

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 050315

FEDERAL AID PROJECT NO. STPF-0012(32)

WEST OF RIVER BLUFF RD.-EAST (PASSING LANE) (S)

STATE HIGHWAY 16 SECTION 12

IN CLEBURNE 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

November 5, 2015

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: 050315
West of River Bluff Rd. - East (Passing Lanes) (S)
Route 16 Section 12
Cleburne County

Transmitted herewith are the requested Soil Survey, Strength Data, and Resilient Modulus test results for the above referenced job. The project consists of adding a west bound passing line on Highway 16. Samples were obtained in the existing travel lanes and ditch line.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of low plasticity sandy clay. The subgrade soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction. Rock was encountered at several locations within the project limits. Table 1 below lists the station, location and depth to rock.

Table 1 Depth of Rock

Station	Location from center line	Depth (ft.)
255+00	6', 21' RT	3.5, 2.2
271+00	21' RT	3.5
287+00	18' RT	2.5
295+00	6', 18' LT	4.5, 2.0
303+00	6', 18' RT	4.5, 2.8

Based on currently available cross sections the construction grade line closely matches that of the existing roadway. The maximum embankment height is approximately 9 feet. Prior to embankment construction, all soft unstable organic material should be removed from the existing ditch line, anticipated to be no more than two feet of undercut. The embankment may be constructed using locally available material utilizing the 3:1 slope configuration shown in the cross sections.

The proposed cut slopes are acceptable as shown.

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 Pearson.
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	4.4	95.6
Base Course	3.9	96.1

Type	PG 76-22	
	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.2	94.8
Binder Course	4.4	95.6
Base Course	3.9	96.1



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

JOB: 050315

Arkansas State Highway Transportation Department

JOB NAME: WEST OF RIVER BLUFF RD - EAST (PASSING LANES)(S)

Materials Division

COUNTY NO. 12 DATE TESTED 10/26/2015

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				
311+00	21' LT	0-5	BROWN	94	92	90	78	42	18	2	A-4(0)	RV555	
255+00	06' RT	0-3.5Z	BR/GR	93	84	79	68	56	24	10	A-4(3)	S539	15.6
255+00	21 RT	0-2.2Z	BROWN	98	92	88	72	60			NO TEST	S540	10.3
263+00	06' LT	0-5	BROWN	94	89	85	74	39	ND	NP	A-4(0)	S541	11.9
263+00	18' LT	0-5	BROWN	100	99	98	89	47	24	08	A-4(1)	S542	13.1
271+00	06' RT	0-5	BROWN	94	87	81	78	65	34	16	A-6(8)	S543	18
271+00	21' RT	0-3.5Z	BROWN	99	96	94	92	78	28	12	A-6(7)	S544	5.3
279+00	06' LT	0-5	RD/BR	95	89	83	63	51	26	10	A-4(2)	S545	18.6
279+00	18' LT	0-5	RD/BR	79	71	65	49	36	ND	NP	A-4(0)	S546	4.9
287+00	06' RT	0-5	BR/GR	96	91	63	59	55	24	07	A-4(1)	S547	18.4
287+00	18' RT	0-2.5Z	BR/GR	80	76	72	50	42	25	6	A-4(0)	S548	10.7
295+00	06' LT	0-4.5Z	BROWN	98	95	89	72	63	38	12	A-6(6)	S549	27.8
295+00	18' LT	2.0Z	BROWN	98	95	89	69	58	34	14	A-6(6)	S550	8.2
303+00	06' RT	0-4.5Z	BROWN	99	97	95	71	46	23	6	A-4(0)	S551	15.3
303+00	18' RT	0-2.8Z	BROWN	96	91	88	66	42	ND	NP	A-4(0)	S552	4.5
311+00	06' LT	0-5	BROWN	97	93	89	71	50	19	6	A-4(0)	S553	18.8
311+00	21' LT	0-5	BROWN	64	53	48	34	27	24	6	A-2-4(0)	S554	7.6

comments: W=MULTIPLE LAYERS, Z=AUGER REFUSAL

Monday, November 02, 2015

JOB: 050315

Arkansas State Highway Transportation Department
Materials Division

DATE TESTED
10/26/2015

JOB NAME: WEST OF RIVER BLUFF RD - EAST (PASSING LANES)(S)

COUNTY NO. 12

Michael Benson, Materials Engineer

PAVEMENT SOUNDINGS

STA.#	LOC.				
255+00	21 RT	ACHMSC	ACHMBC		
		--	--		
255+00	06' RT	ACHMSC	ACHMBC		
	10.5W		2.5		
263+00	18' LT	ACHMSC			
		--			
263+00	06' LT	ACHMSC	ACHMBC		
	7.0W		2.0		
271+00	21' RT	ACHMSC			
		--			
271+00	06' RT	ACHMSC			
	10.0W				
279+00	18' LT	ACHMSC	ACHMBC	AGG BASE CRS CL7	
		--	--	--	
279+00	06' LT	ACHMSC	ACHMBC	AGG.BASE CRS.CL7	
	8.0W		2.0	--	
287+00	18' RT	ACHMSC	AGG. BASE CRS CL-7		
		--	--		
287+00	06' RT	ACHMSC	ACHMBC	AGG.BASE CRS.CL7	
	7.5W		2.5	3.0	
295+00	18' LT	ACHMSC	AGG. BASE CRS CL-7		
		--	--		
295+00	06' LT	ACHMSC	AGG. BASE CRS CL-7		
	7.0W		3.0		
303+00	18' RT	ACHMSC	ACHMBC	AGG. BASE CRS CL-7	
		--	--	--	
303+00	06' RT	ACHMSC	ACHMBC	AGG. BASE CRS CL-7	
	8.5W		--	3.0	
311+00	06' LT	ACHMSC	ACHMBC	AGG. BASE CRS CL-7	
	7.0W		2.0	3.0	

comments: W=MULTIPLE LAYERS, Z=AUGER REFUSAL

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION
MICHAEL BENSON, MATERIALS ENGINEER
*** SOIL SURVEY STRENGTH TEST REPORT ***

DATE - 11/04/2015
JOB NUMBER - 050315

SEQUENCE NO. - 1
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 12
DISTRICT NO. - 05

JOB NAME - WEST OF RIVER BLUFF RD - EAST (PASSING LANES) (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 20

RESILIENT MOCULUS
STA.311+00 6881

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.	50315	Material Code	SSRVPS
Date Sampled:	10/29/15	Station No.:	311+00
Date Tested:	October 29, 2015	Location:	21'LT
Name of Project:	WEST OF RIVER BLUFF ROAD (PASSING LANE)(S)		
County:	Code: 12	Name: CLEBURNE	
Sampled By:	FAULKNER	Depth:	0-5
Lab No.:	20153343	AASHTO Class:	A-4(0)
Sample ID:	RV555	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	3.95
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):	12.20
Initial Volume, AoLo (cu. in):	97.97

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3284.80
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4. Soil Properties:

Optimum Moisture Content (%):	14.1
Maximum Dry Density (pcf):	115.6
95% of MDD (pcf):	109.8
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3284.80
Compaction Moisture content (%):	14.0
Compaction Wet Density (pcf):	127.75
Compaction Dry Density (pcf):	112.06
Moisture Content After Mr Test (%):	13.8

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

7. Resilient Modulus, Mr: $7380(S_c)^{-0.19288}(S_3)^{0.46064}$

8. Comments _____

9. Tested By: GW, DT **Date:** October 29, 2015

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

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

Job No. 50315 **Material Code** SSRVPS
Date Sampled: 10/29/15 **Station No.:** 311+00
Date Tested: October 29, 2015 **Location:** 21'LT
Name of Project: WEST OF RIVER BLUFF ROAD (PASSING LANE)(S)
County: Code: 12 **Name:** CLEBURNE
Sampled By: FAULKNER
Lab No.: 20153343
Sample ID: RV555
LATITUDE:

Depth: 0-5
AASHTO Class: A-4(0)
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	25.0	22.2	2.8	2.1	1.8	0.2	0.00099	0.00012	14,825
Sequence 2	6.0	4.0	47.3	44.4	2.9	3.9	3.6	0.2	0.00213	0.00026	13,755
Sequence 3	6.0	6.0	70.2	66.6	3.7	5.8	5.5	0.3	0.00343	0.00043	12,788
Sequence 4	6.0	8.0	93.8	87.7	6.2	7.7	7.2	0.5	0.00501	0.00062	11,521
Sequence 5	6.0	10.0	117.5	109.0	8.6	9.6	8.9	0.7	0.00659	0.00082	10,875
Sequence 6	4.0	2.0	24.9	22.1	2.8	2.0	1.8	0.2	0.00119	0.00015	12,196
Sequence 7	4.0	4.0	46.6	43.8	2.8	3.8	3.6	0.2	0.00270	0.00034	10,647
Sequence 8	4.0	6.0	67.9	65.1	2.9	5.6	5.3	0.2	0.00437	0.00054	9,809
Sequence 9	4.0	8.0	91.7	86.4	5.2	7.5	7.1	0.4	0.00602	0.00075	9,457
Sequence 10	4.0	10.0	115.0	107.2	7.8	9.4	8.8	0.6	0.00784	0.00098	8,996
Sequence 11	2.0	2.0	24.5	21.8	2.8	2.0	1.8	0.2	0.00155	0.00019	9,261
Sequence 12	2.0	4.0	45.3	42.5	2.8	3.7	3.5	0.2	0.00351	0.00044	7,977
Sequence 13	2.0	6.0	65.6	62.7	2.9	5.4	5.1	0.2	0.00562	0.00070	7,341
Sequence 14	2.0	8.0	87.6	83.1	4.5	7.2	6.8	0.4	0.00774	0.00096	7,074
Sequence 15	2.0	10.0	110.5	103.6	6.8	9.1	8.5	0.6	0.00991	0.00123	6,881

TESTED BY _____ **DATE** October 29, 2015
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.	50315	Material Code	SSRVPS
Date Sampled:	10/29/15	Station No.:	311+00
Date Tested:	October 29, 2015	Location:	21'LT
Name of Project:	WEST OF RIVER BLUFF ROAD (PASSING LANE)(S)		
County:	Code: 12	Name:	CLEBURNE
Sampled By:	FAULKNER	Depth:	0-5
Lab No.:	20153343	AASHTO Class:	A-4(0)
Sample ID:	RV555	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

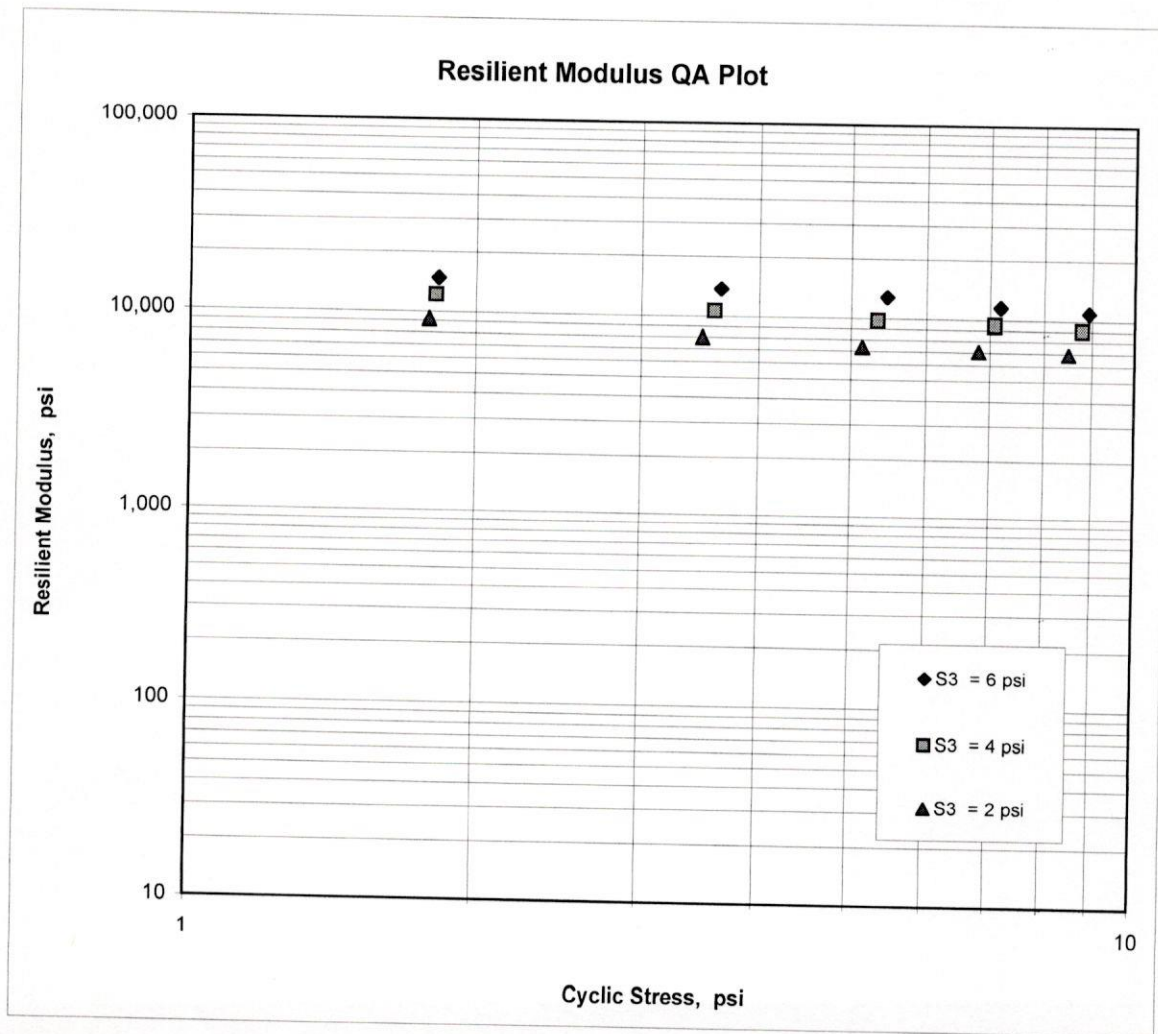
$$M_R = K_1 (S_c)^{K_2} (S_3)^{K_5}$$

$$K_1 = 7,380$$

$$K_2 = -0.19288$$

$$K_5 = 0.46064$$

$$R^2 = 0.99$$



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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE	- 10/27/15	SEQUENCE NO.	- 3
JOB NUMBER	- 050315	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	- 12
SUPPLIER NAME	- STATE	DISTRICT NO.	- 05
NAME OF PROJECT	- WEST OF RIVER BLUFF RD - EAST (PASSING LANES) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CLEBURNE, COUNTY	DATE SAMPLED	- 10/15/15
SAMPLED BY	- B.JORDAN, BATES	DATE RECEIVED	- 10/21/15
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 10/26/15
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20153333	- 20153334	- 20153335
SAMPLE ID	- S545	- S546	- S547
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 279+00	- 279+00	- 287+00
LOCATION	- 06' LT	- 18' LT	- 06' RT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- RD/BR	- RD/BR	- BR/GR
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 26 47.80	- 35 26 47.80	- 35 26 42.40
LONGITUDE DEG-MIN-SEC	- 91 57 .60	- 91 57 .50	- 91 56 53.60
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	100	100
	3/8 IN. - 100	93	99
	NO. 4 - 95	79	96
	NO. 10 - 89	71	91
	NO. 40 - 83	65	63
	NO. 80 - 63	49	59
	NO. 200 - 51	36	55
LIQUID LIMIT	- 26	- ND	- 24
PLASTICITY INDEX	- 10	- NP	- 07
AASHTO SOIL	- A-4(2)	- A-4(0)	- A-4(1)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 18.6	- 4.9	- 18.4
ACHMSC (IN)	- 8.0W	- --	- 7.5W
ACHMBC (IN)	- 2.0	- --	- 2.5
AGG.BASE CRS.CL7 (IN)	- --	- --	- 3.0
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

REMARKS - W=MULITPLE LAYERS, Z=AUGER REFUSAL

