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

Type	Asphalt Cement %	Mineral Aggregate %
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 -
-

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	**Depth:**	0-5
Lab No.:	20170724	**AASHTO Class:**	A-6(4)
Sample ID:	RV193	**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	3.96
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

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(Sc)^-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*
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	25.3	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 J.WENDLAND DATE March 16, 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.	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:**	

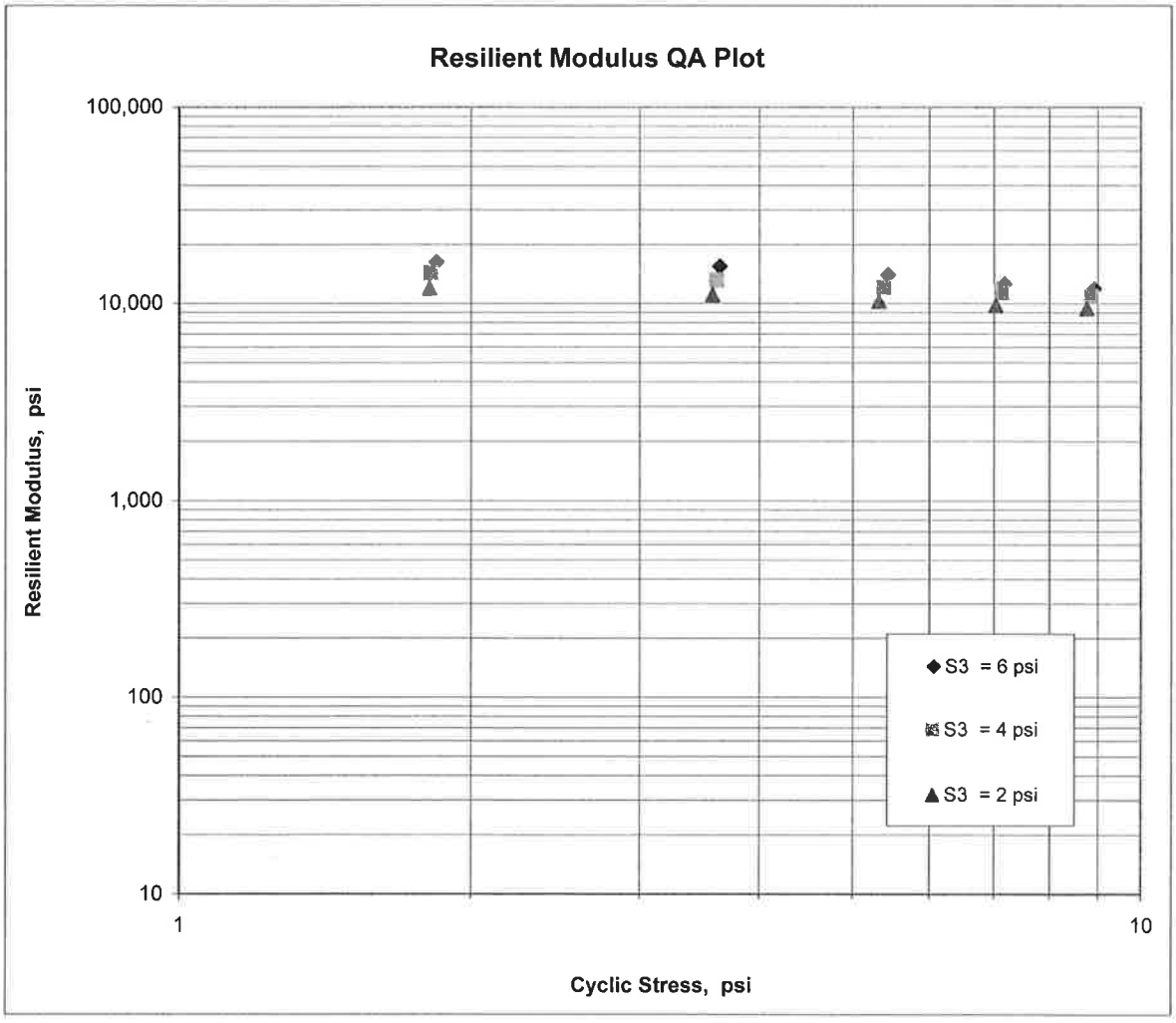
$$M_R = K1\ (S_C)^{K2}\ (S_3)^{K5}$$

K1 = 11,422

K2 = -0.17938

K5 = 0.26182

R^2 = 0.97



JOB: 100835

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

COUNTY NO. 16 **DATE TESTED** 3/14/2017

Arkansas State Highway Transporation Department

Materials Division

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4 SIEVE	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
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

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

COUNTY NO. 16

STA.# LOC.

Arkansas State Highway Transporation Department

Materials Division

Michael Benson, Materials Engineer

DATE TESTED

3/14/2017

PAVEMENT SOUNDINGS

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

comments: W=MULTIPLE LAYERS, X=STRIPPED

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 - 03/28/17
JOB NUMBER - 100835
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY. 18/CARAWAY RD. INTERS. IMPVTS.
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - CRAIGHEAD COUNTY
SAMPLED BY - DICKERSON/FRAZIER
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

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

DATE SAMPLED - 03/01/17
DATE RECEIVED - 03/07/17
DATE TESTED - 03/14/17

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

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.	- 2
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	20170723
SAMPLE ID	S192
TEST STATUS	INFORMATION ONLY
STATION	214+00
LOCATION	24 LT
DEPTH IN FEET	0-5
MAT'L COLOR	BROWN
MAT'L TYPE	
LATITUDE DEG-MIN-SEC	35 49 18.30
LONGITUDE DEG-MIN-SEC	90 40 40.60
% PASSING 2 IN.	
1 1/2 IN.	
3/4 IN.	100
3/8 IN.	99
NO. 4	99
NO. 10	96
NO. 40	93
NO. 80	89
NO. 200	87
LIQUID LIMIT	40
PLASTICITY INDEX	26
AASHTO SOIL	A-6(22)
UNIFIED SOIL	
% MOISTURE CONTENT	22.7
ACHMSC (IN)	5.75W
AGG.BASE CRS CL-5 (IN)	8.0

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	- 03/28/17	SEQUENCE NO.	- 1
JOB NUMBER	- 100835	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	- 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 - RESISTANCE R-VALUE ACTUAL RESULTS

LAB NUMBER	20170724
SAMPLE ID	RV193
TEST STATUS	INFORMATION ONLY
STATION	214+00
LOCATION	42 LT
DEPTH IN FEET	0-5
MAT'L COLOR	RD/BR
MAT'L TYPE	
LATITUDE DEG-MIN-SEC	35 49 18.30
LONGITUDE DEG-MIN-SEC	90 40 40.80
% PASSING 2 IN.	
1 1/2 IN.	
3/4 IN.	100
3/8 IN.	97
NO. 4	95
NO. 10	91
NO. 40	75
NO. 80	58
NO. 200	55
LIQUID LIMIT	24
PLASTICITY INDEX	13
AASHTO SOIL	A-6(4)
UNIFIED SOIL	
% MOISTURE CONTENT	

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265