ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

SUBSURFACE INVESTIGATION

STATE JOB NO. 050249

FEDERAL AID PROJECT NO. STP-0073(56)

HWY. 36-HWY. 16 (S)

STATE HIGHWAY 13 SECTION - - -

IN WHITE COUNTY

LETTING OF AUGUST 10, 2016

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

May 23, 2014

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 050249
Hwy. 36 – Hwy. 16 (Gr. & Strs.) (S)
Route 13
White County

Transmitted herewith is the requested Soil Survey, Strength Data and Resilient Modulus test results for the above referenced job. The project consists of creating a two lane highway between Highway 36 and Highway 16. Samples were obtained along the new location. Locations were measured from centerline of construction and should be noted as such on the logs.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of sandy clay with varying amounts of sandstone fragments. Isolated locations of highly plastic clay were encountered. The subgrade soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction. Rock was encountered within the project limits; station, location and depth to rock are listed in Table 1 below.

Table 1

Station	Location from Centerline	Depth (ft.)
154+70	C.L.	3.5
174+00	C.L.	2.0
190+00	C.L.	4.5
278+00	C.L.	2.5
286+00	C.L.	4.0

Three ponds were encountered within the project limits, at stations 146+00 centerline of construction, 180+00 at centerline of construction, and 241+00 at centerline of construction. These ponds should be drained and all soft unstable organic material should be undercut to a depth of stable material (anticipated to be no more than two feet). The undercut areas should be back filled with material meeting the minimum requirements of Selected Material Class SM-1, in the Standard Specifications for Highway Construction, 2014 edition.

Between stations 104+00 to 114+00, 123+00 to 124+00, 137+00 to 142+00, 161+00 to 163+00, 278+00 to 281+00, and 286+00 to 289+00 the grade line closely matches that of the natural ground. These areas primarily traverse open pasture land and wooded areas, it is recommended these areas be undercut a minimum depth of two feet to remove all soft unstable organic material prior to embankment construction. The undercut may be backfilled with locally available unspecified material. An alternative to undercutting is to raise the grade line three to five feet to bridge across the unstable organic material.

Between stations 164+00 to 181+00 and 213+80 to 237+00 are proposed cuts depths of approximately 65 feet and 37 feet respectively. Cut slope recommendations will be provided in a separate report after the subsurface investigation is complete.

The remaining cuts within the project limits are less than 15 feet in depth. The proposed 3:1 cut slope configuration is acceptable as shown.

Based on currently available cross-sections between stations 182+00 to 192+00 is a proposed embankment approximately 34 feet in height, 199+00 to 213+00 is an approximate 25 feet embankment, 238+00 to 274+00 is an embankment 34 feet in height, and 275+00 to 277+15 is an approximate 30 feet high embankment. It is anticipated that the rock from the cuts will be used in embankment construction. Slope configuration and undercut requirements will be made when the subsurface investigation is complete.

Embankments less than 15 feet in height may be constructed with locally available material utilizing the 3:1 slope configuration shown in the currently available cross-sections.

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 in the vicinity of Judsonia.

2. Asphalt Concrete Hot Mix

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.3	94.7
Binder Course	4.4	95.6
Base Course	4.0	96.0

Michael C. Benson
Materials Engineer

MCB:pt:bjj
Attachment
cc: State Constr. Eng. – Master File Copy
District 5 Engineer
Transportation Planning and Policy 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 - 05/02/2014
JOB NUMBER - 050249

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2003
SUPPLIER ID. - 1
COUNTY/STATE - 73
DISTRICT NO. - 05

JOB NAME - HWY.36-HWY.16 (GR.&STRS.) (S)

STATION LIMITS	R-VALUE AT 240 psi
BEGIN JOB - END JOB	11
RESILIENT MODULUS	
STA.102+50	6989
STA.181+50	9936
STA.299+50	7472

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.	050249	**Material Code**	SSRVPS
Date Sampled:	04/30/14	**Station No.:**	102+50
Date Tested:	April 30, 2014	**Location:**	20'LT
Name of Project:	HWY.36-HWY.16 (GR & STRS.)(S)		
County:	**Code:** 73 **Name:** WHITE		
Sampled By:	FAULKNER	**Depth:**	0-5
Lab No.:	20141075	**AASHTO Class:**	A-4(3)
Sample ID:	RV348	**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	3.86
Bottom	3.92
Average	3.91
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):	11.95
Initial Volume, AoLo (cu. in):	95.99

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3237.10

4. Soil Properties:

Optimum Moisture Content (%):	14.3
Maximum Dry Density (pcf):	115.2
95% of MDD (pcf):	109.4
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3237.10
Compaction Moisture content (%):	14.3
Compaction Wet Density (pcf):	128.49
Compaction Dry Density (pcf):	112.42
Moisture Content After Mr Test (%):	14.3

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

7. Resilient Modulus, Mr: 9515(Sc)^-0.27774(S3)^0.37900

8. Comments _____

_____

9. Tested By: MW/DT **Date:** April 30, 2014

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	050249	**Material Code**	SSRVPS
Date Sampled:	04/30/14	**Station No.:**	102+50
Date Tested:	April 30, 2014	**Location:**	20'LT
Name of Project:	HWY.36-HWY.16 (GR & STRS.)(S)		
County:	**Code:** 73 **Name:** WHITE		
Sampled By:	FAULKNER	**Depth:**	0-5
Lab No.:	20141075	**AASHTO Class:**	A-4(3)
Sample ID:	RV348	**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	24.7	22.0	2.7	2.1	1.8	0.2	0.00094	0.00012	15,702
Sequence 2	6.0	4.0	46.3	43.7	2.7	3.9	3.7	0.2	0.00209	0.00026	14,015
Sequence 3	6.0	6.0	68.3	64.9	3.4	5.7	5.4	0.3	0.00344	0.00043	12,687
Sequence 4	6.0	8.0	90.3	84.5	5.8	7.6	7.1	0.5	0.00531	0.00066	10,697
Sequence 5	6.0	10.0	111.8	103.6	8.3	9.4	8.7	0.7	0.00722	0.00090	9,631
Sequence 6	4.0	2.0	24.7	22.0	2.7	2.1	1.8	0.2	0.00115	0.00014	12,912
Sequence 7	4.0	4.0	45.6	42.9	2.7	3.8	3.6	0.2	0.00248	0.00031	11,604
Sequence 8	4.0	6.0	66.0	63.3	2.7	5.5	5.3	0.2	0.00416	0.00052	10,226
Sequence 9	4.0	8.0	87.6	82.7	5.0	7.3	6.9	0.4	0.00603	0.00075	9,204
Sequence 10	4.0	10.0	109.6	102.2	7.4	9.2	8.5	0.6	0.00811	0.00101	8,458
Sequence 11	2.0	2.0	24.3	21.6	2.7	2.0	1.8	0.2	0.00142	0.00018	10,210
Sequence 12	2.0	4.0	44.8	42.0	2.8	3.8	3.5	0.2	0.00322	0.00040	8,778
Sequence 13	2.0	6.0	64.3	61.4	2.8	5.4	5.1	0.2	0.00514	0.00064	8,034
Sequence 14	2.0	8.0	84.7	80.5	4.2	7.1	6.7	0.3	0.00732	0.00091	7,385
Sequence 15	2.0	10.0	105.9	99.2	6.7	8.9	8.3	0.6	0.00954	0.00119	6,989

TESTED BY MW/DT DATE April 30, 2014

REVIEWED BY _____ DATE _____

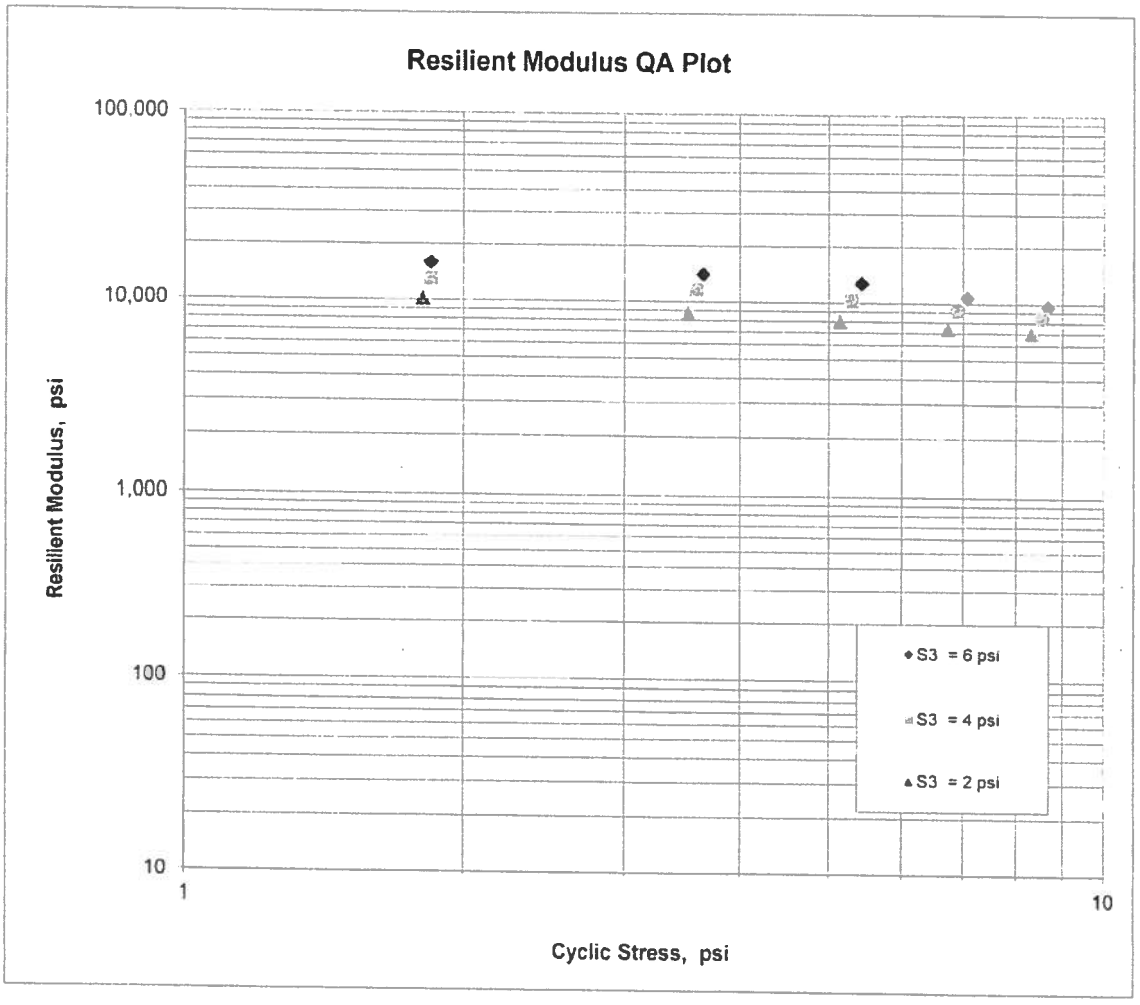
ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	050249	**Material Code**	SSRVPS
Date Sampled:	04/30/14	**Station No.:**	102+50
Date Tested:	April 30, 2014	**Location:**	20'LT
Name of Project:	HWY.36-HWY.16 (GR & STRS.)(S)		
County:	**Code:** 73 **Name:** WHITE		
Sampled By:	FAULKNER	**Depth:**	0-5
Lab No.:	20141075	**AASHTO Class:**	A-4(3)
Sample ID:	RV348	**Material Type (1 or 2):**	2
LATITUDE:		**LONGITUDE:**	

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

K1 =	9,515
K2 =	-0.27774
K5 =	0.37900
R^2 =	0.97



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	050249	**Material Code**	SSRVPS
Date Sampled:	04/29/2014	**Station No.:**	181+50
Date Tested:	April 29, 2014	**Location:**	CL
Name of Project:	HWY.36 (GR & STRS.)(S)		
County:	**Code:** 1 **Name:** ARKANSAS		
Sampled By:	FAULKNER	**Depth:**	0-5
Lab No.:	20141076	**AASHTO Class:**	A-6(11)
Sample ID:	RV349	**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	3.86
Middle	3.90
Bottom	3.90
Average	3.89
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):	11.79
Initial Volume, AoLo (cu. in):	94.33

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3104.60

4. Soil Properties:

Optimum Moisture Content (%):	18.5
Maximum Dry Density (pcf):	107.5
95% of MDD (pcf):	102.1
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3104.60
Compaction Moisture content (%):	18.3
Compaction Wet Density (pcf):	125.40
Compaction Dry Density (pcf):	106.00
Moisture Content After Mr Test (%):	17.9

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

7. Resilient Modulus, Mr: 10376(Sc)^-0.12389(S3)^0.29220

8. Comments _____

9. Tested By: MW/DT **Date:** April 29, 2014

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	050249	**Material Code**	SSRVPS
Date Sampled:	04/29/2014	**Station No.:**	181+50
Date Tested:	April 29, 2014	**Location:**	CL
Name of Project:	HWY.36 (GR & STRS.)(S)		
County:	**Code:** 1 **Name:** ARKANSAS		
Sampled By:	FAULKNER	**Depth:**	0-5
Lab No.:	20141076	**AASHTO Class:**	A-6(11)
Sample ID:	RV349	**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	24.5	21.8	2.7	2.1	1.9	0.2	0.00090	0.00011	16,519
Sequence 2	6.0	4.0	45.7	43.0	2.7	3.9	3.6	0.2	0.00184	0.00023	15,843
Sequence 3	6.0	6.0	67.2	63.8	3.4	5.7	5.4	0.3	0.00290	0.00036	14,920
Sequence 4	6.0	8.0	89.5	83.8	5.7	7.6	7.1	0.5	0.00427	0.00053	13,306
Sequence 5	6.0	10.0	111.0	103.0	8.0	9.4	8.7	0.7	0.00579	0.00072	12,072
Sequence 6	4.0	2.0	24.4	21.7	2.6	2.1	1.8	0.2	0.00105	0.00013	14,059
Sequence 7	4.0	4.0	45.3	42.6	2.7	3.8	3.6	0.2	0.00213	0.00027	13,603
Sequence 8	4.0	6.0	66.2	63.6	2.7	5.6	5.4	0.2	0.00331	0.00041	13,021
Sequence 9	4.0	8.0	88.1	83.4	4.8	7.5	7.1	0.4	0.00456	0.00057	12,401
Sequence 10	4.0	10.0	109.9	102.7	7.2	9.3	8.7	0.6	0.00604	0.00076	11,537
Sequence 11	2.0	2.0	23.9	21.3	2.7	2.0	1.8	0.2	0.00130	0.00016	11,097
Sequence 12	2.0	4.0	44.8	42.0	2.7	3.8	3.6	0.2	0.00268	0.00034	10,635
Sequence 13	2.0	6.0	65.5	62.7	2.8	5.6	5.3	0.2	0.00402	0.00050	10,588
Sequence 14	2.0	8.0	86.3	82.3	4.0	7.3	7.0	0.3	0.00541	0.00068	10,315
Sequence 15	2.0	10.0	107.7	101.2	6.4	9.1	8.6	0.5	0.00691	0.00086	9,936

TESTED BY MW/DT DATE April 29 2014

REVIEWED BY _____ DATE _____

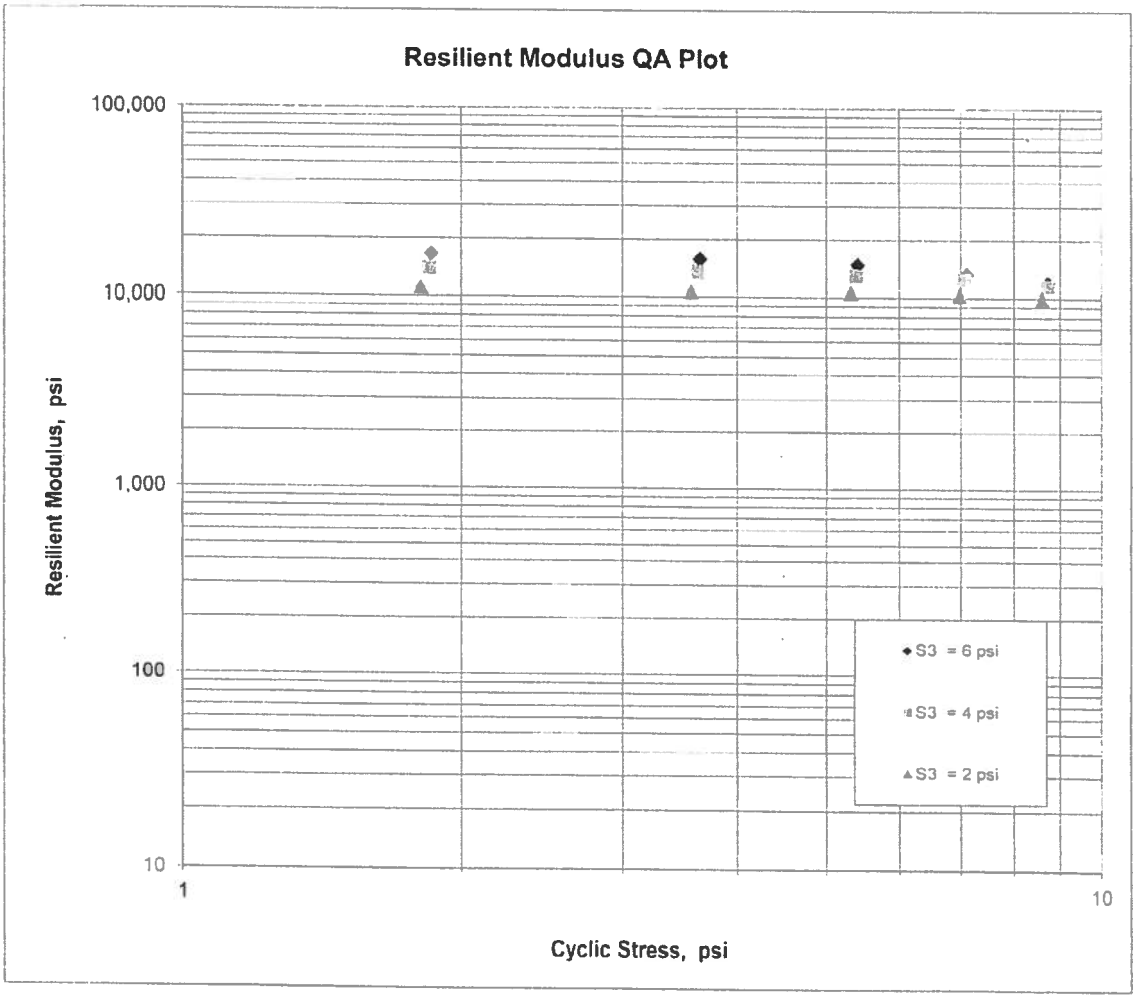
ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	050249	**Material Code**	SSRVPS
Date Sampled:	04/29/2014	**Station No.:**	181+50
Date Tested:	April 29, 2014	**Location:**	CL
Name of Project:	HWY.36 (GR & STRS.)(S)		
County:	**Code:** 1 **Name:** ARKANSAS		
Sampled By:	FAULKNER	**Depth:**	0-5
Lab No.:	20141076	**AASHTO Class:**	A-6(11)
Sample ID:	RV349	**Material Type (1 or 2):**	2
LATITUDE:		**LONGITUDE:**	

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

K1 =	10,376
K2 =	-0.12389
K5 =	0.29220
R^2 =	0.92



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	050249	**Material Code**	SSRVPS
Date Sampled:	04/29/2014	**Station No.:**	299+50
Date Tested:	April 29, 2014	**Location:**	CL
Name of Project:	HWY.36 (GR & STRS.)(S)		
County:	**Code:** 73 **Name:** WHITE		
Sampled By:	FAULKNER	**Depth:**	0-5
Lab No.:	20141077	**AASHTO Class:**	A-4(0)
Sample ID:	RV350	**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	3.95
Middle	3.94
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):	12.16
Initial Volume, AoLo (cu. in):	97.64

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3339.60

4. Soil Properties:

Optimum Moisture Content (%):	13.6
Maximum Dry Density (pcf):	116
95% of MDD (pcf):	110.2
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3339.60
Compaction Moisture content (%):	13.6
Compaction Wet Density (pcf):	130.32
Compaction Dry Density (pcf):	114.72
Moisture Content After Mr Test (%):	13.7

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

7. Resilient Modulus, Mr: 7317(Sc)^-0.15200(S3)^0.45107

8. Comments _____

9. Tested By: MW/DT **Date:** April 29, 2014

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	050249	**Material Code**	SSRVPS
Date Sampled:	04/29/2014	**Station No.:**	299+50
Date Tested:	April 29, 2014	**Location:**	CL
Name of Project:	HWY.36 (GR & STRS.)(S)		
County:	**Code:** 73 **Name:** WHITE		
Sampled By:	FAULKNER	**Depth:**	0-5
Lab No.:	20141077	**AASHTO Class:**	A-4(0)
Sample ID:	RV350	**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	25.0	22.4	2.6	2.1	1.8	0.2	0.00099	0.00012	14,983
Sequence 2	6.0	4.0	47.0	44.4	2.6	3.9	3.7	0.2	0.00209	0.00026	14,017
Sequence 3	6.0	6.0	69.7	66.2	3.5	5.7	5.4	0.3	0.00333	0.00041	13,130
Sequence 4	6.0	8.0	93.2	87.2	6.0	7.7	7.2	0.5	0.00480	0.00060	12,000
Sequence 5	6.0	10.0	116.7	108.1	8.6	9.6	8.9	0.7	0.00623	0.00078	11,466
Sequence 6	4.0	2.0	25.0	22.3	2.7	2.1	1.8	0.2	0.00120	0.00015	12,270
Sequence 7	4.0	4.0	46.4	43.6	2.8	3.8	3.6	0.2	0.00255	0.00032	11,314
Sequence 8	4.0	6.0	67.7	64.8	2.9	5.6	5.3	0.2	0.00409	0.00051	10,465
Sequence 9	4.0	8.0	91.0	85.7	5.3	7.5	7.0	0.4	0.00565	0.00070	10,025
Sequence 10	4.0	10.0	114.6	106.8	7.7	9.4	8.8	0.6	0.00728	0.00091	9,693
Sequence 11	2.0	2.0	24.4	21.6	2.8	2.0	1.8	0.2	0.00155	0.00019	9,194
Sequence 12	2.0	4.0	45.0	42.2	2.8	3.7	3.5	0.2	0.00344	0.00043	8,084
Sequence 13	2.0	6.0	65.2	62.4	2.9	5.4	5.1	0.2	0.00536	0.00067	7,684
Sequence 14	2.0	8.0	87.3	83.0	4.3	7.2	6.8	0.4	0.00718	0.00089	7,639
Sequence 15	2.0	10.0	110.0	103.1	6.9	9.0	8.5	0.6	0.00912	0.00114	7,472

TESTED BY MW/DT DATE April 29, 2014

REVIEWED BY _____ DATE _____

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

MATERIALS DIVISION

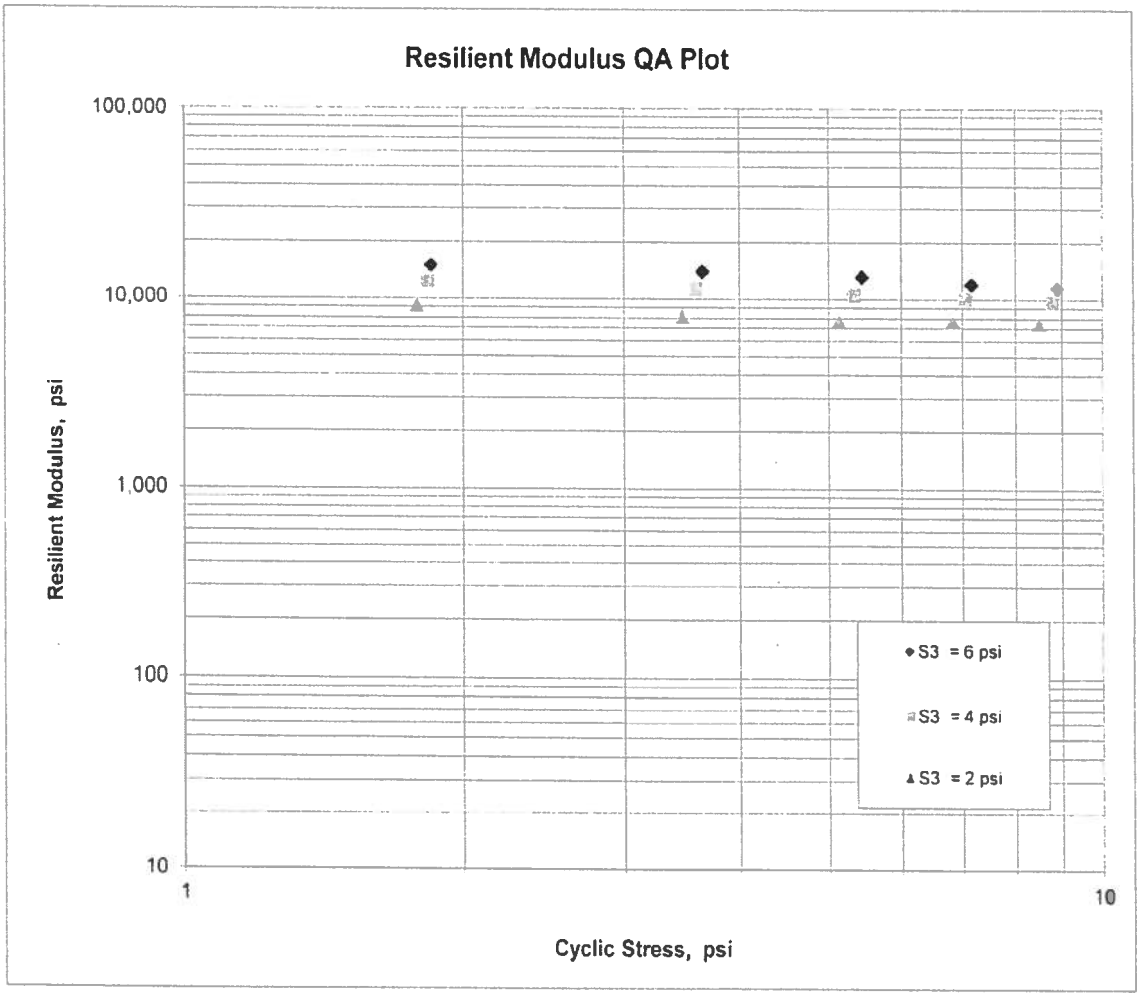
AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS

RECOMPACTED / THINWALL TUBE SAMPLES

Job No.	050249	**Material Code**	SSRVPS
Date Sampled:	04/29/2014	**Station No.:**	299+50
Date Tested:	April 29, 2014	**Location:**	CL
Name of Project:	HWY.36 (GR & STRS.)(S)		
County:	**Code:** 73 **Name:** WHITE		
Sampled By:	FAULKNER	**Depth:**	0-5
Lab No.:	20141077	**AASHTO Class:**	A-4(0)
Sample ID:	RV350	**Material Type (1 or 2):**	2
LATITUDE:		**LONGITUDE:**	

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

K1 =	7,317
K2 =	-0.15200
K5 =	0.45107
R^2 =	0.99



JOB: 050249

JOB NAME: HWY.36-HWY.16 (GR.&STRS.) (S)

COUNTY NO. 73 **DATE TESTED** 4/22/2014

Arkansas State Highway Transporation Department

Materials Division

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					
102+50	20'LT	0-5	BR/GR	83	70	61	58	54	28	10	A-4(3)	RV348	
181+50	CL	0-5	BR/GR	95	92	91	87	81	34	15	A-6(11)	RV349	
299+00	CL	0-5	BR/GR	88	82	80	78	56	21	02	A-4(0)	RV350	
102+50	20LT	0-5	BR/GR	89	77	66	63	60	34	15	A-6(7)	S335	20.6
154+70	CL	0-3.5Z	BR/GR	95	93	90	81	63	27	10	A-4(4)	S336	20.6
174+00	CL	0-2Z	BR/GR	92	85	79	68	45	ND	NP	A-4(0)	S337	14.1
181+50	CL	0-5	BR/GR	96	93	92	87	80	34	14	A-6(10)	S338	22.9
190+00	CL	0-4.5Z	BR/GR	95	93	91	90	88	79	52	A-7-6(52)	S339	33.2
214+35	CL	0-5	BR/GR	88	80	75	70	65	40	25	A-6(14)	S340	18.5
222+00	CL	0-5	BR/GR	95	86	79	72	53	26	11	A-6(3)	S341	20.2
254+00	CL	0-5	BR/GR	97	92	87	85	80	31	13	A-6(9)	S342	19.6
262+00	CL	0-5	BR/GR	97	85	75	73	67	30	11	A-6(5)	S343	19.2
278+00	CL	0-2.5Z	BR/GR	98	96	92	88	59	ND	NP	A-4(0)	S344	17.3
286+00	CL	0-4Z	BR/GR	100	98	96	94	87	25	08	A-4(5)	S345	9.6
294+00	CL	0-5	BR/GR	96	93	90	87	70	27	08	A-4(4)	S346	18.5
299+00	CL	0-5	BR/GR	86	81	78	75	61	23	05	A-4(1)	S347	14

comments: LOCATIONS MEASURED FROM C L OF CONSTRUCTION, Z=AUGER REFUSAL

Friday, May 02, 2014

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION
MICHAEL BENSON, MATERIALS ENGINEER
*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE - 04/22/14
JOB NUMBER - 050249
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY.36-HWY.16 (GR.&STRS.) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - WHITE, COUNTY
SAMPLED BY - FAULKNER/BOUGHNER
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2003
SUPPLIER ID. - 1
COUNTY/STATE - 73
DISTRICT NO. - 05

DATE SAMPLED - 03/27/14
DATE RECEIVED - 04/01/14
DATE TESTED - 04/22/14

LAB NUMBER	20141062	20141063	20141064
SAMPLE ID	S335	S336	S337
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	102+50	154+70	174+00
LOCATION	20LT	CL	CL
DEPTH IN FEET	0-5	0-3.5Z	0-2Z
MAT'L COLOR	BR/GR	BR/GR	BR/GR
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 14 49.50	35 15 41.00	35 15 57.40
LONGITUDE DEG-MIN-SEC	91 47 36.30	91 47 37.30	91 47 26.30
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.	100	100	
3/8 IN.	99	98	100
NO. 4	89	95	92
NO. 10	77	93	85
NO. 40	66	90	79
NO. 80	63	81	68
NO. 200	60	63	45
LIQUID LIMIT	34	27	ND
PLASTICITY INDEX	15	10	NP
AASHTO SOIL	A-6(7)	A-4(4)	A-4(0)
UNIFIED SOIL			
% MOISTURE CONTENT	20.6	20.6	14.1

REMARKS - LOCATIONS MEASURED FROM C.L. OF CONSTRUCTION, Z=AUGER REFUSAL

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 - 04/22/14
JOB NUMBER - 050249
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY.36-HWY.16 (GR.&STRS.) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - WHITE, COUNTY
SAMPLED BY - FAULKNER/BOUGHNER
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE

SEQUENCE NO. - 2
MATERIAL CODE - SSRV
SPEC. YEAR - 2003
SUPPLIER ID. - 1
COUNTY/STATE - 73
DISTRICT NO. - 05

DATE SAMPLED - 03/27/14
DATE RECEIVED - 04/01/14
DATE TESTED - 04/22/14

LAB NUMBER	20141065	20141066	20141067
SAMPLE ID	S338	S339	S340
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	181+50	190+00	214+35
LOCATION	CL	CL	CL
DEPTH IN FEET	0-5	0-4.5Z	0-5
MAT'L COLOR	BR/GR	BR/GR	BR/GR
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 16 2.50	35 16 6.40	35 16 11.50
LONGITUDE DEG-MIN-SEC	91 47 19.40	91 47 11.00	91 46 43.00
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.	100	100	
3/8 IN.	98	96	100
NO. 4	96	95	88
NO. 10	93	93	80
NO. 40	92	91	75
NO. 80	87	90	70
NO. 200	80	88	65
LIQUID LIMIT	34	79	40
PLASTICITY INDEX	14	52	25
AASHTO SOIL	A-6(10)	A-7-6(52)	A-6(14)
UNIFIED SOIL			
% MOISTURE CONTENT	22.9	33.2	18.5

REMARKS - LOCATIONS MEASURED FROM C.L. OF CONSTRUCTION, Z=AUGER REFUSAL

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 - 04/22/14
JOB NUMBER - 050249
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY.36-HWY.16 (GR.&STRS.) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - WHITE, COUNTY
SAMPLED BY - FAULKNER/BOUGHNER
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE

SEQUENCE NO. - 3
MATERIAL CODE - SSRV
SPEC. YEAR - 2003
SUPPLIER ID. - 1
COUNTY/STATE - 73
DISTRICT NO. - 05

DATE SAMPLED - 03/27/14
DATE RECEIVED - 04/01/14
DATE TESTED - 04/22/14

LAB NUMBER	20141068	20141069	20141070
SAMPLE ID	S341	S342	S343
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	222+00	254+00	262+00
LOCATION	CL	CL	CL
DEPTH IN FEET	0-5	0-5	0-5
MAT'L COLOR	BR/GR	BR/GR	BR/GR
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 16 10.60	35 16 8.80	35 16 8.20
LONGITUDE DEG-MIN-SEC	91 46 33.60	91 45 55.10	91 45 45.50
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.			
3/8 IN.	100	100	100
NO. 4	95	97	97
NO. 10	86	92	85
NO. 40	79	87	75
NO. 80	72	85	73
NO. 200	53	80	67
LIQUID LIMIT	26	31	30
PLASTICITY INDEX	11	13	11
AASHTO SOIL	A-6(3)	A-6(9)	A-6(5)
UNIFIED SOIL			
% MOISTURE CONTENT	20.2	19.6	19.2

REMARKS - LOCATIONS MEASURED FROM C.L. OF CONSTRUCTION, Z= AUGER REFUSAL

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 - 04/22/14
JOB NUMBER - 050249
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY.36-HWY.16 (GR.&STRS.) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - WHITE, COUNTY
SAMPLED BY - FAULKNER/BOUGHNER
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE

SEQUENCE NO. - 4
MATERIAL CODE - SSRV
SPEC. YEAR - 2003
SUPPLIER ID. - 1
COUNTY/STATE - 73
DISTRICT NO. - 05

DATE SAMPLED - 03/27/14
DATE RECEIVED - 04/01/14
DATE TESTED - 04/22/14

LAB NUMBER	20141071	20141072	20141073
SAMPLE ID	S344	S345	S346
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	278+00	286+00	294+00
LOCATION	CL	CL	CL
DEPTH IN FEET	0-2.5Z	0-4Z	0-5
MAT'L COLOR	BR/GR	BR/GR	BR/GR
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 16 7.50	35 16 7.30	35 16 8.70
LONGITUDE DEG-MIN-SEC	91 45 26.20	91 45 16.60	91 45 7.10
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.	100		100
3/8 IN.	99		99
NO. 4	98	100	96
NO. 10	96	98	93
NO. 40	92	96	90
NO. 80	88	94	87
NO. 200	59	87	70
LIQUID LIMIT	ND	25	27
PLASTICITY INDEX	NP	08	08
AASHTO SOIL	A-4(0)	A-4(5)	A-4(4)
UNIFIED SOIL			
% MOISTURE CONTENT	17.3	9.6	18.5

REMARKS - LOCATIONS MEASURED FROM C.L. OF CONSTRUCTION, Z=AUGER REFUSAL

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 - 04/22/14
JOB NUMBER - 050249
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY.36-HWY.16 (GR.&STRS.) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - WHITE, COUNTY
SAMPLED BY - FAULKNER/BOUGHNER
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE

SEQUENCE NO. - 5
MATERIAL CODE - SSRV
SPEC. YEAR - 2003
SUPPLIER ID. - 1
COUNTY/STATE - 73
DISTRICT NO. - 05

DATE SAMPLED - 03/27/14
DATE RECEIVED - 04/01/14
DATE TESTED - 04/22/14

LAB NUMBER	20141074
SAMPLE ID	S347
TEST STATUS	INFORMATION ONLY
STATION	299+00
LOCATION	CL
DEPTH IN FEET	0-5
MAT'L COLOR	BR/GR
MAT'L TYPE	
LATITUDE DEG-MIN-SEC	35 16 9.90
LONGITUDE DEG-MIN-SEC	91 45 .90
% PASSING 2 IN.	
1 1/2 IN.	
3/4 IN.	100
3/8 IN.	92
NO. 4	86
NO. 10	81
NO. 40	78
NO. 80	75
NO. 200	61
LIQUID LIMIT	23
PLASTICITY INDEX	05
AASHTO SOIL	A-4(1)
UNIFIED SOIL	
% MOISTURE CONTENT	14.0

REMARKS - LOCATIONS MEASURED FROM C.L. OF CONSTRUCTION, Z=AUGER REFUSAL

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 - 04/23/14
JOB NUMBER - 050249
FEDERAL AID NO. - TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY.36-HWY.16 (GR.&STRS.) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - WHITE, COUNTY
SAMPLED BY - FAULKNER/BOUGHNER
SAMPLE FROM - TESTHOLE
MATERIAL DESC. - SOIL SURVEY - RESISTANCE R-VALUE ACTUAL RESULTS

SEQUENCE NO. - 2
MATERIAL CODE - RV
SPEC. YEAR - 2003
SUPPLIER ID. - 1
COUNTY/STATE - 73
DISTRICT NO. - 05

DATE SAMPLED - 03/27/14
DATE RECEIVED - 04/01/14
DATE TESTED - 04/22/14

LAB NUMBER	20141075	20141076	20141077
SAMPLE ID	RV348	RV349	RV350
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	102+50	181+50	299+00
LOCATION	20'LT	CL	CL
DEPTH IN FEET	0-5	0-5	0-5
MAT'L COLOR	BR/GR	BR/GR	BR/GR
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 14 49.50	35 16 2.50	35 16 9.90
LONGITUDE DEG-MIN-SEC	91 47 36.30	91 47 19.40	91 45 .90
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.	100	100	100
3/8 IN.	93	97	94
NO. 4	83	95	88
NO. 10	70	92	82
NO. 40	61	91	80
NO. 80	58	87	78
NO. 200	54	81	56
LIQUID LIMIT	28	34	21
PLASTICITY INDEX	10	15	02
AASHTO SOIL	A-4(3)	A-6(11)	A-4(0)
UNIFIED SOIL			
% MOISTURE CONTENT			

REMARKS - LOCATIONS MEASURED FROM C.L. OF CONSTRUCTION, Z=AUGER REFUSAL

AASHTO TESTS : T24 T88 T89 T90 T265