

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 101062

FEDERAL AID PROJECT NO. STPC-9227(88)

HWY. 18/QUALITY WAY SIGNAL (JONESBORO) (S)

STATE HIGHWAY 18 SECTION 4

IN CRAIGHEAD 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

March 3, 2021

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 101062
Hwy. 18/Quality Way Signal (Jonesboro) (S)
Route 18 Section 4
Craighead County

Attached is the requested soil survey, strength data, and resilient modulus test results. The project adding a traffic signal and making intersection improvements. Samples were obtained in the existing travel lanes, shoulder and ditch line.


The subgrade soils consist primarily moderately plastic sandy clay. The proposed grade line closely matches that of the existing roadway. The subgrade soils should provide a stable working platform with conventional processing if the weather is favorable during construction.

Based on currently available cross sections the maximum embankment height is less than 5 feet and will be placed in the existing ditch line. All soft unstable organic material should be undercut prior to embankment construction, anticipated to be no more than two feet. The embankment may be constructed with locally available unspecified material.

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 in the vicinity of Black Rock.
2. Asphalt Concrete Hot Mix for **PG 64-22**

<u>Type</u>	<u>Asphalt Cement %</u>	<u>Mineral Aggregate %</u>
Surface Course	5.1	94.9
Binder Course	4.1	95.9
Base Course	3.8	96.2


for Jonathan A. Annable
Materials Engineer

JAA:yz:bjj
Attachment

cc: State Constr. Eng. – Master File Copy
District 10 Engineer
System Information and Research
G. C. File

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION
JONATHAN A. ANNABLE, MATERIALS ENGINEER
*** SOIL SURVEY STRENGTH TEST REPORT ***

DATE - 01/21/2021
JOB NUMBER - 101062

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 16
DISTRICT NO. - 10

JOB NAME - HWY. 18 / QUALITY WAY SIGNAL (JONESBORO) (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB LESS THAN 5

RESILIENT MODULUS
STA. 22+00 5235

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.	101062	Material Code	SSRVPS
Date Sampled:	10/27/2020	Station No.:	22+00
Date Tested:	December 16, 2020	Location:	43'LT
Name of Project:	HWY. 18 / QUALITY WAY SIGNAL (JONESBORO) (S)		
County:	Code: 16	Name:	CRAIGHEAD
Sampled By:	THORNTON / BATES	Depth:	0-5
Lab No.:	20202390	AASHTO Class:	A-6 (8)
Sample ID:	RV399	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	3.95
Bottom	3.95
Average	3.95
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):	12.18
Initial Volume, AoLo (cu. in):	97.68

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3246.70
------------------------------	---------

4. Soil Properties:

Optimum Moisture Content (%):	15.6
Maximum Dry Density (pcf):	112.1
95% of MDD (pcf):	106.5
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3246.70
Compaction Moisture content (%):	15.5
Compaction Wet Density (pcf):	126.64
Compaction Dry Density (pcf):	109.65
Moisture Content After Mr Test (%):	15.5

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

#VALUE!

7. Resilient Modulus, Mr:

8554(Sc)^{-0.32561}(S3)^{0.27999}

8. Comments

9. Tested By:

GW

Date: December 16, 2020

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

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

Job No.	101062	Material Code	SSRVPS
Date Sampled:	10/27/2020	Station No.:	22+00
Date Tested:	December 16, 2020	Location:	43'LT
Name of Project:	HWY. 18 / QUALITY WAY SIGNAL (JONESBORO) (S)	Depth:	0-5
County:	Code: 16 Name: CRAIGHEAD	AASHTO Class:	A-6 (8)
Sampled By:	THORNTON / BATES	Material Type (1 or 2):	2
Lab No.:	20202390	LONGITUDE:	
Sample ID:	RV399		
LATITUDE:			

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
	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	22.4	2.9	2.1	1.8	0.2	0.00130	0.00016	11,363
Sequence 2	6.0	4.0	47.3	44.4	2.9	3.9	3.6	0.2	0.00284	0.00035	10,275
Sequence 3	6.0	6.0	69.4	65.7	3.7	5.7	5.4	0.3	0.00489	0.00061	8,854
Sequence 4	6.0	8.0	91.6	85.4	6.1	7.5	7.0	0.5	0.00762	0.00095	7,383
Sequence 5	6.0	10.0	112.9	104.4	8.6	9.3	8.6	0.7	0.01062	0.00132	6,471
Sequence 6	4.0	2.0	25.1	22.2	2.9	2.1	1.8	0.2	0.00148	0.00018	9,881
Sequence 7	4.0	4.0	46.7	43.8	2.9	3.8	3.6	0.2	0.00342	0.00043	8,441
Sequence 8	4.0	6.0	67.2	64.3	2.9	5.5	5.3	0.2	0.00579	0.00072	7,316
Sequence 9	4.0	8.0	89.3	84.1	5.2	7.3	6.9	0.4	0.00847	0.00106	6,545
Sequence 10	4.0	10.0	111.4	103.8	7.6	9.1	8.5	0.6	0.01140	0.00142	5,991
Sequence 11	2.0	2.0	25.0	22.1	2.8	2.0	1.8	0.2	0.00179	0.00022	8,140
Sequence 12	2.0	4.0	46.1	43.2	2.9	3.8	3.5	0.2	0.00398	0.00050	7,149
Sequence 13	2.0	6.0	66.0	63.2	2.8	5.4	5.2	0.2	0.00665	0.00083	6,260
Sequence 14	2.0	8.0	87.0	82.7	4.3	7.1	6.8	0.4	0.00964	0.00120	5,652
Sequence 15	2.0	10.0	108.4	101.6	6.7	8.9	8.3	0.6	0.01279	0.00159	5,235

TESTED BY	GW	DATE	December 16, 2020
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.	101062	Material Code	SSRVPS
Date Sampled:	10/27/2020	Station No.:	22+00
Date Tested:	December 16, 2020	Location:	43'LT
Name of Project:	HWY. 18 / QUALITY WAY SIGNAL (JONESBORO) (S)		
County:	Code: 16	Name:	CRAIGHEAD
Sampled By:	THORNTON / BATES	Depth:	0-5
Lab No.:	20202390	AASHTO Class:	A-6 (8)
Sample ID:	RV399	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

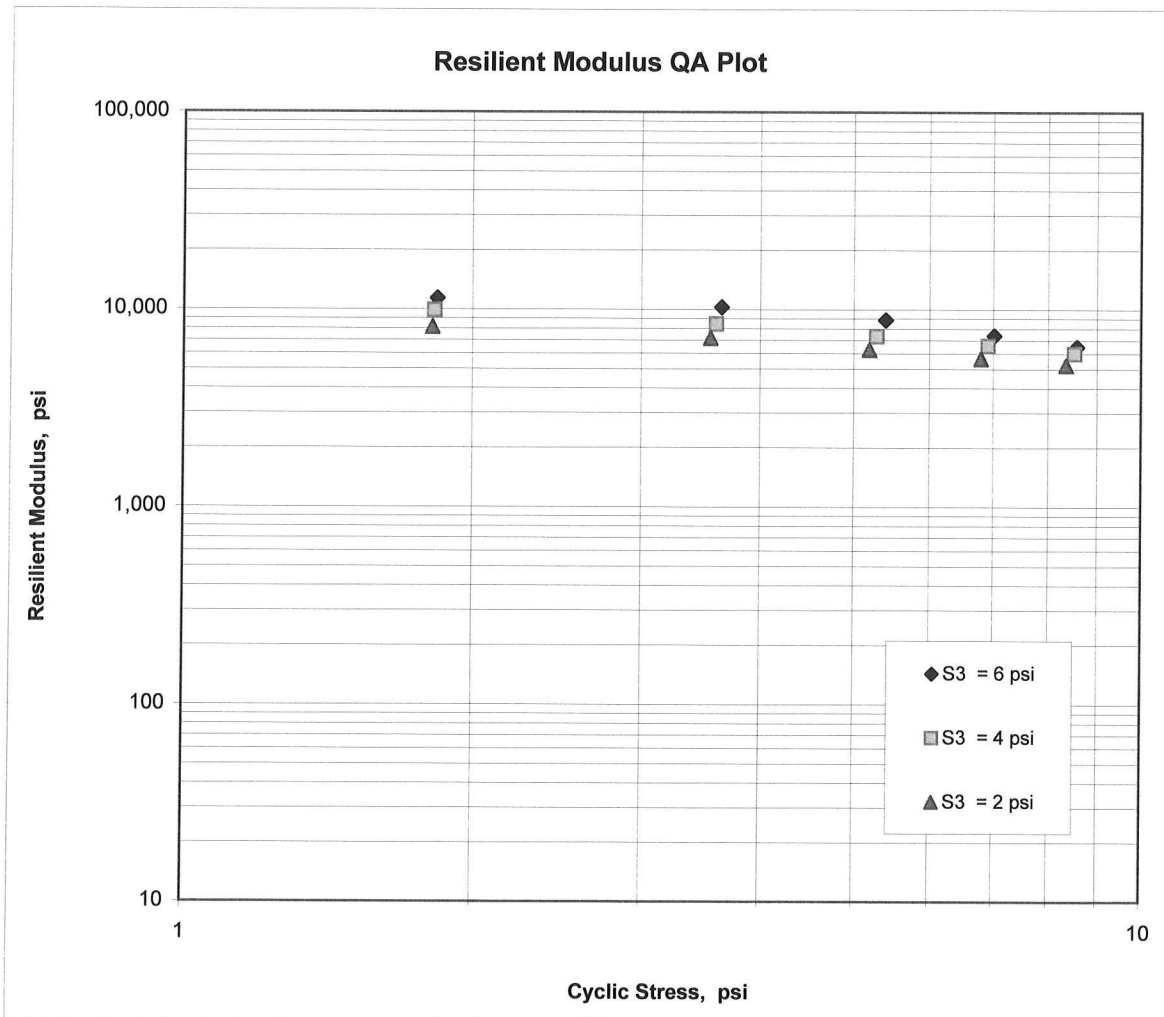
$$M_R = K_1 (S_c)^{K_2} (S_3)^{K_5}$$

$$K_1 = 8,554$$

$$K_2 = -0.32561$$

$$K_5 = 0.27999$$

$$R^2 = 0.95$$



JOB: 101062

Arkansas State Highway Transportation Department

JOB NAME: HWY. 18 / QUALITY WAY SIGNAL (JONESBORO) (S)

Materials Division

COUNTY NO. 16 DATE TESTED 1/21/2021

Jonathan Annable, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#					L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				#4	#10	#40	#80	#200					
22+00	43LT	0-5	BROWN	78	73	67	64	60	34	18	A-6(8)	RV399	
22+00	24LT	0-5	BROWN						41	25		S390	20.7
22+00	35LT	0-5	BROWN	98	97	95	92	88	42	25	A-7-6(22)	S391	24.3
22+00	43LT	0-5	BROWN	98	94	90	82	76	37	21	A-6(14)	S392	18.3
13+00	24RT	0-5	BROWN	98	94	88	84	81	38	21	A-6(16)	S393	22
13+00	36RT	0-5	BROWN	98	97	94	91	88	36	17	A-6(15)	S394	20.6
13+00	44RT	0-5	BROWN	92	91	88	85	82	36	18	A-6(14)	S395	18.2
35+00	6 RT	0-5	BROWN	95	93	90	87	85	33	14	A-6(11)	S396	21.1
35+00	18RT	0-5	BROWN						34	14		S397	20.8
35+00	25RT	0-5	BROWN	95	92	90	88	86	34	15	A-6(12)	S398	16.8

comments: W=MULTIPLE LAYERS

Monday, February 22, 2021

JOB: 101062

**Arkansas State Highway Transportation Department
Materials Division**

DATE TESTED
1/21/2021

JOB NAME: HWY. 18 / QUALITY WAY SIGNAL (JONESBORO) (S)

COUNTY NO. 16

Jonathan Annable, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

13+00	24RT	ACHMSC 4.0W	ACHMBC 10.0W	BST ---	AGG.BASE CRS,CL-7 ---
13+00	36RT	ACHMSC 4.5	ACHMBC ---	BST ---	AGG.BASE CRS,CL-7 4.0
13+00	44RT	ACHMSC 5.5W	ACHMBC 1.0	BST ---	AGG.BASE CRS,CL-7 8.0
22+00	24LT	ACHMSC 7.0W	ACHMBC 7.0W	BST ---	AGG.BASE CRS,CL-7 6.0
22+00	35LT	ACHMSC 2.5	ACHMBC ---	BST 1.25	AGG.BASE CRS,CL-7 10.0
22+00	43LT	ACHMSC ---	ACHMBC ---	BST ---	AGG.BASE CRS,CL-7 ---
35+00	18RT	ACHMSC 2.5	BST 0.75	AGG.BASE CRS,CL-7 6.0	
35+00	25RT	ACHMSC ---	BST ---	AGG.BASE CRS,CL-7 ---	
35+00	6 RT	ACHMSC ---	BST ---	AGG.BASE CRS,CL-7 ---	

Comments: W=MULTIPLE LAYERS

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

JONATHAN A. ANNABLE, MATERIALS ENGINEER

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

DATE	- 01/22/21	SEQUENCE NO.	- 1
JOB NUMBER	- 101062	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	- 16
SUPPLIER NAME	- STATE	DISTRICT NO.	- 10
NAME OF PROJECT	- HWY. 18 / QUALITY WAY SIGNAL (JONESBORO) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS	DATE SAMPLED	- 10/27/20
LOCATION	- CRAIGHEAD COUNTY	DATE RECEIVED	- 11/23/20
SAMPLED BY	- THORNTON/BATES	DATE TESTED	- 01/21/21
SAMPLE FROM	- TEST HOLE		
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20202381	- 20202382	- 20202383
SAMPLE ID	- S393	- S394	- S395
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 13+00	- 13+00	- 13+00
LOCATION	- 24RT	- 36RT	- 44RT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BROWN	- BROWN	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 49 18.80	- 35 49 18.70	- 35 49 18.60
LONGITUDE DEG-MIN-SEC	- 90 33 55.30	- 90 33 55.30	- 90 33 55.30
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	-	100
	3/8 IN. - 100	- 100	- 94
	NO. 4 - 98	- 98	- 92
	NO. 10 - 94	- 97	- 91
	NO. 40 - 88	- 94	- 88
	NO. 80 - 84	- 91	- 85
	NO. 200 - 81	- 88	- 82
LIQUID LIMIT	- 38	- 36	- 36
PLASTICITY INDEX	- 21	- 17	- 18
AASHTO SOIL	- A-6(16)	- A-6(15)	- A-6(14)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 22.0	- 20.6	- 18.2
ACHMSC (IN)	- 4.0W	- 4.5	- 5.5W
ACHMBC (IN)	- 10.0W	- ---	- 1.0
BST (IN)	- ---	- ---	- ---
AGG.BASE CRS,CL-7 (IN)	- ---	- 4.0	- 8.0
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS
-
-
-
-

AASHTO TESTS : T24 T88 T89 T90 T265
:

