ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO.	090523			
FEDERAL AID PROJECT NO.		BFP-0044(35)		
	WAR EAGL	E CREEK STR. & APPRS.	(S)	
STATE HIGHWAY	23	SECTION	9	
IN		MADISON		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

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MATERIALS DIVISION

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April 13, 2020

TO:

Mr. Rick Ellis, Bridge Engineer

SUBJECT:

Job No. 090523

War Eagle Creek Str. & Apprs. (S)

Madison County Route 23 Section 9

Transmitted herewith are a brief summary of the geology and site conditions, rock core unconfined compression test summary, RMR, D50 scour analysis, 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.

This project consists of replacing the Highway 23 Bridge crossing War Eagle Creek, north of Huntsville. The new bridge will be constructed southwest of the existing. A total of six borings were requested for this bridge and six borings were obtained. A few of the borings had to be offset due to steep slopes and high water levels in the channel.

Based on the depth at which bedrock was encountered and correspondence with Bridge Design, it is anticipated that both end bents will be founded on piling bearing on rock. Preboring may be necessary to achieve minimum pile penetration requirements.

Due to the karst geology and the presence of voids encountered in the borings, it is anticipated that all intermediate bents will be founded on drilled shafts socketed into competent rock or pilings bearing on rock. If drilled shafts are to be utilized, it is recommended that exploratory borings be performed at each shaft location to identify potential cavities. Drilled shafts socketed in competent Sandstone with Shale should be designed based on the values provided in Table 1.

TABLE 1 – Bearing Capacity Recommendations for Drilled Shafts

Nominal Tip	Factored Tip	Nominal Side	Factored Side
Resistance (KSF)	Resistance (KSF)	Resistance (KSF)	Resistance (KSF)
1005	502	32.7	18

It is acceptable to utilize 2H:1V end slopes for the proposed embankments. This embankment geometry provides a satisfactory Factor of Safety for static conditions. 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 9 Engineer

G.C. File

GEOLOGY AND SITE CONDITIONS Job No. 090523 War Eagle Creek Str. & Apprs. (S) Madison County Route 23 Section 9

Site Conditions

The existing bridge is a 6-span structure on Highway 23 that crosses over War Eagle Creek. The existing bridge is constructed of concrete deck supported by five sets of steel beams. The bents are composed of concrete wall piers on spread footings. The guardrail is composed steel supported by concrete posts on the bridge and steel posts leading up to the bridge. Stacked stone riprap has been placed on the slopes below the abutments. A water line and telecommunication line run under the west side of the bridge and are buried north and south of the bridge.

At the job site, War Eagle Creek flows to the southwest. The channel is located under Span 5. The area north of the channel is primarily wooded with a parking area located on the west side of the bridge, providing access to a trailhead that leads under Span 6. The area northeast of the bridge has a limestone (Boone Formation) bluff that parallels War Eagle Creek. The area southwest of the bridge is wooded with pastureland beyond and the area southeast of the bridge is pastureland.

Site Geology

The area of the proposed bridge has been mapped as the Boone Formation (Mb). The St. Joe Formation, sometimes included as a member of the Boone Formation, is exposed along the north bank of War Eagle Creek. The St. Joe Limestone is a fine-grained, crinoidal limestone that may occasionally contain some smoothly bedded chert. Some beds may display a coarse bioclastic texture. The limestones (and cherts) are frequently gray, but may also be red, pink, purple, brown, or amber. Some thin calcareous shales are found in the sequence. The base of the St. Joe Limestone is generally marked by a phosphatic, greenish shale or conglomerate. The St. Joe Limestone ranges from a feather edge to over 110 feet in thickness. The Boone and St. Joe formations are well known for dissolutional features, such as sinkholes, caves, and enlarged fissures. There are a number of caves in this region. Many borings encountered shallow, soil-filled cavities. It is unclear if some of these are in fact cavities or boulders overlying more soil before rock. There are a number of faults in this region; however, none were encountered in borings.

Scour Potential

Both banks of the channel were sampled to ascertain the scour potential of the job site. The banks consisted of silty sand and silty sand with some gravel (SM). Silty sand has a high potential for scour and efforts should be taken to minimize this problem.

Subsurface Conditions

Based on the results of the borings from Station 107+60 to Station 109+97, the subsurface stratigraphy may be generalized as follows:

0 to 11.0 Feet:

Consists of moist, very loose to very dense, brown **silty sand** to **silty sand** with gravel.

11.0 to 23.3 Feet:

Varies from moist, medium dense, brown silty sand to sand with gravel to gravel and cobbles to gray to reddish gray, moderately hard, slightly weathered to unweathered limestone to limestone with occasional shale partings and seams. Borings 1 and 2 encountered a single soil-filled cavity with a thickness of 0.2 feet.

23.3 to 45.8 Feet:

Consists of gray to reddish gray, moderately hard, slightly weathered to unweathered limestone to limestone with occasional shale partings and seams.

Based on the results of the borings from Station 111+33 to Station 111+85, the subsurface stratigraphy may be generalized as follows:

0 to 11.9 Feet:

Varies from moist, very dense, brown silty sand to clay with cobbles and boulders to limestone. It is unclear if the limestone in this zone represents boulders or if the soil underneath the limestone represents a cavity. If they represent cavities, the dissolution thickness varies from 2.9' to 5.9'.

11.9 to 38.6 Feet:

Consists of gray to reddish gray, moderately hard, slightly weathered to unweathered **limestone** to **limestone** with occasional shale partings and seams. Boring 6 encountered a single soil-filled cavity with a thickness of 0.2 ft.

Rock Core Unconfined Compression Test Summary

Project Number:

090523

Project Name:

War Eagle Creek Str. & Apprs. (S)

Date Tested:

3/19/2020

Station	Location	Sample No.	Depth (ft.)	Diameter (in)	Height (in)	Total Load (lbs.)	Correction Factor	Stress (psi)	Remarks
111+85	CL	1	5.4	1.70	2.97	13,120	0.98	5,658	
111+85	CL	2	15.3	1.74	3.40	13,900	1.00	5,845	
111+33	CL	3	9.3	1.75	3.38	16,830	1.00	6,997	
111+33	CL	4	12.1	1.75	3.40	12,930	1.00	5,375	
109+97	CL	5	26.0	1.75	3.45	13,030	1.00	5,417	
109+97	CL	6	30.3	1.75	3.38	30,210	1.00	12,588	
109+97	CL	7	36.7	1.75	3.42	14,760	1.00	6,136	
109+30	8' RT	8	21.5	1.74	3.40	15,880	1.00	6,678	
109+30	8' RT	9	23.9	1.75	3.40	30,270	1.00	12,584	
109+30	8' RT	10	29.4	1.75	2.93	4,040	0.97	1,635	Short; Broke
111+85	CL	11	21.4	1.74	3.49	13,180	1.00	5,542	
111+33	CL	12	18.1	1.74	3.40	14,520	1.00	6,106	
108+40	CL	13	13.5	1.74	3.46	13,440	1.00	5,652	
108+40	CL	14	17.6	1.73	3.50	17,400	1.00	7,402	
108+40	CL	15	22.6	1.75	3.43	16,070	1.00	6,681	
								Property St. St. St. No. 5 September 1	

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

ROCK MASS RATING SUMMARY JOB # 090523

SA		

SAIVIP	'LE #1	
Station/Location	111+85/CL	
Depth (ft.)	5.4	
	Relative Rating	
Uniaxial Compressive Strength	4	
RQD	0	
Spacing of Joints	30	
Condition of Joints	25	
Groundwater Conditions	7	
Sum	66	
Class Number	II	
Description	GOOD ROCK	

SAMPLE #2

Station/Location	111+85/CL	
Depth (ft.)	15.3	
	Relative Rating	
Uniaxial Compressive Strength	4	
RQD	13	
Spacing of Joints	30	
Condition of Joints	25	
Groundwater Conditions	7	
Sum	79	
Class Number	II	
Description	GOOD ROCK	

SAMPLE #3

Station/Location	111+33/CL
Depth (ft.)	9.3
	Relative Rating
Uniaxial Compressive Strength	4
RQD	8
Spacing of Joints	30
Condition of Joints	25
Groundwater Conditions	7
Sum	74
Class Number	II
Description	GOOD ROCK

SAMPLE #4

Station/Location Depth (ft.)	111+33/CL 12.1
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	30
Condition of Joints	25
Groundwater Conditions	7
Sum	83
Class Number	I
Description	VERY GOOD ROCK

SAMPLE #5

Station/Location Depth (ft.)	109+97/CL 26
	Relative Rating
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	30
Condition of Joints	25
Groundwater Conditions	7
Sum	86
Class Number Description	I VERY GOOD ROCK

SAMPLE #6

Station/Location	109+97/CL
Depth (ft.)	30.3
Uniaxial Compressive Strength RQD Spacing of Joints Condition of Joints Groundwater Conditions Sum Class Number Description	Relative Rating 7 20 30 25 7 89 I VERY GOOD ROCK

SAMPLE #7

Station/Location	109+97/CL
Depth (ft.)	36.7
Uniaxial Compressive Strength RQD Spacing of Joints Condition of Joints Groundwater Conditions Sum Class Number Description	Relative Rating 4 20 30 25 7 86 I VERY GOOD ROCK

SAMPLE #8

SAWPI	- L #0	_
Station/Location	109+30/8' Rt	
Depth (ft.)	21.5	
	Relative Rating	
Uniaxial Compressive Strength	4	
RQD	8	
Spacing of Joints	30	
Condition of Joints	25	
Groundwater Conditions	7	
Sum	74	
Class Number	II	
Description	GOOD ROCK	

SAMPLE #9 Station/Location Depth (ft.) 109+30/8' Rt 23.9 Relative Rating 7 RQD 17 Spacing of Joints 30 Condition of Joints 25 Groundwater Conditions Sum 86 Class Number Description VERY GOOD ROCK

Station/Location Depth (ft.) Relative Rating Uniaxial Compressive Strength RQD Spacing of Joints Condition of Joints Groundwater Conditions Sum 84 Class Number Description I 09+30/8' Rt 29.4 Relative Rating 20 30 20 525 7 7 84

SAMPLE #10

Station/Location	111+85/CL
Depth (ft.)	21.4
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	30
Condition of Joints	25
Groundwater Conditions	7
Sum	79
Class Number	11
Description	GOOD ROCK

LE #12	
111+33/CL 18.1	
Relative Rating	
4	- 1
8	
30	
25	
7	
74	
II	
GOOD ROCK	
	111+33/CL 18.1 Relative Rating 4 8 30 25 7 74

Station/Location	108+40/CL
Depth (ft.)	13.5
200	Relative Rating
Uniaxial Compressive Strength	4
RQD	8
Spacing of Joints	30
Condition of Joints	25
Groundwater Conditions	7
Sum	74
Class Number	II II
Description	GOOD ROCK

Station/Location	108+40/CL
Depth (ft.)	17.6
	Relative Rating
Jniaxial Compressive Strength	4
RQD	13
Spacing of Joints	30
Condition of Joints	25
Groundwater Conditions	7
Sum	79
Class Number	II
Description	GOOD ROCK

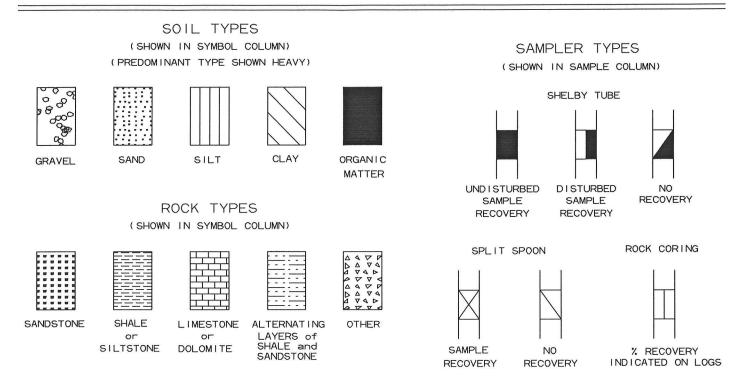
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108+40/CL	
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VERY GOOD ROCK	
	108+40/CL 22.6 Relative Rating 4 17 30 25 7 83

Station/Location Depth (ft.)	
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RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	
Class Number [
Description	

D₅₀ AGGREGATE ANALYSIS FOR SCOUR CALCULATIONS

Job No. 090523												
Creek Name	Station	Sample Type	Location	Depth (FT)	Soil Description	Aggregate Size (D50) (IN)						
War Eagle Creek	111+97	Creek Bank	27' Right of Const. C.L.	N/A	SM Silty Sand	0.0059						
War Eagle Creek	110+10	Creek Bank	60' Right of Const. C.L.	N/A	SM Silty Sand with Some Gravel	0.0059						

LEGEND



TERMS DESCRIBING CONSISTENCY OR CONDITION

GRANL	LAR SOIL		CLAY	CLA	AY-SHALE	SHALE	
"N" Value	Density	"N" Value	Consistency	"N" Value	Consistency	"N" Value	Consistency
0-4	Very Loose	0-1	Very Soft	0-1	Very Soft		
5-10	Loose	2-4	Soft	2-4	Soft	31-60	Soft
11-30	Medium Dense	5-8	Medium Stiff	5-8	Medium Stiff	0ver 60	
31-50	Dense	9-15	Stiff	9-15	Stiff	More than	2'
Over 50	Very Dense	16-30	Very Stiff	16-30	Very Stiff	Penetrati	on
		31-60	Hard	31-60	Hard	in 60 Blov	vs: Medium Haro
		0ver 60	Very Hard	0ver 60	Very Hard	Less than	2'
						Penetrati	on
						in 60 Blov	vs: Hard
				1			

- 1. Ground water elevations indicated on boring logs represent ground water elevations at date or time shown on boring log. Absence of water surface implies that no ground water data is available but does not necessarily mean that ground water will not be encountered at locations or within the vertical reaches of these borings.
- 2. Borings represent subsurface conditions at their respective locations for their respective depths. Variations in conditions between or adjacent to boring locations may be encountered.
- 3. Terms used for describing soils according to their texture or grain size distribution are in accordance with the Unified Soil Classification System.

Standard Penetration Test – Driving a 2.0" O.D., 1-3/8" I.D. sampler a distance of 1.0 foot into undisturbed soil with a 140-pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6.0 inches to seat into undisturbed soil, and then perform the test. The number of hammer blows for seating the spoon and performing the test are recorded for each 6 inches of penetration on the drill log. The field "N" Value (N_f) can be obtained by

adding the bottom two numbers for example: $\frac{6}{8-9} \Rightarrow 8+9=17 blows/ft$. The "N" Value corrected to 60% efficiency (N₆₀) can be obtained by multiplying N_f by the hammer correction factor published on the boring log.

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_			LIMESTONE - Unweathered, Moderately Hard,								'	91	71
 15			Gray to Reddish Gray								-		
-10													
-			Soil Filled Cavity (Clay with Sand) (15.7' to										
			\16.5')								8	84	35
		Ш			6						L		
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=			LIMESTONE WITH OCCASIONAL SHALE								1	00	83
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			LIMESTONE WITH OCCASIONAL SHALE SEAMS - Unweathered, Moderately Hard, Gray									99	83
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AND DESTRUCTIONS			DEPARTMENT OF TRANSPORTATION		BORIN								
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	NAME OF TAXABLE PARTY.		DIVISION - GEOTECHNICAL SEC.		PAGE	1	OF		1	1 200			-
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20	6°, 3		Gravel and Cobbles**										
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REMA	ARKS		Water was encountered at 13.2 feet below ground	level.									
		*	* Hole abandoned due to crooked auger.										

		DEPARTMENT OF TRANSPORTATION DIVISION - GEOTECHNICAL SEC.		BORIN PAGE	G NO		2					
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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

July 25, 2019

TO:

Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT:

Job No. 090523

War Eagle Creek Str. & Apprs. (S)

Route 23 Section 9 Madison County

Attached is the requested soil survey, strength data, and Resilient Modulus test results for the above referenced job. The project consists of replacing the bridge over War Eagle Creek on Highway 23. Samples were taken in the existing travel lanes, ditch line and along the new alignment.

The subgrade soils consist of moderately plastic sandy clay with varying amounts of gravel. Highly plastic clay was encountered at isolated locations within the project limits. 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 station 109+00 6 and 15 feet right of centerline at depths of 3.0 and 2.5 feet respectively.

Earthwork recommendations will be made upon request when plans are further developed and cross sections become 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 near Spring Valley.

2. Asphalt Concrete Hot Mix

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.5	94.5
Binder Course	4.5	95.5
Base Course	4.1	95.9

Michael C. Benson Materials Engineer

MCB:pt:bjj Attachment

CC:

State Constr. Eng. - Master File Copy

District 9 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 - 07/12/2019

SEQUENCE NO. - 1

JOB NUMBER - 090523

MATERIAL CODE - SSRV SPEC. YEAR - 2014

SUPPLIER ID. - 1 COUNTY/STATE - 44

DISTRICT NO. - 09

JOB NAME - WAR EAGLE CREEK STR. & APPRS. (S)

R-VALUE AT 240 psi STATION LIMITS *****************

> 11 BEGIN JOB - END JOB

RESILIENT MODULUS

STA. 122+00 6726

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. Date Sampled: Date Tested: Name of Project: County:	090523 6/3/19 July 11, 2019 WAR EAGLE CREEK STR. & APPRS. (S) Code: 44 Name: MADISON	Material Code Station No.: Location:	SSRVPS 122+00 CL	
Sampled By:	FRAZIER / DICKERSON	Depth:		0-5
Lab No.:	20191801	AASHTO Class:	1	A-4 (0)
Sample ID: LATITUDE:	RV483	Material Type (1 LONGITUDE:	1 or 2):	2
1. Testing Inform	nation:			
	Preconditioning - Permanent Strain > 5% (N
	Testing - Permanent Strain > 5% (Y=Yes o	•		N
	Number of Load Sequences Completed (0-	15)		15
2. Specimen Info	ormation:			
	Specimen Diameter (in):			
	Тор			3.95
	Middle			3.95
	Bottom			3.95
	Average			3.95
	Membrane Thickness (in):			0.01
	Height of Specimen, Cap and Base (in):			8.02
	Height of Cap and Base (in): Initial Length, Lo (in):			0.00 8.02
	Initial Area, Ao (sq. in):			12.18
	Initial Volume, AoLo (cu. in):			97.68
	(33, 11)			07.00
3. Soil Specimen	Weight:			
	Weight of Wet Soil Used (g):			3025.20
4. Soil Properties	S:			
•	Optimum Moisture Content (%):			15.5
	Maximum Dry Density (pcf):			107.1
	95% of MDD (pcf):			101.7
	In-Situ Moisture Content (%):			N/A
5. Specimen Pro	perties:			
	Wet Weight (g):			3025.20
	Compaction Moisture content (%):			15.7
	Compaction Wet Density (pcf):			118.00
	Compaction Dry Density (pcf):			101.99
	Moisture Content After Mr Test (%):			15.5
6. Quick Shear To	est (Y=Yes, N=No, N/A=Not Applicable):			#VALUE!
7. Resilient Modu	ulus, Mr:	6	446(Sc)^-0.12071(S3)^0.37457
8. Comments				~
9. Tested By:	GW	Date: July 11, 2019		

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

SSRVPS 122+00 CL Material Code Station No.: Location: WAR EAGLE CREEK STR. & APPRS. (S) July 11, 2019 090523 6/3/19 Name of Project: Date Sampled: Date Tested: Job No.

County: Code: 44 Name: MADISON
Sampled By: FRAZIER / DICKERSON

Lab No.:20191801Sample ID:RV483LATITUDE:

Depth: 0-5
AASHTO Class: A-4 (0)
Material Type (1 or 2): 2
LONGITUDE:

Nominal Maximum		Actual Applied	Actual Applied	Actual Applied	Actual Applied	Actual Applied	Actual Applied	Average Recov Def.	Resilient Strain	Resilient Modulus
Axial Max. Axial Cyclic Load Stress Load	Axial Cyclic Loac	Cyclic Loac	_	Contact Load	Max. Axial	Cyclic Stress	Contact Stress	LVDT 1 and 2		
					Stress					
Soyclic P _{max} P _{cyclic}		P _{cyclic}		Pcontact	S _{max}	S _{cyclic}	Scontact	Havg	ယ်	Σ̈́
		sql		sql	psi	psi	psi	i	in/in	psi
2.0 25.0 22.5		22.	10	2.5	2.1	1.8	0.2	0.00125	0.00016	11,882
4.0 47.3 44.8		44.8	m	2.5	3.9	3.7	0.2	0.00269	0.00034	10,944
6.0 70.2 66.7		.99	7	3.5	5.8	5.5	0.3	0.00418	0.00052	10,502
8.0 94.1 88.3		88	~	2.8	7.7	7.3	0.5	0.00588	0.00073	9,888
10.0 118.2 110.0		110.	0	8.3	9.7	9.0	0.7	0.00759	0.00095	9,541
2.0 24.9 22.5		22.5		2.4	2.0	1.8	0.2	0.00145	0.00018	10,221
4.0 46.7 44.3		44	~	2.5	3.8	3.6	0.2	0.00320	0.00040	9,111
6.0 68.1 65.5		65.	10	2.5	5.6	5.4	0.2	0.00504	0.00063	8,556
8.0 91.6 86.8		86.	ω	4.8	7.5	7.1	0.4	0.00682	0.00085	8,380
10.0 115.9 108.7		108	.7	7.2	9.5	8.9	9.0	0.00861	0.00107	8,313
2.0 24.6 22.2		22	2	2.3	2.0	1.8	0.2	0.00189	0.00024	7,730
4.0 45.7 43.2		43.2	01	2.5	3.7	3.5	0.2	0.00407	0.00051	6,995
6.0 66.1 63.7		63.	7	2.4	5.4	5.2	0.2	0.00623	0.00078	6,726
8.0 88.7 84.7		84	7.	4.0	7.3	7.0	0.3	0.00828	0.00103	6,738
10.0 112.3 105.9		106	6.9	6.4	9.2	8.7	0.5	0.01031	0.00129	6,763

DATE July 11, 2019	DATE
GW	
TESTED BY	REVIEWED BY

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT MATERIALS DIVISION

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

Job No.

090523

Material Code SSRVPS

Date Sampled:

6/3/19

Station No.: 122+00

Date Tested:

July 11, 2019

Location: CL

Name of Project: WAR EAGLE CREEK STR. & APPRS. (S)

County:

Code: 44

Name: MADISON

Sampled By:

FRAZIER / DICKERSON

Depth: 0-5

Lab No .:

20191801

AASHTO Class: A-4 (0)

Sample ID:

RV483

Material Type (1 or 2): 2

LATITUDE:

LONGITUDE:

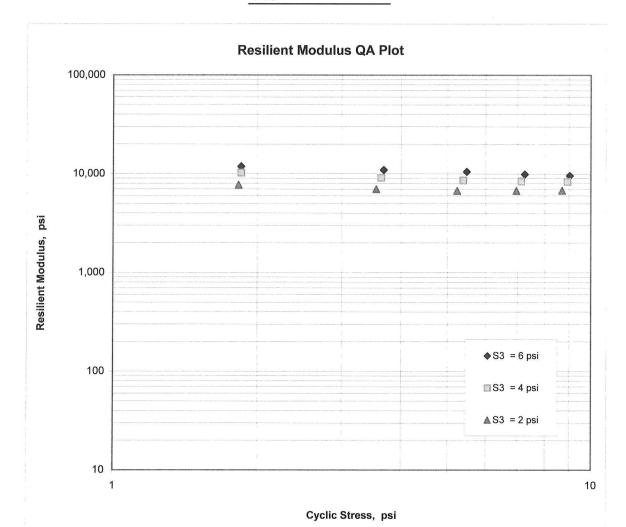
$$M_R = K1 (S_C)^{K2} (S_3)^{K5}$$

$$K1 = 6,446$$

$$K2 = -0.12071$$

$$K5 = 0.37457$$

$$R^2 = 0.99$$



JOB NAME: WAR EAGLE CREEK STR. & APPRS. (S)

Materials Division

COUNTY NO. 44 **DATE TESTED** 7/12/2019

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	<i>LAB</i> #:	%MOISTURE
122+00	CL	0-5	RD/BR	<i>S</i>	50	44	41	E S 36	26	5	A-4(0)	RV483	
109+00	06 RT	0-3Z	BROWN	92	83	75	72	68	55	36	A-7-6(23)	S477	29.4
109+00	15 RT	0-3Z	BROWN	79	74	67	62	56	35	16	A-6(6)	S478	23.9
122+00	CL	0-5	BROWN	65	58	52	49	44	30	8	A-4(1)	S479	23.2
134+70	CL	0-5	RD/BR	60	47	38	35	33	26	9	A-4(2)	S480	11.5
143+00	06 LT	0-5	RD/BR	81	71	60	57	54	37	23	A-6(9)	S481	19.2
143+00	15 LT	0-5	RD/BR	85	75	63	60	57	32	15	A-6(6)	S482	16.2

Arkansas State Highway Transporation Department

Materials Division

 $JOB\ NAME$: WAR EAGLE CREEK STR. & APPRS. (S)

COUNTY NO. 44

STA.# LOC.

090523

JOB:

Michael Benson, Materials Engineer

PAVEMENT SOUNDINGS

AGG.BASE CRS CL-7

ACHIMSC

06 RT

109+00

AGG.BASE CRS CL-7

ACHIMSC

15 RT

109+00

AGG.BASE CRS CL-7

ACHIMSC

占

122+00

AGG.BASE CRS CL-7

ACHIMSC

占

134+70

1.5W

AGG.BASE CRS CL-7

ACHIMSC

06 LT

143+00

3.75

AGG.BASE CRS CL-7

ACHIMSC

15 LT

143+00

7/12/2019

Monday, July 15, 2019

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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 07/24/19 JOB NUMBER - 090523 FEDERAL AID NO TO BE AS PURPOSE - SOIL SUR SPEC. REMARKS - NO SPECI SUPPLIER NAME - STATE NAME OF PROJECT - WAR EA PROJECT ENGINEER - NOT AF PIT/QUARRY - ARKANSAS	PRS. (S)	SEQUENCE NO 1 MATERIAL CODE - SSRVPS SPEC. YEAR - 2014 SUPPLIER ID 1 COUNTY/STATE - 44 DISTRICT NO 09							
LOCATION - MADISON COUNTY DATE SAMPLED - 06/03/1 SAMPLED BY - FRAZIER/DICKERSON DATE RECEIVED - 06/07/1 SAMPLE FROM - TEST HOLE DATE TESTED - 07/12/1									
MATERIAL DESC SOIL SUF	RVEY - R VALUE- PAVE	EMENT SOUNDIN	GS						
LAB NUMBER	- 20191795	- 20191796	- 20191797						
SAMPLE ID	- S477	- S478	- S479						
TEST STATUS	- INFORMATION ONLY	- INFORMATIO	ON ONLY - INFORMATION ONLY						
STATION	- 109+00	- 109+00	- 122+00						
LOCITION	- 06 RT	_ 15 RT	_ CL						
DEPTH IN FEET	- 0-3Z	_ 0-2.5Z	_ 0-5						
IIII E COLOIK	- BROWN	_ BROWN	_ BROWN						
MAT'L TYPE	- 3.6 0 F2 0.0	-	- 36 0 3 30						
LATITUDE DEG-MIN-SEC			53.00 - 36 9 3.20 17.40 93 44 26.70						
LONGITUDE DEG-MIN-SEC	- 93 44 17.40	93 44	17.40 93 44 28.70						
% PASSING 2 IN.		-	-						
1 1/2 IN.		_	- 100						
3/4 IN.		- 100 - 00	- 91 - 76						
3/8 IN. NO. 4	- 94 - 92	- 88 - 79	- 65						
	- 83	- 74 74	_ 58						
	- 75	- 67	_ 52						
	- 72	- 62	- 49						
	- 68	56	4 4						
T TOUTD I TMIM	5.5	2.5	3.0						
LIQUID LIMIT PLASTICITY INDEX	- 55 - 36	- 35 - 16	- 30 - 8						
	- A-7-6(23)	- A-6(6)	- A-4(1)						
UNIFIED SOIL	-	-	- "1" 4(1)						
% MOISTURE CONTENT	- 29.4	- 23.9	- 23.2						
			_						
ACHMSC (IN) AGG.BASE CRS CL-7 (IN)	- 10.0		=						
1100. BIBL CRB CH / (IN)	_	_	_						
	-	-	-						
	_	_	_						
		_	_						
	-	_	-						
	-	_	_						
	-	_	-						

REMARKS - W=MULTIPLE LAYERS, 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 - 07/ JOB NUMBER - 090 FEDERAL AID NO TO PURPOSE - SOI SPEC. REMARKS - NO SUPPLIER NAME - STA NAME OF PROJECT - W PROJECT ENGINEER - N PIT/QUARRY - ARKAN LOCATION - MADIS SAMPLED BY - FRAZIE SAMPLE FROM - TEST MATERIAL DESC SOI	523 BE ASSI L SURVE SPECIFI TE AR EAGL OT APPL SAS ON COUN CR/DICKE HOLE	Y SAMPLE CATION CHECK E CREEK STR. & AP ICABLE TY CRSON			SPEC. Y SUPPLIE COUNTY/ DISTRIC DATE SA DATE RI DATE TI	AL CODE YEAR OR ID. YSTATE T NO. AMPLED ECEIVED	- SSRVPS - 2014 - 1 - 44
LAB NUMBER SAMPLE ID TEST STATUS STATION LOCATION DEPTH IN FEET MAT'L COLOR	- - - - -	20191798 S480 INFORMATION ONLY 134+70 CL 0-5 RD/BR	_	20191799 S481 INFORMATIC 143+00 06 LT 0-5 RD/BR		- 2019 - S482 - INFO - 143+ - 15 I - 0-5 - RD/E	PRMATION ONLY -00
MAT'L TYPE LATITUDE DEG-MIN- LONGITUDE DEG-MIN- % PASSING 2	SEC - IN	36 9 11.60 93 44 17.10		93 44	12.10 5.60	- - 36 93	
3/4		100 81 60 47 38 35 33		100 97 92 81 71 60 57		- 100 - 96 - 85 - 75 - 63 - 60	5 5 5 3
LIQUID LIMIT PLASTICITY INDEX AASHTO SOIL UNIFIED SOIL	 - -	26 9 A-4(2)		37 23 A-6(9)	·e	_	5(6) L6.2
% MOISTURE CONTENT ACHMSC AGG.BASE CRS CL-7	(IN) - (IN) - - - - - -	11.5 1.5W 8.0		3.75 8.0			

REMARKS - W=MULTIPLE LAYERS, 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 - 07/15/19 JOB NUMBER - 090523 FEDERAL AID NO TO BE AS PURPOSE - SOIL SUR SPEC. REMARKS - NO SPECI SUPPLIER NAME - STATE NAME OF PROJECT - WAR EA PROJECT ENGINEER - NOT AP	SEQUENCE NO. MATERIAL CODE SPEC. YEAR SUPPLIER ID. COUNTY/STATE DISTRICT NO.		2014 1		
PIT/QUARRY - ARKANSAS LOCATION - MADISON CO SAMPLED BY - FRAZIER/DIC SAMPLE FROM - TEST HOLE MATERIAL DESC SOIL SUR	KERS	SON	DATE SAMPLED DATE RECEIVED DATE TESTED 'UAL RESULTS	-	06/03/19 06/07/19 07/12/19
LAB NUMBER	- 2	0191801 -	=		
SAMPLE ID		×V483 –	_		
		NFORMATION ONLY -	_		
		22+00 -			
The contract of the contract o		- L			
		_ _5	_		
		_	1—		
INII E COECIC	- R	D/BR _	_		
MAT'L TYPE	-	-	_		
LATITUDE DEG-MIN-SEC		36 9 3.20 -	-		
LONGITUDE DEG-MIN-SEC	-	93 44 26.70			
% PASSING 2 IN.	-	-	-		
1 1/2 IN.	-		_		
3/4 IN.	-	100 -	-		*
3/8 IN		77 -	_		
NO. 4		56	=		
NO. 10		50 _	-		
NO. 40		44 _	_		
			_		
NO. 80 - NO. 200 -		41 – 36	_		
NO. 200	-	36			
LIQUID LIMIT .	-	26 -	_		
PLASTICITY INDEX	-	5 -	_		
AASHTO SOIL	-	A-4(0)	_		
UNIFIED SOIL -		_	_		
% MOISTURE CONTENT -		=	_		
6 HOIDIONE CONTENT					
-		<u>ٿ</u>	-		
-	•	-	-		
-		_	_		
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-		-	_		

REMARKS - W=MULTIPLE LAYERS, Z=AUGER REFUSAL

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AASHTO TESTS : T24 T88 T89 T90 T265