

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 061456

FEDERAL AID PROJECT NO. NHPP-0030(24)

DEE BAYOU STR. & APPRS. (S)

STATE HIGHWAY 171 SECTION 1

IN HOT SPRING 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

AR DOT.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

August 6, 2018

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 061456
Dee Bayou Str. & Apprs. (S)
Route 171 Section 1
Hot Spring 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 over Dee Bayou on Highway 171 with a box culvert. Samples were taken in the existing travel lanes and ditch line. There are no paved shoulders within the project limits.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of low plasticity clayey sands with some gravel. The subgrade soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction. Rock was encountered at station 108+00 12 feet right of centerline at a depth of 2.5 feet.

Based on currently available cross sections the maximum embankment height is approximately eight feet. Prior to embankment construction all soft unstable organic material in the ditch line should be undercut, 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 near Jones Mill.
2. Asphalt Concrete Hot Mix

<u>Type</u>	<u>Asphalt Cement %</u>	<u>Mineral Aggregate %</u>
Surface Course	4.9	95.1
Binder Course	4.0	96.0
Base Course	3.6	96.4


Michael C. Benson
Materials Engineer

MCB:pt:bjj
Attachment

cc: State Constr. Eng. – Master File Copy
District 6 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 - 07/23/2018
JOB NUMBER - 061456

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 30
DISTRICT NO. - 06

JOB NAME - DEE BAYOU STR. & APPRS. (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 20

RESILIENT MODULUS
STA. 111 + 00 7039

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.	061456	Material Code	SSRVPS
Date Sampled:	6/11/18	Station No.:	111+00
Date Tested:	June 27, 2018	Location:	12LT
Name of Project:	DEE BAYOU STR. & APPRS. (S)		
County:	Code: 30	Name:	HOT SPRINGS
Sampled By:	DICKERSON/FRAZIER		
Lab No.:	20181305	Depth:	0-5
Sample ID:	RV306	AASHTO Class:	A-4 (0)
LATITUDE:		Material Type (1 or 2):	2
		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	3.94
Middle	3.94
Bottom	3.94
Average	3.94
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):	12.12
Initial Volume, AoLo (cu. in):	97.19

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3211.30
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4. Soil Properties:

Optimum Moisture Content (%):	13.6
Maximum Dry Density (pcf):	114.1
95% of MDD (pcf):	108.4
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3211.30
Compaction Moisture content (%):	13.9
Compaction Wet Density (pcf):	125.90
Compaction Dry Density (pcf):	110.54
Moisture Content After Mr Test (%):	13.8

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

7. Resilient Modulus, Mr: $8680(S_c)^{-0.24259}(S_3)^{0.39539}$

8. Comments

9. Tested By: GW **Date:** June 27, 2018

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

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

Job No. 061456 **Material Code** SSRVPS
Date Sampled: 6/11/18 **Station No.:** 111+00
Date Tested: June 27, 2018 **Location:** 12'LT
Name of Project: DEE BAYOU STR. & APPRS. (S)
County: Code: 30 **Name:** HOT SPRINGS
Sampled By: DICKERSON/FRAZIER **Depth:** 0-5
Lab No.: 20181305 **AASHTO Class:** A-4 (0)
Sample ID: RV306 **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
Sequence 1	6.0	2.0	25.1	22.4	2.7	2.1	1.8	0.2	0.00098	0.00012	15,076
Sequence 2	6.0	4.0	47.4	44.6	2.7	3.9	3.7	0.2	0.00221	0.00028	13,392
Sequence 3	6.0	6.0	70.1	66.5	3.6	5.8	5.5	0.3	0.00365	0.00045	12,072
Sequence 4	6.0	8.0	93.9	87.8	6.0	7.7	7.2	0.5	0.00531	0.00066	10,946
Sequence 5	6.0	10.0	117.5	109.0	8.5	9.7	9.0	0.7	0.00700	0.00087	10,306
Sequence 6	4.0	2.0	25.0	22.2	2.8	2.1	1.8	0.2	0.00116	0.00014	12,660
Sequence 7	4.0	4.0	46.8	44.0	2.9	3.9	3.6	0.2	0.00265	0.00033	10,980
Sequence 8	4.0	6.0	67.9	65.1	2.8	5.6	5.4	0.2	0.00449	0.00056	9,594
Sequence 9	4.0	8.0	91.7	86.5	5.2	7.6	7.1	0.4	0.00633	0.00079	9,046
Sequence 10	4.0	10.0	115.6	108.0	7.6	9.5	8.9	0.6	0.00821	0.00102	8,705
Sequence 11	2.0	2.0	24.9	22.1	2.8	2.1	1.8	0.2	0.00146	0.00018	10,028
Sequence 12	2.0	4.0	45.9	43.1	2.8	3.8	3.6	0.2	0.00338	0.00042	8,451
Sequence 13	2.0	6.0	66.0	63.2	2.8	5.4	5.2	0.2	0.00556	0.00069	7,522
Sequence 14	2.0	8.0	88.1	83.8	4.3	7.3	6.9	0.4	0.00782	0.00097	7,094
Sequence 15	2.0	10.0	111.9	105.2	6.7	9.2	8.7	0.6	0.00989	0.00123	7,039

TESTED BY _____ DATE June 27, 2018
 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.	061456	Material Code	SSRVPS
Date Sampled:	6/11/18	Station No.:	111+00
Date Tested:	June 27, 2018	Location:	12'LT
Name of Project:	DEE BAYOU STR. & APPRS. (S)		
County:	Code: 30	Name:	HOT SPRINGS
Sampled By:	DICKERSON/FRAZIER		Depth: 0-5
Lab No.:	20181305	AASHTO Class:	A-4 (0)
Sample ID:	RV306	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

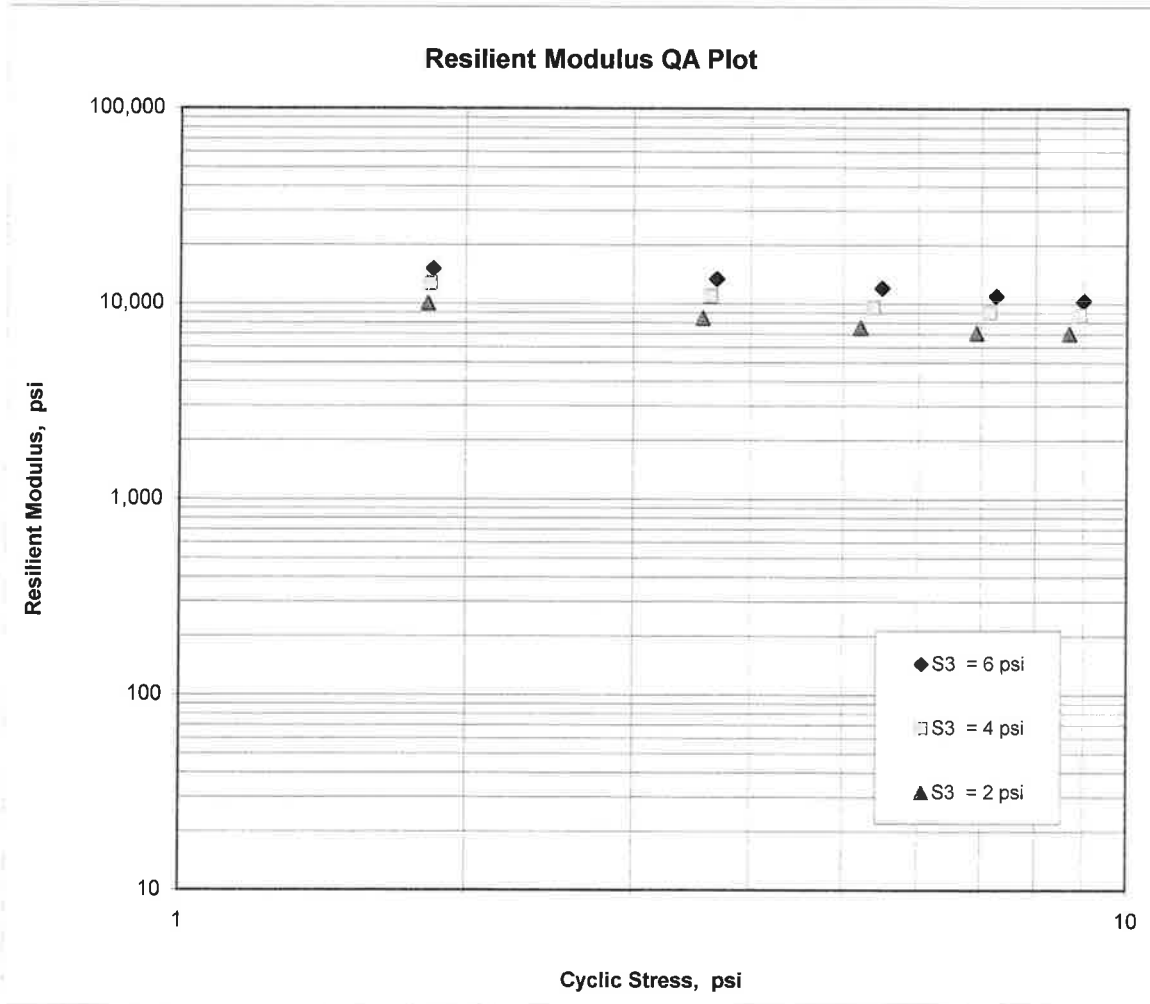
$$M_R = K_1 (S_c)^{K_2} (S_d)^{K_5}$$

K1 = 8,680

K2 = -0.24259

K5 = 0.39539

R² = 0.99



JOB: 061456

Arkansas State Highway Transportation Department

JOB NAME: DEE BAYOU STR. & APPRS. (S)

Materials Division

COUNTY NO. 30 DATE TESTED 6/27/2018

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				S	I	E	P	E					
111+00	12 LT	0-5	BROWN	90	67	58	54	48	25	07	A-4(0)	RV306	
108+00	05 RT	0-5	BROWN	62	48	36	31	26	25	09	A-2-4(0)	S302	6.9
108+00	12 RT	0-2.5Z	BROWN	65	42	28	21	17	24	05	A-1-B	S303	8.8
111+00	06 LT	0-5	BROWN	79	65	50	44	39	26	09	A-4(0)	S304	10.4
111+00	12 LT	0-5	BROWN	67	56	44	40	34	23	06	A-2-4(0)	S305	10.1

comments: W=MULTIPLE LAYERS

Tuesday, July 24, 2018

JOB: 061456

**Arkansas State Highway Transportation Department
Materials Division**

DATE TESTED
6/27/2018

JOB NAME: DEE BAYOU STR. & APPRS. (S)

COUNTY NO. 30

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

108+00	05 RT	ACHMSC 3.5W	AGG. BASE CRS CL-7 6.0
108+00	12 RT	ACHMSC	AGG. BASE CRS CL-7
111+00	06 LT	ACHMSC 2.25W	AGG. BASE CRS CL-7 6.0

comments: W=MULTIPLE LAYERS

