

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 061460

FEDERAL AID PROJECT NO. NHPP-0030(22)

HWY. 84 STRS. & APPRS. (OAK GROVE) (S)

STATE HIGHWAY 84 SECTION 6

IN HOT SPRING 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 20, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 061460
Hwy. 84 Str. & Apprs (S)
Route 84 Section 6
Hot Spring 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 2 bridges on Highway 84. 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 sandy clay with gravel. 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. There were not any active slide areas observed within the project limits. Rock was encountered at station 110+00 6 feet right of centerline at a depth of 4.5 feet.

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 Jones Mill.
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 6 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 - 11/03/2017 SEQUENCE NO. - 1
JOB NUMBER - 061460 MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 30
DISTRICT NO. - 06

JOB NAME - HWY.84 STRS. & APPRS. (OAK GROVE) (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 10

RESILIENT MODULUS
STA. 110 + 10 8260

REMARKS -

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AASHTO TESTS : T190

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	061460	Material Code	SSRVPS
Date Sampled:	10/17/17	Station No.:	110+10
Date Tested:	October 27, 2017	Location:	18'RT
Name of Project:	HWY. 84 STRS. & APPRS. (OAK GROVE)(S)		
County:	Code: 30	Name:	HOT SPRINGS
Sampled By:	BUIE/JORDAN	Depth:	0-5
Lab No.:	20173234	AASHTO Class:	A-6 (0)
Sample ID:	RV649	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	3.96
Average	3.96
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):	12.22
Initial Volume, AoLo (cu. in):	98.01

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3271.30
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4. Soil Properties:

Optimum Moisture Content (%):	12.6
Maximum Dry Density (pcf):	117
95% of MDD (pcf):	111.2
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3271.30
Compaction Moisture content (%):	12.9
Compaction Wet Density (pcf):	127.17
Compaction Dry Density (pcf):	112.64
Moisture Content After Mr Test (%):	12.8

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

7. Resilient Modulus, Mr: 10854(S_c)^{-0.23}136(S₃)^{0.31585}

8. Comments

9. Tested By: GW Date: October 27, 2017

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

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

Job No. 061460 **Material Code** SSRVPS
Date Sampled: 10/17/17 **Station No.:** 110+10
Date Tested: October 27, 2017 **Location:** 18'RT
Name of Project: HWY. 84 STRS. & APPRS. (OAK GROVE)(S)
County: Code: 30 **Name:** HOT SPRINGS
Sampled By: BUIE/JORDAN **Depth:** 0-5
Lab No.: 20173234 **AASHTO Class:** A-6 (0)
Sample ID: RV649 **Material Type (1 or 2):** 2
LATTITUDE: **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	25.1	22.3	2.8	2.1	1.8	0.2	0.00089	0.00011	16,484
Sequence 2	6.0	4.0	47.2	44.4	2.9	3.9	3.6	0.2	0.00194	0.00024	15,012
Sequence 3	6.0	6.0	69.6	65.9	3.7	5.7	5.4	0.3	0.00318	0.00040	13,613
Sequence 4	6.0	8.0	92.5	86.4	6.1	7.6	7.1	0.5	0.00471	0.00059	12,040
Sequence 5	6.0	10.0	115.2	106.7	8.6	9.4	8.7	0.7	0.00628	0.00078	11,150
Sequence 6	4.0	2.0	25.0	22.2	2.8	2.0	1.8	0.2	0.00104	0.00013	14,042
Sequence 7	4.0	4.0	46.7	43.9	2.8	3.8	3.6	0.2	0.00228	0.00028	12,625
Sequence 8	4.0	6.0	67.9	65.0	2.8	5.6	5.3	0.2	0.00370	0.00046	11,540
Sequence 9	4.0	8.0	90.4	85.2	5.2	7.4	7.0	0.4	0.00531	0.00066	10,531
Sequence 10	4.0	10.0	113.0	105.2	7.7	9.2	8.6	0.6	0.00702	0.00088	9,835
Sequence 11	2.0	2.0	24.8	22.0	2.8	2.0	1.8	0.2	0.00125	0.00016	11,565
Sequence 12	2.0	4.0	45.8	43.0	2.8	3.8	3.5	0.2	0.00275	0.00034	10,276
Sequence 13	2.0	6.0	66.2	63.3	2.8	5.4	5.2	0.2	0.00439	0.00055	9,457
Sequence 14	2.0	8.0	87.3	82.9	4.4	7.1	6.8	0.4	0.00622	0.00078	8,739
Sequence 15	2.0	10.0	109.5	102.6	6.8	9.0	8.4	0.6	0.00815	0.00102	8,260

TESTED BY _____ **DATE** October 27, 2017
REVIEWED BY _____ **DATE** _____

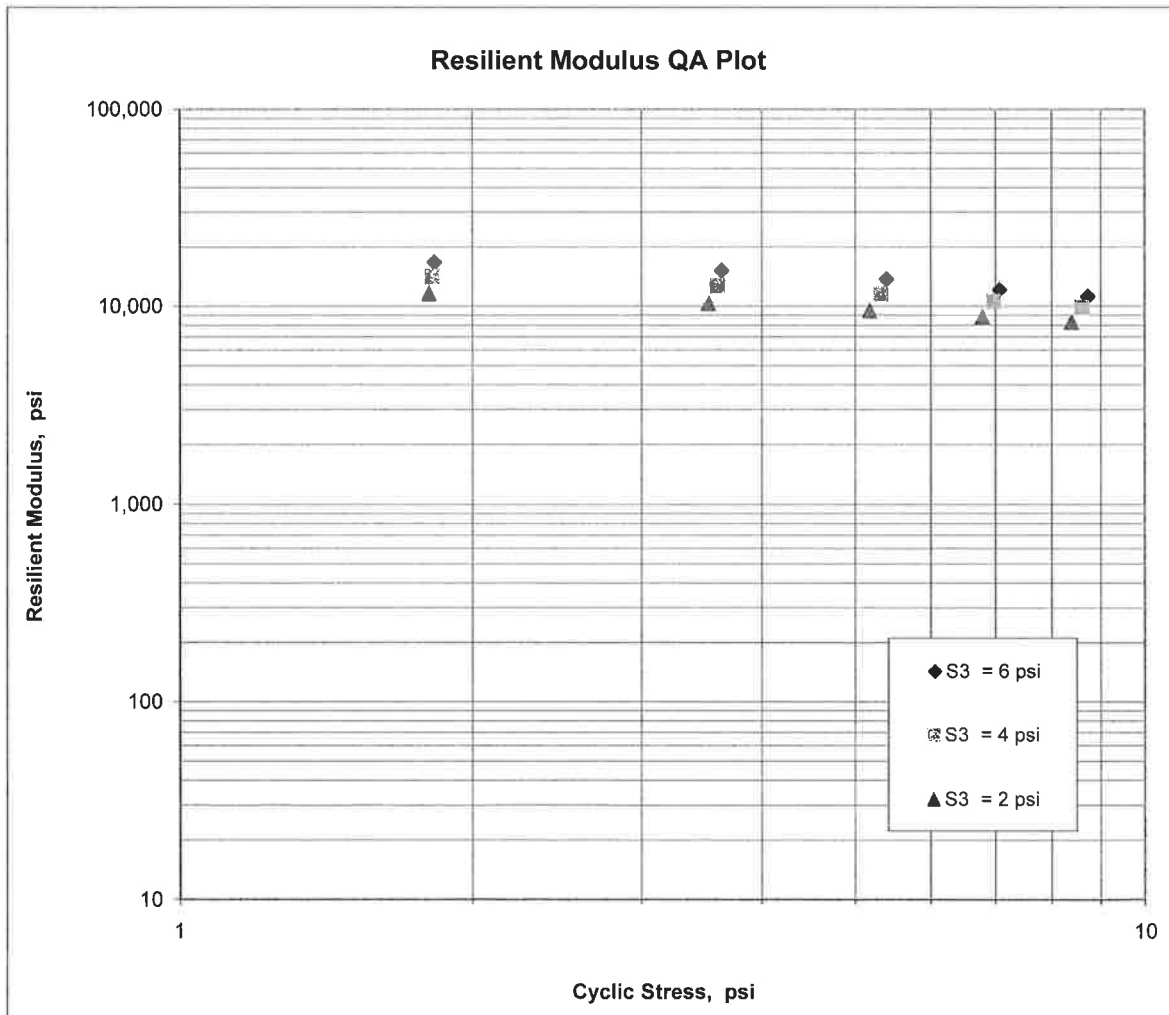
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

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

Job No.	061460	Material Code	SSRVPS
Date Sampled:	10/17/17	Station No.:	110+10
Date Tested:	October 27, 2017	Location:	18'RT
Name of Project:	HWY. 84 STRS. & APPRS. (OAK GROVE)(S)		
County:	Code: 30	Name:	HOT SPRINGS
Sampled By:	BUIE/JORDAN	Depth:	0-5
Lab No.:	20173234	AASHTO Class:	A-6 (0)
Sample ID:	RV649	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

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

$K_1 = \underline{\underline{10,854}}$
 $K_2 = \underline{\underline{-0.23136}}$
 $K_5 = \underline{\underline{0.31585}}$
 $R^2 = \underline{\underline{0.98}}$



JOB: 061460

Arkansas State Highway Transportation Department

JOB NAME: HWY.84 STRS. & APPRS.(OAK GROVE)(S)

Materials Division

COUNTY NO. 30 DATE TESTED 10/24/2017

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				S	I	E	V	E					
110+10	18 RT	0-5	BROWN	74	64	52	45	36	27	11	A-6(0)	RV649	
110+00	06 RT	0-4.5Z	BROWN	92	83	70	63	56	26	12	A-6(4)	S642	9.4
110+00	18 RT	0-5	BROWN	88	76	64	57	49	31	16	A-6(4)	S643	7.8
113+00	06 LT	0-5	BROWN	90	77	63	58	53	39	21	A-6(8)	S644	13.6
219+00	06 RT	0-5	RD/BR	92	80	65	60	54	43	29	A-7-6(12)	S645	18
219+00	15 RT	0-5	BROWN	85	74	64	58	54	44	28	A-7-6(11)	S646	11.7
223+00	06 RT	0-5	BROWN	86	70	53	47	40	24	10	A-4(1)	S647	12.2
223+00	18 LT	0-5	BROWN	77	65	52	45	37	25	10	A-4(0)	S648	6.1

comments: W=MULTIPLE LAYERS, X=STRIPPED, Z=AUGER REFUSAL

Thursday, November 16, 2017

