

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 020586

FEDERAL AID PROJECT NO. NHPP-0009(35)

MAIN DITCH STR. & APPRS. (S)

STATE HIGHWAY 144 SECTION 2

IN CHICOT 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 15, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 020586
Main Ditch Str. & Apprs. (S)
Route 144 Section 2
Chicot County

Transmitted herewith is the requested Soil Survey test results for the above referenced job. The project consists of replacing a bridge 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. 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 3% 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.

The currently available cross sections are acceptable as shown.

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 in Greenville, MS.
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 - 03/09/2017
JOB NUMBER - 020586

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 09
DISTRICT NO. - 02

JOB NAME - MAIN DITCH STR. & APPRS. (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB	LESS THAN 5
RESILIENT MODULUS	
121+00	7174

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.	020586	Material Code	SSRVPS
Date Sampled:	2/13/17	Station No.:	121+00
Date Tested:	March 8, 2017	Location:	15LT
Name of Project:	MAIN DITCH STR. & APPRS. (S)		
County:	Code: 9	Name: CHICOT	
Sampled By:	THORNTON/TAYLOR		Depth: 0-5
Lab No.:	20170530	AASHTO Class:	A-7-6(31)
Sample ID:	RV129	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	3.98
Middle	3.98
Bottom	3.98
Average	3.98
Membrane Thickness (in):	0.00
Height of Specimen, Cap and Base (in):	8.01
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.01
Initial Area, Ao (sq. in):	12.44
Initial Volume, AoLo (cu. in):	99.65

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3034.50
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4. Soil Properties:

Optimum Moisture Content (%):	18.7
Maximum Dry Density (pcf):	102.7
95% of MDD (pcf):	97.6
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3034.50
Compaction Moisture content (%):	19.7
Compaction Wet Density (pcf):	116.02
Compaction Dry Density (pcf):	96.93
Moisture Content After Mr Test (%):	19.7

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

#VALUE!

7. Resilient Modulus, Mr:

11313(Sc)^{-0.24496}(S3)^{0.12859}

8. Comments

9. Tested By:

GW _____

Date: March 8, 2017 _____

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

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

Job No. 020586 **Material Code** SSRVPS
Date Sampled: 2/13/17 **Station No.:** 121+00
Date Tested: March 8, 2017 **Location:** 15LT
Name of Project: MAIN DITCH STR. & APPRS. (S)
County: Code: 9 **Name:** CHICOT
Sampled By: THORNTON/TAYLOR **Depth:** 0-5
Lab No.: 20170530 **AASHTO Class:** A-7-6(31)
Sample ID: RV129 **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	S ₃	S _{cyclic}	P _{max}	P _{cyclic}	P _{contact}	S _{max}	S _{cyclic}	S _{contact}	H _{avg}	ε _r	M _r
UNIT	psi	psi	lbs	lbs	lbs	psi	psi	psi	in	in/in	psi
Sequence 1	6.0	2.0	25.6	22.8	2.8	2.1	1.8	0.2	0.00121	0.00015	12,117
Sequence 2	6.0	4.0	48.2	45.4	2.8	3.9	3.6	0.2	0.00259	0.00032	11,291
Sequence 3	6.0	6.0	71.1	67.3	3.8	5.7	5.4	0.3	0.00427	0.00053	10,148
Sequence 4	6.0	8.0	94.2	87.9	6.3	7.6	7.1	0.5	0.00650	0.00081	8,704
Sequence 5	6.0	10.0	115.8	107.1	8.8	9.3	8.6	0.7	0.00920	0.00115	7,490
Sequence 6	4.0	2.0	25.6	22.8	2.7	2.1	1.8	0.2	0.00132	0.00016	11,131
Sequence 7	4.0	4.0	48.0	45.2	2.8	3.9	3.6	0.2	0.00285	0.00036	10,201
Sequence 8	4.0	6.0	69.8	66.9	2.9	5.6	5.4	0.2	0.00462	0.00058	9,327
Sequence 9	4.0	8.0	93.2	87.8	5.4	7.5	7.1	0.4	0.00672	0.00084	8,412
Sequence 10	4.0	10.0	115.5	107.6	7.9	9.3	8.6	0.6	0.00924	0.00115	7,501
Sequence 11	2.0	2.0	25.6	22.8	2.8	2.1	1.8	0.2	0.00149	0.00019	9,858
Sequence 12	2.0	4.0	47.9	45.1	2.8	3.9	3.6	0.2	0.00311	0.00039	9,346
Sequence 13	2.0	6.0	69.5	66.7	2.8	5.6	5.4	0.2	0.00502	0.00063	8,565
Sequence 14	2.0	8.0	91.8	87.3	4.5	7.4	7.0	0.4	0.00714	0.00089	7,872
Sequence 15	2.0	10.0	114.2	107.2	6.9	9.2	8.6	0.6	0.00962	0.00120	7,174

TESTED BY _____ DATE March 8, 2017
 REVIEWED BY _____ DATE _____

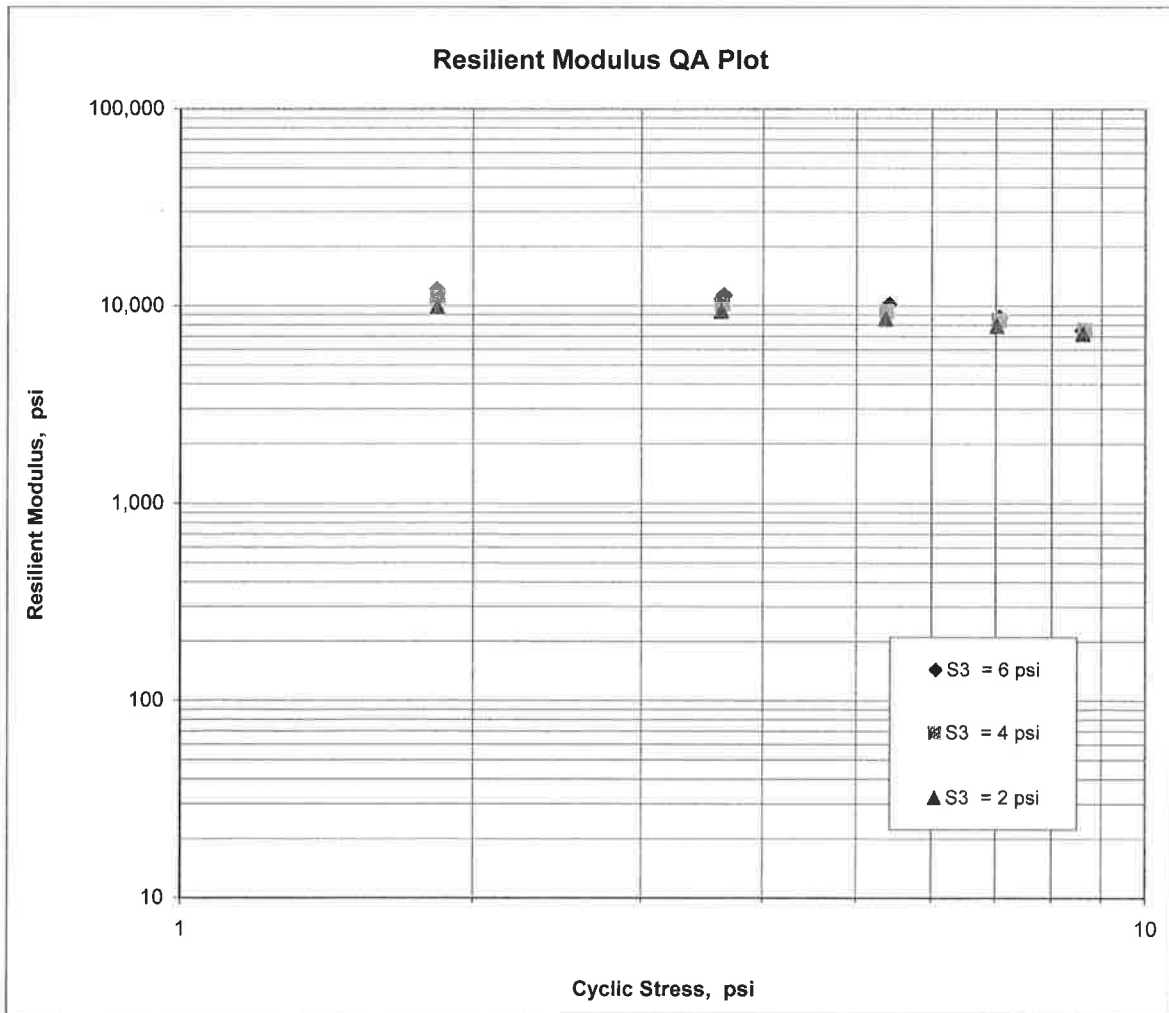
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

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

Job No.	020586	Material Code	SSRVPS
Date Sampled:	2/13/17	Station No.:	121+00
Date Tested:	March 8, 2017	Location:	15LT
Name of Project:	MAIN DITCH STR. & APPRS. (S)		
County:	Code: 9	Name:	CHICOT
Sampled By:	THORNTON/TAYLOR		Depth: 0-5
Lab No.:	20170530	AASHTO Class:	A-7-6(31)
Sample ID:	RV129	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

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

$K_1 = \underline{\underline{11,313}}$
 $K_2 = \underline{\underline{-0.24496}}$
 $K_5 = \underline{\underline{0.12859}}$
 $R^2 = \underline{\underline{0.88}}$



JOB: 020586

Arkansas State Highway Transportation Department

JOB NAME: MAIN DITCH STR. & APPRS. (S)

Materials Division

COUNTY NO. 9 DATE TESTED 3/3/2017

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						S
121+00	15LT	0-5	GRAY	100					90	47	34	A-7-6(31)	RV129	
115+00	04RT	0-5	BROWN	97	96	95	94	85		31	07	A-4(6)	S125	23.9
115+00	24RT	0-5	BROWN	98	98	97	94	85		40	25	A-6(21)	S126	19.1
121+00	04LT	0-5	GRAY	100					93	37	23	A-6(21)	S127	30.1
121+00	15LT	0-5	GRAY	99	98	97	94	87		41	27	A-7-6(23)	S128	23.2

comments: W=MULTIPLE LAYERS, X=STRIPPED

Monday, March 13, 2017

JOB: 020586

**Arkansas State Highway Transportation Department
Materials Division**

DATE TESTED
3/3/2017

JOB NAME: MAIN DITCH STR. & APPRS. (S)

COUNTY NO. 9

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

115+00	24RT	ACHMSC	SA ASPHALT
115+00	04RT	ACHMSC 5.0W	SA ASPHALT 1.0
121+00	04LT	ACHMSC 5.0WX	SA ASPHALT 1.0

comments: W=MULTIPLE LAYERS, X=STRIPPED

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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE	- 03/03/17	SEQUENCE NO.	- 1
JOB NUMBER	- 020586	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	- 09
SUPPLIER NAME	- STATE	DISTRICT NO.	- 02
NAME OF PROJECT	- MAIN DITCH STR. & APPRS. (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CHICOT COUNTY	DATE SAMPLED	- 02/13/17
SAMPLED BY	- THORNTON/TAYLOR	DATE RECEIVED	- 02/14/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 03/03/17
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20170526	- 20170527	- 20170528
SAMPLE ID	- S125	- S126	- S127
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 115+00	- 115+00	- 121+00
LOCATION	- 04RT	- 24RT	- 04LT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BROWN	- BROWN	- GRAY
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 33 23 16.90	- 33 23 16.70	- 33 23 16.90
LONGITUDE DEG-MIN-SEC	- 91 22 19.20	- 91 22 19.20	- 91 22 12.10
% PASSING	2 IN.	-	-
	1 1/2 IN.	-	-
	3/4 IN.	-	-
	3/8 IN.	- 100	-
	NO. 4	- 97	- 100
	NO. 10	- 96	-
	NO. 40	- 95	-
	NO. 80	- 94	-
	NO. 200	- 85	- 93
LIQUID LIMIT	- 31	- 40	- 37
PLASTICITY INDEX	- 07	- 25	- 23
AASHTO SOIL	- A-4 (6)	- A-6 (21)	- A-6 (21)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 23.9	- 19.1	- 30.1
ACHMSC	(IN) - 5.0W	-	- 5.0WX
SA ASPHALT	(IN) - 1.0	-	- 1.0
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
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	-	-	-

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE	- 03/03/17	SEQUENCE NO.	- 2
JOB NUMBER	- 020586	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	- 09
SUPPLIER NAME	- STATE	DISTRICT NO.	- 02
NAME OF PROJECT - MAIN DITCH STR. & APPRS. (S)			
PROJECT ENGINEER - NOT APPLICABLE			
PIT/QUARRY	- ARKANSAS		
LOCATION	- CHICOT COUNTY	DATE SAMPLED	- 02/13/17
SAMPLED BY	- THORNTON/TAYLOR	DATE RECEIVED	- 02/14/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 03/03/17
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

LAB NUMBER	- 20170529	-	-
SAMPLE ID	- S128	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 121+00	-	-
LOCATION	- 15LT	-	-
DEPTH IN FEET	- 0-5	-	-
MAT'L COLOR	- GRAY	-	-
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 33 23 17.00	-	-
LONGITUDE DEG-MIN-SEC	- 91 22 12.10	-	-
% PASSING	2 IN.	-	-
	1 1/2 IN.	-	-
	3/4 IN.	-	-
	3/8 IN.	- 100	-
	NO. 4	- 99	-
	NO. 10	- 98	-
	NO. 40	- 97	-
	NO. 80	- 94	-
	NO. 200	- 87	-
LIQUID LIMIT	- 41	-	-
PLASTICITY INDEX	- 27	-	-
AASHTO SOIL	- A-7-6(23)	-	-
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 23.2	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
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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	- 03/10/17	SEQUENCE NO.	- 1
JOB NUMBER	- 020586	MATERIAL CODE	- RV
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 09
SUPPLIER NAME	- STATE	DISTRICT NO.	- 02
NAME OF PROJECT	- MAIN DITCH STR. & APPRS. (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CHICOT COUNTY	DATE SAMPLED	- 02/13/17
SAMPLED BY	- THORNTON/TAYLOR	DATE RECEIVED	- 02/14/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 03/03/17
MATERIAL DESC.	- SOIL SURVEY - RESISTANCE R-VALUE ACTUAL RESULTS		

LAB NUMBER	-	20170530	-	-	-
SAMPLE ID	-	RV129	-	-	-
TEST STATUS	-	INFORMATION ONLY	-	-	-
STATION	-	121+00	-	-	-
LOCATION	-	15LT	-	-	-
DEPTH IN FEET	-	0-5	-	-	-
MAT'L COLOR	-	GRAY	-	-	-
MAT'L TYPE	-		-	-	-
LATITUDE DEG-MIN-SEC	-	33 23 17.00	-	-	-
LONGITUDE DEG-MIN-SEC	-	91 22 12.20	-	-	-
% PASSING	2	IN.	-	-	-
	1 1/2	IN.	-	-	-
	3/4	IN.	-	-	-
	3/8	IN.	-	-	-
	NO. 4	100	-	-	-
	NO. 10		-	-	-
	NO. 40		-	-	-
	NO. 80		-	-	-
	NO. 200	90	-	-	-
LIQUID LIMIT	-	47	-	-	-
PLASTICITY INDEX	-	34	-	-	-
AASHTO SOIL	-	A-7-6(31)	-	-	-
UNIFIED SOIL	-		-	-	-
% MOISTURE CONTENT	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
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REMARKS - W=MULTIPLE LAYERS, X=STRIPPED
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