

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 061448

FEDERAL AID PROJECT NO. STATE JOB

PULASKI CO. AREA 1 HEADQUARTERS/R.E. OFFICE 61 (S)

STATE HIGHWAY 70 SECTION 13

IN PULASKI COUNTY

The information contained herein was obtained by the Department for design and estimating purposes only. It is being furnished with the express understanding that said information does not constitute a part of the Proposal or Contract and represents only the best knowledge of the Department as to the location, character and depth of the materials encountered. The information is only included and made available so that bidders may have access to subsurface information obtained by the Department and is not intended to be a substitute for personal investigation, interpretation and judgment of the bidder. The bidder should be cognizant of the possibility that conditions affecting the cost and/or quantities of work to be performed may differ from those indicated herein.

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

November 9, 2015

TO: Mr. Joe Sartini, State Maintenance Engineer

SUBJECT: Job No. 061448
Pulaski County Area Headquarters #1 and R.E. Office 61 (North Little Rock)
Route 70, Section 13, L.M. 6.98
Pulaski County

Transmitted herewith are summaries of the site geology and subsurface conditions, design recommendations, percent material passing #200 sieve, undisturbed Shelby tube test results (including unconsolidated-undrained triaxial shear, Atterberg Limits, gradation, and moisture content), and the logs of the borings conducted for the structures of the above referenced project.

If you have any questions concerning these recommendations, please contact the Geotechnical Section.


Michael C. Benson
Materials Engineer

MCB:rpt:mlg
Attachment

cc: Facilities Management
District 6 Engineer
G.C. File

GEOTECHNICAL REPORT FOR JOB NO. 061448
Pulaski County Area Headquarters and R.E. Office 61

INTRODUCTION

The Arkansas State Highway and Transportation Department (AHTD) is planning to construct a new Pulaski County Area Headquarters and Resident Engineer Office. The Area Headquarters and Resident Engineer Office are to be located on the south side of Highway 70, approximately 0.35 miles east of the intersection of Interstate 440 and Highway 70.

The primary purpose of this study is to obtain subsurface data at the site and to provide geotechnical recommendations for earthwork, foundations, and pavement design. The structures planned for this site are one-story buildings. The sample locations and current site layout of the structures and parking areas are included in Appendix A. This location has been investigated and the findings and subsequent recommendations are presented in this report.

FIELD INVESTIGATION AND LABORATORY PROCEDURES

Nine borings were completed at the locations requested and the latitude and longitudinal position of each boring is included. Borings 1 and 2 were completed at the proposed location of the Sealing Building, borings 3 and 4 were completed at the proposed location of the Area Headquarters, borings 5 and 6 were completed at the proposed location of the Resident Engineer Office, and borings 7, 8, and 9 were completed at the proposed location of the future Regional Salt Storage building. Approximately 209 total feet of borings were drilled, 71 Standard Penetration Tests, and 13 Shelby Tube samples were performed. Preliminary descriptions of the materials encountered were recorded in the field and all recovered samples were brought to the laboratory and visually classified by experienced lab personnel to verify field identifications.

Atterberg limits, natural moisture content, and UU Triaxial tests were performed on representative soil samples to verify field classification and measure the shear strength of the subsurface soils. All laboratory testing was performed in accordance with AASHTO standards.

SITE AND SUBSURFACE CONDITIONS

General Site Conditions

The proposed Pulaski County Area Headquarters and Resident Engineer Office 61 are to be located in an open agricultural field on the south side of Highway 70, approximately 0.35 miles east of the intersection of Interstate 440 and Highway 70. The proposed job site is at an approximate elevation of 251 feet above mean sea level. A buried telecommunication line parallels the south side of Highway 70 and overhead lines parallel both the north and south side of Highway 70. A gas pipeline easement is located to the southwest of the project site. No outcrops were observed along the project's alignment during the field investigation.

Site Geology

The proposed job site is located over the Quaternary alluvial deposits of Arkansas River meander belts. Quaternary alluvial deposits consist of clays, sands, silts, and mixtures of any and all of these sediments. At the jobsite, sediments encountered were primarily mixtures of silt and sand and silty clays. The thickness of these deposits is variable and unconformable with underlying geology.

Seismic Considerations

This project is located in the southwestern edge of the New Madrid Seismic Zone (NMSZ), which is the source for most of the seismic activity in the area. The 2012 International Building Code and the AASHTO Bridge Design Guide gives a horizontal ground acceleration coefficient of approximately 0.294 for this location. According to the AASHTO Bridge Design Guide, this site is best characterized as Site Class E.

Description of Subsurface Stratigraphy

The materials comprising the foundation strata for the proposed structure and pavement areas, as determined by the geotechnical exploration, are shown on the Boring Logs in Appendix B. In general, the subsurface stratigraphy is composed of: dry to wet, very loose to medium dense, brown silt to sand with silt to moist, soft to stiff, brown silty clay to clay. Water encountered during drilling operations varied from 10-15 feet below ground level and water level readings taken 24 hours after drilling operations ceased were 10.3 feet below ground level.

Laboratory Test Results

Atterberg limit laboratory tests performed on representative samples of clay resulted in plastic limits ranging from 15 to 23, liquid limits from 22 to 41, and plasticity indices (PI's) ranging from 1 to 26. Unconsolidated Un-drained (UU) Triaxial tests performed on representative "undisturbed" Shelby tube samples resulted in estimated shear strengths of 994 to 2,503 psf. A summary of lab test results is included in Appendix C.

RECOMMENDATIONS

Foundations

A conventional spread footing foundation should be constructed on an above-natural-grade granular fill building pad. It is recommended that the buildings' foundations consist of a minimum of 2 feet of granular fill, placed and compacted according to the requirements of Section 210 of the AHTD Standard Specifications for Highway Construction, 2014 edition. The building pad may then be sloped back to natural grade in the manner best suited to accommodate the final site grading plan, but limited to no steeper than a 2H:1V slope. The granular fill building pad should be utilized for every building foundation. In addition to the granular building pad, it is recommended that the soil under the Regional Salt Storage building be undercut and backfilled with granular fill material. Undercut should be a minimum of 3 feet in depth and extend 5 feet beyond the building perimeter on all sides. Granular fill should meet the material properties of Select Material (SM-1) in Section 302 of the AHTD Standard Specifications for Highway Construction, 2014 edition.

The granular fill is expected to provide a sufficient bridging effect to limit differential movements to tolerable limits. A footing with a minimum width of 2 feet founded a minimum of 2 feet below the surface of the granular fill building pad may be designed based on an allowable bearing capacity of 3.5 ksf.

Pavement Design

Existing material is expected to provide a stable working platform with conventional drying and processing techniques. A resilient modulus of 8300 and an R-Value of 8 should be used for the roadway and parking lot design.

CONSTRUCTION RECOMMENDATIONS

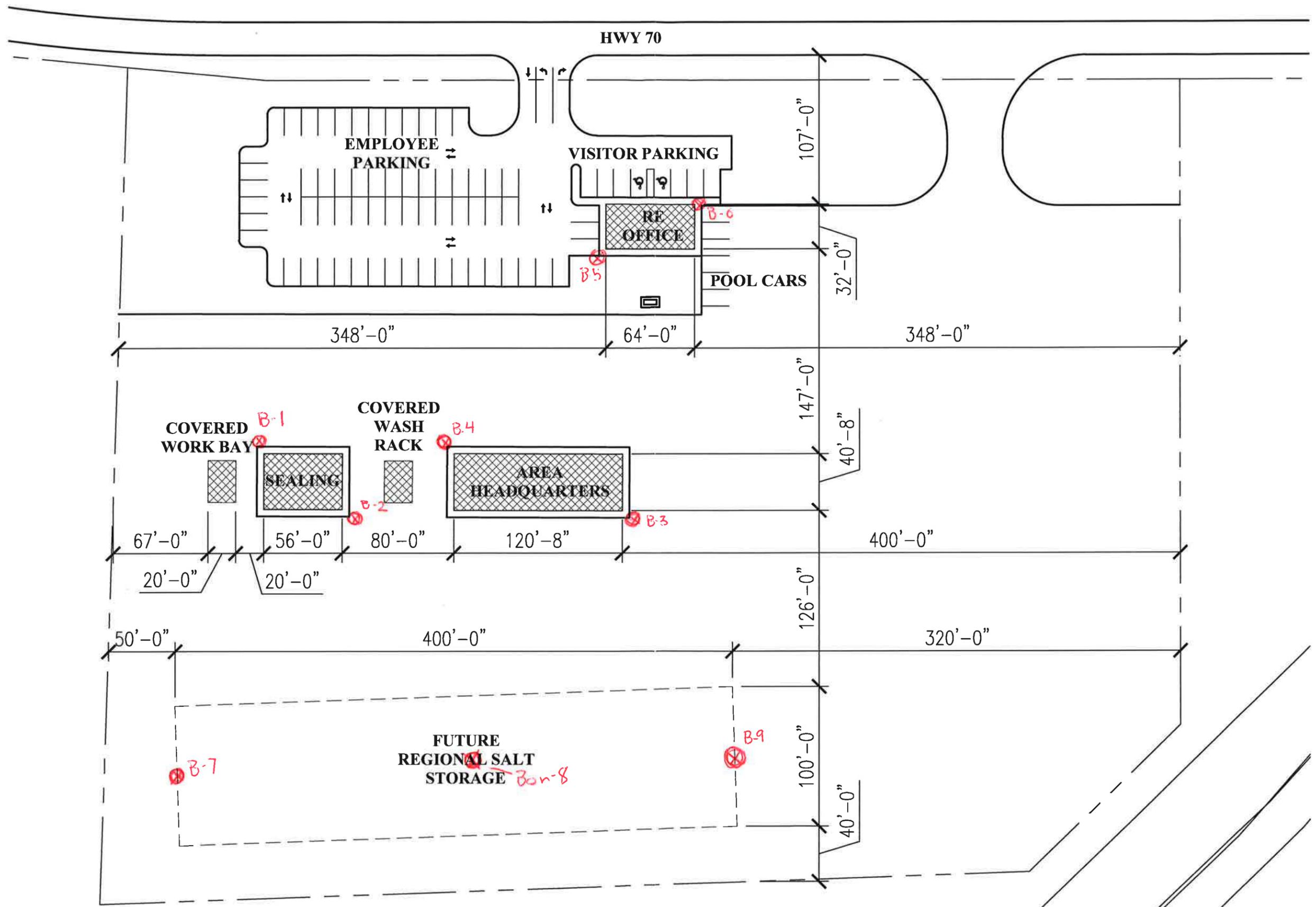
The foundation bearing area should be level and free of loose soil, ponded water, and debris prior to placement of concrete. Should the materials at bearing level become excessively dry or saturated, it is recommend that the affected materials be removed prior to placing concrete. Concrete should be placed as soon as possible after excavating the footing so that excessive drying of bearing materials does not occur.

Before filling operations begin, representative samples of each proposed fill material should be collected. The samples should be tested to determine the maximum dry density, optimum moisture content, natural moisture content, gradation, and plasticity of the soil. These tests are needed for quality control during compaction.

The fill surface must be adequately maintained during construction in order to achieve an acceptable compacted fill. It is recommended that the fill surface be sloped to achieve sufficient drainage and to prevent water from ponding on the fill. If the surface soils become excessively wet or frozen, fill operations should be halted and the Resident Engineer should be consulted for guidance. A draft special provision entitled Embankment Construction, specifying material properties and testing requirements for granular fill material, is included in Appendix D.

APPENDIX A

Site Layout



**PROPOSED SITE LAYOUT
HWY 70 PROPERTY**



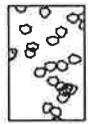
APPENDIX B

Boring Logs

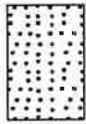
LEGEND

SOIL TYPES

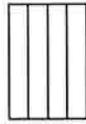
(SHOWN IN SYMBOL COLUMN)
(PREDOMINANT TYPE SHOWN HEAVY)



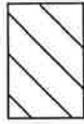
GRAVEL



SAND



SILT



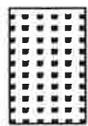
CLAY



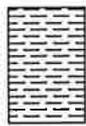
ORGANIC
MATTER

ROCK TYPES

(SHOWN IN SYMBOL COLUMN)



SANDSTONE



SHALE
or
SILTSTONE



LIMESTONE
or
DOLOMITE



ALTERNATING
LAYERS of
SHALE and
SANDSTONE



OTHER

SAMPLER TYPES

(SHOWN IN SAMPLE COLUMN)

SHELBY TUBE



UNDISTURBED
SAMPLE
RECOVERY



DISTURBED
SAMPLE
RECOVERY



NO
RECOVERY

SPLIT SPOON

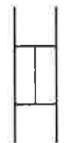


SAMPLE
RECOVERY



NO
RECOVERY

ROCK CORING



% RECOVERY
INDICATED ON LOGS

TERMS DESCRIBING CONSISTENCY OR CONDITION

GRANULAR SOIL		CLAY		CLAY-SHALE		SHALE	
*N' Value	Density	*N' Value	Consistency	*N' Value	Consistency	*N' Value	Consistency
0-4	Very Loose	0-1	Very Soft	0-1	Very Soft		
5-10	Loose	2-4	Soft	2-4	Soft	31-60	Soft
11-30	Medium Dense	5-8	Medium Stiff	5-8	Medium Stiff	Over 60	
31-50	Dense	9-15	Stiff	9-15	Stiff	More than 2'	
Over 50	Very Dense	16-30	Very Stiff	16-30	Very Stiff	Penetration	
		31-60	Hard	31-60	Hard	in 60 Blows	Medium Hard
		Over 60	Very Hard	Over 60	Very Hard	Less than 2'	
						Penetration	
						in 60 Blows	Hard

1. Ground water elevations indicated on boring logs represent ground water elevations at date or time shown on boring log. Absence of water surface implies that no ground water data is available but does not necessarily mean that ground water will not be encountered at locations or within the vertical reaches of these borings.
2. Borings represent subsurface conditions at their respective locations for their respective depths. Variations in conditions between or adjacent to boring locations may be encountered.
3. Terms used for describing soils according to their texture or grain size distribution are in accordance with the Unified Soil Classification System.

Standard Penetration Test – Driving a 2.0” O.D., 1-3/8” I.D. sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and performing the test are recorded for each 6 inches of penetration on the drill log. The field “N” Value (N_f) can be obtained by

adding the bottom two numbers for example: $\frac{6}{8-9} \Rightarrow 8 + 9 = 17 \text{blows/ft}$. The “N” Value corrected to 60% efficiency (N_{60}) can be obtained by multiplying N_f by the hammer correction factor published on the boring log.

ARKANSAS HWY. & TRANS. DEPARTMENT MATERIALS DIVISION - GEOTECHNICAL SEC.				BORING NO. 1 PAGE 1 OF 1							
JOB NO. 061448 Pulaski JOB NAME: Pulaski County Maintenance Yard and RE Office 61		DATE: August 24, 2015 TYPE OF DRILLING: Hollow Stem Auger EQUIPMENT: CME 45B HAMMER CORRECTION FACTOR: NA									
STATION: LOCATION: 34.771533, -92.156606 LOGGED BY: Stanley Bates											
COMPLETION DEPTH: 20											
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 251.6								
			Dry, Stiff, Brown, Clay	-					8 8-5		
			Moist, Medium Dense, Brown Silt	ML	21	14	22	102.5			
5				-					1 5-5		
			Moist, Stiff, Brown Clay	CL	17	22	34	102.0			
				-					2 4-5		
10			Moist, Stiff, Brown Silty Clay	CL-ML	19	25	26	98.9			
									2 1-1		
15			Wet, Very Loose to Loose, Brown Sand with Silt	-					2 3-2		
20									1 3-7		
			Boring Terminated								
25											
30											
35											
REMARKS: Water was encountered at 10.0' below ground level.											

**ARKANSAS HWY. & TRANS. DEPARTMENT
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 2
PAGE 1 OF 1

JOB NO. 061448 Pulaski
JOB NAME: Pulaski County Maintenance Yard and RE Office 61

DATE: August 25, 2015
TYPE OF DRILLING: Hollow Stem Auger

STATION:
LOCATION: 34.771466, -92.156367
LOGGED BY: Stanley Bates

EQUIPMENT: CME 45B
HAMMER CORRECTION FACTOR: NA

COMPLETION DEPTH: 26.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R O D
			SURFACE ELEVATION: 251.3									
			Dry, Stiff, Brown Clay							5 6-6		
5			Moist, Loose, Brown Silty Sand	-						4 5-5		
			Moist, Loose, Brown Silt	ML	23	41	26	78.0				
10			Moist, Medium Stiff, Brown Clay	- CL	15	28	41	95.4		1 3-3		
			Wet, Medium Stiff, Brown Sandy Clay							1 2-3		
15			Wet, Very Loose, Brown Sandy Silt							1 1-2		
20			Wet, Very Loose, Brown Silty Sand							1 1-1		
25			Wet, Loose, Brown Sand with Silt							1 2-7		
30			Boring Terminated									
35												

REMARKS: Water was encountered at a 9.7' below ground level. 24-hr water level reading was 10.3 feet below ground level.

ARKANSAS HWY. & TRANS. DEPARTMENT MATERIALS DIVISION - GEOTECHNICAL SEC.	BORING NO. 3 PAGE 1 OF 1
JOB NO. 061448 Pulaski JOB NAME: Pulaski County Maintenance Yard and RE Office 61	DATE: August 25, 2015 TYPE OF DRILLING: Hollow Stem Auger
STATION: LOCATION: 34.771664, -92.155748 LOGGED BY: Stanley Bates	EQUIPMENT: CME 45B HAMMER CORRECTION FACTOR: NA

COMPLETION DEPTH: 21.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 251.1								
			Dry, Stiff, Brown Clay	-					5 5-6		
5			Moist, Stiff, Brown Clay	CL	16	20	32	107.0			
			Moist, Stiff, Brown Silty Clay	-					2 4-6		
			Moist, Stiff, Brown Silty Clay	CL-ML	20		24				
10			Moist, Soft, Brown Silty Clay						2 1-2		
			Moist, Very Loose, Brown Silty Sand								
15			Wet, Loose, Brown Sandy Clay	-					1 2-3		
20			Wet, Medium Stiff, Brown Silty Sand						1 3-4		
25			Boring Terminated								
30											
35											

REMARKS:

ARKANSAS HWY. & TRANS. DEPARTMENT MATERIALS DIVISION - GEOTECHNICAL SEC.	BORING NO. 4 PAGE 1 OF 1
JOB NO. 061448 Pulaski JOB NAME: Pulaski County Maintenance Yard and RE Office 61	DATE: August 26, 2015 TYPE OF DRILLING: Hollow Stem Auger
STATION: LOCATION: 34.771692, -92.156184 LOGGED BY: Stanley Bates	EQUIPMENT: CME 45B HAMMER CORRECTION FACTOR: NA

COMPLETION DEPTH: 26.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 251.4									
	X		Dry, Stiff, Brown Clay with Some Organic Matter							5 6-8		
5	X		Moist, Loose, Brown Sand with Silt and Some Organic Matter	-						3 3-6		
	X		Moist, Medium Stiff, Brown Silty Clay	CL-ML	19	25	24	92.4				
10	X		Moist, Medium Stiff, Brown Clay	-	17		31			1 3-4		
	X		Moist, Very Loose, Brown Sandy Silt							1 1-2		
15	X		Wet, Soft, Brown Clay	-						1 1-1		
20	X		Wet, Very Loose, Brown Silty Sand							1 1-1		
25	X		Wet, Loose, Brown Sand with Silt							2 3-5		
30			Boring Terminated									
35												

REMARKS: Water was encountered at 15.0' below ground level.

**ARKANSAS HWY. & TRANS. DEPARTMENT
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 5
PAGE 1 OF 1

JOB NO. 061448 Pulaski
JOB NAME: Pulaski County Maintenance Yard and RE Office 61
STATION:
LOCATION: 34.772152, -92.156053
LOGGED BY: Stanley Bates

DATE: August 26, 2015
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: CME 45B
HAMMER CORRECTION FACTOR: NA

COMPLETION DEPTH: 24

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% F C R	% R Q D
			SURFACE ELEVATION: 251.2									
			Dry, Stiff, Brown Clay with Organic Matter	-						4 8-7		
5			Moist, Stiff, Brown Clay	CL	20		28			2 4-5		
			Moist, Stiff, Brown Silty Clay							3 4-5		
10			Moist, Loose, Brown Sandy Silt							3 4-4		
			Moist, Soft, Brown Clay	-						1 1-2		
15			Moist, Medium Stiff, Brown Sandy Clay							1 3-5		
			Wet, Very Loose to Loose, Brown Sand with Silt							1 1-1		
20										1 2-3		
										1 2-1		
25			Boring Terminated									
30												
35												

REMARKS:

**ARKANSAS HWY. & TRANS. DEPARTMENT
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 6
PAGE 1 OF 1

JOB NO. 061448 Pulaski
JOB NAME: Pulaski County Maintenance Yard and RE Office 61

DATE: August 27, 2015
TYPE OF DRILLING: Hollow Stem Auger

STATION:
LOCATION: 34.772309, -92.155923
LOGGED BY: Paul Christenberry

EQUIPMENT: CME 45B
HAMMER CORRECTION FACTOR:

COMPLETION DEPTH: 24

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R O D
			SURFACE ELEVATION: 251.3									
			Dry, Stiff, Brown Clay with Organic Matter							7 7-6		
			Dry, Stiff, Brown Silty Clay							4 5-5		
5			Moist, Stiff, Brown Clay							2 4-5		
			Wet, Loose, Brown Silty Sand							4 3-4		
10			Wet, Very Loose, Brown Sandy Silt							2 2-2		
			Wet, Soft, Brown Clay							1 1-1		
15			Wet, Soft, Brown Sandy Clay							1 1-2		
20			Wet, Very Loose to Loose, Brown Sand with Silt							1 1-2		
			Boring Terminated							0 2-3		
25												
30												
35												

REMARKS:

ARKANSAS HWY. & TRANS. DEPARTMENT MATERIALS DIVISION - GEOTECHNICAL SEC.	BORING NO. 7 PAGE 1 OF 1
JOB NO. 061448 Pulaski JOB NAME: Pulaski County Maintenance Yard and RE Office 61	DATE: August 31, 2015 TYPE OF DRILLING: Hollow Stem Auger
STATION: LOCATION: 34.770840, -92.156386 LOGGED BY: Stanley Bates	EQUIPMENT: CME 45B HAMMER CORRECTION FACTOR: NA

COMPLETION DEPTH: 21.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D	
			SURFACE ELEVATION: 251.7										
		X	Dry, Stiff, Brown Clay with Organic Matter							3 7-5			
		X	Moist, Stiff, Brown Sandy Clay with Some Organic Matter							2 4-5			
5		X	Moist, Stiff, Brown Clay with Some Organic Matter							3 5-5			
		X	Moist, Stiff, Brown Clay							1 4-5			
10		X	Wet, Loose, Brown Sandy Silt							1 2-3			
		X	Wet, Very Loose to Loose, Brown Sand with Silt							1 2-1			
15		X									1 1-1		
		X									1 1-1		
20		X								1 2-3			
			Boring Terminated										
25													
30													
35													

REMARKS: Water was encountered at 13.2' below ground level.

**ARKANSAS HWY. & TRANS. DEPARTMENT
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 8
PAGE 1 OF 1

JOB NO. 061448 Pulaski
JOB NAME: Pulaski County Maintenance Yard and RE Office 61

DATE: August 31, 2015
TYPE OF DRILLING: Hollow Stem Auger

STATION:
LOCATION: 34.771132, -92.155803
LOGGED BY: Stanley Bates

EQUIPMENT: CME 45B
HAMMER CORRECTION FACTOR: NA

COMPLETION DEPTH: 22.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 251.1									
			Dry, Stiff, Brown Clay with Organic Matter							6 6-6		
5			Moist, Stiff, Brown Clay with Some Organic Matter							3 5-7		
			Moist, Loose, Brown Sandy Silt							3 5-5		
10			Moist, Loose, Brown Clayey Silty Sand							2 3-4		
			Wet, Very Loose, Brown Sand with Silt							1 2-3		
15										0 1-2		
										0 0-1		
20										1 1-1		
										1 1-1		
25			Boring Terminated									
30												
35												

REMARKS: Water was encountered at 14.0' below ground level.

**ARKANSAS HWY. & TRANS. DEPARTMENT
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 9
PAGE 1 OF 1

JOB NO. 061448 Pulaski
JOB NAME: Pulaski County Maintenance Yard and RE Office 61

DATE: September 11, 2015
TYPE OF DRILLING: Hollow Stem Auger

STATION:
LOCATION: 34.771390, -92.155247
LOGGED BY: Stanley Bates

EQUIPMENT: CME 45B
HAMMER CORRECTION FACTOR: NA

COMPLETION DEPTH: 22.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 250.6									
		X	Dry, Stiff, Brown Clay with Organic Matter							6 6-7		
		X	Dry, Stiff, Brown Clay with Trace Organic Matter							4 7-7		
5		X	Moist, Medium Dense, Brown Sandy Silt							4 6-5		
		X	Moist, Loose, Brown Silty Sand							4 4-4		
10		X								2 3-3		
		X								2 1-1		
15		X								0 1-1		
		X	Wet, Very Loose, Brown Sand with Silt							0 1-1		
20		X								0 1-1		
			Boring Terminated									
25												
30												
35												

REMARKS: Water was encountered at 11.2' below ground level.

APPENDIX C

Test Results

Shelby Tube Sample Test Summary

Project: 061448 - Pulaski County Area Headquarters and R.E. Office 61

Location	Depth (ft)	Plastic Limit	Liquid Limit	Plasticity Index	% Passing No. 200	Moist Unit Wt. (pcf)	Moisture Content (%)	Dry Unit Wt. (pcf)	Estimated Cohesion (psf)	Description
Boring 1	1.5	21	22	1	88	116.4	13.5	102.5	2,503	Silt (A-4(1))
Boring 1	5.0	17	34	17	98	124.1	21.7	102.0	2,417	Lean Clay (A-6(17))
Boring 1	8.5	19	26	7	96	123.3	24.7	98.9	1,014	Silty Clay (A-4(6))
Boring 2	5.0	23	26	3	99	109.6	40.6	78.0	1,123	Silt (A-4(2))
Boring 2	8.5	15	41	26	99	121.6	27.5	95.4	1,674	Lean Clay (A-7-6(27))
Boring 3	3.5	16	32	16	96	128.0	19.7	107.0	2,408	Lean Clay (A-6(15))
Boring 3	7.0	20	24	4	78	NT	NT	NT	NT	Silty Clay (A-4(1))
Boring 4	5.0	19	24	5	92	116.0	25.5	92.4	994	Silty Clay (A-4(3))
Boring 4	8.5	17	31	14	78	NT	NT	NT	NT	Lean Clay (A-6(9))
Boring 5	1.5	20	28	8	97	NT	NT	NT	NT	Lean Clay (A-4(7))

APPENDIX D

Special Provision

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

SPECIAL PROVISION

JOB NO. 061448

EMBANKMENT CONSTRUCTION

Description. This Special Provision shall be supplementary to Section 210, Excavation and Embankment, of the Standard Specifications, Edition of 2014.

Materials and Construction Requirements. Prior to construction of embankments, the natural ground surface upon which the embankment is to be constructed shall be prepared in accordance with Subsection 210.09 regardless of embankment height. The natural ground surface shall be compacted in accordance with Subsection 210.10, regardless of embankment height. These requirements may be modified by the engineer as conditions justify.

The material furnished for construction of all embankments shown in the plans as Granular Fill shall have a plasticity index less than 3 and a maximum of 25% passing the No. 200 sieve.

Quality Control and Acceptance Testing. Quality control and acceptance sampling and testing shall be performed in accordance with Subsection 210 of the Standard Specifications. The Contractor shall perform acceptance sampling and testing for gradation and plasticity index in addition to, and at the same frequency as density and moisture content. Test for gradation, liquid limit, and plasticity index shall be performed by AASHTO T 11, T 27, T 89, and T 90. If the result of any test shows that the material does not meet the requirements specified herein, unsuitable material shall be removed and replaced at no cost to the Department.

In addition to the required test, the Engineer may require the Contractor to test any location that, by visual inspection appears different from previously approved material. If the material source is consistent, the Engineer may modify the standard lot size for gradation and plasticity index to one test for each soil type encountered.

Method of Measurement: All embankments constructed as described above will be measured as Compacted Embankment in accordance with Section 210 of the Standard Specifications.

Basis of Payment: All embankments constructed as described above shall be paid in accordance with Section 210.13 of the Standard Specifications.

Payment will be made under:

Pay Item

Pay Unit

Compacted Embankment

Cubic Yard