ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO		090474		
FEDERAL AID PROJE	ECT NO	HSIP-0008(38)		
F	IWY. 412 – BER	RYVILLE (SAFETY IMP	VTS.) (S)	
STATE HIGHWAY	21		5	
IN		CARROLL		

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

October 18, 2018

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 090474 Hwy. 412 – Berryville (Safety Impvts.)(Sel. Secs.) (S) Route 21 Section 5 Carroll County

Transmitted herewith is the requested Soil Survey, strength data and Resilient Modulus test results for the above referenced job. The project consists of making safety improvements at select selections of Highway 21. Samples were taken in the existing travel lanes, and ditch line. The shoulders were not paved within the project limits.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of highly plastic cherty clay. Cross sections are not currently available, but it is assumed the construction grade line will closely match that the existing roadway. The subgrade soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction. There were not any slide areas observed within the project limits.

Earthwork recommendations will be made upon request when plans are further developed and cross sections become 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 Berryville.
- 2. Asphalt Concrete Hot Mix

Туре	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.5	94.5
Binder Course	4.5	95.5
Base Course	4.1	95.9

Materials Engineer

MCB:pt:bjj Attachment

cc: State Constr. Eng. – Master File Copy District 9 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 ***

> BEGIN JOB – END JOB 7 RESILIENT MODULUS STA. 114+00 7948

REMARKS -

AASHTO TESTS : T190

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

	Material Code SSRVP	090474	Job No.
	Station No.: 114+00	8/9/18	Date Sampled:
)'LT	Location: 15'LT	August 29, 2018	Date Tested: Name of Project:
	sL. SEC.)(S)	HWY. 412 - BERRYVILLE (SAFETY IMPVTS.) (Code: 8 Name: CARROLL	•
0.5	Death	Code: 8 Name: CARROLL FRAZIER/BATES	County: Sampled By:
0-5	Depth: AASHTO Class:	20181809	Lab No.:
A-6 (9) 2	Material Type (1 or 2):	RV468	Sample ID:
2	LONGITUDE:		LATITUDE:
			4. 7
			1. Testing Inform
N		Preconditioning - Permanent Strain > 5% (Y=Y	
N))	Testing - Permanent Strain > 5% (Y=Yes or N=	
15		Number of Load Sequences Completed (0-15)	
		rmation:	2. Specimen Info
		Specimen Diameter (in):	
3.94		Тор	
3.94		Middle	
3.94		Bottom	
3.94		Average	
0.01		Membrane Thickness (in):	
8.02		Height of Specimen, Cap and Base (in):	
0.00		Height of Cap and Base (in):	
8.02		Initial Length, Lo (in):	
		Initial Area, Ao (sq. in):	
12.12 97.19		Initial Volume, AoLo (cu. in):	
57.15			
		Weight:	3. Soil Specimen
3091.90		Weight of Wet Soil Used (g):	
			4. Soil Properties
18.2		Optimum Moisture Content (%):	
104.8		Maximum Dry Density (pcf):	
99.6		95% of MDD (pcf):	
N/A		In-Situ Moisture Content (%):	
		erties:	5. Specimen Prop
3091.90		Wet Weight (g):	
18.1		Compaction Moisture content (%):	
121.22		Compaction Wet Density (pcf):	
102.64		Compaction Dry Density (pcf):	
18.0		Moisture Content After Mr Test (%):	
#VALUE!		st (Y=Yes, N=No, N/A=Not Applicable):	6. Quick Shear Te
0.21067(S3)^0.19727	11043(Sc)^-0.210	us, Mr:	7. Resilient Modu
			8. Comments
		lus, Mr:	

9. Tested By:

GW

Date: August 29, 2018

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

Job No. Date Samnled:	090474 8/9/18	Material Code	SSRVPS
Date Tested.		Location.	151 T
Name of Project:	HWY. 412 - BERRYVILLE (SAFETY IMPVTS.) (SEL. SEC.)(S)	SEC.)(S)	177 61
County:	Code: 8 Name: CARROLL	~ ~ ~	
Sampled By:	FRAZIER/BATES	Depth:	0-5
Lab No.:	20181809	AASHTO Class:	A-6 (9)
Sample ID:	RV468	Material Type (1 or 2): 2	: 2
LATITUDE:		LONGITUDE:	

Resilient Resilient	Strain Modulus	W		0.00013 13,769	0.00028 12,998	0.00046 11,761	0.00069 10,261	0.00096 8,998	0.00015 12,231	0.00032 11,433	0.00051 10,486	0.00073 9,628	0.00100 8,686	0.00018 10,319	0.00036 9,934	0.00057 9,367	0.00081 8,612	0.00108 7,948
Average Res	4. ²	Т		0.00107 0.0	0.00225 0.0	0.00369 0.0	0.00555 0.0	0.00773 0.0	0.00120 0.0	0.00254 0.0	0.00411 0.0	0.00589 0.0	0.00802 0.0	0.00142 0.0	0.00291 0.0	0.00458 0.0	0.00652 0.0	0.00868 0.0
Actual	Applied F Contact Stress	Ś	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	psi	1.8	3.6	5.4	7.1	8.7	1.8	3.6	5.4	7.1	8.7	1.8	3.6	5.3	7.0	8.6
Actual	Applied Max. Axial	Stress	psi	2.1	3.9	5.7	7.6	9.4	2.1	3.8	5.6	7.5	9.3	2.1	3.8	5.6	7.4	9.2
Actual	Applied Contact Load	P	- contact	2.8	2.8	3.6	6.0	8.4	2.8	2.8	2.8	5.1	7.5	2.8	2.8	2.8	4.2	6.6
Actual	Applied Cyclic Load	C.	- cyclic Ibs	22.2	44.2	65.6	86.0	105.1	22.2	43.8	65.1	85.6	105.2	22.2	43.7	64.8	84.9	104.3
Actual	Applied Max. Axial Load	L. C.	sql	25.0	47.0	69.2	92.0	113.5	25.0	46.6	67.9	90.8	112.8	25.0	46.6	67.6	89.1	110.9
Nominal	Maximum Axial Stress	Samelio	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	ဟိ	bsi	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
	PARAMËTER	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

August 29, 2018

DATE DATE

GW

TESTED BY REVIEWED BY

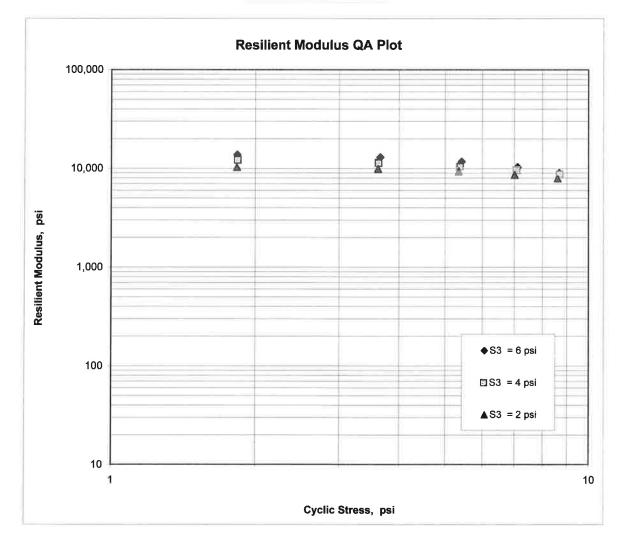
ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

Job No.	090474		5	Material Code SSRVPS
Date Sampled:	8/9/18			Station No.: 114+00
Date Tested:	August 29, 2018			Location: 15'LT
Name of Project:	HWY. 412 - BERRY	VILLE (SAFETY IMPVT	S.) (SEL. SEC.)(S)
County:	Code: 8	Name:	CARROLL	
Sampled By:	FRAZIER/BATES			Depth: 0-5
Lab No.:	20181809			AASHTO Class: A-6 (9)
Sample ID:	RV468		Mate	rial Type (1 or 2): 2
LATITUDE:				LONGITUDE:

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

K1 =	11,043	
K2 =	-0.21067	
K5 =	0.19727	
$R^2 =$	0.89	



comments: W=MULTIPLE LAYERS

Wednesday, October 10, 2018

Arkansas State Highway	Transporation Department
	Acterials Division

9/28/2018

JOB NAME: HWY. 412 - BERRYVILLE (SAFETY IMPVTS.)

COUNTY NO. 8 DATE TESTED

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	<i>L.L</i> .	P.I .	SOIL CLASS	<i>LAB</i> #:	%MOISTURE
114+00	15 LT	0-5	RD/BR	81	69	<i>Е</i> 62	59	<u>56</u>	39	23	A-6 (9)	RV468	
106+00	05 RT	0-5	RD/BR	79	64	57	47	44	39	26	A-6 (6)	S464	21.5
106+00	15 RT	0-5	RD/BR	80	70	62	55	51	39	25	A-6 (9)	S465	16.5
114+00	05 LT	0-5	RD/BR	87	78	73	69	66	48	31	A-7-6(18)	S466	20.7
114+00	15 LT	0-5	RD/BR	77	62	55	51	46	42	25	A-7-6 (7)	S467	24.7

JOB: 090474

Materials Division

DATE TESTED 9/28/2018								
D								Page 1 of 1
2 partment	ıeer						Wednesday, October 10, 2018	
Arkansas State Highway Transporation Department Materials Division	Michael Benson, Materials Engineer	SOUNDINGS					Wednes	
ıs State Highway Materials	Michael Benson	PAVEMENT SOUNDINGS						
Arkanso			AGG. BASE CRS. CL-7 5.0	AGG. BASE CRS. CL-7	AGG. BASE CRS. CL-7			
JOB: 090474 JOB NAME: HWY. 412 - BERRYVILLE (SAFETY IMPVTS.)				BC				
rryville (s/			ACHMBC 5.5W	ACHMBC	ACHMBC	3.0	AYERS	
090474 HWY. 412 - BEI	8		ACHMSC 4.5W	ACHMSC -	ACHMSC	5.0W	W≐MULTIPLE LAYERS	
0 4 <i>МЕ:</i> н	COUNTY NO.	LOC.	05 RT	15 RT	05 LT		2	
JOB: JOB N	COUN	STA.# LOC.	106+00	106+00	114+00		comments:	

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS MATERIALS DIVISION MICHAEL BENSON, MATERIALS ENGINEER *** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT *** - 09/28/18 SEQUENCE NO. - 1 DATE JOB NUMBER - 090474 MATERIAL CODE - SSRVPS FEDERAL AID NO.- TO BE ASSIGNED SPEC. YEAR - 2014 PURPOSE - SOIL SURVEY SAMPLE SUPPLIER ID. - 1 SPEC. REMARKS - NO SPECIFICATION CHECK COUNTY/STATE - 08 SUPPLIER NAME - STATE DISTRICT NO. - 09 NAME OF PROJECT - HWY. 412 - BERRYVILLE (SAFETY IMPVTS.) PROJECT ENGINEER - NOT APPLICABLE PIT/QUARRY - ARKANSAS LOCATION - CARROLL, COUNTY DATE SAMPLED - 08/09/18 SAMPLED BY - FRAZIER/BATES DATE RECEIVED - 08/10/18 SAMPLE FROM - TEST HOLE DATE TESTED - 09/28/18 MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS - S465 LAB NUMBER - 20181805 - 20181806 - 20181807 - S464 SAMPLE ID - S466 - INFORMATION ONLY - INFORMATION ONLY - INFORMATION ONLY TEST STATUS - INFORMATION - 106+00 - 114+00 - 05 LT - 114+00 STATION - 106+00 - 15 RT - 05 RT -LOCATION ud RT - 0-5 _____0-5 DEPTH IN FEET 0 - 5100 - RD/BR _____RD/BR ____ RD/BR MAT'L COLOR MAT'L TYPE _ LATITUDE DEG-MIN-SEC - 36 16 24.50 - 36 16 24.60 -36 16 30.20 LONGITUDE DEG-MIN-SEC - 93 31 26.80 93 31 26.70 93 31 33.70 2 IN. -% PASSING _ _ 1 1/2 IN. --_ - 100 -3/4 IN. - 100 100 _ 3/8 IN. - 94 90 95 _ 80 NO. 4 - 79 87 -NO. 10 - 64 70 78 -_ 62 NO. 40 - 57 73 _ NO. 80 - 47 - 55 69 _ NO. 200 - 44 51 66 48 39 39 LIQUID LIMIT _ -PLASTICITY INDEX 31 26 25 --A-6 (9) - A-6 (6) -AASHTO SOIL A - 7 - 6(18)_ UNIFIED SOIL -16.5 20.7 % MOISTURE CONTENT -21.5 4.5W ACHMSC ____ 5.OW (IN) - \rightarrow (IN) --ACHMBC 5.5W ----3.0 _ AGG. BASE CRS. CL-7 (IN) -5.0 ------6.0 --_ --_ -_ _ _ --

REMARKS - W=MULTIPLE LAYERS

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- 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 - 09/28/18 SEQUENCE NO. - 2 JOB NUMBER - 090474 MATERIAL CODE - SSRVPS FEDERAL AID NO.- TO BE ASSIGNED SPEC. YEAR - 2014 PURPOSE - SOIL SURVEY SAMPLE SUPPLIER ID. - 1 SPEC. REMARKS - NO SPECIFICATION CHECK COUNTY/STATE - 08 SUPPLIER NAME - STATE DISTRICT NO. - 09 NAME OF PROJECT - HWY. 412 - BERRYVILLE (SAFETY IMPVTS.) PROJECT ENGINEER - NOT APPLICABLE PIT/QUARRY - ARKANSAS LOCATION - CARROLL, COUNTY DATE SAMPLED - 08/09/18 SAMPLED BY - FRAZIER/BATES DATE RECEIVED - 08/10/18 SAMPLE FROM - TEST HOLE DATE TESTED - 09/28/18 MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS - 20181808 LAB NUMBER SAMPLE ID - S467 -TEST STATUS - INFORMATION ONLY -- 114+00 STATION _ LOCATION - 15 LT _ DEPTH IN FEET - 0-5 _ - RD/BR MAT'L COLOR MAT'L TYPE -LATITUDE DEG-MIN-SEC - 36 16 30.10 -93 31 33.70 LONGITUDE DEG-MIN-SEC -% PASSING 2 IN. -1 1/2 IN. -3/4 IN. -100 3/8 IN. -95 NO. 4 - 77 NO. 10 -62 NO. 40 - 55 NO. 80 - 51 NO. 200 - 46 LIQUID LIMIT -42 -PLASTICITY INDEX - 25 - A-7-6 (7) AASHTO SOIL UNIFIED SOIL _ % MOISTURE CONTENT _ 24.7

REMARKS - W=MULTIPLE LAYERS

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- AASHTO TESTS : T24 T88 T89 T90 T265
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ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION MICHAEL BENSON, MATERIALS ENGINEER *** SOIL SURVEY / PAVEMENT SOUNDING TEST	
DATE - 09/28/18 JOB NUMBER - 090474 FEDERAL AID NO TO BE ASSIGNED PURPOSE - SOIL SURVEY SAMPLE SPEC. REMARKS - NO SPECIFICATION CHECK	SEQUENCE NO 1 MATERIAL CODE - RV SPEC. YEAR - 2014 SUPPLIER ID 1 COUNTY/STATE - 08 DISTRICT NO 09
LOCATION - CARROLL, COUNTY SAMPLED BY - FRAZIER/BATES SAMPLE FROM - TEST HOLE MATERIAL DESC SOIL SURVEY - RESISTANCE R-VALUE ACTUAL	DATE SAMPLED - 08/09/18 DATE RECEIVED - 08/10/18 DATE TESTED - 09/28/18 RESULTS
LAB NUMBER - 20181809 -	-
SAMPLE ID - RV468 -	-
TEST STATUS - INFORMATION ONLY - STATION - 114+00 -	-
STATION - 114+00 - LOCATION - 15 LT -	
DEPTH IN FEET - 0-5	-
MAT'L COLOR _ RD/BR _	-
MAT'L TYPE –	
LATITUDE DEG-MIN-SEC - 36 16 30.10 - LONGITUDE DEG-MIN-SEC - 93 31 33.70	-
% PASSING 2 IN	-
1 1/2 IN	_
3/4 IN 100 - 3/8 IN 96 -	_
NO. 4 - 81	-
NO. 10 - 69	-
NO. 40 - 62	-
NO. 80 - 59 NO. 200 - 56	-
LIQUID LIMIT - 39 -	-
PLASTICITY INDEX - 23 -	-
AASHTO SOIL - A-6 (9) -	-
UNIFIED SOIL -	_
% MOISTURE CONTENT -	
	-
	-
	-
	-
	-
	-
	_
	-
REMARKS - W=MULTIPLE LAYERS -	

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