

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 020582

FEDERAL AID PROJECT NO. NHPP-0001(94)

KING BAYOU STR. & APPRS. (S)

STATE HIGHWAY 343 SECTION 1

IN ARKANSAS 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

April 6, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 020582
King Bayou Str. & Apprs. (S)
Route 343 Section 1
Chicot 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 King Bayou on Highway 144. 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 highly plastic clay with some sand. 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 efforts, 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 inches be used for 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. 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 Little Rock.
2. Asphalt Concrete Hot Mix

<u>Type</u>	<u>Asphalt Cement %</u>	<u>Mineral Aggregate %</u>
Surface Course	5.2	94.8
Binder Course	4.2	95.8
Base Course	3.5	96.5


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 - 04/06/2017
JOB NUMBER - 020582

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 01
DISTRICT NO. - 02

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

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB	LESS THAN 5
RESILIENT MODULUS	
STA. 103+10	7919

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.	020582	Material Code	SSRVPS
Date Sampled:	2/16/17	Station No.:	103+10
Date Tested:	March 28, 2017	Location:	21RT
Name of Project:	KING BAYOU STR. & APPRS.		
County:	Code: 1	Name: ARKANSAS	
Sampled By:	THORNTON/TAYLOR		Depth: 0-5
Lab No.:	20170633	AASHTO Class:	A-7-6(27)
Sample ID:	RV181	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	3.94
Middle	3.95
Bottom	3.95
Average	3.95
Membrane Thickness (in):	0.01
Height of Specimen, Cap and Base (in):	8
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8
Initial Area, Ao (sq. in):	12.16
Initial Volume, AoLo (cu. in):	97.27

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	2982.80
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4. Soil Properties:

Optimum Moisture Content (%):	20.6
Maximum Dry Density (pcf):	99.9
95% of MDD (pcf):	94.9
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	2982.80
Compaction Moisture content (%):	22.1
Compaction Wet Density (pcf):	116.84
Compaction Dry Density (pcf):	95.69
Moisture Content After Mr Test (%):	21.2

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

7. Resilient Modulus, Mr: $13055(S_c)^{-0.25939}(S_3)^{0.12165}$

8. Comments

9. Tested By: GW **Date:** March 28, 2017

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

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

Job No. 020582 **Material Code** SSRVPS
Date Sampled: 2/16/17 **Station No.:** 103+10
Date Tested: March 28, 2017 **Location:** 2IRT
Name of Project: KING BAYOU STR. & APPRS.
County: Code: 1 **Name:** ARKANSAS
Sampled By: THORNTON/TAYLOR **Depth:** 0-5
Lab No.: 20170633 **AASHTO Class:** A-7-6(27)
Sample ID: RV181 **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	psi	psi	lbs	lbs	lbs	psi	psi	psi	in	in/in	psi
Sequence 1	6.0	2.0	25.2	22.4	2.8	2.1	1.8	0.2	0.00108	0.00013	13,672
Sequence 2	6.0	4.0	47.3	44.5	2.8	3.9	3.7	0.2	0.00232	0.00029	12,612
Sequence 3	6.0	6.0	69.6	66.0	3.6	5.7	5.4	0.3	0.00388	0.00049	11,182
Sequence 4	6.0	8.0	91.8	85.7	6.1	7.5	7.1	0.5	0.00593	0.00074	9,513
Sequence 5	6.0	10.0	112.5	104.0	8.5	9.3	8.6	0.7	0.00835	0.00104	8,201
Sequence 6	4.0	2.0	25.3	22.5	2.8	2.1	1.8	0.2	0.00117	0.00015	12,654
Sequence 7	4.0	4.0	47.1	44.3	2.8	3.9	3.6	0.2	0.00251	0.00031	11,602
Sequence 8	4.0	6.0	68.5	65.6	2.8	5.6	5.4	0.2	0.00408	0.00051	10,570
Sequence 9	4.0	8.0	91.1	85.9	5.1	7.5	7.1	0.4	0.00596	0.00075	9,480
Sequence 10	4.0	10.0	112.4	104.9	7.6	9.2	8.6	0.6	0.00827	0.00103	8,344
Sequence 11	2.0	2.0	25.2	22.3	2.8	2.1	1.8	0.2	0.00132	0.00017	11,105
Sequence 12	2.0	4.0	47.0	44.2	2.8	3.9	3.6	0.2	0.00280	0.00035	10,375
Sequence 13	2.0	6.0	68.2	65.4	2.8	5.6	5.4	0.2	0.00443	0.00055	9,716
Sequence 14	2.0	8.0	89.8	85.6	4.3	7.4	7.0	0.4	0.00639	0.00080	8,804
Sequence 15	2.0	10.0	111.1	104.4	6.7	9.1	8.6	0.5	0.00867	0.00108	7,919

TESTED BY _____ **DATE** March 28, 2017
REVIEWED BY _____ **DATE** _____

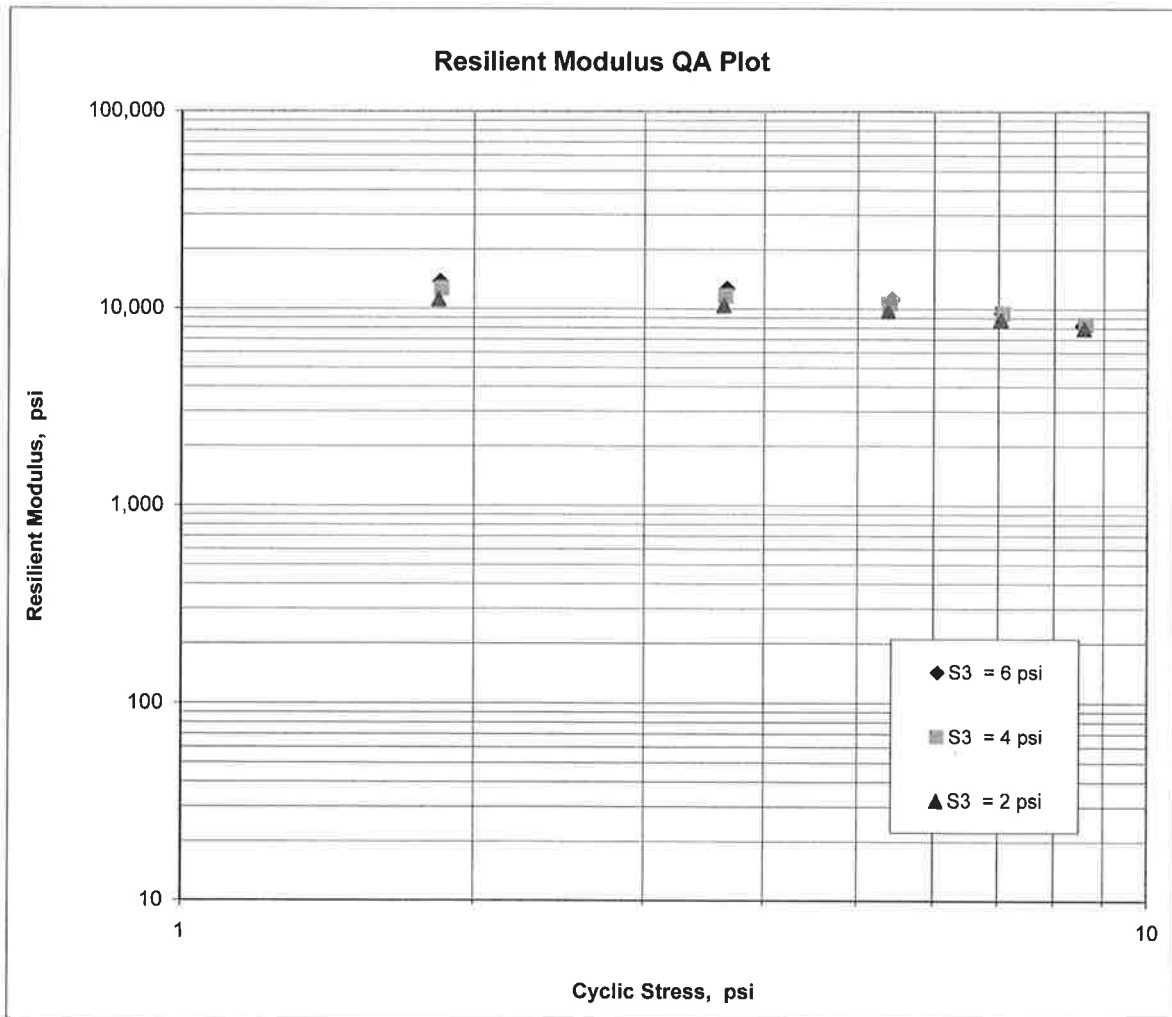
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

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

Job No.:	020582	Material Code:	SSRVPS
Date Sampled:	2/16/17	Station No.:	103+10
Date Tested:	March 28, 2017	Location:	21RT
Name of Project:	KING BAYOU STR. & APPRS.		
County:	Code: 1	Name:	ARKANSAS
Sampled By:	THORNTON/TAYLOR		
Lab No.:	20170633	Depth:	0-5
Sample ID:	RV181	AASHTO Class:	A-7-6(27)
LATITUDE:		Material Type (1 or 2):	2
		LONGITUDE:	

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

$K_1 = \underline{13,055}$
 $K_2 = \underline{-0.25939}$
 $K_5 = \underline{0.12165}$
 $R^2 = \underline{0.87}$



JOB: 020582

Arkansas State Highway Transportation Department

JOB NAME: KING BAYOU STR. & APPRS.(S)

Materials Division

COUNTY NO. 1 DATE TESTED 3/8/2017

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					
103+10	21RT	0-5	GRAY	100				91	46	28	A-7-6(27)	RV181	
103+00	06RT	0-5	BROWN	97	94	91	89	88	34	20	A-6(16)	S177	20.7
103+00	21RT	0-5	BROWN	97	94	89	86	83	37	21	A-6(16)	S178	26.9
113+00	06LT	0-5	GRAY	100				92	39	24	A-6(22)	S179	22.6
113+00	18LT	0-5	GRAY	100				99	56	39	A-7-6(42)	S180	28.1

JOB: 020582

Arkansas State Highway Transportation Department

DATE TESTED

JOB NAME: KING BAYOU STR. & APPRS.(S)

Materials Division

3/8/2017

COUNTY NO. 1

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

103+00	21RT	ACHMSC	ACHMBC	AGG. BASE CRS. CL-7
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103+00	06RT	ACHMSC	ACHMBC	AGG. BASE CRS. CL-7
		1.0X	1.0	7.0
113+00	06LT	ACHMSC	ACHMBC	AGG. BASE CRS. CL-7
		2.5W	1.0	7.0

Comments: W=MULTIPLE LAYERS, X=STRIPPED

