

# ARKANSAS DEPARTMENT OF TRANSPORTATION



## SUBSURFACE INVESTIGATION

STATE JOB NO. 110621

FEDERAL AID PROJECT NO. NHPP-0039(22)

HOG TUSK CREEK STR. & APPRS. (S)

STATE HIGHWAY 238 SECTION 2

IN LEE 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 STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

March 15, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 110621  
Hog Tusk Creek Str. & Apprs. (S)  
Route 238 Section 2  
Lee 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 Hog Tusk Creek on Highway 238. Samples were obtained in the existing travel lanes and ditch line. There were no paved shoulders within the project.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of low plasticity silty clay. Cross sections are not currently available; it is assumed that the construction grade line will closely match that of the existing roadway. The subgrade soils are expected to provide a stable working platform with normal drying and compactive efforts, if the weather is favorable during construction. No slides were observed within the project limits.

Additional earthwork requirements will be made upon request when plans are further developed.

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 at the river ports near West Helena.
2. Asphalt Concrete Hot Mix

PG 64-22		
Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.3	94.7
Binder Course	4.3	95.7
Base Course	4.0	96.0

PG 70-22		
Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.3	94.7
Binder Course	4.3	95.7
Base Course	4.0	96.0

PG 76-22		
Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.3	94.7
Binder Course	4.3	95.7
Base Course	3.8	96.2

  
Michael C. Benson  
Materials Engineer

MCB:pt:bjj  
Attachment

cc: State Constr. Eng. – Master File Copy  
District 1 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 - 03/09/2017  
JOB NUMBER - 110621

SEQUENCE NO. - 1  
MATERIAL CODE - SSRV  
SPEC. YEAR - 2014  
SUPPLIER ID. - 1  
COUNTY/STATE - 39  
DISTRICT NO. - 01

JOB NAME - HOG TUSK CREEK STR. & APPRS. (S)

\*\*\*\*\*  
\* STATION LIMITS R-VALUE AT 240 psi \*  
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BEGIN JOB - END JOB LESS THAN 5  
  
RESILIENT MODULUS  
107+00 9163

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REMARKS -

AASHTO TESTS : T190

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

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

<b>Job No.</b>	110621	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	2/14/17	<b>Station No.:</b>	107+00
<b>Date Tested:</b>	March 8, 2017	<b>Location:</b>	14RT
<b>Name of Project:</b>	HOG TUSK CREEK STR. & APPRS. (S)		
<b>County:</b>	<b>Code:</b> 39	<b>Name:</b> LEE	
<b>Sampled By:</b>	THORNTON/TAYLOR		<b>Depth:</b> 0-5
<b>Lab No.:</b>	20170593	<b>AASHTO Class:</b>	A-4(4)
<b>Sample ID:</b>	RV152	<b>Material Type (1 or 2):</b>	2
<b>LATITUDE:</b>		<b>LONGITUDE:</b>	

**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	3.96
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):	12.20
Initial Volume, AoLo (cu. in):	97.85

**3. Soil Specimen Weight:**

Weight of Wet Soil Used (g):	3096.50
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**4. Soil Properties:**

Optimum Moisture Content (%):	14.6
Maximum Dry Density (pcf):	108.7
95% of MDD (pcf):	103.3
In-Situ Moisture Content (%):	N/A

**5. Specimen Properties:**

Wet Weight (g):	3096.50
Compaction Moisture content (%):	14.9
Compaction Wet Density (pcf):	120.58
Compaction Dry Density (pcf):	104.94
Moisture Content After Mr Test (%):	14.6

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

**7. Resilient Modulus, Mr:** 8783(Sc)<sup>-0.07909</sup>(S3)<sup>0.29225</sup>

**8. Comments**

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**9. Tested By:** GW **Date:** March 8, 2017

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<b>County:</b>	Code: 39 Name: LEE	<b>AASHTO Class:</b>	A-4(4)
<b>Sampled By:</b>	THORNTON/TAYLOR	<b>Material Type (1 or 2):</b>	2
<b>Lab No.:</b>	20170593	<b>LONGITUDE:</b>	
<b>Sample ID:</b>	RV152		

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 <sub>3</sub> psi	S <sub>cyclic</sub> psi	P <sub>max</sub> lbs	P <sub>cyclic</sub> lbs	P <sub>contact</sub> lbs	S <sub>max</sub> psi	S <sub>cyclic</sub> psi	S <sub>contact</sub> psi	H <sub>avg</sub> in	ε <sub>r</sub> in/in	M <sub>r</sub> psi
Sequence 1	6.0	2.0	25.0	22.4	2.6	2.1	1.8	0.2	0.00107	0.00013	13,725
Sequence 2	6.0	4.0	47.5	44.9	2.6	3.9	3.7	0.2	0.00214	0.00027	13,764
Sequence 3	6.0	6.0	70.2	66.7	3.5	5.8	5.5	0.3	0.00332	0.00041	13,216
Sequence 4	6.0	8.0	94.1	88.2	5.9	7.7	7.2	0.5	0.00453	0.00056	12,801
Sequence 5	6.0	10.0	118.2	109.8	8.4	9.7	9.0	0.7	0.00580	0.00072	12,458
Sequence 6	4.0	2.0	25.2	22.5	2.7	2.1	1.8	0.2	0.00117	0.00015	12,636
Sequence 7	4.0	4.0	47.0	44.3	2.7	3.9	3.6	0.2	0.00246	0.00031	11,857
Sequence 8	4.0	6.0	68.5	65.8	2.7	5.6	5.4	0.2	0.00384	0.00048	11,275
Sequence 9	4.0	8.0	92.6	87.5	5.1	7.6	7.2	0.4	0.00521	0.00065	11,041
Sequence 10	4.0	10.0	116.2	108.6	7.6	9.5	8.9	0.6	0.00648	0.00081	11,020
Sequence 11	2.0	2.0	24.7	21.9	2.8	2.0	1.8	0.2	0.00138	0.00017	10,434
Sequence 12	2.0	4.0	46.1	43.2	2.9	3.8	3.5	0.2	0.00292	0.00036	9,732
Sequence 13	2.0	6.0	67.0	64.1	2.9	5.5	5.3	0.2	0.00453	0.00056	9,302
Sequence 14	2.0	8.0	89.5	85.1	4.4	7.3	7.0	0.4	0.00611	0.00076	9,163
Sequence 15	2.0	10.0	113.5	106.6	6.9	9.3	8.7	0.6	0.00758	0.00094	9,253

TESTED BY \_\_\_\_\_ DATE March 8, 2017

REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_

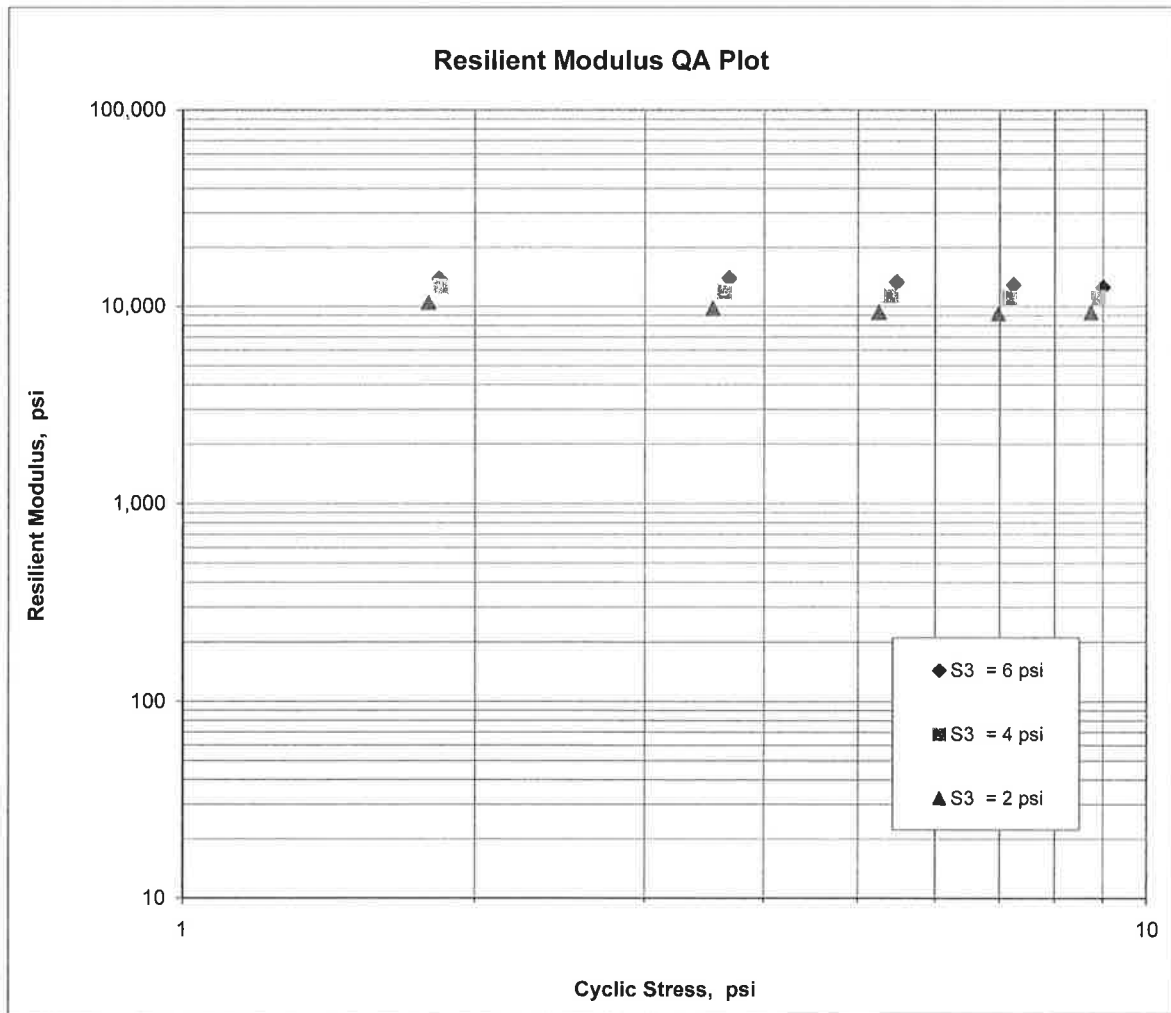
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
MATERIALS DIVISION**

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

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<b>Date Sampled:</b>	2/14/17	<b>Station No.:</b>	107+00
<b>Date Tested:</b>	March 8, 2017	<b>Location:</b>	14RT
<b>Name of Project:</b>	HOG TUSK CREEK STR. & APPRS. (S)		
<b>County:</b>	<b>Code:</b> 39	<b>Name:</b>	LEE
<b>Sampled By:</b>	THORNTON/TAYLOR		<b>Depth:</b> 0-5
<b>Lab No.:</b>	20170593	<b>AASHTO Class:</b>	A-4(4)
<b>Sample ID:</b>	RV152	<b>Material Type (1 or 2):</b>	2
<b>LATITUDE:</b>		<b>LONGITUDE:</b>	

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

$K_1 = \underline{8,783}$   
 $K_2 = \underline{-0.07909}$   
 $K_5 = \underline{0.29225}$   
 $R^2 = \underline{0.99}$



**JOB: 110621**

*Arkansas State Highway Transportation Department*

**JOB NAME: HOG TUSK CREEK STR. & APPRS. (S)**

*Materials Division*

**COUNTY NO. 39 DATE TESTED 3/8/2017**

*Michael Benson, Materials Engineer*

STA.#	LOC.	DEPTH	COLOR	#4 #10 #40 #80 #200					L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				S	I	E	V	E					
107+00	14'RT	0-5	BROWN	93	91	88	86	85	26	6	A-4(4)	RV152	
107+00	05'RT	0-5	GRAY	100				97	27	8	A-4(7)	S148	28.2
107+00	13'RT	0-5	GRAY	100				97	26	6	A-4(5)	S149	24.3
113+00	05'LT	0-5	GRAY	100				96	27	7	A-4(6)	S150	32.7
113+00	16'LT	0-5	GRAY	100				95	28	7	A-4(6)	S151	29.8

*comments:* X=STRIPPED

*Monday, March 13, 2017*

**JOB:** 110621

**JOB NAME:** HOG TUSK CREEK STR. & APPRS. (S)

**Arkansas State Highway Transportation Department  
Materials Division**

**DATE TESTED**  
3/8/2017

**COUNTY NO.** 39

**Michael Benson, Materials Engineer**

**STA.# LOC.** [REDACTED] **PAVEMENT SOUNDINGS**

107+00	13RT	ACHMSC
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107+00	05RT	ACHMSC 4.0X
113+00	05LT	ACHMSC 2.5X

**comments:** X=STRIPPED







