ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO.		110620		
FEDERAL AID PROJECT NO.		NHPP-0074(34)		
	DITCH AT L.M. 10	.96 STR. & APPRS. (S)		
STATE HIGHWAY	17	SECTION	4	
IN	WOOD		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

April 21, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 110620 Ditch at L.M. 10.96 Str. & Apprs. (S) Route 17 Section 4 Woodruff 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 a bridge on Highway 17 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 low plasticity clays with some sand. The subgrade soils are expected to provide a stable working platform with normal drying and compactive efforts, if the weather is favorable during construction.

Based on currently available cross-sections the maximum embankment height is approximately 9 feet. The construction centerline encroaches on irrigation ditches for agricultural fields. Prior to embankment construction the ditch must be drained and the soft unstable material should be undercut to a maximum depth of three feet. The embankment may be constructed of locally available unspecified material. The box culvert should be constructed on a bed of stone backfill three feet thick. The stone backfill should exceed the length and width of the box culvert by four feet.

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 Judsonia.
- 2. Asphalt Concrete Hot Mix

	PG 64-22	
Туре	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.3	94.7
Binder Course	4.3	95.7
Base Course	4.0	96.0
	PG 70-22	
Туре	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.3	94.7
Binder Course	4.3	95.7
Base Course	4.0	96.0

	PG 76-22	
Туре	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.3	94.7
Binder Course	4.3	95.7
Base Course	3.8	96.2

Michael Q. Benson Materials Engineer

MCB:pt:bjj Attachment

cc: State Constr. Eng. – Master File Copy District 1 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 - 04/20/2017 SEQUENCE NO. - 1 MATERIAL CODE - SSRV JOB NUMBER - 110620 SPEC. YEAR - 2014 SUPPLIER ID. - 1 COUNTY/STATE - 74 DISTRICT NO. - 01 JOB NAME - DITCH @ LM 10,96 STR. & APPRS.(S) STATION LIMITS R-VALUE AT 240 psi * BEGIN JOB - END JOB 8

> RESILIENT MODULUS STA. 118+10 10264

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

lame of Project: DiTCIT @ LM 10.96 STR. & APPRS. (S) Jointy: Code: 74 Name: WOODRUFF adv No.: 20170764 ASHTO Class:	Job No. Date Sampled:	110620 3/7/17	Material Code Station No.: Location:	SSRVPS 118+10 15LT
Sounty: Code: 74 Name: WOODRUFF ampled By: THORNTON/BATES Depth: 0-5 anapted D: RV245 AASHTO Class: A-4(4) ample D: RV245 Material Type (1 or 2): 2 ATTTUDE: Preconditioning - Permanent Strain > 5% (Y=Yes or N= No) Testing - Permanent Strain > 5% (Y=Yes or N=No) Number of Load Sequences Completed (0-15) Specimen Diameter (in): Top Middle Bottom Average Membrane Thickness (in): Height of Specimen, Cap and Base (in): Height of Specime, Cap and Base (in): Initial Length, Lo (in): Initial Area, Ao (sq. in): 1 Initial Length, Lo (in): 1 Initial Volume, AoLo (cu. in): Soil Specimen Moisture Content (%): Maximum Dry Density (pc): 1 Soil Properties: Optimum Moisture Content (%): 306 Compaction Woisture content (%): Compaction Woisture content (%): 307 Compaction Dry Density (pcf): 11 11 Compaction Dry Density (pcf): 11 11 Outrout Dry Density (pcf): 11 11 Compaction Woisture content (%): 10 306 Compaction Dry Density	Date Tested:	April 14, 2017	Location:	1511
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. Quick Shear Test (Y=Yes, N=No, N/A=Not Applicable): #VA . Resilient Modulus, Mr: 11454(Sc)^-0.15208(S3)^0.2 . Comments				105.
. Resilient Modulus, Mr: 11454(Sc)^-0.15208(S3)^0.2		Moisture Content After Mr Test (%):		13
. Comments	6. Quick Shear 1	Γest (Y=Yes, N=No, N/A=Not Applicable):		#VALU
	7. Resilient Mod	ulus, Mr:	11454(S	c)^-0.15208(S3)^0.289
. Tested By: <u>GW</u> Date: <u>April 14, 2017</u>	8. Comments			
. Tested By: <u>GW</u> Date: <u>April 14, 2017</u>				
	9. Tested By:	_GWC	ate: April 14, 2017	

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

Job No.	110620	Material Code	SSRVPS
Date Sampled:	3/7/17	Station No.:	118+10
Date Tested:	April 14, 2017	Location:	15LT
Name of Project:	DITCH @ LM 10.96 STR. & APPRS. (S)		
County:	Code: 74 Name: WOODRUFF		
Sampled By:	THORNTON/BATES	Depth:	0-5
Lab No.:	20170764	AASHTO Class:	A-4(4)
Sample ID:	RV245	Material Type (1 or 2): 2	2): 2
LATITUDE:		LONGITUDE:	

	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	Axial	Max. Axial	ial Cyclic Load	Contact	Max.	Cyclic	Contact	LVDT 1		
		Stress	Load		Load	Axial	Stress	Stress	and 2		
						Stress					
DESIGNATION	S3	S _{cyclic}	P _{max}	P _{cyclic}	P _{contact}	S _{max}	S _{cyclic}	S _{contact}	H _{avg}	εr	Mr
UNIT	psi	psi	lbs	sdl	lbs	psi	psi	psi	<u>,c</u>	in/in	psi
Sequence 1	6.0	2.0	25.0	22.3	2.7	2.1	1.8	0.2	0.00084	0.00010	17,519
Sequence 2	6.0	4.0	47.2	44.4	2.8	3.9	3.7	0.2	0.00179	0.00022	16,461
Sequence 3	6.0	6.0	69.7	66.1	3.6	5.8	5.5	0.3	0.00285	0.00035	15,412
Sequence 4	6.0	8.0	93.4	87.4	6.0	7.7	7.2	0.5	0.00409	0.00051	14,197
Sequence 5	6.0	10.0	116.9	108.4	8.5	9.6	8.9	0.7	0.00538	0.00067	13,385
Sequence 6	4.0	2.0	24.9	22.1	2.8	2.1	1.8	0.2	0.00096	0.00012	15,286
Sequence 7	4.0	4.0	46.8	44.0	2.8	3.9	3.6	0.2	0.00209	0.00026	13,970
Sequence 8	4.0	6.0	68.4	65.6	2.8	5.6	5.4	0.2	0.00330	0.00041	13,190
Sequence 9	4.0	8.0	91.8	86.7	5.1	7.6	7.2	0.4	0.00462	0.00058	12,436
Sequence 10	4.0	10.0	115.2	107.6	7.5	9.5	8.9	0.6	0.00593	0.00074	12,039
Sequence 11	2.0	2.0	24.8	22.0	2.8	2.0	1.8	0.2	0.00115	0.00014	12,668
Sequence 12	2.0	4.0	46.2	43.4	2.8	3.8	3.6	0.2	0.00249	0.00031	11,560
Sequence 13	2.0	6.0	67.1	64.3	2.8	5.5	5.3	0.2	0.00391	0.00049	10,905
Sequence 14	2.0	8.0	89.2	84.9	4.2	7.4	7.0	0.3	0.00537	0.00067	10,502
Sequence 15	2.0	10.0	112.3	105.7	6.6	9.3	8.7	0.5	0.00683	0.00085	10,264

TESTED BY REVIEWED BY

GW

DATE April 14, 2017 DATE

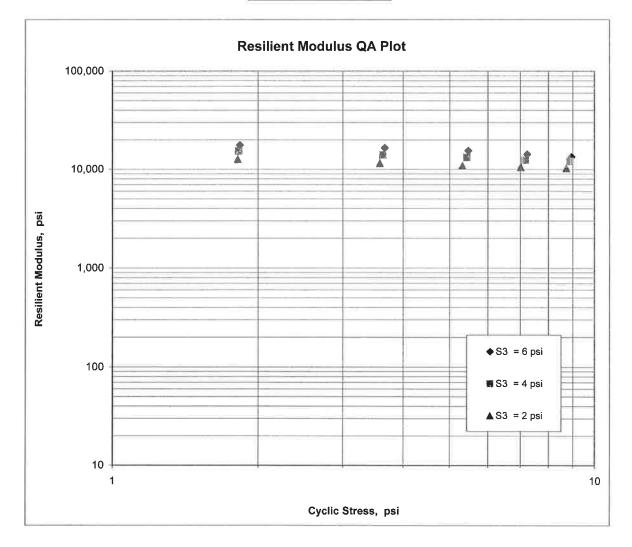
ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

Job No.	110620		Material Code SSRVPS		
Date Sampled:	3/7/17		Station No.: 118+10		
Date Tested:	April 14, 2017		Location: 15LT		
Name of Project:	DITCH @ LM 10.96 STR. &	APPRS. (S)			
County:	Code: 74 Name:	WOODRUFF			
Sampled By:	THORNTON/BATES		Depth: 0-5		
Lab No.:	20170764		AASHTO Class: A-4(4)		
Sample ID:	RV245	Material Type (1 or 2): 2			
LATITUDE:			LONGITUDE:		

 $M_{R} = K1 (S_{C})^{K2} (S_{3})^{K5}$

K1 =	11,454	
K2 =	-0.15208	
K5 =	0.28939	
$R^2 =$	0.98	



JOB: 110620

Arkansas State Highway Transporation Department Materials Division

JOB NAME: DITCH @ LM 1096 STR. & APPRS.(S)

COUNTY NO. 74 DATE TESTED

Michael Benson, Materials Engineer

STA.#	LOC. I	DEPTH	COLOR	#4	#10	# 4 0	#80	#200	L.L.	<i>P.I</i> .	SOIL CLASS	LAB #:	%MOISTURE
118+10	15 LT	0-5	GRAY	97	94	89	85	82	26	7	A-4(4)	RV245	
109+00	06 RT	0-5	GRAY	100	New 10			97	36	20	A-6(19)	S241	27.2
109+00	20 RT	0-5	GRAY	98	95	90	85	80	29	12	A-6(8)	S242	25.7
118+00	06 LT	0-5	GRAY	100		1/22		92	26	6	A-4(4)	S243	25.9
118+00	15 LT	0-5	GRAY	100			Nor ² S	96	25	5	A-4(4)	S244	21.9

3/28/2017

JOB: JOB NAME: D	110620 : DITCH @ LM 1096	JOB: 110620 JOB NAME: DITCH @ LM 1096 STR. & APPRS.(S)	Ark	kansas Siaie Hignway Material	Arkunsus suue mignway Transporation Department Materials Division	DATE TESTED 3/28/2017
COUNTY NO. 74	74			Michael Benso	Michael Benson, Materials Engineer	
STA.# LOC.				PAVEMENT	PAVEMENT SOUNDINGS	
109+00 20 RT	ACHMSC	BST	ACHMBC	BASE	AGG. BASE CRS. CL-	
109+00 06 RT	ACHMSC	BST	ACHMBC	BASE	AGG, BASE CRS, CL-	
		0.5	2.25	1.0	5.0	
118+00 06 LT	ACHMSC	BST	ACHMBC	BASE	AGG. BASE CRS. CL-	
	3.5	1.0	1.5	I	6.0	
8						
comments: W	W=MULTIPLE LAYERS	'ERS				

Thursday, April 20, 2017

Page I of I

MATERIAL MICHAEL BENSON, MAT	TION DEPARTMENT - LITTLE ROCK, ARKANSAS S DIVISION ERIALS ENGINEER NT SOUNDING TEST REPORT ***
DATE - 03/28/17 JOB NUMBER - 110620 FEDERAL AID NO TO BE ASSIGNED PURPOSE - SOIL SURVEY SAMPLE SPEC. REMARKS - NO SPECIFICATION CHECK SUPPLIER NAME - STATE NAME OF PROJECT - DITCH @ LM 10,96 STR. & 2 PROJECT ENGINEER - NOT APPLICABLE PIT/QUARRY - ARKANSAS	DISTRICT NO 01
LOCATION - WOODRUFF COUNTY SAMPLED BY - THORNTON/BATES	DATE SAMPLED - 03/07/17 DATE RECEIVED - 03/09/17
SAMPLE FROM - TEST HOLE MATERIAL DESC SOIL SURVEY - R VALUE- P	DATE TESTED - 03/28/17 AVEMENT SOUNDINGS
SAMPLE ID - S241	
LIQUID LIMIT - 36 PLASTICITY INDEX - 20 AASHTO SOIL - A-6(19) UNIFIED SOIL - % MOISTURE CONTENT - 27.2	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
ACHMSC (IN) - 4.0W BST (IN) - 0.5 ACHMBC (IN) - 2.25 BASE (IN) - 1.0 AGG. BASE CRS. CL-7 (IN) - 5.0	3.5 1.0 1.5 6.0

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REMARKS - W=MULTIPLE LAYERS

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AASHTO TESTS : T24 T88 T89 T90 T265

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MI	AY AND TRANSPORTATION DEPARTMEN MATERIALS DIVISION CHAEL BENSON, MATERIALS ENGINEE L SURVEY / PAVEMENT SOUNDING TE	IR
SPEC. REMARKS - NO SPECIE SUPPLIER NAME - STATE	VEY SAMPLE FICATION CHECK @ LM 1096 STR. & APPRS.(S) PLICABLE	SEQUENCE NO 2 MATERIAL CODE - SSRVPS SPEC. YEAR - 2014 SUPPLIER ID 1 COUNTY/STATE - 74 DISTRICT NO 01
SAMPLED BY - THORNTON/BA		DATE SAMPLED - 03/07/17 DATE RECEIVED - 03/09/17
SAMPLE FROM - TEST HOLE		DATE TESTED - 03/28/17
MATERIAL DESC SOIL SUR	VEY - R VALUE- PAVEMENT SQUNDI	INGS
LAB NUMBER -	20170763 =	12
SAMPLE ID -	- S244 -	(E
TEST STATUS -	- INFORMATION ONLY - - 118+00 -	1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 -
STATION - LOCATION -		-
LOCATION - DEPTH IN FEET -	- 0-5	
MAT'L COLOR -		022
MAT'L TYPE -		~
LATITUDE DEG-MIN-SEC - LONGITUDE DEG-MIN-SEC -		1000:
% PASSING 2 IN		-
1 1/2 IN		-
3/4 IN 3/8 IN		-
378 IN NO. 4 -	_	-
NO. 10 -	-	-
NO. 40 -		-
NO. 80 -		-
NO. 200 -	- 96	
LIQUID LIMIT -	- 25 -	3 5 .
PLASTICITY INDEX -	- 5 -	
AASHTO SOIL	- A-4(4) -	-
UNIFIED SOIL % MOISTURE CONTENT	21.9	-
97 7 <u>4</u>		-
	-	
-	-	
50 20	-	-
:=	· _	-
2. 	-	-
25 21		-
	-	<u></u>
REMARKS - W=MULTIPLE LAY		

AASHTO TESTS : T24 T88 T89 T90 T265

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ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS MATERIALS DIVISION MICHAEL BENSON, MATERIALS ENGINEER *** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***		
DATE - 03/28/1 JOB NUMBER - 110620 FEDERAL AID NO TO BE A PURPOSE - SOIL SU SPEC. REMARKS - NO SPEC SUPPLIER NAME - STATE	7 SSIGNED RVEY SAMPLE IFICATION CHECK @ LM 1096 STR. & APPRS.(S)	SEQUENCE NO 1 MATERIAL CODE - RV SPEC. YEAR - 2014 SUPPLIER ID 1 COUNTY/STATE - 74 DISTRICT NO 01
LOCATION - WOODRUFF SAMPLED BY - THORNTON/B SAMPLE FROM - TEST HOLE MATERIAL DESC SOIL SU	ATES	DATE SAMPLED - 03/07/17 DATE RECEIVED - 03/09/17 DATE TESTED - 03/28/17 VAL RESULTS
LAB NUMBER	20170764	
SAMPLE ID	- RV245 -	0.
TEST STATUS	- INFORMATION ONLY - - 118+10 -	
STATION	- 118+10 -	-
	- 15 LT	-
DEPTH IN FEET	- 0-5	822 12일
MAT'L COLOR	- GRAY -	-
MAT'L TYPE	÷ ×.	.
LATITUDE DEG-MIN-SEC LONGITUDE DEG-MIN-SEC		-
% PASSING 2 IN.		_
$1 \ 1/2 \ IN.$		_
3/4 IN.		-
	- 100 -	-
NO. 4	_	-
NO. 10		-
NO. 40	- 89 _	_
NO. 80		-
NO. 200		
LIQUID LIMIT	- 26 -	ान ः
PLASTICITY INDEX	- 7 -	
AASHTO SOIL	- A-4(4) -	22°
UNIFIED SOIL	H H	
% MOISTURE CONTENT		-
	3 .	-
	ie –	-
		-
	сн —	-
	18	-
	97	-
)#	-
	8 7 . –	-
		-
REMARKS - W=MULTIPLE LAYERS		

AASHTO TESTS : T24 T88 T89 T90 T265

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