

ARKANSAS DEPARTMENT OF TRANSPORTATION



**SUBSURFACE INVESTIGATION**

STATE JOB NO. 110619

FEDERAL AID PROJECT NO. NHPP-0054(21)

LITTLE CYPRESS CREEK STR. & APPRS. (S)

STATE HIGHWAY 39 SECTION 11

IN PHILLIPS 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. 110619  
Little Cypress Creek Str. & Apprs. (S)  
Route 39 Section 11  
Phillips 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 bridge for Little Cypress Creek on Highway 39. 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 range from non-plastic sands to 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.

Due to seismic considerations embankment recommendations will be made after the subsurface investigation is completed.

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 Helena.
2. Asphalt Concrete Hot Mix

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.3	94.7
Binder Course	4.3	95.7
Base Course	4.0	96.0

  
Michael C. Benson  
Materials Engineer

MCB:pt:bjj  
Attachment

cc: State Constr. Eng. – Master File Copy  
District 1 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 - 03/07/2017  
JOB NUMBER - 110619

SEQUENCE NO. - 1  
MATERIAL CODE - SSRV  
SPEC. YEAR - 2014  
SUPPLIER ID. - 1  
COUNTY/STATE - 54  
DISTRICT NO. - 01

JOB NAME - LITTLE CYPRESS CREEK STR. & APPRS. (S)

\*\*\*\*\*  
\* STATION LIMITS R-VALUE AT 240 psi \*

BEGIN JOB - END JOB 10  
RESILIENT MODULUS  
101+00 9112

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REMARKS -

AASHTO TESTS : T190

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

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

<b>Job No.</b>	110619	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	2/15/17	<b>Station No.:</b>	101+00
<b>Date Tested:</b>	March 2, 2017	<b>Location:</b>	15'RT
<b>Name of Project:</b>	LITTLE CYPRESS CREEK STR. & APPRS. (S)		
<b>County:</b>	<b>Code:</b> 54	<b>Name:</b> PHILLIPS	
<b>Sampled By:</b>	T.FRAZIER	<b>Depth:</b>	0-5
<b>Lab No.:</b>	20170570	<b>AASHTO Class:</b>	A-4(1)
<b>Sample ID:</b>	RV147	<b>Material Type (1 or 2):</b>	2
<b>LATITUDE:</b>		<b>LONGITUDE:</b>	

**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	3.95
Bottom	3.95
Average	3.95
Membrane Thickness (in):	0.01
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):	12.18
Initial Volume, AoLo (cu. in):	97.56

**3. Soil Specimen Weight:**

Weight of Wet Soil Used (g):	3295.10
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**4. Soil Properties:**

Optimum Moisture Content (%):	13.2
Maximum Dry Density (pcf):	116.5
95% of MDD (pcf):	110.7
In-Situ Moisture Content (%):	N/A

**5. Specimen Properties:**

Wet Weight (g):	3295.10
Compaction Moisture content (%):	13.8
Compaction Wet Density (pcf):	128.69
Compaction Dry Density (pcf):	113.08
Moisture Content After Mr Test (%):	13.2

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

#VALUE!

**7. Resilient Modulus, Mr:**

8963(Sc)^-0.10686(S3)^0.33293

**8. Comments**

\_\_\_\_\_

\_\_\_\_\_

**9. Tested By:**

G.W.

**Date:** March 2, 2017

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

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

**Job No.** 110619      **Material Code** SSRVPS  
**Date Sampled:** 2/15/17      **Station No.:** 101+00  
**Date Tested:** March 2, 2017      **Location:** 15'RT  
**Name of Project:** LITTLE CYPRESS CREEK STR. & APPRS. (S)  
**County:** Code: 54      **Name:** PHILLIPS  
**Sampled By:** T.FRAZIER      **Depth:** 0-5  
**Lab No.:** 20170570      **AASHTO Class:** A-4(1)  
**Sample ID:** RV147      **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. LVD1 and 2	Resilient Strain	Resilient Modulus
	S <sub>3</sub> psi	S <sub>cyclic</sub> psi	P <sub>max</sub> lbs	P <sub>cyclic</sub> lbs	P <sub>contact</sub> lbs	S <sub>max</sub> psi	S <sub>cyclic</sub> psi	S <sub>contact</sub> psi	H <sub>avg</sub> in	ε <sub>r</sub> in/in	M <sub>r</sub> psi
Sequence 1	6.0	2.0	25.3	22.6	2.7	2.1	1.9	0.2	0.00099	0.00012	15,014
Sequence 2	6.0	4.0	47.6	44.8	2.7	3.9	3.7	0.2	0.00203	0.00025	14,539
Sequence 3	6.0	6.0	70.6	67.0	3.6	5.8	5.5	0.3	0.00317	0.00040	13,919
Sequence 4	6.0	8.0	94.9	88.9	6.0	7.8	7.3	0.5	0.00443	0.00055	13,195
Sequence 5	6.0	10.0	119.3	110.9	8.4	9.8	9.1	0.7	0.00566	0.00071	12,884
Sequence 6	4.0	2.0	25.2	22.5	2.7	2.1	1.8	0.2	0.00110	0.00014	13,456
Sequence 7	4.0	4.0	47.1	44.4	2.7	3.9	3.6	0.2	0.00241	0.00030	12,131
Sequence 8	4.0	6.0	69.0	66.3	2.7	5.7	5.4	0.2	0.00380	0.00047	11,487
Sequence 9	4.0	8.0	93.5	88.5	5.1	7.7	7.3	0.4	0.00515	0.00064	11,304
Sequence 10	4.0	10.0	118.0	110.5	7.5	9.7	9.1	0.6	0.00651	0.00081	11,156
Sequence 11	2.0	2.0	25.0	22.4	2.6	2.1	1.8	0.2	0.00137	0.00017	10,727
Sequence 12	2.0	4.0	46.6	43.9	2.7	3.8	3.6	0.2	0.00295	0.00037	9,771
Sequence 13	2.0	6.0	68.0	65.2	2.7	5.6	5.4	0.2	0.00460	0.00057	9,331
Sequence 14	2.0	8.0	91.1	86.9	4.2	7.5	7.1	0.3	0.00627	0.00078	9,112
Sequence 15	2.0	10.0	115.4	108.7	6.7	9.5	8.9	0.5	0.00773	0.00097	9,244

TESTED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_

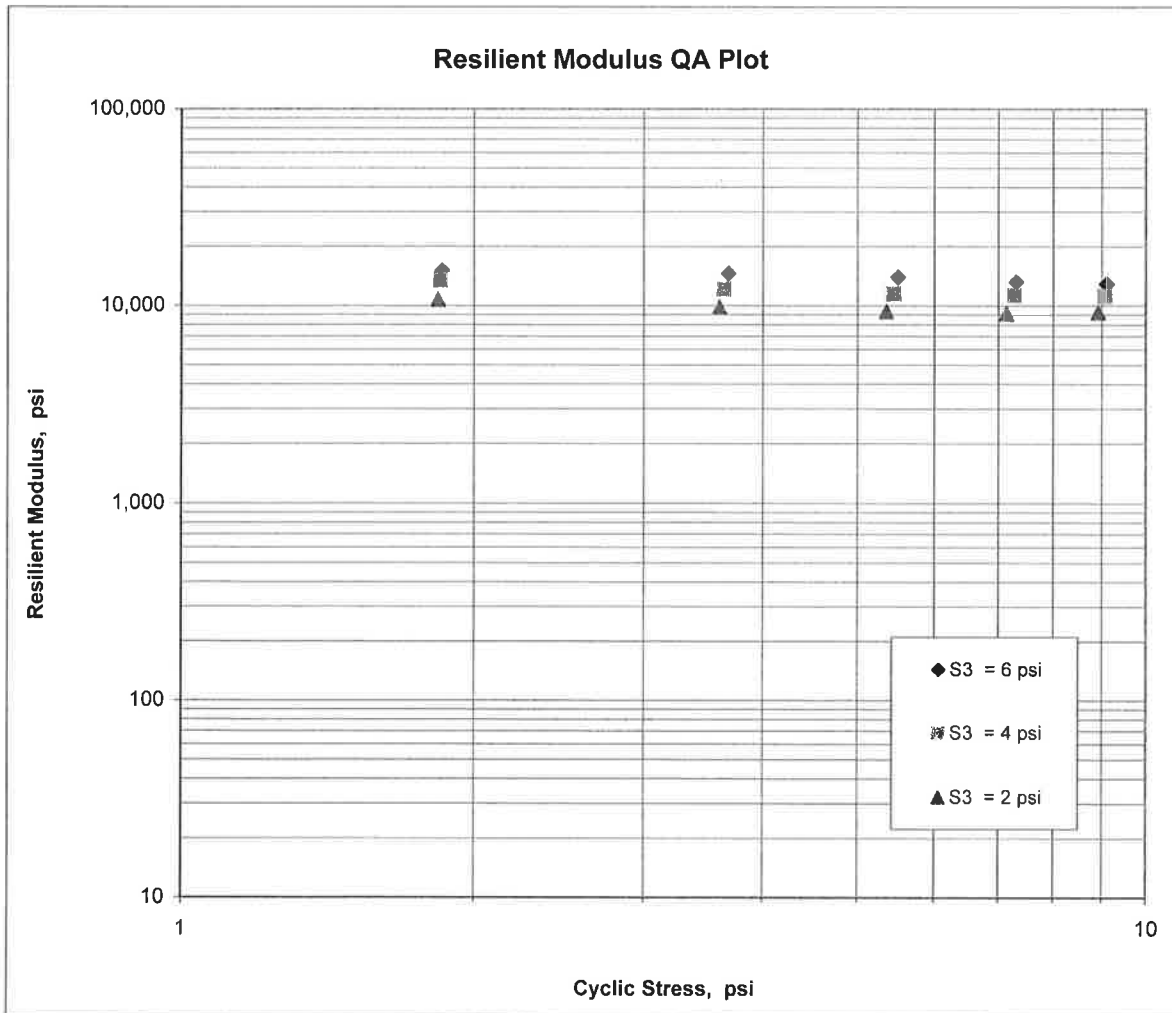
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
MATERIALS DIVISION**

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

<b>Job No.</b>	110619	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	2/15/17	<b>Station No.:</b>	101+00
<b>Date Tested:</b>	March 2, 2017	<b>Location:</b>	15'RT
<b>Name of Project:</b>	LITTLE CYPRESS CREEK STR. & APPRS. (S)		
<b>County:</b>	<b>Code:</b> 54	<b>Name:</b>	PHILLIPS
<b>Sampled By:</b>	T.FRAZIER	<b>Depth:</b>	0-5
<b>Lab No.:</b>	20170570	<b>AASHTO Class:</b>	A-4(1)
<b>Sample ID:</b>	RV147	<b>Material Type (1 or 2):</b>	2
<b>LATITUDE:</b>		<b>LONGITUDE:</b>	

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

$K_1 =$	<u>8,963</u>
$K_2 =$	<u>-0.10686</u>
$K_5 =$	<u>0.33293</u>
$R^2 =$	<u>0.99</u>



**JOB: 110619**

**Arkansas State Highway Transportation Department**

**JOB NAME: LITTLE CYPRESS CREEK STR. & APPRS. (S)**

**Materials Division**

**COUNTY NO. 54 DATE TESTED 3/3/2017**

**Michael Benson, Materials Engineer**

STA.#	LOC.	DEPTH	COLOR						L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				#4	#10	#40	#80	#200					
101+00	15 RT	0-5	BROWN	99	96	93	80	66	20	05	A-4(1)	RV147	
101+00	05 RT	0-5	GRAY	100	99	97	79	61	ND	NP	A-4(0)	S141	21
101+00	15 RT	0-5	BROWN	99	99	95	67	38	ND	NP	A-4(0)	S142	20.2
108+00	40 LT	0-5	BROWN	99	99	98	95	89	ND	NP	A-4(0)	S143	28.5
116+00	16 LT	0-5	BROWN	90	88	83	78	75	39	22	A-6(15)	S144	33.7
122+00	05 LT	0-5	BR/GR	99	98	95	92	85	34	16	A-6(13)	S145	25.7
122+00	16 LT	0-5	BROWN	99	97	94	91	84	29	10	A-4(7)	S146	25.9

**comments: W=MULTIPLE LAYERS**

**Wednesday, March 08, 2017**

**JOB:** 110619

**Arkansas State Highway Transportation Department**  
**Materials Division**

**DATE TESTED**  
3/3/2017

**JOB NAME:** LITTLE CYPRESS CREEK STR. & APPRS. (S)

**COUNTY NO.** 54

**Michael Benson, Materials Engineer**

**STA.# LOC.**  **PAVEMENT SOUNDINGS**

101+00	15 RT	CHIP SEAL	ACHMSC	SOIL CEMENT
		--	--	--
101+00	05 RT	CHIP SEAL	ACHMSC	SOIL CEMENT
		.25	2.75W	1.75
108+00	40 LT	CHIP SEAL	ACHMSC	SOIL CEMENT
		--	--	--
116+00	16 LT	CHIP SEAL	ACHMSC	SOIL CEMENT
		--	--	--
122+00	16 LT	CHIP SEAL	ACHMSC	SOIL CEMENT
		--	--	--
122+00	05 LT	CHIP SEAL	ACHMSC	SOIL CEMENT
		.25	1.0	1.75

**comments:** W=MULTIPLE LAYERS



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	- 110619	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	- 54
SUPPLIER NAME	- STATE	DISTRICT NO.	- 01
NAME OF PROJECT	- LITTLE CYPRESS CREEK STR. & APPRS. (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- PHILLIPS, COUNTY	DATE SAMPLED	- 02/15/17
SAMPLED BY	- T.FRAZIER	DATE RECEIVED	- 02/16/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 03/03/17
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	-	20170564	-	20170565	-	20170566
SAMPLE ID	-	S141	-	S142	-	S143
TEST STATUS	-	INFORMATION ONLY	-	INFORMATION ONLY	-	INFORMATION ONLY
STATION	-	101+00	-	101+00	-	108+00
LOCATION	-	05 RT	-	15 RT	-	40 LT
DEPTH IN FEET	-	0-5	-	0-5	-	0-5
MAT'L COLOR	-	GRAY	-	BROWN	-	BROWN
MAT'L TYPE	-		-		-	
LATITUDE DEG-MIN-SEC	-	34 31 53.50	-	34 31 53.40	-	34 31 46.30
LONGITUDE DEG-MIN-SEC	-	91 00 56.10	-	91 00 56.20	-	91 00 58.60
% PASSING	2 IN.	-	-	-	-	-
	1 1/2 IN.	-	-	-	-	-
	3/4 IN.	-	-	-	-	-
	3/8 IN.	-	-	-	-	-
		-	-	100	-	100
	NO. 4	- 100	-	99	-	99
	NO. 10	- 99	-	99	-	99
	NO. 40	- 97	-	95	-	98
	NO. 80	- 79	-	67	-	95
	NO. 200	- 61	-	38	-	89
LIQUID LIMIT	-	ND	-	ND	-	ND
PLASTICITY INDEX	-	NP	-	NP	-	NP
AASHTO SOIL	-	A-4 (0)	-	A-4 (0)	-	A-4 (0)
UNIFIED SOIL	-		-		-	
% MOISTURE CONTENT	-	21.0	-	20.2	-	28.5
CHIP SEAL	(IN)	- .25	-	--	-	--
ACHMSC	(IN)	- 2.75W	-	--	-	--
SOIL CEMENT	(IN)	- 1.75	-	--	-	--
		-	-		-	
		-	-		-	
		-	-		-	
		-	-		-	
		-	-		-	
		-	-		-	
		-	-		-	
		-	-		-	
		-	-		-	
		-	-		-	

REMARKS - W=MULTIPLE LAYERS

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 - 110619 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 - 54  
SUPPLIER NAME - STATE DISTRICT NO. - 01  
NAME OF PROJECT - LITTLE CYPRESS CREEK STR. & APPRS. (S)  
PROJECT ENGINEER - NOT APPLICABLE  
PIT/QUARRY - ARKANSAS  
LOCATION - PHILLIPS, COUNTY DATE SAMPLED - 02/15/17  
SAMPLED BY - T.FRAZIER DATE RECEIVED - 02/16/17  
SAMPLE FROM - TEST HOLE DATE TESTED - 03/03/17  
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER	20170567	20170568	20170569
SAMPLE ID	S144	S145	S146
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	116+00	122+00	122+00
LOCATION	16 LT	05 LT	16 LT
DEPTH IN FEET	0-5	0-5	0-5
MAT'L COLOR	BROWN	BR/GR	BROWN
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	34 31 39.90	34 31 33.90	34 31 33.90
LONGITUDE DEG-MIN-SEC	91 01 2.10	91 01 2.30	91 01 2.20
% PASSING			
2 IN.			
1 1/2 IN.			
3/4 IN.	100		
3/8 IN.	96	100	100
NO. 4	90	99	99
NO. 10	88	98	97
NO. 40	83	95	94
NO. 80	78	92	91
NO. 200	75	85	84
LIQUID LIMIT	39	34	29
PLASTICITY INDEX	22	16	10
AASHTO SOIL	A-6(15)	A-6(13)	A-4(7)
UNIFIED SOIL			
% MOISTURE CONTENT	33.7	25.7	25.9
CHIP SEAL (IN)	--	.25	--
ACHMSC (IN)	--	1.0	--
SOIL CEMENT (IN)	--	1.75	--

REMARKS - W=MULTIPLE LAYERS  
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AASHTO TESTS : T24 T88 T89 T90 T265  
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ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 03/07/17  
JOB NUMBER - 110619  
FEDERAL AID NO. - TO BE ASSIGNED  
PURPOSE - SOIL SURVEY SAMPLE  
SPEC. REMARKS - NO SPECIFICATION CHECK  
SUPPLIER NAME - STATE  
NAME OF PROJECT - LITTLE CYPRESS CREEK STR. & APPRS. (S)  
PROJECT ENGINEER - NOT APPLICABLE  
PIT/QUARRY - ARKANSAS  
LOCATION - PHILLIPS, COUNTY  
SAMPLED BY - T.FRAZIER  
SAMPLE FROM - TEST HOLE  
MATERIAL DESC. - SOIL SURVEY - RESISTANCE R-VALUE

SEQUENCE NO. - 1  
MATERIAL CODE - RV  
SPEC. YEAR - 2014  
SUPPLIER ID. - 1  
COUNTY/STATE - 54  
DISTRICT NO. - 01  
DATE SAMPLED - 02/15/17  
DATE RECEIVED - 02/16/17  
DATE TESTED - 03/03/17

ACTUAL RESULTS

LAB NUMBER	-	20170570	-	-	-
SAMPLE ID	-	RV147	-	-	-
TEST STATUS	-	INFORMATION ONLY	-	-	-
STATION	-	101+00	-	-	-
LOCATION	-	15 RT	-	-	-
DEPTH IN FEET	-	0-5	-	-	-
MAT'L COLOR	-	BROWN	-	-	-
MAT'L TYPE	-		-	-	-
LATITUDE DEG-MIN-SEC	-	34 31 53.40	-	-	-
LONGITUDE DEG-MIN-SEC	-	91 00 56.20	-	-	-
% PASSING	2 IN.	-	-	-	-
	1 1/2 IN.	-	-	-	-
	3/4 IN.	-	-	-	-
	3/8 IN.	100	-	-	-
	NO. 4	99	-	-	-
	NO. 10	96	-	-	-
	NO. 40	93	-	-	-
	NO. 80	80	-	-	-
	NO. 200	66	-	-	-
LIQUID LIMIT	-	20	-	-	-
PLASTICITY INDEX	-	05	-	-	-
AASHTO SOIL	-	A-4 (1)	-	-	-
UNIFIED SOIL	-		-	-	-
% MOISTURE CONTENT	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-

REMARKS - W=MULTIPLE LAYERS  
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