ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO.	TATE JOB NO. 110567							
FEDERAL AID PROJEC	CT NO.	STPR-0018(51)						
	DEER BA	YOU STR. & APPRS. (S)					
STATE HIGHWAY	42	SECTION	5					
IN		CRITTENDEN		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

August 9, 2013

TO:

Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT:

Job No. 110567

Deer Bayou Str. & Apprs. (S)

Route 42 Section 5 Crittenden 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 existing bridge crossing Deer Bayou. 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 highly plastic clay with some sand and high moisture contents. Cross-sections are not currently available, but it is anticipated that the construction grade line will closely match that of the existing roadway. Based on the moisture content of the highly plastic clay, stabilization will likely be required throughout the project to construct a stable working platform. If so, stabilization with lime is the most appropriate remediation technique. It is recommended that the addition of 6% 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.

Embankment recommendations will be made when plans are further developed and cross-sections become available.

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 the river ports at West Memphis.

2. Asphalt Concrete Hot Mix

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.2	94.8
Binder Course	4.3	95.7
Base Course	3.9	96.1

Michael C. Benson Materials Engineer

MCB:pt:bjj Attachment

cc: State Constr. Eng. - Master File Copy

District 1 Engineer Planning 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 - 08/07/2013

SEQUENCE NO. - 1

JOB NUMBER - 110567

MATERIAL CODE - SSRVPS SPEC. YEAR - 2003

SUPPLIER ID. - 1

COUNTY/STATE - 18

DISTRICT NO. - 01

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

STATION LIMITS

R-VALUE AT 240 psi

LESS THAN 5

BEGIN JOB - END JOB

RESILIENT MODULUS

STA.112+00

10084

REMARKS -

AASHTO TESTS : T190

JOB: 110567

Arkansas State Highway Transporation Department

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

Materials Division

COUNTY NO. 18 DATE TESTED

8/6/2013

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200 E S	L.L.	P.I.	SOIL CLASS	<i>LAB</i> #:	%MOISTURE
112+00	15'LT	0-5	BROWN	5 ()	48(6)		111		81	59	A-7-5(24)	RV1459	
103+00	5'RT	0-5	BROWN		(1)	(a)*)	- (6K.S.)		43	24	A-7-6(18)	S1455	42
103+00	15'RT	0-5	BROWN	574		F-/(6),	(6)(6)	7	53	34	A-7-6(16)	S1456	41.2
112+00	5'LT	0-5	BROWN	· 1:	(9)3)	1376			68	40	A-7-6(36)	S1457	38.9
112+00	15'LT	0-5	BROWN		318	67	(610)	86	50	31	A-7-6(14)	S1458	43.1

DATE TESTED

Arkansas State Highway Transporation Department

Materials Division

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

COUNTY NO. 18

STA.# LOC.

110567

JOB:

Michael Benson, Materials Engineer

PAVEMENT SOUNDINGS

AGG.BASE CRS, CL-5 9.0

ACHIMSC 11.25WX

5'LT

112+00

AGG.BASE CRS, CL-5

ACHMSC

5'RT

103+00

10.5W

AGG.BASE CRS, CL-5

ACHIMSC

15'RT

103+00

8/6/2013

Wednesday, August 07, 2013

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

Job No.	110567	Material Code	SSRVPS
Date Sampled:	8/02/2013	Station No.:	112+00
Date Tested:	August 2, 2013	Location:	15'LT
Name of Project: County:	DEER BAYOU STR. & APPRS.(S) Code: 18 Name: CRITTENDEN		
Sampled By:	FAULKNER	Depth:	0-5
Lab No.:	20133276	AASHTO Class:	A-7-5(24)
Sample ID:	RV1459	Material Type (1 or 2	• •
LATITUDE:		LONGITUDE:	
1. Testing Inform			
	Preconditioning - Permanent Strain > 5% (Y		N
	Testing - Permanent Strain > 5% (Y=Yes or		N
	Number of Load Sequences Completed (0-1	5)	15
2. Specimen Info			
	Specimen Diameter (in):		2.05
	Top		3.95 3.96
	Middle		3.96
	Bottom		3.96
	Average Membrane Thickness (in):		0.00
	Height of Specimen, Cap and Base (in):		8.03
	Height of Cap and Base (in):		0.00
	Initial Length, Lo (in):		8.03
	Initial Area, Ao (sq. in):		12.30
	Initial Volume, AoLo (cu. in):		98.73
	milar Volume, AGEO (Ga. iii).		333
3. Soil Specimer	n Weight:		
	Weight of Wet Soil Used (g):		2825.40
4. Soil Propertie			
	Optimum Moisture Content (%):		27.2
	Maximum Dry Density (pcf):		90.8
	95% of MDD (pcf):		86.3
	In-Situ Moisture Content (%):		N/A
5. Specimen Pro			2825.40
	Wet Weight (g):		26.8
	Compaction Moisture content (%): Compaction Wet Density (pcf):		109.04
	Compaction Dry Density (pcf):		85.99
	Moisture Content After Mr Test (%):		26.8
6. Quick Shear T	est (Y=Yes, N=No, N/A=Not Applicable):		#VALUE!
7. Resilient Mod	ulus, Mr:	11114(Sc)^-0.11966(S3)^0.20584
	,		
8. Comments			
0 Tooted Bu	DEB	Date: August 2, 2013	
9. Tested By:	DLD	Dute. August 2, 2010	

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

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

SSRVPS 112+00 15'LT

Material Code Station No.: Location: DEER BAYOU STR. & APPRS.(S) August 2, 2013 8/02/2013 Date Sampled: Date Tested: Job No.

CRITTENDEN Name: Code: 18 FAULKNER Name of Project: Sampled By: County:

20133276 RV1459 Sample ID: Lab No.:

LATITUDE:

Material Type (1 or 2): 2 LONGITITIDE 0-5 Depth:

Axial Max. Axial Cyclic Load
Stress Load
S _{cyclic} P _{max} P _{cyclic}
-
2.0 25.2 22.4
4.0 47.1 44.2
6.0 69.6 65.8
8.0 92.4 86.1
10.0 114.0 105.3
2.0 25.1 22.2
4.0 46.9 44.0
6.0 68.3 65.4
8.0 91.3 86.0
10.0 113.5 105.6
2.0 24.7 21.9
4.0 46.8 43.9
6.0 68.0 65.1
8.0 90.0 85.5
10.0 111.8 104.8

August 2, 2013	
DATE	DATE
DEB	
TESTED BY	REVIEWED BY

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

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

Job No.

110567

Material Code SSRVPS

Date Sampled:

8/02/2013

Station No.: 112+00

Date Tested:

August 2, 2013

Location: 15'LT

Name of Project: DEER BAYOU STR. & APPRS.(S)

County:

Code: 18

Name: CRITTENDEN

Sampled By:

FAULKNER

Depth: 0-5

Lab No .:

20133276

AASHTO Class: A-7-5(24)

Sample ID:

RV1459

Material Type (1 or 2): 2

LATITUDE:

LONGITUDE:

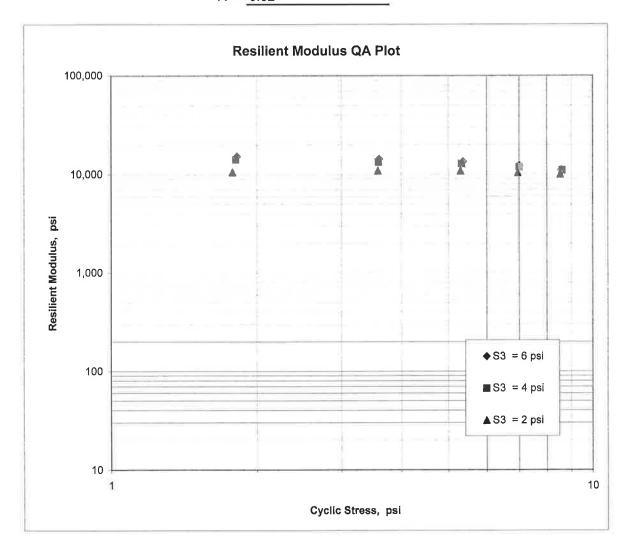
$$M_R = K1 (S_C)^{K2} (S_3)^{K5}$$

$$K1 = 11,114$$

K2 = -0.11966

K5 = 0.20584

 $R^2 = 0.82$



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

MICHAEL BENSON, MATERIALS ENGINEER *** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

202	,			
DATE - 08/06/13	3		SEQUENCE	
JOB NUMBER - 110567			MATERIAL	CODE - SSRVPS
FEDERAL AID NO TO BE AS	SSIGNED		SPEC. YEA	IR - 2003
PURPOSE - SOIL SUR	RVEY SAMPLE		SUPPLIER	ID. = 1
SPEC. REMARKS - NO SPECI	FICATION CHECK		COUNTY/SI	CATE = 18
SUPPLIER NAME - STATE			DISTRICT	NO. = 01
NAME OF PROJECT - DEER B	BAYOU STR.& APPRS.(S)			
PROJECT ENGINEER - NOT AF				
PIT/QUARRY - ARKANSAS				
LOCATION - CRITTENDEN	N, COUNTY		DATE SAM	PLED - 06/24/13
SAMPLED BY - DICKERSON			DATE REC	EIVED - 07/02/13
SAMPLE FROM - TEST HOLE			DATE TEST	TED - 08/06/13
MATERIAL DESC SOIL SUI	RVEY - R VALUE- PAVE	MENT SOUNDIN	GS	
				00122074
LAB NUMBER	- 20133272	- 20133273		20133274
SAMPLE ID	- S1455	_ S1456		S1457
TEST STATUS	- INFORMATION ONLY		ON ONLY -	
STATION	- 103+00	103+00	_	112+00
LOCATION	- 5'RT	_ 15'RT	_	5'LT
DEPTH IN FEET	- 0-5	_ 0-5	_	0-5
MAT'L COLOR	- BROWN	BROWN	_	BROWN
MAT'L TYPE	-	-	-	
LATITUDE DEG-MIN-SEC		- 35 21		35 21 59.80
LONGITUDE DEG-MIN-SEC	- 90 21 16.20	90 21	16.20	90 21 4.90
% PASSING 2 IN.	_	<u>=</u>	1=	
1 1/2 IN.		-	-	
3/4 IN.		- 100	-	
3/8 IN.		96	-	100
NO. 4		94	-	98
NO. 10		84	_	96
NO. 40		70	_	88
NO. 80		~ = 60	-	84
NO. 200	- 78	57		82
				60
LIQUID LIMIT	- 43	- 53	_	68
PLASTICITY INDEX	- 24	- 34		40
AASHTO SOIL	- A-7-6(18)	- A-7-6(16		A-7 - 6(36)
UNIFIED SOIL	-	-	-	
% MOISTURE CONTENT	- 42.0	41.2		38.9
ACHMSC (IN)	- 10.5W		-	11.25WX
AGG.BASE CRS, CL-5 (IN)			-	9.0
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REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265

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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE	- 08/06/13								_	NCE NO.		
JOB NUMBER - 110567									MATER	LIAL CODE	÷	SSRVPS
FEDERAL AID NO.	- TO BE AS	SI	GNED						SPEC.	YEAR	=	2003
	- SOIL SUR			LE					SUPPL	IER ID.	2	1
SPEC. REMARKS	- NO SPECI	FI	CATION	CHE	ECK				COUNT	Y/STATE	_	18
SUPPLIER NAME										RICT NO.		01
NAME OF PROJECT		AY	OU STR	. & 7	APPI	RS.(S)					
PROJECT ENGINEE						· ·	•					
PIT/QUARRY -												
	CRITTENDEN	Ι,	COUNTY						DATE	SAMPLED	_	06/24/13
SAMPLED BY - 1		,								RECEIVED		
SAMPLE FROM -										TESTED		08/06/13
MATERIAL DESC.		av.	Y - F	XV S	LUE	- PAV	EMENT	SOUNDING				, ,
LAB NUMBER			20133	275			_			_		
SAMPLE ID		-	S1458				-			-		
TEST STATUS		-	INFOR	[TAM	ЮИ	ONLY	-			-		
STATION			112+0				-			-		
LOCATION			15'LT				_			_		
DEPTH IN FEET	Γ	-	0-5				_			_		
MAT'L COLOR		-	BROWN				_			_		
MAT'L TYPE		-					-			-		
LATITUDE DEC							-			-		
LONGITUDE DEC	G-MIN-SEC	-	90	21	4	.90						
% PASSING	2 IN.	_					_			_		
	1 1/2 IN.						-			_		
	3/4 IN.		100				-			-		
	3/8 IN.						-			-		
	NO. 4						-			-		
	NO. 10						-			_		
	NO. 40						_			_		
	NO. 80						_			_		
	NO. 200											
	110. 200		30									
LIQUID LIMIT			50				=			-		
PLASTICITY I	NDEX	-	31				=			/ = :		
AASHTO SOIL		-	A-7-	6(1	4)		-			177 122		
UNIFIED SOIL		-					_			255 226		
% MOISTURE CO	ONTENT	-	43	3.1								
		_					-			-		
		-					-			-		
		-					-			-		
		-					-			-		
		-					-			-		
		_					_			_		
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		_					_			_		
		_					-			-		

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265

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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 08/06/13 JOB NUMBER - 110567 FEDERAL AID NO TO BE AS PURPOSE - SOIL SUR SPEC. REMARKS - NO SPECI SUPPLIER NAME - STATE NAME OF PROJECT - DEER B PROJECT ENGINEER - NOT AB PIT/QUARRY - ARKANSAS LOCATION - CRITTENDER SAMPLED BY - DICKERSON SAMPLE FROM - TEST HOLE	SSIGNED RVEY SAMPLE EFICATION CHECK BAYOU STR.& APPRS.(S) PPLICABLE N, COUNTY	SEQUENCE NO 1 MATERIAL CODE - RV SPEC. YEAR - 2003 SUPPLIER ID 1 COUNTY/STATE - 18 DISTRICT NO 01 DATE SAMPLED - 06/24/13 DATE RECEIVED - 07/02/13 DATE TESTED - 08/06/13
MATERIAL DESC SOIL SUI	RVEY - RESISTANCE R-VALUE ACTUAL	RESULTS
LAB NUMBER	- 20133276 -	-
SAMPLE ID	- RV1459 -	-
TEST STATUS	- INFORMATION ONLY -	_
STATION	- 112+00 -	-
LOCATION	- 15'LT	_
DEPTH IN FEET	- 0-5	
MAT'L COLOR	- BROWN _	-
MAT'L TYPE	-	-
LATITUDE DEG-MIN-SEC		-
LONGITUDE DEG-MIN-SEC	- 90 21 4.90	
% PASSING 2 IN.	<u>-</u>	L-
1 1/2 IN.	-	-
3/4 IN.	- 100 -	-
3/8 IN.	- 99 -	_
NO. 4	- 98 <u>-</u>	-
NO. 10	- 96 _	_
NO. 40	- 91 _	-
NO. 80		-
NO. 200	- 86	
LIQUID LIMIT	- 81 =	2.
PLASTICITY INDEX	- 59	= :
AASHTO SOIL	- A-7-5(24)	类)
UNIFIED SOIL	-	表以 595
% MOISTURE CONTENT	-	A.
		_
		-
	-	-
	-	-
	-	-
	<u>-</u>	-
		- -
	_	-
	<u>-</u>	-

REMARKS -

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AASHTO TESTS : T24 T88 T89 T90 T265