

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

Type	PG64-22, PG70-22, PG76-22	
	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:	24RT
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
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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
Lab No.: 20172664
Sample ID: RV557
LATITUDE:
Depth: 0-5
AASHTO Class: A-6 (5)
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
	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	25.3	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 _____ DATE _____
 REVIEWED BY _____ DATE _____
 GW _____ DATE September 14, 2017

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:	

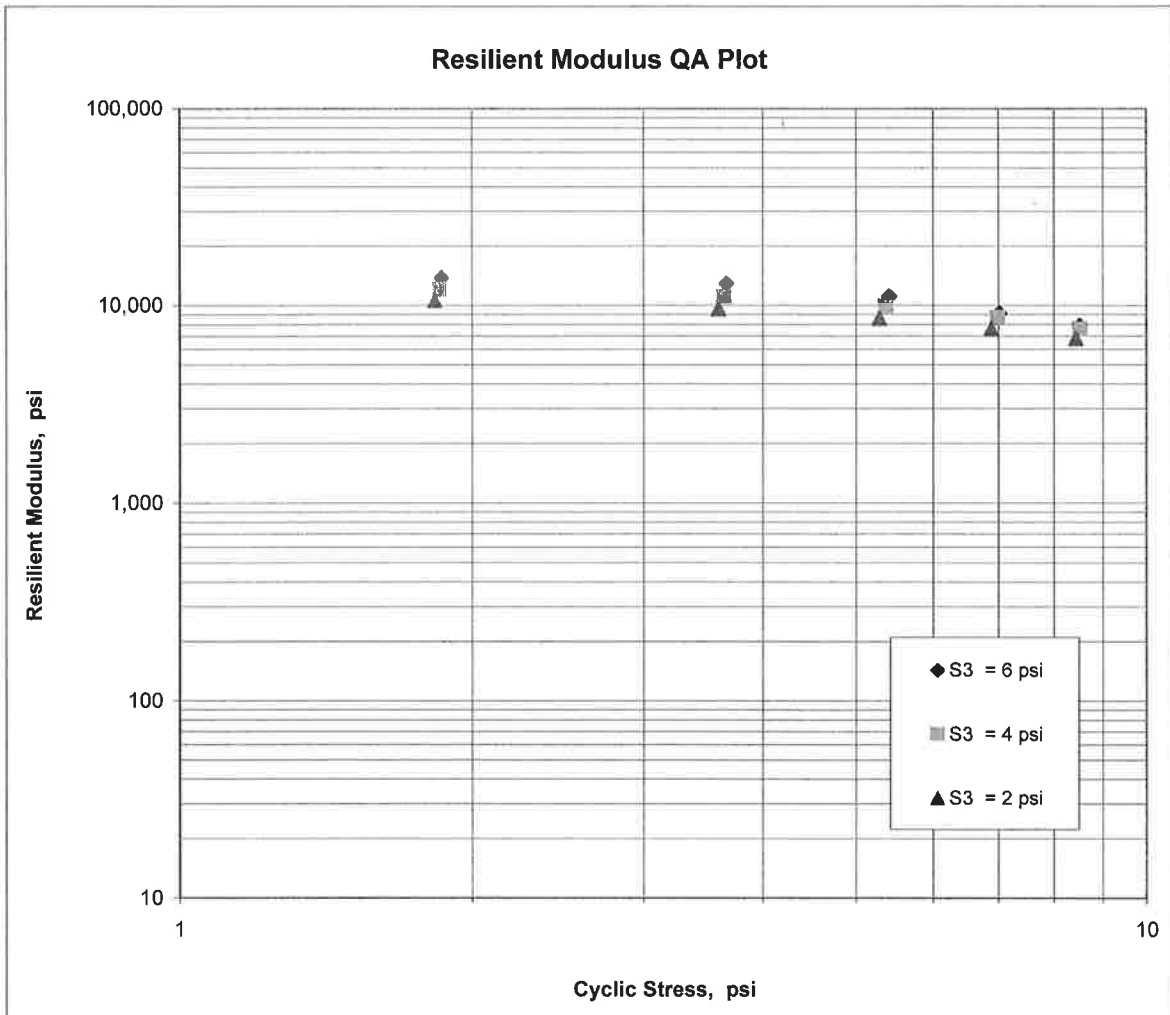
$$M_R = K_1 (S_c)^{K_2} (S_3)^{K_5}$$

$$K_1 = 11,783$$

$$K_2 = -0.31159$$

$$K_5 = 0.21234$$

$$R^2 = 0.90$$



JOB: 030008

Arkansas State Highway Transportation Department

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

Materials Division

COUNTY NO. 66 DATE TESTED 9/5/2017

Michael Benson, Materials Engineer

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

**Arkansas State Highway Transportation Department
Materials Division**

DATE TESTED
9/5/2017

COUNTY NO. 66

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

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

comments: W=MULTIPLE LAYERS,X=STRIPPED

