

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 110642

FEDERAL AID PROJECT NO. NHPP-0054(22)

BEAVER BAYOU STR. & APPRS. (S)

STATE HIGHWAY 85 SECTION 1

IN PHILLIPS 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. 110642
Beaver Bayou Str. & Apprs. (S)
Route 85 Section 1
Phillips 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 Beaver Bayou on Highway 85. 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 range from non-plastic sands to highly plastic clays. 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.

Due to seismic considerations embankment recommendations will be made after the subsurface investigation is completed.

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 the river port in Helena.
2. Asphalt Concrete Hot Mix

<u>Type</u>	<u>Asphalt Cement %</u>	<u>Mineral Aggregate %</u>
Surface Course	5.3	94.7
Binder Course	4.3	95.7
Base Course	4.0	96.0


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 - 03/03/2017
JOB NUMBER - 110642

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 54
DISTRICT NO. - 01

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

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB LESS THAN 5

RESILIENT MODULUS
206+00 10433

REMARKS -

AASHTO TESTS : T190

JOB: 110642

Arkansas State Highway Transportation Department

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

Materials Division

COUNTY NO. 54 DATE TESTED 3/3/2017

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR						L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				#4	#10	#40	#80	#200					
206+00	15 RT	0-5	BROWN	100	95	87	81	76	38	23	A-6(16)	RV140	
206+00	05 RT	0-5	GRAY	100	98	88	78	74	ND	NP	A-4(0)	S136	34.1
206+00	15 RT	0-5	BROWN	75	70	64	59	55	ND	NP	A-4(0)	S137	25.8
215+00	05 LT	0-5	GRAY	99	98	92	88	84	51	31	A-7-6(27)	S138	39
215+00	16 LT	0-5	GRAY	99	99	98	95	88	34	14	A-6(12)	S139	35

comments: W=MULTIPLE LAYERS

Wednesday, March 08, 2017

JOB: 110642

Arkansas State Highway Transportation Department
Materials Division

DATE TESTED
3/3/2017

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

COUNTY NO. 54

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

STA.#	LOC.	CHIP SEAL	ACHMSC	SA ASPHALT	ACHMSC	ACHMBC	ACHMSC	AGG.BASE CRS C
206+00	15 RT	--	--	--	--	--	--	--
206+00	05 RT	CHIP SEAL .25	ACHMSC 4.5W	SA ASPHALT 1.0	ACHMSC --	ACHMBC --	ACHMSC --	AGG.BASE CRS C 9.0
215+00	05 LT	CHIP SEAL .25	ACHMSC 2.25W	SA ASPHALT 1.0	ACHMSC 2.0	ACHMBC 1.5	ACHMSC 2.0	AGG.BASE CRS C 8.0

Comments: W=MULTIPLE LAYERS

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

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

Job No.	110642	Material Code	SSRVPS
Date Sampled:	2/15/17	Station No.:	206+00
Date Tested:	March 2, 2017	Location:	15RT
Name of Project:	BEAVER BAYOU STR. & APPRS. (S)		
County:	Code: 54	Name:	PHILLIPS
Sampled By:	FRAZIER/GREEN	Depth:	0-5
Lab No.:	20170580	AASHTO Class:	A-6(16)
Sample ID:	RV140	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	3.94
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):	12.16
Initial Volume, AoLo (cu. in):	97.52

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3076.70
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4. Soil Properties:

Optimum Moisture Content (%):	18.6
Maximum Dry Density (pcf):	102.4
95% of MDD (pcf):	97.3
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3076.70
Compaction Moisture content (%):	19.5
Compaction Wet Density (pcf):	120.21
Compaction Dry Density (pcf):	100.60
Moisture Content After Mr Test (%):	19.2

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

#VALUE!

7. Resilient Modulus, Mr:

12353(Sc)^{-0.12516}(S3)^{0.14551}

8. Comments

9. Tested By:

G.W. _____

Date: March 2, 2017 _____

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

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

Job No. 110642 **Material Code** SSRVPS
Date Sampled: 2/15/17 **Station No.:** 206+00
Date Tested: March 2, 2017 **Location:** 15'RT
Name of Project: BEAVER BAYOU STR. & APPRS. (S)
County: Code: 54 **Name:** PHILLIPS
Sampled By: FRAZIER/GREEN **Depth:** 0-5
Lab No.: 20170580 **AAASHTO Class:** A-6(16)
Sample ID: RV140 **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 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	25.2	22.5	2.7	2.1	1.9	0.2	0.00101	0.00013	14,754
Sequence 2	6.0	4.0	47.5	44.8	2.7	3.9	3.7	0.2	0.00207	0.00026	14,285
Sequence 3	6.0	6.0	70.0	66.6	3.4	5.8	5.5	0.3	0.00327	0.00041	13,422
Sequence 4	6.0	8.0	93.6	87.8	5.8	7.7	7.2	0.5	0.00468	0.00058	12,358
Sequence 5	6.0	10.0	115.9	107.6	8.3	9.5	8.9	0.7	0.00624	0.00078	11,370
Sequence 6	4.0	2.0	25.0	22.4	2.6	2.1	1.8	0.2	0.00107	0.00013	13,835
Sequence 7	4.0	4.0	47.1	44.5	2.7	3.9	3.7	0.2	0.00224	0.00028	13,115
Sequence 8	4.0	6.0	69.1	66.4	2.7	5.7	5.5	0.2	0.00351	0.00044	12,490
Sequence 9	4.0	8.0	92.6	87.6	5.0	7.6	7.2	0.4	0.00486	0.00061	11,888
Sequence 10	4.0	10.0	115.4	108.0	7.4	9.5	8.9	0.6	0.00636	0.00079	11,198
Sequence 11	2.0	2.0	25.1	22.5	2.7	2.1	1.8	0.2	0.00123	0.00015	12,086
Sequence 12	2.0	4.0	47.1	44.4	2.7	3.9	3.7	0.2	0.00252	0.00031	11,606
Sequence 13	2.0	6.0	68.8	66.1	2.7	5.7	5.4	0.2	0.00385	0.00048	11,314
Sequence 14	2.0	8.0	91.3	87.1	4.2	7.5	7.2	0.3	0.00529	0.00066	10,856
Sequence 15	2.0	10.0	114.5	108.0	6.6	9.4	8.9	0.5	0.00683	0.00085	10,433

TESTED BY _____ DATE _____
 REVIEWED BY _____ DATE _____

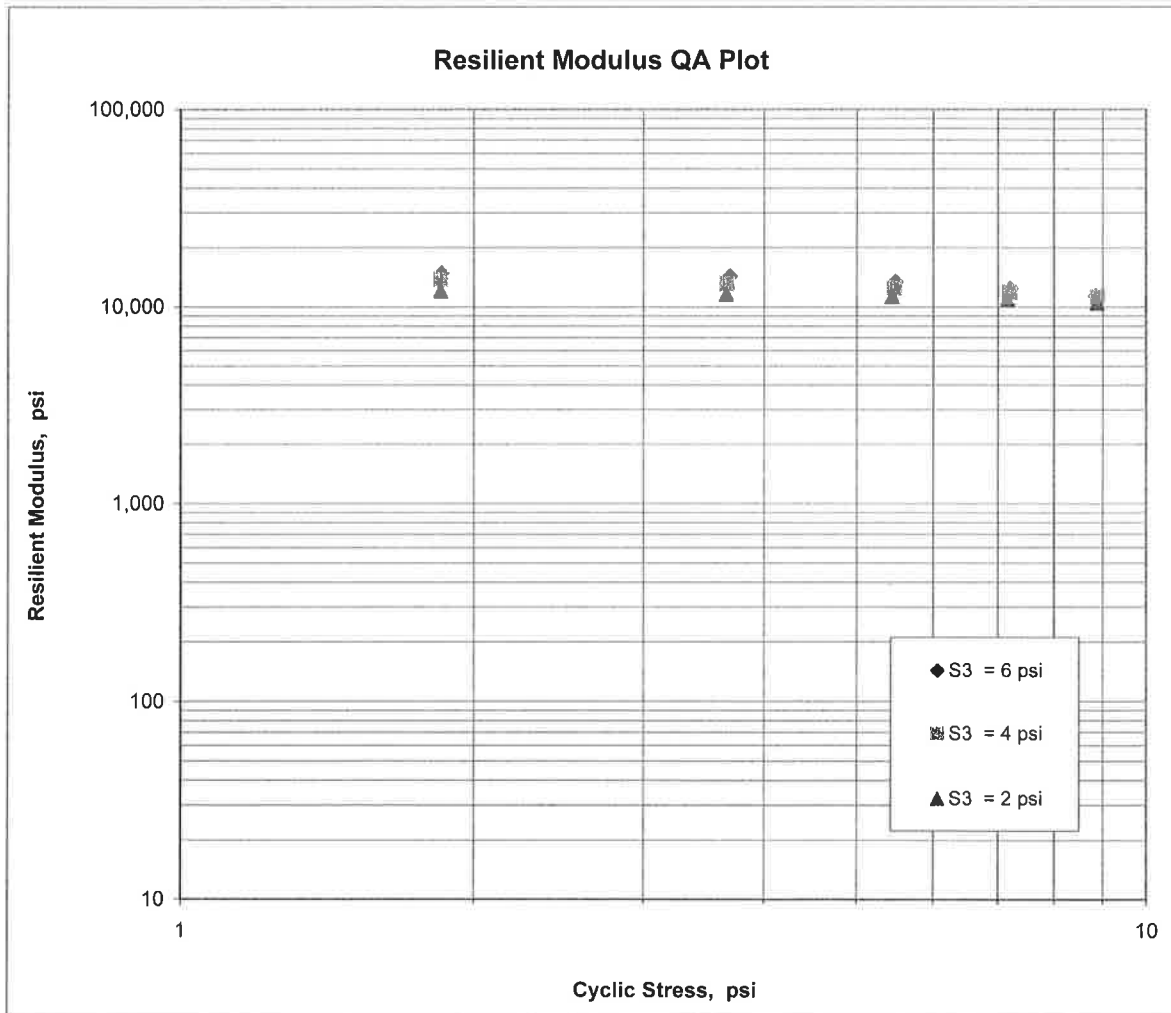
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

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

Job No.	110642	Material Code	SSRVPS
Date Sampled:	2/15/17	Station No.:	206+00
Date Tested:	March 2, 2017	Location:	15'RT
Name of Project:	BEAVER BAYOU STR. & APPRS. (S)		
County:	Code: 54	Name:	PHILLIPS
Sampled By:	FRAZIER/GREEN		
Lab No.:	20170580	Depth:	0-5
Sample ID:	RV140	AASHTO Class:	A-6(16)
LATITUDE:		Material Type (1 or 2):	2
		LONGITUDE:	

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

K1 =	<u>12,353</u>
K2 =	<u>-0.12516</u>
K5 =	<u>0.14551</u>
R ² =	<u>0.91</u>



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	-	03/03/17	SEQUENCE NO.	-	1
JOB NUMBER	-	110642	MATERIAL CODE	-	SSRVPS
FEDERAL AID NO.	-	TO BE ASSIGNED	SPEC. YEAR	-	2014
PURPOSE	-	SOIL SURVEY SAMPLE	SUPPLIER ID.	-	1
SPEC. REMARKS	-	NO SPECIFICATION CHECK	COUNTY/STATE	-	54
SUPPLIER NAME	-	STATE	DISTRICT NO.	-	01
NAME OF PROJECT	-	BEAVER BAYOU STR. & APPRS. (S)			
PROJECT ENGINEER	-	NOT APPLICABLE			
PIT/QUARRY	-	ARKANSAS			
LOCATION	-	PHILLIPS, COUNTY	DATE SAMPLED	-	02/15/17
SAMPLED BY	-	T.FRAZIER	DATE RECEIVED	-	02/16/17
SAMPLE FROM	-	TEST HOLE	DATE TESTED	-	03/03/17
MATERIAL DESC.	-	SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

LAB NUMBER	-	20170576	-	20170577	-	20170578	
SAMPLE ID	-	S136	-	S137	-	S138	
TEST STATUS	-	INFORMATION ONLY	-	INFORMATION ONLY	-	INFORMATION ONLY	
STATION	-	206+00	-	206+00	-	215+00	
LOCATION	-	05 RT	-	15 RT	-	05 LT	
DEPTH IN FEET	-	0-5	-	0-5	-	0-5	
MAT'L COLOR	-	GRAY	-	BROWN	-	GRAY	
MAT'L TYPE	-		-		-		
LATITUDE DEG-MIN-SEC	-	34 27 8.50	-	34 27 8.50	-	34 26 59.90	
LONGITUDE DEG-MIN-SEC	-	90 47 8.60	-	90 47 8.70	-	90 47 8.10	
% PASSING	2	IN.	-		-		
	1 1/2	IN.	-		-		
	3/4	IN.	-	100	-		
	3/8	IN.	-	80	-	100	
	NO. 4	-	100	-	75	-	99
	NO. 10	-	98	-	70	-	98
	NO. 40	-	88	-	64	-	92
	NO. 80	-	78	-	59	-	88
	NO. 200	-	74	-	55	-	84
LIQUID LIMIT	-	ND	-	ND	-	51	
PLASTICITY INDEX	-	NP	-	NP	-	31	
AASHTO SOIL	-	A-4 (0)	-	A-4 (0)	-	A-7-6 (27)	
UNIFIED SOIL	-		-		-		
% MOISTURE CONTENT	-	34.1	-	25.8	-	39.0	
CHIP SEAL	(IN)	-	.25	-	--	-	.25
ACHMSC	(IN)	-	4.5W	-	--	-	2.25W
SA ASPHALT	(IN)	-	1.0	-	--	-	1.0
ACHMSC	(IN)	-	--	-	--	-	2.0
ACHMBC	(IN)	-	--	-	--	-	1.5
ACHMSC	(IN)	-	--	-	--	-	2.0
AGG.BASE CRS CL-5	(IN)	-	9.0	-	--	-	8.0

REMARKS - W=MULTIPLE LAYERS

AASHTO TESTS : T24 T88 T89 T90 T265

