GEOTECHNICAL INVESTIGATION
Authorized 2057 Height Soils Report

WEST BANK AND VICINITY
HURRICANE PROTECTION PROJECT

New Westwego Pump Station to Orleans Village
(Westwego Levee & Westminster Levee)

March 2009

Introduction

This report contains the results of geotechnical designs performed for the proposed West Bank & Vicinity Hurricane Protection Project, WBV-14c.2 Westwego Pumping Station to Orleans Village levee enlargements. The analyses were performed as part of West Bank Hurricane Protection Project to raise the system to the 100 year design elevations by year 2057. The Westbank H.P.P. total protection length runs approximately 18 miles and is located South and West of New Orleans, Louisiana.

Reference was made to the following reports:

- USACE GEOTECHNICAL INVESTIGATION, Authorized Heights Soils Report, WEST BANK H.P.P., New Westwego Pump Station to Orleans Village (Westwego Levee & Westminster Levee), B/L Sta. 69+59 to Sta. 260+20, dated July 2007

- Geotechnical Report, WBV-14c.2, New Westwego Pumping Station to Orleans Village, dated 13 November 2008 by the Joint Venture of FFEB

- Engineering Alternative Report (EAR) for WBV-14c.2 dated November 2008, by the Joint Venture of FFEB

Elevations are all in NAVD 88 datum unless otherwise noted. The WBV-14c.2 reach requires a design elevation of 14.0, a Still Water Level (SWL) of 9.4 and a Low Water Level (LWL) of -8.5 for the protected side canals and -1.0 for the flood side canals at the Seaplane Closure and the Westminster E-W Closure for the year 2057 Hydraulic requirements.

This report covers the soils, foundation investigation and conditions, and the design for the crown elevation and side slopes of the earthen levee. The levee enlargement will be a flood

side shift with earthwork consisting of a 10-foot wide levee crown with 1V on 4H side slopes, flood side and protected side stability berms in all reaches.

This report applies only to this specific project and any changes in the configuration and location of this project may invalidate the conclusions and recommendations contained herein unless the changes have been reviewed and verified in writing. Recommendations and conclusions contained in this report are somewhat subjective and, therefore, should not be included in contract plans and specifications without review and consent.

History

The first Corps enlargement for this levee was in 1996 to approximately elevation 9.5. The Westwego East-West levee and the Westminster levees were constructed well floodside of the existing local levee adjacent to the drainage canal. The Westwego East-West levee was constructed approximately 130 feet floodside of the existing local levee. The Westminster North-South and the Westminster East-West levees were moved approximately 170 feet floodside of the existing local levees. The Westminster North-South levee was constructed by the local levee board (by LDOTD) for future credit and utilized some geogrid and separator fabric in some portions of the levee. The levees were constructed using borrow from the Hwy 45 borrow pit. Adjacent borrow was unsuitable due to high organics and high moisture contents.

A second lift was added in 2002 to return the level of protection again to elevation 9.5. Two to three and one half feet of settlement was noted throughout the course of re-surveying the levee. In 2006, the levee was surveyed again in preparation for the 2007 Geotechnical Report and on average another one foot of settlement was noted.

Currently a third lift is being added to the WBV 14c reach. The Westwego East-West levee and the Westminster North-South levee is being constructed to El. 11.5 with overbuild and the Westminster East-West levee is being constructed to El. 12.5 with overbuild.

Field Investigations

A total of thirty-eight (38) undisturbed (5-in) borings were drilled for this levee reach, including centerline, floodside toe and protected side toe borings. The undisturbed borings were drilled to a depth of 70 feet. Twenty (20) borings drilled prior to the initial enlargement are also presented on the boring plots. The locations of these borings are shown on Plates 1, 2, and 3 in Appendix A. The new undisturbed borings designated with a "WWHC-" prefix were

drilled in Feb and Mar of 2007 for the purpose of 100 year protection design intended to proceed shortly after the current enlargement in 2011. Initial general type and undisturbed borings designated with an "OC-" prefix were drilled in 1996. Plotted soil borings and testing can be found in the attached CD folder labeled "FFEB Final EAR Report". Undisturbed samples retrieved from these borings were in cohesive and semi-cohesive soils using a 5-inch diameter thin wall-sampling barrel. The samples were then classified and representative portions were preserved for laboratory testing.

For the current study, thirty-six (36) CPTs were obtained, most drilled to depths of about 70 feet and some drilled to 90 foot depths, including centerline, floodside toe and protected side toe borings. See attached CD folder labeled "FFEB Final EAR Report" for CPT results.

Surveys for the current study consist of levee cross sections and were taken in 2006 (Survey No. 07-057). The survey cross sections were taken at 600 ft intervals throughout the reach.

Laboratory Tests

For the undisturbed borings, visual classifications were made on all samples obtained from soil borings. Moisture content determinations were made on all cohesive soil samples. Shear strength tests included Unconfined Compression Tests (UCT) and Unconsolidated Undrained (Q) triaxial tests. Liquid and plastic limits were determined on selected samples. Organic Matter Content tests were also performed on selected undisturbed samples as well as consolidation tests. The results of these tests are summarized in the attached CD folder labeled "FFEB Final EAR Report".

Soil Conditions

Soil stratification is consistent throughout the proposed levee enlargement site with predominately fat clays with silty sand strata noted below elev. -50, usually 5 foot thick. A consistent organic clay stratum is present in most borings, but appears predominately in the upper 20 feet below the surface throughout the entire reach with water contents quite often above 200. Below elevation -20, soft clays are present with water contents mostly in the 50 to 80 percent range. Consistency of the clay samples vary widely, from very soft to medium, with most samples falling in the very soft to soft range.

Soil Design Parameters

The analyses for this report utilized the design shear lines and unit weights presented in the Geotechnical Report, WBV-14c.2, New Westwego Pumping Station to Orleans Village, dated

13 November 2008 by the Joint Venture of FFEB on Figures 3-1 through 3-4. The report can be found in attached CD folder labeled "FFEB Final EAR Report".

For the Westwego East-West levee (Sta. 0+27 to Sta. 69+87), the Westminster North-South levee(Sta. 69+87 to Sta. 116+77), and the Westminster East-West levee(Sta. 116+77 to Sta. 203+60), the unit weights and shear strengths were based on new boring data with testing, historical boring data with testing, and Cone Penetrometer data. Increased shear strengths under the centerline of the existing levee Foundation are reflective of consolidation and dissipation of excess pore water pressures from previous levee enlargements. The design shear strengths were based upon laboratory Unconfined Compression Tests (UCT) and Unconsolidated Undrained (Q) triaxial tests. Additional design considerations were given to C/P lines and CPT data, both of which appreciably weighed into adjusting the shear strength design lines. The wet unit weights were based upon laboratory dry densities and moisture contents.

New levee toe undisturbed boring data as well as CPT and historical borings were analyzed to generate composite plots of the variation of shear strength and unit weight with depth in the foundation near the Protected side and Floodside levee toes. The shear data from the floodside and protected sides were similar and thus combined to produce one shear strength and density plot for the toe data for either side of the levee.

Design Specifics

This project reach (New Westwego Pumping Station to Orleans Village Levee) consist of 3 distinct levee reaches due to the physiology of the area. Two canal closures have been separated out as design reaches.

Design Reach I - Entire Main Levee, Excluding Closures (Sta.0+27 to Sta. 203+60)
Design Reach II - Westwego Seaplane Airport Canal Closure (Sta. 56+70 to Sta. 59+20)
Design Reach III - Westminster East-West Canal Closure (Sta. 119+40 to Sta. 121+90)

For Reach I Main Levee the center line of the 2057 levee build was offset approximately 40 feet to the flood side of the existing levee center line. It also should be noted that due to low stability factors of safety a build height of El. 13.5 could only be reached with existing soil conditions. Stability berms on both the protected and flood side of the levee were also required. The following table addresses the Design Grades used for Reach I.

TABLE 1: Summary of Design Grades for Reach I Analysis

Condition	Elevation (NAVD 88)	Slope
PG	13.5'(1)	N/A
SWL	9.4'	N/A
LWL	-1.0'	N/A
Levee Slope (Flood Side) with Stability Berm	13.5'(1) to 6.4'	1V:4H
	6.4' to 4.15'	1V:40H
	4.15' to Ground Surface	1V:3H
Levee Slope (Protected Side) with Stability Berm	13.5'(1) to 5.5'	1V:4H
	5.5' to 1.9'	1V:40H
	1.9' to Ground Surface	1V:3H

Notes: (1) Authorized grade for 2057 protection is to El. 14.0. However, during stability analysis El. 13.5 was the maximum allowable height with current soil conditions.

At the Eastern end of Reach I (Westminster East-west Levee), there is a pipeline crossing through a floodwall. The pipeline crossing floodwall is structural in nature and was not analyzed for this report, which addresses levees only. The pipeline utility crossing is in the vicinity of C/L stations 182+51 to 183+11.

For Reach II Seaplane Airport Canal Closure two levee builds were considered. A geotextile-reinforced earthen levee enlargement alternative built over the existing centerline and a non-reinforced earthen levee enlargement alternative with an approximate 30-foot flood side shift. Both required stability berms on the protected and flood side of the levee. The following tables address the Design Grades used for Reach II.

TABLE 2: Summary of Design Grades for Reach II Analysis Non-Reinforced Earth Levee

Condition	Elevation (NAVD 88)	Slope
PG	14.0'	N/A
SWL	9.4'	N/A
LWL	-1.0'	N/A
Levee Slope (Flood Side) with Stability Berm	14.0' to 8.0'	1V:4H
	8.0' to 1.6'	1V:30H
	1.6' to Ground Surface	1V:4H
Levee Slope (Protected Side) with Stability Berm	14.0' to 6.5'	1V:4H
	6.5' to 3.9'	1V:26H
	3.9' to Ground Surface	1V:10H

TABLE 3: Summary of Design Grades for Reach II Analysis Reinforced Earth Levee

Condition	Elevation (NAVD 88)	Slope
PG	14.0’	N/A
SWL	9.4’	N/A
LWL	-1.0’	N/A
Levee Slope (Flood Side) with Stability Berm	14.0’ to 6.2’	1V:4H
	6.2’ to 4.15’	1V:40H
	4.15’ to Ground Surface	1V:7H
Levee Slope (Protected Side) with Stability Berm	14.0’ to 5.5’	1V:4H
	5.5’ to 3.9’	1V:40H
	3.9’ to Ground Surface	1V:10H

It should be noted that Reach II has an existing vinyl sheetpile wall that tips out at elevation -9.5 NGVD. For enlargement of this section to an all earth section, it is recommended to cut the vinyl sheet pile stickup down to the existing crown surface (or as close as reasonable). The vinyl sheet pile will continue to serve as a seepage cutoff as was the case in the first lift design. Both canal closures (Reach II and Reach III) were constructed as sand based closure sections. If the geotextile option is chosen, costs will have to be considered for degrading the existing levee to El. 3.0 and removing or cutting the vinyl sheet pile down to El. -1.0 such that future ground subsidence does not result in the geotextile being severed by any remaining sheet pile.

For Reach III Westminster East-West Canal Closure the center line of the 2057 levee build was offset approximately 40 feet to the flood side of the existing levee center line. It also should be noted that due to low stability factors of safety a build height of El. 13.5 could only be reached with existing soil conditions. Stability berms on both the protected and flood side of the levee were also required. The following table addresses the Design Grades used for Reach III.

TABLE 4: Summary of Design Grades for Reach III Analysis

Condition	Elevation (NAVD 88)	Slope
PG	13.5’[(1)]	N/A
SWL	9.4’	N/A
LWL	-1.0’	N/A
Levee Slope (Flood Side) with Stability Berm	13.5’[(1)] to 6.4’	1V:4H
	6.4’ to 4.15’	1V:40H
	4.15’ to Ground Surface	1V:3H
Levee Slope (Protected Side) with Stability Berm	13.5’[(1)] to 5.5’	1V:4H
	5.5’ to 1.9’	1V:40H
	1.9’ to Ground Surface	1V:3H

Notes: (1) Authorized grade for 2057 protection is to El. 14.0. However, during stability analysis El. 13.5 was the maximum allowable height with current soil conditions.

Stability Analyses

The stability analyses are presented in Appendices D and E, respectively, of this report. The stability of the earthen levee section was analyzed using Spencer's method in Geostudio's 2007 program Slope/W version 7.13 and the Mississippi Valley Division Stability with Uplift Computer Program was utilized for the Method of Planes (MOP) analysis. Extensive searches were conducted to find the most critical slip surface in Slope/W analyzing optimized block and circular failure surfaces to determine the weakest plane. The Hurricane Storm Damage Risk Reduction System Design Guidelines (Updated 12 June 2008) was referenced for the stability analyses. As shown in Table 5, the stability was analyzed for three water level cases. The water elevations and the required factors of safety for each case are also included in Table 5.

Table 5: Summary of conditions analyzed in stability analyses.

Case	Required FoS (Spencer's Method)	Required FoS (MOP Method)	Water Elevation (NAVD 88)
Still Water Level	1.5	1.3	9.4
Project Grade, High Water Level	1.4	1.2	14.0/13.5(1)
Low Water Level	1.4	1.3	-1.0
Low Water Level (non-hurricane condition) S-case(2)	1.4	1.3	-1.0

Notes: (1) Authorized grade for 2057 protection is to El. 14.0. However, during stability analysis El. 13.5 was the maximum allowable height with current soil conditions for Reaches I and III.
(2) S-case analysis were performed on select runs using Spencer's Method to demonstrate that it was not a concern.

Design Reaches II and III were designed and constructed with use of reinforced geotextile. Design Reach II reinforced levee option utilized an 833 lb/in fabric and Reach III a 950 lb/in fabric, with both allowable strengths determined at 5% strain. For this report, the existing reinforcement was utilized when needed to achieve the required factor-of-safety.

Stability Results:

Table 6 presents the results of the stability analyses.

Table 6: Stability Analysis Results Summary.

Design Section	Levee Construction Limits to Protected Side of Existing Centerline	Levee Construction Limits to Flood Side of Existing Centerline	Analysis Condition	Spencer's Minimum FoS	MOP Minimum FoS
Reach I	149' +/-	168' +/-	SWL	1.51	1.51
			HWL	1.46	1.46
			LWL	1.41	1.46
			S-case LWL FS	3.10	--
			S-case LWL PS	2.54	--
Reach II Centerline Overbuild w/Geotextile	120' +/-	188' +/-	SWL	1.56	1.50
			HWL	1.41	1.38
			LWL	1.41	1.35
Reach II 30 Foot Flood Side Shift w/o Geotextile	87' +/-	279' +/-	SWL	1.50	1.41
			HWL	1.45	1.33
			LWL	1.44	1.43
Reach III	147' +/-	170' +/-	SWL	1.57	1.40
			HWL	1.46	1.32
			LWL	1.43	1.31

Reach I and III were not able to be raised to the authorized grade of El. 14.0 in the immediate analysis as the stability factor or safety did not meet with current guidelines. However, it is expected that with time the planned levee build will surcharge the subsoils and cause a gain in shear strength with time. How much the soil will gain in shear strength is unknown but should be adequate to allow a final lift to at least El. 14.0 prior to 2057. It is recommended that the proposed levee build and subsoil be re-analyzed once levee has been constructed and settled in about 25 years from the future construction date to take advantage of strength gains in subsoils and determine final lift height for the 2057 design requirement.

Seepage

Seepage analysis was performed for the Main Levee as a sand layer was present from elevations -58 to -62 +/-. Underseepage analysis was conducted in general accordance with procedures established in DIVR 1110-1-400, Engineering and Design, Soil Mechanics Design Data, Section 8 Ground Water and Seepage dated December 12, 1998 for the 2057 SWL and HWL case. As no physical seepage entry exists for this reach, the effective seepage entrance (x_1) from the flood side levee toe was conservatively assumed to be 1000 feet. From the assumed effective seepage entrance the effective seepage exit (x_3) was determined from the land side toe of the levee to be 144 feet which is less than the proposed minimum distance of the canal area. Due to its relatively thin thickness the land side stability berm was assumed to not prevent seepage from exiting at the ground surface in that area. The factor of safety (FoS) against piping at the landside levee toe using the DIVR method was determined to be FoS = 28.5. Seep/W finite difference software (GeoStudio 2007®) was utilized to determine the exit gradient at the levee toe and at the drainage canal. Based on the Seep/W analysis a minimum FoS of 28.5 was obtained at the levee toe and a FoS of 1.21 was obtained for the SWL analysis at the canal by not allowing seepage flow through the levee. Results of the seepage analysis can be found in Appendix F.

Settlement

Future settlement due to the induced loads from the proposed main levee enlargement was predicted using empirical methods and past settlement history obtained from past surveys. Since the majority of the main levee will be built on the existing flood side it is reasonable to assume that its settlement performance will behave similarly to the first two lifts (initial construction and a 2nd lift) that were built on ground that did not previously support a levee. Initial construction settlements at the crown in the existing levee ranged from 2 to 3½ feet over a period of 4-5 years. Second lift settlement of the existing levee was approximately 1½ feet over a 5 year period.

Since the majority of the reach will be constructed to El. 13.5, it is predicted that a second lift will be required within 5 years from the completion of the initial construction that would

require approximately 2 ½ feet of fill on the levee crown. A third lift is predicted to be needed in another 5 years that will require approximately 1 ½ feet of fill on the levee crown. The fourth and final lift is predicted to be needed 25 years after the completion of construction. The exact amount of fill needed to maintain the levee crown above the 2057 design grade of El. 14.0 is unknown at this time. It is likely to be minimal as the levee will have stabilized by that time and shear strength gains in the soils beneath the levee will have been realized. However, additional soils exploration and testing will be required at that time to confirm the 4th and final lift thickness.

Settlement calculations and the WBV14c.2 Lift schedule can be found in Appendix G.

Borrow Pit

It is unknown at this time where the fill material will be obtained from, however all levee fill shall be compacted to 90% as per ASTM 698 with a moisture content between 5% above optimum and 3% below. Borrow should also meet all current criteria, including organic matter content to not exceed 9%, a PI greater than 10 and clays with 30% or less sand content. Government furnished borrow pits, if used, shall be forwarded to this branch for design and approval.

Appendix A - Boring Location Plates

Appendix B – FFEB Final EAR Report

(see Attached CD)

Appendix C – Shear Line Summary

Appendix D – Spencer Analysis

Spencer Plates

Spencer Reports (see attached CD)

Electronic SlopeW Files
(see attached CD)

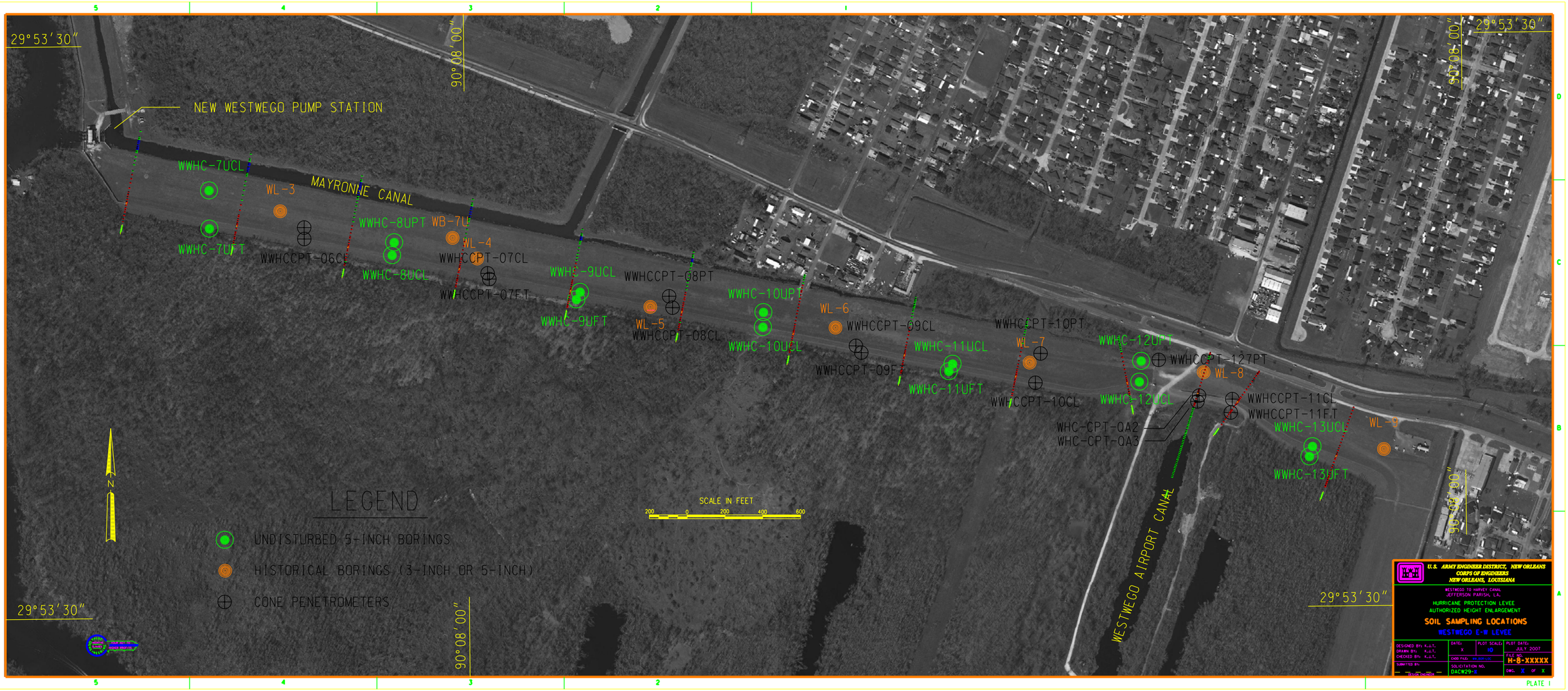
Appendix E – MOP Analysis

MOP Plates

MOP Input and Output Files (see attached CD)

Appendix F – Seepage Analysis

Appendix G – Settlement Analysis



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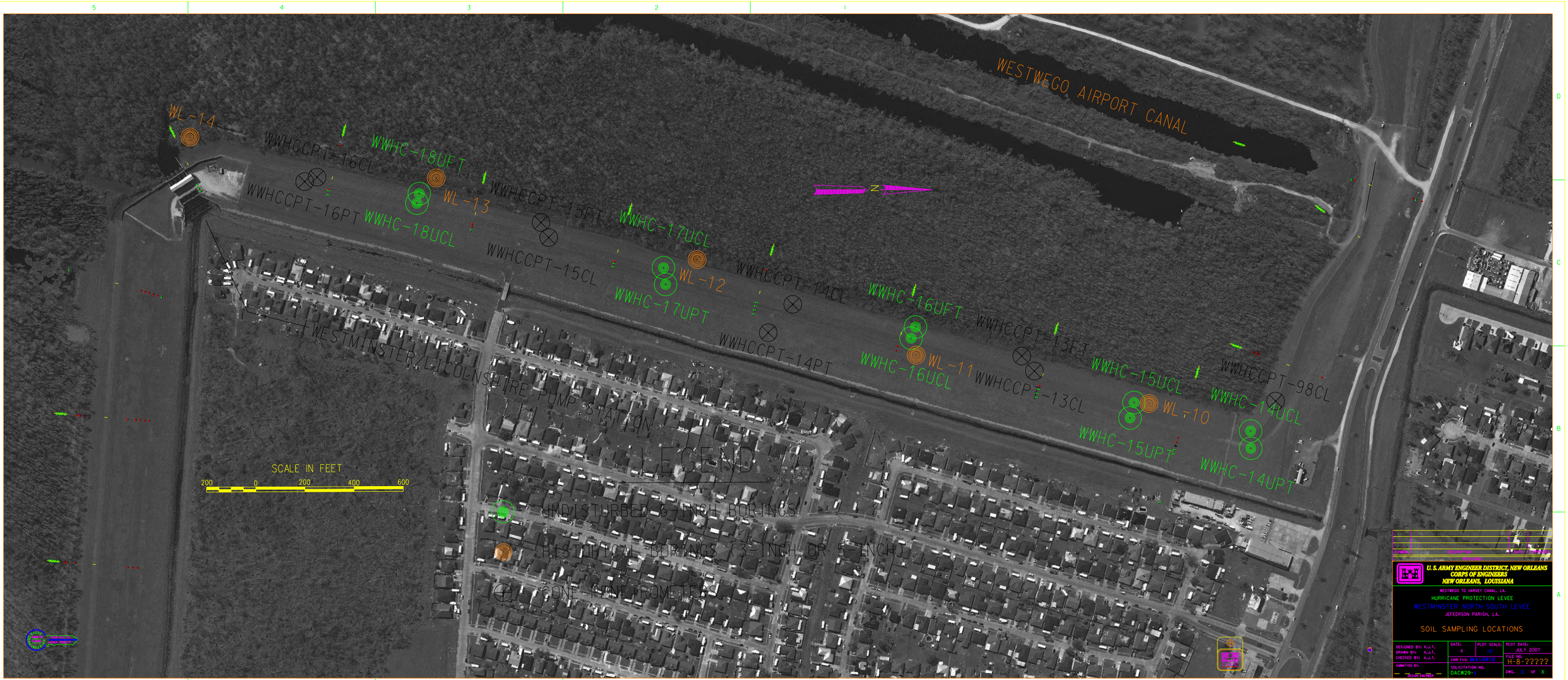

PLATE 2

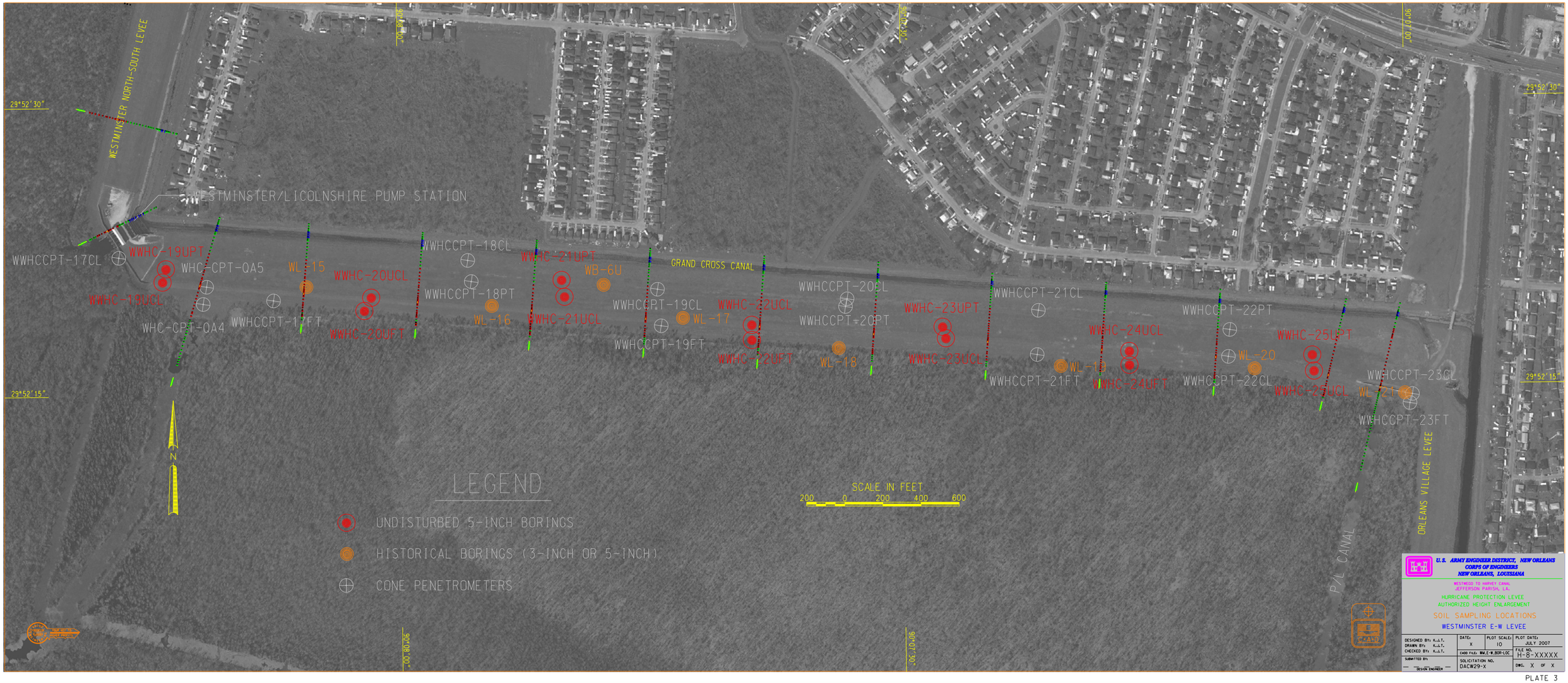

PLATE 3

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GEOTECHNICAL REPORT (100% SUBMITTAL)

U.S. ARMY CORPS OF ENGINEERS

WEST BANK AND VICINITY HURRICANE PROTECTION PROJECT
WESTWEGO TO HARVEY CANAL
WBV-14c.2
NEW WESTWEGO PUMPING STATION TO ORLEANS VILLAGE
PHASE 2

HURRICANE PROTECTION FOR 1% STORM
JEFFERSON PARISH, LOUISIANA
CONTRACT NO. W912P8-07-D-0022 - TASK ORDER NO. 45

FUGRO PROJECT NO. 0022-0045

FOR
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

BY
FFEB JV, L.L.C.
St. Rose, Louisiana

13 NOVEMBER, 2008

TABLE OF CONTENTS

		PAGE
A.	INTRODUCTION	3
B.	REFERENCES	3
C.	BORING AND LABORATORY DATA	4
D.	FURNISHED INFORMATION	8
E.	SOIL BORING DATA	8
F.	SUBSOIL CONDITIONS	8
G.	FOUNDATION ANALYSES	9

FIGURES 1 to 9

TAB 1 – SCOPE OF WORK
TAB 2 – ADDITIONAL DESIGN INFORMATION
TAB 3 – DESIGN DRAWINGS
TAB 4 – SOIL BORING LOGS – CPT LOGS – SOIL PARAMETERS
TAB 5 – CALCULATIONS – ALTERNATIVE 1 (including geotextile spreadsheet)
TAB 6 – CALCULATIONS – ALTERNATIVE 2 (including seepage calculations)
TAB 7 – CALCULATIONS – ALTERNATIVE 3 (including geotextile spreadsheet)
TAB 8 – CALCULATIONS – ALTERNATIVE 4
TAB 9 – CALCULATIONS – ALTERNATIVE 5 (including sheet pile cutoff calculations)
TAB 10 – SETTLEMENT ANALYSES
TAB 11– AXIAL PILE AND SHEET PILE CAPACITY CALCULATIONS

APPENDIX A

GEOTECHNICAL REPORT

U.S. ARMY CORPS OF ENGINEERS

WEST BANK AND VICINITY HURRICANE PROTECTION PROJECT

WESTWEGO TO HARVEY CANAL

WBV-14c.2

NEW WESTWEGO PUMPING STATION TO ORLEANS VILLAGE

PHASE 2

HURRICANE PROTECTION FOR 1% STORM

JEFFERSON PARISH, LOUISIANA

CONTRACT NO. W912P8-07-D-0022

TASK ORDER NO. 45

A. INTRODUCTION

Geotechnical recommendations and analyses were developed for the feasibility level design of flood protection from New Westwego Pumping Station to Orleans Village. Five alternatives were investigated for the 2057 level of protection and include non-reinforced earthen levees, geotextile reinforced levees, T-walls or L-walls, and an earthen levee where the shear strength of foundation soils was improved through the use of soil mixing columns. Both a shift of the landside drainage canal and the installation of a culvert within this canal were considered as part of the alternatives. For these levees and floodwalls, the extreme water level (EWL) was assumed to be at el 14.0 (NAVD 88) and the still water level (SWL) was assumed to be at el 9.4. The low water level for a protected side failure into the drainage canal is at el -8.5. *For practical reasons, we will use the term "EWL" in this report when referring to both "top-of-wall" and "top-of-levee" water conditions.*

Each alternative considered for this task order was investigated for one "worst case" reach. This worst case was defined based on both soil parameters and cross-sections. Existing conditions were also considered in this evaluation.

Further details of the geotechnical services are defined in the Scope of Work included as Tab 1 of the Appendix.

B. REFERENCES

1. Computer Programs. The following computer programs were used to evaluate the levees and the pile supported T-walls.
   (1) UPLIFT, Version 2.0, 4 August 1994, FS004, USACE LMVD Methods of Planes
   (2) SLOPE/W, 2007 ver. 7.03, Spencer's Method

2. Publications. The following United States Army Corps of Engineers (USACE) publications were utilized for guidance.

   (1) EM 1110-2-1901, Seepage Analysis and Control of Dams (April 1993)
   (2) ETL 1110-2-569, Design Guidance for Levee Underseepage (May 2005)
   (3) EM 1110-2-1902, Slope Stability (October 2003)
   (4) EM 1110-2-1913, Design and Construction of Levees (April 2000)
   (5) DIVR 1110-1-400, Soil Mechanics Data (December 1998)
   (6) EM 1110-2-2502, Retaining and Floodwalls (September 1989)
   (7) EM 1110-2-2504, Design of Sheet Pile Walls (March 1994)
   (8) EM 1110-2-2906, Design of Pile Foundations (January 1991)
   (9) Interim Hurricane and Storm Damage Reduction System Design Guidelines (HSDRSDG), New Orleans District, USACE (23 October 2007)

C. GEOTECHNCIAL DESIGN CRITERIA

The design criteria outlined below were provided to FFEB, as part of the scope of work package from the USACE included in total as Tab 1 of the Appendix. A summary of the design criteria is also presented in the engineering alternative report. Additional design criteria and information is contained in Tab 2 of the Appendix.

Hydraulic design criteria were provided for the 2057 water levels as presented in the table below. The application of factors is discussed in detail in this report.

No wave loads were considered in the geotechnical design.

DESIGN WATER CONDITIONS	ELEVATION (NAVD 88)
SWL	9.4
EWL (Top of T-walls and Levees)	14.0
LWL (drainage canal)	-8.5

SWL = Still Water Level; EWL = Extreme Water Level; LWL = Low Water Level

Water on the flood side of the flood protection was assumed to be seawater with a unit weight of 64 pcf. This water body was modeled as a surcharge, however. Fresh water, having a unit weight of 62.4 pcf, was assumed on the protected side of the flood protection.

Levee Design Methods and Assumptions

Earthen levees were considered for flood protection. Levee stability analyses were performed using the LMVD Method of Planes as coded within the UPLIFT program. Spencer analyses were also performed to evaluate the geotextile-reinforced levees. Further, factors of safety are only determined for the still water level (SWL) and low water level (LWL) critical to evaluating feasibility. Top of levee water levels were not investigated. A 10-ft wide levee crown at el 14 was assumed for all 2057 alternatives. Factor of safety criteria are outlined below.

ITEM	LOADING CONDITIONS		DESIGN FEATURE OF CONSIDERATION	FACTOR OF SAFETY
	WATER LEVEL	SHEAR* STRENGTH PARAMETERS		
Levee Embankments	SWL	Q	LMVD Method of Planes	1.40
	LWL	Q	LMVD Method of Planes	1.35
	SWL	Q	Spencer's Method	1.50
	LWL	Q	Spencer's Method	1.40

*Q refers to unconsolidated-undrained shear strengths.

T-wall Design Methods and Assumptions

ITEM	LOADING CONDITIONS		DESIGN FEATURE OF CONSIDERATION	FACTOR OF SAFETY
	WATER LEVEL	SHEAR STRENGTH PARAMETERS		
T-Wall Stability	SWL	Q	Determine if unbalanced load exists (Spencer's Method)	1.5
	EWL, LWL	Q	Determine if unbalanced load exists (Spencer's Method)	1.4
	EWL and LWL	Q	Determine unbalanced load (LMVD)	1.3
Sheet pile Cutoff Wall with Batter Piles Below T-wall with Unbalanced Load	SWL and EWL	Q	Sheet pile penetration and bending moment	1.5
	SWL and EWL	Q	Anchor force at base of T-wall to be carried by batter piles	1.0
	LWL	Q	N/A	1.15

Deep-seated stability analyses were performed for the proposed T-wall foundations. Analyses were initially performed using Spencer's Method with non-circular arc failures to determine if the factors of safety were below acceptable levels and an unbalanced load existed. Analyses to further evaluate the unbalanced loads utilized the Lower Mississippi Valley Division (LMVD) Method of Planes (MOP) Stability with the UPLIFT computer program. Using the results of the LMVD Method, resisting forces were factored by 1.3 for EWL and SWL conditions in order to determine any unbalanced soil forces.

Where the calculated factors of safety were lower than the requirements set forth in the Scope of Work for this Task Order, unbalanced soil forces (i.e., net driving forces) were determined for slip surfaces below the structure by summing all horizontal driving and factored resisting forces of the slip surface from the stability analysis, and subtracting the free water horizontal force that exists above grades and the base of the T-wall slab. All these stability analyses were performed ignoring R_b (i.e., shear) along the central block for the width of the base slab for the slip surface underlying the structure base. This assumption considers that settlement may occur below the base slab, and there may be no contact between the base and the soil. An unbalanced load exists when a stabilizing horizontal force is required to achieve the target factor of safety. The depth at which the unbalanced load equals zero (i.e., above which the computed safety factor is less than the target safety factor and below which the computed safety factor is greater than the target safety factor) is referred to as the critical failure plane.

Should an unbalanced load be determined the unbalanced horizontal soil pressures above the critical failure plane would be modeled and assumed supported as an anchored bulkhead system. Hand calculations were then performed to determine the anchor load, sheet pile tip penetration, and maximum bending moment in the sheet pile. The sheet pile penetration and bending moment were calculated using a factor of safety of 1.5 incorporated into the soil shear strengths below the level of initial support. The anchor load was calculated using a factor of safety of 1.0 incorporated into the soil shear strengths below the above critical failure plane. The scope of work requires the sheet pile tip elevation to be the deeper of that determined by seepage and at least 10 feet deeper than the critical failure plane. The scope of work does not indicate a check on the tip elevation using an anchored bulkhead type analysis.

Seepage Design Methods and Assumptions

Piping, seepage, and heave analyses were performed for the floodwalls for the EWL cases. Piping, seepage, and heave analyses were performed for the levees for the SWL cases. These analyses comply with EM 1110-2-1901 and DIVR 1110-1-400.

Piping potential for the floodwalls was evaluated using the Lane's Weighted Creep Ratio (LWCR). The sheet piles primarily penetrate clay, although for the computed effective grades, the sheet piles are tipped in the bay sound sand deposits. Sheet pile tip penetrations were designed to provide a minimum LWCR of 3 in clay and 8.5 in fine sand. The flow path was assumed only to be the penetration of the sheet, and no horizontal contacts were assumed.

Pile Capacity Design Methods and Assumptions

Factors of safety for the pile capacity calculations are summarized below. Additional pile capacity criteria are presented in the reference design manual noted above.

ITEM	LOADING CONDITIONS		DESIGN FEATURE OF CONSIDERATION	FACTOR OF SAFETY
	WATER LEVEL	SHEAR* STRENGTH PARAMETERS		
Pile Capacity	N/A	Q	With Static Load Test	2.0
	N/A	Q	With Dynamic Load Test	2.5
	N/A	Q	Without Load Test	3.0
	N/A	Q	With Dynamic Pile Test	2.5
	N/A	S	With or Without Load Test	1.5

*Q refers to unconsolidated-undrained shear strengths. S refers to consolidated-drained shear strengths.

A factor of safety of 3.5 was utilized for the pile capacity calculations for the sheet pile beneath the L-wall assuming vibratory installation and no load test. In addition, in accordance with the design guidelines, the capacity on the upper 10 feet below the base of the structure on the flood side of the sheet was also neglected.

D. FURNISHED INFORMATION

1. Survey data and cross-sections are included as Tab 3 of the Appendix. Excerpts from the Phase 1 plans are also included.

2. Elevation Datum. Elevations were furnished in the NAVD 88 Datum

E. SOIL BORING DATA

1. New borings were not performed for this task order. However, significant geotechnical data were obtained in 2007 comprising 5-in. diameter undisturbed soil borings and cone penetrometer tests taken along the centerline and the toe of existing flood protection. These data were incorporated into development of soil design parameters. The locations of soil borings and CPTs used for this study are shown on Figure 1, sheets 1 through 8. Boring logs are included as Tab 4 of the Appendix.

F. SUBSOIL CONDITIONS

1. Geology. The site is characterized by levee fill materials, which are underlain by Holocene Epoch deposits followed by Pleistocene Epoch soils. The Holocene Age soils consist of natural levee, swamp/marsh, deltaic plain (interdistributory), and bay floor deposits. The Holocene/Pleistocene contact is near el -82. A geologic profile is shown on Figure 2, Sheets 1 through 7.

2. Ground Water. Ground water is expected near el 0. The depth to ground water will fluctuate with changes in climatic conditions, site drainage, water levels in the adjacent Harvey Canal, and other factors. For this

reason, the depth to ground water should be determined by those persons responsible for construction immediately prior to beginning work.

3. Soil Parameters. Soil design parameters were developed for geotechnical data obtained along the existing flood protection (termed centerline data) and beyond the existing line of protection (termed toe data). Centerline data and design parameters are presented on Figure 3, Sheets 1 and 2. Toe data and design parameters are presented on Figure 3, Sheets 3 and 4. These parameters were presented to the USACE prior to analysis. Design parameters and plots are also summarized in Tab 4 of the Appendix with the boring and CPT logs. *We inadvertently used sand strength parameters from Task Order 38 in our slope stability analyses (ø= 25°). We later verified that using a friction angle of 30 degrees would not have any effect on our calculations since none of the critical failure surfaces approached the sand layer.*

G. FOUNDATION ANALYSES

1. General. Noting that the development of plans and specifications were not required by the scope of work for this feasibility level design, following are some generalized assumptions regarding construction of the alternatives that are integral with the geotechnical design. These are not intended as complete specifications.

a. Site Preparation

(1) Clearing. Stripping along the flood protection alignment will be to the minimum depth necessary to remove the deleterious materials. Special attention will be given to any weak areas or depressions discovered during the excavation operation. These areas will be thoroughly cleaned out to the surface of firm soil and backfilled with an inorganic clay fill material placed and compacted under controlled conditions. Underground obstructions or utilities may be present in the area of the project. If abandoned underground utilities exist, special care will be taken in their removal. These structures could impact the performance of new foundations if not properly removed and backfilled with select fill material.

(2) Water Levels. Water levels along the project are subject to seasonal and tidal fluctuations. Site conditions should be investigated immediately prior to initiating construction. Semi-compacted fill occupying the main levee

section will not be placed in standing water. Semi-compacted fill comprising stability berms will not be placed in more than 18 inches of standing water.

(3) Backfill and Fill Materials. With the exception of the outfall canal, all depressions will be backfilled and brought to grade at the site using fat or lean clay or silty clay (CH or CL) as defined by the Unified Soil Classification System) that are free from masses of organic matter, sticks, branches, roots, wood, and other debris. Material should have a plasticity index (PI) greater than 20. Backfill placed below the water surface will be select sand (SP) fill. The select sand fill should be non-plastic and have no more than 10% passing the No. 200 sieve.

(4) Fill Compaction. Cohesive fill materials placed within the levee section will be compacted to an in-place density corresponding to 90% of the maximum dry density in accordance with ASTM D 698. Fill materials will generally be placed in loose thicknesses not exceeding 8 inches. However, the initial lift placement may require a larger thickness and will serve as a bridge lift for the overlying materials. Depending on the depth of standing water and moisture content of the borrow materials, consideration should be given to placing an initial fill lift for the entire length of the levee before proceeding to the next lift. This method will initiate consolidation of foundation soils as well as provide a means for the fill to provide a sufficient wearing surface. This will also decrease the potential for slope failure within the fill as the levee is constructed. Sand fill placed within the closed outfall canal may be placed in standing water without compaction.

(5) Geosynthetic Reinforcement. In an effort to reduce the size of stability berms, geosynthetic reinforcement was considered at the base of the levee sections for several alternatives. In general, properties for a Mirafi PET 1000 geotextile fabric were utilized to check required pullout lengths for the critical failure surfaces. Properties for this fabric are included in Tab 2 of the Appendix. The geotextile was assumed placed on a relatively level prepared ground surface. The fabric should be placed in accordance with the manufacturers recommendations. If selected for the project, additional specifications will be required for seams. *A tensile strength (at 5% strain) of 23,986 lb/ft was used in our calculations (as per the Tencate website Technical Data Sheet for Mirafi PET 1000/100*.

(6) Soil Mixing Columns. A specific soil-mix column layout was not evaluated

for alternatives considering this method of improvement. Rather, average soil properties that are required to improve the foundation conditions were evaluated. Specifically, we have analyzed the stability of the levee slopes using enough shear strength to achieve the required factors of safety with a maximum improved shear strength of 2,000 psf for the soils in the mix zone, which extended vertically to the top of the granular layer at el –58 and horizontally to the lateral extent of the toe soil borings. These properties fall within the confines and are consistent with those designed and achieved on similar projects. However, differential settlement potential will need to be addressed for the interface between the soil mixing columns and unimproved deposits.

(7) Removal of Existing Protection. Once the selected alternatives are constructed, removal of the existing protection may be necessary. This includes degrading of the existing levees and removal of the Phase 1 interim improvements (grouted riprap). In most instances the existing sheet pile I-walls may remain in place, but may require being cut off or driven to grade to facilitate drainage. I-walls that are pulled must be grouted to fill any voids created by their removal.

b. Analyses of Alternatives

(1) Alternative 1 – Geotextile-Reinforced Earthen Levee Enlargement. The recommended tensile strengths and widths of reinforcement are shown on Figure 4, Sheets 1 through 3, which summarize the analyses using Spencer's Method of analysis (circular failure surfaces). Figure 4, Sheets 4 and 5 present the LMVD Method of Planes analyses using the COE computer program Uplift. Figure 4, Sheets 6 through 8 present analyses using Spencer's method of analysis (block failure mode). A protected-side shift of 80 feet was assumed so that fabric could be placed on existing grades without degrading of the existing protection prior to construction. Only part of the existing levee fill was considered in our final stability analyses after the levee was assumed to provide positive drainage. The required embedment length is based on Sheets 1 and 4, the SWL cases. These calculations are included in Tab 5. A 100-ft landside shift of the canal was required to meet the factor-of-safety requirements. Calculations for this alternative are provided as Tab 5 of the Appendix. The calculations also include Uplift and Slope/W input and output files for failure surfaces around the geotextile.

(2) Alternative 2 – Non-reinforced Earthen Levee With Landside Shift of Drainage Canal. A non-reinforced levee alternative was evaluated for SWL and LWL conditions. Based on these slope stability analyses, a shift of the centerline of the existing levee was not deemed necessary. However, both flood- and protected-side berms with respective widths of 103 feet and 160 feet are needed to meet the factor-of-safety requirements, which would consequently dictate a 50-foot landside shift of the drainage canal. Consequently, the ROW would have to be extended beyond existing limits. The results of these analyses are presented on Figure 5, Sheets 1 and 2. Calculations for this alternative are provided as Tab 6 of the Appendix. The seepage analyses meet the design criteria and are also included in Tab 6.

(3) Alternative 3 – Geotextile-Reinforced Earthen Levee Enlargement with Culverts in Drainage Canal. The recommended tensile strengths and widths of reinforcement are shown on Figure 6, Sheets 1 through 3, which summarize the analyses using Spencer's Method of analysis (circular failure surfaces). Figure 6, Sheets 4 and 5 present the LMVD Method of Planes analyses. Figure 6, Sheets 6 through 8 present analyses using Spencer's method of analysis (block failure mode). A protected-side shift of 80 feet was assumed so that fabric could be placed on existing grades without degrading of the existing protection prior to construction. Only part of the existing levee fill was considered in our final stability analyses after the levee was assumed to provide positive drainage. The required embedment length is based on Sheets 1 and 4, the SWL cases. These calculations are included in Tab 7. A 100-ft landside shift of the culverts was required to meet the factor-of-safety requirements. Calculations for this alternative are provided as Tab 7 of the Appendix. The calculations also include Uplift and Slope/W input and output files for failure surfaces around the geotextile.

(4) Alternative 4 – Earthen Levee with Soil Mixing Columns. Consideration was also given to the construction of an earthen levee section, minimized through the use of soil mixed columns. For this alternative, the centerline of the existing protection is maintained considering mixing occurs through the existing protection in reaches. The factors of safety for this alternative all meet or exceed the design requirements. The results of these analyses are provided on Figure 7, Sheets 1 and 2. Calculations for this alternative are provided as Tab 8 of the Appendix.

(5) Alternative 5 – Floodwall. T-Walls and L-Walls were considered for this alternative. We recommend a minimum sheet pile tip at el –8.0 for the L-walls and el –13.0 for the T-walls as shown in the seepage cutoff calculations included in Tab 9. This alternative also dictated a reduction in the height of the existing levees to el 5.0 for the T-walls and el 7.0 for the L-Walls. No shift of the centerline of the levee was required; therefore, none was assumed. The results of our analyses for this configuration are shown on Figure 8.1 through 8.8. No unbalanced forces were calculated for this alternative as the factor-of-safety requirements were met or exceeded. Calculations for this alternative are provided as Tab 9 of the Appendix. *The search blocks are shown on Figure 8. Sheets 1 though 8.*

The safety factors from the various alternatives are summarized in the table below.

EAR STABILITY ANALYSIS CALCULATED FACTORS OF SAFETY						
ALTERNATIVE 1 – GEOTEXTILE-REINFORCED LEVEE EMBANKMENT DESIGN						
	Method of Planes		Spncr's Method Circular		Spncr's Method Block	
Still Water Level	1.65		1.66		1.68	
Top of Levee	N/A		1.41		1.51	
Low Water Level (Flood Side)	1.96		1.43		1.45	
ALTERNATIVE 2 – UNREINFORCED LEVEE EMBANKMENT DESIGN						
	Method of Planes		Spncr's Method Circular		Spncr's Method Block	
Still Water Level	1.41		N/A		N/A	
Top of Levee	N/A		N/A		N/A	
Low Water Level (Flood Side)	1.41		N/A		N/A	
ALTERNATIVE 3 – GEOTEXTILE-REINFORCED LEVEE EMBANKMENT DESIGN W/ CULVERTS						
	Method of Planes		Spncr's Method Circular		Spncr's Method Block	
Still Water Level	1.64		1.62		1.66	
Top of Levee	N/A		1.42		1.52	
Low Water Level (Flood Side)	1.96		1.55		1.62	
ALTERNATIVE 4 –EARTHEN LEVEE WITH SOIL MIXING COLUMNS DESIGN						
	Method of Planes		Spncr's Method Circular		Spncr's Method Block	
Still Water Level	1.92		N/A		N/A	
Top of Levee	N/A		N/A		N/A	
Low Water Level (Flood Side)	1.71		N/A		N/A	
ALTERNATIVE 5 – FLOODWALL DESIGN						
	Method of Planes		Spncr's Method Circular		Spncr's Method Block	
	L-Wall	T-Wall	L-Wall	T-Wall	L-Wall	T-Wall
Still Water Level	N/A	1.37	N/A	N/A	2.11	2.17
Top of Levee	N/A	N/A	N/A	N/A	1.53	1.52
Low Water Level (Flood Side)	N/A	2.79	N/A	N/A	2.50	3.50

c. Levee Settlement

Significant settlement will occur due to the levee construction along the proposed alignments. This settlement will be realized as lateral plastic deformation and consolidation settlement during fill placement as well as ongoing, long-term consolidation settlement after construction. In order to quantify the settlement appropriately, site-specific geotechnical data are required along the alignments followed by settlement analyses and gain-in-strength considerations. A gain-in-strength analysis was beyond the current scope of services. Note that settlement within the foundation soils will be significantly reduced due to the presence of soil mixing columns for the applicable alternatives. The presence of the geotextile fabric will also alter the settlement characteristics of the associated levees.

For the non-reinforced levee sections, lift construction was assumed to provide for the required levee crown elevation by 2057. Three (3) lifts will be required to achieve the net grade of el 14.0 by 2057. Based on our analyses, we estimate an initial lift to el 12 followed by a second lift to el 13 after three years. This second lift would require placement of 1.2 feet of fill due to settlement caused by the first lift. The third lift would occur after about 20 years to the design grade at el 14 and would require the placement of an additional two (2) feet of fill. Either a fourth lift would be required after approximately 45 years to maintain el 14, or a gain-in-strength would need to be considered such that the third lift could exceed el 14. These preliminary estimates of lift construction are provided as Tab 10 of the Appendix.

d. Seepage

The seepage analyses presented in Tab 6 indicate that neither piping nor heave will jeopardize the stability of the proposed configurations.

e. Pile Foundations

(1) Estimated Capacities. Computations were made to determine the estimated allowable single pile load capacities in compression and tension for 14-inch and 12-inch steel H-Piles to support the floodwalls. The results of these analyses are included as Tab 11 of the Appendix. Steel H-Pile capacities are plotted on Figures 9, sheets 1 and 2. Pile capacities were

computed using levee toe shear strengths to el -74, the approximate limits of these data. Centerline strengths were utilized below this depth to the limits of all the boring data at approximate el -104.

Capacities were computed for piles driven for support of the T-walls. Capacities were computed for piles driven from a ground surface at el 1.0. The pile capacities were computed for Q-case and S-case. All Q-case computations include a factor of safety of 2 against failure of a single pile. The pile capacities provided would be reduced by 33% (67% of indicated capacities) if a pile load test is not performed or by 20% (80% of indicated values) if a dynamic test is performed in lieu of a static load test. S-case computations are based on a safety factor of 1.5. The Q-case capacities govern over the S-case capacities and should be used for design.

These pile capacity curves can be used to estimate allowable axial capacity for support of the T-walls and L-walls, regardless of the bottom of base slab elevation or grade elevation. Where unbalanced loads exist, the axial capacity of the supporting piles within the zone of unbalanced soil loading will be ignored for support of the structure. The methodology to reduce the pile capacities is presented on Figure 9-3.

Capacities have also been developed for steel sheet piles to be used to support the L-wall in Alternative 5. The results of our analyses are plotted on Figure 9-4. A factor of safety of 3.5 was included in these capacities assuming vibratory installation and no load test.

(2) Pile Group Capacity and Spacing. Piles will derive a majority of their supporting capacity from skin friction. Therefore, it will be necessary to consider the effect of group action. In this regard, the supporting value of the piles driven in groups will be investigated on the basis of group perimeter shear by the formula shown on Figure 9-5. The minimum spacing between piles will be determined using the formula shown on Figure 9-5.

(3) Lateral Loads. Horizontal and axial components of batter piles will be determined from geometry using the formula shown on Figure 9-6. The modulus of horizontal subgrade reaction (K_h) necessary for evaluating lateral support of vertical and batter piles will be estimated using the table of values presented on Figure 9-7.

(4) Estimated Settlement. Long term settlement due to sustained structural

loads on individual pile foundations tipped in the deposits below el -78 is anticipated to be ½ to ¾ inch. This estimate assumes piles will be driven in single rows supporting the T-walls and do not include the elastic deformation of the piles. Elastic deformation will be estimated as 67% to 75% of the static column strain. Elastic deformation can better be defined during the pile load test. Impact barrier dolphins will be installed in small groups but will not be used to support any sustained vertical loads.

Additional settlement due to drag loads (negative skin friction) can be expected for new or existing fill placed adjacent to the pile foundation. Such settlement may also be experienced as the result of area subsidence affected by interim drainage. Settlement estimates due to drag effects are beyond the scope of work for this report.

(5) Quality Control During Pile Driving. Close field supervision will be maintained by experienced personnel to ensure proper procedures are followed and accurate records are kept during all pile driving operations. The driving record will include the pile type, overall length, dimensions, and embedment below finished grade, and number of blows per foot of penetration. An accurate driving record is especially important to verify all piles are installed to the required tip embedment and to give an indication of any unusual driving characteristics which may indicate pile breakage.

(6) Pile Driving Hammers. Steel H-Piles will be driven with a single acting air hammer delivering a manufacturer's rated energy of at least 24,000 ft-lbs per blow.

(7) Dynamic Pile Tests. Consideration will be given to performing DPT using a Pile Driving Analyzer® to evaluate capacity of steel H-Piles. If this is the case, these will be evaluated by re-strike DPT and subsequent CAPWAP® analyses. The re-strikes will be performed no earlier than 21 days after initial installation. In addition, steel test piles may be monitored and evaluated by a DPT using a PDA during the pile's installation. The PDA will monitor driving stresses during installation and evaluate pile integrity during installation. The PDA will also evaluate installation efficiency by monitoring the energy transferred to the pile by the hammer.

(8) Test Piles. Test piles will be installed along the project site. The number and location of the test piles will depend on the type and location of the project features. The test pile program will be developed once the

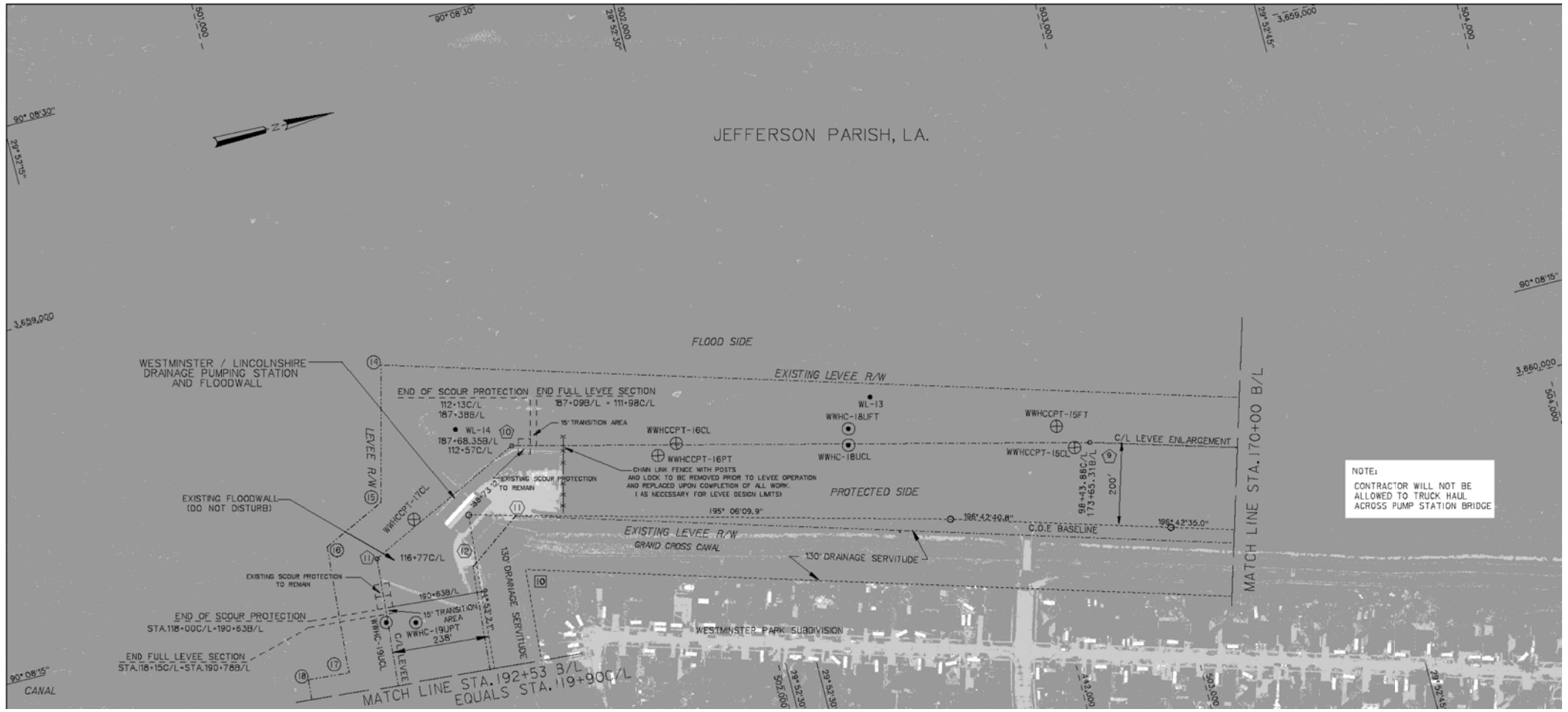
preferred alternative is selected and the project features are finalized.

(9) Static Load Tests. A series of load tests will be performed on piles considered for the project. The number of load tests will depend on the project features and will be provided during preparation of the plans and specifications. In general, load tests will be performed in accordance with ASTM D 1143. Project specifications will require load tests to failure or 300% of design load, whichever is achieved first. Static load tests will be performed no earlier than 21 days after initial pile installation.

f. Preconstruction and Monitoring Considerations

(1) Surveys of Existing Conditions. The existing conditions of the surrounding structures along the project site will be assessed. This study will include all residences and business structures within a 500-ft distance of the construction necessary for the project. The assessment will consist of videotaped surveys of the inside and outside of structures and should be made by a registered engineer.

(2) Vibrations. Installation of piles may affect nearby structures. Vibrations will be monitored during the test pile program, installation of job piles, installation and removal of sheet piles, and any demolition or other construction activities. The monitoring will be performed with a seismograph to evaluate peak particle velocities and frequency at critical structures during pile driving. The record of peak particle velocities will provide information in assessing potential damage and the need for changes in driving operations.



LEGEND

- DENOTES UNDISTURBED SOIL BORING
- DENOTES GENERAL SOIL BORING
- CONE PENETROMETER

FFEB Geotechnical Consultants

SOIL BORING PLAN
STA 170+00 B/L TO STA 192+53 B/L

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

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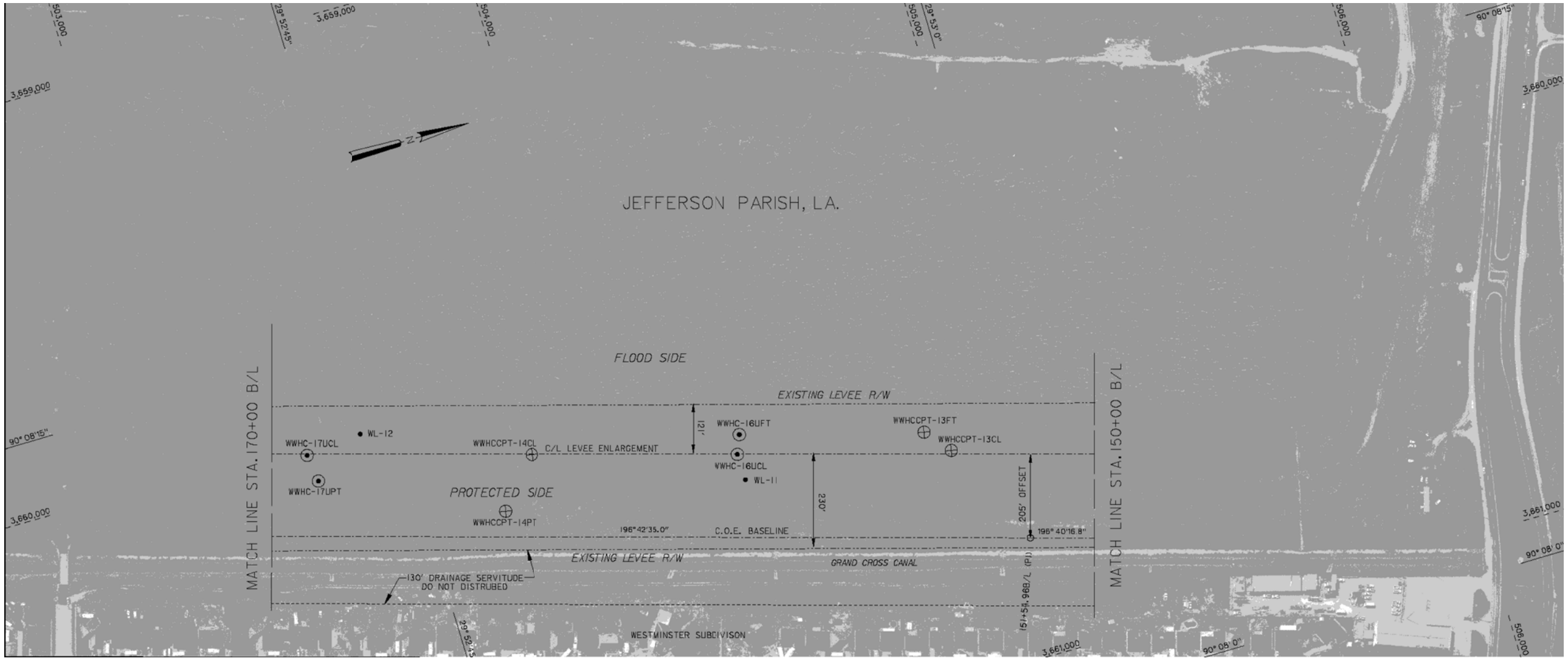
CHECKED BY: ZHA	JOB NO.: 0022-0045	FIGURE: 1-5



LEGEND

- DENOTES UNDISTURBED SOIL BORING
- DENOTES GENERAL SOIL BORING
- CONE PENETROMETER

FFEB Geotechnical Consultants

SOIL BORING PLAN
STA 121+00 B/L TO STA 150+00 B/L

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

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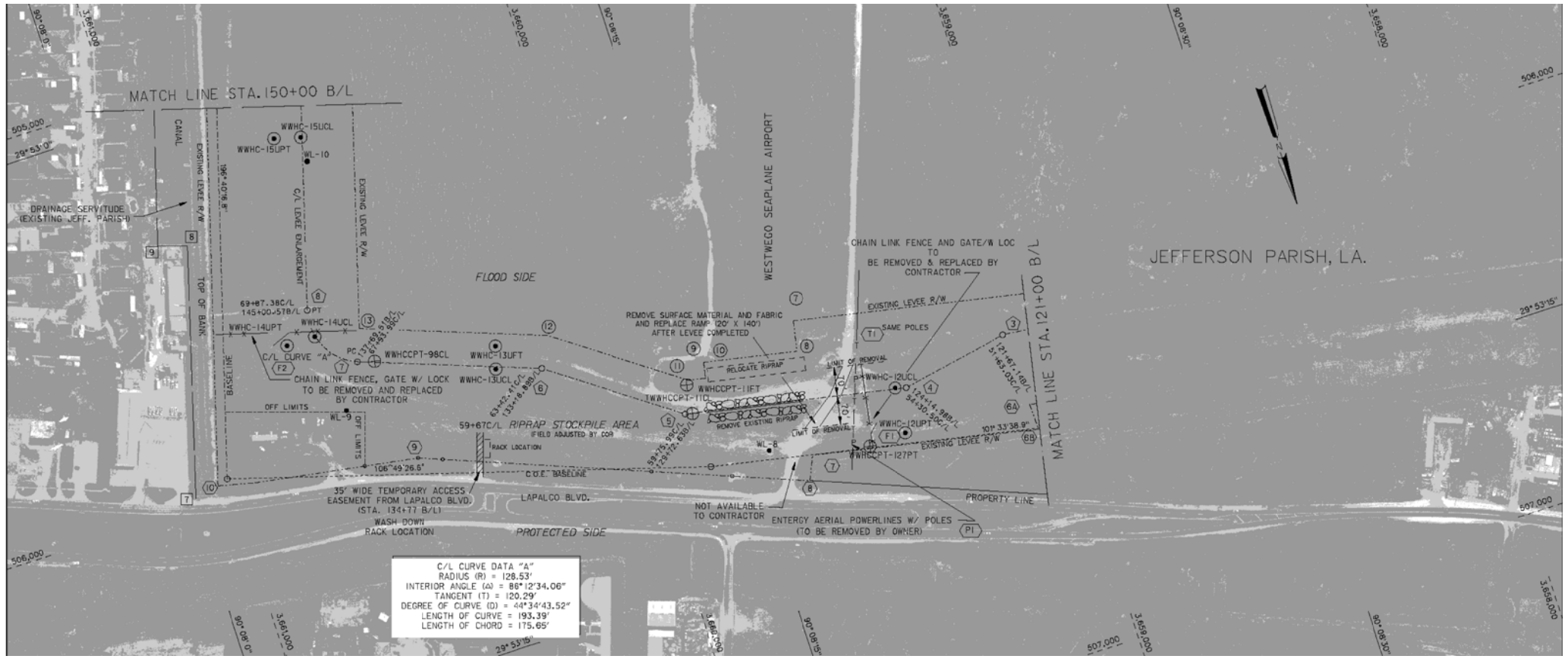
CHECKED BY: ZHA	JOB NO.: 0022-0045	FIGURE: 1-4



LEGEND

- ⊙ DENOTES UNDISTURBED SOIL BORING
- ● DENOTES GENERAL SOIL BORING
- ⊕ CONE PENETROMETER

FFEB Geotechnical Consultants

SOIL BORING PLAN
STA 121+00 B/L TO STA 150+00 B/L

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
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NEW ORLEANS, LOUISIANA

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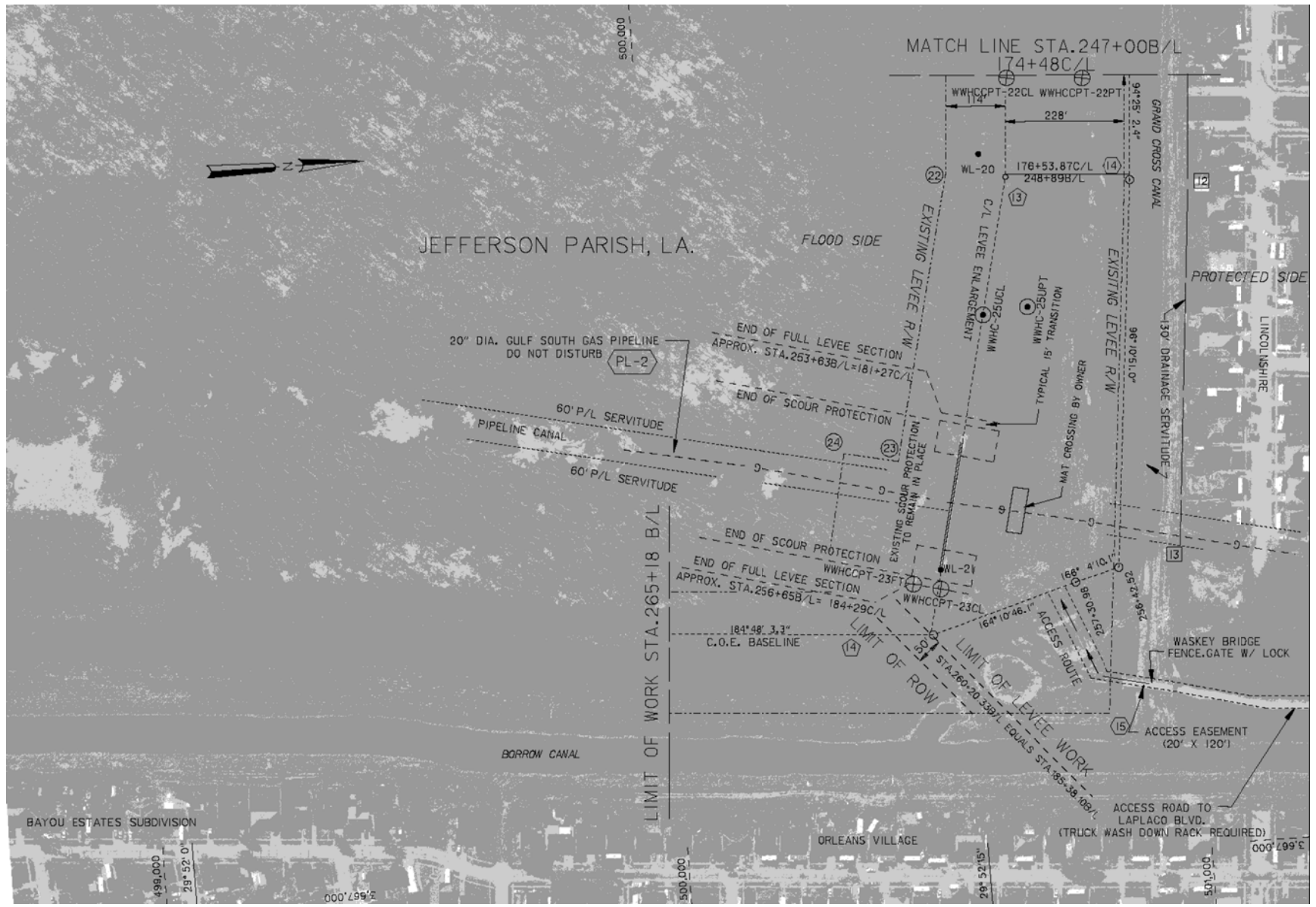

LEGEND

- DENOTES UNDISTURBED SOIL BORING
- DENOTES GENERAL SOIL BORING
- CONE PENETROMETER

FFEB Geotechnical Consultants

SOIL BORING PLAN
STA 247+00 B/L TO 265+18 B/L

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

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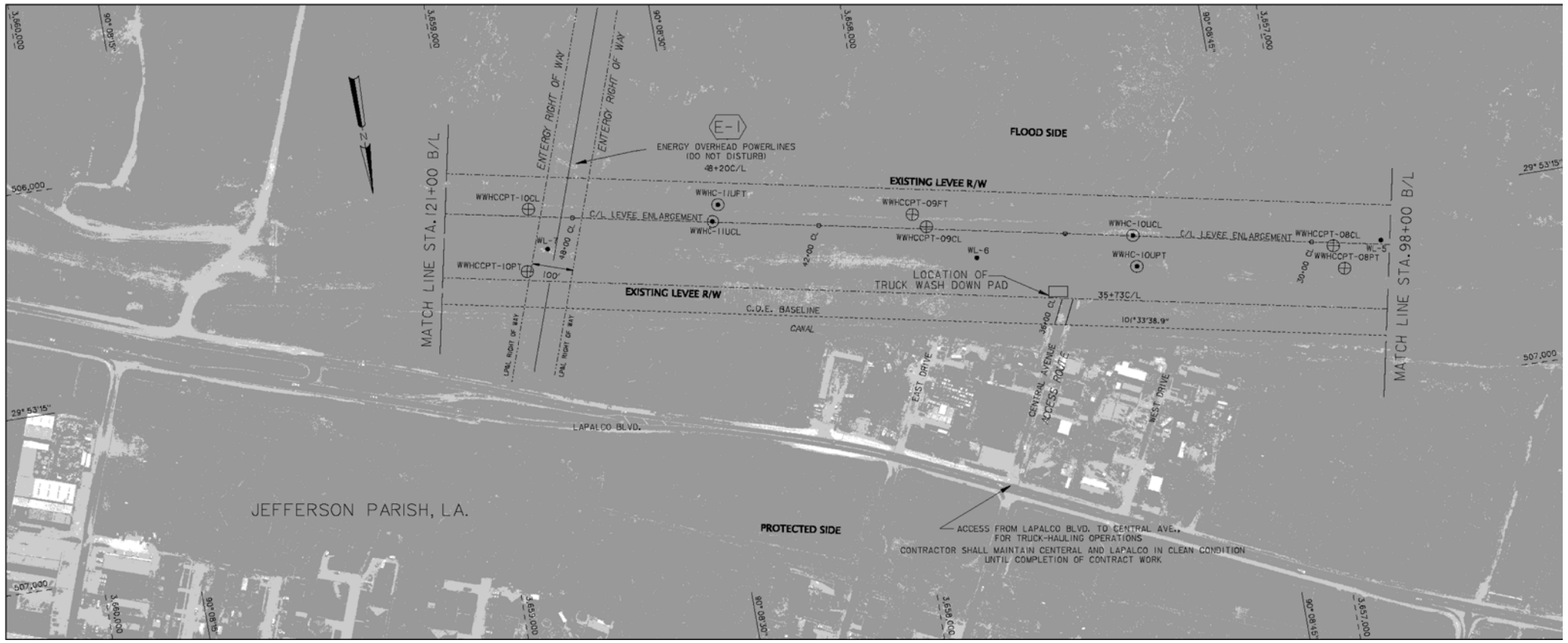

SCLALE: 1" = 271'

LEGEND

- DENOTES UNDISTURBED SOIL BORING
- DENOTES GENERAL SOIL BORING
- CONE PENETROMETER

FFEB Geotechnical Consultants

SOIL BORING PLAN
STA 98+00 B/L TO 121+00 B/L

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
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HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: MBT	DATE: 04/10/08	CADD FILE: PLATE 1B
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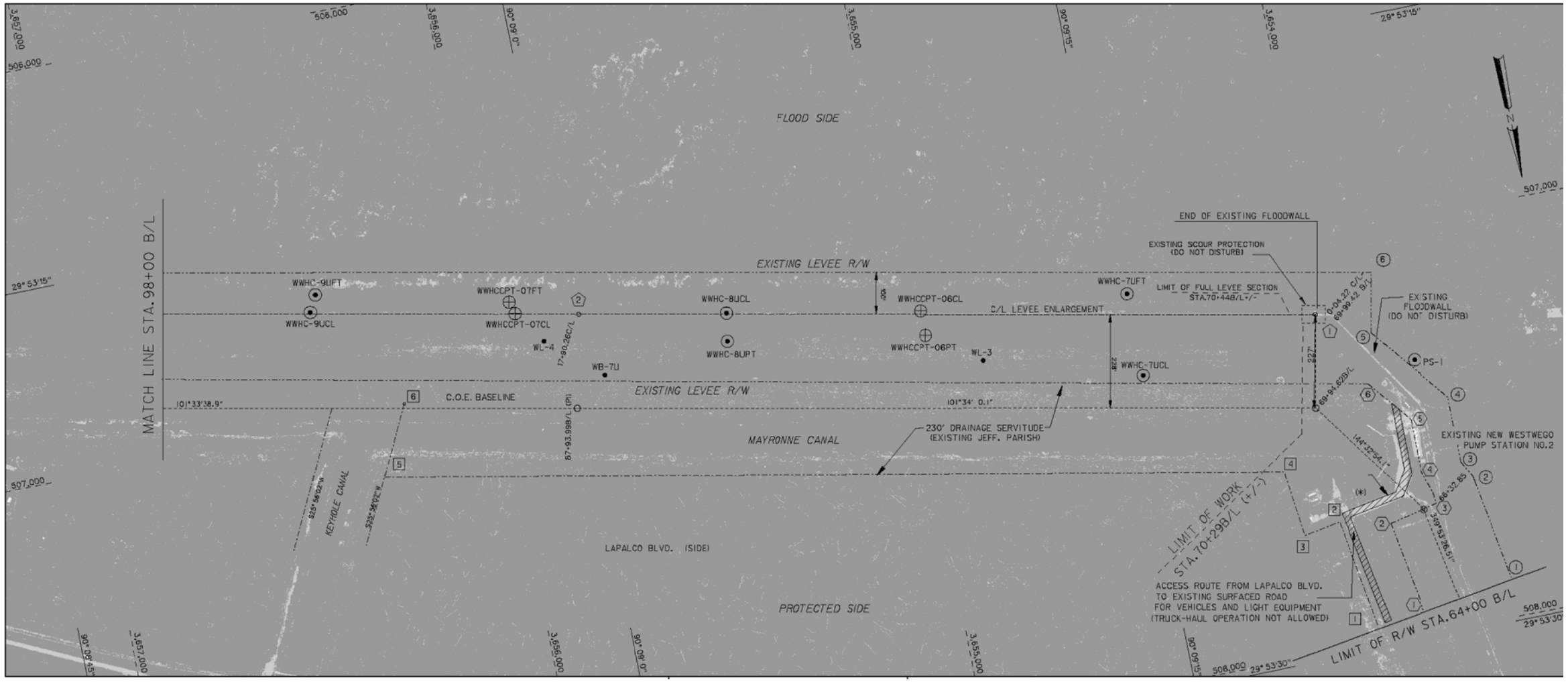


SCLALE: 1" = 271'

LEGEND

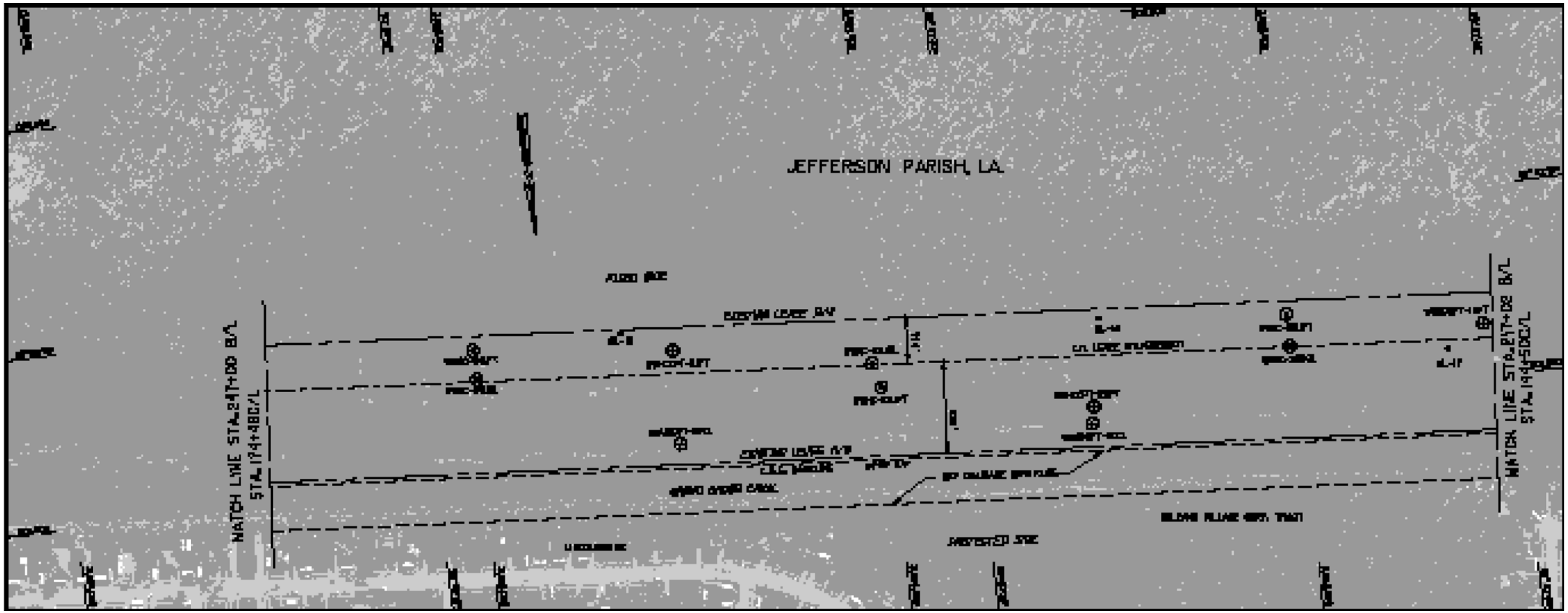
- ⊙ DENOTES UNDISTURBED SOIL BORING
- ● DENOTES GENERAL SOIL BORING
- ⊕ CONE PENETROMETER

FFEB Geotechnical Consultants

SOIL BORING PLAN
STA 64+00 B/L TO 98+00 B/L

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: MBT	DATE: 04/10/08	CADD FILE: PLATE 1A
CHECKED BY: ZHA	JOB NO.: 0022-0045	FIGURE: 1-1



LEGEND

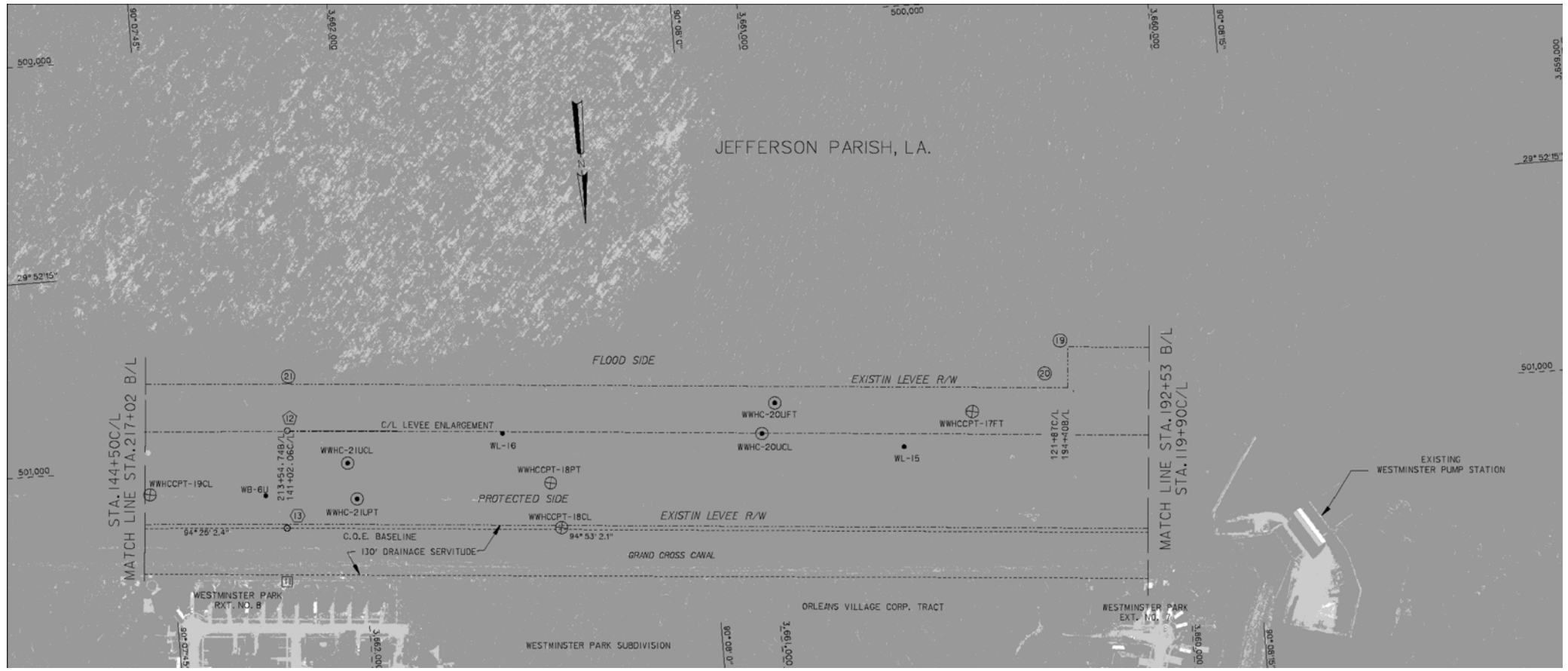
- DENOTES UNDISTURBED SOIL BORING
- DENOTES GENERAL SOIL BORING
- CONE PENETROMETER

FFEB Geotechnical Consultants

SOIL BORING PLAN
STA 217+02 B/L T0 B/L TO 247+00 B/L

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: MBT	DATE: 04/10/08	CADD FILE: PLATE 1G
CHECKED BY: ZHA	JOB NO.: 0022-0045	FIGURE: 1-7



LEGEND

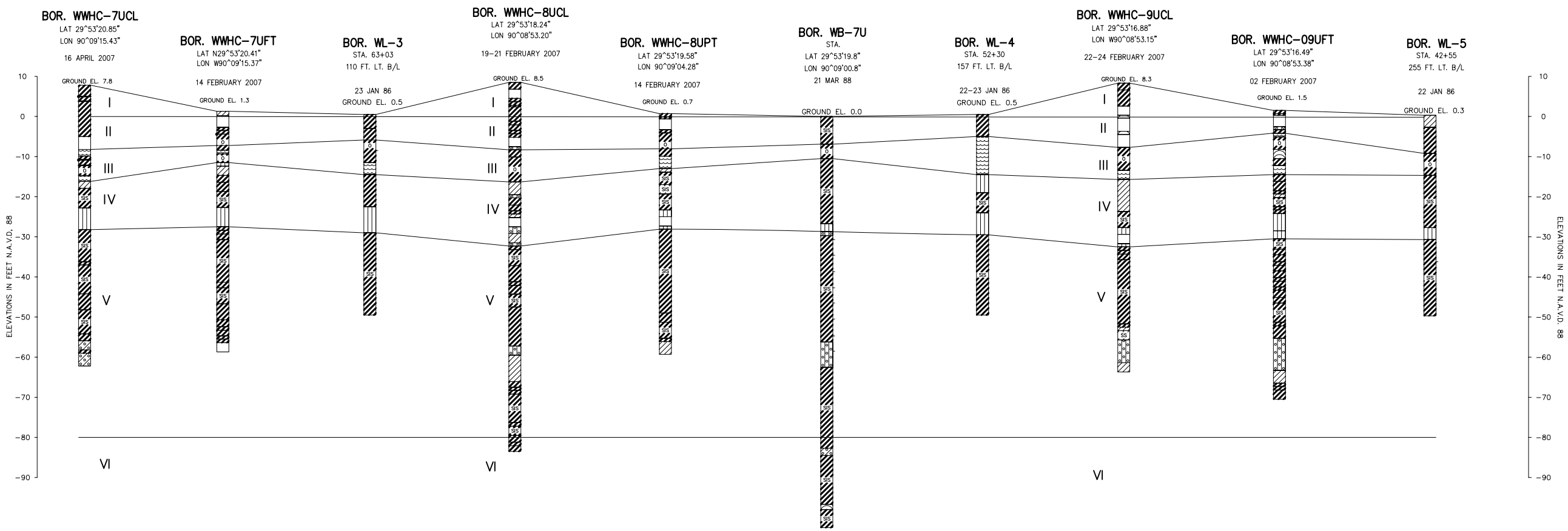
- DENOTES UNDISTURBED SOIL BORING
- DENOTES GENERAL SOIL BORING
- CONE PENETROMETER

FFEB Geotechnical Consultants

SOIL BORING PLAN
STA 192+53 B/L TO 217+02 B/L

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: MBT	DATE: 04/10/08	CADD FILE: PLATE 1F
CHECKED BY: ZHA	JOB NO.: 0022-0045	FIGURE: 1-6



STRATA	GEOLOGIC AGE	GEOLOGIC ORIGIN	DESCRIPTION
I	HOLOCENE	MAN MADE (ARTIFICIAL FILL)	GRAY AND BROWN, CLAY AND SILT, WITH VARIOUS ORGANIC MATTER
II		NATURAL LEVEE	GRAY SILTY CLAY
III		SWAMP/MARSH	DARK GRAY TO BLACK CLAY WITH PEAT AND ORGANIC SILTS
IV		DELTAIC PLAIN (INTERDISTRIBUTARY)	INTERBEDDED GRAY CLAY, SILTS AND SANDS WITH SHELL FRAGMENTS
V		HOLOCENE COASTAL (BAY FLOOR DEPOSITS)	GRAY, SILTY SAND, SAND, SILT WITH CLAY, AND SHELL/SHELL FRAGMENTS
VI	PLEISTOCENE	UNDIFFERENTIATED	GRAY, LIGHT GRAY, AND LIGHT BROWN, CLAYS INTERBEDDED WITH SILTS AND SANDS

GENERAL NOTE: DATA CONCERNING SUBSURFACE CONDITIONS HAVE BEEN OBTAINED AT BORING AND CPT LOCATIONS ONLY. ACTUAL CONDITIONS AT LOCATIONS BETWEEN BORINGS AND CPTS MAY VARY FROM THE GENERALIZED PROFILE SHOWN HERE.

CH – Fat Clay
CL – Lean Clay
ML – Silt, Low Plasticity
Pt – Peat
SC – Clayey Sand
SM – Silty Sand
SP – Sand, Poorly Graded
Wd – Wood

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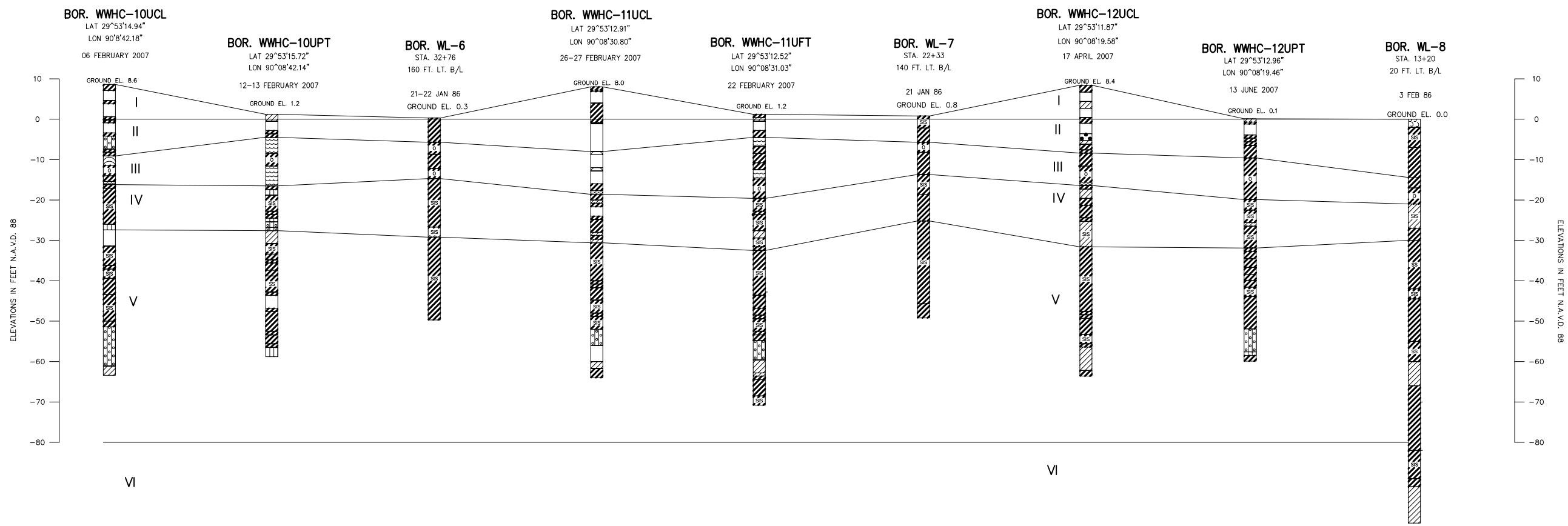
GENERALIZED SUBSURFACE PROFILE
BORINGS WWHC-7UCL TO WL-5

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: DJL	CHECKED BY: ZHA	APPROVED BY:
DATE: 10/31/08	FIGURE: 2-1	



STRATA	GEOLOGIC AGE	GEOLOGIC ORIGIN	DESCRIPTION
I	HOLOCENE	MAN MADE (ARTIFICIAL FILL)	GRAY AND BROWN, CLAY AND SILT, WITH VARIOUS ORGANIC MATTER
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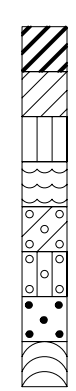
IV		DELTAIC PLAIN (INTERDISTRIBUTARY)	INTERBEDDED GRAY CLAY, SILTS AND SANDS WITH SHELL FRAGMENTS
V		HOLOCENE COASTAL (BAY FLOOR DEPOSITS)	GRAY, SILTY SAND, SAND, SILT WITH CLAY, AND SHELL/SHELL FRAGMENTS
VI	PLEISTOCENE	UNDIFFERENTIATED	GRAY, LIGHT GRAY, AND LIGHT BROWN, CLAYS INTERBEDDED WITH SILTS AND SANDS

GENERAL NOTE: DATA CONCERNING SUBSURFACE CONDITIONS HAVE BEEN OBTAINED AT BORING AND CPT LOCATIONS ONLY. ACTUAL CONDITIONS AT LOCATIONS BETWEEN BORINGS AND CPTS MAY VARY FROM THE GENERALIZED PROFILE SHOWN HERE.



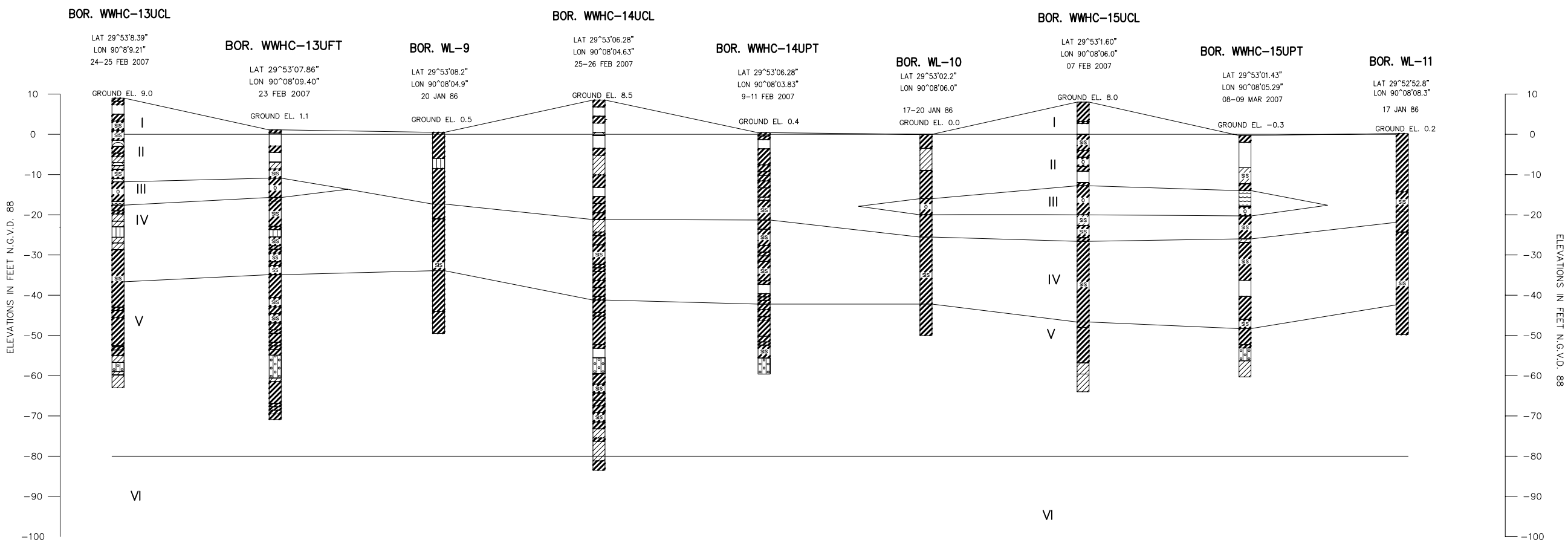
CH – Fat Clay
CL – Lean Clay
ML – Silt, Low Plasticity
Pt – Peat
SC – Clayey Sand
SM – Silty Sand
SP – Sand, Poorly Graded
Wd – Wood

FFEB Geotechnical Consultants

GENERALIZED SUBSURFACE PROFILE
BORINGS WWHC-10UCL TO WL-8

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: DJL	CHECKED BY: ZHA	APPROVED BY:
DATE: 10/31/08	FIGURE: 2-2	



STRATA	GEOLOGIC AGE	GEOLOGIC ORIGIN	DESCRIPTION
I	HOLOCENE	MAN MADE (ARTIFICIAL FILL)	GRAY AND BROWN, CLAY AND SILT, WITH VARIOUS ORGANIC MATTER
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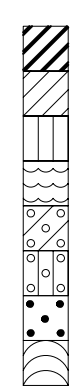
GENERAL NOTE: DATA CONCERNING SUBSURFACE CONDITIONS HAVE BEEN OBTAINED AT BORING AND CPT LOCATIONS ONLY. ACTUAL CONDITIONS AT LOCATIONS BETWEEN BORINGS AND CPTS MAY VARY FROM THE GENERALIZED PROFILE SHOWN HERE.



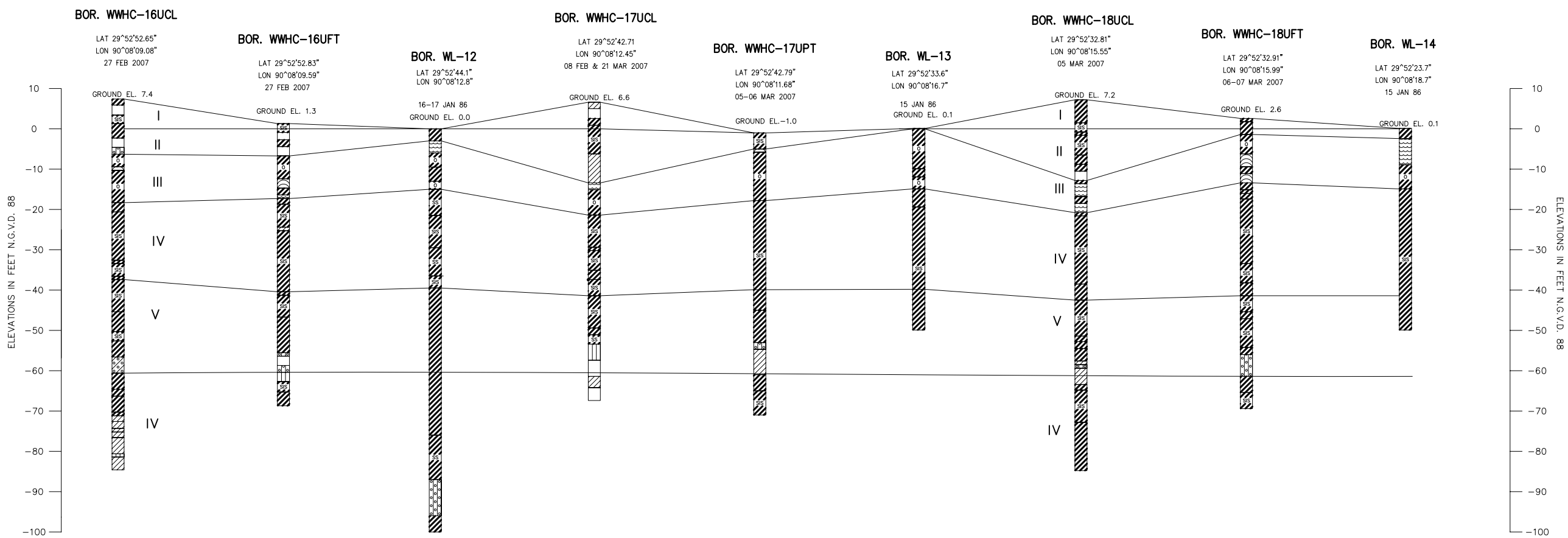
CH – Fat Clay
CL – Lean Clay
ML – Silt, Low Plasticity
Pt – Peat
SC – Clayey Sand
SM – Silty Sand
SP – Sand, Poorly Graded
Wd – Wood

FFEB Geotechnical Consultants

GENERALIZED SUBSURFACE PROFILE
BORINGS WWHC-13UCL TO WL-11

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: DJL	CHECKED BY: ZHA	APPROVED BY:
DATE: 10/31/08	FIGURE: 2-3	



STRATA	GEOLOGIC AGE	GEOLOGIC ORIGIN	DESCRIPTION
I	HOLOCENE	MAN MADE (ARTIFICIAL FILL)	GRAY AND BROWN, CLAY AND SILT, WITH VARIOUS ORGANIC MATTER
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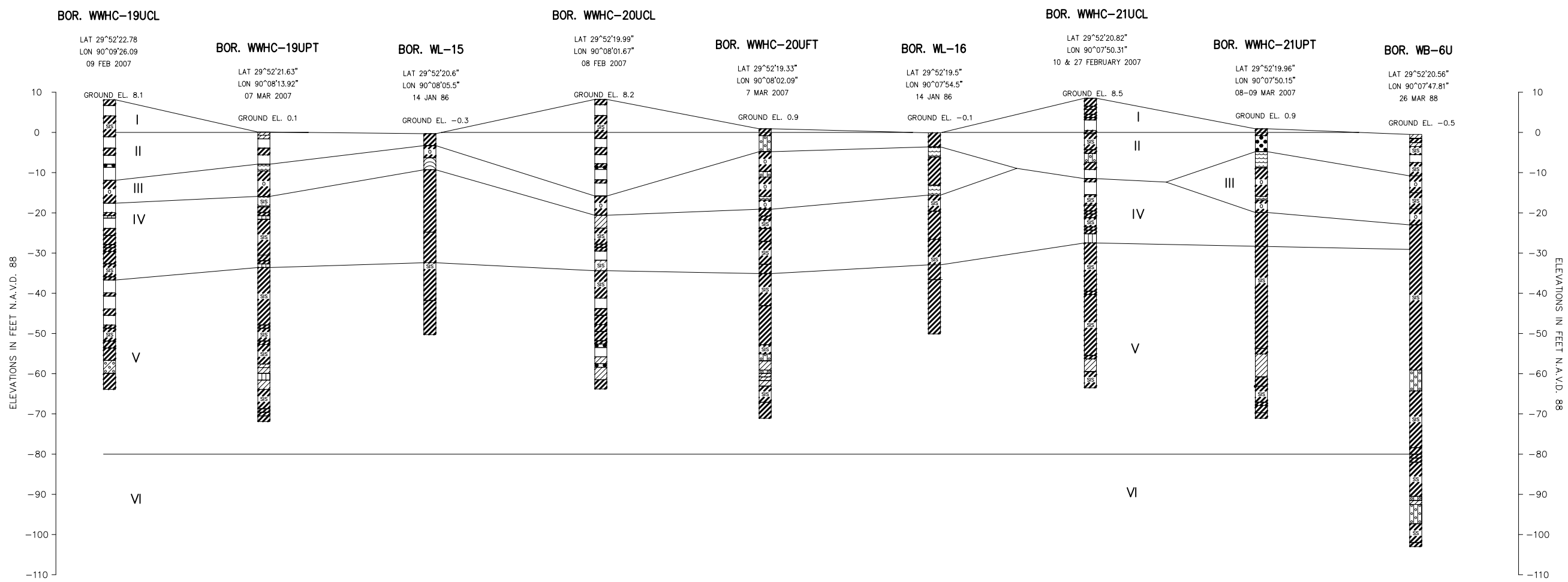
ML – Silt, Low Plasticity
Pt – Peat
SC – Clayey Sand
SM – Silty Sand
SP – Sand, Poorly Graded
Wd – Wood

FFEB Geotechnical Consultants

GENERALIZED SUBSURFACE PROFILE
BORING WWHC-16UCL TO WL-14

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: DJL	CHECKED BY: ZHA	APPROVED BY:
DATE: 10/31/08	FIGURE: 2-4	



STRATA	GEOLOGIC AGE	GEOLOGIC ORIGIN	DESCRIPTION
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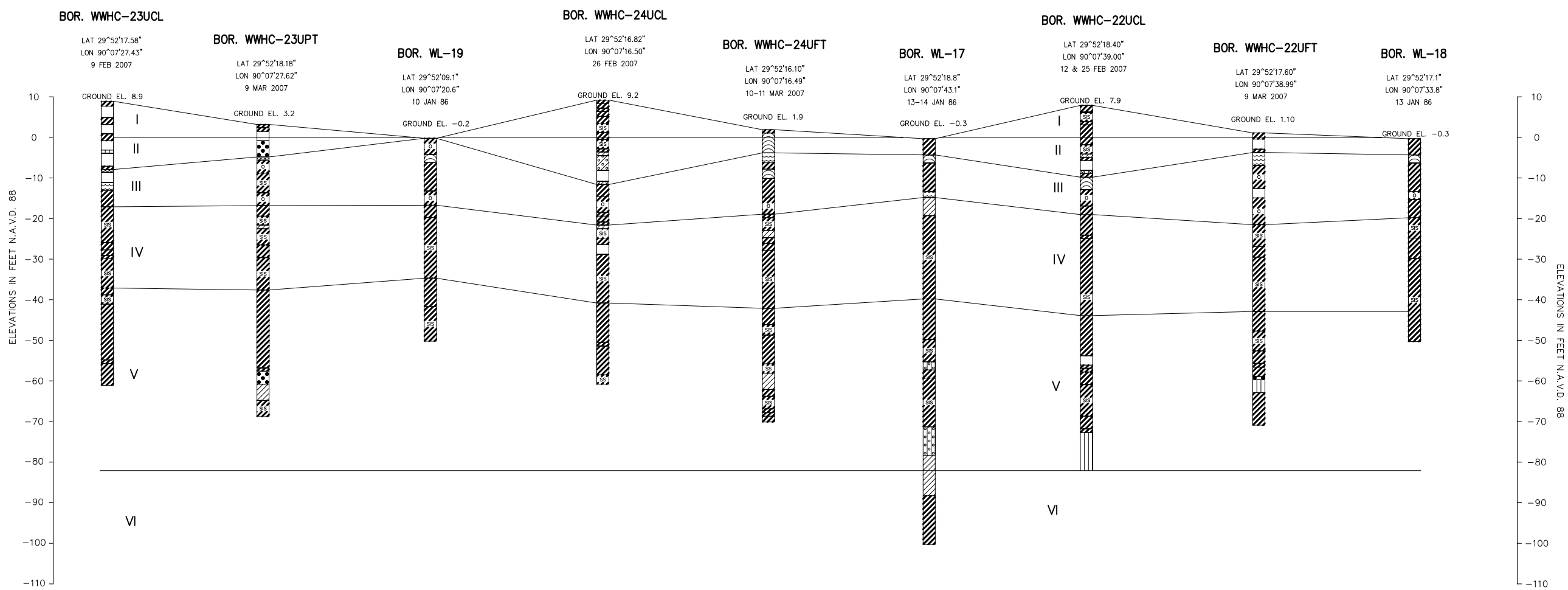
SM – Silty Sand
SP – Sand, Poorly Graded
Wd – Wood

FFEB Geotechnical Consultants

GENERALIZED SUBSURFACE PROFILE
BORING WWHC-19UCL TO WB-6U

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY:DJL	CHECKED BY: ZHA	APPROVED BY:
DATE: 10/31/08	FIGURE: 2-5	



STRATA	GEOLOGIC AGE	GEOLOGIC ORIGIN	DESCRIPTION
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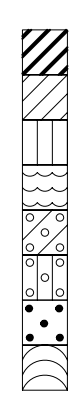

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GENERALIZED SUBSURFACE PROFILE
BORING WWHC-23UCL TO WL-18

U.S. ARMY CORPS OF ENGINEERS
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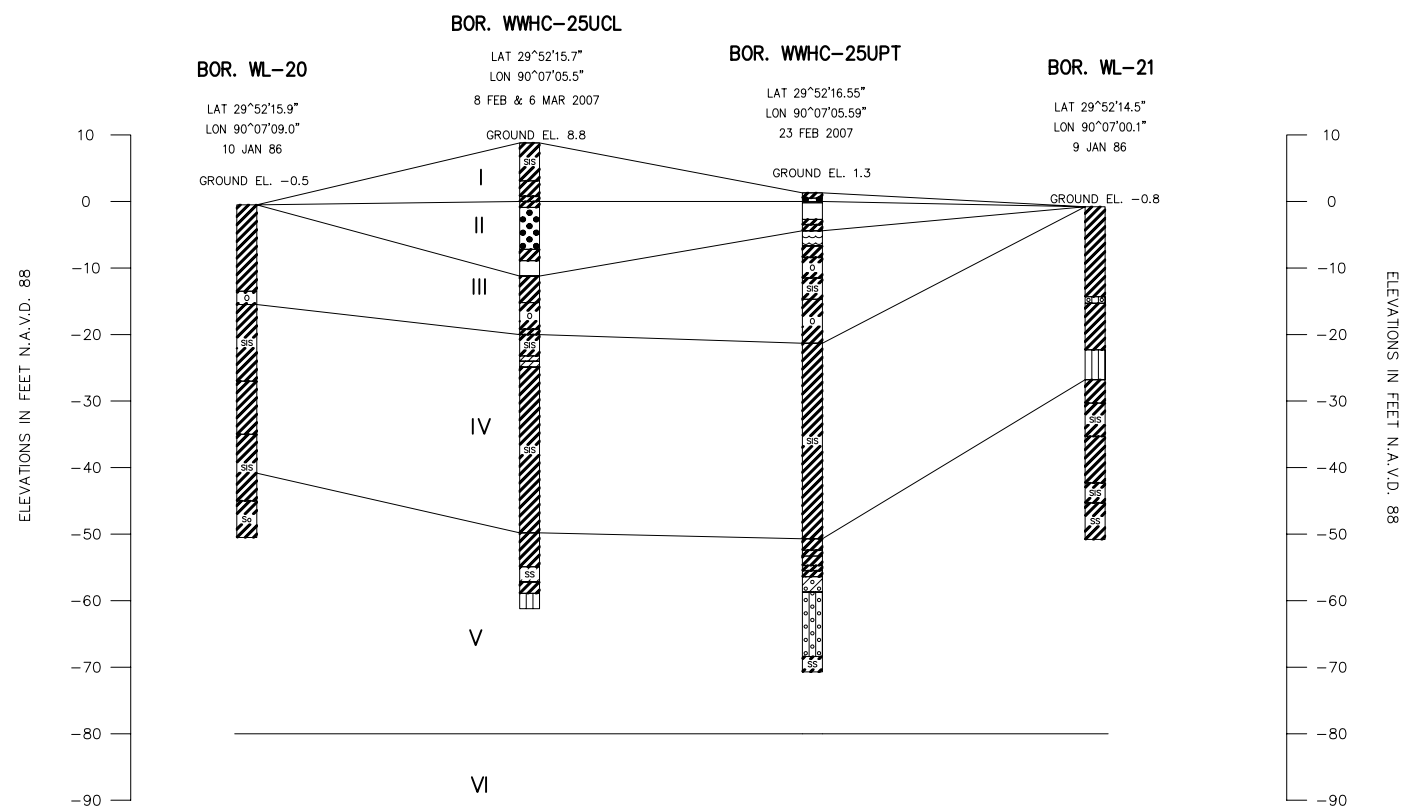
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: DJL	CHECKED BY: ZHA	APPROVED BY:
DATE: 10/31/08	FIGURE 2-6	



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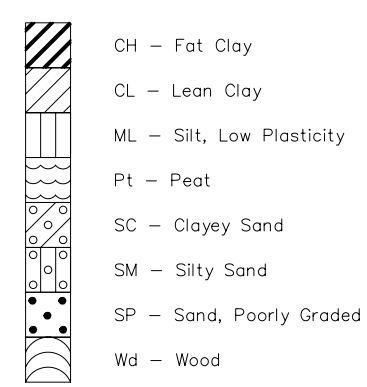

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GENERALIZED SUBSURFACE PROFILEBORINGS
WL-20 TO WL-21

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
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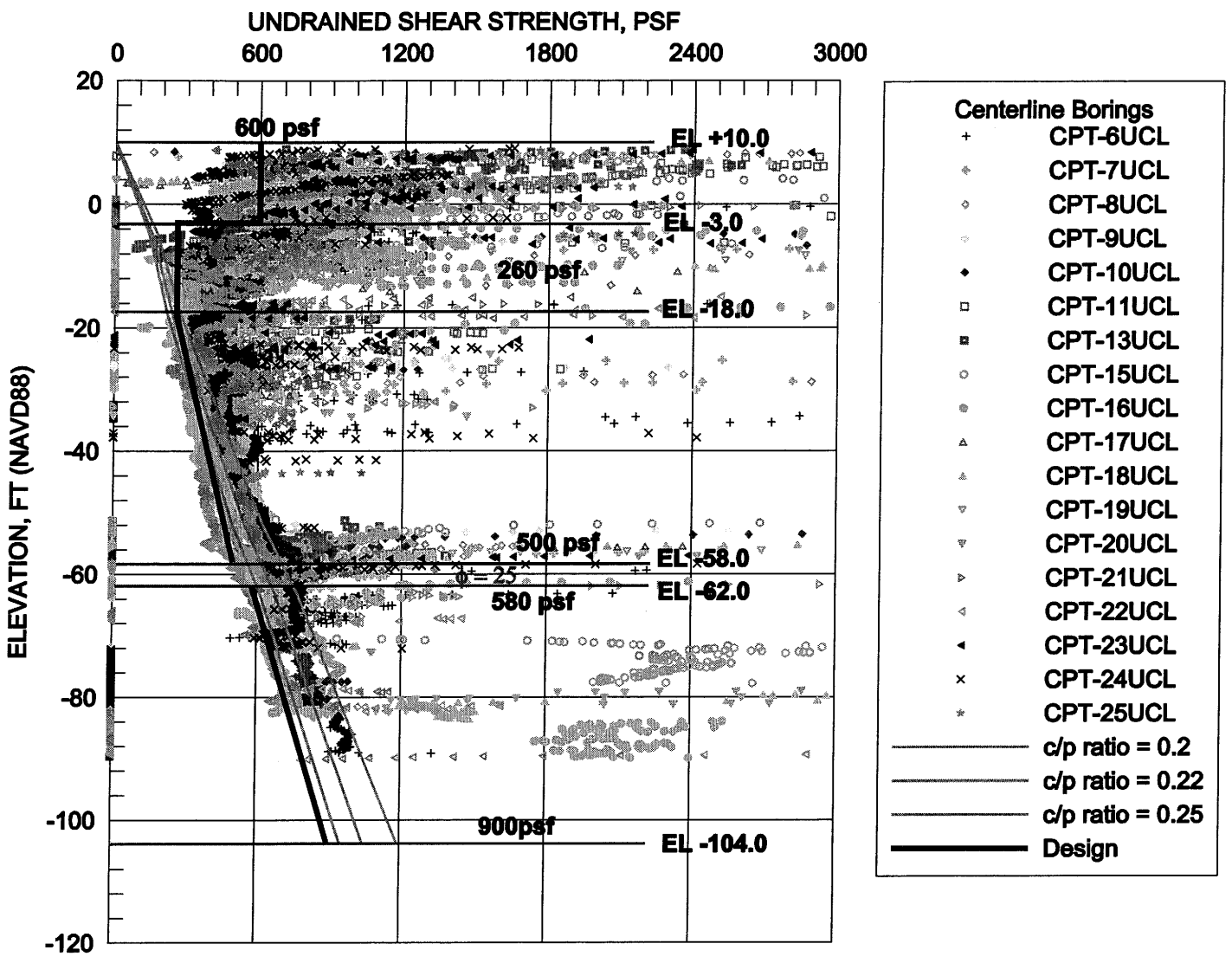
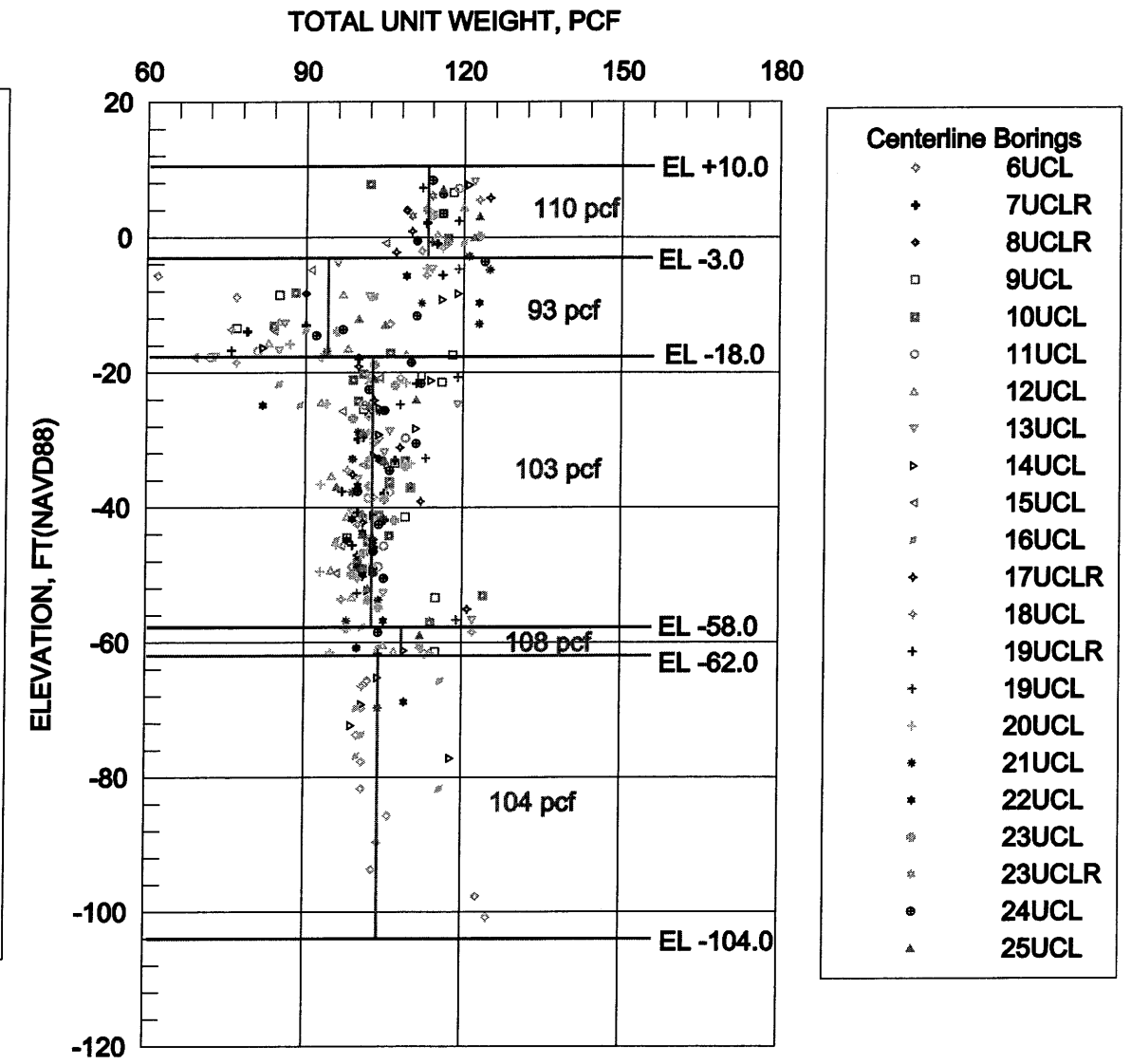
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: DJL	CHECKED BY: ZHA	APPROVED BY:
DATE: 10/31/08	FIGURE 2-7	





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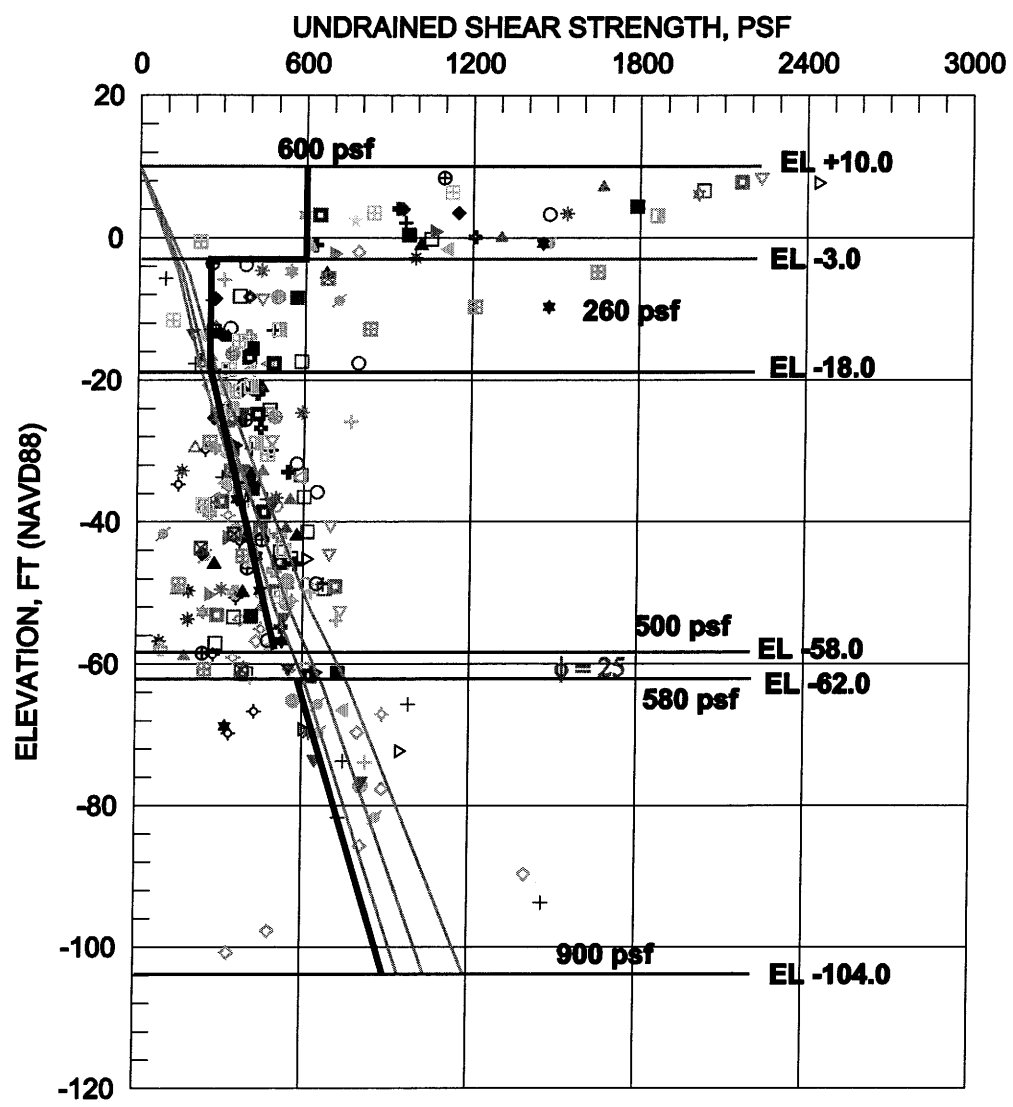
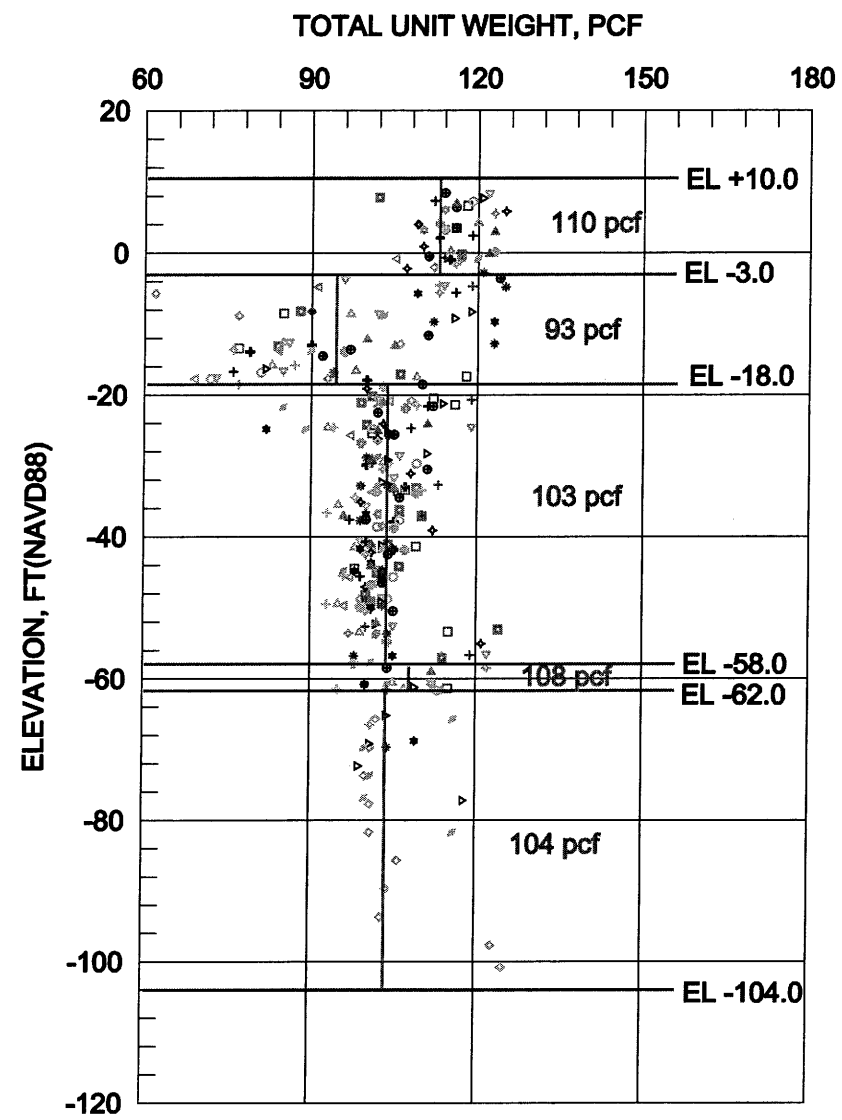
UNDRAINED SHEAR STRENGTH PARAMETERS
CENTERLINE CONE PENETROMETER BORINGS

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: JJL	DATE: 04/10/08	CADD FILE:PLATE 3A
CHECKED BY: ZHA	JOB NO.: 0022-0045	FIGURE: 3-1





Centerline Borings

- 6UCL-UC
- 6UCL-UU
- 7UCLR-UC
- 7UCLR-UU
- 8UCLR-UC
- 8UCLR-UU
- 9UCL-UC
- 9UCL-UU
- 10UCL-UC
- 10UCL-UU
- 11UCL-UC
- 11UCL-UU
- 12UCL-UC
- 12UCL-UU
- 13UCL-UC
- 13UCL-UU
- 14UCL-UC
- 14UCL-UU
- 15UCL-UC
- 15UCL-UU
- 16UCL-UC
- 16UCL-UU
- 17UCL-UC
- 17UCLR-UU
- 18UCL-UC
- 18UCL-UU
- 19UCLR-UC
- 19UCLR-UU
- 19UCL-UC
- 19UCL-UU
- 20UCL-UC
- 20UCL-UU
- 21UCL-UC
- 21UCL-UU
- 22UCL-UC
- 22UCL-UU
- 23UCL-UC
- 23UCL-UU
- 23UCLR-UC
- 23UCLR-UU
- 24UCL-UC
- 24UCL-UU
- 25UCL-UC
- 25UCL-UU
- c/p ratio = 0.2
- c/p ratio = 0.22
- c/p ratio = 0.25
- Design

Centerline Borings

- 6UCL
- 7UCLR
- 8UCLR
- 9UCL
- 10UCL
- 11UCL
- 12UCL
- 13UCL
- 14UCL
- 15UCL
- 16UCL
- 17UCLR
- 18UCL
- 19UCLR
- 19UCL
- 20UCL
- 21UCL
- 22UCL
- 23UCL
- 23UCLR
- 24UCL
- 25UCL

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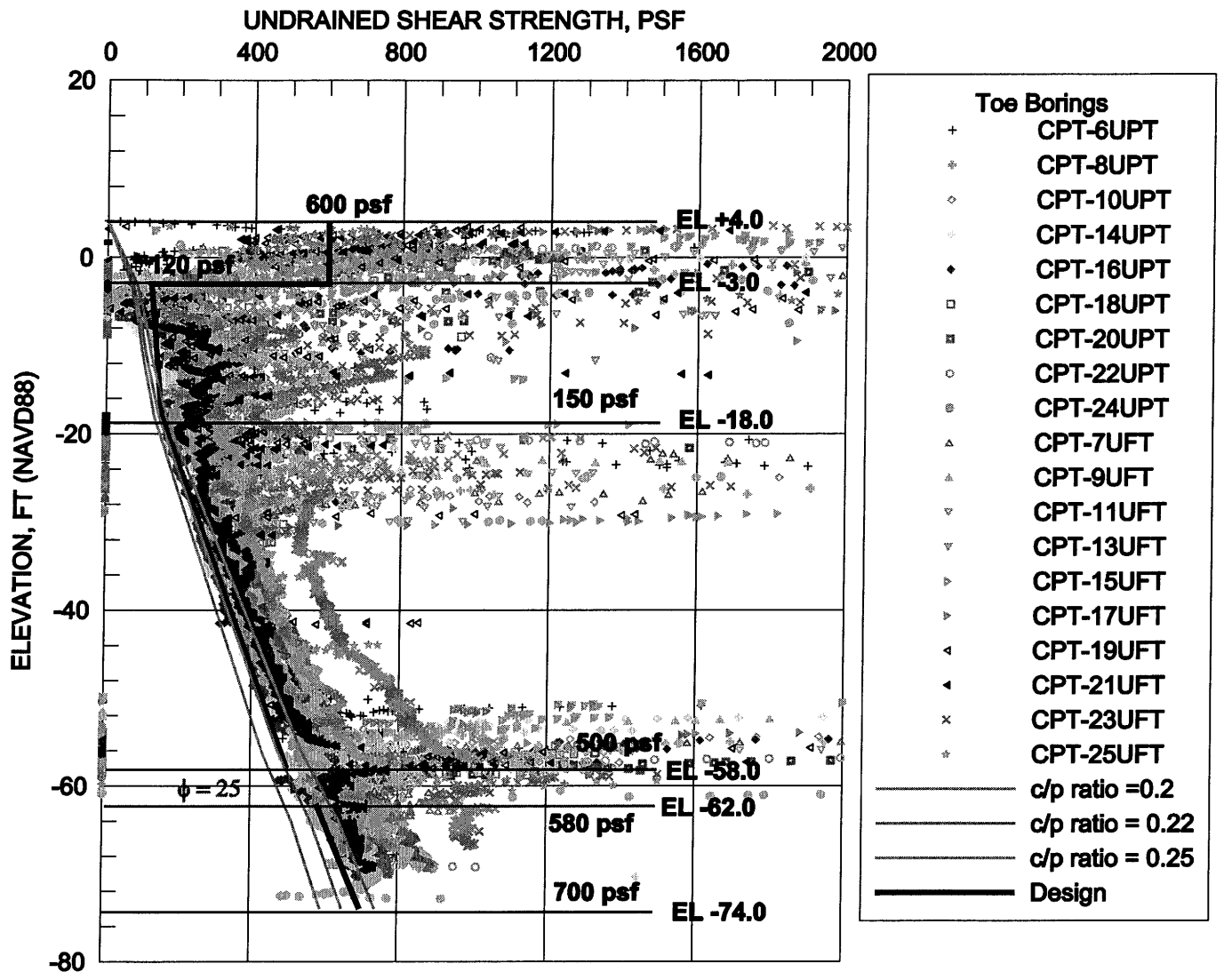
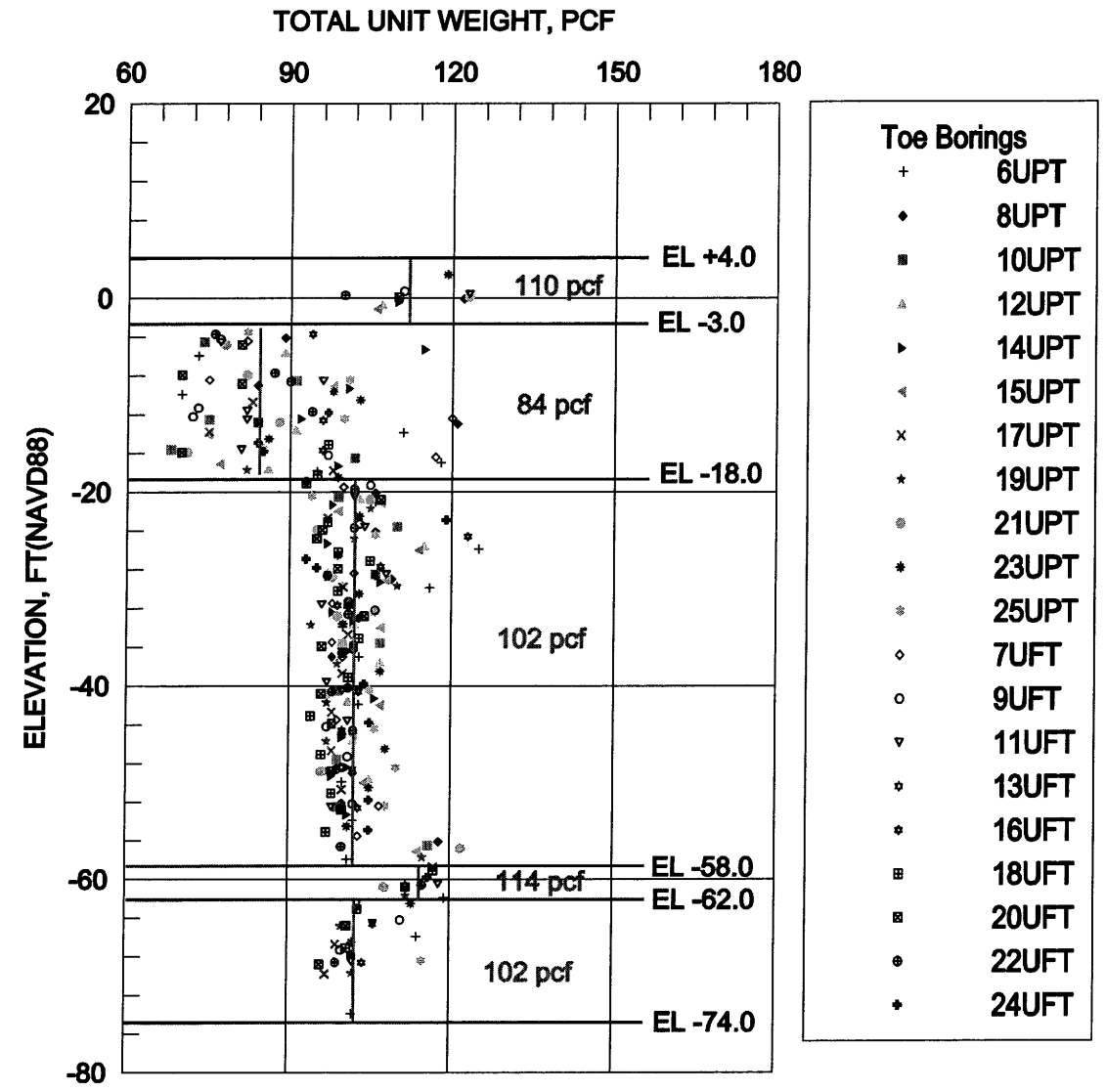
UNDRAINED SHEAR STRENGTH PARAMETERS
CENTERLINE SOIL BORINGS

U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: JJL	DATE: 04/10/08	CADD FILE:PLATE 3B
CHECKED BY: ZHA	JOB NO.: 0022-0045	FIGURE: 3-2





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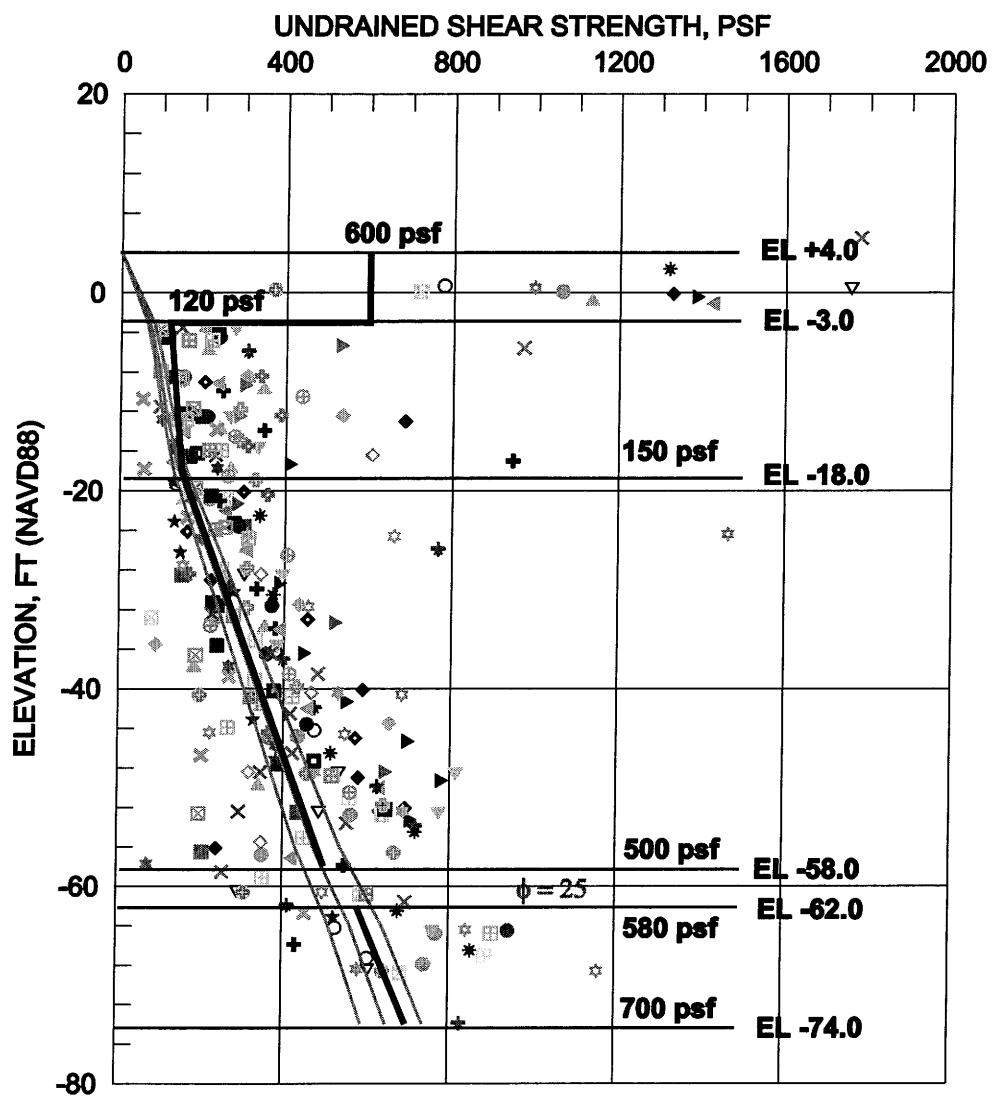
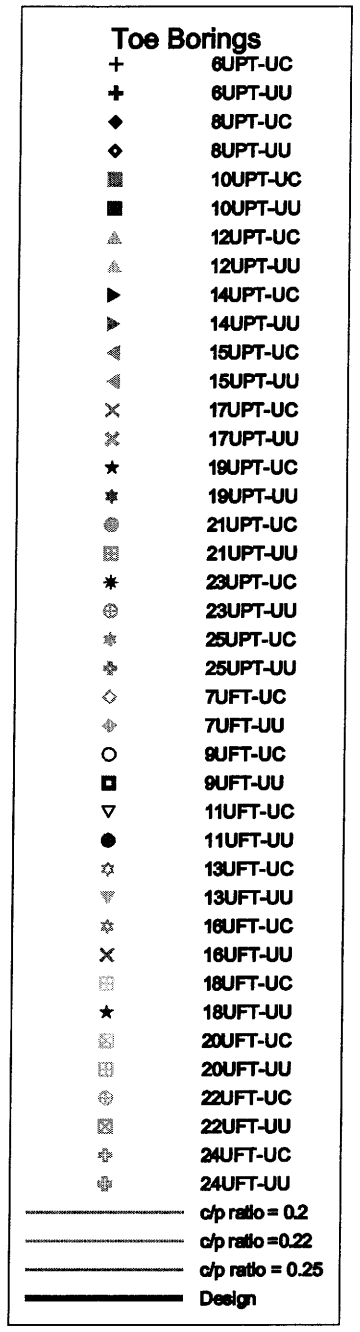
Geotechnical Consultants

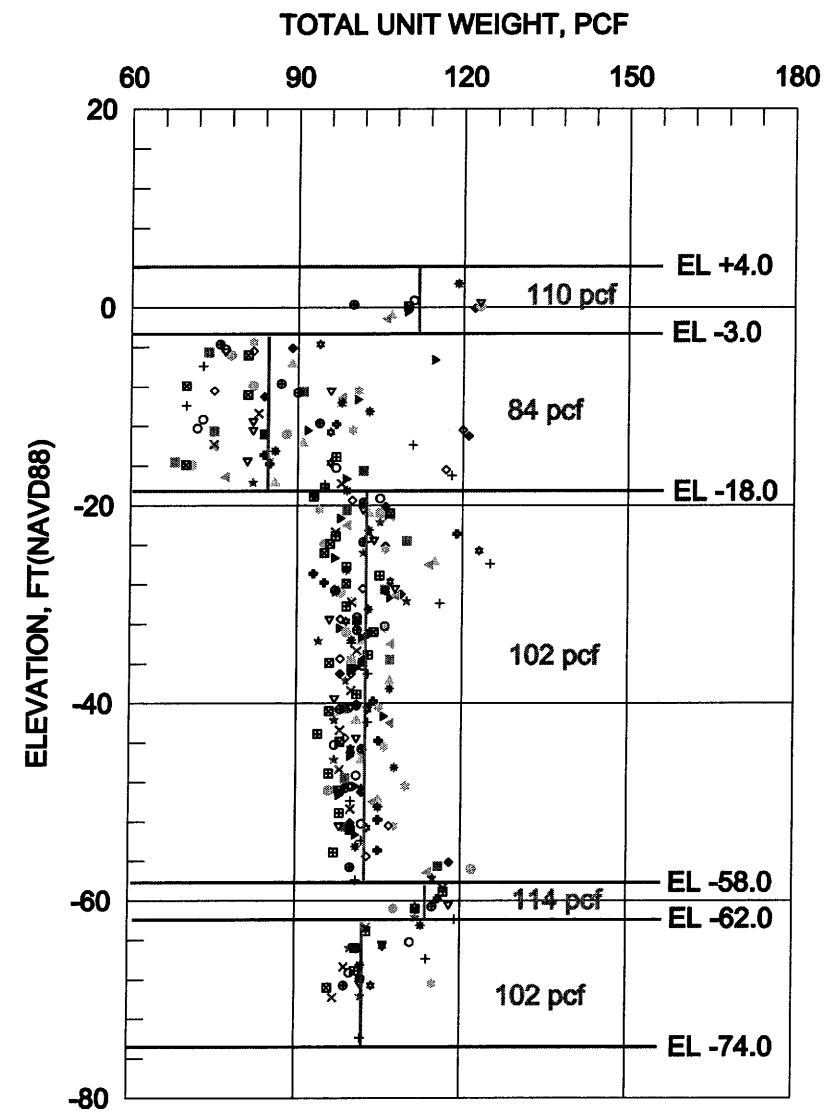
UNDRAINED SHEAR STRENGTH PARAMETERS
TOE CONE PENETROMETER BORINGS

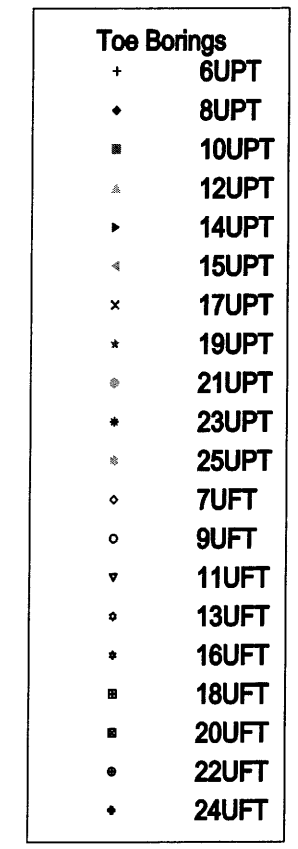
U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: JJL	DATE: 04/10/08	CADD FILE:PLATE 3C
CHECKED BY: ZHA	JOB NO.: 0022-0045	FIGURE: 3-3









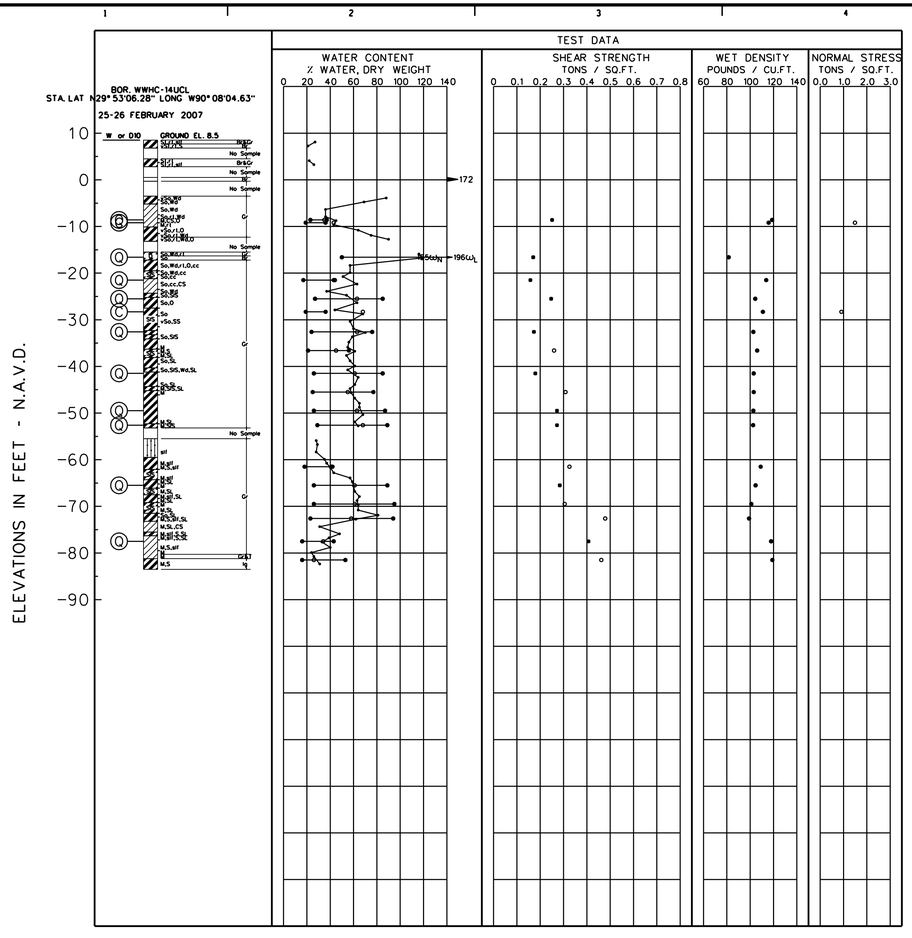
FFEB
Geotechnical Consultants

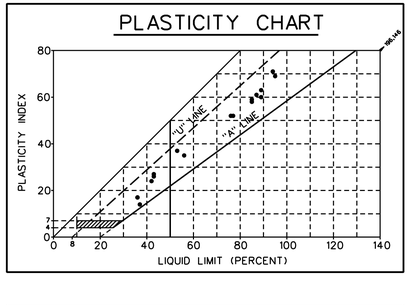
UNDRAINED SHEAR STRENGTH PARAMETERS
TOE SOIL BORINGS

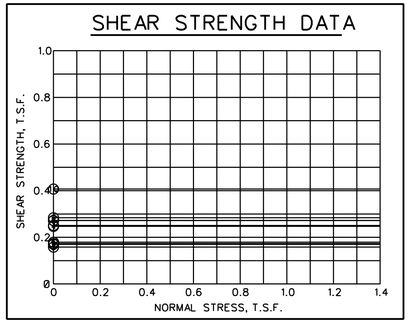
U.S. ARMY CORPS OF ENGINEERS
CONTRACT W912P8-07-D-0022, TASK ORDER 45
LOUISIANA HURRICANE PROTECTION PROJECT
ENGINEERING ALTERNATIVE REPORT
WEST WEGO TO HARVEY CANAL
WBV-14C.2: NEW WEST WEGO PUMPING STATION TO ORLEANS VILLAGE
HURRICANE PROTECTION FOR 1% STORM
NEW ORLEANS, LOUISIANA

DRAWN BY: JJL	DATE: 04/10/08	CADD FILE:PLATE3D
CHECKED BY: ZHA	JOB NO.: 0022-0045	FIGURE: 3-4

BOR. WWHC-14UCL
STA. LAT N29° 53'06.28" LONG W90° 08'04.63"
25-26 FEBRUARY 2007

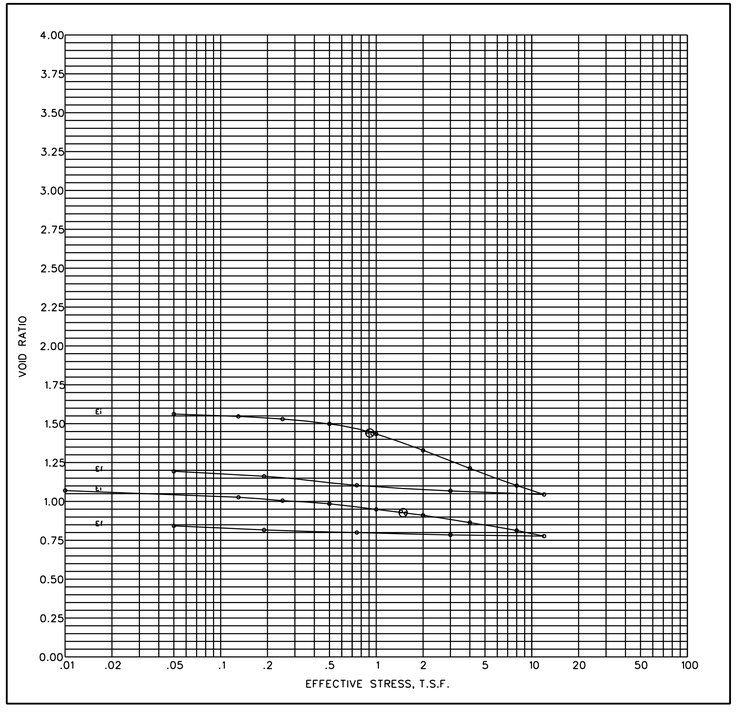






TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS
1	-8.6	Q	0.0	0.251	CL
2	-16.6	Q	0.0	0.170	CH
3	-21.5	Q	0.0	0.158	CL
4	-25.5	Q	0.0	0.247	CH
5	-32.6	Q	0.0	0.173	CH
6	-41.5	Q	0.0	0.179	CH
7	-49.5	Q	0.0	0.272	CH
8	-52.6	Q	0.0	0.272	CH
9	-65.5	Q	0.0	0.284	CH
10	-77.5	Q	0.0	0.407	CL
11	-9.2	C	0.0	0.000	CL
12	-28.3	C	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 A.
FOR LOCATION OF BORINGS SEE PLATE
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

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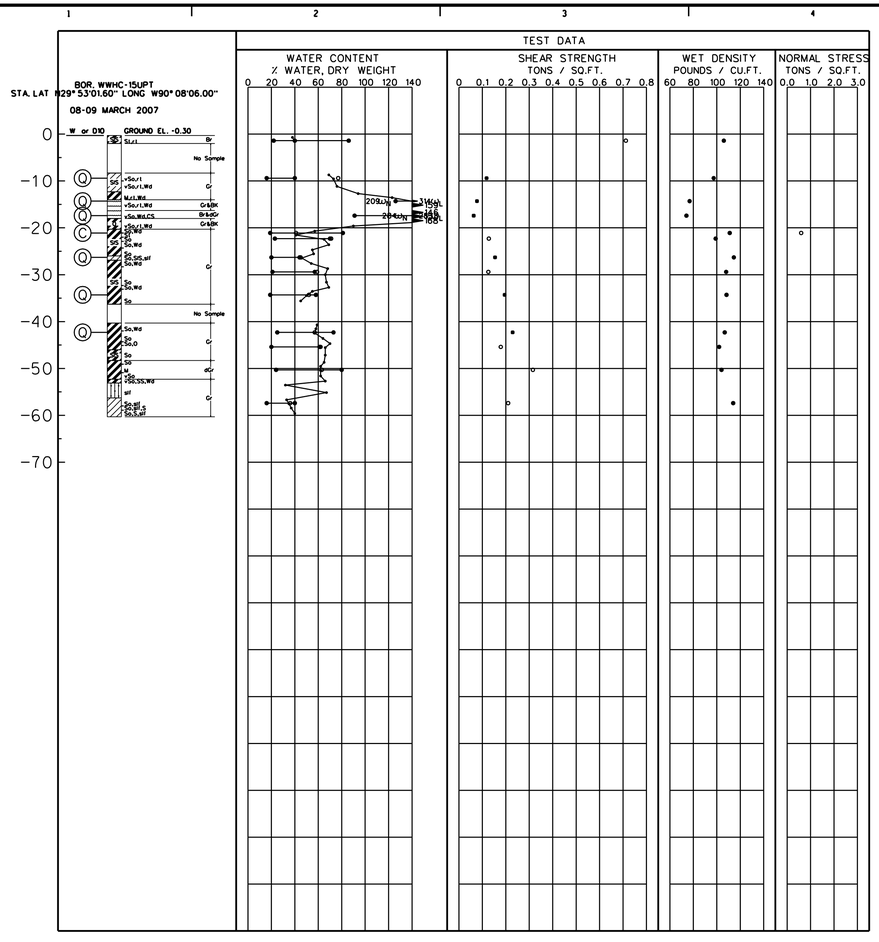
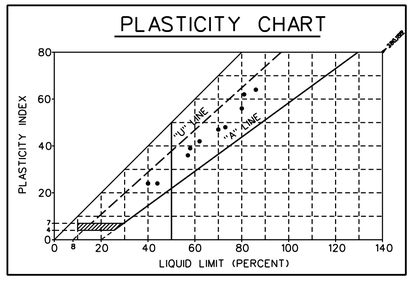
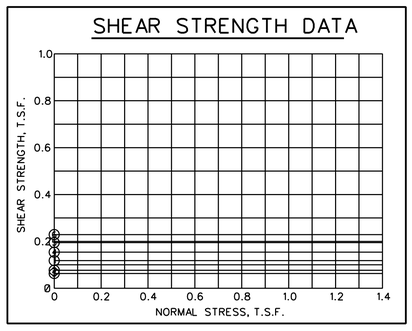
08-09 MARCH 2007

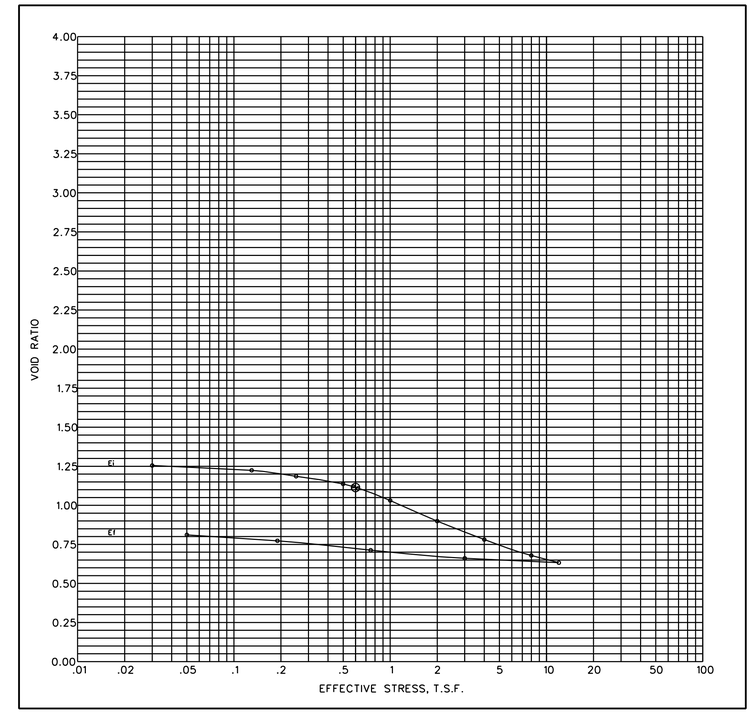






TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS
1	-9.4	Q	0.0	0.118	CL
2	-14.3	Q	0.0	0.077	PT
3	-17.4	Q	0.0	0.063	PT
4	-26.3	Q	0.0	0.154	CL
5	-34.3	Q	0.0	0.195	CH
6	-42.3	Q	0.0	0.229	CH
7	-21.1	C	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 A.
FOR LOCATION OF BORINGS SEE PLATE
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

U.S. ARMY CORPS OF ENGINEERS MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

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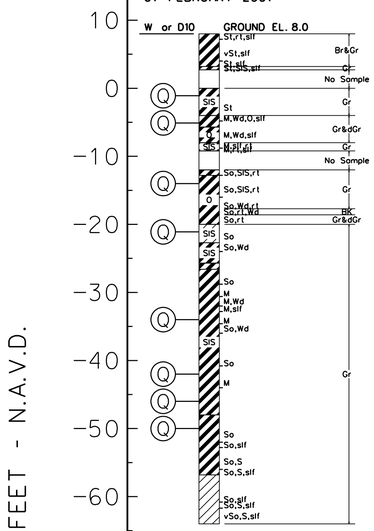
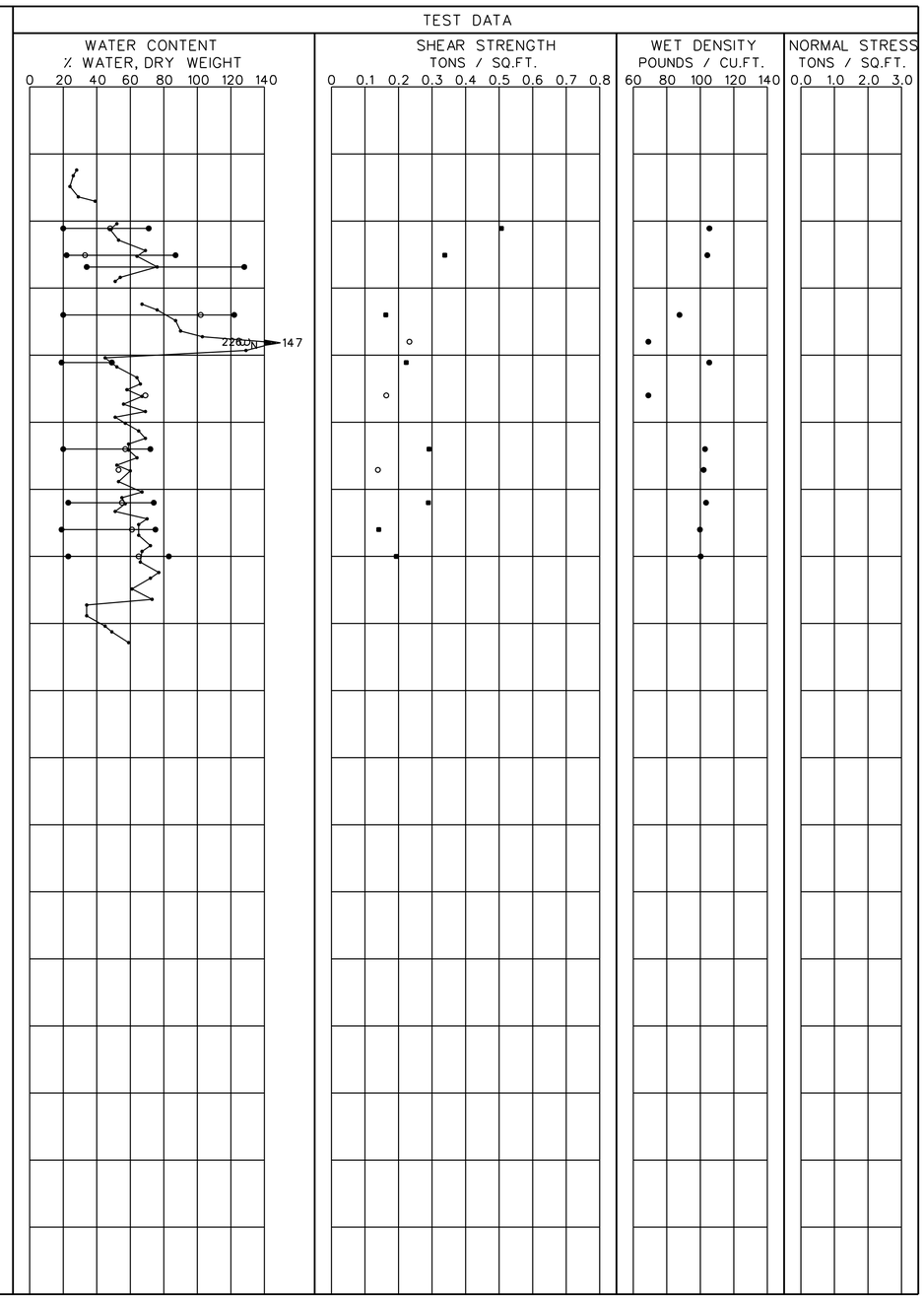
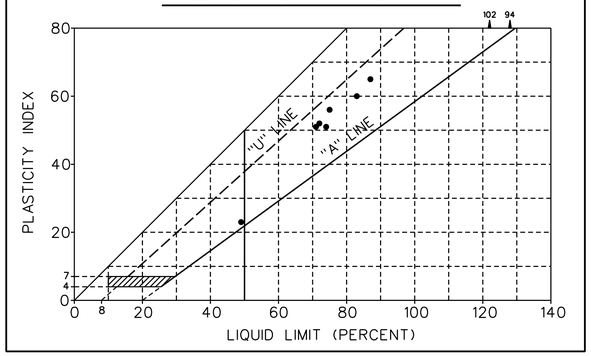
07 FEBRUARY 2007

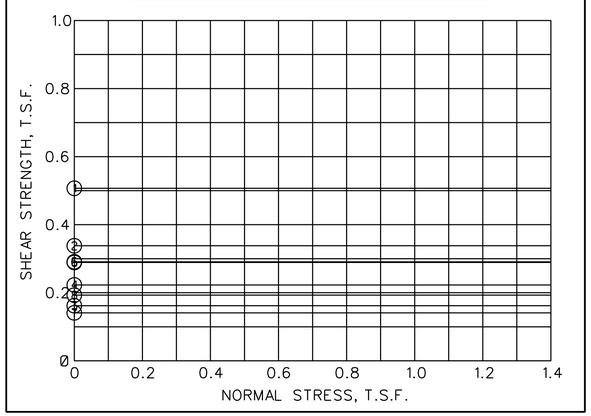




PLASTICITY CHART



SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-1.1	Q	0.0	0.507	CH
2	-5.1	Q	0.0	0.338	CH
3	-14.0	Q	0.0	0.162	CH
4	-21.1	Q	0.0	0.223	CL
5	-34.0	Q	0.0	0.291	CH
6	-42.0	Q	0.0	0.289	CH
7	-46.0	Q	0.0	0.141	CH
8	-50.0	Q	0.0	0.193	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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

DESIGNED BY: DATE:
DWN BY: CKD BY: SOLICITATION NO.:
SUBMITTED BY: CONTRACT NO.:
FILE NAME: FILE NUMBER:
SIZE: PLOT SCALE: PLOT DATE:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

BOR. WWHC-16UCL
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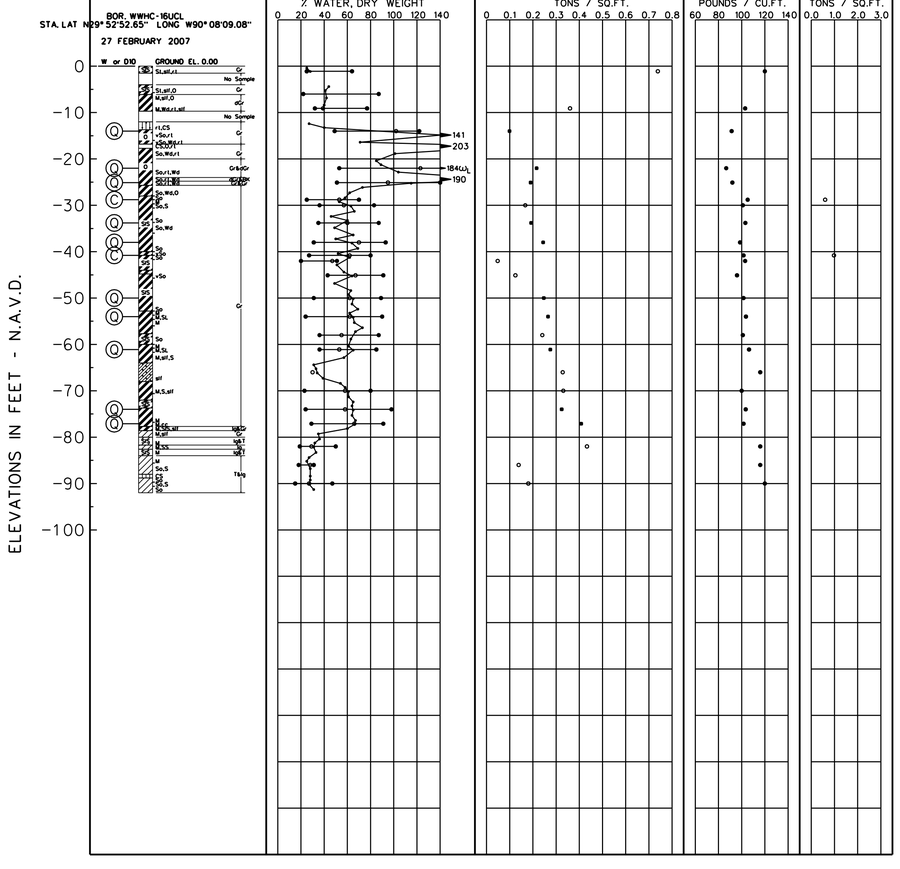
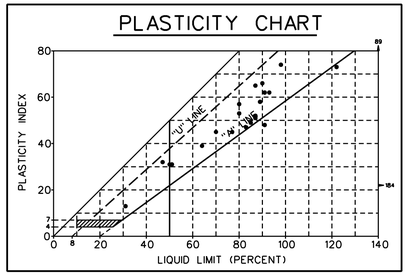
27 FEBRUARY 2007

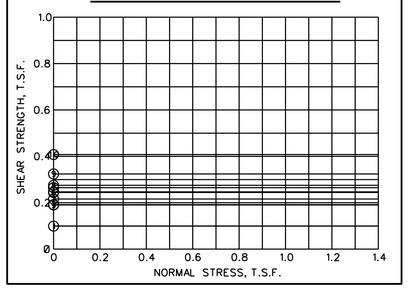
W or DID — GROUND EL. 0.00



PLASTICITY CHART

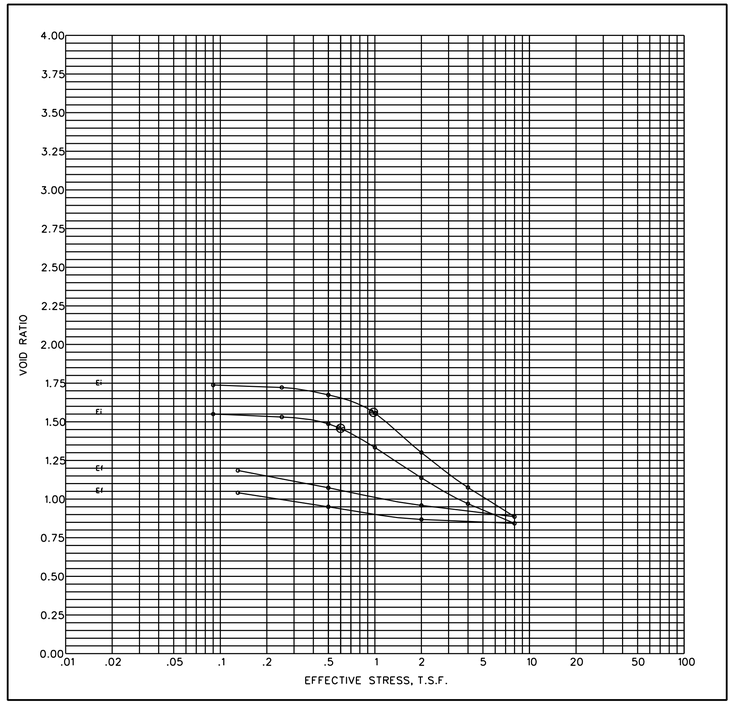


SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS
1	-14.0	Q	0.0	0.099	CH
2	-22.0	Q	0.0	0.216	CH
3	-25.1	Q	0.0	0.190	CH
4	-33.8	Q	0.0	0.192	CH
5	-38.0	Q	0.0	0.244	CH
6	-50.0	Q	0.0	0.247	CH
7	-54.0	Q	0.0	0.265	CH
8	-61.1	Q	0.0	0.275	CH
9	-74.0	Q	0.0	0.324	CH
10	-77.1	Q	0.0	0.408	CH
11	-28.8	C	0.0	0.000	CH
12	-40.8	C	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 A.
FOR LOCATION OF BORINGS SEE PLATE
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

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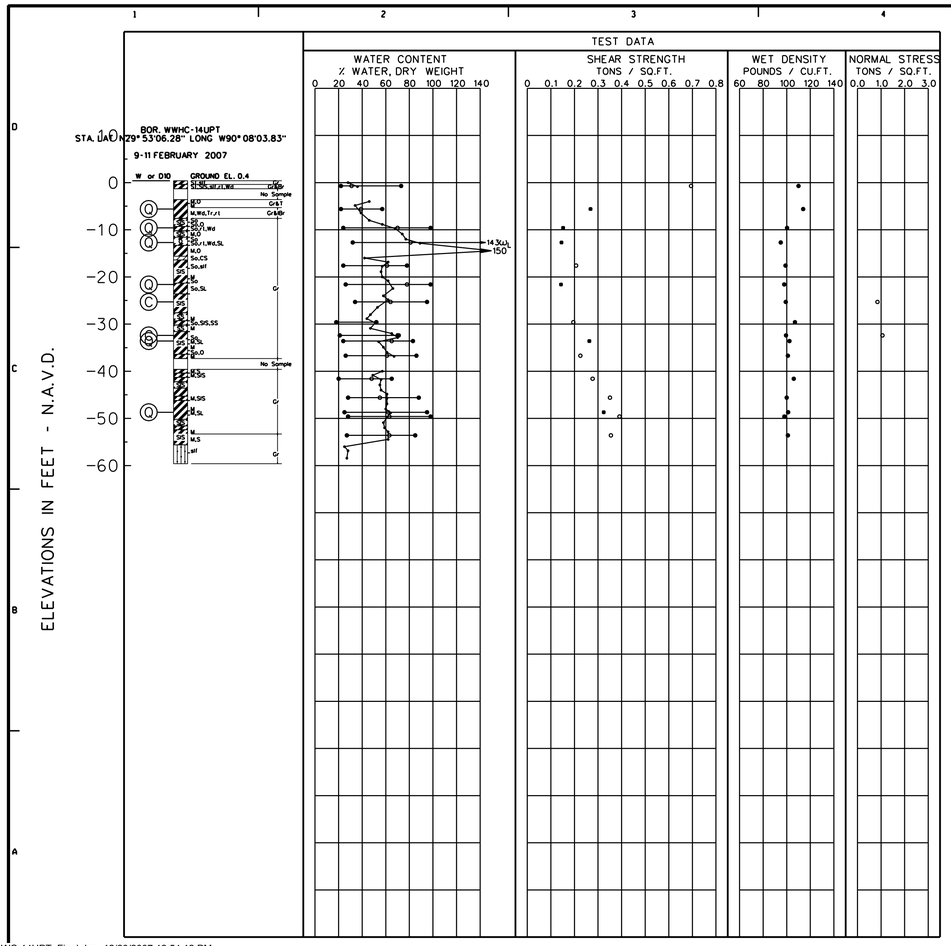
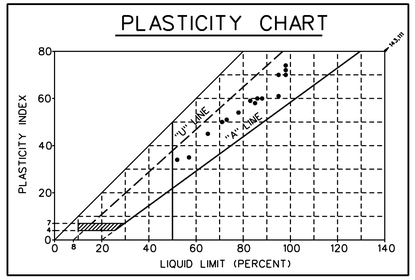
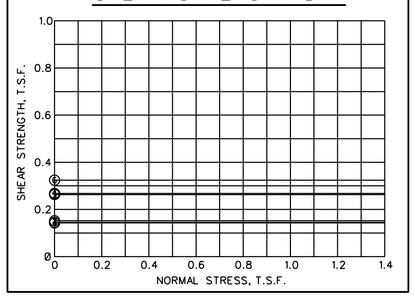


PLASTICITY CHART

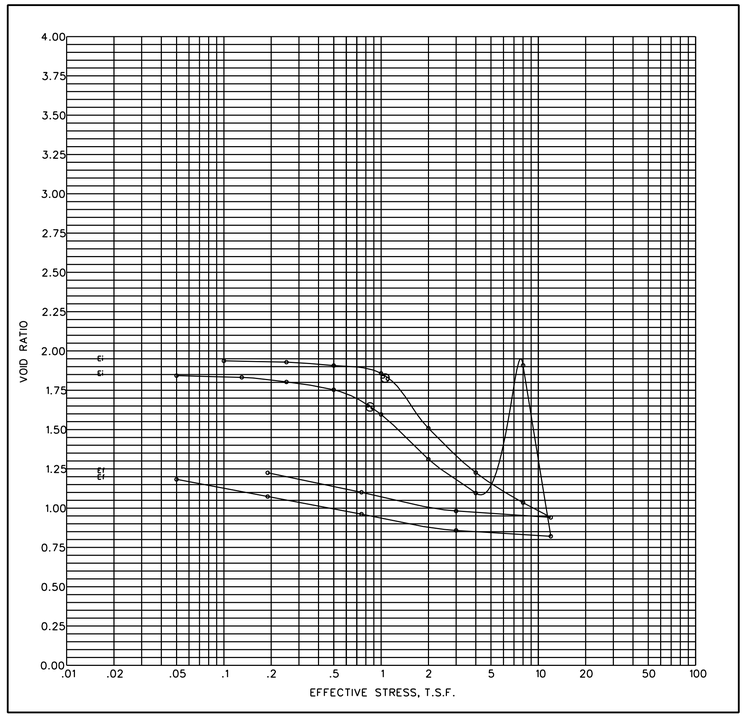


SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	c - TSF	
1	-5.6	Q	0.0	0.268	CH
2	-9.6	Q	0.0	0.152	CH
3	-12.7	Q	0.0	0.145	CH
4	-21.6	Q	0.0	0.143	CH
5	-33.6	Q	0.0	0.263	CH
6	-48.7	Q	0.0	0.324	CH
7	-25.3	C	0.0	0.000	CH
8	-32.4	C	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 A.
FOR LOCATION OF BORINGS SEE PLATE
FOR DETAILED TEST DATA SEE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

US ARMY CORPS OF ENGINEERS NEW ORLEANS DIS

DESIGNED BY | DRAWN BY | CHK BY | SUBMITTED BY | DATE | SCALE | DRAWING NO. | CONTRACT NO.

SHEET IDENTIFICATION NUMBER

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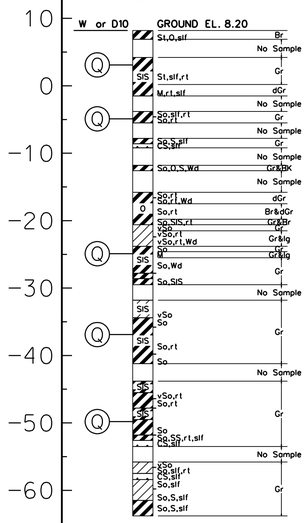
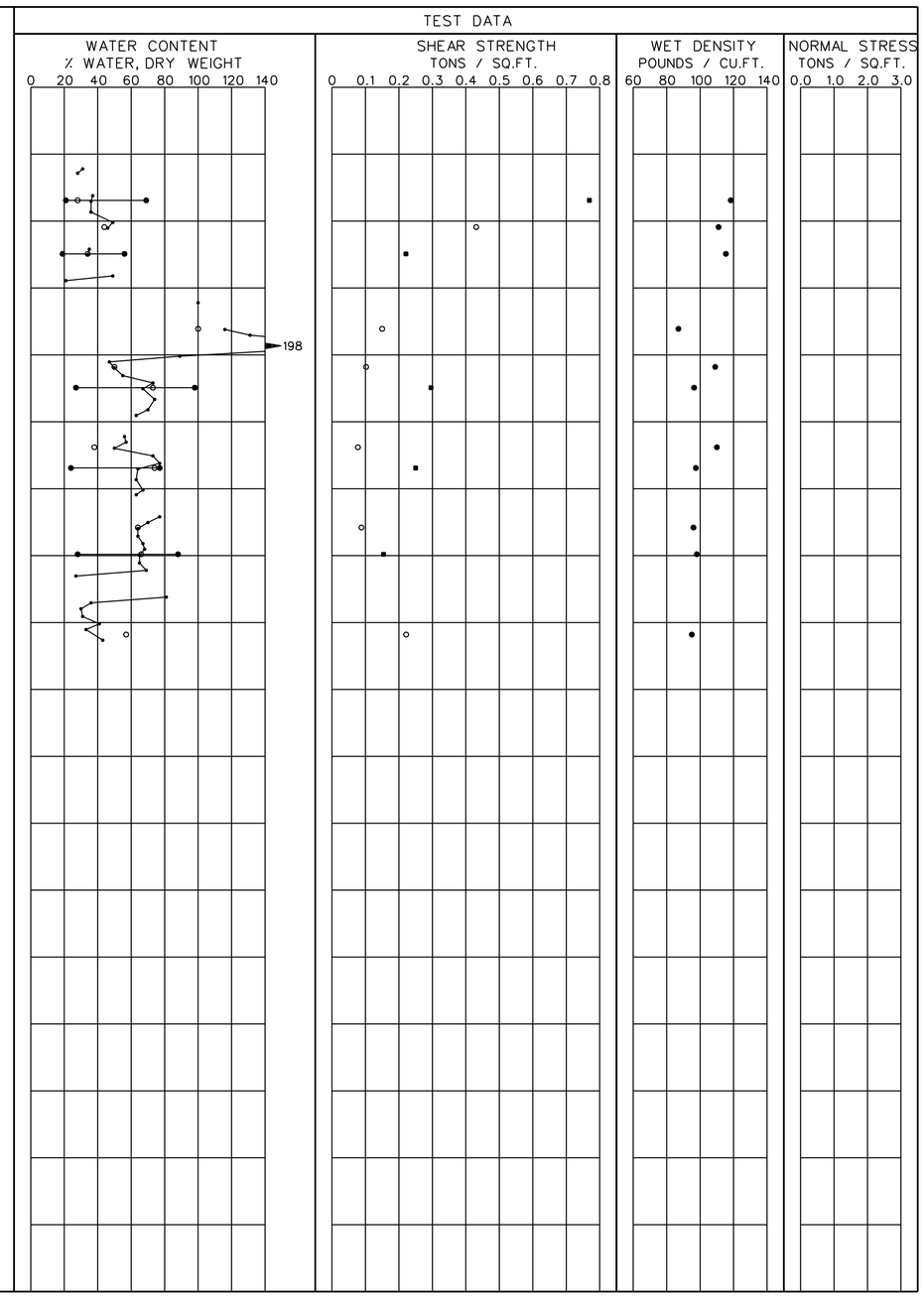
08 FEBRUARY 2007





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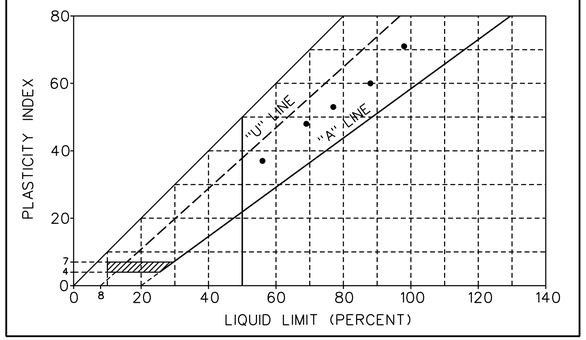
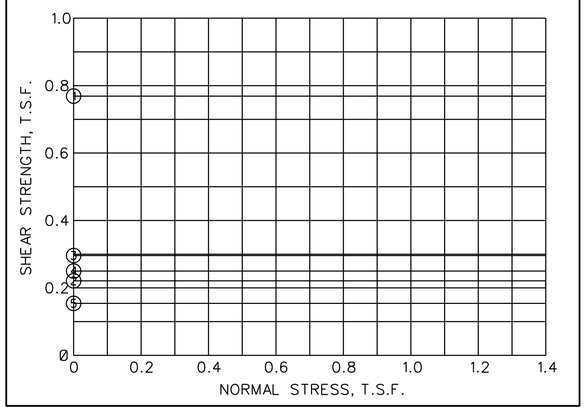


SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	3.1	Q	0.0	0.769	CH
2	-4.9	Q	0.0	0.221	CH
3	-24.9	Q	0.0	0.296	CH
4	-36.9	Q	0.0	0.250	CH
5	-49.8	Q	0.0	0.154	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_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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

DESIGNED BY: | DATE:
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
FILE NAME: | FILE NUMBER:
SIZE: | PLOT SCALE: | PLOT DATE:

SHEET IDENTIFICATION NUMBER

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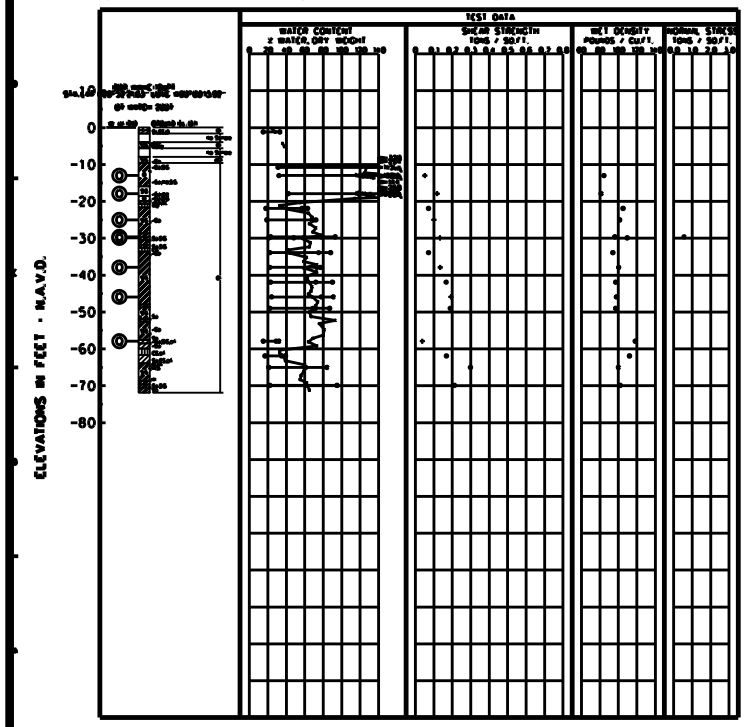

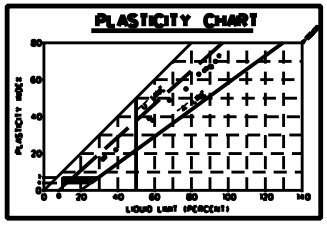

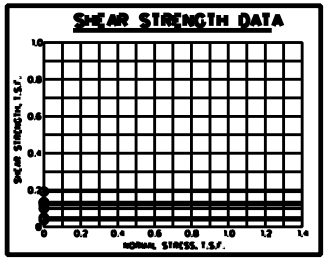

TABULAR TEST DATA

CONE/LOPE NO.	EL.	TYPE	STRENGTH φ	STRENGTH C / RF	CLASS
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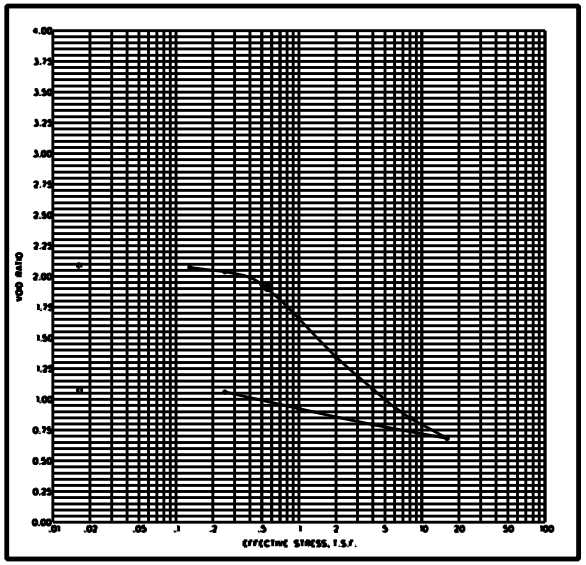
2	-11.0	6	0.0	0.110	Qc
3	-20.0	6	0.0	0.105	Qc
4	-20.0	6	0.0	0.110	Qc
5	-30.0	6	0.0	0.130	Qc
6	-40.0	6	0.0	0.150	Qc
7	-51.0	6	0.0	0.001	Qc
8	-55.0	7	0.0	0.000	Qc



NOTES

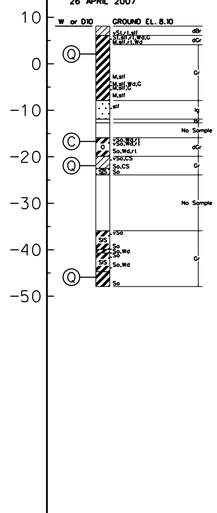
- (NC) UNCONFINED COMPRESSION (KSF)
- (CU) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR (KSF)
- (CD) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR (KSF)
- (DS) CONSOLIDATED - DRAINED DIRECT SHEAR (KSF)

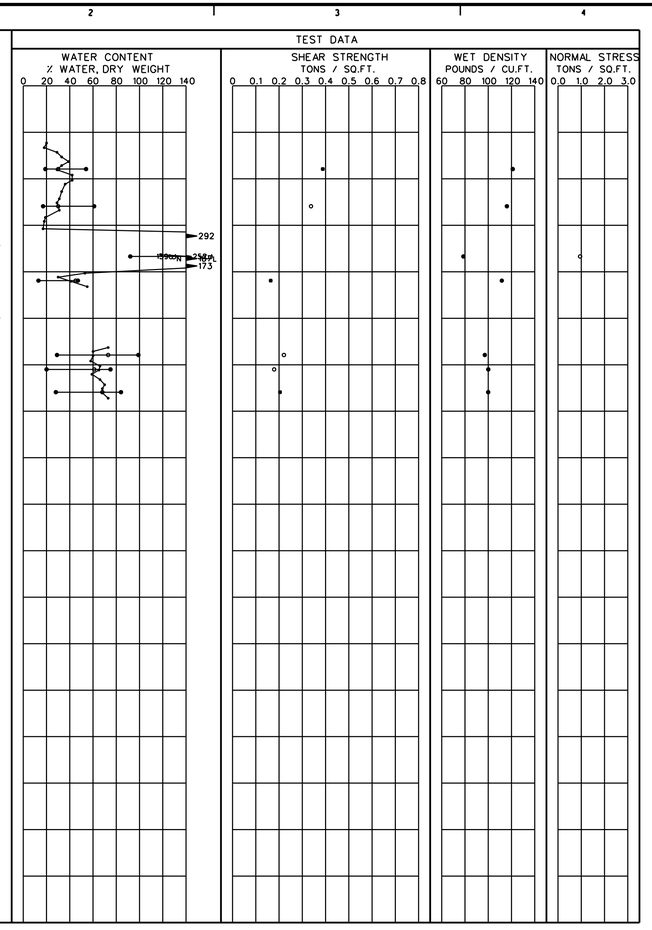
ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER SHOCK HOLE PISTON TYPE SAMPLER.
FOR SOIL BORING LOGS SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLAN.
FOR DETAILED TEST DATA SEE

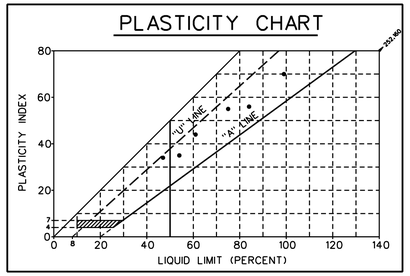
...\WC-19UPT Final.dgn 12/27/2007 4:30:07 PM

BOR. WWHC-19UCLR
STA. LAT N29° 52' 20.91 LONG W90° 08' 14.09
26 APRIL 2007

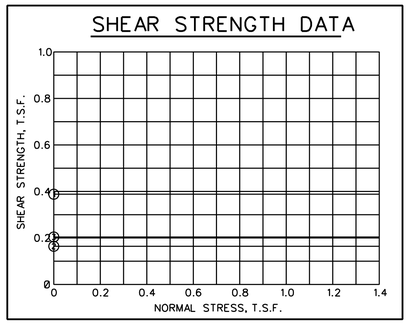




PLASTICITY CHART

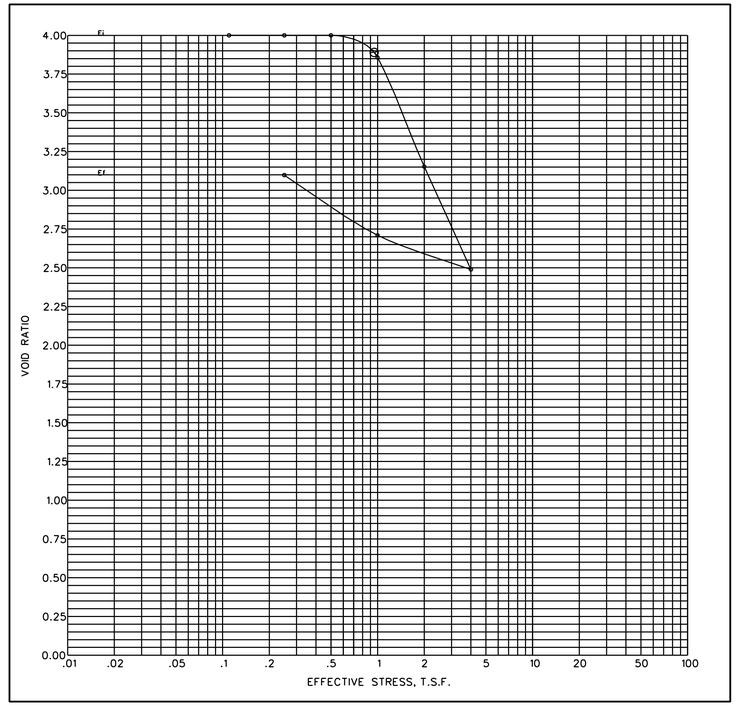


SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	C - TSF	
1	2.1	Q	0.0	0.388	CH
2	-21.9	Q	0.0	0.164	CL
3	-45.9	Q	0.0	0.204	CH
4	-16.7	C	0.0	0.000	PT



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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFIBATION NUMBER

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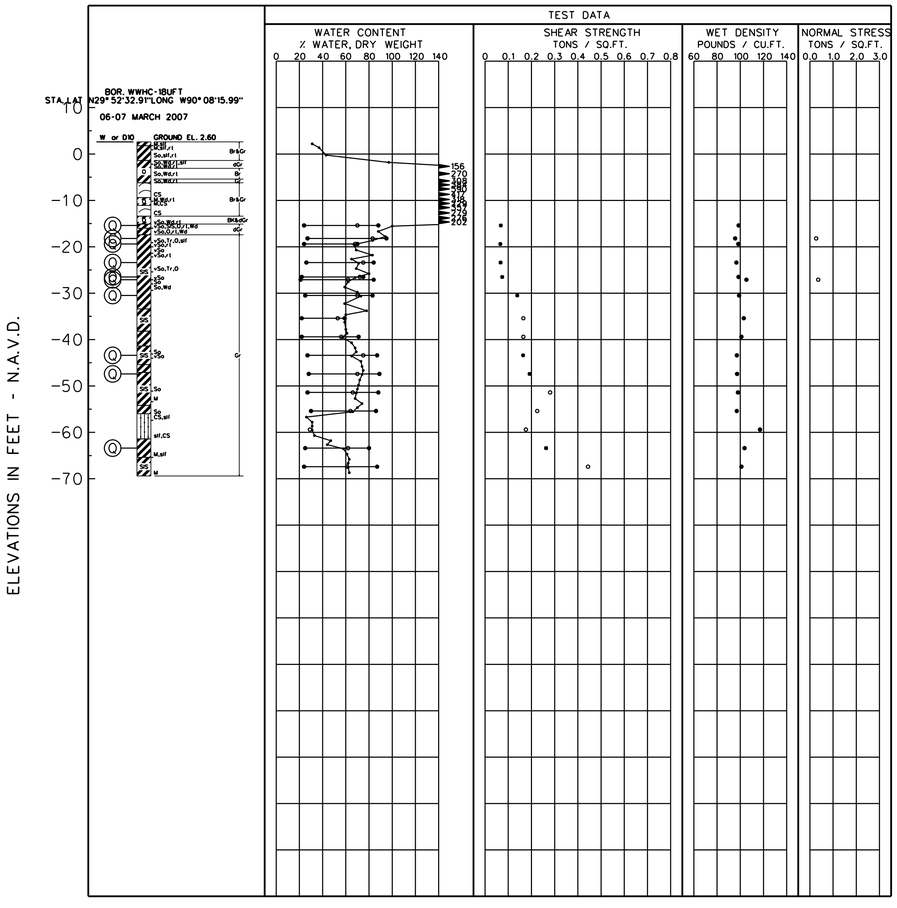
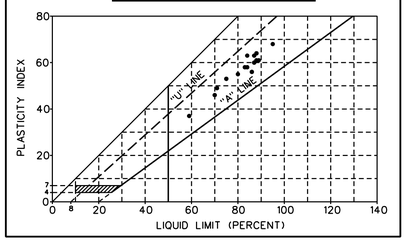
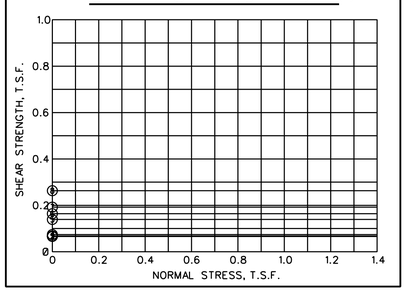


PLASTICITY CHART

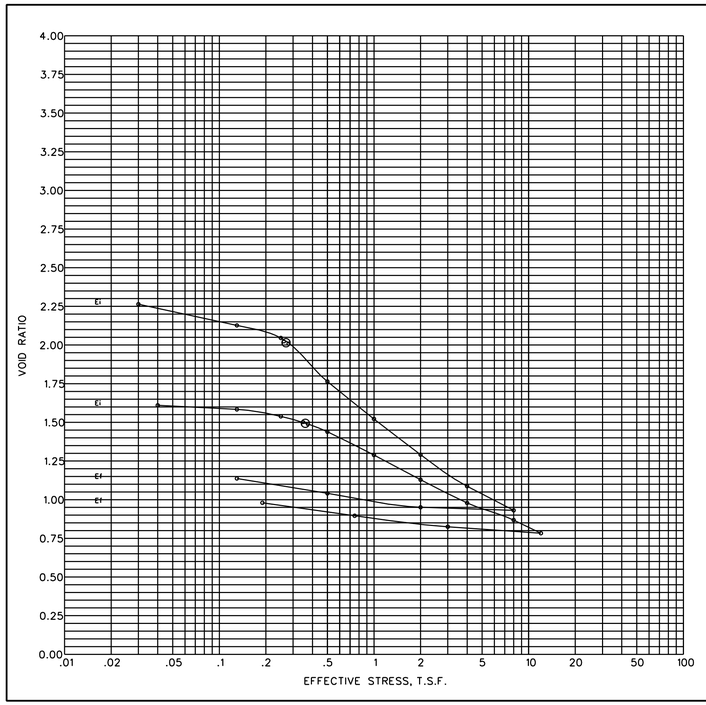


SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-15.4	Q	0.0	0.068	CH
2	-19.4	Q	0.0	0.066	CH
3	-23.4	Q	0.0	0.067	CH
4	-26.5	Q	0.0	0.074	CH
5	-30.5	Q	0.0	0.139	CH
6	-43.4	Q	0.0	0.164	CH
7	-47.4	Q	0.0	0.192	CH
8	-63.4	Q	0.0	0.263	CH
9	-18.2	C	0.0	0.000	CH
10	-27.1	C	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 A.
FOR LOCATION OF BORINGS SEE PLATE
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

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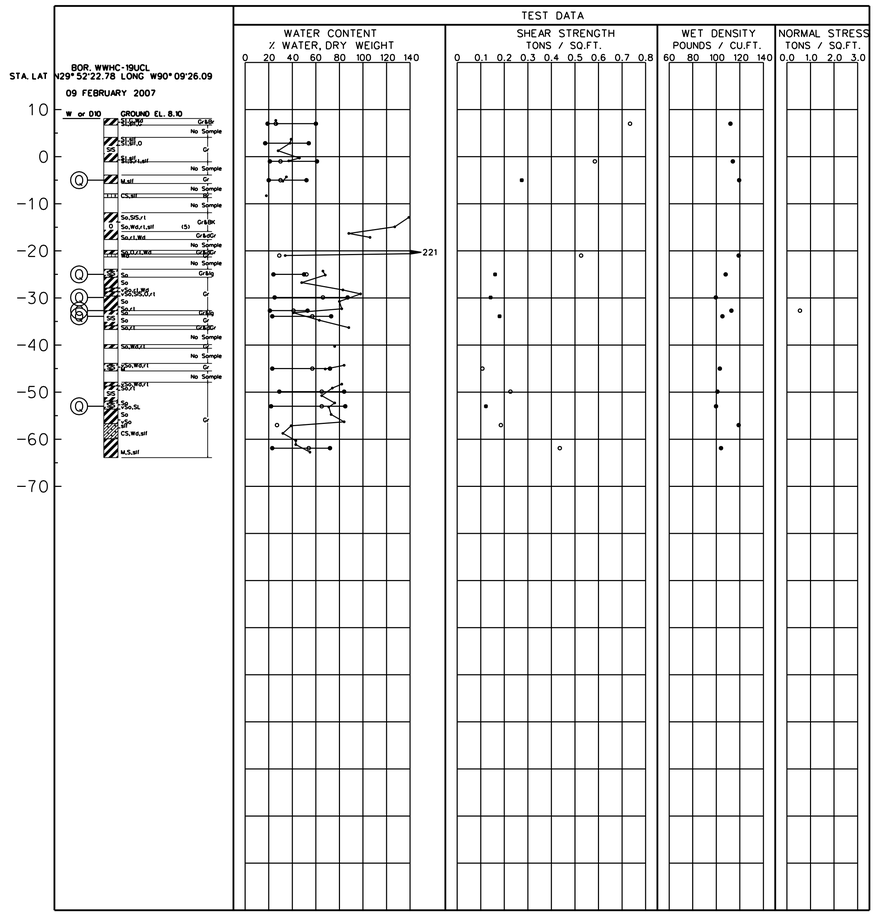
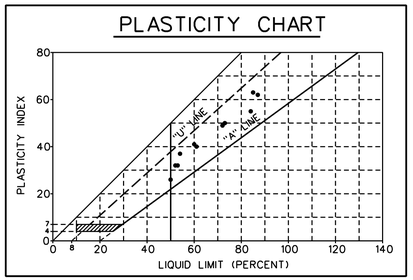
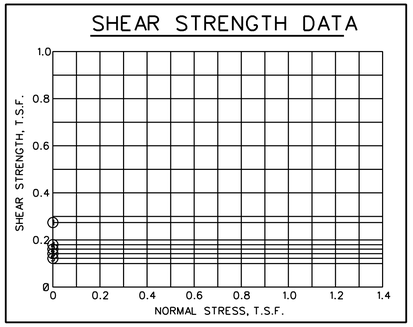
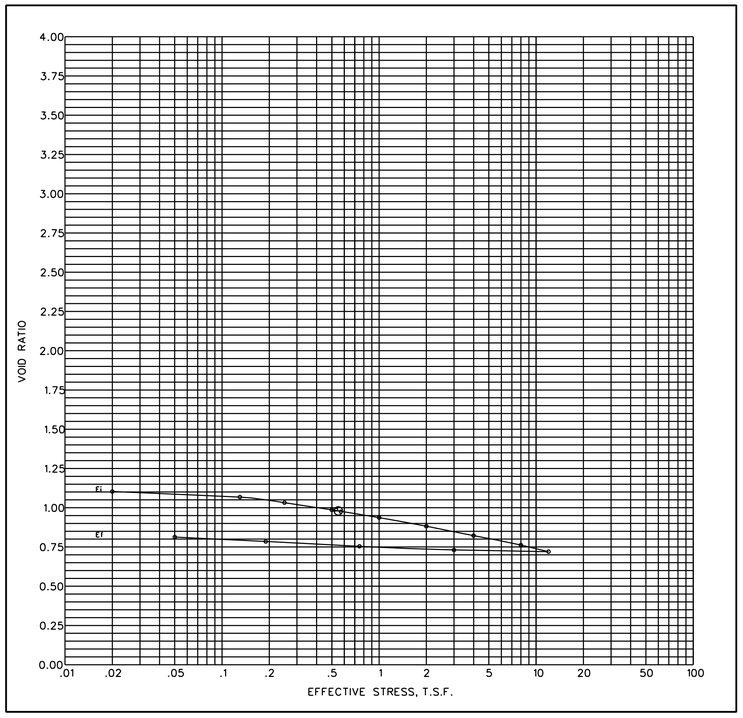






TABULAR TEST DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	c - TSF	
1	-5.0	Q	0.0	0.274	CH
2	-25.0	Q	0.0	0.161	CH
3	-29.9	Q	0.0	0.142	CH
4	-33.9	Q	0.0	0.180	CH
5	-53.0	Q	0.0	0.122	CH
6	-32.7	C	0.0	0.000	CH



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- 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.
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FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

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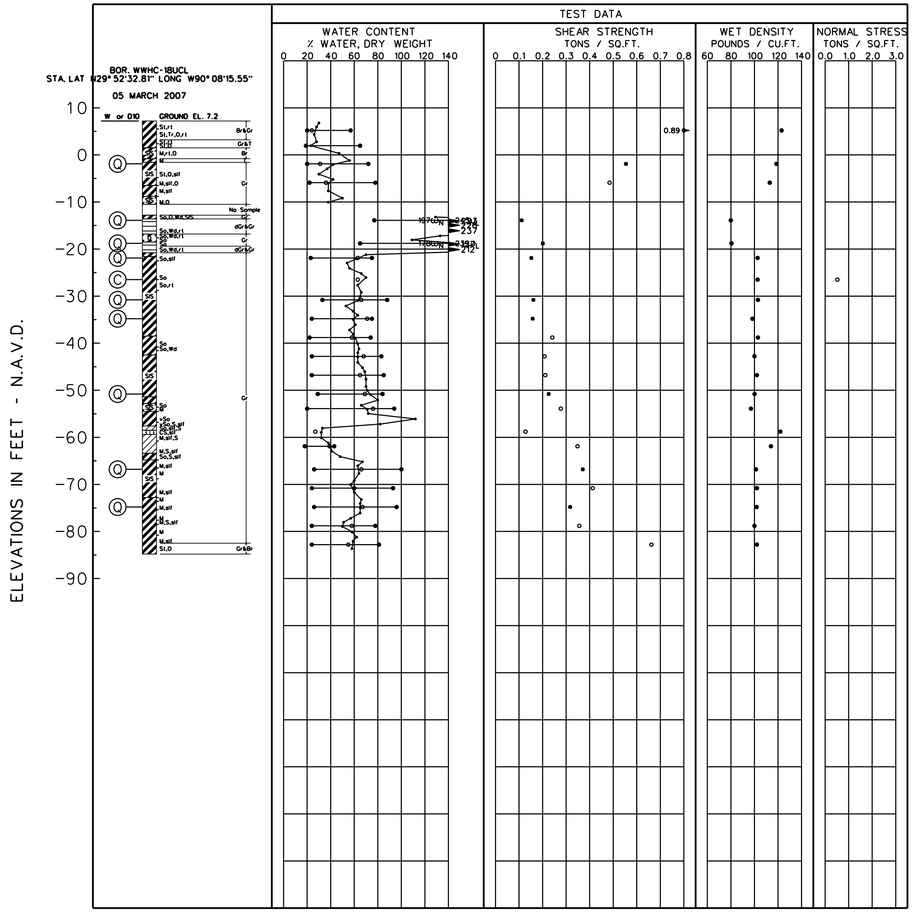
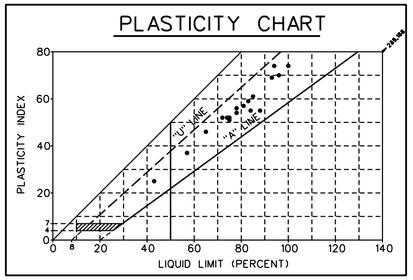
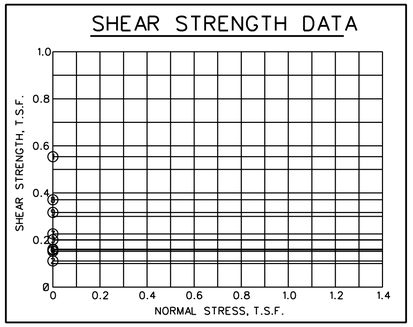


PLASTICITY CHART

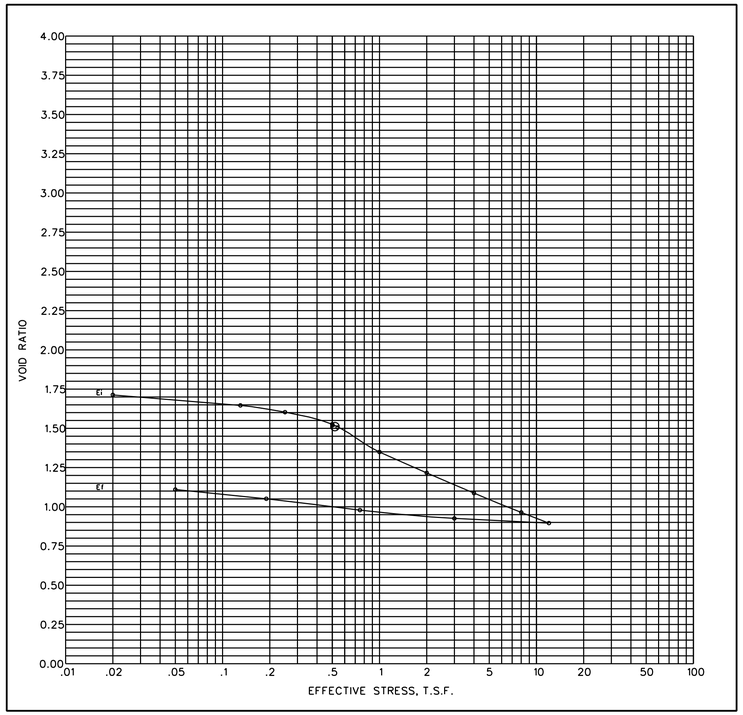


SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS
1	-1.9	Q	0.0	0.554	CH
2	-13.9	Q	0.0	0.111	PT
3	-18.8	Q	0.0	0.201	PT
4	-21.9	Q	0.0	0.152	CH
5	-30.8	Q	0.0	0.161	CH
6	-34.8	Q	0.0	0.158	CH
7	-50.8	Q	0.0	0.226	CH
8	-66.8	Q	0.0	0.371	CH
9	-74.8	Q	0.0	0.317	CH
10	-26.5	C	0.0	0.000	CH



NOTES

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- ■ - (Q) UNCONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
- ▲ - (R) CONSOLIDATED - UNDRAINED TRIAXIAL SHEAR TEST
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- 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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

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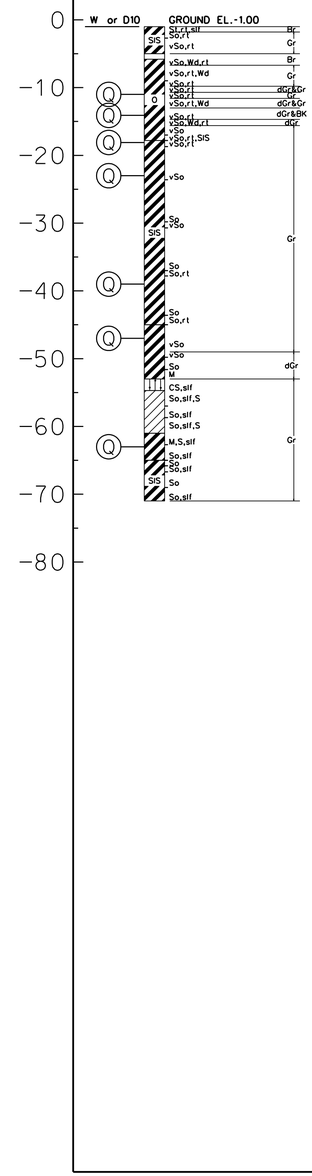
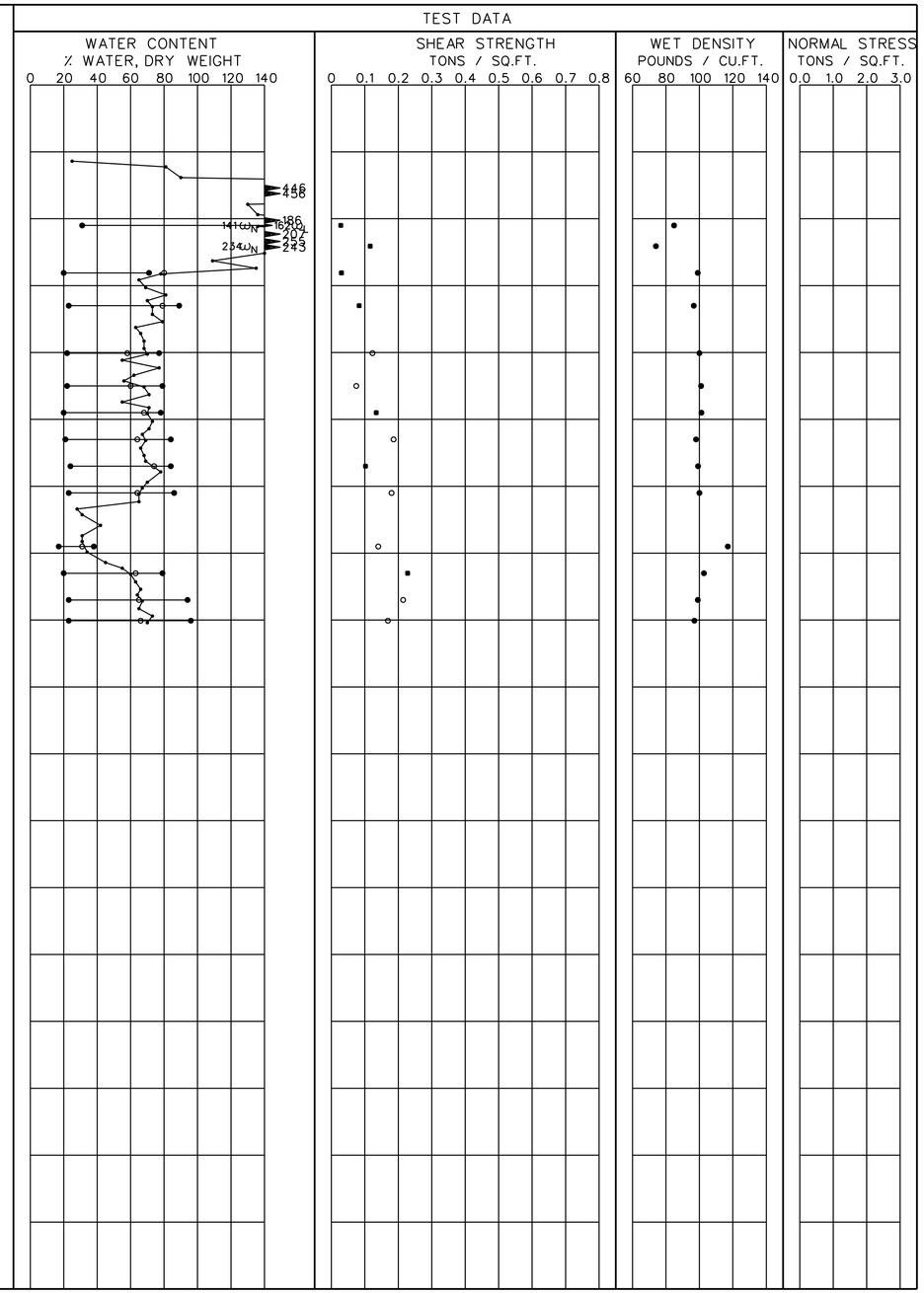
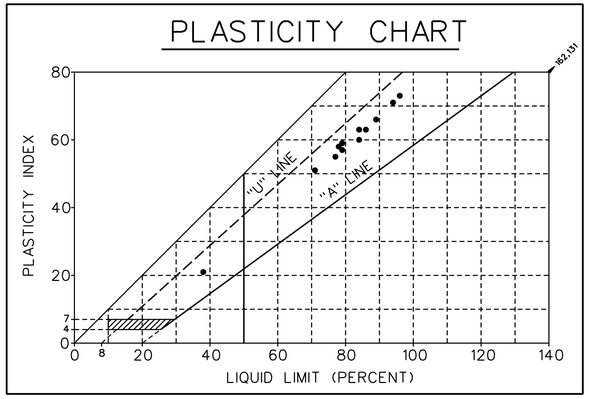
BOR. WWHC-17UPT
STA. LAT N29° 52'42.79" LONG W90° 08'11.68"

05-06 MARCH 2007

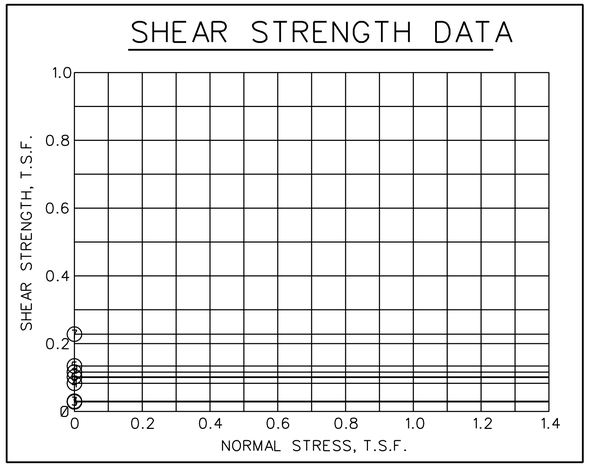






TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS
1	-11.0	Q	0.0	0.028	CH
2	-14.1	Q	0.0	0.116	CH
3	-18.1	Q	0.0	0.030	CH
4	-23.0	Q	0.0	0.083	CH
5	-39.0	Q	0.0	0.134	CH
6	-47.0	Q	0.0	0.102	CH
7	-63.0	Q	0.0	0.228	CH



NOTES

○ - (UC) UNCONFINED COMPRESSION TEST
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▲ - (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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

MARK | DESCRIPTION | DATE | APPR.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

DESIGNED BY: | DATE: | SOLICITATION NO.: | CONTRACT NO.: | FILE NUMBER:
DWN BY: | CKD BY: | SUBMITTED BY: | FILE NAME:
SIZE: | PLOT SCALE: | PLOT DATE:

SHEET IDENTIFICATION NUMBER

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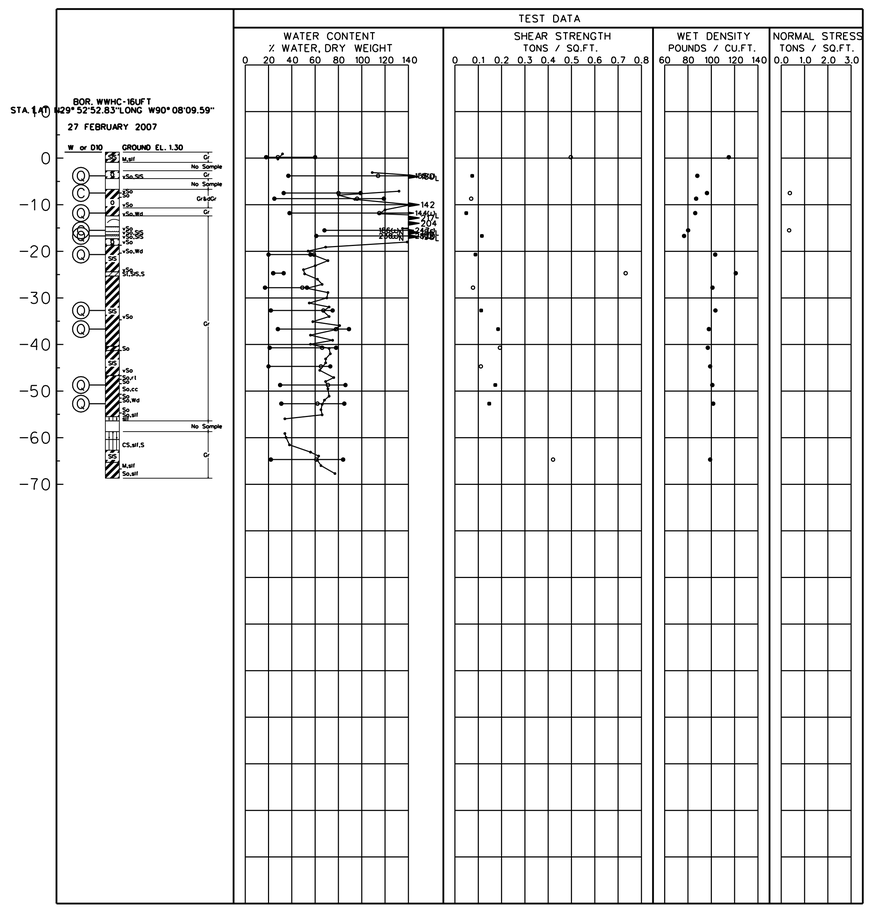
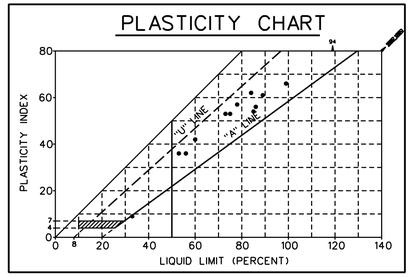
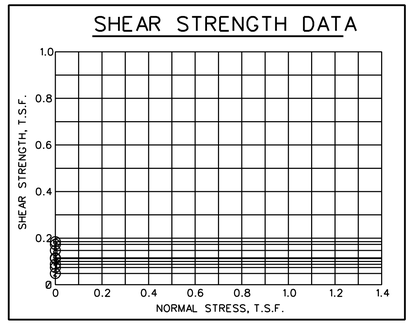
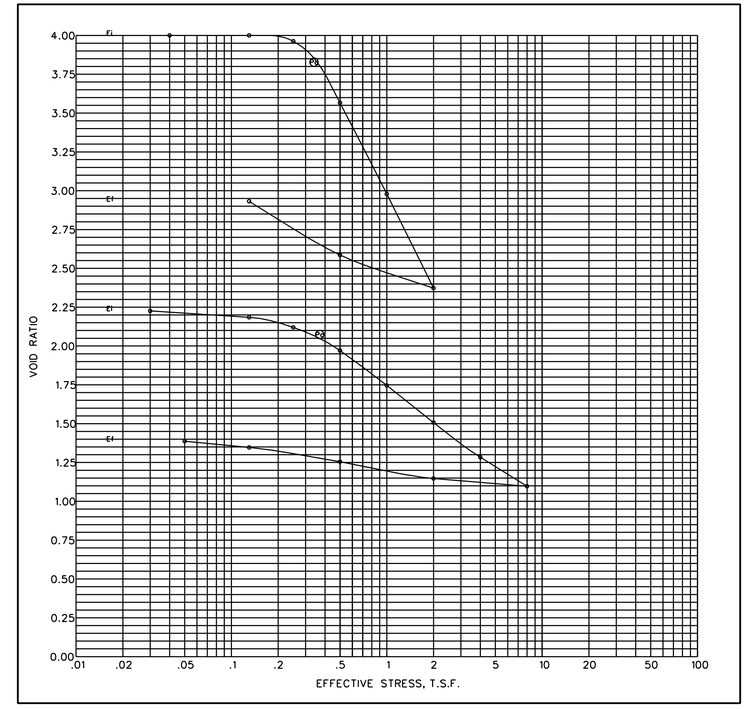






TABULAR TEST DATA

ENVELOPE		TYPE	STRENGTH		CLASS
NO.	EL.		Φ	c - TSF	
1	-3.8	Q	0.0	0.074	CH
2	-11.8	Q	0.0	0.049	CH
3	-16.7	Q	0.0	0.116	PT
4	-20.7	Q	0.0	0.088	CH
5	-32.7	Q	0.0	0.113	CH
6	-36.7	Q	0.0	0.185	CH
7	-48.7	Q	0.0	0.173	CH
8	-52.7	Q	0.0	0.147	CH
9	-7.5	C	0.0	0.000	CH
10	-15.5	C	0.0	0.000	PT



NOTES

- o - (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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

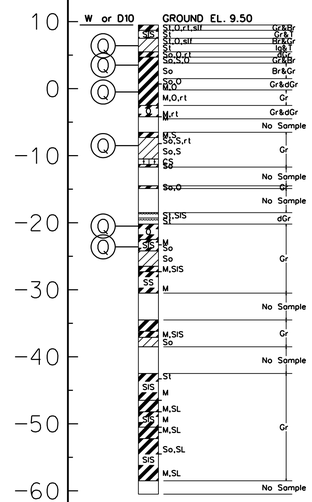
SHEET IDENTIFICATION NUMBER

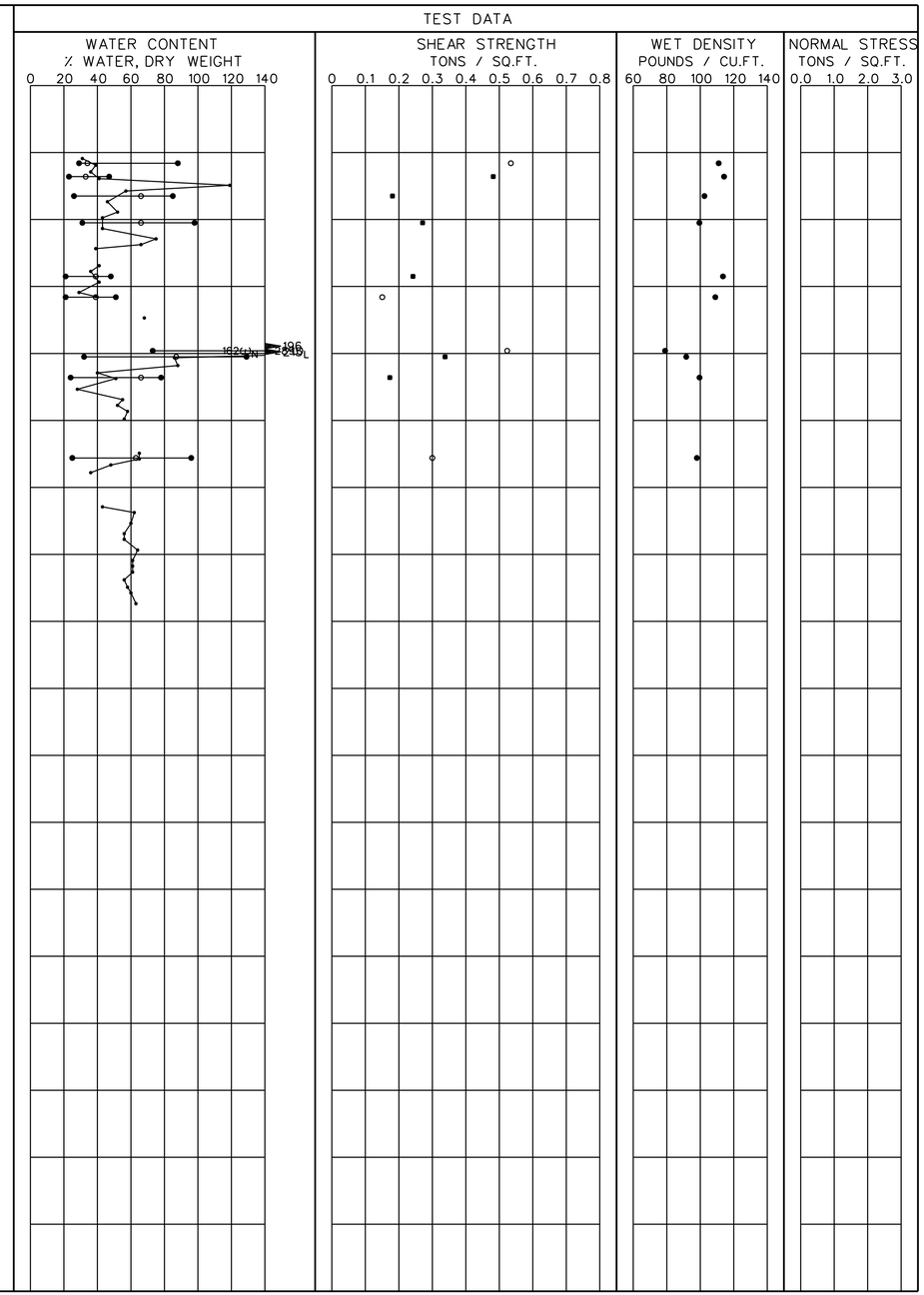
...\WC-16UFT_Final.dgn 12/20/2007 12:53:25 PM

BOR. WWHC-100UCL
STA. LAT N29° 52'04.21" LONG W90° 04'11.65"

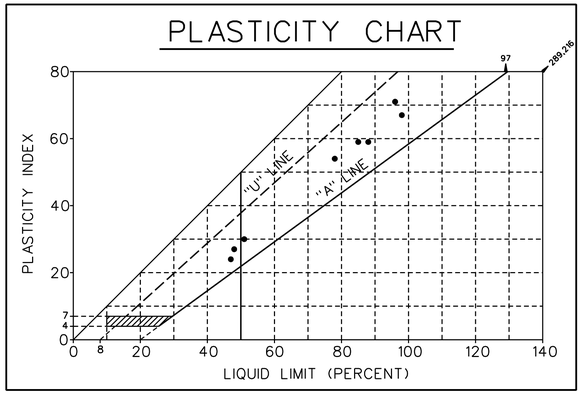
8-9 FEBRUARY 2007

W or D10 GROUND EL. 9.50





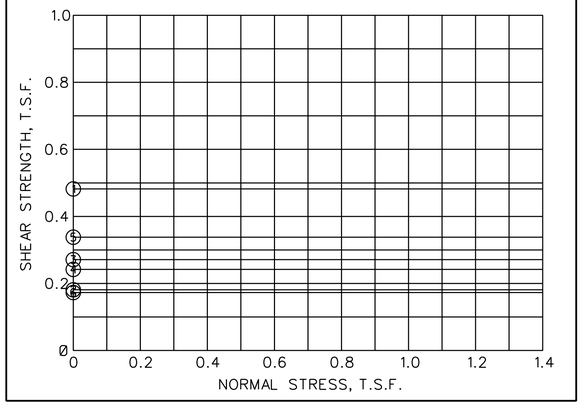
PLASTICITY CHART



TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS
1	6.4	Q	0.0	0.482	CL
2	3.5	Q	0.0	0.181	CH
3	-0.5	Q	0.0	0.271	CH
4	-8.5	Q	0.0	0.242	CL
5	-20.5	Q	0.0	0.338	CH
6	-23.6	Q	0.0	0.173	CH

SHEAR STRENGTH DATA



NOTES

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- 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
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US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

MARK | DESCRIPTION | DATE | APPR.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

DESIGNED BY: | DATE:
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
FILE NAME: | FILE NUMBER
SIZE: | PLOT SCALE: | PLOT DATE:

SHEET IDENTIFICATION NUMBER

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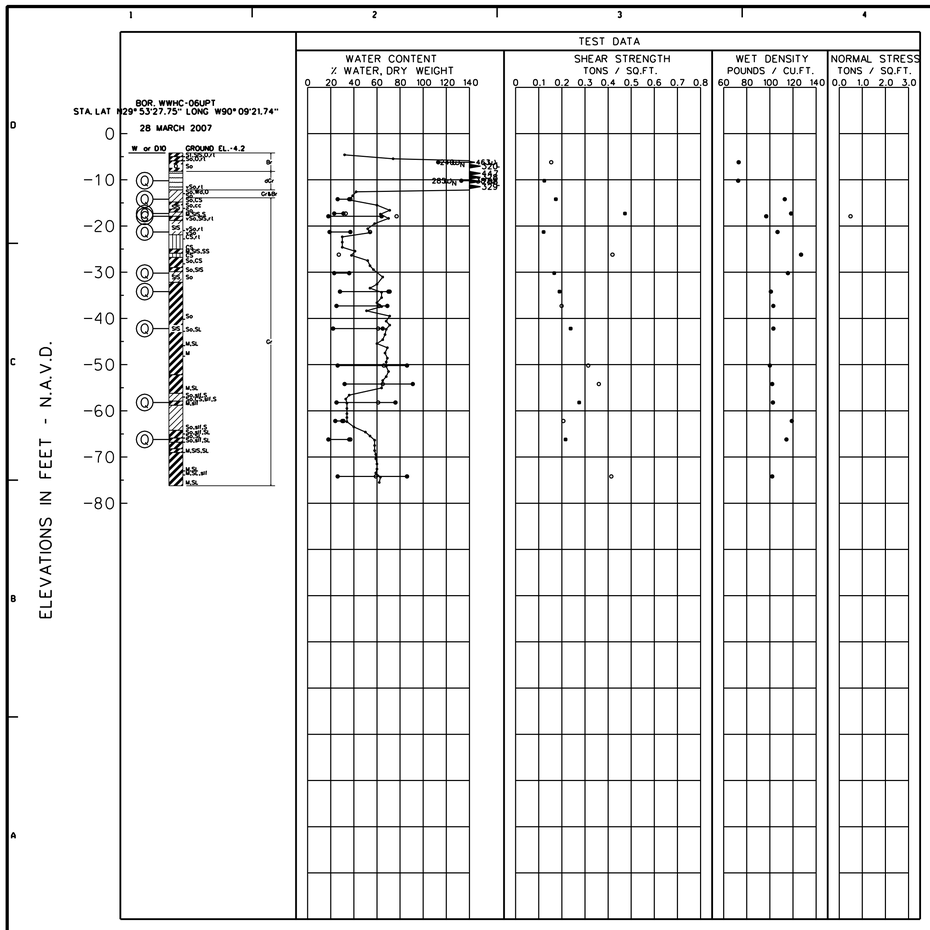
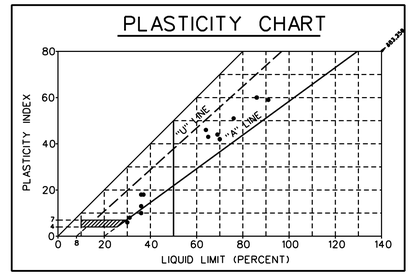
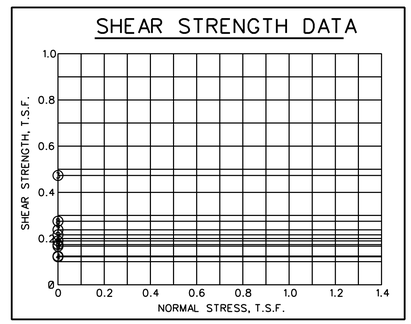
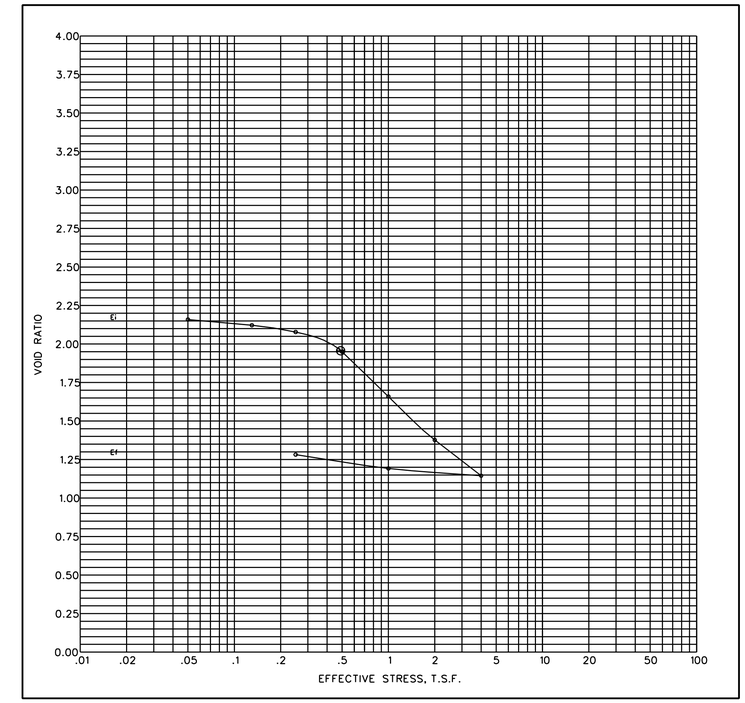






TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-10.2	Q	0.0	0.124	PT
2	-14.2	Q	0.0	0.174	CL
3	-17.3	Q	0.0	0.473	CL
4	-21.3	Q	0.0	0.121	CL
5	-30.2	Q	0.0	0.167	CL
6	-34.2	Q	0.0	0.190	CH
7	-42.2	Q	0.0	0.238	CH
8	-58.2	Q	0.0	0.275	CH
9	-66.2	Q	0.0	0.216	CL
10	-17.9	C	0.0	0.000	CH



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BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
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FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFIBATION NUMBER

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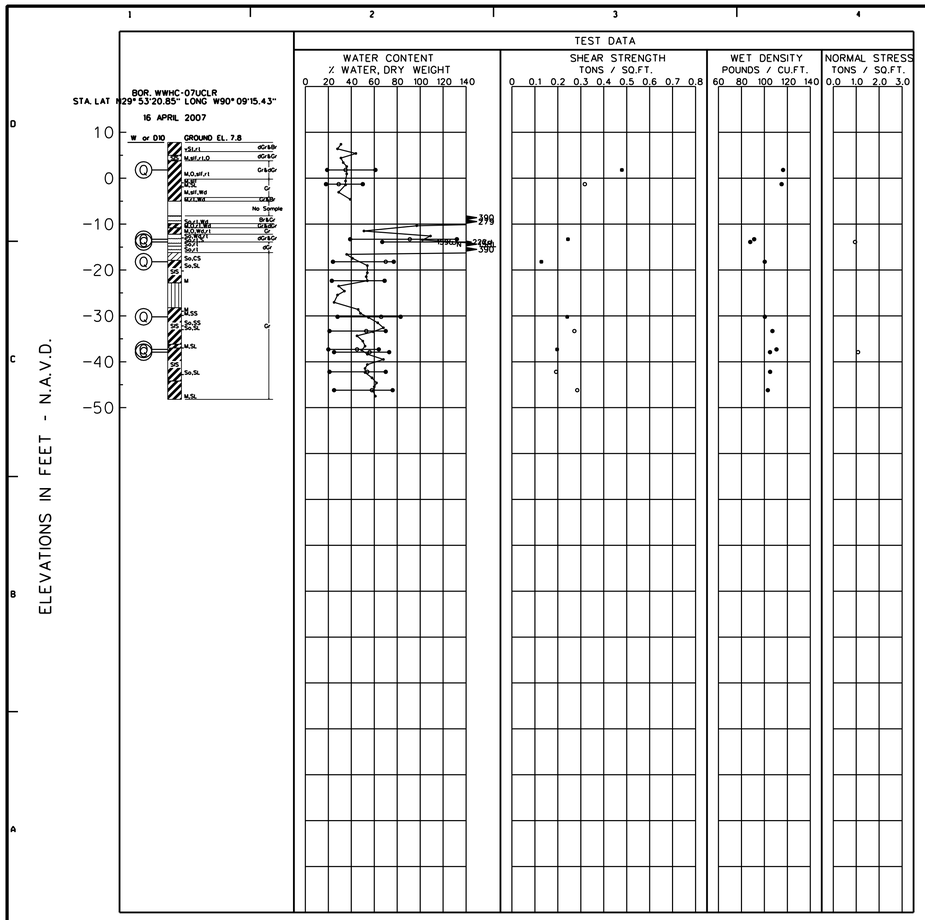
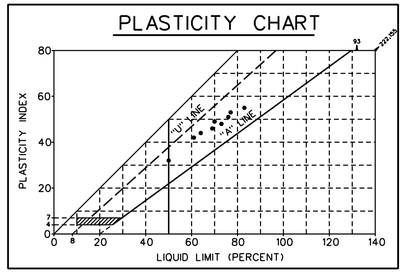
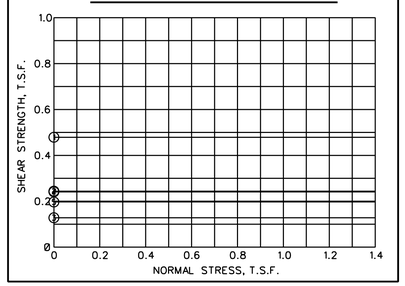


PLASTICITY CHART

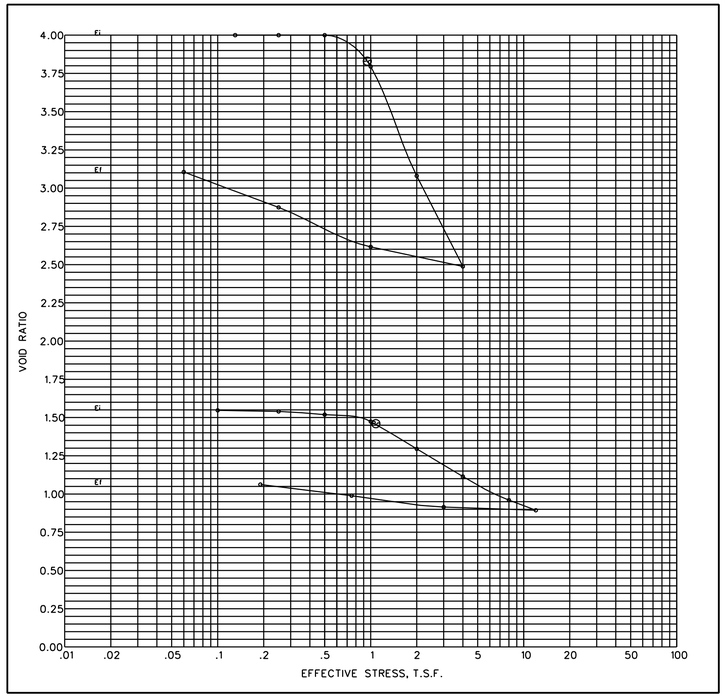


SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	1.8	Q	0.0	0.479	CH
2	-13.3	Q	0.0	0.244	CH
3	-18.2	Q	0.0	0.128	CH
4	-30.2	Q	0.0	0.241	CH
5	-37.3	Q	0.0	0.197	CH
6	-13.9	C	0.0	0.000	PT
7	-37.9	C	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_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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

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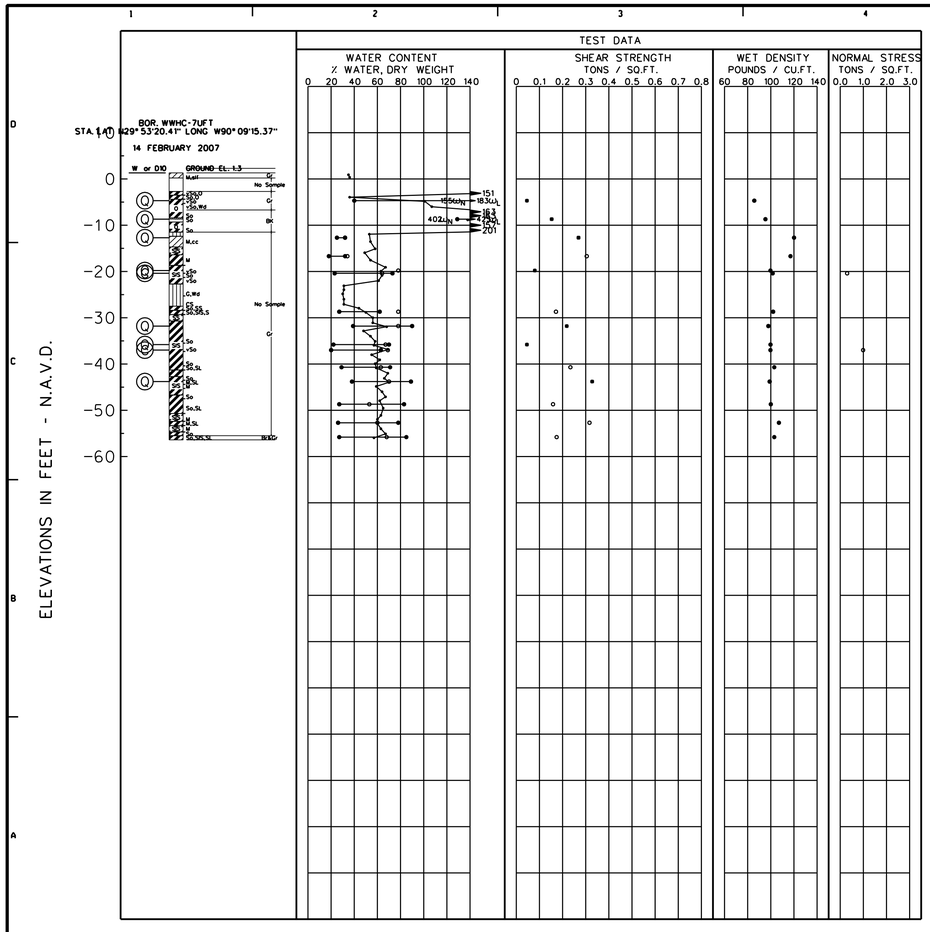
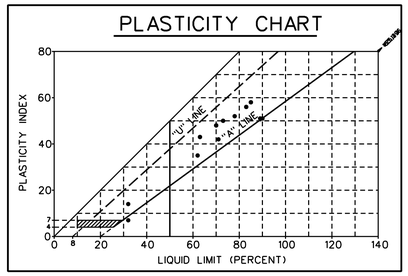
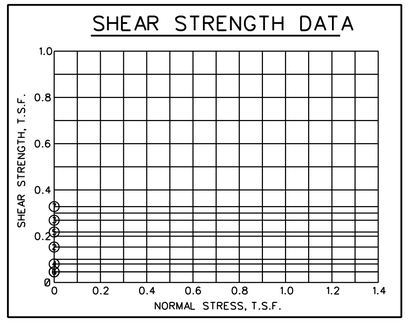
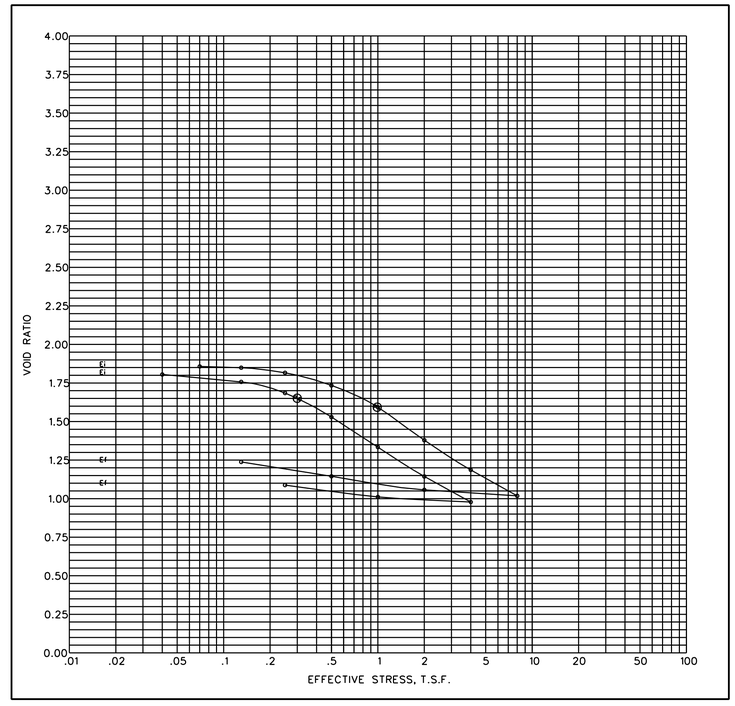






TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS
1	-4.7	O	0.0	0.046	CH
2	-8.7	O	0.0	0.153	PT
3	-12.7	O	0.0	0.269	CL
4	-19.8	O	0.0	0.080	CH
5	-31.8	O	0.0	0.218	CH
6	-35.8	O	0.0	0.046	CH
7	-43.8	O	0.0	0.328	CH
8	-20.4	C	0.0	0.000	CH
9	-37.0	C	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 A.
FOR LOCATION OF BORINGS SEE PLATE
FOR DETAILED TEST DATA SEE

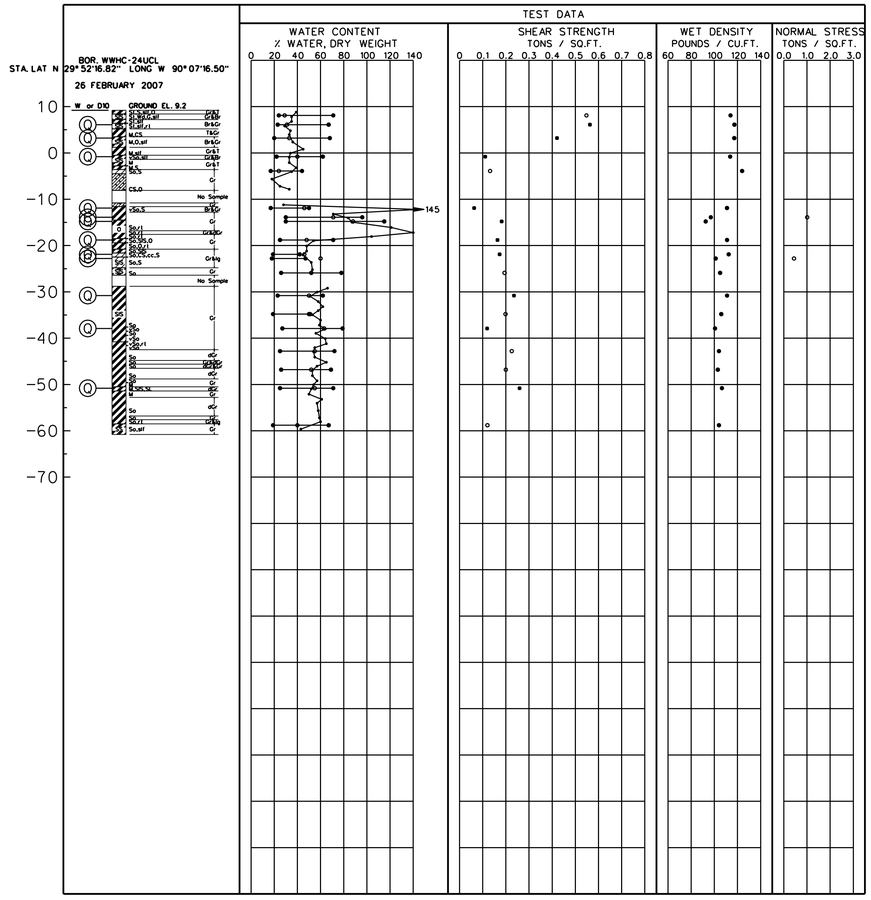
US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

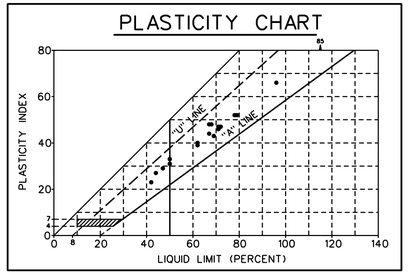
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS MISSISSIPPI VALLEY DIVISION

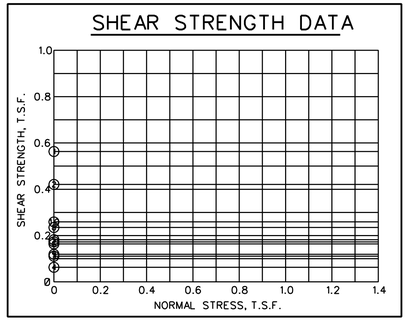
SHEET IDENTIFICATION NUMBER

...\WC-07UFT_Final.dgn 12/20/2007 12:40:32 PM

BOR. WWHC-24UCL
STA. LAT N 29°52'16.82" LONG W 90°07'16.50"
26 FEBRUARY 2007

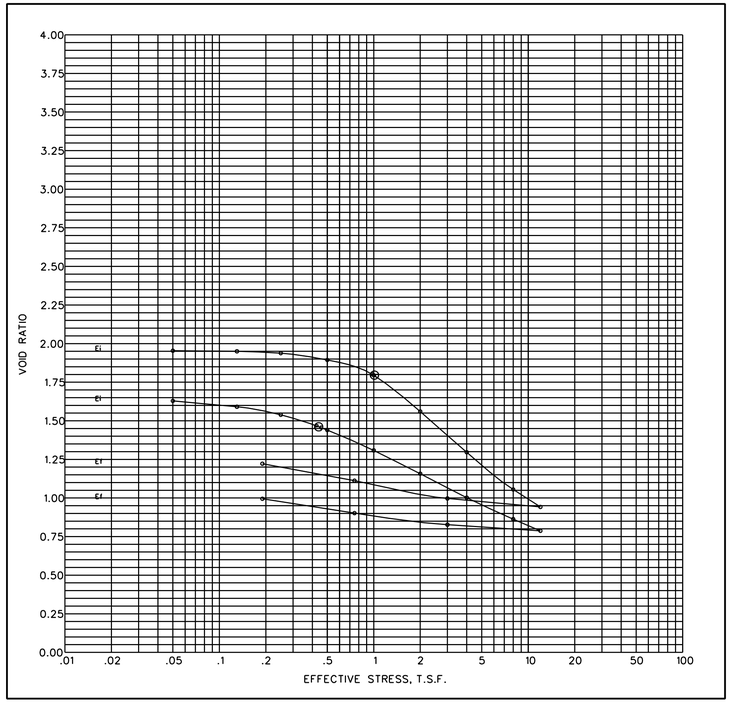






TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	6.1	Q	0.0	0.563	CH
2	3.2	Q	0.0	0.421	CH
3	-0.8	Q	0.0	0.111	CH
4	-11.9	Q	0.0	0.063	CH
5	-14.8	Q	0.0	0.182	CH
6	-18.8	Q	0.0	0.164	CH
7	-21.9	Q	0.0	0.173	CL
8	-30.8	Q	0.0	0.235	CH
9	-37.9	Q	0.0	0.119	CH
10	-50.8	Q	0.0	0.259	CH
11	-13.9	C	0.0	0.000	CH
12	-22.8	C	0.0	0.000	CL



NOTES

- ○ - (UC) UNCONFINED COMPRESSION TEST
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- ▲ - (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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

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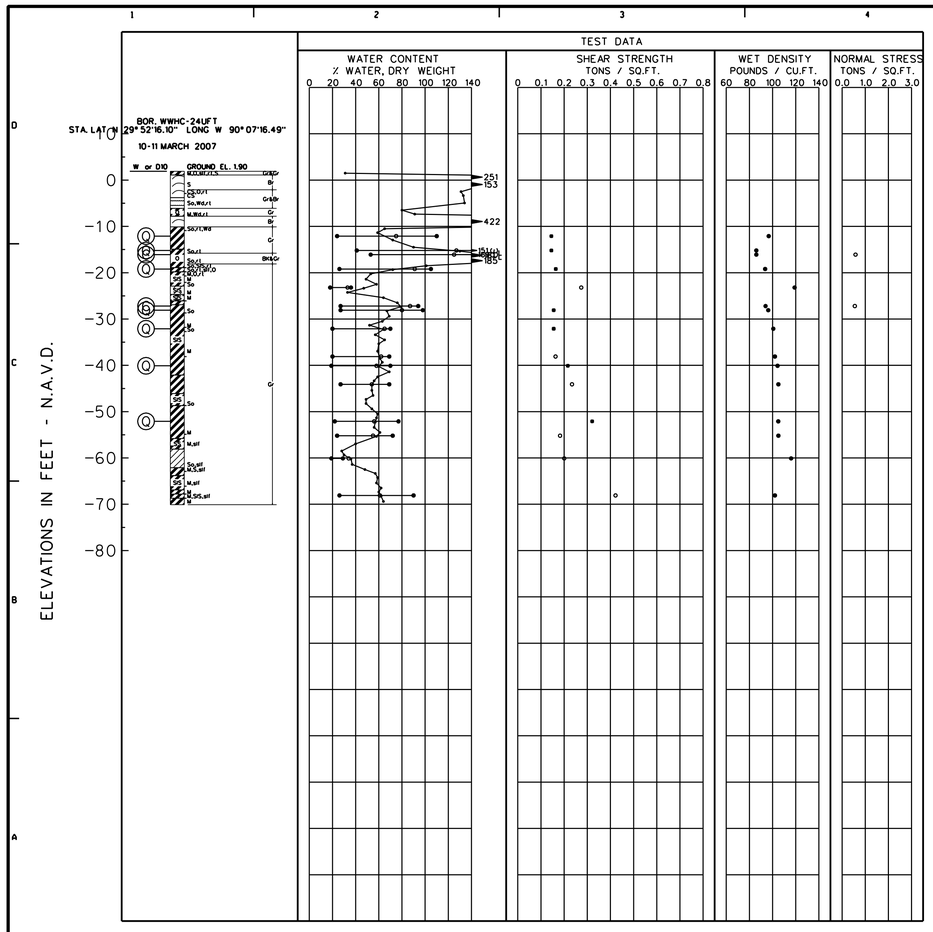
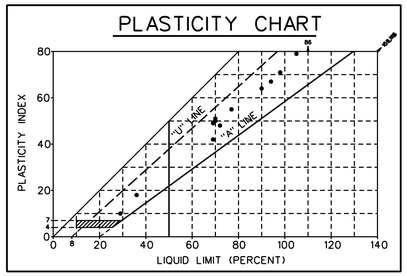
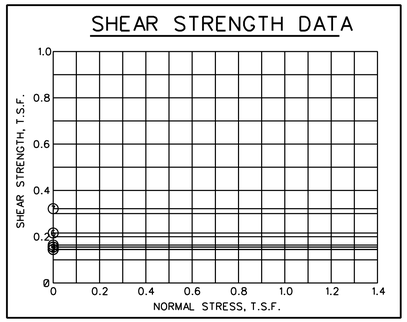
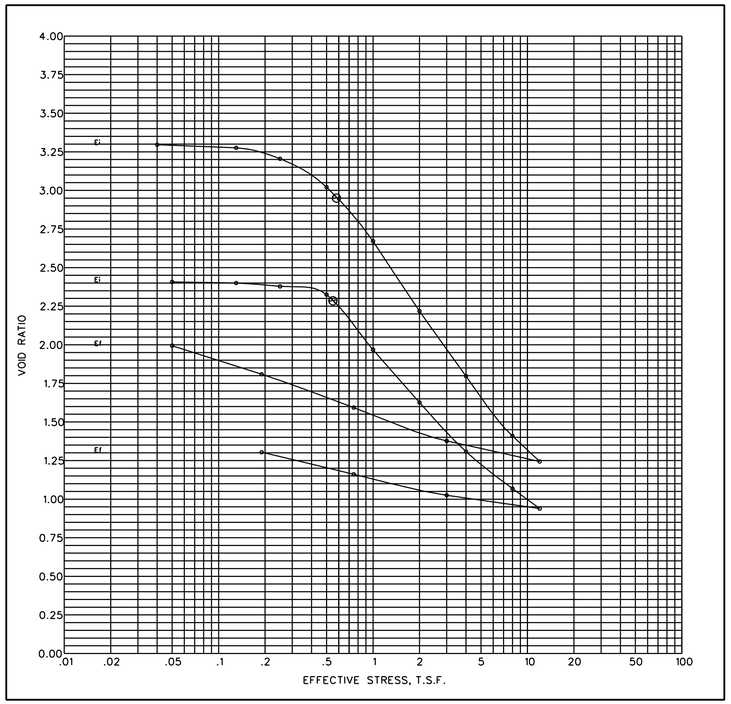






TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-12.1	Q	0.0	0.145	CH
2	-15.2	Q	0.0	0.145	CH
3	-19.2	Q	0.0	0.164	CH
4	-28.1	Q	0.0	0.155	CH
5	-32.1	Q	0.0	0.155	CH
6	-40.1	Q	0.0	0.216	CH
7	-52.1	Q	0.0	0.321	CH
8	-16.1	C	0.0	0.000	CH
9	-27.2	C	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 A.
FOR LOCATION OF BORINGS SEE PLATE
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

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

SHEET IDENTIFICATION NUMBER

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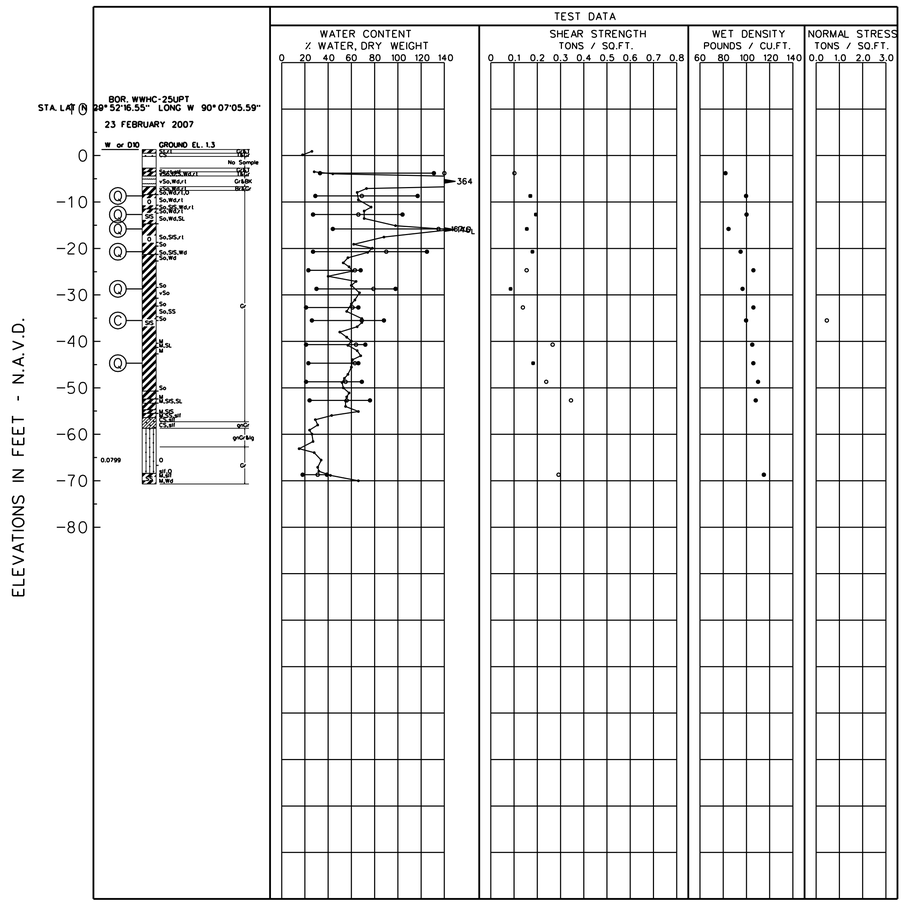
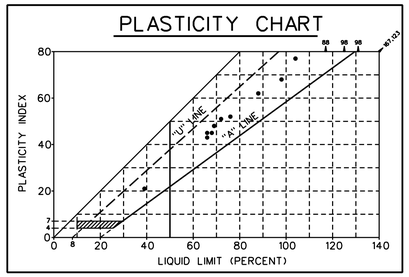
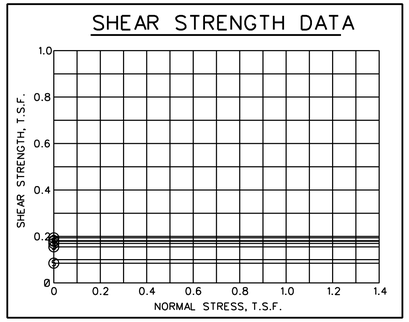
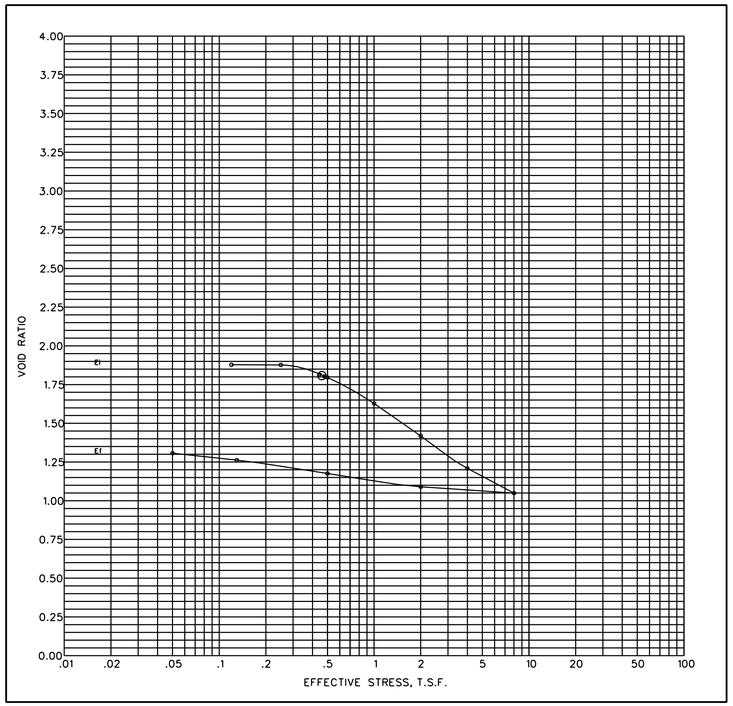






TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-8.7	Q	0.0	0.170	CH
2	-12.7	Q	0.0	0.194	CH
3	-15.8	Q	0.0	0.155	CH
4	-20.7	Q	0.0	0.179	CH
5	-28.7	Q	0.0	0.085	CH
6	-44.7	Q	0.0	0.182	CH
7	-35.5	C	0.0	0.000	CH



NOTES

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- ▲ - (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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

U.S. ARMY CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

...\WC-25UPT Final.dgn 12/27/2007 4:21:59 PM

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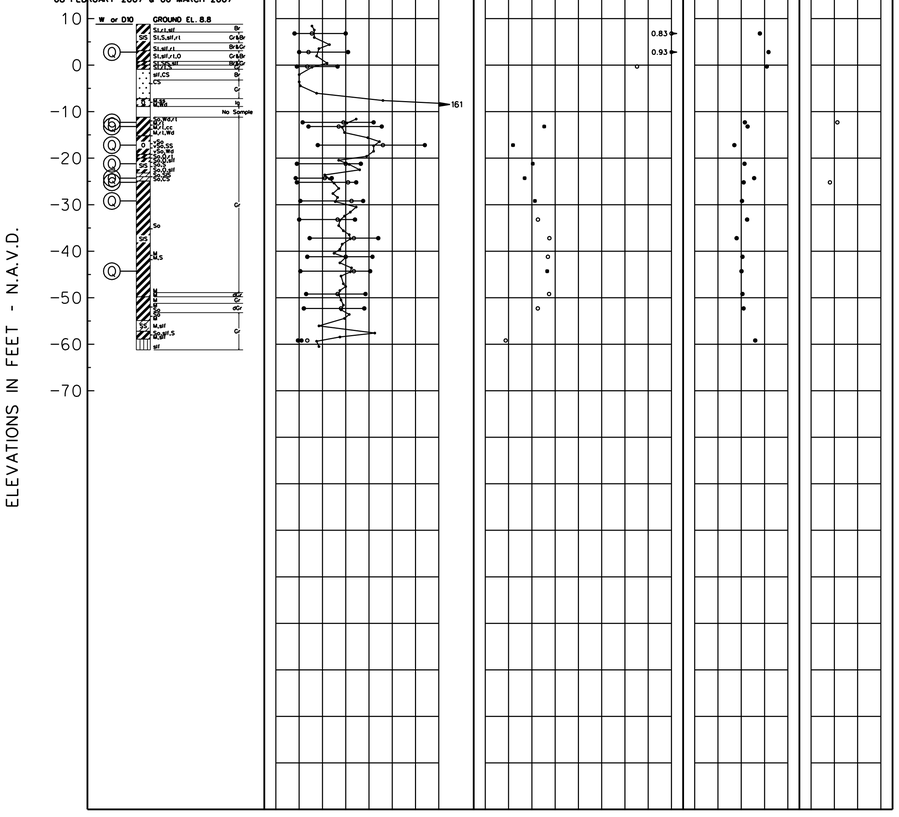
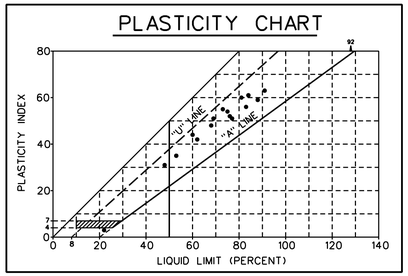
08 FEBRUARY 2007 & 06 MARCH 2007

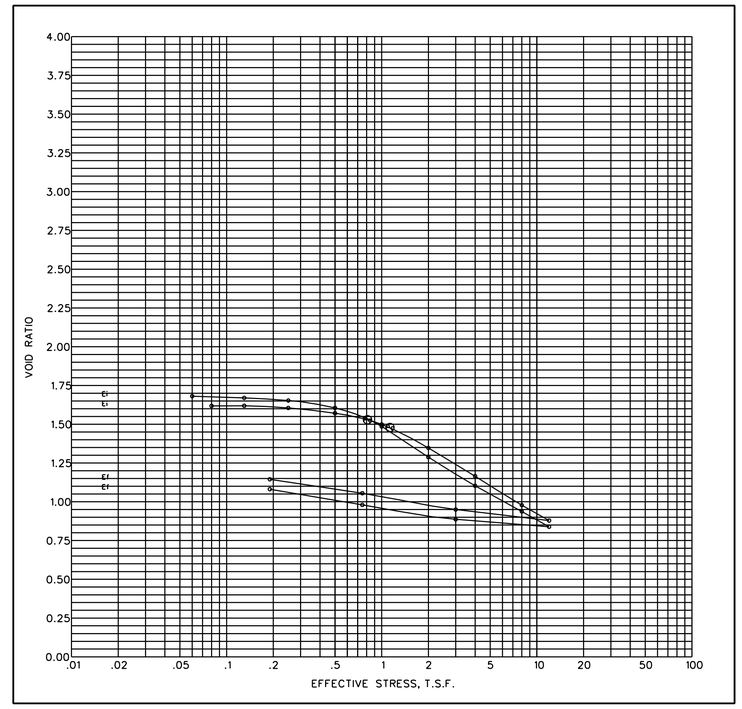


PLASTICITY CHART

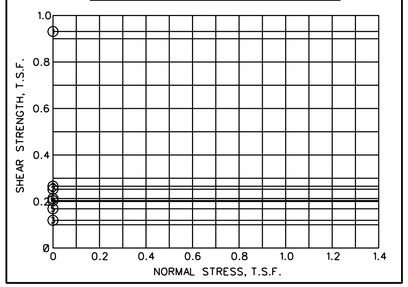


TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	2.8	Q	0.0	0.931	CH
2	-13.2	Q	0.0	0.253	CH
3	-17.2	Q	0.0	0.119	CH
4	-21.2	Q	0.0	0.204	CH
5	-24.3	Q	0.0	0.169	CL
6	-29.2	Q	0.0	0.213	CH
7	-44.3	Q	0.0	0.266	CH
8	-12.3	C	0.0	0.000	CH
9	-25.2	C	0.0	0.000	CH



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
- 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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFIDATION NUMBER

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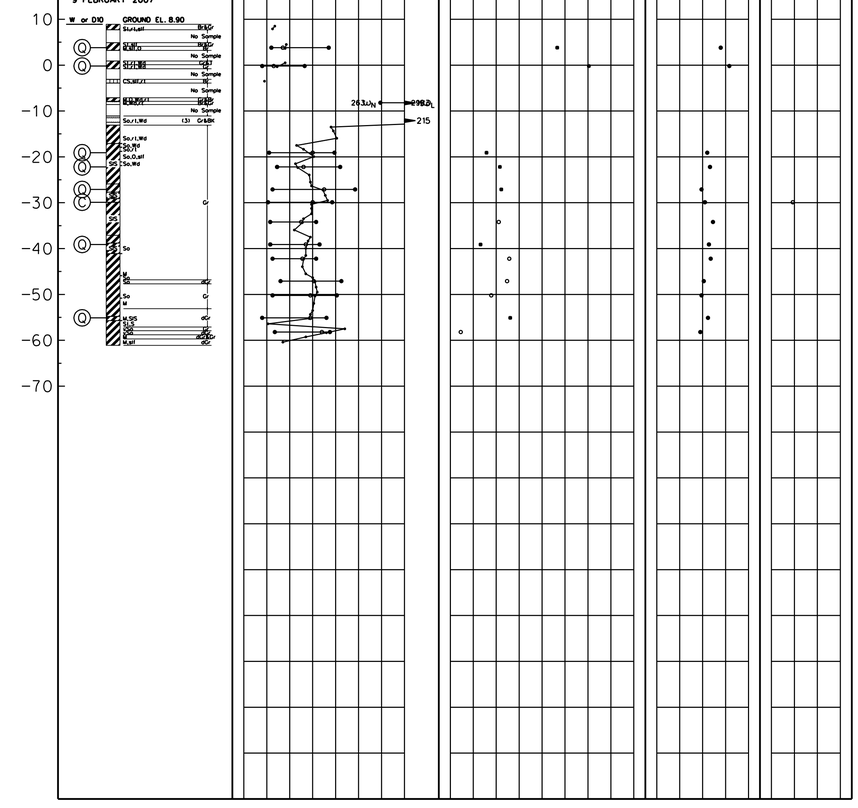
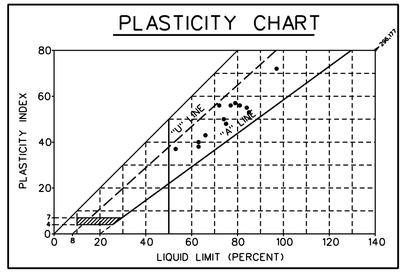
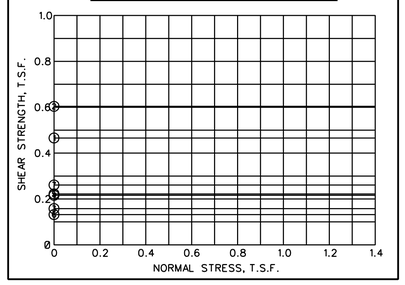
9 FEBRUARY 2007



PLASTICITY CHART

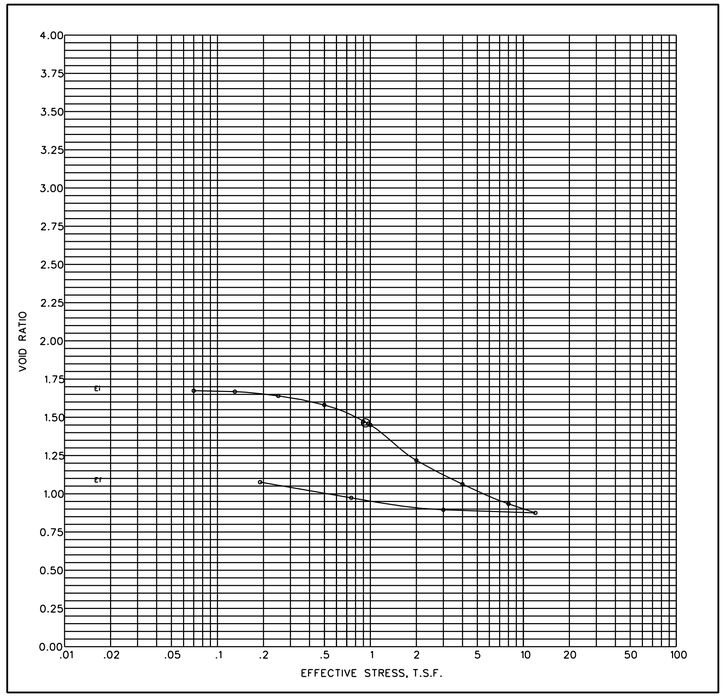


SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS
1	3.8	O	0.0	0.466	CH
2	-0.2	O	0.0	0.604	CH
3	-19.1	O	0.0	0.158	CH
4	-22.2	O	0.0	0.216	CH
5	-27.1	O	0.0	0.222	CH
6	-39.1	O	0.0	0.132	CH
7	-55.1	O	0.0	0.261	CH
8	-29.9	C	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

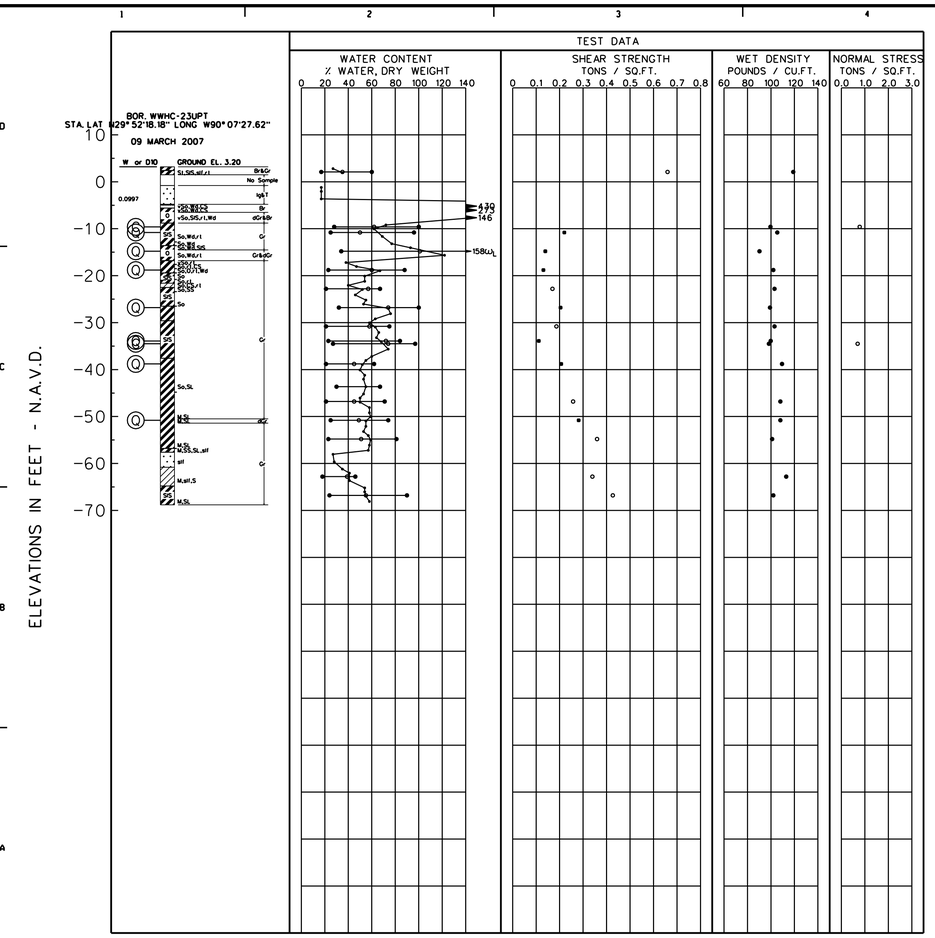
BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
FOR SOIL BORING LEGEND SEE PLATE A.
FOR LOCATION OF BORINGS SEE PLATE
FOR DETAILED TEST DATA SEE

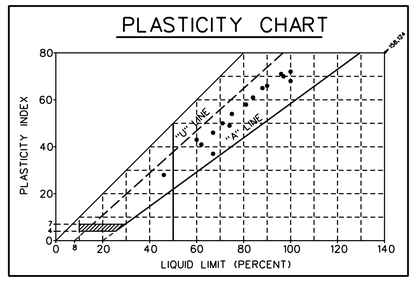
US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

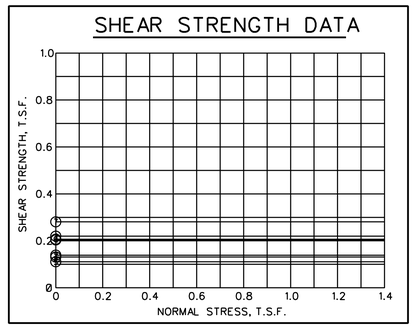
U.S. ARMY ENGINEER DISTRICT
NEW ORLEANS, LA
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

...\WC-23UCL Final.dgn 12/27/2007 4:22:15 PM

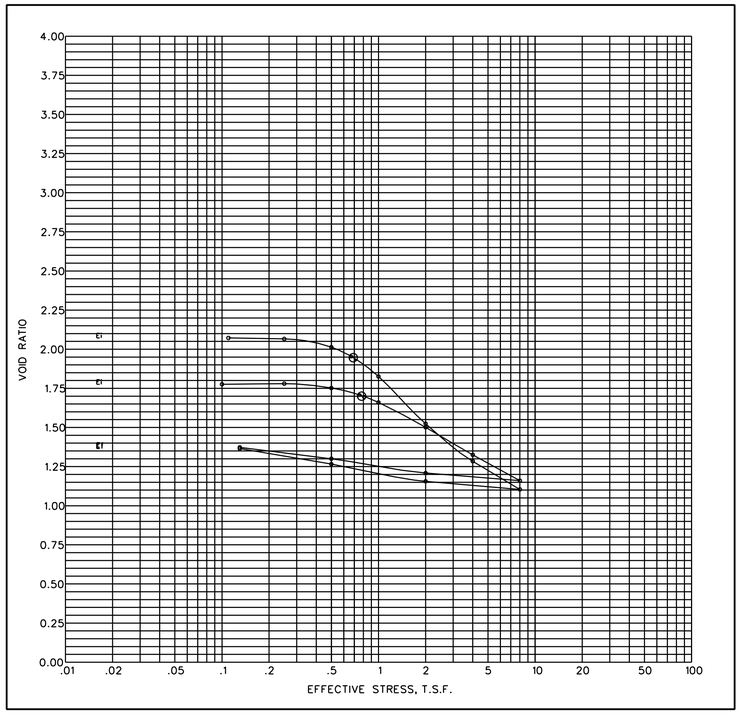






TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-10.8	Q	0.0	0.220	CH
2	-14.8	Q	0.0	0.139	CH
3	-18.8	Q	0.0	0.131	CH
4	-26.8	Q	0.0	0.204	CH
5	-33.9	Q	0.0	0.111	CH
6	-38.8	Q	0.0	0.207	CH
7	-50.8	Q	0.0	0.281	CH
8	-9.6	C	0.0	0.000	CH
9	-34.5	C	0.0	0.000	CH



NOTES

- ○ - (UC) UNCONFINED COMPRESSION TEST
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- ▲ - (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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

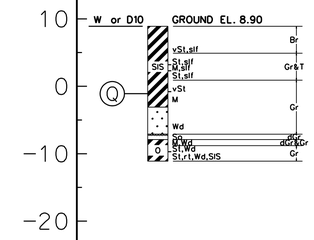
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

...\WC-23UPT_Final.dgn 12/20/2007 1:21:47 PM

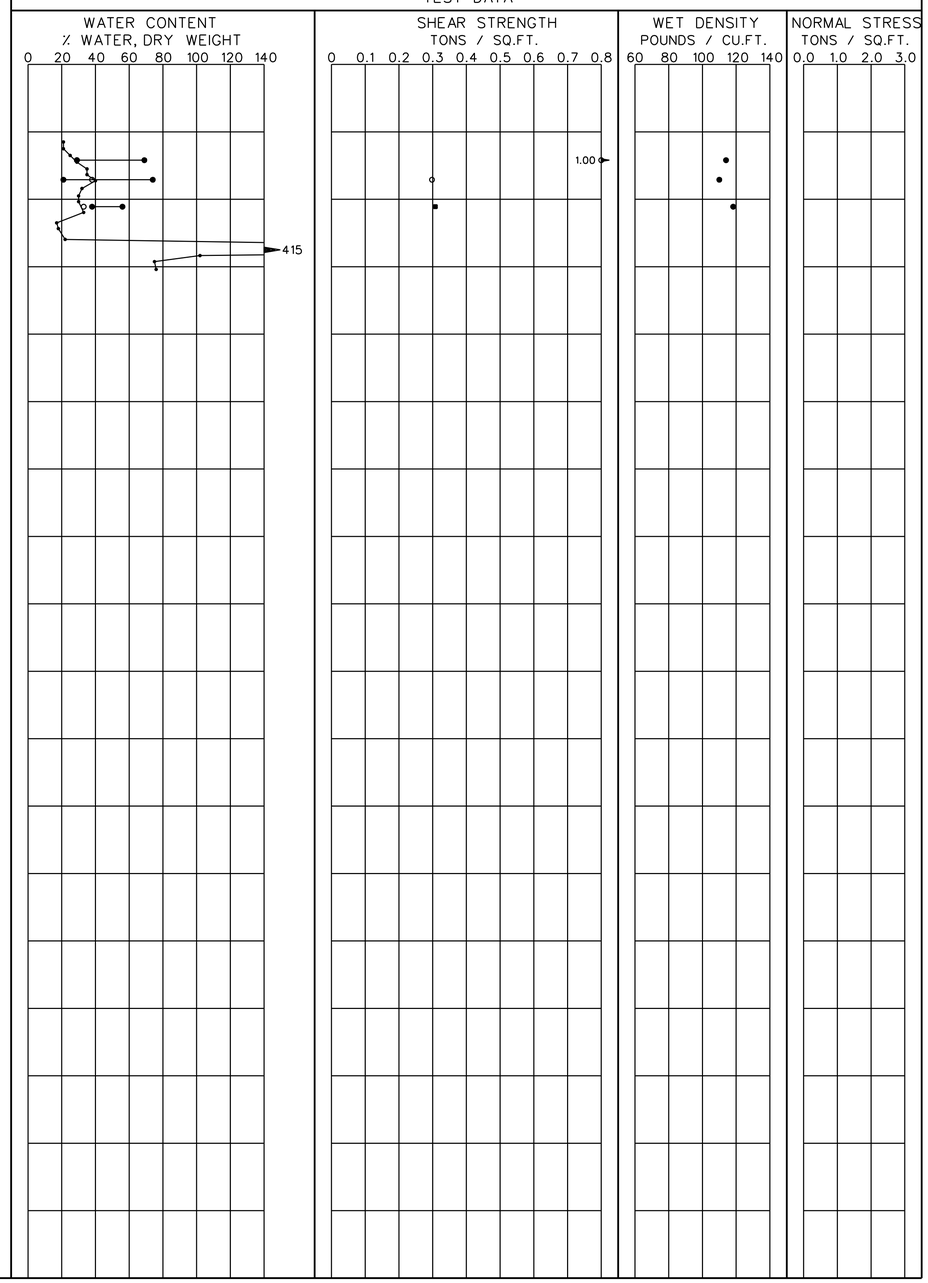
BOR. WWHC-23UCL
STA. LAT N29° 52' 17.58" LONG W90° 07' 27.43"

18 APRIL 2007

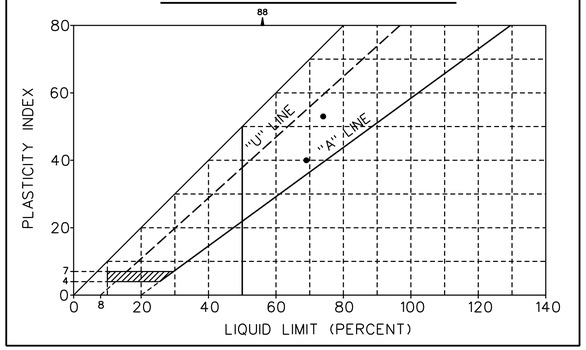


ELEVATIONS IN FEET - N.A.V.D.

TEST DATA



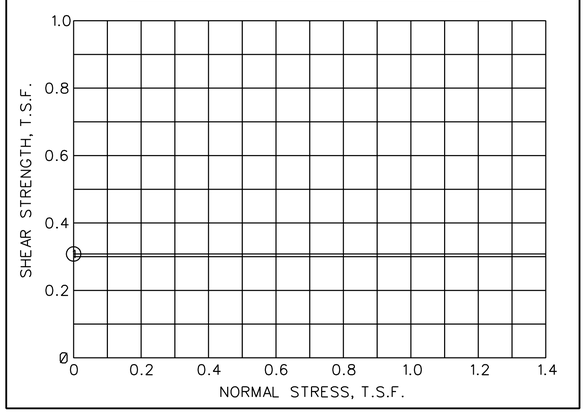
PLASTICITY CHART



TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-1.1	0	0.0	0.308	CH

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
FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

MARK	DESCRIPTION	DATE	APPR.

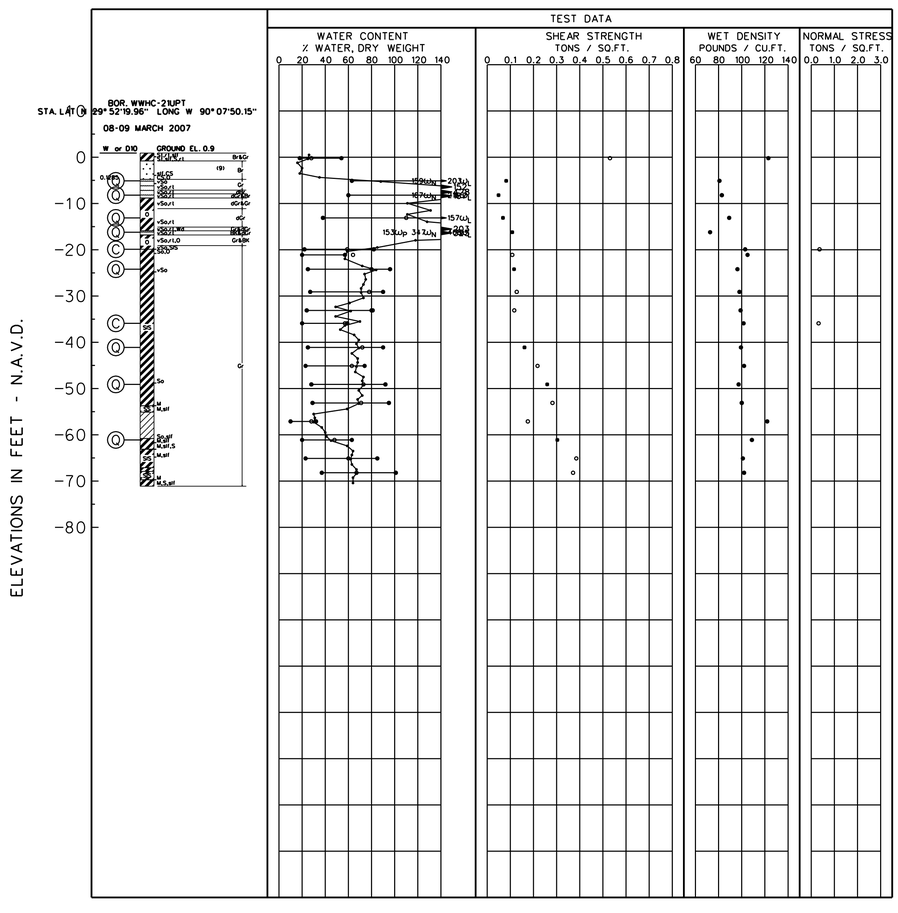
MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

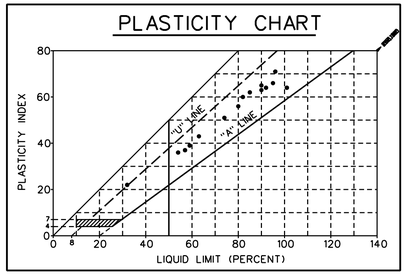
DESIGNED BY: | DATE:
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
FILE NAME: | FILE NUMBER:
SIZE: | PLOT SCALE: | PLOT DATE:

SHEET IDENTIFICATION NUMBER

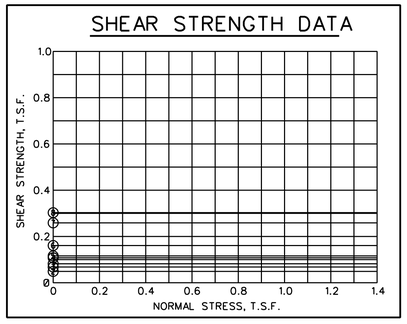
...\WC-23UCLR_Final.dgn 8/21/2007 2:06:41 PM



PLASTICITY CHART

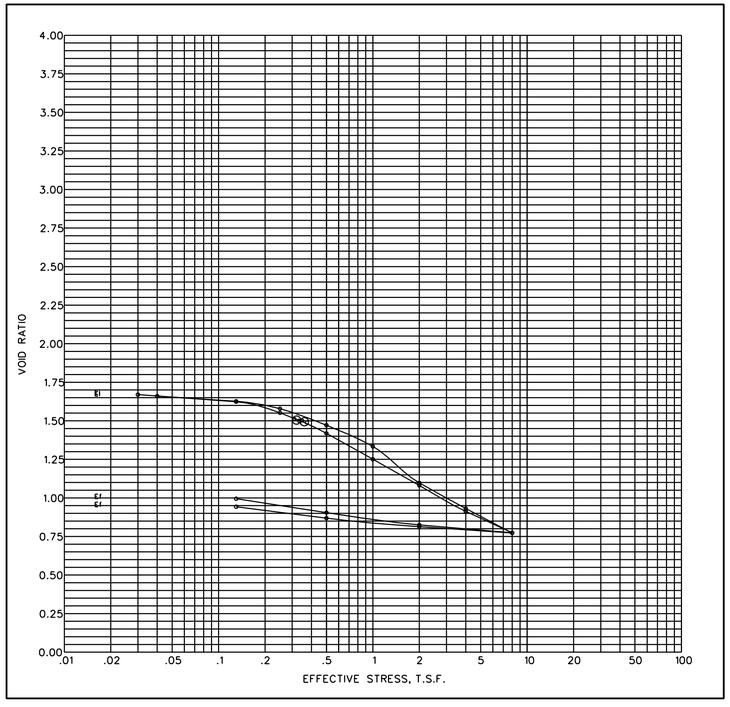


SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE NO.	EL.	TYPE	STRENGTH Φ	STRENGTH C - TSF	CLASS
1	-5.1	Q	0.0	0.082	PT
2	-8.2	Q	0.0	0.049	PT
3	-13.1	Q	0.0	0.068	CH
4	-16.2	Q	0.0	0.108	PT
5	-24.2	Q	0.0	0.116	CH
6	-41.1	Q	0.0	0.161	CH
7	-49.1	Q	0.0	0.259	CH
8	-61.1	Q	0.0	0.303	CH
9	-19.9	C	0.0	0.000	CH
10	-35.9	C	0.0	0.000	CH



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- ⊡ - (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
FOR DETAILED TEST DATA SEE

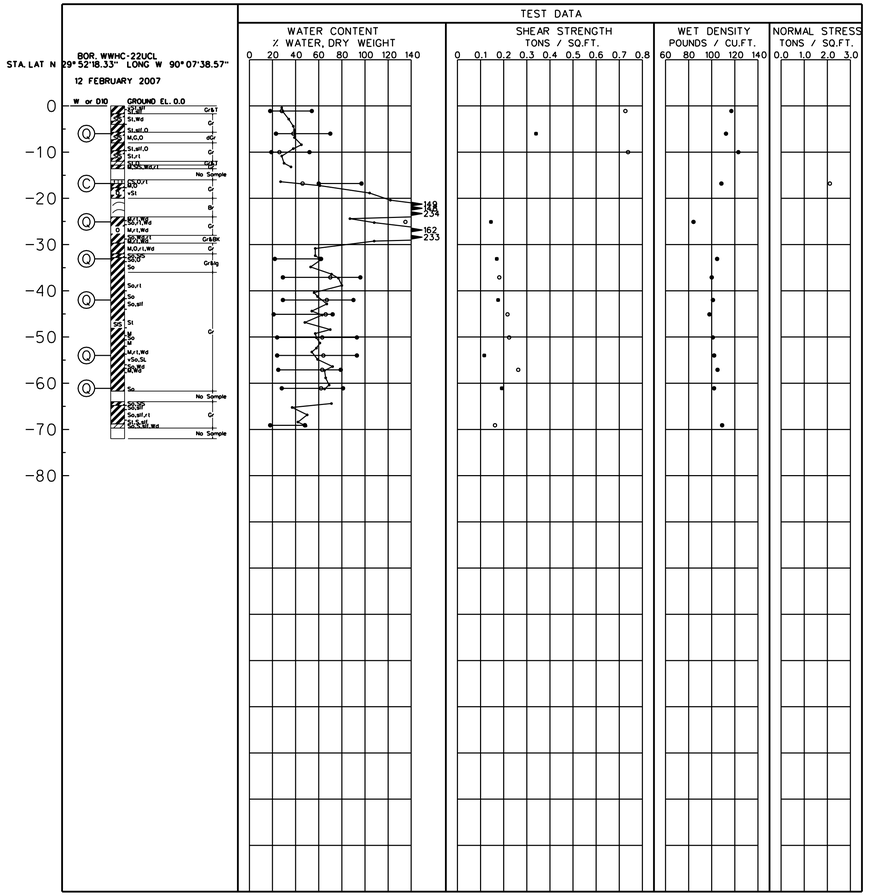
US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS MISSISSIPPI VALLEY DIVISION

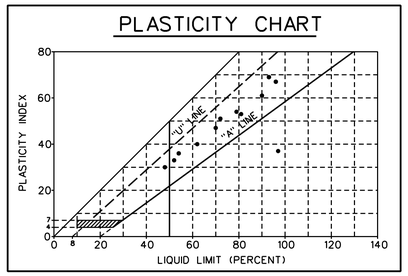
SHEET IDENTIFICATION NUMBER

...\WC-21UPT_Final.dgn 12/20/2007 12:52:26 PM

BOR. WWHC-22UCL
STA. LAT N 29°52'18.33" LONG W 90°07'38.57"
12 FEBRUARY 2007



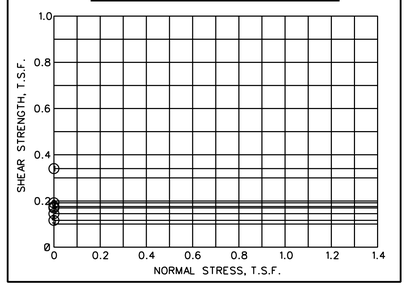
PLASTICITY CHART

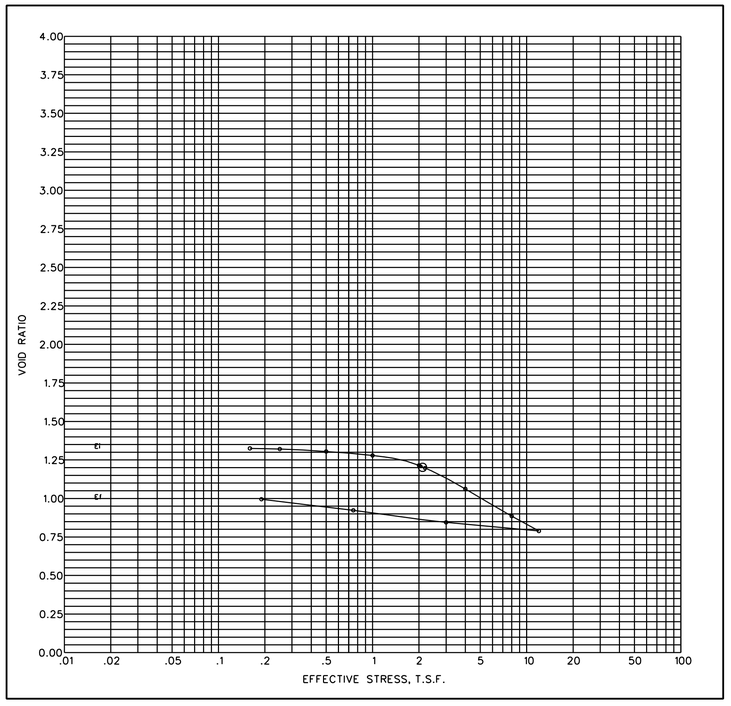


TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS
1	-6.0	Q	0.0	0.340	CH
2	-25.1	Q	0.0	0.145	CH
3	-33.1	Q	0.0	0.170	CH
4	-42.0	Q	0.0	0.176	CH
5	-54.0	Q	0.0	0.116	CH
6	-61.1	Q	0.0	0.192	CH
7	-16.8	C	0.0	0.000	CH

SHEAR STRENGTH DATA





NOTES

- ○ - (UC) UNCONFINED COMPRESSION TEST
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ωP ωN ωL ATTERBERG LIMITS

BORING WAS TAKEN WITH A 5 INCH DIAMETER STEEL TUBE PISTON TYPE SAMPLER.
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FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFICATION NUMBER

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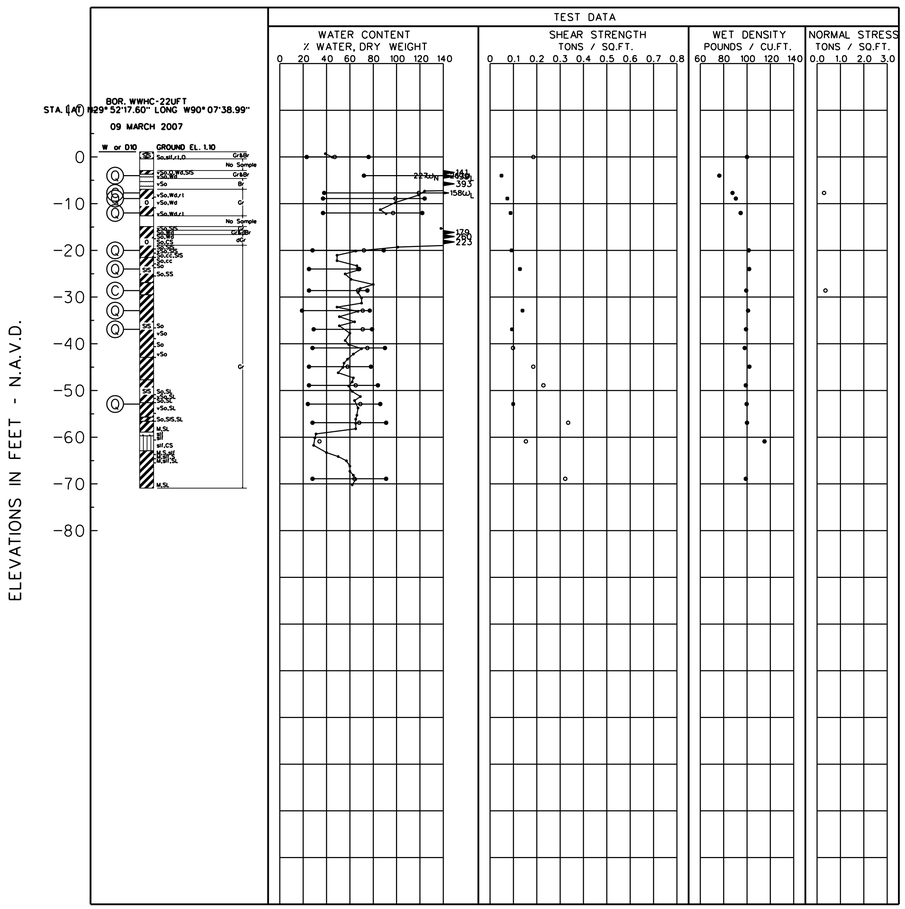
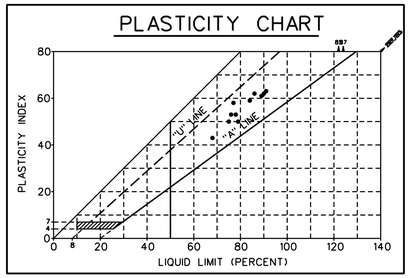
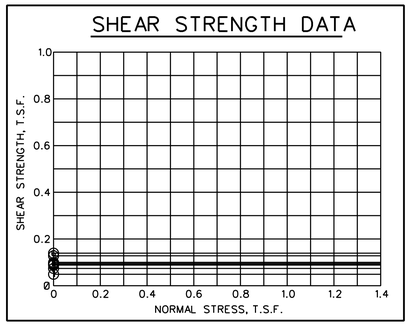


PLASTICITY CHART

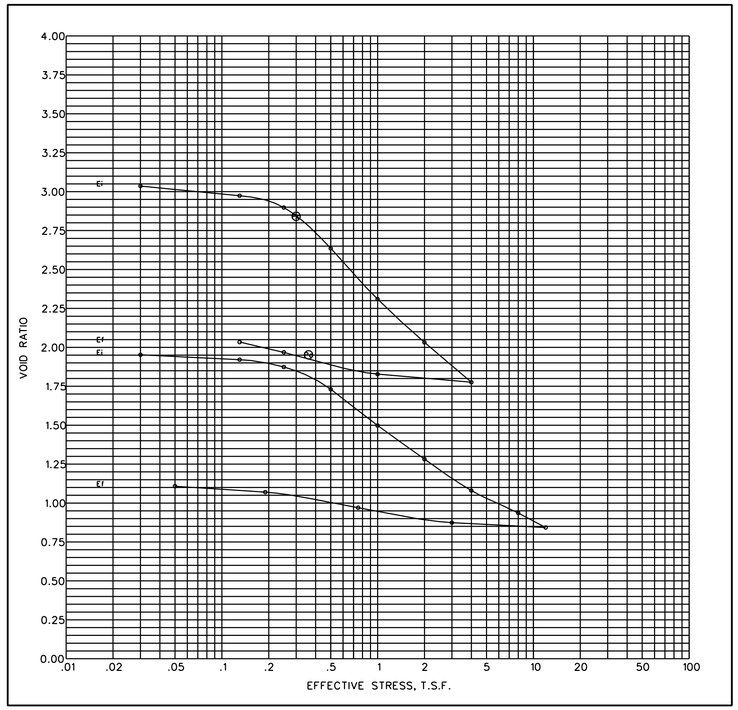


SHEAR STRENGTH DATA



TABULAR TEST DATA

ENVELOPE NO.	ENVELOPE EL.	TYPE	STRENGTH Φ	STRENGTH c - TSF	CLASS
1	-4.0	Q	0.0	0.049	PT
2	-8.9	Q	0.0	0.074	CH
3	-12.0	Q	0.0	0.088	CH
4	-20.0	Q	0.0	0.092	CH
5	-24.0	Q	0.0	0.128	CH
6	-32.9	Q	0.0	0.139	CH
7	-36.9	Q	0.0	0.094	CH
8	-52.9	Q	0.0	0.099	CH
9	-7.7	C	0.0	0.000	CH
10	-28.6	C	0.0	0.000	CH



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FOR DETAILED TEST DATA SEE

US ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT

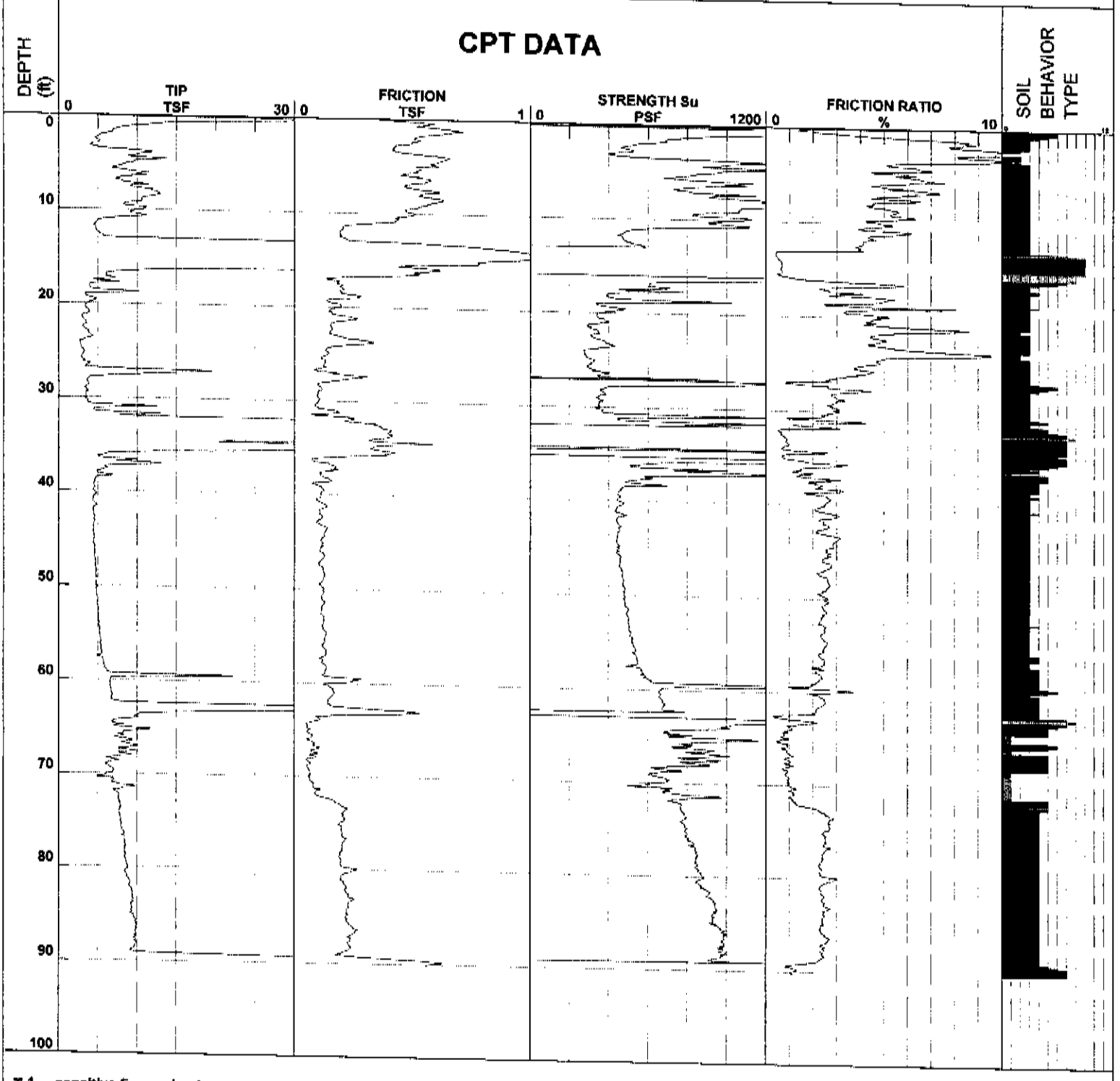
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS MISSISSIPPI VALLEY DIVISION

SHEET IDENTIFIRATION NUMBER

...\WC-22UFT_Final.dgn 12/20/2007 12:55:57 PM

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-06CL	Coordinates	29 53' 19.8"N 90 09' 09.7"W
Operator	HERBERT JACKSON	Date and Time	24-Feb-2007 10:46:26	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

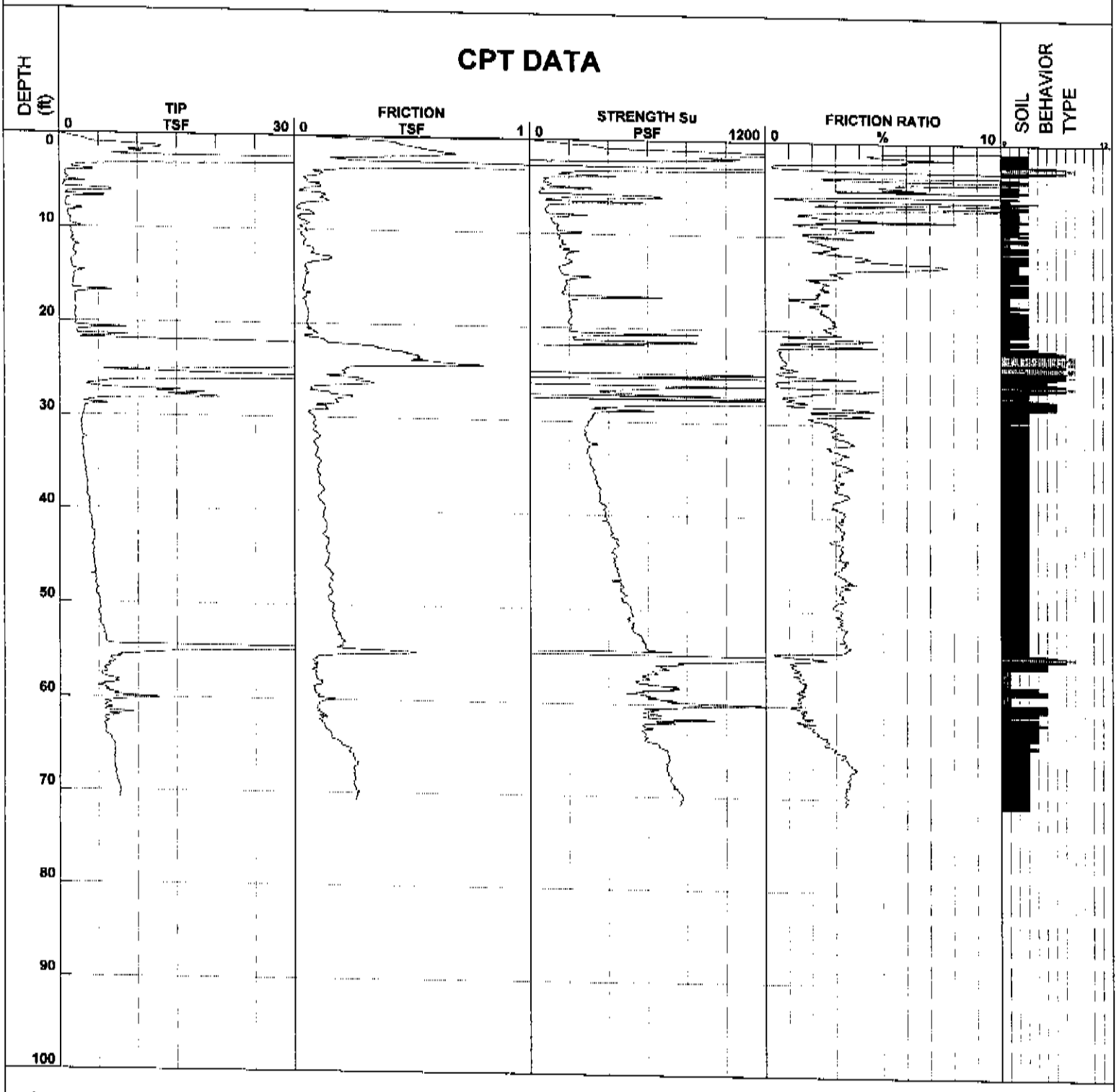


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-06PT	Coordinates	29 53' 20.4"N 90 9' 9.7"W
Operator	JIM BANDLE	Date and Time	25-Feb-2007 13:52:32	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	



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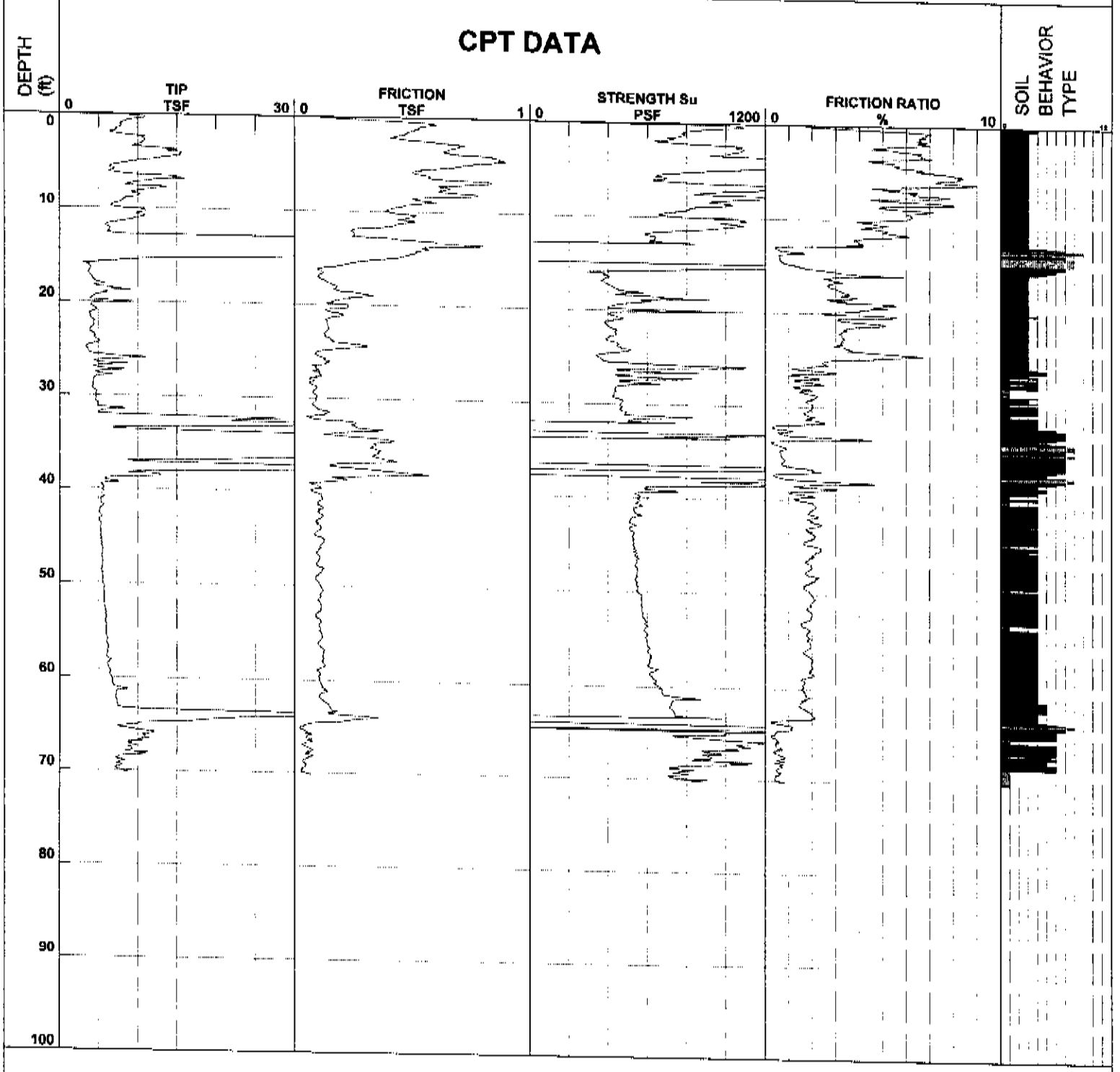
*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-07CL	Coordinates	29 53' 17.9"N 90 08' 58.7"W
Operator	HERBERT JACKSON	Date and Time	24-Feb-2007 13:36:38	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	



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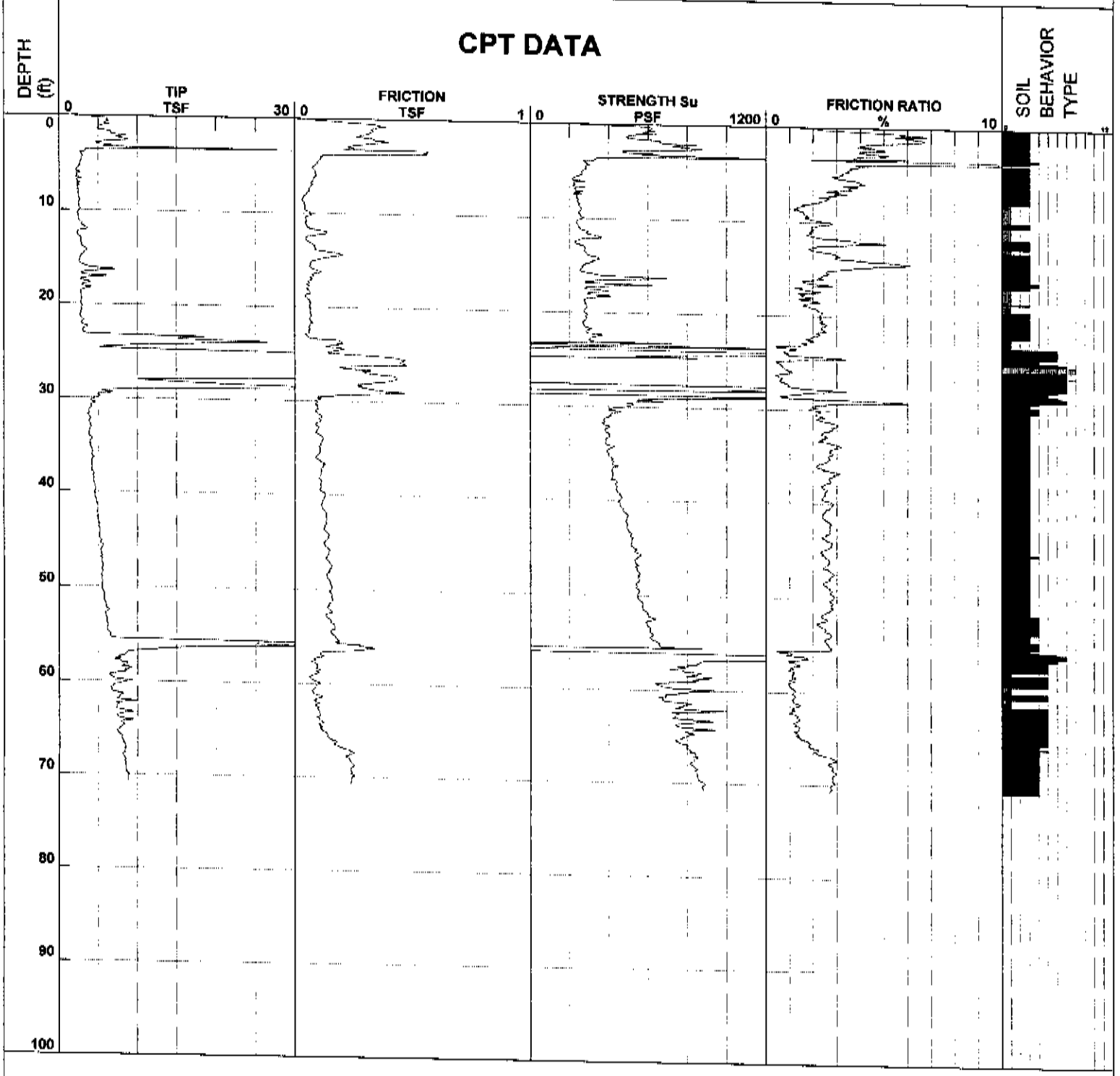
*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-07FT	Coordinates	29 53' 17.6"N 90 8' 58.6"W
Operator	JIM BANDLE	Date and Time	26-Feb-2007 06:50:48	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	



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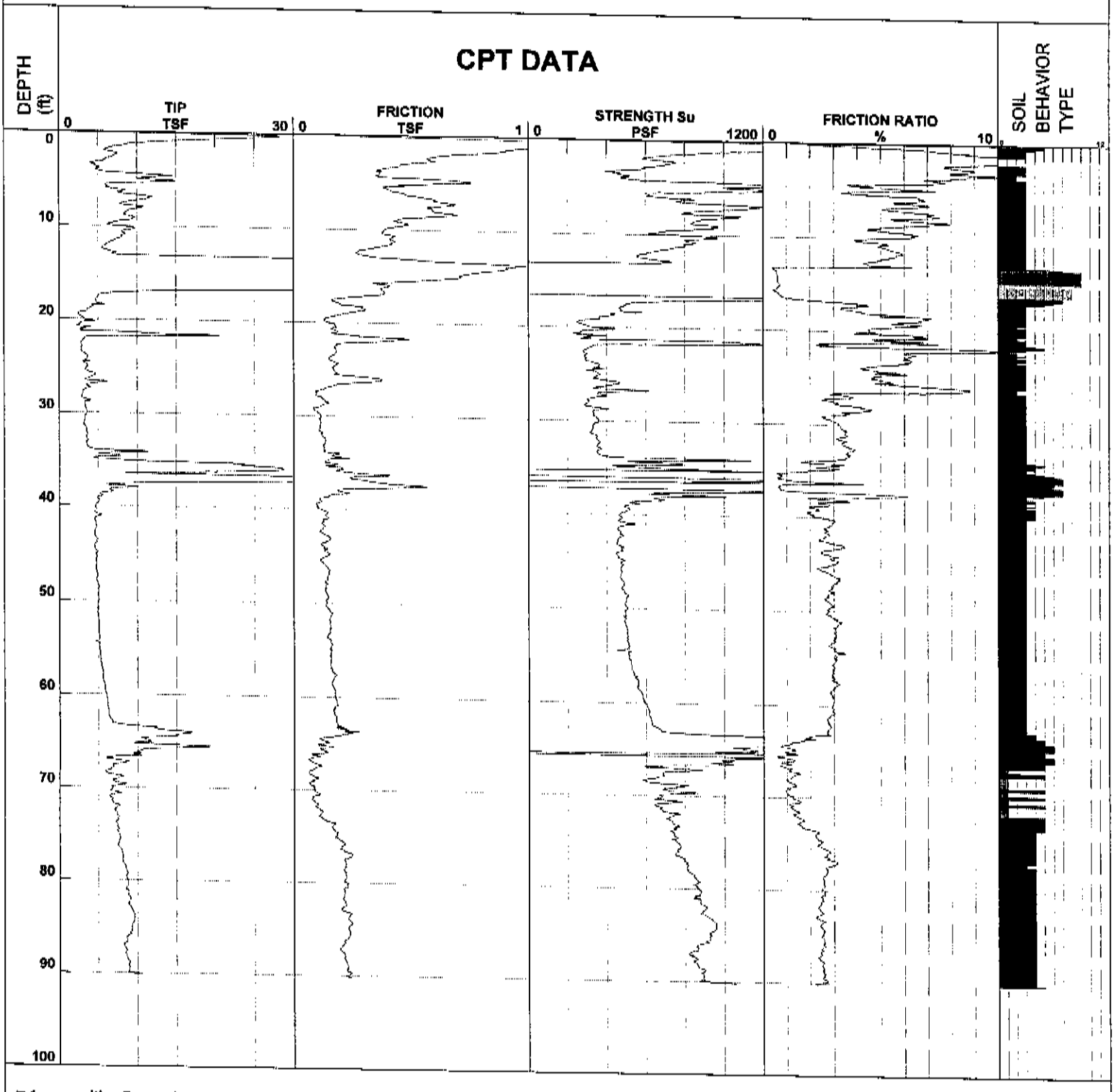
*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-08CL	Coordinates	90 53' 16.0"N 90 08' 47.6"W
Operator	HERBERT JACKSON	Date and Time	24-Feb-2007 14:38:23	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	



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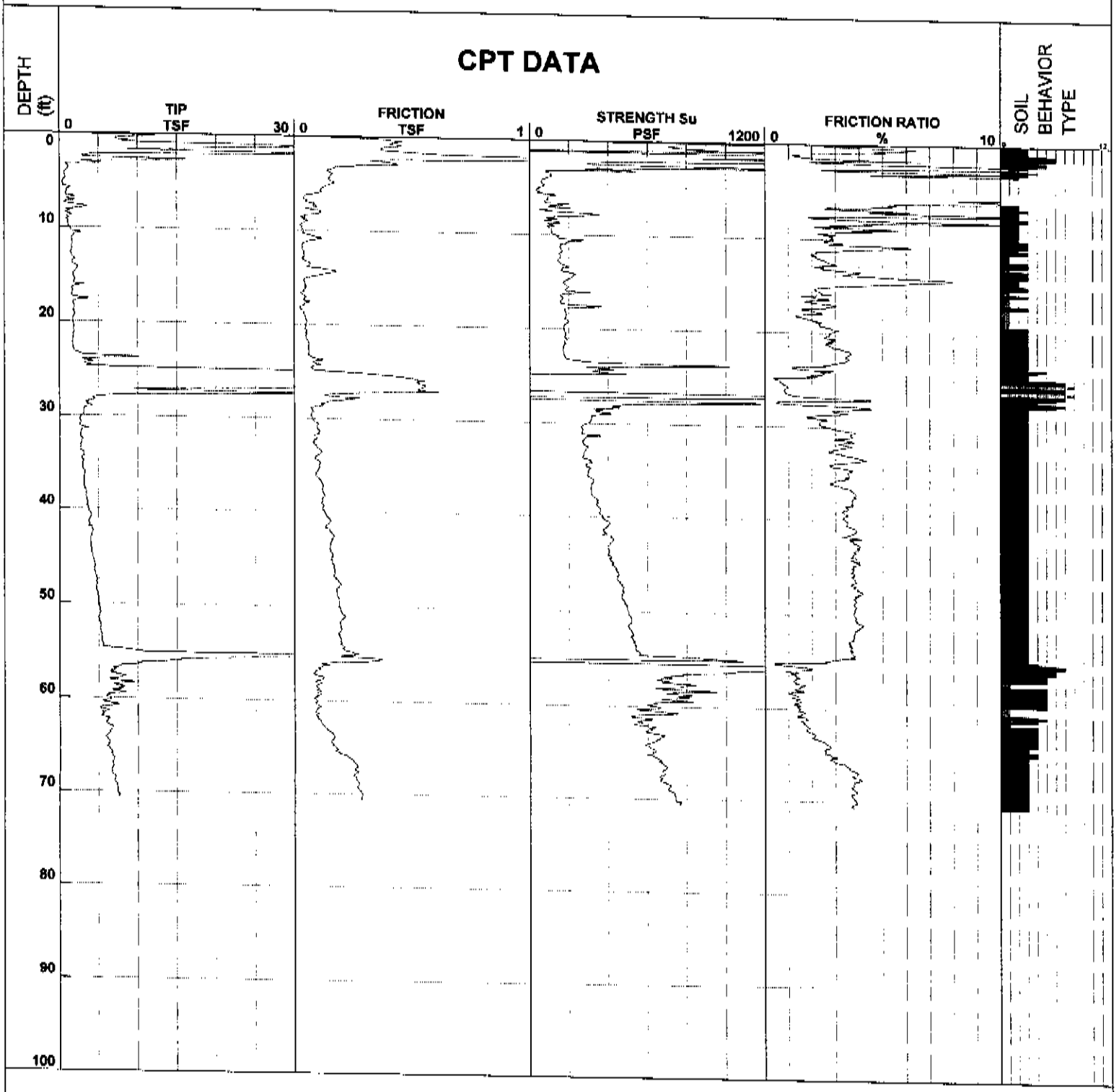
*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-08PT	Coordinates	29 53' 16.6"N 90 8' 47.8"W
Operator	JIM BANDLE	Date and Time	25-Feb-2007 12:18:04	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	



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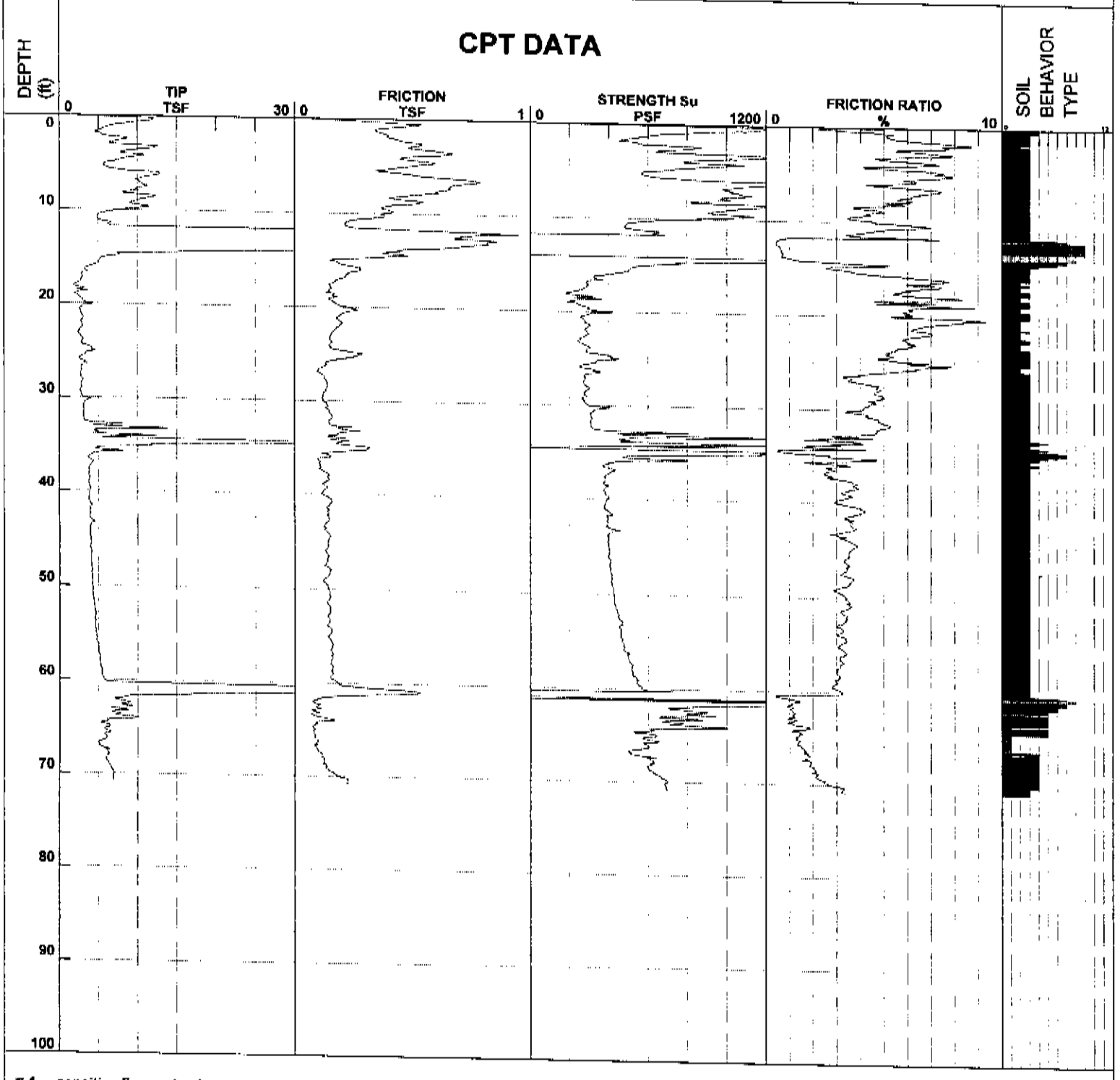
*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-09CL	Coordinates	29 53' 13.9"N 90 8' 36.6"W
Operator	HERBERT JACKSON	Date and Time	25-Feb-2007 07:37:03	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	



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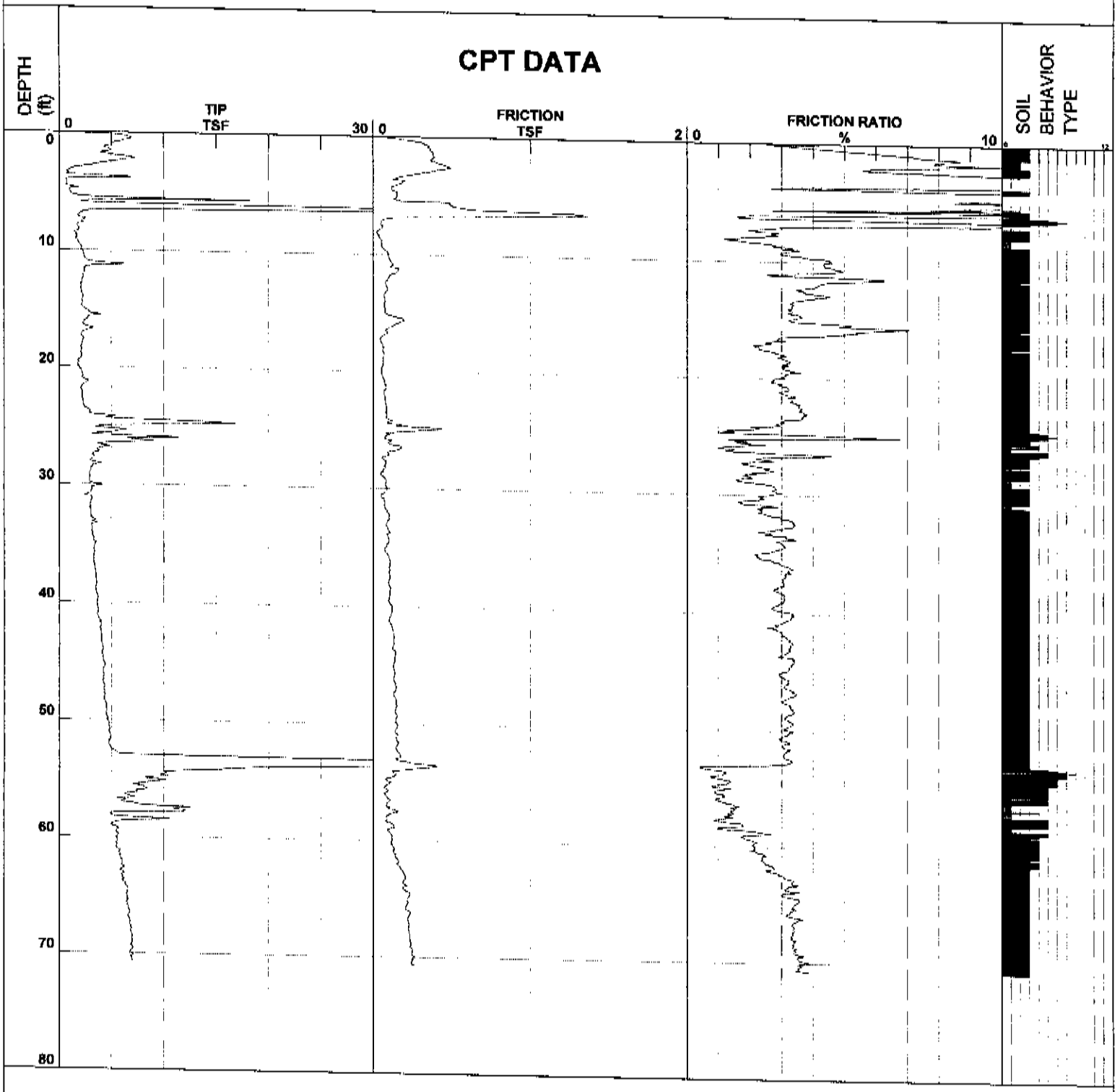
*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-09FT	Coordinates	29 53' 13.5"N 90 8' 36.8"W
Operator	JIM BANDLE	Date and Time	25-Feb-2007 15:48:36	Cone Number	F2.5CKEW2 1628
Client		Elevation		Water Table	



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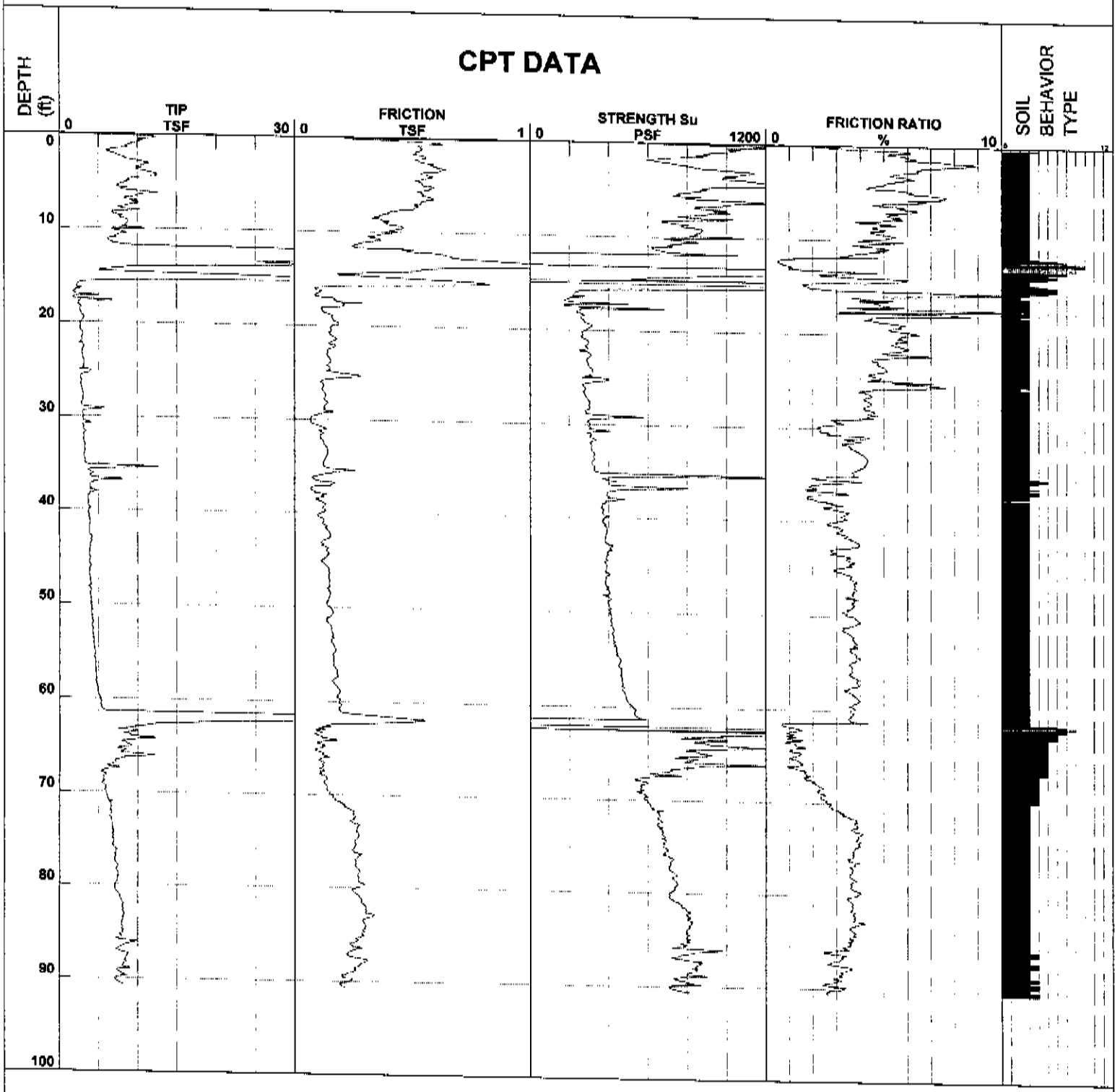
*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-10CL	Coordinates	29 53' 20.5"N 90 8' 25.3"W
Operator	JIM BANDLE	Date and Time	26-Feb-2007 10:37:35	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	



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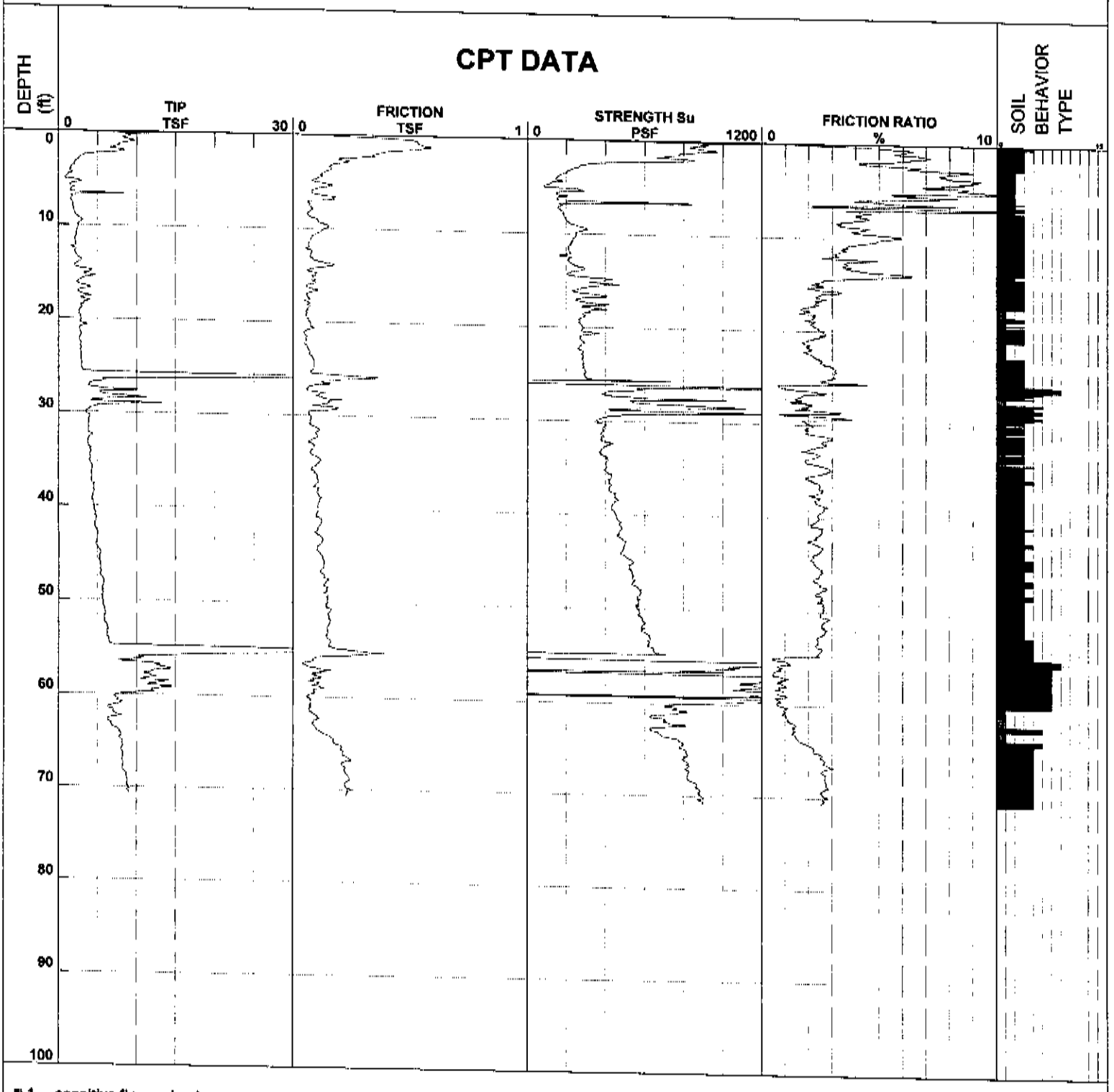
Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-10PT	Coordinates	29 53' 13.4"N 90 8' 25.5"W
Operator	JIM BANDLE	Date and Time	25-Feb-2007 09:16:42	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	



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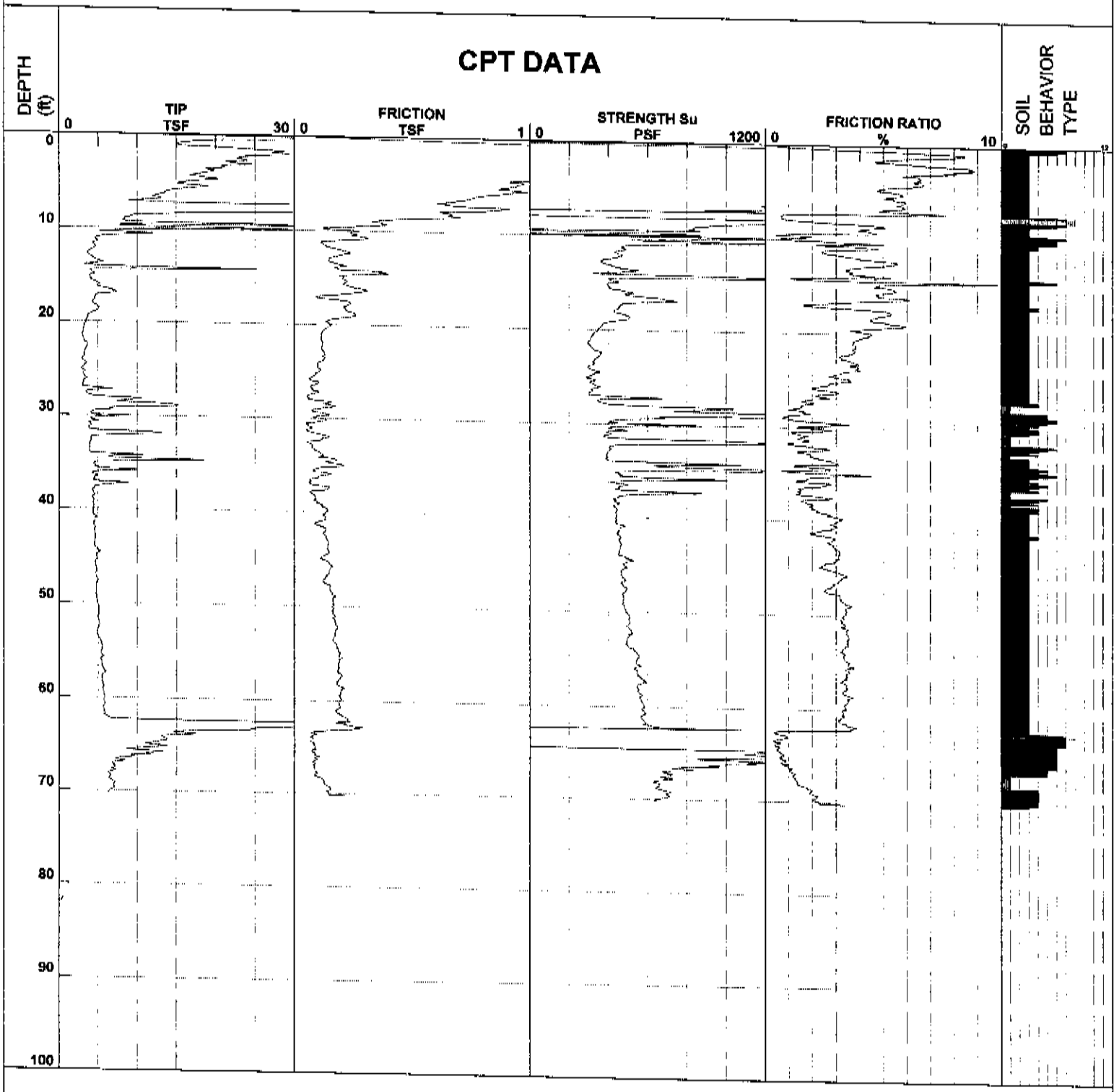
*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-11CL	Coordinates	29 53' 10.9"N 90 08' 14.0"W
Operator	HERBERT JACKSON	Date and Time	08-Mar-2007 08:20:49	Cone Number	F2.5CKE3S 1788
Client	USACE	Elevation		Water Table	



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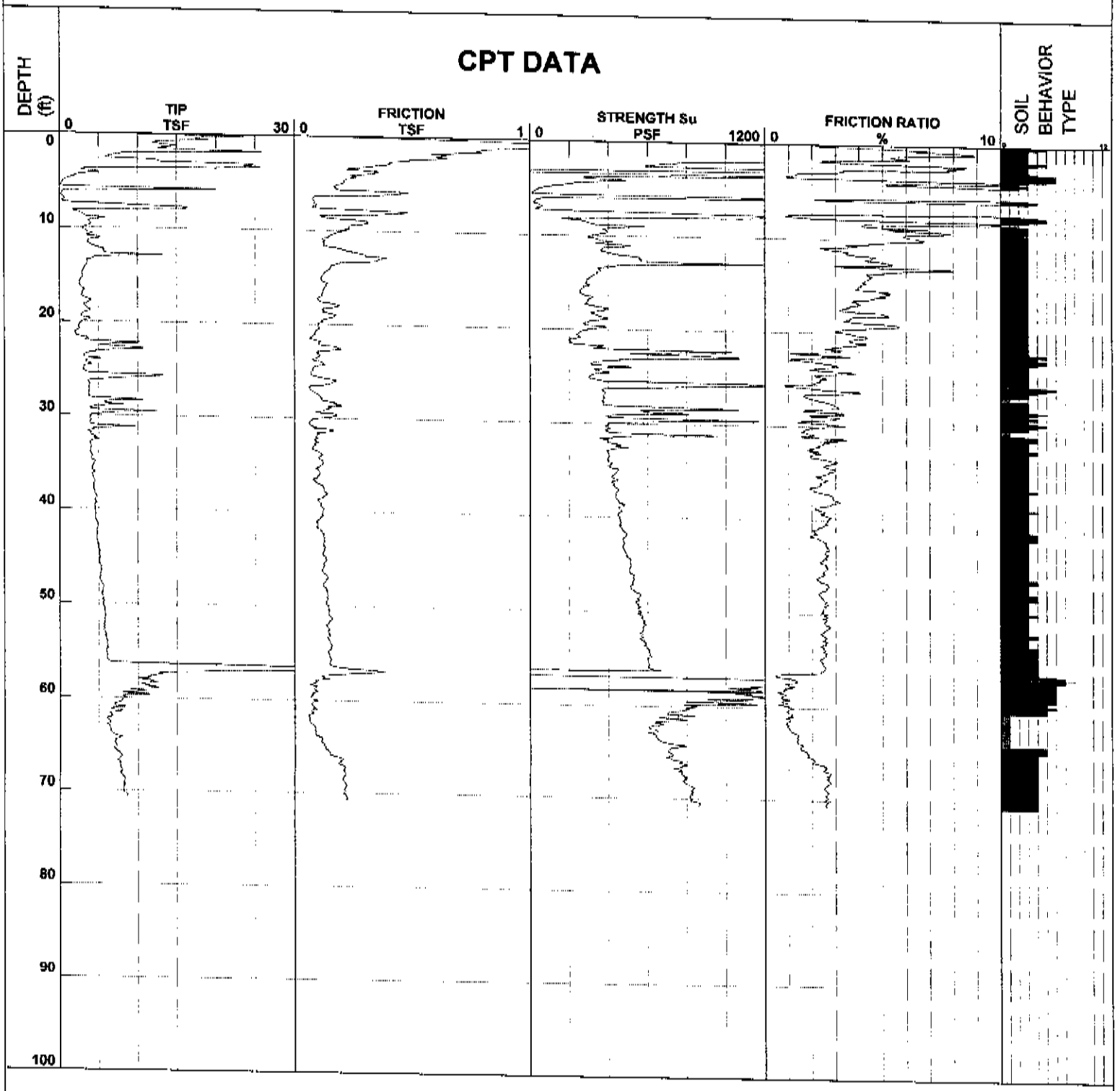
Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-11FT	Coordinates	29 53' 10.2"N 90 8' 14.1"W
Operator	JIM BANDLE	Date and Time	26-Feb-2007 12:33:52	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

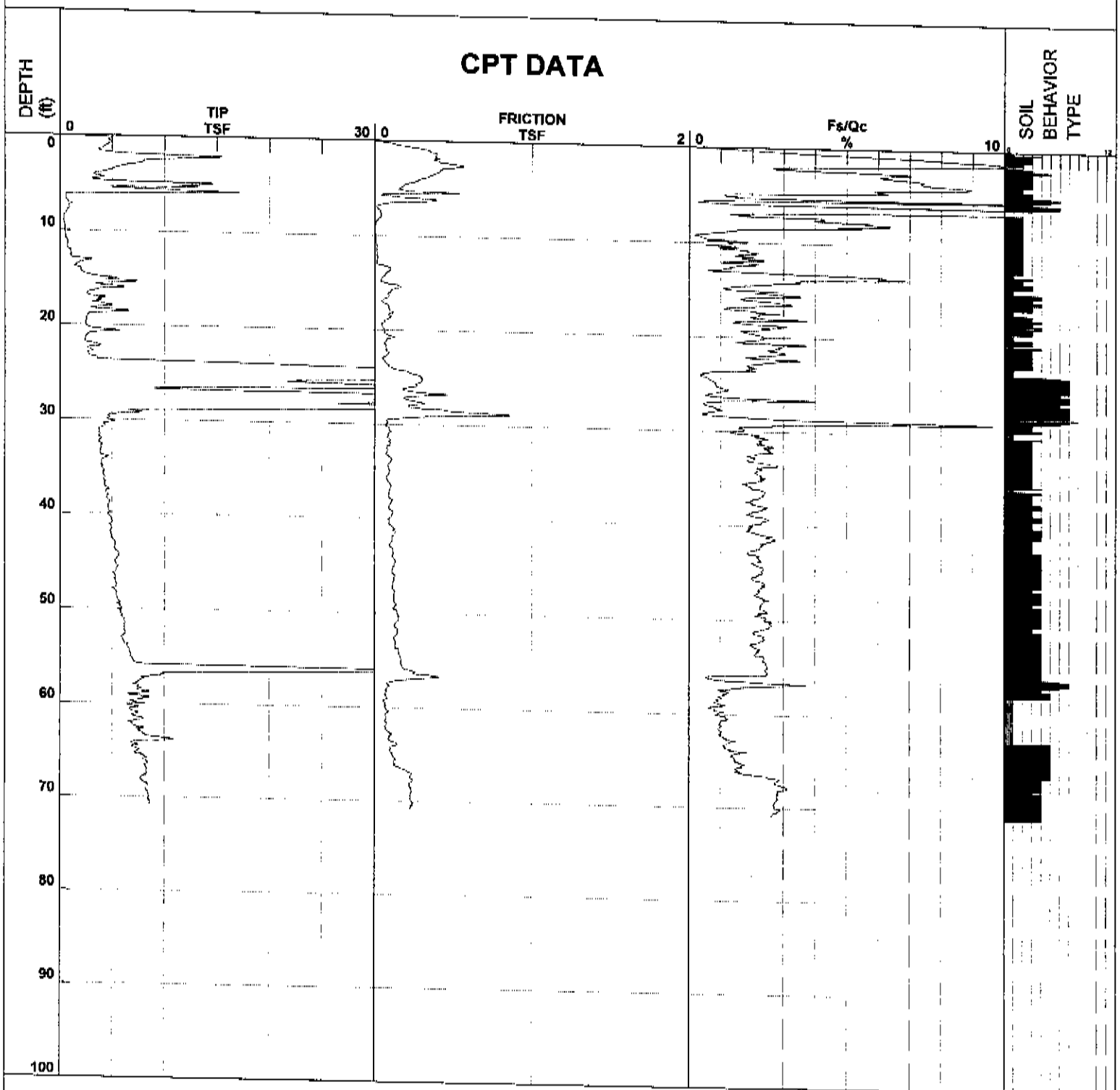


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-126FT	Coordinates	29 53' 20.5"N 90 53' 15.5"W
Operator	JIM BANDLE	Date and Time	26-Feb-2007 08:53:55	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

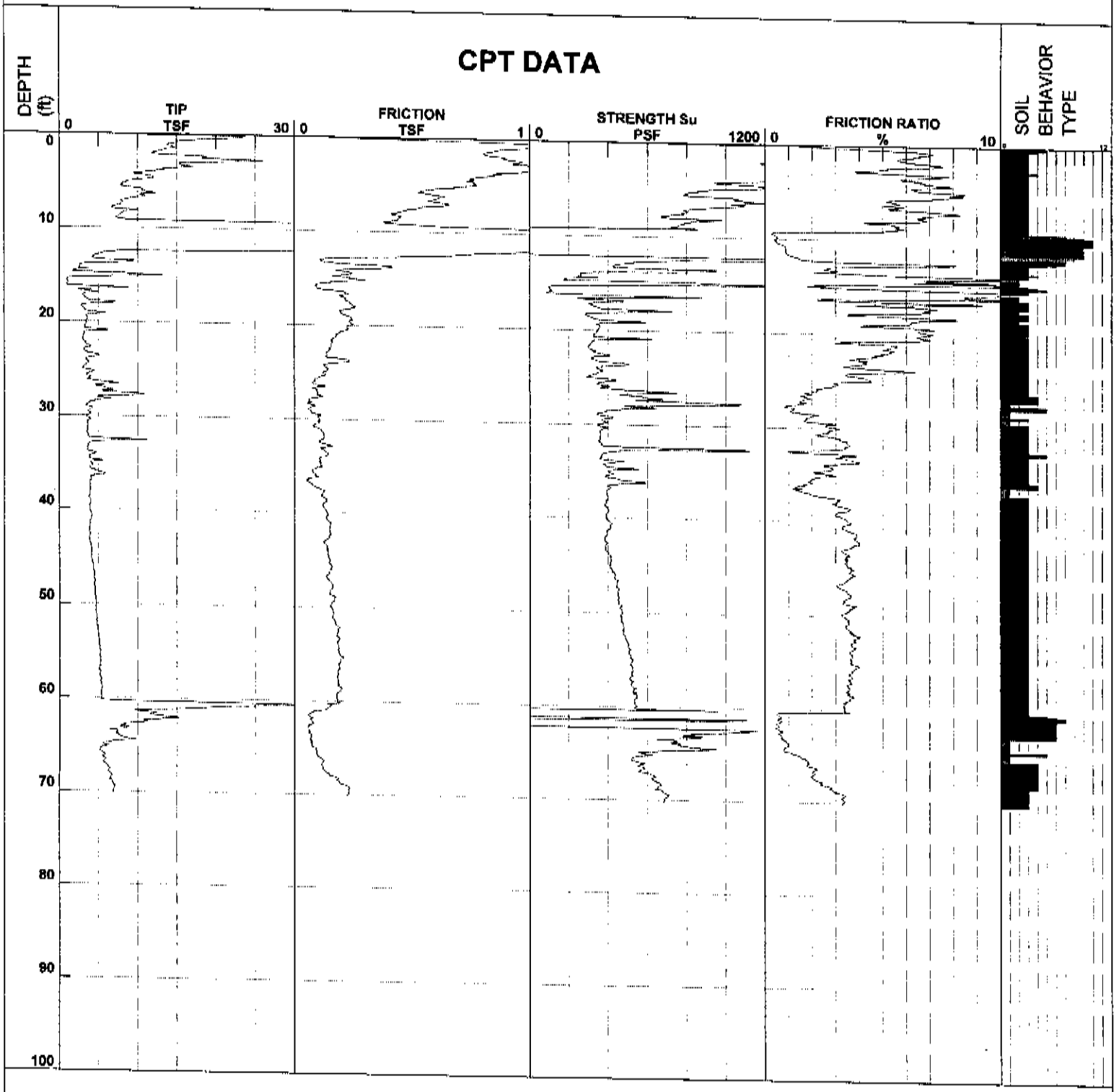


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-13CL	Coordinates	29 52' 57.6"N 90 08' 07.5"W
Operator	HERBERT JACKSON	Date and Time	08-Mar-2007 12:02:00	Cone Number	F2.5CKE3S 1788
Client	USACE	Elevation		Water Table	

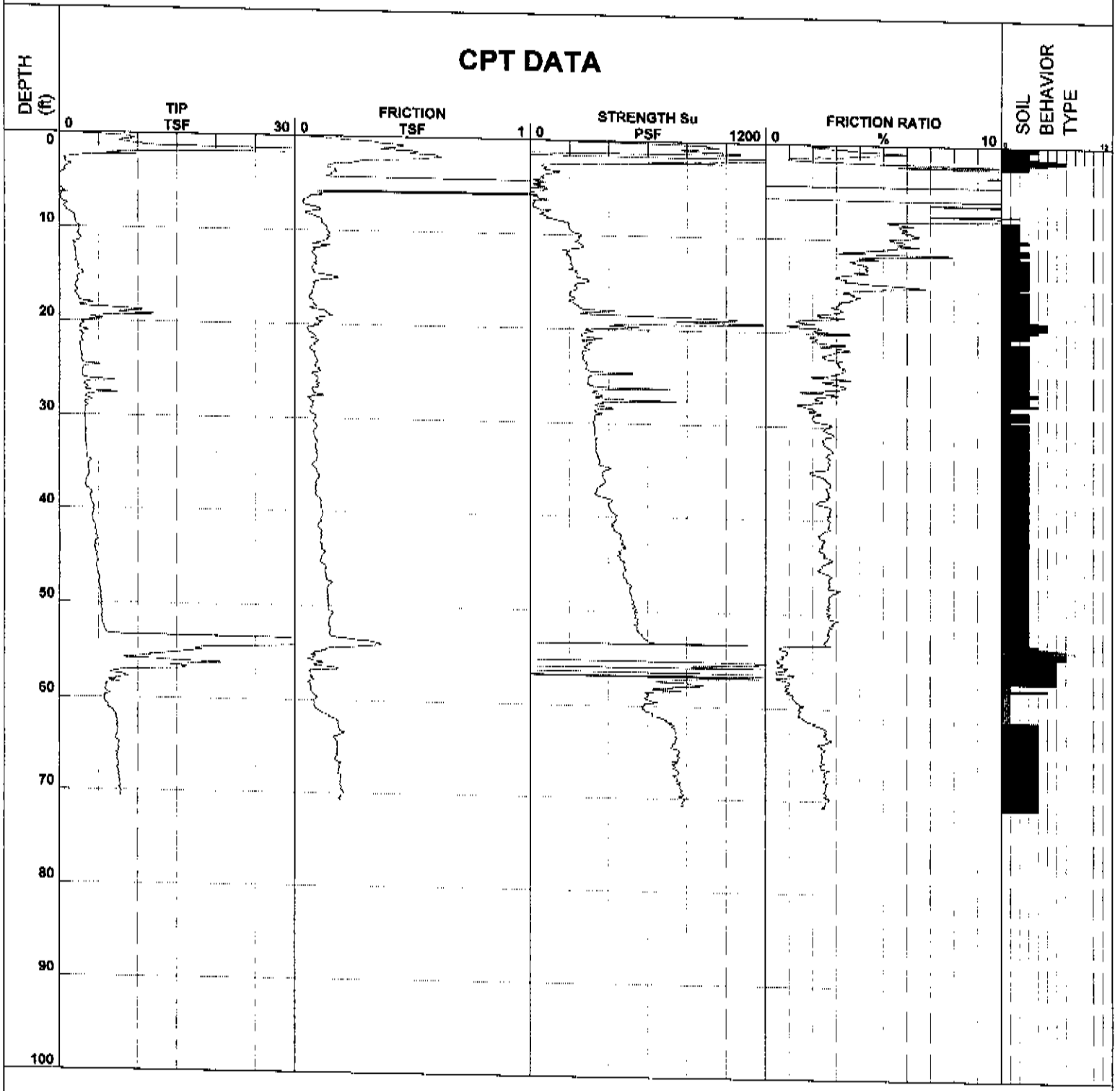


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-13FT	Coordinates	29 52' 57.1"N 90 8' 8.2"W
Operator	JIM BANDLE	Date and Time	26-Feb-2007 14:15:33	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

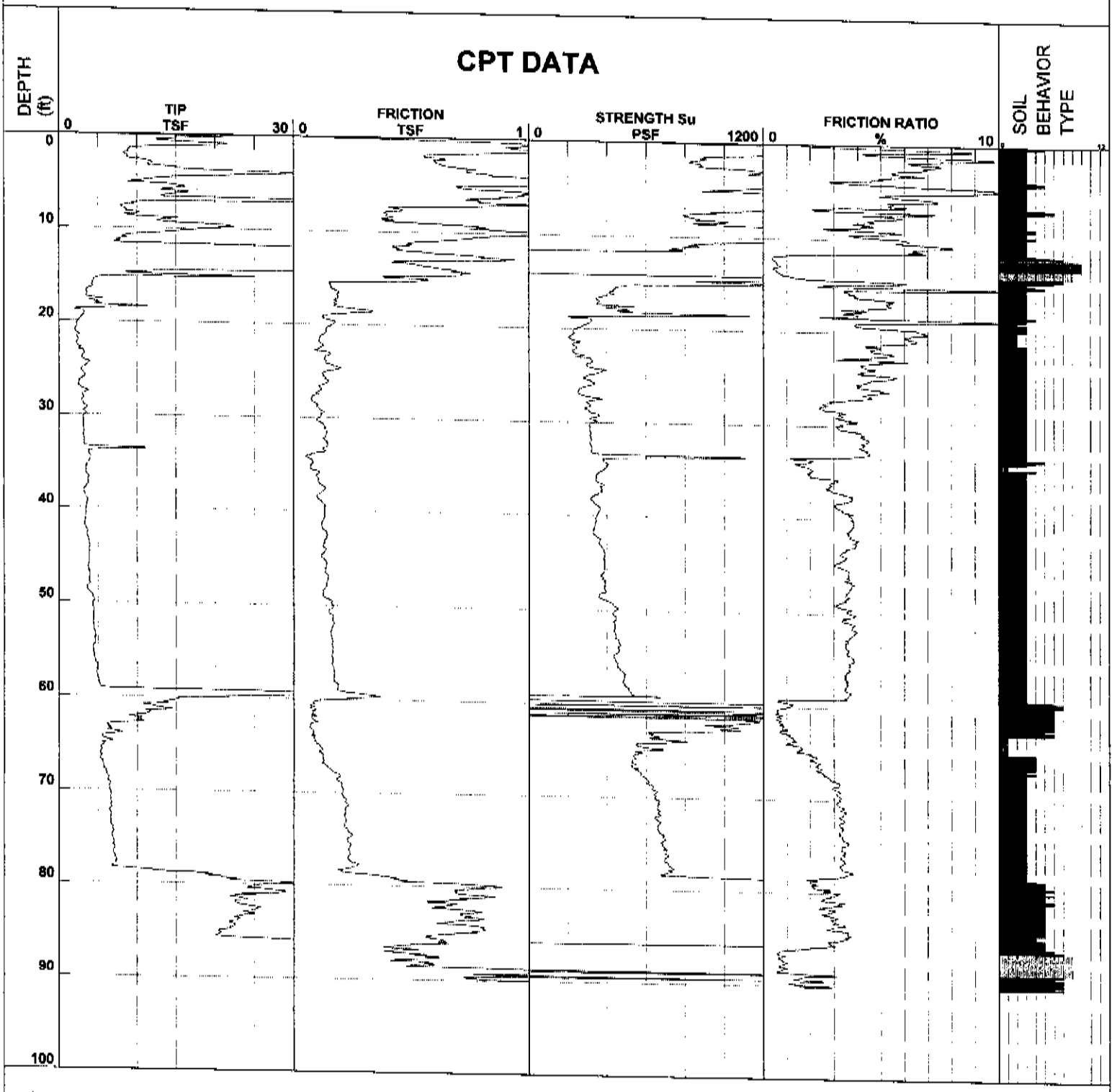


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-14CL	Coordinates	29 52' 47.9"N 90 08' 10.7"W
Operator	HERBERT JACKSON	Date and Time	08-Mar-2007 14:03:45	Cone Number	F2.5CKE3S 1788
Client	USACE	Elevation		Water Table	

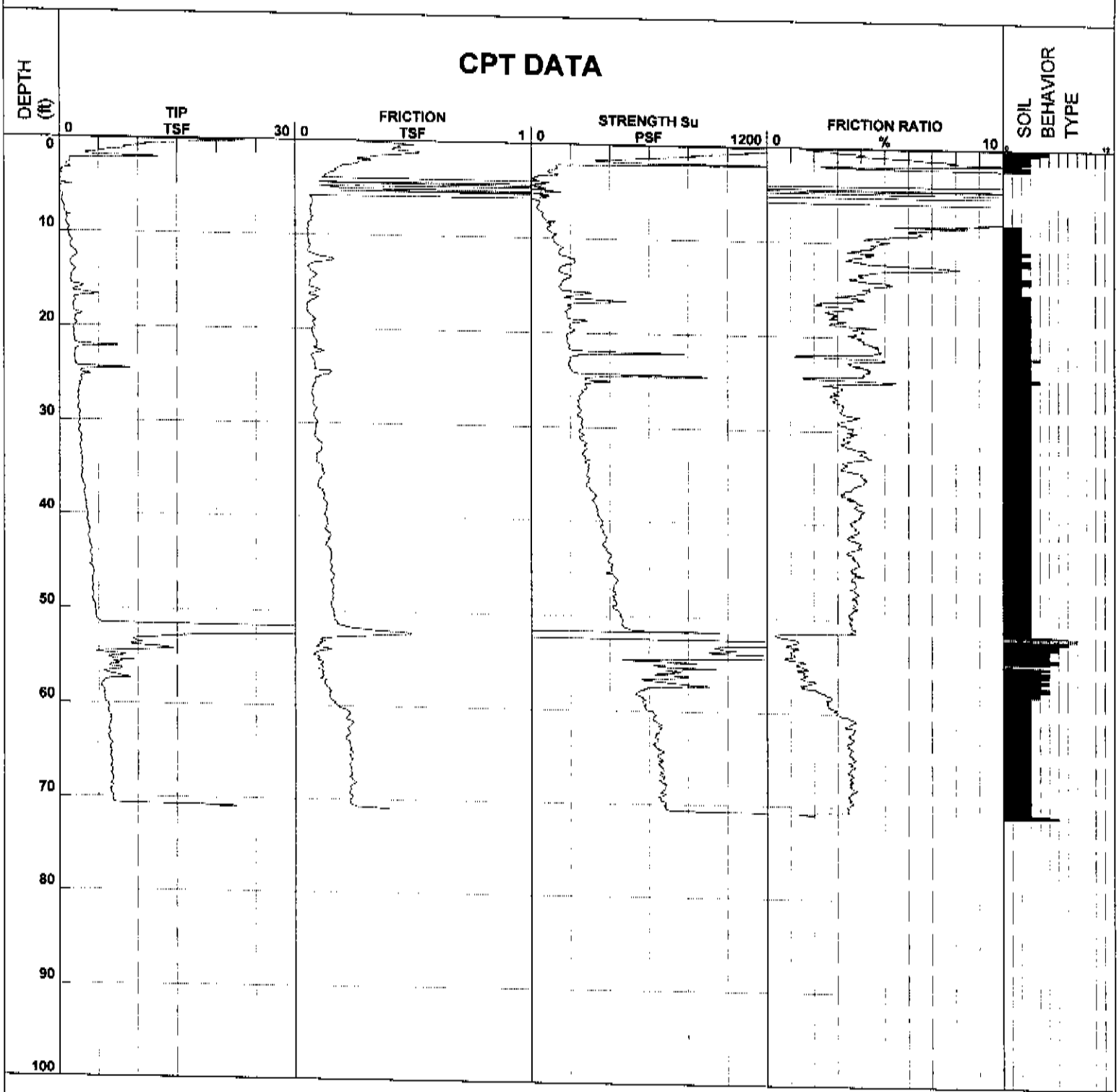


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-14PT	Coordinates	29 52' 46.9"N 90 08' 09.4"W
Operator	Albert Fonseca	Date and Time	27-Feb-2007 09:50:24	Cone Number	F2.5CKEW2 1636
Client	USACE	Elevation		Water Table	

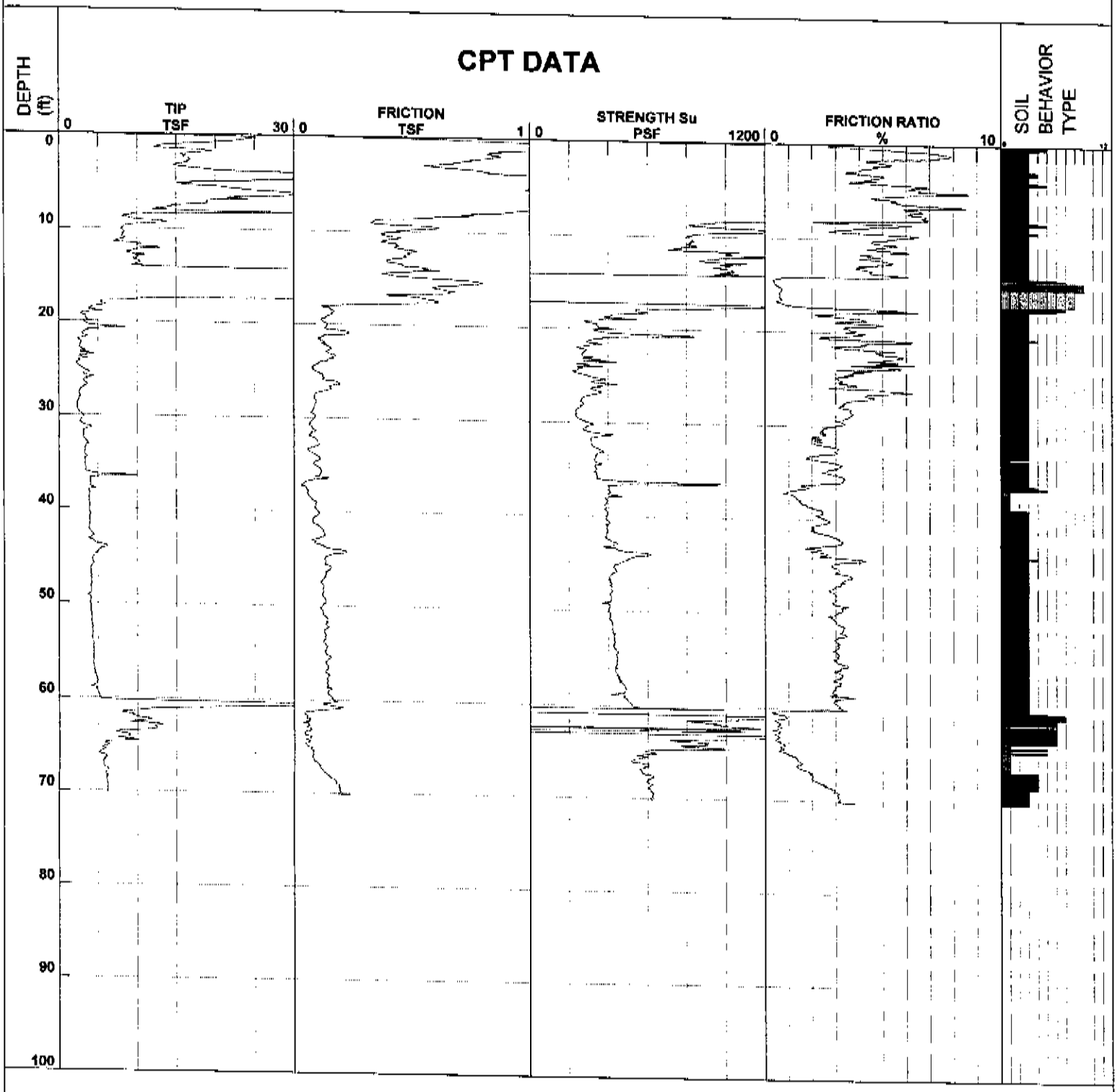


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-15CL	Coordinates	29 52' 38.1"N 90 08' 13.9"W
Operator	HERBERT JACKSON	Date and Time	08-Mar-2007 15:24:42	Cone Number	F2.5CKE3S 1788
Client	USACE	Elevation		Water Table	

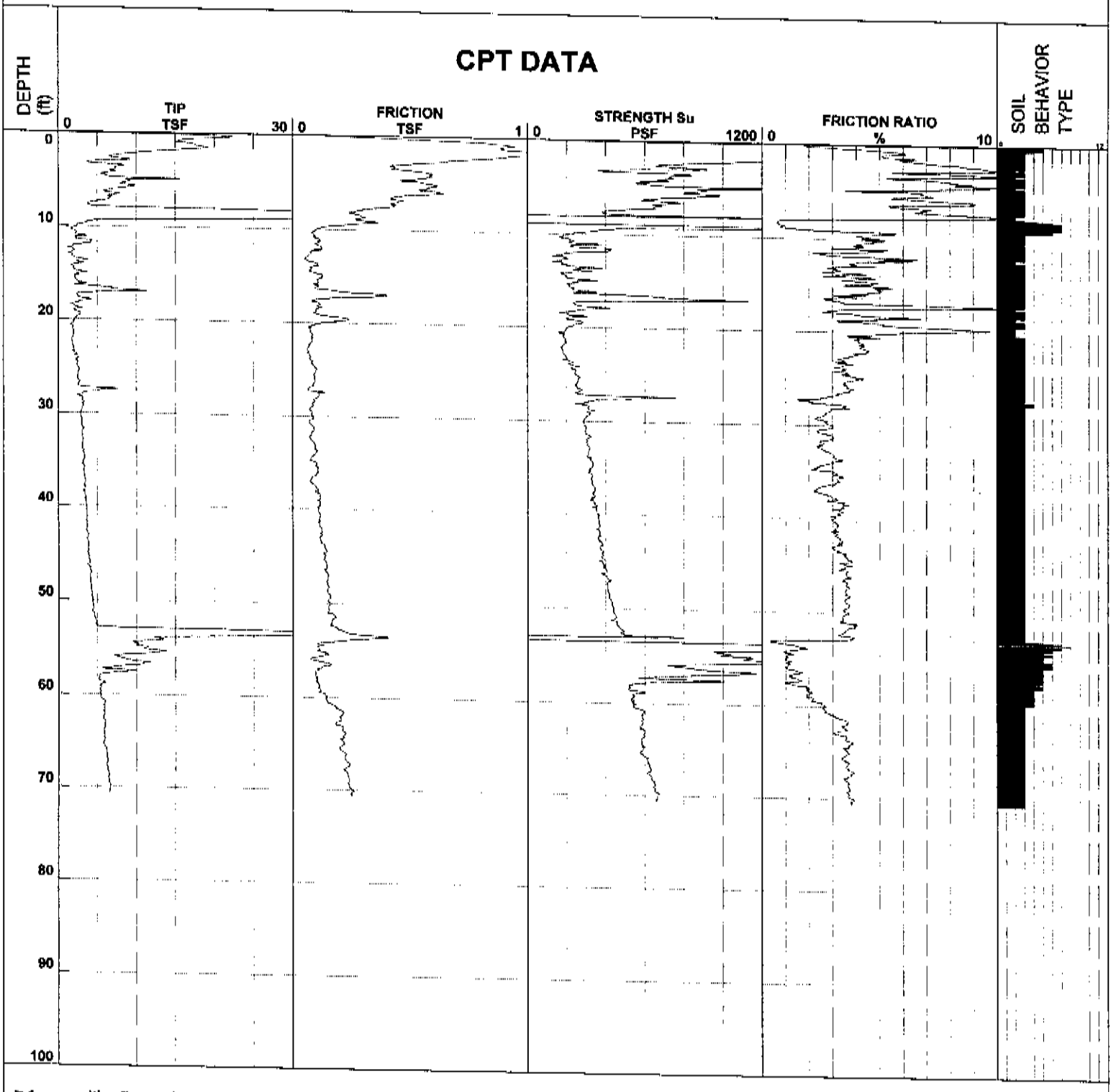


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-15FT	Coordinates	29 52' 37.8"N 90 8' 14.6"W
Operator	JIM BANDLE	Date and Time	26-Feb-2007 15:25:55	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

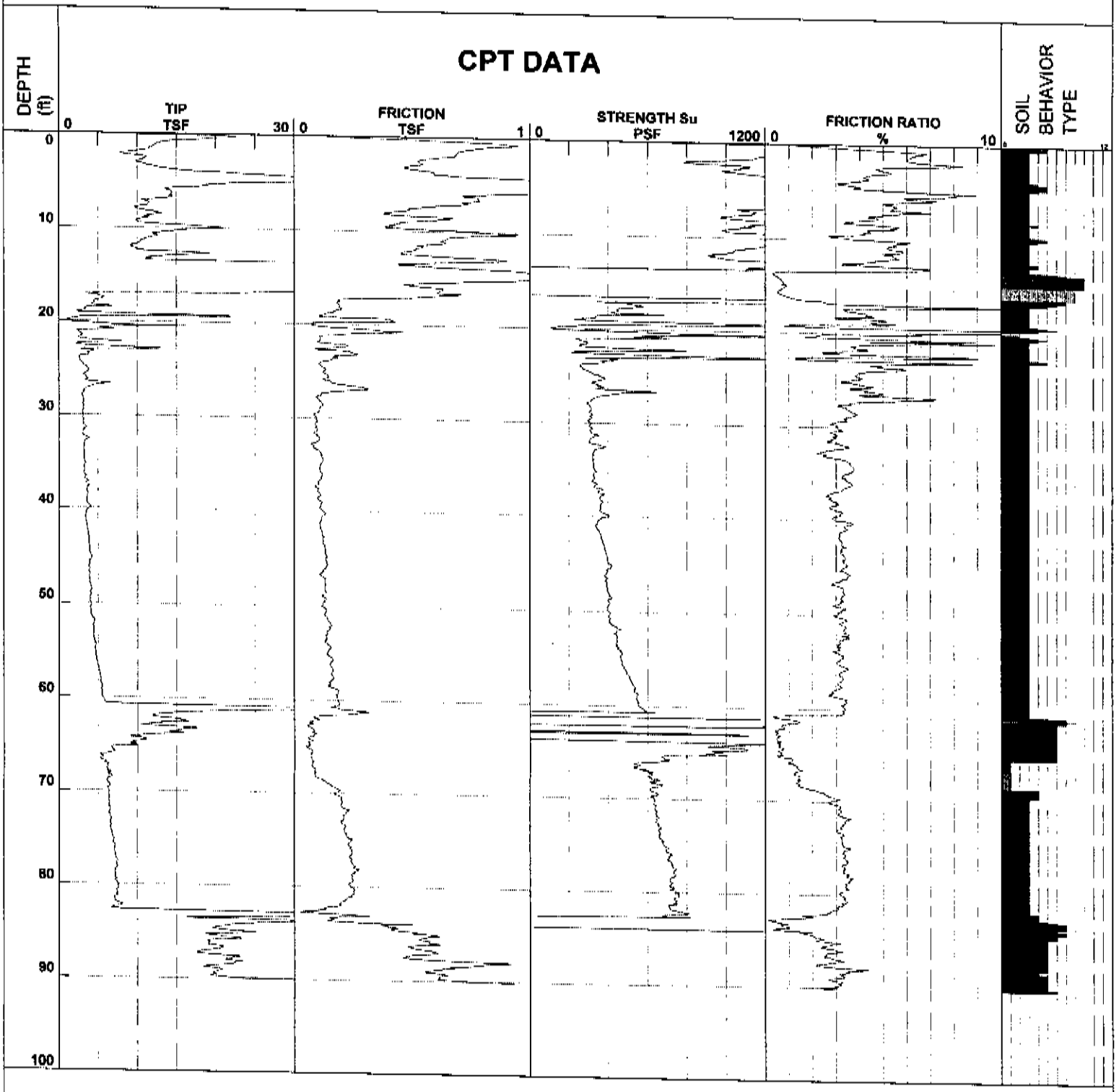


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-16CL	Coordinates	29 52' 28.8"N 90 08' 16.8"W
Operator	HERBERT JACKSON	Date and Time	09-Mar-2007 09:19:35	Cone Number	F2.5CKE3S 1788
Client	USACE	Elevation		Water Table	

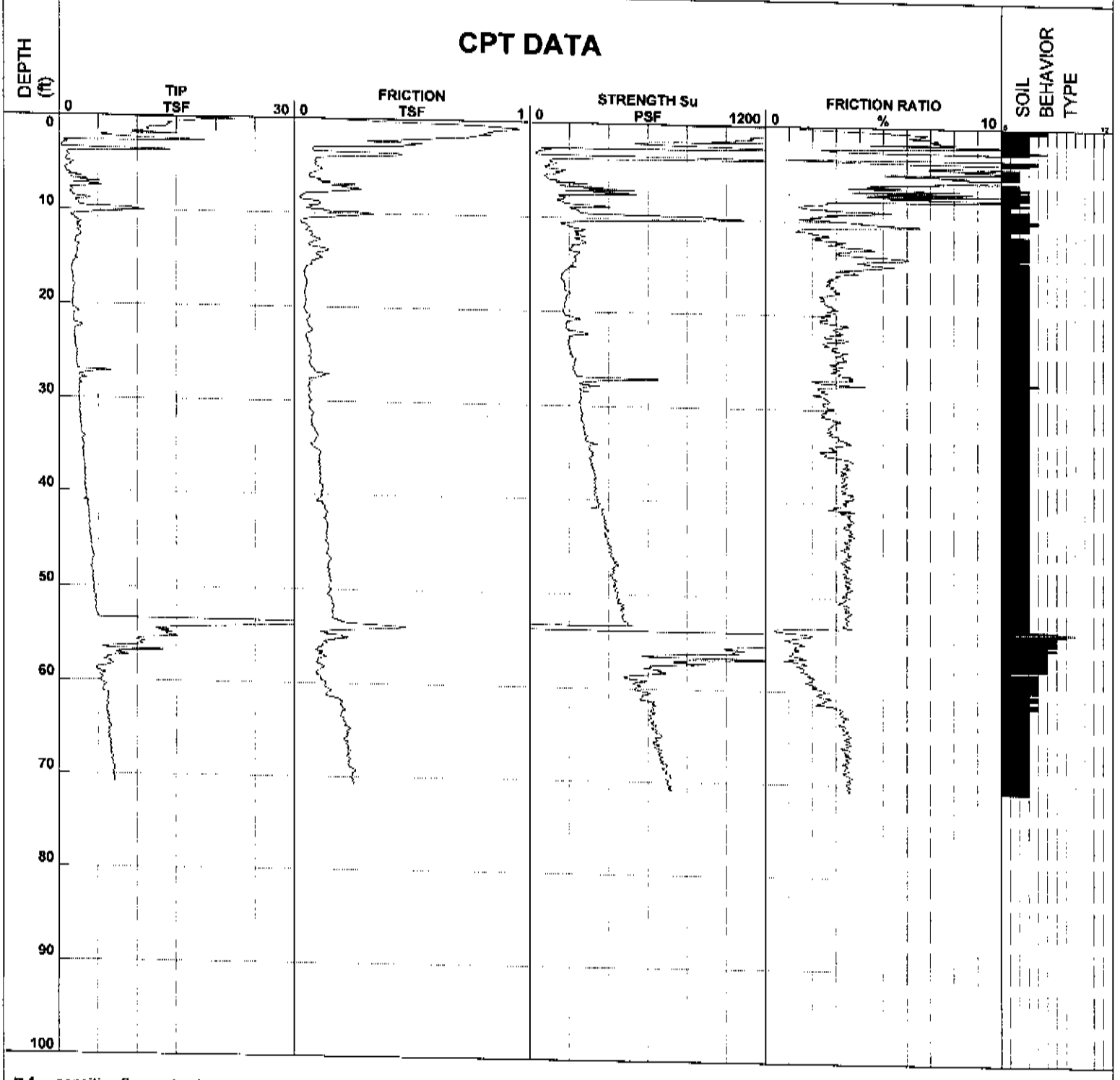


■ 1 - sensitive fine grained
■ 2 - organic material
■ 3 - clay
■ 4 - silty clay to clay
■ 5 - clayey silt to silty clay
■ 6 - sandy silt to clayey silt
■ 7 - silty sand to sandy silt
■ 8 - sand to silty sand
■ 9 - sand
■ 10 - gravelly sand to sand
■ 11 - very stiff fine grained (*)
■ 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-16PT	Coordinates	29 52' 28.3"N 90 08' 16.6"W
Operator	Albert Fonseca	Date and Time	27-Feb-2007 08:09:23	Cone Number	F2.5CKEW2 1636
Client	USACE	Elevation		Water Table	

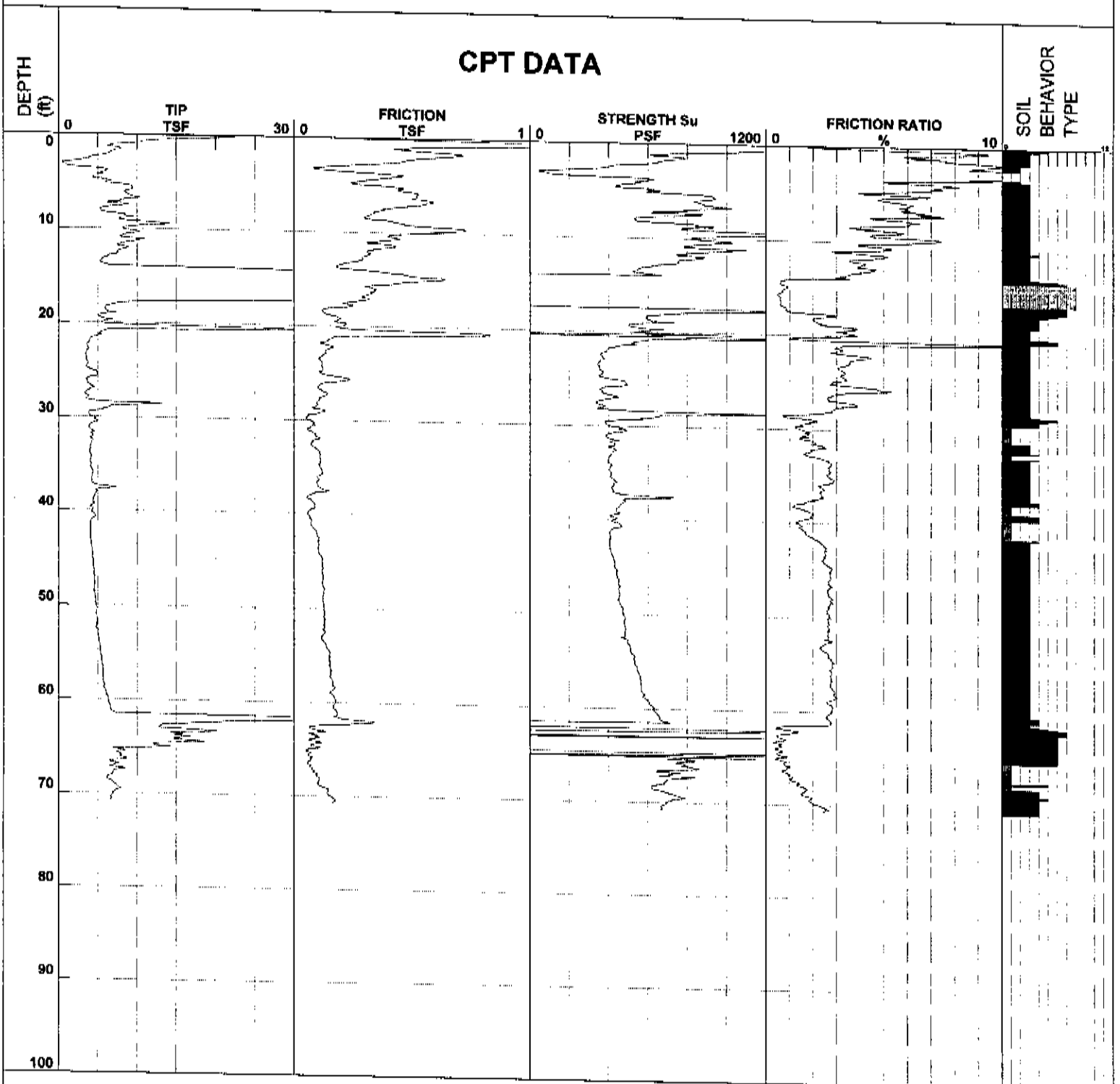


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-17CL	Coordinates	29 52' 22.2"N 90 8' 16.7"W
Operator	JIM BANDLE	Date and Time	06-Mar-2007 09:23:01	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

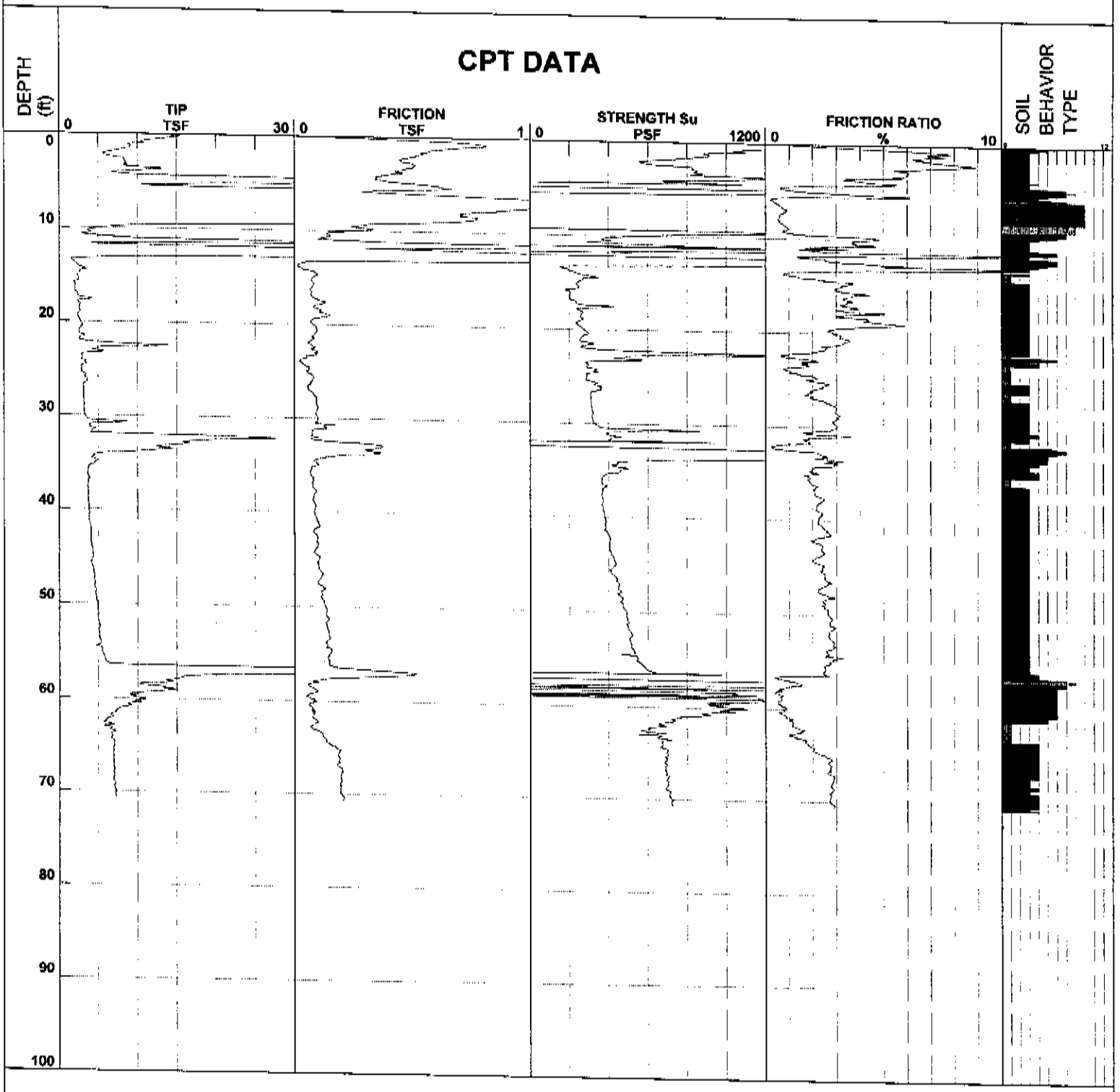


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-17FT	Coordinates	29 52' 19.9"N 90 8' 7.5"W
Operator	JIM BANDLE	Date and Time	08-Mar-2007 12:02:22	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

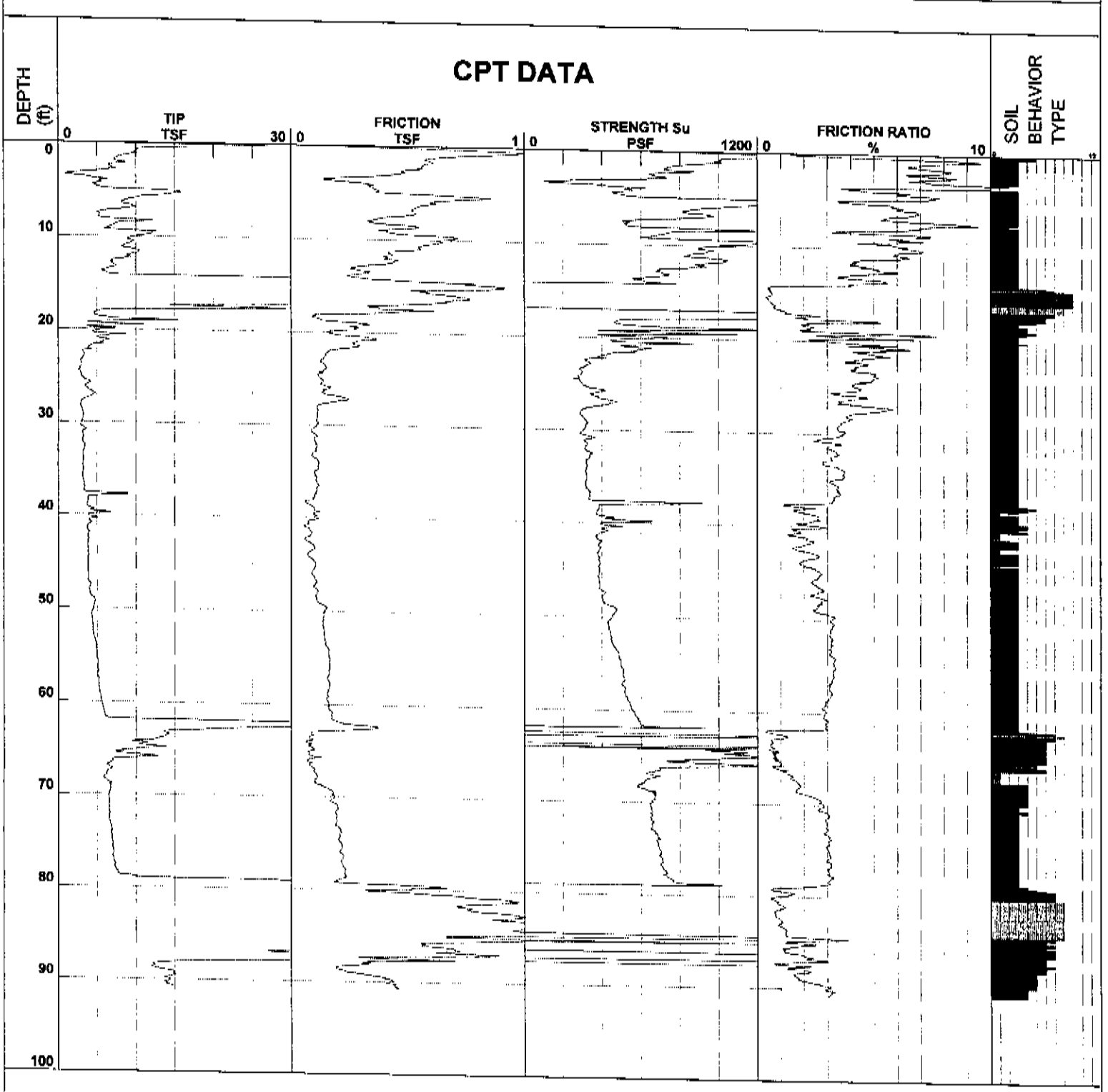


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-18CL	Coordinates	29 52' 21.9"N 90 7' 55.9"W
Operator	JIM BANDLE	Date and Time	06-Mar-2007 10:34:19	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

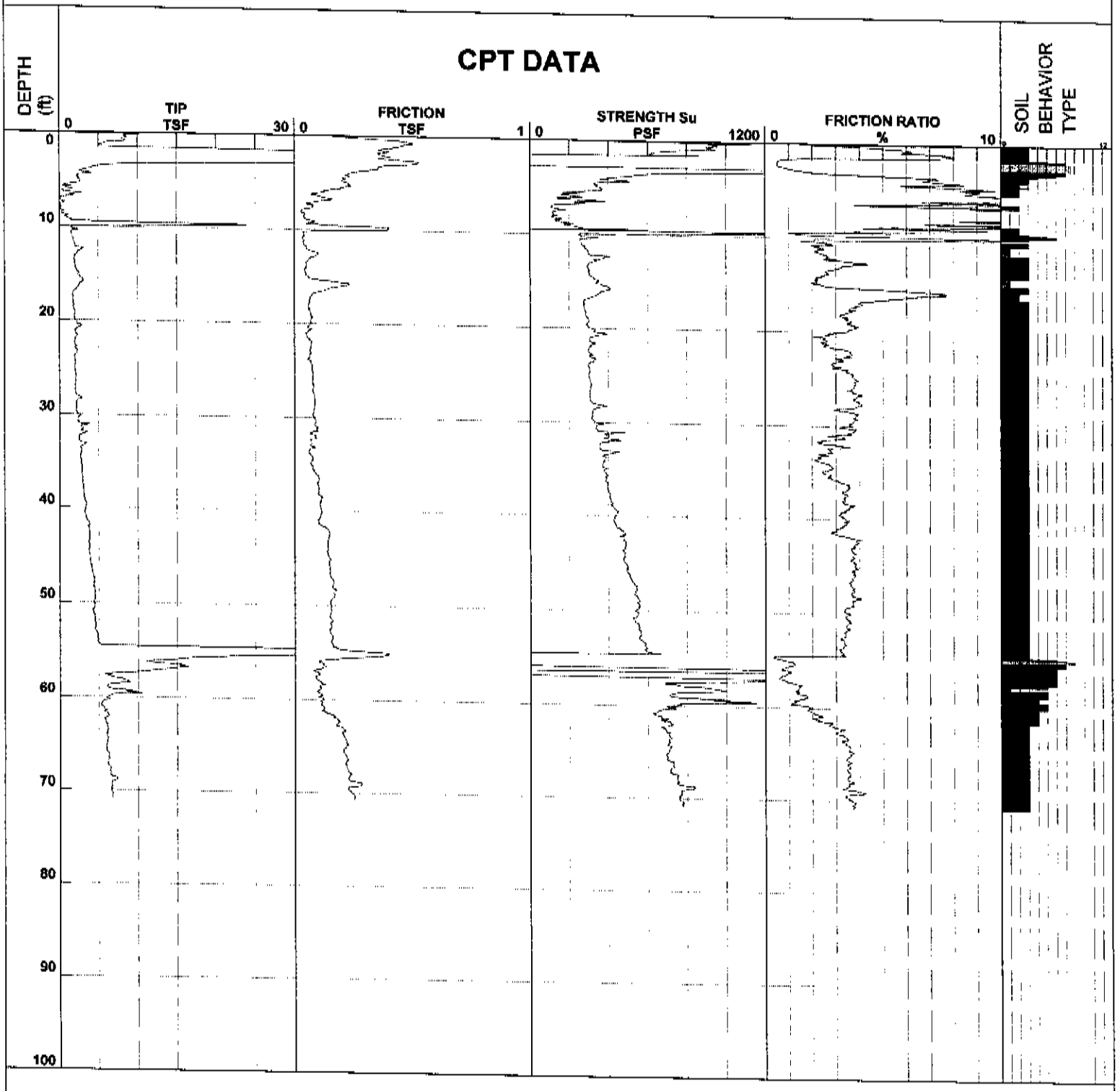


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-18PT	Coordinates	29 52' 20.8"N 90 07' 55.7"W
Operator	Albert Fonseca	Date and Time	27-Feb-2007 11:24:50	Cone Number	F2.5CKEW2 1636
Client	USACE	Elevation		Water Table	

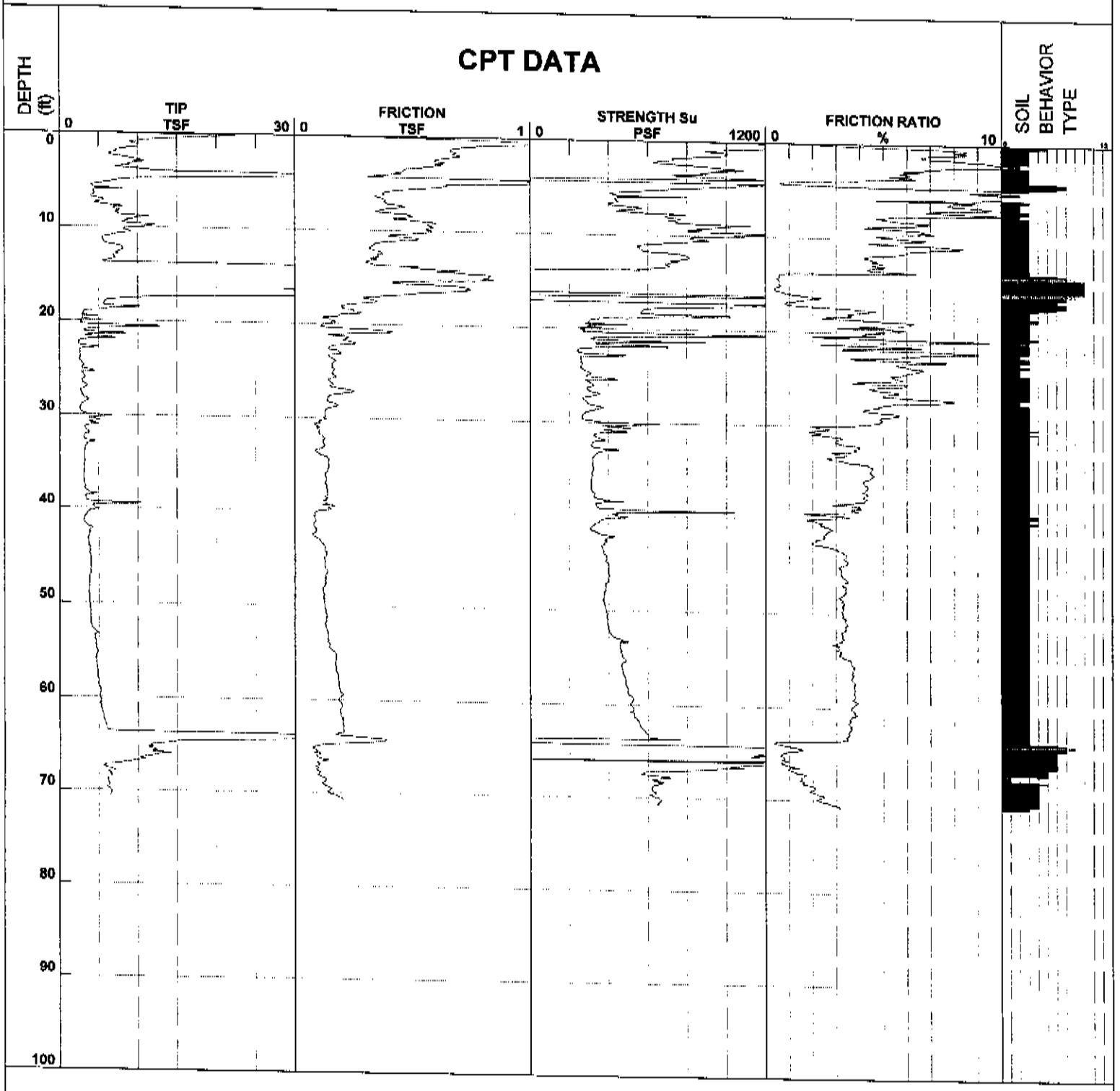


1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-19CL	Coordinates	29 52' 20.3"N 90 7' 44.6"W
Operator	JIM BANDLE	Date and Time	01-Mar-2007 11:12:41	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

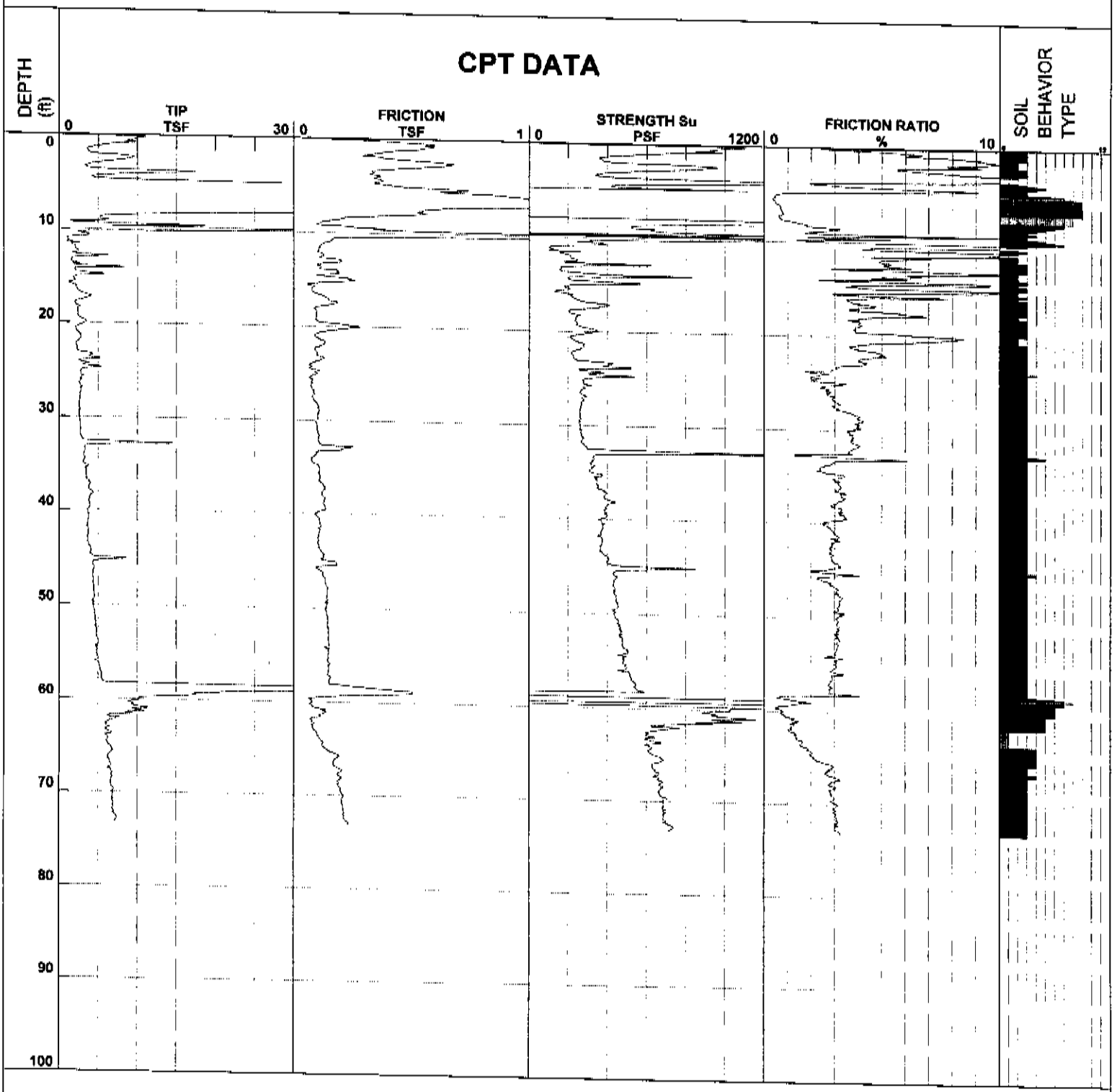


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-19FT	Coordinates	29 52' 18.4"N 90 7' 44.4"W
Operator	JIM BANDLE	Date and Time	27-Feb-2007 11:20:33	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

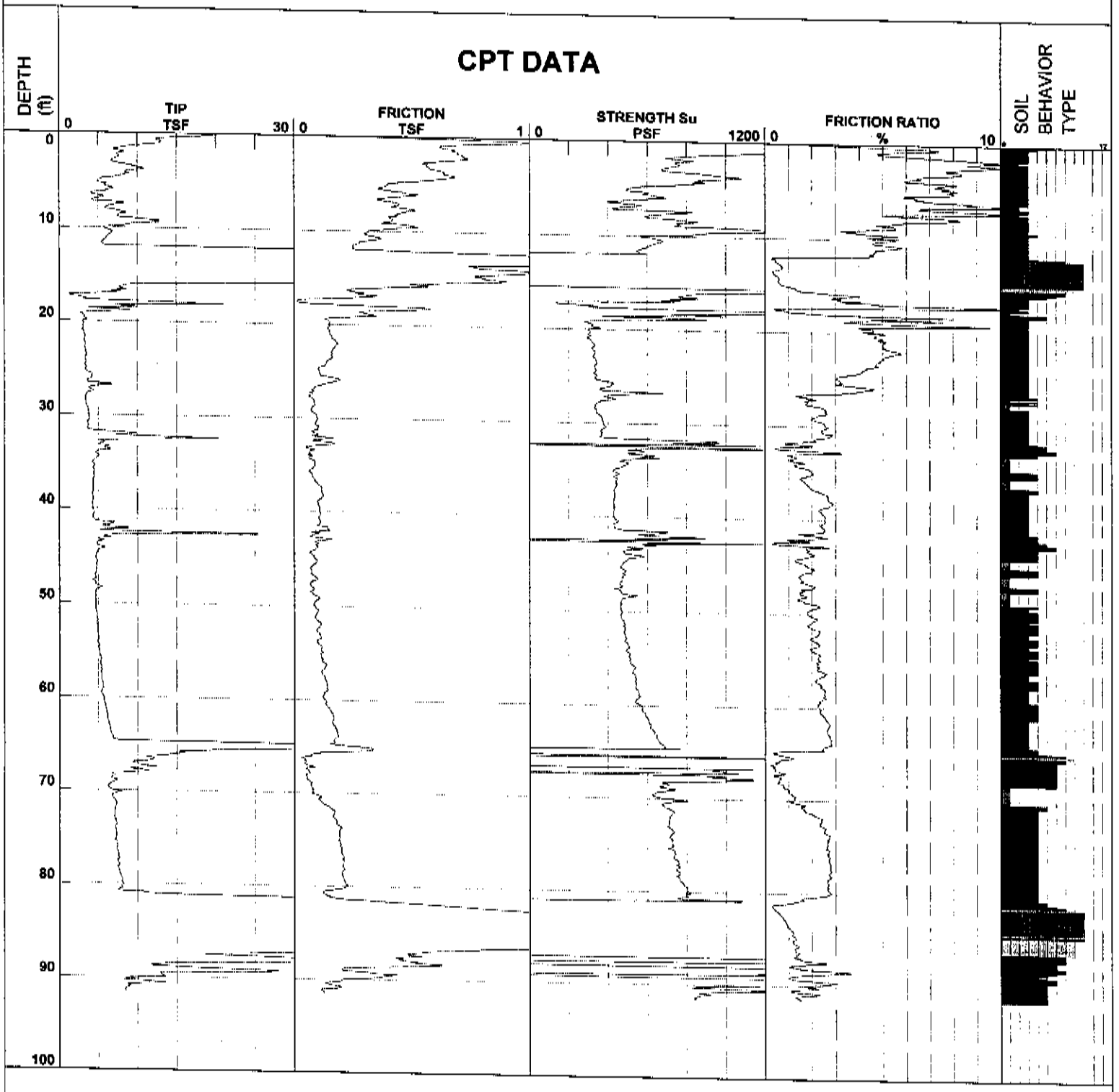


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-20CL	Coordinates	29 52' 19.7"N 90 7' 33.3"W
Operator	JIM BANDLE	Date and Time	01-Mar-2007 09:52:36	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

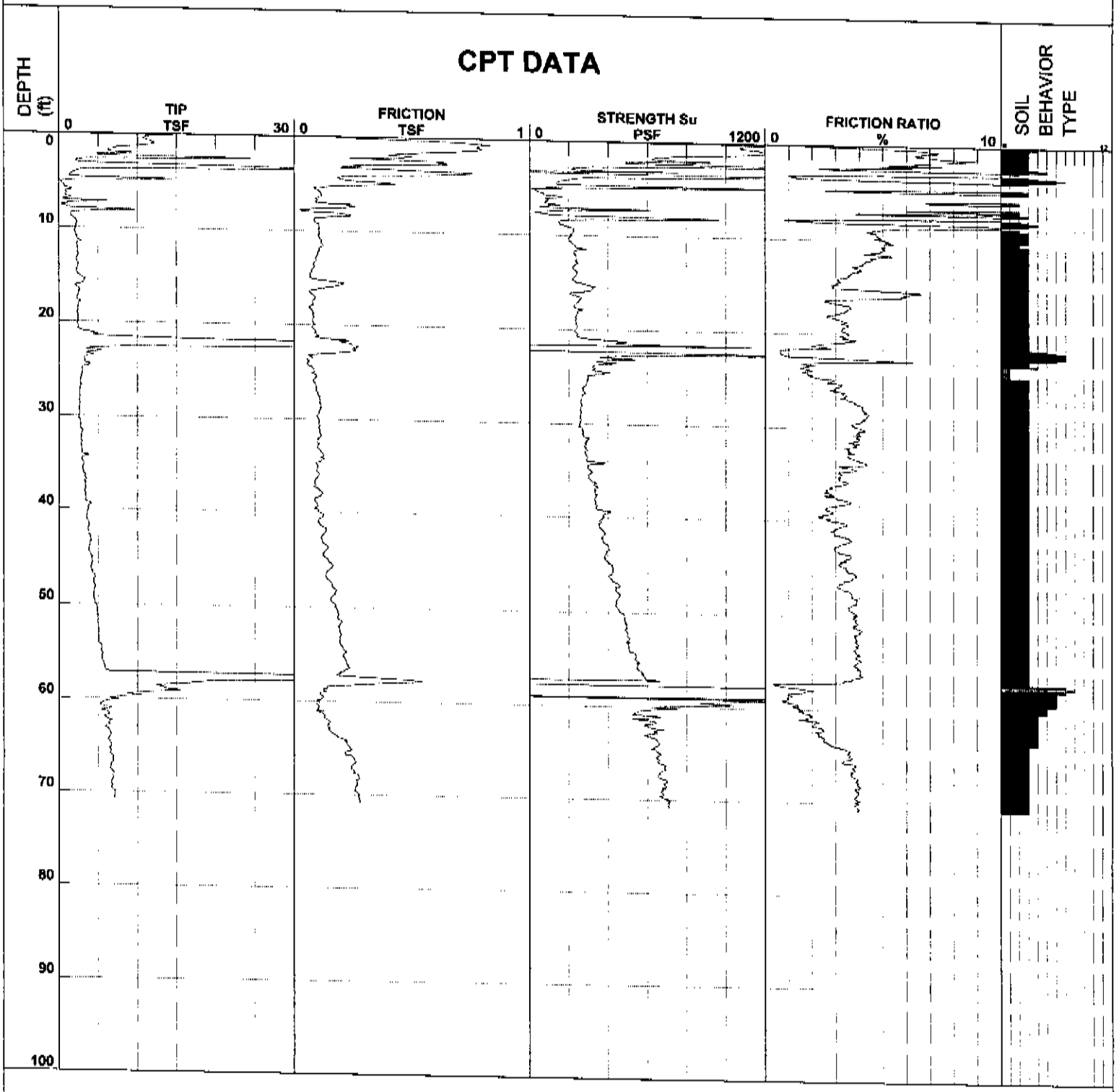


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-20PT	Coordinates	29 52' 19.3"N 90 07' 33.4"W
Operator	Albert Fonseca	Date and Time	27-Feb-2007 12:51:08	Cone Number	F2.5CKEW2 1636
Client	USACE	Elevation		Water Table	

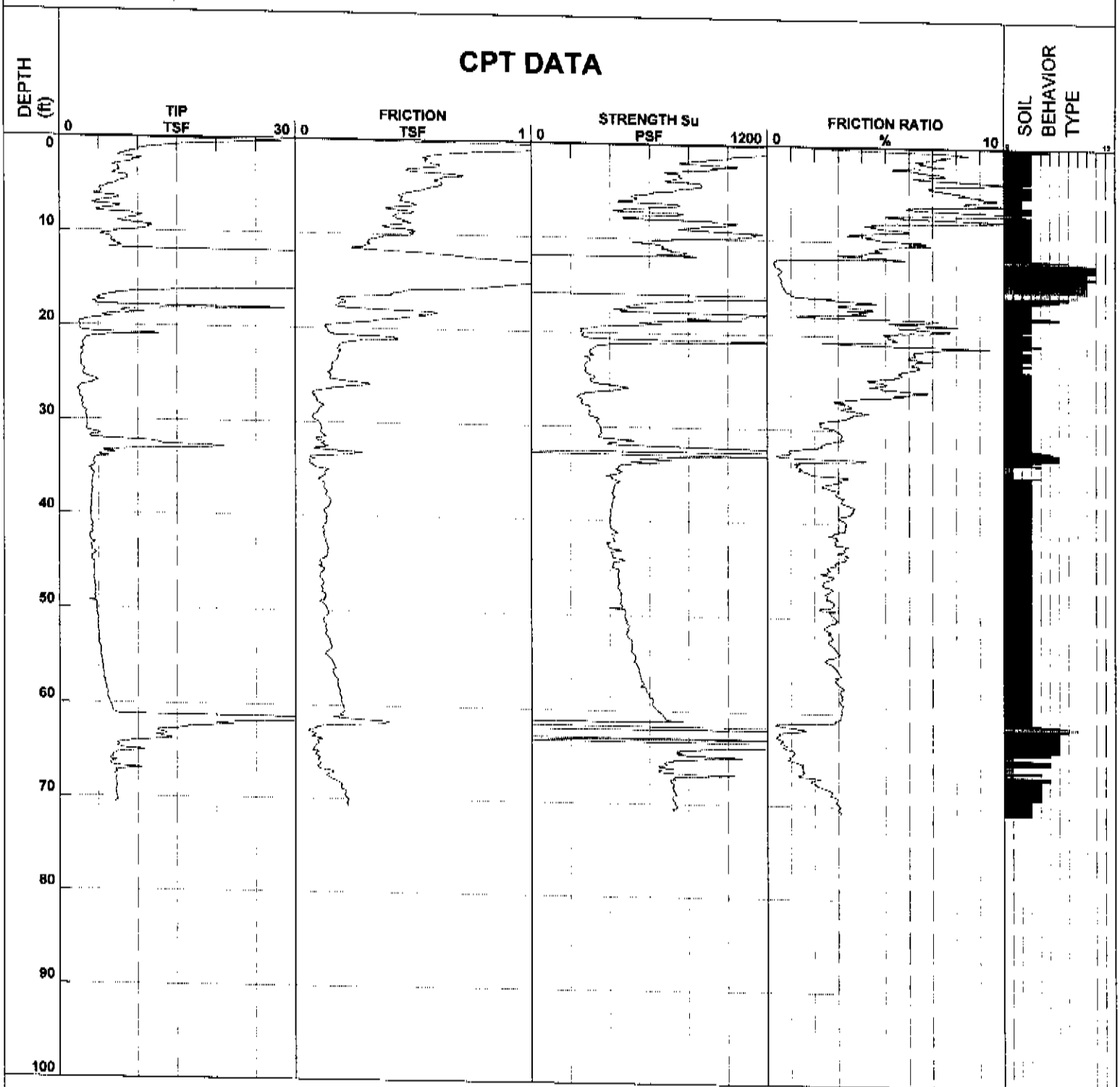


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-21CL	Coordinates	29 52' 19.0"N 90 7' 21.9"W
Operator	JIM BANDLE	Date and Time	01-Mar-2007 08:54:58	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

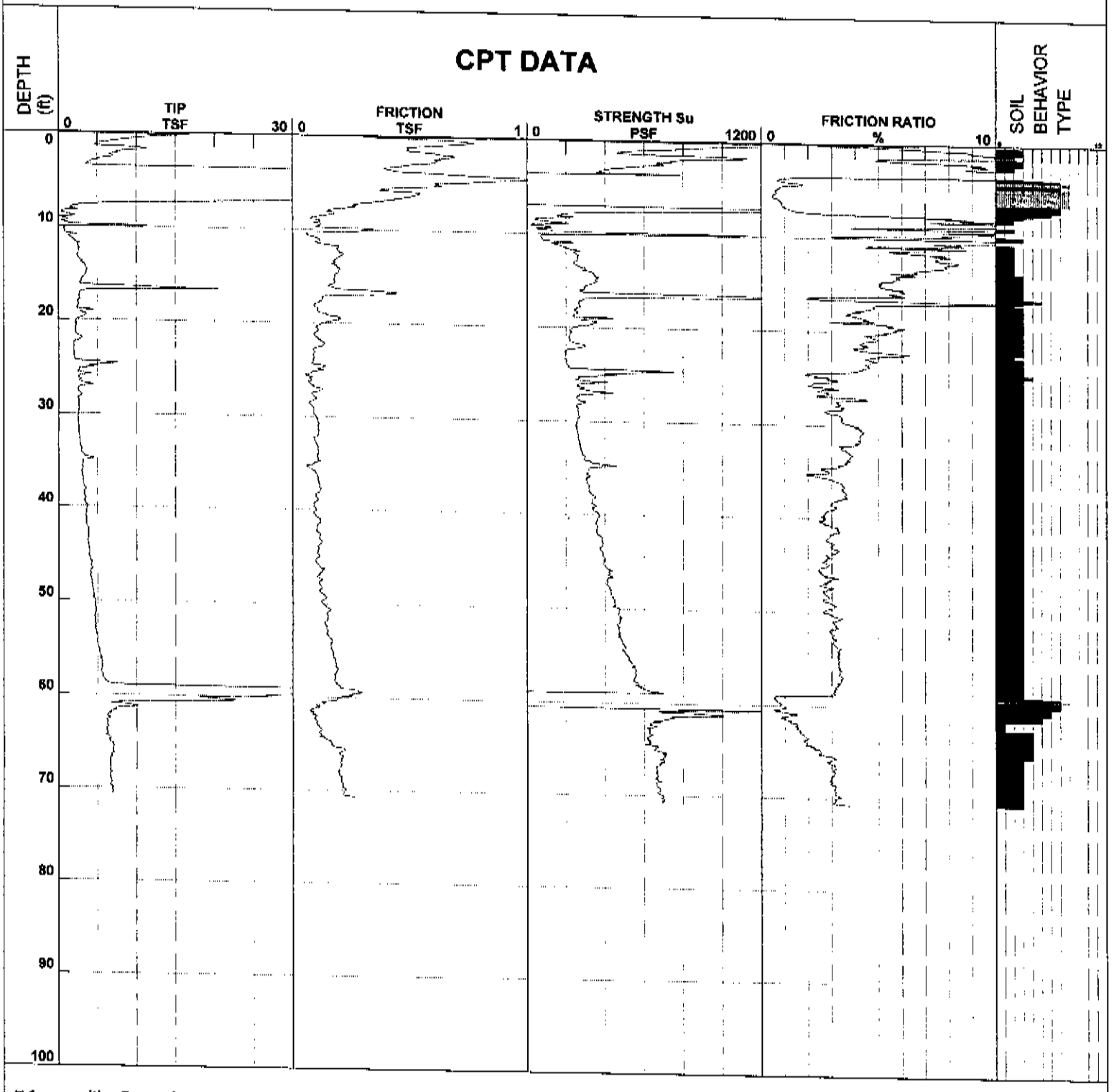


- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-21FT	Coordinates	29 52' 16.7"N 90 7' 22.0"W
Operator	JIM BANDLE	Date and Time	27-Feb-2007 15:48:56	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation		Water Table	

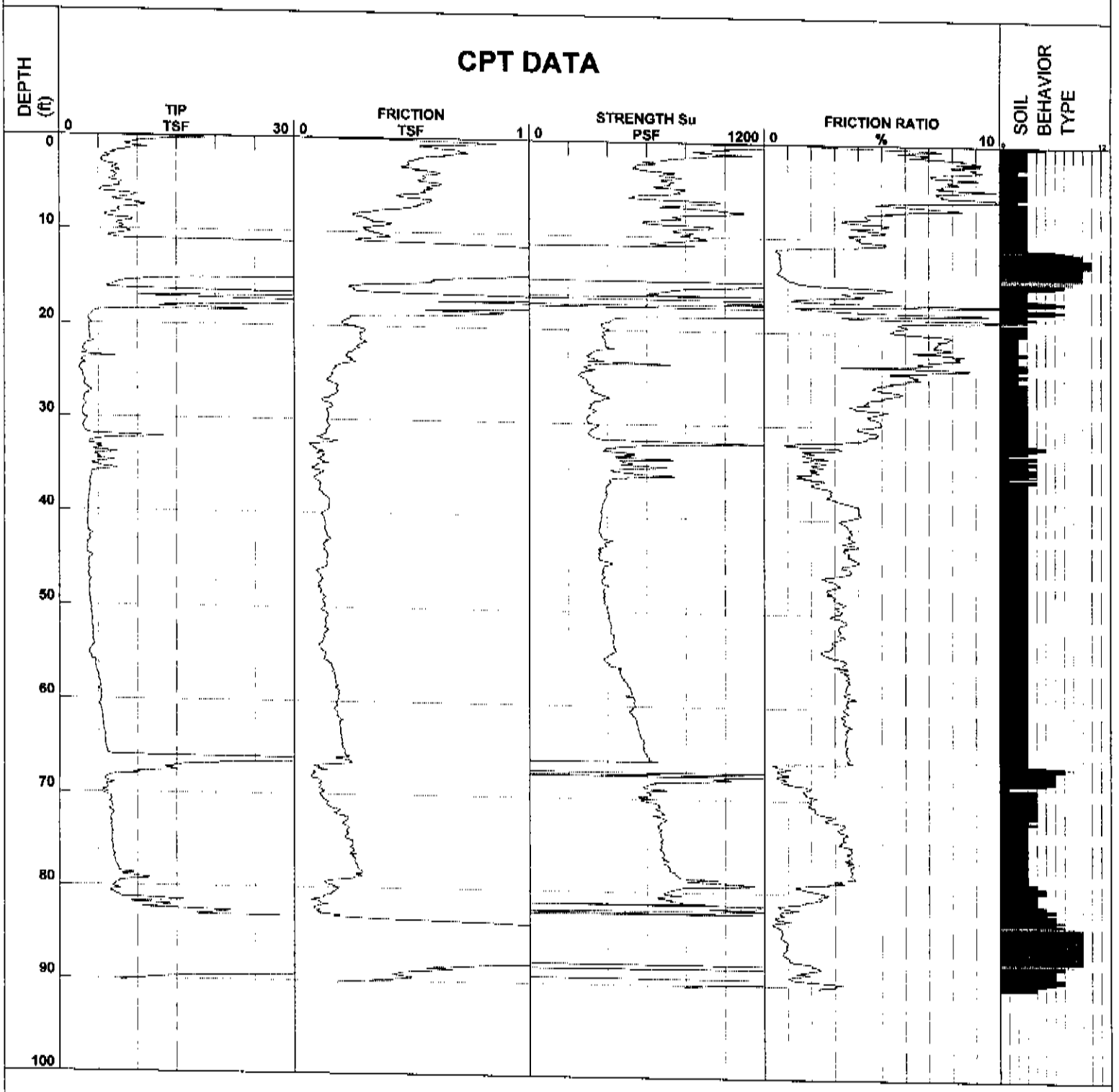


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-22CL	Coordinates	29 52' 16.5"N 90 07' 10.6"W
Operator	HERBERT JACKSON	Date and Time	09-Mar-2007 12:46:05	Cone Number	F2.5CKE3S 1788
Client	USACE	Elevation		Water Table	

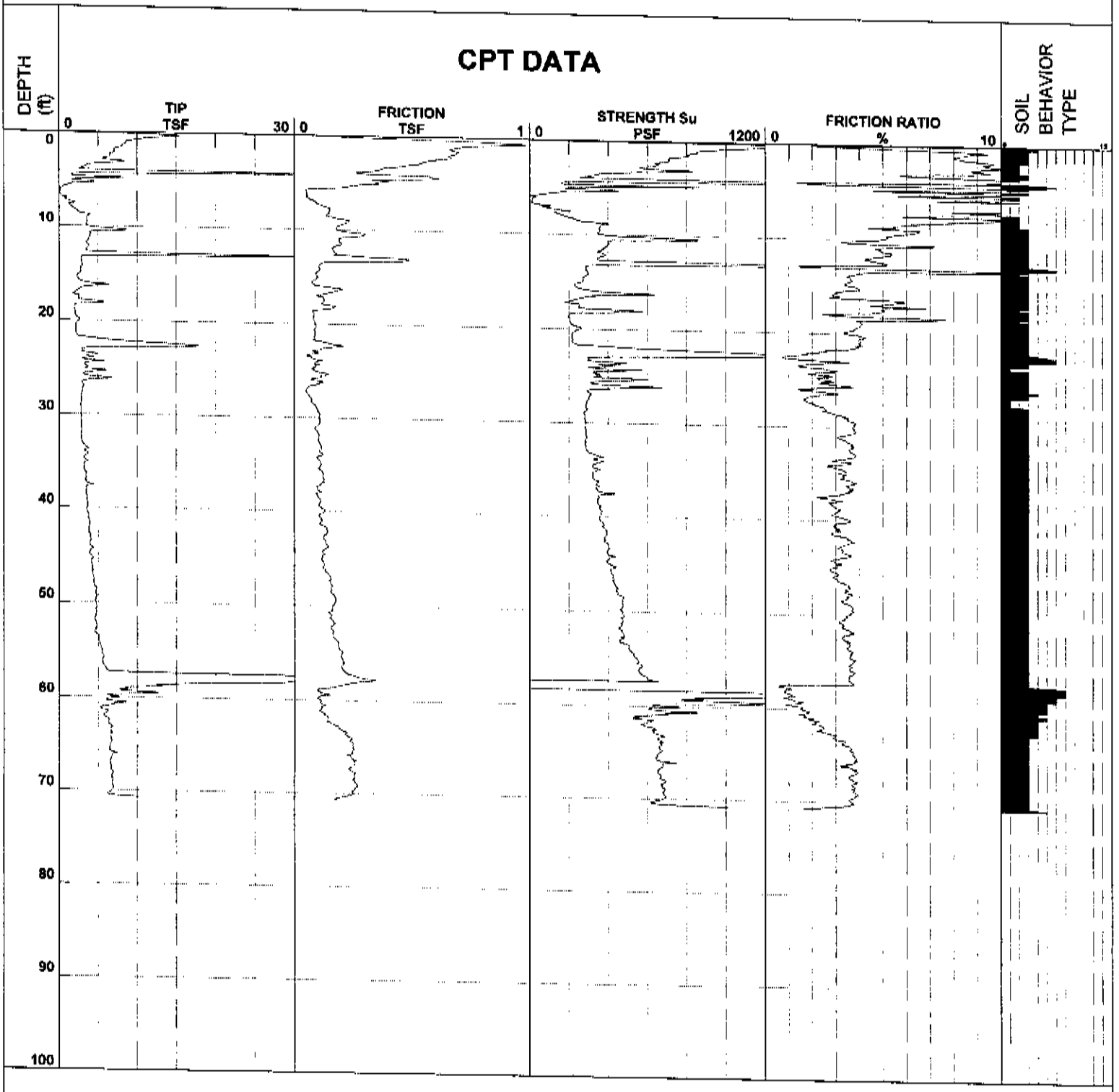


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-22PT	Coordinates	29 52' 17.9"N 90 07' 10.5"W
Operator	Albert Fonseca	Date and Time	27-Feb-2007 15:17:31	Cone Number	F2.5CKEW2 1636
Client	USACE	Elevation		Water Table	

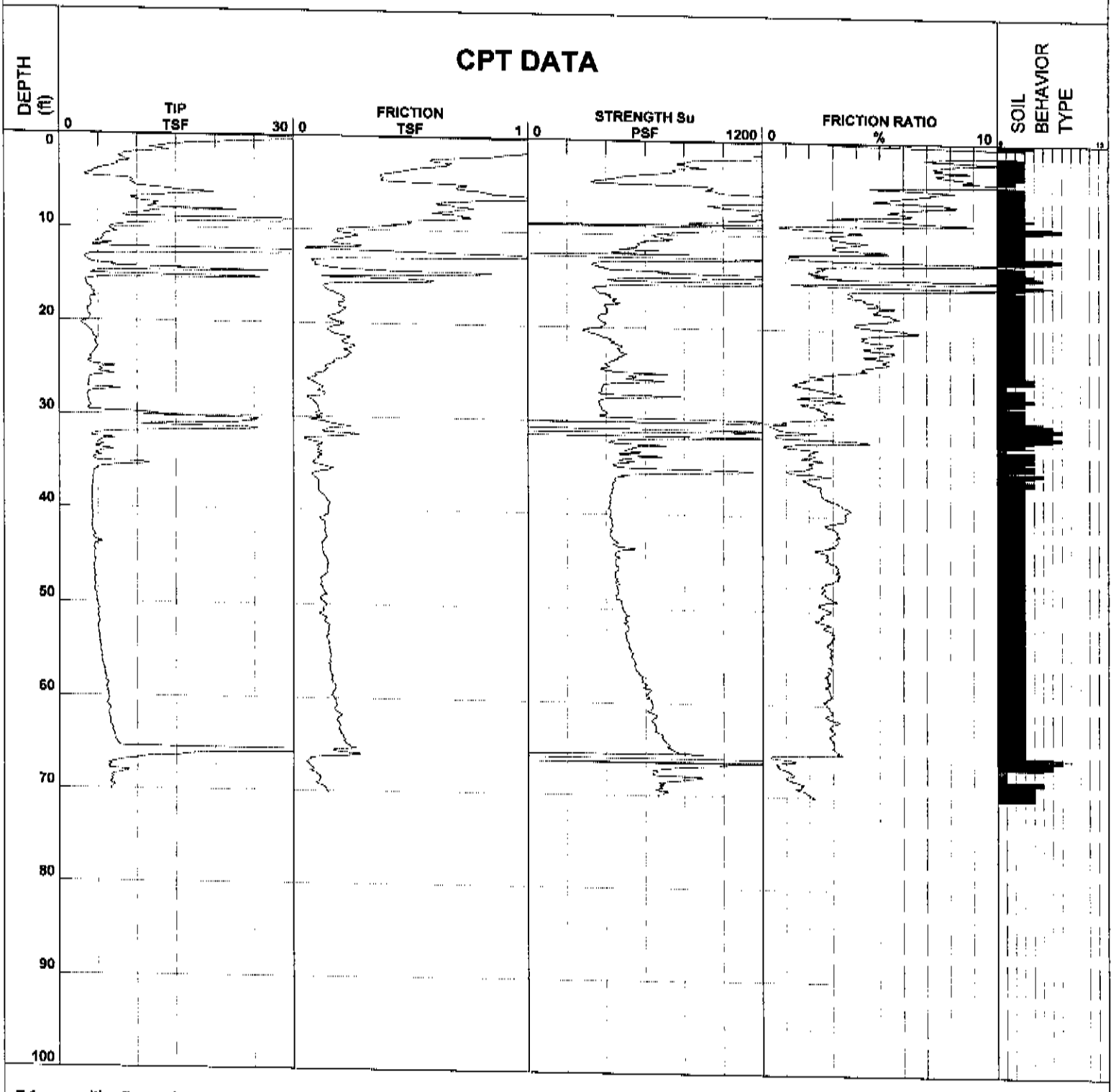


■ 1 - sensitive fine grained
■ 2 - organic material
■ 3 - clay
■ 4 - silty clay to clay
■ 5 - clayey silt to silty clay
■ 6 - sandy silt to clayey silt
■ 7 - silty sand to sandy silt
■ 8 - sand to silty sand
■ 9 - sand
■ 10 - gravelly sand to sand
■ 11 - very stiff fine grained (*)
■ 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-23CL	Coordinates	29 52' 14.47"N 90 06' 59.65"W
Operator	HERBERT JACKSON	Date and Time	09-Mar-2007 14:17:27	Cone Number	F2.5CKE3S 1788
Client	USACE	Elevation	8.6 ft	Water Table	

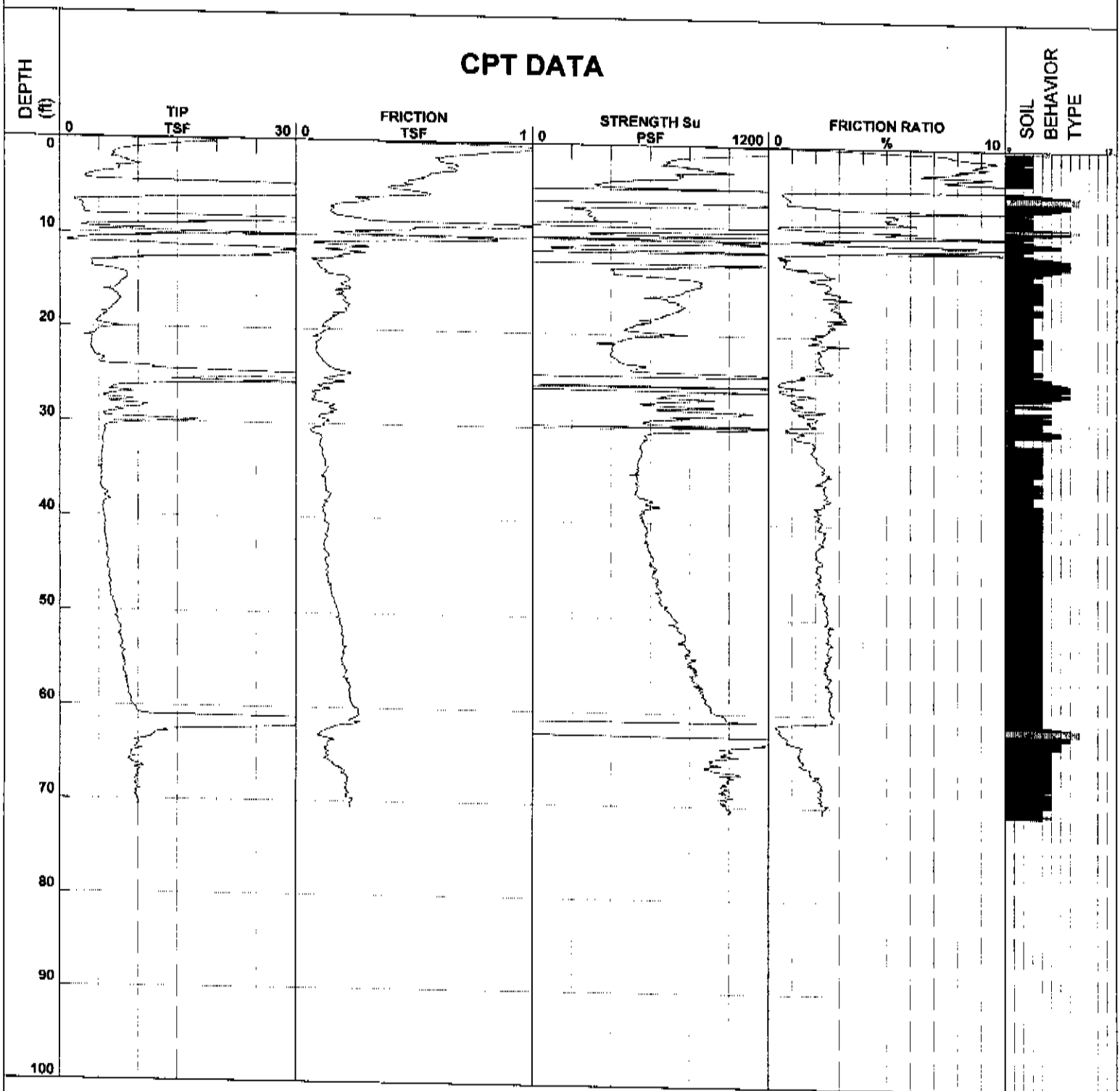


■ 1 - sensitive fine grained
■ 2 - organic material
■ 3 - clay
■ 4 - silty clay to clay
■ 5 - clayey silt to silty clay
■ 6 - sandy silt to clayey silt
■ 7 - silty sand to sandy silt
■ 8 - sand to silty sand
■ 9 - sand
■ 10 - gravelly sand to sand
■ 11 - very stiff fine grained (*)
■ 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Westwego Harvey Canal

Job Number	0022-0002	CPT Number	WWHCCPT-23FT	Coordinates	29 52' 14.00"N 90 06' 59.80"W
Operator	JIM BANDLE	Date and Time	27-Feb-2007 14:00:21	Cone Number	F2.5CKEW2 1628
Client	USACE	Elevation	3.8 ft	Water Table	



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-7UCLR

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	VST DGR & BR CH2 W/ RT	CH2		31												
1B	0.8	VST DGR & BR CH2 W/ RT	CH2		28												
2A	2.0	M DGR & GR CH3 W/ SIF, RT, O	CH3		44												
2B	2.8	M DGR & GR CH3 W/ SIF, RT, O, ARS ML	CH3		31												
3A	4.0	M GR & DGR CH3 W/ O, SIF, RT	CH3		33												
3B	4.8	M GR & DGR CH3 W/ O, SIF, RT	CH3		36												
3C	5.7	M GR & DGR CH3 W/ O, SIF, RT	CH3		35	84	113	91	UU	0	957		61	19	42	0.55	
4A	8.0	M GR CH2 W/ SIF	CH2		35												
4B	8.8	M GR CH2 W/ SL	CH2	9	29	90	115	88	UC	–	635	1271	50	18	32	0.50	
4C	9.7	M GR CH2 W/ SIF, WD	CH2		29												
5A	12.0	M GR & BR CH2 W/ RT, WD	CH2		39												
NS	12.8	NO SAMPLE	NS														
6A	16.0	SO BR & GR PT W/ RT, WD	PT		390												
6B	16.8	SO BR & GR CHOC W/ RT, WD	CHOC		279												OC= 35.9%
6C	17.7	M GR & DGR CHOA W/ RT, WD	CHOA		97												
6D	18.6	M GR CH4 W/ O , WD, RT	CH4		51												
7A	20.0	SO DGR & GR CHOA W/ WD, RT	CHOA		109												
7B	20.8	SO DGR & GR CHOA W/ RT, ARS SM	CHOA		91	47	90	97	UU	0	487		132	39	93	0.34	OC= 12.4%
7C	21.7	SO DGR PT W/ RT	PT		159	31	79	87					222	67	155		CON, Gs
7D	22.6	SO DGR PT W/ RT	PT		390												
8A	24.0	SO GR CL6 W/ LNS CH	CL6		36												
8B	24.8	SO GR CL6 W/ LNS CH	CL6		41												
8C	25.7	SO GR CH4 W/ SL, LNS ML	CH4		70	59	100	100	UU	0	255		77	24	53	0.26	
9A	28.0	M GR CH3 W/ LNS ML	CH3		54												
9B	28.8	M GR CH3 W/ LNS ML	CH3		53												
9C	29.7	M GR CH3 W/ LNS ML	CH3		54				UU				69	23	46	0.26	DIST
9D	30.6	GR ML2	ML2		29												
10A	32.0	GR ML2	ML2		34												
10B	32.8	GR ML2	ML2		28												
10C	33.7	GR ML2	ML2		25												
11A	36.0	M GR CH3 W/ LNS ML	CH3		46												
11B	36.8	M GR CH3 W/ LNS ML, LNS SP	CH3		48												
11C	37.7	SO GR CH4 W/ LNS ML, LNS SP	CH4		66	60	100	98	UU	0	481		83	28	55	0.33	
11D	38.6	M GR CH4 W/ LNS ML, LNS SM	CH4		63												
12A	40.0	M GR CH4 W/ SL, LNS ML	CH4		68												

Remarks:
FFEBJV, LLC.

Checked by: WSY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-7UCLR

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12B	40.8	M GR CH4 W/ SL, LNS ML	CH4	5	53	70	107	102	UC	--	544	1089	70	21	49	0.32	
12C	41.7	M GR CH4 W/ SL, LNS ML	CH4		45												
12D	42.6	M GR CH4 W/ SL, LNS ML	CH4		50												
13A	44.0	M GR CH4 W/ SL	CH4		52												
13B	44.8	SO GR CH3 W/ SL, LNS ML	CH3		45	76	110	99	UU	0	393		64	20	44	0.32	
13C	45.7	SO GR CH4 W/ SL, LNS ML	CH4		56	67	105	99					73	25	48		CON
13D	46.6	SO GR CH3 W/ SL, LNS ML	CH3		68												
14A	48.0	SO GR CH3 W/ SL, LNS ML	CH3		54												
14B	48.8	SO GR CH3 W/ SL, ARS ML	CH3		52												
14C	49.7	SO GR CH3 W/ SL, LNS ML	CH3	4	54	69	105	99	UC	0	385	770	70	21	49	0.23	
14D	50.6	M GR CH4 W/ SL, LNS ML	CH4		52												
15A	52.0	M GR CH4 W/ SL	CH4		62												
15B	52.8	M GR CH4 W/ SL	CH4		60												
15C	53.7	M GR CH4 W/ SL	CH4	5	58	66	103	98	UC	--	569	1138	76	25	51	0.29	
15D	54.6	M GR CH4 W/ SL	CH4		61												

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: U.S.A.C.E. - WEST BANK 100 YEAR BORING PROGRAM.. Assigned By: _____

Project Number: 19667
Boring: WWHC-8UCL

Current Date: 3/21/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1B	0.8	ST BR & GR CH4 W/ ARS ML, SIF, RT	CH4	6	32	86	113	88	UC	--	1605	3210	81	27	54	1.050	
2B	4.8	VSO BR & GR CH4 W/ ARS ML, RT, SIF	CH4	10	49	71	106	96	UC	--	157	315	82	26	56	0.180	
3C	9.7	M GR & BR CH3 W/ ARS ML, WD	CH3		33	86	114	92	UU	0	756		56	15	41	0.400	
4B	12.8	VSO GR CH3 W/ ARS SM, RT, SIF	CH3		43	78	112	100	UU	0	125		58	17	41	0.100	
5B	16.8																
5C	17.7	SO DGR CHOB W/ WD	CHOB	7	90	49	90	92	UC	--	264	529	165	42	123		ORG CONT =
6C	21.7	SO DGR CHOB W/ RT	CHOB		101	42	84	90	UU	0	367		197	41	156	0.290	
7B	24.8	M GR CL6	CL6	13	37	83	113	95	UC	--	521	1042	48	22	26	0.260	
8C	29.7	SO GR CH4 W/ LNS ML	CH4		69	58	98	98	UU	0	455		89	26	63	0.250	
9B	32.8	SO GR CL4-S	CL4-S	9	33	87	115	94	UC	--	346	691	28	18	10	0.110	
10C	37.7																
11C	41.7	SO GR CH4 W/ ARS ML	CH4	7	63	61	99	95	UC	--	406	811	94	32	62	0.200	PD
12C	45.7	M GR CH4 W/ LNS ML	CH4		63	61	99	96	UU	0	569		82	25	57	0.300	
13C	49.7	M GR CH4 W/ ARS ML, SL	CH4	4	66	59	98	95	UC	--	600	1200	91	24	67	0.280	
14C	53.7	M GR CH4 W/ ARS ML, SL	CH4	3	72	57	98	98	UC	--	564	1128	98	31	67	0.230	
15B	56.8	M GR CH4 W/ SL	CH4		61	62	99	95	UU	0	655		87	30	57	0.260	
16B	60.8	VSO DGR CH4 W/ SL	CH4	5	55	65	101	93	UC	--	216	433	78	30	48	0.230	
17C	65.7																
18B	68.8	SO GR CL4-S W/ SIF	CL4-S	4	32	87	116	94	UC	--	360	721	30	19	11		PD
19C	73.7	M GR CL6-S W/ SIF	CL6-S	4	39	79	110	92	UC	--	580	1160	47	19	28	0.280	
20B	76.8	M GR CH4 W/ ARS SM, SIF, SL	CH4		48	72	106	95	UU	0	913		89	23	66	0.390	
21C	81.7	ST GR CH4 W/ LNS ML, SL	CH4	3	56	65	102	96	UC	--	1191	2381	91	25	66	0.320	
22B	84.8	ST GR CH4 W/ SL	CH4	1	61	62	100	95	UC	--	1225	2450	98	31	67	0.320	
23B	88.8	M GR CH4 W/ SIF, SL	CH4	1	64	61	99	96	UC	--	727	1454	98	28	70	0.320	

Remarks:
EUSTIS ENGINEERING COMPANY, INC.

Checked by: _____
File Name: 19667

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-8UPT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	Wt	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST DGR & BR CH4 W/ ARS ML, RT, SL	CH4		44												
1B	0.8	ST GR & T CL6 W/ ARS SP, WD, SL	CL6	15	22	100	122	87	UC	–	1328	2656	44	21	23	0.740	
NS	1.3	NO SAMPLE	NS														
2A	4.0	M GR CH4 W/ LNS SP, WD, RT	CH4		85												
2B	4.8	VSO GR CHOA W/ WD	CHOA		89	39	89	100	UU	0	119		144	38	106	0.210	
2C	5.7	VSO GR & DGR CHOA W/ WD, RT	CHOA		176												
2D	6.6	VSO GR & DGR CHOA W/ WD, RT	CHOA		193												OC=14.0
3A	8.0	VSO DGR CHOA W/ ARS SP, WD, RT	CHOA		152												
3B	8.8	VSO DGR CHOA W/ WD, RT	CHOA		233												
3C	9.7	VSO GR CHOA W/ WD	CHOA		144	35	84	99	UU	0	204		136	49	87	0.18	
3D	10.6	M DGR PT W/ WD, RT	PT		217												
4A	12.0	M BR PT W/ WD	PT		252												
4B	12.8	M GR & DGR PT W/ WD	PT		132												
4C	13.7	M GR CL4 W/ LNS ML	CL4	6	32	91	121	100	UC	–	687	1375	41	24	17	N/A	OC= 59.473 DIST
4D	14.6	M GR CH4 W/ LNS & ARS ML	CH4		44												
5A	16.0	M GR CH4 W/ ARS & LYS ML	CH4		52												
5B	16.8	M GR CH4 W/ ARS & LYS ML	CH4		44												
5C	17.7	M GR CL4 W/ LYS ML	CL4		33								33	17	16		CON, Gs
6A	20.0	M GR CH4 W/ LNS ML	CH4		74												
6B	20.8	SO GR CH4 W/ SIF, ARS ML	CH4		62	66	106	100	UU	0	300		84	33	51	0.22	
6C	21.7	SO GR CH4 W/ LNS & ARS ML	CH4		60												
6D	22.6	SO GR CH4 W/ LNS & ARS ML	CH4		62												
7A	24.0	GR ML2 W/ LYS CH	ML2		46												
7B	24.8	GR ML2 W/ LNS CH	ML2		66	64	106	100	UU	0	165		NP			0.20	
7C	25.7	NO SAMPLE	NS														
8A	28.0	GR ML2 W/ SIF	ML2		31												
8B	28.8	SO GR CH4 W/ LNS & ARS ML	CH4		46												
8C	29.7	VSO GR CH3 W/ LNS & ARS ML	CH3	3	48	74	109	100	UC	–	223	446	68	30	38	0.20	
8D	30.6	M GR CH4 W/ LNS & ARS ML	CH4		66												
9A	32.0	M GR CH4 W/ LNS & ARS ML	CH4		62												
9B	32.8	M GR CH4 W/ LNS & ARS ML	CH4		62												
9C	33.7	SO GR CH4 W/ LNS ML, SL	CH4		62	63	103	100	UU	0	457		86	34	52	0.24	
9D	34.6	M GR CH4 W/ LNS & ARS ML	CH4		63												
10A	36.0	M GR CH4 W/ LNS & ARS ML	CH4		65												
10B	36.8	M GR CH4 W/ LNS & ARS ML	CH4		53												
10C	37.7	M GR CH4 W/ LNS & ARS ML	CH4		63	60	98	94					81	27	54		CON

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-8UPT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
11A	40.0	M GR CH4 W/ LNS & ARS ML	CH4		59												
11B	40.8	M GR CH4 W/ LNS ML, SL	CH4	4	63	62	101	99	UC	–	591	1181	87	26	61	0.25	
11C	41.7	M GR CH4 W/ LNS & ARS ML	CH4		56												
11D	42.7	M GR CH4 W/ ARS ML	CH4		71												
12A	44.0	M GR CH4 W/ ARS ML	CH4		70												
12B	44.8	M GR CH4 W/ LNS & ARS ML	CH4		62												
12C	45.7	M GR CH4 W/ LNS ML, SL	CH4		79	56	100	100	UU	0	574		73	24	49	0.34	
12D	46.6	M GR CH4 W/ LNS & ARS ML	CH4		63												
13A	48.0	M GR CH4 W/ LNS ML	CH4		60												
13B	48.8	M GR CH4 W/ LNS ML	CH4		66												
13C	49.7	M GR CH4 W/ SL	CH4	4	61	63	102	100	UC	–	582	1163	83	27	56	0.30	
13D	50.6	M DGR CH4	CH4		58												
14A	52.0	M GR CH4 W/ LNS & ARS ML	CH4		68												
14B	52.8	M GR CH4 W/ LNS & ARS ML	CH4		69	59	100	99	UC	–	695	1389	85	25	60		
14C	53.7	M GR CH4 W/ LNS & ARS ML	CH4		58												
14D	54.6	M GR CH4 W/ LNS & ARS ML	CH4		60												
15A	56.0	M GR CH4 W/ ARS SP	CH4		57												
15B	56.8	VSO GR CL4 W/ SIF, ARS SP	CL4	5	26	92	118	95	UC	–	240	480	41	24	17	0.17	DIST

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-9UCL

Current Date: 12/21/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST GR & BR CH2 W/ O, SIF, ARS ML,RT	CH2		35												
1B	0.8	ST GR & BR CH2 W/ O, SIF, ARS ML, RT	CH2		43												
1C	1.7	VST DBR CH2-S W/ SIF, CC G, GLASS	CH2-S	8	23	96	118	82	UC	–	2027	4054	55	17	38	1.30	
2A	4.0	M GR & BR CH2 W/ SIF, O, RT	CH2		37												
2B	4.8	ST DGR CH3 W/ ARS SM, RT, WD, SIF	CH3		30	90	116	91	UU	0	1149		64	21	43	0.60	
NS	5.7	NO SAMPLE	NS														
3A	8.0	BR WD	WD		357												
NS	8.8	NO SAMPLE	NS														
4A	12.0	BR WD	WD		327												
NS	12.8	SAMPLE	NS														
5A	16.0	SO GR CHOA W/ WD	CHOA		103												
5B	16.8	SO GR & DGR CHOA W/ RT	CHOA		123	38	85	97	UU	0	277		151	35	116	0.18	OC = 22.2% Untrim mable
5C	17.7	SO GR & DGR PT W/ RT, WD	PT		198								222	51	171		
6A	20.0	SO GR & DGR CHOA W/ RT	CHOA		139												
6B	20.8	SO GR CHOA W/ RT, WD	CHOA		99												
6C	21.7	SO DGR PT W/ RT, WD	PT		182	27	77	95	UU	0	294		239	57	182	0.24	
7A	24.0	M GR CL6-S W/ SIF, O	CL6-S		31												
7B	24.8	M GR CL6-S W/ ARS SM, RT	CL6-S		28												
7C	25.7	M GR CL6-S W/ WD, O	CL6-S	15	32	89	116	98	UC	–	587	1173	49	19	30	0.40	
8A	28.0	VSO GR CL4 W/ WD	CL4		45												
8B	28.8	VSO GR CL4	CL4		46	77	112	100					40	21	19		CON
8C	29.7	SO GR CL4 W/ ARS CH, RT	CL4		35	86	116	100	UU	0	377		39	22	17	0.20	
9A	32.0	SO GR CH3 W/ LNS ML	CH3		49												
9B	32.8	SO GR CH3 W/ LNS ML, LNS SM	CH3		55												
9C	33.7	SO GR CH4 W/ ARS & LNS ML	CH4		65	62	101	100	UU	0	277		76	20	56	0.23	
10A	36.0	GR ML2	ML2		31												
10B	36.8	GR ML2 W/ LNS CH	ML2		29												
NS	37.7	NO SAMPLE	NS														SV
11A	40.0	GR ML2 W/ ARS CH	ML2		35												
11B	40.8	M GR CH3 W/ LNS & ARS SM	CH3		42												
11C	41.7	M GR CH3 W/ LNS ML	CH3	5	49	72	107	98	UC	–	589	1177	59	21	38	0.30	
11D	42.6	M GR CH3 W/ LNS & ARS SM	CH3		56												
12A	44.0	M GR CH3 W/ LNS ML	CH3		49												
12B	44.8	M GR CH3 W/ LNS ML, O	CH3	4	52	70	106	97	UC	–	601	1201	71	20	51	0.25	
12C	45.7	M GR CH3 W/ LNS ML	CH3		52												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-9UCL

Current Date: 12/21/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12D	46.6	M GR CH3 W/ LNS ML	CH3		53												
13A	48.0	M GR CH3 W/ LNS ML	CH3		57												
13B	48.8	M GR CH3 W/ LNS ML	CH3		59												
13C	49.7	M GR CH3 W/ LNS ML, O	CH3	5	47	74	109	99	UC	–	614	1229	58	21	37	0.30	
13D	50.6	VSO GR CH4 W/ LNS ML	CH4		66												
14A	52	VSO GR CH4 W/ LNS ML	CH4		61												
14B	52.8	VSO GR CH4 W/ ARS ML, SL	CH4		71	57	98	98	UU	0	238		91	29	62	0.20	
14C	53.7	M GR CH4 W/ LNS ML	CH4		55												
14D	54.6	M BR CH4 W/ LNS ML	CH4		57												
15A	56.0	M GR CH4 W/ LNS ML	CH4		61												
15B	56.8	M GR CH4 W/ LNS ML	CH4		64												
15C	57.7	M GR CH4 W/ LNS ML, O	CH4	4	58	65	103	98	UC	–	677	1355	76	26	50	0.31	
15D	58.6	M GR CH4 W/ LNS ML	CH4		61												
16A	60.0	M GR CH4	CH4		57												
16B	60.8	SO GR CL4 W/ ARS SM	CL4		37												
16C	61.7	SO GR CL4 W/ LYS SM	CL4	8	35	86	115	95	UC	–	353	705	34	18	16	0.25	
17A	64.0	GR SM1 W/ SIF	SM1		32												
17B	64.8	GR SM1 W/ SIF	SM1		30												
17C	65.7	GR SM1 W/ LYS CH	SM1		40												
18A	68.0	GR SM1 W/ SIF	SM1		48												SV
18B	68.8	GR SM1 W/ SIF	SM1		37												
18C	69.7	SO GR BR CL6-S W/ SIF	CL6-S	5	35	85	115	97	UC	–	400	799	32	19	13	0.29	
18D	70.6	SO GR CL6-S W/ ARS SM, SIF	CL6-S		41												

Remarks:
FFEBJV, LLC.

Checked by: WTY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-10UCL

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	VST GR & BR CH4 W/ O, RT, SIF	CH4		38												
1B	0.8	VST GR & BR CH4 W/ O, RT, SIF	CH4	5	37	75	102	79	UC	–	2164	4327	90	28	62	1.88	OC=9.2%
NS	1.5	NO SAMPLE	NS														
2A	4.0	ST GR CH3 W/ SIF	CH3		31												
NS	4.8	NO SAMPLE	NS														
3A	8.0	ST GR CH3 W/ SIF, ARS ML	CH3		39												
3B	8.8	ST GR CH4 W/ SIF	CH4		33	88	117	96	UU	0	1050		84	22	62	0.75	
NS	9.5	NO SAMPLE	NS														
4A	12.0	ST GR CH3 W/ LYS SP	CH3		33												
4B	12.8	GR SM1 W/ SIF	SM1		15				UC				NP	NP			UC DIST
4C	13.7	GR SM1 W/ ARS CL, SIF	SM1		90												
5A	16.0	SO GR CH3 W/ SIF, O	CH3		44												
5B	16.8	SO GR CHOB W/ RT, WD	CHOB		105	43	88	97	UU	0	364		160	44	116	0.23	OC= 16.0%
5C	17.7	BR & GR WD W/ ARS CH	WD		308												
6A	20.0	SO DGR CHOC W/ WD, RT	CHOC		178												
6B	20.8	SO GR & DGR CHOA W/ WD, RT	CHOA		104												
6C	21.7	SO GR CHOA W/ WD	CHOA		120	38	84	95	UU	0	272		119	41	78	0.20	
6D	22.6	SO GR & DGR CHOA W/ WD, RT	CHOA		134												
7A	24.0	SO DGR & BK PT W/ RT, WD	PT		207												
7B	24.8	SO DGR & BK CHOC W/ RT, WD	CHOC		106												
7C	25.7	VSO GR CH3 W/ LNS & ARS ML	CH3		55	68	106	100	UU	0	238		62	21	41	0.18	OC= 26.3%
8A	28.0	SO GR CH3 W/ ARS ML, WD	CH3		49												
8B	28.8	SO GR CH3 W/ LNS & ARS ML, WD	CH3		62	62	101	98					76	22	54		CON
8C	29.7	SO GR CH4 W/ LNS ML, SIF	CH4		75	57	99	101	UU	0	426		87	27	60	0.21	
9A	32.0	SO GR CH4 W/ LNS ML	CH4		63												
9B	32.8	SO GR CH4 W/ ARS ML	CH4		72	58	100	101	UU	0	475		90	29	61	0.25	
9C	33.7	M GR CH2 W/ LNS & LYS ML	CH2		37												
9D	34.6	GR ML2 W/ LNS & LYS CH	ML2		33												
NS	36.0	NO SAMPLE	NS														
11A	40.0	SO GR CH3 W/ ARS ML	CH3		55												
11B	40.8	SO GR CH3 W/ LNS & ARS ML	CH3		56												
11C	41.7	SO GR CH3 W/ ARS ML, O	CH3		45	75	109	97	UU	0	352		56	21	35	0.28	OC= 5.3%
11D	42.6	SO GR CH3 W/ ARS ML	CH3		41												
12A	44.0	SO GR CH3 W/ ARS ML	CH3		56												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-10UCL

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	Wt	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12B	44.6	SO GR CH3 W/ SL	CH3		54	69	106	99	UU	0	377		72	33	39	0.22	
12C	45.7	SO GR CH3 W/ ARS ML	CH3	15	46	75	110	100	UC	–	306	612	65	23	42	0.27	
13A	48.0	SO GR CH3	CH3		59												
13B	48.8	SO GR CH3	CH3		56												
13C	49.7	SO GR CH3	CH3	8	57	67	104	99	UC	–	446	891	73	27	46	0.27	
14A	52.0	SO GR CH4 W/ ARS ML	CH4		65												
14B	52.8	M GR CH4 W/ LNS & ARS ML	CH4		58	67	106	103	UU	0	518		70	26	44	0.36	
14C	53.7	M GR CH4 W/ LNS ML, SL	CH4		65	62	102	101	UU	0	555		84	36	48	0.30	
14D	54.6	M GR CH4 W/ LNS & ARS ML	CH4		65												
15A	56.0	M GR CH4 W/ LNS & ARS ML	CH4		59												
15B	56.8	M GR CH4 W/ LNS & ARS ML	CH4		62	62	100	96					87	22	65		CON
15C	57.7	M GR CH4 W/ LNS & ARS ML	CH4	4	68	60	101	101	UC	–	715	1429	91	28	63	0.38	
15D	58.6	M GR CH4	CH4		63												
16A	60.0	GR SM1-S W/ SIF	SM1-S		32												
16B	60.8	GR SM1-S W/ SIF	SM1-S		30												
16C	61.7	GR SM1-S W/ SIF, ARS CL	SM1-S	6	29	96	124	105	UC	–	293	587	NP	NP		0.15	
17A	64.0	GR SM1-S W/ SIF	SM1-S		31												
17B	64.8	GR SM1-S W/ SIF	SM1-S		34												
17C	65.7	GR SM1-S W/ SIF, ARS CL	SM1-S		32	87	114	92	UU	0	288		NP	NP			
18A	68.0	GR SM1-S W/ SIF	SM1-S		41												
18B	68.8	GR SM1-S W/ SIF	SM1-S		38												
18C	69.7	VSO GR CL6-S W/ SIF	CL6-S		53												

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-10UPT

Current Date: 12/18/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST GR CL6 W/ ARS CH, SIF, O	CL6		28												
1B	0.8	ST GR & T CL4 W/ ARS SM, O	CL4		19												
NS	1.7	NO SAMPLE	NS														
2A	4.0	VSO GR CH4 W/ O	CH4		64												
2B	4.8	VSO GR CHOA	CHOA		105												
2C	5.7	VSO BR & GR PT W/ RT	PT		227	23	74	96	UU	0	114		232	45	187	0.10	OC= 21.6%
3A	8.0	VSO DGR PT	PT		224												
3B	8.8	VSO DBR PT	PT		304								265	47	218		Gs, CON
3C	9.7	VSO DGR CHOA W/ RT	CHOA		105	44	91	102	UU	0	132		112	29	83	0.10	OC=9.9%
3D	10.6	VSO DGR CHOA W/ RT	CHOA		131												
4A	12.0	VSO DGR CHOA W/ WD	CHOA		135												
4B	12.8	VSO DGR PT	PT		193												
4C	13.7	VSO BK PT	PT		221	23	75	95	UU	0	198		444	48	396	0.09	
4D	14.6	VSO DGR PT	PT		234												
5A	16.0	VSO DGR PT	PT		181												
5B	16.8	SO DBR PT W/ RT	PT		348	15	68	94					224	45	179		Gs, CON
5C	17.7	VSO GR CH3 W/ O	CH3		70	60	102	103	UU	0	169		62	20	42	0.15	OC=5.9%
5D	18.6	GR ML2 W/ LYS CH	ML2		44												
6A	20.0	VSO GR CH3 W/ LNS ML	CH3		69												
6B	20.8	VSO GR CH3 W/ LNS ML, SIF	CH3		72												
6C	21.7	VSO GR CH3 W/ LNS ML, SIF	CH3		70	58	99	100	UU	0	221		71	22	49	0.16	
6D	22.6	SO GR CH3 W/ LNS ML	CH3		64												
7A	24.0	SO GR CH3	CH3		78												
7B	24.8	SO GR CH3 W/ LNS ML, SIF	CH3	14	42	77	110	96	UC	--	301	601	62	22	40	0.16	
7C	25.7	GR ML2 W/ LYS SM & LNS CH	ML2		33												
7D	26.6	GR SM1 W/ LNS & ARS CH & LYS ML	SM1		30												
8A	28.0	GR SM1 W/ SIF	SM1		29												
8B	28.8	VSO GR CL6	CL6		35												
8C	29.7	VSO GR CL6	CL6	13	35	79	106	82	UC	--	153	307	43	17	26	0.17	
9A	32.0	VSO GR CH3 W/ LNS ML, SM	CH3		64												
9B	32.8	VSO GR CH3 W/ ARS ML, SM	CH3		73	58	101	103	UU	0	238		78	24	54	0.18	
9C	33.7	VSO GR CH3 W/ LNS ML, SM	CH3		51												
9D	34.6	VSO GR CH3	CH3		72												
10A	36.0	VSO GR CH2 W/ LNS ML	CH2		55												
10B	36.8	VSO GR CH2	CH2		46	73	107	97	UU	0	238		52	17	35	0.20	
10C	37.7	VSO GR CH2 W/ ARS SM	CH2		56												

Remarks: _____
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-10UPT

Current Date: 12/18/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
10D	38.6	VSO GR CH2 W/ LNS ML, SM	CH2		55												
11A	40.0	SO GR CH3 W/ LNS SM	CH3		61												
11B	40.8	SO GR CH3 W/ LNS SM	CH3		58												
11C	41.7	SO GR CH3 W/ LNS SM	CH3	9	66	59	99	97	UC	–	333	666	78	25	53	0.21	
11D	42.6	SO GR CH3 W/ LNS SM	CH3		63												
12A	44.0	SO GR CH4 W/ LNS ML	CH4		67												
NS	44.8	NO SAMPLE	NS														
13A	48.0	SO GR CH4 W/ LNS ML	CH4		68												
13B	48.8	SO GR CH4	CH4		77	56	99	102	UU	0	390		89	26	63	0.21	
13C	49.7	SO GR CH4	CH4		61												
13D	50.6	SO GR CH4	CH4		68												
14A	52.0	SO GR CH4	CH4		55												
14B	52.8	SO GR CH4	CH4		67												
14C	53.7	SO GR CH4 W/ LYS ML	CH4	6	63	61	99	96	UC	–	436	872	78	25	53	0.25	
14D	54.6	SO GR CH4	CH4		77												
15A	56.0	SO GR CH4	CH4		77												
15B	56.8	SO GR CH2 W/ LYS SM, SIF	CH2		42												
15C	57.7	GR ML2 W/ LYS CH, SIF	ML2	7	27	91	116	88	UC	–	206	413	26	25	1	0.19	

Remarks:
FFEBJV, LLC.

Checked by: WSY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-11UCL

Current Date: 11/28/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR CH2 W/ RT, SIF	CH2		29												
1B	0.8	ST BR CH3 W/ ARS ML, SIF, WD	CH3	9	30	92	119	95	UC	–		3047	58	21	37	0.750	
NS	1.2	NO SAMPLE	NS														
2A	4.0	ST GR & BR CH2 W/ WD	CH2		39												
2B	4.8	M GR CH4 W/ SIF, WD	CH4		35	85	114	95	UU	0	649	1298	81	27	54	0.430	
2C	5.7	ST GR CH4	CH4		44												
3A	8.0	ST GR CH4 W/ SIF	CH4		40												
3B	8.8	GR ML2 W/ SIF, ARS CH, ARS SM	ML2		47								25	19	6		
NS	9.1	NO SAMPLE	NS														
5A	16.0	WD	WD		347												
NS	16.8	NO SAMPLE	NS														
6A	20.0	WD W/ ARS CH	WD		210												
NS	20.8	NO SAMPLE	NS														
7A	24.0	M DGR & GR CHOA W/ WD	CHOA		109												
7B	24.8	SO GR CHOC W/ WD	CHOC		202	30	81	100	UU	0	401	802	196	55	141	0.320	OC = 7.2%
7C	25.7	SO BK & GR PT W/ WD	PT		262	23	72	92	UU	0	488	976	206	54	152	0.400	
7D	26.6	SO GR CH4 W/ O, WD	CH4		101												
8A	28.0	SO GR CL4 W/ LYS CH	CL4		41												
8B	28.8	SO GR CH3 W/ WD, CC	CH3		61												
NS	29.7	NO SAMPLE	NS														
9A	32.0	SO GR CH3 W/ LNS ML	CH3		58												
9B	32.8	SO GR CH4	CH4		71	59	101	100	UU	0	432	864	89	29	60	0.250	
9C	33.7	SO GR CH4 W/ SL	CH4		60												
10A	36.0	SO GR CL6 W/ LNS ML	CL6		36												
10B	36.8	SO GR CH3 W/ LNS ML	CH3		54												
10C	37.7	SO GR CH2	CH2		47	74	109	100	UU	0	340	680	51	21	30	0.200	
10D	38.6	SO GR CH3 W/ LNS ML	CH3		51												
11A	40.0	SO GR CH4 W/ LNS ML	CH4		65												
11B	40.8	SO GR CH3 W/ LNS ML	CH3	8	54	68	104	99	UC	–		896	73	22	51	0.260	CON
11C	41.7	SO GR CH3 W/ LNS ML	CH3		57												
11D	42.6	SO GR CH3 W/ LNS ML	CH3		48												
12A	44.0	SO GR CH4 W/ LNS ML, SL	CH4		58												
12B	44.8	SO GR CH4 W/ LNS ML, SL	CH4		62												
12C	45.7	SO GR CH3 W/ LNS ML	CH3	5	51	70	106	97	UC	–	499	998	61	21	40	0.260	
12D	46.6	SO GR CH3 W/ LNS ML, SL	CH3		63												
13A	48.0	SO GR CH4 W/ SL	CH4		66												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWBC-11UCL

Current Date: 11/28/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
13B	48.8	SO GR CH3 W/ LNS ML	CH3		63	63	102	100	UU	0	457	914	61	24	37	0.270	
13C	49.7	M GR CH4 W/ SL	CH4		65												
13D	50.6	M GR CH4 W/ SL	CH4		61												
14A	52.0	M GR CH4 W/ SL	CH4		67												
14B	52.8	M GR CH4 W/ SL, LNS ML	CH4		58												
14C	53.7	M GR CH4 W/ LNS ML	CH4		71	61	105	100	UU	0	516		90	30	60	0.300	
14D	54.6	M GR CH4 W/ SL, LNS ML	CH4		74												
15A	56.0	M GR CH4 W/ SL	CH4		66												
15B	56.8	M GR CH4 W/ LNS ML	CH4	10	64	64	104	100	UC	–	610	1214	70	30	40	0.280	
15C	57.7	M GR CH4 W/ SL, LNS ML	CH4		60												
15D	58.6	M GR CH4 W/ SL, LNS ML	CH4		65												
16A	60.0	GR SM1 W/ SIF	SM1		29												
16B	60.8	GR SM1 W/ SIF	SM1		29												
16C	61.7	GR SM1 W/ SIF	SM1		29												SV
NS	64.0	NO SAMPLE	NS														
18A	68.0	M GR CL6-S W/ SIF	CL6-S		33												
18B	68.8	M GR CL6-S W/ SIF	CL6-S		37												
18C	69.7	M GR CH4 W/ SIF	CH4		40	81	113	99	UU	0	628	1256	74	27	47	0.400	
18D	70.6	M GR CH3 W/ ARS SM, SIF	CH3		40												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-11UFT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST DGR CH3 W/ O, RT	CH3		38												
1B	0.8	ST GR CL4 W/ ARS SM, ML, RT	CL4	14	23	100	123	90	UC	–	1758	3516	39	17	22	0.89	
NS	1.7	NO SAMPLE	NS														
2A	4.0	SO GR & DGR CHOA W/ RT, WD	CHOA		103												
2B	4.8	SO GR & DGR CHOA W/ RT, WD	CHOA		90												
2C	5.7	SO DBR PT W/ WD	PT		203	24	77	93	UU	0	238		236	85	151	0.15	OC= 39.4%
3A	8.0	SO GR & DGR CHOB W/ WD	CHOB		169												
3B	8.8	VSO DGR CHOA W/ WD, RT	CHOA		135												
3C	9.7	VSO DGR CH4 W/ RT, WD	CH4		77	54	96	98	UU	0	153		96	29	67	0.20	
4A	12.0	VSO DGR CHOB W/ RT	CHOB		156												
4B	12.8	VSO DGR CHOC W/ RT	CHOC		122	37	82	93									
4C	13.7	VSO DBR PT	PT		165	31	82	100	UU	0	210		131	28	103		CON, GS
4D	14.6	VSO DGR & GR PT W/ RT	PT		267								201	47	154	0.17	
5A	16.0	VSO GR & DGR CHOA W/ RT	CHOA		130												
5B	16.8	VSO DGR GR CHOA W/ RT, ARS ML	CHOA		157	32	81	97	UU	0	136		146	45	101	0.16	OC= 21.1%
5C	17.7	VSO GR & DGR CHOA W/ WD	CHOA		97												
5D	18.6	VSO GR CHOA W/ WD	CHOA		121												
6A	20.0	VSO GR CHOA W/ LNS ML	CHOA		102												
6B	20.8	SO GR CH3 W/ LNS ML	CH3		47												
6C	21.7	VSO GR CH4 W/ LNS ML CC	CH4	15	68	61	102	100	UC	–	174	348	74	20	54	0.12	
7A	24.0	VSO GR CH3	CH3		80												
7B	24.8	SO GR CH3 W/ LNS ML	CH3		59	66	104	100	UU	0	289		67	22	45	0.20	
7C	25.7	SO GR CH3 W/ LNS ML	CH3		54												
7D	26.6	SO GR CH3 W/ LNS ML	CH3		39												
8A	28.0	SO GR CH3 W/ LNS ML, LNS SM	CH3		55												
8B	28.8	SO GR CL6 W/ LNS ML, LNS SM	CL6		49												
8C	29.7	SO GR CL6 W/ LNS ML	CL6	15	45	75	108	95	UC	–	303	606	45	17	28	0.22	
8D	30.6	SO GR CH4 W/ LNS ML	CH4		70												
9A	32.0	SO GR CH4 W/ LNS ML, LNS SM	CH4		58												
9B	32.8	SO GR CH4	CH4		76	55	96	98	UU	0	370		88	23	65	0.20	
9C	33.7	SO GR CH4 W/ LNS ML, LNS SM	CH4		60												
9D	34.6	SO GR CH4 W/ LNS ML, LNS SM	CH4		57												
10A	36.0	SO GR CH4 W/ LNS ML	CH4		54												
10B	36.8	SO GR CH4 W/ LNS ML	CH4		63												
10C	37.7	SO GR CH4 W/ ARS ML, SL	CH4		67	60	100	100	UU	0	358		80	24	56	0.25	

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-11UFT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	Wt	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
11A	40.0	SO GR CH4 W/ LNS ML	CH4		64												
11B	40.8	SO GR CH4 W/ LNS ML	CH4		67	58	97	95									
11C	41.7	SO GR CH4 W/ ARS ML	CH4	3	66	60	100	100	UC	--	324	649	72	27	45		CON, GS
12A	44.0	SO GR CH4 W/ LNS ML, SL	CH4		61								76	21	55	0.22	
12B	44.8	SO GR CH4	CH4		67	61	101	100	UU	0	457		85	27	58	0.27	
12C	45.7	SO GR CH4 W/ SL	CH4		64												
12D	46.6	SO GR CH4 W/ SL	CH4		72												
13A	48.0	SO GR CH4 W/ LNS ML, SL	CH4		79												
13B	48.8	M GR CH4 W/ LNS ML, SL	CH4		68												
13C	49.7	M GR CH4	CH4	4	69	59	100	100	UC	--	535	1069	85	23	62	0.26	
13D	50.6	SO GR CH4 W/ SL, LNS ML	CH4		71												
14A	52.0	SO GR CH4 W/ LNS ML, SL	CH4		61												
14B	52.8	SO GR CH4 W/ LNS ML, SL	CH4		68												
14C	53.7	SO GR CH4	CH4	3	66	59	98	95	UC	--	488	976	108	23	85	0.30	
14D	54.6	SO GR CH4 W/ LNS ML, SL	CH4		68												
15A	56.0	GR SM1 W/ SIF	SM1		28												
15B	56.8	GR SM1 W/ SIF	SM1		30												
15C	57.7	GR SM1 W/ SIF	SM1		32												
16A	60.0	GR SM1 W/ SIF	SM1		32												
16B	60.8	SO GR CL4 W/ SIF	CL4		34												SV
16C	61.7	SO GR CL4 W/ ARS CH	CL4	5	33	88	118	100	UC	--	292	583	31	20	11	0.30	
17A	64.0	SO GR CL4 W/ LNS ML, SIF	CL4		42												
17B	64.8	M GR CH4 W/ LNS ML, SIF	CH4		44												
17C	65.7	M GR CH4 W/ SIF	CH4		52	70	106	100	UU	0	943		74	22	52	0.40	
17D	66.6	M GR CH4 W/ SL	CH4		58												
18A	68.0	M GR CH4 W/ SL	CH4		61												
18B	68.8	M GR CH4 W/ SL	CH4		60												
18C	69.7	M DGR CH4 W/ ARS ML, SIF	CH4	4	59	64	102	97	UC	--	609	1218	81	21	60	0.41	

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-12UCL

Current Date: 6/12/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST GR CH2 W/ O, RT, SIF	CH2		29												
1B	0.8	ST GR & T CH2 W/ SIF, RT	CH2		27												
NS	1.7	NO SAMPLE	NS														OC=5.2%
2A	4.0	ST T & GR CL6	CL6		26	95	120	87	UU	0	1788		48	19	29	0.38	
2B	4.8	ST T & GR CL6	CL6		29												
NS	5.7	NO SAMPLE	NS														
3A	8.0	M GR & T CH2 W/ RT, SIF	CH2		31	88	115	92	UU	0	969		53	21	32	0.41	
3B	8.8	M GR & T CH2 W/ RT, SIF	CH2		34												
NS	9.4	NO SAMPLE	NS														
4A	12.0	T SP W/ ARS CL, SIF	SP		23												
4B	12.8	T SP W/ ARS CL, SIF	SP		22												
4C	13.7	M GR & DGR CL6 W/ SIF	CL6		36	**	**	**	UU	**	**		**	**			UU, AL, CON
4D	14.6	M GR CH4 W/ ARS SP	CH4		62												
5A	16.0	M DGR & GR CHOA W/ ARS SP, WD	CHOA		105												
5B	16.8	M DGR & GR CH4 W/ WD, RT	CH4		66	59	97	94	UU	0	568		88	22	66	0.22	
5C	17.7	M GR CH4 W/ RT	CH4		56												
5D	18.6	M GR CH4 W/ RT	CH4		63												
6A	20.0	SO GR CHOA W/ RT, WD	CHOA		78												
6B	20.8	SO GR CHOA W/ RT, WD	CHOA	3	117	39	85	95	UC	–	280	561				0.29	
6C	21.7	SO GR CHOA W/ RT	CHOA		91	**	**	**	UU	**	**		127	29	98	0.28	UU 4TH PT
6D	22.6	SO GR CHOA W/ ARS ML, RT	CHOA		107												
7A	24.0	SO GR PT W/ RT, SIF	PT		120	38	83	94	UU	0	409		285	60	225	0.35	
7B	24.8	SO GR CH3 W/ RT	CH3	4	59	62	98	91	UC	–	260	521				0.26	
7C	25.7	SO GR CL4 W/ RT	CL4	7	23	88	109	70	UC	–	258	516				0.21	
7D	26.6	SO GR CL4	CL4		34												
8A	28.0	SO GR CH4 W/ ARS ML, O	CH4		74												
8B	28.8	SO GR CH4 W/ ARS ML, SIF	CH4		52												
8C	29.7	SO GR CH4 W/ SIF, RT	CH4		72												
8D	30.6	SO GR CH4 W/ SIF, RT	CH4		77												
9A	32.0	SO GR CH4	CH4		69								**	**			AL, CON
9B	32.8	SO GR CH4 W/ LYS ML	CH4		71	55	93	91	UU	0	306		95	27	68	0.21	
9C	33.7	VSO GR CL6 W/ LYS ML	CL6		49												
10A	36.0	VSO GR CL6 W/ LNS & LYS ML	CL6		32												
10B	36.8	VSO GR CL6 W/ LNS & LYS ML	CL6		43												
10C	37.7	VSO GR CL6 W/ LNS & LYS ML	CL6	6	44	72	103	88	UC	–	208	415				0.21	

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-12UCL

Current Date: 6/12/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
10D	38.6	VSO GR CL6 W/ LNS & LYS ML	CL6		50												
11A	40.0	SO GR CH4 W/ LNS & ARS ML	CH4		56												
11B	40.8	SO GR CH4 W/ LNS & ARS ML	CH4		60												
11C	41.7	SO GR CH4 W/ LNS & ARS ML	CH4		51	68	102	92	UU	0	400		83	20	63	0.05	
11D	42.6	SO GR CH4 W/ LNS & ARS ML	CH4		65												
12A	44.0	SO GR CH4 W/ LNS & ARS ML	CH4		54												
12B	45.7	SO GR CH4 W/ LNS & ARS ML	CH4		56												
12C	46.6	SO GR CH4 W/ LNS & ARS ML	CH4		55												
13A	48.0	SO GR CH4 W/ LNS ML	CH4		62												
13B	48.8	SO GR CH4 W/ LNS ML	CH4		62												
13C	49.7	SO GR CH4 W/ LNS ML	CH4	6	66	59	98	97	UC	–	381	762				0.27	
13D	50.6	SO GR CH4 W/ LNS ML	CH4		62												
14A	52.0	SO GR CH4 W/ ARS ML	CH4		72												
14B	52.8	SO GR CH3 W/ LNS ML	CH3		58												
14C	53.7	SO GR CH3 W/ LNS ML	CH3		73	55	95	95	UU	0	416		57	22	35	0.10	
14D	54.6	SO GR CH3 W/ LNS ML	CH3		67												
15A	56.0	VSO GR CH3	CH3		78												
15B	56.8	VSO GR CH3 W/ LNS ML	CH3		67												
15C	57.7	VSO GR CH3	CH3	7	72	55	95	94	UC	–	150	301				0.23	
15D	58.6	VSO GR CH3	CH3		63												
16A	60.0	SO GR CH4	CH4		76												
16B	60.8	SO GR CH4	CH4		68												
16C	61.7	SO GR CH4 W/ ARS ML	CH4		57	63	99	92	UU	0	415		95	29	66	0.05	
16D	62.6	SO GR CH4 W/ ARS ML	CH4		63												
17A	64.0	SO GR CH4	CH4		76												
17B	64.8	SO GR CL4 W/ SIF	CL4		28												
17C	65.7	SO GR CL4 W/ SIF	CL4		32												
17D	66.6	SO GR CL4 W/ SIF	CL4		31												
18A	68.0	SO GR CL4 W/ SIF	CL4		38												
18B	68.8	SO GR CL4 W/ SIF	CL4	4	41	75	105	88	UC	–	391	781				0.35	
18C	69.7	M GR CL6 W/ SIF	CL6		43	75	107	91	UU	0	728		49	16	33	0.23	
18D	70.6	M GR CH3 W/ ARS ML, SIF	CL4		49												

Remarks: _____
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-12UCL

Current Date: 6/12/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
10D	38.6	VSO GR CL6 W/ LNS & LYS ML	CL6		50												
11A	40.0	SO GR CH4 W/ LNS & ARS ML	CH4		56												
11B	40.8	SO GR CH4 W/ LNS & ARS ML	CH4		60												
11C	41.7	SO GR CH4 W/ LNS & ARS ML	CH4		51	68	102	92	UU	0	400		83	20	63	0.05	
11D	42.6	SO GR CH4 W/ LNS & ARS ML	CH4		65												
12A	44.0	SO GR CH4 W/ LNS & ARS ML	CH4		54												
12B	45.7	SO GR CH4 W/ LNS & ARS ML	CH4		56												
12C	46.6	SO GR CH4 W/ LNS & ARS ML	CH4		55												
13A	48.0	SO GR CH4 W/ LNS ML	CH4		62												
13B	48.8	SO GR CH4 W/ LNS ML	CH4		62												
13C	49.7	SO GR CH4 W/ LNS ML	CH4	6	66	59	98	97	UC	–	381	762				0.27	
13D	50.6	SO GR CH4 W/ LNS ML	CH4		62												
14A	52.0	SO GR CH4 W/ ARS ML	CH4		72												
14B	52.8	SO GR CH3 W/ LNS ML	CH3		58												
14C	53.7	SO GR CH3 W/ LNS ML	CH3		73	55	95	95	UU	0	416		57	22	35	0.10	
14D	54.6	SO GR CH3 W/ LNS ML	CH3		67												
15A	56.0	VSO GR CH3	CH3		78												
15B	56.8	VSO GR CH3 W/ LNS ML	CH3		67												
15C	57.7	VSO GR CH3	CH3	7	72	55	95	94	UC	–	150	301				0.23	
15D	58.6	VSO GR CH3	CH3		63												
16A	60.0	SO GR CH4	CH4		76												
16B	60.8	SO GR CH4	CH4		68												
16C	61.7	SO GR CH4 W/ ARS ML	CH4		57	63	99	92	UU	0	415		95	29	66	0.05	
16D	62.6	SO GR CH4 W/ ARS ML	CH4		63												
17A	64.0	SO GR CH4	CH4		76												
17B	64.8	SO GR CL4 W/ SIF	CL4		28												
17C	65.7	SO GR CL4 W/ SIF	CL4		32												
17D	66.6	SO GR CL4 W/ SIF	CL4		31												
18A	68.0	SO GR CL4 W/ SIF	CL4		38												
18B	68.8	SO GR CL4 W/ SIF	CL4	4	41	75	105	88	UC	–	391	781				0.35	
18C	69.7	M GR CL6 W/ SIF	CL6		43	75	107	91	UU	0	728		49	16	33	0.23	
18D	70.6	M GR CH3 W/ ARS ML, SIF	CL4		49												

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO72

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-12UCL

Current Date: 6/12/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST GR CH2 W/ O, RT, SIF	CH2		29												
1B	0.8	ST GR & T CH2 W/ SIF, RT	CH2		27												OC=5.2%
NS	1.7	NO SAMPLE	NS														
2A	4.0	ST T & GR CL6	CL6		26	95	120	87	UU	0	1788		48	19	29	0.38	
2B	4.8	ST T & GR CL6	CL6		29												
NS	5.7	NO SAMPLE	NS														
3A	8.0	M GR & T CH2 W/ RT, SIF	CH2		31	88	115	92	UU	0	969		53	21	32	0.41	
3B	8.8	M GR & T CH2 W/ RT, SIF	CH2		34												
NS	9.4	NO SAMPLE	NS														
4A	12.0	T SP W/ ARS CL, SIF	SP		23												
4B	12.8	T SP W/ ARS CL, SIF	SP		22												
4C	13.7	M GR & DGR CL6 W/ SIF	CL6		36	**	**	**	UU	**	**		**	**			UU, AL, CON
4D	14.6	M GR CH4 W/ ARS SP	CH4		62												
5A	16.0	M DGR & GR CHOA W/ ARS SP, WD	CHOA		105												
5B	16.8	M DGR & GR CH4 W/ WD, RT	CH4		66	59	97	94	UU	0	568		88	22	66	0.22	
5C	17.7	M GR CH4 W/ RT	CH4		56												
5D	18.6	M GR CH4 W/ RT	CH4		63												
6A	20.0	SO GR CHOA W/ RT, WD	CHOA		78												
6B	20.8	SO GR CHOA W/ RT, WD	CHOA	3	117	39	85	95	UC	--	280	561				0.29	
6C	21.7	SO GR CHOA W/ RT	CHOA		91	**	**	**	UU	**	**		127	29	98	0.28	UU 4TH PT
6D	22.6	SO GR CHOA W/ ARS ML, RT	CHOA		107												
7A	24.0	SO GR PT W/ RT, SIF	PT		120	38	83	94	UU	0	409		285	60	225	0.35	
7B	24.8	SO GR CH3 W/ RT	CH3	4	59	62	98	91	UC	--	260	521				0.26	
7C	25.7	SO GR CL4 W/ RT	CL4	7	23	88	109	70	UC	--	258	516				0.21	
7D	26.6	SO GR CL4	CL4		34												
8A	28.0	SO GR CH4 W/ ARS ML, O	CH4		74												
8B	28.8	SO GR CH4 W/ ARS ML, SIF	CH4		52												
8C	29.7	SO GR CH4 W/ SIF, RT	CH4		72												
8D	30.6	SO GR CH4 W/ SIF, RT	CH4		77												
9A	32.0	SO GR CH4	CH4		69								**	**			AL, CON
9B	32.8	SO GR CH4 W/ LYS ML	CH4		71	55	93	91	UU	0	306		95	27	68	0.21	
9C	33.7	VSO GR CL6 W/ LYS ML	CL6		49												
10A	36.0	VSO GR CL6 W/ LNS & LYS ML	CL6		32												
10B	36.8	VSO GR CL6 W/ LNS & LYS ML	CL6		43												
10C	37.7	VSO GR CL6 W/ LNS & LYS ML	CL6	6	44	72	103	88	UC	--	208	415				0.21	

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-12UCL

Current Date: 6/12/2007

Sample Number	Depth	Visual Classification	USCS	B(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
10D	38.6	VSO GR CL6 W/ LNS & LYS ML	CL6		50												
11A	40.0	SO GR CH4 W/ LNS & ARS ML	CH4		56												
11B	40.8	SO GR CH4 W/ LNS & ARS ML	CH4		60												
11C	41.7	SO GR CH4 W/ LNS & ARS ML	CH4		51	68	102	92	UU	0	400		83	20	63	0.05	
11D	42.6	SO GR CH4 W/ LNS & ARS ML	CH4		65												
12A	44.0	SO GR CH4 W/ LNS & ARS ML	CH4		54												
12B	45.7	SO GR CH4 W/ LNS & ARS ML	CH4		56												
12C	46.6	SO GR CH4 W/ LNS & ARS ML	CH4		55												
13A	48.0	SO GR CH4 W/ LNS ML	CH4		62												
13B	48.8	SO GR CH4 W/ LNS ML	CH4		62												
13C	49.7	SO GR CH4 W/ LNS ML	CH4	6	66	59	98	97	UC	–	381	762				0.27	
13D	50.6	SO GR CH4 W/ LNS ML	CH4		62												
14A	52.0	SO GR CH4 W/ ARS ML	CH4		72												
14B	52.8	SO GR CH3 W/ LNS ML	CH3		58												
14C	53.7	SO GR CH3 W/ LNS ML	CH3		73	55	95	95	UU	0	416		57	22	35	0.10	
14D	54.6	SO GR CH3 W/ LNS ML	CH3		67												
15A	56.0	VSO GR CH3	CH3		78												
15B	56.8	VSO GR CH3 W/ LNS ML	CH3		67												
15C	57.7	VSO GR CH3	CH3	7	72	55	95	94	UC	–	150	301				0.23	
15D	58.6	VSO GR CH3	CH3		63												
16A	60.0	SO GR CH4	CH4		76												
16B	60.8	SO GR CH4	CH4		68												
16C	61.7	SO GR CH4 W/ ARS ML	CH4		57	63	99	92	UU	0	415		95	29	66	0.05	
16D	62.6	SO GR CH4 W/ ARS ML	CH4		63												
17A	64.0	SO GR CH4	CH4		76												
17B	64.8	SO GR CL4 W/ SIF	CL4		28												
17C	65.7	SO GR CL4 W/ SIF	CL4		32												
17D	66.6	SO GR CL4 W/ SIF	CL4		31												
18A	68.0	SO GR CL4 W/ SIF	CL4		38												
18B	68.8	SO GR CL4 W/ SIF	CL4	4	41	75	105	88	UC	–	391	781				0.35	
18C	69.7	M GR CL6 W/ SIF	CL6		43	75	107	91	UU	0	728		49	16	33	0.23	
18D	70.6	M GR CH3 W/ ARS ML, SIF	CL4		49												

Remarks: _____
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-13UCL

Current Date: 12/26/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR CH2 W/ RT	CH2		25												
1B	0.8	VST GR & BR CL6 W/ LYS CH, ARS SM, TR-SIF	CL6	6	15	106	122	70	UC	–	2235	4470	46	17	29	0.87	
NS	1.7	NO SAMPLE	NS														
2A	4.0	ST BR & GR CH2 W/ SIF	CH2		25												
2B	4.8	ST BR & GR CH2 W/ SIF	CH2		27												
2C	5.7	ST BR & GR CH3 W/ ARS ML, O	CH3		34	85	114	93	UU	0	1476		62	18	44	0.75	
3A	8.0	M GR CH4 W/ ARS ML, SIF, O	CH4		46												
4A	10.5	BR WD	WD		226												
5A	12.0	SO GR CHOA W/ ARS ML	CHOA		72												
5B	12.8	SO BR & GR CHOA	CHOA		80	53	96	100	UU	0	385		135	29	106	0.40	
5C	13.7	M GR CH2 W/ WD, RT	CH2		38	82	114	99					55	20	35		GS, CON
5D	14.6	M GR CL6 W/ WD, RT	CL6		30												
6A	16.0	BR WD	WD		252												
6B	16.8	M GR CL6 W/ RT	CL6		36												
6C	17.7	SO GR CH4 W/ WD, ARS ML	CH4	7	52	67	102	91	UC	–	445	889	82	23	59	0.49	
7A	20.0	BR WD	WD		179												
7B	20.8	SO GR CHOA W/ WD, RT	CHOA		83												
7C	21.7	SO DGR CHOA	CHOA		112	40	86	95	UU	0	332		145	32	113	0.45	OC= 23.8%
7D	22.6	M GR CHOA W/ WD, RT	CHOA		91												
8A	24.0	M GR CHOA W/ RT	CHOA		96												
8B	24.8	M GR CHOA W/ RT	CHOA		115	40	85	97					154	37	117		GS, CON
8C	25.7	M BK & GR PT	PT		151	30	73	85	UU	0	792		243	86	157		OC= 22.1%
8D	26.6	M GR CHOA W/ RT	CHOA		94												
9A	28.0	M GR & LGR CH4 W/ ARS ML	CH4		58												
9B	28.8	SO GR CL6 W/ LNS ML	CL6		49												
9C	29.7	SO GR CL6 W/ LNS SM, LNS ML	CL6		60	65	102	96	UU	0	383		49	16	33	0.35	
9D	30.6	SO GR CL6	CL6		53												
10A	32.0	GR ML2	ML2		31												
10B	32.8	GR ML2 W/ LYS CL	ML2		34				CD				*	*			
10C	33.7	GR ML2 W/ LNS CH	ML2	3	26	94	119	90	UC	–	478	956	NP	NP		0.24	
10D	34.6	SO GR CL6	CL6		37												
11A	36.0	SO GR CL6 W/ LNS ML	CL6		41												
11B	36.8	SO GR CL6 W/ LNS ML	CL6		37												
11C	37.7	SO GR CH2 W/ LNS SM & ML	CH2	6	47	72	106	93	UC	–	485	969	56	21	35	0.28	

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-13UCL

Current Date: 12/26/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
11D	38.6	M GR CH2 W/ LNS ML	CH2		42												
12A	40.0	M GR CH4 W/ LNS & ARS ML	CH4		54												
12B	40.8	M GR CH4 W/ LNS ML	CH4		59	66	105	102	UU	0	574		75	20	55	0.30	
12C	41.7	M GR CH4 W/ LNS & ARS ML	CH4		53												
12D	42.6	M GR CH4 W/ LNS & ARS ML	CH4		62												
13A	44.0	M GR CH4 W/ LNS & ARS ML	CH4		57												
13B	44.8	M GR CH4 W/ LNS & ARS ML	CH4		70	59	100	101	UU	0	648		91	27	64	0.30	
13C	45.7	M GR CH4 W/ LNS & ARS ML	CH4		45												
14A	48.0	M GR CH4 W/ LNS & ARS ML	CH4		59												
14B	48.8	M GR CH4 W/ LNS & ARS ML	CH4		46												
14C	49.7	M GR CH4 W/ ARS ML	CH4	3	62	61	99	95	UC	–	697	1393	85	28	57	0.36	
14D	50.6	M GR CH4 W/ ARS ML	CH4		64												
15A	52.0	M GR CH4	CH4		63												
15B	52.8	M GR CH4 W/ ARS ML	CH4		57												
15C	53.7	M GR CH4 W/ ARS ML, SM	CH4	3	60	64	102	97	UC	–	693	1385	78	26	52	0.30	
15D	54.6	M GR CH4	CH4		59												
16A	56.0	M DGR CH4	CH4		63												
16B	56.8	M DGR CH4	CH4		61												
16C	57.7	M DGR CH4 W/ SL	CH4		67	62	103	104	UU	0	648		92	29	63	0.32	
17A	60.0	M DGR CH4	CH4		64												
17B	60.8	M DGR CH4	CH4		62												
17C	61.7	M DGR & GR CH4	CH4	4	57	67	105	101	UC	–	734	1469	81	23	58	0.37	
17D	62.6	M GR CH4 W/ ARS ML	CH4		62												
18A	64.0	SO GR CL6-S W/ SIF	CL6-S		34												
18B	64.8	SO GR CL4-S W/ SIF	CL4-S		29												
18C	65.7	GR SM1-S W/ SIF	SM1-S		30	94	122	102	UU	0	475		NP	NP			
19A	66.0	M GR CL6-S W/ SIF	CL6-S		33												
19B	68.8	M GR CL6 W/ ARS SM, SIF	CL6		36												
19C	69.7	M GR CL6 W/ ARS SM, SIF	CL6	4	40	80	112	96	UC	–	612	1223	48	19	29	0.38	
19D	70.6	M GR CL6 W/ ARS SM, SIF	CL6		39												

Remarks:
FFEBJV, LLC.

Checked by: WTY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-13UFT

Current Date: 12/6/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
10D	38.6	M GR CH4	CH4		59												
11A	40.0	M GR CH4	CH4		65												
11B	40.8	M GR CH4	CH4		61												
11C	41.7	M GR CH4 W/ LNS ML	CH4	3	59	65	103	99	UC	–	665	1371					CON
11D	42.6	M GR CH4 W/ LNS ML	CH4		49												
12A	44.0	M GR CH4	CH4		69												
12B	44.8	M GR CH4	CH4		59												
12C	45.7	M GR CH4 W/ ARS ML, SL	CH4	2	60	62	100	93	UC	–	549	1097	78	24	54	0.34	
13A	48.0	M GR CH4	CH4		61												
13B	48.8	M GR CH4	CH4		63												
13C	49.7	M GR CH4 W/ SL, LNS ML	CH4		65	62	102	100	UU	0	815		85	29	56	0.35	
13D	50.6	M GR CH4	CH4		66												
14A	52.0	M GR CH4	CH4		60												
14B	52.8	M GR CH4 W/ LNS ML	CH4		59												
14C	53.7	M DGR CH4	CH4		61	64	103	100	UU	0	775		83	26	57	0.27	
14D	54.6	M GR CH4 W/ LNS SM	CH4		61												
15A	56.0	GR SM1 W/ SIF	SM1		27												
15B	56.8	GR SM1 W/ SIF	SM1		29												SV
16A	58.0	GR SM1 W/ SIF	SM1		32												
17A	60.0	GR SM1 W/ SIF	SM1		34												
17B	60.8	GR SM1 W/ SIF	SM1		34												
17C	61.7	SO GR CL4-S	CL4-S	6	28	88	112	82	UC	–	498	996	37	19	18	0.32	
17D	62.6	M GR CH3 W/ ARS SM, SIF	CH3		38												
18A	64.0	M GR CH4 W/ SIF, ARS SM	CH4		52												
18B	64.8	M GR CH4 W/ SIF, ARS SM	CH4		54												
18C	65.7	M GR CH4 W/ SL	CH4		54	69	106	100	UU	0	762		81	25	56	0.30	
18D	66.6	M GR CH4	CH4		58												
19A	68.0	M GR CH4 W/ LNS & ARS ML	CH4		63												
19B	68.8	M GR CH4 W/ SIF	CH4		60												
19C	69.7	ST GR CH4 W/ ARS ML & SM	CH4	2	58	66	104	100	UC	–	1158	2316	87	24	63	0.45	
19D	70.6	M GR CH4 W/ SIF	CH4		60												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002 Current Date: 12/6/2007
Boring: WWHC-13UFT

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST GR & T CH2 W/ SIF	CH2		33												
NS	0.8	NO SAMPLE	NS														
2A	4.0	SO GR CHOA	CHOA		99												
2B	4.8	SO GR CHOA W/ ARS ML, WD	CHOA		88	50	94	100	UU	0	277		139	48	91	0.25	OC = 13.3%
NS	5.6	NO SAMPLE	NS														
3A	8.0	SO GR CL6	CL6		38												
3B	8.8	SO GR CL6	CL6		48												
3C	9.7	SO GR CH3 W/ ARS ML & SM, RT	CH3	15	64	61	100	97	UC	–	310	621	68	21	47	0.24	
4A	12.0	SO GR CHOA	CHOA		81												
4B	12.8	SO GR CHOA	CHOA		106												
4C	13.7	SO GR CHOA	CHOA		87	51	96	100	UU	0	266		115	29	86	0.25	OC = 8.6%
4D	14.6	SO GR CHOA	CHOA		110												
5A	16.0	SO GR CHOA W/ WD	CHOA		147												
5B	16.8	SO BR & DGR CH4 W/ O, WD	CH4		82	53	96	100	UU	0	333		106	30	76	0.25	OC = 16.1%
5C	17.7	SO LGR CH4 W/ ARS & LYS ML	CH4		61												
5D	18.6	SO LGR CH3 W/ ARS & LYS ML	CH3		44												
6A	20.0	VSO GR CH4 W/ LNS ML	CH4		95												
6B	20.8	SO GR CH4 W/ LNS ML	CH4		53												
6C	21.7	SO GR CH3 W/ LNS ML	CH3		53												
7A	24.0	SO GR CH3	CH3		53												
7B	24.8	GR ML2 W/ LNS CH	ML2		35												
7C	25.7	GR ML2	ML2	4	26	97	123	99	UC	–	663	1327				0.29	
7D	26.6	SO GR CH4 W/ LNS ML	CH4		56												
8A	28.0	SO GR CH4 W/ LYS ML	CH4		55												
8B	28.8	VSO GR CL4 W/ LYS & LNS SM	CL4		40	76	107	89					33	22	11		CON
8C	29.7	SO GR CH4 W/ LNS ML, ARS SP	CH4		54	69	106	100	UU	0	395					0.22	
8D	30.6	SO GR CH4 W/ LYS & LNS SM	CH4		46												
9A	32.0	SO GR CH4 W/ LNS SM	CH4		63												
9B	32.8	SO DGR CH4 W/ LNS SM, ARS ML, SL	CH4	2	65	60	99	97	UC	–	458	916	90	24	66	0.30	
9C	33.7	SO GR CH4 W/ LNS & ARS SM	CH4		55												
9D	34.6	SO GR CH4 W/ LNS & ARS SM	CH4		54												
10A	36.0	SO GR CH4	CH4		70												
10B	36.8	SO BR CH4 W/ SL	CH4		65	62	102	100	UU	0	383		82	25	57	0.24	
10C	37.7	M GR CH4	CH4		48												

Remarks: _____
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-14UCL

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	Wt	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR & GR CH2 W/ SIF	CH2		27												
1B	0.8	VST BR CH2 W/ RT, ARS SM	CH2	8	24	98	121	89	UC	–	2447	4894	60	16	44	1.040	
NS	1.7	NO SAMPLE	NS														
2A	4.0	ST BR & GR CH2 W/ RT	CH2		22												
2B	4.8	ST BR & GR CH2 W/ RT, SIF	CH2		26												
NS	5.7	NO SAMPLE	NS														
3A	8.0	BR WD	WD		172												
NS	8.8	NO SAMPLE	NS														
4A	12.0	VSO GR CH4 W/ WD	CH4		88												
4B	12.8	SO GR CH4 W/ WD	CH4		69												
4C	13.7	SO GR CL4 W/ WD	CL4		36												
5A	16.0	SO GR CL4 W/ RT, WD	CL4		36												
5B	16.8	M GR CL4 W/ ARS CH, O	CL4		35	88	119	100	UU	0	501		37	23	14	0.220	
5C	17.7	VSO GR CL4 W/ RT	CL4		43	81	116	100					36	19	17		CON
5D	18.6	VSO GR CH2 W/ RT, O	CH2		64												
6A	20.0	VSO GR CH2 W/ RT, WD	CH2		75												
6B	20.8	VSO CH2 W/ RT, WD, O	CH2		90												
NS	21.7	NO SAMPLE	NS														
7A	24.0	SO GR CHOA W/ WD, RT	CHOA		116												OC = 40.3%
7B	24.8	SO BR CHOC	CHOC		155	32	82	100	UU	0	340		196	50	146	0.270	
7C	25.7	SO GR CH3 W/ WD, RT, O, CC	CH3		57												OC = 56.4%
8A	28.0	SO GR CH3 W/ WD, ARS ML, CC	CH3		57												
8B	28.8	SO GR CH3 W/ ARS ML, CC	CH3		51												
8C	29.7	SO GR CL6-S W/ CC, ARS CH	CL6-S		44	79	114	100	UU	0	315		43	17	26	0.200	
9A	32.0	SO GR CL6 W/ WD	CL6		37												
9B	32.8	SO GR CH3 W/ LNS ML	CH3		54												
9C	33.7	SO GR CH4 W/ O	CH4		63	64	104	100	UU	0	494		85	27	58	0.260	
10A	36.0	SO GR CH3 W/ LNS ML	CH3		44												
10B	36.8	VSO GR CH2 W/ LYS ML	CH2		68	66	111	100					52	17	35		CON
10C	37.7	SO GR CH3 W/ LNS ML & SM	CH3	11	49	70	104	94	UC	–	357	714	47	18	29	0.230	
11A	40.0	SO GR CH4 W/ LNS ML	CH4		60												
11B	40.8	SO GR CH4	CH4		63	63	103	100	UU	0	346		76	24	52	0.200	
11C	41.7	SO GR CH4 W/ LNS ML	CH4		59												
11D	42.6	M GR CH3	CH3		56												
12A	44.0	M GR CH3	CH3		55												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-14UCL

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12B	44.6	M GR CH3 W/ ARS SM, LNS ML	CH3	8	45	73	106	93	UC	–	519	1038	56	21	35	0.300	
12C	45.7	M GR CH3 W/ LNS ML, SL	CH3		54												
12D	46.6	SO GR CH4 W/ SL	CH4		57												
13A	48.0	SO GR CH4 W/ WD, SL	CH4		61												
13B	48.8	SO GR CH4 W/ LNS ML, WD, SL	CH4		55												
13C	49.7	SO GR CH4 W/ SL	CH4		61	64	103	100	UU	0	358		85	26	59	0.280	
14A	52.0	SO GR CH4 W/ SL	CH4		61												
14B	52.8	M GR CH4 W/ LNS ML, SL	CH4		57												
14C	53.7	M GR CH4	CH4	7	55	66	103	95	UC	–	617	1233	77	25	52	0.360	
14D	54.6	M GR CH4 W/ SL	CH4		61												
15A	56.0	M GR CH4 W/ SL	CH4		65												
15B	56.8	M GR CH4 W/ SL	CH4		65												
15C	57.7	M GR CH4 W/ SL	CH4		63	63	103	100	UU	0	543		87	26	61	0.300	
16A	60.0	M GR CH4 W/ SL	CH4		61												
16B	60.8	M GR CH4 W/ LNS ML	CH4		68	61	102	100	UU	0	543		89	29	60	0.320	
NS	61.7	NO SAMPLE	NS														
17A	64.0	GR SM1 W/ SIF	SM1		28												
17B	64.8	GR SM1 W/ SIF	SM1		29												
17C	65.7	GR SM1 W/ SIF	SM1		28												SV
18A	68.0	M GR CL6 W/ SIF	CL6		35												
18B	68.8	M GR CL6 W/ SIF	CL6		37												
18C	69.7	M GR CL6 W/ ARS SM, SIF	CL6	3	41	77	109	93	UC	–	651	1302	42	18	24	0.310	
18D	70.6	M GR CH4 W/ SIF, ARS ML	CH4		43												
19A	72.0	M GR CH4 W/ LNS ML, SIF	CH4		57												
19B	72.8	M GR CH4 W/ SL	CH4		59												
19C	73.7	M GR CH4	CH4		61	65	104	100	UU	0	568		89	26	63	0.420	
19D	74.6	M GR CH4 W/ SL, LNS ML	CH4		61												
20A	76.0	M GR CH4 W/ SIF, SL	CH4		65												
20B	76.8	M GR CH4 W/ SL	CH4		63												
20C	77.7	M GR CH4 W/ ARS ML	CH4	3	61	63	101	97	UC	–	610	1221	95	26	69	0.460	
20D	78.6	M GR CH4 W/ SL, ARS ML	CH4		64												
21A	80.0	SO GR CH4 W/ SL	CH4		81												
21B	80.8	M GR CH4 W/ ARS SM, SIF, SL	CH4	3	58	63	99	92	UC	–	957	1914	94	23	71	0.460	
21C	81.7	M GR CL6 W/ SL, LYS CH	CL6		31												
22A	84.0	M GR CH2 W/ SIF, ARS SM, SL	CH2		48												
22B	84.8	M GR CL6 W/ SIF, ARS SM, SL	CL6		39												
22C	85.7	M GR CL6 W/ ARS SP, SIF	CL6		34	88	118	100	UU	0	813		43	16	27	0.420	

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-14UCL

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
22D	86.6	M GR CL6 W/ ARS SM, SIF	CL6		40												
23A	88.0	M GR CL6	CL6		24												
23B	88.8	M GR & T CL6	CL6		26												
23C	89.7	M LGR CH2 W/ ARS SM	CH2	15	26	94	119	88	UC	–	924	1847	53	16	37	0.540	

Remarks:
FFEBJV, LLC.

Checked by: WTY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-14UPT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	Wt	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST GR CH3 W/ SIF	CH3		28												
1B	0.8	ST GR & BR CH3 W/ ARS ML, SIF, RT, WD	CH3	8	31	84	110	82	UC	–	1389	2777	73	22	51	0.85	
NS	1.7	NO SAMPLE	NS														
2A	4.0	M GR & T CH3 W/ O	CH3		46												
2B	4.8	M GR & T CH2	CH2		34												
2C	5.7	M GR & LBR CH2 W/ WD, TR-RT	CH2		39	82	115	100	UU	0	535		57	22	35	0.40	
3A	8.0	SO GR CH4 W/ LYS ML	CH4		46												
3B	8.8	SO GR CH4 W/ LYS ML, O	CH4		57												
3C	9.7	SO GR CH4 W/ RT, WD	CH4		70	59	101	100	UU	0	303		98	24	74	0.40	
3D	10.6	M GR CH4 W/ LYS ML, O	CH4		74												
4A	12.0	SO GR CHOA	CHOA		77												
4B	12.8	SO GR CHOA W/ RT, WD, SL	CHOA		81	51	92	94	UU	0	290		143	32	111	0.30	
4C	13.7	M GR CH4 W/ O	CH4		70												
5A	16.0	SO GR CL4 W/ LYS CH	CL4		42												
5B	16.8	SO GR CH4 W/ SIF, ARS ML	CH4		62												
5C	17.7	SO GR CH4 W/ ARS ML, SIF	CH4	3	61	61	89	94	UC	–	413	827	78	24	54	0.33	
5D	18.6	M GR CH4 W/ ARS ML	CH4		56												
6A	20.0	M GR CH4 W/ LYS ML	CH4		57												
6B	20.8	SO GR CH4 W/ LYS ML	CH4		62												
6C	21.7	SO GR CH4 W/ SL	CH4		78	55	98	100	UU	0	286		98	26	72	0.20	
7A	24.0	M GR CH4 W/ LNS ML	CH4		58												
7B	24.8	M GR CH4 W/ LNS ML	CH4		62												
7C	25.7	M GR CH4 W/ LYS ML	CH4		64	59	97	94									OC= 36.8% GS, CON
8A	28.0	M GR CH4 W/ LNS & ARS SM	CH4		47								95	34	61		
8B	28.8	M GR CH4 W/ LNS & ARS SM	CH4		44												
8C	29.7	SO GR CH2 W/ LNS SM, ML	CH2	4	52	70	107	100	UC	–	391	782	52	18	34	0.24	
8D	30.6	M GR CH2 W/ LNS & ARS SM	CH2		47												
9A	32.0	SO GR CH4 W/ LNS ML	CH4		65												
9B	32.8	SO GR CH4 W/ LNS ML	CH4		70	58	98	98					71	21	50		GS, CON
9C	33.7	M GR CH4 W/ LNS ML, SL	CH4		65	62	102	100	UU	0	525		83	24	59	0.29	
9D	34.6	M GR CH4 W/ LNS & ARS ML	CH4		58												
10A	36.0	SO GR CH4 W/ LNS ML, O	CH4		61												
10B	36.8	M GR CH4	CH4	8	61	62	101	97	UC	–	450	900	86	26	60	0.31	
NS	37.7	NO SAMPLE	NS														
11A	40.0	M GR CH4 W/ ARS SM	CH4		57												
~~11B~~	~~40.8~~	~~M GR CH3 W/ ARS ML~~	~~CH3~~		~~49~~												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-14UPT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
11C	41.7	M GR CH3	CH3	5	48	71	106	94	UC	–	554	1107	65	20	45	0.33	
11D	42.6	M GR CH4 W/ LNS ML	CH4		55												
12A	44.0	M GR CH4	CH4		56												
12B	44.8	M GR CH4	CH4		61												
12C	45.7	M GR CH4 W/ ARS ML	CH4	4	55	65	100	91	UC	–	701	1402	88	28	60	0.40	
12D	46.6	M GR CH4	CH4		61												
13A	48.0	M GR CH4	CH4		60												
13B	48.8	M GR CH4 W/ SL	CH4		62	62	101	98	UU		648		95	25	70		
13C	49.7	M GR CH4	CH4	4	63	60	98	94	UC	–	782	1563	98	28	70	0.41	
13D	50.6	M GR CH4 W/ LNS ML	CH4		58												
14A	52.0	M GR CH4	CH4		59												
14B	52.8	M GR CH4 W/ LNS ML	CH4		62												
14C	53.7	M GR CH4 W/ ARS ML, SM	CH4	3	63	61	101	97	UC	–	709	1418	85	27	58	0.37	
15A	56.0	GR SM1 W/ SIF	SM1		25												
15B	56.8	GR SM1 W/ SIF	SM1		28												
15C	57.7	GR SM1	SM1		27												

Remarks:
FFEBJV, LLC.

Checked by: WSY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-15UCL

Current Date: 6/11/2007

Sample Number	Depth	Visual Classification	USCS	Z(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR & GR CH2 W/ RT, SIF	CH2		28												
1B	0.8	VST BR & GR CH2 W/ SIF	CH2		26												
1C	1.7	VST BR & GR CH2 W/ SIF	CH2		24												
2A	4.0	ST BR & GR CH2 W/ SIF	CH2		29												
2B	4.8	ST GR CH3 W/ ARS ML, SIF	CH3		39												
NS	5.3	NO SAMPLE	NS														
3A	8.0	ST GR CH4 W/ ARS ML	CH4		52											0.19	OC = 3.8%
3B	8.8	ST GR CH4 W/ ARS ML	CH4		48	71	105	99	UU	0	1014		71	20	51	0.28	
3C	9.7	ST GR CH4 W/ LYS ML	CH4		53												
4A	12.0	M GR & DGR CH4 W/ WD, O, SIF	CH4		69												
4B	12.8	M GR & DGR CH4 W/ O, WD, SIF	CH4		33	68	91	62	UU	0	675		87	22	65	0.17	
4C	13.7	M GR & DGR CHOA W/ WD, SIF	CHOA		76				UU				128	34	94		UU DIST
5A	16.0	M GR CH4 W/ ARS ML, SIF, RT	CH4		54												
5B	16.8	M GR CH4 W/ ARS ML, SIF, RT	CH4		51	**	**	**	UU	**	**		**	**			UU, AL, CON
NS	17.2	NO SAMPLE	NS														
6A	20.0	SO GR CH4 W/ ARS ML, RT	CH4		67												
6B	20.8	SO GR CHOA W/ ARS ML, RT	CHOA		76												
6C	21.7	SO GR CHOA W/ ARS ML, RT	CHOA		102	42	84	94	UU	0	323		122	20	102	0.34	
7A	24.0	SO GR CHOA W/ WD, RT	CHOA		90												
7B	24.8	SO GR CHOA W/ WD, RT	CHOA		103												
7C	25.7	SO BK CHOC W/ RT, WD	CHOC	5	226	21	69	88	UC	–	465	929				0.27	
7D	26.6	SO GR & DGR CHOA W/ RT	CHOA		129												
8A	28.0	SO GR CL6 W/ LNS ML	CL6		45												
8B	28.8	SO GR CL6 W/ LNS ML	CL6		49	69	104	93	UU	0	446		42	19	23	0.17	
8C	29.7	SO GR CH3 W/ LNS & ARS ML, WD	CH3		64												
9A	32.0	SO GR CH3 W/ LYS ML	CH3		66												
9B	32.8	SO GR CH3 W/ LYS ML	CH3		58												
9C	33.7	SO GR CH3	CH3	6	69	58	97	97	UC	–	327	655				0.38	
9D	34.6	SO GR CH3 W/ LYS ML	CH3		56												
10A	36.0	SO GR CH4 W/ ARS ML	CH4		69												
10B	36.8	M GR CH4 W/ LNS & ARS ML	CH4		51												
10C	37.7	M GR CH4 W/ LNS & ARS ML	CH4		57												
10D	38.6	M GR CH4 W/ LNS & ARS ML, WD	CH4		65												
11A	40.0	M GR CH4 W/ LNS & ARS ML, SIF	CH4		69												
11B	40.8	M GR CH4 W/ LNS & ARS ML	CH4		59								**	**			AL, CON

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-15UCL

Current Date: 6/11/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
11C	41.7	M GR CH4 W/ LNS & ARS ML	CH4		57	64	101	94	UU	0	582		72	20	52	0.23	
11D	42.6	SO GR CH4 W/ ARS ML, WD	CH4		64												
12A	44.0	SO GR CH3 W/ LNS & ARS ML	CH3		52												
12B	44.8	SO GR CH3 W/ LNS & ARS ML	CH3	10	53	67	102	94	UC	--	277	553				0.21	
12C	45.7	SO GR CH3 W/ LNS & ARS ML	CH3		53												
13A	48.0	SO GR CH4 W/ ARS ML	CH4		67												
13B	48.8	M GR CH4 W/ ARS ML	CH4		55												
13C	49.7	M GR CH4 W/ ARS ML	CH4		55	65	101	93	UU	0	577		74	23	51	0.26	
13D	50.6	M GR CH4 W/ ARS ML	CH4		51												
14A	52.0	SO GR CH4 W/ ARS ML	CH4		70												
14B	52.8	SO GR CH4 W/ ARS ML	CH4		65												
14C	53.7	SO GR CH4 W/ ARS ML	CH4		61	60	97	92	UU	0	282		75	19	56		
15A	56.0	SO GR CH4	CH4		72												
15B	56.8	SO GR CH4	CH4		67												
15C	57.7	SO GR CH4	CH4		65	59	96	93	UU	0	385		83	23	60	0.09	
16A	60.0	SO GR CH4 W/ SIF	CH4		77												
16B	60.8	SO GR CH4 W/ ARS SP	CH4		72												
16C	61.7	SO GR CH4 W/ ARS SP	CH4		61												
17A	64.0	SO GR CH4 W/ ARS SP, SIF	CH4		73												
17B	64.8	SO GR CL6 W/ SIF	CL6		34												
17C	65.7	SO GR CL6 W/ SIF	CL6		34												
18A	68.0	SO GR CL6 W/ ARS ML, SIF	CL6		45												
18B	68.8	SO GR CL6 W/ ARS SP, SIF	CL6		49												
18C	69.7	VSO GR CL6 W/ ARS SP, SIF	CL6		59												

Remarks: _____
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-15UPT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR CH4 W/ ARS ML, RT	CH4														
1B	0.8	ST BR CH4 W/ ARS ML, RT	CH4	7	40	76	106	88	UC	–	1424	2849	86	22	64	0.85	
NS	1.7	NO SAMPLE	NS														
NS	4.0	NO SAMPLE	NS														
3A	8.0	VSO GR CL6 W/ ARS ML, RT	CL6		69												
3B	8.8	VSO GR CL6 W/ ARS ML, RT	CL6		77	55	98	100	UU	0	235		40	16	24	0.20	
3C	9.7	VSO GR CL6 W/ ARS ML, RT, WD	CL6		76												
4A	12.0	M GR CH2 W/ RT, WD	CH2		94												
4B	12.8	M GR CH2 W/ RT, WD	CH2		123												
4C	13.7	VSO GR & BK PT W/ RT, WD	PT		209	24	75	95	UU	0	153		314	126	188		
5A	16.0	VSO BR & DGR PT W/ WD, ARS CH	PT		146												
5B	16.8	VSO BR & DGR PT W/ WD, ARS CH	PT		226	25	77	98	UU	0	125		283	91	192	0.15	OC =
5C	17.7	VSO GR & BK CHOC W/ RT, WD	CHOC		168												
5D	18.6	VSO GR & BK CHOA W/ RT, WD	CHOA		90												
6A	20.0	SO GR CH3 W/ ARS ML, WD	CH3		58												
6B	20.8	ST GR CH4 W/ ARS ML	CH4		41	76	107	89									
6C	21.7	SO GR CH4 W/ ARS ML	CH4	6	71	58	99	99	UC	–	255	509	81	19	62		CON
6D	22.6	SO GR CH4 W/ ARS ML, WD	CH4		69								70	23	47	0.18	
7A	24.0	SO GR CH2 W/ LNS & LYS ML	CH2		55												
7B	24.8	SO GR CH2 W/ LNS ML	CH2		56												
7C	25.7	SO GR CL6 W/ LNS ML, SIF	CL6		45	79	114	100	UU	0	308		44	20	24	0.20	
7D	26.6	SO GR CH2 W/ LNS ML, WD	CH2		54												
8A	28.0	SO GR CH2 W/ LNS ML	CH2		68												
8B	28.8	SO GR CH3 W/ LNS ML	CH3	15	59	68	108	100	UC	–	251	503	57	21	36	0.23	
8C	29.7	SO GR CH3 W/ LNS ML	CH3		67												
8D	30.6	SO GR CH3 W/ LNS ML	CH3		67												
9A	32.0	SO GR CH3 W/ LNS ML, WD	CH3		69												
9B	32.8	SO GR CH3 W/ LNS ML	CH3		55												
9C	33.7	SO GR CH3 W/ LNS ML	CH3		52	71	107	99	UU	0	389		58	19	39	0.23	
9D	34.6	SO GR CH3 W/ LNS ML	CH3		45												
NS	36.0	NO SAMPLE	NS														
11A	40.0	SO GR CH3 W/ WD	CH3		59												
11B	40.8	SO GR CH3 W/ WD	CH3		58												
11C	41.7	SO GR CH3	CH3		57	68	107	100	UU	0	457		73	25	48	0.24	
11D	42.6	SO GR CH3	CH3		64												
12A	44.0	SO GR CH3 W/ O	CH3		70												
12B	44.8	SO GR CH3	CH3	9	61	63	102	98	UC	–	357	714	62	20	42	0.28	

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-15UPT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12C	45.7	SO GR CH4 W/ LNS ML	CH4		66												
13A	48.0	SO DGR CH4	CH4		65												
13B	48.8	M DGR CH4	CH4		62												
13C	49.7	M DGR CH4	CH4	4	63	64	104	100	UC	–	631	1261	80	24	56	0.32	
13D	50.6	VSO DGR CH4	CH4		62												
14A	52.0	VSO GR CH4 W/ LYS SP, WD	CH4		64												
14B	52.8	GR SMI-S W/ SIF	SM1-S		32												
14C	53.7	GR SM1-S W/ SIF, SHELL	SM1-S		67												
15A	56.0	SO GR CL4-S W/ SIF	CL4-S		33												
15B	56.8	SO GR CL4-S W/ SIF	CL4-S	6	36	84	114	96	UC	–	420	839	40	16	24	0.30	
15C	57.7	SO GR CL4-S W/ SIF, ARS SP	CL4-S		40												
15D	58.6	SO GR CL6-S W/ ARS SP, SIF, SHELL	CL6-S		40												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-16UCL

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST GR CH3 W/ ARS ML, SIF, RT	CH3		25												
1B	0.8	ST GR CH3 W/ ARS ML, SIF, RT	CH3	6	25	96	120	88	UC	–	1476	2953	64	25	39	0.85	
NS	1.5	NO SAMPLE	NS														
2A	4.0	ST GR CH4 W/ SIF, O, ARS ML	CH4		44												
2B	4.8	ST GR CH4 W/ SIF, O, ARS ML	CH4		41												
2C	5.7	M GR CH4 W/ SIF, O, ARS ML	CH4		42				UU				87	22	65		DIST.
3A	8.0	M DGR CH3 W/ WD, RT, SIF	CH3		40												
3B	8.8	M DGR CH3 W/ WD, RT, SIF	CH3	10	39	75	103	82	UC	–	720	1440	77	32	45	0.49	
NS	9.7	NO SAMPLE	NS														
4A	12.0	GR SM	SM		27												
4B	12.8	GR SM W/ RT, LYS & ARS CH	SM		40												
4C	13.7	VSO GR CHOA W/ RT	CHOA		102	45	90	99	UU	0	198		122	49	73	0.16	OC = 14.5%
5A	16.0	VSO GR CHOA W/ WD, RT	CHOA		71												
5B	16.8	WD W/ ARS CH, O, RT	WD		203												
5C	17.7	SO GR CHOA W/ WD, RT	CHOA		101												
6A	20.0	SO GR & DGR CHOA W/ RT, WD	CHOA		85												
6B	20.8	SO GR & DGR CHOA W/ RT, WD	CHOA		89												
6C	21.7	SO GR & DGR CHOB W/ RT, WD	CHOB		123	38	85	96	UU	0	432		184	53	131	0.22	
7A	24.0	SO DGR & BK CHOB W/ RT, WD	CHOB		190												
7B	24.8	SO GR & DGR CHOA W/ RT, WD	CHOA		95	46	89	95	UU	0	379		140	51	89	0.18	OC = 9.6%
7C	25.7	SO GR CH4 W/ WD, O	CH4		73												
7D	26.6	SO GR CH4 W/ WD, O	CH4		62												
8A	28.0	SO GR CH4 W/ ARS & LNS ML	CH4		58												
8B	28.8	M GR CH4 W/ ARS & LNS ML	CH4		53	67	102	93					70	25	45		CON
8C	29.7	SO GR CH4 W/ ARS SM, LNS ML	CH4	11	57	64	101	94	UC	–	334	669	83	36	47	0.20	
8D	30.6	SO GR CH4 W/ ARS & LNS ML	CH4		66												
9A	32.0	SO GR CH4 W/ LNS & LYS ML	CH4		46												
9B	32.8	SO GR CH4 W/ LNS ML	CH4		60	64	102	98	UU	0	383		87	35	52	0.24	
9C	33.7	SO GR CH4 W/ WD, LNS & LYS ML	CH4		49												
10A	36.0	SO GR CH4 W/ LNS & ARS ML	CH4		65												
10B	36.8	SO GR CH4 W/ ARS & LNS ML	CH4		50												
10C	37.7	SO GR CH4 W/ ARS & LNS ML	CH4		70	58	99	99	UU	0	468		93	31	62	0.32	
10D	38.6	SO GR CH4 W/ ARS ML	CH4		69												
11A	40.0	VSO GR CH2	CH4		52												
11B	40.8	SO GR CH4 W/ LNS ML	CH4		62	62	100	97					80	27	53		CON

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-16UCL

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
11C	41.7	VSO GR CH2 W/ LNS ML	CH2	15	47	70	103	90	UC	--	96	192	51	20	31	0.12	
12A	44.0	VSO GR CH2	CH2		57												
12B	44.8	VSO GR CH4 W/ ARS & LNS ML	CH4	3	67	57	96	93	UC	--	249	498	91	43	48	0.26	
12C	45.7	SO GR CH4 W/ ARS & LNS ML	CH4		49												
13A	48.0	SO GR CH4 W/ ARS ML	CH4		63												
13B	48.8	SO GR CH4 W/ LNS & ARS ML	CH4		61												
13C	49.7	SO GR CH4 W/ ARS & LNS ML	CH4		62	82	101	97	UU	0	494		89	31	58	0.28	
13D	50.6	SO GR CH4 W/ ARS ML	CH4		64												
14A	52.0	SO GR CH4 W/ ARS ML	CH4		69												
14B	52.8	M GR CH4	CH4		62												
14C	53.7	M GR CH4 W/ SL	CH4		62	63	102	98	UU	0	531		90	24	66	0.30	
14D	54.6	M GR CH4	CH4		66												
15A	56.0	SO GR CH4	CH4		73												
15B	56.8	SO GR CH4	CH4		67												
15C	57.7	SO DGR CH4 W/ ARS ML	CH4	5	55	65	101	92	UC	--	481	962	87	36	51	0.33	
16A	60.0	M GR CH4	CH4		81												
16B	60.8	M GR CH4 W/ SL	CH4		57	67	104	96	UU	0	549		85	36	49	0.26	
16C	61.7	M GR CH4 W/ SIF, ARS SM	CH4		57												
17A	64.0	GR SC5-S W/ SIF	SC5-S		31												
17B	64.8	GR SC5-S W/ SIF	SC5-S		33												
17C	65.7	GR SC5-S W/ SIF	SC5-S	4	30	89	116	91	UC	--	657	1315	NP	NP		0.26	SV
17D	66.6	GR SC5-S W/ SIF	SC5-S		39												
18A	68.0	M GR CH4 W/ ARS SP, SIF	CH4		54												
18B	68.8	M GR CH4 W/ ARS SP, SIF	CH4		58												
18C	69.7	M GR CH4 W/ ARS SP, SIF	CH4	4	58	63	100	92	UC	--	662	1325	80	23	57	0.34	
18D	70.6	M GR CH4	CH4		61												
19A	72.0	M GR CH4 W/ ARS ML	CH4		65												
19B	72.8	M GR CH4 W/ ARS ML	CH4		64												
19C	73.7	M GR CH4	CH4		58	64	101	94	UU	0	647		98	24	74	0.40	
19D	74.6	M GR CH4	CH4		64												
20A	76.0	M GR CH4	CH4		67												
20B	76.8	M GR CH4 W/ CC	CH4		64	61	100	98	UU	0	815		91	29	62	0.33	
20C	77.7	M LGR & GR CH4 W/ LYS ML, SIF	CH4		60												
20D	78.6	M GR CL6 W/ SIF	CL6		35												
21A	80.0	M LGR & T CL6 W/ LNS ML	CL6		36												
21B	80.8	M LGR & T CL6 W/ LNS ML	CL6		32												
21C	81.7	M LGR CL6 W/ LNS SM	CL6	4	29	90	116	89	UC	--	866	1733	50	19	31	0.60	

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-16UCL

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
21D	82.6	M LGR & T CL6 W/ LNS ML	CL6		33												
22A	84.0	M T & LGR CL6	CL6		27												
22B	84.8	M T & LGR CL6	CL6		25												
22C	85.7	SO T & LGR CL4 W/ ARS SM	CL4	6	28	91	116	89	UC	--	277	554	31	18	13	0.25	
23A	88.0	T & LGR ML2 W/ LNS CH	ML2		28												
23B	88.8	SO T & LGR CL4	CL4		28												
23C	89.7	SO T & LGR CL6 W/ ARS SM	CL6	3	27	95	120	90	UC	--	360	720	47	15	32	0.47	
23D	90.6	SO T & LGR CL6	CL6		31												

Remarks:
FFEBJV, LLC.

Checked by: WTY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-16UFT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	M GR CH3 W/ LNS & ARS ML, SIF	CH3		32												
1B	0.6	M GR CH3 W/ LNS & ARS ML, SIF	CH3	9	28	90	115	86	UC	–	994	1989	60	18	42	0.650	
NS	1.2	NO SAMPLE	NS														
2A	4.0	VSO GR CHOA W/ ARS ML	CHOA		109												
2B	4.8	VSO GR CHOA W/ ARS ML	CHOA		114	40	86	95	UU	0	148		155	37	118	0.180	
NS	5.7	NO SAMPLE	NS														
3A	8.0	VSO GR & DGR CHOA	CHOA		132												
3B	8.8	SO GR & DGR CH4	CH4		80	53	95	98									
3C	9.7	VSO GR & DGR CHOA	CHOA	15	96	44	87	94	UC	–	139	278	99	33	66		CON
3D	10.6	VSO GR & DGR CHOA	CHOA		142								119	25	94	0.190	
4A	12.0	VSO GR CHOA W/ WD	CHOA		120												
4B	12.8	VSO GR CHOA W/ WD	CHOA		115	39	85	95	UU	0	97		144	38	106	0.140	OC=9.3%
4C	13.7	WD	WD		217												
4D	14.6	WD	WD		204												
5A	16.0	VSO GR CHOA	CHOA		135												
5B	16.8	VSO GR PT W/ ARS ML	PT		186	28	79	100									
5C	17.7	VSO GR PT W/ ARS ML	PT		236	22	73	95	UU	0	231		247	68	179		GS, CON
5D	18.6	VSO GR CHOA	CHOA		139								282	61	221	0.220	
6A	20.0	VSO GR CH2 W/ LNS ML, WD	CH2		69												
6B	20.8	VSO GR CH2 W/ LNS ML, WD	CH2		54												
6C	21.7	VSO GR CH2 W/ LYS ML	CH2		59	65	103	100	UU	0	176		56	20	36	0.200	
6D	22.6	VSO GR CH2 W/ LNS ML	CH2		71												
7A	24.0	VSO GR CH2 W/ LNS ML	CH2		60												
7B	24.8	VSO GR CH2 W/ LNS ML	CH2		50												
7C	25.7	ST GR CL4-S W/ LNS ML	CL4-S	8	24	97	121	91	UC	–	1465	2930	33	24	9	0.750	
7D	26.6	VSO GR CH2 W/ LNS ML	CH2		62												
8A	28.0	VSO GR CH2 W/ LNS ML	CH2		66												
8B	28.8	VSO GR CH2 W/ LNS ML	CH2	14	49	68	101	90	UC	–	155	310	53	17	36	0.190	
8C	29.7	VSO GR CH4 W/ LNS & ARS ML	CH4		71												
8D	30.6	VSO GR CH4 W/ LNS & ARS ML	CH4		70												
9A	32.0	VSO GR CH4 W/ LNS & ARS ML	CH4		55												
9B	32.8	VSO GR CH4 W/ LNS & ARS ML	CH4		72												
9C	33.7	VSO GR CH4 W/ LNS & ARS ML	CH4		67	62	103	103	UU	0	225		75	22	53	0.180	
9D	34.6	VSO GR CH4 W/ LNS & ARS ML	CH4		72												
10A	36.0	SO GR CH4 W/ LNS & ARS ML	CH4		58												
10B	36.8	SO GR CH4 W/ LNS & ARS ML	CH4		81												
10C	37.7	SO GR CH4 W/ LNS ML	CH4		78	55	97	100	UU	0	370		89	28	61	0.200	

Remarks:
FFEBJV, LLC.

Checked by: WJK
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-16UFT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	Wa	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
10D	38.6	SO GR CH4 W/ LNS & ARS ML	CH4		56												
11A	40.0	SO GR CH4 W/ ARS ML	CH4		75												
11B	40.8	SO GR CH4 W/ ARS & LNS ML	CH4		56												
11C	41.7	SO GR CH4	CH4	5	66	58	97	94	UC	--	386	771	78	21	57	0.240	
11D	42.6	VSO GR CH4 W/ LNS & ARS ML	CH4		73												
12A	44.0	VSO GR CH4 W/ LNS ML	CH4		69												
12B	44.8	VSO GR CH4 W/ ARS & LNS ML	CH4		69												
12C	45.7	VSO GR CH4 W/ LNS ML	CH4	4	65	60	99	96	UC	--	222	444	73	20	53	0.240	
13A	48.0	SO GR CH4 W/ RT	CH4		76												
13B	48.8	SO GR CH4	CH4		69												
13C	49.7	SO GR CH4 W/ CC	CH4		71	59	101	102	UU	0	346		86	30	56	0.200	
14A	52.0	SO GR CH4	CH4		72												
14B	52.8	SO GR CH4 W/ WD	CH4		68												
14C	53.7	SO GR CH4	CH4		62	62	101	97	UU	0	294		85	31	54	0.220	
14D	54.6	SO GR CH4	CH4		65												
15A	56.0	SO GR CH4 W/ SIF	CH4		66												
15B	56.8	GR SM1 W/ SIF	SM1		34												
NS	57.7	NO SAMPLE	NS														SV
16A	60.0	GR SM1	SM1		34												
16B	60.8	GR SM1	SM1		35												
16C	61.7	GR ML2-S W/ ARS CH, SIF	ML2-S		38												
17A	64.0	M GR CH4 W/ ARS ML, SIF	CH4		56												SV
17B	64.8	M GR CH4 W/ ARS ML, SIF	CH4		63												
17C	65.7	M GR CH4 W/ ARS ML, SIF	CH4	3	61	61	99	93	UC	--	842	1685	84	22	62	0.400	
17D	66.6	M GR CH4 W/ SIF	CH4		65												
18A	68.0	SO GR CH4 W/ SIF	CH4		77												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-17UCLR

Current Date: 6/13/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR & T CL6 W/ LNS ML, RT	CL6		24												
1B	0.8	ST BR & T CL6 W/ LNS ML	CL6	8	23	101	125	95	UC	–	1524	3048	45	20	25	0.68	
NS	1.6	NO SAMPLE	NS														
2A	4.0	ST T & BR CH4	CH4		35												
2B	4.8	ST T & BR CH4 W/ RT, SIF	CH4		33												
2C	5.7	ST BR CH4 W/ ARS ML, RT, SIF	CH4		36	81	110	89	UU	0	1069		80	26	54	0.40	
2D	6.6	ST BR CH4 W/ ARS ML, RT, SIF	CH4		29												
3A	8.0	ST GR & T CH4 W/ ARS ML, RT, SIF	CH4		38												
3B	8.8	M GR & T CH3 W/ ARS ML, RT, SIF	CH3		50	71	107	98	UU	0	708		72	25	47	0.56	
3C	9.7	M DGR & T CH3 W/ ARS ML, RT, SIF	CH3		26												
4A	12.0	M GR & T CH3 W/ ARS ML, SIF	CH3		48												
4B	12.8	M GR & T CL4-S W/ RT, SIF	CL4-S		21												
4C	13.7	M GR & T CL4-S W/ RT, SIF	CL4-S		22												SV
5A	16.0	M GR & T CL4-S W/ RT, SIF	CL4-S		26												
5B	16.8	M GR & T CL4-S W/ RT, SIF	CL4-S		25												
5C	17.7	M GR & T CL4-S W/ RT, SIF	CL4-S		25												SV
6A	20.0	M GR & R PT W/ WD, RT	PT		278												
6B	20.8	M DGR & R PT W/ WD, RT	PT		246												
6C	21.7	M LGR CHOA W/ WD, RT	CHOA		96								119	32	87		OC = 12.7%
7A	24.0	SO GR & DGR CHOA W/ ARS ML, WD, RT	CHOA		136												
7B	24.8	SO GR & DGR CHOA W/ ARS ML, WD, RT	CHOA		99												
7C	25.7	SO GR CHOA W/ ARS ML, WD, RT	CHOA	7	67	60	100	98	UC	–	336	671	109	25	84	0.25	
8A	28.0	SO GR CH4 W/ LNS ML	CH4		55												
8B	28.8	SO GR CH4 W/ LNS ML	CH4		66												
8C	30.7	SO GR CH4 W/ LNS ML	CH4		64	62	103	101	UU	0	303		84	23	61	0.26	
8D	31.5	SO GR CH4 W/ LNS ML	CH4		69												
9A	32.0	SO GR CH4 W/ LNS ML	CH4		63												
9B	32.8	SO GR CH4 W/ LNS ML	CH4		64	62	102	100	UU	0	334		91	27	64	0.25	
9C	33.7	SO GR CH4 W/ LNS ML	CH4		66												
9D	34.6	SO GR CH4 W/ LNS ML	CH4		61												
10A	36.0	SO GR CH4	CH4		71												
10B	36.8	SO GR CH4 W/ LNS ML	CH4		65												
10C	37.7	SO GR CH3 W/ LNS ML	CH3	7	46	74	108	96	UC	–	396	791	57	19	38	0.27	
11A	40.0	SO GR CH4 W/ LNS ML	CH4		71												
11B	40.8	SO GR CH4 W/ LNS ML	CH4		69												
11C	41.7	SO GR CH4	CH4		75	57	99	100	UU	0	370		91	27	64	0.27	

Remarks:
FFEBJV, LLC.

Checked by: [illegible]
File Name: TO 7

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-17UCLR

Current Date: 6/13/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12A	44.0	SO GR CH4 W/ LNS ML	CH4		49												
12B	44.8	SO GR CH4 W/ SL, LNS ML	CH4		70												
12C	45.7	SO GR CH4 W/ SL, LNS ML	CH4	15	40	80	112	96	UC	–	411	823	83	34	49	0.25	
15A	48.0	SO GR CH4 W/ LNS ML	CH4		68												
15B	48.8	SO GR CH4 W/ LNS ML	CH4		64	62	101	99	UU	0	334		80	29	51	0.25	
15C	49.7	SO GR CH4 W/ LNS ML	CH4		70												
16A	52.0	SO GR CH4 W/ ARS ML	CH4		67												
16B	52.8	SO GR CH4 W/ ARS ML	CH4		67												
16C	53.7	VSO GR CH4 W/ ARS ML	CH4	7	65	61	100	98	UC	–	212	424	84	32	52	0.21	
17A	56.0	VSO GR CH4 W/ SIF	CH4		67												
17B	56.8	SO GR CH4 W/ SIF	CH4		64	61	101	99	UU	0	269		86	30	56	0.25	
17C	57.7	SO GR CH4 W/ LYS SP, SIF, RT	CH4		52												
18A	60.0	GR ML2 W/ SIF	ML2		33												
18B	60.8	GR ML2 W/ SIF	ML2		31												
18C	61.7	GR ML2 W/ SIF	ML2	8	31	92	121	101	UC	–	260	517	25	20	5		
18D	62.6	GR ML2 W/ SIF	ML2		31												
NS	64.0	NO SAMPLE	NS														
20A	68.0	SO GR CL6 W/ SIF, RT	CL6		42												
21A	70.0	SO GR CL6 W/ SIF	CL6		48												
NS	70.8	NO SAMPLE	NS														

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-17UCLR

Current Date: 6/13/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR & T CL6 W/ LNS ML, RT	CL6		24												
1B	0.8	ST BR & T CL6 W/ LNS ML	CL6	8	23	101	125	95	UC	–	1524	3048	45	20	25	0.68	
NS	1.6	NO SAMPLE	NS														
2A	4.0	ST T & BR CH4	CH4		35												
2B	4.8	ST T & BR CH4 W/ RT, SIF	CH4		33												
2C	5.7	ST BR CH4 W/ ARS ML, RT, SIF	CH4		36	81	110	89	UU	0	1069		80	26	54	0.40	
2D	6.6	ST BR CH4 W/ ARS ML, RT, SIF	CH4		29												
3A	8.0	ST GR & T CH4 W/ ARS ML, RT, SIF	CH4		38												
3B	8.8	M GR & T CH3 W/ ARS ML, RT, SIF	CH3		50	71	107	96	UU	0	708		72	25	47	0.56	
3C	9.7	M DGR & T CH3 W/ ARS ML, RT, SIF	CH3		26												
4A	12.0	M GR & T CH3 W/ ARS ML, SIF	CH3		48												
4B	12.8	M GR & T CL4-S W/ RT, SIF	CL4-S		21												
4C	13.7	M GR & T CL4-S W/ RT, SIF	CL4-S		22												SV
5A	16.0	M GR & T CL4-S W/ RT, SIF	CL4-S		26												
5B	16.8	M GR & T CL4-S W/ RT, SIF	CL4-S		25												
5C	17.7	M GR & T CL4-S W/ RT, SIF	CL4-S		25												SV
6A	20.0	M GR & R PT W/ WD, RT	PT		278												
6B	20.8	M DGR & R PT W/ WD, RT	PT		246												
6C	21.7	M LGR CHOA W/ WD, RT	CHOA		96								119	32	87		OC = 12.7%
7A	24.0	SO GR & DGR CHOA W/ ARS ML, WD, RT	CHOA		138												
7B	24.8	SO GR & DGR CHOA W/ ARS ML, WD, RT	CHOA		99												
7C	25.7	SO GR CHOA W/ ARS ML, WD, RT	CHOA	7	67	60	100	98	UC	–	336	671	109	25	84	0.25	
8A	28.0	SO GR CH4 W/ LNS ML	CH4		55												
8B	28.8	SO GR CH4 W/ LNS ML	CH4		66												
8C	30.7	SO GR CH4 W/ LNS ML	CH4		64	62	103	101	UU	0	303		84	23	61	0.26	
8D	31.5	SO GR CH4 W/ LNS ML	CH4		69												
9A	32.0	SO GR CH4 W/ LNS ML	CH4		63												
9B	32.8	SO GR CH4 W/ LNS ML	CH4		64	62	102	100	UU	0	334		91	27	64	0.25	
9C	33.7	SO GR CH4 W/ LNS ML	CH4		66												
9D	34.6	SO GR CH4 W/ LNS ML	CH4		61												
10A	36.0	SO GR CH4	CH4		71												
10B	36.8	SO GR CH4 W/ LNS ML	CH4		65												
10C	37.7	SO GR CH3 W/ LNS ML	CH3	7	46	74	108	96	UC	–	396	791	57	19	38	0.27	
11A	40.0	SO GR CH4 W/ LNS ML	CH4		71												
11B	40.8	SO GR CH4 W/ LNS ML	CH4		69												
11C	41.7	SO GR CH4	CH4		75	57	99	100	UU	0	370		91	27	64	0.27	

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-17UCLR

Current Date: 6/13/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12A	44.0	SO GR CH4 W/ LNS ML	CH4		49												
12B	44.8	SO GR CH4 W/ SL, LNS ML	CH4		70												
12C	45.7	SO GR CH4 W/ SL, LNS ML	CH4	15	40	80	112	96	UC	–	411	823	83	34	49	0.25	
15A	48.0	SO GR CH4 W/ LNS ML	CH4		68												
15B	48.8	SO GR CH4 W/ LNS ML	CH4		64	62	101	99	UU	0	334		80	29	51	0.25	
15C	49.7	SO GR CH4 W/ LNS ML	CH4		70												
16A	52.0	SO GR CH4 W/ ARS ML	CH4		67												
16B	52.8	SO GR CH4 W/ ARS ML	CH4		67												
16C	53.7	VSO GR CH4 W/ ARS ML	CH4	7	65	61	100	98	UC	–	212	424	84	32	52	0.21	
17A	56.0	VSO GR CH4 W/ SIF	CH4		67												
17B	56.8	SO GR CH4 W/ SIF	CH4		64	61	101	99	UU	0	269		86	30	56	0.25	
17C	57.7	SO GR CH4 W/ LYS SP, SIF, RT	CH4		52												
18A	60.0	GR ML2 W/ SIF	ML2		33												
18B	60.8	GR ML2 W/ SIF	ML2		31												
18C	61.7	GR ML2 W/ SIF	ML2	8	31	92	121	101	UC	–	260	517	25	20	5		
18D	62.6	GR ML2 W/ SIF	ML2		31												
NS	64.0	NO SAMPLE	NS														
20A	68.0	SO GR CL6 W/ SIF, RT	CL6		42												
21A	70.0	SO GR CL6 W/ SIF	CL6		48												
NS	70.8	NO SAMPLE	NS														

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-17UCLR

Current Date: 6/13/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR & T CL6 W/ LNS ML, RT	CL6		24												
1B	0.8	ST BR & T CL6 W/ LNS ML	CL6	8	23	101	125	95	UC	--	1524	3048	45	20	25	0.68	
NS	1.6	NO SAMPLE	NS														
2A	4.0	ST T & BR CH4	CH4		35												
2B	4.8	ST T & BR CH4 W/ RT, SIF	CH4		33												
2C	5.7	ST BR CH4 W/ ARS ML, RT, SIF	CH4		36	81	110	89	UU	0	1069		80	26	54	0.40	
2D	6.6	ST BR CH4 W/ ARS ML, RT, SIF	CH4		29												
3A	8.0	ST GR & T CH4 W/ ARS ML, RT, SIF	CH4		38												
3B	8.8	M GR & T CH3 W/ ARS ML, RT, SIF	CH3		50	71	107	96	UU	0	708		72	25	47	0.56	
3C	9.7	M DGR & T CH3 W/ ARS ML, RT, SIF	CH3		26												
4A	12.0	M GR & T CH3 W/ ARS ML, SIF	CH3		48												
4B	12.8	M GR & T CL4-S W/ RT, SIF	CL4-S		21												
4C	13.7	M GR & T CL4-S W/ RT, SIF	CL4-S		22												SV
5A	16.0	M GR & T CL4-S W/ RT, SIF	CL4-S		26												
5B	16.8	M GR & T CL4-S W/ RT, SIF	CL4-S		25												
5C	17.7	M GR & T CL4-S W/ RT, SIF	CL4-S		25												SV
6A	20.0	M GR & R PT W/ WD, RT	PT		278												
6B	20.8	M DGR & R PT W/ WD, RT	PT		246												
6C	21.7	M LGR CHOA W/ WD, RT	CHOA		96								119	32	87		OC = 12.7%
7A	24.0	SO GR & DGR CHOA W/ ARS ML, WD, RT	CHOA		136												
7B	24.8	SO GR & DGR CHOA W/ ARS ML, WD, RT	CHOA		99												
7C	25.7	SO GR CHOA W/ ARS ML, WD, RT	CHOA	7	67	60	100	98	UC	--	336	671	109	25	84	0.25	
8A	28.0	SO GR CH4 W/ LNS ML	CH4		55												
8B	28.8	SO GR CH4 W/ LNS ML	CH4		66												
8C	30.7	SO GR CH4 W/ LNS ML	CH4		64	62	103	101	UU	0	303		84	23	61	0.26	
8D	31.5	SO GR CH4 W/ LNS ML	CH4		69												
9A	32.0	SO GR CH4 W/ LNS ML	CH4		63												
9B	32.8	SO GR CH4 W/ LNS ML	CH4		64	62	102	100	UU	0	334		91	27	64	0.25	
9C	33.7	SO GR CH4 W/ LNS ML	CH4		66												
9D	34.6	SO GR CH4 W/ LNS ML	CH4		61												
10A	36.0	SO GR CH4	CH4		71												
10B	36.8	SO GR CH4 W/ LNS ML	CH4		65												
10C	37.7	SO GR CH3 W/ LNS ML	CH3	7	46	74	108	96	UC	--	396	791	57	19	38	0.27	
11A	40.0	SO GR CH4 W/ LNS ML	CH4		71												
11B	40.8	SO GR CH4 W/ LNS ML	CH4		69												
11C	41.7	SO GR CH4	CH4		75	57	99	100	UU	0	370		91	27	64	0.27	

Remarks: _____
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-17UCLR

Current Date: 6/13/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12A	44.0	SO GR CH4 W/ LNS ML	CH4		49												
12B	44.8	SO GR CH4 W/ SL, LNS ML	CH4		70												
12C	45.7	SO GR CH4 W/ SL, LNS ML	CH4	15	40	80	112	98	UC	–	411	823	83	34	49	0.25	
15A	48.0	SO GR CH4 W/ LNS ML	CH4		68												
15B	48.8	SO GR CH4 W/ LNS ML	CH4		64	62	101	99	UU	0	334		80	29	51	0.25	
15C	49.7	SO GR CH4 W/ LNS ML	CH4		70												
16A	52.0	SO GR CH4 W/ ARS ML	CH4		67												
16B	52.8	SO GR CH4 W/ ARS ML	CH4		67												
16C	53.7	VSO GR CH4 W/ ARS ML	CH4	7	65	61	100	98	UC	–	212	424	84	32	52	0.21	
17A	56.0	VSO GR CH4 W/ SIF	CH4		67												
17B	56.8	SO GR CH4 W/ SIF	CH4		64	61	101	99	UU	0	269		86	30	56	0.25	
17C	57.7	SO GR CH4 W/ LYS SP, SIF, RT	CH4		52												
18A	60.0	GR ML2 W/ SIF	ML2		33												
18B	60.8	GR ML2 W/ SIF	ML2		31												
18C	61.7	GR ML2 W/ SIF	ML2	8	31	92	121	101	UC	–	260	517	25	20	5		
18D	62.6	GR ML2 W/ SIF	ML2		31												
NS	64.0	NO SAMPLE	NS														
20A	68.0	SO GR CL6 W/ SIF, RT	CL6		42												
21A	70.0	SO GR CL6 W/ SIF	CL6		48												
NS	70.8	NO SAMPLE	NS														

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-18UFT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	M BR & GR CH2 W/ SIF	CH2		31												
1B	0.8	M BR & GR CH2 W/ SIF, RT	CH2		37												
1C	1.7	SO BR & GR CH2 W/ SIF, RT	CH2		43												
2A	4.0	SO DGR CHOA W/ WD, RT, SIF	CHOA		97												
2B	4.8	SO DGR CHOB W/ WD, RT	CHOB		156												
2C	5.7	SO BR CHOC W/ WD, RT	CHOC		270												
3A	8.0	SO GR CHOC W/ WD RT	CHOC		308												OC = 6.5%
3B	8.8	BR & GR WD W/ ARS CH	WD		384												
3C	9.7	BR & GR WD W/ ARS CH	WD		590												
3D	10.6	BR & GR WD W/ ARS CH	WD		417												
4A	12.0	M BR & GR CHOC W/ WD, RT	CHOC		318												
4B	12.8	M BR & GR CHOC W/ WD, RT	CHOC		229												
4C	13.7	BR & GR WD W/ ARS CH	WD		357												OC = 8.7%
4D	14.6	BR & GR WD W/ ARS CH	WD		279												
5A	16.0	VSO BK & DGR CHOC W/ WD, RT	CHOC		276												
5B	16.8	VSO BK & DGR CHOC W/ WD, RT	CHOC		202												
5C	17.7	VSO DGR CH4 W/ O, RT, ARS ML, WD	CH4		70	57	97	96	UU	0	136		88	24	64	0.140	
5D	18.6	VSO DGR CH4 W/ O, RT, WD	CH4		88												
6A	20.0	VSO GR CH4 W/ ARS ML, TR-O, SIF	CH4		94												
6B	20.8	VSO GR CH4 W/ ARS ML, TR-O, SIF	CH4		83	52	95	99					95	27	68		CON
6C	21.7	VSO GR CH4 W/ ARS ML, RT	CH4		68	56	93	90	UU	0	131		70	24	46	0.100	
6D	22.6	VSO GR CH4 W/ LNS & ARS ML	CH4		69												
7A	24.0	VSO GR CH4 W/ ARS ML, RT	CH4		83												
7B	24.8	VSO GR CH4 W/ ARS ML, TR-O	CH4		65												
7C	25.7	VSO GR CH4 W/ ARS ML, TR-O	CH4		75	55	97	99	UU	0	133		84	26	58	0.100	
7D	26.6	VSO GR CH4 W/ ARS ML, TR-O	CH4		69												
8A	28.0	VSO GR CH4 W/ LNS & ARS ML	CH4		80												
8B	28.8	VSO GR CH4 W/ LNS & ARS ML	CH4		72	57	99	100	UU	0	146		75	22	53	0.150	
8C	29.7	SO GR CH4 W/ LNS & ARS ML	CH4		62	65	105	100					84	21	63		CON
8D	30.6	SO GR CH4 W/ LNS & ARS ML, WD	CH4		59												
9A	32.0	SO GR CH4 W/ LNS & ARS ML	CH4		70												
9B	32.8	SO GR CH4 W/ LNS & ARS ML	CH4		70	58	99	99	UU	0	278		83	25	58	0.200	
9C	33.7	SO GR CH4 W/ LNS & ARS ML	CH4		59												
10A	36.0	SO GR CH4 W/ LNS & ARS ML	CH4		78												
10B	36.8	SO GR CH3 W/ LNS & ARS ML	CH3		60												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-18UFT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
10C	37.7	SO GR CH3 W/ ARS ML	CH3	5	53	68	103	95	UC	–	330	660	59	22	37	0.240	
11A	40.0	SO GR CH3 W/ ARS ML	CH3		60												
11B	40.8	SO GR CH3	CH3		61												
11C	41.7	SO GR CH3	CH3	7	56	65	101	93	UC	–	330	661	71	22	49	0.250	
11D	42.6	SO GR CH3	CH3		65												
12A	44.0	SO GR CH3 W/ ARS ML	CH3		68												
12B	44.8	SO GR CH4 W/ ARS ML	CH4		69												
12C	45.7	VSO GR CH4 W/ ARS ML	CH4		75	54	94	94	UU	0	327		87	27	60	0.280	
12D	46.6	SO GR CH4 W/ ARS ML	CH4		73												
13A	48.0	SO GR CH4	CH4		74												
13B	48.8	SO GR CH4	CH4		75												
13C	49.7	SO GR CH4 W/ ARS ML	CH4		70	56	96	95	UU	0	383		89	28	61	0.300	
13D	50.6	SO GR CH4 W/ ARS ML	CH4		72												
14A	52.0	SO GR CH4 W/ LNS & ARS ML	CH4		71												
14B	52.8	SO GR CH4 W/ LNS & ARS ML	CH4		70												
14C	53.7	M GR CH4 W/ LNS & ARS ML	CH4	4	66	59	98	95	UC	–	561	1121	88	27	61	0.320	
14D	54.6	M GR CH4 W/ LNS & ARS ML	CH4		68												
15A	56.0	SO GR CH4 W/ LNS ML	CH4		74												
15B	56.8	SO GR CH4	CH4		70												
15C	57.7	SO GR CH4	CH4	6	64	60	97	93	UC	–	450	900	86	30	56	0.300	
15D	58.6	GR SM1 W/ LYS CH, SIF	SM1		26												
16A	60.0	GR SM1 W/ SIF, LYS CL	SM1		31												
16B	60.8	GR SM1 W/ SIF, LYS CL	SM1		31												
16C	61.7	GR SM1 W/ SIF, LYS CL	SM1	4	29	91	117	93	UC	–	352	703				0.240	SV
16D	62.6	GR SM1 W/ SIF, LYS CL	SM1		33												
17A	64.0	M GR CH4 W/ SIF	CH4		47												
17B	64.8	M GR CH4 W/ SIF	CH4		44												
17C	65.7	M GR CH4 W/ SIF	CH4		62	64	103	100	UU	0	525		80	25	55	0.400	
17D	66.6	M GR CH4 W/ SIF	CH4		61												
18A	68.0	M GR CH4 W/ ARS ML	CH4		63												
18B	68.8	M GR CH4 W/ ARS ML	CH4		62												
18C	69.7	M GR CH4 W/ ARS ML	CH4	3	61	63	101	96	UC	–	888	1776	87	24	63	0.390	
18D	70.6	M GR CH4 W/ ARS ML	CH4		63												

Remarks:
FFEBJV, LLC.

Checked by: NJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002 Current Date: 12/18/2007
Boring: WWHC-19UPT

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST GR CL6 W/ O	CL6		25												
1B	0.8	ST GR CL6 W/ O, LNS SM	CL6		28				UC				33	15	18		DIST
NS	1.7	NO SAMPLE	NS														
2A	4.0	M GR CH2 W/ LNS ML, RT	CH2		38												
2B	4.8	M GR CH2 W/ LNS ML, WD	CH2		38												
NS	5.7	NO SAMPLE	NS														
3A	8.0	VSO DGR PT W/ ARS & LNS ML	PT		328												
3B	8.8	VSO DGR PT W/ ARS & LNS ML	PT		294								233	43	190		Gs, CON
3C	9.7	VSO GR CHOB W/ ARS ML	CHOB		127				UU				145	31	114		DIST, OC=9.4%
4A	12.0	VSO GR CHOA W/ WD, ARS ML	CHOA		125												
4B	12.8	VSO GR CHOB W/ WD, ARS ML	CHOB		148	34	84	102	UU	0	102		160	32	128	0.12	
4C	13.7	VSO GR CHOA W/ WD, ARS ML	CHOA		144												
5A	16.0	VSO GR PT W/ LYS ML, WD	PT		258												
5B	16.8	VSO GR PT W/ WD, ARS & LNS ML	PT		216												
5C	17.7	VSO GR PT W/ WD, ARS & LNS ML	PT		154	32	82	100	UU	0	235		205	42	163	0.17	OC= 10.2%
5D	18.6	VSO GR CHOA W/ LYS ML	CHOA		114												
6A	20.0	VSO GR CH3 W/ CC	CH3		55												
6B	20.8	GR ML2 W/ WD	ML2		33												
6C	21.7	VSO GR CH2 W/ LNS & LYS ML	CH2	12	63	64	105	104	UC	–	142	285	57	18	39	0.26	
6D	22.6	VSO GR CH3 W/ ARS & LNS ML	CH3		64												
7A	24.0	VSO GR CH3 W/ ARS & LNS ML	CH3		68												
7B	24.8	VSO GR CH3 W/ ARS & LNS ML	CH3		72	59	102	104	UU	0	200		68	19	49	0.25	
7C	25.7	SO GR CH4 W/ ARS & LNS ML	CH4		65												
7D	26.6	SO GR CH4 W/ ARS & LNS ML	CH4		72												
8A	28.0	SO GR CH4 W/ ARS & LNS ML	CH4		69												
8B	28.8	SO GR CH4	CH4		78	54	97	100					93	23	70		Gs, CON
8C	29.7	SO GR CH3 W/ ARS & LYS ML	CH3		48	74	110	102	UU	0	266		59	21	38	0.16	
8D	30.6	SO GR CH3	CH3		66												
9A	32.0	SO GR CH3 W/ ARS & LNS ML	CH3		65												
9B	32.8	GR ML2 W/ LYS CH	ML2		42												
9C	33.7	VSO GR CH4 W/ LYS ML	CH4	14	75	53	94	94	UC	–	142	284	88	22	66	0.12	
9D	34.6	SO GR CH4 W/ LNS & ARS ML	CH4		62												
10A	36.0	SO GR CH4 W/ LNS & ARS ML	CH4		59												
10B	36.8	SO GR CH4 W/ LNS & ARS ML	CH4		73												
10C	37.7	SO GR CH4 W/ LNS & ARS ML	CH4		73	58	99	101	UU	0	267		77	22	55	0.17	

Remarks:
FFEBJV, LLC.

Checked by: WTY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-19UPT

Current Date: 12/18/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
10D	38.6	SO GR CH4 W/ LNS & ARS ML	CH4		73												
11A	40.0	SO GR CH4 W/ ARS & LNS ML	CH4		63												
11B	40.8	SO GR CH4 W/ ARS & LNS ML	CH4		63												
11C	41.7	SO GR CH4 W/ ARS & LNS ML	CH4	7	72	57	97	98	UC	–	333	665	90	23	67	0.19	
11D	42.6	SO GR CH4 W/ ARS & LNS ML	CH4		68												
12A	44.0	SO GR CH4 W/ LNS ML	CH4		67												
12B	44.8	SO GR CH4 W/ LNS ML	CH4		64												
12C	45.7	SO GR CH4 W/ ARS ML	CH4		78	55	97	100	UU	0	383		91	24	67	0.23	
12D	46.6	SO GR CH4 W/ ARS ML	CH4		74												
13A	48.0	SO GR CH4	CH4		72												
13B	48.8	SO GR CH4 W/ LNS ML	CH4	6	69	58	97	95	UC	–	377	754	87	22	65	0.25	
13C	49.7	SO GR CH4 W/ ARS ML	CH4		65												
13D	50.6	SO GR CH4 W/ ARS & LNS ML	CH4		67												
14A	52.0	VSO GR CH4	CH4		93												
14B	52.8	VSO GR CH4 W/ ARS ML	CH4		76												
14C	53.7	VSO GR CH4 W/ ARS ML	CH4		81												
15A	56.0	SO GR CH4 W/ LNS ML	CH4		80												
15B	56.8	SO GR CH4 W/ LNS ML	CH4		69												
15C	57.7	VSO GR CL4 W/ LYS ML, SIF	CL4		29	89	115	88	UU	0	74		32	15	17		
15D	58.6	VSO GR CL6	CL6		73												
16A	60.0	GR ML2 W/ ARS CH, SIF	ML2		33												
16B	60.8	GR ML2 W/ ARS CH, SIF	ML2		33												
16C	61.7	SO GR CL4 W/ ARS & LNS CH, SIF	CL4	7	35	83	112	93	UC	–	333	666	39	17	22	0.24	
16D	62.6	SO GR CL4 W/ ARS & LNS CH, SIF	CL4		39												
17A	64.0	M GR CH4 W/ ARS & LNS ML, SIF	CH4		60												
17B	64.8	M GR CH4 W/ ARS ML & SM	CH4	6	61	62	100	95	UC	–	597	1193	84	21	63	0.35	
17C	65.7	M GR CH4 W/ ARS & LNS ML	CH4		59												
17D	66.6	M GR CH4 W/ ARS ML	CH4		56												
18A	68.0	M GR CH4 W/ LNS & ARS ML	CH4		55												
18B	68.8	SO GR CH4	CH4		62												
18C	69.7	SO GR CH4 W/ ARS ML	CH4	6	61	63	102	98	UC	–	422	844	95	22	73	0.22	
18D	70.6	SO GR CH4	CH4		65												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-20UCL

Current Date: 6/12/2007

Sample Number	Depth	Visual Classification	USCS	K(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR CH2 W/ O, SIF	CH2		31												
1B	0.8	ST BR CH2 W/ O, SIF	CH2		28												
NS	1.3	NO SAMPLE	NS														
2A	4.0	ST GR CH3 W/ ARS ML, SIF, RT	CH3		37												OC=4.3%
2B	4.8	ST GR CH3 W/ ARS ML, SIF, RT	CH3		28	89	114	85	UU	0	1538		69	21	48	0.18	
2C	5.7	ST GR CH3 W/ ARS ML, SIF, RT	CH3		36												
3A	8.0	M DGR CH3 W/ ARS ML, RT, SIF	CH3		49												
3B	8.8	M DGR CH3 W/ ARS ML, RT, SIF	CH3	3	44	77	111	100	UC	–	862	1724				0.25	
NS	9.7	NO SAMPLE	NS														
4A	12.0	SO GR CH2 W/ SIF, RT	CH2		35												
4B	12.8	SO GR CH2 W/ RT	CH2		34	84	113	91	UU	0	442		56	19	37	0.41	
NS	13.7	NO SAMPLE	NS														
5A	16.0	SO GR CH2 W/ ARS SP, SIF	CH2		49								**	**			AL, CON
5B	16.8	GR SP W/ ARS CL, SIF	SP		21												
NS	17.4	NO SAMPLE	NS														
6A	20.0	SO GR & BK CHOA W/ ARS SP, WD	CHOA		100											0.13	OC=2.4%
NS	20.8	NO SAMPLE	NS														
7A	24.0	SO DGR CHOA W/ RT	CHOA	10	100	44	87	95	UC	–	300	600				0.22	
7B	24.8	SO DGR CHOA W/ RT, WD	CHOA		131	**	**	**	UU	**	**	**	**	**			UU, AL, CON
7C	25.7	SO BR & DGR CHOB W/ RT	CHOB		198												
8A	28.0	SO GR & BR CHOA W/ ARS ML, RT	CHOA		89												
8B	28.8	VSO GR CL6	CL6		47												
8C	29.7	VSO GR & LGR CL6 W/ RT	CL6	14	50	72	109	102	UC	–	204	409				0.21	
8D	30.6	VSO GR & LGR CL6 W/ RT, WD	CL6		55												
9A	32.0	SO GR CH4 W/ LNS ML	CH4		73												
9B	32.8	M GR & LGR CH4 W/ LNS ML	CH4		73	54	94	93	UU	0	592		98	27	71	0.07	
9C	33.7	SO GR CH4 W/ LNS ML, WD	CH4		74												
10A	36.0	SO GR CH4	CH4		70												
10B	36.8	SO GR CH4 W/ LNS & ARS ML	CH4		63												
NS	37.7	NO SAMPLE	NS														
11A	40.0	VSO GR CL6 W/ LNS ML	CL6		56												
11B	40.8	VSO GR CL6 W/ LNS ML	CL6		57												
11C	41.7	VSO GR CL6 W/ LNS ML	CL6	11	38	80	110	93	UC	–	155	310				0.19	
11D	42.6	SO GR CH4 W/ LNS & ARS ML	CH4		73												
12A	44.0	SO GR CH4 W/ LNS ML, RT	CH4		77												
12B	44.8	SO GR CH4 W/ LNS ML, RT	CH4		74	54	93	92	UU	0	500		77	24	53	0.22	

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-20UCL

Current Date: 6/12/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12C	45.7	SO GR CH4 W/ LNS ML, RT	CH4		63												
13A	48.0	SO GR CH4 W/ LNS & ARS ML	CH4		67												
13B	48.8	SO GR CH4 W/ LNS & ARS ML	CH4		63												
NS	49.4	NO SAMPLE	NS														
14A	52.0	VSO GR CH4 W/ LNS & ARS ML, RT	CH4		77												
14B	52.8	VSO GR CH4 W/ LNS & ARS ML, RT	CH4		70												
14C	53.7	VSO GR CH4 W/ RT	CH4	14	64	59	96	91	UC	–	176	351				0.22	
14D	54.6	SO GR CH4 W/ RT	CH4		64												
15A	56.0	SO GR CH4 W/ ARS ML	CH4		67												
15B	56.8	SO GR CH4 W/ ARS ML	CH4		68												
15C	57.7	SO GR CH4	CH4		66	56	93	88	UU	0	308		88	28	60	0.23	
15D	58.6	SO GR CH4	CH4		65												
16A	60.0	SO GR CH4 W/ RT, SIF, LYS SP	CH4		69												
16B	60.8	GR SP W/ SIF, ARS CL	SP		27												
NS	61.7	NO SAMPLE	NS														
17A	64.0	VSO GR CL6	CL6		81												
17B	64.8	SO GR CL6 W/ SIF, RT	CL6		36												
17C	65.7	GR SP W/ ARS CH, SIF	SP		30				UU				NP	NP			DIST
17D	66.6	SO GR CL4 W/ SIF	CL4		31												
18A	68.0	SO GR CL6 W/ ARS SM, SIF	CL6		41												
18B	68.8	SO GR CL6 W/ ARS SM, SIF	CL6		33												
18C	69.7	SO GR CH2 W/ ARS SM, SIF	CH2		57	60	95	86	UC	–	443	887					

Remarks:
FFEBJV, LLC.

Checked by: _____
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: _____ Assigned By: _____

Project Number: Task Order 0002
Boring: WWHC-20-UFT

Current Date: 10/12/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	Torvane (tsf)	Other Tests
1A	0.0	ST GR & T CH3 W/ O	CH3		33												
1B	0.8	M GR & T CH3 W/ O	CH3	12	38	79	110	91	UC	-	722	1445	69	31	38		
1C	1.7	GR SM1	SM1		21												
2A	4.0	GR SM1	SM1		20												
2B	4.8	GR SM1 W/ LNS CH, O	SM1		20												
2C	5.7	VSO GR CHOC W/ RT	CHOC		165	31	81	100	UU	0	219		196	57	139		OC=15.4%
2D	6.8	VSO GR CHOB	CHOB		170												
3A	8.0	SO DGR CHOC W/ RT	CHOC		206												
3B	8.8	SO GR & DGR CHOC W/ RT	CHOC		288	18	70	99					186	48	138		Gs=1.94, CON
3C	9.7	VSO GR CHOB	CHOB		162	31	81	100	UU	0	141		173	49	124		
3D	10.6	GR SM1	SM1		34												
4A	12.0	SO GR CHOB W/ WD	CHOB		153												
4B	12.8	SO GR CHOA	CHOA		123												
4C	13.7	VSO GR CHOA	CHOA		143	35	84	100	UU	0	159		145	41	104		
4D	14.6	SO GR CHOC	CHOC		203												
5A	16.0	SO GR CHOB W/ WD	CHOB		186												
5B	16.8	VSO GR PT	PT		345	16	70	96	UU	0	243		271	71	200		OC=27.2%
5C	17.7	M GR CHOB	CHOB		169												
5D	18.6	M GR CHOA	CHOA		69												
6A	20.0	SO GR CH3 W/ LNS ML	CH3		64												
6B	20.8	M GR CH3 W/ LNS ML	CH3		52												
6C	21.7	SO GR CH3 W/ LNS ML	CH3	16	50	71	107	99	UC	-	258	516	62	24	38		
6D	22.6	SO GR CH3 W/ LNS ML	CH3		69												
7A	24.0	VSO GR CH4 W/ LNS ML	CH4		88												
7B	24.8	SO GR CH4	CH4		55	62	96	85					99	30	69		Gs=2.72, CON
7C	25.7	SO GR CH4	CH4		82	53	95	99	UU	0	313		95	27	68		
7D	26.6	SO GR CH4	CH4		67												
8A	28.0	SO GR CH3 W/ LNS ML	CH3		60												
8B	28.8	VSO GR CH3 W/ LNS ML	CH3		65	60	99	96	UU	0	247		67	31	36		
8C	29.7	SO GR CH3 W/ LNS ML	CH3		47												
8D	30.6	SO GR CH3 W/ LNS ML	CH3		54												
9A	32.0	SO GR CH4 W/ LNS ML	CH4		79												
9B	32.8	SO GR CH4 W/ LNS ML	CH4		62												

Remarks: _____
FFEB JV, LLC

Checked By: DM
File Name: WWHC-20UFT.xls

SUMMARY OF LABORATORY TEST RESULTS

Project: _____ Assigned By: _____

Project Number: Task Order 0002
Boring: WWHC-20-UFT

Current Date: 10/12/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	Torvane (tsf)	Other Tests
9C	33.7	VSO GR CH2	CH2	19	53	68	104	96	UC	-	80	159	54	25	29		
10A	36.0	SO GR CH4 W/ LNS ML	CH4		56												
10B	36.8	SO GR CH4 W/ LNS ML	CH4		65	58	96	93					85	32	53		Gs=2.69, CON
10C	37.7	SO GR CH4 W/ LNS ML	CH4		68												
10D	38.6	SO GR CH4 W/ LNS ML	CH4		65												
11A	40.0	SO GR CH4 W/ LNS ML	CH4		71												
11B	40.8	SO GR CH4 W/ LNS ML	CH4		73												
11C	41.7	SO GR CH4 W/ LNS ML	CH4		71	56	96	95	UU	0	421		80	26	54		
11D	42.6	SO GR CH4 W/ LNS ML	CH4		65												
12A	44.0	SO GR CH4	CH4		72												
12B	44.8	SO GR CH4	CH4		72	57	98	98	UU	0	265		87	27	60		
12C	45.7	M GR CH4	CH4		57												
12D	46.6	M GR CH4	CH4		62												
13A	48.0	M GR CH4	CH4		68												
13B	48.8	M GR CH4	CH4		67												
13C	49.7	M GR CH4	CH4	5	68	58	98	96	UC	-	520	1041	88	28	60		
13D	50.6	M GR CH4	CH4		67												
14A	52.0	M GR CH4	CH4		65												
14B	52.8	M GR CH4	CH4		63												
14C	53.7	M GR CH4 W/ LNS ML	CH4	5	69	59	100	100	UC	-	640	1281	90	29	61		
14D	54.6	ST GR CH4 W/ LNS ML	CH4		66												
15A	56.0	GR SM1 W/ SIF	SM1		35												
15B	56.8	GR SM1 W/ SIF	SM1		31												
15C	57.7	SO GR CL4 W/ SIF	CL4		40				UC				32	18	14		DIST
15A	60.0	GR SM1 W/ SIF	SM1		36												
16B	60.8	ST GR CL4 W/ LNS ML, SIF	CL4		36												
16C	61.7	M GR CL4 W/ SIF	CL4	3	38	81	112	95	UC	-	590	1181	43	33	10		
16D	62.6	ST GR CL4 W/ LNS ML, SIF	CL4		40												
17A	64.0	M GR CH4 W/ LNS ML	CH4		61												
17B	64.8	M GR CH4 W/ LNS ML	CH4		59												
17C	65.7	M GR CH4 W/ LNS ML	CH4		65	62	101	100	UU	0	903		90	26	64		
17D	66.6	M GR CH4 W/ LNS ML	CH4		62												
18A	68.0	M GR CH4	CH4		65												
18B	68.8	M GR CH4	CH4		66												
18C	69.7	M GR CH4	CH4	3	65	58	96	92	UC	-	686	1373	103	28	75		

Remarks: _____
FFEB JV, LLC

Checked By: DM
File Name: WWHC-20UFT.xls

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-21UCL

Current Date: 10/6/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	VST BR & DGR CH3 W/ SIF, 0, RT	CH3		24												
1B	0.8	VST BR & DGR CH3 W/ SIF, 0, RT	CH3		25												OC = 7.1%
1C	1.7	VST BR & DGR CH3 W/ SIF, 0, RT	CH3		30												
2A	2.0	VST BR & GR CH3 W/ SIF, ARS ML, O	CH3		30												
2B	2.8	M GR CH2 W/ SIF	CH2	15	29	94	121	97	UC	–	995	1990	50	17	33	0.350	
3A	4.0	M GR CH3 W/ ARS & LNS ML, SIF	CH3		40												
3B	4.8	ST BR & GR CH2 W/ SIF	CH2		25	101	125	98	UU	0	1649		52	20	32	0.530	
NS	5.4	NO SAMPLE	NS														
4A	8.0	M DGR & GR CH3 W/ SIF, G	CH3		43												
4B	8.8	M DGR & GR CH3 W/ ARS ML, SIF	CH3		41												
4C	9.7	ST GR CH3 W/ ARS ML, SIF	CH3		34	84	112	91	UU	0	1211		70	23	47	0.600	
5A	12.0	M GR CH3 W/ ARS ML, SIF, WD	CH3		35												
5B	12.8	M GR CH2 W/ O	CH2		29	95	123	99	UU	0	833		50	16	34	0.400	
5C	13.7	GR SM1	SM1		21												
6A	16.0	VSO GR CHOA W/ WD	CHOA		118												
6B	16.8	VSO GR CHOA W/ RT, WD	CHOA	5	88	50	94	100	UC	–	237	474	142	33	109	0.180	CON
NS	17.7	NO SAMPLE	NS														
7A	20.0	VSO DGR & GR CHOA W/ RT, WD	CHOA		127												OC = 55.1%
NS	20.8	NO SAMPLE	NS														
8A	24.0	SO GR CH4 W/ ARS & LNS ML	CH4		69												
8B	24.8	SO GR CH4 W/ ARS & LNS ML	CH4		68												
8C	25.7	SO GR CH3 W/ LNS ML	CH3	6	59	65	104	100	UC	–	374	747	59	21	38	0.270	
8D	26.6	SO GR CH4	CH4		78												
9A	28.0	SO GR CH4 W/ ARS ML	CH4		80												
9B	28.8	SO GR CH4 W/ RT, WD	CH4		77	57	100	104	UU	0	261		94	30	64	0.250	
9C	29.7	SO GR CH4 W/ ARS ML	CH4		64												
9D	30.6	SO GR CH4 W/ ARS & LNS ML	CH4		73												
10A	32.0	SO GR CH4	CH4		73												
10B	32.8	VSO GR CH3 W/ ARS ML	CH3	15	63	61	99	96	UC	–	162	323	71	27	44	0.190	
10C	33.7	GR ML2	ML2		38												
11A	36.0	M GR CH3 W/ LNS & ARS ML	CH3		53												
11B	36.8	M GR CH3 W/ LNS & ARS ML	CH3		47												
11C	37.7	VSO GR CH4 W/ LNS ML, SL	CH4		73	57	99	101	UU	0	244		79	25	54	0.240	
11D	38.6	SO GR CH4 W/ LNS & ARS ML	CH4		67												
12A	40.0	M GR CH4 W/ ARS & LNS ML	CH4		54												

Remarks: consolidation added
FFEBJV, LLC.

Checked by: RNE
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-21UCL

Current Date: 10/6/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12B	40.8	SO GR CH4 W/ ARS & LNS ML	CH4		67												
12C	41.7	SO GR CH4 W/ ARS ML	CH4	8	59	66	105	102	UC	--	369	738	72	24	48	0.250	
12D	42.6	SO GR CH4 W/ ARS & LNS ML	CH4		65												
13A	44.0	SO GR CH4 W/ ARS & LNS ML	CH4		62												
13B	44.8	SO GR CH4 W/ LNS ML	CH4		58	65	103	98	UU	0	383		77	26	51	0.200	
13C	45.7	SO GR CH4 W/ ARS & LNS ML	CH4		62												
13D	46.6	SO GR CH4 W/ ARS & LNS ML	CH4		65												
14A	48.6	SO GR CH4	CH4		75												
14B	48.8	VSO GR CH4 W/ LNS ML	CH4		63	62	100	97	UU	0	153		77	22	55	0.100	
14C	49.7	VSO GR CH4 W/ LNS ML	CH4	9	57	65	103	98	UC	--	189	334	80	25	55	0.220	
14D	50.6	SO GR CH4 W/ ARS & LNS ML	CH4		64												
15A	52.0	VSO GR CH4 W/ RT, ARS ML, WD	CH4		68												
15B	52.8	VSO GR CH4 W/ LNS ML, RT, WD	CH4		71												
15C	53.7	VSO GR CH4 W/ LNS ML, SL	CH4	15	58	66	104	99	UC	--	187	374	74	27	47	0.150	
16A	56.0	VSO GR CH4 W/ ARS ML	CH4		79												
16B	56.8	VSO GR CH3 W/ LNS ML	CH3	8	66	59	98	95	UC	--	84	168	68	24	44	0.100	
16C	57.7	VSO GR CH3 W/ ARS ML	CH3		63												
16D	58.6	VSO GR CH4 W/ LNS ML	CH4		70												
17A	60.0	VSO GR CH4 W/ ARS ML	CH4		78												
17B	60.8	VSO GR CH4 W/ LNS ML	CH4		62	61	100	95	UU	0	249		82	29	53	0.200	
17C	61.7	VSO GR CH4 W/ WD, ARS ML	CH4		67												
18A	64.0	VSO GR CH4 W/ ARS SP	CH4		75												
18B	64.8	SO GR CL4-S W/ SIF	CL4-S		30												
18C	65.7	SO GR CL4-S W/ SIF	CL4-S		32				UC	--			36	15	21		-200 = 17.9% DISTURBE
19A	68.0	M GR CH3 W/ ARS ML, SIF	CH3		41												
19B	68.8	M GR CH3 W/ ARS ML, SIF	CH3		42												
19C	69.7	M GR CH3 W/ ARS ML, SIF	CH3	3	56	67	104	98	UC	--	625	1249	66	17	49	0.130	
19D	70.6	M GR CH3 W/ ARS ML, SIF	CH3		56												

Remarks:
FFEBJV, LLC.

Checked by: RNG
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-21UPT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR & GR CH2 W/ RT, SIF	CH2		26												
1B	0.8	ST BR & GR CH2 W/ RT, SIF, ARS SM	CH2	13	28	96	123	99	UC	–	1061	2123	54	18	36	0.66	
1C	1.7	BR SP	SP		16												
2	2.0	BR SP	SP		20												
3A	4.0	BR SP W/ SIF, ARS CL	SP		18												
3B	4.8	BR SP W/ LYS CL, O	SP		35												
3C	5.7	VSO GR PT	PT		159	30	78	94	UU	0	164		203	63	140	0.30	SV OC = 26.5%
3D	6.6	VSO GR PT W/ RT	PT		152												
4A	8.0	VSO DBR PT W/ RT	PT		428												
4B	8.8	VSO DGR & BR PT W/ RT	PT		167	31	82	101	UU	0	97		216	60	156	0.10	
4C	9.7	VSO DGR & GR CHOA W/ RT	CHOA		111												
5A	12.0	VSO DGR CHOA W/ RT	CHOA		131												
5B	12.8	VSO DGR CHOA W/ RT	CHOA		111												
5C	13.7	VSO DGR CHOA W/ RT	CHOA		110	42	88	98	UU	0	136		157	38	119	0.21	
6A	16.0	VSO GR & DGR CHOC W/ RT, WD	CHOC		203												
6B	16.8	VSO BK & DGR PT W/ RT	PT		347	16	71	98	UU	0	215		468	153	315	0.170	OC = 48.9% AL, DSS
6C	17.7	VSO GR & BK CHOA W/ RT	CHOA		118								**	**			
7A	20.0	VSO GR CHOA W/ ARS ML	CHOA		85												
7B	20.8	SO GR CH4 W/ ARS ML, O	CH4		59	64	102	97					82	22	60		CON
7C	21.7	VSO GR CH3 W/ ARS ML	CH3	9	64	64	105	104	UC	–	217	433	57	20	37	0.10	
8A	24.0	VSO GR CH4 W/ LNS & ARS ML	CH4		72												
8B	24.8	VSO GR CH4 W/ ARS ML	CH4		80	53	95	98	UU	0	232		96	25	71	0.18	
8C	25.7	SO GR CH4 W/ LNS & ARS ML	CH4		74												
8D	26.6	SO GR CH4 W/ LNS & ARS ML	CH4		75												
9A	28.0	SO GR CH4 W/ LNS & ARS ML	CH4		73												
9B	28.8	SO GR CH4 W/ LNS & ARS ML	CH4		71												
9C	29.7	SO GR CH4 W/ LNS & ARS ML	CH4	8	78	55	98	101	UC	–	255	509	90	27	63	0.10	
9D	30.6	SO GR CH4 W/ LNS & ARS ML	CH4		73												
10A	32.0	SO GR CH4 W/ LNS & ARS ML	CH4		61												
10B	32.8	SO GR CH4 W/ LNS & ARS ML	CH4		49												
10C	33.7	VSO GR CH4 W/ LNS & ARS ML	CH4	3	81	55	99	104	UC	–	234	468	80	24	56	0.13	
10D	34.6	SO GR CH4 W/ LNS & ARS ML	CH4		49												
11A	36.0	SO GR CH4 W/ LNS & ARS ML	CH4		70												
11B	36.8	SO GR CH3 W/ LNS & ARS ML	CH3		57	64	100	92					59	20	39		CON
11C	37.7	SO GR CH4 W/ LNS & ARS ML	CH4		53												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-21UPT

Current Date: 12/5/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
11D	38.6	SO GR CH4 W/ LNS & ARS ML	CH4		65												
12A	40.0	SO GR CH4 W/ ARS ML	CH4		69												
12B	40.8	SO GR CH4 W/ ARS ML	CH4		67												
12C	41.7	SO GR CH4 W/ LNS & ARS ML	CH4		72	57	97	97	UU	0	321		90	25	65	0.260	
12D	42.6	SO GR CH4 W/ ARS & LNS ML	CH4		63												
13A	44.0	SO GR CH4 W/ LNS & ARS ML	CH4		68												
13B	44.8	SO GR CH4 W/ LNS & ARS ML	CH4		68												
13C	45.7	SO GR CH4 W/ LNS & ARS ML	CH4	4	63	62	102	100	UC	–	435	870	74	23	51	0.18	
13D	46.6	SO GR CH4 W/ LNS & ARS ML	CH4		66												
14A	48.0	SO GR CH4 W/ ARS ML	CH4		73												
14B	48.8	SO GR CH4 W/ ARS ML	CH4		72												
14C	49.7	M GR CH4 W/ ARS ML	CH4		73	55	96	95	UU	0	518		92	28	64	0.28	
14D	50.6	M GR CH4 W/ ARS ML	CH4		69												
15A	52.0	M GR CH4 W/ LNS & ARS ML	CH4		72												
15B	52.8	M GR CH4 W/ LNS & ARS ML	CH4		68												
15C	53.7	M GR CH4 W/ LNS & ARS ML	CH4	5	71	59	100	101	UC	–	564	1127	95	29	66	0.19	
15D	54.6	M GR CH4 W/ LYS SM, SIF	CH4		59												
16A	56.0	SO GR CL4 W/ SIF	CL4		30												
16B	56.8	SO GR CL4 W/ SIF	CL4		31												
16C	57.7	SO GR CL4 W/ SIF	CL4	6	28	95	122	99	UC	–	351	703	32	10	22	0.11	
16D	58.6	SO GR CL4 W/ SIF	CL4		37												
17A	60.0	SO GR CL4 W/ SIF	CL4		40												
17B	60.8	SO GR CL4 W/ SIF	CL4		41												
17C	61.7	M GR CH3 W/ SIF	CH3		46	73	108	98	UU	0	605		63	20	43	0.35	
17D	62.6	M GR CH4 W/ ARS SP, SIF	CH4		59												
18A	64.0	M GR CH4 W/ LNS & ARS ML, SIF	CH4		64												
18B	64.8	M GR CH4 W/ ARS ML , SIF	CH4		63												
18C	65.7	M GR CH4 W/ ARS ML	CH4	4	60	63	101	97	UC	–	770	1540	85	23	62	0.27	
18D	66.6	M GR CH4 W/ LNS & ARS ML	CH4		63												
19A	68.0	M GR CH4	CH4		67												
19B	68.8	M GR CH4 W/ ARS ML	CH4	5	67	61	102	103	UC	–	742	1484	101	37	64	0.33	
19C	69.7	M GR CH4 W/ ARS ML	CH4		64												
19D	70.6	M GR CH4 W/ ARS SM, SIF	CH4		64												

Remarks:
FFEBJV, LLC.

Checked by: WTY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-22UCL

Current Date: 12/21/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	VST GR & T CH2 W/ SIF	CH2		28												
1B	0.8	ST GR & T CH2 W/ SIF	CH2	14	28	92	117	91	UC	–	1453	2906	54	18	36	0.850	
1C	1.7	ST GR CH3 W/ ARS ML, SIF, WD	CH3		34												
2A	4.0	ST GR CH3 W/ SIF, O	CH3		36												
2B	4.8	ST GR CH3 W/ SIF, O	CH3		39												
2C	5.7	M DGR CH3 W/ ARS ML, G, O	CH3		38	79	109	90	UU	0	679		70	23	47	0.250	
3A	8.0	ST GR CH3 W/ SIF, O	CH3		45												
3B	8.8	ST GR CH3 W/ SIF, O	CH3		38												
3C	9.7	ST GR CH3 W/ ARS ML, RT	CH3	15	26	98	123	93	UC	–	1476	2952	52	19	33	0.530	
4A	12.0	ST GR & T CL6 W/ O	CL6		30												
4B	12.8	M GR CH3 W/ ARS ML, WD, RT	CH3		38												
NS	13.6	NO SAMPLE	NS														
5A	16.0	GR SM1 W/ LYS CH, O, RT	SM1		27												
5B	16.8	M GR CH4 W/ O	CH4		61	*	*	*	UC	–	*	*	97	37	60		CON
5C	17.7	VST GR CHOB	CHOB		104												
6A	20.0	BR WD	WD		122												
6B	20.8	BR WD	WD		149												
6C	21.7	BR WD	WD		148												
6D	22.6	BR WD	WD		234												
7A	24.0	M GR CHOA W/ RT, WD	CHOA		87												
7B	24.8	SO GR CHOA W/ RT, WD	CHOA		135	35	82	96	UU	0	289					0.200	OC= 45.1%
7C	25.7	M GR CHOC W/ RT, WD	CHOC		162												OC=
8A	28.0	SO GR & BK CHOC W/ WD, RT	CHOC		233												OC=9.6%
8B	28.8	M GR & BK CHOB W/ RT, WD	CHOB		108												OC=7.4%
8C	29.7	M GR CH4 W/ O, RT, WD	CH4		57												
9A	32.0	SO GR & LGR CH2 W/ LNS ML	CH2		57												
9B	32.8	SO GR CH3 W/ LNS & ARS ML, O	CH3		61	65	104	100	UU	0	340		62	22	40	0.200	
9C	33.7	SO GR & LGR CH2 W/ LNS ML	CH2		53												
10A	36.0	SO GR CH3 W/ ARS ML, RT	CH3		71												
10B	36.8	SO GR CH4 W/ ARS ML, RT	CH4	8	70	59	100	100	UC	–	362	725	96	29	67	0.260	
10C	37.7	SO GR CH4 W/ ARS ML, RT	CH4		80												
11A	40.0	SO GR CH3 W/ LNS & ARS ML	CH3		56												
11B	40.8	SO GR CH3 W/ LNS & ARS ML	CH3		59												
11C	41.7	SO GR CH4 W/ LNS & ARS ML, SIF	CH4		67	60	99	98	UU	0	352		90	29	61	0.210	
12A	44.0	ST GR CH4 W/ LNS ML	CH4		54												
12B	44.8	SO GR CH4 W/ LNS ML	CH4	7	66	59	98	96	UC	–	433	865	72	21	51	0.250	

Remarks:
FFEBJV, LLC.

Checked by: WSK
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-22UCL

Current Date: 12/21/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12C	45.7	ST GR CH4 W/ LNS ML	CH4		48												
13A	48.0	M GR CH4 W/ LNS ML	CH4		70												
13B	48.8	M GR CH4 W/ LNS ML	CH4		57												
13C	49.7	SO GR CH4 W/ LNS ML	CH4	6	63	62	101	98	UC	–	447	894	93	24	69	0.260	
13D	50.6	M GR CH4 W/ LNS ML	CH4		61												
14A	52.0	M GR CH3 W/ ARS ML, RT, WD	CH3		58												
14B	52.8	M GR CH3 W/ ARS ML, RT, WD	CH3		54												
14C	53.7	VSO GR CH4 W/ LNS & ARS ML, SL	CH4		64	62	101	99	UU	0	232		93	24	69	0.250	
15A	56.0	SO GR CH4 W/ LNS ML, WD	CH4		72												
15B	56.8	M GR CH4 W/ LNS ML, WD	CH4	8	63	65	105	100	UC	–	526	1053	79	25	54	0.250	
15C	57.7	SO GR CH4 W/ LNS ML	CH4		66												
16A	60.0	SO GR CH4 W/ ARS ML	CH4		69												
16B	60.8	SO GR CH4 W/ ARS ML	CH4		62	62	100	96	UU	0	383		81	28	53	0.300	
NS	61.7	NO SAMPLE	NS														
17A	64.0	SO GR CH4 W/ LNS & ARS ML	CH4		71												
17B	64.8	SO GR CH3 W/ SIF	CH3		37												
17C	65.7	SO GR CH3 W/ SIF, RT	CH3		72												
18A	68.0	ST GR CH4 W/ ARS SP, SIF	CH4		42												DIST.
18B	68.8	SO GR CL6 W/ ARS SP, SIF, WD	CL6	10	48	74	109	100	UC	–	325	650	48	18	30	0.300	
NS	69.7	NO SAMPLE	NS														

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-23UCL

Current Date: 12/21/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR & GR CH2 W/ RT, SIF	CH2		27												
1B	0.6	ST BR & GR CH2 W/ RT, SIF	CH2		25												
NS	1.2	NO SAMPLE	NS														OC=6.6%
2A	4.0	ST BR & GR CH3 W/ SIF	CH3		37												
2B	4.8	M BR CH4 W/ SIF, O	CH4		34	84	113	90	UU	0	931		74	24	50	0.27	
NS	5.7	NO SAMPLE	NS														
3A	8.0	ST GR & T CH2 W/ RT, WD	CH2		36												
3B	8.8	ST GR CH2 W/ RT, WD	CH2		26	97	123	96	UU	0	1208		53	16	37	0.38	
NS	9.7	NO SAMPLE	NS														
4A	12.0	BR ML2-S W/ LYS CH, SIF, RT	ML2-S		18												
NS	12.8	NO SAMPLE	NS														SV
5A	16.0	M GR & BR CHOA W/ WD, RT	CHOA		94												
5B	16.8	M BR & GR PT W/ WD, RT	PT		263				UU		**		296	119	177		DIST
NS	17.5	NO SAMPLE	NS														
6	20.0	SO GR & BK PT W/ RT, WD	PT		215												
7A	22.0	SO GR CH4 W/ RT, WD	CH4		76												
7B	22.8	SO GR CH4 W/ RT, WD	CH4	10	75	55	96	98	UC	–	398	796	104	26	78	0.20	CON
7C	23.7	SO GR CH4 W/ RT, WD	CH4		81												
8A	26.0	SO GR CH4 W/ LYS & LNS ML, WD	CH4		46												
8B	26.8	SO GR CH4 W/ LNS ML, RT	CH4		52												
8C	27.7	SO GR CH4 W/ ARS ML, O, SIF	CH4		60	65	103	100	UU	0	315		79	22	57	0.28	
9A	30.0	SO GR CH4 W/ LNS ML, WD	CH4		45												
9B	30.8	SO GR CH4 W/ LNS ML	CH4		52	70	107	100	UU	0	432		84	29	55	0.25	
9C	31.7	SO GR CH4 W/ LNS ML	CH4		57												
10A	34.0	SO GR CH4 W/ LNS ML	CH4		58												
10B	34.8	SO GR CH4	CH4		59												
10C	35.7	SO GR CH4	CH4		70	58	99	99	UU	0	444		97	25	72	0.30	
10D	36.6	SO GR CH4 W/ LNS ML	CH4		71												
11A	38.0	SO GR CH4	CH4		73												
11B	38.8	SO GR CH3 W/ ARS ML	CH3		59	**	**	**	UC	–	**	**	77	21	56	0.20	CON
11C	39.7	SO GR CH3 W/ LNS ML	CH3		59												
11D	40.6	SO GR CH3 W/ LNS ML	CH3		59												
12A	42.0	SO GR CH3 W/ LYS ML	CH3		52												
12B	42.8	SO GR CH3 W/ ARS ML	CH3	8	50	73	109	100	UC	–	422	843	63	23	40	0.26	
12C	43.7	SO GR CH3 W/ LNS ML	CH3		44												
13A	46.0	SO GR CH3	CH3		58												
13B	46.8	SO GR CH3	CH3		56												

Remarks: 1 CONSOLIDATION (11B) ADDED
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-23UCL

Current Date: 12/21/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
13C	47.7	SO GR CH3 W/ ARS ML	CH3		54	68	105	98	UU	0	263		66	23	43	0.24	
14A	50.0	M GR CH3	CH3		54												
14B	50.8	M GR CH3	CH3	5	51	70	107	99	UC	–	514	1028	63	25	38	0.30	
14C	51.7	M GR CH3	CH3		51												
15A	54.0	M GR CH3	CH3		54												
15B	54.8	SO GR CH4	CH4		60												
15C	55.7	SO DGR CH4	CH4	4	61	63	101	97	UC	–	495	990	85	32	53	0.35	
15D	56.6	SO GR CH4	CH4		63												
16A	58.0	SO GR CH4	CH4		64												
16B	58.8	SO GR CH4	CH4	9	58	63	99	93	UC	–	357	714	81	25	56	0.25	
16C	59.7	M GR CH4	CH4		61												
17A	62.0	M DGR CH4	CH4		60												
17B	62.8	M DGR CH4	CH4		58												
17C	63.7	M DGR CH4 W/ ARS ML	CH4		58	66	104	99	UU	0	522		72	16	56	0.36	
17D	64.6	ST DGR CH2 W/ ARS SM	CH2		21												
18A	66.0	VSO GR CH4	CH4		88												
18B	66.8	VSO DGR CH4	CH4	15	68	58	98	96	UC	–	91	183	75	27	48	0.12	
18C	67.7	M DGR & GR CH4	CH4		54												
18D	68.6	M DGR CH2 W/ SIF	CH2		34												

Remarks:
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002 Current Date: 12/6/2007
Boring: WWHC-23UPT

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR & GR CH2 W/ SIF, RT	CH2		27												
1B	0.8	ST BR & GR CH3 W/ ARS ML, SIF, RT	CH3	8	35	94	119	90	UC	–	1319	2637	60	17	43	0.60	
NS	1.7	NO SAMPLE	NS														
2A	4.0	LGR & T SP	SP		17												
2B	4.8	LGR & T SP	SP		17												
2C	5.7	LGR & T SP	SP		17												SV
3A	8.0	VSO BR PT W/ WD, ARS CL	PT		430												
3B	8.8	VSO BR CHOC W/ WD, ARS CL	CHOC		275												
3C	9.7	VSO DGR & BR CHOA W/ WD, RT, ARS ML	CHOA		146												OC= 19.4%
4A	12.0	SO GR CH4 W/ WD, RT, ARS ML	CH4		72												
4B	12.8	SO GR CH4 W/ WD, RT, ARS ML	CH4		62	60	98	94					100	28	72		CON, GS
4C	13.7	SO GR CH4 W/ WD, RT, ARS ML	CH4		50	68	103	91	UU	0	439		96	25	71	0.30	
5A	16.0	SO GR CH4 W/ ARS ML, WD	CH4		77												
5B	16.8	SO GR CHOA W/ ARS ML, WD	CHOA		93												
5C	17.7	SO DGR & GR CHOB W/ RT, WD	CHOB		101	43	86	92	UU	0	277		158	34	124	0.35	OC= 15.6%
6A	20.0	SO GR CH2 W/ RT	CH2		38												
6B	20.8	SO GR CH2 W/ RT	CH2		47												
6C	21.7	SO GR CH4 W/ O, RT, WD	CH4		60	62	99	93	UU	0	261		88	23	65	0.25	
6D	22.6	SO GR CH4 W/ ARS ML	CH4		54												
7A	24.0	SO GR CH4 W/ LNS ML, RT	CH4		54												
7B	24.8	SO GR CL4 W/ LNS CH, RT	CL4		40												
7C	25.7	SO GR CH3 W/ LNS ML, LNS SM	CH3	6	57	65	103	98	UC	–	339	679	67	21	46	0.20	
7D	26.6	SO GR CH3 W/ LNS ML	CH3		46												
8A	28.0	SO GR CH3 W/ LNS ML	CH3		55												
8B	28.8	SO GR CH3 W/ LNS ML	CH3		53												
8C	29.7	SO GR CH4 W/ SL	CH4		74	57	99	101	UU	0	407		100	32	68	0.30	
8D	30.6	SO GR CH4 W/ SL	CH4		76												
9A	32.0	SO GR CH4 W/ SL	CH4		63												
9B	32.8	SO GR CH4 W/ LNS ML, SL	CH4		58												
9C	33.7	SO GR CH4 W/ LNS ML, SL	CH4	7	58	65	103	97	UC	–	373	746	75	21	54	0.20	
9D	34.6	SO GR CH4 W/ LNS ML, SL	CH4		66												
10A	36.0	SO GR CH4 W/ SL, LNS ML	CH4		64												
10B	36.8	SO GR CH4 W/ LNS ML, SL	CH4		72	58	100	102	UU	0	222		84	23	61	0.20	
10C	37.7	SO GR CH4 W/ SL, LNS ML	CH4		74	56	97	98					97	27	70		CON
11A	40.0	SO GR CH4 W/ LNS ML, SL	CH4		60												

Remarks: _____
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-23UPT

Current Date: 12/6/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
11B	40.8	SO GR CH3 W/ SL	CH3		55												
11C	41.7	SO GR CH3 W/ SL	CH3		45	74	107	94	UU	0	414		62	21	41	0.25	
11D	42.6	SO GR CH3 W/ SL	CH3		50												
12A	44.0	SO GR CH3 W/ SL	CH3		54												
12B	44.8	SO GR CH3 W/ SL	CH3		53												
12C	45.7	SO GR CH3 W/ SL	CH3		55				UU				67	30	37		UU DIST
13A	48.0	M GR CH4 W/ SL	CH4		53												
13B	48.8	M GR CH4 W/ SL	CH4		50												
13C	49.7	M GR CH4 W/ SL	CH4	15	45	75	108	96	UC	–	515	1030	71	21	50	0.30	
13D	50.6	M GR CH4 W/ SL	CH4		58												
14A	52.0	M GR CH4 W/ SL	CH4		58												
14B	52.8	M GR CH4 W/ SL	CH4		59												
14C	53.7	M DGR CH4 W/ SL	CH4		49	71	105	94	UU	0	562		74	25	49	0.40	
14D	54.6	M GR CH4 W/ SL	CH4		55												
15A	56.0	M GR CH4 W/ SL	CH4		53												
15B	56.8	M GR CH4 W/ SL	CH4		57												
15C	57.7	M GR CH4 W/ SL	CH4	4	51	67	101	90	UC	–	719	1438	81	23	58	0.35	
15D	58.6	M GR CH4 W/ SL	CH4		58												
16A	60.0	M GR CH4 W/ SL, LNS SP, SIF	CH4		57												
16B	60.8	GR SP W/ SIF	SP		27												SV
16C	61.7	GR SP W/ SIF	SP		28												
17A	64.0	M GR CL6-S W/ SIF	CL6-S		35												
17B	64.8	M GR CL6 W/ ARS SP, SIF	CL6		41												
17C	65.7	M GR CL6 W/ ARS SM, SIF	CL6	6	39	81	113	98	UC	–	679	1358	46	18	28	0.34	
18A	68.0	M GR CH4 W/ LNS ML, SL	CH4		54												
18B	68.8	M GR CH4 W/ LNS ML, SL	CH4		54												
18C	69.7	M GR CH4 W/ LNS ML, SL	CH4		55	68	102	51	UC	–	853	1706	90	24	66	0.40	
18D	70.6	M GR CH4 W/ LNS ML, SL	CH4		58												

Remarks: _____
FFEBJV, LLC.

Checked by: WJY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002 Current Date: 9/22/2007
Boring: WWHC-24UCL

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST GR & T CH3 W/ ARS SM, SIF, O	CH3		39												
1B	0.8	ST GR & BR CH3 W/ ARS ML, WD, G, SIF	CH3	7	29	88	114	85	UC	–	1096	2192	71	24	47	0.60	
2A	2.0	ST BR & GR CH3 W/ SIF	CH3		35												
2B	2.8	ST BR & GR CH3 W/ SIF, RT, ARS ML	CH3		31	88	116	93	UU	0	1125		67	23	44	0.63	
3A	4.0	M T & GR CH3 W/ ARS CL	CH3		34												
3B	4.8	M T & GR CH3 W/ ARS CL	CH3		33												
3C	5.7	M BR & GR CH3 W/ ARS ML, O, SIF	CH3		33	87	116	95	UU	0	842		68	20	48	0.62	
4A	8.0	M GR & T CH3 W/ SIF	CH3		45												
4B	8.8	M GR & T CH3 W/ SIF	CH3		34												
4C	9.7	VSO GR & BR CH3 W/ SIF, ARS ML	CH3		40	80	111	95	UU	0	221		62	22	40	0.22	
4D	10.6	M GR & T CH3 W/ ARS ML	CH3		33												
5A	12.0	M GR & T CH3 W/ ARS SM	CH3		39												
5B	12.8	SO GR CL6 W/ ARS SM	CL6	11	24	99	124	96	UC	–	264	528	44	17	27	0.12	
5C	13.7	GR SC1	SC1		18												
6A	16.0	GR SC1	SC1		25												
6B	16.8	GR SC1 W/ ARS CH, O	SC1		33												
NS	17.3	NO SAMPLE	NS														SV
7A	20.0	GR SC1	SC1		28												
7B	20.8	VSO BR & GR CH2 W/ ARS SP	CH2		46	76	111	100	UU	0	125		50	17	33	0.18	OC=5.3%
8A	22.0	SO GR CH4 W/ RT	CH4		71												
8B	22.8	SO GR CH4 W/ RT	CH4		71	56	97	97					96	30	66		Gs, CON
8C	23.7	SO GR CHOA W/ RT	CHOA		88	49	92	99	UU	0	364		115	30	85	0.30	OC= 10.1%
8D	24.6	SO GR CHOB W/ RT	CHOB		121												
9A	26.0	SO GR & DGR CHOB W/ RT	CHOB		140												
9B	26.8	SO GR CHOA W/ RT	CHOA		104												
9C	27.7	SO GR CH3 W/ ARS ML, O	CH3		48	75	110	100	UU	0	327		71	25	46	0.25	
9D	28.6	SO GR CH3 W/ O, RT	CH3		48												
10A	30.0	SO GR & LGR CH2 W/ LNS ML	CH2		48												
10B	30.8	SO GR & LGR CL6-S W/ LNS CH, CC	CL6-S		46	77	112	100	UU	0	346		42	19	23	0.23	
10C	31.7	SO GR & LGR CL6-S W/ LNS ML	CL6-S		60	64	102	99					47	18	29		Gs, CON
11A	34.0	SO GR CH4 W/ LNS ML	CH4		53												
11B	34.8	SO GR CH4 W/ LNS ML	CH4	6	52	69	105	96	UC	–	389	777	78	26	52	0.21	
NS	35.6	NO SAMPLE	NS														
12A	38.0	SO GR CH4 W/ LNS ML	CH4		66												
12B	38.8	SO GR CH3 W/ LNS ML	CH3		57												
12C	39.7	SO GR CH3 W/ LNS ML	CH3		50	74	111	100	UU	0	469		62	23	39	0.28	

Remarks: ADDED 1(UU) & 2 CONSOLIDATIONS
FFEBJV, LLC.

Checked by: RNE
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002

Boring: WWHC-24UCL

Current Date: 9/22/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12D	40.6	SO GR CH3 W/ LNS & LYS ML	CH3		58												
13A	42.0	SO GR CH3 W/ LNS ML	CH3		62												
13B	42.8	SO GR CH3 W/ LNS & LYS ML	CH3		58												
13C	43.7	SO GR CH2 W/ LNS ML	CH2	7	51	70	106	98	UC	--	397	795	50	19	31	0.21	
13D	45.5	SO GR CH4 W/ LNS ML	CH4		60												
14A	46.0	SO GR CH4 W/ LNS & LYS ML	CH4		59												
14B	46.8	VSO GR CH4 W/ LNS ML	CH4		63	61	100	97	UU	0	238		79	27	52	0.22	
14C	47.7	SO GR CH4 W/ LNS & ARS ML	CH4		56												
14D	48.6	VSO GR CH4 W/ LNS & ARS ML	CH4		64												
15A	50.0	VSO GR CH4 W/ RT	CH4		65												
15B	50.8	VSO GR CH4	CH4		55												
15C	51.7	SO DGR CH4	CH4	5	55	67	104	98	UC	--	451	902	72	25	47	0.21	
15D	52.6	SO DGR CH4	CH4		55												
16A	54.0	SO GR & DGR CH4	CH4		65												
16B	54.8	SO DGR & GR CH4	CH4		57												
16C	55.7	SO DGR CH3	CH3	6	52	68	103	94	UC	--	400	801	69	26	43	0.20	
16D	56.6	SO DGR CH3	CH3		53												
17A	58.0	SO GR CH3	CH3		57												
17B	58.8	M GR CH3	CH3		54												
17C	59.7	M DGR CH3 W/ ARS ML, SL	CH3		55	68	105	97	UU	0	518		71	25	46	0.35	
17D	60.6	M GR CH3	CH3		50												
18A	62.0	SO DGR CH3	CH3		61												
18B	62.8	SO DGR CH3	CH3		57												
18C	63.7	SO DGR CH3	CH3		58												
19A	66.0	SO GR CH3	CH3		59												
19B	66.8	SO GR & LGR CH3 W/ RT	CH3		60												
19C	67.7	SO GR CH3 W/ LNS SM, SIF	CH3	15	40	74	104	84	UC	--	241	481	67	19	48	0.20	

Remarks:
FFEBJV, LLC.

Checked by: RJE

File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-24UFT

Current Date: 9/22/2007

Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	M BR & GR CH3 W/ O, SIF, RT, ARS SM	CH3		31												
1B	0.8	BR WD W/ ARS SM	WD		251												
1C	1.7	BR WD W/ ARS SM	WD		163												
2A	4.0	GR & BR WD W/ ARS CH, O, RT	WD		131												
2B	4.8	GR & BR WD W/ ARS CH	WD		133												
2C	5.7	SO GR & BR PT W/ WD, RT	PT		134												
3A	8.0	M GR CHOA W/ WD, RT	CHOA		80												OC = 94.6%
3B	8.8	M GR CHOA W/ WD, RT	CHOA		91												
3C	9.7	BR WD	WD		422												
4A	12.0	SO GR CH4 W/ RT, WD	CH4		65												
4B	12.8	SO GR CH4 W/ RT	CH4		59												
4C	13.7	SO GR CHOA W/ RT	CHOA		75	55	97	99	UU	0	289		110	24	86	0.40	
5A	16.0	SO GR CHOA W/ RT	CHOA		90												
5B	16.8	SO GR CHOA W/ RT	CHOA		127	37	84	96	UU	0	289		151	41	110	0.21	OC = 18.4%
5C	17.7	SO BK & GR CHOB W/ RT	CHOB		125	38	85	99					169	53	116		Gs, CON
5D	18.6	SO BK & GR CHOA W/ RT	CHOA		185												
6A	20.0	SO GR CHOA W/ ARS ML, RT	CHOA		101												
6B	20.8	SO GR CH4 W/ RT, SIF, O	CH4		91	49	93	100	UU	0	328		105	26	79	0.20	
6C	21.7	M GR CH4 W/ ARS ML, O, RT	CH4		53												
6D	22.6	M GR CH4 W/ LNS & ARS ML	CH4		49												
7A	24.0	SO GR CH3 W/ ARS ML	CH3		58												
7B	24.8	M GR CL4 W/ LYS ML	CL4	6	33	89	119	100	UC	–	548	1096	36	18	18	0.20	
7C	25.7	M GR CL4 W/ LNS ML	CL4		33												
7D	26.6	M GR CH4 W/ ARS ML	CH4		64												
8A	28.0	SO GR CH4	CH4		76												
8B	28.8	SO GR CH4 W/ ARS ML	CH4		87	50	93	99					94	27	67		Gs, CON
8C	29.7	SO GR CH4 W/ LNS & ARS ML	CH4		80	53	95	98	UU	0	309		98	27	71	0.20	
8D	30.6	M GR CH4 W/ LNS & ARS ML	CH4		69												
9A	32.0	M GR CH4 W/ LNS & ARS ML	CH4		63												
9B	32.8	M GR CH4 W/ LNS & ARS ML	CH4		52												
9C	33.7	SO GR CH4 W/ LNS & ARS ML	CH4		65	61	101	100	UU	0	309		70	20	50	0.21	
9D	34.6	M GR CH4 W/ LNS & ARS ML	CH4		57												
10A	36.0	SO GR CH4 W/ LNS & ARS ML	CH4		65												
10B	36.8	SO GR CH3 W/ LNS & ARS ML	CH3		60												
10C	37.7	SO GR CH3 W/ LNS & ARS ML	CH3	5	62	63	102	100	UC	–	326	652	69	20	49	0.12	

Remarks: ADDED 2 CONSOLIDATIONS, 1 AL, 1 UC & AL.
FFEBJV, LLC.

Checked by: RNB
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-24UFT

Current Date: 9/22/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
11A	40.0	SO GR CH3 W/ LNS & ARS ML	CH3		61												
11B	40.8	SO GR CH4 W/ LNS & ARS ML	CH4		63												
11C	41.7	SO GR CH4 W/ LNS & ARS ML	CH4		58	66	104	100	UU	0	432		70	19	51	0.28	
11D	42.6	SO GR CH4 W/ LNS & ARS ML	CH4		69												
12A	44.0	SO GR CH4	CH4		59												
12B	44.8	SO GR CH4	CH4		56												
12C	45.7	SO GR CH3	CH3	2	54	69	105	100	UC	–	468	935	69	27	42	0.26	
12D	46.6	SO GR CH3	CH3		54												
13A	48.0	SO GR CH3 W/ ARS ML	CH3		55												
13B	48.8	SO GR CH3 W/ ARS ML	CH3		55												
13C	49.7	SO GR CH3 W/ ARS ML	CH3		49												
13D	50.6	M GR CH4	CH4		54												
14A	52.0	M GR CH4	CH4		59												
14B	52.8	M GR CH4	CH4		58												
14C	53.7	M GR CH4	CH4		56	67	105	99	UU	0	642		77	22	55	0.40	
14D	54.6	M GR CH4	CH4		56												
15A	56.0	M GR CH4	CH4		61												
15B	56.8	M GR CH4 W/ SIF	CH4	9	55	68	105	99	UC	–	365	729	72	24	48	0.29	
15C	57.7	M GR CH4 W/ LYS SM, SIF	CH4		40												
16A	60.0	SO GR CL4 W/ SIF	CL4		28												
16B	60.8	SO GR CL4 W/ SIF	CL4		30												
16C	61.7	SO GR CL4 W/ SIF	CL4	6	34	86	116	98	UC	–	401	801	29	19	10		
16D	62.6	SO GR CL4 W/ SIF	CL4		37												
17A	64.0	M GR CH3 W/ ARS SM, SIF	CH3		48												
17B	64.8	M GR CH4 W/ SIF	CH4		57												
17C	65.7	M GR CH4 W/ ARS ML, SIF	CH4		59												
17D	66.6	M GR CH4 W/ ARS ML, SIF	CH4		58												
18A	68.0	M GR CH4 W/ ARS ML	CH4		62												
18B	68.8	M GR CH4	CH4		60												
18C	69.7	M GR CH4 W/ ARS ML, SIF	CH4	6	61	63	102	100	UC	–	844	1687	90	26	64	0.36	
18D	70.6	M GR CH4	CH4		64												

Remarks:
FFEBJV, LLC.

Checked by: RNE
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002 Current Date: 9/22/2007

Boring: WWHC-25UCL

Sample Number	Depth	Visual Classification	USCS	E(f)	Wt	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST BR CH3 W/ ARS ML, RT, SIF	CH3		31												
1B	0.8	ST BR CH3 W/ ARS ML, RT, SIF	CH3		33												
1C	1.7	ST GR & BR CH3 W/ ARS SM & ML, SIF, RT	CH3	13	31	89	116	91	UC	–	1668	3337	60	16	44	0.64	
2A	4.0	ST BR & GR CH3 W/ ARS ML, SIF , RT	CH3		46												
2B	4.8	ST BR & GR CH3 W/ ARS ML, SIF, RT	CH3		37												
2C	5.7	ST GR & BR CH3 W/ SIF, RT, O	CH3		28	96	123	98	UU	0	1861		62	20	42	0.70	
3A	8.0	ST BR & GR CH3 W/ ARS ML, SIF	CH3		44												
3B	8.8	ST GR CH2 W/ RT, ARS SM	CH2	10	27	96	122	95	UC	–	1304	2608	53	18	35	0.60	
3C	9.7	BR SP W/ SIF, LYS CH	SP		20												
4A	12.0	GR SP W/ ARS CL	SP		20												
4B	12.8	GR SP	SP		21												
4C	13.7	GR SP	SP		35												
5A	16.0	M LGR CHOA W/ LNS SM	CHOA		92												SV
5B	16.8	M LGR CHOB W/ WD	CHOB		161												
NS	17.7	NO SAMPLE	NS														OC = 31.7%
6A	20.0	SO GR CH4 W/ RT, WD	CH4		69												
6B	20.8	M GR CH4 W/ RT	CH4		58	64	100	95					84	23	61		GS, CON
6C	21.7	M GR CH4 W/ RT, CC	CH4		54	68	105	98	UU	0	506		91	28	63	0.35	
6D	22.8	M GR CH4 W/ RT, WD	CH4		59												
7A	24.0	VSO GR CHOA	CHOA		79												
7B	24.8	VSO GR CHOA	CHOA		89												
7C	25.7	VSO GR CHOA W/ ARS ML	CHOA		92	49	94	102	UU	0	238		128	36	92	0.25	OC= 11.8%
7D	26.6	VSO GR CHOA W/ WD	CHOA		84												
8A	28.0	SO GR CH4 W/ O, RT	CH4		78												
8B	28.8	SO GR CH4 W/ O, SIF, ARS ML	CH4		54												
8C	29.7	SO GR CH4 W/ ARS ML, ARS SP	CH4		60	64	103	99	UU	0	407		73	18	55	0.20	
8D	30.6	SO GR CH4 W/ O, SIF, ARS ML	CH4		72												
9A	32.0	SO GR CL6 W/ LNS ML	CL6		42												
9B	32.8	SO GR CL6 W/ LNS CH	CL6		42	78	111	99	UU	0	338		48	17	31	0.20	
9C	33.7	SO GR CH3 W/ LNS & ARS ML	CH3		62	63	102	100					69	18	51		GS, CON
9D	34.6	SO GR CH3 W/ LNS & ARS ML	CH3		54												
10A	36.0	SO GR CH4 W/ LNS & ARS ML	CH4		49												
10B	36.8	SO GR CH4 W/ LNS & ARS ML	CH4		53												
10C	37.7	SO GR CH4 W/ ARS ML	CH4		65	61	101	100	UU	0	426		75	21	54	0.27	
10D	38.6	SO GR CH4 W/ ARS ML	CH4		69												

Remarks: ADDED 2 CONSOLIDATIONS

FFEBJV, LLC.

Checked by: RJG

File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

Project Number: 0022-0002

Boring: WWHC-25UCL

Current Date: 9/22/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
11A	40.0	SO GR CH4 W/ LNS & ARS ML	CH4		64												
11B	40.8	SO GR CH4 W/ LNS & ARS ML	CH4		59												
11C	41.7	SO GR CH3 W/ LNS ML	CH3	8	53	69	105	97	UC	–	452	904	68	20	48	0.25	
11D	42.6	SO GR CH4 W/ LNS & ARS ML	CH4		54												
12A	44.0	M GR CH4 W/ LNS & ARS ML	CH4		58												
12B	44.8	M GR CH4 W/ LNS & ARS ML	CH4		63												
12C	45.7	M GR CH4 W/ LNS ML	CH4	4	67	58	96	93	UC	–	551	1101	88	29	59	0.20	
12D	46.6	M GR CH4 W/ LNS & ARS ML	CH4		57												
13A	48.0	M GR CH4 W/ LNS & ARS ML	CH4		55												
13B	48.8	M GR CH4 W/ LNS & ARS ML	CH4		50												
13C	49.7	M GR CH4 W/ LNS ML, ARS SM	CH4	4	60	63	101	96	UC	–	538	1077	83	27	56	0.25	
13D	50.6	M GR CH4 W/ LNS & ARS ML	CH4		55												
14A	52.0	M GR CH4 W/ LNS & ARS ML	CH4		65												
14B	52.8	M GR CH4 W/ LNS ML	CH4		67	60	101	100	UU	0	531		81	21	60	0.28	
14C	53.7	M GR CH4 W/ LNS & ARS ML	CH4		56												
14D	54.6	M GR CH4 W/ LNS & ARS ML	CH4		58												
15A	56.0	M GR CH4 W/ ARS ML	CH4		60												
15B	56.8	M GR CH4 W/ ARS ML	CH4		55												
15C	57.7	M DGR CH4 W/ ARS ML	CH4	7	53	66	101	92	UC	–	548	1096	77	26	51	0.30	
15D	58.6	M GR CH4	CH4		56												
16A	60.0	M DGR CH4	CH4		58												
16B	60.8	SO DGR CH4	CH4	4	56	65	102	95	UC	–	451	902	76	24	52	0.25	
17A	62.0	SO GR CH4	CH4		63												
17B	62.8	M GR CH4	CH4		59												
17C	63.7	M GR CL6 W/ LYS SM, SIF	CL6		37												
18A	66.0	SO GR CH4 W/ SIF, ARS SP	CH4		85												
18B	66.8	M GR CH3 W/ SIF	CH3		55												
18C	67.7	GR ML2 W/ SIF	ML2	11	27	88	112	83	UC	–	175	350	22	19	3	0.07	
18D	68.6	GR ML2 W/ SIF	ML2		38												

Remarks:
FFEBJV, LLC.

Checked by: RJG

File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program Assigned By: _____

Project Number: 0022-0002
Boring: WWHC-25UPT

Current Date: 12/21/2007

Sample Number	Depth	Visual Classification	USCS	E(f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
1A	0.0	ST GR & T CH2 W/ RT	CH2		26												
1B	0.8	T & GR SP W/ LYS CH	SP		18												
NS	1.5	NO SAMPLE	NS														
2A	4.0	ST GR & T CH2 W/ RT, SIF	CH2		28												
2B	4.8	VSO T & GR CHOA W/ ARS SP, WD, RT	CHOA	12	140	34	82	97	UC	–	203	406	131	33	98	0.190	
2C	5.7	VSO GR & BK PT W/ WD, RT	PT		364												
3A	8.0	VSO BR & GR CHOA W/ WD, RT	CHOA		73												
3B	8.8	SO GR CH4 W/ WD, RT, O	CH4		65												
3C	9.7	SO GR CHOA W/ WD, RT	CHOA		69	59	101	100	UU	0	340		117	29	88	0.280	
4A	12.0	SO GR CHOA W/ ARS ML, WD, RT	CHOA		77												
4B	12.8	SO GR CH4 W/ ARS ML, WD, RT	CH4		71								86	22	64		CON, GS
4C	13.7	SO GR CH4 W/ WD, ARS ML, SL	CH4		66	60	100	98	UU	0	388		104	27	77	0.400	
5A	16.0	SO GR CHOA W/ ARS ML, RT	CHOA		98												
5B	16.8	SO GR CHOB W/ ARS ML, RT	CHOB		135	36	85	100	UU	0	309		167	44	123	0.350	
5C	17.7	SO GR CHOA W/ ARS ML, RT	CHOA		88												
6A	20.0	SO GR CHOA	CHOA		62												
6B	20.8	SO GR CHOA W/ ARS ML, WD	CHOA		78												
6C	21.7	SO GR CHOA W/ SIF, ARS ML, WD	CHOA		90	50	94	100	UU	0	357		125	27	98	0.230	
6D	22.6	SO GR CH3 W/ WD, ARS ML	CH3		57												
7A	24.0	SO GR CH3 W/ LNS & ARS ML	CH3		53												
7B	24.8	SO GR CH3 W/ LNS & ARS ML	CH3		58												
7C	25.7	SO GR CH3 W/ LNS & ARS ML	CH3	6	63	65	106	100	UC	–	308	615	68	23	45	0.170	
7D	26.6	SO GR CH3 W/ LNS & ARS ML	CH3		46												
8A	28.0	SO GR CH4 W/ LNS & ARS ML	CH4		64												
8B	28.8	SO GR CH4 W/ LNS & ARS ML	CH4		60												
8C	29.7	VSO GR CH4 W/ LNS & ARS ML	CH4		79	54	97	100	UU	0	170		98	30	68	0.180	
9A	32.0	SO GR CH3 W/ LNS & ARS ML	CH3		63												
9B	32.8	SO GR CH3 W/ LNS & ARS ML	CH3		60												
9C	33.7	SO GR CH3 W/ LNS ML & SM	CH3	13	61	66	106	100	UC	–	276	553	66	21	45	0.190	
10A	36.0	SO GR CH3 W/ LNS & ARS ML	CH3		69												
10B	36.8	SO GR CH4 W/ LNS & ARS ML	CH4		69	59	100	100					88	26	62		CON
10C	37.7	M GR CH4 W/ LNS & ARS ML	CH4		65												
10D	38.6	M GR CH4 W/ LNS & ARS ML	CH4		50												
11A	40.0	M GR CH4 W/ LNS ML	CH4		56												
11B	40.8	M GR CH4 W/ LNS ML	CH4		60												
11C	41.7	M GR CH4 W/ LNS ML, SL	CH4	3	64	64	105	100	UC	–	532	1063	72	21	51	0.230	
11D	42.6	M GR CH4 W/ LNS ML	CH4		65												

Remarks:
FFEBJV, LLC.

Checked by: WTY
File Name: TO 2

SUMMARY OF LABORATORY TEST RESULTS

Project: Westbank 100-yr Boring Program

Assigned By: _____

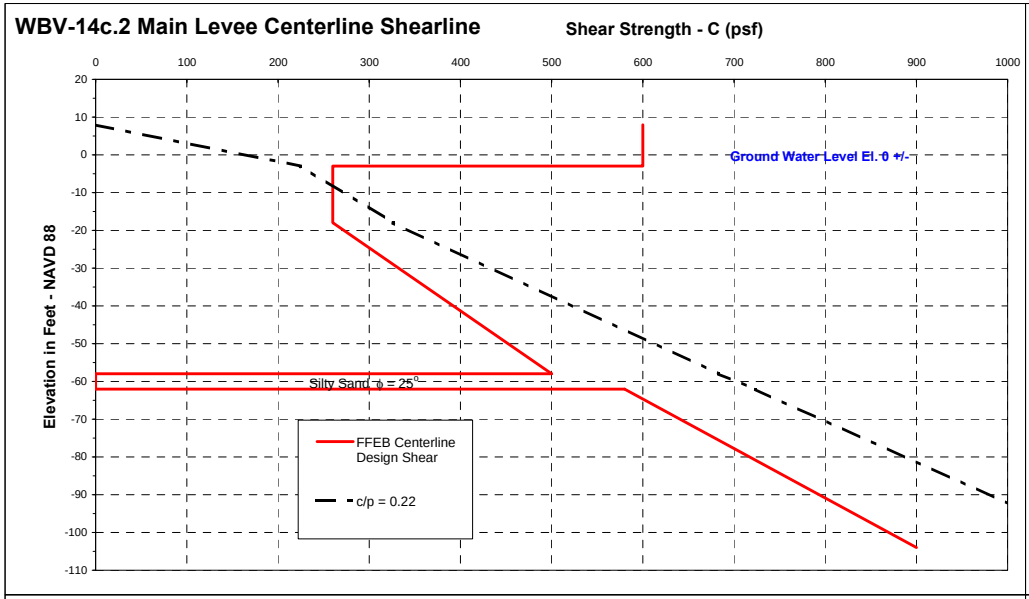
Project Number: 0022-0002
Boring: WWHC-25UPT

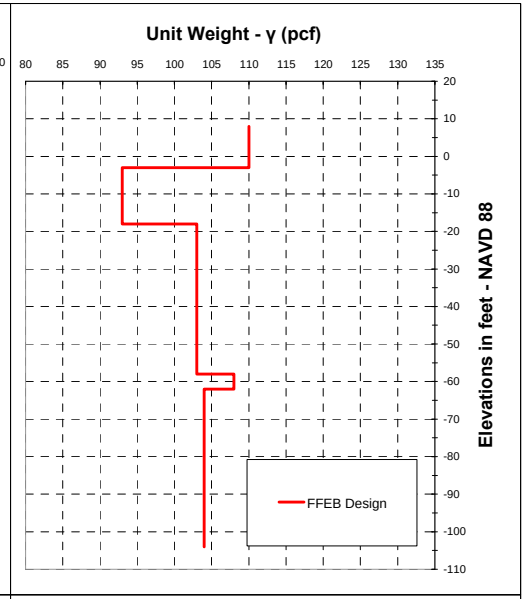
Current Date: 12/21/2007

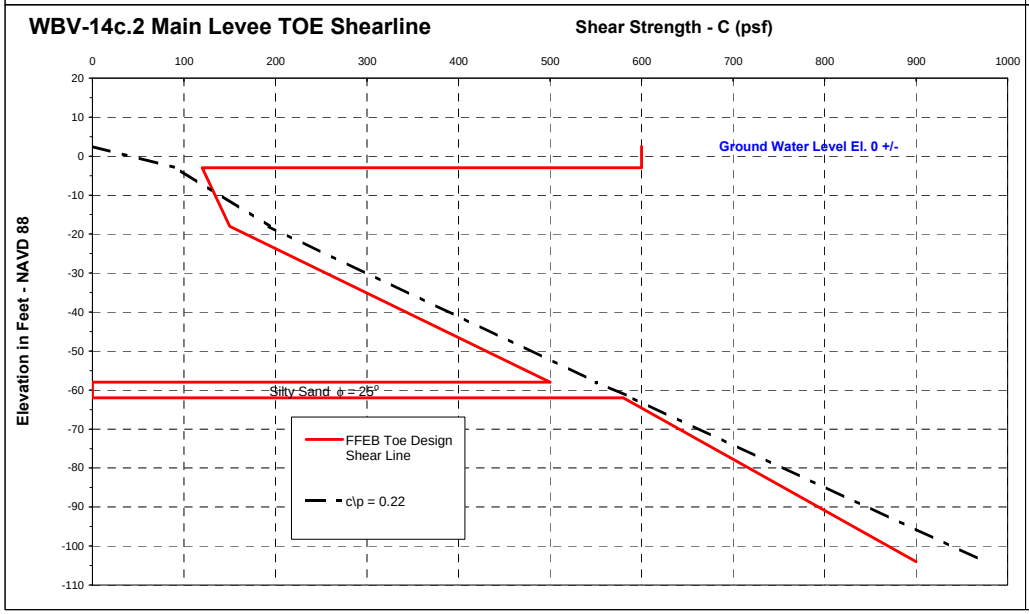
Sample Number	Depth	Visual Classification	USCS	E (f)	W%	Dry Dens (pcf)	Wet Dens (pcf)	Sat %	Shear Test Type	Angle	Cohesion (psf)	Unconf. Comp. Str.	LL	PL	PI	TORVANE (tsf)	Other Tests
12A	44.0	SO GR CH3 W/ LNS ML	CH3		68												
12B	44.8	SO GR CH3 W/ LNS ML	CH3		61												
12C	45.7	SO GR CH3 W/ LNS ML	CH3		63	65	106	100	UU	0	364		66	23	43	0.270	
13A	48.0	SO GR CH3 W/ LNS ML	CH3		57												
13B	48.8	SO GR CH3 W/ LNS ML	CH3		54												
13C	49.7	SO GR CH3 W/ LNS ML, SL	CH3	3	55	71	110	100	UC	–	477	955	69	21	48	0.25	
13D	50.6	SO GR CH3 W/ LNS ML	CH3		53												
14A	52.0	M GR CH4	CH4		58												
14B	52.8	M GR CH4	CH4		56												
14C	53.7	M GR CH4 W/ ARS ML, SL	CH4	3	56	69	108	100	UC	–	690	1381	76	24	52	0.34	
14D	54.6	M GR CH4	CH4		55												
15A	56.0	M GR CH4 W/ ARS ML	CH4		66												
15B	56.8	M GR CH4 W/ LNS SM, SIF	CH4		43												
15C	57.7	GR SC3-S W/ ARS CH, SIF	SC3-S		29												
15D	58.6	GNG SC3-S W/ ARS CH, SIF	SC3-S		31												SV
16A	60.0	GNG & LGR SM1	SM1		24												
16B	60.8	GNG & LGR SM1	SM1		26												
16C	61.7	GNG & LGR SM1	SM1		27												
17A	64.0	GR SM1	SM1		26												SV
17B	64.8	GR SM1	SM1		28												
17C	65.7	GR SM1 W/ O	SM1		34												
18A	68.0	GR SM1 W/ SIF, O	SM1		31												SV
18B	68.8	GR SM1 W/ SIF, O	SM1		32												
18C	69.7	M GR CL4 W/ WD, LYS SM, SIF	CL4	7	31	88	115	92	UC	–	583	1166	39	18	21	0.380	
18D	70.6	M GR CH4 W/ WD, LYS SM	CH4		68												

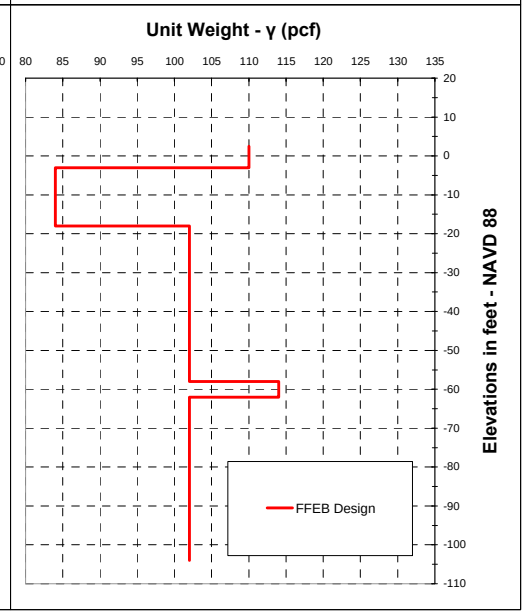
Remarks:
FFEBJV, LLC.

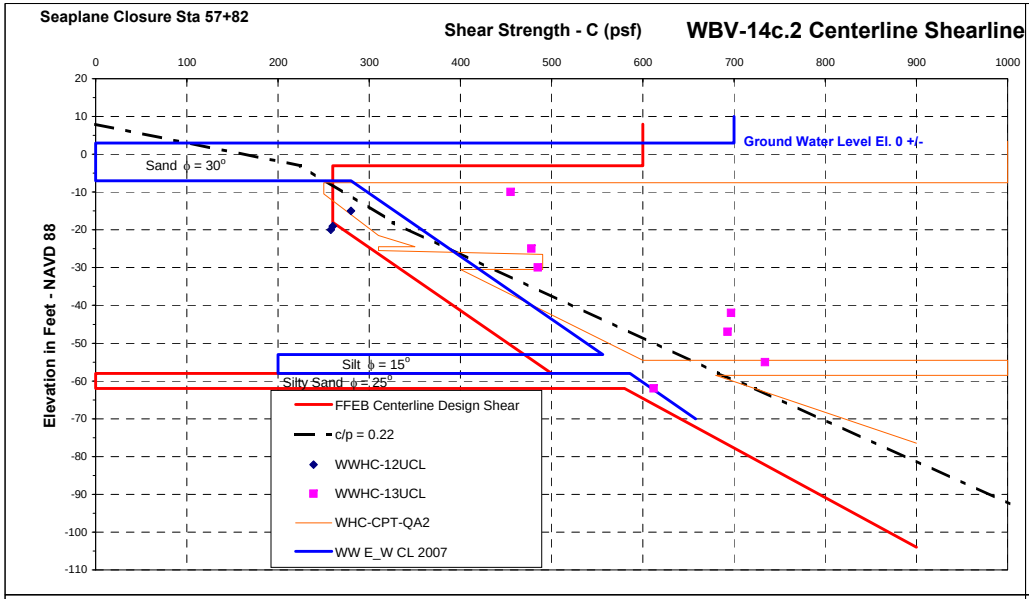
Checked by: WTY
File Name: TO 2

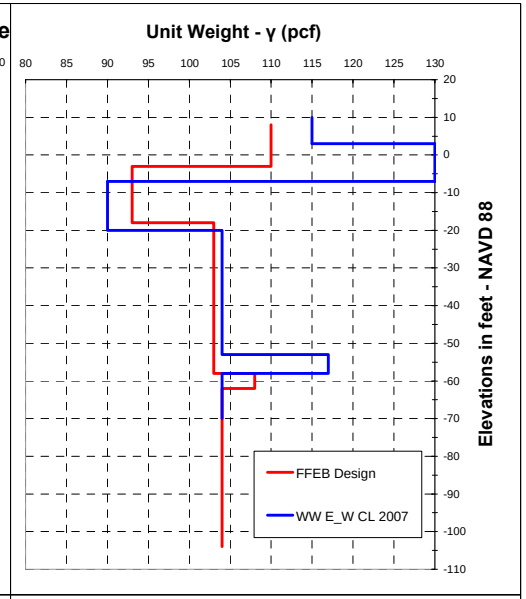

WBV-14c.2 Main Levee Centerline Shearline
Shear Strength - C (psf)
Elevation in Feet - NAVD 88
Ground Water Level El. 0 +/-
Silty Sand ϕ = 25°
FFEB Centerline Design Shear
c/p = 0.22

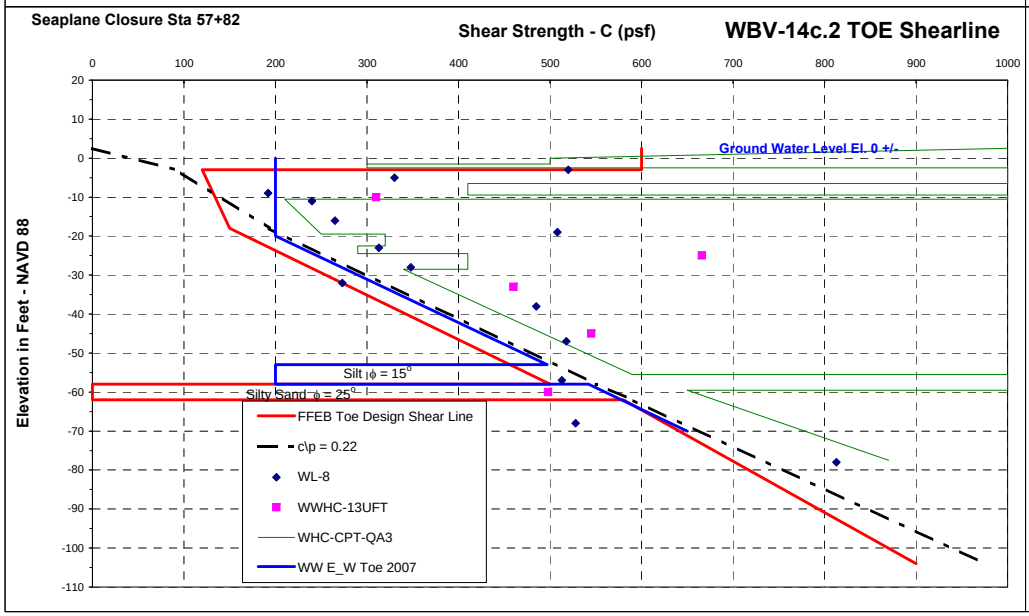

Unit Weight - γ (pcf)
Elevations in feet - NAVD 88
FFEB Design

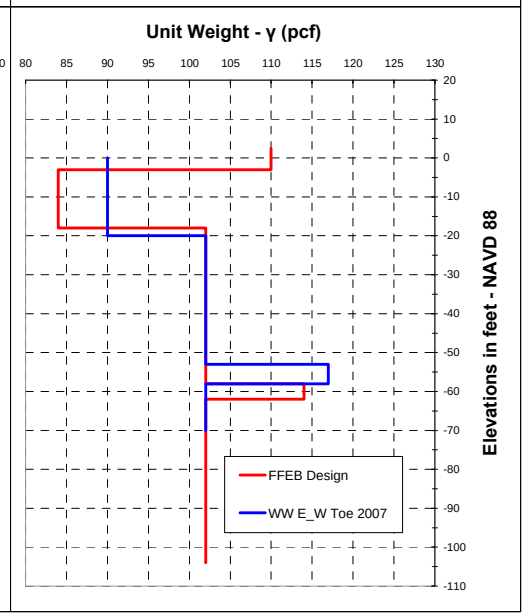

WBV-14c.2 Main Levee TOE Shearline
Shear Strength - C (psf)
Elevation in Feet - NAVD 88
Ground Water Level El. 0 +/-
Silty Sand ϕ = 25°
FFEB Toe Design Shear Line
c\p = 0.22

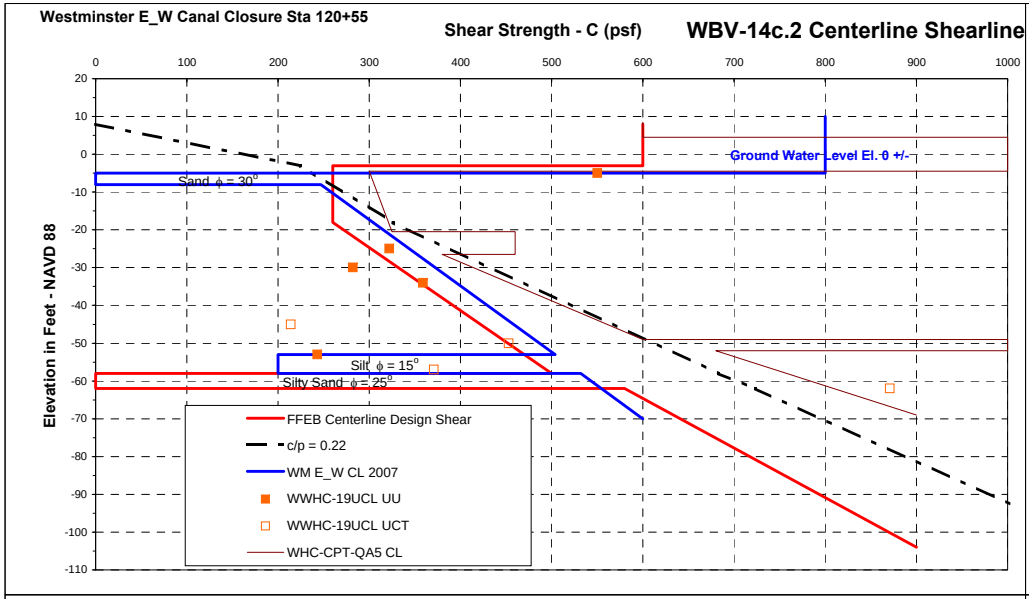

Unit Weight - γ (pcf)
Elevations in feet - NAVD 88
FFEB Design

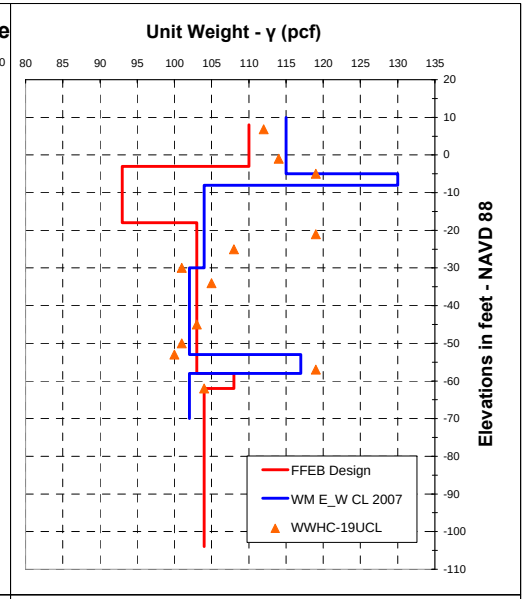

Seaplane Closure Sta 57+82
Shear Strength - C (psf)
WBV-14c.2 Centerline Shearline
Ground Water Level El. 0 +/-
Sand ϕ = 30°
Silt ϕ = 15°
Silty Sand ϕ = 25°
FFEB Centerline Design Shear
c/p = 0.22
WWHC-12UCL
WWHC-13UCL
WHC-CPT-QA2
WW E_W CL 2007
Elevation in Feet - NAVD 88

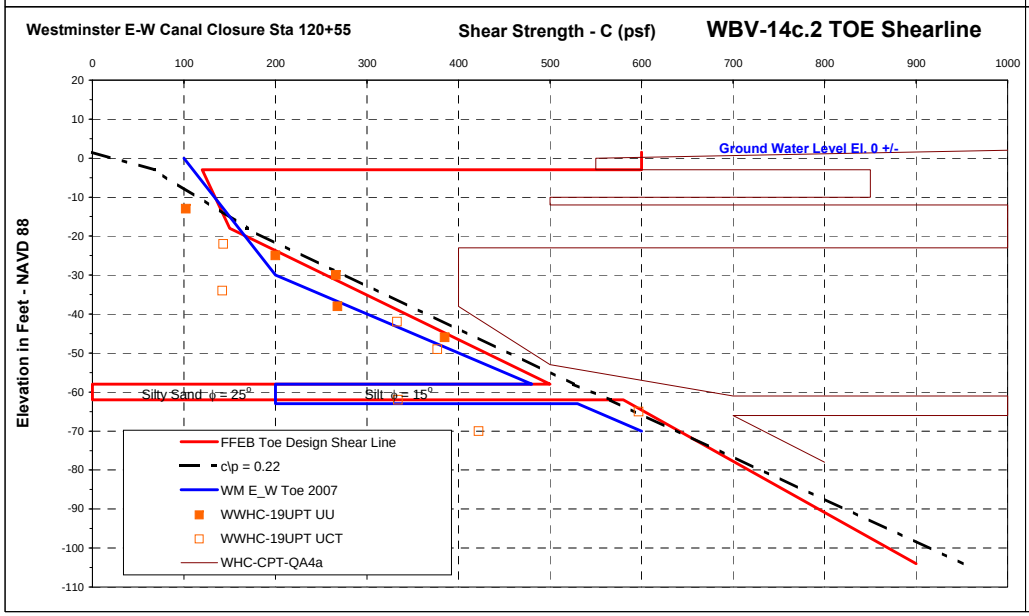

Unit Weight - γ (pcf)
FFEB Design
WW E_W CL 2007
Elevations in feet - NAVD 88

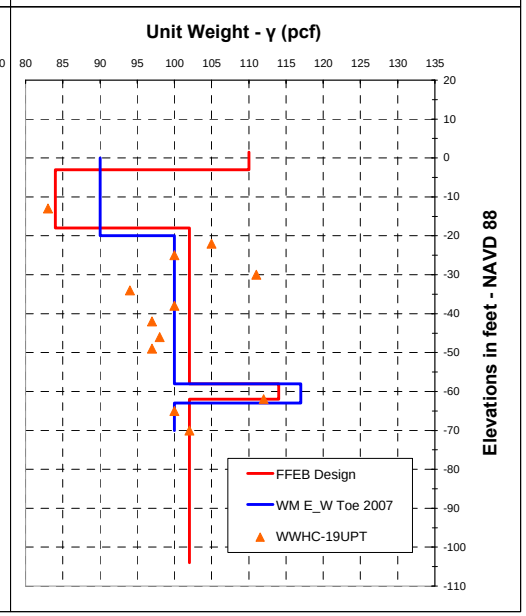

Seaplane Closure Sta 57+82
Shear Strength - C (psf)
WBV-14c.2 TOE Shearline
Ground Water Level El. 0 +/-
Silt ϕ = 15°
Silty Sand ϕ = 25°
FFEB Toe Design Shear Line
c\p = 0.22
WL-8
WWHC-13UFT
WHC-CPT-QA3
WW E_W Toe 2007
Elevation in Feet - NAVD 88


Unit Weight - γ (pcf)
FFEB Design
WW E_W Toe 2007
Elevations in feet - NAVD 88

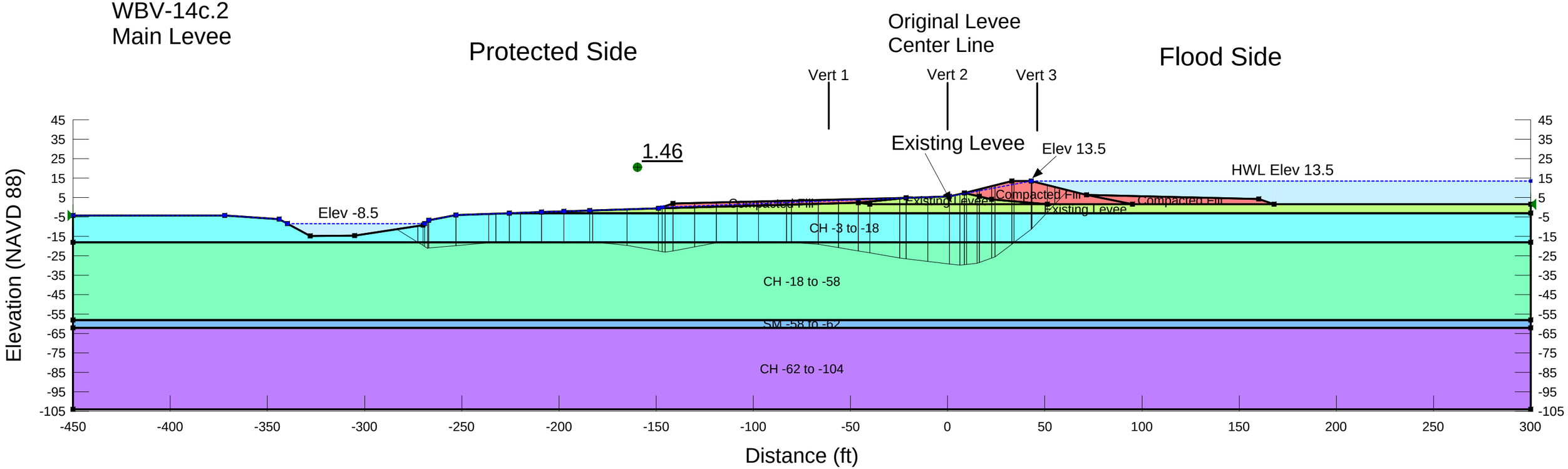

Westminster E_W Canal Closure Sta 120+55
Shear Strength - C (psf)
WBV-14c.2 Centerline Shearline
Elevation in Feet - NAVD 88
Ground Water Level El. 0 +/-
Sand ϕ = 30°
Silt ϕ = 15°
Silty Sand ϕ = 25°
FFEB Centerline Design Shear
c/p = 0.22
WM E_W CL 2007
WWHC-19UCL UU
WWHC-19UCL UCT
WHC-CPT-QA5 CL


Unit Weight - γ (pcf)
Elevations in feet - NAVD 88
FFEB Design
WM E_W CL 2007
WWHC-19UCL


Westminster E-W Canal Closure Sta 120+55
Shear Strength - C (psf)
WBV-14c.2 TOE Shearline
Elevation in Feet - NAVD 88
Ground Water Level El. 0 +/-
Silty Sand ϕ = 25°
Silt ϕ = 15°
FFEB Toe Design Shear Line
c\p = 0.22
WM E_W Toe 2007
WWHC-19UPT UU
WWHC-19UPT UCT
WHC-CPT-QA4a


Unit Weight - γ (pcf)
Elevations in feet - NAVD 88
FFEB Design
WM E_W Toe 2007
WWHC-19UPT

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Main Levee



HWL Case

Critical Block Search	Critical Circular Search
FS	FS
1.46	1.59

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104

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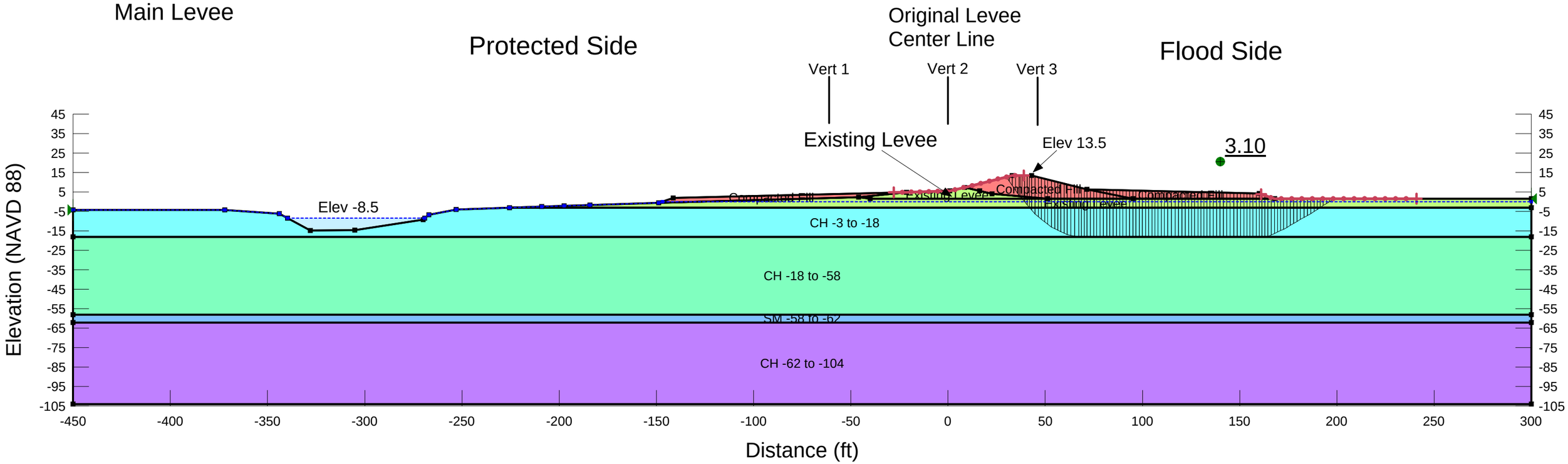
File Name: WBV-14c.2 Reach I Main Levee HWL.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Main Levee



LWL S-Case

Critical Block Search		Critical Circular Search
Elev.	FS	FS
-18	3.11	3.10

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 0 psf Phi: 23 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 0 psf Phi: 23 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 23 ° Weight Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 23 ° Weight Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 23 ° Weight Fn: CH -62 to -104

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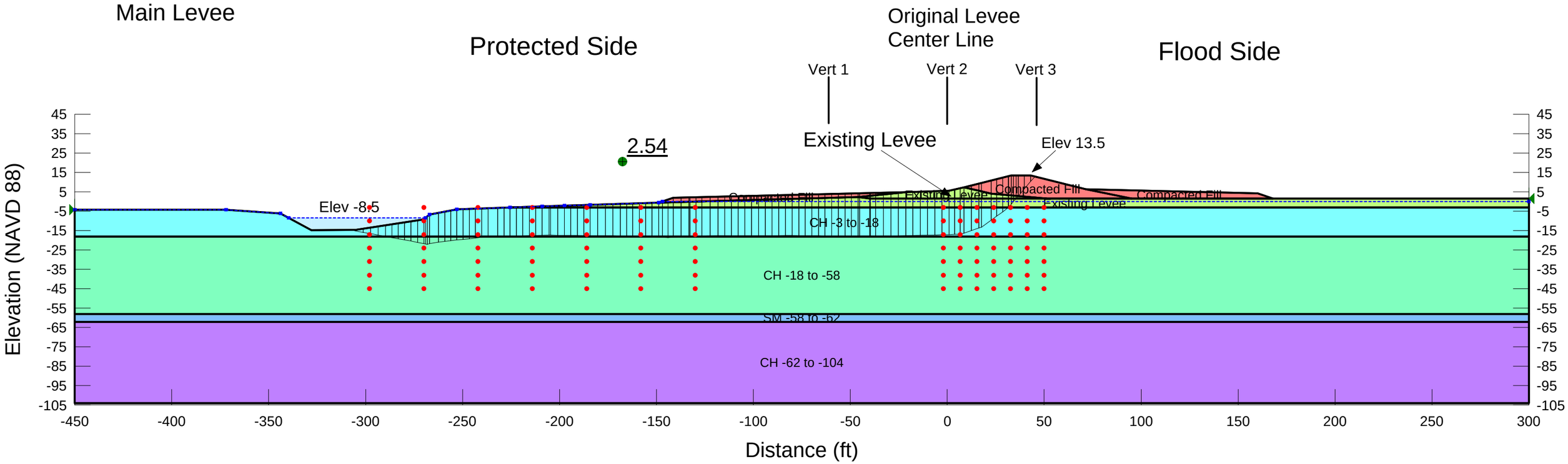
File Name: WBV-14c.2 Reach I Main Levee LWL Scase FS 2.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Main Levee



LWL S-Case

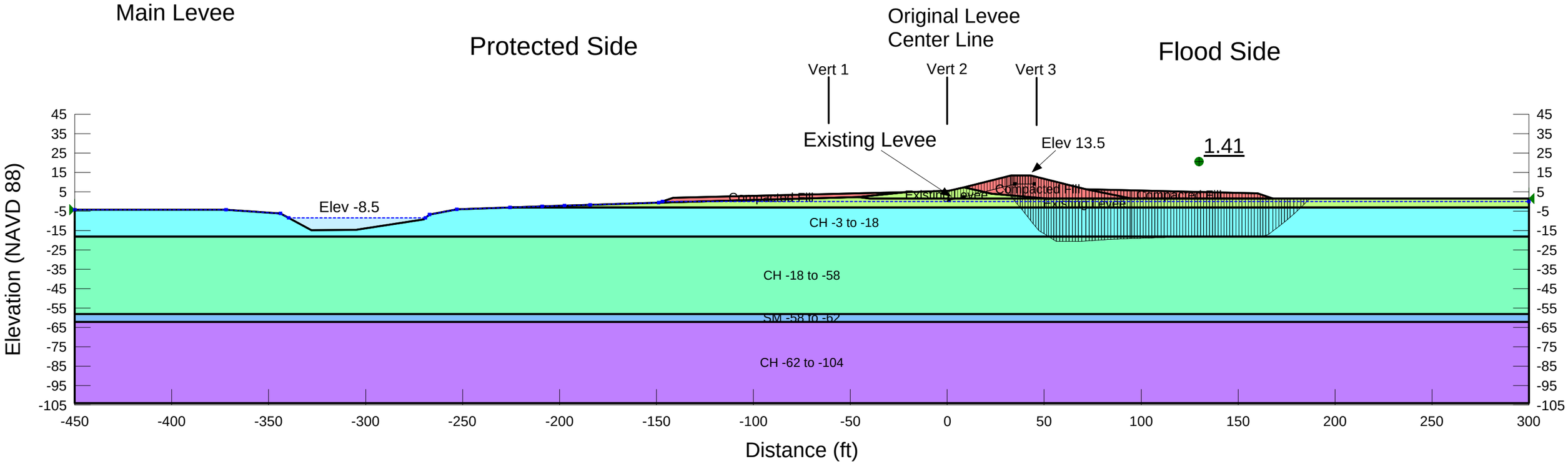
Critical Block Search		Critical Circular Search
Elev.	FS	FS
-18	2.54	2.71

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 0 psf Phi: 23 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 0 psf Phi: 23 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 23 ° Weight Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 23 ° Weight Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 23 ° Weight Fn: CH -62 to -104

Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\

File Name: WBV-14c.2 Reach I Main Levee LWL Scase PS 2.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Main Levee



LWL Case

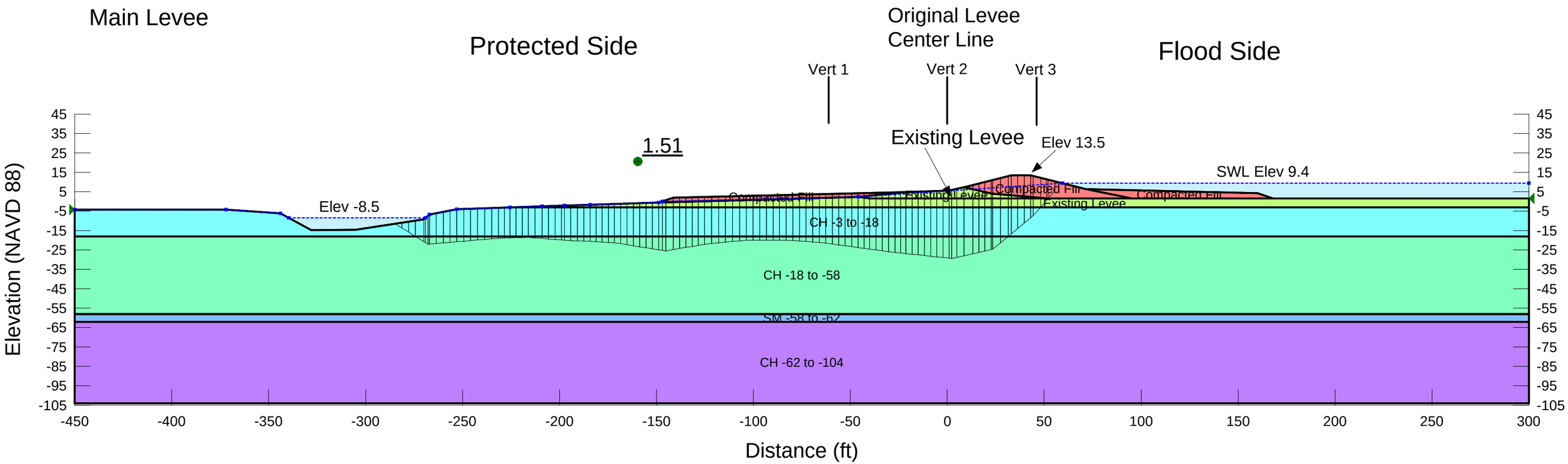
Critical Block Search		Critical Circular Search
Elev.	FS	FS
-18	1.41	1.47

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104

Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\

File Name: WBV-14c.2 Reach I Main Levee LWL.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Main Levee



SWL Case

Critical Block Search	Critical Circular Search
FS	FS
1.51	1.62

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104

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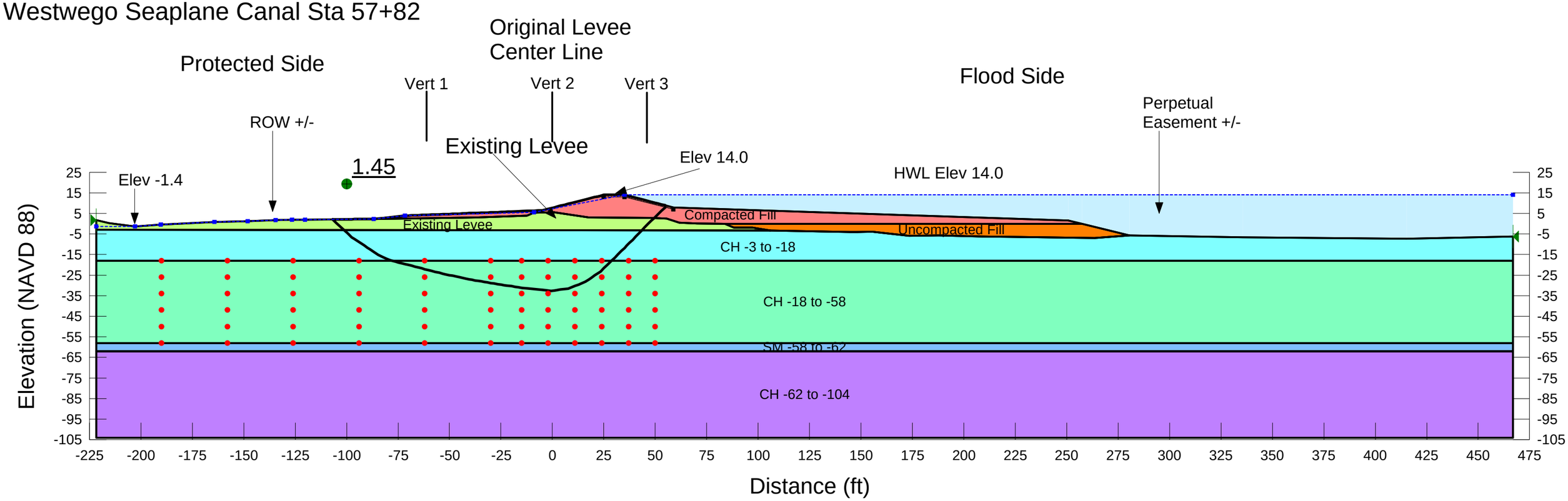
File Name: WBV-14c.2 Reach I Main Levee SWL.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Westwego Seaplane Canal Sta 57+82



HWL Case

Critical Block Search	Critical Circular Search
FS	FS
1.45	1.47

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104
Name: Uncompacted Fill Model: Mohr-Coulomb Unit Weight: 100 pcf Cohesion: 150 psf Phi: 0 °

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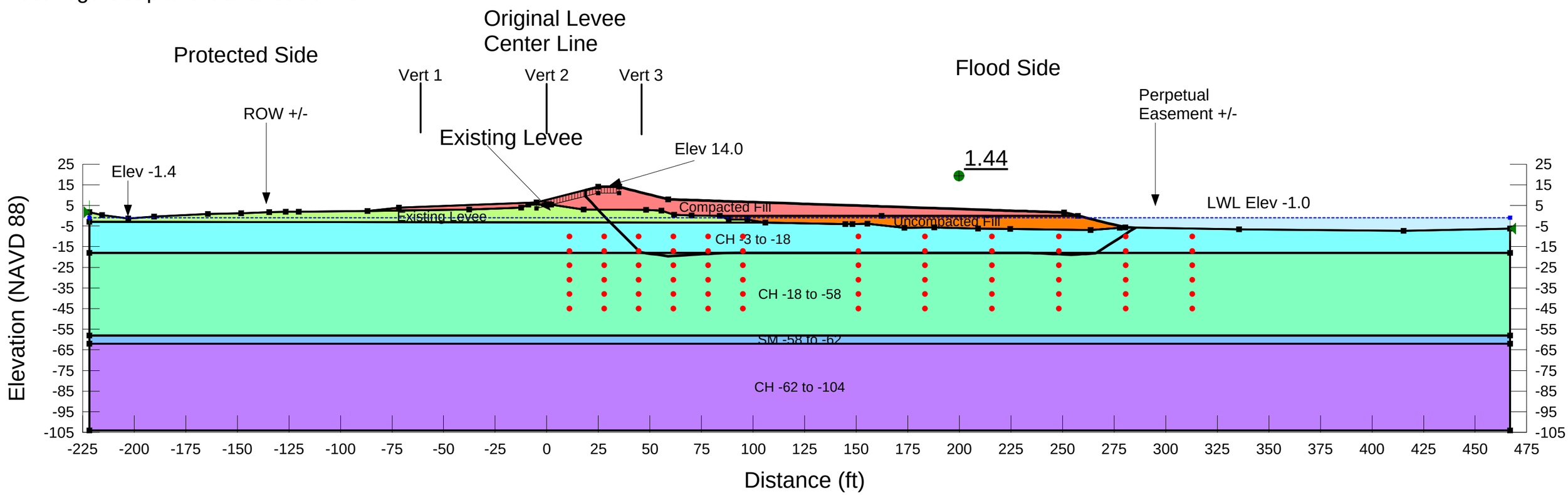
File Name: WBV-14c.2 Reach II Nonreinforced Levee HWL.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Westwego Seaplane Canal Sta 57+82



LWL Case

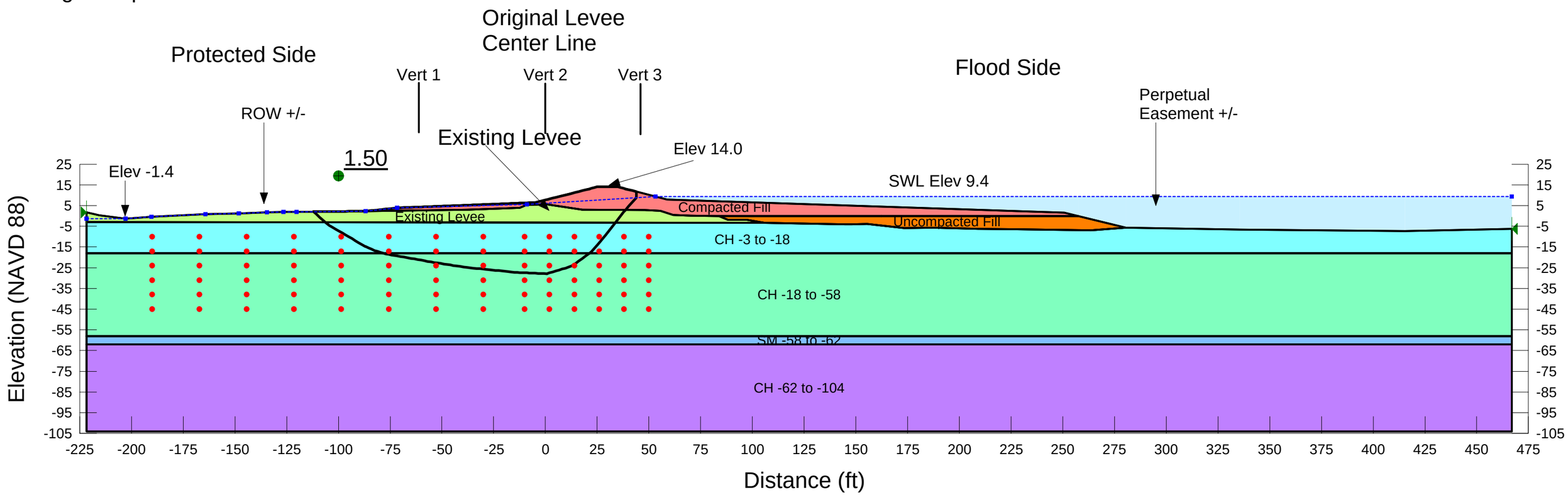
Critical Block Search	Critical Circular Search
FS	FS
1.44	1.54

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104
Name: Uncompacted Fill Model: Mohr-Coulomb Unit Weight: 100 pcf Cohesion: 150 psf Phi: 0 °

Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\

File Name: WBV-14c.2 Reach II Nonreinforced Levee LWL.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Westwego Seaplane Canal Sta 57+82



SWL Case

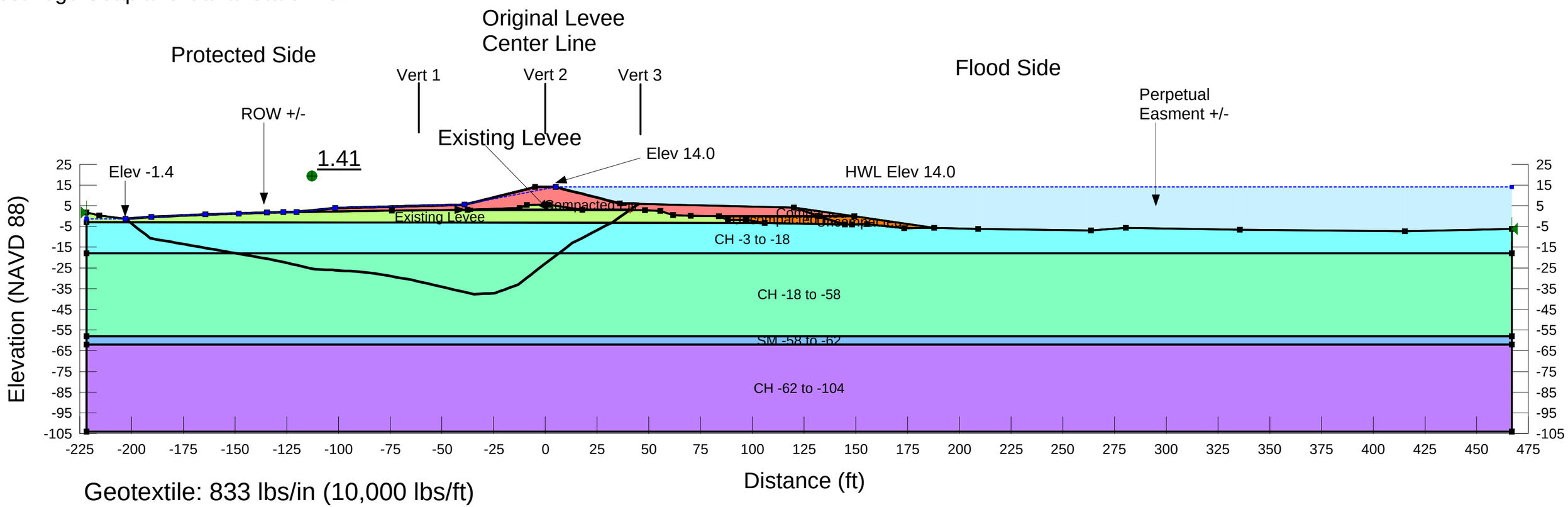
Critical Block Search	Critical Circular Search
FS	FS
1.50	1.50

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104
Name: Uncompacted Fill Model: Mohr-Coulomb Unit Weight: 100 pcf Cohesion: 150 psf Phi: 0 °

Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\

File Name: WBV-14c.2 Reach II Nonreinforced Levee SWL.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Westwego Seaplane Canal Sta 57+82



Geotextile: 833 lbs/in (10,000 lbs/ft)
36 ft protected side of center line
41 ft flood side of center line (77 ft total length)

HWL Case

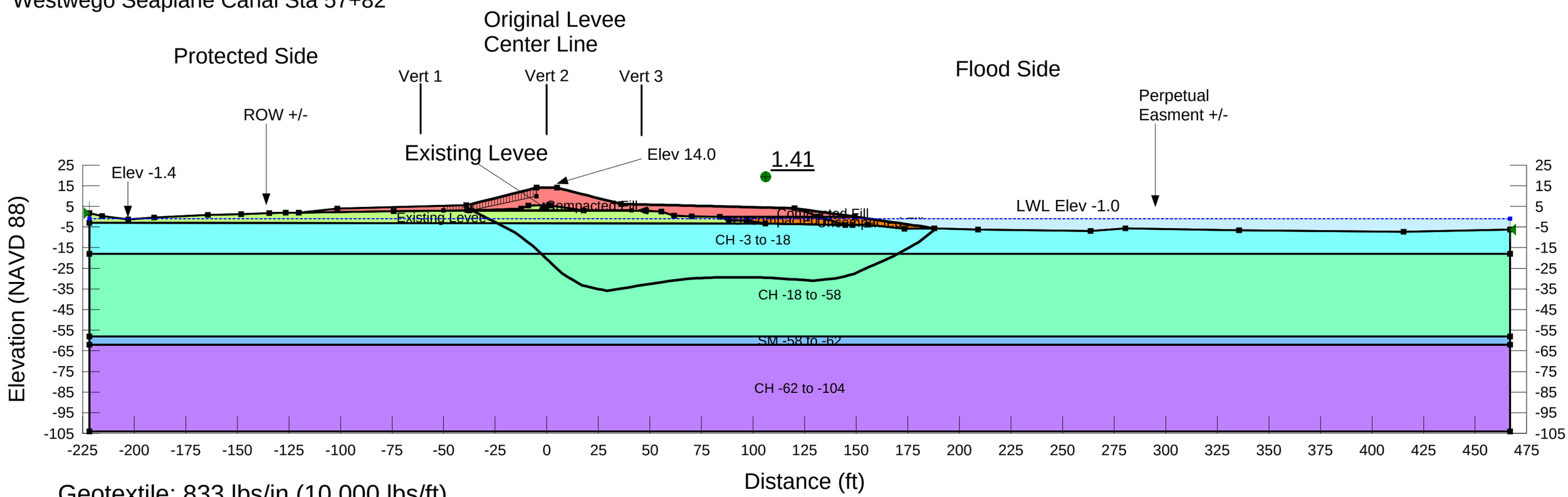
Critical Block Search	Critical Circular Search
FS	FS
1.41	1.44

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104
Name: Uncompacted Fill Model: Mohr-Coulomb Unit Weight: 100 pcf Cohesion: 150 psf Phi: 0 °

Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\

File Name: WBV-14c.2 Reach II Reinforced Levee HWL.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Westwego Seaplane Canal Sta 57+82



Geotextile: 833 lbs/in (10,000 lbs/ft)
36 ft protected side of center line
41 ft flood side of center line (77 ft total length)

LWL Case

Critical Block Search	Critical Circular Search
FS	FS
1.41	1.45

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104
Name: Uncompacted Fill Model: Mohr-Coulomb Unit Weight: 100 pcf Cohesion: 150 psf Phi: 0 °

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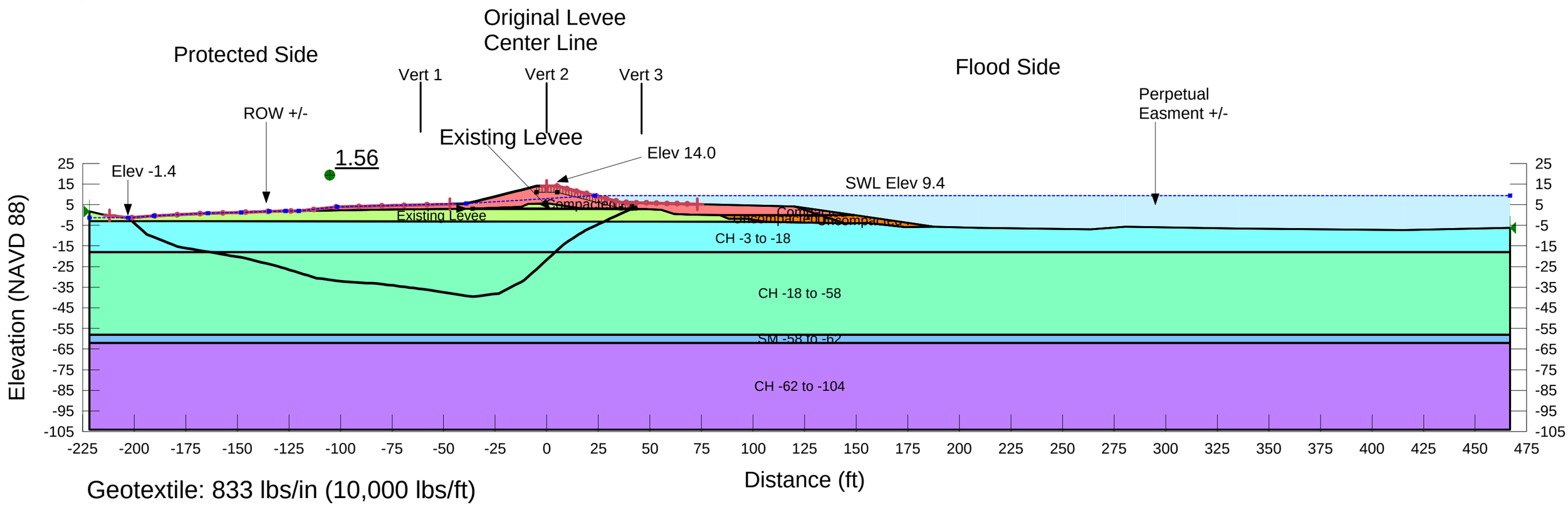
File Name: WBV-14c.2 Reach II Reinforced Levee LWL.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Westwego Seaplane Canal Sta 57+82



Geotextile: 833 lbs/in (10,000 lbs/ft)
36 ft protected side of center line
41 ft flood side of center line (77 ft total length)

SWL Case

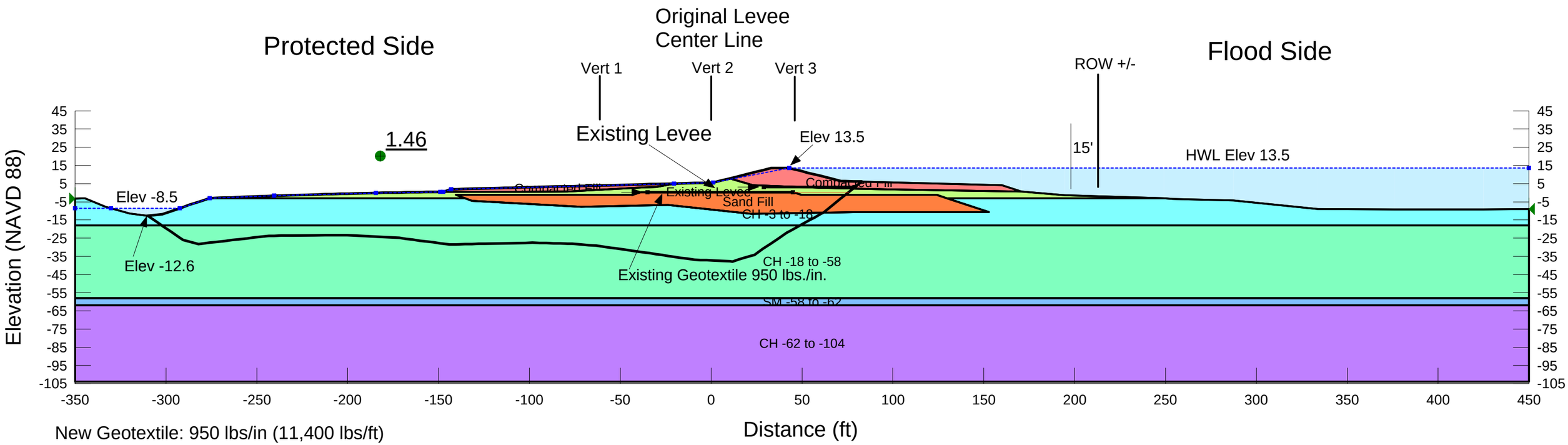
Critical Block Search	Critical Circular Search
FS	FS
1.57	1.56

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104
Name: Uncompacted Fill Model: Mohr-Coulomb Unit Weight: 100 pcf Cohesion: 150 psf Phi: 0 °

Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\

File Name: WBV-14c.2 Reach II Reinforced Levee SWL.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Westminster E-W Closure



New Geotextile: 950 lbs/in (11,400 lbs/ft)
9 ft protected side of new center line
41 ft flood side of new center line (50 ft total length)
Placed at El. 3.0

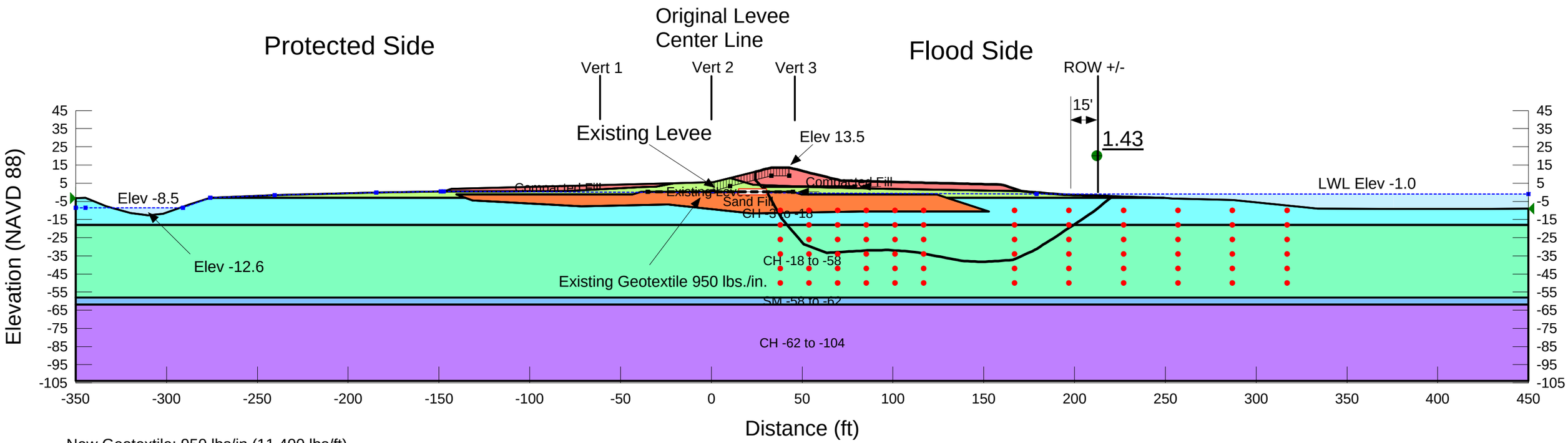
HWL Case	Critical Block Search	Critical Circular Search
	FS	FS
	1.46	1.50

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104
Name: Sand Fill Model: Mohr-Coulomb Unit Weight: 122 pcf Cohesion: 0 psf Phi: 30 °

Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\

File Name: WBV-14c.2 Reach III WM E_W Closure HWL.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Westminster E-W Closure



New Geotextile: 950 lbs/in (11,400 lbs/ft)
9 ft protected side of new center line
41 ft flood side of new center line (50 ft total length)
Placed at El. 3.0

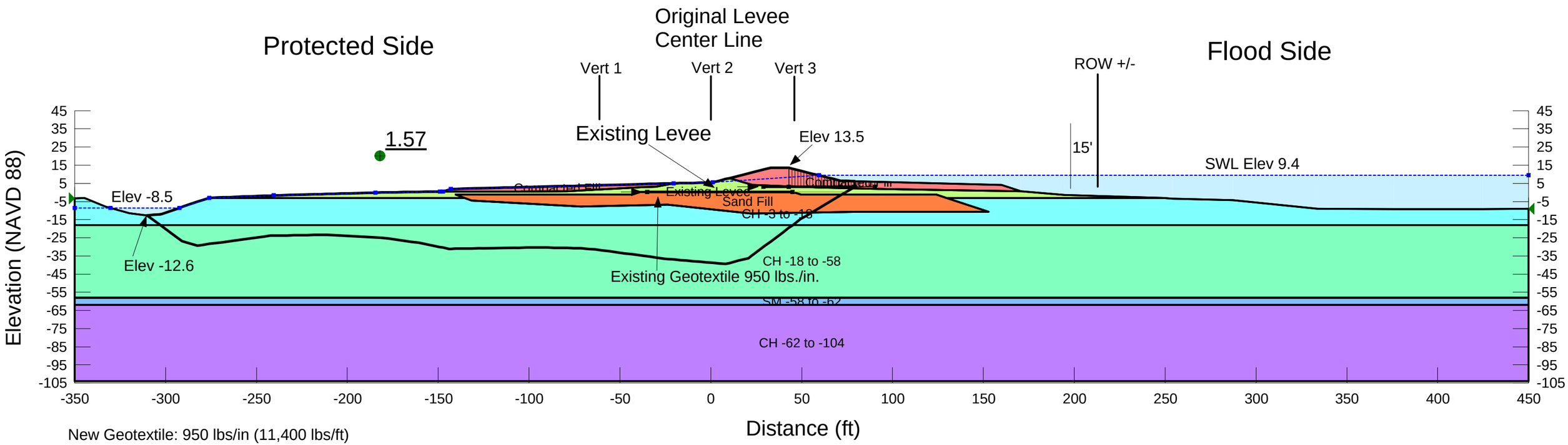
LWL Case	Critical Block Search	Critical Circular Search
	FS	FS
	1.43	1.44

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104
Name: Sand Fill Model: Mohr-Coulomb Unit Weight: 122 pcf Cohesion: 0 psf Phi: 30 °

Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\

File Name: WBV-14c.2 Reach III WM E_W Closure LWL.gsz

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Westminster E-W Closure



New Geotextile: 950 lbs/in (11,400 lbs/ft)
9 ft protected side of new center line
41 ft flood side of new center line (50 ft total length)
Placed at El. 3.0

SWL Case	Critical Block Search	Critical Circular Search
	FS	FS
	1.57	1.65

Name: Existing Levee Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 600 psf Phi: 0 °
Name: Compacted Fill Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion: 400 psf Phi: 0 °
Name: CH -18 to -58 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -18 to -58 Cohesion Spatial Fn: CH -18 to -58
Name: CH -3 to -18 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -3 to -18 Cohesion Spatial Fn: CH -3 to -18
Name: SM -58 to -62 Model: Spatial Mohr-Coulomb Cohesion: 0 psf Phi: 25 ° Weight Fn: SM -58 to -62
Name: CH -62 to -104 Model: Spatial Mohr-Coulomb Phi: 0 ° Weight Fn: CH -62 to -104 Cohesion Spatial Fn: CH -62 to -104
Name: Sand Fill Model: Mohr-Coulomb Unit Weight: 122 pcf Cohesion: 0 psf Phi: 30 °

Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\

File Name: WBV-14c.2 Reach III WM E_W Closure SWL.gsz

PS Block TC (4)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 482
Last Edited By: Breen, Scott A MVN-Contractor
Date: 2/20/2009
Time: 3:42:13 PM
File Name: WBV-14c.2 Reach I Main Levee HWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 2/20/2009
Last Solved Time: 3:43:00 PM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

PS Block TC (4)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Fully-Specified
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Search for Tension Crack
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf

FOS Distribution

FOS Calculation Option: Constant

Advanced

Number of Slices: 30

Optimization Tolerance: 0.01

Minimum Slip Surface Depth: 0.1 ft

Optimization Maximum Iterations: 3000

Optimization Convergence Tolerance: 1e-007

Starting Optimization Points: 8

Ending Optimization Points: 16

Complete Passes per Insertion: 1

Driving Side Maximum Convex Angle: 15 °

Resisting Side Maximum Convex Angle: 10 °

Materials

Existing Levee

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 600 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 400 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb

Weight Fn: CH -18 to -58

Cohesion Spatial Fn: CH -18 to -58

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb

Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-450, -4.3) ft
Right Coordinate: (300, 1.5) ft

Fully Specified Slip Surfaces

Fully Specified Slip Surface 1

	X (ft)	Y (ft)
	-295	-6
	-269	-24
	24	-24
	66	17

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-450	-4.3
	-372	-4.3
	-344	-6.2
	-339.67059	-8.5
	-269.16	-8.5
	-267	-6.7
	-253	-4
	-225.5	-3
	-209	-2.4
	-197.4	-2.06552
	-184.2	-1.68491
	-148.9	-0.6
	-147	0.03333
	1	5.5
	43	13.5
	300	13.5

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 102)
Data Point: (-61, 102)
Data Point: (0, 103)
Data Point: (46, 102)
Data Point: (300, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-450, 84)
    Data Point: (-61, 84)
    Data Point: (0, 93)
    Data Point: (46, 84)
    Data Point: (300, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-450, 114)
    Data Point: (-61, 114)
    Data Point: (0, 108)
    Data Point: (46, 114)
    Data Point: (300, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-450, 102)
    Data Point: (-61, 102)
    Data Point: (0, 104)
    Data Point: (46, 102)
    Data Point: (300, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
    Data Point: (-450, -3, 120)

Data Point: (-61, -3, 120)
Data Point: (0, -3, 260)
Data Point: (46, -3, 120)
Data Point: (300, -3, 120)
Data Point: (-450, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (300, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-450, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (300, -18, 150)
Data Point: (-450, -58, 500)
Data Point: (-61, -58, 500)
Data Point: (0, -58, 500)
Data Point: (46, -58, 500)
Data Point: (300, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-450, -62, 580)
Data Point: (-61, -62, 580)
Data Point: (0, -62, 580)
Data Point: (46, -62, 580)
Data Point: (300, -62, 580)
Data Point: (-450, -104, 900)
Data Point: (-61, -104, 900)
Data Point: (0, -104, 900)
Data Point: (46, -104, 900)
Data Point: (300, -104, 900)

Regions

	Material	Points	Area (ft^2)
Region 1	CH -18 to -58	17,15,16,18	30000
Region 2	CH -3 to -18	19,16,15,1,2,3,39,4,5,6,40,7,8,38	10325.45
Region 3	Existing Levee	14,19,38,9,29,31,30,10,20,13,28,36	2049.8335

Region 4	Existing Levee	12,13,20,10,11,37,32,27	264.63142
Region 5	SM -58 to -62	18,22,21,17	3000
Region 6	CH -62 to -104	21,22,24,23	31500
Region 7	Compacted Fill	27,32,25,26,34,28,13,12	541.90858
Region 8	Compacted Fill	30,33,11,10	236.85
Region 9	Compacted Fill	35,36,28,34	287.1125

Points

	X (ft)	Y (ft)
Point 1	-450	-4.3
Point 2	-372	-4.3
Point 3	-344	-6.2
Point 4	-328	-14.7
Point 5	-305	-14.6
Point 6	-270	-9.2
Point 7	-267	-6.7
Point 8	-253	-4
Point 9	-209	-2.4
Point 10	-46	2.3
Point 11	-21.4	4.9
Point 12	22.6	4
Point 13	51.3	1.5
Point 14	300	1.5
Point 15	-450	-18
Point 16	300	-18
Point 17	-450	-58
Point 18	300	-58
Point 19	300	-3
Point 20	-40	1.5
Point 21	-450	-62
Point 22	300	-62
Point 23	-450	-104
Point 24	300	-104
Point 25	33	13.5
Point 26	43	13.5

Point 27	16.3	5.55806
Point 28	95	1.5
Point 29	-197.4	-2.06552
Point 30	-148.9	-0.6
Point 31	-184.2	-1.68491
Point 32	8.6	7.4
Point 33	-141.4	1.9
Point 34	71.5	6.4
Point 35	160	4.15
Point 36	168	1.5
Point 37	1	5.5
Point 38	-225.5	-3
Point 39	-339.67059	-8.5
Point 40	-269.16	-8.5

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.46	(-115.095, 15.001)	129.9154	(62.0142, 8.76312)	(-283.291, -11.2507)
2	1	1.54	(-115.095, 15.001)	132.862	(58.4674, 9.64672)	(-286.664, -11.771)

Slices of Slip Surface: **Optimized**

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	-277.91775	-14.62535	382.22302	556.96863	0	143.25
2	Optimized	-271.272	-18.798815	642.65547	962.15237	0	156.99
3	Optimized	-269.58	-19.861385	708.95202	1090.9358	0	166.29
4	Optimized	-268.40025	-20.602255	794.69335	1233.7003	0	172.77
5	Optimized	-267.32025	-21.05021	878.80007	1227.3348	0	176.69
6	Optimized	-260	-20.38367	938.11887	1295.0707	0	170.86
7	Optimized	-244.5843	-18.98	953.84776	1291.3422	0	158.57
8	Optimized	-234.34005	-18.11848	923.32873	1241.5635	0	151.04
9	Optimized	-229.00575	-18.016875	929.10192	1255.6368	0	150.15
10	Optimized	-222.6147	-18.00525	942.87717	1276.7052	0	150.05

11	Optimized	-214.3647	-17.99024	960.63243	1308.3689	0	149.98
12	Optimized	-203.2	-17.96993	981.98107	1346.4632	0	149.94
13	Optimized	-190.8	-17.947375	1002.8773	1383.9373	0	149.89
14	Optimized	-183.40725	-17.93393	1015.457	1406.3764	0	149.87
15	Optimized	-173.83155	-18.72797	1083.3526	1536.0724	0	156.37
16	Optimized	-156.9743	-20.99477	1257.121	1846.0519	0	176.2
17	Optimized	-147.95	-22.6392	1395.0283	2080.219	0	190.59
18	Optimized	-146.1846	-22.960895	1436.7197	2179.0893	0	193.41
19	Optimized	-143.3846	-22.74445	1429.6645	2173.1654	0	191.51
20	Optimized	-135.8193	-21.35295	1360.2511	2120.959	0	179.34
21	Optimized	-124.6579	-19.30001	1257.86	1945.4313	0	161.38
22	Optimized	-113.63535	-18.205155	1214.9387	1898.847	0	151.8
23	Optimized	-102.7517	-18.068385	1231.5678	1914.7411	0	150.6
24	Optimized	-90.150025	-17.910025	1250.6913	1934.8671	0	149.82
25	Optimized	-81.70374	-17.910025	1270.1688	1974.3275	0	149.82
26	Optimized	-73.477935	-18.48536	1325.0483	2054.5976	0	154.25
27	Optimized	-61.403905	-19.837885	1437.2967	2249.3228	0	166.08
28	Optimized	-51.134635	-21.572215	1569.1298	2483.4153	0	197.46
29	Optimized	-43	-22.94604	1673.6333	2669.8592	0	221.72
30	Optimized	-32.331545	-24.74779	1810.6492	2914.8603	0	252.02
31	Optimized	-23.031545	-26.239865	1925.1628	3103.9432	0	276.46
32	Optimized	-15.8	-27.11296	1996.3072	3234.3704	0	292.68
33	Optimized	-4.6	-28.465185	2106.4892	3436.9175	0	316.67
34	Optimized	3.63676	-29.459645	2212.8026	3629.4555	0	322.55
35	Optimized	7.43676	-29.64698	2269.6597	3649.173	0	317.28
36	Optimized	9.126405	-29.456685	2277.8456	3670.8115	0	313.17
37	Optimized	12.434295	-29.084135	2293.9762	3713.019	0	305.01
38	Optimized	15.75789	-28.57793	2301.8778	3650.8021	0	295.75
39	Optimized	19.45	-27.263875	2263.7551	3609.9253	0	279.84
40	Optimized	23.49893	-25.822825	2221.9381	3565.466	0	261.73
41	Optimized	28.69893	-22.21697	2058.7996	3211.7533	0	223.91
42	Optimized	33.609345	-18.465525	1883.0291	2960.6572	0	183.36
43	Optimized	38.609345	-14.64564	1704.1439	2634.1294	0	162.04
44	Optimized	43.21114	-11.129975	1536.9046	2343.5664	0	143.76
45	Optimized	47.36114	-6.788324	1265.9991	1890.8593	0	127.58
46	Optimized	53.235335	-0.553989	876.96282	957.64665	0	600

47	Optimized	58.59245	5.131561	522.18895	433.16501	0	400

Slices of Slip Surface: 1

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	1	-282.1654	-14.885515	398.45785	572.3651	0	143.77
2	1	-273.83335	-20.653845	758.39722	1167.7631	0	173.22
3	1	-269.58	-23.59846	942.1441	1513.8123	0	198.99
4	1	-269.08	-23.944615	967.92577	1564.6318	0	202.02
5	1	-268	-24	1027.5	1498.1	0	202.5
6	1	-260	-24	1163.7857	1681.5	0	202.5
7	1	-246.125	-24	1263.6364	1815.9273	0	202.5
8	1	-232.375	-24	1294.8364	1857.8909	0	202.5
9	1	-217.25	-24	1329.0909	1911.9394	0	202.5
10	1	-203.2	-24	1358.2759	1963.2759	0	202.5
11	1	-190.8	-24	1380.6061	2002.6515	0	202.5
12	1	-178.31665	-24	1403.7107	2043.4838	0	202.5
13	1	-166.55	-24	1426.3169	2083.2572	0	202.5
14	1	-154.78335	-24	1448.8381	2123.0306	0	202.5
15	1	-147.95	-24	1479.8947	2177.7368	0	202.5
16	1	-144.2	-24	1506.125	2315.1786	0	202.5
17	1	-135.4375	-24	1526.2893	2434.2977	0	202.5
18	1	-123.5125	-24	1553.7945	2467.086	0	202.5
19	1	-111.5875	-24	1581.2998	2499.8742	0	202.5
20	1	-99.6625	-24	1608.805	2532.6625	0	202.5
21	1	-87.7375	-24	1636.3103	2565.5346	0	202.5
22	1	-75.8125	-24	1663.7317	2598.3229	0	202.5
23	1	-63.8875	-24	1691.2369	2631.1111	0	202.5
24	1	-51.9625	-24	1718.7421	2685.1992	0	216.35
25	1	-43	-24	1739.3333	2731	0	230.09
26	1	-32.35363	-24	1763.9089	2785.5048	0	246.41
27	1	-23.05363	-24	1785.3736	2833.0677	0	260.66
28	1	-15.8	-24	1802.0536	2871.25	0	271.78
29	1	-4.6	-24	1827.8571	2930.7143	0	288.95
30	1	4.8	-24	1885.9211	3047.6316	0	286.24

31	1	9.126405	-24	1937.3866	3152.9906	0	277.45
32	1	12.976405	-24	1983.0936	3246.7855	0	269.62
33	1	19.45	-24	2060.1587	3404.4444	0	256.47
34	1	23.3	-24	2105.8571	3498.3571	0	248.64
35	1	27.07317	-21	1963.4703	2990.3192	0	218.12
36	1	31.57317	-16.607145	1742.86	2708.424	0	182.59
37	1	38	-10.333336	1427.7853	2233.8082	0	156.46
38	1	44.2561	-4.2261905	1106.1201	1737.4115	0	127.67
39	1	47.86533	-0.7028945	886.26766	1088.3687	0	600
40	1	54.34292	5.6204675	491.68567	466.42476	0	400

FS entry exit (TC) (3)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 470
Last Edited By: Breen, Scott A MVN-Contractor
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File Name: WBV-14c.2 Reach I Main Levee LWL Scase FS 2.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 3/9/2009
Last Solved Time: 3:31:30 PM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

FS entry exit (TC) (3)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Search for Tension Crack
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf

FOS Distribution

FOS Calculation Option: Constant

Advanced

Number of Slices: 100

Optimization Tolerance: 0.01

Minimum Slip Surface Depth: 0.1 ft

Optimization Maximum Iterations: 2000

Optimization Convergence Tolerance: 1e-007

Starting Optimization Points: 8

Ending Optimization Points: 16

Complete Passes per Insertion: 1

Driving Side Maximum Convex Angle: 5 °

Resisting Side Maximum Convex Angle: 1 °

Materials

Existing Levee

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 0 psf

Phi: 23 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 0 psf

Phi: 23 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb

Weight Fn: CH -18 to -58

Cohesion: 0 psf

Phi: 23 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb

Weight Fn: CH -3 to -18
Cohesion: 0 psf
Phi: 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion: 0 psf
Phi: 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (-28, 4.735) ft
Left-Zone Right Coordinate: (39, 13.5) ft
Left-Zone Increment: 15
Right Projection: Range
Right-Zone Left Coordinate: (161, 3.81875) ft
Right-Zone Right Coordinate: (241, 1.5) ft
Right-Zone Increment: 15
Radius Increments: 15

Slip Surface Limits

Left Coordinate: (-450, -4.3) ft
Right Coordinate: (300, 1.5) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-450	-4.3
	-372	-4.3
	-344	-6.2
	-339.67059	-8.5
	-269.16	-8.5
	-267	-6.7
	-253	-4
	-225.5	-3
	-209	-2.4
	-197.4	-2.06552
	-184.2	-1.68491
	-148.9	-0.6
	-147	0.03333
	300	0

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 102)
Data Point: (-61, 102)
Data Point: (0, 103)
Data Point: (46, 102)
Data Point: (300, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %

Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 84)
Data Point: (-61, 84)
Data Point: (0, 93)
Data Point: (46, 84)
Data Point: (300, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 114)
Data Point: (-61, 114)
Data Point: (0, 108)
Data Point: (46, 114)
Data Point: (300, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (300, 102)

Regions

	Material	Points	Area (ft²)
Region 1	CH -18 to -58	17,15,16,18	30000
Region 2	CH -3 to -18	19,16,15,1,2,3,39,4,5,6,40,7,8,38	10325.45
Region 3	Existing Levee	14,19,38,9,29,31,30,10,20,13,28,36	2049.8335
Region 4	Existing Levee	12,13,20,10,11,37,32,27	264.63142
Region 5	SM -58 to -62	18,22,21,17	3000
Region 6	CH -62 to -104	21,22,24,23	31500
Region 7	Compacted Fill	27,32,25,26,34,28,13,12	541.90858

Region 8	Compacted Fill	30,33,11,10	236.85
Region 9	Compacted Fill	35,36,28,34	287.1125

Points

	X (ft)	Y (ft)
Point 1	-450	-4.3
Point 2	-372	-4.3
Point 3	-344	-6.2
Point 4	-328	-14.7
Point 5	-305	-14.6
Point 6	-270	-9.2
Point 7	-267	-6.7
Point 8	-253	-4
Point 9	-209	-2.4
Point 10	-46	2.3
Point 11	-21.4	4.9
Point 12	22.6	4
Point 13	51.3	1.5
Point 14	300	1.5
Point 15	-450	-18
Point 16	300	-18
Point 17	-450	-58
Point 18	300	-58
Point 19	300	-3
Point 20	-40	1.5
Point 21	-450	-62
Point 22	300	-62
Point 23	-450	-104
Point 24	300	-104
Point 25	33	13.5
Point 26	43	13.5
Point 27	16.3	5.55806
Point 28	95	1.5
Point 29	-197.4	-2.06552
Point 30	-148.9	-0.6

Point 31	-184.2	-1.68491
Point 32	8.6	7.4
Point 33	-141.4	1.9
Point 34	71.5	6.4
Point 35	160	4.15
Point 36	168	1.5
Point 37	1	5.5
Point 38	-225.5	-3
Point 39	-339.67059	-8.5
Point 40	-269.16	-8.5

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	3.10	(118.738, 123.034)	67.78734	(29.8983, 12.7246)	(198.425, 1.5)
2	3190	3.51	(118.738, 123.034)	145.17	(25.6279, 11.657)	(198.134, 1.5)

Slices of Slip Surface: Optimized

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Coh Stre (p
1	Optimized	30.67374	11.613845	-723.44772	112.03474	47.555925	
2	Optimized	32.22458	9.3923755	-584.84842	336.10421	142.66777	
3	Optimized	33.86635	7.040656	-438.09776	554.71679	235.46331	
4	Optimized	35.59905	4.5586855	-283.2323	767.86865	325.9409	
5	Optimized	36.7101	3.033641	-188.07782	939.12216	398.63371	
6	Optimized	37.493025	2.124791	-131.36482	1020.6754	433.25102	
7	Optimized	38.66896	0.75971913	-46.190525	1143.1469	485.23708	
8	Optimized	39.95694	-0.73542136	47.100069	1283.0646	524.63583	
9	Optimized	41.25748	-2.2451405	141.2992	1430.0046	547.02297	
10	Optimized	42.453875	-3.6339605	227.95855	1552.1307	562.07772	
11	Optimized	43.892595	-5.3040805	332.16755	1659.7592	563.52923	
12	Optimized	45.59954	-6.99617	437.74599	1840.5539	595.45662	
13	Optimized	47.22824	-8.30803	519.57441	1904.2933	587.7783	
14	Optimized	48.856945	-9.61989	601.43631	1968.2718	580.18725	

15	Optimized	50.48565	-10.93175	683.29821	2032.2503	572.59621	
16	Optimized	52.253935	-12.35604	772.18832	2101.7303	564.35709	
17	Optimized	54.01883	-13.49937	843.52695	2250.3752	597.17166	
18	Optimized	55.640745	-14.24931	890.31184	2269.8503	585.57933	
19	Optimized	57.26266	-14.999245	937.09672	2289.2694	573.96323	
20	Optimized	58.884575	-15.74918	983.8816	2308.6884	562.34714	
21	Optimized	60.50649	-16.49912	1030.6665	2328.1635	550.7548	
22	Optimized	62.28334	-17.06174	1065.7581	2413.2893	571.99308	
23	Optimized	64.215115	-17.437045	1089.1841	2392.9122	553.39974	
24	Optimized	66.16076	-17.815045	1112.7381	2372.4086	534.69839	
25	Optimized	67.8671	-18.005865	1124.6525	2405.4474	543.6652	
26	Optimized	69.32026	-18.006815	1124.7213	2365.3968	526.6355	
27	Optimized	70.77342	-18.007765	1124.7213	2325.2773	509.6058	
28	Optimized	72.339285	-18.008785	1124.8251	2302.9099	500.06729	
29	Optimized	74.017855	-18.00988	1124.8847	2298.3226	498.09484	
30	Optimized	75.696425	-18.010975	1124.9443	2293.6758	496.0971	
31	Optimized	77.375	-18.01207	1125.0039	2289.0886	494.12464	
32	Optimized	79.053575	-18.013165	1125.0634	2284.4418	492.1269	
33	Optimized	80.732145	-18.01426	1125.123	2279.795	490.12916	
34	Optimized	82.410715	-18.015355	1125.1826	2275.2077	488.15671	
35	Optimized	84.089285	-18.01645	1125.2422	2270.5609	486.15897	
36	Optimized	85.767855	-18.017545	1125.3017	2265.9737	484.18652	
37	Optimized	87.446425	-18.01864	1125.3613	2261.3269	482.18878	
38	Optimized	89.125	-18.019735	1125.4209	2256.6801	480.19104	
39	Optimized	90.803575	-18.02083	1125.4805	2252.0929	478.21858	
40	Optimized	92.482145	-18.02193	1125.54	2247.446	476.22084	
41	Optimized	94.160715	-18.023025	1125.5996	2242.7992	474.2231	
42	Optimized	95.820735	-18.024105	1125.6401	2238.2431	472.27195	
43	Optimized	97.4622	-18.025175	1125.7011	2233.735	470.33249	
44	Optimized	99.103665	-18.02625	1125.762	2229.2268	468.39303	
45	Optimized	100.74515	-18.027325	1125.8229	2224.6577	466.42771	
46	Optimized	102.3866	-18.028395	1125.8838	2220.1495	464.48825	
47	Optimized	104.02805	-18.029465	1125.9447	2215.6414	462.54878	
48	Optimized	105.66955	-18.030535	1126.0057	2211.1332	460.60932	
49	Optimized	107.274	-18.03273	1126.1253	2206.3787	458.54037	
50	Optimized	108.8414	-18.03605	1126.3167	2202.2955	456.72592	

51	Optimized	110.4088	-18.03937	1126.5081	2198.2123	454.91148	
52	Optimized	112.11585	-18.044645	1126.8821	2193.443	452.72821	
53	Optimized	113.9626	-18.051875	1127.3153	2188.9486	450.63661	
54	Optimized	115.8094	-18.0591	1127.7485	2184.5085	448.56799	
55	Optimized	117.65615	-18.066325	1128.1817	2180.0142	446.47639	
56	Optimized	119.43645	-18.08388	1129.2853	2173.2193	443.1237	
57	Optimized	121.15035	-18.11176	1130.9771	2171.2941	441.58835	
58	Optimized	122.8642	-18.13964	1132.7273	2169.3105	440.00346	
59	Optimized	124.51155	-18.152015	1133.4948	2171.1559	440.46099	
60	Optimized	126.0924	-18.14889	1133.305	2166.3484	438.50088	
61	Optimized	127.67325	-18.145765	1133.1153	2161.6041	436.56762	
62	Optimized	129.25415	-18.142635	1132.9255	2156.7966	434.60751	
63	Optimized	130.8324	-18.132355	1132.2687	2153.8555	433.63786	
64	Optimized	132.40795	-18.11492	1131.1264	2147.636	431.48274	
65	Optimized	133.9835	-18.097485	1130.0475	2141.353	429.27374	
66	Optimized	135.5591	-18.080055	1128.9686	2135.1335	427.09168	
67	Optimized	137.2256	-18.067375	1128.1516	2127.3048	424.11541	
68	Optimized	138.983	-18.05945	1127.6394	2121.5008	421.86911	
69	Optimized	140.74035	-18.051525	1127.1842	2115.7536	419.62281	
70	Optimized	142.4977	-18.043595	1126.6721	2109.9495	417.37652	
71	Optimized	144.2551	-18.03567	1126.16	2104.2024	415.15437	
72	Optimized	146.0125	-18.027745	1125.6478	2098.3983	412.90808	
73	Optimized	147.76985	-18.019815	1125.1357	2092.6511	410.68593	
74	Optimized	149.5272	-18.01189	1124.6236	2086.8471	408.43964	
75	Optimized	151.2846	-18.003965	1124.1115	2081.0999	406.21749	
76	Optimized	152.94695	-17.996465	1123.6701	2075.7144	404.11884	
77	Optimized	154.5143	-17.989395	1123.2235	2070.6741	402.16893	
78	Optimized	156.08165	-17.982325	1122.7768	2065.6338	400.21902	
79	Optimized	157.649	-17.975255	1122.3302	2060.5935	398.26911	
80	Optimized	159.21635	-17.968185	1121.8836	2055.6169	396.34628	
81	Optimized	160.74055	-17.96131	1121.4221	2025.5814	383.79283	
82	Optimized	162.2217	-17.95463	1121.017	1970.4892	360.57956	
83	Optimized	163.70285	-17.94795	1120.612	1915.3971	337.36628	
84	Optimized	165.33255	-17.5282	1094.3922	1933.2395	356.06956	
85	Optimized	167.11085	-16.695375	1042.3971	1787.1338	316.12198	
86	Optimized	168.75165	-15.926935	994.44166	1682.8642	292.21803	

87	Optimized	170.255	-15.222885	950.52671	1620.4556	284.36793	
88	Optimized	171.75835	-14.518835	906.55152	1558.0469	276.5434	
89	Optimized	173.3878	-13.65985	852.98627	1504.823	276.6883	
90	Optimized	175.1434	-12.645935	789.70162	1413.7681	264.90052	
91	Optimized	176.899	-11.63202	726.41697	1322.6639	253.0918	
92	Optimized	178.6546	-10.6181	663.13233	1231.609	241.30402	
93	Optimized	180.4102	-9.6041835	599.84768	1140.5541	229.51624	
94	Optimized	182.1658	-8.5902685	536.56304	1049.4991	217.72846	
95	Optimized	183.9214	-7.5763515	473.30305	958.44423	205.93021	
96	Optimized	185.67695	-6.562435	410.02827	867.33999	194.11731	
97	Optimized	187.4325	-5.5485185	346.75349	776.28508	182.32534	
98	Optimized	189.0995	-4.53117	283.26234	692.94041	173.89803	
99	Optimized	190.67785	-3.51039	219.55438	600.47742	161.69224	
100	Optimized	192.2421	-2.498709	156.42189	493.67309	143.15464	
101	Optimized	193.7923	-1.496127	93.85422	372.54064	118.29537	
102	Optimized	195.3425	-0.49354512	31.284379	251.40819	93.437015	
103	Optimized	197.2713	0.75387293	-46.563745	95.420195	40.50347	

Slices of Slip Surface: 3190

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	3190	26.54941	10.899375	-678.86133	94.8612	40.26619	0
2	3190	28.392435	9.4090675	-585.87048	283.44749	120.31632	0
3	3190	30.23546	7.9675815	-495.93139	468.87903	199.02734	0
4	3190	32.078485	6.573104	-408.91384	651.24815	276.43844	0
5	3190	33.75595	5.341552	-332.07568	796.36603	338.03732	0
6	3190	35.267855	4.2644295	-264.86877	904.3613	383.8786	0
7	3190	36.77976	3.2160675	-199.45779	1010.1727	428.79287	0
8	3190	38.43857	2.09949	-129.79296	1123.6297	476.95252	0
9	3190	40.498495	0.75963156	-46.194025	1260.7536	535.15817	0
10	3190	42.32778	-0.39687449	25.963825	1381.6089	575.4372	0
11	3190	43.92451	-1.368992	86.618589	1463.1399	584.29865	0
12	3190	45.77353	-2.462486	154.84239	1535.0053	585.84439	0
13	3190	47.46503	-3.432256	215.34804	1587.4386	582.41789	0
14	3190	48.999015	-4.284633	268.53078	1621.1788	574.165	0

15	3190	50.533005	-5.1129775	320.21085	1652.961	565.71889	0
16	3190	52.141665	-5.955745	372.78972	1684.0807	556.61001	0
17	3190	53.825	-6.8110595	426.15519	1714.4296	546.84006	0
18	3190	55.508335	-7.639091	477.81815	1742.4742	536.81466	0
19	3190	57.191665	-8.4403555	527.80895	1768.2227	526.52439	0
20	3190	58.875	-9.21534	576.15864	1791.796	516.00744	0
21	3190	60.558335	-9.9645055	622.90901	1813.1578	505.23063	0
22	3190	62.241665	-10.68828	668.05187	1832.3271	494.2055	0
23	3190	63.925	-11.387075	711.64413	1849.3836	482.94175	0
24	3190	65.608335	-12.06129	753.6912	1864.3533	471.44808	0
25	3190	67.291665	-12.71128	794.25832	1877.2116	459.68639	0
26	3190	68.975	-13.33739	833.3031	1888.0465	447.71202	0
27	3190	70.658335	-13.939955	870.89684	1896.7805	435.46177	0
28	3190	72.41663	-14.54401	908.61248	1925.1666	431.50164	0
29	3190	74.24989	-15.14774	946.24563	1973.0758	435.86356	0
30	3190	76.083145	-15.72462	982.26152	2018.9048	440.02898	0
31	3190	77.9164	-16.27499	1016.5708	2062.6128	444.01847	0
32	3190	79.74966	-16.79916	1049.2948	2104.2643	447.80798	0
33	3190	81.58292	-17.297425	1080.4007	2143.8221	451.39561	0
34	3190	83.41618	-17.77006	1109.8589	2181.3593	454.82493	0
35	3190	85.22174	-18.210935	1137.3481	2220.0234	459.56839	0
36	3190	86.999605	-18.621035	1162.9343	2259.6755	465.53903	0
37	3190	88.77747	-19.0077	1187.0777	2297.1046	471.17846	0
38	3190	90.555335	-19.371125	1209.7573	2332.2245	476.45904	0
39	3190	92.3332	-19.71148	1230.9557	2365.1762	481.448	0
40	3190	94.111065	-20.02893	1250.7663	2395.824	486.04813	0
41	3190	95.855035	-20.318435	1268.7949	2423.7724	490.25888	0
42	3190	97.565105	-20.580975	1285.1768	2449.0962	494.05451	0
43	3190	99.27517	-20.822705	1300.2622	2472.3988	497.5425	0
44	3190	100.98525	-21.043735	1314.0415	2493.6086	500.69653	0
45	3190	102.69535	-21.24416	1326.5636	2512.7702	503.5148	0
46	3190	104.4054	-21.42406	1337.7613	2529.8696	506.01996	0
47	3190	106.11545	-21.58352	1347.7427	2545.0112	508.21033	0
48	3190	107.82555	-21.722605	1356.3866	2558.0142	510.06065	0
49	3190	109.53565	-21.84137	1363.8016	2569.0407	511.59362	0
50	3190	111.2457	-21.939865	1369.927	2578.03	512.8093	0

51	3190	112.95575	-22.018135	1374.8152	2584.9144	513.65662	0
52	3190	114.66585	-22.07621	1378.4045	2589.8059	514.20936	0
53	3190	116.3759	-22.114115	1380.7527	2592.6461	514.41821	0
54	3190	118.08595	-22.131865	1381.8571	2593.3723	514.25768	0
55	3190	119.79605	-22.129465	1381.7175	2592.1018	513.77766	0
56	3190	121.50615	-22.10692	1380.2748	2588.7169	512.95323	0
57	3190	123.2162	-22.06422	1377.648	2583.2799	511.76039	0
58	3190	124.92625	-22.001345	1373.7206	2575.7334	510.22417	0
59	3190	126.63635	-21.91827	1368.496	2566.0833	508.34565	0
60	3190	128.3464	-21.81496	1362.0363	2554.3359	506.10115	0
61	3190	130.05645	-21.691365	1354.3443	2540.4959	503.4915	0
62	3190	131.76655	-21.54744	1345.3683	2524.5166	500.51876	0
63	3190	133.47665	-21.383125	1335.0553	2506.4065	497.20908	0
64	3190	135.1867	-21.19835	1323.5275	2486.0588	493.46525	0
65	3190	136.89675	-20.993035	1310.7366	2463.6069	489.36443	0
66	3190	138.60685	-20.767085	1296.6317	2438.9467	484.88393	0
67	3190	140.31695	-20.52041	1281.2232	2412.0373	480.00214	0
68	3190	142.027	-20.252905	1264.5208	2382.9533	474.74644	0
69	3190	143.73705	-19.96445	1246.538	2351.6021	469.07185	0
70	3190	145.44715	-19.65492	1227.1709	2317.9447	463.00603	0
71	3190	147.1572	-19.324175	1206.5493	2282.0068	456.50463	0
72	3190	148.86725	-18.972065	1184.5733	2243.7562	449.59647	0
73	3190	150.57735	-18.598435	1161.2602	2203.1081	442.23821	0
74	3190	152.28745	-18.20311	1136.5699	2160.1484	434.48332	0
75	3190	153.99965	-17.785355	1110.4975	2118.7496	427.97761	0
76	3190	155.714	-17.34492	1082.9958	2079.1828	422.85627	0
77	3190	157.4284	-16.88209	1054.1258	2037.5831	417.45284	0
78	3190	159.1428	-16.39665	1023.8011	1993.9863	411.81917	0
79	3190	160.8	-15.90606	993.17287	1921.0833	393.87463	0
80	3190	162.4	-15.411565	962.33856	1818.8765	363.57879	0
81	3190	164	-14.89674	930.1961	1714.4849	332.91085	0
82	3190	165.6	-14.361355	896.77239	1607.92	301.86425	0
83	3190	167.2	-13.805165	862.03545	1499.0768	270.40802	0
84	3190	168.87605	-13.199425	824.26882	1417.2025	251.6854	0
85	3190	170.62815	-12.54171	783.19017	1362.2275	245.78674	0
86	3190	172.38025	-11.85803	740.52546	1304.8692	239.5497	0

87	3190	174.13235	-11.14799	696.21689	1245.0344	232.9592	0
88	3190	175.88445	-10.41117	650.21123	1182.6887	226.02329	0
89	3190	177.63655	-9.6471195	602.56519	1117.8051	218.70637	0
90	3190	179.38865	-8.8553665	553.1305	1050.2583	211.01823	0
91	3190	181.14075	-8.0354105	501.96285	980.03547	202.92979	0
92	3190	182.89285	-7.1867185	448.99393	907.02948	194.42456	0
93	3190	184.6449	-6.3087245	394.20335	831.24539	185.51334	0
94	3190	186.39695	-5.4008265	337.54186	752.49439	176.1369	0
95	3190	188.14905	-4.4623865	278.97317	670.80283	166.32182	0
96	3190	189.90115	-3.4927245	218.45976	586.00843	156.01515	0
97	3190	191.61455	-2.513939	157.37394	485.77081	139.3962	0
98	3190	193.2893	-1.526706	95.765143	369.49841	116.19288	0
99	3190	194.96405	-0.50888228	32.243082	248.99979	92.007763	0
100	3190	196.9676	0.75388472	-46.562407	94.06379	39.92771	0

FS block (2)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 477
Last Edited By: Breen, Scott A MVN-Contractor
Date: 3/9/2009
Time: 4:13:09 PM
File Name: WBV-14c.2 Reach I Main Levee LWL Scase PS 2.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 3/9/2009
Last Solved Time: 4:15:48 PM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

FS block (2)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Search for Tension Crack
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf
FOS Distribution
FOS Calculation Option: Constant
Restrict Block Crossing: Yes
Advanced
Number of Slices: 100
Optimization Tolerance: 0.01
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Existing Levee

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion: 0 psf
Phi: 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion: 0 psf
Phi: 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb
Weight Fn: CH -18 to -58
Cohesion: 0 psf
Phi: 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb
Weight Fn: CH -3 to -18
Cohesion: 0 psf
Phi: 23 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion: 0 psf
Phi: 23 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-450, -4.3) ft
Right Coordinate: (300, 1.5) ft

Slip Surface Block

Left Grid
    Upper Left: (-298, -3) ft
    Lower Left: (-298, -45) ft
    Lower Right: (-130, -45) ft
    X Increments: 6
    Y Increments: 6
    Starting Angle: 135 °
    Ending Angle: 180 °
    Angle Increments: 4
Right Grid
    Upper Left: (-2, -3) ft
    Lower Left: (-2, -45) ft
    Lower Right: (50, -45) ft

X Increments: 6
Y Increments: 6
Starting Angle: 45 °
Ending Angle: 55 °
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-450	-4.3
	-372	-4.3
	-344	-6.2
	-339.67059	-8.5
	-269.16	-8.5
	-267	-6.7
	-253	-4
	-225.5	-3
	-209	-2.4
	-197.4	-2.06552
	-184.2	-1.68491
	-148.9	-0.6
	-147	0.03333
	300	0

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 102)
Data Point: (-61, 102)
Data Point: (0, 103)

Data Point: (46, 102)
Data Point: (300, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 84)
Data Point: (-61, 84)
Data Point: (0, 93)
Data Point: (46, 84)
Data Point: (300, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 114)
Data Point: (-61, 114)
Data Point: (0, 108)
Data Point: (46, 114)
Data Point: (300, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (300, 102)

Regions

	Material	Points	Area (ft^2)
Region 1	CH -18 to -58	17,15,16,18	30000

Region 2	CH -3 to -18	19,16,15,1,2,3,39,4,5,6,40,7,8,38	10325.45
Region 3	Existing Levee	14,19,38,9,29,31,30,10,20,13,28,36	2049.8335
Region 4	Existing Levee	12,13,20,10,11,37,32,27	264.63142
Region 5	SM -58 to -62	18,22,21,17	3000
Region 6	CH -62 to -104	21,22,24,23	31500
Region 7	Compacted Fill	27,32,25,26,34,28,13,12	541.90858
Region 8	Compacted Fill	30,33,11,10	236.85
Region 9	Compacted Fill	35,36,28,34	287.1125

Points

	X (ft)	Y (ft)
Point 1	-450	-4.3
Point 2	-372	-4.3
Point 3	-344	-6.2
Point 4	-328	-14.7
Point 5	-305	-14.6
Point 6	-270	-9.2
Point 7	-267	-6.7
Point 8	-253	-4
Point 9	-209	-2.4
Point 10	-46	2.3
Point 11	-21.4	4.9
Point 12	22.6	4
Point 13	51.3	1.5
Point 14	300	1.5
Point 15	-450	-18
Point 16	300	-18
Point 17	-450	-58
Point 18	300	-58
Point 19	300	-3
Point 20	-40	1.5
Point 21	-450	-62
Point 22	300	-62
Point 23	-450	-104
Point 24	300	-104

Point 25	33	13.5
Point 26	43	13.5
Point 27	16.3	5.55806
Point 28	95	1.5
Point 29	-197.4	-2.06552
Point 30	-148.9	-0.6
Point 31	-184.2	-1.68491
Point 32	8.6	7.4
Point 33	-141.4	1.9
Point 34	71.5	6.4
Point 35	160	4.15
Point 36	168	1.5
Point 37	1	5.5
Point 38	-225.5	-3
Point 39	-339.67059	-8.5
Point 40	-269.16	-8.5

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	2.54	(-133.948, 19.824)	131.6163	(45.2246, 12.9458)	(-307.912, -14.6127)
2	2566	2.68	(-133.948, 19.824)	132.09	(45.2683, 12.9349)	(-309.957, -14.6215)

Slices of Slip Surface: **Optimized**

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohes Stren (ps
1	Optimized	-306.45615	-14.883415	398.32231	410.81314	5.3020411	0
2	Optimized	-303.08685	-15.5099	437.42693	476.14888	16.43649	0
3	Optimized	-299.2606	-16.221355	481.80171	550.61218	29.208309	0
4	Optimized	-295.43435	-16.93281	526.20219	625.04978	41.958313	0
5	Optimized	-291.60805	-17.64427	570.60267	699.51309	54.719225	0
6	Optimized	-288.05365	-18.305175	611.84575	774.48147	69.034766	0
7	Optimized	-284.7712	-18.91552	649.91389	850.01872	84.939461	0
8	Optimized	-281.48875	-19.525865	688.01198	925.55597	100.83144	0

9	Optimized	-278.20625	-20.136215	726.11007	1001.0932	116.72342	0
10	Optimized	-274.92375	-20.746565	764.17821	1076.6305	132.62812	0
11	Optimized	-271.64125	-21.35691	802.2763	1152.1378	148.50739	0
12	Optimized	-269.58	-21.740175	826.18444	1207.0493	161.66753	0
13	Optimized	-268.66205	-21.91086	862.72903	1267.4735	171.80385	0
14	Optimized	-267.58205	-21.89202	917.69669	1279.8144	153.70984	0
15	Optimized	-264.6769	-21.33585	941.23049	1301.1836	152.79104	0
16	Optimized	-260.7948	-20.72122	949.59825	1314.382	154.8415	0
17	Optimized	-257.67685	-20.381445	965.9228	1330.1007	154.58436	0
18	Optimized	-254.55895	-20.04167	982.24736	1345.8514	154.34075	0
19	Optimized	-251.39175	-19.696525	983.12471	1340.8747	151.85585	0
20	Optimized	-248.1753	-19.34601	968.53655	1315.2218	147.15914	0
21	Optimized	-244.95885	-18.995495	953.97929	1289.5688	142.44931	0
22	Optimized	-241.7424	-18.64498	939.39113	1263.9159	137.75261	0
23	Optimized	-238.52595	-18.294465	924.80297	1238.263	133.0559	0
24	Optimized	-234.3806	-18.059605	919.57637	1239.5584	135.8243	0
25	Optimized	-230.25765	-17.96274	922.89333	1242.9432	135.85309	0
26	Optimized	-227.0859	-17.888225	925.4149	1246.3788	136.24109	0
27	Optimized	-223.85	-17.812205	928.01654	1251.4424	137.28614	0
28	Optimized	-220.55	-17.734675	930.68247	1258.1375	138.99643	0
29	Optimized	-217.25	-17.65715	933.31811	1264.8629	140.73243	0
30	Optimized	-213.95	-17.579625	935.98404	1271.5581	142.44272	0
31	Optimized	-210.65	-17.502095	938.61967	1278.2835	144.17873	0
32	Optimized	-207.1548	-17.41998	940.57016	1283.8566	145.71645	0
33	Optimized	-204.92775	-17.374655	941.74618	1290.0105	147.82945	0
34	Optimized	-202.75945	-17.394465	946.87546	1301.373	150.4753	0
35	Optimized	-199.1865	-17.43804	956.02685	1316.4575	152.99371	0
36	Optimized	-195.75	-17.47995	964.83746	1330.9921	155.42342	0
37	Optimized	-192.45	-17.520195	973.29138	1344.9305	157.75143	0
38	Optimized	-189.15	-17.56044	981.71499	1358.8688	160.0923	0
39	Optimized	-185.85	-17.600685	990.16891	1372.8072	162.4203	0
40	Optimized	-182.25095	-17.644575	999.62112	1388.424	165.03701	0
41	Optimized	-178.35285	-17.69211	1010.0614	1405.7132	167.94424	0
42	Optimized	-174.45475	-17.73965	1020.5016	1423.0024	170.85147	0
43	Optimized	-170.5567	-17.78719	1030.9419	1440.2917	173.7587	0
44	Optimized	-167.00735	-17.85822	1042.1855	1461.5769	178.02108	0

45	Optimized	-163.8067	-17.95274	1054.2092	1480.5025	180.95076	0
46	Optimized	-160.5431	-18.04912	1066.5104	1500.6986	184.30195	0
47	Optimized	-157.2165	-18.14736	1079.0102	1522.1526	188.10278	0
48	Optimized	-153.8899	-18.2456	1091.51	1543.6367	191.91636	0
49	Optimized	-150.5633	-18.34384	1104.0399	1565.1207	195.71719	0
50	Optimized	-147.95	-18.421015	1131.7699	1613.9282	204.66406	0
51	Optimized	-145.47725	-18.49404	1156.0876	1713.5854	236.64379	0
52	Optimized	-142.67725	-18.4746	1154.884	1796.4254	272.31818	0
53	Optimized	-139.3665	-18.30764	1144.4459	1831.8894	291.80247	0
54	Optimized	-135.2995	-18.102545	1131.6272	1822.214	293.13671	0
55	Optimized	-132.94405	-17.983765	1124.2031	1816.8233	293.99986	0
56	Optimized	-131.08705	-17.933645	1121.0785	1825.0986	298.8388	0
57	Optimized	-128.017	-17.865875	1116.8125	1827.8992	301.83839	0
58	Optimized	-124.42835	-17.78666	1111.8562	1831.1866	305.33765	0
59	Optimized	-120.3211	-17.695995	1106.1847	1834.9352	309.33622	0
60	Optimized	-116.52865	-17.64663	1103.1009	1846.5625	315.58073	0
61	Optimized	-113.051	-17.638575	1102.5833	1855.5628	319.62085	0
62	Optimized	-109.57335	-17.63052	1102.037	1864.5632	323.67317	0
63	Optimized	-106.0957	-17.622465	1101.5194	1873.5635	327.71329	0
64	Optimized	-102.6181	-17.61441	1101.0018	1882.5638	331.7534	0
65	Optimized	-99.140455	-17.606355	1100.4842	1891.5929	335.80572	0
66	Optimized	-95.66279	-17.5983	1099.9666	1900.5932	339.84584	0
67	Optimized	-92.18515	-17.590245	1099.449	1909.5936	343.88596	0
68	Optimized	-88.707505	-17.58219	1098.9314	1918.5939	347.92608	0
69	Optimized	-85.22986	-17.574135	1098.4138	1927.5942	351.96619	0
70	Optimized	-81.75222	-17.56608	1097.8963	1936.5946	356.00631	0
71	Optimized	-78.31273	-17.583425	1098.9799	1952.0174	362.09293	0
72	Optimized	-74.91139	-17.626175	1101.6257	1965.1289	366.53533	0
73	Optimized	-71.51005	-17.66892	1104.2715	1978.2403	370.97773	0
74	Optimized	-68.10871	-17.711665	1106.9173	1991.3517	375.42013	0
75	Optimized	-64.70737	-17.754415	1109.5632	2004.4632	379.86253	0
76	Optimized	-61.30603	-17.797165	1112.2384	2017.5746	384.29245	0
77	Optimized	-57.90469	-17.839915	1114.8842	2037.5652	391.65485	0
78	Optimized	-54.50335	-17.88266	1117.53	2058.2907	399.32922	0
79	Optimized	-51.10201	-17.925405	1120.1758	2079.0455	407.01606	0
80	Optimized	-47.70067	-17.968155	1122.8216	2099.8592	414.72787	0

81	Optimized	-45.583455	-17.994765	1124.4783	2112.8002	419.51777	0
82	Optimized	-42.583455	-18.03247	1126.8137	2131.8619	426.61768	0
83	Optimized	-39.800985	-18.06744	1128.9967	2149.4172	433.14279	0
84	Optimized	-38.245875	-18.03497	1126.9451	2140.956	430.42212	0
85	Optimized	-34.95356	-17.95007	1121.6313	2149.4254	436.27272	0
86	Optimized	-31.081115	-17.85021	1115.384	2159.9062	443.37336	0
87	Optimized	-27.20867	-17.75035	1109.1368	2170.2838	450.43016	0
88	Optimized	-23.336225	-17.65049	1102.8896	2180.5323	457.43218	0
89	Optimized	-19.533335	-17.552425	1096.7516	2190.8523	464.41819	0
90	Optimized	-15.8	-17.45615	1090.7268	2201.2685	471.39697	0
91	Optimized	-12.066665	-17.359875	1084.702	2211.5508	478.31891	0
92	Optimized	-8.3333335	-17.263605	1078.6772	2221.7527	485.20676	0
93	Optimized	-4.6	-17.167335	1072.6525	2231.8208	492.03777	0
94	Optimized	-0.8666665	-17.07106	1066.6277	2241.8086	498.83469	0
95	Optimized	2.430005	-16.986045	1061.3217	2274.131	514.80699	0
96	Optimized	5.290015	-16.912295	1056.7079	2338.6198	544.13933	0
97	Optimized	7.66001	-16.55795	1034.5683	2247.9396	515.04557	0
98	Optimized	10.525	-15.59034	974.17394	2229.7699	532.96886	0
99	Optimized	14.375	-14.29006	893.03995	2206.9333	557.71463	0
100	Optimized	16.923605	-13.429305	839.32116	2192.8395	574.53446	0
101	Optimized	20.073605	-11.397035	712.46965	1964.9021	531.62603	0
102	Optimized	24.087945	-8.502498	531.83356	1817.5886	545.77064	0
103	Optimized	27.063835	-6.3567345	397.92118	1710.9602	557.35201	0
104	Optimized	30.039725	-4.2109715	264.01971	1606.4579	569.8312	0
105	Optimized	31.58647	-3.069045	192.75862	1428.1296	524.38386	0
106	Optimized	32.322635	-2.204585	138.81258	1362.8089	519.55559	0
107	Optimized	33.608455	-0.6946761	44.587077	1233.3412	504.59618	0
108	Optimized	34.847165	0.7599089	-46.184605	1101.2377	467.44769	0
109	Optimized	36.023755	2.1415465	-132.40333	981.78075	416.7412	0
110	Optimized	38.177565	4.6707135	-290.23923	763.16866	323.94588	0
111	Optimized	41.39252	8.445957	-525.82669	436.85119	185.43233	0
112	Optimized	44.112275	11.639695	-725.13252	136.84836	58.088683	0

Slices of Slip Surface: 2566

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal	Frictional Strength (psf)	Cohesiv Strengt

					Stress (psf)		(psf)
1	2566	-307.47865	-15.11458	412.75117	431.24998	7.8522824	0
2	2566	-303.25	-15.95571	465.2285	514.85624	21.065724	0
3	2566	-299.75	-16.651905	508.6913	586.95797	33.222229	0
4	2566	-296.25	-17	530.4	616	36.335044	0
5	2566	-292.75	-17	530.4	627.4	41.174057	0
6	2566	-289.25	-17	530.4	638.8	46.01307	0
7	2566	-285.75	-17	530.4	650.2	50.852083	0
8	2566	-282.25	-17	530.4	661.6	55.691096	0
9	2566	-278.75	-17	530.4	673	60.530109	0
10	2566	-275.25	-17	530.4	684.4	65.369122	0
11	2566	-271.75	-17	530.4	695.8	70.208135	0
12	2566	-269.58	-17	530.40476	710.07143	76.263975	0
13	2566	-268.08	-17	586.57407	792.12963	87.253157	0
14	2566	-265.25	-17	663.77143	896.42857	98.757098	0
15	2566	-261.75	-17	705.91429	953.28571	105.00294	0
16	2566	-258.25	-17	748.02857	1010.1714	111.27304	0
17	2566	-254.75	-17	790.14286	1067.0571	117.54314	0
18	2566	-251.28125	-17	815.09818	1100.7709	121.26088	0
19	2566	-247.84375	-17	822.89455	1111.3018	122.42162	0
20	2566	-244.40625	-17	830.69091	1121.8327	123.58237	0
21	2566	-240.96875	-17	838.48727	1132.3636	124.74312	0
22	2566	-237.53125	-17	846.31273	1142.8945	125.89151	0
23	2566	-234.09375	-17	854.10909	1153.4255	127.05226	0
24	2566	-230.65625	-17	861.90545	1163.9564	128.213	0
25	2566	-227.21875	-17	869.70182	1174.5164	129.3861	0
26	2566	-223.85	-17	877.33333	1186.3939	131.18844	0
27	2566	-220.55	-17	884.81818	1199.6667	133.64525	0
28	2566	-217.25	-17	892.33333	1212.9394	136.0892	0
29	2566	-213.95	-17	899.81818	1226.2121	138.54601	0
30	2566	-210.65	-17	907.30303	1239.4848	141.00282	0
31	2566	-207.06665	-17	914.50854	1252.293	143.38099	0
32	2566	-203.2	-17	921.46544	1264.6292	145.66438	0
33	2566	-199.33335	-17	928.42233	1276.9395	147.93678	0
34	2566	-195.75	-17	934.87879	1288.3939	150.05828	0
35	2566	-192.45	-17	940.81818	1298.9091	152.00057	0

36	2566	-189.15	-17	946.75758	1309.4242	153.94287	0
37	2566	-185.85	-17	952.69697	1319.9394	155.88516	0
38	2566	-182.435	-17	959.03683	1331.2181	157.98159	0
39	2566	-178.905	-17	965.80737	1343.2011	160.19415	0
40	2566	-175.375	-17	972.5779	1355.2125	162.41873	0
41	2566	-171.845	-17	979.34844	1367.1955	164.63129	0
42	2566	-168.315	-17	986.11898	1379.2068	166.85588	0
43	2566	-164.785	-17	992.88952	1391.1898	169.06844	0
44	2566	-161.255	-17	999.66006	1403.2011	171.29302	0
45	2566	-157.725	-17	1006.4306	1415.2125	173.51761	0
46	2566	-154.195	-17	1013.2011	1427.1955	175.73017	0
47	2566	-150.665	-17	1019.9717	1439.2068	177.95475	0
48	2566	-147.95	-17	1043.1053	1480.2105	185.54018	0
49	2566	-145.6	-17	1062.8571	1567.2143	214.08691	0
50	2566	-142.8	-17	1062.8571	1671.1429	258.20197	0
51	2566	-139.53525	-17	1062.8494	1728.3268	282.4784	0
52	2566	-135.80575	-17	1062.8226	1738.7035	286.89444	0
53	2566	-132.07625	-17	1062.8226	1749.0802	291.29909	0
54	2566	-128.34675	-17	1062.7958	1759.4838	295.72651	0
55	2566	-124.7324	-17	1062.7806	1769.5387	300.00102	0
56	2566	-121.2332	-17	1062.752	1779.2838	304.14967	0
57	2566	-117.73395	-17	1062.752	1789.0288	308.2862	0
58	2566	-114.2347	-17	1062.7235	1798.7738	312.43485	0
59	2566	-110.7355	-17	1062.7235	1808.5189	316.57137	0
60	2566	-107.2363	-17	1062.6949	1818.2639	320.72003	0
61	2566	-103.7371	-17	1062.6663	1828.009	324.86868	0
62	2566	-100.23788	-17	1062.6663	1837.754	329.0052	0
63	2566	-96.738645	-17	1062.6377	1847.4704	333.14173	0
64	2566	-93.23943	-17	1062.6377	1857.2155	337.27825	0
65	2566	-89.74021	-17	1062.6091	1866.9605	341.4269	0
66	2566	-86.240995	-17	1062.6091	1876.7056	345.56342	0
67	2566	-82.74178	-17	1062.5806	1886.4506	349.71208	0
68	2566	-79.24256	-17	1062.552	1896.1956	353.86073	0
69	2566	-75.743345	-17	1062.552	1905.9407	357.99725	0
70	2566	-72.24413	-17	1062.5234	1915.6857	362.14591	0
71	2566	-68.74491	-17	1062.5234	1925.4307	366.28243	0

72	2566	-65.24569	-17	1062.4948	1935.1758	370.43108	0
73	2566	-61.746475	-17	1062.4948	1944.9208	374.56761	0
74	2566	-58.24726	-17	1062.4663	1960.41	381.1545	0
75	2566	-54.74804	-17	1062.4377	1977.471	388.40858	0
76	2566	-51.248825	-17	1062.4377	1994.5319	395.65053	0
77	2566	-47.74961	-17	1062.4091	2011.5929	402.90461	0
78	2566	-44.5	-17	1062.4	2027.4333	409.63235	0
79	2566	-41.5	-17	1062.4	2042.0667	415.84383	0
80	2566	-38.14	-17	1062.3656	2058.4409	422.80887	0
81	2566	-34.42	-17	1062.3656	2076.586	430.51103	0
82	2566	-30.7	-17	1062.3387	2094.7312	438.22461	0
83	2566	-26.98	-17	1062.3118	2112.8495	445.92677	0
84	2566	-23.26	-17	1062.3118	2130.9946	453.62893	0
85	2566	-19.533335	-17	1062.2947	2149.5538	461.51408	0
86	2566	-15.8	-17	1062.268	2168.4913	469.56394	0
87	2566	-12.066665	-17	1062.2412	2187.4288	477.6138	0
88	2566	-8.3333335	-17	1062.2412	2206.3663	485.65229	0
89	2566	-4.6	-17	1062.2144	2225.3306	493.71352	0
90	2566	-0.8666665	-17	1062.1876	2244.2681	501.76339	0
91	2566	2.9	-17	1062.1842	2296.5	523.93597	0
92	2566	6.7	-17	1062.1579	2391.7632	564.38395	0
93	2566	10.283335	-17	1062.1484	2481.5938	602.51883	0
94	2566	13.65	-17	1062.1187	2566.0096	638.36383	0
95	2566	15.816665	-16.516665	1031.9859	2213.3419	501.4559	0
96	2566	17.875	-14.45833	903.50283	2089.2872	503.33558	0
97	2566	21.025	-11.308332	706.92715	1902.0722	507.30898	0
98	2566	24.283335	-8.05	503.59301	1711.7374	512.82685	0
99	2566	27.65	-4.6833335	293.4983	1518.6552	520.04826	0
100	2566	30.84331	-1.4900216	94.229177	1310.4374	516.24977	0
101	2566	32.676645	0.34331172	-20.178531	1175.614	499.01854	0
102	2566	33.416665	1.0833334	-66.360009	1116.3239	473.85138	0
103	2566	34.53312	2.1997865	-136.03328	1015.9678	431.25275	0
104	2566	37.17468	4.8413465	-300.88317	778.4544	330.43429	0
105	2566	41.058225	8.724895	-543.2284	429.30247	182.22809	0
106	2566	44.13413	11.8008	-735.1763	127.36447	54.06301	0

FS block (TC) (3)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 463
Last Edited By: Breen, Scott A MVN-Contractor
Date: 2/20/2009
Time: 3:53:30 PM
File Name: WBV-14c.2 Reach I Main Levee LWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 2/20/2009
Last Solved Time: 3:55:06 PM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

FS block (TC) (3)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Fully-Specified
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Tension Crack Line
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf

FOS Distribution

FOS Calculation Option: Constant

Advanced

Number of Slices: 100

Optimization Tolerance: 0.01

Minimum Slip Surface Depth: 0.1 ft

Optimization Maximum Iterations: 2000

Optimization Convergence Tolerance: 1e-007

Starting Optimization Points: 8

Ending Optimization Points: 16

Complete Passes per Insertion: 1

Driving Side Maximum Convex Angle: 5 °

Resisting Side Maximum Convex Angle: 1 °

Materials

Existing Levee

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 600 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 400 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb

Weight Fn: CH -18 to -58

Cohesion Spatial Fn: CH -18 to -58

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb

Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-450, -4.3) ft
Right Coordinate: (300, 1.5) ft

Fully Specified Slip Surfaces

Fully Specified Slip Surface 1

	X (ft)	Y (ft)
	18	18
	53	-19
	166	-20
	197	8

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-450	-4.3
	-372	-4.3
	-344	-6.2
	-339.67059	-8.5
	-269.16	-8.5
	-267	-6.7
	-253	-4
	-225.5	-3
	-209	-2.4
	-197.4	-2.06552
	-184.2	-1.68491
	-148.9	-0.6
	-147	0.03333
	300	0

Tension Crack Line

	X (ft)	Y (ft)
	1	0.5
	8.6	2.4
	35	9
	45	9

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)

Data Point: (-450, 102)
Data Point: (-61, 102)
Data Point: (0, 103)
Data Point: (46, 102)
Data Point: (300, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 84)
Data Point: (-61, 84)
Data Point: (0, 93)
Data Point: (46, 84)
Data Point: (300, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 114)
Data Point: (-61, 114)
Data Point: (0, 108)
Data Point: (46, 114)
Data Point: (300, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (300, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-450, -3, 120)
- Data Point: (-61, -3, 120)
- Data Point: (0, -3, 260)
- Data Point: (46, -3, 120)
- Data Point: (300, -3, 120)
- Data Point: (-450, -18, 150)
- Data Point: (-61, -18, 150)
- Data Point: (0, -18, 260)
- Data Point: (46, -18, 150)
- Data Point: (300, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-450, -18, 150)
- Data Point: (-61, -18, 150)
- Data Point: (0, -18, 260)
- Data Point: (46, -18, 150)
- Data Point: (300, -18, 150)
- Data Point: (-450, -58, 500)
- Data Point: (-61, -58, 500)
- Data Point: (0, -58, 500)
- Data Point: (46, -58, 500)
- Data Point: (300, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-450, -62, 580)
- Data Point: (-61, -62, 580)
- Data Point: (0, -62, 580)
- Data Point: (46, -62, 580)
- Data Point: (300, -62, 580)
- Data Point: (-450, -104, 900)
- Data Point: (-61, -104, 900)
- Data Point: (0, -104, 900)
- Data Point: (46, -104, 900)
- Data Point: (300, -104, 900)

Regions

	Material	Points	Area (ft²)
Region 1	CH -18 to -58	17,15,16,18	30000
Region 2	CH -3 to -18	19,16,15,1,2,3,39,4,5,6,40,7,8,38	10325.45
Region 3	Existing Levee	14,19,38,9,29,31,30,10,20,13,28,36	2049.8335
Region 4	Existing Levee	12,13,20,10,11,37,32,27	264.63142
Region 5	SM -58 to -62	18,22,21,17	3000
Region 6	CH -62 to -104	21,22,24,23	31500
Region 7	Compacted Fill	27,32,25,26,34,28,13,12	541.90858
Region 8	Compacted Fill	30,33,11,10	236.85
Region 9	Compacted Fill	35,36,28,34	287.1125

Points

	X (ft)	Y (ft)
Point 1	-450	-4.3
Point 2	-372	-4.3
Point 3	-344	-6.2
Point 4	-328	-14.7
Point 5	-305	-14.6
Point 6	-270	-9.2
Point 7	-267	-6.7
Point 8	-253	-4
Point 9	-209	-2.4
Point 10	-46	2.3
Point 11	-21.4	4.9
Point 12	22.6	4
Point 13	51.3	1.5
Point 14	300	1.5
Point 15	-450	-18
Point 16	300	-18
Point 17	-450	-58
Point 18	300	-58
Point 19	300	-3
Point 20	-40	1.5
Point 21	-450	-62

Point 22	300	-62
Point 23	-450	-104
Point 24	300	-104
Point 25	33	13.5
Point 26	43	13.5
Point 27	16.3	5.55806
Point 28	95	1.5
Point 29	-197.4	-2.06552
Point 30	-148.9	-0.6
Point 31	-184.2	-1.68491
Point 32	8.6	7.4
Point 33	-141.4	1.9
Point 34	71.5	6.4
Point 35	160	4.15
Point 36	168	1.5
Point 37	1	5.5
Point 38	-225.5	-3
Point 39	-339.67059	-8.5
Point 40	-269.16	-8.5

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.41	(109.125, 8.73)	62.16682	(28.4692, 12.3673)	(187.064, 1.5)
2	1	1.46	(109.125, 8.73)	63.413	(28.1366, 12.2842)	(189.804, 1.5)

Slices of Slip Surface: Optimized

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	29.44006	6.313099	-392.6713	369.50526	0	400
2	Optimized	31.42567	4.1569605	-258.14615	663.58124	0	400
3	Optimized	32.720225	2.725333	-168.81165	665.02469	0	600
4	Optimized	33.38001	1.947818	-120.29997	755.29074	0	600
5	Optimized	34.388075	0.75987909	-46.180766	881.79951	0	600

6	Optimized	35.65676	-0.73518141	47.105378	1041.0349	0	600
7	Optimized	36.938015	-2.2450605	141.31613	1201.8739	0	600
8	Optimized	38.17752	-3.70574	232.45613	1701.0158	0	144.98
9	Optimized	39.480335	-5.3006165	331.97185	1820.9402	0	143.79
10	Optimized	40.8882	-7.078889	442.92306	1967.1851	0	142.81
11	Optimized	42.296065	-8.8571615	553.89632	2112.3277	0	142.04
12	Optimized	43.664255	-10.585319	661.73956	2234.6734	0	141.51
13	Optimized	44.992765	-12.263355	766.39935	2334.3338	0	141.19
14	Optimized	46.321275	-13.94139	871.10586	2433.0131	0	141.88
15	Optimized	47.70461	-15.22778	951.36772	2607.0805	0	144.46
16	Optimized	49.142765	-16.122525	1007.2194	2641.4417	0	146.25
17	Optimized	50.58092	-17.01727	1063.012	2675.8619	0	148.03
18	Optimized	51.73025	-17.73232	1107.6115	2703.3614	0	149.46
19	Optimized	52.85688	-18.43325	1151.367	2736.7371	0	153.79
20	Optimized	54.249645	-19.299755	1205.4421	2782.9479	0	161.37
21	Optimized	55.64241	-20.16626	1259.5173	2829.1586	0	168.95
22	Optimized	57.14949	-20.590805	1285.9753	2957.1512	0	172.67
23	Optimized	58.77089	-20.5734	1284.9269	2910.8975	0	172.52
24	Optimized	60.39229	-20.555995	1283.8168	2864.7056	0	172.36
25	Optimized	62.01369	-20.53859	1282.7067	2818.4519	0	172.21
26	Optimized	63.63509	-20.521185	1281.5967	2772.2599	0	172.06
27	Optimized	65.25649	-20.503775	1280.5482	2726.0062	0	171.91
28	Optimized	66.87789	-20.48637	1279.4381	2679.8142	0	171.76
29	Optimized	68.49929	-20.468965	1278.3281	2633.5606	0	171.6
30	Optimized	70.404995	-20.389025	1273.3296	2583.6584	0	170.9
31	Optimized	72.302045	-20.26561	1265.6425	2538.6878	0	169.82
32	Optimized	73.90614	-20.16125	1259.1105	2523.4466	0	168.91
33	Optimized	75.510235	-20.056895	1252.5786	2508.2054	0	168
34	Optimized	77.114325	-19.95254	1246.0466	2493.0264	0	167.08
35	Optimized	78.718415	-19.84818	1239.5769	2477.7852	0	166.17
36	Optimized	80.32251	-19.743825	1233.0449	2462.6062	0	165.26
37	Optimized	81.926605	-19.63947	1226.513	2447.365	0	164.35
38	Optimized	83.567195	-19.547315	1220.7303	2430.0847	0	163.54
39	Optimized	85.244285	-19.467365	1215.7868	2417.1603	0	162.84
40	Optimized	86.921375	-19.387415	1210.7838	2404.2954	0	162.14
41	Optimized	88.598465	-19.307465	1205.7808	2391.371	0	161.44

42	Optimized	90.260625	-19.23544	1201.2906	2377.7705	0	160.81
43	Optimized	91.907855	-19.17134	1197.287	2366.6087	0	160.25
44	Optimized	93.555085	-19.10724	1193.2226	2355.3862	0	159.69
45	Optimized	94.68935	-19.06593	1190.6669	2346.2939	0	159.33
46	Optimized	95.74602	-19.03443	1188.7152	2340.1826	0	159.05
47	Optimized	97.23806	-18.98995	1185.9016	2331.4736	0	158.66
48	Optimized	98.7301	-18.945475	1183.1549	2322.6976	0	158.27
49	Optimized	100.22216	-18.901	1180.3412	2313.9886	0	157.88
50	Optimized	101.7142	-18.85652	1177.5945	2305.2126	0	157.49
51	Optimized	103.2062	-18.81204	1174.7808	2296.5035	0	157.11
52	Optimized	104.69825	-18.767565	1172.0341	2287.7945	0	156.72
53	Optimized	106.1903	-18.72309	1169.2204	2279.0185	0	156.33
54	Optimized	107.76445	-18.67906	1166.469	2269.5023	0	155.94
55	Optimized	109.4207	-18.635485	1163.7529	2260.4486	0	155.56
56	Optimized	111.0769	-18.59191	1161.0368	2251.3347	0	155.18
57	Optimized	112.7331	-18.548335	1158.2604	2242.2207	0	154.8
58	Optimized	114.3893	-18.50476	1155.5443	2233.1067	0	154.42
59	Optimized	115.98635	-18.467195	1153.2043	2223.8418	0	154.09
60	Optimized	117.5242	-18.435645	1151.2539	2216.3002	0	153.81
61	Optimized	119.062	-18.404095	1149.2385	2208.7587	0	153.54
62	Optimized	120.5998	-18.372545	1147.2881	2201.2172	0	153.26
63	Optimized	122.13765	-18.340995	1145.3377	2193.6756	0	152.98
64	Optimized	123.6755	-18.309445	1143.3223	2186.1341	0	152.71
65	Optimized	125.2133	-18.2779	1141.3719	2178.5926	0	152.43
66	Optimized	126.7511	-18.246355	1139.3565	2171.1161	0	152.16
67	Optimized	128.28895	-18.214805	1137.4061	2163.5745	0	151.88
68	Optimized	129.8268	-18.183255	1135.4557	2156.033	0	151.6
69	Optimized	131.3646	-18.151705	1133.4403	2148.4915	0	151.33
70	Optimized	132.9024	-18.120155	1131.4899	2140.9499	0	151.05
71	Optimized	134.44025	-18.088605	1129.4745	2133.4084	0	150.78
72	Optimized	135.9781	-18.057055	1127.5241	2125.8669	0	150.5
73	Optimized	137.489	-18.03784	1126.297	2117.0799	0	150.33
74	Optimized	138.97295	-18.03096	1125.8927	2112.2281	0	150.27
75	Optimized	140.4569	-18.02408	1125.421	2107.3763	0	150.21
76	Optimized	141.94085	-18.0172	1125.0167	2102.5244	0	150.15
77	Optimized	143.4248	-18.01032	1124.545	2097.6726	0	150.09

78	Optimized	144.9088	-18.00344	1124.1407	2092.8208	0	150.03
79	Optimized	146.44795	-17.996305	1123.6998	2087.8388	0	149.99
80	Optimized	148.0423	-17.988915	1123.198	2082.7584	0	149.98
81	Optimized	149.63665	-17.98152	1122.759	2077.678	0	149.96
82	Optimized	151.231	-17.974125	1122.2572	2072.5977	0	149.95
83	Optimized	152.8254	-17.966735	1121.8182	2067.5173	0	149.93
84	Optimized	154.41975	-17.959345	1121.3164	2062.437	0	149.92
85	Optimized	156.0141	-17.951955	1120.8774	2057.3566	0	149.9
86	Optimized	157.60845	-17.944565	1120.3756	2052.2763	0	149.89
87	Optimized	159.2028	-17.93717	1119.9366	2047.1959	0	149.87
88	Optimized	160.67745	-17.93033	1119.5288	2019.713	0	149.86
89	Optimized	162.0324	-17.92405	1119.086	1969.8217	0	149.85
90	Optimized	163.4953	-17.66518	1102.9574	1946.1711	0	149.33
91	Optimized	165.06615	-17.15372	1070.9964	1844.7797	0	148.31
92	Optimized	166.9258	-16.04414	1001.7625	1754.0772	0	146.09
93	Optimized	168.7347	-14.606315	912.02591	1588.8398	0	143.21
94	Optimized	170.2041	-13.43836	839.14482	1487.0833	0	140.88
95	Optimized	171.6735	-12.270405	766.26373	1385.3801	0	138.54
96	Optimized	173.1429	-11.102455	693.38263	1283.6769	0	136.2
97	Optimized	174.6123	-9.9345015	620.50154	1181.9204	0	133.87
98	Optimized	176.0817	-8.7665465	547.62044	1080.2172	0	131.53
99	Optimized	177.73055	-7.3188085	457.26344	972.29108	0	128.64
100	Optimized	179.5589	-5.591285	349.45549	820.82405	0	125.18
101	Optimized	181.3873	-3.8637615	241.65152	669.31727	0	121.73
102	Optimized	183.0975	-2.2478655	140.81015	849.50863	0	600
103	Optimized	184.68955	-0.74359619	46.93824	679.57951	0	600
104	Optimized	186.27485	0.75426931	-46.535487	510.38921	0	600

Slices of Slip Surface: 1

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	1	29.107305	6.2579885	-389.22833	383.21079	0	400
2	1	31.0487	4.2056595	-261.18226	665.39779	0	400
3	1	32.5097	2.661176	-164.81249	732.11839	0	600
4	1	33.304055	1.8214285	-112.41631	834.7768	0	600

5	1	34.308225	0.75987938	-46.180159	947.98499	0	600
6	1	35.72247	-0.73518112	47.104889	1107.4956	0	600
7	1	37.15073	-2.2450605	141.31659	1268.5342	0	600
8	1	38.72072	-3.904762	244.87223	1736.5156	0	143.68
9	1	40.432435	-5.714286	357.77747	1886.8659	0	141.72
10	1	42.144145	-7.5238095	470.6827	2035.8914	0	140.02
11	1	43.83	-9.3060005	581.88442	2159.2565	0	138.62
12	1	45.49	-11.06086	691.38102	2257.0376	0	137.5
13	1	47.15	-12.815715	800.87763	2353.6181	0	139.63
14	1	48.81	-14.57057	910.37423	2450.0331	0	143.14
15	1	50.47	-16.32543	1019.8708	2546.4481	0	146.65
16	1	51.677025	-17.60143	1099.4409	2616.549	0	149.2
17	1	52.527025	-18.5	1155.5209	2672.3874	0	154.38
18	1	53.84091	-19.00744	1187.1806	2882.1845	0	158.82
19	1	55.52273	-19.022325	1188.1319	2837.6511	0	158.95
20	1	57.204545	-19.03721	1189.0237	2793.0583	0	159.08
21	1	58.88636	-19.05209	1189.9751	2748.5249	0	159.21
22	1	60.56818	-19.066975	1190.8669	2703.9915	0	159.34
23	1	62.25	-19.08186	1191.8182	2659.3986	0	159.47
24	1	63.93182	-19.09674	1192.7101	2614.8652	0	159.6
25	1	65.61364	-19.111625	1193.6614	2570.2724	0	159.73
26	1	67.295455	-19.12651	1194.5533	2525.739	0	159.86
27	1	68.97727	-19.14139	1195.5046	2481.2056	0	159.99
28	1	70.65909	-19.156275	1196.3964	2436.6128	0	160.12
29	1	72.283335	-19.17065	1197.3361	2412.863	0	160.24
30	1	73.85	-19.184515	1198.1659	2409.9269	0	160.36
31	1	75.416665	-19.19838	1198.9956	2406.927	0	160.49
32	1	76.983335	-19.21224	1199.8892	2403.991	0	160.61
33	1	78.55	-19.226105	1200.719	2400.9911	0	160.73
34	1	80.116665	-19.23997	1201.6125	2398.0551	0	160.85
35	1	81.683335	-19.253835	1202.4423	2395.0552	0	160.97
36	1	83.25	-19.2677	1203.3359	2392.1191	0	161.09
37	1	84.816665	-19.281565	1204.1656	2389.1831	0	161.21
38	1	86.383335	-19.29543	1205.0592	2386.1832	0	161.33
39	1	87.95	-19.30929	1205.889	2383.2471	0	161.46
40	1	89.516665	-19.323155	1206.7187	2380.2472	0	161.58

41	1	91.083335	-19.33702	1207.6123	2377.3112	0	161.7
42	1	92.65	-19.350885	1208.4421	2374.3113	0	161.82
43	1	94.216665	-19.36475	1209.3356	2371.3752	0	161.94
44	1	95.8125	-19.37887	1210.1677	2368.3375	0	162.07
45	1	97.4375	-19.39325	1211.0908	2365.2607	0	162.19
46	1	99.0625	-19.40763	1211.9523	2362.1839	0	162.32
47	1	100.6875	-19.42201	1212.8753	2359.1071	0	162.44
48	1	102.3125	-19.43639	1213.7368	2356.0303	0	162.57
49	1	103.9375	-19.45077	1214.6599	2352.9535	0	162.69
50	1	105.5625	-19.465155	1215.5214	2349.8767	0	162.82
51	1	107.1875	-19.47954	1216.4444	2346.7999	0	162.95
52	1	108.8125	-19.49392	1217.3059	2343.7231	0	163.07
53	1	110.4375	-19.5083	1218.2289	2340.6463	0	163.2
54	1	112.0625	-19.52268	1219.0904	2337.5695	0	163.32
55	1	113.6875	-19.53706	1219.952	2334.4927	0	163.45
56	1	115.3125	-19.55144	1220.875	2331.4159	0	163.58
57	1	116.9375	-19.56582	1221.7365	2328.3391	0	163.7
58	1	118.5625	-19.5802	1222.6595	2325.3238	0	163.83
59	1	120.1875	-19.59458	1223.521	2322.247	0	163.95
60	1	121.8125	-19.60896	1224.4441	2319.1702	0	164.08
61	1	123.4375	-19.62334	1225.3056	2316.0934	0	164.2
62	1	125.0625	-19.63772	1226.2286	2313.0166	0	164.33
63	1	126.6875	-19.6521	1227.0901	2309.9398	0	164.46
64	1	128.3125	-19.66648	1228.0132	2306.863	0	164.58
65	1	129.9375	-19.68086	1228.8747	2303.7862	0	164.71
66	1	131.5625	-19.69524	1229.7362	2300.7094	0	164.83
67	1	133.1875	-19.70962	1230.6592	2297.6326	0	164.96
68	1	134.8125	-19.724	1231.5207	2294.5558	0	165.09
69	1	136.4375	-19.738385	1232.4438	2291.479	0	165.21
70	1	138.0625	-19.75277	1233.3053	2288.4022	0	165.34
71	1	139.6875	-19.76715	1234.2283	2285.3254	0	165.46
72	1	141.3125	-19.78153	1235.0898	2282.2486	0	165.59
73	1	142.9375	-19.79591	1236.0129	2279.1718	0	165.71
74	1	144.5625	-19.81029	1236.8744	2276.095	0	165.84
75	1	146.1875	-19.82467	1237.7974	2273.0182	0	165.97
76	1	147.8125	-19.83905	1238.6589	2269.9414	0	166.09

77	1	149.4375	-19.85343	1239.5819	2266.8646	0	166.22
78	1	151.0625	-19.86781	1240.4435	2263.7878	0	166.34
79	1	152.6875	-19.88219	1241.305	2260.711	0	166.47
80	1	154.3125	-19.89657	1242.228	2257.6342	0	166.59
81	1	155.9375	-19.91095	1243.0895	2254.5574	0	166.72
82	1	157.5625	-19.92533	1244.0125	2251.4806	0	166.85
83	1	159.1875	-19.93971	1244.874	2248.4038	0	166.97
84	1	160.75	-19.95354	1245.751	2220.246	0	167.09
85	1	162.25	-19.966815	1246.551	2166.9814	0	167.21
86	1	163.75	-19.98009	1247.4176	2113.6502	0	167.33
87	1	165.25	-19.993365	1248.2176	2060.3856	0	167.44
88	1	167	-19.096775	1192.2621	2060.7077	0	159.6
89	1	168.10715	-18.096775	1129.8513	1912.6955	0	150.85
90	1	169.04465	-17.25	1077.0159	1836.2714	0	148.5
91	1	170.70535	-15.75	983.39924	1704.8506	0	145.5
92	1	172.36605	-14.25	889.7826	1573.4299	0	142.5
93	1	174.02675	-12.75	796.16596	1441.9644	0	139.5
94	1	175.6875	-11.25	702.59401	1310.5436	0	136.5
95	1	177.34825	-9.75	608.97737	1179.1228	0	133.5
96	1	179.00895	-8.25	515.36073	1047.702	0	130.5
97	1	180.66965	-6.75	421.75302	916.23657	0	127.5
98	1	182.33035	-5.25	328.14532	784.81578	0	124.5
99	1	183.99105	-3.75	234.53761	653.395	0	121.5
100	1	185.6541	-2.247915	140.80214	819.00261	0	600
101	1	187.31945	-0.7437451	46.932561	648.99907	0	600
102	1	188.97785	0.7541699	-46.544274	479.68732	0	600

PS Block TC (6)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 488
Last Edited By: Breen, Scott A MVN-Contractor
Date: 2/20/2009
Time: 12:50:35 PM
File Name: WBV-14c.2 Reach I Main Levee SWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 2/20/2009
Last Solved Time: 12:52:06 PM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

PS Block TC (6)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Fully-Specified
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Search for Tension Crack
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf

FOS Distribution

FOS Calculation Option: Constant

Advanced

Number of Slices: 100

Optimization Tolerance: 0.01

Minimum Slip Surface Depth: 0.1 ft

Optimization Maximum Iterations: 2000

Optimization Convergence Tolerance: 1e-007

Starting Optimization Points: 8

Ending Optimization Points: 16

Complete Passes per Insertion: 1

Driving Side Maximum Convex Angle: 15 °

Resisting Side Maximum Convex Angle: 10 °

Materials

Existing Levee

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 600 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 400 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb

Weight Fn: CH -18 to -58

Cohesion Spatial Fn: CH -18 to -58

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb

Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-450, -4.3) ft
Right Coordinate: (300, 1.5) ft

Fully Specified Slip Surfaces

Fully Specified Slip Surface 1

	X (ft)	Y (ft)
	-295	-6
	-269	-24
	24	-24
	66	17

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-450	-4.3
	-372	-4.3
	-344	-6.2
	-339.67059	-8.5
	-269.16	-8.5
	-267	-6.7
	-253	-4
	-225.5	-3
	-209	-2.4
	-197.4	-2.06552
	-184.2	-1.68491
	-148.9	-0.6
	-147	0.03333
	-46	2.3
	59.4	9.4
	300	9.4

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-450, 102)
Data Point: (-61, 102)
Data Point: (0, 103)
Data Point: (46, 102)
Data Point: (300, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-450, 84)
    Data Point: (-61, 84)
    Data Point: (0, 93)
    Data Point: (46, 84)
    Data Point: (300, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-450, 114)
    Data Point: (-61, 114)
    Data Point: (0, 108)
    Data Point: (46, 114)
    Data Point: (300, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-450, 102)
    Data Point: (-61, 102)
    Data Point: (0, 104)
    Data Point: (46, 102)
    Data Point: (300, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
    Data Point: (-450, -3, 120)

Data Point: (-61, -3, 120)
Data Point: (0, -3, 260)
Data Point: (46, -3, 120)
Data Point: (300, -3, 120)
Data Point: (-450, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (300, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-450, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (300, -18, 150)
Data Point: (-450, -58, 500)
Data Point: (-61, -58, 500)
Data Point: (0, -58, 500)
Data Point: (46, -58, 500)
Data Point: (300, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-450, -62, 580)
Data Point: (-61, -62, 580)
Data Point: (0, -62, 580)
Data Point: (46, -62, 580)
Data Point: (300, -62, 580)
Data Point: (-450, -104, 900)
Data Point: (-61, -104, 900)
Data Point: (0, -104, 900)
Data Point: (46, -104, 900)
Data Point: (300, -104, 900)

Regions

	Material	Points	Area (ft^2)
Region 1	CH -18 to -58	17,15,16,18	30000
Region 2	CH -3 to -18	19,16,15,1,2,3,39,4,5,6,40,7,8,38	10325.45
Region 3	Existing Levee	14,19,38,9,29,31,30,10,20,13,28,36	2049.8335

Region 4	Existing Levee	12,13,20,10,11,37,41,32,27	264.63142
Region 5	SM -58 to -62	18,22,21,17	3000
Region 6	CH -62 to -104	21,22,24,23	31500
Region 7	Compacted Fill	27,32,25,26,34,28,13,12	541.90858
Region 8	Compacted Fill	30,33,11,10	236.85
Region 9	Compacted Fill	35,36,28,34	287.1125

Points

	X (ft)	Y (ft)
Point 1	-450	-4.3
Point 2	-372	-4.3
Point 3	-344	-6.2
Point 4	-328	-14.7
Point 5	-305	-14.6
Point 6	-270	-9.2
Point 7	-267	-6.7
Point 8	-253	-4
Point 9	-209	-2.4
Point 10	-46	2.3
Point 11	-21.4	4.9
Point 12	22.6	4
Point 13	51.3	1.5
Point 14	300	1.5
Point 15	-450	-18
Point 16	300	-18
Point 17	-450	-58
Point 18	300	-58
Point 19	300	-3
Point 20	-40	1.5
Point 21	-450	-62
Point 22	300	-62
Point 23	-450	-104
Point 24	300	-104
Point 25	33	13.5
Point 26	43	13.5

Point 27	16.3	5.55806
Point 28	95	1.5
Point 29	-197.4	-2.06552
Point 30	-148.9	-0.6
Point 31	-184.2	-1.68491
Point 32	8.6	7.4
Point 33	-141.4	1.9
Point 34	71.5	6.4
Point 35	160	4.15
Point 36	168	1.5
Point 37	1	5.5
Point 38	-225.5	-3
Point 39	-339.67059	-8.5
Point 40	-269.16	-8.5
Point 41	5	6.5

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.51	(-115.236, 14.586)	124.0939	(55.4002, 10.4108)	(-284.871, -11.4943)
2	1	1.60	(-115.236, 14.586)	128.513	(58.1268, 9.73157)	(-286.664, -11.771)

Slices of Slip Surface: **Optimized**

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	-283.1101	-12.578615	254.5059	356.88861	0	139.16
2	Optimized	-279.58885	-14.74717	389.82325	558.41376	0	143.49
3	Optimized	-276.06755	-16.915725	525.14059	759.93891	0	147.83
4	Optimized	-272.15345	-19.32618	675.55184	1012.5963	0	161.6
5	Optimized	-269.58	-20.91101	774.44565	1201.1003	0	175.47
6	Optimized	-268.442	-21.611845	855.49905	1336.1984	0	181.6
7	Optimized	-267.362	-22.023095	937.34109	1324.1794	0	185.2
8	Optimized	-265.25	-21.84262	965.96546	1359.3604	0	183.62
9	Optimized	-261.75	-21.54354	989.42283	1385.5222	0	181.01

10	Optimized	-258.25	-21.244455	1012.8802	1411.6555	0	178.39
11	Optimized	-254.75	-20.94537	1036.3376	1437.8173	0	175.77
12	Optimized	-251.20305	-20.642275	1042.5428	1440.7912	0	173.12
13	Optimized	-247.6091	-20.335165	1031.5366	1420.5807	0	170.43
14	Optimized	-244.01515	-20.028055	1020.5304	1400.398	0	167.75
15	Optimized	-240.4212	-19.72094	1009.5241	1380.1876	0	165.06
16	Optimized	-236.82725	-19.413825	998.5179	1360.0048	0	162.37
17	Optimized	-233.2333	-19.106715	987.51166	1339.7944	0	159.68
18	Optimized	-229.95225	-18.91198	982.79155	1339.7784	0	157.98
19	Optimized	-226.9841	-18.82962	984.40809	1340.4183	0	157.26
20	Optimized	-223.93455	-18.745005	986.04518	1342.5782	0	156.52
21	Optimized	-220.80365	-18.65813	987.73733	1346.2179	0	155.76
22	Optimized	-217.67275	-18.571255	989.39756	1349.8577	0	155
23	Optimized	-214.33045	-18.66611	1002.92	1390.8403	0	155.83
24	Optimized	-210.7768	-18.942695	1028.2259	1433.6246	0	158.25
25	Optimized	-207.3189	-19.21183	1052.085	1473.8679	0	160.6
26	Optimized	-203.9567	-19.47351	1074.473	1511.5568	0	162.89
27	Optimized	-200.59455	-19.73519	1096.8313	1549.2456	0	165.18
28	Optimized	-198.15675	-19.904815	1111.8252	1569.5153	0	166.67
29	Optimized	-195.75	-20.02816	1123.8281	1589.8528	0	167.75
30	Optimized	-192.45	-20.197285	1140.3216	1617.7556	0	169.23
31	Optimized	-189.15	-20.366415	1156.8151	1645.6281	0	170.71
32	Optimized	-185.85	-20.535545	1173.3086	1673.5309	0	172.19
33	Optimized	-182.63985	-20.70007	1189.5488	1700.9786	0	173.63
34	Optimized	-179.51955	-20.859985	1205.4879	1727.9919	0	175.02
35	Optimized	-176.3993	-21.0199	1221.4591	1755.0053	0	176.42
36	Optimized	-173.27905	-21.17982	1237.4303	1782.0187	0	177.82
37	Optimized	-170.08895	-21.519915	1264.7621	1850.5072	0	180.8
38	Optimized	-166.8291	-22.040185	1303.4766	1915.6977	0	185.35
39	Optimized	-163.5693	-22.560455	1342.191	1980.9185	0	189.9
40	Optimized	-160.30945	-23.080725	1380.9054	2046.1392	0	194.46
41	Optimized	-157.0496	-23.60099	1419.6199	2111.36	0	199.01
42	Optimized	-153.78975	-24.121255	1458.3343	2176.5808	0	203.56
43	Optimized	-150.5299	-24.641525	1497.079	2241.8016	0	208.11
44	Optimized	-147.95	-25.05328	1545.6491	2325.2563	0	211.72
45	Optimized	-146.119	-25.345505	1584.8596	2423.3029	0	214.27

46	Optimized	-143.319	-25.15759	1577.067	2421.4189	0	212.63
47	Optimized	-139.7707	-24.550145	1544.1364	2434.6237	0	207.31
48	Optimized	-136.51205	-23.99229	1513.8889	2387.4678	0	202.43
49	Optimized	-133.2534	-23.434435	1483.6414	2340.3119	0	197.55
50	Optimized	-129.99475	-22.87658	1453.3938	2293.1863	0	192.67
51	Optimized	-126.7361	-22.318725	1423.1463	2246.0304	0	187.79
52	Optimized	-123.31695	-21.8646	1399.6083	2226.3728	0	183.82
53	Optimized	-119.73725	-21.5142	1382.7322	2200.6833	0	180.75
54	Optimized	-116.15755	-21.1638	1365.8838	2175.0215	0	177.68
55	Optimized	-112.57785	-20.8134	1349.0355	2149.332	0	174.62
56	Optimized	-108.99815	-20.463	1332.1871	2123.6702	0	171.55
57	Optimized	-105.41845	-20.1126	1315.3388	2098.0084	0	168.49
58	Optimized	-101.9143	-19.947425	1309.9479	2112.7919	0	167.04
59	Optimized	-98.4857	-19.967475	1315.9852	2124.2832	0	167.22
60	Optimized	-95.057085	-19.987525	1322.0517	2135.7453	0	167.39
61	Optimized	-91.628455	-20.00758	1328.089	2147.2366	0	167.57
62	Optimized	-88.199825	-20.027635	1334.1554	2158.7279	0	167.74
63	Optimized	-84.7712	-20.047685	1340.1927	2170.2191	0	167.92
64	Optimized	-81.342575	-20.067735	1346.2592	2181.6813	0	168.09
65	Optimized	-77.925825	-20.20464	1359.5727	2220.1571	0	169.29
66	Optimized	-74.52096	-20.458405	1380.1918	2255.7133	0	171.51
67	Optimized	-71.116095	-20.712175	1400.7817	2291.2696	0	173.73
68	Optimized	-67.71123	-20.96594	1421.4008	2326.8258	0	175.95
69	Optimized	-64.3414	-21.31506	1447.8831	2385.8519	0	179.01
70	Optimized	-61.0066	-21.75954	1480.3119	2441.1979	0	182.9
71	Optimized	-57.6718	-22.204015	1512.711	2504.8071	0	192.16
72	Optimized	-54.337	-22.64849	1545.1101	2568.5055	0	201.29
73	Optimized	-51.0022	-23.09297	1577.5092	2632.2039	0	210.3
74	Optimized	-47.6674	-23.53745	1609.9083	2695.9321	0	219.17
75	Optimized	-44.5	-23.959615	1644.9201	2756.4901	0	227.47
76	Optimized	-41.5	-24.35947	1682.4548	2813.9156	0	235.22
77	Optimized	-38.36838	-24.77687	1721.667	2873.8495	0	243.19
78	Optimized	-35.105135	-25.21181	1762.5224	2936.3324	0	251.38
79	Optimized	-31.84189	-25.64675	1803.3778	2998.8457	0	259.44
80	Optimized	-28.57865	-26.08169	1844.2332	3061.2679	0	267.37
81	Optimized	-25.560275	-26.44492	1879.5945	3105.8239	0	274.31

82	Optimized	-22.78676	-26.736435	1909.4641	3150.7537	0	280.3
83	Optimized	-19.8	-27.050365	1941.5861	3199.5629	0	286.68
84	Optimized	-16.6	-27.38671	1976.0215	3251.7753	0	293.41
85	Optimized	-13.4	-27.72305	2010.4568	3304.2985	0	300.05
86	Optimized	-10.2	-28.059395	2044.9232	3356.8217	0	306.59
87	Optimized	-7	-28.39574	2079.3585	3409.6556	0	313.03
88	Optimized	-3.8	-28.73208	2113.7938	3462.1788	0	319.38
89	Optimized	-0.6	-29.06842	2148.2291	3514.702	0	325.63
90	Optimized	1.61806	-29.301555	2172.1273	3556.9208	0	325.03
91	Optimized	3.61806	-29.05944	2165.4056	3455.7344	0	320.1
92	Optimized	6.8	-28.35238	2134.6556	3461.4058	0	310.06
93	Optimized	10.919185	-27.437055	2094.8503	3469.2137	0	296.67
94	Optimized	14.769185	-26.58155	2057.6456	3476.7049	0	283.75
95	Optimized	17.875	-25.89141	2027.6234	3482.6728	0	273.04
96	Optimized	21.025	-25.19145	1997.1911	3488.8708	0	261.91
97	Optimized	23.036255	-24.74453	1977.7543	3492.9847	0	254.67
98	Optimized	25.47702	-22.985695	1878.2684	3189.5268	0	236.58
99	Optimized	29.486035	-19.6619	1687.7225	2973.6913	0	202.39
100	Optimized	32.24527	-17.37427	1556.5808	2833.1698	0	182.01
101	Optimized	34.666665	-15.36674	1441.4897	2684.5483	0	173.13
102	Optimized	38	-12.60314	1283.0358	2455.909	0	160.21
103	Optimized	41.333335	-9.839538	1124.6049	2230.9649	0	146.49
104	Optimized	43.65807	-7.912143	1014.1245	2059.074	0	136.45
105	Optimized	46.20725	-5.183275	854.5492	1723.5873	0	124.37
106	Optimized	49.69918	-1.1518644	617.65823	935.83279	0	600
107	Optimized	51.648085	1.0981356	485.45351	650.7479	0	600
108	Optimized	53.69819	3.464967	346.37928	479.57249	0	400

Slices of Slip Surface: 1

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	1	-285.1645	-12.80919	268.89333	374.58923	0	139.62
2	1	-282.16535	-14.885515	398.4671	567.03774	0	143.77
3	1	-279.16625	-16.96184	528.02716	759.48624	0	147.92
4	1	-275.75	-19.326925	675.60611	1007.6931	0	161.61

5	1	-271.91665	-21.98077	841.20994	1311.6398	0	184.83
6	1	-269.58	-23.59846	942.1441	1503.9265	0	198.99
7	1	-269.08	-23.944615	967.92577	1554.5599	0	202.02
8	1	-268	-24	1027.5	1497.25	0	202.5
9	1	-265.25	-24	1100.5714	1595.6286	0	202.5
10	1	-261.75	-24	1142.7143	1652.3143	0	202.5
11	1	-258.25	-24	1184.8286	1709.0286	0	202.5
12	1	-254.75	-24	1226.9429	1765.7143	0	202.5
13	1	-251.28125	-24	1251.8982	1799.3018	0	202.5
14	1	-247.84375	-24	1259.6945	1809.8036	0	202.5
15	1	-244.40625	-24	1267.4909	1820.3055	0	202.5
16	1	-240.96875	-24	1275.2873	1830.8073	0	202.5
17	1	-237.53125	-24	1283.1127	1841.3091	0	202.5
18	1	-234.09375	-24	1290.9091	1851.8109	0	202.5
19	1	-230.65625	-24	1298.7055	1862.3127	0	202.5
20	1	-227.21875	-24	1306.5018	1872.8145	0	202.5
21	1	-223.85	-24	1314.1515	1884.6667	0	202.5
22	1	-220.55	-24	1321.6364	1897.8788	0	202.5
23	1	-217.25	-24	1329.1212	1911.0606	0	202.5
24	1	-213.95	-24	1336.6061	1924.2727	0	202.5
25	1	-210.65	-24	1344.0909	1937.4545	0	202.5
26	1	-207.06665	-24	1351.3188	1950.2067	0	202.5
27	1	-203.2	-24	1358.2757	1962.4653	0	202.5
28	1	-199.33335	-24	1365.2326	1974.724	0	202.5
29	1	-195.75	-24	1371.6667	1986.0909	0	202.5
30	1	-192.45	-24	1377.6061	1996.5455	0	202.5
31	1	-189.15	-24	1383.5455	2007.0303	0	202.5
32	1	-185.85	-24	1389.4848	2017.4848	0	202.5
33	1	-182.435	-24	1395.8357	2028.6969	0	202.5
34	1	-178.905	-24	1402.6062	2040.6232	0	202.5
35	1	-175.375	-24	1409.3768	2052.5496	0	202.5
36	1	-171.845	-24	1416.1473	2064.5042	0	202.5
37	1	-168.315	-24	1422.9178	2076.4306	0	202.5
38	1	-164.785	-24	1429.6884	2088.3569	0	202.5
39	1	-161.255	-24	1436.4589	2100.2833	0	202.5
40	1	-157.725	-24	1443.2295	2112.238	0	202.5

41	1	-154.195	-24	1450	2124.1643	0	202.5
42	1	-150.665	-24	1456.7705	2136.0907	0	202.5
43	1	-147.95	-24	1479.8947	2176.8947	0	202.5
44	1	-145.6	-24	1501.6429	2263.0714	0	202.5
45	1	-142.8	-24	1505.5714	2365.75	0	202.5
46	1	-139.69645	-24	1509.9161	2421.7357	0	202.5
47	1	-136.2893	-24	1514.6708	2431.1278	0	202.5
48	1	-132.88215	-24	1519.4549	2440.4905	0	202.5
49	1	-129.475	-24	1524.2096	2449.8531	0	202.5
50	1	-126.06785	-24	1528.9936	2459.2158	0	202.5
51	1	-122.6607	-24	1533.7777	2468.6079	0	202.5
52	1	-119.25355	-24	1538.5324	2477.9705	0	202.5
53	1	-115.84645	-24	1543.3165	2487.3332	0	202.5
54	1	-112.4393	-24	1548.0712	2496.6959	0	202.5
55	1	-109.03215	-24	1552.8553	2506.0879	0	202.5
56	1	-105.625	-24	1557.61	2515.4506	0	202.5
57	1	-102.21785	-24	1562.3941	2524.8133	0	202.5
58	1	-98.81072	-24	1567.1781	2534.176	0	202.5
59	1	-95.40357	-24	1571.9328	2543.568	0	202.5
60	1	-91.99643	-24	1576.7169	2552.9307	0	202.5
61	1	-88.589285	-24	1581.4716	2562.2934	0	202.5
62	1	-85.18214	-24	1586.2557	2571.6561	0	202.5
63	1	-81.775	-24	1591.0104	2581.0481	0	202.5
64	1	-78.36786	-24	1595.7945	2590.4108	0	202.5
65	1	-74.960715	-24	1600.5492	2599.7735	0	202.5
66	1	-71.55357	-24	1605.3333	2609.1362	0	202.5
67	1	-68.14643	-24	1610.1173	2618.4988	0	202.5
68	1	-64.739285	-24	1614.872	2627.8909	0	202.5
69	1	-61.33214	-24	1619.6561	2637.2536	0	202.5
70	1	-57.925	-24	1624.4108	2653.8657	0	207.21
71	1	-54.51786	-24	1629.1949	2671.2703	0	212.44
72	1	-51.110715	-24	1633.9496	2688.6749	0	217.66
73	1	-47.70357	-24	1638.7337	2706.0796	0	222.88
74	1	-44.5	-24	1647.4333	2722.4333	0	227.79
75	1	-41.5	-24	1660.0333	2737.7667	0	232.39
76	1	-38.14	-24	1674.1667	2754.8387	0	237.54

77	1	-34.42	-24	1689.7849	2773.9247	0	243.24
78	1	-30.7	-24	1705.4301	2793.0108	0	248.94
79	1	-26.98	-24	1721.0753	2811.828	0	254.65
80	1	-23.26	-24	1736.6935	2830.914	0	260.35
81	1	-19.533335	-24	1752.3752	2850.2681	0	266.06
82	1	-15.8	-24	1768.0716	2870.0895	0	271.78
83	1	-12.066665	-24	1783.768	2889.911	0	277.5
84	1	-8.3333335	-24	1799.4377	2909.7324	0	283.23
85	1	-4.6	-24	1815.1341	2929.5538	0	288.95
86	1	-0.8666665	-24	1830.8305	2949.3753	0	294.67
87	1	3	-24	1847.075	3002.5	0	289.9
88	1	6.8	-24	1863.0556	3095	0	282.18
89	1	10.919185	-24	1880.3788	3195.5164	0	273.81
90	1	14.769185	-24	1896.5739	3289.4286	0	265.98
91	1	17.875	-24	1909.619	3365.0794	0	259.67
92	1	21.025	-24	1922.8571	3441.9048	0	253.26
93	1	23.3	-24	1932.4286	3497.2857	0	248.64
94	1	25.536585	-22.5	1848.2117	3111.2825	0	232.8
95	1	28.609755	-19.5	1673.9268	2906.1455	0	203.15
96	1	31.57317	-16.607145	1505.8697	2724.7232	0	182.59
97	1	34.666665	-13.587305	1330.4527	2512.3093	0	170.45
98	1	38	-10.333334	1141.4123	2247.4038	0	156.46
99	1	41.333335	-7.079365	952.37196	1987.0707	0	141.53
100	1	44.2561	-4.2261905	786.61479	1729.6638	0	127.67
101	1	47.817075	-0.75	584.67522	1039.6555	0	600
102	1	52.147285	3.477111	339.10875	592.62769	0	400
103	1	56.149695	7.384227	112.12208	77.055991	0	400

HWL Block TC (2)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 559
Last Edited By: Breen, Scott A MVN-Contractor
Date: 3/26/2009
Time: 10:10:05 AM
File Name: WBV-14c.2 Reach II Nonreinforced Levee HWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 3/26/2009
Last Solved Time: 10:10:51 AM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

HWL Block TC (2)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Tension Crack Line
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf
FOS Distribution
FOS Calculation Option: Constant
Restrict Block Crossing: Yes
Advanced
Number of Slices: 100
Optimization Tolerance: 0.01
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 3000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 10 °
Resisting Side Maximum Convex Angle: 5 °

Materials

Existing Levee

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion: 600 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion: 400 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb
Weight Fn: CH -18 to -58
Cohesion Spatial Fn: CH -18 to -58
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb
Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

Uncompacted Fill

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion: 150 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-221.8, 1.8) ft
Right Coordinate: (467, -6.2) ft

Slip Surface Block

Left Grid
    Upper Left: (-190, -18) ft
    Lower Left: (-190, -58) ft
    Lower Right: (-30, -58) ft

X Increments: 5
Y Increments: 5
Starting Angle: 135 °
Ending Angle: 180 °
Angle Increments: 4

Right Grid

Upper Left: (-15, -18) ft
Lower Left: (-15, -58) ft
Lower Right: (50, -58) ft
X Increments: 5
Y Increments: 5
Starting Angle: 45 °
Ending Angle: 55 °
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-221.8	-1.4
	-202.9	-1.4
	-190.4	-0.4
	-164.3	0.8
	-148.1	1.27268
	-134.5	1.7695
	-126.6	1.9
	-120.3	1.99618
	-86.9	2.3
	-71.6	3.9051
	-9	5.5
	35	14
	467	14

Tension Crack Line

	X (ft)	Y (ft)
	25	13

	35	13
	58.85	7

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 102)
Data Point: (-61, 102)
Data Point: (0, 103)
Data Point: (46, 102)
Data Point: (467, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 84)
Data Point: (-61, 84)
Data Point: (0, 93)
Data Point: (46, 84)
Data Point: (467, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 114)
Data Point: (-61, 114)
Data Point: (0, 108)
Data Point: (46, 114)
Data Point: (467, 114)

CH -62 to -104

Model: Spline Data Point Function

Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (467, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-221.8, -3, 120)
Data Point: (-61, -3, 120)
Data Point: (0, -3, 260)
Data Point: (46, -3, 120)
Data Point: (467, -3, 120)
Data Point: (-221.8, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (467, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-221.8, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (467, -18, 150)
Data Point: (-221.8, -58, 500)
Data Point: (-61, -58, 500)
Data Point: (0, -58, 500)
Data Point: (46, -58, 500)
Data Point: (467, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values

Data Points: X (ft), Y (ft), Cohesion (psf)

Data Point: (-221.8, -62, 580)
Data Point: (-61, -62, 580)
Data Point: (0, -62, 580)
Data Point: (46, -62, 580)
Data Point: (467, -62, 580)
Data Point: (-221.8, -104, 900)
Data Point: (-61, -104, 900)
Data Point: (0, -104, 900)
Data Point: (46, -104, 900)
Data Point: (467, -104, 900)

Regions

	Material	Points	Area
Region 1	CH -18 to -58	3,1,2,4	27552
Region 2	SM -58 to -62	4,6,5,3	2755.
Region 3	CH -62 to -104	5,6,8,7	28929.
Region 4	CH -3 to -18	29,39,1,2,38,37,36,35,34,51,33,41,32,31,30,43	9177.
Region 5	Existing Levee	9,10,11,12,13,40,48,14,49,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,39	1606.
Region 6	Uncompacted Fill	42,26,27,28,29,43,30,31,32,41,33,51,34,35,53	920.
Region 7	Compacted Fill	50,47,46,45,44,52,53,42,26,25,24,23,22,21,20,19,18,17,16,15	1547.

Points

	X (ft)	Y (ft)
Point 1	-221.8	-18
Point 2	467	-18
Point 3	-221.8	-58
Point 4	467	-58
Point 5	-221.8	-62
Point 6	467	-62
Point 7	-221.8	-104

Point 8	467	-104
Point 9	-221.8	1.8
Point 10	-215.5	0.3
Point 11	-202.9	-1.4
Point 12	-190.4	-0.4
Point 13	-164.3	0.8
Point 14	-126.6	1.9
Point 15	-86.9	2.3
Point 16	-37.6	3.1
Point 17	-12.4	4
Point 18	-8.9	5.3
Point 19	1	5.5
Point 20	2.1	5.4
Point 21	17.8	3.1
Point 22	48.2	2.8
Point 23	55.6	2.5
Point 24	61.8	0.5
Point 25	70.3	0.2
Point 26	83.9	-0.1
Point 27	88.1	-1.9
Point 28	97.3	-1.8
Point 29	105.9	-3.3
Point 30	148.1	-4.1
Point 31	155.5	-3.9
Point 32	173.4	-5.8
Point 33	209	-6.2
Point 34	263.6	-7
Point 35	280.5	-5.7
Point 36	335.6	-6.6
Point 37	415.3	-7.3
Point 38	467	-6.2
Point 39	-221.8	-3
Point 40	-148.1	1.27268
Point 41	187.9	-5.6
Point 42	162.4	0
Point 43	144.7	-4.03555

Point 44	58.85	8
Point 45	35	14
Point 46	25	14
Point 47	-5	6.5
Point 48	-134.5	1.7695
Point 49	-120.3	1.99618
Point 50	-71.6	3.9051
Point 51	224.7	-6.43004
Point 52	250.8	1.6
Point 53	257.4	0

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.45	(-31.977, 9.965)	67.17978	(54.8427, 9.00813)	(-106.886, 2.1182)
2	2621	1.57	(-31.977, 9.965)	71.62	(53.3769, 9.37688)	(-116.976, 2.02642)

Slices of Slip Surface: Optimized

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	-105.945	1.2467683	54.90961	507.15478	0	600
2	Optimized	-104.0624	-0.4960872	164.73273	706.72687	0	600
3	Optimized	-102.1798	-2.238943	274.55584	906.29896	0	600
4	Optimized	-100.32701	-3.954218	382.6402	755.507	0	121.91
5	Optimized	-98.504	-5.6419125	488.99244	905.85165	0	125.28
6	Optimized	-96.82874	-6.9974	574.52134	995.17343	0	127.99
7	Optimized	-95.30124	-8.0206805	639.24542	1085.624	0	130.04
8	Optimized	-93.77374	-9.043961	703.96949	1176.0745	0	132.09
9	Optimized	-92.246245	-10.067241	768.69356	1266.5794	0	134.13
10	Optimized	-90.71875	-11.09052	833.41764	1357.03	0	136.18
11	Optimized	-89.19125	-12.1138	898.14171	1447.4805	0	138.23
12	Optimized	-87.66375	-13.13708	962.86579	1537.931	0	140.27
13	Optimized	-85.79878	-14.386435	1048.4476	1660.2621	0	142.77
14	Optimized	-83.76335	-15.554725	1134.6817	1752.3794	0	145.11

15	Optimized	-81.894935	-16.41587	1200.6414	1848.3296	0	146.83
16	Optimized	-80.02652	-17.277015	1266.6011	1944.2799	0	148.55
17	Optimized	-78.518295	-17.853795	1312.5041	1976.6486	0	149.71
18	Optimized	-77.151245	-18.20199	1343.1204	2026.1977	0	151.77
19	Optimized	-75.565175	-18.60597	1378.7407	2086.9292	0	155.3
20	Optimized	-73.979105	-19.009955	1414.2998	2147.6608	0	158.84
21	Optimized	-72.393035	-19.41394	1449.92	2208.3923	0	162.37
22	Optimized	-70.7969	-19.820485	1481.763	2263.6706	0	165.93
23	Optimized	-69.190695	-20.229595	1509.8176	2313.4448	0	169.51
24	Optimized	-67.58449	-20.638705	1537.9325	2363.219	0	173.09
25	Optimized	-65.97829	-21.047815	1565.987	2412.9932	0	176.67
26	Optimized	-64.37209	-21.456925	1594.1019	2462.7071	0	180.25
27	Optimized	-62.765885	-21.866035	1622.1565	2512.4813	0	183.83
28	Optimized	-61.15968	-22.275145	1650.2713	2562.2555	0	187.41
29	Optimized	-59.55348	-22.684255	1678.3259	2615.8306	0	193.29
30	Optimized	-57.82958	-23.12528	1708.5701	2674.4071	0	199.83
31	Optimized	-55.987985	-23.598225	1741.0206	2736.6785	0	206.76
32	Optimized	-54.14639	-24.07117	1773.4711	2799.0024	0	213.61
33	Optimized	-52.431165	-24.475625	1801.4351	2842.148	0	219.61
34	Optimized	-50.842315	-24.811595	1824.896	2888.146	0	224.8
35	Optimized	-49.253465	-25.147565	1848.4184	2934.2056	0	229.94
36	Optimized	-47.664615	-25.483535	1871.8792	2980.2036	0	235.03
37	Optimized	-46.075765	-25.81951	1895.4016	3026.2632	0	240.07
38	Optimized	-44.486915	-26.155485	1918.8625	3072.2612	0	245.07
39	Optimized	-42.898065	-26.491455	1942.3849	3118.3208	0	250.01
40	Optimized	-41.309215	-26.827425	1965.8457	3164.3804	0	254.91
41	Optimized	-39.786095	-27.12451	1986.8386	3196.2246	0	259.37
42	Optimized	-38.3287	-27.382705	2005.2835	3233.1142	0	263.39
43	Optimized	-36.85703	-27.643425	2023.8834	3270.4053	0	267.42
44	Optimized	-35.37109	-27.90668	2042.6366	3308.0442	0	271.45
45	Optimized	-33.88515	-28.169935	2061.456	3345.683	0	275.45
46	Optimized	-32.39921	-28.433185	2080.2092	3383.3219	0	279.41
47	Optimized	-30.81411	-28.695425	2099.1014	3414.8167	0	283.46
48	Optimized	-29.12985	-28.956655	2118.111	3453.5401	0	287.6
49	Optimized	-27.445595	-29.217885	2137.062	3492.3222	0	291.7
50	Optimized	-25.76134	-29.479115	2156.0717	3531.0456	0	295.75

51	Optimized	-24.07708	-29.740345	2175.0227	3569.8277	0	299.77
52	Optimized	-22.39282	-30.001575	2194.0324	3608.6097	0	303.74
53	Optimized	-20.70856	-30.262805	2212.9834	3647.3918	0	307.68
54	Optimized	-19.024305	-30.524035	2231.9344	3686.1739	0	311.58
55	Optimized	-17.34005	-30.785265	2250.944	3724.9559	0	315.44
56	Optimized	-15.65579	-31.046495	2269.895	3763.7967	0	319.26
57	Optimized	-13.60683	-31.30277	2289.1496	3786.9394	0	323.44
58	Optimized	-11.55	-31.516935	2305.8277	3823.2123	0	327.31
59	Optimized	-9.85	-31.693945	2319.5769	3853.2265	0	330.48
60	Optimized	-8.95	-31.787655	2327.3185	3869.0837	0	332.15
61	Optimized	-7.925	-31.89438	2346.392	3887.2414	0	334.04
62	Optimized	-5.975	-32.09742	2382.5554	3921.6706	0	337.61
63	Optimized	-4.2752585	-32.274405	2414.0889	3968.5862	0	340.69
64	Optimized	-2.825775	-32.42533	2440.9876	4027.9417	0	343.29
65	Optimized	-1.3762915	-32.576255	2467.8863	4087.2972	0	345.88
66	Optimized	0.174225	-32.538195	2484.158	4039.6285	0	346.96
67	Optimized	1.55	-32.349055	2488.9539	4053.7814	0	343.72
68	Optimized	3.038	-32.14449	2494.1317	4069.0309	0	340.17
69	Optimized	4.914	-31.886585	2500.6271	4088.3587	0	335.65
70	Optimized	6.79	-31.628675	2507.1753	4107.6865	0	331.07
71	Optimized	8.568854	-31.16645	2499.7499	4012.8669	0	325.25
72	Optimized	10.250564	-30.499915	2478.4672	3987.383	0	318.15
73	Optimized	11.93227	-29.83338	2457.1292	3961.9543	0	310.91
74	Optimized	13.613975	-29.166845	2435.7912	3936.6914	0	303.53
75	Optimized	15.295685	-28.50031	2414.5085	3911.4286	0	296.03
76	Optimized	16.96827	-27.602315	2378.6196	3773.9809	0	286.78
77	Optimized	18.5121	-26.55409	2331.7957	3710.1001	0	276.52
78	Optimized	19.9363	-25.58709	2288.6347	3651.2548	0	266.89
79	Optimized	21.3605	-24.62009	2245.4738	3592.6418	0	257.09
80	Optimized	22.7847	-23.65309	2202.3128	3534.087	0	247.13
81	Optimized	24.2484	-22.42703	2143.4355	3369.7364	0	234.99
82	Optimized	25.93233	-20.76335	2059.9234	3230.0301	0	218.85
83	Optimized	27.796985	-18.921115	1967.4471	3053.5851	0	200.59
84	Optimized	29.513145	-17.22559	1882.3506	2899.6694	0	188.43
85	Optimized	31.08082	-15.67677	1804.5735	2768.846	0	182.54
86	Optimized	32.648495	-14.12795	1726.8418	2639.0662	0	176.43

87	Optimized	34.216165	-12.57913	1649.1101	2510.3756	0	170.11
88	Optimized	35.63254	-11.179785	1571.215	2387.581	0	164.23
89	Optimized	36.89762	-9.929915	1493.2222	2270.395	0	158.82
90	Optimized	38.26073	-8.5472025	1406.9494	2133.6761	0	152.78
91	Optimized	39.72187	-7.0316475	1312.3737	1994.639	0	146.07
92	Optimized	41.18301	-5.5160925	1217.7981	1856.5519	0	139.17
93	Optimized	42.64415	-4.0005375	1123.2224	1719.4623	0	132.07
94	Optimized	44.148725	-2.43993	1025.8461	1241.507	0	600
95	Optimized	45.74205	-0.84047089	926.04787	1080.7173	0	600
96	Optimized	47.380685	0.75278711	826.63938	891.61368	0	600
97	Optimized	48.81736	2.14968	739.48305	725.77924	0	600
98	Optimized	50.336045	3.626309	647.30261	675.77994	0	400
99	Optimized	52.138695	5.379039	537.96713	467.68856	0	400
100	Optimized	53.941345	7.131769	428.59188	253.65512	0	400

Slices of Slip Surface: 2621

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	2621	-116.0902	1.659726	23.384492	214.35045	0	600
2	2621	-114.31965	0.9263359	70.150868	297.92725	0	600
3	2621	-112.5491	0.1929457	116.91985	381.50405	0	600
4	2621	-110.7785	-0.5404445	163.68884	465.08085	0	600
5	2621	-109.00795	-1.2738348	210.45782	548.6733	0	600
6	2621	-107.2374	-2.007225	257.22681	632.21357	0	600
7	2621	-105.46685	-2.740615	303.99579	715.80602	0	600
8	2621	-103.6975	-3.473507	350.72997	651.9364	0	120.95
9	2621	-101.9293	-4.205901	397.43719	716.5187	0	122.41
10	2621	-100.16115	-4.938295	444.14441	781.15325	0	123.88
11	2621	-98.39301	-5.6706885	490.8464	845.78781	0	125.34
12	2621	-96.624855	-6.403082	537.55884	910.42236	0	126.81
13	2621	-94.8567	-7.135476	584.27128	975.05691	0	128.27
14	2621	-93.088545	-7.86787	630.98373	1039.6392	0	129.74
15	2621	-91.32039	-8.600264	677.64392	1104.2738	0	131.2
16	2621	-89.552235	-9.3326575	724.35636	1168.9083	0	132.67
17	2621	-87.78408	-10.065052	771.0688	1233.5429	0	134.13

18	2621	-86.05	-10.78333	821.98094	1305.9851	0	135.57
19	2621	-84.35	-11.48749	877.03328	1386.3082	0	136.97
20	2621	-82.65	-12.191655	932.08563	1466.577	0	138.38
21	2621	-80.95	-12.89582	987.19231	1546.8458	0	139.79
22	2621	-79.25	-13.59998	1042.2447	1627.169	0	141.2
23	2621	-77.55	-14.304145	1097.297	1707.4378	0	142.61
24	2621	-75.85	-15.00831	1152.3493	1787.761	0	144.02
25	2621	-74.15	-15.71247	1207.456	1868.0298	0	145.42
26	2621	-72.45	-16.416635	1262.5084	1948.353	0	146.83
27	2621	-70.856855	-17.07654	1310.4584	2018.1507	0	148.15
28	2621	-69.370565	-17.69218	1351.2354	2077.3893	0	149.38
29	2621	-67.765545	-18.357	1395.2424	2148.6047	0	153.12
30	2621	-66.0418	-19.071	1442.5687	2231.7875	0	159.37
31	2621	-64.318055	-19.785	1489.8415	2314.9168	0	165.62
32	2621	-62.59431	-20.498995	1537.1142	2398.0997	0	171.87
33	2621	-60.870565	-21.21299	1584.4405	2481.6041	0	178.33
34	2621	-59.146815	-21.92699	1631.7133	2569.5035	0	187.37
35	2621	-57.42307	-22.64099	1679.0396	2657.4029	0	196.31
36	2621	-55.699325	-23.35499	1726.3123	2745.3023	0	205.14
37	2621	-53.97558	-24.06899	1773.585	2833.2553	0	213.85
38	2621	-52.251835	-24.78299	1820.9114	2921.2084	0	222.45
39	2621	-50.52809	-25.49699	1868.1841	3009.1078	0	230.94
40	2621	-48.804345	-26.210985	1915.5104	3097.0608	0	239.32
41	2621	-47.0806	-26.92498	1962.7832	3185.0674	0	247.59
42	2621	-45.356855	-27.63898	2010.0559	3273.0204	0	255.75
43	2621	-43.63311	-28.35298	2057.3822	3360.9734	0	263.8
44	2621	-41.909365	-29.06698	2104.655	3448.98	0	271.74
45	2621	-40.18562	-29.78098	2151.9277	3536.9866	0	279.56
46	2621	-38.461875	-30.49498	2199.254	3624.9932	0	287.28
47	2621	-36.65	-31.24548	2248.9661	3717.4971	0	295.27
48	2621	-34.75	-32.032485	2301.0924	3814.5044	0	303.51
49	2621	-32.85	-32.81949	2353.2186	3911.5118	0	311.63
50	2621	-30.95	-33.606495	2405.3449	4008.5678	0	319.6
51	2621	-29.12	-34	2432.8409	3923.0682	0	324.49
52	2621	-27.36	-34	2435.625	3934.9432	0	326.4
53	2621	-25.6	-34	2438.4091	3946.875	0	328.3

54	2621	-23.84	-34	2441.1932	3958.8068	0	330.21
55	2621	-22.08	-34	2443.9773	3970.7386	0	332.11
56	2621	-20.32	-34	2446.8182	3982.6705	0	334.01
57	2621	-18.56	-34	2449.6023	3994.6023	0	335.92
58	2621	-16.8	-34	2452.3864	4006.5341	0	337.82
59	2621	-15.04	-34	2455.1705	4018.4659	0	339.73
60	2621	-13.28	-34	2458.0114	4030.3409	0	341.63
61	2621	-11.55	-34	2460.7647	4042.0588	0	343.5
62	2621	-9.85	-34	2463.4706	4053.5882	0	345.34
63	2621	-8.95	-34	2465.4	4059.7	0	346.32
64	2621	-7.925	-34	2477.7436	4066.6154	0	347.43
65	2621	-5.975	-34	2501.2821	4079.8462	0	349.54
66	2621	-4.25	-34	2522.0667	4108.9333	0	351.4
67	2621	-2.75	-34	2540.1333	4153.8667	0	353.02
68	2621	-1.25	-34	2558.2	4198.8667	0	354.65
69	2621	0.25	-34	2576.3333	4242.4	0	355.64
70	2621	1.55	-34	2592	4273.9091	0	353.78
71	2621	2.99	-34	2609.3258	4308.8202	0	351.71
72	2621	4.77	-34	2630.7865	4351.9663	0	349.16
73	2621	6.55	-34	2652.2472	4395.1685	0	346.6
74	2621	8.33	-34	2673.7079	4438.3146	0	344.05
75	2621	10.11	-34	2695.1685	4481.4607	0	341.49
76	2621	11.85	-33.15	2663.089	4090.8208	0	333.3
77	2621	13.55	-31.45	2577.5291	3970.1551	0	319.19
78	2621	15.25	-29.75	2491.9275	3849.7806	0	304.74
79	2621	16.95	-28.05	2406.326	3729.7388	0	289.95
80	2621	18.7	-26.3	2318.25	3606.5202	0	274.36
81	2621	20.5	-24.5	2227.6224	3480.1444	0	257.94
82	2621	22.3	-22.7	2136.9949	3354.1223	0	241.14
83	2621	24.1	-20.9	2046.3674	3228.493	0	223.95
84	2621	26	-19	1950.6956	3069.6567	0	205.38
85	2621	27.8	-17.2	1860.0883	2905.2362	0	192.55
86	2621	29.4	-15.6	1779.5224	2769.3833	0	186.63
87	2621	31	-14	1699.0006	2634.6353	0	180.48
88	2621	32.6	-12.4	1618.4346	2500.9922	0	174.11
89	2621	34.2	-10.8	1537.8687	2368.4538	0	167.51

90	2621	35.84484	-9.15516	1444.8637	2223.4144	0	160.5
91	2621	37.53452	-7.46548	1339.4471	2066.0638	0	153.05
92	2621	39.2242	-5.7758	1234.0306	1909.885	0	145.36
93	2621	40.91388	-4.08612	1128.5722	1754.9616	0	137.41
94	2621	42.51437	-2.4856315	1028.6825	1311.0953	0	600
95	2621	44.025665	-0.9743344	934.40453	1132.4116	0	600
96	2621	45.53696	0.5369626	840.07978	953.728	0	600
97	2621	47.04826	2.04826	745.80182	775.04437	0	600
98	2621	48.73274	3.732738	640.66208	694.78967	0	400
99	2621	50.5904	5.5903965	524.75595	475.15802	0	400
100	2621	52.448055	7.448055	408.84982	250.06414	0	400

LWL Block TC (4)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 570
Last Edited By: Breen, Scott A MVN-Contractor
Date: 2/18/2009
Time: 1:54:52 PM
File Name: WBV-14c.2 Reach II Nonreinforced Levee LWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 2/18/2009
Last Solved Time: 1:57:12 PM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

LWL Block TC (4)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Tension Crack Line
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf
FOS Distribution
FOS Calculation Option: Constant
Restrict Block Crossing: Yes
Advanced
Number of Slices: 100
Optimization Tolerance: 0.01
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 10 °
Resisting Side Maximum Convex Angle: 5 °

Materials

Existing Levee

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion: 600 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion: 400 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb
Weight Fn: CH -18 to -58
Cohesion Spatial Fn: CH -18 to -58
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb
Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

Uncompacted Fill

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion: 150 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-221.8, 1.8) ft
Right Coordinate: (467, -6.2) ft

Slip Surface Block

Left Grid
    Upper Left: (11, -10) ft
    Lower Left: (11, -45) ft
    Lower Right: (95, -45) ft

X Increments: 5
Y Increments: 5
Starting Angle: 125 °
Ending Angle: 135 °
Angle Increments: 4

Right Grid
Upper Left: (151, -10) ft
Lower Left: (151, -45) ft
Lower Right: (313, -45) ft
X Increments: 5
Y Increments: 5
Starting Angle: 0 °
Ending Angle: 45 °
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-221.8	-1
	467	-1

Tension Crack Line

	X (ft)	Y (ft)
	-5	3.5
	25	11
	35	11

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 102)

Data Point: (-61, 102)
Data Point: (0, 103)
Data Point: (46, 102)
Data Point: (467, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 84)
Data Point: (-61, 84)
Data Point: (0, 93)
Data Point: (46, 84)
Data Point: (467, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 114)
Data Point: (-61, 114)
Data Point: (0, 108)
Data Point: (46, 114)
Data Point: (467, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (467, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-221.8, -3, 120)
- Data Point: (-61, -3, 120)
- Data Point: (0, -3, 260)
- Data Point: (46, -3, 120)
- Data Point: (467, -3, 120)
- Data Point: (-221.8, -18, 150)
- Data Point: (-61, -18, 150)
- Data Point: (0, -18, 260)
- Data Point: (46, -18, 150)
- Data Point: (467, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-221.8, -18, 150)
- Data Point: (-61, -18, 150)
- Data Point: (0, -18, 260)
- Data Point: (46, -18, 150)
- Data Point: (467, -18, 150)
- Data Point: (-221.8, -58, 500)
- Data Point: (-61, -58, 500)
- Data Point: (0, -58, 500)
- Data Point: (46, -58, 500)
- Data Point: (467, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-221.8, -62, 580)
- Data Point: (-61, -62, 580)
- Data Point: (0, -62, 580)
- Data Point: (46, -62, 580)
- Data Point: (467, -62, 580)
- Data Point: (-221.8, -104, 900)
- Data Point: (-61, -104, 900)
- Data Point: (0, -104, 900)
- Data Point: (46, -104, 900)
- Data Point: (467, -104, 900)

Regions

	Material	Points	Area
Region 1	CH -18 to -58	3,1,2,4	27552
Region 2	SM -58 to -62	4,6,5,3	2755.
Region 3	CH -62 to -104	5,6,8,7	28929.
Region 4	CH -3 to -18	29,39,1,2,38,37,36,35,51,34,50,33,41,32,31,30,43	9177.
Region 5	Existing Levee	9,10,11,12,13,40,47,14,48,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,39	1606.
Region 6	Uncompacted Fill	42,26,27,28,29,43,30,31,32,41,33,50,34,51,35,54	920.
Region 7	Compacted Fill	49,46,45,44,52,53,54,42,26,25,24,23,22,21,20,19,18,17,16,15	1547.

Points

	X (ft)	Y (ft)
Point 1	-221.8	-18
Point 2	467	-18
Point 3	-221.8	-58
Point 4	467	-58
Point 5	-221.8	-62
Point 6	467	-62
Point 7	-221.8	-104
Point 8	467	-104
Point 9	-221.8	1.8
Point 10	-215.5	0.3
Point 11	-202.9	-1.4
Point 12	-190.4	-0.4
Point 13	-164.3	0.8
Point 14	-126.6	1.9
Point 15	-86.9	2.3
Point 16	-37.6	3.1
Point 17	-12.4	4

Point 18	-8.9	5.3
Point 19	1	5.5
Point 20	2.1	5.4
Point 21	17.8	3.1
Point 22	48.2	2.8
Point 23	55.6	2.5
Point 24	61.8	0.5
Point 25	70.3	0.2
Point 26	83.9	-0.1
Point 27	88.1	-1.9
Point 28	97.3	-1.8
Point 29	105.9	-3.3
Point 30	148.1	-4.1
Point 31	155.5	-3.9
Point 32	173.4	-5.8
Point 33	209	-6.2
Point 34	263.6	-7
Point 35	280.5	-5.7
Point 36	335.6	-6.6
Point 37	415.3	-7.3
Point 38	467	-6.2
Point 39	-221.8	-3
Point 40	-148.1	1.27268
Point 41	187.9	-5.6
Point 42	162.4	0
Point 43	144.7	-4.03555
Point 44	35	14
Point 45	25	14
Point 46	-5	6.5
Point 47	-134.5	1.7695
Point 48	-120.3	1.99618
Point 49	-71.6	3.9051
Point 50	224.7	-6.43004
Point 51	277.7	-5.91538
Point 52	58.84615	8
Point 53	250.8	1.6

Point 54	257.4	0

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.44	(155.632, 13.121)	99.73413	(18.8033, 12.4508)	(285.335, -5.77897)
2	1345	1.51	(155.632, 13.121)	101.644	(18.28, 12.32)	(291.717, -5.88321)

Slices of Slip Surface: Optimized

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	20.3087	7.8457875	-551.97803	248.21175	0	400
2	Optimized	23.3195	4.6357125	-351.6636	669.76727	0	400
3	Optimized	24.91245	2.9373325	-245.6888	754.13226	0	600
4	Optimized	26.802685	0.921995	-119.93301	968.97798	0	600
5	Optimized	29.60759	-2.068555	66.678657	1284.3926	0	600
6	Optimized	31.731015	-4.251362	202.88591	1801.304	0	165.15
7	Optimized	33.92611	-6.432841	339.00163	1985.2319	0	161.81
8	Optimized	36.283045	-8.775154	485.16182	2145.1936	0	158.68
9	Optimized	38.849135	-11.325325	644.29335	2285.5014	0	155.83
10	Optimized	41.415225	-13.8755	803.42488	2422.9897	0	153.54
11	Optimized	43.981315	-16.425675	962.55641	2557.6586	0	151.82
12	Optimized	46.346495	-17.85038	1051.4618	2784.0647	0	149.7
13	Optimized	47.814315	-18.053325	1064.1269	2761.5111	0	150.47
14	Optimized	49.433335	-18.277175	1078.0955	2739.6138	0	152.43
15	Optimized	51.9	-18.618225	1099.3795	2706.1618	0	155.41
16	Optimized	54.366665	-18.959275	1120.6635	2672.7097	0	158.39
17	Optimized	57.14838	-19.343885	1144.6731	2635.0033	0	161.76
18	Optimized	58.771455	-19.55384	1157.7461	2654.0203	0	163.6
19	Optimized	60.323075	-19.46803	1152.3937	2637.7417	0	162.85
20	Optimized	63.216665	-19.308005	1142.419	2610.7399	0	161.45
21	Optimized	66.05	-19.151315	1132.6574	2584.2745	0	160.07
22	Optimized	68.883335	-18.994625	1122.8606	2557.809	0	158.7
23	Optimized	71.66	-18.841065	1113.2989	2531.9035	0	157.36

24	Optimized	74.38	-18.69064	1103.9015	2506.5011	0	156.04
25	Optimized	77.1	-18.54022	1094.5041	2481.0987	0	154.73
26	Optimized	79.82	-18.389795	1085.1067	2455.6964	0	153.41
27	Optimized	82.54	-18.23937	1075.746	2430.294	0	152.09
28	Optimized	84.95	-18.10609	1067.4165	2403.2799	0	150.93
29	Optimized	86.43417	-18.02401	1062.2958	2382.9904	0	150.21
30	Optimized	86.98524	-17.993535	1060.3838	2375.6355	0	149.99
31	Optimized	87.60107	-17.987475	1060.0682	2358.9474	0	149.97
32	Optimized	89.633335	-17.989135	1060.1082	2349.7164	0	149.98
33	Optimized	92.7	-17.99164	1060.2713	2339.0533	0	149.98
34	Optimized	95.766665	-17.99414	1060.4343	2328.3903	0	149.99
35	Optimized	98.7139	-17.99654	1060.5741	2315.5037	0	149.99
36	Optimized	101.5417	-17.998845	1060.7156	2300.4391	0	150
37	Optimized	104.4278	-18.0012	1060.8656	2285.0589	0	150.01
38	Optimized	107.32945	-18.003565	1061.0312	2272.5389	0	150.03
39	Optimized	110.18835	-18.005895	1061.1711	2263.1297	0	150.05
40	Optimized	113.04725	-18.00823	1061.311	2253.7206	0	150.07
41	Optimized	115.9062	-18.010565	1061.4509	2244.2764	0	150.09
42	Optimized	118.76515	-18.012895	1061.5908	2234.8673	0	150.11
43	Optimized	121.2041	-18.010545	1061.482	2227.2201	0	150.09
44	Optimized	123.22315	-18.003515	1061.0362	2219.6919	0	150.03
45	Optimized	125.53265	-17.995475	1060.5245	2211.1664	0	149.99
46	Optimized	128.13255	-17.98642	1059.9475	2201.6277	0	149.97
47	Optimized	130.7325	-17.977365	1059.3706	2192.0506	0	149.95
48	Optimized	133.33245	-17.968315	1058.8321	2182.5119	0	149.94
49	Optimized	136.2248	-17.97284	1059.1166	2171.3916	0	149.95
50	Optimized	139.40955	-17.990945	1060.247	2162.1603	0	149.98
51	Optimized	141.4074	-18.002305	1060.9438	2156.3909	0	150.02
52	Optimized	143.25645	-18.003825	1061.0464	2151.4989	0	150.03
53	Optimized	146.4	-18.002115	1060.9409	2140.7053	0	150.02
54	Optimized	149.19615	-18.000595	1060.8484	2130.3178	0	150.01
55	Optimized	151.59425	-17.99929	1060.7374	2120.3226	0	150
56	Optimized	154.1981	-17.997875	1060.6606	2109.4925	0	150
57	Optimized	156.65	-17.996545	1060.5652	2101.7391	0	149.99
58	Optimized	158.95	-17.995295	1060.5217	2097.087	0	149.99
59	Optimized	161.25	-17.994045	1060.4348	2092.4348	0	149.99

60	Optimized	163.51625	-17.99281	1060.3502	2087.822	0	149.99
61	Optimized	165.7487	-17.991595	1060.2606	2083.3427	0	149.98
62	Optimized	168.08345	-17.99249	1060.3472	2078.4709	0	149.98
63	Optimized	170.3265	-17.994175	1060.4608	2074.4114	0	149.99
64	Optimized	172.3755	-17.99454	1060.4608	2070.4094	0	149.99
65	Optimized	174.73495	-17.99496	1060.4836	2063.2125	0	149.99
66	Optimized	177.40485	-17.995435	1060.5211	2052.8751	0	149.99
67	Optimized	180.07475	-17.99591	1060.5585	2042.5377	0	149.99
68	Optimized	182.7447	-17.996385	1060.5585	2032.2003	0	149.99
69	Optimized	185.41465	-17.99686	1060.596	2021.8629	0	149.99
70	Optimized	187.3248	-17.997215	1060.6469	2014.4642	0	149.99
71	Optimized	189.2521	-17.997595	1060.6507	2007.9218	0	150
72	Optimized	191.9563	-17.99813	1060.6877	1999.2685	0	150
73	Optimized	194.6605	-17.998665	1060.7247	1990.6153	0	150
74	Optimized	197.3647	-17.9992	1060.7617	1981.999	0	150
75	Optimized	200.06885	-17.999735	1060.7986	1973.3458	0	150
76	Optimized	202.6841	-18.00025	1060.8181	1965.0073	0	150
77	Optimized	205.21045	-18.00075	1060.8577	1956.9324	0	150.01
78	Optimized	207.7368	-18.00125	1060.8973	1948.8575	0	150.01
79	Optimized	210.2533	-18.001745	1060.8989	1940.5597	0	150.02
80	Optimized	212.75995	-18.00224	1060.9388	1931.9825	0	150.02
81	Optimized	215.2666	-18.002735	1060.9786	1923.4452	0	150.02
82	Optimized	217.77325	-18.00323	1061.0185	1914.9079	0	150.03
83	Optimized	219.421	-18.00174	1060.9032	1909.8995	0	150.02
84	Optimized	221.03655	-17.994615	1060.4697	1903.7274	0	149.99
85	Optimized	223.47885	-17.98384	1059.7736	1894.4329	0	149.97
86	Optimized	225.97245	-17.972835	1059.0898	1884.9701	0	149.95
87	Optimized	228.51735	-17.96161	1058.4219	1875.2645	0	149.92
88	Optimized	231.06225	-17.950385	1057.7146	1865.5982	0	149.9
89	Optimized	232.9846	-17.972385	1059.0543	1852.4611	0	149.94
90	Optimized	235.06495	-18.06078	1064.6063	1853.8153	0	150.53
91	Optimized	237.92585	-18.182345	1072.1844	1856.3995	0	151.6
92	Optimized	240.78675	-18.30391	1079.7625	1858.9838	0	152.66
93	Optimized	243.6477	-18.425475	1087.3407	1861.5331	0	153.72
94	Optimized	246.50865	-18.54704	1094.9188	1864.1173	0	154.79
95	Optimized	249.36955	-18.6686	1102.5319	1866.6667	0	155.85

96	Optimized	252.5203	-18.80248	1110.8804	1830.0082	0	157.02
97	Optimized	255.8203	-18.789805	1110.0808	1759.037	0	156.91
98	Optimized	258.41315	-18.649015	1101.3152	1677.9177	0	155.68
99	Optimized	260.43945	-18.538985	1094.4163	1616.9607	0	154.72
100	Optimized	262.5263	-18.425665	1087.3588	1570.9136	0	153.72
101	Optimized	264.77085	-18.303785	1079.7696	1536.6739	0	152.66
102	Optimized	266.1286	-18.120105	1068.291	1603.7192	0	151.05
103	Optimized	267.73855	-17.085595	1003.7425	1493.7753	0	148.17
104	Optimized	270.5847	-15.256785	889.61434	1304.0346	0	144.51
105	Optimized	273.43085	-13.427975	775.51574	1114.294	0	140.86
106	Optimized	276.27695	-11.599165	661.38759	924.55334	0	137.2
107	Optimized	279.1	-9.7851745	548.19158	736.34043	0	133.57
108	Optimized	281.7087	-8.1089345	443.58553	572.03949	0	130.22
109	Optimized	284.12605	-6.555625	346.67257	435.72029	0	127.11

Slices of Slip Surface: 1345

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	1345	19.851695	7.7483055	-545.88731	276.44163	0	400
2	1345	22.995085	4.604917	-349.75299	695.59185	0	400
3	1345	24.78339	2.8166115	-238.15458	809.3926	0	600
4	1345	26.8	0.8	-112.31998	1028.4868	0	600
5	1345	29.71564	-2.1156385	69.614914	1336.998	0	600
6	1345	31.87346	-4.2734575	204.26212	1809.0858	0	164.76
7	1345	33.95782	-6.357819	334.32822	1983.7964	0	161.61
8	1345	36.2	-8.6	474.23288	2137.6719	0	158.64
9	1345	38.6	-11	623.99219	2270.3133	0	155.95
10	1345	41	-13.4	773.75149	2400.5094	0	153.76
11	1345	43.4	-15.8	923.5108	2528.201	0	152.07
12	1345	46.4	-17	998.38889	2740.7778	0	148
13	1345	49.433335	-17	998.39176	2656.8645	0	148
14	1345	51.9	-17	998.39176	2588.6753	0	148
15	1345	54.366665	-17	998.39176	2520.4456	0	148
16	1345	57.223075	-17	998.41351	2441.4768	0	148
17	1345	60.323075	-17	998.39193	2391.2182	0	148

18	1345	63.216665	-17	998.40012	2380.6591	0	148
19	1345	66.05	-17	998.40012	2370.3532	0	148
20	1345	68.883335	-17	998.40012	2360.012	0	148
21	1345	71.66	-17	998.38235	2349.8897	0	148
22	1345	74.38	-17	998.38235	2340	0	148
23	1345	77.1	-17	998.38235	2330.0735	0	148
24	1345	79.82	-17	998.38235	2320.1471	0	148
25	1345	82.54	-17	998.38235	2310.2574	0	148
26	1345	84.95	-17	998.38095	2296.9524	0	148
27	1345	87.05	-17	998.38095	2280.2857	0	148
28	1345	89.633335	-17	998.41293	2266.4998	0	148
29	1345	92.7	-17	998.41293	2255.6085	0	148
30	1345	95.766665	-17	998.41293	2244.7498	0	148
31	1345	98.73335	-17	998.40686	2231.5463	0	148
32	1345	101.6	-17	998.40686	2216.0928	0	148
33	1345	104.46665	-17	998.40686	2200.6044	0	148
34	1345	107.2857	-17	998.40191	2188.1852	0	148
35	1345	110.05715	-17	998.40191	2178.8038	0	148
36	1345	112.8286	-17	998.40191	2169.4584	0	148
37	1345	115.6	-17	998.40191	2160.1131	0	148
38	1345	118.3714	-17	998.40191	2150.7316	0	148
39	1345	121.14285	-17	998.40191	2141.3863	0	148
40	1345	123.9143	-17	998.40191	2132.0048	0	148
41	1345	126.6857	-17	998.40191	2122.6595	0	148
42	1345	129.45715	-17	998.40191	2113.3141	0	148
43	1345	132.2286	-17	998.40191	2103.9327	0	148
44	1345	135	-17	998.40191	2094.5873	0	148
45	1345	137.7714	-17	998.40191	2085.2419	0	148
46	1345	140.54285	-17	998.40191	2075.8605	0	148
47	1345	143.3143	-17	998.40191	2066.5151	0	148
48	1345	146.4	-17	998.41176	2056.0882	0	148
49	1345	149.33335	-17	998.39176	2045.27	0	148
50	1345	151.8	-17	998.39176	2035.1349	0	148
51	1345	154.26665	-17	998.39176	2024.9997	0	148
52	1345	156.65	-17	998.3913	2017.6522	0	148
53	1345	158.95	-17	998.3913	2013.087	0	148

54	1345	161.25	-17	998.3913	2008.5217	0	148
55	1345	163.775	-17	998.4	2003.5273	0	148
56	1345	166.525	-17	998.4	1998.1091	0	148
57	1345	169.275	-17	998.4	1992.6909	0	148
58	1345	172.025	-17	998.4	1987.2727	0	148
59	1345	174.85	-17	998.41379	1978.931	0	148
60	1345	177.75	-17	998.41379	1967.6552	0	148
61	1345	180.65	-17	998.41379	1956.3793	0	148
62	1345	183.55	-17	998.41379	1945.1034	0	148
63	1345	186.45	-17	998.41379	1933.8276	0	148
64	1345	189.21875	-17	998.40758	1923.9431	0	148
65	1345	191.85625	-17	998.40758	1915.4882	0	148
66	1345	194.49375	-17	998.40758	1906.9953	0	148
67	1345	197.13125	-17	998.40758	1898.5403	0	148
68	1345	199.76875	-17	998.40758	1890.0474	0	148
69	1345	202.40625	-17	998.40758	1881.5924	0	148
70	1345	205.04375	-17	998.40758	1873.1374	0	148
71	1345	207.68125	-17	998.40758	1864.6445	0	148
72	1345	210.30835	-17	998.40752	1855.9106	0	148
73	1345	212.925	-17	998.40752	1846.9297	0	148
74	1345	215.54165	-17	998.40752	1837.9488	0	148
75	1345	218.15835	-17	998.40752	1828.9679	0	148
76	1345	220.775	-17	998.40752	1819.987	0	148
77	1345	223.39165	-17	998.40752	1811.0061	0	148
78	1345	226.005	-17	998.3908	1802.0307	0	148
79	1345	228.615	-17	998.3908	1793.0651	0	148
80	1345	231.225	-17	998.3908	1784.0996	0	148
81	1345	233.835	-17	998.3908	1775.1341	0	148
82	1345	236.445	-17	998.3908	1766.1686	0	148
83	1345	239.055	-17	998.3908	1757.2414	0	148
84	1345	241.665	-17	998.3908	1748.2759	0	148
85	1345	244.275	-17	998.3908	1739.3103	0	148
86	1345	246.885	-17	998.3908	1730.3448	0	148
87	1345	249.495	-17	998.3908	1721.3793	0	148
88	1345	252.45	-17	998.39394	1673.303	0	148
89	1345	255.75	-17	998.39394	1586.0606	0	148

90	1345	259.4263	-17	998.38821	1492.931	0	148
91	1345	262.5263	-17	998.385	1433.8483	0	148
92	1345	265.01	-17	998.40426	1409.7163	0	148
93	1345	267.83	-17	998.40426	1380.4965	0	148
94	1345	270.65	-17	998.40426	1351.2766	0	148
95	1345	273.47	-17	998.40426	1322.0567	0	148
96	1345	276.29	-17	998.40426	1292.8723	0	148
97	1345	279.1	-17	998.39286	1263.75	0	148
98	1345	281.9396	-15.6104	911.68457	1271.0307	0	145.22
99	1345	284.7688	-12.831205	738.27523	1028.222	0	139.66
100	1345	287.548	-10.052011	564.85676	780.12873	0	134.1
101	1345	290.3272	-7.2728125	391.41283	532.01003	0	128.55

SWL Block TC (3)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 551
Last Edited By: Breen, Scott A MVN-Contractor
Date: 2/18/2009
Time: 2:19:54 PM
File Name: WBV-14c.2 Reach II Nonreinforced Levee SWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 2/18/2009
Last Solved Time: 2:23:06 PM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

SWL Block TC (3)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Search for Tension Crack
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf
FOS Distribution
FOS Calculation Option: Constant
Restrict Block Crossing: Yes
Advanced
Number of Slices: 100
Optimization Tolerance: 0.01
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 3000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 10 °
Resisting Side Maximum Convex Angle: 5 °

Materials

Existing Levee

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion: 600 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion: 400 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb
Weight Fn: CH -18 to -58
Cohesion Spatial Fn: CH -18 to -58
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb
Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

Uncompacted Fill

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion: 150 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-221.8, 1.8) ft
Right Coordinate: (467, -6.2) ft

Slip Surface Block

Left Grid
    Upper Left: (-190, -10) ft
    Lower Left: (-190, -45) ft
    Lower Right: (-30, -45) ft

X Increments: 7
Y Increments: 5
Starting Angle: 135 °
Ending Angle: 180 °
Angle Increments: 4

Right Grid

Upper Left: (-10, -10) ft
Lower Left: (-10, -45) ft
Lower Right: (50, -45) ft
X Increments: 5
Y Increments: 5
Starting Angle: 45 °
Ending Angle: 55 °
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-221.8	-1.4
	-202.9	-1.4
	-190.4	-0.4
	-164.3	0.8
	-148.1	1.27268
	-134.5	1.7695
	-126.6	1.9
	-120.3	1.99618
	-86.9	2.3
	-71.6	3.9051
	-9	5.5
	53.2	9.4
	467	9.4

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X

Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 102)
Data Point: (-61, 102)
Data Point: (0, 103)
Data Point: (46, 102)
Data Point: (467, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 84)
Data Point: (-61, 84)
Data Point: (0, 93)
Data Point: (46, 84)
Data Point: (467, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 114)
Data Point: (-61, 114)
Data Point: (0, 108)
Data Point: (46, 114)
Data Point: (467, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (467, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-221.8, -3, 120)
- Data Point: (-61, -3, 120)
- Data Point: (0, -3, 260)
- Data Point: (46, -3, 120)
- Data Point: (467, -3, 120)
- Data Point: (-221.8, -18, 150)
- Data Point: (-61, -18, 150)
- Data Point: (0, -18, 260)
- Data Point: (46, -18, 150)
- Data Point: (467, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-221.8, -18, 150)
- Data Point: (-61, -18, 150)
- Data Point: (0, -18, 260)
- Data Point: (46, -18, 150)
- Data Point: (467, -18, 150)
- Data Point: (-221.8, -58, 500)
- Data Point: (-61, -58, 500)
- Data Point: (0, -58, 500)
- Data Point: (46, -58, 500)
- Data Point: (467, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-221.8, -62, 580)
- Data Point: (-61, -62, 580)
- Data Point: (0, -62, 580)
- Data Point: (46, -62, 580)
- Data Point: (467, -62, 580)
- Data Point: (-221.8, -104, 900)
- Data Point: (-61, -104, 900)
- Data Point: (0, -104, 900)
- Data Point: (46, -104, 900)
- Data Point: (467, -104, 900)

Regions

	Material	Points	Area
Region 1	CH -18 to -58	3,1,2,4	27552
Region 2	SM -58 to -62	4,6,5,3	2755.
Region 3	CH -62 to -104	5,6,8,7	28929.
Region 4	CH -3 to -18	29,39,1,2,38,37,36,35,34,51,33,41,32,31,30,43	9177.
Region 5	Existing Levee	9,10,11,12,13,40,48,14,49,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,39	1606.
Region 6	Uncompacted Fill	42,26,27,28,29,43,30,31,32,41,33,51,34,35,53	920.
Region 7	Compacted Fill	50,47,46,45,44,52,53,42,26,25,24,23,22,21,20,19,18,17,16,15	1547.

Points

	X (ft)	Y (ft)
Point 1	-221.8	-18
Point 2	467	-18
Point 3	-221.8	-58
Point 4	467	-58
Point 5	-221.8	-62
Point 6	467	-62
Point 7	-221.8	-104
Point 8	467	-104
Point 9	-221.8	1.8
Point 10	-215.5	0.3
Point 11	-202.9	-1.4
Point 12	-190.4	-0.4
Point 13	-164.3	0.8
Point 14	-126.6	1.9
Point 15	-86.9	2.3
Point 16	-37.6	3.1
Point 17	-12.4	4

Point 18	-8.9	5.3
Point 19	1	5.5
Point 20	2.1	5.4
Point 21	17.8	3.1
Point 22	48.2	2.8
Point 23	55.6	2.5
Point 24	61.8	0.5
Point 25	70.3	0.2
Point 26	83.9	-0.1
Point 27	88.1	-1.9
Point 28	97.3	-1.8
Point 29	105.9	-3.3
Point 30	148.1	-4.1
Point 31	155.5	-3.9
Point 32	173.4	-5.8
Point 33	209	-6.2
Point 34	263.6	-7
Point 35	280.5	-5.7
Point 36	335.6	-6.6
Point 37	415.3	-7.3
Point 38	467	-6.2
Point 39	-221.8	-3
Point 40	-148.1	1.27268
Point 41	187.9	-5.6
Point 42	162.4	0
Point 43	144.7	-4.03555
Point 44	58.85	8
Point 45	35	14
Point 46	25	14
Point 47	-5	6.5
Point 48	-134.5	1.7695
Point 49	-120.3	1.99618
Point 50	-71.6	3.9051
Point 51	224.7	-6.43004
Point 52	250.8	1.6
Point 53	257.4	0

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.50	(-35.525, 10.524)	64.27289	(43.8812, 11.7657)	(-112.09, 2.07086)
2	3192	1.59	(-35.525, 10.524)	64.592	(44.0816, 11.7153)	(-114.697, 2.04715)

Slices of Slip Surface: Optimized

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	-111.355	1.4237777	40.795026	449.06698	0	600
2	Optimized	-109.88525	0.12960725	122.38508	596.98916	0	600
3	Optimized	-108.4155	-1.164563	203.97513	744.87049	0	600
4	Optimized	-106.94575	-2.4587335	285.56518	892.75182	0	600
5	Optimized	-105.3493	-3.8644595	374.19145	734.12293	0	121.73
6	Optimized	-103.6963	-5.0793145	450.93365	808.55408	0	124.16
7	Optimized	-102.1135	-5.9917435	508.76727	888.96065	0	125.98
8	Optimized	-100.53071	-6.9041725	566.62279	969.42196	0	127.81
9	Optimized	-98.94791	-7.8166015	624.42357	1049.8833	0	129.63
10	Optimized	-97.365105	-8.7290305	682.27908	1130.3446	0	131.46
11	Optimized	-95.7823	-9.6414575	740.07986	1210.8059	0	133.28
12	Optimized	-94.199495	-10.553885	797.93537	1291.2672	0	135.11
13	Optimized	-92.61669	-11.466315	855.79089	1371.7285	0	136.93
14	Optimized	-91.033885	-12.378745	913.59167	1452.1351	0	138.76
15	Optimized	-89.45108	-13.291175	971.44718	1532.5964	0	140.58
16	Optimized	-87.868275	-14.203605	1029.248	1613.0577	0	142.41
17	Optimized	-86.988435	-14.69994	1060.7624	1638.4614	0	143.4
18	Optimized	-86.171815	-15.070395	1088.6571	1678.9456	0	144.14
19	Optimized	-84.71545	-15.73107	1139.4319	1752.7316	0	145.46
20	Optimized	-83.259085	-16.39175	1190.2067	1826.5177	0	146.78
21	Optimized	-81.81832	-16.935075	1233.5113	1865.4607	0	147.87
22	Optimized	-80.393155	-17.361045	1269.4114	1918.3696	0	148.72
23	Optimized	-78.96799	-17.787015	1305.3788	1971.3458	0	149.57
24	Optimized	-77.673445	-18.173945	1337.987	2022.8678	0	151.52
25	Optimized	-76.405045	-18.46821	1364.6147	2047.7113	0	154.1

26	Optimized	-75.032175	-18.708845	1388.6497	2088.6784	0	156.2
27	Optimized	-73.659305	-18.94948	1412.613	2129.5738	0	158.31
28	Optimized	-72.286435	-19.19012	1436.648	2170.541	0	160.41
29	Optimized	-70.779595	-19.45424	1458.9185	2209.4784	0	162.72
30	Optimized	-69.138785	-19.74184	1479.5089	2246.3971	0	165.24
31	Optimized	-67.497975	-20.02944	1500.0393	2283.3758	0	167.76
32	Optimized	-65.85717	-20.317045	1520.5697	2320.3546	0	170.27
33	Optimized	-64.216365	-20.60465	1541.1601	2357.2733	0	172.79
34	Optimized	-62.575555	-20.89225	1561.6905	2394.252	0	175.31
35	Optimized	-60.934745	-21.17985	1582.281	2431.3507	0	177.93
36	Optimized	-59.30822	-21.466605	1602.7268	2472.6441	0	183.12
37	Optimized	-57.695975	-21.752515	1623.125	2513.3184	0	188.23
38	Optimized	-56.08373	-22.03842	1643.5232	2553.9927	0	193.31
39	Optimized	-54.47149	-22.324325	1663.9215	2594.7281	0	198.34
40	Optimized	-52.89552	-22.590015	1683.0357	2629.1299	0	203.1
41	Optimized	-51.355815	-22.83548	1700.8018	2665.1111	0	207.6
42	Optimized	-49.81611	-23.080945	1718.5679	2701.0282	0	212.06
43	Optimized	-48.27641	-23.326415	1736.334	2737.0094	0	216.5
44	Optimized	-46.73671	-23.571885	1754.1002	2772.9906	0	220.89
45	Optimized	-45.197005	-23.81735	1771.8663	2808.9718	0	225.25
46	Optimized	-43.6573	-24.062815	1789.6324	2844.953	0	229.58
47	Optimized	-42.00621	-24.29917	1807.0174	2873.2094	0	233.98
48	Optimized	-40.243725	-24.52641	1823.9554	2908.7173	0	238.43
49	Optimized	-38.48124	-24.75365	1840.9496	2944.2251	0	242.85
50	Optimized	-36.966955	-24.94889	1855.5191	2974.7683	0	246.61
51	Optimized	-35.571255	-25.10683	1867.6	2993.0917	0	249.89
52	Optimized	-34.045945	-25.259475	1879.6031	3019.1855	0	253.3
53	Optimized	-32.520635	-25.41212	1891.541	3045.2793	0	256.7
54	Optimized	-30.99532	-25.56476	1903.479	3071.3731	0	260.07
55	Optimized	-29.470005	-25.7174	1915.4169	3097.4669	0	263.41
56	Optimized	-27.944695	-25.870045	1927.3548	3123.626	0	266.74
57	Optimized	-26.419385	-26.02269	1939.2927	3149.7198	0	270.05
58	Optimized	-24.894075	-26.17533	1951.2959	3175.8789	0	273.34
59	Optimized	-23.368765	-26.32797	1963.2338	3202.0379	0	276.6
60	Optimized	-21.843455	-26.480615	1975.1717	3228.1317	0	279.85
61	Optimized	-20.318145	-26.63326	1987.1097	3254.2908	0	283.07

62	Optimized	-18.79283	-26.7859	1999.0476	3280.4499	0	286.27
63	Optimized	-17.267515	-26.93854	2011.0507	3306.6089	0	289.45
64	Optimized	-15.742205	-27.091185	2022.9887	3332.768	0	292.61
65	Optimized	-14.216895	-27.24383	2034.9266	3358.927	0	295.75
66	Optimized	-12.92712	-27.34049	2042.9848	3358.9725	0	298.18
67	Optimized	-11.55	-27.39363	2048.5345	3373.6661	0	300.43
68	Optimized	-9.85	-27.459225	2055.2941	3391.8878	0	303.19
69	Optimized	-8.95	-27.49395	2059.0681	3401.4693	0	304.66
70	Optimized	-8.25	-27.52096	2063.4651	3409.0027	0	305.79
71	Optimized	-6.95	-27.571125	2071.6898	3422.9154	0	307.89
72	Optimized	-5.65	-27.62129	2079.9144	3436.8281	0	309.99
73	Optimized	-4.2627875	-27.674815	2088.6168	3468.8063	0	312.22
74	Optimized	-2.7883625	-27.731705	2097.9694	3518.8225	0	314.59
75	Optimized	-1.3139375	-27.7886	2107.2542	3568.9065	0	316.94
76	Optimized	0.1604875	-27.845495	2116.6069	3618.0416	0	318.78
77	Optimized	0.94885	-27.85806	2120.4791	3526.0411	0	317.44
78	Optimized	1.55	-27.671415	2111.1322	3521.9687	0	315.22
79	Optimized	2.8532145	-27.26679	2091.0162	3513.0696	0	310.36
80	Optimized	4.359643	-26.799075	2067.7496	3502.9261	0	304.66
81	Optimized	5.8660715	-26.33136	2044.4196	3492.7826	0	298.88
82	Optimized	7.3725	-25.86364	2021.153	3482.7025	0	293.02
83	Optimized	8.8789285	-25.39592	1997.8864	3472.6224	0	287.07
84	Optimized	10.385357	-24.928205	1974.5563	3462.6691	0	281.04
85	Optimized	11.891785	-24.46049	1951.2897	3452.7158	0	274.92
86	Optimized	13.504165	-23.61151	1904.6245	3294.5162	0	265.91
87	Optimized	15.2225	-22.38127	1834.5455	3217.5761	0	253.87
88	Optimized	16.940835	-21.15103	1764.5138	3140.7778	0	241.59
89	Optimized	18.685505	-19.90193	1693.394	3063.0211	0	228.85
90	Optimized	20.45651	-18.633975	1621.2213	2984.3291	0	215.66
91	Optimized	21.803195	-17.669815	1566.2975	2928.1688	0	207.55
92	Optimized	22.948285	-16.529465	1499.6218	2757.0329	0	203.66
93	Optimized	24.316095	-14.90913	1403.8882	2655.7816	0	198.59
94	Optimized	25.758305	-13.20066	1302.8988	2530.0046	0	193.03
95	Optimized	27.27491	-11.40406	1196.7376	2379.8222	0	186.96
96	Optimized	28.791515	-9.60746	1090.5764	2230.8308	0	180.64
97	Optimized	30.25611	-7.7966305	983.2906	2063.0774	0	174.23

98	Optimized	31.668695	-5.9715715	874.96528	1914.8884	0	167.71
99	Optimized	33.08128	-4.1465125	766.59663	1767.8692	0	160.97
100	Optimized	34.393785	-2.4507525	665.92456	1254.004	0	600
101	Optimized	35.69355	-0.7714515	566.22498	1057.9653	0	600
102	Optimized	37.080655	1.0206895	459.79304	831.59881	0	600
103	Optimized	38.206895	2.405553	377.79436	721.19781	0	600
104	Optimized	39.513185	3.881239	290.82167	671.16487	0	400
105	Optimized	41.260395	5.8550245	174.49073	414.71707	0	400
106	Optimized	43.007605	7.82881	58.163576	153.62968	0	400

Slices of Slip Surface: 3192

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	3192	-113.9255	1.531925	32.587956	329.34091	0	600
2	3192	-112.3833	0.5014729	97.764407	446.80593	0	600
3	3192	-110.84115	-0.52897911	162.93708	564.27634	0	600
4	3192	-109.299	-1.559431	228.11515	681.75753	0	600
5	3192	-107.7568	-2.589883	293.28783	799.1848	0	600
6	3192	-106.21315	-3.621295	358.5259	687.16298	0	121.24
7	3192	-104.6681	-4.653667	423.82495	778.37931	0	123.31
8	3192	-103.12305	-5.686039	489.11862	869.54182	0	125.37
9	3192	-101.578	-6.718411	554.40152	960.75814	0	127.44
10	3192	-100.03296	-7.750783	619.73286	1051.9745	0	129.5
11	3192	-98.487905	-8.783155	685.01039	1143.1908	0	131.57
12	3192	-96.94285	-9.8155255	750.28791	1234.4071	0	133.63
13	3192	-95.397795	-10.847895	815.61925	1325.6234	0	135.7
14	3192	-93.852745	-11.88027	880.89677	1416.8398	0	137.76
15	3192	-92.30769	-12.912645	946.1743	1508.0561	0	139.83
16	3192	-90.762635	-13.945015	1011.5056	1599.2186	0	141.89
17	3192	-89.21758	-14.977385	1076.7832	1690.4349	0	143.95
18	3192	-87.672525	-16.009755	1142.1145	1781.6513	0	146.02
19	3192	-85.79696	-17.26297	1227.9373	1904.2827	0	148.53
20	3192	-83.945615	-18.5	1317.2573	2044.2212	0	154.38
21	3192	-82.44901	-19.5	1389.4815	2170.169	0	163.13
22	3192	-80.952405	-20.5	1461.6501	2296.0612	0	171.88

23	3192	-79.4558	-21.5	1533.8742	2422.009	0	180.63
24	3192	-77.959195	-22.5	1606.0428	2547.9568	0	189.38
25	3192	-76.46259	-23.5	1678.267	2673.8491	0	198.13
26	3192	-75.028575	-24	1718.864	2599.6242	0	202.5
27	3192	-73.657145	-24	1727.8328	2615.4471	0	202.5
28	3192	-72.285715	-24	1736.8015	2631.3429	0	202.5
29	3192	-70.790475	-24	1742.5672	2642.7258	0	202.5
30	3192	-69.171425	-24	1745.1614	2649.7053	0	202.5
31	3192	-67.55238	-24	1747.6937	2656.6847	0	202.5
32	3192	-65.933335	-24	1750.2878	2663.6641	0	202.5
33	3192	-64.314285	-24	1752.8819	2670.6435	0	202.5
34	3192	-62.695235	-24	1755.4143	2677.6229	0	202.5
35	3192	-61.07619	-24	1758.0084	2684.6023	0	202.5
36	3192	-59.457145	-24	1760.6025	2695.1641	0	204.86
37	3192	-57.838095	-24	1763.1349	2705.9111	0	207.35
38	3192	-56.219045	-24	1765.729	2716.6582	0	209.83
39	3192	-54.6	-24	1768.3231	2727.4052	0	212.31
40	3192	-52.980955	-24	1770.8555	2738.0905	0	214.79
41	3192	-51.361905	-24	1773.4496	2748.8376	0	217.27
42	3192	-49.742855	-24	1776.0437	2759.5846	0	219.75
43	3192	-48.12381	-24	1778.5761	2770.3317	0	222.24
44	3192	-46.504765	-24	1781.1702	2781.017	0	224.72
45	3192	-44.885715	-24	1783.7643	2791.764	0	227.2
46	3192	-43.266665	-24	1786.2966	2802.5111	0	229.68
47	3192	-41.64762	-24	1788.8908	2813.1964	0	232.16
48	3192	-40.028575	-24	1791.4849	2823.9435	0	234.64
49	3192	-38.409525	-24	1794.0172	2834.6905	0	237.13
50	3192	-36.8125	-24	1796.5714	2845.2698	0	239.57
51	3192	-35.2375	-24	1799.1111	2855.6825	0	241.99
52	3192	-33.6625	-24	1801.5873	2866.0952	0	244.4
53	3192	-32.0875	-24	1804.127	2876.5714	0	246.82
54	3192	-30.5125	-24	1806.6032	2886.9841	0	249.23
55	3192	-28.9375	-24	1809.0794	2897.3968	0	251.64
56	3192	-27.3625	-24	1811.619	2907.8095	0	254.06
57	3192	-25.7875	-24	1814.0952	2918.2857	0	256.47
58	3192	-24.2125	-24	1816.6349	2928.6984	0	258.89

59	3192	-22.6375	-24	1819.1111	2939.1111	0	261.3
60	3192	-21.0625	-24	1821.6508	2949.5238	0	263.72
61	3192	-19.4875	-24	1824.127	2960	0	266.13
62	3192	-17.9125	-24	1826.6032	2970.4127	0	268.54
63	3192	-16.3375	-24	1829.1429	2980.8254	0	270.96
64	3192	-14.7625	-24	1831.619	2991.2381	0	273.37
65	3192	-13.1875	-24	1834.1587	3001.6508	0	275.79
66	3192	-11.55	-24	1836.7647	3012.5294	0	278.3
67	3192	-9.85	-24	1839.4706	3023.7647	0	280.9
68	3192	-8.95	-24	1841	3029.7	0	282.28
69	3192	-7.925	-24	1845.0256	3036.5128	0	283.85
70	3192	-5.975	-24	1852.6154	3049.3846	0	286.84
71	3192	-4.25	-24	1859.4	3078.2	0	289.49
72	3192	-2.75	-24	1865.2667	3122.9333	0	291.78
73	3192	-1.25	-24	1871.1333	3167.7333	0	294.08
74	3192	0.25	-24	1877	3211.0667	0	295.49
75	3192	1.55	-24	1882.0909	3242.9091	0	292.85
76	3192	2.95	-24	1887.5294	3277.1176	0	290
77	3192	4.65	-24	1894.2353	3318.6471	0	286.55
78	3192	6.35	-24	1900.8824	3360.2353	0	283.09
79	3192	8.05	-24	1907.5294	3401.8235	0	279.64
80	3192	9.75	-24	1914.1765	3443.3529	0	276.18
81	3192	11.45	-24	1920.8235	3484.9412	0	272.73
82	3192	13.15	-24	1927.4706	3526.5294	0	269.27
83	3192	14.95	-22.963255	1869.8202	3172.8558	0	258.47
84	3192	16.85	-20.88977	1747.8584	3024.2971	0	239.96
85	3192	18.648995	-18.926515	1632.4101	2884.0519	0	222
86	3192	20.41499	-16.99927	1519.0428	2755.8046	0	210.29
87	3192	22.248995	-14.997805	1401.3121	2632.5852	0	203.89
88	3192	24.083	-12.99634	1283.6183	2510.9498	0	197.17
89	3192	25.80292	-11.119375	1173.2316	2377.0067	0	190.58
90	3192	27.408755	-9.3669095	1070.1579	2230.5158	0	184.17
91	3192	29.01459	-7.6144475	967.08414	2085.2029	0	177.52
92	3192	30.62043	-5.861984	864.01039	1941.152	0	170.62
93	3192	32.226265	-4.1095205	760.93665	1798.2792	0	163.47
94	3192	34.01459	-2.157905	646.13882	1329.7111	0	600

95	3192	35.91102	-0.08831545	524.44117	1085.5903	0	600
96	3192	37.733065	1.9000961	407.49494	825.70563	0	600
97	3192	39.550335	3.883296	290.83873	695.31133	0	400
98	3192	41.362825	5.8612835	174.50249	436.81534	0	400
99	3192	43.175315	7.839271	58.166255	173.79056	0	400

HWL Block TC (2)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 533
Last Edited By: Breen, Scott A MVN-Contractor
Date: 2/17/2009
Time: 1:55:23 PM
File Name: WBV-14c.2 Reach II Reinforced Levee HWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 2/17/2009
Last Solved Time: 1:56:22 PM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

HWL Block TC (2)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Fully-Specified
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Search for Tension Crack
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf

FOS Distribution

FOS Calculation Option: Constant

Advanced

Number of Slices: 100

Optimization Tolerance: 0.01

Minimum Slip Surface Depth: 0.1 ft

Optimization Maximum Iterations: 3000

Optimization Convergence Tolerance: 1e-007

Starting Optimization Points: 8

Ending Optimization Points: 16

Complete Passes per Insertion: 1

Driving Side Maximum Convex Angle: 10 °

Resisting Side Maximum Convex Angle: 5 °

Materials

Existing Levee

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 600 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 400 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb

Weight Fn: CH -18 to -58

Cohesion Spatial Fn: CH -18 to -58

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb

Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Uncompacted Fill

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion: 150 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-221.8, 1.8) ft
Right Coordinate: (467, -6.2) ft

Fully Specified Slip Surfaces

Fully Specified Slip Surface 1

	X (ft)	Y (ft)
	-213	6
	-146	-32

	3	-32
	54	15

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-221.8	-1.4
	-202.9	-1.4
	-190.4	-0.4
	-164.3	0.8
	-148.1	1.27268
	-134.5	1.7695
	-126.6	1.9
	-120.3	1.99618
	-101.6	3.9051
	-39	5.5
	5	14
	467	14

Reinforcements

Reinforcement 1

Type: Fabric
Outside Point: (-36, 3) ft
Inside Point: (41, 3) ft
Slip Surface Intersection: (40.939, 3) ft
Total Length: 77 ft
Reinforcement Direction: 180 °
Applied Load Option: Variable
F of S Dependent: No
Contact Cohesion: 265 psf
Contact Phi: 19 °
Interface Factor: 2
Bond Safety Factor: 1
Fabric Capacity: 10000 lbs
Fabric Safety Factor: 1

Fabric Load: 10000 lbs
Load Distribution: Even along reinf.
Load Orientation: 0
Applied Load: 10000 lbs
Fabric Load Used: 37.044 lbs
Resisting Force Used: 608.86 lbs/ft
Available Bond Length: 0.060842 ft
Required Bond Length: 0.060842 ft
Governing Component: Bond

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-221.8, 102)
    Data Point: (-61, 102)
    Data Point: (0, 103)
    Data Point: (46, 102)
    Data Point: (467, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-221.8, 84)
    Data Point: (-61, 84)
    Data Point: (0, 93)
    Data Point: (46, 84)
    Data Point: (467, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-221.8, 114)

Data Point: (-61, 114)
Data Point: (0, 108)
Data Point: (46, 114)
Data Point: (467, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (467, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-221.8, -3, 120)
Data Point: (-61, -3, 120)
Data Point: (0, -3, 260)
Data Point: (46, -3, 120)
Data Point: (467, -3, 120)
Data Point: (-221.8, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (467, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-221.8, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (467, -18, 150)
Data Point: (-221.8, -58, 500)
Data Point: (-61, -58, 500)

Data Point: (0, -58, 500)
Data Point: (46, -58, 500)
Data Point: (467, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-221.8, -62, 580)
Data Point: (-61, -62, 580)
Data Point: (0, -62, 580)
Data Point: (46, -62, 580)
Data Point: (467, -62, 580)
Data Point: (-221.8, -104, 900)
Data Point: (-61, -104, 900)
Data Point: (0, -104, 900)
Data Point: (46, -104, 900)
Data Point: (467, -104, 900)

Regions

	Material	Points	Area
Region 1	CH -18 to -58	3,1,2,4	27552
Region 2	SM -58 to -62	4,6,5,3	2755.
Region 3	CH -62 to -104	5,6,8,7	28929.
Region 4	CH -3 to -18	29,39,1,2,38,37,36,35,34,33,41,32,31,30,43	9177.
Region 5	Existing Levee	9,10,11,12,13,40,49,14,50,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,39	1615.
Region 6	Uncompacted Fill	42,26,27,28,29,43	158.
Region 7	Compacted Fill	51,48,47,46,45,44,42,26,25,24,23,22,21,20,19,18,17,16,15,50	1026.
Region 8	Uncompacted Fill	42,52,41,32,31,30,43	129.
Region 9	Compacted Fill	44,42,52	34.

Points

	X (ft)	Y (ft)
Point 1	-221.8	-18
Point 2	467	-18
Point 3	-221.8	-58
Point 4	467	-58
Point 5	-221.8	-62
Point 6	467	-62
Point 7	-221.8	-104
Point 8	467	-104
Point 9	-221.8	1.8
Point 10	-215.5	0.3
Point 11	-202.9	-1.4
Point 12	-190.4	-0.4
Point 13	-164.3	0.8
Point 14	-126.6	1.9
Point 15	-74.2	2.7
Point 16	-37.6	3.1
Point 17	-12.4	4
Point 18	-8.9	5.3
Point 19	1	5.5
Point 20	2.1	5.4
Point 21	17.8	3.1
Point 22	48.2	2.8
Point 23	55.6	2.5
Point 24	61.8	0.5
Point 25	70.3	0.2
Point 26	83.9	-0.1
Point 27	88.1	-1.9
Point 28	97.3	-1.8
Point 29	105.9	-3.3
Point 30	148.1	-4.1
Point 31	155.5	-3.9
Point 32	173.4	-5.8
Point 33	209	-6.2

Point 34	263.6	-7
Point 35	280.5	-5.7
Point 36	335.6	-6.6
Point 37	415.3	-7.3
Point 38	467	-6.2
Point 39	-221.8	-3
Point 40	-148.1	1.27268
Point 41	187.9	-5.6
Point 42	132.4	0
Point 43	144.7	-4.03555
Point 44	120	4.1
Point 45	36	6.2
Point 46	5	14
Point 47	-5	14
Point 48	-39	5.5
Point 49	-134.5	1.7695
Point 50	-120.3	1.99618
Point 51	-101.6	3.9051
Point 52	149.3	0

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.41	(-78.203, 7.791)	94.82515	(45.1722, 5.9707)	(-202.783, -1.3906)
2	1	1.70	(-78.203, 7.791)	94.903	(44.2279, 5.9943)	(-200.317, -1.19336)

Slices of Slip Surface: Optimized

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	-201.74325	-2.2049565	56.005278	457.38842	0	600
2	Optimized	-199.47755	-3.9803415	178.09902	369.19445	0	121.96
3	Optimized	-197.02465	-5.902398	310.28058	559.55182	0	125.8
4	Optimized	-194.57175	-7.8244545	442.45573	749.8771	0	129.65
5	Optimized	-192.11885	-9.7465115	574.63408	940.23446	0	133.49

6	Optimized	-190.6462	-10.75071	644.65217	961.32727	0	135.5
7	Optimized	-189.21365	-11.001915	664.98404	990.89637	0	136
8	Optimized	-186.8409	-11.41798	697.73717	1038.3033	0	136.84
9	Optimized	-184.46815	-11.834045	730.4903	1085.7103	0	137.67
10	Optimized	-182.09545	-12.250115	763.28494	1133.1172	0	138.5
11	Optimized	-179.72275	-12.66618	796.03807	1180.5241	0	139.33
12	Optimized	-177.35	-13.082245	828.83272	1227.9311	0	140.16
13	Optimized	-174.97725	-13.49831	861.58585	1275.338	0	141
14	Optimized	-172.60455	-13.914375	894.33898	1322.745	0	141.83
15	Optimized	-170.23185	-14.33044	927.13362	1370.1519	0	142.66
16	Optimized	-167.8591	-14.746505	959.88675	1417.5588	0	143.49
17	Optimized	-165.48635	-15.16257	992.6814	1464.9658	0	144.33
18	Optimized	-163.05045	-15.58972	1024.9969	1511.3058	0	145.18
19	Optimized	-160.5513	-16.027955	1056.8815	1556.63	0	146.06
20	Optimized	-158.05215	-16.466185	1088.7661	1601.9148	0	146.93
21	Optimized	-155.553	-16.904415	1120.6901	1647.1996	0	147.81
22	Optimized	-153.05385	-17.34265	1152.5747	1692.4844	0	148.69
23	Optimized	-150.5547	-17.780885	1184.4592	1737.7692	0	149.56
24	Optimized	-148.70255	-18.10566	1208.1525	1773.3247	0	150.92
25	Optimized	-146.74	-18.4498	1233.7851	1816.6201	0	153.94
26	Optimized	-144.02	-18.926765	1269.7438	1877.2393	0	158.11
27	Optimized	-141.3	-19.40373	1305.7025	1937.8585	0	162.28
28	Optimized	-138.58	-19.88069	1341.6612	1998.4776	0	166.46
29	Optimized	-135.86	-20.35765	1377.6199	2059.0968	0	170.63
30	Optimized	-134.02315	-20.679745	1401.3034	2098.96	0	173.45
31	Optimized	-132.0422	-21.079205	1428.3047	2151.0295	0	176.94
32	Optimized	-129.03405	-21.710895	1470.8255	2222.4398	0	182.47
33	Optimized	-127.065	-22.132035	1499.0986	2273.5036	0	186.16
34	Optimized	-125.55	-22.475105	1521.9878	2311.939	0	189.16
35	Optimized	-123.45	-22.950655	1553.662	2365.2093	0	193.32
36	Optimized	-121.35	-23.426205	1585.3362	2418.4331	0	197.48
37	Optimized	-119.1934	-23.914575	1623.8638	2483.7845	0	201.75
38	Optimized	-116.98015	-24.415765	1669.2527	2561.21	0	206.14
39	Optimized	-114.7669	-24.91696	1714.6415	2638.6354	0	210.52
40	Optimized	-112.55365	-25.418155	1759.9863	2716.0609	0	214.91
41	Optimized	-110.04785	-25.72192	1794.9012	2729.5253	0	217.57

42	Optimized	-107.2495	-25.828265	1819.3622	2771.9482	0	218.5
43	Optimized	-104.45115	-25.93461	1843.8232	2814.3711	0	219.43
44	Optimized	-102.326	-26.03887	1863.8862	2857.1802	0	220.34
45	Optimized	-100.42989	-26.17231	1878.6727	2882.4161	0	221.51
46	Optimized	-98.089655	-26.33701	1892.6965	2905.9879	0	222.95
47	Optimized	-95.749425	-26.501705	1906.6776	2929.5598	0	224.39
48	Optimized	-93.409195	-26.6664	1920.7014	2953.1743	0	225.83
49	Optimized	-91.068965	-26.831095	1934.6825	2976.7461	0	227.27
50	Optimized	-88.728735	-26.99579	1948.6637	3000.318	0	228.71
51	Optimized	-86.438105	-27.22669	1966.7483	3047.1084	0	230.73
52	Optimized	-84.19708	-27.52379	1988.8217	3084.2219	0	233.33
53	Optimized	-81.956055	-27.82089	2010.9394	3121.3354	0	235.93
54	Optimized	-79.729615	-28.16121	2035.7217	3174.1917	0	238.91
55	Optimized	-77.51777	-28.544755	2063.1622	3220.3416	0	242.27
56	Optimized	-75.305925	-28.9283	2090.6027	3266.4471	0	245.62
57	Optimized	-73.03692	-29.321755	2118.7519	3313.777	0	249.07
58	Optimized	-70.710765	-29.725125	2147.6396	3362.3184	0	252.59
59	Optimized	-68.38461	-30.12849	2176.4849	3410.8174	0	256.12
60	Optimized	-66.05845	-30.531855	2205.3725	3459.3589	0	259.65
61	Optimized	-63.6006	-31.030935	2240.41	3535.4948	0	264.02
62	Optimized	-61.011065	-31.62573	2281.66	3604.9724	0	269.23
63	Optimized	-58.42153	-32.220525	2322.8724	3681.3376	0	277.43
64	Optimized	-55.83199	-32.81532	2364.1224	3757.7405	0	285.5
65	Optimized	-53.242455	-33.410115	2405.3348	3834.0681	0	293.44
66	Optimized	-50.65292	-34.00491	2446.5848	3910.4709	0	301.24
67	Optimized	-48.06338	-34.599705	2487.7972	3987.2501	0	308.89
68	Optimized	-45.47384	-35.1945	2529.0472	4063.653	0	316.41
69	Optimized	-42.884305	-35.789295	2570.2596	4140.0558	0	323.8
70	Optimized	-40.29477	-36.38409	2611.5096	4216.835	0	331.04
71	Optimized	-38.3	-36.84227	2650.6207	4293.0657	0	336.52
72	Optimized	-36.042965	-37.36069	2710.1608	4416.0529	0	342.63
73	Optimized	-33.22	-37.6501	2762.2573	4419.5801	0	347.42
74	Optimized	-30.68814	-37.513635	2784.2645	4481.5	0	348.74
75	Optimized	-28.15628	-37.377165	2806.2322	4543.4198	0	350.09
76	Optimized	-25.62442	-37.2407	2828.2394	4605.3397	0	351.46
77	Optimized	-23.23983	-36.766575	2827.4315	4504.9663	0	350.35

78	Optimized	-21.002515	-35.95478	2803.7344	4489.8405	0	346.86
79	Optimized	-18.7652	-35.142985	2780.0373	4474.2945	0	343.52
80	Optimized	-16.527885	-34.33119	2756.3402	4459.1688	0	340.35
81	Optimized	-14.29057	-33.519395	2732.6852	4443.6228	0	337.34
82	Optimized	-12.785955	-32.8131	2706.7003	4261.1412	0	334.36
83	Optimized	-10.65	-31.15062	2628.7404	4161.0262	0	326.01
84	Optimized	-7.925	-29.02967	2529.2569	4033.1569	0	315.83
85	Optimized	-5.975	-27.511925	2458.0319	3941.3333	0	308.86
86	Optimized	-3.615915	-25.675775	2371.8951	3792.9454	0	300.79
87	Optimized	-0.615915	-23.36858	2264.1058	3578.5064	0	291.25
88	Optimized	1.55	-21.72004	2187.3146	3415.9927	0	278.96
89	Optimized	3.55	-20.19778	2116.4744	3264.4095	0	265.16
90	Optimized	5.7187605	-18.54707	2030.9475	3091.8117	0	249.79
91	Optimized	7.5333375	-17.16594	1944.7435	2940.0435	0	241.71
92	Optimized	9.724972	-15.497825	1840.6496	2763.2255	0	235.69
93	Optimized	11.916605	-13.82971	1736.5921	2587.9688	0	229.34
94	Optimized	14.209315	-12.376645	1645.9139	2489.2606	0	222.55
95	Optimized	16.603105	-11.138635	1568.659	2349.816	0	215.34
96	Optimized	18.974225	-9.912348	1492.1303	2212.8734	0	207.95
97	Optimized	21.32268	-8.697784	1416.3343	2078.4527	0	200.39
98	Optimized	23.671135	-7.48322	1340.5382	1945.2045	0	192.57
99	Optimized	26.01959	-6.268656	1264.78	1813.1666	0	184.51
100	Optimized	28.368045	-5.054092	1188.984	1682.2634	0	176.2
101	Optimized	30.7165	-3.8395285	1113.188	1552.5704	0	167.64
102	Optimized	32.209825	-3.0672185	1065.001	1319.8558	0	600
103	Optimized	34.26446	-1.6842119	978.69334	1062.3853	0	600
104	Optimized	37.1897	0.36868315	850.60505	823.49687	0	600
105	Optimized	39.569105	2.0385165	746.40369	641.27351	0	600
106	Optimized	41.86216	3.6477485	645.98525	557.96211	0	400
107	Optimized	44.06886	5.1963795	549.35639	388.96361	0	400

Slices of Slip Surface: 1

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	1	-198.70435	-2.107989	65.122905	335.12122	0	600

2	1	-195.9764	-3.6551685	175.28419	342.90171	0	121.31
3	1	-193.74585	-4.9202655	265.36159	472.47841	0	123.84
4	1	-191.5153	-6.185362	355.439	602.0239	0	126.37
5	1	-189.16775	-7.516791	447.61143	733.67755	0	129.03
6	1	-186.7033	-8.9145525	541.91972	867.44567	0	131.83
7	1	-184.23885	-10.312312	636.19271	1001.1785	0	134.62
8	1	-181.77435	-11.710075	730.501	1134.9113	0	137.42
9	1	-179.30985	-13.10784	824.774	1268.6442	0	140.22
10	1	-176.8454	-14.5056	919.08229	1402.377	0	143.01
11	1	-174.38095	-15.90336	1013.3553	1536.1098	0	145.81
12	1	-171.91645	-17.30112	1107.6636	1669.8426	0	148.6
13	1	-169.62015	-18.603485	1195.4955	1807.0179	0	155.28
14	1	-167.4921	-19.81045	1276.9173	1947.6668	0	165.84
15	1	-165.36405	-21.017415	1358.3392	2088.3158	0	176.4
16	1	-163.14285	-22.27719	1442.1189	2232.9182	0	187.43
17	1	-160.82855	-23.58977	1528.2273	2381.4562	0	198.91
18	1	-158.51425	-24.90235	1614.3733	2530.0318	0	210.4
19	1	-156.2	-26.21493	1700.4817	2678.6073	0	221.88
20	1	-153.88575	-27.52751	1786.5902	2827.1829	0	233.37
21	1	-151.57145	-28.84009	1872.6986	2975.7585	0	244.85
22	1	-149.25715	-30.15267	1958.8446	3124.2964	0	256.34
23	1	-147.05	-31.40448	2041.4647	3266.8571	0	267.29
24	1	-144.85	-32	2083.6087	3178.8261	0	272.5
25	1	-142.55	-32	2088.8696	3188.1304	0	272.5
26	1	-140.25	-32	2094.1304	3197.4348	0	272.5
27	1	-137.95	-32	2099.3478	3206.7391	0	272.5
28	1	-135.65	-32	2104.6087	3216.0435	0	272.5
29	1	-133.18335	-32	2108.5825	3223.1017	0	272.5
30	1	-130.55	-32	2111.2787	3227.9624	0	272.5
31	1	-127.91665	-32	2114.0129	3232.7852	0	272.5
32	1	-125.55	-32	2116.381	3237	0	272.5
33	1	-123.45	-32	2118.381	3240.5714	0	272.5
34	1	-121.35	-32	2120.381	3244.1429	0	272.5
35	1	-119.13125	-32	2128.8128	3259.123	0	272.5
36	1	-116.79375	-32	2143.7005	3285.3904	0	272.5
37	1	-114.45625	-32	2158.5882	3311.7005	0	272.5

38	1	-112.11875	-32	2173.4759	3338.0107	0	272.5
39	1	-109.78125	-32	2188.3636	3364.3209	0	272.5
40	1	-107.44375	-32	2203.2513	3390.631	0	272.5
41	1	-105.10625	-32	2218.139	3416.9412	0	272.5
42	1	-102.76875	-32	2233.0267	3443.2086	0	272.5
43	1	-100.35455	-32	2242.4745	3459.9016	0	272.5
44	1	-97.863635	-32	2246.4088	3466.9271	0	272.5
45	1	-95.372725	-32	2250.3833	3473.9928	0	272.5
46	1	-92.881815	-32	2254.3577	3481.0184	0	272.5
47	1	-90.390905	-32	2258.2921	3488.0439	0	272.5
48	1	-87.9	-32	2262.2665	3495.1096	0	272.5
49	1	-85.409095	-32	2266.2008	3502.1352	0	272.5
50	1	-82.918185	-32	2270.1753	3509.1607	0	272.5
51	1	-80.427275	-32	2274.1497	3516.2264	0	272.5
52	1	-77.936365	-32	2278.084	3523.252	0	272.5
53	1	-75.445455	-32	2282.0585	3530.3176	0	272.5
54	1	-72.942855	-32	2286.0566	3537.386	0	272.5
55	1	-70.42857	-32	2290.0338	3544.4655	0	272.5
56	1	-67.914285	-32	2294.0509	3551.5848	0	272.5
57	1	-65.4	-32	2298.0281	3558.7041	0	272.5
58	1	-62.885715	-32	2302.0452	3565.7837	0	272.5
59	1	-60.37143	-32	2306.0225	3574.4541	0	273.24
60	1	-57.857145	-32	2310.0395	3587.6985	0	276.18
61	1	-55.342855	-32	2314.0168	3600.9428	0	279.13
62	1	-52.82857	-32	2318.0338	3614.1871	0	282.08
63	1	-50.314285	-32	2322.0111	3627.4712	0	285.03
64	1	-47.8	-32	2326.0281	3640.7155	0	287.97
65	1	-45.285715	-32	2330.0054	3653.9598	0	290.92
66	1	-42.77143	-32	2334.0225	3667.2041	0	293.87
67	1	-40.257145	-32	2337.9997	3680.4484	0	296.81
68	1	-38.3	-32	2348.4286	3708.0714	0	299.11
69	1	-36.34	-32	2372.0635	3766.7857	0	301.4
70	1	-33.82	-32	2402.4603	3842.2619	0	304.36
71	1	-31.3	-32	2432.8175	3917.7778	0	307.31
72	1	-28.78	-32	2463.2143	3993.254	0	310.27
73	1	-26.26	-32	2493.5714	4068.6508	0	313.22

74	1	-23.74	-32	2523.9683	4144.4444	0	316.17
75	1	-21.22	-32	2554.3254	4219.8413	0	319.13
76	1	-18.7	-32	2584.7222	4295.2381	0	322.08
77	1	-16.18	-32	2615.0794	4370.6349	0	325.03
78	1	-13.66	-32	2645.4762	4446.4286	0	327.99
79	1	-10.65	-32	2681.7429	4536.5714	0	331.52
80	1	-7.925	-32	2714.6154	4618.1026	0	334.71
81	1	-5.975	-32	2738.1026	4676.5128	0	337
82	1	-3.5	-32	2767.9333	4709.3333	0	339.9
83	1	-0.5	-32	2804.1	4716.6667	0	343.41
84	1	1.55	-32	2828.8182	4713	0	341.59
85	1	2.55	-32	2840.8889	4709.7778	0	340.04
86	1	4	-31.07843	2800.824	4283.8165	0	332.03
87	1	6.28	-28.977255	2681.7801	4061.6929	0	314.97
88	1	8.84	-26.61804	2534.5653	3799.4351	0	295.12
89	1	11.4	-24.258825	2387.3505	3537.7518	0	274.56
90	1	13.96	-21.89961	2240.1357	3276.6429	0	253.27
91	1	16.52	-19.54039	2092.9208	3016.1086	0	231.26
92	1	17.995745	-18.18039	2008.1494	2866.3699	0	218.24
93	1	19.33594	-16.94531	1930.9993	2740.6986	0	212.88
94	1	21.624835	-14.835935	1799.3746	2530.7159	0	205.31
95	1	23.91373	-12.72656	1667.7499	2322.7572	0	197.33
96	1	26.20263	-10.617185	1536.1252	2116.8225	0	188.93
97	1	28.491525	-8.5078115	1404.5004	1912.9439	0	180.11
98	1	30.78042	-6.3984365	1272.8757	1711.1215	0	170.87
99	1	33.06932	-4.289061	1141.251	1511.323	0	161.21
100	1	35.106885	-2.411304	1024.0524	1090.9091	0	600
101	1	37.210125	-0.4730197	903.11643	876.83478	0	600
102	1	39.63038	1.7574113	763.93003	636.80585	0	600
103	1	42.534185	4.433465	596.95077	449.39552	0	400

LWL Block TC (3)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 530
Last Edited By: Breen, Scott A MVN-Contractor
Date: 3/26/2009
Time: 10:52:46 AM
File Name: WBV-14c.2 Reach II Reinforced Levee LWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 3/26/2009
Last Solved Time: 10:54:25 AM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

LWL Block TC (3)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Fully-Specified
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Tension Crack Line
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf

FOS Distribution

FOS Calculation Option: Constant

Advanced

Number of Slices: 100

Optimization Tolerance: 0.01

Minimum Slip Surface Depth: 0.1 ft

Optimization Maximum Iterations: 3000

Optimization Convergence Tolerance: 1e-007

Starting Optimization Points: 8

Ending Optimization Points: 16

Complete Passes per Insertion: 1

Driving Side Maximum Convex Angle: 10 °

Resisting Side Maximum Convex Angle: 5 °

Materials

Existing Levee

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 600 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 400 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb

Weight Fn: CH -18 to -58

Cohesion Spatial Fn: CH -18 to -58

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb

Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Uncompacted Fill

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion: 150 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-221.8, 1.8) ft
Right Coordinate: (467, -6.2) ft

Fully Specified Slip Surfaces

Fully Specified Slip Surface 1

	X (ft)	Y (ft)
	-50.2	11.3
	23	-38

	129	-38
	200	5

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-221.8	-1
	467	-1

Reinforcements

Reinforcement 1

Type: Fabric
Outside Point: (41, 3) ft
Inside Point: (-36, 3) ft
Slip Surface Intersection: (-36.019, 3) ft
Total Length: 77 ft
Reinforcement Direction: 0 °
Applied Load Option: Variable
F of S Dependent: No
Contact Cohesion: 265 psf
Contact Phi: 19 °
Interface Factor: 2
Bond Safety Factor: 1
Fabric Capacity: 10000 lbs
Fabric Safety Factor: 1
Fabric Load: 10000 lbs
Load Distribution: Even along reinf.
Load Orientation: 0
Applied Load: 10000 lbs
Fabric Load Used: 0 lbs
Resisting Force Used: 817.63 lbs/ft
Available Bond Length: 0 ft
Required Bond Length: 0 ft
Governing Component: Bond

Tension Crack Line

	X (ft)	Y (ft)

	-50	3.1
	-39	3.1
	-37	3.1
	-5	10

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 102)
Data Point: (-61, 102)
Data Point: (0, 103)
Data Point: (46, 102)
Data Point: (467, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 84)
Data Point: (-61, 84)
Data Point: (0, 93)
Data Point: (46, 84)
Data Point: (467, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 114)
Data Point: (-61, 114)
Data Point: (0, 108)
Data Point: (46, 114)
Data Point: (467, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (467, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-221.8, -3, 120)
Data Point: (-61, -3, 120)
Data Point: (0, -3, 260)
Data Point: (46, -3, 120)
Data Point: (467, -3, 120)
Data Point: (-221.8, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (467, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-221.8, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (467, -18, 150)
Data Point: (-221.8, -58, 500)
Data Point: (-61, -58, 500)
Data Point: (0, -58, 500)
Data Point: (46, -58, 500)
Data Point: (467, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-221.8, -62, 580)
Data Point: (-61, -62, 580)
Data Point: (0, -62, 580)
Data Point: (46, -62, 580)
Data Point: (467, -62, 580)
Data Point: (-221.8, -104, 900)
Data Point: (-61, -104, 900)
Data Point: (0, -104, 900)
Data Point: (46, -104, 900)
Data Point: (467, -104, 900)

Regions

	Material	Points	Area
Region 1	CH -18 to -58	3,1,2,4	27552
Region 2	SM -58 to -62	4,6,5,3	2755.
Region 3	CH -62 to -104	5,6,8,7	28929.
Region 4	CH -3 to -18	29,39,1,2,38,37,36,35,34,33,41,32,31,30,43	9177.
Region 5	Existing Levee	9,10,11,12,13,40,49,14,50,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,39	1615.
Region 6	Uncompacted Fill	42,26,27,28,29,43	158.
Region 7	Compacted Fill	51,48,47,46,45,44,42,26,25,24,23,22,21,20,19,18,17,16,15,50	1026.
Region 8	Uncompacted Fill	42,52,41,32,31,30,43	129.
Region 9	Compacted Fill	44,42,52	34.

Points

	X (ft)	Y (ft)
Point 1	-221.8	-18

Point 2	467	-18
Point 3	-221.8	-58
Point 4	467	-58
Point 5	-221.8	-62
Point 6	467	-62
Point 7	-221.8	-104
Point 8	467	-104
Point 9	-221.8	1.8
Point 10	-215.5	0.3
Point 11	-202.9	-1.4
Point 12	-190.4	-0.4
Point 13	-164.3	0.8
Point 14	-126.6	1.9
Point 15	-74.2	2.7
Point 16	-37.6	3.1
Point 17	-12.4	4
Point 18	-8.9	5.3
Point 19	1	5.5
Point 20	2.1	5.4
Point 21	17.8	3.1
Point 22	48.2	2.8
Point 23	55.6	2.5
Point 24	61.8	0.5
Point 25	70.3	0.2
Point 26	83.9	-0.1
Point 27	88.1	-1.9
Point 28	97.3	-1.8
Point 29	105.9	-3.3
Point 30	148.1	-4.1
Point 31	155.5	-3.9
Point 32	173.4	-5.8
Point 33	209	-6.2
Point 34	263.6	-7
Point 35	280.5	-5.7
Point 36	335.6	-6.6
Point 37	415.3	-7.3

Point 38	467	-6.2
Point 39	-221.8	-3
Point 40	-148.1	1.27268
Point 41	187.9	-5.6
Point 42	132.4	0
Point 43	144.7	-4.03555
Point 44	120	4.1
Point 45	36	6.2
Point 46	5	14
Point 47	-5	14
Point 48	-39	5.5
Point 49	-134.5	1.7695
Point 50	-120.3	1.99618
Point 51	-101.6	3.9051
Point 52	149.3	0

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.41	(72.979, 5.117)	86.98576	(-36.4439, 6.13902)	(188.843, -5.62682)
2	1	1.54	(72.979, 5.117)	88.4	(-38.0247, 5.74381)	(183.542, -4.96771)

Slices of Slip Surface: **Optimized**

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	-36.37282	3.1831375	-261.03075	121.39076	0	400
2	Optimized	-35.2998	2.628071	-226.3934	208.74804	0	600
3	Optimized	-33.295915	1.591479	-161.70704	374.81655	0	600
4	Optimized	-31.29203	0.55488731	-97.02511	540.88507	0	600
5	Optimized	-29.28815	-0.48170419	-32.341851	706.96688	0	600
6	Optimized	-27.232155	-1.545254	34.023674	877.32492	0	600
7	Optimized	-25.124045	-2.635762	102.07018	1052.0484	0	600
8	Optimized	-23.02066	-3.7238265	169.96582	1347.1146	0	207.71
9	Optimized	-20.922	-4.8094475	237.71091	1497.9931	0	213.22

10	Optimized	-18.823335	-5.8950685	305.45177	1649.5488	0	218.59
11	Optimized	-16.72467	-6.9806895	373.19686	1801.8662	0	223.8
12	Optimized	-14.03767	-8.7250485	482.03567	1979.6891	0	230.42
13	Optimized	-11.525	-10.568578	597.09772	2210.183	0	236.41
14	Optimized	-9.775	-11.852545	677.21754	2371.5745	0	240.4
15	Optimized	-8.01469	-13.144075	757.80723	2534.6607	0	244.27
16	Optimized	-6.06469	-14.798495	861.02289	2680.5404	0	248.43
17	Optimized	-3.8363075	-16.901685	992.25135	2897.8551	0	252.94
18	Optimized	-1.7544613	-18.86657	1114.8752	3081.1046	0	262.1
19	Optimized	0.0818462	-20.59971	1223.0321	3249.023	0	275.42
20	Optimized	1.55	-21.985385	1309.4948	3379.6828	0	280.58
21	Optimized	3.55	-23.873025	1427.2714	3557.2071	0	288
22	Optimized	6.196325	-26.370675	1583.1414	3759.5276	0	298.51
23	Optimized	8.634091	-28.23328	1699.3461	3990.4656	0	306.04
24	Optimized	11.116971	-29.70026	1790.8896	4061.2038	0	311.39
25	Optimized	13.599855	-31.167235	1882.4331	4131.5952	0	317.19
26	Optimized	16.08274	-32.63421	1973.9767	4201.6399	0	323.42
27	Optimized	17.56209	-33.418775	2022.9277	4377.3797	0	326.7
28	Optimized	18.938465	-33.714255	2041.3851	4365.3178	0	326.79
29	Optimized	21.2154	-34.20306	2071.8727	4345.1358	0	327.04
30	Optimized	23.492335	-34.691865	2102.3604	4324.9538	0	327.42
31	Optimized	25.76927	-35.180675	2132.891	4304.7718	0	327.93
32	Optimized	28.046205	-35.669485	2163.3787	4284.5899	0	328.58
33	Optimized	30.32056	-35.732935	2167.3396	4365.2822	0	326.04
34	Optimized	32.592335	-35.371025	2144.7351	4256.5197	0	320.13
35	Optimized	34.86411	-35.009115	2122.174	4147.8006	0	314.14
36	Optimized	37.22	-34.6338	2098.7401	4065.5375	0	307.81
37	Optimized	39.66	-34.245085	2074.4967	4010.1701	0	301.15
38	Optimized	42.1	-33.856375	2050.2532	3954.6813	0	294.37
39	Optimized	44.54	-33.467665	2025.9693	3899.1925	0	287.48
40	Optimized	46.98	-33.078955	2001.7258	3847.1439	0	281.94
41	Optimized	49.433335	-32.68812	1977.323	3799.8279	0	278.52
42	Optimized	51.9	-32.29516	1952.8211	3752.3056	0	275.08
43	Optimized	54.366665	-31.9022	1928.2793	3704.7431	0	271.64
44	Optimized	57.2843	-31.4374	1899.2823	3648.4068	0	267.58
45	Optimized	60.3843	-31.012595	1872.7851	3580.2987	0	263.86

46	Optimized	62.83433	-30.74178	1855.8914	3545.778	0	261.49
47	Optimized	64.902995	-30.513115	1841.6212	3516.4688	0	259.49
48	Optimized	66.97166	-30.28445	1827.3511	3487.2078	0	257.49
49	Optimized	69.040325	-30.05579	1813.0809	3457.8987	0	255.49
50	Optimized	70.18733	-29.937075	1805.6793	3420.7246	0	254.45
51	Optimized	71.429585	-29.88872	1802.6625	3412.3911	0	254.03
52	Optimized	73.68875	-29.80078	1797.1779	3397.1758	0	253.26
53	Optimized	75.947915	-29.712835	1791.6933	3382.0047	0	252.49
54	Optimized	78.207085	-29.62489	1786.2087	3366.7894	0	251.72
55	Optimized	80.46625	-29.53695	1780.7241	3351.6183	0	250.95
56	Optimized	82.725415	-29.44901	1775.2395	3336.4472	0	250.18
57	Optimized	84.9275	-29.40421	1772.4001	3310.0218	0	249.79
58	Optimized	87.05	-29.402565	1772.3325	3294.9984	0	249.77
59	Optimized	89.25	-29.40086	1772.2166	3284.4334	0	249.76
60	Optimized	91.55	-29.399075	1772.0862	3278.1725	0	249.74
61	Optimized	93.85	-29.39729	1771.9992	3271.9116	0	249.73
62	Optimized	96.15	-29.39551	1771.8688	3265.6508	0	249.71
63	Optimized	98.36609	-29.393795	1771.7514	3257.6457	0	249.7
64	Optimized	100.49829	-29.39214	1771.6576	3247.9373	0	249.68
65	Optimized	102.6305	-29.390485	1771.5638	3238.1821	0	249.67
66	Optimized	104.7983	-29.45732	1775.7285	3217.0669	0	250.25
67	Optimized	107.075	-29.59714	1784.4674	3223.4581	0	251.48
68	Optimized	109.425	-29.741465	1793.4717	3232.335	0	252.74
69	Optimized	111.775	-29.88579	1802.476	3241.2119	0	254
70	Optimized	114.125	-30.03011	1811.4803	3250.0888	0	255.26
71	Optimized	116.475	-30.17443	1820.4846	3259.0081	0	256.53
72	Optimized	118.825	-30.318755	1829.4889	3267.885	0	257.79
73	Optimized	121.1435	-30.461145	1838.3739	3262.2168	0	259.03
74	Optimized	123.43045	-30.601595	1847.1464	3242.0097	0	260.26
75	Optimized	125.7174	-30.742045	1855.9188	3221.8025	0	261.49
76	Optimized	128.00435	-30.882495	1864.6476	3201.5953	0	262.72
77	Optimized	130.7739	-30.808015	1860.013	3197.2131	0	262.07
78	Optimized	133.92395	-30.5277	1842.5428	3120.6658	0	259.62
79	Optimized	136.56705	-30.2925	1827.8678	3056.4296	0	257.56
80	Optimized	138.8053	-30.09332	1815.4073	3002.0039	0	255.82
81	Optimized	141.1183	-29.69275	1790.417	2972.3464	0	252.31

82	Optimized	143.5061	-29.090785	1752.8535	2872.9352	0	247.04
83	Optimized	145.55	-28.575515	1720.692	2787.8895	0	242.54
84	Optimized	147.25	-28.146945	1693.9408	2717.1042	0	238.79
85	Optimized	148.4366	-27.847795	1675.321	2667.3784	0	236.17
86	Optimized	149.0366	-27.644305	1662.6027	2689.0436	0	234.39
87	Optimized	150.33335	-27.060255	1626.1637	2606.7855	0	229.28
88	Optimized	152.4	-26.12941	1568.0596	2476.0624	0	221.13
89	Optimized	154.46665	-25.19857	1509.9997	2345.2952	0	212.99
90	Optimized	155.84645	-24.577115	1471.2594	2258.7385	0	207.55
91	Optimized	157.38135	-23.88577	1428.0552	2176.0111	0	201.5
92	Optimized	159.7583	-22.815155	1361.2728	2052.7647	0	192.13
93	Optimized	162.1353	-21.74454	1294.452	1929.5182	0	182.76
94	Optimized	164.5123	-20.673925	1227.6695	1806.3102	0	173.4
95	Optimized	166.8893	-19.60331	1160.8487	1683.0637	0	164.03
96	Optimized	169.0544	-18.534	1094.1064	1577.0566	0	154.67
97	Optimized	171.7155	-17.078915	1003.3177	1429.7504	0	148.16
98	Optimized	174.5279	-15.541085	907.36859	1283.8669	0	145.08
99	Optimized	176.78375	-14.30759	830.39648	1164.1886	0	142.62
100	Optimized	179.0396	-13.074095	753.42436	1044.5493	0	140.15
101	Optimized	181.45625	-11.44268	651.60838	921.41498	0	136.89
102	Optimized	184.03375	-9.4133375	524.98127	728.63937	0	132.83
103	Optimized	186.61125	-7.3839935	398.35415	535.89425	0	128.77
104	Optimized	188.37155	-5.9980695	311.87619	405.45404	0	126

Slices of Slip Surface: 1

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	1	-37.812375	2.956967	-246.90649	44.413487	0	600
2	1	-36.656185	2.1782785	-198.32395	177.66767	0	600
3	1	-34.76856	0.90696725	-118.99437	364.72097	0	600
4	1	-32.880935	-0.36434425	-39.664789	551.75668	0	600
5	1	-30.3211	-2.0883865	67.916041	805.44601	0	600
6	1	-27.54043	-3.9611605	184.77575	1226.9244	0	197.66
7	1	-25.21113	-5.5299355	282.66692	1423.7322	0	204.23
8	1	-22.881835	-7.09871	380.54739	1621.6439	0	210.56

9	1	-20.55254	-8.6674845	478.43499	1820.6951	0	216.65
10	1	-18.22324	-10.236261	576.3582	2020.9214	0	222.5
11	1	-15.893945	-11.805035	674.2458	2222.2871	0	228.11
12	1	-13.56465	-13.37381	772.1334	2424.7923	0	233.48
13	1	-11.525	-14.74751	857.86381	2603.0716	0	237.99
14	1	-9.775	-15.92613	931.37469	2756.7288	0	241.71
15	1	-7.79787	-17.25772	1014.4974	2931.0965	0	245.75
16	1	-5.84787	-18.57104	1096.4189	3108.4768	0	253.03
17	1	-4	-19.815575	1174.094	3255.7461	0	264.01
18	1	-2	-21.16257	1258.1564	3390.6937	0	275.65
19	1	0	-22.509565	1342.1772	3525.8486	0	287.06
20	1	1.55	-23.553485	1407.3101	3624.9697	0	290.13
21	1	3.55	-24.90048	1491.3941	3752.7246	0	294.38
22	1	6.0666665	-26.595445	1597.164	3884.1644	0	300.18
23	1	8.2	-28.03224	1686.8198	3962.1953	0	305.5
24	1	10.333334	-29.469035	1776.4756	4039.954	0	311.19
25	1	12.466665	-30.90583	1866.1314	4117.3239	0	317.24
26	1	14.6	-32.342625	1955.7872	4194.305	0	323.66
27	1	16.733335	-33.779415	2045.443	4271.2862	0	330.45
28	1	19.1	-35.37336	2144.8963	4356.4019	0	338.4
29	1	21.7	-37.124455	2254.1573	4449.2338	0	347.67
30	1	24.083335	-38	2308.7996	4728.9223	0	351.2
31	1	26.25	-38	2308.7996	4661.9993	0	348.61
32	1	28.416665	-38	2308.7996	4594.7531	0	346.02
33	1	30.583335	-38	2308.7996	4527.5531	0	343.43
34	1	32.75	-38	2308.7996	4460.3532	0	340.84
35	1	34.916665	-38	2308.7996	4393.1993	0	338.25
36	1	37.016665	-38	2308.8201	4353.3942	0	335.74
37	1	39.05	-38	2308.8201	4341.0499	0	333.31
38	1	41.083335	-38	2308.8201	4328.7056	0	330.88
39	1	43.116665	-38	2308.8201	4316.3122	0	328.45
40	1	45.15	-38	2308.8201	4303.9679	0	326.02
41	1	47.183335	-38	2308.8201	4295.5581	0	325
42	1	49.433335	-38	2308.7835	4289.594	0	325
43	1	51.9	-38	2308.7835	4282.7021	0	325
44	1	54.366665	-38	2308.7835	4275.8102	0	325

45	1	56.633335	-38	2308.79	4269.8219	0	325
46	1	58.7	-38	2308.79	4264.1606	0	325
47	1	60.766665	-38	2308.79	4258.5477	0	325
48	1	62.8625	-38	2308.8	4252.8471	0	325
49	1	64.9875	-38	2308.8	4247.0588	0	325
50	1	67.1125	-38	2308.8	4241.2706	0	325
51	1	69.2375	-38	2308.8	4235.4353	0	325
52	1	71.433335	-38	2308.8085	4229.47	0	325
53	1	73.7	-38	2308.8085	4223.2935	0	325
54	1	75.966665	-38	2308.8085	4217.117	0	325
55	1	78.233335	-38	2308.8085	4210.9406	0	325
56	1	80.5	-38	2308.8085	4204.7641	0	325
57	1	82.766665	-38	2308.8085	4198.5876	0	325
58	1	84.95	-38	2308.8095	4188.0952	0	325
59	1	87.05	-38	2308.8095	4173.3333	0	325
60	1	89.25	-38	2308.7826	4162.913	0	325
61	1	91.55	-38	2308.7826	4156.8261	0	325
62	1	93.85	-38	2308.7826	4150.7826	0	325
63	1	96.15	-38	2308.7826	4144.6957	0	325
64	1	98.375	-38	2308.7907	4136.8372	0	325
65	1	100.525	-38	2308.7907	4127.2093	0	325
66	1	102.675	-38	2308.7907	4117.5349	0	325
67	1	104.825	-38	2308.7907	4107.8605	0	325
68	1	107.075	-38	2308.8085	4100.1702	0	325
69	1	109.425	-38	2308.8085	4094.3404	0	325
70	1	111.775	-38	2308.8085	4088.5532	0	325
71	1	114.125	-38	2308.8085	4082.766	0	325
72	1	116.475	-38	2308.8085	4076.9787	0	325
73	1	118.825	-38	2308.8085	4071.1489	0	325
74	1	121.125	-38	2308.8	4051.2444	0	325
75	1	123.375	-38	2308.8	4017.2889	0	325
76	1	125.625	-38	2308.8	3983.2889	0	325
77	1	127.875	-38	2308.8	3949.2889	0	325
78	1	129.85	-37.48521	2276.6656	4085.1475	0	320.5
79	1	131.55	-36.455635	2212.413	3947.5856	0	311.49
80	1	133.92395	-35.01789	2122.7174	3755.497	0	298.91

81	1	136.6044	-33.394505	2021.41	3538.6324	0	284.7
82	1	138.91745	-31.99366	1933.9889	3351.4758	0	272.44
83	1	141.2305	-30.592815	1846.6048	3164.3561	0	260.19
84	1	143.5435	-29.19197	1759.1837	2977.1995	0	247.93
85	1	145.55	-27.97676	1683.3479	2814.8881	0	237.3
86	1	147.25	-26.94718	1619.0953	2677.3261	0	228.29
87	1	148.7	-26.06901	1564.3098	2559.5918	0	220.6
88	1	150.33335	-25.07981	1502.5632	2427.1379	0	211.95
89	1	152.4	-23.82817	1424.4633	2260.26	0	201
90	1	154.46665	-22.576525	1346.3635	2093.3821	0	190.04
91	1	155.84645	-21.740895	1294.2914	1982.6708	0	182.73
92	1	157.1646	-20.942575	1244.3973	1888.1618	0	175.75
93	1	159.10805	-19.765545	1170.9851	1753.5729	0	165.45
94	1	161.05155	-18.588515	1097.529	1618.984	0	155.15
95	1	163.16095	-17.310985	1017.8158	1487.5336	0	148.62
96	1	165.4363	-15.932955	931.80427	1359.3057	0	145.87
97	1	167.71165	-14.55493	845.83032	1231.0778	0	143.11
98	1	169.987	-13.176905	759.85637	1102.8124	0	140.35
99	1	172.26235	-11.798875	673.84482	974.58449	0	137.6
100	1	174.52145	-10.430659	588.47039	845.04668	0	134.86
101	1	176.7644	-9.072256	503.69496	714.24159	0	132.14
102	1	179.00735	-7.713854	418.95766	583.43649	0	129.43
103	1	181.2503	-6.355452	334.17842	452.63139	0	126.71
104	1	182.95675	-5.321979	269.69011	358.25861	0	150

SWL Circular TC (2)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 534
Last Edited By: Breen, Scott A MVN-Contractor
Date: 3/26/2009
Time: 10:21:36 AM
File Name: WBV-14c.2 Reach II Reinforced Levee SWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 3/26/2009
Last Solved Time: 10:22:08 AM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

SWL Circular TC (2)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Tension Crack Line
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf

FOS Distribution

FOS Calculation Option: Constant

Advanced

Number of Slices: 100

Optimization Tolerance: 0.01

Minimum Slip Surface Depth: 0.1 ft

Optimization Maximum Iterations: 3000

Optimization Convergence Tolerance: 1e-007

Starting Optimization Points: 8

Ending Optimization Points: 16

Complete Passes per Insertion: 1

Driving Side Maximum Convex Angle: 10 °

Resisting Side Maximum Convex Angle: 5 °

Materials

Existing Levee

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 600 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 400 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb

Weight Fn: CH -18 to -58

Cohesion Spatial Fn: CH -18 to -58

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb

Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Uncompacted Fill

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion: 150 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (-212, -0.17222) ft
Left-Zone Right Coordinate: (-47, 5.29618) ft
Left-Zone Increment: 15
Right Projection: Range
Right-Zone Left Coordinate: (0, 14) ft
Right-Zone Right Coordinate: (73, 5.275) ft
Right-Zone Increment: 15
Radius Increments: 15

Slip Surface Limits

Left Coordinate: (-221.8, 1.8) ft
Right Coordinate: (467, -6.2) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-221.8	-1.4
	-202.9	-1.4
	-190.4	-0.4
	-164.3	0.8
	-148.1	1.27268
	-134.5	1.7695
	-126.6	1.9
	-120.3	1.99618
	-101.6	3.9051
	-39	5.5
	23.28205	9.4
	467	9.4

Reinforcements

Reinforcement 1

Type: Fabric
Outside Point: (-36, 3) ft
Inside Point: (41, 3) ft
Slip Surface Intersection: (41.133, 3) ft
Total Length: 77 ft
Reinforcement Direction: 180 °
Applied Load Option: Variable
F of S Dependent: No
Contact Cohesion: 265 psf
Contact Phi: 19 °
Interface Factor: 2
Bond Safety Factor: 1
Fabric Capacity: 10000 lbs

Fabric Safety Factor: 1
Fabric Load: 10000 lbs
Load Distribution: Even along reinf.
Load Orientation: 0
Applied Load: 10000 lbs
Fabric Load Used: 0 lbs
Resisting Force Used: 629.44 lbs/ft
Available Bond Length: 0 ft
Required Bond Length: 0 ft
Governing Component: Bond

Tension Crack Line

	X (ft)	Y (ft)
	-5	11
	5	11
	36	3.2
	42.8	3.2

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 102)
Data Point: (-61, 102)
Data Point: (0, 103)
Data Point: (46, 102)
Data Point: (467, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 84)
Data Point: (-61, 84)
Data Point: (0, 93)

Data Point: (46, 84)
Data Point: (467, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 114)
Data Point: (-61, 114)
Data Point: (0, 108)
Data Point: (46, 114)
Data Point: (467, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-221.8, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (467, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-221.8, -3, 120)
Data Point: (-61, -3, 120)
Data Point: (0, -3, 260)
Data Point: (46, -3, 120)
Data Point: (467, -3, 120)
Data Point: (-221.8, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (467, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-221.8, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (467, -18, 150)
Data Point: (-221.8, -58, 500)
Data Point: (-61, -58, 500)
Data Point: (0, -58, 500)
Data Point: (46, -58, 500)
Data Point: (467, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-221.8, -62, 580)
Data Point: (-61, -62, 580)
Data Point: (0, -62, 580)
Data Point: (46, -62, 580)
Data Point: (467, -62, 580)
Data Point: (-221.8, -104, 900)
Data Point: (-61, -104, 900)
Data Point: (0, -104, 900)
Data Point: (46, -104, 900)
Data Point: (467, -104, 900)

Regions

	Material	Points	Area
Region 1	CH -18 to -58	3,1,2,4	27552
Region 2	SM -58 to -62	4,6,5,3	2755.
Region 3	CH -62 to -104	5,6,8,7	28929.
Region 4	CH -3 to -18	29,39,1,2,38,37,36,35,34,33,41,32,31,30,43	9177.
Region 5	Existing Levee	9,10,11,12,13,40,49,14,50,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,39	1615.
Region	Uncompacted	42,26,27,28,29,43	158.

6	Fill		
Region 7	Compacted Fill	51,48,47,46,45,44,42,26,25,24,23,22,21,20,19,18,17,16,15,50	1026.
Region 8	Uncompacted Fill	42,52,41,32,31,30,43	129.
Region 9	Compacted Fill	44,42,52	34.

Points

	X (ft)	Y (ft)
Point 1	-221.8	-18
Point 2	467	-18
Point 3	-221.8	-58
Point 4	467	-58
Point 5	-221.8	-62
Point 6	467	-62
Point 7	-221.8	-104
Point 8	467	-104
Point 9	-221.8	1.8
Point 10	-215.5	0.3
Point 11	-202.9	-1.4
Point 12	-190.4	-0.4
Point 13	-164.3	0.8
Point 14	-126.6	1.9
Point 15	-74.2	2.7
Point 16	-37.6	3.1
Point 17	-12.4	4
Point 18	-8.9	5.3
Point 19	1	5.5
Point 20	2.1	5.4
Point 21	17.8	3.1
Point 22	48.2	2.8
Point 23	55.6	2.5
Point 24	61.8	0.5
Point 25	70.3	0.2

Point 26	83.9	-0.1
Point 27	88.1	-1.9
Point 28	97.3	-1.8
Point 29	105.9	-3.3
Point 30	148.1	-4.1
Point 31	155.5	-3.9
Point 32	173.4	-5.8
Point 33	209	-6.2
Point 34	263.6	-7
Point 35	280.5	-5.7
Point 36	335.6	-6.6
Point 37	415.3	-7.3
Point 38	467	-6.2
Point 39	-221.8	-3
Point 40	-148.1	1.27268
Point 41	187.9	-5.6
Point 42	132.4	0
Point 43	144.7	-4.03555
Point 44	120	4.1
Point 45	36	6.2
Point 46	5	14
Point 47	-5	14
Point 48	-39	5.5
Point 49	-134.5	1.7695
Point 50	-120.3	1.99618
Point 51	-101.6	3.9051
Point 52	149.3	0

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.56	(-83.556, 161.517)	94.56341	(41.5649, 6.06088)	(-202.897, -1.39979)
2	406	1.78	(-83.556, 161.517)	200.757	(39.891, 6.10272)	(-201.07, -1.25356)

Slices of Slip Surface: Optimized

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	-201.98355	-2.2093825	55.080928	459.27394	0	600
2	Optimized	-199.86225	-4.0888415	182.94939	375.40716	0	122.18
3	Optimized	-197.44715	-6.228569	328.51613	584.10788	0	126.46
4	Optimized	-195.03205	-8.3682965	474.08597	792.8086	0	130.74
5	Optimized	-192.11225	-10.128085	598.48045	917.70975	0	134.26
6	Optimized	-189.27305	-11.272105	681.64693	1036.5856	0	136.54
7	Optimized	-187.01915	-12.18029	744.77458	1125.845	0	138.36
8	Optimized	-184.76525	-13.088475	807.94338	1215.0632	0	140.18
9	Optimized	-182.51135	-13.99666	871.07103	1304.3226	0	141.99
10	Optimized	-180.25745	-14.904845	934.19868	1393.582	0	143.81
11	Optimized	-177.8946	-15.56674	982.2685	1430.7926	0	145.13
12	Optimized	-175.42285	-15.98234	1015.3034	1478.5894	0	145.96
13	Optimized	-172.9511	-16.39794	1048.3382	1526.3862	0	146.8
14	Optimized	-170.47935	-16.81354	1081.3731	1574.183	0	147.63
15	Optimized	-168.0076	-17.22914	1114.3681	1621.9798	0	148.46
16	Optimized	-165.53585	-17.64474	1147.4029	1669.7767	0	149.29
17	Optimized	-163.8615	-17.92627	1169.3343	1701.3201	0	149.85
18	Optimized	-162.1461	-18.2147	1190.455	1735.3868	0	151.88
19	Optimized	-159.59225	-18.6441	1221.8875	1788.1732	0	155.64
20	Optimized	-157.0384	-19.073505	1253.3199	1840.9596	0	159.39
21	Optimized	-154.4846	-19.50291	1284.791	1893.746	0	163.15
22	Optimized	-151.93075	-19.93231	1316.2234	1946.4938	0	166.91
23	Optimized	-149.3769	-20.36171	1347.6558	1999.2802	0	170.66
24	Optimized	-147.46905	-20.6825	1371.4303	2039.2103	0	173.47
25	Optimized	-145.6043	-21.09366	1401.3357	2103.046	0	177.07
26	Optimized	-143.1367	-21.703795	1445.0426	2176.6908	0	182.41
27	Optimized	-140.66905	-22.31393	1488.7495	2250.3356	0	187.75
28	Optimized	-138.2014	-22.92407	1532.4564	2324.0197	0	193.09
29	Optimized	-135.7338	-23.53421	1576.124	2397.6645	0	198.42
30	Optimized	-132.71555	-24.280495	1627.3679	2483.7843	0	204.95
31	Optimized	-129.84835	-25.050975	1678.3972	2581.3033	0	211.7
32	Optimized	-127.6828	-25.709505	1721.7377	2654.2886	0	217.46

33	Optimized	-125.55	-26.35807	1764.3226	2726.0758	0	223.13
34	Optimized	-123.45	-26.99667	1806.1459	2796.5557	0	228.72
35	Optimized	-121.35	-27.635265	1848.0148	2867.0357	0	234.31
36	Optimized	-119.19805	-28.289655	1896.8345	2949.9176	0	240.03
37	Optimized	-116.99415	-28.95984	1952.7055	3045.1196	0	245.9
38	Optimized	-114.7903	-29.630025	2008.5764	3140.3216	0	251.76
39	Optimized	-112.58645	-30.30021	2064.4474	3235.5237	0	257.63
40	Optimized	-110.24895	-30.7908	2109.9181	3266.9803	0	261.92
41	Optimized	-107.77785	-31.1018	2145.0901	3326.9654	0	264.64
42	Optimized	-105.3067	-31.4128	2180.2219	3386.9907	0	267.36
43	Optimized	-102.83555	-31.7238	2215.3538	3446.9758	0	270.08
44	Optimized	-100.68078	-31.99499	2241.6304	3491.538	0	272.46
45	Optimized	-98.842345	-32.226365	2259.0083	3520.627	0	274.48
46	Optimized	-96.607675	-32.419135	2274.5857	3528.3114	0	276.17
47	Optimized	-93.976765	-32.5733	2288.3596	3551.5714	0	277.52
48	Optimized	-91.34585	-32.727465	2302.1714	3574.8693	0	278.87
49	Optimized	-88.714935	-32.881635	2315.9832	3598.1293	0	280.21
50	Optimized	-86.084025	-33.0358	2329.795	3621.3893	0	281.56
51	Optimized	-83.453115	-33.189965	2343.5689	3644.6873	0	282.91
52	Optimized	-80.814715	-33.42052	2362.1515	3692.2156	0	284.93
53	Optimized	-78.16883	-33.727465	2385.5406	3731.3727	0	287.62
54	Optimized	-75.522945	-34.03441	2408.8922	3770.4171	0	290.3
55	Optimized	-73.7659	-34.23824	2424.4227	3796.5842	0	292.08
56	Optimized	-72.20813	-34.43288	2439.019	3824.6738	0	293.79
57	Optimized	-69.96079	-34.72144	2460.6009	3860.8643	0	296.31
58	Optimized	-67.713455	-35.009995	2482.1828	3897.0107	0	298.84
59	Optimized	-65.46612	-35.29855	2503.7647	3933.2012	0	301.36
60	Optimized	-63.21878	-35.58711	2525.3466	3969.3475	0	303.89
61	Optimized	-60.97144	-35.87567	2546.9285	4005.5822	0	306.44
62	Optimized	-58.68956	-36.19359	2570.373	4057.5826	0	311.47
63	Optimized	-56.37314	-36.540865	2595.7326	4106.1245	0	316.71
64	Optimized	-54.05672	-36.88814	2621.0922	4154.7091	0	321.88
65	Optimized	-51.7403	-37.235415	2646.4518	4203.2937	0	326.98
66	Optimized	-49.423885	-37.58269	2671.7688	4251.921	0	332
67	Optimized	-47.10747	-37.92997	2697.1284	4300.4629	0	336.96
68	Optimized	-44.79105	-38.277245	2722.488	4349.1329	0	341.84

69	Optimized	-42.47463	-38.62452	2747.8476	4397.8028	0	346.65
70	Optimized	-40.15821	-38.971795	2773.2073	4446.4728	0	351.38
71	Optimized	-38.3	-39.250375	2795.1903	4502.9619	0	355.13
72	Optimized	-36.74061	-39.48416	2815.8422	4574.3699	0	358.24
73	Optimized	-34.627275	-39.45434	2822.2396	4536.2014	0	359.78
74	Optimized	-32.119385	-39.13702	2812.2312	4578.9248	0	359.51
75	Optimized	-29.611495	-38.819695	2802.2229	4621.6483	0	359.31
76	Optimized	-27.103605	-38.50237	2792.2145	4664.3717	0	359.19
77	Optimized	-24.595715	-38.18505	2782.2457	4707.0952	0	359.14
78	Optimized	-21.97405	-37.32698	2738.9458	4561.9802	0	355.48
79	Optimized	-19.23861	-35.928165	2662.3269	4503.3932	0	348.43
80	Optimized	-16.503165	-34.52935	2585.7406	4444.8061	0	341.71
81	Optimized	-13.76772	-33.13053	2509.1217	4385.8935	0	335.35
82	Optimized	-11.658565	-32.051975	2450.0662	4340.2425	0	330.67
83	Optimized	-9.908565	-30.751535	2375.7495	4133.9345	0	324.34
84	Optimized	-7.925	-28.939605	2270.4555	4014.9938	0	315.26
85	Optimized	-5.975	-27.15834	2166.938	3897.997	0	306.64
86	Optimized	-3.5	-24.897505	2035.5225	3708.6241	0	296.16
87	Optimized	-0.5	-22.157095	1876.2404	3446.7636	0	284.13
88	Optimized	1.55	-20.28448	1767.4239	3263.0758	0	270.21
89	Optimized	3.0754395	-18.891035	1686.4159	3125.5086	0	258.16
90	Optimized	4.5254395	-17.566505	1609.4127	2998.0552	0	249.09
91	Optimized	6.648185	-15.62744	1496.7171	2777.6048	0	243.42
92	Optimized	9.484325	-13.3503	1365.696	2553.4219	0	235.4
93	Optimized	11.860235	-11.807155	1278.6876	2349.5082	0	228.45
94	Optimized	14.23614	-10.264008	1191.6792	2147.1476	0	221.17
95	Optimized	16.612045	-8.7208635	1104.6709	1946.3047	0	213.57
96	Optimized	18.158925	-7.7161705	1048.0355	1816.4126	0	208.46
97	Optimized	19.7089	-6.9309605	1005.0774	1738.785	0	203.38
98	Optimized	22.091	-5.8267815	945.50934	1577.5247	0	195.48
99	Optimized	24.38569	-4.763121	883.76848	1440.229	0	187.65
100	Optimized	26.592965	-3.7399785	819.93459	1326.7009	0	179.92
101	Optimized	29.0805	-2.586926	747.99496	1067.3982	0	600
102	Optimized	31.8483	-1.3039637	667.91469	895.04371	0	600
103	Optimized	34.6161	-0.0210011	587.8672	722.6892	0	600
104	Optimized	37.21457	1.183473	512.69467	575.18015	0	600

105	Optimized	39.643715	2.3094585	442.44053	450.0598	0	600
106	Optimized	41.21161	3.0362255	397.10531	391.21209	0	400

Slices of Slip Surface: 406

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	406	-199.8254	-2.1374065	61.363583	365.2524	0	600
2	406	-197.21775	-3.9578545	187.97488	363.70242	0	121.92
3	406	-194.49065	-5.7985235	316.43481	545.61624	0	125.6
4	406	-191.76355	-7.5751735	440.93002	721.71559	0	129.15
5	406	-189.18785	-9.1977895	552.45944	878.3579	0	132.4
6	406	-186.76355	-10.674363	651.56122	1016.3308	0	135.35
7	406	-184.3392	-12.10453	747.76297	1150.0945	0	138.21
8	406	-181.91485	-13.489425	841.10668	1279.8371	0	140.98
9	406	-179.49055	-14.830115	931.72135	1405.5897	0	143.66
10	406	-177.06625	-16.127605	1019.6443	1527.5136	0	146.26
11	406	-174.6419	-17.382835	1104.9238	1645.6414	0	148.77
12	406	-172.2885	-18.56232	1185.2758	1768.2654	0	154.92
13	406	-170.0061	-19.669155	1260.89	1895.1904	0	164.61
14	406	-167.72365	-20.740685	1334.3352	2018.0895	0	173.98
15	406	-165.4412	-21.777525	1405.57	2137.0968	0	183.05
16	406	-163.14285	-22.78703	1473.9531	2250.9164	0	191.89
17	406	-160.82855	-23.76929	1539.4359	2359.5032	0	200.48
18	406	-158.51425	-24.71761	1602.8322	2464.3355	0	208.78
19	406	-156.2	-25.6325	1664.1195	2565.4639	0	216.78
20	406	-153.88575	-26.514455	1723.4011	2662.9487	0	224.5
21	406	-151.57145	-27.363945	1780.6223	2756.8566	0	231.93
22	406	-149.25715	-28.181395	1835.8138	2847.2223	0	239.09
23	406	-146.96665	-28.95945	1889.0584	2934.2377	0	245.9
24	406	-144.7	-29.69914	1940.3906	3017.9512	0	252.37
25	406	-142.43335	-30.40921	1989.858	3098.4136	0	258.58
26	406	-140.16665	-31.089985	2037.507	3175.7292	0	264.54
27	406	-137.9	-31.741775	2083.3475	3249.8845	0	270.24
28	406	-135.63335	-32.364875	2127.3885	3320.9502	0	275.69
29	406	-133.18335	-33.0052	2171.2997	3391.2369	0	281.3

30	406	-130.55	-33.658135	2214.7694	3460.3257	0	287.01
31	406	-127.91665	-34.273475	2255.8616	3525.3809	0	292.39
32	406	-125.55	-34.796395	2290.8413	3580.4756	0	296.97
33	406	-123.45	-35.2339	2320.1677	3626.3501	0	300.8
34	406	-121.35	-35.64807	2348.0146	3669.8076	0	304.42
35	406	-119.13125	-36.05978	2382.1423	3724.1552	0	308.02
36	406	-116.79375	-36.46643	2422.4014	3789.2001	0	311.58
37	406	-114.45625	-36.8447	2460.8877	3851.1792	0	314.89
38	406	-112.11875	-37.194755	2497.6255	3910.2308	0	317.95
39	406	-109.78125	-37.516745	2532.5921	3966.2757	0	320.77
40	406	-107.44375	-37.8108	2565.855	4019.4119	0	323.34
41	406	-105.10625	-38.07705	2597.354	4069.6104	0	325.67
42	406	-102.76875	-38.315605	2627.1166	4116.8891	0	327.76
43	406	-100.35455	-38.53255	2650.1045	4152.1398	0	329.66
44	406	-97.863635	-38.726115	2666.1231	4174.9774	0	331.35
45	406	-95.372725	-38.888535	2680.2285	4194.7953	0	332.77
46	406	-92.881815	-39.019885	2692.3714	4211.58	0	333.92
47	406	-90.390905	-39.120225	2702.5856	4224.9215	0	334.8
48	406	-87.9	-39.189605	2710.9058	4235.2133	0	335.41
49	406	-85.409095	-39.228055	2717.2458	4242.0459	0	335.75
50	406	-82.918185	-39.23559	2721.683	4245.8174	0	335.81
51	406	-80.427275	-39.212215	2724.176	4246.5274	0	335.61
52	406	-77.936365	-39.15792	2724.7635	4244.1749	0	335.13
53	406	-75.445455	-39.07268	2723.4055	4238.7618	0	334.39
54	406	-73.026665	-38.96069	2720.2423	4230.2633	0	333.41
55	406	-70.68	-38.823645	2715.4478	4219.2482	0	332.21
56	406	-68.333335	-38.659	2708.8823	4205.4556	0	330.77
57	406	-65.986665	-38.466685	2700.6341	4188.8504	0	329.08
58	406	-63.64	-38.24662	2690.6235	4169.4847	0	327.16
59	406	-61.293335	-37.998715	2678.8569	4147.2859	0	324.99
60	406	-58.946665	-37.72286	2665.3838	4127.3419	0	324.45
61	406	-56.6	-37.41894	2650.1703	4105.2957	0	324
62	406	-54.253335	-37.08683	2633.1831	4080.3568	0	323.37
63	406	-51.906665	-36.726385	2614.3912	4052.542	0	322.58
64	406	-49.56	-36.33745	2593.8491	4021.787	0	321.62
65	406	-47.213335	-35.91986	2571.527	3988.153	0	320.52

66	406	-44.866665	-35.47343	2547.3981	3951.5383	0	319.28
67	406	-42.52	-34.997965	2521.4774	3912.0088	0	317.9
68	406	-40.173335	-34.493255	2493.6987	3869.508	0	316.39
69	406	-38.3	-34.07159	2471.9744	3850.8298	0	315.11
70	406	-36.34	-33.60472	2450.5425	3858.8639	0	313.66
71	406	-33.82	-32.97761	2421.2532	3866.4545	0	311.71
72	406	-31.3	-32.31571	2389.7948	3870.155	0	309.65
73	406	-28.78	-31.618665	2356.1193	3870.3638	0	307.48
74	406	-26.26	-30.886085	2320.256	3867.0934	0	305.22
75	406	-23.74	-30.11757	2282.162	3859.9815	0	302.86
76	406	-21.22	-29.312685	2241.7969	3849.0511	0	300.43
77	406	-18.7	-28.470965	2199.1236	3834.327	0	297.93
78	406	-16.18	-27.59192	2154.1101	3815.4656	0	295.37
79	406	-13.66	-26.675025	2106.7273	3793.2474	0	292.76
80	406	-10.65	-25.52492	2046.7266	3760.4293	0	289.56
81	406	-7.925	-24.44626	1990.0698	3727.2778	0	286.69
82	406	-5.975	-23.6412	1947.4472	3699.9794	0	284.59
83	406	-3.5	-22.580385	1890.9145	3620.4904	0	281.89
84	406	-0.5	-21.246425	1819.404	3487.1353	0	278.65
85	406	1.55	-20.307315	1768.8236	3387.4665	0	270.35
86	406	3.55	-19.351555	1717.0117	3283.532	0	259.91
87	406	5.658409	-18.326615	1661.2923	3155.3669	0	248.54
88	406	7.465136	-17.41586	1611.5149	3013.8091	0	241.96
89	406	9.761772	-16.228845	1546.4281	2836.6025	0	235.9
90	406	12.05841	-15.003965	1478.9549	2657.3254	0	229.59
91	406	14.355045	-13.740425	1409.0701	2476.0315	0	223.01
92	406	16.65168	-12.43739	1336.7556	2292.7076	0	216.15
93	406	19.170515	-10.959615	1254.3694	2089.0067	0	208.29
94	406	21.91154	-9.297127	1161.3523	1864.8005	0	199.31
95	406	24.5962	-7.610548	1061.4636	1662.5055	0	190.07
96	406	27.224505	-5.9006025	954.74981	1482.0992	0	180.58
97	406	29.85281	-4.1313035	844.35489	1298.9158	0	170.61
98	406	32.37522	-2.376911	734.87182	937.98185	0	600
99	406	34.79174	-0.6404071	626.50668	714.51779	0	600
100	406	37.743635	1.5637024	488.98599	452.54224	0	600
101	406	39.689155	3.0429905	396.68669	304.50899	0	400

HWL Block TC (3)

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Time: 11:41:35 AM
File Name: WBV-14c.2 Reach III WM E_W Closure HWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 3/2/2009
Last Solved Time: 11:43:54 AM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

HWL Block TC (3)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Fully-Specified
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Search for Tension Crack
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf

FOS Distribution

FOS Calculation Option: Constant

Advanced

Number of Slices: 100

Optimization Tolerance: 0.01

Minimum Slip Surface Depth: 0.1 ft

Optimization Maximum Iterations: 2000

Optimization Convergence Tolerance: 1e-007

Starting Optimization Points: 8

Ending Optimization Points: 16

Complete Passes per Insertion: 1

Driving Side Maximum Convex Angle: 10 °

Resisting Side Maximum Convex Angle: 5 °

Materials

Existing Levee

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 600 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 400 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb

Weight Fn: CH -18 to -58

Cohesion Spatial Fn: CH -18 to -58

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb

Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Sand Fill

Model: Mohr-Coulomb
Unit Weight: 122 pcf
Cohesion: 0 psf
Phi: 30 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-350, -3.3) ft
Right Coordinate: (450, -9) ft

Fully Specified Slip Surfaces

Fully Specified Slip Surface 1

	X (ft)	Y (ft)
	-336	5
	-283	-30

	23	-30
	74.8	12

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-350	-8.5
	-330.2	-8.50677
	-292.3	-8.5
	-275.9	-3
	-240.5	-1.7
	-184.4	-0.1
	-149.1	0.5
	-147.3	0.5
	-143	1.9
	-20.5	5
	1	5.5
	43	13.5
	450	13.5

Reinforcements

Reinforcement 1

Type: Fabric
Outside Point: (-35, 0.3) ft
Inside Point: (45, 0.3) ft
Slip Surface Intersection: (75.724, 0.3) ft
Total Length: 80 ft
Reinforcement Direction: 180 °
Applied Load Option: Variable
F of S Dependent: No
Contact Cohesion: 265 psf
Contact Phi: 19 °
Interface Factor: 1
Bond Safety Factor: 1
Fabric Capacity: 11400 lbs

Fabric Safety Factor: 1
Fabric Load: 11400 lbs
Load Distribution: Even along reinf.
Load Orientation: 0
Applied Load: 11400 lbs
Fabric Load Used: 0 lbs
Resisting Force Used: 359.05 lbs/ft
Available Bond Length: 0 ft
Required Bond Length: 0 ft
Governing Component: Bond

Reinforcement 2

Type: Fabric
Outside Point: (29, 3) ft
Inside Point: (79, 3) ft
Slip Surface Intersection: (79.047, 3) ft
Total Length: 50 ft
Reinforcement Direction: 180 °
Applied Load Option: Variable
F of S Dependent: No
Contact Cohesion: 265 psf
Contact Phi: 19 °
Interface Factor: 2
Bond Safety Factor: 1
Fabric Capacity: 11400 lbs
Fabric Safety Factor: 1
Fabric Load: 11400 lbs
Load Distribution: Even along reinf.
Load Orientation: 0
Applied Load: 11400 lbs
Fabric Load Used: 0 lbs
Resisting Force Used: 594.51 lbs/ft
Available Bond Length: 0 ft
Required Bond Length: 0 ft
Governing Component: Bond

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-350, 102)

Data Point: (-61, 102)
Data Point: (0, 103)
Data Point: (46, 102)
Data Point: (450, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-350, 84)
Data Point: (-61, 84)
Data Point: (0, 93)
Data Point: (46, 84)
Data Point: (450, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-350, 114)
Data Point: (-61, 114)
Data Point: (0, 108)
Data Point: (46, 114)
Data Point: (450, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-350, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (450, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-350, -3, 120)
- Data Point: (-61, -3, 120)
- Data Point: (0, -3, 260)
- Data Point: (46, -3, 120)
- Data Point: (450, -3, 120)
- Data Point: (-350, -18, 150)
- Data Point: (-61, -18, 150)
- Data Point: (0, -18, 260)
- Data Point: (46, -18, 150)
- Data Point: (450, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-350, -18, 150)
- Data Point: (-61, -18, 150)
- Data Point: (0, -18, 260)
- Data Point: (46, -18, 150)
- Data Point: (450, -18, 150)
- Data Point: (-350, -58, 500)
- Data Point: (-61, -58, 500)
- Data Point: (0, -58, 500)
- Data Point: (46, -58, 500)
- Data Point: (450, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
- Data Point: (-350, -62, 580)
- Data Point: (-61, -62, 580)
- Data Point: (0, -62, 580)
- Data Point: (46, -62, 580)
- Data Point: (450, -62, 580)
- Data Point: (-350, -104, 900)
- Data Point: (-61, -104, 900)
- Data Point: (0, -104, 900)
- Data Point: (46, -104, 900)
- Data Point: (450, -104, 900)

Regions

	Material	Points
Region 1	CH -18 to -58	3,1,2,4
Region 2	SM -58 to -62	4,6,5,3
Region 3	CH -62 to -104	5,6,8,7
Region 4	Compacted Fill	9,10,11,12,13,14,15
Region 5	Compacted Fill	16,17,18,19,20,21,22,23,24,25,26
Region 6	Sand Fill	27,28,29,30,31,32,58,33,34,35,36,37,38,57
Region 7	Existing Levee	49,57,27,28,29,30,31,32,58,59,40,21,22,23,24,25,26,16,39,11,12,13,14,15,9,46,47,48
Region 8	CH -3 to -18	56,55,54,53,52,51,50,49,57,38,37,36,35,34,33,58,59,41,42,43,44,45,60,2,1

Points

	X (ft)	Y (ft)
Point 1	-350	-18
Point 2	450	-18
Point 3	-350	-58
Point 4	450	-58
Point 5	-350	-62
Point 6	450	-62
Point 7	-350	-104
Point 8	450	-104
Point 9	-147.3	0.5
Point 10	-143	1.9
Point 11	-20.5	5
Point 12	-30.3	3
Point 13	-37.6	2.8
Point 14	-79.1	0.7
Point 15	-113.8	0.4

Point 16	10.4	7.9
Point 17	33	13.5
Point 18	43	13.5
Point 19	71.5	6.4
Point 20	160	4.2
Point 21	170.7	0.6
Point 22	156.1	0.8
Point 23	131.1	1.3
Point 24	95.8	1.9
Point 25	60.4	2.7
Point 26	23	4.1
Point 27	-140.4	-1.2
Point 28	-43.4	-1.2
Point 29	-38.8	0.3
Point 30	45.1	0.3
Point 31	49.7	-1.2
Point 32	124.1	-1.2
Point 33	152.9	-10.6
Point 34	82.1	-10.6
Point 35	22.2	-11.6
Point 36	-23.7	-6.8
Point 37	-71.6	-7.8
Point 38	-131.5	-4.5
Point 39	1	5.5
Point 40	194.7	-1.4
Point 41	254	-3.5
Point 42	287.4	-4.3
Point 43	333.9	-8.9
Point 44	375.8	-9.3
Point 45	425	-9.2
Point 46	-149.1	0.5
Point 47	-184.4	-0.1
Point 48	-240.5	-1.7
Point 49	-275.9	-3
Point 50	-287.5	-6.8
Point 51	-301.9	-11.9

Point 52	-310.1	-12.6
Point 53	-319.8	-11.4
Point 54	-333.1	-7.7
Point 55	-344.7	-3
Point 56	-350	-3.3
Point 57	-135.5	-3
Point 58	129.6	-3
Point 59	249.2	-3
Point 60	450	-9

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.46	(-121.111, 11.995)	144.5685	(82.8824, 6.11705)	(-310.035, -12.5945)
2	1	1.71	(-121.111, 11.995)	140.819	(68.741, 7.08732)	(-309.435, -12.5432)

Slices of Slip Surface: Optimized

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	-308.08005	-13.945845	339.63923	457.97859	0	141.89
2	Optimized	-304.17	-16.648615	508.34382	702.14688	0	147.3
3	Optimized	-302.0575	-18.108855	599.49539	836.44142	0	150.95
4	Optimized	-299.5	-19.876665	709.82332	1051.1877	0	166.42
5	Optimized	-294.7	-23.194575	916.91439	1451.1799	0	195.45
6	Optimized	-291.4213	-25.46091	1076.7395	1744.699	0	215.28
7	Optimized	-289.0213	-26.45461	1188.9691	1823.1136	0	223.98
8	Optimized	-284.7953	-27.52777	1344.387	2056.7516	0	233.37
9	Optimized	-280.54295	-28.03574	1465.0733	2133.519	0	237.81
10	Optimized	-277.44765	-27.677995	1507.5332	2182.1088	0	234.68
11	Optimized	-273.86065	-27.26342	1518.6993	2190.7947	0	231.05
12	Optimized	-269.782	-26.79202	1498.6302	2159.5464	0	226.93
13	Optimized	-265.70335	-26.32062	1478.5611	2128.298	0	222.81
14	Optimized	-261.62465	-25.84922	1458.4921	2097.0496	0	218.68
15	Optimized	-257.546	-25.37782	1438.423	2065.8013	0	214.56

16	Optimized	-253.46735	-24.90642	1418.3539	2034.5529	0	210.43
17	Optimized	-249.38865	-24.43502	1398.2848	2003.3046	0	206.31
18	Optimized	-245.31	-23.96362	1378.2157	1972.0562	0	202.18
19	Optimized	-241.88535	-23.713355	1370.4543	1983.6995	0	199.99
20	Optimized	-238.49015	-23.677655	1374.9827	1991.9376	0	199.68
21	Optimized	-234.47045	-23.63539	1379.5102	2000.2214	0	199.31
22	Optimized	-230.4508	-23.593125	1384.0128	2008.5052	0	198.94
23	Optimized	-226.43115	-23.550855	1388.5403	2016.789	0	198.57
24	Optimized	-222.41145	-23.50859	1393.0429	2025.0976	0	198.2
25	Optimized	-218.39175	-23.466325	1397.5703	2033.3814	0	197.83
26	Optimized	-214.37205	-23.42406	1402.0729	2041.6652	0	197.46
27	Optimized	-210.35235	-23.381795	1406.6004	2049.9489	0	197.09
28	Optimized	-206.3327	-23.33953	1411.103	2058.2327	0	196.72
29	Optimized	-202.31305	-23.297265	1415.6305	2066.5165	0	196.35
30	Optimized	-198.3153	-23.38542	1428.25	2102.7697	0	197.12
31	Optimized	-194.3395	-23.603995	1448.9693	2137.7539	0	199.03
32	Optimized	-190.3637	-23.82257	1469.6634	2172.7381	0	200.95
33	Optimized	-186.3879	-24.04115	1490.3827	2207.6972	0	202.86
34	Optimized	-182.27375	-24.26733	1510.2989	2241.1932	0	204.84
35	Optimized	-178.0213	-24.501115	1529.3884	2273.2204	0	206.88
36	Optimized	-173.76885	-24.734905	1548.5013	2305.224	0	208.93
37	Optimized	-169.76405	-25.101415	1575.6221	2369.6335	0	212.14
38	Optimized	-166.00695	-25.60065	1610.7397	2428.4443	0	216.51
39	Optimized	-162.24985	-26.099885	1645.8837	2487.255	0	220.87
40	Optimized	-158.49275	-26.599115	1681.0277	2546.0658	0	225.24
41	Optimized	-154.73565	-27.09835	1716.1717	2604.8766	0	229.61
42	Optimized	-150.97855	-27.597585	1751.2893	2663.7665	0	233.98
43	Optimized	-148.2	-27.96679	1776.3315	2705.4429	0	237.21
44	Optimized	-145.644	-28.306425	1831.1628	2800.3045	0	240.18
45	Optimized	-143.494	-28.51544	1887.8708	2854.5229	0	242.01
46	Optimized	-141.7	-28.475385	1897.4886	2871.7458	0	241.66
47	Optimized	-137.95	-28.39166	1898.1801	2884.3833	0	240.93
48	Optimized	-133.5	-28.292305	1899.0017	2926.0207	0	240.06
49	Optimized	-129.73	-28.20813	1899.6962	2959.997	0	239.32
50	Optimized	-126.19	-28.12909	1900.374	2969.3167	0	238.63
51	Optimized	-122.65	-28.05005	1901.0235	2978.354	0	237.94

52	Optimized	-119.11	-27.97101	1901.6731	2987.6737	0	237.25
53	Optimized	-115.57	-27.891975	1902.3226	2996.711	0	236.55
54	Optimized	-111.8586	-27.80911	1903.0159	3006.3882	0	235.83
55	Optimized	-107.97585	-27.722415	1903.7369	3016.4301	0	235.07
56	Optimized	-104.0931	-27.635725	1904.4578	3026.472	0	234.31
57	Optimized	-100.21033	-27.549035	1905.1788	3036.5139	0	233.55
58	Optimized	-96.352055	-27.561465	1912.0501	3071.6387	0	233.66
59	Optimized	-92.518265	-27.67301	1925.0605	3101.8832	0	234.64
60	Optimized	-88.684475	-27.784555	1938.0969	3131.8669	0	235.61
61	Optimized	-84.850685	-27.896105	1951.1072	3162.1114	0	236.59
62	Optimized	-81.016895	-28.00765	1964.1175	3192.3559	0	237.57
63	Optimized	-77.79096	-28.10151	1975.0778	3217.6384	0	238.39
64	Optimized	-74.04096	-28.31297	1994.1899	3270.3897	0	240.24
65	Optimized	-69.46571	-28.63793	2021.6959	3320.1475	0	243.08
66	Optimized	-65.197135	-28.94111	2047.3542	3359.8733	0	245.73
67	Optimized	-61.096565	-29.3764	2080.9696	3436.1935	0	249.54
68	Optimized	-57.163995	-29.9438	2122.5976	3510.1875	0	259.36
69	Optimized	-53.231425	-30.5112	2164.2004	3584.6849	0	269.1
70	Optimized	-49.298855	-31.0786	2205.8283	3659.1824	0	278.64
71	Optimized	-45.366285	-31.646	2247.4563	3733.9315	0	287.98
72	Optimized	-41.1	-32.26155	2292.5648	3824.3123	0	297.88
73	Optimized	-38.2	-32.67997	2323.2758	3888.6497	0	304.48
74	Optimized	-35.775	-33.029855	2348.9369	3934.8706	0	309.91
75	Optimized	-32.125	-33.556485	2387.5778	4004.8311	0	317.94
76	Optimized	-28.65	-34.057865	2424.35	4071.4756	0	325.42
77	Optimized	-25.35	-34.534	2459.2612	4134.7597	0	332.39
78	Optimized	-22.1	-35.00292	2493.647	4203.6586	0	339.11
79	Optimized	-18.61893	-35.505175	2530.2452	4284.0298	0	346.15
80	Optimized	-14.856795	-36.047985	2569.576	4370.3208	0	353.59
81	Optimized	-11.09466	-36.590795	2608.9068	4456.0855	0	360.84
82	Optimized	-7.511325	-36.94084	2635.967	4476.3144	0	366.51
83	Optimized	-4.106795	-37.098125	2650.7257	4517.9791	0	370.72
84	Optimized	-0.702265	-37.25541	2665.4551	4559.0569	0	374.88
85	Optimized	3.35	-37.44262	2707.5377	4655.46	0	372.54
86	Optimized	8.05	-37.659755	2777.038	4815.077	0	368.17
87	Optimized	11.025445	-37.797215	2820.9011	4916.1332	0	365.47

88	Optimized	13.409075	-37.29852	2818.0945	4776.8146	0	359.2
89	Optimized	16.925445	-36.24334	2794.1247	4771.9117	0	347.45
90	Optimized	20.441815	-35.18816	2770.1548	4767.5535	0	335.25
91	Optimized	22.6	-34.54054	2755.249	4763.7685	0	327.55
92	Optimized	23.43026	-34.2914	2749.5801	4759.6463	0	324.54
93	Optimized	26.14539	-32.59267	2675.805	4504.0463	0	307.84
94	Optimized	30.71513	-29.45343	2534.2137	4316.8211	0	276.3
95	Optimized	35.15219	-26.40534	2396.8922	4079.1401	0	244.04
96	Optimized	39.456565	-23.4484	2263.423	3791.1378	0	211.19
97	Optimized	42.304375	-21.591515	2181.4226	3650.2475	0	189.47
98	Optimized	44.05	-20.64191	2130.456	3543.7743	0	177.47
99	Optimized	47.00326	-19.03536	2030.2112	3343.4157	0	159.06
100	Optimized	49.30326	-17.784175	1952.08	3188.3346	0	149.57
101	Optimized	51.483335	-16.59823	1878.1351	3063.3574	0	147.2
102	Optimized	55.05	-14.65799	1757.0589	2861.1532	0	143.32
103	Optimized	58.616665	-12.71775	1635.9826	2659.1952	0	139.44
104	Optimized	61.155195	-11.33681	1549.834	2515.1069	0	136.67
105	Optimized	64.307795	-8.977724	1402.6032	2044.0435	370.33569	0
106	Optimized	69.1026	-5.081192	1159.4674	1590.5148	248.86529	0
107	Optimized	72.689265	-2.166463	977.58619	1264.1212	165.43106	0
108	Optimized	76.030805	0.5490615	808.13642	739.82568	0	600
109	Optimized	80.53273	4.2075855	579.84752	447.32086	0	400

Slices of Slip Surface: 1

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	1	-307.55095	-13.787115	329.75061	428.65142	0	141.57
2	1	-303.78365	-16.27495	485.02378	651.83723	0	146.55
3	1	-301.5357	-17.759435	577.68836	789.16459	0	149.52
4	1	-298.95355	-19.464625	684.11317	987.93353	0	162.82
5	1	-294.51785	-22.39387	866.95095	1338.1641	0	188.45
6	1	-289.9	-25.443395	1107.491	1757.765	0	215.13
7	1	-285.25	-28.51415	1396.4117	2226.3517	0	242
8	1	-281.225	-30	1573.3521	2342.8169	0	255
9	1	-277.675	-30	1647.662	2440.4789	0	255

10	1	-273.93335	-30	1689.3052	2497.2714	0	255
11	1	-270	-30	1698.3307	2513.1612	0	255
12	1	-266.06665	-30	1707.3307	2529.0511	0	255
13	1	-262.13335	-30	1716.3561	2544.9155	0	255
14	1	-258.2	-30	1725.3561	2560.9324	0	255
15	1	-254.26665	-30	1734.3815	2576.6951	0	255
16	1	-250.33335	-30	1743.3815	2592.7121	0	255
17	1	-246.4	-30	1752.4069	2608.4748	0	255
18	1	-242.46665	-30	1761.4069	2624.4917	0	255
19	1	-238.63	-30	1769.2513	2638.2086	0	255
20	1	-234.89	-30	1775.9091	2649.9465	0	255
21	1	-231.15	-30	1782.5668	2661.6578	0	255
22	1	-227.41	-30	1789.2246	2673.3957	0	255
23	1	-223.67	-30	1795.8824	2685.0267	0	255
24	1	-219.93	-30	1802.5401	2696.7914	0	255
25	1	-216.19	-30	1809.1711	2708.5561	0	255
26	1	-212.45	-30	1815.8289	2720.3209	0	255
27	1	-208.71	-30	1822.4866	2732.0856	0	255
28	1	-204.97	-30	1829.1444	2743.8503	0	255
29	1	-201.23	-30	1835.8021	2755.615	0	255
30	1	-197.49	-30	1842.4599	2767.3797	0	255
31	1	-193.75	-30	1849.1176	2778.877	0	255
32	1	-190.01	-30	1855.7754	2790.6417	0	255
33	1	-186.27	-30	1862.4332	2802.4064	0	255
34	1	-182.4389	-30	1867.8443	2811.9265	0	255
35	1	-178.5167	-30	1872.0001	2819.3203	0	255
36	1	-174.59445	-30	1876.1559	2826.714	0	255
37	1	-170.6722	-30	1880.3117	2834.1078	0	255
38	1	-166.75	-30	1884.4675	2841.2466	0	255
39	1	-162.8278	-30	1888.6488	2848.6404	0	255
40	1	-158.90555	-30	1892.8046	2856.0342	0	255
41	1	-154.9833	-30	1896.9604	2863.4279	0	255
42	1	-151.0611	-30	1901.1163	2870.5667	0	255
43	1	-148.2	-30	1903.2222	2874.3333	0	255
44	1	-145.15	-30	1946.8837	2951.3953	0	255
45	1	-141.7	-30	1992.6154	3031.9615	0	255

46	1	-137.95	-30	1998.5306	3053.2653	0	255
47	1	-133.5	-30	2005.55	3105	0	255
48	1	-129.73	-30	2011.5254	3147.4576	0	255
49	1	-126.19	-30	2017.1186	3164.9718	0	255
50	1	-122.65	-30	2022.6836	3182.2034	0	255
51	1	-119.11	-30	2028.2768	3199.435	0	255
52	1	-115.57	-30	2033.8701	3216.6667	0	255
53	1	-111.8722	-30	2039.7058	3234.5529	0	255
54	1	-108.01665	-30	2045.8009	3253.4867	0	255
55	1	-104.1611	-30	2051.896	3272.161	0	255
56	1	-100.30554	-30	2057.9911	3291.0947	0	255
57	1	-96.45	-30	2064.0603	3309.7691	0	255
58	1	-92.594445	-30	2070.1554	3328.7028	0	255
59	1	-88.73889	-30	2076.2505	3347.3771	0	255
60	1	-84.883335	-30	2082.3196	3366.3109	0	255
61	1	-81.02778	-30	2088.4147	3384.9852	0	255
62	1	-77.225	-30	2094.4267	3403.7333	0	255
63	1	-73.475	-30	2100.3467	3421.8667	0	255
64	1	-69.585715	-30	2106.4789	3435.2131	0	255
65	1	-65.557145	-30	2112.8584	3443.1564	0	255
66	1	-61.528575	-30	2119.213	3451.0997	0	255
67	1	-57.5	-30	2125.5676	3465.2486	0	259.42
68	1	-53.471425	-30	2131.947	3480.6387	0	264.5
69	1	-49.442855	-30	2138.3016	3496.0287	0	269.59
70	1	-45.414285	-30	2144.6563	3511.4188	0	274.67
71	1	-41.1	-30	2151.4783	3536.9565	0	280.12
72	1	-38.2	-30	2156.0833	3557.3333	0	283.78
73	1	-35.775	-30	2159.8904	3566.8493	0	286.84
74	1	-32.125	-30	2165.6438	3581.0959	0	291.45
75	1	-28.65	-30	2171.1212	3594.8485	0	295.84
76	1	-25.35	-30	2176.3333	3607.8788	0	300
77	1	-22.1	-30	2181.4688	3627.1875	0	304.1
78	1	-18.708335	-30	2186.5956	3653.8608	0	308.38
79	1	-15.125	-30	2191.8142	3681.2096	0	312.91
80	1	-11.541665	-30	2197.0049	3708.0003	0	317.43
81	1	-7.9583335	-30	2202.1956	3734.512	0	321.95

82	1	-4.375	-30	2207.4142	3760.7445	0	326.48
83	1	-0.7916665	-30	2212.6049	3786.419	0	331
84	1	3.35	-30	2243.1915	3864.2553	0	326.39
85	1	8.05	-30	2298.9362	4002.3404	0	318.52
86	1	11.019355	-30	2334.2832	4089.3349	0	313.55
87	1	13.398925	-30	2362.5807	4157.7307	0	309.57
88	1	16.919355	-30	2404.4222	4259.7069	0	303.68
89	1	20.439785	-30	2446.2637	4361.9671	0	297.79
90	1	22.6	-30	2471.875	4423.25	0	294.17
91	1	24.666665	-28.64865	2412.0598	4085.1918	0	280.61
92	1	28	-25.945945	2283.1494	3909.4896	0	254.02
93	1	31.333335	-23.24324	2154.1225	3743.8076	0	226.35
94	1	35.4	-19.945945	1996.7477	3465.1396	0	191.14
95	1	40.4	-15.89189	1803.119	3101.4961	0	159.69
96	1	44.05	-12.93243	1649.3851	2856.2784	0	144.96
97	1	45.643615	-11.640315	1568.7614	2744.868	0	138.23
98	1	47.943615	-9.7754505	1452.3817	2324.0052	503.23211	0
99	1	51.905	-6.5635135	1251.9683	1936.2532	395.07206	0
100	1	56.315	-2.987838	1028.8404	1512.0494	278.98087	0
101	1	59.46	-0.43783785	869.71863	1049.488	0	600
102	1	61.825275	1.4799527	750.03781	811.43055	0	600
103	1	65.99579	4.8614515	539.04108	484.44658	0	400

LWL Block TC (5)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 501
Last Edited By: Breen, Scott A MVN-Contractor
Date: 3/26/2009
Time: 12:00:27 PM
File Name: WBV-14c.2 Reach III WM E_W Closure LWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 3/26/2009
Last Solved Time: 12:01:20 PM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

LWL Block TC (5)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Tension Crack Line
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf
FOS Distribution
FOS Calculation Option: Constant
Restrict Block Crossing: Yes
Advanced
Number of Slices: 100
Optimization Tolerance: 0.01
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 15 °
Resisting Side Maximum Convex Angle: 10 °

Materials

Existing Levee

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion: 600 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion: 400 psf
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb
Weight Fn: CH -18 to -58
Cohesion Spatial Fn: CH -18 to -58
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb
Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

Sand Fill

Model: Mohr-Coulomb
Unit Weight: 122 pcf
Cohesion: 0 psf
Phi: 30 °
Phi-B: 0 °
Pore Water Pressure
    Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-350, -3.3) ft
Right Coordinate: (450, -9) ft

Slip Surface Block

Left Grid
    Upper Left: (38, -10) ft
    Lower Left: (38, -50) ft
    Lower Right: (117, -50) ft

X Increments: 5
Y Increments: 5
Starting Angle: 125 °
Ending Angle: 135 °
Angle Increments: 4

Right Grid

Upper Left: (167, -10) ft
Lower Left: (167, -50) ft
Lower Right: (317, -50) ft
X Increments: 5
Y Increments: 5
Starting Angle: 0 °
Ending Angle: 45 °
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-350	-8.5
	-344.7	-8.5
	-291	-8.5
	-275.9	-3
	-240.5	-1.7
	-184.4	-0.1
	-149.1	0.5
	-147.3	0.5
	179	-1
	450	-1

Reinforcements

Reinforcement 1

Type: Fabric
Outside Point: (45, 0.3) ft
Inside Point: (-35, 0.3) ft
Slip Surface Intersection: (30.434, 0.3) ft
Total Length: 80 ft
Reinforcement Direction: 0 °

Applied Load Option: Variable
F of S Dependent: No
Contact Cohesion: 265 psf
Contact Phi: 19 °
Interface Factor: 1
Bond Safety Factor: 1
Fabric Capacity: 11400 lbs
Fabric Safety Factor: 1
Fabric Load: 11400 lbs
Load Distribution: Even along reinf.
Load Orientation: 0
Applied Load: 11400 lbs
Fabric Load Used: 11400 lbs
Resisting Force Used: 740.16 lbs/ft
Available Bond Length: 65.434 ft
Required Bond Length: 15.402 ft
Governing Component: Fabric

Reinforcement 2

Type: Fabric
Outside Point: (79, 3) ft
Inside Point: (29, 3) ft
Slip Surface Intersection: (27.913, 3) ft
Total Length: 50 ft
Reinforcement Direction: 0 °
Applied Load Option: Variable
F of S Dependent: No
Contact Cohesion: 265 psf
Contact Phi: 19 °
Interface Factor: 2
Bond Safety Factor: 1
Fabric Capacity: 11400 lbs
Fabric Safety Factor: 1
Fabric Load: 11400 lbs
Load Distribution: Even along reinf.
Load Orientation: 0
Applied Load: 11400 lbs
Fabric Load Used: 0 lbs
Resisting Force Used: 1225.7 lbs/ft
Available Bond Length: 0 ft
Required Bond Length: 0 ft
Governing Component: Bond

Tension Crack Line

	X (ft)	Y (ft)
	1	0.5

	10.4	3.4
	33	9
	43	9

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-350, 102)
    Data Point: (-61, 102)
    Data Point: (0, 103)
    Data Point: (46, 102)
    Data Point: (450, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-350, 84)
    Data Point: (-61, 84)
    Data Point: (0, 93)
    Data Point: (46, 84)
    Data Point: (450, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-350, 114)
    Data Point: (-61, 114)
    Data Point: (0, 108)
    Data Point: (46, 114)
    Data Point: (450, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 104
Data Points: X (ft), Unit Weight (pcf)
Data Point: (-350, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (450, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-350, -3, 120)
Data Point: (-61, -3, 120)
Data Point: (0, -3, 260)
Data Point: (46, -3, 120)
Data Point: (450, -3, 120)
Data Point: (-350, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (450, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-350, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (450, -18, 150)
Data Point: (-350, -58, 500)
Data Point: (-61, -58, 500)
Data Point: (0, -58, 500)
Data Point: (46, -58, 500)
Data Point: (450, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-350, -62, 580)
Data Point: (-61, -62, 580)
Data Point: (0, -62, 580)
Data Point: (46, -62, 580)
Data Point: (450, -62, 580)
Data Point: (-350, -104, 900)
Data Point: (-61, -104, 900)
Data Point: (0, -104, 900)
Data Point: (46, -104, 900)
Data Point: (450, -104, 900)

Regions

	Material	Points
Region 1	CH -18 to -58	3,1,2,4
Region 2	SM -58 to -62	4,6,5,3
Region 3	CH -62 to -104	5,6,8,7
Region 4	Compacted Fill	9,10,11,12,13,14,15
Region 5	Compacted Fill	16,17,18,19,20,21,22,23,24,25,26
Region 6	Sand Fill	27,28,29,30,31,32,58,33,34,35,36,37,38,57
Region 7	Existing Levee	49,57,27,28,29,30,31,32,58,59,61,40,21,22,23,24,25,26,16,39,11,12,13,14,15,9,46,47,48
Region 8	CH -3 to -18	56,55,54,53,52,51,50,49,57,38,37,36,35,34,33,58,59,41,42,43,44,45,60,2,1

Points

	X (ft)	Y (ft)
Point 1	-350	-18
Point 2	450	-18
Point 3	-350	-58

Point 4	450	-58
Point 5	-350	-62
Point 6	450	-62
Point 7	-350	-104
Point 8	450	-104
Point 9	-147.3	0.5
Point 10	-143	1.9
Point 11	-20.5	5
Point 12	-30.3	3
Point 13	-37.6	2.8
Point 14	-79.1	0.7
Point 15	-113.8	0.4
Point 16	10.4	7.9
Point 17	33	13.5
Point 18	43	13.5
Point 19	71.5	6.4
Point 20	160	4.2
Point 21	170.7	0.6
Point 22	156.1	0.8
Point 23	131.1	1.3
Point 24	95.8	1.9
Point 25	60.4	2.7
Point 26	23	4.1
Point 27	-140.4	-1.2
Point 28	-43.4	-1.2
Point 29	-38.8	0.3
Point 30	45.1	0.3
Point 31	49.7	-1.2
Point 32	124.1	-1.2
Point 33	152.9	-10.6
Point 34	82.1	-10.6
Point 35	22.2	-11.6
Point 36	-23.7	-6.8
Point 37	-71.6	-7.8
Point 38	-131.5	-4.5
Point 39	1	5.5

Point 40	194.7	-1.4
Point 41	254	-3.5
Point 42	287.4	-4.3
Point 43	333.9	-8.9
Point 44	375.8	-9.3
Point 45	425	-9.2
Point 46	-149.1	0.5
Point 47	-184.4	-0.1
Point 48	-240.5	-1.7
Point 49	-275.9	-3
Point 50	-287.5	-6.8
Point 51	-301.9	-11.9
Point 52	-310.1	-12.6
Point 53	-319.8	-11.4
Point 54	-333.1	-7.7
Point 55	-344.7	-3
Point 56	-350	-3.3
Point 57	-135.5	-3
Point 58	129.6	-3
Point 59	249.2	-3
Point 60	450	-9
Point 61	197	-1.46752

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.43	(119.106, 8.574)	80.4106	(24.3035, 11.3451)	(220.943, -2.17045)
2	2884	1.51	(119.106, 8.574)	78.448	(22.7532, 10.961)	(214.902, -1.99308)

Slices of Slip Surface: **Optimized**

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	25.662475	5.397283	-355.20924	385.44999	0	400
2	Optimized	27.87	3.0455195	-209.08842	559.3705	0	600

3	Optimized	29.567005	1.237633	-96.762628	798.96821	0	600
4	Optimized	30.4249	0.316845	-39.550727	2019.0964	0	600
5	Optimized	30.60671	-0.0093146	-19.251652	857.3939	495.0166	0
6	Optimized	31.889565	-2.3106796	123.98483	1049.6167	534.41383	0
7	Optimized	33.98266	-6.0655675	357.69108	1424.2239	615.76301	0
8	Optimized	35.947985	-9.5912425	577.11689	1758.8997	682.3026	0
9	Optimized	37.743935	-12.813065	777.65116	2709.9103	0	161.2
10	Optimized	39.35805	-15.20404	926.39763	3013.2032	0	161.1
11	Optimized	40.95971	-17.068015	1042.2431	3166.1176	0	160.3
12	Optimized	42.38027	-18.721225	1145.0079	3313.9291	0	164.8
13	Optimized	44.05	-20.664415	1265.7678	3444.5047	0	177.6
14	Optimized	46.164515	-23.12524	1418.7059	3611.5074	0	194.8
15	Optimized	48.464515	-25.801925	1585.0936	3787.7349	0	218.2
16	Optimized	50.31913	-27.96028	1719.2259	3932.4036	0	237.1
17	Optimized	51.884435	-29.03525	1785.8574	4191.8263	0	246.5
18	Optimized	53.776785	-29.74413	1829.5537	4209.3939	0	252.7
19	Optimized	55.66913	-30.453015	1873.25	4226.9615	0	258.9
20	Optimized	57.561475	-31.1619	1916.9463	4244.5291	0	265.1
21	Optimized	59.453825	-31.87078	1960.6426	4262.1461	0	271.3
22	Optimized	61.183925	-32.518885	2000.6009	4278.2218	0	277.0
23	Optimized	62.751775	-33.10621	2036.7962	4292.7358	0	282.1
24	Optimized	64.53124	-33.34039	2050.8607	4393.0541	0	284.2
25	Optimized	66.522315	-33.22143	2042.8892	4324.9712	0	283.1
26	Optimized	68.51339	-33.10247	2034.8677	4256.8381	0	282.1
27	Optimized	70.504465	-32.98351	2026.8963	4188.7552	0	281.1
28	Optimized	72.56	-32.8607	2018.6177	4144.6383	0	280.0
29	Optimized	74.68	-32.73404	2010.1423	4124.4856	0	278.9
30	Optimized	76.8	-32.60738	2001.6198	4104.3328	0	277.8
31	Optimized	78.92	-32.480715	1993.0972	4084.1801	0	276.7
32	Optimized	81.04	-32.35405	1984.5747	4064.0273	0	275.6
33	Optimized	83.088625	-32.231655	1976.3437	4045.1762	0	274.5
34	Optimized	85.06588	-32.11352	1968.4175	4027.6578	0	273.4
35	Optimized	87.043135	-31.995385	1960.4913	4010.089	0	272.4
36	Optimized	89.00279	-31.92664	1955.6606	3983.921	0	271.8
37	Optimized	90.94485	-31.90728	1953.8585	3976.6095	0	271.6
38	Optimized	92.88691	-31.88792	1952.1079	3969.2981	0	271.5

39	Optimized	94.82897	-31.86856	1950.3573	3962.0381	0	271.3
40	Optimized	96.66005	-31.850305	1948.6858	3955.156	0	271.1
41	Optimized	98.42222	-31.90372	1951.5143	3934.1595	0	271.6
42	Optimized	100.22647	-32.0277	1958.7026	3941.7902	0	272.7
43	Optimized	102.0307	-32.15168	1965.9462	3949.4762	0	273.8
44	Optimized	103.83495	-32.27566	1973.1898	3957.1621	0	274.9
45	Optimized	105.6392	-32.39964	1980.3781	3964.7928	0	276
46	Optimized	107.4434	-32.52362	1987.6217	3972.4787	0	277.0
47	Optimized	109.2662	-32.69694	1997.9006	3970.4615	0	278.6
48	Optimized	111.1076	-32.919605	2011.2713	3987.9836	0	280.5
49	Optimized	112.949	-33.14227	2024.642	4005.4518	0	282.4
50	Optimized	114.8927	-33.44847	2043.1601	4011.2788	0	285.1
51	Optimized	116.93875	-33.838205	2066.9255	4044.8865	0	288.5
52	Optimized	118.98485	-34.22794	2090.643	4078.4943	0	291.9
53	Optimized	121.0309	-34.61768	2114.3605	4112.1021	0	295.4
54	Optimized	123.07695	-35.007415	2138.126	4145.7098	0	298.8
55	Optimized	125.01665	-35.37689	2160.5886	4173.9873	0	302.0
56	Optimized	126.85	-35.72611	2181.8607	4196.974	0	305.1
57	Optimized	128.68335	-36.075325	2203.1327	4219.9071	0	308.1
58	Optimized	130.35	-36.39279	2222.4405	4234.4643	0	310.9
59	Optimized	132.1537	-36.736365	2243.3792	4241.8084	0	313.9
60	Optimized	134.26115	-37.137795	2267.8509	4250.4318	0	317.4
61	Optimized	136.3686	-37.539225	2292.276	4259.0551	0	320.9
62	Optimized	138.3612	-37.79547	2307.7168	4296.5211	0	323.2
63	Optimized	140.239	-37.906535	2314.0962	4279.4033	0	324.1
64	Optimized	142.1168	-38.0176	2320.4755	4262.3387	0	325.1
65	Optimized	143.9946	-38.12866	2326.8548	4245.274	0	326.1
66	Optimized	145.8724	-38.239725	2333.2873	4228.1562	0	327.1
67	Optimized	147.7502	-38.35079	2339.6666	4211.0915	0	328.0
68	Optimized	149.74185	-38.3415	2338.5012	4218.7266	0	327.9
69	Optimized	151.8473	-38.21186	2329.8259	4173.5011	0	326.8
70	Optimized	153.7	-38.09778	2322.1649	4143.653	0	325.8
71	Optimized	155.3	-37.99926	2315.5524	4129.1804	0	324.9
72	Optimized	157.075	-37.889965	2308.2439	4113.0822	0	324.0
73	Optimized	159.025	-37.769895	2300.1567	4095.4234	0	322.9
74	Optimized	160.99035	-37.64888	2292.0378	4043.6195	0	321.9

75	Optimized	162.97105	-37.52692	2283.8743	3957.7008	0	320.8
76	Optimized	164.9517	-37.40496	2275.7107	3871.7821	0	319.7
77	Optimized	167.1315	-36.797965	2237.2035	3849.2644	0	314.4
78	Optimized	169.5105	-35.705935	2168.3629	3644.691	0	304.9
79	Optimized	171.668	-34.71557	2105.9619	3486.2771	0	296.2
80	Optimized	173.604	-33.826875	2049.9587	3374.177	0	288.4
81	Optimized	175.54	-32.93818	1993.9556	3262.0299	0	280.7
82	Optimized	177.476	-32.049485	1937.9055	3149.9297	0	272.9
83	Optimized	178.722	-31.42979	1898.8888	3116.843	0	267.5
84	Optimized	179.90835	-30.681455	1852.1252	3025.4047	0	260.9
85	Optimized	181.725	-29.535485	1780.6138	2885.3616	0	250.9
86	Optimized	183.54165	-28.389515	1709.1025	2745.3651	0	240.9
87	Optimized	185.35835	-27.243545	1637.5911	2605.3221	0	230.8
88	Optimized	187.175	-26.097575	1566.0798	2465.2791	0	220.8
89	Optimized	188.99645	-24.94859	1494.3864	2324.9201	0	210.8
90	Optimized	191.1072	-23.578855	1408.932	2170.5056	0	198.8
91	Optimized	193.5024	-21.991385	1309.8551	1989.8564	0	184.9
92	Optimized	195.85	-20.43547	1212.7758	1815.757	0	171.3
93	Optimized	198.26235	-18.836645	1112.9923	1640.1209	0	157.3
94	Optimized	200.59305	-17.29192	1016.6039	1485.6616	0	148.5
95	Optimized	202.7298	-15.875755	928.24594	1360.5562	0	145.7
96	Optimized	204.86655	-14.45959	839.88801	1235.4507	0	142.9
97	Optimized	207.0033	-13.043425	751.49106	1110.3842	0	140.0
98	Optimized	209.14005	-11.62726	663.13313	985.27875	0	137.2
99	Optimized	211.18015	-10.127262	569.54954	870.49858	0	134.2
100	Optimized	213.1236	-8.543426	470.70902	730.41468	0	131.0
101	Optimized	215.067	-6.95959	371.87648	590.33078	0	127.9
102	Optimized	217.0104	-5.375754	273.04793	450.24688	0	124.7
103	Optimized	218.9538	-3.791918	174.21539	310.17096	0	121.5
104	Optimized	220.43445	-2.5852235	98.917987	478.55165	0	600

Slices of Slip Surface: 2884

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	2884	23.68216	5.250331	-345.48324	297.30432	0	400

2	2884	26.0459	2.1698455	-153.92328	530.36026	0	600
3	2884	27.71303	-0.0028012	-18.827657	917.09503	529.48506	0
4	2884	28.787815	-1.4034872	68.265897	1048.0878	565.70045	0
5	2884	30.47269	-3.599257	204.79769	1299.0176	631.74814	0
6	2884	32.157565	-5.795027	341.3331	1549.9473	697.79374	0
7	2884	33.8574	-8.010295	479.07937	1787.5926	755.47049	0
8	2884	35.572195	-10.245059	618.02837	2012.2044	804.92789	0
9	2884	37.278455	-12.4687	756.30581	2772.93	0	161.89
10	2884	38.97618	-14.68122	893.89093	2956.341	0	161.17
11	2884	40.673905	-16.89374	1031.4402	3138.0308	0	160.78
12	2884	42.261385	-18.962585	1160.0915	3319.1861	0	167.15
13	2884	44.05	-21.293555	1305.0396	3491.392	0	183.1
14	2884	46.164515	-24.049245	1476.3893	3684.5398	0	202.93
15	2884	48.464515	-27.046665	1662.7453	3889.1257	0	229.16
16	2884	50.725	-29.992585	1845.943	4094.1436	0	254.94
17	2884	52.775	-32.664195	2012.0606	4284.196	0	278.31
18	2884	54.9	-34	2094.8182	4712.2727	0	290
19	2884	57.1	-34	2094.1818	4650.4545	0	290
20	2884	59.3	-34	2093.5455	4589.0909	0	290
21	2884	61.325	-34	2092.973	4532.2162	0	290
22	2884	63.175	-34	2092.4324	4480.3243	0	290
23	2884	65.025	-34	2091.8919	4428.4324	0	290
24	2884	66.875	-34	2091.3514	4376.5946	0	290
25	2884	68.725	-34	2090.8108	4324.7027	0	290
26	2884	70.575	-34	2090.3243	4272.8649	0	290
27	2884	72.383335	-34	2089.8109	4243.9237	0	290
28	2884	74.15	-34	2089.3015	4237.9803	0	290
29	2884	75.916665	-34	2088.7921	4232.0369	0	290
30	2884	77.683335	-34	2088.2826	4226.0935	0	290
31	2884	79.45	-34	2087.7732	4220.1501	0	290
32	2884	81.216665	-34	2087.2638	4214.1501	0	290
33	2884	83.07857	-34	2086.7152	4208.5325	0	290
34	2884	85.035715	-34	2086.1531	4203.1676	0	290
35	2884	86.99286	-34	2085.5911	4197.8026	0	290
36	2884	88.95	-34	2085.029	4192.4887	0	290
37	2884	90.90714	-34	2084.467	4187.1238	0	290

38	2884	92.864285	-34	2083.905	4181.7588	0	290
39	2884	94.82143	-34	2083.3429	4176.3939	0	290
40	2884	96.743335	-34	2082.7735	4171.1653	0	290
41	2884	98.63	-34	2082.2434	4166.024	0	290
42	2884	100.51666	-34	2081.7134	4160.8297	0	290
43	2884	102.40335	-34	2081.1834	4155.6883	0	290
44	2884	104.29	-34	2080.6533	4150.547	0	290
45	2884	106.17665	-34	2080.0703	4145.3526	0	290
46	2884	108.06335	-34	2079.5403	4140.2113	0	290
47	2884	109.95	-34	2079.0102	4135.0699	0	290
48	2884	111.83665	-34	2078.4802	4129.8756	0	290
49	2884	113.72335	-34	2077.9502	4124.7343	0	290
50	2884	115.61	-34	2077.3671	4119.5929	0	290
51	2884	117.49665	-34	2076.8371	4114.3986	0	290
52	2884	119.38335	-34	2076.3071	4109.2572	0	290
53	2884	121.27	-34	2075.777	4104.1159	0	290
54	2884	123.15665	-34	2075.194	4098.9215	0	290
55	2884	125.01665	-34	2074.6913	4090.2553	0	290
56	2884	126.85	-34	2074.1458	4078.0371	0	290
57	2884	128.68335	-34	2073.6549	4065.8189	0	290
58	2884	130.35	-34	2073.1333	4048.3333	0	290
59	2884	132.0909	-34	2072.6424	4022.0141	0	290
60	2884	134.0727	-34	2072.0873	3992.0417	0	290
61	2884	136.05455	-34	2071.5323	3962.0692	0	290
62	2884	138.0364	-34	2070.9268	3932.0967	0	290
63	2884	140.0182	-34	2070.3717	3902.0738	0	290
64	2884	142	-34	2069.8167	3872.1013	0	290
65	2884	143.9818	-34	2069.2617	3842.1288	0	290
66	2884	145.9636	-34	2068.6562	3812.1563	0	290
67	2884	147.94545	-34	2068.1011	3782.1838	0	290
68	2884	149.9273	-34	2067.5461	3752.1609	0	290
69	2884	151.9091	-34	2066.991	3722.1884	0	290
70	2884	153.7	-34	2066.4375	3705	0	290
71	2884	155.3	-34	2066	3700.625	0	290
72	2884	157.075	-34	2065.4872	3695.7949	0	290
73	2884	159.025	-34	2064.9231	3690.4615	0	290

74	2884	160.875	-34	2064.4	3655.4286	0	290
75	2884	162.625	-34	2063.8857	3590.6286	0	290
76	2884	164.375	-34	2063.3714	3525.8857	0	290
77	2884	166.125	-34	2062.9143	3461.0857	0	290
78	2884	167.925	-33.381935	2023.7971	3503.903	0	284.59
79	2884	169.775	-32.145805	1946.1334	3301.7435	0	273.78
80	2884	171.7375	-30.834505	1863.7744	3116.5889	0	262.3
81	2884	173.8125	-29.448035	1776.6604	2948.3715	0	250.17
82	2884	175.8875	-28.061565	1689.5464	2780.1943	0	238.04
83	2884	177.9625	-26.675095	1602.4325	2611.9769	0	225.91
84	2884	179.90835	-25.37493	1520.9947	2454.2242	0	214.53
85	2884	181.725	-24.16107	1445.247	2306.9854	0	203.91
86	2884	183.54165	-22.94721	1369.4994	2159.7008	0	193.29
87	2884	185.35835	-21.73335	1293.7517	2012.462	0	182.67
88	2884	187.175	-20.519495	1218.0041	1865.1774	0	172.05
89	2884	188.99165	-19.30564	1142.2564	1717.9386	0	161.42
90	2884	190.42285	-18.349355	1082.5807	1604.6684	0	153.06
91	2884	191.88425	-17.372865	1021.6448	1507.3302	0	148.75
92	2884	193.7614	-16.11859	943.4213	1391.8997	0	146.24
93	2884	195.85	-14.723045	856.3054	1266.4007	0	143.45
94	2884	197.9108	-13.34605	770.37889	1144.9789	0	140.69
95	2884	199.73245	-12.12887	694.42733	1037.67	0	138.26
96	2884	201.5541	-10.911685	618.47577	930.361	0	135.82
97	2884	203.37575	-9.694501	542.5242	823.05203	0	133.39
98	2884	205.1974	-8.4773205	466.57264	715.74306	0	130.95
99	2884	207.01905	-7.260138	390.63477	608.43409	0	128.52
100	2884	208.8407	-6.042956	314.67864	501.12512	0	126.09
101	2884	210.6623	-4.8257735	238.72708	393.81616	0	123.65
102	2884	212.48395	-3.608591	162.77552	286.50262	0	121.22
103	2884	214.14825	-2.4965385	93.383741	398.28097	0	600

SWL Block TC (3)

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File Information

Created By: Hotstream, Jonathan
Revision Number: 497
Last Edited By: Breen, Scott A MVN-Contractor
Date: 3/26/2009
Time: 11:33:48 AM
File Name: WBV-14c.2 Reach III WM E_W Closure SWL.gsz
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Phase 2 Final Geotechnical Report_Draft 2009\Spencer Runs\
Last Solved Date: 3/26/2009
Last Solved Time: 11:34:05 AM

Project Settings

Length(L) Units: feet
Time(t) Units: Seconds
Force(F) Units: lbf
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D

Analysis Settings

SWL Block TC (3)

Kind: SLOPE/W
Method: Spencer
Settings
- Apply Phreatic Correction: No
- PWP Conditions Source: Piezometric Line
- Use Staged Rapid Drawdown: No

SlipSurface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Fully-Specified
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Tension Crack
  - Tension Crack Option: Tension Crack Line
  - Percentage Wet: 1

Tension Crack Fluid Unit Weight: 62.4 pcf

FOS Distribution

FOS Calculation Option: Constant

Advanced

Number of Slices: 100

Optimization Tolerance: 0.01

Minimum Slip Surface Depth: 0.1 ft

Optimization Maximum Iterations: 2000

Optimization Convergence Tolerance: 1e-007

Starting Optimization Points: 8

Ending Optimization Points: 16

Complete Passes per Insertion: 1

Driving Side Maximum Convex Angle: 10 °

Resisting Side Maximum Convex Angle: 5 °

Materials

Existing Levee

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 600 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

Compacted Fill

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion: 400 psf

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -18 to -58

Model: Spatial Mohr-Coulomb

Weight Fn: CH -18 to -58

Cohesion Spatial Fn: CH -18 to -58

Phi: 0 °

Phi-B: 0 °

Pore Water Pressure

Piezometric Line: 1

CH -3 to -18

Model: Spatial Mohr-Coulomb

Weight Fn: CH -3 to -18
Cohesion Spatial Fn: CH -3 to -18
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

SM -58 to -62

Model: Spatial Mohr-Coulomb
Weight Fn: SM -58 to -62
Cohesion: 0 psf
Phi: 25 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

CH -62 to -104

Model: Spatial Mohr-Coulomb
Weight Fn: CH -62 to -104
Cohesion Spatial Fn: CH -62 to -104
Phi: 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Sand Fill

Model: Mohr-Coulomb
Unit Weight: 122 pcf
Cohesion: 0 psf
Phi: 30 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-350, -3.3) ft
Right Coordinate: (450, -9) ft

Fully Specified Slip Surfaces

Fully Specified Slip Surface 1

	X (ft)	Y (ft)
	-336	5
	-283	-30

	23	-30
	74.8	12

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
	-350	-8.5
	-330.2	-8.50677
	-292.3	-8.5
	-275.9	-3
	-240.5	-1.7
	-184.4	-0.1
	-149.1	0.5
	-147.3	0.5
	-143	1.9
	-20.5	5
	1	5.5
	59.5	9.4
	450	9.4

Reinforcements

Reinforcement 1

Type: Fabric
Outside Point: (-35, 0.3) ft
Inside Point: (45, 0.3) ft
Slip Surface Intersection: (74.586, 0.3) ft
Total Length: 80 ft
Reinforcement Direction: 180 °
Applied Load Option: Variable
F of S Dependent: No
Contact Cohesion: 265 psf
Contact Phi: 19 °
Interface Factor: 1
Bond Safety Factor: 1
Fabric Capacity: 11400 lbs

Fabric Safety Factor: 1
Fabric Load: 11400 lbs
Load Distribution: Even along reinf.
Load Orientation: 0
Applied Load: 11400 lbs
Fabric Load Used: 0 lbs
Resisting Force Used: 374.38 lbs/ft
Available Bond Length: 0 ft
Required Bond Length: 0 ft
Governing Component: Bond

Reinforcement 2

Type: Fabric
Outside Point: (29, 3) ft
Inside Point: (79, 3) ft
Slip Surface Intersection: (79.111, 3) ft
Total Length: 50 ft
Reinforcement Direction: 180 °
Applied Load Option: Variable
F of S Dependent: No
Contact Cohesion: 265 psf
Contact Phi: 19 °
Interface Factor: 2
Bond Safety Factor: 1
Fabric Capacity: 11400 lbs
Fabric Safety Factor: 1
Fabric Load: 11400 lbs
Load Distribution: Even along reinf.
Load Orientation: 0
Applied Load: 11400 lbs
Fabric Load Used: 0 lbs
Resisting Force Used: 645.43 lbs/ft
Available Bond Length: 0 ft
Required Bond Length: 0 ft
Governing Component: Bond

Tension Crack Line

	X (ft)	Y (ft)
	43	3.1
	71.5	3.1
	90.3	3.1

Unit Weight Functions

CH -18 to -58

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 103
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-350, 102)
    Data Point: (-61, 102)
    Data Point: (0, 103)
    Data Point: (46, 102)
    Data Point: (450, 102)

CH -3 to -18

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 93
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-350, 84)
    Data Point: (-61, 84)
    Data Point: (0, 93)
    Data Point: (46, 84)
    Data Point: (450, 84)

SM -58 to -62

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 108
Data Points: X (ft), Unit Weight (pcf)
    Data Point: (-350, 114)
    Data Point: (-61, 114)
    Data Point: (0, 108)
    Data Point: (46, 114)
    Data Point: (450, 114)

CH -62 to -104

Model: Spline Data Point Function
Function: Unit Weight vs. X
    Curve Fit to Data: 100 %
    Segment Curvature: 0 %
Y-Intercept: 104

Data Points: X (ft), Unit Weight (pcf)
Data Point: (-350, 102)
Data Point: (-61, 102)
Data Point: (0, 104)
Data Point: (46, 102)
Data Point: (450, 102)

Spatial Functions

CH -3 to -18

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-350, -3, 120)
Data Point: (-61, -3, 120)
Data Point: (0, -3, 260)
Data Point: (46, -3, 120)
Data Point: (450, -3, 120)
Data Point: (-350, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (450, -18, 150)

CH -18 to -58

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-350, -18, 150)
Data Point: (-61, -18, 150)
Data Point: (0, -18, 260)
Data Point: (46, -18, 150)
Data Point: (450, -18, 150)
Data Point: (-350, -58, 500)
Data Point: (-61, -58, 500)
Data Point: (0, -58, 500)
Data Point: (46, -58, 500)
Data Point: (450, -58, 500)

CH -62 to -104

Model: Linear Interpolation
Limit Range By: Data Values
Data Points: X (ft), Y (ft), Cohesion (psf)
Data Point: (-350, -62, 580)
Data Point: (-61, -62, 580)
Data Point: (0, -62, 580)

Data Point: (46, -62, 580)
Data Point: (450, -62, 580)
Data Point: (-350, -104, 900)
Data Point: (-61, -104, 900)
Data Point: (0, -104, 900)
Data Point: (46, -104, 900)
Data Point: (450, -104, 900)

Regions

	Material	Points
Region 1	CH -18 to -58	3,1,2,4
Region 2	SM -58 to -62	4,6,5,3
Region 3	CH -62 to -104	5,6,8,7
Region 4	Compacted Fill	9,10,11,12,13,14,15
Region 5	Compacted Fill	16,17,18,19,20,21,22,23,24,25,26
Region 6	Sand Fill	27,28,29,30,31,32,58,33,34,35,36,37,38,57
Region 7	Existing Levee	49,57,27,28,29,30,31,32,58,59,40,21,22,23,24,25,26,16,39,11,12,13,14,15,9,46,47,48
Region 8	CH -3 to -18	56,55,54,53,52,51,50,49,57,38,37,36,35,34,33,58,59,41,42,43,44,45,60,2,1

Points

	X (ft)	Y (ft)
Point 1	-350	-18
Point 2	450	-18
Point 3	-350	-58
Point 4	450	-58
Point 5	-350	-62
Point 6	450	-62
Point 7	-350	-104
Point 8	450	-104

Point 9	-147.3	0.5
Point 10	-143	1.9
Point 11	-20.5	5
Point 12	-30.3	3
Point 13	-37.6	2.8
Point 14	-79.1	0.7
Point 15	-113.8	0.4
Point 16	10.4	7.9
Point 17	33	13.5
Point 18	43	13.5
Point 19	71.5	6.4
Point 20	160	4.2
Point 21	170.7	0.6
Point 22	156.1	0.8
Point 23	131.1	1.3
Point 24	95.8	1.9
Point 25	60.4	2.7
Point 26	23	4.1
Point 27	-140.4	-1.2
Point 28	-43.4	-1.2
Point 29	-38.8	0.3
Point 30	45.1	0.3
Point 31	49.7	-1.2
Point 32	124.1	-1.2
Point 33	152.9	-10.6
Point 34	82.1	-10.6
Point 35	22.2	-11.6
Point 36	-23.7	-6.8
Point 37	-71.6	-7.8
Point 38	-131.5	-4.5
Point 39	1	5.5
Point 40	194.7	-1.4
Point 41	254	-3.5
Point 42	287.4	-4.3
Point 43	333.9	-8.9
Point 44	375.8	-9.3

Point 45	425	-9.2
Point 46	-149.1	0.5
Point 47	-184.4	-0.1
Point 48	-240.5	-1.7
Point 49	-275.9	-3
Point 50	-287.5	-6.8
Point 51	-301.9	-11.9
Point 52	-310.1	-12.6
Point 53	-319.8	-11.4
Point 54	-333.1	-7.7
Point 55	-344.7	-3
Point 56	-350	-3.3
Point 57	-135.5	-3
Point 58	129.6	-3
Point 59	249.2	-3
Point 60	450	-9

Critical Slip Surfaces

	Number	FOS	Center (ft)	Radius (ft)	Entry (ft)	Exit (ft)
1	Optimized	1.57	(-123.297, 7.011)	143.0961	(79.279, 6.20662)	(-310.107, -12.5991)
2	1	1.85	(-123.297, 7.011)	137.89	(63.8233, 8.31243)	(-309.435, -12.5432)

Slices of Slip Surface: **Optimized**

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	Optimized	-310.1037	-12.601825	255.7569	333.24711	0	139.2
2	Optimized	-308.2798	-13.95342	340.11909	457.08951	0	141.91
3	Optimized	-304.63935	-16.65114	508.49029	700.03487	0	147.3
4	Optimized	-302.35955	-18.340555	613.93556	859.67412	0	152.98
5	Optimized	-299.5	-20.45961	746.19583	1113.0001	0	171.52
6	Optimized	-294.7	-24.016615	968.21336	1538.8239	0	202.65
7	Optimized	-291.6105	-26.306065	1125.5247	1828.7592	0	222.68
8	Optimized	-289.2105	-27.309315	1238.3553	1908.8549	0	231.46

9	Optimized	-285.00595	-28.51944	1401.8477	2156.7926	0	242.05
10	Optimized	-280.85895	-29.015735	1519.6172	2220.6792	0	246.39
11	Optimized	-277.553	-28.572685	1561.1401	2266.4593	0	242.51
12	Optimized	-274.03545	-28.101285	1570.5962	2271.6128	0	238.39
13	Optimized	-270.3064	-27.601535	1547.951	2236.1566	0	234.01
14	Optimized	-266.57735	-27.101785	1525.3058	2200.6739	0	229.64
15	Optimized	-262.8483	-26.602035	1502.6873	2165.2177	0	225.27
16	Optimized	-259.11925	-26.102285	1480.0421	2129.7616	0	220.9
17	Optimized	-255.3902	-25.602535	1457.3969	2094.3054	0	216.52
18	Optimized	-251.66115	-25.102785	1434.7518	2058.8492	0	212.15
19	Optimized	-247.9321	-24.603035	1412.1066	2023.3665	0	207.78
20	Optimized	-244.20305	-24.103285	1389.488	1987.9104	0	203.4
21	Optimized	-241.41925	-23.8363	1379.1937	1995.7277	0	201.07
22	Optimized	-238.65355	-23.78483	1381.393	1999.9632	0	200.62
23	Optimized	-234.96065	-23.716105	1383.6673	2004.5388	0	200.02
24	Optimized	-231.2678	-23.64738	1385.9415	2009.1143	0	199.41
25	Optimized	-227.57495	-23.578655	1388.2429	2013.6629	0	198.81
26	Optimized	-223.88205	-23.50993	1390.5171	2018.2384	0	198.21
27	Optimized	-220.18915	-23.441205	1392.7914	2022.7869	0	197.61
28	Optimized	-216.49625	-23.37248	1395.0927	2027.3625	0	197.01
29	Optimized	-212.8034	-23.303755	1397.367	2031.9381	0	196.41
30	Optimized	-209.06005	-23.375235	1408.4859	2066.239	0	197.03
31	Optimized	-205.2662	-23.58692	1428.4609	2099.9254	0	198.89
32	Optimized	-201.47235	-23.798605	1448.4096	2133.5855	0	200.74
33	Optimized	-197.6785	-24.010295	1468.3582	2167.2719	0	202.59
34	Optimized	-193.88465	-24.22198	1488.3332	2200.9583	0	204.44
35	Optimized	-190.0908	-24.433665	1508.2819	2234.6183	0	206.29
36	Optimized	-186.29695	-24.645355	1528.2568	2268.3047	0	208.15
37	Optimized	-182.77765	-24.84172	1545.6163	2297.4994	0	209.87
38	Optimized	-179.1123	-25.21105	1572.5436	2360.6583	0	213.1
39	Optimized	-175.0263	-25.76867	1611.6571	2426.1062	0	217.98
40	Optimized	-170.9403	-26.32629	1650.7949	2491.5783	0	222.86
41	Optimized	-166.8543	-26.88391	1689.9327	2556.808	0	227.73
42	Optimized	-162.76825	-27.44153	1729.0463	2622.2801	0	232.61
43	Optimized	-158.7877	-28.110555	1775.0304	2715.7346	0	238.47
44	Optimized	-154.91265	-28.890985	1827.8272	2804.2774	0	245.3

45	Optimized	-151.03755	-29.671415	1880.6493	2893.0732	0	252.12
46	Optimized	-148.2	-30.242885	1918.3701	2956.1439	0	257.13
47	Optimized	-145.7238	-30.74158	1981.5057	3064.9759	0	261.49
48	Optimized	-143.5738	-31.050175	2044.4419	3111.6641	0	264.19
49	Optimized	-141.7	-31.0213	2056.3325	3132.8584	0	263.94
50	Optimized	-137.95	-30.96351	2058.7351	3148.1975	0	263.43
51	Optimized	-133.5	-30.89493	2061.4052	3192.8708	0	262.83
52	Optimized	-129.73	-30.83683	2063.7382	3229.5603	0	262.32
53	Optimized	-126.19	-30.782275	2065.9131	3241.1409	0	261.84
54	Optimized	-122.65	-30.727725	2068.1162	3253.0039	0	261.37
55	Optimized	-119.11	-30.67317	2070.2911	3264.5844	0	260.89
56	Optimized	-115.57	-30.618615	2072.466	3276.4474	0	260.41
57	Optimized	-111.7524	-30.559785	2074.8458	3289.0384	0	259.9
58	Optimized	-107.65715	-30.49667	2077.3606	3302.467	0	259.35
59	Optimized	-103.5619	-30.433555	2079.8999	3315.8956	0	258.79
60	Optimized	-99.46667	-30.370445	2082.4147	3329.5684	0	258.24
61	Optimized	-95.37142	-30.307335	2084.9539	3342.9971	0	257.69
62	Optimized	-91.545825	-30.31372	2091.3978	3373.0136	0	257.75
63	Optimized	-87.989875	-30.389605	2101.7443	3398.3176	0	258.41
64	Optimized	-84.433925	-30.46549	2112.0908	3423.3403	0	259.07
65	Optimized	-80.877975	-30.541375	2122.4373	3448.6443	0	259.74
66	Optimized	-77.225	-30.61933	2133.0609	3474.4088	0	260.42
67	Optimized	-73.475	-30.699355	2143.9917	3500.8028	0	261.12
68	Optimized	-71.49806	-30.741545	2149.7462	3514.5033	0	261.49
69	Optimized	-69.47336	-30.896565	2162.6091	3552.158	0	262.84
70	Optimized	-65.627835	-31.20225	2187.754	3591.3009	0	265.52
71	Optimized	-61.674565	-31.62691	2220.4942	3660.0239	0	269.24
72	Optimized	-57.61355	-32.170555	2260.8385	3730.8032	0	277.94
73	Optimized	-53.552535	-32.7142	2301.1827	3803.291	0	287.24
74	Optimized	-49.49152	-33.25784	2341.5025	3875.7788	0	296.34
75	Optimized	-45.430505	-33.801485	2381.8467	3948.2667	0	305.25
76	Optimized	-41.1	-34.381205	2424.8901	4035.0913	0	314.52
77	Optimized	-38.2	-34.769425	2453.6943	4096.1258	0	320.61
78	Optimized	-35.775	-35.09406	2477.76	4139.7832	0	325.62
79	Optimized	-32.125	-35.58268	2514.012	4205.4983	0	333.03
80	Optimized	-28.12316	-36.1184	2553.6606	4277.7286	0	340.97

81	Optimized	-24.82316	-36.509755	2583.3675	4314.5696	0	347.01
82	Optimized	-22.1	-36.752075	2602.8094	4357.47	0	351.34
83	Optimized	-18.708335	-37.053875	2626.7744	4415.8542	0	356.66
84	Optimized	-15.125	-37.37273	2651.8475	4477.0079	0	362.17
85	Optimized	-11.541665	-37.69159	2676.9483	4537.6056	0	367.58
86	Optimized	-7.9583335	-38.01045	2702.0491	4597.9254	0	372.89
87	Optimized	-4.375	-38.32931	2727.1499	4657.9673	0	378.1
88	Optimized	-0.7916665	-38.64817	2752.2507	4717.4532	0	383.2
89	Optimized	2.77377	-38.96544	2782.0136	4811.0981	0	382.64
90	Optimized	6.32131	-39.281115	2816.4648	4947.2745	0	380.61
91	Optimized	9.24754	-39.141265	2819.9105	4869.4179	0	376.42
92	Optimized	12.80776	-38.221645	2777.2796	4878.7873	0	366.19
93	Optimized	17.98781	-36.883615	2715.414	4892.6346	0	350.59
94	Optimized	21.48005	-35.629165	2651.6354	4675.555	0	337.05
95	Optimized	22.6	-34.791705	2604.09	4625.5558	0	329.39
96	Optimized	24.666665	-33.246325	2516.2162	4528.3722	0	314.98
97	Optimized	28	-30.75377	2374.5604	4372.2049	0	290.91
98	Optimized	31.333335	-28.261215	2232.8806	4216.7583	0	265.86
99	Optimized	34.666665	-25.768665	2091.2248	4017.8252	0	239.81
100	Optimized	38	-23.276115	1949.545	3775.4054	0	212.77
101	Optimized	41.333335	-20.78356	1807.8892	3533.7064	0	184.74
102	Optimized	44.05	-18.75213	1692.4034	3309.7551	0	161.16
103	Optimized	47.33323	-16.297045	1552.8879	3001.743	0	146.59
104	Optimized	51.101755	-13.711125	1407.1922	2709.8692	0	141.42
105	Optimized	54.10557	-11.91899	1307.8722	2481.6823	0	137.84
106	Optimized	57.537045	-9.8717015	1194.3894	2053.0714	495.76029	0
107	Optimized	59.95	-8.432084	1112.6813	1848.7437	424.96581	0
108	Optimized	62.25	-7.059858	1027.09	1675.6478	374.44499	0
109	Optimized	65.95	-4.8523645	889.33854	1397.1971	293.21228	0
110	Optimized	69.65	-2.644871	751.61025	1118.7464	211.96617	0
111	Optimized	71.78588	-1.370562	672.08809	961.84882	167.29344	0
112	Optimized	73.539835	-0.32411895	606.78419	695.1139	0	600
113	Optimized	76.47598	1.427643	497.48348	503.39163	0	600
114	Optimized	78.61154	2.701762	417.96717	407.23077	0	400

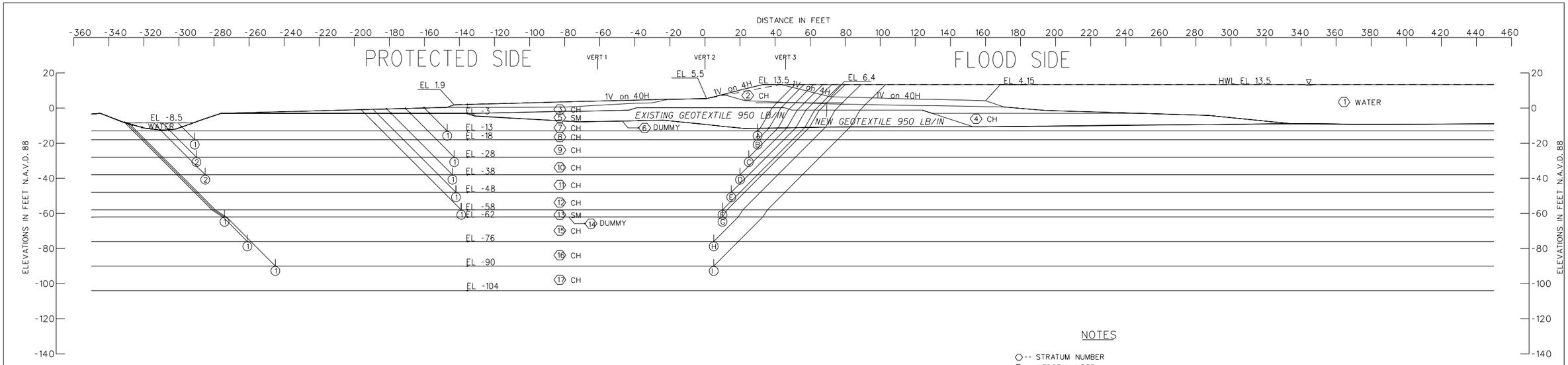
Slices of Slip Surface: 1

	Slip Surface	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
1	1	-307.55095	-13.787115	329.75061	421.29754	0	141.57
2	1	-303.78365	-16.27495	485.02378	643.19864	0	146.55
3	1	-301.5357	-17.759435	577.68836	779.32609	0	149.52
4	1	-298.95355	-19.464625	684.11317	976.77778	0	162.82
5	1	-294.51785	-22.39387	866.95095	1324.6004	0	188.45
6	1	-289.9	-25.443395	1107.491	1741.2496	0	215.13
7	1	-285.25	-28.51415	1396.4117	2206.51	0	242
8	1	-281.225	-30	1573.3521	2341.3803	0	255
9	1	-277.675	-30	1647.662	2439.0704	0	255
10	1	-273.93335	-30	1689.3052	2495.8477	0	255
11	1	-270	-30	1698.3307	2511.7375	0	255
12	1	-266.06665	-30	1707.3307	2527.6273	0	255
13	1	-262.13335	-30	1716.3561	2543.39	0	255
14	1	-258.2	-30	1725.3561	2559.407	0	255
15	1	-254.26665	-30	1734.3815	2575.1697	0	255
16	1	-250.33335	-30	1743.3815	2591.1867	0	255
17	1	-246.4	-30	1752.4069	2606.9494	0	255
18	1	-242.46665	-30	1761.4069	2622.9663	0	255
19	1	-238.63	-30	1769.2513	2636.7647	0	255
20	1	-234.89	-30	1775.9091	2648.5027	0	255
21	1	-231.15	-30	1782.5668	2660.2406	0	255
22	1	-227.41	-30	1789.2246	2671.9786	0	255
23	1	-223.67	-30	1795.8824	2683.6898	0	255
24	1	-219.93	-30	1802.5401	2695.4545	0	255
25	1	-216.19	-30	1809.1711	2707.2193	0	255
26	1	-212.45	-30	1815.8289	2718.984	0	255
27	1	-208.71	-30	1822.4866	2730.7487	0	255
28	1	-204.97	-30	1829.1444	2742.246	0	255
29	1	-201.23	-30	1835.8021	2754.0107	0	255
30	1	-197.49	-30	1842.4599	2765.7754	0	255
31	1	-193.75	-30	1849.1176	2777.5401	0	255
32	1	-190.01	-30	1855.7754	2789.3048	0	255

33	1	-186.27	-30	1862.4332	2801.0695	0	255
34	1	-182.4389	-30	1867.8443	2810.6517	0	255
35	1	-178.5167	-30	1872.0001	2817.7905	0	255
36	1	-174.59445	-30	1876.1559	2825.1843	0	255
37	1	-170.6722	-30	1880.3117	2832.5781	0	255
38	1	-166.75	-30	1884.4675	2839.9718	0	255
39	1	-162.8278	-30	1888.6488	2847.1106	0	255
40	1	-158.90555	-30	1892.8046	2854.5044	0	255
41	1	-154.9833	-30	1896.9604	2861.8982	0	255
42	1	-151.0611	-30	1901.1163	2869.2919	0	255
43	1	-148.2	-30	1903.2222	2872.8889	0	255
44	1	-145.15	-30	1946.8837	2950	0	255
45	1	-141.7	-30	1992.6154	3030.5385	0	255
46	1	-137.95	-30	1998.5306	3051.8367	0	255
47	1	-133.5	-30	2005.55	3103.5	0	255
48	1	-129.73	-30	2011.5254	3146.0452	0	255
49	1	-126.19	-30	2017.1186	3163.2768	0	255
50	1	-122.65	-30	2022.6836	3180.791	0	255
51	1	-119.11	-30	2028.2768	3198.0226	0	255
52	1	-115.57	-30	2033.8701	3215.2542	0	255
53	1	-111.8722	-30	2039.7058	3233.2561	0	255
54	1	-108.01665	-30	2045.8009	3251.9305	0	255
55	1	-104.1611	-30	2051.896	3270.8642	0	255
56	1	-100.30554	-30	2057.9911	3289.5385	0	255
57	1	-96.45	-30	2064.0603	3308.4722	0	255
58	1	-92.594445	-30	2070.1554	3327.1466	0	255
59	1	-88.73889	-30	2076.2505	3346.0803	0	255
60	1	-84.883335	-30	2082.3196	3364.7547	0	255
61	1	-81.02778	-30	2088.4147	3383.6884	0	255
62	1	-77.225	-30	2094.4267	3402.1333	0	255
63	1	-73.475	-30	2100.3467	3420.5333	0	255
64	1	-69.8375	-30	2106.0993	3433.1915	0	255
65	1	-66.3125	-30	2111.6596	3440.2837	0	255
66	1	-62.7875	-30	2117.2199	3447.0922	0	255
67	1	-59.2625	-30	2122.7801	3457.305	0	257.19
68	1	-55.7375	-30	2128.3688	3470.6383	0	261.64

69	1	-52.2125	-30	2133.9291	3483.9716	0	266.09
70	1	-48.6875	-30	2139.4894	3497.305	0	270.54
71	1	-45.1625	-30	2145.0496	3510.922	0	274.99
72	1	-41.1	-30	2151.4783	3535.4348	0	280.12
73	1	-38.2	-30	2156.0833	3555.75	0	283.78
74	1	-35.775	-30	2159.8904	3565.2055	0	286.84
75	1	-32.125	-30	2165.6438	3579.4521	0	291.45
76	1	-28.65	-30	2171.1212	3593.0303	0	295.84
77	1	-25.35	-30	2176.3333	3606.0606	0	300
78	1	-22.1	-30	2181.4688	3625.625	0	304.1
79	1	-18.708335	-30	2186.5956	3652.1864	0	308.38
80	1	-15.125	-30	2191.8142	3679.2562	0	312.91
81	1	-11.541665	-30	2197.0049	3706.3259	0	317.43
82	1	-7.9583335	-30	2202.1956	3732.8376	0	321.95
83	1	-4.375	-30	2207.4142	3758.791	0	326.48
84	1	-0.7916665	-30	2212.6049	3784.4655	0	331
85	1	2.5666665	-30	2221.7236	3839.6813	0	327.7
86	1	5.7	-30	2234.7449	3931.277	0	322.46
87	1	8.8333335	-30	2247.7981	4023.5111	0	317.21
88	1	12.80776	-30	2264.3467	4139.1194	0	310.56
89	1	16.96164	-30	2281.6008	4259.1562	0	303.61
90	1	20.45388	-30	2296.1187	4360.5238	0	297.76
91	1	22.6	-30	2305	4421.625	0	294.17
92	1	24.666665	-28.64865	2229.3202	4117.5825	0	280.61
93	1	28	-25.945945	2074.5439	3940.2491	0	254.02
94	1	31.333335	-23.24324	1919.7675	3771.0717	0	226.35
95	1	35.4	-19.945945	1730.8707	3490.2223	0	191.14
96	1	40.4	-15.89189	1498.6905	3123.6038	0	159.69
97	1	44.05	-12.93243	1329.2878	2859.1265	0	144.96
98	1	45.643615	-11.640315	1255.2663	2720.5057	0	138.23
99	1	47.943615	-9.7754505	1148.4699	2227.1533	622.77814	0
100	1	51.905	-6.5635135	964.53344	1790.2372	476.72028	0
101	1	56.315	-2.987838	759.75877	1311.2025	318.37621	0
102	1	59.01	-0.8027027	634.60938	886.29407	0	600
103	1	59.95	-0.04054055	589.09176	788.85614	0	600
104	1	61.825275	1.4799527	494.2211	584.38913	0	600

105	1	63.53694	2.8677905	407.60499	474.92213	0	400



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	-13.0	19220	25665	6459	39147	8471	51344	30676	1.67
Ⓑ ①	-18.0	19318	48150	2081	54759	3624	69549	51135	1.36
Ⓒ ①	-28.0	21649	39984	11439	92417	36924	73072	55493	1.32
Ⓒ ②	-28.0	21649	74970	5536	92417	16143	102155	76274	1.34
Ⓓ ①	-38.0	25595	53300	16710	138882	67584	95605	71298	1.34
Ⓓ ②	-38.0	25595	99125	11069	138882	39674	135789	99208	1.37
Ⓔ ①	-48.0	31711	64684	23835	194689	108910	120230	85779	1.40
Ⓕ ①	-58.0	39662	74500	32733	259711	160587	146895	99124	1.48
Ⓖ ①	-62.0	46139	164720	40365	288629	139368	251224	149261	1.68
Ⓗ ①	-76.0	63502	182742	58116	402795	230426	304360	172369	1.77
Ⓘ ①	-90.0	84336	198250	78738	538864	343480	361324	195384	1.85

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	62	62	0	0	0	0	0	0	0
②	CH	110	110	110	400	400	400	400	400	400	0
③	CH	110	110	110	600	600	600	600	600	600	0
④	CH	84	93	84	120	260	127	120	260	127	0
⑤	SM	122	122	122	0	0	0	0	0	0	30
⑥	DUMMY	84	93	84	120	260	127	120	260	127	0
⑦	CH	84	93	84	134	260	134	145	260	145	0
⑧	CH	84	93	84	145	260	145	150	260	150	0
⑨	CH	102	103	102	194	290	194	238	320	238	0
⑩	CH	102	103	102	281	350	281	325	380	325	0
⑪	CH	102	103	102	369	410	369	412	440	412	0
⑫	CH	102	103	102	456	470	456	500	500	500	0
⑬	SM	114	108	114	0	0	0	0	0	0	25
⑭	DUMMY	102	104	102	580	580	580	580	580	580	0
⑮	CH	102	104	102	633	633	633	687	687	687	0
⑯	CH	102	104	102	740	740	740	793	793	793	0
⑰	CH	102	104	102	847	847	847	900	900	900	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.

THOUGH THE GEOTEXTILE IS SHOWN IT WAS NOT NEEDED FOR THIS ANALYSIS.

WESTBANK IN THE VICINITY OF NEW ORLEANS, LA
WESTWEGO TO HARVEY CANAL, LA
AUTHORIZED 2057 HEIGHT
WESTWEGO & WESTMINSTER LEVEE
EWCC Floodside Shift HWL
SOILS STABILITY ANALYSIS
C/L STA. 119+40 TO STA. 121+90

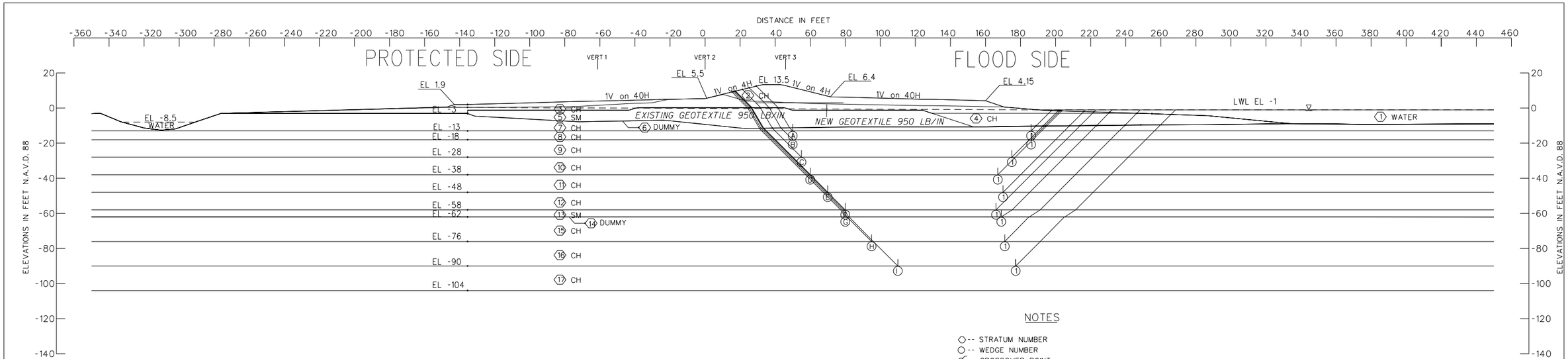
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: J.J.	PLOT SCALE: 20	PLOT DATE: MAR 09	CADD FILE: EWCHWL		
DRAWN BY: J.J.			FILE NO. H-4-XXXXX		
CHECKED BY: S.A.B.	DATE: MAR 09				

PLATE XX

INPUT DATA FILENAME: 1EWCHWL

ewchwl.DGN 3/30/2009 9:44:02 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	FACTOR OF SAFETY
A	1	-13.0	25166	19720	4393	38379	6577	49279	31802	1.55	
B	1	-18.0	26454	20400	5673	53969	12795	52527	41174	1.28	1.55
C	1	-28.0	29814	28560	9587	90620	33671	67961	56949	1.19	1.39
D	1	-38.0	34437	34775	15139	135903	65286	84351	70617	1.19	1.36
E	1	-48.0	41817	41200	22077	189334	104292	105094	85042	1.24	1.37
F	1	-58.0	50937	43000	30993	251052	155577	124930	95475	1.31	
G	1	-62.0	58216	51620	43937	279349	176873	153773	102476	1.50	
H	1	-76.0	76029	52212	60240	388401	269746	188481	118655	1.59	
I	1	-90.0	96848	53131	80403	516806	381204	230382	135602	1.70	

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	62	62	0	0	0	0	0	0	0
2	CH	110	110	110	400	400	400	400	400	400	0
3	CH	110	110	110	600	600	600	600	600	600	0
4	CH	84	93	84	120	260	127	120	260	127	0
5	SM	122	122	122	0	0	0	0	0	0	30
6	DUMMY	84	93	84	120	260	127	120	260	127	0
7	CH	84	93	84	134	260	134	145	260	145	0
8	CH	84	93	84	145	260	145	150	260	150	0
9	CH	102	103	102	194	290	194	238	320	238	0
10	CH	102	103	102	281	350	281	325	380	325	0
11	CH	102	103	102	369	410	369	412	440	412	0
12	CH	102	103	102	456	470	456	500	500	500	0
13	SM	114	108	114	0	0	0	0	0	0	25
14	DUMMY	102	104	102	580	580	580	580	580	580	0
15	CH	102	104	102	633	633	633	687	687	687	0
16	CH	102	104	102	740	740	740	793	793	793	0
17	CH	102	104	102	847	847	847	900	900	900	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 $= \dfrac{R_A + R_B + R_P}{D_A - D_P}$

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.

PULLOUT LENGTH CALCULATIONS:

h(avg) = 9.5 FT

γ'h(avg) = 9.5(110) = 1045 lb/sq. ft

q (clay) = 265+1045(tan 19) = 625 lb/sq. ft.

q (sand) = 1045(tan 30) = 603 lb/sq. ft.

L = 11400/(625 + 603) = 9.3 ft

14 feet available for active wedge "C, D, E" - okay

WESTBANK IN THE VICINITY OF NEW ORLEANS, LA
WESTWEGO TO HARVEY CANAL, LA
AUTHORIZED 2057 HEIGHT
WESTWEGO & WESTMINSTER LEVEE
EWCC Floodside Shift LWL
SOILS STABILITY ANALYSIS
C/L STA. 119+40 TO STA. 121+90

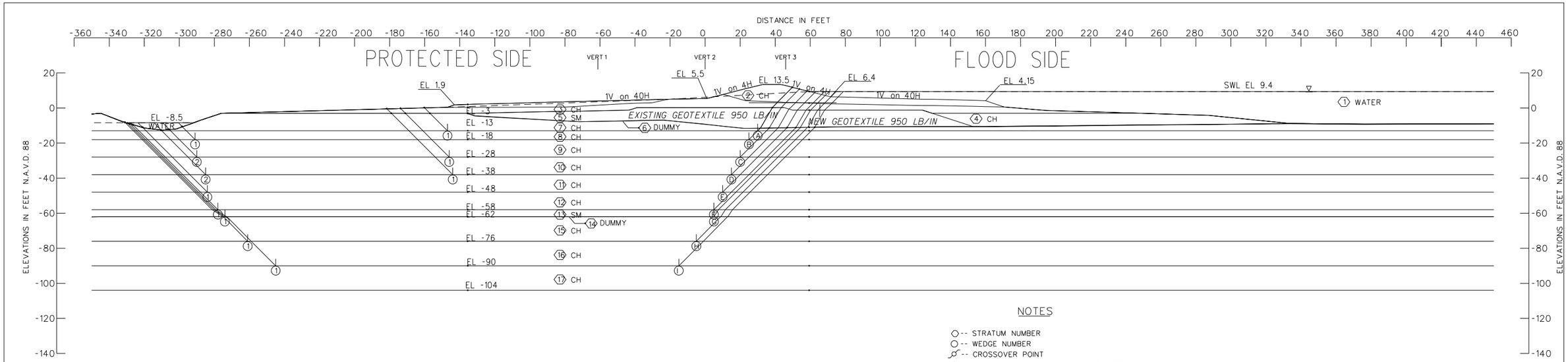
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: J.J.	PLOT SCALE: 20	PLOT DATE: MAR 09	CADD FILE: EWCLWL	
DRAWN BY: J.J.				FILE NO. H-4-XXXXX
CHECKED BY: S.A.B.	DATE: MAR 09			

PLATE XX

INPUT DATA FILENAME: EWCLWL

ewclwl.DGN 3/30/2009 9:49:14 AM



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. SEE BORING DATA PLATES.

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

THOUGH THE GEOTEXTILE IS SHOWN IT WAS NOT NEEDED FOR THIS ANALYSIS.

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	21137	25665	6459	38696	8471	53261	30225	1.76
Ⓑ ①	-18.0	22587	47400	2081	54084	3624	72068	50460	1.43
Ⓒ ①	-28.0	25416	39508	11344	90917	36399	76268	54518	1.40
Ⓒ ②	-28.0	25416	73780	5536	90917	16143	104732	74774	1.40
Ⓓ ①	-38.0	29186	51675	16710	136106	67584	97571	68522	1.42
Ⓓ ②	-38.0	29186	97500	11069	136106	39674	137755	96432	1.43
Ⓔ ①	-48.0	34218	121128	18842	189589	72709	174188	116880	1.49
Ⓕ ①	-58.0	41429	141500	28375	252410	118140	211304	134270	1.57
Ⓖ ①	-62.0	47173	161820	40365	280394	139368	249358	141026	1.77
Ⓗ ①	-76.0	64005	175872	58116	389831	230426	297993	159405	1.87
Ⓘ ①	-90.0	84606	182390	78738	518455	343480	345734	174975	1.98

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	62	62	0	0	0	0	0	0	0
◇2	CH	110	110	110	400	400	400	400	400	400	0
◇3	CH	110	110	110	600	600	600	600	600	600	0
◇4	CH	84	93	84	120	260	127	120	260	127	0
◇5	SM	122	122	122	0	0	0	0	0	0	30
◇6	DUMMY	84	93	84	120	260	127	120	260	127	0
◇7	CH	84	93	84	134	260	134	145	260	145	0
◇8	CH	84	93	84	145	260	145	150	260	150	0
◇9	CH	102	103	102	194	290	194	238	320	238	0
◇10	CH	102	103	102	281	350	281	325	380	325	0
◇11	CH	102	103	102	369	410	369	412	440	412	0
◇12	CH	102	103	102	456	470	456	500	500	500	0
◇13	SM	114	108	114	0	0	0	0	0	0	25
◇14	DUMMY	102	104	102	580	580	580	580	580	580	0
◇15	CH	102	104	102	633	633	633	687	687	687	0
◇16	CH	102	104	102	740	740	740	793	793	793	0
◇17	CH	102	104	102	847	847	847	900	900	900	0

WESTBANK IN THE VICINITY OF NEW ORLEANS, LA
WESTWEGO TO HARVEY CANAL, LA
AUTHORIZED 2057 HEIGHT
WESTWEGO & WESTMINSTER LEVEE
EWCC Floodside Shift SWL
SOILS STABILITY ANALYSIS
C/L STA. 119+40 TO STA. 121+90

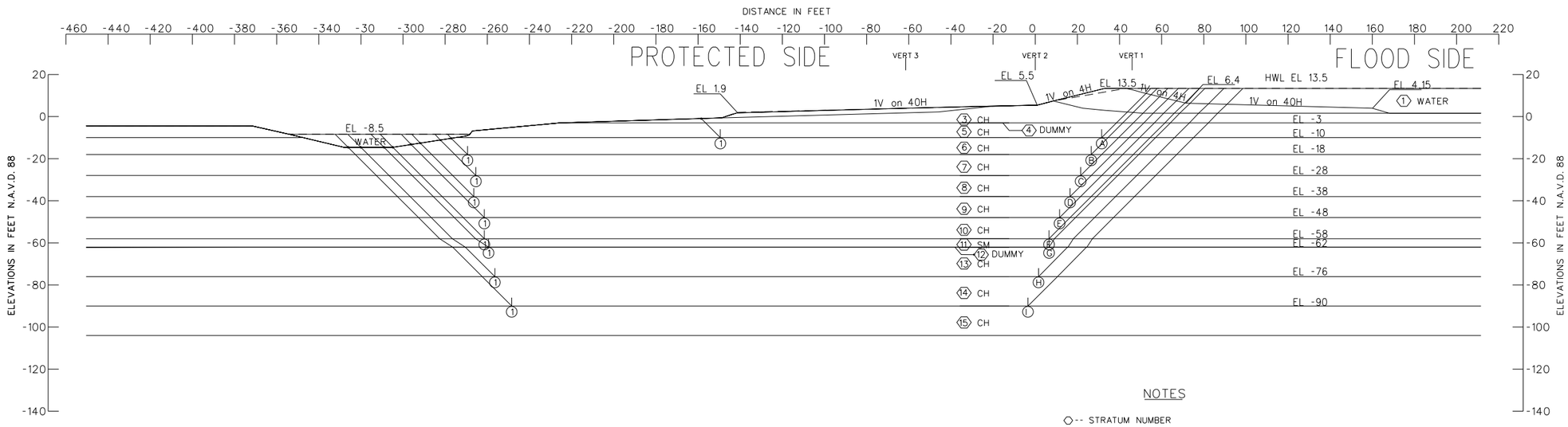
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: J.J.	PLOT SCALE: 20	PLOT DATE: MAR 09	CADD FILE: EWCSWL	
DRAWN BY: J.J.			FILE NO.	
CHECKED BY: S.A.B.	DATE: MAR 09		H-4-XXXXX	

PLATE XX

INPUT DATA FILENAME: EWCSWL

EWCSWL.DGN 3/30/2009 9:47:14 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	-10.0	15537	30739	4297	29062	4059	50573	25003	2.02
Ⓑ ①	-18.0	17745	49858	2167	50300	3554	69770	46746	1.49
Ⓒ ①	-28.0	21065	72178	5822	84564	16678	99065	67886	1.46
Ⓓ ①	-38.0	26080	94411	11031	128158	39012	131522	89146	1.48
Ⓔ ①	-48.0	32617	113619	18224	181102	72843	164460	108259	1.52
Ⓕ ①	-58.0	40674	134000	26969	243467	115352	201643	128115	1.57
Ⓖ ①	-62.0	46521	154280	38272	271318	135195	239073	136123	1.76
Ⓗ ①	-76.0	63751	177246	55552	381851	219507	296549	162344	1.83
Ⓘ ①	-90.0	84263	194285	76147	512254	325452	354695	186802	1.90

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	62	62	0	0	0	0	0	0	0
2	CH	110	110	110	400	400	400	400	400	400	0
3	CH	110	110	110	600	600	600	600	600	600	0
4	Dummy	84	93	84	120	260	120	120	260	120	0
5	CH	84	93	84	127	260	127	134	260	134	0
6	CH	84	93	84	142	260	142	150	260	150	0
7	CH	102	103	102	194	290	194	238	320	238	0
8	CH	102	103	102	281	350	281	325	380	325	0
9	CH	102	103	102	369	410	369	412	440	412	0
10	CH	102	103	102	456	470	456	500	500	500	0
11	SM	114	108	114	0	0	0	0	0	0	25
12	Dummy	102	104	102	580	580	580	580	580	580	0
13	CH	102	104	102	633	633	633	687	687	687	0
14	CH	102	104	102	740	740	740	793	793	793	0
15	CH	102	104	102	847	847	847	900	900	900	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

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

GENERAL NOTES

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

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

WESTBANK IN THE VICINITY OF NEW ORLEANS, LA
WESTWEGO TO HARVEY CANAL, LA
AUTHORIZED 2057 HEIGHT
WESTWEGO & WESTMINSTER LEVEE
MAIN LEVEE
SOILS STABILITY ANALYSIS
C/L STA. 0+27 TO STA. 203+60

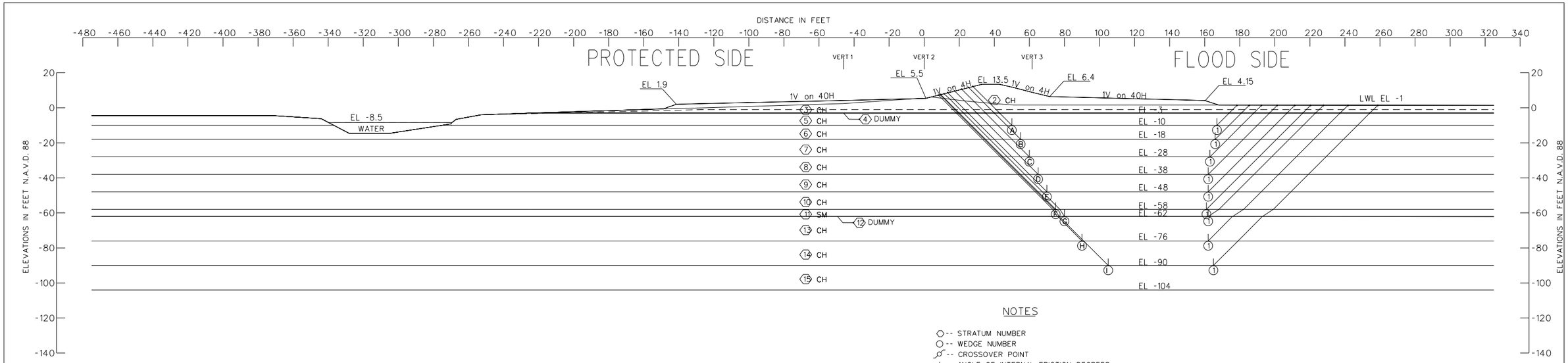
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: J.J.	PLOT SCALE: 20	PLOT DATE: MAR 09	CADD FILE: THWL
DRAWN BY: J.J.			FILE NO. H-4-XXXXX
CHECKED BY: S.A.B.	DATE: MAR 09		

PLATE XX

INPUT DATA FILENAME: T7HWL

t7hwl.DGN 3/30/2009 9:02:00 AM



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

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

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	16651	15813	7178	28647	6655	39642	21992	1.80
Ⓑ ①	-18.0	18965	16688	9450	48870	18061	45103	30809	1.46
Ⓒ ①	-28.0	22735	24516	13330	81632	41093	60581	40539	1.49
Ⓓ ①	-38.0	28231	31525	18950	123358	74142	78706	49216	1.60
Ⓔ ①	-48.0	35644	37904	26330	174129	117191	99878	56938	1.75
Ⓕ ①	-58.0	44827	43000	35450	234051	170676	123277	63375	1.95
Ⓖ ①	-62.0	51664	47560	49970	259770	194452	149194	65318	2.28
Ⓗ ①	-76.0	69479	49464	67072	365906	292757	186015	73149	2.54
Ⓘ ①	-90.0	90170	47580	87792	490221	410324	225542	79897	2.82

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	62	62	0	0	0	0	0	0	0
2	CH	110	110	110	400	400	400	400	400	400	0
3	CH	110	110	110	600	600	600	600	600	600	0
4	DUMMY	84	93	84	120	260	120	120	260	120	0
5	CH	84	93	84	127	260	127	134	260	134	0
6	CH	84	93	84	142	260	142	150	260	150	0
7	CH	102	103	102	194	290	194	238	320	238	0
8	CH	102	103	102	281	350	281	325	380	325	0
9	CH	102	103	102	369	410	369	412	440	412	0
10	CH	102	103	102	456	470	456	500	500	500	0
11	SM	114	108	114	0	0	0	0	0	0	25
12	DUMMY	102	104	102	580	580	580	580	580	580	0
13	CH	102	104	102	633	633	633	687	687	687	0
14	CH	102	104	102	740	740	740	793	793	793	0
15	CH	102	104	102	847	847	847	900	900	900	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.

WESTBANK IN THE VICINITY OF NEW ORLEANS, LA
WESTWEGO TO HARVEY CANAL, LA
AUTHORIZED 2057 HEIGHT
WESTWEGO & WESTMINSTER LEVEE
MAIN LEVEE
SOILS STABILITY ANALYSIS
C/L STA. 0+27 TO STA. 203+60

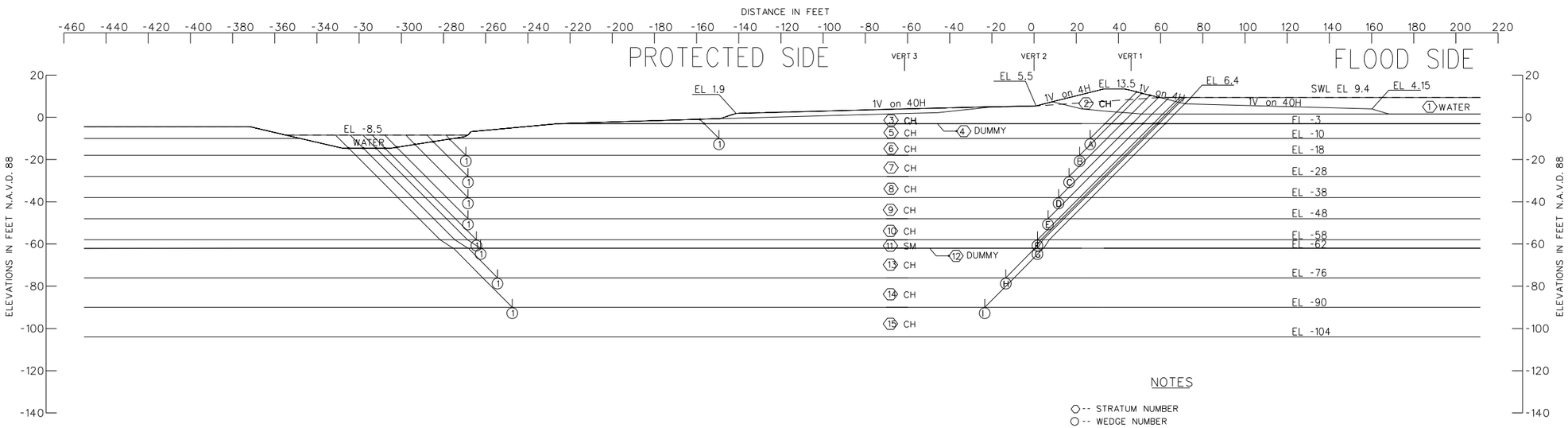
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: J.J.	PLOT SCALE: 20	PLOT DATE: MAR 09	CADD FILE: T7LWL	
DRAWN BY: J.J.			FILE NO. H-4-XXXXX	
CHECKED BY: S.A.B.	DATE: MAR 09			

PLATE XX

INPUT DATA FILENAME: T7LWL

t7lwl.DGN 3/30/2009 9:14:31 AM



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

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

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	16717	29836	4297	28700	4059	50850	24641	2.06
Ⓑ ①	-18.0	19135	48845	2167	49159	3554	70147	45605	1.54
Ⓒ ①	-28.0	22672	71462	5710	82346	16160	99844	66186	1.51
Ⓓ ①	-38.0	27603	93245	10956	124560	38644	131804	85916	1.53
Ⓔ ①	-48.0	34099	114330	17962	175944	71039	166391	104905	1.59
Ⓕ ①	-58.0	41990	133000	26962	236704	114436	201952	122268	1.65
Ⓖ ①	-62.0	47502	153120	38644	263876	134330	239266	129546	1.85
Ⓗ ①	-76.0	65429	165567	55600	369678	220217	286596	149461	1.92
Ⓘ ①	-90.0	85297	177632	76168	496253	325866	339097	170387	1.99

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	62	62	0	0	0	0	0	0	0
2	CH	110	110	110	400	400	400	400	400	400	0
3	CH	110	110	110	600	600	600	600	600	600	0
4	DUMMY	84	93	84	120	260	120	120	260	120	0
5	CH	84	93	84	127	260	127	134	260	134	0
6	CH	84	93	84	142	260	142	150	260	150	0
7	CH	102	103	102	194	290	194	238	320	238	0
8	CH	102	103	102	281	350	281	325	380	325	0
9	CH	102	103	102	369	410	369	412	440	412	0
10	CH	102	103	102	456	470	456	500	500	500	0
11	SM	114	108	114	0	0	0	0	0	0	25
12	DUMMY	102	104	102	580	580	580	580	580	580	0
13	CH	102	104	102	633	633	633	687	687	687	0
14	CH	102	104	102	740	740	740	793	793	793	0
15	CH	102	104	102	847	847	847	900	900	900	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.

WESTBANK IN THE VICINITY OF NEW ORLEANS, LA
WESTWEGO TO HARVEY CANAL, LA
AUTHORIZED 2057 HEIGHT
WESTWEGO & WESTMINSTER LEVEE
MAIN LEVEE
SOILS STABILITY ANALYSIS
C/L STA. 0+27 TO STA. 203+60

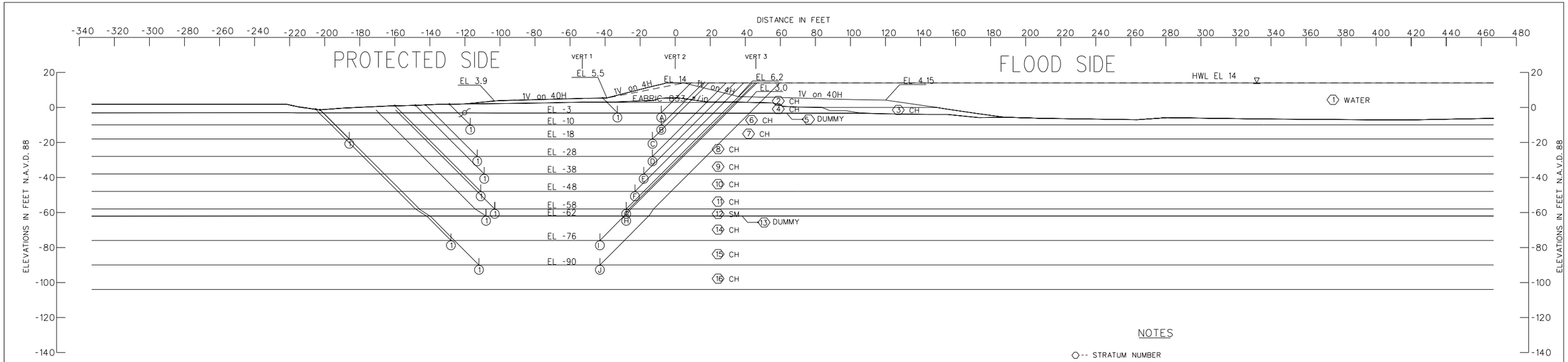
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY:	J.J.	PLOT SCALE: 20	PLOT DATE: MAR 09	CADD FILE:	T7SWL
DRAWN BY:	J.J.			FILE NO.	H-4-XXXXX
CHECKED BY:	S.A.B.	DATE: MAR 09			

PLATE XX

INPUT DATA FILENAME: T7SWL

T7SWL.DGN 3/30/2009 9:05:15 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	-3.0	16353	15000	9183	15693	4459	40536	11234	3.61
Ⓑ	①	-10.0	18542	17013	7697	30564	7288	43252	23276	1.86
Ⓒ	①	-18.0	21848	27610	6015	52498	13461	55473	39037	1.42
Ⓓ	①	-28.0	25266	25038	13373	88391	42095	63677	46296	1.38
Ⓔ	①	-38.0	30887	30211	18734	133471	75514	79832	57957	1.38
Ⓕ	①	-48.0	37742	36494	25698	187780	117705	99934	70075	1.43
Ⓖ	①	-58.0	45827	37500	34748	251248	172473	118075	78775	1.50
Ⓗ	①	-62.0	51953	46400	47597	279619	194216	145950	85403	1.71
Ⓘ	①	-76.0	69720	58395	63041	385629	283568	191156	102061	1.87
Ⓙ	①	-90.0	88897	54717	83415	519490	403453	227029	116037	1.96

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	62	62	0	0	0	0	0	0	0
2	CH	110	110	110	400	400	400	400	400	400	0
3	CH	100	100	100	150	150	150	150	150	150	0
4	CH	110	110	110	600	600	600	600	600	600	0
5	DUMMY	84	93	84	120	260	120	120	260	120	0
6	CH	84	93	84	127	260	127	134	260	134	0
7	CH	84	93	84	142	260	142	150	260	150	0
8	CH	102	103	102	194	290	194	238	320	238	0
9	CH	102	103	102	281	350	281	325	380	325	0
10	CH	102	103	102	369	410	369	412	440	412	0
11	CH	102	103	102	456	470	456	500	500	500	0
12	SM	114	108	114	0	0	0	0	0	0	25
13	DUMMY	102	104	102	580	580	580	580	580	580	0
14	CH	102	104	102	633	633	633	687	687	687	0
15	CH	102	104	102	740	740	740	793	793	793	0
16	CH	102	104	102	847	847	847	900	900	900	0

NOTES

⬡ -- STRATUM NUMBER
○ -- WEDGE NUMBER
-- CROSSOVER POINT
ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
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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. SEE BORING DATA PLATES.

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

THOUGH THE GEOTEXTILE IS SHOWN IT WAS NOT NEEDED FOR THIS ANALYSIS.

WESTBANK IN THE VICINITY OF NEW ORLEANS, LA
WESTWEGO TO HARVEY CANAL, LA
AUTHORIZED 2057 HEIGHT
WESTWEGO & WESTMINSTER LEVEE
SEAPLANE CANAL C/L OVERBUILD HWL
SOILS STABILITY ANALYSIS
C/L STA. 56+70 TO STA. 59+20

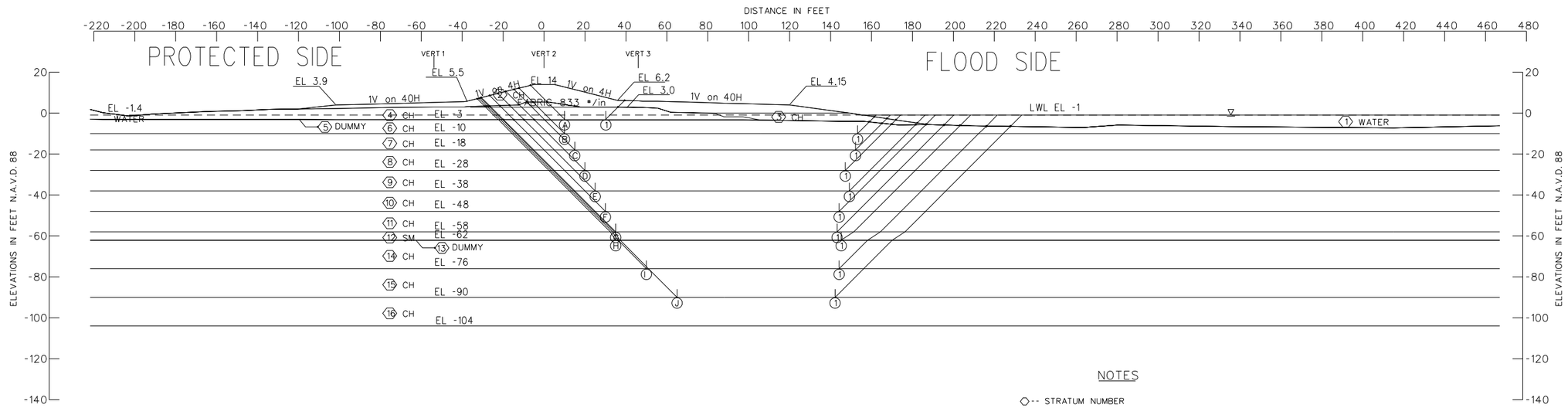
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: J.J.	PLOT SCALE: 20	PLOT DATE: MAR 09	CADD FILE: T4HWL
DRAWN BY: J.J.			FILE NO.
CHECKED BY: S.A.B.	DATE: MAR 09		H-4-XXXXX

PLATE XX

INPUT DATA FILENAME: T4HWL

t4hwl.DGN 3/30/2009 9:22:26 AM



ASSUMED FAILURE SURFACE		RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY	FOS W/GEO-TEXTILE
NO.	ELEV.	R_A	R_B	R_P	D_A	$-D_P$	RESISTING	DRIVING		
A 1	-3.0	16660	12120	9661	15503	5105	38441	10398	3.70	
B 1	-10.0	19031	20964	2200	30020	3731	42195	26289	1.60	
C 1	-18.0	22352	21729	4238	51289	12642	48319	38647	1.25	1.51
D 1	-28.0	26542	30876	7952	85444	32679	65370	52765	1.24	1.43
E 1	-38.0	32277	40629	13131	128583	61460	86037	67123	1.28	1.43
F 1	-48.0	39250	47128	20319	180602	101760	106697	78842	1.35	
G 1	-58.0	47698	54100	29336	241581	151062	131134	90519	1.45	
H 1	-62.0	54265	63916	42208	268657	172314	160389	96343	1.66	
I 1	-76.0	72129	64715	59077	373722	264863	195921	108859	1.80	
J 1	-90.0	93012	61220	79483	497940	377528	233715	120412	1.94	

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	62	62	0	0	0	0	0	0	0
2	CH	110	110	110	400	400	400	400	400	400	0
3	CH	100	100	100	150	150	150	150	150	150	0
4	CH	110	110	110	600	600	600	600	600	600	0
5	DUMMY	84	93	84	120	260	120	120	260	120	0
6	CH	84	93	84	127	260	127	134	260	134	0
7	CH	84	93	84	142	260	142	150	260	150	0
8	CH	102	103	102	194	290	194	238	320	238	0
9	CH	102	103	102	281	350	281	325	380	325	0
10	CH	102	103	102	369	410	369	412	440	412	0
11	CH	102	103	102	456	470	456	500	500	500	0
12	SM	114	108	114	0	0	0	0	0	0	25
13	DUMMY	102	104	102	580	580	580	580	580	580	0
14	CH	102	104	102	633	633	633	687	687	687	0
15	CH	102	104	102	740	740	740	793	793	793	0
16	CH	102	104	102	847	847	847	900	900	900	0

NOTES

- ⬡ -- STRATUM NUMBER
- ○ -- WEDGE NUMBER
- -- CROSSOVER POINT
- ϕ -- ANGLE OF INTERNAL FRICTION, DEGREES
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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. SEE BORING DATA PLATES.

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

PULLOUT LENGTH CALCULATIONS:

h(avg) = 10.4 FT

γ'h(avg) = 10.4(110) = 1144 lb/sq ft

q (clay) = 265+1144(tan 19) = 659 lb/sq ft

L = 10000/(659 * 2) = 7.6 ft

25 feet available for active wedge "D" - okay

WESTBANK IN THE VICINITY OF NEW ORLEANS, LA
WESTWEGO TO HARVEY CANAL, LA
AUTHORIZED 2057 HEIGHT
WESTWEGO & WESTMINSTER LEVEE
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SOILS STABILITY ANALYSIS
C/L STA. 56+70 TO STA. 59+20

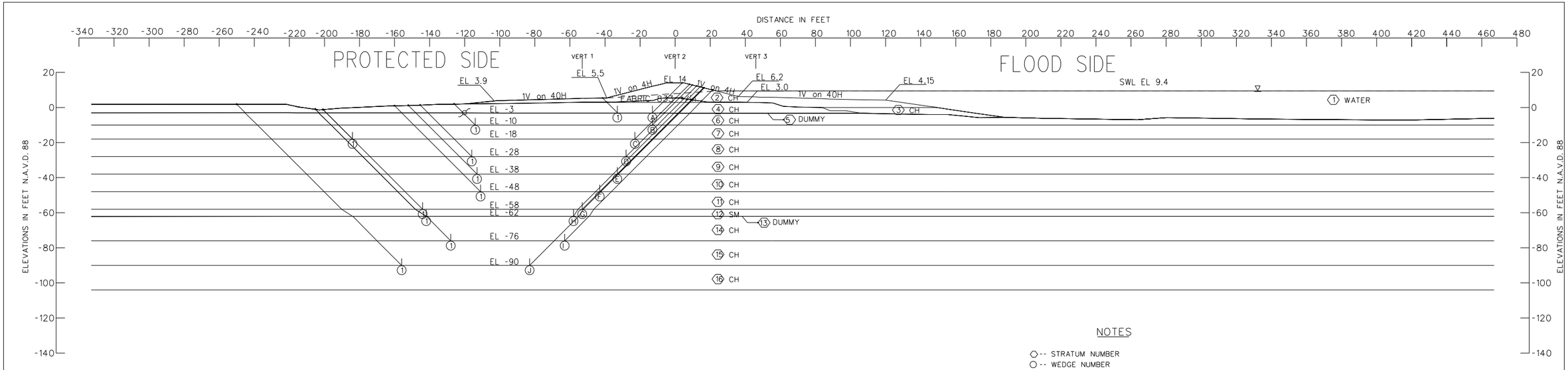
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: J.J.	PLOT SCALE: 20	PLOT DATE: MAR 09	CADD FILE: T4LWL
DRAWN BY: J.J.			FILE NO. H-4-XXXXX
CHECKED BY: S.A.B.	DATE: MAR 09		

PLATE XX

INPUT DATA FILENAME: T4LWL

t4lwl.DGN 3/30/2009 9:29:18 AM



NOTES

- ⬡ -- STRATUM NUMBER
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- ⌐ -- 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
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- 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	-3.0	16955	12000	9183	15012	4459	38138	10553	3.61
Ⓑ ①	-10.0	19437	15436	7756	29971	7485	42629	22486	1.90
Ⓒ ①	-18.0	23220	25084	6194	49494	13714	54498	35780	1.52
Ⓓ ①	-28.0	27540	21427	13243	83287	41710	62210	41577	1.50
Ⓔ ①	-38.0	33291	26208	18595	126094	74749	78094	51345	1.52
Ⓕ ①	-48.0	40903	28042	25698	174506	117705	94643	56801	1.67
Ⓖ ①	-58.0	50050	45500	32194	232102	162167	127744	69935	1.83
Ⓗ ①	-62.0	55874	48720	45328	255884	185132	149922	70752	2.12
Ⓘ ①	-76.0	72778	44655	63041	366403	283568	180474	82835	2.18
Ⓙ ①	-90.0	94144	57889	86754	484588	400866	238787	83722	2.85

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	62	62	0	0	0	0	0	0	0
⬡2	CH	110	110	110	400	400	400	400	400	400	0
⬡3	CH	100	100	100	150	150	150	150	150	150	0
⬡4	CH	110	110	110	600	600	600	600	600	600	0
⬡5	DUMMY	84	93	84	120	260	120	120	260	120	0
⬡6	CH	84	93	84	127	260	127	134	260	134	0
⬡7	CH	84	93	84	142	260	142	150	260	150	0
⬡8	CH	102	103	102	194	290	194	238	320	238	0
⬡9	CH	102	103	102	281	350	281	325	380	325	0
⬡10	CH	102	103	102	369	410	369	412	440	412	0
⬡11	CH	102	103	102	456	470	456	500	500	500	0
⬡12	SM	114	108	114	0	0	0	0	0	0	25
⬡13	DUMMY	102	104	102	580	580	580	580	580	580	0
⬡14	CH	102	104	102	633	633	633	687	687	687	0
⬡15	CH	102	104	102	740	740	740	793	793	793	0
⬡16	CH	102	104	102	847	847	847	900	900	900	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.

THOUGH THE GEOTEXTILE IS SHOWN IT WAS NOT NEEDED FOR THIS ANALYSIS.

WESTBANK IN THE VICINITY OF NEW ORLEANS, LA
WESTWEGO TO HARVEY CANAL, LA
AUTHORIZED 2057 HEIGHT
WESTWEGO & WESTMINSTER LEVEE
SEAPLANE CANAL C/L OVERBUILD SWL
SOILS STABILITY ANALYSIS
C/L STA. 56+70 TO STA. 59+20

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

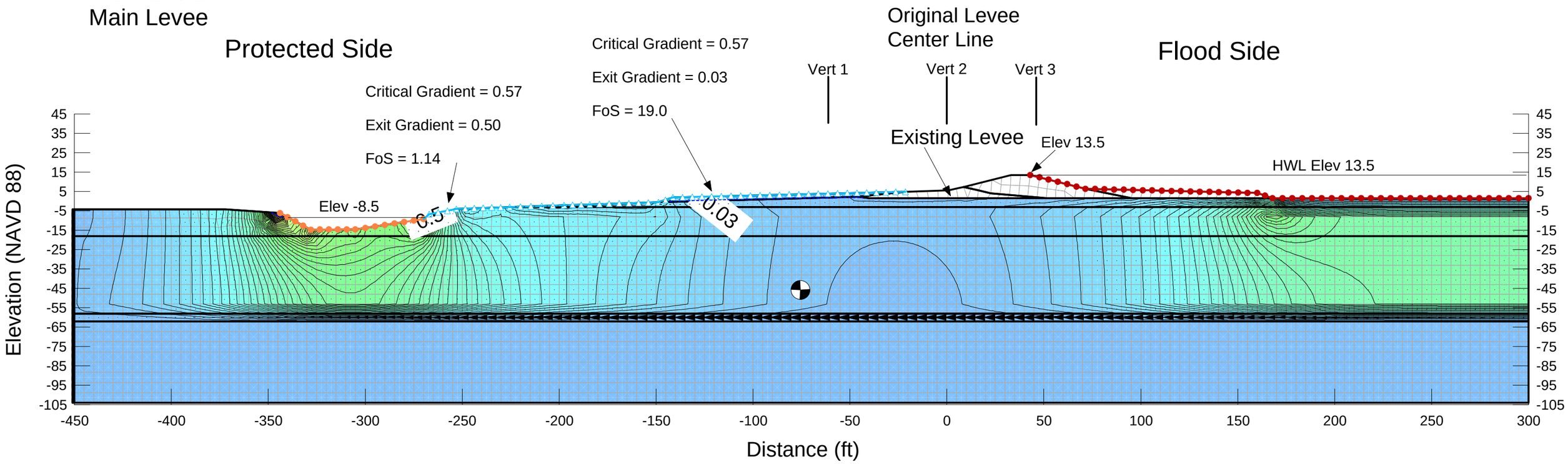
DESIGNED BY: J.J.	PLOT SCALE: 20	PLOT DATE: MAR 09	CADD FILE: T4SWL	
DRAWN BY: J.J.			FILE NO. H-4-XXXXX	
CHECKED BY: S.A.B.	DATE: MAR 09			

PLATE XX

INPUT DATA FILENAME: T4SWL

t4swl.DGN 3/30/2009 9:26:13 AM

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Main Levee



HWL Case

Name: Existing Levee Model: Saturated / Unsaturated K-Function: CH Fill K-Ratio: 1 K-Direction: 0 °
Name: Compacted Levee Fill Model: (none)
Name: CH -18 to -58 Model: Saturated / Unsaturated K-Function: CH K-Ratio: 1 K-Direction: 0 °
Name: CH -3 to -18 Model: Saturated / Unsaturated K-Function: CH K-Ratio: 1 K-Direction: 0 °
Name: SM -58 to -62 Model: Saturated / Unsaturated K-Function: SM K-Ratio: 1 K-Direction: 0 °
Name: CH -62 to -104 Model: Saturated / Unsaturated K-Function: CH K-Ratio: 1 K-Direction: 0 °
Name: Compacted Berm Fill Model: Saturated / Unsaturated K-Function: CH Fill K-Ratio: 1 K-Direction: 0 °

K-Functions

CH - Hyd K Fn = 3.28e-10 ft/sec (1e-8 cm/sec)
CH Fill - Hyd K Fn = 3.28e-9 ft/sec (1e-7 cm/sec)
SM - Hyd K Fn = 3.28e-5 ft/sec (1e-3 cm/sec)

Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Analysis\Seepage\

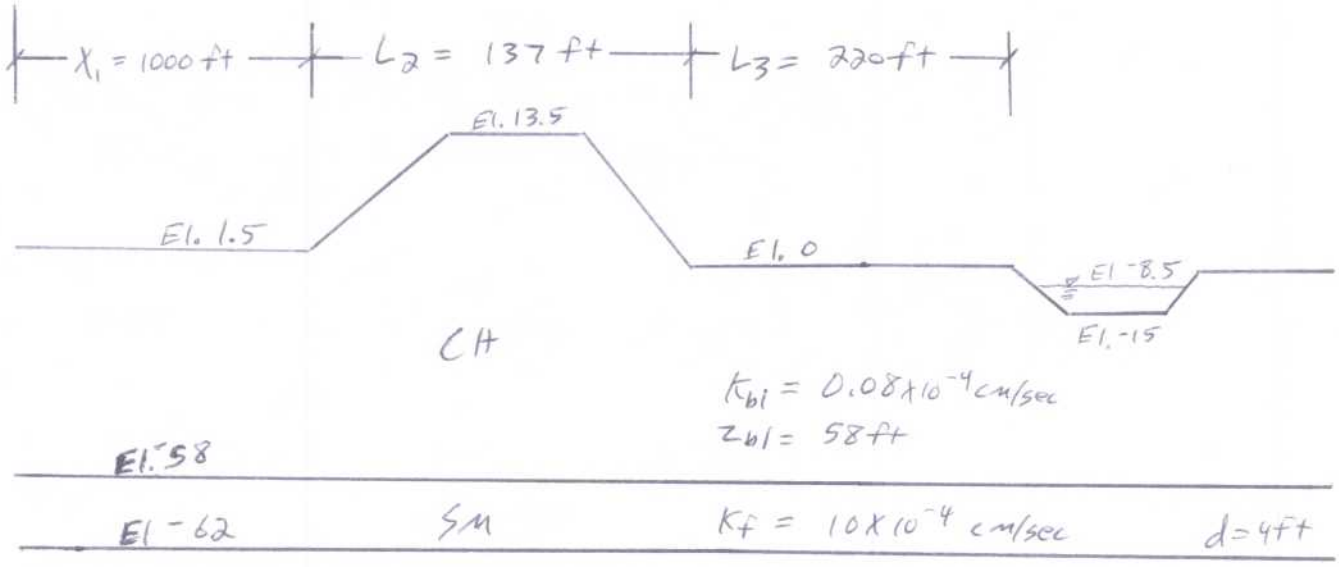
File Name: WBV-14c.2 Reach I Main Levee HWL seepage4d.gsz

PROJECT WBV 14C.2 Westwego to Westminster Levee	PAGE 1 OF 2	COMPUTED BY SAB	DATE 3/26/09
SUBJECT Proj # 08A140		CHECKED BY	DATE

Main Levee Seepage Analysis

References: DIVR 1110-1-400
EM 1110-2-1901
EM 1110-2-1913

*NTS



- From Table 3 DIVR for CH 720' $K_{bl} = 0.08 \times 10^{-4}$ cm/sec
- By inspection of Table 1 DIVR $x_1 = 1000$ ft is conservative

$$X_3 = \frac{\tanh(cL_3)}{c} \quad \text{where} \quad c = \sqrt{\frac{K_{bL}}{K_f z_{bL} d}}$$

$$X_3 = \frac{\tanh(0.006 \times 220)}{0.006} \qquad c = \sqrt{\frac{0.08}{10 \times 58 \times 4}}$$

$$X_3 = 144 \text{ ft} \qquad c = 0.006$$

for SWL = 9.4 H is also equal to 9.4 ft

$$h_o = \frac{H X_3}{X_1 + L_2 + X_3} = \frac{9.4 \times 144}{1000 + 137 + 144} = 1.06 \text{ ft}$$

$$i_o = \frac{h_o}{z_i} = \frac{1.06}{58} = 0.02$$

COMPUTATION SHEET

PROJECT	WBV 146.2 Westwego to Westminster Levee	PAGE 2 OF 2	COMPUTED BY SAVS	DATE 3/26/09
SUBJECT	Proj # 08A140		CHECKED BY	DATE

$$\gamma_{ave} \text{ @ levee toe} = \frac{3 \times 110 + 15 \times 84 + 40 \times 102}{58} = 98 \text{ pcf}$$

$$i_c = \frac{\gamma'}{\gamma_w} = \frac{98 - 62.4}{62.4} = 0.57$$

$$FoS_{piping} = \frac{i_c}{i_o} = \frac{0.57}{0.02} = 28.5$$

$$FoS_{heave} = \frac{z_{b1}\,\gamma_T}{\gamma_w\,h_w} = \frac{58 \times 98}{62.4 \times (58 + 1.06)} = 1.54$$

FOR HWL = 13.5 H = 13.5 also

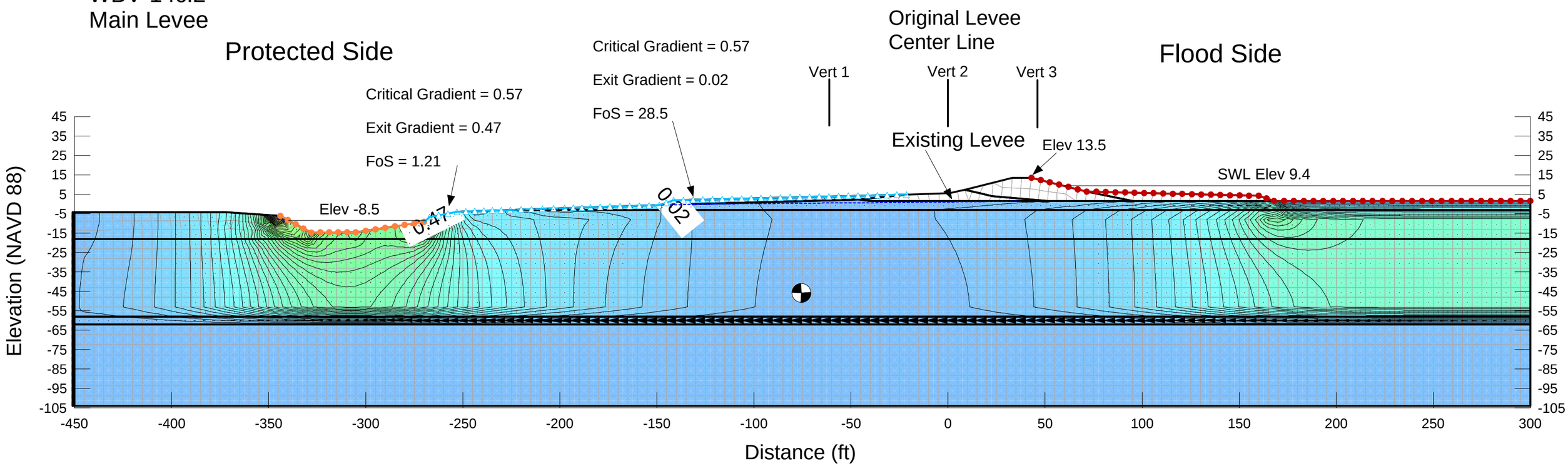
$$h_o = \frac{13.5 \times 144}{1000 + 137 + 144} = 1.52$$

$$i_o = \frac{h_o}{z_i} = \frac{1.52}{58} = 0.03$$

$$FoS_{piping} = \frac{i_c}{i_o} = \frac{0.57}{0.03} = 19$$

$$FoS_{heave} = \frac{58 \times 98}{62.4 \times (58 + 1.52)} = 1.53$$

Westwego to Harvey Canal
New Westwego Pumping Station to Orleans Village
West Jefferson Parish, Louisiana
WBV-14c.2
Main Levee



SWL Case

Name: Existing Levee Model: Saturated / Unsaturated K-Function: CH Fill K-Ratio: 1 K-Direction: 0 °
Name: Compacted Levee Fill Model: (none)
Name: CH -18 to -58 Model: Saturated / Unsaturated K-Function: CH K-Ratio: 1 K-Direction: 0 °
Name: CH -3 to -18 Model: Saturated / Unsaturated K-Function: CH K-Ratio: 1 K-Direction: 0 °
Name: SM -58 to -62 Model: Saturated / Unsaturated K-Function: SM K-Ratio: 1 K-Direction: 0 °
Name: CH -62 to -104 Model: Saturated / Unsaturated K-Function: CH K-Ratio: 1 K-Direction: 0 °
Name: Compacted Berm Fill Model: Saturated / Unsaturated K-Function: CH Fill K-Ratio: 1 K-Direction: 0 °

K-Functions

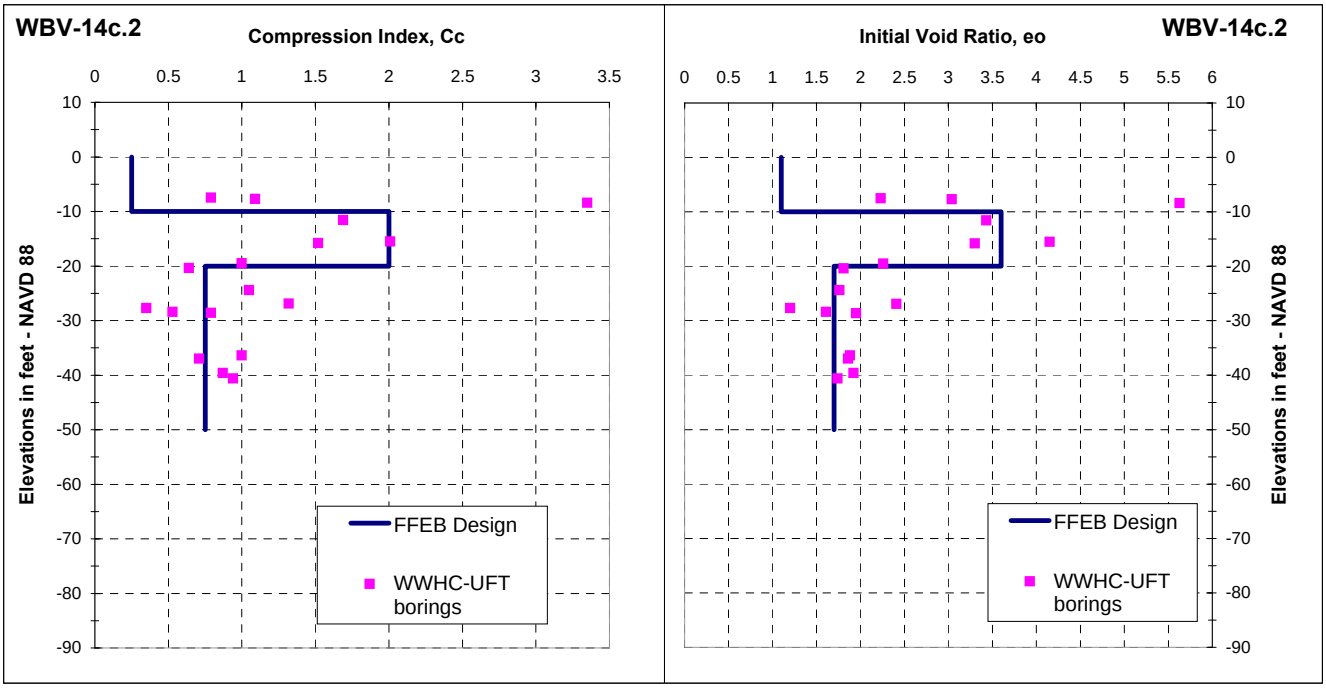
CH - Hyd K Fn = 3.28e-10 ft/sec (1e-8 cm/sec)
CH Fill - Hyd K Fn = 3.28e-9 ft/sec (1e-7 cm/sec)
SM - Hyd K Fn = 3.28e-5 ft/sec (1e-3 cm/sec)

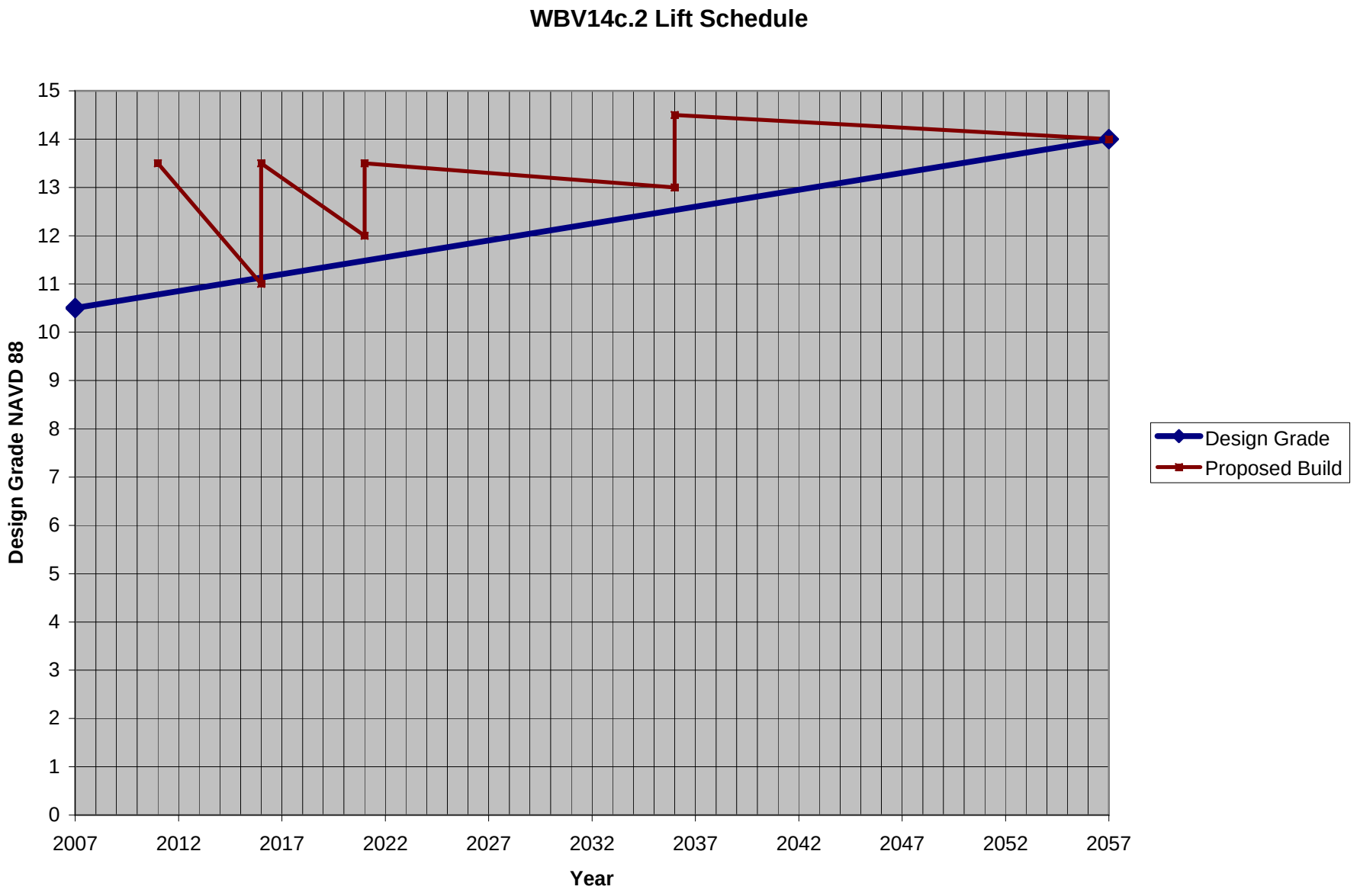
Directory: G:\F&MHOME\Breen\New Westwego PS to Orleans Village WBV-14c.2\Analysis\Seepage\

File Name: WBV-14c.2 Reach I Main Levee SWL seepage4d.gsz

Reach	Boring	Elev.	γd (pcf)	%w	γm (pcf)	Cc	eo	Cv (sq ft/day)	Cv (sq ft/year)
Westwego	WWHC-7UFT	-20.4	60.5	63.8	99.1	0.64	1.81	0.02	7.30
	WWHC-7UFT	-37.0	59.3	69.2	100.3	0.71	1.86	0.03	10.95
	WWHC-11UFT	-11.6	36.9	121.7	81.8	1.69	3.43	0.01	3.65
	WWHC-11UFT	-39.6	57.9	67.4	96.9	0.87	1.92	0.03	10.95
	WWHC-13UFT	-27.7	76.1	40.0	106.5	0.35	1.20	0.32	116.80
	WWHC-13UFT	-40.6	61.9	66.1	102.8	0.94	1.74	0.09	32.85
Westminster N-S	WWHC-16UFT	-7.5	52.6	80.3	94.8	0.79	2.23	0.02	7.30
	WWHC-16UFT	-15.5	27.5	186.2	78.7	2.01	4.15	0.01	3.65
	WWHC-18UFT	-19.5	52.0	82.5	94.9	1.00	2.26	0.01	3.65
	WWHC-18UFT	-28.4	65.1	61.9	105.4	0.53	1.61	0.03	10.95
Westminster E-W	WWHC-20UFT	-8.4	18.3	287.7	70.9	3.35	5.63		
	WWHC-20UFT	-24.4	61.6	55.1	95.5	1.05	1.76		
	WWHC-20UFT	-36.4	58.2	65.2	96.1	1.00	1.88		
	WWHC-22UFT	-7.7	39.6	118.6	86.6	1.09	3.04	0.01	3.65
	WWHC-22UFT	-28.6	58	67.2	97.0	0.79	1.95	0.02	7.30
	WWHC-24UFT	-15.8	37.8	125.1	85.1	1.52	3.3	0.01	3.65
	WWHC-24UFT	-26.9	49.8	87.4	93.3	1.32	2.41	0.01	3.65

	Elev	Cc	eo
FFEB Design	0	0.25	1.1
	-10	0.25	1.1
	-10	2	3.6
	-20	2	3.6
	-20	0.75	1.7
	-50	0.75	1.7




WBV14c.2 Lift Schedule
Design Grade NAVD 88
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
2007
2012
2017
2022
2027
2032
2037
2042
2047
2052
2057
Year
Design Grade
Proposed Build

PROGRAM CSETT - VERTICAL STRESS INDUCTION AND SETTLEMENT PROGRAM
DATE: 04-MAR-2009 TIME: 22.25.02

I. INPUT DATA

1. TITLE - WBV 14c.2

2. BOUSSINESQ SOLUTION WILL BE USED TO COMPUTE INDUCED STRESSES.
THE MAXIMUM DEPTH TO WHICH THE ANALYSIS WILL BE EXTENDED
IS 100.00 FEET.

3. 2-DIMENSIONAL PRESSURE LOAD DATA
NONE

4. 2-DIMENSIONAL SOIL LOAD DATA

PROFILE NUMBER 1 :NUMBER OF POINTS= 7
BEGINNING TIME OF APPLICATION = 0.0000 YRS.
ENDING TIME OF APPLICATION = 1.0000 YRS.
EFFECTIVE UNIT WEIGHT OF SOIL LOAD= 110.00 PCF

POINT NO.	X (FT.)	Y (FT.)
1	0.00	5.00
2	22.00	10.50
3	34.00	13.50
4	44.00	13.50
5	56.10	10.50
6	74.90	5.80
7	100.00	5.00

5. 3-DIMENSIONAL RECTANGULAR LOAD DATA
NONE

6. 3-DIMENSIONAL IRREGULAR LOAD DATA
   NONE

7. EXCAVATION DATA
   NONE

8. SOIL DATA

STRATA NO.	EL. OF TOP OF STRATUM (FEET NGVD)	DRAINAGE CONDITION	EFF UNIT WEIGHT (PCF)	RECOMPR. INDEX	COEF.OF CONSOL. (SQFT/YR)	POISSON'S RATIO
1	3.50	C	110.00	0.25000	5.00000	0.32000
2	0.00	C	110.00	0.25000	5.00000	0.32000
3	-3.00	C	47.60	0.25000	5.00000	0.32000
4	-18.00	C	21.60	2.00000	15.00000	0.32000
5	-58.00	D	39.60	0.75000	5.00000	0.32000
6	-62.00	D	51.60	0.02800	1000.00000	0.32000

9. STRESS-STRAIN DATA

```
          STRATUM NO.  1
          --------------
     COMPRESSION INDEX= 0.25000
   RECOMPRESSION INDEX= 0.25000
     INSITU VOID RATIO= 1.10000
     INSITU OVERBURDEN=  193.00 PSF

          STRATUM NO.  2
          --------------
     COMPRESSION INDEX= 0.25000
   RECOMPRESSION INDEX= 0.25000
     INSITU VOID RATIO= 1.10000
     INSITU OVERBURDEN=  456.00 PSF

          STRATUM NO.  3
          --------------
     COMPRESSION INDEX= 0.25000
   RECOMPRESSION INDEX= 0.25000
     INSITU VOID RATIO= 1.10000
     INSITU OVERBURDEN=  690.00 PSF

          STRATUM NO.  4
          --------------
     COMPRESSION INDEX= 2.00000
   RECOMPRESSION INDEX= 2.00000
     INSITU VOID RATIO= 3.60000
     INSITU OVERBURDEN= 1644.00 PSF
```

```
            STRATUM NO.  5
            --------------
      COMPRESSION INDEX= 0.75000
    RECOMPRESSION INDEX= 0.75000
      INSITU VOID RATIO= 1.70000
      INSITU OVERBURDEN= 2539.00 PSF


            STRATUM NO.  6
            --------------
      COMPRESSION INDEX= 0.02800
    RECOMPRESSION INDEX= 0.02800
      INSITU VOID RATIO= 0.50000
      INSITU OVERBURDEN= 3395.00 PSF



 10. TIME SEQUENCE FOR CONSOLIDATION CALCULATIONS


     A GEOMETRIC PROGRESSION WITH AN INITIAL TIME PERIOD OF   0.0192
     YEARS AND A MULTIPLICATIVE FACTOR OF   2.0000 WILL BE USED IN
     THE TIME RATE OF CONSOLIDATION CALCULATIONS.



 11. OUTPUT CONTROL DATA


      XXL=    0.0000 FT.
      XUL=  100.0000 FT.
     DELX=   20.0000 FT.
.
1
 PROGRAM CSETT - VERTICAL STRESS INDUCTION AND SETTLEMENT PROGRAM
 DATE: 04-MAR-2009                                  TIME: 22.25.02




 II.  OUTPUT SUMMARY.



 1. TITLE- WBV 14c.2



                          POSITION:  X=     0.0
                          ********************



 2. SUMMARY OF ULTIMATE SETTLEMENTS.

    STRATA   MID-DEPTH    IN-SITU    DELTA     ULTIMATE
```

NO.	OF STRATA (FEET)	OVERBURDEN (LB/SQ FT)	SIGMA (LB/SQ FT)	SETTLEMENT (FEET)
1	1.75	192.50	97.80	0.087
2	5.00	550.00	125.80	0.032
3	14.00	1072.00	194.12	0.133
4	41.50	1861.00	292.45	1.135
5	63.50	2372.20	304.25	0.057
6	82.75	3341.50	285.25	0.024

3. TIME-SETTLEMENT SUMMARY.

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	ULT	0.02 (YRS.)	0.04 (YRS.)	0.08 (YRS.)	0.15 (YRS.)	0.31 (YRS.)	0.61 (YRS.)
1	0.087	0.001	0.001	0.001	0.002	0.002	0.003
2	0.032	0.000	0.000	0.001	0.001	0.001	0.001
3	0.133	0.000	0.000	0.000	0.005	0.005	0.005
4	1.135	0.014	0.014	0.014	0.028	0.028	0.041
5	0.057	0.000	0.000	0.002	0.002	0.008	0.022
6	0.024	0.000	0.000	0.000	0.000	0.001	0.012
TOTALS:	1.468	0.015	0.015	0.018	0.038	0.045	0.084

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	1.23 (YRS.)	2.46 (YRS.)	4.92 (YRS.)	9.83 (YRS.)	19.66 (YRS.)	39.32 (YRS.)	78.64 (YRS.)
1	0.004	0.006	0.008	0.011	0.016	0.022	0.031
2	0.002	0.002	0.003	0.004	0.006	0.008	0.012
3	0.005	0.010	0.010	0.016	0.025	0.035	0.049
4	0.054	0.073	0.106	0.147	0.205	0.292	0.414
5	0.051	0.057	0.057	0.057	0.057	0.057	0.057
6	0.023	0.024	0.024	0.024	0.024	0.024	0.024
TOTALS:	0.139	0.172	0.208	0.259	0.333	0.438	0.587

POSITION: X= 20.0
****

2. SUMMARY OF ULTIMATE SETTLEMENTS.

STRATA NO.	MID-DEPTH OF STRATA (FEET)	IN-SITU OVERBURDEN (LB/SQ FT)	DELTA SIGMA (LB/SQ FT)	ULTIMATE SETTLEMENT (FEET)

1	1.75	192.50	714.85	0.301
2	5.00	550.00	713.10	0.130
3	14.00	1072.00	685.18	0.400
4	41.50	1861.00	538.89	2.000
5	63.50	2372.20	433.40	0.080
6	82.75	3341.50	368.45	0.031

3. TIME-SETTLEMENT SUMMARY.

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	ULT	0.02 (YRS.)	0.04 (YRS.)	0.08 (YRS.)	0.15 (YRS.)	0.31 (YRS.)	0.61 (YRS.)
1	0.301	0.005	0.005	0.005	0.006	0.008	0.010
2	0.130	0.002	0.002	0.002	0.003	0.003	0.004
3	0.400	0.005	0.006	0.007	0.008	0.011	0.013
4	2.000	0.029	0.031	0.034	0.041	0.052	0.069
5	0.080	0.000	0.000	0.002	0.004	0.012	0.031
6	0.031	0.000	0.000	0.000	0.000	0.006	0.015
TOTALS:	2.942	0.041	0.044	0.050	0.062	0.092	0.142

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	1.23 (YRS.)	2.46 (YRS.)	4.92 (YRS.)	9.83 (YRS.)	19.66 (YRS.)	39.32 (YRS.)	78.64 (YRS.)
1	0.014	0.019	0.027	0.039	0.055	0.078	0.110
2	0.006	0.008	0.012	0.017	0.024	0.034	0.047
3	0.019	0.026	0.036	0.051	0.073	0.103	0.146
4	0.094	0.129	0.181	0.257	0.366	0.515	0.727
5	0.070	0.080	0.080	0.080	0.080	0.080	0.080
6	0.029	0.031	0.031	0.031	0.031	0.031	0.031
TOTALS:	0.232	0.293	0.367	0.475	0.629	0.841	1.141

POSITION: X= 40.0
****

2. SUMMARY OF ULTIMATE SETTLEMENTS.

STRATA NO.	MID-DEPTH OF STRATA (FEET)	IN-SITU OVERBURDEN (LB/SQ FT)	DELTA SIGMA (LB/SQ FT)	ULTIMATE SETTLEMENT (FEET)

1	1.75	192.50	1097.95	0.365
2	5.00	550.00	1080.80	0.170
3	14.00	1072.00	969.72	0.522
4	41.50	1861.00	662.46	2.392
5	63.50	2372.20	493.30	0.090
6	82.75	3341.50	405.95	0.033

3. TIME-SETTLEMENT SUMMARY.

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	ULT	0.02 (YRS.)	0.04 (YRS.)	0.08 (YRS.)	0.15 (YRS.)	0.31 (YRS.)	0.61 (YRS.)
1	0.365	0.005	0.005	0.006	0.008	0.010	0.012
2	0.170	0.002	0.003	0.003	0.004	0.004	0.006
3	0.522	0.007	0.008	0.009	0.011	0.013	0.017
4	2.392	0.034	0.036	0.040	0.050	0.062	0.080
5	0.090	0.000	0.000	0.002	0.004	0.013	0.035
6	0.033	0.000	0.000	0.000	0.000	0.007	0.016
TOTALS:	3.572	0.048	0.052	0.060	0.077	0.109	0.166

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	1.23 (YRS.)	2.46 (YRS.)	4.92 (YRS.)	9.83 (YRS.)	19.66 (YRS.)	39.32 (YRS.)	78.64 (YRS.)
1	0.017	0.023	0.033	0.047	0.066	0.094	0.133
2	0.008	0.011	0.016	0.022	0.031	0.044	0.062
3	0.024	0.035	0.047	0.067	0.096	0.134	0.189
4	0.111	0.155	0.218	0.310	0.436	0.614	0.872
5	0.080	0.090	0.090	0.090	0.090	0.090	0.090
6	0.032	0.033	0.033	0.033	0.033	0.033	0.033
TOTALS:	0.272	0.347	0.437	0.569	0.752	1.009	1.379

POSITION: X= 60.0
****

2. SUMMARY OF ULTIMATE SETTLEMENTS.

STRATA NO.	MID-DEPTH OF STRATA (FEET)	IN-SITU OVERBURDEN (LB/SQ FT)	DELTA SIGMA (LB/SQ FT)	ULTIMATE SETTLEMENT (FEET)
1	1.75	192.50	662.70	0.290

2	5.00	550.00	662.20	0.124
3	14.00	1072.00	650.54	0.384
4	41.50	1861.00	543.84	2.015
5	63.50	2372.20	445.40	0.082
6	82.75	3341.50	378.23	0.031

3. TIME-SETTLEMENT SUMMARY.

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	ULT	0.02 (YRS.)	0.04 (YRS.)	0.08 (YRS.)	0.15 (YRS.)	0.31 (YRS.)	0.61 (YRS.)
1	0.290	0.005	0.005	0.005	0.006	0.008	0.010
2	0.124	0.002	0.002	0.002	0.003	0.003	0.004
3	0.384	0.005	0.005	0.006	0.008	0.010	0.013
4	2.015	0.030	0.031	0.034	0.041	0.052	0.068
5	0.082	0.000	0.000	0.002	0.004	0.012	0.032
6	0.031	0.000	0.000	0.000	0.000	0.006	0.015
TOTALS:	2.926	0.042	0.043	0.049	0.062	0.091	0.142

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	1.23 (YRS.)	2.46 (YRS.)	4.92 (YRS.)	9.83 (YRS.)	19.66 (YRS.)	39.32 (YRS.)	78.64 (YRS.)
1	0.013	0.019	0.026	0.037	0.053	0.074	0.106
2	0.006	0.008	0.011	0.016	0.023	0.032	0.045
3	0.018	0.024	0.036	0.050	0.069	0.099	0.140
4	0.093	0.131	0.184	0.259	0.365	0.519	0.733
5	0.072	0.082	0.082	0.082	0.082	0.082	0.082
6	0.031	0.031	0.031	0.031	0.031	0.031	0.031
TOTALS:	0.233	0.295	0.370	0.475	0.623	0.837	1.137

POSITION: X= 80.0
****

2. SUMMARY OF ULTIMATE SETTLEMENTS.

STRATA NO.	MID-DEPTH OF STRATA (FEET)	IN-SITU OVERBURDEN (LB/SQ FT)	DELTA SIGMA (LB/SQ FT)	ULTIMATE SETTLEMENT (FEET)
1	1.75	192.50	235.85	0.163
2	5.00	550.00	242.30	0.057
3	14.00	1072.00	279.86	0.188

4	41.50	1861.00	334.49	1.292
5	63.50	2372.20	329.75	0.063
6	82.75	3341.50	303.60	0.026

3. TIME-SETTLEMENT SUMMARY.

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	ULT	0.02 (YRS.)	0.04 (YRS.)	0.08 (YRS.)	0.15 (YRS.)	0.31 (YRS.)	0.61 (YRS.)
1	0.163	0.003	0.003	0.003	0.003	0.004	0.006
2	0.057	0.001	0.001	0.001	0.001	0.001	0.002
3	0.188	0.003	0.004	0.005	0.005	0.005	0.005
4	1.292	0.014	0.017	0.024	0.028	0.033	0.042
5	0.063	0.000	0.000	0.002	0.004	0.009	0.024
6	0.026	0.000	0.000	0.000	0.000	0.003	0.012
TOTALS:	1.789	0.021	0.025	0.035	0.041	0.055	0.091

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	1.23 (YRS.)	2.46 (YRS.)	4.92 (YRS.)	9.83 (YRS.)	19.66 (YRS.)	39.32 (YRS.)	78.64 (YRS.)
1	0.008	0.011	0.015	0.021	0.030	0.042	0.059
2	0.003	0.004	0.005	0.007	0.010	0.015	0.021
3	0.010	0.012	0.017	0.024	0.034	0.047	0.069
4	0.061	0.084	0.117	0.166	0.235	0.332	0.470
5	0.055	0.063	0.063	0.063	0.063	0.063	0.063
6	0.025	0.026	0.026	0.026	0.026	0.026	0.026
TOTALS:	0.162	0.200	0.243	0.307	0.398	0.525	0.708

POSITION: X= 100.0
****

2. SUMMARY OF ULTIMATE SETTLEMENTS.

STRATA NO.	MID-DEPTH OF STRATA (FEET)	IN-SITU OVERBURDEN (LB/SQ FT)	DELTA SIGMA (LB/SQ FT)	ULTIMATE SETTLEMENT (FEET)
1	1.75	192.50	84.50	0.079
2	5.00	550.00	88.40	0.023
3	14.00	1072.00	104.80	0.075
4	41.50	1861.00	172.26	0.683
5	63.50	2372.20	210.30	0.041

6	82.75	3341.50	217.00	0.018

3. TIME-SETTLEMENT SUMMARY.

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	ULT	0.02 (YRS.)	0.04 (YRS.)	0.08 (YRS.)	0.15 (YRS.)	0.31 (YRS.)	0.61 (YRS.)
1	0.079	0.001	0.001	0.001	0.001	0.002	0.003
2	0.023	0.000	0.000	0.000	0.000	0.001	0.001
3	0.075	0.000	0.000	0.000	0.000	0.000	0.002
4	0.683	0.014	0.014	0.014	0.014	0.014	0.027
5	0.041	0.000	0.000	0.000	0.002	0.006	0.016
6	0.018	0.000	0.000	0.000	0.000	0.000	0.012
TOTALS:	0.919	0.015	0.015	0.015	0.017	0.023	0.061

(SETTLEMENT IN FEET AT SPECIFIED TIMES)

STRATA NO	1.23 (YRS.)	2.46 (YRS.)	4.92 (YRS.)	9.83 (YRS.)	19.66 (YRS.)	39.32 (YRS.)	78.64 (YRS.)
1	0.004	0.006	0.007	0.010	0.014	0.020	0.029
2	0.001	0.002	0.002	0.003	0.004	0.006	0.008
3	0.005	0.005	0.006	0.010	0.014	0.019	0.027
4	0.028	0.042	0.064	0.089	0.123	0.176	0.246
5	0.036	0.040	0.041	0.041	0.041	0.041	0.041
6	0.017	0.018	0.018	0.018	0.018	0.018	0.018
TOTALS:	0.091	0.113	0.138	0.171	0.214	0.280	0.369