

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 080507

FEDERAL AID PROJECT NO. NHPP-0053(33)

DITCH AT L.M. 4.30 STR. & APPRS. (S)

STATE HIGHWAY 155 SECTION 4

IN PERRY 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

June 22, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 080507
Ditch at LM 4.3 Str. & Apprs. (S)
Route 155 Section 4
Perry 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 at log mile 4.3 on Highway 155. 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 low plasticity sandy clay. Based on currently available cross sections the construction grade line closely matches 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.

The maximum embankment height is approximately 8 feet. All soft unstable organic material within the existing ditch line should be undercut prior to construction, anticipated to be no more than two feet. The embankment may be constructed with locally available unspecified material utilizing a 3:1 slope configuration.

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 Russellville.
2. Asphalt Concrete Hot Mix

<u>Type</u>	<u>Asphalt Cement %</u>	<u>Mineral Aggregate %</u>
Surface Course	5.5	94.5
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 8 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 - 06/16/2017
JOB NUMBER - 080507

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 53
DISTRICT NO. - 08

JOB NAME - DITCH @ L.M. 4.3 STR. & APPRS.(S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 7

RESILIENT MODULUS
STA. 113+90 9690

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.	080507	Material Code	SSRVPS
Date Sampled:	5/31/17	Station No.:	113+90
Date Tested:	June 15, 2017	Location:	23'LT
Name of Project:	DITCH AT L.M. 4.3 STR. & APPRS. (S)		
County:	Code: 53	Name: PERRY	
Sampled By:	THORNTON/TAYLOR		Depth: 0-5
Lab No.:	20171806	AASHTO Class:	A-4(2)
Sample ID:	RV411	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):	3255.50
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4. Soil Properties:

Optimum Moisture Content (%):	12.0
Maximum Dry Density (pcf):	117
95% of MDD (pcf):	111.2
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3255.50
Compaction Moisture content (%):	12.3
Compaction Wet Density (pcf):	126.99
Compaction Dry Density (pcf):	113.08
Moisture Content After Mr Test (%):	12.0

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

#VALUE!

7. Resilient Modulus, Mr:

12062(Sc)^{-0.21053(S3)}^{0.32591}

8. Comments

9. Tested By:

B.H. _____

Date: June 15, 2017

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

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

Job No. 080507 **Material Code** SSRVPS
Date Sampled: 5/31/17 **Station No.:** 113+90
Date Tested: June 15, 2017 **Location:** 23'LT

Name of Project: DITCH AT L.M. 4.3 STR. & APPRS. (S)

County: Code: 53 **Name:** PERRY

Sampled By: THORNTON/TAYLOR

Lab No.: 20171806

Sample ID: RV411

LATITUDE:

Depth: 0-5

AAASHTO Class: A-4(2)

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
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	22.5	2.8	2.1	1.8	0.2	0.00079	0.00010	18,627
Sequence 2	6.0	4.0	47.6	44.9	2.7	3.9	3.7	0.2	0.00169	0.00021	17,433
Sequence 3	6.0	6.0	70.3	66.7	3.6	5.8	5.5	0.3	0.00278	0.00035	15,815
Sequence 4	6.0	8.0	93.8	87.8	6.1	7.7	7.2	0.5	0.00408	0.00051	14,181
Sequence 5	6.0	10.0	117.1	108.7	8.5	9.6	8.9	0.7	0.00542	0.00068	13,212
Sequence 6	4.0	2.0	25.2	22.5	2.7	2.1	1.8	0.2	0.00092	0.00011	16,173
Sequence 7	4.0	4.0	47.1	44.4	2.8	3.9	3.6	0.2	0.00202	0.00025	14,465
Sequence 8	4.0	6.0	68.6	65.9	2.7	5.6	5.4	0.2	0.00326	0.00041	13,304
Sequence 9	4.0	8.0	91.9	86.9	5.0	7.5	7.1	0.4	0.00465	0.00058	12,293
Sequence 10	4.0	10.0	114.9	107.5	7.4	9.4	8.8	0.6	0.00606	0.00076	11,677
Sequence 11	2.0	2.0	25.0	22.4	2.6	2.1	1.8	0.2	0.00111	0.00014	13,243
Sequence 12	2.0	4.0	46.1	43.5	2.7	3.8	3.6	0.2	0.00245	0.00031	11,683
Sequence 13	2.0	6.0	66.9	64.3	2.6	5.5	5.3	0.2	0.00394	0.00049	10,733
Sequence 14	2.0	8.0	88.7	84.6	4.1	7.3	6.9	0.3	0.00552	0.00069	10,093
Sequence 15	2.0	10.0	111.7	105.2	6.6	9.2	8.6	0.5	0.00715	0.00089	9,690

TESTED BY

B.H.

DATE

June 15, 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. 080507 Material Code SSRVPS
Date Sampled: 5/31/17 Station No.: 113+90
Date Tested: June 15, 2017 Location: 23'LT
Name of Project: DITCH AT L.M. 4.3 STR. & APPRS. (S)
County: Code: 53 Name: PERRY
Sampled By: THORNTON/TAYLOR Depth: 0-5
Lab No.: 20171806 AASHTO Class: A-4(2)
Sample ID: RV411 Material Type (1 or 2): 2
LATITUDE: LONGITUDE:

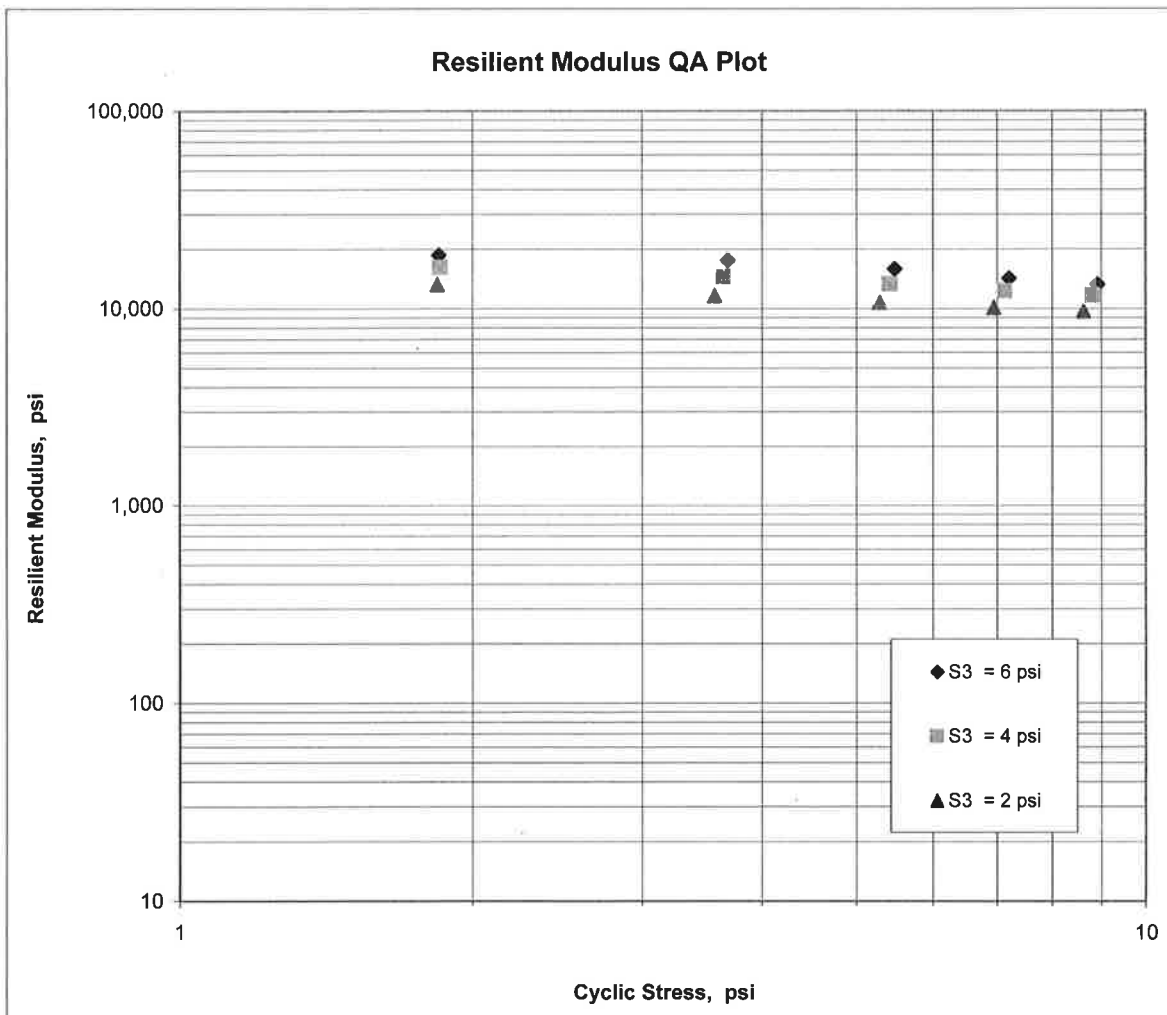
$$M_R = K_1 (S_c)^{K_2} (S_3)^{K_5}$$

$$K_1 = \frac{12,062}{\quad}$$

$$K_2 = \frac{-0.21053}{\quad}$$

$$K_5 = \frac{0.32591}{\quad}$$

$$R^2 = \frac{0.98}{\quad}$$



JOB: 080507

Arkansas State Highway Transportation Department

JOB NAME: DITCH @ L.M. 4.3 STR. & APPRS.(S)

Materials Division

COUNTY NO. 53 DATE TESTED 6/12/2017

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					
113+90	23 LT	0-5	BROWN	87	81	79	74	60	24	8	A-4(2)	RV411	
110+00	06 RT	0-5	BR/GR	99	97	89	83	70	27	13	A-6(6)	S407	17.6
110+00	23 RT	0-5	BR/GR	88	77	67	65	57	27	11	A-6(3)	S408	18.1
114+00	06 LT	0-5	BROWN	97	93	90	84	67	22	8	A-4(2)	S409	21.1
114+00	23 LT	0-5	BROWN	88	83	80	76	62	25	8	A-4(2)	S410	20.4

comments: W=MULTIPLE LAYERS, X=STRIPPED

Monday, June 19, 2017

JOB: 080507

JOB NAME: DITCH @ L.M. 4.3 STR. & APPRS.(S)

**Arkansas State Highway Transportation Department
Materials Division**

DATE TESTED
6/12/2017

COUNTY NO. 53

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

110+00	06 RT	ACHMSC 6.5W	AGG. BASE CRS. CL-7 9.0
110+00	23 RT	ACHMSC ---	AGG. BASE CRS. CL-7 ---
114+00	06 LT	ACHMSC 4.5WX	AGG. BASE CRS. CL-7 7.0

comments: W=MULTIPLE LAYERS, X=STRIPPED

