ARKANSAS DEPARTMENT OF TRANSPORTATION

SUBSURFACE INVESTIGATION

STATE JOB NO. 061371

FEDERAL AID PROJECT NO. FEDERAL AID PROJECT NHPP-9065(28)

I-57/HWY. 5 INTCHNG. IMPVTS. (CABOT) (F)

STATE HIGHWAY I-57 & 5 **SECTION** 2 & 12

IN LONOKE **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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June 9, 2021

TO: Mr. Rick Ellis, Bridge Engineer

SUBJECT: Highways 5 & 89 Overpass Foundation Recommendations
Job No. CA0613
Hwy. 67 Intchng. Impvts. (Cabot) (S)
Lonoke County
Route 67 Section 11

Provided herein are foundation recommendations for the planned construction of the new interstate overpasses at Site 1 (Highway 5 over Highway 67) and Site 2 (Highway 89 over Highway 67). Retaining wall recommendations will be provided in a separate report.

Introduction

This project includes the construction of replacement bridges and access ramps at two sites along Highway 67 in Cabot, Arkansas. At **Site 1,** a new bridge and new access ramps will be constructed, in stages, on a new alignment, southwest of the existing. **Site 2** is approximately 2.75 miles northeast of Site 1 and is located at the intersection of Highway 89 and Highway 67. At this site, a new bridge and new access ramps will be constructed, in stages, on the same alignment as the existing.

Field Investigation

A subsurface investigation was carried out by ARDOT personnel for Site 1 (Highway 5) and Site 2 (Highway 89). The subsurface conditions in the vicinity of the proposed bridges were explored using auger boring and rock coring methods. At Site 1 and Site 2 there were a total of 34 proposed boring locations, 17 at each site. However, some requested intermediate borings were not obtained due to the close proximity of planned borings, conflicts with utilities, height restrictions, and steep slopes. 11 borings were performed at Site 1, three at each bridge end bent and five in the vicinity of the intermediate bent. 10 borings were completed at Site 2, three at each end bent and four in the vicinity of the intermediate bent. The approximate locations of the borings for Site 1 and Site 2 are shown in Attachment A and Attachment B, respectively.

Lab Investigation

All samples were brought to the laboratory and classified by experienced personnel in accordance with the Unified Soil Classification System and the AASHTO soil classification system. Representative laboratory tests were performed to determine moisture content, grain size analysis, and Atterberg Limits of soil samples. Unconsolidated-undrained

triaxial compression (UU) tests were performed on representative undisturbed Shelby Tube samples to evaluate undrained shear strength. Rock core compressive strengths were determined using uniaxial compressive tests on intact rock cores. The boring logs, rock core unconfined compression test summary, and rock mass rating (RMR) are included in Attachment C. The laboratory tests and their corresponding test methods are listed in Table 1.

Table 1 – Summary of Laboratory Tests and Methods

Laboratory Test	**ASTM**	**AASHTO**
Moisture Content	D 2216	T 265
Atterberg Limits	D 4318	T 89 / T 90
Grain Size Analysis by Sieving	D 6913	T 88
Unconfined-Undrained Triaxial Compression	D 2850	T 296
Unconfined Compression of Rock Cores	D 7012, Method C	N/A

Site Conditions

Site 1. The Highway 5 overpass is the southernmost overpass on this project. It is a two span structure allowing Highway 5 to cross over Highway 67. The superstructure of the existing bridge is composed of six sets of steel girders overlain by concrete decking and supported by concrete piers. Bridge end walls are constructed of concrete and concrete riprap has been placed over the end slopes. The side slopes are vegetated with close cut grasses. The area surrounding the overpass is moderately wooded.

Site 2. The Highway 89 overpass is the northernmost overpass on this project. It is a two span structure allowing Highway 89 to cross over Highway 67 and is constructed similarly to the Highway 5 overpass. The superstructure of the existing bridge is composed of six sets of steel girders overlain by concrete decking and supported by concrete piers. Bridge end walls are constructed of concrete and concrete riprap has been placed over the end slopes. Overhead power lines parallel the north side of the existing overpass. The side slopes are vegetated with close cut grasses. The area southeast and southwest of the overpass is moderately wooded.

Site Geology

Site 1 is located on the middle section of the Atoka Formation. The Atoka Formation is a sequence of marine, mostly tan to gray silty sandstones and grayish black shales. Some rare calcareous bed and siliceous shales are known to exist in this formation. This unit has the largest areal extent of any of the Paleozoic formations in the state. It is the surface rock of the Boston Mountains and dominates the exposures in the Arkansas River Valley and the frontal Ouachita Mountains. It is also present in the southern part of the Ouachita Mountains. In the Arkansas River Valley and frontal Ouachita Mountains, the Atoka Formation has been subdivided into upper, middle, and lower lithic members based on regionally mappable shale or sandstone intervals. The unit locally contains discontinuous streaks of coal and coaly shale in the Boston Mountains and Arkansas River Valley. The Atoka may be up to 25,000 feet thick in the Ouachita Mountains.

Arkansas Geological Survey maps indicate that rocks near Site 1 dip in a westerly direction at 15 to 17 degrees and rocks near Site 2 are dipping in a south-southwest direction at 42 degrees.

Subsurface Conditions

Site 1. The borings performed in the vicinity of the proposed bridge foundations indicate that surface and near-surface soils are generally comprised of very loose to medium dense

clayey sand to soft to very hard clay to sandy clay. These soils extend to a depth of approximately 8 to 10 feet. This clayey sand to sandy clay layer is underlain by natural, very hard clay (completely weathered shale) to highly weathered shale. SPT refusal was encountered in this formation. The weathering of this clay/highly weathered shale layer decreases with depth. As the weathering decreases, the competence and hardness increase and the clay begins displaying weathered rock (Shale) properties. Shale to shale with sandstone partings and seams was encountered at approximately 19 to 25 feet below ground level and extending beyond the boring termination depth of approximately 48 feet below ground level. This competent shale varies from slightly weathered to unweathered and contains varying amounts of sandstone partings and seams.

Site 2. The borings performed in the vicinity of the proposed bridge foundations indicate that surface and near-surface soils are generally comprised of loose to medium dense clayey sand to soft to very hard clay to sandy clay. These soils typically extend to a depth of 10 feet below ground level. Beginning at approximately 10 feet below ground level and extending to approximately 19 to 23 feet, highly weathered to weathered shale was encountered. The weathering of this layer decreases with depth and as the weathering decreases, the competence and hardness increase. Competent unweathered shale to shale with occasional sandstone seams and layers was encountered beginning at approximately 19 to 23 feet below ground level and extending beyond the boring termination depth of approximately 49 feet.

Seismic Conditions

A site-specific seismic ground motion response analysis (SSGMRA) was performed by Geotechnology on February 9-10, 2021. The site-specific study was conducted at three (3) bridge locations along the Highway 67 alignment: Highway 5 over Highway 67 Interchange, Highway 67 over Two Prairie Creek, and Highway 89 over Highway 67 Interchange.

The scope of work for this SSGMRA included: 1) measuring shear wave velocities at these bridge locations for use in determining Seismic Site Class; and 2) performing site-specific seismic ground motion response analyses to develop seismic design accelerations.

Detailed results of the site-specific analysis are included in Attachment D. The measured shear wave velocity and the resultant Seismic Site Class are summarized below in Table 2.

Table 2: Summary of Measured Shear Wave Velocity and Seismic Site Class

Site	Average Shear Wave Velocity	Seismic Site Class
Highway 5	1,985	C
Highway 89	2,843*	B

Note: Shear wave velocity adjusted in accordance with borings results.

Deign peak ground acceleration coefficient, short-period spectral acceleration coefficient, as well as long-period spectral acceleration coefficient, as determined utilizing both the "General Procedure" (Code-Based) and the "Site-Specific" Procedure, are summarized in Tables 3 and 4 below, for the Highway 5 and Highway 89 sites.

Table 3: Summary of the SSGMRA Results – Highway 5

Acceleration Coefficient	Code-Based Value (g)	Site-Specific Value (g)
A_s (Site PGA)	0.201	0.277
S_{DS} (0.2 sec)	0.430	0.405
S_{D1} (1 Sec)	0.178	0.119

Table 4: Summary of the SSGMRA Results – Highway 89

Acceleration Coefficient	Code-Based Value (g)	Site-Specific Value (g)
A_s (Site PGA)	0.168	0.262
S_{DS} (0.2 sec)	0.359	0.393
S_{D1} (1 Sec)	0.105	0.105

Utilizing the site-specific long-period spectral acceleration coefficient (S_{D1}) of 0.119 for the Highway 5 site and 0.105 for the Highway 89 site, Geotechnology recommends that Seismic Performance Zone 1 be utilized in seismic design for both the Highway 5 and Highway 89 sites.

Foundation Recommendations

The new Highway 5 Bridge will vary in length from 163 to 232 feet long and consist of two spans of approximate equal length. The new Highway 89 Bridge will vary in length from 185 to 260 feet long and also consist of two spans of approximate equal length. Both new bridges will be considerably larger than the existing. From the plans, it is anticipated that MSE walls will be used to transition grades at the abutments. Therefore, large amounts of fill will be placed to raise the grade at the abutments. The abutment bents are to be supported by driven h-piling and intermediate bents are to be supported by drilled shafts, socketed into competent rock.

Steel H-Piling. It is anticipated that steel h-piling will be utilized to support the foundation loads at the end bents of both the Highway 5 and Highway 89 bridges. Pile size is not known at this time. Steel h-piles should be driven to practical refusal and should penetrate through embankment fill, overburden soils, and the highly weathered shale, to bear in the medium hard weathered shale to shale with sandstone seams.

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 1 foot into the weathered shale is assumed. This estimated penetration is based on the results of the borings and 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. Pre-Boring is generally not required for Steel H-Piling.

A minimum pile penetration of 10 feet, measured below natural ground surface, is recommended. Greater pile length / penetration may be warranted by lateral resistance demand. Based on the results of the borings and the assumption of 1 foot penetration into the competent rock, the estimated pile tip elevation is summarized below in Table 5 and Table 6.

Table 5: Summary of Estimated Pile Tip Elevation – Highway 5

Bent No.	Boring No.	Boring Location	Estimated Tip Elevation
1	1	Sta. 68+85 91' Lt. of CL Hwy. 67	255
1	2	Sta. 67+69 73' Lt. of CL Hwy. 67	258
1	3	Sta. 66+81 84' Lt. of CL of Hwy. 67	260
3	9	Sta. 68+90 75' Rt. of CL of Hwy. 67	256
3	10	Sta. 67+80 73' Rt. of CL of Hwy. 67	258
3	11	Sta. 66+94 77' Rt. of CL of Hwy. 67	259

Table 6: Summary of Estimated Pile Tip Elevation – Highway 89

Bent No.	Boring No.	Boring Location	Estimated Tip Elevation
1	1	Sta. 216+31 95' Lt. of CL of Hwy. 67	283
1	2A	Sta. 215+18 84' Lt. of CL of Hwy. 67	277
1	3	Sta. 213+51 107' Lt. of CL Hwy. 67	271
3	8	Sta. 216+10 80' Rt. of CL of Hwy. 67	276.5
3	9	Sta. 215+06 85' Rt. of CL of Hwy. 67	273
3	10	Sta. 213+81 89' Rt. of CL Hwy. 67	270

The estimated pile tip elevations summarized in the tables above are based on the evaluation of the rock cores retrieved from the borings. Actual subsurface conditions may vary from those encountered in the borings. Pile tip elevation can vary and must be field verified before installation. Due to the width of the bridges, it is recommended that a minimum of one (1) test pile be driven at each bridge end prior to driving production piles.

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. Geotechnical Section personnel will be 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.

Drilled Shafts. Based on the results of the borings at both proposed bridge locations and the depth at which bedrock was encountered, it is recommend that the foundation loads of the intermediate bents be supported on drilled shafts founded in the competent shale to shale with sandstone. For drilled shafts founded in the competent shale to shale with sandstone, a maximum nominal tip resistance (q_p) of 160 ksf is recommended. A resistance factor (φ_{stat}) of 0.50 is recommended for drilled shaft tip resistance. Applying the resistance factor to the nominal tip resistance gives a maximum factored tip resistance of 80 ksf. Due to several unpredictable factors, such as: the roughness of the shaft side wall after drilling and the rate of deterioration of the shale mass once exposed to the atmosphere, it is recommended that shaft side resistance be neglected. However, if side resistance is to be neglected it is important that quality construction practices are observed. For example, it is imperative that efficient clean-out methods at the base of the shaft rock socket are utilized to ensure all loose material is removed before concrete can be placed.

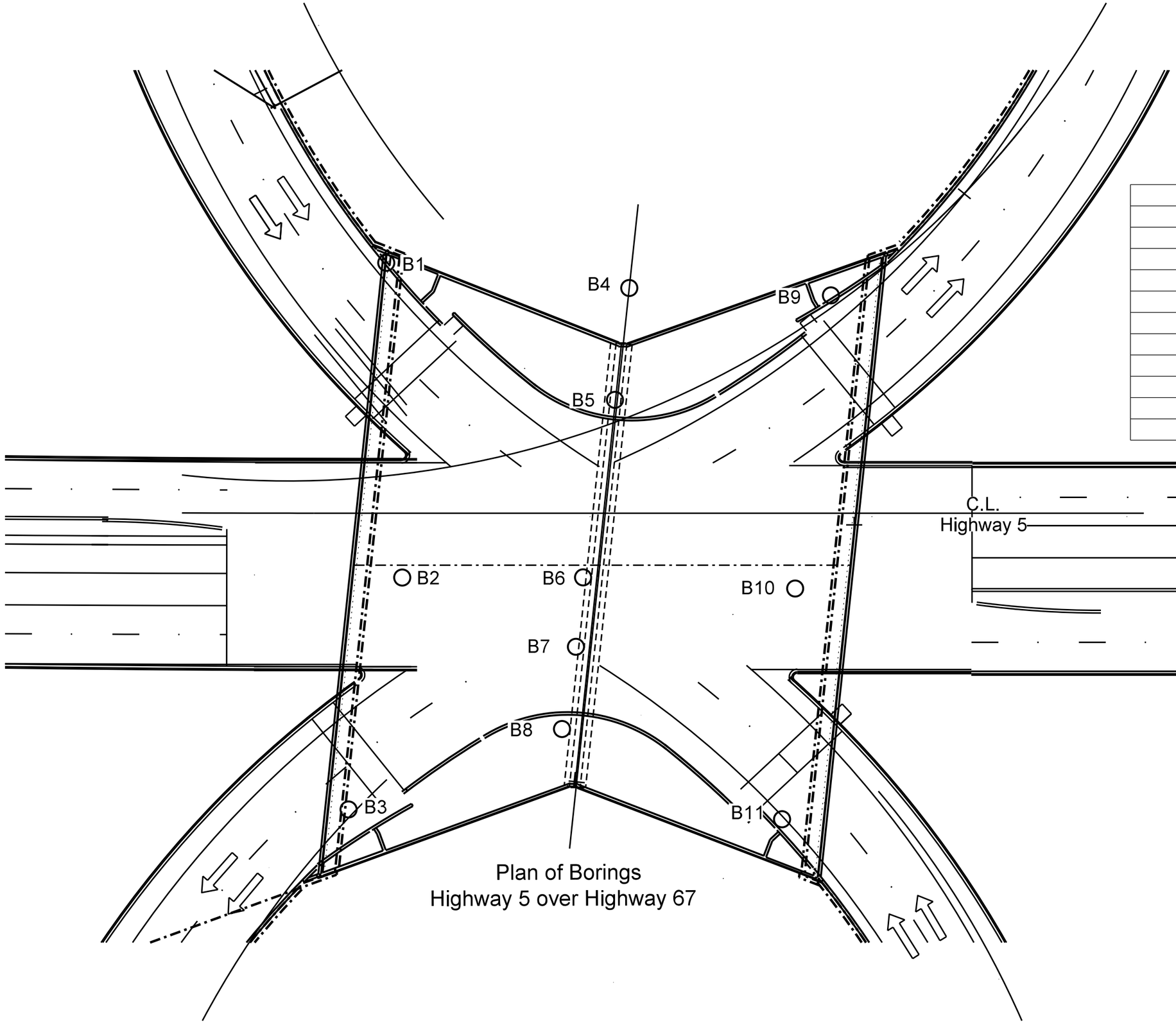
If you have any questions regarding these recommendations, please contact the Geotechnical Section.

Jonathan A. Annable
Materials Engineer

JAA:yz:mlg
cc: State Construction Engineer - Master File Copy
District 6 Engineer
G.C. File

Attachment A

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		CA0613		
PLAN OF BORINGS				



Plan of Borings
Highway 5 over Highway 67

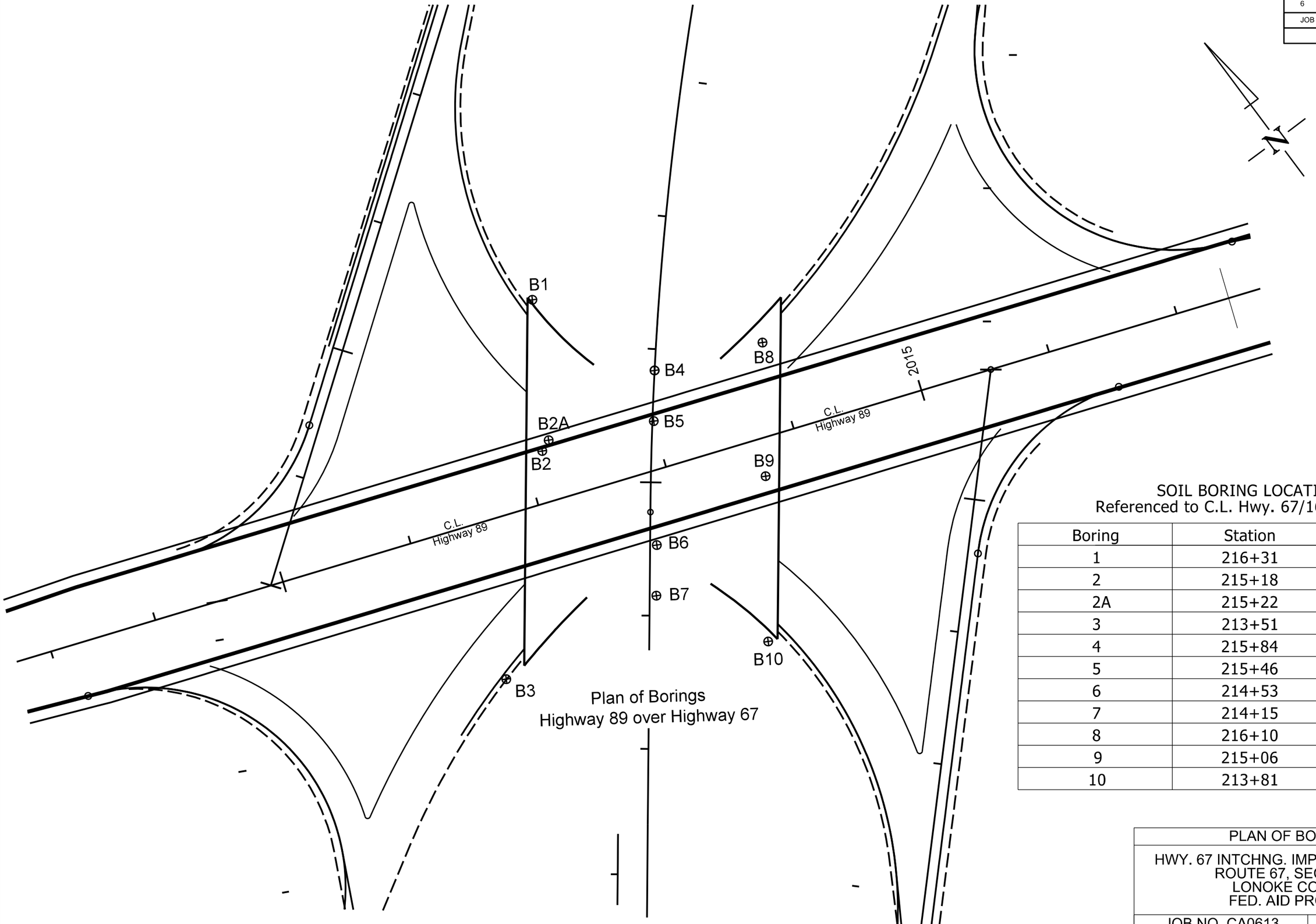
SOIL BORING LOCATIONS
Referenced to C.L. Hwy. 67/167 Alignment

Boring	Station	Offset
1	68+85	91' Left
2	67+69	73' Left
3	66+81	84' Left
4	68+58	CL
5	68+43	1' Left
6	67+76	CL
7	67+50	6' Left
8	67+19	8' Left
9	68+90	75' Right
10	67+80	73' Right
11	66+94	77' Right

PLAN OF BORINGS	
HWY. 67 INTCHNG. IMPVTS. (CABOT) (S) ROUTE 67, SECTION 11 LONOKE COUNTY FED. AID PROJECT	
JOB NO. CA0613	SHEET 2/2

Attachment B

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		CA0613		
PLAN OF BORINGS				



Plan of Borings
Highway 89 over Highway 67

SOIL BORING LOCATIONS
Referenced to C.L. Hwy. 67/167 Alignment

Boring	Station	Offset
1	216+31	95' Left
2	215+18	84' Left
2A	215+22	82' Left
3	213+51	107' Left
4	215+84	CL
5	215+46	1' Right
6	214+53	5' Right
7	214+15	5' Right
8	216+10	80' Right
9	215+06	85' Right
10	213+81	89' Right

PLAN OF BORINGS

HWY. 67 INTCHNG. IMPVTS. (CABOT) (S)
ROUTE 67, SECTION 11
LONOKE COUNTY
FED. AID PROJECT

JOB NO. CA0613 | SHEET 1/2

Attachment C

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-1
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+85
LOCATION: 91' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 16, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 278.2	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
			Clayey Sand	-					
5			Moist, Medium Dense, Reddish Brown Clayey Sand	-	●		5 7-10		
				-					
10			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-	●		16 33-42		
				-					
15				-	●		45 40 (2")		
				-					
20				-	●		20 37 (4")		
			SHALE - Weathered, Medium Hard, Dark Gray				15 (2")	100	0
25			SHALE - Slightly Weathered, Medium Hard, Frequent Fractures, Dark Gray					100	54
30			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray	-				100	76
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-1
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+85
LOCATION: 91' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 16, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.2

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: 278.2						
			SHALE - Unweathered, Medium Hard, Dark Gray					100	90
40								98	98
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-2
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+69
LOCATION: 73' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 18, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 278.1	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
			Moist, Very Stiff, Brown Clay with Some Gravel	-			1 5-11 13		
				-					
			Moist, Very Stiff, Brown Clay	-			11-12 5 10-13		
5				-			5 13-17		
			Dry, Very Hard, Brown Clay	-			15 24-43		
				-			24 54-25 (7")		
10				-			19 52-30 (8")		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-					
15				-			21 50 (2")		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray						
20			SHALE - Weathered, Medium Hard, Dark Gray				25 (1")		
			SHALE - Unweathered, Medium Hard, Dark Gray					97	80
25			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					100	96
30			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Dark Gray	-				100	94
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-2
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+69
LOCATION: 73' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 18, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.8

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: 278.1						
			SHALE - Unweathered, Medium Hard, Dark Gray					100	64
40								100	84
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-3
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+81
LOCATION: 84' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 19 and 23, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 42.7

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: 280.3						
			Moist, Loose, Reddish Brown Clayey Sand	-			4		
				-			4-3		
			Moist, Medium Dense, Reddish Brown Clayey Sand	-			3		
							3-4		
5							4		
							5-7		
			Moist, Very Stiff, Brown Clay	-			6		
							11-17		
			Dry, Very Hard, Brown Clay	-			26		
							47-45 (10")		
				-			26		
10				-			61 (4")		
							20		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			61 (5")		
15				-			33		
							61 (4")		
20			SHALE - Weathered, Medium Hard, Dark Gray				61 (4")		
								100	50
25								100	90
				-					
30								100	94
			SHALE - Unweathered, Medium Hard, Dark Gray						
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-3
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+81
LOCATION: 84' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 19 and 23, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 42.7

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: 280.3						
								100	96
40								94	90
			Boring Terminated						
45									
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-4
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+58
LOCATION: Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Campbell

DATE: August 12, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 278.2	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
			Clay						
5							5 7-10		
			Moist, Very Stiff, Light Brown Clay						
10							12 20-61 (11.5")		
								100	0
15			Dry, Very Hard, Light Brown Clay (Highly Weathered Shale)					48	0
20									
			SHALE - Highly Weathered, Soft, Brown					82	40
			SHALE - Weathered, Medium Hard, Dark Gray						
			SHALE - Slightly Weathered, Medium Hard, Dark Gray						
25								100	84
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Dark Gray						
30								100	80
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-4
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+58
LOCATION: Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Campbell

DATE: August 12, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44

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: 278.2						
			SHALE WITH FREQUENT SANDSTONE SEAMS AND LAYERS - Unweathered, Medium Hard, Dark Gray					96	80
40			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Dark Gray					100	100
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-5
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+43
LOCATION: 1' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Campbell

DATE: August 17, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 278.4	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
			Clayey Sand						
5			Moist, Stiff, Light Brown Clay with Trace Gravel				3 5-9		
10			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				8 28-44		
15							20 32-52		
20							23 62 (6")		
25			SHALE - Weathered, Medium Hard, Gray					42	0
30								100	60
35			SHALE WITH OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Dark Gray					100	94

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-5
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+43
LOCATION: 1' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Campbell

DATE: August 17, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.7

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
40			SURFACE ELEVATION: 278.4					100	96
45			SHALE WITH OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					96	68
50			Boring Terminated						
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-6
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+76
LOCATION: Centerline of Hwy 67/167
LOGGED BY: James Carson Sloan

DATE: August 24, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 41.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 279.5	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
			Sandy Silt with Some Gravel						
5			Moist, Soft, Reddish Brown Clay with Trace Gravel				2 2-2		
10			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				21 60 (6")		
15							19 59-23 (8")		
20			SHALE				60 (1")		
			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Slightly Weathered, Medium Hard, Dark Gray					71	55
25			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray					100	99
30			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray					100	100
35			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard,					100	82

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-6
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+76
LOCATION: Centerline of Hwy 67/167
LOGGED BY: James Carson Sloan

DATE: August 24, 2020
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 41.7

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
			Occasional Fractures, Dark Gray						
40			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					99	99
			Boring Terminated						
45									
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-7
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+50
LOCATION: 6' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Tierney

DATE: August 19 and 20, 2020
TYPE OF DRILLING: Hollow Stem Auger Diamond Core
EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 42.1

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: 279.3						
5			Moist, Medium Dense, Brown Clayey Sand with Trace Gravel				3 6-9		
10			Dry, Very Hard, Light Brown Clay (Highly Weathered Shale)				28 61 (6")	20	0
15								64	0
20			SHALE - Weathered with Occasional Highly Weathered Layers, Medium Hard with Occasional Soft Layers, Dark Gray					92	66
25								98	90
30			SHALE WITH OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Dark Gray					100	96
35								100	94

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-7
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+50
LOCATION: 6' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Tierney

DATE: August 19 and 20, 2020
TYPE OF DRILLING: Hollow Stem Auger Diamond Core
EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 42.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 279.3	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
40			SHALE WITH OCCASIONAL SANDSTONE SEAMS AND LAYERS - Unweathered, Medium Hard, Dark Gray					100	74
			Boring Terminated						
45									
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-8
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+19
LOCATION: 8' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Tierney

DATE: August 18 & 19, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 38.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 279.4	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 Clayey Sand with Trace Gravel				4 5-10		
10			Dry, Very Hard, Light Brown Clay (Highly Weathered Shale)				19 30-51		
15							37 60-61 (11")	28	0
20			SHALE WITH OCCASIONAL CLAY LAYERS - Weathered, Medium Hard with Occasional Soft Layers, Dark Gray					96	50
25			SHALE WITH OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Dark Gray					100	90
30								100	92
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-8
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+19
LOCATION: 8' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Tierney

DATE: August 18 & 19, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 38.5

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: 279.4						
			SHALE WITH OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					100	86
40			Boring Terminated						
45									
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-9
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+90
LOCATION: 75' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 277.2	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
			Wet, Very Loose, Reddish Brown Clayey Sand with Trace Gravel	-			1 2-2		
			Moist, Medium Dense, Reddish Brown Clayey Sand with Trace Gravel	-			4 5-8		
			Moist, Stiff, Brown Sandy Clay	-			3 6-7		
5			Moist, Very Stiff, Brown and Gray Clay with Sand	-			3 6-10		
				-			10 12-17		
			Moist, Hard, Brown Sandy Clay	-			9 15-24		
10			Dry, Very Hard, Brown Clay (Highly Weathered Shale)*	-			12 37-42		
			Dry, Very Hard, Brown Clay with Layers of Highly Weathered Shale	-			28 35 (2")		
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			39 61 (4")		
			SHALE - Highly Weathered, Medium Hard, Brown	-			19 61 (2")		
20			SHALE (No Sample Recovered)				12 (1")		
			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray					95	71
25			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					100	66
30			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Dark	-				100	100
35									

REMARKS: * Water level was measured at 11.6' bgl 17 hours after drilling.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-9
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+90
LOCATION: 75' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.6

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
			Gray					100	78
40			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray					100	100
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS: * Water level was measured at 11.6' bgl 17 hours after drilling.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-10
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+80
LOCATION: 73' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 8 and 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.8

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: 278.0						
			Moist, Medium Stiff, Sandy Clay with Trace Gravel	-			1		
			Moist, Medium Stiff, Reddish Brown Silty Clay with Trace Gravel	-			3-2		
			Moist, Stiff, Reddish Brown Silty Clay with Trace Gravel	-			1		
5			Moist, Very Stiff, Brown Sandy Clay with Trace Gravel	-			3-4		
			Moist, Hard, Brown Clay	-			1		
				-			4-6		
				-			6		
10			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			8-12		
				-			13		
				-			18-31		
				-			12		
15				-			21-40		
			SHALE - Highly Weathered, Medium Hard, Brown	-			15		
			SHALE - Weathered, Medium Hard, Dark Gray				48-40 (10")		
20			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Slightly Weathered, Medium Hard, Occasional Fractures, Dark Gray				28		
							61 (4")		
							67 (5")	88	70
25			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray				24	96	86
							61 (4")		
30				-			61 (5")	100	100
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-10
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+80
LOCATION: 73' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 8 and 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 278.0	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
			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					100	94
40			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					100	95
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-11
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+94
LOCATION: 77' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 8 and 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 277.3	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
			Moist, Medium Stiff, Sandy Clay with Trace Gravel	-			2 2-6		
			Moist, Stiff, Reddish Brown Sandy Clay	-			6 4-5		
			Moist, Medium Stiff, Reddish Brown Silty Clay	-			1 3-4		
5			Moist, Stiff, Brown Silty Clay	-			3 5-10		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			16 28-36		
				-			16 31-32		
10			Dry, Hard, Brown Sandy Clay with Some Gravel	-			7 13-31		
				-					
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			15 42-45 (11")		
				-					
15			SHALE - Highly Weathered, Medium Hard, Brown	-			27 61 (5")		
			SHALE - Weathered, Medium Hard, Dark Gray				12 (1") 15 (1")		
20									
			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray					90	75
25								92	86
30			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray	-				100	96
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-11
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+94
LOCATION: 77' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 8 and 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 277.3	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
			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					100	62
40			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					100	76
45								98	60
50			Boring Terminated						
55									
60									
65									
70									

REMARKS:

Rock Core Unconfined Compression Test Summary

Project Number: CA0613
Project Name: Hwy. 67 Intchng Impvts. (Cabot) (S)
Project Site: Hwy. 5 over Hwy. 67

Station	Location	Sample No.	Depth (ft.)	Diameter (in)	Height (in)	Total Load (lbs.)	Correction Factor	Stress (psi)	Remarks
68+58	C.L.	1	22.0	1.76	3.46	11,600	1.00	4,823	
68+58	C.L.	2	23.5	1.76	3.75	11,210	1.00	4,607	
68+58	C.L.	3	27.2	1.76	3.71	9,810	1.00	4,033	
68+58	C.L.	4	30.2	1.75	3.56	15,220	1.00	6,327	
68+58	C.L.	5	31.7	1.75	3.43	5,010	1.00	2,082	
68+58	C.L.	6	34.3	1.76	3.46	13,230	1.00	5,438	
68+43	1' Lt.	7	26.8	1.76	3.55	10,350	1.00	4,254	
68+43	1' Lt.	8	27.3	1.76	3.58	5,550	1.00	2,281	
68+43	1' Lt.	9	30.9	1.76	3.55	10,320	1.00	4,241	
68+43	1' Lt.	10	35.9	1.76	3.55	12,850	1.00	5,281	
68+43	1' Lt.	11	40.0	1.76	3.56	6,060	1.00	2,490	
67+76	C.L.	12	21.0	1.75	3.57	3,900	1.00	1,621	
67+76	C.L.	13	24.2	1.75	3.06	11,710	0.979	4,766	Broke before cut
67+76	C.L.	14	29.0	1.75	3.62	7,600	1.00	3,159	
67+76	C.L.	15	32.9	1.75	3.62	6,650	1.00	2,764	
67+76	C.L.	16	36.1	1.76	3.26	6,880	1.00	2,828	
67+50	6' Lt.	17	18.9	1.75	3.52	10,030	1.00	4,170	
67+50	6' Lt.	18	22.4	1.75	3.50	9,200	1.00	3,824	
67+50	6' Lt.	19	25.7	1.76	3.58	7,120	1.00	2,926	
67+50	6' Lt.	20	29.8	1.75	3.45	10,950	1.00	4,552	
67+50	6' Lt.	21	31.4	1.75	3.74	13,140	1.00	5,463	
67+50	6' Lt.	22	35.3	1.76	3.47	8,470	1.00	3,481	
67+19	8' Lt.	23	21.9	1.75	3.52	11,270	1.00	4,685	
67+19	8' Lt.	24	26.0	1.75	3.51	13,080	1.00	5,438	
67+19	8' Lt.	25	30.8	1.75	3.63	9,620	1.00	3,999	
67+19	8' Lt.	26	33.9	1.75	3.66	13,610	1.00	5,658	
67+19	8' Lt.	27	36.1	1.76	3.64	8,950	1.00	3,678	

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

ROCK MASS RATING SUMMARY

JOB # CA0613 Hwy 5 over Hwy. 67

SAMPLE #1

Station/Location	68+58/CL
Depth (ft.)	22.0
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*64*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #2

Station/Location	68+58/CL
Depth (ft.)	23.5
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	*73*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #3

Station/Location	68+58/CL
Depth (ft.)	27.2
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	*73*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #4

Station/Location	68+58/CL
Depth (ft.)	30.2
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	*73*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #5

Station/Location	68+58/CL
Depth (ft.)	31.7
	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 #6

Station/Location	68+58/CL
Depth (ft.)	34.3
	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 #7

Station/Location	68+43/1'LT
Depth (ft.)	26.8
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*74*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #8

Station/Location	68+43/1'LT
Depth (ft.)	27.3
	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 #9

Station/Location	68+43/1'LT
Depth (ft.)	30.9
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	*73*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #10

Station/Location	68+43/1'LT
Depth (ft.)	35.9
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	*73*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #11

Station/Location	68+43/1'LT
Depth (ft.)	40.0
	Relative Rating
Uniaxial Compressive Strength	2
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*62*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #12

Station/Location	67+76/6'LT
Depth (ft.)	21.0
	Relative Rating
Uniaxial Compressive Strength	2
RQD	20
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	*74*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #13

Station/Location	67+76/6'LT
Depth (ft.)	24.2
	Relative Rating
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	*76*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #14

Station/Location	67+76/6'LT
Depth (ft.)	29.0
	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 #15

Station/Location	67+76/6'LT
Depth (ft.)	32.9
	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 #16

Station/Location	67+76/6'LT
Depth (ft.)	36.1
	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 #17

Station/Location	67+50/6'LT
Depth (ft.)	18.9
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*74*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #18

Station/Location	67+50/6'LT
Depth (ft.)	22.4
	Relative Rating
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	*76*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #19

Station/Location	67+50/6'LT
Depth (ft.)	25.7
	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 #20

Station/Location	67+50/6'LT
Depth (ft.)	29.8
	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 #21

Station/Location	67+50/6'LT
Depth (ft.)	31.4
	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 #22

Station/Location	67+50/6'LT
Depth (ft.)	35.3
	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 #23

Station/Location	67+19/8'LT
Depth (ft.)	21.9
	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 #24

Station/Location	67+19/8'LT
Depth (ft.)	26.0
	Relative Rating
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*71*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #25

Station/Location	67+19/8'LT
Depth (ft.)	30.8
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	*73*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #26

Station/Location	67+19/8'LT
Depth (ft.)	33.9
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*68*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #27

Station/Location	67+19/8'LT
Depth (ft.)	36.1
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*68*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #28

Station/Location	
Depth (ft.)	
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	
Class Number	
Description	

SAMPLE #29

Station/Location	
Depth (ft.)	
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	
Class Number	
Description	

SAMPLE #30

Station/Location	
Depth (ft.)	
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	
Class Number	
Description	

SAMPLE #31

Station/Location	
Depth (ft.)	
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	
Class Number	
Description	

SAMPLE #32

Station/Location	
Depth (ft.)	
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	
Class Number	
Description	

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-1
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 216+31
LOCATION: 95' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 17 and 21, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 38.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 301.3	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, Brown, Stiff, Brown Clay with Trace Gravel				3 7-6		
10			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				17 40 (5")		
15			Clay (Highly Weathered Shale) with Occasional Sandstone Layers					7	0
20			SHALE WITH FREQUENT SANDSTONE SEAMS - Weathered, Medium Hard, Brown and Dark Gray					36	0
25			SHALE - Unweathered, Medium Hard, Dark Gray					100	94
30			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray					96	86
35								98	96

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-1
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 216+31
LOCATION: 95' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 17 and 21, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 38.5

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: 301.3						
			SHALE WITH OCCASIONAL SANDSTONE SEAMS AND LAYERS - Unweathered, Medium Hard, Dark Gray					100	100
40			Boring Terminated						
45									
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-2
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+18
LOCATION: 84' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 24, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 15

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: 298.9						
5			Moist, Medium Stiff, Brown Clay with Trace Organic Matter				2 3-5		
10			Moist, Very Hard, Brown Clay				5 25-37		
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				8 19-42		
			Boring Terminated						
20									
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-2A
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+22
LOCATION: 82' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Tierney

DATE: September 28, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 299.2	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, Loose, Brown Clayey Sand				3 4-5		
10			Hard, Dry, Brown Clay (Highly Weathered Shale)				8 17-24		
15			SHALE - Highly Weathered, Medium Hard, Brown and Gray				22 40-40		
20							17 52-35 (8")		
			SHALE - Weathered to Highly Weathered, Medium Hard, Brown and Gray					35	0
25			SHALE - Unweathered, Medium Hard, Dark Gray					100	84
30								70	54
35			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray						

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-2A
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+22
LOCATION: 82' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Tierney

DATE: September 28, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.7

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: 299.2						
								100	72
40									
			SHALE - Unweathered, Medium Hard, Dark Gray					100	96
45									
								100	100
50			Boring Terminated						
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-3
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 213+51
LOCATION: 107' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 29, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 42.9

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: 292.3						
5			Moist, Stiff, Brown Clay				1 5-8		
10							16 42-44 (10")		
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				25 35-35		
20									
			SHALE - Weathered, Medium Hard, Gray				61 (4")		
			SHALE - Unweathered, Medium Hard, Dark Gray					100	100
25								100	84
			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray						
30								100	82
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-3
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 213+51
LOCATION: 107' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 29, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 42.9

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: 292.3						
			SHALE WITH FREQUENT SANDSTONE LAYERS - Unweathered, Medium Hard, Dark Gray					100	90
40			SHALE - Unweathered, Medium Hard, Dark Gray					100	100
			Boring Terminated						
45									
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-4
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JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+84
LOCATION: Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Campbell

DATE: August 4 and 5, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 298.2	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, Stiff, Brown Clay with Trace Gravel				2 5-6		
10			Dry, Hard, Brown Clay (Highly Weathered Shale)				11 20-38		
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				13 37-50		
20			SHALE - Highly Weathered with Weathered Layers, Soft with Medium Hard Layers, Brown and Gray					37 80	0 0
25			SHALE - Unweathered, Medium Hard, Dark Gray					100	90
30			SHALE WITH OCCASIONAL SANDSTONE LAYERS - Unweathered, Medium Hard, Dark Gray					96	68
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-4
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+84
LOCATION: Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Campbell

DATE: August 4 and 5, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 298.2	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
40			SHALE - Unweathered, Medium Hard, Dark Gray					100	60
								96	74
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-5
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+46
LOCATION: 1' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: August 3 and 4, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.5

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: 297.1						
5			Moist, Stiff, Brown Clay with Trace Gravel				2 3-7		
10			Moist, Hard, Brown Clay				7 22-36		
			Dry, Hard, Brown Clay (Highly Weathered Shale)				16 16-20		
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				7 51-50 (8")	36	0
20			SHALE - Weathered with Highly Weathered Layers, Medium Hard with Soft Layers, Gray					76	20
25								90	80
30			SHALE - Unweathered, Medium Hard, Dark Gray					96	60
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-5
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+46
LOCATION: 1' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: August 3 and 4, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 297.1	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
								96	70
40			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					90	84
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-6
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 214+53
LOCATION: 5' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman - Paul Campbell

DATE: August 10, 2022
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 38.2

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: 294.7						
			Sandy Clay						
5							2 / 3-8		
			Moist, Stiff, Brown Clay with Some Sand						
10			Moist, Very Hard, Brown Clay (Highly Weathered Shale)				14 / 57-60		
			Moist, Very Hard, Brown Clay with Occasional Highly Weathered Shale Layers					61	0
15			SHALE WITH OCCASIONAL CLAY SEAMS - Highly Weathered, Medium Hard with Occasional Soft Layers, Brown					72	0
20			SHALE - Weathered with Highly Weathered Layers, Medium Hard with Soft Layers, Dark Gray						
			SHALE - Unweathered, Medium Hard, Dark Gray					100	80
25								100	86
			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray						
30								100	100
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-6
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 214+53
LOCATION: 5' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman - Paul Campbell

DATE: August 10, 2022
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 38.2

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: 294.7						
			SHALE - Unweathered, Medium Hard, Dark Gray					100	78
			Boring Terminated						
40									
45									
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-7
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 214+15
LOCATION: 5' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: August 5, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.9

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 293.4	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
			Moist, Stiff, Brown Clay with Trace Gravel						
5							2 4-6		
			Clay with Gravel and Cobbles						
			Clay						
10			Moist, Hard, Brown Clay				5 17-21		
			Dry, Hard, Brown Clay (Highly Weathered Shale)						
15							31 62 (6")		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)					45	0
20									
			Dry, Very Hard, Brown Clay (Highly Weathered Shale) *						
			SHALE - Weathered, Medium Hard, Dark Gray					52	8
25			SHALE WITH OCCASIONAL SANDSTONE SEAMS AND LAYERS - Slightly Weathered, Medium Hard, Dark Gray					98	98
30									
								98	84
35			SILTSTONE - Unweathered,						

REMARKS: * Multiple runs made to complete a full run from 19.9' - 24.9' due to core barrel blocking off.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-7
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 214+15
LOCATION: 5' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: August 5, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.9

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: 293.4						
			Medium Hard, Dark Gray						
								97	76
40									
								98	98
45									
			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS: * Multiple runs made to complete a full run from 19.9' - 24.9' due to core barrel blocking off.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-8
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 216+10
LOCATION: 80' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 49.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 299.6	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
			Moist, Medium Stiff to Stiff, Brown Sandy Clay with Gravel				4 7-5 3 4-4		
5							1 2-3		
			Moist, Stiff, Brown Sandy Clay Gravel				4 5-10		
10			Moist, Very Stiff, Reddish Brown Clay				4 11-21		
			Dry, Very Stiff, Brown Clay (Highly Weathered Shale)						
15							12 21-36		
			Dry, Hard, Brown Clay (Highly Weathered Shale)						
20							40 61 (4")		
			SHALE - Highly Weathered, Medium Hard, Gray						
			SHALE - Slightly Weathered, Medium Hard, Occasional Fractures, Dark Gray					54	50
25									
			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					100	48
30									
			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					98	72
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-8
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 216+10
LOCATION: 80' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 49.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 299.6	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
			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					80	55
40			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					96	90
45								94	94
50			Boring Terminated						
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-9
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+06
LOCATION: 85' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 8, 2020
TYPE OF DRILLING: Hollow Stem Auger -

EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 296.3	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
			Moist, Loose, Brown Clayey Sand with Trace Gravel				1 3-6		
			Moist, Stiff, Brown Clay with Some Shale Fragments				5 7-8		
5			Moist, Medium Stiff, Brown Sandy Clay				1 3-5		
							3 4-7		
10			Moist, Stiff to Very Stiff, Brown Sandy Clay with Some Gravel				5 9-13		
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				62 (5")		
20			SHALE - Highly Weathered, Medium Hard, Brown and Gray				25 (4")		
								88	74
25								92	88
30			SHALE - Unweathered, Medium Hard, Dark Gray					100	100
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-9
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+06
LOCATION: 85' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 8, 2020
TYPE OF DRILLING: Hollow Stem Auger -

EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 296.3	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
								90	80
40			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray						
			SANDSTONE - Unweathered, Cemented, Occasional Fractures, Gray					94	58
45			SHALE WITH OCCASIONAL SANDSTONE LAYERS - Unweathered, Medium Hard, Occasional Fractures, Dark Gray						
			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-10
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 213+81
LOCATION: 89' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 1 and 3, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75/Acker 1779*

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 43.7

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: 292.4						
5			Moist, Soft, Brown Sandy Clay				1 1-2		
10			Dry, Hard, Brown Clay (Highly Weathered Shale)				4 15-19		
15							6 15-23		
20			SHALE - Highly Weathered, Medium Hard, Brown and Gray				60 (5")		
			SHALE - Slightly Weathered, Medium Hard, Dark Gray					70	50
25			SHALE WITH OCCASIONAL SANDSTONE LAYERS - Slightly Weathered, Medium Hard, Occasional Fractures, Dark Gray					100	80
30								90	56
35									

REMARKS: * Boring began with CME 75 and finished with Acker 1779.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-10
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 213+81
LOCATION: 89' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 1 and 3, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75/Acker 1779*

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 43.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 292.4	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
			SHALE - Slightly Weathered, Medium Hard, Dark Gray					100	70
40								100	100
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS: * Boring began with CME 75 and finished with Acker 1779.

Rock Core Unconfined Compression Test Summary

Project Number: CA0613
Project Name: Hwy. 67 Intchng. Impvts. (Cabot) (S)
Project Site: Hwy. 89 over Hwy. 67.

Station	Location	Sample No.	Depth (ft.)	Diameter (in)	Height (in)	Total Load (lbs.)	Correction Factor	Stress (psi)	Remarks
214+53	5' Rt.	1	19.1	1.75	3.08	4,240	1.00	1,762	
214+53	5' Rt.	2	20.9	1.75	3.84	6,550	1.00	2,732	
214+53	5' Rt.	3	24.4	1.75	2.14	N/A	N/A	N/A	Broke before testing
214+53	5' Rt.	4	28.4	1.75	3.60	6,600	1.00	2,744	
214+53	5' Rt.	5	32.9	1.75	3.58	N/A	N/A	N/A	Broke before testing
214+15	5' Rt.	6	25.2	1.75	3.62	2,772	1.00	1,151	
214+15	5' Rt.	7	29.8	1.75	3.66	10,940	1.00	4,548	
214+15	5' Rt.	8	34.7	1.75	3.62	1,550	1.00	644	
214+15	5' Rt.	9	38.2	1.75	3.68	3,480	1.00	1,446	
215+46	1' Rt.	10	25.3	1.75	3.61	4,760	1.00	1,979	
215+46	1' Rt.	11	30.5	1.75	3.08	N/A	N/A	N/A	Broke before testing
215+46	1' Rt.	12	33.5	1.75	2.98	N/A	N/A	N/A	Broke before testing
215+46	1' Rt.	13	35.9	1.75	3.00	N/A	N/A	N/A	Broke before testing
215+46	1' Rt.	14	37.5	1.76	3.66	5,410	1.00	2,249	
215+84	C.L.	15	24.8	1.75	3.58	N/A	N/A	N/A	Broke before testing
215+84	C.L.	16	29.5	1.75	3.66	N/A	N/A	N/A	Broke before testing
215+84	C.L.	17	33.3	1.75	N/A	N/A	N/A	N/A	Broke before testing
215+84	C.L.	18	37.1	1.75	N/A	N/A	N/A	N/A	Broke before testing
215+84	C.L.	19	38.9	1.75	3.72	3,600	1.00	1,497	

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

ROCK MASS RATING SUMMARY

JOB # CA0613 Hwy 89 OP

SAMPLE #1

Station/Location	214+53/5'RT
Depth (ft)	19.1
	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 #2

Station/Location	214+53/5'RT
Depth (ft)	20.9
	Relative Rating
Uniaxial Compressive Strength	2
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*66*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #3

Station/Location	214+53/5'RT
Depth (ft)	24.4
	Relative Rating
Uniaxial Compressive Strength	NT/Broke
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*64*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #4

Station/Location	214+53/5'RT
Depth (ft)	28.4
	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 #5

Station/Location	214+53/5'RT
Depth (ft)	32.9
	Relative Rating
Uniaxial Compressive Strength	NT/Broke
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*64*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #6

Station/Location	214+15/5'RT
Depth (ft)	25.2
	Relative Rating
Uniaxial Compressive Strength	1
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*78*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #7

Station/Location	214+15/5'RT
Depth (ft)	29.8
	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 #8

Station/Location	214+15/5'RT
Depth (ft)	34.7
	Relative Rating
Uniaxial Compressive Strength	1
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*75*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #9

Station/Location	214+15/5'RT
Depth (ft)	38.2
	Relative Rating
Uniaxial Compressive Strength	1
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*78*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #10

Station/Location	215+46/1'RT
Depth (ft)	25.3
	Relative Rating
Uniaxial Compressive Strength	2
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*66*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #11

Station/Location	215+46/1'RT
Depth (ft)	30.5
	Relative Rating
Uniaxial Compressive Strength	NT/Broke
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*60*
Class Number	**III**
Description	**FAIR ROCK**

SAMPLE #12

Station/Location	215+46/1'RT
Depth (ft)	33.5
	Relative Rating
Uniaxial Compressive Strength	NT/Broke
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	*60*
Class Number	**III**
Description	**FAIR ROCK**

SAMPLE #13

Station/Location	215+46/1'RT
Depth (ft)	35.9
	Relative Rating
Uniaxial Compressive Strength	NT/Broke
RQD	13
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	*65*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #14

Station/Location	215+46/1'RT
Depth (ft)	37.5
	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 #15

Station/Location	215+84/CL
Depth (ft)	24.8
	Relative Rating
Uniaxial Compressive Strength	NT/Broke
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*74*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #16

Station/Location	215+84/CL
Depth (ft)	29.5
	Relative Rating
Uniaxial Compressive Strength	NT/Broke
RQD	13
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*70*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #17

Station/Location	215+84/CL
Depth (ft)	33.3
	Relative Rating
Uniaxial Compressive Strength	NT/Broke
RQD	13
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	*65*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #18

Station/Location	215+84/CL
Depth (ft)	37.1
	Relative Rating
Uniaxial Compressive Strength	NT/Broke
RQD	13
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*70*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #19

Station/Location	215+84/CL
Depth (ft)	38.9
	Relative Rating
Uniaxial Compressive Strength	2
RQD	13
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	*72*
Class Number	**II**
Description	**GOOD ROCK**

SAMPLE #20

Station/Location	
Depth (ft)	
	Relative Rating
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	
Class Number	
Description	

SAMPLE #21

Station/Location	
Depth (ft)	
	Relative Rating
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	
Class Number	
Description	

SAMPLE #22

Station/Location	
Depth (ft)	
	Relative Rating
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	
Class Number	
Description	

SAMPLE #23

Station/Location	
Depth (ft)	
	Relative Rating
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	
Class Number	
Description	

SAMPLE #24

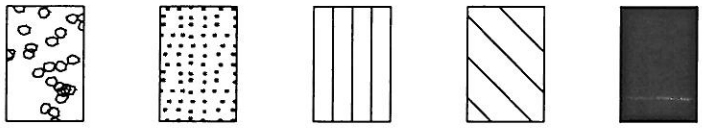
Station/Location	
Depth (ft)	
	Relative Rating
Uniaxial Compressive Strength	
RQD	
Spacing of Joints	
Condition of Joints	
Groundwater Conditions	
Sum	
Class Number	
Description	

LEGEND

SOIL TYPES

(SHOWN IN SYMBOL COLUMN)

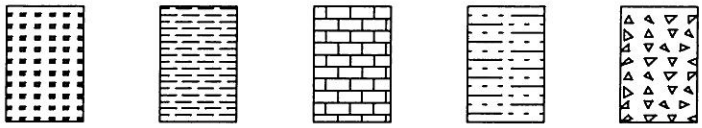
(PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL | SAND | SILT | CLAY | ORGANIC MATTER

ROCK TYPES

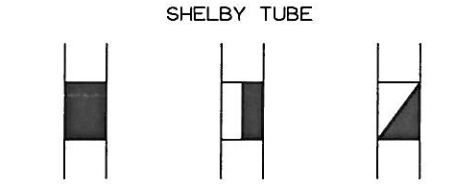
(SHOWN IN SYMBOL COLUMN)



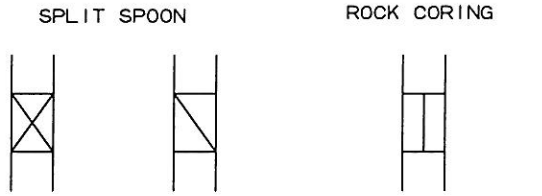
SANDSTONE | SHALE or SILTSTONE | LIMESTONE or DOLOMITE | ALTERNATING LAYERS of SHALE and SANDSTONE | OTHER

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.

Attachment D

Site-Specific Seismic Ground Motion Response Analysis (SSGMRA)
ArDOT Job No. CA0613
Jacksonville - Cabot (Widening & Intchng. Impvts.) (Sel. Secs.) (F)
Route 67, Sections 10 & 11
Lonoke & Pulaski Counties, Arkansas

Prepared for:

Arkansas Department of Transportation
Little Rock, Arkansas

Prepared by:

Geotechnology, Inc.
Memphis, Tennessee

Date:

April 2, 2021

Geotechnology Project No.:

J037967.01

SAFETY
QUALITY
INTEGRITY
PARTNERSHIP
OPPORTUNITY
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GEOTECHNOLOGY INC
FROM THE GROUND UP

April 2, 2021

Mr. Jonathan A. Annable
Materials Engineer
Arkansas Department of Transportation
10324 Interstate 40
Little Rock, Arkansas 72203-2261

Re: Site-Specific Seismic Ground Motion Response Analysis (SSGMRA)
ArDOT Job No. CA0613
Jacksonville - Cabot (Widening & Intchng. Impvts.) (Sel. Secs.) (F)
Lonoke & Pulaski Counties, Arkansas
Route 67, Sections 10 & 11
Geotechnology Project No. J037967.01

Dear Mr. Annable:

Presented in this report are the results of site-specific seismic ground motion response analyses completed for the referenced project based on the provided geotechnical data, measured shear-wave velocity data, and provisions of the AASHTO LRFD Bridge Design Specifications, 8th Edition (2017). Our services were performed in general accordance with the scope of work under Task Order No G008. Our services were authorized under the existing on-call contract with ArDOT.

We appreciate the opportunity to provide geotechnical services for this project. If you have any questions regarding this report, or if we can be of any additional service to you, please do not hesitate to contact us.

Respectfully submitted,
GEOTECHNOLOGY, INC.

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EXECUTIVE SUMMARY

The following executive summary is provided solely for the purpose of overview. A party who relies on this report should read each section.

- The project includes the replacement of three bridges along the alignment of U.S. 67 near Cabot, Arkansas in Lonoke and Pulaski County.
- Our scope of services included seismic shear wave testing at the general location of each bridge to develop shear wave velocity profiles and performing site-specific seismic ground motion response analyses to develop seismic design accelerations for the bridges.
- The site-specific seismic ground motion response analysis includes interpretation of the soil conditions based on provided soil information and developing general soil profiles for use in the seismic response analysis. If additional subsurface information is available, please provide this information to Geotechnology for review. Geotechnology may recommend revising the analysis if the additional subsurface information results in discrepancies in our interpretation of the soil conditions.
- Presented in Table 1 below is a summary of the results of code-based acceleration parameters for each site. Presented in Table 2 is a summary of the site-specific response results.

Table 1. Summary of Seismic Parameters Based on AASHTO Mapped Values

Period	Hwy 5 Over U.S. 67	U.S. 67 Over Two Prairie Creek	Hwy 89 Over U.S. 67
Average V_{s100} (ft/s)	1,985	1,532	3,300
AASHTO Site Class (Sec. 3.10.3.1 of AASHTO)	C		B
A_s (g) (Site-adjusted PGA)	0.201		0.168
S_{DS} (g) (0.2 sec)	0.43		0.359
S_{D1} (g) (1 Sec)	0.178		0.105
Seismic Performance Zone	2		1

Table 2. Summary of Site-Specific Response Results

Period	Hwy 5 Over U.S. 67	U.S. 67 Over Two Prairie Creek	State Hwy 89 Over U.S. 67
A_s (g) (Site-adjusted PGA)	0.277	0.328	0.262
S_{DS} (g) (0.2 sec)	0.405	0.857	0.393
S_{D1} (g) (1 Sec)	0.119	0.119	0.105
Seismic Performance Zone	1	1	1

SITE-SPECIFIC SEISMIC GROUND MOTION RESPONSE ANALYSIS (SSGMRA)
ROUTE 67, SECTIONS 10 & 11
LONOKE & PULASKI COUNTIES, ARKANSAS
April 2, 2021 | Geotechnology Project No. J037967.01

1.0 INTRODUCTION AND SCOPE OF WORK

Geotechnology, Inc. prepared this site-specific ground motion response analysis (SSGMRA) for the Arkansas Department of Transportation for Route 67, Sections 10 & 11, located in Lonoke & Pulaski Counties, Arkansas. The project includes the replacement of three bridges along the alignment of U.S. 67 near Cabot, Arkansas.

In general, the purpose of our services was to perform a site-specific seismic ground motion response analysis (SSGMRA) by developing shear wave velocity profiles at each bridge site, interpreting the soil conditions at each bridge site based on provided information, developing a target response spectrum using probabilistic seismic hazard analysis methods, selecting ground motions for use in a site response model of the site, and performing a one-dimensional ground motion analysis to determine the seismic response at the ground surface. It is our understanding the project will be designed in accordance with the AASHTO LRFD Bridge Design and Specifications (2017), herein referred to as AASHTO. Geotechnology has conducted the analysis based on the provided soil information, our interpretation of the soil information, and our experience with the current state of practice for site-specific ground motion response analyses. The reader should refer to the references in Section 7.0 for more details about the procedures used in this analysis.

A copy of "Important Information about This Geotechnical-Engineering Report," published by the Geotechnical Business Council (GBC) of the Geoprofessional Business Association (GBA), is included in Appendix A for your review. The publication discusses report limitations and ways to manage risk associated with subsurface conditions.

2.0 PROJECT AND SITE DESCRIPTION

The project site is near Cabot in Lonoke and Pulaski County, Arkansas as shown in Figure 1. The coordinates at each bridge site are also provided in Table 3. The project includes demolishing the existing bridges and constructing the new bridges. Site-specific seismic accelerations were requested for design of the new structures.

Figure 1. ArDOT CA0613 Bridge Locations

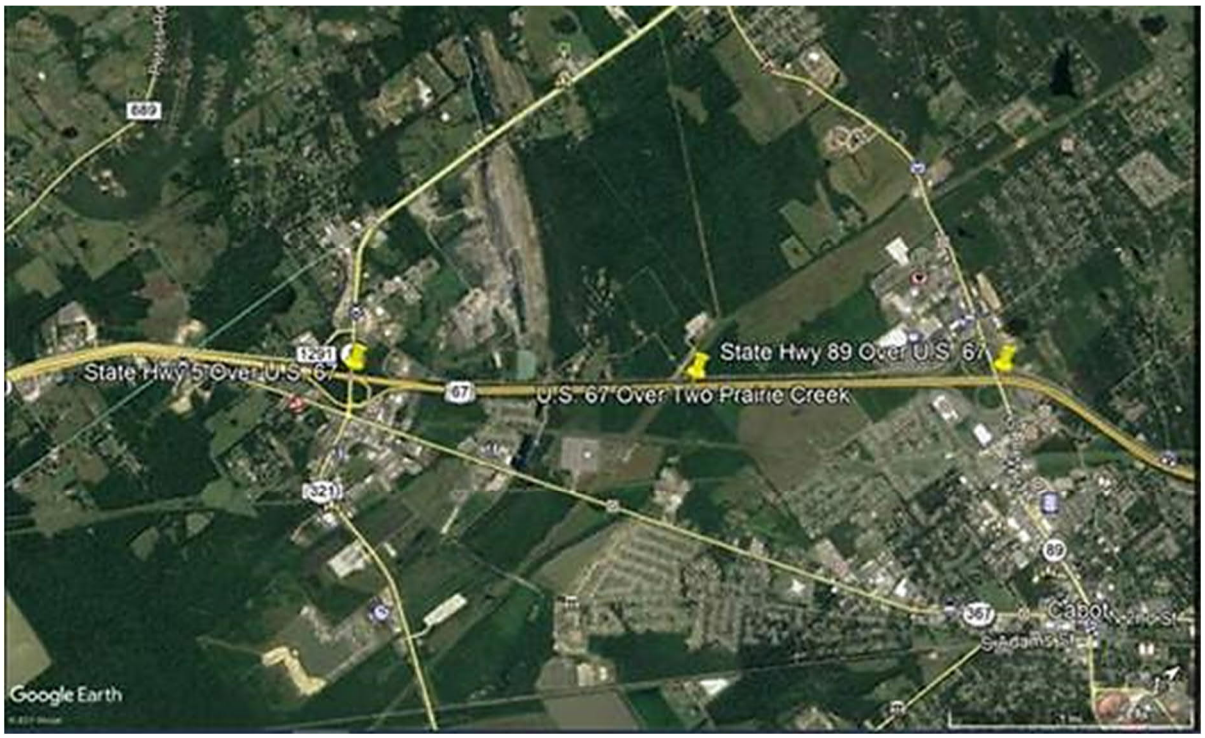


Table 3. Coordinates for Bridge Locations

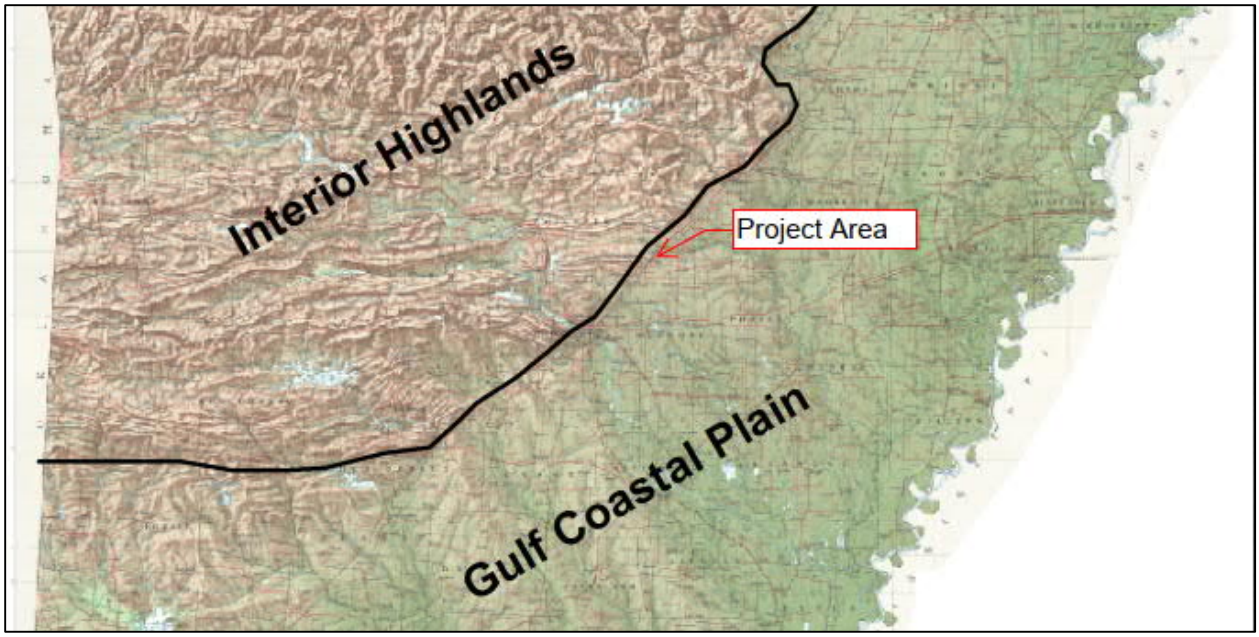
Location	Latitude	Longitude
State Highway 5 Over U.S. 67	34.948564	-92.064143
U.S. 67 Over Two Prairie Creek	34.964811	-92.047598
State Highway 89 Over U.S. 67	34.979947	-92.033640

3.0 GEOTECHNICAL INFORMATION

3.1 General Geology

Based on publicly available information from the USGS and Arkansas.gov websites, the physiographic region of the project site is on the western edge of the Gulf Coastal Plains near its boundary with the Interior Highlands (Ouachita Mountains) as shown in Figure 2.

Figure 2. General Geology of Project Area (from Arkansas.gov)



Based on general geologic maps of the area, the geology generally consists of Pleistocene alluvial clays, sands and gravels and undifferentiated clays and sands of Eocene age that overlay bedrock.

3.2 Provided Subsurface and Groundwater Information

Based on the provided preliminary boring logs, the general soil profile at the project site consists of stiff sandy clay underlain by weathered shale which becomes more competent with depth. The provided boring logs are presented in Appendix B. Field and laboratory test results presented on the preliminary boring logs include SPT blow counts, percent recovery and RQD of rock core samples, moisture content, Atterberg limits, grain size information, and compressive strength.

Groundwater was encountered generally around depths of 19 to 25 feet in the borings drilled at the U.S. 67 bridge over Two Prairie Creek. Groundwater was not noted on the boring logs for the other bridges. Groundwater levels will vary over time because of seasonal variations in precipitation, influence from Two Prairie Creek, and other factors.

3.3 Shear-Wave Velocity Profile

Our field services included performing a Multichannel Analysis of Surface Waves (MASW) survey. MASW surveying is a surface geophysical method used to determine a shear wave velocity profile. For this project a weighted average shear wave velocity profile was calculated to a depth of approximately 100 feet (Vs_{100}). This information was then used to assign a seismic Site Class per Section 3.10.3.1 of AASHTO LRFD Bridge Design Specifications (2017). The MASW survey was performed by recording surface seismic energy (in the form of Raleigh waves) produced by an “active” source (sledgehammer impact) and using ambient “passive” sources

such as vehicle traffic. The surface waves are detected by geophones and recorded using a seismograph. A shear wave velocity profile was constructed by analyzing plots of surface wave phase velocities versus frequencies through an inversion process. Geotechnology performed the MASW surveys on February 9 and 10, 2021 in the general vicinity of each bridge as shown in Figures 3 through 5.

Figure 3. Location of MASW Array – Highway 5 Over U.S. 67

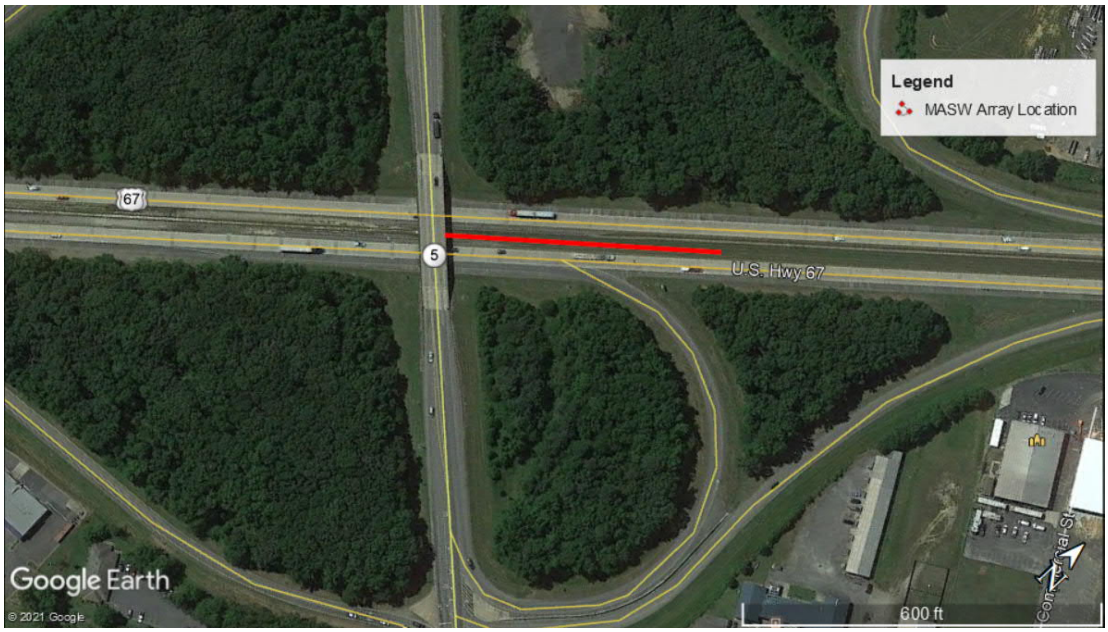


Figure 4. Location of MASW Array – U.S. 67 Over Two Prairie Creek

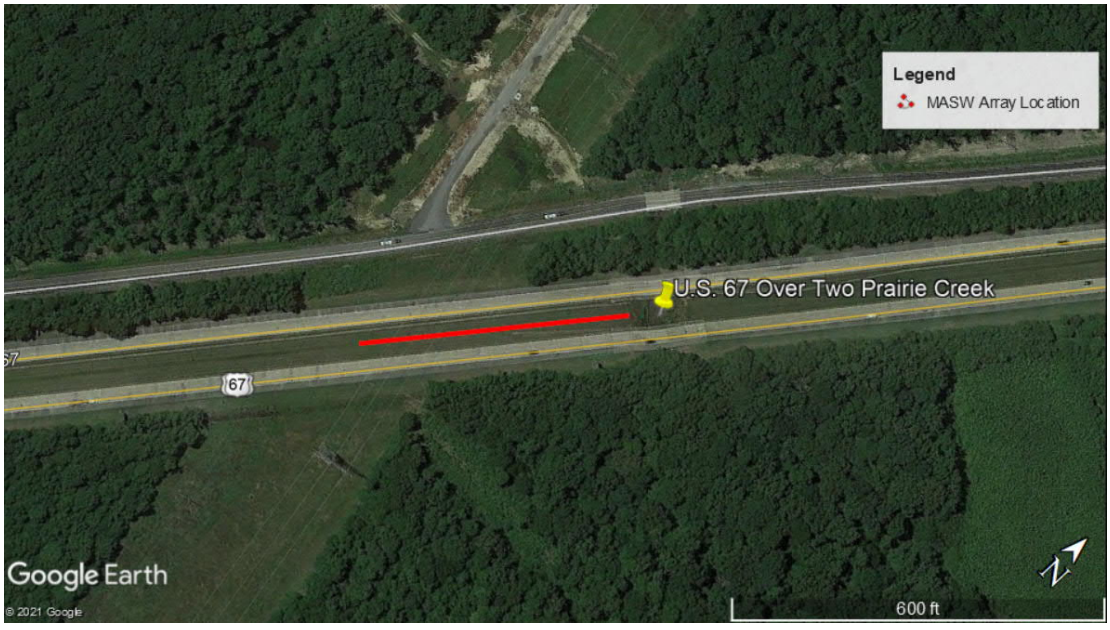
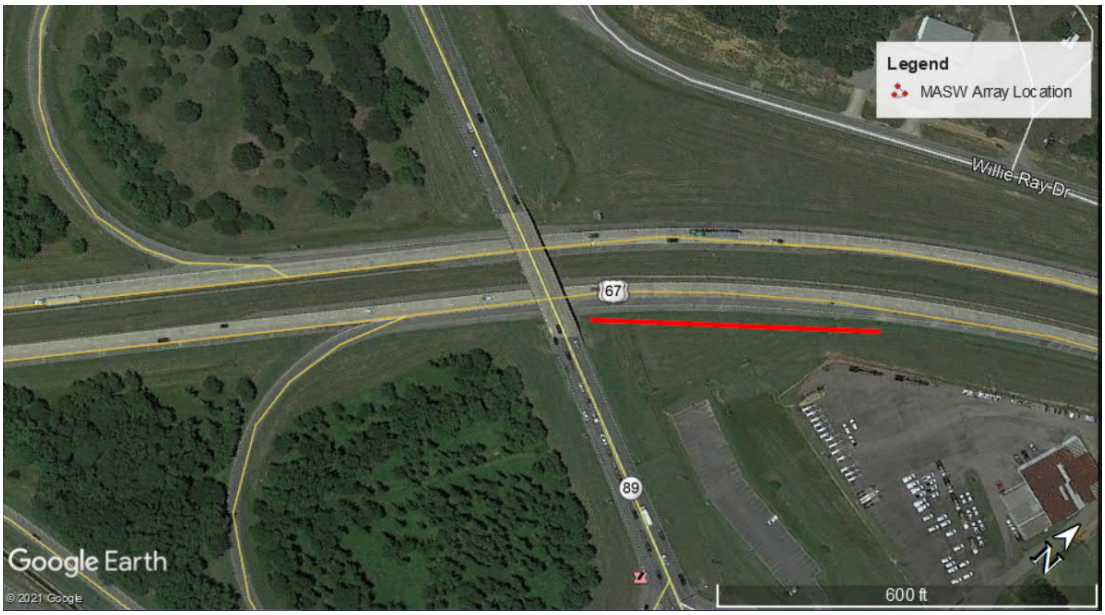


Figure 5. Location of MASW Array – Highway 89 Over U.S. 67



Each survey consisted of collecting active and passive data with a linear geophone array of 24 geophones. The active data were collected utilizing geophone spacings of 3 and 5 feet, with active shot locations at 9 to 60 feet from each end of the geophone array. The passive data were collected utilizing geophone spacings of 10 and 20 feet.

The MASW data were processed and modeled using ParkSEIS software. For each location, the passive data were combined with the active data to produce the shear wave velocity profile. Based on the processed MASW data, the AASHTO weighted average shear wave velocities measured for each bridge are presented in Table 4. Note that measured shear wave velocity in the upper 7 feet of the profile at Hwy 89 Over U.S. 67 was unusually high compared to the provided soil information. Since the measured shear wave values are not representative of the general soil conditions, the shear wave velocity in the upper 7 feet was reduced to reflect the general soil conditions. The adjusted average shear wave velocity is shown in Table 4, and the adjusted shear wave velocity values were used in our analysis.

Table 4. Average Shear Wave Velocity and AASHTO Site Classification

Location	Average Shear Wave Velocity	AASHTO Site Class
State Highway 5 Over U.S. 67	1,985	C
U.S. 67 Over Two Prairie Creek	1,532	C
State Highway 89 Over U.S. 67	3,300	B
State Highway 89 Over U.S. 67- Adjusted based on boring log interpretation	2,843	

Presented in Appendix C are the measured shear wave velocity profiles and average shear wave velocity in the upper 100 feet for each bridge site. The depth to rock based on shear wave velocity generally matches the depth to rock noted on the provided boring logs except for the U.S. 67 bridge over Two Prairie Creek. The shear-wave velocity at U.S 67 over Two Prairie creek indicated deeper bedrock than the boring logs. The top of bedrock does appear to be deeper from the north abutment (approximately 28 feet deep) to the south abutment (approximately 38 to 40 feet) and may be deeper at the MASW array located south of the south abutment. Additionally, based on some of the rock coring information, the upper 5 to 10 feet of rock is weathered which can result in lower shear-wave velocities.

4.0 SEISMIC BACKGROUND

The project site is located within the influence of the New Madrid Seismic Zone (NMSZ). The NMSZ was the source of several earthquakes that caused major destruction between December 16, 1811 and February 7, 1812. The estimated magnitudes of three of the major earthquakes near New Madrid, Missouri range from 6.8 to 8.1 (Bakun and Hopper). These three earthquakes are considered some of the largest since North America was settled.

Large earthquakes have occurred at intervals of approximately 200 to 800 years dating back to 900 A.D. based on sand blows, artifacts and radiocarbon dating, and other conditions studied in the NMSZ area (Tuttle). The recurrence period for large earthquakes in the NMSZ is estimated to be approximately 200 to 500 years. As such, the next occurrence of large earthquakes in the NMSZ could occur during the life of existing structures and structures currently being constructed.

5.0 RESPONSE SPECTRUM BASED ON AASHTO MAPPED VALUES

It is our understanding the proposed construction will be designed in accordance with AASHTO LRFD Bridge Design Specifications. AASHTO stipulates bridges be designed based an earthquake event with a probability of exceedance of 7% in 75 years (approximately 1,000-year return period). Based on the borings and the average shear wave velocity from the shear wave velocity surveys, the Highway 5 Bridge over U.S. 67 and the U.S. 67 Bridge Over Two Prairie Creek can be classified as Site Class C. The Highway 89 Bridge over U.S. 67 can be classified as Site Class B. Seismic parameters based on mapped values from AASHTO are presented in Table 5.

Table 5. Published Site Class and Seismic Parameters.

Category/ Parameter	Hwy 5 Over U.S. 67 / U.S. 67 Bridge Over Two Prairie Creek	Hwy 89 Over U.S. 67
	Site Class C	Site Class B
PGA (g)	0.168	0.168
F_{PGA}	1.2	1.0
A_s (g)	0.201	0.168
S_s (g)	0.359	0.359
F_a	1.2	1.0
S_{ds} (g)	0.43	0.359
S_1 (g)	0.105	0.105
F_v	1.695	1.0
S_{D1} (g)	0.178	0.105
S_{DC}	B	A
T_s (s)	0.413	0.292
T_0 (s)	0.083	0.058

6.0 SITE-SPECIFIC ANALYSIS AND RESULTS

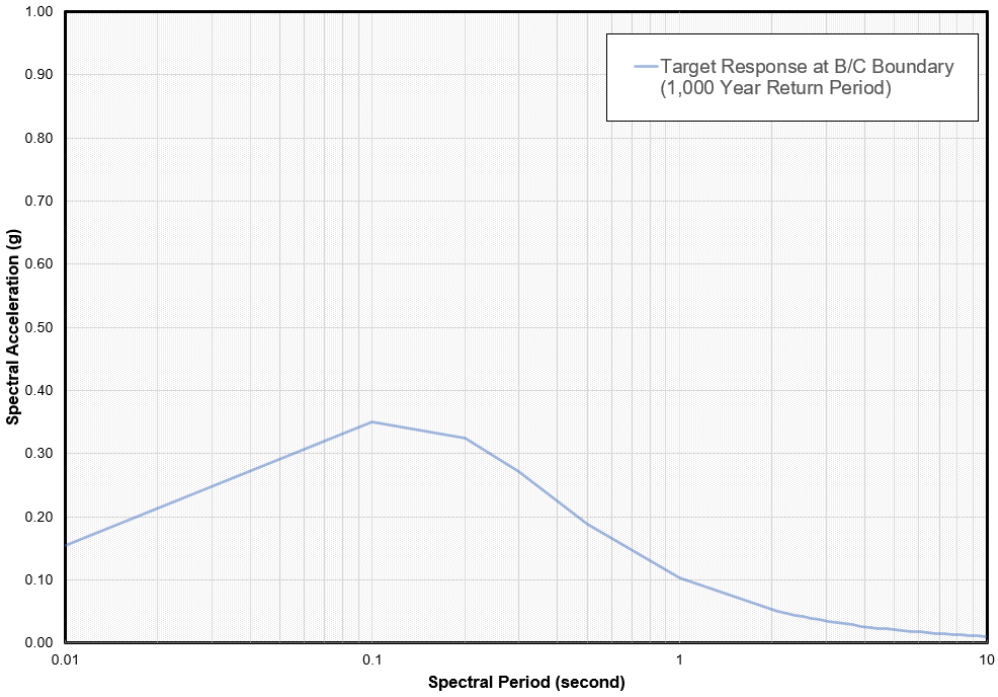
6.1 Overview

The AASHTO 2017 was used as the reference procedure for the site response analysis. Generally, the site-specific response analysis procedures in the AASHTO includes development of a target bedrock response spectrum, selecting recorded time histories and scaling and spectrally matching them to the target spectrum, and then calculating the surface response from bedrock motions propagated by the soil profile. A general soil profile was developed based on our interpretation of the provided boring logs, laboratory test data, review of local geologic information, the measured shear-wave velocity data, and our experience and judgement.

6.2 Target Spectrum Development

The site-specific target response spectrum was developed using the Unified Hazard Tool on the USGS website and the data developed for the AASHTO code. The coordinates for the Highway 89 Bridge over U.S. 67 were used for the target spectrum. Site Class B, i.e., weighted average shear-wave velocity of 2,500 feet per second, was used as the reference site condition to obtain the target response. The target spectrum is shown in Figure 6.

Figure 6. Target Response Spectrum at B/C Boundary – 1,000 Year Return Period



6.3 Hazard Analysis

The USGS Unified Hazard Tool provides probabilistic seismic hazard analysis (PSHA) data, which represents the probability of an earthquake occurring at a given site and the earthquake magnitude. Based on deaggregation data for peak ground acceleration (PGA) and 7 percent probability of exceedance in 75 years (1,000 return period required by AASHTO), the New Madrid Seismic Zone (NMSZ) is the primary contribution to seismic hazards, and generally includes earthquakes with a magnitude 7.7 at a distance of about 138 kilometers (86 miles). Deaggregation of PSHA data was also performed for other spectral periods, and the NMSZ was the primary contributor to seismic hazards at those periods. Presented in Table 6 is an example of the deaggregation data for the Highway 89 over U.S. 67 bridge site for selected periods.

Table 6. Example Deaggregation Data for Hwy 89 Over U.S. 67

Period	Magnitude			Distance (km)		
	Mean	Mode (m-r)	Mode (m-r-ε)	Mean	Mode (m-r)	Mode (m-r-ε)
PGA	7.18	7.7	7.7	118.02	137.99	137.99
0.2	7.31	7.7	7.7	127.87	137.99	137.99
0.5	7.48	7.7	7.7	144.42	137.99	137.99
1.0	7.52	7.7	7.7	155.95	137.99	137.99
2.0	7.56	7.7	7.7	166.83	137.99	137.99

6.4 Time History Selection, Scaling and Matching

Time Histories. Five earthquakes consisting of orthogonal direction pairs of acceleration time histories (e.g. north-south and east-west direction records) were selected based on the target spectrum and the deaggregation data. The ground motions were selected using the Pacific Earthquake Engineering Research Center NGA West-2 ground motion database and the database developed for the Central and Eastern United States by the Nuclear Regulatory Committee (NUREG). Strong ground motion time histories for the magnitude and distance combinations for central and eastern United States sites near the NMSZ have not been recorded. Therefore, these databases are typically used to select times histories with similar characteristics to the governing earthquake at each period as determined from the deaggregation data discussed in the previous section. Selected ground motions are from earthquakes with magnitudes ranging from 6.9 to 7.6 at distances of 124 to 152 km. A summary of the selected time histories is provided in Table 7.

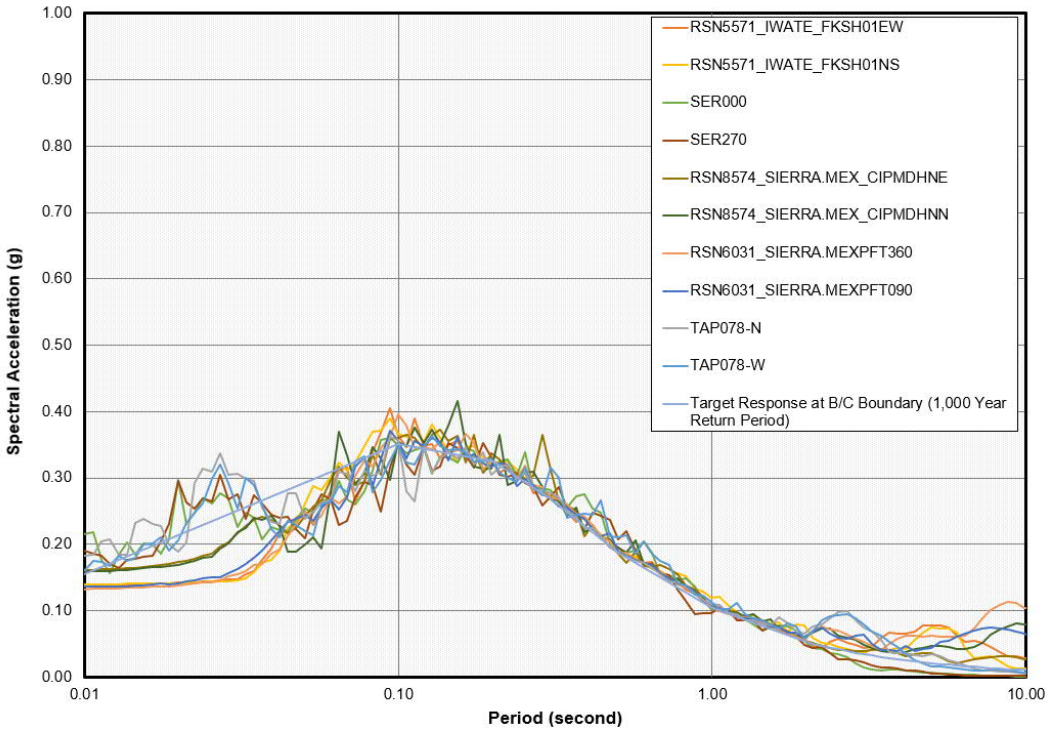
Table 7. Input Time Histories

Database	Event	Mag.	Distance (km)[a]	PGA (g)	Acceleration Record filename
NUREG	Chi Chi Taiwan	7.6	131	0.088	TAP078-N
				0.094	TAP078-W
	Landers	7.3	131.4	0.095	SER000
				0.121	SER270
PEER NGAWest2	Iwate Japan	6.9	152.5	0.0068	RSN5571_IWATE_FKSH01NS
				0.0087	RSN5571_IWATE_FKSH01EW
	El Mayor-Cucapha, Mexico	7.2	124.4	0.014	RSN6031_SIERRA.MEXPFT360
				0.013	RSN6031_SIERRA.MEXPFT090
	El Mayor-Cucapha, Mexico	7.2	124.8	0.014	RSN8574_SIERRA.MEX_CIPMDHNN
				0.029	RSN8574_SIERRA.MEX_CIPMDHNE

[a] Joyner-Boore Distance

Time histories were scaled to the target spectrum PGA and spectrally matched to the target spectrum. The displacement, velocity, and acceleration time histories of the original and matched motions were evaluated to check that reasonable matching was obtained. Presented in Figure 7 are the spectrally matched motions with the design target spectrum shown for reference.

Figure 7. Scaled and Spectrally Matched Input Motions to Target Spectrum



6.5 Site Response Analysis

Site Response Analysis. The one-dimensional site response computer software DEEPSOIL v7 was used to compute site response of input bedrock motions. Equivalent linear analyses were used to determine the response accelerations at the surface. Nonlinear analysis methods were also performed using DEEPSOIL; however, equivalent linear methods were considered more appropriate for this site as large strains are not anticipated based on the stiffness of the soil profile and relatively low seismic input motions. Per Kramer (1996), for sites where the anticipated strain levels remain low, i.e. sites with stiff soil profiles and/or relatively weak input motions, equivalent linear analyses can produce reasonable estimates of the ground response. Additionally, per Cox, Ellis and Griffiths (2012), nonlinear analyses are preferred when large strains are expected.

Soil Properties. Geotechnology reviewed the provided soil information and developed generalized soil profiles for each bridge site. The soil properties required for the analysis depend on the soil type and the selected normalized modulus reduction and damping curves, but typically include unit weight, shear wave velocity, shear strength parameters, plasticity index (PI) (for clay/silt), overconsolidation Ratio (OCR), and at-rest earth pressure coefficient. Modulus reduction and damping ratio curves developed by Darendeli (2001) were used for sands, and curves developed by Vucetic & Dobry (1991) were used for clays and silts. Weathered shale above the estimated B/C boundary was modeled using a very dense sand model. In DEEPSOIL, the GQ/H model was selected which performs implied shear strength corrections using a shear-strain dependent curve-fitting function (Groholski et. Al. 2015 and 2016).

Shear Wave Velocity Profiles. Presented in Appendix D are the generalized shear wave velocity profiles for each bridge used in the SSGMRA, indicated as the mean profile. Also, 60 randomized shear wave velocity profiles and the logmean of the random profiles are included in Appendix D. The random profiles were generated using the Toro (1995) model. The depth to rock (B/C Boundary) at each bridge was selected based on our interpretation of the provided boring logs and the measured shear wave velocities. Presented in Table 8 is the depth of rock used in the analyses.

Table 8. Estimated Rock Depth for SSGMR

Location	Estimated Depth to Bedrock (V_s = 2,500 ft/s) (feet)
State Highway 5 Over U.S. 67	25
U.S. 67 Over Two Prairie Creek	40
State Highway 89 Over U.S. 67- Adjusted based on boring log interpretation	24

The software output represents surface ground motions after amplification effects of bedrock motions by the soil column. Sixty profiles with randomized shear wave velocities and layer thicknesses were considered in our analysis (refer to Appendix D). The Toro (1995) method is used in the DEEPSOIL software to model randomization of layer thickness and shear wave velocity.

Site-Specific Results. Per the procedure outlined in AASHTO Guide Specifications for Seismic Bridge Design, the results of the equivalent linear analysis at each bridge were used to calculate spectral ratios of the input rock motions and the ground surface motions. The average spectral ratios were then multiplied by the Site Class B acceleration response spectrum to calculate the site-specific seismic response spectrum at each bridge. However, based on Section 3.10.2.2 of AASHTO LRFD, the design values shall not be lower than two-thirds of the code-based design response spectra. The design response spectrums for each bridge are shown in Figure 8, Figure 9, and Figure 10.

Figure 8. Response Spectrum – Hwy 5 Over U.S. 67 – Site Class C

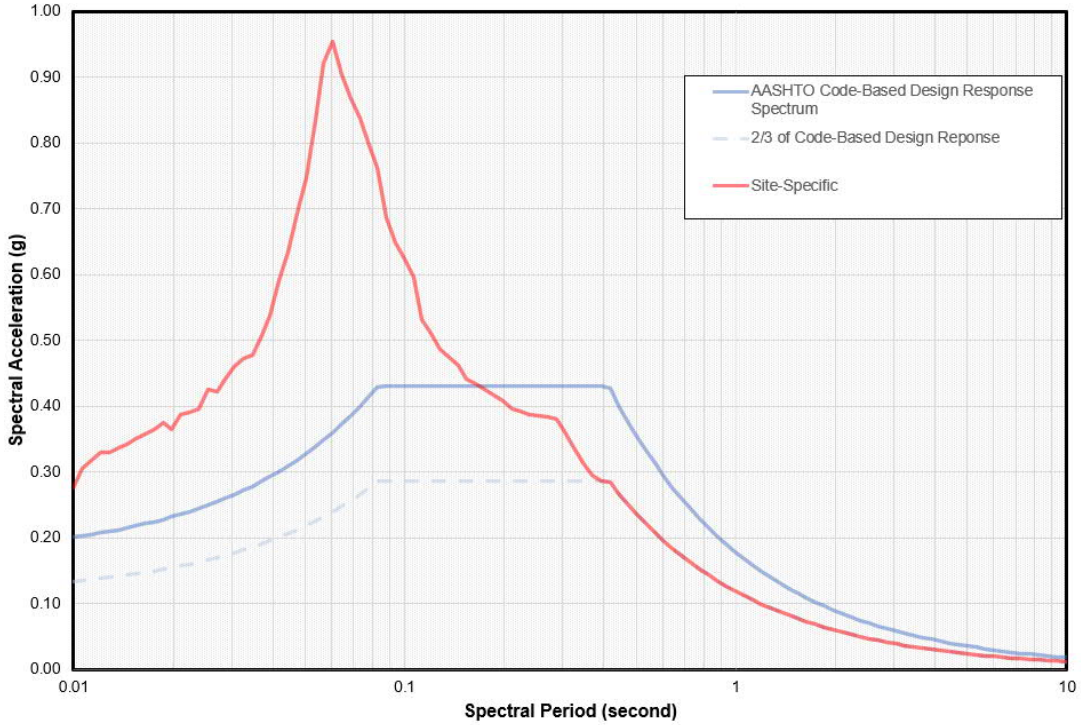


Figure 9. Response Spectrum – U.S. 67 Over Two Prairie Creek – Site Class C

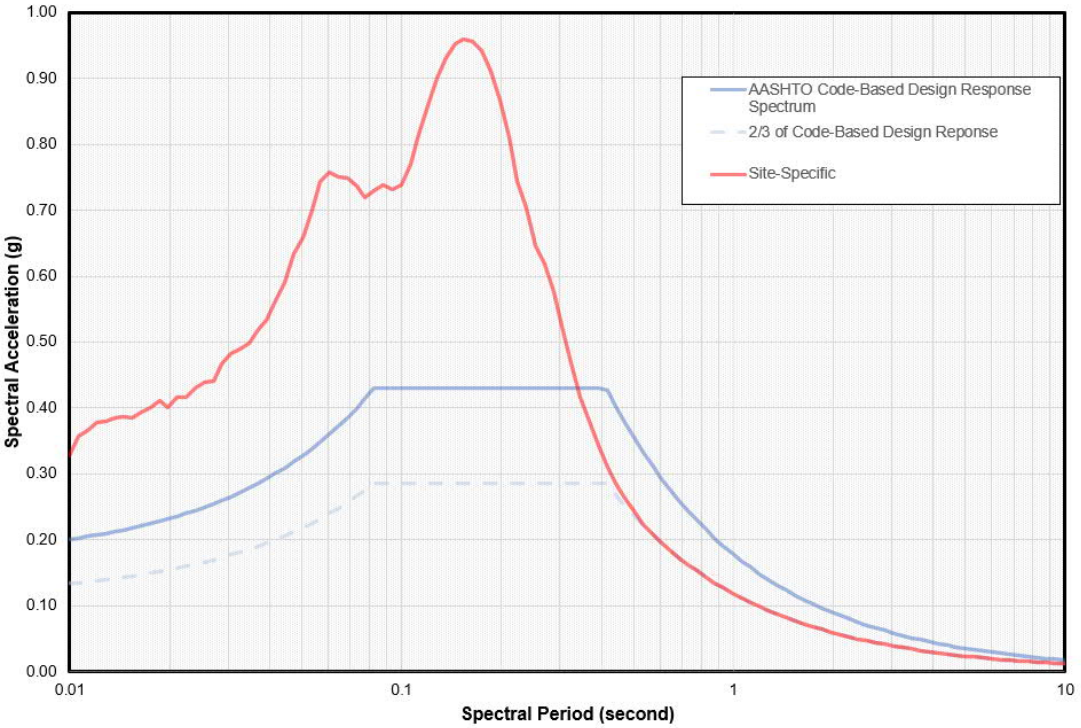
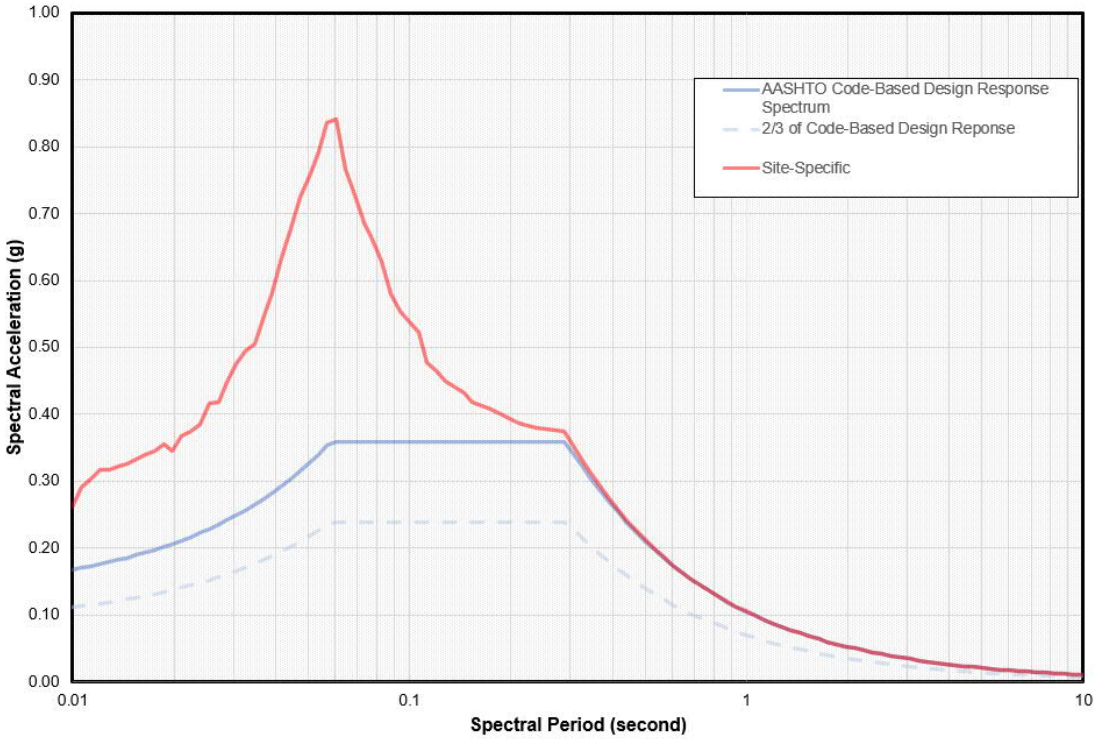


Figure 10. Response Spectrum – Hwy 89 Over U.S. 67 – Site Class B



The AASHTO LRFD spectra, two-thirds of the AASHTO LRFD spectra, and the site-specific spectra for the Hwy 5 Over U.S. 67 bridge and the U.S. 67 Over Two Prairie Creek bridge are presented in Table 9. The same information for the Hwy 89 Over U.S. 67 bridge is presented in Table 10.

Seismic Performance Zone. Note that the AASHTO Seismic Performance Zone is based on the S_{D1} value. Based on the AASHTO mapped values, the Hwy 5 over U.S. 67 and U.S. 67 over Two Prairie Creek bridges are classified as Zone 2. However, the site-specific S_{D1} value for both bridges is below 0.15, and therefore can be classified as Zone I. Based on the AASHTO mapped values and the site-specific values, the Hwy 89 Over U.S. 67 bridge is classified as Seismic Performance Zone I.

Table 9. Site-Specific Response Spectrum – Hwy 5 Over U.S. 67 and U.S. 67 Over Two Prairie Creek

Period (s)	AASHTO Site Class C Spectrum (g)	2/3 AASHTO Spectrum (g)	Site-Specific Spectrum (g)	
			Hwy 5 Over U.S. 67	U.S. 67 Over Two Prairie Creek
0.01	0.201	0.134	0.277	0.328
0.02	0.232	0.155	0.369	0.402
0.03	0.264	0.176	0.454	0.477
0.04	0.295	0.197	0.553	0.543
0.05	0.327	0.218	0.742	0.656
0.07	0.390	0.260	0.859	0.745
0.10	0.430	0.287	0.622	0.741
0.15	0.430	0.287	0.450	0.957
0.20	0.430	0.287	0.405	0.857
0.25	0.430	0.287	0.386	0.659
0.30	0.430	0.287	0.366	0.539
0.40	0.429	0.286	0.286	0.332
0.50	0.356	0.237	0.237	0.246
0.75	0.238	0.158	0.158	0.158
1.00	0.178	0.119	0.119	0.119
1.50	0.119	0.079	0.079	0.079
2.00	0.089	0.059	0.059	0.059
3.00	0.059	0.040	0.040	0.040
4.00	0.045	0.030	0.030	0.030
5.00	0.036	0.024	0.024	0.024
7.50	0.024	0.016	0.016	0.016

Table 10. Site-Specific Response Spectrum – Hwy 89 Over U.S. 67

Period (s)	AASHTO Site Class B Spectrum (g)	2/3 AASHTO Spectrum (g)	Site-Specific Spectrum (g)
			Hwy 89 Over U.S. 67
0.01	0.168	0.112	0.262
0.02	0.207	0.138	0.349
0.03	0.247	0.165	0.467
0.04	0.286	0.191	0.597
0.05	0.326	0.217	0.753
0.07	0.359	0.239	0.715
0.10	0.359	0.239	0.490
0.15	0.359	0.239	0.424
0.20	0.359	0.239	0.393
0.25	0.359	0.239	0.379
0.30	0.348	0.232	0.361
0.40	0.263	0.175	0.268
0.50	0.210	0.140	0.213
0.75	0.140	0.093	0.141
1.00	0.105	0.070	0.105
1.50	0.070	0.047	0.070
2.00	0.053	0.035	0.053
3.00	0.035	0.023	0.035
4.00	0.026	0.018	0.026
5.00	0.021	0.014	0.021
7.50	0.014	0.009	0.014

7.0 REFERENCES

American Association of State Highway and Transportation Officials (AASHTO), Guide Specifications for LRFD Seismic Bridge Design, 2nd ed., AASHTO, Washington, D.C., 2011.

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June 21, 2021

TO: Mr. Rick Ellis, Bridge Engineer

SUBJECT: Retaining Wall Recommendations
Job No. CA0613
Hwy. 67 Intchng. Impvts. (Cabot) (S)
Lonoke County
Route 5 Section 12 and Route 89 Section 1

Introduction

Submitted herein are retaining wall recommendations for the planned Highway 5 over Highway 67 interchange and Highway 89 over Highway 67 interchange. Foundation recommendations for these two (2) bridges were provided on June 10, 2021 under a separate cover. Site Geology, Seismic Conditions, and Site Conditions were discussed in the foundation recommendations report and therefore will not be addressed in this retaining wall report.

Based on the layout and profile provided by the Design Consultant (Garver) on March 22, 2021 and subsequent design drawings received on April 15, 2021, retaining walls are planned at both ends of the Highway 5 over Highway 67 overpass, with Wall No. 1 planned at the north abutment and Wall No. 2 at the south abutment. These two (2) walls are referenced in this report as Highway 5 Wall No. 1 and Highway 5 Wall No. 2, respectively. Layout and profile drawings for the Highway 5 walls, as provided by Garver, are included in Attachment A.

Retaining walls are also planned at the bridge ends of the Highway 89 over Highway 67 overpass. These abutment walls are referenced as Highway 89 Wall No. 1 (at the north bridge end) and Highway 89 Wall No. 2 (at the south end), respectively. Relevant drawings for the Highway 89 abutment walls are included in Attachment B.

In addition to these abutment walls, retaining walls are also planned along Ramp 1 and Ramp 3 of the Highway 89 over Highway 67 Interchange. Having a height generally less than 9 ft, Ramp 1 Wall will be designed based on standard drawings. Therefore, this wall is not discussed in the report. Highway 89 Ramp 3 Wall is planned along the north side of Ramp 3. Layout and profile drawings for the Highway 89 Ramp 3 Wall are included in Attachment C.

Mechanically Stabilized Earth (MSE) walls are utilized for all the abutment retaining walls and the Highway 89 Ramp 3 retaining wall.

In summary, recommendations for the following MSE walls are provided in this report:

- Highway 5 Abutment Walls – presented in Attachment A
  - Retaining Wall No. 1 at the north abutment
  - Retaining Wall No. 2 at the south abutment
- Highway 89 Abutment Walls – presented in Attachment B
  - Retaining Wall No. 1 at the north abutment
  - Retaining Wall No. 2 at the south abutment
- Highway 89 Ramp 3 Wall – presented in Attachment C.

Field Investigation

A field investigation was requested on April 2, 2020 by Bridge Division to perform field and laboratory exploration and to develop recommendations for bridge foundations. An additional subsurface investigation request for the interchange ramps was received on August 6, 2020. Ramp borings were performed in September 2020 through January 2021 based on the August 6, 2020 request and the design concept at that time. Due to the revised wall layouts, test pits were added in April 2021 to explore the subsurface conditions in the proposed wall alignment that was not originally included in the August 6, 2020 request.

The approximate locations of the relevant borings and test pits, as utilized for developing retaining wall recommendations, are presented in the Plan of Borings and Test Pits included in Attachment A, Attachment B, and Attachment C for the Highway 5 interchange (abutment walls and ramps), Highway 89 abutment walls, and Highway 89 ramps, respectively. The borings were advanced with an Acker Renegade rotary drill rig using hollow-stem auger method. The boring logs, showing the subsurface conditions encountered in the borings and the results of field and laboratory tests, are also included in corresponding attachments, immediately following the Plan of Borings. Standard Penetration Tests (SPT) were conducted in accordance with ASTM D1586 for field testing and soil sampling. The correction factor for the 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.

The test pits were performed using two (2) track-mounted excavators fitted with a 24 in.-wide and 36 in.-wide buckets. Representative soil and weathered rock samples were obtained from excavation spoil for further evaluation and for laboratory testing. Undrained shear strength of soil and weathered rock was determined using a hand penetrometer on test pit sidewalls. Penetrometer readings are indicated on the log forms.

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. Soil samples were tested to evaluate index and engineering properties and to verify soil type and classification. Lab tests were performed on representative soil samples to determine moisture content, Atterberg limits, and gradation. Tested soils are classified by experienced professionals in accordance with both USCS and AASHTO soil classification systems. In addition, strength of cohesive soils was evaluated by unconsolidated-undrained (UU) triaxial compression tests on undisturbed Shelby tube samples.

Rock cores were first examined by licensed Professional Geologists to verify Rock Quality Designation (RQD) measured in field and to determine Geological Strength Index (GSI). Compressive strength of rock cores was determined by uniaxial compressive tests on intact rock cores.

The laboratory test results are presented in Attachment A, Attachment B, and Attachment C for Highway 5 Abutment Wall, Highway 89 Abutment Walls, and Highway 89 Ramp 3, respectively. The laboratory test and their corresponding ASTM and / or and AASHTO test methods are listed in Table 1.

Table 1: Summary of Laboratory Tests and Methods

Laboratory Test	ASTM	AASHTO
Moisture Content	D2216	T 265
Grain Size Analysis by Sieving	D6913	T 88
Atterberg Limits	D4318	T 89 and T 90
UU Triaxial Compression	D2850	T 296
Uniaxial Compression of Rock Cores	D7012, Method C	Not Available

General Retaining Wall Recommendations

Where the depth to stable soils or highly weathered shale is relatively shallow (i.e., no deeper than 6 to 8 ft below plan subgrade elevations), it is more economical to bear the MSE walls on the stable native soils or undercut backfill, depending on the wall configuration and factored bearing pressure. If unstable and compressible soils extend deeper than 6 to 8 ft below plan subgrade elevations, Aggregate Piers are considered a suitable alternative to undercut and backfill. Other ground improvements may also be considered.

Shorter and / or wider MSE walls with relatively low factored bearing pressure may be founded on the stable native subgrade soils. All foundation / subgrade excavations should be observed and inspected by the Engineer. Subgrade soils in some areas may be locally unstable and compressible and some undercut could be warranted. Undercut may be properly backfilled with locally available silty clay / clay with shale / sandstone fragments. Substitution of Aggregate Base Course (ARDOT Standard Specifications Section 303, Class 7) for the silty clay / clay with shale / sandstone fragment soil is considered suitable. However, design parameters should be based on the native subgrade soils and the soil undercut backfill. For MSE wall bearing on the stable native soils or undercut backfill, resistance to wall sliding can be evaluated using a nominal friction factor ($\tan\delta$) value of 0.58 between the MSE wall reinforced zone and the subgrade soils.

Increased bearing capacity may be achieved by undercutting a minimum of 2 ft below the plan subgrade elevations and backfilling to the plan subgrade elevations with compacted Class 7 Base. Where highly weathered shale is within 2 ft below the plan subgrade elevations, it is suitable for the undercut to stop at the stable highly weathered shale.

For further increased bearing capacity, we recommend the foundation soils be undercut to the stable hard highly weathered shale stratum and backfill with Stone Backfill (ARDOT Standard Specifications Section 206) to approximately 2 ft below plan subgrade elevations. The remaining undercut backfill should be comprised of compacted Class 7 Base. Where the highly weathered shale is within 2 ft below the plan subgrade elevations, it is suitable for the undercut to extend to and terminate at the highly weathered shale. In this case, the undercut should be fully backfilled with Class 7 Base. For MSE walls bearing on the Class 7 Base, resistance to wall sliding can be evaluated using a nominal friction factor ($\tan\delta$) value of 0.68 between the MSE wall reinforced zone and the Class 7 Base backfill.

Undercut should extend at least 5 ft outside the footprint of the MSE wall reinforced zone. Substitution of Class 7 Base for Stone Backfill is not acceptable. The Class 7 Base utilized for undercut backfill should be compacted to a minimum of 98 percent of the laboratory-determined maximum dry density near optimum moisture content in accordance with ARDOT Standard Specifications Sub-Section 210.10. Fill and backfill should be placed in horizontal, nominal 6- to 8-inch thick loose lifts. Density and moisture of each lift of backfill and fill should be tested (minimum one test per lift) and approved prior to placing subsequent lifts.

Where undercut is shallow, the likelihood to encounter groundwater during undercut is expected to be low. However, minor seepage into the undercut bottom should be anticipated. Where undercut is relatively deep, groundwater and significant seepage should be expected. Provisions should be included to maintain a dry excavation bottom at the time of Class 7 Base placement.

A resistance factor (φ_b) of 0.5 is recommended for evaluation of bearing capacity for all subgrade materials while a resistance factor (φ_τ) of 0.9 is recommended for evaluation of sliding resistance. The passive resistance of the soil at the front face of the wall should be neglected. Factored bearing capacities for all the walls are provided in detail in the following sections. The recommended factored bearing capacities are determined with respect to a maximum long-term settlement of 1.5 inches.

When unstable subsurface soils are deep, Aggregate Piers may also be considered in lieu of mass undercut to provide a stable foundation for the MSE walls. Utilizing Aggregate Piers has the advantages of eliminating the requirements for excavation retention system and also excluding the potential for seepage infiltration into the excavations.

Recommended subgrade and foundation alternatives and the corresponding sliding factors are summarized below:

- Where unstable soils are shallower than 6 to 8 ft below plan subgrade elevations:
  - Walls with lower factored bearing pressure – bear on stable native soils or compacted soil undercut backfill: factored sliding factor = $\varphi_\tau \tan\delta = 0.52$
  - Walls with moderate factored bearing pressure – undercut 2 ft and backfill with Class 7 Base: factored sliding factor = $\varphi_\tau \tan\delta = 0.61$
  - Walls with higher factored bearing pressure – undercut to stable highly weathered shale / sandstone and backfill with Stone Backfill and Class 7 Base: factored sliding factor = $\varphi_\tau \tan\delta = 0.61$
- Where compressible soils are deeper than 6 to 8 ft below plan subgrade elevations:
  - Undercut to stable highly weathered shale / sandstone and backfill with Stone Backfill and Class 7 Base: factored sliding factor = $\varphi_\tau \tan\delta = 0.61$
  - Utilize Aggregate Piers – detailed Aggregate Piers design parameters, including factored sliding factor, will be provided by Pier Designer.

Concepts for MSE Wall Bearing, showing factored bearing capacity and undercut depth for various foundation alternatives, are included in Attachment A for Highway 5 Abutment Walls and Attachment B for Highway 89 Abutments, respectively. Estimated length of reinforced strips and factored wall bearing pressure are also indicated on these concepts. **It must be noted that**

the factored wall bearing pressure is a function of reinforcing strip length, wall profile (wall height, subgrade embedment, etc.), properties of the reinforced fill and retained fill (unit weight and angle of internal friction), backslope configuration, live load surcharge, etc. These parameters should be determined by the Wall Designer.

Highway 5 Abutment Walls

Highway 5 Wall No. 1. Layout and profile geometry of the Highway 5 Wall No. 1 (north abutment wall) is summarized below in Table 2a. The table summarizes the global station and offset as referenced to Highway 67 Centerline, wall local station, design top elevation of the wall, design subgrade elevation of the wall, existing groundline elevation, wall height, and wall embedment below existing groundline elevation at representative locations.

Table 2a: Layout and Profile Geometry - Highway 5 Wall No. 1

Hwy. 67 Sta.	65+02.29	66+44.70	68+94.42	70+05.29
Hwy. 67 Offset	83.63' Lt.	83.63' Lt.	83.63' Lt.	83.63' Lt.
Wall Local Sta.	0+00	1+42.41	3+92.18	5+03.00
Wall Top Elev., ft	281.59	296.67	296.17	279.00
Exist. Groundline Elev., ft	277.58	279.70	277.76	275.12
Subgrade Elev., ft	273.68	273.68	272.62	272.62
Wall Height, ft	7.91	22.99	23.55	6.38
Wall Embedment, ft	3.90	6.02	5.14	2.50

At Elev. 273.68 to Elev. 272.62, the foundation soils at the plan subgrade elevation are expected to be very stiff clay and medium dense clayey fine sand / very stiff fine sandy clay. These subgrade soils are stable and undercut potential is expected to be generally low unless intending for increased bearing capacity. Nominal and Factored bearing capacities for various foundation alternatives are summarized in Table 2b below.

Table 2b: Nominal and Factored Bearing Capacities - Highway 5 Wall No. 1

Foundation Alternative	Estimated Depth of Undercut Below Plan Subgrade, ft	Nominal Bearing Capacity, q_n, ksf	Factored Bearing Capacity, $q_R = \varphi_b q_n$, ksf
Native Soils	0	10	5
Undercut up to 2 Feet and Backfill w/ Class 7 Base	1* to 2	15	7.5
Undercut to Highly Weathered Shale and Backfill w/ Stone Backfill and Class 7 Base	1* to 4	25	12.5

* Undercut terminating at highly weathered shale is suitable.

Highway 5 Wall No. 2. Table 3a summarizes the layout and profile geometry of the Highway 5 Wall No. 2 (south abutment wall).

Table 3a: Layout and Profile Geometry - Highway 5 Wall No. 2

Hwy. 67 Sta.	70+48.36	69+10.13	66+76.72	65+73.36
Hwy. 67 Offset	83.63' Rt.	83.63' Rt.	83.63' Rt.	83.63' Rt.
Wall Local Sta.	0+00	1+38.23	3+71.63	4+75.00
Wall Top Elev., ft	280.32	296.05	296.05	280.76
Exist. Groundline Elev., ft	276.32	275.77	276.39	276.32
Subgrade Elev., ft	272.46	272.46	273.46	273.46
Wall Height, ft	7.86	23.59	22.59	7.30
Wall Embedment, ft	3.86	3.31	2.93	2.86

The wall subgrade at Elev. 273.46 to Elev. 272.46 is expected to be medium stiff to very stiff clay, silty clay to fine sandy clay. Subgrade soils in this wall alignment may be locally unstable and compressible (see the Boring 11) and undercut to the very stiff soil or hard highly weathered shale could be warranted. Undercut may be properly backfilled with locally available silty clay / clay with shale / sandstone fragments. Substitution of Class 7 Base for silty clay / clay with shale / sandstone fragment backfill is acceptable. Nominal and Factored bearing capacities for various foundation alternatives are summarized in Table 3b below.

Table 3b: Nominal and Factored Bearing Capacities - Highway 5 Wall No. 2

Foundation Alternative	Estimated Depth of Undercut Below Plan Subgrade, ft	Nominal Bearing Capacity, q_n, ksf	Factored Bearing Capacity, $q_R = \varphi_b q_n$, ksf
Native Soils or Undercut Backfill	0**	10	5
Undercut 2 Feet and Backfill w/ Class 7 Base	2**	15	7.5
Undercut to Highly Weathered Shale and Backfill w/ Stone Backfill and Class 7 Base	3 to 5	25	12.5

** Locally may be as deep as 3 feet.

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Highway 89 Abutment Walls

Highway 89 Wall No. 1. Table 4a summarizes the Layout and Profile geometry of the Highway 89 Wall No. 1 (north abutment wall).

Table 4a: Layout and Profile Geometry - Highway 89 Wall No. 1

Hwy. 67 Sta.	212+34.83	213+55.84	216+24.38	218+52.07
Hwy. 67 Offset	85.43' Lt.	85.44' Lt.	85.33' Lt.	85.13' Lt.
Wall Local Sta.	0+00	1+21.01	3+94.53	6+29.84
Wall Top Elev., ft	293.95	321.89	321.89	312.56
Exist. Groundline Elev., ft	289.95	293.40	302.24	308.56
Subgrade Elev., ft	286.15	288.15	299.15	305.15
Wall Height, ft	7.80	33.74	22.74	7.41
Wall Embedment, ft	3.80	5.25	3.09	3.41

The foundation soils at the plan subgrade elevation are expected to be stiff clay to fine sandy clay and loose clayey fine sand. Nominal and Factored bearing capacities for various foundation alternatives are summarized in Table 4b below.

Table 4b: Nominal and Factored Bearing Capacities - Highway 89 Wall No. 1

Foundation Alternative	Estimated Depth of Undercut Below Plan Subgrade, ft	Nominal Bearing Capacity, q_n, ksf	Factored Bearing Capacity, $q_R = \varphi_b q_n$, ksf
Native Soils	0	7	3.5
Undercut 2 ft and Backfill w/ Class 7 Base	2	12	6
Undercut to Highly Weathered Shale and Backfill w/ Stone Backfill and Class 7 Base	3 to 7	25	12.5

Highway 89 Wall No. 2. Table 5a summarizes the layout and profile geometry of the Highway 89 Wall No. 2 (south abutment wall).

Table 5a: Layout and Profile Geometry - Highway 89 Wall No. 2

Hwy. 67 Sta.	217+90.82	216+49.82	213+75.73	212+43.20
Hwy. 67 Offset	88.69' Rt.	88.57' Rt.	88.43' Rt.	88.44' Rt.
Wall Local Sta.	0+00	1+36.09	4+04.14	5+36.66
Wall Top Elev., ft	308.09	322.65	322.65	293.79
Exist. Groundline Elev., ft	304.09	299.08	292.29	289.79
Subgrade Elev., ft	301.04	296.04	289.04	287.04
Wall Height, ft	7.05	26.61	33.61	6.75
Wall Embedment, ft	3.05	3.04	3.24	2.75

The borings performed in this MSE wall alignment indicate the overburden soils are generally unstable with low shear strength and high compressibility. Bearing the MSE wall on the native soils is unsuitable. Utilizing the boring results and the subgrade elevations of Elev. 301.04 to Elev. 287.04, depth of undercut to the stable hard highly weathered shale is estimated to be on the order of 6.5 to 11.5 feet. By undercutting to the highly weathered shale, MSE wall may be supported on Class 7 Base and Stone Backfill.

A more economical and practical alternative to undercut and Stone Backfill will be ground improvements utilizing Aggregate Piers. Other ground improvements alternatives may be evaluated upon request. Ground improvements should encompass the entire MSE wall reinforced zone. Detailed design parameters of Aggregate Piers should be provided by the Pier Designer. A minimum pier coverage ratio (total area of piers to footprint area of wall reinforced zone) of 20 percent is recommended. It is also recommended that all the piers penetrate through the unstable overburden soils and rest in the highly weathered shale. Minimum pier penetration below subgrade elevations is estimated on the order of 7 to 12 feet. For the purpose of preliminary design, a factored bearing capacity of 6 to 10 ksf or higher, depending on pier coverage ratio and length, and a factored sliding factor of 0.4 to 0.6 may be anticipated. These values must be verified by the Pier Designer. Recommended foundation alternatives are summarized in Table 5b.

Table 5b: Factored Bearing Capacities and Factored Sliding Factors - Highway 89 Wall No. 2

Foundation Alternative	Depth of Ground Improvements Below Plan Subgrade, ft	Factored Bearing Capacity, $q_R = \varphi_b q_n$, ksf	Factored Sliding Factor, $\varphi_\tau \tan\delta$
Undercut to Highly Weathered Shale and Backfill w/ Stone Backfill and Class 7 Base	6.5 to 11.5	12.5	0.61
Aggregate Piers	7 to 12 (Minimum)	6 to 10 (Estimated)	0.4 to 0.6 (Estimated)

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Highway 89 Ramp 3 Wall

The approximately 2056 ft long Ramp 3 Wall for the Highway 89 interchange has a maximum design height of 13 feet. The majority of the wall alignment has a height of less than 9 feet. Wall embedment below existing groundline elevation is planned to be 2 to 3 feet. The test pits dug in this wall alignment (Test Pits 2 through 9) indicate the subsurface strata are generally comprised of a thin stratum of overburden soils overlying highly weathered shale to weathered shale. The thin, organic-containing overburden soils of silty clay / clay with shale / sandstone fragments extends to approximately 6 in. to 2 ft deep and exhibits variable shear strength. The subgrade for the MSE wall is expected to be typically highly weathered shale. Locally, highly weathered to weathered sandstone can be encountered at plan subgrade elevation (see Test Pit 6). The weathered sandstone is relatively resistant. Considering the subgrade embedment and subsurface conditions, potential for rock excavation is generally considered to be low but should not be completely neglected.

For the ramp wall bearing on the highly weathered shale or locally on stable native soils / undercut backfill, a factored bearing capacity, q_R, of 5 ksf and a factored sliding factor, $\varphi_\tau \tan\delta$, of 0.48 are recommended.

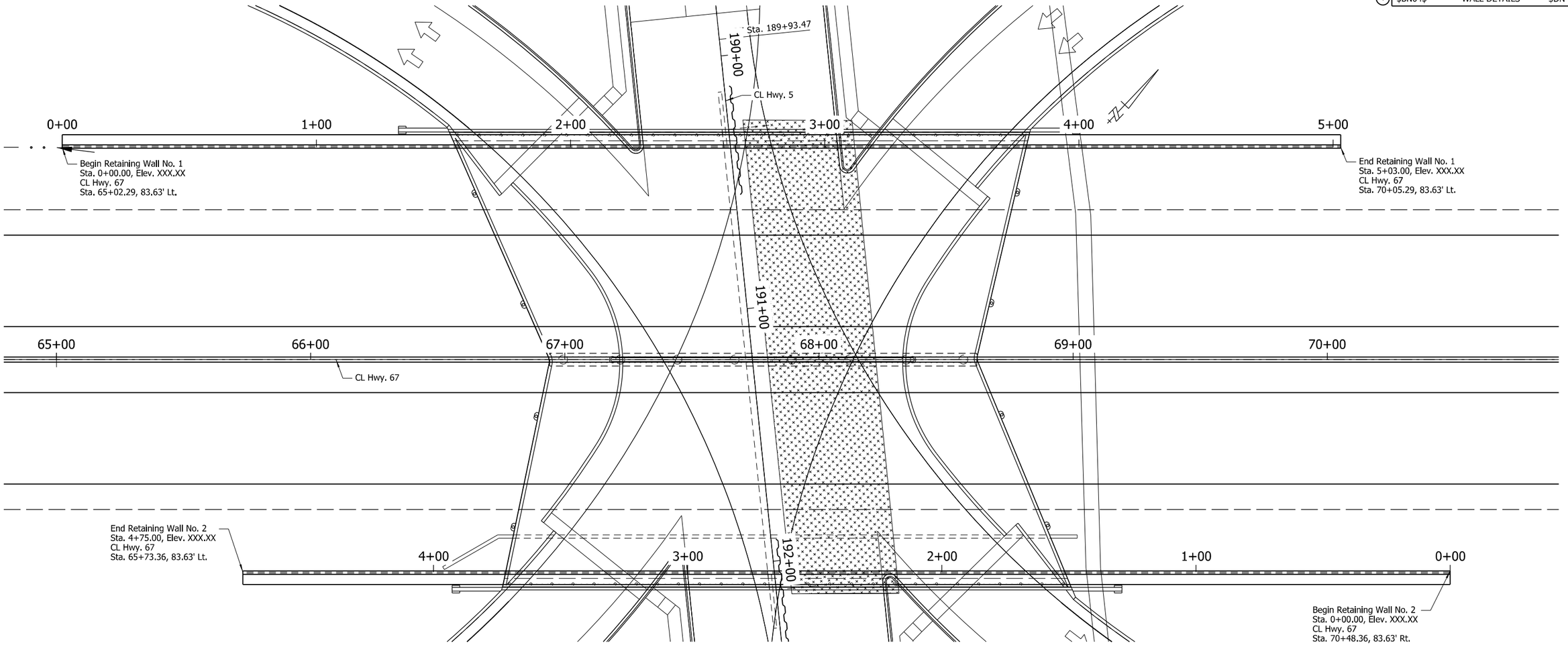
Jonathan A. Annable
Materials Engineer

JAA:yz:mlg:bjj:pjt
Attachments
cc: State Construction Engineer
District 6 Engineer
G. C. File

Attachment A

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0613	$SN4101$	ST
(1) $BN04$		WALL DETAILS		$DN4101$



PLAN - HIGHWAY 5 RETAINING WALLS

PRELIMINARY
NOT FOR
CONSTRUCTION

BRIDGE ENGINEER

DETAILS OF RETAINING WALLS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: CSW DATE: MAR. 2021 FILENAME: BCA0613x4_L1.DGN
CHECKED BY: XXX DATE: XXX. 2021 SCALE: 1" = 20'-0"
DESIGNED BY: CSW DATE: MAR. 2021

BRIDGE NO. $BN04$ DRAWING NO. $DN4101$

CSWylie 4/14/2021 8:37:02 AM
WORKSPACE: ARDOT Bridge (2019)
L:\2017\17017575 - 061549 Hwy 5 - White Co Line\Drawings\bCA0613-S10X-WALL (Hwy. 5 Wall 1).dgn
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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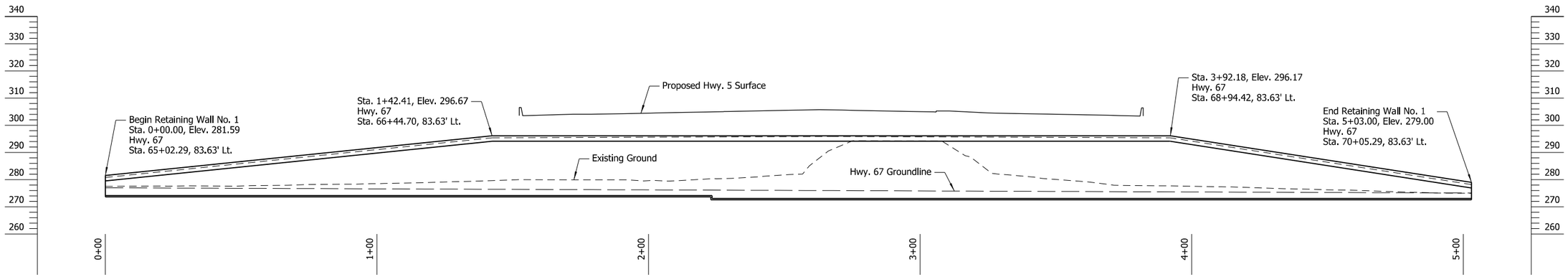
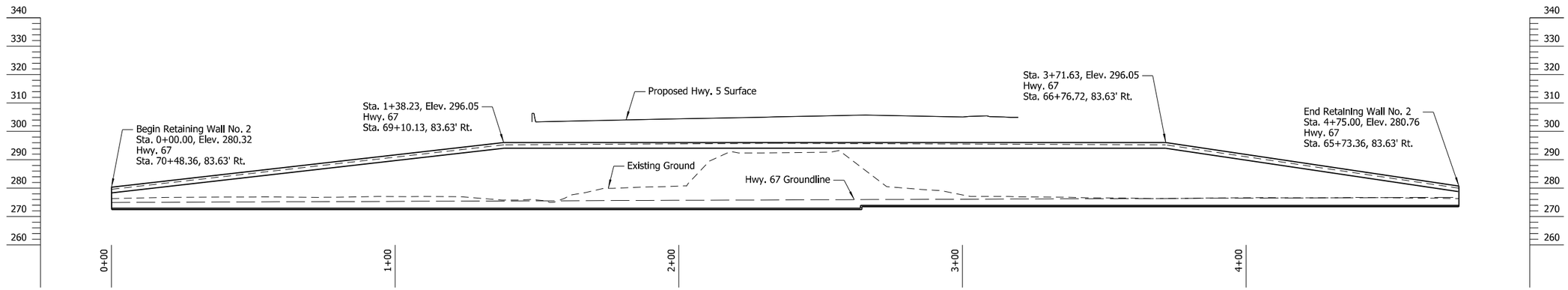


RETAINING WALL NO. 1 - ELEVATION



RETAINING WALL NO. 2 - ELEVATION

PRELIMINARY
NOT FOR
CONSTRUCTION

BRIDGE ENGINEER

DETAILS OF RETAINING WALLS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

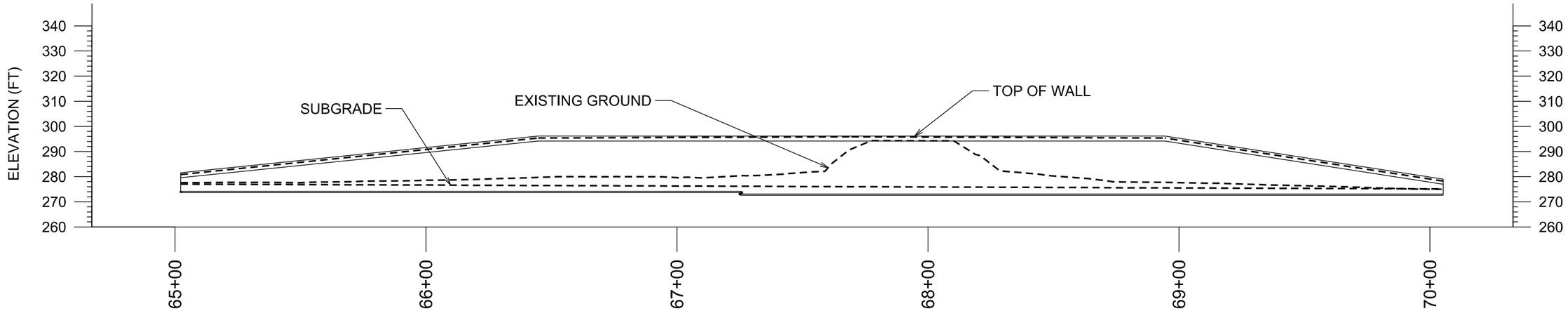
LITTLE ROCK, ARK.

DRAWN BY: CSW DATE: MAR. 2021 FILENAME: BCA0613x4_L1.DGN
CHECKED BY: XXX DATE: XXX. 2021 SCALE: 1" = 20'-0"
DESIGNED BY: CSW DATE: MAR. 2021

BRIDGE NO. $BN04$ DRAWING NO. $DN4101$

CSWylie 4/14/2021 8:37:55 AM
WORKSPACE: ARDOT Bridge (2019)
L:\2017\17017575 - 061549 Hwy 5 - White Co Line\Drawings\BCA0613-S10X-WALL (Hwy. 5 Wall Elev.).dgn
REVISED DATE:

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		CA0613		
CONCEPT FOR MSE WALL BEARING				



ASSUMED LENGTH OF REINFORCING STRIPS	10' TO 20'	20'	9' TO 20'
MAX. FACTORED WALL BEARING PRESSURE	2.0 TO 7.7 KSF	7.7 TO 8.1 KSF	1.6 TO 8.1 KSF

FACTORED BEARING CAPACITIES FOR VARIOUS CASES

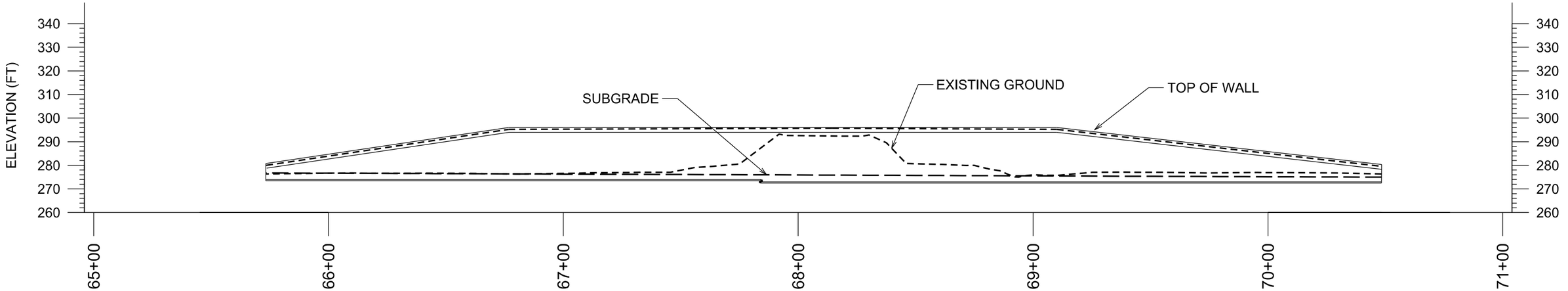
BEARING ON NATIVE SOILS	5 KSF	
UNDERCUT DEPTH	0'	
BEARING ON CLASS 7 AGGREGATE BASE	7.5 KSF	
UNDERCUT DEPTH	1' TO 2'	
BEARING ON STONE BACKFILL	12.5 KSF	
UNDERCUT DEPTH	1' TO 4'	

NOTES:
1. SUBGRADE ELEVATIONS UTILIZED TO CALCULATE BEARING CAPACITIES WERE INFERRED FROM WALL PROFILES PROVIDED BY THE DESIGN CONSULTANT (GARVER) ON 3/22/2021. THESE VALUES ARE SUBJECT TO CHANGE.
2. ASSUMED MINIMUM LENGTH OF REINFORCING STRIPS IS DETERMINED TO ACHIEVE A CDR (CAPACITY-DEMAND-RATIO) GREATER THAN 1.0 OR 0.7 TIMES WALL HEIGHT, WHICHEVER IS GREATER.
3. FACTORED BEARING PRESSURE IS ESTIMATED BASED ON THE ABOVE ASSUMED LENGTH OF REINFORCING STRIPS, PROVIDED WALL PROFILE, UNIT WEIGHT (γ) OF 102 PCF FOR THE REINFORCED SELECT BACKFILL, RETAINED BACKFILL PARAMETERS (γ=125 PCF/$\emptyset$=30 DEGREES), ASSUMED 2H:1V BACKSLOPE OF 20 FT AND MAXIMUM LIIVE LOAD SURCHARGE OF 2' (TO BE VERIFIED BY THE WALL DESIGNER).
4. REFER TO GEOTECHNICAL INVESTIGATION REPORT FOR DETAILS.
5. STATIONING IS IN REFERENCE TO HWY. 67/167

CONCEPT FOR MSE WALL BEARING	
HWY. 67 INTCHNG. IMPVTS. (CABOT) (S) ROUTE 67, SECTION 11 LONOKE COUNTY HWY. 5 MSE WALL NO. 1	
JOB NO. CA0613	SHEET 1/4

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		CA0613		

CONCEPT FOR MSE WALL BEARING



ASSUMED LENGTH OF REINFORCING STRIPS	10' TO 20'	20'	9' TO 20'
MAX. FACTORED WALL BEARING PRESSURE	2.0 TO 8.1 KSF	7.5 TO 8.1 KSF	1.9 TO 7.5 KSF

FACTORED BEARING CAPACITIES FOR VARIOUS CASES

BEARING ON NATIVE SOILS	5 KSF	
UNDERCUT DEPTH	0'	
BEARING ON CLASS 7 AGGREGATE BASE	7.5 KSF	
UNDERCUT DEPTH	2'	
BEARING ON STONE BACKFILL	12.5 KSF	
UNDERCUT DEPTH	3' TO 5'	

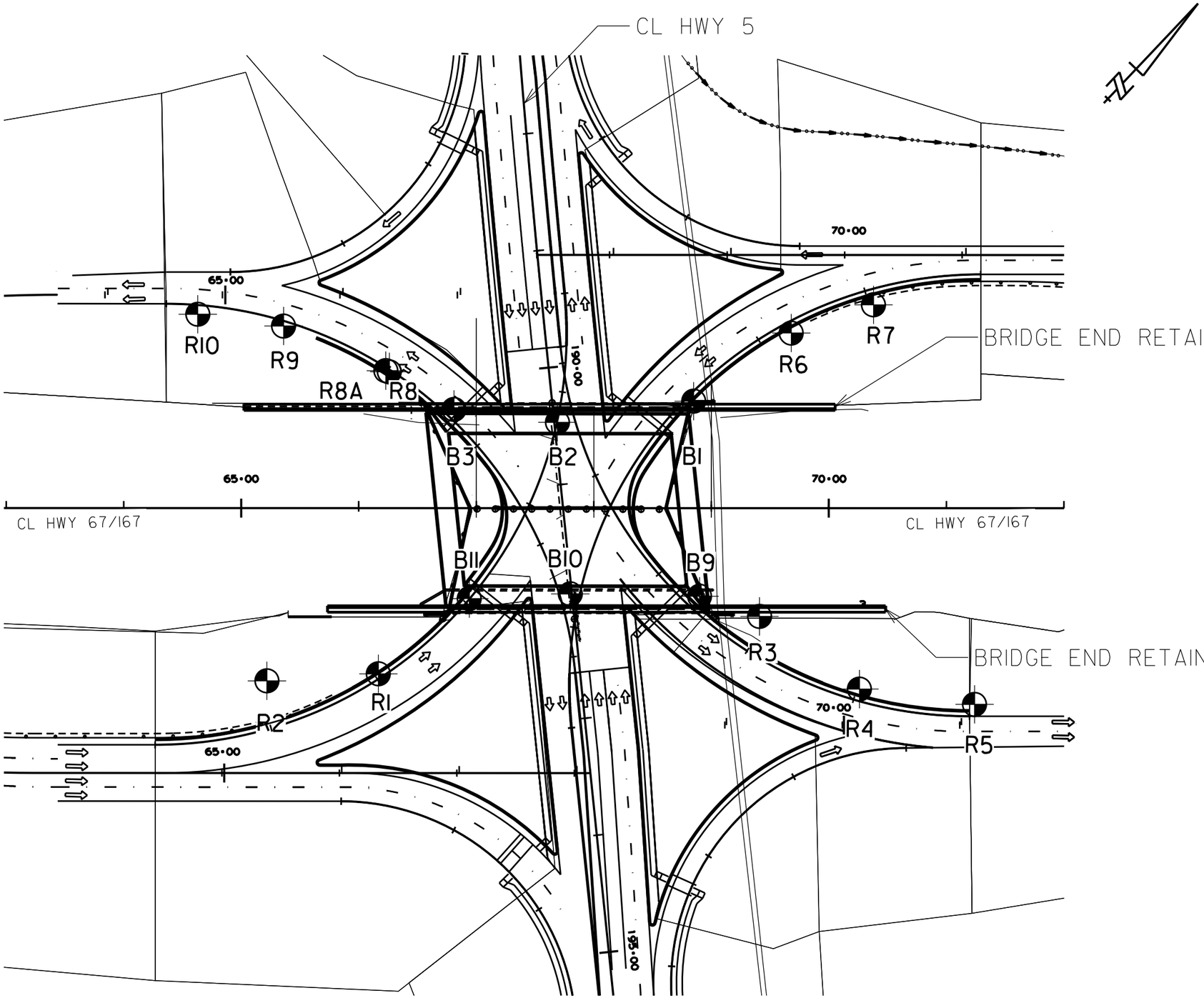
NOTES:
1. SUBGRADE ELEVATIONS UTILIZED TO CALCULATE BEARING CAPACITIES WERE INFERRED FROM WALL PROFILES PROVIDED BY THE DESIGN CONSULTANT (GARVER) ON 3/22/2021. THESE VALUES ARE SUBJECT TO CHANGE.
2. ASSUMED MINIMUM LENGTH OF REINFORCING STRIPS IS DETERMINED TO ACHIEVE A CDR (CAPACITY-DEMAND-RATIO) GREATER THAN 1.0 OR 0.7 TIMES WALL HEIGHT, WHICHEVER IS GREATER.
3. FACTORED BEARING PRESSURE IS ESTIMATED BASED ON THE ABOVE ASSUMED LENGTH OF REINFORCING STRIPS, PROVIDED WALL PROFILE, UNIT WEIGHT (γ) OF 102 PCF FOR THE REINFORCED SELECT BACKFILL, RETAINED BACKFILL PARAMETERS (γ=125 PCF/$\varnothing$=30 DEGREES), ASSUMED 2H:1V BACKSLOPE OF 20 FT AND MAXIMUM LIIVE LOAD SURCHARGE OF 2' (TO BE VERIFIED BY THE WALL DESIGNER).
4. REFER TO GEOTECHNICAL INVESTIGATION REPORT FOR DETAILS.
5. STATIONING IS IN REFERENCE TO HWY. 67/167

CONCEPT FOR MSE WALL BEARING

HWY. 67 INTCHNG. IMPVTS. (CABOT) (S)
ROUTE 67, SECTION 11
LONOKE COUNTY
HWY. 5 MSE WALL NO. 2

JOB NO. CA0613 | SHEET 2/4

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		CA0613		
PLAN OF BORINGS				



HWY 5 BRIDGE ENDS			
BORING	STATION	OFFSET	ELEVATION
B1	68+85	91 LT	278.2
B2	67+69	73 LT	278.1
B3	66+81	84 LT	280.3
B9	68+90	75 RT	277.2
B10	67+80	73 RT	278.0
B11	66+94	77 RT	277.3

HWY 5 RAMP 1			
BORING	STATION	OFFSET	ELEVATION
R1	66+17	141 RT	275.0
R2	65+22	147 RT	273.7

HWY 5 RAMP 2			
BORING	STATION	OFFSET	ELEVATION
R3	69+41	92 RT	276.8
R4	70+26	154 RT	276.4
R5	71+24	167 RT	274.1

HWY 5 RAMP 3			
BORING	STATION	OFFSET	ELEVATION
R6	69+68	149 LT	278.2
R7	70+38	173 LT	276.1

HWY 5 RAMP 4			
BORING	STATION	OFFSET	ELEVATION
R8	66+26	116 LT	281.0
R8A	66+23	117 LT	281.3
R9	65+36	155 LT	281.1
R10	64+63	165 LT	279.9

NOTE: ALL REFERENCES TO STATION AND OFFSET ARE MADE TO CL HWY. $^{67}/_{167}$.

PLAN OF BORINGS

HWY. 67 INTCHNG. IMPVTS. (CABOT) (S)
ROUTE 67, SECTION 11
LONOKE COUNTY
HWY. 5

JOB NO. CA0613 | SHEET 1/1

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-1
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+85
LOCATION: 91' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 16, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 278.2	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
			Clayey Sand	-					
5			Moist, Medium Dense, Reddish Brown Clayey Sand	-	●		5 7-10		
				-					
10			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-	●		16 33-42		
				-					
15				-	●		45 40 (2")		
				-					
20				-	●		20 37 (4")		
			SHALE - Weathered, Medium Hard, Dark Gray				15 (2")	100	0
25			SHALE - Slightly Weathered, Medium Hard, Frequent Fractures, Dark Gray					100	54
30			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray	-				100	76
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-1
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+85
LOCATION: 91' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 16, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.2

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: 278.2						
			SHALE - Unweathered, Medium Hard, Dark Gray					100	90
40								98	98
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-2
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+69
LOCATION: 73' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 18, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 278.1	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
			Moist, Very Stiff, Brown Clay with Some Gravel	-			1 5-11 13		
				-					
			Moist, Very Stiff, Brown Clay	-			11-12 5 10-13		
5				-			5 13-17		
			Dry, Very Hard, Brown Clay	-			15 24-43		
				-			24 54-25 (7")		
10				-			19 52-30 (8")		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-					
15				-			21 50 (2")		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray						
20			SHALE - Weathered, Medium Hard, Dark Gray				25 (1")		
			SHALE - Unweathered, Medium Hard, Dark Gray					97	80
25			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					100	96
30			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Dark Gray	-				100	94
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-2
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+69
LOCATION: 73' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 18, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.8

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: 278.1						
			SHALE - Unweathered, Medium Hard, Dark Gray					100	64
40								100	84
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-3
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+81
LOCATION: 84' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 19 and 23, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 42.7

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: 280.3						
			Moist, Loose, Reddish Brown Clayey Sand	-			4		
				-			4-3		
			Moist, Medium Dense, Reddish Brown Clayey Sand	-			3		
							3-4		
5							4		
							5-7		
			Moist, Very Stiff, Brown Clay	-			6		
							11-17		
			Dry, Very Hard, Brown Clay	-			26		
							47-45 (10")		
				-			26		
10				-			61 (4")		
							20		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			61 (5")		
15				-			33		
							61 (4")		
20			SHALE - Weathered, Medium Hard, Dark Gray				61 (4")		
								100	50
25								100	90
				-					
30								100	94
			SHALE - Unweathered, Medium Hard, Dark Gray						
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-3
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+81
LOCATION: 84' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 19 and 23, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 42.7

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: 280.3						
								100	96
40								94	90
			Boring Terminated						
45									
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-9
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+90
LOCATION: 75' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 277.2	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
			Wet, Very Loose, Reddish Brown Clayey Sand with Trace Gravel	-			1 2-2		
			Moist, Medium Dense, Reddish Brown Clayey Sand with Trace Gravel	-			4 5-8		
			Moist, Stiff, Brown Sandy Clay	-			3 6-7		
5			Moist, Very Stiff, Brown and Gray Clay with Sand	-			3 6-10		
				-			10 12-17		
			Moist, Hard, Brown Sandy Clay	-			9 15-24		
10			Dry, Very Hard, Brown Clay (Highly Weathered Shale)*	-			12 37-42		
			Dry, Very Hard, Brown Clay with Layers of Highly Weathered Shale	-			28 35 (2")		
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			39 61 (4")		
			SHALE - Highly Weathered, Medium Hard, Brown	-			19 61 (2")		
20			SHALE (No Sample Recovered)				12 (1")		
			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray					95	71
25			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					100	66
30			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Dark	-				100	100
35									

REMARKS: * Water level was measured at 11.6' bgl 17 hours after drilling.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-9
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 68+90
LOCATION: 75' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.6

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
			Gray					100	78
40			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray					100	100
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS: * Water level was measured at 11.6' bgl 17 hours after drilling.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-10
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+80
LOCATION: 73' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 8 and 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.8

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: 278.0						
			Moist, Medium Stiff, Sandy Clay with Trace Gravel	-			1		
			Moist, Medium Stiff, Reddish Brown Silty Clay with Trace Gravel	-			3-2		
			Moist, Stiff, Reddish Brown Silty Clay with Trace Gravel	-			1		
5			Moist, Very Stiff, Brown Sandy Clay with Trace Gravel	-			3-4		
			Moist, Hard, Brown Clay	-			1		
				-			4-6		
				-			6		
10			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			8-12		
				-			13		
				-			18-31		
				-			12		
15				-			21-40		
			SHALE - Highly Weathered, Medium Hard, Brown	-			15		
			SHALE - Weathered, Medium Hard, Dark Gray				48-40 (10")		
20			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Slightly Weathered, Medium Hard, Occasional Fractures, Dark Gray				28		
							61 (4")		
							67 (5")	88	70
25			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray				24	96	86
							61 (4")		
30				-			61 (5")	100	100
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-10
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 67+80
LOCATION: 73' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 8 and 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 43.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 278.0	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
			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					100	94
40			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					100	95
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-11
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+94
LOCATION: 77' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 8 and 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 277.3	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
			Moist, Medium Stiff, Sandy Clay with Trace Gravel	-			2 2-6		
			Moist, Stiff, Reddish Brown Sandy Clay	-			6 4-5		
			Moist, Medium Stiff, Reddish Brown Silty Clay	-			1 3-4		
5			Moist, Stiff, Brown Silty Clay	-			3 5-10		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			16 28-36		
				-			16 31-32		
10			Dry, Hard, Brown Sandy Clay with Some Gravel	-			7 13-31		
				-					
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			15 42-45 (11")		
				-					
15			SHALE - Highly Weathered, Medium Hard, Brown	-			27 61 (5")		
			SHALE - Weathered, Medium Hard, Dark Gray				12 (1") 15 (1")		
20									
			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray					90	75
25								92	86
30			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray	-				100	96
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-11
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+94
LOCATION: 77' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 8 and 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 277.3	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
			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					100	62
40			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					100	76
45								98	60
50			Boring Terminated						
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 R1
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+17
LOCATION: 141' Right of Centerline of Hwy 67/167
LOGGED BY: Brandon McKinney and Austin Dillman

DATE: January 27, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 19.7

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: 275.0						
			Wet, Very Soft, Brown Clay	-	●	95	0		
				-	●	93	0-0 0		
			Wet, Medium Stiff, Brown Lean Clay	CL	●	93	0-0 0		
5			Moist, Very Stiff, Brown Lean Clay	CL	●	94	3-4 4		
			Moist, Hard, Brown Lean Clay	CL	●	93	6-12 7		
			Moist, Very Hard, Brown Sandy Lean Clay with Some Sandstone and Shale Fragments	CL	●	58	13-25 14		
10			Dry, Very Hard, Brown Sandy Lean Clay (Highly Weathered Shale)	CL	●	60	38-50 14		
				-			45-55 (11")		
			SHALE - Highly Weathered, Medium Hard, Brown (Very Hard, Lean Clay with Sand)	CL	●	72	45		
15			SHALE - Highly Weathered, Medium Hard, Brown and Gray	-			51 (4")		
							61 (5")		
			SHALE - Unweathered, Medium Hard, Dark Gray				12 (2")		
20			Boring Terminated				13 (2")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 R2
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 65+22
LOCATION: 147' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: January 27, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 19.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 273.7	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
			Wet, Very Soft, Brown Clay	-			0 0-0 0 0-0 0 0-0		
5			Wet, Medium Stiff, Brown Clay	-			0 2-5		
			Wet, Very Stiff, Brown Clay with Some Iron Concretions	-			5 7-14		
			Wet, Very Stiff, Brown Clay with Some Sandstone and Shale Fragments	-			4 10-15		
10			Moist, Very Hard, Brown Clay (Highly Weathered Shale)	-			30 40-31 (8")		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray	-			36 40 (4")		
15			SHALE - Unweathered, Medium Hard, Dark Gray	-			12 (2") 15 (5")		
20			Boring Terminated				14 (4")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 R3
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 69+41
LOCATION: 92' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: December 14, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.4

SURFACE ELEVATION: 276.8

DEPTH FT.	DESCRIPTION OF MATERIAL	SOIL GROUP	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
	Moist, Reddish Brown Lean Clay with Sand	CL	77			
	Moist, Stiff, Reddish Brown Silty Clay with Trace Gravel	-		2 5-7		
5	Moist, Brown Lean Clay with Sand and Some Iron Concretions	CL	75			
	Moist, Very Stiff, Brown Silty Clay	-		7 9-15		
	Moist, Hard, Brown Silty Clay with Trace Gravel	-		10 14-23		
10	Dry, Very Hard, Brown Clay (Highly Weathered Shale)*	-		12 40-50 (11")		
		-		29 45-30 (8")		
		-		38 61 (2")		
15	SHALE - Highly Weathered, Medium Hard, Brown	-		24 25 (5")		
		-		50 (5")		
20		-				
	SHALE - Weathered, Medium Hard, Brown and Gray			61 (5")		
	Boring Terminated					
25						
30						
35						

MOISTURE CONTENT (%) ●
PL + – – – – – – – – + LL
10 20 30 40 50 60 70

REMARKS: * Water level was measured at 10.6' bgl 18 hours after drilling.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 R4
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 70+26
LOCATION: 154' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: December 15, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.6

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: 276.4						
			Moist, Brown Clayey Sand with Gravel	SC					
			Moist, Very Stiff, Brown Sandy Clay with Some Gravel	-			8 12-7		
5			Moist, Brown Lean Clay with Sand	CL					
			Moist, Very Stiff, Brown Silty Clay	-			7 12-17		
				-			6 11-14		
			Moist, Hard, Brown Clay with Some Iron Concretions	-			9 16-19		
10				-			8 20-22		
			Dry, Hard, Brown Clay (Highly Weathered Shale)	-					
				-			22 61 (5")		
15				-					
			SHALE - Highly Weathered, Medium Hard, Brown	-			41 61 (4")		
				-			23 61 (4")		
20				-					
				-			54 50 (2")		
			Boring Terminated						
25									
30									
35									

REMARKS: * No water was measured in the boring after 19 hours.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 R5
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 71+24
LOCATION: 167' Right of Centerline of Hwy 67/167
LOGGED BY: Brandon McKinney and Austin Dillman

DATE: December 16, 2020
TYPE OF DRILLING: Hollow Stem Auger
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: 274.1						
			Wet, Soft, Brown Silty Clay with Trace Gravel	-			0		
			Moist, Stiff, Brown Silty Clay	-			2-1 2		
			Dry, Stiff, Brown Silty Clay with Some Gravel	-			3-7 4		
5			Dry, Hard, Brown Sandy Clay	-			5-9 8		
				-			16-24 14		
			Dry, Very Stiff, Brown Clay with Some Gravel	-			21-27 6		
10			Dry, Hard, Brown Clay (Highly Weathered Shale)	-			13-16 10		
				-			16-17		
				-			56		
				-			13 (1")		
15			SHALE - Highly Weathered, Medium Hard, Brown	-			26		
				-			37-15 (8")		
				-			30		
				-			72 (5")		
20			SHALE - Highly Weathered, Medium Hard, Brown and Gray	-			12 (2")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 R6
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 69+68
LOCATION: 149' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: December 2, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 278.2	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
			Moist, Stiff, Brown Sandy Clay	-	●		3 6-5		
			Moist, Loose, Brown Clayey Sand	-	●		3 4-5		
			Wet, Medium Stiff, Brown Sandy Clay	- -	●		2 3-2		
5			Wet, Soft, Brown Sandy Clay	-	●		0 2-2		
			Wet, Stiff, Brown Sandy Clay	-	●		1 3-6		
			Moist, Very Stiff, Brown, Clay	-	●		3 7-10		
10			Moist, Hard, Bown Sandy Clay with Some Gravel	-	●		7 15-17		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	- -	●		18 55-30 (8")		
15			Dry, Hard, Brown Clay (Highly Weathered Shale)	- -	●		16 29-20		
			SHALE - Highly Weathered, Medium Hard, Brown	- -	●		16 58-30 (8")		
20			SHALE - Weathered, Medium Hard, Dark Gray	-			61 (5")		
			SHALE - Unweathered, Medium Hard, Dark Gray Boring Terminated				45 (5")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 R7
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 70+38
LOCATION: 173' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: December 2, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 276.1	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
			Moist, Stiff, Brown Sandy Clay with Some Gravel	-	●		2 5-5		
			Moist, Loose, Brown Clayey Sand	-	●		4 4-6		
			Moist, Medium Dense, Brown Clayey Sand	-	●		3 5-8		
5			Moist, Very Stiff, Brown Sandy Clay	-	●		6 11-18		
			Moist, Hard, Brown Sandy Clay	-	●		17 24-25		
			Moist, Hard, Brown Clay	-	●		9 16-21		
10			Moist, Very Hard, Brown Clay (Highly Weathered Shale)	-	●		16 36-50		
			Moist, Hard, Brown Clay (Highly Weathered Shale)	-	●		15 25-34		
				-					
15			SHALE - Highly Weathered, Medium Hard, Brown	-	●		24 49-30 (10")		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray	-			55 45 (2")		
20			SHALE - Weathered, Medium Hard, Dark Gray				12 (2")		
			SHALE - Slightly Weathered, Medium Hard, Dark Gray				15 (2")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 R8
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+26
LOCATION: 116' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 23 and 24, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.7

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: 281.0						
			Moist, Stiff, Brown Sandy Clay	-			1 5-5		
			Moist, Medium Dense, Brown Clayey Sand	- - -			4 5-8 5 9-11		
5			Moist, Medium Dense, Brown Sandy Silt with Gravel	ML			14 13-17		
			Moist, Very Hard, Brown Clay	- - - - -			17 30-49 30 59-15 (8") 13 58-30 (8")		
10									
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	- - -			20 42-40 (10") 13 30 (2")		
15									
			SHALE - Unweathered, Medium Hard, Dark Gray	- -			15 (4")		
20			SHALE - Soft*	- -			9 10-26		
			Boring Terminated						
25									
30									
35									

REMARKS: * Water encountered at 18.9' below ground level.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 R8A
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+23
LOCATION: 117' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 30, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 24.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 281.3	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			*						
10									
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				46 (6")		
20			SHALE - Unweathered, Medium Hard, Dark Gray				15 (1") 15 (4")		
			SHALE - Softer Zone with water encountered 21.1'-21.5' bgl.				13 (1")		
25			SHALE - Unweathered, Medium Hard, Dark Gray				11 (4")		
			Boring Terminated						
30									
35									

REMARKS: This boring was drilled to further investigate a wet zone encountered in "Hwy 5 R8" at a depth of 18.9' bgl. Sampling in this boring was not conducted until 14.5' bgl.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 R9
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 65+36
LOCATION: 155' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 24, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 19.4

SURFACE ELEVATION: 281.1

DEPTH FT.	DESCRIPTION OF MATERIAL	SOIL GROUP	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
	Moist, Medium Dense, Brown Silt with Sand and Some Gravel	ML	2 8-9 7		
	Moist, Medium Dense, Reddish Brown, Clayey Sand	-	11-12 6		
5	Moist, Very Stiff, Reddish Brown Clay	-	10-11 9		
		-	11-15 25		
		-	34-42 (10")		
		-	31		
10	Moist, Very Hard, Brown Clay (Highly Weathered Shale)	-	61 (5")		
		-	12 59-30 (7")		
		-	20 61 (5")		
15	SHALE - Highly Weathered, Medium Hard, Brown and Gray	-	21 40 (5")		
	SHALE - Weathered, Medium Hard, Dark Gray		25 (4")		
20	SHALE - Unweathered, Medium Hard, Dark Gray		11 (2")		
	Boring Terminated				
25					
30					
35					

MOISTURE CONTENT (%) ●
PL + – – – – – – – – + LL
10 20 30 40 50 60 70

PERCENT PASSING NO. 200 SIEVE

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 R10
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 64+63
LOCATION: 165' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: December 1, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 21.95

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 279.9	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
			Wet, Soft, Brown Sandy Clay with Trace Gravel	-			1		
			Wet, Medium Stiff, Brown Sandy Clay	-			2-1 0		
			Moist, Stiff, Brown Clay	-			2-3 2		
5			Moist, Very Stiff, Brown Clay	-			4-8 6		
			Moist, Hard, Brown Clay	-			11-19 19		
			Moist, Hard, Brown Clay (Highly Weathered Shale)	-			26-34 9		
10				-			16-27 39		
			Moist, Very Hard, Brown Clay (Highly Weathered Shale)	-			58-10 (7") 33		
				-			50-20 (7") 42		
15				-			20 (1")		
			SHALE - Highly Weathered, Medium Hard, Brown	-			15 (2")		
20			SHALE - Unweathered, Medium Hard, Dark Gray				25 (5")		
			Boring Terminated				21 (5")		
25									
30									
35									

REMARKS:

Arkansas Department of Transportation

Unconsolidated Undrained Triaxial Test (ASTM D2850)

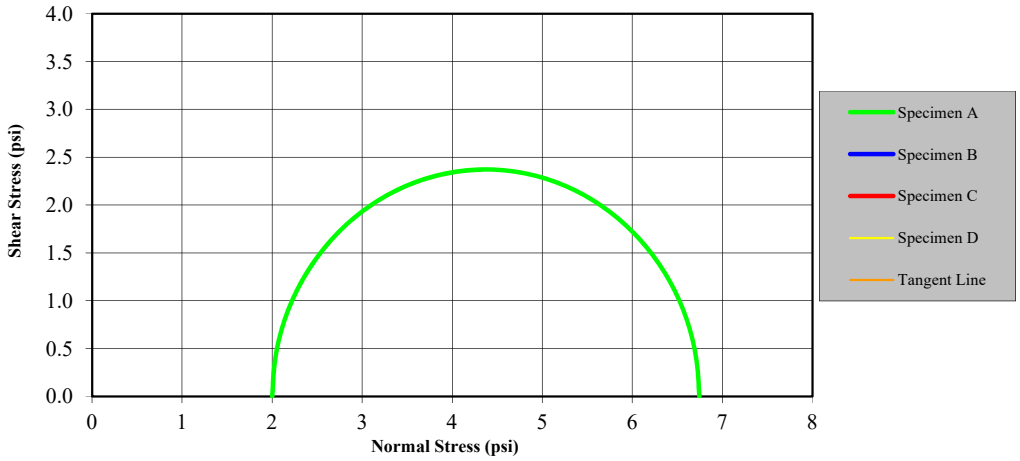
Date:

Checked By:

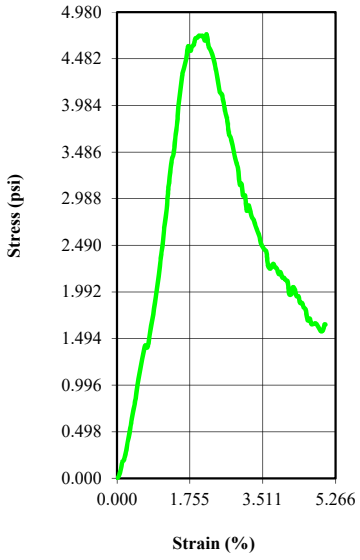
Date:

Tested By:

Mohr Circles



Stress-Strain Curve



Before Test	Specimen A	B	C	D
Water Content (%)	19.73	0.00	0.00	0.00
Dry Density (pcf)	104.10	0.00	0.00	0.00
Saturation (%)	85.95	0.00	0.00	0.00
Void Ratio	0.62	0.00	0.00	0.00
Diameter (in)	2.875	0.000	0.000	0.000
Height (in)	6.023	0.000	0.000	0.000
Liquid Limit	32.0			
Plastic Limit	20.0			
Specific Gravity	2.700			
After Test	**A**	**B**	**C**	**D**
Water Content (%)	21.73	0.00	0.00	0.00
Test Data	**A**	**B**	**C**	**D**
Strain Rate (in/min)	0.02	0.00	0.00	0.00
Peak Deviator Stress (psi)	4.743	0.000	0.000	0.000
Axial Strain @ Failure (%)	2.155	0.000	0.000	0.000
	Cell Pressure			
Cell (psi)	2.0	0.0	0.0	0.0
Back (psi)	n/a	n/a	n/a	n/a
	Principle Stresses at Failure			
σ1 (psi)	6.7	0.0	0.0	0.0
σ3 (psi)	2.0	0.0	0.0	0.0

Mohr-Coulomb Strength Parameters		Sample Description
C (psi)	2.4	Reddish brown fine sandy clay (LL = 32, PI = 12, -No. 200 = 77%).
Friction Angle Ø	0.00	

Project Information			
Project Name:	Hwy. 67 Intchng. Imprvts. (Cabot)(S)		
Project Number:	CA0613	Job Number:	CA0613
Location:	Sta. 69+41, 92' Rt. of CL 67/167.	Boring Number:	Hwy 5 R3
Client:		Sample Depth, ft:	1.0
Remarks:			

Arkansas Department of Transportation

Unconsolidated Undrained Triaxial Test (ASTM D2850)

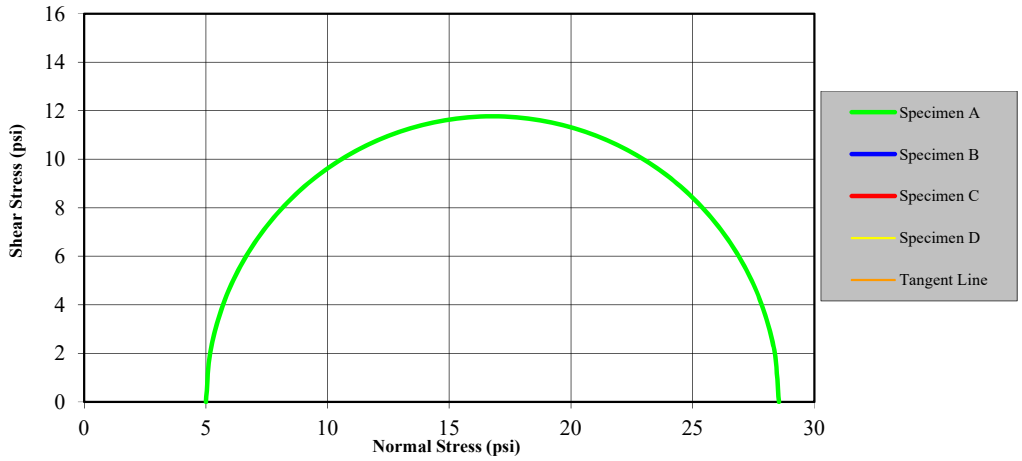
Date:

Checked By:

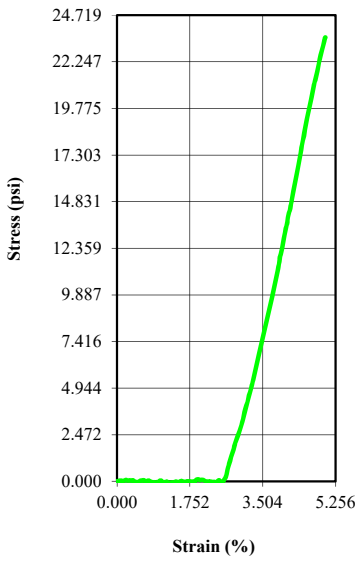
Date:

Tested By:

Mohr Circles



Stress-Strain Curve



Before Test	Specimen A	B	C	D
Water Content (%)	19.17	0.00	0.00	0.00
Dry Density (pcf)	108.06	0.00	0.00	0.00
Saturation (%)	92.45	0.00	0.00	0.00
Void Ratio	0.56	0.00	0.00	0.00
Diameter (in)	2.875	0.000	0.000	0.000
Height (in)	6.000	0.000	0.000	0.000
Liquid Limit	41.0			
Plastic Limit				
Specific Gravity	2.700			
After Test	**A**	**B**	**C**	**D**
Water Content (%)	20.40	0.00	0.00	0.00
Test Data	**A**	**B**	**C**	**D**
Strain Rate (in/min)	0.02	0.00	0.00	0.00
Peak Deviator Stress (psi)	23.542	0.000	0.000	0.000
Axial Strain @ Failure (%)	5.006	0.000	0.000	0.000
	Cell Pressure			
Cell (psi)	5.0	0.0	0.0	0.0
Back (psi)	n/a	n/a	n/a	n/a
	Principle Stresses at Failure			
σ1 (psi)	28.5	0.0	0.0	0.0
σ3 (psi)	5.0	0.0	0.0	0.0

Mohr-Coulomb Strength Parameters		Sample Description
C (psi)	11.8	Brown fine sandy clay (LL = 41, PI = 22, -No. 200 = 75%)
Friction Angle Ø	0.00	

Project Information			
Project Name:	Hwy. 67 Intchng. Imprvts. (Cabot)(S)		
Project Number:	CA0613	Job Number:	CA0613
Location:	Sta. 69+41, 92' Rt. of CL 67/167.	Boring Number:	Hwy 5 R3
Client:		Sample Depth, ft	5
Remarks:			

Arkansas Department of Transportation

Unconsolidated Undrained Triaxial Test (ASTM D2850)

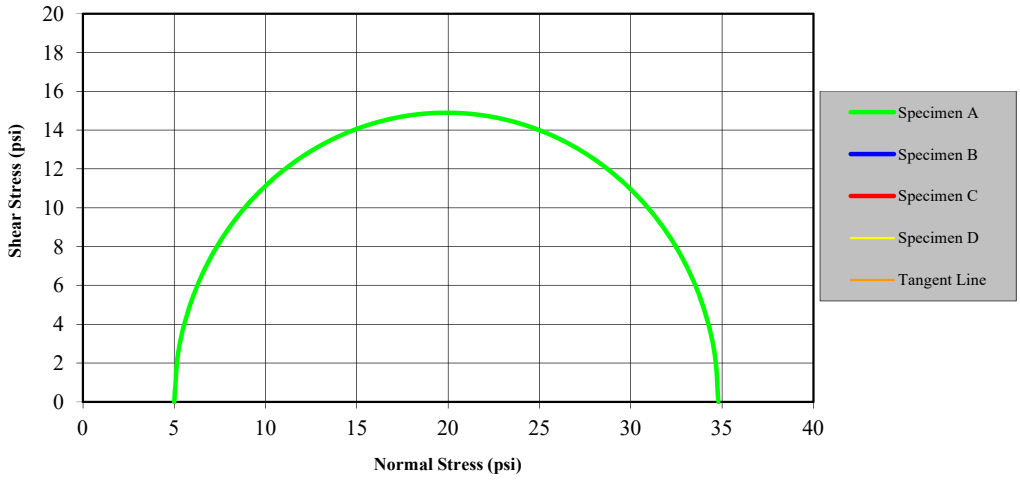
Date:

Checked By:

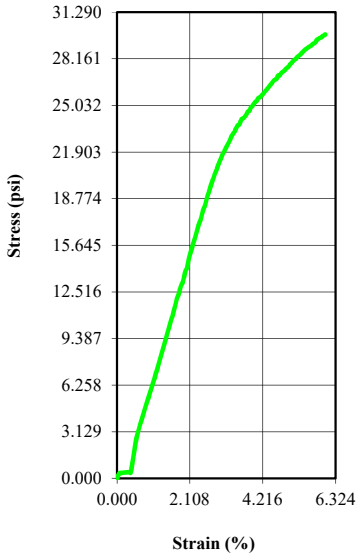
Date:

Tested By:

Mohr Circles



Stress-Strain Curve



Before Test	Specimen A	B	C	D
Water Content (%)	18.87	0.00	0.00	0.00
Dry Density (pcf)	107.03	0.00	0.00	0.00
Saturation (%)	88.62	0.00	0.00	0.00
Void Ratio	0.57	0.00	0.00	0.00
Diameter (in)	2.875	0.000	0.000	0.000
Height (in)	5.963	0.000	0.000	0.000
Liquid Limit	35.0			
Plastic Limit	21.0			
Specific Gravity	2.700			
After Test	**A**	**B**	**C**	**D**
Water Content (%)	16.76	0.00	0.00	0.00
Test Data	**A**	**B**	**C**	**D**
Strain Rate (in/min)	0.02	0.00	0.00	0.00
Peak Deviator Stress (psi)	29.800	0.000	0.000	0.000
Axial Strain @ Failure (%)	6.022	0.000	0.000	0.000
	Cell Pressure			
Cell (psi)	5.0	0.0	0.0	0.0
Back (psi)	n/a	n/a	n/a	n/a
	Principle Stresses at Failure			
σ1 (psi)	34.8	0.0	0.0	0.0
σ3 (psi)	5.0	0.0	0.0	0.0

Mohr-Coulomb Strength Parameters		Sample Description
C (psi)	14.9	Brown fine sandy clay (LL = 35, PI = 14)
Friction Angle Ø	0.00	

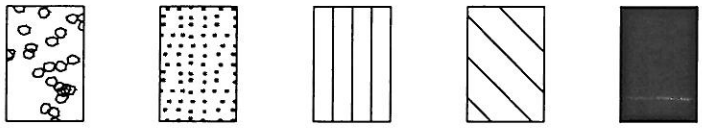
Project Information			
Project Name:	Hwy. 67 Intrchng. Imprvts. (Cabot)(S)		
Project Number:	CA0613	Job Number:	CA0613
Location:	Sta. 70+26, 154' Rt. of CL 67/167	Boring Number:	Hwy 5 R4
Client:		Sample Depth, ft:	4.5
Remarks:			

LEGEND

SOIL TYPES

(SHOWN IN SYMBOL COLUMN)

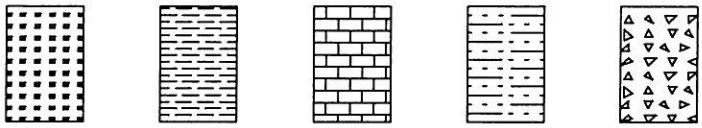
(PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL | SAND | SILT | CLAY | ORGANIC MATTER

ROCK TYPES

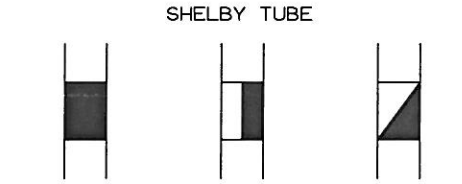
(SHOWN IN SYMBOL COLUMN)



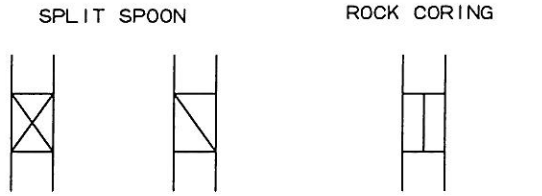
SANDSTONE | SHALE or SILTSTONE | LIMESTONE or DOLOMITE | ALTERNATING LAYERS of SHALE and SANDSTONE | OTHER

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.

Materials Division

Results of Classification Tests
ARDOT Project No.: CA0613 / 061371
Project: Hwy. 67 Intchng. Impvts. (Cabot) (S)
Site: Highway 5 & Hwy 89 / County: Lonoke

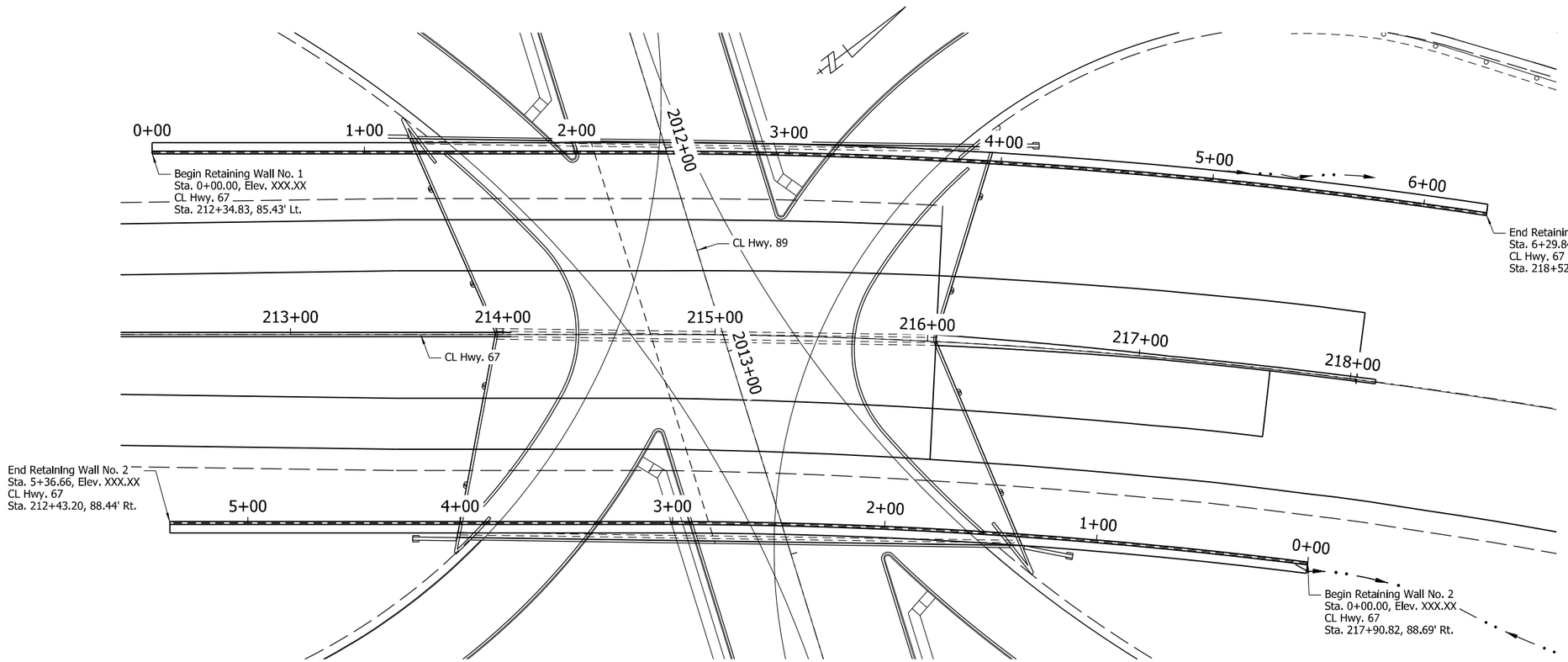
Summarized by: JCS
Checked by: PWC

Sample Identification					Moisture Content, %	Atterberg Limits			% Fines	Soil Classification	
Boring	Structure	Station	Offset	Depth, ft		LL	PL	PI		USCS	AASHTO
Hwy 5 B-1	Ramp 1	1+99.5	4' Lt.	0-1.5	33				95		
Hwy 5 B-1	Ramp 1	1+99.5	4' Lt.	1.5-3	29				93		
Hwy 5 B-1	Ramp 1	1+99.5	4' Lt.	3-4.5	26	38	22	16	93	CL	A-6
Hwy 5 B-1	Ramp 1	1+99.5	4' Lt.	4.5-6	21	31	20	11	94	CL	A-6
Hwy 5 B-1	Ramp 1	1+99.5	4' Lt.	6-7.5	18	33	18	15	93	CL	A-6
Hwy 5 B-1	Ramp 1	1+99.5	4' Lt.	7.5-9	12	35	20	15	58	CL	A-6
Hwy 5 B-1	Ramp 1	1+99.5	4' Lt.	9-10.4	11	35	22	13	60	CL	A-6
Hwy 5 B-1	Ramp 1	1+99.5	4' Lt.	12-12.8	11	32	21	11	72	CL	A-6
Hwy 5 B-3	Ramp 2	2+06	30' Rt.	0-2	20	32	20	12	77	CL	A-6
Hwy 5 B-3	Ramp 2	2+06	30' Rt.	3.6-5.6	19	41	19	22	75	CL	A-7-6(15)
Hwy 5 B-4	Ramp 2	1+00	7' Rt.	0-1.9	13	29	19	10	32	SC	A-2-4
Hwy 5 B-4	Ramp 2	1+00	7' Rt.	3.4-5.4	19	35	21	14	88	CL	A-6

Attachment B

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0613	$SN6101$	ST
(1) $BN06$		WALL DETAILS		$DN6101$



PLAN - HIGHWAY 89 RETAINING WALLS

PRELIMINARY
NOT FOR
CONSTRUCTION

BRIDGE ENGINEER

SHEET 1 OF 5
DETAILS OF RETAINING WALLS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

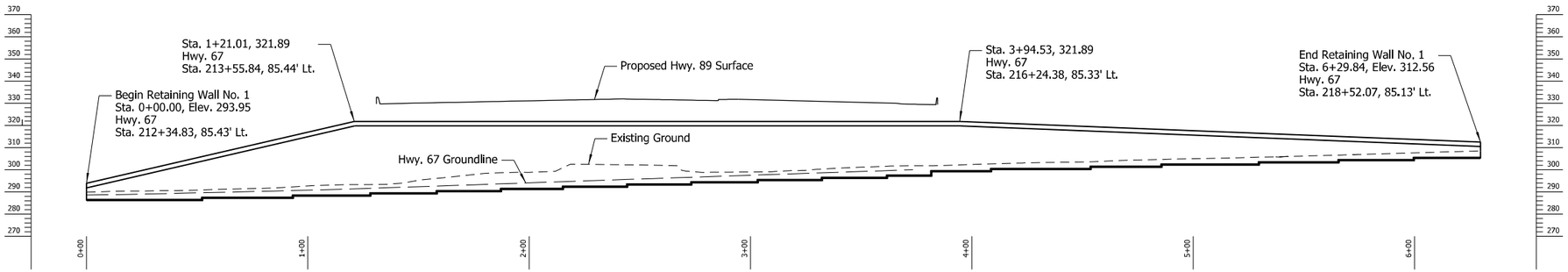
LITTLE ROCK, ARK.

DRAWN BY: CSW DATE: MAR. 2021 FILENAME: BCA0613x6_L1.DGN
CHECKED BY: XXX DATE: XXX. 2021 SCALE: 1" = 30'-0"
DESIGNED BY: CSW DATE: MAR. 2021

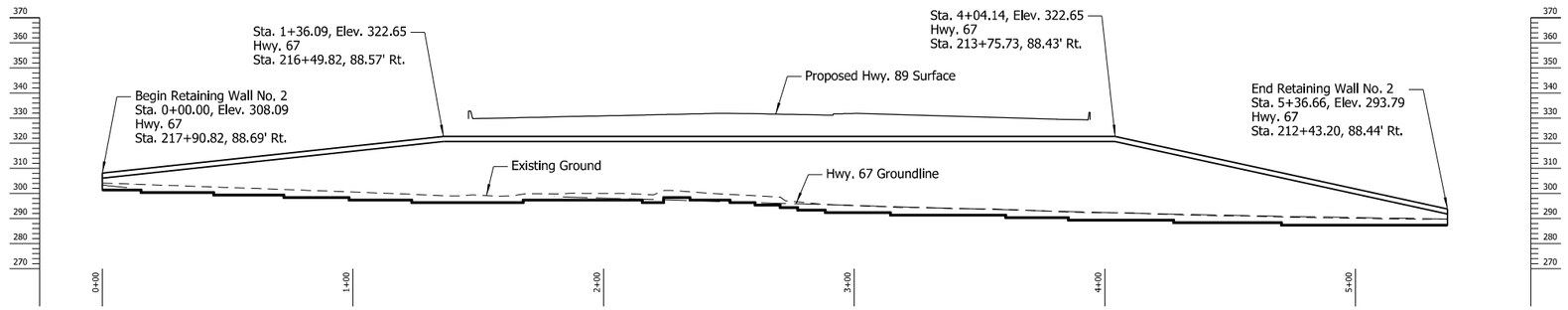
BRIDGE NO. $BN06$ DRAWING NO. $DN6101$

CSWlle 4/14/2021 8:39:32 AM
WORKSPACE: ARDOT Bridge (2019)
L:\2017\1701757S - 061549 Hwy 5 - White Co Line\Drawings\bCA0613-S10X-WALL (Hwy. 89 Walls).dgn
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0613	$SN6101$	ST
				(1)				



RETAINING WALL NO. 1 - ELEVATION



RETAINING WALL NO. 2 - ELEVATION

PRELIMINARY
NOT FOR
CONSTRUCTION

BRIDGE ENGINEER

DETAILS OF RETAINING WALLS

ROUTE SEC.

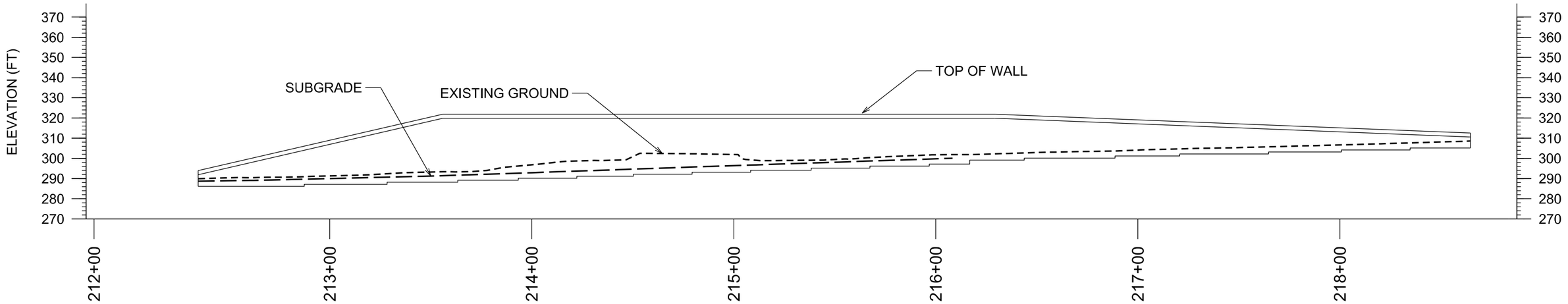
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: CSW DATE: APR. 2021 FILENAME: BCA0613x6_L1.DGN
CHECKED BY: XXX DATE: XXX. 2021 SCALE: 1" = 30'-0"
DESIGNED BY: CSW DATE: APR. 2021
BRIDGE NO. $BN06$ DRAWING NO. $DN6101$

CSWylie 4/14/2021 8:41:36 AM
WORKSPACE: ARDOT Bridge (2019)
L:\2017\17017575 - 061549 Hwy 5 - White Co Line\Drawings\BCA0613-S10X-WALL (Hwy. 89 Elev.).dgn
REVISED DATE:

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		CA0613		
CONCEPT FOR MSE WALL BEARING				



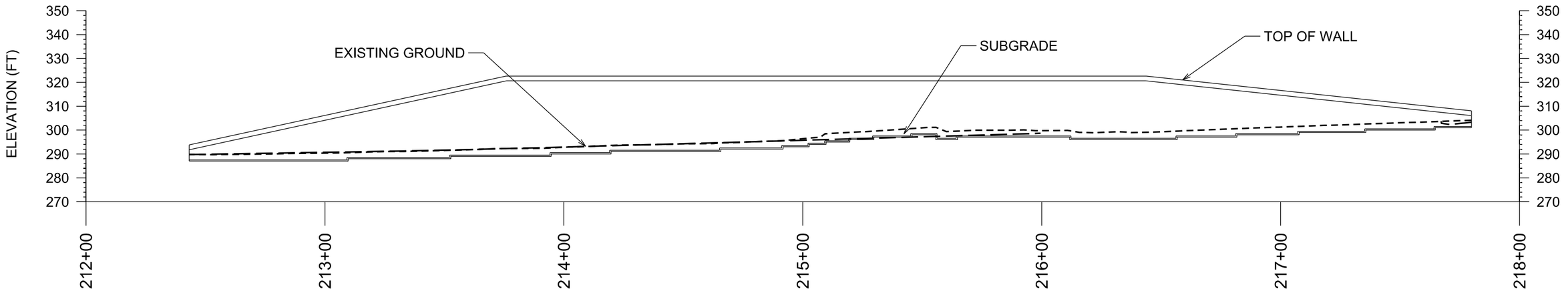
FACTORED BEARING CAPACITIES FOR VARIOUS CASES

ASSUMED LENGTH OF REINFORCING STRIPS	10' TO 25'	20' TO 25'	9' TO 20'
MAX. FACTORED WALL BEARING PRESSURE	2.0 TO 11.3 KSF	7.6 TO 11.3 KSF	1.9 TO 7.6 KSF
BEARING ON NATIVE SOILS	3.5 KSF		
UNDERCUT DEPTH	0'		
BEARING ON CLASS 7 AGGREGATE BASE	6 KSF		
UNDERCUT DEPTH	2'		
BEARING ON STONE BACKFILL	12.5 KSF		
UNDERCUT DEPTH	3' TO 7'		

NOTES:
1. SUBGRADE ELEVATIONS UTILIZED TO CALCULATE BEARING CAPACITIES WERE INFERRED FROM WALL PROFILES PROVIDED BY THE DESIGN CONSULTANT (GARVER) ON 3/22/2021. THESE VALUES ARE SUBJECT TO CHANGE.
2. ASSUMED MINIMUM LENGTH OF REINFORCING STRIPS IS DETERMINED TO ACHIEVE A CDR (CAPACITY-DEMAND-RATIO) GREATER THAN 1.0 OR 0.7 TIMES WALL HEIGHT, WHICHEVER IS GREATER.
3. FACTORED BEARING PRESSURE IS ESTIMATED BASED ON THE ABOVE ASSUMED LENGTH OF REINFORCING STRIPS, PROVIDED WALL PROFILE, UNIT WEIGHT (γ) OF 102 PCF FOR THE REINFORCED SELECT BACKFILL, RETAINED BACKFILL PARAMETERS (γ=125 PCF/Ø=30 DEGREES), ASSUMED 2H:1V BACKSLOPE OF 20 FT AND MAXIMUM LIIVE LOAD SURCHARGE OF 2' (TO BE VERIFIED BY THE WALL DESIGNER).
4. REFER TO GEOTECHNICAL INVESTIGATION REPORT FOR DETAILS.
5. STATIONING IS IN REFERENCE TO HWY. 67/167

CONCEPT FOR MSE WALL BEARING	
HWY. 67 INTCHNG. IMPVTS. (CABOT) (S) ROUTE 67, SECTION 11 LONOKE COUNTY HWY. 89 MSE WALL NO. 1	
JOB NO. CA0613	SHEET 3/4

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		CA0613		
CONCEPT FOR MSE WALL BEARING				



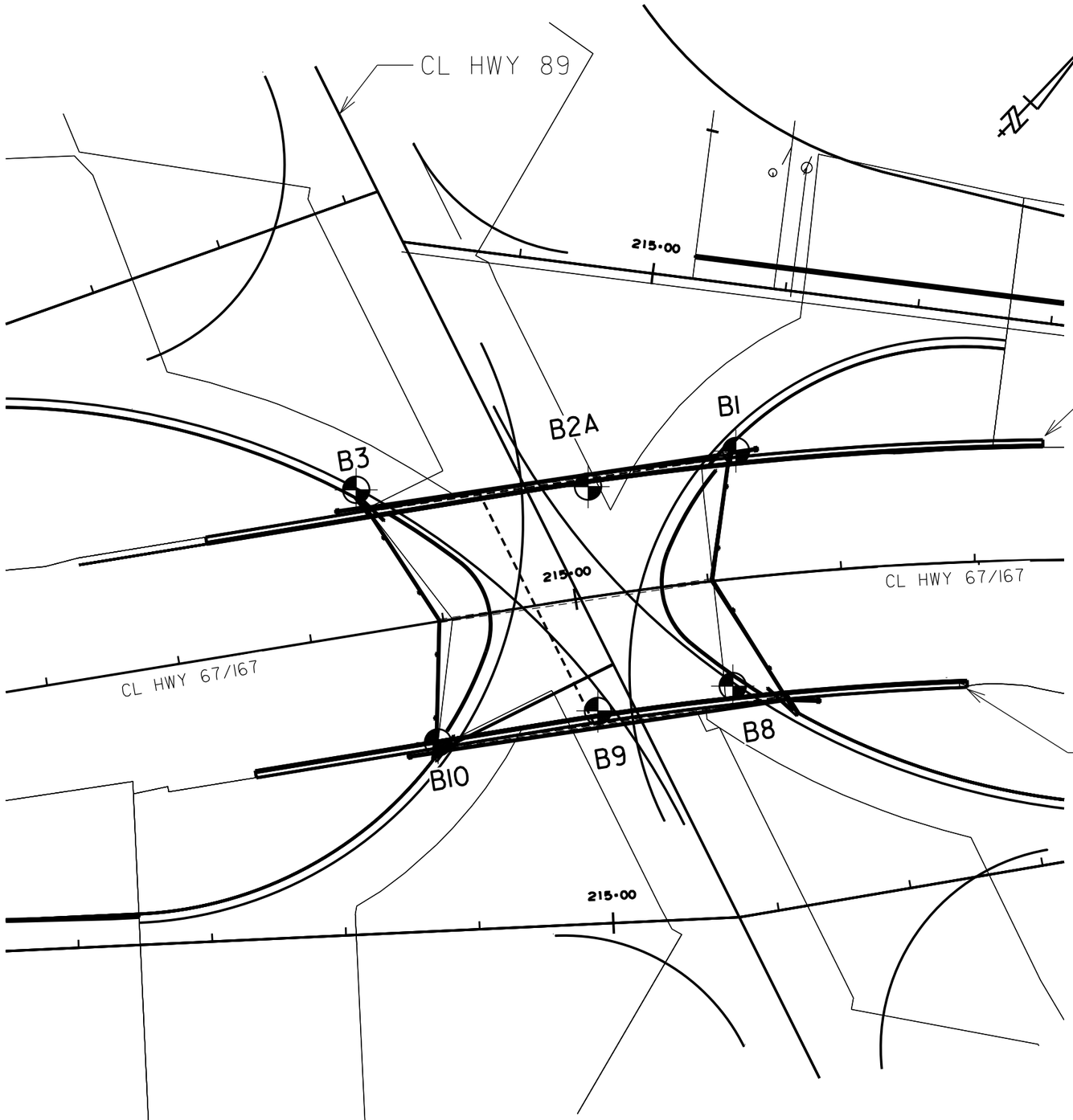
FACTORED BEARING CAPACITIES FOR VARIOUS CASES

ASSUMED LENGTH OF REINFORCING STRIPS	6' TO 22'	22' TO 25'	6' TO 25'
MAX. FACTORED WALL BEARING PRESSURE	2.1 TO 8.7 KSF	8.7 TO 11.1 KSF	2.0 TO 11.1 KSF
BEARING ON STONE BACKFILL	12.5 KSF		
UNDERCUT DEPTH	6.5' TO 11.5'		
AGGREGATE PIERS	6 KSF - 10 KSF OR HIGHER		
DEPTH OF GROUND IMPROVEMENTS	7' TO 12'		

NOTES:
1. SUBGRADE ELEVATIONS UTILIZED TO CALCULATE BEARING CAPACITIES WERE INFERRED FROM WALL PROFILES PROVIDED BY THE DESIGN CONSULTANT (GARVER) ON 3/22/2021. THESE VALUES ARE SUBJECT TO CHANGE.
2. ASSUMED MINIMUM LENGTH OF REINFORCING STRIPS IS DETERMINED TO ACHIEVE A CDR (CAPACITY-DEMAND-RATIO) GREATER THAN 1.0 OR 0.7 TIMES WALL HEIGHT, WHICHEVER IS GREATER.
3. FACTORED BEARING PRESSURE IS ESTIMATED BASED ON THE ABOVE ASSUMED LENGTH OF REINFORCING STRIPS, PROVIDED WALL PROFILE, UNIT WEIGHT (γ) OF 102 PCF FOR THE REINFORCED SELECT BACKFILL, RETAINED BACKFILL PARAMETERS (γ=125 PCF/Ø=30 DEGREES), ASSUMED 2H:1V BACKSLOPE OF 20 FT AND MAXIMUM LIIVE LOAD SURCHARGE OF 2' (TO BE VERIFIED BY THE WALL DESIGNER).
4. REFER TO GEOTECHNICAL INVESTIGATION REPORT FOR DETAILS.
5. STATIONING IS IN REFERENCE TO HWY. 67/167
6. DETAILED DESIGN PARAMETERS OF AGGREGATE PIERS SHOULD BE PROVIDED BY THE PIER DESIGNER

CONCEPT FOR MSE WALL BEARING	
HWY. 67 INTCHNG. IMPVTS. (CABOT) (S) ROUTE 67, SECTION 11 LONOKE COUNTY HWY. 89 MSE WALL NO. 2	
JOB NO. CA0613	SHEET 4/4

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		CA0613		
PLAN OF BORINGS				



HWY 89 BRIDGE ENDS			
BORING	STATION	OFFSET	ELEVATION
B1	216+31	95 LT	301.3
B2A	215+22	82 LT	299.2
B3	213+51	107 LT	292.3
B8	216+10	80 RT	299.6
B9	215+06	85 RT	296.3
B10	213+81	89 RT	292.4

NOTE: ALL REFERENCES TO STATION AND OFFSET ARE MADE TO CL HWY. 67/167.

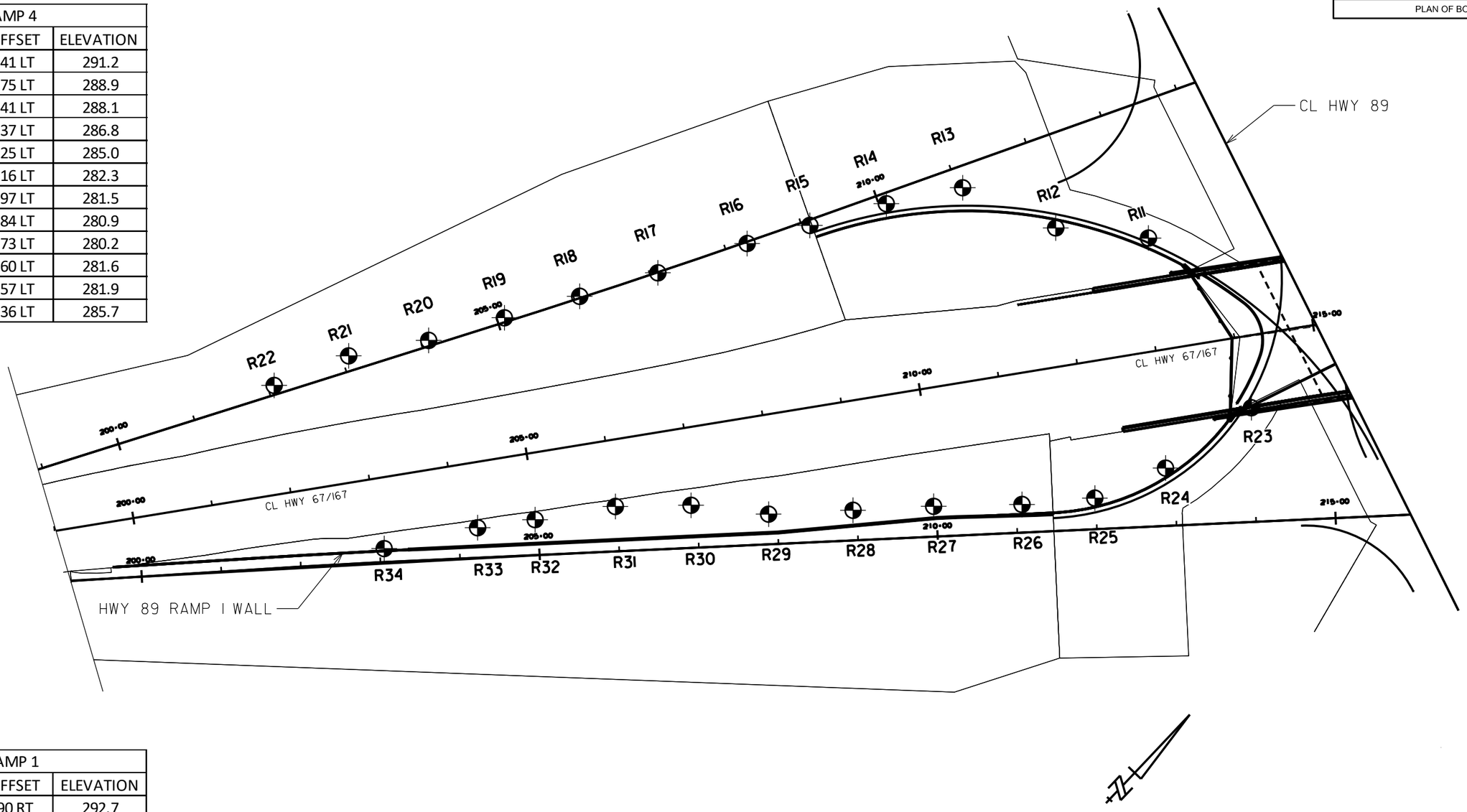
PLAN OF BORINGS

HWY. 67 INTCHNG. IMPVTS. (CABOT) (S)
ROUTE 67, SECTION 11
LONOKE COUNTY
HWY. 89

JOB NO. CA0613	SHEET 1/1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		CA0613		
PLAN OF BORINGS				

HWY 89 RAMP 4			
BORING	STATION	OFFSET	ELEVATION
R11	213+14	141 LT	291.2
R12	212+01	175 LT	288.9
R13	210+94	241 LT	288.1
R14	209+96	237 LT	286.8
R15	208+97	225 LT	285.0
R16	208+16	216 LT	282.3
R17	206+99	197 LT	281.5
R18	205+98	184 LT	280.9
R19	205+00	173 LT	280.2
R20	204+02	160 LT	281.6
R21	202+99	157 LT	281.9
R22	202+01	136 LT	285.7



HWY 89 RAMP 1			
BORING	STATION	OFFSET	ELEVATION
R23	214+07	90 RT	292.7
R24	212+88	147 RT	286.5
R25	211+95	170 RT	285.2
R26	211+03	163 RT	284.8
R27	209+93	148 RT	282.5
R28	208+93	136 RT	281.8
R29	207+88	124 RT	281.5
R30	206+93	97 RT	281.2
R31	205+99	83 RT	283.2
R32	204+97	83 RT	282.8
R33	204+24	82 RT	283.0
R34	203+04	89 RT	281.2

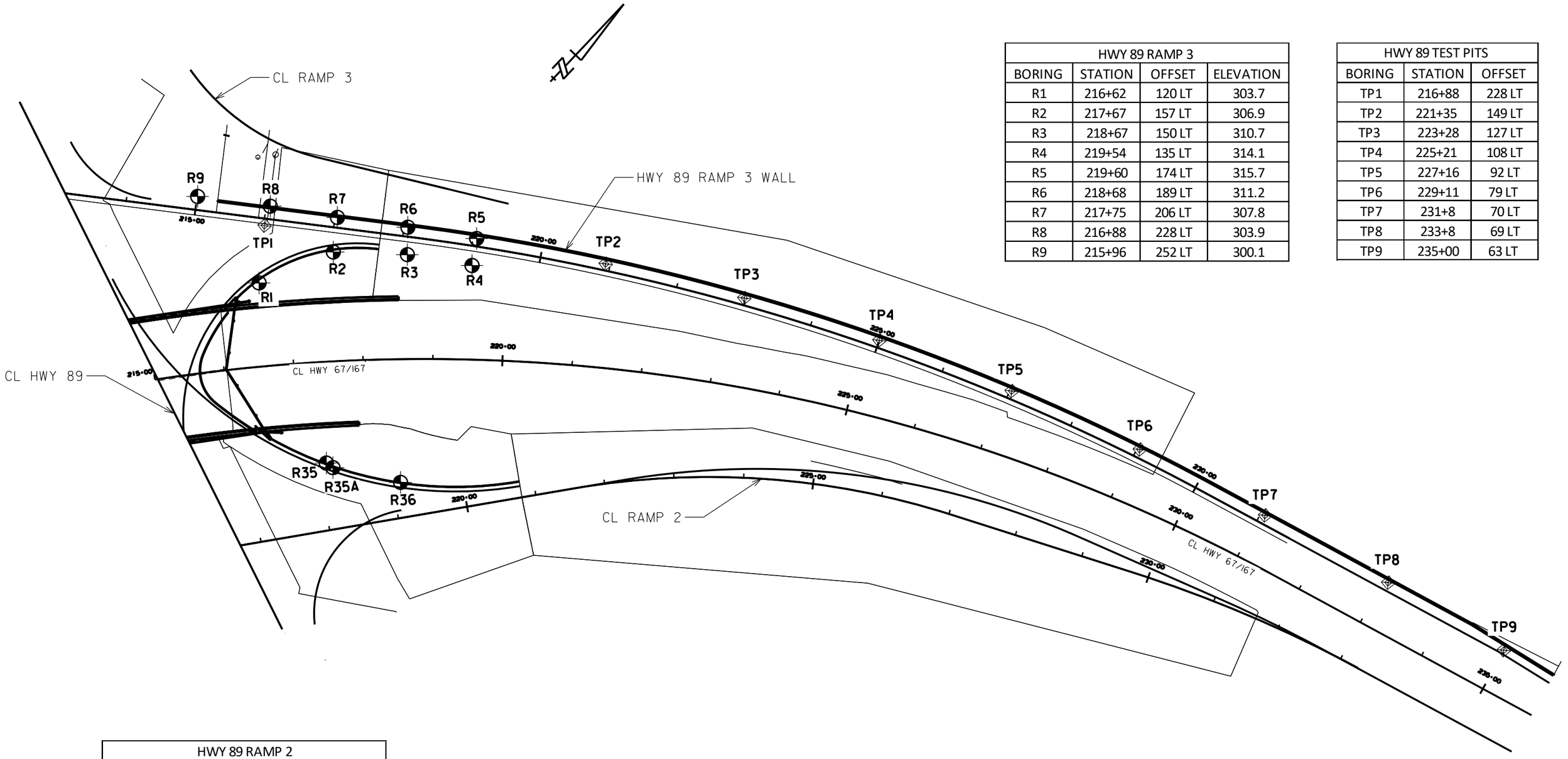
NOTE: ALL REFERENCES TO STATION AND OFFSET ARE MADE TO CL HWY. $^{67}/_{167}$.

PLAN OF BORINGS

HWY. 67 INTCHNG. IMPVTS. (CABOT) (S)
ROUTE 67, SECTION 11
LONOKE COUNTY
HWY. 89

JOB NO. CA0613 | SHEET 1/2

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		CA0613		
PLAN OF BORINGS & TEST PITS				



HWY 89 RAMP 3			
BORING	STATION	OFFSET	ELEVATION
R1	216+62	120 LT	303.7
R2	217+67	157 LT	306.9
R3	218+67	150 LT	310.7
R4	219+54	135 LT	314.1
R5	219+60	174 LT	315.7
R6	218+68	189 LT	311.2
R7	217+75	206 LT	307.8
R8	216+88	228 LT	303.9
R9	215+96	252 LT	300.1

HWY 89 TEST PITS		
BORING	STATION	OFFSET
TP1	216+88	228 LT
TP2	221+35	149 LT
TP3	223+28	127 LT
TP4	225+21	108 LT
TP5	227+16	92 LT
TP6	229+11	79 LT
TP7	231+8	70 LT
TP8	233+8	69 LT
TP9	235+00	63 LT

HWY 89 RAMP 2			
BORING	STATION	OFFSET	ELEVATION
R35	217+37	145 RT	300.0
R35A	217+47	152 RT	299.7
R36	218+49	177 RT	301.9

NOTE: ALL REFERENCES TO STATION AND OFFSET ARE MADE TO CL HWY. 67/167.

PLAN OF BORINGS & TEST PITS

HWY. 67 INTCHNG. IMPVTS. (CABOT) (S)
ROUTE 67, SECTION 11
LONOKE COUNTY
HWY 89

JOB NO. CA0613	SHEET 2/2

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-1
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 216+31
LOCATION: 95' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 17 and 21, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 38.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 301.3	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, Brown, Stiff, Brown Clay with Trace Gravel				3 7-6		
10			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				17 40 (5")		
15			Clay (Highly Weathered Shale) with Occasional Sandstone Layers					7	0
20			SHALE WITH FREQUENT SANDSTONE SEAMS - Weathered, Medium Hard, Brown and Dark Gray					36	0
25			SHALE - Unweathered, Medium Hard, Dark Gray					100	94
30			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray					96	86
35								98	96

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-1
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 216+31
LOCATION: 95' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 17 and 21, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 38.5

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: 301.3						
			SHALE WITH OCCASIONAL SANDSTONE SEAMS AND LAYERS - Unweathered, Medium Hard, Dark Gray					100	100
40			Boring Terminated						
45									
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-2A
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+22
LOCATION: 82' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Tierney

DATE: September 28, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 299.2	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, Loose, Brown Clayey Sand				3 4-5		
10			Hard, Dry, Brown Clay (Highly Weathered Shale)				8 17-24		
15			SHALE - Highly Weathered, Medium Hard, Brown and Gray				22 40-40		
20							17 52-35 (8")		
			SHALE - Weathered to Highly Weathered, Medium Hard, Brown and Gray					35	0
25			SHALE - Unweathered, Medium Hard, Dark Gray					100	84
30								70	54
35			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray						

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-2A
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+22
LOCATION: 82' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Tierney

DATE: September 28, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.7

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: 299.2						
								100	72
40									
			SHALE - Unweathered, Medium Hard, Dark Gray					100	96
45									
								100	100
50			Boring Terminated						
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-3
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 213+51
LOCATION: 107' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 29, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 42.9

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: 292.3						
5			Moist, Stiff, Brown Clay				1 5-8		
10							16 42-44 (10")		
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				25 35-35		
20									
			SHALE - Weathered, Medium Hard, Gray				61 (4")		
			SHALE - Unweathered, Medium Hard, Dark Gray					100	100
25								100	84
			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray						
30								100	82
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-3
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 213+51
LOCATION: 107' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 29, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 42.9

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: 292.3						
			SHALE WITH FREQUENT SANDSTONE LAYERS - Unweathered, Medium Hard, Dark Gray					100	90
40			SHALE - Unweathered, Medium Hard, Dark Gray					100	100
			Boring Terminated						
45									
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-8
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 216+10
LOCATION: 80' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 49.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 299.6	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
			Moist, Medium Stiff to Stiff, Brown Sandy Clay with Gravel				4 7-5 3 4-4		
5							1 2-3		
			Moist, Stiff, Brown Sandy Clay Gravel				4 5-10		
10			Moist, Very Stiff, Reddish Brown Clay				4 11-21		
			Dry, Very Stiff, Brown Clay (Highly Weathered Shale)						
15							12 21-36		
			Dry, Hard, Brown Clay (Highly Weathered Shale)						
20							40 61 (4")		
			SHALE - Highly Weathered, Medium Hard, Gray						
			SHALE - Slightly Weathered, Medium Hard, Occasional Fractures, Dark Gray					54	50
25									
			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					100	48
30									
			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					98	72
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-8
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 216+10
LOCATION: 80' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 49.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 299.6	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
			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					80	55
40			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					96	90
45								94	94
50			Boring Terminated						
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-9
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+06
LOCATION: 85' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 8, 2020
TYPE OF DRILLING: Hollow Stem Auger -

EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 296.3	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
			Moist, Loose, Brown Clayey Sand with Trace Gravel				1 3-6		
			Moist, Stiff, Brown Clay with Some Shale Fragments				5 7-8		
5			Moist, Medium Stiff, Brown Sandy Clay				1 3-5		
							3 4-7		
10			Moist, Stiff to Very Stiff, Brown Sandy Clay with Some Gravel				5 9-13		
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				62 (5")		
20			SHALE - Highly Weathered, Medium Hard, Brown and Gray				25 (4")		
								88	74
25								92	88
30			SHALE - Unweathered, Medium Hard, Dark Gray					100	100
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-9
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+06
LOCATION: 85' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 8, 2020
TYPE OF DRILLING: Hollow Stem Auger -

EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 44.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 296.3	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
								90	80
40			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray						
			SANDSTONE - Unweathered, Cemented, Occasional Fractures, Gray					94	58
45			SHALE WITH OCCASIONAL SANDSTONE LAYERS - Unweathered, Medium Hard, Occasional Fractures, Dark Gray						
			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-10
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 213+81
LOCATION: 89' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 1 and 3, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75/Acker 1779*

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 43.7

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: 292.4						
5			Moist, Soft, Brown Sandy Clay				1 1-2		
10			Dry, Hard, Brown Clay (Highly Weathered Shale)				4 15-19		
15							6 15-23		
20			SHALE - Highly Weathered, Medium Hard, Brown and Gray				60 (5")		
			SHALE - Slightly Weathered, Medium Hard, Dark Gray					70	50
25			SHALE WITH OCCASIONAL SANDSTONE LAYERS - Slightly Weathered, Medium Hard, Occasional Fractures, Dark Gray					100	80
30								90	56
35									

REMARKS: * Boring began with CME 75 and finished with Acker 1779.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-10
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 213+81
LOCATION: 89' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 1 and 3, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75/Acker 1779*

HAMMER CORRECTION FACTOR: 1.37

COMPLETION DEPTH: 43.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 292.4	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
			SHALE - Slightly Weathered, Medium Hard, Dark Gray					100	70
40								100	100
45			Boring Terminated						
50									
55									
60									
65									
70									

REMARKS: * Boring began with CME 75 and finished with Acker 1779.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R1
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 216+62
LOCATION: 120' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 14, 2020
TYPE OF DRILLING: Hollow Stem Aguer
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 303.7	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
			Moist, Very Stiff, Brown Sandy Clay with Gravel				2 7-12		
			Moist, Medium Dense, Brown Clayey Sand				3 6-9		
5			Moist, Stiff, Brown Sandy Clay				2 4-7		
			Moist, Very Stiff, Reddish Brown and Gray Clay				3 7-14		
10			SHALE - Highly Weathered, Medium Hard, Brown				20 50-31 (10")		
							6 24-50		
15							20 44-50 (10")		
			SHALE - Weathered, Medium Hard, Dark Gray				61 (5")		
20			SHALE - Unweathered, Hard, Dark Gray				12 (1")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R2
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 217+67
LOCATION: 157' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 13, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 17

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 306.9	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
			Moist, Medium Dense, Brown Clayey Sand with Trace Gravel				0 7-9		
			Moist, Very Stiff, Brown Sandy Clay				5 12-16		
5			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				16 26-61 (10")		
			SHALE - Highly Weathered, Medium Hard, Brown				56 52 (5") 35 65 (5") 16 62 (4")		
10									
15			SHALE - Weathered, Medium Hard, Dark Gray Auger refusal at 17' below ground level. Boring Terminated				62 (4")		
20									
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R3
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 218+67
LOCATION: 150' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 13, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 310.7	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
			Moist, Stiff, Brown Clay				3 5-8		
			Moist, Stiff, Brown Clay (Highly Weathered Shale)				1 15-30		
5			Moist, Stiff, Brown Clay (Highly Weathered Shale)*				28 58-20 (7")		
							20 52-30 (8")		
10			SHALE - Highly Weathered, Medium Hard, Brown				30 61 (4")		
							44 61 (4")		
15							12 (1")		
			SHALE - Weathered, Medium Hard, Brown And Dark Gray				11 (2")		
20			SHALE - Medium Hard No sample recovered				15 (2")		
			Boring Terminated						
25									
30									
35									

REMARKS: * Utility cable encountered in this sample.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R4
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 219+54
LOCATION: 135' Left of Centerline of Hwy 67/167
LOGGED BY: Paul Tierney and Austin Dillman

DATE: October 12, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 17.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 314.1	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
			Moist, Medium Dense, Brown Clayey Sand				1 6-13		
5			Dry, Hard, Brown Clay (Highly Weathered Shale)				11 25-33		
10			SHALE - Highly Weathered, Medium Hard, Brown				30 61 (5") 41 40 (4")		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray				34 62 (4")		
15			SHALE - Weathered, Medium Hard, Dark Gray				19 29 (4")		
			SHALE - Medium Hard (No sample recovered)				12 (2")		
20			Boring Terminated				11 (2")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R5
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 219+60
LOCATION: 174' Left of Centerline of Hwy 67/167
LOGGED BY: Paul Tierney and Austin Dillman

DATE: October 12, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.3

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: 315.7						
			Moist, Hard, Brown Sandy Clay				0 16-28		
			Shale - Highly Weathered, Soft, Brown and Gray				37 62 (5")		
5			SHALE - Weathered, Medium Hard, Brown and Gray				19 45-39 (8")		
			SHALE - Weathered with Highly Weathered Layers, Medium Hard, Brown and Gray				34 62 (4")		
10			SHALE - Weathered, Medium Hard, Dark Gray				20 (2")		
							15 (2")		
15			SHALE - Medium Hard (No sample recovered)				12 (2")		
							12 (2")		
20									
			Boring Terminated				12 (2")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R6
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 218+68
LOCATION: 189' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 8, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 22

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: 311.2						
			Moist, Stiff, Brown Sandy Clay with Some Gravel				3 5-4		
			Wet, Very Hard, Brown Sandy Clay with Some Gravel				1 30-51		
5							20 45-40 (10")		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				30 61 (4")		
10							20 21-58		
							35 61 (4")		
15							61 (5")		
			SHALE - Unweathered, Medium Hard, Dark Gray				20 (5")		
20							15 (2")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R7
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 217+75
LOCATION: 206' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Tierney

DATE: October 7, 2020
TYPE OF DRILLING: Hollow Stem Auger - Shelby Tube
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 19.8

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: 307.8						
			Moist, Reddish Brown Sand with Some Gravel				17		
			Moist, Medium Dense, Reddish Brown Sand with Gravel				12-11		
			Moist, Very Stiff, Brown Clay (Highly Weathered Shale)				8		
5							10-14		
			Moist, Hard, Brown Clay (Highly Weathered Shale)				12		
							17-15		
							24		
							41-44		
10			Moist, Very Hard, Brown Clay (Highly Weathered Shale)				20		
							61 (4")		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray				40		
							61 (4")		
15							61		
			SHALE - Weathered, Medium Hard, Brown and Gray				(5")		
							61		
			SHALE - Unweathered, Medium Hard, Dark Gray				(2")		
20							15		
			Boring Terminated				(2")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R8
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 216+88
LOCATION: 228' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 30, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.8

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: 303.9						
			Moist, Brown Clayey Gravel with Sand	GC		31			
			Moist, Medium Stiff, Reddish Brown Clay	-			2 3-5		
5			Moist, Brown Lean Clay	CL		91			
			Moist, Hard, Reddish Brown Sandy Clay	-			7 20-11		
			Moist, Very Clay, Brown Clay with Gravel (Shale Fragments)				5 12-16		
10			SHALE - Highly Weathered, Medium Hard, Brown	-			7 44-55		
							8 44-60 (11")		
15			SHALE - Highly Weathered, Medium Hard, Brown and Gray				22 33 (2")		
			SHALE - Unweathered, Medium Hard, Dark Gray				40 (5")		
20							17 (5")		
			Boring Terminated				15 (4")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R9
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JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+96
LOCATION: 252' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 30, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 21.6

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: 300.1						
			Moist, Brown Clayey Gravel with Sand	GC	● – – +	45			
			Moist, Medium Stiff, Brown Clay	-			2 2-3		
5			Wet, Brown Lean Clay with Sand and Trace Gravel	CL	● – – – +	80			
			Moist, Stiff, Reddish Brown Clay				4 7-8		
			Moist, Hard, Reddish Brown Clay with Sand				7 10-21		
10			Moist, Very Stiff, Reddish Brown Clay with Gravel (Shale Fragments)				8 10-13		
			SHALE - Highly Weathered, Soft, Brown and Gray	-			8 12-23		
15			SHALE - Highly Weathered, Medium Hard, Brown and Gray				30 40-31 (8")		
			SHALE - Unweathered, Medium Hard, Dark Gray				34 61 (4")		
20							20 (2")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R11
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 213+14
LOCATION: 141' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 19, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 291.2	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
			Dry, Medium Dense, Brown Sand with Gravel				4 9-4		
			No Sample Recovered				0 0-0		
5			Moist, Stiff, Brown and Light Gray Sandy Clay				1 3-6		
			Dry, Hard, Brown Clay with Shale Fragments				7 18-20		
10			Dry, Very Hard, Brown and Gray Clay (Highly Weathered Shale)				9 35-61 (11")		
							14 25-54		
15			SHALE - Weathered, Medium Hard, Dark Gray				61 (5")		
			SHALE - Unweathered, Medium Hard, Dark Gray				35 30 (2")		
20			Boring Terminated				11 (2")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R12
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 212+01
LOCATION: 175' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 20, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 288.9	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
			Dry, Medium Dense, Brown Sand				2 3-14		
			Dry, Very Stiff, Brown Sandy Clay				6 7-7		
5			Dry, Stiff, Brown Sandy Clay				4 7-22		
			Dry, Very Stiff, Brown Clay with Sand and Trace Gravel				7 9-10		
10			Dry, Very Stiff, Brown Clay with Gravel				5 23-60		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				11 52-40 (8")		
15			SHALE - Highly Weathered, Medium Hard, Brown				22 61 (5")		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray				20 30 (1")		
20			SHALE - Weathered, Medium Hard, Dark Gray				12 (2")		
			SHALE - Unweathered, Medium Hard, Dark Gray Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R13
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 210+94
LOCATION: 241' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 20, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 288.1	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
			Moist, Medium Dense, Brown Sand with Gravel				1 4-7		
			Moist, Stiff, Light Brown Sandy Clay				3 4-6		
5			Dry, Very Stiff, Brown Clay (Highly Weathered Shale)				5 10-14		
							6 16-17		
10			Dry, Hard, Brown Clay (Highly Weathered Shale)				18 21-32		
							13 21-36		
15							14 21-31		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray				17 33-52		
20			SHALE - Weathered, Medium Hard, Dark Gray Boring Terminated				18 (4")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R14
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 209+96
LOCATION: 237' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 21, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.9

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 286.8	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
			Moist, Medium Dense, Brown Sand with Gravel				4 15-13		
			Wet, Loose, Brown Clayey Sand				2 2-4		
5			Moist, Stiff, Brown and Light Gray Clay				3 5-7		
							5 13-18		
10			SHALE - Highly Weathered, Soft, Brown and Gray				10 19-29		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray				19 32-29		
15							7 15-23		
			Dry, Hard, Brown Clay (Highly Weathered Shale)				7 22-42		
20			SHALE - Highly Weathered, Medium Hard, Brown and Gray				23 61 (5")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R15
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 208+97
LOCATION: 225' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 21, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 285.0	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
			Dry, Hard, Brown Sandy Clay with Trace Gravel				6 10-39		
			Dry, Very Stiff, Brown Sandy Clay				10 9-8		
5			Dry, Hard, Reddish Brown Sandy Clay				8 15-18		
			Dry, Very Stiff, Brown Clay (Highly Weathered Shale)				7 13-17		
10			Dry, Hard, Brown Clay (Highly Weathered Shale)				5 20-36		
							15 28-56		
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				12 26-58		
							24 61 (6")		
20			SHALE - Highly Weathered, Medium Hard, Brown and Gray				22 20 (1")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R16
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 208+16
LOCATION: 216' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 22, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 282.3	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
			Wet, Very Loose, Brown Clayey Sand				0 0-1		
			Wet, Very Soft, Brown Sandy Clay with Some Gravel				0 0-0		
5			Wet, Stiff, Brown Sandy Clay				2 6-7		
							11 14-36		
10			Dry, Hard, Brown Clay (Highly Weathered Shale)				15 20-33		
							15 25-32		
15			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				3 32-35		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray				30 40 (4")		
20			SHALE - Weathered, Medium Hard, Dark Brown Boring Terminated				61 (5")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R17
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 206+99
LOCATION: 197' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 26, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 18.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 281.5	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
			Moist, Medium Dense, Brown Sand with Clay and Trace Gravel				2 7-6		
			Moist, Loose, Brown Clayey Sand				4 4-4		
5			Moist, Medium Dense, Brown Clayey Sand				3 4-7		
							3 5-10		
10			SHALE - Highly Weathered, Soft, Dark Gray				11 20-24		
			SHALE - Weathered, Medium Hard, Dark Gray				10 22-51		
15							20 30-30 (8")		
			SHALE - Unweathered, Medium Hard, Dark Gray*				11 (1")		
			Boring Terminated						
20									
25									
30									
35									

REMARKS: * Auger Refusal at 18.3' bgl.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R18
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 205+98
LOCATION: 184' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 27, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 18.2

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: 280.9						
			Moist, Medium Dense, Brown Clayey Sand				2 6-6 4 6-6		
5							3 5-6		
			Moist, Very Stiff, Brown Sandy Clay with Trace Gravel				8 15-8		
10							11 34-48		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray				16 59-35 (8")		
15							29 45-20 (8")		
			SHALE - Unweathered, Medium Hard, Dark Gray *				14 (2")		
20			Boring Terminated						
25									
30									
35									

REMARKS: * Auger Refusal at 18.2' bgl.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R19
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 205+00
LOCATION: 173' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: October 27, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 280.2	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 Clayey Sand				3 6-8 4 6-8		
			Moist, Hard, Reddish Brown Sandy Clay with Some Gravel				10 23-25		
			Gravel and Cobbles						
10			Moist, Medium Dense, Reddish Brown Clayey Sand				5 10-17		
			Gravel and Cobbles						
15			SHALE - Highly Weathered, Medium Hard, Brown and Gray				11 26-37 16 24-60		
20							14 22-50 7 20-52		
			SHALE - Unweathered, Medium Hard, Dark Gray				35 (5")		
25			Boring Terminated						
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R20
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 204+02
LOCATION: 160' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 2, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 281.6	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
			Wet, Soft, Brown Sandy Clay				0 1-1		
			Wet, Very Loose, Brown Clayey Sand				0 1-3		
5			Most, Hard, Brown Sandy Clay with Some Gravel				4 11-28		
			Moist, Very Stiff, Brown Clay				2 7-9		
10			SHALE - Highly Weathered, Soft, Brown and Gray				11 22-33		
							11 21-36		
15			SHALE - Highly Weathered, Medium Hard, Brown and Gray				21 36-50 (11")		
			SHALE - Slightly Weathered, Medium Hard, Dark Gray				59 15 (0")		
20			SHALE - Unweathered, Medium Hard, Dark Gray				31 (4")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R21
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 202+99
LOCATION: 157' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 3, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 281.9	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
			Moist, Very Loose, Brown Clayey Sand				0 1-2		
			Moist, Very Loose, Brown Clayey Sand with Trace Gravel				0 0-2		
5			Moist, Very Stiff, Brown and Gray Clay				3 8-12		
			Moist, Hard, Brown Sandy Clay with Some Gravel				14 25-16		
10			SHALE - Highly Weathered, Soft, Brown and Gray				8 16-30		
							4 10-35		
15			SHALE - Highly Weathered, Medium Hard, Brown and Gray				22 41-32 (10")		
							50 (5")		
20			SHALE - Weathered, Medium Hard, Dark Gray Boring Terminated				12 (1")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R22
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 202+01
LOCATION: 136' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 4, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 285.7	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
			Moist, Medium Dense, Brown Sand with Clay with Some Gravel				2 6-5		
			Moist, Loose, Brown Sand with Clay				2 2-4		
5			Wet, Loose, Brown Clayey Sand				3 3-3		
			Moist, Stiff, Brown Clay with Sand				3 4-7		
10							3 5-6		
			Moist, Hard, Brown Sandy Clay with Gravel				6 13-22		
15			Dry, Very Stiff, Brown Clay (Highly Weathered Shale)				5 9-18		
			SHALE - Highly Weathered, Medium Hard, Brown				16 41-45 (10")		
20			SHALE - Highly Weathered, Medium Hard, Brown and Gray				17 20 (2")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R23
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 214+07
LOCATION: 90' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: January 4, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.9

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 292.7	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
			Wet, Medium Stiff, Brown Sandy Clay with Some Gravel	-			0 3-4 6		
			Moist, Very Stiff, Brown Sandy Clay with Some Gravel	-			6-10 6		
			Moist, Medium Dense, Brown Clayey Sand with Some Gravel	-			7-7 2		
5			Wet, Loose, Brown Silt with Sand	-			3-4 0		
			Wet, Loose, Brown Silt	-			1-5 0		
			Moist, Stiff, Brown Sandy Clay with Trace Gravel	-			3-7 15		
10				-			20-30		
				-			17		
			SHALE - Highly Weathered, Soft, Brown	-			19-26		
15							16		
				-			16-38		
							57		
			SHALE - Weathered, Medium Hard, Brown and Gray				20 (1")		
20							61 (5")		
			Boring Terminated				61 (5")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R24
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 212+88
LOCATION: 147' Right of Centerline of Hwy 67/167
LOGGED BY: Brandon McKinney and Austin Dillman

DATE: January 5, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 19.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 286.5	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
			Wet, Very Loose, Brown Silt with Sand	-	●		0 0-0		
			Wet, Loose, Brown Sandy Silt	-	●		1 3-6		
			Moist, Medium Dense, Brown Sandy Silt	-	●		5 8-13		
5			Moist, Medium Dense, Brown Sandy Silt with Trace Gravel	-	●		7 9-12		
			Dry, Hard, Brown Clay (Highly Weathered Shale)	-	●		18 25-32		
			SHALE - Highly Weathered, Medium Hard, Brown				9 19-64		
10			SHALE - Weathered, Medium Hard, Dark Gray				56 46 (2")		
			SHALE - Highly Weathered, Soft, Brown	-			6 13-17		
15			SHALE - Weathered, Medium Hard, Dark Gray				21 59-38 (10")		
			SHALE - Unweathered, Medium Hard, Dark Gray				30 (2")		
20			Boring Terminated				15 (4")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R25
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 211+95
LOCATION: 170' Right of Centerline of Hwy 67/167
LOGGED BY: Brandon McKinney and Austin Dillman

DATE: January 5, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 285.2	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
			Wet, Very Loose, Brown Silt with Sand	-	●		0 0-0		
			Wet, Loose, Brown Sandy Silt		●		1 3-4		
			Wet, Medium Dense, Brown Sandy Silt with Trace Gravel	-	●		3 6-6		
5			Wet, Medium Dense, Brown Sandy Silt with Gravel (Shale Fragments)	-	●		4 7-11		
			SHALE - Highly Weathered, Medium Hard, Brown*				24 34-36		
							9 20-26		
10			SHALE - Highly Weathered, Soft, Brown	-			10 15-31		
							16 28-31		
15			SHALE - Highly Weathered, Medium Hard, Brown				20 28-35		
							25 57-18 (7")		
20			SHALE - Weathered, Medium Hard, Brown and Gray				27 38 (5")		
			Boring Terminated						
25									
30									
35									

REMARKS: * Water level was 6' bgl 18 hours after drilling.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R26
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 211+03
LOCATION: 163' Right of Centerline of Hwy 67/167
LOGGED BY: Brandon McKinney and Austin Dillman

DATE: January 6, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 284.8	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
			Wet, Very Loose, Brown Sandy Silt with Some Gravel	-			0		
			Wet, Loose, Brown Sandy Silt	-			1-3 2		
				-			3-5 1		
5			Moist, Medium Dense, Brown Sandy Silt with Trace Gravel	-			2-5 5		
			Moist, Hard, Brown Clay	-			6-8 13		
			Dry, Hard, Brown Clay (Highly Weathered Shale)	-			19-25 6		
10			SHALE - Highly Weathered, Medium Hard, Brown	-			17-20 16		
				-			30-43		
			SHALE - Highly Weathered, Soft, Brown*	-			11 20-31		
15			SHALE - Highly Weathered, Medium Hard, Brown and Gray	-			19 43-30 (10")		
			SHALE - Weathered, Medium Hard, Brown and Gray				26 57-15 (7")		
20			SHALE - Weathered, Medium Hard, Dark Gray				35 61 (5")		
			Boring Terminated						
25									
30									
35									

REMARKS: * Water level was 14.2' bgl one hour after drilling.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R27
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 209+93
LOCATION: 148' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: January 12, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 282.5	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
			Wet, Very Loose, Brown Sandy Silt	-			0		
			Wet, Loose, Brown Sandy Silt with Some Gravel	-			2-1 0		
			Wet, Loose, Brown Sandy Silt with Gravel	-			1-6 3		
5			Wet, Loose, Brown Sandy Silt	-			5-2 0		
			Wet, Medium Dense, Brown Sandy Silt	-			1-6 6		
			Moist, Very Stiff, Brown Clay with Gravel (Highly Weathered Shale)	-			11-16 10		
10			Moist, Hard, Brown Clay (Highly Weathered Shale)	-			11-10 7		
			SHALE - Highly Weathered, Medium Hard, Brown	-			17-35 17		
15				-			32-46 17		
			SHALE - Weathered, Medium Hard, Dark Gray	-			30-42 40		
20			Boring Terminated				61 (4") 58 20 (1")		
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R28
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 208+93
LOCATION: 136' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: January 12, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 19.9

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: 281.8						
			Wet, Very Loose, Brown Sandy Silt	-			2		
			Wet, Loose, Brown Sandy Silt	-			2-1 0		
			Moist, Loose, Brown Sandy Silt	-			1-6 1		
5			Moist, Medium Dense, Brown Sandy Silt	-			3-3 2		
			Moist, Medium Dense, Brown Sandy Silt with Some Gravel	-			7-7 12		
			Moist, Medium Dense, Brown Sandy Silt	-			12-15 4		
10			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			9-14 14		
				-			28-42		
			SHALE - Highly Weathered, Medium Hard, Brown	-			22 42-40		
15				-					
				-			21 42-40 (10")		
			SHALE - Weathered, Medium Hard, Dark Gray	-			25 55-21 (8")		
20							61 (5")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R29
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 207+88
LOCATION: 124' Right of Centerline of Hwy 67/167
LOGGED BY: Brandon McKinney and Austin Dillman

DATE: January 13, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 281.5	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
			Wet, Loose, Brown Sandy Silt	-			2 3-4		
			Wet, Very Loose, Brown Sandy Silt	-			0 0-0		
			Moist, Loose, Brown Silt with Sand	-			0 4-6		
5			Moist, Loose, Brown Sandy Silt	-			2 4-6		
			Wet, Medium Dense, Brown Sandy Silt with Trace Gravel	-			7 11-10		
			Moist, Hard, Brown Clay with Trace Gravel	-			4 11-20		
10			SHALE - Highly Weathered, Soft, Dark Gray				15 26-27		
			SHALE - Highly Weathered, Soft, Dark Gray				11 30-50		
15			SHALE - Weathered, Medium Hard, Dark Gray	-			28 52-25 (8")		
							61 (5")		
20			SHALE - Unweathered, Medium Hard, Dark Gray				12 (2")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R30
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 206+93
LOCATION: 97' Right of Centerline of Hwy 67/167
LOGGED BY: Brandon McKinney and Austin Dillman

DATE: January 13, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 20.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 281.2	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
			Wet, Very Loose, Brown Sandy Silt with Some Gravel	-			1 1-2		
			Wet, Very Loose, Brown Sandy Silt*	-			0 0-2		
5				-			0 0-0		
			Wet, Loose, Brown Sandy Silt with Trace Gravel	-			0 0-0		
			Moist, Very Stiff, Brown Clay with Gravel	-			0 1-9		
10			Dry, Very Stiff, Brown Clay with Some Gravel (Highly Weathered Shale)	-			8 9-9		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray				6 12-14		
15			SHALE - Weathered, Medium Hard, Brown and Gray	-			21 22-39		
							20 40-44		
20			SHALE - Slightly Weathered, Medium Hard, Dark Gray				26 38-38 (11")		
			Boring Terminated				19 37-45 (8")		
25									
30									
35									

REMARKS: * Water level was measured at 2.1' bgl 18 hours after drilling.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R31
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 205+99
LOCATION: 83' Right of Centerline of Hwy 67/167
LOGGED BY: Brandon McKinney

DATE: January 19, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 21

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 283.2	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
			Wet, Stiff, Brown Sandy Clay with Shale and Sandstone Fragments	-			2 6-6		
			Moist, Very Stiff, Brown Sandy Clay with Shale and Sandstone Fragments	-			8 10-13		
			Moist, Soft, Brown Sandy Clay with Some Sandstone Fragments	-			6 2-2		
5			Moist, Very Soft, Brown Sandy Clay with Some Sandstone Fragments	-			0 0-0		
				-			0 1-4		
			Wet, Medium Stiff, Brown Sandy Clay	-			0 2-3		
10				-			0 3-3		
				-					
			SHALE - Highly Weathered, Medium Hard, Brown	-			18 29-35		
15				-					
			SHALE - Highly Weathered, Soft, Brown	-			8 17-25		
				-					
			SHALE - Highly Weathered, Medium Hard, Brown	-			20 30-35		
20				-					
			SHALE - Highly Weathered, Medium Hard, Brown and Gray	-			28 37-37		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R32
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 204+97
LOCATION: 83' Right of Centerline of Hwy 67/167
LOGGED BY: Brandon McKinney and Austin Dillman

DATE: January 19, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 19.8

SURFACE ELEVATION: 282.8

DEPTH FT.	DESCRIPTION OF MATERIAL	SOIL GROUP	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% TCR	% RQD
	Moist, Medium Dense, Brown Clayey Sand with Sandstone and Shale Fragments	SC	29	2 5-6		
	Moist, Medium Dense, Brown and Gray Clayey Sand with Sandstone and Shale Fragments*	SC	29	7 8-7		
5	Moist, Very Soft, Brown and Gray Sandy Clay with Some Sandstone Fragments	-	50	1 0-1		
	Wet, Very Soft, Brown Silty Clay with Sand	CL-ML	83	0 0-0		
	Wet, Medium Stiff, Brown Sandy, Silty Clay with Rock Fragments	CL-ML	78	0 0-1		
10	Wet, Very Stiff, Brown Sandy Lean Clay with Some Shale and Sandstone Fragments	CL	50	2 3-2		
	Moist, Hard, Brown Sandy Lean Clay with Some Shale Fragments (Highly Weathered Shale)	CL	55	7 6-13		
15		-				
	SHALE - Weathered, Medium Hard, Brown and Gray	-	52	16 15-23		
		-		12 26-52		
		-		4 22-58		
20	SHALE - Slightly Weathered, Medium Hard, Dark Gray	-		15 (4")		
	Boring Terminated					
25						
30						
35						

MOISTURE CONTENT (%) ●
PL + – – – – – – – – + LL
10 20 30 40 50 60 70

REMARKS: * Split spoon blocked by gravel clast.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R33
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 204+24
LOCATION: 82' Right of Centerline of Hwy 67/167
LOGGED BY: Brandon McKinney and Austin Dillman

DATE: January 20, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 19.9

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 283.0	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
			Moist, Loose, Brown Clayey Sand	-			1 4-4		
			Moist, Loose, Shale Fragments with Clay and Sand	-			4 4-4		
			Wet, Very Soft, Brown Sandy Clay	-			0 0-0		
5				-			0 0-0		
			Wet, Soft, Brown Sandy Clay	-			0 1-2		
				-			0 0-2		
10			Moist, Stiff, Brown Clay with Sand and Some Shale Fragments	-			4 7-6		
				-					
			Moist, Very Stiff, Brown Sandy Clay	-			6 13-11		
				-					
15			SHALE - Highly Weathered, Medium Hard, Brown	-			12 25-37		
				-					
			SHALE - Weathered, Medium Hard, Brown and Gray	-			40 61 (2")		
				-					
20			SHALE - Slightly Weathered, Medium Hard, Dark Gray	-			17 (5")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R34
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 203+04
LOCATION: 89' Right of Centerline of Hwy 67/167
LOGGED BY: Brandon McKinney and Austin Dillman

DATE: January 26, 2021
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 19.8

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: 281.2						
			Moist, Very Loose, Brown Silt with Sand with Trace Sandstone Fragments	-		77	1 1-3		
			Wet, Very Loose, Brown Silt with Sand	ML		84	0 2-2		
			Wet, Very Soft, Brown Silty Clay with Sand	CL-ML		82	0 0-0		
5			Wet, Stiff, Brown Silty Clay with Sand	CL-ML		75	0 5-5		
			Wet, Stiff, Brown Lean Clay with Sand	CL		81	0 4-8		
			Wet, Stiff, Brown Sandy Lean Clay	CL		66	0 4-9		
10			Moist, Medium Dense, Reddish Brown Clayey Sand with Some Sandstone and Shale Fragments and Iron Concretions	SC		31	9 12-16		
			SHALE - Highly Weathered, Medium Hard, Brown	-			14 31-40		
15				-			58 15 (1")		
			SHALE - Weathered, Medium Hard, Brown and Gray	-			32 61 (4")		
20			SHALE - Unweathered, Medium Hard, Dark Gray				15 (4")		
			Boring Terminated						
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R35
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 217+37
LOCATION: 145' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 14, 2020
TYPE OF DRILLING: Hollow Stem Auger
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 3.2

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: 300.0						
			Moist, Brown Clayey Gravel with Sand	GC	● – – +	36			
			Wet, Stiff, Brown Sandy Clay with Gravel*	-			1 2-13 (8")		
			Boring Terminated						
5									
10									
15									
20									
25									
30									
35									

REMARKS: * A former sewer line was encountered at a depth 3.2 feet below ground level. Hole was abandoned.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R35A
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 217+47
LOCATION: 152' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 14, 2020
TYPE OF DRILLING: Hollow Stem Auger - Shelby Tube
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 12.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 299.7	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
			Moist, Loose, Brown Clayey Gravel with Sand	GC	+ +	29	3 4-6		
				-					
5			Moist, Brown Lean Clay with Gravel	CL	● + – +	50	7 9-13		
			Dry, Very Stiff, Brown Clay with Trace Gravel (Highly Weathered Shale)				8 15-27		
10			Dry, Hard, Brown Clay (Highly Weathered Shale)	-			27 32 (1")		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)				22 (1")		
			Boring Terminated						
15									
20									
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 R36
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 218+49
LOCATION: 177' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman / Paul Tierney

DATE: September 15, 2020
TYPE OF DRILLING: Hollow Stem Auger - Shelby Tube
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 21.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 301.9	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
			Moist, Medium Stiff, Brown Lean Clay with Sand and Gravel	CL	● + +	58	3 3-4		
5							37 68 (6")		
			SHALE - Highly Weathered, Medium Hard, Brown	-			10 37-60 (11")		
10							14 22-61 (10")		
			SHALE - Highly Weathered, Medium Hard, Brown and Gray				15 40-60 (10")		
15							21 (2")		
			SHALE - Unweathered, Medium Hard, Dark Gray				50 (5")		
20							31 (4")		
			Boring Terminated				15 (4")		
25									
30									
35									

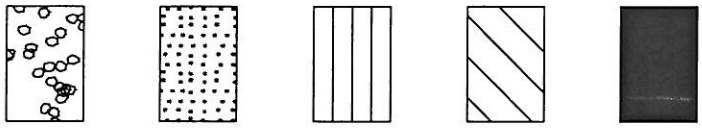
REMARKS:

LEGEND

SOIL TYPES

(SHOWN IN SYMBOL COLUMN)

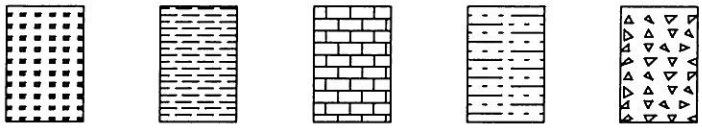
(PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL | SAND | SILT | CLAY | ORGANIC MATTER

ROCK TYPES

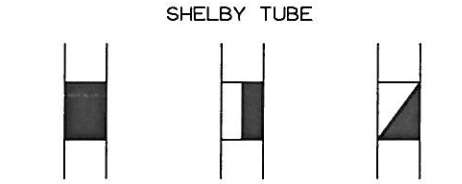
(SHOWN IN SYMBOL COLUMN)



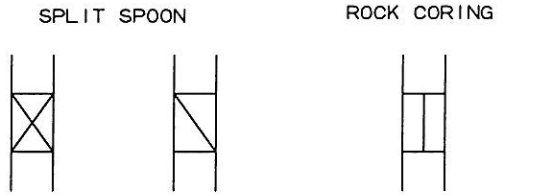
SANDSTONE | SHALE or SILTSTONE | LIMESTONE or DOLOMITE | ALTERNATING LAYERS of SHALE and SANDSTONE | OTHER

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.

Materials Division

Results of Classification Tests
ARDOT Project No.: CA0613 / 061371
Project: Hwy. 67 Intchng. Impvts. (Cabot) (S)
Site: Highway 5 & Hwy 89 / County: Lonoke

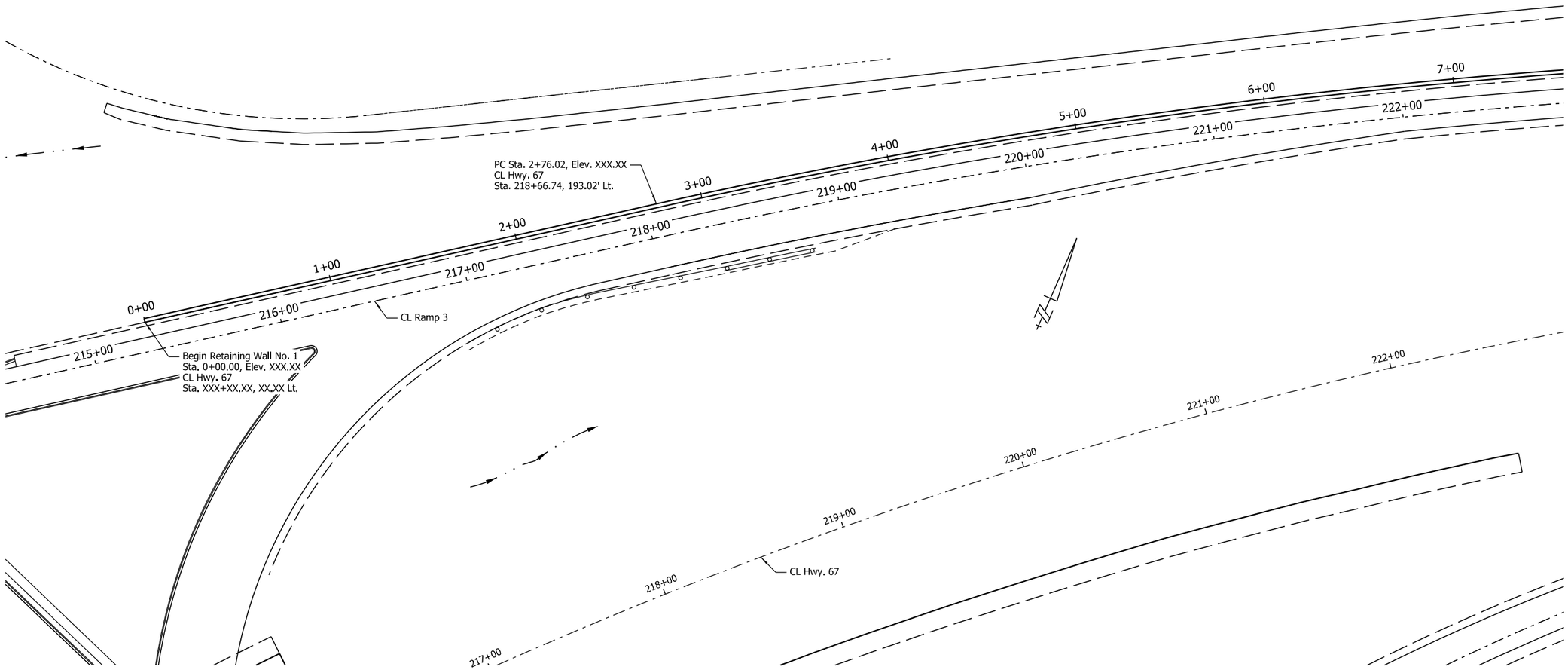
Summarized by: JCS
Checked by: PWC

Sample Identification					Moisture Content, %	Atterberg Limits			% Fines	Soil Classification	
Boring	Structure	Station	Offset	Depth, ft		LL	PL	PI		USCS	AASHTO
Hwy 89 R32	Ramp 1	204+97	83' Rt.	0-1.5	17	43	21	22	29	SC	A-2-7(2)
Hwy 89 R32	Ramp 1	204+97	83' Rt.	1.5-3	11	34	13	21	29	SC	A-2-6(2)
Hwy 89 R32	Ramp 1	204+97	83' Rt.	3-4.5					50		
Hwy 89 R32	Ramp 1	204+97	83' Rt.	4.5-6	22	23	18	5	83	CL-ML	A-4
Hwy 89 R32	Ramp 1	204+97	83' Rt.	6-7.5	23	24	18	6	78	CL-ML	A-4
Hwy 89 R32	Ramp 1	204+97	83' Rt.	7.5-9	17	23	16	7	50	CL-ML	A-4
Hwy 89 R32	Ramp 1	204+97	83' Rt.	9-10.5	25	30	21	9	55	CL	A-4
Hwy 89 R32	Ramp 1	204+97	83' Rt.	11.5-13	16	37	22	15	52	CL	A-6
Hwy 89 R34	Ramp 1	203+04	89' Rt.	0-1.5	22				77		
Hwy 89 R34	Ramp 1	203+04	89' Rt.	1.5-3	25	NP			84	ML	A-4
Hwy 89 R34	Ramp 1	203+04	89' Rt.	3-4.5	23	22	18	4	82	CL-ML	A-4
Hwy 89 R34	Ramp 1	203+04	89' Rt.	4.5-6	20	24	17	7	75	CL-ML	A-4
Hwy 89 R34	Ramp 1	203+04	89' Rt.	6-7.5	24	34	15	19	81	CL	A-6
Hwy 89 R34	Ramp 1	203+04	89' Rt.	7.5-9	22	32	15	17	66	CL	A-6
Hwy 89 R34	Ramp 1	203+04	89' Rt.	9-10.5	13	30	13	17	31	SC	A-2-6(1)
Hwy 89 R35	Ramp 2	217+37	145' Rt.	0-2	11	33	20	13	36	GC	A-6
Hwy 89 R35A	Ramp 2	217+47	152' Rt.	0-2	0	31	21	10	29	GC	A-2-4
Hwy 89 R35A	Ramp 2	217+47	152' Rt.	3.5-5.1	14	35	23	12	50	CL	A-6
Hwy 89 R36	Ramp 2	218+49	177' Rt.	0-2	12	35	23	12	58	CL	A-6
Hwy 89 R9	Ramp 3	215+96	252' Lt.	0-2	15	31	21	10	45	GC	A-4
Hwy 89 R9	Ramp 3	215+96	252' Lt.	3.5-5.5	20	39	21	18	80	CL	A-6
Hwy 89 R8	Ramp 3	216+88	228' Lt.	0-2	0	32	20	12	31	GC	A-2-6(0)
Hwy 89 R8	Ramp 3	216+88	228' Lt.	3.5-5.5	24	38	24	14	91	CL	A-6

Attachment C

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0613	$SN6103$	ST
(1) $BN06$		WALL DETAILS		$DN6103$



HIGHWAY 89 RAMP 3 RETAINING WALL

PRELIMINARY
NOT FOR
CONSTRUCTION

BRIDGE ENGINEER

SHEET 3 OF 5
DETAILS OF RETAINING WALLS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: CSW DATE: MAR. 2021 FILENAME: BCA0613x6_L2.DGN
CHECKED BY: XXX DATE: XXX. 2021 SCALE: 1" = 30'-0"
DESIGNED BY: CSW DATE: MAR. 2021
BRIDGE NO. $BN06$ DRAWING NO. $DN6103$

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WORKSPACE: ARDOT Bridge (2019)
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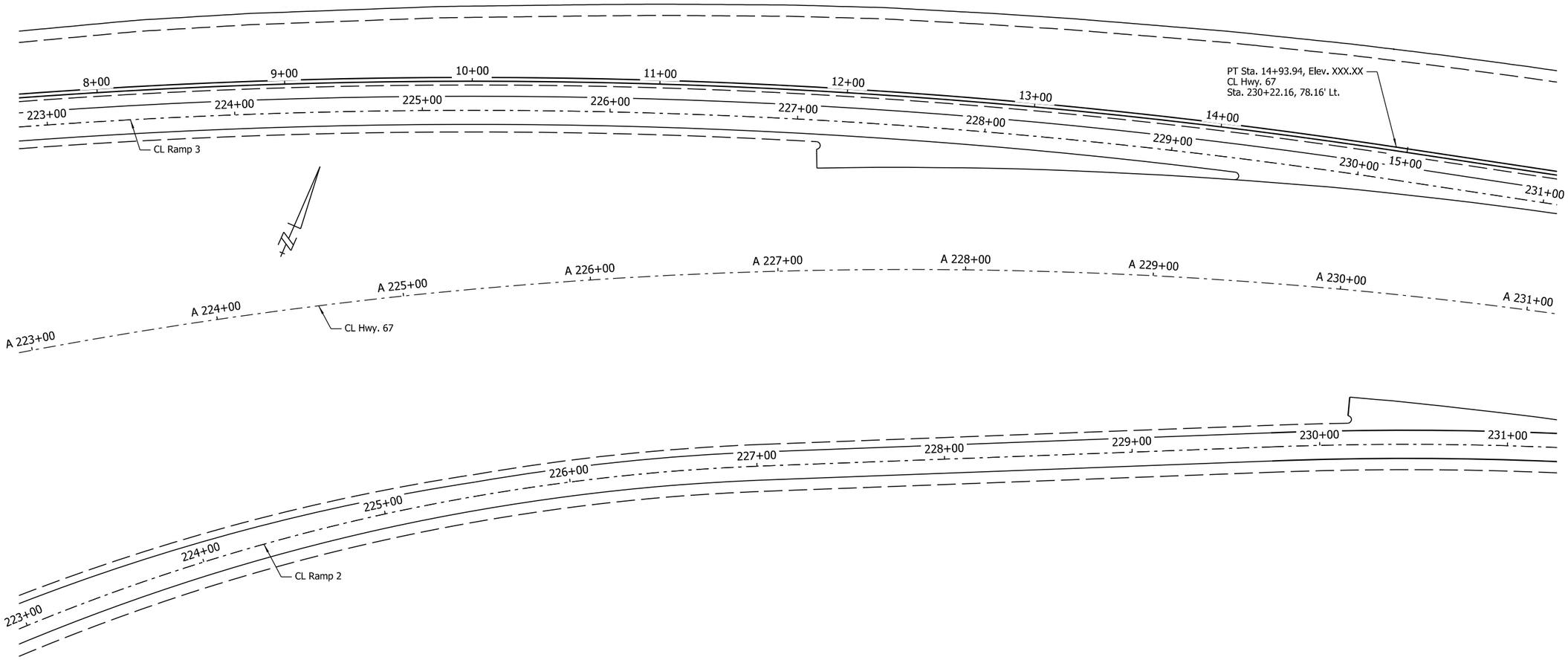
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0613	$SN6104$	ST
(1) $BN06$		WALL DETAILS		$DN6104$



HIGHWAY 89 RAMP 3 RETAINING WALL

PRELIMINARY
NOT FOR
CONSTRUCTION

BRIDGE ENGINEER

SHEET 4 OF 5
DETAILS OF RETAINING WALLS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

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DESIGNED BY: CSW DATE: MAR. 2021

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WORKSPACE: ARDOT Bridge (2019)
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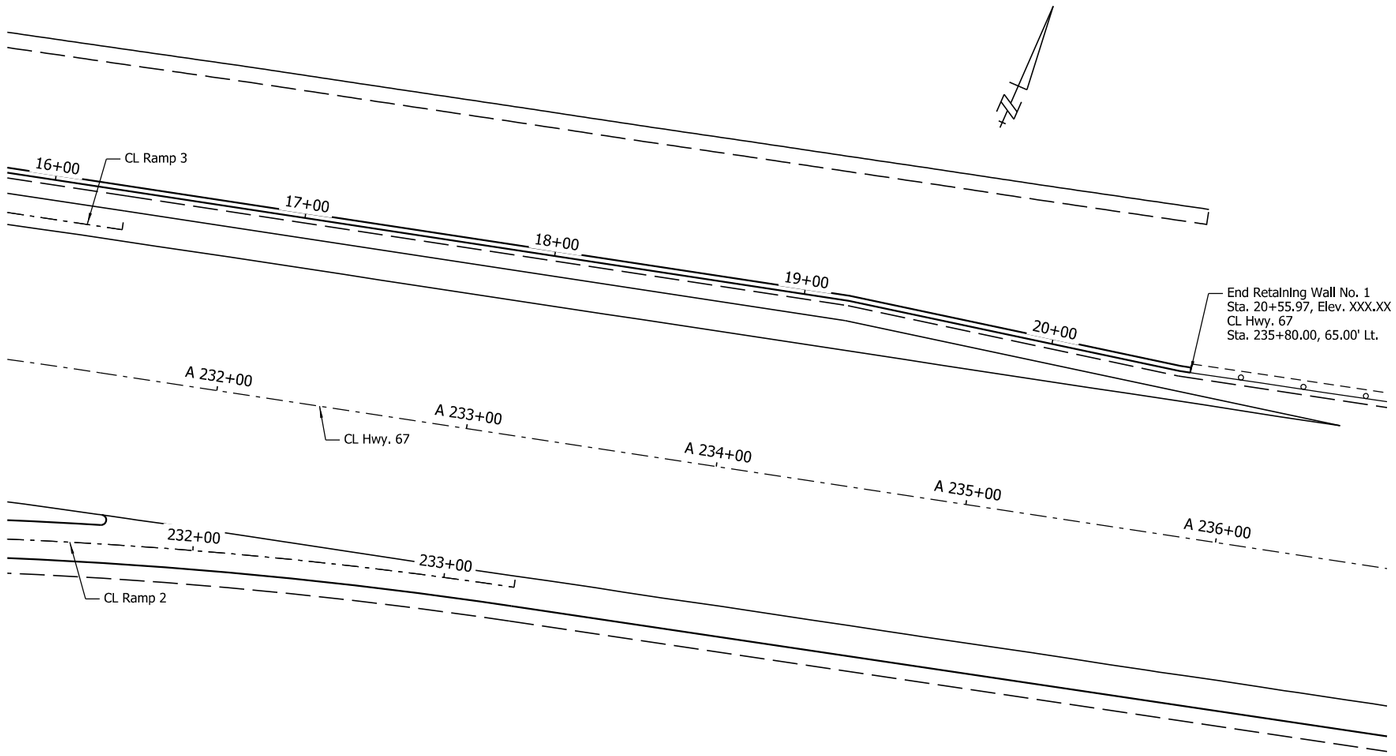
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0613	$SN6105$	ST
(1) $BN06$		WALL DETAILS		$DN6105$



HIGHWAY 89 RAMP 3 RETAINING WALL

PRELIMINARY
NOT FOR
CONSTRUCTION

BRIDGE ENGINEER

SHEET 5 OF 5
DETAILS OF RETAINING WALLS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: CSW DATE: MAR. 2021 FILENAME: BCA0613x6_L5.DGN
CHECKED BY: XXX DATE: XXX. 2021 SCALE: 1" = 30'-0"
DESIGNED BY: CSW DATE: MAR. 2021

BRIDGE NO. $BN06$ DRAWING NO. $DN6105$

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WORKSPACE: ARDOT Bridge (2019)
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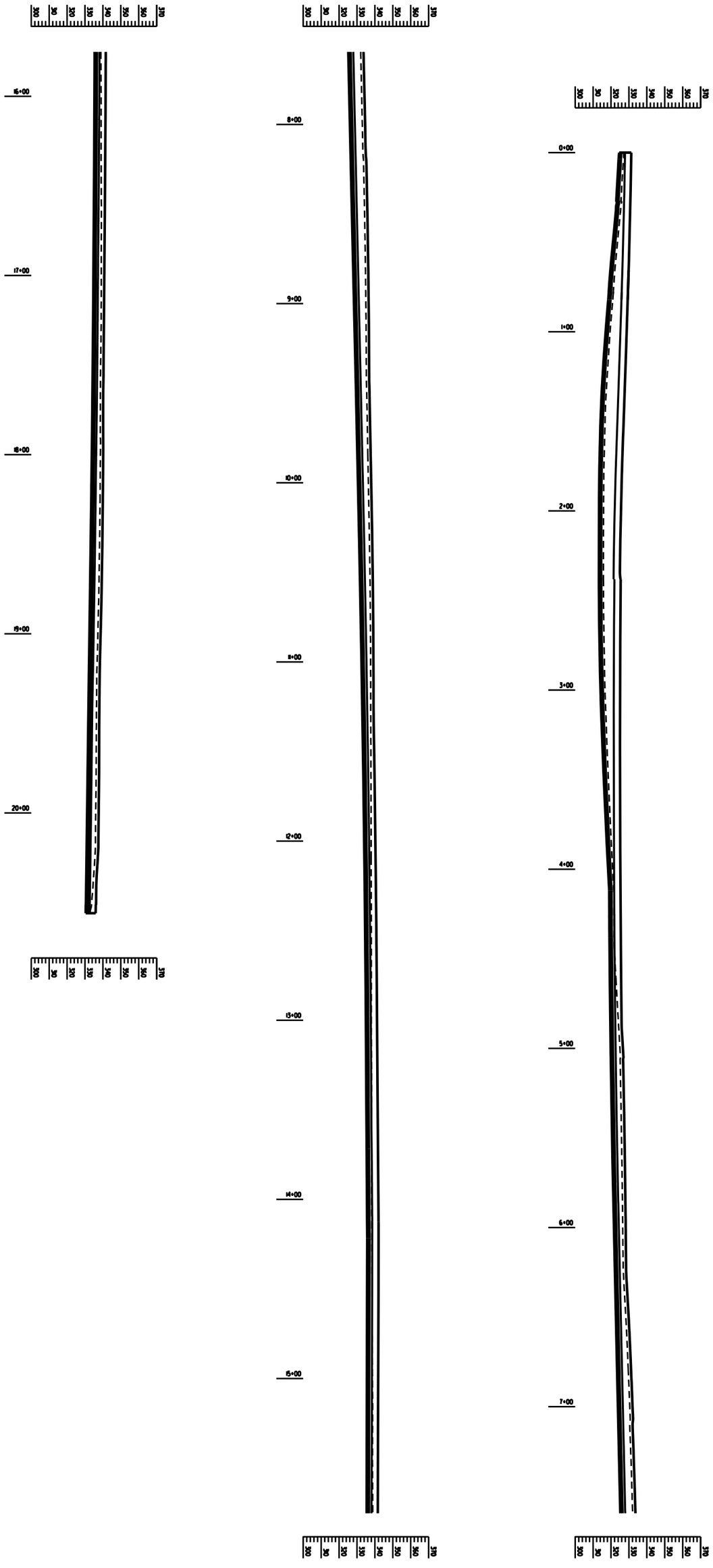
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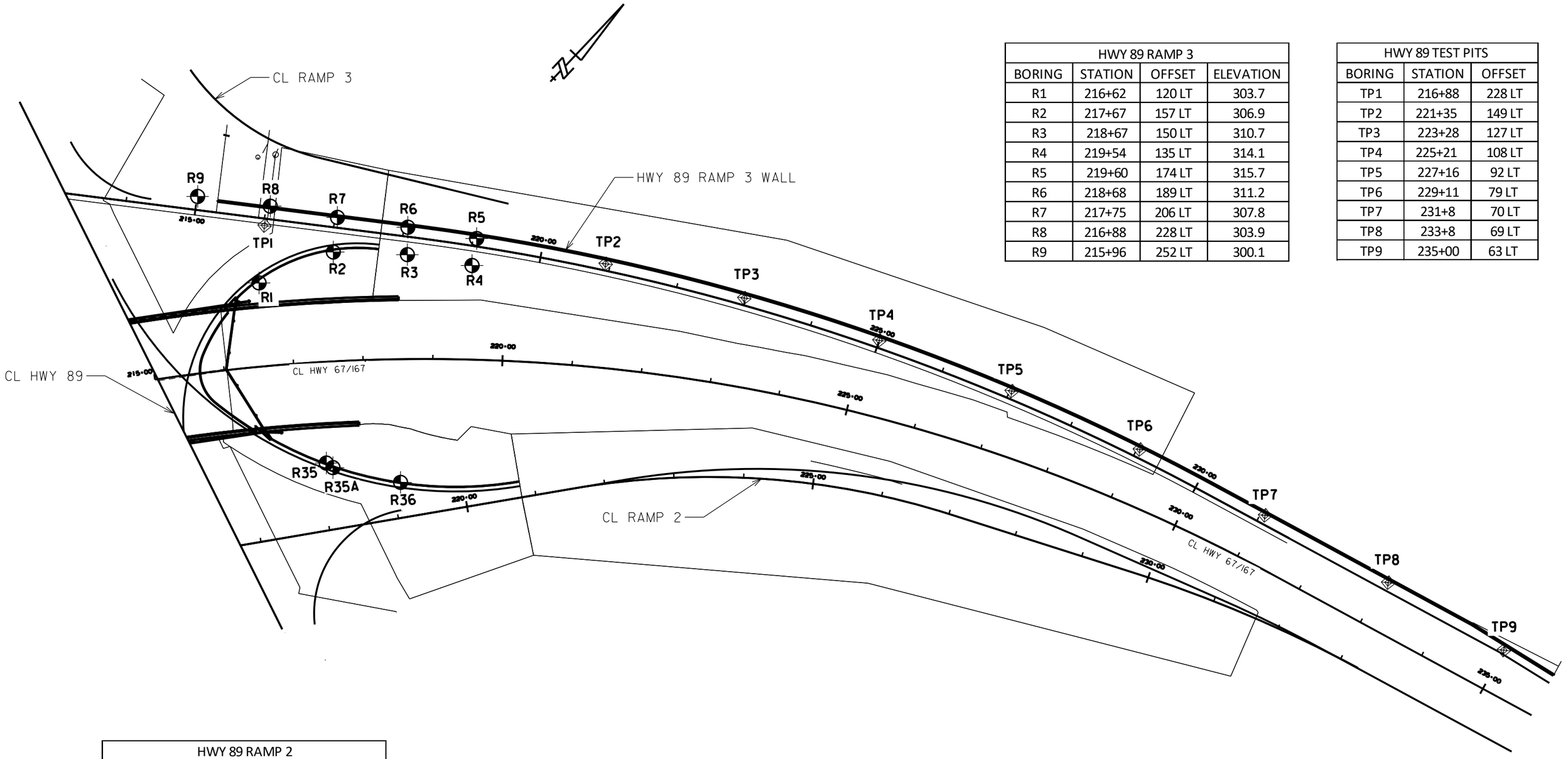
18+00
19+00
20+00

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		CA0613		
PLAN OF BORINGS & TEST PITS				



HWY 89 RAMP 3			
BORING	STATION	OFFSET	ELEVATION
R1	216+62	120 LT	303.7
R2	217+67	157 LT	306.9
R3	218+67	150 LT	310.7
R4	219+54	135 LT	314.1
R5	219+60	174 LT	315.7
R6	218+68	189 LT	311.2
R7	217+75	206 LT	307.8
R8	216+88	228 LT	303.9
R9	215+96	252 LT	300.1

HWY 89 TEST PITS		
BORING	STATION	OFFSET
TP1	216+88	228 LT
TP2	221+35	149 LT
TP3	223+28	127 LT
TP4	225+21	108 LT
TP5	227+16	92 LT
TP6	229+11	79 LT
TP7	231+8	70 LT
TP8	233+8	69 LT
TP9	235+00	63 LT

HWY 89 RAMP 2			
BORING	STATION	OFFSET	ELEVATION
R35	217+37	145 RT	300.0
R35A	217+47	152 RT	299.7
R36	218+49	177 RT	301.9

NOTE: ALL REFERENCES TO STATION AND OFFSET ARE MADE TO CL HWY. 67/167.

PLAN OF BORINGS & TEST PITS

HWY. 67 INTCHNG. IMPVTS. (CABOT) (S)
ROUTE 67, SECTION 11
LONOKE COUNTY
HWY 89

JOB NO. CA0613	SHEET 2/2

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-1
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION:
LOGGED BY: Yongsheng Zhao

DATE: April 13, 2021
TYPE OF DRILLING: Excavator dug trench
EQUIPMENT:

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 7.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION:	SOIL GROUP	PLASTIC LIMIT	% MOISTURE	LIQUID LIMIT	Percent Passing No. 200 Sieve	Penetrometer Reading (TSF)	% TCR	% RQD
			Brown Sandy Silt with Clay	-							
			Stiff, Reddish Brown Sandy Fat Clay with Trace Sandstone Fragments	CH	25	25	61	67	3.0		
				-					>5.0		
5			SHALE - Highly Weathered, Minor Water Seepage, Brown	-							
			Test Pit Terminated								
10											
15											
20											
25											
30											
35											

REMARKS: Trench dug adjacent to boring Hwy 89 R2.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-2
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION:
LOGGED BY: Yongsheng Zhao

DATE: April 13, 2021
TYPE OF DRILLING: Excavator dug trench
EQUIPMENT:

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 1.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOISTURE	LIQUID LIMIT	Percent Passing No. 200 Sieve	Penetrometer Reading (TSF)	% TCR	% RQD
			SURFACE ELEVATION:								
			SHALE - Weathered Refusal in Weathered Shale at 1.5' below ground level. Test Pit Terminated								
5											
10											
15											
20											
25											
30											
35											

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-3
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION:
LOGGED BY: Yongsheng Zhao

DATE: April 13, 2021
TYPE OF DRILLING: Excavator dug trench
EQUIPMENT:

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 2.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOISTURE	LIQUID LIMIT	Percent Passing No. 200 Sieve	Penetrometer Reading (TSF)	% TCR	% RQD
			SURFACE ELEVATION:								
			Brown Silty Clay with Shale Fragments								
			SHALE - Weathered with Highly Weathered Layers, Frequent Fractures, Brown and Gray								
			Refusal at 2.5' below ground level on Unweathered Shale								
			Test Pit Terminated								
5											
10											
15											
20											
25											
30											
35											

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-4
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION:
LOGGED BY: Yongsheng Zhao

DATE: April 13, 2021
TYPE OF DRILLING: Excavator dug trench
EQUIPMENT:

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 9

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION:	SOIL GROUP	PLASTIC LIMIT	% MOISTURE	LIQUID LIMIT	Percent Passing No. 200 Sieve	Penetrometer Reading (TSF)	% TCR	% RQD
			Stiff, Brown Clayey Sand with Rock Fragments	SC	21	16	31	40	3.5		
5			SHALE - Highly Weathered, Brown and Gray, Approximate Dip of 45 Degrees	-							
			SHALE - Slightly Weathered, Water encountered at 8.5' below ground level. Refusal at 9.0' below ground level.								
10			Test Pit Terminated								
15											
20											
25											
30											
35											

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-5
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION:
LOGGED BY: Yongsheng Zhao

DATE: April 13, 2021
TYPE OF DRILLING: Excavator dug trench
EQUIPMENT:

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION:	SOIL GROUP	PLASTIC LIMIT	% MOISTURE	LIQUID LIMIT	Percent Passing No. 200 Sieve	Penetrometer Reading (TSF)	% TCR	% RQD
			Soft, Brown Silty Clay with Rock Fragments						0.25		
			SHALE - Highly Weathered, Approximate Dip of 30 Degrees, Brown and Gray								
			Refusal at 3.0' below ground level.								
			Test Pit Terminated								
5											
10											
15											
20											
25											
30											
35											

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-6
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION:
LOGGED BY: Yongsheng Zhao

DATE: April 13, 2021
TYPE OF DRILLING: Excavator dug trench
EQUIPMENT:

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 3.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION:	SOIL GROUP	PLASTIC LIMIT	% MOISTURE	LIQUID LIMIT	Percent Passing No. 200 Sieve	Penetrometer Reading (TSF)	% TCR	% RQD
			Soft, Brown Silty Clay with Shale Fragments								
			SANDSTONE - Highly Weathered, Brown, Water encountered at 3.0' below ground level Refusal at 3.5' below ground level								
5			Test Pit Terminated								
10											
15											
20											
25											
30											
35											

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-7
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION:
LOGGED BY: Yongsheng Zhao

DATE: April 13, 2021
TYPE OF DRILLING: Excavator dug trench
EQUIPMENT:

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 4.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION:	SOIL GROUP	PLASTIC LIMIT	% MOISTURE	LIQUID LIMIT	Percent Passing No. 200 Sieve	Penetrometer Reading (TSF)	% TCR	% RQD
			Reddish Brown Clayey Sand with Sandstone Fragments	SC	21	18	40	38			
			SHALE - Highly Weathered, Brown and Dark Gray Refusal at 4.5' below ground level.	-							
5			Test Pit Terminated								
10											
15											
20											
25											
30											
35											

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-8
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION:
LOGGED BY: Yongsheng Zhao

DATE: April 13, 2021
TYPE OF DRILLING: Excavator dug trench
EQUIPMENT:

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION:	SOIL GROUP	PLASTIC LIMIT	% MOISTURE	LIQUID LIMIT	Percent Passing No. 200 Sieve	Penetrometer Reading (TSF)	% TCR	% RQD
			Soft, Brown Fine Clayey Rock Fragments with Sand	GC	18	12	32	28	0.25		
			SHALE - Highly Weathered, Dark Gray	-							
			Sandstone encountered at 3.0' below ground level.								
			Refusal at 3.0' below ground level.								
			Test Pit Terminated								
5											
10											
15											
20											
25											
30											
35											

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-9
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)
STATION:
LOCATION:
LOGGED BY: Yongsheng Zhao

DATE: April 13, 2021
TYPE OF DRILLING: Excavator dug trench
EQUIPMENT:
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOISTURE	LIQUID LIMIT	Percent Passing No. 200 Sieve	Penetrometer Reading (TSF)	% TCR	% RQD
			SURFACE ELEVATION:								
			Soft, Reddish Brown Fine Sandy Clay with Sandstone Fragments								
			SHALE WITH SANDSTONE PARTINGS - Weathered, Brown								
			Test Pit Terminated								
5											
10											
15											
20											
25											
30											
35											

REMARKS:

Materials Division

Results of Classification Tests
ARDOT Project No.: CA0613 / 061371
Project: Hwy. 67 Intchng. Impvts. (Cabot) (S)
Site: Highway 5 & Hwy 89 / County: Lonoke

Summarized by: JCS
Checked by: PWC

Sample Identification					Moisture Content, %	Atterberg Limits			% Fines	Soil Classification	
Boring	Structure	Station	Offset	Depth, ft		LL	PL	PI		USCS	AASHTO
Hwy 89 Test Pit 1	Ramp 3			0.8-2	25	61	25	36	67	CH	A-7-6(23)
Hwy 89 Test Pit 4	Ramp 3			0-1.0	16	31	19	12	40	SC	A-6
Hwy 89 Test Pit 7	Ramp 3			0-2	18	40	21	19	38	SC	A-6
Hwy 89 Test Pit 8	Ramp 3			0-1.5	12	32	18	14	28	GC	A-2-6(1)

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

January 7, 2022

TO: Mr. Rick Ellis, Bridge Engineer

SUBJECT: Temporary Retaining Wall Nos. 5 through 10
Job No. CA0613
Hwy. 67 Intchng. Impvts. (Cabot) (S)
Lonoke County
Route 5 Section 12 and Route 89 Section 1

Summarized herein are results of additional geotechnical investigation and recommendations performed for Temporary Retaining Wall Nos. 5 through 10. This request was submitted through Email by the Design Consultant (Garver) and were received by Materials Division on December 15, 2021. Reports for the bridge foundations and permanent retaining walls were provided on June 9, 2021, and June 21, 2021, respectively.

Relevant design drawings for Temporary Wall Nos. 5 through 10, as provided by Garver, are included in Attachment A. Additional subsurface conditions for these temporary walls were investigated by excavating test pits at accessible locations using a backhoe supplied by ARDOT District 6 Maintenance. Relevant subsurface information is included in Attachment B.

Temporary Retaining Walls Along South Side of Highway 5 – Wall Nos. 5 through 8. The results of the test pits indicate natural soils immediately below the existing embankment fill are wet, very soft gray clay / silty clay with very high compressibility. In light of the available topographic information and wall design drawings, plan subgrade of these temporary walls is expected to be in the compacted onsite embankment fill. There could be a minor possibility that plan subgrade at the west end of Wall No. 7 and east end of Wall No. 8 will encounter this unstable / compressible soil stratum. However, areas of unstable subgrade soils are expected to be limited. If unstable subgrade soils are encountered during the construction phase, it is recommended that these areas of unstable subgrade soils be undercut 2 ft. and backfilled with Stone Backfill, as specified in Section 207 of ARDOT Standard Specifications (2014 Edition). In addition, it is recommended embedment of these temporary walls be designed as shallow as possible. **The wall subgrade should be proof rolled to detect unstable areas.** For temporary retaining walls founded as recommended above, the following factored bearing capacity and factored sliding resistance are recommended.

Table 1: Temporary Wall Nos. 5 through 8

Wall No.	Expected Foundation Soil at Subgrade Elevation	Factored Bearing Capacity, $q_R = \varphi_b q_n$, ksf	Factored Sliding Factor, $\varphi_\tau \tan\delta$
5	Stable natural soils	4.5	0.52
6	Stable natural soils or existing compacted embankment fill	4.5	0.52
7	Existing compacted embankment fill or Stone Backfill	3.0	0.52
8		3.0	0.52

ARKANSAS DEPARTMENT OF TRANSPORTATION
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MATERIALS DIVISION
11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

Temporary Retaining Walls Along North Side of Highway 89 – Wall Nos. 9 and 10. The results of the test pits and relevant borings indicate foundation soils at the plan temporary wall subgrade elevations are generally stable and are suitable to support these temporary retaining walls. For temporary walls supported on the onsite stable natural soils or compacted embankment fill, the following factored bearing capacity and factored sliding resistance are recommended.

Table 2: Temporary Wall Nos. 9 and 10

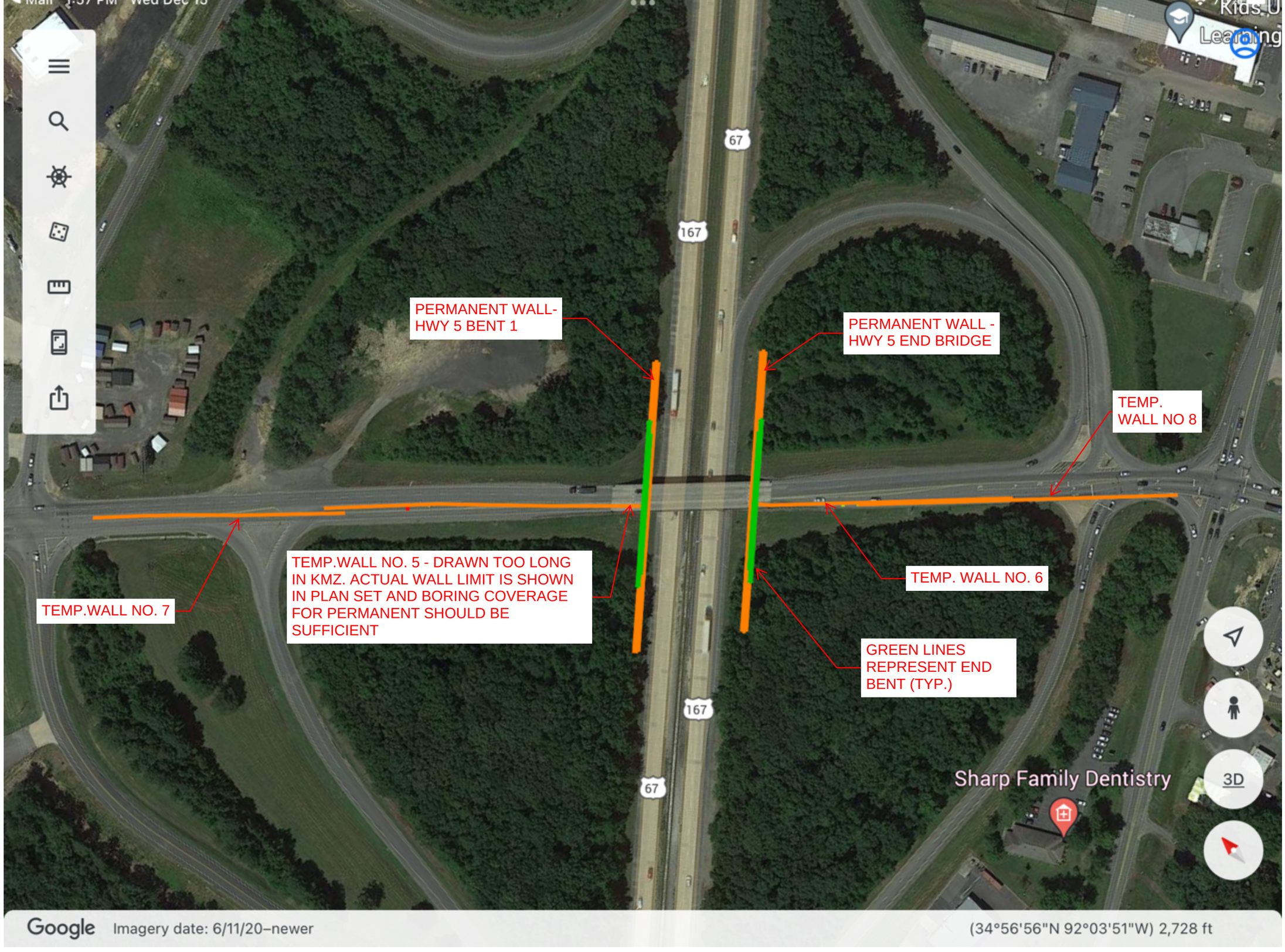
Wall No.	Expected Foundation / Subgrade	Factored Bearing Capacity, $q_R = \varphi_b q_n$, ksf	Factored Sliding Factor, $\varphi_\tau \tan\delta$
9	Stable natural soils or existing compacted embankment fill	4.5	0.52
10		4.5	0.52

For the taller wall sections (i.e., Sta. 0+00 to 0+57 of Wall No. 9 and Sta. 0+00 to 0+66 of Wall No. 10), increased bearing capacity and improved sliding resistance can be obtained as recommended in the June 21, 2021 report.

Jonathan A. Annable
Materials Engineer

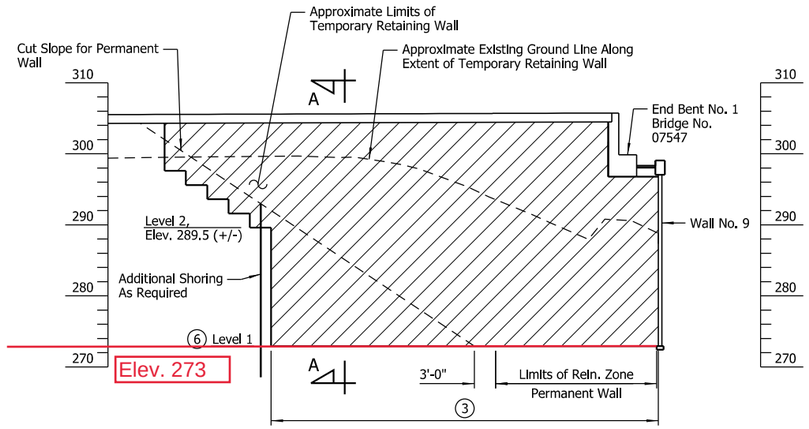
JAA:yz:mlg:pjt:pwc
Attachments
cc: State Construction Engineer
District 6 Engineer
Garver
G. C. File

Attachment A


PERMANENT WALL-
HWY 5 BENT 1
PERMANENT WALL -
HWY 5 END BRIDGE
TEMP.
WALL NO 8
TEMP.WALL NO. 7
TEMP.WALL NO. 5 - DRAWN TOO LONG IN KMZ. ACTUAL WALL LIMIT IS SHOWN IN PLAN SET AND BORING COVERAGE FOR PERMANENT SHOULD BE SUFFICIENT
TEMP. WALL NO. 6
GREEN LINES
REPRESENT END
BENT (TYP.)
67
167
Sharp Family Dentistry
3D
Google
Imagery date: 6/11/20–newer
(34°56'56"N 92°03'51"W) 2,728 ft


2:15 PM Wed Dec 15
76%
Cabot Emergency Hospital
PERM. WALL - HWY 89
END BENT 1
PERM. WALL - HWY 89
END BENT 3
TEMP. WALL NO 9
TEMP. WALL NO. 10
167
167
67
3D

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0613	1701	2268
				(1)		TEMP. WALL DETAILS		64813



ELEVATION - TEMPORARY WALL NO. 5

(Looking from fill side of Temporary Wall)
Scale: 3/32" = 1'-0"

NOTE:
For "SECTION A-A" see Dwg. No. 64818.

TEMPORARY WALL NO. 5 DESIGN PARAMETERS

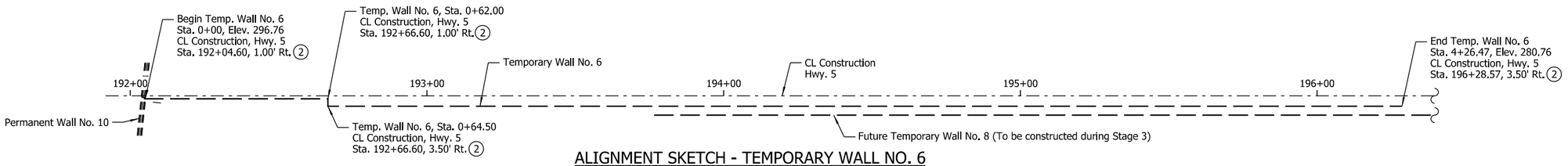
Leveling Pad Elevation	Factored Bearing Resistance (KSF)	Minimum Strap Length
Level 1	X.X	X.X H
Level 2 and above	(2) X.X	X.X H

NOTE:
"H" shall be measured from the top of leveling pad elevation to the finished surface of the roadway.

(2) Bearing stratum shall be field verified during construction

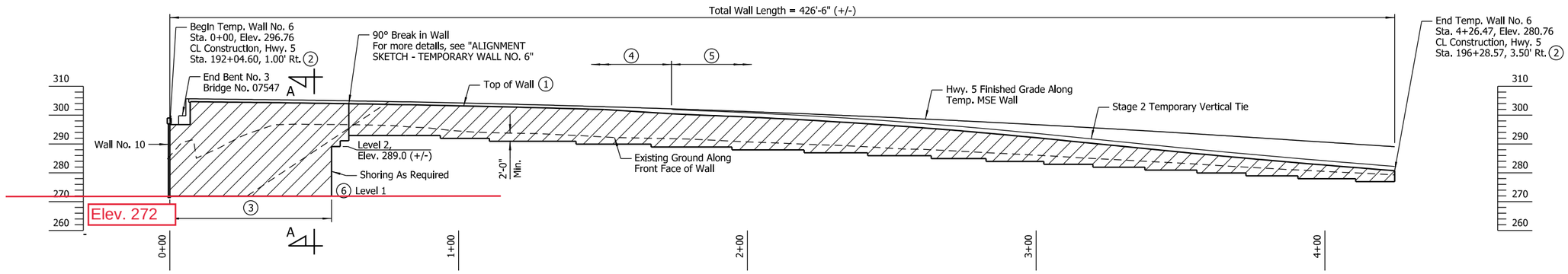
TEMP. RETAINING WALL NO. 6 ELEVATIONS

STATION ALONG WALL	FINISHED GROUND ELEV.	STAGE 2 TEMP. VERT. TIE ELEV.	EXIST. GROUND ELEV.
0+00.00	305.73	-	285.82
0+56.00	305.08	-	296.78
1+00.00	304.26	-	294.50
2+00.00	-	300.85	290.73
3+00.00	-	293.69	286.14
4+00.00	-	284.19	280.52
4+26.47	-	282.26	279.31



ALIGNMENT SKETCH - TEMPORARY WALL NO. 6

1" = 20'-0"



ELEVATION - TEMPORARY WALL NO. 6

(Looking from fill side of Temporary Wall)
1" = 20'-0"

(1) Top of Temporary Retaining Wall to be constructed at bottom of proposed pavement section constructed during Stage 2.

(2) Stationing shown is along CL Construction of Hwy. 5. Final location of Temporary Wall shall be determined by Contractor. See "ALIGNMENT SKETCH - TEMPORARY WALL NO. 6" for more information.

(3) Extend ground improvements required for permanent wall to accommodate temporary wall bearing pressure.

(4) Top of temporary wall elevations controlled by final Hwy. 5 profile

(5) Top of temporary wall elevations controlled by Stage 2 Temporary Tie profile

(6) Match leveling pad elevation for permanent wall.

TABLE OF QUANTITIES

(FOR INFORMATION ONLY)

Wall No.	Temporay Retaining Wall (Square Foot)	(1) Select Granular Backfill (Cubic Yard)
Wall No. 5	1,822	247
Wall No. 6	5,175	1,052

(1) Material used for Select Granular Backfill shall match that used within reinforcement zone of the adjacent permanent wall.

TEMPORARY WALL NO. 6 DESIGN PARAMETERS

Leveling Pad Elevation	Factored Bearing Resistance (KSF)	Minimum Strap Length
Level 1	X.X	X.X H
Level 2 and above	(2) X.X	X.X H

NOTE:
"H" shall be measured from the top of leveling pad elevation to the finished surface of the roadway.

BRIDGE ENGINEER

SHEET 3 OF 8
DETAILS OF TEMPORARY RETAINING WALLS
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

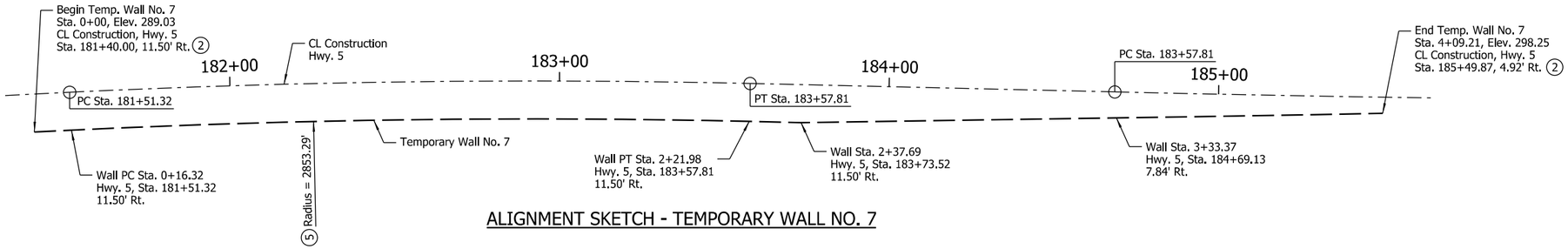
DRAWN BY: CSW DATE: NOV. 2021 FILENAME: BCA0613_TW3.DGN
CHECKED BY: JHR DATE: NOV. 2021 SCALE: As Shown
DESIGNED BY: CSW DATE: NOV. 2021
BRIDGE NO. DRAWING NO. 64813

CSWilie 11/30/2021 5:57:47 PM
WORKSPACE: ARDOT Bridge (2019)
L:\2017\17017575 - 061549 Hwy 5 - White Co Line\Drawings\bCA0613-S203-WALL.dgn
REVISED DATE:

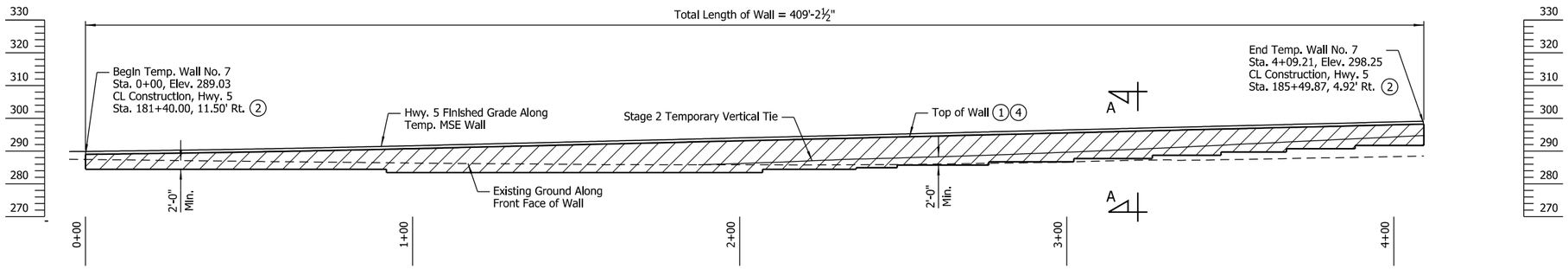
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0613	1702	2268
(1)	TEMP. WALL DETAILS			64814

(5) Portions of temporary wall between wall Sta. 0+16.32 to Sta. 2+21.98 shall be built concentric to the horizontal curve along CL Construction Hwy. 5



ALIGNMENT SKETCH - TEMPORARY WALL NO. 7



NOTE:
For "SECTION A-A" see Dwg. No. 64818.

ELEVATION - TEMPORARY WALL NO. 7

(Looking from fill side of Temporary Wall)

TEMP. RETAINING WALL NO. 7 ELEVATIONS

STATION ALONG WALL	FINISHED GRADE ELEV.	EXIST. GROUND ELEV.	STAGE 2 TEMPORARY VERTICAL TIE ELEVATION
0+00.00	287.46	289.91	-
1+00.00	291.64	286.36	-
2+00.00	294.03	285.82	286.22
3+00.00	296.46	286.69	289.66
4+00.00	298.91	288.33	294.33
4+09.21	299.14	288.48	294.76

TABLE OF QUANTITIES

(FOR INFORMATION ONLY)

Temporary Retaining Wall (Square Foot)	Select Granular Backfill (Cubic Yard)
3,086	600

WALL NO. 7 DESIGN PARAMETERS

Wall No.	Factored Bearing Resistance (KSF)	Minimum Strap Length (FT)
Wall No. 7	X.X	X.X H

NOTE:
"H" shall be measured from the top of leveling pad elevation to the finished surface of the roadway.

(1) Top of Temporary Retaining Wall to be constructed at bottom of proposed pavement section constructed during Stage 3.

(2) Stationing shown is along CL Construction of Hwy. 5. Final location of Temporary Wall shall be determined by Contractor. See "ALIGNMENT SKETCH - TEMPORARY WALL NO. 7" for more information.

(3) Extend ground improvements required for permanent wall to accommodate temporary wall bearing pressure.

(4) Top of temporary wall elevations controlled by final Hwy. 5 profile

BRIDGE ENGINEER

SHEET 4 OF 8
DETAILS OF TEMPORARY RETAINING WALLS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

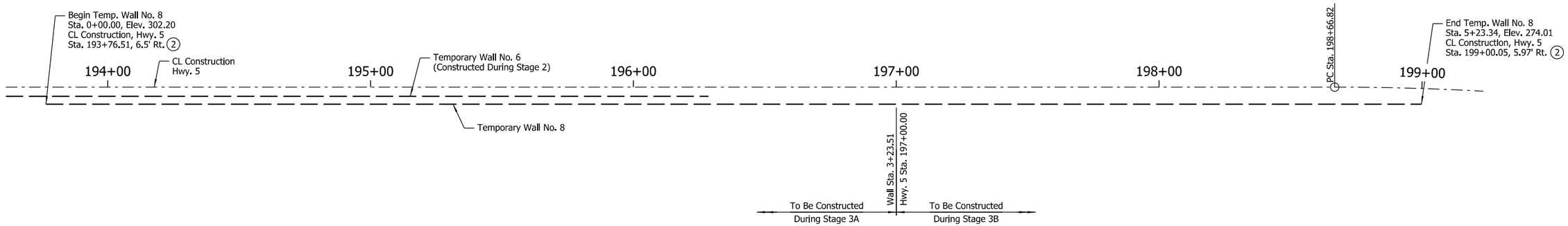
DRAWN BY: CSW DATE: NOV. 2021 FILENAME: BCA0613_TW4.DGN
CHECKED BY: JHR DATE: NOV. 2021 SCALE: 1" = 20'-0"
DESIGNED BY: CSW DATE: NOV. 2021

BRIDGE NO. DRAWING NO. 64814

CSWylie 11/30/2021 5:57:48 PM
WORKSPACE: ARDOT Bridge (2019)
L:\2017\1701757S - 061549 Hwy 5 - White Co Line\Drawings\BCA0613-S204-WALL.dgn
REVISED DATE:

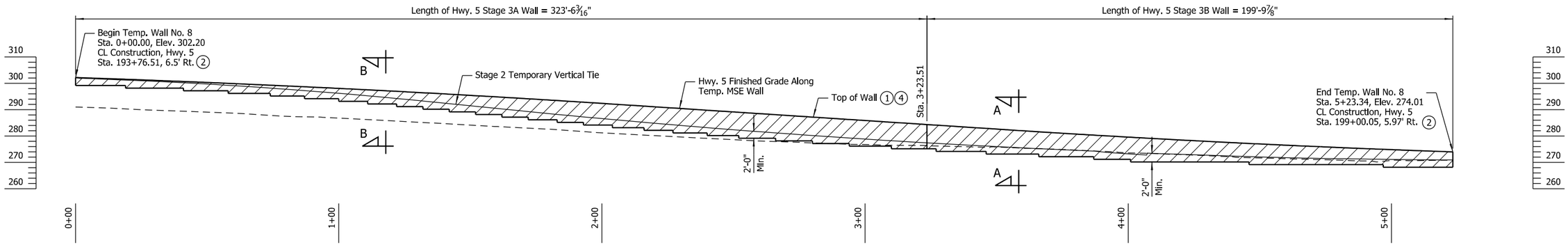
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0613	1703	2268
①	TEMP. WALL DETAILS			64815



ALIGNMENT SKETCH - TEMPORARY WALL NO. 8

TEMP. RETAINING WALL NO. 8 ELEVATIONS			
STATION ALONG WALL	FINISHED GRADE ELEV.	EXIST. GROUND ELEV.	STAGE 2 TEMPORARY VERTICAL TIE ELEVATION
0+00.00	302.20	291.10	302.20
1+00.00	298.09	286.84	296.38
2+00.00	292.41	281.22	286.62
3+00.00	285.91	276.79	278.88
4+00.00	279.58	273.65	273.28
5+00.00	274.84	270.84	271.16
5+23.34	274.01	270.84	270.94



ELEVATION - TEMPORARY WALL NO. 8

(Looking from fill side of Temporary Wall)

NOTE:
For "SECTION A-A" and "SECTION B-B", see Dwg. No. 64818.

TABLE OF QUANTITIES

(FOR INFORMATION ONLY)

Temporary Retaining Wall (Square Foot)	Select Granular Backfill (Cubic Yard)
3,697	671

WALL NO. 8 DESIGN PARAMETERS

Wall No.	Factored Bearing Resistance (KSF)	Minimum Strap Length (FT)
Wall No. 8	X.X	X.X H

NOTE:
"H" shall be measured from the top of leveling pad elevation to the finished surface of the roadway.

(1) Top of Temporary Retaining Wall to be constructed at Hwy. 5 Finished Grade.

(2) Stationing shown is along CL Construction of Hwy. 5. Final location of Temporary Wall shall be determined by Contractor. See "ALIGNMENT SKETCH - TEMPORARY WALL NO. 8" for more information.

(3) Extend ground improvements required for permanent wall to accommodate temporary wall bearing pressure.

(4) Top of temporary wall elevations controlled by final Hwy. 5 profile

BRIDGE ENGINEER

SHEET 5 OF 8
DETAILS OF TEMPORARY RETAINING WALLS
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: CSW DATE: NOV. 2021 FILENAME: BCA0613_TW5.DGN
CHECKED BY: JHR DATE: NOV. 2021 SCALE: 1" = 20'-0"
DESIGNED BY: CSW DATE: NOV. 2021
BRIDGE NO. DRAWING NO. 64815

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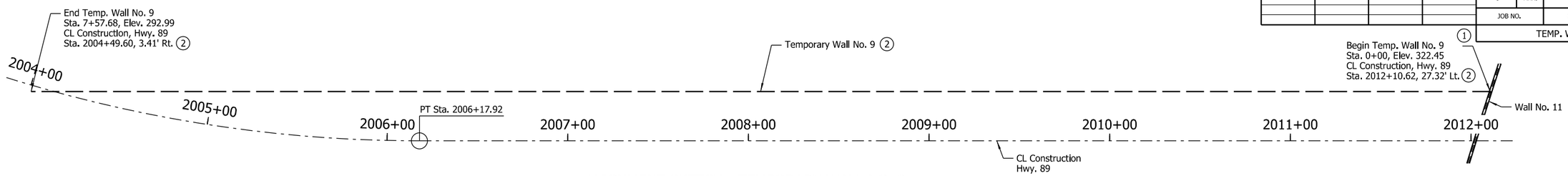
L:\2017\17017575 - 061549 Hwy 5 - White Co Line\Drawings\bCA0613-S205-WALL.dgn
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0613	1704	2268
TEMP. WALL DETAILS				64816



ALIGNMENT SKETCH - TEMPORARY WALL NO. 9

Scale: 1" = 30'-0"

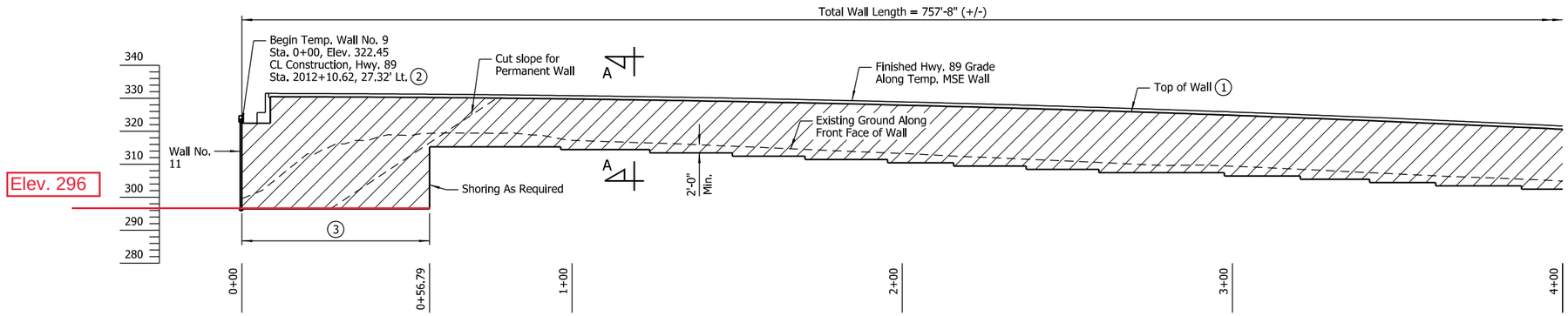
(1) Top of Temporary Retaining Wall to be constructed at bottom of proposed pavement section constructed during Stage 2.

(2) Stationing shown is along CL Construction of Hwy. 89. Temporary Retaining Wall is offset approximately 28' (+/-) Lt. from existing Hwy. 89 alignment. Final location of Temporary Wall shall be determined by Contractor. See "ALIGNMENT SKETCH - TEMPORARY WALL NO. 9" for more information.

(3) Extend ground improvements required for permanent wall to accommodate temporary wall bearing pressure.

(4) Top of temporary wall elevations controlled by final Hwy. 89 profile.

(5) Top of temporary wall elevations controlled by Stage 2 Temporary Tie profile.



PART ELEVATION - TEMPORARY WALL NO. 9

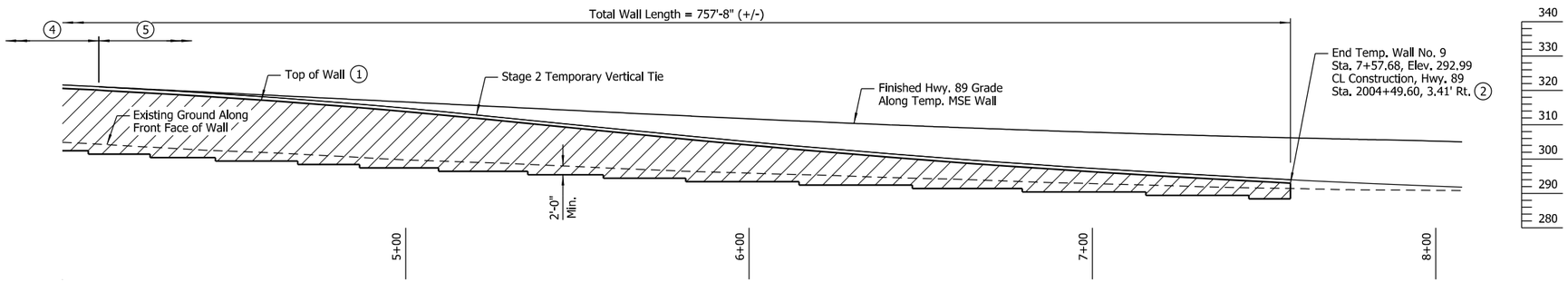
(Looking from fill side of Temporary Wall)
Scale: 1" = 20'-0"

NOTE:
For "SECTION A-A" see Dwg. No. 64818.

TABLE OF QUANTITIES

(FOR INFORMATION ONLY)

Temporary Retaining Wall (Square Foot)	Select Granular Backfill (Cubic Yard)
11,978	4,469



TEMP. RETAINING WALL NO. 9 ELEVATIONS			
STATION ALONG WALL	FINISHED GRADE ELEV.	STAGE 2 TEMP. VERT. TIE ELEV.	EXIST. GROUND ELEV.
0+00.00	331.49	-	299.53
0+56.79	331.23	-	319.34
1+00.00	330.78	-	317.21
2+00.00	328.90	-	313.27
3+00.00	325.84	-	309.46
4+00.00	321.58	-	304.97
5+00.00	-	314.80	299.69
6+00.00	-	305.05	295.89
7+00.00	-	297.28	292.83
7+57.68	-	292.99	291.42

PART ELEVATION - TEMPORARY WALL NO. 9

(Looking from fill side of Temporary Wall)
Scale: 1" = 20'-0"

WALL NO. 9 DESIGN PARAMETERS

Wall No.	Factored Bearing Resistance (KSF)	Minimum Strap Length (FT)
Wall No. 9	X.X	X.X H

NOTE:
"H" shall be measured from the top of leveling pad elevation to the finished surface of the roadway.

BRIDGE ENGINEER

SHEET 6 OF 8
DETAILS OF TEMPORARY RETAINING WALLS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: CSW DATE: NOV. 2021 FILENAME: BCA0613_TW6.DGN
CHECKED BY: JHR DATE: NOV. 2021 SCALE: As Shown
DESIGNED BY: CSW DATE: NOV. 2021
BRIDGE NO. DRAWING NO. 64816

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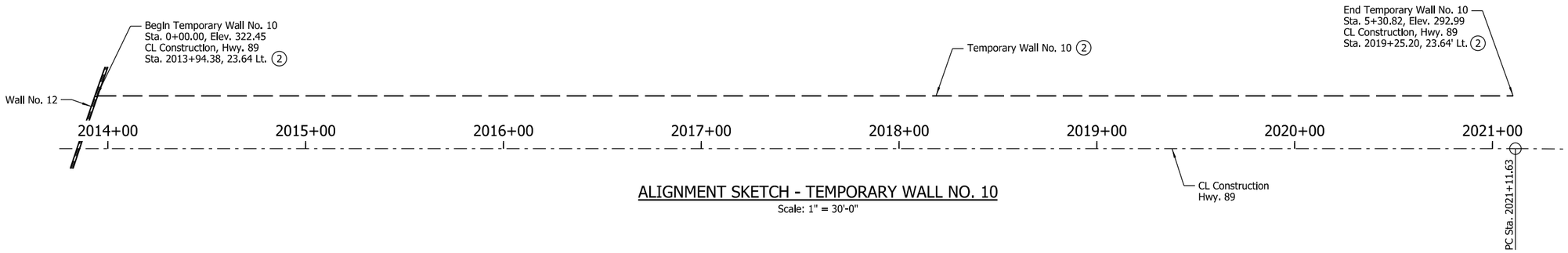
WORKSPACE: ARDOT Bridge (2019)
L:\2017\1701795 - 061549 Hwy 5 - White Co Line\Drawings\bCA0613-S206-WALL.dgn
REVISED DATE:

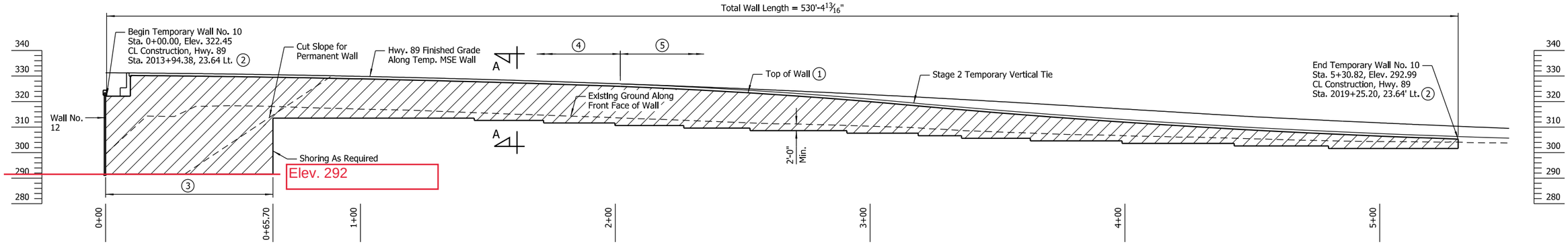
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0613	1705	2268
(1)	TEMP. WALL DETAILS			64817



ALIGNMENT SKETCH - TEMPORARY WALL NO. 10

Scale: 1" = 30'-0"



ELEVATION - TEMPORARY WALL NO. 10

(Looking from fill side of Temporary Wall)

NOTE:
For "SECTION A-A" see Dwg. No. 64818.

TEMP. RETAINING WALL NO. 10 ELEVATIONS			
STATION ALONG WALL	FINISHED GRADE ELEV.	STAGE 2 TEMP. VERT. TIE ELEV.	EXIST. GROUND ELEV.
0+00.00	299.53	-	299.53
0+65.70	330.54	-	318.11
1+00.00	329.89	-	315.07
2+00.00	327.03	-	313.56
3+00.00	-	320.98	310.38
4+00.00	-	312.92	316.59
5+00.00	-	307.48	314.40
5+30.82	-	306.30	314.12

TABLE OF QUANTITIES

(FOR INFORMATION ONLY)

Temporay Retaining Wall (Square Foot)	Select Granular Backfill (Cubic Yard)
7,595	2,014

WALL NO. 10 DESIGN PARAMETERS

Wall No.	Factored Bearing Resistance (KSF)	Minimum Strap Length (FT)
Wall No. 10	X.X	X.X H

NOTE:
"H" shall be measured from the top of leveling pad elevation to the finished surface of the roadway.

(1) Top of Temporary Retaining Wall to be constructed at bottom of proposed pavement section constructed during Stage 2.

(2) Stationing shown is along CL Construction of Hwy. 89. Temporary Retaining Wall is offset approximately 27' (+/-) Lt. from CL Construction of Hwy. 89. Final location of Temporary Wall shall be determined by Contractor. See "ALIGNMENT SKETCH - TEMPORARY WALL NO. 10" for more information.

(3) Extend ground improvements required for permanent wall to accommodate temporary wall bearing pressure.

(4) Top of temporary wall elevations controlled by Final Hwy. 89 Profile.

(5) Top of temporary wall elevations controlled by Stage 2 Temporary Tie profile.

BRIDGE ENGINEER

SHEET 7 OF 8
DETAILS OF TEMPORARY RETAINING WALLS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: CSW DATE: NOV. 2021 FILENAME: BCA0613_TW7.DGN
CHECKED BY: JHR DATE: NOV. 2021 SCALE: As Shown
DESIGNED BY: CSW DATE: NOV. 2021
BRIDGE NO. DRAWING NO. 64817

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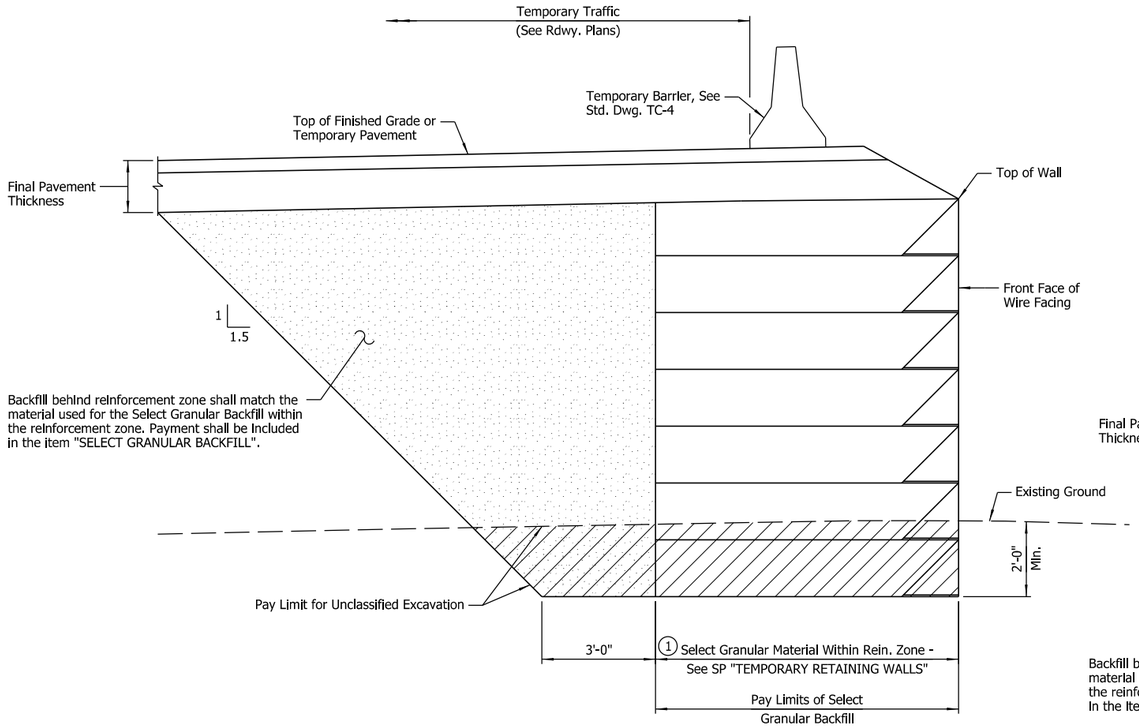
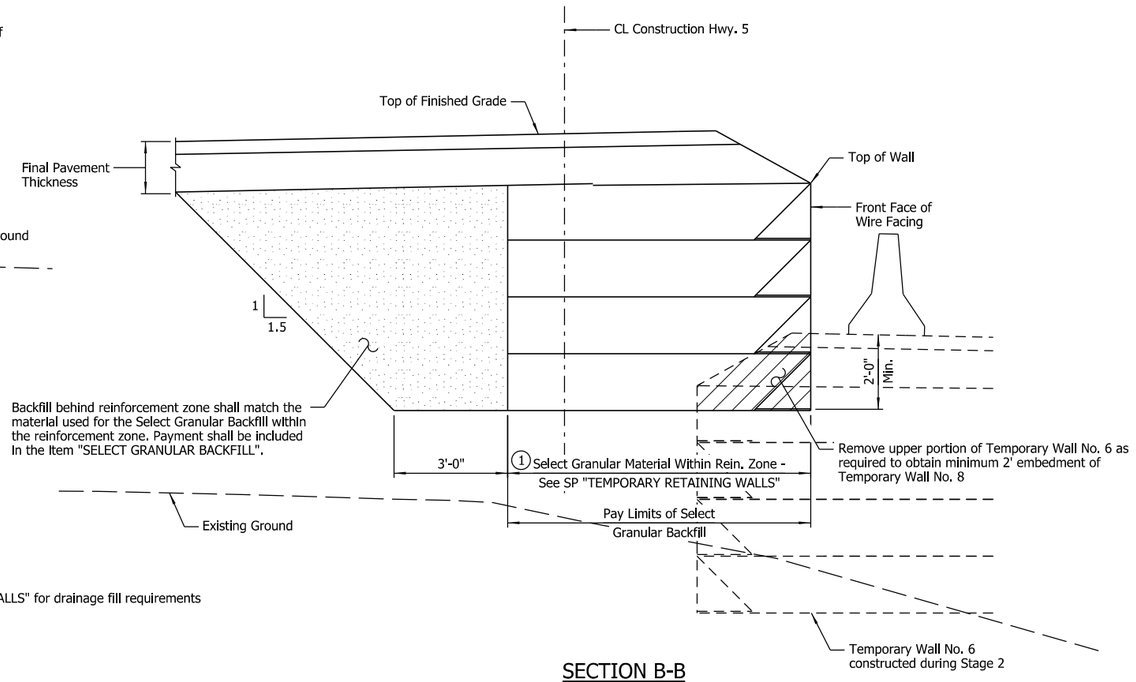
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0613	1706	2268
①	TEMP. WALL DETAILS			64818



SECTION A-A
No Scale



SECTION B-B
No Scale

① See SP "TEMPORARY RETAINING WALLS" for drainage fill requirements

SHEET 8 OF 8
DETAILS OF TEMPORARY RETAINING WALLS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: CSW DATE: NOV. 2021 FILENAME: BCA0613_TW8.DGN
CHECKED BY: JHR DATE: NOV. 2021 SCALE: As Shown
DESIGNED BY: CSW DATE: NOV. 2021

BRIDGE ENGINEER

BRIDGE NO.

DRAWING NO. 64818

CSWilE 11/30/2021 5:57:51 PM
WORKSPACE: ARDOT Bridge (2019)
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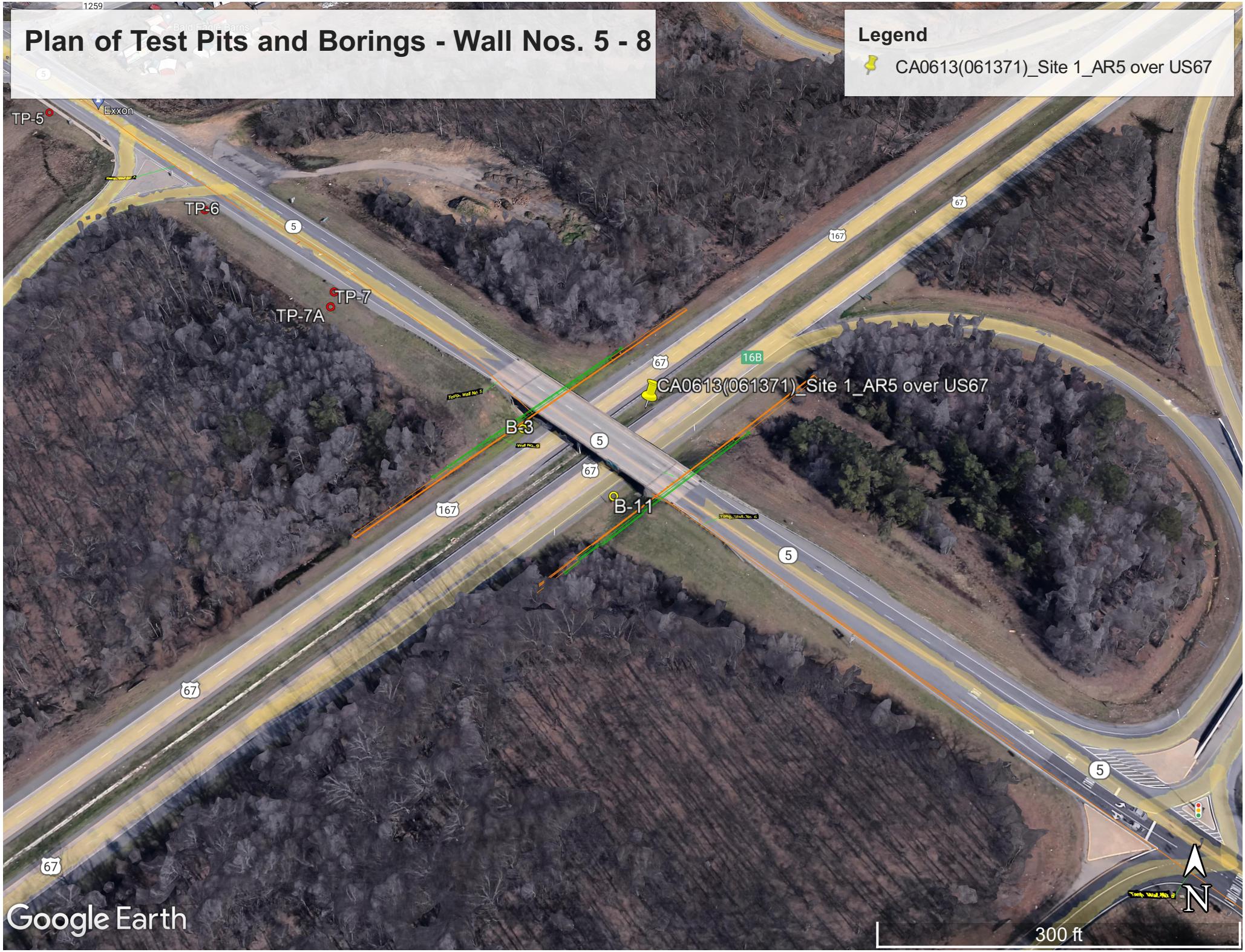
REVISED DATE:

Attachment B


Plan of Test Pits and Borings - Wall Nos. 5 - 8
Legend
CA0613(061371)_Site 1_AR5 over US67
TP-5
TP-6
TP-7
TP-7A
B-3
B-11
CA0613(061371)_Site 1_AR5 over US67
Exxon
16B
5
67
167
Google Earth
300 ft
N

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 TP-5
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION: 34.950162724, -92.06653558
LOGGED BY: P. Tierney

DATE: January 5, 2022
TYPE OF DRILLING: Backhoe Excavation

EQUIPMENT: Backhoe

HAMMER CORRECTION FACTOR:

COMPLETION DEPTH: 8

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: 285.6						
			Silty Clay with Shale Fragments (Fill)						
5			Very Soft Gray Clay, Wet						
			SHALE - Highly Weathered, Brown and Gray						
10			Boring Terminated						
15									
20									
25									
30									
35									

REMARKS:


BKC
741

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 TP-6
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION: 34.949643909, -92.065741628
LOGGED BY: P. Tierney

DATE: January 4, 2022
TYPE OF DRILLING: Backhoe Excavation

EQUIPMENT: Backhoe

HAMMER CORRECTION FACTOR:

COMPLETION DEPTH: 10

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
5			Brown Silty Clay with Shale Fragments (Fill)						
			Wet, Very Soft, Gray Clay						
10			Wet, Stiff, Gray Clay						
			Boring Terminated						
15									
20									
25									
30									
35									

REMARKS: Water seepage into the test pit was observed at approximately 7 feet below ground level.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 TP-7
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION: 34.949239171, -92.06514896
LOGGED BY: P. Campbell

DATE: January 4, 2022
TYPE OF DRILLING: Backhoe Excavation

EQUIPMENT: Backhoe

HAMMER CORRECTION FACTOR:

COMPLETION DEPTH: 9

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
5			Moist, Silty Clay with Gravel and Cobbles (Fill)						
10			Boring Terminated						
15									
20									
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 TP-7A
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION: 34.949185948, -92.065156709
LOGGED BY: P. Campbell

DATE: January 4, 2022
TYPE OF DRILLING: Backhoe Excavation

EQUIPMENT: Backhoe

HAMMER CORRECTION FACTOR:

COMPLETION DEPTH: 10

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
5			Moist, Brown Silty Clay with Gravel (Fill)						
10			Wet, Very Soft Gray Silty Clay						
15			Boring Terminated						
20									
25									
30									
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-3
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+81 Near Wall No. 5
LOCATION: 84' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 19 and 23, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 42.7

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: 280.3						
			Moist, Loose, Reddish Brown Clayey Sand	-			4		
				-	●		4-3		
							3		
			Moist, Medium Dense, Reddish Brown Clayey Sand	-	●		3-4		
5							4		
			Moist, Very Stiff, Brown Clay	-	●		5-7		
							6		
			Dry, Very Hard, Brown Clay	-	●		11-17		
							26		
				-	●		47-45 (10")		
							26		
10				-	●		61 (4")		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			20		
							61 (5")		
15				-	●		33		
							61 (4")		
20			SHALE - Weathered, Medium Hard, Dark Gray				61 (4")		
								100	50
25								100	90
				-					
30								100	94
			SHALE - Unweathered, Medium Hard, Dark Gray						
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-3
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JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+81
LOCATION: 84' Left of Centerline Hwy 67/167
LOGGED BY: Austin Dillman

DATE: November 19 and 23, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 42.7

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: 280.3						
								100	96
40								94	90
			Boring Terminated						
45									
50									
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-11
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+94 Near Wall No. 6, Sta. 0+00 to 0+62
LOCATION: 77' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

DATE: December 8 and 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.5

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: 277.3						
			Moist, Medium Stiff, Sandy Clay with Trace Gravel	-			2 2-6		
			Moist, Stiff, Reddish Brown Sandy Clay	-			6 4-5		
			Moist, Medium Stiff, Reddish Brown Silty Clay	-			1 3-4		
5			Moist, Stiff, Brown Silty Clay	-			3 5-10		
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			16 28-36		
				-			16 31-32		
10			Dry, Hard, Brown Sandy Clay with Some Gravel	-			7 13-31		
				-					
			Dry, Very Hard, Brown Clay (Highly Weathered Shale)	-			15 42-45 (11")		
				-					
15			SHALE - Highly Weathered, Medium Hard, Brown	-			27 61 (5")		
			SHALE - Weathered, Medium Hard, Dark Gray				12 (1") 15 (1")		
20								90	75
25			SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray					92	86
30			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Dark Gray	-				100	96
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 5 OP B-11
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 66+94
LOCATION: 77' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Brandon McKinney

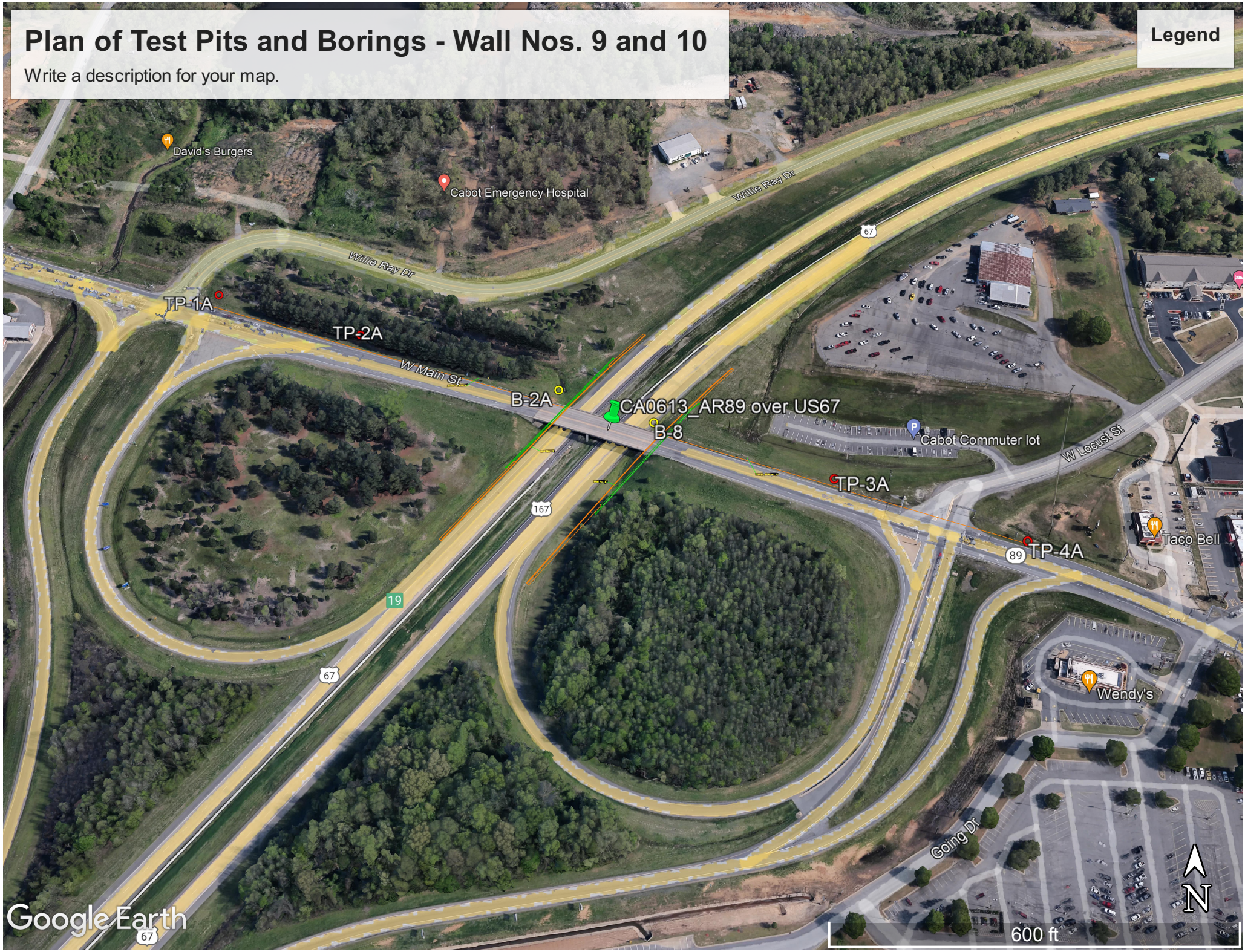
DATE: December 8 and 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 277.3	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
			SHALE WITH OCCASIONAL SANDSTONE SEAMS - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					100	62
40			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					100	76
45								98	60
50			Boring Terminated						
55									
60									
65									
70									

REMARKS:


Plan of Test Pits and Borings - Wall Nos. 9 and 10
Write a description for your map.
Legend
David's Burgers
Cabot Emergency Hospital
Willie Ray Dr
Willie Ray Dr
67
TP-1A
TP-2A
W Main St
B-2A
CA0613_AR89 over US67
B-8
Cabot Commuter lot
W Locust St
TP-3A
167
TP-4A
89
Taco Bell
19
67
Wendy's
Going Dr
N
600 ft
Google Earth
67

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-1A
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION: 34.980876605, -92.036179862
LOGGED BY: P. Tierney

DATE: January 5, 2022
TYPE OF DRILLING: Backhoe Excavation

EQUIPMENT: Backhoe

HAMMER CORRECTION FACTOR:

COMPLETION DEPTH: 7

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: 288.0						
			Tan Silty Clay						
5			Reddish Brown Silty Clay With Rock Fragments						
			Boring Terminated						
10									
15									
20									
25									
30									
35									

REMARKS: Approximately 30' right of the shoulder pavement.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-2A
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION: 34.98056245, -92.035188371
LOGGED BY: P. Tierney

DATE: January 5, 2022
TYPE OF DRILLING: Backhoe Excavation

EQUIPMENT: Backhoe

HAMMER CORRECTION FACTOR:

COMPLETION DEPTH: 9

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 297.7	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
			Reddish Brown Clay with Gravel (Rock Fragments)						
5			Reddish Brown Silty Clay with Gravel (Rock Fragments)						
			SHALE - Highly Weathered						
10			Boring Terminated						
15									
20									
25									
30									
35									

REMARKS: Approximately 30' right of the shoulder pavement. No water was encountered in this test pit.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-3A
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION: 34.979624153, -92.032224797
LOGGED BY: P. Tierney

DATE: January 5, 2022
TYPE OF DRILLING: Backhoe Excavation

EQUIPMENT: Backhoe

HAMMER CORRECTION FACTOR:

COMPLETION DEPTH: 10

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
5			Tan to Brown Silty Clay with Gravel (Sandstone and Shale Fragments)						
10			Tan Clay with Gravel (Shale Fragments)						
15			Boring Terminated						
20									
25									
30									
35									

REMARKS: No water was encountered in this boring.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 TP-4A
PAGE 1 OF 1

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION:
LOCATION: 34.979290649, -92.031125326
LOGGED BY: P. Tierney

DATE: January 5, 2022
TYPE OF DRILLING: Backhoe Excavation

EQUIPMENT: Backhoe

HAMMER CORRECTION FACTOR:

COMPLETION DEPTH: 8

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: 301.9						
			Tan Silty Clay						
			Stiff, Reddish Brown Clay						
5			Gray Silty Clay						
			Boring Terminated						
10									
15									
20									
25									
30									
35									

REMARKS: Water seepage into the test pit was observed at 8 feet below ground level after approximately 30 min.

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-2A
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+22
LOCATION: 82' Left of ~~Centerline of Hwy 67/167~~ Near Wall No. 9, Sta. 0+00 to 0+57
LOGGED BY: Austin Dillman and Paul Tierney

DATE: September 28, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 299.2	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, Loose, Brown Clayey Sand				3 4-5		
10			Hard, Dry, Brown Clay (Highly Weathered Shale)				8 17-24		
15			SHALE - Highly Weathered, Medium Hard, Brown and Gray				22 40-40		
20							17 52-35 (8")		
			SHALE - Weathered to Highly Weathered, Medium Hard, Brown and Gray					35	0
25			SHALE - Unweathered, Medium Hard, Dark Gray					100	84
30								70	54
35			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray						

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-2A
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 215+22
LOCATION: 82' Left of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman and Paul Tierney

DATE: September 28, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.7

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: 299.2						
								100	72
40									
			SHALE - Unweathered, Medium Hard, Dark Gray					100	96
45									
								100	100
50			Boring Terminated						
55									
60									
65									
70									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-8
PAGE 1 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)
STATION: 216+10 Near Wall No. 10, Sta. 0+00 to 0+66
LOCATION: 80' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 49.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 299.6	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 Stiff to Stiff, Brown Sandy Clay with Gravel				4 7-5 3 4-4 1 2-3		
			Moist, Stiff, Brown Sandy Clay Gravel				4 5-10		
10			Moist, Very Stiff, Reddish Brown Clay				4 11-21		
15			Dry, Very Stiff, Brown Clay (Highly Weathered Shale)				12 21-36		
20			Dry, Hard, Brown Clay (Highly Weathered Shale)				40 61 (4")		
			SHALE - Highly Weathered, Medium Hard, Gray						
25			SHALE - Slightly Weathered, Medium Hard, Occasional Fractures, Dark Gray					54	50
30			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					100	48
35			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					98	72

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SEC.

BORING NO. Hwy 89 OP B-8
PAGE 2 OF 2

JOB NO. CA0613 Lonoke County
JOB NAME: Hwy. 67 Intchng. Imprvts. (Cabot) (S)

STATION: 216+10
LOCATION: 80' Right of Centerline of Hwy 67/167
LOGGED BY: Austin Dillman

DATE: September 9, 2020
TYPE OF DRILLING: Hollow Stem Auger - Diamond Core
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 49.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE ELEVATION: 299.6	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
			SHALE - Unweathered, Medium Hard, Frequent Fractures, Dark Gray					80	55
40			SHALE - Unweathered, Medium Hard, Occasional Fractures, Dark Gray					96	90
45								94	94
50			Boring Terminated						
55									
60									
65									
70									

REMARKS: