

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. BR2605

FEDERAL AID PROJECT NO. STPB-0026(36)

LOST CR. & S. FORK LITTLE MAZARN CR. STRS. & APPRS. (S)

COUNTY ROAD NO. CR 63

IN GARLAND COUNTY

The information contained herein was obtained by the Department for design and estimating purposes only. It is being furnished with the express understanding that said information does not constitute a part of the Proposal or Contract and represents only the best knowledge of the Department as to the location, character and depth of the materials encountered. The information is only included and made available so that bidders may have access to subsurface information obtained by the Department and is not intended to be a substitute for personal investigation, interpretation and judgment of the bidder. The bidder should be cognizant of the possibility that conditions affecting the cost and/or quantities of work to be performed may differ from those indicated herein.



ARKANSAS DEPARTMENT OF TRANSPORTATION

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MATERIALS DIVISION

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February 27, 2020

TO: Mr. Rick Ellis, Bridge Engineer
SUBJECT: Job No. BR2605
Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs. (S)
Garland County
County Road 63

Transmitted herewith are a brief summary of the geology and site conditions, rock core unconfined compression test summary, RMR, D50 scour analysis test results, and the logs of the borings conducted for the structures and approaches of the above referenced project.

This project consists of replacing two bridges on Garland County Road 63, southwest of Hot Springs. The bridges being replaced cross South Fork Little Mazarn Creek and Lost Creek.

South Fork Little Mazarn Creek Bridge

The proposed bridge will be constructed on a slightly different alignment. The centerline of the proposed southwest bridge end will be located approximately 3 feet southeast of the existing centerline and the centerline of the proposed northeast bridge end will be located approximately 20 feet southeast of the existing.

Based on the depth at which bedrock was encountered and correspondence with Bridge Design, it is anticipated that end bents will be founded on piling and interior bents will be founded on spread footings. Piling should be tipped into competent Sandstone and preboring may be necessary to achieve minimum penetration requirements.

TABLE 1 – Bearing Capacity Recommendations for Spread Footings

Table with 3 columns: Nominal Bearing Resistance (ksf), Factored Bearing Resistance (ksf), Bearing Resistance at Service Limit State (ksf). Values: 275, 124, 40.

Lost Creek Bridge

The proposed bridge will be constructed on the same alignment as the existing, except the centerline of the proposed bridge will be aligned with the eastern edge of the existing. Two of the four requested borings were inaccessible due to steep slopes and high water levels in the channel. The remaining two borings had to be offset due to utility conflicts. The borings that were not obtained are located at: 208+49 C.L. Construction and 208+95 C.L. Construction.

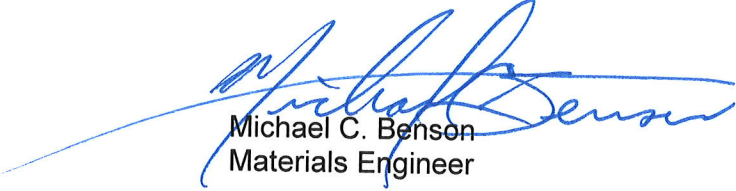
Based on the depth at which bedrock was encountered and correspondence with Bridge Design, it is anticipated that both end bents will be founded on piling. Piling should be tipped into competent Shale to Shale with Sandstone and preboring may be necessary to achieve minimum penetration requirements. Although no borings were obtained at the intermediate bents of the proposed bridge, correlating the depths at which bedrock was encountered in the end bent borings, it is anticipated that competent rock will be less than 15 feet below ground level. Based on this information both interior bents should be founded on spread footings. Spread footings founded in competent Shale to Shale with Sandstone should be designed based on the values provided in Table 2.

Although these bridges are only a little more than a mile apart, their subsurface stratigraphies vary greatly. The rock mass underlying the Lost Creek Bridge is frequently fractured with slickensides and has a considerably lower RQD. This mass is composed primarily of Shale and tends to be brittle in the unconfined condition. Therefore, testing of the rock cores unconfined compressive strength is not practical and yields unreliable results. After inspection, this shale has been deemed a sound Medium Hard rock and spread footing Bearing Resistance values have been determined from Table C10.6.2.6.1-1 of the AASHTO LRFD Bridge Design Specifications, edition 2017. This Factored Bearing Resistance is equivalent to the Bearing Resistance at the Service Limit State.

TABLE 2 – Bearing Capacity Recommendations for Spread Footings

Factored Bearing Resistance (ksf)
16

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
G.C. File

GEOLOGY AND SITE CONDITIONS
Job No. BR2605
LOST CR. & S. FORK LITTLE MAZARN CR. STRS. & APPRS. (S)
GARLAND COUNTY
CO. RD. 63

Site Conditions

The proposed job consists of replacing two bridges. **Bridge 1**, the southernmost bridge, is a five span bridge that crosses the South Fork of Little Mazarn Creek. The superstructure consists of concrete decking over corrugated steel bridge pans with an asphalt overlay. The decking is supported by steel beams resting on cast-in-place concrete piers, founded on spread footings. There are cables securing the decking to the piers. There are no curbs on the bridge and the guardrails are composed of steel supported by steel posts. No utilities were observed around the existing structure. The South Fork of Little Mazarn Creek flows northwest to southeast, at the bridge location, and has a rocky bottom. Vertically bedded sandstone was observed, during the field investigation, under the north bridge end and in the creek channel on the northwest side of the bridge. There are sparsely scattered residences located on both sides of the bridge. The creek channel is primarily lined with trees and dense vegetation.

Bridge 2 is constructed very similarly to bridge 1. It is a three span bridge that crosses Lost Creek. The superstructure consists of concrete decking over corrugated steel bridge pans with an asphalt overlay. The decking is supported by steel beams resting on cast-in-place concrete piers, founded on spread footings. There are cables securing the decking to the piers. There are no curbs on the bridge and the guardrails are composed of steel supported by steel posts. There is vertically bedded shale exposed in the channel on the west side of the bridge. There is a water line and overhead powerlines paralleling the east side of the bridge. The area surrounding the bridge and creek channel is primarily wooded with the exception of a pasture on the southwest side.

Site Geology

Both bridges are 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 rock encountered at the existing bridges belongs to the Stanley Formation, which consists of dark-gray shale interbedded with fine-grained sandstone and occasional layers of metaquartzite. 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. A thick, steeply dipping sandstone unit of the Stanley Formation was observed at the jobsite under the north bridge end and in the creek channel on the northwest side of the Little Mazarn Creek Bridge. This sandstone is very hard, well cemented, and contained occasional interbedded layers of metaquartzite.

Shale and sandstone beds, dipping towards the northwest, are exposed in the channel upstream from the existing Mazarn Creek Bridge. Core samples collected at both jobsites show evidence of high levels of deformation such as slickensides, fractures, and mineral veins. Most of the rock layers encountered in the cores were moderately to steeply dipping. Some of the sandstone layers evaluated in the cores were very hard. Metaquartzite was encountered interbedded with the sandstone at both bridges. Numerous thrust faults surround the project alignment and one is mapped several hundred feet south of the existing bridge. Other unmapped faults in the area are likely. Based on previous jobs located in this formation, this type of rock has proven to be very difficult to excavate and drill. Overall, the rock in this formation tends to be extremely variable, alternating between vertically bedded sandstone and shale with frequent to occasional layers of interbedded quartzite and other mineral veins. The variability of this formation makes any generalization of the sampled rock difficult and impractical.

Scour Potential

There were no obvious signs of scour at either of the two existing bridges and scour is not anticipated along the new bridge alignments.



Figure 1. Looking downstream at Lost Creek.



Figure 2. Looking upstream at Lost Creek.

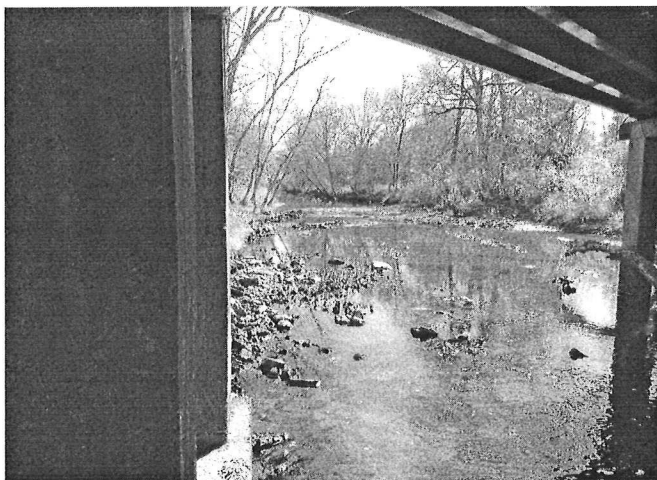


Figure 3. Looking downstream at S. Fork Little Mazarn Creek.

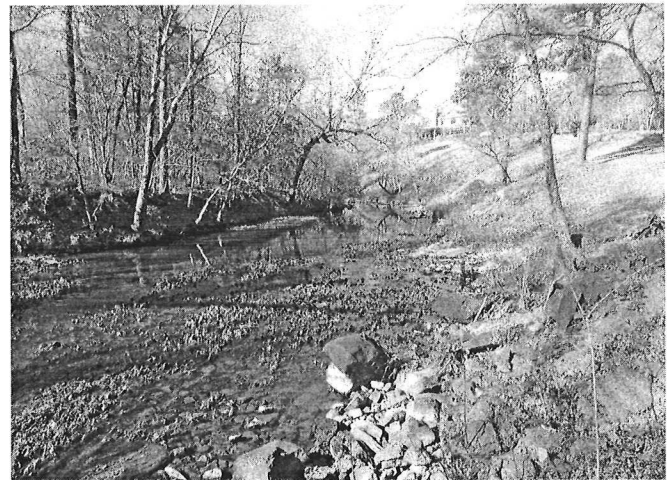


Figure 4. Looking upstream at S. Little Mazarn Creek.

Subsurface Conditions

Bridge 1 - South Fork Little Mazarn Creek

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

- 0 to 4.7 Consists of **sand, gravel, cobbles, and boulders.**
- 4.7 to 10.6 Varies from moist to wet, loose to very dense, light brown **sand to clayey sand with gravel** to moist, very stiff, light brown **clay with gravel and occasional cobbles and boulders.**
- 10.6 to 37.5 Consists of weathered to unweathered, well cemented, frequently to occasionally fractured gray **sandstone with interbedded quartzite and frequent to occasional shale layers and seams and occasional quartz veins.**

Bridge 2 - Lost Creek

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

- 0 to 10.8 Feet: Varies from **sandy clay with gravel** to wet, very loose to medium dense, light brown to brown **sand with gravel and cobbles.**
- 10.8 to 22.3 Feet: Consists of highly weathered to slightly weathered, medium hard, steeply dipping, slickensided, frequently fractured, dark gray **shale with occasional to frequent sandstone partings and seams.**
- 22.3 to 32.3 Feet: Varies from unweathered, medium hard, steeply dipping, frequently fractured dark gray **shale with interbedded sandstone to sandstone with interbedded shale.**
- 32.3 to 37.3 Feet: Consists of unweathered, medium hard, steeply dipping, frequently fractured dark gray **shale with interbedded sandstone.**

Rock Core Unconfined Compression Test Summary

Project Number: BR2605
 Project Name: Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs. (S)
 Date Tested: 1/27/2020 & 1/28/2020

Station	Location	Sample No.	Depth (ft.)	Diameter (in)	Height (in)	Total Load (lbs.)	Correction Factor	Stress (psi)	Remarks
South Fork Little Mazarn Creek Bridge									
110+11	5' Rt	1	20.2	1.76	4.11	58,250	1.00	23,943	SS
110+11	5' Rt	2	27.7	1.76	3.92	4,860	1.00	1,998	SS w/ Occ Intbd SH
110+46	5' Lt	3	16.2	1.75	3.66	32,550	1.00	13,533	SS w/ Intbd Quartzite
110+46	5' Lt	4	23.8	1.75	4.08	8,840	1.00	3,675	SS w/ Intbd Quartzite
111+99	14' Lt	5	15.3	1.75	3.80	30,590	1.00	12,718	Quartzite
111+99	14' Lt	6	21.3	1.75	3.70	30,870	1.00	12,834	SS w/ Intbd Quartzite
Lost Creek Bridge									
209+32.5	C.L.	7	15.3	1.70	5.56	2,260	1.00	996	SH
209+32.5	C.L.	8	16.6	1.70	4.93	4,080	1.00	1,798	SH
209+32.5	C.L.	9	23.1	1.74	4.27	3,140	1.00	1,321	SH w/ Freq. SS P & S
209+32.5	C.L.	10	27.6	1.74	6.27	6,520	1.00	2,742	SH w/ Freq. SS P & S
209+32.5	C.L.	11	33.5	1.75	4.59	12,070	1.00	5,018	SS
208+11.5	C.L.	12	24.7	1.75	6.07	960	1.00	399	SH
208+11.5	C.L.	13	28.0	1.74	4.63	2,970	1.00	1,249	SH
208+11.5	C.L.	14	32.6	1.72	4.15	5,700	1.00	2,453	SH w/ Intbd SS
208+11.5	C.L.	15	18.4	1.75	2.77	33,800	0.966	13,575	SS - Fractured
208+11.5	C.L.	16	21.3	1.75	2.85	4,740	0.972	1,915	SH - Fractured

Terminology

SS = Sandstone

Freq. = Frequent

SH = Shale

Occ. = Occasional

Intbd = Interbedded

P & S = Partings and Seams

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

ROCK MASS RATING SUMMARY
JOB # BR2605

SAMPLE #1

Station/Location	110+11 \ 5' RT
Depth (ft)	20.2
Relative Rating	
Uniaxial Compressive Strength	12
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	89
Class Number	I
Description	VERY GOOD ROCK

SAMPLE #2

Station/Location	110+11 \ 5' RT
Depth (ft)	27.7
Relative Rating	
Uniaxial Compressive Strength	2
RQD	20
Spacing of Joints	30
Condition of Joints	25
Groundwater Conditions	7
Sum	84
Class Number	I
Description	VERY GOOD ROCK

SAMPLE #3

Station/Location	110+46 \ 5' LT
Depth (ft)	16.2
Relative Rating	
Uniaxial Compressive Strength	7
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	84
Class Number	I
Description	VERY GOOD ROCK

SAMPLE #4

Station/Location	110+46 \ 5' LT
Depth (ft)	23.8
Relative Rating	
Uniaxial Compressive Strength	2
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	71
Class Number	II
Description	GOOD ROCK

SAMPLE #5

Station/Location	111+99 \ 14' LT
Depth (ft)	15.3
Relative Rating	
Uniaxial Compressive Strength	15.1
RQD	15.4
Spacing of Joints	15.7
Condition of Joints	16
Groundwater Conditions	16.3
Sum	78.5
Class Number	II
Description	GOOD ROCK

SAMPLE #6

Station/Location	111+99 \ 14' LT
Depth (ft)	21.3
Relative Rating	
Uniaxial Compressive Strength	19
RQD	20.2
Spacing of Joints	21.4
Condition of Joints	22.6
Groundwater Conditions	23.8
Sum	107
Class Number	I
Description	VERY GOOD ROCK

SAMPLE #7

Station/Location	209+32.5 \ CL
Depth (ft)	15.3
Relative Rating	
Uniaxial Compressive Strength	1
RQD	8
Spacing of Joints	10
Condition of Joints	6
Groundwater Conditions	7
Sum	32
Class Number	IV
Description	POOR ROCK

SAMPLE #8

Station/Location	209+32.5 \ CL
Depth (ft)	16.6
Relative Rating	
Uniaxial Compressive Strength	2
RQD	8
Spacing of Joints	10
Condition of Joints	6
Groundwater Conditions	7
Sum	33
Class Number	IV
Description	POOR ROCK

SAMPLE #9

Station/Location	209+32.5 \ CL
Depth (ft)	23.1
Relative Rating	
Uniaxial Compressive Strength	1
RQD	13
Spacing of Joints	20
Condition of Joints	6
Groundwater Conditions	7
Sum	47
Class Number	III
Description	FAIR ROCK

SAMPLE #10

Station/Location	209+32.5 \ CL
Depth (ft)	27.6
Relative Rating	
Uniaxial Compressive Strength	2
RQD	13
Spacing of Joints	20
Condition of Joints	6
Groundwater Conditions	7
Sum	48
Class Number	III
Description	FAIR ROCK

SAMPLE #11

Station/Location	209+32.5 \ CL
Depth (ft)	33.5
Relative Rating	
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	69
Class Number	II
Description	GOOD ROCK

SAMPLE #12

Station/Location	208+11.5 \ CL
Depth (ft)	24.7
Relative Rating	
Uniaxial Compressive Strength	0
RQD	8
Spacing of Joints	10
Condition of Joints	6
Groundwater Conditions	7
Sum	31
Class Number	IV
Description	POOR ROCK

SAMPLE #13

Station/Location	208+11.5 \ CL
Depth (ft)	28
Relative Rating	
Uniaxial Compressive Strength	2
RQD	8
Spacing of Joints	10
Condition of Joints	6
Groundwater Conditions	7
Sum	33
Class Number	IV
Description	POOR ROCK

SAMPLE #14

Station/Location	208+11.5 \ CL
Depth (ft)	32.6
Relative Rating	
Uniaxial Compressive Strength	2
RQD	13
Spacing of Joints	10
Condition of Joints	6
Groundwater Conditions	7
Sum	38
Class Number	IV
Description	POOR ROCK

SAMPLE #15

Station/Location	208+11.5 \ CL
Depth (ft)	18.4
Relative Rating	
Uniaxial Compressive Strength	7
RQD	8
Spacing of Joints	10
Condition of Joints	6
Groundwater Conditions	7
Sum	38
Class Number	IV
Description	POOR ROCK

SAMPLE #16

Station/Location	208+11.5 \ CL
Depth (ft)	21.3
Relative Rating	
Uniaxial Compressive Strength	2
RQD	8
Spacing of Joints	10
Condition of Joints	6
Groundwater Conditions	7
Sum	33
Class Number	IV
Description	POOR ROCK

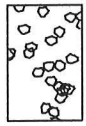
**D₅₀ AGGREGATE ANALYSIS
FOR SCOUR CALCULATIONS**

Job No. BR2605						
Creek Name	Station	Sample Type	Location	Depth (FT)	Soil Description	Aggregate Size (D50) (IN)
South Fork Little Mazarn Creek	110+97	Creek Bank	33' Left of Existing Bridge C.L.	N/A	SP-SM Poorly Graded Sand with Silt	0.0331
Lost Creek	214+05	River Bank	21' Left of Existing Bridge C.L.	N/A	SP-SM Poorly Graded Sand with Silt	0.0394

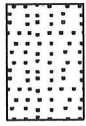
LEGEND

SOIL TYPES

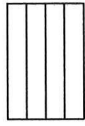
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(PREDOMINANT TYPE SHOWN HEAVY)



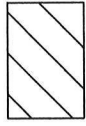
GRAVEL



SAND



SILT



CLAY



ORGANIC
MATTER

SAMPLER TYPES

(SHOWN IN SAMPLE COLUMN)

SHELBY TUBE



UNDISTURBED
SAMPLE
RECOVERY



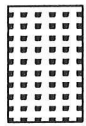
DISTURBED
SAMPLE
RECOVERY



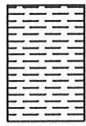
NO
RECOVERY

ROCK TYPES

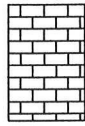
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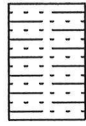
SANDSTONE



SHALE
or
SILTSTONE



LIMESTONE
or
DOLOMITE



ALTERNATING
LAYERS of
SHALE and
SANDSTONE



OTHER

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, 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: $\frac{6}{8-9} \Rightarrow 8+9 = 17 \text{ blows/ft}$. 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.

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 1
PAGE 1 OF 2

JOB NO. BR2605 Garland County
JOB NAME: Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs. (S)
Co. Rd. 63
STATION: 110+11
LOCATION: 5' Right of Construction Centerline
LOGGED BY: Austin Dillman

DATE: January 14, 2020
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 37.5

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: 511.1									
			Sandy Clay									
			Cobbles									
5			Moist, Soft, Brown Sandy Clay with Trace Gravel*							1 1-2		
10			Wet, Very Loose, Light Brown and Gray Sand with Some Clay							1 2-2		
15			Cobbles and Boulders									
			No recovery									
			SANDSTONE - Slightly Weathered, Well Cemented, Frequent Fractures, Gray							15 (1")	53	22
20			SANDSTONE - Unweathered, Well Cemented, Occasional Quartz Veins, Gray								76	54
25											100	100
30			SANDSTONE WITH OCCASIONAL INTERBEDDED SHALE - Slightly Weathered, Well Cemented, Gray								100	100
35			SANDSTONE - Unweathered, Well Cemented, Occasional Shale Clasts and Quartz Veins, Gray									

REMARKS: Lat: 34.4140, Long: -93.2476. S. Fork Little Mazarn Creek. *Water encountered at approximately 8.7 feet below ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 1
PAGE 2 OF 2

JOB NO. BR2605 Garland County
JOB NAME: Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs. (S)
Co. Rd. 63
STATION: 110+11
LOCATION: 5' Right of Construction Centerline
LOGGED BY: Austin Dillman

DATE: January 14, 2020
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 37.5

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	% ROD
			SURFACE ELEVATION: 511.1									
			SANDSTONE WITH OCCASIONAL INTERBEDDED SHALE - Unweathered, Well Cemented, Occasional Interbedded Shale, Gray								96	90
40			Boring Terminated									
45												
50												
55												
60												
65												
70												

REMARKS: Lat: 34.4140, Long: -93.2476. S. Fork Little Mazarn Creek. *Water encountered at approximately 8.7 feet below ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 2
PAGE 1 OF 2

JOB NO. BR2605 Garland County
JOB NAME: Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs. (S)
Co. Rd. 63
STATION: 110+46
LOCATION: 5' Left of Construction Centerline
LOGGED BY: Austin Dillman

DATE: January 8, 2020
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75
HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 36.1

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: 511.3									
5			Cobbles									
			Moist, Loose, Brown Clayey Sand							1 4-4		
10			Moist, Medium Dense, Brown Sand with Gravel*							5 7-13		
15			Wet, Loose, Brown Sand with Gravel (Rock Fragments)							1 2-6		
20			SANDSTONE WITH INTERBEDDED QUARTZITE - Unweathered, Well Cemented, Occasional Fractures, Light Gray								100	100
25											100	78
30			SANDSTONE WITH INTERBEDDED QUARTZITE AND OCCASIONAL SHALE - Unweathered, Well Cemented, Occasional Fractures, Seams, Light Gray								98	84
35			SANDSTONE WITH INTERBEDDED QUARTZITE - Unweathered, Well Cemented,								100	78
											100	66

REMARKS: Lat: 34.4142, Long: -93.2476. S. Fork Little Mazarn Creek. *Water level encountered at approximately 13.2 feet below ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 2
PAGE 2 OF 2

JOB NO. BR2605 Garland County
JOB NAME: Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs. (S)
Co. Rd. 63
STATION: 110+46
LOCATION: 5' Left of Construction Centerline
LOGGED BY: Austin Dillman

DATE: January 8, 2020
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75
HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 36.1

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 O D
			SURFACE ELEVATION: 511.3									
			Occasional Fractures and Quartz Veins, Occasional Shale Layers and Seams, Light Gray									
40			Boring Terminated									
45												
50												
55												
60												
65												
70												

REMARKS: Lat: 34.4142, Long: -93.2476. S. Fork Little Mazarn Creek. *Water level encountered at approximately 13.2 feet below ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 3

PAGE 1 OF 1

JOB NO. BR2605 Garland County
 JOB NAME: Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs. (S)
 Co. Rd. 63
 STATION: 111+99
 LOCATION: 14' Left of Construction Centerline
 LOGGED BY: Austin Dillman

DATE: January 7, 2020
 TYPE OF DRILLING:
 Hollow Stem Auger - Diamond Core
 EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 32.5

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: 512.7									
			Asphalt									
			Cobbles and Boulders									
			Cobbles									
5			Moist, Very Stiff, Light Brown Clay with Gravel (Rock Fragments)							5 7-21		
10			Moist, Very Dense, Light Brown Sand with Gravel (Sandstone Fragments)							18 44-26 (7")	50	0
			SANDSTONE - Weathered, Well Cemented, Frequent Fractures, Slickensided, Light Brown and Gray*									
15			QUARTZITE - Unweathered, Well Cemented, Gray								88	52
20			SANDSTONE WITH INTERBEDDED QUARTZITE AND OCCASIONAL SHALE LAYERS - Unweathered, Well Cemented, Slickensided, Light Gray								96	80
25			SANDSTONE WITH INTERBEDDED QUARTZITE AND OCCASIONAL SHALE LAYERS - Unweathered, Well Cemented, Slickensided, Frequent Fractures, Light Gray								94	60
30											100	70
35			Boring Terminated									

REMARKS: Lat: 34.4145, Long: -93.2473. S. Fork Little Mazarn Creek. *Total water loss at approximately 10.6 feet below ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 4
PAGE 1 OF 2

JOB NO. BR2605 Garland County
JOB NAME: Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs. (S)
Co. Rd. 63
STATION: 208+11.5
LOCATION: Construction Centerline
LOGGED BY: Austin Dillman

DATE: December 18, 2019
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 37.3

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: 482.7									
5			Sandy Clay with Gravel							1 3-4		
10			Wet, Loose, Light Brown Sand with Some Gravel							4 5-11		
			Wet, Medium Dense, Light Brown Sand									
			Wet, Medium Dense, Light Brown Sand with Gravel									
			SHALE - Highly Weathered, Dark Gray									
			SHALE									
15			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Slightly Weathered, Medium Hard, Slickensided, Steep Dip, Dark Gray								80	0
20			SHALE WITH FREQUENT SANDSTONE/METAQUARTZITE SEAMS - Slightly Weathered, Medium Hard, Slickensided, Steep Dip, Dark Gray								82	18
25			SANDSTONE WITH INTERBEDDED SHALE - Unweathered, Well Cemented, Steep Dip, Gray								80	40
30			SHALE - Unweathered, Medium Hard, Frequent Fractures, Slickensided, Steep Dip, Occasional Calcite Seams, Dark Gray								100	30
35			SHALE WITH INTERBEDDED SANDSTONE -									

REMARKS: Lat: -93.233300, Long: -93.23330. Lost Creek.

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 4
PAGE 2 OF 2

JOB NO. BR2605 Garland County
JOB NAME: Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs. (S)
Co. Rd. 63
STATION: 208+11.5
LOCATION: Construction Centerline
LOGGED BY: Austin Dillman

DATE: December 18, 2019
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 37.3

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: 482.7									
			Unweathered, Medium Hard, Frequent Fractures, Slickensided, Steep Dip, Dark Gray								100	62
40			Boring Terminated									
45												
50												
55												
60												
65												
70												

REMARKS: Lat: -93.233300, Long: -93.23330. Lost Creek.

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 5
PAGE 1 OF 2

JOB NO. BR2605 Garland County
JOB NAME: Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs. (S)
Co. Rd. 63
STATION: 209+32.5
LOCATION: Construction Centerline
LOGGED BY: Austin Dillman

DATE: December 17, 2019
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75
HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 36.9

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	% ROD
			SURFACE ELEVATION: 483.2									
5			Sandy Clay with Gravel							1 1-2		
			Moist, Very Loose, Brown Sand									
10			Wet, Medium Dense, Brown Sand with Some Gravel							4 6-14		
			Gravel and Cobbles									
15			SHALE (No Recovery)							25 (1")	100	30
			SHALE - Slightly Weathered, Medium Hard, Frequent Fractures, Slickensided, Steep Dip, Dark Gray									
20			SHALE - Slightly Weathered, Medium Hard, Slickensided, Steep Dip, Occasional Calcite Partings, Dark Gray								100	36
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Frequent Fractures, Slickensided, Steep Dip, Dark Gray								96	25
25			SHALE WITH FREQUENT SANDSTONE SEAMS AND LAYERS - Unweathered, Medium Hard, Frequent Fractures, Slickensided, Steep Dip, Dark Gray								100	42
30			SHALE WITH FREQUENT SANDSTONE SEAMS AND LAYERS - Unweathered, Medium Hard, Frequent Fractures, Slickensided, Steep Dip, Dark Gray									
35			SANDSTONE - Unweathered, Well Cemented,								100	65

REMARKS: Lat: 34.43010, Long: -93.23330. Lost Creek. *Boring prematurely terminated due to loss of drilling fluid and the core barrel being blocked off.

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 5
PAGE 2 OF 2

JOB NO. BR2605 Garland County
JOB NAME: Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs. (S)
Co. Rd. 63
STATION: 209+32.5
LOCATION: Construction Centerline
LOGGED BY: Austin Dillman

DATE: December 17, 2019
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 36.9

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: 483.2									
			Steep Dip, Gray									
			SHALE - Unweathered, Medium Hard, Steep Dip, Dark Gray*									
			Boring Terminated									
40												
45												
50												
55												
60												
65												
70												

REMARKS: Lat: 34.43010, Long: -93.23330. Lost Creek. *Boring prematurely terminated due to loss of drilling fluid and the core barrel being blocked off.



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

January 22, 2018

TO: Mr. Trinity Smith, Engineer of Roadway Design
SUBJECT: Job No. BR2605
Lost Cr. & S. Fork Little Mazarn Cr. Strs. & Apprs.(S)
County Road 63
Garland County

Transmitted herewith is the requested Soil Survey, strength data and Resilient Modulus test results for the above referenced job. The project consists of replacing the bridges crossing Lost Creek and the South Fork of Little Mazarn Creek on County Road 63 (Harris Road). Samples were obtained in the existing travel lanes and ditch line. There were no paved shoulders within the project limits.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of non-plastic sand to low plasticity clayey sand with sandstone fragments. Isolated locations of highly plastic clay were encountered within the project limits. Cross-sections are not currently available, but it is assumed the construction grade line will closely match that of the existing roadway. The subgrade soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction. Rock was encountered at stations 118+00 at 5 and 14 feet left of centerline at a depth of 2.5 feet, and 205+00 at 5 and 14 feet right of centerline at a depth of 2.5 feet.

Additional earthwork recommendations will be made upon request when plans are further developed and cross-sections become available.

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

- 1. The Qualified Products List (QPL) indicates that Aggregate Base Course (Class CL-7) is available from commercial producers located in the vicinity of Bryant.
2. Asphalt Concrete Hot Mix

Table with 3 columns: Type, Asphalt Cement %, Mineral Aggregate %. Rows include Surface Course, Binder Course, and Base Course.

Handwritten signature of Michael C. Benson, Materials Engineer

MCB:pt:bjj
Attachment
cc: State Constr. Eng. - Master File Copy
District 6 Engineer
System Information and Research Div.
G. C. File

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION
MICHAEL BENSON, MATERIALS ENGINEER
*** SOIL SURVEY STRENGTH TEST REPORT ***

DATE - 01/12/2018
JOB NUMBER - BR2605
SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 26
DISTRICT NO. - 06

JOB NAME - LOST CR. & S. FORK LITTLE MAZARN CR.STRS. & APPRS.

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 10

RESILIENT MODULUS

STA. 107 + 00 8668
STA. 213 + 00 6229

REMARKS -

AASHTO TESTS : T190

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

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

Job No.	BR2605	Material Code	SSRVPS
Date Sampled:	12/12/17	Station No.:	107+00
Date Tested:	January 11, 2018	Location:	14'RT
Name of Project:	LOST CR. & S. FORK LITTLE MAZARN CR. STRS. & APPRS.		
County:	Code: 26	Name: GARLAND	
Sampled By:	FRAZIER/BATES	Depth:	0-5
Lab No.:	20173688	AASHTO Class:	A-4 (0)
Sample ID:	RV794	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

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	3.94
Middle	3.94
Bottom	3.94
Average	3.94
Membrane Thickness (in):	0.01
Height of Specimen, Cap and Base (in):	8.03
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.03
Initial Area, Ao (sq. in):	12.12
Initial Volume, AoLo (cu. in):	97.31

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3225.60
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4. Soil Properties:

Optimum Moisture Content (%):	11.9
Maximum Dry Density (pcf):	118.1
95% of MDD (pcf):	112.2
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3225.60
Compaction Moisture content (%):	11.9
Compaction Wet Density (pcf):	126.30
Compaction Dry Density (pcf):	112.87
Moisture Content After Mr Test (%):	11.9

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

7. Resilient Modulus, Mr: 9344(Sc)^{-0.18000}(S3)^{0.40009}

8. Comments _____

9. Tested By: GW **Date:** January 11, 2018

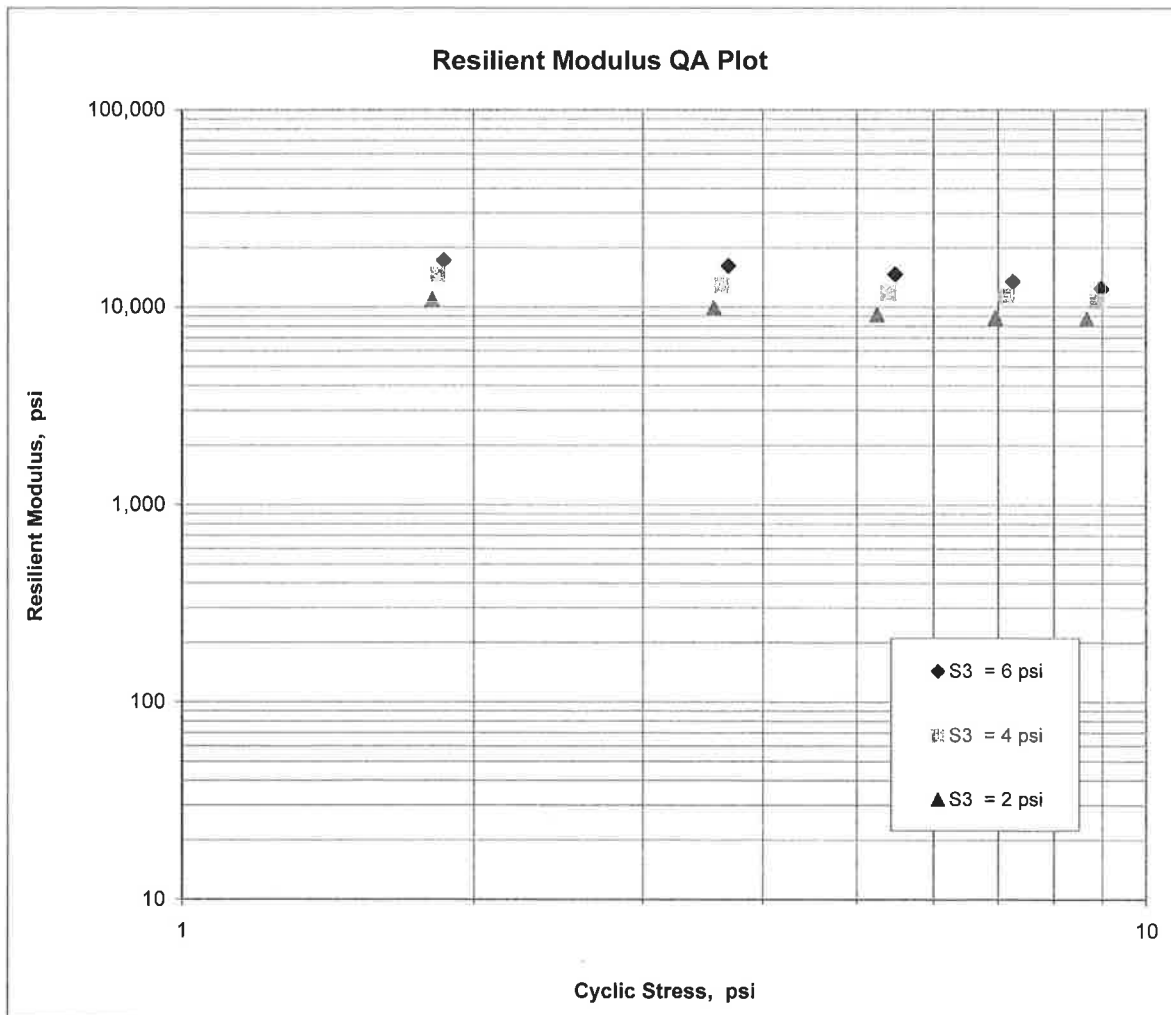
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

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

Job No.	BR2605	Material Code	SSRVPS
Date Sampled:	12/12/17	Station No.:	107+00
Date Tested:	January 11, 2018	Location:	14'RT
Name of Project:	LOST CR. & S. FORK LITTLE MAZARN CR. STRS. & APPRS.		
County:	Code: 26	Name:	GARLAND
Sampled By:	FRAZIER/BATES	Depth:	0-5
Lab No.:	20173688	AASHTO Class:	A-4 (0)
Sample ID:	RV794	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

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

$K_1 =$	<u>9,344</u>
$K_2 =$	<u>-0.18000</u>
$K_5 =$	<u>0.40009</u>
$R^2 =$	<u>0.98</u>



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

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

Job No.	BR2605	Material Code	SSRVPS
Date Sampled:	12/12/17	Station No.:	213+00
Date Tested:	January 11, 2018	Location:	14LT
Name of Project:	LOST CR. & S. FORK LITTLE MAZARN CR. STRS. & APPRS.		
County:	Code: 26	Name: GARLAND	
Sampled By:	FRAZIER/BATES	Depth:	0-5
Lab No.:	20173689	AASHTO Class:	A-4 (0)
Sample ID:	RV795	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

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	3.94
Middle	3.95
Bottom	3.94
Average	3.94
Membrane Thickness (in):	0.01
Height of Specimen, Cap and Base (in):	8.02
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.02
Initial Area, Ao (sq. in):	12.14
Initial Volume, AoLo (cu. in):	97.35

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3226.10
------------------------------	---------

4. Soil Properties:

Optimum Moisture Content (%):	13.3
Maximum Dry Density (pcf):	116
95% of MDD (pcf):	110.2
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3226.10
Compaction Moisture content (%):	13.4
Compaction Wet Density (pcf):	126.27
Compaction Dry Density (pcf):	111.35
Moisture Content After Mr Test (%):	13.2

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

#VALUE!

7. Resilient Modulus, Mr:

7316(Sc)^-0.24176(S3)^0.42734

8. Comments

9. Tested By:

GW

Date: January 11, 2018

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

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

Job No. BR2605 **Material Code** SSRVPS
Date Sampled: 12/12/17 **Station No.:** 213+00
Date Tested: January 11, 2018 **Location:** 14LT
Name of Project: LOST CR. & S. FORK LITTLE MAZARN CR. STRS. & APPRS.
County: Code: 26 **Name:** GARLAND
Sampled By: FRAZIER/BATES **Depth:** 0-5
Lab No.: 20173689 **AASHTO Class:** A-4 (0)
Sample ID: RV795 **Material Type (1 or 2):** 2
LATITUDE: LONGITUDE:

PARAMETER	Chamber Confining Pressure	Nominal Maximum Axial Stress	Actual Applied Max. Axial Load	Actual Applied Cyclic Load	Actual Applied Contact Load	Actual Applied Max. Axial Stress	Actual Applied Cyclic Stress	Actual Applied Contact Stress	Average Recov Def. LVDT 1 and 2	Resilient Strain	Resilient Modulus
	S ₃ psi	S _{cyclic} psi	P _{max} lbs	P _{cyclic} lbs	P _{contact} lbs	S _{max} psi	S _{cyclic} psi	S _{contact} psi	H _{avg} in	ε _r in/in	M _r psi
Sequence 1	6.0	2.0	25.2	22.4	2.8	2.1	1.8	0.2	0.00109	0.00014	13,563
Sequence 2	6.0	4.0	47.3	44.5	2.8	3.9	3.7	0.2	0.00249	0.00031	11,783
Sequence 3	6.0	6.0	69.8	66.2	3.6	5.8	5.5	0.3	0.00409	0.00051	10,692
Sequence 4	6.0	8.0	93.8	87.7	6.0	7.7	7.2	0.5	0.00593	0.00074	9,771
Sequence 5	6.0	10.0	117.6	109.2	8.4	9.7	9.0	0.7	0.00772	0.00096	9,344
Sequence 6	4.0	2.0	25.0	22.2	2.8	2.1	1.8	0.2	0.00127	0.00016	11,579
Sequence 7	4.0	4.0	46.6	43.8	2.8	3.8	3.6	0.2	0.00304	0.00038	9,506
Sequence 8	4.0	6.0	67.6	64.8	2.8	5.6	5.3	0.2	0.00512	0.00064	8,368
Sequence 9	4.0	8.0	91.7	86.6	5.1	7.6	7.1	0.4	0.00720	0.00090	7,943
Sequence 10	4.0	10.0	115.8	108.2	7.5	9.5	8.9	0.6	0.00917	0.00114	7,795
Sequence 11	2.0	2.0	24.8	22.1	2.7	2.0	1.8	0.2	0.00167	0.00021	8,725
Sequence 12	2.0	4.0	45.4	42.7	2.7	3.7	3.5	0.2	0.00396	0.00049	7,117
Sequence 13	2.0	6.0	65.2	62.5	2.7	5.4	5.1	0.2	0.00654	0.00082	6,315
Sequence 14	2.0	8.0	88.1	84.0	4.2	7.3	6.9	0.3	0.00889	0.00111	6,239
Sequence 15	2.0	10.0	112.0	105.4	6.6	9.2	8.7	0.5	0.01118	0.00139	6,229

TESTED BY _____ DATE January 11, 2018
 REVIEWED BY _____ DATE _____

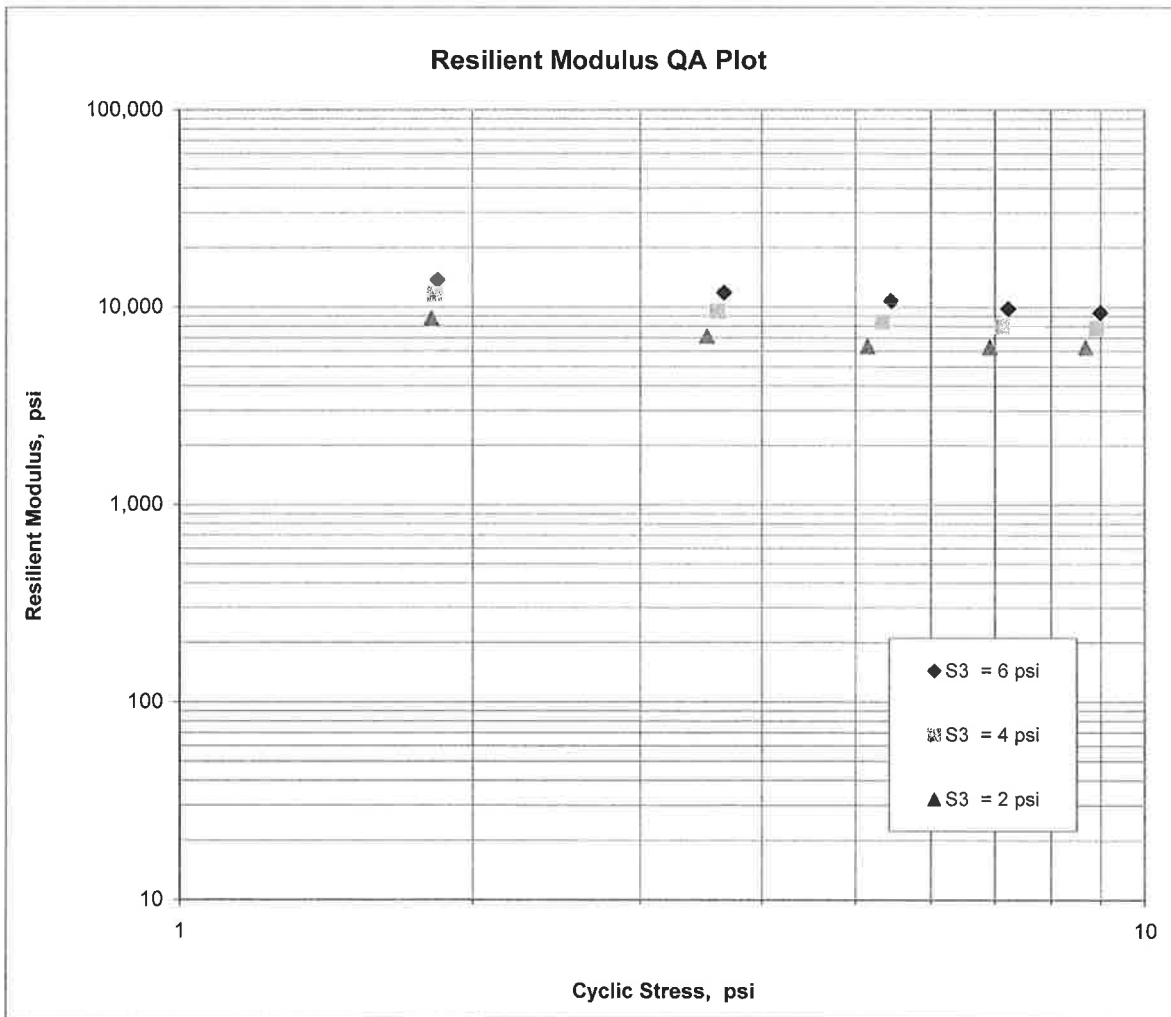
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

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

Job No.	BR2605	Material Code	SSRVPS
Date Sampled:	12/12/17	Station No.:	213+00
Date Tested:	January 11, 2018	Location:	14'LT
Name of Project:	LOST CR. & S. FORK LITTLE MAZARN CR. STRS. & APPRS.		
County:	Code: 26	Name:	GARLAND
Sampled By:	FRAZIER/BATES	Depth:	0-5
Lab No.:	20173689	AASHTO Class:	A-4 (0)
Sample ID:	RV795	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

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

K1 =	<u>7,316</u>
K2 =	<u>-0.24176</u>
K5 =	<u>0.42734</u>
R ² =	<u>0.98</u>



JOB: BR2605

Arkansas State Highway Transportation Department

JOB NAME: LOST CR. & S. FORK LITTLE MAZARN CR.STRS. & APPRS.

Materials Division

COUNTY NO. 26 DATE TESTED 12/19/2017

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR						L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				#4	#10	#40	#80	#200					
				S	I	E	V	E	S				
107+00	14 RT	0-5	RD/BR	77	68	60	51	40	19	3	A-4 (0)	RV794	
213+00	14 LT	0-5	BROWN	75	68	60	56	46	ND	NP	A-4 (0)	RV795	
107+00	05 RT	0-5	BROWN	97	91	84	74	59	21	8	A-4 (2)	S786	17.4
107+00	14 RT	0-5	RD/BR	79	72	64	56	42	ND	NP	A-4 (0)	S787	12.9
118+00	05 LT	0-2.5Z	BROWN	99	96	91	82	69	40	27	A-6 (16)	S788	13.5
118+00	14 LT	0-2.5Z	BROWN	84	73	61	54	44	30	14	A-6 (3)	S789	10.3
205+0	14 RT	0-2.5Z	BROWN	98	94	87	80	68	24	9	A-4 (3)	S790	11.9
205+00	05 RT	0-2.5Z	BROWN	69	59	51	47	39	ND	NP	A-4 (0)	S791	11.6
213+00	05 LT	0-5	BR/GR	97	92	86	78	61	ND	NP	A-4 (0)	S792	14.4
213+00	14 LT	0-5	BR/GR	99	98	95	88	70	ND	NP	A-4 (0)	S793	16.4

comments: W=MULTIPLE LAYERS, X=STRIPPED, Z=AUGER REFUSAL

Wednesday, January 17, 2018

JOB: BR2605

Arkansas State Highway Transportation Department

DATE TESTED

JOB NAME: LOST CR. & S. FORK LITTLE MAZARN CR. STRS. & APPRS.

Materials Division

12/19/2017

COUNTY NO. 26

Michael Benson, Materials Engineer

STA.# LOC. [REDACTED] **PAVEMENT SOUNDINGS**

107+00	05 RT	ACHMSC 2.5W	AGG. BASE CRS. CL-7 2.0
107+00	14 RT	ACHMSC	AGG. BASE CRS. CL-7
118+00	05 LT	ACHMSC 3.0W	AGG. BASE CRS. CL-7 2.0
118+00	14 LT	ACHMSC	AGG. BASE CRS. CL-7
205+0	14 RT	ACHMSC 2.75W	AGG. BASE CRS. CL-7 2.0
205+00	05 RT	ACHMSC	AGG. BASE CRS. CL-7
213+00	05 LT	ACHMSC 3.5W	AGG. BASE CRS. CL-7 2.0
213+00	14 LT	ACHMSC	AGG. BASE CRS. CL-7

comments: W=MULTIPLE LAYERS, X=STRIPPED, Z=AUGER REFUSAL

