ARKANSAS DEPARTMENT OF TRANSPORTATION

SUBSURFACE INVESTIGATION

STATE JOB NO. 090430

FEDERAL AID PROJECT NO. NHPP-0044(15)

PIGEON CREEK STR. & APPRS. (S)

STATE HIGHWAY 74 **SECTION** 3

IN MADISON **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

June 19, 2018

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 090430
Pigeon Creek Str. & Apprs. (S)
Route 74 Section 3
Madison 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 Pigeon Creek on Highway 74. Samples were taken in the existing travel lanes and ditch line. The shoulders are not paved within the project limits.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of moderately plastic cherty clay. Cross-sections are not currently available, but it is assumed the construction grade line will closely match 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. Rock was encountered at station 40+00 at 6 and 18 feet right of centerline at a depth of 3.0 feet.

There were no slide areas observed within the project limits. Earthwork recommendations will be made upon requests when plans are further developed and cross-sections are available.

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 Farmington.

2. Asphalt Concrete Hot Mix

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.5	94.5
Binder Course	4.5	95.5
Base Course	4.1	95.9

Michael C. Benson
Materials Engineer

MCB:pt:bjj
Attachment
cc: State Constr. Eng. – Master File Copy
District 9 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 - 06/12/2018
JOB NUMBER - 090430

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 44
DISTRICT NO. - 09

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

STATION LIMITS	R-VALUE AT 240 psi
BEGIN JOB - END JOB	9
RESILIENT MODULUS STA. 47+00	7271

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.	090430	**Material Code**	SSRVPS
Date Sampled:	4/23/18	**Station No.:**	47+00
Date Tested:	May 15, 2018	**Location:**	18'LT
Name of Project:	PIGEON CREEK STR. & APPRS. (S)		
County:	**Code:** 44 **Name:** MADISON		
Sampled By:	THORNTON/BATES	**Depth:**	0-5
Lab No.:	20180679	**AASHTO Class:**	A-4 (1)
Sample ID:	RV 170	**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	3.95
Middle	3.95
Bottom	3.95
Average	3.95
Membrane Thickness (in):	0.01
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):	12.18
Initial Volume, AoLo (cu. in):	97.68

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3320.60

4. Soil Properties:

Optimum Moisture Content (%):	12.6
Maximum Dry Density (pcf):	117.5
95% of MDD (pcf):	111.6
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3320.60
Compaction Moisture content (%):	12.9
Compaction Wet Density (pcf):	129.52
Compaction Dry Density (pcf):	114.73
Moisture Content After Mr Test (%):	12.9

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

7. Resilient Modulus, Mr: 7495(Sc)^-0.15366(S3)^0.40190

8. Comments

9. Tested By: GW **Date:** May 15, 2018

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	090430	**Material Code**	SSRVPS
Date Sampled:	4/23/18	**Station No.:**	47+00
Date Tested:	May 15, 2018	**Location:**	18'LT
Name of Project:	PIGEON CREEK STR. & APPRS. (S)		
County:	**Code:** 44 **Name:** MADISON		
Sampled By:	THORNTON/BATES	**Depth:**	0-5
Lab No.:	20180679	**AASHTO Class:**	A-4 (1)
Sample ID:	RV 170	**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	0.00104	0.00013	14,098
Sequence 2	6.0	4.0	47.4	44.6	2.8	3.9	3.7	0.2	0.00220	0.00027	13,315
Sequence 3	6.0	6.0	70.1	66.5	3.6	5.8	5.5	0.3	0.00351	0.00044	12,467
Sequence 4	6.0	8.0	93.8	87.8	6.1	7.7	7.2	0.5	0.00511	0.00064	11,315
Sequence 5	6.0	10.0	117.7	109.1	8.5	9.7	9.0	0.7	0.00681	0.00085	10,561
Sequence 6	4.0	2.0	25.0	22.2	2.8	2.1	1.8	0.2	0.00126	0.00016	11,610
Sequence 7	4.0	4.0	46.8	44.0	2.8	3.8	3.6	0.2	0.00271	0.00034	10,668
Sequence 8	4.0	6.0	68.2	65.4	2.8	5.6	5.4	0.2	0.00434	0.00054	9,913
Sequence 9	4.0	8.0	91.7	86.6	5.2	7.5	7.1	0.4	0.00602	0.00075	9,463
Sequence 10	4.0	10.0	115.3	107.7	7.6	9.5	8.8	0.6	0.00777	0.00097	9,133
Sequence 11	2.0	2.0	24.7	21.9	2.8	2.0	1.8	0.2	0.00163	0.00020	8,831
Sequence 12	2.0	4.0	46.0	43.2	2.8	3.8	3.5	0.2	0.00344	0.00043	8,278
Sequence 13	2.0	6.0	66.6	63.8	2.9	5.5	5.2	0.2	0.00540	0.00067	7,778
Sequence 14	2.0	8.0	88.5	84.2	4.3	7.3	6.9	0.4	0.00745	0.00093	7,442
Sequence 15	2.0	10.0	111.6	104.8	6.8	9.2	8.6	0.6	0.00949	0.00118	7,271

TESTED BY GW DATE May 15, 2018

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.	090430	**Material Code**	SSRVPS
Date Sampled:	4/23/18	**Station No.:**	47+00
Date Tested:	May 15, 2018	**Location:**	18'LT
Name of Project:	PIGEON CREEK STR. & APPRS. (S)		
County:	**Code:** 44 **Name:** MADISON		
Sampled By:	THORNTON/BATES	**Depth:**	0-5
Lab No.:	20180679	**AASHTO Class:**	A-4 (1)
Sample ID:	RV 170	**Material Type (1 or 2):**	2
LATITUDE:		**LONGITUDE:**	

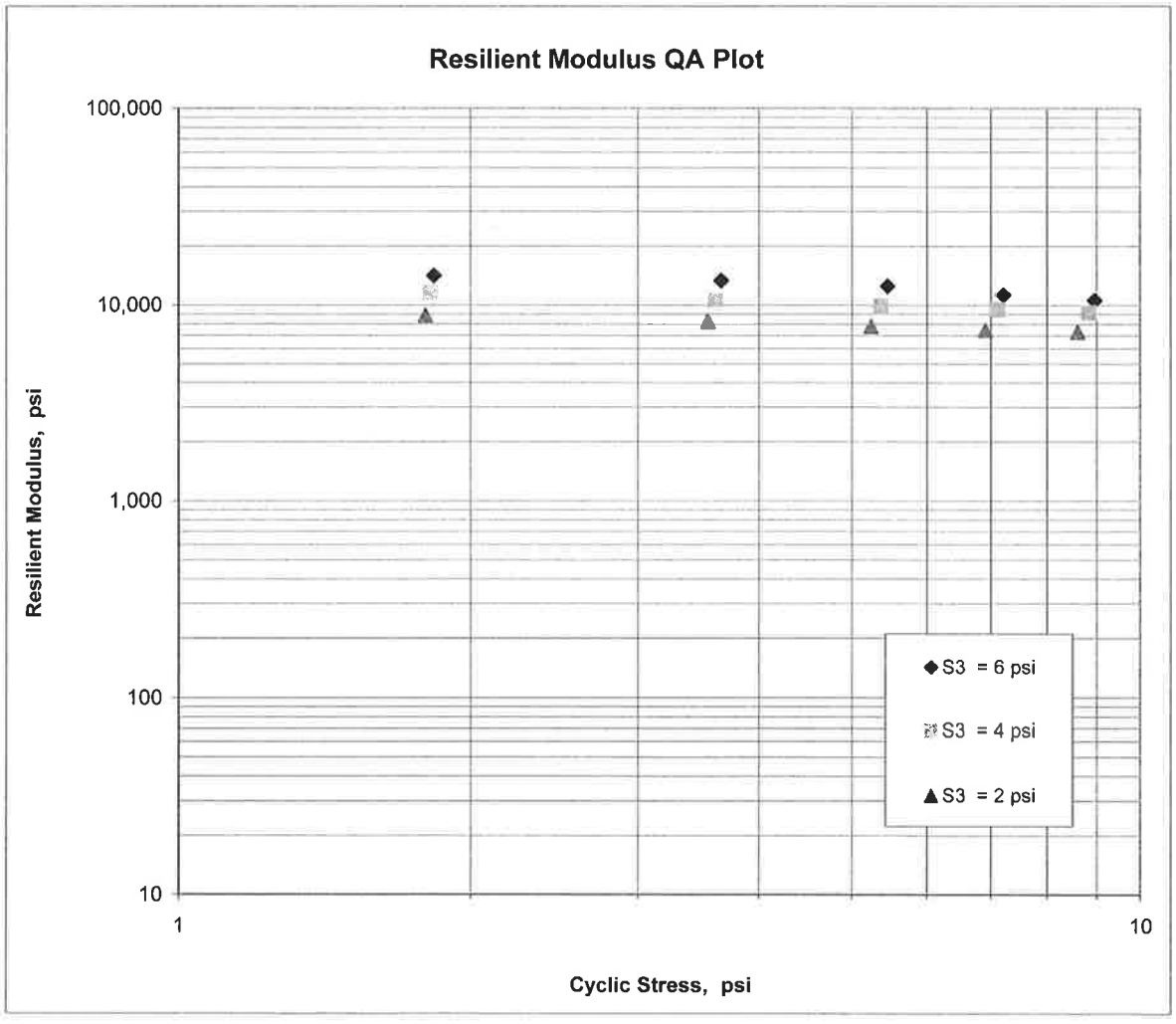
$$M_R = K1\,(S_C)^{K2}\,(S_3)^{K5}$$

K1 = 7,495

K2 = -0.15366

K5 = 0.40190

R^2 = 0.98



JOB: 090430

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

COUNTY NO. 44 **DATE TESTED** 5/8/2018

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					
47+00	18 LT	0-5	BROWN	88	82	76	69	57	25	06	A-4(1)	RV170	
40+00	06 RT	0-3Z	BR/GR	83	77	72	63	50	21	07	A-4(5)	S166	40.3
40+00	18 RT	0-3Z	BR/GR	97	78	65	59	52	36	20	A-6(7)	S167	34.7
47+00	06 LT	0-5	BR/GR	92	84	73	67	62	41	22	A-7-6(11)	S168	20.4
47+00	18 LT	0-5	BROWN	89	82	76	73	69	41	23	A-7-6(14)	S169	18.7

comments: W=MULTIPLE LAYERS

Friday, June 15, 2018

JOB: 090430
JOB NAME: PIGEON CREEK STR. & APPRS. (S)

COUNTY NO. 44

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

DATE TESTED
5/8/2018

PAVEMENT SOUNDINGS

STA.#	LOC.				
40+00	06 RT	BST	ACHMSC	ACHMBC	AGG. BASE CRS CL-7
		4.0	---	**1.5**	**7.0**
40+00	18 RT	BST	ACHMSC	ACHMBC	AGG. BASE CRS CL-7
		---	---	---	---
47+00	06 LT	BST	ACHMSC	ACHMBC	AGG. BASE CRS CL-7
		2.0	**4.0**	**1.5**	**5.0**
47+00	18 LT	BST	ACHMSC	ACHMBC	AGG. BASE CRS CL-7
		---	---	---	---

comments: W=MULTIPLE LAYERS

Friday, June 15, 2018

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

DATE - 06/14/18
JOB NUMBER - 090430
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - PIGEON CREEK STR. & APPRS. (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - MADISON 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 - 44
DISTRICT NO. - 09

DATE SAMPLED - 03/20/18
DATE RECEIVED - 03/23/18
DATE TESTED - 05/08/18

LAB NUMBER	20180675	20180676	20180677
SAMPLE ID	S166	S167	S168
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	40+00	40+00	47+00
LOCATION	06 RT	18 RT	06 LT
DEPTH IN FEET	0-3Z	0-3Z	0-5
MAT'L COLOR	BR/GR	BR/GR	BR/GR
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	36 1 .80	36 01 .60	36 57.50
LONGITUDE DEG-MIN-SEC	93 53 47.50	93 53 47.60	93 53 39.90
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.	100		100
3/8 IN.	88	100	94
NO. 4	83	97	92
NO. 10	77	78	84
NO. 40	72	65	73
NO. 80	63	59	67
NO. 200	50	52	62
LIQUID LIMIT	21	36	41
PLASTICITY INDEX	07	20	22
AASHTO SOIL	A-4(5)	A-6(7)	A-7-6(11)
UNIFIED SOIL			
% MOISTURE CONTENT	40.3	34.7	20.4
BST (IN)	4.0	---	2.0
ACHMSC (IN)	---	---	4.0
ACHMBC (IN)	1.5	---	1.5
AGG. BASE CRS CL-7 (IN)	7.0	---	5.0

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	- 05/08/18	SEQUENCE NO.	- 2
JOB NUMBER	- 090430	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	- 44
SUPPLIER NAME	- STATE	DISTRICT NO.	- 09
NAME OF PROJECT	- PIGEON CREEK STR. & APPRS. (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- MADISON COUNTY	DATE SAMPLED	- 03/20/18
SAMPLED BY	- THORNTON/BATES	DATE RECEIVED	- 03/23/18
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 05/08/18

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

LAB NUMBER	20180678
SAMPLE ID	S169
TEST STATUS	INFORMATION ONLY
STATION	47+00
LOCATION	18 LT
DEPTH IN FEET	0-5
MAT'L COLOR	BROWN
MAT'L TYPE	
LATITUDE DEG-MIN-SEC	36 57.60
LONGITUDE DEG-MIN-SEC	93 53 39.90
% PASSING 2 IN.	
1 1/2 IN.	
3/4 IN.	100
3/8 IN.	97
NO. 4	89
NO. 10	82
NO. 40	76
NO. 80	73
NO. 200	69
LIQUID LIMIT	41
PLASTICITY INDEX	23
AASHTO SOIL	A-7-6(14)
UNIFIED SOIL	
% MOISTURE CONTENT	18.7

BST	(IN)	---
ACHMSC	(IN)	---
ACHMBC	(IN)	---
AGG. BASE CRS CL-7	(IN)	---

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 - 05/08/18
JOB NUMBER - 090430
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - PIGEON CREEK STR. & APPRS. (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - MADISON COUNTY
SAMPLED BY - THORNTON/BATES
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - RESISTANCE R-VALUE ACTUAL RESULTS

SEQUENCE NO. - 1
MATERIAL CODE - RV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 44
DISTRICT NO. - 09

DATE SAMPLED - 03/20/18
DATE RECEIVED - 03/23/18
DATE TESTED - 05/08/18

LAB NUMBER	20180679	
SAMPLE ID	RV170	
TEST STATUS	INFORMATION ONLY	
STATION	47+00	
LOCATION	18 LT	
DEPTH IN FEET	0-5	
MAT'L COLOR	BROWN	
MAT'L TYPE		
LATITUDE DEG-MIN-SEC	36 57.60	
LONGITUDE DEG-MIN-SEC	93 53 39.90	
% PASSING 2 IN.		
1 1/2 IN.		
3/4 IN.	100	
3/8 IN.	94	
NO. 4	88	
NO. 10	82	
NO. 40	76	
NO. 80	69	
NO. 200	57	
LIQUID LIMIT	25	
PLASTICITY INDEX	06	
AASHTO SOIL	A-4(1)	
UNIFIED SOIL		
% MOISTURE CONTENT		

REMARKS - W=MULTIPLE LAYERS

AASHTO TESTS : T24 T88 T89 T90 T265