

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 110648

FEDERAL AID PROJECT NO. NHPP-0019(43)

HWY. 364 STR. & APPRS. (S)

STATE HIGHWAY 364 SECTION 2

IN _____ CROSS _____ 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

March 15, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 110648
Hwy. 364 Str. & Apprs. (S)
Route 364 Section 2
Cross 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 364. 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 of non-plastic sands to low plasticity clayey sand. Cross sections are not currently available; it is assumed that 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 drying and compactive efforts, if the weather is favorable during construction. No slides were observed within the project limits.

Additional earthwork requirements will be made upon request when plans are further developed

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 port in West Memphis.
2. Asphalt Concrete Hot Mix

PG 64-22		
Type	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		
Type	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		
Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.3	94.7
Binder Course	4.3	95.7
Base Course	3.8	96.2



Michael C. 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 - 03/10/2017
JOB NUMBER - 110648

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 19
DISTRICT NO. - 01

JOB NAME - HWY. 364 STR. & APPRS. (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 20

RESILIENT MODULUS
124+00 8971

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.	110648	Material Code	SSRVPS
Date Sampled:	2/15/17	Station No.:	124+00
Date Tested:	March 8, 2017	Location:	19RT
Name of Project:	HWY. 364 STR. & APPRS. (S)		
County:	Code: 19	Name: CROSS	
Sampled By:	THORNTON/TAYLOR		
Lab No.:	20170598	Depth:	0-5
Sample ID:	RV162	AASHTO Class:	A-4(2)
LATITUDE:		Material Type (1 or 2):	2
		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	3.97
Middle	3.97
Bottom	3.97
Average	3.97
Membrane Thickness (in):	0.01
Height of Specimen, Cap and Base (in):	8.02
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.02
Initial Area, Ao (sq. in):	12.30
Initial Volume, AoLo (cu. in):	98.68

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3042.90
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4. Soil Properties:

Optimum Moisture Content (%):	15.3
Maximum Dry Density (pcf):	106
95% of MDD (pcf):	100.7
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3042.90
Compaction Moisture content (%):	15.5
Compaction Wet Density (pcf):	117.50
Compaction Dry Density (pcf):	101.73
Moisture Content After Mr Test (%):	15.2

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

#VALUE!

7. Resilient Modulus, Mr:

9437(Sc)^-0.13030(S3)^0.29781

8. Comments

9. Tested By:

GW

Date: March 8, 2017

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

**AAASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS
RECOMPACTED SAMPLES**

Job No. 110648 **Material Code** SSRVPS
Date Sampled: 2/15/17 **Station No.:** 124+00
Date Tested: March 8, 2017 **Location:** 19RT

Name of Project: HWY. 364 STR. & APPRS. (S)

County: Code: 19 **Name:** CROSS

Sampled By: THORNTON/TAYLOR

Lab No.: 20170598

Sample ID: RV162

LATITUDE:

Depth: 0-5

AAASHTO Class: A-4(2)

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
	S ₃ psi	S _{cyclic} psi	P _{max} lbs	P _{cyclic} lbs	P _{contact} lbs	S _{max} psi	S _{cyclic} psi	S _{contact} psi	H _{avg} in	ε _r in/in	M _r psi
Sequence 1	6.0	2.0	25.4	22.9	2.5	2.1	1.9	0.2	0.00103	0.00013	14,469
Sequence 2	6.0	4.0	48.0	45.4	2.6	3.9	3.7	0.2	0.00215	0.00027	13,748
Sequence 3	6.0	6.0	71.0	67.5	3.5	5.8	5.5	0.3	0.00338	0.00042	13,029
Sequence 4	6.0	8.0	95.0	89.0	5.9	7.7	7.2	0.5	0.00467	0.00058	12,420
Sequence 5	6.0	10.0	119.2	110.9	8.3	9.7	9.0	0.7	0.00590	0.00074	12,254
Sequence 6	4.0	2.0	25.1	22.7	2.5	2.0	1.8	0.2	0.00109	0.00014	13,522
Sequence 7	4.0	4.0	47.1	44.6	2.5	3.8	3.6	0.2	0.00243	0.00030	11,965
Sequence 8	4.0	6.0	68.9	66.2	2.6	5.6	5.4	0.2	0.00387	0.00048	11,145
Sequence 9	4.0	8.0	93.3	88.2	5.1	7.6	7.2	0.4	0.00527	0.00066	10,907
Sequence 10	4.0	10.0	117.7	110.1	7.6	9.6	9.0	0.6	0.00669	0.00083	10,735
Sequence 11	2.0	2.0	25.1	22.5	2.6	2.0	1.8	0.2	0.00134	0.00017	10,909
Sequence 12	2.0	4.0	46.7	44.1	2.6	3.8	3.6	0.2	0.00295	0.00037	9,727
Sequence 13	2.0	6.0	67.7	65.0	2.7	5.5	5.3	0.2	0.00466	0.00058	9,096
Sequence 14	2.0	8.0	90.6	86.3	4.3	7.4	7.0	0.3	0.00625	0.00078	9,001
Sequence 15	2.0	10.0	114.6	107.9	6.7	9.3	8.8	0.5	0.00784	0.00098	8,971

TESTED BY _____
 REVIEWED BY _____

GW

DATE

DATE

March 8, 2017

DATE

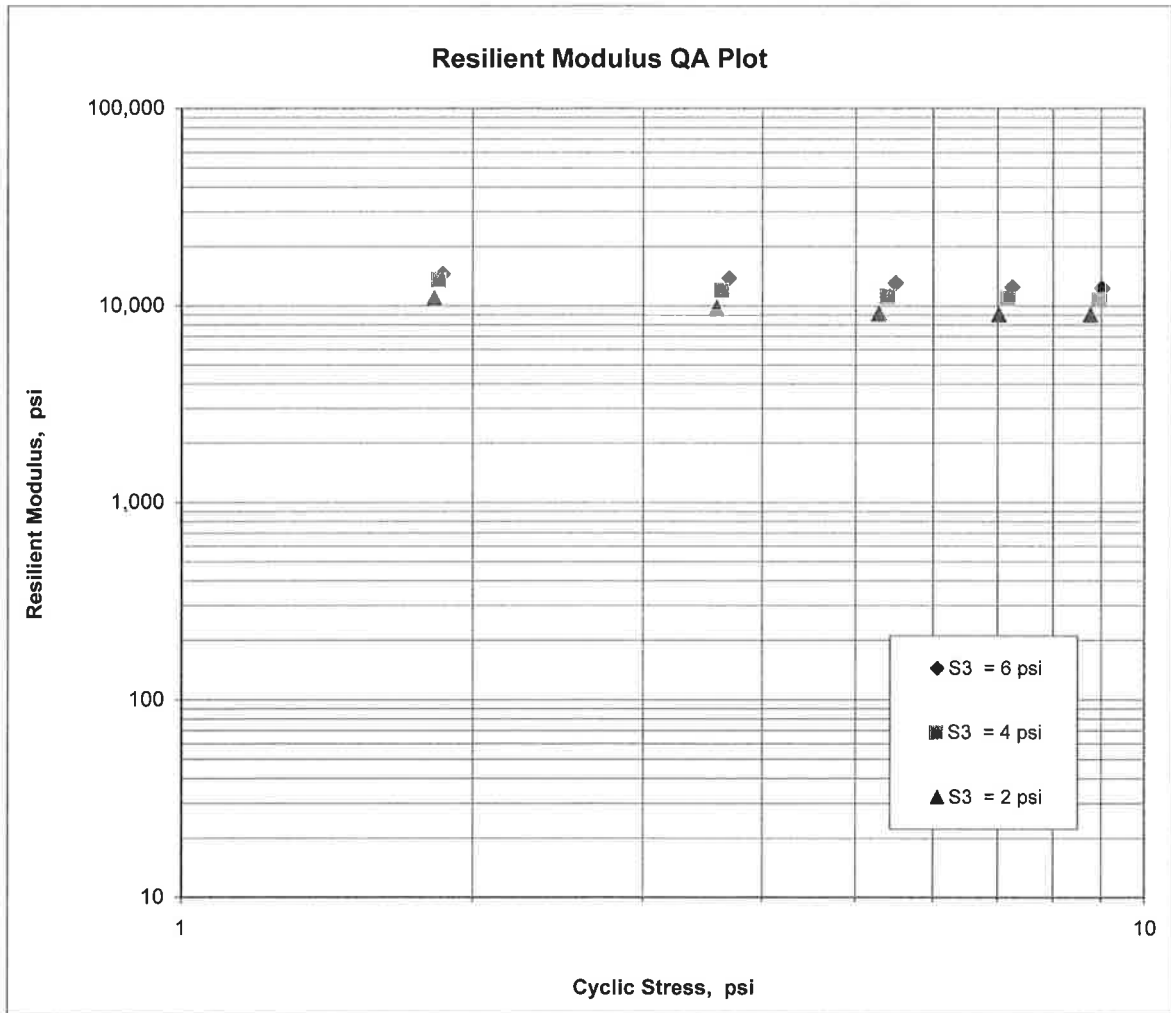
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

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

Job No.	110648	Material Code	SSRVPS
Date Sampled:	2/15/17	Station No.:	124+00
Date Tested:	March 8, 2017	Location:	19RT
Name of Project:	HWY. 364 STR. & APPRS. (S)		
County:	Code: 19	Name:	CROSS
Sampled By:	THORNTON/TAYLOR		Depth: 0-5
Lab No.:	20170598	AASHTO Class:	A-4(2)
Sample ID:	RV162	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

$$M_R = K_1 (S_C)^{K_2} (S_3)^{K_5}$$

$K_1 = \underline{9,437}$
 $K_2 = \underline{-0.13030}$
 $K_5 = \underline{0.29781}$
 $R^2 = \underline{0.99}$



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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE	- 03/09/17	SEQUENCE NO.	- 1
JOB NUMBER	- 110648	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	- 19
SUPPLIER NAME	- STATE	DISTRICT NO.	- 01
NAME OF PROJECT	- HWY. 364 STR. & APPRS. (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CROSS, COUNTY	DATE SAMPLED	- 02/15/17
SAMPLED BY	- THORNTON/TAYLOR	DATE RECEIVED	- 02/17/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 03/08/17
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20170594	- 20170595	- 20170596
SAMPLE ID	- S158	- S159	- S160
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 124+00	- 124+00	- 133+00
LOCATION	- 06' RT	- 18' RT	- 06' LT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- GRAY	- GRAY	- GRAY
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 20 45.20	- 35 20 45.00	- 35 20 46.60
LONGITUDE DEG-MIN-SEC	- 90 43 4.20	- 90 43 4.10	- 90 42 53.70
% PASSING			
2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	- 100	- 100	-
3/8 IN.	- 99	- 99	-
NO. 4	- 98	- 95	- 100
NO. 10	- 96	- 95	-
NO. 40	- 92	- 94	-
NO. 80	- 89	- 90	-
NO. 200	- 88	- 89	- 91
LIQUID LIMIT	- 27	- 28	- ND
PLASTICITY INDEX	- 8	- 9	- NP
AASHTO SOIL	- A-4 (6)	- A-4 (7)	- A-4 (0)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 20.8	- 25.3	- 19.4
ACHMSC (IN)	- 3.0W	- ---	- 3.0W
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS
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-
-
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 - 03/10/17 SEQUENCE NO. - 2
JOB NUMBER - 110648 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 - 19
SUPPLIER NAME - STATE DISTRICT NO. - 01
NAME OF PROJECT - HWY. 364 STR. & APPRS. (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - CROSS, COUNTY DATE SAMPLED - 02/15/17
SAMPLED BY - THORNTON/TAYLOR DATE RECEIVED - 02/17/17
SAMPLE FROM - TEST HOLE DATE TESTED - 03/08/17
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER - 20170597 -
SAMPLE ID - S161 -
TEST STATUS - INFORMATION ONLY -
STATION - 133+00 -
LOCATION - 18'LT -
DEPTH IN FEET - 0-5 -
MAT'L COLOR - GRAY -
MAT'L TYPE - -
LATITUDE DEG-MIN-SEC - 35 20 46.60 -
LONGITUDE DEG-MIN-SEC - 90 42 53.80 -
% PASSING 2 IN. - -
1 1/2 IN. - -
3/4 IN. - 100 -
3/8 IN. - 99 -
NO. 4 - 95 -
NO. 10 - 94 -
NO. 40 - 93 -
NO. 80 - 90 -
NO. 200 - 87 -
LIQUID LIMIT - ND -
PLASTICITY INDEX - NP -
AASHTO SOIL - A-4(0) -
UNIFIED SOIL - -
% MOISTURE CONTENT - 23.4 -
- -
- -
- -
- -
- -
- -
- -
- -
- -
- -
- -

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	- 03/10/17	SEQUENCE NO.	- 1
JOB NUMBER	- 110648	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	- 19
SUPPLIER NAME	- STATE	DISTRICT NO.	- 01
NAME OF PROJECT	- HWY. 364 STR. & APPRS. (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CROSS, COUNTY	DATE SAMPLED	- 02/15/17
SAMPLED BY	- THORNTON/TAYLOR	DATE RECEIVED	- 02/17/17
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 03/08/17
MATERIAL DESC.	- SOIL SURVEY - RESISTANCE R-VALUE	ACTUAL RESULTS	

LAB NUMBER	-	20170598	-	-
SAMPLE ID	-	RV162	-	-
TEST STATUS	-	INFORMATION ONLY	-	-
STATION	-	124+00	-	-
LOCATION	-	19'RT	-	-
DEPTH IN FEET	-	0-5	-	-
MAT'L COLOR	-	GRAY	-	-
MAT'L TYPE	-		-	-
LATITUDE DEG-MIN-SEC	-	35 20 45.00	-	-
LONGITUDE DEG-MIN-SEC	-	90 43 4.10	-	-
% PASSING	2	IN.	-	-
	1 1/2	IN.	-	-
	3/4	IN.	-	100
	3/8	IN.	-	99
	NO. 4		-	97
	NO. 10		-	94
	NO. 40		-	88
	NO. 80		-	83
	NO. 200		-	82
LIQUID LIMIT	-	26	-	-
PLASTICITY INDEX	-	4	-	-
AASHTO SOIL	-	A-4 (2)	-	-
UNIFIED SOIL	-		-	-
% MOISTURE CONTENT	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-

REMARKS - W=MULTIPLE LAYERS

-
-
-
-

AASHTO TESTS : T24 T88 T89 T90 T265

JOB: 110648

Arkansas State Highway Transportation Department

JOB NAME: HWY. 364 STR. & APPRS. (S)

Materials Division

COUNTY NO. 19 DATE TESTED 3/8/2017

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				
124+00	19'RT	0-5	GRAY	97	94	88	83	82	26	4	A-4(2)	RV162	
124+00	06' RT	0-5	GRAY	98	96	92	89	88	27	8	A-4(6)	S158	20.8
124+00	18'RT	0-5	GRAY	95	95	94	90	89	28	9	A-4(7)	S159	25.3
133+00	06' LT	0-5	GRAY	100				91	ND	NP	A-4(0)	S160	19.4
133+00	18'LT	0-5	GRAY	95	94	93	90	87	ND	NP	A-4(0)	S161	23.4

comments: W=MULTIPLE LAYERS

Monday, March 13, 2017

JOB: 110648

JOB NAME: HWY. 364 STR. & APPRS. (S)

**Arkansas State Highway Transportation Department
Materials Division**

DATE TESTED
3/8/2017

COUNTY NO. 19

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

124+00	18'RT	ACHMSC

124+00	06' RT	ACHMSC
		3.0W
133+00	06' LT	ACHMSC
		3.0W

comments: W=MULTIPLE LAYERS