ARKANSAS DEPARTMENT OF TRANSPORTATION

SUBSURFACE INVESTIGATION

STATE JOB NO. 040820 (COMBINATION JOB)

FEDERAL AID PROJECT NO. NHPP-1765(8)

HWYS. 59, 64, 96 & 252 STRS. & APPRS. (S)

STATE HIGHWAY VARIOUS **SECTION** VARIOUS

IN CRAWFORD & SEBASTIAN **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

June 6, 2017

TO: Mr. Rick Ellis, Bridge Engineer

SUBJECT: Job No. 040625
Hwy. 22 – Hwy. 252 Strs. & Apprs. (S)
Route 96 Section 3
Sebastian County

Transmitted herewith are a brief summary of the geology and site conditions, D50 analysis test results, unconfined compressive strength results, RMR, and the logs of the borings conducted for the structures and approaches of the above referenced project. The samples obtained by the Standard Penetration Tests were brought to the laboratory and visually classified by experienced lab personnel to confirm the field identifications. As noted in the attached Site Geology, there are a number of normal faults in this area. An east-west trending, down-to-the-south normal fault has been mapped to the north of the proposed bridge site. The rocks encountered during the subsurface investigation do not correlate very well between the borings (there are two shale beds present in the southern boring that are not present in the northern boring). This may be explained most likely by a moderate dip of the rocks to the south or less likely a small offsetting fault between the borings. The rock cores are available for inspection at the Materials Division.

Based on the depth at which bedrock was encountered, it is anticipated that both end bents will be founded on piling. No borings were obtained at intermediate bents 2 or 3, station 488+88 and 489+33, due to inaccessibility caused by the steep bank and low bridge clearance. Based on discussions with Bridge Design, it is anticipated that all intermediate bents will be founded on drilled shafts. Drilled shafts socketed into the competent shale with sandstone or sandstone with shale should be sized based on the values provided in Table 1.

TABLE 1 – Bearing Capacity Recommendations for Drilled Shafts

Foundation Description	Nominal Shaft Side Resistance (ksf)	Factored Shaft Side Resistance (ksf)	Nominal Shaft Tip Resistance (ksf)	Factored Shaft Tip Resistance (ksf)
Drilled Shafts	21.2	11.7	38	19

If you have any questions concerning these recommendations, please contact the Geotechnical Section.

Michael C. Benson
Materials Engineer

MCB:rpt:mlg

cc: State Construction Engineer - Master File Copy
District 4 Engineer
G.C. File

GEOLOGY AND SITE CONDITIONS
Job No. 040625

Hwy. 22 – Hwy. 252 Strs. & Apprs. (S)
Sebastian County
Route 96 Section 3

Site Conditions

The existing structure over Onion Creek is a two span bridge. The deck is constructed of corrugated steel overlain by asphalt. The deck is supported by 10 sets of steel beams. The bents are constructed of rock and mortar. The guardrail is constructed of steel supported by steel posts on the bridge and concrete and timber posts leading up to the bridge. An overhead power line parallels the west side of the roadway. The channel is lined with trees and thick vegetation, with pastureland in the areas beyond the channel. Onion Creek is a slow-moving slough that flows into the Arkansas River to the west.

Site Geology

The project alignment is located on deposits mapped as alluvial deposits (map symbol Qal). Alluvial deposits are typically composed of gravels, sands, silts, clays, and mixtures of any and all of these clastic materials and have been deposited by present-day streams. The alluvial deposits have an unconformable contact with bedrock, meaning that the depth to bedrock could be quite variable. Depth to bedrock in the two borings drilled ranged from 29 to 35.3 feet below ground level (bgl).

The rocks encountered below the alluvial deposits are shales and sandstones of the McAlester Formation (map symbol Pm). The McAlester consists of (in ascending order): several hundred feet of shale with thin sandstone and coal (the Lower Hartshorne coal is just above the base), several hundred feet of shale with a few sandstone beds and coal (Upper Hartshorne Coal), and capped by several hundred feet of shale with a few coal beds. The unit ranges from about 500 to 2,300 feet in thickness. The proposed bridge site is most likely in the lowest part of the McAlester, below the Lower Hartshorne coal.

There are a number of normal faults in this area. An east-west trending, down-to-the-south normal fault has been mapped to the north of the proposed bridge site. The rocks encountered during the subsurface investigation do not correlate very well between the borings (there are two shale beds present in the southern boring that are not present in the northern boring). This may be explained most likely by a moderate dip of the rocks to the south or less likely a small offsetting fault between the borings.

Onion Creek may lie in a previous course of the Arkansas River. Due to the connectivity of Onion Creek to the Arkansas River and the low elevation, the area of the proposed bridge site may be subject to flooding when the Arkansas River floods.

Subsurface Conditions

Based on the results of the borings, the subsurface stratigraphy may be generalized as follows:

0 to 20.0 Feet:	Consists of moist, soft to stiff, brown **clay**. Many samples in this zone contained some amount of **gravel**.
20.0 to 29.0 Feet:	Consists of moist to wet, stiff, brown **sandy clay** to **clay with gravel (rock fragments)**.
29.0 to 35.3 Feet:	Varies from wet, stiff to very hard, brown **clay with gravel (rock fragments)** to **sandstone with frequent shale seams**.
35.3 to 51.6 Feet:	Varies from unweathered, cemented, gray **sandstone with frequent shale seams** to unweathered, medium hard, dark gray **shale with occasional sandstone layers**.
51.6 to 57.5 Feet:	Consists of unweathered, cemented, gray **sandstone with frequent shale seams**.

D_{50} AGGREGATE ANALYSIS FOR SCOUR CALCULATIONS

Job No. 040625

Creek Name	Station	Sample Type	Location	Depth (FT)	Aggregate Size (D50) (IN)
Onion Creek	489+30	Creek Bank	30' Rt. C.L. Construction	NA	0.0035

Rock Core Unconfined Compression Test Summary

Project Number: 040625
Project Name: Hwy. 22 - Hwy. 252 Str. & Apprs. (S)
Date Tested: 5/23/2017

Station	Location	Sample No.	Depth (ft)	Diameter (in)	Height (in)	Total Load (lbs)	Correction Factor	Stress (psi)	Remarks
488+53	7' RT	1	39.00	1.75	3.50	18,430	1.00	7,662	SS w/ Shale Seams & Layers
488+53	7' RT	2	41.00	1.75	3.50	13,140	1.00	5,463	SS w/ Shale Seams & Layers
488+53	7' RT	3	53.00	0	0.00	0	1.00	0	SS w/ Shale Seams (Broke while capping)
488+53	7' RT	4	55.25	1.75	3.50	12,580	1.00	5,230	SS w/ Shale Seams (Shale)
488+53	7' RT	5	56.50	1.75	3.55	19,740	1.00	8,207	SS w/ Shale Seams
489+68	12' RT	6	29.75	1.75	3.50	8,850	1.00	3,679	SS w/ Shale Seams
489+68	12' RT	7	35.75	1.75	3.55	20,030	1.00	8,328	SS w/ Shale Seams
489+68	12' RT	8	40.75	1.75	3.55	32,460	1.00	13,495	SS w/ Shale Seams
489+68	12' RT	9	45.00	0	0.00	0	1.00	0	SS w/ Shale Seams (Broke while capping)
489+68	12' RT	10	46.75	1.75	3.50	17,130	1.00	7,122	SS w/ Shale Seams

* Please note any broken samples, fractures or other characteristics of sample in Remarks.

ROCK MASS RATING SUMMARY

JOB # 040625

SAMPLE #1

Station/Location	488+53/ 7' RT
Depth (ft)	39
	Relative Rating
Uniaxial Compressive Strength	7
RQD	13
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	*57*
Class Number	III
Description	FAIR ROCK

SAMPLE #2

Station/Location	488+53/ 7' RT
Depth (ft)	41
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	*54*
Class Number	III
Description	FAIR ROCK

SAMPLE #3

Station/Location	488+53/ 7' RT
Depth (ft)	53
	Relative Rating
Uniaxial Compressive Strength	n/a
RQD	17
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	*54*
Class Number	III
Description	FAIR ROCK

SAMPLE #4

Station/Location	488+53/ 7' RT
Depth (ft)	55.25
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	*58*
Class Number	III
Description	FAIR ROCK

SAMPLE #5

Station/Location	488+53/ 7' RT
Depth (ft)	56.5
	Relative Rating
Uniaxial Compressive Strength	7
RQD	17
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	*61*
Class Number	II
Description	GOOD ROCK

SAMPLE #6

Station/Location	489+68/ 12' RT
Depth (ft)	29.75
	Relative Rating
Uniaxial Compressive Strength	4
RQD	8
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	*49*
Class Number	III
Description	FAIR ROCK

SAMPLE #7

Station/Location	489+68/ 12' RT
Depth (ft)	35.75
	Relative Rating
Uniaxial Compressive Strength	7
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*71*
Class Number	II
Description	GOOD ROCK

SAMPLE #8

Station/Location	489+68/ 12' RT
Depth (ft)	40.75
	Relative Rating
Uniaxial Compressive Strength	7
RQD	20
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	*64*
Class Number	II
Description	GOOD ROCK

SAMPLE #9

Station/Location	489+68/ 12' RT
Depth (ft)	45
	Relative Rating
Uniaxial Compressive Strength	n/a
RQD	17
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	54
Class Number	III
Description	FAIR ROCK

SAMPLE #10

Station/Location	489+68/ 12' RT
Depth (ft)	46.75
	Relative Rating
Uniaxial Compressive Strength	12
RQD	20
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	79
Class Number	II
Description	GOOD ROCK

SAMPLE #11

Station/Location	
Depth (ft)	
	Relative Rating
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	0
Class Number	V
Description	VERY POOR ROCK

SAMPLE #12

Station/Location	
Depth (ft)	
	Relative Rating
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	0
Class Number	V
Description	VERY POOR ROCK

SAMPLE #13

Station/Location	
Depth (ft)	
	Relative Rating
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	0
Class Number	V
Description	VERY POOR ROCK

SAMPLE #14

Station/Location	
Depth (ft)	
	Relative Rating
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	0
Class Number	V
Description	VERY POOR ROCK

SAMPLE #15

Station/Location	
Depth (ft)	
	Relative Rating
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	0
Class Number	V
Description	VERY POOR ROCK

SAMPLE #16

Station/Location	
Depth (ft)	
	Relative Rating
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	0
Class Number	V
Description	VERY POOR ROCK

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	040625	**Material Code**	SSRVPS
Date Sampled:	11/10/16	**Station No.:**	100+00
Date Tested:	November 10, 2016	**Location:**	18 RT
Name of Project:	HWY.22 - HWY.252 STRS & APPRS (S)		
County:	**Code:** 65 **Name:** SEBASTIAN		
Sampled By:	THORNTON	**Depth:**	0-5
Lab No.:	20163507	**AASHTO Class:**	A-4(1)
Sample ID:	RV389	**Material Type (1 or 2):**	2
LATITUDE:		**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	25.3	22.6	2.7	2.1	1.8	0.2	0.00106	0.00013	13,958
Sequence 2	6.0	4.0	47.7	44.9	2.8	3.9	3.7	0.2	0.00224	0.00028	13,051
Sequence 3	6.0	6.0	70.3	66.7	3.6	5.7	5.4	0.3	0.00361	0.00045	12,062
Sequence 4	6.0	8.0	94.1	88.0	6.1	7.7	7.2	0.5	0.00518	0.00065	11,101
Sequence 5	6.0	10.0	118.1	109.5	8.6	9.6	8.9	0.7	0.00670	0.00084	10,668
Sequence 6	4.0	2.0	25.2	22.4	2.8	2.1	1.8	0.2	0.00123	0.00015	11,916
Sequence 7	4.0	4.0	47.1	44.3	2.8	3.8	3.6	0.2	0.00271	0.00034	10,677
Sequence 8	4.0	6.0	68.5	65.6	2.8	5.6	5.4	0.2	0.00432	0.00054	9,909
Sequence 9	4.0	8.0	92.4	87.2	5.2	7.5	7.1	0.4	0.00598	0.00075	9,525
Sequence 10	4.0	10.0	115.8	108.2	7.7	9.5	8.8	0.6	0.00767	0.00096	9,209
Sequence 11	2.0	2.0	24.8	22.0	2.7	2.0	1.8	0.2	0.00162	0.00020	8,872
Sequence 12	2.0	4.0	45.9	43.2	2.7	3.7	3.5	0.2	0.00343	0.00043	8,222
Sequence 13	2.0	6.0	66.2	63.5	2.7	5.4	5.2	0.2	0.00545	0.00068	7,605
Sequence 14	2.0	8.0	88.6	84.3	4.3	7.2	6.9	0.4	0.00746	0.00093	7,376
Sequence 15	2.0	10.0	111.6	104.8	6.8	9.1	8.6	0.6	0.00935	0.00117	7,320

TESTED BY DT DATE November 10, 2016

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.	040625	**Material Code**	SSRVPS
Date Sampled:	11/10/16	**Station No.:**	100+00
Date Tested:	November 10, 2016	**Location:**	18 RT
Name of Project:	HWY.22 - HWY.252 STRS & APPRS (S)		
County:	**Code:** 65 **Name:** SEBASTIAN		
Sampled By:	THORNTON	**Depth:**	0-5
Lab No.:	20163507	**AASHTO Class:**	A-4(1)
Sample ID:	RV389	**Material Type (1 or 2):**	2
LATITUDE:		**LONGITUDE:**	

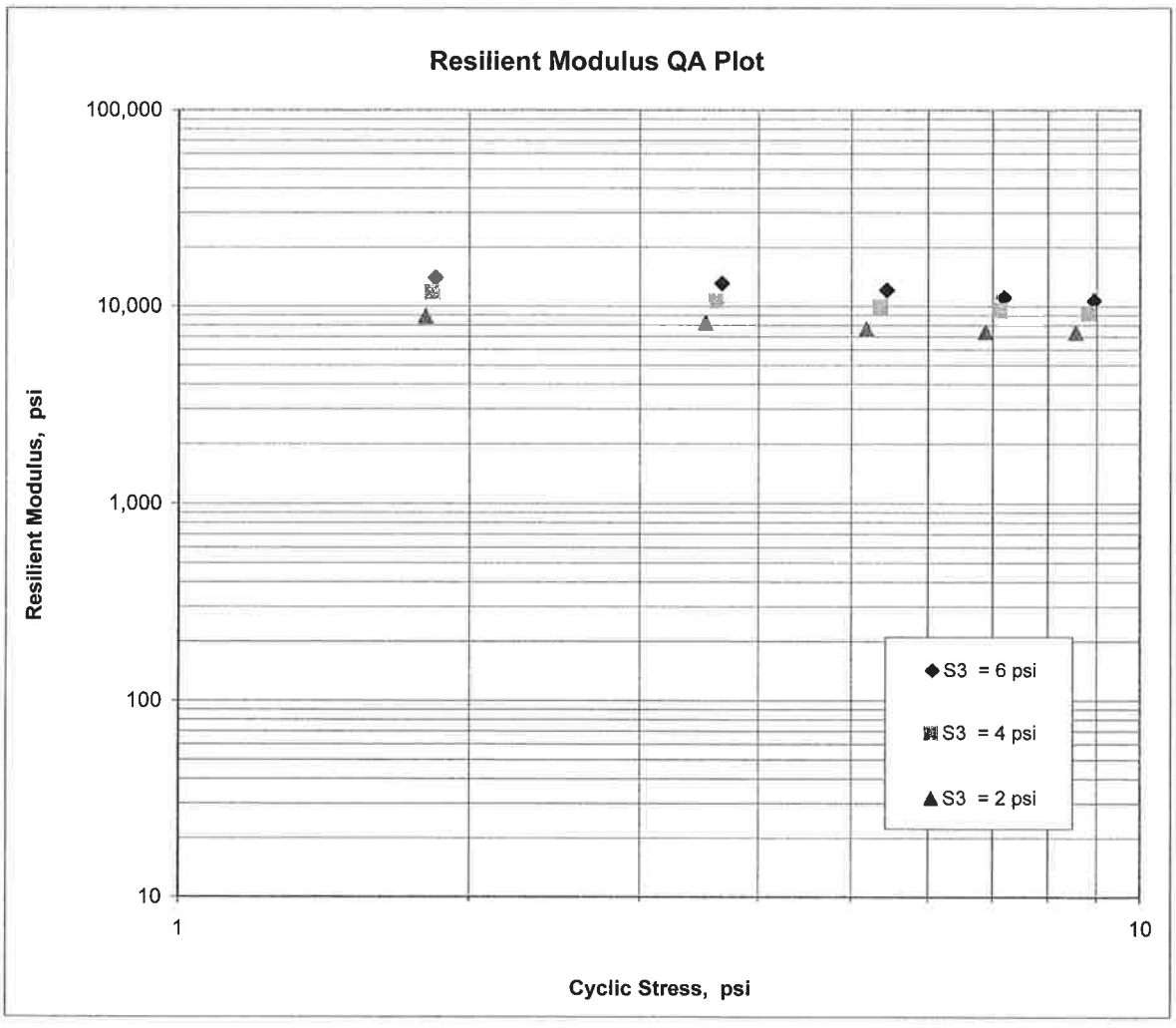
$$M_R = K1\ (S_C)^{K2}\ (S_3)^{K5}$$

K1 = 7,547

K2 = -0.15722

K5 = 0.39753

R^2 = 0.99



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	040625	**Material Code**	SSRVPS
Date Sampled:	11/10/16	**Station No.:**	495+00
Date Tested:	November 10, 2016	**Location:**	18 LT
Name of Project:	HWY.22 - HWY.252 STRS & APPRS (S)		
County:	**Code:** 65 **Name:** SEBASTIAN		
Sampled By:	THORNTON	**Depth:**	0-5
Lab No.:	20163508	**AASHTO Class:**	A-7-6(29)
Sample ID:	RV390	**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	3.92
Middle	3.94
Bottom	3.94
Average	3.93
Membrane Thickness (in):	0.00
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):	12.15
Initial Volume, AoLo (cu. in):	97.57

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3003.30

4. Soil Properties:

Optimum Moisture Content (%):	19.2
Maximum Dry Density (pcf):	104
95% of MDD (pcf):	98.8
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3003.30
Compaction Moisture content (%):	19.6
Compaction Wet Density (pcf):	117.28
Compaction Dry Density (pcf):	98.06
Moisture Content After Mr Test (%):	20.1

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

7. Resilient Modulus, Mr: 8772(Sc)^-0.31280(S3)^0.13779

8. Comments _____

9. Tested By: DT **Date:** November 10, 2016

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

Job No.	040625	**Material Code**	SSRVPS
Date Sampled:	11/10/16	**Station No.:**	495+00
Date Tested:	November 10, 2016	**Location:**	18 LT
Name of Project:	HWY.22 - HWY.252 STRS & APPRS (S)		
County:	**Code:** 65 **Name:** SEBASTIAN		
Sampled By:	THORNTON	**Depth:**	0-5
Lab No.:	20163508	**AASHTO Class:**	A-7-6(29)
Sample ID:	RV390	**Material Type (1 or 2):**	2
LATITUDE:		**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	25.1	22.4	2.8	2.1	1.8	0.2	0.00165	0.00021	8,966
Sequence 2	6.0	4.0	47.1	44.3	2.8	3.9	3.6	0.2	0.00364	0.00045	8,035
Sequence 3	6.0	6.0	68.5	65.0	3.5	5.6	5.3	0.3	0.00627	0.00078	6,845
Sequence 4	6.0	8.0	90.4	84.5	6.0	7.4	7.0	0.5	0.00936	0.00117	5,963
Sequence 5	6.0	10.0	111.9	103.5	8.4	9.2	8.5	0.7	0.01277	0.00159	5,353
Sequence 6	4.0	2.0	25.1	22.5	2.7	2.1	1.8	0.2	0.00172	0.00021	8,634
Sequence 7	4.0	4.0	46.6	43.9	2.7	3.8	3.6	0.2	0.00387	0.00048	7,488
Sequence 8	4.0	6.0	67.3	64.6	2.7	5.5	5.3	0.2	0.00649	0.00081	6,579
Sequence 9	4.0	8.0	89.5	84.4	5.1	7.4	6.9	0.4	0.00959	0.00119	5,817
Sequence 10	4.0	10.0	111.4	103.9	7.5	9.2	8.6	0.6	0.01312	0.00163	5,234
Sequence 11	2.0	2.0	25.1	22.4	2.7	2.1	1.8	0.2	0.00198	0.00025	7,479
Sequence 12	2.0	4.0	46.5	43.7	2.7	3.8	3.6	0.2	0.00435	0.00054	6,639
Sequence 13	2.0	6.0	66.8	64.0	2.8	5.5	5.3	0.2	0.00716	0.00089	5,906
Sequence 14	2.0	8.0	87.9	83.6	4.3	7.2	6.9	0.4	0.01037	0.00129	5,328
Sequence 15	2.0	10.0	109.7	103.0	6.7	9.0	8.5	0.6	0.01402	0.00175	4,854

TESTED BY DT DATE November 10, 2016

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.	040625	**Material Code**	SSRVPS
Date Sampled:	11/10/16	**Station No.:**	495+00
Date Tested:	November 10, 2016	**Location:**	18 LT
Name of Project:	HWY.22 - HWY.252 STRS & APPRS (S)		
County:	**Code:** 65 **Name:** SEBASTIAN		
Sampled By:	THORNTON	**Depth:**	0-5
Lab No.:	20163508	**AASHTO Class:**	A-7-6(29)
Sample ID:	RV390	**Material Type (1 or 2):**	2
LATITUDE:		**LONGITUDE:**	

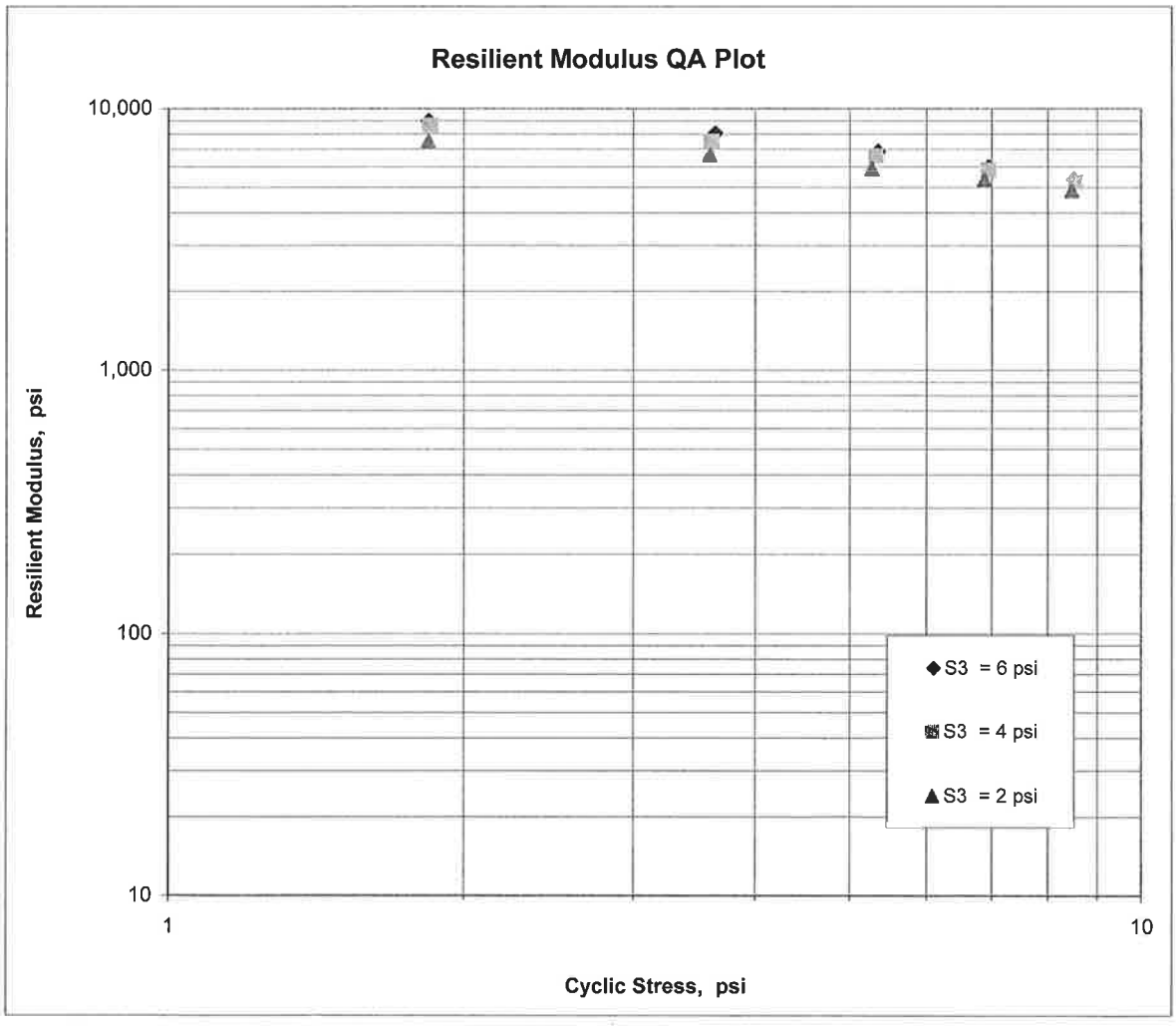
$$M_R = K1\,(S_C)^{K2}\,(S_3)^{K5}$$

K1 = 8,772

K2 = -0.31280

K5 = 0.13779

R^2 = 0.95



JOB: 040625

JOB NAME: HWY.22 - HWY.252 STRS. & APPRS. (S)

COUNTY NO. 65 **DATE TESTED** 11/2/2016

Arkansas State Highway Transporation Department

Materials Division

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 S					
100+00	18RT	0-5	BR/RD	98	95	93	92	86	22	04	A-4(1)	RV389	
495+00	18 LT	0-5	RD/BR	99	97	95	88	84	50	34	A-7-6(29)	RV390	
100+00	06 RT	0-5	BROWN	99	98	95	94	89	22	5	A-4 (2)	S377	18.3
100+00	17 RT	0-5	BROWN	99	97	94	93	87	21	3	A-4 (0)	S378	12.5
109+00	06 LT	0-5	GRAY	99	97	95	93	82	24	7	A-4 (4)	S379	21
109+00	18 LT	0-5	BR/GR	95	90	86	81	71	21	7	A-4 (2)	S380	15.7
487+00	06 RT	0-5	BROWN	99	93	86	80	73	36	22	A-6 (14)	S381	26.3
487+00	12 RT	0-5	BROWN	90	79	68	62	55	26	12	A-6 (3)	S382	18.4
495+00	06 LT	0-5	BR/RD	96	86	75	56	36	ND	NP	A-4 (0)	S383	24.3
495+00	18 LT	0-5	BR/RD	98	93	86	79	71	42	26	A-7-6(17)	S384	18.2
503+00	06 RT	0-5	BROWN	97	91	80	74	70	34	16	A-6 (9)	S385	25.2
503+00	18 RT	0-5	BROWN	79	72	64	60	53	26	10	A-4 (2)	S386	11.4
510+00	06 LT	0-4Z	BROWN	98	93	87	84	78	32	19	A-6 (13)	S387	10.8
510+00	18' LT	0-2.5Z	BROWN	96	93	87	80	69	31	15	A-6 (8)	S388	9.4

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

Monday, November 14, 2016

JOB: 040625
JOB NAME: HWY.22 - HWY.252 STRS. & APPRS. (S)

COUNTY NO. 65

Arkansas State Highway Transporation Department
Materials Division
Michael Benson, Materials Engineer

DATE TESTED
11/2/2016

PAVEMENT SOUNDINGS

STA.#	LOC.				
100+00	17 RT	ACHMSC	ACHMSC	ACHMBC	AGG. BASE CRS CL
		--	--	--	--
100+00	06 RT	ACHMSC	ACHMSC	ACHMBC	AGG. BASE CRS CL
		1.0	**3.0XW**	--	**5**
109+00	18 LT	ACHMSC	ACHMSC	AGG.BASE CRS CL	
		--	--	--	
109+00	06 LT	ACHMSC	ACHMSC	ACHMBC	AGG. BASE CRS CL
		3.0W	**1.5X**	--	**7**
487+00	12 RT	ACHMSC	ACHMSC	AGG.BASE CRS CL	
		--	--	--	
487+00	06 RT	ACHMSC	ACHMSC	AGG.BASE CRS CL	
		1.5	**4.0XW**	**5**	
495+00	18 LT	ACHMSC	ACHMSC	AGG.BASE CRS CL	
		--	--	--	
495+00	06 LT	ACHMSC	ACHMSC	AGG.BASE CRS CL	
		3.0W	--	**5**	
503+00	18 RT	ACHMSC	AGG. BASE CRS CL		
		--	--		
503+00	06 RT	ACHMSC	ACHMSC	AGG.BASE CRS CL	
		1.75WX	--	**5**	
510+00	18' LT	ACHMSC	AGG. BASE CRS CL		
		--	--		
510+00	06 LT	ACHMSC	AGG. BASE CRS CL		
		3.0W	**1.5**		

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

Monday, November 14, 2016

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

DATE - 11/03/16
JOB NUMBER - 040625
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY.22 - HWY.252 STRS. & APPRS. (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - SEBASTIAN, COUNTY
SAMPLED BY - THORNTON, BATES
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

SEQUENCE NO. - 1
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 65
DISTRICT NO. - 04

DATE SAMPLED - 10/25/16
DATE RECEIVED - 10/27/16
DATE TESTED - 11/02/16

LAB NUMBER	20163495	20163496	20163497
SAMPLE ID	S377	S378	S379
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	100+00	100+00	109+00
LOCATION	06 RT	17 RT	06 LT
DEPTH IN FEET	0-5	0-5	0-5
MAT'L COLOR	BROWN	BROWN	GRAY
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 19 3.00	35 19 3.00	35 19 9.60
LONGITUDE DEG-MIN-SEC	94 11 47.20	94 11 47.10	94 11 41.60
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.			
3/8 IN.	100	100	100
NO. 4	99	99	99
NO. 10	98	97	97
NO. 40	95	94	95
NO. 80	94	93	93
NO. 200	89	87	82
LIQUID LIMIT	22	21	24
PLASTICITY INDEX	5	3	7
AASHTO SOIL	A-4 (2)	A-4 (0)	A-4 (4)
UNIFIED SOIL			
% MOISTURE CONTENT	18.3	12.5	21.0
ACHMSC (IN)	1.0	--	3.0W
ACHMSC (IN)	3.0XW	--	1.5X
ACHMBC (IN)	--	--	--
AGG. BASE CRS CL (IN)	5	--	7

REMARKS - W= MULTIPLE LAYERS, X= STRIPPED, Z=AUGER REFUSAL

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 - 11/02/16
JOB NUMBER - 040625
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY.22 - HWY.252 STRS. & APPRS. (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - SEBASTIAN, COUNTY
SAMPLED BY - THORNTON, BATES
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

SEQUENCE NO. - 2
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 65
DISTRICT NO. - 04

DATE SAMPLED - 10/25/16
DATE RECEIVED - 10/27/16
DATE TESTED - 11/02/16

LAB NUMBER	20163498	20163499	20163500
SAMPLE ID	S380	S381	S382
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	109+00	487+00	487+00
LOCATION	18 LT	06 RT	12 RT
DEPTH IN FEET	0-5	0-5	0-5
MAT'L COLOR	BR/GR	BROWN	BROWN
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 19 9.60	35 23 35.30	35 23 35.30
LONGITUDE DEG-MIN-SEC	94 11 41.70	94 07 5.60	94 07 5.50
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.			100
3/8 IN.	100	100	99
NO. 4	95	99	90
NO. 10	90	93	79
NO. 40	86	86	68
NO. 80	81	80	62
NO. 200	71	73	55
LIQUID LIMIT	21	36	26
PLASTICITY INDEX	7	22	12
AASHTO SOIL	A-4 (2)	A-6 (14)	A-6 (3)
UNIFIED SOIL			
% MOISTURE CONTENT	15.7	26.3	18.4
ACHMSC (IN)	--	1.5	--
ACHMSC (IN)	--	4.0XW	--
AGG.BASE CRS CL (IN)	--	5	--

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED, Z=AUGER REFUSAL

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 - 11/02/16
JOB NUMBER - 040625
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY.22 - HWY.252 STRS. & APPRS. (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - SEBASTIAN, COUNTY
SAMPLED BY - THORNTON, BATES
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

SEQUENCE NO. - 3
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 65
DISTRICT NO. - 04

DATE SAMPLED - 10/25/16
DATE RECEIVED - 10/27/16
DATE TESTED - 11/02/16

LAB NUMBER	20163501	20163502	20163503
SAMPLE ID	S383	S384	S385
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	495+00	495+00	503+00
LOCATION	06 LT	18 LT	06 RT
DEPTH IN FEET	0-5	0-5	0-5
MAT'L COLOR	BR/RD	BR/RD	BROWN
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 23 43.00	35 23 43.00	35 23 50.60
LONGITUDE DEG-MIN-SEC	94 07 5.70	94 07 5.80	94 07 10.20
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.	100		100
3/8 IN.	98	100	99
NO. 4	96	98	97
NO. 10	86	93	91
NO. 40	75	86	80
NO. 80	56	79	74
NO. 200	36	71	70
LIQUID LIMIT	ND	42	34
PLASTICITY INDEX	NP	26	16
AASHTO SOIL	A-4 (0)	A-7-6(17)	A-6 (9)
UNIFIED SOIL			
% MOISTURE CONTENT	24.3	18.2	25.2
ACHMSC (IN)	3.0W	--	1.75WX
ACHMSC (IN)	--	--	--
AGG.BASE CRS CL (IN)	5	--	5

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED, Z=AUGER REFUSAL

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 - 11/02/16
JOB NUMBER - 040625
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY.22 - HWY.252 STRS. & APPRS. (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - SEBASTIAN, COUNTY
SAMPLED BY - THORNTON, BATES
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

SEQUENCE NO. - 4
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 65
DISTRICT NO. - 04

DATE SAMPLED - 10/25/16
DATE RECEIVED - 10/27/16
DATE TESTED - 11/02/16

LAB NUMBER	20163504	20163505	20163506
SAMPLE ID	S386	S387	S388
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	503+00	510+00	510+00
LOCATION	18 RT	06 LT	18' LT
DEPTH IN FEET	0-5	0-4Z	0-2.5Z
MAT'L COLOR	BROWN	BROWN	BROWN
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 23 50.70	35 23 56.70	35 23 56.70
LONGITUDE DEG-MIN-SEC	94 07 10.20	94 07 12.40	94 07 12.40
% PASSING 2 IN.			
1 1/2 IN.			
3/4 IN.	100		
3/8 IN.	87	100	100
NO. 4	79	98	96
NO. 10	72	93	93
NO. 40	64	87	87
NO. 80	60	84	80
NO. 200	53	78	69
LIQUID LIMIT	26	32	31
PLASTICITY INDEX	10	19	15
AASHTO SOIL	A-4 (2)	A-6 (13)	A-6 (8)
UNIFIED SOIL			
% MOISTURE CONTENT	11.4	10.8	9.4
ACHMSC (IN)	--	3.0W	--
AGG. BASE CRS CL (IN)	--	1.5	--

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED, Z=AUGER REFUSAL

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	- 11/03/16	SEQUENCE NO.	- 1
JOB NUMBER	- 040625	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	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.22 - HWY.252 STRS. & APPRS. (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEBASTIAN, COUNTY	DATE SAMPLED	- 10/25/16
SAMPLED BY	- THORNTON, BATES	DATE RECEIVED	- 10/27/16
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 11/02/16

MATERIAL DESC. - SOIL SURVEY - RESISTANCE R-VALUE ACTUAL RESULTS

LAB NUMBER	20163507	20163508
SAMPLE ID	RV389	RV390
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY
STATION	100+00	495+00
LOCATION	18RT	18 LT
DEPTH IN FEET	0-5	0-5
MAT'L COLOR	BR/RD	RD/BR
MAT'L TYPE		
LATITUDE DEG-MIN-SEC	35 19 3.00	35 23 43.00
LONGITUDE DEG-MIN-SEC	94 11 47.10	94 07 5.80
% PASSING 2 IN.		
1 1/2 IN.		
3/4 IN.		
3/8 IN.	100	100
NO. 4	98	99
NO. 10	95	97
NO. 40	93	95
NO. 80	92	88
NO. 200	86	84
LIQUID LIMIT	22	50
PLASTICITY INDEX	04	34
AASHTO SOIL	A-4(1)	A-7-6(29)
UNIFIED SOIL		
% MOISTURE CONTENT		

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED, Z=AUGER REFUSAL

AASHTO TESTS : T24 T88 T89 T90 T265