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Exhibit W. Port of Columbia Site Preliminary Geotechnical Engineering Report & DOTD Soil Borings

March 27, 2014

Bryant Hammett & Associates, LLC
6885 Hwy. 84 West
Ferriday, Louisiana 71334

Attn: Mr. Keith Capdepon Jr., P.E.

Re: Preliminary Geotechnical Engineering Services Report
Tier 3 Industrial Park Facility
Columbia, Louisiana
PSI Project Number: 0257374

Dear Mr. Capdepon:

Thank you for choosing Professional Service Industries, Inc. (PSI) as your consultant for the referenced project. Per your authorization, PSI has completed a preliminary geotechnical engineering study for the referenced project. The results of the study are discussed in the accompanying report.

If you have any questions pertaining to this report, please contact our office at (318) 387-2327. PSI would be pleased to continue providing geotechnical services throughout the implementation of the project, and we look forward to working with you and your organization on this and future projects.

Respectfully submitted,
PROFESSIONAL SERVICE INDUSTRIES, INC.

Ali Hijazi
Branch Manager

Matthew D. Redmon, P.E.
Project Engineer

Name: Matthew D. Redmon, P.E.
Date: March 27, 2014
License No.: 36757

THIS PRELIMINARY DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

Martin L. Skyrman, P.E.
Principal Consultant

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PROJECT INFORMATION

Project Authorization

The following Table summarizes (in chronological order) the Project Authorization History for the services performed and represented in this report by Professional Service Industries, Inc. (PSI):

PROJECT TITLE: INDUSTRIAL PARK		
Document and Reference Number	**Date**	**Requested/Provided By**
Request for Proposal	11/21/2013	Mr. Keith Capdepon Jr. of Bryant Hammett & Associates
PSI Proposal Number: 109866	11/22/2013	Mr. Ali Hijazi of PSI
Notice to Proceed	2/25/2014	Mr. Keith Capdepon Jr. of Bryant Hammett & Associates

Project Description

Project information indicates that the proposed project will potentially involve the development of a 175 acre Tier 3 Industrial Park Facility. No information regarding building(s) location or size, equipment(s) location or size, loads, or site grading was provided to PSI at the time this report was written. It is understood that this report is to provide an overview of the site based on the four (4) borings conducted in the proposed construction areas.

The preliminary geotechnical recommendations presented in this report are based on the available project information and the subsurface materials described in this report. If any of the information noted above is incorrect, please inform PSI in writing so that we may amend the recommendations presented in this report if appropriate and if desired by the client. PSI will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

Purpose and Scope of Services

The purpose of this preliminary geotechnical exploration was to determine the various soil profile components, determine the general engineering characteristics of the materials encountered, provide information to the design engineers and architects which could be used to formulate preliminary design criteria, and to aid in the development of a design level study for obtaining final design information.

PSI's contracted scope of services included drilling four (4) soil test borings, select laboratory testing, and preparation of this geotechnical report. This report briefly outlines the testing procedures, presents available project information, describes the site and subsurface conditions, and presents recommendations regarding the following:

- Grading procedures for site development.
- Preliminary foundation recommendations.
- Comments regarding factors which could impact construction and performance of the proposed construction.

It should be noted that the number of borings conducted in our exploration is not considered comprehensive for determining geotechnical recommendations across a site encompassing 175 acres. This report only provides preliminary recommendations, and PSI should be retained to provide a more detailed scope and exploration once a final site plan has been developed.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, groundwater, or air on, below, or around this site. Any statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

SITE AND SUBSURFACE CONDITIONS

Site Location and Description

The Tier 3 Industrial Park is located south of the intersection of Riverton Camp Road and Highway 165 in Columbia, Louisiana. The new industrial park will be located in the areas of Sections 19,41,42 & 43, T14N-R4E & Sections 13,24 & 44, T14N-R3E. The site Latitude and Longitude are approximately N 32.187236° and W 92.105873°, respectively.

The subject property is currently developed for agricultural purposes. The current adjoining and surrounding properties consist of farmland on all sides and residential areas to the north and east. The Ouachita River is located approximately 0.3 miles west of the site.

Site Geology

Based on the Geologic Map of Louisiana (1984) provided by the Louisiana Geological Society, the proposed site is located on Natural Levees consisting of gray and brown silt, silty clay, some very fine sand, reddish brown along the Red River.

Subsurface Conditions

The site was explored with a total of four (4) borings drilled across the site proposed industrial park. The borings were drilled to depths of 25 feet. Please see the attached Boring Location Plan in the appendix for the approximate locations of the borings.

The boring locations and the boring depths were specified by the owner. PSI personnel staked the borings in the field by measuring distances from available surface features and using a handheld GPS system. The borings were drilled with a Geoprobe 7822DT ATV drilling rig. Hollow-stem auger drilling techniques were used to advance the boreholes. Samples were generally obtained continuously from the ground surface to a depth of about 10 feet, and at intervals of five (5) feet thereafter.

The soils were generally sampled using standard penetration resistance testing and undisturbed sample collection in general accordance with the requirements of ASTM Designations D-1586 and D-1587, respectively. The samples were identified according to boring number and depth, sealed and encased at the site to protect against moisture loss, and transported to the laboratory in protective containers to prevent damage. All samples obtained during the field exploration were identified and evaluated by experienced geotechnical personnel upon arrival at the laboratory.

The test borings disclosed a layer of loose to medium silt in the upper two (2) feet, followed by a layer of medium to stiff lean clay extending to 10 to 13 feet in Borings B-1 and B-2, and to six (6) feet in Borings B-3 and B-4. Below the clay, very loose to loose silt, and very soft to medium lean clay and silty clay were encountered until boring termination at 25 feet.

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs included in the Appendix should be reviewed for specific information at individual boring locations. These records include soil descriptions, stratifications, penetration resistances, and locations of the samples and laboratory test data. The stratifications shown on the boring logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual. Water level information obtained during field operations is also shown on these boring logs. Samples not altered by laboratory testing will be retained for sixty (60) days from the date of this report and then will be discarded.

Water Level Measurements

Free groundwater was not observed in the borings upon completion, indicating that groundwater at the site at the time of the exploration was either below the terminated depths of the borings, or that the soils encountered are relatively impermeable. Although free groundwater was not encountered at this time, the groundwater levels at the site can fluctuate based on variations in rainfall, evaporation, surface run-off and other related hydro-geologic factors. PSI recommends the contractor determine the current groundwater depth at the time of construction.

PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

The in situ clay soils between two (2) and six (6) feet across the site are generally considered adequate for supporting lightly loaded structures on a shallow foundation system, if the site is prepared as subsequently recommended. In order to use conventional shallow foundations at the site, it will be necessary to undercut and waste the medium to loose silt at the location of any structure footprint, and for five (5) feet beyond its perimeter. The depth of undercut approaches approximately two (2) feet.

Loose to very loose silt was encountered at depths ranging from six (6) to thirteen (13) feet below existing grade. This soil layer will control the allowable bearing pressure and settlement of the proposed structures if large structural loads are planned. If a larger allowable bearing pressure is required to accommodate the anticipated design loads, other construction methods or foundation types may be considered. Deep foundation recommendations can be provided, however additional drilling will be required to explore the soils at a greater depth than those explored under this scope of service.

The silty soils had low plasticity index (PI) values and will therefore be very moisture content sensitive. If wet conditions exist during construction, this can cause significant difficulty in the preparation of the building pad areas. We recommend the construction take place during warmer and drier times of the year. In order for construction to progress in wetter periods of the year, it may necessary to replace the subgrade soil with select fill in the construction areas or cement stabilize the existing subgrade soil.

The following preliminary geotechnical-related recommendations have been developed on the basis of the subsurface conditions encountered and PSIs' understanding of the proposed development. Should changes in the project criteria occur, a review must be made by PSI to determine if modifications to our recommendations will be required.

Site Preparation

PSI recommends all silt, topsoil, organic material, loose and soft soils or other unsuitable material at the site be stripped from the site, and either wasted or stockpiled for later use in non-foundation areas. In general, PSI anticipates an average stripping depth of approximately two (2) feet. There may be areas of the site that require additional or possibly less stripping. Voids resulting from the removal of trees, organic material, or unsuitable soils should be backfilled in accordance with the following recommendations for fill placement as soon as practical.

PSI recommends that areas to receive pavement be undercut to a depth of at least one (1) foot below existing site grade, and subsequently backfilled with engineered fill in accordance with the following recommendations. Alternatively, paving areas may be cement stabilized in lieu of undercutting and backfilling activities. Detailed traffic information will be required for more specific pavement section recommendations.

In this region, the silts and lean clays can undergo a significant loss of stability when construction activities are performed during wetter portions of the year. PSI anticipates that the soils in the project area can become easily disturbed if subjected to conventional rubber tire or narrow track-type equipment. Soils that become disturbed would need to be excavated and replaced; however, this remedial excavation may expose progressively wetter soils with depth, thus compounding the problem condition. Thus, a normal approach to subgrade preparation may not be possible. Appropriate wide-track equipment selection should aid in minimizing potential disturbance.

After stripping and required excavation, the subgrade in the construction areas should be proofrolled with a loaded tandem axle dump truck or similar pneumatic tired vehicle having a minimum gross weight of 20 tons. Soils observed to rut or deflect excessively under the moving load should be undercut and recompacted as recommended for select fill or replaced with properly compacted select fill material. Proofrolled soils should be scarified for a depth of at least eight (8) inches and recompacted to 95 percent or greater of the soils Standard Proctor (ASTM D-698) maximum dry density. Proofrolling and undercutting activities should be performed during a period of dry weather and witnessed by a representative of the geotechnical engineer.

After subgrade preparation and observation have been completed, fill placement required to establish design grades may begin. Fill used at the site should be select material free of organic or other deleterious materials and have a maximum particle size of less than three (3) inches. Select fill should also have a liquid limit of 40 or less with plasticity index values between 10 and 20. Excavated in-situ soils meeting select fill criteria are suitable for reuse as fill. A representative of PSI should be on-site to observe, test, and document the placement of the fill. If the fill is too dry, water should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Close moisture content control will be required to achieve the recommended degree of compaction. If fill placement must proceed during a wetter time of the climate cycle, it will likely be difficult to compact the on-site soils, and the use of imported select fill materials or cement stabilization will likely be required.

Fill should be placed in maximum loose lifts of eight (8) inches, moisture conditioned and compacted to at least 95% of the materials' Standard Proctor (ASTM D-698) maximum dry density. The required select fill density will be more readily attained if compaction is done within a range of -1 to +2 percent of the optimum moisture content. Compacted fill should extend a minimum of five (5) feet beyond the foundation perimeters prior to sloping in fill areas.

Each lift of compacted fill should be tested and documented by a representative of the geotechnical engineer prior to placement of subsequent lifts. Tests should be performed at a frequency not less than one (1) test for every 2,500 square feet of fill placed in structure areas and not less than one (1) test for every 5,000 square feet of fill placed in non-load bearing areas.

Tested fill materials not meeting either the required dry density or moisture content range shall be recorded, the location noted, and reported to the Contractor and Owner. A re-test of that area should be performed after the Contractor performs remedial measures.

Preliminary Foundation Recommendations

Structures can be supported on a shallow foundation system using both spread and/or continuous footings bearing at least 18 inches below final grade in stiff in-situ clay soil or properly compacted select fill. Spread footings for building columns and continuous footings for walls bearing in compacted soil can be designed for net allowable soil bearing capacities of 1,800 pounds per square foot (psf) and 1,400 psf, respectively. These values are in consideration of dead loads plus sustained live loads and may be increased by one third when accounting for transient live loads. Minimum dimensions of 18 and 24 inches are recommended for continuous and spread footings, respectively. To minimize settlement, the maximum spread footing dimension should be limited to five (5) feet.

Foundation excavations should be observed and documented by a representative of PSI prior to steel or concrete placement to verify the foundation materials are consistent with the materials discussed in this report and capable of supporting the design loads. Soft or loose soil zones encountered at the bottom of the footing excavations, as indicated by blows with a dynamic cone penetrometer (DCP) equivalent to N-values of less than 8 blows per foot, should be removed to a suitable soil level, and replaced with compacted select fill. Fill placed below the foundations where unsuitable materials are removed should extend one (1) foot outside the foundation limits for every one (1) foot in thickness between the intended bearing surface and the underlying, suitable natural soils.

After opening, footing excavations should be observed and concrete placed as quickly as possible to avoid exposure of the footing bottoms to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond. If possible, the foundation concrete should be placed the same day the excavation is made. If footing excavations are required to be left open for more than one (1) day, they should be protected to reduce evaporation or entry of moisture.

There is the possibility that soft and/or compressible soil zones may exist which can cause excessive total and/or differential settlement. Settlement estimates can be provided once final plans are more complete.

If a larger allowable bearing pressure is required to accommodate the anticipated design loads and the potential for settlement to exceed an inch, under the larger structural loads, is not

satisfactory to the client, other construction methods or foundation types may be considered. Deep foundation recommendations can be provided, however additional drilling will be required to explore the soils at a greater depth than those explored under this scope of service.

Slab on Grade

If slabs are to bear on properly compacted select fill as described in the site preparation section, a modulus of subgrade reaction, *k* value, of 100 pounds per cubic inch (pci) based on correlation to values typically resulting from a 1 ft. x 1 ft. plate load test may be used in the slab design. However, depending on how the slab load is applied, the value will have to be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesive and cohesionless soil:

Modulus of Subgrade Reaction, $k_s = (\frac{k}{B})$ for cohesive soil and

$k_s = k(\frac{B+1}{2B})^2$ for cohesionless soil

where: k_s = coefficient of vertical subgrade reaction for loaded area,
k = coefficient of vertical subgrade reaction for one square foot area, and
B = effective width of area loaded, in feet

A suitable vapor retarder should be placed on the prepared subgrade to act as a vapor barrier as required by codes or manufacturer requirements.

Earthquake and Seismic Design Consideration

The 2012 International Building Code requires a site class for the calculation of earthquake design forces. This class is a function of soil type (i.e., depth of soil and strata types). Based on the estimated depth to rock and the estimated shear strength of the soil at the boring locations, Site Class "E" is recommended. It should be noted that our borings extended to a depth of 25 feet whereas IBC site classifications are based on the upper 100 feet of the soil profile. Based on the USGS website and Site Class "E", the ground motion values near latitude N 32.187236° and longitude W 92.105873° are as follows:

Period (seconds)	Mapped Spectral Response Acceleration	Site Coefficients	Max. Spectral Acceleration Parameters	Design Spectral Acceleration Parameters
0.2 (S_s)	0.137 g	F_a = 2.5	S_{MS} = 0.342 g	S_{DS}= 0.228 g
1.0 (S_1)	0.078 g	F_v = 3.5	S_{M1} = 0.272 g	S_{D1}= 0.181 g

The Site Coefficients, F_a and F_v were interpolated from IBC 2012 Tables 1613.3.3(1) and 1613.3.3(2) as a function of the site classifications and the mapped spectral response acceleration at the short (S_s) and 1 second (S_1) periods. A liquefaction analysis was not included in the scope of this exploration. Deeper borings would be necessary to evaluate an improvement in site class as well as susceptibility of soils to liquefaction and seismic-induced settlement.

CONSTRUCTION CONSIDERATIONS

Moisture Sensitive Soils/Weather Related Concerns

The soils encountered at this site (i.e. silt and clay) will be very sensitive to disturbances caused by construction traffic when wet. This was evident during our drilling operations. The contractor should be cognizant of the importance of proper maintenance of surface drainage. Depending on weather-related ground conditions, the contractor's maintenance of drainage during construction, and other factors, some difficulty may be encountered by the contractor in achieving compaction on initial lifts of fill placed on loose or soft subgrade. This will be exacerbated by wet weather, particularly if the contractor allows surface drainage to enter and pond in the excavations.

During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support characteristics. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather. Earthwork activities performed during cooler, wetter months may certainly offer more difficulties than if performed during warmer, drier periods.

If construction is performed during wet conditions, work platforms may be necessary; these can be created for earthwork by mixing soil and hydrated lime, cement, or combinations of these additives.

Drainage and Groundwater Concerns

Water should not be allowed to collect in the foundation excavations, on floor slab areas, or on prepared subgrade areas either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater, or surface runoff. Positive site surface drainage should be provided to reduce infiltration of surface water around the perimeter of the building and beneath the floor slabs. The grades should be sloped away from the building and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill and floor slab areas of the building.

Any water accumulation should be removed from excavations by pumping. The Geotechnical engineer should be consulted in the event excessive and uncontrolled amounts of seepage occur.

Excavations

In 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 applicable OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should 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.

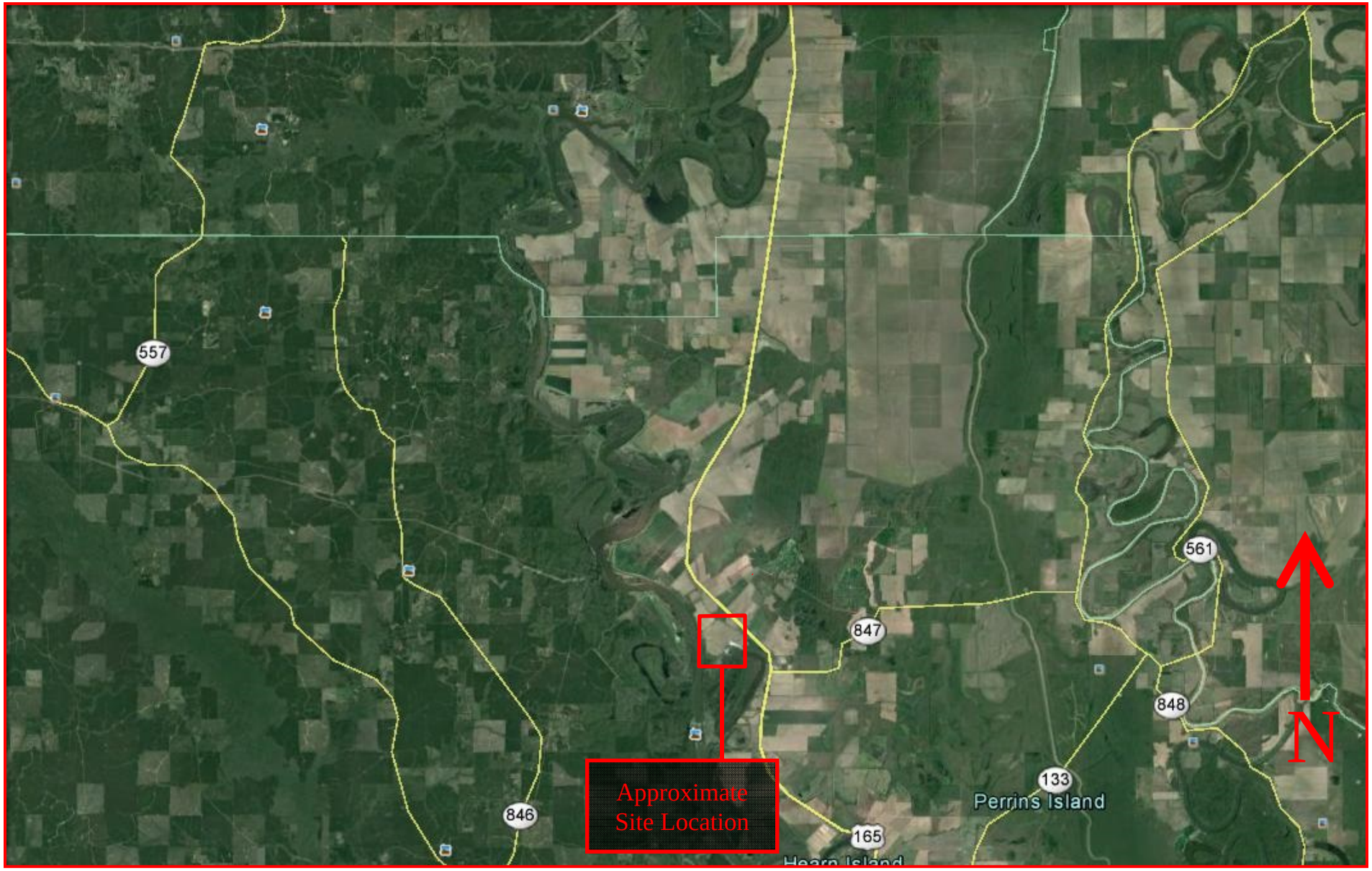
We are providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other party's compliance with local, state, and federal safety or other regulations.

REPORT LIMITATIONS

The preliminary recommendations submitted in this report, are based on the available subsurface information obtained by PSI and the project information furnished by the Client for the proposed project. This report only provides preliminary recommendations. After the plans are more complete, PSI should be retained and provided the opportunity to review the final design plans and to provide a more detailed scope and exploration. At this time, it may be necessary to submit supplementary recommendations. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the project. This report has been prepared for the exclusive use of Bryant Hammett and Associates for the proposed Tier 3 Industrial Park to be constructed in Columbia, Louisiana.

Appendix

SITE VICINITY PLAN



GEOTECHNICAL ENGINEERING SERVICES

TIER 3 INDUSTRIAL PARK FACILITY

RIVERTON CAMP ROAD
COLUMBIA, LOUISIANA

DATE:	3/26/14
DRAWN	AH
CHKD:	MS
SHEET NO.:	1
PSI PROJ. NO.:	0257374

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BORING LOCATION PLAN

GEOTECHNICAL ENGINEERING SERVICES

TIER 3 INDUSTRIAL PARK FACILITY

RIVERTON CAMP ROAD
COLUMBIA, LOUISIANA

DATE: 3/26/14

DRAWN: AH

SHEET NO.: 1

PSI PROJ. NO.: 0257374

CHKD: MS

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Log of Boring B-1

Columbia Industrial Park

Columbia, Louisiana

Type of Boring: Hollow-Stem Auger **PROJECT NUMBER: 0257374**

Surface Elevation: Not Recorded
Boring Location Plan: Appendix Sheet 2

DEPTH, FEET	USCS GROUP SYMBOL	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
	ML	Medium Brown Silt	17						18				
	CL	Stiff Brown Lean Clay		2.00		1.85			23	30	17	13	
5		*Becoming Medium at 4 Feet*		1.25					19	31	18	13	
				1.00		0.63			21				
				0.75		0.72			23	29	17	12	
10													
	ML	Loose Brown Silt	8						23				
15													
			4						28	24	20	4	
20													
		Becoming Very Loose at 23 Feet	2						26				91
25													
		Boring Terminated at 25 Feet											
30													
35													
40													
45													
50													

Depth of Boring: 25 FEET **Depth to Free Groundwater: Not Encountered**

Date Drilled: March 5, 2014

Log of Boring B-2

Columbia Industrial Park

Columbia, Louisiana

Type of Boring: Hollow-Stem Auger **PROJECT NUMBER: 0257374**

Surface Elevation: Not Recorded
Boring Location Plan: Appendix Sheet 2

DEPTH, FEET	USCS GROUP SYMBOL	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
	ML	Loose Brown Silt	5						22	NP	NP	NP	
	CL	Medium Brown Lean Clay		0.75		0.71			22	28	17	11	
5				1.25					25	27	19	9	
				1.50		1.48			23				
				1.00		1.19			26	29	20	9	
10													
	ML	Very Loose Brown Silt	2						31				
15													
			1						28	NP	NP	NP	90
20													
	CL	Stiff Brown Lean Clay		1.75		1.13			36				
25		Boring Terminated at 25 Feet											
30													
35													
40													
45													
50													

Depth of Boring: 25 FEET **Depth to Free Groundwater: Not Encountered**

Date Drilled: March 5, 2014

Geotechnical Consulting Services
West Monroe, Louisiana

Log of Boring B-3

Columbia Industrial Park

Columbia, Louisiana

Type of Boring: Hollow-Stem Auger **PROJECT NUMBER: 0257374**

DEPTH, FEET	SOIL	USCS GROUP SYMBOL	SAMPLES	Surface Elevation: Not Recorded Boring Location Plan: Appendix Sheet 2 SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
		ML		Medium Brown Silt	5						23				
		CL		Medium Brown Lean Clay		1.00		0.94			29	38	20	18	
5						1.00					25				
		CL-ML		Medium Brown Silty Clay	6						22	26	20	6	
					4						26	25	21	4	
10															
		ML		Very Loose Brown Silt with Sand	WOH						32				
15															
					WOH						26	NP	NP	NP	
20															
					1						28				84
25															
				Boring Terminated at 25 Feet											
30															
35															
40															
45															
50															

Depth of Boring: 25 FEET **Depth to Free Groundwater: Not Encountered**

Date Drilled: March 5, 2014

Log of Boring B-4

Columbia Industrial Park

Columbia, Louisiana

Type of Boring: Hollow-Stem Auger **PROJECT NUMBER: 0257374**

DEPTH, FEET	SOIL	USCS GROUP SYMBOL	SAMPLES	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
				Surface Elevation: Not Recorded Boring Location Plan: Appendix Sheet 2											
		CL		Stiff Brown Lean Clay		1.25		1.07			25				
						1.25		1.19			24	32	17	16	
5						1.25		1.23			26				
		ML		Loose Brown Silt	6						27	NP	NP	NP	
				Becoming Very Loose at 8 Feet	WOH						31				
10															
					WOH						33	NP	NP	NP	
15															
		CL		Very Soft Brown Lean Clay		0.25					35	34	19	15	
20															
				Becoming Medium at 23 Feet		0.75		0.55				38			
25															
				Boring Terminated at 25 Feet											
30															
35															
40															
45															
50															

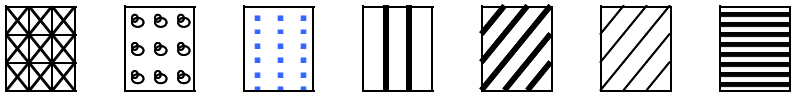
Depth of Boring: 25 FEET **Depth to Free Groundwater: Not Encountered**

Date Drilled: March 5, 2014

Geotechnical Consulting Services
West Monroe, Louisiana

KEY TO TERMS AND SYMBOLS USED ON LOGS

SOIL TYPE

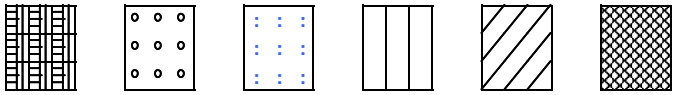


ROCK | GRAVEL | SAND | SILT | FAT CLAY | LEAN CLAY | PEAT

SAMPLER TYPE

NO SAMPLE | AUGER SAMPLE | SHELBY TUBE | SPLIT SPOON

MODIFIERS



STONE/ CONC. | GRAVELY/ W/ GRAVEL | SANDY | SILTY | CLAYEY | FILL

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

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D 2487 (2005)

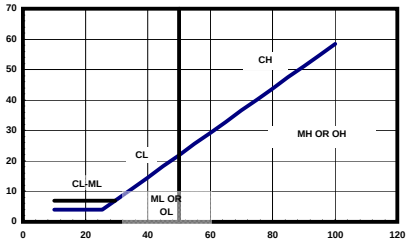
MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS LESS THAN 50% PASSING NO. 200 SIEVE	GRAVEL SOILS LESS THAN 50% PASSING NO. 4 SIEVE	CLEAN GRAVEL (LITTLE OR NO FINES	GW	WELL GRADED GRAVEL, GRAVEL WITH SAND MIXTURES WITH LITTLE OR NO FINES
			GP	POORLY GRADED GRAVEL, GRAVEL WITH 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, SAND WITH GRAVEL (LITTLE FINES)
			SP	POORLY GRADED SANDS, SAND WITH GRAVEL (LITTLE 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	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

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

152 76.2 19.1 4.76 2.0 0.42 0.074 0.002

GRAIN SIZE IN MM

INDEX TO SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2 - 2h	TYPICAL SECTIONS AND DETAILS
3 - 3g	SUMMARY SHEETS
4 - 31	PLAN AND PROFILE SHEETS
32 - 35	EXISTING DRAINAGE MAPS
36 - 39	DESIGN DRAINAGE MAPS
40 - 43	SUMMARY OF DRAINAGE STRUCTURES
44 - 57	GEOMETRIC DETAILS
58 - 70	CONCRETE PAVING DETAILS
71 - 95	CONSTRUCTION SEQUENCING AND SIGNING
96 - 100a	TRAFFIC CONTROL DETAILS (TC-00,01,02,03,04,05,06 & 15)
101 - 105	SUBGRADE SOIL SURVEY
106 - 136	RIGHT-OF-WAY MAPS Construction As-Built Road
201 - 334	BRIDGE PLANS
335 - 339	SOIL BORING LOGS AND TEST PILES

	STANDARD PLANS	REVISION DATE
501	BM-01	2/19/86
502	CB-01	11/2/00
503	CB-02	11/2/00
504	CC-30-20	1/5/78
505	CC-99.15. REV.	11/29/76
506-509	CP-01	6/26/01
510	DW-03	9/21/82
511-512	EC-01	1/14/94
513-514	FN-02	2/10/78
515-523	GR-200	6/4/01
524	HS-03	5/23/86
525-526	MB-01	1/14/92
527-531	MC-01	9/26/94
532	PC-01	4/16/90
533-536	PM-01	1/21/98
537	RM-01	7/2/03
538	RS-31	6/1/83
539-540	SAM-1	7/3/02
541	WP-01	7/9/97

	SPECIAL DETAILS	REVISION DATE
542	COLLAR-01.	10/15/03
543	PRCB-01	10/15/03
544	SETCRD1	1/16/98
545-546	RUMBLE STRIP DETAILS	

401 - 459 CROSS SECTIONS
TOTAL SHEETS WITHOUT CROSS SECTIONS = 336
TOTAL SHEETS WITH CROSS SECTIONS = 395

TRAFFIC DATA
2005 A.D.T. = 6,300
2025 A.D.T. = 9,500
D = 55%
K = 10%
T = 10%

DESIGN SPEED = 60 M.P.H. (70 M.P.H. ON NEW ALIGNMENT)
DESIGN CLASS: RA-3 (RA-4 ON NEW ALIGNMENT)

	DATE	REVISION	DATE	RECOMMENDED	DATE	APPROVED
4	5/17/05	Shts 1,3f & 3g	5/17/05		5/17/05	
3	5/11/05	Shts 1,3,3c,3e,13-20,22-29,31,40-43, 56,74,76,78,80,82,85 & 87-95	5-11-05	NKI	5-11-05	
2	4/12/05	Shts. 1, 97a-b, 100a, 201 & 203	4/12/05	N.K.I.	4-12-05	
1	3/28/05	Shts. 1, 2-2h, 3a, 3d, 3f, 4-12, 30 & 58-70	4/4/05	N.K.I.	4-5-05	

SCHEDULE OF REVISIONS*

TYPE OF CONSTRUCTION :
GRADING, DRAINAGE STRUCTURES, CLASS II BASE COURSE, SUBGRADE LAYER, SUPERPAVE ASPHALTIC CONCRETE PAVEMENT OR JOINTED PLAIN CONCRETE PAVEMENT AND SUPERPAVE ASPHALTIC CONCRETE SHOULDERS, AASHTO CONCRETE GIRDER BRIDGE AND CONCRETE SLAB SPAN BRIDGE AND RELATED WORK.

DOTD Soil Borings

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

PLANS OF PROPOSED
STATE HIGHWAY

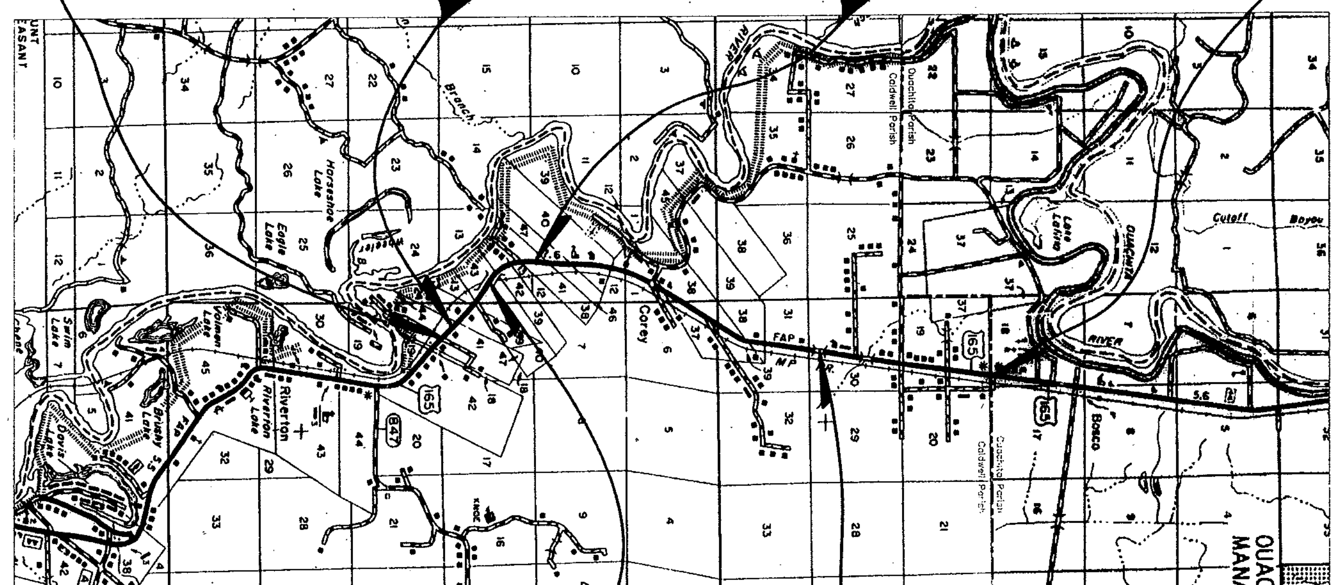
STATE PROJECT NO. 015-07-0044
LA. 847 - OUACHITA PARISH LINE
CALDWELL PARISH
U. S. 165

C.S. LOG MILE: 7.239
STA. 446+50.00
BEGIN S.P. NO. 015-07-0044

EQUATION: -81.36
STA. 456+00.00 P&A L.B. =
STA. 456+81.36 P&A L.A.

EQUATION: -209.08
STA. 520+16.27 P&A L.B. =
STA. 522+25.35 P&A L.A.

C.S. LOG MILE: 13.905
STA. 797+22.69
END S.P. NO. 015-07-0044



BRIDGE SITE: RAILROAD OVERPASS
STA. 480+36.48 P&A TO
STA. 502+29.84 P&A

BRIDGE SITE: BALLARD BAYOU
STA. 695+35.00 P&A TO
STA. 696+35.00 P&A

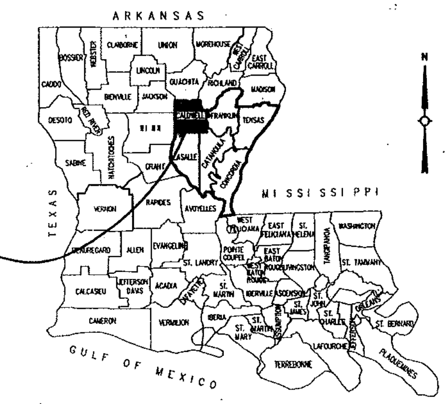
LAYOUT MAP
SCALE: 1 INCH = 5280 FEET

1 MILE 0 1 MILE 2 MILES 3 MILES

DATUM USED : M.S.L.
BEARINGS ARE GRID
TRANSIT BOOKS : 185-430 : 185-442
LEVEL BOOKS : 185-777
SCALES
PLAN : 1"=50'
PROFILE : 1"=50' HORIZONTAL
1"=5' VERTICAL

NOTE:
THE 2000 EDITION OF THE LOUISIANA DOTD STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, AS AMENDED BY THE PROJECT SPECIFICATIONS, SHALL GOVERN ON THIS PROJECT

STATE PROJECT
NO. 015-07-0044



VICINITY MAP

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT OFFICE OF HIGHWAYS
REVISED PLANS

PLANS PREPARED BY AND RECOMMENDED FOR APPROVAL BY
MEYER, MEYER, LaCROIX & HIXSON, INC.
DATE 10-26-04

STATE OF LOUISIANA
ANTHONY DeMARCO
REG. No. 20912
REGISTERED PROFESSIONAL ENGINEER
IN CIVIL ENGINEERING

STATE OF LOUISIANA
MATTHEW L. VIRDEN, IV
REG. No. 23474
REGISTERED PROFESSIONAL ENGINEER
IN CIVIL ENGINEERING
10-26-04

APPROVED
D.O.T.D. CHIEF ENGINEER
DATE 8-21-05

As-Builts
03-31-09

LENGTH OF PROJECT

DESCRIPTION	ALGEBRAIC SUM OF ALL EQUATIONS	GROSS LENGTH	EXCEPTION	BRIDGE LENGTH		ROADWAY LENGTH	
STATION TO STATION	FEET	FEET	FEET	FEET	MILES	FEET	MILES
446+50.00 - 797+22.69	-290.44	34,782.25				34,782.25	6.587
480+36.48 - 502+29.84				2,193.33	0.415		
695+35.00 - 696+35.00				100.000	0.019		
TOTAL LENGTH OF BRIDGES				2,293.36	0.434		
TOTAL LENGTH OF ROADWAY						32,488.89	6.153
TOTAL MILES							6.587

SHEET NUMBER 1

PARISH	FEDERAL PROJECT	STATE PROJECT
CALDWELL		015-07-0044

DESIGNED MLV · CHECKED JTB · DETAILED TES · CHECKED JTB · DATE OCTOBER 2004 · SHEET 1

NO. · DATE · REVISION DESCRIPTION · BY

ROUTE U.S. 165
LA. 847 - OUACHITA PARISH LINE
TITLE SHEET

mmlh

SAMPLE LEGEND

(3)	S-3	STY LM A-4 (05)	LL 24	PI 7		(0,0,2,3,79)
(4)	S-4	STY LM A-4 (06)	LL 27	PI 9		(0,0,1,16,67)
(5)	S-5	STY CL LM A-7-6(23)	LL 46	PI 22		(0,0,1,5,67)
(6)	S-6	SI A-4 (00)	NP			(0,0,1,11,80)
(7)	S-7	SI A-6 (07)	LL 21	PI 11		(0,0,1,8,81)
(8)	S-8	SI A-4 (00)	NP			(0,0,0,8,84)
(9)	S-9	SI A-4 (00)	NP			(0,0,1,8,87)
(10)	S-10	SI A-4 (00)	NP			(0,0,0,2,90)
(11)	S-11	STY CL LM A-6 (11)	LL 30	PI 12		(0,0,1,2,74)
(12)	S-12	STY LM A-6 (15)	LL 33	PI 16		(0,0,0,3,78)
(13)	S-13	STY LM A-6 (12)	LL 30	PI 13		(0,0,2,2,79)
(14)	S-14	STY CL A-7-6(29)	LL 47	PI 27		(0,0,1,2,62)
(15)	S-15	SI A-4 (00)	NP			(0,0,2,3,87)
(16)	S-16	SI A-4 (07)	LL 26	PI 9		(0,0,2,2,83)
(17)	S-17	SI A-6 (11)	LL 27	PI 13		(0,0,1,2,84)
(18)	S-18	SI A-4 (03)	LL 25	PI 4		(0,0,1,2,86)
(19)	S-19	SI A-4 (06)	LL 26	PI 7		(0,0,1,2,89)
(22)	S-22	STY CL LM A-4 (06)	LL 21	PI 10		(0,0,2,3,72)
(21)	S-21	SI A-4 (06)	LL 26	PI 8		(0,0,1,4,85)
(20)	S-20	SI A-4 (00)	NP			(0,0,1,4,89)
(23)	S-23	SI A-4 (00)	NP			(0,0,1,4,89)
(24)	S-24	SI A-4 (09)	LL 30	PI 10		(0,0,1,2,85)
(25)	S-25	SI A-4 (03)	LL 27	PI 4		(0,0,1,2,87)
(26)	S-26	SI A-6 (13)	LL 32	PI 13		(0,0,1,1,81)
(27)	S-27	SI A-4 (06)	LL 27	PI 7		(0,0,1,1,85)
(28)	S-28	SI A-4 (00)	NP			(0,0,0,4,92)
(30)	S-30	STY CL LM A-6 (10)	LL 31	PI 11		(0,0,1,3,77)
(29)	S-29	SI A-4 (03)	LL 24	PI 4		(0,0,0,2,90)
(31)	S-31	STY CL LM A-6 (15)	LL 32	PI 16		(0,0,0,1,76)
(33)	S-33	SI A-4 (00)	NP			(0,0,0,4,88)
(32)	S-32	SI A-4 (06)	LL 21	PI 10		(0,0,1,4,84)
(34)	S-34	SI A-4 (06)	LL 21	PI 10		(0,0,1,5,83)
(36)	S-36	SI A-4 (00)	NP			(0,0,0,1,91)
(35)	S-35	SI A-6 (07)	LL 21	PI 11		(0,0,1,1,85)
(37)	S-37	STY CL LM A-6 (14)	LL 30	PI 15		(0,0,0,1,78)
(40)	S-40	STY CL LM A-6 (09)	LL 21	PI 13		(0,0,0,1,78)
(39)	S-39	SI A-4 (06)	LL 25	PI 8		(0,0,1,1,81)
(38)	S-38	STY LM A-6 (07)	LL 24	PI 12		(0,0,6,13,64)
(43)	S-43	STY CL LM A-6 (09)	LL 21	PI 13		(0,0,1,1,77)
(42)	S-42	STY LM A-4 (04)	LL 17	PI 9		(0,0,1,4,78)
(41)	S-41	STY CL A-6 (22)	LL 33	PI 25		(0,0,1,3,65)
(45)	S-45	SI A-4 (00)	LL 12	PI 6		(0,0,1,6,80)
(44)	S-44	STY LM A-4 (05)	LL 18	PI 10		(0,0,1,6,76)
(48)	S-48	SI A-4 (01)	LL 13	PI 6		(0,0,1,3,81)
(47)	S-47	SI A-6 (07)	LL 18	PI 12		(0,0,1,2,82)
(46)	S-46	STY LM A-4 (00)	NP			(0,0,15,27,50)
(50)	S-50	SI A-4 (00)	NP			(0,0,1,3,85)
(49)	S-49	SI A-4 (00)	NP			(0,0,0,2,90)
(51)	S-51	STY LM A-4 (00)	NP			(0,0,12,15,67)
(54)	S-54	SI A-6 (07)	LL 18	PI 12		(0,0,0,2,83)
(53)	S-53	SI A-4 (00)	NP			(0,0,1,3,94)
(52)	S-52	SI A-4 (00)	NP			(0,0,0,5,87)
(57)	S-57	STY LM A-4 (03)	LL 16	PI 8		(0,0,1,3,79)
(56)	S-56	STY LM A-6 (06)	LL 19	PI 11		(0,0,1,5,77)
(55)	S-55	STY LM A-4 (04)	LL 18	PI 10		(0,0,7,10,66)
(59)	S-59	STY LM A-6 (12)	LL 24	PI 15		(0,0,1,1,79)
(58)	S-58	STY LM A-6 (04)	LL 19	PI 11		(0,0,16,9,58)
(62)	S-62	SI A-4 (02)	LL 13	PI 7		(0,0,3,1,81)
(61)	S-61	SI A-4 (00)	NP			(0,0,1,1,87)
(60)	S-60	LM A-4 (00)	NP			(0,0,18,29,42)
(64)	S-64	STY LM A-6 (10)	LL 22	PI 14		(0,0,1,1,79)
(63)	S-63	STY LM A-4 (01)	LL 15	PI 8		(0,0,17,15,55)
(67)	S-67	SI A-6 (09)	LL 19	PI 14		(0,0,4,1,80)
(66)	S-66	SI A-6 (07)	LL 18	PI 12		(0,0,3,2,80)
(65)	S-65	STY LM A-6 (10)	LL 22	PI 14		(0,0,3,2,76)
(71)	S-71	STY LM A-4 (03)	LL 19	PI 7		(0,0,4,9,76)
(70)	S-70	SI A-4 (02)	LL 15	PI 7		(0,0,3,5,81)
(68)	S-68	LM A-4 (00)	NP			(0,0,29,20,47)
(69)	S-69	STY LM A-4 (00)	LL 16	PI 5		(0,0,25,11,51)
(72)	S-72	STY LM A-4 (03)	LL 19	PI 8		(0,0,9,14,64)
(77)	S-77	STY LM A-6 (07)	LL 20	PI 11		(0,0,1,6,77)
(76)	S-76	STY LM A-4 (00)	NP			(0,0,1,35,58)
(75)	S-75	STY LM A-4 (03)	LL 17	PI 8		(0,0,0,13,76)
(74)	S-74	STY LM A-6 (07)	LL 23	PI 14		(0,0,11,15,57)
(73)	S-73	STY LM A-6 (09)	LL 26	PI 14		(0,0,9,8,64)
(78)	S-78	SI A-6 (07)	LL 20	PI 11		(0,0,0,2,83)
(81)	S-81	SI A-4 (00)	NP			(0,0,0,3,91)
(80)	S-80	SI A-4 (00)	NP			(0,0,0,3,89)
(79)	S-79	STY LM A-4 (00)	NP			(0,0,9,17,66)
(82)	S-82	STY LM A-4 (00)	LL 17	PI 4		(0,0,5,9,73)
(85)	S-85	SI A-4 (00)	NP			(0,0,1,3,92)
(84)	S-84	SI A-4 (00)	LL -12	PI 0		(0,0,0,2,86)
(83)	S-83	STY LM A-4 (00)	LL 16	PI 4		(0,0,4,7,75)
(88)	S-88	SI A-4 (00)	NP			(0,0,1,3,92)
(87)	S-87	SI A-4 (00)	NP			(0,0,0,6,90)
(86)	S-86	STY LM A-4 (00)	LL 13	PI 4		(0,0,4,8,77)
(90)	S-90	STY LM A-4 (00)	NP			(0,0,8,17,71)
(89)	S-89	STY LM A-4 (00)	NP			(0,0,7,15,74)
(92)	S-92	STY LM A-6 (09)	LL 29	PI 14		(0,0,9,14,64)
(91)	S-91	STY LM A-6 (06)	LL 25	PI 11		(0,0,9,14,64)
(94)	S-94	SI A-4 (00)	NP			(0,0,1,5,86)
(93)	S-93	SI A-4 (00)	NP			(0,0,1,5,86)
(95)	S-95	SI A-4 (04)	LL 20	PI 7		(0,0,1,1,85)
(97)	S-97	STY LM A-6 (07)	LL 20	PI 11		(0,0,1,3,79)
(96)	S-96	SI A-4 (03)	LL 19	PI 6		(0,0,1,1,85)
(98)	S-98	STY LM A-6 (05)	LL 20	PI 11		(0,0,4,17,68)
(99)	S-99	STY LM A-6 (08)	LL 25	PI 12		(0,0,4,8,77)
(100)	S-100	SI A-4 (07)	LL 22	PI 10		(0,0,0,3,82)
(101)	S-101	STY LM A-6 (08)	LL 26	PI 12		(0,0,9,7,65)
(102)	S-102	SI A-4 (07)	LL 22	PI 10		(0,0,1,3,81)
(103)	S-103	SI A-4 (03)	LL 15	PI 8		(0,0,1,4,80)
(104)	S-104	STY LM A-4 (05)	LL 18	PI 10		(0,0,4,8,77)
(106)	S-106	SI A-4 (00)	NP			(0,0,4,8,80)
(105)	S-105	SI A-4 (04)	LL 17	PI 9		(0,0,1,2,80)
(107)	S-107	STY LM A-6 (06)	LL 21	PI 11		(0,0,4,8,75)
(108)	S-108	STY LM A-4 (03)	LL 17	PI 8		(0,0,1,13,75)
(109)	S-109	STY LM A-4 (03)	LL 27	PI 4		(0,0,0,13,76)
(112)	S-112	SI A-4 (02)	LL 17	PI 6		(0,0,1,4,80)
(111)	S-111	STY CL LM A-6 (10)	LL 27	PI 12		(0,0,1,2,76)
(110)	S-110	SI A-4 (04)	LL 23	PI 6		(0,0,1,4,80)
(113)	S-113	STY LM A-6 (06)	LL 20	PI 11		(0,0,4,9,74)
(114)	S-114	SI A-4 (02)	LL 16	PI 7		(0,0,1,4,80)
(116)	S-116	STY LM A-4 (03)	LL 20	PI 7		(0,0,1,12,76)
(115)	S-115	STY LM A-4 (00)	LL 15	PI 5		(0,0,5,8,74)
(117)	S-117	STY LM A-6 (06)	LL 18	PI 12		(0,0,4,8,75)
(119)	S-119	STY CL LM A-4 (01)	LL 18	PI 5		(0,0,1,4,74)
(118)	S-118	STY LM A-4 (05)	LL 28	PI 7		(0,0,4,8,75)
(120)	S-120	SI A-4 (00)	NP			(0,0,1,2,88)
(122)	S-122	SI A-4 (00)	NP			(0,0,2,3,86)
(121)	S-121	STY LM A-4 (03)	LL 17	PI 8		(0,0,4,8,77)
(125)	S-125	STY LM A-4 (00)	NP			(0,0,5,12,72)
(124)	S-124	STY LM A-4 (04)	LL 20	PI 9		(0,0,6,13,66)
(123)	S-123	STY LM A-4 (01)	LL 17	PI 5		(0,0,3,8,76)
(126)	S-126	SI A-4 (00)	NP			(0,0,2,4,89)
(128)	S-128	SI A-4 (00)	NP			(0,0,1,2,86)
(127)	S-127	SI A-4 (00)	NP			(0,0,3,4,84)

LEGEND

(3) INDICATES LOCATION & IDENTIFICATION OF SAMPLE TESTED IN LABORATORY

S-3 INDICATES MATERIAL SAME AS (3)

A-4 (05) INDICATES SUBGRADE SOIL GROUP & GROUP INDEX
LL INDICATES LIQUID LIMIT
PI INDICATES PLASTICITY INDEX
NP INDICATES NON PLASTIC
(0,0,2,3,79) INDICATES %RETAINED ON #4, #10, #40, #200 SIEVES, AND % SILT (TR 407)

STA. 444+00 30 FT RT. CL — INDICATES BORING LOCATION & IDENTIFICATION

SAMPLES CLASSIFIED ACCORDING TO TR 423
FIELD BOOKS 58-257 & 58-263
PCCP = PORTLAND CEMENT CONCRETE PAVEMENT
SCG = SAND CLAY GRAVEL

EXISTING ROADWAY AND SHOULDERS

S & A STATION	LOCATION	ASPHALTIC CONCRETE SURFACING	BASE	WIDTH
124+69	RIGHT SHOULDER	2.0"	8.0" SCG	7'3"
	RIGHT LANE	8.5"	PCCP	24'0"
	LEFT LANE	10.5"	PCCP	---
	LEFT SHOULDER	3.0"	8.0" SCG	8'2"
184+50	RIGHT SHOULDER	2.0"	9.0" SCG	8'0"
	RIGHT LANE	10.0"	PCCP	24'0"
	LEFT LANE	11.0"	PCCP	---
	LEFT SHOULDER	3.0"	9.0" SCG	8'0"
239+81	RIGHT SHOULDER	3.0"	7.0" SCG	8'2"
	RIGHT LANE	11.0"	PCCP	24'2"
	LEFT LANE	13.0"	PCCP	---
	LEFT SHOULDER	3.0"	7.0" SCG	9'0"
281+00	RIGHT SHOULDER	3.0"	7.0" SCG	8'5"
	RIGHT LANE	10.0"	PCCP	24'2"
	LEFT LANE	10.0"	PCCP	---
	LEFT SHOULDER	3.5"	7.0" SCG	8'3"
344+50	RIGHT SHOULDER	4.5"	4.0" SCG	8'1"
	RIGHT LANE	12.0"	PCCP	24'5"
	LEFT LANE	12.0"	PCCP	---
	LEFT SHOULDER	4.5"	4.0" SCG	9'2"
405+50	RIGHT SHOULDER	7.0"	2.0" SCG	7'6"
	RIGHT LANE	12.0"	PCCP	24'0"
	LEFT LANE	12.0"	PCCP	---
	LEFT SHOULDER	3.0"	7.0" SCG	8'6"
465+50	RIGHT SHOULDER	5.0"	6.0" SCG	8'0"
	RIGHT LANE	12.0"	PCCP	24'0"
	LEFT LANE	12.0"	PCCP	---
	LEFT SHOULDER	4.0"	5.0" SCG	8'2"

FOR INFORMATIONAL PURPOSES ONLY

SHEET NUMBER 105

PARISH: CALDWELL | FEDERAL PROJECT: | STATE PROJECT: 015-07-0044

SUBGRADE SOIL SURVEY PLOT (SHEET 5 OF 5)

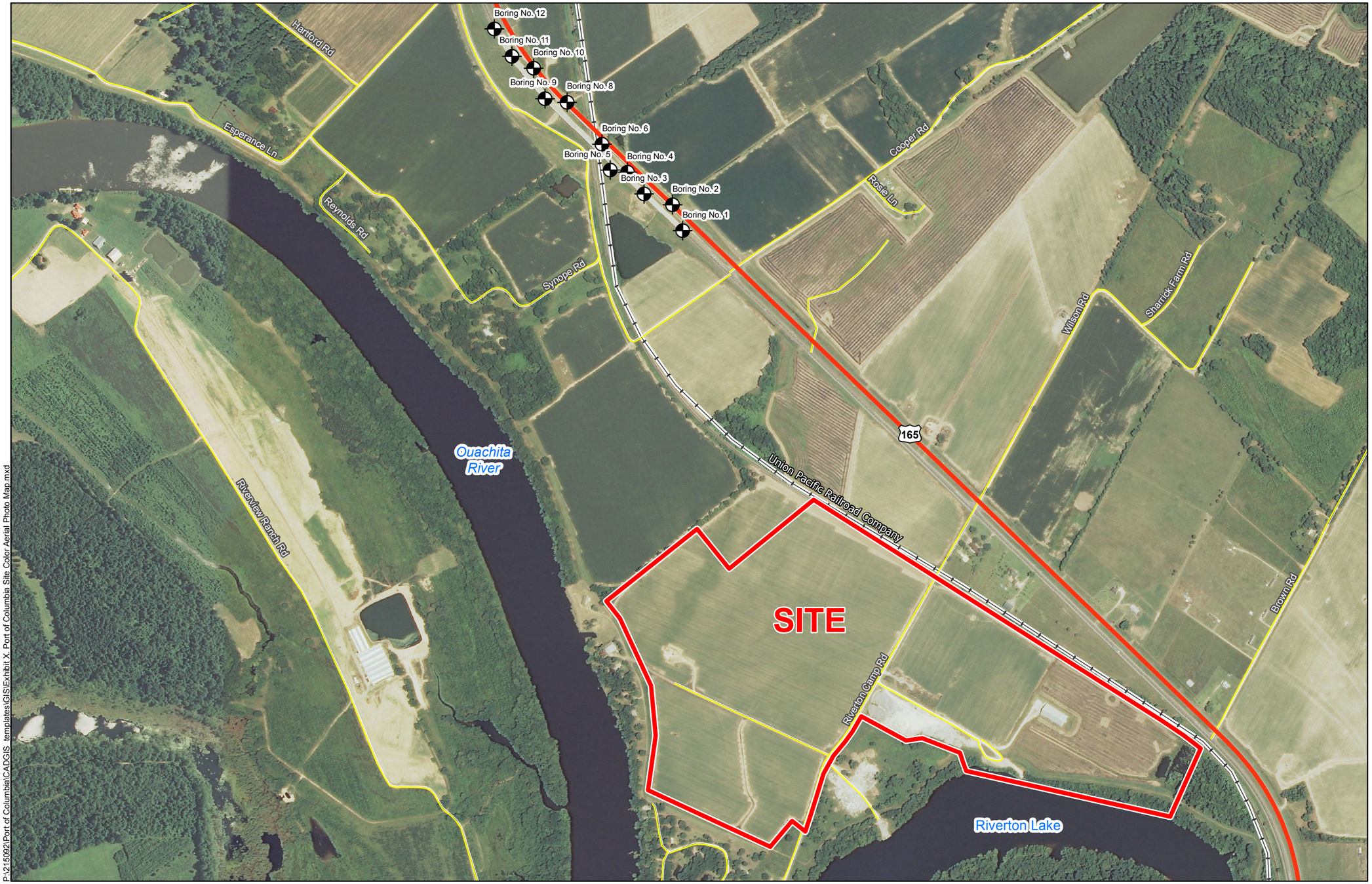
US 165 | JCT. LA 847 - OUACHITA PARISH LINE

PAVEMENT AND GEOTECHNICAL SERVICES

DESIGNED C.N.W.	DETAILED K.M.Z.	DATE 12/23/2004
CHECKED	CHECKED B.S.R.	SHEET

NO.	DATE	REVISION DESCRIPTION	BY

Louisiana DOTD Riverton Overpass Soil Boring Location Exhibit



DOTD Boring Location
Port of Columbia Site
Caldwell Parish, LA

Columbia Port Commission

Caldwell Parish

LEGEND

- Site Boundary (171.37 Ac. +/-)
- DOTD Riverton Overpass Soil Borings

Existing Roadway

- Interstate
- US Highway
- 4-Lane State Highway
- Urban State Highway
- Rural State Highway
- Local Roads
- Railroad

NORTHEAST LOUISIANA ECONOMIC ALLIANCE
NELEA

Date:	10/27/2015
Project Number:	215092
Drawn By:	AMB
Checked By:	JAY

CSRS
IMAGINE SHAPE DELIVER
6767 Perkins Road Suite 200 Baton Rouge, LA 70808
Telephone: 225 769-0546 Fax: 225 767-0060
www.csrsonline.com

P:\215092\Port of Columbia\CADGIS templates\GIS\Exhibit X. Port of Columbia Site Color Aerial Photo Map.mxd

General Notes:
1. No attempt has been made by CSRS, Inc. to verify site boundary, title, actual legal ownership, deed restrictions, servitudes, easements, or other burdens on the property, other than that furnished by the client or his representative.
2. Transportation data from 2013 TIGER datasets via U.S. Census Bureau at ftp://ftp2.census.gov/geo/tiger/TIGER2013.
3. 2013 aerial imagery from USDA-APFO National Agricultural Inventory Project (NAIP) and may not reflect current ground conditions.

N

Scale 1:10,000

0 540 1,080 Feet

08:31 30-DEC-2004

FINAL PLANS

R:\GANG2\PROJECTS\01507004 4\BORING1.DGN

SOIL TYPE* AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	DEPTH	ELEVATION	WATER TABLE
									0	64.8	
BR LEAN CL Org=7%	127	17	34	15	1.89		S/S	100			
BR SA SI	121	23	N	P	0.470		M.S.	101			
BR LEAN CL W/CONC	123	19	35	18	0.600		M.S.	102			
SI W/SA Org=12%	110	35	N	P	0.350		S/S	103	10	54.8	
BR GR CL	109	37	69	45	0.630		S/S	104			
GR CL Org=13%	104	41	67	41	0.420		S/S	105			
GR LEAN CL	118	25	47	27	0.890		S/S	106	20	44.8	
GR CL Org=9%	115	28	57	36	0.820		S/S	107			
Org=9%	116	30	65	33	1.20		S/S	108			
W/IR OX	115	28	59	37	1.30		S/S	109	30	34.8	
GR LEAN CL W/SA	128	21	26	16	0.770		M.S.	110			
W/TR SA	118	23	38	20	0.640		YLD	111	40	24.8	
GR CL W/ TR IR OX	116	29	59	37	1.06		S/S	112			
BR CL W/ TR SA IR OX & CONC	121	26	56	34	1.84		S/S	113	50	14.8	
BR LEAN CL W/ SA & CONC	125	20	29	14	1.03		YLD	114			
BR SA SI	121	27	N	P	0.480		M.S.	115	60	4.8	
BR SA W/ORG			N	P				116			
			N	P		n=29		117	70	-5.2	
W/TR GRAV			N	P		NC n=50		118			
GR SA			N	P		n=31		119	80	-15.2	
			N	P		9"=50		120			
			N	P		NC 8"=50		121	90	-25.2	
W/TR GRAV			N	P		n=50		122			
GR SI SA			N	P		NC 9"=50		123	100	-35.2	
GR SI W/ SA	117	20	N	P				124			
GR LEAN CL			28	11		NC 11"=50		125	110	-45.2	
GR SA LEAN CL	119	21	26	11				126			
		20	35	18		9"=50		127	120	-55.2	
GR SA SI			N	P		NC 9"=50		128			
GR SA LEAN CL		22	45	33		NC 9"=50		129	130	-65.2	
GR SI CL W/SA			27	6		NC 8"=50		130			
GR SA W/ LENS CL			N	P		NC n=50		131	140	-75.2	

BORING NO. 1	STA.: 460+30
LATITUDE: 32° 11' 45.04"N	LOCATION: 38' LT Adopt. CL
LONGITUDE: 92° 06' 29.62"W	DATE TAKEN: 6/9/2004
CONT. SECT.:	LOG MILE:

TEST PILE NO.
STA: 460+30
LOCATION: 38' LT Adopt. CL
TYPE OF PILE:
TYPE OF HAMMER:
RATED ENERGY: FT. LBS.
DATE OF DRIVING:
DRIVING RESISTANCE (TONS)
STR. NO.:
SQD. LDR.:

SOIL TYPE* AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	DEPTH	ELEVATION	WATER TABLE
									0	64.5	
BR SI CL Org=12%	125	22	26	6	0.700		M.S.	072			
BR GR LEAN CL Org=12%	125	32	29	12	0.870		M.S.	073	10	54.5	▽
BR CL Org=11%	110	38	62	38	0.360		S/S	074			
BR GR CL Org=3%	109	43	62	35	0.340		S/S	075	20	44.5	
GR CL	112	33	60	38	0.800		S/S	076			
BR SI W/SA	121	24	N	P	0.710		M.S.	077	30	34.5	
BR GR SI SA	125	22	N	P	0.330		M.S.	078			
GR SI CL SA		32	21	7		n=3		079	40	24.5	
GR CL W/IR OX	118	27	59	33	1.05		S/S	080			
BR LEAN CL W/TR CONC	115	33	49	26	1.06		S/S	081	50	14.5	
W/TR ORG	123	19	41	23	1.28		M.S.	082			
BR SA W/TR SI	118	23	N	P	0.270		M.S.	083	60	4.5	
W/SI			N	P		n=50		084			
GR SA			N	P		11"=50		085	70	-5.5	
			N	P		11"=50		086			
			N	P		n=32		087	80	-15.5	
			N	P		NC 11"=50		088			
W/TR PEA GRAV			N	P		NC n=50		089	90	-25.5	
GR CL SA		22	25	9		9"=50		090			
GR SA LEAN CL	115	23	28	10	0.460		M.S.	091	100	-35.5	
GR SI SA W/ LENS CL			N	P		8"=50		092			
GR CL SA		22	27	13		8"=50		093	110	-45.5	
GR CL W/LENS SI		20	59	31		n=41		094			
GR CL SA	123		N	P	0.570		M.S.	095	120	-55.5	
GR SI SA W/LENS CL			N	P		8"=50		096			
NO SAMPLE RETAINED						NC n=50		097	130	-65.5	
GR SA LEAN CL		28	36	18		NC n=50		098			
	126		36	18	0.690		S/S	099	140	-75.5	

BORING NO. 2	STA.: 462+30
LATITUDE: 32° 11' 47.19"N	LOCATION: 55' RT Adopt. CL
LONGITUDE: 92° 06' 30.82"W	DATE TAKEN: 6/8/2004
CONT. SECT.:	LOG MILE:

TEST PILE NO.
STA: 462+30
LOCATION: 55' RT Adopt. CL
TYPE OF PILE:
TYPE OF HAMMER:
RATED ENERGY: FT. LBS.
DATE OF DRIVING:
DRIVING RESISTANCE (TONS)
STR. NO.:
SQD. LDR.:

SOIL TYPE* AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	DEPTH	ELEVATION	WATER TABLE
									0	64.7	
BR LEAN CL ORG=8%	123	21	44	24	1.72		M.S.	132			▽
BR SI CL	122	24	29	7	0.910		M.S.	133	10	54.7	
W/SA	119	23	25	5	0.400		YLD	134			
	124	28	25	4	0.510		M.S.	135	20	44.7	
GR CL	114	38	76	42	0.860		S/S	136			
W/IR OX	123	29	50	30	1.22		S/S	137	30	34.7	
BR SA	118	23	N	P	0.270		M.S.	138			
GR CL W/ORG	110	34	66	40	1.36		S/S	139	40	24.7	
W/IR OX	117	31	71	44	2.12		S/S	140			
BR CL W/IR OX & CONC	119	30	65	49	1.90		S/S	141	50	14.7	
BR LEAN CL W/ORG	126	24	34	15	1.19		YLD	142			
BR SA	109	25	N	P	0.340		M.S.	143	60	4.7	
W/TR GRAV			N	P		n=28		144			
			N	P		NC n=50		145	70	-5.3	
			N	P		n=36		146			
			N	P		NC n=50		147	80	-15.3	
			N	P		11"=50		148			
W/TR GRAV			N	P		NC 10"=50		149	90	-25.3	
			N	P		NC n=50		150			
GR SA LEAN CL	113	23	32	15	0.410		M.S.	151	100	-35.3	
GR CL SA			26	8		NC 10"=50		152			
GR SA LEAN CL		28	39	20		NC n=50		153	110	-45.3	
GR LEAN CL W/SA		25	44	26		10"=50		154			
GR SA CL	121	24	56	28	0.430		M.S.	155	120	-55.3	
GR CL SA			35	15		NC 9"=50		156			
GR CL	121	24	56	28	3.88		M.S.	157	130	-65.3	
		22	60	34		NC n=50		158			
GR SI W/SA	115	26	43	15	0.630		YLD	159	140	-75.3	

BORING NO. 3	STA.: 464+36
LATITUDE: 32° 11' 48.08"N	LOCATION: 42' LT Adopt. CL
LONGITUDE: 92° 06' 33.40"W	DATE TAKEN: 7/13/2004
CONT. SECT.:	LOG MILE:

TEST PILE NO.
STA: 464+36
LOCATION: 42' LT Adopt. CL
TYPE OF PILE:
TYPE OF HAMMER:
RATED ENERGY: FT. LBS.
DATE OF DRIVING:
DRIVING RESISTANCE (TONS)
STR. NO.:
SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

MATERIAL:		COLOR:		STRUCTURE:	
CL.	= Clay	BR.	= Brown	ALT	= Alternating
CONC.	= Concretion	BK.	= Black	LAM.	= Laminated
GRAV.	= Gravel	BL.	= Blue	LEN	= Lens
I.O.	= Iron Ore	GR.	= Gray	LYR	= Layer
LIG	= Lignite	GN	= Green	MOT	= Mottled
N P	= Non-Plastic	PK	= Pink	PKT	= Pocket
ORG.	= Organic	RD.	= Red	STK.	= Streak
PT	= Peat	TN	= Tan	STR.	= Strata
RT.	= Roots	WH	= White	TR.	= Trace
SA.	= Sand	YE	= Yellow	**FAILURE MODE:**	
SH.	= Shell	**TEXTURE:**		M.S.	= Multiple Shear
SI.	= Silt	CO.	= Coarse	SL.	= Slump
VEG.	= Vegetation	FI.	= Fine	S/S	= Slickensides
WD.	= Wood	MED	= Medium	V.S.	= Vertical Shear
				YLD.	= Yield
				60 S.	= Shear Angle

SOIL PROPERTIES

WET DENSITY	= Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T208
MOISTURE CONTENT	= Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX	= Atterberg limits and indices, DOTD TR 428
qu	= Unconfined compressive strength, AASHTO T 208, (tons per sq. ft.)
SPT	= Standard Penetration Test, AASHTO T 206, number of blows, N = , per foot of penetration, unless amount of penetration is shown otherwise
UU	= Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
c	= Soil cohesion (tons per sq. ft.)
ϕ	= Soil angle of internal friction (degrees)
△	= Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
*	= Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
#	= Pocket penetrometer strength, (tons per sq. ft)

MISCELLANEOUS:

(circle)	= Location and identification of thin-walled tube sample, AASHTO T 207
(square)	= Location and identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
(circle)	= Location and identification of SPT sample, AASHTO T 206
N.C.	= No Cut, no preliminary 6 in. driving prior to securing SPT data
NO PENT	= No Penetration, unable to drive split spoon sampler initial 6 inches of the Standard Penetration Test.
NO RECV.	= No Recovery, unable to recover sample for testing or classification.
DIST.	= Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS	= Water Table depth below ground surface recorded at noted time after completion of bore hole.
⊗	= SOIL TYPE nomenclature is based on ASTM D 2487

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL		DESIGNATION	"N" (blows per ft.)	Approximate "qu" (tons per sq. ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4	
		LOOSE	4 - 10	
		MEDIUM	10 - 30	
		DENSE	30 - 50	
		VERY DENSE	OVER 50	
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2	LESS THAN 0.25
		SOFT	2 - 4	0.25 - 0.50
		MEDIUM	4 - 8	0.50 - 1.00
		STIFF	8 - 15	1.00 - 2.00
		VERY STIFF	15 - 30	2.00 - 4.00
		HARD	OVER 30	OVER 4.00

STATE OF LOUISIANA RITTIRONG CHAROENPAP REG. No. 27416 REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

8/18/04

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES. NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME.

SHEET NUMBER	335
PARISH	CALDWELL
FEDERAL PROJECT	
STATE PROJECT	015-07-0044
DESIGNED / CHECKED	
DETAILED / CHECKED	
DATE / SHEET	
NO. / DATE / REVISION DESCRIPTION / BY	

LA 847-Quachita Parish Line

US 165

MATERIALS AND TESTING SECTION

BORING NO. 4

SOIL TYPE ⊗ AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	DEPTH	ELEVATION	WATER TABLE
									0	64.3	
BR CL W/CONC	117	21	64	28	0.880		S/S	160			∇
BR SA SI W/CONC Org=11%	119	25	38	12	0.530		YLD	161	10	54.3	
BR SI SA	130	24	N	P	0.630		M.S.	162			
BR SI	129	32	N	P	0.350		M.S.	163	20	44.3	
GR ELASTIC SI Org=12%	113	35	67	34	0.740		S/S	164			
W/IR OX	112	32	75	37	1.09		S/S	165	30	34.3	
BR CL	113	52	61	30	0.420		S/S	166			
GR CL W/ORG	109	37	78	44	1.18		S/S	167	40	24.3	
GR CL SA	136	20	41	20	1.12		M.S.	168			
BR LEAN CL W/IR OX	126	20	41	20	5.56		M.S.	169	50	14.3	
	124	22	26	8	2.20		M.S.	170			
	132	26	28	10	1.84		M.S.	171	60	4.3	
NO SAMPLE RETAINED						n=7		172			
GR SA			N	P		n=20		173	70	-5.7	
			N	P		n=57		174			
			N	P		n=50		175	80	-15.7	
			N	P		n=23		176			
			N	P		n=33		177	90	-25.7	
GR LEAN CL W/SA		16	34	19		n=75		178			
GR SA SI CL			28	7		n=100		179	100	-35.7	
GR SA LEAN CL		25	33	15		n=69		180			
GR SI SA W/STR CL			N	P		NC 11"=100		181	110	-45.7	
GR SA SI		24	29	6		11"=100		182			
GR SA LEAN CL		24	38	19		n=60		183	120	-55.7	
GR SI CL SA		22	28	5		3"=100		184			
GR SA LEAN CL W/TR ORG		22	42	23		11"=68		185	130	-65.7	
GR LEAN CL W/SA		24	43	25		n=65		186			
		24	44	24		n=70		187	140	-75.7	

BORING NO. 4	STA.: 486+36
LATITUDE: 32° 11' 49.85"N	LOCATION: 35' RT Adopt. CL
LONGITUDE: 92° 06' 35.02"W	DATE TAKEN: 7/14/2004
CONT. SECT.:	LOG MILE:

TEST PILE NO.
STA.: 486+36
LOCATION: 35' RT Adopt. CL
TYPE OF PILE:
TYPE OF HAMMER:
RATED ENERGY: FT. LBS.
DATE OF DRIVING:
DRIVING RESISTANCE (TONS)
STR. NO.:
SQD. LDR.:

BORING NO. 5

SOIL TYPE ⊗ AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	DEPTH	ELEVATION	WATER TABLE
									0	66.5	
BR LEAN CL W/TR ORG	120	21	46	24	2.93		S/S	264			
W/TR ORG	161	23	33	13	0.800		S/S	265	10	56.5	∇
BR CL W/TR ORG & IR OX	110	41	77	46	0.700		S/S	266			
BR GR CL W/TR IR OX	115	35	55	27	0.620		S/S	267	20	46.5	
	112	32	65	35	0.800		S/S	268			
GR CL W/TR IR OX	116	30	58	32	1.03		S/S	269	30	36.5	
GR LEAN CL W SA & TR IR OX	128	21	33	14	1.05		YLD	270			
GR ELASTIC SI	116	28	56	26	1.39		S/S	271	40	26.5	
BR GR CL W/TR IR OX	117	32	52	24	1.26		S/S	272			
GR CL W/TR IR OX & CONC	124	28	61	32	1.89		S/S	273	50	16.5	
BR LEAN CL W/TR ORG	125	22	35	16	1.60		YLD	274			
BR SI SA	111	24			0.440		M.S.	275	60	6.5	
						n=27		276			
GR SA						n=60		277	70	-3.5	
W/TR GRAV						n=49		278			
						n=51		279	80	-13.5	
W/TR GRAV						n=25		280			
W/GRAV						n=65		281	90	-23.5	
W/GRAV						11"=8		282			
GR SA SI CL						n=68		283	100	-33.5	
									110	-43.5	
									120	-53.5	
									130	-63.5	
									140	-73.5	

BORING NO. 5	STA.: 486+36
LATITUDE: 32° 11' 50.00"N	LOCATION: 65' LT Adopt. CL
LONGITUDE: 92° 06' 36.72"W	DATE TAKEN: 9/28/2004
CONT. SECT.:	LOG MILE:

TEST PILE NO.
STA.: 486+36
LOCATION: 65' LT Adopt. CL
TYPE OF PILE:
TYPE OF HAMMER:
RATED ENERGY: FT. LBS.
DATE OF DRIVING:
DRIVING RESISTANCE (TONS)
STR. NO.:
SQD. LDR.:

BORING NO. 6

SOIL TYPE ⊗ AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	DEPTH	ELEVATION	WATER TABLE
									0	64.4	
BR LEAN CL	122	17	45	23	1.62		M.S.	216			∇
BR CL W/TR CONC	114	30	71	41	0.860		S/S	217	10	54.4	
	106	33	86	52	0.700		S/S	218			
BR LEAN CL	122	27	34	13	0.310		M.S.	219	20	44.4	
GR CL	114	36	59	32	0.780		S/S	220			
W/TR IR OX	114	28	68	39	0.960		S/S	221	30	34.4	
BR CL	110	28	86	53	0.710		S/S	222			
GR LEAN CL W/SA	127	23	30	12	0.650		S/S	223	40	24.4	
BR GR SI CL W/TR IR OX			N	P				224			
BR CL W/CONC	124	25	62	34	0.820		M.S.	225	50	14.4	
BR LEAN CL W/SA & IR OX	122	20	35	16	0.810		M.S.	226			
BR SI SA			N	P		n=46		227	60	4.4	
			N	P		n=30		228			
BR SA SI CL		25	23	5		n=39		229	70	-5.6	
GR SA			N	P		n=46		230			
			N	P		6"=76		231	80	-15.6	
			N	P		n=52		232			
BR SA W/TR GRAV			N	P		11"=76		233	90	-25.6	
BR GR SA			N	P		10"=80		234			
GR LEAN CL		20	28	9		11"=74		235	100	-35.6	
		21	26	6		n=82		236			
GR SA SI W/ LENS & STR CL		27	N	P				237	110	-45.6	
GR SI		26	27	4		9"=76		238			
GR LEAN CL		21	31	9		n=76		239	120	-55.6	
W/LENS SA		19	40	17		n=60		240			
W/LENS SI & SA		22	39	18		11"=82		241	130	-65.6	
GR SA W/LENS & STR CL			N	P		10"=77		242			
			N	P		10"=97		243	140	-75.6	

BORING NO. 6	STA.: 490+36
LATITUDE: 32° 11' 52.16"N	LOCATION: 42' RT Adopt. CL
LONGITUDE: 92° 06' 37.54"W	DATE TAKEN: 7/21/2004
CONT. SECT.:	LOG MILE:

TEST PILE NO.
STA.: 490+36
LOCATION: 42' RT Adopt. CL
TYPE OF PILE:
TYPE OF HAMMER:
RATED ENERGY: FT. LBS.
DATE OF DRIVING:
DRIVING RESISTANCE (TONS)
STR. NO.:
SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

MATERIAL:
CL. = Clay
CONC. = Concretion
GRAV. = Gravel
I.O. = Iron Ore
LIG = Lignite
N.P. = Non-Plastic
ORG. = Organic
PT. = Peat
RT. = Roots
SA. = Sand
SH = Shell
SI = Silt
VEG. = Vegetation
WD. = Wood

COLOR:
BR = Brown
BK = Black
BL = Blue
GR. = Gray
GN. = Green
PK. = Pink
RD = Red
TN. = Tan
WH. = White
YE. = Yellow

TEXTURE:
CO. = Coarse
FI. = Fine
MED. = Medium

STRUCTURE:
ALT. = Alternating
LAM = Laminated
LEN. = Lens
LYR = Layer
MOT. = Mottled
PKT. = Pocket
STK. = Streak
STR. = Strata
TR. = Trace

FAILURE MODE:
M.S. = Multiple Shear
SL = Slump
S/S = Slickensides
V.S. = Vertical Shear
YLD. = Yield
60 S = Shear Angle

SOIL PROPERTIES

WET DENSITY = Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T208.
MOISTURE CONTENT = Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX = Atterberg limits and indices, DOTD TR 428
qu = Unconfined compressive strength, AASHTO T 208, (tons per sq. ft.)
SPT = Standard Penetration Test, AASHTO T 206, number of blows, N = , per foot of penetration, unless amount of penetration is shown otherwise
UU = Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C = Soil cohesion (tons per sq. ft.)
ϕ = Soil angle of internal friction (degrees)
Δ = Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
* = Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
\# = Pocket penetrometer strength, (tons per sq. ft)

MISCELLANEOUS:

(circled number) = Location and identification of thin-walled tube sample, AASHTO T 207
(boxed number) = Location and identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
(circled number) = Location and identification of SPT sample, AASHTO T 206
N.C. = No Cull, no preliminary 6 in. driving prior to securing SPT data
NO PENT = No Penetration, unable to drive split spoon sampler initial 6 inches of the Standard Penetration Test.
NO RECV. = No Recovery, unable to recover sample for testing or classification
DIST. = Disturbed sample recovered with thin-walled tube sampler
∇ 24 HRS = Water Table depth below ground surface recorded at noted time after completion of bore hole.
⊗ = SOIL TYPE nomenclature is based on ASTM D 2487

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		"N" (blows per ft.)	Approximate "qu" (tons per sq. ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4	
		LOOSE	4 - 10	
		MEDIUM	10 - 30	
		DENSE	30 - 50	
		VERY DENSE	OVER 50	
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2	LESS THAN 0.25
		SOFT	2 - 4	0.25 - 0.50
		MEDIUM	4 - 8	0.50 - 1.00
		STIFF	8 - 15	1.00 - 2.00
		VERY STIFF	15 - 30	2.00 - 4.00
		HARD	OVER 30	OVER 4.00

STATE OF LOUISIANA
RITTIRONG CHAROENPAP
REG. No. 27448
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING
11/18/04

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES. NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME.

SHEET NUMBER 336
PARISH: CALDWELL
FEDERAL PROJECT:
STATE PROJECT: 015-07-044
DESIGNED / CHECKED / DETAILED / CHECKED / DATE / SHEET
NO. / DATE / REVISION DESCRIPTION / BY
LA 847-Ouachita Parish Line
US 165
DOTD
MATERIALS AND TESTING SECTION

Boring No. 7

SOIL TYPE* AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	DEPTH	ELEVATION	WATER TABLE
									0	65.2	
BR LEAN CL W/CONC Org=7%	118	21	35	18	0.610		M.S.	C244			▽
	119	32	34	21	0.570		M.S.	C245	10	55.2	
BR SA SI	137	27	N	P	0.310		M.S.	C246			
BR SI CL W/SA & IR OX	122	24	23	5	0.370		M.S.	C247	20	45.2	
GR CL Org=11%	113	29	67	43	0.610		S/S	C248			
W/TR ORT	118	30	63	40	1.07		S/S	C249	30	35.2	
GR CL SA	125	21	24	12	0.190		M.S.	C250			
GR CL W/TR ORG	116	31	63	40	1.16		M.S.	C251	40	25.2	
GR BR CL W TR IR OX	117	26	68	44	1.35		S/S	C252			
W/TR CONC & IR OX	126	26	54	35	1.74		S/S	C253	50	15.2	
BR LEAN CL	129	21	28	12	0.950		YLD	C254			
	121	24	31	16	0.510		YLD	C255	60	5.2	
BR SI SA			N	P		n=25		D256			
BR LEAN CL		29	31	14		n=8		D257	70	-4.8	
GR SA						n=38		D258			
						n=72		D259	80	-14.8	
W/TR GRAV						n=58		D260			
						n=62		D261	90	-24.8	
W/GRAV						11"=74		D262			
						NC 5"=50		D263	100	-34.8	
									110	-44.8	
									120	-54.8	
									130	-64.8	
									140	-74.8	

BORING NO. 7	STA.: 492+45	
LATITUDE: 32° 11' 53.00"N	LOCATION: 85' LT Adopt. CL	DRIVING RESISTANCE (TONS)
LONGITUDE: 92° 08' 48.32"W	DATE TAKEN: 7/27/2004	STR. NO.:
CONT. SECT.:	LOG MILE:	SQD. LDR.:

TEST PILE NO.
STA.: 492+45
LOCATION: 85' LT Adopt. CL
TYPE OF PILE:
TYPE OF HAMMER:
RATED ENERGY: FT. LBS.
DATE OF DRIVING:

Boring No. 8

SOIL TYPE* AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	DEPTH	ELEVATION	WATER TABLE
									0	65.1	
BR GN SI W/SA	122	18	24	2	0.820		M.S.	C188			▽
BR LEAN CL	126	24	29	9	0.840		M.S.	C189	10	55.1	
BR SI CL W/TR IR OX	122	25	25	4	0.300		M.S.	C190			
BR SI W/SA	118	22	N	P	0.530		M.S.	C191	20	45.1	
BR GR CL W/TR ORG	118	30	56	28	0.510		S/S	C192			
W/TR CONC	117	30	75	44	0.820		S/S	C193	30	35.1	
BR GN CL	117	28	70	41	0.730		S/S	C194			
BR CL	103	28	71	40	0.200		S/S	C195	40	25.1	
W/TR ORG	103	54	91	58	0.750		S/S	C196			
GR CL W/TR ORG	100	58	84	54	0.410		S/S	C197	50	15.1	
GR SA W/LENS CL			N	P				D198			
GR CL W/SA		27	65	34		n=14		D199	60	5.1	
BR SI SA			N	P		n=17		D200			
GR SA			N	P		n=48		D201	70	-4.9	
BR SA			N	P		n=62		D202			
BR SI SA			N	P		n=46		D203	80	-14.9	
GR SA W/GRAV			N	P		n=57		D204			
W/GRAV			N	P		n=30		D205	90	-24.9	
W/TR GRAV			N	P		n=67		D206			
			N	P		9"=76		D207	100	-34.9	
W/ORG			N	P		n=84		D208			
W/TR ORG			N	P		10"=90		D209	110	-44.9	
			N	P		NC 5"=50		D210			
			N	P		5"=50		D211	120	-54.9	
			N	P		NC 5"=50		D212			
GR LEAN CL W SA		25	34	19		11"=62		D213	130	-64.9	
GR CL SA		22	29	13		11"=60		D214			
GR SA LEAN CL			27	11		10"=68		D215	140	-74.9	

BORING NO. 8	STA.: 494+30	
LATITUDE: 32° 11' 55.65"N	LOCATION: 42' RT Adopt. CL	DRIVING RESISTANCE (TONS)
LONGITUDE: 92° 08' 40.97"W	DATE TAKEN: 7/20/2004	STR. NO.:
CONT. SECT.:	LOG MILE:	SQD. LDR.:

TEST PILE NO.
STA.: 494+30
LOCATION: 42' RT Adopt. CL
TYPE OF PILE:
TYPE OF HAMMER:
RATED ENERGY: FT. LBS.
DATE OF DRIVING:

Boring No. 9

SOIL TYPE* AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	DEPTH	ELEVATION	WATER TABLE
									0	64.6	
BR LEAN CL	123	20	31	10	1.22		M.S.	C328			
GR BR CL W/TR CONC Org=12%	114	28	64	37	0.650		S/S	C329	10	54.6	▽
BR SI CL Org=5%	122	25	27	7			YLD	C330			
GR BR LEAN CL	118	29	27	9	0.470		YLD	C331	20	44.6	
GR CL	110	38	61	34	0.470		M.S.	C332			
Org=9%	110	29	62	35	1.12		S/S	C333	30	34.6	
BR GR CL	112	26	69	41	0.320		S/S	C334			
GR BR CL	106	40	68	42	0.380		S/S	C335	40	24.6	
GR ELASTEC SI W/LESN SA & TR ORG & CONC	106	58	60	18	0.650		M.S.	C336			
GR SI CL SA	121	21	21	6	0.260		YLD	C337	50	14.6	
GR CL W/TR IR OX & CONC	117	28	65	39	1.17		S/S	C338			
BR SI SA						n=17		D339	60	4.6	
						n=22		D340			
GR SA						n=41		D341	70	-5.2	
						n=64		D342			
						n=64		D343	80	-15.2	
W/TR ORG						n=21		D344			
						n=66		D345	90	-25.2	
W/TR GRAV						n=71		D346			
						4"=50		D347	100	-35.2	
GR SI SA						6"=73		D348			
W/ORG						NC 4"=50		D349	110	-45.2	
						NC 4"=50		D350			
W/TR ORG						9"=87		D351	120	-55.2	
						NC 5"=50		D352			
GR SA SI						n=56		D353	130	-65.2	
GR SI W/SA						n=60		D354			
GR SA SI						11"=62		D355	140	-75.2	

BORING NO. 9	STA.: 496+29	
LATITUDE: 32° 11' 56.94"N	LOCATION: 42' LT Adopt. CL	DRIVING RESISTANCE (TONS)
LONGITUDE: 92° 08' 43.14"W	DATE TAKEN: 10/5/2004	STR. NO.:
CONT. SECT.:	LOG MILE:	SQD. LDR.:

TEST PILE NO.
STA.: 496+29
LOCATION: 42' LT Adopt. CL
TYPE OF PILE:
TYPE OF HAMMER:
RATED ENERGY: FT. LBS.
DATE OF DRIVING:

STANDARD ABBREVIATIONS & DEFINITIONS

MATERIAL:		COLOR:		STRUCTURE:	
CL.	= Clay	BR.	= Brown	ALT.	= Alternating
CONC	= Concretion	BK.	= Black	LAM.	= Laminated
GRAV.	= Gravel	BL.	= Blue	LEN.	= Lens
I.O.	= Iron Ore	GR.	= Gray	LYR.	= Layer
LIG.	= Lignite	GN.	= Green	MOT.	= Mottled
N.P.	= Non-Plastic	PK.	= Pink	PKT	= Pocket
ORG	= Organic	RD	= Red	STK.	= Streak
PT.	= Peat	TN.	= Tan	STR	= Strata
RT	= Roots	WH.	= White	TR.	= Trace
SA	= Sand	YE.	= Yellow	FAILURE MODE:	
SH.	= Shell	TEXTURE:		M.S.	= Multiple Shear
SI	= Silt	CO.	= Coarse	SL.	= Slump
VEG	= Vegetation	FI.	= Fine	S/S	= Slickensides
WD.	= Wood	MED	= Medium	V.S.	= Vertical Shear
				YLD.	= Yield
				60 S.	= Shear Angle

SOIL PROPERTIES

- WET DENSITY = Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T208.
- MOISTURE CONTENT = Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
- LIQUID LIMIT & PLASTICITY INDEX = Atterberg limits and indices, DOTD TR 428
- qu = Unconfined compressive strength, AASHTO T 208, (tons per sq. ft.)
- SPT = Standard Penetration Test, AASHTO T 206, number of blows, N = , per foot of penetration, unless amount of penetration is shown otherwise
- UU = Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
- C = Soil cohesion (tons per sq. ft.)
- ϕ = Soil angle of internal friction (degrees)
- Δ = Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ)
- * = Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
- # = Pocket penetrometer strength, (tons per sq. ft)

MISCELLANEOUS:

- (C) = Location and Identification of thin-walled tube sample, AASHTO T 207
- [C] = Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
- (D) = Location and Identification of SPT sample, AASHTO T 206
- N.C. = No Cut, no preliminary 6 in. driving prior to securing SPT data
- NO PENT = No Penetration, unable to drive split spoon sampler initial 6 inches of the Standard Penetration Test.
- NO RECV. = No Recovery, unable to recover sample for testing or classification.
- DIST = Disturbed sample recovered with thin-walled tube sampler.
- ▽ / 24 HRS = Water Table depth below ground surface recorded at noted time after completion of bore hole.
- ⊗ = SOIL TYPE nomenclature is based on ASTM D 2487

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL		DESIGNATION	"N" (blows per ft.)	Approximate "qu" (tons per sq. ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4	
		LOOSE	4 - 10	
		MEDIUM	10 - 30	
		DENSE	30 - 50	
		VERY DENSE	OVER 50	
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2	LESS THAN 0.25
		SOFT	2 - 4	0.25 - 0.50
		MEDIUM	4 - 8	0.50 - 1.00
		STIFF	8 - 15	1.00 - 2.00
		VERY STIFF	15 - 30	2.00 - 4.00
		HARD	OVER 30	OVER 4.00

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES, NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME

STATE OF LOUISIANA — REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

8/18/04

MATERIALS AND TESTING SECTION

LA 847-Quachita Parish Line
US 165

PARISH: CALDWELL
STATE PROJECT: 015-07-0044

30-DEC-2004 08:32

FINAL PLANS

R:\GANG2\PROJECTS\01507004\BORING4.DGN

BORING NO. 10

TEST PILE NO.	
STA.: 498+18	
LOCATION: 42'RT Adopt. CL	
TYPE OF PILE:	
TYPE OF HAMMER:	
RATED ENERGY:	FT. LBS.
DATE OF DRIVING:	

SOIL TYPE* AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	WATER TABLE
BR SI	113	13	24	3				[illegible]	
	127	21	24	1	0.920		M.S.	[illegible]	∇
BR LEAN CL W/TR IR OX	123	25	42	22	0.760		S/S	[illegible]	
BR SA SI	127	24	N	P	0.390		M.S.	[illegible]	
GR CL	113	35	68	38	0.730		S/S	[illegible]	
W/IR OX	114	31	61	34	1.03		S/S	[illegible]	
BR SA SI	118	26	N	P	0.710		M.S.	[illegible]	
BR CL W/CONC	105	45	79	46	0.830		S/S	[illegible]	
GR CL W/ ORG & CONC	103	26	85	51	0.450		S/S	[illegible]	
W/IR OX	122	28	53	35	1.09		S/S	[illegible]	
GR LEAN CL W/ IR OX & CONC & TR ORG	122	31	46	23	1.38		S/S	[illegible]	
BR SI	124	25	22	2	0.600		M.S.	[illegible]	
BR SA SI			N	P		n=18		[illegible]	
			N	P		n=42		[illegible]	
GR SA			N	P		n=43		370	
			N	P		n=40		[illegible]	
BR SI SA W/TR ORG			N	P		n=32		[illegible]	
			N	P		n=28		[illegible]	
BR & GR SA W/GRAV			N	P		n=46		374	
GR SA W/STRA SI			N	P		9"=75		[illegible]	
GR SI SA			N	P		5"=50		[illegible]	

DEPTH	ELEVATION
0	64.9
10	54.9
20	44.9
30	34.9
40	24.9
50	14.9
60	4.9
70	-5.1
80	-15.1
90	-25.1
100	-35.1
110	-45.1
120	-55.1
130	-65.1
140	-75.1

DRIVING RESISTANCE (TONS)

BORING NO. 10	STA.: 498+18	
LATITUDE: 32° 11' 58.44"N	LOCATION: 42'RT Adopt. CL	
LONGITUDE: 92° 08' 44.26"W	DATE TAKEN: 10/6/2004	STR. NO.:
CONT. SECT.:	LOG MILE:	SQD. LDR.:

BORING NO. 11

TEST PILE NO.	
STA.: 500+20	
LOCATION: 42' LT Adopt. CL	
TYPE OF PILE:	
TYPE OF HAMMER:	
RATED ENERGY:	FT. LBS.
DATE OF DRIVING:	

SOIL TYPE* AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	WATER TABLE
BR LEAN CL W/ STR BR SI	125	17	38	15	2.38		M.S.	[illegible]	
BR SI W/SA	123	22	N	P	0.620		M.S.	[illegible]	∇
GR BR CL	106	39	78	46	0.710		S/S	310	
GR SI CL	116	27	28	6	0.300		M.S.	311	
GR CL	113	31	66	34	0.870		S/S	312	
	114	38	71	47	0.870		S/S	313	
BR LEAN CL W/ TR SA	121	24	44	22	0.460		M.S.	314	
GR BR CL W/STRA SI	105	38	81	52	0.440		S/S	315	
GR CL W/TR CONC & SA	107	47	78	46	0.280		S/S	316	
GR SI SA	137	24	N	P	0.260		M.S.	317	
GR LEAN CL W/TR IR OX	128	21	37	18	2.24		M.S.	318	
BR LEAN CL	126	25	34	14	1.18		M.S.	319	
GR LEAN CL	124	25	30	9	0.990		YLD	320	
BR SI SA			N	P		n=31		321	
GR SA			N	P		n=58		322	
W/TR ORG			N	P		n=42		323	
W/TR GRAV			N	P		n=75		324	
			N	P		n=50		[illegible]	
			N	P		n=64		326	
W/TR GRAV			N	P		11"=70		327	

DEPTH	ELEVATION
0	64.8
10	54.8
20	44.8
30	34.8
40	24.8
50	14.8
60	4.8
70	-5.2
80	-15.2
90	-25.2
100	-35.2
110	-45.2
120	-56.2
130	-65.2
140	-75.2

DRIVING RESISTANCE (TONS)

BORING NO. 11	STA.: 500+20	
LATITUDE: 32° 11' 59.42"N	LOCATION: 42' LT Adopt. CL	
LONGITUDE: 92° 08' 46.38"W	DATE TAKEN: 9/29/2004	STR. NO.:
CONT. SECT.:	LOG MILE:	SQD. LDR.:

BORING NO. 12

TEST PILE NO.	
STA.: 502+07	
LOCATION: 42' RT Adopt. CL	
TYPE OF PILE:	
TYPE OF HAMMER:	
RATED ENERGY	FT. LBS.
DATE OF DRIVING:	

SOIL TYPE* AND COLOR	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	qu	SPT or UU	FAILURE MODE	SAMPLE NUMBER	WATER TABLE
BR LEAN CL	124	18	32	12	2.21		M.S.	284	
BR GR CL W/TR CONC	112	87	63	35	0.950		S/S	[illegible]	
BR SI	122	23	26	1	0.630		M.S.	[illegible]	∇
BR CL W/STR SI & TR ORG	108	42	73	40	0.680		S/S	[illegible]	
GR BR CL W/TR ORG & IR OX	108	42	73	40	0.680		S/S	[illegible]	
GR BR ELASTIC SI W/TR ORG	98	42	77	40	0.560		S/S	[illegible]	
GR CL W/TR ORG	118	28	57	28	1.03		S/S	[illegible]	
W/TR IR OX & CONC	113	27	58	30	1.14		S/S	[illegible]	
GR SA LEAN CL	121	17	33	14	0.690		M.S.	[illegible]	
GR SI SA	122	23	N	P	0.430		M.S.	[illegible]	
BR GR SA LEAN CL	121	24	34	14	0.460		M.S.	[illegible]	
GR CL W/TR ORG	115	29	63	38	1.48		S/S	[illegible]	
W/TR IR OX	117	32	66	37	1.32		S/S	[illegible]	
BR CL W/CONC& IR OX	121	21	51	26	1.45		S/S	[illegible]	
BR LEAN CL W/SA	127	23	28	11	0.680		M.S.	[illegible]	
BR SI SA			N	P		n=23		299	
NO SAMPLE RETAINED						n=11		300	
GR SA W/SI			N	P		n=46		301	
W/SI			N	P		n=33		302	
BR SI			N	P		n=12		303	
BR SI SA			N	P		n=34		304	
GR SA W/TR GRAV			N	P		n=72		305	
			N	P		n=53		306	
			N	P		9"=77		307	

DEPTH	ELEVATION
0	65.0
10	55.0
20	45.0
30	35.0
40	25.0
50	15.0
60	5.0
70	-5.0
80	-15.0
90	-25.0
100	-35.0
110	-45.0
120	-55.0
130	-65.0
140	-75.0

DRIVING RESISTANCE (TONS)

BORING NO. 12	STA.: 502+07	
LATITUDE: 32° 12' 01.68"N	LOCATION: 42' RT Adopt. CL	
LONGITUDE: 92° 08' 48.11"W	DATE TAKEN: 9/28/2004	STR. NO.:
CONT. SECT.:	LOG MILE:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

MATERIAL:
CL = Clay; CONC = Concretion; GRAV. = Gravel; I O = Iron Ore; LIG = Lignite; N P. = Non-Plastic; ORG = Organic; PT = Peat; RT = Roots; SA = Sand; SH = Shell; SI = Silt; VEG. = Vegetation; WD. = Wood

COLOR:
BR = Brown; BK = Black; BL. = Blue; GR = Gray; GN. = Green; PK = Pink; RD = Red; TN. = Tan; WH = White; YE. = Yellow

TEXTURE:
CO. = Coarse; FI. = Fine; MED. = Medium

STRUCTURE:
ALT = Alternating; LAM. = Laminated; LEN. = Lens; LYR. = Layer; MOT. = Mottled; PKT. = Pocket; STK. = Streak; STR = Strata; TR. = Trace

FAILURE MODE:
M.S. = Multiple Shear; SL. = Slump; S/S = Slickensides; V.S = Vertical Shear; YLD = Yield; 60 S. = Shear Angle

SOIL PROPERTIES

- WET DENSITY = Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T208
- MOISTURE CONTENT = Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
- LIQUID LIMIT & PLASTICITY INDEX = Atterberg limits and indices, DOTD TR 428
- qu = Unconfined compressive strength, AASHTO T 208, (tons per sq. ft.)
- SPT = Standard Penetration Test, AASHTO T 206, number of blows, N = , per foot of penetration, unless amount of penetration is shown otherwise
- UU = Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
- C = Soil cohesion (tons per sq. ft.)
- ϕ = Soil angle of internal friction (degrees)
- Δ = Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
- * = Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
- # = Pocket penetrometer strength, (tons per sq. ft.)

MISCELLANEOUS:

- (circled number) = Location and Identification of thin-walled tube sample, AASHTO T 207
- (boxed number) = Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
- (circled S number) = Location and Identification of SPT sample, AASHTO T 206
- N.C. = No Cull, no preliminary 6 in. driving prior to securing SPT data
- NO PENT. = No Penetration, unable to drive split spoon sampler initial 6 inches of the Standard Penetration Test.
- NO RECV. = No Recovery, unable to recover sample for testing or classification.
- DIST. = Disturbed sample recovered with thin-walled tube sampler.
- ∇ 24 HRS = Water Table depth below ground surface recorded at noted time after completion of bore hole.
- ⊛ = SOIL TYPE nomenclature is based on ASTM D 2487

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL		DESIGNATION	"N" (blows per ft.)	Approximate "qu" (tons per sq. ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4	
		LOOSE	4 - 10	
		MEDIUM	10 - 30	
		DENSE	30 - 50	
		VERY DENSE	OVER 50	
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2	LESS THAN 0.25
		SOFT	2 - 4	0.25 - 0.50
		MEDIUM	4 - 8	0.50 - 1.00
		STIFF	8 - 15	1.00 - 2.00
		VERY STIFF	15 - 30	2.00 - 4.00
		HARD	OVER 30	OVER 4.00

STATE OF LOUISIANA — REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

11/18/04

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES. NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME.

SHEET NUMBER	338
PARISH	CALDWELL
FEDERAL PROJECT	
STATE PROJECT	015-07-044
DESIGNED / CHECKED / DETAILED / CHECKED / DATE / SHEET	
NO / DATE / REVISION DESCRIPTION / BY	

LA 847-Ouachita Parish Line

US 165

DOTD

MATERIALS AND TESTING SECTION