

**GEOTECHNICAL INVESTIGATION
FOR THE
NEW CHILD DEVELOPMENT COUNCIL
OFFICE COMPLEX
OPELOUSAS, LOUISIANA
BO - 2316**

**PREPARED FOR
CHILD DEVELOPMENT COUNCIL OF ACADIANA, INC.
OPELOUSAS, LOUISIANA**

JUNE 2005

**LOUISIANA TESTING & INSPECTION, INC.
LAFAYETTE, HOUMA, BATON ROUGE**

Louisiana Testing & Inspection, Inc.

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Lafayette, Louisiana 70502

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June 24, 2005

Child Development Council of Acadiana, Inc.
C/o Robert Lee Wiltse Architects & Associates, Inc.
P.O. Box 2025
Covington, Louisiana 70434

RE: New Child Development Council Office Complex
Opelousas, La
BO - 2316

Gentlemen:

This report transmits findings of our geotechnical investigation for the proposed structure. Robert Wiltse of Robert Lee Wiltse Architects & Associates, Inc. authorized this investigation. The purpose of our work was to investigate subsurface conditions at the site of the structure and analyze these conditions for foundation design.

This study included the drilling of exploratory borings to investigate subsurface soil and ground water conditions at the proposed structure. Laboratory tests, conducted on representative samples from the boring, were used to determine physical properties of the soils encountered. The results of the field and laboratory programs were analyzed to prepare our recommendations for suitable foundation design, site preparation, and earthwork alternatives.

On file in our office are details of the subsurface exploration program and laboratory procedures. Attached to this report, however, are the logs of the borings with the results of laboratory testing.

1.0 GENERAL

1.1 The proposed structure will be constructed on LA 167/Compass Road in Opelousas, Louisiana. Ground surface was level, pasture land, grassy, hard and dry on the day of drilling. It is anticipated that the structure will be a single story structure of CMU construction with brick veneer. Loads were not provided but should be no greater than expected for this type of construction.

2.0 FIELD INVESTIGATION

2.1 The subsurface investigation at the site consisted of one (1) thirty (30) foot soil boring and one (1) fifteen (15) foot soil boring drilled on June 10, 2005. The trailer mounted auger was used to advance the borings and to obtain samples for laboratory evaluation. Samples of cohesive materials were obtained using standard, thin walled, seamless Shelby Tube samplers. When cohesionless soils were encountered, disturbed samples were taken during the Standard Penetration Test. This test is performed by driving a two (2) inch O.D. split-spoon sampler one (1) foot, after first sending it six (6) inches, using blows of a 140 pound weight dropped thirty (30) inches. The results of this test give indications of in-situ characteristics of the cohesionless soils. The values obtained from this test are shown in the boring log. The boreholes were plugged in accordance with Louisiana Water Well Regulations upon completion of drilling.

2.2 The borings were advanced to completion without the use of drilling fluids. Ground water was observed at approximately six (6) feet at Boring B-1 and at about eight (8) feet at Boring B-2 during drilling. It should be realized that the depth of water will fluctuate with rainfall and other seasonal variations, therefore, water levels should be verified prior to commencing any construction activities, such as excavations, that ground water might affect.

2.3 This investigation does not include any environmental review.

3.0 LABORATORY INVESTIGATION

3.1 Soil mechanics laboratory tests were performed on selected samples from the boring representative of the various strata encountered to define their physical characteristics for the intended foundation support. Unconfined compression tests (ASTM D2166) were performed to evaluate soil shear strengths. Atterberg limit determinations using ASTM D4318, Procedure B and moisture content tests, were also conducted to aid in classifying the subsurface soils more accurately than allowed by visual examination procedures in the field (ASTM D2488). The results of the laboratory tests are shown on the boring log under the specific headings.

3.2 The boring logs are included after Figure 1 of this report. They present detailed soil stratifications that encountered at the particular borings investigated.

In general:

The borings are silty clays from ground surface to the termination of the borings.

3.3 Swell indexes for the upper layers of the site (two {2} feet to four {4} feet) averages between 2200 and 2400 psf. The Potential Volume Change (PVC) averages between 2.7 and 2.9 and is considered marginal.

4.0 RECOMMENDATIONS

4.1 Recommendations presented in this report are based, in part, on evaluations of technical information gathered and in part on our general experience with subsurface conditions in the area. We do not guarantee the performance of the project in any other respect than that our engineering work and the judgments rendered meet the standards practiced by this profession. The borings may not represent potentially unfavorable subsurface conditions. During construction, if soils are encountered that vary from those discussed here, or if any design criteria changes, Louisiana Testing & Inspection, Inc. should be notified immediately in order that we may evaluate the effects, if any, on the performance of the foundation design. Additional borings should be performed if such conditions become evident. The additional borings would be necessary to characterize these conditions for a design review. The recommendations presented in this report are applicable to this specific site only, and should not be used for other purposes.

4.2 This investigation is performed for structural properties of the encountered soils only. No other evaluation is made or implied. The designs of foundations are not a part of this report. The geotechnical investigation does not discover environmental issues nor does it go beyond the evaluation of soil strengths and settlement potential. Minimum foundation sizes are given in this report to establish parameters for soils and not for foundation recommendations.

4.3 A monolithic slab and grade beam foundation system including turned down edges and interior stiffened ribs may be considered adequate for structure foundation support, provided that some differential movements are acceptable. Individual column loads can be supported by thickened portions. The grade beams and thickened portions, bearing in natural insitu material, should be proportioned for critical loading conditions using net design pressure in pounds per square foot, respectively, as shown in Table 1. The grade beams should be reinforced for both positive and negative bending and should bear about two (2) feet below finished grade. Thickened portions should bear at least two (2) feet below finished grade. Differential movements should, therefore, be minimized and thus more tolerable. Interior stiffening ribs should be spaced about two (2) to three (3) times the slab thickness in feet on center each way for thin slabs. Thickened slabs may not need stiffening ribs. If the slab is supported on fill, it is imperative that the fill meets the specification set forth in the following paragraphs and is adequately compacted after proper site preparation to provide the necessary support for the structure loading and to minimize movements of the slab. Settlements on the order of one half (1/2) inch can be expected for grade beams no wider than one foot six inches (1' 6") or thickened portions no larger than four (4) feet square under full service load conditions. Larger footings will produce increased amounts of settlement. About one half (1/2) of this will be differential between individual supports or within a ten (10) foot section of wall. The structure load portion of these values can be expected to occur rapidly with the remainder occurring over an extended period of time. Normal structure loads would be about 60% to 70% of the full service loading.

	THICKENED PORTIONS	STRIP FOOTINGS
INSITU MATERIAL	2000	1500
STRUCTURAL FILL	1500	1100

With a factor of safety of 3.0 against bearing failure

4.4 The site should be prepared and drained as described in the following paragraphs. The floor slab should be placed to bear on the prepared compacted drainage fill consisting of a four (4) inch layer of clean aggregate having a uniform distribution of particle sizes not contaminated with clay, silt, or organic material. The use of so called cushion sand or clean sand with uniform particle size, such as concrete sand meeting ASTM C33, will not be adequate. The following gradations are acceptable for drainage fill:

	SIZE #57 (coarse)	SIZE #10 (fine)
1 1/2"	100	
1"	95 to 100	
3/4"	-	
1/2"	25 to 60	
3/8"	-	100
No. 4	0 to 10	85 to 100
No. 8	0 to 5	
No. 16		
No. 50		
No. 100		10 to 30
No. 200		0 to 5*

*This criterion is not part of ASTM D 448 but is added to this project.

River silt or pit run should not be used as drainage fill due to high fines content. A polyethylene vapor barrier shall be placed over drainage fill. If the floor slab is placed upon properly constructed drainage fill, the design may be based upon a soil modulus, k, of 250 pounds per cubic inch. Crack control, if required, should follow ACI recommendations. Thin slabs with stiffening ribs are only one option for a stiffened slab. Post tensioned slabs are also considered stiffened slabs.

4.5 Although a shallow foundation will perform satisfactorily, loads may be supported by cast-in-place, reinforced concrete, straight shafts. We recommend that the straight sided shafts, if used, be founded on stiff clays at a depth derived from Figure 2. Each shaft should be proportioned for the capacities derived from Figure 2. The weight of the shaft must be accounted for in load calculations. Buoyant forces must also be accounted for.

4.6 Normal construction practices should be employed for the construction of drilled cast-in-place, reinforced concrete straight sided shafts. We strongly recommend that careful inspection be made during drilling of the shafts. This is necessary to insure that any materials that slough into the holes are detected and removed. The information on the boring log indicates that it is likely that material would slough, during shaft excavation. Should sloughing occur, casing may be required. As an alternative, an approved slurry may be used to "wet case" the hole. Concrete should be placed immediately after each pier has been excavated and inspected. In no case should shaft excavation remain open for more than three (3) hours. Ground water was encountered during drilling of the borings for this investigation; however, seasonal changes can change the ground water conditions. If seepage water is allowed to build more than one (1) inch in any individual drilled hole, during pier construction, the hole should be pumped dry or concrete should be tremied into place. If the hole is "wet cased", concrete should be tremied into place using caution to make certain all slurry is displaced. All soils excavated during drilling operations should be removed from the site and not used for fill material.

4.7 The site should be initially stripped of any topsoil materials in the upper crust, particularly any loose or water-softened surface materials, vegetation, or any similar matter. All shallow excavations, such as utility trenches, tree stumps and roots should be properly backfilled as recommended below. All exposed surfaces may be proof-rolled to detect any soft spots, which

should be removed. Soft spots observed during other construction activities should also be removed. The soils at this site are susceptible to loss of strength when wet. Standing water should be removed and the site allowed to dry before any construction activity proceeds. Care should be taken during this construction stage, however, since proof-rolling can damage the subgrade. The site should be prepared so that it can accept fill, and then be filled to grade using a clean, select, non-expansive fill, free from excess silt, clay balls or other deleterious materials, and having a plasticity index no more than fifteen (15) and a maximum liquid limit of forty (40). Generally, soils classified as "CL" by the Unified Soil Classification System (USC) and meeting these plasticity requirements exhibit the characteristics of a desirable structural fill. Other materials, not meeting these criteria, may be locally available, which may satisfy the intent of earthwork requirements. We recommend that all materials be approved or rejected by a geotechnical technician. The fill should be placed at moisture contents within two (2) percent of optimum, in six (6) to eight (8) inch loose lifts, with each lift compacted to at least ninety-five (95) percent of the maximum dry density as obtained in the Standard Proctor Compaction Test (ASTM D 698). Closer moisture control may be necessary for more silty soils in order to obtain the recommended compaction. The compaction obtained and soils materials provided for each lift should be inspected and approved by an engineering technician before another lift is added.

4.8 After the contractor has proof rolled the subgrade and the engineer approves the subgrade, the contractor may begin his compaction operations. No fill should be placed on any area of the subgrade, or subsequent lifts, that the engineer has not accepted. Any soft areas that the contractor believes may be difficult in achieving the desired compaction, be removed and replaced with compacted approved backfill.

4.9 Rainfall conditions during the site preparation work may dictate the need for drainage swales. Pumping of these soils can occur even without recent rains since moisture contents usually increase with depth. The potential for pumping is ever present. If excessive moisture is present, these upper silty soils could pump under the vibrations of the heavy compaction/construction equipment.

4.10 The borrow source should be checked to insure the soil meets the specifications. Initial acceptance of the soil in the borrow pit does not indicate general acceptance of the entire borrow pit.

4.11 If the material is placed on the site within 2% of its optimum moisture content, minimum preparation effort will be required. The starting layers shall be placed in the deepest portion of the fill/excavation. Each layer shall be constructed parallel to the finished grade line. During construction of the fill, the contractor shall at all times, evenly route his equipment, both when loaded and when empty, over the layers as they are placed, and shall distribute the travel evenly over the entire width of the lift of fill being placed.

4.12 The thickness of lifts shall be no more than the teeth height of the sheep's foot roller. The thickness of a lift will be based upon the capability of the contractor's equipment to achieve the required compaction throughout the entire lift thickness. Lift thickness should be based upon the tooth length of the sheep's foot roller being used for compaction.

4.13 Sheep's foot rollers are generally the most suitable equipment for the compaction of clay soils. The contractor may use any compaction equipment that has sufficient mass to achieve compaction of the soil as specified. The drums of sheep's foot rollers should be filled with water, or for additional weight, with both water and sand. Smooth wheel rollers, to seal the working area, should be available on the site so rains will not saturate the soil and delay any work in progress. The contractor should be advised to modify, or remove from the site, any equipment not capable of compacting the fill to the required density. When obtaining the density of a lift, any density more than 2% below the required average, should be cause for that portion of the lift will be rejected.

4.14 Drainage should be maintained away from the footings, both during and after construction. Foundation excavations should not be left open for extended periods of time to minimize moisture changes in the exposed bearing soils. All exposed foundation excavations should be kept free of loose or water-softened soils. These materials should be removed prior to concrete placement. After construction, the drainage away from foundations should be improved as required. Drainage must be maintained away from the structure to prevent the surface water from ponding near the foundation. This is very important to prevent clayey soils from gaining moisture, thereby reducing the potential for loss of strength.

5.0 PAVEMENT DESIGN

5.1 Alternate pavement sections, which could possibly be used for the drive and parking area, are schematically presented hereinafter. The exposed subgrade (native nonexpansive soil or imported fill) should be compacted to a dry density of at least ninety-five (95) percent of the maximum dry unit weight attained in the Standard Proctor Compaction Test (ASTM D 698). Subgrade should be prepared as indicted in the previous section. Recommendations are based upon estimated ESAL's since such data was not provided. The estimates may or may not reflect actual traffic counts. Estimates are based upon the following data:

TRAFFIC DATA ESTIMATES

	VOLUME/DAY	
	LIGHT VEHICLE DUTY	HEAVY VEHICLE DUTY
PASSENGER VEHICLES	1000	200
BUSSES/SINGLE UNIT BODY TRUCKS	2	5
SEMI TRUCKS	0	1

Equivalent Single Axle Loads are calculated from this data and the results are given below:

	DESIGN LIFE 20 YR.	ESAL OVER DESIGN LIFE	ESAL/DAY
LIGHT DUTY		3360	0.46
HEAVY DUTY		49121	6.73

These data should be verified for actual counts and anticipated increases. Based upon these data, the roadway should be designed for the volume that best suits the actual traffic count.

5.2 For flexible pavement design construction, a soil cement base course may be constructed using the native silty clays if they satisfy other parts of this report, or select fill materials recommended previously. We estimate that an application of ten (10) to twelve (12) percent cement by volume will achieve adequate hardening, provided the base course is constructed in accordance with the applicable provisions of LDOTD Section 301. Construction methods and materials and design intent for asphaltic concrete surfacing should follow the guidelines provided in LDOTD Section 501, Type 1 mix and Section 503. Actual cement content should be determined when roadway is at grade. Lower cement content on thicker base course may provide a better design using a more flexible base while maintaining overall structure numbers.

5.3 A better design alternative is a compacted granular base coarse on a geotextile fabric over compacted natural subgrade. Geofabric should be properly designed for fines retention and moisture passage.

5.4 The rigid pavement section recommended provides a granular base intended to minimize pumping of fine-grained subgrade soils through joints, cracks and at pavement edges. This base should also provide more uniform support. We recommend that the granular base material specified consist of that shown on the table below. The portland cement concrete slab should be constructed in accordance with the latest PCA standards, including thickened exterior edges and corners and load transfer devices. Panels should not be larger than that shown in the table below. The provisions of LDOTD Specifications 601 (1992 edition) for construction procedures

and materials are recommended for application.

<p>LIGHT VEHICLE PARKING AREA</p> <p>FLEXIBLE PAVEMENT SECTION STONE BASE</p> <p>a. 2" Asphalt Concrete Wearing Course b. 7" Crushed Limestone Base ASTM D1241 Type I Gradation C 75% Relative Density c. Separation Fabric</p> <p>FLEXIBLE PAVEMENT SECTION SOIL CEMENT BASE</p> <p>a. 2" Asphalt Concrete Wearing Course b. 8" Soil Cement Base</p> <p>RIGID PAVEMENT SECTION STONE BASE</p> <p>a. 5" Portland Cement Concrete b. 4" Crushed Limestone Base ASTM D1241 Type I Gradation C 75% Relative Density c. Separation Fabric d. Control Joints @ 15' oc Each Way</p> <p>RIGID PAVEMENT SECTION SOIL CEMENT BASE</p> <p>a. 5" Portland Cement Concrete b. 6" Soil Cement Base c. Control Joints @ 15' o c Each Way Max</p>	<p>MAIN ENTRANCE ROAD AND SERVICE DRIVES</p> <p>FLEXIBLE PAVEMENT SECTION STONE BASE</p> <p>a. 3" Asphalt Concrete Wearing Course b. 7" Crushed Limestone Base ASTM D1241 Type I Gradation C 75% Relative Density c. Separation Fabric</p> <p>FLEXIBLE PAVEMENT SECTION SOIL CEMENT BASE</p> <p>a. 3" Asphalt Concrete Wearing Course b. 12" Soil Cement Base</p> <p>RIGID PAVEMENT SECTION STONE BASE</p> <p>a. 8" Portland Cement Concrete b. 4" Crushed Limestone Base ASTM D1241 Type I Gradation C 75% Relative Density c. Separation Fabric d. Control Joints @ 20' oc Each Way</p> <p>RIGID PAVEMENT SECTION SOIL CEMENT BASE</p> <p>a. 8" Portland Cement Concrete b. 6" Soil Cement Base c. Control Joints @ 20' o c Each Way Max</p>
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5.5 The subgrade should be prepared so there is drainage of any "free water" or rainfall in the aggregate fill. If aggregate fill is in a low area surrounded by clay, drainage trenches or sumps shall be installed in sufficient amount and kept pumped dry.

5.6 Compaction should be done with the aggregate fill sufficiently wet so that bulking will be eliminated. Generally, when "free water" appears on the aggregate fill surface, the material can be compacted to the proper density.

5.7 After the contractor has proof rolled the subgrade and the subgrade is approved by the engineer, the contractor may begin his compaction operations. No aggregate fill should be placed on any area of the subgrade, or subsequent lifts, that the engineer has not accepted. Any soft areas that the contractor believes may be difficult in achieving the desired compaction, be removed and replaced with compacted approved back aggregate fill.

5.8 During construction of the aggregate fill, the contractor shall at all times, evenly route his equipment, both when loaded and when empty, over the layers as they are placed, and shall distribute the travel evenly over the entire width of the lift of aggregate fill being placed.

5.9 Fine aggregate shall have a maximum of ten (10) percent (10%) by weight passing the #

100 mesh sieve and shall be free of all organic matter. Crushed limestone shall conform to specification ASTM D 1242 Type 1, Gradation C.

5.10 If the material is placed on the site within two (2) percent (2%) of its optimum moisture content, minimum preparation effort will be required. The starting layers shall be placed in the deepest portion of the aggregate fill/excavation. Each layer shall be constructed parallel to the finished grade line. During construction of the aggregate fill, the contractor shall at all times, evenly route his equipment, both when loaded and when empty, over the layers as they are placed, and shall distribute the travel evenly over the entire width of the lift of aggregate fill being placed.

5.11 The thickness of lifts shall be no more than the teeth height of the sheep's foot roller. The thickness of a lift will be based upon the capability of the contractor's equipment to achieve the required compaction throughout the entire lift thickness. Lift thickness should be based upon the tooth length of the sheep's foot roller being used for compaction.

5.12 The contractor shall use "vibratory" equipment of sufficient mass needed for achieving compaction. The vibratory frequency of the compaction equipment shall be adjustable. Vibrating equipment should not be used directly on clay soils.

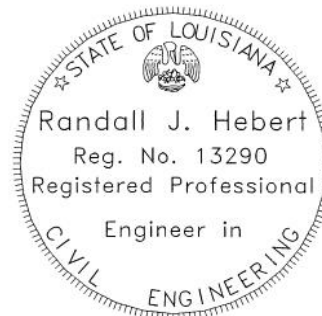
We appreciate the opportunity to be of service to you on this project.

Very truly yours,

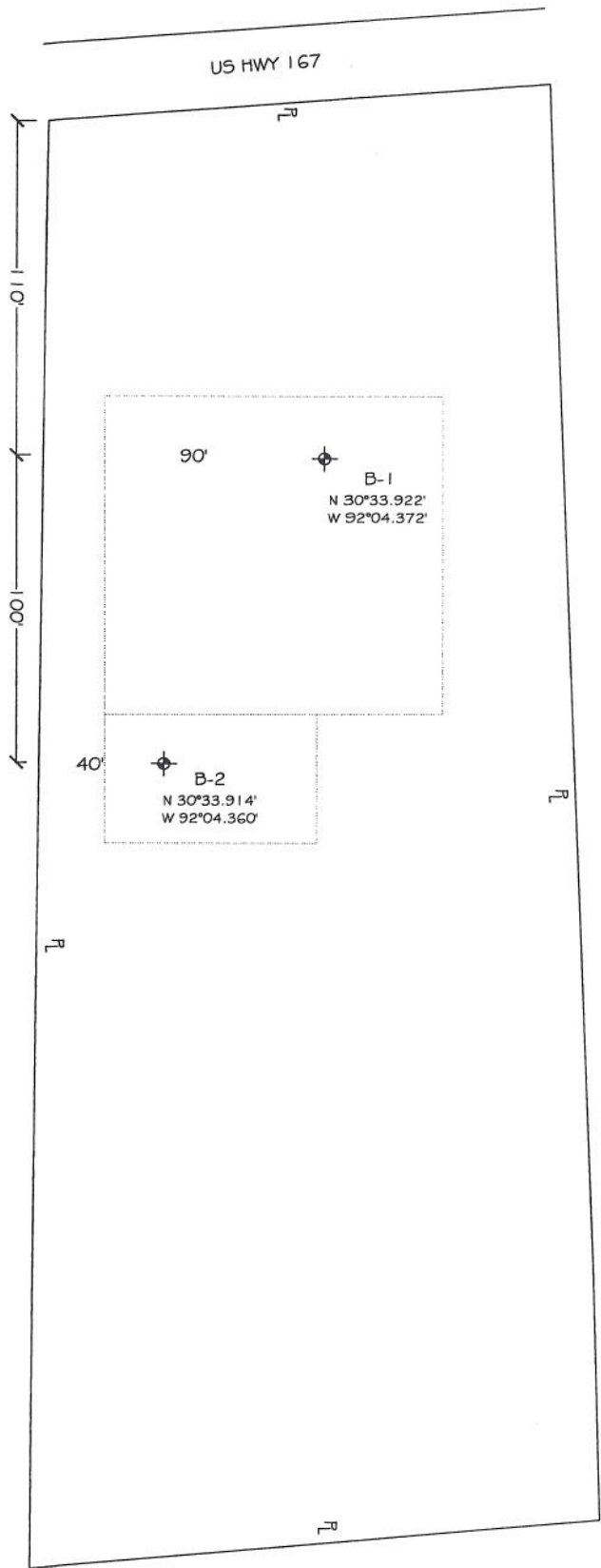
LOUISIANA TESTING & INSPECTION, INC.



Randall J. Hebert P.E. P.L.S.



RJH/rbh
Copies submitted: (3)



Site Plan

Louisiana Testing & Inspection, Inc.

Lafayette-Baton Rouge-Houma

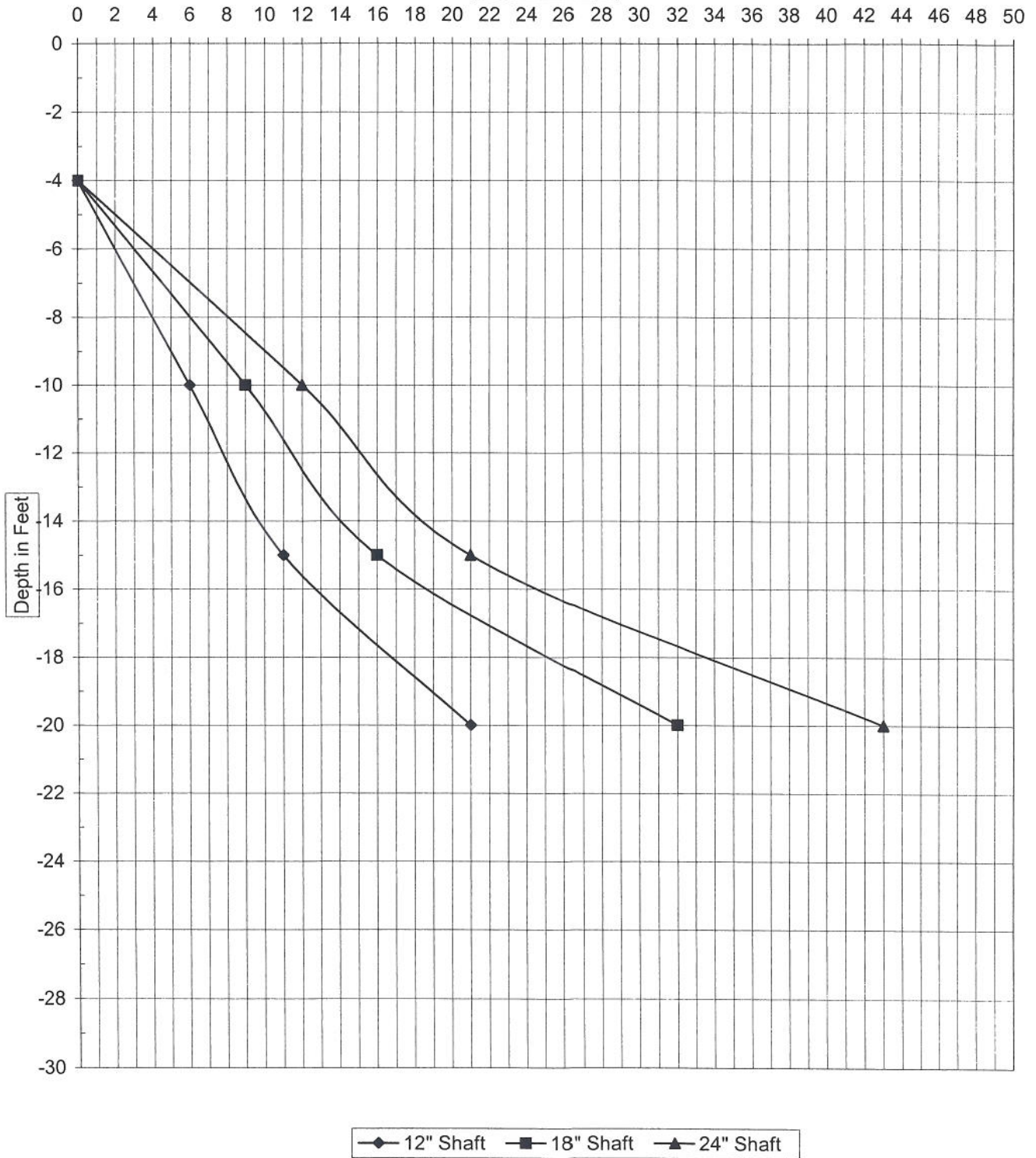
New Child Development
Council Office Complex

Opelousas, Louisiana

Figure:	1
BO -	2316
Scale:	N.T.S.
Date:	6/23/05

Straight Sided Drilled Shaft Capacities

Capacity in Kips
F.S. = 2.0



LOUISIANA TESTING & INSPECTION, INC

LAFAYETTE, LOUISIANA

New Child Development Council Office Complex
Opelousas, Louisiana

Figure	2
Boring	2316
Date	6/24/05
Scale	NTS
File	BO-2316

Louisiana Testing & Inspection, Inc.
Lafayette, Louisiana

LOG OF BORING B-1

PAGE 1 OF 1

DATE

6-10-05

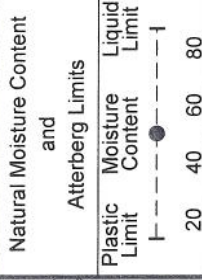
PROJECT: New Child Development Council Office Complex
Opelousas, La

SURFACE ELEVATION

PROJECT NO.: BO - 2316

BORING TYPE: Rotary

MOISTURE CONTENT (%)		PASSING #200 SIEVE (%)		ESTIMATED ANGLE OF INTERNAL FRICTION (°)		OTHER TESTS & REMARKS	
LL	PL	PI	PL	PL	PI		
39	20	19	24	19	19		



FIELD STRENGTH DATA	DRY DENSITY (pcf)	UNCONF COMPRESSIVE STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)
4.50+P	91.4	1.58		
3.25P	87.3	1.01		
1.25P	83.5	0.72		
0.25P	92.0	0.45		
1.75P	73.0	1.38		
3.00P	105.0	3.28		
2.75P	103.4	2.55		
1.00P	103.0	1.06		

USC	LOCATION	MATERIAL DESCRIPTION
CL	Eastings: Refer to Site Map N30°33.922' W92°04.372'	Tan and brown stiff slightly silty CLAY
CL		Brown and tan stiff silty CLAY
CL		Tan and brown firm to soft silty CLAY
CL		Tan stiff very silty CLAY
CL		Red and tan very stiff to stiff very silty to silty CLAY

DEPTH (ft)	SAMPLES	WATER LEVEL	FIELD STRENGTH DATA	DRY DENSITY (pcf)	UNCONF COMPRESSIVE STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)	Natural Moisture Content and Atterberg Limits	MOISTURE CONTENT (%)	PASSING #200 SIEVE (%)	ESTIMATED ANGLE OF INTERNAL FRICTION (°)	OTHER TESTS & REMARKS
0												
4.50			4.50+P	91.4	1.58				17.3	24	19	
3.25			3.25P	87.3	1.01				23.9	18	19	
1.25			1.25P	83.5	0.72				30.7	37	19	
0.25			0.25P	92.0	0.45				34.8	39	19	
1.75			1.75P	73.0	1.38				29.3	31	16	
3.00			3.00P	105.0	3.28				20.2	30	17	
2.75			2.75P	103.4	2.55				21.3	13	17	
1.00			1.00P	103.0	1.06				22.8	39	20	

Notes:

Dry augered full depth using hollow stem auger. Boundaries between strata are approximate. Bottom of boring at 30 feet.

Key to Abbreviations:

- N - SPT Data (Blows/Ft)
- P - Pocket Penetrometer (tsf)
- T - Torvane (psf)
- C_u - Undrained Cohesion (tsf)
- SS - Shear Strength (P/2, tsf)

Water Level Est.: Measured: Perched:

Water Observations:

Sample Key: SPT Shelby Tube Disturbed

Louisiana Testing & Inspection, Inc.
Lafayette, Louisiana

LOG OF BORING B-2

PAGE 1 OF 1

DATE

6-10-05

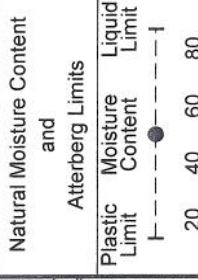
PROJECT: New Child Development Council Office Complex
Opelousas, La

SURFACE ELEVATION

PROJECT NO.: BO - 2316

BORING TYPE: Rotary

MOISTURE CONTENT (%)		ATTEBERG LIMITS(%)		PASSING #200 SIEVE (%)	ESTIMATED ANGLE OF INTERNAL FRICTION (°), OTHER TESTS & REMARKS
LL	PL	LIQUID LIMIT	PLASTIC LIMIT		



FIELD STRENGTH DATA	DRY DENSITY (pcf)	UNCONF COMPRESS STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)
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BLOW COUNT	C _u (tsf)	SS (tsf)	Torvane (psf)
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DEPTH (#)	SAMPLES	USC	WATER LEVEL	LOCATION	MATERIAL DESCRIPTION
0					
3.75		CL			Tan and brown stiff to firm silty CLAY
5.00		CL			Brown and tan firm silty CLAY
6.50		CL			Tan and brown firm silty CLAY
7.50		CL			Tan stiff very silty CLAY
15.00					

3.75P	89.3	1.70			
3.00P	91.0	1.48			
0.50P	82.7	0.58			
0.50P	85.6	0.76			
0.50P	88.0	0.72			
1.75P	107.6	1.89			

Notes:
Dry augered full depth using hollow stem auger. Boundaries between strata are approximate. Bottom of boring at 15 feet.

Key to Abbreviations:
N - SPT Data (Blows/Ft)
P - Pocket Penetrometer (tsf)
T - Torvane (psf)
C_u - Undrained Cohesion (tsf)
SS - Shear Strength (P/2, tsf)

Water Level Est.: Measured: Perched:
Water Observations:
Sample Key: SPT Shelby Tube Disturbed

EMPIRICAL CORRELATIONS WITH STANDARD PENETRATION RESISTANCE N VALUES *

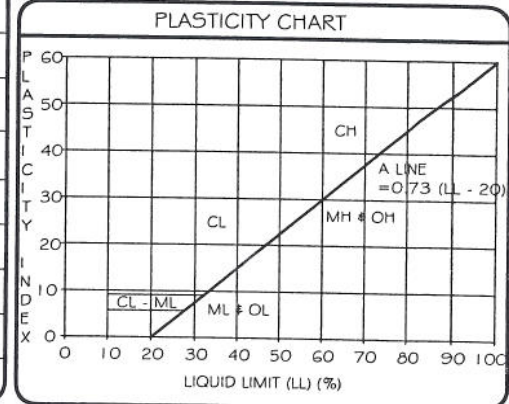
	N VALUE * (BLOWS/FT)	CONSISTANCY	UNCONFINED COMPRESSIVE STRENGTH (TONS/SQ.FT)		N VALUE * (BLOWS/FT)	RELATIVE DENSITY
FINE GRAINED SOILS	0 - 2	VERY SOFT	<0.25	COURSE GRAINED SOILS	0 - 4	VERY LOOSE
	3 - 4	SOFT	0.25 - 0.50		5 - 10	LOOSE
	5 - 8	FIRM	0.50 - 1.00		11 - 30	MEDIUM DENSE
	9 - 15	STIFF	1.00 - 2.00		31 - 50	DENSE
	16 - 30	VERY STIFF	2.00 - 4.00		>50	VERY DENSE
	31 - 50	HARD	>4.00			
	>50	VERY HARD				

* ASTM D 1586; NUMBER OF BLOWS OF 140 POUND HAMMER FALLING 30 INCHES TO DRIVE A 2 IN. O.D., 1.4 IN. I.D. SAMPLER ONE FOOT.

MAJOR DIVISIONS			SYMBOL		DESCRIPTIONS
			GRAPH	LETTER	
COURSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS <small>LITTLE OR NO FINES</small>		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES <small>APPRECIABLE AMOUNT OF FINES</small>		GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		SAND AND SANDY SOILS <small>MORE THAN 50% OF COURSE FRACTION RETAINED ON NO. 4 SIEVE</small>		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS <small>LITTLE OR NO FINES</small>		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES <small>APPRECIABLE AMOUNT OF FINES</small>		SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES <small>APPRECIABLE AMOUNT OF FINES</small>		SM	SILTY SANDS, SAND-SILT MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	CLEAN SANDS <small>LITTLE OR NO FINES</small>		SC	CLAYEY SANDS, SAND-CLAY MIXTURES
		SANDS WITH FINES <small>APPRECIABLE AMOUNT OF FINES</small>		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
		SANDS WITH FINES <small>APPRECIABLE AMOUNT OF FINES</small>		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
	SILTS AND CLAYS	SANDS WITH FINES <small>APPRECIABLE AMOUNT OF FINES</small>		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
		SANDS WITH FINES <small>APPRECIABLE AMOUNT OF FINES</small>		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
		SANDS WITH FINES <small>APPRECIABLE AMOUNT OF FINES</small>		CH	INORGANIC CLAYS OF HIGH PLASTICITY
HIGHLY ORGANIC SOILS			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

PARTICLE SIZE IDENTIFICATION	
BOULDERS	>300 mm
COBBLES	75 - 300 mm
GRAVEL: COURSE	19.0 - 75 mm
GRAVEL: FINE	4.75 - 19 mm
SAND: COURSE	2.00 - 4.75 mm
SAND: MEDIUM	0.425 - 2.00 mm
SAND: FINE	0.075 - 0.425 mm
SILT	0.075 - 0.002 mm
CLAY	<0.002 mm

WELL GRADED - HAVING WIDE RANGE OF GRAIN SIZES AND APPRECIABLE AMOUNTS OF ALL INTERMEDIATE PARTICLE SIZES
POORLY GRADED - PREDOMINANTLY ONE GRAIN SIZE, OR HAVING A RANGE OF SIZES WITH SOME INTERMEDIATE SIZES MISSING



NOTE: DUAL SYMBOLS USED FOR BORDERLINE CLASSIFICATIONS

OTHER MATERIAL SYMBOLS

	ASPHALT		SANDY CLAY		LIMESTONE
	CONCRETE		GRAVELLY CLAY		MARBLE
	FILL		PARTIALLY WEATHERED ROCK		GRANITE
	RUBBLE FILL		MUDSTONE		GNEISS
	TOPSOIL		SILTSTONE		COAL
	ORGANIC SAND POORLY GRADED		SANDSTONE		
	SANDY SILT		SHALE		
	ORGANIC SILT		SANDSTONE AND SHALE INTERBEDDED		

SAMPLER AND OTHER SYMBOLS

	BULK SAMPLE		VANE SHEAR TEST
	WASH SAMPLE		WATER LEVEL AT TIME DRILLING, OR AS SHOWN
	STANDARD PENETRATION TEST		WATER LEVEL AFTER 24 HOURS, OR AS SHOWN
	SHELBY TUBE		LOSS DRILLING FLUID
	SHELBY TUBE, NO RECOVERY		POCKET PENETROMETER
	PISTON SAMPLE		TORVANE
	PISTON SAMPLE, NO RECOVERY		PHOTOIONIZATION DETECTOR
	ROCK CORE		COMBUSTION GAS INDICATOR
			PPM PARTS PER MILLION

CLASSIFICATIONS AND SYMBOLS

LOUISIANA TESTING & INSPECTION, INC.
Lafayette, Louisiana