ARKANSAS DEPARTMENT OF TRANSPORTATION

SUBSURFACE INVESTIGATION

STATE JOB NO. 020587

FEDERAL AID PROJECT NO. NHPP-0022(37)

ABLES CREEK STR. & APPRS. (S)

STATE HIGHWAY 138 **SECTION** 3

IN DREW **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 DEPARTMENT OF TRANSPORTATION
ArDOT.gov | IDriveArkansas.com | Scott E. Bennett, P.E., Director
MATERIALS DIVISION
11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

October 6, 2017

TO: Mr. Rick Ellis, Bridge Engineer

SUBJECT: Job No. 020587
Ables Creek Str. & Apprs. (S)
Route 138 Section 3
Drew County

Transmitted herewith are a brief summary of the geology and site conditions, summary of percent material passing #200 sieve and Atterberg Limits test results (for liquefaction susceptibility analysis), D50 scour analysis, and the logs of the borings conducted for the structures 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.

This project consists of replacing the bridge crossing Ables Creek, on Highway 138, northeast of Monticello. The new bridge will be constructed on the existing alignment and a temporary detour bridge will be constructed to maintain traffic. Three of the five requested borings, all intermediate bents, were inaccessible due to steep slopes, low bridge clearance, and high water levels in the channel. The three borings that were not obtained were located at: 218+32 C.L. Construction, 218+82 C.L. Construction, and 219+32 C.L. Construction.

Based on plans provided by Bridge Division and the findings from this subsurface investigation, it is anticipated that all bents will be founded on concrete filled steel shell piles.

The project is located in a seismic area with a horizontal acceleration coefficient of 0.236, as provided by Bridge Design, A global stability analysis was performed for this embankment configuration and provides for a satisfactory Factor of Safety for seismic and static conditions. However, if the embankment geometry is altered in any way the embankment will need to be reanalyzed for seismic and static conditions.

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 2 Engineer
G.C. File

GEOLOGY AND SITE CONDITIONS
Job No. 020587

Ables Creek Str. & Apprs. (S)
Route 138 Section 3
Drew County

Site Conditions

The existing bridge is located over Ables Creek. The existing bridge is an 8 span structure constructed of concrete deck, timber pilings with concrete caps, and timber end walls. The bridge has steel guardrail supported by concrete posts on the bridge and steel posts leading up to the bridge. Overhead power lines parallel the right side of the existing roadway. The area on the right side of the roadway is moderately to heavily wooded. The channel to the left of the bridge is lined with trees and brush with agricultural fields beyond. There are trees growing in the channel, both up and downstream from the bridge. The main part of the channel is located under spans 3 and 4.

Site Geology

The area around the bridge is mapped as point bar deposits of a paleo-meander belt of the Arkansas River. These deposits consist of clay, silt, and sand. The top layer at the jobsite varies in thickness from 26.7 to 56.1 feet below ground level and consists primarily of clay with some layers of silt. This layer overlies sand and sand with silt. Some of the samples in the lower part of the lower layer contain a trace to some gravel.

Subsurface Conditions

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

0 to 31.7 Feet:	Consists of moist to wet, soft to very stiff, reddish brown **clay**, **silty clay**, and **sandy clay**.
31.7 to 56.1 Feet:	Varies from wet, soft to medium stiff, brown to gray **clay** to very loose to medium dense, brown **silty sand** to **sand**.
56.1 to 61.7 Feet:	Consists of wet, very loose to medium dense, brown **clayey sand** to **sand with silt** to **sand**.
61.7 to 91.7 Feet:	Consists of wet, medium dense to dense, brown **silty sand with some gravel** to **sand with some gravel**.
91.7 to 99.6 Feet:	Consists of wet, medium dense to very dense, brown **silty sand** to **sand with gravel**.

Lab Test Summary

Project: 020587

Station	Location	Depth (Ft.)	Plastic Limit	Liquid Limit	Plasticity Index	% Passing No. 200
217+96.5	7' LT.	4.6	NT			95
217+96.5	7' LT.	9.6	NT			93
217+96.5	7' LT.	11.1	NT			97
217+96.5	7' LT.	16.1	18	25	7	93
217+96.5	7' LT.	21.1	21	63	42	99
217+96.5	7' LT.	26.1	22	61	39	98
217+96.5	7' LT.	31.1	17	35	18	99
217+96.5	7' LT.	36.1	NP			82
217+96.5	7' LT.	41.1	16	32	16	93
217+96.5	7' LT.	46.1	30	87	57	99
217+96.5	7' LT.	51.1	27	53	26	92
217+96.5	7' LT.	56.1	NP			7
217+96.5	7' LT.	61.1	NP			4
217+96.5	7' LT.	66.1	NP			4
217+96.5	7' LT.	71.1	NP			6
217+96.5	7' LT.	76.1	NP			5
217+96.5	7' LT.	81.1	NP			14
217+96.5	7' LT.	86.1	NP			5
217+96.5	7' LT.	91.1	NP			6
217+96.5	7' LT.	98.1	NP			4
219+67.5	7' RT.	4.2	NT			77
219+67.5	7' RT.	9.2	NT			95
219+67.5	7' RT.	11.7	NT			98
219+67.5	7' RT.	16.7	NT			99
219+67.5	7' RT.	21.7	17	35	18	94
219+67.5	7' RT.	26.7	20	28	8	91
219+67.5	7' RT.	31.7	NP			38
219+67.5	7' RT.	36.7	NP			36
219+67.5	7' RT.	41.7	NP			3
219+67.5	7' RT.	46.7	NP			5
219+67.5	7' RT.	51.7	NP			4
219+67.5	7' RT.	56.7	NP			23
219+67.5	7' RT.	61.7	NP			3
219+67.5	7' RT.	66.7	NP			2
219+67.5	7' RT.	71.7	NP			3
219+67.5	7' RT.	76.7	NP			21
219+67.5	7' RT.	81.7	NP			3
219+67.5	7' RT.	86.7	NP			3
219+67.5	7' RT.	91.7	NP			1
219+67.5	7' RT.	96.7	NP			2

NT = NO TEST

D_{50} AGGREGATE ANALYSIS FOR SCOUR CALCULATIONS

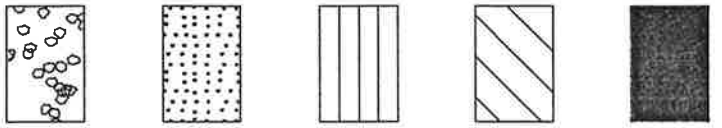
Job No. 020587					
Creek Name	**Station**	**Sample Type**	**Location**	**Depth (FT)**	**Aggregate Size (D50) (IN)**
Ables Creek	218+47	Creek Bank	20' Lt. C.L. Construction	N/A	Less Than 0.0029

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

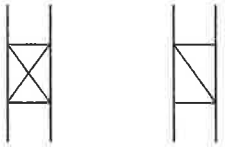
SAMPLER TYPES

(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: $\frac{6}{8-9} \Rightarrow 8+9=17 blows/ft$. 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 3

JOB NO. 020587 Drew County
JOB NAME: Ables Creek Str. & Apprs. (S)
Route 138 Section 3
STATION: 219+67.5
LOCATION: 7' Right of Construction Centerline
LOGGED BY: Winston Buie

DATE: August 16, 2017
TYPE OF DRILLING:
Hollow Stem Auger -Rotary Wash
EQUIPMENT: Acker

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 98.2

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.	% TCR	% RQD
			SURFACE ELEVATION: 158.6								
5		X	Moist, Stiff, Brown Sandy Clay with Trace Gravel						3 4-6		
10		X	Moist, Very Stiff, Reddish Brown Clay	-					4 7-10		
		X							3 6-8		
15			Wet, Stiff, Reddish Brown Clay								
		X							4 5-7		
20											
		X	Wet, Medium Stiff, Reddish Brown Clay	CL	17		35		2 3-4		
25				-							
		X	Wet, Soft, Reddish Brown Clay	CL	20		28		2 1-1		
30				-							
		X	Wet, Medium Dense, Brown Silty Sand	SM	NP				3 5-8		
35											

REMARKS:

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

BORING NO. 1
PAGE 2 OF 3

JOB NO. 020587 Drew County
JOB NAME: Ables Creek Str. & Apprs. (S)
Route 138 Section 3
STATION: 219+67.5
LOCATION: 7' Right of Construction Centerline
LOGGED BY: Winston Buie

DATE: August 16, 2017
TYPE OF DRILLING:
Hollow Stem Auger -Rotary Wash
EQUIPMENT: Acker

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 98.2

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.	% TCR	% RQD
			SURFACE ELEVATION: 158.6	-							
		X	Wet, Loose, Brown Silty Sand	SM	NP				5 4-2		
40				-							
		X	Wet, Medium Dense, Brown Sand	SW	NP				6 10-7		
45				-							
		X	Wet, Medium Dense, Brown Sand with Silt	SW-SM	NP				8 11-13		
50				-							
		X	Wet, Medium Dense, Brown Sand	SW	NP				5 8-7		
55				-							
		X	Wet, Very Loose, Brown Clayey Sand	SC	NP				4 1-1		
60				-							
		X	Wet, Medium Dense, Brown Sand with Trace Gravel	SW	NP				7 6-10		
65				-							
		X		SW	NP				9 8-6		
70											

REMARKS:

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

BORING NO. 1
PAGE 3 OF 3

JOB NO. 020587 Drew County
JOB NAME: Ables Creek Str. & Apprs. (S)
Route 138 Section 3
STATION: 219+67.5
LOCATION: 7' Right of Construction Centerline
LOGGED BY: Winston Buie

DATE: August 16, 2017
TYPE OF DRILLING:
Hollow Stem Auger -Rotary Wash
EQUIPMENT: Acker

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 98.2

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.	% TCR	% RQD
			SURFACE ELEVATION: 158.6	-							
		X	Wet, Medium Dense, Brown Sand with Some Gravel	SW	NP				8 9-9		
75				-							
		X	Wet, Dense, Brown Silty Sand with Some Gravel	SM	NP				6 18-21		
80				-							
		X	Wet, Medium Dense, Brown Sand with Some Gravel	SW	NP				7 14-16		
85				-							
		X	Wet, Dense, Brown Sand with Some Gravel	SW	NP				8 16-24		
90				-							
		X	Wet, Medium Dense, Brown Sand with Gravel	SW	NP				8 13-16		
95				-							
		X	Wet, Dense, Brown Sand with Gravel	SW	NP				16 15-16		
			Boring Terminated								
100											
105											

REMARKS:

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

BORING NO. 2
PAGE 1 OF 3

JOB NO. 020587 Drew County
JOB NAME: Ables Creek Str. & Apprs. (S)
Route 138 Section 3
STATION: 217+96.5
LOCATION: 7' Left of Construction Centerline
LOGGED BY: Stanley Bates

DATE: August 22, 2017
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 99.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 158.6	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
5		X	Moist, Stiff, Reddish Brown Clay	-					2 4-8		
10		X							2 5-8		
15		X	Moist, Stiff, Reddish Brown Silty Clay						3 5-6		
20		X	Wet, Medium Stiff, Reddish Brown Silty Clay	CL-ML -	18		25		1 2-6		
25		X	Wet, Stiff, Reddish Brown Clay	CH -	21		63		2 4-5		
30		X	Wet, Medium Stiff, Brown Clay	CH -	22		61		2 3-4		
35		X		CL -	17		35		1 2-3		

REMARKS:

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

BORING NO. 2
PAGE 2 OF 3

JOB NO. 020587 Drew County
JOB NAME: Ables Creek Str. & Apprs. (S)
Route 138 Section 3
STATION: 217+96.5
LOCATION: 7' Left of Construction Centerline
LOGGED BY: Stanley Bates

DATE: August 22, 2017
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 99.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 158.6	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
		X	Wet, Very Loose, Brown Silt with Sand	ML	NP				3		
40				-					2-1		
		X	Wet, Soft, Brown Clay	CL	16		32		1		
45				-					1-1		
		X	Wet, Soft, Gray Clay	CH	30		87		1		
50				-					1-2		
		X		CH	27		53		1		
55				-					1-1		
		X	Wet, Medium Dense, Brown Sand with Silt	SW-SM	NP				5		
60				-					11-14		
		X	Wet, Dense, Brown Sand with Trace Gravel	SW	NP				7		
65				-					14-22		
		X	Wet, Medium Dense, Brown Sand with Some Gravel	SW	NP				7		
70				-					11-10		

REMARKS:

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

BORING NO. 2
PAGE 3 OF 3

JOB NO. 020587 Drew County
JOB NAME: Ables Creek Str. & Apprs. (S)
Route 138 Section 3
STATION: 217+96.5
LOCATION: 7' Left of Construction Centerline
LOGGED BY: Stanley Bates

DATE: August 22, 2017
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 99.6

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.	% TCR	% RQD
			SURFACE ELEVATION: 158.6								
75		X	Wet, Dense, Brown Sand with Silt	SW-SM	NP				10 14-21		
				-							
		X		SW-SM	NP				11 16-18		
80				-							
85		X	Wet, Medium Dense, Brown Silty Sand with Trace Gravel	SM	NP				9 11-19		
				-							
90		X	Wet, Dense, Brown Sand with Silt and Some Gravel	SW-SM	NP				8 15-20		
				-							
95		X	Wet, Very Dense, Brown Silty Sand	SW-SM	NP				19 28-25		
				-							
100		X	Wet, Medium Dense, Brown Sand with Trace Gravel	SW	NP				8 13-17		
			Boring Terminated								
105											

REMARKS:

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

May 16, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 020587
Ables Creek Str. & Apprs. (S)
Route 138 Section 3
Drew County

Transmitted herewith is the requested Soil Survey, strength data and Resilient Modulus test results for the above referenced job. The project consists of replacing the bridge crossing Ables Creek on Highway 138. Samples were obtained in the existing travel lanes and ditch line. There were no paved shoulders within the project limits.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of highly plastic sandy clay. The subgrade soils are expected to provide a stable working platform with normal drying and compactive efforts, if the weather is favorable during construction.

The maximum embankment height is approximately 15 feet. Cross-sections indicate that the embankment will be placed within the existing ditch line. Based on seasonal conditions, water may be present during the time of construction. The ditches should be drained of all water and the soft unstable organic material should be undercut to a maximum depth of two feet. The embankment may be constructed with locally available unspecified material utilizing the slope configuration shown in the cross-sections.

The proposed 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 at the river port near Dumas.

2. Asphalt Concrete Hot Mix

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.2	94.8
Binder Course	4.4	95.6
Base Course	4.0	96.0

Michael C. Benson
Materials Engineer

MCB:pt:bjj
Attachment
cc: State Constr. Eng. – Master File Copy
District 2 Engineer
System Information and Research 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 - 05/01/2017
JOB NUMBER - 020587

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 22
DISTRICT NO. - 02

JOB NAME - ABLES CREEK STR. & APPRS.(S)

STATION LIMITS	R-VALUE AT 240 psi
BEGIN JOB - END JOB	LESS THAN 5
RESILIENT MODULUS	
STA. 224+00	6443

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.	020587	**Material Code**	SSRVPS
Date Sampled:	3/20/17	**Station No.:**	224+55
Date Tested:	April 27, 2017	**Location:**	20LT
Name of Project:	ABLES CREEK STR. & APPRS. (S)		
County:	**Code:** 22 **Name:** DREW		
Sampled By:	THORNTON/BATES	**Depth:**	0-5
Lab No.:	20171040	**AASHTO Class:**	A-6(17)
Sample ID:	RV302	**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	3.94
Middle	3.94
Bottom	3.94
Average	3.94
Membrane Thickness (in):	0.01
Height of Specimen, Cap and Base (in):	8.05
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.05
Initial Area, Ao (sq. in):	12.12
Initial Volume, AoLo (cu. in):	97.55

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3031.70

4. Soil Properties:

Optimum Moisture Content (%):	16.6
Maximum Dry Density (pcf):	105.3
95% of MDD (pcf):	100.0
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3031.70
Compaction Moisture content (%):	16.7
Compaction Wet Density (pcf):	118.42
Compaction Dry Density (pcf):	101.47
Moisture Content After Mr Test (%):	16.7

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

7. Resilient Modulus, Mr: 10752(Sc)^-0.29096(S3)^0.17416

8. Comments

9. Tested By: GW **Date:** April 27, 2017

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	020587	**Material Code**	SSRVPS
Date Sampled:	3/20/17	**Station No.:**	224+55
Date Tested:	April 27, 2017	**Location:**	20LT
Name of Project:	ABLES CREEK STR. & APPRS. (S)		
County:	**Code:** 22 **Name:** DREW		
Sampled By:	THORNTON/BATES	**Depth:**	0-5
Lab No.:	20171040	**AASHTO Class:**	A-6(17)
Sample ID:	RV302	**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. LVDT 1 and 2*	*Resilient Strain*	*Resilient Modulus*
DESIGNATION	S_3	S_{cyclic}	P_{max}	P_{cyclic}	$P_{contact}$	S_{max}	S_{cyclic}	$S_{contact}$	H_{avg}	ε_r	M_r
UNIT	psi	psi	lbs	lbs	lbs	psi	psi	psi	in	in/in	psi
Sequence 1	6.0	2.0	25.2	22.3	2.8	2.1	1.8	0.2	0.00121	0.00015	12,242
Sequence 2	6.0	4.0	47.2	44.3	2.8	3.9	3.7	0.2	0.00262	0.00033	11,216
Sequence 3	6.0	6.0	69.2	65.6	3.7	5.7	5.4	0.3	0.00447	0.00056	9,747
Sequence 4	6.0	8.0	91.1	85.1	6.1	7.5	7.0	0.5	0.00699	0.00087	8,085
Sequence 5	6.0	10.0	111.9	103.4	8.5	9.2	8.5	0.7	0.00980	0.00122	7,007
Sequence 6	4.0	2.0	25.0	22.2	2.8	2.1	1.8	0.2	0.00138	0.00017	10,670
Sequence 7	4.0	4.0	46.8	43.9	2.9	3.9	3.6	0.2	0.00299	0.00037	9,740
Sequence 8	4.0	6.0	67.9	65.0	2.9	5.6	5.4	0.2	0.00496	0.00062	8,710
Sequence 9	4.0	8.0	90.1	85.0	5.2	7.4	7.0	0.4	0.00727	0.00090	7,765
Sequence 10	4.0	10.0	111.5	103.9	7.6	9.2	8.6	0.6	0.00997	0.00124	6,923
Sequence 11	2.0	2.0	25.0	22.1	2.8	2.1	1.8	0.2	0.00154	0.00019	9,530
Sequence 12	2.0	4.0	46.5	43.6	2.9	3.8	3.6	0.2	0.00336	0.00042	8,629
Sequence 13	2.0	6.0	67.2	64.4	2.8	5.5	5.3	0.2	0.00550	0.00068	7,772
Sequence 14	2.0	8.0	88.4	84.1	4.3	7.3	6.9	0.4	0.00790	0.00098	7,074
Sequence 15	2.0	10.0	109.9	103.3	6.6	9.1	8.5	0.5	0.01065	0.00132	6,443

TESTED BY GW DATE April 27, 2017

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.	020587	**Material Code**	SSRVPS
Date Sampled:	3/20/17	**Station No.:**	224+55
Date Tested:	April 27, 2017	**Location:**	20LT
Name of Project:	ABLES CREEK STR. & APPRS. (S)		
County:	**Code:** 22 **Name:** DREW		
Sampled By:	THORNTON/BATES	**Depth:**	0-5
Lab No.:	20171040	**AASHTO Class:**	A-6(17)
Sample ID:	RV302	**Material Type (1 or 2):**	2
LATITUDE:		**LONGITUDE:**	

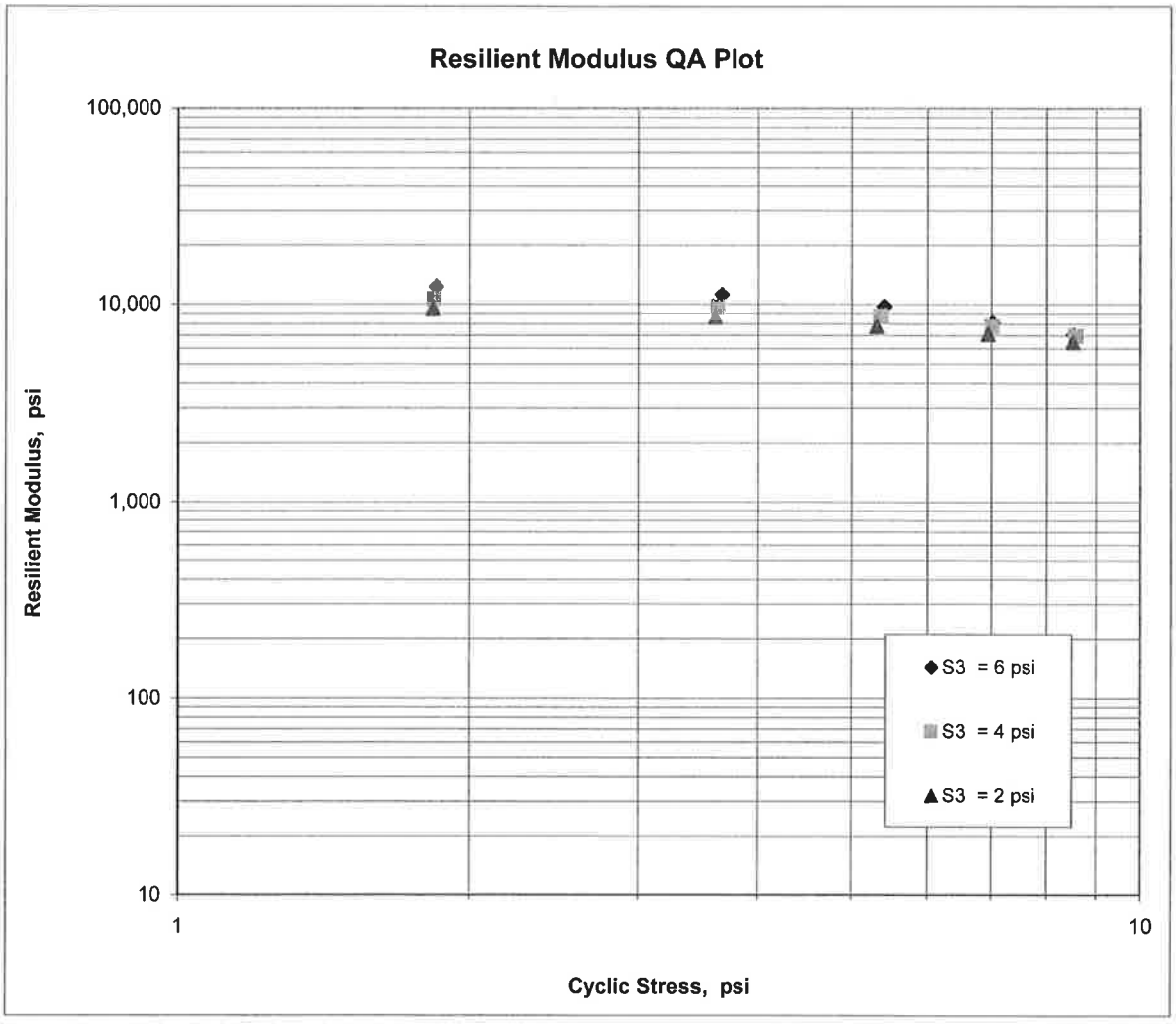
$$M_R = K1\ (S_C)^{K2}\ (S_3)^{K5}$$

K1 = 10,752

K2 = -0.29096

K5 = 0.17416

R^2 = 0.90



JOB: 020587

JOB NAME: ABLES CREEK STR. & APPRS.(S)

COUNTY NO. 22 **DATE TESTED** 4/28/2017

Arkansas State Highway Transporation Department

Materials Division

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				S	I	E	V	E S					
224+55	20 LT	0-5	BROWN	94	93	89	87	82	35	23	A-6(17)	RV302	
214+00	06 RT	0-5	BROWN	84	80	72	67	62	36	24	A-6(11)	S298	15
214+00	18 RT	0-5	BROWN	99	97	95	92	88	35	22	A-6(18)	S299	24
224+59	06 LT	0-5	BROWN	97	95	87	83	78	33	21	A-6(14)	S300	21
224+59	18 LT	0-5	BROWN	100				91	42	29	A-7-6(26)	S301	23

comments: W-MULTIPLE LAYERS

Tuesday, May 02, 2017

JOB: 020587
JOB NAME: ABLES CREEK STR. & APPRS.(S)

COUNTY NO. 22

Arkansas State Highway Transporation Department
Materials Division
Michael Benson, Materials Engineer

DATE TESTED
4/28/2017

PAVEMENT SOUNDINGS

STA.#	LOC.			
214+00	06 RT	ACHMSC	ACHMSC	SOIL CEMENT
		3.0W	**8.0**	--
214+00	18 RT	ACHMSC	ACHMSC	SOIL CEMENT
		--	--	--
224+59	06 LT	ACHMSC	ACHMSC	SOIL CEMENT
		2.5W	--	**6.5**

comments: W=MULTIPLE LAYERS

Tuesday, May 02, 2017

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

DATE - 05/01/17
JOB NUMBER - 020587
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - ABLES CREEK STR. & APPRS.(S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - DREW COUNTY
SAMPLED BY - THORNTON/BATES
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

SEQUENCE NO. - 1
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 22
DISTRICT NO. - 02

DATE SAMPLED - 03/20/17
DATE RECEIVED - 03/22/17
DATE TESTED - 04/28/17

LAB NUMBER	20171036	20171037	20171038
SAMPLE ID	S298	S299	S300
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	214+00	214+00	224+59
LOCATION	06 RT	18 RT	06 LT
DEPTH IN FEET	0-5	0-5	0-5
MAT'L COLOR	BROWN	BROWN	BROWN
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	33 44 6.70	33 44 6.70	33 44 14.50
LONGITUDE DEG-MIN-SEC	91 33 43.80	91 33 43.70	91 33 36.90
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.	100		100
3/8 IN.	86	100	99
NO. 4	84	99	97
NO. 10	80	97	95
NO. 40	72	95	87
NO. 80	67	92	83
NO. 200	62	88	78
LIQUID LIMIT	36	35	33
PLASTICITY INDEX	24	22	21
AASHTO SOIL	A-6(11)	A-6(18)	A-6(14)
UNIFIED SOIL			
% MOISTURE CONTENT	15.0	24.0	21.0
ACHMSC (IN)	3.0W	--	2.5W
ACHMSC (IN)	8.0	--	--
SOIL CEMENT (IN)	--	--	6.5

REMARKS - W=MULTIPLE LAYERS

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	- 05/02/17	SEQUENCE NO.	- 2
JOB NUMBER	- 020587	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 22
SUPPLIER NAME	- STATE	DISTRICT NO.	- 02
NAME OF PROJECT	- ABLES CREEK STR. & APPRS.(S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- DREW COUNTY	DATE SAMPLED	- 03/20/17
SAMPLED BY	- THORNTON/BATES	DATE RECEIVED	- 03/22/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 04/28/17

MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER	20171039
SAMPLE ID	S301
TEST STATUS	INFORMATION ONLY
STATION	224+59
LOCATION	18 LT
DEPTH IN FEET	0-5
MAT'L COLOR	BROWN
MAT'L TYPE	
LATITUDE DEG-MIN-SEC	33 44 14.60
LONGITUDE DEG-MIN-SEC	91 33 37.20
% PASSING 2 IN.	
1 1/2 IN.	
3/4 IN.	
3/8 IN.	
NO. 4	100
NO. 10	
NO. 40	
NO. 80	
NO. 200	91
LIQUID LIMIT	42
PLASTICITY INDEX	29
AASHTO SOIL	A-7-6(26)
UNIFIED SOIL	
% MOISTURE CONTENT	23.0

REMARKS - W-MULTIPLE LAYERS

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 - 05/01/17
JOB NUMBER - 020587
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - ABLES CREEK STR. & APPRS.(S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - DREW COUNTY
SAMPLED BY - THORNTON/BATES
SAMPLE FROM - TEST HOLE

SEQUENCE NO. - 1
MATERIAL CODE - RV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 22
DISTRICT NO. - 02

DATE SAMPLED - 03/20/17
DATE RECEIVED - 03/22/17
DATE TESTED - 04/28/17

MATERIAL DESC. - SOIL SURVEY - RESISTANCE R-VALUE ACTUAL RESULTS

LAB NUMBER	20171040		
SAMPLE ID	RV302		
TEST STATUS	INFORMATION ONLY		
STATION	224+55		
LOCATION	20 LT		
DEPTH IN FEET	0-5		
MAT'L COLOR	BROWN		
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	33 44 14.60		
LONGITUDE DEG-MIN-SEC	91 33 37.20		
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.	100		
3/8 IN.	97		
NO. 4	94		
NO. 10	93		
NO. 40	89		
NO. 80	87		
NO. 200	82		
LIQUID LIMIT	35		
PLASTICITY INDEX	23		
AASHTO SOIL	A-6(17)		
UNIFIED SOIL			
% MOISTURE CONTENT			

REMARKS - W=MULTIPLE LAYERS

AASHTO TESTS : T24 T88 T89 T90 T265