ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 080507								
FEDERAL AID PROJE	CT NO.	NHPP-0053(33)						
	DITCH AT L.	M. 4.30 STR. & APPRS. (S)					
STATE HIGHWAY	155	SECTION	4					
IN		PERRY	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

June 22, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 080507

Ditch at LM 4.3 Str. & Apprs. (S)

Route 155 Section 4

Perry 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 at log mile 4.3 on Highway 155. 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 low plasticity sandy clay. Based on currently available cross sections the construction grade line closely matches 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.

The maximum embankment height is approximately 8 feet. All soft unstable organic material within the existing ditch line should be undercut prior to construction, 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 in the vicinity of Russellville.

2. Asphalt Concrete Hot Mix

Туре	Asphalt Cement %	Mineral Aggregate %				
Surface Course	5.5	94.5				
Binder Course	4.4	95.6				
Base Course	4.0	96.0				

Michael C. Benson Materials Engineer

MCB:pt:bjj Attachment

cc: State Constr. Eng. - Master File Copy

District 8 Engineer

System Information and Research Div.

G. C. File

MICHAEL BENSON, MATERIALS ENGINEER *** SOIL SURVEY STRENGTH TEST REPORT ***

DATE = 06/16/2017 SEQUENCE NO. - 1

JOB NUMBER - 080507 MATERIAL CODE - SSRV

SPEC. YEAR - 2014

SUPPLIER ID. - 1

COUNTY/STATE - 53

DISTRICT NO. - 08

JOB NAME - DITCH @ L.M. 4.3 STR. & APPRS.(S)

BEGIN JOB = END JOB 7

RESILIENT MODULUS

STA. 113+90 9690

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:	080507 5/31/17	Material Code Station No.:	SSRVPS 113+90	
Date Tested:	June 15, 2017	Location:	23'LT	
Name of Project:	DITCH AT L.M. 4.3 STR. & APPRS. (S)			
County:	Code: 53 Name: PERRY			
Sampled By:	THORNTON/TAYLOR	Depth:		0-5
Lab No.: Sample ID:	20171806 RV411	AASHTO Class: Material Type (1		A-4(2) 2
LATITUDE:	RV411	LONGITUDE:	1 01 2).	2
1. Testing Inform				
	Preconditioning - Permanent Strain > 5% (Y	·		N
	Testing - Permanent Strain > 5% (Y=Yes or	•		N
	Number of Load Sequences Completed (0-1	5)		15
2. Specimen Info				
	Specimen Diameter (in):			
	Top			3.95
	Middle			3.95
	Bottom			3.95
	Average Membrane Thickness (in):		50	3.95 0.01
	Height of Specimen, Cap and Base (in):			8.02
	Height of Cap and Base (in):			0.02
	Initial Length, Lo (in):			8.02
	Initial Area, Ao (sq. in):			12.18
	Initial Volume, AoLo (cu. in):			97.68
2 Sail Smaaiman	Majoht			
3. Soil Specimen	Weight of Wet Soil Used (g):			3255.50
	veight of vvet soil used (g).			3233.30
4. Soil Properties	s:			
	Optimum Moisture Content (%):			12.0
	Maximum Dry Density (pcf):			117
	95% of MDD (pcf):			111.2
	In-Situ Moisture Content (%):			N/A
5. Specimen Pro	perties:			
	Wet Weight (g):			3255.50
	Compaction Moisture content (%):			12.3
	Compaction Wet Density (pcf):			126.99
	Compaction Dry Density (pcf):			113.08
	Moisture Content After Mr Test (%):			12.0
6. Quick Shear T	est (Y=Yes, N=No, N/A=Not Applicable):			#VALUE!
7. Resilient Mode	ulus, Mr:	12	2062(Sc)^-0.21053	(S3)^0.32591
8. Comments				
9. Tested By:	B.H.	Date: June 15, 2017		
-				

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

SSRVPS

113+90 23'LT

Material Code Station No.: Location: DITCH AT L.M. 4.3 STR. & APPRS. (S) fune 15, 2017 380507 5/31/17 Name of Project: Date Sampled: Date Tested: Job No.

County: Code: 53 Name: PERRY Sampled By: THORNTON/TAYLOR Lab No.: 20171806 Sample ID: RV411

LATITUDE:

Material Type (1 or 2): 2 LONGITUDE:

A-4(2)

AASHTO Class:

Depth:

0-5

Modulus Resilient 17,433 15,815 13,212 16,173 14,465 13,304 12,293 13,243 11,683 10,733 10,093 18,627 11,677 14,181 069'6 psi ≥ 0.00011 0.00010 0.00025 0.00076 0.00049 0.00069 0.00089 Resilient 0.00021 0.00035 0.00068 0.00041 0.00058 0.00014 0.00031 0.00051 Strain in/in ယ် Recov Def. 0.00326 0.00278 0.00092 0.00245 0.00715 LVDT 1 0.00079 0.00169 0.00408 0.00465 0.00606 Average 0.00542 0.00202 0.00394 0.00552 and 2 0.00111 Havd .⊑ Contact Applied Scontact Stress Actual 0.5 9.0 0.3 0.5 0.2 0.3 0.2 0.2 0.2 0.4 0.2 0.7 psi Applied Actual Cyclic Stress Scyclic 5.5 7.2 8.9 6. 3.6 5.4 8.8 3.6 5.3 6.9 8.6 3.7 7.1 psi Actual Applied Stress Axia! Smax Мах. 7.3 psi 2.1 3.9 5.8 9.6 2.1 3.9 5.6 7.5 9.4 2.1 3.8 5.5 9.2 Contact Load Applied Pcontact Actua! 2.8 2.7 3.6 6.1 8.5 2.8 2.7 5.0 7.4 2.6 9.9 g 2.7 2.7 4.1 Max. Axial | Cyclic Load Applied P_{cyclic} Actua/ 107.5 105.2 22.5 44.9 87.8 108.7 22.5 44.4 62.9 86.9 43.5 64.3 84.6 66.7 22.4 lbs Applied **Actual** 114.9 111.7 Load 47.6 70.3 93.8 117.1 9.89 91.9 25.0 P_{\max} 25.2 6.99 88.7 25.2 47.1 46.1 g Maximum Nominal Stress Scyclic Axial 10.0 10.0 10.0 2.0 6.0 8.0 2.0 4.0 6.0 8.0 2.0 4.0 8.0 4.0 6.0 psi Confining Pressure Chamber 6.0 6.0 6.0 6.0 0.9 4.0 4.0 2.0 2.0 2.0 2.0 2.0 4.0 4.0 4.0 တိ psi DESIGNATION **PARAMETER** Sequence 12 Sequence 13 Sequence 14 Sequence 15 Sequence 10 Sequence 2 Sequence 3 Sequence 4 Sequence 5 Sequence 6 Sequence 8 Sequence 9 Sequence 11 Sequence 7 Sequence 1 LIND

TESTED BY	B.H.	DATE	June 15, 2017
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.

080507

Material Code SSRVPS

Date Sampled:

5/31/17

Station No.: 113+90

Date Tested:

June 15, 2017

Location: 23'LT

Name of Project: DITCH AT L.M. 4.3 STR. & APPRS. (S)

County:

Code: 53

Name: PERRY

Sampled By:

THORNTON/TAYLOR

Depth: 0-5

Lab No .:

20171806

AASHTO Class: A-4(2)

Sample ID:

RV411

Material Type (1 or 2): 2

LATITUDE:

LONGITUDE:

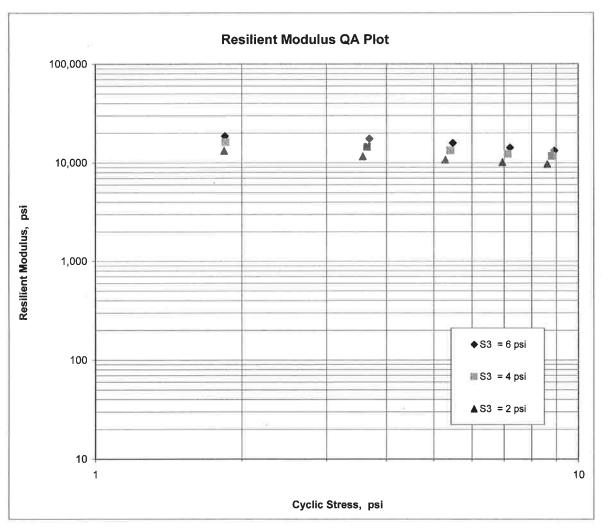
$$M_R = K1 (S_C)^{K2} (S_3)^{K5}$$

K1 = 12,062

K2 = -0.21053

K5 = 0.32591





JOB: 080507

Arkansas State Highway Transporation Department

JOB NAME: DITCH @ L.M. 4.3 STR. & APPRS.(S)

Materials Division

COUNTY NO. 53 **DATE TESTED** 6/12/2017

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	<i>LAB</i> #:	%MOISTURE
113+90	23 LT	0-5	BROWN	87	81	79	74	60	24	8	A-4(2)	RV411	=====
110+00	06 RT	0-5	BR/GR	99	97	89	83	70	27	13	A-6(6)	S407	17.6
110+00	23 RT	0-5	BR/GR	88	77	67	65	57	27	11	A-6(3)	S408	18.1
114+00	06 LT	0-5	BROWN	97	93	90	84	67	22	8	A-4(2)	S409	21.1
114+00	23 LT	0-5	BROWN	88	83	80	76	62	25	8	A-4(2)	S410	20.4

DATE TESTED 6/12/2017

Arkansas State Highway Transporation Department

JOB: 080507 JOB NAME: DITCH @ L.M. 4.3 STR. & APPRS.(S)

COUNTY NO. 53

STA.# LOC.

Materials Division

PAVEMENT SOUNDINGS

AGG. BASE CRS. CL-7 7.0

ACHMSC 4.5WX

06 LT

114+00

AGG. BASE CRS. CL-7

ACHMSC 6.5W

06 RT

110+00

AGG. BASE CRS. CL-7

ACHIMSC

23 RT

110+00

Michael Benson, Materials Engineer

Monday, June 19, 2017

MICHAEL BENSON, MATERIALS ENGINEER

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

	5522	, , , , , , , , , , , , , , , , , , , ,						
DATE - 06/	19/17				SEQUENCE	NO 1		
JOB NUMBER - 080	507				MATERIAL	CODE - SSRVPS		
FEDERAL AID NO TO	BE ASSI	GNED			SPEC. YEA	AR - 2014		
PURPOSE - SOI	L SURVE		SUPPLIER	ID 1				
SPEC. REMARKS - NO	COUNTY/STATE - 53							
SUPPLIER NAME - STA					DISTRICT NO 08			
NAME OF PROJECT - D	ITCH @	L.M. 4.3 STR. &	APPR	S.(S)				
PROJECT ENGINEER - N	OT APPL	ICABLE						
PIT/QUARRY - ARKAN								
LOCATION - PERRY		Y			DATE SAM	PLED - 05/31/17		
SAMPLED BY - THORNT	EIVED - 06/02/17							
SAMPLE FROM - TEST	-					TED - 06/12/17		
MATERIAL DESC SOI		Y - R VALUE- P	AVEME	NT SOUNDING		00,, -		
LAB NUMBER	-	20171802		20171803		20171804		
SAMPLE ID	-	S407		S408		S409		
TEST STATUS	-	INFORMATION ON	LY -	INFORMATIC		INFORMATION ONLY		
STATION	-	110+00	3	110+00	=:	114+00		
LOCATION	-	06 RT	: :::	23 RT	-	06 LT		
DEPTH IN FEET	-	0-5	9 77 . 7925	0-5		0-5		
MAT'L COLOR	_	BR/GR	7E	BR/GR		BROWN		
MAT'L TYPE	-		-					
LATITUDE DEG-MIN-	SEC -	35 3 18.00	250	35 03 3	18.10 -	35 3 17.90		
LONGITUDE DEG-MIN-	SEC -	93 02 13.20)	93 02	13.10	93 02 17.90		
% PASSING 2	IN							
	IN		_					
	IN		_		_			
•	IN -	100	_	100	_	100		
	4 -	99	_	88	_	97		
			-		_	-		
	10 -	97	-	77	-	93		
	40 -	89	-	67	-	90		
NO.		83	-	65	-	84		
NO.	200 -	70		57		67		
LIQUID LIMIT	_	27	244	27	- -	22		
PLASTICITY INDEX	_	13		11	. 	8		
AASHTO SOIL	_	A-6(6)		A-6(3)	27	A-4(2)		
UNIFIED SOIL	_		-		*			
% MOISTURE CONTENT	_	17.6	-	18.1	æ3	21.1		
	(IN) -	6.5W	-		:=	4.5WX		
AGG. BASE CRS. CL-7	(IN) -	9.0	=			7.0		
	_				12			
	-				-			
	_		55		:=:			
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	-		=		~			
	-		*		-			
	-		=					

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 06/12/1 JOB NUMBER - 080507 FEDERAL AID NO TO BE A PURPOSE - SOIL SU SPEC. REMARKS - NO SPEC SUPPLIER NAME - STATE NAME OF PROJECT - DITCH PROJECT ENGINEER - NOT A PIT/QUARRY - ARKANSAS LOCATION - PERRY, CO SAMPLED BY - THORNTON/T SAMPLE FROM - TEST HOLE	SSI RVE IFI @ PPI UNT	Y SAMPLE CATION CH: L.M. 4.3 ICABLE Y		PPRS.(S)	MATERIA SPEC. Y SUPPLIE COUNTY/ DISTRIC	ER ID. /STATE CT NO. AMPLED ECEIVED	- - -	SSRVPS 2014 1
MATERIAL DESC SOIL SU	JRVE	Y - R VA	LUE- PAVI	EMENT SOUNDING	3S			
LAB NUMBER SAMPLE ID TEST STATUS	- - -	20171805 S410 INFORMATI	ION ONLY	** **		= = =		
STATION	_	114+00		A		***		
LOCATION	-	23 LT		Care Care Care Care Care Care Care Care		##		
DEPTH IN FEET	-	0-5		_				
MAT'L COLOR	-	BROWN		-		-		
MAT'L TYPE	-			0 <u>#</u>		¥)		
LATITUDE DEG-MIN-SEC	-	35 3	17:80	=		20		
LONGITUDE DEG-MIN-SEC	-	93 02	17.90					
% PASSING 2 IN.	_			-		-		
1 1/2 IN.						-		
3/4 IN.		100		~		<u>~</u>		
3/8 IN.		98		-		=		
NO. 4		88				-		
NO. 10		83		-		=		
NO. 40		80		-				
NO. 80		76		-		-		
NO. 200		62		. T :		~		
LIQUID LIMIT	-	25		-		=7.		
PLASTICITY INDEX	-	8		-		=)		
AASHTO SOIL	-	A-4(2)				-		
UNIFIED SOIL	-			-				
% MOISTURE CONTENT	-	20.4						
	_			-		-		
	_			2 4		=		
	-	•		0 =		-		
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REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

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AASHTO TESTS : T24 T88 T89 T90 T265

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 06/12/2 JOB NUMBER - 080507 FEDERAL AID NO TO BE 2 PURPOSE - SOIL SU SPEC. REMARKS - NO SPEC SUPPLIER NAME - STATE NAME OF PROJECT - DITC PROJECT ENGINEER - NOT 2 PIT/QUARRY - ARKANSAS LOCATION - PERRY, CO SAMPLE FROM - TEST HOLD	ASSI JRVE CIFI H @ APPI DUNT	Y SAMPLE CATION CHECK L.M. 4.3 STR. & APPRS.(S) LICABLE Y	SEQUENCE NO 1 MATERIAL CODE - RV SPEC. YEAR - 2014 SUPPLIER ID 1 COUNTY/STATE - 53 DISTRICT NO 08 DATE SAMPLED - 05/31/17 DATE RECEIVED - 06/02/17 DATE TESTED - 06/12/17
MATERIAL DESC SOIL S	URVI	EY - RESISTANCE R-VALUE ACTUAL	RESULTS
LAB NUMBER	-	20171806	-
SAMPLE ID	_	20171000	_
TEST STATUS	-		-
STATION	_	113+90	-
LOCATION	-	23 LT -	-
DEPTH IN FEET	-	0-5	-
MAT'L COLOR	_	BROWN	-
MAT'L TYPE	-	•	_
LATITUDE DEG-MIN-SEC	-	35 3 17.80	-
LONGITUDE DEG-MIN-SEC	_	93 02 17.80	
% PASSING 2 IN	_	-	
1 1/2 IN.		- -	-
3/4 IN		100 -	-
3/8 IN.		98 -	ė
NO. 4		_	-
NO. 10		_	*
NO. 40		79	# ***
NO. 80		74 -	-
NO. 200		60	
		.2	
LIQUID LIMIT	-		≅
PLASTICITY INDEX	-	8 -	Ī
AASHTO SOIL	-	A-4(2) -	-
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	-		
	-	=	-
	-	=	-
	-	=	-
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REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

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AASHTO TESTS : T24 T88 T89 T90 T265