NUMBER
-- CROSSOVER POINT
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

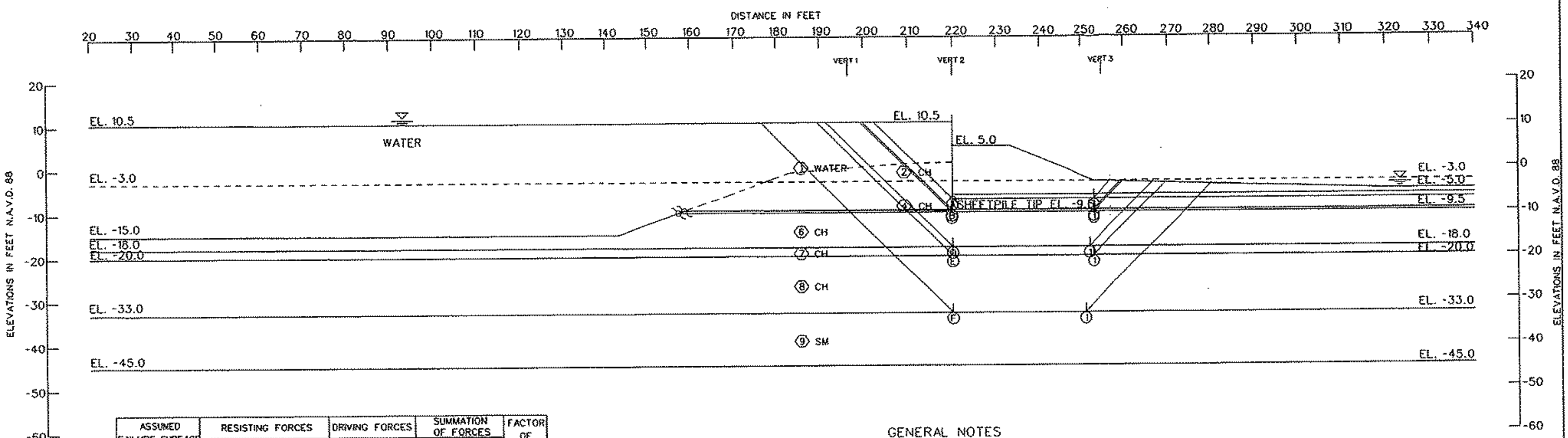
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 8

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

DESIGNED BY: F.Y.	PLOT SCALE: 20	PLOT DATE: 21 MAR 07	CADD FILE:	
DRAWN BY: C.R.			FILE NO.	
CHECKED BY: F.Y.	DATE: JAN 2007			

PLATE: 114



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	-7.0	43	9178	4646	9568	917	13867	8651	1.60
Ⓑ ①	-9.5	0	9220	5134	12500	2389	14354	10111	1.42
Ⓒ ①	-10.0	428	8515	5214	13138	2762	14157	10376	1.36
Ⓓ ①	-18.0	5837	8310	6623	26331	12358	20770	13973	1.49
Ⓔ ①	-20.0	6950	8980	7107	30492	15697	23037	14795	1.56
Ⓕ ①	-33.0	12882	10168	13196	68210	47795	36246	20415	1.78

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. CENTER OF STRATUM			C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	118	123	118	600	900	600	600	900	600	0
③	CH	118	106	118	600	430	600	600	430	600	0
④	CH	108	106	108	105	430	105	105	430	105	0
⑤	CH	108	106	108	105	430	105	105	430	105	0
⑥	CH	108	81	108	105	390	105	105	390	105	0
⑦	CH	108	81	108	140	390	140	140	390	140	0
⑧	CH	100	101	100	250	390	250	250	390	250	0
⑨	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

◇ -- STRATUM NUMBER
○ -- WEDGE NUMBER
-- CROSSOVER POINT
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

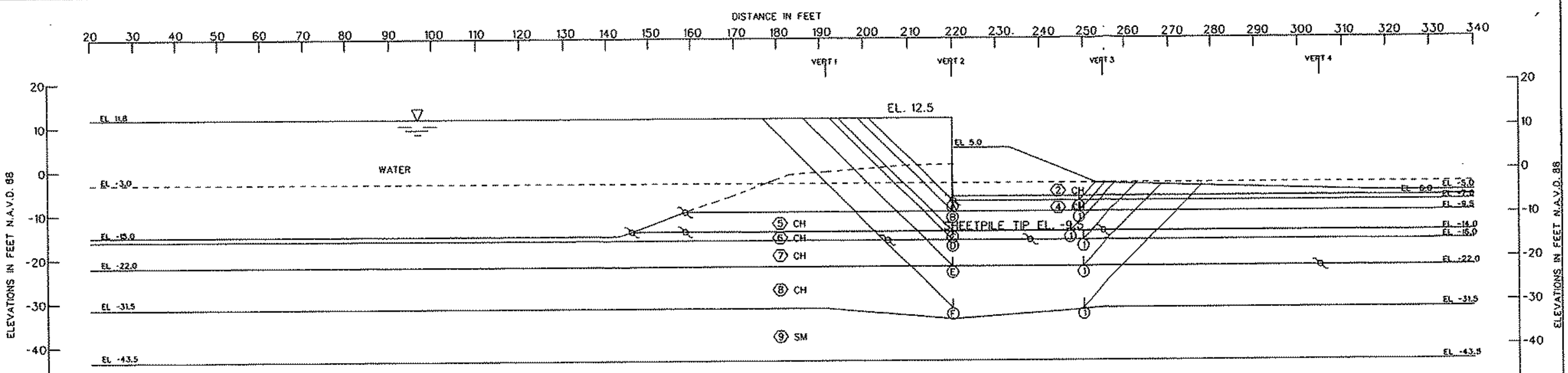
$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 9

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

DESIGNED BY: F.V. | DRAWN BY: K.R. | CHECKED BY: F.V./C.R. | PLOT SCALE: 20 | PLOT DATE: 28 MAR 07 | DATE: MAR 2007 | CADD FILE: | FILE NO.

PLATE: 115



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	-7.0	-49	9067	4218	10887	1214	13236	9673	1.37
Ⓑ ①	-9.5	117	8353	5979	14006	2990	14449	11016	1.31
Ⓒ ①	-14.0	2572	8353	9115	21094	6621	20040	14473	1.38
Ⓓ ①	-16.0	3923	10308	10648	24908	7943	24879	16965	1.47
Ⓔ ①	-22.0	8410	10826	14495	38623	16354	33731	22269	1.51
Ⓕ ①	-31.5	16987	13885	21940	67326	36910	52812	30416	1.74

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.				C - UNIT COHESION - P.S.F. CENTER OF STRATUM				C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM				FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	
①	WATER	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0
②	CH	108	112	108	108	520	750	520	520	520	750	520	520	0
③	CH	108	108	108	108	520	265	520	520	520	265	520	520	0
④	CH	76	108	76	76	380	265	380	380	380	265	380	380	0
⑤	CH	76	108	76	76	380	265	380	380	380	265	380	380	0
⑥	CH	76	101	76	76	380	319	380	380	380	328	380	380	0
⑦	CH	108	101	108	100	330	356	330	200	330	384	330	200	0
⑧	CH	100	101	100	100	420	440	420	200	420	495	420	200	0
⑨	SM	122	122	122	122	0	0	0	0	0	0	0	0	30

NOTES

- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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

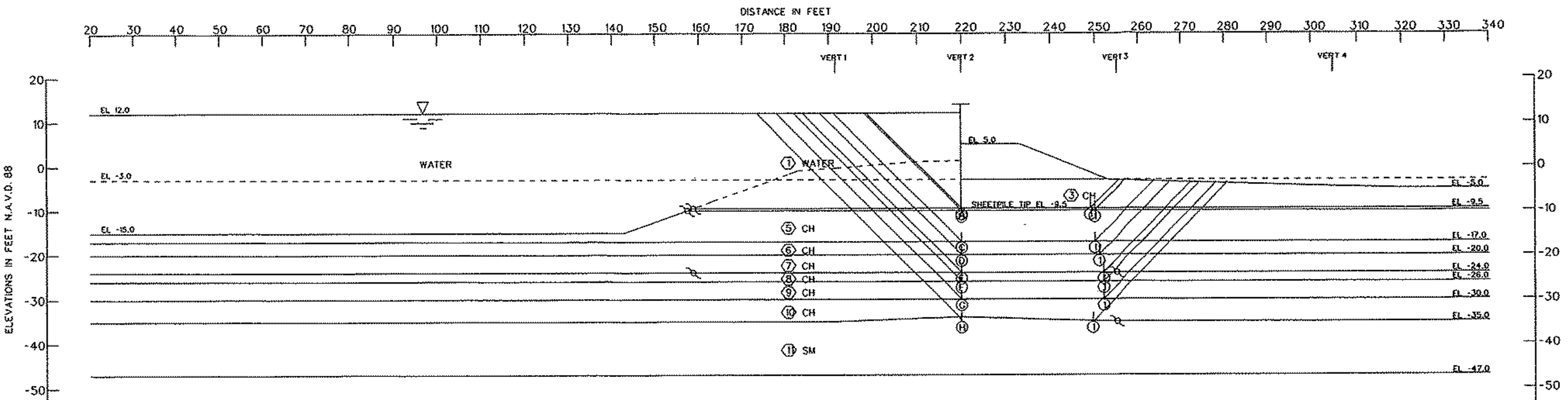
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 10

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

DESIGNED BY: F.V. DRAWN BY: C.R. CHECKED BY: F.V. | PLOT SCALE: 20 | PLOT DATE: 21 MAR 07 | DATE: JAN 2007

PLATE: 116



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	-9.5	0	9139	6509	14444	2621	15747	11823	1.32
Ⓑ ①	-10.0	340	8914	6710	15130	2834	15964	12296	1.30
Ⓒ ①	-17.0	4982	8914	10417	27616	10731	24313	16885	1.44
Ⓓ ①	-20.0	6895	8206	11748	34617	15585	26849	19032	1.41
Ⓔ ①	-24.0	9349	8393	13503	45486	23540	31245	21946	1.42
Ⓕ ①	-26.0	10523	11172	14141	51574	28149	35836	23425	1.53
Ⓖ ①	-30.0	13920	13366	15422	64967	38524	42708	26443	1.62
Ⓗ ①	-35.0	18244	34870	18964	83931	54093	72078	29838	2.42

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.				C - UNIT COHESION - P.S.F. CENTER OF STRATUM				BOTTOM OF STRATUM				FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	
①	WATER	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0
②	CH	110	124	110	110	500	900	500	500	500	900	500	500	0
③	CH	110	82	110	110	500	580	500	500	500	580	500	500	0
④	CH	110	110	110	110	280	340	280	280	280	340	280	280	0
⑤	CH	110	110	110	110	280	340	280	280	280	340	280	280	0
⑥	CH	110	110	110	110	240	340	240	240	240	340	240	240	0
⑦	CH	100	110	100	100	240	340	240	240	240	340	240	240	0
⑧	CH	100	110	100	100	170	340	170	170	170	340	170	170	0
⑨	CH	100	100	100	100	170	500	170	170	170	500	170	170	0
⑩	CH	100	100	100	100	320	500	320	320	320	500	320	320	0
⑪	SM	122	122	122	122	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- ↗ -- CROSSOVER POINT
- 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

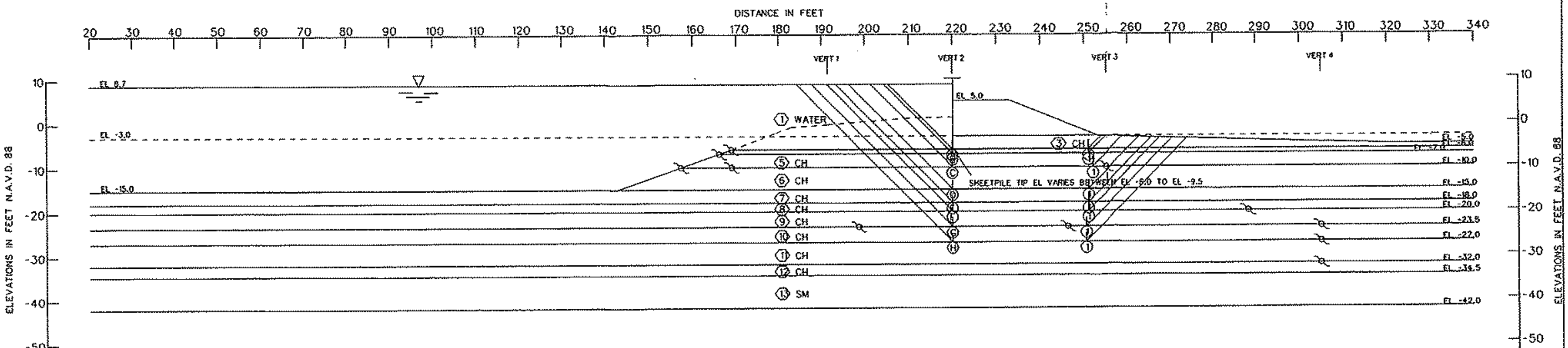
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 11

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

DESIGNED BY: F.Y.	PLOT SCALE: 20	PLOT DATE: 27 MAR 07	CAD FILE: T.PLOCK
DRAWN BY: C.R.			FILE NO.
CHECKED BY: F.Y.	DATE: JAN 2007		

PLATE: 117



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	-6.0	0	9260	2092	6745	550	11352	6195	1.83
Ⓑ ①	-7.0	504	7338	2788	7718	911	10630	6807	1.56
Ⓒ ①	-10.0	2018	7561	4082	11278	2431	13661	8847	1.54
Ⓓ ①	-15.0	4954	5956	6225	18981	6796	17135	12185	1.41
Ⓔ ①	-18.0	5910	5956	7427	24644	10339	19293	14305	1.35
Ⓕ ①	-20.0	6565	5956	8265	28927	13141	20786	15786	1.32
Ⓖ ①	-23.5	9133	8420	9981	37370	19052	27534	18318	1.50
Ⓗ ①	-27.0	10809	8462	11776	46992	26072	31047	20920	1.48

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.				C - UNIT COHESION - P.S.F.								FRICTION ANGLE DEGREES
						CENTER OF STRATUM				BOTTOM OF STRATUM				
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	
1	WATER	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0
2	CH	104	101	104	104	360	660	360	360	360	660	360	360	0
3	CH	104	108	104	104	360	250	360	360	360	250	360	360	0
4	CH	104	108	104	104	360	250	360	360	360	250	360	360	0
5	CH	84	108	84	84	220	250	220	220	220	250	220	220	0
6	CH	84	80	84	84	220	300	220	220	220	300	220	220	0
7	CH	84	105	84	84	220	170	220	220	220	170	220	220	0
8	CH	100	105	100	100	220	170	220	220	220	170	220	220	0
9	CH	100	102	100	100	240	380	240	200	260	380	260	200	0
10	CH	100	100	100	100	280	260	280	200	300	260	300	200	0
11	CH	100	100	100	100	327	530	327	200	355	530	355	200	0
12	CH	100	100	100	100	370	530	370	200	385	530	385	200	0
13	SM	122	122	122	122	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

- ⬡ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- ⌀ -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

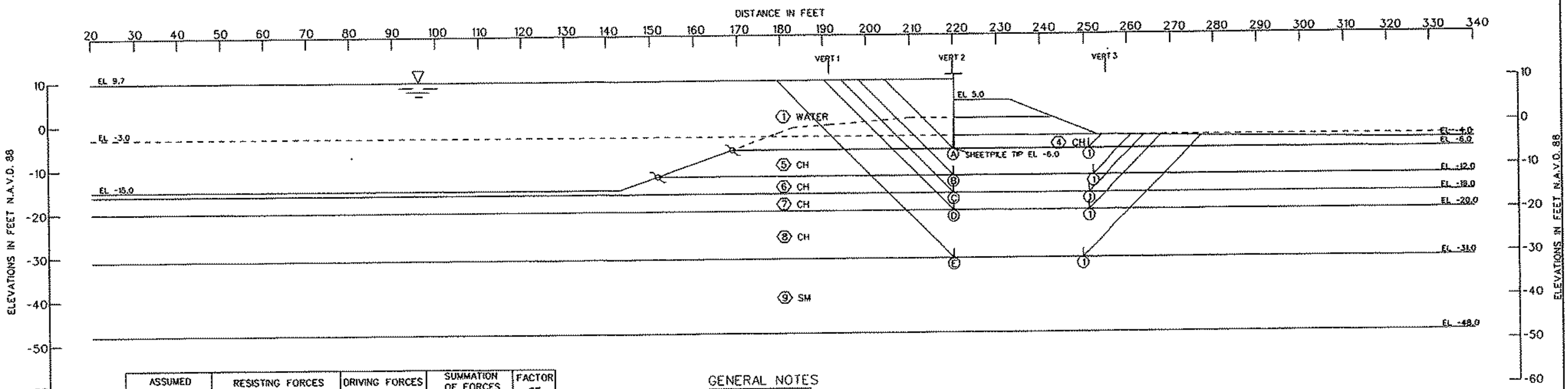
LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

SLOPE STABILITY ANALYSIS

TENSION CRACK CONDITIONS
REACH 12

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

DESIGNED BY: F.V.	PLOT SCALE: 20	PLOT DATE: 22 MAR 07	CADD FILE: [illegible]
DRAWN BY: C.R.	DATE: JAN 2007		FILE NO.
CHECKED BY: F.V.			



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	-6.0	58	9379	1169	7696	540	10606	7156	1.48
Ⓑ ①	-12.0	4522	7844	3198	15528	4025	15564	11503	1.35
Ⓒ ①	-16.0	6484	7652	4677	22868	8469	18813	14399	1.31
Ⓓ ①	-20.0	8570	8688	6186	31832	14396	23444	17436	1.34
Ⓔ ①	-31.0	14573	10688	11350	64700	39026	36611	25674	1.43

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT. 1	VERT. 2	VERT. 3	C - UNIT COHESION - P.S.F. CENTER OF STRATUM VERT. 1	VERT. 2	VERT. 3	BOTTOM OF STRATUM VERT. 1	VERT. 2	VERT. 3	FRICTION ANGLE DEGREES
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	110	109	110	500	900	500	500	900	500	0
③	CH	110	109	110	500	600	500	500	600	500	0
④	CH	100	109	100	180	400	180	180	400	180	0
⑤	CH	100	109	100	180	400	180	180	400	180	0
⑥	CH	100	105	100	180	300	180	180	300	180	0
⑦	CH	100	103	100	190	334	190	190	352	190	0
⑧	CH	100	103	100	240	384	240	290	415	290	0
⑨	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

- ◯ -- STRATUM NUMBER
- ◯ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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 $= \dfrac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

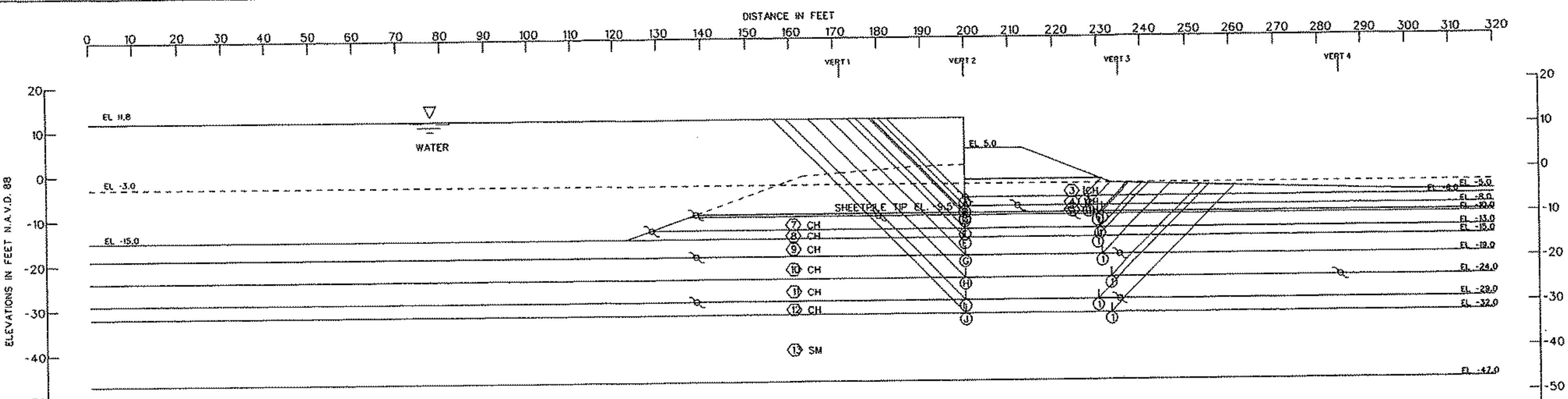
SLOPE STABILITY ANALYSIS

TENSION CRACK CONDITIONS
REACH 13

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

DESIGNED BY: F.V. | DRAWN BY: C.R. | CHECKED BY: F.V. | PLOT SCALE: 20 | PLOT DATE: 22 MAR 07 | DATE: JAN 2007 | FILE NO.

PLATE: 119



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	-6.0	-29	15777	5864	9890	1105	21612	8785	2.46
Ⓑ ①	-8.0	-9	13022	7786	12237	1854	20799	10383	2.00
Ⓒ ①	-9.5	132	15870	8735	14165	2274	24737	11891	2.08
Ⓓ ①	-10.0	755	9989	9055	14844	2741	19799	12103	1.64
Ⓔ ①	-13.0	2528	7898	10937	19473	5248	21363	14225	1.50
Ⓕ ①	-15.0	3166	5914	12253	23081	7523	21333	15558	1.37
Ⓖ ①	-19.0	4573	6160	13842	31542	12922	24575	18620	1.32
Ⓗ ①	-24.0	7875	9278	15586	44382	21780	32739	22602	1.45
Ⓘ ①	-29.0	13207	14786	20035	59702	33732	48028	25970	1.85
Ⓙ ①	-32.0	17168	18649	21832	70093	41306	57649	28787	2.00

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.				C - UNIT COHESION - P.S.F. CENTER OF STRATUM				C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM				FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	
1	WATER	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0
2	CH	105	110	105	100	830	900	830	500	830	900	830	500	0
3	CH	105	112	105	100	830	430	830	500	830	430	830	500	0
4	CH	105	112	105	100	830	430	830	500	830	430	830	500	0
5	CH	100	110	100	100	200	760	200	200	200	760	200	200	0
6	CH	100	110	100	100	200	760	200	200	200	760	200	200	0
7	CH	100	105	100	100	400	300	400	300	400	300	400	300	0
8	CH	100	105	100	100	400	150	400	300	400	150	400	300	0
9	CH	100	105	100	100	260	150	260	200	260	150	260	200	0
10	CH	100	100	100	100	260	300	260	200	260	300	260	200	0
11	CH	100	102	100	100	470	510	470	200	470	510	470	200	0
12	CH	100	102	100	100	470	650	470	200	470	650	470	200	0
13	SM	122	122	122	122	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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 PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

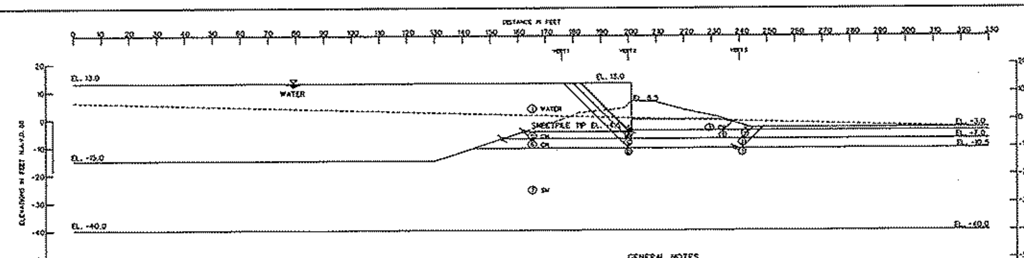
SLOPE STABILITY ANALYSIS

TENSION CRACK CONDITIONS
REACH 14

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

DESIGNED BY: F.V./D.R. DRAWN BY: K.D. CHECKED BY: F.V. | PLOT SCALE: 20 | PLOT DATE: 1 MAY 07 | DATE: MAY 2007 | FILE NO.

PLATE: 120



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	
[illegible] ①	-4.0	-91	15500	1874	9033	116	16580	8917	2.08
[illegible] ①	-4.5	0	18559	5183	9370	978	23842	8392	2.77
[illegible] ①	-7.0	2000	12700	3900	12639	1032	18100	11607	1.56
[illegible] ①	-10.5	4598	12144	5300	18057	3127	22142	14925	1.48

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	112	112	112	750	850	750	750	850	750	0
③	CH	112	107	112	750	600	750	750	400	750	0
④	CH	105	107	105	400	600	600	400	600	600	0
⑤	CH	105	107	105	400	400	600	400	600	600	0
⑥	CH	98	107	98	200	400	200	200	600	200	0
⑦	SW	122	122	122	0	0	0	0	0	0	30

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
Ⅴ -- 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

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

17th STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS

PLATE: 121

INPUT DATA FILENAME: [illegible]

01-MAY-07

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

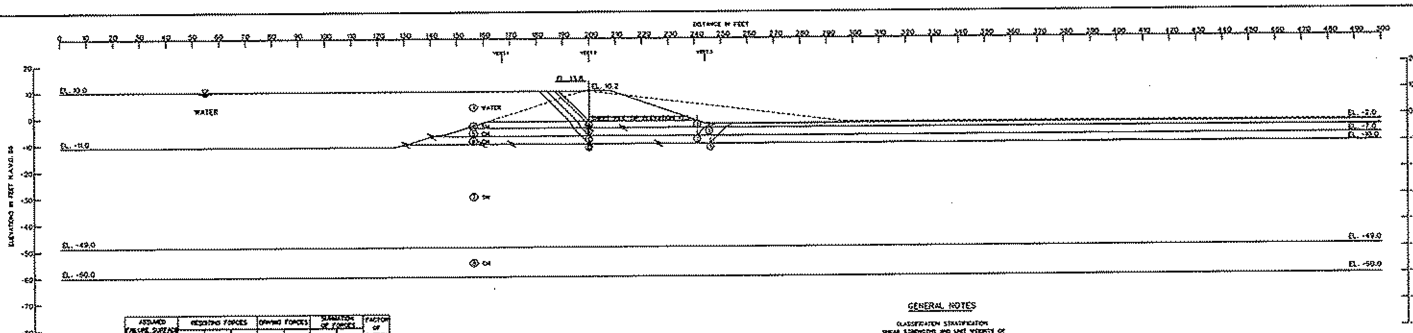
SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
Ⅴ -- 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 = (R_A + R_B + R_P) / (D_A - D_P)

DISTANCE IN FEET



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	
[illegible]	-1.5	79	8063	0	4137	0	8142	4137	1.97
[illegible]	-4.0	127	9607	0	4316	137	9734	4179	[illegible]
[illegible]	-7.0	2524	12579	2400	9866	1349	17503	8517	2.05
[illegible]	-10.0	4565	11910	3000	14378	3094	19479	11284	1.73

STRATUM NO.	SOIL TYPE	WET UNIT WEIGHT P.C.F.			C = UNIT COHESION P.S.F. CENTER OF STRATUM			BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	112	112	112	250	350	250	250	350	250	0
3	SM	122	122	122	0	0	0	0	0	0	30
4	SM	122	122	122	0	0	0	0	0	0	30
5	CH	103	107	103	400	500	400	400	400	400	0
6	CH	98	107	95	200	400	200	200	100	200	0
7	SM	122	122	122	0	0	0	0	0	0	30
8	CH	107	107	107	1000	1000	1000	1000	1000	1000	0

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

GENERAL NOTES

CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
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

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

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS

PLATE: 122

INPUT DATA FILENAME: T32R450

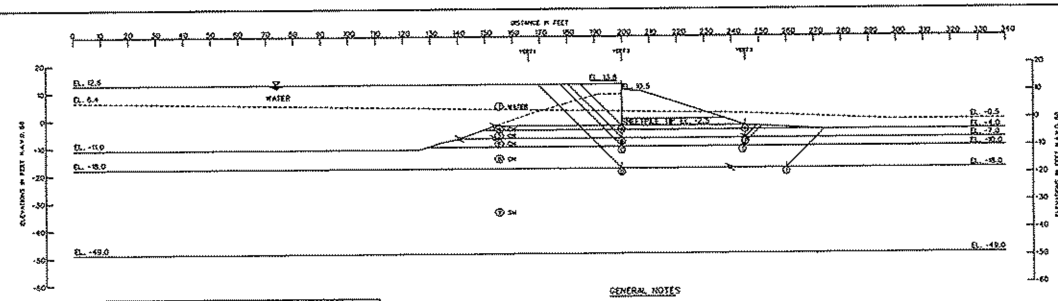
GENERAL NOTES

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

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

PLATE 122 - [illegible].DGN 3/7/2009 10:32:50 AM



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 ①	-2.5	15	13540	1032	7473	-8	14587	7481	1.95
② ①	-7.0	3718	13500	4317	12459	1048	21533	11613	1.87
③ ①	-10.0	6156	15096	3370	17238	2894	26622	14322	1.86
④ ①	-18.0	13337	19033	7355	34541	10371	39723	24170	1.64

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	112	110	112	750	650	750	750	650	750	0
③	CH	112	107	112	750	400	750	750	400	750	0
④	CH	112	107	112	750	400	750	750	400	750	0
⑤	CH	105	107	105	400	400	400	400	400	400	0
⑥	CH	98	107	98	200	400	200	200	400	200	0
⑦	CH	98	107	98	200	450	200	200	450	200	0
⑧	CH	96	107	96	235	450	235	270	450	270	0
⑨	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
⊅ -- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

17th STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS

PLATE: 123

INPUT DATA FILENAME: T555.txt

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

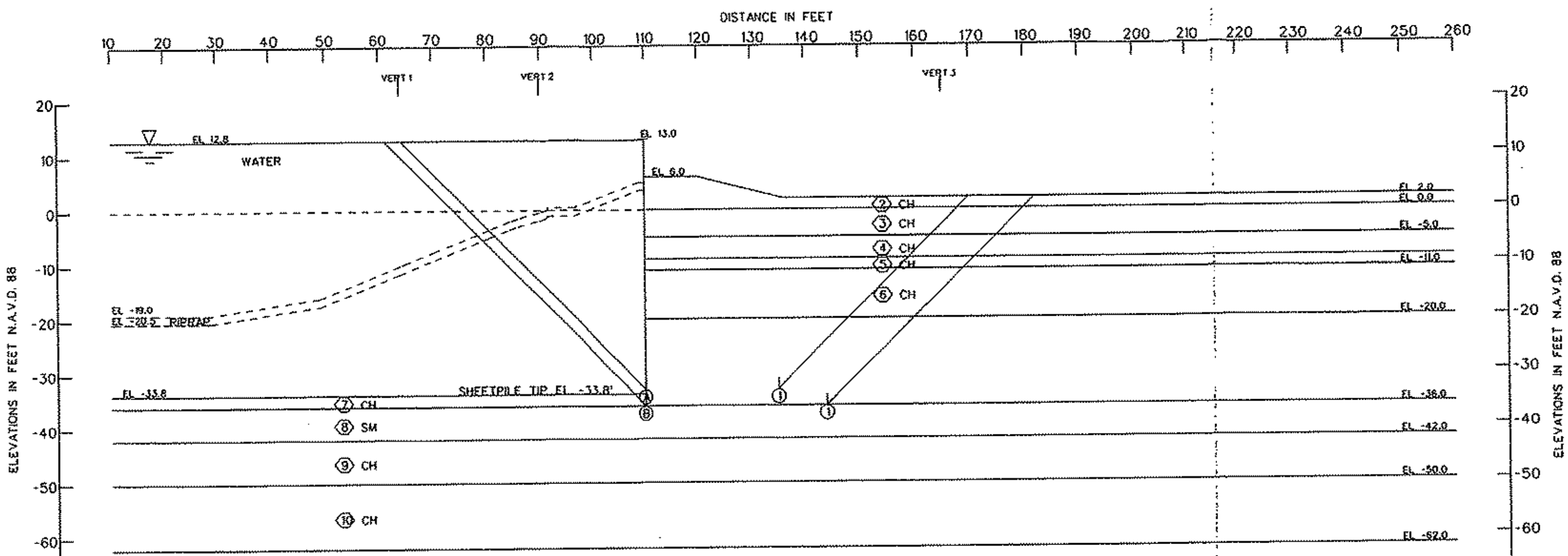
○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
⊅ -- CROSSOVER POINT
φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
▽ -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS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

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

U.S. ARMY ENGINEER DISTRICT
NEW ORLEANS

01-MAY-07

PLATE 123 - MSR.DGN 5/27/2008 10:22:51 AM



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	-33.0	121	8500	24240	65547	61942	32861	3605	9.12
Ⓑ ①	-36.0	1496	11560	26280	74528	72938	39336	1590	24.74

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	110	110	110	500	500	500	500	500	500	0
③	CH	100	100	100	175	500	500	175	500	500	0
④	CH	76	100	100	175	280	280	175	280	280	0
⑤	CH	76	100	100	380	280	280	380	280	280	0
⑥	CH	100	100	100	150	280	280	150	280	280	0
⑦	CH	100	100	100	300	340	340	300	340	340	0
⑧	SM	122	122	122	0	0	0	0	0	0	30
⑨	CH	100	100	100	150	485	485	150	500	500	0
⑩	CH	108	100	100	610	595	595	610	690	690	0

GENERAL NOTES

CLASSIFICATION STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 3 in the Report for reach stationing, boring and testing information.

NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- ⌿ -- CROSSOVER POINT
- 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 PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

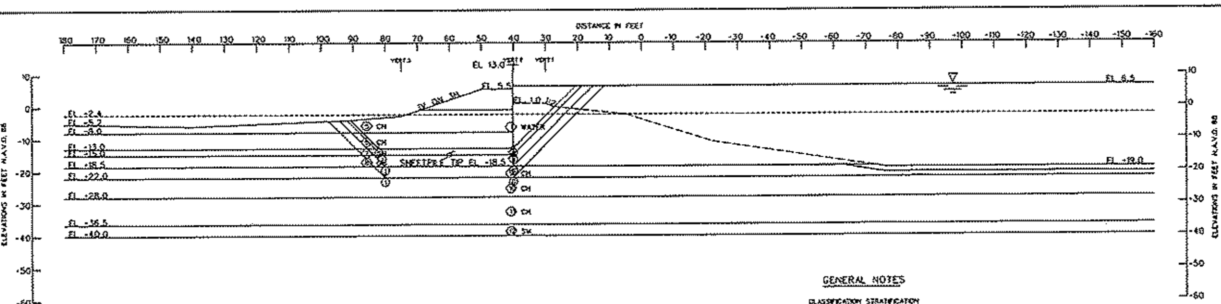
SLOPE STABILITY ANALYSIS

TENSION CRACK CONDITIONS
REACH 1B

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

DESIGNED BY: C.R. DRAWN BY: C.R. CHECKED BY: F.V. PLOT SCALE: 20 PLOT DATE: 26 MAR 07 DATE: MAR 2007

PLATE: 124



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⟩	-13.0	-52	8823	5584	11978	4123	14355	7755	1.85
Ⓑ ⟨1⟩	-15.0	-51	8460	6198	14433	6007	14607	8426	1.73
Ⓒ ⟨1⟩	-18.5	1	8475	7462	19531	10183	15938	9348	1.70
Ⓓ ⟨1⟩	-22.0	2046	11550	9330	25614	15433	22926	10181	2.25

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
⟨1⟩	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
⟨2⟩	RIPRAP	132	132	132	0	0	0	0	0	0	40
⟨3⟩	CH	110	110	110	400	400	400	400	400	400	0
⟨4⟩	CH	116	116	116	600	600	600	600	600	600	0
⟨5⟩	CH	106	103	106	360	430	360	360	430	360	0
⟨6⟩	CH	80	93	80	280	280	280	280	280	280	0
⟨7⟩	CH	93	102	93	360	280	360	360	280	360	0
⟨8⟩	CH	93	102	93	330	240	330	330	240	330	0
⟨9⟩	CH	98	102	98	280	300	280	280	300	280	0
⟨10⟩	CH	98	102	98	300	350	300	300	350	300	0
⟨11⟩	CH	102	102	102	350	350	350	350	350	350	0
⟨12⟩	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

SEE TABLE 3 IN REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

⟨ ⟩ -- STRATUM NUMBER
◯ -- WEDGE NUMBER
$\not\!\!\!/$ -- CROSSOVER POINT
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
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B -- AS A SUBSCRIPT REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT REFERS TO PASSIVE WEDGE

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

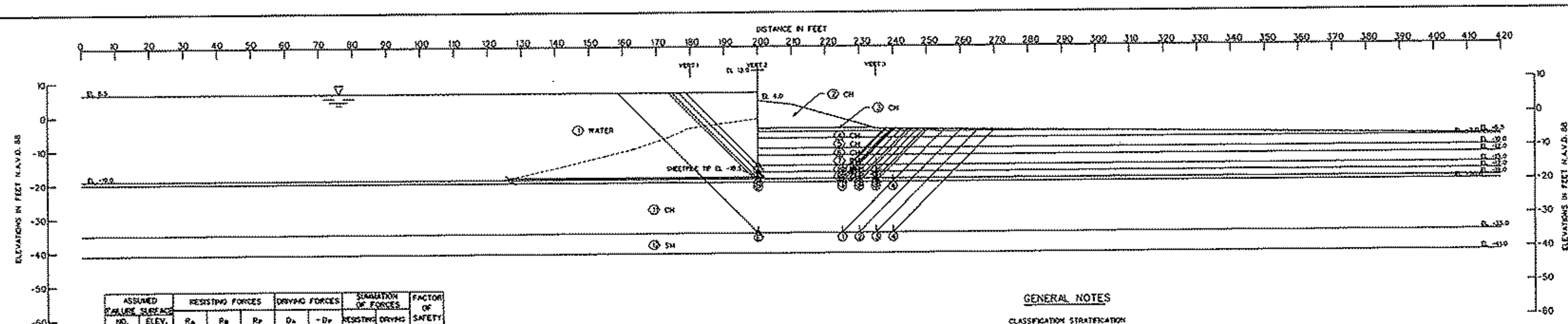
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS

PLATE: 125

INPUT DATA FILENAME: T28

GENERAL NOTES:
CLASSIFICATION, STRATIFICATION, SHEAR STRENGTH AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS. SEE BORING DATA PLATES.

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



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	-15.0	56	5075	6288	14465	6245	11418	8220	1.39
Ⓐ	②	-15.0	56	5565	6713	14465	5712	11834	8753	1.35
Ⓐ	③	-15.0	56	6556	6099	14465	5248	12711	9217	1.38
Ⓑ	①	-17.0	271	4402	7078	17286	9197	11751	8089	1.45
Ⓑ	②	-17.0	271	4849	7007	17286	8463	12127	8823	1.37
Ⓑ	③	-17.0	271	5297	6954	17286	7927	12522	9359	1.34
Ⓑ	④	-17.0	271	6195	6854	17286	7456	13320	9830	1.35
Ⓒ	①	-19.0	439	4402	7733	20397	11845	12574	8552	1.47
Ⓒ	②	-19.0	439	5297	7633	20397	10563	13369	9834	1.36
Ⓒ	③	-19.0	439	6195	7530	20397	10079	14164	10318	1.37
Ⓓ	①	-20.0	543	4689	6073	22071	13321	13305	8750	1.52
Ⓓ	②	-20.0	543	5603	7975	22071	12033	14121	10038	1.41
Ⓓ	③	-20.0	543	6508	7868	22071	11538	14919	10533	1.42
Ⓓ	④	-20.0	543	7408	7757	22071	11431	15708	10640	1.48
Ⓔ	①	-35.0	9757	10925	16303	58982	47040	36985	11942	3.10
Ⓔ	②	-35.0	9757	12933	16106	58982	45620	38796	13362	2.90
Ⓔ	③	-35.0	9757	14879	15995	58982	45040	40631	13942	2.91
Ⓔ	④	-35.0	9757	16794	15884	58982	44832	42435	14150	3.00

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	109	109	109	900	900	900	900	900	900	0
③	CH	100	100	100	900	500	900	900	500	500	0
④	CH	100	100	100	500	500	500	500	500	500	0
⑤	CH	80	100	80	170	225	170	170	225	170	0
⑥	CH	80	90	80	170	200	170	170	200	170	0
⑦	CH	110	90	110	200	200	200	200	200	200	0
⑧	CH	110	114	110	200	175	200	200	175	200	0
⑨	CH	100	114	100	180	175	180	180	175	180	0
⑩	CH	100	100	100	180	184	180	180	193	180	0
⑪	CH	98	100	98	282	322	282	383	470	383	0
⑫	SH	122	122	122	0	0	0	0	0	0	30

NOTE: SEE TABLE 3 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
-- CROSSOVER POINT
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

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

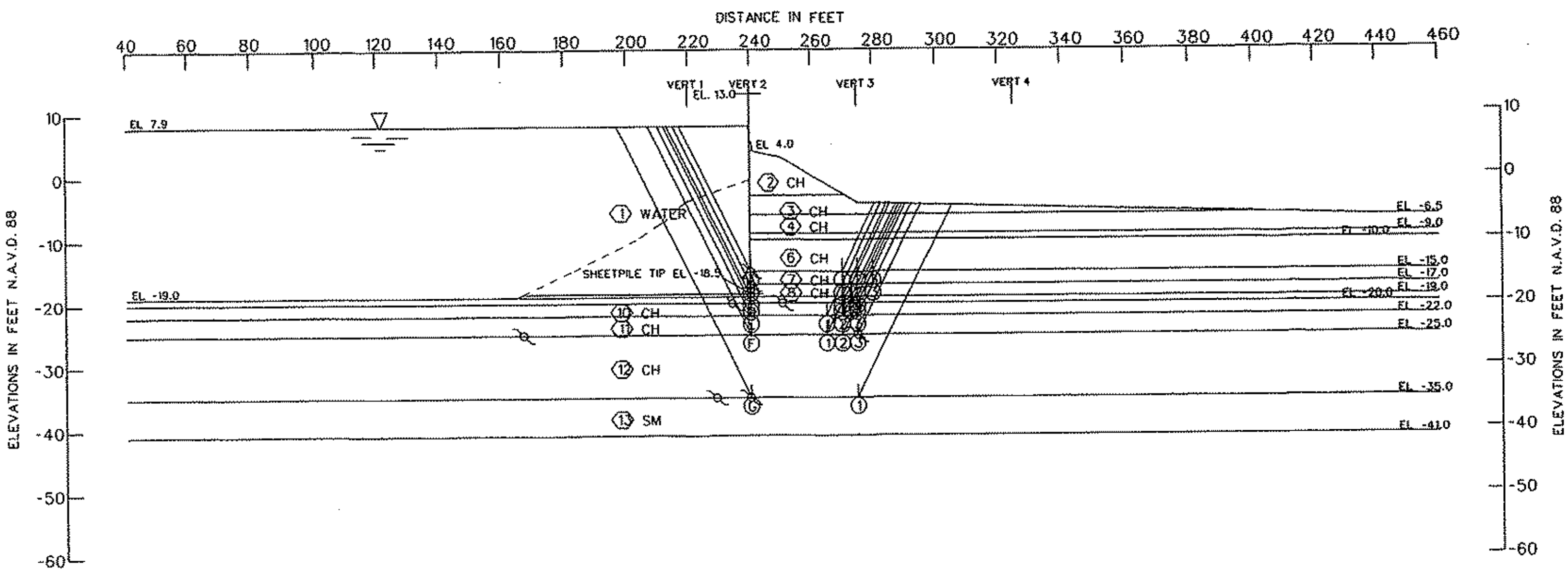
LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 21

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

PLATE: 126

INPUT DATA FILENAME: 0T23

PLATE 126 - ef23.dgn 3/27/2009 10:34:57 AM



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	-15.0	74	7169	7462	16397	5853	14705	10544	1.39
Ⓐ ②	-15.0	74	8019	7157	16397	5388	15250	11009	1.39
Ⓐ ③	-15.0	74	8819	6920	16397	5312	15813	11085	1.43
Ⓑ ①	-17.0	295	7169	8020	19389	7927	15484	11462	1.35
Ⓑ ②	-17.0	295	8019	7701	19389	7461	16015	11928	1.34
Ⓑ ③	-17.0	295	8819	7468	19389	7370	16582	12019	1.38
Ⓒ ①	-19.0	636	7169	8582	22667	10453	16387	12214	1.34
Ⓒ ②	-19.0	636	7691	8357	22667	10082	16684	12585	1.33
Ⓒ ③	-19.0	636	8019	8247	22667	9983	16902	12684	1.33
Ⓓ ①	-20.0	886	6804	8857	24431	11886	16547	12545	1.32
Ⓓ ②	-20.0	886	7326	8626	24431	11515	16838	12916	1.30
Ⓓ ③	-20.0	886	7654	8520	24431	11414	17060	13017	1.31
Ⓔ ①	-22.0	1781	6530	10324	28282	16305	18635	11977	1.56
Ⓔ ②	-22.0	1781	8034	9936	28282	15083	19751	13199	1.50
Ⓔ ③	-22.0	1781	9602	9699	28282	14600	21082	13682	1.54
Ⓕ ①	-25.0	3189	6530	11864	34881	21882	21583	12999	1.66
Ⓕ ②	-25.0	3189	8034	11656	34881	20648	22879	14233	1.61
Ⓕ ③	-25.0	3189	9602	11434	34881	20138	24225	14743	1.64
Ⓖ ①	-35.0	11415	13603	16934	63427	44941	41952	18486	2.27

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.				C - UNIT COHESION - P.S.F.								FRICTION ANGLE DEGREES
						CENTER OF STRATUM				BOTTOM OF STRATUM				
		VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 1	VERT. 2	VERT. 3	VERT. 4	
①	WATER	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0
②	CH	105	105	105	105	900	900	900	500	900	900	900	500	0
③	CH	105	108	105	105	900	500	900	500	900	500	900	500	0
④	CH	100	108	100	100	300	500	300	300	300	500	300	300	0
⑤	CH	75	108	75	75	220	500	220	220	220	500	220	220	0
⑥	CH	75	75	75	75	220	300	220	220	220	300	220	220	0
⑦	CH	114	75	114	114	160	300	160	160	160	300	160	160	0
⑧	CH	114	110	114	114	160	300	160	160	160	300	160	160	0
⑨	CH	114	110	114	114	160	300	160	160	160	300	160	160	0
⑩	CH	108	110	108	108	320	230	320	200	320	230	320	200	0
⑪	CH	99	110	99	99	320	230	320	200	320	230	320	200	0
⑫	CH	99	100	99	99	320	425	320	200	320	460	320	200	0
⑬	SM	122	122	122	122	0	0	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- ⌀ -- CROSSOVER POINT
- 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: SEE TABLE 3 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

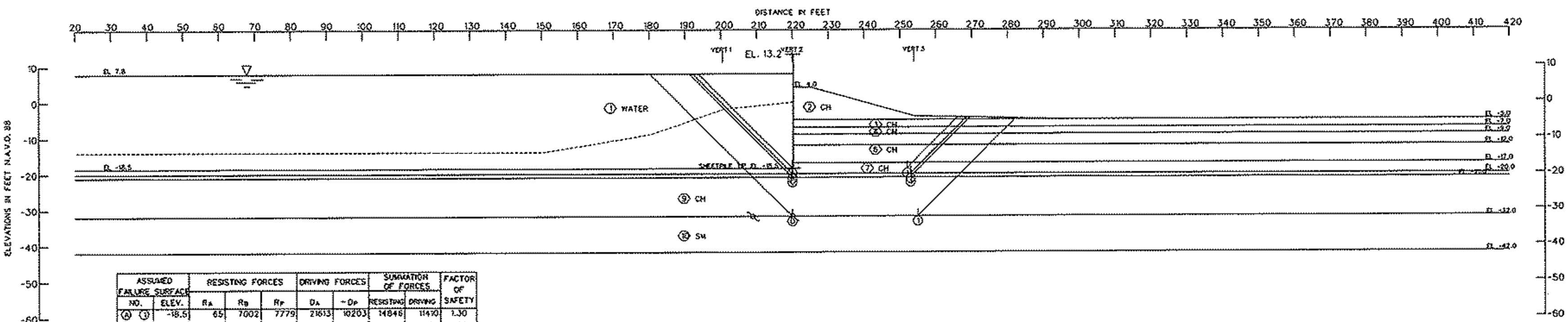
SLOPE STABILITY ANALYSIS

TENSION CRACK CONDITIONS
REACH 22

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

DESIGNED BY: F.V. DRAWN BY: C.R. CHECKED BY: F.V. | PLOT SCALE: 20 | PLOT DATE: 23 MAR 07 | DATE: MAR 2007 | FILE NO.

PLATE: 127



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	-18.5	65	7002	7779	21613	10203	14846	11410	1.30
Ⓑ ①	-20.0	824	7158	8077	24200	12336	16059	11864	1.35
Ⓒ ①	-21.0	1356	7238	8338	26055	13923	16932	12132	1.40
Ⓓ ①	-32.0	8565	10740	11737	53044	37672	31042	15372	2.02

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. CENTER OF STRATUM			C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	109	122	109	900	900	900	900	900	900	0
3	CH	109	100	109	900	320	900	900	320	900	0
4	CH	76	100	76	120	320	120	120	320	120	0
5	CH	76	80	80	120	210	120	120	210	120	0
6	CH	100	80	100	125	210	125	135	210	135	0
7	CH	100	105	100	140	280	140	150	280	150	0
8	CH	100	106	100	150	280	150	155	280	155	0
9	CH	100	100	100	180	410	180	210	410	210	0
10	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTE: SEE TABLE 3 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
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A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
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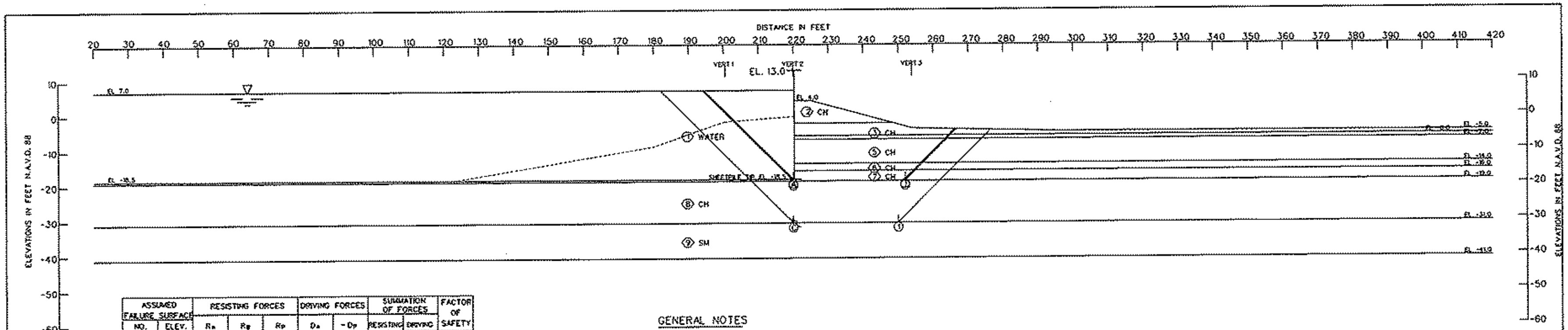
P -- AS A SUBSCRIPT REFERS TO PASSIVE WEDGE

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

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 23

PLATE: 128

INPUT DATA FILENAME: OT17



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	-18.5	0	7708	5831	20319	9886	13540	10433	1.30
(B) ①	-19.0	311	7708	5962	21133	10586	13981	10547	1.33
(C) ①	-31.0	8919	13350	12004	48053	34860	34273	13193	2.60

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. CENTER OF STRATUM			C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	106	106	106	900	900	900	900	900	900	0
3	CH	106	106	106	900	340	900	900	340	900	0
4	CH	90	90	90	90	340	90	90	340	90	0
5	CH	90	90	90	90	175	90	90	175	90	0
6	CH	101	90	101	135	175	135	135	175	135	0
7	CH	108	106	108	155	265	155	180	295	180	0
8	CH	98	100	98	270	405	270	360	515	360	0
9	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
-- CROSSOVER POINT
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

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

NOTE: SEE TABLE 3 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 24

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS

PLATE: 129

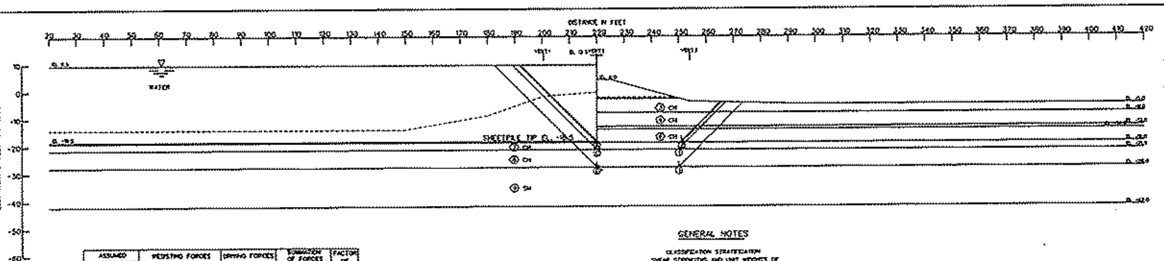
INPUT DATA FILENAME: OT18

PLATE 129 - ot18.dgn 3/27/2009

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.



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	-19.5	190	6533	11697	24323	10333	18419	13991	1.32
B	2	-20.0	491	6392	11855	25209	11035	18733	14176	1.32
C	3	-21.5	1458	8029	13144	29967	15054	22631	14913	1.52
D	5	-28.0	6312	11106	17219	43262	27962	34539	17300	2.00

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT.1	VERT.2	VERT.3	C = UNIT COHESION = P.S.F. CENTER OF STRATUM VERT.1	VERT.2	VERT.3	BOTTOM OF STRATUM VERT.1	VERT.2	VERT.3	FRICTION ANGLE DEGREES
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	100	110	100	200	200	200	200	200	200	0
3	CH	102	105	103	200	170	200	200	170	200	0
4	CH	85	105	85	300	170	300	300	170	300	0
5	CH	100	90	100	180	220	180	350	220	350	0
6	CH	100	90	100	150	230	150	350	240	350	0
7	CH	100	100	100	275	245	275	290	230	290	0
8	CH	95	103	95	325	350	325	350	380	350	0
9	SM	122	122	122	0	0	0	0	0	0	30

See Table 3 in the Report for Reach Stationing, Boring and Testing information.

NOTES

- O -- STRATUM NUMBER
- O -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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

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

[illegible]
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
[illegible]

PLATE: 130

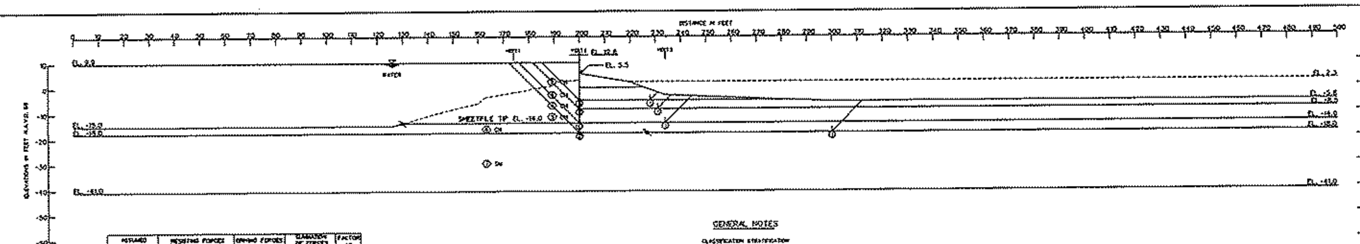
INPUT DATA FILENAME: 0719

CORPS OF ENGINEERS 03-MAY-07

GENERAL NOTES:
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

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

PLATE 130-w19.dgn 3/27/2009 10:32:13 AM



GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in report for reach stationing, boring and testing information

NOTES

O -- STRATUM NUMBER
O -- WEDGE NUMBER
-- CROSSOVER POINT
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

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

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
(1) (7)	-5.8	0	10237	4110	4538	822	19456	9378	2.08
(2) (7)	-8.5	0	9573	8007	10590	1632	17580	8938	1.97
(3) (7)	-14.0	0	10200	9778	17677	3682	19978	12193	1.64
(4) (7)	-18.0	3077	11892	7850	24601	7081	22819	17520	1.30

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT.1	VERT.2	VERT.3	C - UNIT COHESION - P.S.F. CENTER OF STRATUM VERT.1	VERT.2	VERT.3	BOTTOM OF STRATUM VERT.1	VERT.2	VERT.3	FRICTION ANGLE DEGREES
(1)	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
(2)	CH	100	112	100	250	200	250	250	200	250	0
(3)	CH	100	112	100	250	400	250	250	400	250	0
(4)	CH	100	95	100	250	400	250	250	400	250	0
(5)	CH	97	95	97	200	400	200	200	400	200	0
(6)	CH	97	95	97	200	400	200	200	400	200	0
(7)	SM	122	122	122	0	0	0	0	0	0	30

SLOPE STABILITY ANALYSIS

PLATE: 134

INPUT DATA FILENAME: 127

GENERAL NOTES

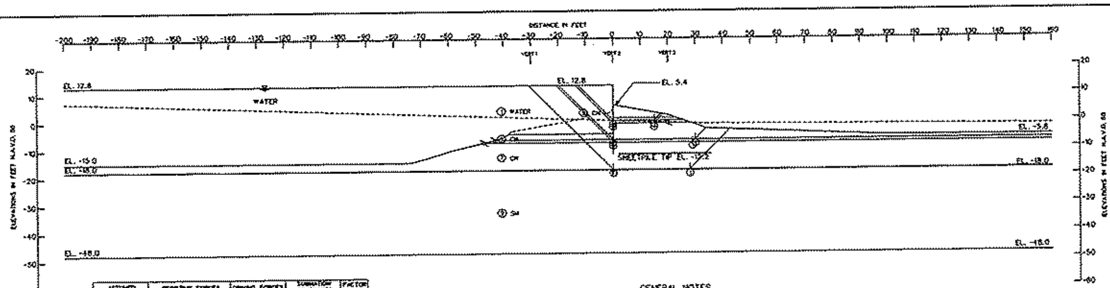
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
⬡ -- WEDGE NUMBER
-- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$



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	
[illegible]	[illegible]	0	43	4500	1701	5106	386	6244	4720	1.32
[illegible]	[illegible]	-1.5	47	5344	2410	5940	694	7810	5246	1.49
[illegible]	[illegible]	-7.0	1606	10200	3600	12346	1089	15406	11257	1.37
[illegible]	[illegible]	-8.0	2374	9890	4240	13777	1709	16494	12068	1.37
[illegible]	[illegible]	-18.0	9832	9560	10310	33414	12415	29702	20999	1.41

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	110	110	110	380	380	380	380	380	380	0
3	CH	105	105	105	300	300	300	300	320	300	0
4	CH	122	105	122	450	300	450	450	320	450	0
5	CH	122	107	122	450	380	450	450	380	450	0
6	CH	110	107	110	320	380	320	320	380	320	0
7	CH	110	109	110	320	380	320	320	380	320	0
8	CH	110	109	110	320	380	320	320	380	320	0
9	SM	122	122	122	0	0	0	0	0	0	30
10	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 3 in the Report for reach stationing, boring and testing information.

NOTES

○ -- STRATUM NUMBER
⬡ -- WEDGE NUMBER
-- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

17TH STREET CANAL
SLOPE STABILITY ANALYSIS

PLATE: 135

INPUT DATA FILENAME: 128

GENERAL NOTES
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS. SEE BORING DATA PLATES.

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

17th Street Canal ... 01-MAY-07

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	
[illegible]	[illegible]	0	43	4500	1701	5106	386	6244	4720	1.32
[illegible]	[illegible]	-1.5	47	5344	2410	5940	694	7810	5246	1.49
[illegible]	[illegible]	-7.0	1606	10200	3600	12346	1089	15406	11257	1.37
[illegible]	[illegible]	-8.0	2374	9890	4240	13777	1709	16494	12068	1.37
[illegible]	[illegible]	-18.0	9832	9560	10310	33414	12415	29702	20999	1.41

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	110	110	110	380	380	380	380	380	380	0
3	CH	105	105	105	300	300	300	300	320	300	0
4	CH	122	105	122	450	300	450	450	320	450	0
5	CH	122	107	122	450	380	450	450	380	450	0
6	CH	110	107	110	320	380	320	320	380	320	0
7	CH	110	109	110	320	380	320	320	380	320	0
8	CH	110	109	110	320	380	320	320	380	320	0
9	SM	122	122	122	0	0	0	0	0	0	30
10	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

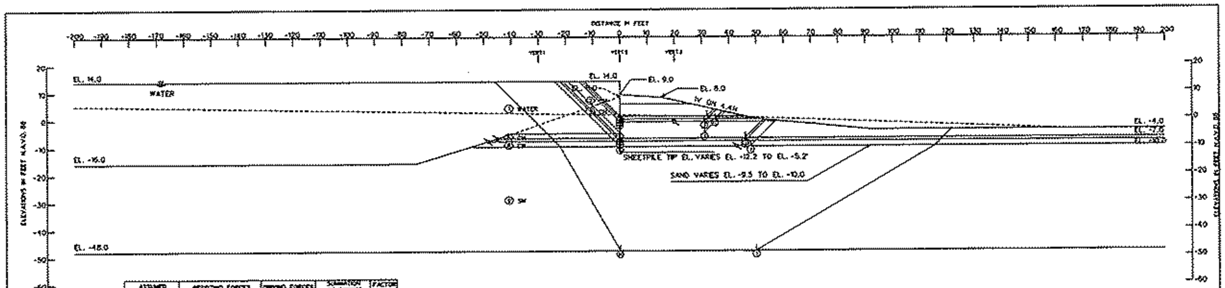
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$



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	1.0	11	10200	1933	5281	436	12145	4845	2.51
B	1	.0	11	10500	1967	6123	529	12478	5595	2.23
C	1	-1.0	11	12450	3291	7033	1272	15752	5760	2.73
D	1	-3.0	12	12450	6325	11286	3791	18787	7495	2.51
E	1	-7.0	1337	15320	6065	13846	2653	22722	11193	2.03
F	1	-8.0	2103	15320	6626	15275	3390	24049	11885	2.02
G	1	-10.0	5624	15781	7293	18465	4900	28998	13565	1.99
H	1	-48.0	56923	92494	105055	172365	110066	254472	52299	4.87

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	111	111	111	700	700	700	700	700	700	0
3	CH	110	110	110	380	380	380	380	380	380	0
4	CH	105	105	105	300	300	300	300	300	300	0
5	CH	102	106	102	450	300	450	450	300	450	0
6	CH	102	102	102	450	380	450	450	380	450	0
7	CH	110	102	110	320	380	320	320	380	320	0
8	CH	110	102	110	320	380	320	320	380	320	0
9	SM	122	122	122	0	0	0	0	0	0	30
10	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 3 in the Report for reach stationing, boring and testing information.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
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 AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
TENSION CRACK CONDITIONS
REACH 22

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

PLATE: 136

INPUT DATA FILENAME: TC29

GENERAL NOTES:
CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS, AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS SEE BORING DATA PLATES

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

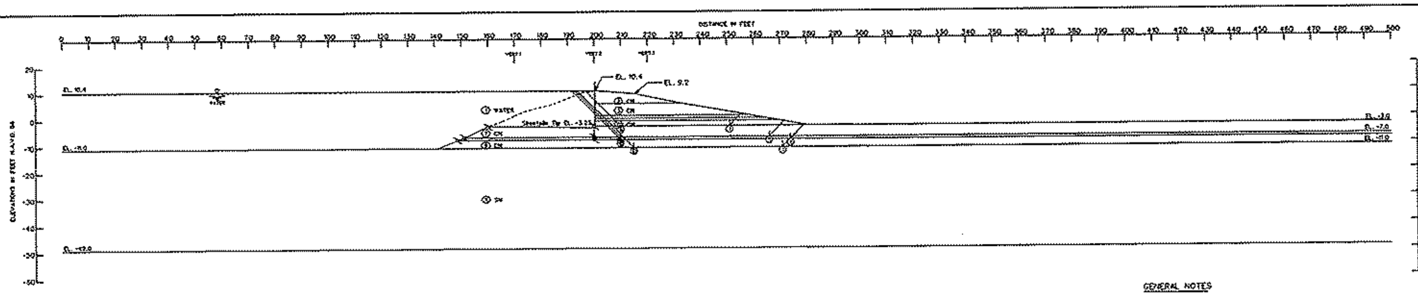
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

U.S. ARMY ENGINEER DISTRICT NEW ORLEANS
CORPS OF ENGINEERS
03-MAY-07

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	1.0	12	10200	1933	5281	436	12145	4845	2.51
B	1	.0	11	10500	1967	6123	529	12478	5595	2.23
C	1	-1.0	11	12450	3291	7033	1272	15752	5760	2.73
D	1	-3.0	12	12450	6325	11286	3791	18787	7495	2.51
E	1	-7.0	1337	15320	6065	13846	2653	22722	11193	2.03
F	1	-8.0	2103	15320	6626	15275	3390	24049	11885	2.02
G	1	-10.0	5624	15781	7293	18465	4900	29998	13565	1.99
H	1	-48.0	56923	92494	105055	171365	110066	254472	52299	4.87

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	111	111	111	700	700	700	700	700	700	0
3	CH	110	110	110	380	380	380	380	380	380	0
4	CH	105	105	105	300	300	300	300	300	300	0
5	CH	102	106	102	450	300	450	450	300	450	0
6	CH	102	102	102	450	380	450	450	380	450	0
7	CH	110	102	110	320	380	320	320	380	320	0
8	CH	110	102	110	320	380	320	320	380	320	0
9	SM	122	122	122	0	0	0	0	0	0	30
10	SM	122	122	122	0	0	0	0	0	0	30

PLATE 136 - tc29.DGN



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	
[illegible]	-3.0	7890	16273	3586	1408	1267	29063	7841	3.71
[illegible]	-7.0	7379	25025	3472	11474	1950	37506	12694	2.95
[illegible]	-8.0	7404	20630	4788	16152	1890	32822	14164	2.77
[illegible]	-11.0	10910	17257	6145	22748	4217	35315	18531	1.91

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	111	111	111	200	200	200	200	200	200	0
3	CH	110	110	110	300	300	300	300	300	300	0
4	CH	105	105	105	300	300	300	300	300	300	0
5	CH	102	105	102	450	300	450	450	300	450	0
6	CH	102	102	102	450	350	450	450	350	450	0
7	CH	102	102	102	450	350	450	450	350	450	0
8	CH	110	102	110	320	350	320	320	350	320	0
9	CH	110	102	110	320	320	320	320	350	320	0
10	SM	122	122	122	0	0	0	0	0	0	30

NOTE: SEE TABLE 3 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ○ -- STRATUM NUMBER
- ◇ -- WEDGE NUMBER
- ø -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS

PLATE: 137

INPUT DATA FILENAME: 071158

GENERAL NOTES

NOTES

PLATE 137 - [illegible] 3/27/2009 10:38:43 AM

GENERAL NOTES

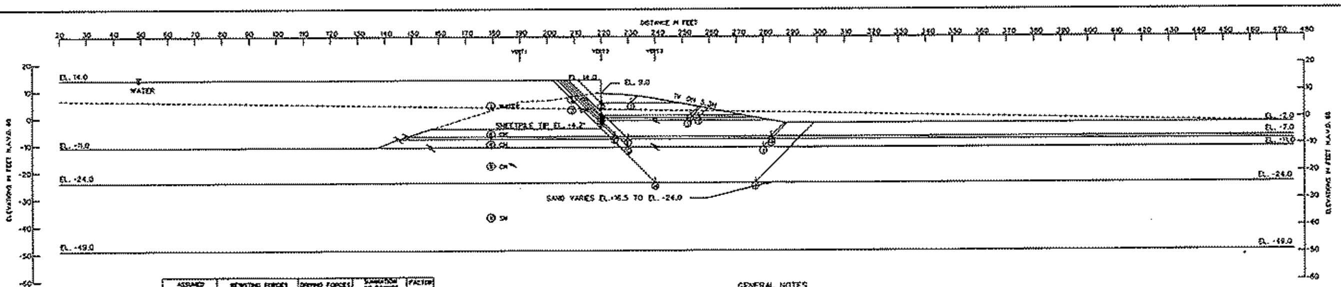
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

(O) -- STRATUM NUMBER
(◇) -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$



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) [illegible]	5.5	37	4183	3689	2230	424	7905	1834	4.31
(2) [illegible]	1.0	34	9900	2293	3231	631	12353	4640	2.66
(3) [illegible]	.0	56	10800	2209	6138	807	13565	5331	2.51
(4) [illegible]	-1.0	57	12900	3779	7047	1522	18736	5425	3.05
(5) [illegible]	-7.0	3550	10897	4500	15204	1521	27347	13683	2.00
(6) [illegible]	-8.0	7563	17110	5140	17241	2066	29813	15155	1.97
(7) [illegible]	-11.0	7591	18150	7060	22903	4826	30801	18077	1.70
(8) [illegible]	-24.0	14833	11840	15360	58117	27033	42113	31084	1.33

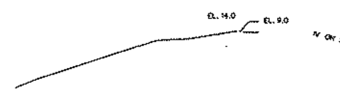
STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
(1)	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
(2)	CH	111	111	111	200	200	200	200	200	200	0
(3)	CH	110	110	110	350	350	350	350	350	350	0
(4)	CH	105	105	105	300	300	320	300	300	300	0
(5)	CH	102	105	102	450	320	650	450	320	450	0
(6)	CH	102	102	102	450	350	650	450	350	650	0
(7)	CH	110	102	110	320	350	320	320	380	320	0
(8)	CH	110	120	110	320	380	320	320	380	320	0
(9)	CH	110	103	110	320	470	320	320	470	320	0
(10)	SM	122	122	122	0	0	0	0	0	0	32

See Table 3 in the Report for reach stationing, boring and testing information.

SLOPE STABILITY ANALYSIS

PLATE: 138

INPUT DATA FILENAME: TC



GENERAL NOTES

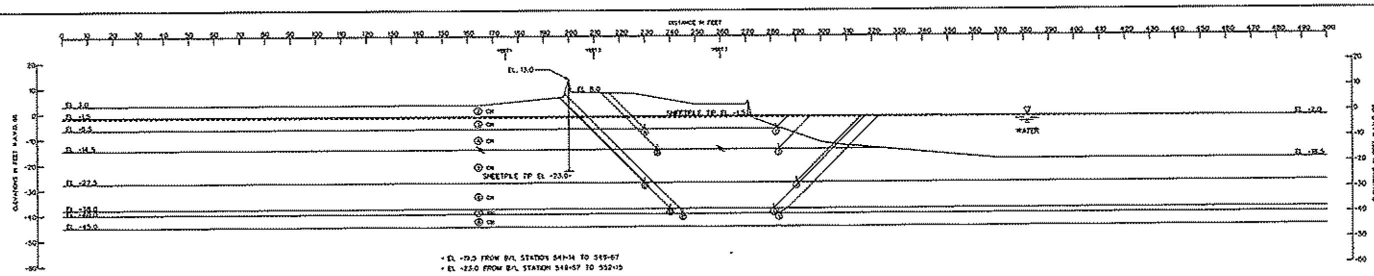
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

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



* EL -13.0 FROM B/L STATION 541+14 TO 545+67
* EL -23.0 FROM B/L STATION 548+57 TO 552+15

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	
[illegible]	-8.5	14181	13640	390	42500	782	35921	7778	3.13
[illegible]	-14.5	19648	14190	3004	24507	817	37342	18772	2.00
[illegible]	-27.5	30413	10670	8337	94643	25833	54754	34781	1.50
[illegible]	-38.0	40010	17780	15584	105573	55625	73390	49743	1.48
[illegible]	-40.0	63992	17530	20004	112404	81877	81525	51727	1.58

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	110	110	110	500	500	500	500	500	500	0
3	CH	100	100	100	500	500	500	500	500	500	0
4	CH	95	100	95	280	400	280	280	400	280	0
5	CH	100	100	100	250	500	250	280	560	280	0
6	CH	100	100	100	340	520	340	400	743	400	0
7	SM	122	122	122	0	0	0	0	0	0	30
8	CH	104	104	104	440	400	440	440	800	440	0

NOTES

○ -- STRATUM NUMBER
□ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
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 = $\frac{R_A + R_B + R_P}{D_A - D_P}$

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

[illegible]
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS

PLATE: 139

INPUT DATA FILENAME: LW1549

GENERAL NOTES:

[illegible]

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

PLATE 139 [illegible].DGN [illegible]

GENERAL NOTES

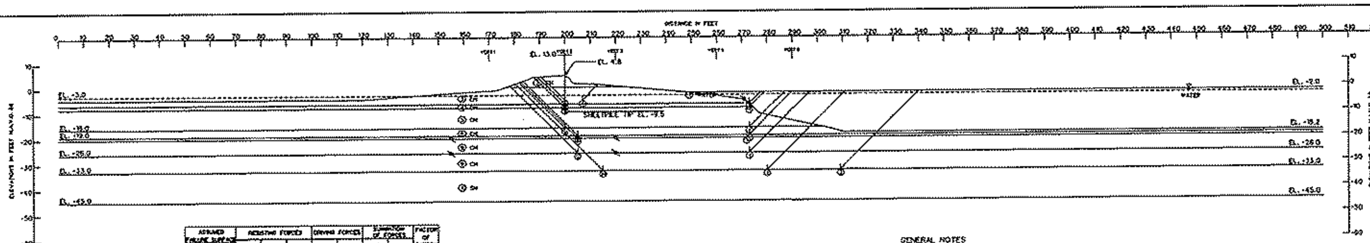
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ○ -- STRATUM NUMBER
- ◇ -- WEDGE NUMBER
- ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
- C -- UNIT COHESION, P.S.F.
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$



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
[illegible]	-3.0	16514	8300	1723	3500	2333	34343	3167	10.84
[illegible]	-6.3	17094	19183	-2359	7148	634	36018	6514	5.53
[illegible]	-8.0	19150	15570	244	931	929	34964	7863	4.38
[illegible]	-18.0	20980	15120	1984	21493	6294	38084	15199	2.51
[illegible]	-19.0	23770	13632	2148	27950	9345	40311	18305	2.20
[illegible]	-20.0	23942	23483	3500	29783	10583	50930	19201	2.65
[illegible]	-28.0	26348	24848	6243	44054	19620	57239	24434	2.34
[illegible]	-33.0	34398	22520	7553	44472	34442	64471	29990	2.16
[illegible]	-33.0	34398	28387	9904	64472	33784	69089	30528	2.26

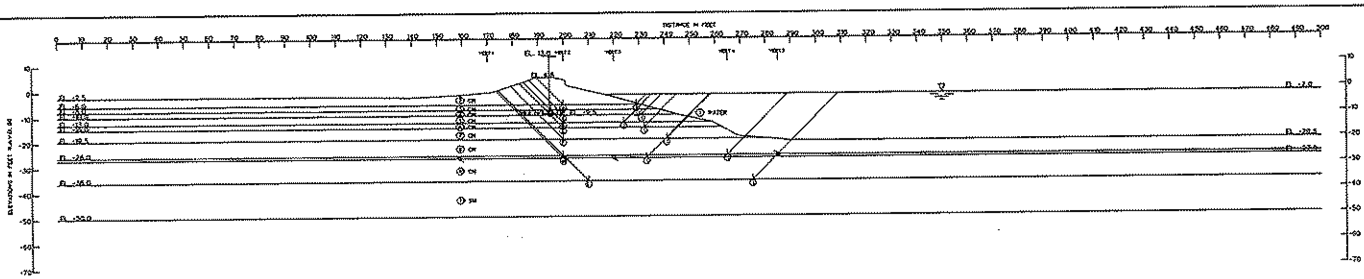
NOTE: SEE TABLE 1 IN THE REPORT FOR BORING STATIONING, BORING AND TESTING INFORMATION.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	C = UNIT COHESION = P.S.F. CENTER OF STRATUM VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	BOTTOM OF STRATUM VERT. 1	VERT. 2	VERT. 3	VERT. 4	VERT. 5	FRICTION ANGLE DEGREES
1	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
[illegible]	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

SLOPE STABILITY ANALYSIS

PLATE: 140

INPUT DATA FILENAME:



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
[illegible]	-6.0	17382	12787	351	3983	556	30735	3471	5.81
[illegible]	-8.0	18335	8273	772	8225	1220	27408	7009	3.91
[illegible]	-10.0	20120	8395	1276	9298	2274	29955	9074	3.30
[illegible]	-13.0	20535	8900	2672	15130	4336	23697	11002	3.04
[illegible]	-15.0	20533	9240	4707	19345	6063	34484	13283	2.60
[illegible]	-19.3	20533	10570	5615	28095	10483	36738	17547	2.09
[illegible]	-26.0	19563	17050	3704	43178	19292	40339	23916	1.69
[illegible]	-27.0	19472	11400	9994	45005	24095	40864	21781	1.88
[illegible]	-38.0	27605	25375	7200	74223	40095	60590	33433	1.83

STRATUM NO.	SOIL TYPE	UNIT WEIGHT P.C.F. VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	C - UNIT COHESION P.S.F. TOP OF STRATUM VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	BOTTOM OF STRATUM VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	FRICTION ANGLE DEGREES
1	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
2	CH	100	105	100	100	100	500	900	500	500	500	500	900	500	500	500	0
3	CH	100	104	100	100	100	200	200	220	200	200	200	900	200	200	200	0
4	CH	100	51	102	100	100	200	440	200	200	200	200	450	200	200	200	0
5	CH	75	51	75	75	75	400	510	400	400	400	400	510	400	400	400	0
6	CH	75	51	75	75	75	400	530	400	400	400	400	330	400	400	400	0
7	CH	107	51	107	102	102	220	220	270	270	220	220	220	225	220	220	0
8	CH	102	105	103	102	102	270	220	270	270	200	270	270	270	270	200	0
9	CH	102	105	102	102	102	400	225	400	400	200	400	220	400	400	200	0
10	CH	102	105	102	102	102	400	620	400	400	200	400	470	400	400	400	0
11	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

NOTE: SEE TABLE 1 IN THE REPORT FOR BORING STATIONING, BORING AND TESTING INFORMATION.

NOTES

○ -- STRATUM NUMBER
◇ -- WEDGE NUMBER
⌀ -- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS

PLATE: 141

INPUT DATA FILENAME: #2

GENERAL NOTES:

NOTES

FACTOR OF SAFETY

GENERAL NOTES

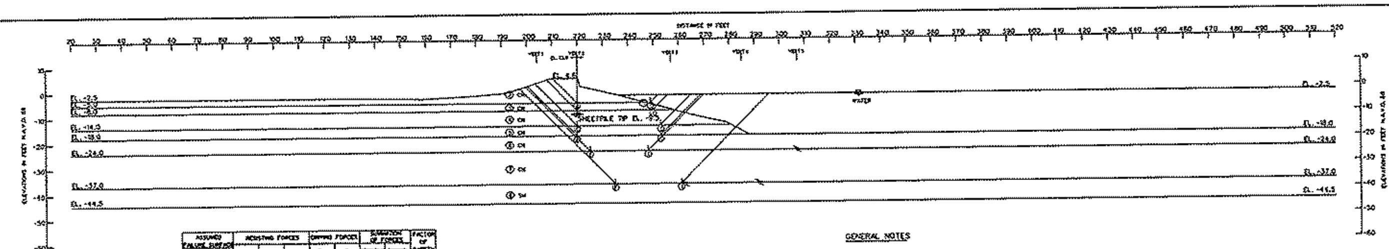
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ○ -- STRATUM NUMBER
- ◇ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$



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	1	-5.0	14874	11263	-1507	5314	747	25732	5027	5.12
2	2	-8.0	14943	6993	1599	9027	1203	23535	7824	3.01
3	3	-14.0	16457	7672	1818	18209	5053	25947	13157	1.76
4	4	-18.0	14309	7672	2477	25492	9003	24258	16390	1.48
5	5	-24.0	17578	7864	8657	39185	18552	32099	20633	1.56
6	6	-37.0	29875	13423	16837	78020	47701	60226	30319	1.99

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

STRATUM NO.	SOIL TYPE	γ/γ', UNIT WEIGHT P.C.F.					C = UNIT COHESION = P.S.F.										FRICTION ANGLE DEGREES
							CENTER OF STRATUM					BOTTOM OF STRATUM					
		VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	
1	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
2	CH	105	100	105	105	105	500	500	500	500	500	500	500	500	500	500	0
3	CH	105	92	101	105	105	500	500	500	500	500	500	500	500	500	500	0
4	SM	82	82	82	82	82	135	300	135	135	135	135	300	135	135	135	0
5	CH	82	82	82	82	82	135	300	135	135	135	135	300	135	135	135	0
6	CH	100	88	100	100	100	387	300	387	387	200	394	300	394	394	200	0
7	CH	100	100	100	100	100	452	535	452	452	200	535	535	535	535	200	0
8	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

NOTES

- ○ -- STRATUM NUMBER
- ◇ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

SLOPE STABILITY ANALYSIS

PLATE: 142

INPUT DATA

GENERAL NOTES:

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS. SEE BORING DATA PLATES.

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

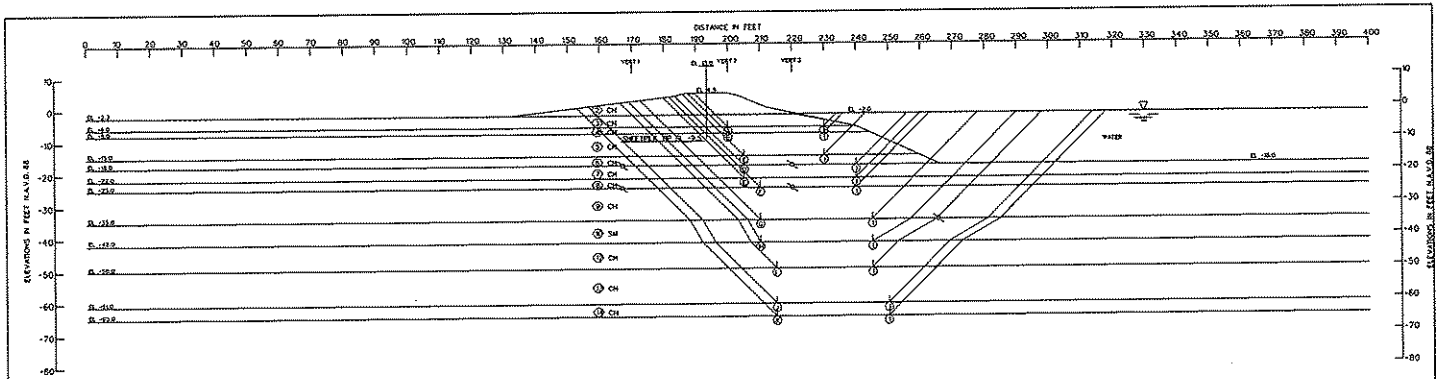
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

25-APR-07

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	1	-5.0	14874	11263	-1507	5314	747	25732	5027	5.12
2	2	-8.0	14943	6993	1599	9027	1203	23535	7824	3.01
3	3	-14.0	16457	7672	1818	18209	5053	25947	13157	1.76
4	4	-18.0	14309	7672	2477	25492	9003	24258	16390	1.48
5	5	-24.0	17578	7864	8657	39185	18552	32099	20633	1.56
6	6	-37.0	29875	13423	16837	78020	47701	60226	30319	1.99

STRATUM NO.	SOIL TYPE	γ/γ', UNIT WEIGHT P.C.F.					C = UNIT COHESION = P.S.F.										FRICTION ANGLE DEGREES
							CENTER OF STRATUM					BOTTOM OF STRATUM					
		VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	
1	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
2	CH	105	100	105	105	105	500	500	500	500	500	500	500	500	500	500	0
3	CH	105	92	101	105	105	500	500	500	500	500	500	500	500	500	500	0
4	SM	82	82	82	82	82	135	300	135	135	135	135	300	135	135	135	0
5	CH	82	82	82	82	82	135	300	135	135	135	135	300	135	135	135	0
6	CH	100	88	100	100	100	387	300	387	387	200	394	300	394	394	200	0
7	CH	100	100	100	100	100	452	535	452	452	200	535	535	535	535	200	0
8	SM	122	122	122	122	122	0	0	0	0	0	0	0	0	0	0	30

PLATE 142



NOTES

- ○ -- STRATUM NUMBER
- ◇ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A + D_P}$

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	100	100	100	900	900	900	900	900	900	0
3	CH	100	100	100	900	900	900	900	900	900	0
4	CH	100	74	100	900	300	900	900	300	900	0
5	CH	76	74	76	300	300	300	300	300	300	0
6	CH	95	74	95	215	300	215	215	300	215	0
7	CH	95	101	95	215	410	215	215	410	215	0
8	CH	99	101	99	355	410	355	355	410	355	0
9	CH	99	101	99	355	600	355	355	600	355	0
10	SM	122	122	122	0	0	0	0	0	0	30
11	CH	103	105	103	360	830	360	360	830	360	0
12	CH	103	105	103	470	830	470	580	830	580	0
13	CH	105	105	105	830	830	830	830	830	830	0
14	CH	105	105	105	1400	1400	1400	1400	1400	1400	0
15	CH	105	105	105	1400	1400	1400	1400	1400	1400	0

See Table 1 in the Report for search stationing, boring and testing information.

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	-6.0	18699	21002	3363	6003	572	43064	5431	7.93
B	1	-8.0	20180	9000	6128	8435	1391	35308	7044	5.01
C	1	-15.0	24032	5853	8110	15886	3610	37995	12276	3.10
D	1	-18.0	24955	8093	4459	24487	8883	37407	15604	2.39
E	1	-22.0	27549	8622	5403	32975	14282	41574	18693	2.22
F	1	-25.0	29893	10787	6961	39710	19323	47641	20387	2.34
G	1	-35.0	39787	13057	11498	70490	41486	64342	29004	2.22
H	1	-42.0	47533	13774	24536	97914	62469	85843	35445	2.42
I	1	-50.0	57594	17556	31183	135387	94283	106333	41104	2.59
J	1	-61.0	75521	29050	48163	198550	168062	152734	30488	3.03
K	1	-65.0	84290	49000	59363	224245	170917	192653	53328	3.61

GENERAL NOTES

CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

LAKE PONTCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS
REACH 1

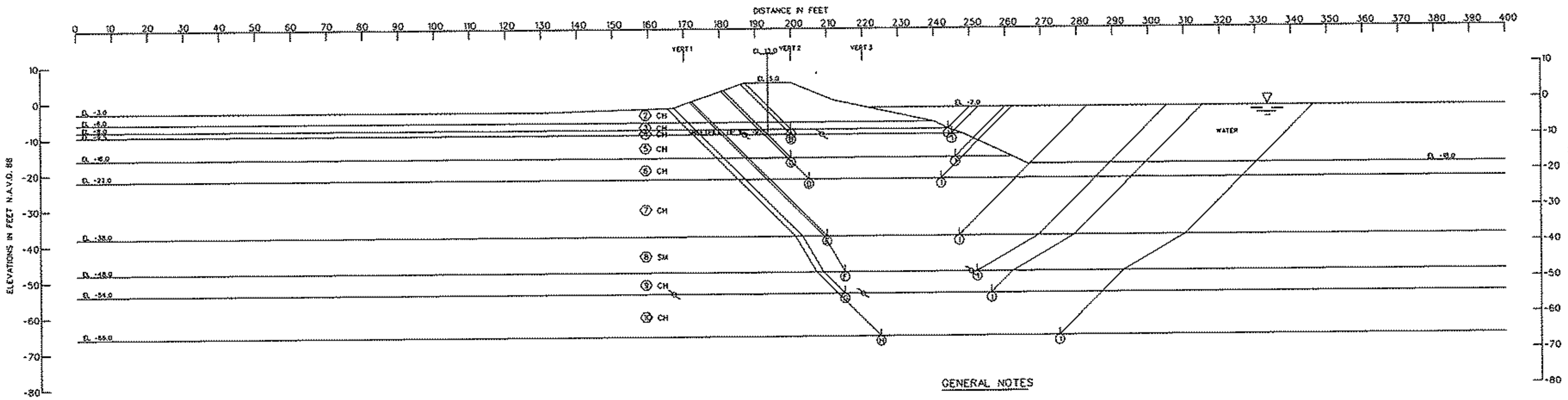
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS

PLATE: 143

LAKE PONTCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS
REACH 1

GENERAL NOTES:
CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS. SEE BORING DATA PLATES.

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 $= \frac{R_A + R_B + R_P}{D_A + D_P}$



GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

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	-8.0	21467	6379	-4	9876	1125	27842	8751	3.18
B	1	-9.5	22045	6015	114	12238	1764	28174	10474	2.69
C	1	-16.0	22997	10200	2028	23887	6395	35225	17492	2.01
D	1	-22.0	26180	12669	5975	37661	14126	44824	23535	1.90
E	1	-38.0	35458	16650	17200	87183	50624	69308	36559	1.90
F	1	-48.0	46513	33069	40750	131168	85926	120332	45242	2.66
G	1	-54.0	53656	36675	50250	163249	113344	140581	49905	2.82
H	1	-66.0	74919	45000	71668	236612	179016	191587	57596	3.33

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	117	117	117	900	900	900	900	900	900	0
3	CH	117	113	117	900	400	900	900	400	900	0
4	CH	77	113	77	70	400	70	70	400	70	0
5	CH	77	80	77	200	300	200	200	300	200	0
6	CH	102	80	102	350	300	350	350	300	350	0
7	CH	103	104	103	450	450	450	450	450	450	0
8	SM	122	122	122	0	0	0	0	0	0	30
9	CH	101	99	101	900	540	900	900	540	900	0
10	CH	108	106	108	900	900	900	900	900	900	0
11	CH	108	108	108	900	900	900	900	900	900	0

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

- ◇ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- ⌀ -- CROSSOVER POINT
- 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, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS
REACH 3

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

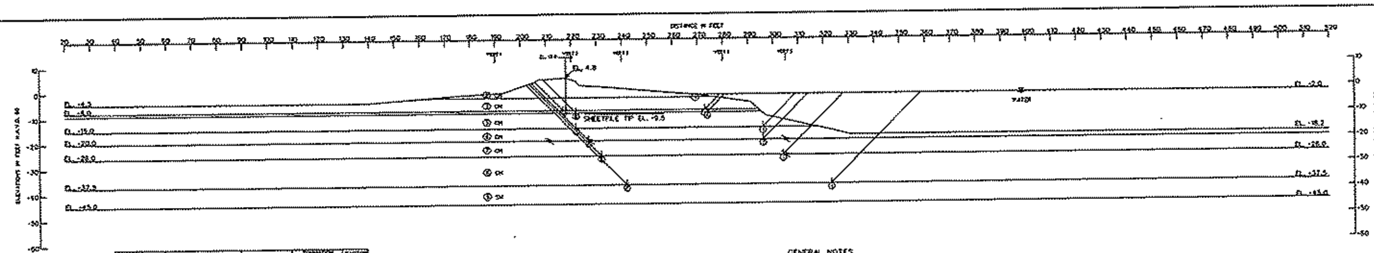
DESIGNED BY: C.R. | DRAWN BY: C.R. | CHECKED BY: R.V. / C.R. | DATE: JAN 2007

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES



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
		-8.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.93
		-9.0	[illegible]	[illegible]	[illegible]	9900	2350	[illegible]	7550	[illegible]
		-15.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	14245	2.40
		-20.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	37478	[illegible]	2.09
		-26.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		-37.5	[illegible]	29300	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.95

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	C - UNIT COHESION - P.S.F. CENTER OF STRATUM VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	BOTTOM OF STRATUM VERT.1	VERT.2	VERT.3	VERT.4	VERT.5	FRICTION ANGLE DEGREES
1	WATER	62.5	62.5	62.5	62.5	62.5	0	0	0	0	0	0	0	0	0	0	0
2	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
3	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
4	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
5	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
6	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
7	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
8	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
9	SM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	[illegible]

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ○ -- STRATUM NUMBER
- ◇ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

17TH STREET CANAL

SLOPE STABILITY ANALYSIS

PLATE: 145

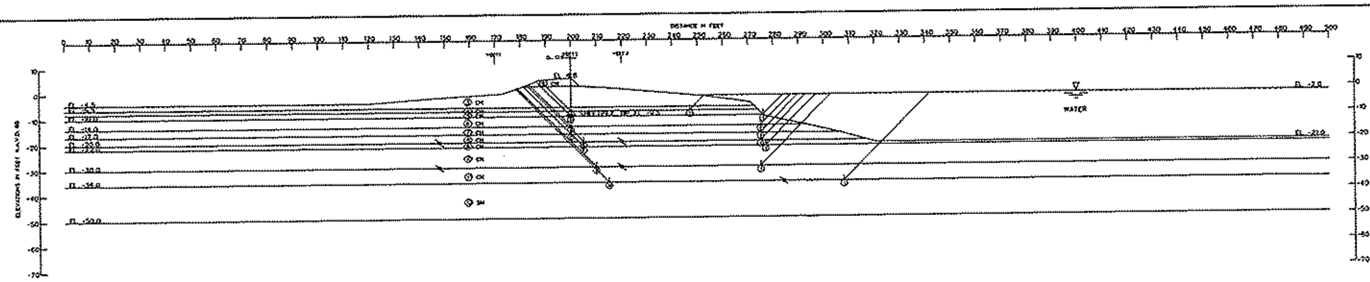
INPUT DATA FILENAME: 6

GENERAL NOTES

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

25-APR-07

PLATE 145 - [illegible] 3/27/2008 10:41:12 AM



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
[illegible]	-5.0	13297	13100	4895	8345	1007	31532	9338	4.??
[illegible]	-10.0	13495	14548	-1	7739	2000	28042	9739	3.03
[illegible]	-14.0	13940	14370	1059	17795	4785	29369	12410	2.37
[illegible]	-17.0	14407	15800	2017	22502	7872	32224	14630	2.25
[illegible]	-20.0	16816	17669	3340	28704	7809	37857	16895	2.24
[illegible]	-22.0	17327	18453	6154	33223	14701	39926	18521	2.16
[illegible]	-30.0	22142	24700	12331	54952	30947	45523	23993	2.90
[illegible]	-36.0	26532	47718	13240	75401	4788	81872	34333	2.66

STRATUM NO.	SOIL TYPE	γ, UNIT WEIGHT P.C.F. VERT.1	VERT.2	VERT.3	C - UNIT COHESION - P.S.F. CENTER OF STRATUM VERT.1	VERT.2	VERT.3	BOTTOM OF STRATUM VERT.1	VERT.2	VERT.3	FRICTION ANGLE DEGREES
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	102	102	102	500	900	500	500	900	500	0
3	CH	103	104	107	500	450	500	450	450	500	0
4	CH	80	106	80	280	450	280	280	450	280	0
5	CH	80	76	80	280	280	280	280	280	280	0
6	CH	101	76	101	151	230	151	175	230	175	0
7	CH	104	104	104	150	200	316	320	230	200	0
8	CH	100	101	100	250	280	250	250	280	250	0
9	CH	100	102	100	250	320	250	250	334	250	0
10	CH	100	102	100	330	315	330	330	55	330	0
11	CH	100	102	100	330	435	330	330	455	330	0
12	SM	122	122	122	0	0	0	0	0	0	32

NOTE: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

○ -- STRATUM NUMBER
⬡ -- WEDGE NUMBER
β -- CROSSOVER POINT
ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
S.W. -- STATIC WATER SURFACE
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$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS

PLATE: 146

GENERAL NOTES:

NOTES

ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
S.W. -- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
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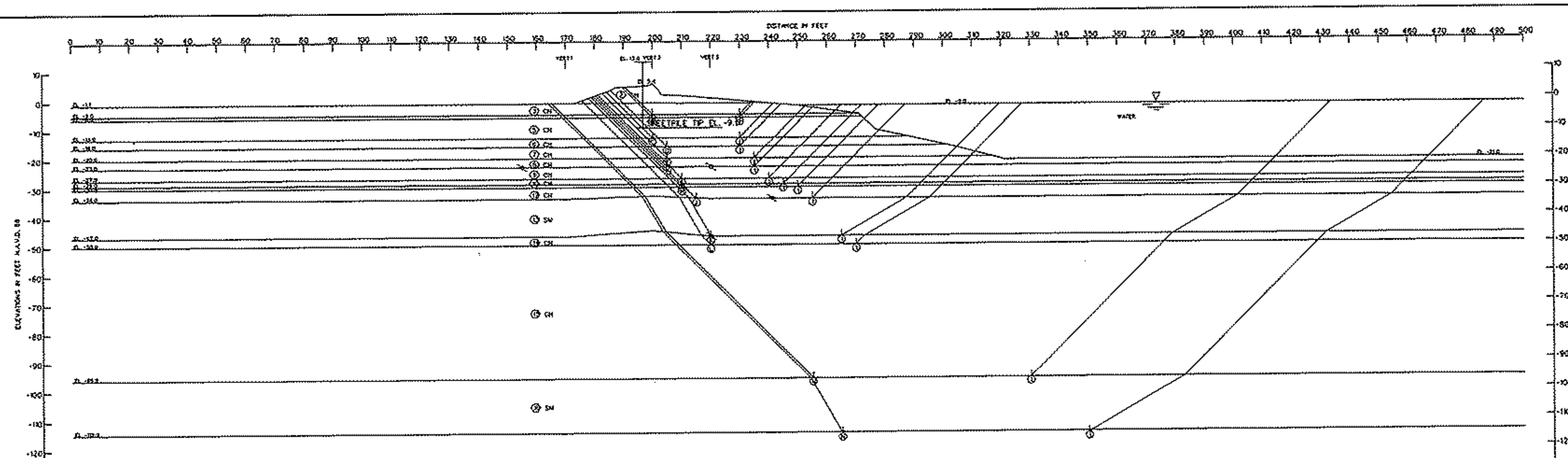
P -- AS A SUBSCRIPT REFERS TO PASSIVE WEDGE
FACTOR OF SAFETY = $\frac{R_A + R_B + R_P}{D_A - D_P}$



NOTES

- ◇ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- ø -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

See Table 1 in the Report for reach stationing, boring and testing information.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	110	110	110	500	600	500	600	600	600	0
3	CH	109	110	109	500	600	500	500	600	500	0
4	CH	109	80	109	500	300	500	500	300	500	0
5	CH	80	80	80	300	300	300	300	300	300	0
6	CH	103	80	103	240	300	240	240	300	240	0
7	CH	103	104	103	240	220	240	240	220	240	0
8	CH	101	104	101	400	220	400	400	220	400	0
9	CH	101	102	101	400	310	400	400	310	400	0
10	CH	100	102	100	520	310	520	520	310	520	0
11	CH	100	102	100	520	240	520	520	240	520	0
12	CH	101	102	97	620	240	570	570	240	570	0
13	SM	122	122	122	0	0	0	0	0	0	30
14	CH	106	106	106	500	600	500	600	600	600	0
15	CH	106	106	106	900	900	900	900	900	900	0
16	SM	122	122	122	0	0	0	0	0	0	30

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
[illegible]	[illegible]	-5.0	11225	13001	4387	5175	1103	28613	4072	7.03
[illegible]	[illegible]	-6.0	11743	9000	5289	6245	1622	26032	4624	5.63
[illegible]	[illegible]	-13.0	14089	7600	8852	15549	7350	30721	8199	3.75
[illegible]	[illegible]	-18.0	15459	5566	10017	20461	10975	32365	9486	3.41
[illegible]	[illegible]	-20.0	17003	7088	11078	28323	16283	35169	12040	2.92
[illegible]	[illegible]	-23.0	17486	10988	13117	35001	21796	41591	13205	3.15
[illegible]	[illegible]	-27.0	20650	11775	15235	45249	29548	47660	15701	3.04
[illegible]	[illegible]	-29.0	21417	17500	16473	50959	33517	55390	17442	3.18
[illegible]	[illegible]	-30.0	21702	20100	15730	53933	35158	57532	18775	3.06
[illegible]	[illegible]	-34.0	26347	26279	18775	66970	44802	71401	22168	3.22
[illegible]	[illegible]	-47.0	38976	27000	49253	121883	87283	115229	34600	3.33
[illegible]	[illegible]	-50.0	40854	30000	50166	137281	99233	121020	38048	3.18
[illegible]	[illegible]	-98.0	123408	67500	122667	487550	405345	313575	82205	3.81
[illegible]	[illegible]	-115.0	181337	228655	273429	696911	603631	683421	93280	7.33

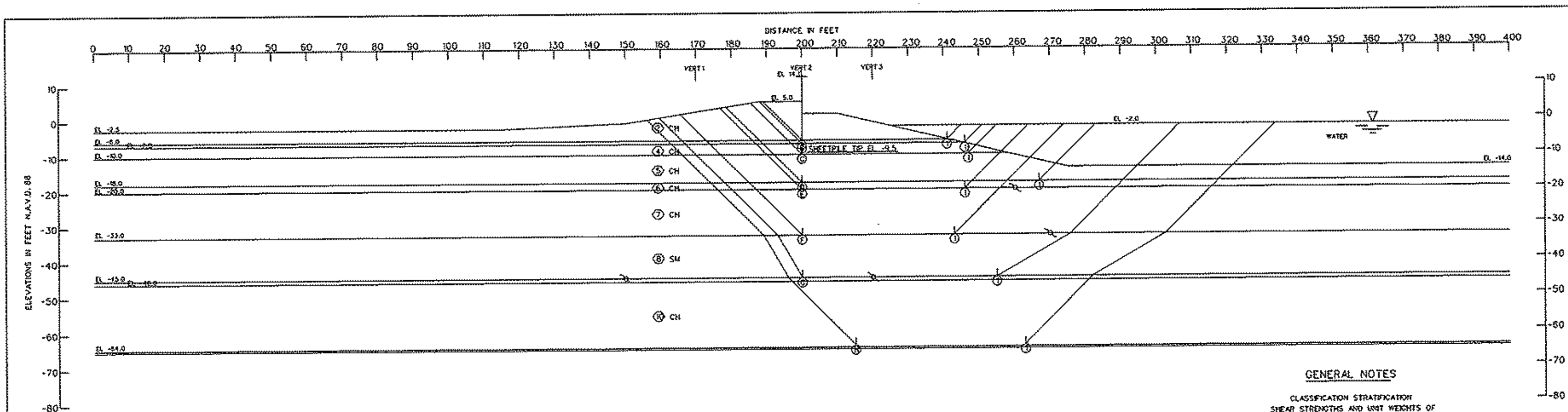
GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

LAKE PONTCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS
REACH A

PLATE: 147



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	-6.0	18572	7554	110	7287	500	26236	6787	3.87
Ⓑ ①	-7.0	19236	7680	-14	8681	781	26902	7900	3.41
Ⓒ ①	-10.0	20478	7785	454	13422	2132	28717	11290	2.54
Ⓓ ①	-18.0	22504	11880	1001	29269	8640	35385	-20629	1.72
Ⓔ ①	-20.0	22876	12900	2329	33912	13188	38105	20724	1.84
Ⓕ ①	-33.0	24892	20410	8425	72872	42388	53727	30484	1.76
Ⓖ ①	-45.0	36479	26050	37219	126288	79976	99748	46312	2.15
Ⓗ ①	-64.0	55670	22691	52578	240183	176631	130939	63552	2.06

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	118	123	118	600	900	600	600	900	600	0
③	CH	118	106	118	600	430	600	600	430	600	0
④	CH	108	106	108	105	430	105	105	430	105	0
⑤	CH	108	81	108	105	390	105	105	390	105	0
⑥	CH	108	81	108	140	390	140	140	390	140	0
⑦	CH	100	101	100	250	390	250	250	390	250	0
⑧	SM	122	122	122	0	0	0	0	0	0	30
⑨	CH	100	106	100	470	490	470	470	490	470	0
⑩	CH	100	106	100	470	585	470	470	680	470	0
⑪	CH	100	105	100	470	680	470	470	680	470	0

See Table 1 in the Report for reach stationing, boring and testing information.

NOTES

◯ -- STRATUM NUMBER
◯ -- WEDGE NUMBER
-- CROSSOVER POINT
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

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

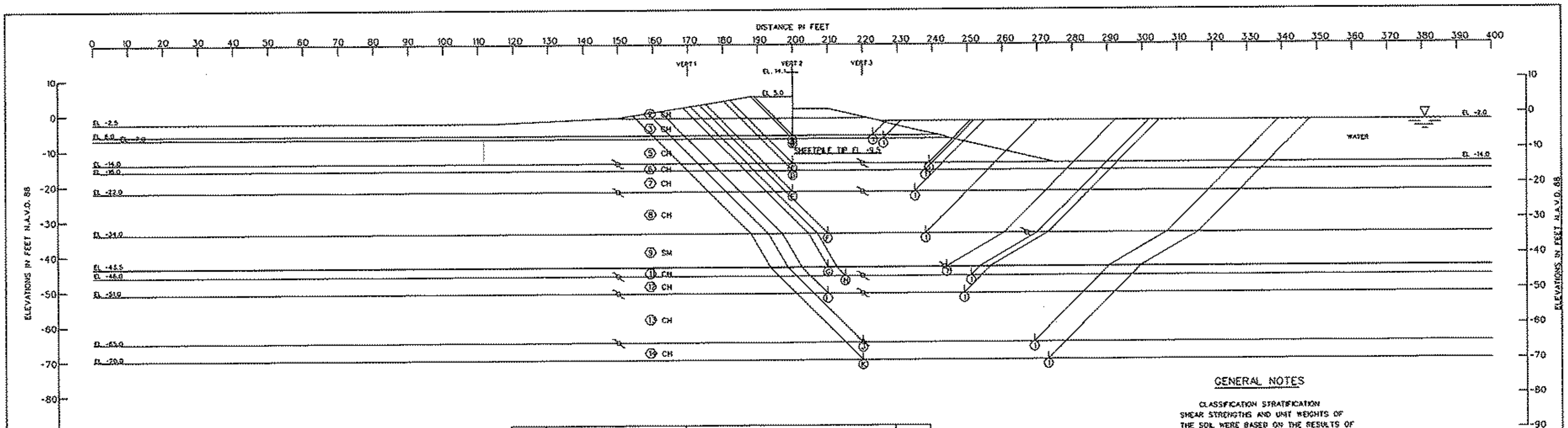
GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS
REACH 2

PLATE: 148



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	-6.0	16306	9411	3623	6682	888	29340	5794	5.06
Ⓑ ①	-7.0	16788	8730	3868	7965	1170	29386	6795	4.32
Ⓒ ①	-14.0	18791	13670	5175	19477	5074	37636	14403	2.61
Ⓓ ①	-16.0	19641	13925	6551	23531	6989	40117	16542	2.43
Ⓔ ①	-22.0	22794	14340	11160	37514	15030	48294	22484	2.15
Ⓕ ①	-34.0	32916	11947	19083	74298	40619	63946	33679	1.90
Ⓖ ①	-43.5	42658	26549	36716	114521	70778	105923	43743	2.42
Ⓗ ①	-46.0	46470	28651	40140	125875	80357	115261	45518	2.53
Ⓘ ①	-51.0	52493	30713	47961	153443	102509	131167	50934	2.58
Ⓙ ①	-65.0	73023	39200	69746	238403	177093	181969	61310	2.97
Ⓚ ①	-70.0	79185	42400	77746	272931	208947	199331	63984	3.12

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	112	112	112	750	750	750	750	750	750	0
③	CH	108	112	108	520	750	520	520	750	520	0
④	CH	108	108	108	520	265	520	520	265	520	0
⑤	CH	76	108	76	380	265	380	380	265	380	0
⑥	CH	76	101	76	380	319	380	380	328	380	0
⑦	CH	100	101	100	420	356	420	420	384	420	0
⑧	CH	100	101	100	420	440	420	420	495	420	0
⑨	SM	122	122	122	0	0	0	0	0	0	30
⑩	CH	105	105	105	800	540	600	800	540	800	0
⑪	CH	105	105	105	800	551	800	800	562	800	0
⑫	CH	105	105	105	800	584	800	800	605	800	0
⑬	CH	105	105	105	800	720	800	800	720	800	0
⑭	CH	105	105	105	800	800	800	800	800	800	0
⑮	CH	105	105	105	800	800	800	800	800	800	0

See Table 1 in the Report for reach stationing, boring and testing information.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

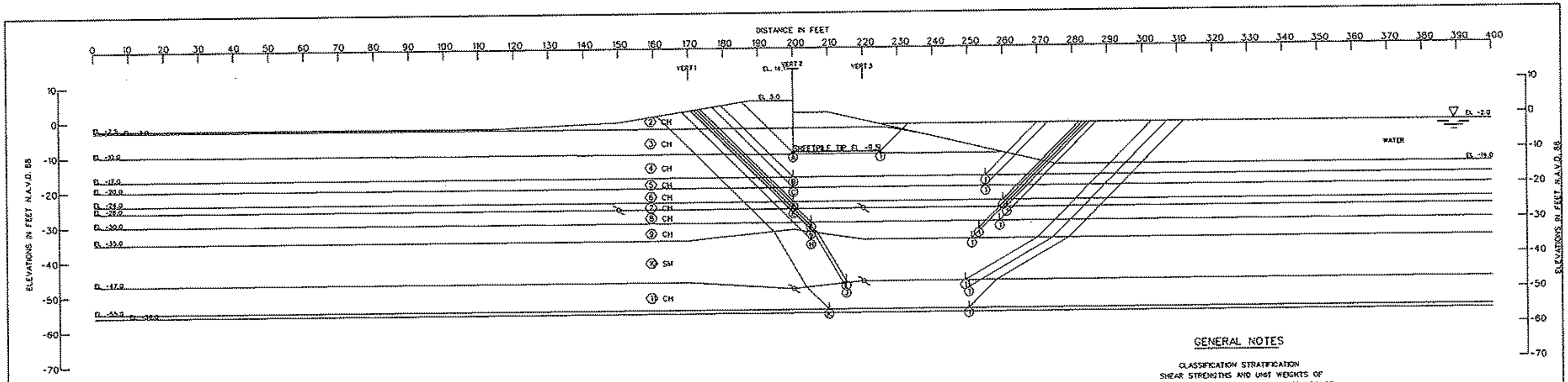
- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- ⌀ -- CROSSOVER POINT
- ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
- C -- UNIT COHESION, P.S.F.
- ▽ -- STATIC WATER SURFACE
- D -- HORIZONTAL DRIVING FORCE IN POUNDS
- R -- HORIZONTAL RESISTING FORCE IN POUNDS
- A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
- B -- 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, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS
REACH 10

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS

PLATE: 149



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	-10.0	19469	13300	6404	12576	3206	39173	9370	4.18
Ⓑ ①	-17.0	21447	14200	3510	25324	7494	39157	17830	2.20
Ⓒ ①	-20.0	22246	14200	4627	32183	11052	41073	21131	1.94
Ⓓ ①	-24.0	23311	11900	5578	42600	16899	40789	25701	1.59
Ⓔ ①	-26.0	23836	12070	5935	48350	20488	41841	27862	1.50
Ⓕ ①	-30.0	27865	11036	7080	60542	29023	45981	31519	1.46
Ⓖ ①	-32.0	29141	16372	8791	67469	34406	54304	33063	1.64
Ⓗ ①	-35.0	30799	15732	10603	78460	42670	57134	35790	1.60
Ⓘ ①	-47.0	46530	20316	38536	131064	84774	105382	46290	2.28
Ⓙ ①	-49.0	49370	38598	44454	141929	93437	132422	48492	2.73
Ⓚ ①	-55.0	55457	20550	45266	180227	122577	121273	57650	2.10

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	110	124	110	500	900	500	500	900	500	0
③	CH	110	82	110	500	580	500	500	580	500	0
④	CH	77	110	77	280	340	280	280	340	280	0
⑤	CH	108	110	108	240	340	240	240	340	240	0
⑥	CH	100	110	100	240	340	240	240	340	240	0
⑦	CH	100	110	100	170	340	170	170	340	170	0
⑧	CH	100	100	100	170	500	170	170	500	170	0
⑨	CH	100	100	100	320	500	320	320	500	320	0
⑩	SM	122	122	122	0	0	0	0	0	0	30
⑪	CH	105	105	105	500	720	500	500	720	500	0
⑫	CH	105	105	105	500	720	500	500	720	500	0

See Table 1 in the Report for reach stationing, boring and testing information.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- ⌿ -- CROSSOVER POINT
- 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 PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT

17TH STREET CANAL

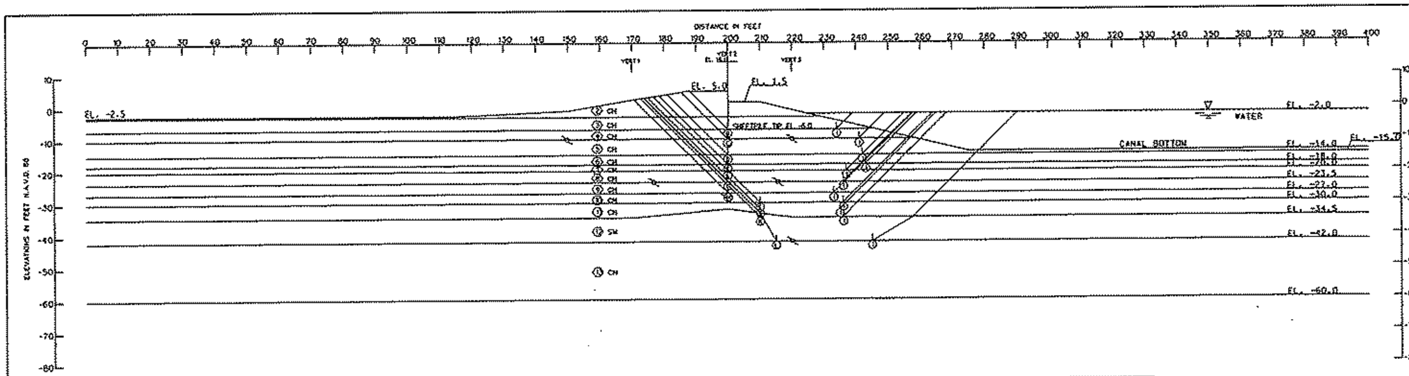
ANALYSIS OF EXISTING CONDITIONS

SLOPE STABILITY ANALYSIS

LOW WATER CONDITIONS

REACH 11

PLATE: 150



NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
-- CROSSOVER POINT
φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
-- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
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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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

PORTIONS OF THIS REACH HAVE A SHEETPILE TIP OF EL -9.5

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	
B	3	-7.0	11339	7780	1619	7290	911	20738	6379	3.25
C	3	-10.0	12019	9320	1552	11474	2194	22891	9280	2.47
D	3	-15.0	13673	8440	3151	20241	5997	25264	14244	1.77
E	3	-18.0	14647	8610	3831	26533	9308	27088	17225	1.57
F	3	-20.0	15287	9480	5091	31152	12584	29858	18568	1.61
G	3	-23.5	16948	10021	6681	40036	18556	33650	21480	1.57
H	3	-27.0	17795	9730	8686	49853	26062	36211	23791	1.52
I	3	-30.0	22409	9315	10127	58438	32629	41851	25809	1.62
J	3	-32.0	23846	9987	11492	65373	37953	45325	27420	1.65
K	3	-34.5	25609	10372	13007	74450	44794	48988	29656	1.65
L	3	-42.0	33498	16970	28271	104111	67525	78739	36586	2.15

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	104	101	104	360	660	360	360	660	360	0
3	CH	104	110	104	360	250	360	360	250	360	0
4	CH	84	110	84	220	250	220	220	250	220	0
5	CH	84	105	84	220	300	220	220	300	220	0
6	CH	110	105	110	170	300	170	170	300	170	0
7	CH	102	105	102	230	300	230	240	300	240	0
8	CH	102	102	102	257	380	257	275	380	275	0
9	CH	102	90	102	292	260	292	330	260	330	0
10	CH	102	100	102	325	530	325	340	530	340	0
11	CH	102	100	102	352	530	352	385	530	385	0
12	SM	112	112	112	0	0	0	0	0	0	30
13	CH	100	100	100	490	490	490	490	490	490	0

GENERAL NOTES

CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS

PLATE: 151

INPUT DATA FILENAME: 12

GENERAL NOTES:
CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS, AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS. SEE BORING DATA PLATES.

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

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	5	-3.0	8976	2549	5500	3225	1027	16025	2198	7.29
A	2	-3.0	8976	7756	1093	3225	148	17825	3077	5.79
B	3	-7.0	11339	7780	1619	7290	911	20738	6379	3.25
C	3	-10.0	12019	9320	1552	11474	2194	22891	9280	2.47
D	3	-15.0	13673	8440	3151	20241	5997	25264	14244	1.77
E	3	-18.0	14647	8610	3831	26533	9308	27088	17225	1.57
F	3	-20.0	15287	9480	5091	31152	12584	29858	18568	1.61
G	3	-23.5	16948	10021	6681	40036	18556	33650	21480	1.57
H	3	-27.0	17795	9730	8686	49853	26062	36211	23791	1.52
I	3	-30.0	22409	9315	10127	58438	32629	41851	25809	1.62
J	3	-32.0	23846	9987	11492	65373	37953	45325	27420	1.65
K	3	-34.5	25609	10372	13007	74450	44794	48988	29656	1.65
L	3	-42.0	33498	16970	28271	104111	67525	78739	36586	2.15
M	3	-53.0	47827	41104	59993	160793	113927	148924	46866	3.18

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	104	101	104	360	660	360	360	660	360	0
3	CH	104	110	104	360	250	360	360	250	360	0
4	CH	84	110	84	220	250	220	220	250	220	0
5	CH	84	105	84	220	300	220	220	300	220	0
6	CH	110	105	110	170	300	170	170	300	170	0
7	CH	102	105	102	230	300	230	240	300	240	0
8	CH	102	102	102	257	380	257	275	380	275	0
9	CH	102	90	102	292	260	292	330	260	330	0
10	CH	102	100	102	325	530	325	340	530	340	0
11	CH	102	100	102	352	530	352	385	530	385	0
12	SM	112	112	112	0	0	0	0	0	0	30
13	CH	100	100	100	490	490	490	490	490	490	0

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

(O) -- STRATUM NUMBER
(◇) -- WEDGE NUMBER
-- CROSSOVER POINT
φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
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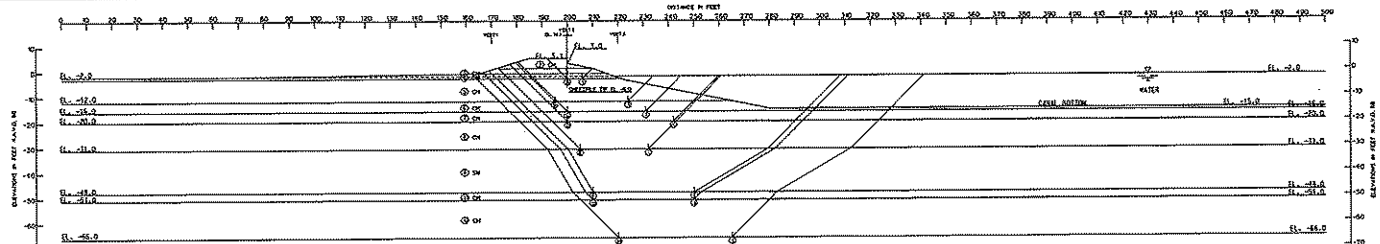
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

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



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	
[illegible]	[illegible]	-3.0	12041	2202	4657	3183	1045	18905	2134	7.77
[illegible]	[illegible]	-12.0	14941	6970	2464	35133	4180	24375	10953	2.23
[illegible]	[illegible]	-16.0	17843	4780	3243	33548	7152	27866	15366	1.79
[illegible]	[illegible]	-20.0	18628	10620	3061	32532	12608	32915	19924	1.65
[illegible]	[illegible]	-31.0	22946	8758	9081	64783	38528	40785	28254	1.44
[illegible]	[illegible]	-48.0	44416	21075	49649	135817	91951	114640	45148	2.38
[illegible]	[illegible]	-51.0	47070	21050	51095	157075	105967	120219	51208	2.35
[illegible]	[illegible]	-66.0	64917	30600	68202	251953	188278	161719	63704	2.54

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C = UNIT COHESION = P.S.F.						FRICTION ANGLE (DEGREES)
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	100	100	100	900	900	900	900	900	900	0
3	CH	100	100	100	600	600	600	600	600	600	0
4	CH	110	100	110	500	500	500	500	500	500	0
5	CH	100	100	100	150	450	150	150	450	150	0
6	CH	100	103	100	150	300	150	150	300	150	0
7	CH	100	103	100	150	355	150	150	455	150	0
8	CH	100	103	100	235	355	240	290	455	250	0
9	SM	122	122	122	0	0	0	0	0	0	30
10	CH	104	105	104	550	500	550	550	500	550	0
11	CH	104	105	104	550	550	550	550	550	550	0
12	CH	105	105	105	605	605	605	600	605	600	0
13	CH	105	105	105	650	650	650	650	650	650	0

NOTE: SEE TABLE 1-1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

(O) -- STRATUM NUMBER
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-- CROSSOVER POINT
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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 = $\frac{R_A + R_B + R_P}{D_A - D_P}$

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS

PLATE: 152

GENERAL NOTES:

NOTES

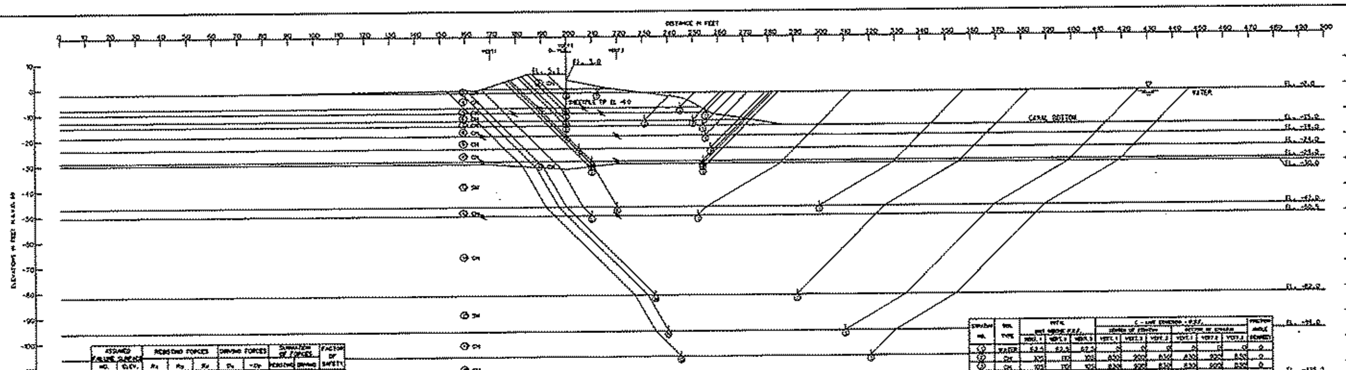
φ -- ANGLE OF INTERNAL FRICTION, DEGREES
C -- UNIT COHESION, P.S.F.
-- STATIC WATER SURFACE
D -- HORIZONTAL DRIVING FORCE IN POUNDS
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT, REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT, REFERS TO PASSIVE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

U.S. ARMY ENGINEER DISTRICT NEW ORLEANS FACTOR OF SAFETY = $\frac{R_A + R_B + R_P}{D_A - D_P}$

CORPS OF ENGINEERS
12-APR-07

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	
[illegible]	[illegible]	-3.0	12044	2202	4657	3483	1047	18505	2434	7.77
[illegible]	[illegible]	-12.0	14941	6970	2464	35133	4180	24375	10953	2.23
[illegible]	[illegible]	-16.0	17843	4780	3243	33548	7152	27866	15366	1.79
[illegible]	[illegible]	-20.0	18628	10620	3061	32532	12608	32915	19924	1.65
[illegible]	[illegible]	-31.0	22946	8758	9081	64783	38528	40785	28254	1.44
[illegible]	[illegible]	-48.0	44416	21075	49649	135817	91951	114640	45148	2.38
[illegible]	[illegible]	-51.0	47070	21050	51095	157075	105967	120219	51208	2.35
[illegible]	[illegible]	-66.0	64917	30600	68202	251953	188278	161719	63704	2.54

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C = UNIT COHESION = P.S.F.						FRICTION ANGLE (DEGREES)
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	100	100	100	900	900	900	900	900	900	0
3	CH	100	100	100	600	600	600	600	600	600	0
4	CH	110	100	110	500	500	500	500	500	500	0
5	CH	100	100	100	150	450	150	150	450	150	0
6	CH	100	103	100	150	300	150	150	300	150	0
7	CH	100	103	100	150	355	150	150	455	150	0
8	CH	100	103	100	235	355	240	290	455	250	0
9	SM	122	122	122	0	0	0	0	0	0	30
10	CH	104	105	104	550	500	550	550	500	550	0
11	CH	104	105	104	550	550	550	550	550	550	0
12	CH	105	105	105	605	605	605	600	605	600	0
13	CH	105	105	105	650	650	650	650	650	650	0



GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

① — STRATUM NUMBER
○ — WEDGE NUMBER
— CROSSOVER POINT
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 = $\frac{R_A + R_B + R_P}{D_A - D_P}$

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
[illegible]	-2.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	-8.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.39
[illegible]	-10.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.33
[illegible]	-13.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.47
[illegible]	-13.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.06
[illegible]	-15.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.35
[illegible]	-19.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.99
[illegible]	-24.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.78
[illegible]	-28.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.10
[illegible]	-30.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.09
[illegible]	-32.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.07
[illegible]	-47.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.20
[illegible]	-50.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.83
[illegible]	-82.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.45
[illegible]	-96.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5.29
[illegible]	-108.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5.73

See Table 1 in the Report for reach stationing, boring and testing information.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT. 1	VERT. 2	VERT. 3	C - UNIT COHESION - P.S.F. CENTER OF STRATUM VERT. 1	VERT. 2	VERT. 3	BOTTOM OF STRATUM VERT. 1	VERT. 2	VERT. 3	FRICTION ANGLE DEGREES
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
3	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
4	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
5	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
6	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
7	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
8	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
9	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
10	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
11	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
12	SM	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	30
13	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
14	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
15	SM	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	30
16	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
17	CH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
18	SM	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	30

SLOPE STABILITY ANALYSIS

PLATE: 153

INPUT DATA FILENAME: 16

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

① — STRATUM NUMBER
○ — WEDGE NUMBER
— CROSSOVER POINT
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 = $\frac{R_A + R_B + R_P}{D_A - D_P}$

GENERAL NOTES

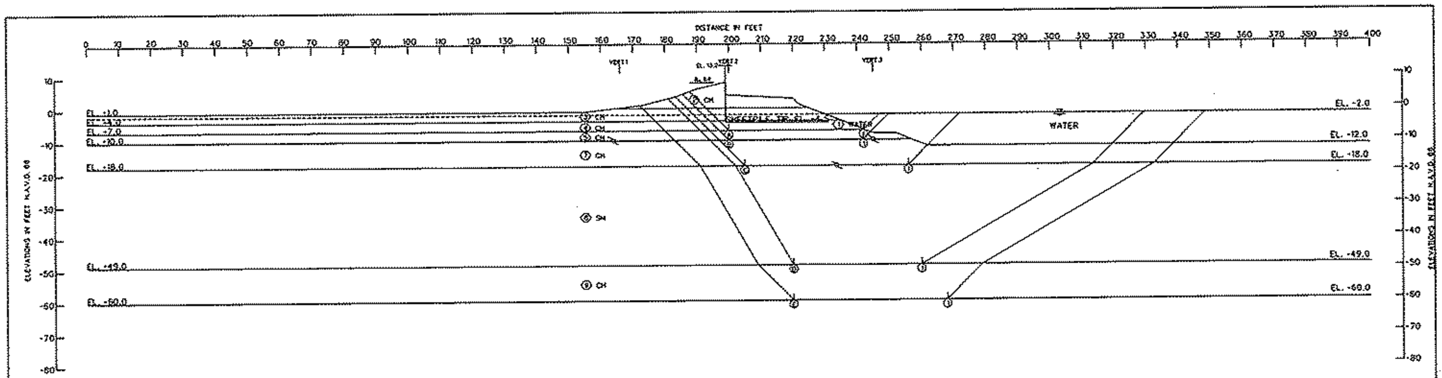
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
⬡ -- WEDGE NUMBER
X -- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$



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	-7.0	14553	12880	112	10737	782	27645	9955	2.78
B	1	-10.0	15864	12880	932	15162	2131	29696	13031	2.28
C	1	-18.0	22234	16166	2820	30993	8831	41220	22192	1.86
D	1	-49.0	67258	40000	72484	160888	104466	179742	56422	3.19
E	1	-50.0	90706	48000	94455	235200	165736	233161	70454	3.31

NOTES

○ -- STRATUM NUMBER
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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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	112	112	112	750	860	750	750	860	750	0
3	CH	112	107	112	750	400	750	750	400	750	0
4	CH	105	107	105	400	400	400	400	400	400	0
5	CH	98	107	98	200	400	200	200	400	200	0
6	CH	98	107	98	200	450	200	200	450	200	0
7	CH	96	107	96	235	450	235	270	450	270	0
8	SM	122	122	122	0	0	0	0	0	0	30
9	CH	107	107	107	1000	1000	1000	1000	1000	1000	0
10	CH	107	107	107	1000	1000	1000	1000	1000	1000	0

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 1 in the Report for reach stationing, boring and testing information.

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS

PLATE: 154

INPUT DATA FILENAME: S13JPL19

GENERAL NOTES:

CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS, AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS. SEE BORING DATA PLATES.

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

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- ⌿ -- CROSSOVER POINT
- 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
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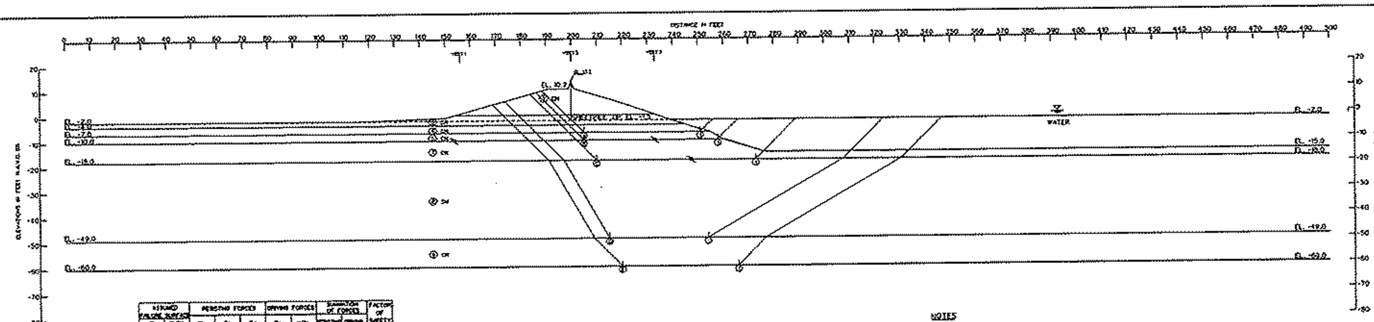
- P -- AS A SUBSCRIPT, REFERS TO PASSIVE WEDGE

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



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	
①③	-7.0	24632	11073	755	17214	800	35518	16511	2.05
②③	-10.0	22881	12973	300	23273	2016	35154	21090	1.70
③③	-18.0	28932	18134	1466	43085	8215	46332	34871	1.33
④③	-49.0	93322	39000	68075	108595	10725	191002	86180	2.22
⑤③	-60.0	109700	49000	86415	266346	161645	239322	104547	2.29

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C = UNIT COHESION P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	112	112	112	750	850	750	750	850	750	0
③	CH	112	107	112	750	600	750	750	600	750	0
④	CH	103	107	103	400	600	400	400	600	400	0
⑤	CH	95	107	95	220	600	220	220	600	220	0
⑥	CH	95	107	95	225	450	225	225	450	225	0
⑦	CH	95	107	95	235	450	235	270	450	270	0
⑧	SM	122	122	122	0	0	0	0	0	0	30
⑨	CH	107	107	107	1000	1000	1000	1000	1000	1000	0
⑩	CH	107	107	107	1000	1000	1000	1000	1000	1000	0

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- ⌿ -- CROSSOVER POINT
- φ -- ANGLE OF INTERNAL FRICTION, DEGREES
- C -- UNIT COHESION, P.S.F.
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- 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: SEE TABLE 1 IN THE REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

SLOPE STABILITY ANALYSIS

LOW WATER CONDITIONS

23-APR-07

PLATE: 155

INPUT DATA FILENAME: 635

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	
①③	-7.0	24632	11073	755	17214	800	35518	16511	2.05
②③	-10.0	22881	12973	300	23273	2016	35154	21090	1.70
③③	-18.0	28932	18134	1466	43085	8215	46332	34871	1.33
④③	-49.0	93322	39000	68075	108595	10725	191002	86180	2.22
⑤③	-60.0	109700	49000	86415	266346	161645	239322	104547	2.29

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C = UNIT COHESION P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	112	112	112	750	850	750	750	850	750	0
③	CH	112	107	112	750	600	750	750	600	750	0
④	CH	103	107	103	400	600	400	400	600	400	0
⑤	CH	95	107	95	220	600	220	220	600	220	0
⑥	CH	95	107	95	225	450	225	225	450	225	0
⑦	CH	95	107	95	235	450	235	270	450	270	0
⑧	SM	122	122	122	0	0	0	0	0	0	30
⑨	CH	107	107	107	1000	1000	1000	1000	1000	1000	0
⑩	CH	107	107	107	1000	1000	1000	1000	1000	1000	0

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
⬡ -- WEDGE NUMBER
ϕ' -- CROSSOVER POINT
ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
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SWS -- STATIC WATER SURFACE
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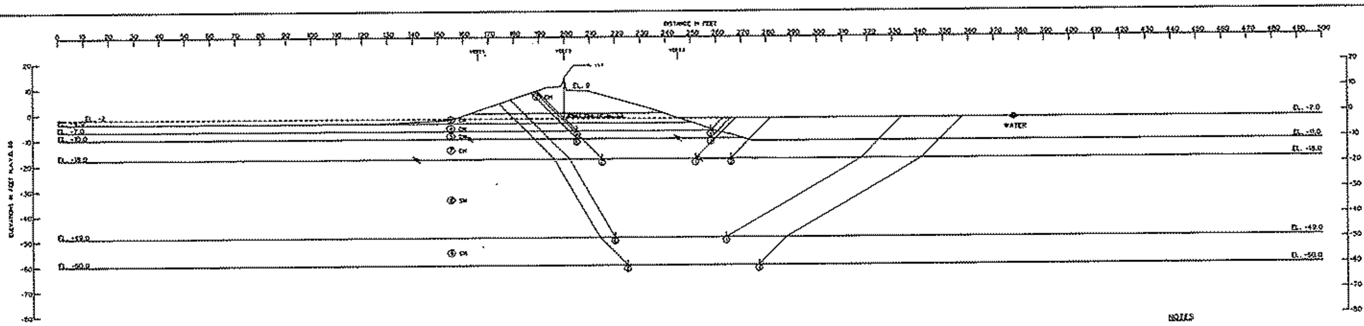
R -- HORIZONTAL RESISTING FORCE IN POUNDS
A -- AS A SUBSCRIPT, REFERS TO ACTIVE WEDGE
B -- AS A SUBSCRIPT REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT REFERS TO PASSIVE WEDGE

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



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
1	-7.0	25433	14155	345	16960	788	39970	15874	2.39
2	-10.0	21800	14155	1062	22368	2707	36823	20201	1.83
3	-15.0	22030	12050	4573	42144	10435	43793	31675	1.45
4	-18.0	29030	15253	3421	47144	9159	47684	37985	1.45
5	-49.0	87934	44000	75874	186324	105075	210075	80379	2.31
6	-50.0	104700	53000	97092	263783	187365	253737	95404	2.65

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F. VERT. 1	VERT. 2	VERT. 3	C - UNIT COHESION - P.S.F. TOP OF STRATUM VERT. 1	VERT. 2	VERT. 3	BOTTOM OF STRATUM VERT. 1	VERT. 2	VERT. 3	FRICTION ANGLE DEGREES
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	112	115	112	750	650	750	750	650	750	0
3	CH	112	107	112	750	600	750	750	600	750	0
4	CH	100	107	100	600	600	600	600	600	600	0
5	CH	94	107	95	200	600	200	200	600	200	0
6	CH	95	107	95	200	650	200	200	650	200	0
7	CH	95	107	95	235	650	235	210	650	235	0
8	SM	122	122	122	0	0	0	0	0	0	30
9	CH	107	107	107	1000	1000	1000	1000	1000	1000	0
10	CH	107	107	107	1000	1000	1000	1000	1000	1000	0

See Table 1 in the Report for soil stratification, boring and testing information.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NOTES

○ -- STRATUM NUMBER
⬡ -- WEDGE NUMBER
ϕ' -- CROSSOVER POINT
ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
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R -- HORIZONTAL RESISTING FORCE IN POUNDS
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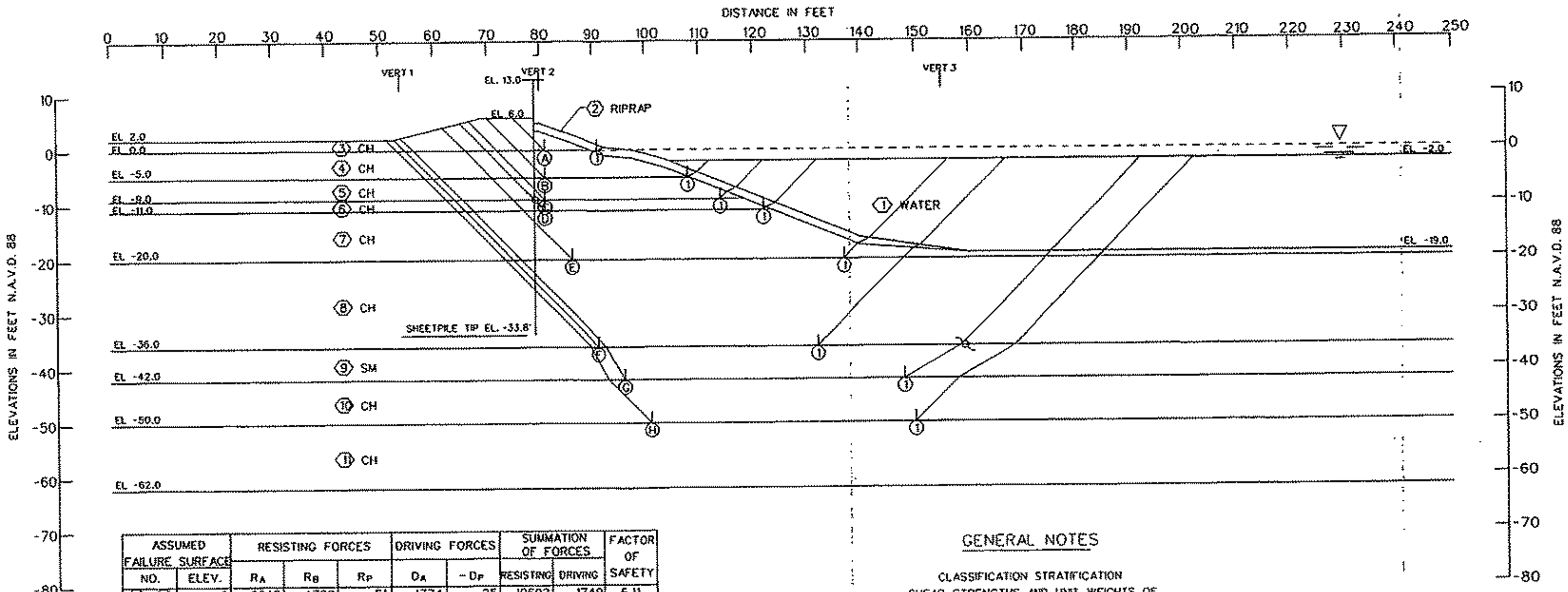
B -- AS A SUBSCRIPT REFERS TO CENTRAL BLOCK
P -- AS A SUBSCRIPT REFERS TO PASSIVE WEDGE

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

SLOPE STABILITY ANALYSIS

PLATE: 156

INPUT DATA FILENAME: [illegible]



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	5945	4798	-51	1774	25	10692	1749	6.11
Ⓑ	①	-5.0	10991	7012	63	6306	332	18066	5974	3.02
Ⓒ	①	-9.0	12640	8431	581	11647	1733	21652	9914	2.18
Ⓓ	①	-11.0	13361	9952	285	14791	2621	23598	12170	1.94
Ⓔ	①	-20.0	17554	11495	945	32959	10635	29994	22324	1.34
Ⓕ	①	-36.0	26231	13251	10424	82678	44487	49906	38191	1.31
Ⓖ	①	-42.0	32837	15807	18846	106570	60651	67490	45919	1.47
Ⓗ	①	-50.0	39400	14095	20681	145220	91862	74176	53358	1.39

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	DEGREES
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	RIPRAP	132	132	132	0	0	0	0	0	0	40
③	CH	110	110	110	500	500	500	500	500	500	0
④	CH	100	100	100	500	500	175	500	500	175	0
⑤	CH	100	100	76	280	280	175	280	280	175	0
⑥	CH	100	100	76	280	280	380	280	280	380	0
⑦	CH	100	100	100	280	280	150	280	280	150	0
⑧	CH	100	100	100	340	340	300	340	340	300	0
⑨	SM	122	122	122	0	0	0	0	0	0	30
⑩	CH	100	100	100	485	485	150	500	500	150	0
⑪	CH	100	100	108	595	595	610	690	690	610	0

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

See Table 3 in the Report for reach stationing, boring and testing information.

NOTES

- ○ -- STRATUM NUMBER
- ⬡ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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

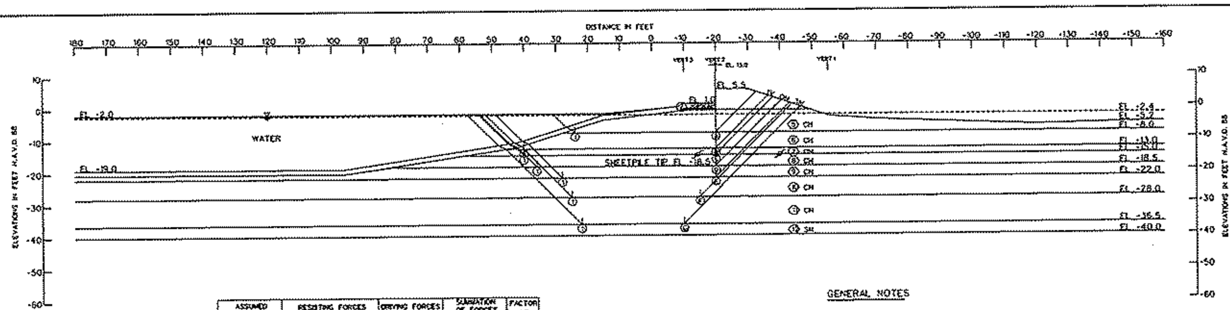
FACTOR OF SAFETY $= \frac{R_A + R_B + R_P}{D_A - D_P}$

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS
REACH 18

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

DESIGNED BY: C.R. DRAWN BY: C.R./K.O. CHECKED BY: F.V. PLOT SCALE: 20 PLOT DATE: 30 APRIL 07 DATE: APRIL 2007

PLATE: 157



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)	(3)	-8.0	12853	12320	656	9922	3286	25829	6636	3.89
(B)	(3)	-13.0	13784	10200	745	17593	3928	24729	13665	1.81
(C)	(3)	-15.0	14235	10086	1199	21023	5596	25520	15427	1.65
(D)	(3)	-18.5	14702	10890	2565	27988	9879	28157	18109	1.55
(E)	(3)	-22.0	15546	13540	5061	35720	15665	34147	20055	1.70
(F)	(3)	-28.0	19285	12067	8275	51361	27775	39602	23786	1.66
(G)	(3)	-35.5	24048	11200	13790	79701	51073	49038	28628	1.71

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	VERT.1	VERT.2	VERT.3	
(1)	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
(2)	RIPRAP	132	132	132	0	0	0	0	0	0	40
(3)	CH	110	110	110	400	400	400	400	400	400	0
(4)	CH	116	116	116	600	600	600	600	500	600	0
(5)	CH	106	113	106	350	430	350	350	430	350	0
(6)	CH	80	93	80	280	280	280	280	280	280	0
(7)	CH	98	102	98	160	280	160	160	280	160	0
(8)	CH	98	102	98	190	240	190	190	240	190	0
(9)	CH	98	102	98	280	300	280	280	300	280	0
(10)	CH	98	102	98	300	350	300	300	350	300	0
(11)	CH	102	102	102	350	350	350	350	350	350	0
(12)	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

SEE TABLE 3 IN REPORT FOR REACH STATIONING, BORING AND TESTING INFORMATION.

NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
-- CROSSOVER POINT
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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS

PLATE: 158

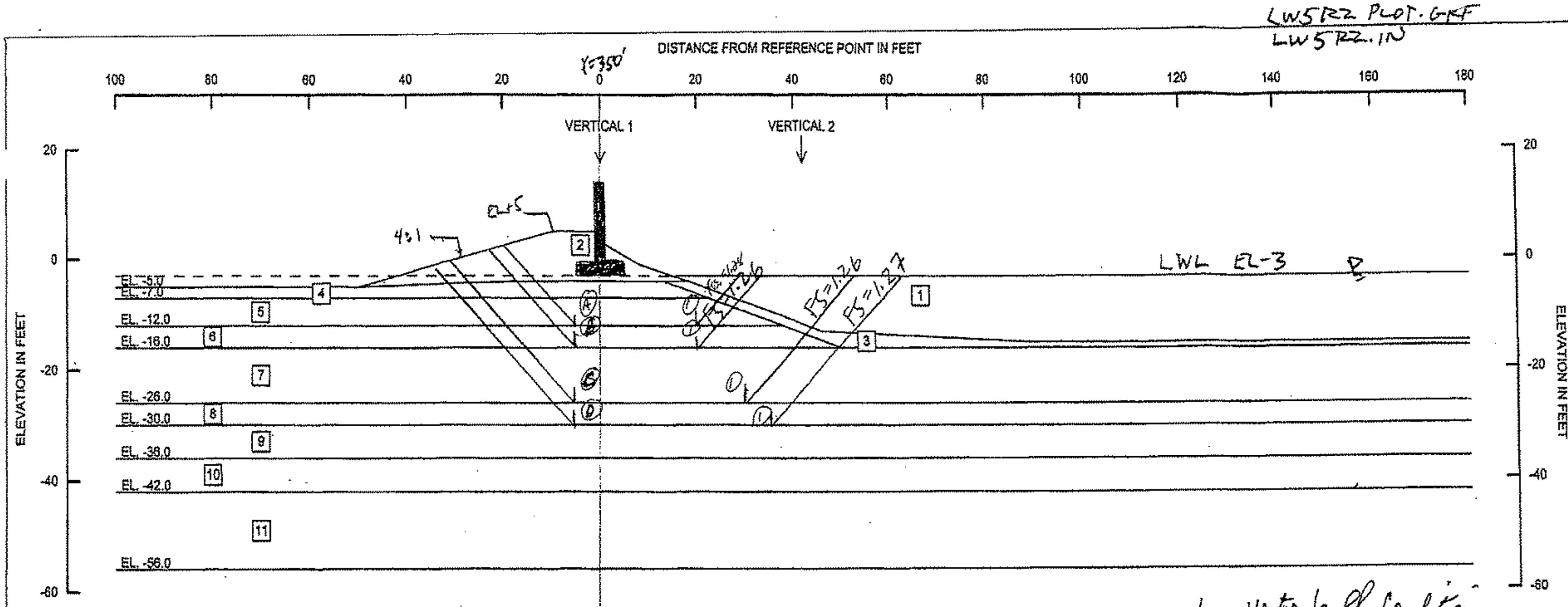
INPUT DATA FILENAME: LW19

GENERAL NOTES:
CLASSIFICATION, STRATIFICATION, SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS SEE BORING DATA PLATES.

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

PLATE 158-LW19.DGN 3/27/2006 10:45:24 AM

LW5RZ PLOT.GRF
LW5RZ.IN



SOIL NO.	DESCRIPTION	FRICTION ANGLE IN DEGREES	VERTICAL 1 UNIT WEIGHT IN PCF	VERTICAL 1 COHESION IN PSF AVG.	VERTICAL 1 COHESION IN PSF BASE	VERTICAL 2 UNIT WEIGHT IN PCF	VERTICAL 2 COHESION IN PSF AVG.	VERTICAL 2 COHESION IN PSF BASE
1	DESCRIPTION	0	62	0	0	62	0	0
2	DESCRIPTION	0	115	400	400	115	400	400
3	DESCRIPTION	30	130	0	0	130	0	0
4	DESCRIPTION	0	115	400	400	115	400	400
5	DESCRIPTION	0	75	150	150	75	150	150
6	DESCRIPTION	0	95	200	200	95	200	200
7	DESCRIPTION	0	95	250	250	112	150	150
8	DESCRIPTION	0	95	250	250	93	160	160
9	DESCRIPTION	0	95	400	400	83	200	200
10	DESCRIPTION	25	120	0	0	120	0	0
11	DESCRIPTION	0	100	600	600	101	400	400

Low Water level Condition does not govern T-wall design. Refer to high water level condition (HW5RZ.IN)

FAILURE SURFACE	SUMMATION OF FORCES IN KIPS/L.F. RESISTING	DRIVING	FACTOR OF SAFETY
A①	14362	11179	1.28
B①	17877	14132	1.26
C①	25849	20868	1.24
D①	28454	22321	1.27

JJH 2/15/2005

REV	DATE	DESCRIPTION	REV	DATE	DESCRIPTION

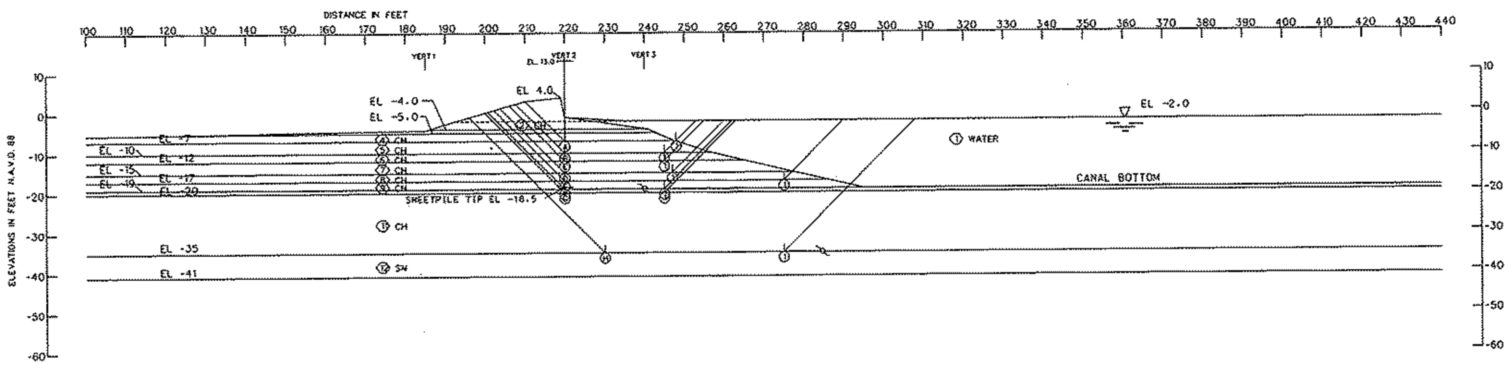
EUSTIS ENGINEERING COMPANY, INC.
GEOTECHNICAL ENGINEERING & CQC SERVICES
3011 28TH STREET METAIRIE, LOUISIANA

FIRST TITLE BLOCK LINE
SECOND TITLE BLOCK LINE
THIRD TITLE BLOCK LINE
FOURTH TITLE BLOCK LINE
FIFTH TITLE BLOCK LINE

DRAWN BY: G.L.H. | DATE: 12 JAN 2005
CHECKED BY: C.L.S. | FIGURE / DRAWING NO.
SCALE: AS SHOWN
FILE: PLOT1117.GRF

G-1

PLATE 159



NOTES

- ○ -- STRATUM NUMBER
- ◇ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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
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- B -- AS A SUBSCRIPT REFERS TO CENTRAL BLOCK
- P -- AS A SUBSCRIPT REFERS TO PASSIVE WEDGE

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

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)	-7.0	15658	5507	-148	5669	782	21017	4887	4.30
(B)	(1)	-10.0	15863	4550	969	9196	2126	21382	7070	3.02
(C)	(1)	-12.0	15887	4550	1484	11899	3377	21921	8522	2.57
(D)	(1)	-15.0	15917	5150	2269	16435	5854	23336	10581	2.21
(E)	(1)	-17.0	15840	9850	846	19830	7163	26536	12667	2.09
(F)	(1)	-19.0	15767	4450	3623	23580	10857	23840	12723	1.87
(G)	(1)	-20.0	15748	4630	3900	25581	12327	24278	13254	1.83
(H)	(1)	-35.0	23325	17452	9089	65367	40420	49866	24947	2.00

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	109	109	109	900	900	900	900	900	900	0
3	CH	100	100	100	900	500	900	900	500	900	0
4	CH	100	100	100	500	500	500	500	500	500	0
5	CH	80	100	80	170	225	170	170	225	170	0
6	CH	80	90	80	170	200	170	170	200	170	0
7	CH	110	90	110	200	200	200	200	200	200	0
8	CH	110	114	110	200	175	200	200	175	200	0
9	CH	100	114	100	180	175	180	180	175	180	0
10	CH	100	100	100	180	184	180	180	193	180	0
11	CH	98	100	98	282	322	282	383	470	383	0
12	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

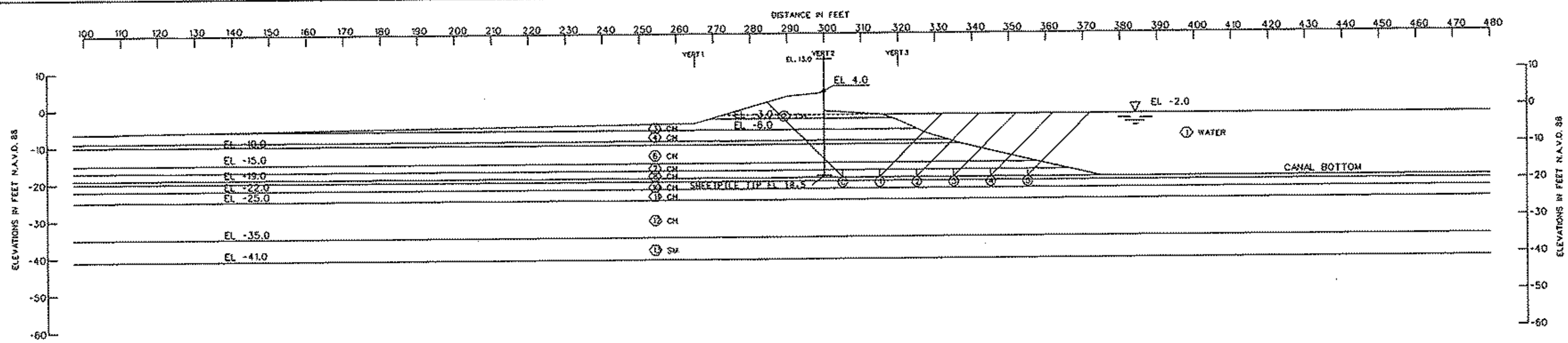
See Table 3 in the Report for reach stationing, boring and testing information.

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS
REACH 21

DATE: MAR 2007

PLATE: 160

INPUT DATA FILENAME: OH23



NOTES

- ◇ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

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	-19.0	20557	2300	5422	21984	12156	28279	9828	2.88
© ②	-19.0	20557	3987	3769	21984	10428	28313	11556	2.45
© ③	-19.0	20557	5587	2859	21984	9791	29003	12193	2.38
© ④	-19.0	20557	7187	2010	21984	9591	29754	12393	2.40
© ⑤	-19.0	20557	8787	1196	21984	9443	30540	12541	2.44

See Table 3 in the Report for reach stationing, boring and testing information.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. CENTER OF STRATUM			BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	105	105	105	900	900	900	900	900	900	0
3	CH	105	108	105	900	500	900	900	500	900	0
4	CH	100	108	100	300	500	300	300	500	300	0
5	CH	75	108	75	220	500	220	220	500	220	0
6	CH	75	75	75	220	300	220	220	300	220	0
7	CH	114	75	114	160	300	160	160	300	160	0
8	CH	114	110	114	160	300	160	160	300	160	0
9	CH	114	110	114	160	300	160	150	300	160	0
10	CH	108	110	108	320	230	320	320	230	320	0
11	CH	99	110	99	320	230	320	320	230	320	0
12	CH	99	100	99	320	425	320	320	460	320	0
13	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

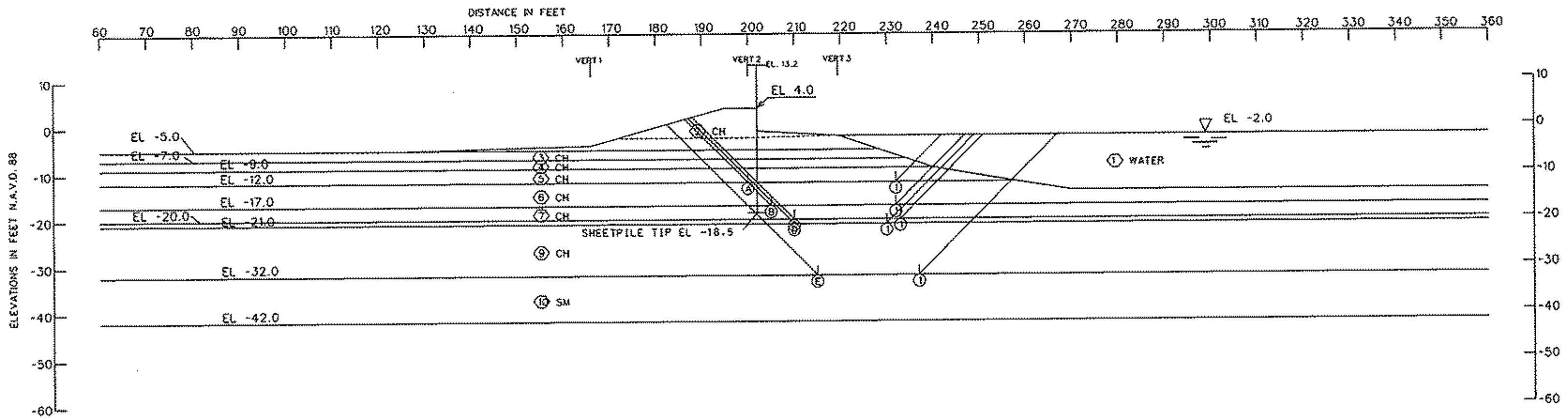
LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS
REACH 22

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

DESIGNED BY: K.O. | DRAWN BY: O.L. | CHECKED BY: E.V./C.R. | PLOT SCALE: 29 | PLOT DATE: 2 MAY 07 | DATE: MAY 2007 | FILE NO.

PLATE: 161

INPUT DATA FILENAME: OH22



NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- ⌀ -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

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	-12.0	16040	4717	1026	13198	3335	21783	9863	2.21
Ⓑ ①	-17.0	16280	5051	1970	20958	8016	23301	12942	1.80
Ⓒ ①	-20.0	18578	4901	2673	26827	11924	26152	14903	1.75
Ⓓ ①	-21.0	18736	4549	3041	28908	13675	26326	15233	1.73
Ⓔ ①	-32.0	24351	6133	6384	56823	36273	36868	20550	1.79

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F.						FRICTION ANGLE DEGREES
					CENTER OF STRATUM			BOTTOM OF STRATUM			
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
①	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
②	CH	109	122	109	900	900	900	900	900	900	0
③	CH	109	100	109	900	320	900	900	320	900	0
④	CH	76	100	76	120	320	120	120	320	120	0
⑤	CH	76	80	80	120	210	120	120	210	120	0
⑥	CH	100	80	100	125	210	125	135	210	135	0
⑦	CH	100	106	100	140	280	140	150	280	150	0
⑧	CH	100	106	100	150	280	150	155	280	155	0
⑨	CH	100	100	100	180	410	180	210	410	210	0
⑩	SM	122	122	122	0	0	0	0	0	0	30

See Table 3 in the Report for reach stationing, boring and testing information.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

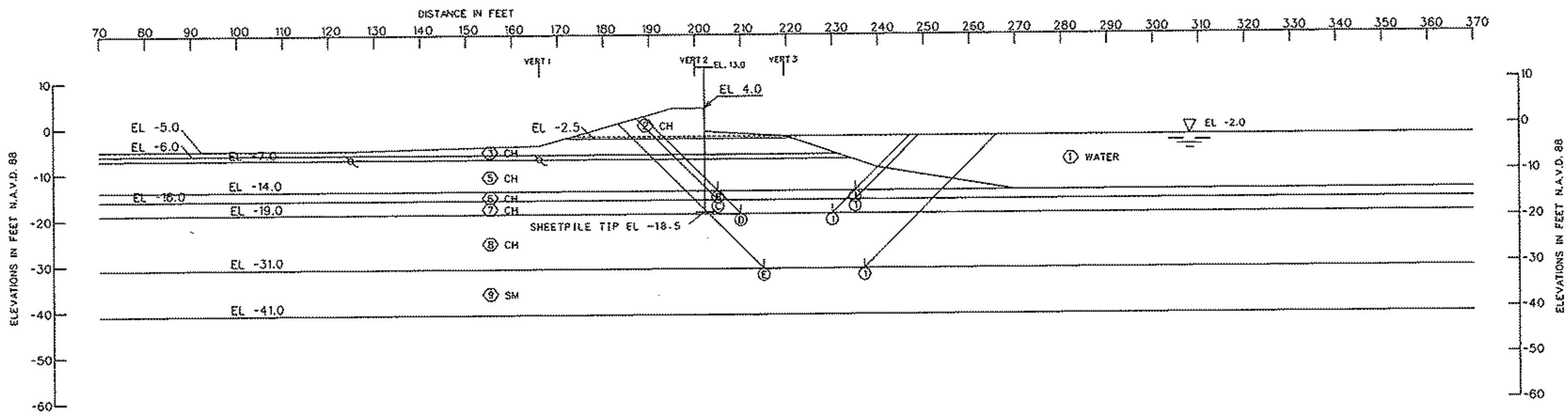
LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS
SLOPE STABILITY ANALYSIS
LOW WATER CONDITIONS
REACH 23

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

DESIGNED BY: R.D.
DRAWN BY: G.L.
CHECKED BY: E.V./ C.P.

PLATE: 162

INPUT DATA FILENAME: OH17.



NOTES

- ○ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- -- CROSSOVER POINT
- 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 $= \frac{R_A + R_B + R_P}{D_A - D_P}$

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	SAFETY
(B) (1)	-14.0	13053	3979	900	14727	4961	17932	9766	1.84
(C) (1)	-16.0	13103	5115	1388	17827	6931	19606	10896	1.80
(D) (1)	-19.0	15216	5120	2370	23199	11050	22706	12149	1.87
(E) (1)	-31.0	22043	10079	8361	52314	33925	40483	18389	2.20

See Table 3 in the Report for reach stationing, boring and testing information.

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. CENTER OF STRATUM			C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	52.5	62.5	0	0	0	0	0	0	0
2	CH	106	106	106	900	900	900	900	900	900	0
3	CH	106	106	106	900	340	900	900	340	900	0
4	CH	90	90	90	90	340	90	90	340	90	0
5	CH	90	90	90	90	175	90	90	175	90	0
6	CH	101	90	101	135	175	135	135	175	135	0
7	CH	108	106	108	155	265	155	180	295	180	0
8	CH	98	100	98	270	405	270	360	515	360	0
9	SM	122	122	122	0	0	0	0	0	0	30

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

SLOPE STABILITY ANALYSIS

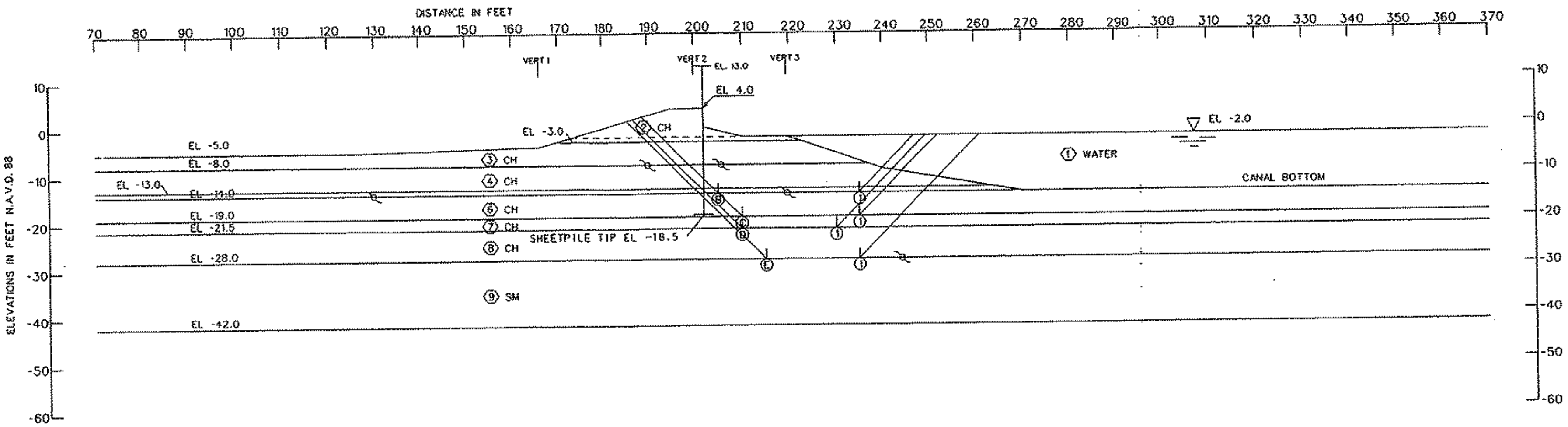
LOW WATER CONDITIONS
REACH 24

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

DESIGNED BY: K.O.	PLOT SCALE: 20	PLOT DATE: 20 MAR 07	CADD FILE:
DRAWN BY: D.L.			FILE NO.
CHECKED BY: F.V. / C.R.	DATE: MAR 2007		

PLATE: 163

INPUT DATA FILENAME: OH18



NOTES

○ -- STRATUM NUMBER
○ -- WEDGE NUMBER
ϕ -- CROSSOVER POINT
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

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

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	-14.0	13349	6690	2759	15538	4903	22798	10635	2.14
Ⓒ ①	-19.0	15585	5723	4131	24767	10500	25439	14267	1.78
Ⓓ ①	-21.5	16558	7034	5720	30135	14763	29312	15372	1.91
Ⓔ ①	-28.0	21011	9046	8959	45573	26629	39016	18944	2.06

STRATUM NO.	SOIL TYPE	TOTAL UNIT WEIGHT P.C.F.			C - UNIT COHESION - P.S.F. CENTER OF STRATUM			C - UNIT COHESION - P.S.F. BOTTOM OF STRATUM			FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	VERT. 1	VERT. 2	VERT. 3	
1	WATER	62.5	62.5	62.5	0	0	0	0	0	0	0
2	CH	109	110	109	900	900	900	900	900	900	0
3	CH	109	106	109	900	170	900	900	170	900	0
4	CH	85	106	85	300	170	300	300	170	300	0
5	CH	100	90	100	180	220	180	180	220	180	0
6	CH	100	90	100	180	230	180	180	240	180	0
7	CH	100	90	100	275	245	275	290	250	290	0
8	CH	98	103	98	325	380	325	360	380	360	0
9	SM	122	122	122	0	0	0	0	0	0	30

See Table 3 in the Report for reach stationing, boring and testing information.

GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

LAKE PONCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT
17TH STREET CANAL
ANALYSIS OF EXISTING CONDITIONS

SLOPE STABILITY ANALYSIS

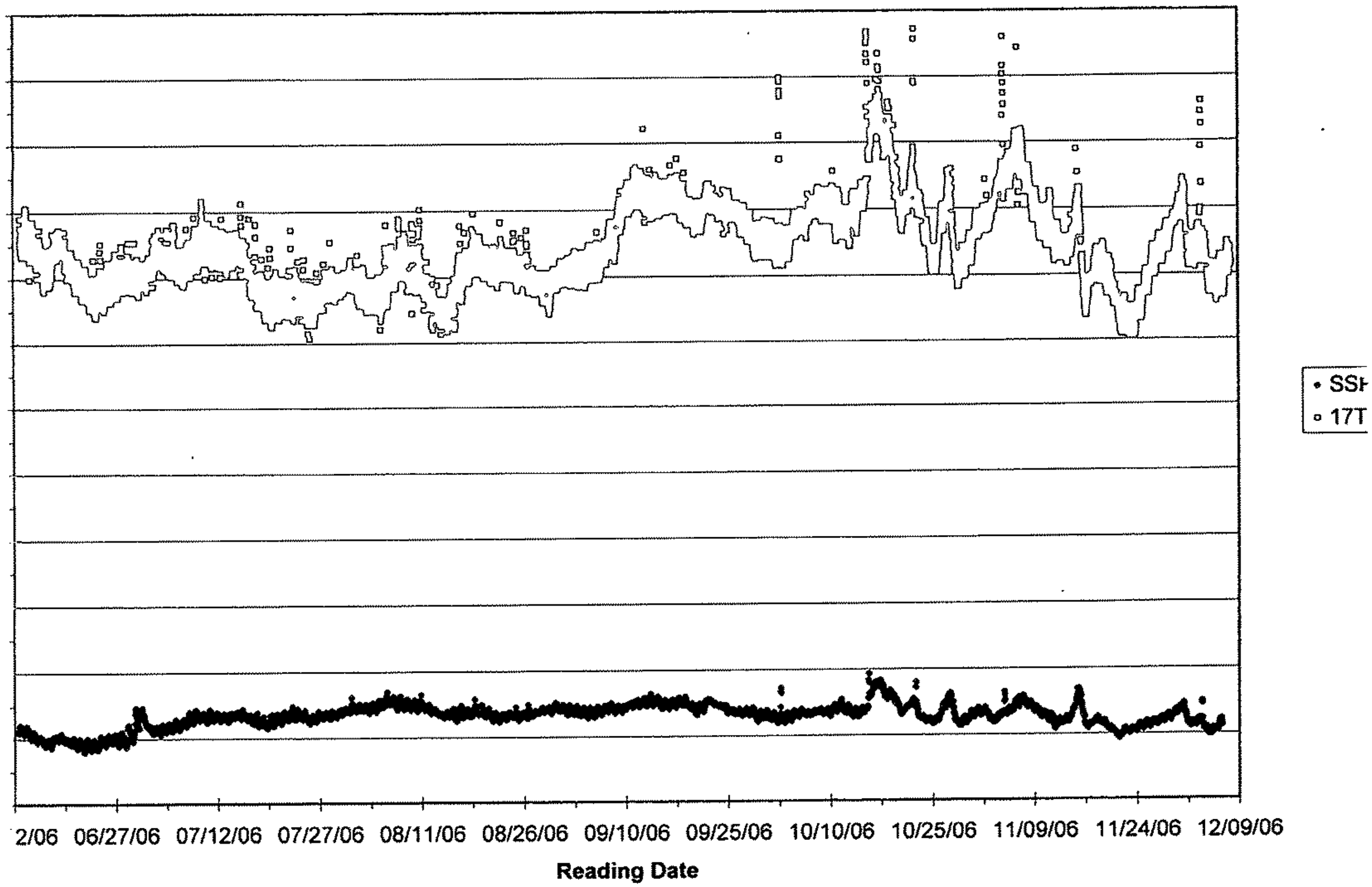
LOW WATER CONDITIONS
REACH 25

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

DESIGNED BY: K.O. DRAWN BY: O.L. CHECKED BY: F.V./ C.R.	PLOT SCALE: 20	PLOT DATE: 20 MAR 07	CADD FILE: [illegible]
	DATE: MAR 2007		FILE NO.

PLATE: 164

SSP-1A 2006-12-06 13.01.34



Plat

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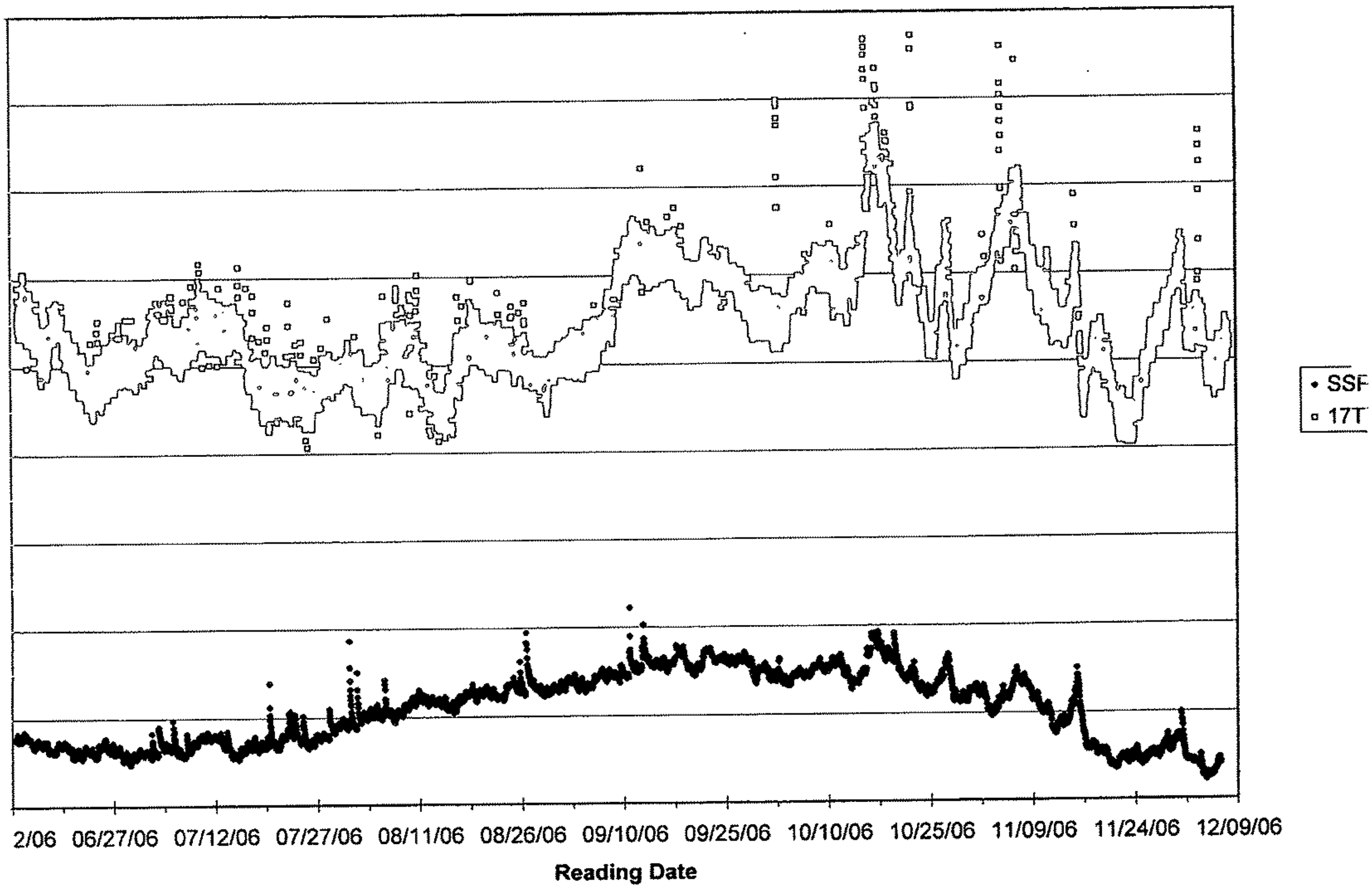

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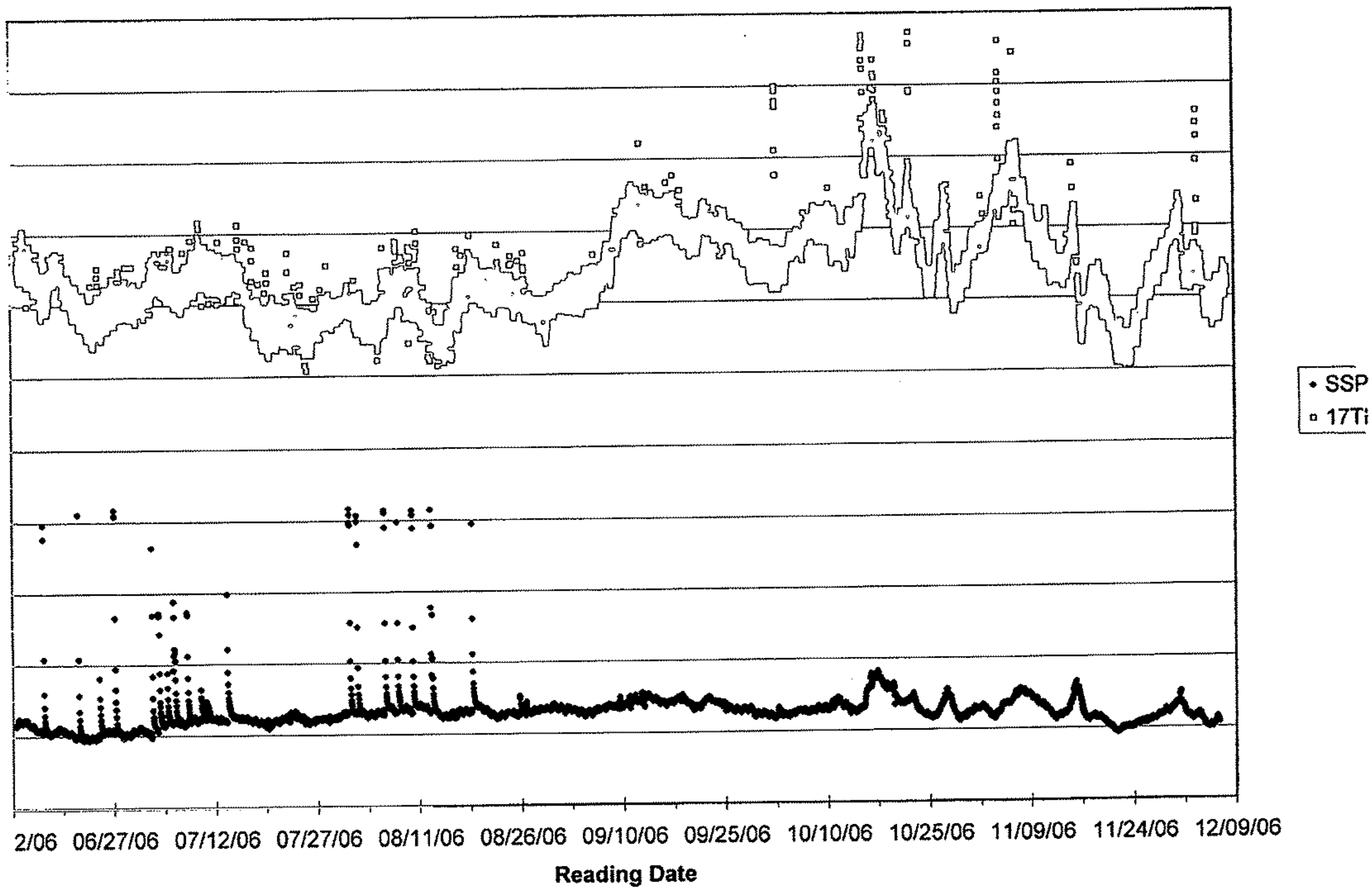

Plat

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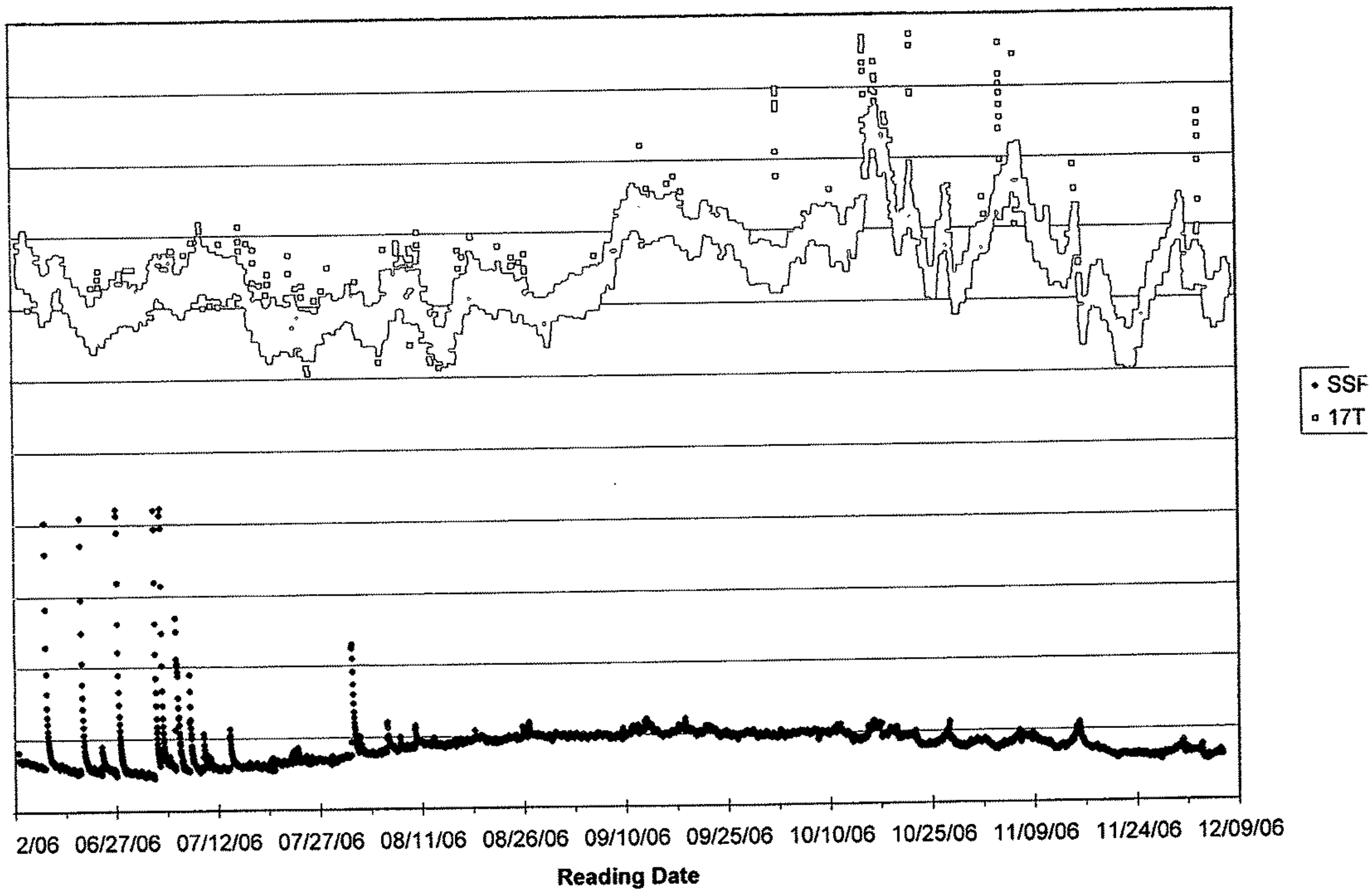
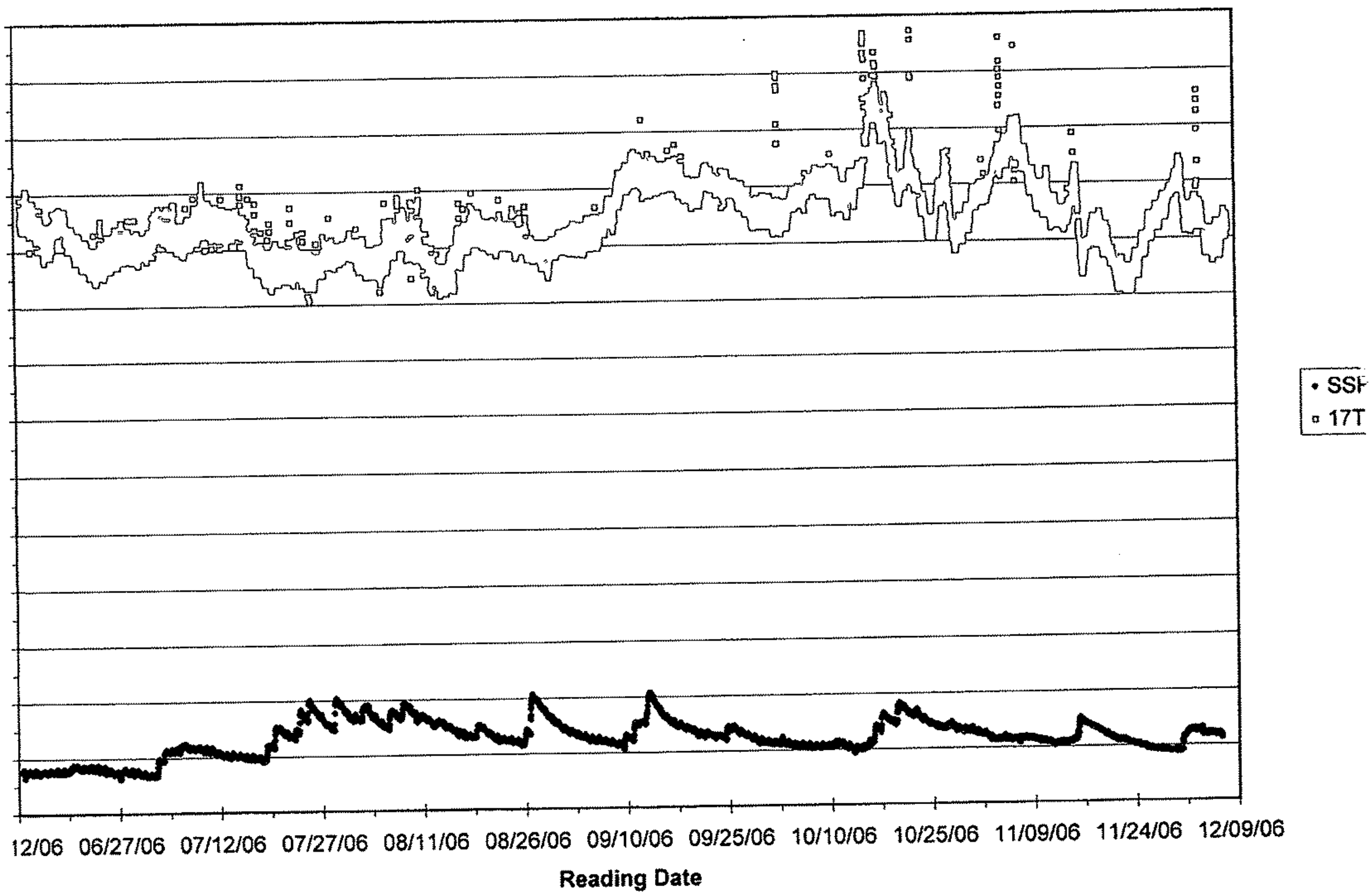


Plat

SSP-5 2006-12-06 12.36.12



Plat

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			Si		SHELLS
NO SAMPLE			NS		No Sample Retrieved

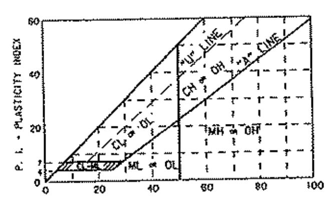
NOTE: Soils possessing characteristics of two groups are designated by combinations of group symbols.

DESCRIPTIVE SYMBOLS

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	brGr
GRAYISH-BROWN	gyBr
GREENISH-GRAY	gnGr
GRAYISH-GREEN	gyGn
GREEN	Gn
BLUE	Bl
BLUE-GREEN	BlGn
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 in accordance with ASTM D 2487

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
- Ⓒ Denotes location of consolidation test**
- Ⓢ Denotes location of consolidated-drained direct shear test**
- Ⓡ Denotes location of consolidated-undrained triaxial compression test**
- Ⓠ Denotes location of unconsolidated-undrained triaxial compression test**
- Ⓣ Denotes location of sample subjected to consolidation test and each of the above three types of shear test**
- 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 (1 3/8" 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 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.

TYPICAL NOTES:

1. 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 the contract clause entitled "Differing Site Conditions".
2. Ground-water elevations shown on the boring logs represent ground-water surfaces encountered in such borings on the dates shown. Absence of water surface data on certain borings indicates that no ground-water data are available from the boring but does not necessarily mean that ground-water will not be encountered at the locations or within the vertical reaches of such borings.
3. 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 are shown.
4. Unless otherwise noted:
   a. Undisturbed borings, indicated by the letter "U", are taken with a 5" I.D. Piston Type Sampler.
   b. General type borings are taken with a 1 7/8" I.D. Tube Sampler and/or a 1 3/8" I.D. Split Spoon Sampler.

LAKE PONCHARTRAIN, LOUISIANA AND VICINITY
HURRICANE PROTECTION PROJECT
17TH STREET CANAL
UNDISTURBED & GENERAL BORINGS
BORING LEGEND

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

DESIGNED BY: YOURKOVICH	PLOT SCALE: 20	PLOT DATE: 06 FEB 07	CADD FILE:
DRAWN BY: WOODS			FILE NO.
CHECKED BY: YOURKOVICH	DATE: MAR 2001		

PLATE