

ARKANSAS DEPARTMENT OF TRANSPORTATION



**SUBSURFACE INVESTIGATION**

STATE JOB NO. 009784

FEDERAL AID PROJECT NO. NHPP-STPB-0051(13)

BUFFALO RIVER & MILL CREEK STRS. & APPRS. (S)

STATE HIGHWAY 7 SECTION 18

IN NEWTON COUNTY

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# ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

March 6, 2017

**TO:** Mr. Rick Ellis, Bridge Engineer

**SUBJECT:** Job No. 009784  
Buffalo River Br. & Apprs. (Pruitt) (S)  
Route 7, Section 18  
Newton County

Transmitted herewith are a brief summary of the geology and site conditions, D50 analysis test results, rock mass rating summary, unconfined compressive strength results, and the logs of the borings conducted for the structure 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. The rock cores are available for inspection at the Materials Division.

Based on plans provided by the Bridge Division, it is anticipated that the south bridge end, Bent 1, will be founded on piling. Preboring may be necessary in order to achieve minimum penetration requirements.

Based on the depth at which bedrock was encountered, it is anticipated that the north bridge end, Bent 5, will be founded on a spread footing and all intermediate bents will be founded on drilled shafts. Spread footings should be founded in the competent Sandstone and should be sized based on the values provided in Table 1.

TABLE 1 – Bearing Capacity Recommendations for Spread Footings

Foundation Description	Nominal Bearing Resistance (ksf)	Resistance Factor	Nominal Bearing Resistance (ksf)
Spread Footing	44.2	0.45	20.0

Drilled shafts socketed into the competent Sandstone to Dolostone should be designed based on the values provided in Table 2.

TABLE 2 – Bearing Capacity Recommendations for Drilled Shafts

Foundation Description	Nominal Tip Resistance (ksf)	Factored Tip Resistance (ksf)	Nominal Side Resistance (ksf)	Factored Side Resistance (ksf)
Drilled Shafts	412	206	21.2	11.7

Bent 5 is currently located on the edge of a steep bluff. It is recommended that the bent be moved a minimum of 30 feet up station. This will ensure the bent is founded on a stable formation and provide protection against natural weathering of the bluff face. The area around Bent 5 was heavily vegetated prior to the subsurface investigation. It is recommended that Surveys Division verify the topography in this area before final plans are produced.

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  
Surveys Division

## **GEOLOGY AND SITE CONDITIONS**

**Job No. 009784**

**Buffalo River BR. & APPRS. (Pruitt) (S)**

**Newton County**

**Route 7 Section 18**

### **Site Conditions**

The existing Buffalo River Bridge is located on Route 7 in Newton County. It is a 4 span bridge, approximately 280 feet long, running northeast to southwest. The superstructure consists of an arched steel truss supported by 3 wall piers on spread footings with concrete end bents. The decking is cast-in-place, reinforced concrete and contains multiple steel drainpipes. The decking is in poor condition and contains multiple cracks with exposed rebar. Both endwalls are concrete and show signs of erosion under their structures. The northernmost endwall has additional stacked stone on the left side for erosion control and the southernmost endwall has stone riprap on its endslope. The guardrails are steel and concrete leading up to the bridge and the guardrails on the bridge, attached to the bridge trusses, are steel. Suspended telecommunication lines parallel the right side of the bridge and cross the road up-station from the northernmost bridge end. Overhead power lines parallel the right side of Route 7 both up- and down-station from the bridge, but terminate before reaching the bridge ends. Down-station from the southern bridge end, there is a National Forest Visitor Center on the left and a storage facility on the right.

The Buffalo National River flows from west to east under the bridge, to its confluence with the White River at Buffalo City. Sediment deposited in the channel is primarily sand, gravel, and boulders. A secondary channel has developed on the southern flank of the river forming an island during periods of high flow. There is a major sandstone bluff on the northern side of the bridge and both sides of the channel are heavily vegetated. There is a canoe takeout/drop-off point located approximately one quarter of a mile downstream from the bridge. A moderately used horseback riding/hiking trail can be found up-station from the northern bridge end, which leads to the canoe pickup/drop-off point downstream from the bridge. The remains of an older bridge can be found just east of the project alignment on both sides of the river channel.

### **Site Geology**

The project alignment is located in the Boston Mountains Plateau of the Ozarks in the Ordovician-aged Everton Formation (Oe). This formation has several named members including the Calico Rock Sandstone, the Kings River Sandstone, and the Newton Sandstone. The sandstone in this area correlates to the Newton Sandstone. The Everton Formation is composed primarily of dolostone, sandstone, and limestone with the majority consisting of clean friable sandstone with alternating layers of dolostone and limestone at the project locality. The limestone is light-gray to brownish-gray and generally more or less dolomitic and sandy. The dolostone is light- to dark-gray and generally more or less limy and sandy. The Everton Formation has thick members of friable sandstone dominating local sections in different regions. The sandstone tends to be made up of clean, white, well-rounded, frosted, medium-sized sand grains and thickness ranges from 300 to 650 feet. The lower contact is unconformable and

other disconformities occur within the formation. The thickness of the Everton Formation varies from about 300 feet to as much as 650 feet. Multiple soil filled cavities were encountered in the borings ranging from 0.1 to 3.2 feet in thickness with the larger cavities located on the northern side of the channel. Several faults exist in the surrounding area, including the Carlton Fault Zone which runs adjacent to the project alignment. However, no faulting was evident in any of the borings.

### **Subsurface Conditions**

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

0 to 14.3 Feet: Varies from loose to very dense, reddish brown clayey sand with gravel (rock fragments) to moist, stiff to very stiff, reddish brown sandy clay with gravel (rock fragments).

14.3 to 52.0 Feet: Consists of slightly weathered to weathered, poorly cemented to well cemented, white to light gray, occasionally fractured, partially calcareous, sandstone with occasional layers of limestone and dolostone.

Cavities were encountered in many of the borings. These ranged in thickness from 0.1 to 0.3 feet for stations 151+34 to 158+41 and 3.0 to 3.2 feet at stations 158+25 18' right and 158+34 6' left.

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

<b>Job No. 009784</b>					
<b>Creek Name</b>	<b>Station</b>	<b>Sample Type</b>	<b>Location</b>	<b>Depth (FT)</b>	<b>Aggregate Size (D50) (IN)</b>
Buffalo River	155+90	River Channel	Construction C.L.	N/A	0.0197

# ROCK MASS RATING SUMMARY

JOB # **009784**

**SAMPLE #1**

Station/Location	151+34/20' LT
Depth (ft)	12
<b>Relative Rating</b>	
Uniaxial Compressive Strength	4
RQD	3
Spacing of Joints	20
Condition of Joints	12
Groundwater Conditions	7
Sum	46
Class Number	III
Description	<b>FAIR ROCK</b>

**SAMPLE #2**

Station/Location	151+34/20' LT
Depth (ft)	20.5
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	67
Class Number	II
Description	<b>GOOD ROCK</b>

**SAMPLE #3**

Station/Location	151+34/20' LT
Depth (ft)	32
<b>Relative Rating</b>	
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	30
Condition of Joints	25
Groundwater Conditions	7
Sum	86
Class Number	I
Description	<b>VERY GOOD ROCK</b>

**SAMPLE #4**

Station/Location	151+50/3' LT
Depth (ft)	13.5
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	8
Spacing of Joints	10
Condition of Joints	12
Groundwater Conditions	7
Sum	44
Class Number	III
Description	<b>FAIR ROCK</b>

**SAMPLE #5**

Station/Location	151+50/3' LT
Depth (ft)	20
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	17
Spacing of Joints	20
Condition of Joints	12
Groundwater Conditions	7
Sum	63
Class Number	II
Description	<b>GOOD ROCK</b>

**SAMPLE #6**

Station/Location	151+50/3' LT
Depth (ft)	32.5
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	84
Class Number	I
Description	<b>VERY GOOD ROCK</b>

**SAMPLE #7**

Station/Location	151+34/20' RT
Depth (ft)	12
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	8
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	52
Class Number	III
Description	<b>FAIR ROCK</b>

**SAMPLE #8**

Station/Location	151+34/20' RT
Depth (ft)	19.5
<b>Relative Rating</b>	
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	73
Class Number	II
Description	<b>GOOD ROCK</b>

**SAMPLE #9**

Station/Location	151+34/20' RT
Depth (ft)	29.5
<b>Relative Rating</b>	
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	71
Class Number	II
Description	GOOD ROCK

**SAMPLE #10**

Station/Location	152+75/21' RT
Depth (ft)	24
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	17
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	76
Class Number	II
Description	GOOD ROCK

**SAMPLE #11**

Station/Location	152+75/21' RT
Depth (ft)	31
<b>Relative Rating</b>	
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	73
Class Number	II
Description	GOOD ROCK

**SAMPLE #12**

Station/Location	152+75/21' RT
Depth (ft)	42
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	20
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	79
Class Number	II
Description	GOOD ROCK

**SAMPLE #13**

Station/Location	152+75/18' LT
Depth (ft)	24
<b>Relative Rating</b>	
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	73
Class Number	II
Description	GOOD ROCK

**SAMPLE #14**

Station/Location	152+75/18' LT
Depth (ft)	34.5
<b>Relative Rating</b>	
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 #15**

Station/Location	152+75/18' LT
Depth (ft)	44
<b>Relative Rating</b>	
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 #16**

Station/Location	154+00/12' RT
Depth (ft)	22.5
<b>Relative Rating</b>	
Uniaxial Compressive Strength	12
RQD	8
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	57
Class Number	III
Description	FAIR ROCK



**SAMPLE #17**

Station/Location	154+00/12' RT
Depth (ft)	32
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	67
Class Number	II
Description	GOOD ROCK

**SAMPLE #18**

Station/Location	154+00/12' RT
Depth (ft)	42
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	13
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	72
Class Number	II
Description	GOOD ROCK

**SAMPLE #19**

Station/Location	154+00/18' LT
Depth (ft)	28
<b>Relative Rating</b>	
Uniaxial Compressive Strength	12
RQD	3
Spacing of Joints	10
Condition of Joints	12
Groundwater Conditions	7
Sum	44
Class Number	III
Description	FAIR ROCK

**SAMPLE #20**

Station/Location	154+00/18' LT
Depth (ft)	36
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	8
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	62
Class Number	II
Description	GOOD ROCK

**SAMPLE #21**

Station/Location	154+00/18' LT
Depth (ft)	41.5
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	13
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	77
Class Number	II
Description	GOOD ROCK

**SAMPLE #22**

Station/Location	155+96/12' RT
Depth (ft)	11.5
<b>Relative Rating</b>	
Uniaxial Compressive Strength	4
RQD	8
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	59
Class Number	III
Description	FAIR ROCK

**SAMPLE #23**

Station/Location	155+96/12' RT
Depth (ft)	21.5
<b>Relative Rating</b>	
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 #24**

Station/Location	155+96/12' RT
Depth (ft)	30.5
<b>Relative Rating</b>	
Uniaxial Compressive Strength	7
RQD	20
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	79
Class Number	II
Description	GOOD ROCK

**SAMPLE #25**

Station/Location	156+07/18' LT
Depth (ft)	10.5
	<b>Relative Rating</b>
Uniaxial Compressive Strength	4
RQD	3
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	44
Class Number	III
Description	FAIR ROCK

**SAMPLE #26**

Station/Location	156+07/18' LT
Depth (ft)	15
	<b>Relative Rating</b>
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #27**

Station/Location	156+07/18' LT
Depth (ft)	21.5
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 #28**

Station/Location	158+34/6' LT
Depth (ft)	35.5
Uniaxial Compressive Strength	N/A
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	0
Class Number	V
Description	Failed Test

**SAMPLE #29**

Station/Location	158+41/20' RT
Depth (ft)	28.5
Uniaxial Compressive Strength	4
RQD	3
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	
Sum	47
Class Number	III
Description	FAIR ROCK

**SAMPLE #30**

Station/Location	158+41/20' RT
Depth (ft)	31.7
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #31**

Station/Location	158+41/20' RT
Depth (ft)	32.2
Uniaxial Compressive Strength	2
RQD	8
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	
Sum	50
Class Number	III
Description	FAIR ROCK

**SAMPLE #32**

Station/Location	158+41/20' RT
Depth (ft)	33.5
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	
Sum	57
Class Number	III
Description	FAIR ROCK

**SAMPLE #33**

Station/Location	158+41/20' LT
Depth (ft)	34
Uniaxial Compressive Strength	4
RQD	8
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	
Sum	52
Class Number	III
Description	FAIR ROCK

**SAMPLE #34**

Station/Location	158+41/20' LT
Depth (ft)	35
Uniaxial Compressive Strength	12
RQD	8
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	
Sum	60
Class Number	III
Description	FAIR ROCK

# Rock Core Unconfined Compression Test Summary

Project Number: 009784  
 Project Name: Buffalor River Br. & Apprs. (Pruitt) (S)  
 Date Tested: 1/4/2017

Page 1 of 2

Station	Location	Sample No.	Depth (ft)	Diameter (in)	Height (in)	Total Load (lbs)	Correction Factor	Stress (psi)	Remarks
151+34	20' Lt	1	12.0	1.75	3.65	16,720	1.00	6,951	SS
151+34	20' Lt	2	20.5	1.75	3.55	27,510	1.00	11,437	SS
151+34	20' Lt	3	32.0	1.75	3.55	15,350	1.00	6,382	SS
151+50	3' Lt	4	13.5	1.75	3.65	20,700	1.00	8,606	SS
151+50	3' Lt	5	20.0	1.75	4.00	20,610	1.00	8,569	SS
151+50	3' Lt	6	32.5	1.75	3.75	28,630	1.00	11,903	SS
151+34	20' Rt	7	12.0	1.75	3.75	28,390	1.00	11,803	SS
151+34	20' Rt	8	19.5	1.75	3.65	17,180	1.00	7,143	SS
151+34	20' Rt	9	29.5	1.75	3.65	17,110	1.00	7,113	SS
152+75	21' Rt	10	24.0	1.75	3.60	19,140	1.00	7,957	SS
152+75	21' Rt	11	31.0	1.75	3.60	15,440	1.00	6,419	Dolostone
152+75	21' Rt	12	42.0	1.75	3.70	25,140	1.00	10,452	SS
152+75	18' Lt	13	24.0	1.75	3.70	17,020	1.00	7,076	SS w/ vertical seam
152+75	18' Lt	14	34.5	1.75	3.65	10,680	1.00	4,440	SS
152+75	18' Lt	15	44.0	1.75	3.70	18,960	1.00	7,883	Dolostone
154+00	12' Rt	16	22.5	1.75	3.60	40,800	1.00	16,963	SS
154+00	12' Rt	17	32.0	1.75	3.65	22,190	1.00	9,225	SS
154+00	12' Rt	18	42.0	1.75	3.65	29,810	1.00	12,393	SS
154+00	18' Lt	19	28.0	1.75	3.65	37,860	1.00	15,740	SS
154+00	18' Lt	20	36.0	1.75	3.70	33,830	1.00	14,065	SS
154+00	18' Lt	21	41.5	1.75	3.65	28,350	1.00	11,786	Dolostone
155+96	12' Rt	22	11.5	1.75	3.95	18,020	1.00	7,492	
155+96	12' Rt	23	21.5	1.75	3.85	28,730	1.00	11,944	
155+96	12' Rt	24	30.5	1.75	3.65	24,280	1.00	10,094	
156+07	18' Lt	25	10.5	1.75	3.60	11,530	1.00	4,794	SS
156+07	18' Lt	26	15.0	1.75	3.70	14,800	1.00	6,153	
156+07	18' Lt	27	21.5	1.75	3.75	48,260	1.00	20,064	

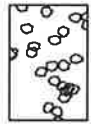
\* Please note any broken samples, fractures or other characteristics of sample in Remarks.



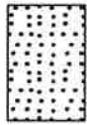
# LEGEND

## SOIL TYPES

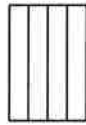
( SHOWN IN SYMBOL COLUMN)  
( PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL



SAND



SILT



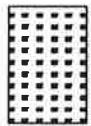
CLAY



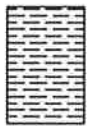
ORGANIC  
MATTER

## ROCK TYPES

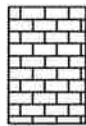
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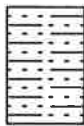
SANDSTONE



SHALE  
or  
SILTSTONE



LIMESTONE  
or  
DOLOMITE



ALTERNATING  
LAYERS of  
SHALE and  
SANDSTONE



OTHER

## SAMPLER TYPES

( SHOWN IN SAMPLE COLUMN)

### SHELBY TUBE



UNDISTURBED  
SAMPLE  
RECOVERY



DISTURBED  
SAMPLE  
RECOVERY



NO  
RECOVERY

### SPLIT SPOON



SAMPLE  
RECOVERY



NO  
RECOVERY

### ROCK CORING



% RECOVERY  
INDICATED ON LOGS

## TERMS DESCRIBING CONSISTENCY OR CONDITION

GRANULAR SOIL		CLAY		CLAY-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	Over 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	Penetration	
		31-60	Hard	31-60	Hard	in 60 Blows: Medium Hard	
		Over 60	Very Hard	Over 60	Very Hard	Less than 2'	
						Penetration	
						in 60 Blows: Hard	


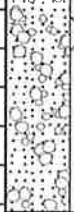
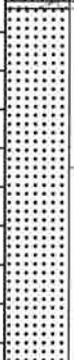

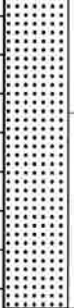

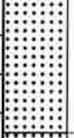

1. Ground water elevations indicated on boring logs represent ground water elevations at date or time shown on boring log. Absence of water surface implies that no ground water data is available but does not necessarily mean that ground water will not be encountered at locations or within the vertical 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, 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:  $\frac{6}{8-9} \Rightarrow 8 + 9 = 17 \text{ blows/ft}$ . The "N" Value corrected to 60% efficiency ( $N_{60}$ ) can be obtained by multiplying  $N_f$  by the hammer correction factor published on the boring log.

JOB NO. 009784      Newton County JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S) Route 7 Section 18 STATION: 151+34 LOCATION: 20' Left of Construction Centerline LOGGED BY: Steve Faulkner	DATE: November 15, 2016 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: CME 850 HAMMER CORRECTION FACTOR: 1.23
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COMPLETION DEPTH: 38.5

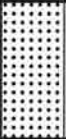
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			SURFACE ELEVATION: 815.5									
5		×	Moist, Very Dense, Brown and Gray Sand with Gravel (Rock Fragments)							40 60 (4")		
10			Moist, Very Dense, Brown and Gray Sand with Gravel (Rock Fragments)*							30 (3")		
15			SANDSTONE - Weathered, Poorly Cemented, Frequent Fractures, Light Gray								90	18
20			CHERT - Weathered, Hard, Fractured, Gray									
20			SANDSTONE - Weathered, Poorly Cemented, Occasional Fractures, White and Light Gray**								96	50
25			SANDSTONE - Slightly Weathered, Poorly Cemented, Occasional Fractures, White and Light Gray								100	90
30			SANDSTONE - Unweathered, Well Cemented, Occasional Fractures, White and Light Gray								100	98
35												

REMARKS: \* No sampler advancement after 10 hammer blows at 9.4 feet below ground level (bgl). \*\* Drill bit failure at approximately 20' bgl.

JOB NO. 009784 Newton County  
 JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
 Route 7 Section 18  
 STATION: 151+34  
 LOCATION: 20' Left of Construction Centerline  
 LOGGED BY: Steve Faulkner

DATE: November 15, 2016  
 TYPE OF DRILLING:  
 Hollow Stem Auger - Diamond Core  
 EQUIPMENT: CME 850  
 HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 38.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			SURFACE ELEVATION: 815.5									
			SANDSTONE - Unweathered, Well Cemented, White and Light Gray								100	100
40			Boring Terminated									
45												
50												
55												
60												
65												
70												

REMARKS: \* No sampler advancement after 10 hammer blows at 9.4 feet below ground level (bgl). \*\* Drill bit failure at approximately 20' bgl.



JOB NO. 009784      Newton County JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S) Route 7 Section 18 STATION: 151+50 LOCATION: 3' Left of Construction Centerline LOGGED BY: Steve Faulkner	DATE: November 16, 2016 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: CME 850 HAMMER CORRECTION FACTOR: 1.23
---	--

COMPLETION DEPTH: 38.1

D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R O D
			SURFACE ELEVATION: 816.4								
5		X	Moist, Very Dense, Brown and Gray Clayey Sand and Gravel (Chert Fragments)						15 32-60 (9")		
10		X	Moist, Very Dense, Brown and Gray Sand with Gravel (Chert Fragments)*						26 60 (5")		
			SANDSTONE								
			SANDSTONE - Weathered, Poorly Cemented, Frequent Fractures, Light Gray and Brown							94	0
15			SANDSTONE - Weathered, Poorly Cemented, Light Gray and Brown							94	43
20			SANDSTONE - Weathered with Occasional Highly Weathered Layers, Cemented with Poorly Cemented Layers, Light Gray and Brown							96	90
25										92	88
30										99	99
35			SANDSTONE - Slightly Weathered, Well Cemented, Calcareous in Part, Light Gray and White								

REMARKS: \* No sampler advancement after 10 hammer blows at 9.5 feet below ground level (bgl).

<b>ARKANSAS HWY. &amp; TRANS. DEPARTMENT MATERIALS DIVISION - GEOTECHNICAL SEC.</b>						BORING NO. 2 PAGE 2 OF 2						
JOB NO. 009784      Newton County JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S) Route 7 Section 18 STATION: 151+50 LOCATION: 3' Left of Construction Centerline LOGGED BY: Steve Faulkner						DATE: November 16, 2016 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: CME 850 HAMMER CORRECTION FACTOR: 1.23						
COMPLETION DEPTH: 38.1												
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	P <small>L</small> A <small>S</small> T <small>I</small> C L <small>I</small> M <small>I</small> T	% M <small>O</small> I <small>S</small> T.	L <small>I</small> Q <small>U</small> I <small>D</small> L <small>I</small> M <small>I</small> T	D <small>R</small> Y W <small>E</small> I <small>G</small> H <small>T</small>	L <small>B</small> S P <small>E</small> R C <small>U</small> . <small>F</small> T.	N <small>O</small> . O <small>F</small> B <small>L</small> O <small>W</small> S P <small>E</small> R 6- <small>I</small> N.	T <small>C</small> R	R <small>Q</small> D
			SURFACE ELEVATION: 816.4									
											100	100
40			Boring Terminated									
45												
50												
55												
60												
65												
70												
REMARKS: * No sampler advancement after 10 hammer blows at 9.5 feet below ground level (bgl).												

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 3  
PAGE 1 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 151+34  
LOCATION: 20' Right of Construction Centerline  
LOGGED BY: Paul Campbell / Carson Sloan

DATE: November 28 and 29, 2016  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 52.3

DEPTH FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 816.7									
5		X	Moist, Very Dense, Reddish Brown Clayey Sand with Gravel (Chert Fragments)							23 30-38		
10		X	Moist, Very Dense, Brown and Gray Sand with Gravel (Chert Fragments)							31 30-29		
15			SANDSTONE - Weathered, Poorly Cemented, Frequent Fractures, White and Light Gray								93	0
20			SANDSTONE - Weathered, Cemented, Occasional Fractures, White and Brown								98	40
25			SANDSTONE - Weathered with Slightly Weathered Layers, Cemented, Calcareous in Part, White and Light Gray								100	95
30			SANDSTONE - Slightly Weathered, Well Cemented with Cemented Layers, Calcareous in Part, White and Light Gray								100	78
35											100	41
											100	88

REMARKS: \*Changed from diamond impregnated to surface set bit at 25.1 feet below ground level (bgl) to grind up gravel below augers. \*\*Driller noted a void at approximately 43.9 feet bgl.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 3  
PAGE 2 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 151+34  
LOCATION: 20' Right of Construction Centerline  
LOGGED BY: Paul Campbell / Carson Sloan

DATE: November 28 and 29, 2016  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 52.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			SURFACE ELEVATION: 816.7									
40			SANDSTONE - Unweathered, Well Cemented, Calcareous in Part, White and Light Gray								100	100
45			DOLOSTONE - Weathered, Moderately Hard, Light Gray**								90	58
			SANDSTONE - Unweathered, Well Cemented, White and Light Gray									
50			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray									
			SANDSTONE WITH INTERBEDDED DOLOSTONE AND CHERT- Unweathered, Well Cemented, White and Light Gray								100	98
			DOLOSTONE - Slightly Weathered, Moderately Hard, Light Gray									
55			Boring Terminated									
60												
65												
70												

REMARKS: \*Changed from diamond impregnated to surface set bit at 25.1 feet below ground level (bgl) to grind up gravel below augers. \*\*Driller noted a void at approximately 43.9 feet bgl.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 4  
PAGE 1 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 152+75  
LOCATION: 21' Right of Construction Centerline  
LOGGED BY: Paul Campbell / Carson Sloan

DATE: November 29 and 30, 2016  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 60.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 798.9									
5			Moist, Very Stiff, Brown Clay with Organic Matter							4 7-11		
			Moist, Very Stiff, Brown Clay									
10			Sandstone Boulder									
			Clayey Sand with Gravel, Cobbles, and Boulders								69	0
15			Wet, Medium Dense, Brown Clayey Sand							5 6-10		
20			Moist, Very Dense, Gray Clayey Sand							20 16-45		
			Moist, Very Dense, Gray Sand with Gravel (Rock Fragments)									
			SANDSTONE							20 (0")	54	0
25			SANDSTONE - Unweathered with Highly Weathered Layers, Well Cemented with Poorly Cemented Layers, Calcareous in Part, Light Gray									
			SANDSTONE - Unweathered, Well Cemented, Calcareous in Part, White and Light Gray								99	75
30			DOLOSTONE - Slightly Weathered, Moderately Hard, Light Gray									
			Cavity									
			DOLOSTONE - Slightly Weathered, Moderately Hard, Light Gray								95	84
35			SANDSTONE - Unweathered, Well Cemented,									

REMARKS: \* Total water loss at 38.6 feet bgl.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 4  
PAGE 2 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 152+75  
LOCATION: 21' Right of Construction Centerline  
LOGGED BY: Paul Campbell / Carson Sloan

DATE: November 29 and 30, 2016  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 60.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			SURFACE ELEVATION: 798.9									
			White and Light Gray									
			DOLOSTONE - Slightly Weathered, Moderately Hard, Light Gray								99	88
40			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray									
			DOLOSTONE - Unweathered, Moderately Hard, Light Gray*									
			SANDSTONE - Unweathered, Well Cemented with Poorly Cemented Layers, Occasionally Friable, Calcareous, White and Light Gray								96	81
45			DOLOSTONE - Slightly Weathered, Moderately Hard, Light Gray									
			SANDSTONE - Slightly Weathered, Well Cemented with Occasional Poorly Cemented Layers, Light Gray								100	98
50			SANDSTONE - Slightly Weathered, Cemented, White and Light Gray									
			SANDSTONE - Slightly Weathered, Cemented, White and Light Gray								100	100
55			SANDSTONE - Slightly Weathered, Cemented, White and Light Gray									
			DOLOSTONE - Slightly Weathered, Cemented, Occasional Fractures, Gray								98	73
60			DOLOSTONE - Slightly Weathered, Cemented, Occasional Fractures, Gray									
			Boring Terminated								100	100
65												
70												

REMARKS: \* Total water loss at 38.6 feet bgl.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 5  
PAGE 1 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 152+75  
LOCATION: 18' Left of Construction Centerline  
LOGGED BY: Steve Faulkner

DATE: December 6, 2016  
TYPE OF DRILLING: Hollow Stem Auger -  
Rotary Wash - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 63.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 797.9									
5			Moist, Medium Stiff, Brown and Gray Sandy Clay with Gravel (Rock Fragments)							3		
			Chert Boulder							12 (5")		
			Moist, Stiff, Brown and Gray Sandy Clay with Gravel (Rock Fragments)							2		
10										6-8		
			Moist, Medium Dense, Brown to Dark Brown Clayey Sand							8		
15										10-12		
			Moist, Very Dense, Brown and Gray Sand with Gravel (Rock Fragments)							3		
20										5-13		
			SANDSTONE - Weathered, Cemented, White and Light Gray							40		
			Fracture/Void*							60 (5")	50	23
			SANDSTONE - Weathered, Cemented, White and Light Gray									
25			SANDSTONE - Slightly Weathered, Cemented, Calcareous, White and Light Gray								92	82
			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray									
30			DOLOSTONE - Unweathered, Moderately Hard, Light Gray**								98	90
			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray									
35												

REMARKS: \* Possible Void at 22.1 to 22.4 feet bgl. \*\* Total water loss between 30.0 and 63.2 feet bgl.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 5  
PAGE 2 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 152+75  
LOCATION: 18' Left of Construction Centerline  
LOGGED BY: Steve Faulkner

DATE: December 6, 2016  
TYPE OF DRILLING: Hollow Stem Auger -  
Rotary Wash - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 63.2

D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 797.9								
			DOLOSTONE - Unweathered, Moderately Hard, Light Gray							100	64
			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray								
40			DOLOSTONE - Unweathered, Moderately Hard, Light Gray							99	70
			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray								
45			DOLOSTONE - Unweathered, Moderately Hard, Light Gray							99	82
50			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray							100	100
55										99	94
60			DOLOSTONE - Unweathered, Moderately Hard, Light Gray								
			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray							99	86
65			Boring Terminated								
70											

REMARKS: \* Possible Void at 22.1 to 22.4 feet bgl. \*\* Total water loss between 30.0 and 63.2 feet bgl.



**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 6  
PAGE 1 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 154+00  
LOCATION: 12' Right of Construction Centerline  
LOGGED BY: Raymond Taylor

DATE: December 12 and 13, 2016  
TYPE OF DRILLING: Hollow Stem Auger -  
Rotary Wash - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 63.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 799.0								
			Moist, Very Stiff, Reddish Brown Sandy Clay								
5		X	Moist, Medium Dense, Reddish Brown Sand and Gravel with Some Clay						14 10-6		
10		X	Moist, Medium Dense, Reddish Brown Sand						5 8-9		
15		X	Moist, Medium Dense, Reddish Brown Sand						9 10-11		
20		X	Gravel (Sandstone Fragments)								
		X	Moist, Very Dense, Reddish Brown and Light Gray Sand with Gravel (Sandstone Fragments)						21 31-60		
			CEMENTED SANDSTONE								
			SANDSTONE - Weathered, Poorly Cemented, Occasional Fractures, Light Gray							62	29
25			SANDSTONE - Weathered, Cemented, Calcareous, Light Gray							60	28
30			DOLOSTONE - Slightly Weathered, Moderately Hard, Light Gray							100	72
35			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray								

REMARKS: \* Partial water loss at 41.1' below ground level (bgl).

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 6  
PAGE 2 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 154+00  
LOCATION: 12' Right of Construction Centerline  
LOGGED BY: Raymond Taylor

DATE: December 12 and 13, 2016  
TYPE OF DRILLING: Hollow Stem Auger -  
Rotary Wash - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 63.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			SURFACE ELEVATION: 799.0									
40			DOLOSTONE WITH INTERBEDDED SANDSTONE - Unweathered, Moderately Hard, Light Gray								100	54
45			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray*									
50			DOLOSTONE - Unweathered, Moderately Hard, Light Gray								100	76
55			SANDSTONE - Slightly Weathered, Well Cemented, Calcareous, White and Light Gray								100	86
60			DOLOSTONE - Unweathered, Moderately Hard, Light Gray								100	80
			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray								100	90
65			Boring Terminated									
70												

REMARKS: \* Partial water loss at 41.1' below ground level (bgl).

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 7  
PAGE 1 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 154+00  
LOCATION: 18' Left of Construction Centerline  
LOGGED BY: Steve Faulkner

DATE: December 13 and 14, 2016  
TYPE OF DRILLING: Hollow Stem Auger -  
Rotary Wash - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 63.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R O D
			SURFACE ELEVATION: 799.5									
5			Moist, Medium Dense, Reddish Brown Clayey Sand							3 6-5		
10			Moist, Loose, Reddish Brown Clayey Sand							1 4-5		
15			Moist, Medium Dense, Brown Sand with Some Gravel (Rock Fragments)							10 13-12		
20			Moist, Very Dense, Brown to Light Brown Sand with Gravel (Rock Fragments)							15 34-50		
			SANDSTONE								14	0
			SANDSTONE - Highly Weathered, Poorly Cemented, Frequent Fractures, Light Brown and Gray									
25			SANDSTONE - Weathered, Cemented, Frequent Fractures, Light Brown and Gray*								72	24
30			SANDSTONE - Slightly Weathered, Cemented, White and Light Gray								90	10
35			DOLOSTONE - Slightly Weathered, Moderately									

REMARKS: \* Complete water loss at 24.8 feet bgl.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 7  
PAGE 2 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 154+00  
LOCATION: 18' Left of Construction Centerline  
LOGGED BY: Steve Faulkner

DATE: December 13 and 14, 2016  
TYPE OF DRILLING: Hollow Stem Auger -  
Rotary Wash - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 63.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 799.5									
			Hard, Light Gray									
			SANDSTONE - Slightly Weathered, Well Cemented, Calcareous, White and Light Gray								94	26
40			SANDSTONE - Slightly Weathered, Cemented, White and Light Gray								100	48
			DOLOSTONE - Slightly Weathered, Moderately Hard, Light Gray									
45			SANDSTONE - Slightly Weathered, Cemented, Calcareous, White and Light Gray								98	80
50			DOLOSTONE - Unweathered, Moderately Hard, Light Gray									
			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray								100	72
55			SANDSTONE - Unweathered, Well Cemented, Occasional Calcareous Layer, White and Light Gray								100	78
60			SANDSTONE - Unweathered, Well Cemented, Occasional Calcareous Layer, White and Light Gray								96	86
			DOLOSTONE - Unweathered, Moderately Hard, Light Gray									
65			Boring Terminated									
70												

REMARKS: \* Complete water loss at 24.8 feet bgl.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 8  
PAGE 1 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 155+96  
LOCATION: 12' Right of Construction Centerline  
LOGGED BY: Coty Campbell

DATE: December 20, 2016  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 53.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
SURFACE ELEVATION: 773.5												
5		X	Wet, Loose, Brown Sand with Some Gravel							4 4-4		
10		X	Wet, Medium Dense, Brown Sand with Gravel (Rock Fragments)							15 15-15		
			SANDSTONE - Weathered, Cemented, Calcareous, Occasional Fractures, Light Gray								95	79
15			SANDSTONE - Weathered, Cemented, Calcareous In Part, Frequent Fractures, Light Gray								88	24
			LIMESTONE - Slightly Weathered, Moderately Hard, Frequent Fractures, Light Gray									
20			DOLOSTONE - Slightly Weathered, Moderately Hard, Light Gray								96	74
			SANDSTONE - Slightly Weathered, Well Cemented, Calcareous, White and Light Gray									
25			DOLOSTONE - Unweathered, Moderately Hard, Light Gray								98	92
30			SANDSTONE - Unweathered, Well Cemented, White and Light Gray								100	100
35												

REMARKS:

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 8  
PAGE 2 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 155+96  
LOCATION: 12' Right of Constrction Centerline  
LOGGED BY: Coty Campbell

DATE: December 20, 2016  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 53.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 773.5									
38			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray								100	100
40			DOLOSTONE - Unweathered, Moderately Hard, Light Gray								100	80
45			SANDSTONE - Unweathered, Well Cemented, Calcareous, White and Light Gray								100	76
50			LIMESTONE - Unweathered, Moderately Hard, Light Gray								100	88
55			Boring Terminated									
60												
65												
70												

REMARKS:

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 9  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 156+07  
LOCATION: 21' Left of Construction of Centerline  
LOGGED BY: Raymond Taylor

DATE: December 20, 2016  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 22.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 773.1									
5			Wet, Brown Gravel									
10			SANDSTONE - Weathered, Cemented, Frequent Fractures, Calcareous, Light Gray Cavity (10.7'-11.0')								59	8
15			SANDSTONE - Slightly Weathered, Cemented, Calcareous in Part, White and Light Gray*								32	30
20			LIMESTONE - Slightly Weathered, Moderately Hard, Light Gray									
20			SANDSTONE WITH INTERBEDDED LIMESTONE - Slightly Weathered, Well Cemented, Calcareous, Light Gray								98	92
20			SANDSTONE - Slightly Weathered, Cemented, Calcareous, White and Light Gray									
25			Boring Terminated									
30												
35												

REMARKS: \* Total water loss at approximately 15.4 feet below ground level (bgl).

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 10  
PAGE 1 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 158+41  
LOCATION: 20' Left of construction Centerline  
LOGGED BY: Paul Campbell

DATE: January 10, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 58.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 845.0									
5			Moist, Loose, Reddish Brown Clayey Sand with Gravel (Sandstone Fragments)							7 5-4		
10			Moist, Loose, Brown Clayey Sand with Gravel (Sandstone Fragments) and Organic Matter							12 13-14		
15			Moist, Medium Dense, Red Clayey Sand with Some Gravel							10 35 (5")		
15			SANDSTONE								100	86
15			SANDSTONE - Slightly Weathered, Well Cemented, Occasional Fractures, White and Gray									
20			SANDY LIMESTONE - Slightly Weathered, Moderately Hard, Gray								99	60
25			SANDSTONE - Slightly Weathered, Well Cemented, Calcareous in Part, White and Light Gray								100	68
25			LIMESTONE - Slightly Weathered, Moderately Hard, Gray									
25			SANDSTONE - Slightly Weathered, Well Cemented, Calcareous In Part, Frequent Fractures, White and Light Gray									
30											100	0
35												

REMARKS:



JOB NO. 009784      Newton County JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S) Route 7 Section 18 STATION: 158+41 LOCATION: 20' Left of construction Centerline LOGGED BY: Paul Campbell	DATE: January 10, 2017 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: CME 850 HAMMER CORRECTION FACTOR: 1.23
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COMPLETION DEPTH: 58.1

D E P T H	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	P L A S T I C L I M I T	% M O I S T	L I Q U I D L I M I T	D R Y W E I G H T	L B S P E R C U F T	N O O F B L O W S P E R 6 - I N	% T C R	% R O D
			SURFACE ELEVATION: 845.0									
40			SANDSTONE - Slightly Weathered, Poorly Cemented, Frequent Fractures, White								100	26
45											100	0
50			SANDSTONE - Slightly Weathered, Cemented, White								99	32
55			SANDSTONE - Slightly Weathered with Occasional Weathered Layers, Cemented, Occasional Fractures, White and Light Gray Soil Filled Cavity (54.0' to 54.1')								99	78
60			Boring Terminated									
65												
70												

REMARKS:

JOB NO. 009784      Newton County JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S) Route 7 Section 18 STATION: 158+34 LOCATION: 6' Left of Construction Centerline LOGGED BY: Paul Campbell	DATE: January 11, 2017 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: CME 850 HAMMER CORRECTION FACTOR: 1.23
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COMPLETION DEPTH: 47.8

D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 844.8									
			Moist, Medium Dense, Reddish Brown Clayey Sand									
5			Moist, Medium Dense, Reddish Brown Clayey Sand with Gravel (Rock Fragments)							10 16-9		
10			SANDY LIMESTONE - Slightly Weathered, Moderately Hard, Occasional Vertical Fractures, Gray								92	62
15			Clay-Filled Cavity (12.8' to 16.0')								74	31
			Gravel (Sandstone Fragments)									
			SANDSTONE - Slightly Weathered, Poorly Cemented, White									
			SANDSTONE - Slightly Weathered, Well Cemented, White									
20			LIMESTONE - Slightly Weathered, Moderately Hard, Gray								87	86
25			SANDSTONE - Slightly Weathered, Cemented, White								99	90
			LIMESTONE - Slightly Weathered, Moderately Hard, Gray									
			SANDSTONE - Slightly Weathered, Cemented, Calcareous, White and Light Gray									
30											100	14
35												

REMARKS:

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 11  
PAGE 2 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 158+34  
LOCATION: 6' Left of Construction Centerline  
LOGGED BY: Paul Campbell

DATE: January 11, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 47.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 844.8									
40	[Dotted Pattern]		SANDSTONE - Slightly Weathered, Cemented, Frequent Fractures, White and Light Gray								100	7
45											100	0
47.8												100
50			Boring Terminated									
55												
60												
65												
70												

REMARKS:

JOB NO. 009784      Newton County JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S) Route 7 Section 18 STATION: 158+25 LOCATION: 18' Right of Construction Centerline LOGGED BY: Steve Faulkner	DATE: January 17, 2017 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: CME 850 HAMMER CORRECTION FACTOR: 1.23
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COMPLETION DEPTH: 57.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 844.1									
5		X	Moist, Medium Dense, Brown and Gray Clayey Sand with Gravel (Rock Fragments)							8 11-12		
10		X	Moist, Very Stiff, Brown and Gray Sandy Clay with Gravel (Rock Fragments)							6 9-12		
15		X	Moist, Very Dense, Brown and Gray Clayey Sand with Gravel (Sandstone Fragments)							11 38 (5")		
			SANDSTONE								100	67
			SANDSTONE - Slightly Weathered, Cemented, Light Gray									
20			SANDSTONE - Slightly Weathered, Cemented, Calcareous In Part, Gray Clay Filled Cavity with Rock Fragments (17.9 to 20.9')								56	23
25			SANDSTONE - Slightly Weathered, Cemented, Calcareous In Part, Frequent Vertical Fractures, Gray								94	32
30											80	0
35												

REMARKS: \* Total water loss at approximately 17.9 feel below ground level (bgl).

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 12  
PAGE 2 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 158+25  
LOCATION: 18' Right of Construction Centerline  
LOGGED BY: Steve Faulkner

DATE: January 17, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 57.5

DEPTH FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 844.1									
40			SANDSTONE - Slightly Weathered, Poorly Cemented, Frequent Fractures, White and Light Gray								86	0
45											100	8
50											98	0
55				SANDSTONE - Slightly Weathered, Poorly Cemented, Frequent Fractures, Occasional Clay Seams, Light Gray								74
60			Boring Terminated									
65												
70												

REMARKS: \* Total water loss at approximately 17.9 feet below ground level (bgl).

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 13  
PAGE 1 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 158+41  
LOCATION: 20' Right of Construction Centerline  
LOGGED BY: 1.23

DATE: January 24, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR:

COMPLETION DEPTH: 58.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 844.7									
5		X	Moist, Medium Dense, Brown and Gray Clayey Sand with Gravel (Rock Fragments)							20 12-8		
10		X	Moist, Medium Dense, Brown and Gray Clayey Sand							10 12-14		
15		X	Moist, Very Dense, Brown and Gray Clayey Sand							7 14-60		
			SANDSTONE - Weathered, Cemented, Frequent Fractures, Gray								50	0
20			SANDSTONE - Weathered, Cemented, Calcareous, Gray*								70	63
			SANDY LIMESTONE - Slightly Weathered, Cemented, Moderately Hard, Gray									
25			SANDSTONE - Slightly Weathered, Well Cemented, Gray								100	100
30											100	22
35												

REMARKS: \* Temporary total water loss at approximately 18.4 feet below ground level (bgl). \*\* Partial water loss at approximately 56.0 to 58.4 feet (bgl).

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 13  
PAGE 2 OF 2

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River BR. & APPRS. (Pruitt)(S)  
Route 7 Section 18  
STATION: 158+41  
LOCATION: 20' Right of Construction Centerline  
LOGGED BY: 1.23

DATE: January 24, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: CME 850  
HAMMER CORRECTION FACTOR:

COMPLETION DEPTH: 58.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 844.7									
40			SANDSTONE - Slightly Weathered, Poorly Cemented, Frequent Fractures, Light Gray								100	66
45											100	92
50			SANDSTONE - Slightly Weathered, Well Cemented, Frequent Fractures, Light Gray**								100	78
55			SANDSTONE - Slightly Weathered with Occasional Highly Weathered Seams, Well Cemented, Light Gray								99	98
60			Boring Terminated								99	84
65												
70												

REMARKS: \* Temporary total water loss at approximately 18.4 feet below ground level (bgl). \*\* Partial water loss at approximately 56.0 to 58.4 feet (bgl).

# ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

November 22, 2017

**TO:** Mr. Trinity Smith, Roadway Engineer

**SUBJECT:** Job No. 009784  
Buffalo River Br. & Apprs. (Pruitt) (S)  
Route 7, Section 18  
Newton County

The Materials Division has evaluated the proposed cut and fill slopes for the above referenced project and offers the following recommendations.

**Station 134+94 to 138+00 Left**

Rock Fill should be utilized to create the proposed 2:1 fills.

**Station 138+00 to 161+00 Left**

Slopes shown on the current cross sections as 3:1 or flatter are acceptable as shown.

**Station 161+00 to End of Project Left**

Cut slopes shown with a 3:1 slope on the current cross sections are acceptable. These slopes may be steepened to 2:1 if they are plated with Dumped Rip-Rap.

**Station 134+94 o 148+00 Right**

A subsurface investigation was conducted in this area. Borings were extended to the elevation of the proposed ditch line. Rock was not encountered in any of the borings. It is recommended that slopes be cut on a 2:1 and be plated with Dumped Rip-Rap.

**Station 148+00 to 162+00 Right**

Slopes shown on the current cross sections 3:1 or flatter are acceptable as shown.

**Station 162+00 to 163+35 Right**

Rock Fill should be utilized below elevation 833.0 with a 2:1 slope face. Compacted Embankment may be placed above the Rock Fill with a 2:1 slope face plated with Dumped Rip-Rap.

**Station 163+35 to 166+00 Right**

Compacted Embankment plated with Dumped Rip may be utilized to create the 2:1 slope configuration shown in the cross sections.

**Station 166+00 to End of Project Right**

Embankment should be constructed of Rock Fill. This area will support a large fill in project BR5102.



A copy of the boring logs is attached along with a draft Rock Fill special provision. The special provision states, "Native Sandstone shall be used on the exterior side slopes the color and appearance approximating that locally." If you have any questions concerning these recommendations, please contact the Geotechnical Section.



Michael C. Benson  
Materials Engineer

MCB:rpt  
Attachment

cc: State Construction Engineer - Master File Copy  
District 9 Engineer  
Environmental Division  
Bridge Division  
G.C. File

**ARKANSAS DEPARTMENT OF TRANSPORTATION****SPECIAL PROVISION****JOB NO. 009784****ROCK FILL**

**Description:** This item shall consist of the construction of embankments at the locations shown on the plans or as directed by the Engineer as Rock Fill. Embankments designated as Rock Fill shall comply with Section 210, Excavation and Embankment, of the Standard Specifications, Edition of 2014. Where there is a conflict between these Special Provisions and Section 210, these Special Provisions shall govern.

**Materials and Construction Requirements:** Embankments requiring Rock Fill shall be constructed of materials meeting the following requirements:

- (1) Material for Rock Fill shall include stone obtained from an approved source and shall consist of hard and durable limestone, sandstone, dolomite, or rock-like shale. Shale shall have a minimum slake durability index (SDI) of 95% as tested according to AHTD Test Method 399. The SDI shall be determined by the Engineer using the above method at least once per 3000 cubic yards. The stone shall be greater than 1½” and less than 30” reasonably well-graded and angular, with fractured faces on at least 75% of the surface and shall not contain more than 10% overburden or fines less than 1½” in maximum cross-section. The stone shall weigh not less than 140 pounds per solid cubic foot and shall have a percent of wear not greater than 45 by Los Angeles Test (AASHTO T 96).
- (2) The following shall be added to the third paragraph of Section 801.08 of the Standard Specifications. Rock Fill placed immediately adjacent to Pipe Culverts or Box Culverts including a minimum of 6 inches on top of the culvert, shall meet the gradation requirements of 802.02(c) of the Standard Specifications for Coarse Aggregate AASHTO M43 #57.
- (3) Material Placed in the vicinity of piling, shall be constructed in accordance with Sections 303.02, 303.03, and 303.04 of the Standard Specifications, Edition of 2014. It shall meet the material requirements of Aggregate Base Course (Class 7).
- (4) The top layer of Rock Fill shall be in accordance with Section 303 of the Standard Specifications for Aggregate Base Course (Class 7). It shall be placed to provide a barrier for preventing the migration of fines from the overlaying embankment material into the rock fill embankment. The layer shall be at least 6 inches in thickness. The layer will not be required on the exterior side slopes (the exterior surface that daylights and is not covered with fill). Native Sandstone shall be used on the exterior side slopes the color and appearance approximating that locally. The Engineer will inspect the completed surface of the rock fill embankment prior to allowing placement of additional embankment material. Density testing will not be required for the Aggregate Base Course (Class 7) material used to cap Rock Fill. The stone shall be spread, shaped, and consolidated to provide a firm and unyielding foundation for the subgrade and/or base

**ARKANSAS DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION**

**JOB NO. 009784**

**ROCK FILL**

course. The Contractor shall not place overlaying embankment material without approval of the Engineer.

- (5) Prior to construction of Rock Fill and regardless of embankment height, all sod and vegetable matter shall be removed from the surface upon which the embankment is to be constructed. The cleared surface shall then be completely broken up by plowing, scarifying, or disking to a minimum depth of 6". The area shall then be recompact and stabilized in accordance with Subsection 210.10. These requirements may be modified by the engineer as conditions justify. When Rock Fill is to be placed and compacted on hillsides, or when Rock Fill is to be compacted against existing embankments, the slopes shall be continuously benched as the work is brought up in layers. Benching shall be sufficient width to permit operations of placing and compacting equipment. Each horizontal cut shall begin at the intersection of the original ground and the vertical sides of the previous cuts. Unless otherwise specified, material thus cut out shall be wasted or placed in another location. Excavation and removal of this material shall be considered subsidiary to the item Rock Fill and shall be performed at no additional cost to the Department.

**Method of Measurement:** Rock Fill, which includes all embankment material types described above, including Aggregate Base Course (Class 7), will be measured by the cubic yard in place as provided for in Section 210, Excavation and Embankment, Subsection 210.12(c) of the Standard Specifications.

**Basis of Payment:** Placement and compaction of Rock Fill embankment material shall be paid for under the item "Rock Fill", which price shall be full compensation for all costs involved in furnishing all materials for constructing the embankments in accordance with Section 210 and this Special Provision; and for all labor, tools, equipment, quality control sampling and testing, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item

Pay Unit

Rock Fill

Cubic Yard

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 1  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)  
Cut Slope  
STATION: 138+40  
LOCATION: 47' Right of Construction Centerline  
LOGGED BY: Stanley Bates

DATE: October 25, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger  
EQUIPMENT: Acker  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 31.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 934.3									
5			Clay with Gravel, Cobbles, and Boulders							8 9-7		
10			Moist, Very Stiff, Reddish Brown Clay with Gravel and Cobbles (Chert Fragments)							9 15-25		
15			Moist, Dense, Reddish Brown Clayey Sand							7 15-26		
20			Moist, Dense, Reddish Brown Sand with Gravel and Cobbles (Chert Fragments)							9 20-20		
25			Moist, Hard, Reddish Brown Clay with Gravel (Rock Fragments)							6 8-9		
30			Moist, Medium Dense, Gray and Reddish Brown Clayey Sand							3 34-14		
35			Moist, Dense, Reddish Brown Sand with Trace Gravel									
			Boring Terminated									

REMARKS: Dry Hole measured 24 hours after drilling.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 2  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)  
Cut Slope  
STATION: 139+03  
LOCATION: 44' Right of Construction Centerline  
LOGGED BY: Stanley Bates

DATE: October 25, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger  
EQUIPMENT: Acker  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 31.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 928.0									
5			Clay with Gravel, Cobbles, and Boulders							6 10-14		
10			Moist, Very Stiff, Reddish Brown Clay with Some Gravel (Chert Fragments)							10 16-21		
15			Moist, Dense, Reddish Brown Sand							14 22-17		
20			Gravel, Cobbles, and Boulders							21 31-30		
25			Moist, Very Dense, Reddish Brown Clayey Sand with Gravel and Cobbles (Rock Fragments)							10 13-11		
30			Moist, Medium Dense, Reddish Brown Sand with Gravel (Rock Fragments)							9 11-10		
35			Boring Terminated									

REMARKS: Dry Hole measured 24 hours after drilling.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 3  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)  
Cut Slope  
STATION: 139+46  
LOCATION: 40' Right of Construction Centerline  
LOGGED BY: Stanley Bates

DATE: October 23 & 24, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger  
EQUIPMENT: Acker  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 31.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 921.7									
5			Clay with Gravel, Cobbles, and Boulders							10 28-22		
10			Moist, Hard, Reddish Brown Clay with Gravel (Chert Fragments)							11 45-65		
15			Moist, Very Hard, Reddish Brown Clay with Gravel and Cobbles (Chert Fragments)							25 57-66		
20			Moist, Very Hard, Reddish Brown Clay with Gravel (Chert Fragments)							8 19-27		
25			Moist, Very Dense, Reddish Brown Sand with Trace Gravel (Rock Fragments)							11 28-60 (10")		
30			Sand with Gravel, Cobbles, and Boulders							11 19-21		
			Moist, Dense, Reddish Brown Sand with Gravel (Rock Fragments)									
			Boring Terminated									
35												

REMARKS: Dry Hole measured 24 hours after drilling.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 4  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)  
Cut Slope  
STATION: 140+00  
LOCATION: 41' Right of Construction Centerline  
LOGGED BY: Stanley Bates

DATE: October 19, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger  
EQUIPMENT: Acker  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 25.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 914.4									
5			Clay with Gravel, Cobbles, and Boulders							16 20-20		
10			Moist, Hard, Reddish Brown Clay with Gravel and Cobbles (Chert Fragments)							7 9-13		
15			Moist, Very Stiff, Reddish Brown Clay with Some Gravel (Chert Fragments)							8 10-12		
20			Moist, Very Stiff, Reddish Brown Clay with Gravel and Cobbles (Chert Fragments)							8 13-15		
25			Moist, Very Hard, Reddish Brown Sandy Clay with Gravel (Chert Fragments)							10 60 (5")		
			Boring Terminated									
30												
35												

REMARKS: Dry Hole measured 24 hours after drilling.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 5  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)  
Cut Slope  
STATION: 140+55  
LOCATION: 45' Right of Construction Centerline  
LOGGED BY: Stanley Bates

DATE: October 18, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger  
EQUIPMENT: Acker  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 26.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 907.0									
5			Clay with Gravel, Cobbles, and Boulders							9 24-29		
10			Moist, Hard, Reddish Brown Sandy Clay with Gravel and Cobbles (Chert Fragments)							16 24-20		
15			Moist, Very Stiff, Reddish Brown Clay with Some Gravel and Cobbles							7 9-13		
20			Moist, Hard, Reddish Brown Clay with Some Gravel							7 14-20		
25			Moist, Very Stiff, Reddish Brown Clay with Trace Gravel							7 12-17		
			Boring Terminated									
30												
35												

REMARKS: Dry Hole measured 24 hours after drilling.



<b>ARKANSAS HWY. &amp; TRANS. DEPARTMENT</b>		BORING NO. 6
<b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>		PAGE 1 OF 1
JOB NO. 009784	Newton County	DATE: October 17, 2017
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)	Cut Slope	TYPE OF DRILLING: Hollow Stem Auger
STATION: 141+00		EQUIPMENT: Acker
LOCATION: 72' Right of Construction Centerline		HAMMER CORRECTION FACTOR: N/A
LOGGED BY: Stanley Bates		

COMPLETION DEPTH: 26.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 907.5									
5			Clay with Gravel, Cobbles, and Boulders							16 27-34		
10			Dry, Very Hard, Reddish Brown Sandy Clay with Gravel and Cobbles (Chert Fragments)							11 16-38		
15			Moist, Hard, Reddish Brown Sandy Clay with Gravel and Cobbles (Chert Fragments)							5 10-14		
20			Moist, Very Stiff, Reddish Brown Clay with Sand and Some Gravel (Chert Fragments)							4 7-10		
25			Moist, Stiff, Reddish Brown Clay with Some Gravel (Chert Fragments)							3 5-8		
30			Boring Terminated									
35												

REMARKS: Dry Hole measured 24 hours after drilling.





**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 7  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)  
Cut Slope  
STATION: 141+50  
LOCATION: 43' Right of Construction Centerline  
LOGGED BY: Stanley Bates

DATE: October 11, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger  
EQUIPMENT: Acker  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 16

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 902.2									
5			Clay with Gravel, Cobbles, and Boulders and Some Organic Matter									
10			Dry, Very Hard, Reddish Brown Clay with Gravel (Chert Fragments)							36 60-60 (11")		
15			Moist, Hard, Reddish Brown Clay with Gravel (Chert Fragments)							8 16-30		
15			Moist, Hard, Reddish Brown Clay with Gravel and Cobbles (Chert Fragments)							13 18-22		
			Boring Terminated									
20												
25												
30												
35												

REMARKS: Dry Hole measured 19 hours after drilling.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 8  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)  
Cut Slope  
STATION: 142+00  
LOCATION: 38' Right of Construction Centerline  
LOGGED BY: Stanley Bates

DATE: October 11, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger  
EQUIPMENT: Acker  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 16

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 896.6									
5			Clay with Gravel, Cobbles, and Boulders							28 26		
10			Dry, Hard, Reddish Brown Clay with Gravel (Chert Fragments)							8 12-19		
15			Dry, Hard, Reddish Brown Clay with Trace Gravel (Chert Fragments)							10 22-33		
20			Boring Terminated									
25												
30												
35												

REMARKS: Dry Hole measured 19 hours after drilling.

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 9  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)  
Cut Slope  
STATION: 144+00  
LOCATION: 38' Right of Construction Centerline  
LOGGED BY: Stanley Bates

DATE: October 10, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger  
EQUIPMENT: Acker  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 21.3

DEPTH FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 884.5									
5			Clay with Gravel, Cobbles, and Boulders							17 38-30		
10			Dry, Very Dense, Reddish Brown Gravel and Cobbles (Chert Fragments) with Clay							31 73 (6")		
15			Dry, Very Dense, Reddish Brown Gravel (Chert Fragments) with Clay							7 23-40		
20			Moist, Very Hard, Reddish Brown Clay with Some Gravel and Some Organic Matter.							8 11-10		
			Cobbles and Boulders									
			Moist, Medium Dense, Reddish Brown Sand									
25			Boring Terminated									
30												
35												

REMARKS:

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 10  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)  
Cut Slope  
STATION: 144+50  
LOCATION: 38' Right of Construction Centerline  
LOGGED BY: Stanley Bates

DATE: October 4, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 21.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			SURFACE ELEVATION: 884.5									
5			Clay with Gravel, Cobbles, and Boulders							10 25-18		
10			Dry, Hard, Reddish Brown Clay with Gravel (Chert Fragments)							19 28-27		
15			Dry, Hard, Reddish Brown, Sandy Clay with Gravel (Chert Fragments)							28 60 (6")		
20			Moist, Very Hard, Reddish Brown Sandy Clay with Gravel (Rock Fragments) Boulder								26	0
			Clay with Gravel, Cobbles, and Boulders									
25			Boring Terminated									
30												
35												

REMARKS:

<b>ARKANSAS HWY. &amp; TRANS. DEPARTMENT</b>		BORING NO. 11
<b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>		PAGE 1 OF 1
JOB NO. 009784	Newton County	DATE: October 4, 2017
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)	Cut Slope	TYPE OF DRILLING: Hollow Stem Auger
STATION: 146+00		EQUIPMENT: Acker
LOCATION: 38' Right of Construction Centerline		HAMMER CORRECTION FACTOR: 1.37
LOGGED BY: Stanley Bates		

COMPLETION DEPTH: 30.8

D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	P L A S T I C  L I M I T	% M O I S T.	L I Q U I D  L I M I T	D R Y  W E I G H T	L B S  P E R  C U. F T.	N O. O F  B L O W S  P E R 6- I N.	% T C R	% R Q D
			SURFACE ELEVATION: 871.5									
5			Clay with Gravel, Cobbles, and Boulders							11 20-28		
10			Dry, Hard, Reddish Brown Clay with Gravel (Chert Fragments)							9 17-25		
15			Dry, Hard, Reddish Brown Sandy Clay							8 20-26		
20			Moist, Hard, Reddish Brown Sandy Clay							10 21-29		
25			Moist, Very Dense, Reddish Brown Sand with Clay and Some Gravel (Chert Fragments)							7 14-18		
30			Moist, Very Dense, Reddish Brown Sand with Clay and Some Gravel (Chert Fragments)							28 35-20		
			Boring Terminated									
35												

REMARKS:

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 12  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)  
Cut Slope  
STATION: 146+50  
LOCATION: 38' Right of Construction  
LOGGED BY: Stanley Bates

DATE: October 3, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger  
EQUIPMENT: Acker  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 21

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 866.6									
5			Clay with Gravel, Cobbles, and Boulders							38 53-60		
10			Dry, Very Dense, Reddish Brown Gravel (Chert Fragments) with Clay							7 14-20		
15			Moist, Dense, Reddish Brown Clayey Sand							13 23-30		
20			Moist, Very Hard, Reddish Brown Sandy Clay with Gravel							12 39-51		
25			Boring Terminated									
30												
35												

REMARKS:

**ARKANSAS HWY. & TRANS. DEPARTMENT  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 13  
PAGE 1 OF 1

JOB NO. 009784 Newton County  
JOB NAME: Buffalo River Br. & Apprs. (Pruitt)(S)  
Cut Slope  
STATION: 147+00  
LOCATION: 38' Right of Construction Centerline  
LOGGED BY: Stanley Bates

DATE: October 3, 2017  
TYPE OF DRILLING:  
Hollow Stem Auger  
EQUIPMENT: Acker  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 16

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 861.2									
5			Clay with Gravel, Cobbles, and Boulders							12 28-20		
10			Dry, Hard, Reddish Brown Clay with Gravel (Chert Fragments)							12 21-17		
15			Moist, Dense, Reddish Brown Clayey Sand with Gravel (Chert Fragments)							6 13-16		
			Boring Terminated									
20												
25												
30												
35												

REMARKS:



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

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

<b>Job No.</b>	009784	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	04/19/2007	<b>Station No.:</b>	138+00
<b>Date Tested:</b>	April 19, 2007	<b>Location:</b>	NBL CL
<b>Name of Project:</b>	BUFFALO RIVER BR & APPR. (PRUITT) (S)		
<b>County:</b>	<b>Code:</b> 51	<b>Name:</b>	NEWTON
<b>Sampled By:</b>		<b>Depth:</b>	0-5
<b>Lab No.:</b>	20070686	<b>AASHTO Class:</b>	A-2-4(0)
<b>Sample ID:</b>	RV110	<b>Material Type (1 or 2):</b>	2
<b>LATITUDE:</b>		<b>LONGITUDE:</b>	

**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	3.99
Middle	3.99
Bottom	4.00
Average	3.99
Membrane Thickness (in):	0.00
Height of Specimen, Cap and Base (in):	8.01
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.01
Initial Area, Ao (sq. in):	12.52
Initial Volume, AoLo (cu. in):	100.32

**3. Soil Specimen Weight:**

Weight of Wet Soil Used (g):	3335.90
------------------------------	---------

**4. Soil Properties:**

Optimum Moisture Content (%):	13.8
Maximum Dry Density (pcf):	117.4
95% of MDD (pcf):	111.5
In-Situ Moisture Content (%):	N/A

**5. Specimen Properties:**

Wet Weight (g):	3335.90
Compaction Moisture content (%):	14.4
Compaction Wet Density (pcf):	126.70
Compaction Dry Density (pcf):	110.75
Moisture Content After Mr Test (%):	14.3

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

#VALUE!

**7. Resilient Modulus, Mr:**

11042(Sc)<sup>-0.21543(S3)<sup>0.31481</sup></sup>

**8. Comments**

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**9. Tested By:**

DEB

**Date:** April 19, 2007

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
MATERIALS DIVISION

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

Job No. 009784 Material Code SSRVPS  
 Date Sampled: 04/19/2007 Station No.: 138+00  
 Date Tested: April 19, 2007 Location: NBL CL  
 Name of Project: BUFFALO RIVER BR & APPR. (PRUITT) (S)  
 County: Code: 51 Name: NEWTON  
 Sampled By: Depth: 0-5  
 Lab No.: 20070686 AASHTO Class: A-2-4(0)  
 Sample ID: RV110 Material Type (1 or 2): 2  
 LATITUDE: LONGITUDE:

PARAMETER	Chamber Confining Pressure	Nominal Maximum Axial Stress	Actual Applied		Actual Applied		Actual Applied		Actual Applied		Average Recov Def. LVD T 1 and 2	Resilient Strain	Resilient Modulus
			psi	lbs	psi	lbs	psi	lbs	psi	lbs			
Sequence 1	6.0	2.0	25.8	23.1	2.7	2.1	1.8	0.2	0.00088	0.00011	16,777		
Sequence 2	6.0	4.0	48.1	45.4	2.7	3.8	3.6	0.2	0.00189	0.00024	15,409		
Sequence 3	6.0	6.0	71.0	67.3	3.7	5.7	5.4	0.3	0.00311	0.00039	13,837		
Sequence 4	6.0	8.0	94.5	88.3	6.2	7.5	7.1	0.5	0.00464	0.00058	12,174		
Sequence 5	6.0	10.0	117.5	108.7	8.8	9.4	8.7	0.7	0.00618	0.00077	11,262		
Sequence 6	4.0	2.0	25.5	22.8	2.7	2.0	1.8	0.2	0.00097	0.00012	15,019		
Sequence 7	4.0	4.0	47.8	45.1	2.8	3.8	3.6	0.2	0.00211	0.00026	13,692		
Sequence 8	4.0	6.0	69.9	66.9	2.9	5.6	5.3	0.2	0.00341	0.00043	12,552		
Sequence 9	4.0	8.0	93.7	88.3	5.4	7.5	7.0	0.4	0.00490	0.00061	11,534		
Sequence 10	4.0	10.0	116.5	108.7	7.9	9.3	8.7	0.6	0.00666	0.00083	10,428		
Sequence 11	2.0	2.0	25.4	22.8	2.7	2.0	1.8	0.2	0.00132	0.00016	11,055		
Sequence 12	2.0	4.0	47.5	44.8	2.7	3.8	3.6	0.2	0.00269	0.00034	10,634		
Sequence 13	2.0	6.0	68.7	65.9	2.8	5.5	5.3	0.2	0.00425	0.00053	9,920		
Sequence 14	2.0	8.0	91.0	86.5	4.5	7.3	6.9	0.4	0.00596	0.00074	9,281		
Sequence 15	2.0	10.0	112.8	105.7	7.1	9.0	8.4	0.6	0.00800	0.00100	8,449		

TESTED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 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. 009784 Material Code SSRVPS  
Date Sampled: 04/19/2007 Station No.: 138+00  
Date Tested: April 19, 2007 Location: NBL CL  
Name of Project: BUFFALO RIVER BR & APPR. (PRUITT) (S)  
County: Code: 51 Name: NEWTON  
Sampled By: Depth: 0-5  
Lab No.: 20070686 AASHTO Class: A-2-4(0)  
Sample ID: RV110 Material Type (1 or 2): 2  
LATITUDE: LONGITUDE:

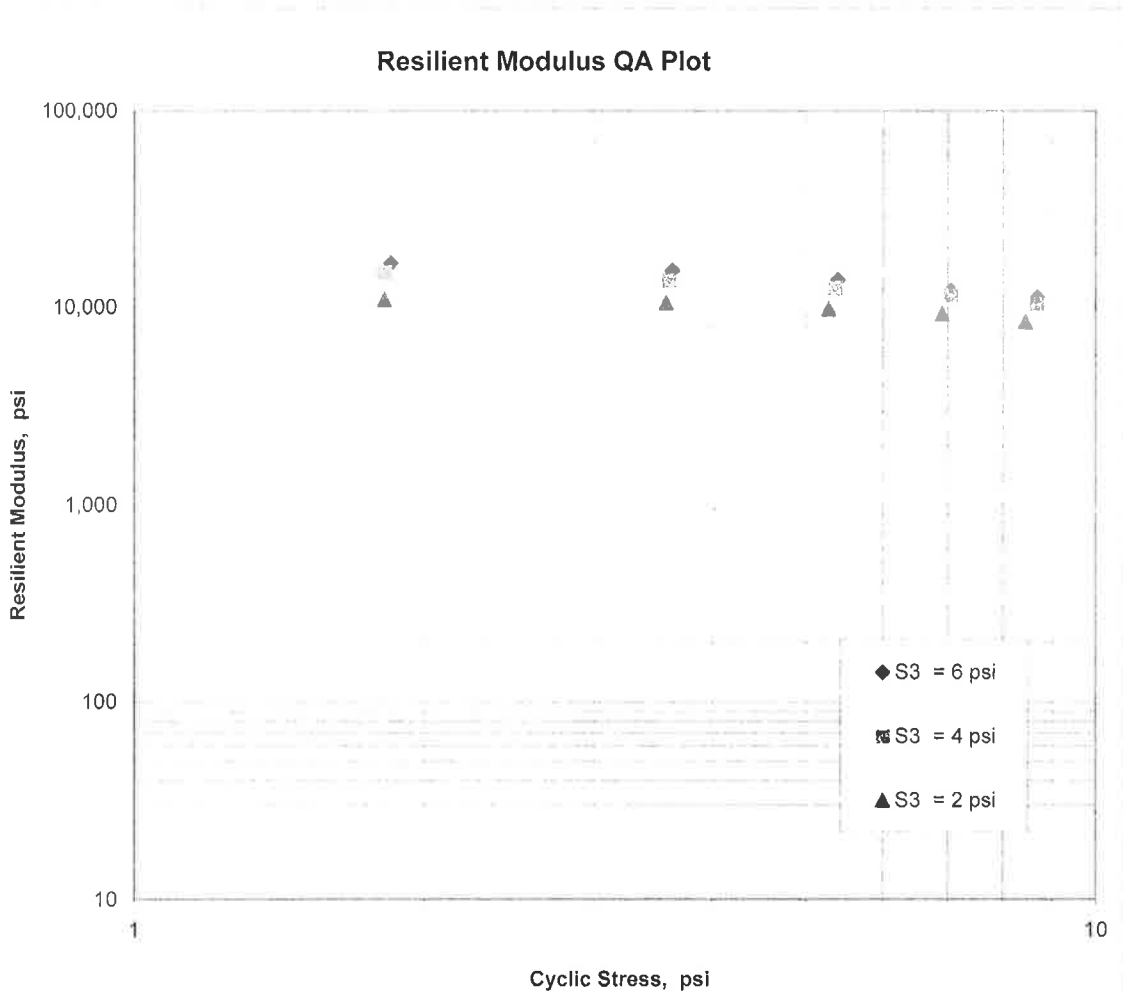
$$M_R = K_1 (S_C)^{K_2} (S_3)^{K_5}$$

$$K_1 = 11,042$$

$$K_2 = -0.21543$$

$$K_5 = 0.31481$$

$$R^2 = 0.95$$



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION  
JERRY WESTERMAN, MATERIALS ENGINEER  
\*\*\* SOIL SURVEY STRENGTH TEST REPORT \*\*\*

DATE - 04/23/2007  
JOB NUMBER - 009784

SEQUENCE NO. - 1  
MATERIAL CODE - SSRVPS  
SPEC. YEAR - 2003  
SUPPLIER ID. - 1  
COUNTY/STATE - 51  
DISTRICT NO. - 09

JOB NAME - BUFFALO RIVER BR. & APPRS (PRUITT) (S)

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

BEGIN JOB - END JOB 15  
  
RESILIENT MODULUS  
STA.138+00 8449

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REMARKS -

AASHTO TESTS : T190

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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE	- 05/21/07	SEQUENCE NO.	- 1
JOB NUMBER	- 009784	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2003
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 51
SUPPLIER NAME	- STATE	DISTRICT NO.	- 09
NAME OF PROJECT	- BUFFALO RIVER BR. & APPRS (PRUITT) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- NEWTON, COUNTY	DATE SAMPLED	- 04/09/07
SAMPLED BY	- D KRAFT M CREAMER	DATE RECEIVED	- 04/10/07
SAMPLE FROM	- NEWTON COUNTY	DATE TESTED	- 04/19/07
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20070680	- 20070681	- 20070682
SAMPLE ID	- S104	- S105	- S106
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 138+00	- 138+00	- 163+00
LOCATION	- 15'LT	- CL	- 7'LT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- RED	- RED	- RED
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 36 3 28.70	- 36 03 28.40	- 36 3 45.10
LONGITUDE DEG-MIN-SEC	- 93 08 32.70	- 93 08 33.50	- 93 08 14.20
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	-	-
	3/8 IN. -	-	-
	NO. 4 - 100	- 100	- 100
	NO. 10 - 90	- 80	- 99
	NO. 40 - 77	- 62	- 94
	NO. 80 - 64	- 42	- 36
	NO. 200 - 55	- 33	- 24
LIQUID LIMIT	- 31	- 33	- ND
PLASTICITY INDEX	- 17	- 17	- NP
AASHTO SOIL	- A-6(6)	- A-2-6(1)	- A-2-4(0)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 16.1	- 12.4	- 10.2
ACHMSC TY2 (IN)	- 4.5W	-	- 5.0W
CHIP SEAL (IN)	- .50X	-	- .50
ACHMSC TY2 (IN)	- 1.5	-	-
ACHMSC TY2 (IN)	-	-	- 1.0
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED



