

**ARKANSAS DEPARTMENT OF TRANSPORTATION**



**SUBSURFACE INVESTIGATION**

STATE JOB NO. 100871

FEDERAL AID PROJECT NO. NHPP-0047(53)

HWY. 14 STR. & APPRS. (S)

STATE HIGHWAY 14 SECTION 16

IN MISSISSIPPI 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

January 31, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 100871  
Hwy. 14 Str. & Apprs. (S)  
Route 14 Section 16  
Mississippi 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 a bridge on Highway 14. 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 to highly plastic clays containing some sand. Cross sections are not currently available. Seismic considerations are expected to be very significant for this project. Fully reinforced embankment is anticipated. Earthwork requirements will be provided with the subsurface investigation report.

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 Osceola.

2. Asphalt Concrete Hot Mix

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.1	94.9
Binder Course	4.2	95.8
Base Course	3.8	96.2

  
Michael C. Benson  
Materials Engineer

MCB:pt:bjj

Attachment

cc: State Constr. Eng. – Master File Copy  
District 10 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 - 01/26/2017  
JOB NUMBER - 100871

SEQUENCE NO. - 1  
MATERIAL CODE - SSRV  
SPEC. YEAR - 2014  
SUPPLIER ID. - 1  
COUNTY/STATE - 47  
DISTRICT NO. - 10

JOB NAME - HWY.14 STR. & APPRS. (S)

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

BEGIN JOB - END JOB LESS THAN 5  
  
RESILIENT MODULEUS  
120+00 7587

-----  
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>	100871	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	12/28/16	<b>Station No.:</b>	120+00
<b>Date Tested:</b>	January 25, 2017	<b>Location:</b>	22LT
<b>Name of Project:</b>	HWY. 14 STR. & APPRS. (S)		
<b>County:</b>	<b>Code:</b> 47	<b>Name:</b>	MISSISSIPPI
<b>Sampled By:</b>	THORNTON/TAYLOR		
<b>Lab No.:</b>	20164179	<b>Depth:</b>	0-5
<b>Sample ID:</b>	RV537	<b>AASHTO Class:</b>	A-6(8)
<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	3.97
Bottom	3.97
Average	3.97
Membrane Thickness (in):	0.01
Height of Specimen, Cap and Base (in):	8.04
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.04
Initial Area, Ao (sq. in):	12.28
Initial Volume, AoLo (cu. in):	98.76

**3. Soil Specimen Weight:**

Weight of Wet Soil Used (g):	3000.20
------------------------------	---------

**4. Soil Properties:**

Optimum Moisture Content (%):	19.9
Maximum Dry Density (pcf):	101.6
95% of MDD (pcf):	96.5
In-Situ Moisture Content (%):	N/A

**5. Specimen Properties:**

Wet Weight (g):	3000.20
Compaction Moisture content (%):	20.1
Compaction Wet Density (pcf):	115.75
Compaction Dry Density (pcf):	96.38
Moisture Content After Mr Test (%):	20.1

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

#VALUE!

**7. Resilient Modulus, Mr:**

12006(Sc)<sup>-0.23973</sup>(S3)<sup>0.11063</sup>

**8. Comments**

\_\_\_\_\_

\_\_\_\_\_

**9. Tested By:**

G.W.

**Date:** January 25, 2017

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

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

**Job No.** 100871      **Material Code** SSRVPS  
**Date Sampled:** 12/28/16      **Station No.:** 120+00  
**Date Tested:** January 25, 2017      **Location:** 22/LT  
**Name of Project:** HWY. 14 STR. & APPRS. (S)  
**County:** Code: 47      **Name:** MISSISSIPPI  
**Sampled By:** THORNTON/TAYLOR      **Depth:** 0-5  
**Lab No.:** 20164179      **AASHTO Class:** A-6(8)  
**Sample ID:** RV537      **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	25.4	22.6	2.8	2.1	1.8	0.2	0.00118	0.00015	12,479
Sequence 2	6.0	4.0	47.6	44.8	2.8	3.9	3.6	0.2	0.00253	0.00031	11,598
Sequence 3	6.0	6.0	70.1	66.4	3.7	5.7	5.4	0.3	0.00418	0.00052	10,389
Sequence 4	6.0	8.0	93.1	86.9	6.2	7.6	7.1	0.5	0.00634	0.00079	8,978
Sequence 5	6.0	10.0	115.0	106.4	8.6	9.4	8.7	0.7	0.00870	0.00108	8,004
Sequence 6	4.0	2.0	25.3	22.5	2.8	2.1	1.8	0.2	0.00128	0.00016	11,483
Sequence 7	4.0	4.0	47.4	44.6	2.8	3.9	3.6	0.2	0.00274	0.00034	10,664
Sequence 8	4.0	6.0	68.9	66.1	2.8	5.6	5.4	0.2	0.00445	0.00055	9,716
Sequence 9	4.0	8.0	91.8	86.5	5.2	7.5	7.0	0.4	0.00649	0.00081	8,726
Sequence 10	4.0	10.0	114.4	106.6	7.7	9.3	8.7	0.6	0.00879	0.00109	7,941
Sequence 11	2.0	2.0	25.3	22.5	2.8	2.1	1.8	0.2	0.00139	0.00017	10,611
Sequence 12	2.0	4.0	47.2	44.3	2.8	3.8	3.6	0.2	0.00296	0.00037	9,804
Sequence 13	2.0	6.0	68.5	65.7	2.8	5.6	5.3	0.2	0.00476	0.00059	9,028
Sequence 14	2.0	8.0	90.7	86.4	4.4	7.4	7.0	0.4	0.00684	0.00085	8,259
Sequence 15	2.0	10.0	112.9	106.1	6.8	9.2	8.6	0.6	0.00915	0.00114	7,587

TESTED BY \_\_\_\_\_ DATE January 25, 2017  
 REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_

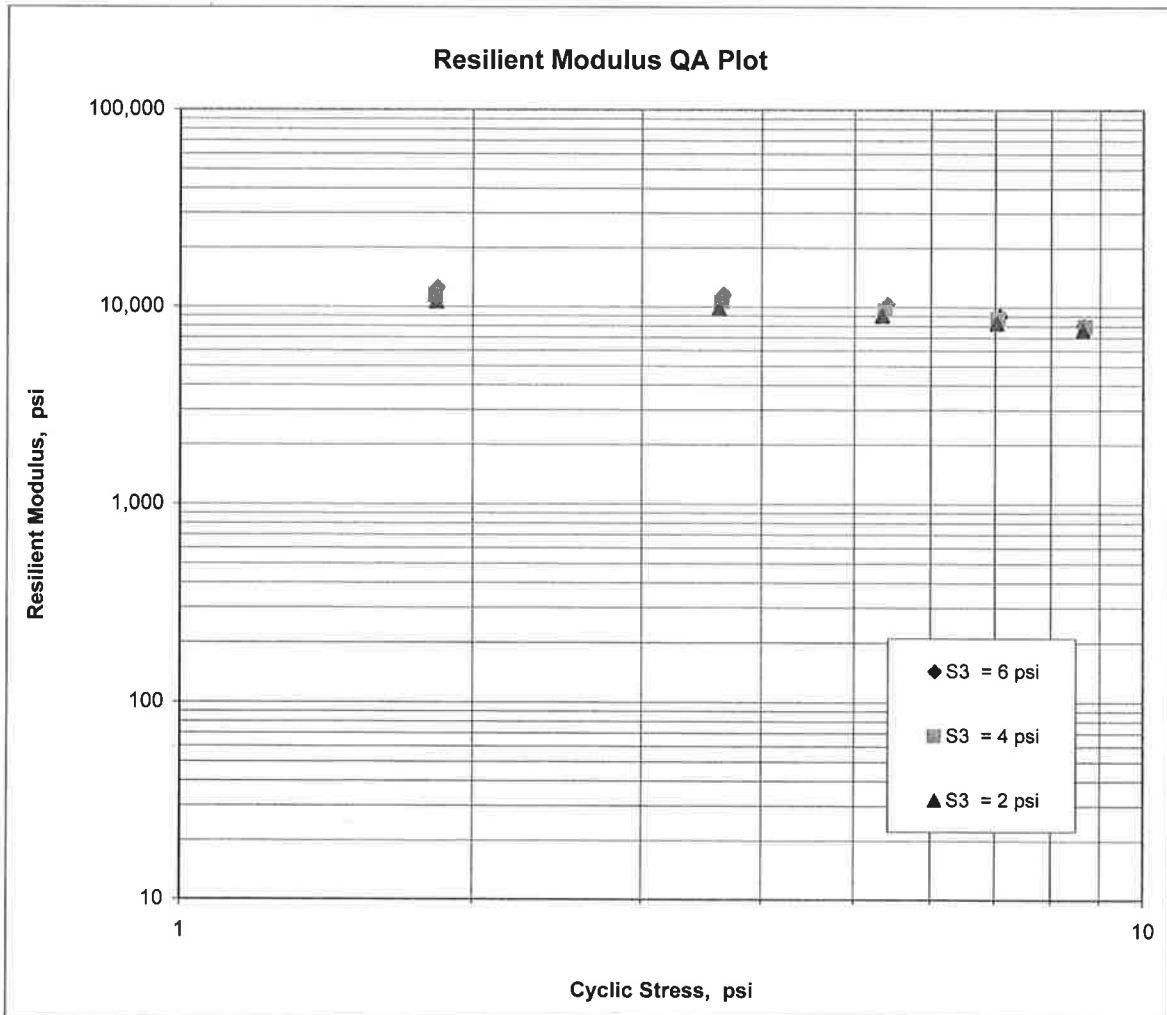
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
MATERIALS DIVISION**

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

<b>Job No.</b>	100871	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	12/28/16	<b>Station No.:</b>	120+00
<b>Date Tested:</b>	January 25, 2017	<b>Location:</b>	22'LT
<b>Name of Project:</b>	HWY. 14 STR. & APPRS. (S)		
<b>County:</b>	<b>Code:</b> 47	<b>Name:</b>	MISSISSIPPI
<b>Sampled By:</b>	THORNTON/TAYLOR		<b>Depth:</b> 0-5
<b>Lab No.:</b>	20164179	<b>AASHTO Class:</b>	A-6(8)
<b>Sample ID:</b>	RV537	<b>Material Type (1 or 2):</b>	2
<b>LATITUDE:</b>		<b>LONGITUDE:</b>	

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

$K_1 = \underline{\underline{12,006}}$   
 $K_2 = \underline{\underline{-0.23973}}$   
 $K_5 = \underline{\underline{0.11063}}$   
 $R^2 = \underline{\underline{0.90}}$



**JOB: 100871**

**JOB NAME: HWY.14 STR. & APPRS. (S)**

**Arkansas State Highway Transportation Department  
Materials Division**

**DATE TESTED  
1/11/2017**

**COUNTY NO. 47**

**Michael Benson, Materials Engineer**

**STA.# LOC.**

**PAVEMENT SOUNDINGS**

102+00	21RT	BST	PCCP	AGG BASE CRS CL-7
		--	--	--
102+00	06RT	BST	PCCP	AGG BASE CRS CL-7
		--	8.0	8.0
108+00	21LT	PCCP	AGG.BASE CRS CL-7	
		--	--	--
108+00	06LT	BST	PCCP	AGG BASE CRS CL-7
		1.5	8.0	8.0
115+00	21RT	PCCP	AGG.BASE CRS CL-7	
		--	--	--
115+00	06RT	PCCP	AGG.BASE CRS CL-7	
		8.0	7.0	
120+00	21LT	PCCP	AGG.BASE CRS CL-7	
		--	--	--
120+00	6LT	PCCP	AGG.BASE CRS CL-7	
		8.0	8.0	

**comments:**

**JOB: 100871**

**Arkansas State Highway Transportation Department**

**JOB NAME: HWY.14 STR. & APPRS. (S)**

**Materials Division**

**COUNTY NO. 47 DATE TESTED 1/11/2017**

**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					
120+00	22LT	0-5	GRAY	97	95	93	85	69	30	16	A-6(8)	RV537	
102+00	06RT	0-5	GRAY	98	97	94	90	83	65	42	A-7-6(37)	S529	40.7
102+00	21RT	0-5	GRAY	99	99	97	90	68	37	23	A-6(13)	S530	36
108+00	06LT	0-5	GRAY	100	99	98	95	88	65	43	A-7-6(41)	S531	31.7
108+00	21LT	0-5	GRAY	96	95	91	82	58	31	17	A-6(7)	S532	28.1
115+00	06RT	0-5	GRAY	99	98	94	88	77	50	30	A-7-6(23)	S533	32.8
115+00	21RT	0-5	GRAY	99	98	94	85	72	43	27	A-7-6(18)	S534	30.6
120+00	6LT	0-5	GRAY	98	96	94	89	83	56	34	A-7-6(30)	S535	35.5
120+00	21LT	0-5	GRAY	99	99	97	94	87	45	29	A-7-6(25)	S536	32.4

**comments:**

**Friday, January 27, 2017**









