# ARKANSAS DEPARTMENT OF TRANSPORTATION



# SUBSURFACE INVESTIGATION

STATE JOB NO.		080506	
FEDERAL AID PROJEC	CT NO	NHPP-0058(47)	
	CROOKED I	BRANCH STR. & APPRS.	(S)
STATE HIGHWAY	7	SECTION	15
IN		POPE	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

October 25, 2017

TO:

Mr. Rick Ellis, Bridge Engineer

SUBJECT:

Job No. 080506

Crooked Branch Str. & Apprs. (S)

Route 7 Section 15

Pope County

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 bridge crossing Crooked Branch, on Highway 7, northwest of Dover. The new bridge will be constructed on the existing alignment. Two of the four requested borings, all intermediate bents, were inaccessible due to steep slopes and low bridge clearance. The borings that were not obtained were located at: 310+62 C.L. Construction and 311+02 C.L. Construction. Both proposed bridge end borings were located on the centerline of the existing roadway and were offset to only impact one travel lane, due to the large volume of traffic on this section of Highway 7.

The subsurface investigation revealed that bedrock is approximately 15 feet deep at each bridge end. It is anticipated that both end bents will be founded on piling. Preboring may be necessary in order to achieve minimum penetration requirements. Correlating the elevation of bedrock between the bridge end boring logs, competent bedrock should be encountered less than 15 feet below ground level. Based on this information and correspondence with Bridge Division, it is anticipated that both intermediate bents will be founded on spread footings or drilled shafts. Spread Footings founded in competent Shale should be sized based on the values provided in Table 1.

TABLE 1 – Bearing Capacity Recommendations for Spread Footings

Nominal Bearing	Factored Bearing	Bearing Resistance at
Resistance (ksf)	Resistance (ksf)	Service Limit State (ksf)
144	65	40

Drilled Shafts socketed into Shale to Sandstone with Shale should be designed based on the values provided in Table 2.

TABLE 2 - Bearing Capacity Recommendations for Drilled Shafts

Nominal Shaft Side	Factored Shaft Side	Nominal Shaft Tip	Factored Shaft Tip
Resistance (ksf)	Resistance (ksf)	Resistance (ksf)	Resistance (ksf)
32.7	18	163	81.5

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 8 Engineer

G.C. File

# GEOLOGY AND SITE CONDITIONS Job No. 080506 Crooked Branch Str. & Apprs. (S) Route 7 Section 15 Pope County

# **Site Conditions**

The existing bridge is located over Crooked Branch on highway 7 in Pope County, northwest of Dover. It is a 2 span bridge, approximately 70 foot long, running north to south. The existing bridge is constructed of concrete deck, cast-in-place, supported by a single spread footing and end walls constructed of stone and mortar. The bridge has been widened by the addition of concrete to the decking and supports. Additional Steel beams were added, vertically and horizontally, at the bridge ends to provide additional support and stability. There is riprap lining the channel bank at the north bridge end. There are remnants of an older bridge abutment under the northern end of the existing structure. Overhead power lines and buried telecommunication lines both parallel the east side of the existing bridge. A buried water line runs east to west under the bridge, adjacent to the river channel, and has been covered by concrete.

Crooked Branch Creek flows west to east under the bridge before making its confluence with the Illinois Bayou. This creek appears to be capable of transporting large amounts of debris, as evident by trees and branches piled up at the base of the middle bent. On the west side of highway 7, there is a business located down-station from the bridge and a residence located up-station from the bridge. The east side of the bridge is primarily pastureland with the exception of scattered trees lining the Crooked Branch Creek channel. West of the bridge, the creek channel runs through moderately to heavily wooded property. There are multiple faults mapped to the north and south of the project alignment and additional unmapped faults in the area are possible.

# **Site Geology**

The project alignment is located in the mapped outcrop of the Atoka Formation (map symbol Pa). This formation is Pennsylvanian in age and has the widest areal extent of all the Paleozoic rocks in Arkansas. The Atoka is a sequence of mostly tan to gray marine sandstones and grayish black shales. This formation represents prominent surface exposures in the Boston Mountains, along the Arkansas River Valley, and along the frontal Ouachita Mountains, where unit thickness can be up to 25,000 feet. This formation contains rare calcareous beds, discontinuous coal, and abundant trace fossils.

# **Subsurface Conditions**

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

0 to 14.5 Feet: Consists

Consists of moist, medium stiff, brown sandy clay with some gravel (rock

fragments) to moist, loose, brown clayey sand with some gravel (rock

fragments).

14.5 to 38.5 Feet:

Consists of slightly weathered to unweathered, medium hard, dark gray

shale with occasional fractures and coal seams.

38.5 to 48.6 Feet:

Consists of unweathered, well cemented, gray sandstone with occasional

shale seams and layers.

# Rock Core Unconfined Compression Test Summary

Project Number:

080506

Project Name:

Crooked Branch Str. & Apprs. (S)

Date Tested:

10/4/2017

Station	Location	Sample No.	Depth (ft)	Diameter (in)	Height (in)	Total Load (lbs)	Correction Factor	Stress (psi)	Remarks
310+32	8' RT	1	15.4	1.75	3.51	8,050	1.00	3,347	Shale
310+32	8' RT	2	22.0	1.75	3.50	13,540	1.00	5,630	Shale
310+32	8' RT	3	29.5	1.75	3.50	8,810	1.00	3,663	Shale
310+32	8' RT	4	37.6	1.75	3.52	39,080	1.00	16,249	SS w/ SH seams
311+46	8' LT	5	19.0	1.75	3.51	9,660	1.00	4,017	Shale
311+46	8' LT	6	30.4	1.75	3.50	14,480	1.00	6,021	Shale
311+46	8' LT	7	36.0	1.75	3.51	5,760	1.00	2,395	Shale
311+46	8' LT	8	40.1	1.75	3.51	22,150	1.00	9,210	SS w/ SH seams
				-					

<sup>\*</sup> Please note any broken samples, fractures or other characteristics of sample in Remarks.

# ROCK MASS RATING SUMMARY JOB# 080506

_E #1
310+32/8' Rt CL 15.5
Relative Rating
2
13
25
20
7
67
l l
GOOD ROCK

SAMPL	E #2
Station/Location Depth (ft)	310+32/8' Rt CL 22
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	1 To
Sum	74
Class Number	U I
Description	GOOD ROCK

Station/Location	310+32/8' Rt CL 29.5
Depth (ft)	29.5
	Relative Rating
Iniaxial Compressive Strength	4
RQD	8
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	69
Class Number	ii
Description	GOOD ROCK

SAMP	LE #4
Station/Location Depth (ft)	310+32/8' Rt CL 37.5
	Relative Rating
Uniaxial Compressive Strength	12
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	86
Class Number	
Description	VERY GOOD ROCK

Station/Location	311+46/8' Lt CL
Depth (ft)	19
	Relative Rating
Jniaxial Compressive Strength	4
ROD	13
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	69
Class Number	u l
Description	GOOD ROCK

Station/Location	311+46/8' Lt CL
Depth (ft)	30.5
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	74
Class Number	11
Description	GOOD ROCK

SAMPI	_E #7
Station/Location Depth (ft)	311+46/8' L1 CL 36
	Relative Rating
Uniaxial Compressive Strength	2
ROD	13
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	72
Class Number	11
Description	GOOD ROCK

SAMP	LE #8
Station/Location Depth (ft)	311+46/8' Lt CL 40
Uniaxial Compressive Strength	7
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	81
Class Number	I
Description	VERY GOOD ROCK

# D<sub>50</sub> AGGREGATE ANALYSIS FOR SCOUR CALCULATIONS

		Job No.	080506		
Creek Name	Station	Sample Type	Location	Depth (FT)	Aggregate Size (D50) (IN)
Crooked Branch	311+00	Creek Bank	Construction C.L.	N/A	0.007

# LEGEND

### SOIL TYPES SAMPLER TYPES (SHOWN IN SYMBOL COLUMN) (SHOWN IN SAMPLE COLUMN) (PREDOMINANT TYPE SHOWN HEAVY) SHELBY TUBE CLAY SILT SAND GRAVEL MATTER DISTURBED **UNDISTURBED** RECOVERY SAMPLE SAMPLE ROCK TYPES RECOVERY RECOVERY (SHOWN IN SYMBOL COLUMN) ROCK CORING SPLIT SPOON ALTERNATING SANDSTONE LAYERS of SHALE and SANDSTONE or % RECOVERY SAMPLE NO SILTSTONE DOLOMITE INDICATED ON LOGS RECOVERY RECOVERY

# TERMS DESCRIBING CONSISTENCY OR CONDITION

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

- 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.
- 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, 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 (N<sub>60</sub>) can be obtained by multiplying N<sub>f</sub> by the hammer correction factor published on the boring log.

			HWY. & TRANS. DEPARTMENT		BORIN								
			DIVISION - GEOTECHNICAL SEC.		PAGE	1		F 2					
JOB N			080506 Pope County		DATE:			-	nber	20, 2	2017		
1 JOR I	IAME:		Crooked Branch Str. & Apprs.(S) Route 7 Section 15		TYPEC				_			~	
STAT	TON		310+32				Stem A	Auge				Core	;
	TION: ATION:		8' Right of Construction Centerline		EQUIP	MENT	`:		F	Acker	•		
			stanley Bates		LIANANA	ED C	ADDEC'	TIOM	EAC	ron.		N/A	
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			Dark Gray									100	44
		+											_
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			SHALE - Unweathered, Medium Hard, Dark										
			Gray									94	84
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30													
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			Occasional Coal Seams, Dark Gray									84	40
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			Gray										
===													
			SANDSTONE WITH OCCASIONAL SHALE										
40			SEAMS AND LAYERS - Unweathered, Well										
			Cemented, Gray									100	80
									-				
			SHALE WITH FREQUENT SANDSTONE						- 1				
			SEAMS AND LAYERS - Unweathered, Medium						- 1				
45			\Hard, Dark Gray										
			SANDSTONE WITH OCCASIONAL SHALE									97	51
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			Cemented, Gray										
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5	Moist, Medium Stiff, Brown Sandy Clay with Some Gravel (Rock Fragments)							3-	3		
10	Moist, Loose, Brown Clayey Sand with Some Gravel and Cobbles (Rock Fragments)							3-3-	4		
15	SHALE							(0			
	SHALE - Slightly Weathered, Medium Hard, Occasional Fractures, Dark Gray									90	40
20	SHALE - Slightly Weathered, Medium Hard, Occasional Coal Seams, Dark Gray									80	66
25	SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray*									47	28
30	SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray									100	66
	Poor recovery due to core barrel malfunction.										

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JOB N		_	DIVISION - GEOTECHNICAL SEC.  080506 Pope County		PAGE	2		2	. 1	20. 0	2017		
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### ARKANSAS DEPARTMENT OF TRANSPORTATION

July 17, 2017

TO:

Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT:

Job No. 080506

Crooked Branch Str. & Apprs. (S)

Route 7 Section 7
Pope 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 the bridge crossing Crooked Branch creek on Highway 7. 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 of non-plastic sands to low plasticity clayey sands. The subgrade soils are expected to provide a stable working platform with conventional processing, if the weather is favorable during construction.

Based on currently available cross sections the maximum embankment height is approximately 9 feet. Where embankment is placed in the existing ditch line, all soft unstable organic material should be undercut a maximum of two feet prior to construction. The embankment may be constructed with locally available unspecified material utilizing the 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 Russellville.

# 2. Asphalt Concrete Hot Mix

PG 64-22

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.5	94.5
Binder Course	4.4	95.6
Base Course	4.0	96.0

### PG 70-22

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.5	94.5
Binder Course	4.5	95.5
Base Course	4.0	96.0

ı	<b>2</b> G	76.	.22

Asphalt Cement %	Mineral Aggregate %
5.4	94.6
4.3	95.7
3.8	96.2
	5.4 4.3

Michael C. Benson Materials Engineer

MCB:pt:bjj Attachment

State Constr. Eng. – Master File Copy District 8 Engineer System Information and Research Div. CC:

G.C. File

### MICHAEL BENSON, MATERIALS ENGINEER

\*\*\* SOIL SURVEY STRENGTH TEST REPORT \*\*\*

DATE - 07/05/2017 SEQUENCE NO. - 1

JOB NUMBER - 080506 MATERIAL CODE - SSRV

SPEC. YEAR - 2014

SUPPLIER ID. - 1

COUNTY/STATE - 58

DISTRICT NO. - 08

JOB NAME - CROOKED BRANCH STR. & APPRS. (S)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

BEGIN JOB - END JOB 15

RESILIENT MODULUS

308 + 00 11198

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.	080506	Material Code	SSRVPS
Date Sampled:	6/15/17	Station No.:	308+00
Date Tested:	June 28, 2017	Location:	18'RT
Name of Project:	CROOKED BRANCH STR. & APPRS. (S)		
County:	Code: 58 Name: POPE		0.7
Sampled By:	THORNTON	Depth:	0-5
Lab No.:	20172006	AASHTO Class:	A-4(2)
Sample ID: LATITUDE:	RV443	Material Type (1 or 2) LONGITUDE:	: 2
4 Tastina Info	and an		<del></del>
1. Testing Inform	Preconditioning - Permanent Strain > 5% (Y	=Yes or N= No)	N
	Testing - Permanent Strain > 5% (Y=Yes or	-	N
	Number of Load Sequences Completed (0-1s	•	15
2. Specimen Info	ormation:		
2. Opeomicii iiii	Specimen Diameter (in):		
	Top		3.95
	Middle		3.94
	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 (iii):		0.00
	Initial Length, Lo (in):		8.02
	Initial Area, Ao (sq. in):		12.16
	Initial Volume, AoLo (cu. in):		97.52
3. Soil Specimer	n Weight:		
	Weight of Wet Soil Used (g):		3183.20
4. Soil Propertie	s:		
	Optimum Moisture Content (%):		14.3
	Maximum Dry Density (pcf):		113.2
	95% of MDD (pcf):		107.5
	In-Situ Moisture Content (%):		N/A
5. Specimen Pro	perties:		
	Wet Weight (g):		3183.20
	Compaction Moisture content (%):		14.6
	Compaction Wet Density (pcf):		124.38
	Compaction Dry Density (pcf):		108.53
	Moisture Content After Mr Test (%):		14.4
6. Quick Shear T	est (Y=Yes, N=No, N/A=Not Applicable):		#VALUE!
7. Resilient Mod	ulus, Mr:	13696(5	Sc)^-0.17193(S3)^0.24596
8. Comments			
	S		
9. Tested By:	GW	Date: June 28, 2017	
-			

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

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

SSRVPS 308+00 18'RT Material Code Station No.: Location: June 28, 2017 6/15/17 080508 Date Sampled: Date Tested: Job No.

POPE Name: Code: 58 THORNTON 20172006 Sampled By: Sample ID: Lab No.: County:

CROOKED BRANCH STR. & APPRS. (S)

Name of Project:

RV443 LATITUDE:

A-4(2)

**AASHTO Class:** 

Depth:

Material Type (1 or 2): 2 LONGITUDE:

0-5

	Chamber	Nominal	Actual	Actual	Actual	Actual	Actual	Actual	Average	Resilient	Resilient
	Confining	Maximum	Applied	Applied	Applied	Applied	Applied	Applied	Recov Def.	Strain	Modulus
PARAMETER	Pressure	Axial	Max. Axial	Cyclic Load	Contact	Мах.	Cyclic	Contact	LVDT 1		
		Stress	Load		Load	Axial	Stress	Stress	and 2		
						Stress					
DESIGNATION	လိ	Scyclic	P <sub>max</sub>	P <sub>cyclic</sub>	Pcontact	S <sub>max</sub>	Scyclic	Scontact	Havg	ۍ ک	Mr
LINO	psi	psi	sql	sql	sql	psi	psi	psi	Ŀ.	in/in	psi
Sequence 1	0.9	2.0	25.4	22.7	2.7	2.1	1.9	0.2	0.00079	0.00010	19,049
Sequence 2	0.9	4.0	47.6	44.9	2.7	3.9	3.7	0.2	0.00162	0.00020	18,269
Sequence 3	9.0	0.9	70.5	6.99	3.6	5.8	5.5	0.3	0.00263	0.00033	16,775
Sequence 4	0.9	8.0	94.3	88.3	6.0	7.8	7.3	0.5	0.00394	0.00049	14,793
Sequence 5	6.0	10.0	117.2	108.8	8.4	9.6	8.9	0.7	0.00527	0.00066	13,611
Sequence 6	4.0	2.0	25.4	22.6	2.8	2.1	1.9	0.2	0.00091	0.00011	16,480
Sequence 7	4.0	4.0	47.4	44.6	2.8	3.9	3.7	0.2	0.00188	0.00023	15,656
Sequence 8	4.0	0.9	69.3	66.5	2.8	5.7	5.5	0.2	0.00299	0.00037	14,676
Seguence 9	4.0	8.0	92.9	87.8	5.1	9.7	7.2	0.4	0.00422	0.00053	13,727
Sequence 10	4.0	10.0	116.2	108.6	9.7	9.6	8.9	9.0	0.00563	0.00070	12,733
Sequence 11	2.0	2.0	25.1	22.3	2.8	2.1	1.8	0.2	0.00104	0.00013	14,134
Sequence 12	2.0	4.0	47.1	44.3	2:8	3.9	3.6	0.2	0.00221	0.00028	13,194
Sequence 13	2.0	0.9	68.6	65.8	2.8	5.6	5.4	0.2	0.00349	0.00044	12,430
Sequence 14	2.0	8.0	91.1	8.98	4.3	7.5	7.1	0.4	0.00488	0.00061	11,733
Sequence 15	2.0	10.0	114.1	107.3	6.7	9.4	8.8	9.0	0.00632	0.00079	11,198

June 28, 2017	ļ
DATE	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.

080506

**Material Code SSRVPS** 

**Date Sampled:** 

6/15/17

**Station No.: 308+00** 

Date Tested:

June 28, 2017

Location: 18'RT

Name of Project: CROOKED BRANCH STR. & APPRS. (S)

County:

**Code:** 58

Sampled By:

**THORNTON** 

Depth: 0-5

Lab No.:

20172006

**AASHTO Class:** A-4(2)

Sample ID:

**RV443** 

Material Type (1 or 2): 2

LATITUDE:

LONGITUDE:

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

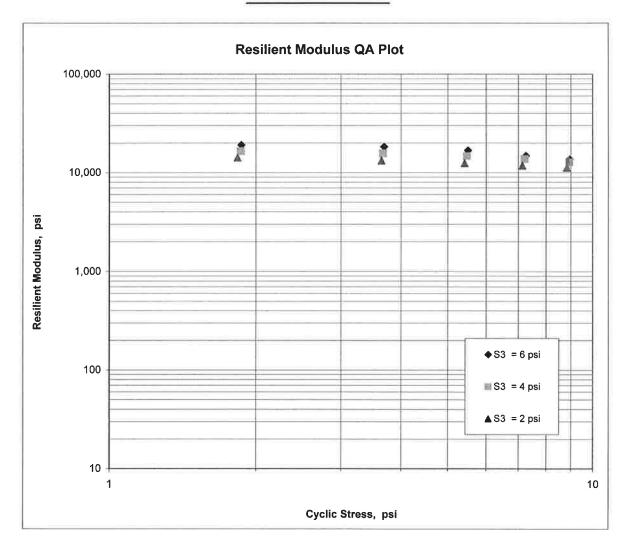
Name: POPE

K1 = 13,696

K2 = -0.17193

K5 = 0.24596

 $R^2 = 0.94$ 



JOB: 080506

Arkansas State Highway Transporation Department

JOB NAME: CROOKED BRANCH STR. & APPRS. (S)

Materials Division

COUNTY NO. 58 DATE TESTED

6/26/2017

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	<i>LAB</i> #:	%MOISTURE
308+00	18 RT	0-5	BROWN	93	87	E 81	75	60	26	7	A-4(2)	RV443	
308+00	06 RT	0-5	BROWN	96	91	84	74	59	28	10	A-4(3)	S439	15.4
308+00	18 RT	0-5	BROWN	97	93	88	82	67	ND	NP	A-4(0)	S440	18.2
314+00	06 LT	0-5	BROWN	89	82	76	58	42	ND	NP	A-4(0)	S441	11.6
314+00	18 LT	0-5	BROWN	99	96	90	76	57	24	8	A-4(1)	S442	11.6

DATE TESTED

6/26/2017

Arkansas State Highway Transporation Department

Materials Division

 $JOB\ NAME$ : CROOKED BRANCH STR. & APPRS. (S)

COUNTY NO. 58

080506

JOB:

Michael Benson, Materials Engineer

PAVEMENT SOUNDINGS AGG. BASE CRS CL-7 9.0 AGG. BASE CRS CL-7 AGG. BASE CRS CL-7 ACHIMSC 3.0X ACHIMSC **ACHIMSC** 6.0X ACHMSC 5.0W ACHMSC 2.0W ACHMSC 06 RT 06 LT 18 RT STA.# LOC. 314+00 308+00 308+00

Friday, July 14, 2017

### MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 07/13/17  JOB NUMBER - 080506  FEDERAL AID NO - TO BE ASSIGNED  PURPOSE - SOIL SURVEY SAMPLE  SPEC. REMARKS - NO SPECIFICATION CHECK SUPPLIER NAME - STATE  NAME OF PROJECT - CROOKED BRANCH STR. & APPRS. (S)  PROJECT ENGINEER - NOT APPLICABLE  PIT/QUARRY - ARKANSAS  LOCATION - POPE, COUNTY  SAMPLED BY - THORNTON  SEQUENCE NO 1  AMTERIAL CODE - SSRVPS  SPEC. YEAR - 2014  COUNTY/STATE - 58  DISTRICT NO 08  NATE SAMPLED - 06/15/17											
SAMPLE FROM - TEST HOLE DATE TESTED - 06/26/17 MATERIAL DESC SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS											
LAB NUMBER SAMPLE ID TEST STATUS STATION LOCATION DEPTH IN FEET	- - - -	20172002 S439 INFORMATI			20172003 S440	N ONLY	20172 - S441 - INFOR - 314+0 - 06 LT	MATION ONLY			
MAT'L COLOR	-	BROWN			BROWN		BROWN	ſ			
MAT'L TYPE	-	25 05	20.10	1	25		-	05 40 00			
LATITUDE DEG-MIN- LONGITUDE DEG-MIN-					35 25 3 93 08	38.10 4.80	= 35 93	25 43.80 08 5.00			
% PASSING 2				_							
	2 IN			-			_				
3/4	1 IN						100				
3/8	3 IN	100		-	100		99				
	4 -			-	97		89				
	10 -			-	93		82				
	40 -			•	88		_ 76				
	80 -			-	82		- 58				
NO.	200 -	59			67		42				
LIQUID LIMIT	-	28		-	ND		- ND				
PLASTICITY INDEX	-			-	NP		NP				
AASHTO SOIL	-	A-4(3)		_	A-4(0)		A-4(	0)			
UNIFIED SOIL	-			_			-				
% MOISTURE CONTENT	-	15.4			18.2		11	6			
ACHMSC	(IN) -	2.0W		-			- 5.0	W			
ACHMSC	(IN) -	6.0X	2		(*)*(*)		3.0				
AGG. BASE CRS CL-7	(IN) -	9.0		=			- 9.0 -	)			
	-			2**			= 1				
	-			-			<del>.</del>				
	-			-			-				
	_						<b>→</b> 0				
	_			-			<del>-</del> 2				

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265

### MICHAEL BENSON, MATERIALS ENGINEER

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

JOB NUMBER - FEDERAL AID NO PURPOSE - SPEC. REMARKS - SUPPLIER NAME - NAME OF PROJECT PROJECT ENGINEER PIT/QUARRY - A LOCATION - P	SOIL SURVI NO SPECIF STATE - CROOKED - NOT APP RKANSAS OPE, COUNT IORNTON EST HOLE	EY SAMPLE ICATION C BRANCH S LICABLE	HECK		MATERIAL CODE - SPEC. YEAR - SUPPLIER ID COUNTY/STATE - DISTRICT NO  DATE SAMPLED DATE RECEIVED DATE TESTED	- 2014 - 1 - 58 - 08
LAB NUMBER	_	2017222	F	2	<del>:=</del> :	
	_	2017200	5	-		
SAMPLE ID	_		TITONI ONITA	-	-	
TEST STATUS	_		TION ONLY	12 12		
STATION	-			1017 19 <b>2</b>	#3	
LOCATION	-	18 LT 0-5		0 <b>=</b> :	-	
DEPTH IN FEET				5 <del>5</del>	<del>,=</del> 1	
MAT'L COLOR MAT'L TYPE	_	BROWN		<del>-</del>	<b>3</b> /1	
LATITUDE DEG-	MIN CEC	25 2	5 43.80	<b>1</b> €	-	
LATITUDE DEG-				S <del></del>		
LONGITODE DEG-	MIN-SEC -	93 0	8 5.10	P		
% PASSING 2	IN				===	
1	1/2 IN			-	8	
	3/4 IN			-	<b>20</b>	
	3/8 IN	100		_	=	
	NO. 4 -	99		_		
	NO -	96		-	~ (**) 설명	
	NO 40 -	90		-	<b>*</b> 0	
	NO: 80 -	76		=	<b>5</b> 8	
	NO. 200 -	57				
LIQUID LIMIT	_	24		=	_	
PLASTICITY IND	EX -	8	÷	2#	-	
AASHTO SOIL	_	A-4(1)		-	-	
UNIFIED SOIL	-			35	-	
% MOISTURE CON'	TENT -	11.6	5	=	_	
	_			_	· <del>-</del>	
	_			_	-	
	_			<del></del>		
	_			<u>=</u>	72	
	-			-	3 <b>=</b>	
	_			-	·=	
	_			2	9 <b>5</b> . 743	
				-	· <del>-</del>	

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265

# MICHAEL BENSON, MATERIALS ENGINEER

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

SAMPLED BY - THORNTON DATE RECEIVED - 06/2										RV 2014 1 58 08
LAB NUMBER	_	0017000			_			_		
		2017200	)6							
SAMPLE ID	-	RV443	·	ON ONT 1/	1. <del>**</del>	79		-		
TEST STATUS	-		7.T.T	ON ONLY	1. <del></del>			-		
STATION	-	308+00						48		
LOCATION	-				-			===		
DEPTH IN FEET	-				S#6			æ:		
MAT'L COLOR	-	BROWN								
MAT'L TYPE	-		_		-			=		
LATITUDE DEG-MIN-SEC				38.10	24			-		
LONGITUDE DEG-MIN-SEC	-	93 (	8 (	4.80						
% PASSING 2 IN.					: <del>-</del>			<b>35</b> )		
1 1/2 IN.		100			2			201 (201		
3/4 IN.		100			=			=		
3/8 IN.		95						-		
NO. 4		93			-			<b>3</b> 0		
NO. 10		87			**			<i>≥</i> 0		
NO. 40		81						<b>3</b> 0		
1,0.	-	75			•			<b>≅</b> 8		
NO. 200	-	60								
LIQUID LIMIT	_	26						2		
PLASTICITY INDEX	_	7			V2			5 <del>-</del> 6		
AASHTO SOIL	_	A-4(2)	)		: <del></del>			-		
UNIFIED SOIL	-				-					
% MOISTURE CONTENT	_				3.50			-		
	-				=			=		
	-				=			3		
	_				_			1 <del></del>		
	_				2			32		
	_				74			1200 1200		
	-				~			: <del>=</del>		
	-				=					
	-				7			· ·		
	-				22			-		

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265

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