ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO.		110653	
FEDERAL AID PROJEC	CT NO.	CMAQ-9448(40)	
HWY. 118/W.		-40 EB RAMPS SIGNAL & EST MEMPHIS) (S)	k INTERS. IMPVTS.
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

ARDOT.gov | IDriveArkansas.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. Serivice 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

Туре	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.2	94.8
Binder Course	4.1	95.9
Base Course	3.6	96.4

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)

BEGIN JOB = END JOB LESS THAN 5

RESILIENT MODULUS

STA. 104 + 70 7313

REMARKS -

3

AASHTO TESTS : T190

JOB: 110653

Arkansas State Highway Transporation 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	<i>LAB</i> #:	%MOISTURE
101+00	24 RT	0-0						S S					
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

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

Job No. Date Sampled: Date Tested:	110653 9/14/17 September 29, 2017	Material Code Station No.: Location:	SSRVPS 104+70 57 LT
Name of Project:	HWY. 118/W SERVICE RD/I40 EB RAMPS SIGNA Code: 18 Name: CRITTENDEN	L INTERS. IMPVTS. (WE	ST MEMPHIS)(S)
County: Sampled By: Lab No.: Sample ID: LATITUDE:	Code: 18 Name: CRITTENDEN THORNTON 20172872 RV584	Depth: AASHTO Class: Material Type (1 or 2) LONGITUDE:	0-5 A-7-6 (15)
1. Testing Inform	nation:		
•	Preconditioning - Permanent Strain > 5% (Y=Ye Testing - Permanent Strain > 5% (Y=Yes or N=N Number of Load Sequences Completed (0-15)	•	N N 15
2. Specimen Info	ormation:		
Soil Specimer Soil Properties	Weight of Wet Soil Used (g): s: Optimum Moisture Content (%): Maximum Dry Density (pcf):		3.94 3.94 3.95 3.94 0.01 8.02 0.00 8.02 12.14 97.35
	95% of MDD (pcf): In-Situ Moisture Content (%):		96.0 N/A
5. Specimen Pro	Perties: Wet Weight (g): Compaction Moisture content (%): Compaction Wet Density (pcf): Compaction Dry Density (pcf): Moisture Content After Mr Test (%):		2980.00 19.4 116.63 97.68 19.6
6. Quick Shear T	est (Y=Yes, N=No, N/A=Not Applicable):		#VALUE!
7. Resilient Mod	ulus, Mr:	11313(5	Sc)^-0.24124(S3)^0.13327
8. Comments			
9. Tested By:	GW Dat	e: September 29, 2017	

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

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

SSRVPS 104+70Material Code Station No.: 9/14/17 Date Sampled:

Job No.

HWY. 118/W SERVICE RD/140 EB RAMPS SIGNAL INTERS. IMPVTS. (WEST MEMPHIS)(S) 57 LT Location: September 29, 2017 Name of Project: Date Tested:

AASHTO Class: Depth: CRITTENDEN Name: Code: 18 THORNTON 20172872 Sampled By: Lab No.: County:

RV584 LATITUDE: Sample ID:

A-7-6 (15) Material Type (1 or 2): 2 LONGITUDE:

0-5

	Chamber	Nominal	Actual	Actual	Actual	Actual	Actual	Actual	Average	Resilient	Resilient
	Confining	Maximum	Applied	Applied	Applied	Applied	Applied	Applied	Recov Def.	Strain	Modulus
PARAMETER	Pressure	Axial	Max. Axial	Cyclic Load	Contact	Мах.	Cyclic	Contact	LVDT 1		
		Stress	Load		Load	Axial	Stress	Stress	and 2		
						Stress					
DESIGNATION	တိ	Scyclic	P	Peyclic	Pcontact	S _{max}	Scyclic	Scontact	H _{avg}	ယ်	M
UNIT	psi	psi	sql	sql	sql	psi	psi	psi	ij	in/in	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	0.9	4.0	47.1	44.3	2.8	3.9	3.7	0.2	0.00257	0.00032	11,375
Sequence 3	0.9	6.0	69.2	9:29	3.6	5.7	5.4	0.3	0.00427	0.00053	10,163
Sequence 4	0.9	8.0	91.9	85.8	0.9	7.6	7.1	0.5	0.00649	0.00081	8,735
Sequence 5	0.9	10.0	113.0	104.6	8.5	9.3	9.8	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	1.4	2.8	3.9	3.6	0.2	0.00281	0.00035	10,361
Sequence 8	4.0	0.0	68.1	65.3	2.8	5.6	5.4	0.2	0.00457	0.00057	9,440
Sednence 9	4.0	8.0	90.7	97.6	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	9.0	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	0.9	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	9.5	8.6	0.5	0.00948	0.00118	7,313

September 29, 2017

DATE DATE

ΜS

REVIEWED BY

TESTED BY

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:

Location: 57 LT

Name of Project: HWY. 118/W SERVICE RD/I40 EB RAMPS SIGNAL INTERS. IMPVTS. (WEST MEN

September 29, 2017

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:

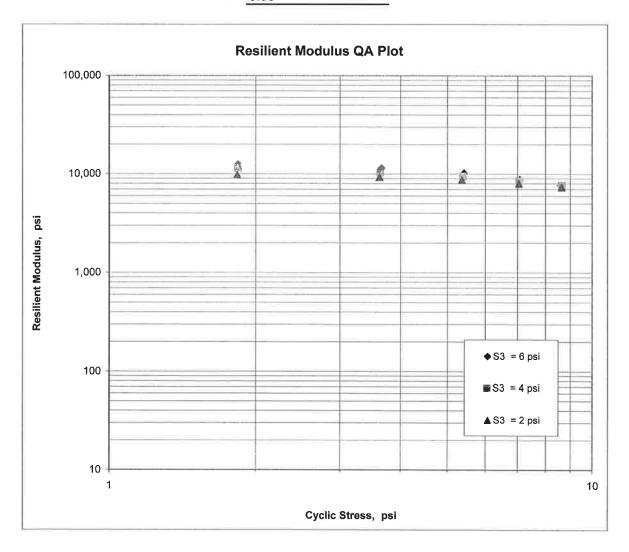
$$M_R = K1 (S_C)^{K2} (S_3)^{K5}$$

$$K1 = 11,313$$

$$K2 = -0.24124$$

$$K5 = 0.13327$$

$$R^2 = 0.88$$



DATE TESTED

9/29/2017

Arkansas State Highway Transporation Department

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

COUNTY NO. 18

110653

JOB:

Materials Division

Michael Benson, Materials Engineer

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

Monday, October 30, 2017

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

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

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- 10/19/17
DATE
                                                     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
           - CRITTENDEN, COUNTY
LOCATION
                                                     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
                                        = S583
  SAMPLE ID
                   - INFORMATION ONLY - INFORMATION ONLY -
  TEST STATUS
                     - 101+00
                                        109+00
  STATION
                                        32 LT
  LOCATION
                   - 24 RT
- 0-0
                                        32 I
- 0-5
  DEPTH IN FEET
                                         GRAY
  MAT'L COLOR
  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
             2
  % PASSING
                  IN. -
             1 1/2 IN. -
               3/4 IN. -
               3/8 IN. -
                                           100
              NO. 4 -
                                            98
              NO. 10 -
                                            92
              NO. 40 -
                                           8.0
                                            73
              NO. 80 -
              NO. 200 -
                                            68
  LIOUID LIMIT
                                           44
  PLASTICITY INDEX
  AASHTO SOIL
                                            A-7-6(15)
  UNIFIED SOIL
  % MOISTURE CONTENT -
                                            29.1
ACHMSC
                  (IN) -
                         3.0W
                                            2.5W
                  (IN) -
ACHMSC
                           2.0X
                  (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

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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 - 09/29/17 JOB NUMBER - 110653 FEDERAL AID NO TO BE ASS PURPOSE - SOIL SURV SPEC. REMARKS - NO SPECIE SUPPLIER NAME - STATE NAME OF PROJECT - HWY.118 PROJECT ENGINEER - NOT APP PIT/QUARRY - ARKANSAS LOCATION - CRITTENDEN, SAMPLED BY - THORNTON/ SAMPLE FROM - TEST HOLE MATERIAL DESC SOIL SUR	YEY SAMPLE FICATION CHECK B/W.SERV.RD/I40 EB : PLICABLE COUNTY		COUNTY/STATE - DISTRICT NO EMPHIS)(S) DATE SAMPLED - DATE RECEIVED - DATE TESTED -	2014 1 18 01
		VILLOE ACTUAL		
LAB NUMBER -	20172872	.=	-	
	RV584			
	INFORMATION ONLY	()본 ()원		
	104+70	162 162	##:	
	· 57 LT · 0-5	:=	-	
		25	375	
MAT'L COLOR - MAT'L TYPE -	GRAY	8	3	
LATITUDE DEG-MIN-SEC -	35 9 31.30	12	≅	
LONGITUDE DEG-MIN-SEC -		1.6	-	
LONGITODE DEG-MIN-SEC	90 13 20.40			
% PASSING 2 IN		0 .5	-	
1 1/2 IN		72	-	
3/4 IN		K#	-	
3/8 IN		15t	-	
NO. 4	76	9 4	_	
NO. 10 -		R =	_	
NO. 40	64	35	-	
NO. 80 -	57	955	-	
NO. 200 -	54			
LIQUID LIMIT	- 50	<u>~</u>	¥	
	35	12	(*)	
AASHTO SOIL	A-7-6(15)	. H	: 	
UNIFIED SOIL -		15	=	
% MOISTURE CONTENT -		7	-	
a a				
		-	-	
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	•	_	=	

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265

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