EXHIBIT
23

REPORT OF

GEOTECHNICAL INVESTIGATION

GENTILLY LANDFILL
SLOPE STABILITY ANALYSES
NEW ORLEANS (ORLEANS PARISH), LOUISIANA

FOR

LA DEPARTMENT OF ENVIRONMENTAL QUALITY
BATON ROUGE, LOUISIANA

STE
Soil Testing Engineers, Inc.
Geotechnical, Environmental & Materials Consultants

Baton Rouge, LA • Biloxi, MS • New Orleans, LA

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Soil Testing Engineers, Inc.

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25 July 2006

LA Department of Environmental Quality
P.O. Box 4303
Baton Rouge, LA 70821

Attn: Mr. Bijan Sharafkhani, P.E.

Re: Report of Geotechnical Investigation
Gentilly Landfill
Slope Stability Analyses
New Orleans (Orleans Parish), Louisiana
STE File: 06-1046

Dear Bijan,

Transmitted are three copies (one bound and two unbound) of our engineering report covering a geotechnical investigation for the subject project. Our findings, together with the analyses and conclusions based on them, are submitted in the attached report.

Thank you for asking us to perform these services. It has been a pleasure working with you on this project and we look forward to serving you again in the future.

Sincerely,
SOIL TESTING ENGINEERS, INC.

for:

DR. GORDON P. BOUTWELL, JR., P.E.
President

CHAD M. POCHE, P.E.
Vice President

STATE OF LOUISIANA
CHAD M. POCHE
REG. No. 27667
LICENSED
PROFESSIONAL ENGINEER
CIVIL ENGINEERING

bbl

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TABLE OF CONTENTS

		PAGE
1.0	EXECUTIVE SUMMARY	1
2.0	SCOPE	2
3.0	FIELD PROCEDURES	3
4.0	LABORATORY TESTING	3
5.0	SUBSURFACE SOIL CONDITIONS	3
6.0	PROJECT CONSIDERATIONS	3
	6.1 Project Description	3
	6.2 Limitations	4
7.0	ENGINEERING ANALYSES	4
	7.1 Slope Stability	4
	7.2 Results of Analyses	6
8.0	CONSULTATION	6

FIGURES 1 Through 21

APPENDIX A	Undisturbed Borings
APPENDIX B	CPT Soundings
APPENDIX C	Miscellaneous Calculations

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STE
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REPORT OF
GEOTECHNICAL INVESTIGATION
GENTILLY LANDFILL
SLOPE STABILITY ANALYSES
NEW ORLEANS (ORLEANS PARISH), LOUISIANA

1.0 EXECUTIVE SUMMARY

STE has completed an exploration and evaluation of the subsurface conditions for proposed C & D waste (Type III Facility) stacking at the Gentilly Landfill located off Almonaster Avenue in New Orleans, Louisiana. Work for this project was authorized by the Louisiana Department of Environmental Quality (LA DEQ).

The Gentilly Landfill was a closed Type II landfill, roughly 5300 feet long (E-W) and 1200 feet wide (N-S), lying parallel to and about 180 feet north of the toe of the MRGO/GIWW north levee. It was originally filled and capped at about El 5 (feet MSL). After Hurricane Katrina, the landfill was reopened for Type III wastes. These now cover about the western third of the landfill area to near El 20. The anticipated final height of the landfill is to El 140. Temporarily, the height is being limited to El 60. The exterior side slope is 1(V):4(H).

Permitting, including slope stability analyses, was performed by Metroplex Industries, Inc. (now Metroplex Core) of Houston, Texas. Their geotechnical report, Attachment 8 to the Permit Application (revised July 2004) was furnished to STE. Stability analyses for the south (MRGO/ICWW) face are included as Figure No. 8 of the Metroplex geotechnical report. It indicates a minimum safety factor of 1.9 against failure of the waste mass at El 140, with a safety factor of 3.1 against a failure involving the MRGO/ICWW levee.

These analyses assumed that filling was slow enough that all excess pore water pressures would dissipate, so that Metroplex used solely a drained (frictional only) strength condition for the underlying soils. The filling rate for the landfill was furnished to STE by Metroplex as averaging some 30,000 to 40,000 cu.yd./day until recently. Since then, we understand the rate is about 10,000 cu. yd./day (approximately 6,000 tons per day).

Subsequently, the Metroplex analyses were questioned by the New Orleans District of the U. S. Army Corps of Engineers (USACE). According to information furnished to STE, the USACE requires that the slope stability analyses use only the soils' initial (preconstruction) undrained shear strengths. Since this assumption will lead to unrealistically low shear strengths (especially under the landfill and levee), it will also lead to unrealistically low safety factors for the landfill waste stacks.

The objective of this study is to determine the stability of the south face of the final landfill configuration, especially with respect to effects on the MRGO/ICWW levee.

Data was available from the Metroplex borings of 2002, and also from the original investigations by Eustis Engineering Company in 1980-1982. In general, the natural soils consist of a soft to medium clay crust to about El -5, followed by extremely soft and very soft clays and peats to around El -25. The soils increase in strength there to soft clays, which extend to near El -65 to El -75. Here, stiff Pleistocene clays begin. There are layers of loose silts in the upper soils, and some loose to firm sands at greater depths.

One (1) cone pentrometer sounding (CPT) and three (3) undisturbed soil borings were performed by STE for this investigation. The borings and CPT sounding were completed to depths ranging from 70 to 80 feet below the existing ground surface.

In addition to the information obtained from our soil borings and CPT sounding, information obtained from the previous investigations performed at the site was used for our analyses. The most recent data consists of our soil borings and CPT sounding and 2 CPT soundings taken by others through the U.S. EPA. In general, survey information indicates ground surface at our boring locations is at approximate El 0.

Engineering analyses consisting of slope stability analyses were performed. The findings of our investigation, together with our evaluations and conclusions, are presented in this report. Various figures consisting of a boring location plan, subsoil cross sections, shear strength computations, and the results of our slope stability analyses follow the report.

Appendix A contains the completed logs of the STE undisturbed soil borings. The results of consolidation tests and consolidated, undrained, triaxial compression tests follow the soil boring logs in Appendix A. In addition, the results of the direct simple shear tests and consolidation tests performed by others for the U.S. EPA are contained within Appendix A. The results of the CPT soundings performed by STE and the soundings provided by the U.S. EPA are provided in Appendix B. Appendix C contains various calculations as they pertain to projected strength gain of the subsoils.

2.0 SCOPE

One (1) CPT sounding and three (3) undisturbed soil borings were performed by STE to determine soil stratigraphy and develop engineering properties of the subsurface soil conditions. Selected samples were tested in STE's LA DEQ approved soils laboratory in Baton Rouge to develop the engineering and physical properties of the subsurface soils. This information was used to provide engineering analyses to determine safe slope configurations for various waste heights and loading rates.

3.0 FIELD PROCEDURES

As discussed, three (3) undisturbed soil borings and one (1) CPT sounding were performed by STE to depths ranging from 70 to 80 feet below ground surface. The undisturbed soil borings and CPT sounding were performed using truck and ATV-mounted, rotary type, drilling equipment.

The locations of the soil borings and CPT soundings at the site are provided on Figure 1 of this report. Detailed descriptions of the methods utilized in the field for the soil borings and CPT soundings are provided in Appendices A & B, respectively.

4.0 LABORATORY TESTING

Soil mechanics laboratory testing was performed on selected samples from the undisturbed soil borings. Certain samples from the various strata were tested in the laboratory to determine their pertinent physical and engineering characteristics. The samples and types of tests performed were selected by a geotechnical engineer to develop information necessary for appropriate analyses.

The testing program was conducted in general accordance with ASTM and LA DEQ methods and was conducted at STE's LA DEQ approved soils laboratory in Baton Rouge, LA. The results of the laboratory testing program are summarized and included in Appendix A.

5.0 SUBSURFACE SOIL CONDITIONS

Cross section subsoil profiles were created from the findings of the soil borings and CPT soundings. Figures 2 through 5 provide various subsoil cross sections.

6.0 PROJECT CONSIDERATIONS

This section provides information regarding the project that is pertinent to the geotechnical investigation. This information includes a description of the project as provided to this office and a statement of the limitations inherent to an investigation of this nature.

6.1 Project Description

The Gentilly Landfill was a closed Type II landfill, roughly 5300 feet long (E-W) and 1200 feet wide (N-S), lying parallel to and about 180 feet north of the toe of the MRGO/GIWW north levee. After Hurricane Katrina, the landfill was reopened for Type III wastes. These now cover about the western third of the landfill area to near El 20. The anticipated final height of the landfill is to El 140. Temporarily, the height is being limited to El 60. The waste will be placed on 4 (horizontal) to 1 (vertical) slopes.

The objective of this study is to determine the stability of the south face of the final landfill configuration, especially with respect to effects on the MRGO/ICWW levee. Both present loading rates (estimated to be approximately 6,000 tons per day) and maximum allowable loading rates (as dictated by slope stability analyses of the waste stack) were evaluated.

6.2 Limitations

The analyses and recommendations presented in this report are based on the preceding project information and the results of the subsurface investigation. While it is not likely that conditions will differ greatly from those observed in the soil borings and CPT soundings, it is always possible that variations can occur between or away from the borehole or CPT locations.

If it becomes apparent during construction that subsurface conditions differing significantly from those discussed in this report are encountered, this office should be notified at once so that their effects can be determined and any remedial measures necessary be prescribed. Also, should the nature of the project change, these recommendations may have to be re-evaluated.

This report has been prepared for the exclusive use of LA DEQ for the purpose of providing geotechnical engineering design recommendations. The recommendations provided in this report are site specific and are not intended for use at any other site or for any other facility.

7.0 ENGINEERING ANALYSES

7.1 Slope Stability

Slope stability analyses were performed to investigate the stability of waste slopes. Our slope stability analyses were performed using the computer program Slope/W, Version 5.20, by Geo-Slope International, Ltd.

For our stability analyses, the soil strength and density properties defined from our investigation were utilized. Strength gain due to levee and waste placement and soil consolidation was considered. Strength gain of the underlying soils occurs over time as fill is placed and the soils consolidate. A summary of our assumptions for the primary items of concern is presented below.

Waste:
A significant amount of research has been conducted on the subject of slope stability modeling techniques for waste fills. An undrained shear strength of 100 psf and internal friction angle of 23 degrees are considered appropriate strength properties for C & D waste and were used in our analyses. An assumed unit weight of 65 pcf for the waste stack was also used in our analyses.

Strength Gain:
Due to the placement of fill and waste over time, the underlying subsoils have consolidated and gained strength. Extensive research has been performed in the study of strength gain effects. Our analyses closely matched and follow previous studies. The results of the consolidation tests, consolidated undrained triaxial tests, and the direct shear tests were used in conjunction with shear strength and overburden ratios. Various calculations made by STE as they relate to strength gain are included as Appendix C of this report.

In general, Su/P ratios of 0.16 to 0.37 were calculated at the various boring and CPT locations. Closer analysis of the CPT data and direct simple shear tests as well as the laboratory shear strength data indicate a Su/P ratio of 0.28 is applicable for this site and project. Therefore, a Su/P ratio of 0.28 was used for our analysis.

The strength data and analysis of shear strength versus effective overburden for Borings L-1, L-2, L-3, and CB-3 are provided on Figures 6 through 9. In addition, a summary of the direct simple shear test data, as provided by the U.S. EPA, is provided on Figure 10.

Waste Stacking:
The first option analyzed utilized a current loading rate on the order of 6,000 tons/day. Given this rate, we estimate waste is currently at a height of approximately El 26 (2006). Projected fill heights of El 62 in 2009 and El 140 in 2012 were also analyzed. The waste will be placed on approximate 4 (Horizontal) to 1 (Vertical) slopes.

The second option requested to be analyzed focused on the maximum amount of waste that could be placed while maintaining a safe slope for the waste stack. In general, our analyses for this case indicate a waste stack to El 60 after the first year (2007), waste to El 85 after year 2 (2008), and waste to El 140 after year 3 (2009). We estimate these heights correspond to an approximate loading rate of 12,000 tons per day. This calculated loading rate (as based on fill heights) should be verified by LA DEQ.

7.2 Results of Analyses

Preliminary evaluations indicated the soil conditions and layering encountered at Boring L-2 appeared to govern the analyses. Therefore, analyses using the current waste loading rate (6,000 tons per day) and Boring L-2 properties were made.

The results of these analyses are provided on Figures 11 through 15. Projected waste stack configurations in the years 2006 (current), 2009 (three year), and 2012 (6 year) were analyzed. In addition to presenting the critical failure arc (lowest computed factor of safety), failure arcs for the waste stack into the levee are also shown. As shown on Figures 11 through 15, the projected waste stack and levee appear stable with respect to slope failure.

Figures 16 through 21 provide the results of our analyses for a potential maximum loading rate. In general, our analyses increased the waste stack height to the maximum point where the minimum factor of safety against failure was approximately 1.2. The same rates of consolidation and overburden pressures used for a waste loading rate of 6,000 tons per day were used for these analyses as well. Therefore, the analyses presented on Figures 16 through 21 should be considered conservative.

8.0 CONSULTATION

Often during final design and/or construction, questions can arise which are not specifically covered in the report. They can normally be handled by a brief phone call or conference with the designers.

FIGURES

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APPENDIX B

CPT-FIELD PROCEDURES

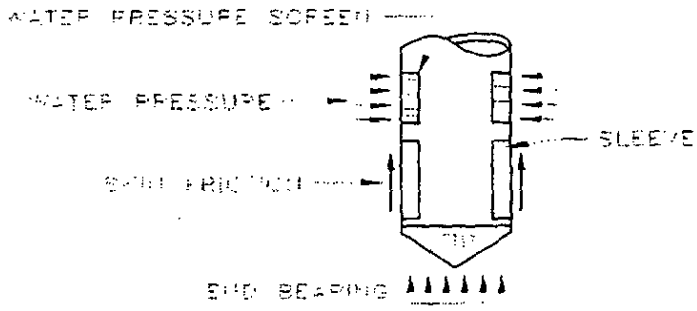
The following paragraphs describe the field and laboratory procedures used for this investigation for the cone penetrometer soundings (CPT). CPT logs are included with this appendix. The logs included with this appendix are from both STE's activities and the soundings made for the U.S. EPA by others.

B.1 FIELD EXPLORATION

One (1) CPT sounding was made by STE to a depth of 70 feet below ground surface in order to supplement the undisturbed soil borings. Due to its ability to continuously measure in-situ shear strength of the underlying subsoils, the CPT soundings provide invaluable data with regards to analyzing soft cohesive soils.

STE's soundings were made on 10 May 2006. The soundings made for the U.S. EPA were performed on 17 May 2006. The approximate locations of the soundings are shown on the Boring Plan, Figure 1.

For the CPT equipment, the sensing tip is pushed continuously into the soil by a hydraulic ram. Data is transmitted from the CPT sensor to the operator as it occurs for real time evaluation. The force is transmitted from the rig through small diameter rods. As illustrated in the sketch below, the tip has three sensing units. It measures simultaneously the resistance at the end of the tip (end-bearing), the resistance along the vertical sides of the sleeve above the tip (skin-friction), and the groundwater pressure just above the sleeve.



SKETCH - CPT TIP

The absolute values of the tip and sleeve resistance can be related to the soil shear strength. This ratio (sleeve/tip) depends on the ratio of soil cohesion (c) to its friction [Tan(φ)]. A high sleeve/tip ratio indicates a clayey soil, while a low ratio indicates a sandy soil. The soil stratigraphy shown on the CPT plots is identified using Campanella and Robertson's Simplified Soil Behavior Chart.

APPENDIX A

APPENDIX A

FIELD (UNDISTURBED SOIL BORINGS) AND LABORATORY TESTING PROCEDURES

The following paragraphs describe the field and laboratory procedures used for this investigation for the undisturbed soil borings. Completed soil boring logs are included with this appendix. The boring logs provide the field and laboratory data collected.

A.1 FIELD EXPLORATION

Three (3) undisturbed soil borings were made by STE for this project to investigate subsurface conditions. The borings were completed at the 80 foot depth below ground surface. The borings were drilled on 2 and 9 May 2006. The approximate locations of the borings are shown on the Boring Plan, Figure 1.

A.1.1 Drilling Methods

The borings were drilled with truck and ATV-mounted, rotary-type drilling equipment. The soil borings were advanced using a nominal four-inch diameter short flight auger. This technique allowed the proper borehole advancement to secure the appropriate samples (see "Sampling Procedures") and allowed the observation of the presence of free water in the boreholes. Upon completion of the borings, the boreholes were grouted full depth in accordance with Louisiana regulations.

A.1.2 Sampling Procedures

Soil samples were obtained continuously within the upper 60 feet of the ground surface. Continuous sampling was performed to provide detailed soil information. Below the 60 foot depth, the samples were obtained at three to five feet on center.

In these cohesive and semi-cohesive soils, relatively undisturbed samples were secured using a three-inch diameter, thin-wall steel tube sampler. In this sampling procedure, the borehole is advanced to the desired level, and the tube is lowered to the bottom of the boring. It is then pushed about two feet into the undisturbed soil in one continuous stroke. The sample and tube are retrieved from the borehole and detached from the drill string.

The sample is extruded by a hydraulic piston onto a rigid sample catcher to minimize disturbance. The sample is then visually classified. The classification includes description of soil color, strength estimates, identification of structural conditions (layering, seams, etc.) and variations (organics, oxide inclusions, etc.). A pocket penetrometer strength test is performed. Any disturbed portions are discarded, and the sample is sealed to minimize disturbance and moisture loss during transportation to STE's LA DEQ approved soils laboratory.

In the less cohesive materials, standard penetration tests were performed. These tests provide a measure of the in situ characteristics of the soil and secure a disturbed sample. In this test, a 2 inch OD, 1.37 ID, heavy-walled "split spoon" sampler is driven into the undisturbed soil at the bottom of the borehole with a drop hammer weighing 140 pounds and having a stroke of 30 inches. It is first seated 6 inches, then driven an additional two, six-inch increments. The "Penetration Resistance" is the number of such blows required to drive the spoon the last 12 inches. It is recorded on the boring log in the following manner:

24 b/f
(7-9-15)

where the figures in parenthesis indicate the number of blows required for each 6 inch increment.

A.2 LABORATORY PROCEDURES

Certain samples from the various strata were tested in the laboratory to determine their pertinent physical characteristics. The samples and types of tests performed were selected by a geotechnical engineer to develop information necessary for appropriate analyses. The testing program was conducted in general accordance with ASTM and LA DEQ methods and is described below.

A.2.1 Strength Tests

The strength characteristics of the various soil strata are important for geotechnical engineering analyses. Twenty-nine (29) unconsolidated, undrained, triaxial compression (UU) tests (ASTM D 2850), and four (4) consolidated, undrained, triaxial compression (CU) tests (ASTM D 4767) were performed to develop this data. The testing procedures also include determination of the moisture content and wet and dry density of the sample.

The results of the UU compression tests are tabulated in the laboratory data portion of the soil boring logs under the column heading "Compressive Strength". The results of the CU tests are provided on separate plots following the boring logs in this Appendix. The moisture content and dry density data are tabulated in the subsequent two columns within the laboratory data portion of the logs. A summary of the CU test results is provided on Table A-2 of this Appendix.

A.2.2 Classification Tests

In order to classify the soils more definitely than can be done by field methods, twenty-three (23) Atterberg Limit determinations (ASTM D 4318) were made. The Atterberg Limits data consist of Liquid Limit (LL), Plastic Limit (PL), and Plasticity Index (PI). The relationship among these variables is as follows:

$$PI = LL - PL$$

The Atterberg Limits data is provided within the laboratory portion of the logs under the headings "Liquid Limit" and "Plasticity Index".

A.2.3 Consolidation Tests

Five (5) consolidation tests (ASTM D 2435) were performed to analyze the compressibility characteristics of the subsoils. The consolidation test results are shown on separate plots following the boring logs. A summary of the consolidation test results is provided on Table A-1 of this Appendix.

DESCRIPTION OF TERMS AND SYMBOLS USED ON SOIL BORING LOG

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FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type

5
10
15
20
25
30
35
40

Ground Water Levels

Long-Term Depth
Depth to water after boring is completed (time noted).

Short-Term Depth
Depth to water after initial water encountered prior to proceeding with boring (time noted).

Initially Encountered
Depth where free water was initially encountered during augering.

Sampling/Field Data

3.5 (P) — **Undisturbed**
3" dia. Tube sample

Pocket Penetrometer (P)
Penetration resistance (tons/sq. ft.).

Torvane (T)
Shearing resistance (tons/sq. ft.)

13 b/f (3-7-6) — **Split Spoon**
Std. penetration test

Std. Penetration
No. of blows per foot (blows per each six inch increments).

Auger
Disturbed (auger) collected in accordance with ASTM D-1452.

No Recovery
Sampling attempted but no sample retrieved.

DESCRIPTION

Description
Classifications are based on visual observatio by field & lab representatives as well as result of laboratory data (when available).

Laboratory Data

Compressive Strength
Value based on peak compressive strength. Determined by unconfined compression test unless otherwise noted.

Dry Unit Weight
As determined by method similar to ASTM D-2937.

Water Content
As determined by pertinent portions of ASTM D-2216.

Atterberg Limits
LL : Liquid Limit
PL : Plastic Limit
PI : Plasticity Index
(= Liquid Limit - Plastic Limit)

Other
Results of other tests such as consolidation, permeability, grain size or notes associated wi testing program.

Soil Type
Graphical representation of soil type. In accordance with USCS Symbols.

Ground Water Level Data	Boring Advancement Method	Notes
	Boring Abandonment Method	

Form LOGTERMS

Strata Boundaries May Not Be E

Stability Analysis
Gentilly Landfill
New Orleans, LA

LOG OF SOIL BORING L-1

STE
Soil Testing Engineers, Inc.

Sheet 1 of 2

File: 06-1046
Date: 05/02/06
Logged by: K. Moody
Driller: D. Robinson
Rig: CME 75

LA Dept of Environmental Quality
Baton Rouge, LA

LELAP Certificate No. 02052

Location: Lat. 30° 00' 06.8"
Long. 89° 58' 48.9"
Surface Elevation: +0.5 (ft., NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			2.5 (P)									Medium tan and gray CLAY (CH)
▽			1.2 (P)									Medium dark gray and brown CLAY (CH) w/organic matter and shell fragments
	5		0.7 (P)	0.33t1	48	67	65	25	40			Soft gray CLAY (CH) w/organic matter
			0.2 (P)									Very soft dark gray CLAY (CH) w/organic matter and wood fragments
▽	10		0.2 (P)	0.12t2	63	57	81	22	59			
			1.5 (P)									Medium gray CLAY (CH) w/trace of organic matter
			1.0 (P)	0.38t3	39	79	43	22	21			
	15		0.4 (P)	0.27t4	265	18	377	231	146	CS		Soft black and dark brown PEAT (PT) w/large wood fragments
			0.5 (P) Tube									
			0.2 (P)									
	20		0.4 (P)									Very soft gray CLAY (CH) w/trace of organic matter – w/sand seams and layers at 20 to 24 ft.
			0.5 (P)	0.18t5	60	62	77	25	52			
	25		0.5 (P)									
			0.4 (P)	0.17t6	67	55	83	25	58			– w/sand seams at 28 to 30 ft.
			0.5 (P)									
	30		0.5 (P) Tube									
			0.5 (P)	0.23t7	69	58	83	35	48	CS		
	35		0.7 (P)									Soft gray CLAY (CH)
			0.5 (P)									
			1.0 (P)									– w/sand seams at 38 to 42 ft.
	40											

Continued Next Page

Ground Water Level Data

▽ Free water first encountered

▼ Water level after 15 mins.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 10 ft.
4" Dia. Rotary Wash: 10 to 80 ft.

Boring Abandonment Method

Tremie grouted bottom-to-top with 4% cement/bentonite grout

Notes

t: Unconsolidated, Undrained Triaxial Compression Test
Lateral Pressure (psi)
t1 = 2.2 t2 = 2.8
t3 = 4.35 t4 = 2.2
t5 = 6.7 t6 = 7.1
t7 = 9.1
CS: See Consolidation Curve

Strata Boundaries May Not Be Exact

Stability Analysis
Gentilly Landfill
New Orleans, LA

LOG OF SOIL BORING L-1

STE
Soil Testing Engineers, Inc.

File: 06-1046
Date: 05/02/06
Logged by: K. Moody
Driller: D. Robinson
Rig: CME 75

LA Dept of Environmental Quality
Baton Rouge, LA

LELAP Certificate No. 02052

Location: Lat. 30° 00' 06.8"
Long. 89° 58' 48.9"

Surface Elevation: +0.5 (ft., NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			0.7 (P)									Soft gray CLAY (CH) – w/sand seams at 40 to 42 ft.
			1.0 (P)	0.48t8	69	56	101	38	63			– jointed at 42 to 46 ft.
	45		0.5 (P)									
			0.7 (P)									– w/shell fragments at 46 to 48 ft.
			0.5 (P)									
	50		0.4 (P)									
	55		2.0 (P)	0.77t9	32	91	55	25	30			Medium greenish-gray CLAY (CH) – w/calcareous nodules at 54 to 56 ft. – slickensided at 54 to 58 ft.
			2.0 (P)									
			2.5 (P)									Stiff greenish-gray CLAY (CH), slickensided
	60											
			2.5 (P)	1.58t10	49	74						
	65											
			2.0 (P)									– w/sand seams at 68 to 70 ft.
	70											
			1.7 (P)									Firm gray SILTY SAND (SM) w/clay streaks
	75											
			54 b/f 21-26-28		26					GS		Very dense gray SILTY SAND (SM)
	80											Boring completed at 80 ft

Ground Water Level Data

Free water first encountered

Water level after 15 mins.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 10 ft.
4" Dia. Rotary Wash: 10 to 80 ft.

Boring Abandonment Method

Tremie grouted bottom-to-top with 4% cement/bentonite grout

Notes

t: Unconsolidated, Undrained Triaxial Compression Test
Lateral Pressure (psi)
t8 = 11.0 t9 = 23.0
t10 = 22.0
GS: Particle Size Analysis
Gravel = 0%, Sand = 52%

Strata Boundaries May Not Be Exact

LOG01R 061046.GPJ LOG01.GDT 06/21/06

Stability Analysis
Gentilly Landfill
New Orleans, LA

LOG OF SOIL BORING L-2

STE
Soil Testing Engineers, Inc.

Sheet 1 of 2

LA Dept of Environmental Quality
Baton Rouge, LA

LELAP Certificate No. 02052

File: 06-1046
Date: 05/09/06
Logged by: M. Machen
Driller: Ironhorse
Rig: Buggy

Location: Lat. 30° 00' 08.5"
Long. 89° 58' 30.2"

Surface Elevation: -0.2 (ft., NGVD)

Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			1.0 (P)									Medium tan and gray SILTY CLAY (CL) w/roots
			1.0 (P)									Medium gray CLAY (CH) w/wood fragments – w/3-inch sand layer at 2.5 ft.
▽	5		0.2 (P)	0.30t1	36	78	55	20	35			Soft dark gray CLAY (CH) w/sand pockets and organic matter
▽			Tube									WOOD w/Very soft gray CLAY (CH)
			No (P)		458	11	487	288	199	CU		Very soft black and dark brown PEAT (PT)
	10											
			Tube									
	15		0.2 (P)	0.11t2	259	21	202	88	114			Very soft dark gray and dark brown ORGANIC CLAY (OH) w/PEAT (PT)
			0.2 (P)									
			5 b/f 2-3-3							GS		Loose gray SANDY SILT (ML) w/clay layers
	20		No (P)									
			0.2 (P)									Very soft gray CLAY (CH) – w/silt layers at 22 to 24 ft.
	25		Tube	0.14t3	49	64	64	28	36	CS		
			0.2 (P)									
			0.2 (P)									
	30		0.2 (P)									
			0.2 (P)	0.09t4	76	55	60	29	31			– w/silt laminations at 32 to 34 ft.
	35		0.2 (P)									– w/silt seams at 34 to 36 ft.
			0.3 (P)									Soft gray CLAY (CH) w/sand laminations
	40		0.3 (P)	0.25t5	59	62	81	25	56	CS		

Continued Next Page

Ground Water Level Data

▽ Free water first encountered

▼ Water level after 15 mins.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 10 ft.
4" Dia. Rotary Wash: 10 to 80 ft.

Boring Abandonment Method

Tremie grouted bottom-to-top with 4% cement/bentonite grout

Notes

t: Unconsolidated, Undrained Triaxial Compression Test
Lateral Pressure (psi)
t1 = 3.7 t2 = 3.5
t3 = 8.0 t4 = 10.0
t5 = 12.1
CU: Consolidated, Undrained Triaxial Compression Test - See Table A-2
GS: Particle Size Analysis
Gravel = 0%, Sand = 27% Silt = 44%, Clay = 29%
CS: See Consolidation Curve

Strata Boundaries May Not Be Exact

Stability Analysis
Gentilly Landfill
New Orleans, LA

LOG OF SOIL BORING L-2

STE
Soil Testing Engineers, Inc.
Sheet 2 of 2

File: 06-1046
Date: 05/09/06
Logged by: M. Machen
Driller: Ironhorse
Rig: Buggy

LA Dept of Environmental Quality
Baton Rouge, LA

LELAP Certificate No. 02052

Location: Lat. 30° 00' 08.5"
Long. 89° 58' 30.2"
Surface Elevation: -0.2 (ft., NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			0.2 (P)									Very soft gray CLAY (CH) -- w/sand seams at 40 to 42 ft.
			0.3 (P)									
	45		0.2 (P)	0.14t6	64	60						-- w/sand layers at 44 to 48 ft.
			Tube									-- w/4-inch sand layer at 48 ft.
			1.0 (P)									Very soft greenish-gray CLAY (CH) w/sand seams and shell fragments
	50		1.0 (P)	0.18t7	67	56						
			0.2 (P)									
	55		~~2.7 (P)~~									Firm greenish-gray SILT (ML)
												Medium greenish-gray CLAY (CH)
			0.2 (P)	0.27t8	72	55	83	25	58			Soft dark gray CLAY (CH) w/silt laminations
			1.7 (P)									Stiff light gray and greenish-gray CLAY (CH)
	60											
			1.2 (P)	1.23t9	35	84						-- slickensided at 63 to 65 ft.
	65											
			2.0 (P)									Firm greenish-gray CLAYEY SILT (ML) w/clay seams
	70											
			1.2 (P)	0.85t10	31	86						Medium greenish-gray SILTY CLAY (CL) w/sand laminations and shell fragments
	75											
			No (P)									Firm greenish-gray SILTY SAND (SM)
	80											Boring completed at 80 ft.

Ground Water Level Data

Free water first encountered

Water level after 15 mins.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 10 ft.
4" Dia. Rotary Wash: 10 to 80 ft.

Boring Abandonment Method

Tremie grouted bottom-to-top with 4% cement/bentonite grout

Notes

t: Unconsolidated, Undrained Triaxial Compression Test
Lateral Pressure (psi)
t6 = 13.3 t7 = 13.3
t8 = 14.7 t9 = 24.5
t10 = 28.3

Strata Boundaries May Not Be Exact

LOG01R 061046.GPJ LOG01.GDT 06/21/06

Stability Analysis
Gentilly Landfill
New Orleans, LA

LOG OF SOIL BORING L-3

STE
Soil Testing Engineers, Inc.

Sheet 1 of 2

File: 06-1046
Date: 05/09/06
Logged by: K. Moody
Driller: D. Robinson
Rig: CME 75

LA Dept of Environmental Quality
Baton Rouge, LA

LELAP Certificate No. 02052

Location: Lat. 30° 00' 11.2"
Long. 89° 58' 01.3"
Surface Elevation: +0.6 (ft., NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			4.5 (P)									Very stiff tan and brown SILTY CLAY (CL) w/organic matter
			2.0 (P)	0.74t1	32	85						Medium tan and gray CLAY (CH) w/organic matter
	5		1.0 (P)									-- w/wood fragments at 4 to 6 ft.
▽			0.7 (P)	0.26t2	69	50	103	31	72			Soft dark gray CLAY (CH) w/organic matter and silt seams
▽			0.5 (P)									-- w/shell fragments at 8 to 10 ft.
	10		0.4 (P)	0.22t3	97	43	129	33	96			Very soft dark brown ORGANIC CLAY (OH) w/wood fragments
			0.5 (P)									Very soft black and dark brown PEAT (PT)
			Tube									
	15		0.3 (P)									
			0.7 (P)		176	28	175	51	124	CU		Soft dark brown and gray ORGANIC CLAY (OH)
			0.5 (P)									Soft gray CLAY (CH) -- w/organic matter at 18 to 20 ft.
	20		0.7 (P)									
			Tube									
			0.5 (P)	0.31t4	44	78						-- w/sand seams at 22 to 24 ft.
	25		0.7 (P)									Loose gray CLAYEY SAND (SC)
			0.5 (P)									
			1.0 (P)	0.99t5	33	87	28	26	2			-- w/shell fragments at 28 to 30 ft.
	30		1.5 (P)									
			1.7 (P)									Soft gray SILTY CLAY (CL) w/silt laminations
	35		0.5 (P)									
			1.0 (P)	0.43t6	30	90						
			1.0 (P)									
	40											

Continued Next Page

Ground Water Level Data

▽ Free water first encountered

▼ Water level after 15 mins.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 10 ft.
4" Dia. Rotary Wash: 10 to 80 ft.

Boring Abandonment Method

Tremie grouted bottom-to-top with 4% cement/bentonite grout

Notes

t: Unconsolidated, Undrained Triaxial Compression Test
Lateral Pressure (psi)
t1 = 2.4 t2 = 4.1
t3 = 4.7 t4 = 11.0
t5 = 13.6 t6 = 17.0
CU: Consolidated, Undrained Triaxial Compression Test - See Table A-2

Strata Boundaries May Not Be Exact

Stability Analysis
Gentilly Landfill
New Orleans, LA

LOG OF SOIL BORING L-3

STE
Soil Testing Engineers, Inc.

Sheet 2 of 2

LA Dept of Environmental Quality
Baton Rouge, LA

LELAP Certificate No. 02052

File: 06-1046
Date: 05/09/06
Logged by: K. Moody
Driller: D. Robinson
Rig: CME 75

Location: Lat. 30° 00' 11.2"
Long. 89° 58' 01.3"
Surface Elevation: +0.6 (ft., NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			0.7 (P)									Soft gray SILTY CLAY (CL) w/silt laminations
			1.0 (P)	0.49t7	36	82						Soft gray CLAY (CH) w/sand layers
	45		1.0 (P)		51	67	79	24	55	CU		
			0.7 (P) Tube									
			0.9 (P)									
	50		1.2 (P)							GS1		Loose grayish-blue SAND (SP) w/shell fragments
			0.9 (P)		23	100				GS2 CU		
	55		No (P)									
			WOH									Very soft grayish-blue CLAY (CH), very shelly
	60		1.0 (P)	0.17t8	26	90						Very loose grayish-blue CLAYEY SAND (SC) w/shells
	65		1.5 (P)									Medium to stiff greenish-gray CLAY (CH), slickensided
	70		2.5 (P)	0.74t9	52	71	96	27	69			
	75		2.7 (P)									-- grayish-brown, w/silt laminations at 73 to 75 ft.
	80		2.5 (P)	1.59t10	34	91	49	25	24			Stiff gray SILTY CLAY (CL)

Boring completed at 80 ft

Ground Water Level Data

▽ Free water first encountered

▼ Water level after 15 mins.

Boring Advancement Method

4" Nom. Dia. Short Flight Auger: 0 to 10 ft.
4" Dia. Rotary Wash: 10 to 80 ft.

Boring Abandonment Method

Tremie grouted bottom-to-top with 4% cement/bentonite grout

Notes

t: Unconsolidated, Undrained Triaxial Compression Test
Lateral Pressure =(psi)
t7 = 18.4 t8 = 23.8
t9 = 24.8 t10 = 35.2
CU: Consolidated, Undrained Triaxial Compression Test - See Table A-2
GS: Particle Size Analysis
GS1: Sand = 92%
GS2: Gravel = 14%, Sand = 78%
WOH: Weight of Hammer

Strata Boundaries May Not Be Exact

LOG01R 061046.GPJ LOG01.GDT 05/21/06

GENTILLY LANDFILL
NEW ORLEANS, LA
TABLE A-1
SUMMARY OF CONSOLIDATION TESTS

BORING	DEPTH (ft)	LL (%)	PI (%)	W_o (%)	DD_o (pcf)	C'c (dec/cy)	C_v (ft^2/day) for Pressure Range (ksf)							Remarks
							.12 .25	.25 .50	.50 1.00	1.00 2.00	2.00 4.00	4.00 8.00	8.00 16.00	
L-1	15	377	146	265	18	0.36	0.066	0.060	0.034	0.023	0.012	0.007	0.004	STE
L-1	33	83	48	69	58	0.31	0.084	0.022	0.020	0.010	0.006	0.005	-	STE
L-2	14	224	179	180	27	0.29	0.009	0.010	0.012	-	-	-	-	EPA
L-2	25	64	36	56	66	0.16	0.107	0.090	0.061	0.043	0.059	0.053	0.038	STE
L-2	28	54	35	53	69	0.26	-		0.030	0.037	0.044	-	-	EPA
L-2	39	81	56	59	62	0.27	0.265	0.070	0.044	0.022	0.013	0.008	0.007	STE
L-2	48	95	70	79	52	0.26	-	0.009	0.024	0.021	0.018	-	-	EPA
L-3	14	73	50	64	61	0.21	-	0.006	0.009	0.022	0.026	0.024	-	EPA
L-3	22	57	39	55	70	0.21	-	-	-	-	-	-	-	EPA
L-3	48	95	68	69	57	0.30	-	0.003	0.006	0.015	0.021	0.062	-	EPA
CB-4	43	88	65	77	55	0.27	0.065	0.044	0.038	0.024	0.015	0.009	-	METROP.
CB-5	23	45	19	40	76	0.12	-	0.072	-	-	-	-	-	METROP.

LL = Liquid Limit (D 4318)
PI = Plas. Index (D 4318)
W_o = Initial Water Content (D 2216)
DD_o = Initial Dry Density (D 2937)

C'c = Compression Index: Δ (Strain/ Δ (log cycle stress) - (D 2435)
C_v = Coefficient of Consolidation (D 2435)

GENTILLY LANDFILL
NEW ORLEANS, LA
TABLE A-2
SUMMARY OF
CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TESTS
(with Pore Pressure Measurements)

BORING NO.	DEPTH (feet)	LL (%)	PI (%)	W_o (%)	DD_o (pcf)	STAGE	EFFECTIVE PRESSURES (KSF)			SOIL TYPE
							CONSOL. (P'c)	AT FAILURE (P'_3)	FAILURE SHEAR (7_f)	
L-2	8-10	487	199	485	11	1	0.40	0.09	0.12	PT
						2	0.71	0.10	0.21	
						3	0.94	0.12	0.37	
L-3	16-18	175	124	179	28	1	0.58	0.10	0.15	OH
						2	0.94	0.20	0.33	
						3	1.37	0.39	0.46	
L-3	44-46	79	55	51	67	1	1.27	0.46	0.30	CH
						2	1.92	0.88	0.66	
						3	3.31	1.29	0.89	
L-3	52-54	-	NP	23	100	1	2.04	1.53	3.67	SP
						2	2.68	4.10	7.47	
						3	3.40	5.80	9.45	
CB-1	22	81	58	69	60	1	2.34	1.04	0.93	PT*
CB-5	22	45	19	41	75	1	2.34	0.49	1.35	PT*

* Test by Metroplex. Classified "Humus." CB-1 sample should be "CH" and CB-5 sample should be "CL".

LL = Liquid Limit (D 4318)
PI = Plas. Index (D 4318)
W_o = Initial Water Content (D 2116) Soil Types USCS (D 2487)
DD_o = Initial Dry Density (D 2937)
PRESSURE AT FAILURE = MINOR PRINCIPAL STRESS (p'_3)

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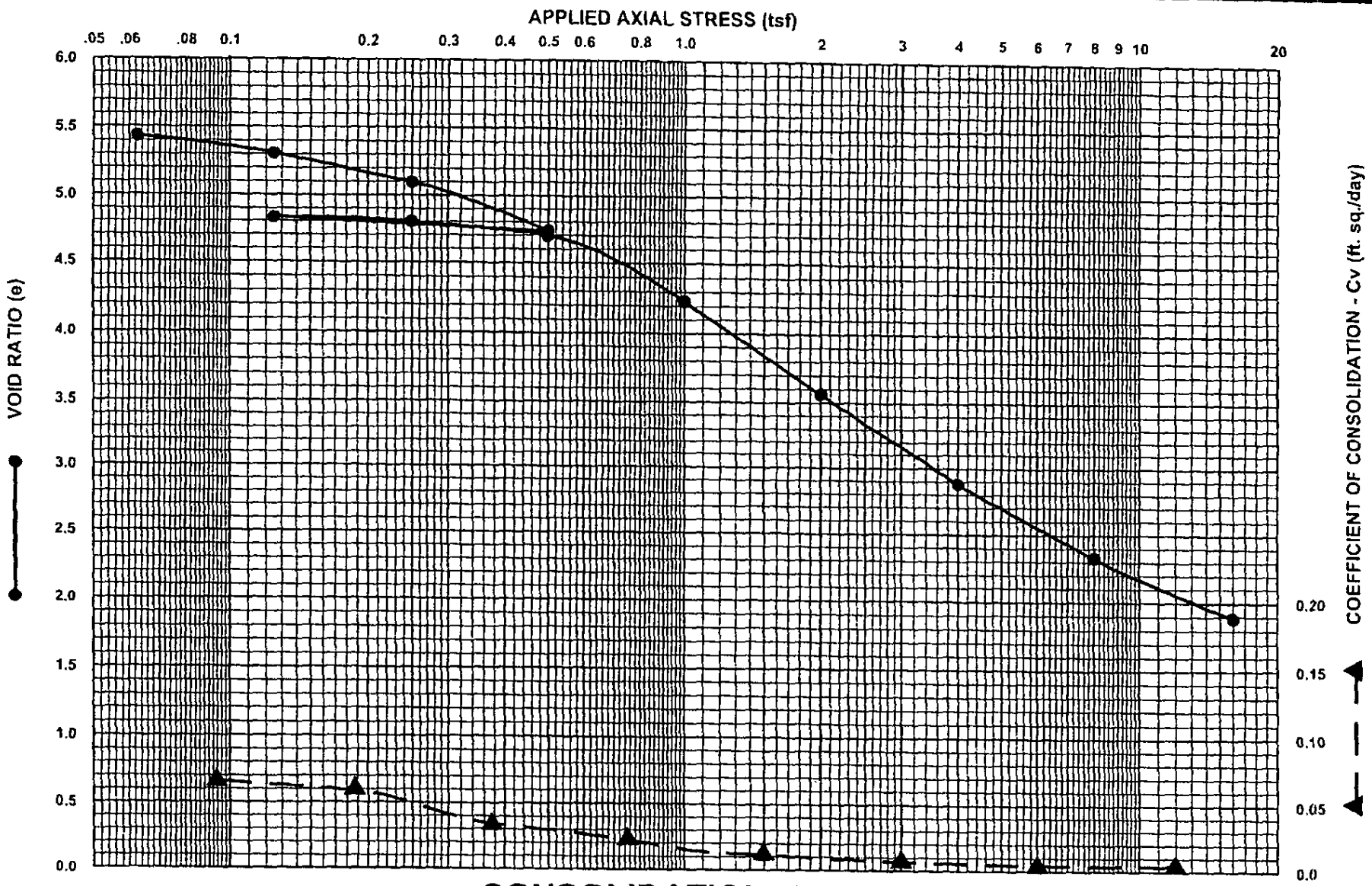

CONSOLIDATION TEST

SAMPLE IDENTIFICATION

BORING NO.: L-1
DEPTH (feet): 14-16
MATERIAL: Black & dark brown PEAT w/large wood fragments
FILE NO.: 06-1046

STE
Soil Testing Engineers, Inc.

CLASSIFICATION DATA

INITIAL MOISTURE CONTENT (%) = 218.3 LL = 377
INITIAL DRY DENSITY (lbs./cu.ft.) = 24.0 PL = 231
FINAL MOISTURE CONTENT (%) = 57.0 PI = 146
Eo = 5.477 Gs = 2.5 Assumed

FIGURE NO.:

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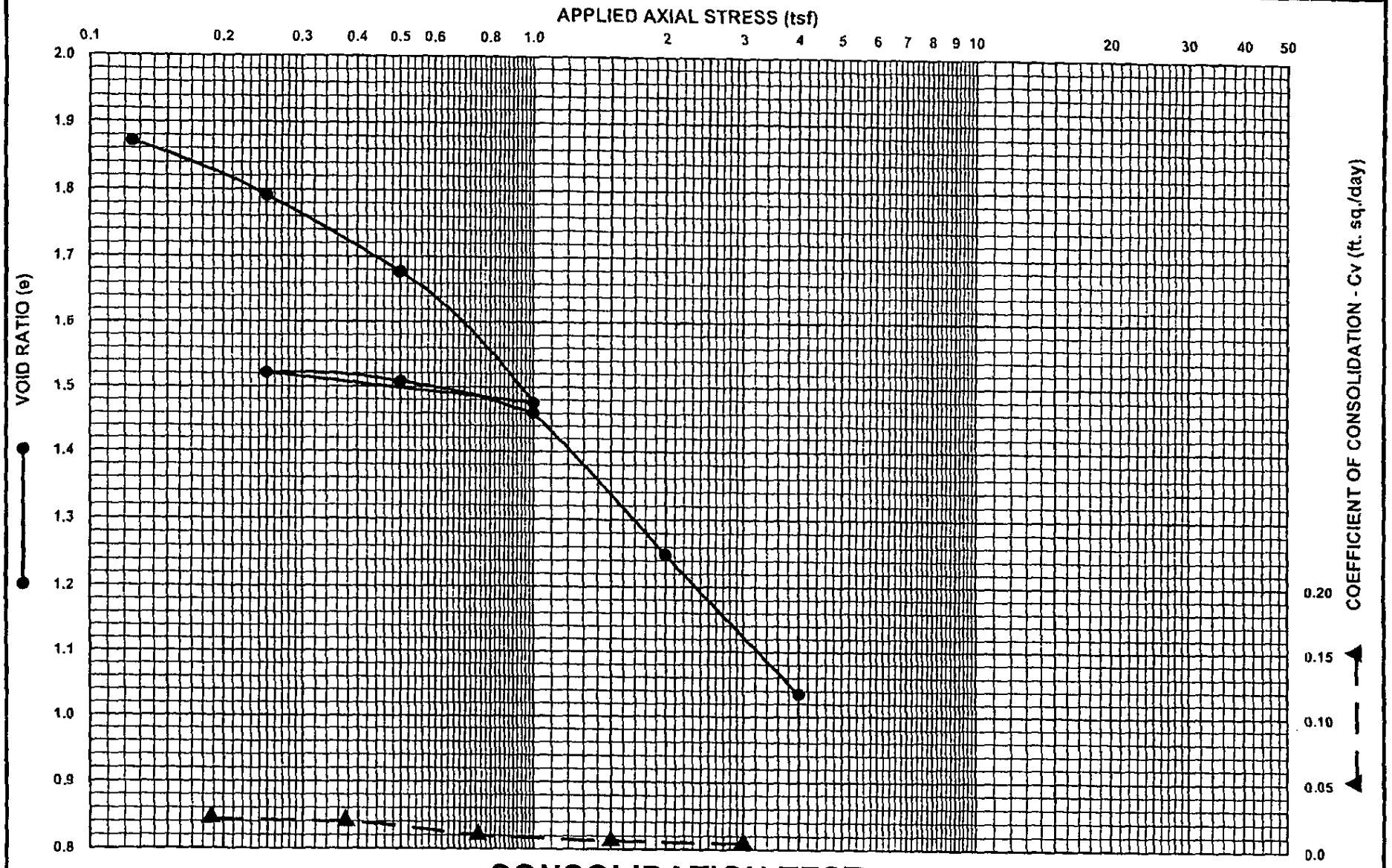

CONSOLIDATION TEST

SAMPLE IDENTIFICATION

BORING NO.: L-1
DEPTH (feet): 32-34
MATERIAL: Gray CLAY w/trace organic matter
FILE NO.: 06-1046

STE
Soil Testing Engineers, Inc.

CLASSIFICATION DATA

INITIAL MOISTURE CONTENT (%) = 70.8 LL = 83
INITIAL DRY DENSITY (lbs./cu.ft.) = 55.9 PL = 35
FINAL MOISTURE CONTENT (%) = PI = 48
Eo = 1.902 Gs = 2.6 Assumed

FIGURE NO.:

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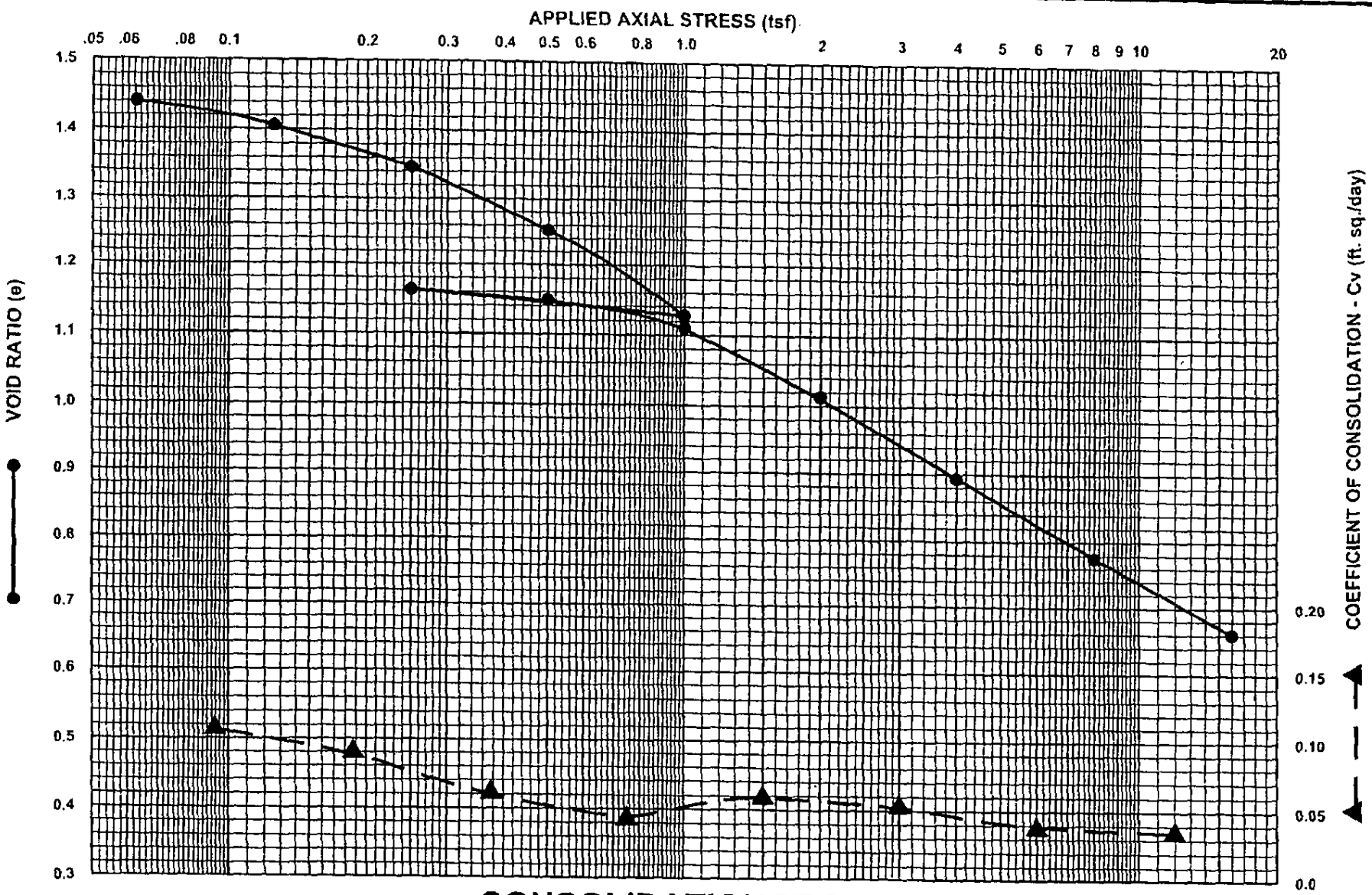

CONSOLIDATION TEST

SAMPLE IDENTIFICATION

BORING NO.: L-2
DEPTH (feet): 24-26
MATERIAL: Gray CLAY

FILE NO.: 06-1046

STE
Soil Testing Engineers, Inc.

CLASSIFICATION DATA

INITIAL MOISTURE CONTENT (%) =	56.0	LL = 64
INITIAL DRY DENSITY (lbs./cu.ft.) =	65.8	PL = 28
FINAL MOISTURE CONTENT (%) =	31.7	PI = 36
	Eo = 1.465	Gs = 2.6 Assumed

FIGURE NO.:

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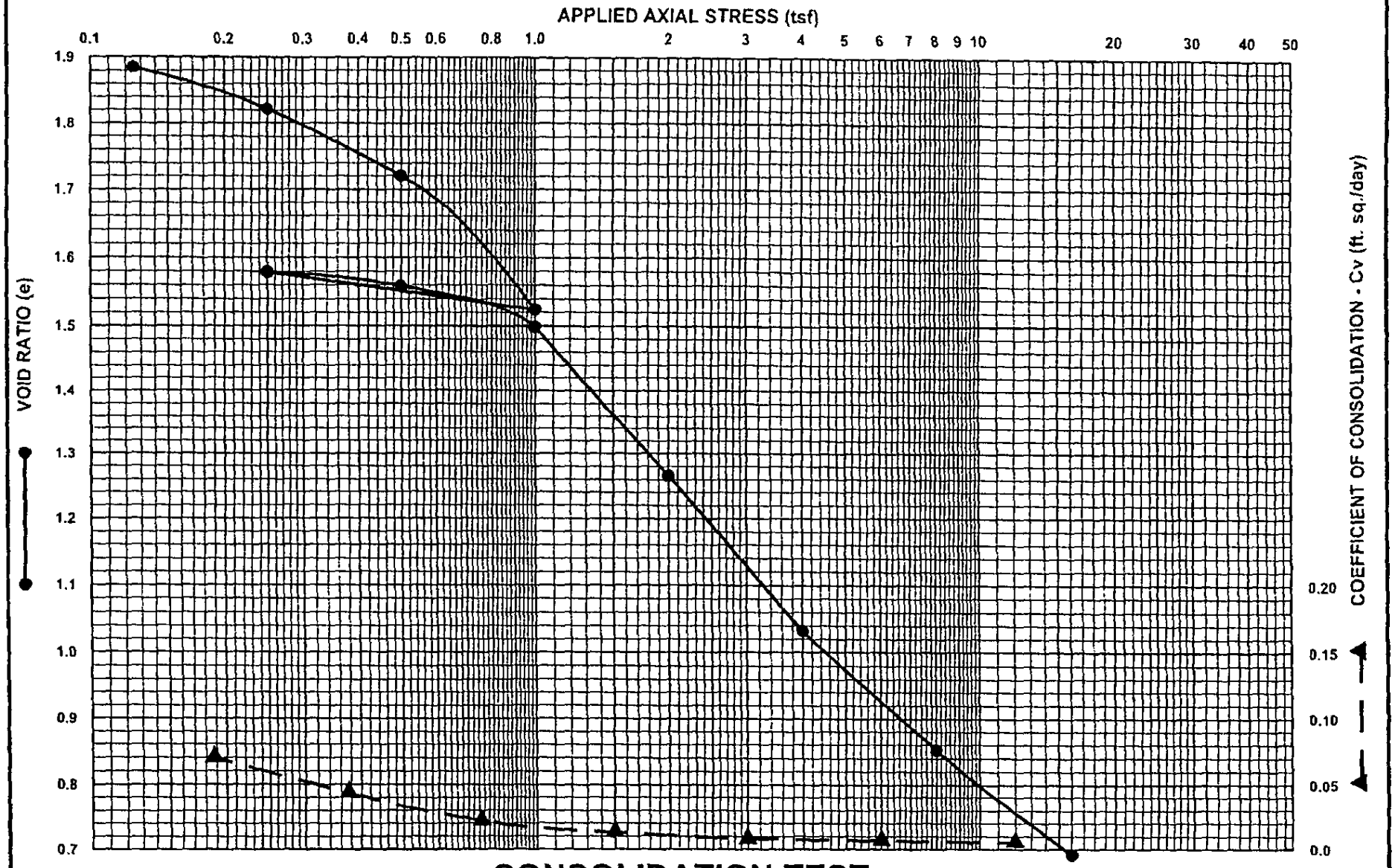


CONSOLIDATION TEST

SAMPLE IDENTIFICATION

BORING NO.: L-2
DEPTH (feet): 38-40
MATERIAL: Gray CLAY w/sand laminations
FILE NO.: 06-1046

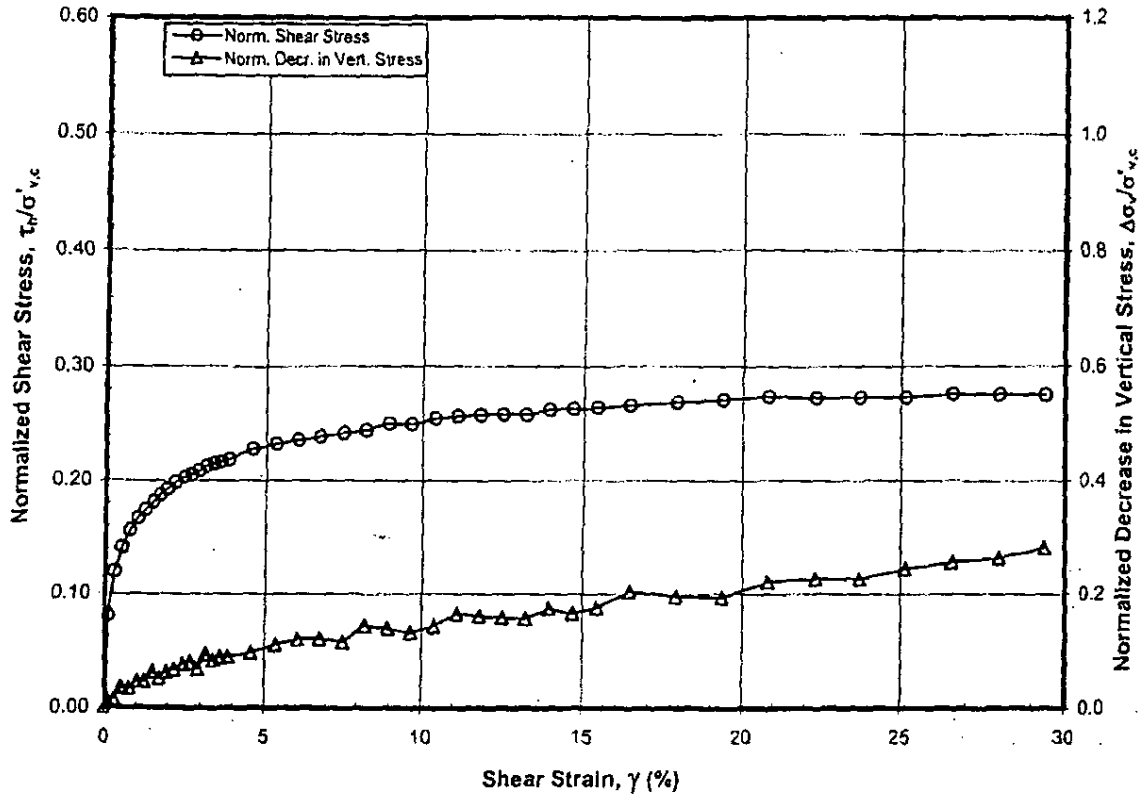
STE
Soil Testing Engineers, Inc.

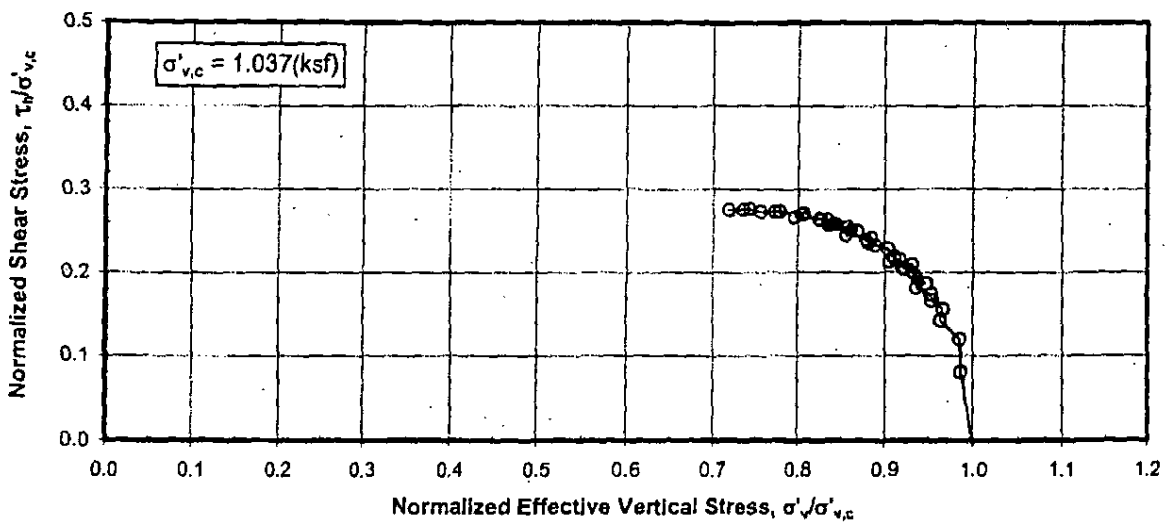
CLASSIFICATION DATA

INITIAL MOISTURE CONTENT (%) = 71.1 LL = 81
INITIAL DRY DENSITY (lbs./cu.ft.) = 55.6 PL = 25
FINAL MOISTURE CONTENT (%) = 31.8 PI = 56
Eo = 1.918 Gs = 2.6 Assumed

FIGURE NO.:

DRAFT





STATIC DSS TEST

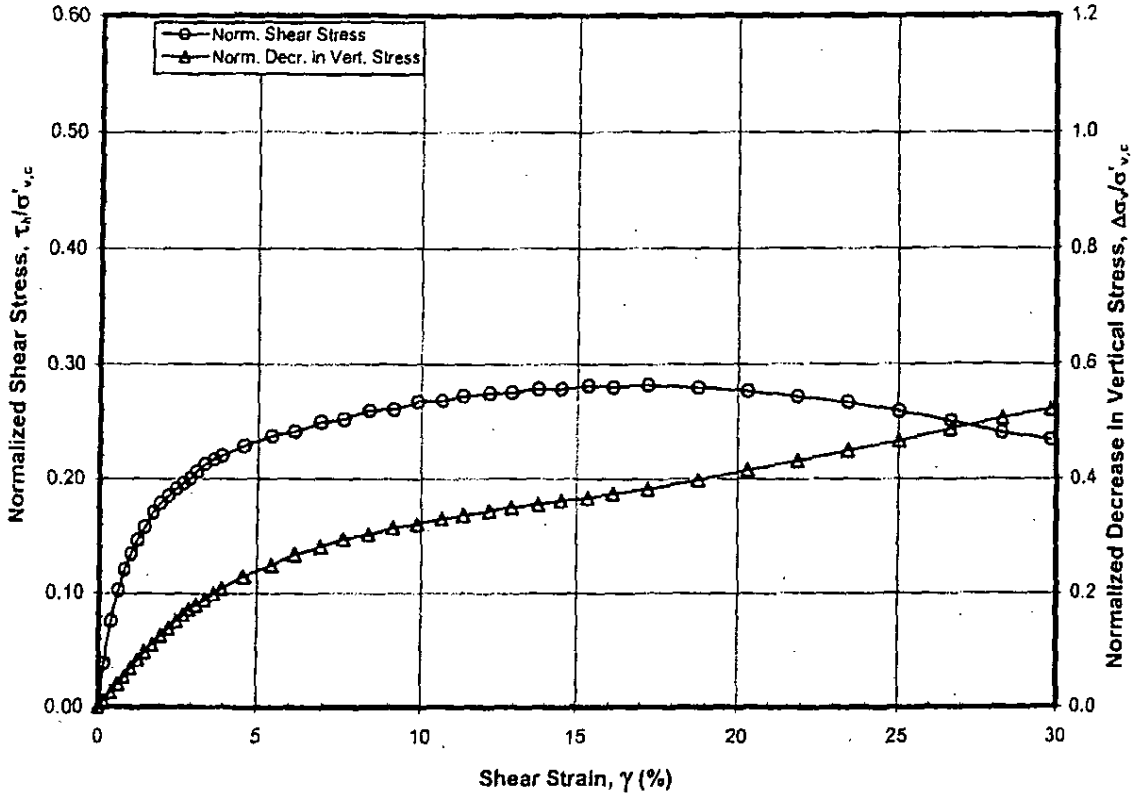
K_o Consolidation - OCR = 1

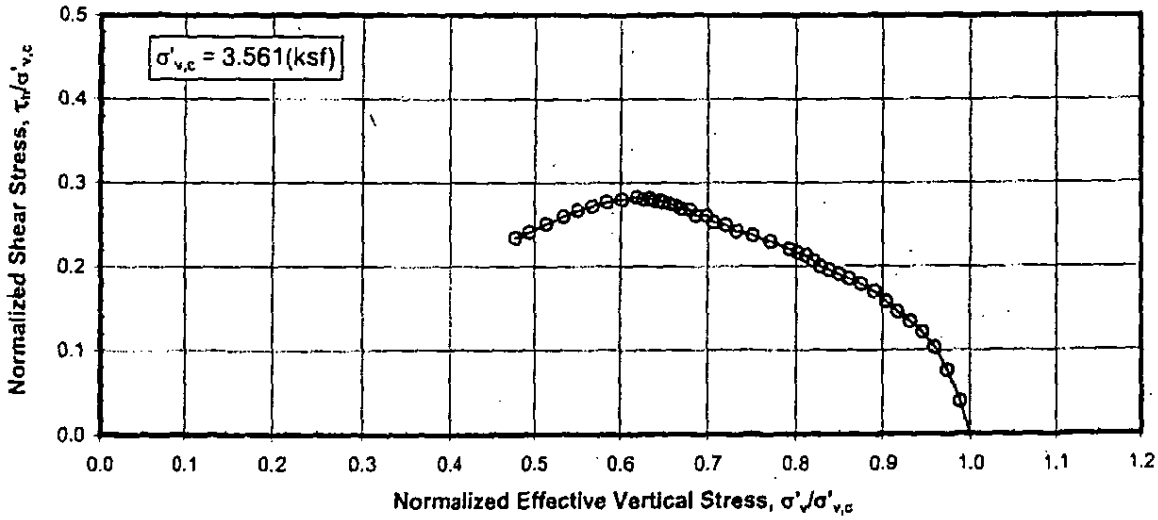
Sample: 14b - Depth: 13.60 ft

Boring B-2

Reviewed By:_____.

DRAFT





STATIC DSS TEST

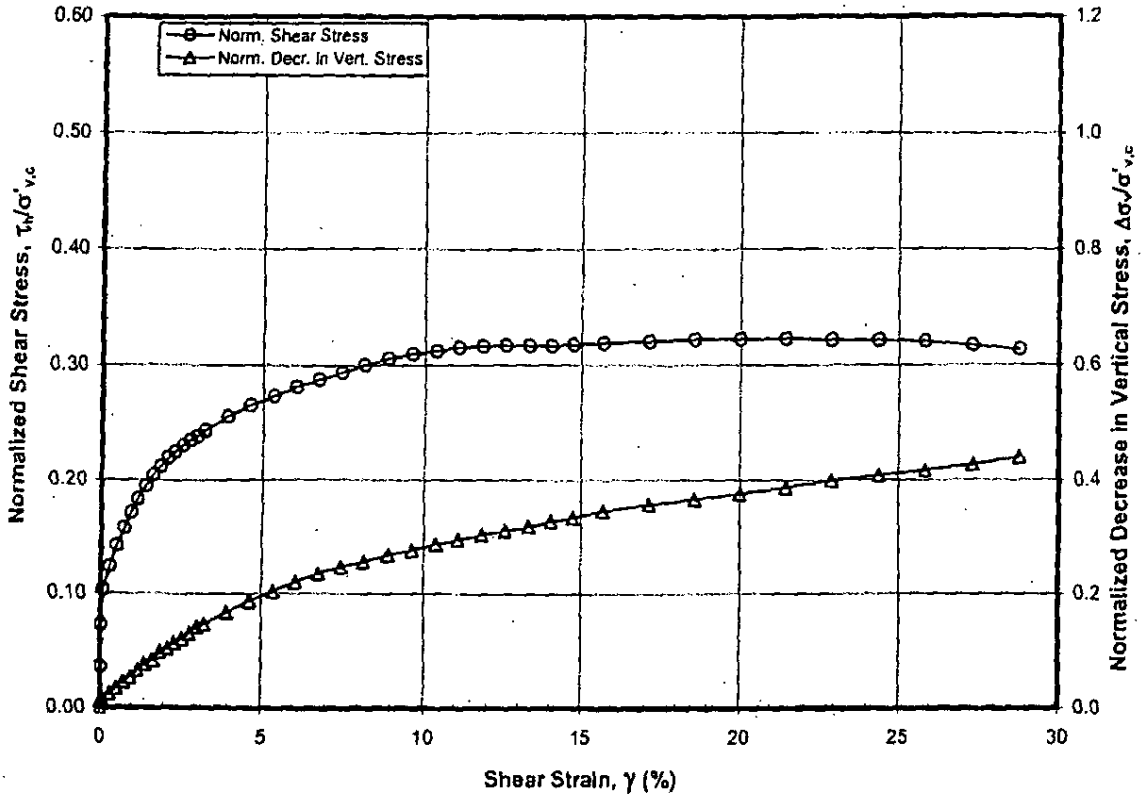
K_o Consolidation - OCR = 1

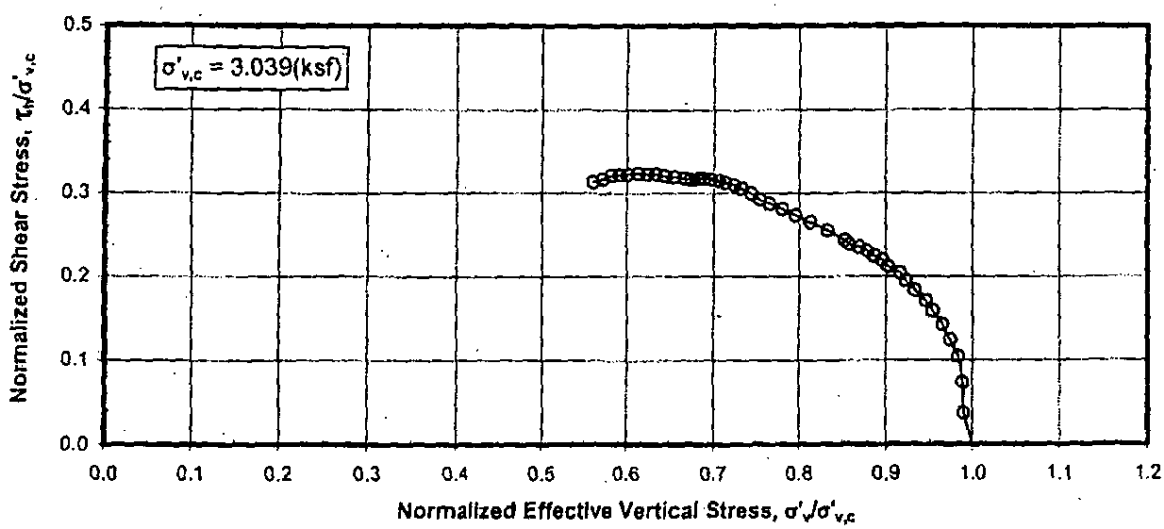
Sample: 28b - Depth: 27.55 ft

Boring B-2

Reviewed By:____

DRAFT





STATIC DSS TEST

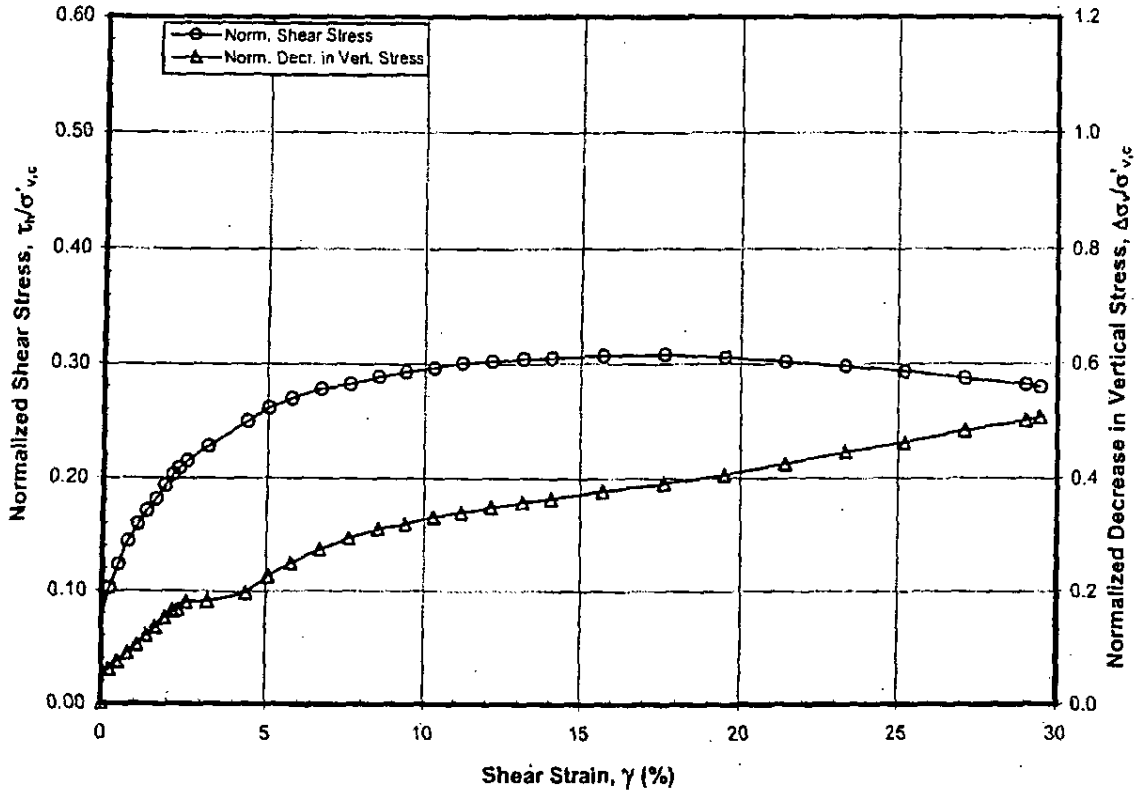
K_o Consolidation - OCR = 1

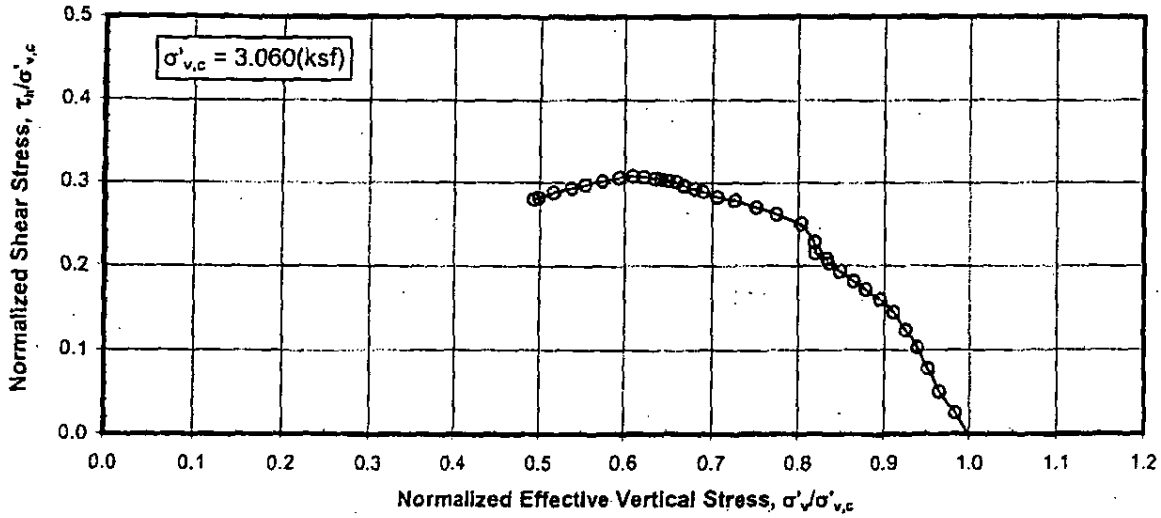
Sample: 48b - Depth: 47.50 ft

Boring B-2

Reviewed By:_____

DRAFT





STATIC DSS TEST

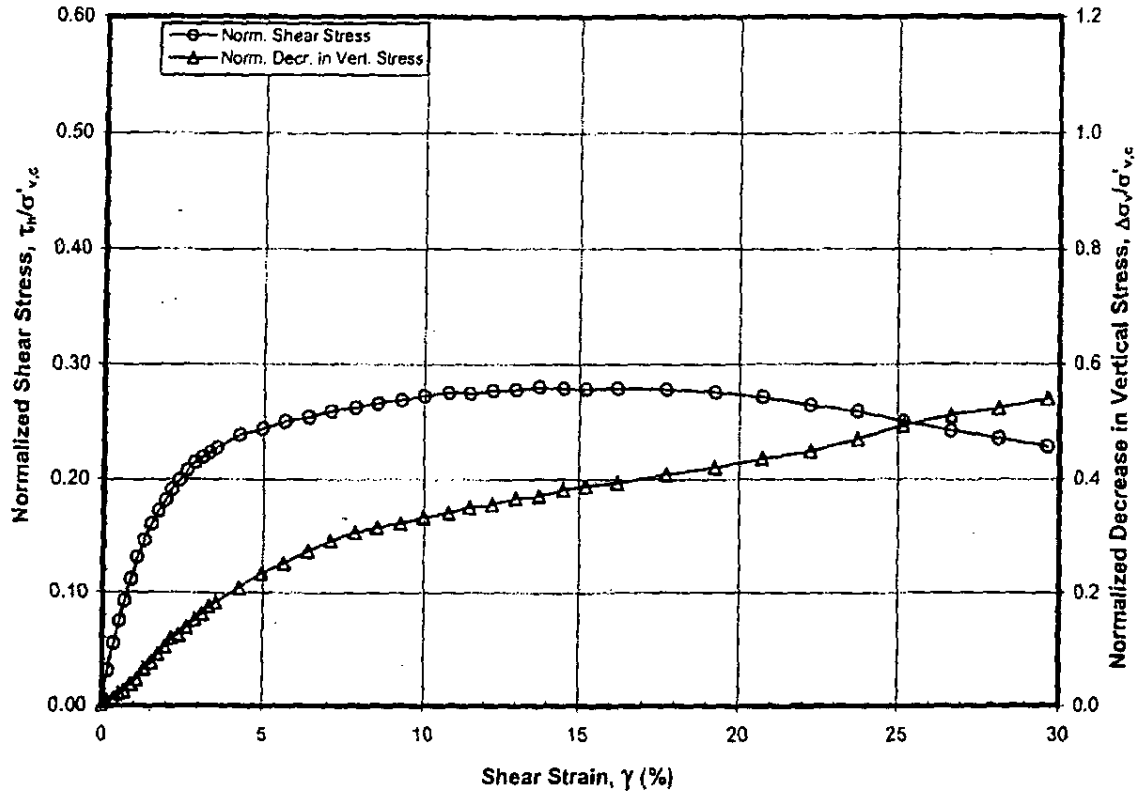
K_o Consolidation - OCR = 1

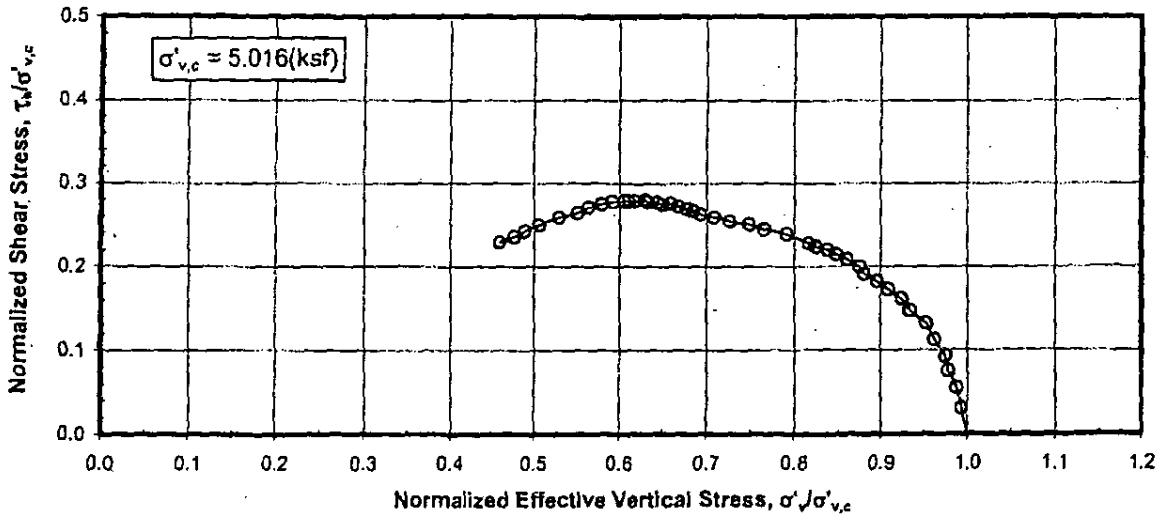
Sample: 14b - Depth: 13.30 ft

Boring B-3

Reviewed By:_____

DRAFT





STATIC DSS TEST

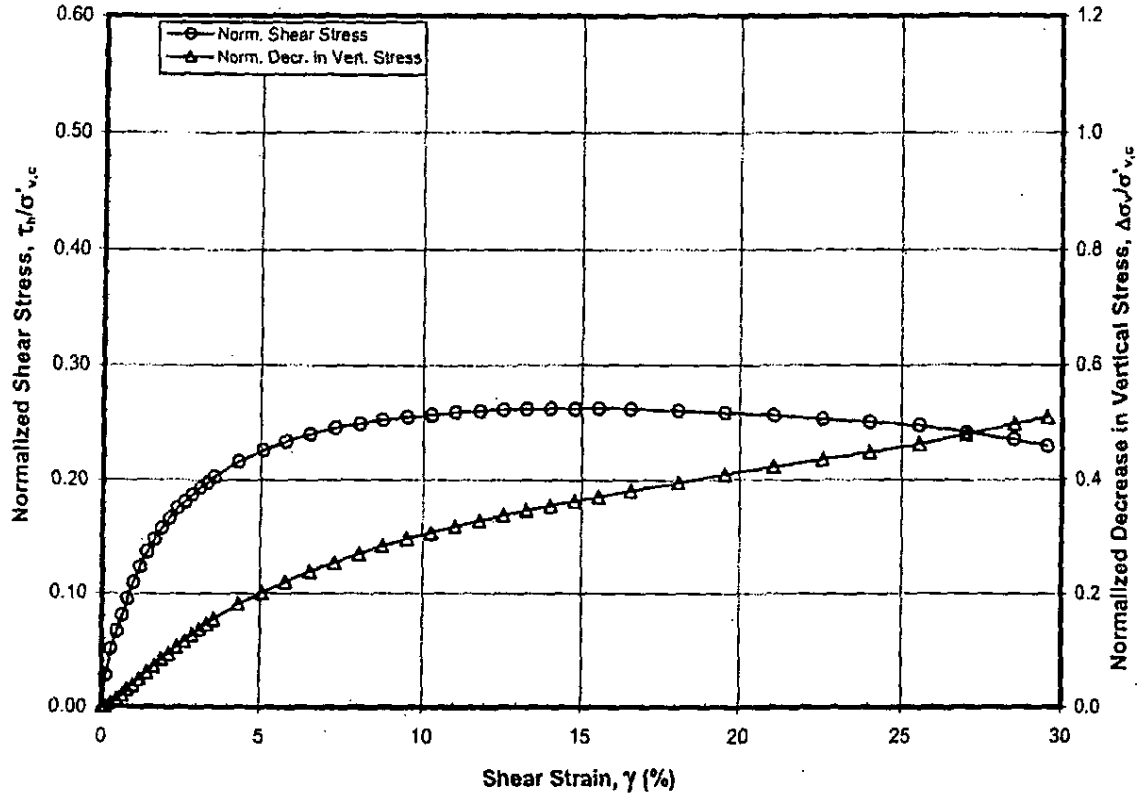
K_o Consolidation - OCR = 1

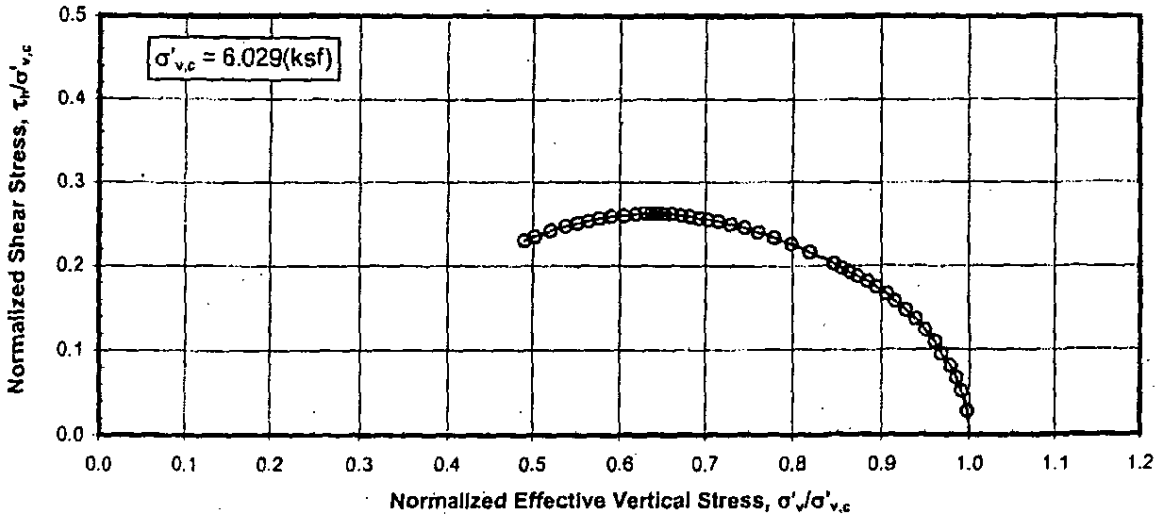
Sample: 22b - Depth: 21.65 ft

Boring B-3

Reviewed By:_____

DRAFT





STATIC DSS TEST

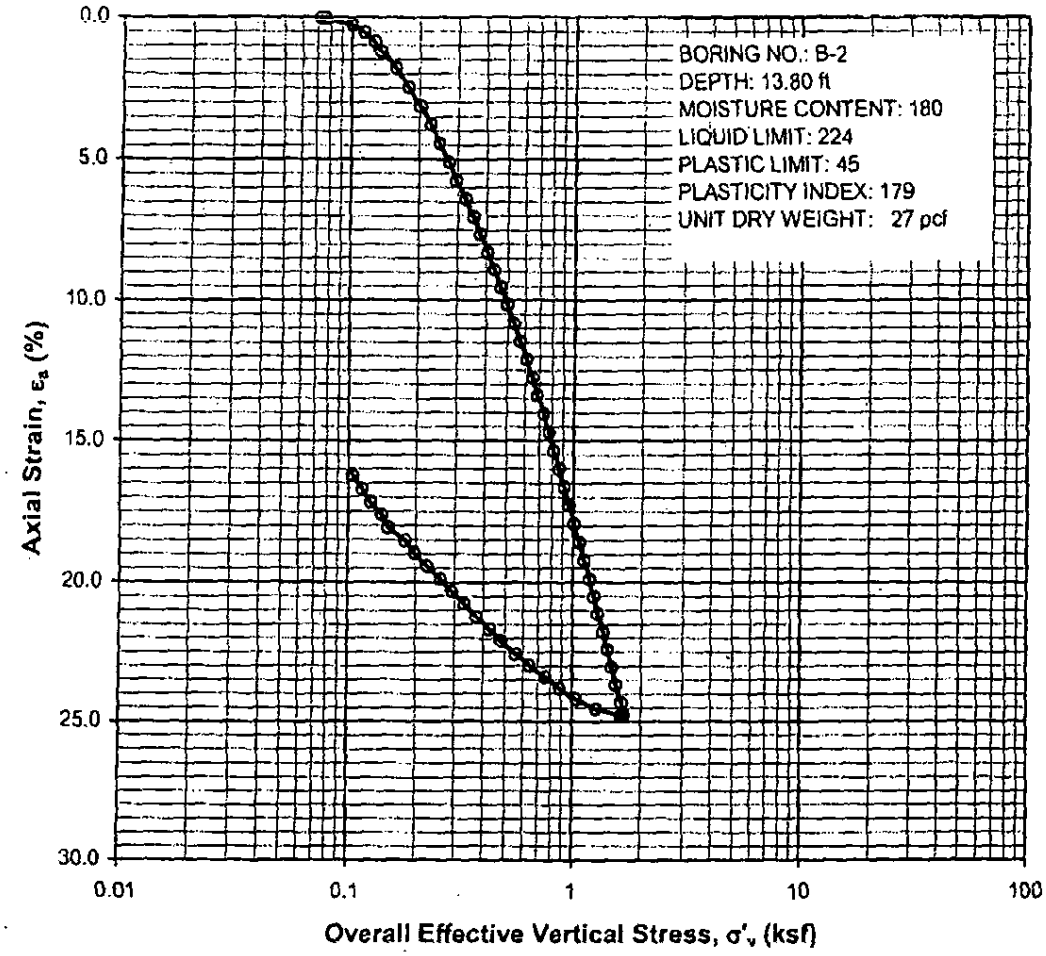
K_o Consolidation - OCR = 1

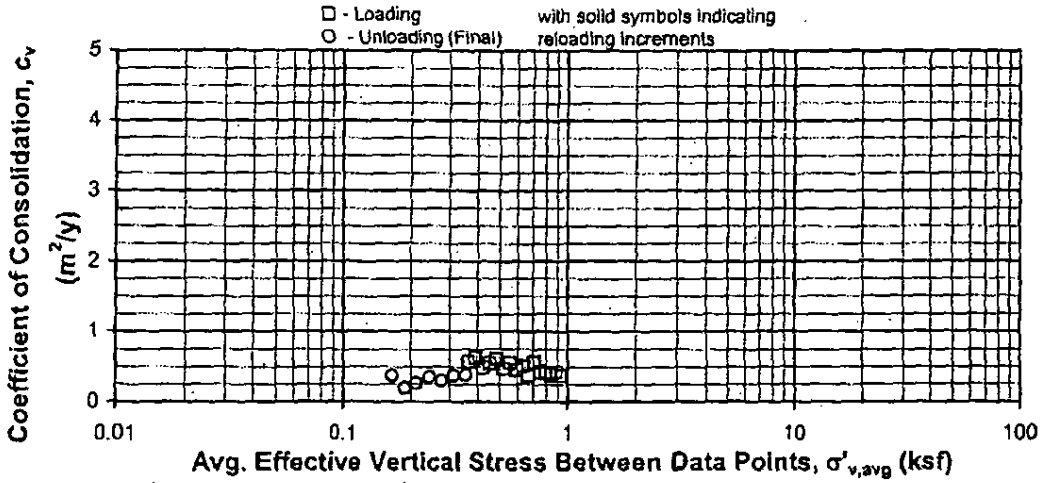
Sample: 48b - Depth: 47.55 ft

Boring B-3

Reviewed By:_____

DRAFT





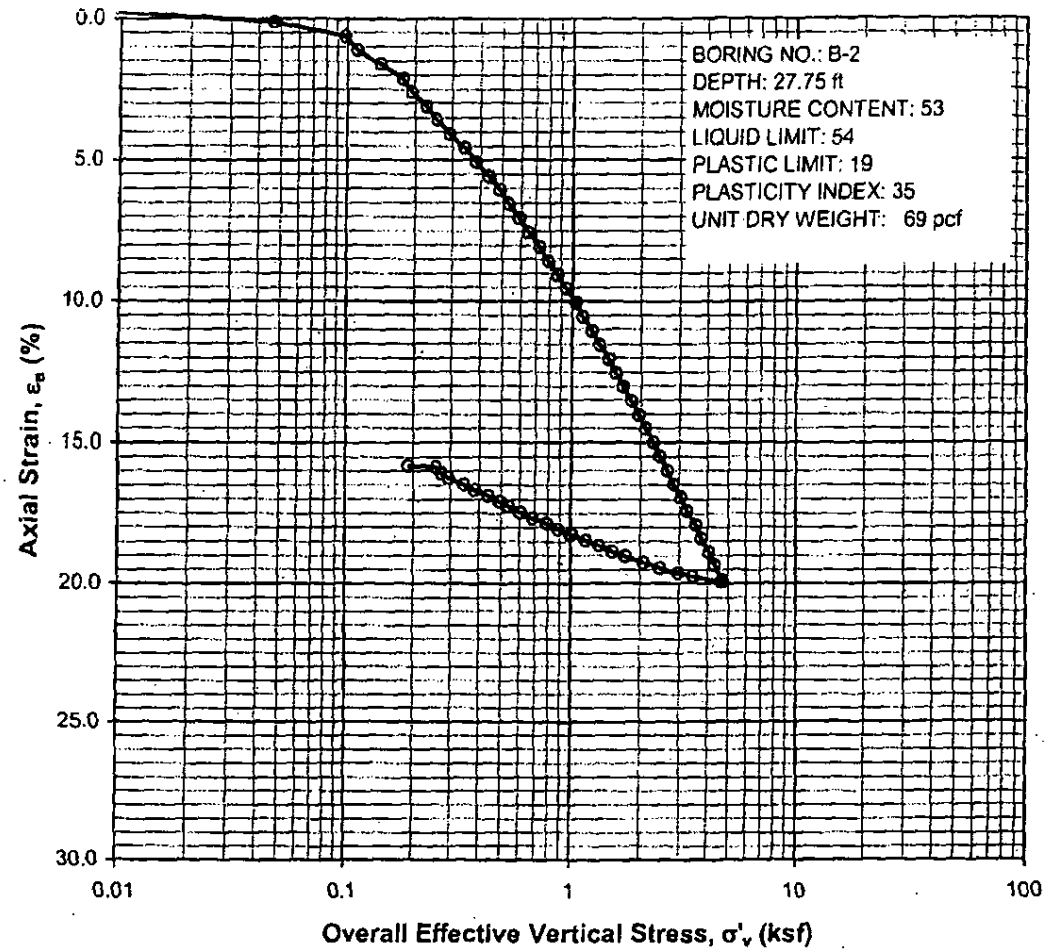
1-D CONSOLIDATION TEST: CRS

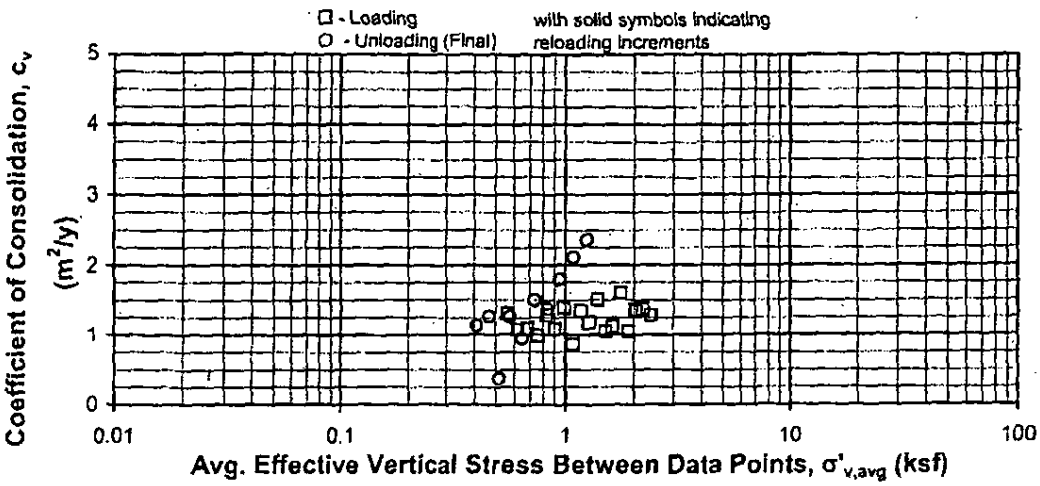
Sample No. 14a - Depth 13.80 ft

Boring B-2

Reviewed By: _____

DRAFT





1-D CONSOLIDATION TEST: CRS

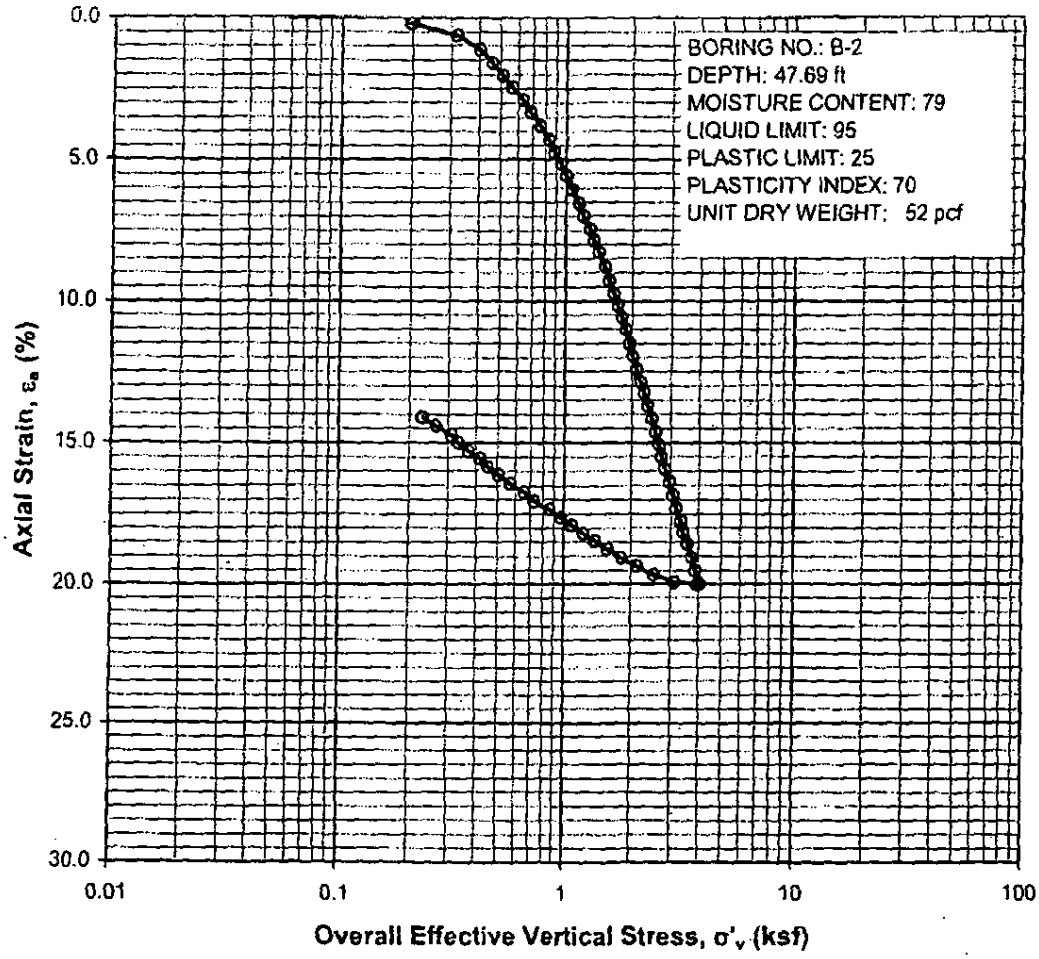
Sample No. 28a - Depth 27.75 ft

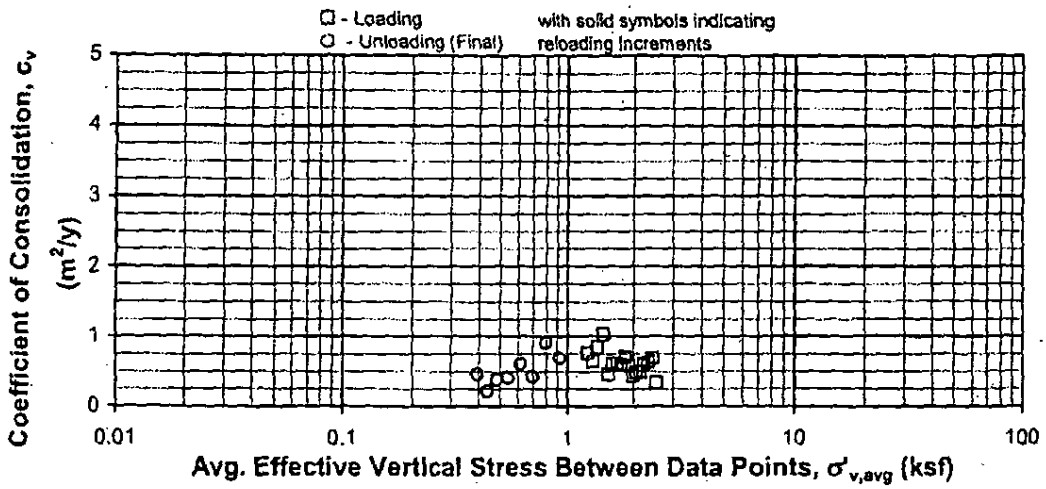
Boring B-2

Reviewed By: _____

Report No. 5506-4022

DRAFT





1-D CONSOLIDATION TEST: CRS

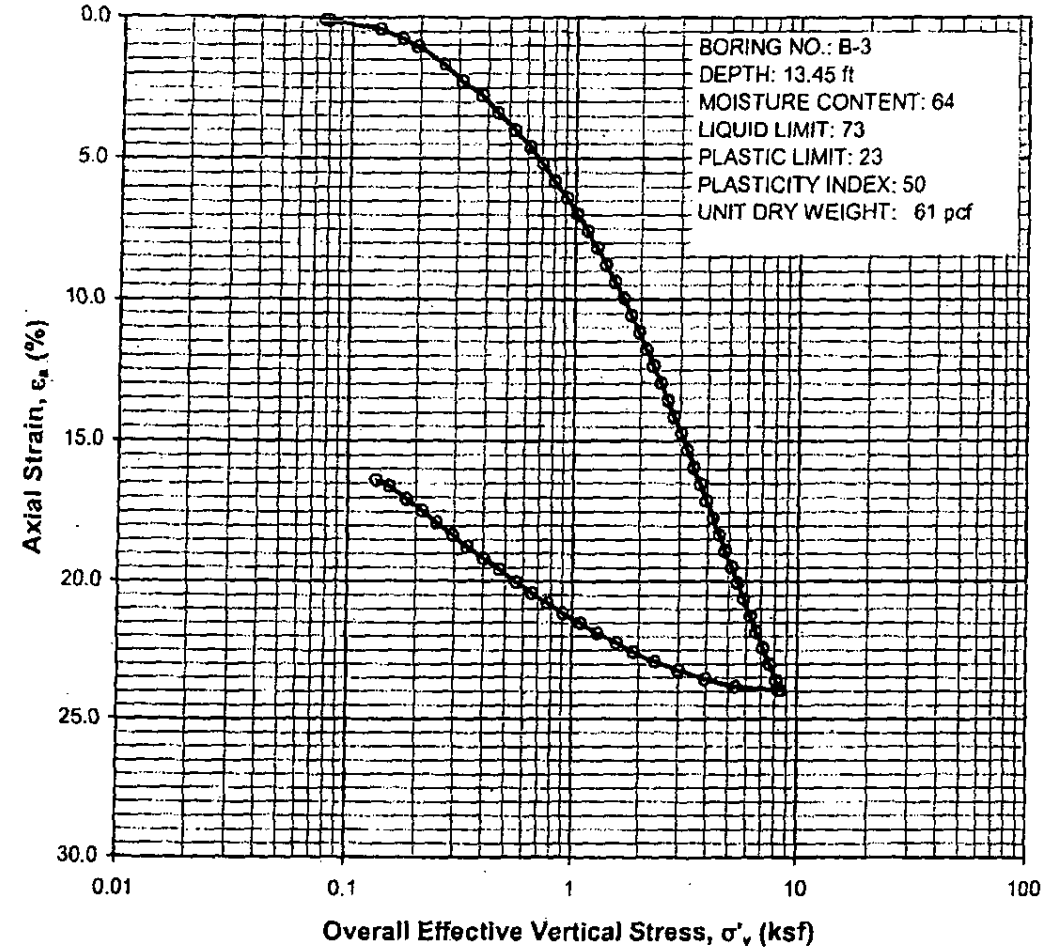
Sample No. 48a - Depth 47.69 ft

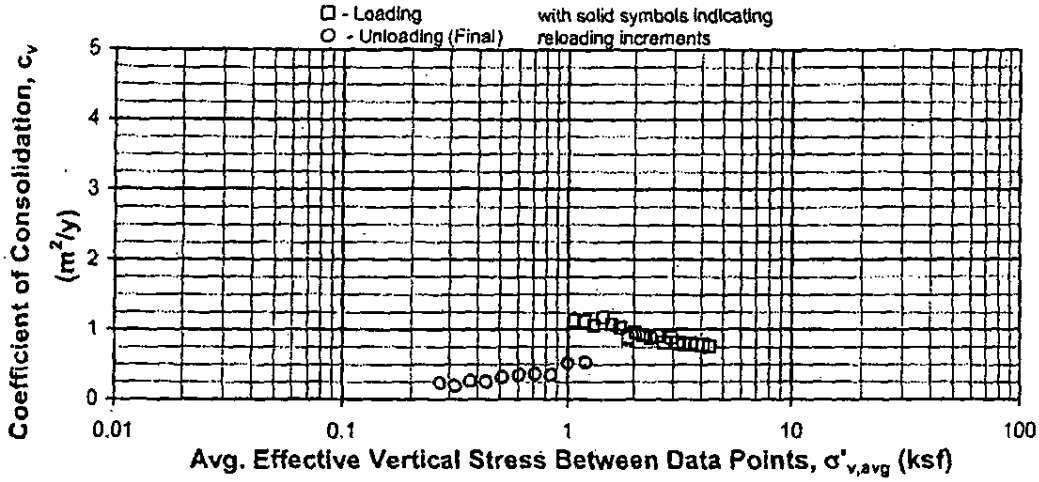
Boring B-2

Reviewed By: _____

Report No. 5506-4022

DRAFT





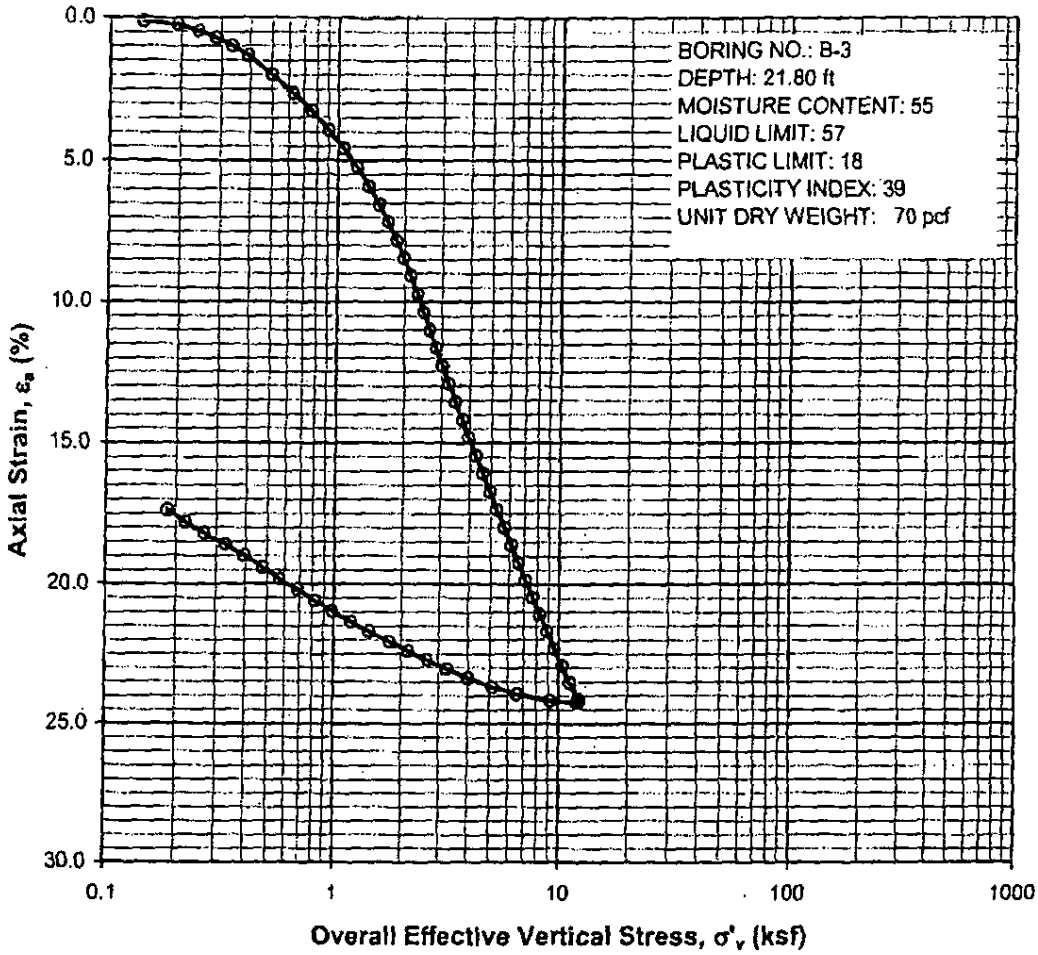
1-D CONSOLIDATION TEST: CRS

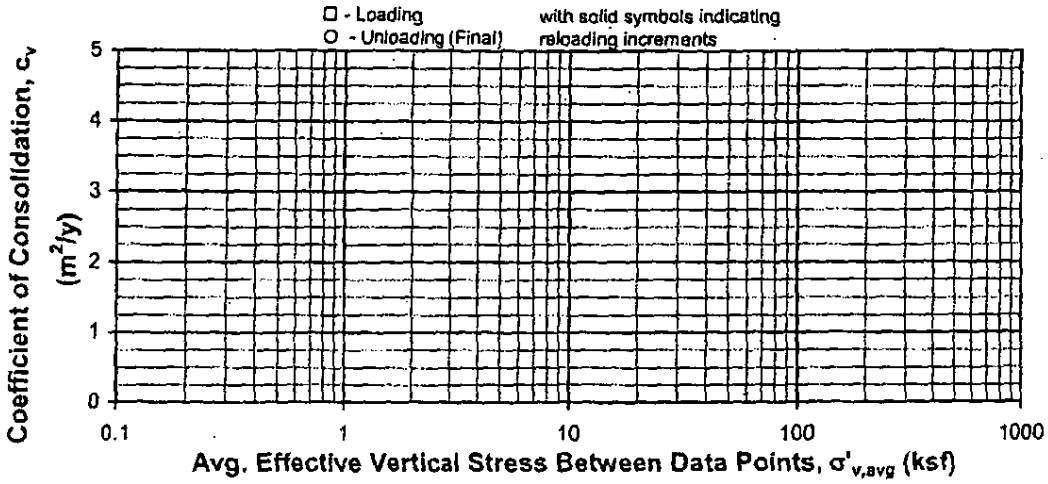
Sample No. 14a - Depth 13.45 ft

Boring B-3

Reviewed By: _____

DRAFT





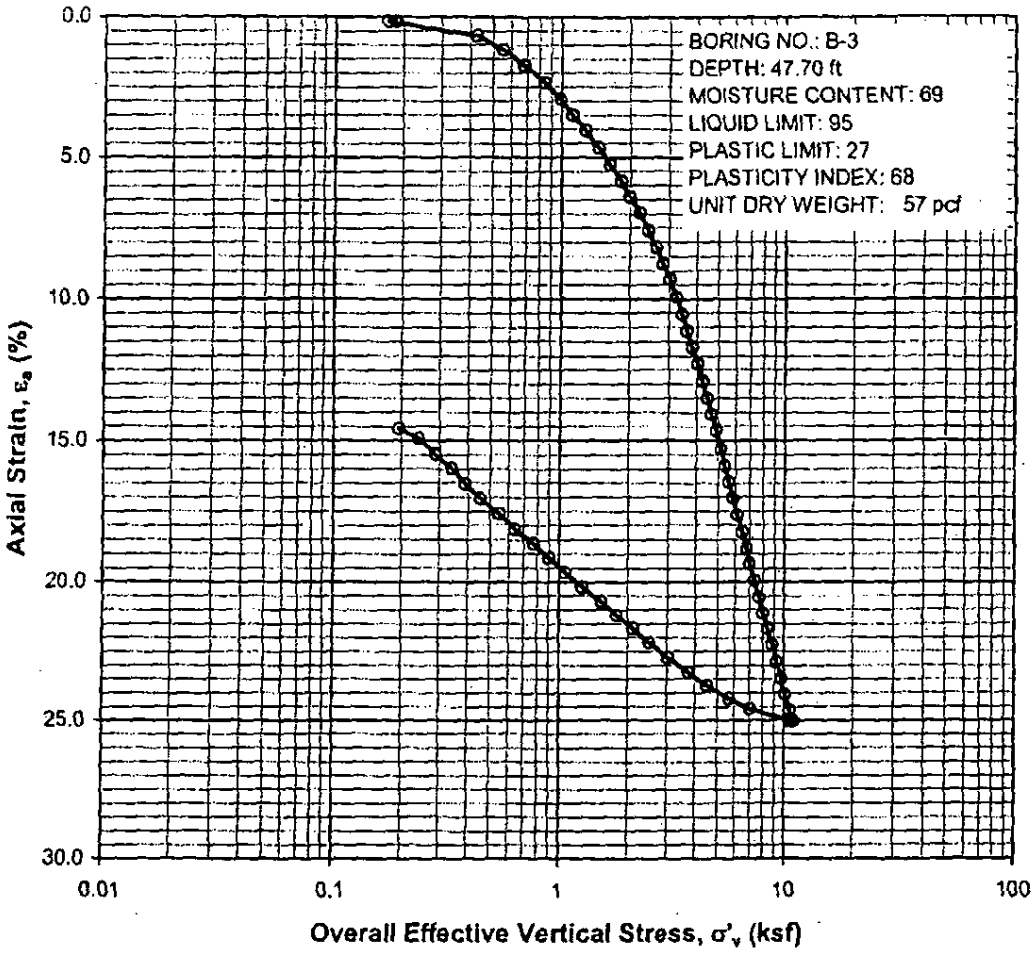
1-D CONSOLIDATION TEST: CRS

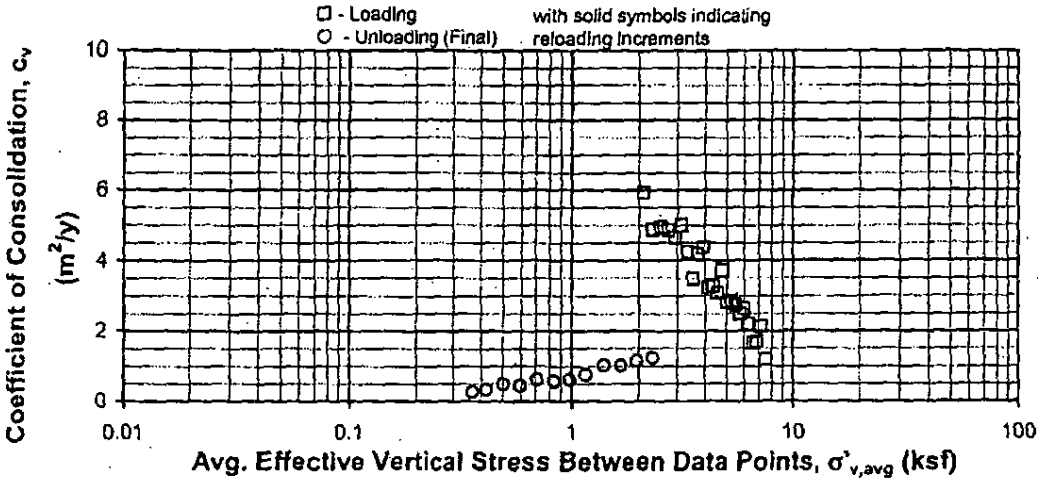
Sample No. 22a - Depth 21.80 ft

Boring B-3

Reviewed By: _____

DRAFT





1-D CONSOLIDATION TEST: CRS

Sample No. 48a - Depth 47.70 ft

Boring B-3

Reviewed By: _____

APPENDIX B

STE
Soil Testing Engineers, Inc.

APPENDIX B

CPT-FIELD PROCEDURES

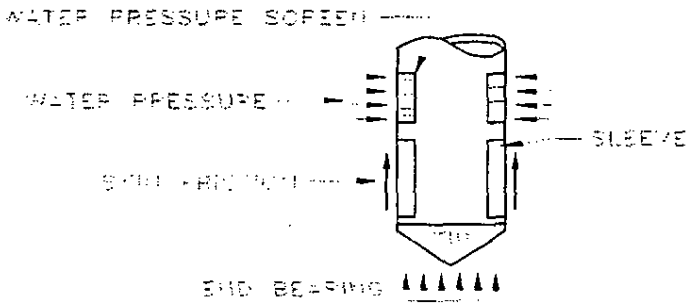
The following paragraphs describe the field and laboratory procedures used for this investigation for the cone penetrometer soundings (CPT). CPT logs are included with this appendix. The logs included with this appendix are from both STE's activities and the soundings made for the U.S. EPA by others.

B.1 FIELD EXPLORATION

One (1) CPT sounding was made by STE to a depth of 70 feet below ground surface in order to supplement the undisturbed soil borings. Due to its ability to continuously measure in-situ shear strength of the underlying subsoils, the CPT soundings provide invaluable data with regards to analyzing soft cohesive soils.

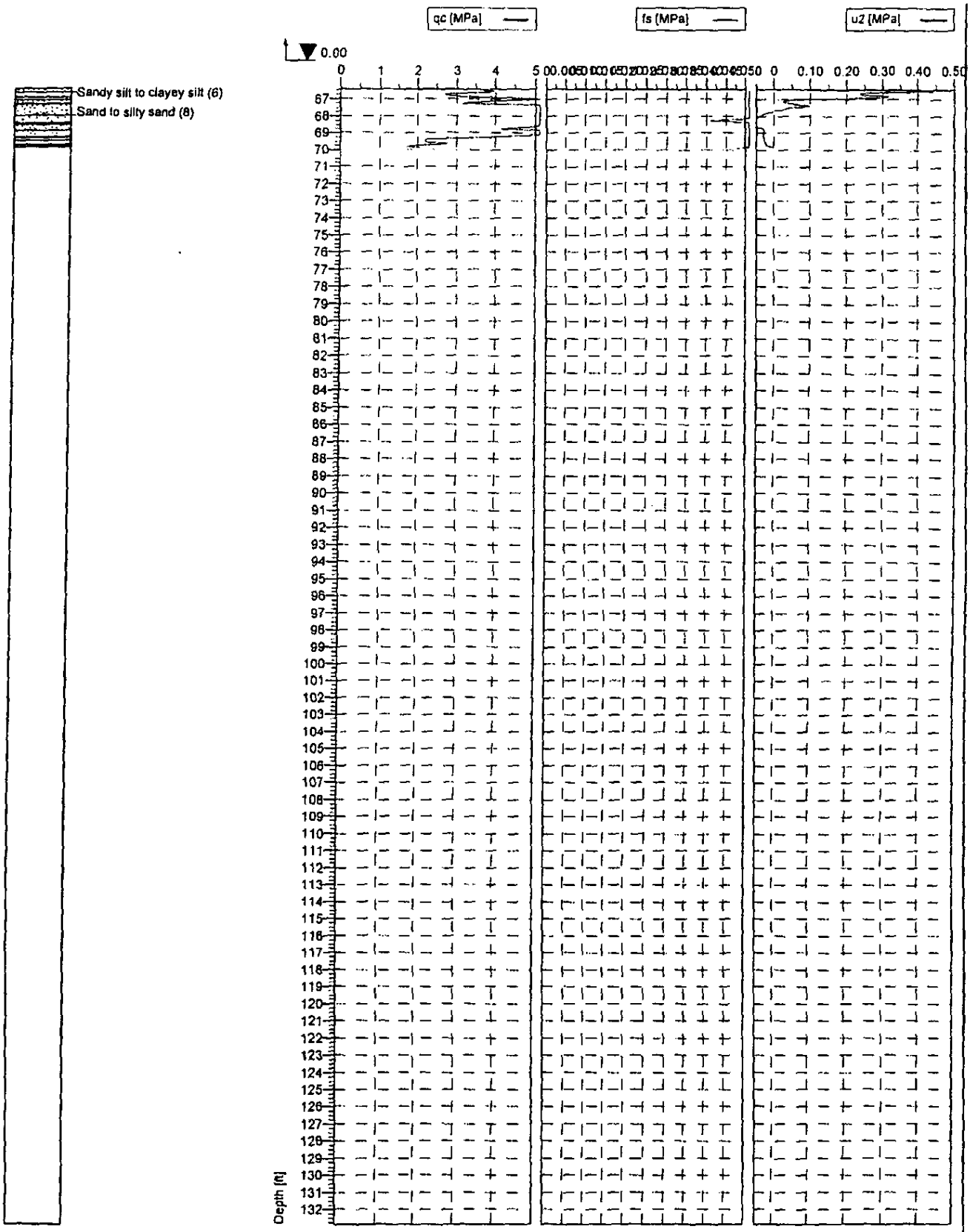
STE's soundings were made on 10 May 2006. The soundings made for the U.S. EPA were performed on 17 May 2006. The approximate locations of the soundings are shown on the Boring Plan, Figure 1.

For the CPT equipment, the sensing tip is pushed continuously into the soil by a hydraulic ram. Data is transmitted from the CPT sensor to the operator as it occurs for real time evaluation. The force is transmitted from the rig through small diameter rods. As illustrated in the sketch below, the tip has three sensing units. It measures simultaneously the resistance at the end of the tip (end-bearing), the resistance along the vertical sides of the sleeve above the tip (skin-friction), and the groundwater pressure just above the sleeve.



SKETCH - CPT TIP

The absolute values of the tip and sleeve resistance can be related to the soil shear strength. This ratio (sleeve/tip) depends on the ratio of soil cohesion (c) to its friction [Tan(φ)]. A high sleeve/tip ratio indicates a clayey soil, while a low ratio indicates a sandy soil. The soil stratigraphy shown on the CPT plots is identified using Campanella and Robertson's Simplified Soil Behavior Chart.



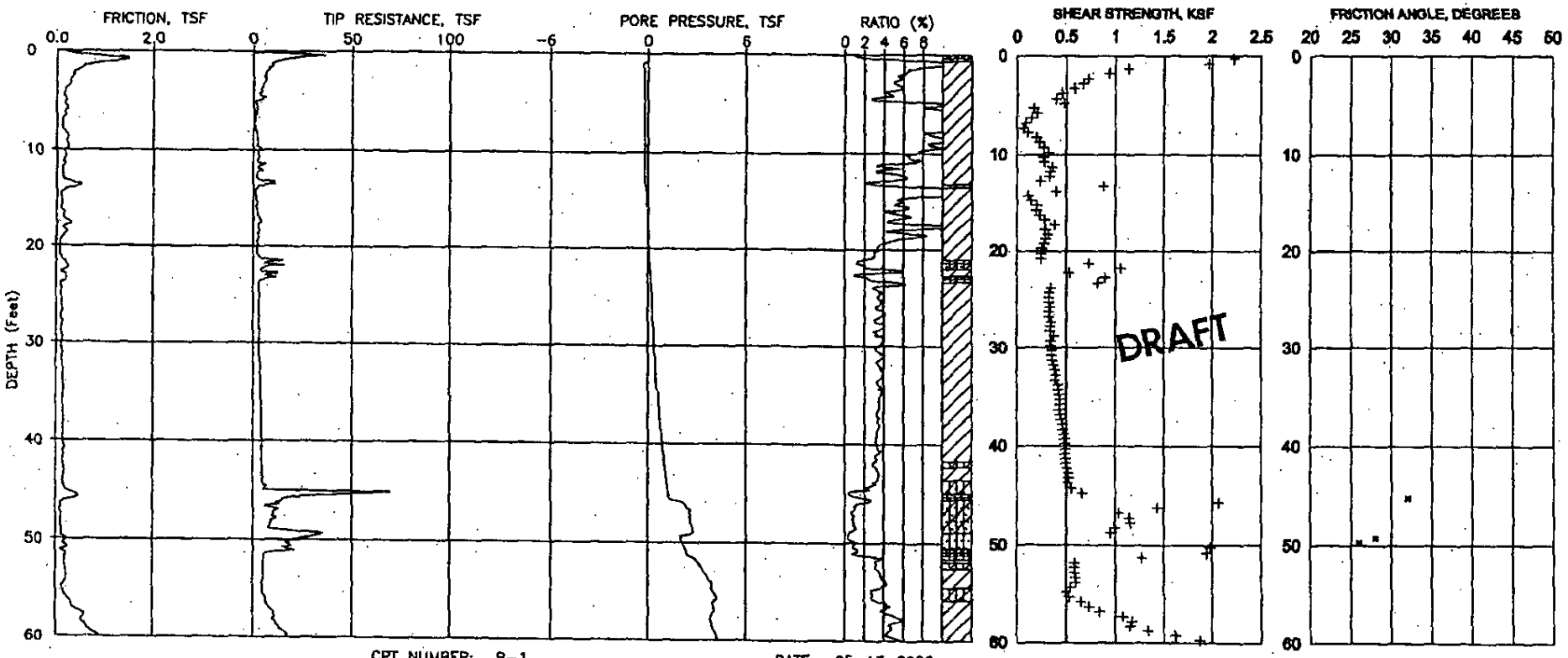
Test no: CPT-1	Position: X: 0.00 m, Y: 0.00 m	Ground level: 0.00
Client:		Date: 5/10/2006 / Scale: 1 : 100
Project:		Page: 2/2 / Fig:
		File: Gentilly LF-CPT-1 m.cpt

Cone No: 0
Tip area [cm2]: 10
Sleeve area [cm2]: 150

Report No. 5506-4022

MEASURED CPT DATA

CORRELATED SOIL PROPERTIES



CPT NUMBER: B-1

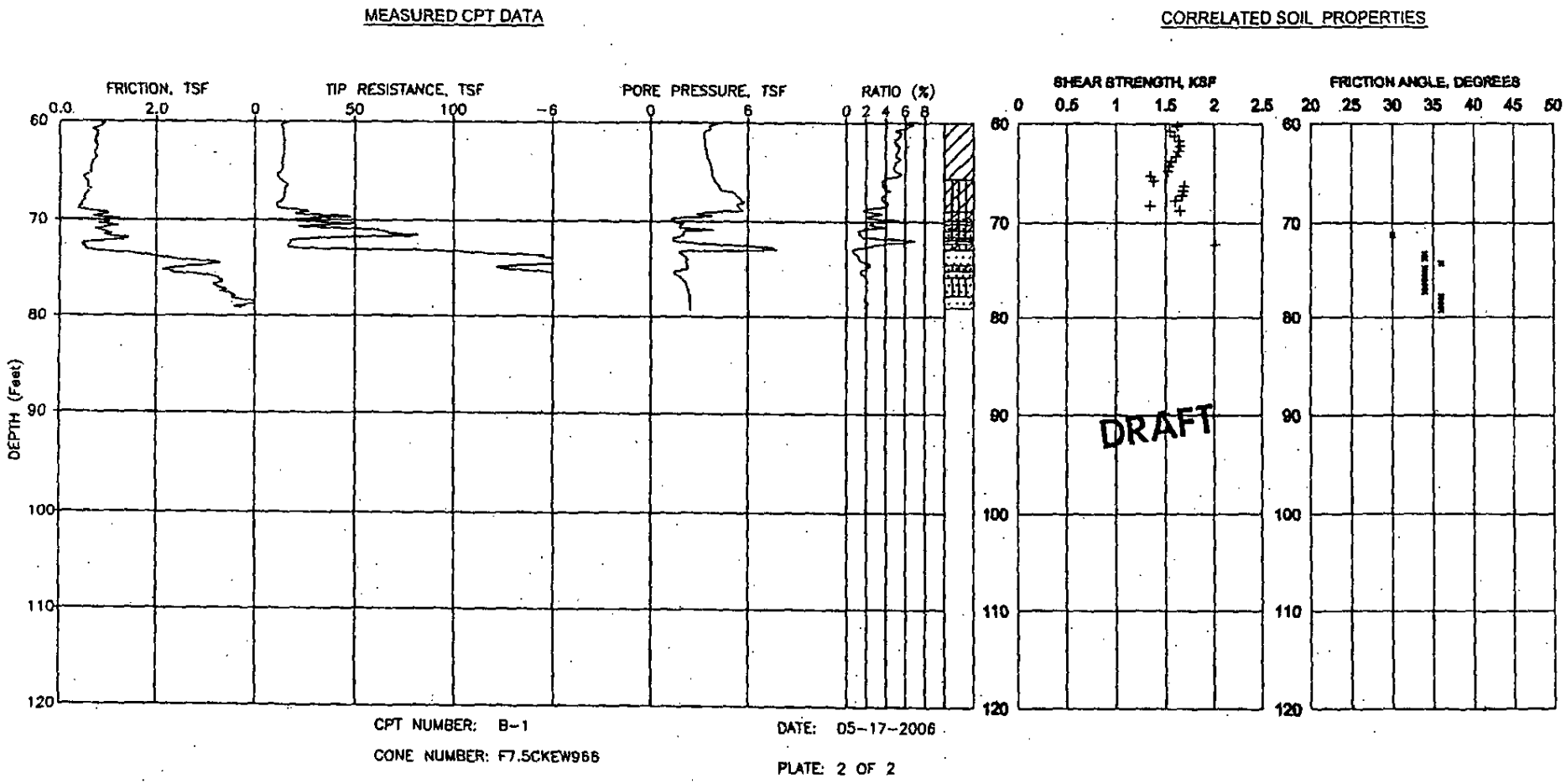
CONE NUMBER: F7.5CKEW966

DATE: 05-17-2008

PLATE: 1 OF 2

NOTE: THE CORRELATED SOIL PROPERTIES (FRICTION ANGLE) ARE BASED ON MODIFIED ROBERTSON & CAMPANELLA METHOD.

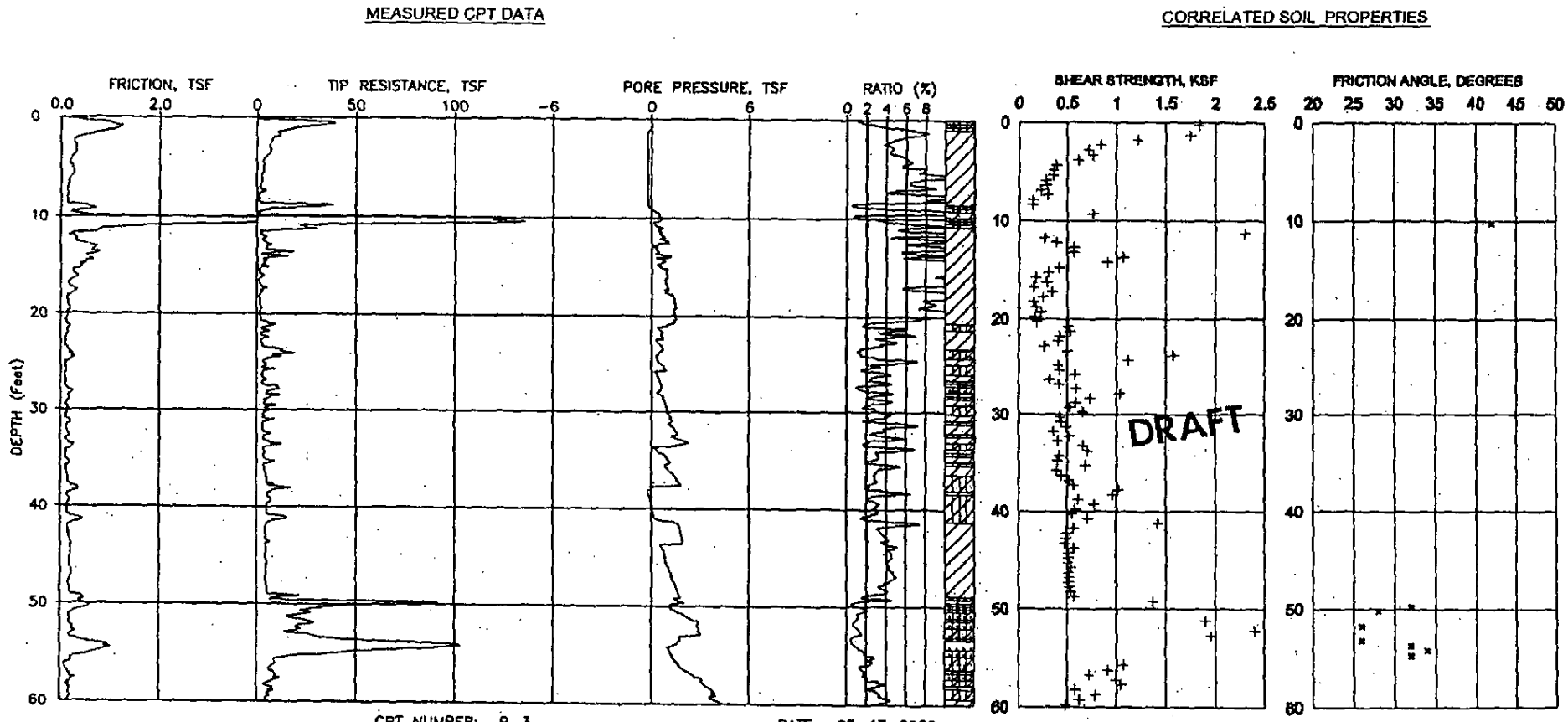
CONE PENETROMETER TEST RESULTS - CPT B1
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA



NOTE: THE CORRELATED SOIL PROPERTIES (FRICTION ANGLE) ARE BASED ON MODIFIED ROBERTSON & CAMPANELLA METHOD.

CONE PENETROMETER TEST RESULTS - CPT B1
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

Report No. 5506-4022



CPT NUMBER: B-3

CONE NUMBER: F7.5CKEW966

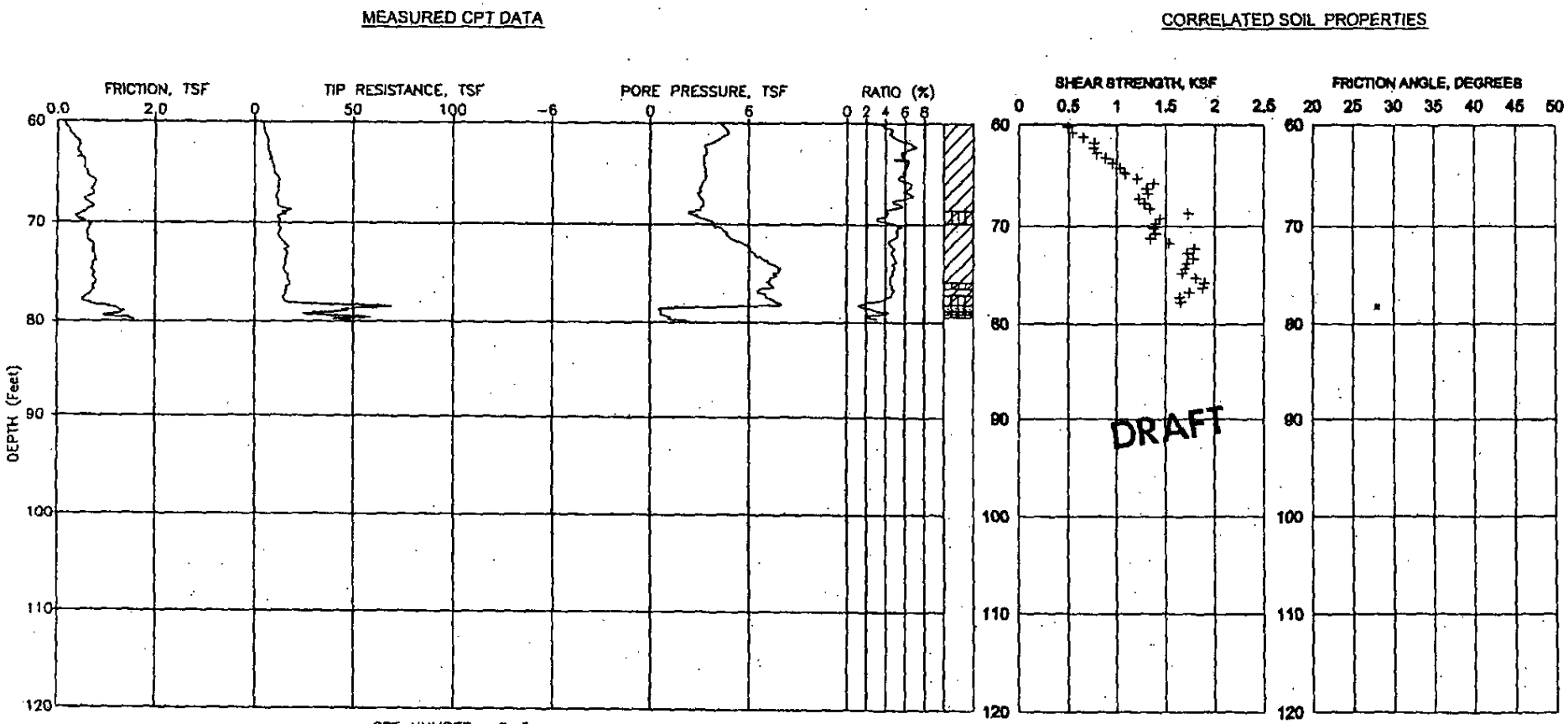
DATE: 05-17-2006

PLATE: 1 OF 2

NOTE: THE CORRELATED SOIL PROPERTIES (FRICTION ANGLE) ARE BASED ON MODIFIED ROBERTSON & CAMPANELLA METHOD.

CONE PENETROMETER TEST RESULTS - CPT B3
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

Report No. 5508-4022



CPT NUMBER: B-3

CONE NUMBER: F7.5CKEW966

DATE: 05-17-2006

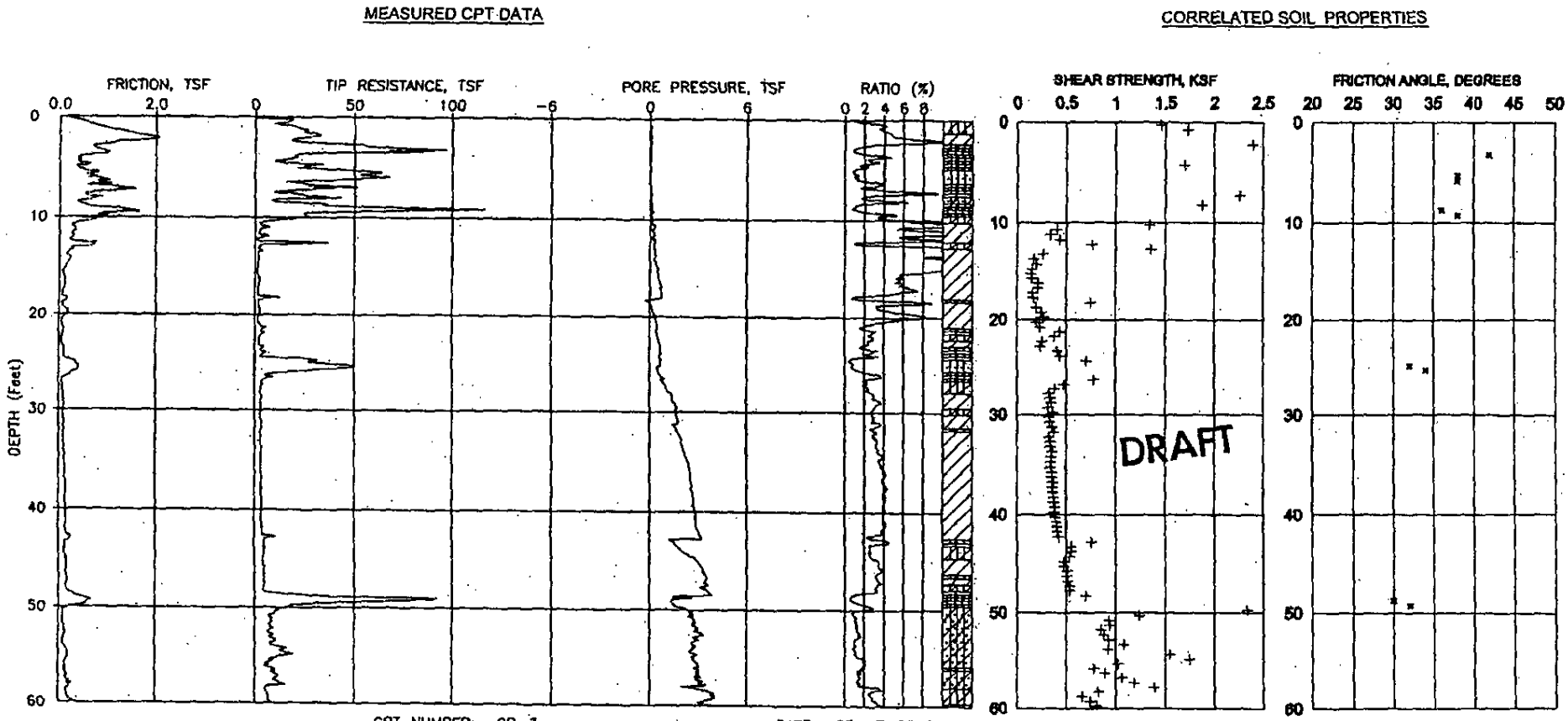
PLATE: 2 OF 2

NOTE: THE CORRELATED SOIL PROPERTIES (FRICTION ANGLE) ARE BASED ON MODIFIED ROBERTSON & CAMPANELLA METHOD.

CONE PENETROMETER TEST RESULTS - CPT B3
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

PLATE A-2b

Report No. 5506-4022



CPT NUMBER: CB-3

CONE NUMBER: F7.5CKEW966

DATE: 05-17-2006

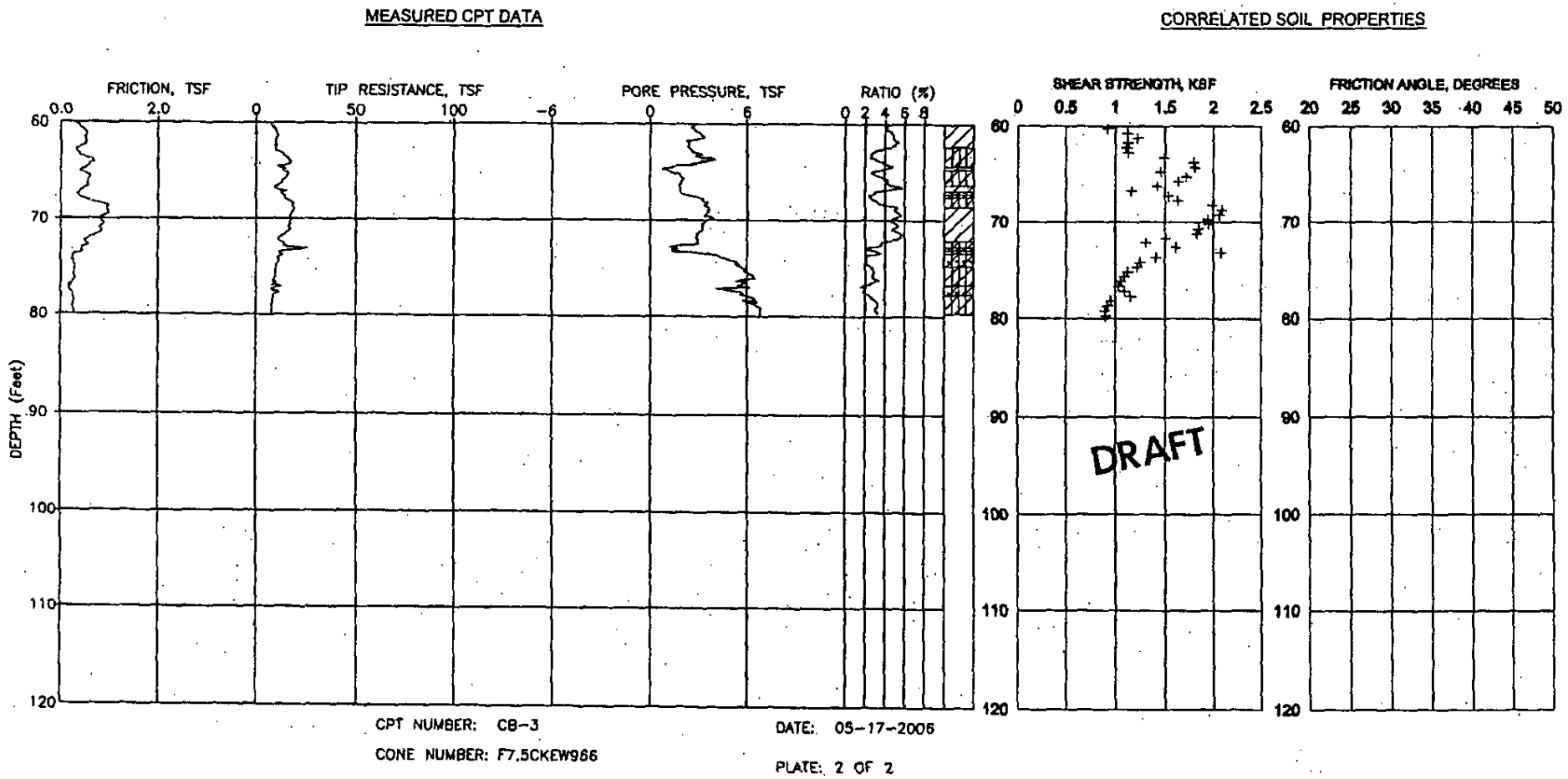
PLATE: 1 OF 2

NOTE: THE CORRELATED SOIL PROPERTIES (FRICTION ANGLE) ARE BASED ON MODIFIED ROBERTSON & CAMPANELLA METHOD.

CONE PENETROMETER TEST RESULTS - CPT CB3
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

PLATE A-3a

Report No. 5506-4022



NOTE: THE CORRELATED SOIL PROPERTIES (FRICTION ANGLE) ARE BASED ON MODIFIED ROBERTSON & CAMPANELLA METHOD.

CONE PENETROMETER TEST RESULTS - CPT CB3
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

APPENDIX C

BEST COPY OF THE NEXT ___ __ PAGES

STE Soil Testing Engineers, Inc.
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Baton Rouge, Louisiana 70884
Telephone (225) 752-4790
FAX (225) 752-4878

Project: Gentilly LF Client: Job #: 06-1046
By: GPB Checked by: Date: Sheet SR-4 of

NEAR TOE:

X	f (1)	(2)	(3)	(4)	(5)	(6)	q (ksf)
0	0						0
32	0.84						0.84
104	1.69						1.69
140	1.69 + .58						2.27
188	1.69 + .58 + .78						3.05
248	1.69 + .58 + .78 + .98						4.03
324	1.69 + .58 + .78 + .98 + 1.24						5.26
428	1.69 + .58 + .78 + .98 + 1.24 + 1.69						6.95
560	1.69 + .58 + .78 + .98 + 1.24 + 1.69 + 2.14						9.10

(1) = 1.69 ksf (1.84)
(2) = .58
(3) = .78
(4) = .98
(5) = 1.24

X LOAD — t when True Time =

		1/2	1 1/2	2 1/2	3 1/2	4 1/2	5 1/2
32	0.84	0.5	1	2.5	3.5	4.5	5.5
104	1.69						

BORING L-2

Zone	L (ft)	Type	$\overline{OBO}$	(1)	Cv FOR LOAD (2)	(3)	(4)	(5)	(6)	(7)
4-17	9	CH, PT	0.42	.034	.023	.016	.012	.008	.006	.004
17-22	silt	silt	—							
22-36	5	CH	0.92	.022	.013	.008	.008	.007	.006	.004
36-48	4	CH	1.38	.020	.012	.008	.008	.007	.006	.004
48-54	6	CH	1.68	.013	.012	.008	.008	.007	.006	.005
54-55	silt	silt	—							
55-58	3	CH	1.92	.013	.012	.008	.008	.007	.006	.005

THUS

Zone	Cv/L² (1/dy) FOR LOAD 1=1.69	2=+.58	3=+.78	4=+.98	5=+1.24	6=+1.69	7=+2.14
4-17	.00042	.00028	.00019	.00016	.00010	.00007	.00005
17-22	—	—	—	—	—	—	—
22-36	.00088	.00052	.00032	.00032	.00024	.00024	.00016
36-48	.00125	.0005	.0005	.00044	.00040	.00038	.00025
48-54	.00036	.00033	.00022	.00022	.00019	.00017	.00014
54-55	—	—					
55-58	.00144	.0013	.00089	.00089	.00078	.00067	.00056

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Project: Gentilly LF Client: Job #: 06-1046

By: GPB Checked by: Date: Sheet SR-5 of

I 704 4'-17'

1. X=52

$T_c = .00042(30) = 0.04$

$t_c = 0.25y = 90 day$ $C_v/L^2 = .00042$

LOAD ① 2NLY

Tyr	t	T	Tv	U	$\Delta\sigma_v$ (P=.84)	ΔC = .28
1/4	90	90	0.038	.14	.11	.03
1/2	180	180	0.076	.25	.21	.06
1	360	360	0.151	.40	.34	.10
2	720	720	0.302	.65	.54	.15
3	1095	1095	0.460	.76	.63	.18
4	1460	1460	0.613	.84	.71	.20
5	1825	1825	0.766	.88	.74	.21
6	2190	2190	0.920	.92	.77	.22

2. X=104

$T_c = .00042(180) = 0.08$

Tyr	t	T	Tv	U	$\Delta\sigma_v$ (P=1.65)	ΔC = .28
1/4			.038	.07	.12	.03
1/2			.076	.18	.30	.08
1			.151	.38	.64	.18
2			.302	.60	1.01	.28
3			.460	.73	1.23	.34
4			.613	.82	1.39	.39
5			.766	.86	1.45	.41
6			.920	.92	1.55	.43

3. X=140

Load ① $T_c = 0.08$

Load ② $T_c = .00028 \times 360 = .102$

TRUE

LOAD ① $\Delta\sigma = 1.65$

LOAD ② $\Delta\sigma = 0.58$

Tyr	Tyr	Tv	U	$\Delta\sigma_v$	Tyr	Tv	U	$\Delta\sigma_v$	$\Sigma\Delta\sigma_v$	ΔC
1/4	.25			.12		0	0	0	.12	.03
1/2	.50			.30	0	0	0	0	.30	.08
1	1			.64	1/2	.051	.08	.05	.69	.17
2	2			1.01	1 1/2	.153	.35	.20	1.21	.33
3	3			1.23	2 1/2	.255	.53	.31	1.54	.43
4	4			1.39	3 1/2	.36	.64	.37	1.76	.49
5	5			1.45	4 1/2	.46	.70	.41	1.86	.52
6	6			1.55	5 1/2	.56	.77	.45	2.00	.56

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Project: Gentilly LF Client: Job #: 06-1046
By: GPB Checked by: Date: Sheet SR-6 of

I, 4'-17', CONT.

$T_c = .00019(365) = .069$ $dq = 0.78$ ksf

X = 188'

$T_v = .00019\ t_y \times 365 = .0694\ t_y$

TRUE t_y	LOADS ①+② $\Delta\sigma_v$	t_y (load 3)	T_v	U	$\Delta\sigma_v$	$\Sigma\Delta\sigma_v$	$A_c^{.28}$
1/4	.12			0		.12	.03
1/2	.30			0		.30	.08
1	.69			0		.69	.19
2	1.21	1/2	.035	.07	.05	1.26	0.35
3	1.54	1 1/2	.104	.28	.22	1.76	0.49
4	1.76	2 1/2	.173	.43	.34	2.10	0.59
5	1.86	3 1/2	.243	.54	.42	2.28	0.64
6	2.00	4 1/2	.312	.62	.48	2.48	0.70

X = 248' q = .98 $T_c = .00015(365) = .055$

$T_v = .00015\ t_y \times 365$ $.0548\ t_y$

TRUE t_y	LOADS ①-③ $\Delta\sigma_v$	t_y load 4	T_v	U	$\Delta\sigma_v$		A_{c28}
1/4	.12	–		0			
1/2	.30	–		0			.03
1	.69	–		0			.08
2	1.26	–		0			.19
3	1.76	1/2	.027	.09	.09	1.85	.35
4	2.10	1 1/2	.082	.25	.24	2.34	.52
5	2.28	2 1/2	.137	.35	.34	2.62	.66
6	2.48	3 1/2	.192	.45	.44	2.92	.73

X = 324' q = 1.24 ksf $T_c = .00010(365) = .0365$

TRUE t_y	LOADS 1-4 $\Delta\sigma_v$	t_y	T_v	U	$\Delta\sigma_v$	$\Sigma\Delta\sigma_v$	A_{c28}
1/4	.12						.03
1/2	.30						.08
1	.69						.19
2	1.26						.35
3	1.85						.52
4	2.34	1/2	.018	.05	.06	2.40	.67
5	2.62	1 1/2	.055	.19	.24	2.86	0.80
6	2.92	2 1/2	.091	.30	.37	3.29	0.92

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Project: Gentilly LF Client: Job #: 06-1046
By: [illegible] Checked by: Date: Sheet SR-7 of

X = 428' (LOAD 6) = 1.69 ksf T_c = .026 T_v = .0256 t_y

t_y	LOADS 1-5 $\Delta\sigma_v$	t_y	T_v	U	$\Delta\sigma_v$	$\Sigma\Delta\sigma_v$	$\Delta C_{.28}$
1/4	.12						
1/2	.30						0.03
1	.69						0.08
2	1.26						0.19
3	1.85						0.35
4	2.40						0.52
5	2.86	1/2	.013	.06	.10	2.96	0.67
6	3.29	1 1/2	.038	.17	.29	3.58	0.83
							1.00

X = 560 Load 7 = 2.14 ksf T_c = 365 (.00005) = .018

t_y	$\Delta\sigma_v$ LOADS 1-6	t_y	T_v	U	$\Delta\sigma_v$	$\Sigma\Delta\sigma_v$	$C_{.28}$
1/4							
1/2							.03
1							.08
2							.19
3							.35
4							.52
5							.67
6	3.58	1/2	.009	.05	0.11	3.69	.83
							1.03

II. ZONE 22-36

1. X = 52 FT

T_c = .00088 (90) = .079
T_v = t_{yr} (.321)

t	T	T_v	U	$\Delta\sigma_v$	$\Delta C_{.28}$
1/4	.25	.08	.17	.14	.04
1/2	.50	.16	.39	.33	.09
1	1	.32	.61	.51	.14
2	2	.64	.80	.67	.19
3	3	.96	.90	.76	.21
4	4	1.28	.95	.80	.22
5	5	1.61	.98		.22
6	6	1.93	.97	.81	.23

ϕ = .84
LOAD 1 ONLY

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Project: Gentilly LF Client: Job #: 06-1046
By: [illegible] Checked by: Date: Sheet SR-8 of

ZONE 22-36

II 2. X = 104' $T_c = .16$ $q = 1.69$ ksf

t	τ	T_v	U	$\Delta\sigma_v$	$\Delta c_{.28}$	
1/4		.08	.11	.19	.05	
1/2		.16	.31	.52	.15	06
1		.32	.55	.93	.26	07
2		.64	.80	1.35	.38	08
3		.96	.90	1.52	.43	09
4		1.28	.95	1.61	.45	10
5		1.61	.96	1.62	.45	11
6		1.93	.97	1.64	.46	12

II.3 X = 140 $q_3 = 0.58$ $\frac{T_c}{2\Delta\sigma} = .00032 \times 365 = .192$

t	τ	$\Delta\sigma$ (1)	T_3 (2)	U_3	$\Delta\sigma_3$	$\Sigma\Delta\sigma$	$\Delta c_{.28}$
1/4	0	.19	0	0	0		.05
1/2	0	.52	0	0	0		.15
1	1/2	.93	.095	.11	.06	.99	.28
2	1 1/2	1.35	.28	.46	.27	1.62	.45
3	2 1/2	1.52	.47	.67	.39	1.91	.53
4	3 1/2	1.61	.66	.80	.46	2.07	.58
5	4 1/2	1.62	.85	.86	.50	2.12	.59
6	5 1/2	1.64	1.04	.91	.53	2.17	.61

II.4 X = 188 $q_4 = 0.78$ ksf $c_v/L^2 = .00032$ $T_c = .12$

t	τ	$\Delta\sigma$ (1)+(3)	T_4	U_4	$\Delta\sigma_4$	$\Sigma\Delta\sigma$	$\Delta c_{.28}$
1/4		.19		0	0		.05
1/2		.52		0	0		.15
1		.99		0	0		.28
2	1/2	1.62	.058	.05	.04	1.66	.46
3	1 1/2	1.91	.175	.35	.27	2.18	.61
4	2 1/2	2.07	.29	.54	.42	2.49	.70
5	3 1/2	2.12	.41	.67	.52	2.64	.74
6	4 1/2	2.17	.53	.75	.58	2.75	.77

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Project: Gentilly LF Client: Job #: 06-1046
By: [illegible] Checked by: Date: Sheet SR-9 of

II Bore 22'-36', CONT.

5. X = 248 q_5 = 0.98 c_v/L^2 = 0.00032/d = .117/yr

t	τ	$\Delta\sigma_v$ 1-4	T_5	U_5	$\Delta\sigma_5$	$\Sigma\Delta\sigma$	$\Delta C_{.28}$
1/4	—	.19					.05
1/2	—	.52					.15
1	—	.99					.28
2	—	1.66					.46
3	1/2	2.18	.059	.11	.11	2.29	0.64
4	1 1/2	2.49	.175	.37	.36	2.85	0.80
5	2 1/2	2.64	.292	.55	.54	3.18	0.89
6	3 1/2	2.75	.409	.65	.64	3.39	0.95

6. X = 324 q_6 = 1.24 ksf c_v/L^2 = 0.00024 T_c = .088

t	τ	$\Delta\sigma_v$ 1-5	T_6	U_6	$\Delta\sigma_6$	$\Sigma\Delta\sigma$	$\Delta C_{.28}$
1/4		.19					.05
1/2		.52					.15
1		.99					.28
2		1.66					.46
3		2.29					.64
4	1/2	2.85	.044	.08	.10	2.95	.83
5	1 1/2	3.18	.131	.31	.38	3.56	1.00
6	2 1/2	3.39	.219	.49	.61	4.00	1.12

X = 428 q_7 = 1.69 ksf c_v/L^2 = .00024 T_c = .088

t	τ	$\Delta\sigma_v$ 1-6	T_7	U_7	$\Delta\sigma_7$	$\Sigma\Delta\sigma$	$\Delta C_{.28}$
1/4							.05
1/2							.15
1							.28
2							.46
3							.64
4							.83
5	1/2	3.56	.044	.08	.14	3.70	1.03
6	1 1/2	4.00	.131	.31	.52	4.52	1.27

X = 560 q_8 = 2.14 ksf c_v/L^2 = .00016

t	τ	$\Delta\sigma_v$	T_8	U_8	$\Delta\sigma_8$	$\Sigma\Delta\sigma$	$\Delta C_{.28}$
1/4							
5							
6	1/2	.029	.12	.26		4.78	1.34

SAME AS X = 428

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Project: Gentilly LF Client: Job #: 06-1046

By: [signature] Checked by: Date: Sheet SR-10 of

III ZONE 36'-48' $C_0 = .51$ ksf.

1. X = 52' $\Delta C = .28\,\Delta\sigma$ $q = .84$ ksf

Receives 1/2 Load ① ONLY $c_v/L^2 = .00125/dy = 0.456/yr$

t	τ	T_v	$U_{①}$	$\Delta\sigma_1$	ΔC_1	C_1	
1/4	1/4	.114	.22	.18	.05	.56	
.5	.5	.23	.45	.38	.11	.62	← 2006
1	1	.45	.67	.56	.16	.67	07
2	2	.91	.92	.77	.22	.73	08
3	3	1.37	.97	.81	.23	.74	09
4	4	1.82	.98			.74	10
5	5	2.28	.99			.74	11
6	6	2.73	1.00	.84	.24	.75	12

2. X = 104' All Load ① $q = 1.69$ ksf $c_v/L^2 = .456/yr$ $T_c = .23$ (.46 x 1/2 yr)

t	τ	T_v	$U_{①}$	$\Delta\sigma_1$	ΔC_1	C_1	
1/4	1/4	.114	.16	.27	.08	.59	
1/2	1/2	.23	.31	.52	.15	.66	2006 (Load 1 Applied)
1	1	.45	.63	1.06	.30	.81	
2	2	.91	.87	1.47	.41	.92	
3	3	1.37	.95	1.60	.45	.96	
4	4	1.82	.97		.46	.97	
5	5	2.28	.99		.46	.97	
6	6	2.73	1.00	1.69	.47	.98	

3. X = 140' Load ② $\Delta q = .58$ ksf $c_v/L^2 = .0005/dy = .1825/yr$ $T_c = .18$

t	τ	$\Delta\sigma_{①}$	T_2	U_2	$\Delta\sigma_2$	$\Sigma\Delta\sigma$	ΔC	C	
1/4		.37	.036					.59	
1/2		.52	.071					.66	2006
1	.5	1.06	.091	.11	.06	1.12	.31	.82	2007 (Load 2 Applied)
2	1.5	1.47	.27	.47	.27	1.74	.49	1.00	2008
3	2.5	1.60	.46	.67	.39	1.99	.56	1.07	2009
4	3.5	1.64	.64	.80	.46	2.10	.59	1.10	2010
5	4.5	1.67	.82	.88	.50	2.17	.61	1.12	2011
6	5.5	1.69	1.00	.94	.51	2.20	.62	1.13	2012

4. X = 188' LOAD ③ = 0.78 ksf $c_v/L^2 = .1825/yr$ $T_c = .18$

t	τ	$\Delta\sigma_{1-2}$	T_3	U_3	$\Delta\sigma_3$	$\Sigma\Delta\sigma$	ΔC	C	
1/4		.27						.59	
1/2		.52						.66	2006
1		1.02						.82	2007
2	.5	1.74		.11	.09	1.83	.51	1.02	2008 Load 3 Applied
3	1.5	1.99		.47	.37	2.36	.66	1.17	2009
4	2.5	2.10		.67	.52	2.62	.73	1.24	2010
5	3.5	2.17		.80	.62	2.79	.78	1.29	2011
6	4.5	2.20		.86	.67	2.87	.80	1.31	2012

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Project: Gentilly LF Client: Job #: 06-1046

By: GPB Checked by: Date: Sheet SR-11 of

III ~~Zone~~ 36-48, CONT.

5. X = 248, LOAD ④ = .98 ksf, cv/L^2 = .00044 x 365 = .161

t	τ	$\Delta\sigma_{1-3}$	T_4	U_4	$\Delta\sigma_4$	$\Sigma\Delta\sigma$	ΔC	C	
1/4		.27						.59	
1/2		.52						.66	2006
1		1.12						.82	2007
2		1.83						1.02	2008
3	.5	2.36	.08	.11	.11	2.47	.69	1.20	2009
4	1.5	2.62	.24	.45	.44	3.06	.96	1.37	2010
5	2.5	2.79	.40	.64	.63	3.42	.96	1.47	2011
6	3.5	2.87	.56	.76	.74	3.61	1.01	1.52	2012

6. X = 324, LOAD ⑤ = 1.24 ksf, cv/L^2 = .00040 x 365 = .146/yr

t	τ	$\Delta\sigma_{1-4}$	T_5	U_5	$\Delta\sigma_5$	$\Sigma\Delta\sigma$	ΔC	C	
1/4		.27						.59	
1/2		.52						.66	06
1		1.12						.82	07
2		1.83						1.02	08
3		2.47						1.20	09
4	.5	3.06	.073	.11	.14	3.20	.90	1.41	10
5	1.5	3.42	.22	.42	.52	3.94	1.10	1.61	11
6	2.5	3.61	.36	.60	.74	4.35	1.22	1.73	12

7. X = 428 LOAD ⑥ = 1.63 ksf, cv/L^2 = .00036 = .128/yr

t	τ	$\Delta\sigma_{1-5}$	T_6	U_6	$\Delta\sigma_6$	$\Sigma\Delta\sigma$	ΔC	C	
1/4		.27						.59	
1/2		.52						.66	06
1		1.12						.82	07
2		1.83						1.02	08
3		2.47						1.20	09
4		3.20						1.41	10
5	.5	3.94	.064	.10	.17	4.11	1.15	1.66	11
6	1.5	4.35	.19	.37	.62	4.97	1.39	1.90	12

8. X = 560 LOAD ⑦ = 2.14 ksf, cv/L^2 = .00025 x 365 = .091

t	τ	$\Delta\sigma_{1-6}$	T_7	U_7	$\Delta\sigma_7$	$\Sigma\Delta\sigma$	ΔC	C	
1/4		.27						.59	
1/2		.52						.66	06
1		1.12						.82	07
2		1.83						1.02	08
3		2.47						1.20	09
4		3.20						1.41	10
5		4.11						1.66	11
6	.5	4.97	.046	.09	.19	5.16	1.45	1.96	12

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Project: Gentilly LF Client: Job #: 06-1046
By: [illegible] Checked by: Date: Sheet SR-12 of

IV ZONE 48-54 $C_0 = 0.60$ ksf CPT

1. X = 52' $q = 1/2(1.69) = .84$ ksf $c_v/L^2 = .00036$ 1/d = .131/yr $T_c = .066$

t	τ	T_v	U_1	$\Delta\sigma_1$	Δc_1	c	
1/4	1/4	.033	.07	.06	.02	.62	
1/2	1/2	.066	.19	.16	.04	.64	2006
1	1	.131	.37	.31	.09	.69	07
2	2	.26	.53	.45	.12	.72	08
3	3	.39	.68	.57	.16	.76	09
4	4	.52	.77	.65	.18	.78	10
5	5	.66	.84	.71	.20	.80	11
6	6	.78	.88	.74	.21	.81	12

2. X = 104' $q = 1.69$ ksf $c_v/L^2 = .131$/yr $T_c = .13$

t	τ	T_v	U_1	$\Delta\sigma_1$	Δc_1	c	
1/4	1/4	.033	.04	.07	.02	.62	
1/2	1/2	.066	.10	.17	.05	.65	2006
1	1	.13	.24	.41	.11	.71	07
2	2	.26	.49	.83	.23	.83	08
3	3	.39	.64	1.08	.30	.90	09
4	4	.52	.74	1.25	.35	.95	10
5	5	.66	.83	1.40	.39	.99	11
6	6	.78	.807	1.47	.41	1.01	12

3. X = 140' $q_2 = .58$ ksf $c_v/L^2 = .00033 = .120$ $T_c = .12$

t	τ	$\Delta\sigma_1$	T_2	U_2	$\Delta\sigma_2$	$E\Delta\sigma$	Δc_2	c_2	
1/4		.07						.62	
1/2		.17						.65	2006
1	.5	.41	.060	.09	.05	.46	.13	.73	07
2	1.5	.83	.18	.38	.22	1.05	.29	.89	08
3	2.5	1.08	.30	.55	.32	1.40	.39	.99	09
4	3.5	1.25	.42	.66	.38	1.63	.46	1.06	10
5	4.5	1.40	.54	.75	.44	1.84	.51	1.11	11
6	5.5	1.47	.66	.83	.48	1.95	.55	1.15	12

4. X = 188 Load ③ = 0.78 ksf $c_v/L^2 = .00022$ 1/d = .0803

t	τ	$\Delta\sigma_{1-2}$	T_3	U_3	$\Delta\sigma_3$	$E\Delta\sigma$	Δc_3	c_3	
1/4		.07							
1/2		.17							2006
1		.46							07
2	.5	1.05	.04	.10	.08	1.13	.32	.92	08
3	1.5	1.40	.12	.30	.23	1.63	.46	1.06	09
4	2.5	1.63	.20	.45	.30	1.98	.55	1.15	10
5	3.5	1.84	.28	.56	.44	2.28	.64	1.24	11
6	4.5	1.95	.36	.65	.57	2.46	.69	1.29	12

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Project: Gentilly LF Client: Job #: 06-1046
By: Checked by: Date: Sheet SR-13 of

IV ZONE 48-54 CONT $\sigma_0 = 0.60$ ksf, μ = 4 CPT

5. X = 248', LOAD ④ = 0.98 ksf, c_v/L^2 = .00022 1/d = .0803 1/yr

t	τ	$\Delta\sigma_{1-3}$	T_4	U_4	$\Delta\sigma_4$	$\Sigma\Delta\sigma$	ΔC_4	C_4	
1/4		.07							
1/2		.17						.62	
1		.46						.65	.06
2		1.13						.73	.07
3	.5	1.63	.104	.10	.10	1.73	.48	.92	.09
4	1.5	1.98	.12	.30	.29	2.28	.64	1.08	.09
5	2.5	2.28	.20	.45	.44	2.72	.76	1.26	.10
6	3.5	2.46	.28	.56	.55	3.01	.84	1.44	.12

6. X = 324', LOAD ⑤ = 1.2 ksf, c_v/L^2 = .00019 1/d = .0694 1/yr

t	τ	$\Delta\sigma_{1-4}$	T_5	U_5	$\Delta\sigma_5$	$\Sigma\Delta\sigma$	ΔC_5	C_5	
1/4		.07							
1/2		.17						.62	
1		.46						.65	.04
2		1.13						.73	.07
3		1.73						.92	.08
4	.5	2.28	.035	.07	.09	2.37	.66	1.08	.09
5	1.5	2.72	.104	.25	.31	3.03	.85	1.26	.10
6	2.5	3.01	.17	.40	.50	3.51	.98	1.44	.11

7. X = 428', LOAD ⑥ = 1.65 ksf, c_v/L^2 = .00017 1/d = .0621 1/yr

t	τ	$\Delta\sigma_{1-5}$	T_6	U_6	$\Delta\sigma_6$	$\Sigma\Delta\sigma$	ΔC_6	C_6	
1/4		.07							
1/2		.17						.62	
1		.46						.65	.04
2		1.13						.73	.07
3		1.73						.92	.08
4		2.37						1.08	.09
5	.5	3.03	.031	.07	.12	3.15	.88	1.26	.10
6	1.5	3.51	.093	.24	.41	3.92	1.10	1.44	.11

8. X = 560', Load ⑦ = 2.14 ksf, c_v/L^2 = .00014 1/d = .051 1/yr

t	τ	$\Delta\sigma_{1-6}$	T_7	U_7	$\Delta\sigma_7$	$\Sigma\Delta\sigma$	ΔC_7	C_7	
1/4		.07							
1/2		.17							
1		.46							
2		1.13							
3		1.73							
4		2.37							
5		3.15							
6	.5	3.92	.026	.06	.13	4.05	1.13	1.73	.2012

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Project: Gentilly LF Client: Job #: 06-1046
By: GPB Checked by: Date: Sheet SR-14 of

V Zone 54-58 C_o = 0.65 kcf OPT

1. X = 52 FT q = .84 kcf c_v/L^2 = .00144 1/day = 0.526 1/yr T_c = .26

t	τ	T_o	U_o	$\Delta\sigma_o$	ΔC_o	C_o	
1/4	.25	.13	.12	.10	.03	.68	
1/2	.50	.26	.24	.20	.06	.71	06
1	1	.52	.62	.52	.15	.80	07
2	2	1.05	.90	.76	.21	.86	08
3	3	1.58	.96	.80	.23	.88	09
4	4	2.10	.98	.82		.88	10
5	5	2.63	1.00	.84	.24	.89	11
6	6	3.15	1.00	.84		.89	12

2. X = 104' q = 1.69 kcf c_v/L^2 = .001 kcf/day = .526 1/yr T_c = .53

t	τ	T_1	U_1	$\Delta\sigma_1$	ΔC_1	C_1	
1/4	.25	.13	.07	.12	.03	.68	
1/2	.50	.26	.20	.34	.09	.74	06
1	1	.52	.57	.96	.27	.92	07
2	2	1.05	.88	1.49	.42	1.06	08
3	3	1.58	.95	1.60	.45	1.10	09
4	4	2.10	.98	1.66	.46	1.11	10
5	5	2.63	1.00	1.69	.47	1.12	11
6	6	3.15	1.00	1.69	.47	1.12	12

3. X = 140' q_2 = 0.58 kcf, c_v/L^2 = .0013 = .474/yr T_c = .47

t	τ	$\Delta\sigma_1$	T_2	U_2	$\Delta\sigma_2$	$\Sigma\Delta\sigma$	ΔC_2	C_2	
1/4		.12						.68	
1/2		.34						.74	06
1	.5	.96	.24	.20	.12	1.08	.30	.95	07
2	1.5	1.49	.71	.75	.43	1.92	.54	1.19	08
3	2.5	1.60	1.19	.92	.53	2.13	.60	1.25	09
4	3.5	1.66	1.66	.96	.56	2.22	.62	1.27	10
5	4.5	1.69	2.14	.98	.57	2.26	.63	1.28	11
6	5.5	1.69	2.61	1.00	.58	2.27	.64	1.29	12

4. X = 188' q_3 = 0.78 kcf, c_v/L^2 = .00089 1/day = 0.325/yr

t	τ	$\Delta\sigma_{1,2}$	T_3	U_3	$\Delta\sigma_3$	$\Sigma\Delta\sigma$	ΔC_3	C_3	
1/4		.12						.68	
1/2		.34						.74	06
1		1.08						.95	07
2	.5	1.92	.10	.15	.12	2.04	.57	1.22	08
3	1.5	2.13	.48	.60	.47	2.60	.73	1.38	09
4	2.5	2.22	.81	.82	.64	2.86	.80	1.45	10
5	3.5	2.26	1.14	.91	.71	2.97	.83	1.48	11
6	4.5	2.27	1.46	.95	.74	3.01	.84	1.49	12

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Project: Gentilly LF Client: Job #: 06-1046
By: GPB Checked by: Date: Sheet SR-15 of

t 54-58

5. X = 248' LOAD (4) = 0.98 ksf c_v/L^2 = .00089/d = .3248/yr

t	T	$\Delta\sigma_{1-3}$	T_4	U_4	$\Delta\sigma_4$	$\Sigma\Delta\sigma$	ΔC_4	C_4
1/4		.12						.68
1/2		.34						.74
1		1.08						.95
2		2.04						1.22
3	.5	2.60	.16	.15	.15	2.75	.77	1.42
4	1.5	2.86	.49	.60	.59	3.45	.96	1.62
5	2.5	2.97	.81	.82	.80	3.77	1.06	1.71
6	3.5	3.01	1.14	.91	.89	3.90	1.09	1.74

6. X = 324' LOAD (5) = 1.24 ksf c_v/L^2 = .00078 1/d = .2847/yr

t	T	$\Delta\sigma_{1-4}$	T_5	U_5	$\Delta\sigma_5$	$\Sigma\Delta\sigma$	ΔC_5	C_5
1/4		.12						.68
1/2		.34						.74
1		1.08						.95
2		2.04						1.22
3		2.75						1.42
4	.5	3.45	.14	.15	.19	3.64	1.01	1.66
5	1.5	3.77	.43	.58	.72	4.49	1.26	1.91
6	2.5	3.90	.71	.80	.99	4.89	1.37	2.02

7. X = 428' LOAD (6) = 1.69 ksf c_v/L^2 = .00067 1/d = .2446/yr

t	T	$\Delta\sigma_{1-5}$	T_6	U_6	$\Delta\sigma_6$	$\Sigma\Delta\sigma$	ΔC_6	C_6	
1/4		.12						.68	
1/2		.34						.74	06
1		1.08						.95	07
2		2.04						1.22	08
3		2.75						1.42	09
4		3.64						1.66	10
5	.5	4.49	.12	.12	.20	4.69	1.31	1.96	11
6	1.5	4.89	.37	.53	.90	5.79	1.62	2.27	12

8. X = 560' LOAD (7) = 2.14 ksf c_v/L^2 = .00056 1/d = .2044 1/yr

t	T	$\Delta\sigma_{1-6}$	T_7	U_7	$\Delta\sigma_7$	$\Sigma\Delta\sigma$	ΔC_7	C_7
1/4		.12						
1/2		.34						
1		1.08						
2		2.04						
3		2.75						
4		3.64						
5		4.69						
6	.5	5.79	.10	.12	.26	6.05	1.69	2.34

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Project: Gentilly LF Client: Job #: 06-1046

By: GPB Checked by: Date: Sheet SR-16 of

VERY ROUGHLY: $\gamma = 65$ $H = 120$

$H_s = 5.53 \frac{\bar{c}}{\gamma}$

$120 = 5.53 \frac{\bar{c}/SF}{65}$

$\bar{c} = SF \times 1645$ (vertical cut, no N_d)

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grating Eq.
s simplified

Fig. 1) with
pplied load

. . . . (8a)

. . . . (8b)

. . . . (8c)

. . . . (8d)

evant T –

30	0.060	17	1.7								
50	0.100	27	2.7	0	0	0	0				
100	0.200	47	4.7	50	0.100	21	4.2				
200	0.400	68	6.8	150	0.300	57	11.4	0	0	0	
400	0.800	89	8.9	350	0.700	84	16.8	200	0.400	70	–7.

$T_c = \frac{c_v t_c}{L^2}$

Olson, 1977

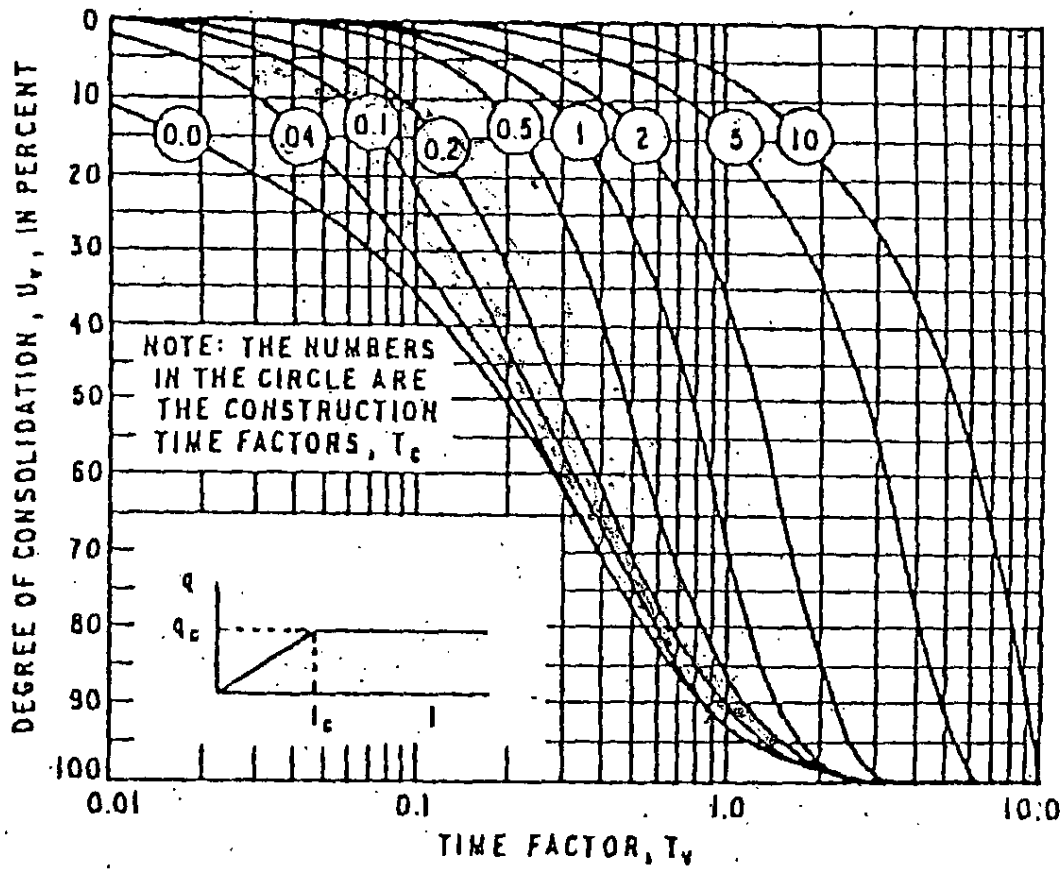

FIG. 1.—U_v – T Curves for One-Dimensional Vertical Flow and Single Ram

be obtained by simply adding the solutions for each of the constituent
As an example of the analysis, consider a case with the same soil c

From Lambe + Whitman

equation applicable to numerous physical problems. In particular, the equations for transient heat flow are basically identical to these equations for consolidation, with temperature replacing excess pore pressure. Solutions have been obtained for many problems in heat flow involving a variety of initial and boundary conditions, and these solutions often may be used to considerable advantage in the study of consolidation.

27.2 SOLUTION FOR UNIFORM INITIAL EXCESS PORE PRESSURE

The simplest case of consolidation is the one-dimensional problem in which: (*a*) the total stress is constant with time, so that $\partial\sigma_v/\partial t = 0$; (*b*) the initial excess pore pressure is uniform with depth; and (*c*) there is drainage at both the top and bottom of the consolidating stratum. These conditions are met by the loading in Fig. 26.2 provided that the loading is applied in a time that is very small compared to the consolidation time so that literally no consolidation occurs before the loading is complete. The total vertical stress at any point will then be constant during the consolidation process.

For this problem, it is convenient to convert Eq. 27.4 by introducing nondimensional variables:

$$Z = \frac{z}{H} \tag{27.8a}$$

$$T = \frac{c_v t}{H^2} \tag{27.8b}$$

where z and Z are measured from the top of the consolidating stratum and H is *one-half* of the thickness of the consolidating stratum. (The reason for this choice of H will be apparent later.) The nondimensional time T is called the *time factor*. With these variables, Eq. 27.4 becomes

$$\frac{\partial^2 u_e}{\partial Z^2} = \frac{\partial u_e}{\partial T} \tag{27.9}$$

We now need a solution to Eq. 27.9 satisfying the following conditions:

Initial condition at $t = 0$:

$$u_e = u_0 \text{ for } 0 \le Z \le 2$$

Boundary condition at all t:

$$u_e = 0 \text{ for } Z = 0 \text{ and } Z = 2$$

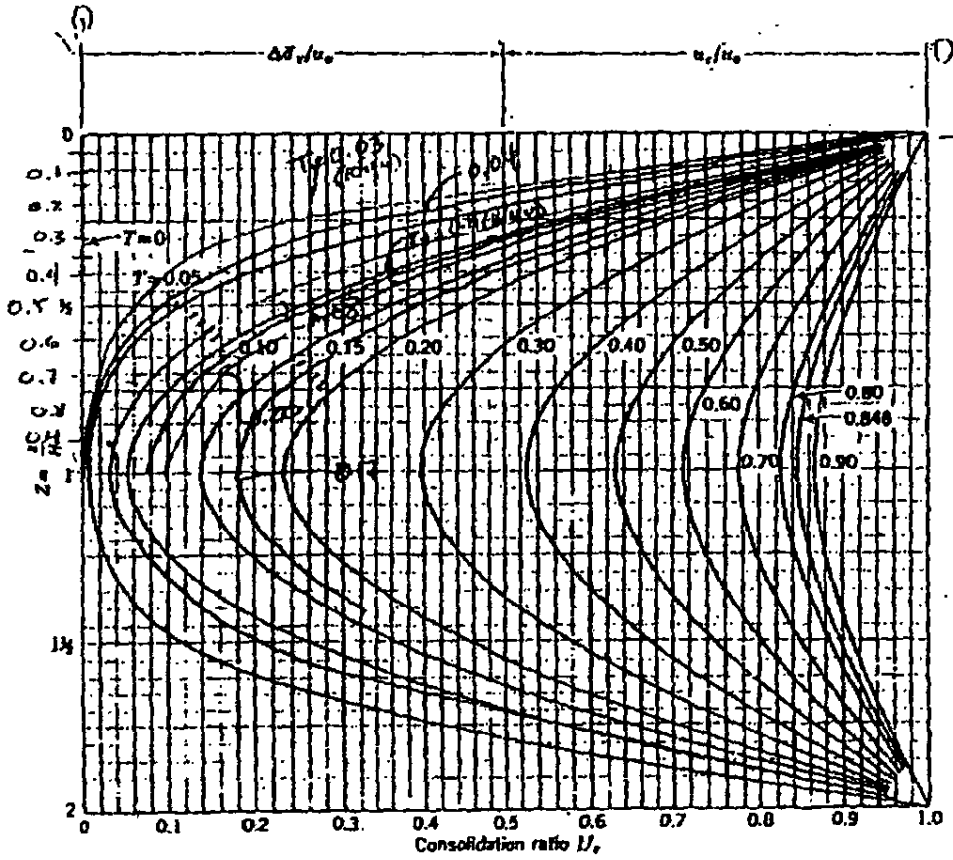

Fig. 27.2 Consolidation ratio as function of depth and time factor: uniform initial excess pore pressure.

where u_0 is the initial excess pore pressure. The solution (e.g., see Taylor 1948)

$$u_e = \sum_{m=0}^{m=\infty} \frac{2u_0}{M}(\sin MZ)e^{-M^2T} \qquad (27.10)$$

where

$$M = \frac{\pi}{2}(2m + 1) \qquad (27.11)$$

and m is a dummy variable taking on values 1, 2, 3, ... This solution may be conveniently portrayed in graph form (Fig. 27.2) where the consolidation ratio

$$U_s = 1 - \frac{u_e}{u_0}$$

is shown as a function of Z and T.

Example 27.1 illustrates the use of Fig. 27.2 to evaluate excess pore pressure, velocity of flow, and effective

▸**Example 27.1**

Given. The stratum of clay and loading shown in Fig. E27.1-1. This is the same profile and loading as in Example 25.6.

Find. At elevation −27.5 ft and 4 months after loading

a. Excess pore pressure.

b. Pore pressure.

c. Vertical effective stress.

d. Velocity of flow.

Solution. Because the overlying and underlying soils are much more permeable than the clay, there is double drainage.

$$H = 7 \text{ ft}, \quad Z = \frac{(27.5 - 24)}{7} = 0.5, \quad T = \frac{13.6(0.33)}{(7)^2} = 0.092$$

Interpolating in Fig. 27.2, $U_s = 0.24$

Thus:

$$u_e = 2.1(1 - 0.24) = 1.60 \text{ ksf}$$

$$u = \bar{u}_{ss} + u_e = 1.13 + 1.60 = 2.73 \text{ ksf}$$

$$\bar{\sigma}_v = (\bar{\sigma}_v)_0 + \Delta\bar{\sigma}_v = 1.27 + 2.1(0.24) = 1.27 + 0.50 = 1.77 \text{ ksf}$$

The stresses and pore pressures after 4 months are shown in Fig. E27.1-2. The slope of the tangent at $Z = 0.5$ to the interpolated curve for $T = 0.092$ is shown in Fig. E27.1-3. In terms of gradient this becomes

$$i = \frac{1}{\gamma_w}\frac{U_s}{Z}\frac{u_0}{H} = \frac{(0.95)(2.10)}{(0.0624)(7)} = 4.56$$

The superficial seepage velocity is thus

$$v = ki = 0.06(4.56) = 0.27 \text{ ft/yr upward}$$

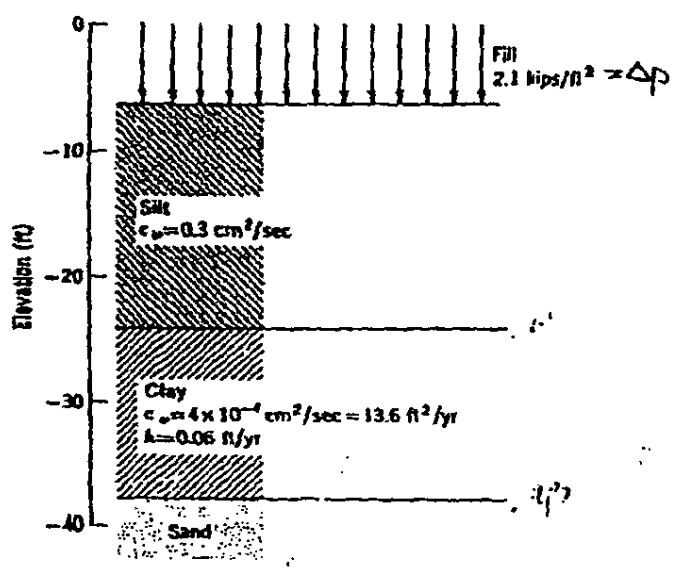

Fig. E27.1-1

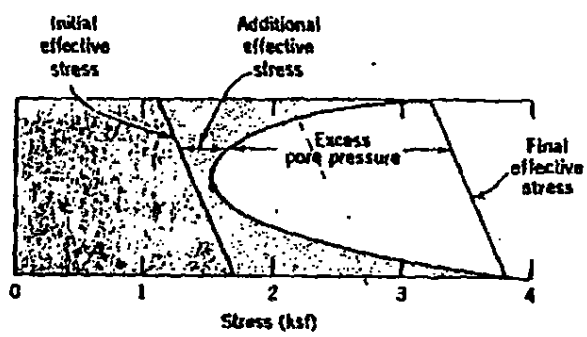

Fig. E27.1-2

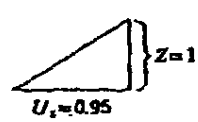

Fig. E27.1-3

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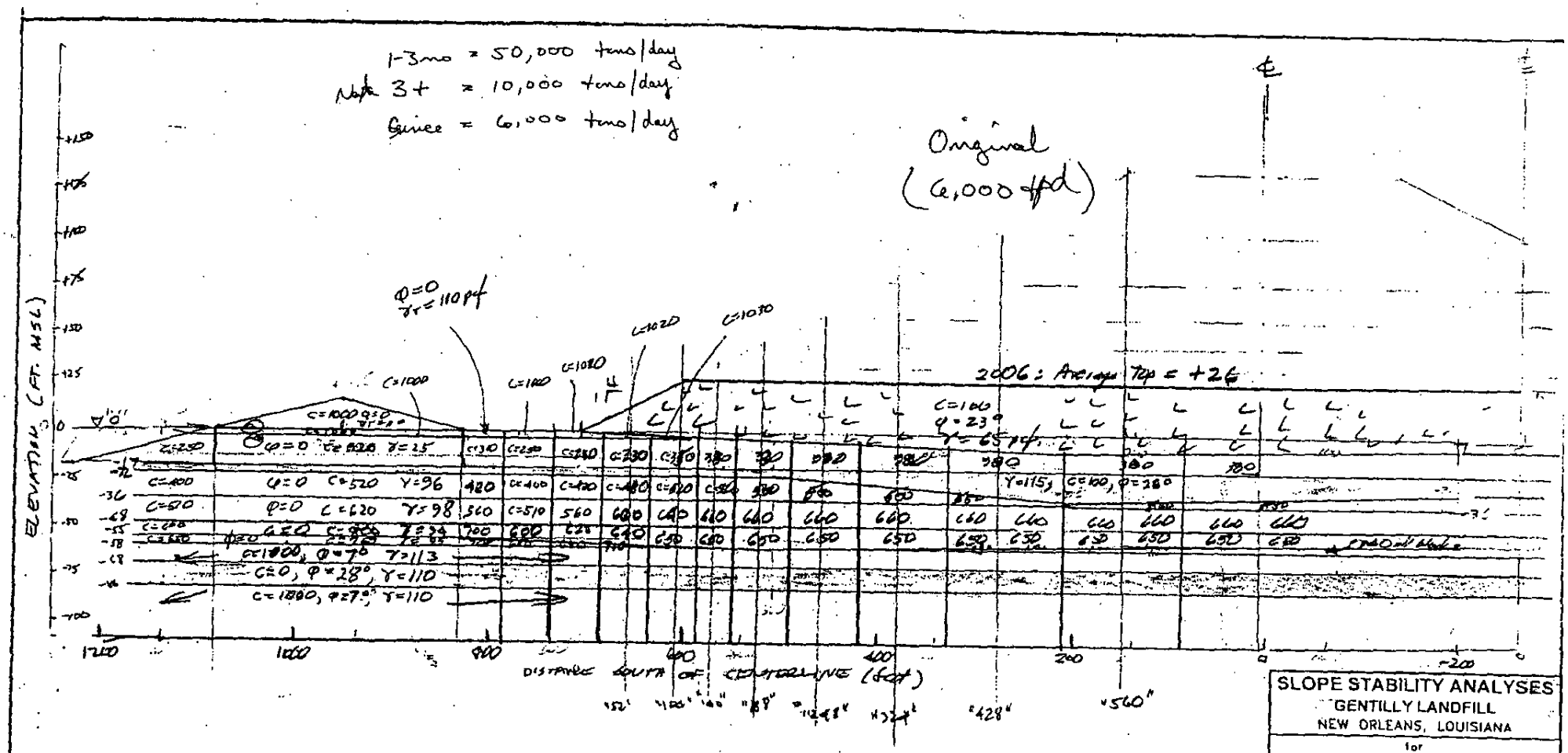
Telephone (504) 835-2593
Fax (504) 835-2982

Project: Gentilly LF Client: LA DEQ Job #: 06-1046
By: CA Checked by: Date: 7/18/06 Sheet 1 of

Year 2006

Depth (El)	El	L-1	γ (pcf)	c (psf)	φ (deg)	
0						0
5		CH	100	250	0	
10						
15						14
		PT	80	250	0	
20						20
25		VBO CH	96	400	0	
30						
35						34
40						
		SO CH	96	500	0	
45						
50						
55						54
		UST CH	95	650	0	
60						58
65		ST CH	110	1000	7°	
70						
		de Vde CH	110	0	30°	72
80						80

Use Su/p = 0.28



SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

for

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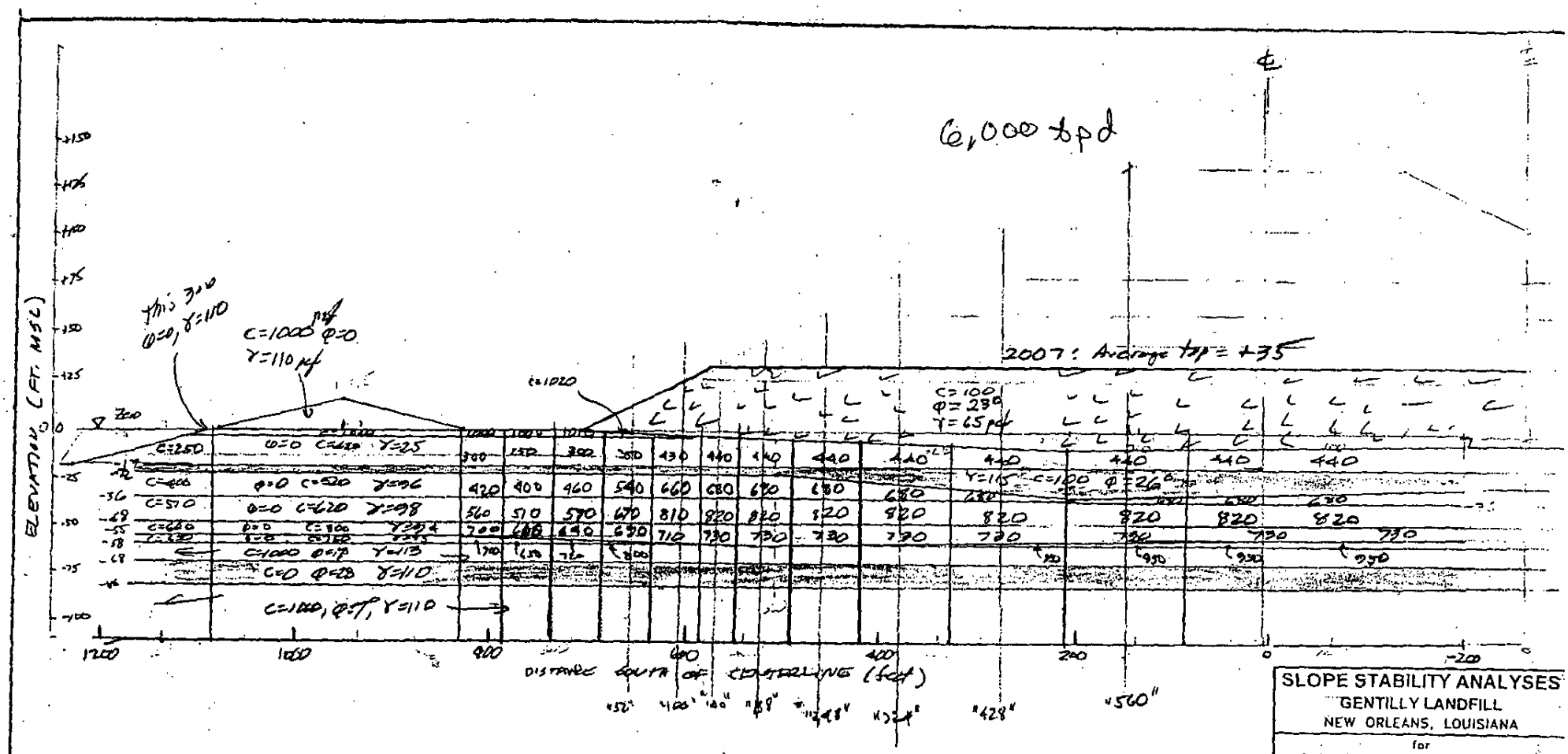
OFFICE OF ENVIRONMENTAL SERVICES
BATON ROUGE, LOUISIANA

STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
G.P. Boutwell	DMS	
File No.: 06-1046	Date: 6-17-06	Figure No.:

Title: STABILITY ANALYSIS
NS-02 1



Note: Vertical Exaggeration 2X

SLOPE STABILITY ANALYSES
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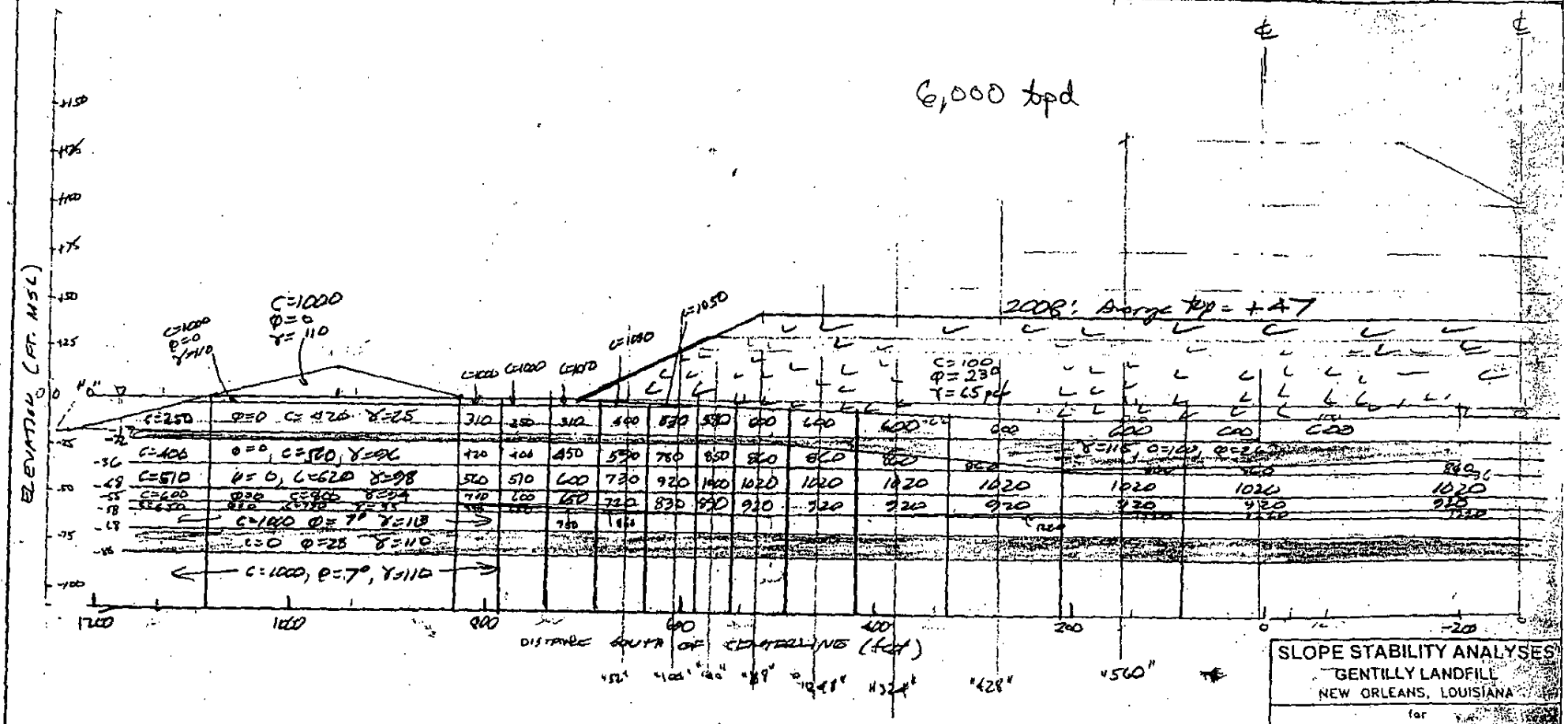
Title: STABILITY ANALYSIS
NS-02 :



Note: Vertical Exaggeration 2X

SLOPE STABILITY ANALYSES
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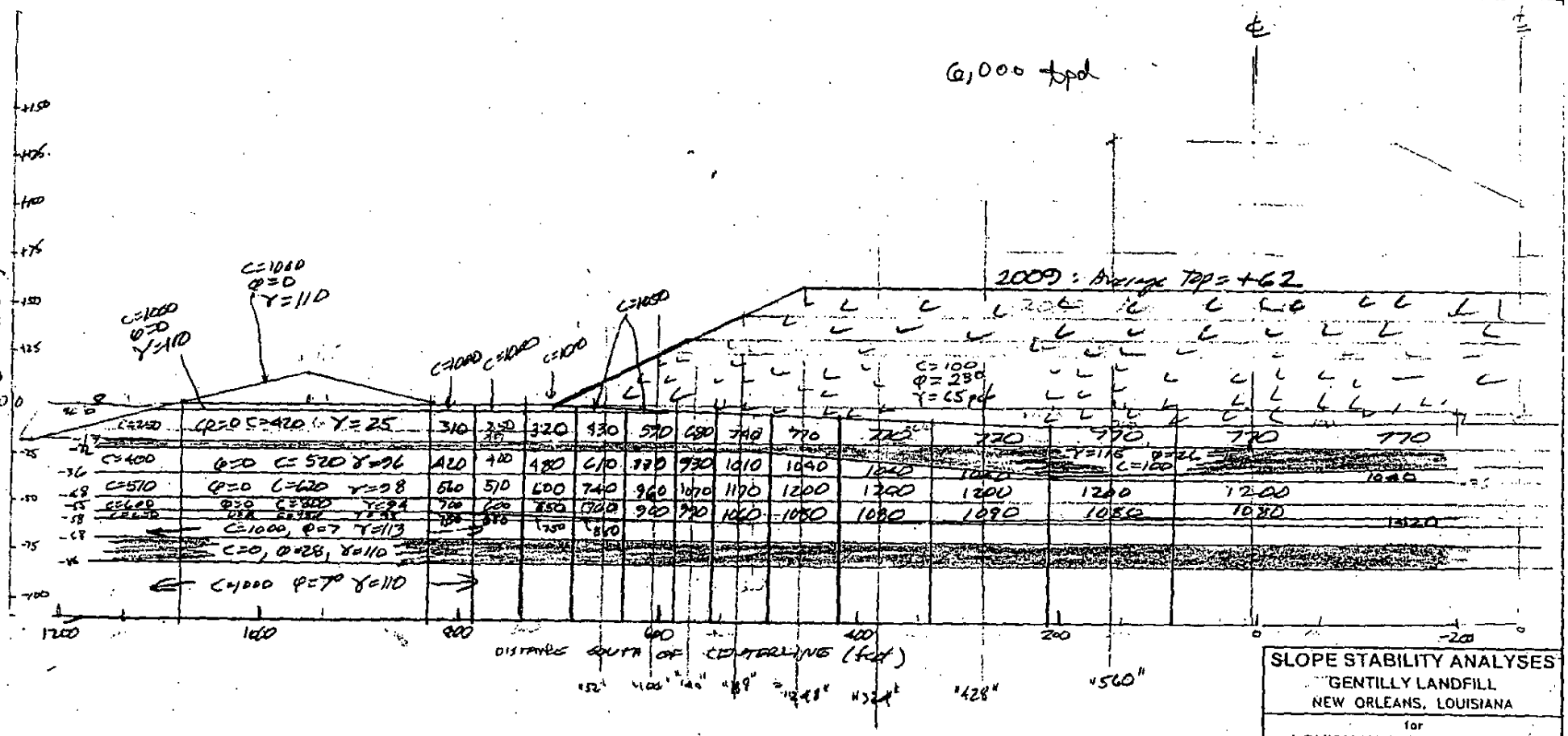
Title: STABILITY ANALYSIS
NS-02 1



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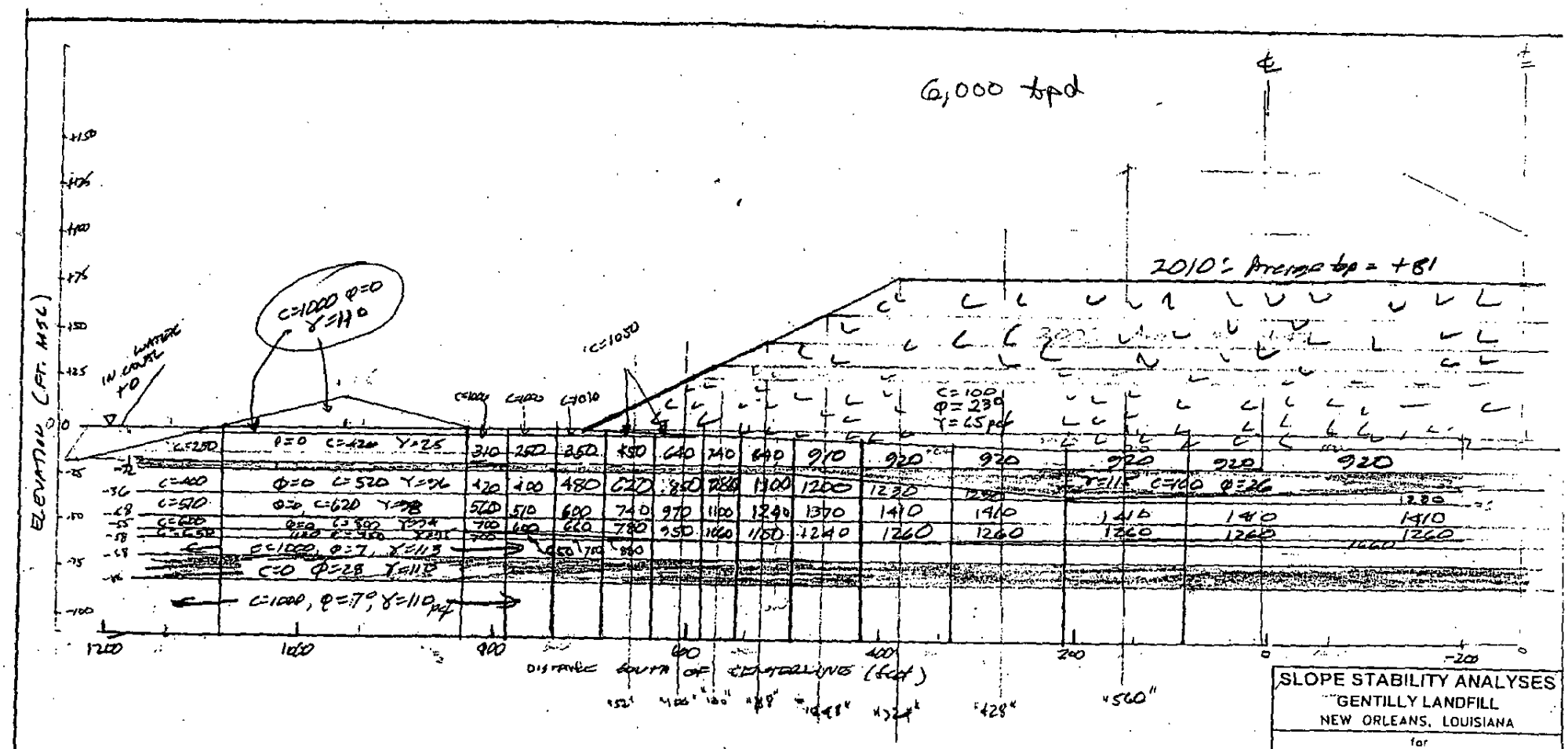
Title: STABILITY ANALYSIS NS-02 1



SLOPE STABILITY ANALYSES
"GENTILLY LANDFILL"
NEW ORLEANS, LOUISIANA

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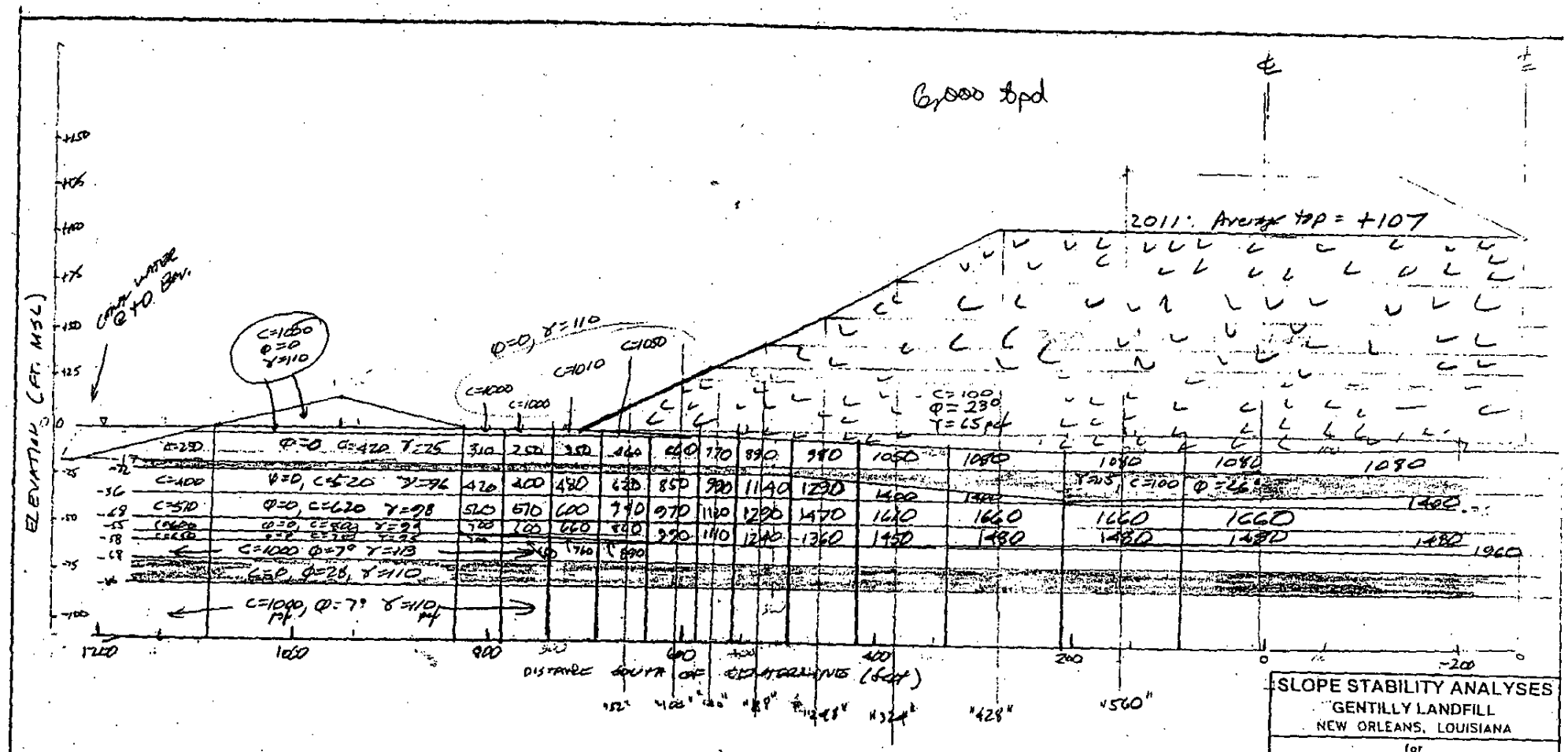
File No.: 06-1046	Date: 6-17-06	Figure No.:

Title: STABILITY ANALYSIS NS-02 8



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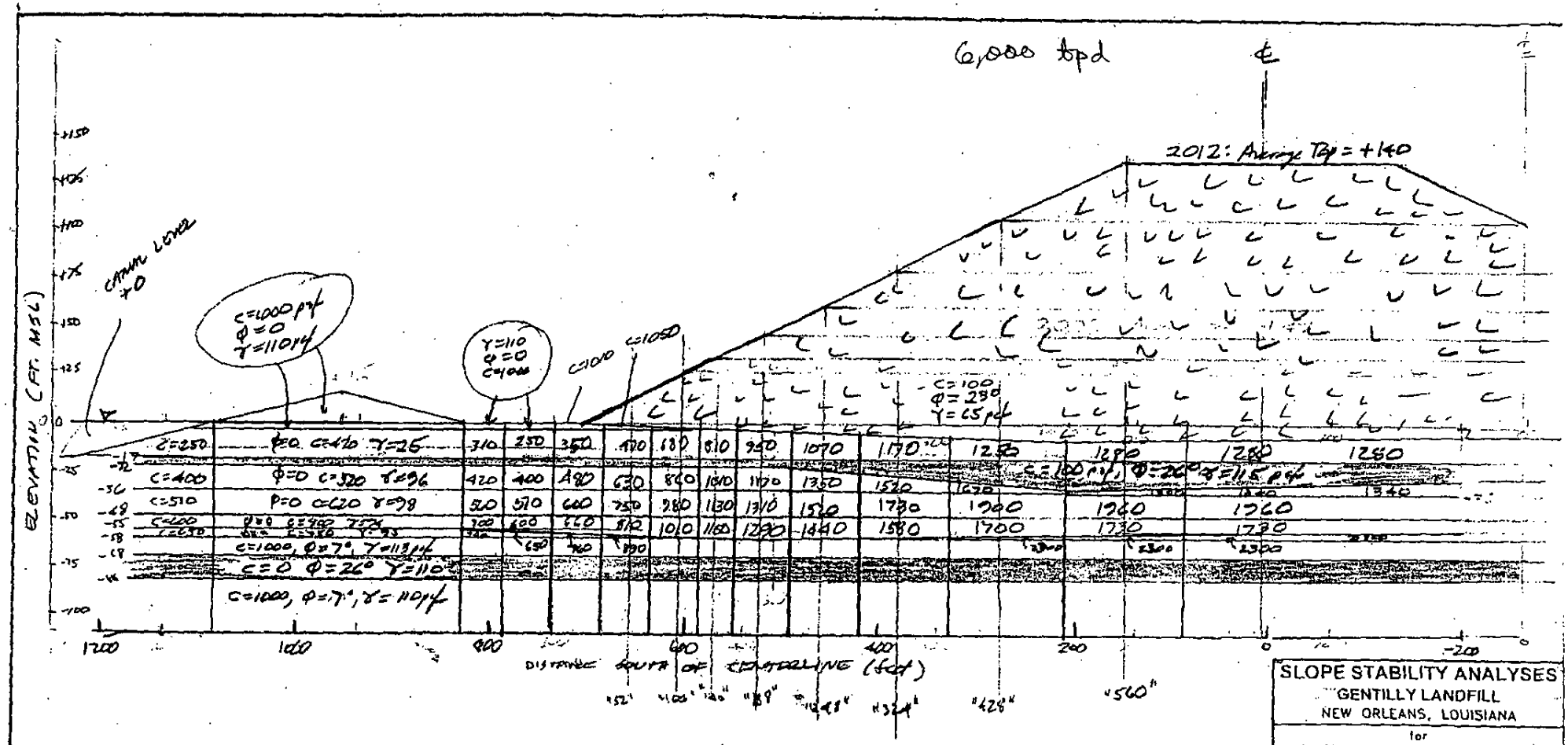
Title: STABILITY ANALYSIS
NS-02'3



Note: Vertical Exaggeration 2X

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

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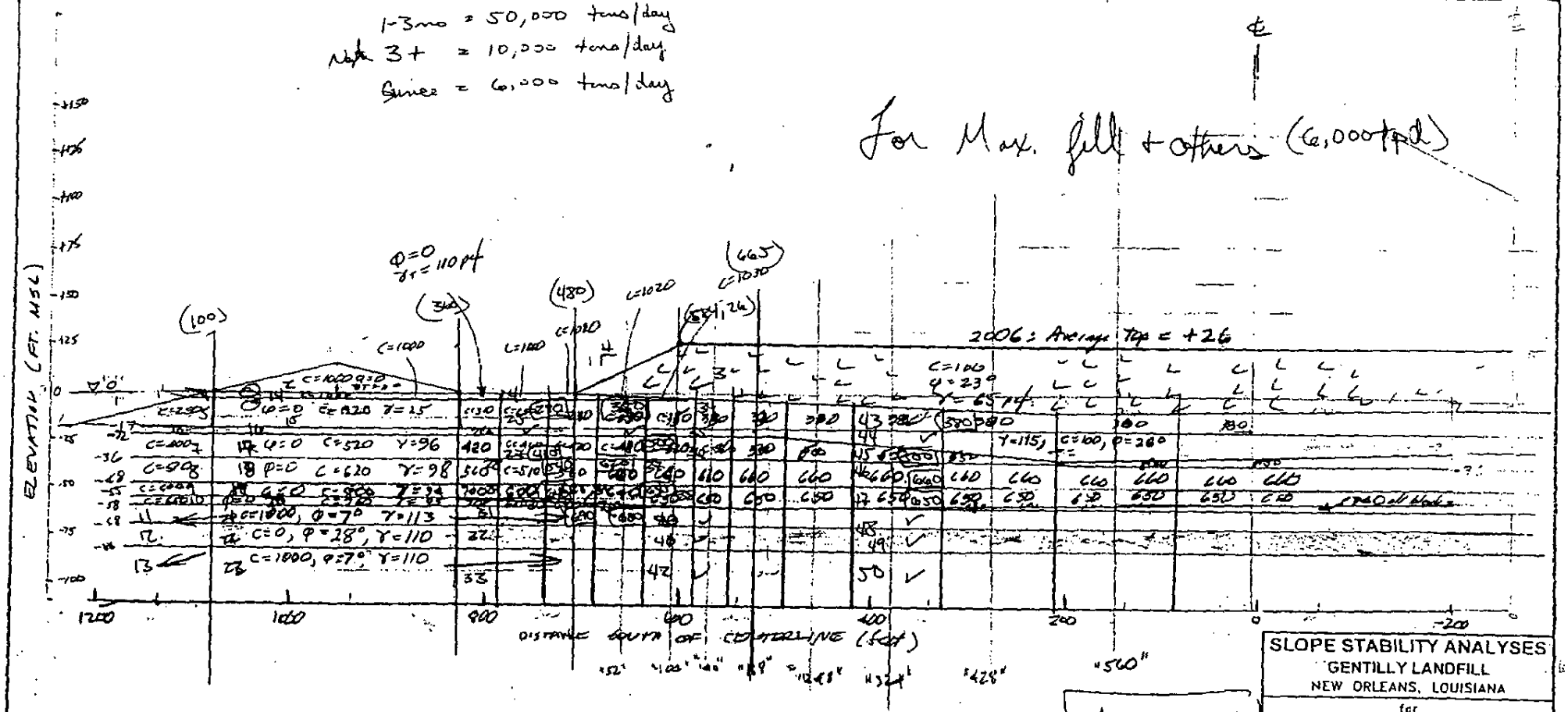
Title: STABILITY ANALYSIS NE-02:

1-3 mo = 50,000 tons/day
North 3+ = 10,000 tons/day
Sunset = 6,000 tons/day

For Max. fill + others (6,000 tpd)



Note: Vertical Exaggeration 2X

1200 = S + 1200 Tan φ
Cu = 1000 φ = 7°

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
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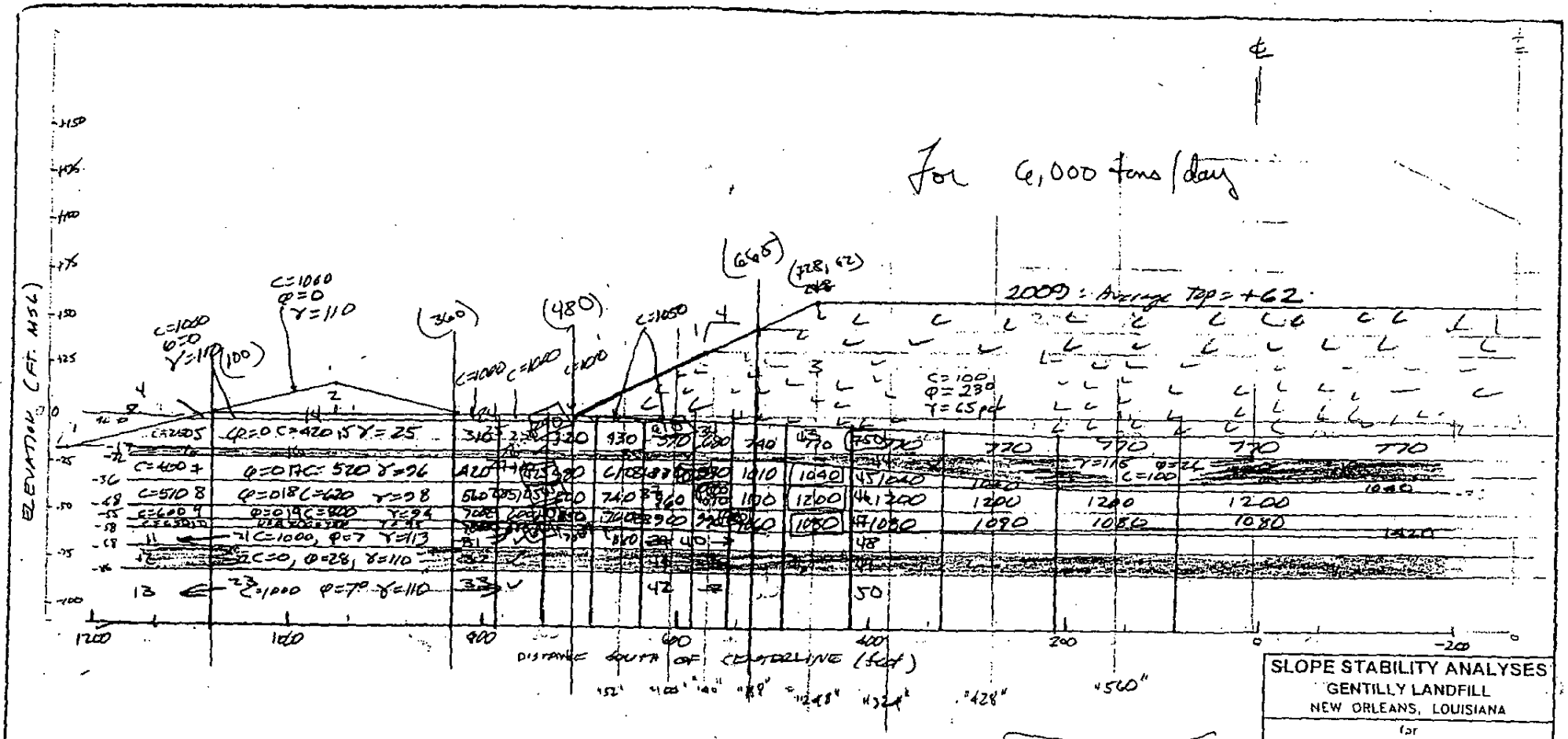
File No.: 06-1046	Date: 6-17-06	Figure No.:

Title: STABILITY ANALYSIS
NS-02 :



Note: Vertical Exaggeration 2X

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
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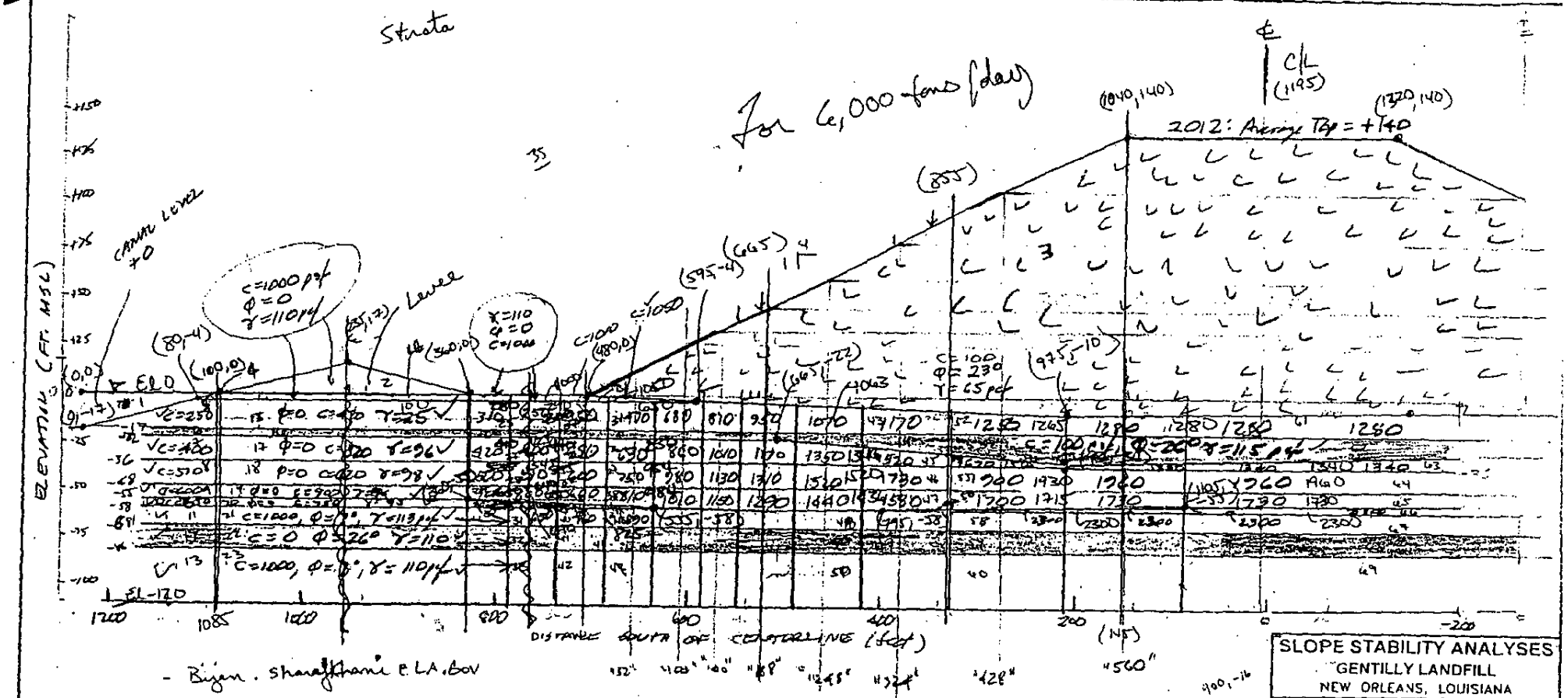
Title: STABILITY ANALYSIS
NS-02 :



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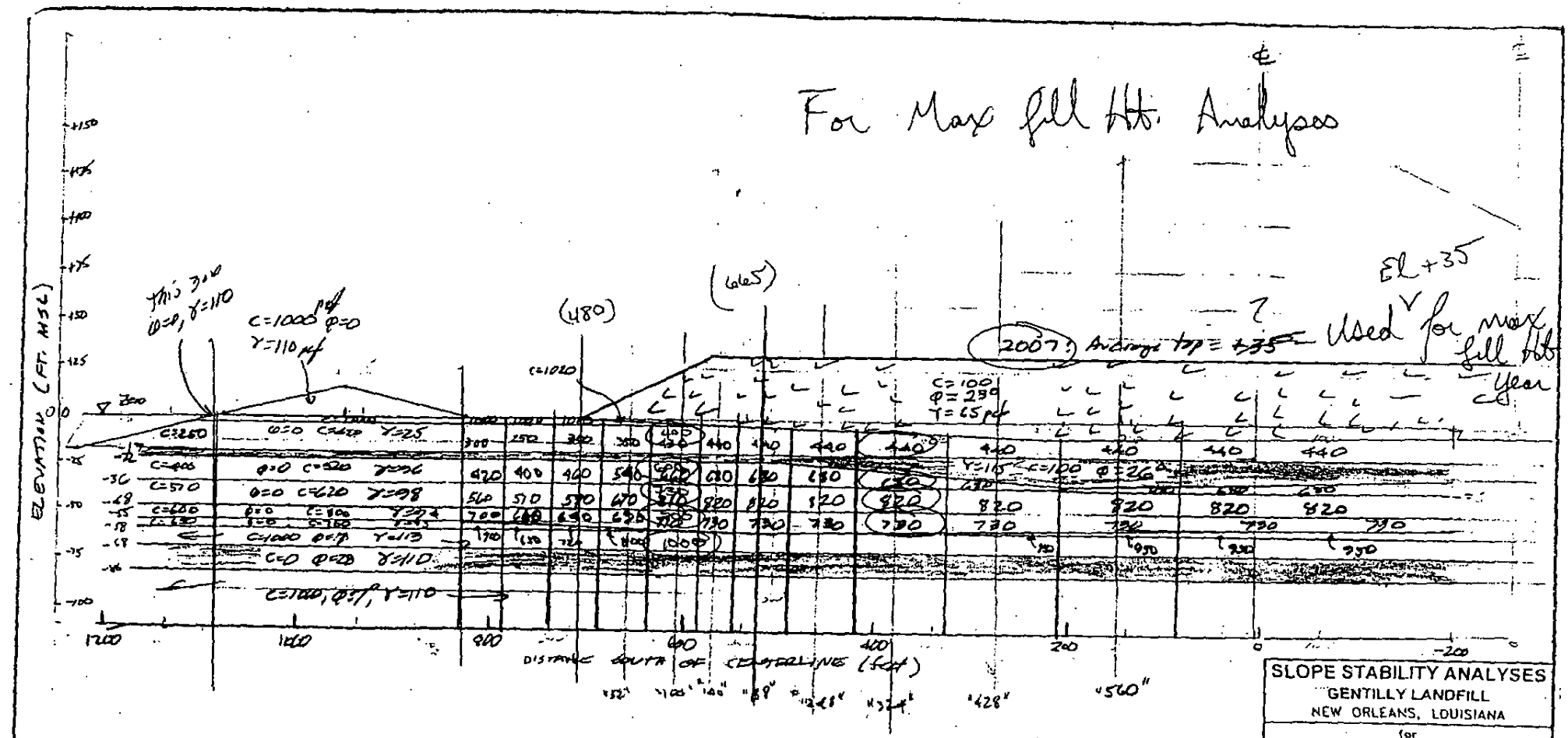
Title: STABILITY ANALYSIS NS-02 :



Note: Vertical Exaggeration 2X

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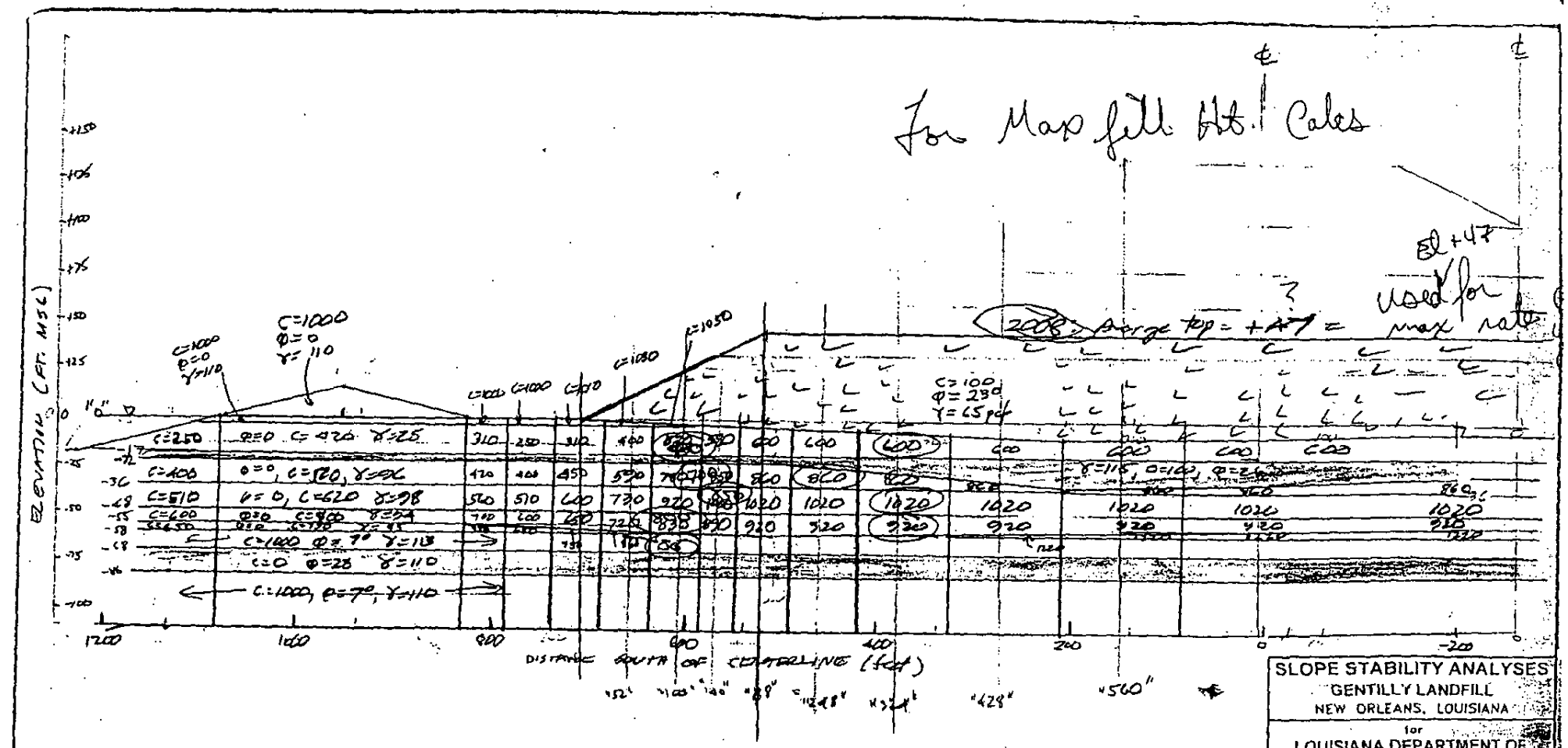

Note: Vertical Exaggeration 2X

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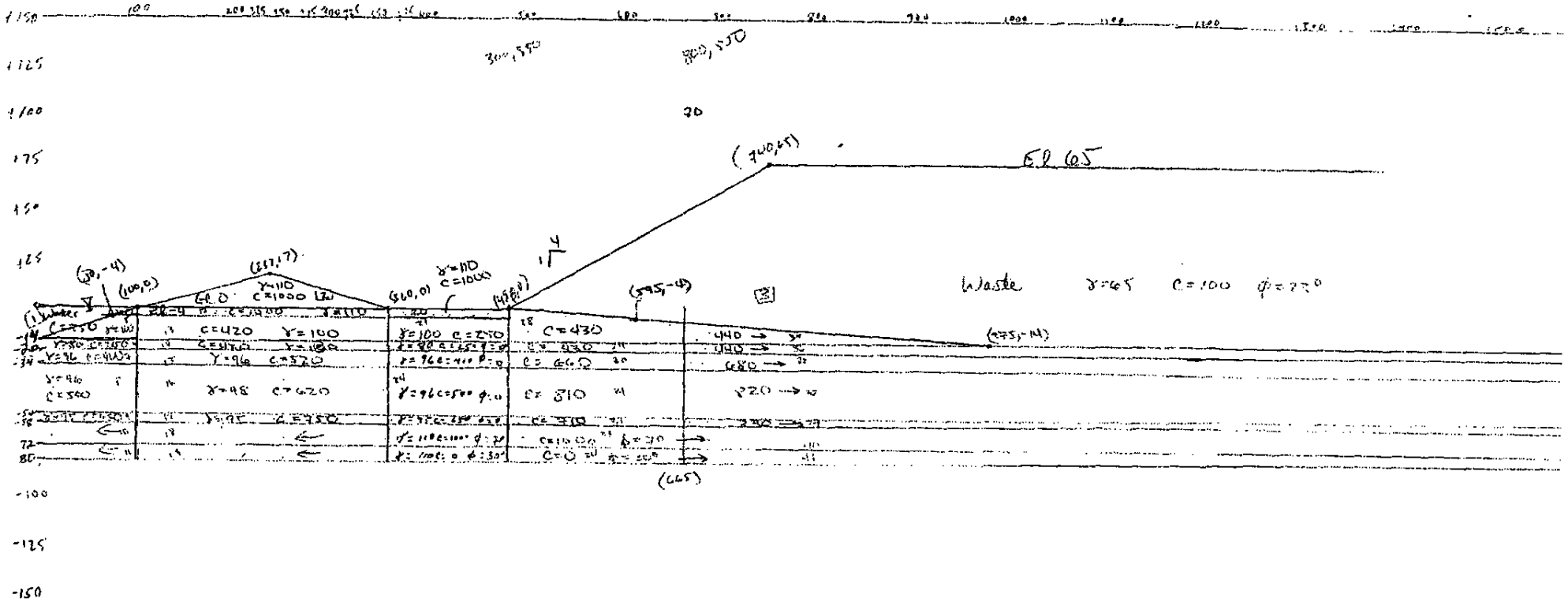
File No.: 06-1046	Date: 6-17-06	Figure:
Title: STABILITY ANALYSIS NS-02		

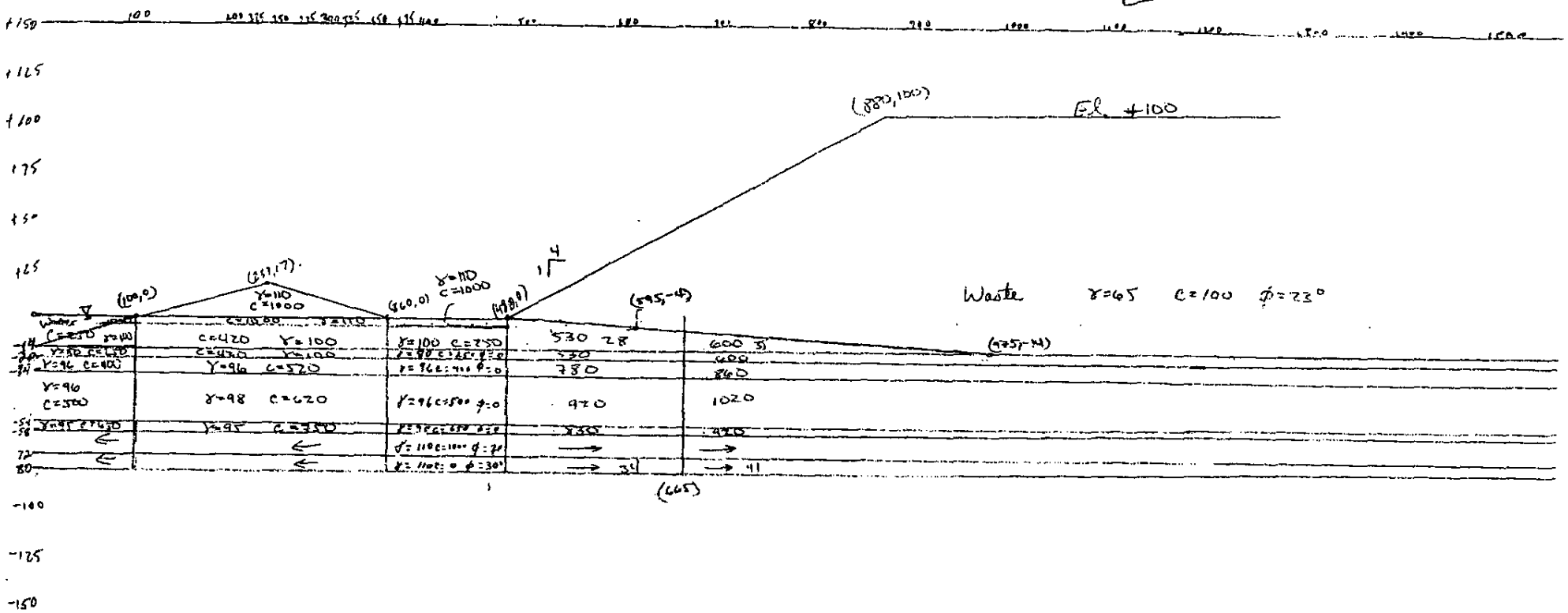


2007
Max. ht. + loading

Used Su/p = 0.28

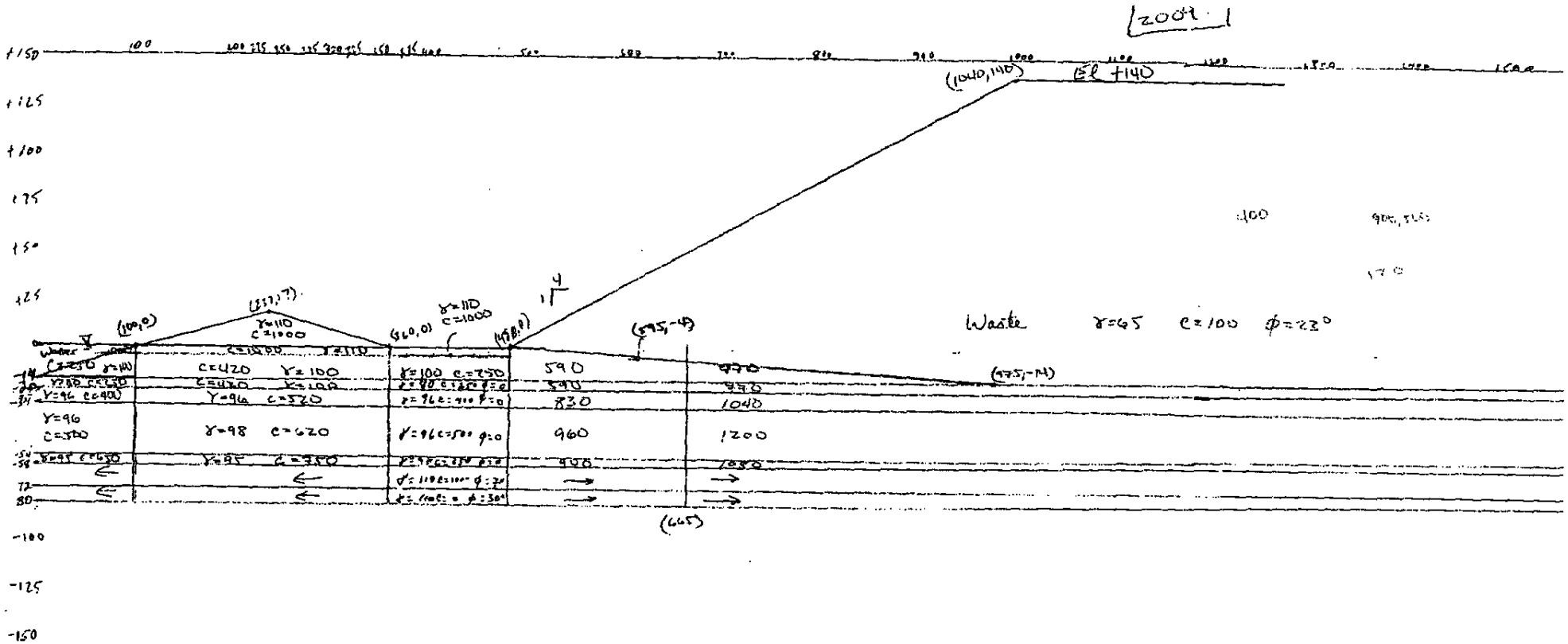
Boring L-1 Conditions

06-1046



2008
Max. Ht + Loading
used Su/p = 0.28
Boring L-1 Condition

06-1046
Gentilly LF



2009
Max. ht + loading
Su/p = 0.28
Boring L-1 Conditions

06-1046
[illegible] LF

Jul 25, 2006 - 9:19am

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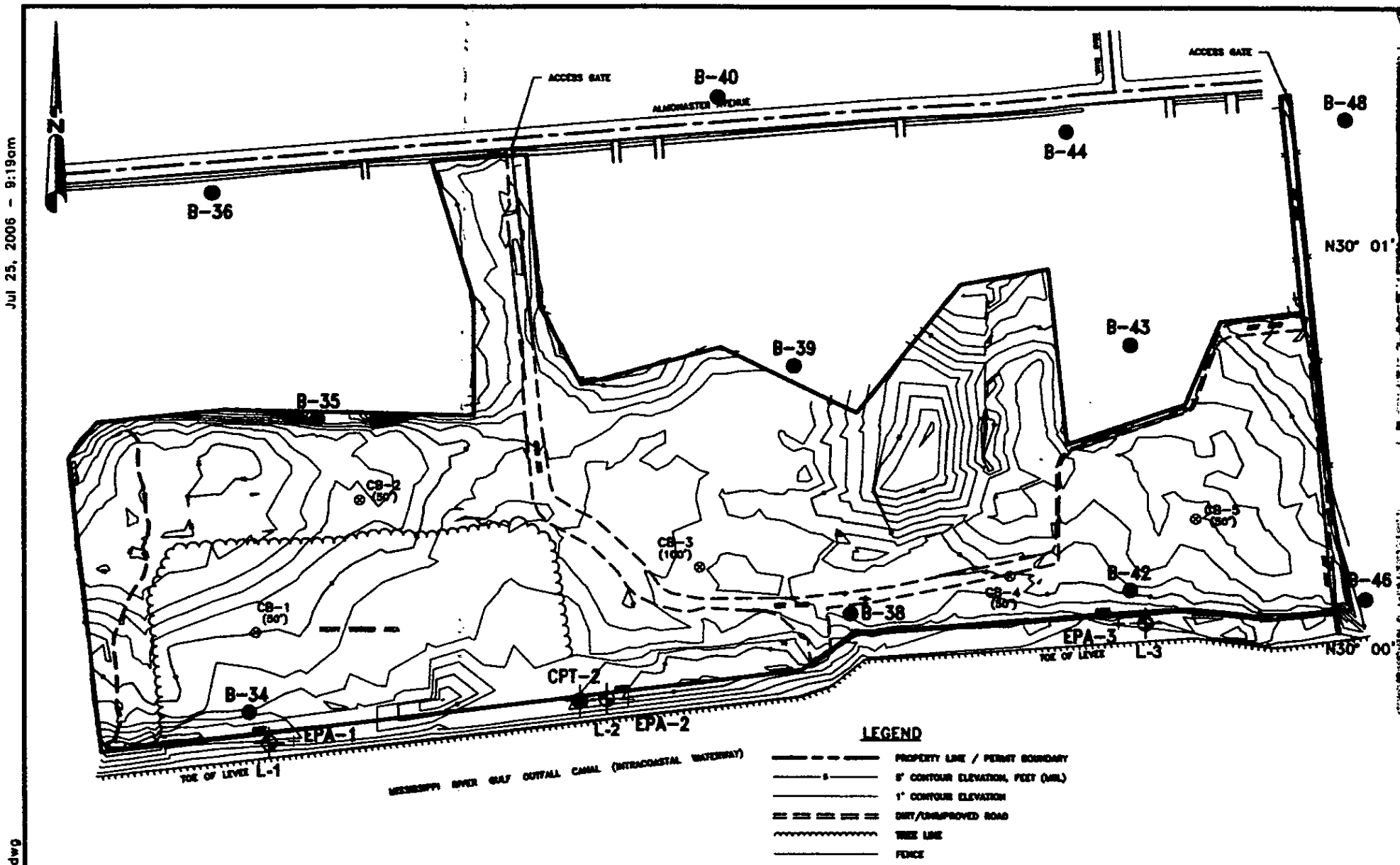

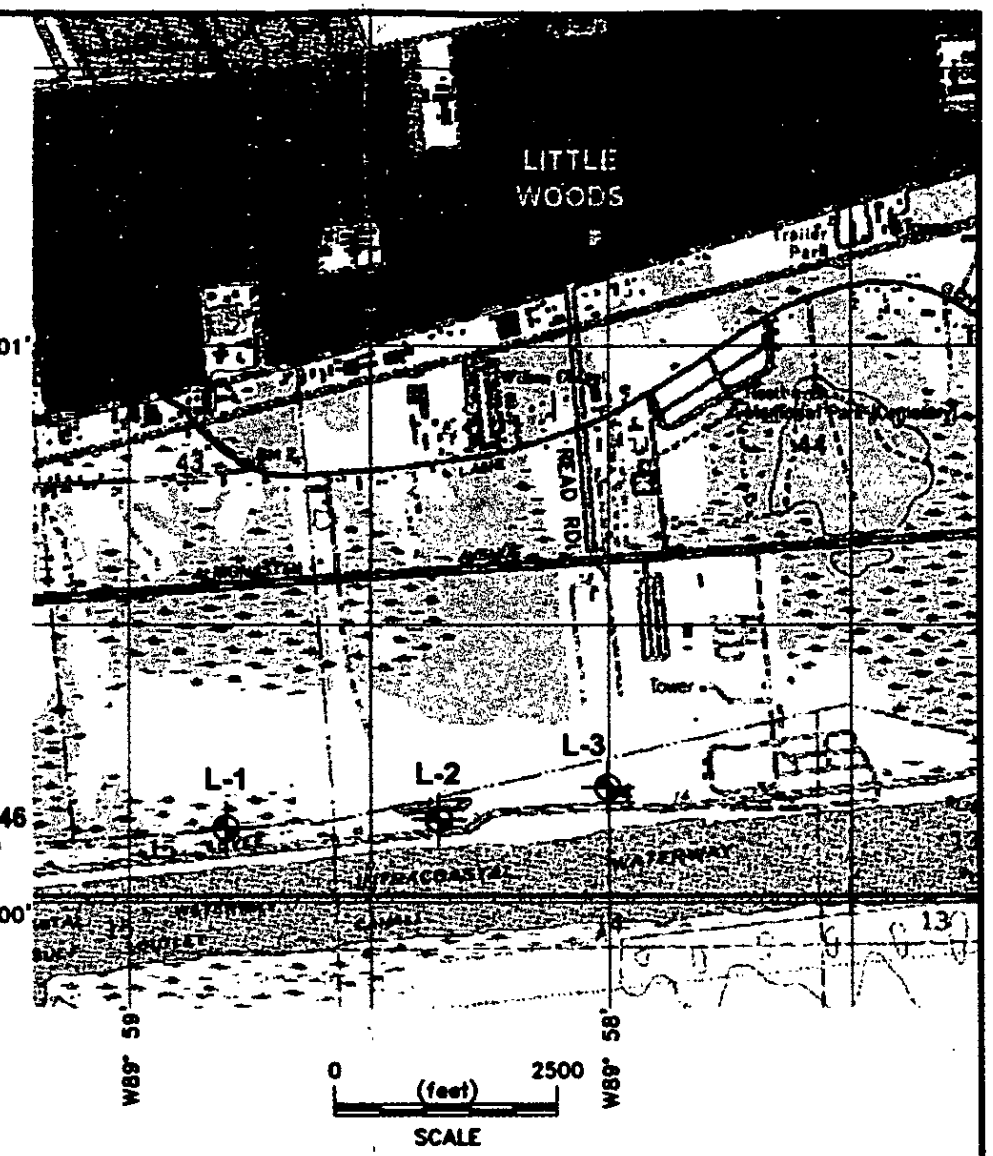

NOTE:
Boring locations are approximate.

0 (feet) 1000
SCALE

BORING DESIGNATIONS	
SYMBOL	DESCRIPTION
●	EUSTIS BORING 1982
⊗	METROPLEX BORING 2002
⊕	STE BORING 2006
⊕	STE ECPT 2006
+	EPA ECPT 2006

REFERENCE:
Boring Plan by Metroplex Industries, Inc., dated 08/2002.

Boring Plan by Eustis Engineering Co. dated March, 1982.

USGS Quadrangle Map of Little Woods, LA, 1994 edition.

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

for
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BATON ROUGE, LOUISIANA

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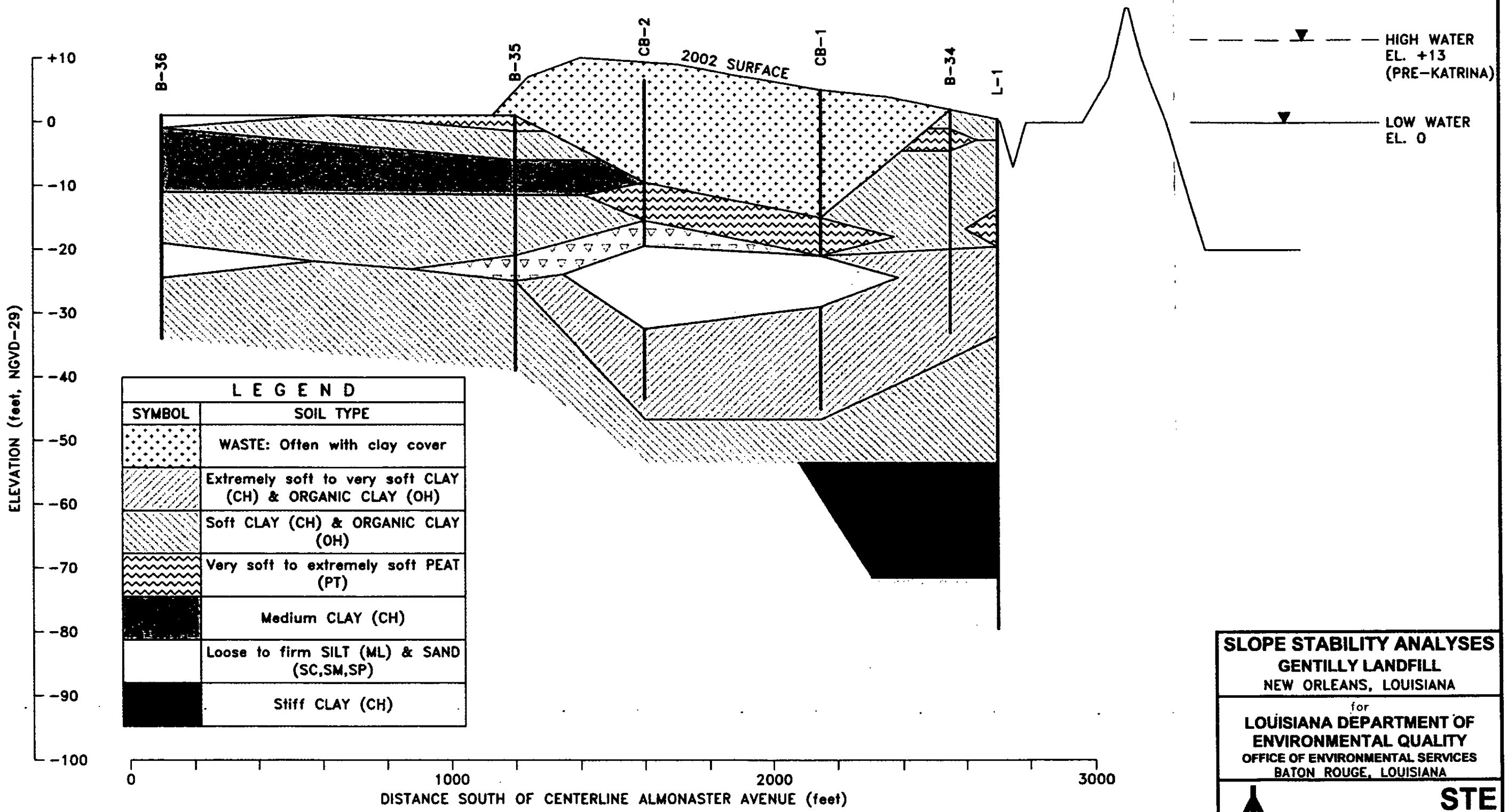
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
G.P. Boutwell	DMS	
File No.: 06-1046	Date: 6-16-06	Figure No.: 1

Title:
BORING PLAN



SOURCES:
Borings & locations: EECO 1982, Metroplex 2004.

Levee sections: USACE fax 16 Feb 06.

SLOPE STABILITY ANALYSES
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06-1046	6-16-06	2

Title: **SOIL PROFILE NS-01**
4800' W OF READ ROAD

Jul 25, 2006 - 9:18am

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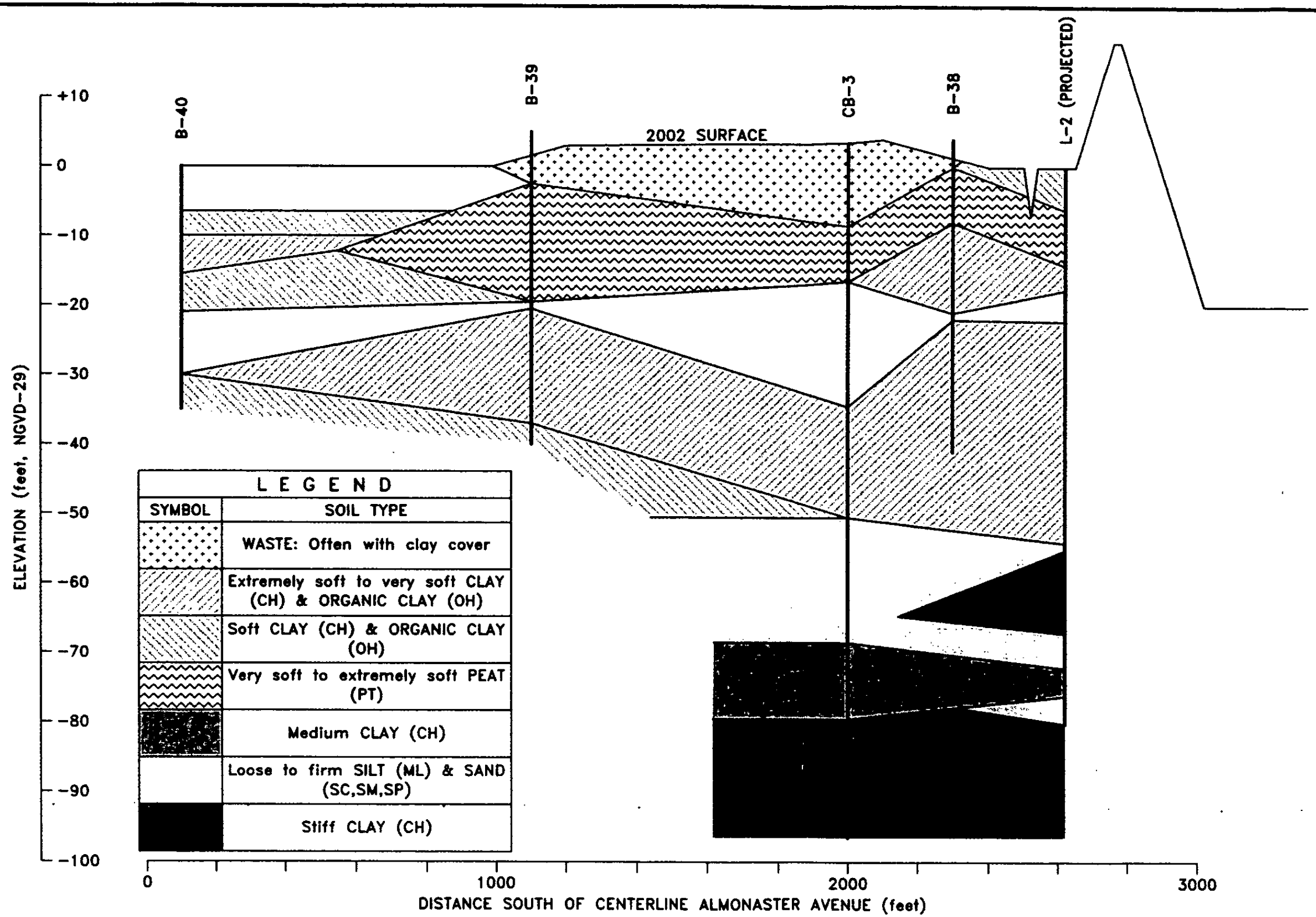

SOURCES:
Borings & locations: EECO 1982, Metroplex 2004.

Levee sections: USACE fax 16 Feb 06.

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

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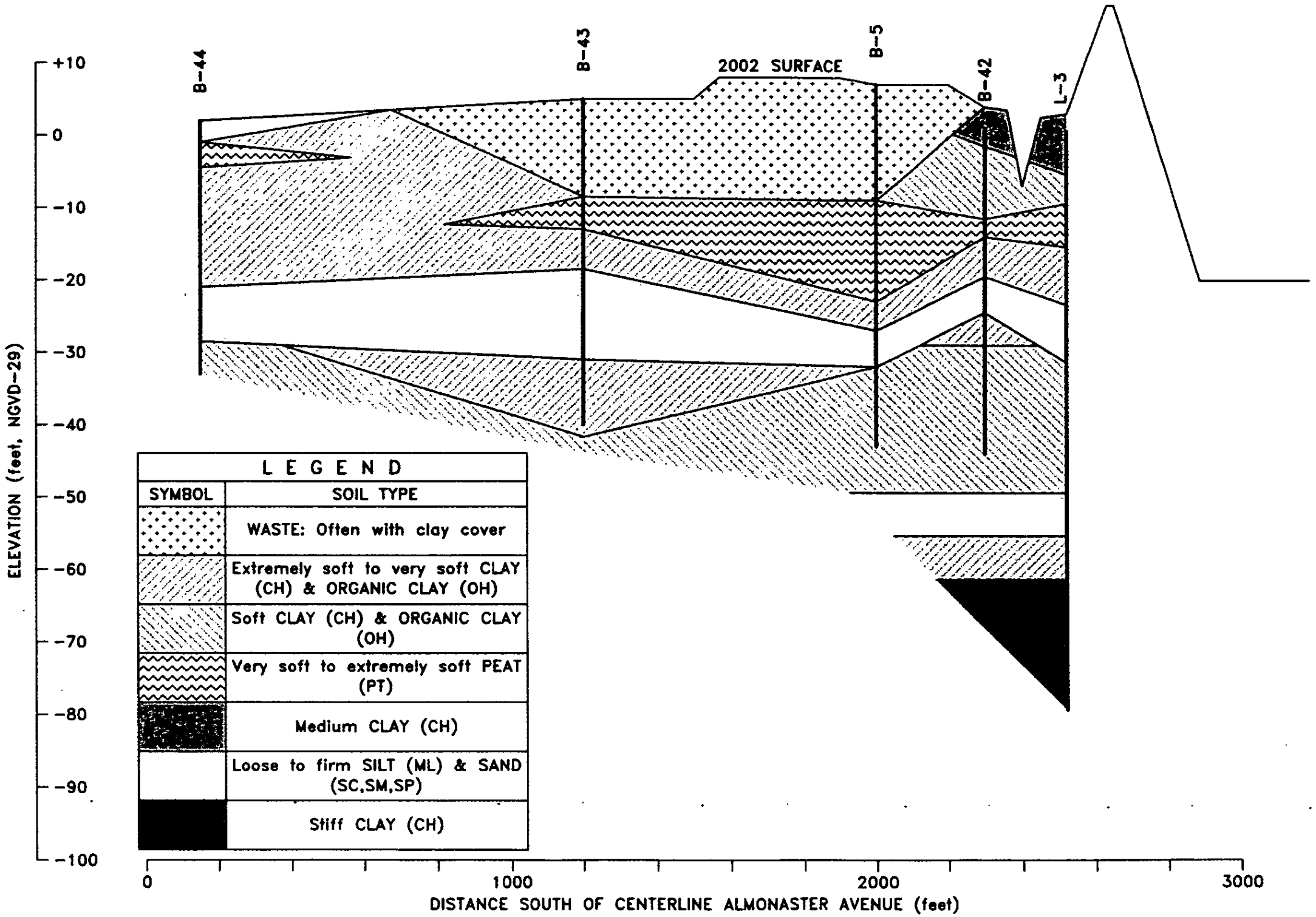
File No.: 06-1046	Date: 6-16-06	Figure No.: 3

Title: **SOIL PROFILE NS-02**
1700' W OF READ ROAD

Jul 25, 2006 - 9:19am

P:\2006\06-1046 Gentilly LF\CADD\061046-03 XSECT NS-02.dwg



LEGEND	
SYMBOL	SOIL TYPE
	WASTE: Often with clay cover
	Extremely soft to very soft CLAY (CH) & ORGANIC CLAY (OH)
	Soft CLAY (CH) & ORGANIC CLAY (OH)
	Very soft to extremely soft PEAT (PT)
	Medium CLAY (CH)
	Loose to firm SILT (ML) & SAND (SC,SM,SP)
	Stiff CLAY (CH)

SOURCES:
Borings & locations: EECO 1982, Metroplex 2004.

Levee sections: USACE fax 16 Feb 06.

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

for

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL SERVICES
BATON ROUGE, LOUISIANA

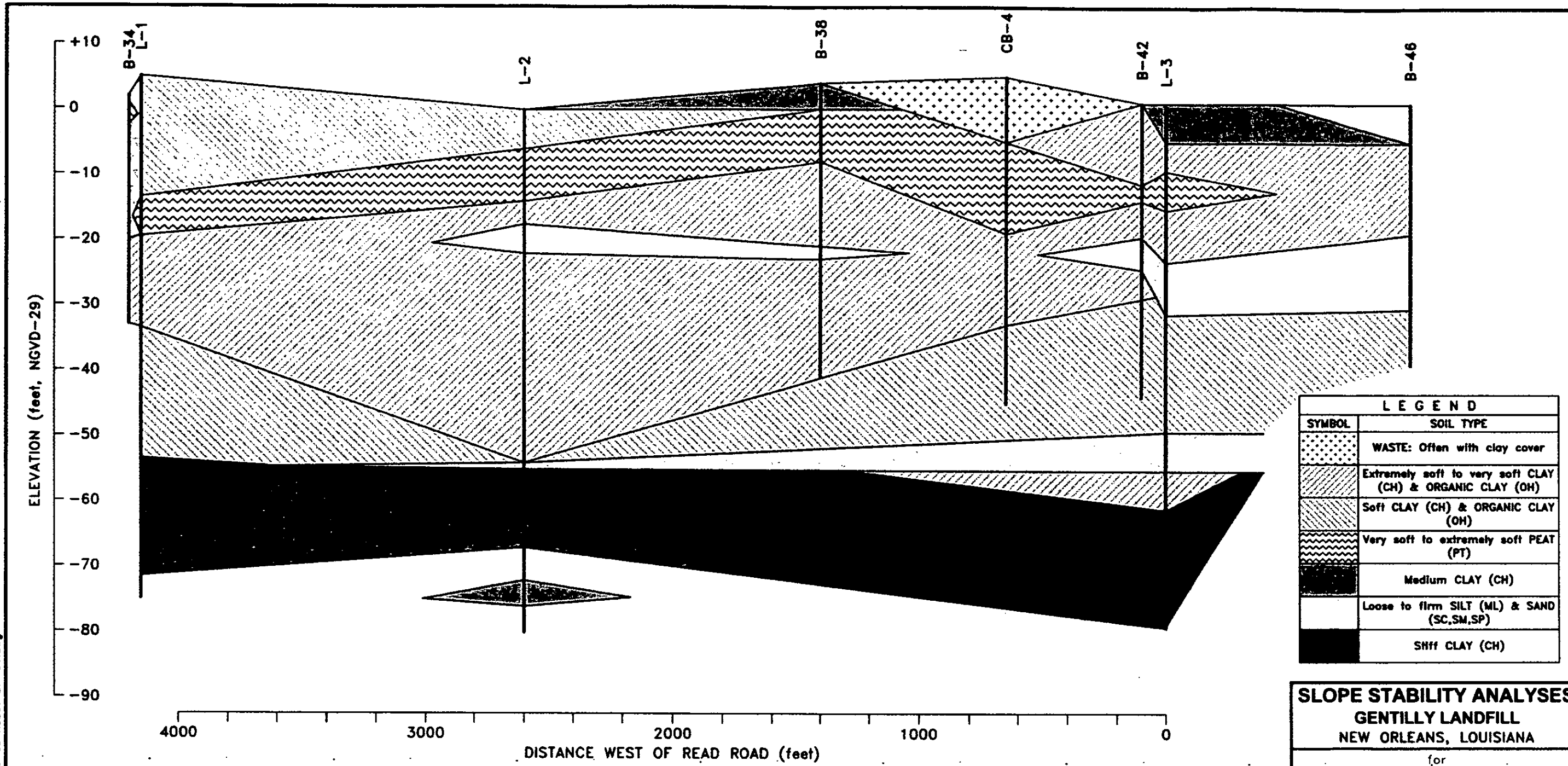
STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
G.P. Boutwell	DMS	
File No.: 06-1046	Date: 6-16-06	Figure No.: 4

Title: **SOIL PROFILE NS-03**
0' W OF READ ROAD

Jul 25, 2006 - 9:20am

P:\2006\06-1046 Gentilly LF\CADD\061046-04 XSECT NS-03.dwg



LEGEND	
SYMBOL	SOIL TYPE
	WASTE: Often with clay cover
	Extremely soft to very soft CLAY (CH) & ORGANIC CLAY (OH)
	Soft CLAY (CH) & ORGANIC CLAY (OH)
	Very soft to extremely soft PEAT (PT)
	Medium CLAY (CH)
	Loose to firm SILT (ML) & SAND (SC,SM,SP)
	Stiff CLAY (CH)

SOURCES:
Borings & locations: EECO 1982, Metroplex 2004.

Levee sections: USACE fax 16 Feb 06.

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

for

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL SERVICES
BATON ROUGE, LOUISIANA

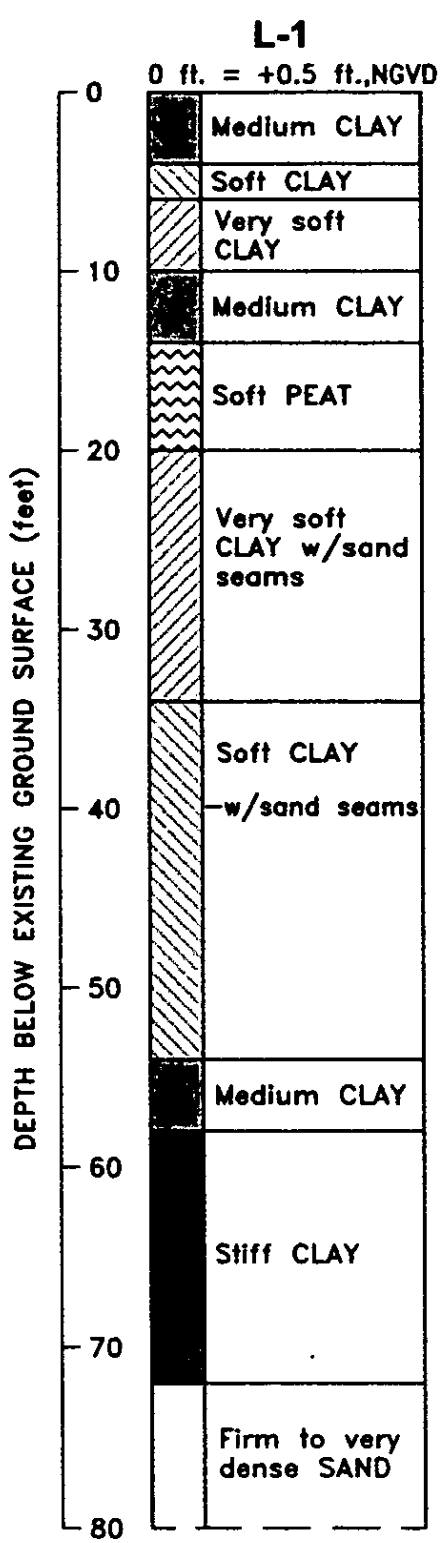
STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
G.P. Boutwell	DMS	
File No.:	Date:	Figure No.:
06-1046	6-16-06	5

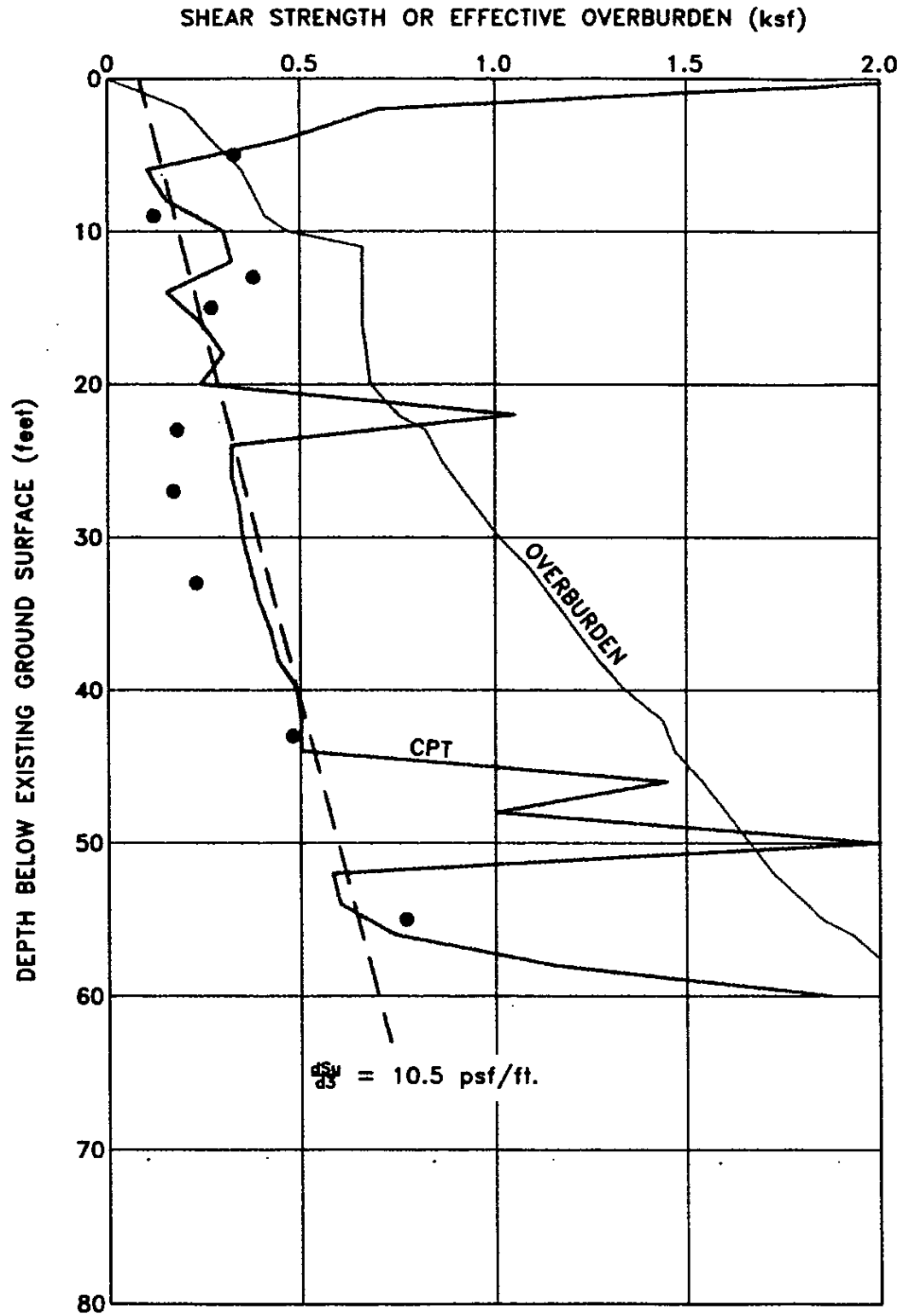
Title: **SOIL PROFILE EW-01 ALONG CANAL SIDE**

Jul 25, 2006 - 9:20am

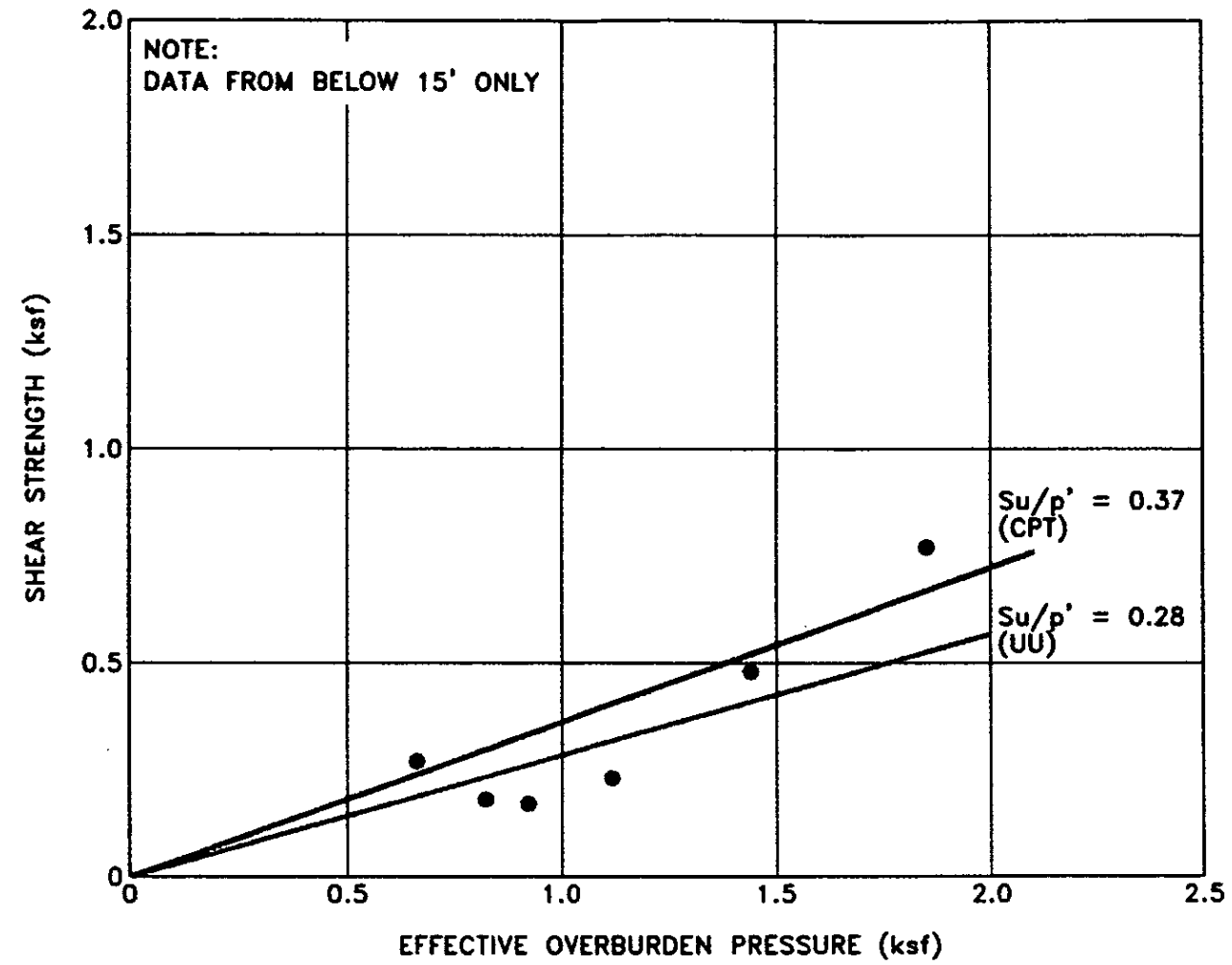
P:\2006\06-1046 Gentilly LF\CADD\061046-05 XSECT EW-01.dwg



SOIL TYPES



SOIL STRENGTH PROFILE



LEGEND	
SYMBOL	DESCRIPTION
———	SHEAR STRENGTH BY CPT
●	SHEAR STRENGTH BY UU TRIAXIAL
	SHEAR STRENGTH BY DIRECT SIMPLE SHEAR
———	EFFECTIVE OVERBURDEN

NOTE:
CPT and DSS data furnished by USEPA.

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

for

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL SERVICES
BATON ROUGE, LOUISIANA

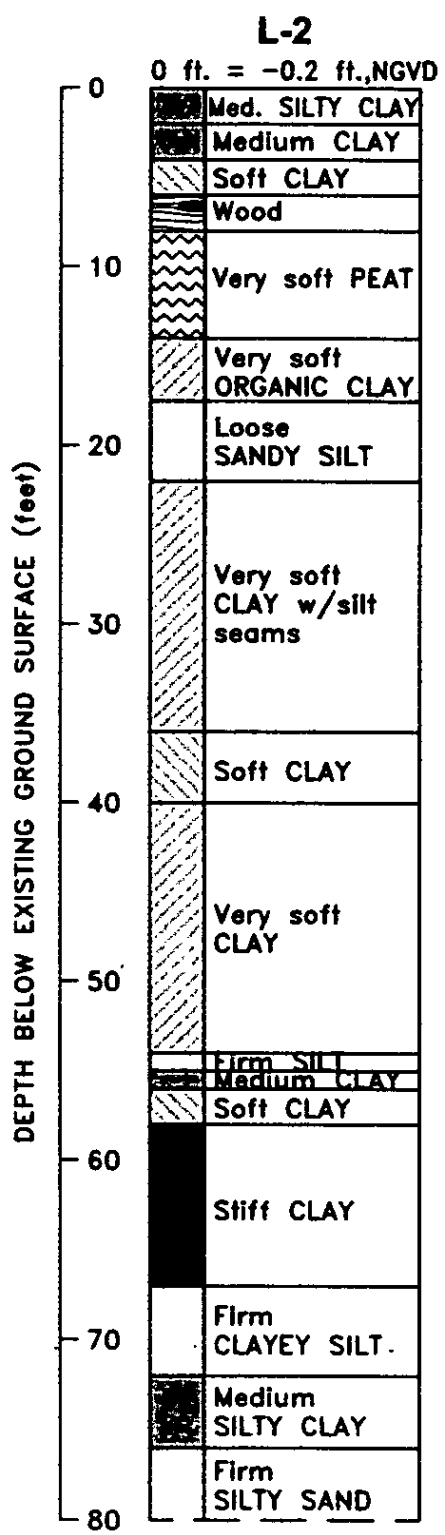
STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
G.P. Boutwell	DMS	[signature]
File No.: 06-1046	Date: 6-17-06	Figure No.: 6

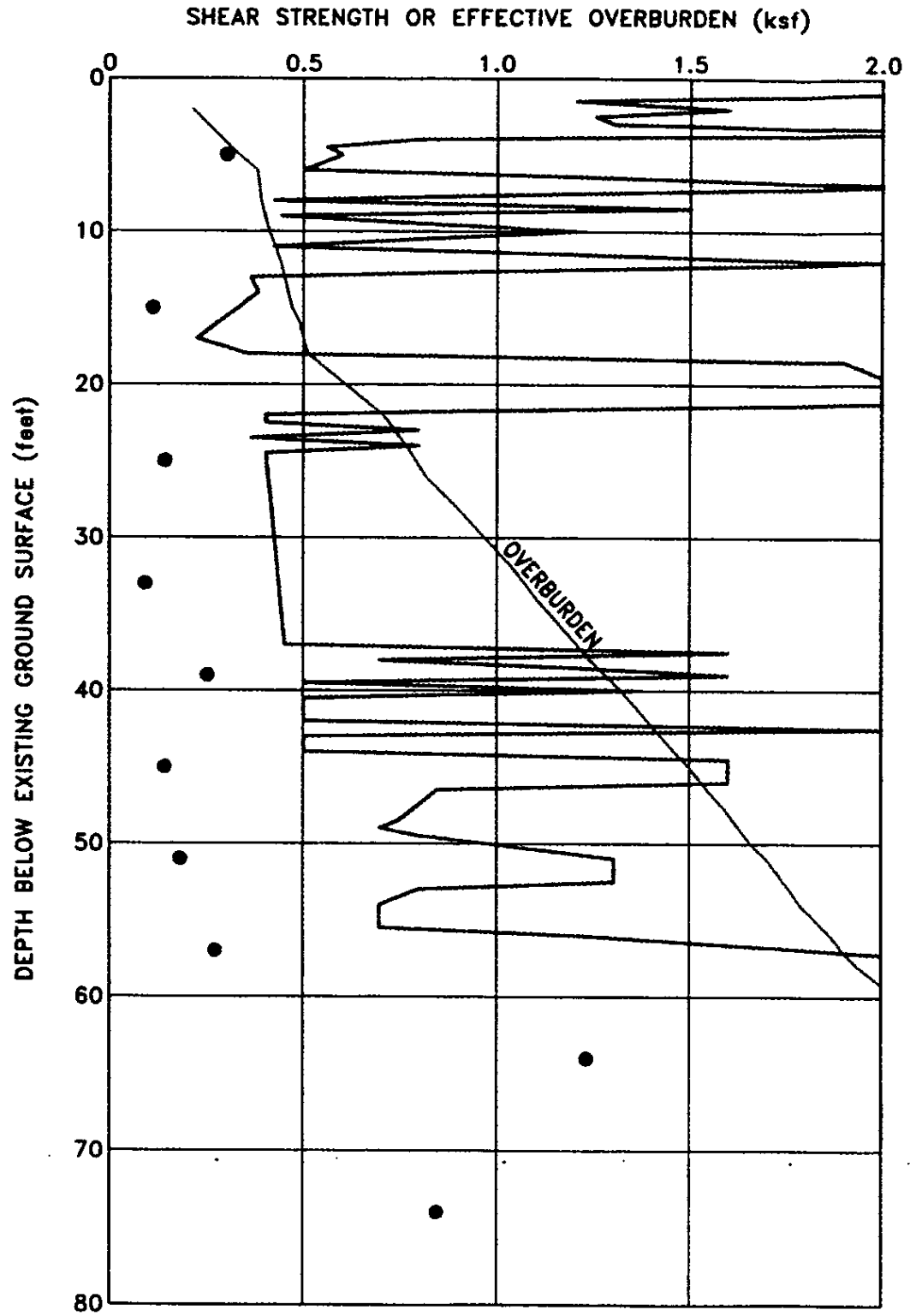
Title: **STRENGTH DATA BORING L-1**

Jul 25, 2006 - 9:21am

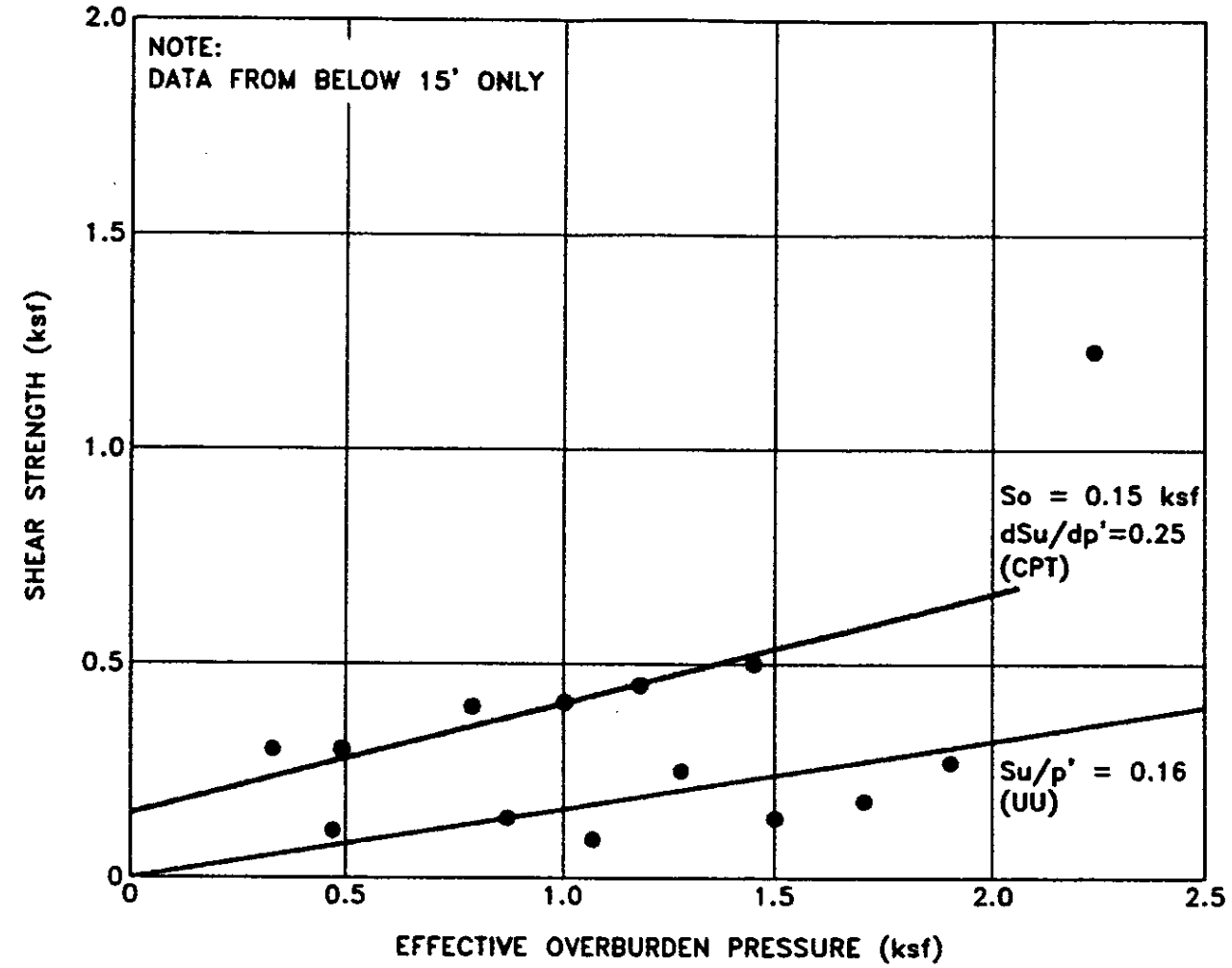
P:\2006\06-1046 Gentilly LF\CADD\061046-06 Strength L-1.dwg



SOIL TYPES



SOIL STRENGTH PROFILE



LEGEND	
SYMBOL	DESCRIPTION
———	SHEAR STRENGTH BY CPT
●	SHEAR STRENGTH BY UU TRIAXIAL
	SHEAR STRENGTH BY DIRECT SIMPLE SHEAR
———	EFFECTIVE OVERBURDEN

NOTE:
DSS data furnished by USEPA.

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

for

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL SERVICES
BATON ROUGE, LOUISIANA

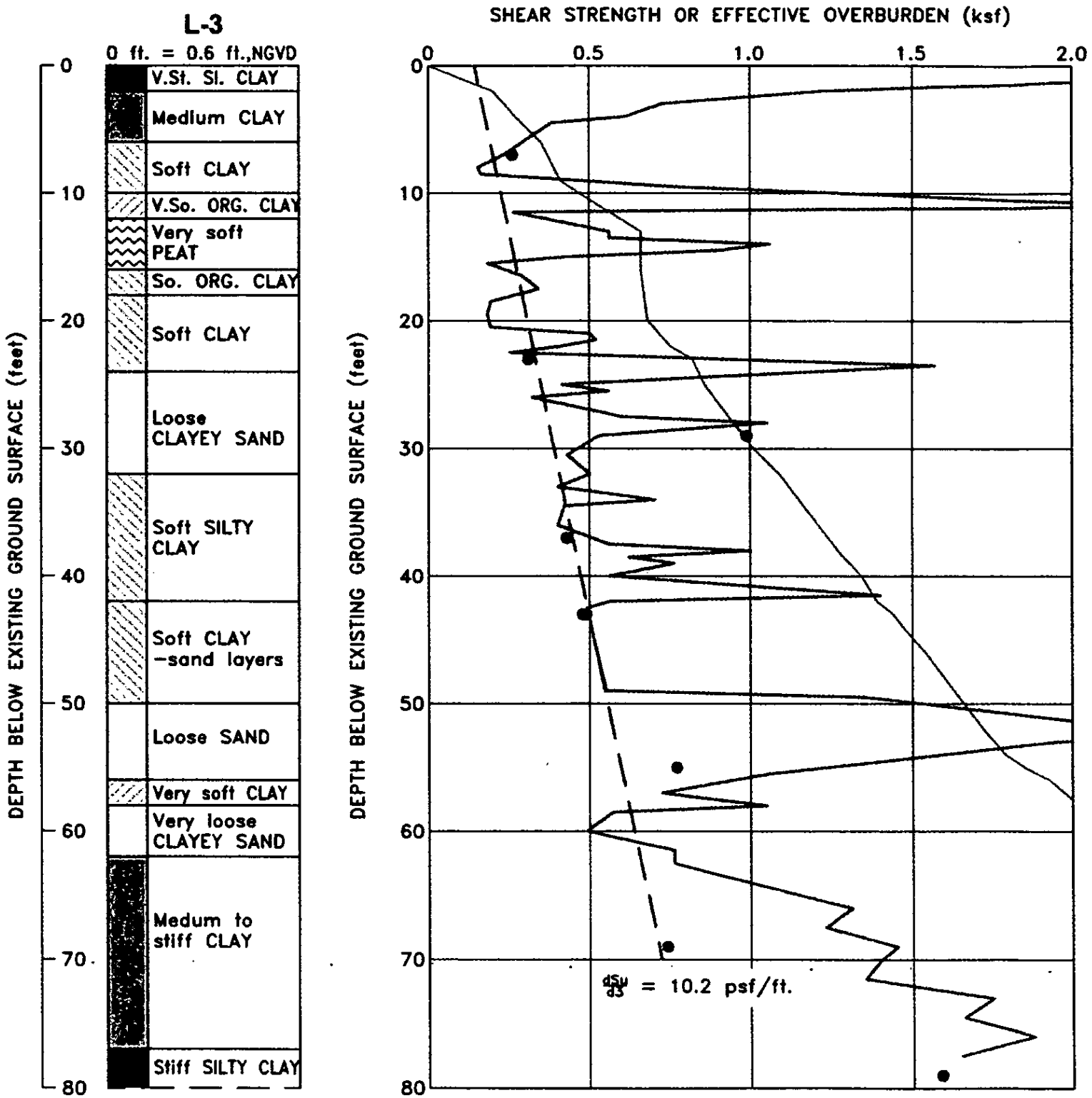
STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
G.P. Boutwell	DMS	
File No.: 06-1046	Date: 6-17-06	Figure No.: 7

Title: **STRENGTH DATA BORING L-2**

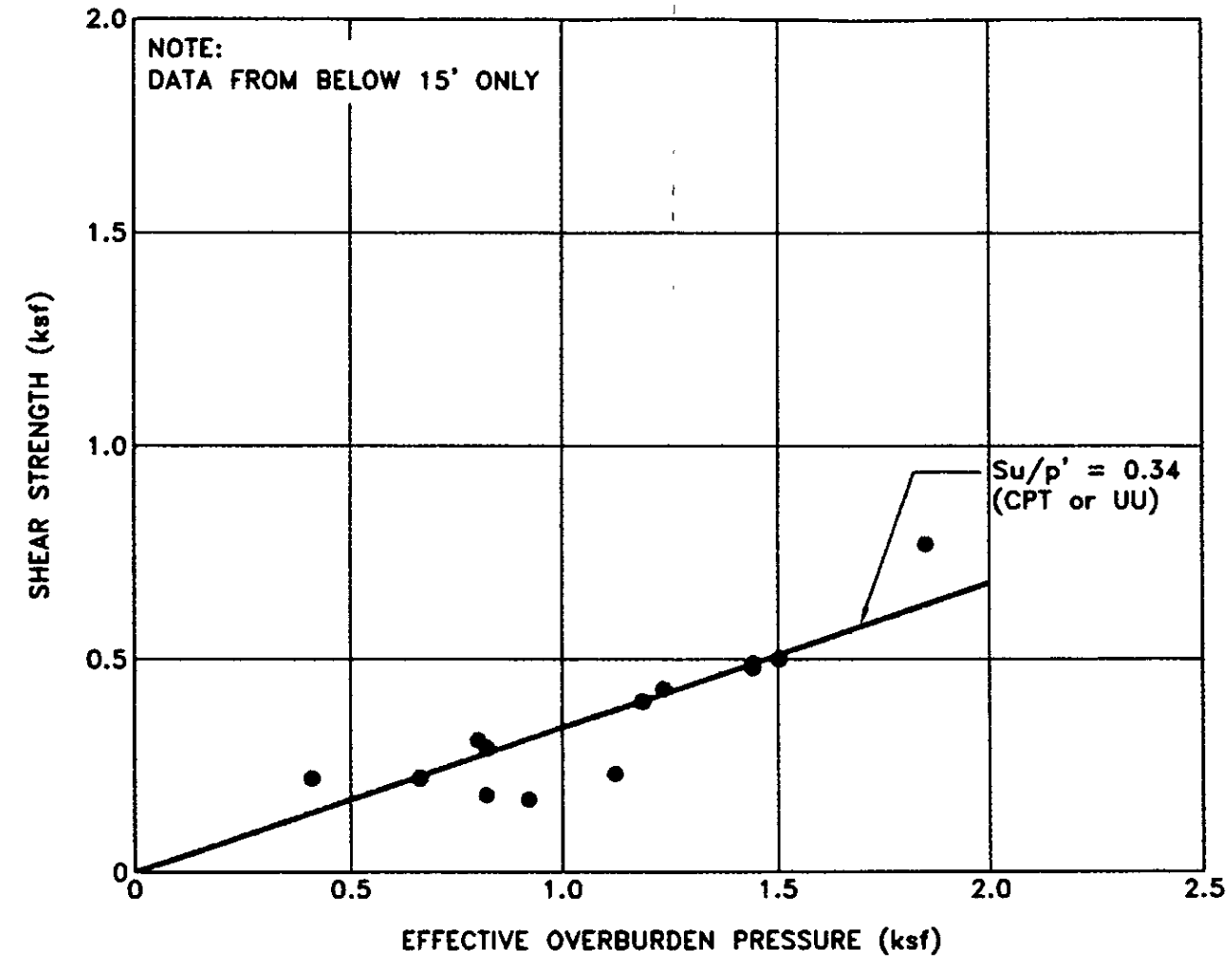
Jul 25, 2006 - 9:21am

P:\2006\06-1046 Gentilly LF\CADD\061046-07 Strength L-2.dwg



SOIL TYPES

SOIL STRENGTH PROFILE



LEGEND	
SYMBOL	DESCRIPTION
———	SHEAR STRENGTH BY CPT
●	SHEAR STRENGTH BY UU TRIAXIAL
	SHEAR STRENGTH BY DIRECT SIMPLE SHEAR
———	EFFECTIVE OVERBURDEN

NOTE:
CPT and DSS data furnished by USEPA.

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

for

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL SERVICES
BATON ROUGE, LOUISIANA

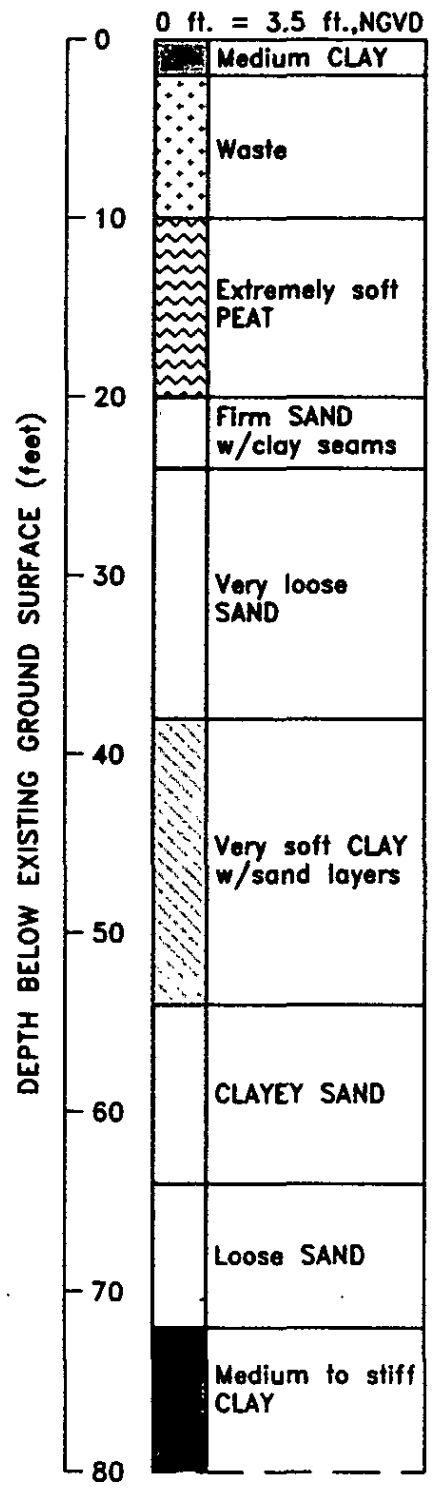
STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
G.P. Boutwell	DMS	
File No.: 06-1046	Date: 6-17-06	Figure No.: 8

Title: **STRENGTH DATA BORING L-3**

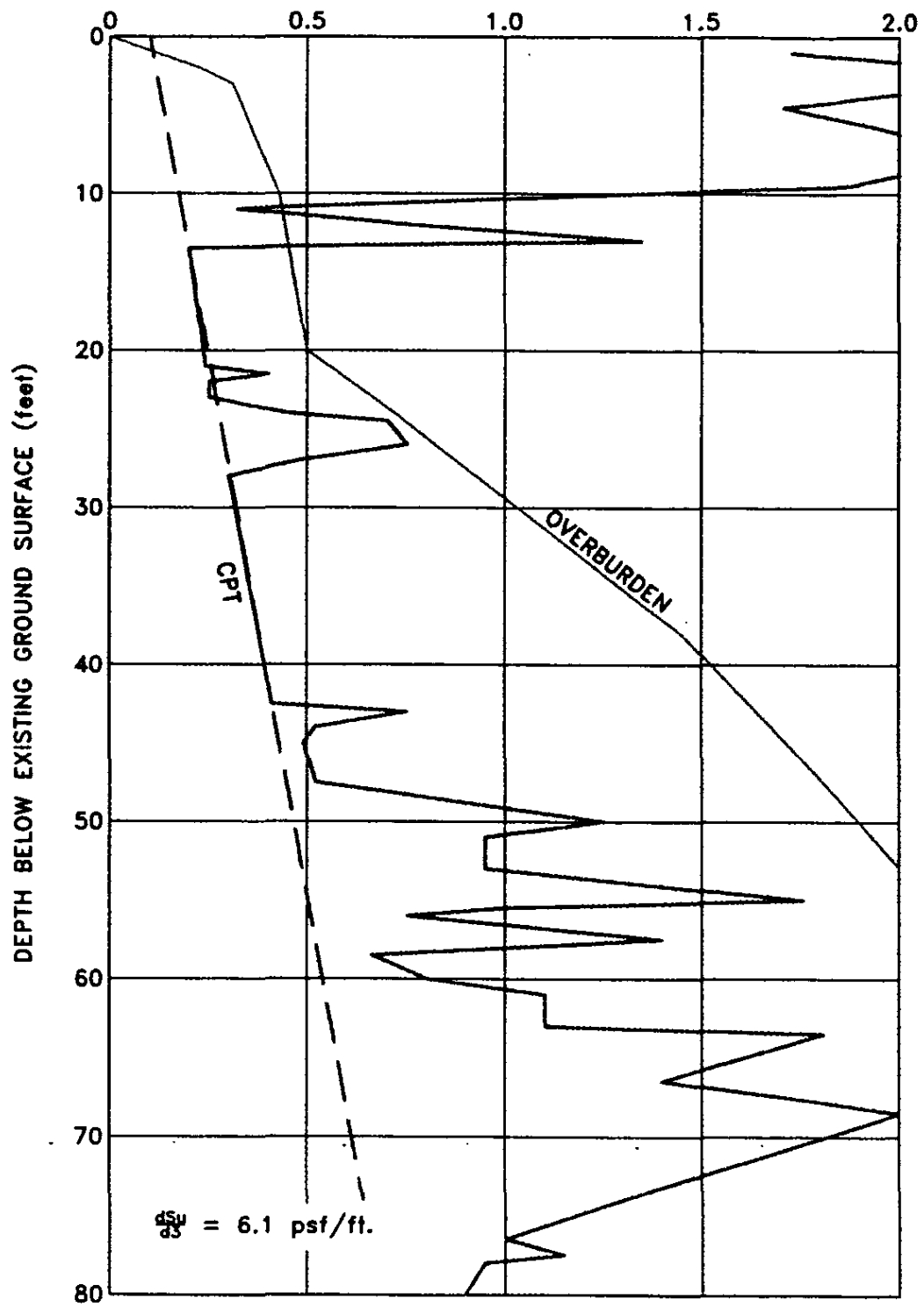
Jul 25, 2006 - 9:22am

P:\2006\06-1046 Gentilly LF\CADD\061046-08 Strength L-3.dwg

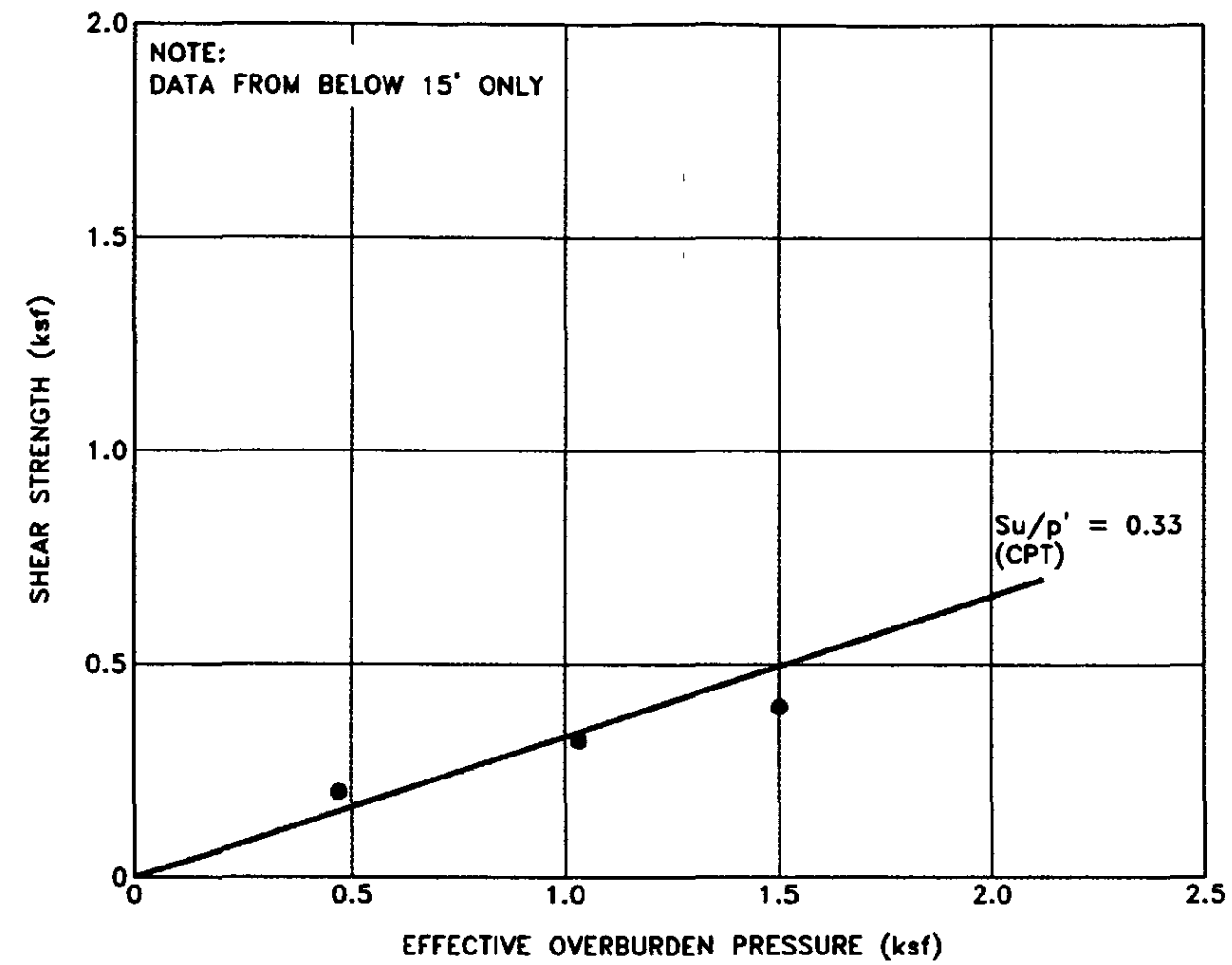


SOIL TYPES

(N): Std. Penetration Resistance (b/f)



SOIL STRENGTH PROFILE



LEGEND	
SYMBOL	DESCRIPTION
———	SHEAR STRENGTH BY CPT
●	SHEAR STRENGTH BY UU TRIAXIAL
	SHEAR STRENGTH BY DIRECT SIMPLE SHEAR
———	EFFECTIVE OVERBURDEN

NOTE:
CPT data furnished by USEPA.
Boring furnished by Metroplex.

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

for

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL SERVICES
BATON ROUGE, LOUISIANA

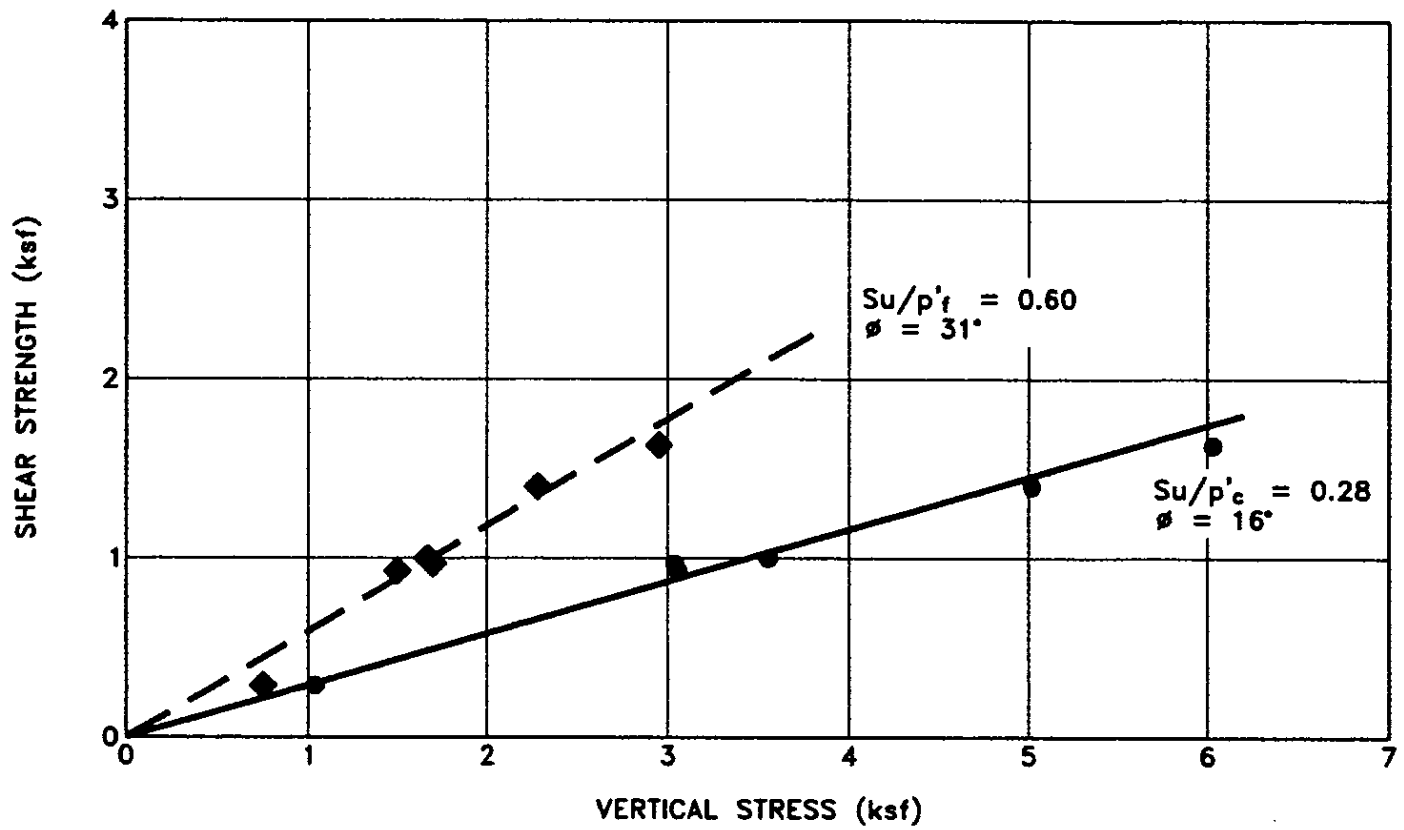
STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
G.P. Boutwell	DMS	CM
File No.: 06-1046	Date: 6-21-06	Figure No.: 9

Title: **STRENGTH DATA BORING CB-3**

Jul 25, 2006 - 9:22am

P:\2006\06-1046 Gentilly LF\CADD\061046-09 Strength CB-3.dwg



BORING NO.	DEPTH (feet)	WATER CONTENT (%)	DRY DENSITY (pcf)	LIQUID LIMIT (%)	VERTICAL EFFECTIVE STRESS (ksf)		SHEAR STRENGTH (ksf)
					CONSOLIDATION	AT FAILURE	
L-1	13.8	180	27	224	1.04	0.75	0.29
L-2	27.8	53	69	54	3.56	1.67	1.00
L-2	47.7	79	52	95	3.04	1.70	0.97
L-3	13.5	64	61	73	3.06	1.50	0.93
L-3	21.8	55	70	57	5.02	2.28	0.40
L-3	47.7	69	57	95	6.03	2.95	1.63

NOTE: Data furnished by USEPA: Water and Density are before consolidation.

SLOPE STABILITY ANALYSES
GENTILLY LANDFILL
NEW ORLEANS, LOUISIANA

for

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL SERVICES
BATON ROUGE, LOUISIANA

STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
G.P. Boutwell	DMS	
File No.: 06-1046	Date: 6-17-06	Figure No.: 10

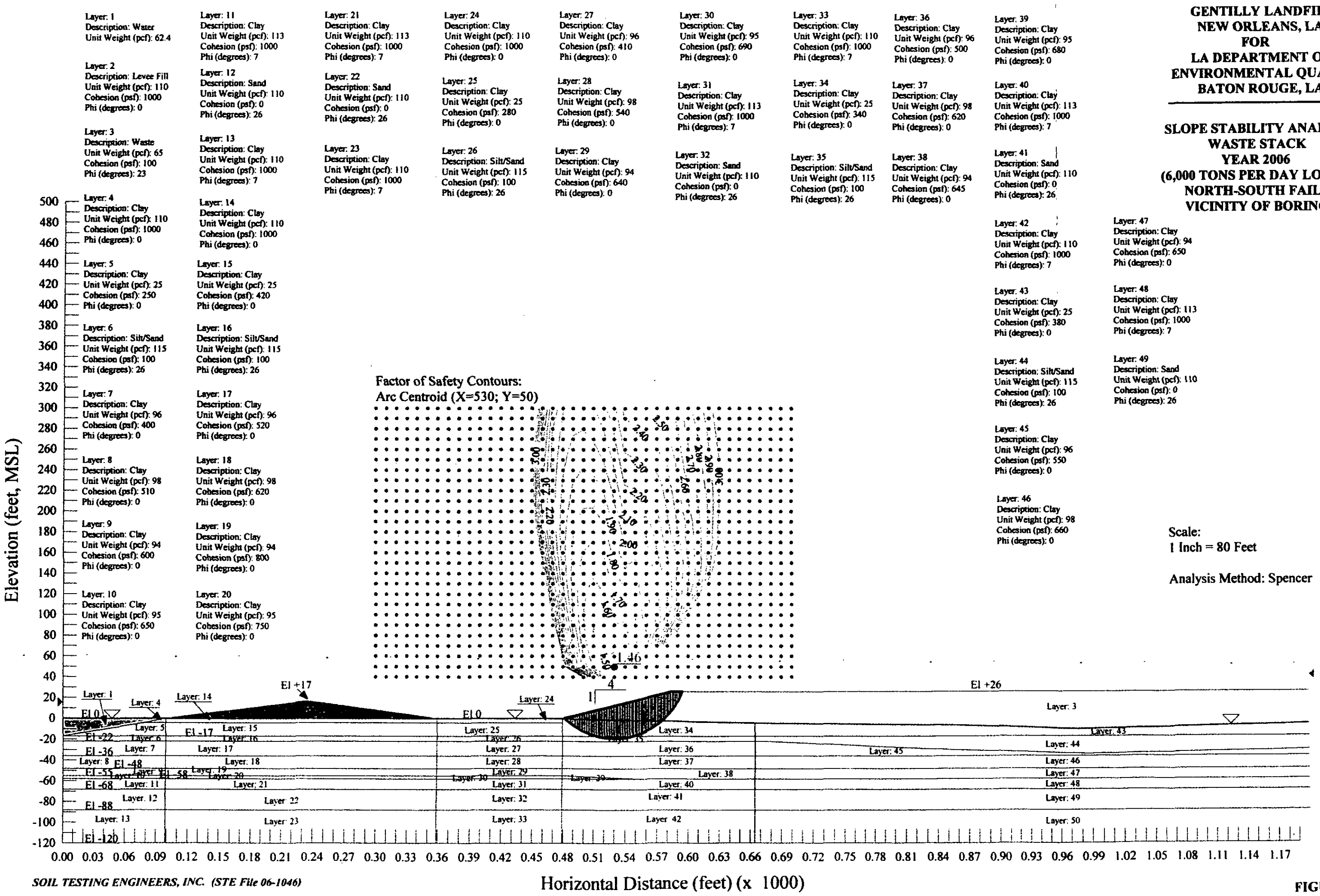
Title: **DIRECT SIMPLE SHEAR TESTS**

Jul 25, 2006 - 9:23am

P:\2006\06-1046 Gentilly LF\CADD\061046-10 Direct Shear.dwg

GENTILLY LANDFILL
NEW ORLEANS, LA
FOR
LA DEPARTMENT OF
ENVIRONMENTAL QUALITY
BATON ROUGE, LA

SLOPE STABILITY ANALYSES
WASTE STACK
YEAR 2006
(6,000 TONS PER DAY LOADING)
NORTH-SOUTH FAILURE
VICINITY OF BORING L-2



SOIL TESTING ENGINEERS, INC. (STE File 06-1046)

FIGURE 11

GENTILLY LANDFILL
NEW ORLEANS, LA
FOR
LA DEPARTMENT OF
ENVIRONMENTAL QUALITY
BATON ROUGE, LA

SLOPE STABILITY ANALYSES
WASTE HEIGHT
YEAR 2009
(6,000 TONS PER DAY LOADING)
NORTH-SOUTH FAILURE
VICINITY OF BORING L-2

Layer: 1
Description: Water
Unit Weight (pcf): 62.4

Layer: 2
Description: Levee Fill
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 3
Description: Waste
Unit Weight (pcf): 65
Cohesion (psf): 100
Phi (degrees): 23

Layer: 4
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 5
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 250
Phi (degrees): 0

Layer: 6
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 7
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 400
Phi (degrees): 0

Layer: 8
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 510
Phi (degrees): 0

Layer: 9
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 600
Phi (degrees): 0

Layer: 10
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 650
Phi (degrees): 0

Layer: 11
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 12
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 13
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 14
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 15
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 420
Phi (degrees): 0

Layer: 16
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 17
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 520
Phi (degrees): 0

Layer: 18
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 620
Phi (degrees): 0

Layer: 19
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 800
Phi (degrees): 0

Layer: 20
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 750
Phi (degrees): 0

Layer: 21
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 22
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 23
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 24
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 25
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 290
Phi (degrees): 0

Layer: 26
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 27
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 425
Phi (degrees): 0

Layer: 28
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 545
Phi (degrees): 0

Layer: 29
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 640
Phi (degrees): 0

Layer: 30
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 690
Phi (degrees): 0

Layer: 31
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 32
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 33
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 34
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 610
Phi (degrees): 0

Layer: 35
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 36
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 800
Phi (degrees): 0

Layer: 37
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 900
Phi (degrees): 0

Layer: 38
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 920
Phi (degrees): 0

Layer: 39
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 815
Phi (degrees): 0

Layer: 40
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 41
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 42
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 43
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 750
Phi (degrees): 0

Layer: 44
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 45
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 1040
Phi (degrees): 0

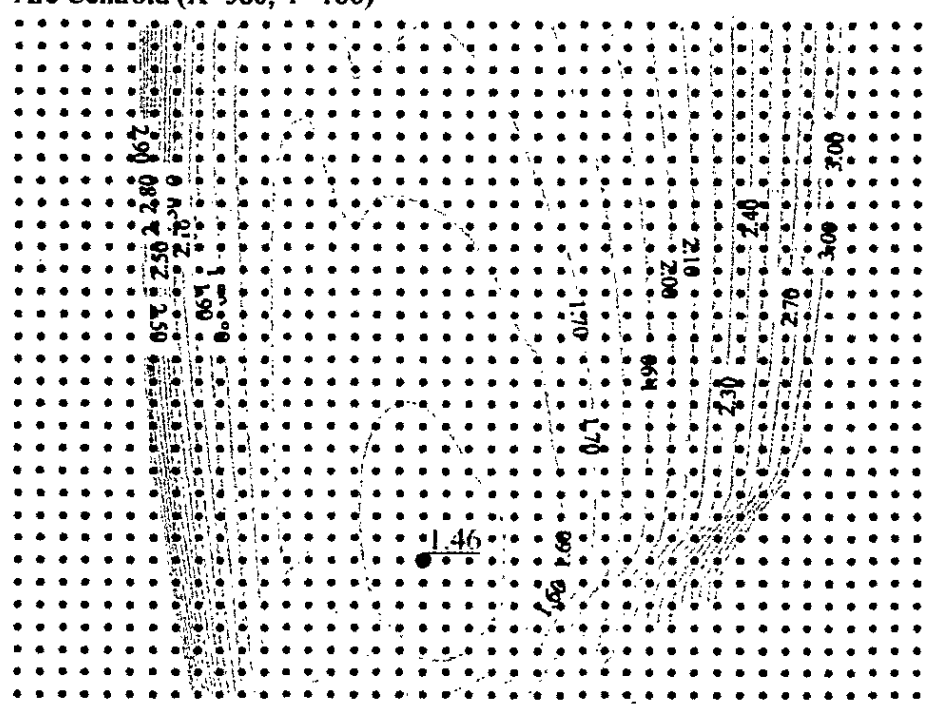
Layer: 46
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 1200
Phi (degrees): 0

Layer: 47
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 1080
Phi (degrees): 0

Layer: 48
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

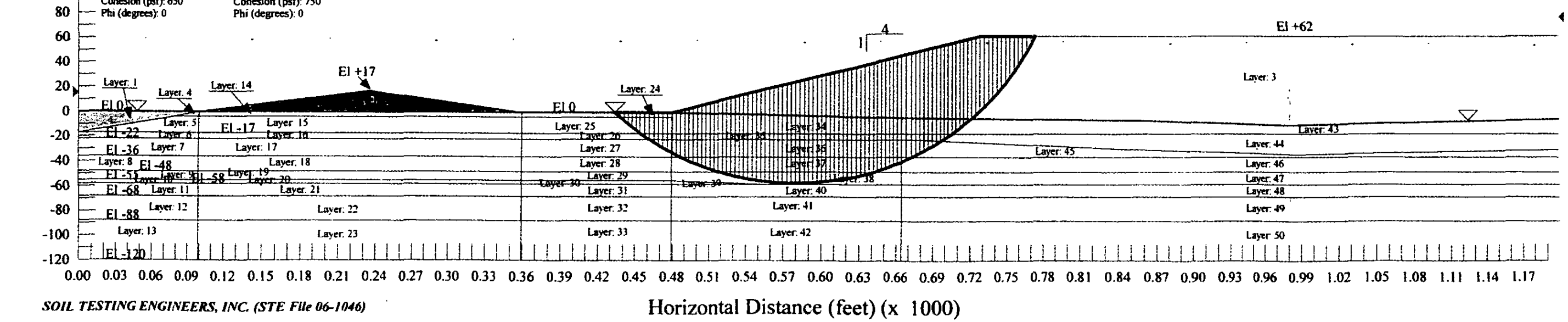
Layer: 49
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Factor of Safety Contours:
Arc Centroid (X=580; Y=160)



Scale:
1 Inch = 80 Feet

Analysis Method: Spencer



SOIL TESTING ENGINEERS, INC. (STE File 06-1046)

FIGURE 12

GENTILLY LANDFILL
NEW ORLEANS, LA
FOR
LA DEPARTMENT OF
ENVIRONMENTAL QUALITY
BATON ROUGE, LA

SLOPE STABILITY ANALYSES
WASTE HEIGHT
YEAR 2009
(6,000 TONS PER DAY LOADING)
NORTH-SOUTH FAILURE
VICINITY OF BORING L-2

Layer: 1
Description: Water
Unit Weight (pcf): 62.4

Layer: 2
Description: Levee Fill
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 3
Description: Waste
Unit Weight (pcf): 65
Cohesion (psf): 100
Phi (degrees): 23

Layer: 4
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 5
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 250
Phi (degrees): 0

Layer: 6
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 7
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 400
Phi (degrees): 0

Layer: 8
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 510
Phi (degrees): 0

Layer: 9
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 600
Phi (degrees): 0

Layer: 10
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 650
Phi (degrees): 0

Layer. 11
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf). 1000
Phi (degrees): 7

Layer: 12
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 13
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 14
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 15
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 420
Phi (degrees): 0

Layer: 16
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 17
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 520
Phi (degrees): 0

Layer: 18
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 620
Phi (degrees): 0

Layer: 19
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 800
Phi (degrees): 0

Layer: 20
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 750
Phi (degrees): 0

Layer: 21
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 22
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 23
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 24
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 25
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 290
Phi (degrees): 0

Layer: 26
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 27
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 425
Phi (degrees): 0

Layer: 28
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 545
Phi (degrees): 0

Layer: 29
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 640
Phi (degrees): 0

Layer: 30
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 690
Phi (degrees): 0

Layer: 31
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 32
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 33
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 34
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 610
Phi (degrees): 0

Layer: 35
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 36
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 800
Phi (degrees): 0

Layer: 37
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 900
Phi (degrees): 0

Layer: 38
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 920
Phi (degrees): 0

Layer: 39
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 815
Phi (degrees): 0

Layer: 40
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 41
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 42
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 43
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 750
Phi (degrees): 0

Layer: 44
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 45
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 1040
Phi (degrees): 0

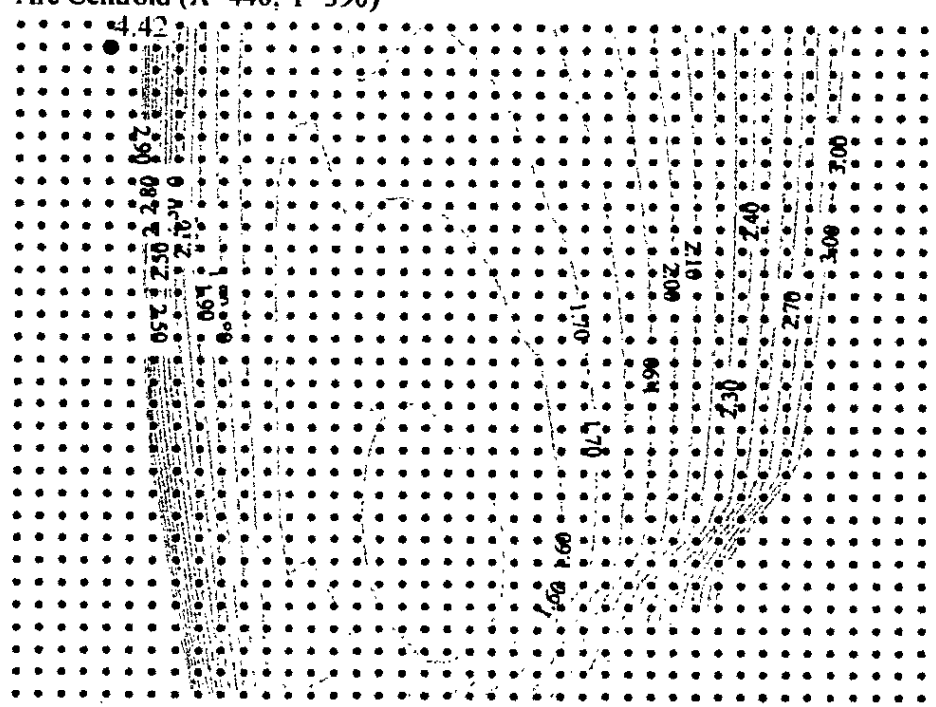
Layer: 46
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 1200
Phi (degrees): 0

Layer: 47
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 1080
Phi (degrees): 0

Layer: 48
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 49
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Factor of Safety Contours:
Arc Centroid (X=440; Y=390)



Scale:
1 Inch = 80 Feet

Analysis Method: Spencer

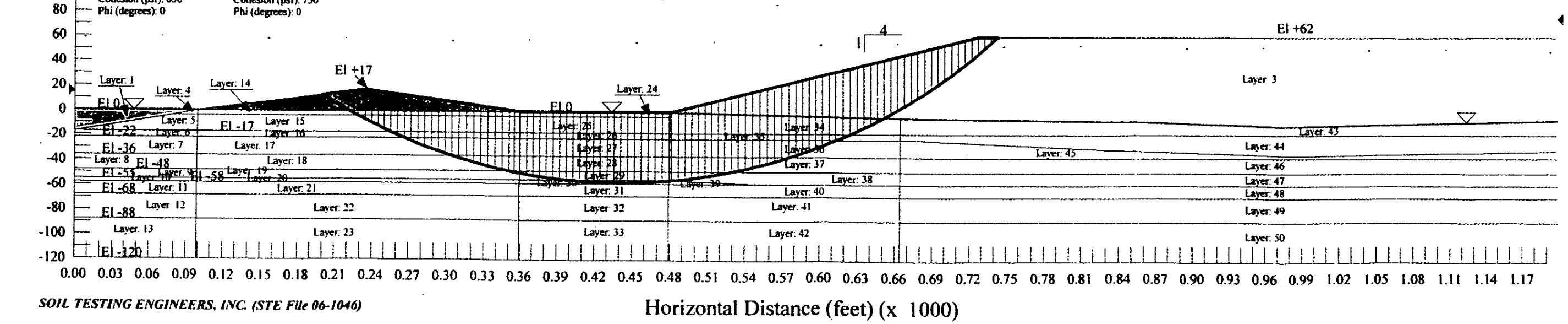


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FIGURE 13

GENTILLY LANDFILL
NEW ORLEANS, LA
FOR
LA DEPARTMENT OF
ENVIRONMENTAL QUALITY
BATON ROUGE, LA

SLOPE STABILITY ANALYSES
FINAL WASTE HEIGHT
YEAR 2012
(6,000 TONS PER DAY LOADING)
NORTH-SOUTH FAILURE
VICINITY OF BORING L-2

Scale:
1 Inch = 80 Feet

Analysis Method: Spencer

Stability Results for Other Waste Heights:

Waste to EL +135:
F of S = 1.40 (Centroid: X=640, Y=420)

Waste to EL +130:
F of S = 1.46 (Centroid: X=640, Y=420)

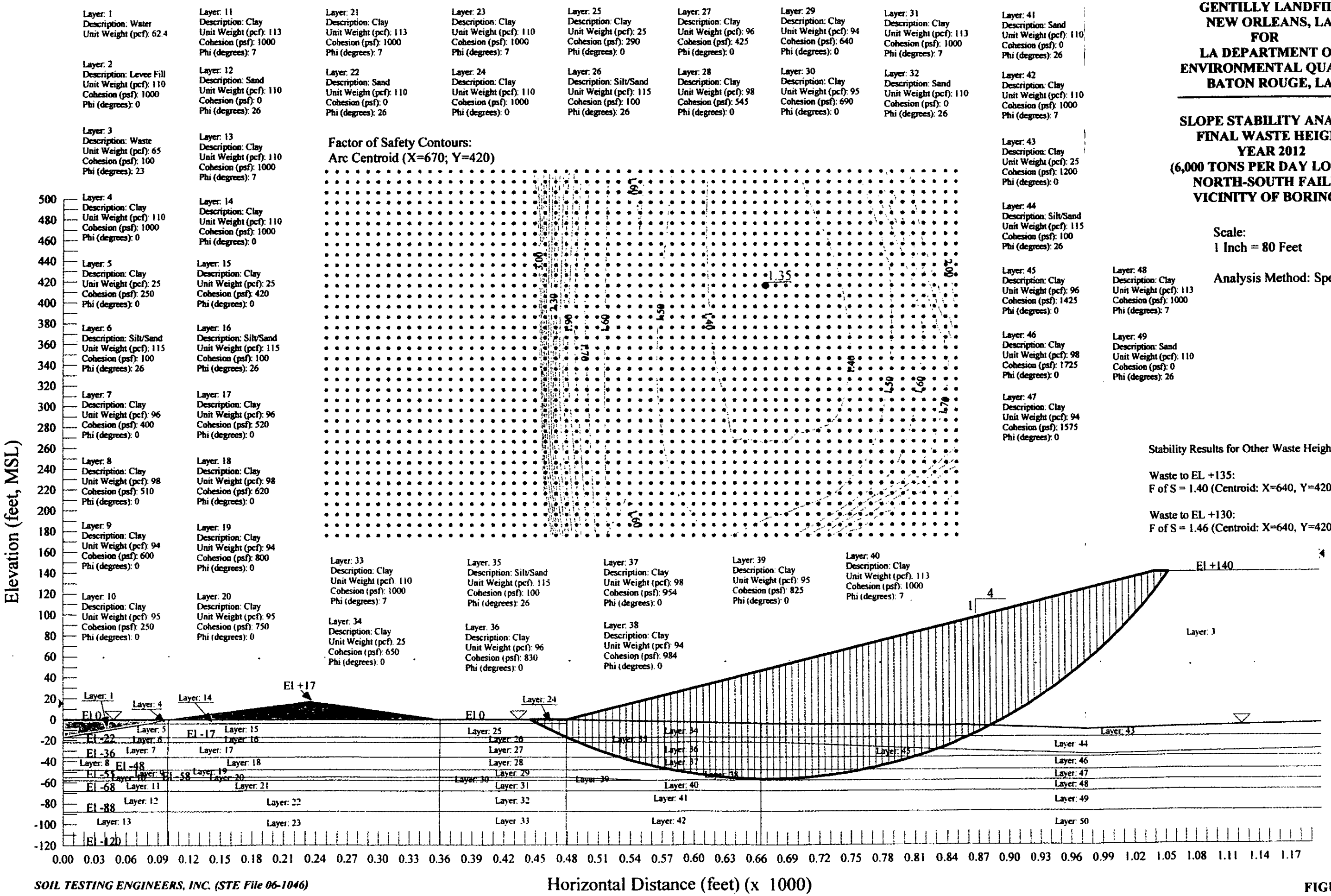


FIGURE 14

GENTILLY LANDFILL
NEW ORLEANS, LA
FOR
LA DEPARTMENT OF
ENVIRONMENTAL QUALITY
BATON ROUGE, LA

SLOPE STABILITY ANALYSES
FINAL WASTE HEIGHT
YEAR 2012
(6,000 TONS PER DAY LOADING)
NORTH-SOUTH FAILURE
VICINITY OF BORING L-2

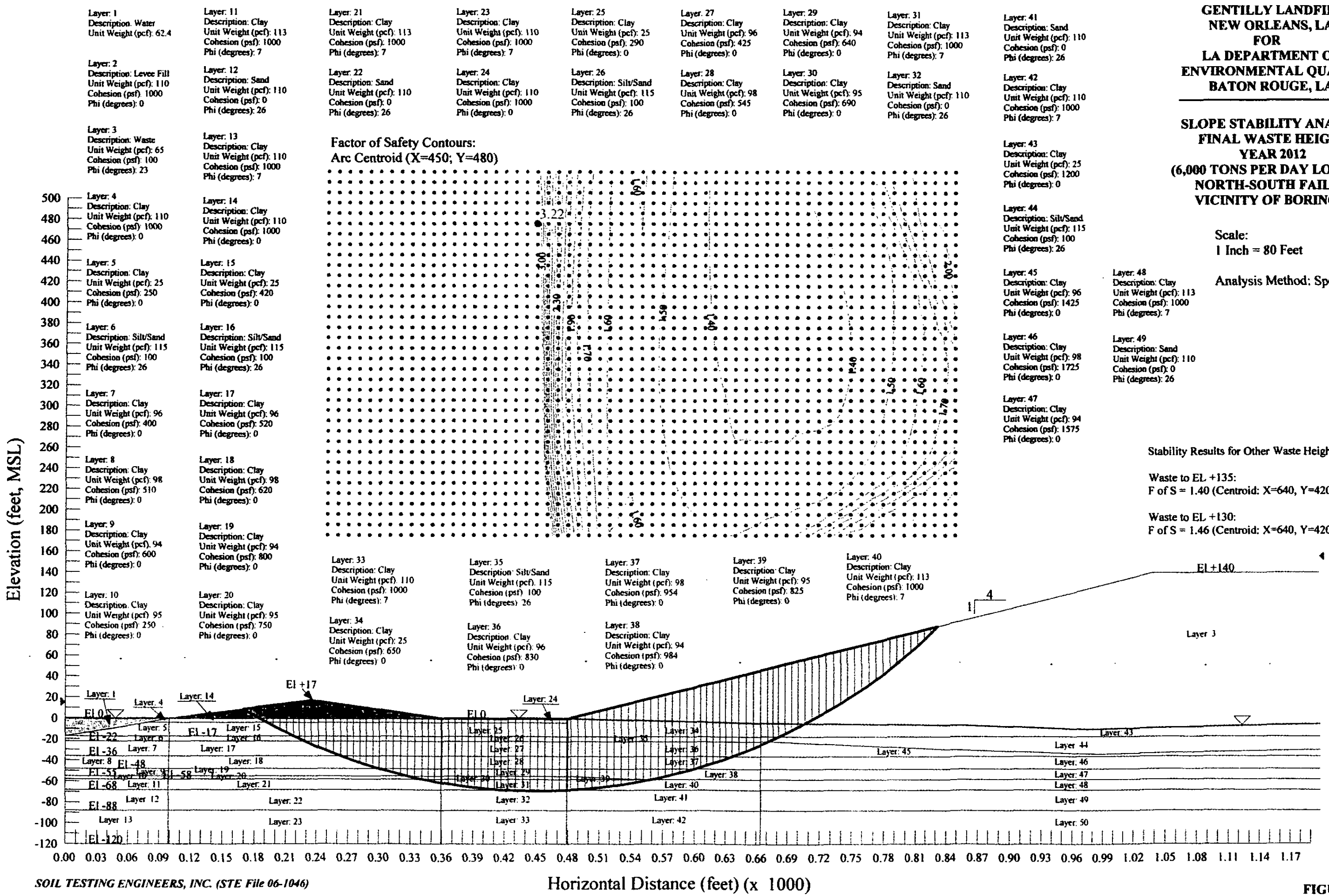
Scale:
1 Inch = 80 Feet

Analysis Method: Spencer

Stability Results for Other Waste Heights:

Waste to EL +135:
F of S = 1.40 (Centroid: X=640, Y=420)

Waste to EL +130:
F of S = 1.46 (Centroid: X=640, Y=420)



SOIL TESTING ENGINEERS, INC. (STE File 06-1046)

FIGURE 15

GENTILLY LANDFILL
NEW ORLEANS, LA
FOR
LA DEPARTMENT OF ENVIRONMENTAL QUALITY
BATON ROUGE, LA

SLOPE STABILITY ANALYSES
WASTE STACK
YEAR 2007
(MAXIMUM LOADING RATE)
NORTH-SOUTH FAILURE
VICINITY OF BORING L-1

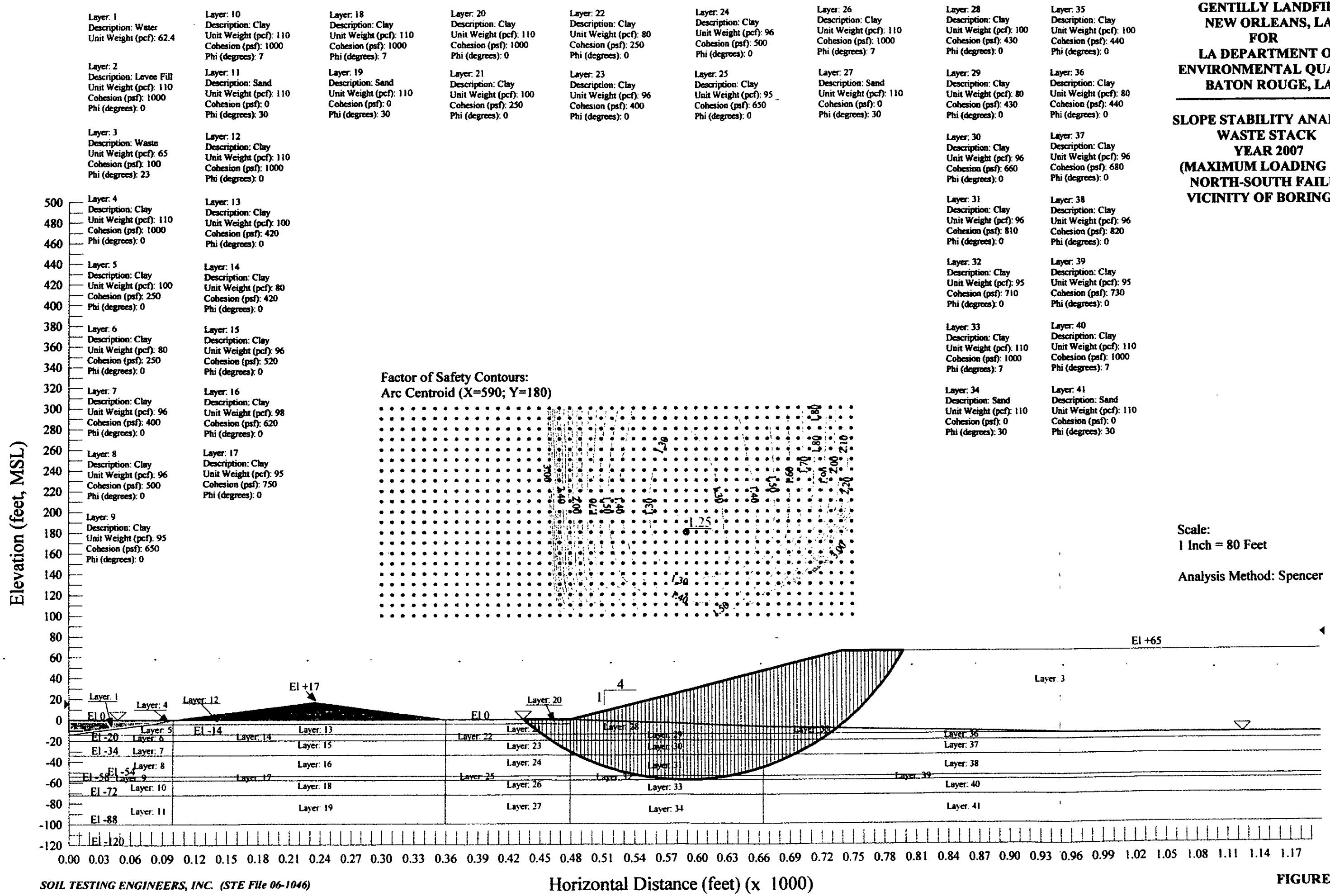


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FIGURE 16

GENTILLY LANDFILL
NEW ORLEANS, LA
FOR
LA DEPARTMENT OF
ENVIRONMENTAL QUALITY
BATON ROUGE, LA

SLOPE STABILITY ANALYSES
WASTE STACK
YEAR 2008
(MAXIMUM LOADING RATE)
NORTH-SOUTH FAILURE
VICINITY OF BORING L-1

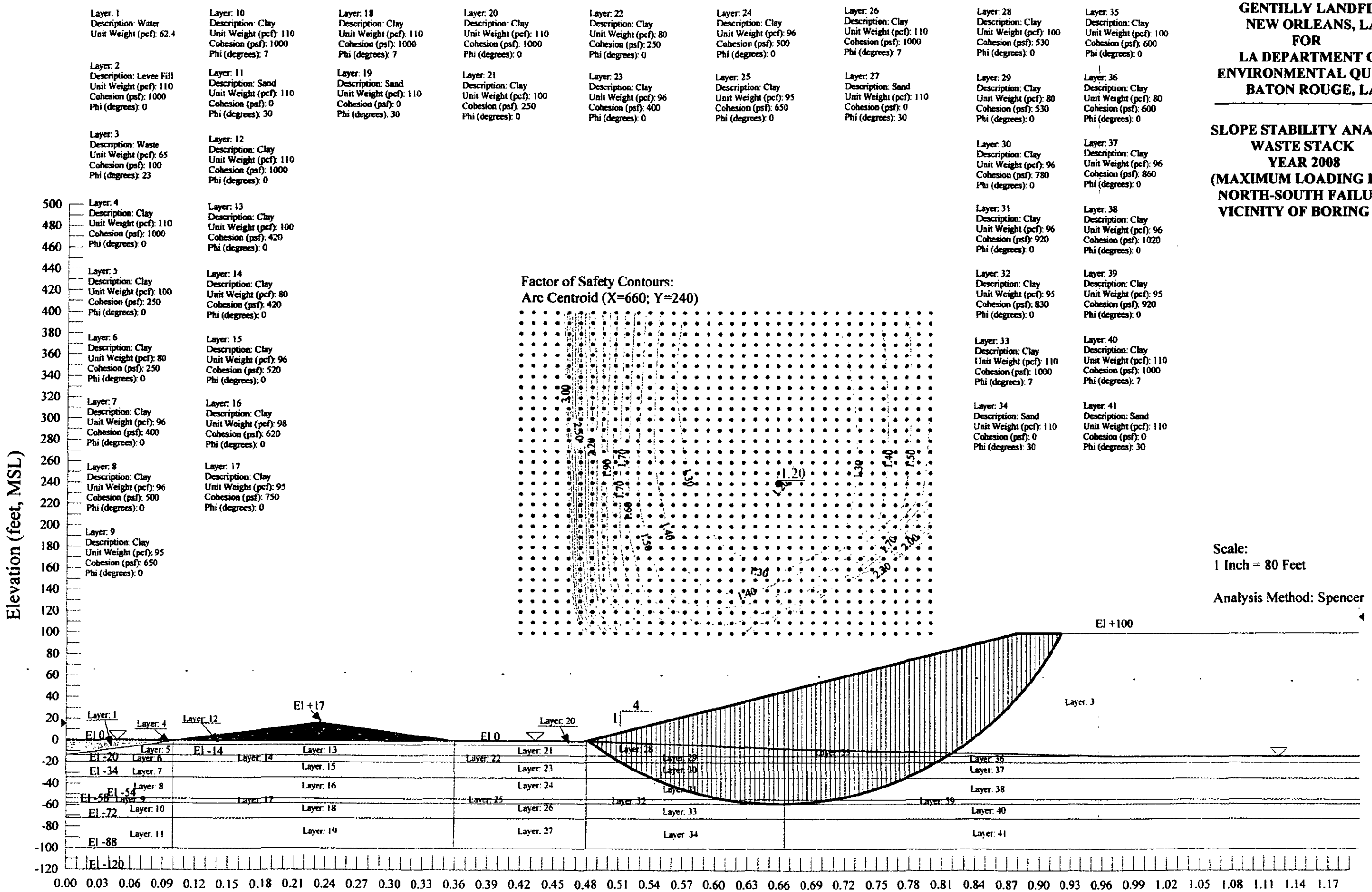

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FIGURE 17

GENTILLY LANDFILL
NEW ORLEANS, LA
FOR
LA DEPARTMENT OF ENVIRONMENTAL QUALITY
BATON ROUGE, LA

SLOPE STABILITY ANALYSES
WASTE STACK
YEAR 2009
MAXIMUM LOADING RATE
NORTH-SOUTH FAILURE
VICINITY OF BORING L-1

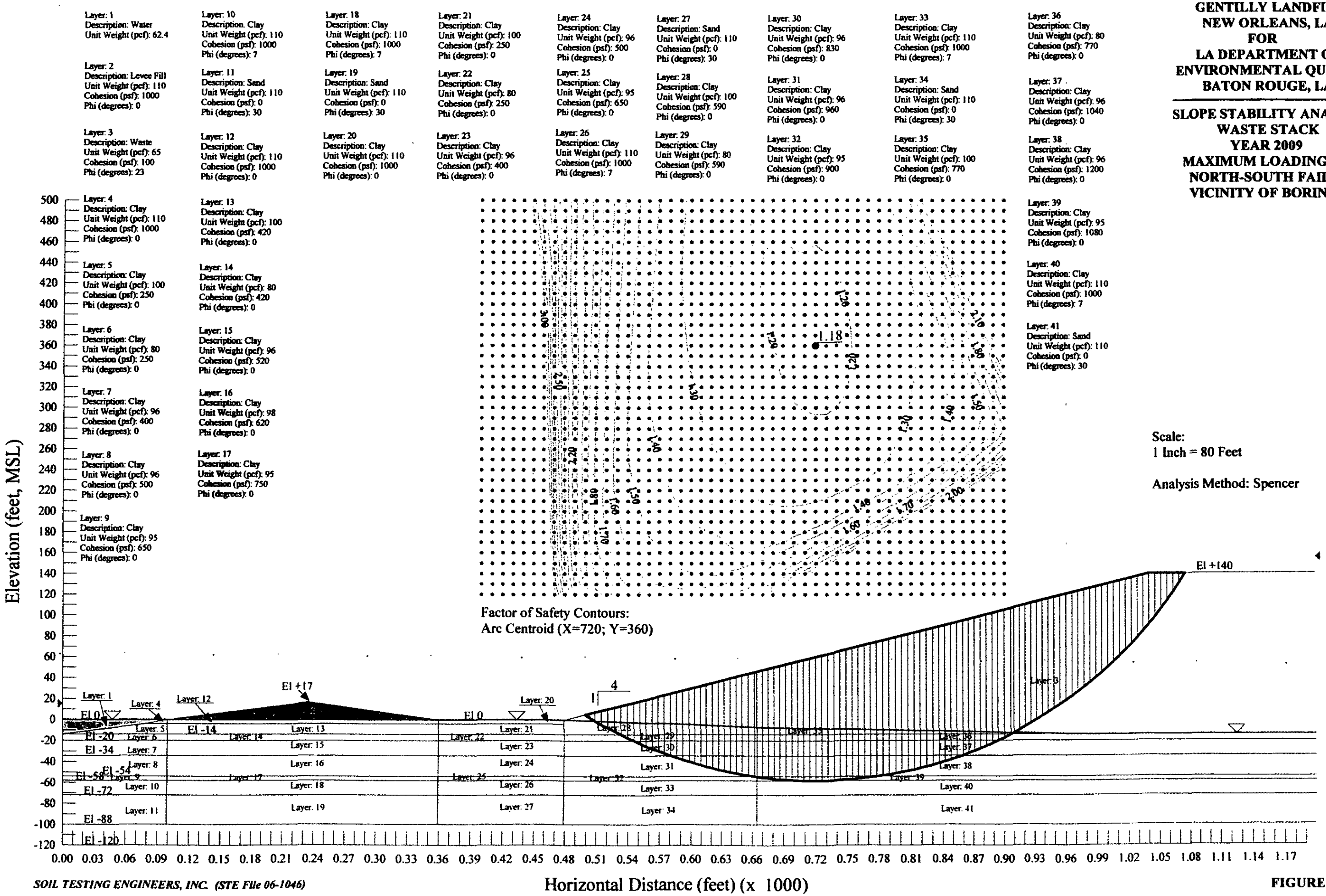

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FIGURE 18

GENTILLY LANDFILL
NEW ORLEANS, LA
FOR
LA DEPARTMENT OF
ENVIRONMENTAL QUALITY
BATON ROUGE, LA

SLOPE STABILITY ANALYSES
WASTE STACK
YEAR 2007
(MAXIMUM LOADING RATE)
NORTH-SOUTH FAILURE
VICINITY OF BORING L-2

Layer: 1
Description: Water
Unit Weight (pcf): 62.4

Layer: 2
Description: Levee Fill
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 3
Description: Waste
Unit Weight (pcf): 65
Cohesion (psf): 100
Phi (degrees): 23

Layer: 4
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 5
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 250
Phi (degrees): 0

Layer: 6
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 7
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 400
Phi (degrees): 0

Layer: 8
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 510
Phi (degrees): 0

Layer: 9
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 600
Phi (degrees): 0

Layer: 10
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 650
Phi (degrees): 0

Layer: 11
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 12
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 13
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 14
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 15
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 420
Phi (degrees): 0

Layer: 16
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 17
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 520
Phi (degrees): 0

Layer: 18
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 620
Phi (degrees): 0

Layer: 19
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 800
Phi (degrees): 0

Layer: 20
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 750
Phi (degrees): 0

Layer: 21
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 22
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 23
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 24
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf) 1000
Phi (degrees): 0

Layer: 25
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 280
Phi (degrees): 0

Layer: 26
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 27
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 410
Phi (degrees): 0

Layer: 28
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 540
Phi (degrees): 0

Layer: 29
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 640
Phi (degrees): 0

Layer: 30
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf). 690
Phi (degrees): 0

Layer: 31
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 32
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 33
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 34
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 400
Phi (degrees): 0

Layer: 35
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 36
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 600
Phi (degrees): 0

Layer: 37
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 730
Phi (degrees): 0

Layer: 38
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 700
Phi (degrees): 0

Layer: 39
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf). 800
Phi (degrees): 0

Layer: 40
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 41
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 42
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 43
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 440
Phi (degrees): 0

Layer: 44
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 45
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 680
Phi (degrees): 0

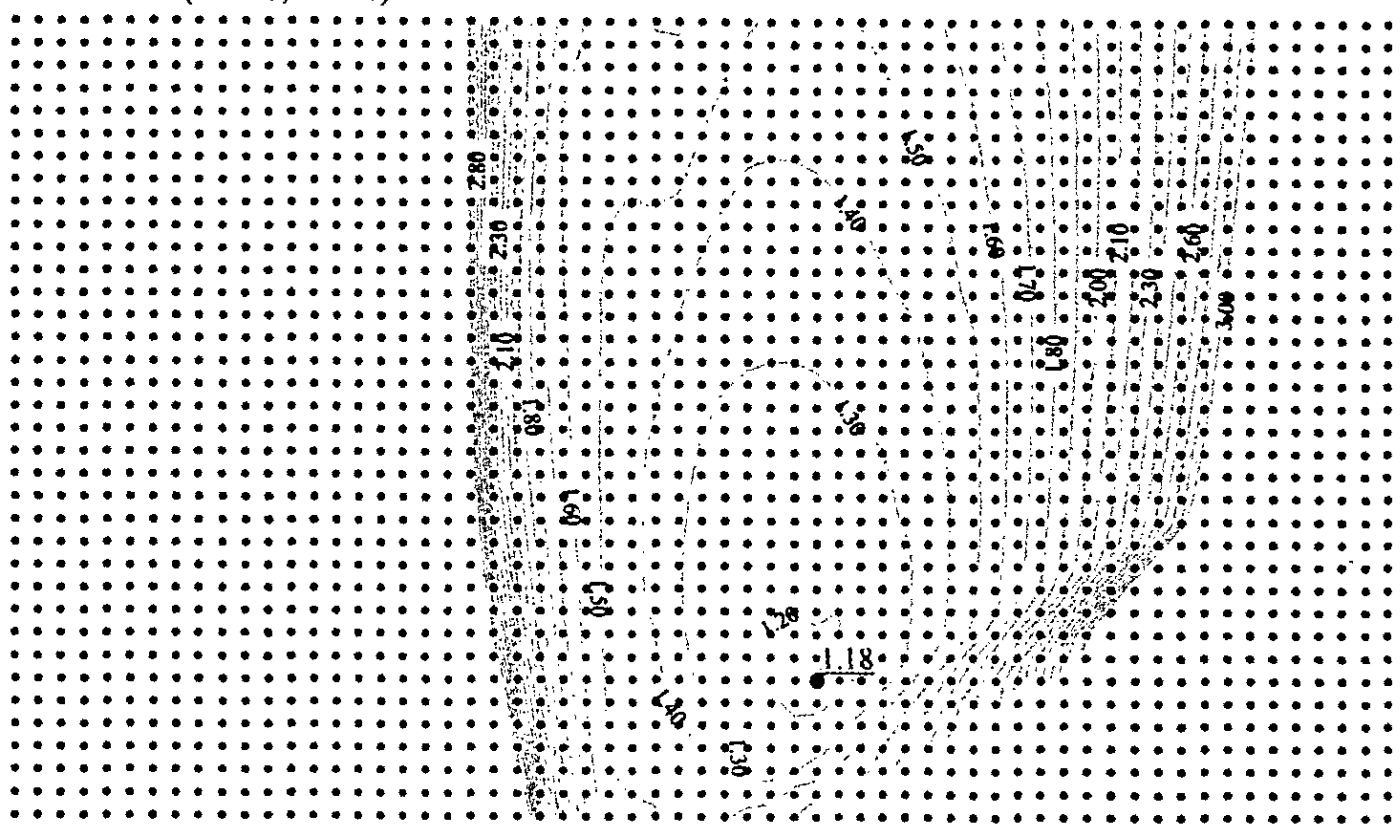
Layer: 46
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 820
Phi (degrees): 0

Layer: 47
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 730
Phi (degrees): 0

Layer: 48
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

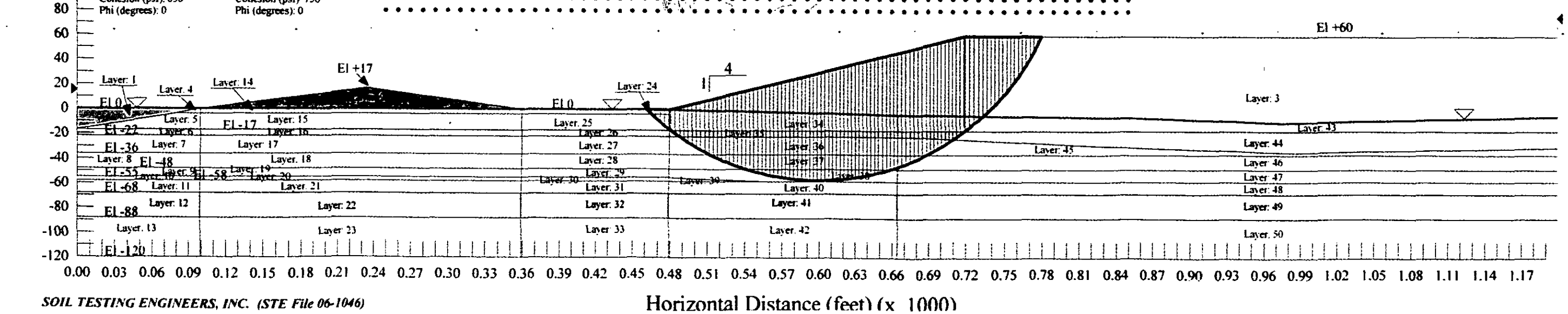
Layer: 49
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Factor of Safety Contours:
Arc Centroid (X=600; Y=140)



Scale:
1 Inch = 80 Feet

Analysis Method: Spencer



SOIL TESTING ENGINEERS, INC. (STE File 06-1046)

GENTILLY LANDFILL
NEW ORLEANS, LA
FOR
LA DEPARTMENT OF
ENVIRONMENTAL QUALITY
BATON ROUGE, LA

SLOPE STABILITY ANALYSES
WASTE STACK
YEAR 2008
(MAXIMUM LOADING RATE)
NORTH-SOUTH FAILURE
VICINITY OF BORING L-2

Layer: 1
Description: Water
Unit Weight (pcf): 62.4

Layer: 2
Description: Levee Fill
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 3
Description: Waste
Unit Weight (pcf): 65
Cohesion (psf): 100
Phi (degrees): 23

Layer: 4
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 5
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 250
Phi (degrees): 0

Layer: 6
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 7
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 400
Phi (degrees): 0

Layer: 8
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 510
Phi (degrees): 0

Layer: 9
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 600
Phi (degrees): 0

Layer: 10
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 650
Phi (degrees): 0

Layer: 11
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 12
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 13
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 14
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 15
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 420
Phi (degrees): 0

Layer: 16
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 17
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 520
Phi (degrees): 0

Layer: 18
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 620
Phi (degrees): 0

Layer: 19
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 800
Phi (degrees): 0

Layer: 20
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 750
Phi (degrees): 0

Layer: 21
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 22
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 23
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 24
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 0

Layer: 25
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 280
Phi (degrees): 0

Layer: 26
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 27
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 410
Phi (degrees): 0

Layer: 28
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 540
Phi (degrees): 0

Layer: 29
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 640
Phi (degrees): 0

Layer: 30
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 690
Phi (degrees): 0

Layer: 31
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 32
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 33
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 34
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 480
Phi (degrees): 0

Layer: 35
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 36
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 700
Phi (degrees): 0

Layer: 37
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 850
Phi (degrees): 0

Layer: 38
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 800
Phi (degrees): 0

Layer: 39
Description: Clay
Unit Weight (pcf): 95
Cohesion (psf): 860
Phi (degrees): 0

Layer: 40
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 41
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Layer: 42
Description: Clay
Unit Weight (pcf): 110
Cohesion (psf): 1000
Phi (degrees): 7

Layer: 43
Description: Clay
Unit Weight (pcf): 25
Cohesion (psf): 600
Phi (degrees): 0

Layer: 44
Description: Silt/Sand
Unit Weight (pcf): 115
Cohesion (psf): 100
Phi (degrees): 26

Layer: 45
Description: Clay
Unit Weight (pcf): 96
Cohesion (psf): 860
Phi (degrees): 0

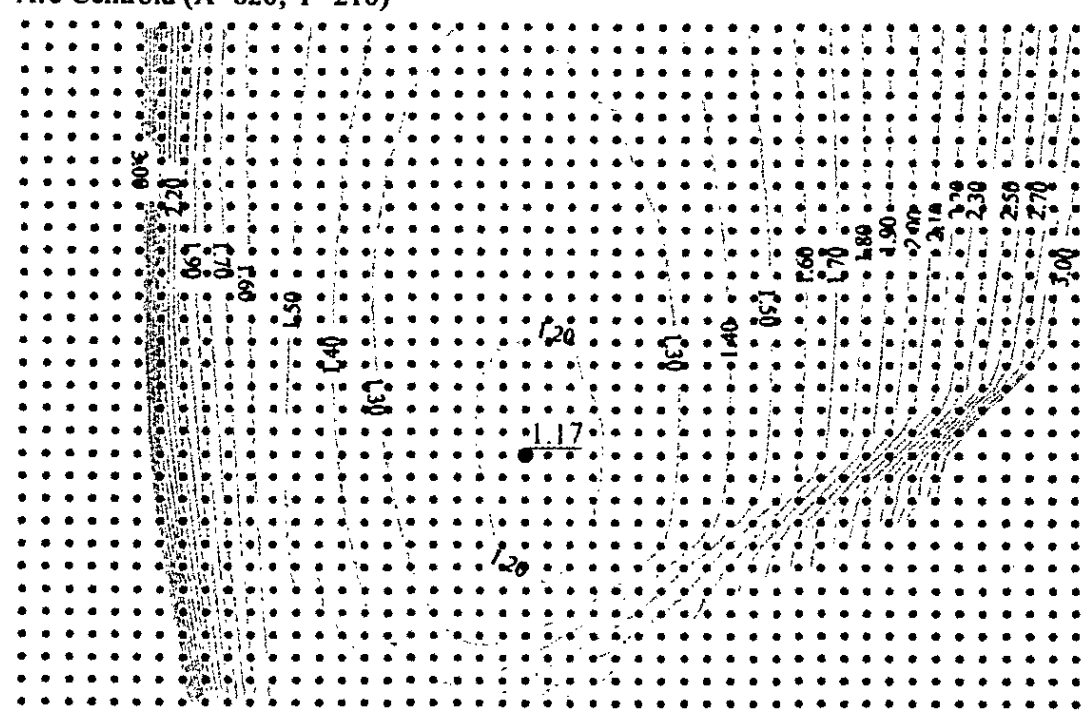
Layer: 46
Description: Clay
Unit Weight (pcf): 98
Cohesion (psf): 1020
Phi (degrees): 0

Layer: 47
Description: Clay
Unit Weight (pcf): 94
Cohesion (psf): 920
Phi (degrees): 0

Layer: 48
Description: Clay
Unit Weight (pcf): 113
Cohesion (psf): 1000
Phi (degrees): 7

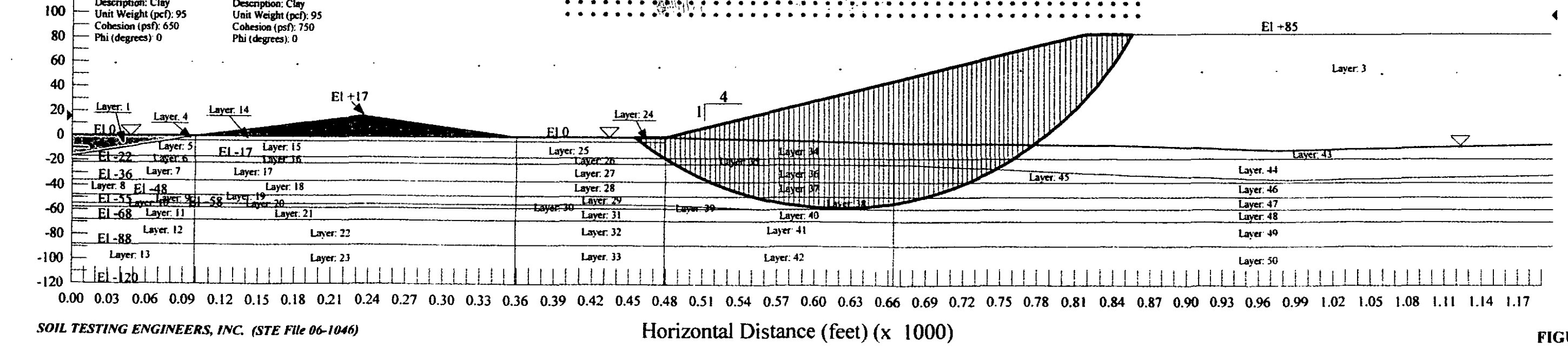
Layer: 49
Description: Sand
Unit Weight (pcf): 110
Cohesion (psf): 0
Phi (degrees): 26

Factor of Safety Contours:
Arc Centroid (X=620; Y=210)



Scale:
1 Inch = 80 Feet

Analysis Method: Spencer



SOIL TESTING ENGINEERS, INC. (STE File 06-1046)

FIGURE 20

GENTILLY LANDFILL
NEW ORLEANS, LA
FOR
LA DEPARTMENT OF ENVIRONMENTAL QUALITY
BATON ROUGE, LA

SLOPE STABILITY ANALYSES
WASTE HEIGHT
YEAR 2009
(MAXIMUM LOADING RATE)
NORTH-SOUTH FAILURE
VICINITY OF BORING L-2

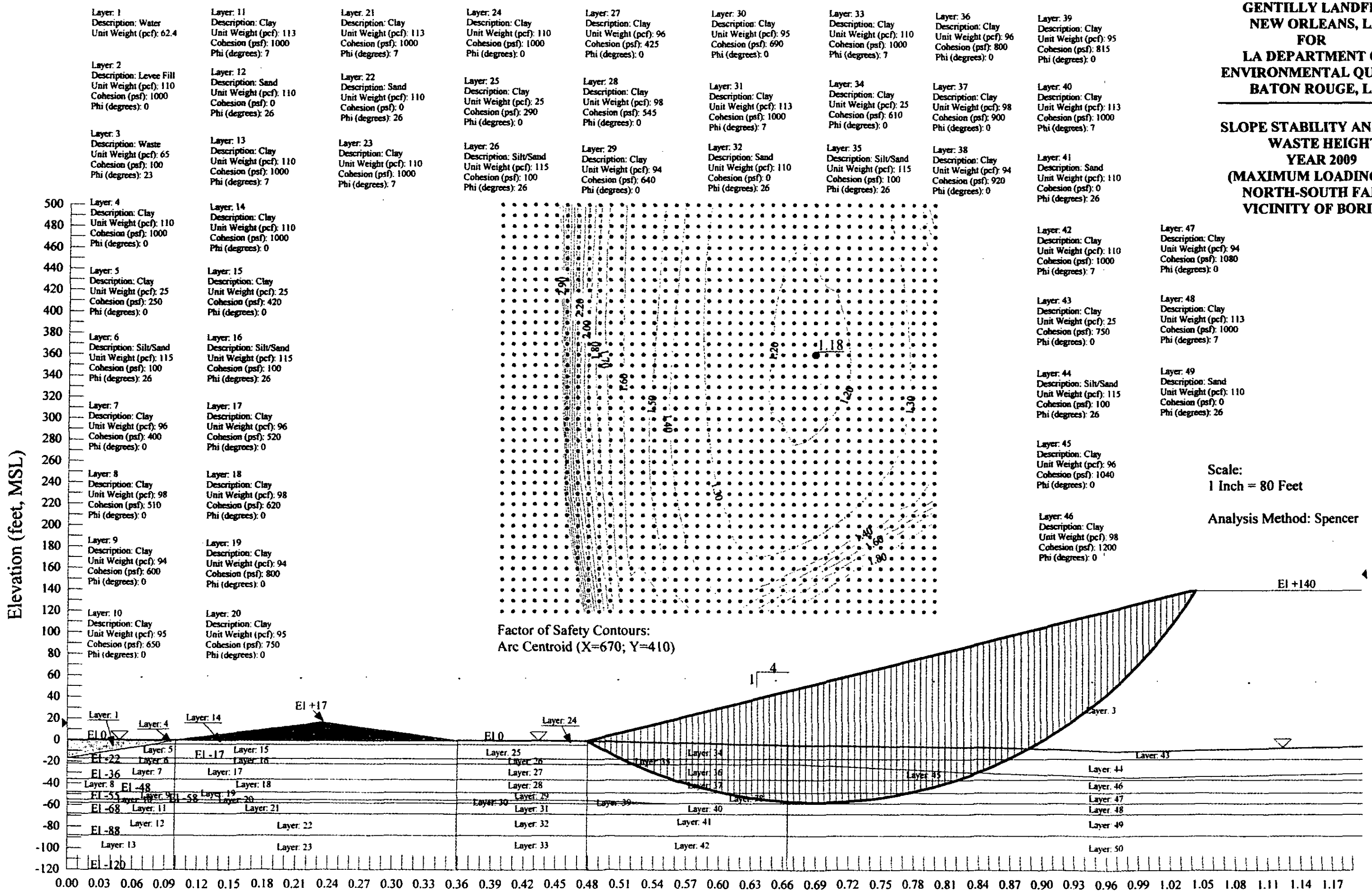


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FIGURE 21