

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT



**SUBSURFACE INVESTIGATION**

STATE JOB NO. 061349

FEDERAL AID PROJECT NO. STPF-9061(5)

BAUXITE & NORTHERN RR SPUR STR. & APPRS. (S)

STATE HIGHWAY 183 SECTION 1

IN SALINE COUNTY

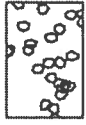
LETTING OF JANUARY 13, 2016

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.

# LEGEND

## SOIL TYPES

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



GRAVEL



SAND



SILT



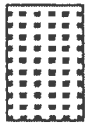
CLAY



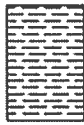
ORGANIC  
MATTER

## 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)

### SHELBY TUBE



UNDISTURBED  
SAMPLE  
RECOVERY



DISTURBED  
SAMPLE  
RECOVERY



NO  
RECOVERY

### SPLIT SPOON



SAMPLE  
RECOVERY



NO  
RECOVERY

### ROCK CORING



% RECOVERY  
INDICATED ON LOGS

## TERMS DESCRIBING CONSISTENCY OR CONDITION

GRANULAR SOIL		CLAY		CLAY-SHALE		SHALE	
'N' Value	Density	'N' Value	Consistency	'N' Value	Consistency	'N' Value	Consistency
0-4	Very Loose	0-1	Very Soft	0-1	Very Soft		
5-10	Loose	2-4	Soft	2-4	Soft	31-60	Soft
11-30	Medium Dense	5-8	Medium Stiff	5-8	Medium Stiff	Over 60	
31-50	Dense	9-15	Stiff	9-15	Stiff	More than 2'	
Over 50	Very Dense	16-30	Very Stiff	16-30	Very Stiff	Penetration	
		31-60	Hard	31-60	Hard	In 60 Blows: Medium Hard	
		Over 60	Very Hard	Over 60	Very Hard	Less than 2'	
						Penetration	
						In 60 Blows: Hard	

1. Ground water elevations indicated on boring logs represent ground water elevations at date or time shown on boring log. Absence of water surface implies that no ground water data is available but does not necessarily mean that ground water will not be encountered at locations or within the vertical reaches of these borings.
2. Borings represent subsurface conditions at their respective locations for their respective depths. Variations in conditions between or adjacent to boring locations may be encountered.
3. Terms used for describing soils according to their texture or grain size distribution are in accordance with the Unified Soil Classification System.

Standard Penetration Test – Driving a 2.0" O.D., 1-3/8" I.D. sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and performing the test are recorded for each 6 inches of penetration on the drill log. The field "N" Value ( $N_f$ ) can be obtained by

adding the bottom two numbers for example:  $\frac{6}{8-9} \Rightarrow 8+9 = 17 \text{ blows/ft}$ . The "N" Value corrected to 60%

efficiency ( $N_{60}$ ) can be obtained by multiplying  $N_f$  by the hammer correction factor published on the boring log.

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

BORING NO. 1  
PAGE 1 OF 2

JOB NO. 061349 Saline County  
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs.  
S.H. 183  
STATION: 113+09  
LOCATION: 27' Right of Center Line of Construction  
LOGGED BY: David Allen

DATE: October 1, 2013  
TYPE OF DRILLING: Hollow Stem Auger &  
Diamond Coring  
EQUIPMENT: CME 850 w/ CME  
Automatic Hammer  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 58.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% S C R	% R O D
			SURFACE ELEVATION: 365.0									
5			Moist, Stiff, Reddish Brown to Brown Sandy Clay							6 8-7		
10			Moist, Medium Dense, Brown and Gray Silty Sand							6 8-14		
15			Moist, Very Stiff, Gray Clay with Silt and Sand Seams							8 10-12		
20			Moist, Very Stiff, Dark Brown Clay with Silt and Sand Partings							5 8-9		
25			Moist, Very Stiff, Brown and Gray Clay with Silt and Sand Partings							6 9-11		
30			Moist, Very Stiff, Brown and Gray Clay with Silt and Sand Partings							9 13-15		
35										5		

REMARKS:

ARKANSAS HWY. & TRANS. DEPARTMENT MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. 1 PAGE 2 OF 2							
JOB NO. 061349 Saline County					DATE: October 1, 2013							
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs. S.H. 183					TYPE OF DRILLING: Hollow Stem Auger & Diamond Coring							
STATION: 113+09					EQUIPMENT: CME 850 w/ CME Automatic Hammer							
LOCATION: 27' Right of Center Line of Construction					HAMMER CORRECTION FACTOR: 1.23							
LOGGED BY: David Allen												
COMPLETION DEPTH: 58.2												
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% S C R	% R O D
			SURFACE ELEVATION: 365.0									
			Moist, Very Stiff, Brown and Gray Clay with Silt and Sand Seams							10-13		
40			Moist, Very Stiff, Brown and Gray Clay with Silt Partings							8 10-15		
45			Moist, Very Hard, Brown and Gray Clay with Silt Partings							10 38-60 (1")		
			SANDSTONE - Light Brown, Poorly-Cemented (Bauxite)									
50			SANDSTONE WITH REDDISH BROWN CLAY LAYERS - Reddish Brown and Gray, Medium Bedded, Cemented, with Slight Dip (Bauxite)							60 (1")	100	18
55			SANDSTONE WITH REDDISH BROWN CLAY LAYERS - Reddish Brown and Gray, Medium Bedded, Poorly- Cemented, with Slight Dip (Bauxite)								100	36
60			Boring Terminated									
65												
70												
REMARKS:												

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

BORING NO. 2  
PAGE 1 OF 2

JOB NO. 061349 Saline County  
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs.  
S.H. 183  
STATION: 113+10  
LOCATION: 37' Left of Center Line of Construction  
LOGGED BY: Tracy Henderson

DATE: September 30, 2013  
TYPE OF DRILLING: Hollow Stem Auger  
EQUIPMENT: CME 850 w/ CME Automatic Hammer  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 41.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% S C R	% R O D
			SURFACE ELEVATION: 366.6									
5			Moist, Stiff, Dark Gray Sandy Clay							3 4-5		
10			Moist, Medium Dense, Dark Gray Sand with Clay							3 5-11		
15										4 7-11		
20										6 8-12		
25			Moist, Very Stiff, Gray and Brown Clay with Silt and Sand Seams							8 11-16		
30										8 12-17		
35												

REMARKS:


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

BORING NO. 2  
PAGE 2 OF 2

JOB NO. 061349 Saline County  
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs.  
S.H. 183  
STATION: 113+10  
LOCATION: 37' Left of Center Line of Construction  
LOGGED BY: Tracy Henderson

DATE: September 30, 2013  
TYPE OF DRILLING: Hollow Stem Auger  
EQUIPMENT: CME 850 w/ CME Automatic Hammer  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 41.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% S C R	% R O D
			SURFACE ELEVATION: 366.6									
40			Moist, Very Stiff, Gray and Brown Clay with Sand Layers							8 9-13		
			Boring Terminated							8 12-18		
45												
50												
55												
60												
65												
70												

REMARKS:

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

BORING NO. 3  
PAGE 1 OF 2

JOB NO. 061349 Saline County  
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs.  
S.H. 183  
STATION: 113+34  
LOCATION: 29' Left of Center Line of Construction  
LOGGED BY: David Allen

DATE: October 2, 2013  
TYPE OF DRILLING: Hollow Stem Auger &  
Diamond Coring  
EQUIPMENT: CME 850 w/ CME  
Automatic Hammer  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 48

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% S C R	% R O D
5		X								6 8-11		
10		X	Moist, Very Stiff, Brown and Gray Clay with Silt and Sand Partings							7 10-12		
15		X								8 11-16		
20		X	Moist, Very Stiff, Brown and Gray Clay with Sand Seams							7 10-12		
25		X	Moist, Hard, Brown and Gray Clay with Sand Seams							10 13-20		
30		X								10 14-17		
35		X	Moist, Hard, Dark Brown Clay with Slickensides							38		

REMARKS:

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

BORING NO. 3  
PAGE 2 OF 2

JOB NO. 061349 Saline County  
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs.  
S.H. 183  
STATION: 113+34  
LOCATION: 29' Left of Center Line of Construction  
LOGGED BY: David Allen

DATE: October 2, 2013  
TYPE OF DRILLING: Hollow Stem Auger &  
Diamond Coring  
EQUIPMENT: CME 850 w/ CME  
Automatic Hammer  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 48

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% S C R	% R Q D
			SURFACE ELEVATION: 352.9									
40	[Pattern]	[Pattern]	SANDSTONE WITH REDDISH BROWN CLAY SEAMS - Reddish Brown and Gray, Medium Bedded, Poorly- Cemented, with Slight Dip (Bauxite)							60 (3 <sup>1/2</sup> )	86	30
45										56	8	
50			Boring Terminated									
55												
60												
65												
70												

REMARKS:



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

BORING NO. 4  
PAGE 1 OF 2

JOB NO. 061349 Saline County  
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs.  
S.H. 183  
STATION: 113+34  
LOCATION: 27' Right of Center Line of Construction  
LOGGED BY: David Allen

DATE: October 2, 2013  
TYPE OF DRILLING: Hollow Stem Auger &  
Diamond Coring  
EQUIPMENT: CME 850 w/ CME  
Automatic Hammer  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 48.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% S C R	% R Q D
			SURFACE ELEVATION: 352.3									
5		X	Moist, Very Stiff, Gray and Brown Clay with Silt and Sand Partings							6 8-11		
10		X								9 10-13		
15		X								6 8-15		
20		X	Moist, Very Stiff, Gray and Brown Clay with Sand Seams							6 9-14		
25		X	Moist, Very Stiff, Gray and Brown Clay with Sand Partings							8 13-16		
30		X	Moist, Hard, Gray and Brown Clay with Sand Seams							11 14-20		
35			SANDSTONE - Light Brown, Poorly-Cemented (Bauxite)							30		

REMARKS:

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

BORING NO. 4  
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JOB NO. 061349 Saline County  
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs.  
S.H. 183  
STATION: 113+34  
LOCATION: 27' Right of Center Line of Construction  
LOGGED BY: David Allen

DATE: October 2, 2013  
TYPE OF DRILLING: Hollow Stem Auger &  
Diamond Coring  
EQUIPMENT: CME 850 w/ CME  
Automatic Hammer  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 48.4

D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL G R O U P	P L A S T I C  L I M I T	% M O I S T.	L I Q U I D  L I M I T	D R Y W E I G H T	L B S P E R C U. F T.	N O. O F B L O W S  P E R 6- I N.	% S C R	% R Q D
			SURFACE ELEVATION: 352.3									
			SANDSTONE - Light Brown and Gray, Medium Bedded, Cemented, with Slight Dip (Bauxite)							(2")	94	71
40			SANDSTONE WITH REDDISH BROWN CLAY LAYERS - Reddish Brown and Gray, Medium Bedded, Poorly- Cemented, with Slight Dip (Bauxite)								100	56
45											92	46
50			Boring Terminated									
55												
60												
65												
70												

REMARKS:

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

BORING NO. 5  
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JOB NO. 061349 Saline County  
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs.  
S.H. 183  
STATION: 114+72  
LOCATION: 25' Left of Center Line of Construction  
LOGGED BY: David Allen

DATE: October 7-8, 2013  
TYPE OF DRILLING: Hollow Stem Auger &  
Diamond Coring  
EQUIPMENT: CME 850 w/ CME  
Automatic Hammer  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 63.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% C R	% K Q D
			SURFACE ELEVATION: 367.5									
5		X	Moist, Medium Dense, Brown Sand with Gray Clay and some Gravel (Sandstone Fragments)							9 7-8		
10		X	Moist, Medium Dense, Brown and Gray Sand with Clay							4 8-10		
15		X	Moist, Very Stiff, Gray Clay with Sand Seams							5 9-15		
20		X	Moist, Very Stiff, Gray Clay with Sand Partings							7 10-14		
25		X	Moist, Very Stiff, Gray and Brown Clay with Sand Seams							10 12-15		
30		X	Moist, Hard, Gray and Brown Clay with Sand Partings							10 15-22		
35		X								8		

REMARKS:

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

BORING NO. 5  
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JOB NO. 061349 Saline County  
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs.  
S.H. 183  
STATION: 114+72  
LOCATION: 25' Left of Center Line of Construction  
LOGGED BY: David Allen

DATE: October 7-8, 2013  
TYPE OF DRILLING: Hollow Stem Auger &  
Diamond Coring  
EQUIPMENT: CME 850 w/ CME  
Automatic Hammer  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 63.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% S C R	% R Q D
			SURFACE ELEVATION: 367.5									
		X	Moist, Hard, Gray and Brown Clay with Sand Seams							15-18		
40		X								13 18-23		
45		X	Moist, Hard, Gray and Brown Clay with Sand Partings							10 14-18		
50			SANDSTONE WITH CLAY LAYERS - Reddish Brown, Poorly-Cemented (Bauxite)							60 (2")		
			SANDSTONE WITH CLAY LAYERS - Reddish Brown, Medium Bedded, Poorly-Cemented, with Slight Dip (Bauxite)								65	10
55			SANDSTONE WITH CLAY SEAMS - Reddish Brown, Medium Bedded, Poorly-Cemented, with Slight Dip (Bauxite)								96	70
60			ALTERNATING LAYERS OF REDDISH BROWN AND BLACK SANDSTONE WITH CLAY SEAMS - Medium Bedded, Poorly-Cemented, with Slight Dip (Bauxite)								100	82
65			Boring Terminated									
70												

REMARKS:

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

BORING NO. 6  
PAGE 1 OF 2

JOB NO. 061349 Saline County  
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs.  
S.H. 183  
STATION: 114+89  
LOCATION: 41' Left of Center Line of Construction  
LOGGED BY: David Allen

DATE: October 8, 2013  
TYPE OF DRILLING: Hollow Stem Auger &  
Diamond Coring  
EQUIPMENT: CME 850 w/ CME  
Automatic Hammer  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 58.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% C R	% R Q D
			SURFACE ELEVATION: 366.6									
5		X	Moist, Medium Stiff, Gray Clay with Sand Seams							3 4-4		
10		X	Moist, Medium Dense, Brown Sand with Clay							4 6-10		
15		X	Moist, Very Stiff, Gray and Brown Clay with Sand Seams							5 8-12		
20		X	Moist, Very Stiff, Dark Brown Clay with Sand Seams							5 8-12		
25		X	Moist, Very Stiff, Gray and Brown Clay with Sand Partings							9 10-13		
30		X								7 10-15		
35		X	Moist, Very Stiff, Gray Clay with Sand Seams							7		

REMARKS:

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

BORING NO. 6  
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JOB NO. 061349 Saline County  
JOB NAME: Bauxite & Northern RR Spur Str. & Apprs.  
S.H. 183  
STATION: 114+89  
LOCATION: 41' Left of Center Line of Construction  
LOGGED BY: David Allen

DATE: October 8, 2013  
TYPE OF DRILLING: Hollow Stem Auger &  
Diamond Coring  
EQUIPMENT: CME 850 w/ CME  
Automatic Hammer  
HAMMER CORRECTION FACTOR: 1.23

COMPLETION DEPTH: 58.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	PLASTIC LIMIT	% MOIST.	LIQUID LIMIT	DRY WEIGHT	LBS PER CU.FT.	NO. OF BLOWS PER 6-IN.	% S C R	% R Q D
			SURFACE ELEVATION: 366.6							11-14		
40			Moist, Hard, Gray and Brown Clay with Sand Partings							9 14-23		
45										14 20-30		
50			SANDSTONE WITH CLAY LAYERS - Reddish Brown, Poorly-Cemented (Bauxite)							58 60 (2")	73	26
55			SANDSTONE WITH CLAY LAYERS - Reddish Brown, Medium Bedded, Poorly-Cemented, with Slight Dip (Bauxite)								90	52
60			Boring Terminated									
65												
70												

REMARKS: