February 4, 2015

Baton Rouge Area Chamber
564 Laurel Street
Baton Rouge, LA 70801

Attention : Mr. Jim A. Cavanaugh
Site Development Director
Email: jim@brac.org
Phone: (225) 339-1163

Re: **Preliminary Geotechnical Site Evaluation Report**
Geismar Parks Site
Ascension Parish, Louisiana
PSI Project No. 0254650

Dear Mr. Cavanaugh:

Professional Service Industries, Inc. is pleased to submit this Geotechnical Site Evaluation Report for the Preliminary Geismar Parks Site Study. This report includes the results of field and laboratory testing, and information regarding the compatibility of this site with industrial development, suitability of soils for building foundations and on-site roadways, requirements of soil augmentation for construction of a typical 100,000 square feet (sf) industrial manufacturing building and depth of groundwater.

We appreciate the opportunity to perform this Preliminary Geotechnical Site Evaluation Report. If you have any questions pertaining to this report, or if we may be of further service, please contact our office.

Respectfully submitted,

PROFESSIONAL SERVICE INDUSTRIES, INC.

Christian Rogers
Staff Engineer
Geotechnical Services

Ryan T. Coggins, P.E.
Department Manager
Geotechnical Services

Name: Ryan T. Coggins, P.E., S.I.
Date: February 4, 2015
License No.: 38292
THIS PRELIMINARY DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

PRELIMINARY GEOTECHNICAL SITE EVALUATION REPORT

PARKS/GEISMAR SITE
ASCENSION PARISH, LOUISIANA
PSI PROJECT NO.: 0254650

PREPARED FOR

BATON ROUGE AREA CHAMBER
564 LAUREL STREET
BATON ROUGE, LA 70801

FEBRUARY 4, 2015

BY
PROFESSIONAL SERVICE INDUSTRIES, INC.
11950 INDUSTRIPLEX BLVD.
BATON ROUGE, LOUISIANA 70809

TABLE OF CONTENTS

Page No.

APPENDIX

PROJECT INFORMATION

Project Authorization

Professional Service Industries, Inc. (PSI) has completed a Preliminary Geotechnical Site Study at the Geismar Parks site, located in general vicinity of Ascension Parish, Louisiana. Our services were provided in general accordance with PSI Proposal No. 254-140077, dated December 5, 2014. Authorization to provide our services was provided by Mr. Iain Vasey (Executive Director Baton Rouge Area Chamber) who signed our Proposal on December 15, 2014.

Project Description

The site for the requested geotechnical evaluation is approximately 183.51 acres in size and is located just south of the City of Geismar in Ascension Parish, Louisiana. The undeveloped site is generally located generally east River Road and south of Ashland Road.Primary objectives for this preliminary report are to provide information regarding the compatibility of this site with industrial development, suitability of soils for building foundations and on-site roadways, requirements of soil augmentation for construction of a typical 100,000 square feet (sf) industrial manufacturing building, and the depth of the free groundwater table.

This geotechnical site evaluation report will provide an initial baseline of the site subsurface conditions that will likely be encountered during future site development. However, as with any geotechnical investigation, particularly given the size of this project site and relatively limited number of borings performed, variations between borings may and should be expected to exist, and there remains a distinct possibility that other conditions may exist on site that were not encountered within the scope of this exploration.

The opinions and information to be presented in this report are estimates for preliminary consideration only, are based on limited geotechnical exploration, and are not to be used for final design and construction.

Purpose and Scope of Services

The purposes of PSI's geotechnical services are to:

- Perform 4 soil borings at the site, per the clients' request. Two borings (B-1 and B-4) were extended to a depth of approximately 75 feet each; and two borings (B-2, and B-3) were drilled and sampled to a depth of approximately 25 feet each below the existing grades;
- Evaluate subsurface soil conditions and groundwater depths at the project site;
- Perform limited laboratory testing on selected soil samples recovered from the project site; and,
- Provide information regarding the compatibility of this site with industrial development, suitability of soils for building foundations and on-site roadways, requirements of soil augmentation for construction of a typical 100,000 sf industrial manufacturing building and depth of groundwater.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater, or air on or below, or around this site. Any statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes. Prior to development of this site, an environmental assessment is advisable. Additionally, PSI did not provide any service to investigate or detect the presence of moisture, mold or other biological

contaminants in or around any structure, or any service that was designed or intended to prevent or lower the risk of the occurrence or the amplification of the same. Client acknowledges that mold is ubiquitous to the environment with mold amplification occurring when building materials are impacted by moisture. Client further acknowledges that site conditions are outside of PSI's control, and that mold amplification will likely occur, or continue to occur, in the presence of moisture. As such, PSI cannot and shall not be held responsible for the occurrence or recurrence of mold amplification.

SITE AND SUBSURFACE CONDITIONS

Site Location and Description

The project site is located approximately southwest of the City of Geismar, Louisiana, bounded generally by the Mississippi River and Hwy 75 to the west and undeveloped property to the north, east and south as illustrated on the Site Vicinity Map provided on Figure No. 1 in the Appendix. The site was undeveloped and heavily wooded with moderate to heavy undergrowth at the time of PSI's field exploration, and the ground surface appeared to be topographically level (within a few feet). The site is predominately wet in the western portion of the site with a northwest to south drainage feature. During heavy rains as experienced during the field exploration, much of the site can become flooded. PSI's ATV-mounted drill rig was used to perform this field exploration and experienced difficulty traversing the site during and within a few days of rain.

Site Geology

Based on the Geological Map of Louisiana (1984), the site is located within the Natural Levees Formation (Qnl) geologic unit. The Natural Levees geologic unit is characterized by gray and brown silt and silty clay with some very fine sand. Per the U.S. Geological Society (USGS), these deposits are encountered on past and present courses of major streams. Natural Levee deposits in the site vicinity are relatively weak and compressible in nature. A drainage or seepage drainage feature is located in the western portion of the site.

Field Exploration

The field exploration included mobilization to the site by a PSI drilling crew, drilling of the soil borings, and recovering soil samples. Borings B-1 and B-2 were completed using auger and sampling methods. B-3 and B-4 were completed with Cone Penetration Test (CPT) soundings. Borings B-1 and B-4 were extended to a depth of approximately 75 feet below the existing grade while Borings B-2 and B-3 were extended to a depth of about 25 feet below the existing grade. Refer to the Boring Location Plan on Figure No. 2 in the Appendix.

Drilling and sampling activities were performed in general accordance with referenced ASTM procedures or other accepted methods. The borings were backfilled with a cement/bentonite grout mixture per LA DOTD requirements.

Undisturbed samples of cohesive soils were generally obtained using three-inch-diameter, thin-wall tube samplers (Shelby tube) in general accordance with the procedures for "Thin-Walled Tube Geotechnical Sampling of Soils" (ASTM D1587). These samples were extruded in the field with a hydraulic ram and were identified according to boring number and depth, wrapped in aluminum foil, placed in polyethylene plastic wrapping to protect against moisture loss and transported to the laboratory in containers to minimize disturbance.

For cohesionless soils, Standard Penetration Tests (SPT) were performed to obtain standard penetration values of the soil using a 140-pound hammer, falling 30 inches. The test is performed by lowering the standard penetrometer sampler to the bottom of the previously cleaned drill hole and advanced by blows from the hammer. The number of blows is recorded for each of the three consecutive 6-inch increments. The "SPT-N" value is obtained by adding the second and the third incremental numbers. The results of the standard penetration test indicate the relative density of cohesionless soils, and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components. Soil samples were obtained utilizing a two-inch O.D. split-barrel sampler in general accordance with procedures for "Penetration Test and Split-Barrel Sampling of Soils" (ASTM D 1586). These samples were identified according to boring number and depth, placed in polyethylene plastic wrapping to protect against moisture loss and transported to the laboratory.

Cone Penetration Test with piezometric measurements (CPTu) were also utilized at select locations to provide refined subsurface information and in-situ geotechnical data at the site. The CPT method involves hydraulically pushing an instrumented piezocone probe through the subsurface strata and recording the cone tip resistance, the skin friction and the pore water pressure within the soil with depth at approximate one (1) inch depth intervals. With the CPT method, in-situ testing is performed which provides a more-thorough and refined assessment of the subsurface materials and their associated properties.

Laboratory Testing

Selected soil samples were tested in the laboratory to determine material properties for our evaluation. Visual classifications were performed in the laboratory. Physical testing included determination of moisture contents, Atterberg limits classification testing and unconfined compressive strength or unconsolidated undrained triaxial shear tests to supplement the field pocket penetrometer and torvane testing. The laboratory testing was performed in general accordance with ASTM procedures. Samples not altered by laboratory testing will be retained for sixty days from the date of this report and then be discarded.

Subsurface Conditions

The borings and soundings generally encountered lean to fat clay with variable silt and sand seams throughout the depth of exploration. Organic clay layers were also identified at variable depths within the borings. Soil consistencies were generally firm to stiff near the ground surface and very soft to firm at greater depths.

The above subsurface description is generalized in nature to highlight the major subsurface stratification features and material characteristics. The boring logs included in the Appendix should be reviewed for specific information at the individual boring locations. These records include soil descriptions, stratifications, penetration resistances, locations of the samples, and laboratory test data. The stratifications shown on the boring logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual.

Groundwater Information

Groundwater encountered during the exploration water generally indicated to be present within the upper 10 feet of the subsurface profile with near-surface groundwater identified near the ground surface after rain events. Surface flows were also observed after heavy rains at the site.

It should be noted that groundwater level fluctuations at this site may occur due to seasonal and climatic variations, the stage of the Mississippi River due to its relative close proximity to the project site, alteration of drainage patterns, land usage and ground cover. We recommend the Contractor determine the actual groundwater levels at the time any future construction activities begin.

Seismic Design Considerations

The design of structures must consider dynamic forces resulting from seismic events. These forces are dependent upon the magnitude of the earthquake event as well as the properties of the soils that underlie the site. As part of the procedure to evaluate seismic forces, the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristics of the subsurface profile within the upper 100 feet of the ground surface, is required. To define the Site Class for this project, we have interpreted the results of soil test borings drilled within the project site and estimated appropriate soil properties below the base of the borings to a depth of 100 feet as permitted by the International Building Code, 2012 edition. The estimated soil properties were based upon our experience with subsurface conditions in the general site area. Based upon our evaluation, the subsurface conditions within the site are consistent with the characteristics of a Site Class “E” as defined in Table 1613.5.2 of the building code.

EVALUATION AND DISCUSSIONS

The type and depth of foundation suitable for a given structure primarily depends on several factors including the subsurface conditions, the function of the structure, the loads it may carry, the cost of the foundation and the criteria set by the Design Engineer with respect to vertical and differential movement which the structure can withstand without damage. Detailed column loads for a typical 100,000 sq. ft. industrial manufacturing building were not provided at the time of this study; however, the structural column loads are anticipated to be on the order of 100 kips, with wall loads on the order of about 5 kips per lineal foot. Grading plans are also not available at this time; although, we anticipate at least four feet of fill may be required to achieve final grades.

The choice of type of deep foundation should be based on the tolerance criteria for the performance of the structures and economics of construction. Grade supported foundations or surface coverings will likely be governed by the anticipated load and settlement tolerances, particularly where new fill is placed. Driven piles should be viable foundation types considering the subsurface and groundwater conditions encountered and should be anticipated to carry the structural loads anticipating that settlement will occur as a result of new fill, building and slab loads. Lightly-loaded equipment pads may be able to be supported on shallow spread footings, or mat foundations, as long as the PVR issues described below are mitigated and settlement potential considered. Prior to new fill placement, site preparation should include removal of surficial topsoil and soil soil or demucking of wet areas and proofrolling in the presence of the Geotechnical Engineer to assess general stability and firmness prior to fill placement.

Based on the limited number of soil borings, field data and laboratory test results, the proposed site is generally feasible for industrial development. The subsurface soils explored are suitable for building foundations and site roadways after proper preparation. Fat clay soils with high shrink-swell potential (Plasticity Indices ranging from 39 to 52) were encountered near the ground surface across the site. Potential Vertical Rise (PVR) should be further evaluated considering new fill that may be placed at the site to achieve final grades. PVR in portions of this site could be mitigated by undercutting the fat clay soils to a predetermined depth and replacing with moisture-conditioned, properly compacted lean clay (CL) soils, or with the addition of chemical treatment such as lime mixing. Based on the anticipated new fill thickness of at least feet along with consideration of the relatively shallow groundwater conditions, PVR is not anticipated to adversely impact the project.

Please note that site pavement should be underlain by at least 12 inches of properly compacted low plasticity engineered fill material or otherwise or chemically treated with lime prior to base material placement due to the surficial fat clay soils. At this time, we anticipate pavement areas will receive at least two to four feet of fill to achieve final grades.

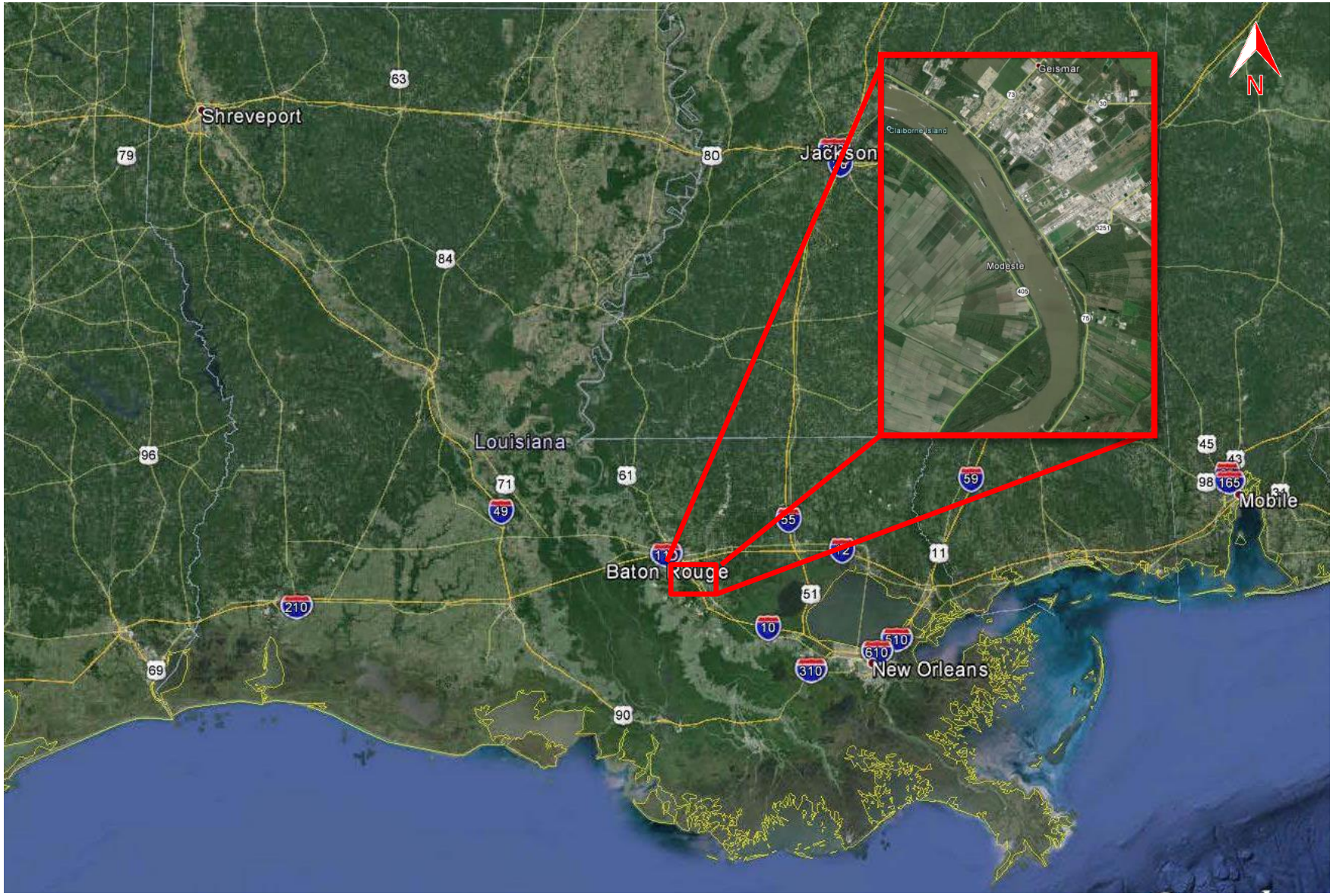
Areas within 1,500 feet of the existing levee to the west of the site should anticipate U.S. Army Corps of Engineers (USACE) interaction per the Hurricane and Storm Damage Risk Reduction System (HSDRRS) Design Guidelines. Special permitting should also be anticipated for any geotechnical borings, new fill or excavations, and any loading or changes in loading configurations within the referenced area of the site. Supplemental exploration and sampling methods, laboratory testing and engineering analysis (including, but not limited to, slope stability, seepage analysis, and settlement analysis) following the HSDRRS Design Guidelilines may be required for the project. Additionally, the USACE permits typically prohibit excavation or deep foundation installation during periods of high water (typically late April through late July but may vary dependent on the weather conditions in the region) as detailed by the permit requirements.

As stated previously, PSI's opinions and information presented in this site evaluation report are provided for planning purposes and preliminary considerations only; they are based on a very limited geotechnical exploration, and are not to be used for final design and construction.

REPORT LIMITATIONS

The preliminary information submitted in this report is based on the available subsurface data obtained by PSI at the time of our field exploration. PSI warrants that the preliminary findings contained herein have been made in accordance with generally accepted drilling procedures and visual soil classification methods in the local area. No other warranties are implied or expressed. This report has been prepared for the exclusive use of the Baton Rouge Area Chamber for the specific purpose of determining general subsurface information at the site of the referenced project. Upon authorization through a supplemental services agreement, PSI will be available to perform a thorough geotechnical study and provide final recommendations.

APPENDIX

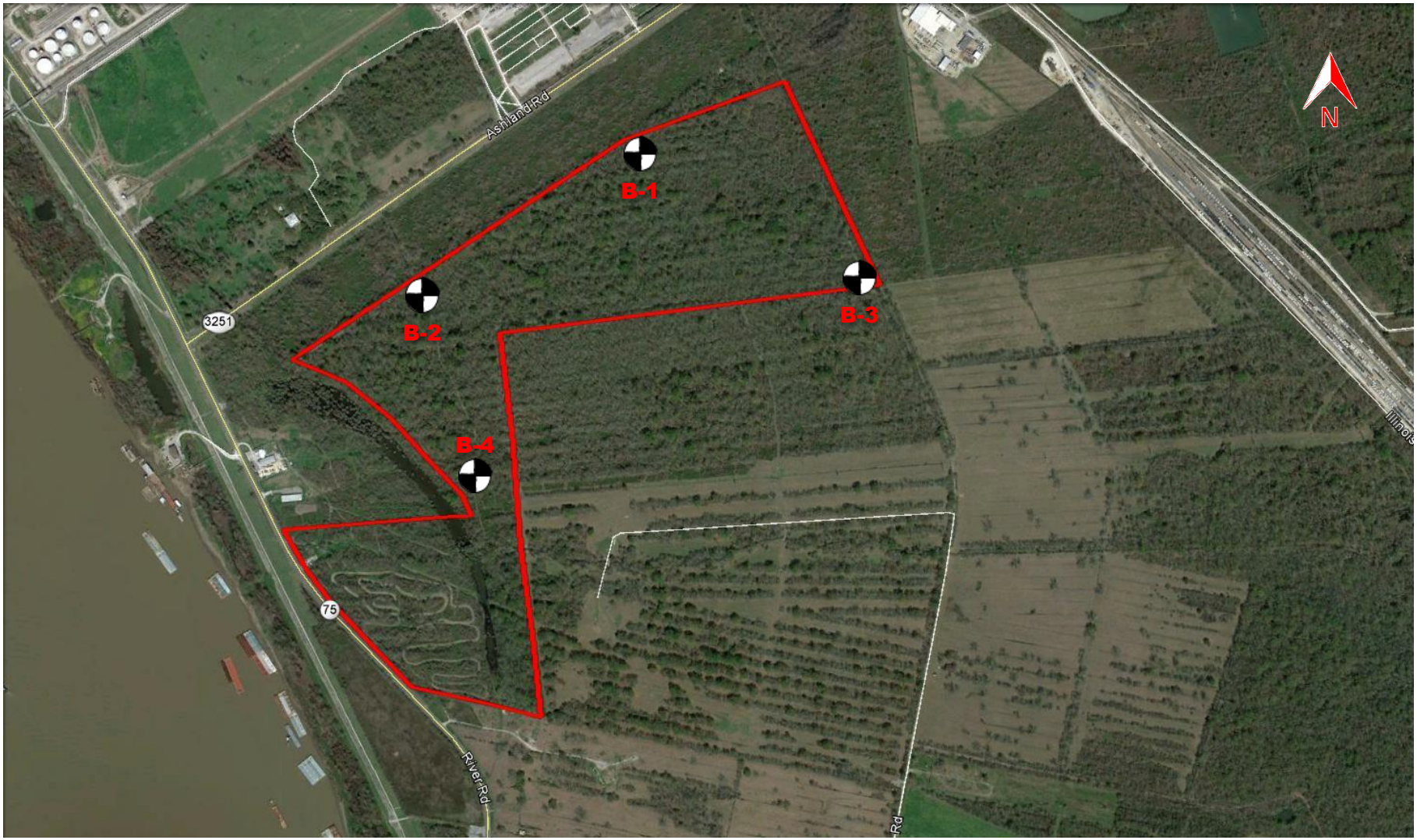


Information To Build On
Engineering • Consulting • Testing

SITE VICINITY PLAN

PSI PROJECT NO.: 0254650

GEOTECHNICAL ENGINEERING SERVICES
BRAC – PARKS GEISMAR SITE
GEISMAR, LOUISIANA



APPROXIMATE BORING LOCATION

psi Information To Build On
Engineering • Consulting • Testing

BORING LOCATION PLAN

PSI PROJECT NO.: 0254650

GEOTECHNICAL ENGINEERING SERVICES
BRAC – PARKS GEISMAR SITE
GEISMAR, LOUISIANA

LOG OF BORING B-1

BRAC - GEISMAR, LA
75TH AND ASHLAND ROAD
GEISMAR, LOUISIANA

TYPE OF BORING: WET ROTARY | LOCATION: BUILDING AREA | PSI Project No.: 0254650

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	MOISTURE CONTENT (%)	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	% PASSING No. 200 SIEVE	SHEAR STRENGTH (tsf) ○ HP ● UC △ TV ▲ UU 0.0 0.5 1.0 1.5	SHEAR STRENGTH (tsf) HAND PEN (tsf)	SHEAR STRENGTH (tsf) UC (tsf)	SHEAR STRENGTH (tsf) TORVANE (tsf)	SHEAR STRENGTH (tsf) UU (tsf)	UNIT DRY WEIGHT (pcf)
		CH		Firm to stiff gray **FAT CLAY**, with silt and sand seams		24						2.00				
2.5						34						1.00				
5.0						34	72	20	52			0.88				
7.5						34						0.88				
10.0						35						0.75				
12.5		CL		Very soft to soft gray **LEAN CLAY**, with silt and sand seams		33	34	19	15					0.25	0.17	97
15.0																
17.5																
20.0			⊠		WOH	42										
22.5																
25.0			⊠		WOH	53										
27.5		CH		Soft to firm gray **FAT CLAY**, with silt and sand seams		48								0.45	0.35	73
30.0																
32.5		OH		Soft to firm gray **ORGANIC CLAY**		113								0.45		
35.0																
37.5						78	142	31	111					0.40	0.44	52
40.0																
42.5		CH		Soft to firm gray **FAT CLAY**, with silt and sand seams and traces of organics		43								0.20		
45.0																
47.5						56								0.35		
50.0																

DEPTH OF BORING: 75 FEET
DATE DRILLED: 1/14/15
NOTE:

▽ GROUNDWATER DURING DRILLING: N/ A
▼ GROUNDWATER UPON COMPLETION: N/ A
▼ DELAYED GROUNDWATER:

BORINGLOG_JEFFERSON - PSIHOUSTON.GDT - 1/21/15 09:13 - 0254

psi Information To Build On Engineering • Consulting • Testing
Geotechnical Consulting Services
22171 MCH Road
Mandeville, Louisiana 70471

LOG OF BORING B-1

BRAC - GEISMAR, LA
75TH AND ASHLAND ROAD
GEISMAR, LOUISIANA

TYPE OF BORING: WET ROTARY | LOCATION: BUILDING AREA | PSI Project No.: 0254650

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	MOISTURE CONTENT (%)	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	% PASSING No. 200 SIEVE	SHEAR STRENGTH (tsf) ○ HP ● UC △ TV ▲ UU 0.0 0.5 1.0 1.5	SHEAR STRENGTH (tsf) HAND PEN (tsf)	SHEAR STRENGTH (tsf) UC (tsf)	SHEAR STRENGTH (tsf) TORVANE (tsf)	SHEAR STRENGTH (tsf) UU (tsf)	UNIT DRY WEIGHT (pcf)
52.5		CH		Soft to firm gray **FAT CLAY**, with silt and sand seams and traces of organics												
55.0						44					△▲			0.35	0.44	77
57.5		OH		Soft to firm gray **ORGANIC CLAY**												
60.0						75	110	30	80		△			0.35		
62.5																
65.0						60					▲△			0.40	0.30	66
67.5																
70.0						55					△			0.30		
72.5																
75.0						56					▲			0.45	0.41	64
77.5				Boring terminated at 75 feet												
80.0																
82.5																
85.0																
87.5																
90.0																
92.5																
95.0																
97.5																
100.0																

DEPTH OF BORING: 75 FEET
DATE DRILLED: 1/14/15
NOTE:

BORINGLOG_JEFFERSON - PSIHOUSTON.GDT - 1/21/15 09:13 - 0254

LOG OF BORING B-2

BRAC - GEISMAR, LA
75TH AND ASHLAND ROAD
GEISMAR, LOUISIANA

TYPE OF BORING: WET ROTARY | LOCATION: BUILDING AREA | PSI Project No.: 0254650

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	MOISTURE CONTENT (%)	LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	% PASSING No. 200 SIEVE	SHEAR STRENGTH (tsf) ○ HP ● UC △ TV ▲ UU 0.0 0.5 1.0 1.5	SHEAR STRENGTH (tsf) HAND PEN (tsf)	SHEAR STRENGTH (tsf) UC (tsf)	SHEAR STRENGTH (tsf) TORVANE (tsf)	SHEAR STRENGTH (tsf) UU (tsf)	UNIT DRY WEIGHT (pcf)
0		CL		Soft to firm brown and gray **FAT CLAY**, with silt and sand seams		40	57	18	39					0.55	0.32	84
2.5						28								0.55		
5.0						30								0.25	0.26	92
7.5						34								0.20		
10.0						38								0.10		
12.5				-traces of organics below 13 feet		32								0.25		
15.0																
17.5						36								0.40	0.40	87
20.0																
22.5						47	52	17	35					0.30		
25.0				Boring terminated at 25 feet												
27.5																
30.0																
32.5																
35.0																
37.5																
40.0																
42.5																
45.0																
47.5																
50.0																

DEPTH OF BORING: 25 FEET
DATE DRILLED: 1/12/15
NOTE:

▽ GROUNDWATER DURING DRILLING: 11 feet
▼ GROUNDWATER UPON COMPLETION: N/ A
▼ DELAYED GROUNDWATER:

BORINGLOG_JEFFERSON - PSIHOUSTON.GDT - 1/21/15 09:13 - 0254

psi Information To Build On
Engineering • Consulting • Testing
Geotechnical Consulting Services
22171 MCH Road
Mandeville, Louisiana 70471

CPT: B-3

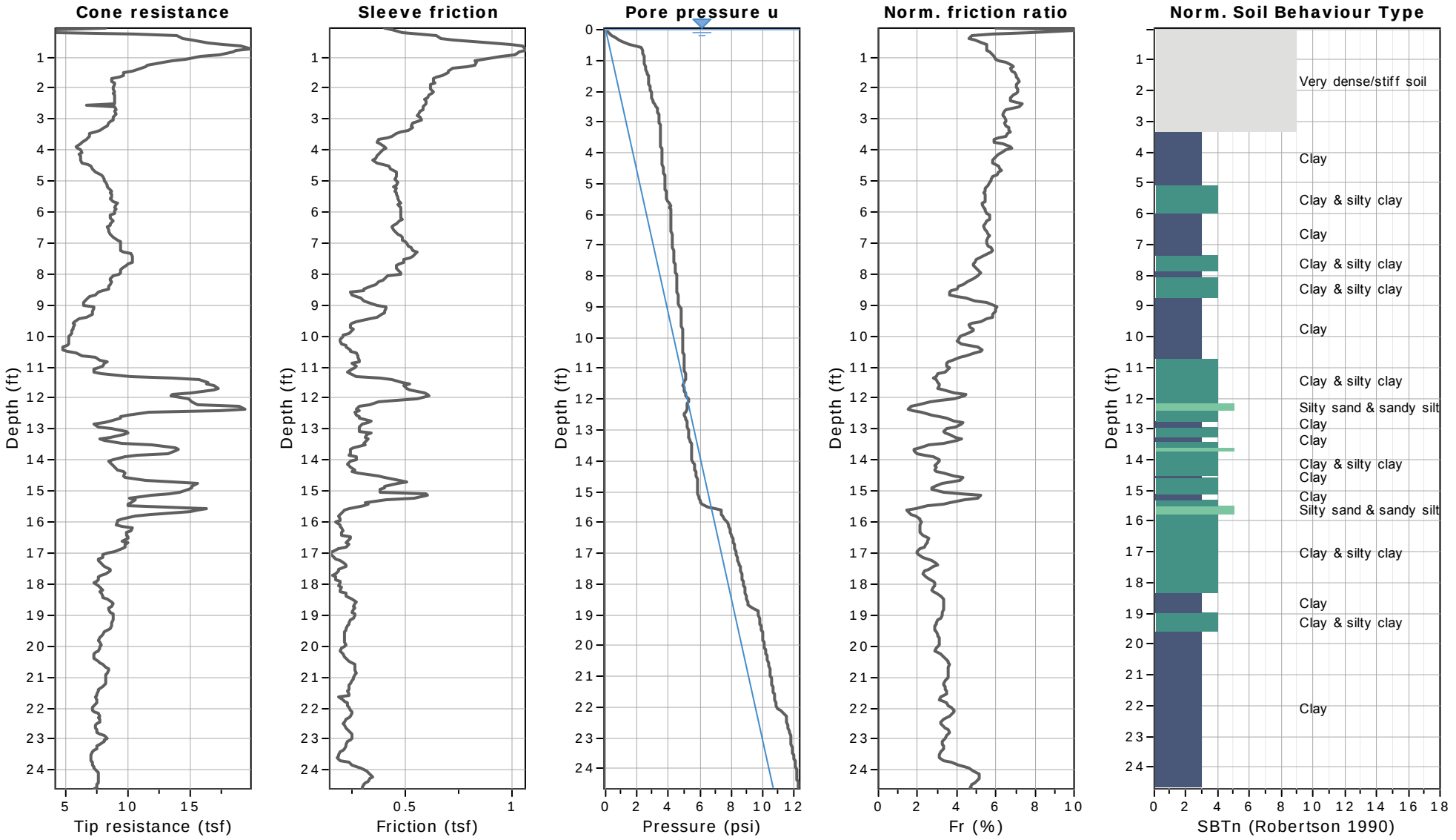
Total depth: 24.61 ft, Date: 2/3/2015

Cone Type: 60° 1.4" Diam. Type 2 Electric Cone Penetrometer

Cone Operator: Bill Penick

Project: 0254650 - BRAC

Location: Geismer, Louisiana



psi Information To Build On
Engineering • Consulting • Testing

CPT: B-4

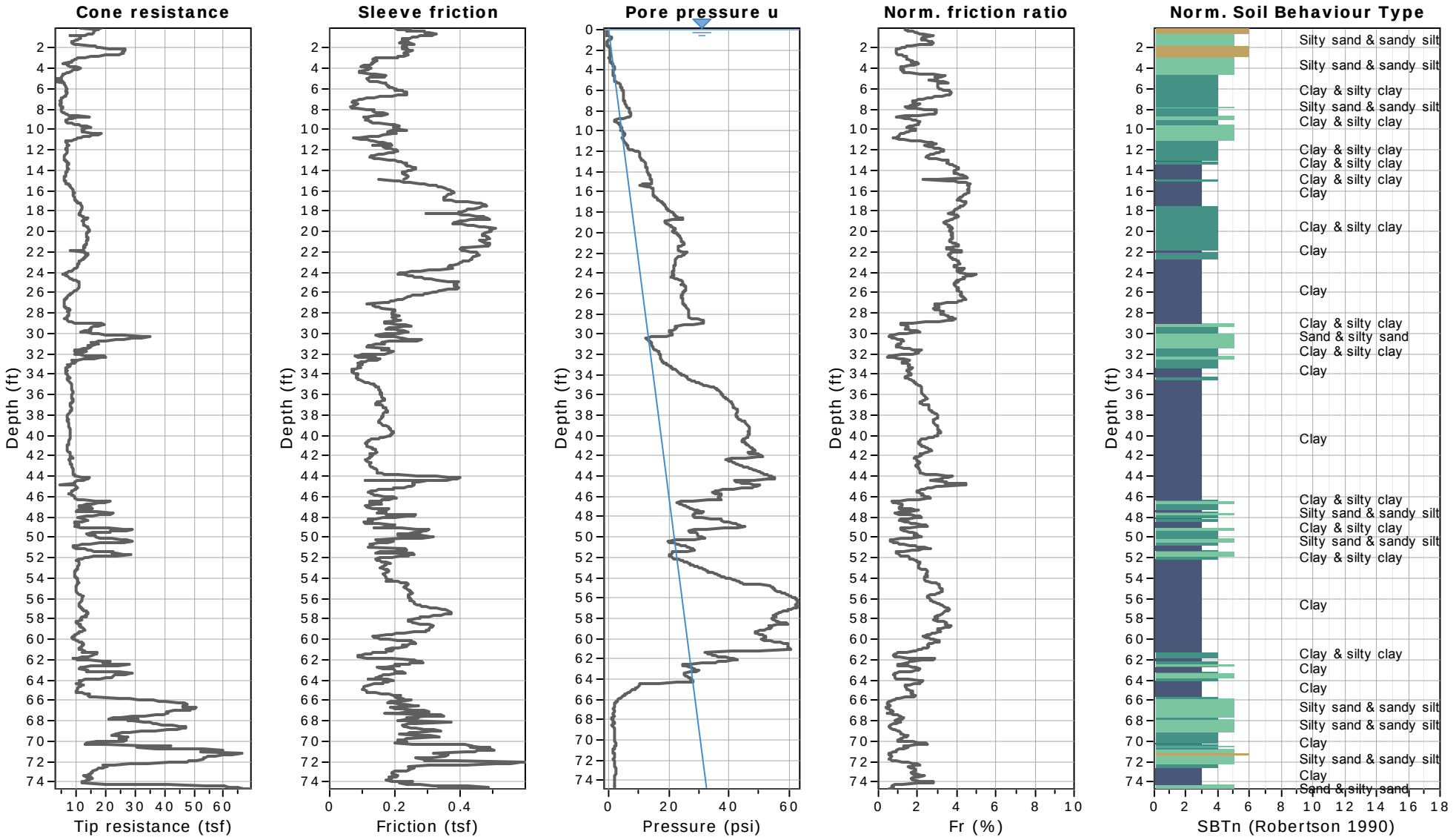
Total depth: 74.67 ft, Date: 2/2/2015

Cone Type: 60° 1.4" Diam. Type 2 Electric Cone Penetrometer

Cone Operator: Bill Penick

Project: 0254650 - BRAC

Location: Geismer, Louisiana



CPT: B-3

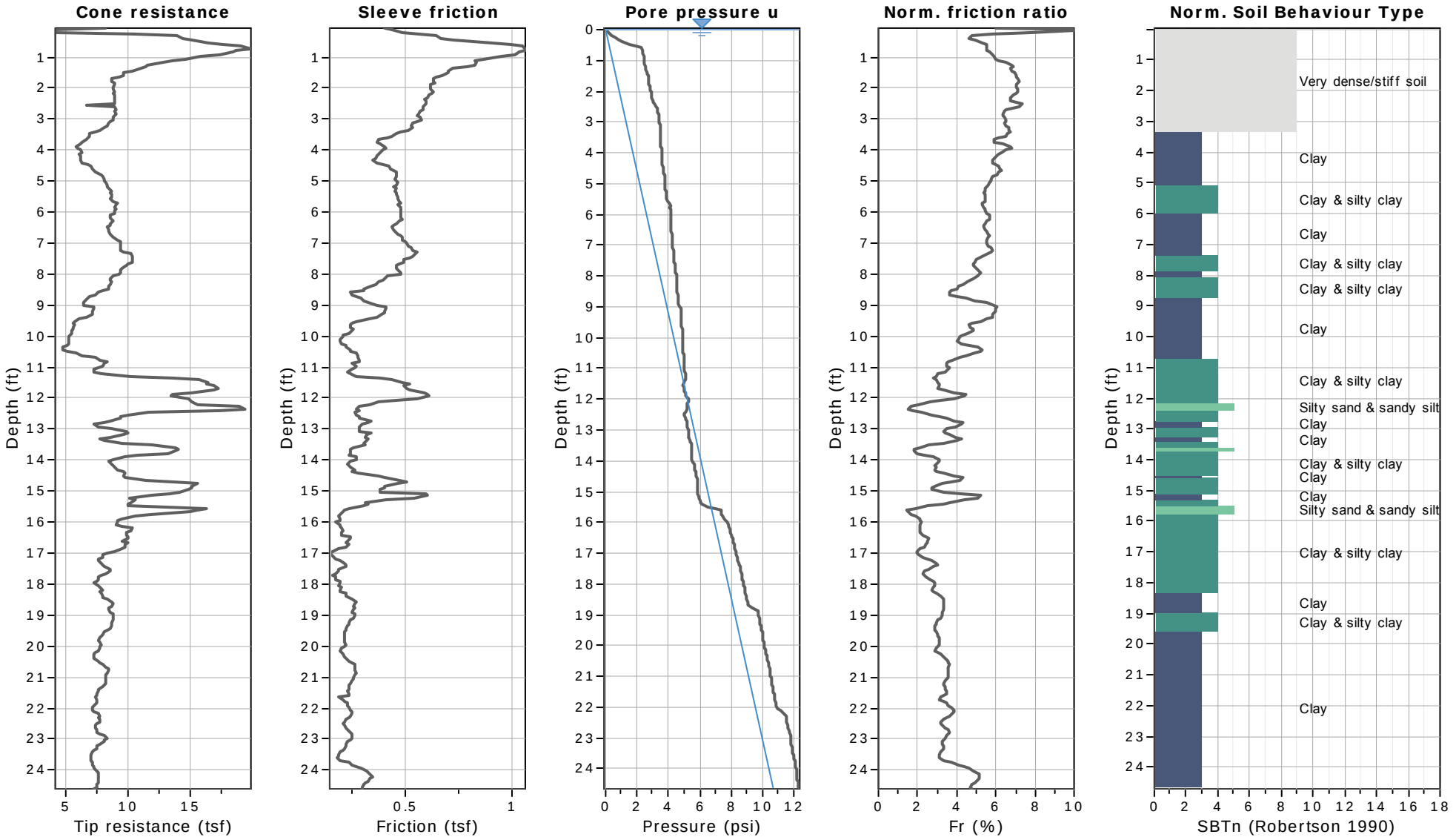
Total depth: 24.61 ft, Date: 2/3/2015

Cone Type: 60° 1.4" Diam. Type 2 Electric Cone Penetrometer

Cone Operator: Bill Penick

Project: 0254650 - BRAC

Location: Geismer, Louisiana



psi Information To Build On
Engineering • Consulting • Testing

CPT: B-4

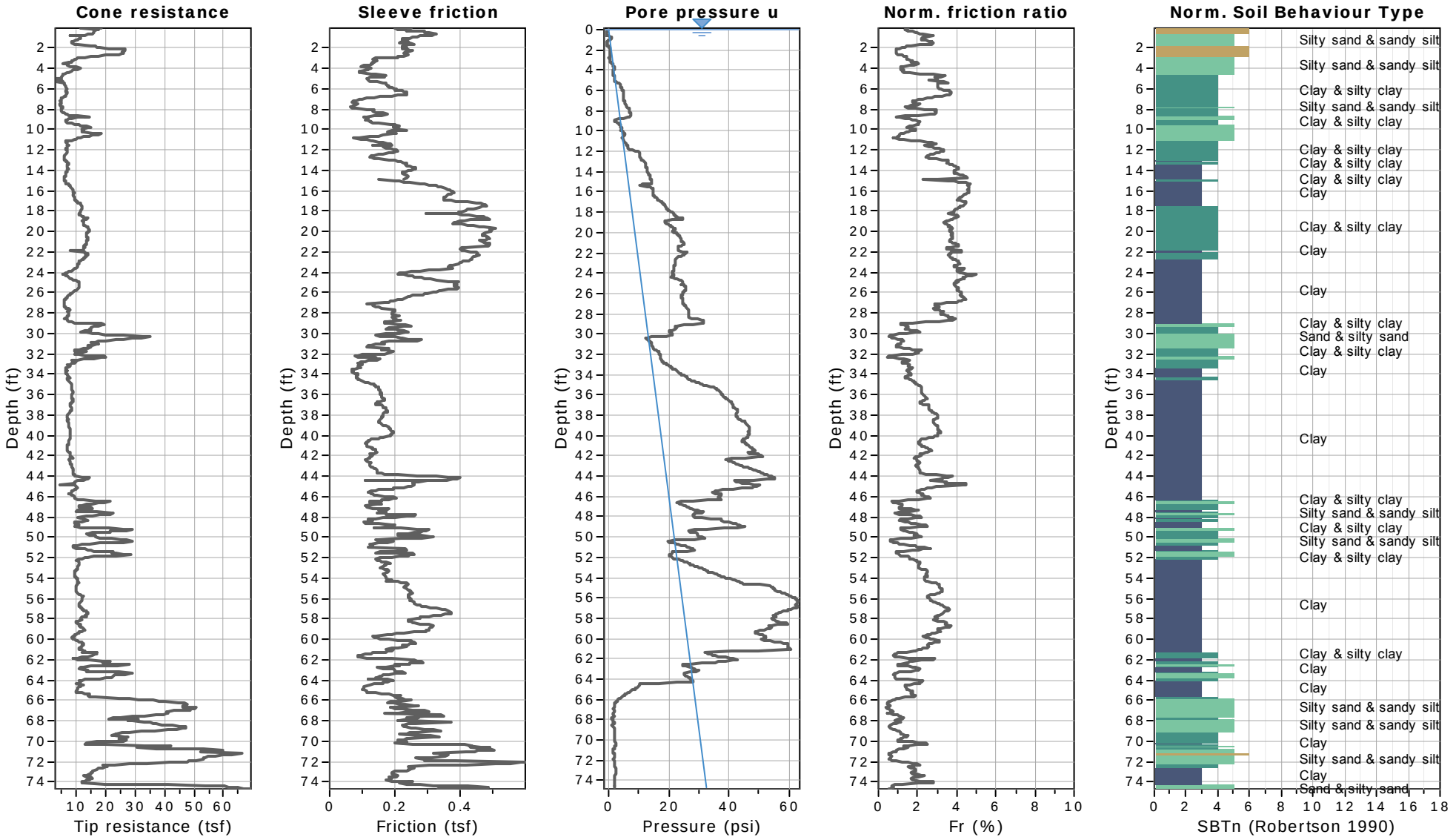
Total depth: 74.67 ft, Date: 2/2/2015

Cone Type: 60° 1.4" Diam. Type 2 Electric Cone Penetrometer

Cone Operator: Bill Penick

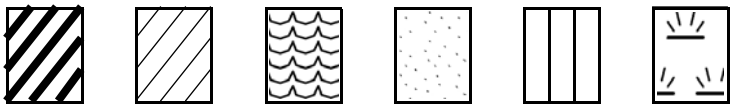
Project: 0254650 - BRAC

Location: Geismer, Louisiana



KEY TO TERMS AND SYMBOLS USED ON LOGS

SOIL TYPE

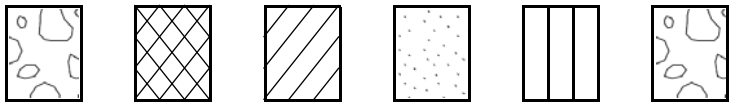


FAT CLAY | LEAN CLAY | ORGANIC CLAY | SAND | SILT | PEAT

SAMPLER TYPE

NO RECOVERY | AUGER SAMPLE | SHELBY TUBE | SPLIT SPOON

SOIL TYPE / MODIFIERS



GRAVEL | FILL | CLAYEY | SANDY | SILTY | GRAVELY

GROUNDWATER DURING DRILLING

GROUNDWATER UPON COMPLETION

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D 2487 (1980)

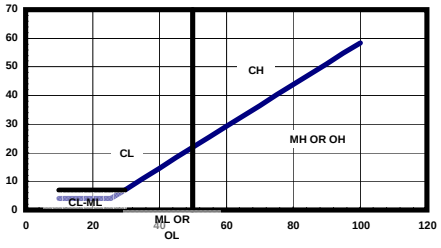
MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS LESS THAN 50% PASSING NO. 200 SIEVE	GRAVEL & GRAVELY SOILS LESS THAN 50% PASSING NO. 4 SIEVE	CLEAN GRAVEL (LITTLE OR NO FINES	GW	WELL GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			GP	POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		W/ APPRECIABLE FINES	GM	SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN 50% PASSING NO. 4 SIEVE	CLEAN SANDS LITTLE FINES	SW	WELL GRADED SAND, GRAVELY SAND (LITTLE FINES)
			SP	POORLY GRADED SANDS, GRAVELY SAND (L.FINES)
		SANDS WITH APPREA. FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS,SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS & VERY FINE SANDS,ROCK FLOUR SILTY OR CLAYEY FINE SANDS OR CLAYEY SILT W/ LOW PI
			CL	INORGANIC CLAY OF LOW TO MEDIUM PI LEAN CLAY GRAVELY CLAYS, SANDY CLAYS, SILTY CLAYS
			OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PI
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY FAT CLAYS
			OH	ORGANIC CLAYS OF MED TO HIGH PI, ORGANIC SILT
HIGHLY ORGANIC SOIL			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS
UNCLASSIFIED FILL MATERIALS				ARTIFICIALLY DEPOSITED AND OTHER UNCLASSIFIED SOILS AND MAN MADE SOIL MIXTURES

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	SHEAR STRENGTH IN TONS/FT^2
VERY SOFT	0 TO 0.125
SOFT	0.125 TO 0.25
FIRM	0.25 TO .50
STIFF	0.50 TO 1.00
VERY STIFF	1.00 TO 2.00
HARD	> 2.00 OR 2.00+

RELATIVE DENSITY - GRANULAR SOILS

CONSISTENCY	N-VALUE (BLOWS/FOOT)
VERY LOOSE	0-4
LOOSE	4-9
MEDIUM DENSE	10-29
DENSE	30-49
VERY DENSE	> 50 OR 50+



ABBREVIATIONS

HP - HAND PENETROMETER
TV - TORVANE
MV - MINIATURE VANE
UC - UNCONFINED COMPRESSION TEST
UU - UNCONSOLIDATED UNDRAINED TRAIXIAL
CU - CONSOLIDATED UNDRAINED

NOTE: PLOT INDICATES SHEAR STRENGTH AS OBTAINED BY ABOVE TESTS

CLASSIFICATION OF GRANULAR SOILS

U.S. STANDARD SIEVE SIZE(S)

6"	3"	3/4"	4	10	40	200

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

152	76.2	19.1	4.76	2.0	0.42	0.074	0.002

GRAIN SIZE IN MM