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**

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

Paul Snily
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)		
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:**	

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	25.2	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:**	

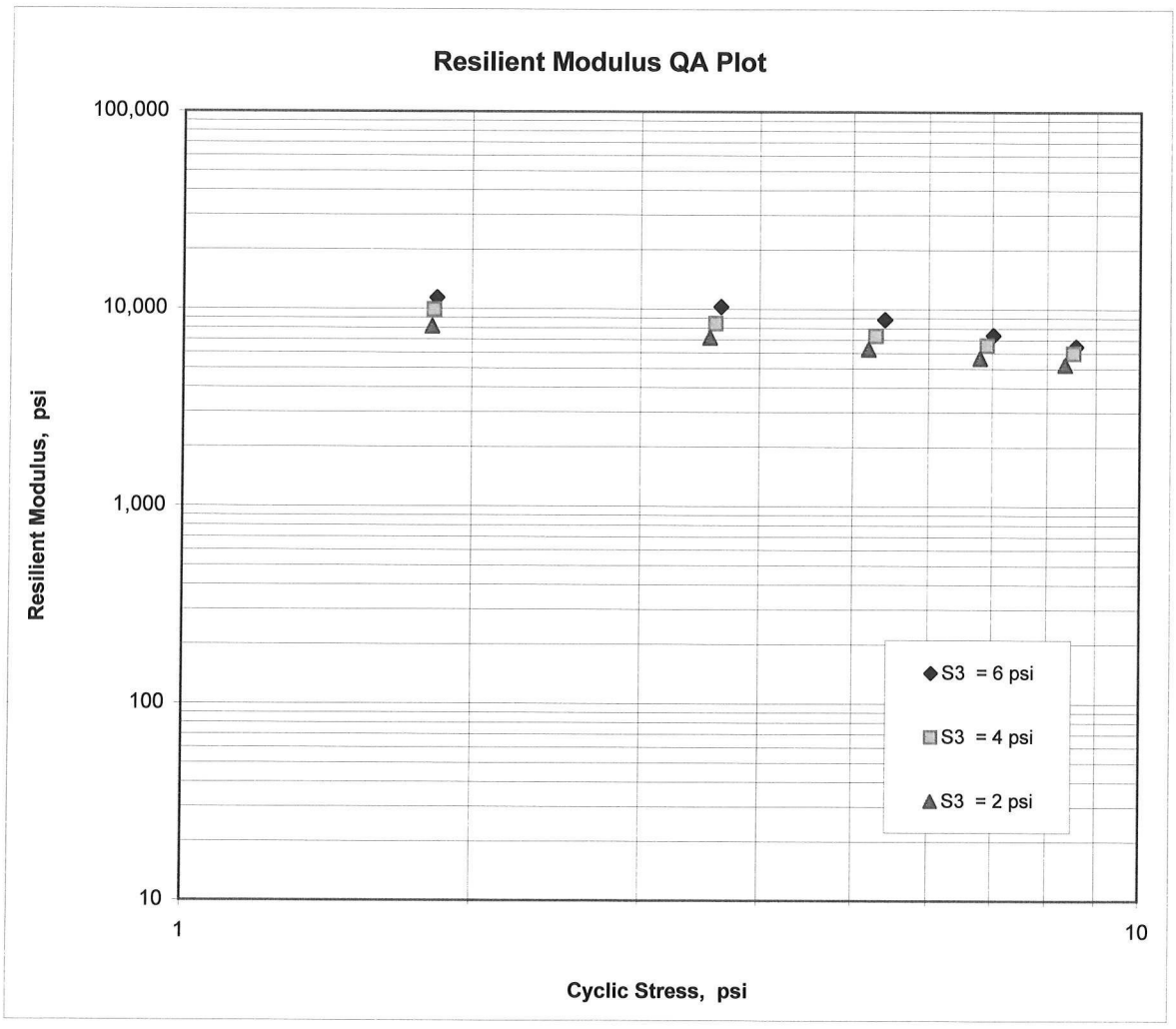
$$M_R = K1\,(S_C)^{K2}\,(S_3)^{K5}$$

K1 = 8,554

K2 = -0.32561

K5 = 0.27999

R^2 = 0.95



JOB: 101062

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

COUNTY NO. 16 **DATE TESTED** 1/21/2021

Arkansas State Highway Transporation Department

Materials Division

Jonathan Annable, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				S	I	E	V	E S					
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

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

COUNTY NO. 16

Arkansas State Highway Transporation Department
Materials Division

Jonathan Annable, Materials Engineer

DATE TESTED
1/21/2021

PAVEMENT SOUNDINGS

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

Monday, February 22, 2021

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
JOB NUMBER - 101062
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE

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

NAME OF PROJECT - HWY. 18 / QUALITY WAY SIGNAL (JONESBORO) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - CRAIGHEAD COUNTY
SAMPLED BY - THORNTON/BATES
SAMPLE FROM - TEST HOLE

DATE SAMPLED - 10/27/20
DATE RECEIVED - 11/23/20
DATE TESTED - 01/21/21

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

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
JOB NUMBER - 101062
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE

SEQUENCE NO. - 2
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 16
DISTRICT NO. - 10

NAME OF PROJECT - HWY. 18 / QUALITY WAY SIGNAL (JONESBORO) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - CRAIGHEAD COUNTY
SAMPLED BY - THORNTON/BATES
SAMPLE FROM - TEST HOLE

DATE SAMPLED - 10/27/20
DATE RECEIVED - 11/23/20
DATE TESTED - 01/21/21

MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER	20202384	20202385	20202386
SAMPLE ID	S390	S391	S392
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	22+00	22+00	22+00
LOCATION	24LT	35LT	43LT
DEPTH IN FEET	0-5	0-5	0-5
MAT'L COLOR	BROWN	BROWN	BROWN
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 49 19.50	35 49 19.60	35 49 19.60
LONGITUDE DEG-MIN-SEC	90 33 44.50	90 33 44.50	90 33 44.50
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.			
3/8 IN.		100	100
NO. 4		98	98
NO. 10		97	94
NO. 40		95	90
NO. 80		92	82
NO. 200		88	76
LIQUID LIMIT	41	42	37
PLASTICITY INDEX	25	25	21
AASHTO SOIL		A-7-6(22)	A-6(14)
UNIFIED SOIL			
% MOISTURE CONTENT	20.7	24.3	18.3
ACHMSC (IN)	7.0W	2.5	---
ACHMBC (IN)	7.0W	---	---
BST (IN)	---	1.25	---
AGG.BASE CRS,CL-7 (IN)	6.0	10.0	---

REMARKS - W=MULTIPLE LAYERS

AASHTO TESTS : T24 T88 T89 T90 T265

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

DATE - 01/21/21
JOB NUMBER - 101062
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE

SEQUENCE NO. - 3
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 16
DISTRICT NO. - 10

NAME OF PROJECT - HWY. 18 / QUALITY WAY SIGNAL (JONESBORO) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - CRAIGHEAD COUNTY
SAMPLED BY - THORNTON/BATES
SAMPLE FROM - TEST HOLE

DATE SAMPLED - 10/27/20
DATE RECEIVED - 11/23/20
DATE TESTED - 01/21/21

MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER	20202387	20202388	20202389
SAMPLE ID	S397	S398	S396
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	35+00	35+00	35+00
LOCATION	18RT	25RT	6 RT
DEPTH IN FEET	0-5	0-5	0-5
MAT'L COLOR	BROWN	BROWN	BROWN
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 49 16.60	35 49 16.60	35 49 16.60
LONGITUDE DEG-MIN-SEC	90 33 50.20	90 33 50.10	90 33 50.30
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.		100	100
3/8 IN.		98	97
NO. 4		95	95
NO. 10		92	93
NO. 40		90	90
NO. 80		88	87
NO. 200		86	85
LIQUID LIMIT	34	34	33
PLASTICITY INDEX	14	15	14
AASHTO SOIL		A-6(12)	A-6(11)
UNIFIED SOIL			
% MOISTURE CONTENT	20.8	16.8	21.1
ACHMSC (IN)	2.5	---	---
BST (IN)	0.75	---	---
AGG.BASE CRS,CL-7 (IN)	6.0	---	---

REMARKS - W=MULTIPLE LAYERS

AASHTO TESTS : T24 T88 T89 T90 T265

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

DATE - 01/21/21
JOB NUMBER - 101062
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE

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

NAME OF PROJECT - HWY. 18 / QUALITY WAY SIGNAL (JONESBORO) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - CRAIGHEAD COUNTY
SAMPLED BY - THORNTON/BATES
SAMPLE FROM - TEST HOLE

DATE SAMPLED - 10/27/20
DATE RECEIVED - 11/23/20
DATE TESTED - 01/21/21

MATERIAL DESC. - SOIL SURVEY - RESISTANCE R-VALUE ACTUAL RESULTS

LAB NUMBER	20202390		
SAMPLE ID	RV399		
TEST STATUS	INFORMATION ONLY		
STATION	22+00		
LOCATION	43LT		
DEPTH IN FEET	0-5		
MAT'L COLOR	BROWN		
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 49 19.60		
LONGITUDE DEG-MIN-SEC	90 33 44.50		
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.	100		
3/8 IN.	87		
NO. 4	78		
NO. 10	73		
NO. 40	67		
NO. 80	64		
NO. 200	60		
LIQUID LIMIT	34		
PLASTICITY INDEX	18		
AASHTO SOIL	A-6(8)		
UNIFIED SOIL			
% MOISTURE CONTENT			

REMARKS - W=MULTIPLE LAYERS

AASHTO TESTS : T24 T88 T89 T90 T265