

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 110653

FEDERAL AID PROJECT NO. CMAQ-9448(40)

**HWY. 118/W. SERVICE RD./I-40 EB RAMPS SIGNAL
& INTERS. IMPVTS. (WEST MEMPHIS) (S)**

STATE HIGHWAY 118 SECTION 4

IN CRITTENDEN 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 DEPARTMENT OF TRANSPORTATION

AR DOT.gov | I Drive Arkansas.com | Scott E. Bennett, P.E., Director

MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

November 1, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 110653
Hwy. 118/W. Service Rd/I-40 EB Ramps Signal Inters. Impvts.
(West Memphis) (S)
Route 118 Section 4
Crittenden County

Transmitted herewith is the requested Soil Survey, strength data and Resilient Modulus test results for the above referenced job. The project consists of adding a traffic signal at the I-40 East bound ramps and Highway 118 intersection. Samples were obtained in the existing travel lanes. At station 101+00 only pavement data was collected due to utility conflicts.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of highly plastic clay with sand. Cross-sections are not currently available, but it is assumed 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 processing if the weather is favorable during construction.

Additional earthwork recommendations will be made upon request when plans are further developed and cross-sections are available.

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 West Memphis.

- 2. Asphalt Concrete Hot Mix

Table with 3 columns: Type, Asphalt Cement %, Mineral Aggregate %. Rows include Surface Course, Binder Course, and Base Course.

Handwritten signature of 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 - 10/12/2017 SEQUENCE NO. - 1
JOB NUMBER - 110653 MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 18
DISTRICT NO. - 01

JOB NAME - HWY.118/W.SERV.RD/I40 EB RAMPS (WEST MEMPHIS) (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB LESS THAN 5

RESILIENT MODULUS
STA. 104 + 70 7313

REMARKS -

AASHTO TESTS : T190

JOB: 110653

Arkansas State Highway Transportation Department

JOB NAME: HWY.118/W.SERV.RD/I40 EB RAMPS (WEST MEMPHIS)(S)

Materials Division

COUNTY NO. 18 DATE TESTED 9/29/2017

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					
101+00	24 RT	0-0											
104+70	57 LT	0-5	GRAY	76	72	64	57	54	50	35	A-7-6(15)	RV584	
109+00	32 LT	0-5	GRAY	98	92	80	73	68	44	25	A-7-6(15)	S583	29.1

comments: W=MULTIPLE LAYERS, X=STRIPPED

Monday, October 30, 2017

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

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

Job No.	110653	Material Code	SSRVPS
Date Sampled:	9/14/17	Station No.:	104+70
Date Tested:	September 29, 2017	Location:	57 LT
Name of Project:	HWY. 118/W SERVICE RD/140 EB RAMPS SIGNAL INTERS. IMPVTS. (WEST MEMPHIS)(S)		
County:	Code: 18	Name:	CRITTENDEN
Sampled By:	THORNTON	Depth:	0-5
Lab No.:	20172872	AASHTO Class:	A-7-6 (15)
Sample ID:	RV584	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	3.94
Middle	3.94
Bottom	3.95
Average	3.94
Membrane Thickness (in):	0.01
Height of Specimen, Cap and Base (in):	8.02
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.02
Initial Area, Ao (sq. in):	12.14
Initial Volume, AoLo (cu. in):	97.35

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	2980.00
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4. Soil Properties:

Optimum Moisture Content (%):	19.3
Maximum Dry Density (pcf):	101
95% of MDD (pcf):	96.0
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	2980.00
Compaction Moisture content (%):	19.4
Compaction Wet Density (pcf):	116.63
Compaction Dry Density (pcf):	97.68
Moisture Content After Mr Test (%):	19.6

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

#VALUE!

7. Resilient Modulus, Mr:

11313(Sc)^{-0.24124}(S3)^{0.13327}

8. Comments

9. Tested By:

GW _____

Date: September 29, 2017

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

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

Job No. 110653 **Material Code** SSRVPS
Date Sampled: 9/14/17 **Station No.:** 104+70
Date Tested: September 29, 2017 **Location:** 57 LT
Name of Project: HWY. 118/W SERVICE RD/140 EB RAMPS SIGNAL INTERS. IMPVTS. (WEST MEMPHIS)(S)
County: Code: 18 **Name:** CRITTENDEN
Sampled By: THORNTON **Depth:** 0-5
Lab No.: 20172872 **AAASHTO Class:** A-7-6 (15)
Sample ID: RV584 **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 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	25.2	22.3	2.8	2.1	1.8	0.2	0.00119	0.00015	12,356
Sequence 2	6.0	4.0	47.1	44.3	2.8	3.9	3.7	0.2	0.00257	0.00032	11,375
Sequence 3	6.0	6.0	69.2	65.6	3.6	5.7	5.4	0.3	0.00427	0.00053	10,163
Sequence 4	6.0	8.0	91.9	85.8	6.0	7.6	7.1	0.5	0.00649	0.00081	8,735
Sequence 5	6.0	10.0	113.0	104.6	8.5	9.3	8.6	0.7	0.00902	0.00112	7,662
Sequence 6	4.0	2.0	25.1	22.3	2.8	2.1	1.8	0.2	0.00129	0.00016	11,412
Sequence 7	4.0	4.0	46.9	44.1	2.8	3.9	3.6	0.2	0.00281	0.00035	10,361
Sequence 8	4.0	6.0	68.1	65.3	2.8	5.6	5.4	0.2	0.00457	0.00057	9,440
Sequence 9	4.0	8.0	90.7	85.6	5.2	7.5	7.0	0.4	0.00664	0.00083	8,519
Sequence 10	4.0	10.0	112.5	105.0	7.5	9.3	8.7	0.6	0.00907	0.00113	7,651
Sequence 11	2.0	2.0	25.0	22.2	2.8	2.1	1.8	0.2	0.00150	0.00019	9,784
Sequence 12	2.0	4.0	46.8	44.0	2.8	3.9	3.6	0.2	0.00313	0.00039	9,297
Sequence 13	2.0	6.0	67.9	65.1	2.8	5.6	5.4	0.2	0.00495	0.00062	8,688
Sequence 14	2.0	8.0	89.7	85.5	4.2	7.4	7.0	0.3	0.00707	0.00088	7,987
Sequence 15	2.0	10.0	111.6	104.9	6.7	9.2	8.6	0.5	0.00948	0.00118	7,313

TESTED BY _____ DATE September 29, 2017
 REVIEWED BY _____ DATE _____

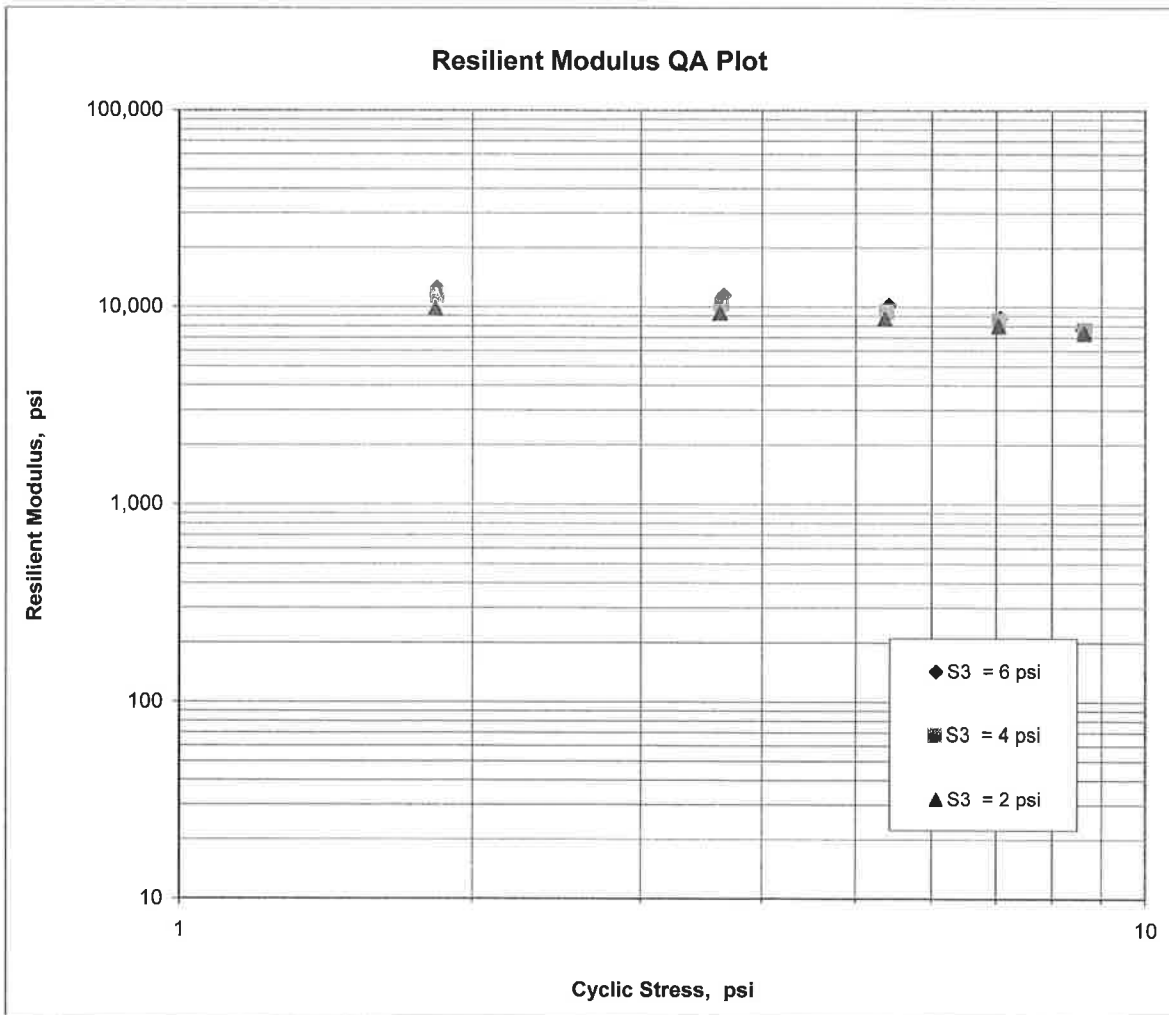
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

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

Job No.	110653	Material Code	SSRVPS
Date Sampled:	9/14/17	Station No.:	104+70
Date Tested:	September 29, 2017	Location:	57 LT
Name of Project:	HWY. 118/W SERVICE RD/140 EB RAMPS SIGNAL INTERS. IMPVTS. (WEST MEN		
County:	Code: 18	Name:	CRITTENDEN
Sampled By:	THORNTON	Depth:	0-5
Lab No.:	20172872	AASHTO Class:	A-7-6 (15)
Sample ID:	RV584	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

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

$K_1 = \underline{11,313}$
 $K_2 = \underline{-0.24124}$
 $K_5 = \underline{0.13327}$
 $R^2 = \underline{0.88}$



JOB: 110653

Arkansas State Highway Transportation Department
Materials Division

DATE TESTED
9/29/2017

JOB NAME: HWY.118/W.SERV.RD/I40 EB RAMPS (WEST MEMPHIS)(S)

COUNTY NO. 18

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

101+00	24 RT	ACHMSC 3.0W	ACHMSC ---	ACHMBC 12.5W	AGG. BASE CRS CL-7 ---
109+00	32 LT	ACHMSC 2.5W	ACHMSC 2.0X	ACHMBC 14.0W	AGG. BASE CRS CL-7 4.0

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	- 10/19/17	SEQUENCE NO.	- 1
JOB NUMBER	- 110653	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	- 18
SUPPLIER NAME	- STATE	DISTRICT NO.	- 01
NAME OF PROJECT	- HWY.118/W.SERV.RD/I40 EB RAMPS (WEST MEMPHIS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CRITTENDEN, COUNTY	DATE SAMPLED	- 09/14/17
SAMPLED BY	- THORNTON/	DATE RECEIVED	- 09/15/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 09/29/17
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20172870	- 20172871	-
SAMPLE ID	-	- S583	-
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	-
STATION	- 101+00	- 109+00	-
LOCATION	- 24 RT	- 32 LT	-
DEPTH IN FEET	- 0-0	- 0-5	-
MAT'L COLOR	-	- GRAY	-
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 9 26.40	- 35 09 34.30	-
LONGITUDE DEG-MIN-SEC	- 90 13 27.30	- 90 13 28.30	-
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	-	-
	3/8 IN. -	-	-
	NO. 4 -	- 100	-
	NO. 10 -	- 98	-
	NO. 40 -	- 92	-
	NO. 80 -	- 80	-
	NO. 80 -	- 73	-
	NO. 200 -	- 68	-
LIQUID LIMIT	-	- 44	-
PLASTICITY INDEX	-	- 25	-
AASHTO SOIL	-	- A-7-6 (15)	-
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	-	- 29.1	-
ACHMSC (IN)	- 3.0W	- 2.5W	-
ACHMSC (IN)	- ---	- 2.0X	-
ACHMBC (IN)	- 12.5W	- 14.0W	-
AGG. BASE CRS CL-7 (IN)	- ---	- 4.0	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

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	- 09/29/17	SEQUENCE NO.	- 1
JOB NUMBER	- 110653	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	- 18
SUPPLIER NAME	- STATE	DISTRICT NO.	- 01
NAME OF PROJECT	- HWY.118/W.SERV.RD/I40 EB RAMPS (WEST MEMPHIS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CRITTENDEN, COUNTY	DATE SAMPLED	- 09/14/17
SAMPLED BY	- THORNTON/	DATE RECEIVED	- 09/15/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 09/29/17
MATERIAL DESC.	- SOIL SURVEY - RESISTANCE R-VALUE	ACTUAL RESULTS	

LAB NUMBER	- 20172872	-	-
SAMPLE ID	- RV584	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 104+70	-	-
LOCATION	- 57 LT	-	-
DEPTH IN FEET	- 0-5	-	-
MAT'L COLOR	- GRAY	-	-
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 9 31.30	-	-
LONGITUDE DEG-MIN-SEC	- 90 13 28.40	-	-
% PASSING	2 IN.	-	-
	1 1/2 IN.	- 100	-
	3/4 IN.	- 93	-
	3/8 IN.	- 83	-
	NO. 4	- 76	-
	NO. 10	- 72	-
	NO. 40	- 64	-
	NO. 80	- 57	-
	NO. 200	- 54	-
LIQUID LIMIT	- 50	-	-
PLASTICITY INDEX	- 35	-	-
AASHTO SOIL	- A-7-6(15)	-	-
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED