

**ARKANSAS DEPARTMENT OF TRANSPORTATION**



**SUBSURFACE INVESTIGATION**

STATE JOB NO. 020584

FEDERAL AID PROJECT NO. NHPP-0035(50)

SANDY BAYOU STR. & APPRS. (S)

STATE HIGHWAY 54 SECTION 9

IN JEFFERSON 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 7, 2017

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

**SUBJECT:** Job No. 020584  
Sandy Bayou Str. & Apprs. (S)  
Route 54 Section 9  
Jefferson 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 Sandy Bayou on Highway 54. Samples were obtained in the existing travel lanes and ditch line.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of highly plastic clay. 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. If soil remediation is needed to allow construction to proceed during adverse weather conditions or if a stable working platform cannot be obtained with normal drying and compactive effort, stabilization with lime is the most appropriate remediation technique. It is recommended that the addition of 4% lime (by dry weight) mixed to a depth of 16" be used for soil stabilization quantity estimation purposes; however, if the Engineer determines that stabilization is necessary, field trials or local experience may dictate that a stable working platform can be achieved at a lower lime content.

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 near Little Rock.
2. Asphalt Concrete Hot Mix

<b>PG 64-22</b>		
<b>Type</b>	<b>Asphalt Cement %</b>	<b>Mineral Aggregate %</b>
Surface Course	5.2	94.8
Binder Course	4.2	95.8
Base Course	3.5	96.5

<b>PG 70-22</b>		
<b>Type</b>	<b>Asphalt Cement %</b>	<b>Mineral Aggregate %</b>
Surface Course	5.1	94.9
Binder Course	4.3	95.7
Base Course	3.8	96.2

<u>Type</u>	<b>PG 76-22</b>	
	<b>Asphalt Cement %</b>	<b>Mineral Aggregate %</b>
Surface Course	5.2	94.8
Binder Course	4.3	95.7
Base Course	3.6	96.4



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 - 03/01/2017  
JOB NUMBER - 020584

SEQUENCE NO. - 1  
MATERIAL CODE - SSRV  
SPEC. YEAR - 2014  
SUPPLIER ID. - 1  
COUNTY/STATE - 35  
DISTRICT NO. - 02

JOB NAME - SANDY BAYOU STR. & APPRS.(S)

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

BEGIN JOB - END JOB LESS THAN 5

RESILIENT MODULUS  
110+00 10976

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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>	020584	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	2/1/2017	<b>Station No.:</b>	110+00
<b>Date Tested:</b>	February 28, 2017	<b>Location:</b>	23'RT
<b>Name of Project:</b>			
<b>County:</b>	<b>Code:</b> 35	<b>Name:</b> JEFFERSON	
<b>Sampled By:</b>	THORNTON/BATES	<b>Depth:</b>	0-5
<b>Lab No.:</b>	20170418	<b>AASHTO Class:</b>	A-7-6(36)
<b>Sample ID:</b>	RV117	<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	3.94
Bottom	3.96
Average	3.95
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):	12.18
Initial Volume, AoLo (cu. in):	98.05

**3. Soil Specimen Weight:**

Weight of Wet Soil Used (g):	2774.90
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**4. Soil Properties:**

Optimum Moisture Content (%):	24.5
Maximum Dry Density (pcf):	92.1
95% of MDD (pcf):	87.5
In-Situ Moisture Content (%):	N/A

**5. Specimen Properties:**

Wet Weight (g):	2774.90
Compaction Moisture content (%):	25.0
Compaction Wet Density (pcf):	107.84
Compaction Dry Density (pcf):	86.27
Moisture Content After Mr Test (%):	25.0

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

#VALUE!

**7. Resilient Modulus, Mr:**

11149(Sc)^-0.07009(S3)^0.17109

**8. Comments**

\_\_\_\_\_

\_\_\_\_\_

**9. Tested By:**

G.WENDLAND

**Date:** February 28, 2017

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

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

**Job No.** 020584 **Material Code** SSRVPS  
**Date Sampled:** 2/1/2017 **Station No.:** 110+00  
**Date Tested:** February 28, 2017 **Location:** 23'RT

**Name of Project:** **Name:** JEFFERSON  
**County:** **Code:** 35 **Depth:** 0-5  
**Sampled By:** THORNTON/BATES **AASHTO Class:** A-7-6(36)  
**Lab No.:** 20170418 **Material Type (1 or 2):** 2  
**Sample ID:** RV117 **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	25.1	22.5	2.6	2.1	1.9	0.2	0.00101	0.00013	14,683
Sequence 2	6.0	4.0	47.0	44.5	2.6	3.9	3.7	0.2	0.00207	0.00026	14,191
Sequence 3	6.0	6.0	69.6	66.1	3.5	5.7	5.4	0.3	0.00318	0.00040	13,744
Sequence 4	6.0	8.0	92.5	86.7	5.9	7.6	7.1	0.5	0.00448	0.00056	12,796
Sequence 5	6.0	10.0	115.3	106.9	8.4	9.5	8.8	0.7	0.00589	0.00073	11,990
Sequence 6	4.0	2.0	25.0	22.3	2.7	2.0	1.8	0.2	0.00107	0.00013	13,709
Sequence 7	4.0	4.0	46.9	44.2	2.7	3.8	3.6	0.2	0.00217	0.00027	13,493
Sequence 8	4.0	6.0	68.5	65.8	2.7	5.6	5.4	0.2	0.00335	0.00042	12,972
Sequence 9	4.0	8.0	91.7	86.6	5.1	7.5	7.1	0.4	0.00458	0.00057	12,504
Sequence 10	4.0	10.0	114.4	107.0	7.5	9.4	8.8	0.6	0.00593	0.00074	11,924
Sequence 11	2.0	2.0	24.8	22.0	2.8	2.0	1.8	0.2	0.00130	0.00016	11,161
Sequence 12	2.0	4.0	46.8	44.0	2.8	3.8	3.6	0.2	0.00258	0.00032	11,289
Sequence 13	2.0	6.0	68.3	65.4	2.9	5.6	5.4	0.2	0.00382	0.00047	11,333
Sequence 14	2.0	8.0	90.8	86.5	4.3	7.5	7.1	0.4	0.00509	0.00063	11,237
Sequence 15	2.0	10.0	113.8	107.1	6.7	9.3	8.8	0.6	0.00645	0.00080	10,976

TESTED BY \_\_\_\_\_ DATE February 28, 2017  
 REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
MATERIALS DIVISION

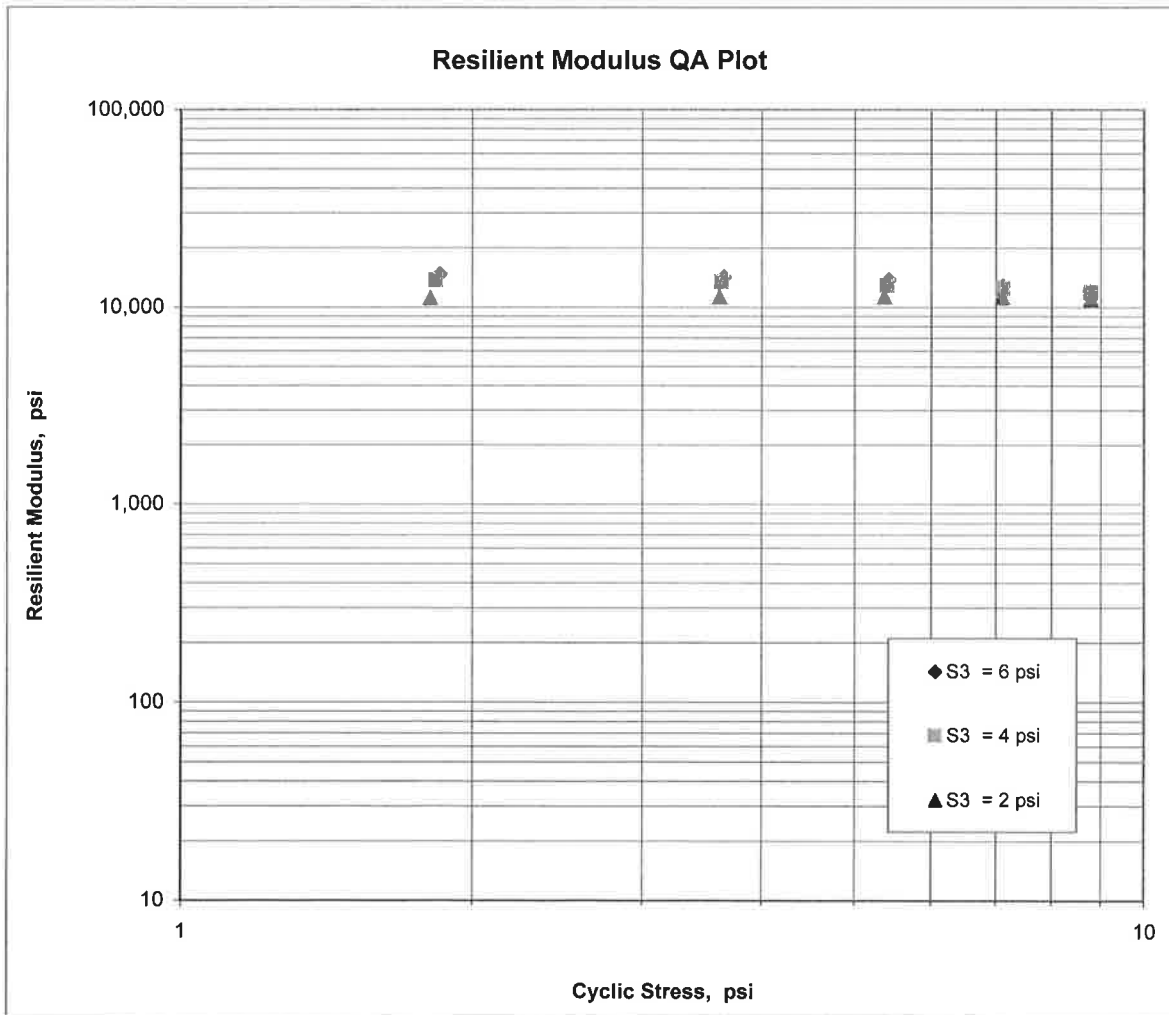
AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS  
RECOMPACTED / THINWALL TUBE SAMPLES

Job No. 020584  
Date Sampled: 2/1/2017  
Date Tested: February 28, 2017  
Name of Project:  
County: Code: 35 Name: JEFFERSON  
Sampled By: THORNTON/BATES  
Lab No.: 20170418  
Sample ID: RV117  
LATITUDE:

Material Code SSRVPS  
Station No.: 110+00  
Location: 23'RT  
Depth: 0-5  
AASHTO Class: A-7-6(36)  
Material Type (1 or 2): 2  
LONGITUDE:

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

$K_1 = 11,149$   
 $K_2 = -0.07009$   
 $K_5 = 0.17109$   
 $R^2 = 0.85$



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE	- 02/24/17	SEQUENCE NO.	- 1
JOB NUMBER	- 020584	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	- 35
SUPPLIER NAME	- STATE	DISTRICT NO.	- 02
NAME OF PROJECT - SANDY BAYOU STR. & APPRS.(S)			
PROJECT ENGINEER - NOT APPLICABLE			
PIT/QUARRY	- ARKANSAS		
LOCATION	- JEFFERSON, COUNTY	DATE SAMPLED	- 02/02/17
SAMPLED BY	- THORNTON/BATES	DATE RECEIVED	- 02/03/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 02/14/17
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

LAB NUMBER	- 20170414	- 20170415	- 20170416
SAMPLE ID	- S113	- S114	- S115
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 110+00	- 110+00	- 117+00
LOCATION	- 06RT	- 22RT	- 06LT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BROWN	- BROWN	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 34 6 1.70	- 34 06 1.60	- 34 6 1.70
LONGITUDE DEG-MIN-SEC	- 92 00 9.30	- 92 00 9.30	- 92 00 1.10
% PASSING			
2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	-	-	- 100
3/8 IN.	- 100	-	- 99
NO. 4	- 98	- 100	- 98
NO. 10	- 97	-	- 96
NO. 40	- 93	-	- 92
NO. 80	- 86	-	- 87
NO. 200	- 74	- 91	- 81
LIQUID LIMIT	- 32	- 56	- 52
PLASTICITY INDEX	- 15	- 31	- 37
AASHTO SOIL	- A-6(9)	- A-7-6(32)	- A-7-6(30)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 21.2	- 42.2	- 16.8
ACHMSC (IN)	- 7.5W	-	- 4.5WX
AGG.BASE CRS CL-7 (IN)	- 6.0	-	- 6.0

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265







**JOB:** 020584

**JOB NAME:** SANDY BAYOU STR. & APPRS.(S)

*Arkansas State Highway Transportation Department*

*Materials Division*

*Michael Benson, Materials Engineer*

**DATE TESTED**

2/14/2017

**COUNTY NO.** 35

**STA.# LOC.**

**PAVEMENT SOUNDINGS**

110+00	22RT	ACHMSC	AGG.BASE CRS CL-7
110+00	06RT	ACHMSC	AGG.BASE CRS CL-7
117+00	06LT	ACHMSC	AGG.BASE CRS CL-7
		4.5WX	6.0

**Comments:** W=MULTIPLE LAYERS,X=STRIPPED

*Monday, March 06, 2017*

**JOB: 020584**

**Arkansas State Highway Transportation Department**

**JOB NAME: SANDY BAYOU STR. & APPRS.(S)**

**Materials Division**

**COUNTY NO. 35 DATE TESTED 2/14/2017**

**Michael Benson, Materials Engineer**

STA.#	LOC.	DEPTH	COLOR						L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				#4	#10	#40	#80	#200					
110+00	23RT	0-5	BROWN	99	97	93	91	87	59	39	A-7-6(36)	RV117	
110+00	06RT	0-5	BROWN	98	97	93	86	74	32	15	A-6(9)	S113	21.2
110+00	22RT	0-5	BROWN	100				91	56	31	A-7-6(32)	S114	42.2
117+00	06LT	0-5	BROWN	98	96	92	87	81	52	37	A-7-6(30)	S115	16.8
117+00	19LT	0-5	BROWN	97	95	91	87	81	51	34	A-7-6(28)	S116	40.7

**comments:**

**Monday, March 06, 2017**