

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 050343

FEDERAL AID PROJECT NO. NHPP-0032(29)

DRY RUN CREEK STR. & APPRS. (S)

STATE HIGHWAY 106 SECTION 1

IN INDEPENDENCE 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 1, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 050343
Dry Run Str. & Apprs (S)
Route 106 Section 1
Independence 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 for Dry Run creek on Highway 106. 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 clay with sand. 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.

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 Batesville.
2. Asphalt Concrete Hot Mix

Table with 3 columns: Type, Asphalt Cement %, Mineral Aggregate %. Rows include Surface Course, Binder Course, and Base Course.

Handwritten signature of Michael C. Benson, Materials Engineer

MCB:pt:bjj
Attachment

cc: State Constr. Eng. - Master File Copy
District 5 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 - 10/12/2017
JOB NUMBER - 050343

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 32
DISTRICT NO. - 5

JOB NAME - DRY RUN CREEK STR. & APPRS. (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB LESS THAN 5

RESILIENT MODULUS
STA. 110 + 50 8713

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.	050343	Material Code	SSRVPS
Date Sampled:	9/13/17	Station No.:	110+50
Date Tested:	October 3, 2017	Location:	21' RT
Name of Project:	DRY RUN CREEK STR. & APPRS. (S)		
County:	Code: 32	Name:	INDEPENDENCE
Sampled By:	THORNTON/BUIE	Depth:	0-5
Lab No.:	20172887	AASHTO Class:	A-7-6 (9)
Sample ID:	RV582	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

1. Testing Information:

Preconditioning - Permanent Strain > 5% (Y=Yes or N= No)	N
Testing - Permanent Strain > 5% (Y=Yes or N=No)	N
Number of Load Sequences Completed (0-15)	15

2. Specimen Information:

Specimen Diameter (in):	
Top	3.96
Middle	3.95
Bottom	3.94
Average	3.95
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):	12.18
Initial Volume, AoLo (cu. in):	97.80

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	2969.90
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4. Soil Properties:

Optimum Moisture Content (%):	18.3
Maximum Dry Density (pcf):	103.4
95% of MDD (pcf):	98.2
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	2969.90
Compaction Moisture content (%):	18.6
Compaction Wet Density (pcf):	115.70
Compaction Dry Density (pcf):	97.56
Moisture Content After Mr Test (%):	18.5

6. Quick Shear Test (Y=Yes, N=No, N/A=Not Applicable):

#VALUE!

7. Resilient Modulus, Mr:

11166(Sc)^{-0.18666}(S3)^{0.21343}

8. Comments

9. Tested By:

GW _____

Date: October 3, 2017

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No. 050343
 Date Sampled: 9/13/17
 Date Tested: October 3, 2017
 Name of Project: DRY RUN CREEK STR. & APPRS. (S)
 County: Code: 32 Name: INDEPENDENCE
 Sampled By: THORNTON/BUJE
 Lab No.: 20172887
 Sample ID: RV582
 LATITUDE:
 Material Code: SSRVPS
 Station No.: 110+50
 Location: 21' RT
 Depth: 0-5
 AASHTO Class: A-7-6 (9)
 Material Type (1 or 2): 2
 LONGITUDE:

PARAMETER	Chamber Confining Pressure	Nominal Maximum Axial Stress	Actual Applied Max. Axial Load	Actual Applied Cyclic Load	Actual Applied Contact Load	Actual Applied Max. Axial Stress	Actual Applied Cyclic Stress	Actual Applied Contact Stress	Average Recov Def. LVDT 1 and 2	Resilient Strain	Resilient Modulus
DESIGNATION	S ₃	S _{cyclic}	P _{max}	P _{cyclic}	P _{contact}	S _{max}	S _{cyclic}	S _{contact}	H _{avg}	ε _r	M _r
UNIT	psi	psi	lbs	lbs	lbs	psi	psi	psi	in	in/in	psi
Sequence 1	6.0	2.0	25.2	22.3	2.9	2.1	1.8	0.2	0.00103	0.00013	14,299
Sequence 2	6.0	4.0	47.2	44.4	2.8	3.9	3.6	0.2	0.00213	0.00027	13,703
Sequence 3	6.0	6.0	69.8	66.1	3.7	5.7	5.4	0.3	0.00348	0.00043	12,537
Sequence 4	6.0	8.0	92.8	86.7	6.1	7.6	7.1	0.5	0.00515	0.00064	11,091
Sequence 5	6.0	10.0	114.6	106.1	8.5	9.4	8.7	0.7	0.00700	0.00087	9,994
Sequence 6	4.0	2.0	25.1	22.4	2.7	2.1	1.8	0.2	0.00110	0.00014	13,389
Sequence 7	4.0	4.0	47.0	44.3	2.7	3.9	3.6	0.2	0.00240	0.00030	12,183
Sequence 8	4.0	6.0	68.3	65.5	2.8	5.6	5.4	0.2	0.00384	0.00048	11,266
Sequence 9	4.0	8.0	91.4	86.3	5.1	7.5	7.1	0.4	0.00540	0.00067	10,535
Sequence 10	4.0	10.0	114.0	106.5	7.5	9.4	8.7	0.6	0.00727	0.00090	9,665
Sequence 11	2.0	2.0	24.9	22.2	2.7	2.0	1.8	0.2	0.00135	0.00017	10,878
Sequence 12	2.0	4.0	46.8	44.0	2.8	3.8	3.6	0.2	0.00285	0.00035	10,183
Sequence 13	2.0	6.0	67.9	65.1	2.8	5.6	5.3	0.2	0.00443	0.00055	9,689
Sequence 14	2.0	8.0	89.9	85.6	4.3	7.4	7.0	0.4	0.00614	0.00077	9,183
Sequence 15	2.0	10.0	111.8	105.1	6.7	9.2	8.6	0.6	0.00795	0.00099	8,713

TESTED BY _____ DATE _____
 REVIEWED BY _____ DATE _____
 GW _____

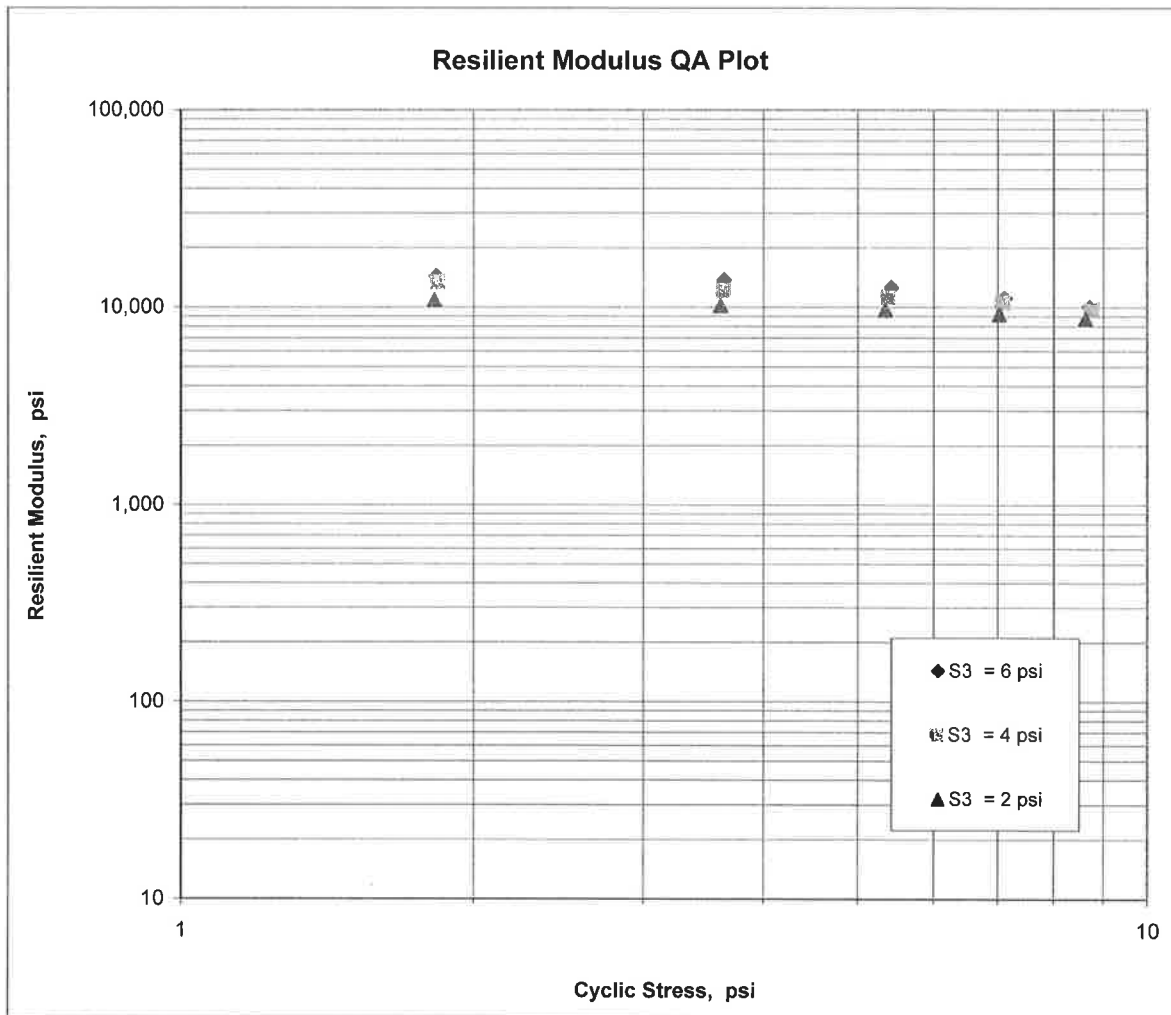
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

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

Job No.	050343	Material Code	SSRVPS
Date Sampled:	9/13/17	Station No.:	110+50
Date Tested:	October 3, 2017	Location:	21' RT
Name of Project:	DRY RUN CREEK STR. & APPRS. (S)		
County:	Code: 32	Name:	INDEPENDENCE
Sampled By:	THORNTON/BUIE	Depth:	0-5
Lab No.:	20172887	AASHTO Class:	A-7-6 (9)
Sample ID:	RV582	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

$$M_R = K_1 (S_C)^{K_2} (S_d)^{K_5}$$

$K_1 = \underline{11,166}$
 $K_2 = \underline{-0.18666}$
 $K_5 = \underline{0.21343}$
 $R^2 = \underline{0.93}$



JOB: 050343

Arkansas State Highway Transportation Department

JOB NAME: DRY RUN CREEK STR. & APPRS. (S)

Materials Division

COUNTY NO. 32 DATE TESTED 9/29/2017

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR						L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				#4	#10	#40	#80	#200					
				S	I	E	V	E	S				
110+50	21 RT	0-5	BROWN	64	58	52	47	40	54	42	A-7-6(9)	RV582	
106+00	06 LT	0-5	BROWN	94	90	85	80	73	40	26	A-6(17)	S578	20.7
106+00	15 LT	0-5	BROWN	87	80	70	64	56	36	23	A-6(9)	S579	15.8
119+00	06 RT	0-5	BROWN	94	87	83	80	74	57	39	A-7-6(28)	S580	30.1
119+00	27 RT	0-5	BROWN	92	88	86	84	78	69	49	A-7-6(39)	S581	36.1

comments: W=MULTIPLE LAYERS

Monday, October 30, 2017

JOB: 050343

JOB NAME: DRY RUN CREEK STR. & APPRS. (S)

Arkansas State Highway Transportation Department

Materials Division

DATE TESTED

9/29/2017

COUNTY NO. 32

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

106+00	06 LT	ACHMSC 5.5W	ACHMBC 4.0	AGG. BASE CRS CL-7 6.0
106+00	15 LT	ACHMSC ---	ACHMBC ---	AGG. BASE CRS CL-7 ---
119+00	06 RT	ACHMSC 6.25W	ACHMBC 1.0	AGG. BASE CRS CL-7 7.0

comments: W=MULTIPLE LAYERS

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE	- 09/29/17	SEQUENCE NO.	- 1
JOB NUMBER	- 050343	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	- 32
SUPPLIER NAME	- STATE	DISTRICT NO.	- 5
NAME OF PROJECT - DRY RUN CREEK STR. & APPRS. (S)			
PROJECT ENGINEER - NOT APPLICABLE			
PIT/QUARRY - ARKANSAS			
LOCATION	- INDEPENDENCE COUNTY	DATE SAMPLED	- 09/13/17
SAMPLED BY	- THORNTON, BUIE	DATE RECEIVED	- 09/19/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 09/29/17
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

LAB NUMBER	- 20172883	- 20172884	- 20172885
SAMPLE ID	- S578	- S579	- S580
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 106+00	- 106+00	- 119+00
LOCATION	- 06 LT	- 15 LT	- 06 RT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BROWN	- BROWN	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 46 30.70	- 35 46 30.70	- 35 46 31.70
LONGITUDE DEG-MIN-SEC	- 91 40 1.50	- 91 40 1.50	- 91 40 13.50
% PASSING			
2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	-	100	100
3/8 IN.	100	96	99
NO. 4	94	87	94
NO. 10	90	80	87
NO. 40	85	70	83
NO. 80	80	64	80
NO. 200	73	56	74
LIQUID LIMIT	- 40	- 36	- 57
PLASTICITY INDEX	- 26	- 23	- 39
AASHTO SOIL	- A-6(17)	- A-6(9)	- A-7-6(28)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 20.7	- 15.8	- 30.1
ACHMSC (IN)	- 5.5W	- ---	- 6.25W
ACHMBC (IN)	- 4.0	- ---	- 1.0
AGG. BASE CRS CL-7 (IN)	- 6.0	- ---	- 7.0
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS

-
-
-
-

AASHTO TESTS : T24 T88 T89 T90 T265
:

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 09/29/17 SEQUENCE NO. - 2
JOB NUMBER - 050343 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 - 32
SUPPLIER NAME - STATE DISTRICT NO. - 5
NAME OF PROJECT - DRY RUN CREEK STR. & APPRS. (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - INDEPENDENCE COUNTY DATE SAMPLED - 09/13/17
SAMPLED BY - THORNTON, BUIE DATE RECEIVED - 09/19/17
SAMPLE FROM - TEST HOLE DATE TESTED - 09/29/17
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER	-	20172886	-	-
SAMPLE ID	-	S581	-	-
TEST STATUS	-	INFORMATION ONLY	-	-
STATION	-	119+00	-	-
LOCATION	-	27 RT	-	-
DEPTH IN FEET	-	0-5	-	-
MAT'L COLOR	-	BROWN	-	-
MAT'L TYPE	-		-	-
LATITUDE DEG-MIN-SEC	-	35 46 31.90	-	-
LONGITUDE DEG-MIN-SEC	-	91 40 16.60	-	-
% PASSING	2	IN.	-	-
	1 1/2	IN.	-	-
	3/4	IN.	-	100
	3/8	IN.	-	98
	NO. 4		-	92
	NO. 10		-	88
	NO. 40		-	86
	NO. 80		-	84
	NO. 200		-	78
LIQUID LIMIT	-	69	-	-
PLASTICITY INDEX	-	49	-	-
AASHTO SOIL	-	A-7-6(39)	-	-
UNIFIED SOIL	-		-	-
% MOISTURE CONTENT	-	36.1	-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-

REMARKS - W=MULTIPLE LAYERS

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE	- 09/29/17	SEQUENCE NO.	- 1
JOB NUMBER	- 050343	MATERIAL CODE	- RV
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 32
SUPPLIER NAME	- STATE	DISTRICT NO.	- 5
NAME OF PROJECT	- DRY RUN CREEK STR. & APPRS. (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- INDEPENDENCE COUNTY	DATE SAMPLED	- 09/13/17
SAMPLED BY	- THORNTON, BUIE	DATE RECEIVED	- 09/19/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 09/29/17
MATERIAL DESC.	- SOIL SURVEY - RESISTANCE R-VALUE ACTUAL RESULTS		

LAB NUMBER	- 20172887	-	-
SAMPLE ID	- RV582	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 110+50	-	-
LOCATION	- 21 RT	-	-
DEPTH IN FEET	- 0-5	-	-
MAT'L COLOR	- BROWN	-	-
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 46 31.20	-	-
LONGITUDE DEG-MIN-SEC	- 91 40 11.80	-	-
% PASSING	2 IN.	-	-
	1 1/2 IN.	- 100	-
	3/4 IN.	- 94	-
	3/8 IN.	- 73	-
	NO. 4	- 64	-
	NO. 10	- 58	-
	NO. 40	- 52	-
	NO. 80	- 47	-
	NO. 200	- 40	-
LIQUID LIMIT	- 54	-	-
PLASTICITY INDEX	- 42	-	-
AASHTO SOIL	- A-7-6(9)	-	-
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS