ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO.		061460	
FEDERAL AID PROJEC	CT NO.	NHPP-0030(22)	
	HWY. 84 STRS	. & APPRS. (OAK GROVE	≣) (S)
STATE HIGHWAY	84	SECTION	6
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

November 20, 2017

TO:

Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT:

Job No. 061460

Hwy. 84 Str. & Apprs (S) Route 84 Section 6 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 2 bridges on Highway 84. 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 highly plastic sandy clay with 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. There were not any active slide areas observed within the project limits. Rock was encountered at station 110+00 6 feet right of centerline at a depth of 4.5 feet.

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 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				

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

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY STRENGTH TEST REPORT ***

DATE - 11/03/2017 SEQUENCE NO. - 1

JOB NUMBER - 061460 MATERIAL CODE - SSRV SPEC. YEAR - 2014

SUPPLIER ID. = 1

COUNTY/STATE = 30

DISTRICT NO. - 06

JOB NAME - HWY.84 STRS. & APPRS. (OAK GROVE) (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 10

RESILIENT MODULUS

STA. 110 + 10 8260

REMARKS -

. 77

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:	061460 10/17/17 October 27, 2017 HWY. 84 STRS. & APPRS. (OAK GROVE)(S)	Material Code Station No.: Location:	SSRVPS 110+10 18'RT
County: Sampled By: Lab No.:	Code: 30 Name: HOT SPRINGS BUIE/JORDAN 20173234	Depth: AASHTO Class:	0-5 A-6 (0)
Sample ID: LATITUDE:	RV649	Material Type (1 or 2) LONGITUDE:): 2
1. Testing Inform			-
	Preconditioning - Permanent Strain > 5% (Y		N
	Testing - Permanent Strain > 5% (Y=Yes or N Number of Load Sequences Completed (0-15		N 15
	Number of Load Sequences Completed (0-13	7)	15
2. Specimen Info	ormation:		
	Specimen Diameter (in):		
	Тор		3.96
	Middle		3.95
	Bottom		3.96
	Average		3.96
	Membrane Thickness (in):		0.01
	Height of Specimen, Cap and Base (in):		8.02
	Height of Cap and Base (in): Initial Length, Lo (in):		0.00 8.02
	Initial Area, Ao (sq. in):		12.22
	Initial Volume, AoLo (cu. in):		98.01
	midal volume, AoLo (cu. m).		90.01
3. Soil Specimer	n Weight:		
	Weight of Wet Soil Used (g):		3271.30
4. Soil Propertie	s:		
	Optimum Moisture Content (%):		12.6
	Maximum Dry Density (pcf):		117
	95% of MDD (pcf):		111.2
	In-Situ Moisture Content (%):		N/A
5. Specimen Pro	operties:		
	Wet Weight (g):		3271.30
	Compaction Moisture content (%):		12.9
	Compaction Wet Density (pcf):		127.17
	Compaction Dry Density (pcf):		112.64
	Moisture Content After Mr Test (%):		12.8
6. Quick Shear 1	Test (Y=Yes, N=No, N/A=Not Applicable):		#VALUE!
7. Resilient Mod	lulus, Mr:	10854(Sc)^-0.23136(S3)^0.31585
8. Comments	i e		
	0.11		
9. Tested By:	GW	Date: October 27, 2017	

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

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

SSRVPS 110 + 10

18'RT

Material Code Station No.: Location: HWY. 84 STRS. & APPRS. (OAK GROVE)(S) October 27, 2017 10/17/17 061460 Name of Project: Date Sampled: Date Tested: Job No.

HOT SPRINGS Name: Code: 30 County:

20173234 Sampled By: Sample ID: Lab No.:

BUIE/JORDAN RV649 LATITUDE:

A-6 (0)

AASHTO Class:

Depth:

Material Type (1 or 2): 2 LONGITUDE:

0-5

					_				_										
Resilient Modulus			M	psi	16,484	15,012	13,613	12,040	11,150	14,042	12,625	11,540	10,531	9,835	11,565	10,276	9,457	8,739	8,260
Resilient Strain			చ్	in/in	0.00011	0.00024	0.00040	0.00059	0.00078	0.00013	0.00028	0.00046	0.00066	0.00088	0.00016	0.00034	0.00055	0.00078	0.00102
Average Recov Def.	LVDT 1	a110 2	Havg	Ë	0.00089	0.00194	0.00318	0.00471	0.00628	0.00104	0.00228	0.00370	0.00531	0.00702	0.00125	0.00275	0.00439	0.00622	0.00815
Actual Applied	Contact	olless	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	olless	Scyclic	psi	1.8	3.6	5.4	7.1	8.7	1.8	3.6	5.3	7.0	8.6	1.8	3.5	5.2	6.8	8.4
Actual Applied	Max.	Stress	S _{max}	psi	2.1	3.9	5.7	7.6	9.4	2.0	3.8	5.6	7.4	9.2	2.0	3.8	5.4	7.1	9.0
Actual Applied	Contact	neo-7	Pcontact	sql	2.8	2.9	3.7	6.1	9.8	2.8	2.8	2.8	5.2	7.7	2.8	2.8	2.8	4.4	6.8
Actual Applied	Cyclic Load		Pcyclic	sql	22.3	44.4	62.9	86.4	106.7	22.2	43.9	65.0	85.2	105.2	22.0	43.0	63.3	82.9	102.6
Actual Applied	Max. Axial	гоап	Р _{мах}	sql	25.1	47.2	9.69	92.5	115.2	25.0	46.7	62.9	90.4	113.0	24.8	45.8	66.2	87.3	109.5
Nominal Maximum	Axial	Siless	S _{cyclic}	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	6.0	6.0	6.0	6.0	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

TESTED BY	GW	DATE	October 27, 2
KEVIEWED BY		DAIE	

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

Job No.061460Material Code SSRVPSDate Sampled:10/17/17Station No.: 110+10

Date Tested: October 27, 2017 Location: 18'RT

Name of Project: HWY. 84 STRS. & APPRS. (OAK GROVE)(S)

County: Code: 30 Name: HOT SPRINGS

Sampled By:BUIE/JORDANDepth: 0-5Lab No.:20173234AASHTO Class: A-6 (0)Sample ID:RV649Material Type (1 or 2): 2LATITUDE:LONGITUDE:

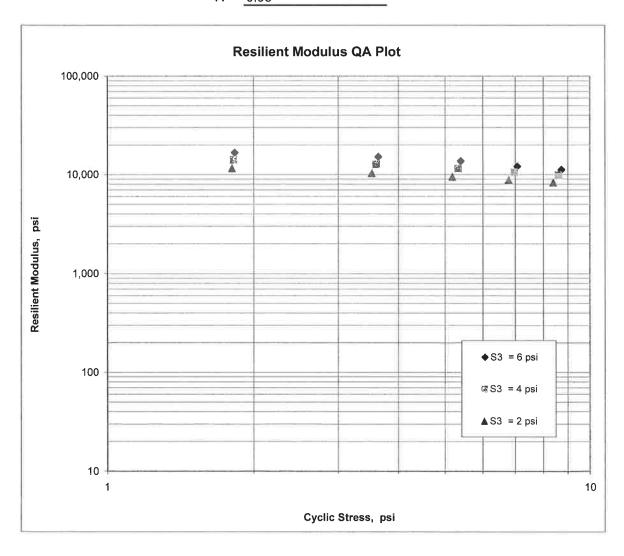
$$M_R = K1 (S_C)^{K2} (S_3)^{K5}$$

K1 = 10,854

K2 = -0.23136

K5 = 0.31585

 $R^2 = 0.98$



DATE TESTED

10/24/2017

Arkansas State Highway Transporation Department

Materials Division

 $JOB\ NAME$: HWY.84 STRS. & APPRS.(OAK GROVE)(S)

061460

JOB:

Michael Benson, Materials Engineer

PAVEMENT SOUNDINGS AGG.BASE CRS CL-7 ACHIMSC ACHIMSC ACHIMSC 7.0 2.0X ACHMSC ACHIMSC ACHIMSC ACHIMSC ACHIMSC ACHMSC 3.25W 12.0W 7.5W 4.0W COUNTY NO. 30 06 RT 18 RT 06 RT 15 RT 06 RT 190 LT STA.# LOC. 110+00 223+00 110+00 219+00 219+00 113+00

Thursday, November 16, 2017

JOB NAME: HWY.84 STRS. & APPRS.(OAK GROVE)(S)

Materials Division

COUNTY NO. 30 DATE TESTED 10/24/2017

Michael Benson, Materials Engineer

STA.#	LOC. L	EPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	<i>LAB</i> #:	%MOISTURE
110+10	18 RT	0-5	BROWN	74	64	52	45	8 36	27	11	A-6(0)	RV649	
110+00	06 RT	0-4.5Z	BROWN	92	83	70	63	56	26	12	A-6(4)	S642	9.4
110+00	18 RT	0-5	BROWN	88	76	64	57	49	31	16	A-6(4)	S643	7.8
113+00	06 LT	0-5	BROWN	90	77	63	58	53	39	21	A-6(8)	S644	13.6
219+00	06 RT	0-5	RD/BR	92	80	65	60	54	43	29	A-7-6(12)	S645	18
219+00	15 RT	0-5	BROWN	85	74	64	58	54	44	28	A-7-6(11)	S646	11.7
223+00	06 RT	0-5	BROWN	86	70	53	47	40	24	10	A-4(1)	S647	12.2
223+00	18 LT	0-5	BROWN	77	65	52	45	37	25	10	A-4(0)	S648	6.1

MICHAEL BENSON, MATERIALS ENGINEER

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

SPEC. REMARKS - NO SUPPLIER NAME - STA NAME OF PROJECT - H PROJECT ENGINEER - N PIT/QUARRY - ARKAN LOCATION - HOT S SAMPLED BY - BUIE/J	460 BE ASSI L SURVE SPECIFI TE WY.84 S OT APPL SAS PRING C ORDAN	Y SAMPLE CATION CHECK TRS. & APPRS.(OAF ICABLE	K GR	OVE)(S)	MATERIAL SPEC. YEA SUPPLIER COUNTY/ST DISTRICT DATE SAM DATE REC	NO 1 CODE - SSRVPS AR - 2014 ID 1 FATE - 30 NO 06 PLED - 10/17/17 EIVED - 10/18/17				
SAMPLE FROM - TEST HOLE DATE TESTED - 10/24/1 MATERIAL DESC SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS										
LAB NUMBER SAMPLE ID TEST STATUS STATION	- - -	20173227 S642 INFORMATION ONLY 110+00	- -	20173228 S643 INFORMATIO	ON ONLY -	20173229 S644 INFORMATION ONLY 113+00				
LOCATION DEPTH IN FEET MAT'L COLOR MAT'L TYPE	- - -	06 RT 0-4.5Z BROWN	- - -	18 RT 0-5 BROWN	12 74 65	06 LT 0-5 BROWN				
LATITUDE DEG-MIN- LONGITUDE DEG-MIN-				34 21 92 53	20.10 = 17.90	34 21 21.50 92 53 14.80				
% PASSING 2 1 1/2 3/4 3/8 NO. NO. NO.	IN IN IN IN 10 - 40 -	100 92 83 70 63				100 98 90 77 63 58				
LIQUID LIMIT PLASTICITY INDEX AASHTO SOIL UNIFIED SOIL % MOISTURE CONTENT	- - -	12	- - - -	31 16 A-6(4) 7.8	# # # #	39 21 A-6(8) 13.6				
ACHMSC AGG.BASE CRS CL-7	(IN) - (IN) - - - - - -	3.25W 7.0		55.	- - - - - -	7.5W 7.0				

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED, Z=AUGER REFUSAL

#: #:

AASHTO TESTS : T24 T88 T89 T90 T265

MICHAEL BENSON, MATERIALS ENGINEER

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

SPEC. REMARKS - NO SUPPLIER NAME - STA NAME OF PROJECT - H PROJECT ENGINEER - N PIT/QUARRY - ARKAN	460 BE ASSIGN L SURVEY SPECIFICA TE WY.84 STN OT APPLICA SAS PRING CON ORDAN HOLE	SAMPLE ATION CHECK RS. & APPRS.(OAK CABLE UNTY		MATERI SPEC. SUPPLI COUNTY DISTRI DATE S DATE S	ICE NO YEAR - TER ID YSTATE - TOT NO SAMPLED - RECEIVED -	SSRVPS 2014 1 30 06
	- 8 - 1 - 2 - 0 - 0 - F SEC - SEC - IN	3645 INFORMATION ONLY 219+00 06 RT 0-5 RD/BR 34 21 33.90 92 52 48.60	219+00 15 RT 0-5 BROWN	ATION ONLY	- 223+00 - 06 RT - 0-5 - BROWN - 34 2 92 !	
3/8 NO. NO. NO. NO. NO. LIQUID LIMIT	IN 4 - 10 - 40 - 80 - 200 -	60 54 43	97 - 85 - 74 - 64 - 58 - 54		- 100 - 99 - 86 - 70 - 53 - 47 40	
PLASTICITY INDEX AASHTO SOIL UNIFIED SOIL % MOISTURE CONTENT	= = = = =	29 A-7-6(12) 18.0	- 28 - A-7-6 - 11	6(11)	- 10 - A-4(1 - 12.	
ACHMSC ACHMSC AGG.BASE CRS CL-7	(IN) - (IN) - (IN) - - - - - -	12.0W 5.0			- 4.0W - 2.0X - 6.0 -	

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED, Z=AUGER REFUSAL

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AASHTO TESTS : T24 T88 T89 T90 T265

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MICHAEL BENSON, MATERIALS ENGINEER

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

JOB NUMBER FEDERAL AID NO PURPOSE SPEC. REMARKS SUPPLIER NAME NAME OF PROJECT PROJECT ENGINEER PIT/QUARRY LOCATION SAMPLED BY SAMPLE FROM MATERIAL DESC.	SOIL SURE NO SPECION STATE - HWY.84 R - NOT ARE ARKANSAS HOT SPRINGUIE/JORDAN TEST HOLE - SOIL SUR	SIC VEY FIC S'PL	7 SAMPI CATION FRS. & ICABLE DUNTY	API	ECK PRS.			SPEC. SUPPI COUNT DISTR DATE DATE DATE	YEAL IER YY/ST ICT SAME	CODE R ID. ATE NO.	 SSRVPS 2014 1
LAB NUMBER		ä	201732	233			-		-		
SAMPLE ID			S648				_		-		
TEST STATUS		#	INFORM	ITA	ON	ONLY	_		-		
STATION			223+00)			-		177		
LOCATION		22	18 LT				-		-		
DEPTH IN FEET		<u></u>	0-5				-		-		
MAT'L COLOR		-	BROWN				-		-		
MAT'L TYPE		=					_		275 1920		
LATITUDE DEG	-MIN-SEC	#	34	21	37	.00	-		-		
LONGITUDE DEG											
	2 IN.						2		(
	1 1/2 IN.						<u>=</u>				
	3/4 IN.						_		_		
	3/8 IN.						-		-		
	NO. 4						<u>22</u>		-		
	NO. 10										
	NO. 40		52						$\langle \frac{1}{2\pi i} \rangle$		
	NO. 80		45				=		100		
	NO. 200		37								
LIQUID LIMIT		2	25				_		_		
PLASTICITY IN	DEX	<u></u>	10				_		_		
AASHTO SOIL		_	A-4 ())			-		-		
UNIFIED SOIL		=	·	,			-		-		
% MOISTURE COI	VLENT	_	6	. 1			-		-		
0 1101D101111 CO1				-							
		-					-		-		
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		2					-		<u>~</u>		
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REMARKS - W=MULTIPLE LAYERS, X=STRIPPED, Z=AUGER REFUSAL

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AASHTO TESTS : T24 T88 T89 T90 T265

MICHAEL BENSON, MATERIALS ENGINEER

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

SPEC. REMARKS - NO SPE SUPPLIER NAME - STATE NAME OF PROJECT - HWY. PROJECT ENGINEER - NOT PIT/QUARRY - ARKANSAS LOCATION - HOT SPRI	ASSI CURVE CCIFI 84 S APPL CING C	Y SAMPLE CATION CHECK TRS. & APPRS.(OAK ICABLE	GROVE) (S)	SUPPLIER ID COUNTY/STATE -	2014 1 30 06
SAMPLED BY - BUIE/JORI				DATE RECEIVED -	, ,
SAMPLE FROM - TEST HOI MATERIAL DESC SOIL S		Y - RESISTANCE R-	VALUE ACTUAL		10/24/17
LAB NUMBER	_	20173234	₩	·	
SAMPLE ID	_	RV649		=	
TEST STATUS	_		3 53	1. E.	
STATION	_	110+10	÷	-	
LOCATION	_	18 RT		· 😅	
DEPTH IN FEET		0-5	= -	:=	
MAT'L COLOR	_	BROWN	##/	ii n	
MAT'L TYPE	_		(조) - 발	(© 7 <u>₽</u>	
LATITUDE DEG-MIN-SEC		34 21 20 10	(= 3		
LONGITUDE DEG-MIN-SEC					
	I _* -		= 0	-	
1 1/2 IN			3).	-	
3/4 IN		100		_	
3/8 IN	i -	85	=	_	
NO. 4	-	74	±6	_	
NO. 10	-	64	#1	=	
NO. 40) -	52	*	-	
		45	3 .	=	
NO. 200) –	36			
LIQUID LIMIT	-	27	-	8≅	
PLASTICITY INDEX	-	11	-	(=	
AASHTO SOIL	-	A-6(0)	-	16	
UNIFIED SOIL	-		-	ve	
% MOISTURE CONTENT	-		-	: -	
	_		_	41	
	-		_	#	
	-		-	*	
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REMARKS - W=MULTIPLE LAYERS, X=STRIPPED, Z=AUGER REFUSAL

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AASHTO TESTS : T24 T88 T89 T90 T265

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