Exhibit T - St. Tammany South Central Site
Preliminary Geotechnical Engineering Report

PROJECT REPORT

APS Design and Testing, LLC

"Building a Better World"

PRELIMINARY GEOTECHNICAL ENGINEERING SERVICES REPORT

PRELIMINARY GEOTECHNICAL RECOMMENDATIONS
ST. TAMMANY SOUTH CENTRAL SITE (HICKORY HIGHWAY)
ABITA SPRINGS, LOUISIANA
APS FILE NO: 1512-G085

Presented to

PIVOTAL ENGINEERING, LLC
1515 POYDRAS ST., SUITE 1875
NEW ORLEANS, LA 70112

Prepared by

APS DESIGN AND TESTING, LLC
8000 INNOVATION PARK DRIVE
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SEPTEMBER 26, 2016

APS Design and Testing, LLC
"Building a Better World"

September 26, 2016

Pivotal Engineering, LLC
1515 Poydras Street Suite 1875
New Orleans Louisiana 70112

Attention: Mr. Terry Elnaggar, P.E.

Re: **Preliminary Geotechnical Engineering Recommendations**
St. Tammany South Central Site
Abita Springs, Louisiana

Dear Mr. Elnaggar:

APS Design and Testing, LLC is pleased to submit our Geotechnical Subsurface Exploration Report for the above referenced project. The report includes the results of field and laboratory testing and recommendations for the foundation design and general site preparation as related to soils.

We appreciate the given opportunity to perform this Geotechnical Study and look forward to continue participating during the design and construction phases of this project. If you have any questions pertaining to this report, or if we may be of further service, please contact our office.

Respectfully submitted,
APS DESIGN AND TESTING, LLC

STATE OF LOUISIANA
SAIRAM EDDANAPUDI
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PROFESSIONAL ENGINEER
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President

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Appendix

Boring Location Plan

Key to Terms and Symbols Used on Logs

Boring Logs

1.0 PROJECT INFORMATION

1.1 Project Authorization

APS Design and Testing has completed a subsurface exploration of the sod farm located south of Hickory Highway in Abita Springs, Louisiana. Authorization to perform drilling and laboratory testing services was received from Mr. Terry Elnaggar with **Pivotal Engineering, LLC** via email on September 4, 2015. Mr. Terry Elnaggar requested to provide a complete preliminary geotechnical report on September 23, 2016.

1.2 Project Description

Based upon the information provided, we understand that the project site is located south of Hickory Highway (LA-36) and approximately 2.9 miles west from the intersection of Hickory Highway (LA-36) and LA-1088 in Abita Springs, Louisiana. The purpose of the project is to determine the engineering properties of subsurface soils and provide preliminary foundation recommendations for the *St. Tammany South Central Site*.

2.0 PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to explore the subsurface conditions at the site to enable an evaluation of subsurface soil conditions at the project site. As requested by the client, a total of four (4) soil borings were drilled to a depth of 50 feet each within the footprint of the project site.

The scope of services also included conducting laboratory tests on selected samples recovered from the soil borings. As requested, a total of 16 atterberg limit tests (ASTM D4318) and eight (8) unconfined compressive strength tests (ASTM D2166) were performed on the obtained soil samples. Both field and laboratory testing procedures are briefly discussed in this report.

The scope of services included the following:

- Subsurface soil conditions at *St. Tammany South Central Site*;
- Bearing capacity of near surface soils;
- 14-inch PPC pile capacities; and
- General Construction Recommendations.

The scope of geotechnical services did not include an environmental site assessment for determining the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or around the 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.

In addition, APS did not provide any service to investigate or detect the presence of moisture, mold, or other biological contaminates in or around any structure, or any service that was designed or intended to prevent or lower the risk of the occurrence or amplification of the same. The client acknowledges that mold is ubiquitous to the environment with mold amplification occurring when building materials are impacted by moisture. The client further acknowledges that site conditions are outside of APS's control, and that mold amplification will likely occur, or continue to occur, in the presence of moisture. As such, APS cannot and shall not be held responsible for the occurrence or recurrence of mold amplification.

3.0 SITE LOCATION AND DESCRIPTION

The project site is located south of Hickory Highway (LA-36) and approximately 2.9 miles west from the intersection of Hickory Highway (LA-36) and LA-1088 in Abita Springs, Louisiana. Approximate GPS coordinates of the project site are 30°26'22.89"N 89°58'8.56"W. During our field exploration, we observed that site was covered with grass and the presence of mature trees.

4.0 FIELD EXPLORATION

The field exploration, performed to evaluate the engineering characteristics of the subsurface soil materials, included a reconnaissance visit to the project site by an APS representative, drilling the soil borings and recovering soil samples.

As requested by the client, a total of four (4) soil borings were drilled to a depth of 50 feet each within the footprint of the project site. Soil borings were located in the field by tape measurements/GPS coordinates that were referenced to physical elements/boundaries of the site. The Boring Location Plan, included in the Appendix, presents the approximate location of the soil borings.

5.0 DRILLING AND SAMPLING PROCEDURES

The borings were drilled on 12/10/2015 and 12/11/2015 with a track-mounted SIMCO 2800 drill rig, using auger and wet rotary drilling techniques to advance the boreholes. Undisturbed samples were continuously obtained from the ground surface to a depth of 20 feet, then at five-foot intervals to the depth of the boring. They were obtained using thin-walled tube sampling procedures in general accordance with ASTM D-1587 *Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes*. These samples were extruded in the field with a hydraulic ram, and were identified according to project number, boring number and depth, wrapped in aluminum foil and placed in plastic bags to preserve the natural moisture condition and transported to the laboratory in special containers to prevent disturbance.

For Cohesionless and semi-cohesive soils, Standard Penetration Tests (SPT) were performed at intervals to obtain standard penetration values of the soil. The standard penetration value (N) is defined as the number of blows of a 140-pound hammer, falling 30 inches, required to advance the split-barrel sampler 18 inches into the soil. To perform the test and obtain a sample, the sampler is lowered to the bottom of the previously cleaned drill rig and advanced by blows from the hammer. The number of blows is recorded for each of three successive increments of six inches penetration. The "N" value is obtained by adding the second and third incremental numbers. The results of the SPT 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 D1586).

6.0 LABORATORY TESTING PROGRAM

A laboratory testing program was conducted to determine pertinent engineering characteristics of the subsurface materials. This program included visual description and classification and determination of the moisture content (ASTM D2216 Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass) on all soil samples. Selected samples were subjected to ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils, ASTM D2166 Standard Test Method for Unconfined Compressive Strength of Cohesive Soils. The results of these tests are found in the accompanying boring logs located in the Appendix.

7.0 SUBSURFACE CONDITIONS

7.1 Subsurface Materials

In general, beneath approximately four (4) inches of topsoil, medium to stiff lean clays (CL) and/or sandy lean clays (CL) were encountered to a depth of six (6) feet followed by medium dense clayey sands (SC) and poorly graded sands (SP) to a maximum depth of 30 feet. Below this depth, soft to medium lean clays (CL) and fat clays (CH) were encountered to the termination depth of the borings.

The above subsurface description is a generalized nature to highlight the major subsurface materials features and characteristics. The boring logs, included in the Appendix, present specific information at individual boring location including: soil description, stratification, ground water level, unconfined compressive strength, samples’ location, and laboratory tests results. This information represents the actual conditions at the boring locations. Variations may occur and should be expected between boring locations. The stratification represents the approximate boundary between subsurface materials and the actual transition may be gradual.

7.2 Groundwater

Ground water was encountered at a depth of approximately three (3) feet from the existing ground surface in all of the soil borings, during our field exploration. These were measured from the existing ground surface at the time of our field exploration. It should be noted that the groundwater conditions are likely to change due to topography, permeability, weather, and other soil and terrain properties. <u>Therefore, we recommend that the contractor determine the actual groundwater levels at the site at the time of the construction activities.</u>

8.0 DISCUSSION

Upon review of the existing subsoil conditions and laboratory tests results, we consider that the soil conditions are feasible from a geotechnical point of view, if and when the included recommendations are correctly interpreted and applied.

Generally, the encountered subsoil materials provided fair strength parameters; this is based on unconfined compression strength test results and field standard penetration (SPT) test results. Shallow ground water conditions are very critical for any type of construction at the project site.

Please review the following sections for further information on the corresponding site and preliminary foundation recommendations.

9.0 GEOTECHNICAL RECOMMENDATIONS

9.1 Site Development Recommendations

9.1.1 Site Preparation

Prior to the development of any structure or fill deposit, the complete earthwork area must be properly cleaned. The cleaning activities shall include the removal of all surface vegetation, debris and any foreign matter present on the site.

APS recommends removal of a minimum of six (6) inches of topsoil materials in building and parking areas, containing soft soils, concrete, debris, organic matter, standing water due to recent rainfall, vegetation and all muck shall be stripped completely from the site to make the ground surface properly leveled. In the building areas where soft soils are present, should be removed along with roots and backfilled with structural fill. The actual removal depth of top soil shall be determined in the field by the Geotechnical Engineer or a representative. Please note that the stripped materials can only be used in landscaping, but not at any structural area.

9.1.2 Proof Rolling

Upon completion of the stripping activities, the exposed areas shall be properly proof rolled in order to prepare the natural terrain to receive the design structural fill and traffic loads. The proof roll consists of compacting the exposed surface with a 20-25 ton loaded dump truck. Surface soils that are observed to rut or deflect excessively under the truck load should be undercut and replaced with the proper structural fill. These activities should be performed during a period of dry weather and should be supervised by a Geotechnical Engineer or a representative.

9.1.3 Structural Fill Materials

After subgrade preparation and observation has been completed, structural fill placement, if necessary, may begin. The first layer of structural fill should be placed in a relatively uniform horizontal lift and be adequately keyed into the properly prepared subgrade soils. The structural fill should consist of lean clays, sandy lean clays (CL) or clayey sands (SC) having the following recommended material properties:

a. Percent Passing U.S. Sieve #200: 50 percent minimum
b. Liquid Limit: 40 maximum
c. Plasticity Index: 10 to 20 maximum
d. Inert Material (Non-Expansive)
e. Free of Organics
f. Maximum Particle Size: 2-in

This material must be certified and approved by the Geotechnical Engineer prior to its use. Alternatively, the structural fill material could consist of “clean” sand or pumped sand having less than 10 percent fines passing the No. 200 Sieve. Fill materials should be compacted to at least 95 percent of Maximum Dry Density Optimum Moisture Content according to ASTM D-698. In place density measurements should be taken to assure that this degree of compaction is achieved.

9.1.4 Structural Fill Deposit Construction

After all surface preparation and observation has been completed, the structural fill activities, If necessary, may begin. These activities must be performed in a sequential order where lower elevations must be worked before higher ones. The structural fill shall be deposited in lifts of eight (8) inches of loose material. Each lift shall be compacted and certified by the Geotechnical Engineer or a representative prior to placement of other lifts. The passing criteria shall be a 95% of the maximum dry density as determined by ASTM D-698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)), and a moisture content between one (1) below and three (3) above percentages of the optimum moisture content. If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. As a guideline, it is recommended that field density tests be performed at a frequency of not less than one test per 2,500 square feet.

It is important to maintain the structural fill thickness as uniform as possible. Uneven fill thicknesses under a structure may cause differential soil responses to the applied loads which can produce cracking, settling, or tilting of the structure. Uniform fill areas shall consider the footprint of the structure plus a five (5) feet strip around its perimeter.

Fill slopes shall be maintained at a maximum 2 Horizontal: 1 Vertical steepness. The runoff of water across the faces of the slopes shall be avoided by appropriate drainage ways. In addition, appropriate drainage ways shall be maintained at all earthwork surface areas in order to not affect compaction.

9.2 Preliminary Shallow Foundation Recommendations

9.2.1 Foundation Parameters

The minimum dimensions of 24 inches for spread and 18 inches for continuous footings should be used in the foundation design to reduce the possibility of a local bearing failure. These footings can be placed on a minimum of 12 inches of well compacted structural fill material or on existing medium clay soils present at a minimum depth of 24 inches from the top of existing soils.

TABLE 1.0

Spread Footing Bearing Capacity (psf)	Continuous Footing Bearing Capacity (psf)
1,200	1,000

It should be noted that these bearing capacity values are preliminary; therefore, an extensive field and laboratory testing must be performed prior to the commencement of any type of construction at *St. Tammany South Central Site.*

Total settlements and differential settlements for spread and continuous footings up to three (3) and two (2) feet in width respectively, are expected to be on order of one (1) inches and one-half (1/2) inches, respectively. Settlement was estimated based on total sustained dead loads of 70 percent of the above recommended net allowable bearing capacities plus two (2) feet of structural fill. The structural engineer shall confirm if these magnitudes are within tolerance limits; if not, APS shall be notified in order to provide some remedial measures and/or change the foundation type.

9.3 Preliminary Deep Foundation Recommendations

As requested, 14-inch square concrete piles were analyzed for the subject project. These capacities for piles are based on factors of safety (F.S.) shown below. We recommend that all the piles be embedded to the same elevation.

TABLE 2.0
14-inch Concrete Pile - Allowable Axial Capacities[1]

Pile Length (Feet)	Allowable Compression Capacity[1] (Tons); F.S. =2.0	Allowable Compression Capacity[2] (Tons); F.S. =2.5	Allowable Compression Capacity[3] (Tons); F.S. =3.0
	14-inch	14-inch	14-inch
20	10	8	6
30	14	11	9
40	20	17	14
50	35	28	23

[1]These are soil-pile related capacities. The structural capacity of the piles to support design loads is beyond our scope of services and must be verified by others.
Pile lengths are referenced from the existing ground surface.

1. Factor of safety 2.0 shall be applied if a static load test was performed on test or production piles.
2. Factor of safety 2.5 shall be applied if pile dynamic analysis (PDA) testing was performed on test or production piles.
3. Factor of safety 3.0 shall be shall be applied if NO static load test or PDA was performed.

The above presented pile capacities are based on the subsurface soil data obtained from the boring locations SF-1 through SF-4. Pile lengths are measured from the existing ground surface. These capacities may vary across the structure.

Negative Skin Friction (Down-drag)

The above presented axial capacities of the timber piles DO NOT account for negative skin friction induced by placement of any structural fill greater than two (2) feet in thickness. APS does not anticipate placement of any structural fill for this project, however, we should be notified if this information is incorrect, otherwise detrimental movements and down-drag problems could develop for the new addition.

If piles are installed immediately after placement of a significantly thick fill or directly adjacent to “large” ground supported structure, the soil will settle downward relative to the pile rather than supporting it, imparting a downward load to the pile through shear transfer at the pile soil interface. This phenomenon, called negative skin friction, requires a reduction in allowable single pile capacity of a given length.

Settlement

The estimated settlement of individual piles properly driven to the design depths and loaded to the design capacities presented in **above table** will be on the order of one (1) inches.

Group Effects

A group of piles subjected to vertical loads may not necessarily have the same capacity as the sum of the individual pile capacities. For axially loaded piles, published results indicate that the ratio of capacity per pile in a group to that of a single isolated pile typically ranges from 0.5 to 1.0. This efficiency factor depends on the spacing or distance between each pile. In planning pile groups, a minimum center-to-center spacing of four (4) diameters (4D is the diameter or width) is recommended to avoid a reduction in group capacity. Group action should be checked after the actual pile spacing is determined. Further, if the pile spacing is less than four (4) diameters, construction sequence and other installation issues must be addressed.

Lateral Capacity

For deep foundations, the lateral loads are resisted by the soil as well as the rigidity of the pile. Analyses can be performed by methods ranging from chart solutions to finite difference methods. It is recommended that once the pile type, length and group dimensions are determined, our office be contacted to perform lateral load analysis for the proposed project.

10.0 CONSTRUCTION CONSIDERATIONS

10.1 Observation and Testing

The preceding preliminary recommendations require a close supervision of the Geotechnical Engineer or representative; therefore, it is recommended that APS be retained to provide observation and testing for the complete duration of all earthwork and foundation activities for this project. APS cannot accept responsibility for any conditions deviated from those described in this report, nor for the performance of the foundation if not engaged to provide construction observation and testing.

10.2 Moisture Sensitive Soils/Weather Related Concerns

Most of the subsurface materials encountered at this site are expected to be sensitive to disturbances caused by changes in moisture content. During wet weather periods, the increment of the moisture content of the soil may cause a significant reduction of the soil strength and support capabilities. Furthermore, soils that become wet may be slow to dry, thus significantly retarding the progress of grading and compaction activities. For these reasons, it will be advantageous to perform earthwork and foundation construction activities during dry weather.

10.3 Excavations Regulations

In the Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to better insure the safety of workmen entering trenches or excavations. It is mandated, by this federal regulation, that excavations, whether they be utility trenches, basement excavations or footing excavations, be constructed in accordance with the new OSHA guidelines.

The contractor is solely responsible for designing and constructing stable, temporary excavations and shall shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

We are providing this information solely as a service to our client. APS does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.

11.0 REPORT LIMITATIONS

The analyses and preliminary recommendations presented in this report are based on the existing field conditions at the time of the investigation. Furthermore, they are based on the assumption that the exploratory borings are a representation of the subsoil conditions throughout the site. Please note that variations in the subsoil conditions may occur between and beyond borings. Therefore, an extensive field and laboratory testing must be performed prior to the commencement of any type of construction at the project site. If variations in those conditions are encountered during construction, APS shall be notified immediately in order to assess the situation, confirm the recommendations included in this report, or modify them according to their own judgment. If APS is not notified of such variations, APS will not be responsible for the impact of those variations on the project.

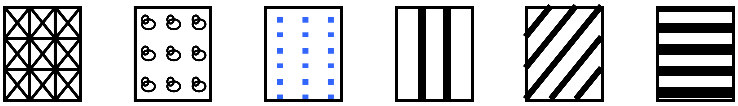
This report has been prepared for the exclusive use of **Pivotal Engineering, LLC** and their design/construction team associated to this specific project.

APPENDIX

Drilling and Testing Services Abita Springs, Louisiana	APS Design and Testing, LLC *Geotechnical, Environmental, & Construction Materials Testing*	Figure 1 General Site Location Plan

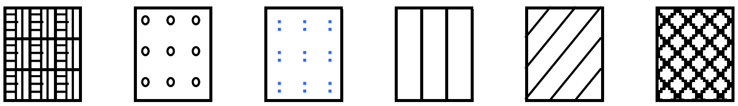
KEY TO TERMS AND SYMBOLS USED ON LOGS

SOIL TYPE



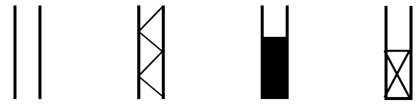
ROCK | GRAVEL | SAND | SILT | FAT CLAY | PEAT

MODIFIERS

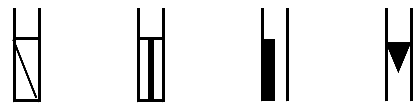


STONE or CONCRETE | GRAVELY | SANDY | SILTY | LEAN CLAY | FILL

SAMPLER TYPE



NO SAMPLE | AUGER SAMPLE | SHELBY TUBE | SPLIT SPOON



NO RECOVERY | ROCK CORE | 2" SHELBY TUBE | TXDOT CONE

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D 2487 (1980)

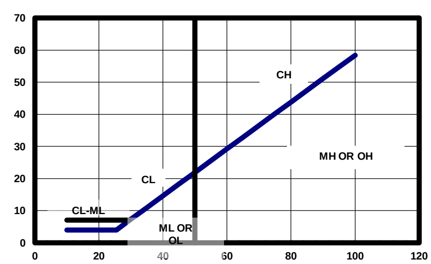
MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS LESS THAN 50% PASSING NO. 200 SIEVE	GRAVEL & GRAVELY SOILS LESS THAN 50% PASSING NO. 4 SIEVE	CLEAN GRAVEL (LITTLE OR NO FINES	GW	WELL GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			GP	POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		W/ APPRECIA BLE 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	UNCONFINED COMPRESSIVE STRENGTH IN TONS/FT^2
VERY SOFT	0.0 TO 0.25
SOFT	0.25 TO 0.50
MEDIUM	0.50 TO 1.0
STIFF	1.0 TO 2.0
VERY STIFF	2.0 TO 4.0
HARD	> 4.0 OR 4.0+

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

▼ GROUNDWATER FIRST ENCOUNTERED

∇ 24-HOUR GROUNDWATER READING

CLASSIFICATION OF GRANULAR SOILS

U.S. STANDARD SIEVE SIZE(S)

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

BOUL- -DERS	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

kmv

BORING LOG

BORING NO.: SF-1
PROJECT: Abita Springs
PROJECT LOCATION: St. Tammany Parish, LA
BORING LOCATION: N708461.2 E3709585.16
DATE DRILLED: 12/10/2015
WATER LEVEL: 3.00 feet
GEOL/ENGR: SE/SA

PROJECT NO.: APS 1512-G085
METHOD: AUGER/WET ROTARY
BORING ELEVATION: Not Surveyed
DATE COMPLETED: 12/10/2015
WATER LEVEL DATE: 12/10/2015
DRILLER: VG

DEPTH (FEET)	SAMPLE	Standard Penetration (Blows/Ft.) or Penetrometer (TSF)	Qu (TSF)	Moisture Content (%)	Dry Unit Weight (PCF)	LL	PI	Symbol	MATERIAL CLASSIFICATION
	Shelby Tube	0.75		21					Gray Sandy Lean Clay (CL)
	Shelby Tube	1.50		20					▼
	Shelby Tube	1.75		18					-with Fe nodules
	Shelby Tube	1.25		20	110				Medium Dense Tan and Gray Clayey Sand (SC) @ 6'-8' : C = 2,398.1 psf @ 3.2 psi confining pressure
	Shelby Tube	1.75		21					Tan and Gray Clayey Sand (SC)
10	Shelby Tube	2.00		21					-Grades Gray -with decayed wood
	Shelby Tube	1.25		24					
	Split Spoon	2/1/1		23					Very Loose Gray Clayey Sand (SC) @ 14'-16' : -200 = 48.9 %
	Shelby Tube	1.50	0.73	23	105				Medium Gray Lean Clay (CL) -with silt lenses
	Shelby Tube	2.00		30					
20									
	Shelby Tube	1.50		41		75	48		Gray Fat Clay (CH) -with silt lenses
	Shelby Tube	0.50		62					
30									
	Shelby Tube	2.00		31		48	31		Gray Lean Clay (CL)
	B			45					Gray Fat Clay (CH)
40									
	Shelby Tube	2.00		37					Gray Fat Clay (CH) -with sand pockets
	Shelby Tube	2.75		21					Tan and Gray Lean Clay (CL) -with Fe nodules
50									Boring terminated @ 50.0 feet Boring grouted upon completion

COMMENTS:

Shelby Tube   Split Spoon
B Disturbed Sample (Bag)

BORING LOG

BORING NO.: SF-2
PROJECT: Abita Springs
PROJECT LOCATION: St. Tammany Parish, LA
BORING LOCATION: N707446.85 E3709247.02
DATE DRILLED: 12/10/2015
WATER LEVEL: 2.50 feet
GEOL/ENGR: SE/SA

PROJECT NO.: APS 1512-G085
METHOD: AUGER/WET ROTARY
BORING ELEVATION: Not Surveyed
DATE COMPLETED: 12/10/2015
WATER LEVEL DATE: 12/10/2015
DRILLER: VG

DEPTH (FEET)	SAMPLE	Standard Penetration (Blows/Ft.) or Penetrometer (TSF)	Moisture Content (%)	Dry Unit Weight (PCF)	LL	PI	Symbol	MATERIAL CLASSIFICATION
0-2	Shelby Tube	2.75	12					Gray Lean Clay (CL) -with silt lenses
2-4	Shelby Tube	1.50	14					Tan and Gray Sandy Lean Clay (CL) @ 2'-4' : -200 = 61.6 %
4-6	Bag		18					
6-8	Shelby Tube		20					Gray Sandy Clayey Silt (ML) @ 6'-8' : -200 = 51.2 %
8-10	Shelby Tube		20	111				Medium Dense Tan and Gray Clayey Sand (SC) @ 8'-10' : C= 3175 psf @ 4.0 psi confining pressure
10-12	Shelby Tube	1.50	22					
12-14	No Recovery							No Recovery
14-16	Split Spoon	2/5/8	19					Medium Dense Tan Clayey Sand (SC) @ 14'-16' : -200 = 31.6 %
16-18	Bag		25					Gray Clayey Sand (SC)
18-20	Split Spoon	1/3/5	16					Medium Tan and Gray Sandy Lean Clay (CL)
23-25	Shelby Tube	1.75	35		66	40		Tan and Gray Fat Clay (CH) -with sand pockets
28-30	Shelby Tube	0.25	69					Gray Fat Clay (CH)
33-35	Shelby Tube	1.00	29		50	30		Gray Fat Clay (CH)
38-40	Shelby Tube	1.00	36					-with sand lenses
43-45	Shelby Tube	2.25	26		49	33		Gray Lean Clay (CL)
48-50	Shelby Tube	2.00	22					-with sand lenses
50								Boring terminated @ 50.0 feet Boring grouted upon completion

COMMENTS:

Shelby Tube — Disturbed Sample (Bag) — No Recovery — Split Spoon

BORING LOG

BORING NO.: SF-3
PROJECT: Abita Springs
PROJECT LOCATION: St. Tammany Parish, LA
BORING LOCATION: N708190.46 E3712302.23
DATE DRILLED: 12/10/2015
WATER LEVEL: 3.00 feet
GEOL/ENGR: SE/SA

PROJECT NO.: APS 1512-G085
METHOD: AUGER/WET ROTARY
BORING ELEVATION: Not Surveyed
DATE COMPLETED: 12/10/2015
WATER LEVEL DATE: 12/10/2015
DRILLER: VG

DEPTH (FEET)	SAMPLE	Standard Penetration (Blows/Ft.) or Penetrometer (TSF)	Qu (TSF)	Moisture Content (%)	Dry Unit Weight (PCF)	LL	PI	Symbol	MATERIAL CLASSIFICATION
	Shelby Tube	2.00		20					Tan and Gray Lean Clay (CL) -with silt lenses and Fe nodules
	Shelby Tube	1.00		24					
	Shelby Tube	1.25	0.78	19	110	29	12		Medium Tan and Gray Lean Clay (CL) -with Fe nodules
	Shelby Tube	2.25		21					-with Fe nodules
	Shelby Tube	2.00		20					Tan and Gray Clayey Sand (SC)
10	Shelby Tube	1.50		24					
	Split Spoon	10/13/14		17					Medium Dense Gray Poorly Graded Sand (SP) @ 12'-14' : -200 = 4.6 %
	Split Spoon	3/7/9		14					
	Split Spoon	14/14/14		26					Medium Dense Gray Clayey Sand (SC)
	Split Spoon	17/19/20		21					Dense Gray Clayey Sand (SC)
20									
	Shelby Tube			30		24	7		Gray Sandy Silty Clay (CL-ML) -with traces of organics @ 23'-25' : -200 = 67.2 %
	Shelby Tube	0.50	0.43	67	63				Soft Gray Fat Clay (CH) @ 28'-30' : S/S Failure @ Peak Strain = 1.60 %
30									
	Shelby Tube	3.00		27		58	37		Gray Fat Clay (CH)
	Shelby Tube	1.75		38					
40									
	Shelby Tube	1.50		32		51	30		
	Shelby Tube	2.50		23					Tan and Gray Sandy Lean Clay (CL)
50									Boring terminated @ 50.0 feet Boring grouted upon completion

COMMENTS:

Shelby Tube   Split Spoon

BORING LOG

BORING NO.: SF-4
PROJECT: Abita Springs
PROJECT LOCATION: St. Tammany Parish, LA
BORING LOCATION: N707377.08 E3711874.22
DATE DRILLED: 12/11/2015
WATER LEVEL: 3.00 feet
GEOL/ENGR: SE/SA

PROJECT NO.: APS 1512-G085
METHOD: AUGER/WET
BORING ELEVATION: Not Surveyed
DATE COMPLETED: 12/11/2015
WATER LEVEL DATE: 12/11/2015
DRILLER: VG

DEPTH (FEET)	SAMPLE	Standard Penetration (Blows/Ft.) or Penetrometer (TSF)	Qu (TSF)	Moisture Content (%)	Dry Unit Weight (PCF)	LL	PI	Symbol	MATERIAL CLASSIFICATION
	Shelby Tube	3.75		15					Gray Lean Clay (CL)
	Shelby Tube	2.00		16					Stiff Tan and Gray Sandy Lean Clay (CL) ▼
	Shelby Tube	4.00	1.54	16	117	31	16		Tan and Gray Lean Clay (CL) -with fine sand lenses
	Shelby Tube	3.75		11					Reddish Brown and Gray Clayey Sand (SC)
10	Split Spoon	10/13/24		15					Dense Tan and Gray Clayey Sand (SC)
	Split Spoon	11/9/9		13					Medium Dense Poorly Graded Sand (SP) -with traces of gravel
	Split Spoon	1/1/1		55					Very Soft to Soft Gray Fat Clay (CH) -with traces of organics and gravel
	Shelby Tube	0.75		27					Gray Clayey Sand (SC) with traces of gravel
	Bag			17					Gray Clayey Sand (SC) @ 16'-18' : -200 = 30.7 %
20	Split Spoon	4/7/8		20					Medium Dense Gray Poorly Graded Sand with Clay (SP-SC)
	Bag			20					@ 23'-25' : -200 = 9.9 %
30	Bag			24					Gray Clayey Sand (SC)
	Shelby Tube	2.50	1.19	28		52	33		Stiff Gray Fat Clay (CH)
40	Shelby Tube	2.50		29					
	Bag			20		38	23		Gray Lean Clay (CL)
50	Shelby Tube	3.00		18					-Grades Tan and Gray -with Fe nodules
									Boring terminated @ 50.0 feet Boring grouted upon completion

COMMENTS:

Shelby Tube
Split Spoon
B Disturbed Sample (Bag)