

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 101141

FEDERAL AID PROJECT NO. FEDERAL AID PROJECT STPSC-9326(7) & 9030

HWYS. 61/140 INTERS. IMPVTS. (OSCEOLA) (S)

STATE HIGHWAY 61 & 140 SECTION 2 & 2

IN MISSISSIPPI 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 | Lorie H. Tudor, 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

October 2, 2024

TO: Mr. Charles Martin, Engineer of Roadway Design

SUBJECT: Job No. 101141
Hwys. 61/140 Inters. Impvts. (Osceola) (S)
Routes 61 & 140 Section 2
Mississippi County

Attached is the soil survey, pavement soundings and strength data for the above referenced job. The project consists of improving the intersection of Highway 61 and Highway 140. Samples were obtained in the existing travel lanes and ditch line.

The subgrade soils consist of low to moderately plastic sandy clay. The soils should provide a stable working platform with conventional processing. A Resilient Modulus value of 5300 psi is recommended for in-situ subgrade soils. Due to the nature of the subgrade and site terrain, the possibility of instability is low. However, if the subgrade is exposed to rain instability may occur. If instability does occur, under cut and replacement is the most appropriate remediation technique. The undercut depth is anticipated to be no more than two feet. The backfill material must comply with the following requirements:

- Granular soils with 35% or less passing the number 200 sieve.
- Cohesive soils with 35% or more pass the number 200 sieve must have a PI between 8 and 20 and no more than 65% passing the number 200 sieve.

A Resilient Modulus of 5500 psi may be used for the back fill material.

Based on currently available cross sections the construction grade line will closely match that of the existing roadway. The maximum embankment height is approximately 10 feet. The embankment may be constructed with locally available material utilizing the slope configuration shown in the cross sections.

The Qualified Products List (QPL) indicates that Aggregate Base Course (Class CL-7) is available from commercial producers located at the river port of Osceola.

Paul Tinsley
Materials Engineer

RPT:yz:bjj

Attachment

cc: District 10 Engineer
Maintenance
G. C. File

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION
PAUL TINSLEY, MATERIALS ENGINEER
*** SOIL SURVEY STRENGTH TEST REPORT ***

DATE - 09/04/2024
JOB NUMBER - 101141

SEQUENCE NO. - 1
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 47
DISTRICT NO. - 10

JOB NAME - HWY61/140 INTERS. IMPVTS. (OSCEOLA) (S)

* STATION LIMITS R-VALUE AT 240 psi *

RESILIENT MODULUS
STA 109+00 45'RT 5337

REMARKS -
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AASHTO TESTS : T190

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

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

Job No.	101141	Material Code	RV
Date Sampled:	4/25/2024	Station No.:	109+00
Date Tested:	September 3, 2024	Location:	62RT
Name of Project:	HWY61/140 INTERS. IMPVTS. (OSCEOLA)(S)		
County:	Code: 47	Name:	MISSISSIPPI
Sampled By:	ADM	Depth:	0-5.0
Lab No.:	20240774	AASHTO Class:	A-4(1)
Sample ID:	RV79	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	3.98
Bottom	3.98
Average	3.98
Membrane Thickness (in):	0.00
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):	12.42
Initial Volume, AoLo (cu. in):	99.59

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	6714.20
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4. Soil Properties:

Optimum Moisture Content (%):	12.9
Maximum Dry Density (pcf):	114.2
95% of MDD (pcf):	108.5
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	6714.20
Compaction Moisture content (%):	15.9
Compaction Wet Density (pcf):	256.87
Compaction Dry Density (pcf):	221.59
Moisture Content After Mr Test (%):	15.9

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

#VALUE!

7. Resilient Modulus, Mr:

$7039(S_c)^{-0.23453}(S_3)^{0.29834}$

8. Comments

9. Tested By:

AM

Date: September 3, 2024

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No. 101141

Date Sampled: 4/25/2024

Date Tested: September 3, 2024

Name of Project: HWY61/140 INTERS. IMPVTS. (OSCEOLA)(S)

County: Code: 47 Name: MISSISSIPPI

Sampled By: ADM

Lab No.: 20240774

Sample ID: RV79

LATITUDE:

Material Code

RV

Station No.: 109+00

Location: 62RT

Depth: 0-5.0

AASHTO Class: A-4(1)

Material Type (1 or 2): 2

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	25.5	22.7	2.8	2.1	1.8	0.2	0.00144	0.00018	10,224
Sequence 2	6.0	4.0	48.2	45.3	2.8	3.9	3.6	0.2	0.00312	0.00039	9,371
Sequence 3	6.0	6.0	71.0	67.2	3.8	5.7	5.4	0.3	0.00513	0.00064	8,460
Sequence 4	6.0	8.0	94.7	88.5	6.3	7.6	7.1	0.5	0.00744	0.00093	7,681
Sequence 5	6.0	10.0	118.1	109.4	8.7	9.5	8.8	0.7	0.00992	0.00124	7,125
Sequence 6	4.0	2.0	25.4	22.6	2.8	2.0	1.8	0.2	0.00162	0.00020	9,010
Sequence 7	4.0	4.0	47.3	44.5	2.8	3.8	3.6	0.2	0.00371	0.00046	7,751
Sequence 8	4.0	6.0	68.6	65.7	2.9	5.5	5.3	0.2	0.00611	0.00076	6,951
Sequence 9	4.0	8.0	92.4	87.0	5.3	7.4	7.0	0.4	0.00862	0.00107	6,522
Sequence 10	4.0	10.0	116.1	108.2	7.9	9.3	8.7	0.6	0.01112	0.00139	6,288
Sequence 11	2.0	2.0	25.3	22.4	2.8	2.0	1.8	0.2	0.00189	0.00024	7,656
Sequence 12	2.0	4.0	46.6	43.8	2.8	3.8	3.5	0.2	0.00432	0.00054	6,543
Sequence 13	2.0	6.0	67.1	64.3	2.8	5.4	5.2	0.2	0.00706	0.00088	5,880
Sequence 14	2.0	8.0	89.4	84.9	4.5	7.2	6.8	0.4	0.00996	0.00124	5,505
Sequence 15	2.0	10.0	112.9	105.9	7.0	9.1	8.5	0.6	0.01282	0.00160	5,337

TESTED BY

AM

DATE September 3, 2024

REVIEWED BY

DATE

DATE

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	101141	Material Code	RV
Date Sampled:	4/25/2024	Station No.:	109+00
Date Tested:	September 3, 2024	Location:	62RT
Name of Project:	HWY61/140 INTERS. IMPVTS. (OSCEOLA)(S)		
County:	Code: 47	Name:	MISSISSIPPI
Sampled By:	ADM	Depth:	0-5.0
Lab No.:	20240774	AASHTO Class:	A-4(1)
Sample ID:	RV79	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

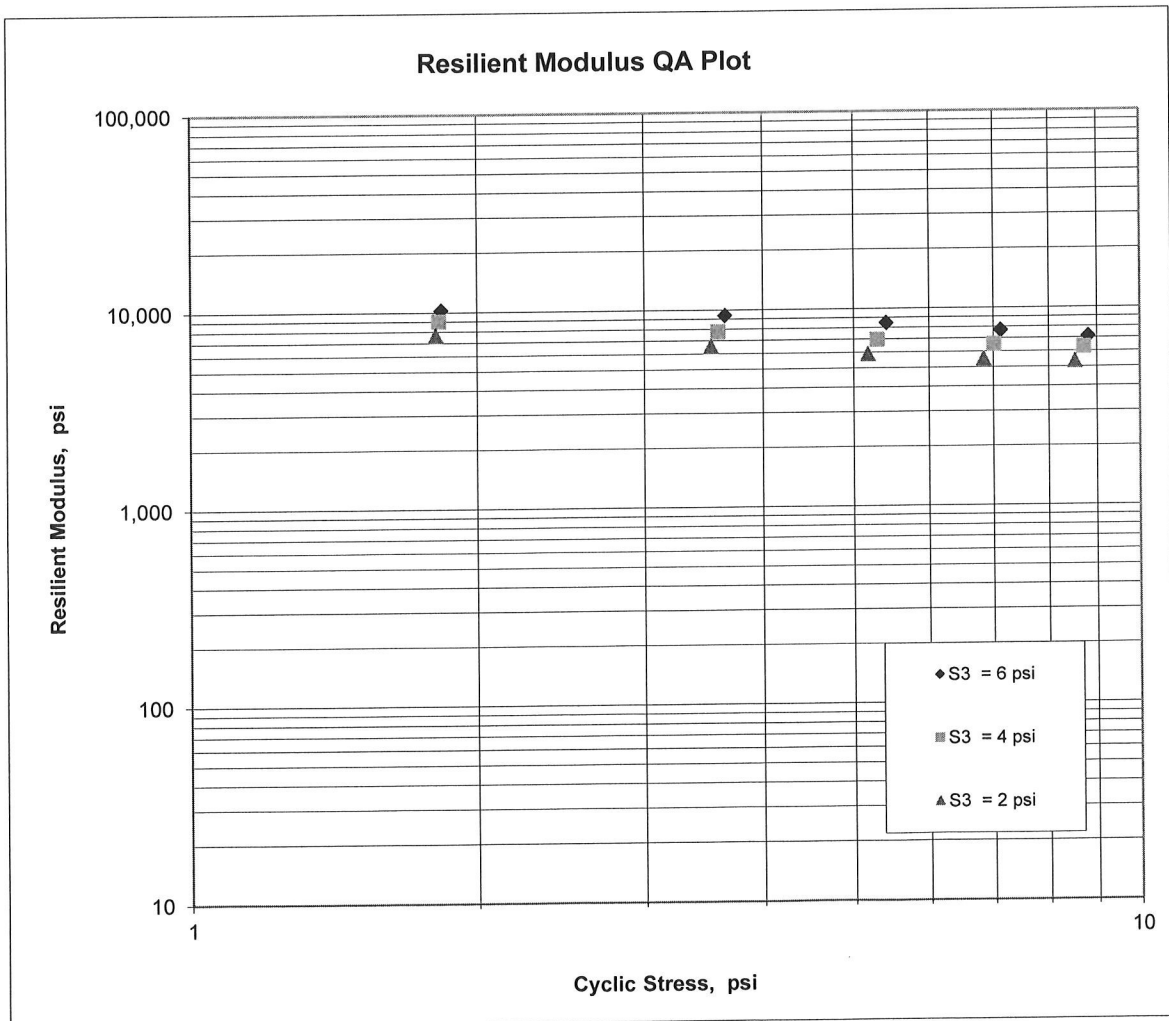
$$M_R = K_1 (S_c)^{K_2} (S_3)^{K_5}$$

$$K_1 = 7,039$$

$$K_2 = -0.23453$$

$$K_5 = 0.29834$$

$$R^2 = 0.98$$



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

PAUL TINSLEY, MATERIALS ENGINEER

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

DATE	- 05/28/24	SEQUENCE NO.	- 1
JOB NUMBER	- 101141	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	- 47
SUPPLIER NAME	- STATE	DISTRICT NO.	- 10
NAME OF PROJECT	- HWY61/140 INTERS. IMPVTS. (OSCEOLA) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS	DATE SAMPLED	- 04/25/24
LOCATION	- MISSISSIPPI COUNTY	DATE RECEIVED	- 04/25/24
SAMPLED BY	- d.thornton	DATE TESTED	- 05/28/24
SAMPLE FROM	- TEST HOLE		
MATERIAL DESC.	- SOIL SURVEY - RESISTANCE R-VALUE	ACTUAL RESULTS	

LAB NUMBER	- 20240774	-	-
SAMPLE ID	- RV79	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 109+00	-	-
LOCATION	- 62 RT	-	-
DEPTH IN FEET	- 0-5.0	-	-
MAT'L COLOR	- BROWN	-	-
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 41 51.40	-	-
LONGITUDE DEG-MIN-SEC	- 89 58 56.70	-	-
% PASSING	2 IN.	-	-
	1 1/2 IN.	-	-
	3/4 IN.	-	-
	3/8 IN.	- 100	-
	NO. 4	- 98	-
	NO. 10	- 98	-
	NO. 40	- 97	-
	NO. 80	- 93	-
	NO. 200	- 87	-
LIQUID LIMIT	- ND	-	-
PLASTICITY INDEX	- NP	-	-
AASHTO SOIL	- A-4 (1)	-	-
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS X=STRIPPED Z=AUGER REFUSAL

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- CC:GEOTECH, SOILS

AASHTO TESTS : T24 T88 T89 T90 T265

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

PAUL TINSLEY, MATERIALS ENGINEER

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

DATE	- 09/17/24	SEQUENCE NO.	- 1
JOB NUMBER	- 101141	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	- 47
SUPPLIER NAME	- STATE	DISTRICT NO.	- 10
NAME OF PROJECT - HWY61/140 INTERS. IMPVTS. (OSCEOLA) (S)			
PROJECT ENGINEER - NOT APPLICABLE			
PIT/QUARRY	- ARKANSAS		
LOCATION	- MISSISSIPPI COUNTY	DATE SAMPLED	- 04/25/24
SAMPLED BY	- d.thornton	DATE RECEIVED	- 04/25/24
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 05/28/24
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			
LAB NUMBER	- 20240769	- 20240770	- 20240771
SAMPLE ID	- S74	- S75	- S76
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 109+00	- 109+00	- 305+00
LOCATION	- 45 RT	- 62 RT	- 06 RT
DEPTH IN FEET	- 0-5.0	- 0-5.0	- 0-5.0
MAT'L COLOR	- BROWN	- BR/GR	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 41 51.50	- 35 41 51.40	- 35 41 46.40
LONGITUDE DEG-MIN-SEC	- 89 58 56.70	- 89 58 56.70	- 89 58 53.90
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. - 100	- 100	-
	3/8 IN. - 99	- 98	- 100
	NO. 4 - 99	- 96	- 99
	NO. 10 - 98	- 95	- 98
	NO. 40 - 96	- 91	- 97
	NO. 80 - 91	- 82	- 93
	NO. 200 - 82	- 71	- 68
LIQUID LIMIT	- 32	- 27	- ND
PLASTICITY INDEX	- 16	- 10	- NP
AASHTO SOIL	- A-6 (11)	- A-4 (4)	- A-4 (1)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 31.5	- 29.8	- 57.3
ACHMSC (IN)	- 6.25W	- --	- 11.0W
PCCP (IN)	- --	- --	- 10.0
AGG BASE CL7 (IN)	- 5.0	- --	- --
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS X=STRIPPED Z=AUGER REFUSAL

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- CC:GEOTECH,SOILS

AASHTO TESTS : T24 T88 T89 T90 T265

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

PAUL TINSLEY, MATERIALS ENGINEER

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

DATE	- 05/28/24	SEQUENCE NO.	- 2
JOB NUMBER	- 101141	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	- 47
SUPPLIER NAME	- STATE	DISTRICT NO.	- 10
NAME OF PROJECT	- HWY61/140 INTERS. IMPVTS. (OSCEOLA) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS	DATE SAMPLED	- 04/25/24
LOCATION	- MISSISSIPPI COUNTY	DATE RECEIVED	- 04/25/24
SAMPLED BY	- d.thornton	DATE TESTED	- 05/28/24
SAMPLE FROM	- TEST HOLE		
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20240772	- 20240773	-
SAMPLE ID	- S77	- S78	-
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	-
STATION	- 305+00	- 305+18	-
LOCATION	- 26 RT	- 18RT	-
DEPTH IN FEET	- 0-5.0	- 0-5.0	-
MAT'L COLOR	- GRAY	- GRAY	-
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 41 46.40	- 35 41 46.40	-
LONGITUDE DEG-MIN-SEC	- 89 58 53.80	- 89 58 53.90	-
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	-	-
	3/8 IN. -	-	-
	NO. 4 -	-	-
	NO. 10 -	-	-
	NO. 40 -	-	-
	NO. 80 - 100	- 100	-
	NO. 200 - 91	- 93	-
LIQUID LIMIT	- 32	- 32	-
PLASTICITY INDEX	- 16	- 16	-
AASHTO SOIL	- A-6(13)	- A-6(13)	-
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 36.5	- 24.3	-
ACHM	(IN) - 3.5W	- --	-
AGG BASE CRS CL7	(IN) - 2.0	- --	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS X=STRIPPED Z=AUGER REFUSAL

- CC:GEOTECH,SOILS

AASHTO TESTS : T24 T88 T89 T90 T265

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