ARKANSAS DEPARTMENT OF TRANSPORTATION

SUBSURFACE INVESTIGATION

STATE JOB NO. 030008

FEDERAL AID PROJECT NO. NHPP-0066(32)

JOHNS BRANCH STR. & APPRS. (S)

STATE HIGHWAY 71 **SECTION** 5

IN SEVIER **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

October 5, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 030008
Johns Branch Str. & Apprs. (S)
Route 71 Section 5
Sevier County

Transmitted herewith is the requested Soil Survey, strength data and Resilient Modulus test results for the above referenced job. The project consists of replacing the bridge crossing Johns Branch on Highway 71. Samples were obtained in the existing travel lanes and ditch line.

Based on laboratory results of samples obtained, the subgrade soils consist of sand and moderately plastic sandy clay. Isolated locations of highly plastic clay were encountered within the project limits. 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 conventional 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 in the vicinity Hatton.

2. Asphalt Concrete Hot Mix

PG64-22, PG70-22, PG76-22

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.2	94.8
Binder Course	4.4	95.6
Base Course	4.0	96.0

Michael C. Benson
Materials Engineer

MCB:pt:bjj
Attachment
cc: State Constr. Eng. – Master File Copy
District 3 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 - 10/02/2017
JOB NUMBER - 030008

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 66
DISTRICT NO. - 03

JOB NAME - JOHNS BRANCH STR. & APPRS.(S)

STATION LIMITS	R-VALUE AT 240 psi
BEGIN JOB - END JOB	7
RESILIENT MODULUS	
STA. 108 + 10	6787

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.	030008	**Material Code**	SSRVPS
Date Sampled:	8/14/17	**Station No.:**	108+10
Date Tested:	September 14, 2017	**Location:**	24'RT
Name of Project:	JOHNS BRANCH STR. & APPRS. (S)		
County:	**Code:** 66 **Name:** SEVIER		
Sampled By:	THORNTON/BATES	**Depth:**	0-5
Lab No.:	20172664	**AASHTO Class:**	A-6 (5)
Sample ID:	RV557	**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	3.93
Average	3.94
Membrane Thickness (in):	0.00
Height of Specimen, Cap and Base (in):	8.03
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.03
Initial Area, Ao (sq. in):	12.21
Initial Volume, AoLo (cu. in):	98.07

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3034.90

4. Soil Properties:

Optimum Moisture Content (%):	18.4
Maximum Dry Density (pcf):	102.8
95% of MDD (pcf):	97.7
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3034.90
Compaction Moisture content (%):	18.7
Compaction Wet Density (pcf):	117.91
Compaction Dry Density (pcf):	99.34
Moisture Content After Mr Test (%):	18.3

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

7. Resilient Modulus, Mr: 11783(Sc)^-0.31159(S3)^0.21234

8. Comments _____

9. Tested By: GW **Date:** September 14, 2017

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	030008	**Material Code**	SSRVPS
Date Sampled:	8/14/17	**Station No.:**	108+10
Date Tested:	September 14, 2017	**Location:**	24'RT
Name of Project:	JOHNS BRANCH STR. & APPRS. (S)		
County:	**Code:** 66 **Name:** SEVIER		
Sampled By:	THORNTON/BATES	**Depth:**	0-5
Lab No.:	20172664	**AASHTO Class:**	A-6 (5)
Sample ID:	RV557	**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	25.3	22.7	2.6	2.1	1.9	0.2	0.00109	0.00014	13,740
Sequence 2	6.0	4.0	47.3	44.7	2.7	3.9	3.7	0.2	0.00228	0.00028	12,888
Sequence 3	6.0	6.0	69.6	66.1	3.5	5.7	5.4	0.3	0.00391	0.00049	11,122
Sequence 4	6.0	8.0	91.6	85.7	5.9	7.5	7.0	0.5	0.00618	0.00077	9,112
Sequence 5	6.0	10.0	112.3	104.0	8.3	9.2	8.5	0.7	0.00867	0.00108	7,882
Sequence 6	4.0	2.0	25.2	22.6	2.6	2.1	1.8	0.2	0.00122	0.00015	12,129
Sequence 7	4.0	4.0	47.0	44.4	2.6	3.9	3.6	0.2	0.00264	0.00033	11,074
Sequence 8	4.0	6.0	68.2	65.5	2.7	5.6	5.4	0.2	0.00433	0.00054	9,950
Sequence 9	4.0	8.0	90.4	85.2	5.2	7.4	7.0	0.4	0.00648	0.00081	8,652
Sequence 10	4.0	10.0	111.7	104.1	7.6	9.1	8.5	0.6	0.00903	0.00112	7,579
Sequence 11	2.0	2.0	25.1	22.3	2.8	2.1	1.8	0.2	0.00138	0.00017	10,604
Sequence 12	2.0	4.0	46.7	43.9	2.8	3.8	3.6	0.2	0.00300	0.00037	9,603
Sequence 13	2.0	6.0	67.4	64.6	2.8	5.5	5.3	0.2	0.00495	0.00062	8,570
Sequence 14	2.0	8.0	88.4	84.0	4.4	7.2	6.9	0.4	0.00730	0.00091	7,573
Sequence 15	2.0	10.0	109.8	103.1	6.8	9.0	8.4	0.6	0.00999	0.00124	6,787

TESTED BY GW DATE September 14, 2017
REVIEWED BY _____ DATE _____

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

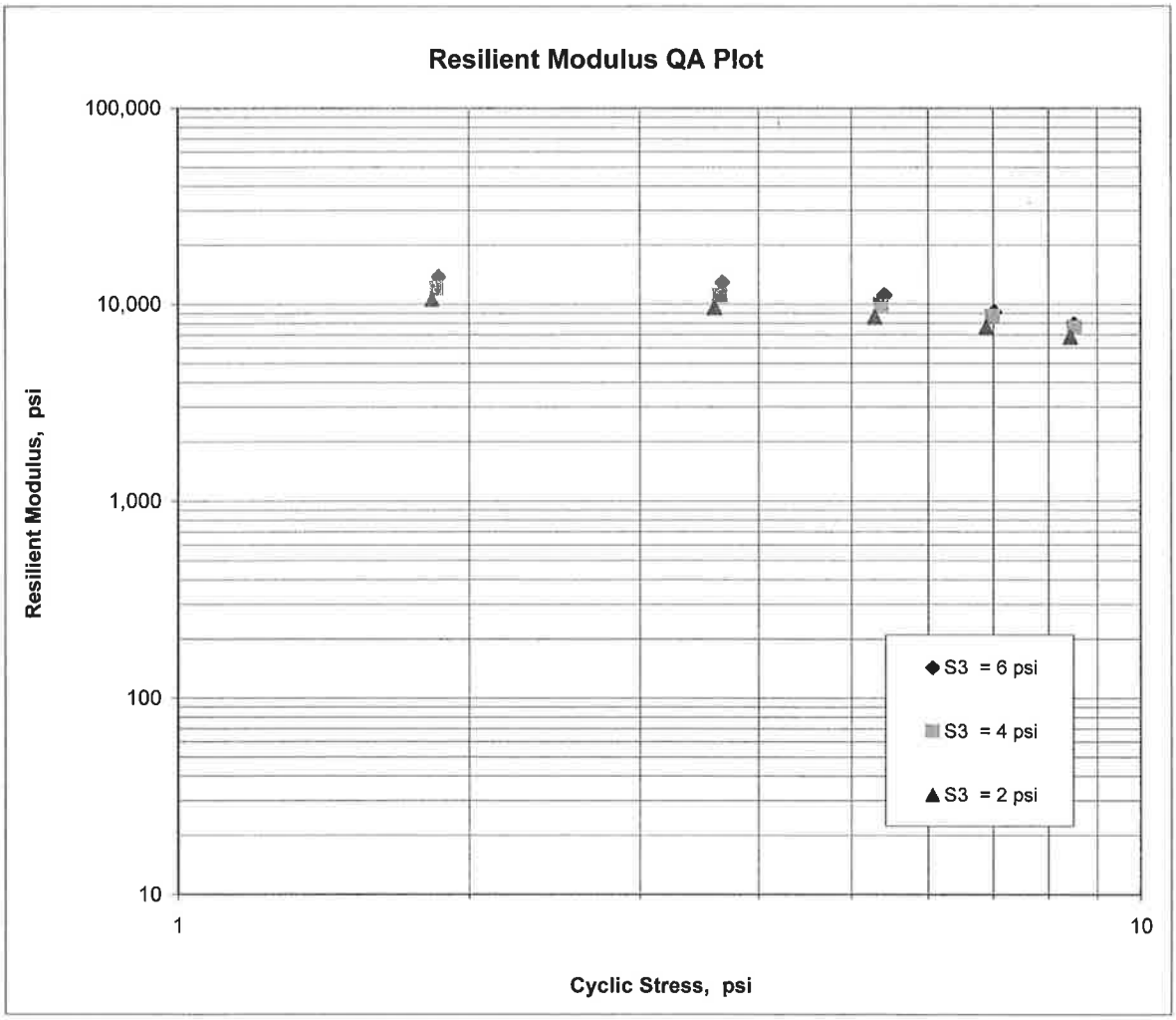
MATERIALS DIVISION

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

Job No.	030008	**Material Code**	SSRVPS
Date Sampled:	8/14/17	**Station No.:**	108+10
Date Tested:	September 14, 2017	**Location:**	24'RT
Name of Project:	JOHNS BRANCH STR. & APPRS. (S)		
County:	**Code:** 66 **Name:** SEVIER		
Sampled By:	THORNTON/BATES	**Depth:**	0-5
Lab No.:	20172664	**AASHTO Class:**	A-6 (5)
Sample ID:	RV557	**Material Type (1 or 2):**	2
LATITUDE:		**LONGITUDE:**	

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

K1 = 11,783
K2 = -0.31159
K5 = 0.21234
R^2 = 0.90



JOB: **030008**

JOB NAME: **JOHNS BRANCH STR. & APPRS.(S)**

COUNTY NO. **66** *DATE TESTED* **9/5/2017**

Arkansas State Highway Transporation Department

Materials Division

Michael Benson, Materials Engineer

STA.#	*LOC.*	*DEPTH*	*COLOR*	*#4*	*#10*	*#40*	*#80*	*#200*	*L.L.*	*P.I.*	*SOIL CLASS*	*LAB #:*	*%MOISTURE*
				SIEVE SIZES									
108+10	24 RT	0-5	BROWN	78	69	61	55	46	37	20	A-6(5)	RV557	
108+00	06 RT	0-5	BROWN	91	84	74	67	57	35	22	A-6(9)	S553	23.8
108+00	24 RT	0-5	BROWN	91	82	73	65	55	43	23	A-7-6(10)	S554	35.6
114+40	06 LT	0-5	BROWN	76	59	39	30	23	ND	NP	A-1-B(0)	S555	28.7
114+40	16 LT	0-5	BROWN	82	77	72	63	41	ND	NP	A-4(0)	S556	20.6

comments: W=MULTIPLE LAYERS, X=STRIPPED

Tuesday, October 03, 2017

JOB: 030008
JOB NAME: JOHNS BRANCH STR. & APPRS.(S)

COUNTY NO. 66

Arkansas State Highway Transporation Department
Materials Division
Michael Benson, Materials Engineer

DATE TESTED
9/5/2017

PAVEMENT SOUNDINGS

STA.#	LOC.				
108+00	06 RT	ACHMSC	ACHMBC	ACHMBC	AGG BASE CRS CL-7
		1.5W	**2.0X**	**2.0**	**13**
108+00	24 RT	ACHMSC	ACHMBC	ACHMBC	AGG BASE CRS CL-7
		---	---	---	---
114+40	06 LT	ACHMSC	ACHMBC	ACHMBC	AGG BASE CRS CL-7
		4.0WX	---	---	**13**

comments: W=MULTIPLE LAYERS,X=STRIPPED

Tuesday, October 03, 2017

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION
MICHAEL BENSON, MATERIALS ENGINEER
*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE - 10/02/17
JOB NUMBER - 030008
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - JOHNS BRANCH STR. & APPRS.(S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - SEVIER, COUNTY
SAMPLED BY - THORNTON/BATES
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

SEQUENCE NO. - 1
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 66
DISTRICT NO. - 03

DATE SAMPLED - 08/14/17
DATE RECEIVED - 08/16/17
DATE TESTED - 09/05/17

LAB NUMBER	20172660	20172661	20172662
SAMPLE ID	S553	S554	S555
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	108+00	108+00	114+40
LOCATION	06 RT	24 RT	06 LT
DEPTH IN FEET	0-5	0-5	0-5
MAT'L COLOR	BROWN	BROWN	BROWN
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	33 54 15.20	33 54 15.20	33 54 21.10
LONGITUDE DEG-MIN-SEC	94 10 18.50	94 10 18.50	94 10 22.50
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.	100		100
3/8 IN.	98	100	94
NO. 4	91	91	76
NO. 10	84	82	59
NO. 40	74	73	39
NO. 80	67	65	30
NO. 200	57	55	23
LIQUID LIMIT	35	43	ND
PLASTICITY INDEX	22	23	NP
AASHTO SOIL	A-6(9)	A-7-6(10)	A-1-B(0)
UNIFIED SOIL			
% MOISTURE CONTENT	23.8	35.6	28.7
ACHMSC (IN)	1.5W	---	4.0WX
ACHMBC (IN)	2.0X	---	---
ACHMBC (IN)	2.0	---	---
AGG BASE CRS CL-7 (IN)	13	---	13

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	- 09/05/17	SEQUENCE NO.	- 2
JOB NUMBER	- 030008	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	- 66
SUPPLIER NAME	- STATE	DISTRICT NO.	- 03
NAME OF PROJECT	- JOHNS BRANCH STR. & APPRS.(S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEVIER, COUNTY	DATE SAMPLED	- 08/14/17
SAMPLED BY	- THORNTON/BATES	DATE RECEIVED	- 08/16/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 09/05/17

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

LAB NUMBER	20172663
SAMPLE ID	S556
TEST STATUS	INFORMATION ONLY
STATION	114+40
LOCATION	16 LT
DEPTH IN FEET	0-5
MAT'L COLOR	BROWN
MAT'L TYPE	
LATITUDE DEG-MIN-SEC	33 54 21.10
LONGITUDE DEG-MIN-SEC	94 10 22.50
% PASSING 2 IN.	
1 1/2 IN.	
3/4 IN.	100
3/8 IN.	91
NO. 4	82
NO. 10	77
NO. 40	72
NO. 80	63
NO. 200	41
LIQUID LIMIT	ND
PLASTICITY INDEX	NP
AASHTO SOIL	A-4(0)
UNIFIED SOIL	
% MOISTURE CONTENT	20.6

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	- 09/05/17	SEQUENCE NO.	- 1
JOB NUMBER	- 030008	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	- 66
SUPPLIER NAME	- STATE	DISTRICT NO.	- 03
NAME OF PROJECT	- JOHNS BRANCH STR. & APPRS.(S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEVIER, COUNTY	DATE SAMPLED	- 08/14/17
SAMPLED BY	- THORNTON/BATES	DATE RECEIVED	- 08/16/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 09/05/17

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

LAB NUMBER	- 20172664	-
SAMPLE ID	- RV557	-
TEST STATUS	- INFORMATION ONLY	-
STATION	- 108+10	-
LOCATION	- 24 RT	-
DEPTH IN FEET	- 0-5	-
MAT'L COLOR	- BROWN	-
MAT'L TYPE	-	-
LATITUDE DEG-MIN-SEC	- 33 54 15.30	-
LONGITUDE DEG-MIN-SEC	- 94 10 18.50	
% PASSING 2 IN.	-	-
1 1/2 IN.	-	-
3/4 IN.	- 100	-
3/8 IN.	- 89	-
NO. 4	- 78	-
NO. 10	- 69	-
NO. 40	- 61	-
NO. 80	- 55	-
NO. 200	- 46	
LIQUID LIMIT	- 37	-
PLASTICITY INDEX	- 20	-
AASHTO SOIL	- A-6(5)	-
UNIFIED SOIL	-	-
% MOISTURE CONTENT	-	-

REMARKS - W=MULTIPLE LAYERS,X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265