

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 061335

FEDERAL AID PROJECT NO. STPC-9061(6)

ALCOA RD. – HWY. 183 (S)

STATE HIGHWAY 5 SECTION 8

IN SALINE 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

February 20, 2015

TO: Mr. Rick Ellis, Bridge Engineer

SUBJECT: Job No. 061335
Alcoa Rd. - Hwy. 183 (S)
Route 5 Section 8
Saline County

Transmitted herewith are a brief summary of the geology and site conditions, D50 analysis test results, and the logs of the borings conducted for the structure and approaches of the above referenced project. The samples obtained by the Standard Penetration Tests were brought to the laboratory and visually classified by experienced lab personnel to confirm the field identifications. The rock cores are available for inspection at the Materials Division.

It is anticipated that all end bents will be founded on piling. However, preboring may be necessary in order to achieve minimum penetration requirements. Based on the depth at which bedrock was encountered, all intermediate bents should be founded on spread footings and should be sized based on the value provided in Table 1.

The rock cores for this job are composed primarily of shale, and tend to be brittle in the unconfined condition. Therefore, testing of unconfined compressive strength is not practical. After inspection, this shale has been deemed a sound Medium Hard rock and spread footing Bearing Resistance values have been determined from Table C10.6.2.6.1-1 of the AASHTO LRFD Bridge Design Specifications, edition 2012. This Factored Bearing Resistance is equivalent to the Bearing Resistance at the Service Limit State.

TABLE 1 – Bearing Capacity Recommendation for Interior bents

Foundation Description	Factored Bearing Resistance (ksf)
Spread Footings	20

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



Michael C. Benson
Materials Engineer

MCB:rpt:mlg
cc: State Construction Engineer - Master File Copy
District 6 Engineer
G.C. File

GEOLOGY AND SITE CONDITIONS

Job No. 061335

Alcoa Rd. – Hwy. 183 (S)

Saline County

Route 5 Section 8

Site Conditions

The existing structure crosses over Hurricane Creek on Hwy 5. The existing structure is a four span overpass constructed of concrete deck, endwalls, and spread footings. The deck is supported by 5 sets of steel beams. The guardrail is constructed of steel supported by steel posts. A buried telecommunication line, gas line, and water line parallel the north side of the roadway.

The areas north and southwest of the bridge are moderately to heavily wooded. The area southeast of the bridge has trees adjacent to the channel and the roadway with an open field beyond. Smaller channels flow into Hurricane Creek southwest and northeast of the bridge.

Site Geology

The project alignment is located over the Womble Formation. The Womble is mostly black shale with thin layers of limestone, silty sandstone, and some chert. Some green shales are interbedded with the black shales. Cleavage, at an angle to bedding, frequently displays ribboned cleavage surfaces. The sandstones are dark-gray, compact, fine-grained, occasionally conglomeratic, and may be phosphatic. These sandstones are generally present in the lower part of the formation. Dense, blue-gray limestones usually occur near the top of the formation in thin to medium beds. Black chert is also present in thin layers at the top of the formation. Large milky quartz veins often fill fractures in the formation. The formation rests conformably on the underlying Blakely Sandstone and ranges from 500 to 1200 feet in thickness. Shale was encountered in borings at the job site under alluvial deposits and embankment material at depths ranging from 0 to 12.5 feet below ground level.

Previous drilling at the job site, on the opposite side of the bridge, encountered igneous dikes. The igneous dikes were up to 2 feet thick. No igneous rock was encountered during the drilling for the current job. Igneous dikes can vary widely in thickness, and with more excavation, dikes may be encountered.

Subsurface Conditions

Based on the results of the borings, the subsurface stratigraphy may be generalized as follows:

- 0 to 12.5 Feet: Varies from moist to wet, soft, brown **sandy clay with gravel (sandstone fragments)** to medium dense, brown **clayey sand with quartz gravel** to dark gray **shale with weathered shale and sandstone with occasional quartz layers.**
- 12.5 to 39 Feet: Consists of dark gray **shale with weathered shale and sandstone with occasional quartz layers.**

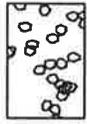
**D₅₀ AGGREGATE ANALYSIS
FOR SCOUR CALCULATIONS**

Job No. 061335					
Creek Name	Station	Sample Type	Location	Depth (FT)	Aggregate Size (D50) (IN)
Hurricane Creek	117+26	Creek Bank	28' Rt. C.L. Construction	N/A	0.132

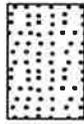
LEGEND

SOIL TYPES

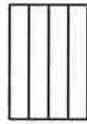
(SHOWN IN SYMBOL COLUMN)
(PREDOMINANT TYPE SHOWN HEAVY)



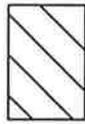
GRAVEL



SAND



SILT



CLAY



ORGANIC
MATTER

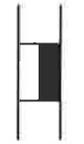
SAMPLER TYPES

(SHOWN IN SAMPLE COLUMN)

SHELBY TUBE



UNDISTURBED
SAMPLE
RECOVERY



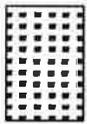
DISTURBED
SAMPLE
RECOVERY



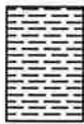
NO
RECOVERY

ROCK TYPES

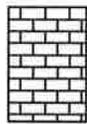
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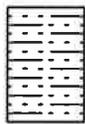
SANDSTONE



SHALE
or
SILTSTONE



LIMESTONE
or
DOLOMITE



ALTERNATING
LAYERS of
SHALE and
SANDSTONE



OTHER

SPLIT SPOON

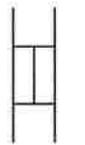


SAMPLE
RECOVERY



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 2

JOB NO. 061335 Saline County
JOB NAME: Springhill Rd. - Hwy. 183 (Bryant)
S.H. 5
STATION: 115+38
LOCATION: 25' Right of Center Line of Construction
LOGGED BY: David Allen

DATE: December 30-31, 2014
TYPE OF DRILLING: Hollow Stem Auger &
Diamond Coring
EQUIPMENT: CME 850 w/ CME
Automatic Hammer
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 39

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.	% S C R	% R Q D
			SURFACE ELEVATION: 374.1									
5			Moist, Soft, Brown Sandy Clay with Gravel (Sandstone Fragments)							2 1-2		
10			Moist to Wet, Medium Dense, Brown Clayey Sand with Quartz Gravel							10 13-16		
15			SHALE - Dark Gray, Medium Hard							60 (3")	98	0
20											46	0
25			SHALE WITH WEATHERED SHALE AND GRAY SANDSTONE SEAMS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, Slickensides and some Pyrite								94	0
30											60	0
35												

REMARKS: * A water stratum was encountered at 10.1'.

ARKANSAS HWY. & TRANS. DEPARTMENT		BORING NO. 1
MATERIALS DIVISION - GEOTECHNICAL SEC.		PAGE 2 OF 2
JOB NO. 061335	Saline County	DATE: December 30-31, 2014
JOB NAME: Springhill Rd. - Hwy. 183 (Bryant)	S.H. 5	TYPE OF DRILLING: Hollow Stem Auger & Diamond Coring
STATION: 115+38		EQUIPMENT: CME 850 w/ CME Automatic Hammer
LOCATION: 25' Right of Center Line of Construction		HAMMER CORRECTION FACTOR: 1.23
LOGGED BY: David Allen		

COMPLETION DEPTH: 39

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.	% S C R	% R Q D
			SURFACE ELEVATION: 374.1									
											100	0
40			Boring Terminated									
45												
50												
55												
60												
65												
70												

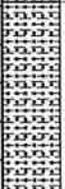
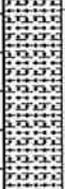
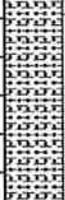
REMARKS: * A water stratum was encountered at 10.1'.

ARKANSAS HWY. & TRANS. DEPARTMENT MATERIALS DIVISION - GEOTECHNICAL SEC.		BORING NO. 2 PAGE 1 OF 1
JOB NO. 061335 Saline County	JOB NAME: Springhill Rd. - Hwy. 183 (Bryant) S.H. 5	DATE: January 5, 2015
STATION: 115+98	LOCATION: 7' Right of Center Line of Construction	TYPE OF DRILLING: Hollow Stem Auger & Diamond Coring
LOGGED BY: David Allen		EQUIPMENT: CME 850 w/ CME Automatic Hammer
		HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 33.2

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.	% S C R	% R Q D
			SURFACE ELEVATION: 365.0									
5			SHALE - Dark Gray, Medium Hard							50		
			SHALE WITH WEATHERED SHALE AND GRAY SANDSTONE SEAMS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, Slickensides and some Quartz and Fractured Layers							60 (3")	98	0
10			SHALE WITH WEATHERED SHALE SEAMS AND OCCASIONAL WHITE QUARTZ LAYERS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, and Slickensides								72	0
15			SHALE WITH WEATHERED SHALE SEAMS AND OCCASIONAL WHITE QUARTZ LAYERS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, and Slickensides								36	0
20			SHALE WITH WEATHERED SHALE SEAMS AND OCCASIONAL WHITE QUARTZ LAYERS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, Slickensides and Trace of Pyrite								98	0
25			SHALE WITH WEATHERED SHALE SEAMS AND OCCASIONAL WHITE QUARTZ LAYERS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, and Slickensides								98	0
30			SHALE WITH WEATHERED SHALE SEAMS AND OCCASIONAL WHITE QUARTZ LAYERS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, and Slickensides								92	0
35			Boring Terminated									

REMARKS:

ARKANSAS HWY. & TRANS. DEPARTMENT MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. 3 PAGE 1 OF 1							
JOB NO. 061335 Saline County			DATE: January 5, 2015									
JOB NAME: Springhill Rd. - Hwy. 183 (Bryant) S.H. 5			TYPE OF DRILLING: Hollow Stem Auger & Diamond Coring									
STATION: 116+71			EQUIPMENT: CME 850 w/ CME Automatic Hammer									
LOCATION: 6' Right of Center Line of Construction			HAMMER CORRECTION FACTOR: 1.23									
LOGGED BY: David Allen												
COMPLETION DEPTH: 28.9												
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.	% S C R	% R Q D
			SURFACE ELEVATION: 365.7									
			Moist, Soft, Brown Sandy Clay with Gravel (Sandstone Fragments)									
5			SHALE - Dark Gray, Medium Hard							60 (2")		
			SHALE WITH WEATHERED SHALE AND GRAY SANDSTONE SEAMS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, and Slickensides								98	0
10			SHALE WITH WEATHERED SHALE AND SANDSTONE SEAMS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, and Slickensides								100	0
15			SHALE WITH WEATHERED SHALE AND GRAY SANDSTONE SEAMS AND OCCASIONAL WHITE QUARTZ LAYERS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, and Slickensides								96	0
20			SHALE WITH WEATHERED SHALE AND GRAY SANDSTONE SEAMS AND OCCASIONAL WHITE QUARTZ LAYERS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, and Slickensides								98	20
25			SHALE WITH WEATHERED SHALE AND GRAY SANDSTONE SEAMS AND OCCASIONAL WHITE QUARTZ LAYERS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, and Slickensides								94	28
30			Boring Terminated									
35												
REMARKS:												

ARKANSAS HWY. & TRANS. DEPARTMENT MATERIALS DIVISION - GEOTECHNICAL SEC.		BORING NO. 4 PAGE 1 OF 1
JOB NO. 061335 Saline County	JOB NAME: Springhill Rd. - Hwy. 183 (Bryant) S.H. 5	DATE: January 6, 2015
STATION: 117+07	LOCATION: 14' Right of Center Line of Construction	TYPE OF DRILLING: Hollow Stem Auger & Diamond Coring
LOGGED BY: David Allen		EQUIPMENT: CME 850 w/ CME Automatic Hammer
		HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 32.5

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.	% S C R	% R Q D
			SURFACE ELEVATION: 364.4									
5			SHALE - Dark Gray, Medium Hard								80	0
10											100	22
15											32*	0
20			SHALE WITH WEATHERED SHALE AND GRAY SANDSTONE SEAMS AND OCCASIONAL WHITE QUARTZ LAYERS - Dark Gray, Laminated, Medium Hard, with Moderate Dip, and Slickensides								90	34
25											90	0
30											94	72
35			Boring Terminated									

REMARKS: * Poor core recovery due to inner core barrel not locking in.

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

January 14, 2014

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 061335
Springhill Rd. – Hwy. 183 (Bryant) (S)
Route 5 Section 8
Saline County

Transmitted herewith is the requested Soil Survey, Strength Data and Resilient Modulus test results for the above referenced job. The project consists of widening approximately 1.3 miles of Highway 5 to five lanes with bike lanes. Samples were obtained in the travel lanes, shoulders and ditch line. Locations were measured from the centerline of the existing roadway and should be noted as such on the logs.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of moderately plastic sandy clay with varying amounts of gravel. Based on currently available cross-sections the proposed grade line closely matches that of the existing roadway. The subgrade soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction.

The proposed maximum embankment height is approximately five feet. If embankment material is to be placed within the existing ditch line all soft unstable organic material will need to be undercut prior to embankment construction. The maximum undercut depth is anticipated to be no more than two feet. The embankment may be constructed with locally available unspecified material utilizing the 3:1 slope configuration shown in the cross-sections.

The proposed 3:1 cut slopes are acceptable as shown in the currently available cross-sections.

Listed below is the additional information requested for use in developing the plans:

1. The Qualified Products List (QPL) indicates that Aggregate Base Course (Class CL-7) is available from commercial producers located in the vicinity of Bryant.

2. Asphalt Concrete Hot Mix

<u>Type</u>	<u>Asphalt Cement %</u>	<u>Mineral Aggregate %</u>
Surface Course	5.1	94.9
Binder Course	4.3	95.7
Base Course	3.9	96.1


Michael C. Benson
Materials Engineer

MCB:pt:bjj

Attachment

cc: State Constr. Eng. – Master File Copy
District 6 Engineer
Planning Div.
G. C. File

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION
MICHAEL BENSON, MATERIALS ENGINEER
*** SOIL SURVEY STRENGTH TEST REPORT ***

DATE - 12/16/2013
JOB NUMBER - 061335

SEQUENCE NO. - 1
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2003
SUPPLIER ID. - 1
COUNTY/STATE - 15
DISTRICT NO. - 08

JOB NAME - SPRINGHILL RD. - HWY.183 (BRYANT) (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 12

RESILIENT MODULUS
STA.144+00 13762

REMARKS -

AASHTO TESTS : T190

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

**AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS
RECOMPACTED SAMPLES**

Job No.	061335	Material Code	SSRVPS
Date Sampled:	12/13/13	Station No.:	144+00
Date Tested:	December 13, 2013	Location:	22'RT
Name of Project:	SPRINGHILL RD. - HWY.183 (BRYANT)(S)		
County:	Code: 62	Name: SALINE	
Sampled By:	FAULKNER	Depth:	0-5
Lab No.:	20135469	AASHTO Class:	A-6(4)
Sample ID:	RV2003	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

1. Testing Information:

Preconditioning - Permanent Strain > 5% (Y=Yes or N= No)	N
Testing - Permanent Strain > 5% (Y=Yes or N=No)	N
Number of Load Sequences Completed (0-15)	15

2. Specimen Information:

Specimen Diameter (in):	
Top	3.98
Middle	3.97
Bottom	3.98
Average	3.98
Membrane Thickness (in):	0.00
Height of Specimen, Cap and Base (in):	8.02
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.02
Initial Area, Ao (sq. in):	12.42
Initial Volume, AoLo (cu. in):	99.61

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3277.00
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4. Soil Properties:

Optimum Moisture Content (%):	12.3
Maximum Dry Density (pcf):	117.3
95% of MDD (pcf):	111.4
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3277.00
Compaction Moisture content (%):	12.4
Compaction Wet Density (pcf):	125.35
Compaction Dry Density (pcf):	111.52
Moisture Content After Mr Test (%):	11.9

6. Quick Shear Test (Y=Yes, N=No, N/A=Not Applicable):

#VALUE!

7. Resilient Modulus, Mr:

15846(Sc)^-0.14630(S3)^0.23477

8. Comments

9. Tested By:

DEB

Date: December 13, 2013

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

**AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS
RECOMPACTED SAMPLES**

Job No. 061335 **Material Code** SSRVPS
Date Sampled: 12/13/13 **Station No.:** 144+00
Date Tested: December 13, 2013 **Location:** 22'RT
Name of Project: SPRINGHILL RD. - HWY.183 (BRYANT)(S)
County: Code: 62 **Name:** SALINE
Sampled By: FAULKNER **Depth:** 0-5
Lab No.: 20135469 **AASHTO Class:** A-6(4)
Sample ID: RV2003 **Material Type (1 or 2):** 2
LATITUDE: **LONGITUDE:**

PARAMETER	Chamber Confining Pressure	Nominal Maximum Axial Stress	Actual Applied Max. Axial Load	Actual Applied Cyclic Load	Actual Applied Contact Load	Actual Applied Max. Axial Stress	Actual Applied Cyclic Stress	Actual Applied Contact Stress	Average Recov Def. LVD1 and 2	Resilient Strain	Resilient Modulus
	S ₃ psi	S _{cyclic} psi	P _{max} lbs	P _{cyclic} lbs	P _{contact} lbs	S _{max} psi	S _{cyclic} psi	S _{contact} psi	H _{avg} in	ε _r in/in	M _r psi
Sequence 1	6.0	2.0	25.4	22.6	2.8	2.0	1.8	0.2	0.0067	0.0008	21,881
Sequence 2	6.0	4.0	47.6	44.8	2.8	3.8	3.6	0.2	0.00138	0.00017	20,930
Sequence 3	6.0	6.0	70.3	66.6	3.8	5.7	5.4	0.3	0.00220	0.00027	19,528
Sequence 4	6.0	8.0	94.2	88.0	6.3	7.6	7.1	0.5	0.00321	0.00040	17,677
Sequence 5	6.0	10.0	117.3	108.5	8.8	9.4	8.7	0.7	0.00430	0.00054	16,298
Sequence 6	4.0	2.0	25.1	22.3	2.8	2.0	1.8	0.2	0.00071	0.00009	20,406
Sequence 7	4.0	4.0	47.2	44.4	2.8	3.8	3.6	0.2	0.00151	0.00019	18,958
Sequence 8	4.0	6.0	69.1	66.2	2.9	5.6	5.3	0.2	0.00242	0.00030	17,667
Sequence 9	4.0	8.0	92.9	87.6	5.4	7.5	7.1	0.4	0.00343	0.00043	16,509
Sequence 10	4.0	10.0	116.5	108.6	8.0	9.4	8.7	0.6	0.00453	0.00057	15,461
Sequence 11	2.0	2.0	25.1	22.3	2.8	2.0	1.8	0.2	0.00091	0.00011	15,850
Sequence 12	2.0	4.0	47.1	44.2	2.8	3.8	3.6	0.2	0.00185	0.00023	15,421
Sequence 13	2.0	6.0	68.5	65.6	2.9	5.5	5.3	0.2	0.00282	0.00035	15,049
Sequence 14	2.0	8.0	91.4	86.9	4.6	7.4	7.0	0.4	0.00392	0.00049	14,331
Sequence 15	2.0	10.0	114.7	107.6	7.1	9.2	8.7	0.6	0.00505	0.00063	13,762

TESTED BY DEB DATE December 13, 2013
 REVIEWED BY _____ DATE _____

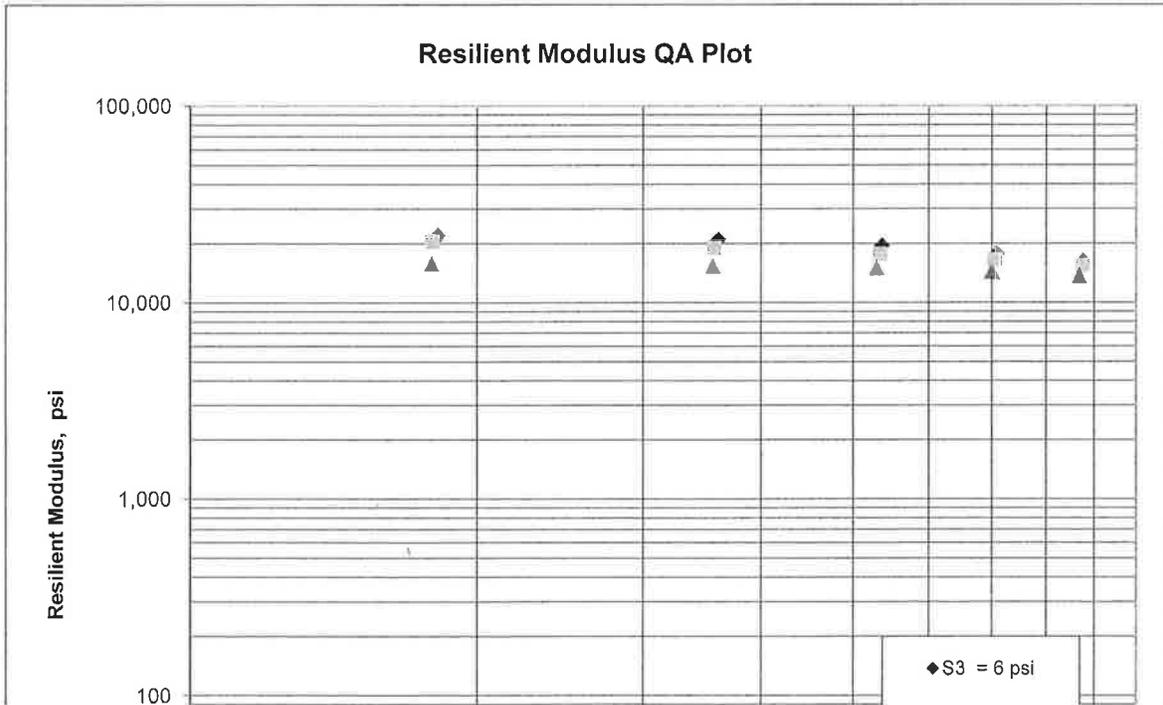
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

**AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS
RECOMPACTED / THINWALL TUBE SAMPLES**

Job No.	061335	Material Code	SSRVPS
Date Sampled:	12/13/13	Station No.:	144+00
Date Tested:	December 13, 2013	Location:	22'RT
Name of Project:	SPRINGHILL RD. - HWY.183 (BRYANT)(S)		
County:	Code: 62	Name:	SALINE
Sampled By:	FAULKNER	Depth:	0-5
Lab No.:	20135469	AASHTO Class:	A-6(4)
Sample ID:	RV2003	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

$$M_R = K_1 (S_C)^{K_2} (S_3)^{K_5}$$

$K_1 = 15,846$
 $K_2 = -0.14630$
 $K_5 = 0.23477$
 $R^2 = 0.93$



JOB: 061335

Arkansas State Highway Transportation Department

DATE TESTED

JOB NAME: SPRINGHILL RD. - HWY. 183 (BRYANT)(S)

12/16/2013

COUNTY NO. 62

Michael Benson, Materials Engineer

STA.# LOC. PAVEMENT SOUNDINGS

144+00	06RT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
		4.0W	6.0	3	
144+00	13RT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
		7.0W		4	
144+00	22RT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
151+00	11LT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
		6.5W	7.5		
151+00	25LT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
159+00	05RT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
		5.75W	5.5		
159+00	13RT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	AGG.BASE CRS.CL-7
		4.75W		3	
167+00	06LT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	AGG.BASE CRS.CL-7
		4.75W	9.0		
167+00	12LT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	AGG.BASE CRS.CL-7
		5.0W			4
167+00	22LT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
175+00	04RT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
		6.0W	6.5	3	
175+00	12RT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
		4.0		4	
183+00	06LT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
		5.5W	8.5		
183+00	14LT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
		6.0W		2	
183+00	22LT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
191+00	06RT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
		4.75W	5.75		
191+00	13RT	ACHMSC	PCCP	AGG.BASE CRS.CL-5	
		4.25W		2	

comments: W=MULTIPLE LAYERS

PAVEMENT SOUNDINGS

STA.# LOC.

199+00	05LT	ACHMSC 4.75	PCCP 6.25	AGG.BASE CRS.CL-5 ---
199+00	13LT	ACHMSC 3.0	ACHMBC ---	AGG.BASE CRS CL-5 3
205+00	12RT	ACHMSC 6.25W	ACHMBC 6.5	AGG.BASE CRS.CL-5 3

comments: W=MULTIPLE LAYERS

JOB: 061335

Arkansas State Highway Transportation Department

JOB NAME: SPRINGHILL RD. - HWY.183 (BRYANT)(S)

Materials Division

COUNTY NO. 62 DATE TESTED 12/16/2013

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR						L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				#4	#10	#40	#80	#200					
				S	T	E	V	E	S				
144+00	22RT	0-5	BROWN	100	93	78	67	44	34	18	A-6(4)	RV2003	
144+00	06RT	0-5	BROWN	95	83	69	75	60	48	29	A-7-6(15)	S1983	27.1
144+00	13RT	0-5	BR/GR	83	77	67	62	60	39	22	A-6(7)	S1984	18.6
144+00	22RT	0-5	BR/GR	94	67	77	70	51	39	22	A-6(7)	S1985	20.1
151+00	11LT	0-5	BROWN	92	81	75	66	35	19	5	A-2-4	S1986	19.1
151+00	25LT	0-5	BROWN	83	70	60	53	33	41	27	A-2-7(3)	S1987	22.5
159+00	05RT	0-5	BROWN	99	96	93	89	52	49	30	A-7-6(12)	S1988	23.1
159+00	13RT	0-5	BR/GR	94	86	76	71	40	48	29	A-7-6(16)	S1989	20.3
167+00	06LT	0-5	BROWN	95	92	89	83	51	44	28	A-7-6(10)	S1990	19.2
167+00	12LT	0-5	BROWN	99	96	95	90	55	49	32	A-7-6(14)	S1991	25.8
167+00	22LT	0-5	BROWN	95	83	81	73	47	35	20	A-6(5)	S1992	23.4
175+00	04RT	0-5	BROWN	92	85	77	72	60	37	21	A-6(10)	S1993	15.5
175+00	12RT	0-5	BROWN	95	89	80	74	60	37	21	A-6(10)	S1994	22.5
183+00	06LT	0-5	BROWN	99	99	97	95	72	49	31	A-7-6(21)	S1995	29.2
183+00	14LT	0-5	BROWN	99	98	95	92	65	40	22	A-6(12)	S1996	27.2
183+00	22LT	0-5	BROWN	98	92	87	81	54	39	20	A-6(8)	S1997	28.4
191+00	06RT	0-5	BR/GR	98	96	93	77	57	31	15	A-6(6)	S1998	17.8
191+00	13RT	0-5	BR/GR	97	94	91	74	53	29	13	A-6(4)	S1999	22.1
199+00	05LT	0-5	BROWN	99	96	92	74	51	32	14	A-6(4)	S2000	16.4
199+00	13LT	0-5	BROWN	99	98	96	77	44	31	12	A-6(2)	S2001	15.3
205+00	12RT	0-5	BROWN	99	97	94	82	62	30	14	A-6(6)	S2002	16.7

comments: W=MULTIPLE LAYERS

Tuesday, December 17, 2013

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	- 01/03/14	SEQUENCE NO.	- 1
JOB NUMBER	- 061335	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2003
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 62
SUPPLIER NAME	- STATE	DISTRICT NO.	- 06
NAME OF PROJECT	- SPRINGHILL RD. - HWY.183 (BRYANT) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SALINE, COUNTY	DATE SAMPLED	- 12/04/13
SAMPLED BY	- FAULKNER/BOUGHNER	DATE RECEIVED	- 12/05/13
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 12/16/13
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20135449	- 20135450	- 20135451
SAMPLE ID	- S1983	- S1984	- S1985
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 144+00	- 144+00	- 144+00
LOCATION	- 06RT	- 13RT	- 22RT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BROWN	- BR/GR	- BR/GR
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 34 36 54.60	- 34 36 54.50	- 34 36 54.50
LONGITUDE DEG-MIN-SEC	- 92 31 2.80	- 92 31 2.80	- 92 31 2.70
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. - 100	- 100	- 100
	3/8 IN. - 99	- 97	- 99
	NO. 4 - 95	- 88	- 94
	NO. 10 - 88	- 77	- 87
	NO. 40 - 80	- 67	- 77
	NO. 80 - 75	- 62	- 70
	NO. 200 - 60	- 50	- 51
LIQUID LIMIT	- 48	- 39	- 39
PLASTICITY INDEX	- 29	- 22	- 22
AASHTO SOIL	- A-7-6(15)	- A-6(7)	- A-6(7)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 27.1	- 18.6	- 20.1
ACHMSC	(IN) - 4.0W	- 7.0W	- ----
PCCP	(IN) - 6.0	- ----	- ----
AGG.BASE CRS.CL-5	(IN) - 3	- 4	- ----
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS, LOCATIONS MEASURED FROM CENTERLINE OF EXISTING ROADWAY.

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	- 12/20/13	SEQUENCE NO.	- 3
JOB NUMBER	- 061335	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2003
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 62
SUPPLIER NAME	- STATE	DISTRICT NO.	- 06
NAME OF PROJECT	- SPRINGHILL RD. - HWY.183 (BRYANT) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SALINE, COUNTY	DATE SAMPLED	- 12/04/13
SAMPLED BY	- FAULKNER/BOUGHNER	DATE RECEIVED	- 12/05/13
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 12/16/13
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20135455	- 20135456	- 20135457
SAMPLE ID	- S1989	- S1990	- S1991
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 159+00	- 167+00	- 167+00
LOCATION	- 13RT	- 06LT	- 12LT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BR/GR	- BROWN	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 34 37 1.70	- 34 37 5.90	- 34 37 6.00
LONGITUDE DEG-MIN-SEC	- 92 30 47.00	- 92 30 38.50	- 92 30 38.50
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	100	-
	3/8 IN. -	96	100
	NO. 4 -	95	99
	NO. 10 -	92	96
	NO. 40 -	89	93
	NO. 80 -	86	90
	NO. 200 -	51	55
LIQUID LIMIT	- 48	- 44	- 49
PLASTICITY INDEX	- 29	- 28	- 32
AASHTO SOIL	- A-7-6(6)	- A-7-6(10)	- A-7-6(14)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 20.3	- 19.2	- 25.8
ACHMSC (IN)	- 4.75W	- 4.75W	- 5.0W
PCCP (IN)	-	- 9.0	-
AGG.BASE CRS.CL-5 (IN)	- 3	-	-
AGG.BASE CRS.CL-7 (IN)	-	-	- 4
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

REMARKS - W=MULTIPLE LAQYERS

AASHTO TESTS : T24 T88 T89 T90 T265

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	- 12/16/13	SEQUENCE NO.	- 6
JOB NUMBER	- 061335	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2003
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 62
SUPPLIER NAME	- STATE	DISTRICT NO.	- 06
NAME OF PROJECT	- SPRINGHILL RD. - HWY.183 (BRYANT) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SALINE, COUNTY	DATE SAMPLED	- 12/04/13
SAMPLED BY	- FAULKNER/BOUGHNER	DATE RECEIVED	- 12/05/13
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 12/16/13
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20135464	- 20135465	- 20135466
SAMPLE ID	- S1998	- S1999	- S2000
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 191+00	- 191+00	- 199+00
LOCATION	- 06RT	- 13RT	- 05LT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BR/GR	- BR/GR	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 34 37 19.30	- 34 37 19.30	- 34 37 23.70
LONGITUDE DEG-MIN-SEC	- 92 30 14.50	- 92 30 14.50	- 92 30 7.90
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. - 100	-	-
	3/8 IN. - 99	100	100
	NO. 4 - 98	97	99
	NO. 10 - 96	94	96
	NO. 40 - 93	91	92
	NO. 80 - 77	74	74
	NO. 200 - 57	53	51
LIQUID LIMIT	- 31	- 29	- 32
PLASTICITY INDEX	- 15	- 13	- 14
AASHTO SOIL	- A-6(6)	- A-6(4)	- A-6(4)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 17.8	- 22.1	- 16.4
ACHMSC (IN)	- 4.75W	- 4.25W	- 4.75
PCCP (IN)	- 5.75	-	- 6.25
AGG.BASE CRS.CL-5 (IN)	-	- 2	-

REMARKS - W=MULTIPLE LAYERS
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