ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO.		012318		
FEDERAL AID PROJEC	CT NO	NHPP-2653(1)		
MIDDLE FORM	SALINE RIVE	ER & DRY RUN CREEK	STRS. & APF	PRS. (S)
STATE HIGHWAY	7	SECTION	10 & 11	
IN	G.A	ARLAND & PERRY		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

September 11, 2018

TO:

Mr. Rick Ellis, Bridge Engineer

SUBJECT:

Job No. 012318 (Formerly Job No. 061501)

Middle Fork Saline River & Dry Run Creek Str. & Apprs. (S)

Route 7 Sections 10 & 11 Garland & Perry Counties

Transmitted herewith are summaries of the site geology and subsurface conditions, unconfined compressive strength test results, RMR, D50 scour analysis test 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 to confirm the field identifications. The rock cores are available for inspection at the Materials Division.

This project consists of replacing the bridge crossing the Middle Fork of the Saline River, on Highway 7, north of Jesseville. The new bridge will be constructed on the existing alignment. A total of eight borings were requested for this project: one for each end bent, two borings at each intermediate bent, and two borings for the temporary detour bridge. One of the eight requested borings, Station 312+75 20' Left of C.L. Construction, was not accessible due to high water levels, steep slopes, and low bridge clearance.

Bedrock at this site is composed of Shale with varying degrees of weathering and thin bedding planes dipping in different directions. These properties led to low unconfined compressive strength results. Unconfined compressive strength values used in bearing capacity calculations were adjusted to better represent the rock mass and provide appropriate resistance values.

Based on plans provided by Bridge Division and the depth at which bedrock was encountered, it is anticipated that end bents will be founded on piling and intermediate bents will be founded on drilled shafts or spread footings. Piling should be tipped into competent shale and preboring may be necessary to achieve minimum penetration requirements. Spread Footings, founded at least 2 feet in competent shale, should be sized based on the values provided in Table 1.

TABLE 1 – Bearing Capacity Recommendations for Spread Footings

Presumptive Bearing Resistance at Service Limit State (ksf)

20

Drilled Shafts socketed into competent shale, should be sized based on the values provided in Table 2.

TABLE 2 – Bearing Capacity Recommendations for Drilled Shafts

Nominal Side	Factored Side	Nominal Tip Resistance (ksf)	Factored Tip
Resistance (ksf)	Resistance (ksf)		Resistance (ksf)
15.7	8.6	120	60

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 6 Engineer District 8 Engineer

G.C. File



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11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

July 23, 2019

TO:

Mr. Rick Ellis, Bridge Engineer

SUBJECT:

Job No. 012318

Middle Fork Saline River & Dry Run Creek Strs. & Apprs. (S)

Route 7, Sections 10 & 11 Garland & Perry Counties

Transmitted herewith are summaries of the site geology and subsurface conditions, unconfined compressive strength test results, RMR, D50 scour analysis test results, and the logs of the borings conducted for the structure and approaches of Dry Run Creek. 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. The rock cores are available for inspection at the Materials Division. This information is considered supplementary to the subsurface investigation report submitted by IOM dated September 11, 2018.

This project consists of replacing the bridge crossing Dry Run Creek, on Highway 7, north of Jesseville. The new bridge will be constructed east of the existing alignment. A total of six borings were requested for this project.

Based on plans provided by Bridge Division and the depth at which bedrock was encountered, it is anticipated that end bents will be founded on piling and intermediate bents will be founded on spread footings. Piling should be tipped into competent shale or sandstone and preboring may be necessary to achieve minimum penetration requirements. Spread Footings, founded at least 2 feet in competent sandstone, shale, or interbedded shale and sandstone, should be sized based on the values provided in Table 1.

TABLE 1 - Bearing Capacity Recommendations for Spread Footings

Nominal Bearing Resistance (ksf)	Factored Bearing Resistance (ksf)	Presumptive Bearing Resistance at Service Limit State (ksf)
114	51	40

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

Michael C. Benson Materials Engineer

MCB:rpt:mlg

: State Construction Engineer - Master File Copy

District 6 Engineer District 8 Engineer

G.C. File

GEOLOGY AND SITE CONDITIONS Job No. 012318

Middle Fork Saline River & Dry Run Creek Str. & Apprs. (S) Garland & Perry Counties Route 7, Sections 10 & 11

Site Conditions

The existing bridge is located on Highway 7, north of Jessieville, and crosses Dry Run Creek. It is a two span, approximately 60 feet long, 18 feet wide, north to south running bridge. The bridge superstructure and substructure are cast-in-place concrete. The bridge superstructure consists of decking supported by two concrete beams resting on concrete bents with web walls and a single spread footing. The guardrails leading up to the bridge are steel supported by concrete posts. The original guardrail on the bridge were stone and mortar, but the guardrail on the south side of the bridge has been replaced by steel. Dry Fork Creek runs from east to west under the existing bridge before reaching its confluence with Trace Creek, approximately 280 feet down stream. Dry Fork Creek is capable of maintaining a large sediment load as indicated by rounded cobbles and boulders in the channel and surrounding the channel banks. The existing bridge is located in the Ouachita National Forest and is predominately surrounded by woodland. No utilities were observed surrounding the project locality.

Site Geology

The bridge is located in Mississippian aged rocks in the Ouachita Mountain Orogeny which consist primarily of extensively faulted and folded rocks with a generally east to west trend of ridges and valleys. The rocks encountered at the existing bridge belong to the Stanley Formation, which consists of dark-gray shale interbedded with fine-grained sandstone. A thick sandstone member, the Hot Springs Sandstone, is found near the base of the sequence and an equivalent thin conglomerate/breccia occurs at the base of the unit in many other places. Stratigraphically minor amounts of tuff, chert, bedded and vein barite, and conglomerate have been noted in various parts of the sequence. Silty sandstones outside the Hot Springs Sandstone Member are normally found in thin to massive beds separated by thick intervals of shale. The tuffs (Hatton Tuff Lentil and others) seem to be restricted to the lower part of the Stanley Shale. Cherts are sometimes present in the middle and upper parts of the formation. The total thickness of the Stanley Formation varies from 3,500 feet to over 10,000 feet. Shale and Sandstone beds dipping towards the northwest are exposed in the channel, upstream from the existing bridge. Core samples collected at the jobsite show evidence of high levels of deformation such as slickensides, fractures, and mineral veins. Most of the rock layers encountered in the core were moderately to steeply dipping. Some of the sandstone layers evaluated in the core were very hard and it is possible that metaguartzite could be encountered during excavation for the new bridge. There are numerous thrust faults surrounding the project alignment and one is mapped several hundred feet south of the existing bridge. Other unmapped faults in the area are likely.

Scour Potential

Rock was encountered in all five borings between 1.4 and 5.1 feet below ground level. Therefore, it is likely that the bridge footings will be set in solid rock. The sediment observed around the bridge footings consists of sand and rounded gravel, cobbles, and boulders. This coarse sized sediment has diminished capacity for scour and no scour was observed around the existing structure, channel banks, and bridge footing. Analysis of D50 particle size yielded a median value 8.0mm, which is not considered a highly scourable sediment size (Fig 2). Based on grain size analysis and visual observation, scour is not anticipated at the new bridge.



Clay Sill VFS FS MS CS VCS Gran Peobles Cobbles Boulders

D50 = 8.0mm

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Figure 1. Looking downstream at Dry Run Creek.

Figure 2. Hjulstroms Diagram with D50 plotted.

Subsurface Conditions

Based on the boring logs, the subsurface stratigraphy may be generalized as follows:

0 - 5.1 Feet:

Consists of brown and gray sand, gravel, cobbles, and boulders.

5.1 - 41.0 Feet:

Varies from weathered to unweathered, medium hard, frequently to occasionally fractured, moderately to steeply dipping **shale with interbedded sandstone** and frequent to occasional mineral veins to weathered to unweathered, cemented to well cemented, frequently to occasionally fractured, moderately to steeply dipping, **sandstone with interbedded shale** and frequent to occasional mineral veins.

Rock Core Unconfined Compression Test Summary

Project Number:

012318

Project Name:

Middle Fork Saline River & Dry Run Creek Strs. & Apprs. (S)

Date Tested:

7/8/2019

Station	Location	Sample No.	Depth (ft.)	Diameter (in)	Height (in)	Total Load (lbs.)	Correction Factor	Stress (psi)	Remarks
510+27	7' Rt	1	11.5	1.75	4.03	2,160	1.00	898	SH
510+27	7' Rt	2	13.0	1.75	4.25	2,600	1.00	1,081	SH
510+65	10' Lt	3	2.7	1.75	4.25	18,470	1.00	7,679	SS
510+65	10' Lt	4	14.0	1.75	4.25	4,130	1.00	1,717	SH
511+00	41' Lt	5	3.6	1.75	3.34	5,940	1.00	2,470	SS
511+00	41' Lt	6	5.1	1.75	4.14	51,230	1.00	21,299	SS
511+35	C.L.	7	13.2	1.75		Broke bet	fore testing	9	SS w/ SH
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Terminology

SS = Sandstone

L & S = Layers and Seams

Intbd = Interbedded

SH = Shale

Freq. = Frequent

P & S = Partings and Seams

WTD = Weathered

Occ. = Occasional

ROCK MASS RATING SUMMARY

JOB# 012318

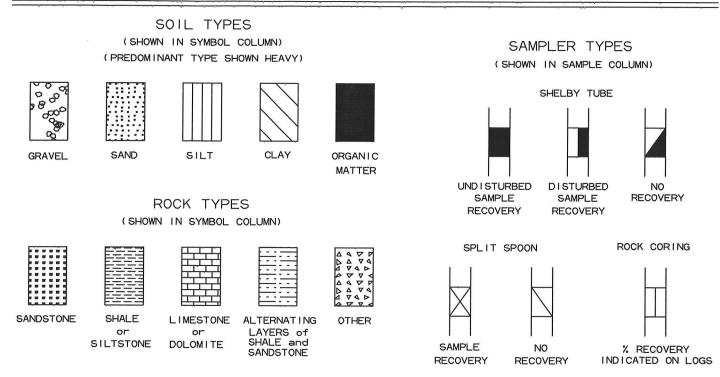
	Dry	Run Creek	CON (NEC.) ON THE PROPERTY OF	F #4
SAMP	LE #1	_	SAMP	LE #1
Station/Location Depth (ft.)	510+27, 7' RT 11.5		Station/Location Depth (ft.)	510+27, 7' RT 13
Uniaxial Compressive Strength RQD Spacing of Joints Condition of Joints Groundwater Conditions Sum	Relative Rating 1 13 25 25 7 71	Ur	niaxial Compressive Strength RQD Spacing of Joints Condition of Joints Groundwater Conditions Sum	Relative Rating 1 13 25 25 7 71
Class Number Description	II GOOD ROCK		Class Number Description	II GOOD ROCK
SAME	LE #3		SAME	PLE #4
Station/Location Depth (ft.)	210+65, 10' LT 2.7		Station/Location Depth (ft.)	210+65, 10' LT
Uniaxial Compressive Strength RQD Spacing of Joints Condition of Joints Groundwater Conditions Sum	Relative Rating 7 3 20 25 7 62	U	Iniaxial Compressive Strength RQD Spacing of Joints Condition of Joints Groundwater Conditions Sum	Relative Rating 2 17 25 20 7 71
Class Number Description	II GOOD ROCK		Class Number Description	II GOOD ROCK
SAMI	PLE #5		SAM	PLE #6
Station/Location Depth (ft.)	511+00, 41' LT 3.6		Station/Location Depth (ft.)	511+00, 41'LT 5.1
Uniaxial Compressive Strength RQD Spacing of Joints Condition of Joints Groundwater Conditions Sum	Relative Rating 2 13 25 27 77 72	Ţ	Uniaxial Compressive Strength RQD Spacing of Joints Condition of Joints Groundwater Conditions Sum Class Number	13 25 25 7 82
Class Number Description	GOOD ROCK		Description	VERY GOOD ROCK
SAM	PLE #7	. –	SAN	IPLE #8
Station/Location Depth (ft.)	511+35, CL 13.2		Station/Location Depth (ft.)	
Uniaxial Compressive Strength RQD Spacing of Joints Condition of Joints Groundwater Conditions Sum	Relative Rating N/A 3 10 25 7 45		Uniaxial Compressive Strength RQD Spacing of Joints Condition of Joints Groundwater Conditions Sum	Relative Rating
Class Number Description	III FAIR ROCK		Class Number Description	

D₅₀ AGGREGATE ANALYSIS FOR SCOUR CALCULATIONS

loh	No	01231	12

Creek Name	Station	Sample Type	Location	Depth (FT)	Aggregate Size (D50) (IN)
Dry Run Creek	510+80	Creek Bank	C.L. of Construction	N/A	0.312

LEGEND



TERMS DESCRIBING CONSISTENCY OR CONDITION

GRANL	LAR SOIL		CLAY	CL/	AY-SHALE	SHALE				
"N" Value	Density	"N" Value	"N" Value Consistency "!		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	Penetrati	on			
		31-60	Hard	31-60	Hard	in 60 Blov	vs: Medium Har			
		0ver 60	Very Hard	0ver 60	Very Hard	Less than	2'			
						Penetrati	on			
						in 60 Blov	vs: 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, and then perform the test. The number of hammer blows for seating the spoon and performing the test are recorded for each 6 inches of penetration on the drill log. The field "N" Value (N_f) can be obtained by

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

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JOB		LO			PAGE	1	0	F 1					
	NO. NAME:		and the state of t		DATE:				e 26	, 2019)		
JOB	NAME:		Middle Fork Saline River and Dry Run Creek Strs. Apprs. (S). Route 7, Sections 10 & 11	&	TYPE C								
STAT	ΓΙΟΝ:		510+27				Stem A					Core	•
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		v. 1	Austin Dillman		100								
			N DEPTH: 30		HAMM	ER C	ORREC'	rion i	FACT	FOR:		N/A	
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<u> </u>			Sand, Gravel, Cobbles, and Boulders										
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JOB N			012318 Garland & Perry Counties	PAGE 1 OF 1 DATE: June 25, 2019										
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STAT	ION:		510+65		EQUIP					cer 20		Core		
	TION:		10' Left of Construction Centerline											
			Austin Dillman		HAMMER CORRECTION FACTOR: N/									
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	L	E			PLASTIC LIMIT	% MOIST.	LIQUID	DRY WEIGHT	LBS PER CU.FT	NO. OF BLOW	PER 6-IN.	R	D	
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			Gray											
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JOB N			012318 Garland & Perry Counties		DATE: June 24 and 25, 2019								
	NAME:		Middle Fork Saline River and Dry Run Creek Strs.	&	TYPE C)F DR			ına	25, 20	19		
			Apprs. (S). Route 7, Sections 10 & 11						- D	iamono	Cor	e	
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		Dr	y Run Creek	-									

JOB NO. JOB NAME Middle Fork Selline River and Dry Run Creek Strs. & Middle Fork Selline River and Dry Run Creek Strs. & Middle Fork Selline River and Dry Run Creek Strs. & Hollow Stem Auger - Diamend Core EQUIPMENT. ACKER 2094 41 - Left of Construction Centerline LOCGED BY: Austin Dillman COMPLETION DEPTH: 23.6 BE N A P M D L S S AND STONE - Unweathered, Well Cemented, Occasional Fractures, Frequent Calcite Veins, Sight to Moderate Dip, Light Gray* SHALE - Weathered, Medium Hard, Gray** SHALE - Unweathered, Well Cemented, Occasional Shale Clast, Moderate Dip, Gray SANDSTONE - Unweathered, Well Cemented, Occasional Shale Clast, Moderate Dip, Gray SANDSTONE - Unweathered, Well Cemented, Occasional Shale Clast, Moderate Dip, Gray SANDSTONE - Unweathered, Well Cemented, Occasional Shale Clast, Moderate Dip, Gray SANDSTONE - Unweathered, Well Cemented, Occasional Shale Clast, Moderate Dip, Gray SANDSTONE - Unweathered, Well Cemented, Occasional Shale Clast, Moderate Dip, Gray SANDSTONE - Unweathered, Well Cemented, Occasional Shale Clast, Moderate Dip, Gray SANDSTONE - Unweathered, Well Cemented, Occasional Shale Clast, Moderate Dip, Gray SANDSTONE - Unweathered, Well Cemented, Frequent Friectures and Calcite Veins, Steep Dip, Gray SANDSTONE - Unweathered, Well Cemented, Frequent Friectures and Calcite Veins, Steep Dip, Gray SANDSTONE - Unweathered, Well Cemented, Frequent Friectures and Calcite Veins, Steep Dip, Gray SANDSTONE - Unweathered, Frequent Friectures and Calcite Veins, Steep Dip, Gray SANDSTONE - Unweathered, Well Cemented, Frequent Friectures and Calcite Veins, Steep Dip, Gray SANDSTONE - Unweathered, Well Cemented, Frequent Friectures and Calcite Veins, Steep Dip, Gray SANDSTONE - Unweathered, Well Cemented, Frequent Friectures and Calcite Veins, Steep Dip, Gray SANDSTONE - Unweathered, Well Cemented, Frequent Friectures and Calcite Veins, Steep Dip, Gray SANDSTONE - Unweathered, Well Cemented, Frequent Friectures and Calcite Veins, Steep Dip, Gray SANDSTONE - Unweathered, W				DEPARTMENT OF TRANSPORTATION DIVISION - GEOTECHNICAL SEC.	BORING NO. 4 PAGE 1 OF 1									
JOB NAME: Address and Dry Run Creek Strs. & Apprs. (S). Route 7, Sections 10 & 11 STATION: 511+00 LOCATION: 41' Left of Construction Centerline LOCATION: Avaisin Dillman COMPLETION DEPTH: 23.6 D S S A P M DESCRIPTION OF MATERIAL SOIL FIT. L S SURFACE ELEVATION: 759.9 Sand, Gravel, Cobbles, and Boulders SANDSTONE - Unweathered, Well Cemented, Occasional Fractures, Frequent Calcite Veins, Slight to Moderate Dip, Light Gray* SHALE - Weathered, Medium Hard, Gray** SHALE - Unweathered, Medium Hard, Gray** SHALE - Unweathered, Medium Hard, Gray* SANDSTONE - Unweathered, Gray SANDSTONE - Unweathere			-					<u> </u>		e 24	201	9	-	
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ARKANSAS DEPARTMENT OF TRANSPORTATION					BORING NO. 5										
MATERIALS DIVISION - GEOTECHNICAL SEC. JOB NO. 012318 Garland & Perry Counties					PAGE 1 OF 1										
8					DATE: June 18, 2019										
JOB	OB NAME: Middle Fork Saline River and Dry Run Creek Strs. & Apprs. (S). Route 7, Sections 10 & 11				TYPE OF DRILLING:										
STAT	STATION: 511+02					Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 2094									
	LOCATION: 10' Right of Construction Centerline						EQUITMENT. ACKEL 2094								
			sustin Dillman		НАММ	ER CO	ORREC	TION I	FACT	OR.	1	N/A			
COM	IPLET	ION	N DEPTH: 32.9				June	110111	1101	OIC.		1/11			
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FT.	L	S	SURFACE ELEVATION: 763.0		PLASTIC LIMIT	% MOIST	LIQUID	DRY WEIGHT	LBS PER CU.FT	NO. OF BLOWS	PER 6-IN				
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15			SANDSTONE WITH INTERBEDDED SHALE -									00			
			Unweathered, Well Cemented, Frequent Calcite									96	50		
			Layers and Seams, Slickensided, Moderate Dip, Gray												
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			Occasional Calcite Veins, Slickensided, Gray								1	00	100		
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			Boring Terminated												
35															
REMARKS: Dry Run Creek															

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.					BORIN			. 0							
JOB NO. 012318 Garland & Perry Counties				PAGE 1 OF 2											
JOB NAME:			Middle Fork Saline River and Dry Run Creek Strs. &			DATE: June 19, 2019 TYPE OF DRILLING:									
			Apprs. (S). Route 7, Sections 10 & 11	~	Hollow Stem Auger - Diamond Core										
STATION:			511+35			EQUIPMENT: Acker 2094									
LOCA	LOCATION: Construction Centerline				110001 2077										
LOGO	LOGGED BY: Austin Dillman						HAMMER CORRECTION FACTOR: N/A								
COM	N DEPTH: 48.9														
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			CHAIR Highland I Mark												
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											50	0			
	-	+	SANDSTONE - Unweathered, Well Cemented,												
20			Frequent Fractures and Mineral Veins, Gray												
											62	40			
		\sqcup													
25				1											
											46	0			
30															
			SHALE WITH INTERBEDDED SANDSTONE -								100	68			
			Unweathered, Medium Hard, Frequent								. 33				
			Fractures, Slickensided, Gray												
35											\vdash				
	RKS.	Dr	v Run Creek												
			REMARKS: Dry Run Creek												

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC							o. 6				155,2%			
MATERIALS DIVISION - GEOTECHNICAL SEC. JOB NO. 012318 Garland & Perry Counties					PAGE 2 OF 2									
	Canana a rony Counties					DATE: June 19, 2019								
	OB NAME: Middle Fork Saline River and Dry Run Creek Strs. & Apprs. (S). Route 7, Sections 10 & 11				TYPE OF DRILLING:									
STAT	FATION: 511+35				Hollow Stem Auger - Diamond Core									
LOCATION: Construction Centerline						EQUIPMENT: Acker 2094								
LOGO	GED B	Austin Dillman		HAMMER CORRECTION FACTOR: N/A										
COM	IPLET		Zit C	OTTTE	11011	n ne	IOK.		1 4/ 2	1				
D	s	S												
E P	Y	A							. •					
T	М	M P	DESCRIPTION OF MATERIAL	SOIL				H	J.FT	SMC		% T	% R	
H	В	Ĺ		GROUP	C	ST.		EIG	R CI	BL(ż	С	Q	
	ľ	Е			PLASTIC LIMIT	% MOIST.		DRY WEIGHT	PE	OF	11-9	R	D	
FT.	_	S	SURFACE ELEVATION: 761.3		PLAST LIMIT	N %	LIQUID	DR	LBS PER CU.FT	NO. OF BLOWS	PER 6-IN.			
L -														
L -												72	48	
<u> </u>														
40														
												92	60	
		+												
45			SANDSTONE - Unweathered, Well Cemented,											
		Ш	Frequent Fractures, Gray											
											ŀ	00	74	
		\dashv	Roring Torminated								_			
50			Boring Terminated											
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		-												
											- 1			
65														
-00														
70														
	RKS:	Drv	Run Creek							w/				
		,												