ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

IN		MISSISSIPPI	COUNTY					
STATE HIGHWAY	181		2					
	DITCH NC). 43 STR. & APPRS. (S)						
FEDERAL AID PROJEC	CT NO. 1	NHPP-0047(54)						
STATE JOB NO. 100839								

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

May 24, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 100839 Drainage Ditch No. 43 Str. & Apprs. (S) Route 181 Section 2 Mississippi 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 Ditch No. 43 on Highway 181 with a box culvert. 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 consist primarily of highly plastic clay with sand. The subgrade soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction.

Based on currently available cross-sections the maximum embankment height is approximately 8 feet, and will be placed within an existing irrigation ditch. The ditch must be drained and all soft unstable organic material should be undercut prior to embankment construction, anticipated to be no more than two feet. The embankment may be constructed with locally available unspecified material utilizing the slope configuration shown in the crosssection.

The proposed cut slopes are acceptable as shown.

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 at the river ports in Osceola.
- 2. Asphalt Concrete Hot Mix

	PG 64-22	
Туре	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.2	94.8
Binder Course	4.1	95.9
Base Course	3.9	96.1
	PG 70-22	
Туре	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.1	94.9
Binder Course	4.1	95.9
Base Course	3.7	96.3

	PG 76-22	
Туре	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.2	94.8
Binder Course	4.2	95.8
Base Course	3.8	96.2

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Michael C. Benson Materials Engineer

MCB:pt:bjj

Attachment cc: State Constr. Eng. – Master File Copy District 10 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 - 05/01/2017 SEQUENCE NO. - 3

> RESILIENT MODULUS STA. 106+90 10218

REMARKS -

AASHTO TESTS : T190

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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:	100839 3/28/17 April 28, 2017 DITCH NO. 43 STR. & APPRS. (S)	Material Code Station No.: Location:	SSRVPS 106+90 18LT
County: Sampled By: Lab No.: Sample ID: LATITUDE:	Code: 47 Name: MISSISSIPPI THORNTON/TAYLOR 20171234 RV333	Depth: AASHTO Class: Material Type (1 or 2): LONGITUDE:	0-5 A-7-6(9) 2
1. Testing Inform	nation:		
	Preconditioning - Permanent Strain > 5% (Y=)		N
	Testing - Permanent Strain > 5% (Y=Yes or N=	⊧No)	Ν
	Number of Load Sequences Completed (0-15)		15
2. Specimen Inf	ormation:		
	Specimen Diameter (in):		
	Тор		3.93
	Middle		3.94
	Bottom		3.94
	Average		3.94
	Membrane Thickness (in):		0.01
	Height of Specimen, Cap and Base (in):		8.03
	Height of Cap and Base (in):		0.00
	Initial Length, Lo (in):		8.03
	Initial Area, Ao (sq. in):		12.10
	Initial Volume, AoLo (cu. in):		97.14
3. Soil Specime	n Weight:		
of oon opeonine	Weight of Wet Soil Used (g):		2999.50
4. Soil Propertie	es:		
	Optimum Moisture Content (%):		18.5
	Maximum Dry Density (pcf):		100.9
	95% of MDD (pcf):		95.9
	In-Situ Moisture Content (%):		N/A
5. Specimen Pro	operties		
o. opconnen i re	Wet Weight (g):		2999.50
	Compaction Moisture content (%):		19.0
	Compaction Wet Density (pcf):		117.65
	Compaction Dry Density (pcf):		98.87
	Moisture Content After Mr Test (%):		19.0
6 Quick Sheer	Fast (V-Vas N-Na N/A-Nat Applicable);		
o. Quick Shear	Γest (Y=Yes, N=No, N/A=Not Applicable):		#VALUE!
7. Resilient Mod	lulus, Mr:	12502(8	c)^-0.13410(S3)^0.12521
8. Comments			
9. Tested By:	Da	ate: April 28, 2017	

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

Job No.	100839	Material Code	SSRVPS
Date Sampled:	3/28/17	Station No.:	106+90
Date Tested:	April 28, 2017	Location:	18LT
Name of Project:	DITCH NO. 43 STR. & APPRS. (S)		
County:	Code: 47 Name: MISSISSIPPI		
Sampled By:	THORNTON/TAYLOR	Depth:	0-5
Lab No.:	20171234	AASHTO Class:	A-7-6(9)
Sample ID:	RV333	Material Type (1 or 2): 2	2): 2
LATITUDE:		LONGITUDE:	

Resilient	Modulus				Mr	psi	14,575	13,667	12,898	11,774	10,807	13,407	13,008	12,232	11,577	10,772	11,827	11,434	11,188	10,714	10,218
Resilient F	Strain				εr	in/in	0.00013	0.00027	0.00042	0.00060	0.00081	0.00014	0.00028	0.00044	0.00062	0.00082	0.00016	0.00032	0.00048	0.00066	0.00086
Average	Recov Def.	LVDT 1	and 2		H _{avg}	IJ	0.00101	0.00214	0.00336	0.00486	0.00650	0.00110	0.00224	0.00355	0.00494	0.00655	0.00125	0.00255	0.00387	0.00533	0.00689
Actual	Applied	Contact	Stress		Scontact	psi	0.2	0.2	0.3	0.5	0.7	0.2	0.2	0.2	0.4	0.6	0.2	0.2	0.2	0.3	0.5
Actual	Applied	Cyclic	Stress		S _{cyclic}	psi	1.8	3.6	5.4	7.1	8.8	1.8	3.6	5.4	7.1	8.8	1.8	3.6	5.4	7.1	8.8
Actual	Applied	Max.	Axial	Stress	S _{max}	psi	2.1	3.9	5.7	7.6	9.4	2.1	3.9	5.6	7.5	9.4	2.1	3.8	5.6	7.4	9.3
Actual	Applied	Contact	Load		P _{contact}	lbs	2.8	2.8	3.5	5.9	8.3	2.6	2.7	2.7	5.0	7.3	2.6	2.6	2.6	4.1	6.6
Actual	Applied	Cyclic Load			P _{cyclic}	lbs	22.2	44.0	65.3	86.1	105.9	22.2	43.9	65.4	86.2	106.4	22.3	43.9	65.3	86.0	106.0
Actual	Applied	16	Load		P _{max}	lbs	25.0	46.8	68.8	92.0	114.2	24.8	46.6	68.1	91.1	113.7	24.9	46.6	67.9	90.1	112.5
Nominal	Maximum	Axial	Stress		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			Ŝ	psi	6.0	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

DATE April 28, 2017 DATE DATE

TESTED BY REVIEWED BY

GW

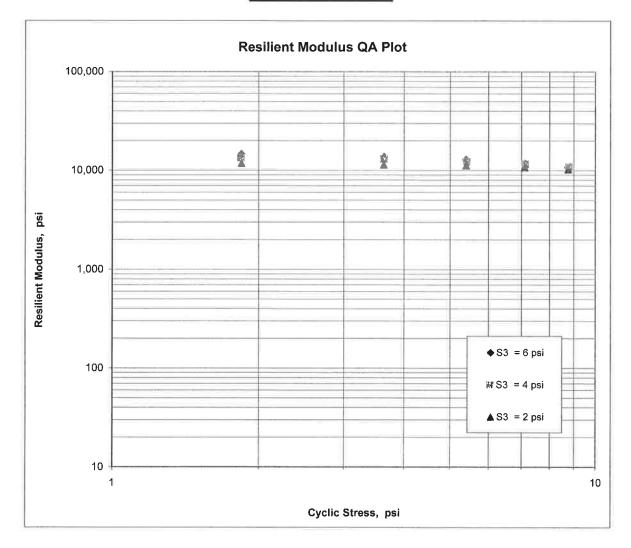
ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

Job No.	100839		Material Code SSRVPS
Date Sampled:	3/28/17		Station No.: 106+90
Date Tested:	April 28, 2017		Location: 18LT
Name of Project:	DITCH NO. 43 STR. & APP	RS. (S)	
County:	Code: 47 Name:	MISSISSIPPI	
Sampled By:	THORNTON/TAYLOR		Depth: 0-5
Lab No.:	20171234		AASHTO Class: A-7-6(9)
Sample ID:	RV333	Mate	erial Type (1 or 2): 2
LATITUDE:			LONGITUDE:

 $M_{R} = K1 (S_{C})^{K_{2}} (S_{3})^{K_{5}}$

K1 =	12,502
K2 =	-0.13410
K5 =	0.12521
$R^2 =$	0.88



JOB: 100839

COUNTY NO.

Arkansas State Highway Transporation Department Materials Division

JOB NAME: DITCH NO.43 STR.& APPRS.(S)

47 DATE TESTED

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	# 4 0	#80	#200	L.L.	<i>P.I</i> .	SOIL CLASS	LAB #:	%MOISTURE
106+90	18 LT	0-5	GRAY	86	82	77	62	51	41	26	A-7-6(9)	RV333	
107+00	06 LT	0-5	GRAY	99	99	94	83	76	49	33	A-7-6(24)	S329	33.8
107+00	18 LT	0-5	GRAY	98	96	92	78	66	26	13	A-6(6)	S330	39.2
113+00	06 RT	0-5	GRAY	99	98	92	75	62	35	23	A-6(11)	S331	30.5
113+00	18 RT	0-5	GRAY	99	97	91	75	64	44	30	A-7-6(16)	S332	32.3

4/24/2017

WHICH SPANTAPA

CHALFOY

Said a

SUSTREET

Alberto Table Topological Provestion

		8.0				113+00
		AGG.BASE CRS CL-7	ACHMBC	ACHMSC	06 RT	
		I	ı	3		
	7	AGG.BASE CRS CL-7	ACHMBC	ACHMSC	18 LT	107+00
		7.0	1.0	8.0W		
		AGG.BASE CRS CL-7	ACHMBC	ACHMSC	06 LT	107+00
	PAVEMENT SOUNDINGS				STA.# LOC.	STA.#
	Michael Benson, Materials Engineer			47	COUNTY NO. 47	coui
4/24/2017	Materials Division		JOB NAME: DITCH NO.43 STR.& APPRS.(S)	NTCH NO.43 ST	VAME: D	JOB]
	Arkansas State Highway Transporation Department	Arka		100839		JOB:

Tuesday, May 02, 2017

ARKANSAS STATE	HIGHWAY	Y AND TRANSPORTATI MATERIALS			- LITTLE	ROCK, ARKANSAS	
* * *		IAEL BENSON, MATER SURVEY / PAVEMENT			REPORT *	**	
DATE - 04/2 JOB NUMBER - 1008 FEDERAL AID NO TO E PURPOSE - SOII SPEC. REMARKS - NO S SUPPLIER NAME - STAT NAME OF PROJECT - DI PROJECT ENGINEER - NO PIT/QUARRY - ARKANS	339 SE ASSI SPECIFI FE ITCH NO OT APPL SAS	Y SAMPLE CATION CHECK .43 STR.& APPRS.(ICABLE			MATERIAL SPEC. YEZ SUPPLIER COUNTY/S' DISTRICT	NO 1 CODE - SSRVPS AR - 2014 ID 1 FATE - 47 NO 10	
LOCATION - MISSIS SAMPLED BY - THORNTO						PLED - 03/28/1 EIVED - 03/31/1	
SAMPLE FROM - TEST H					DATE TES	TED - 04/24/1	
MATERIAL DESC SOI							
SAMPLE ID TEST STATUS STATION LOCATION DEPTH IN FEET MAT'L COLOR MAT'L TYPE LATITUDE DEG-MIN-S LONGITUDE DEG-MIN-S % PASSING 2 1 1/2 3/4	- - - - - - - - - - - - - - - - - - -	S329 INFORMATION ONLY 107+00 06 LT 0-5 GRAY 35 43 9.60 90 04 23.20		S330 INFORMATION 107+00 18 LT 0-5 GRAY 35 43 90 04 2 100	- N ONLY - - - - - - - - - - - - - - - - - - -	S331 INFORMATION ON 113+00 06 RT 0-5 GRAY 35 43 15.6 90 04 23.1	0
NО. NО. NO.	IN 4 - 10 - 40 - 80 - 200 -	99 99 94	- - -	99 98 96 92 78 66		100 99 98 92 75 62	
LIQUID LIMIT PLASTICITY INDEX AASHTO SOIL UNIFIED SOIL % MOISTURE CONTENT	- - -	49 33 A-7-6(24) 33.8		26 13 A-6(6) 39.2		35 23 A-6(11) 30.5	
ACHMBC	(IN) - (IN) - (IN) - - - - - - - - - - - - - - - - - - -	8.0W 1.0 7.0				4.5WX 8.0	

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

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	MATERIALS	DIVISION	- LITTLE ROCK, ARKANSAS
	MICHAEL BENSON, MATER DIL SURVEY / PAVEMENT		
DATE - 04/24/1 JOB NUMBER - 100839 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	SSIGNED RVEY SAMPLE RIFICATION CHECK NO.43 STR.& APPRS.(;		SEQUENCE NO 2 MATERIAL CODE - SSRVPS SPEC. YEAR - 2014 SUPPLIER ID 1 COUNTY/STATE - 47 DISTRICT NO 10
LOCATION - MISSISSIE SAMPLED BY - THORNTON/T SAMPLE FROM - TEST HOLE	TAYLOR	a	DATE SAMPLED - 03/28/17 DATE RECEIVED - 03/31/17 DATE TESTED - 04/24/17
MATERIAL DESC SOIL SU			
LAB NUMBER		-	-
SAMPLE ID TEST STATUS	- S332 - INFORMATION ONLY	-	-
STATION	- 113+00	-	-
LOCATION		-	-
DEPTH IN FEET		-	-
MAT'L COLOR	- GRAY	-	-
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC LONGITUDE DEG-MIN-SEC		-	-
% PASSING 2 IN.	-	*	-
1 1/2 IN.			3 2 .
3/4 IN.			
	- 100	*	-
	- 99	15 5	.
NO. 10 NO. 40			
NO. 80		-	-
NO. 200	- 64		
LIQUID LIMIT	- 44		-
PLASTICITY INDEX	- 30		-
AASHTO SOIL	- A-7-6(16)	-	-
UNIFIED SOIL % MOISTURE CONTENT	- 32.3	-	
	-		-
	-		-
	-		-
	-	-	-
	-		_
	-	-	-
	-)=:	-
	-		-

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

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	HWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION MICHAEL BENSON, MATERIALS ENGINEER DIL SURVEY / PAVEMENT SOUNDING TEST	
DATE - 04/24/3 JOB NUMBER - 100839 FEDERAL AID NO TO BE A	17 ASSIGNED URVEY SAMPLE CIFICATION CHECK H NO.43 STR.& APPRS.(S)	SEQUENCE NO 1 MATERIAL CODE - RV SPEC. YEAR - 2014 SUPPLIER ID 1 COUNTY/STATE - 47 DISTRICT NO 10
LOCATION - MISSISSI SAMPLED BY - THORNTON/ SAMPLE FROM - TEST HOLD	TAYLOR	DATE SAMPLED - 03/28/17 DATE RECEIVED - 03/31/17 DATE TESTED - 04/24/17 RESULTS
LAB NUMBER	- 20171234 -	-
SAMPLE ID	- RV333 -	-
TEST STATUS	- INFORMATION ONLY - - 106+90 -	-
STATION	- 106+90 -	-
LOCATION	- 18 LT -	-
DEPTH IN FEET	-	-
MAT'L COLOR MAT'L TYPE	- GRAI _	-
LATITUDE DEG-MIN-SEC	- 35 43 9.20 -	-
LONGITUDE DEG-MIN-SEC		
% PASSING 2 IN	2 -	-
1 1/2 IN		
	100	-
3/8 IN.	93 -	
	- 86 -	-
NO. 10	- 82	0772
	- 77 -	-
NO. 80 NO. 200		-
LIQUID LIMIT PLASTICITY INDEX	- 41 - - 26 -	77 12
AASHTO SOIL	- 20 - - A-7-6(9) -	-
UNIFIED SOIL		-
& MOISTURE CONTENT		-
		_
		-
	- ~	-
	- 22	-
		-
	- 2	-
		-
		-
	-	-
REMARKS - W=MULTIPLE LAYERS, X=STRIPPED		

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED ---

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