

# ARKANSAS DEPARTMENT OF TRANSPORTATION



## SUBSURFACE INVESTIGATION

STATE JOB NO. 030487

FEDERAL AID PROJECT NO. ER-0041(42)

HURRICANE CREEK STR. & APPRS. (S)

STATE HIGHWAY 234 SECTION 1

IN LITTLE RIVER 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**

March 15, 2017

**TO:** Mr. Trinity Smith, Engineer of Roadway Design

**SUBJECT:** Job No. 030487  
Hurricane Creek Str. & Apprs. (S)  
Route 234 Section 1  
Little River County

Transmitted herewith is the requested Soil Survey test results for the above referenced job. The project consists of replacing the culvert for Hurricane Creek on Highway 234. Samples were obtained in the existing travel lanes and ditch line. There were no paved shoulders within the project.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of non-plastic sands with some gravel. Cross sections are not currently available; it is assumed that the construction grade line will closely match that of the existing roadway. The subgrade soils are expected to provide a stable working platform with normal drying and compactive efforts, if the weather is favorable during construction. No slides were observed within the project limits.

Additional earthwork requirements will be made upon request when plans are further developed.

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 Hatton.
2. Asphalt Concrete Hot Mix

<u>Type</u>	<u>Asphalt Cement %</u>	<u>Mineral Aggregate %</u>
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 3 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 - 03/03/2017  
JOB NUMBER - 030487

SEQUENCE NO. - 1  
MATERIAL CODE - SSRV  
SPEC. YEAR - 2014  
SUPPLIER ID. - 1  
COUNTY/STATE - 41  
DISTRICT NO. - 03

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

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

BEGIN JOB - END JOB 19  
  
RESILIENT MODULUS  
116+00 10199

-----  
REMARKS -

AASHTO TESTS : T190

JOB: 030487

Arkansas State Highway Transportation Department

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

Materials Division

COUNTY NO. 41 DATE TESTED 3/3/2017

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR						L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				#4	#10	#40	#80	#200					
116+00	17 LT	0-5	BROWN	87	83	77	64	50	ND	NP	A-4(0)	RV135	
113+00	05 RT	0-5	BROWN	92	86	79	66	53	ND	NP	A-4(0)	S131	17.7
113+00	15 RT	0-5	BROWN	86	80	74	65	53	ND	NP	A-4(0)	S132	13.4
116+00	05 LT	0-5	BROWN	85	76	68	57	46	ND	NP	A-4(0)	S133	13.1
116+00	17 LT	0-5	BROWN	95	88	82	68	52	ND	NP	A-4(0)	S134	11.1

comments:

Wednesday, March 08, 2017

**JOB:** 030487

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

**COUNTY NO.** 41

**STA.# LOC.**

*Arkansas State Highway Transportation Department*

*Materials Division*

*Michael Benson, Materials Engineer*

**DATE TESTED**

3/3/2017

**PAVEMENT SOUNDINGS**

113+00	15 RT	ACHMSC	ACHMSC	AGG.BASE CRS CL-5
113+00	05 RT	ACHMSC	ACHMSC	AGG.BASE CRS CL-5
		2.0		12.0
116+00	05 LT	ACHMSC	ACHMSC	AGG.BASE CRS CL-5
		2.0		14.0

**Comments:**

Wednesday, March 08, 2017

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

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

<b>Job No.</b>	030487	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	2/13/17	<b>Station No.:</b>	116+00
<b>Date Tested:</b>	March 2, 2017	<b>Location:</b>	17LT
<b>Name of Project:</b>	HURRICANE CREEK STR. & APPRS. (S)		
<b>County:</b>	<b>Code:</b> 41	<b>Name:</b>	LITTLE RIVER
<b>Sampled By:</b>	D.DICKERSON	<b>Depth:</b>	0-5
<b>Lab No.:</b>	20170575	<b>AASHTO Class:</b>	A-4(0)
<b>Sample ID:</b>	RV135	<b>Material Type (1 or 2):</b>	2
<b>LATITUDE:</b>		<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	3.95
Middle	3.95
Bottom	3.94
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):	12.16
Initial Volume, AoLo (cu. in):	97.52

**3. Soil Specimen Weight:**

Weight of Wet Soil Used (g):	3275.80
------------------------------	---------

**4. Soil Properties:**

Optimum Moisture Content (%):	9.2
Maximum Dry Density (pcf):	122.3
95% of MDD (pcf):	116.2
In-Situ Moisture Content (%):	N/A

**5. Specimen Properties:**

Wet Weight (g):	3275.80
Compaction Moisture content (%):	9.0
Compaction Wet Density (pcf):	127.99
Compaction Dry Density (pcf):	117.43
Moisture Content After Mr Test (%):	8.9

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

**7. Resilient Modulus, Mr:** 9455(Sc)<sup>-0.08470</sup>(S3)<sup>0.34246</sup>

**8. Comments**

---



---

**9. Tested By:** G.W. **Date:** March 2, 2017

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

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

**Job No.** 030487      **Material Code** SSRVPS  
**Date Sampled:** 2/13/17      **Station No.:** 116+00  
**Date Tested:** March 2, 2017      **Location:** 17/LT  
**Name of Project:** HURRICANE CREEK STR. & APPRS. (S)  
**County:** Code: 41      **Name:** LITTLE RIVER  
**Sampled By:** D.DICKERSON      **Depth:** 0-5  
**Lab No.:** 20170575      **AASTHO Class:** A-4(0)  
**Sample ID:** RV135      **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
	S <sub>3</sub> psi	S <sub>cyclic</sub> psi	P <sub>max</sub> lbs	P <sub>cyclic</sub> lbs	P <sub>contact</sub> lbs	S <sub>max</sub> psi	S <sub>cyclic</sub> psi	S <sub>contact</sub> psi	H <sub>avg</sub> in	ε <sub>r</sub> in/in	M <sub>r</sub> psi
Sequence 1	6.0	2.0	25.2	22.5	2.7	2.1	1.8	0.2	0.00090	0.00011	16,535
Sequence 2	6.0	4.0	47.6	44.8	2.8	3.9	3.7	0.2	0.00184	0.00023	16,096
Sequence 3	6.0	6.0	70.7	67.1	3.6	5.8	5.5	0.3	0.00284	0.00035	15,603
Sequence 4	6.0	8.0	95.1	89.1	6.1	7.8	7.3	0.5	0.00397	0.00050	14,788
Sequence 5	6.0	10.0	119.4	111.0	8.5	9.8	9.1	0.7	0.00503	0.00063	14,550
Sequence 6	4.0	2.0	25.1	22.3	2.8	2.1	1.8	0.2	0.00103	0.00013	14,319
Sequence 7	4.0	4.0	47.2	44.4	2.8	3.9	3.7	0.2	0.00220	0.00027	13,282
Sequence 8	4.0	6.0	69.2	66.4	2.8	5.7	5.5	0.2	0.00343	0.00043	12,768
Sequence 9	4.0	8.0	93.6	88.4	5.2	7.7	7.3	0.4	0.00469	0.00058	12,439
Sequence 10	4.0	10.0	118.0	110.3	7.6	9.7	9.1	0.6	0.00581	0.00072	12,520
Sequence 11	2.0	2.0	24.9	22.1	2.8	2.0	1.8	0.2	0.00125	0.00016	11,632
Sequence 12	2.0	4.0	46.4	43.6	2.8	3.8	3.6	0.2	0.00269	0.00034	10,695
Sequence 13	2.0	6.0	67.8	64.9	2.8	5.6	5.3	0.2	0.00419	0.00052	10,234
Sequence 14	2.0	8.0	91.1	86.8	4.3	7.5	7.1	0.4	0.00561	0.00070	10,199
Sequence 15	2.0	10.0	115.4	108.7	6.7	9.5	8.9	0.6	0.00695	0.00087	10,313

TESTED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_

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

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

<b>Job No.</b>	030487	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	2/13/17	<b>Station No.:</b>	116+00
<b>Date Tested:</b>	March 2, 2017	<b>Location:</b>	17'LT
<b>Name of Project:</b>	HURRICANE CREEK STR. & APPRS. (S)		
<b>County:</b>	<b>Code:</b> 41	<b>Name:</b>	LITTLE RIVER
<b>Sampled By:</b>	D.DICKERSON		
<b>Lab No.:</b>	20170575	<b>Depth:</b>	0-5
<b>Sample ID:</b>	RV135	<b>AASHTO Class:</b>	A-4(0)
<b>LATITUDE:</b>		<b>Material Type (1 or 2):</b>	2
		<b>LONGITUDE:</b>	

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

$K_1 =$	<u>9,455</u>
$K_2 =$	<u>-0.08470</u>
$K_5 =$	<u>0.34246</u>
$R^2 =$	<u>0.98</u>







