

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 100835

FEDERAL AID PROJECT NO. CMF-9227(57)

HWY. 18/CARAWAY RD. INTERS. IMPVTS. (JONESBORO) (S)

STATE HIGHWAY 18 SECTION 4

IN CRAIGHEAD 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. 100835
Hwy. 18/Caraway Rd. Inters. Impvts. (Jonesboro) (S)
Route 18 Section 4
Craighead County

Transmitted herewith is the requested Soil Survey, strength data and Resilient Modulus test results for the above referenced job. The project consists of making improvements at the intersection of Highway 18 and Caraway Road. Soil samples were taken in the existing travel lanes. There were no paved shoulders within the project limits.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of moderately plastic sandy 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. 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 Powhatan.
2. Asphalt Concrete Hot Mix

<u>Type</u>	<u>Asphalt Cement %</u>	<u>Mineral Aggregate %</u>
Surface Course	5.2	94.8
Binder Course	4.1	95.9
Base Course	3.9	96.1


Michael C. Benson
Materials Engineer

MCB:pt:bjj
Attachment

cc: State Constr. Eng. – Master File Copy
District 10 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 - 03/28/2017
JOB NUMBER - 100835

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 16
DISTRICT NO. - 10

JOB NAME - HWY. 18/CARAWAY RD. INTERS. IMPVTS.

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB LESS THAN 5

RESILIENT MODULUS
STA. 214+00 9427



REMARKS -
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AASHTO TESTS : T190

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

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

Job No.	100835	Material Code	SSRVPS
Date Sampled:	3/1/17	Station No.:	214+00
Date Tested:	March 16, 2017	Location:	42LT
Name of Project:	HWY. 18/CARAWAY RD. INTERS. IMPVTS.		
County:	Code: 16	Name:	CRAIGHEAD
Sampled By:	DICKERSON/FRAZIER		
Lab No.:	20170724	Depth:	0-5
Sample ID:	RV193	AASHTO Class:	A-6(4)
LATITUDE:		Material Type (1 or 2):	2
		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	3.96
Middle	3.95
Bottom	3.95
Average	3.95
Membrane Thickness (in):	0.01
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):	12.20
Initial Volume, AoLo (cu. in):	97.97

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3244.20
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4. Soil Properties:

Optimum Moisture Content (%):	12.0
Maximum Dry Density (pcf):	116.3
95% of MDD (pcf):	110.5
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3244.20
Compaction Moisture content (%):	12.1
Compaction Wet Density (pcf):	126.17
Compaction Dry Density (pcf):	112.55
Moisture Content After Mr Test (%):	11.7

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

7. Resilient Modulus, Mr: 11422(S_c)^{-0.17938}(S₃)^{0.26182}

8. Comments

9. Tested By: G.WENDLAND **Date:** March 16, 2017

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

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

Job No. 100835 **Material Code** SSRVPS
Date Sampled: 3/1/17 **Station No.:** 214+00
Date Tested: March 16, 2017 **Location:** 42LT
Name of Project: HWY. 18/CARAWAY RD. INTERS. IMPVTS.
County: Code: 16 **Name:** CRAIGHEAD
Sampled By: DICKERSON/FRAZIER **Depth:** 0-5
Lab No.: 20170724 **AASHTO Class:** A-6(4)
Sample ID: RV193 **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
	S ₃ psi	S _{cyclic} psi	P _{max} lbs	P _{cyclic} lbs	P _{contact} lbs	S _{max} psi	S _{cyclic} psi	S _{contact} psi	H _{avg} in	ε _r in/in	M _r psi
Sequence 1	6.0	2.0	25.3	22.5	2.8	2.1	1.8	0.2	0.00091	0.00011	16,243
Sequence 2	6.0	4.0	47.3	44.4	2.8	3.9	3.6	0.2	0.00190	0.00024	15,407
Sequence 3	6.0	6.0	70.0	66.3	3.7	5.7	5.4	0.3	0.00312	0.00039	14,003
Sequence 4	6.0	8.0	93.7	87.6	6.1	7.7	7.2	0.5	0.00457	0.00057	12,616
Sequence 5	6.0	10.0	117.3	108.8	8.5	9.6	8.9	0.7	0.00603	0.00075	11,870
Sequence 6	4.0	2.0	25.0	22.2	2.8	2.1	1.8	0.2	0.00102	0.00013	14,365
Sequence 7	4.0	4.0	46.9	44.1	2.8	3.8	3.6	0.2	0.00221	0.00028	13,109
Sequence 8	4.0	6.0	68.5	65.6	2.8	5.6	5.4	0.2	0.00356	0.00044	12,153
Sequence 9	4.0	8.0	92.2	87.0	5.2	7.6	7.1	0.4	0.00504	0.00063	11,351
Sequence 10	4.0	10.0	115.7	108.1	7.7	9.5	8.9	0.6	0.00657	0.00082	10,832
Sequence 11	2.0	2.0	25.0	22.1	2.8	2.0	1.8	0.2	0.00121	0.00015	12,026
Sequence 12	2.0	4.0	46.5	43.7	2.8	3.8	3.6	0.2	0.00261	0.00032	11,019
Sequence 13	2.0	6.0	67.7	64.9	2.8	5.5	5.3	0.2	0.00417	0.00052	10,240
Sequence 14	2.0	8.0	90.1	85.8	4.3	7.4	7.0	0.4	0.00579	0.00072	9,743
Sequence 15	2.0	10.0	113.7	106.9	6.7	9.3	8.8	0.6	0.00746	0.00093	9,427

TESTED BY _____ DATE _____
 REVIEWED BY _____ DATE _____
 i. WENDLAND March 16, 2017

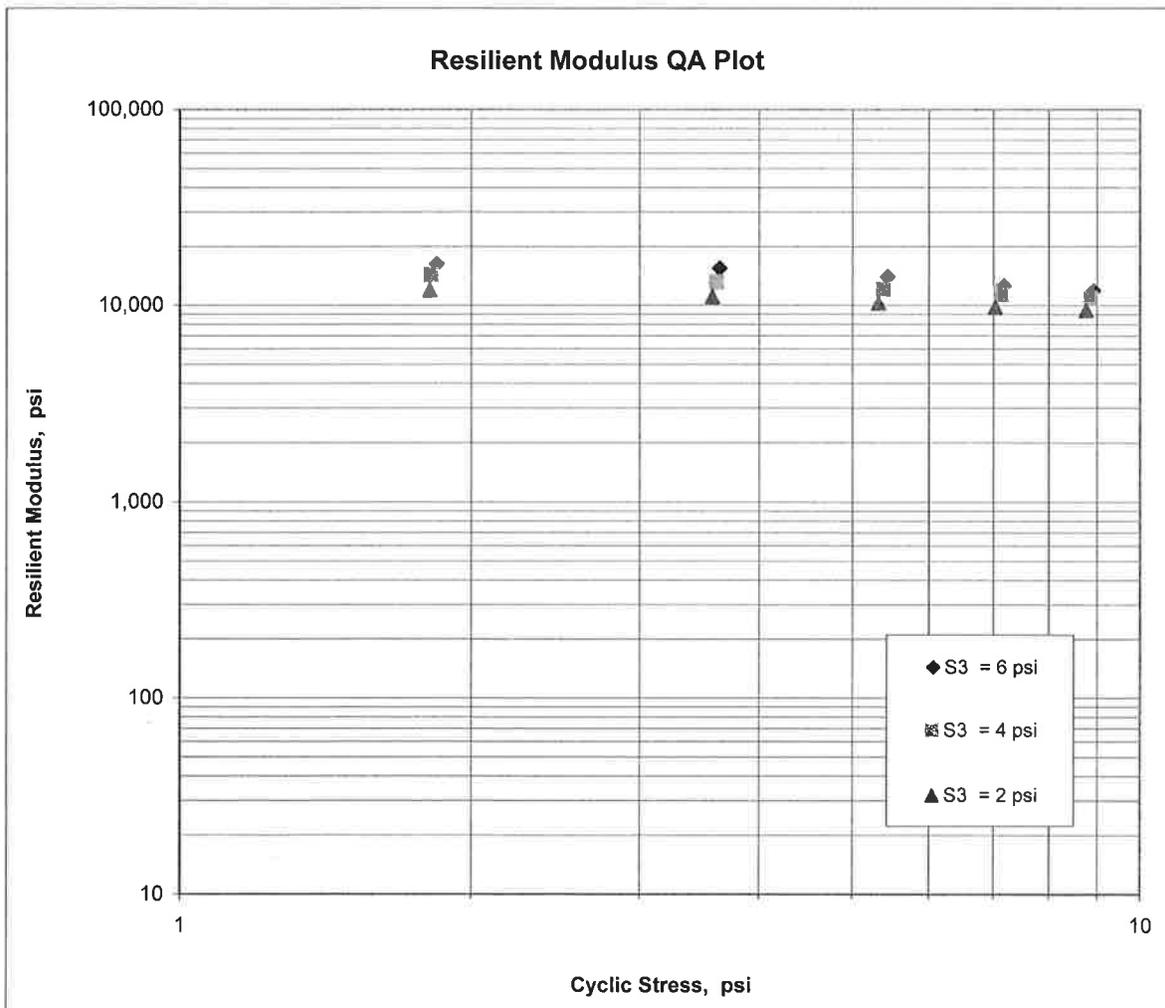
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

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

Job No.	100835	Material Code	SSRVPS
Date Sampled:	3/1/17	Station No.:	214+00
Date Tested:	March 16, 2017	Location:	42LT
Name of Project:	HWY. 18/CARAWAY RD. INTERS. IMPVTS.		
County:	Code: 16	Name:	CRAIGHEAD
Sampled By:	DICKERSON/FRAZIER		Depth: 0-5
Lab No.:	20170724	AASHTO Class:	A-6(4)
Sample ID:	RV193	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

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

K1 =	11,422
K2 =	-0.17938
K5 =	0.26182
R ² =	0.97



JOB: 100835

Arkansas State Highway Transportation Department

JOB NAME: HWY. 18/CARAWAY RD. INTERS. IMPVTS.

Materials Division

COUNTY NO. 16 DATE TESTED 3/14/2017

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR						L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				#4	#10	#40	#80	#200					
				S	I	E	V	E	S				
214+00	42 LT	0-5	RD/BR	95	91	75	58	55	24	13	A-6(4)	RV193	
118+00	24 RT	0-5	BROWN	95	93	89	83	82	37	17	A-6(12)	S189	21.5
125+00	24 LT	0-5	BROWN	100				91	32	15	A-6(13)	S190	29.8
210+00	24 RT	0-5	BROWN	91	87	79	73	70	28	12	A-6(6)	S191	21.9
214+00	24 LT	0-5	BROWN	99	96	93	89	87	40	26	A-6(22)	S192	22.7

comments: W=MULTIPLE LAYERS, X=STRIPPED

Monday, April 03, 2017

JOB: 100835

Arkansas State Highway Transportation Department

DATE TESTED

JOB NAME: HWY. 18/CARAWAY RD. INTERS. IMPVTS.

Materials Division

3/14/2017

COUNTY NO. 16

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

118+00	24 RT	ACHMSC 2.5	ACHMBC 2.5	ACHMSC 4.0	ACHMBC 2.0	ACHMSC 1.5	ACHMBC 1.5	ACHMSC 2.0	ACHMBC 2.0	ACHMSC 2.0	AGG.BASE CRS --
125+00	24 LT	ACHMSC 1.5	ACHMBC 2.5	ACHMSC 8.0X	ACHMBC --	ACHMSC --	ACHMBC --	ACHMSC --	ACHMBC --	ACHMSC --	AGG.BASE CRS 8.0
210+00	24 RT	ACHMSC 5.25W	ACHMBC 4.25W	ACHMSC --	ACHMBC --	ACHMSC --	ACHMBC --	ACHMSC --	ACHMBC --	ACHMSC --	AGG.BASE CRS 6.0
214+00	24 LT	ACHMSC 5.75W	AGG.BASE CRS CL-5 8.0								

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	- 03/28/17	SEQUENCE NO.	- 1
JOB NUMBER	- 100835	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	- 16
SUPPLIER NAME	- STATE	DISTRICT NO.	- 10
NAME OF PROJECT	- HWY. 18/CARAWAY RD. INTERS. IMPVTS.		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CRAIGHEAD COUNTY	DATE SAMPLED	- 03/01/17
SAMPLED BY	- DICKERSON/FRAZIER	DATE RECEIVED	- 03/07/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 03/14/17
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20170720	- 20170721	- 20170722
SAMPLE ID	- S189	- S190	- S191
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 118+00	- 125+00	- 210+00
LOCATION	- 24 RT	- 24 LT	- 24 RT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BROWN	- BROWN	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 49 16.10	- 35 49 16.60	- 35 49 13.80
LONGITUDE DEG-MIN-SEC	- 90 40 44.60	- 90 40 36.20	- 90 40 40.00
% PASSING			
2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	- 100	-	- 100
3/8 IN.	- 96	-	- 94
NO. 4	- 95	- 100	- 91
NO. 10	- 93	-	- 87
NO. 40	- 89	-	- 79
NO. 80	- 83	-	- 73
NO. 200	- 82	- 91	- 70
LIQUID LIMIT	- 37	- 32	- 28
PLASTICITY INDEX	- 17	- 15	- 12
AASHTO SOIL	- A-6(12)	- A-6(13)	- A-6(6)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 21.5	- 29.8	- 21.9
ACHMSC (IN)	- 2.5	- 1.5	- 5.25W
ACHMBC (IN)	- 2.5	- 2.5	- 4.25W
ACHMSC (IN)	- 4.0	- 8.0X	- --
ACHMBC (IN)	- 2.0	- --	- --
ACHMSC (IN)	- 1.5	- --	- --
ACHMBC (IN)	- 1.5	- --	- --
ACHMSC (IN)	- 2.0	- --	- --
AGG.BASE CRS CL-5 (IN)	- --	- 8.0	- 6.0

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265

