

ARKANSAS DEPARTMENT OF TRANSPORTATION



**SUBSURFACE INVESTIGATION**

STATE JOB NO. 100840

FEDERAL AID PROJECT NO. NHPP-0056(36)

DITCH NOS. 1 & 47 STRS. & APPRS. (S)

STATE HIGHWAY 308 SECTION 1

IN POINSETT 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

April 3, 2017

**TO:** Mr. Trinity Smith, Engineer of Roadway Design

**SUBJECT:** Job No. 100840  
Ditch Nos. 1 & 47 Str. & Apprs. (S)  
Route 308 Section 1  
Poinsett 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 for Ditch Numbers 1 and 47 on Highway 308. Samples were obtained in the existing travel lanes and ditch line. There were no paved shoulders within the project limits.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of highly plastic clay with gravel. 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 will likely require remediation where new embankment crosses existing ditches or shallow fills in agricultural fields. Remediation recommendations can be made when cross sections become available. 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 Osceola.
2. Asphalt Concrete Hot Mix

<u>Type</u>	<u>Asphalt Cement %</u>	<u>Mineral Aggregate %</u>
Surface Course	5.2	94.8
Binder Course	4.1	95.9
Base Course	3.9	96.1

  
Michael C. Benson  
Materials Engineer

MCB:pt:bjj  
Attachment

cc: State Constr. Eng. – Master File Copy  
District 10 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 - 03/23/2017  
JOB NUMBER - 100840

SEQUENCE NO. - 1  
MATERIAL CODE - SSRV  
SPEC. YEAR - 2014  
SUPPLIER ID. - 1  
COUNTY/STATE - 56  
DISTRICT NO. - 10

JOB NAME - DITCH NOS. 1 & 47 STR. & APPRS. (S)

\*\*\*\*\*  
\* STATION LIMITS R-VALUE AT 240 psi \*  
\*\*\*\*\*

BEGIN JOB - END JOB LESS THAN 5

RESILIENT MODULUS  
STA. 228+00 10327

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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>	100840	<b>Material Code:</b>	SSRVPS
<b>Date Sampled:</b>	2/28/17	<b>Station No.:</b>	228+00
<b>Date Tested:</b>	March 16, 2017	<b>Location:</b>	16LT
<b>Name of Project:</b>	DITCH NOS. 1 & 47 STR. & APPRS. (S)		
<b>County:</b>	<b>Code:</b> 56	<b>Name:</b>	POINSETT
<b>Sampled By:</b>	DICKERSON/FRAZIER		
<b>Lab No.:</b>	20170731	<b>Depth:</b>	0-5
<b>Sample ID:</b>	RV188	<b>AASHTO Class:</b>	A-7-6(12)
<b>LATITUDE:</b>		<b>Material Type (1 or 2):</b>	2
		<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	3.96
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):	12.20
Initial Volume, AoLo (cu. in):	97.85

**3. Soil Specimen Weight:**

Weight of Wet Soil Used (g):	2928.40
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**4. Soil Properties:**

Optimum Moisture Content (%):	20.2
Maximum Dry Density (pcf):	98.5
95% of MDD (pcf):	93.6
In-Situ Moisture Content (%):	N/A

**5. Specimen Properties:**

Wet Weight (g):	2928.40
Compaction Moisture content (%):	20.5
Compaction Wet Density (pcf):	114.03
Compaction Dry Density (pcf):	94.63
Moisture Content After Mr Test (%):	20.4

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

#VALUE!

**7. Resilient Modulus, Mr:**

13140(Sc)^-0.14252(S3)^0.10666

**8. Comments**

\_\_\_\_\_

\_\_\_\_\_

**9. Tested By:**

G.WENDLAND

**Date:** March 16, 2017

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

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

**Job No.** 100840      **Material Code** SSRVPS  
**Date Sampled:** 2/28/17      **Station No.:** 228+00  
**Date Tested:** March 16, 2017      **Location:** 16LT  
**Name of Project:** DITCH NOS. 1 & 47 STR. & APPRS. (S)  
**County:** Code: 56      **Name:** POINSETT  
**Sampled By:** DICKERSON/FRAZIER      **Depth:** 0-5  
**Lab No.:** 20170731      **AAASHTO Class:** A-7-6(12)  
**Sample ID:** RV188      **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
	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	25.2	22.5	2.7	2.1	1.8	0.2	0.00101	0.00013	14,608
Sequence 2	6.0	4.0	47.1	44.3	2.8	3.9	3.6	0.2	0.00211	0.00026	13,800
Sequence 3	6.0	6.0	69.5	66.0	3.6	5.7	5.4	0.3	0.00337	0.00042	12,863
Sequence 4	6.0	8.0	92.8	86.8	6.0	7.6	7.1	0.5	0.00484	0.00060	11,781
Sequence 5	6.0	10.0	114.9	106.6	8.4	9.4	8.7	0.7	0.00648	0.00081	10,819
Sequence 6	4.0	2.0	25.1	22.4	2.7	2.1	1.8	0.2	0.00107	0.00013	13,725
Sequence 7	4.0	4.0	46.9	44.2	2.7	3.8	3.6	0.2	0.00222	0.00028	13,120
Sequence 8	4.0	6.0	68.6	65.9	2.7	5.6	5.4	0.2	0.00348	0.00043	12,437
Sequence 9	4.0	8.0	91.8	86.8	5.0	7.5	7.1	0.4	0.00489	0.00061	11,673
Sequence 10	4.0	10.0	114.5	107.0	7.5	9.4	8.8	0.6	0.00647	0.00081	10,872
Sequence 11	2.0	2.0	25.0	22.4	2.6	2.0	1.8	0.2	0.00121	0.00015	12,180
Sequence 12	2.0	4.0	46.9	44.3	2.7	3.8	3.6	0.2	0.00244	0.00030	11,913
Sequence 13	2.0	6.0	68.5	65.8	2.7	5.6	5.4	0.2	0.00379	0.00047	11,420
Sequence 14	2.0	8.0	90.8	86.6	4.2	7.4	7.1	0.3	0.00524	0.00065	10,873
Sequence 15	2.0	10.0	113.6	107.0	6.6	9.3	8.8	0.5	0.00681	0.00085	10,327

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

WENDLAND      March 16, 2017

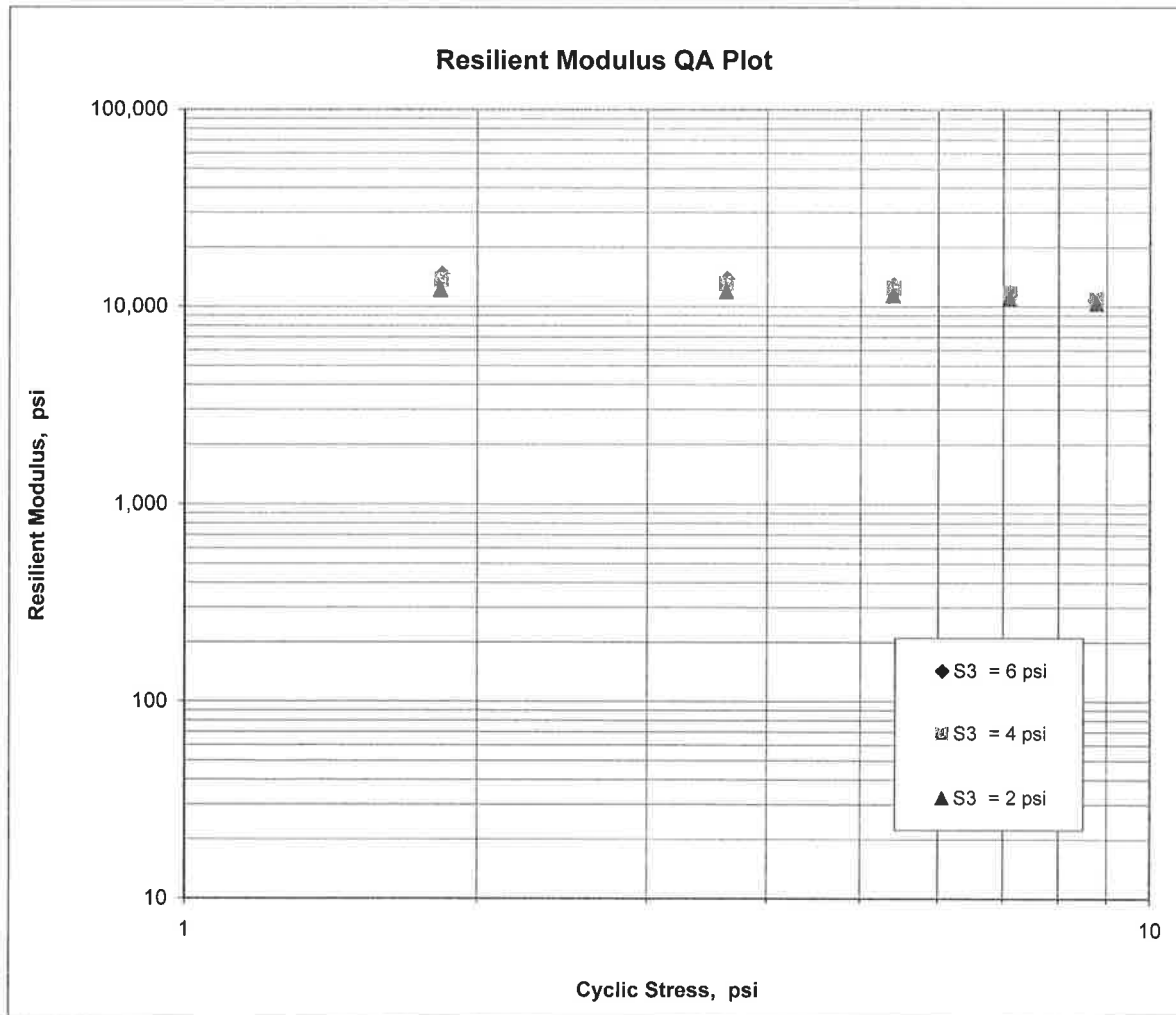
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
MATERIALS DIVISION**

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

<b>Job No.</b>	100840	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	2/28/17	<b>Station No.:</b>	228+00
<b>Date Tested:</b>	March 16, 2017	<b>Location:</b>	16LT
<b>Name of Project:</b>	DITCH NOS. 1 & 47 STR. & APPRS. (S)		
<b>County:</b>	<b>Code:</b> 56	<b>Name:</b>	POINSETT
<b>Sampled By:</b>	DICKERSON/FRAZIER		
<b>Lab No.:</b>	20170731	<b>Depth:</b>	0-5
<b>Sample ID:</b>	RV188	<b>AASHTO Class:</b>	A-7-6(12)
<b>LATITUDE:</b>		<b>Material Type (1 or 2):</b>	2
		<b>LONGITUDE:</b>	

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

$K_1 = \underline{13,140}$   
 $K_2 = \underline{-0.14252}$   
 $K_5 = \underline{0.10666}$   
 $R^2 = \underline{0.88}$



**JOB: 100840**

**Arkansas State Highway Transportation Department**

**JOB NAME: DITCH NOS. 1 & 47 STR. & APPRS. (S)**

**Materials Division**

**COUNTY NO. 56 DATE TESTED 3/9/2017**

**Michael Benson, Materials Engineer**

STA.#	LOC.	DEPTH	COLOR						L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				#4	#10	#40	#80	#200					
				S	I	E	V	E	S				
228+00	16 LT	0-5	BR/GR	89	88	84	75	60	41	26	A-7-6(12)	RV188	
202+00	05RT	0-5	BR/GR	96	92	86	81	78	57	40	A-7-6(31)	S182	44.3
202+00	16 RT	0-5	GR/BR	92	86	78	72	68	51	34	A-7-6(21)	S183	39.4
210+00	05 LT	0-5	BR/GR	96	92	87	74	64	42	29	A-7-6(15)	S184	23.8
220+00	05 LT	0-5	BR/GR	93	91	86	76	68	46	31	A-7-6(19)	S185	23.8
228+00	05 LT	0-5	BR/GR	96	90	81	66	56	40	28	A-6(12)	S186	34.3
228+00	16 LT	0-5	BR/GR	96	95	92	76	65	38	24	A-6(13)	S187	33.1

**comments:** W=MULTIPLE LAYERS, X=STRIPPED

**Tuesday, March 28, 2017**

**JOB:** 100840

*Arkansas State Highway Transportation Department  
Materials Division*

**DATE TESTED**  
3/9/2017

**JOB NAME:** DITCH NOS. 1 & 47 STR. & APPRS. (S)

**COUNTY NO.** 56

*Michael Benson, Materials Engineer*

**STA.# LOC.**

**PAVEMENT SOUNDINGS**

202+00	16 RT	ACHMSC	---	AGG. BASE CRS. CL-5
202+00	05RT	ACHMSC	6.0WX	AGG. BASE CRS. CL-5
210+00	05 LT	ACHMSC	7.0WX	AGG. BASE CRS. CL-5
220+00	05 LT	ACHMSC	6.75W	AGG. BASE CRS. CL-5
228+00	16 LT	ACHMSC	---	AGG. BASE CRS. CL-5
228+00	05 LT	ACHMSC	4.5W	AGG. BASE CRS. CL-5

**comments:** W=MULTIPLE LAYERS, X=STRIPPED







