ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO.		070379								
FEDERAL AID PROJE	CT NO.	NHPP-0007(29)								
	HURRICANE	CREEK STR. & APPRS.	(S)							
STATE HIGHWAY	172	SECTION	1							
IN		CALHOUN	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

November 28, 2017

TO:

Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT:

Job No. 070379

Hurricane Creek Strs. & Apprs. (S)

Route 172 Section 1 Calhoun 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 crossing Hurricane Creek on Highway 172. 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 non-plastic sand and gravel. Cross-sections are not currently available, but it is assumed 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 processing if the weather is favorable during construction.

The proposed detour crosses the ditch on the south side of Highway 172, and based on seasonal conditions may contain standing water. Prior to embankment construction the ditch should be drained and all organic material should be undercut, anticipated to be no more than 2 feet. The embankment may be constructed with locally available unspecified material.

Additional earthwork recommendations will be made upon request when plans are further developed and cross-sections are available.

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 Little Rock.

2. Asphalt Concrete Hot Mix

	PG64-22	
Туре	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.3	94.7
Binder Course	4.4	95.6
Base Course	4.0	96.0

PG70-22

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.2	94.8
Binder Course	4.4	95.6
Base Course	4.0	96.0

- 1		$\hat{}$	7	C		1	2
	P	5	•	o	-	Z	Z

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.2	94.8
Binder Course	3.8	96.2
Base Course	3.6	96.4

Mtchael C. Berison Materials Engineer

MCB:pt:bjj Attachment

State Constr. Eng. - Master File Copy CC:

District 7 Engineer
System Information and Research Div.

G. C. File

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY STRENGTH TEST REPORT ***

DATE - 11/22/2017 SEQUENCE NO. - 1

JOB NUMBER - 070379 MATERIAL CODE - SSRV

SPEC. YEAR = 2014

SUPPLIER ID. = 1

COUNTY/STATE - 07

DISTRICT NO. = 07

JOB NAME - HURRICANE CREEK STR. & APPRS. (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 35

RESILIENT MODULUS

STA. 102 + 00 8209

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:	070379 11/7/17 November 15, 2017 HURRICANE CREEK STR. & APPRS. (S)	Material Code Station No.: Location:	SSRVPS 102+00 20'RT	
County: Sampled By: Lab No.: Sample ID: LATITUDE:	Code: 7 Name: CALHOUN BUIE/JORDAN 20173368 RV668	Depth: AASHTO Class: Material Type (1 LONGITUDE:	or 2):	0-5 A-4 (0) 2
1. Testing Inform	nation:			
	Preconditioning - Permanent Strain > 5% (Yaresting	N=No)		N N 15
2. Specimen Info	rmation:			
	Specimen Diameter (in): Top Middle Bottom Average Membrane Thickness (in):			3.95 3.95 3.95 3.95 0.01
	Height of Specimen, Cap and Base (in): Height of Cap and Base (in): Initial Length, Lo (in): Initial Area, Ao (sq. in): Initial Volume, AoLo (cu. in):			8.02 0.00 8.02 12.18 97.68
2 Cail Chaoiman	Maight.			
3. Soil Specimen	Weight of Wet Soil Used (g):			3302.30
4. Soil Properties	s:			
	Optimum Moisture Content (%): Maximum Dry Density (pcf): 95% of MDD (pcf): In-Situ Moisture Content (%):			10.0 120.1 114.1 N/A
5. Specimen Pro	perties:			
	Wet Weight (g): Compaction Moisture content (%): Compaction Wet Density (pcf): Compaction Dry Density (pcf): Moisture Content After Mr Test (%):			3302.30 9.8 128.81 117.31 9.8
6. Quick Shear T	est (Y=Yes, N=No, N/A=Not Applicable):			#VALUE!
7. Resilient Mod	ulus, Mr:	7:	215(Sc)^-0.09403	(S3)^0.46904
8. Comments	\$			
9. Tested By:	GW	Date: November 15, 20)17	

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

SSRVPS 102+00

20'RT

0-5

Depth:

Material Code Station No.: Location: November 15, 2017 11/7/17 070379 Date Sampled: Date Tested: Job No.

Name of Project: HURRICANE CREEK STR. & APPRS. (S)
County: Code: 7 Name: CALHOUN

Sampled By: BUIE/JORDAN
Lab No.: 20173368
Sample ID: RV668
LATITUDE:

Material Type (1 or 2): 2 LONGITUDE:

	_	_						-1													
Resilient	Modulus				Μ̈́	psi	16,267	14,878	14,497	13,980	13,735	13,587	11,823	11,086	11,069	11,234	9,633	8,415	8,209	8,588	9,023
Resilient	Strain				ž	in/in	0.00011	0.00024	0.00037	0.00051	0.00065	0.00013	0.00030	0.00047	0.00063	0.00078	0.00018	0.00040	0.00061	0.00078	0.00093
Average	Recov Def.	LVDT 1	and 2		H _{avg}	"Ľ	06000.0	0.00196	0.00300	0.00412	0.00523	0.00107	0.00240	0.00380	0.00509	0.00626	0.00144	0.00319	0.00485	0.00625	0.00746
Actual	Applied	Contact	Stress		Scontact	psi	0.2	0.2	0.3	0.5	0.7	0.2	0.2	0.2	0.4	9.0	0.2	0.2	0.2	0.4	9.0
Actual	Applied	Cyclic	Stress		S _{cyclic}	psi	1.8	3.6	5.4	7.2	9.0	1.8	3.5	5.3	7.0	8.8	1.7	3.3	5.0	6.7	8.4
Actual	Applied	Max.	Axial	Stress	S _{max}	psi	2.1	3.9	5.7	7.7	9.7	2.0	3.8	5.5	7.4	9.4	1.9	3.6	5.2	7.1	8.9
Actual	Applied	Contact	Load		Pcontact	sql	2.8	2.9	3.6	0.9	8.5	2.6	2.6	2.8	5.1	7.6	2.7	2.7	2.8	4.3	6.7
Actual	Applied	Cyclic Load			P _{cyclic}	sql	22.3	44.3	0.99	87.4	109.1	22.1	43.2	64.0	85.6	106.9	21.0	40.7	60.5	81.6	102.2
Actual	Applied	Max. Axial	Load		Р _{шах}	sql	25.1	47.1	9.69	93.4	117.6	24.7	45.8	8.99	90.7	114.4	23.7	43.4	63.3	85.9	109.0
Nominal	Maximum	Axial	Stress		Scyclic	psi	2.0	4.0	6.0	8.0	10.0	2.0	4.0	6.0	8.0	10.0	2.0	4.0	6.0	8.0	10.0
Chamber	Confining	Pressure			လိ	psi	0.9	0.9	6.0	0.9	0.9	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0
		PARAMETER			DESIGNATION	UNIT	Sequence 1	Sequence 2	Sequence 3	Sequence 4	Sequence 5	Sequence 6	Sequence 7	Sequence 8	Sequence 9	Sequence 10	Sequence 11	Sequence 12	Sequence 13	Sequence 14	Sequence 15

November 15, 20	
DATE	DATE
GW	
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.

070379

Material Code SSRVPS

Date Sampled:

11/7/17

Station No.: 102+00

Date Tested:

Location: 20'RT

Name of Project: HURRICANE CREEK STR. & APPRS. (S)

November 15, 2017

County:

Code: 7

Name: CALHOUN

Sampled By:

BUIE/JORDAN

Depth: 0-5

Lab No.:

20173368

AASHTO Class: A-4 (0)

Sample ID:

RV668

Material Type (1 or 2): 2

LATITUDE:

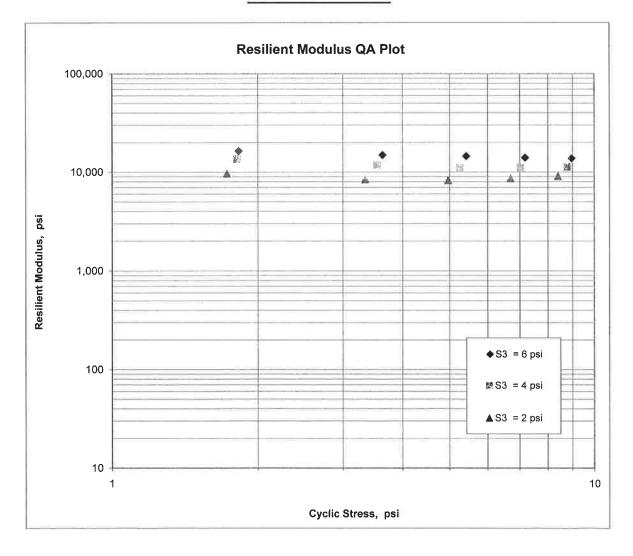
LONGITUDE:

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

$$K1 = 7,215$$

$$K2 = -0.09403$$

$$R^2 = 0.96$$



JOB: 070379

Arkansas State Highway Transporation Department

JOB NAME: HURRICANE CREEK STR. & APPRS. (S)

Materials Division

COUNTY NO. 7 **DATE TESTED** 11/15/2017

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	<i>LAB</i> #:	%MOISTURE
102+00	20RT	0-5	RD/BR	89	85	82	65	E S 44	ND	NP	A-4 (0)	RV668	***
102+00	05RT	0-5	RD/BR	80	67	56	42	29	ND	NP	A-2-4 (0)	S664	7.1
102+00	20RT	0-5	BR/GR	99	98	97	79	53	ND	NP	A-4 (0)	S665	15.4
108+00	05LT	0-5	BR/GR	94	89	84	69	51	ND	NP	A-4 (0)	S666	12
108+00	20LT	0-5	BR/GR	97	94	91	74	57	ND	NP	A-4 (0)	S667	16.3

DATE TESTED 11/15/2017

Arkansas State Highway Transporation Department

JOB: 070379
JOB NAME: HURRICANE CREEK STR. & APPRS. (S)

COUNTY NO.

STA.# LOC.

Materials Division

Michael Benson, Materials Engineer

PAVEMENT SOUNDINGS

AGG. BASE CRS. CL-7

CHIP SEAL

20RT

102+00

AGG. BASE CRS. CL-7

CHIP SEAL 1.5W

05RT

102+00

AGG. BASE CRS. CL-7 6.0

CHIP SEAL

05LT

108+00

Monday, November 27, 2017

Page I of I

W=MULTIPLE LAYERS comments:

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 11/27/17 SEQUENCE NO 1 JOB NUMBER - 070379 MATERIAL CODE - SSRVP. FEDERAL AID NO TO BE ASSIGNED SPEC. YEAR - 2014 PURPOSE - SOIL SURVEY SAMPLE SUPPLIER ID 1 SPEC. REMARKS - NO SPECIFICATION CHECK COUNTY/STATE - 07 SUPPLIER NAME - STATE DISTRICT NO 07 NAME OF PROJECT - HURRICANE CREEK STR. & APPRS. (S) PROJECT ENGINEER - NOT APPLICABLE PIT/QUARRY - ARKANSAS LOCATION - CALHOUN COUNTY DATE SAMPLED - 11/07 SAMPLED BY - BOULE/JORDAN DATE RECEIVED - 11/08 SAMPLE FROM - TEST HOLE DATE TESTED - 11/15 MATERIAL DESC SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS														
LAB NUMBER SAMPLE ID TEST STATUS STATION LOCATION DEPTH IN FEET MAT'L COLOR MAT'L TYPE LATITUDE DEG-MIN-	- 20173364 - S664 - INFORMATION ON - 102+00 - 05RT - 0-5 - RD/BR - SEC - 33 27 3.1	- 20173365 - S665 NLY - INFORMATION ONL - 102+00 - 20RT - 0-5 - BR/GR - 33 27 3.00	- 108+00 - 05LT - 0-5 - BR/GR - 33 27 2.70											
% PASSING 2 1 1/2 3/4 3/8 NO. NO. NO.	40 - 56	92 25 22.90 100 - 99 - 99 - 98 - 97 - 79 - 53	92 25 15.70 100 - 99 - 94 - 89 - 84 - 69 - 51											
LIQUID LIMIT PLASTICITY INDEX AASHTO SOIL UNIFIED SOIL % MOISTURE CONTENT CHIP SEAL AGG. BASE CRS. CL-7	- ND - NP - A-2-4 (0) - 7.1 (IN) - 1.5W	- ND - NP - A-4 (0) - 15.4	- ND - NP - A-4 (0) - 12.0 - 2.0W - 6.0											

REMARKS - W=MULTIPLE LAYERS

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AASHTO TESTS : T24 T88 T89 T90 T265

1

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 11/15/1 JOB NUMBER - 070379 FEDERAL AID NO TO BE A PURPOSE - SOIL SU SPEC. REMARKS - NO SPEC SUPPLIER NAME - STATE NAME OF PROJECT - HURRI PROJECT ENGINEER - NOT A PIT/QUARRY - ARKANSAS LOCATION - CALHOUN C SAMPLED BY - BOUIE/JORI SAMPLE FROM - TEST HOLE	SSI RVE TEAN PPL OUN DAN	Y SAMP CATION E CREE ICABLE TY	CHI KST	ΓR.				MATER SPEC. SUPPI COUNT DISTR DATE DATE DATE	ENCE NO. EIAL CODE YEAR JIER ID. EY/STATE EICT NO. SAMPLED RECEIVED TESTED	- - - -	SSRVPS 2014 1
MATERIAL DESC SOIL ST	JRVE	Y - R	. VA	LUE-	- PAV	EMENT	r sounding	3S			
LAB NUMBER	_	20173	367			All			-		
SAMPLE ID	_	S667				90			-		
TEST STATUS	-	INFOR	ITAN	ON	ONLY	=			-		
STATION	-	108+0	0			-			_		
LOCATION	_	20LT				20			_		
DEPTH IN FEET	-	0-5				:= ::			-		
MAT'L COLOR	_	BR/GR				### ###			_		
MAT'L TYPE	-					200 200			_		
LATITUDE DEG-MIN-SEC	-	33	27	2	. 80	*			_		
LONGITUDE DEG-MIN-SEC	-	92	25	15	.70						
% PASSING 2 IN.	_					_					
1 1/2 IN.						=					
3/4 IN.						-			-		
3/8 IN.		100				-					
NO. 4		97				-			.e.		
NO. 10		94				-			-		
NO. 40		91				_			-		
NO. 80		74				_			-		
NO. 200		57									
LIQUID LIMIT	-	ND							2=		
PLASTICITY INDEX	-					-			100		
AASHTO SOIL	-	A-4	(0)			-			(-		
UNIFIED SOIL	-								7 =		
% MOISTURE CONTENT	-	16	. 3								
	-					144					
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REMARKS W=MULTIPLE LAYERS

5 5 81

AASHTO TESTS : T24 T88 T89 T90 T265

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MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 11/15/1 JOB NUMBER - 070379 FEDERAL AID NO TO BE A PURPOSE - SOIL SU SPEC. REMARKS - NO SPEC SUPPLIER NAME - STATE NAME OF PROJECT - HURRI PROJECT ENGINEER - NOT A PIT/QUARRY - ARKANSAS	SSI RVE IFI CAN PPL	Y SAMP CATION E CREE ICABLE	CHE KS:			PPRS. (S)	MATER SPEC. SUPPI COUNT DISTR	ENCE NO. PLAIL CODE YEAR LIER ID. TY/STATE PLICT NO.	- - - -	RV 2014 1 07 07			
LOCATION - CALHOUN COUNTY DATE SAMPLED - 11/07/1 SAMPLED BY - BOUIE/JORDAN DATE RECEIVED - 11/08/1														
SAMPLED BY - BOUIE/JORDAN DATE RECEIVED - 11/08/1 SAMPLE FROM - TEST HOLE DATE TESTED - 11/15/1														
SAMPLE FROM - TEST HOLE DATE TESTED - 11/15/1 MATERIAL DESC SOIL SURVEY - RESISTANCE R-VALUE ACTUAL RESULTS														
LAB NUMBER - 20173368														
SAMPLE ID	_	20173. RV668	368						_					
TEST STATUS	_		דייבוע	ON	ONLY				-					
STATION	_			. 011	01111	270			-					
LOCATION	_	20RT	-			20			-					
DEPTH IN FEET	_	0-5				-			-					
MAT'L COLOR	_	RD/BR				-			_					
MAT'L TYPE	-					2			_					
LATITUDE DEG-MIN-SEC	-	33	27	3	.00	#			_					
LONGITUDE DEG-MIN-SEC	_	92	25	22	.90									
% PASSING 2 IN.	_					_			_					
1 1/2 IN	_					-			-					
3/4 IN.	-	100				-			-					
3/8 IN.	-	97				-			-					
NO. 4	-	89				-			_					
NO. 10	-	85				_			_					
NO. 40	-	82				-			-					
NO. 80		65				-			-					
NO. 200	-	44												
LIQUID LIMIT	_	ND				-,								
PLASTICITY INDEX	-	NP				4								
AASHTO SOIL	-	A-4	(0)			-								
UNIFIED SOIL	-								155 155					
% MOISTURE CONTENT	-					- T								
	_					-			3					
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	-					-			43					

REMARKS - W=MULTIPLE LAYERS

AASHTO TESTS : T24 T88 T89 T90 T265