#### ARKANSAS DEPARTMENT OF TRANSPORTATION



#### SUBSURFACE INVESTIGATION

STATE JOB NO									
FEDERAL AID PROJEC	CT NO	NHPP-0030(24)							
	DEE BAY	OU 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

ARDOT.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

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

MCB:pt:bjj Attachment

cc: State Constr. Eng. - Master File Copy

District 6 Engineer

System Information and Research Div.

G. C. File

Michael C. Benson

Materials Engineer

# 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)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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. Date Sampled: Date Tested: Name of Project:	061456 6/11/18 June 27, 2018 DEE BAYOU STR. & APPRS. (S)	Material Code Station No.: Location:	SSRVPS 111+00 12'LT
County:	Code: 30 Name: HOT SPRING		
Sampled By:	DICKERSON/FRAZIER	Depth:	0-5
Lab No.: Sample ID:	20181305 RV306	AASHTO Class:	A-4 (0) a con 2):
LATITUDE:	KV300	Material Type (1 LONGITUDE:	or 2);
1. Testing Inform			
	Preconditioning - Permanent Strain > 5%		N
	Testing - Permanent Strain > 5% (Y=Yes of	•	N
	Number of Load Sequences Completed (0	-15)	15
2. Specimen Info			
	Specimen Diameter (in):		
	Тор		3.94
	Middle		3.94
	Bottom		3.94
	Average		3.94
	Membrane Thickness (in):		0.01
	Height of Specimen, Cap and Base (in): Height of Cap and Base (in):		8.02 0.00
	Initial Length, Lo (in):		8.02
	Initial Area, Ao (sq. in):		12.12
	Initial Volume, AoLo (cu. in):		97.19
2 Sail Speaimen	Mainte.		
3. Soil Specimer	weight:  Weight of Wet Soil Used (g):		3211.30
	weight of wet soil osed (g).		3211.30
4. Soil Properties	s:		
	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 Pro	perties:		
	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 T	est (Y=Yes, N=No, N/A=Not Applicable):		#VALUE!
7. Resilient Modu	ulus, Mr:	866	80(Sc)^-0.24259(S3)^0.39539
8. Comments			
<b></b>			
9. Tested By:	GW	<b>Date</b> : June 27, 2018	

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

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

SSRVPS 111+00 12'LT Material Code Station No.: Location: DEE BAYOU STR. & APPRS. (S) June 27, 2018 061456 6/11/18 Name of Project: Date Sampled: Date Tested: Job No.

HOT SPRINGS Name: DICKERSON/FRAZIER Code: 30 20181305 Sampled By: Lab No.: County:

RV306 LATITUDE: Sample 1D:

Material Type (1 or 2): 2 LONGITUDE:

0-5

Depth:

	Chamber	Nominal	Actual	Actual	Actual	Actual	Actual	Actual	Average	Resilient	Resilient
	Confining	Maximum	Applied	Applied	Applied	Applied	Applied	Applied	Recov Def.	Strain	Modulus
PARAMETER	Pressure	Axia/	Max. Axial	Cyclic Load	Contact	Мах.	Cyclic	Contact	LVDT 1		
		Stress	Load		Load	Axial	Stress	Stress	and 2		
						Stress					
DESIGNATION	တ်	Scyclic	P <sub>max</sub>	P <sub>cyclic</sub>	Pcontact	S <sub>max</sub>	Scyclic	Scontact	Havg	ယ်	Ŋ
LINO	psi	psi	sql	sql	sql	psi	psi	psi	ņ	in/in	isd
Sequence 1	0.9	2.0	25.1	22.4	2.7	2.1	1.8	0.2	0.00098	0.00012	15,076
Sequence 2	0.9	4.0	47.4	44.6	2.7	3.9	3.7	0.2	0.00221	0.00028	13,392
Sequence 3	0.9	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	0.9	7.7	7.2	0.5	0.00531	0.00066	10,946
Sequence 5	0.9	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	0.9	67.9	65.1	2.8	5.6	5.4	0.2	0.00449	0.00056	9,594
Sednence 9	4.0	8.0	91.7	86.5	5.2	9.7	7.1	9.0	0.00633	0.00079	9,046
Sequence 10	4.0	10.0	115.6	108.0	9.7	9.5	8.9	9.0	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	0.9	0.99	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	9.0	0.00989	0.00123	7,039

June 27, 2018	
DATE	DATE
MS	
TESTED BY	REVIEWED BY

#### 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:** 

Name of Project: DEE BAYOU STR. & APPRS. (S)

June 27, 2018

Location: 12'LT

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:

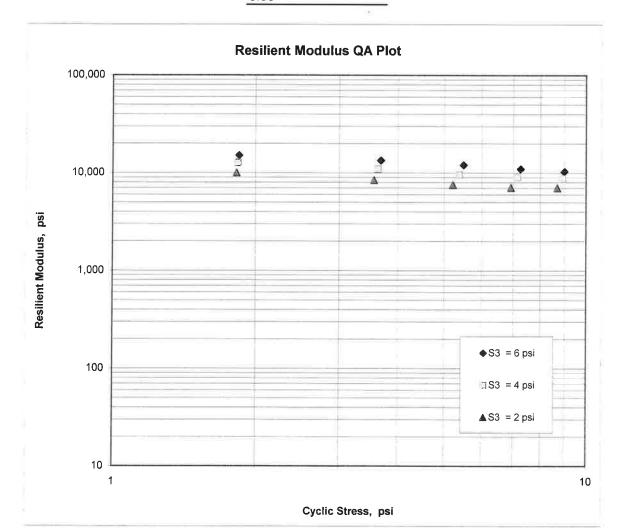
K1 = 8,680

K2 = -0.24259

 $M_R = K1 (S_C)^{K2} (S_3)^{K5}$ 

K5 = 0.39539

 $R^2 = 0.99$ 



JOB: 061456

Arkansas State Highway Transporation 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	<i>LAB</i> #:	%MOISTURE
111+00	12 LT	0-5	BROWN	90	67	58	54	<i>E S</i> 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

DATE TESTED

Arkansas State Highway Transporation Department

JOB: 061456 JOB NAME: DEE BAYOU STR. & APPRS. (S)

COUNTY NO. 30

STA.# LOC.

Materials Division

Michael Benson, Materials Engineer

PAVEMENT SOUNDINGS

AGG. BASE CRS CL-7

ACHMSC 3.5W

05 RT

108+00

AGG. BASE CRS CL-7

ACHMSC

12 RT

108+00

AGG. BASE CRS CL-7 6.0

ACHIMSC 2.25W

06 LT

111+00

6/27/2018

Tuesday, July 24, 2018

Page I of I

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

#### MICHAEL BENSON, MATERIALS ENGINEER

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

	DOIL	BOICUBL / IIIV	dildin 50	ONDING 110	I KELOKI	
DATE - 0.7/ JOB NUMBER - 0.61 FEDERAL AID NO TO PURPOSE - SOI SPEC. REMARKS - NO SUPPLIER NAME - STA NAME OF PROJECT - D PROJECT ENGINEER - N PIT/QUARRY - ARKAN	456 BE ASSI L SURVE SPECIFI TE BEE BAYCOT APPI	CATION CHECK OU STR. & APE LICABLE			MATERIAL SPEC. YEAR SUPPLIER COUNTY/S'	NO 1 CODE - SSRVPS AR - 2014 ID 1 FATE - 30 NO 06
LOCATION - HOT S SAMPLED BY - DICKER						PLED - 06/11/18 EIVED - 06/12/18
SAMPLE FROM - TEST	HOLE				DATE TES	TED - 06/27/18
MATERIAL DESC SOI	L SURVI	EY - R VALUE	E- PAVEME	NT SOUNDIN	GS	
LAB NUMBER SAMPLE ID TEST STATUS STATION LOCATION	-	108+00	-	20181302 S303 INFORMATIO 108+00 12 RT	ON ONLY -	20181303 S304 INFORMATION ONLY 111+00 06 LT
DEPTH IN FEET			_	0-2.5Z	_	0-5
MAT'L COLOR MAT'L TYPE	_	BROWN		BROWN		BROWN
LATITUDE DEG-MIN- LONGITUDE DEG-MIN-				34 24 92 54		34 24 37.40 92 54 11.60
3/4 3/8 NO. NO. NO.	IN IN IN IN 4 - 10 - 40 - 80 - 200 -	48 36 31	- - - - - -	100 74 65 42 28 21		100 90 79 65 50 44
LIQUID LIMIT		25		24	-	26
PLASTICITY INDEX AASHTO SOIL	_		=	05 A-1-B	-	09 A-4(0)
UNIFIED SOIL	_	6.0	-	0.0	)=1 1=1	
% MOISTURE CONTENT		6.9 3.5W		8.8		10.4
ACHMSC AGG. BASE CRS CL-7	(IN) -	6.0	-		-	2.25W 6.0
	_		_		-	
	_		~		_	
	_		_		_	
	_		-		-	
	_		_		_	

REMARKS = W=MULTIPLE LAYERS

=

AASHTO TESTS : T24 T88 T89 T90 T265

:

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

#### MICHAEL BENSON, MATERIALS ENGINEER

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

	,	BORVET / LIVERIENT	BOOMBING 1151	KELOKI	
DATE - 07/23/1  JOB NUMBER - 061456  FEDERAL AID NO TO BE A  PURPOSE - SOIL SU  SPEC. REMARKS - NO SPEC  SUPPLIER NAME - STATE  NAME OF PROJECT - DEE E  PROJECT ENGINEER - NOT A  PIT/QUARRY - ARKANSAS	ASSI IRVE CIFI BAYC	Y SAMPLE CATION CHECK OU STR. & APPRS. (		SEQUENCE NO MATERIAL CODE - SPEC. YEAR - SUPPLIER ID COUNTY/STATE - DISTRICT NO	SSRVPS 2014 1 30
LOCATION - HOT SPRIN	iG C	COUNTY		DATE SAMPLED -	06/11/18
SAMPLED BY - DICKERSON,				DATE RECEIVED -	
SAMPLE FROM - TEST HOLE				DATE TESTED -	
MATERIAL DESC SOIL SU		Y - R VALUE - DAV	EMENT SOUNDING		00/2//10
			BINDINI SOUNDING	טט	
LAB NUMBER	-	20181304	-	≥	
SAMPLE ID	_		-		
TEST STATUS	_	INFORMATION ONLY	_	<del>=</del>	
STATION	-	111+00	_	<b>=</b> 0.	
		12 LT	_	<u>~</u> √	
DEPTH IN FEET			_	=	
MAT'L COLOR	_	BROWN	_	=	
MAT'L TYPE	_		-		
LATITUDE DEG-MIN-SEC	-	34 24 37.40	_		
LONGITUDE DEG-MIN-SEC	_	92 54 11.50			
% PASSING 2 IN.	_		_	_	
1 1/2 IN.			_	_	
3/4 IN.		100	_	_	
3/8 IN.		82	-	-	
NO. 4			-	-	
NO. 10			_	_	
NO. 40		44	_	-	
NO. 80			-	_	
NO. 200			-	_	
LIQUID LIMIT	_	2 9	-	***	
PLASTICITY INDEX			~	**	
AASHTO SOIL	_	A-2-4(0)	_	<del>-</del>	
UNIFIED SOIL	-		-	±\/ ±\/	
% MOISTURE CONTENT	-	10.1			
	_		_	_	
	_		_	_	
	-		-	-	
	-		-	-	
	-		-	_	
	_		_	_	
	_		_	_	
	_		_	_	
	-		_	_	

REMARKS = W=MULTIPLE LAYERS

-

:

AASHTO TESTS : T24 T88 T89 T90 T265

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

#### MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 07/23/1 JOB NUMBER - 061456 FEDERAL AID NO TO BE A PURPOSE - SOIL SU SPEC. REMARKS - NO SPEC SUPPLIER NAME - STATE NAME OF PROJECT - DEE B PROJECT ENGINEER - NOT A PIT/QUARRY - ARKANSAS LOCATION - HOT SPRIN	SEQUENCE NO 1 MATERIAL CODE - RV SPEC. YEAR - 2014 SUPPLIER ID 1 COUNTY/STATE - 30 DISTRICT NO 06			
SAMPLED BY - DICKERSON, SAMPLE FROM - TEST HOLE MATERIAL DESC SOIL SU	3		-VALUE ACTUAI	DATE RECEIVED - 06/12/18 DATE TESTED - 06/27/18 RESULTS
LAB NUMBER	=	20181305	_	=
SAMPLE ID	_	RV306 ,	_	<b>≅</b>
TEST STATUS	_	INFORMATION ONLY	_	· <del>-</del>
STATION	_	111+00	-	· 5
LOCATION	_	12 LT	-	
DEPTH IN FEET	-	0-5	_	_
MAT'L COLOR	_	BROWN	_	=
MAT'L TYPE	_		_	- 1
		34 24 37.40	_	:=
LONGITUDE DEG-MIN-SEC	-	92 54 11.50		
% PASSING 2 IN.	_		<del>-</del>	_
1 1/2 IN.	_		<del></del>	-
3/4 IN.	-	100	<u>-</u>	-
3/8 IN.	_	92	<u>#</u> (	-
NO. 4	_	90	<del></del>	_
NO. 10	-	67	<b>=</b> 0	_
NO. 40	_	58	-	-
NO. 80	_	54	<del>=</del> :	-
NO. 200	-	48		
LIQUID LIMIT	_	25	***	-
PLASTICITY INDEX	_	07	-	_
AASHTO SOIL	_	A-4 (0)	<u>22</u> ?	-
UNIFIED SOIL	_	, ,	=	-
% MOISTURE CONTENT	_		<del>7</del> 2	-
	_		_	_
	_		_	_
	_		_	-
	-		_	-
	-		_	_
	_		_	<del>-</del>
	_		_	<del>-</del>
	_		_	_
	-		_	-

REMARKS - W=MULTIPLE LAYERS

--

AASHTO TESTS : T24 T88 T89 T90 T265