



February 27, 2015

EXHIBIT 16
PRELIMINARY GEOTECHNICAL
INVESTIGATION SERVICES REPORT
(Full Report)

Central Louisiana Economic and Development Alliance

P.O. Box 465
Alexandria, Louisiana 71309

Attention: Mr. Rick Ranson
Vice President Major Employers

Pan American Engineers, Inc.

P.O. Box 89
Alexandria, Louisiana 71309-0089

Attention: Mr. Kyle Randall, P.E.

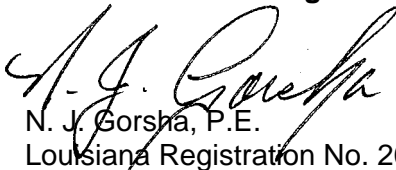
RE: Preliminary Geotechnical Investigation Services
England Air Park Site W-2 Industrial Certification
Alexandria, Rapides Parish, Louisiana
GTL Report No. 01-15-012

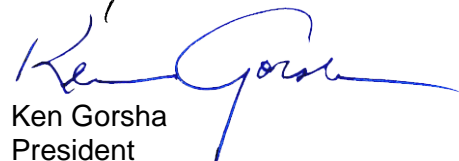
Dear Mr. Ranson:

Geotechnical Testing Laboratory, Inc. is pleased to submit this preliminary report of subsurface exploration for the above referenced project. Included in the report are the results of the exploration and general recommendations concerning the potential design and construction of the foundations.

We appreciate the opportunity to have provided you with our geotechnical engineering services and look forward to assisting you by providing additional investigation services for individual projects during the development of the subject tract. If you have any questions concerning this report, or if we may be of further service, please contact our office.

Respectfully submitted,
Geotechnical Testing Laboratory, Inc.


N. J. Gorsha, P.E.
Louisiana Registration No. 20082


Ken Gorsha
President

NJG/krq



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Preliminary Geotechnical Investigation Services
England Air Park Site W-2 Industrial Certification
Alexandria, Rapides Parish, Louisiana
GTL Report No. 01-15-012

Prepared For:

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Prepared By:

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Preliminary Geotechnical Investigation Services
England Air Park Site W-2 Industrial Certification
Alexandria, Rapides Parish, Louisiana
GTL Report No. 01-15-012

Introduction:

This report transmits the findings of a geotechnical investigation performed for the above-referenced project. The purpose of this investigation was to define and evaluate the general subsurface conditions in the general vicinity of a planned new industrial complex. Specifically, the study was planned to determine the following:

- Subsurface stratigraphy within the limits of our exploratory borings.
- Classification, strength, and compressibility characteristics of the foundation strata.
- Suitable foundation systems and allowable soil bearing pressures.
- Preliminary recommendations for rigid and flexible pavements below unspecified traffic.

The purpose of this report is to provide the owner, structural engineer, civil engineer, and other design team professionals with preliminary recommendations to consider for the design and construction of the proposed project. This report should not be used by the contractor in lieu of project plans and specifications.

Project Authorization:

Formal authorization to perform the work on behalf of the Central Louisiana Economic and Development Alliance (CLEDA) (Client), was provided by Mr. Thomas C. David, Jr., P.E. with Pan American Engineers, Inc., by accepting our December 11, 2014 written proposal. Authorization to proceed was provided on December 12, 2014. Field procedures were conducted between January 27 and February 13, 2015 and were delayed due to site access. To accomplish the intended purposes, a three-phase study program was conducted which included:

- a field investigation consisting of 14 exploratory test borings with samples obtained at selected intervals;
- a lab testing program designed to evaluate the expansive and strength characteristics of the subsurface soils; and,
- an engineering analysis of the field and laboratory test data for preliminary foundation design recommendations.

No additional analysis was requested. A brief description of the field and laboratory test procedures are provided in the Appendix.

Project Description:

The project will be the development of an industrial park site. We understand that the industrial park could consist of a number of structures varying from one (1) story to four (4) stories in height. Preliminary structural information was not available at the time this report was prepared. The proposed buildings should consist of either steel or wood framing and could be supported on either shallow foundations, or on drilled shafts bearing at depths sufficient to resist the anticipated loadings. The pavements will most likely consist of light duty pavements for passenger cars and pickup trucks and heavy duty pavements for tractor-trailer trucks.

For the purpose of this report, we have assumed that column loads could be between 25 and 150 kips, and that maximum continuous wall loads will be between one (1) and four (4) kips per linear foot. Maximum uniform and isolated concentrated floor loads are expected to be 125 psf and five (5) kips, respectively. Grade changes are expected to be nominal with no more than two (2) to three (3) feet of cut or fill.

If any of this information should change significantly or be in error, it should be brought to our attention so that we may review recommendations made in this report.

Site and Subsurface Conditions:

The project site is located northwest of the intersection of State Highway 1202 and Jimmy Brown Road in Alexandria, Rapides Parish, Louisiana. Elevation data obtained from Google Earth indicates the site slopes downward to the north with estimated elevation differences on the order of nine (9) feet. At the time of drilling, the site was utilized as farmland. The drilling rig experienced moderate difficulty moving about the site.

Subsurface Stratigraphy:

The subsurface conditions at the proposed building site were explored by drilling a total of 14 borings to depths between approximately 30 and 100 feet. The borings were located in the field by the drilling crew as shown on the Plan of Borings included in the Appendix of this report.

The stratification of the soils encountered during field drilling operations is presented on the boring logs in the Appendix. The stratification of the subsurface materials shown on the boring logs represents the subsurface conditions encountered at the actual boring locations and variations may occur across the site. The lines of demarcation represent the approximate boundary between the soil types, but the actual transition may be gradual. The following subsurface descriptions are of a generalized nature to highlight the major stratification features. The boring logs should be reviewed for more detailed information.

In order of increasing depth, the borings generally encountered the following soil strata beneath the surface: lean clay (CL), lean to fat clay (CL-CH), slightly clayey silt (CL-ML), sandy silt (ML), fat clay (CH), silty sand to sandy silt (SM/ML), silt (ML), silty sand (SM), and poorly graded sand (SP-SM).

Groundwater Conditions:

Seepage was observed at depths of six (6) to 20 feet during advancement of the test borings. Groundwater was measured at depths of five (5) to 15 feet below existing ground surface upon completion of the borings. A 48 hour water level reading obtained in Boring B-2 indicated a hydrostatic water level at 4.5 feet. The subsurface water regime is subject to change with variations in climatic conditions. Future construction activities may also alter the surface and/or subsurface drainage patterns of this site. Therefore, groundwater conditions should be explored at the start of construction by others. If there is a noticeable variance from the observations reported herein, then GTL should be notified immediately to review the effect, if any, such data may have on the design recommendations. It is not possible to predict future ground water conditions based upon short-term observations.

Foundation Recommendations:

The soil parameters presented below are based on single borings placed at irregular intervals across the site. The deviations between the boring locations indicate variable subsurface conditions across the site and should not be assumed as representative of the entire site. Thus, the findings presented herein should be considered preliminary in nature and should be confirmed through further investigation prior to development of the subject parcel. Prior to

developing any section of the tract, a specific subsurface investigation should be obtained and tailored to the individual project. This report should not be used in lieu of a final geotechnical investigation addressing site specific needs for the intended projects.

Detailed information on structural systems and planned grading is currently unavailable. Based on the size and type of anticipated structures, as well as the findings from this investigation, a system of shallow footings with an on-grade floor slab, in conjunction with the recommended subgrade preparation is believed to be the most practical and economical means of support. However, heavier building loads could result in the use of deep foundations. Recommendations for both foundation types are discussed separately below.

Potential Vertical Rise (PVR) values were estimated to vary between less than one (1) inch and approximately three (3) inches for this site. One (1) inch of PVR is generally accepted as the maximum allowable value for design and construction in the geographical area. The surficial soils encountered by the borings are considered to be moderately to highly expansive.

Shallow Foundations:

To remediate the loose soil conditions in the surficial zone, provide a consistent subgrade for slab support, and reduce the potential for active soils to affect the foundations, GTL recommends that a uniform layer of density-approved select fill be provided beneath the floor slabs. Areas where loose or soft soils are present will require further undercut to remediate the low strength within the supporting subgrade. Additional undercutting could reach depths of four (4) to five (5) feet.

The select fill for the building pads should extend at least five (5) feet beyond the perimeter of the buildings. The table below indicates the estimated undercut and select fill pad thickness to limit the PVR to a value of one (1) inch or less for the individual building pads in the vicinity of the boring locations.

Boring No.	Estimated PVR (inches)	Estimated Thickness of Select Fill Pad (feet)
1	1.0"	1.5
2	< 1.0	1.0
3	< 1.0	1.0
4	1.5	1.0
5	< 1.0	1.0
6	< 1.0	1.0
7	2.0	2.0
8	2.25	3.0
9	2.5	4.0
10	3.0	5.0
11	< 1.0	1.0
12	1.75	2.0
13	< 1.0	1.0
14	2.25	4.0

Shallow foundations may utilize individual or continuous footings bearing within the upper five (5) feet of the surficial zone. The provision of at least one (1) to two (2) feet of select fill should be anticipated to provide a suitable subgrade for the structures. Typical bearing capacity values

for shallow spread footings may vary from between approximately 1,500 psf to 2,500 psf for soils with consistencies of medium dense or medium stiff. Strip footings for continuous wall loads may be estimated between 1,150 and 2,000 pounds per linear foot.

Select Fill:

Select fill material should be free of organic or other deleterious materials, homogeneous mixture, have a maximum particle size of three (3) inches, have a liquid limit less than 40 and plasticity index between 8 and 20, and consist of silty-clayey sands (SM-SC), low plasticity sandy clays (CL), or clayey sands (SC) as defined by the Unified Soil Classification System. If a fine-grained material is used for fill, very close moisture content control will be required to achieve the recommended degree of compaction.

Deep Foundations:

Deep foundations may be considered for use at this site due to special equipment or building loads. Shafts should be founded at a minimum estimated depth of 20 feet below the existing ground surface. The table below presents the estimated allowable single shaft capacities for an 18 inch diameter shaft founded at depths between 20 and 50 feet below present ground surface. The factor of safety for these values is estimated to be 2.0.

<u>Diameter of Shaft (inches)</u>	<u>Depth of Shaft (feet)</u>	<u>Allowable Compressive Single Shaft Capacity (kips)</u>
18	20	15
	25	20
	30	25
	35	30
	40	35
	45	40
	50	45

Driven Piles:

The superstructure loads may be supported on Class B creosote treated timber piles founded at a minimum depth of 30 feet below the existing ground surface. The final depth of the piles may be selected from the following table after considering the estimated structural total loads.

<u>Depth (feet)</u>	<u>Allowable Compressive Load (kips)</u>
30	10
35	15
40	20
45	25
50	30

If the above allowable timber pile loads are found to be inadequate, consideration may be given to using 12-inch square per-cast, pre-stressed concrete piles. Such piles may be selected from the following table. The factor of safety for these and the above values is 2.0.

<u>Depth (feet)</u>	<u>Allowable Compressive Load (kips)</u>
30	20
35	25
40	30
45	35
50	40

Total settlement is estimated to be on the order of one (1) inch or less for driven piles. Differential settlements (between adjacent piles or clusters) are estimated to be on the order of 0.5 inch or less.

Seismicity:

Based on Section 1613 of the IBC-2012, a Site Class of D has been estimated for this site. According to the USGS website for Seismic Hazard Design Parameters, the project site has a mapped 0.2 second spectral response acceleration (S_s) of 0.111 g. The project also has a mapped 1.0 second spectral response acceleration (S_1) of 0.062. The design spectral response accelerations, S_{DS} and S_{D1} , were determined to be 0.118 g and 0.100 g, respectively. Based on Tables 1613.3.5(1) and 1613.3.5(2), the site has an assigned Seismic Design Category of B for structures classified as Risk Categories I, II, and III. For structures classified as Risk Category IV, site has an assigned Seismic Design Category of C.

Pavements:

Information for this pavement analysis is inferred from the building borings. Our scope of services did not include extensive sampling and CBR testing of existing subgrade or potential sources of imported base material for the specific purpose of a detailed pavement analysis. Instead, we have assumed pavement related design parameters that are considered to be typical for the area soil types. It has been assumed that the constructed pavement subgrade will consist of well compacted soils. Based on experience, it is anticipated that the compacted native subgrade will yield a California Bearing Ratio (CBR) of between 2.0 and 5.0.

Lime Treatment:

A review of the boring logs indicates that the subgrade below the pavements will consist of highly plastic clays. Normally, these materials are considered to have poor support characteristics for pavements unless they are chemically treated to improve their engineering properties. Generally, soils with a PI value greater than 22 should be either removed to a depth of eight (8) inches and replaced with density approved select fill, or lime-treated as discussed below.

A bulk sample of the surficial clays was submitted to the laboratory for testing. Based on the results of our laboratory tests, it appears that the fat clay subgrade should be treated with a minimum of four (4) percent by dry weight of hydrated lime. Assuming an average dry unit soil weight of 92 pounds per cubic foot, the estimated weight of lime for field purposes should be 2.76 pounds per square yard per inch of compacted thickness. A copy of the Using pH to Estimate the Soil-Lime Proportion Requirement for Soil Stabilization is included in the Appendix of this report.

Lime treatment should be performed in accordance with the applicable provisions of Section 304 of the LA SSFRB, 2006 Edition.

Geogrid

We recommend placing geogrid below all heavy duty drives and heavy duty parking areas. The addition of the geogrid can significantly improve the performance of the pavements and extend the service life. All pavements receiving heavy duty traffic should receive a single layer of Tensar TriAx TX160 geogrid or equal. If a biaxial geogrid is considered, Tensar BX1200 geogrid or equal may be substituted. The placement and lap joints should be in accordance with the manufacturer's suggestions.

Base:

Granular base should meet the requirements for Item 1003.03(b) of the LA SSFRB for crushed stone or Item 1003.03(c) for recycled Portland cement concrete. The material should be compacted to 95 percent of the maximum density defined by the Modified Proctor (ASTM D-1557).

Asphaltic Pavement Materials:

Surface or wearing course asphaltic concrete should consist of a Type 3 Wearing Course Mixture contained in Item 501 of the LA SSFRB. Field density results should be based on the Theoretical Maximum Specific Gravity in accordance with DOTD TR 327. Minimum density requirements should be 89.0 percent for parking lots and shoulders and 92.0 percent for Travel Lane Wearing, Binder and Base Courses. Placement and processes should be in strict accordance with Part V of the above referenced specifications.

Portland Cement Concrete:

Concrete compressive strength should be a minimum of 3,500 psi at 28 days. The concrete should be designed with 5 percent (\pm 1 percent) entrained air to improve workability and durability. The design of steel reinforcement should be in accordance with local or accepted codes.

Subbase:

Consideration should be given to using a subbase below concrete pavements to provide a consistently firm surface upon which to place the concrete and reduce instability. The table below presents the options to reduce the likelihood of a pumping subgrade below the pavements.

REDUCED PUMPING SUBBASES			
Recommended Thickness	Type Material	LA SSFRB Designation	Maximum P.I.
4.0"	Crushed Stone	Item 1003.03(b)	4
4.0"	Clean Sand	Item 1003.02(a)	N/P
6.0"	Sand-Clay-Gravel	Item 1003.04(b)	15

Granular base material should be compacted to 95 percent of the maximum density defined by the Modified Proctor (ASTM D-1557). Clean sand and sand-clay-gravel mixtures should be compacted to 95 percent of Standard Proctor density (ASTM D-698).

Traffic and Design Data:

The general pavement design information presented in this report is based on subsurface conditions inferred by the test borings, information published by The Asphalt Institute, the Portland Cement Association, and past experience in the locale. The published information was utilized in conjunction with the available field and laboratory test data to develop general pavement designs based on the AASHTO structural numbering system.

The sections shown below are not based upon anticipated traffic loads as these were not available at the time this report was prepared. For the purpose of our pavement analysis of this report, we assume that the industrial traffic could consist of up to 250 repetitions of light passenger cars and pick-up trucks, 25 medium-sized delivery trucks and vans, and up to 50 heavy tractor-trailer trucks per day.

Recommended Pavement Sections:

The table below presents a summary of both rigid and flexible pavement sections for light and heavy duty applications. It should be noted that the pavement sections as presented below are minimums. If it is desired to reduce potential cracking, greater thickness of select fill and/or greater pavement section thickness could be utilized. In addition, long term pavement performance requires good drainage and performance of periodic maintenance activities.

MINIMUM PAVEMENT RECOMMENDATIONS *		
Pavement Type	Light Duty (Parking Stalls)	Heavy Duty (Entries, Drives & Parking)
Portland Cement Concrete	5.0" Portland Cement Concrete 4.0" Item 1003.03 (b) Base 8.0" Lime-Treated Subgrade or Density Approved Imported Fill	8.0" Portland Cement Concrete 4.0" Item 1003.03 (b) Base One Layer Tensar TriAx TX160 Geogrid 8.0" Lime-Treated Subgrade or Density Approved Imported Fill
Asphalt Over Crushed Stone Base	2.0" Item 501 Type 3 Surface 6.0" Item 1003.03 (b) Base 8.0" Lime-Treated Subgrade or Density Approved Imported Fill	4.0" Item 501 Type 3 Surface 12.0" Item 1003.03 (b) Base One Layer Tensar TriAx TX160 Geogrid 8.0" Lime-Treated Subgrade or Density Approved Imported Fill
*Materials should meet general requirements of the Louisiana DOTD Standard Specifications for Construction of Roads & Bridges, and specific requirements listed herein.		

Concrete thickness at trash receptacles should be a minimum of seven (7) inches. All paving recommendations are based on stable subgrade. Subgrade areas which are unstable should be over-excavated and replaced, or otherwise rendered stable prior to proceeding with base material placement.

Geotechnical Risk:

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned. The engineering recommendations presented in the preceding sections constitutes GTL's professional estimate of those measures that are necessary for the proposed structure to perform according to the proposed design based on the information generated and referenced during this evaluation, and GTL's experience in working with these conditions.

Limitations:

The exploration and analysis of the site conditions reported herein are considered preliminary in detail and scope and are not intended to form a basis for pavement and foundation design. The information submitted is based on the available soil information only and not on design details for the intended projects.

The findings, recommendations or professional advice contained herein have been made after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology. No other warranties are implied or expressed.

The scope of services did not include any environmental assessment for 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, or unusual or suspicious items or conditions are strictly for the information of the client. Prior to purchase or development of this site, an environmental assessment is advisable.

The scope of services did not include a geologic investigation to address any faults, large scale subsidence, or other macro geologic features not specifically addressed in this report or the agreement between GTL and the client.

After plans are more complete, it is recommended that the soils and foundation engineer be retained to provide a subsurface investigation tailored to meet the specific needs of the project.

This report has been prepared for the exclusive use of our client for the general application for the referenced project. GTL cannot be responsible for interpretations, opinions, or recommendations made by others based on the data contained in this report.

This report was prepared for general purposes only and should not be considered sufficient for purposes of preparing accurate plans for construction. Contractors reviewing this report are advised that the discussions and recommendations contained herein were provided exclusively to and for use by the project owner.

END OF REPORT TEXT

SEE FOLLOWING APPENDIX w/BORING LOGS & TEST RESULTS

APPENDIX

FIELD AND LABORATORY PROCEDURES

PLAN OF BORINGS

LOG OF BORINGS

SOIL-LIME PROPORTION RESULTS

SOIL CLASSIFICATION CHART

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Field And Laboratory Procedures
England Airpark Site W-2 Industrial Certification
Alexandria, Rapides Parish, Louisiana
GTL Report Number 01-15-012

I. Field Operations:

Subsurface conditions were evaluated by advancing fourteen (14) intermittent sample borings drilled and sampled between the dates of January 27, 2015 and February 13, 2015 within the project area. Boring locations were selected and staked in the field by representatives of Geotechnical Testing Laboratory, Inc. An illustration of the approximate boring locations with respect to the areas investigated is provided on the attached Plan of Borings. Descriptive terms and symbols used on the logs are in accordance with the Unified Soil (USCS) Classification System.

A truck-mounted rotary drill rig was used to make the test borings. Each boring was rotary washed using flight auger drilling techniques. Intermittent undisturbed samples were obtained in the following manner.

Standard penetration tests were performed in accordance with ASTM D-1586 procedures. This test is conducted by recording the number of blows required for a 140-pound hammer falling 30 inches to drive a split-spoon sampler eighteen inches into the substrata. Depths at which split-spoon samples were taken are indicated by two crossed lines in the "Samples" column on the Log of Boring. The number of blows required to drive the sampler for each 6-inch increment were recorded. The penetration resistance is the number of blows required to drive the split-spoon sampler the final 12-inches of penetration. Information related to the penetration resistance is presented under the "Field Data" heading of the Log of Boring as the Standard Penetration (Blows/Foot). These samples were visually examined, logged, and packaged for transport to our laboratory.

Cohesive strata were sampled in accordance with ASTM D-1587 procedures by means of pushing a thin walled Shelby tube a distance of two feet into the substrata. Consistency of the sample was measured in the field by means of a calibrated hand penetrometer. Such values, in tons per square foot, are provided under the "Field Data" heading on the Log of Boring. Depths which these undisturbed samples were obtained are indicated by a shaded portion in the "Samples" column of the Log of Boring. All samples were prudently extruded in the field were sealed to maintain "in-situ" conditions, labeled, and packaged for transport to our laboratory.

The presence of ground water was monitored during drilling operations. Initial water seepage readings are provided under "Groundwater Information" in the right hand column of the Log of Boring. After boring completion, water levels were allowed to rise and stabilize for several minutes prior to final water readings. These readings are also found under "Groundwater Information". Soil sloughing from the walls of the boring are also recorded here as depth of cave-in.

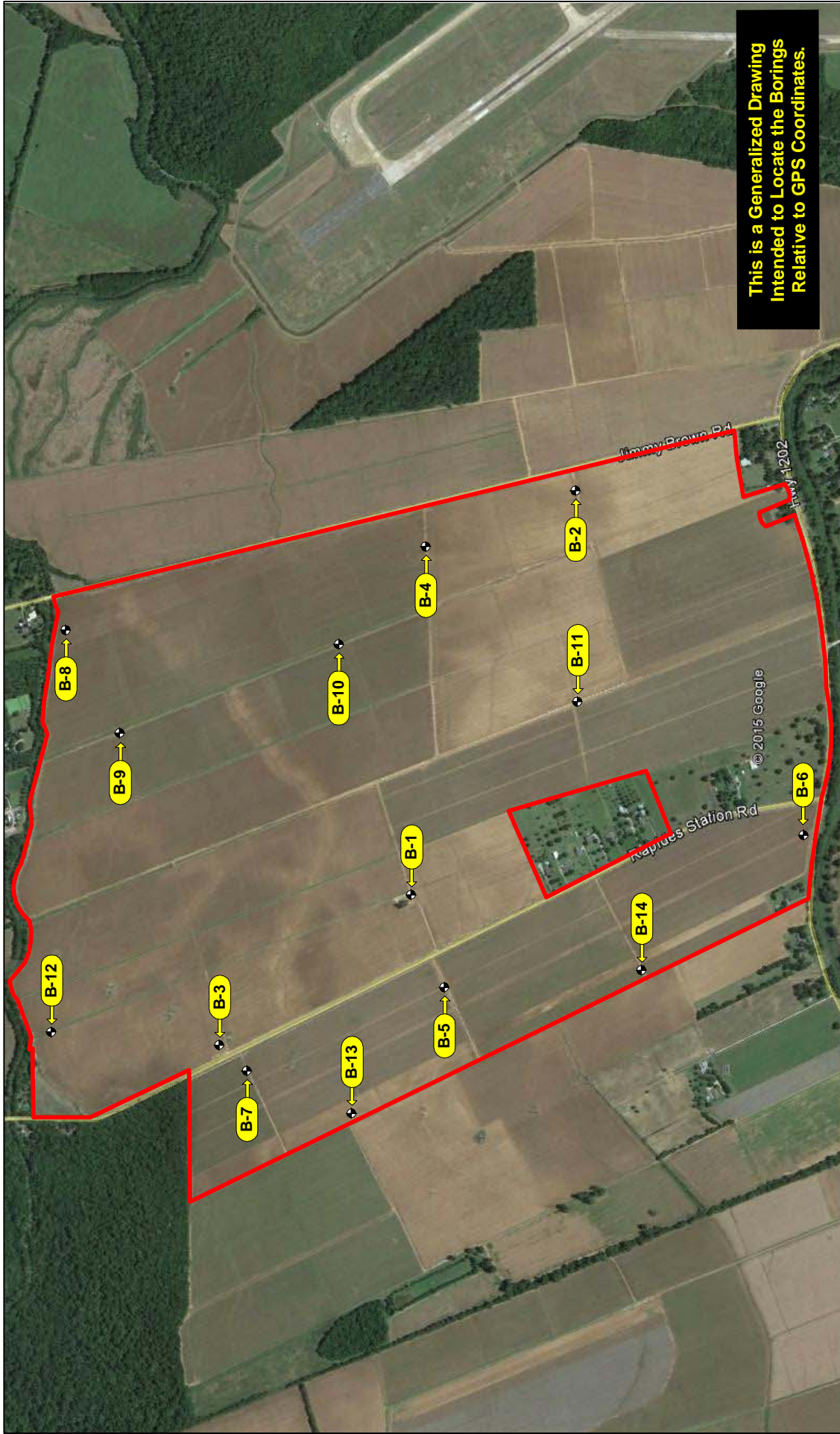
II. Laboratory Studies:

Upon return to the laboratory, all samples were visually examined and representative samples were selected for testing. Tests were performed on selected samples recovered from the test borings to verify classification and to determine pertinent engineering properties of the substrata. Individual test and designations are provided on the following page.

Test	Designations
Atterberg Limits	ASTM D4318
Moisture Content	ASTM D2216
Partial Gradation	ASTM D1140
Unconfined Compression Tests	ASTM D2166
Soil-Lime Proportion Results	ASTM D6276-99a

Results for soil classifications are tabulated on the Log of Boring in their respective columns under "Laboratory Data."

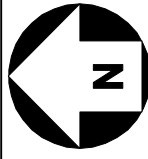
Samples obtained during our field studies and not consumed by laboratory testing procedures will be retained free of charge for a period of 30 days. Arrangements for storage beyond that period of time must be made in writing to ***Geotechnical Testing Laboratory, Inc.***



This is a Generalized Drawing
Intended to Locate the Borings
Relative to GPS Coordinates.

Plan of Borings

PROJECT		England Airpark Site W-2 Industrial Certification, Alexandria, Rapides Parish, Louisiana		CLIENT		Central Louisiana Economic and Development Alliance	
SCALE	Not to Scale	DATE	2/16/2015	FILE NUMBER	01-15-012		



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LOG OF BORING B-1



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012

DRILL DATE: 1/27/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRILLING METHOD(S): Diedrich D-50, Rotary Wash	
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	LOGGED BY: R. Leggett CHECKED BY: H. Carroll, E.I.	
					LL	PL	PI				GROUNDWATER INFORMATION: Water Seepage Noted @ 8.5 Feet While Drilling After 10 Minutes, Water Level @ 5.0 Feet Boring Walls Remained Uncaved	
DESCRIPTION OF STRATUM												
5	N = 10 N = 5 N = 3	22 24 29	42 23 19	98						Stiff to Soft Yellowish Brown LEAN CLAY (CL) w/silt	4.0'	
7.0	P = 1.75	26	47 25	22	99	90	2035			Stiff Yellowish Brown LEAN to FAT CLAY (CL-CH)	7.0'	
10	P = 0.25 N = 3	26 29	32 23	9	99				**	Soft Yellowish Brown LEAN CLAY (CL) w/silt	12.0'	
15	P = 1.25	33				81	1497			Firm Yellowish Brown & Gray FAT CLAY (CH)		
20	P = 1.50	33	71 28	43	99	83	1380			Firm Yellowish Brown & Gray FAT CLAY (CH)	23.0'	
25	P = 0.25 N = 3	29 27							**	Soft Yellowish Brown LEAN CLAY (CL) w/silt	28.0'	
30	N = 4	31	NP NP	NP	80					Loose Yellowish Brown SILT (ML)s w/sand	30.0'	
35	P = 1.50 P = 1.75	32 28				85	2456			Stiff Yellowish Brown FAT CLAY (CH)		
40	N = 4	28	74 30	44	99					- firm below 34.0 feet		
45	N = 5	44										
50	N = 7	37									50.0'	
Boring Terminated @ 50.0 Feet												

GTL LOG 1 - LOG A.GNNL01.GDT - 2/12/15 10:05 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°20'13.5" N / 92°34'51.5" W
 Stratification and Groundwater Depths Are Not Exact
 ** = Disturbed Sample

LOG OF BORING B-2



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012
 DRILL DATE: 1/28/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY DENSITY (Lbs./Cu.Ft.)		COMPRESSIVE STRENGTH (Lb./Sq. Ft.)		DRILLING METHOD(S): Diedrich D-50, Rotary Wash	
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)							
					LL	PL	PI								
			P = 3.50	29					91	1193	Firm to Stiff Yellowish Brown LEAN to FAT CLAY (CL-CH)				
			P = 2.50	24	45	24	21	97	97	2923					
	5		P = 2.25	24					98	2525			5.5'		
			N = 5	25							Loose Yellowish Brown, Slightly Clayey, SILT (CL-ML)				
	10		N = 5	26	26	22	4	94					11.5'		
			P = 1.50	29					95	2198	Stiff Yellowish Brown FAT CLAY (CH)				
	15														
			P = 2.00	33	60	25	35	98	89	1871	- firm @ 19.0 feet				
	20												23.0'		
			P = 1.25	32					90	1286	Firm Yellowish Brown & Gray LEAN to FAT CLAY (CL-CH)				
	25														
			P = 2.50	29	53	25	28	96	95	3227	- stiff @ 29.0 feet				
	30														
			P = 3.50	21					105	5005	- very stiff @ 34.0 feet				
	35												37.0'		
			N = 21	25	NP	NP	NP	28			Medium Dense Yellowish Brown Silty SAND (SM)				
	40														
			N = 21	28											
	45														
			N = 24	20											
	50														
			N = 27	24	NP	NP	NP	18							
	55														
			N = 30	32							- dense @ 58.5 feet				
	60														

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°19'58.1" N / 92°34'6.7" W
 Stratification and Groundwater Depths Are Not Exact
 ** = Disturbed Sample

GTL LOG 1 - LOG A.GNNL01.GDT - 2/16/15 09:14 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

LOG OF BORING B-2



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012
 DRILL DATE: 1/28/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRILLING METHOD(S): Diedrich D-50, Rotary Wash	
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)		
					LL	PL	PI				
DESCRIPTION OF STRATUM											
										Medium Dense Yellowish Brown Silty SAND (SM) <i>(continued)</i>	
	65	N = 19		26						- medium dense @ 64.0 feet	
	70	N = 12		23						68.5'	
	75	N = 41		22	NP	NP	NP	8		- dense @ 74.0 feet	
	80	N = 11		21						- medium dense @ 79.0 feet	
	85	N = 34		22						- dense, brown @ 84.0 feet	
	90	N = 62		25						- very dense, brown below 89.0 feet	
	95	N = 70		23	NP	NP	NP	7			
	100	N = 66		23						100.0'	
Boring Terminated @ 100.0 Feet											

GTL LOG 1 - LOG A.GNLI.01.GDT - 2/16/15 09:14 - Z:\GINT PROJECTS\2015_JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°19'58.1" N / 92°34'6.7" W
 Stratification and Groundwater Depths Are Not Exact
 ** = Disturbed Sample

LOG OF BORING B-3



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012
 DRILL DATE: 1/29/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRILLING METHOD(S): Diedrich D-50, Rotary Wash		
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)			COMPRESSIVE STRENGTH (Lb./Sq. Ft.)
					LL	PL	PI					
											LOGGED BY: R. Leggett	CHECKED BY: H. Carroll, E.I.
											GROUNDWATER INFORMATION: Water Seepage Noted @ 6.0 Feet While Drilling Water Level @ 11.0 Feet Upon Completion Boring Walls Caved @ 82.5 Feet	
											SURFACE ELEVATION: Not Determined	
											DESCRIPTION OF STRATUM	
											Very Stiff Yellowish Brown LEAN CLAY (CL) w/silt	
	5	N = 3 N = 3 N = 2 N = 2		20 29 31 31	40 36	24 24	16 12	98 97	107	4630	- soft @ 3.5 feet - very soft @ 5.5 feet	
	10	N = 4		31							- firm @ 9.0 feet	
	11.0'											
											Stiff Yellowish Brown FAT CLAY (CH)	
	15	P = 1.25		32	69	29	40	99	92	2596		
	20	P = 1.50		30					94	1847	- firm @ 19.0 feet	
	25	N = 8									- stiff @ 24.0 feet	
	30	P = 2.00		30					92	2222		
	35	P = 1.75		31	67	29	38	98	94	2760	- yellowish brown & gray @ 33.0 feet	
	40	P = 1.00		32					91	2643		
	45	P = 1.00		42					84	1255	- firm below 44.0 feet	
	50	P = 1.25		30					86	1130		
	53.0'											
											Loose Yellowish Brown, Slightly Clayey, SILT (CL-ML)	
	55	N = 4		25	26	22	4	93				
	58.0'											
											Firm Yellowish Brown & Gray FAT CLAY (CH)	
	60	N = 5		43								
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE										NOTES: See Plan of Borings for Location GPS Coordinates: 31°20'32.0" N / 92°35'7.8" W Stratification and Groundwater Depths Are Not Exact ** = Disturbed Sample		

GTL LOG 1 - LOG A.GNLL01.GDT - 2/12/15 10:05 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

LOG OF BORING B-3



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012
 DRILL DATE: 1/29/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRILLING METHOD(S): Diedrich D-50, Rotary Wash		LOGGED BY: R. Leggett CHECKED BY: H. Carroll, E.I.	
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)				
					LL	PL	PI							
DESCRIPTION OF STRATUM														
Firm Yellowish Brown & Gray FAT CLAY (CH) <i>(continued)</i>														
- stiff below 64.0 feet	65	P = 2.25		30					95	3485				
- gray & brownish yellow below 74.0 feet	70	P = 2.50		33	84	32	52	97	90	3555				
- very dense below 89.0 feet	75	P = 2.25		23					103	3718				
- stiff below 83.0 feet	80	P = 2.50		20					105	3665				
Dense Yellowish Brown, Poorly Graded, SAND (SP-SM) w/silt	85	N = 33		23										
- very dense below 89.0 feet	90	N = 52		22	NP	NP	NP	9						
- very dense below 89.0 feet	95	N = 61		21										
- very dense below 89.0 feet	100	N = 77		22										
Boring Terminated @ 100.0 Feet														

GTL LOG 1 - LOG A.GNNL01.GDT - 2/12/15 10:05 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°20'32.0" N / 92°35'7.8" W
 Stratification and Groundwater Depths Are Not Exact
 ** = Disturbed Sample

LOG OF BORING B-4



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012

DRILL DATE: 2/3/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRILLING METHOD(S): Diedrich D-50, Rotary Wash		LOGGED BY: R. Leggett CHECKED BY: H. Carroll, E.I.		
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)					COMPRESSIVE STRENGTH (Lb./Sq. Ft.)
					LL	PL	PI							
2.0'		P = 2.25	27	66	28	38	99	96	5332	Very Stiff Yellowish Brown FAT CLAY (CH)				
5.0'		P = 1.50 P = 1.00 P = 0.50	23 24 27					100 94 99	3391 678 1871	Stiff Yellowish Brown LEAN to FAT CLAY (CL-CH) - soft @ 5.0 feet - firm @ 7.0 feet				
11.5'		N = 4	29							- w/clayey silt (CL-ML) layer @ 9.0 feet				
15.0'		P = 1.25	31	76	30	46	99	92	2456	Stiff Yellowish Brown FAT CLAY (CH)				
22.0'		P = 1.00	31					86	1894	- firm @ 19.0 feet				
27.0'		N = 4	27	NP	NP	NP	70			Loose Yellowish Brown Sandy SILT s(ML)				
30.0'		N = 10	29							Stiff Yellowish Brown & Gray FAT CLAY (CH)				
35.0'		P = 1.25	25					101	2456					
40.0'		P = 1.00	37	87	32	55	99	86	2008					
45.0'		P = 1.00	46					75	1637	- firm @ 44.0 feet				
47.5'														
50.0'		N = 18	23							Medium Dense Yellowish Brown Silty SAND (SM)				
Boring Terminated @ 50.0 Feet														

GTL LOG 1 - LOG A.GNNL01.GDT - 2/12/15 10:05 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°20'12.8" N / 92°34'13.0" W
 Stratification and Groundwater Depths Are Not Exact

LOG OF BORING B-5



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012
 DRILL DATE: 2/7/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY DENSITY (Lbs./Cu.Ft.)		COMPRESSIVE STRENGTH (Lb./Sq. Ft.)		DESCRIPTION OF STRATUM
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)						
					LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI							
5	N = 14 N = 5 N = 4 N = 1	21 27 30 31	31 23 8	98								Stiff Yellowish Brown LEAN CLAY (CL) w/occasional clayey silt (CL-ML) layers - firm @ 2.5 feet - very soft 6.5 feet		
10	N = 2	34	39	24	15	98						- firm @ 14.0 feet		
15	P = 0.50	26						96	1080			17.0'		
20	P = 1.75	33	69	29	40	99		92	3110			Stiff Yellowish Brown FAT CLAY (CH)		
25	P = 1.25	32						91	1520			- firm @ 24.0 feet		
30	N = 5	26	NP	NP	NP	56						Loose Yellowish Brown Sandy SILT s(ML)		
35	N = 4	43										31.5'		
40	P = 1.75	31	74	36	38	99		93	3368			Firm Yellowish Brown & Gray FAT CLAY (CH) - stiff below 39.0 feet		
45	P = 1.00	35						88	2619					
50	P = 1.25	34						90	2995			50.0'		
Boring Terminated @ 50.0 Feet														

GTL LOG 1 - LOG A GNNL01.GDT - 2/12/15 10:05 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°20'10.7" N / 92°35'0.4" W
 Stratification and Groundwater Depths Are Not Exact

LOG OF BORING B-6



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012

DRILL DATE: 2/7/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRILLING METHOD(S): Diedrich D-50, Rotary Wash		LOGGED BY: R. Leggett CHECKED BY: H. Carroll, E.I.																																															
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	GROUNDWATER INFORMATION: Water Seepage Noted @ 19.0 Feet While Drilling Water Level @ 12.0 Feet Upon Completion Boring Walls Caved @ 25.0 Feet																																																
					LL	PL	PI																																																				
DESCRIPTION OF STRATUM																																																											
3.0'	Loose Yellowish Brown, Slightly Clayey, SILT (CL-ML)																																																										
5	Firm Yellowish Brown LEAN to FAT CLAY (CL-CH) - stiff below 6.0 feet																																																										
10	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">N = 8</td> <td style="width: 5%;">20</td> <td style="width: 5%;">24</td> <td style="width: 5%;">18</td> <td style="width: 5%;">6</td> <td style="width: 5%;">92</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td>N = 7</td> <td>24</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P = 1.00</td> <td>28</td> <td></td> <td></td> <td></td> <td></td> <td>94</td> <td>1875</td> </tr> <tr> <td>P = 1.25</td> <td>32</td> <td>48</td> <td>26</td> <td>22</td> <td>98</td> <td>90</td> <td>2260</td> </tr> <tr> <td>P = 1.25</td> <td>34</td> <td></td> <td></td> <td></td> <td></td> <td>87</td> <td>2015</td> </tr> <tr> <td>P = 1.50</td> <td>26</td> <td></td> <td></td> <td></td> <td></td> <td>98</td> <td>2339</td> </tr> </table>											N = 8	20	24	18	6	92			N = 7	24							P = 1.00	28					94	1875	P = 1.25	32	48	26	22	98	90	2260	P = 1.25	34					87	2015	P = 1.50	26					98	2339
N = 8	20	24	18	6	92																																																						
N = 7	24																																																										
P = 1.00	28					94	1875																																																				
P = 1.25	32	48	26	22	98	90	2260																																																				
P = 1.25	34					87	2015																																																				
P = 1.50	26					98	2339																																																				
17.5'	Very Loose Yellowish Brown Sandy SILT s(ML) - w/lean clay (CL) layer @																																																										
20	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">N = 1</td> <td style="width: 5%;">30</td> <td style="width: 5%;">NP</td> <td style="width: 5%;">NP</td> <td style="width: 5%;">NP</td> <td style="width: 5%;">65</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td>N = 2</td> <td>29</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>											N = 1	30	NP	NP	NP	65			N = 2	29																																						
N = 1	30	NP	NP	NP	65																																																						
N = 2	29																																																										
25	Very Loose Yellowish Brown Silty SAND to Sandy SILT (SM/ML)																																																										
30	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">N = 2</td> <td style="width: 5%;">35</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td>N = 1</td> <td>32</td> <td>NP</td> <td>NP</td> <td>NP</td> <td>48</td> <td></td> <td></td> </tr> </table>											N = 2	35							N = 1	32	NP	NP	NP	48																																		
N = 2	35																																																										
N = 1	32	NP	NP	NP	48																																																						
35	Very Loose Yellowish Brown, Slightly Clayey, SILT (CL-ML)s w/sand																																																										
40	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">N = 2</td> <td style="width: 5%;">34</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> </table>											N = 2	34																																														
N = 2	34																																																										
42.0'	- loose @ 49.0 feet																																																										
45	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">N = 1</td> <td style="width: 5%;">33</td> <td style="width: 5%;">28</td> <td style="width: 5%;">22</td> <td style="width: 5%;">6</td> <td style="width: 5%;">80</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> </table>											N = 1	33	28	22	6	80																																										
N = 1	33	28	22	6	80																																																						
50	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">N = 4</td> <td style="width: 5%;">32</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> </table>											N = 4	32																																														
N = 4	32																																																										
Boring Terminated @ 50.0 Feet																																																											

GTL LOG 1 - LOG A.GNNL01.GDT - 2/12/15 10:05 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°19'36.0" N / 92°34'44.2" W
 Stratification and Groundwater Depths Are Not Exact

LOG OF BORING B-7



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012

DRILL DATE: 2/9/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRILLING METHOD(S): Diedrich D-50, Rotary Wash	
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	LOGGED BY: R. Leggett CHECKED BY: H. Carroll, E.I.	
					LL	PL	PI				GROUNDWATER INFORMATION: Water Seepage Noted @ 6.0 Feet While Drilling No Water Observed Upon Completion Boring Walls Remained Uncaved	
DESCRIPTION OF STRATUM												
			P = 1.00	27	61	26	35	98	96	3321	Stiff Yellowish Brown FAT CLAY (CH)	2.0'
			P = 0.25	29						**	Firm Yellowish Brown LEAN CLAY (CL) w/silt	
	5	X	N = 4	31								5.5'
			P = 1.25	31	72	30	42	98	93	3157	Stiff Yellowish Brown FAT CLAY (CH)	
			P = 1.50	32					92	2385		
			P = 1.50	33					91	2339		
			P = 1.25	29					94	1894	- firm, yellowish brown & gray @ 19.0 feet	
			P = 1.75	30	69	30	39	99	94	3952	- stiff, yellowish brown & gray @ 24.0 feet	
			P = 1.50	26					96	3414		
			P = 1.50	31					92	3157		
			P = 1.75	36	84	33	51	99	88	1918	- firm, yellowish brown & gray below 39.0 feet	
			P = 1.00	30					94	1450		
			P = 0.25	33						**		50.0'
Boring Terminated @ 50.0 Feet												

GTL LOG 1 - LOG A.GNNL01.GDT - 2/12/15 10:05 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°20'29.45" N / 92°35'9.77" W
 Stratification and Groundwater Depths Are Not Exact

LOG OF BORING B-8



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012

DRILL DATE: 2/9/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY DENSITY (Lbs./Cu.Ft.)		COMPRESSIVE STRENGTH (Lb./Sq. Ft.)		DESCRIPTION OF STRATUM
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)							
					LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI								
5	P = 2.25 P = 2.50 P = 2.50 P = 2.25 P = 2.00	28 24 26 23 30	66 28 38 61 26 35 98	98	92	2643	Stiff Yellowish Brown FAT CLAY (CH) - hard @ 3.0 feet - very stiff @ 5.0 feet - stiff below 7.0 feet		17.0'						
15	P = 2.00	31		92	2175	21.0'									
20	P = 1.00	27	29	20	9	97			94	1150	Firm Yellowish Brown LEAN CLAY (CL) w/silt Firm Yellowish Brown & Gray FAT CLAY (CH)		37.0'		
25	P = 1.75	33		89	1776	47.0'									
30	P = 2.00	30	74	29	45	99			94	1801	- stiff @ 34.0 feet Medium Dense Yellowish Brown SILT (ML)s w/sand		47.0'		
35	P = 2.50	32		91	2670	50.0'									
40	N = 14	18	NP	NP	NP	78			Very Dense Yellowish Brown Silty SAND (SM)		50.0'				
45	N = 22	23									Boring Terminated @ 50.0 Feet				
50	N = 59	27													

GTL LOG 1 - LOG A GNNL01.GDT - 2/12/15 10:05 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°20'46.80" N / 92°34'21.93" W
 Stratification and Groundwater Depths Are Not Exact

LOG OF BORING B-9



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012

DRILL DATE: 2/12/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRILLING METHOD(S): CME 55B, 4.5" I.D. Hollow Stem Auger	
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	LOGGED BY: R. Leggett CHECKED BY: H. Carroll, E.I.	
					LL	PL	PI				GROUNDWATER INFORMATION: Water Seepage Noted @ 8.0 Feet While Drilling Water Level @ 7.0 Feet Upon Completion Boring Walls Caved @ 16.0 Feet	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
5	P = 2.50	32	64	27	37	99	91	3391	Stiff Yellowish Brown FAT CLAY (CH)			
	P = 2.25	29					94	3905				
	P = 3.00	31					91	3952				
	P = 2.75	34	71	29	42	99	88	2745				
	P = 2.75	33					91	3157				
	P = 3.00	33					89	2105				
18.0'												
20	P = 2.25	25	53	25	28	98	99	1941	Firm Yellowish Brown & Gray LEAN to FAT CLAY (CL-CH)			
	P = 2.50	26					97	2255				
	P = 2.25	26					98	2105				
30.0'												
Boring Terminated @ 30.0 Feet												

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°20'41.6" N / 92°34'32.9" W
 Stratification and Groundwater Depths Are Not Exact

LOG OF BORING B-10



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012
 DRILL DATE: 2/12/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY DENSITY (Lbs./Cu.Ft.)		COMPRESSIVE STRENGTH (Lb./Sq. Ft.)		DESCRIPTION OF STRATUM	
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)							
					LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI								
5		P = 3.25	36					84	2058	Stiff Yellowish Brown FAT CLAY (CH) - firm @ 3.0 feet - stiff below 5.0 feet					
		P = 2.25	42	74	30	44	99	79	1650						
		P = 2.75	30					93	2666						
	▽	P = 2.75	33					90	3227						
		P = 2.25	29					95	2760						
			▼												
15		P = 3.00	30	68	28	40	98	95	3040	17.5'					
20	X	N = 6	23							Loose Yellowish Brown Silty SAND to Sandy SILT (SM/ML)					
	X	N = 5	25	NP	NP	NP	47								
	X	N = 4	24												
30										30.0'					
Boring Terminated @ 30.0 Feet															

GTL LOG 1 - LOG A.GNLL01.GDT - 2/17/15 10:12 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°20'20.5" N / 92°34'23.4" W
 Stratification and Groundwater Depths Are Not Exact

LOG OF BORING B-11



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012
 DRILL DATE: 2/12/15

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 55B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)
					LL	PL	PI			
DESCRIPTION OF STRATUM										
										Loose Yellowish Brown LEAN CLAY (CL) w/silt
	5	N = 7		23						2.0'
		N = 3		26	26	21	5	95		Loose Yellowish Brown, Slightly Clayey, SILT (CL-ML)
		N = 1		29						- very loose @ 4.0 feet
		N = 2		30						
		N = 2		33	28	23	5	99		
	10	N = 2		32						
		N = 2		32						
	15	N = 2		32						
		N = 3		30	25	21	4	98		- loose below 19.0 feet
	20	N = 3		31						
		N = 3		31						
	25	N = 3		30						
		N = 4		30						
	30	N = 4		30						30.0'
Boring Terminated @ 30.0 Feet										

GTL LOG 1 - LOG A GNNL01.GDT - 2/17/15 10:12 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°19'58.1" N / 92°34'29.6" W
 Stratification and Groundwater Depths Are Not Exact

LOG OF BORING B-12



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012
 DRILL DATE: 2/13/15

FIELD DATA		LABORATORY DATA								
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)		
					LL	PL	PI			
DRILLING METHOD(S): CME 55B, 4.5" I.D. Hollow Stem Auger										
LOGGED BY: R. Leggett CHECKED BY: H. Carroll, E.I.										
GROUNDWATER INFORMATION: Water Seepage Noted @ 8.5 Feet While Drilling Water Level @ 11.0 Feet Upon Completion Boring Walls Caved @ 18.0 Feet										
SURFACE ELEVATION: Not Determined										
DESCRIPTION OF STRATUM										
5	P = 4.00	21						104	6759	Very Stiff Yellowish Brown LEAN to FAT CLAY (CL-CH)
	P = 4.50+	16	54	27	27	97		111	21211	- hard below 3.0 feet
5	P = 4.50+	21						105	15645	6.0'
	P = 3.25	26						99	4256	Very Stiff Yellowish Brown FAT CLAY (CH)
10	P = 3.25	28	64	28	36	99		97	4326	
	P = 1.50	30						94	3368	- stiff @ 14.0 feet
15										17.0'
20	N = 4	27	NP	NP	NP	81				Loose Yellowish Brown SILT (ML)s w/sand
25	N = 4	28								
30	N = 5	28								30.0'
Boring Terminated @ 30.0 Feet										
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE								NOTES: See Plan of Borings for Location GPS Coordinates: 31°20'47.8" N / 92°35'4.8" W Stratification and Groundwater Depths Are Not Exact		

GTL LOG 1 - LOG A.GNNL01.GDT - 2/17/15 10:12 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

LOG OF BORING B-13



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012
 DRILL DATE: 2/13/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA					DRY DENSITY (Lbs./Cu.Ft.)		COMPRESSIVE STRENGTH (Lb./Sq. Ft.)		DRILLING METHOD(S): CME 55B, 4.5" I.D. Hollow Stem Auger	
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)						
					LL	PL	PI							
5		N = 11		23										Stiff Yellowish Brown LEAN CLAY (CL) w/clayey silt (CL-ML) layers - soft @ 2.0 feet
		N = 3		27	36	23	13	97						
		N = 3		29										
	▼	N = 3		29										
		N = 3		33	34	22	12	96						
		N = 2		31										
		N = 3		34										
		N = 3		33	36	24	12	97						
		N = 4		34										
	N = 4		33											
													30.0'	
													Boring Terminated @ 30.0 Feet	

GTL LOG 1 - LOG A.GNLL01.GDT - 2/17/15 10:12 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°20'18.0" N / 92°35'14.5" W
 Stratification and Groundwater Depths Are Not Exact

LOG OF BORING B-14



Geotechnical Testing Laboratory, Inc.
 226 Parkwood Drive
 Alexandria, LA 71301
 Telephone: (318) 443-7429

CLIENT: Central Louisiana Economic and Development Alliance
 PROJECT: Heavy Industrial Site W2
 LOCATION: Alexandria, Rapides Parish, Louisiana
 FILE NO.: 01-15-012
 DRILL DATE: 2/13/15

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY DENSITY (Lbs./Cu.Ft.)		COMPRESSIVE STRENGTH (Lb./Sq. Ft.)		DRILLING METHOD(S): CME 55B, 4.5" I.D. Hollow Stem Auger			
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)									
					LL	PL	PI										
DESCRIPTION OF STRATUM														2.0'		Very Stiff Yellowish Brown LEAN CLAY (CL) w/silt	
Firm Yellowish Brown FAT CLAY (CH)																	
5	N = 15	20	44	23	21	98											
	N = 5	37															
	N = 6	32															
	P = 1.50	32	69	28	41	99	86	1660									
	N = 6	30															
	P = 2.00	29					93	2456									- stiff @ 9.5 feet
	P = 3.25	30	74	28	46	99	91	2736									
	P = 3.00	27					95	2222									- yellowish brown & gray below 19.0 feet
	P = 2.50	28	67	26	41		98	1885									- firm below 24.0 feet
	P = 2.50	29					96	1652									
Boring Terminated @ 30.0 Feet														30.0'			

GTL LOG 1 - LOG A.GNNL01.GDT - 2/17/15 08:45 - Z:\GINT PROJECTS\2015 JOBS\01-15-012.GPJ

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE

NOTES:
 See Plan of Borings for Location
 GPS Coordinates: 31°19'51.6" N / 92°35'0.1" W
 Stratification and Groundwater Depths Are Not Exact

Using pH to Estimate the Soil-Lime Proportion Requirement for Soil Stabilization

Report Date: 2/10/2015

Sample Date: 2/9/2015

Project No: 01-15-012

Prepared Central Louisiana Economic and Development Alliance

For: P.O. Box 465
Alexandria, Louisiana 71309
Attention: Mr. Rick Ranson, Vice President Major Employees

Pan American Engineers, Inc.

P.O. Box 89
Alexandria, LA 71309-0089
Attention: Mr. Kyle Randall

Project: England Airpark Site W-2 Industrial Certification, Alexandria, Rapides Parish, Louisiana

Test Method: ASTM D4318; D6276-99a

Scope: This test method provides a means for estimating the soil-lime proportion requirements for stabilization of a soil. The optimum soil-lime proportion is selected by determining the lowest percentage of lime that results in a soil-lime pH of 12.4 for at least two successive test samples at increasing lime percentages.

Laboratory Results:

Material Origin	Site Subgrade @ B-8				
Material Description	Fat Clay (CH) (A-7-6)				
Average Liquid Limit (LL)	66				
Average Plasticity Index (PI)	38				
Lime Quantity	2.0%	3.0%	4.0%	5.0%	6.0%
pH Readings	11.55	12.12	12.52	12.53	12.53
Recommended, % by weight:	4.0				
Spread Rate:	2.76 pounds per square yard per inch of compacted thickness				

Comments: The spread rate is based off of an average dry unit soil weight of 92.0 pounds per cubic foot.

GEOTECHNICAL TESTING LABORATORY, INC.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS	
			GRAPH	LETTER		
<p>COARSE GRAINED SOILS</p> <p>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE</p>	<p>GRAVEL AND GRAVELLY SOILS</p>	<p>CLEAN GRAVELS</p> <p>(LITTLE OR NO FINES)</p>		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
		<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES	
	<p>SAND AND SANDY SOILS</p>	<p>CLEAN SANDS</p> <p>(LITTLE OR NO FINES)</p>		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES	
		<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		SM	SILTY SANDS, SAND - SILT MIXTURES	
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES	
			<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT LESS THAN 50</p>		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
					CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT GREATER THAN 50</p>		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY			
		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS			
		CH	INORGANIC CLAYS OF HIGH PLASTICITY			
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS			
<p>HIGHLY ORGANIC SOILS</p>				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS