ARKANSAS DEPARTMENT OF TRANSPORTATION

SUBSURFACE INVESTIGATION

STATE JOB NO. 080614

FEDERAL AID PROJECT NO. NHPP-BFP-0071(41)

PEE DEE CREEK STR. & APPRS. (CLINTON) (S)

STATE HIGHWAY 16 **SECTION** 10

IN VAN BUREN **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 | Lorie H. Tudor, P.E., Director
MATERIALS DIVISION
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August 17, 2021

TO: Mr. Rick Ellis, Bridge Engineer

SUBJECT: Job No. 080614
Pee Dee Creek Str. & Apprs. (S)
Van Buren County
Route 16, Section 10

Introduction

Submitted herein are foundation recommendations for the proposed replacement bridge planned on Arkansas Highway 16 in Van Buren County. Preliminary information and recommendations have been provided to and discussed with Bridge Division personnel.

This project consists of replacing the existing 160-ft. long, 25.4-ft. wide bridge over Pee Dee Creek with a new 201-ft. long, 36.5-ft. wide (out-to-out width) structure. The new bridge will be a five (5)-span, integral continuous W-beam unit to be constructed at an offset location north of the existing bridge. 2-Horizontal to 1-vertical (2H:1V) end slopes are planned for both abutments of the bridge while 3H:1V configuration is designed for the side slopes. Maximum abutment embankment height varies from 12 ft. to 13 feet.

Field Investigation

A subsurface investigation was requested on April 22, 2021 by Bridge Division to develop recommendations for bridge foundations and to verify suitability of bridge abutment embankment configuration. A total of 12 borings were requested and ten (10) borings were completed. The originally requested boring at Sta. 114+55, 11 ft. Left was not drilled due to the presence of an electric fence, a buried fiber optic cable, and overhead power lines in the vicinity of the planned boring location. The other requested boring that was not drilled is planned at Sta. 114+95, 11 ft. Left. That boring was not performed due to the extremely steep terrain at the planned boring location as well as utility conflict. Attempts to drill at offset locations were not practically warranted due to the distance of accessible locations from the planned boring locations.

The approximate locations of the borings are presented in the Plan of Borings included in Attachment A. The borings were advanced with two (2) track-mounted Acker Renegade rotary drill rigs using a combination of hollow-stem auger and diamond core method. The boring logs, showing the subsurface conditions encountered in the borings and the results of field and laboratory tests, are also included in Attachment A, immediately following the Plan of Borings. A Legend is attached after the boring logs to interpret / explain the symbols, terms, and conventions used on logs. Standard Penetration Tests (SPT) were conducted in accordance with ASTM D1586 for field testing and soil sampling. The correction factor for the calibrated hammer is indicated on the boring logs. Liners were not used inside the standard split-barrel samplers.

The number of blows required to drive the standard split-barrel sampler for each 6-inch penetration of the total 18-inch drive were counted and shown on the logs. SPT N-values are defined as the number of blows required to advance the split barrel the final 12 inches. The SPT N-values indicated on the logs are raw (uncorrected) blow count measured in field.

Core samples of bedrock were retrieved by using NQ3-size triple-tube core barrels (rock core diameter of 1-3/4 in. and hole diameter of 3 in.). For each core run, Rock Quality Designation (RQD) was determined in field by logger and further evaluated by licensed Professional Geologist (PG). RQD, expressed in percent, is defined as the sum of the intact core pieces that are longer than 4 in. divided by the total length of the core run. The RQD of each core run is indicated on corresponding log. Core pictures are also included in Attachment A, following the boring logs and Legend.

Groundwater was also observed during the drilling and excavating process. Groundwater observations were noted on the logs.

Lab Investigation

All samples were brought to the Materials laboratory for further evaluation and testing. Rock cores were first examined by licensed Professional Geologists to verify RQD measured in field and to determine Geological Strength Index (GSI) and Rock Mass Rating (RMR). Compressive strength of rock cores was then determined by uniaxial compressive test on intact rock cores in accordance with ASTM D7012, Method C. The results of uniaxial compressive tests on intact rock cores are presented in Attachment B. GSI and RMR, as evaluated by licensed Professional Geologists, are also included in Attachment B.

Site Conditions

The existing bridge (Bridge No. 02173) consists of a 160 feet long, southwest to northeast oriented 5-span structure that crosses Pee Dee Creek. The bridge superstructure consists of cast-in-place concrete deck supported by steel I-Beams. The I-Beams are supported on two (2) column concrete abutments on spread footings and two (2) column intermediate bents also on spread footings. The bridge ends rest on concrete end walls with dumped riprap placed on both end slopes. Overhead power lines and buried fiber optic parallel the northwest side of the existing Highway 16. Pee Dee Creek flows northwest to southeast for approximately 1.7 miles from the existing bridge before reaching its confluence with the Little Red River. The land surrounding the bridge is primarily agricultural fields with localized tree islands. Minor scour of the southwest creek bank was observed during field investigation on the left side of Highway 16. A picture of the existing scour is included as Attachment C.

D_{50} for Scour Analysis

The particle size through which 50% of particles by weight passing, D_{50}, is summarized below in Table 1. Detailed particle size distribution curves used for D_{50} determination are included in Attachment C.

Table 1: Summary of D_{50} for Scour Analysis

Creek Name	Station	Sample Type	Location	D_{50}, mm
Pee Dee Creek	116+20, C.L.	Bulk	Creek Bank	1.0

Site Geology

The project alignment is located over the mapped outcrop of the Atoka Formation (Pa). The Atoka is composed primarily of gray to black shale interbedded with very thin- to thin-, ripple-

bedded, tan to gray siltstone and thin- to thick-bedded, flat- to cross-bedded, massive sandstone. Several east to west trending normal faults, including the Weaver Creek Fault and the South Fork Fault, are mapped within less than a mile to the north and south of the project alignment. Additional unmapped faults in the surrounding area are possible.

Generalized Subsurface Conditions

Generalized Subsurface Profiles are included in Attachment D to aid in visualizing subsurface conditions and stratigraphy. In light of the natural variations in stratigraphy and subsurface conditions, slight deviation from those illustrated on the profiles should be anticipated.

Competent medium hard gray, slightly weathered to unweathered shale with interbedded sandstone was encountered in the borings 5.3 ft. to 10 feet (Elev. 488.2 to 484.7). The estimated elevation of the competent rock, as revealed by the borings, are summarized below in Table 2.

Table 2: Estimated Elevation of Competent Rock

Boring No.	Boring Location	Ground Surf. Elev., ft.	Depth to Competent Rock, ft.	Estimated Elev. of Competent Rock, ft.
1 (Bent 1)	Sta. 114+55, 9 Rt.	495.6	9.5	486.1
2 (Bent 2)	Sta. 114+89, 9 Rt.	494.7	9.8	484.9
3 (Bent 3)	Sta. 115+35, 11 Lt.	493.1	6.0	487.1
4 (Bent 3)	Sta. 115+35, 8 Rt.	492.8	7.0	485.8
5 (Bent 4)	Sta. 115+78, 8 Rt.	492.7	8.0	484.7
6 (Bent 4)	Sta. 115+80, 11 Lt.	492.8	5.3	487.5
7 (Bent 5)	Sta. 116+15, 8 Rt.	494.1	6.4	487.7
8 (Bent 5)	Sta. 116+27, 11 Lt.	497.7	9.7	488.0
9 (Bent 6)	Sta. 116+55, 8 Lt.	498.0	9.8	488.2
10 (Bent 6)	Sta. 116+55, 11 Rt.	494.9	10.0	484.9
Average		494.6	8.2	486.5

Seismic Conditions

In light of the average subsurface conditions as revealed by the borings, a **Seismic Site Class B (Rock Profile)** is calculated for the project site. Utilizing the Seismic Site Class B and the approximate GPS coordinates of the project site, the following design peak ground acceleration coefficient (A_S), design short-period spectral acceleration coefficient (S_{DS}), as well as design long-period spectral acceleration coefficient (S_{D1}), are determined. These seismic coefficients are summarized in Table 3. Design Response Spectrum is presented in Attachment E.

Table 3: Summary of Design Ground Motion Acceleration Response Coefficients

Acceleration Coefficient	Value (g)
A_S (Site PGA)	0.146
S_{DS} (0.2 sec)	0.315
S_{D1} (1 sec)	0.096

For the design long-period spectral acceleration coefficient (S_{D1}) of 0.096, a **Seismic Performance Zone 1** is considered applicable to the project site.

Foundation Recommendations

Steel H-Piling – Bents 1 and 6. It is anticipated steel h-piling will be utilized to support the foundation loads at the bridge end bents (Bents 1 and 6). Final pile size has not been determined. Steel h-piles should be driven to practical refusal and should penetrate through embankment fill, the overburden soils and the weathered shale, to bear in the competent slightly weathered to weathered shale with interbedded sandstone. Preboring will be required at all the end bent locations for penetrating through the overburden soils that contain gravel and cobbles.

Practical refusal is defined as a maximum penetration of 1.0 inch for 20 blows by a pile hammer. For the purpose of estimating pile length, a pile penetration of 6 in. into the competent rock is assumed. This estimated penetration is based on the results of the borings and our experience with similar foundation rock. The results of the borings indicate moderate to severe driving conditions are expected to be experienced. Consequently, rock points are recommended for all the h-piles driven to refusal.

A minimum pile penetration of 10 ft., measured below natural ground surface, is recommended. Greater pile length / penetration may be warranted by lateral resistance demand. Preboring is expected to be required for achieving the minimum 10 ft. of penetration at Bent 1. Based on the results of the borings and the assumption of approximately 6 in. penetration into the competent rock, the estimated shallowest pile tip elevation is summarized below in Table 4.

Table 4: Summary of Estimated Shallowest Pile Tip Elevation

Bent No.	Boring No.	Estimated Shallowest Pile Tip Elevation, ft.	Comments
1	1	485.6	Prebore to achieve the required min. 10 ft. of penetration
6	9	487.7	Prebore to penetrate cobbles
6	10	484.4	

The estimated shallowest pile tip elevation summarized in the table above is based on our evaluation of the rock cores retrieved from the borings. Actual subsurface conditions can vary from those encountered in the borings. As-constructed pile tip elevation can vary and must be field verified.

Nominal axial resistance of steel h piles driven to refusal in competent rock is governed by the structural capacity of the piles. Therefore, the nominal resistance should be determined by the Structural Engineer utilizing applicable AASHTO LRFD design procedures. The Geotechnical Section is available to provide geotechnical inputs for structural evaluation of the nominal axial pile resistance. In light of the expected moderate to severe driving conditions, a resistance factor (φ_c) of 0.50 is recommended for calculating factored structural bearing resistance of h-piles. For steel piling driven to refusal in competent rock, long-term, post-construction settlement is expected to be negligible.

Spread Footings – Bents 2 through 5. It is understood spread footings are preferred by the bridge designers for use to support the foundation loads of the intermediate bents (Bents 2 through 5). It is also understood bridge designers plan to embed the spread footings 2 ft. into competent rock. Based on the results of the borings and our field observations, spread footings founded 2 ft. into competent rock are suitable to be utilized to support the intermediate bents. Other foundation type can be provided upon request. Estimated footing bottom elevations are summarized below in Table 5. These elevations are estimated by assuming minimum 2 ft. embedment into the competent rock. Deeper footing embedment may be warranted by scour protection requirements.

Table 5: Summary of Estimated Footing Bottom Elevation

Bent No.	Boring No.	Estimated Elev. at 2 ft. Below Competent Rockline, ft.	Estimated Footing Bottom Elevation
2	2	482.9	482.9
3	3	485.1	483.8
	4	483.8	
4	5	482.7	482.7
	6	485.5	
5	7	485.7	485.7
	8	486.0	

It is recommended a maximum nominal bearing capacity of 45 ksf be utilized for spread footings embedded at least 2 ft. into competent slightly weathered to unweathered shale. A resistance factor (φ_b) of 0.45 is considered suitable for evaluation of factored bearing resistance of spread footings on rock. Consequently, a maximum factored bearing capacity of 20.3 ksf is suitable. Post-construction settlement of spread footings founded in competent rock is expected to be negligible.

Uplift resistance can be provided by footing self-weight and structure dead loads. Footings may be sized to negate the factored uplift loads. If additional uplift resistance is needed, rock anchors can be utilized. Recommendations of rock anchors can be provided upon request.

Lateral resistance of spread footings can be evaluated utilizing a maximum nominal coefficient of friction ($\tan\delta$) of 0.70 for concrete footings on clean rock and a resistance factor for

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sliding (φ_τ) of 0.85. Additional lateral resistance may be provided by passive resistance of the competent rock that is in hard contact with the spread footings and below scour depth. Passive resistance from any overburden soils, weathered rock, and upper 2 ft. of competent rock should be neglected from passive resistance evaluation. Factored passive resistance can be provided upon request.

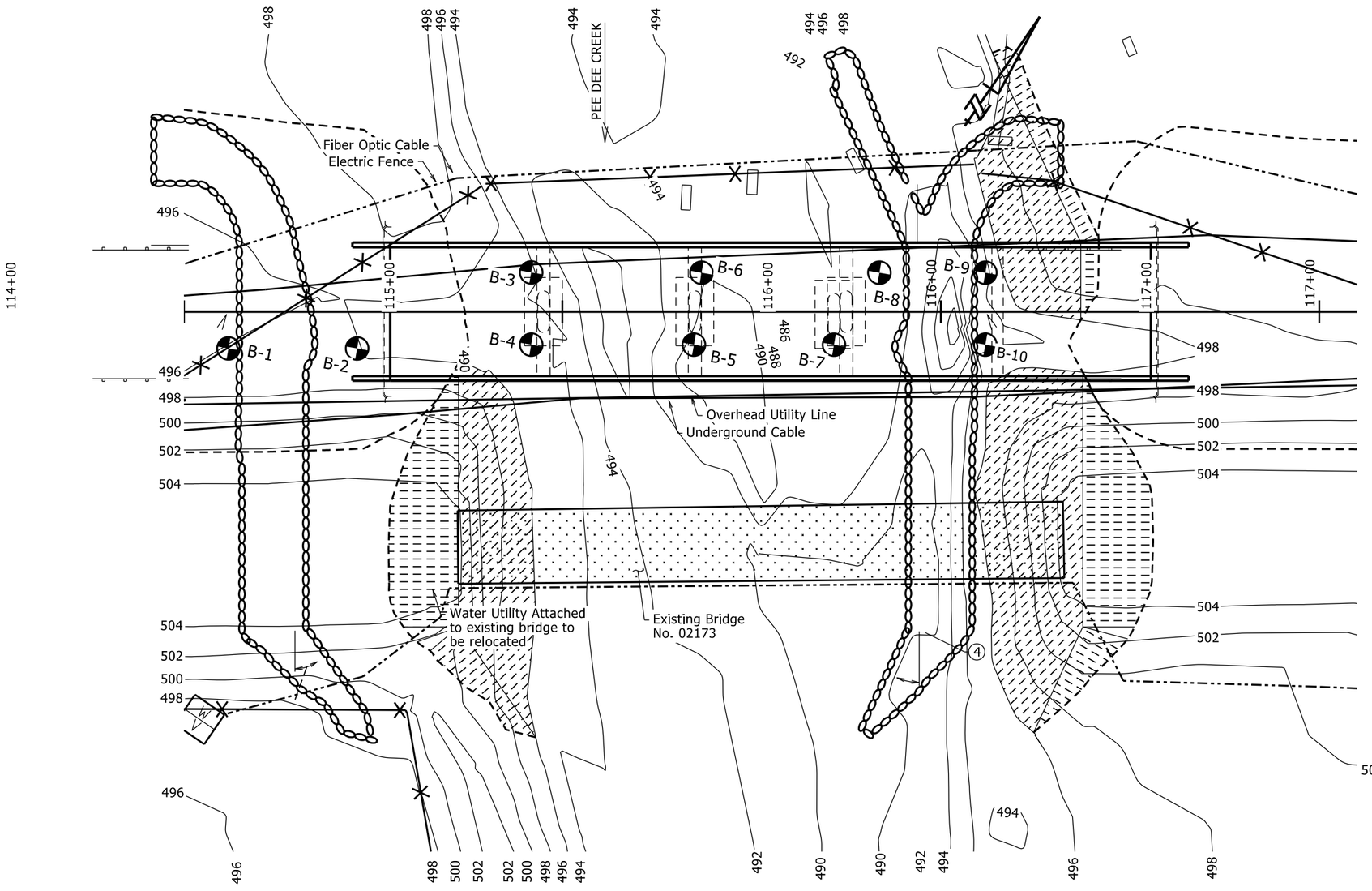
It is recommended the water flow be diverted from the plan footing excavation areas before starting footing excavation. Any underground utilities in the plan footing excavation areas should be completely removed or relocated and properly backfilled to prevent seepage into excavation bottom. As a minimum, sump pump should be established to remove any water seepage into the excavation bottom. Any footing over-excavation should be properly backfilled with Class S concrete. The shale contains variable amounts of sandstone partings and layers and can be resistant to excavation. Rock excavation should be anticipated for footing construction.

Jonathan A. Annable
Materials Engineer

JAA:yz:mlg:pwc
cc: State Construction Engineer
District 8 Engineer
G. C. File

Attachment A

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		080614		



PEE DEE CREEK BORINGS			
BORING	STATION	OFFSET	ELEVATION
B1	114+55	9' RT CL	495.6'
B2	114+89	9' RT CL	494.7'
B3	115+35	11' LT CL	493.1'
B4	115+35	8' RT CL	492.8'
B5	115+78	8' RT CL	492.7'
B6	115+80	11' LT CL	492.8'
B7	116+15	8' RT CL	494.1'
B8	116+27	11' LT CL	497.7'
B9	116+55	8' LT CL	498.0'
B10	116+55	11' RT CL	494.9'

PLAN OF BORINGS

PEE DEE CREEK STR. & APPRS. (S)
ROUTE 16, SECTION 10
VAN BUREN COUNTY

JOB NO. 080614	SHEET 1/1

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. 1
PAGE 1 OF 1

JOB NO. 080614 Van Buren County
JOB NAME: Pee Dee Creek Str. & Apprs. (S)
Route 16, Section 10
STATION: 114+55
LOCATION: 9' Right of Construction Centerline
LOGGED BY: Coty Campbell

DATE: August 3, 2021
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 19.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL + – – – – – – – – + LL (10 20 30 40 50 60 70)	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			SURFACE ELEVATION: 495.6						
			Moist, Brown Sand with Gravel and Cobbles						
5			Moist, Medium Dense, Brown Sand with Gravel and Cobbles		●		14 8-5		
			SHALE - Weathered, Medium Hard, Gray						
10								92	92
			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Gray						
15								99	84
20			Boring Terminated						
25									
30									
35									

REMARKS:

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BORING NO. 2
PAGE 1 OF 1

JOB NO. 080614 Van Buren County
JOB NAME: Pee Dee Creek Str. & Apprs. (S)
Route 16, Section 10
STATION: 114+89
LOCATION: 9' Right of Construction Centerline
LOGGED BY: Daniel Dickerson

DATE: August 3, 2021
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 33.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 494.7	SOIL GROUP	MOISTURE CONTENT (%) PL + – – – – – – – – + LL (10 20 30 40 50 60 70)	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			No Sample Collected						
5		X	Wet, Dense, Brown Sand and Gravel		●		15 13-21		
			SHALE WITH INTERBEDDED SANDSTONE- Weathered, Gray						
10			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Gray				36 (0")	100	100
15			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray					99	88
20			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional to Frequent Slickensides, Gray					99	70
25								90	76
			SANDSTONE - Unweathered, Well Cemented, Gray						
30			SANDSTONE - Unweathered, Well Cemented, Occasional Shale Clasts and Seams, Gray					99	84
35			Boring Terminated						

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. 3
PAGE 1 OF 1

JOB NO. 080614 Van Buren County
JOB NAME: Pee Dee Creek Str. & Apprs. (S)
Route 16, Section 10
STATION: 115+35
LOCATION: 11' Left of Construction Centerline
LOGGED BY: Coty Campbell

DATE: June 29, 2021
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 2094

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 28

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 493.1	SOIL GROUP	MOISTURE CONTENT (%) PL + – – – – – – – – + LL 10 20 30 40 50 60 70	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
5			Moist, Very Dense, Brown and Gray Sand with Gravel		●		13 25 (0") 85 (4")		
			SHALE - Weathered, Medium Hard, Gray		●			98	98
10			SHALE WITH INTERBEDDED SANDSTONE - Slightly Weathered, Medium Hard, Gray						
			SHALE - Unweathered, Medium Hard, Gray					100	100
15			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures, Gray					100	70
20			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray					100	84
25			SHALE - Unweathered, Medium Hard, Occasional Fractures, Gray						
			SANDSTONE - Unweathered, Well Cemented, Occasional Fractures, Light Gray					94	76
30			Boring Terminated						
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. 4
PAGE 1 OF 1

JOB NO. 080614 Van Buren County
JOB NAME: Pee Dee Creek Str. & Apprs. (S)
Route 16, Section 10
STATION: 115+35
LOCATION: 8' Right of Construction Centerline
LOGGED BY: Coty Campbell

DATE: June 29, 2021
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 2094
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 29

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 492.8	SOIL GROUP	MOISTURE CONTENT (%) PL + – – – – – – – – + LL (10 20 30 40 50 60 70)	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			No Sample Observed						
5			SHALE - Weathered, Medium Hard, Gray		●		46 / 60 (0")		
			SHALE WITH INTERBEDDED SANDSTONE - Slightly Weathered, Medium Hard, Gray					100	100
10								100	100
15			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray					100	96
20								100	100
25			SANDSTONE WITH OCCASIONAL SHALE PARTINGS AND SEAMS - Unweathered, Well Cemented, Gray					95	95
30			Boring Terminated						
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
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BORING NO. 5
PAGE 1 OF 1

JOB NO. 080614 Van Buren County
JOB NAME: Pee Dee Creek Str. & Apprs. (S)
Route 16, Section 10
STATION: 115+78
LOCATION: 8' Right of Construction Centerline
LOGGED BY: Coty Campbell

DATE: June 30, 2021
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 2094
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 30.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 492.7	SOIL GROUP	MOISTURE CONTENT (%) PL + – – – – – – – – + LL 10 20 30 40 50 60 70	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
5			Gravel						
		X	SHALE - Weathered, Medium Hard, Gray		●		11 60 (6")		
10			SHALE WITH INTERBEDDED SANDSTONE -Unweathered, Medium Hard, Gray					100	100
15			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures, Gray					100	78
20			SHALE WITH OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures, Gray					100	84
25			SHALE WITH OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures and Slickensides, Gray					100	72
30			SHALE WITH OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Slickensides, Gray SANDSTONE - Unweathered, Well Cemented, Gray					94	76
35			Boring Terminated						

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. 6
PAGE 1 OF 1

JOB NO. 080614 Van Buren County
JOB NAME: Pee Dee Creek Str. & Apprs. (S)
Route 16, Section 10
STATION: 115+80
LOCATION: 11' Left of Construction Centerline
LOGGED BY: Coty Campbell

DATE: June 30, 2021
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 2094

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 29.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 492.8	SOIL GROUP	MOISTURE CONTENT (%) PL + – – – – – – – – + LL 10 20 30 40 50 60 70	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			No Sample Observed						
5			Moist, Very Dense, Brown Gravel (Sandstone Fragments)		●		45 (4")		
			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Gray					100	100
10								100	100
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray					98	86
15									
			SHALE WITH OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweatherd, Medium Hard, Gray					100	80
20									
25			SANDSTONE - Unweathered, Well Cemented, Gray					100	80
30			Boring Terminated						
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
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BORING NO. 7
PAGE 1 OF 1

JOB NO. 080614 Van Buren County
JOB NAME: Pee Dee Creek Str. & Apprs. (S)
Route 16, Section 10
STATION: 116+15
LOCATION: 8' Right of Construction Centerline
LOGGED BY: Coty Campbell

DATE: July 27, 2021
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 33.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 494.1	SOIL GROUP	MOISTURE CONTENT (%) ● PL + — — — — — — — — + LL (10 20 30 40 50 60 70)	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			Sand with Gravel and Cobbles						
5			Wet, Very Dense, Brown Sand and Gravel		●		10 28 (4")		
			SHALE - Weathered, Medium Hard, Gray					100	100
10								100	84
15			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Gray					100	90
20								96	86
25			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Gray*					54	36
30			SANDSTONE - Unweathered, Well Cemented, Occasional Shale Partings and Seams, Gray					92	92
35			Boring Terminated						

REMARKS: *Poor core recovery from 23.8 to 28.8 feet below ground level due to drill bit malfunction.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. 8
PAGE 1 OF 2

JOB NO. 080614 Van Buren County
JOB NAME: Pee Dee Creek Str. & Apprs. (S)
Route 16, Section 10
STATION: 116+27
LOCATION: 11' Left of Construction Centerline
LOGGED BY: Conner Bunton

DATE: July 6, 2021
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 2094
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 39.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 497.7	SOIL GROUP	MOISTURE CONTENT (%) PL + – – – – – – – – + LL (10 20 30 40 50 60 70)	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
5			Dry, Brown Sand with Gravel, Cobbles, and Boulders						
10			Moist, Very Dense, Brown Sand with Gravel (Sandstone Fragments)		●		26 32-42 (11")		
15			SANDSTONE WITH INTERBEDDED SHALE - Unweathered, Cemented, Frequent Slickensides, Gray				16 (5")	72	61
20			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Occasional Fractures, Gray					100	92
25			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray					100	100
30			SANDSTONE WITH INTERBEDDED SHALE - Unweathered, Well Cemented, Frequent Fractures, Light Gray*					99	78
35			SHALE - Unweathered, Medium					38	0

REMARKS: * Poor core recovery from 29.2 to 34.2 feet below ground level due to core barrel malfunction.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. 8
PAGE 2 OF 2

JOB NO. 080614 Van Buren County
JOB NAME: Pee Dee Creek Str. & Apprs. (S)
Route 16, Section 10
STATION: 116+27
LOCATION: 11' Left of Construction Centerline
LOGGED BY: Conner Bunton

DATE: July 6, 2021
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 2094
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 39.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL + – – – – – – – – + LL (10 20 30 40 50 60 70)	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			SURFACE ELEVATION: 497.7						
			Hard, Trace Coal, Gray						
			SANDSTONE - Unweathered, Well Cemented, Light Gray					99	94
40			Boring Terminated						
45									
50									
55									
60									
65									
70									

REMARKS: * Poor core recovery from 29.2 to 34.2 feet below ground level due to core barrel malfunction.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. 9
PAGE 1 OF 1

JOB NO. 080614 Van Buren County
JOB NAME: Pee Dee Creek Str. & Apprs. (S)
Route 16, Section 10
STATION: 116+55
LOCATION: 8' Left of Construction Centerline
LOGGED BY: Coty Campbell

DATE: July 28, 2021
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 19.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 498.0	SOIL GROUP	MOISTURE CONTENT (%) ● PL + – – – – – – – – + LL 10 20 30 40 50 60 70	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
5			Moist, Medium Dense, Brown Sand with Gravel and Cobbles		●		6 9-8		
10			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Gray				15 (0")	96	72
15			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray					100	100
20			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. 10
PAGE 1 OF 1

JOB NO. 080614 Van Buren County
JOB NAME: Pee Dee Creek Str. & Apprs. (S)
Route 16, Section 10
STATION: 116+55
LOCATION: 11' Right of Construction Centerline
LOGGED BY: Coty Campbell

DATE: July 28, 2021
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 24.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 494.9	SOIL GROUP	MOISTURE CONTENT (%) PL + – – – – – – – – + LL (10 20 30 40 50 60 70)	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
			Sand with Gravel and Cobbles						
5			Moist, Dense, Brown Sand with Gravel and Cobbles				1 17-16		
10			Moist, Very Dense, Brown Sand with Gravel and Cobbles				25 15 (0")		
			SHALE WITH INTERBEDDED SANDSTONE - Weathered, Medium Hard, Gray					85	85
15			SHALE WITH INTERBEDDED SAN6DSTONE - Unweathered, Medium Hard, Gray					100	90
20			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray					100	100
25			Boring Terminated						
30									
35									

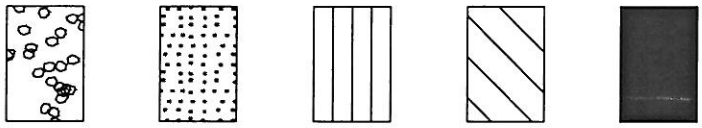
REMARKS:

LEGEND

SOIL TYPES

(SHOWN IN SYMBOL COLUMN)

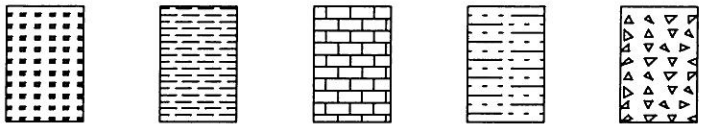
(PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL | SAND | SILT | CLAY | ORGANIC MATTER

ROCK TYPES

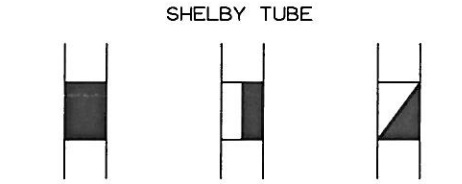
(SHOWN IN SYMBOL COLUMN)



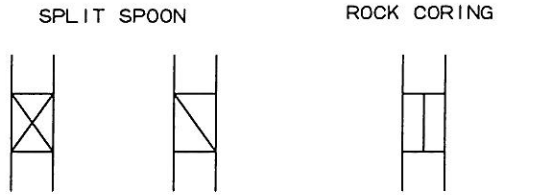
SANDSTONE | SHALE or SILTSTONE | LIMESTONE or DOLOMITE | ALTERNATING LAYERS of SHALE and SANDSTONE | OTHER

SAMPLER TYPES

(SHOWN IN SAMPLE COLUMN)



UNDISTURBED SAMPLE RECOVERY | DISTURBED SAMPLE RECOVERY | NO RECOVERY



SAMPLE RECOVERY | NO RECOVERY | % 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: $\frac{6}{8-9} \Rightarrow 8+9=17 blows/ft$. 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.

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 114+55, 9 Rt.
Depth, ft: 9.5-19.2

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 114+89, 9 Rt.
Depth, ft: 9.8-18.4

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 114+89, 9 Rt.
Depth, ft: 18.4-28.4

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 114+89, 9 Rt.
Depth, ft: 28.4-33.4

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+35, 11 Lt.
Depth, ft: 6.0-13.0

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+35, 11 Lt.
Depth, ft: 13.0-23.0

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+35, 11 Lt.
Depth, ft: 23.0-28.0

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+35, 8 Rt.
Depth, ft: 7.0-14.0

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+35, 8 Rt.
Depth, ft: 14.0-24.0

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+35, 8 Rt.
Depth, ft: 24.0-29.0

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+78, 8 Rt.
Depth, ft: 8.0-15.4

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+78, 8 Rt.
Depth, ft: 15.4-25.4

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+78, 8 Rt.
Depth, ft: 25.4-30.4

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+80, 11 Lt.
Depth, ft: 7.3-14.6

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+80, 11 Lt.
Depth, ft: 14.6-24.6

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 115+80, 11 Lt.
Depth, ft: 24.6-29.6

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 116+15, 8 Rt.
Depth, ft: 6.3-13.8

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 116+15, 8 Rt.
Depth, ft: 13.8-23.8

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 116+15, 8 Rt.
Depth, ft: 23.8-33.8

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 116+27, 11 Lt.
Depth, ft: 10.1-19.2

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 116+27, 11 Lt.
Depth, ft: 19.2-29.2

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 116+27, 11 Lt.
Depth, ft: 29.2-39.2

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 116+55, 8 Lt.
Depth, ft: 9.9-19.6

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 116+55, 11 Rt.
Depth, ft: 11.5-19.1

ROCK CORE PHOTO

Job No.: 080614
Job Name: Pee Dee Creek Str. & Apprs. (S)

Station and Offset, ft: Sta. 116+55, 11 Rt.
Depth, ft: 19.1-24.1

Attachment B

Rock Core Unconfined Compression Test Summary

Project Number: 080614
Project Name: Pee Dee Creek Str. & Apprs. (S)
Date Tested:

Station	Location	Sample No.	Depth (ft.)	Diameter (in)	Height (in)	Total Load (lbs.)	Correction Factor	Stress (psi)	Remarks
114+89	9' Rt	1	11.5	1.75	3.49	5,490		2,282	
114+89	9' Rt	2	12.3	1.75	3.50	5,050		2,099	
115+35	11' Lt	3	11.7						Broke
115+35	11' Lt	4	12.5	1.75	3.46	9,160		3,808	
115+35	8' Rt	5	10.7						Broke
115+35	8' Rt	6	12.6	1.75	3.53	9,250		3,845	
115+78	8' Rt	7	14.8						Broke
115+80	11' Lt	8	9.1	1.75	3.49	11,280		4,689	
115+80	11' Lt	9	12.3						Broke
116+15	8' Rt	10	9.2						Broke
116+15	8' Rt	11	10.1	1.75	3.07	8,250		3,430	
116+27	11' Lt	12	12.3						Broke

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

ROCK MASS RATING SUMMARY

JOB # 080614 **AVG GSI = 85**

SAMPLE #1

Station/Location	114+89, 9' RT CL
Depth (ft)	11.5
	Relative Rating
Uniaxial Compressive Strength	2
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*79*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #2

Station/Location	114+89, 9' RT CL
Depth (ft)	12.3
	Relative Rating
Uniaxial Compressive Strength	2
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*79*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #3

Station/Location	115+35,11' LT CL
Depth (ft)	11.7
	Relative Rating
Uniaxial Compressive Strength	N/A
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*74*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #4

Station/Location	115+35,11' LT CL
Depth (ft)	12.5
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*78*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #5

Station/Location	115+35, 8' RT CL
Depth (ft)	10.7
	Relative Rating
Uniaxial Compressive Strength	N/A
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*77*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #6

Station/Location	115+35, 8' RT CL
Depth (ft)	12.6
	Relative Rating
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*81*
Class Number	**I**
Description	**VERY GOOD ROCK**

SAMPLE #7

Station/Location	115+78, 8' RT CL
Depth (ft)	14.8
	Relative Rating
Uniaxial Compressive Strength	N/A
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*74*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #8

Station/Location	115+80, 11' LT CL
Depth (ft)	9.1
	Relative Rating
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*81*
Class Number	**I**
Description	**VERY GOOD ROCK**

SAMPLE #9

Station/Location	115+80, 11' LT CL
Depth (ft)	12.3
	Relative Rating
Uniaxial Compressive Strength	N/A
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*77*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #10

Station/Location	116+15, 8' RT CL
Depth (ft)	9.2
	Relative Rating
Uniaxial Compressive Strength	N/A
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*74*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #11

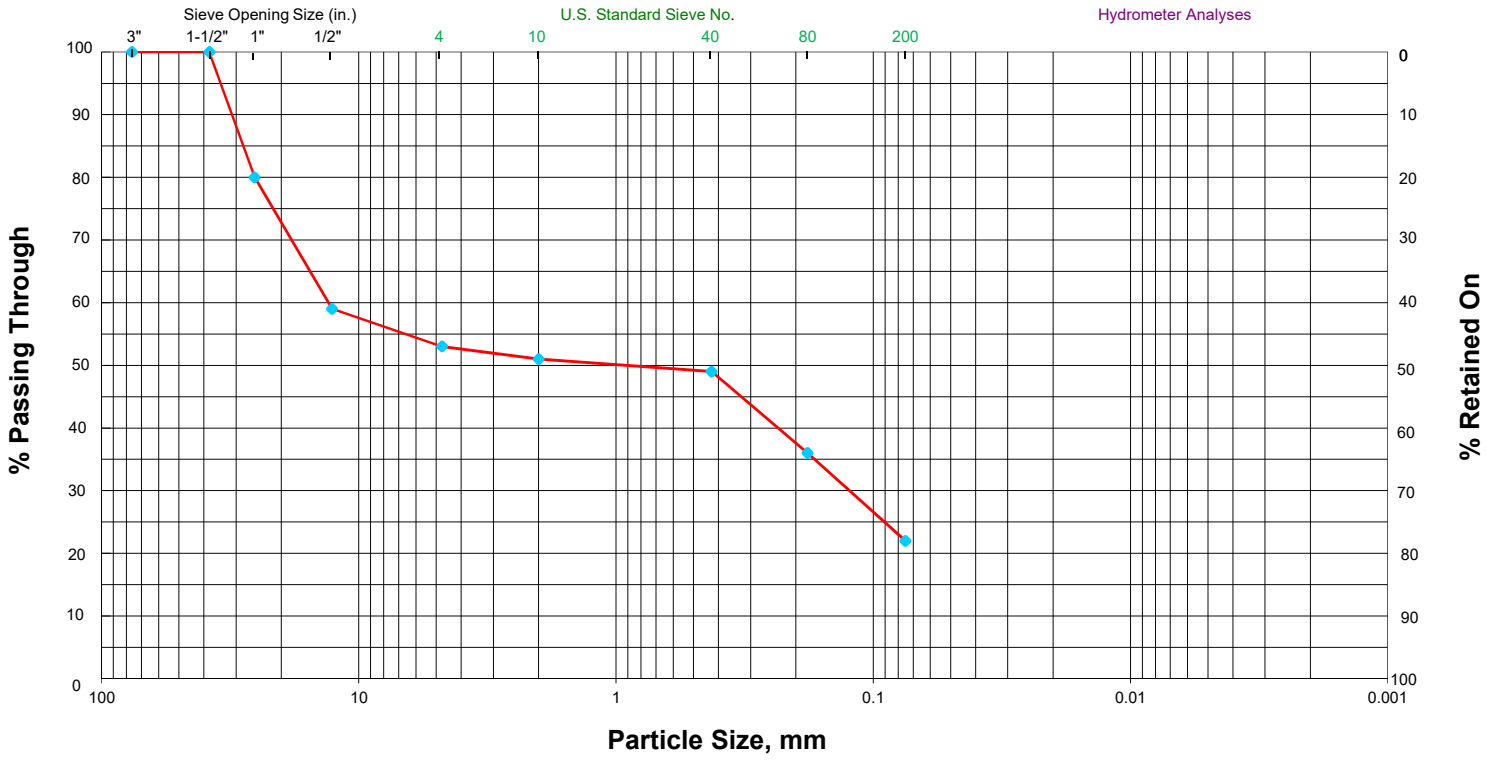
Station/Location	116+15, 8' RT CL
Depth (ft)	10.1
	Relative Rating
Uniaxial Compressive Strength	2
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*76*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #12

Station/Location	116+27, 11' LT CL
Depth (ft)	12.3
	Relative Rating
Uniaxial Compressive Strength	N/A
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*74*
Class Number	**II**
Description	**GOOD ROCK**

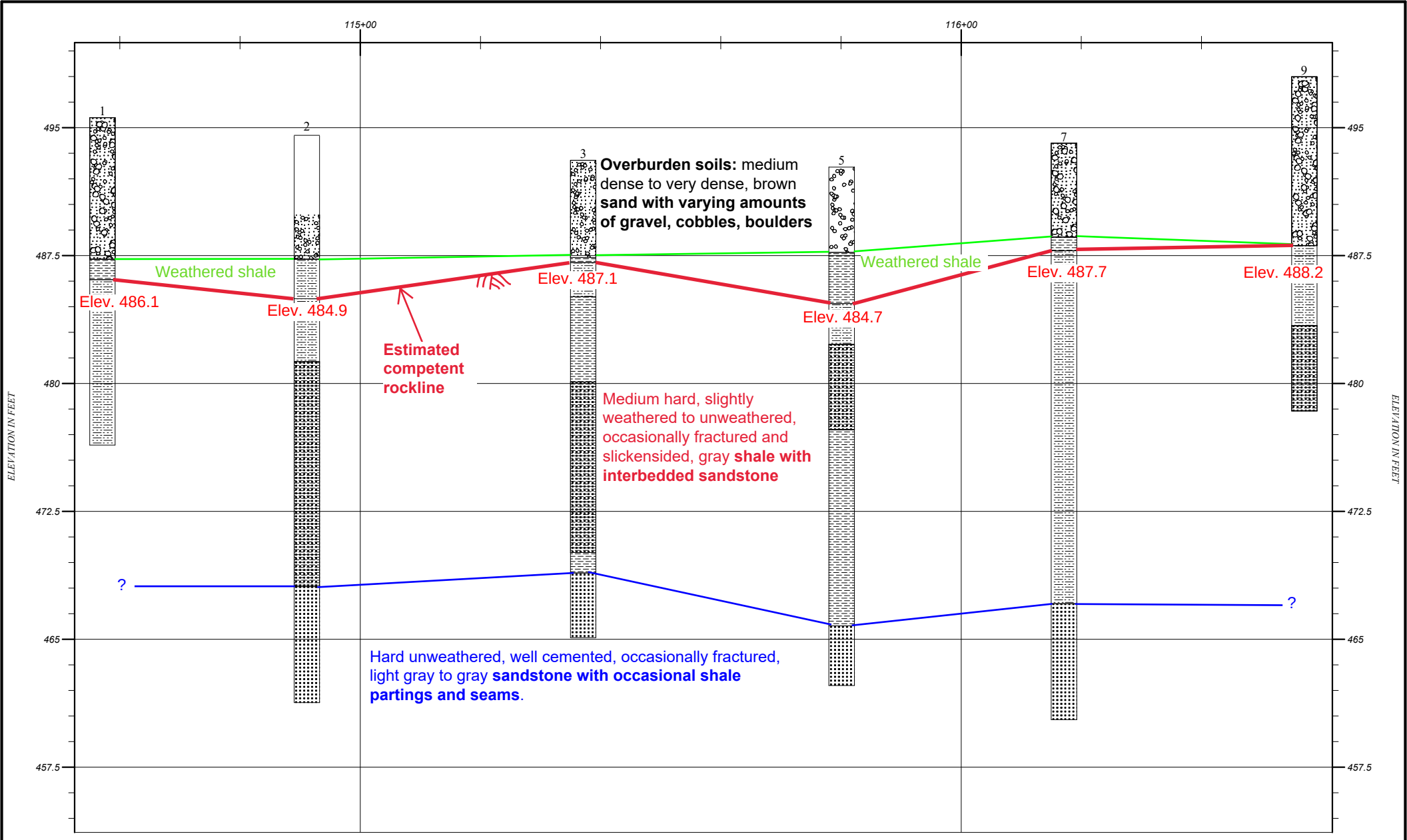
Attachment C

Minor Scour Observed on the Southwest Bank of the Creek (July 2021)



Particle Size Distribution Curve

Attachment D



Plan View

Strata symbols

- sand, gravel and cobbles
- shale/siltstone
- sandstone interbedded with shale
- sand and gravel
- shale with sandstone seams
- cemented sand/sandstone
- gravel

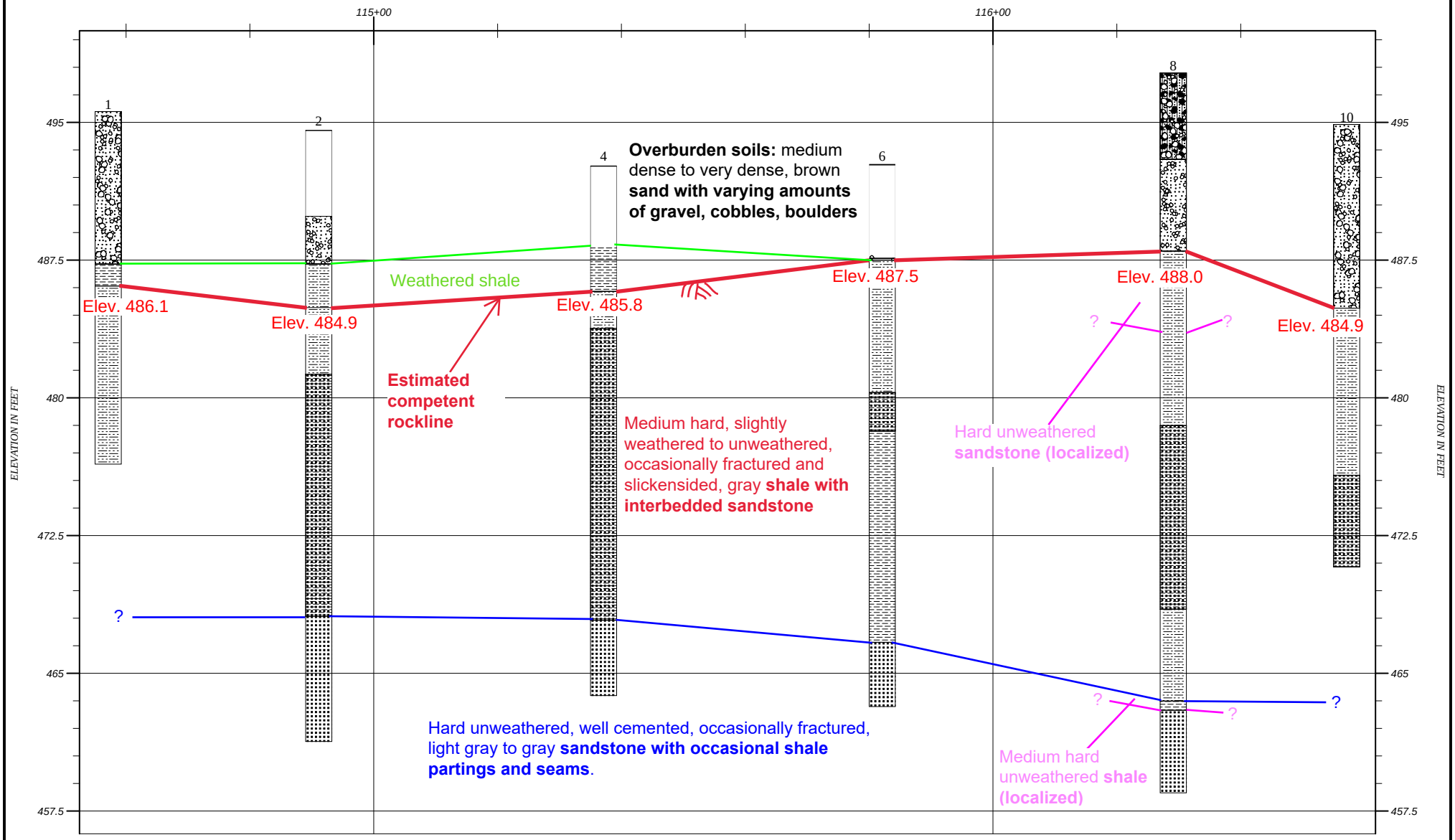
GENERALIZED SUBSURFACE PROFILE

HORIZONTAL SCALE: NTS	DRAWN BY/APPROVED BY	DATE DRAWN
VERTICAL SCALE: NTS		8/16/2021

Pee Dee Creek Str. & Apprs. (S) Profile 1

PROJECT NO. 080614
Van Buren County

FIGURE NUMBER



Plan View

Strata symbols

- sand, gravel and cobbles
- shale/siltstone
- sandstone interbedded with shale
- sand and gravel
- shale with sandstone seams
- cemented sand/sandstone
- gravel
- silty sand gravel, cobbles and boulders

GENERALIZED SUBSURFACE PROFILE

HORIZONTAL SCALE: NTS	DRAWN BY/APPROVED BY	DATE DRAWN
VERTICAL SCALE: NTS		8/13/2021

Pee Dee Creek Str. & Apprs. (S) Profile 2

PROJECT NO. 080614
Van Buren County

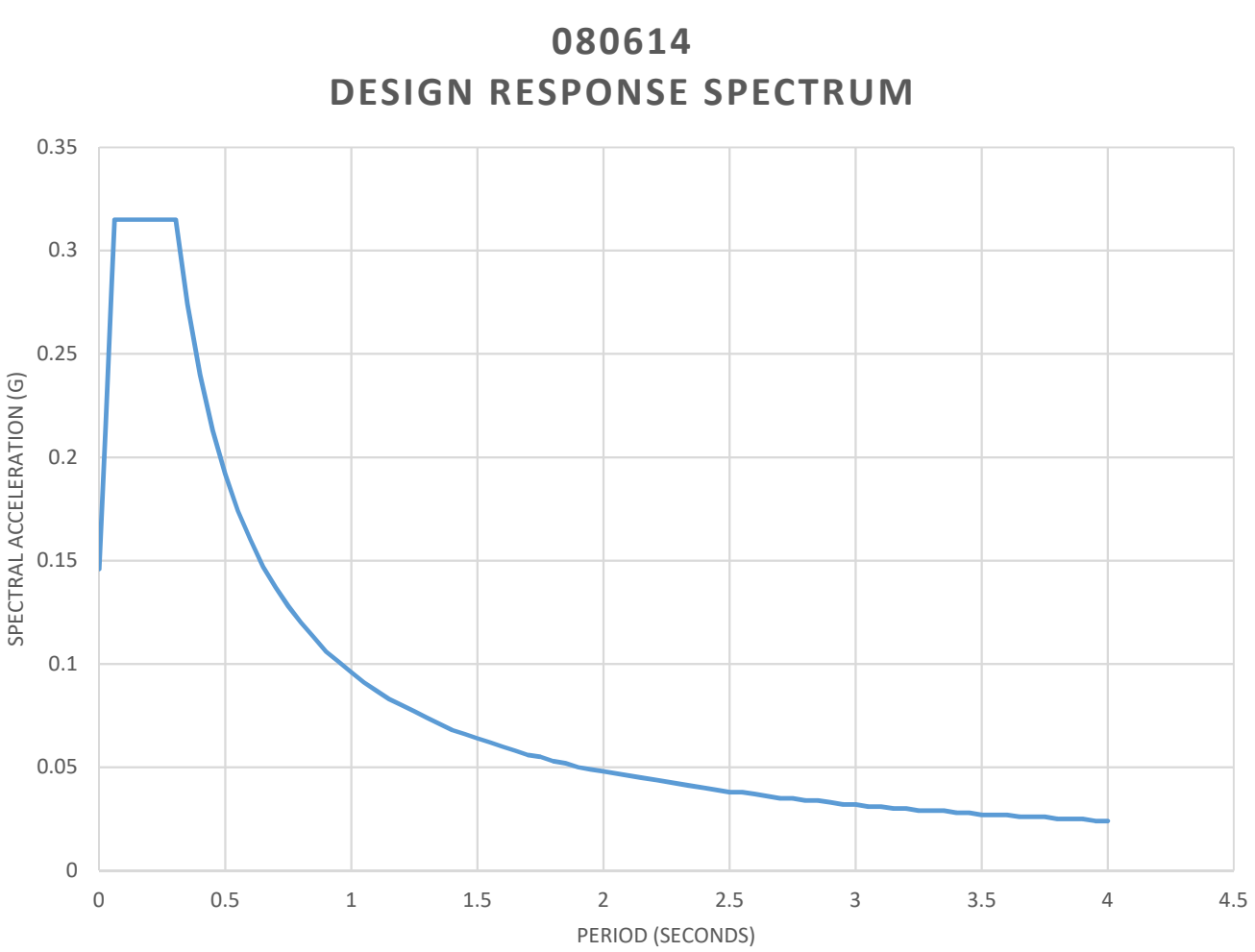
FIGURE NUMBER

Attachment E

Title:	080614
Latitude:	35.604805
Longitude:	-92.417609
Site Class	B

Get USGS Data

PGA:	0.146
F_{PGA}:	1
A_S:	0.146
S_S:	0.315
F_A:	1
S_{DS}:	0.315
S_1:	0.096
F_V:	1
S_{D1}:	0.096
S_{Dc}:	A
T_S:	0.304
T_0:	0.061



ARKANSAS DEPARTMENT OF TRANSPORTATION
ArDOT.gov | IDriveArkansas.com | Lorie H. Tudor, 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

February 1, 2021

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 080614
Pee Dee Creek Str. & Apprs. (S)
Route 16 Section 10
Van Buren County

Attached is the requested soil survey, and estimated R-Value. The project consists of replacing the bridge crossing Pee Dee Creek on Highway 16 on new location. Samples were obtained in the ditch line and new location.

An estimated R-Values of 10 is appropriate for pavement design purposes.

The subgrade soils consist primarily of non-plastic sand. The subgrade soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction. Earthwork recommendations will be made upon request when plans are further developed and cross sections are available.

Listed below is the additional information requested for use in developing the plans:

1. The Qualified Products List (QPL) indicates that Aggregate Base Course (Class CL-7) is available from commercial producers in the vicinity of Bee Branch.

2. Asphalt Concrete Hot Mix for **PG 64-22**

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.6	94.4
Binder Course	4.5	95.5
Base Course	4.3	95.7

Jonathan A. Annable
Materials Engineer

JAA:yz:bjj
Attachment
cc: State Constr. Eng. – Master File Copy
District 8 Engineer
System Information and Research
G. C. File

JOB: 080614

JOB NAME: PEEDEE CREEK STR.& APPRS.(S)

COUNTY NO. 71 **DATE TESTED** 12/10/2020

Arkansas State Highway Transporation Department

Materials Division

Jonathan Annable, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				SIEVES									
101+00	06RT	0	BROWN										
101+00	22RT	0-5	BROWN	65	58	52	43	33	23	09	A-2-4(0)	S470	10.5
117+00	80LT	0-5	BROWN	87	84	80	55	33	ND	NP	A-2-4(0)	S471	15.6
131+00	30RT	0-5	BROWN	47	30	17	12	9	ND	NP	A-1-2	S472	6.8

comments:

Tuesday, February 2, 2021

JOB: 080614
JOB NAME: PEEDEE CREEK STR.& APPRS.(S)
COUNTY NO. 71

Arkansas State Highway Transporation Department
Materials Division
Jonathan Annable, Materials Engineer

DATE TESTED
12/10/2020

STA.# LOC.

PAVEMENT SOUNDINGS

101+00	06RT	ACHMSC	ACHMBC
		6.0	**3.5**
101+00	22RT	ACHMSC	ACHMBC
		---	---
117+00	80LT	ACHMSC	ACHMBC
		---	---

comments:

Tuesday, February 2, 2021

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION
JONATHAN A. ANNABLE, MATERIALS ENGINEER
*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE - 12/10/20
JOB NUMBER - 080614
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - PEEDEE CREEK STR.& APPRS.(S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - VAN BUREN COUNTY
SAMPLED BY - DICKERSON/MCCOLLUM/CAMPBE
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY PAVEMENT SOUNDINGS

SEQUENCE NO. - 1
MATERIAL CODE - SSPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 71
DISTRICT NO. - 08

DATE SAMPLED - 11/02/20
DATE RECEIVED - 11/06/20
DATE TESTED - 12/10/20

LAB NUMBER	20202243	20202244	20202245
SAMPLE ID		S470	S471
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	101+00	101+00	117+00
LOCATION	06RT	22RT	80LT
DEPTH IN FEET	0	0-5	0-5
MAT'L COLOR	BROWN	BROWN	BROWN
MAT'L TYPE			
LATITUDE DEG-MIN-SEC	35 36 8.90	35 36 8.90	35 36 18.70
LONGITUDE DEG-MIN-SEC	92 25 17.50	92 25 17.50	92 25 1.30
% PASSING 2 IN.			
1 1/2 IN.		100	
3/4 IN.		96	100
3/8 IN.		73	93
NO. 4		65	87
NO. 10		58	84
NO. 40		52	80
NO. 80		43	55
NO. 200		33	33
LIQUID LIMIT		23	ND
PLASTICITY INDEX		09	NP
AASHTO SOIL		A-2-4(0)	A-2-4(0)
UNIFIED SOIL			
% MOISTURE CONTENT		10.5	15.6
ACHMSC (IN)	6.0	---	---
ACHMBC (IN)	3.5	---	---

REMARKS -

AASHTO TESTS : T24 T88 T89 T90 T265

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION
JONATHAN A. ANNABLE, MATERIALS ENGINEER
*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE - 12/10/20
JOB NUMBER - 080614
FEDERAL AID NO.- TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - PEEDEE CREEK STR.& APPRS.(S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - VAN BUREN COUNTY
SAMPLED BY - DICKERSON/MCCOLLUM/CAMPBE
SAMPLE FROM - TEST HOLE
MATERIAL DESC. - SOIL SURVEY PAVEMENT SOUNDINGS

SEQUENCE NO. - 2
MATERIAL CODE - SSPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 71
DISTRICT NO. - 08

DATE SAMPLED - 11/02/20
DATE RECEIVED - 11/06/20
DATE TESTED - 12/10/20

LAB NUMBER	20202246
SAMPLE ID	S472
TEST STATUS	INFORMATION ONLY
STATION	131+00
LOCATION	30RT
DEPTH IN FEET	0-5
MAT'L COLOR	BROWN
MAT'L TYPE	
LATITUDE DEG-MIN-SEC	35 36 24.40
LONGITUDE DEG-MIN-SEC	92 24 46.80
% PASSING 2 IN.	
1 1/2 IN.	100
3/4 IN.	90
3/8 IN.	67
NO. 4	47
NO. 10	30
NO. 40	17
NO. 80	12
NO. 200	9
LIQUID LIMIT	ND
PLASTICITY INDEX	NP
AASHTO SOIL	A-1-2
UNIFIED SOIL	
% MOISTURE CONTENT	6.8

REMARKS -

AASHTO TESTS : T24 T88 T89 T90 T265