

ARKANSAS DEPARTMENT OF TRANSPORTATION



**SUBSURFACE INVESTIGATION**

STATE JOB NO. 050324

FEDERAL AID PROJECT NO. NHPP-0067(28)

HURRICANE CREEK STR. & APPRS. (S)

STATE HIGHWAY 354 SECTION 4

IN SHARP 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

May 16, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 050324  
Hurricane Creek Str. & Apprs. (S)  
Route 354 Section 4  
Sharp 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 Hurricane Creek on Highway 354 on new location. 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 moderately plastic cherty clay. Isolated locations of highly plastic clay were encountered within the project limits. The subgrade soils are expected to provide a stable working platform with normal drying and compactive efforts, if the weather is favorable during construction. Rock was encountered at stations 205+00, 18 feet right of centerline at a depth of 3.5 feet; at 205+12, 25 feet right of centerline at a depth of 3.5 feet and at 223+00, 6 feet left of centerline at a depth of 3.5 feet. There were no slide areas observed within the project limits.


Based on currently available cross sections the maximum embankment height is approximately 22 feet. The embankment may be constructed with locally available unspecified material utilizing the 3:1 slope configuration shown.

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 in the vicinity of Ash Flat.
2. Asphalt Concrete Hot Mix

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.5	94.5
Binder Course	4.5	95.5
Base Course	4.0	96.0

  
Michael C. Benson  
Materials Engineer

MCB:pt:bjj

Attachment

cc: State Constr. Eng. – Master File Copy  
District 5 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 - 05/09/2017  
JOB NUMBER - 050324

SEQUENCE NO. - 1  
MATERIAL CODE - SSRV  
SPEC. YEAR - 2014  
SUPPLIER ID. - 1  
COUNTY/STATE - 67  
DISTRICT NO. - 05

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

\*\*\*\*\*  
\* STATION LIMITS R-VALUE AT 240 psi \*  
\*\*\*\*\*

BEGIN JOB - END JOB 8  
  
RESILIENT MODULUS  
STA. 205+12 7388

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REMARKS -

AASHTO TESTS : T190

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

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

<b>Job No.</b>	050324	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	3/29/17	<b>Station No.:</b>	205+12
<b>Date Tested:</b>	May 4, 2017	<b>Location:</b>	25RT
<b>Name of Project:</b>	HURRICANE CREEK STR. & APPRS. (S)		
<b>County:</b>	<b>Code:</b> 67	<b>Name:</b> SHARP	
<b>Sampled By:</b>	THORNTON/TAYLOR		
<b>Lab No.:</b>	20171244	<b>Depth:</b>	0-5
<b>Sample ID:</b>	RV326	<b>AASHTO Class:</b>	A-2-6(0)
<b>LATITUDE:</b>		<b>Material Type (1 or 2):</b>	2
		<b>LONGITUDE:</b>	

**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	3.96
Middle	3.96
Bottom	3.94
Average	3.95
Membrane Thickness (in):	0.00
Height of Specimen, Cap and Base (in):	8.03
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.03
Initial Area, Ao (sq. in):	12.27
Initial Volume, AoLo (cu. in):	98.57

**3. Soil Specimen Weight:**

Weight of Wet Soil Used (g):	3135.60
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**4. Soil Properties:**

Optimum Moisture Content (%):	14.7
Maximum Dry Density (pcf):	107.7
95% of MDD (pcf):	102.3
In-Situ Moisture Content (%):	N/A

**5. Specimen Properties:**

Wet Weight (g):	3135.60
Compaction Moisture content (%):	15.1
Compaction Wet Density (pcf):	121.21
Compaction Dry Density (pcf):	105.31
Moisture Content After Mr Test (%):	14.6

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

**7. Resilient Modulus, Mr:**  $9127(S_c)^{-0.21112}(S_3)^{0.33798}$

**8. Comments** \_\_\_\_\_

**9. Tested By:** GW **Date:** May 4, 2017

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MATERIALS DIVISION**

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**Date Sampled:** 3/29/17      **Station No.:** 205+12  
**Date Tested:** May 4, 2017      **Location:** 25RT  
**Name of Project:** HURRICANE CREEK STR. & APPRS. (S)  
**County:** Code: 67      **Name:** SHARP  
**Sampled By:** THORNTON/TAYLOR  
**Lab No.:** 20171244  
**Sample ID:** RV326  
**LATITUDE:**  
**Depth:** 0-5  
**AASHTO Class:** A-2-6(0)  
**Material Type (1 or 2):** 2  
**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	
												UNIT	
	S <sub>3</sub>	S <sub>cyclic</sub>	P <sub>max</sub>	P <sub>cyclic</sub>	P <sub>contact</sub>	S <sub>max</sub>	S <sub>cyclic</sub>	S <sub>contact</sub>	H <sub>avg</sub>	ε <sub>r</sub>	M <sub>r</sub>	psi	psi
Sequence 1	6.0	2.0	25.4	22.5	2.8	2.1	1.8	0.2	0.00100	0.00012	14,697	14,697	14,697
Sequence 2	6.0	4.0	47.7	44.9	2.8	3.9	3.7	0.2	0.00215	0.00027	13,645	13,645	13,645
Sequence 3	6.0	6.0	70.4	66.7	3.7	5.7	5.4	0.3	0.00353	0.00044	12,374	12,374	12,374
Sequence 4	6.0	8.0	94.0	87.8	6.2	7.7	7.2	0.5	0.00525	0.00065	10,947	10,947	10,947
Sequence 5	6.0	10.0	116.8	108.2	8.6	9.5	8.8	0.7	0.00707	0.00088	10,010	10,010	10,010
Sequence 6	4.0	2.0	25.3	22.5	2.8	2.1	1.8	0.2	0.00121	0.00015	12,158	12,158	12,158
Sequence 7	4.0	4.0	47.2	44.3	2.9	3.8	3.6	0.2	0.00260	0.00032	11,165	11,165	11,165
Sequence 8	4.0	6.0	68.7	65.8	2.8	5.6	5.4	0.2	0.00424	0.00053	10,150	10,150	10,150
Sequence 9	4.0	8.0	92.1	86.8	5.3	7.5	7.1	0.4	0.00594	0.00074	9,552	9,552	9,552
Sequence 10	4.0	10.0	115.4	107.6	7.7	9.4	8.8	0.6	0.00789	0.00098	8,920	8,920	8,920
Sequence 11	2.0	2.0	25.0	22.2	2.8	2.0	1.8	0.2	0.00145	0.00018	9,989	9,989	9,989
Sequence 12	2.0	4.0	46.3	43.5	2.8	3.8	3.5	0.2	0.00314	0.00039	9,062	9,062	9,062
Sequence 13	2.0	6.0	67.0	64.2	2.8	5.5	5.2	0.2	0.00511	0.00064	8,220	8,220	8,220
Sequence 14	2.0	8.0	88.9	84.5	4.4	7.2	6.9	0.4	0.00711	0.00089	7,775	7,775	7,775
Sequence 15	2.0	10.0	111.8	105.0	6.8	9.1	8.6	0.6	0.00930	0.00116	7,388	7,388	7,388

TESTED BY \_\_\_\_\_ DATE May 4, 2017  
 REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_

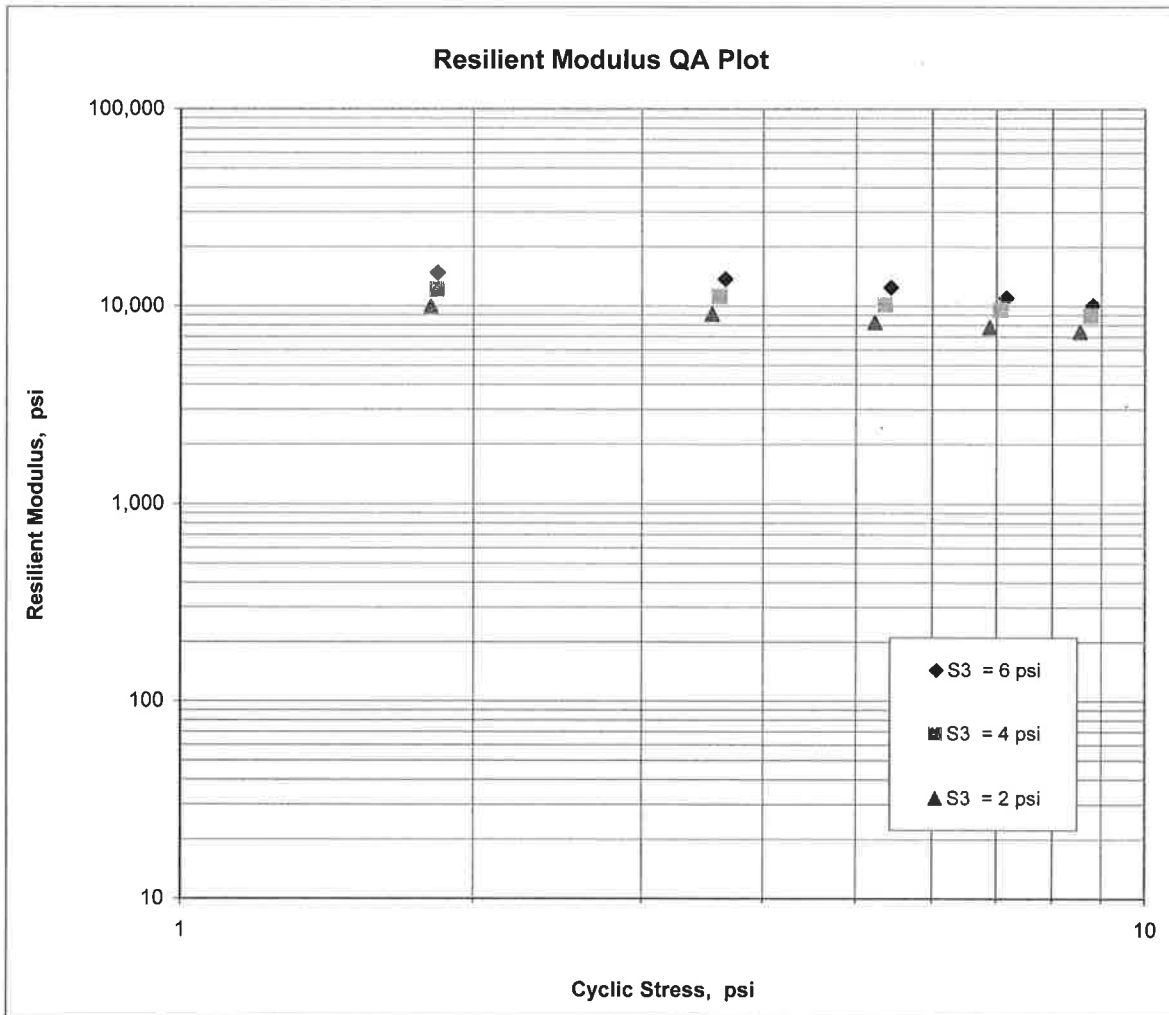
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
MATERIALS DIVISION**

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

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		<b>LONGITUDE:</b>	

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

$K_1 = \underline{9,127}$   
 $K_2 = \underline{-0.21112}$   
 $K_5 = \underline{0.33798}$   
 $R^2 = \underline{0.97}$



JOB: 050324

Arkansas State Highway Transportation Department

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

Materials Division

COUNTY NO. 67 DATE TESTED 4/24/2017

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					
205+12	25 RT	0-3.5Z	BROWN	45	38	33	30	28	35	19	A-2-6(0)	RV326	
205+00	06 RT	0-5	BR/GR	93	82	65	57	53	25	14	A-6(4)	S322	4.8
205+00	18 RT	0-3.5Z	BROWN	64	54	41	36	33	39	23	A-2-6(2)	S323	10.2
223+00	06 LT	0-3.5Z	BROWN	85	60	38	31	28	18	06	A-2-4(0)	S324	5.4
223+00	18 LT	0-5	BROWN	71	63	47	38	35	47	34	A-2-7(5)	S325	7.8

comments: X=STRIPPED, Z=AUGER REFUSAL

Wednesday, May 10, 2017

**JOB:** 050324

**JOB NAME:** HURRICANE CREEK STR. & APPRS.(S)

**COUNTY NO.** 67

**STA.# LOC.**

205+00	06 RT	ACHMSC 3.0X	AGG.BASE CRS CL-7 9.0
205+00	18 RT	ACHMSC	AGG.BASE CRS CL-7
223+00	06 LT	ACHMSC 3.5X	AGG.BASE CRS CL-7 8.0

**Arkansas State Highway Transportation Department  
Materials Division**

**Michael Benson, Materials Engineer**

**PAVEMENT SOUNDINGS**

**DATE TESTED**  
4/24/2017

**comments:** X=STRIPPED, Z=AUGER REFUSAL







