ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO.		020582			
FEDERAL AID PROJE	CT NO. N	NHPP-0001(94)			
	KING BAY	OU STR. & APPRS. (S)			
STATE HIGHWAY	343	SECTION	1		
IN		ARKANSAS			

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

TypeAsphalt Cement %Mineral Aggregate %Surface Course5.294.8Binder Course4.295.8Base Course3.596.5

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 SEQUENCE NO. - 1

JOB NUMBER - 020582 MATERIAL CODE - SSRV

SPEC. YEAR - 2014

SUPPLIER ID. = 1

COUNTY/STATE - 01

DISTRICT NO. - 02

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

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. Date Sampled: Date Tested: Name of Project:	020582 2/16/17 March 28, 2017 KING BAYOU STR. & APPRS.	Material Code Station No.: Location:	SSRVPS 103+10 21RT
County: Sampled By: Lab No.: Sample ID: LATITUDE:	Code: 1 Name: ARKANSAS THORNTON/TAYLOR 20170633 RV181	Depth: AASHTO Class: Material Type (1 or 2): LONGITUDE:	0-5 A-7-6(27) 2
1. Testing Inforn		/ W NI - NI >	
	Preconditioning - Permanent Strain > 5% (Y=Yes or Number of Load Sequences Completed (0-1	N=No)	N N 15
2. Specimen Info	ormation:		
	Specimen Diameter (in):		
	Тор		3.94
	Middle		3.95
	Bottom		3.95
	Average	v	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): Initial Volume, AoLo (cu. in):		12.16 97.27
3. Soil Specimen	Weight:		
	Weight of Wet Soil Used (g):		2982.80
4. Soil Properties	3:		
	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 Pro			
	Wet Weight (g):		2982.80
	Compaction Moisture content (%):		22.1
	Compaction Wet Density (pcf):		116.84
	Compaction Dry Density (pcf): Moisture Content After Mr Test (%):		95.69 21.2
6. Quick Shear T	est (Y=Yes, N=No, N/A=Not Applicable):		#VALUE!
	••		#V/\LOL:
7. Resilient Modu	ılus, Mr:	13055(Sc	c)^-0.25939(S3)^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

Material Code Station No.: Location: KING BAYOU STR. & APPRS. March 28, 2017 2/16/17 020582 Name of Project: Date Sampled: Date Tested: Job No.

SSRVPS 103+10

21RT

County:Code: 1Name:ARKANSASSampled By:THORNTON/TAYLORLab No.:20170633Sample ID:RV181

LATITUDE:

Depth: 0-5
AASHTO Class: A-7-6(27)
Material Type (1 or 2): 2
LONGITUDE:

	Chamber	Nominal	Actual	Actual	Actual	Actual	Actual	Actual	Average	Resilient	Resilient
	Confining	Maximum	Applied	Applied	Applied	Applied	Applied	Applied	Recov Def.	Strain	Modulus
PARAMETER	Pressure	Axial	Max. Axial	Cyclic Load	Contact	Мах.	Cyclic	Contact	LVDT 1		
		Stress	Load		Load	Axial	Stress	Stress	and 2		
						Stress					
DESIGNATION	လိ	Scyclic	Р _{мах}	P _{cyclic}	Pcontact	S _{max}	Scyclic	Scontact	Havg	ట్	M
UNIT	psi	psi	lbs	sql	sql	psi	psi	psi	in	in/in	psi
Sequence 1	0.9	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	0.9	0.9	9.69	0.99	3.6	5.7	5.4	0.3	0.00388	0.00049	11,182
Sequence 4	0.9	8.0	91.8	85.7	6.1	7.5	7.1	0.5	0.00593	0.00074	9,513
Sequence 5	0.9	10.0	112.5	104.0	8.5	9.3	9.8	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	0.9	68.5	9.59	2.8	5.6	5.4	0.2	0.00408	0.00051	10,570
Sednence 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	9.7	9.2	9.8	9.0	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

March 28,	
DATE	DATE
GW	
TESTED BY	REVIEWED BY

2017

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:

Location: 21RT

Name of Project:

March 28, 2017

County:

KING BAYOU STR. & APPRS. 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:

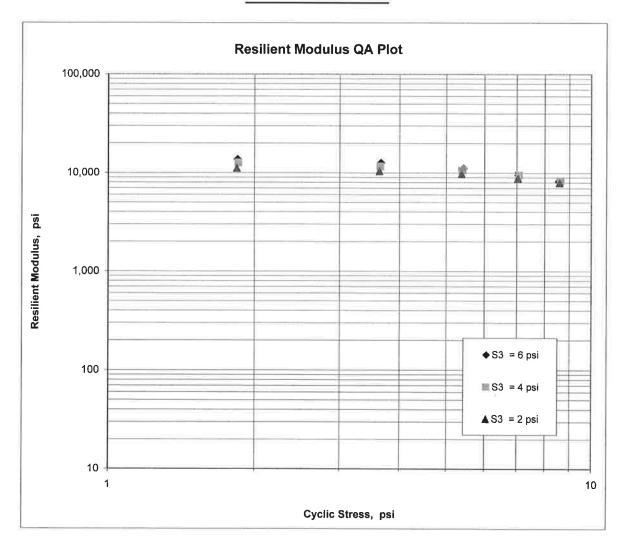
$$M_R = K1 (S_C)^{K2} (S_3)^{K5}$$

K1 = 13,055

K2 = -0.25939

 $K5 = \overline{0.12165}$

 $R^2 = 0.87$



JOB: 020582

Arkansas State Highway Transporation 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.	<i>P.I.</i>	SOIL CLASS	<i>LAB</i> #:	%MOISTURE
103+10	21RT	0-5	GRAY	100		E		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	N. H.		US S	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

DATE TESTED

3/8/2017

Arkansas State Highway Transporation Department

JOB: 020582 JOB NAME: KING BAYOU STR. & APPRS.(S)

Materials Division

Michael Benson, Materials Engineer

PAVEMENT SOUNDINGS AGG. BASE CRS. CL-7 7.0 AGG. BASE CRS. CL-7 7.0 AGG. BASE CRS. CL-7 ACHMBC 1.0 ACHMBC 1.0 ACHIMBC ACHIMSC 1.0X ACHMSC 2.5W **ACHIMSC** COUNTY NO. 1 STA.# LOC. 21RT O6LT 06RT 103+00 103+00 113+00

Monday, April 03, 2017

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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 03/21/17 SEQUENCE NO 1 JOB NUMBER - 020582 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 - 01 SUPPLIER NAME - STATE DISTRICT NO 02 NAME OF PROJECT - KING BAYOU STR. & APPRS.(S) PROJECT ENGINEER - NOT APPLICABLE PIT/QUARRY - ARKANSAS LOCATION - ARKANSAS, COUNTY DATE SAMPLED - 02/16, SAMPLED BY - THORNTON/TAYLOR DATE RECEIVED - 02/22, SAMPLE FROM - TEST HOLE DATE TESTED - 03/08, MATERIAL DESC SOIL SURVEY - R VALUE - PAVEMENT SOUNDINGS								14	
								0010000	
SAMPLE ID		20170629 3177			20170630 S178			20170631 S179	
TEST STATUS			V.TIVO INC		INFORMATIC	V.TIAO IN			ON ONLY
STATION		L03+00	ON ONLI	_	103+00	M ONLI		113+00	ON ONLI
LOCATION)6RT		-	21RT			06LT	
DEPTH IN FEET	- C)-5		-	0-5		-	0-5	
MAT'L COLOR	e= E	BROWN		_	BROWN		_	GRAY	
MAT'L TYPE	-			-			-		
LATITUDE DEG-MIN-SEC						54.20			6.70
LONGITUDE DEG-MIN-SEC	(#	91 34	47.90		91 34	47.80		91 34	47.80
% PASSING 2 IN	100			-			-		
1 1/2 IN				**					
3/4 IN				50			::::::::::::::::::::::::::::::::::::::		
3/8 IN		100		-	100		_		
NO. 4		97		**	97		-	100	
NO. 10 NO. 40				7	94				
NO. 40	-			2	89 86		-		
NO. 80 NO. 200		88		-	83		: - :	92	
LIQUID LIMIT	: 75	34		*	37		:## :000	39	
PLASTICITY INDEX	·			=	21		-	24	
AASHTO SOIL		A-6(16)			A-6(16)		-	A-6(22)	
UNIFIED SOIL % MOISTURE CONTENT	=	20.7		77	26.9			22.6	
ACHMSC (IN) -	1.0X		_			-	2.5W	
ACHMBC (IN		1.0		-	######################################		#	1.0	
AGG. BASE CRS. CL-7 (IN) -	7.0		-	*(***)		ä	7.0	
	-			-			_		
	122			_					
	(4)			-			20		
	5 = 2			-			2		
	=			-			## _		
				-			-		

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265

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

MICHAEL BENSON, MATERIALS ENGINEER

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

LAB NUMBER	DATE - 03/10/11 JOB NUMBER - 020582 FEDERAL AID NO TO BE AMBER PURPOSE - SOIL SUMBER SPEC. REMARKS - NO SPECT SUPPLIER NAME - STATE NAME OF PROJECT - KING PROJECT ENGINEER - NOT AMBER PIT/QUARRY - ARKANSAS LOCATION - ARKANSAS SAMPLED BY - THORNTON/T SAMPLE FROM - TEST HOLE MATERIAL DESC SOIL SU	SSIGNED RVEY SAMPLE IFICATION CHECK BAYOU STR. & APPRS.(S PPLICABLE COUNTY AYLOR		SUPPLIER ID COUNTY/STATE - DISTRICT NO DATE SAMPLED - DATE RECEIVED - DATE TESTED -	SSRVPS 2014 1 01 02
SAMPLE ID - S180			_		
TEST STATUS - INFORMATION ONLY			-		
STATION - 113+00 - 10CATION - 18LT -			-	2	
LOCATION - 18LT DEPTH IN FEET - 0-5 MAT'L COLOR - GRAY MAT'L TYPE			_	-	
DEPTH IN FEET - 0-5 MAT'L COLOR - GRAY MAT'L TYPE			_	-	
MAT'L COLOR			_		
MAT'L TYPE - 34 21 6.70 - 1			-	-	
LATITUDE DEG-MIN-SEC - 34 21 6.70 - LONGITUDE DEG-MIN-SEC - 91 34 47.90 % PASSING 2 IN		_ GRAY	-	ie.	
LONGITUDE DEG-MIN-SEC - 91 34 47.90 % PASSING 2 IN		- 24 01 6 50	-	1.55	
% PASSING 2 IN			-	7=	
1 1/2 IN	LONGITUDE DEG-MIN-SEC	- 91 34 47.90			
3/4 IN 3/8 IN NO. 4 - 100 NO. 10 - NO. 40 - NO. 80 - NO. 200 - 99 LIQUID LIMIT - 56 - PLASTICITY INDEX - 39 AASHTO SOIL - A-7-6(42)	% PASSING 2 IN.	_	-	7 4	
3/8 IN NO. 4 - 100 NO. 10 - NO. 40 - NO. 80 - NO. 200 - 99 LIQUID LIMIT - 56 - PLASTICITY INDEX - 39 AASHTO SOIL - A-7-6(42)	1 1/2 IN.	_	=2	35	
NO. 4 - 100 NO. 10	3/4 IN.	_		-	
NO. 10 - NO. 40 - NO. 80 - NO. 200 - 99 LIQUID LIMIT - 56 - PLASTICITY INDEX - 39 - AASHTO SOIL - A-7-6(42) -	3/8 IN.	=	¥3	72	
NO. 40 - NO. 80 - NO. 200 - 99 LIQUID LIMIT - 56 - PLASTICITY INDEX - 39 - AASHTO SOIL - A-7-6(42) - UNIFIED SOIL -	NO. 4	- 100	-	2 =	
NO. 40 -	NO. 10	_	-	5 5 .	
NO. 200 - 99 LIQUID LIMIT - 56	NO. 40	_	27 ≥ 1	1627) 17 <u>2</u> 6	
LIQUID LIMIT - 56	NO. 80	_	=)	=	
PLASTICITY INDEX - 39	NO. 200	- 99			
PLASTICITY INDEX - 39	I TOUTD I TMTT	E 6			
AASHTO SOIL - A-7-6(42)			50 20	<u>-</u>	
UNIFIED SOIL -			=: =:	-	
		- A-/-0(42)	•	-	
# MOISTORE CONTENT - 20.1		29 1	(#)	-	
	6 MOISTURE CONTENT	- 28.1			
		-	-	3 0	
		-	-		
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REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

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AASHTO TESTS : T24 T88 T89 T90 T265

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

MICHAEL BENSON, MATERIALS ENGINEER

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

JOB NUMBER - FEDERAL AID NO PURPOSE - SPEC. REMARKS - SUPPLIER NAME - NAME OF PROJECT PROJECT ENGINEER PIT/QUARRY - F	SOIL SURVE NO SPECIF STATE - KING BAY - NOT APPE	EY SAMPLE ICATION CHECK YOU STR. & APPRS.(LICABLE		SUPPLIER ID COUNTY/STATE -	RV 2014 1 01 02
SAMPLED BY - TH SAMPLE FROM - T	HORNTON/TAY: TEST HOLE	LOR		DATE RECEIVED - DATE TESTED -	
MATERIAL DESC	SOIL SURV	EY - RESISTANCE R-	-VALUE ACTUAI	L RESULTS	
LAB NUMBER	=	20170633	<u>=</u> :	r <u>u</u>	
SAMPLE ID	-	RV181	20	N2	
TEST STATUS	-	INFORMATION ONLY	= :	-	
STATION	-	103+10		5 5	
LOCATION	-	21RT	-	(-	
DEPTH IN FEET	-	0-5	-	-	
MAT'L COLOR	-	GRAY		. 	
MAT'L TYPE	-		-	-75	
		34 20 54.30	₩	3 <u>2</u>	
LONGITUDE DEG-	MIN-SEC -	91 34 47.90			
% PASSING 2	IN		-	-	
1	1/2 IN		-	-	
	3/4 IN		-	-	
	3/8 IN		-	-	
	NO. 4 -	100	_	-	
	NO. 10 -		_	_	
	NO. 40 -		_	-	
	NO. 80 -		-	-	
	NO. 200 -	91			
LIQUID LIMIT	_	46	_	2	
PLASTICITY IND			-	52 52	
AASHTO SOIL		A-7-6(27)	-	100	
UNIFIED SOIL	_		-	. 	
% MOISTURE CON	TENT -		-	-	
	_				
	_		_	_	
	_		- 2		
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REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

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AASHTO TESTS : T24 T88 T89 T90 T265