ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

SUBSURFACE INVESTIGATION

STATE JOB NO. BB0612

FEDERAL AID PROJECT NO. BIM-B440(202)

ARK. RIVER BRIDGE – I-40 (S)

STATE HIGHWAY 440 SECTION 1

IN PULASKI COUNTY

LETTING OF DECEMBER 7, 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.

Grubbs, Hoskyn, Barton & Wyatt, INC.
CONSULTING ENGINEERS

P.O. Box 30970
Little Rock, Arkansas 72260-0970
#1 Trigon Place 72209
(501) 455-2536
FAX (501) 455-4137

Memo

To: Shahriar Azad
Company: Bridgefarmer & Associates, Inc.
From: Mark Wyatt MW
Date: February 6, 2016
Job No: 15-190
Ref: Recommendations for Pavement Subgrade Support: I-440
AHTD JOB BB0612 Ark. River Bridge-I-40 (F)
North Little Rock, Pulaski County, Arkansas

Dear Mr. Azad,

Submitted herewith are recommendations for subgrade support for AHTD Job No. BB0612 Ark. River Bridge-I-40 (F). This project consists of rehabilitation of 3.4 miles of Interstate 440 between Log Miles 6.5 and 9.9 in North Little Rock, Pulaski County, Arkansas. The subject alignment extends between Log Miles 6.5 and 9.9 of Interstate 440 (I-440). Conclusions and recommendations related to subgrade support have been developed based on the results of sample borings and test pits performed for this study. Data on subgrade classification and subgrade support has been developed by laboratory tests performed on samples obtained from the borings and bulk samples obtained from the test pits.

Subsurface Exploration

Subsurface conditions in the subject I-440 alignment were explored by drilling 20 sample borings (Borings 1 through 20) to 10-ft depth. The project alignment is shown on Plate 1 of Attachment 1. The approximate boring locations are shown on the Plans of Borings and Test Pits, Plates 2a through 2g of Attachment 1. The boring logs, presenting descriptions of the soil strata encountered and results of the field and laboratory tests, are included as Plates 3 through 22 of Attachment 1. A key to the terms and symbols used on the boring logs is presented as Plate 23. The subsurface exploration program is summarized on Plate 24 of Attachment 1.

The boring locations were typically offset from the roadway shoulder. Initially it was planned to drill the borings in the outside lane pavement coreholes. However, the offset boring locations were utilized to facilitate obtaining data for use in developing pavement subgrade support recommendations. The borings were drilled with a truck-mounted SIMCO 2400 rotary-drilling rig using dry-auger drilling procedures. Soil samples were obtained at approximately 2-ft intervals. Samples were recovered using a 2-in.-diameter split-barrel sampler driven into the strata by blows of a 140-lb safety hammer with 30-in. drop in accordance with Standard Penetration Test (SPT) procedures. The number of blows required to drive the standard split-barrel sampler the final 12 in.

of an 18-in. total drive, or a portion thereof, is defined as the Standard Penetration Number (N). Recorded N-values are shown on the boring logs in the "Blows Per Ft" column.

All samples were extruded or otherwise removed from samplers in the field. Samples were visually classified and placed in appropriate containers to prevent moisture loss and/or disturbance during transfer to our laboratory for further examination and testing. Observations regarding groundwater are noted in the lower-right portion of each log. All boreholes were backfilled after obtaining final groundwater readings.

Bulk samples of the subgrade soils were obtained by excavating four (4) test pits along the project alignment. The test pit locations are noted on the Plans of Borings and Test Pits in Attachment 1 and are tabulated on the summary shown on Plate 24.

Laboratory Testing

Laboratory testing was performed to evaluate subgrade soil plasticity and to confirm visual classification. A total of 76 natural water content determinations (AASHTO T-265) were performed to develop a soil water content profile for each boring. Water content results are plotted on the boring logs (see Attachment 1) in accordance with the scale and symbols shown in the legend located in the upper-right corner of the logs.

To verify soil classification and to evaluate soil plasticity, 29 liquid and plastic (Atterberg) limit determinations (AASHTO T-89 and T-90) and 34 sieve analyses (AASHTO T-88) were performed on selected representative soil samples. The Atterberg limits are plotted on the boring logs in Attachment 1 as pluses inter-connected with a dashed line using the water content scale. The percent of soil passing the No. 200 sieve is noted in the "- No. 200%" column on the log forms. Classification test results, as well as soil classification by the Unified Soil Classification System (ASTM D-2487) and the AASHTO Classification System (AASHTO M-145), are summarized on Plates 1 and 2 of Attachment 2.

Moisture-Density Relationship (Proctor) tests were performed on the four (4) representative bulk samples, i.e., Test Pits 1 through 5. These tests were performed in accordance with AASHTO T-99 methods. Pavement subgrade support properties were evaluated by performing four (4) California Bearing Ratio (CBR) tests (AASHTO T-193), with one (1) test performed for each bulk sample obtained from the test pits. For the CBR tests, the specimens were molded at approximately the optimum water content and 95 percent of the maximum dry density as determined by the corresponding laboratory Proctor tests. A 10-lb surcharge was used for each CBR test.

The Proctor and CBR test results are summarized in Attachment 3. Graphical results are also included in Attachment 3.

Conclusions and Recommendations

In light of the results of the borings and test pits, the on-site subgrade soils are expected to be comprised primarily of fine sandy silt and silty fine sand. The AASHTO classification of the subgrade soils is expected to predominantly be A-4 with subordinate amounts of A-2-4 and A-6 soils.

We recommend that any soils classifying as A-7-6 and soils with a plasticity index (PI) in excess of 18, if encountered during the work, be excluded from use as subgrade within 18 in. of

the plan subgrade elevation. The top 18 in. of subgrade soils should have a maximum plasticity index (PI) of 18. The as-built pavement subgrade should be evaluated by the Engineer. Areas of unstable or otherwise unsuitable subgrade should be improved by undercut and replacement or treatment with additives approved by the Engineer.

Based on the results of CBR tests and correlation with the AASHTO classification of the anticipated subgrade soils, subgrade support is expected to be fair. In light of the correlation with laboratory test data and factoring for environmental and serviceability criteria, the following parameters are recommended for use in pavement design.

- Resilient Modulus (M_R): 4570 lbs per sq in.
- R value: 6.2
- Modulus of Subgrade Reaction (k): 140 lbs per cu in.

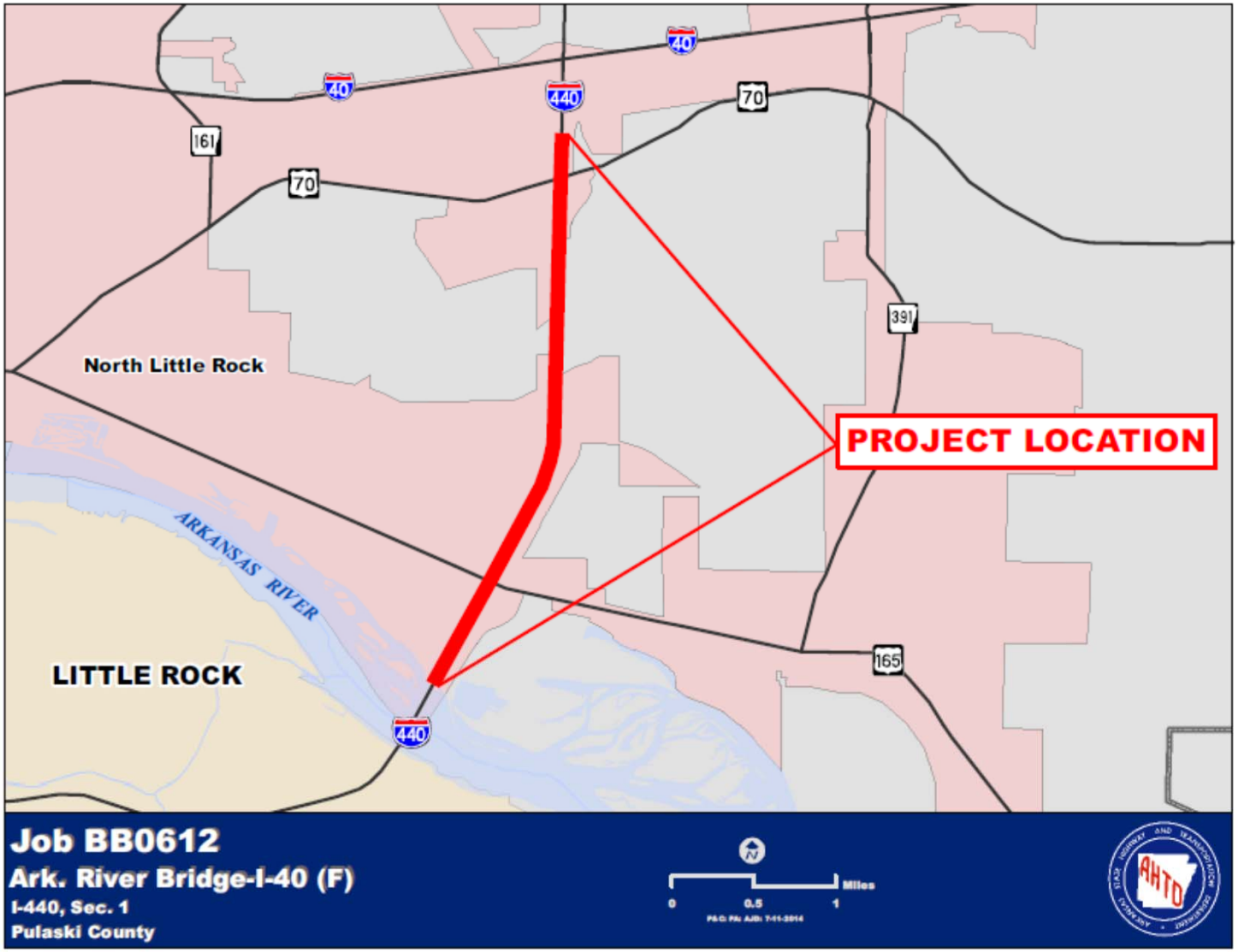
The following attachments are included and complete this submittal.

Attachment 1	Roadway Subsurface Exploration
Attachment 2	Summary of Classification Test Results
Attachment 3	Subgrade Support Test Results

* * * * *

We appreciate the opportunity to be of service to you on this project phase. Should you have any questions regarding this information, or when we can be of additional service, please call on us.

ATTACHMENT 1



Grubbs, Hoskyn, Barton & Wyatt, INC.
CONSULTING ENGINEERS

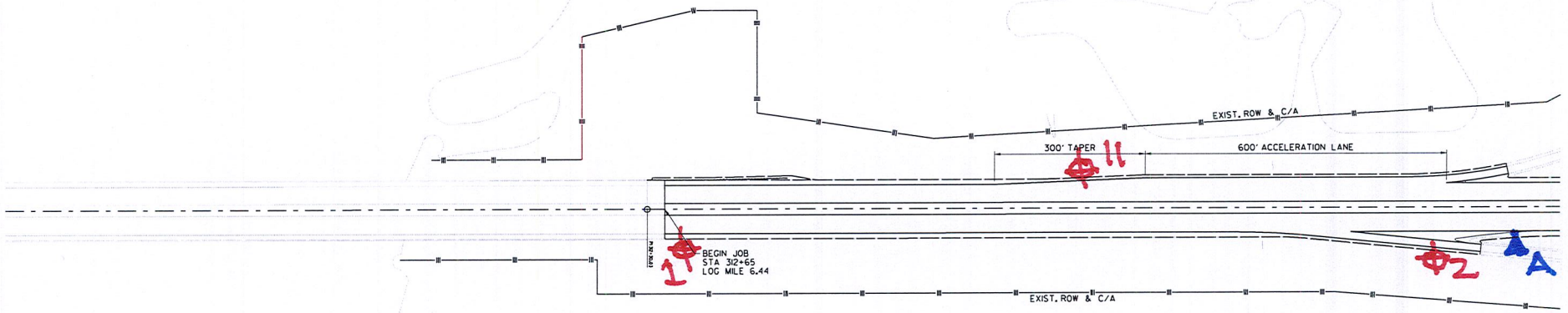
Site Vicinity Map
BB0612 Ark. River Bridge-I-40 (F)
North Little Rock, Pulaski County, AR

Job No. 15-190

Plate 1

30% SUBMITTAL
PRELIMINARY FOR REVIEW ONLY
SHAHRIAR AZAD, P.E., 12404
JANUARY-2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		BB0612		*TOTS
				② PLAN STA XXX+00 TO STA XXX+00				



⊕ BORING LOCATION

▲ TEST PIT LOCATION

PLAN of BORINGS and TEST PITS
BB0612 Ark. River Bridge-I-40 (F)
North Little Rock, Pulaski County, AR

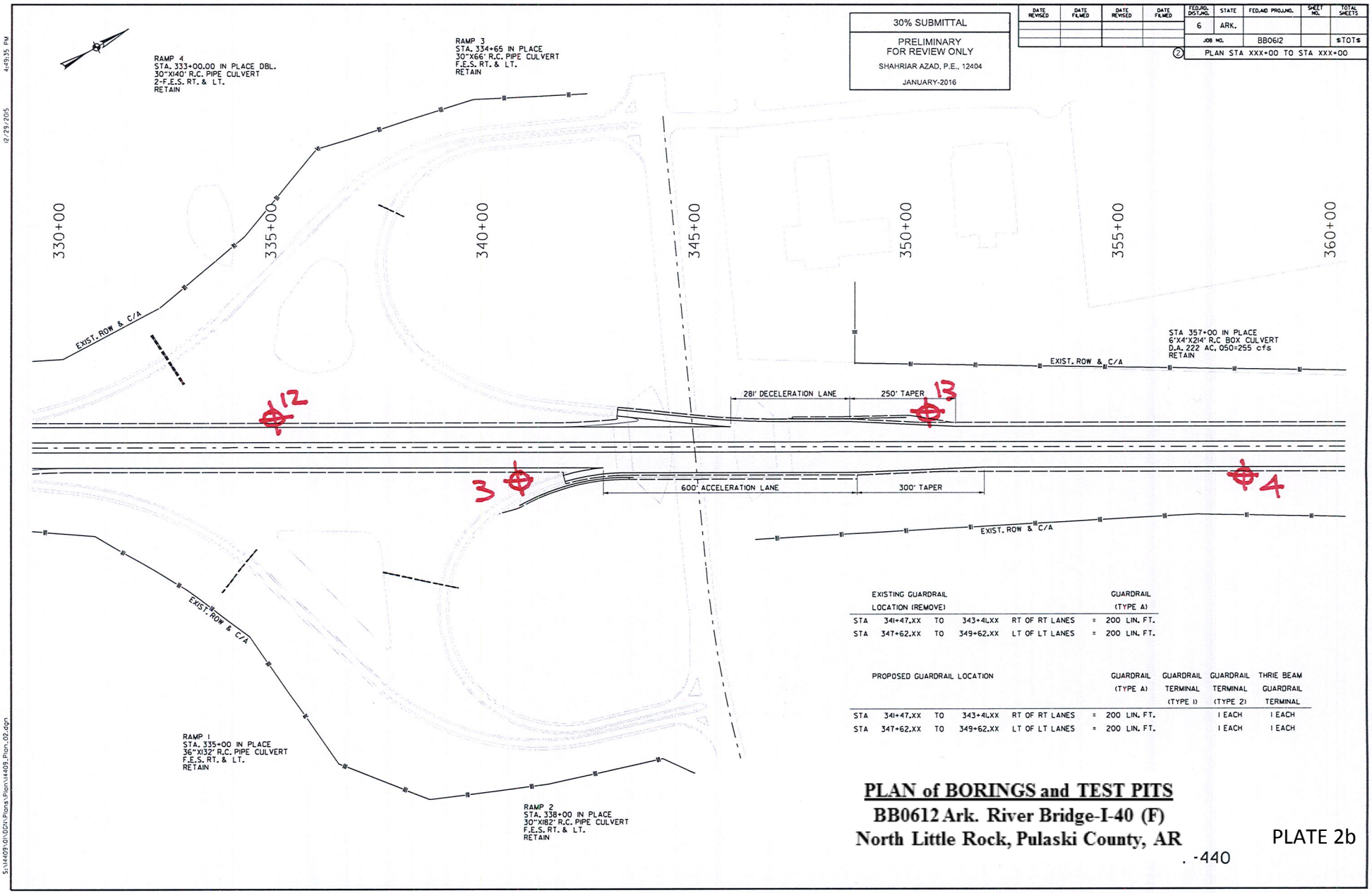
EXISTING GUARDRAIL LOCATION (REMOVE)					GUARDRAIL (TYPE A)
STA	312+58.XX	TO	314+58.XX	LT OF LT LANES	= 200 LIN. FT.

PROPOSED GUARDRAIL LOCATION					GUARDRAIL (TYPE A)	GUARDRAIL TERMINAL (TYPE I)	GUARDRAIL TERMINAL (TYPE 2)	THRIE BEAM GUARDRAIL TERMINAL
STA	312+58.XX	TO	314+58.XX	LT OF LT LANES	= 200 LIN. FT.		1 EACH	1 EACH

PLATE 2a

I-440

S:\14409\01\02\Plans\Plan\14409_Plan_01.dgn 12/29/2015 4:49:55 PM



EXISTING GUARDRAIL LOCATION (REMOVE)					GUARDRAIL (TYPE A)
STA	341+47.XX	TO	343+41.XX	RT OF RT LANES	= 200 LIN. FT.
STA	347+62.XX	TO	349+62.XX	LT OF LT LANES	= 200 LIN. FT.

PROPOSED GUARDRAIL LOCATION					GUARDRAIL (TYPE A)	GUARDRAIL TERMINAL (TYPE I)	GUARDRAIL TERMINAL (TYPE 2)	THRIE BEAM GUARDRAIL TERMINAL
STA	341+47.XX	TO	343+41.XX	RT OF RT LANES	= 200 LIN. FT.		1 EACH	1 EACH
STA	347+62.XX	TO	349+62.XX	LT OF LT LANES	= 200 LIN. FT.		1 EACH	1 EACH

PLAN of BORINGS and TEST PITS

BB0612 Ark. River Bridge-I-40 (F)

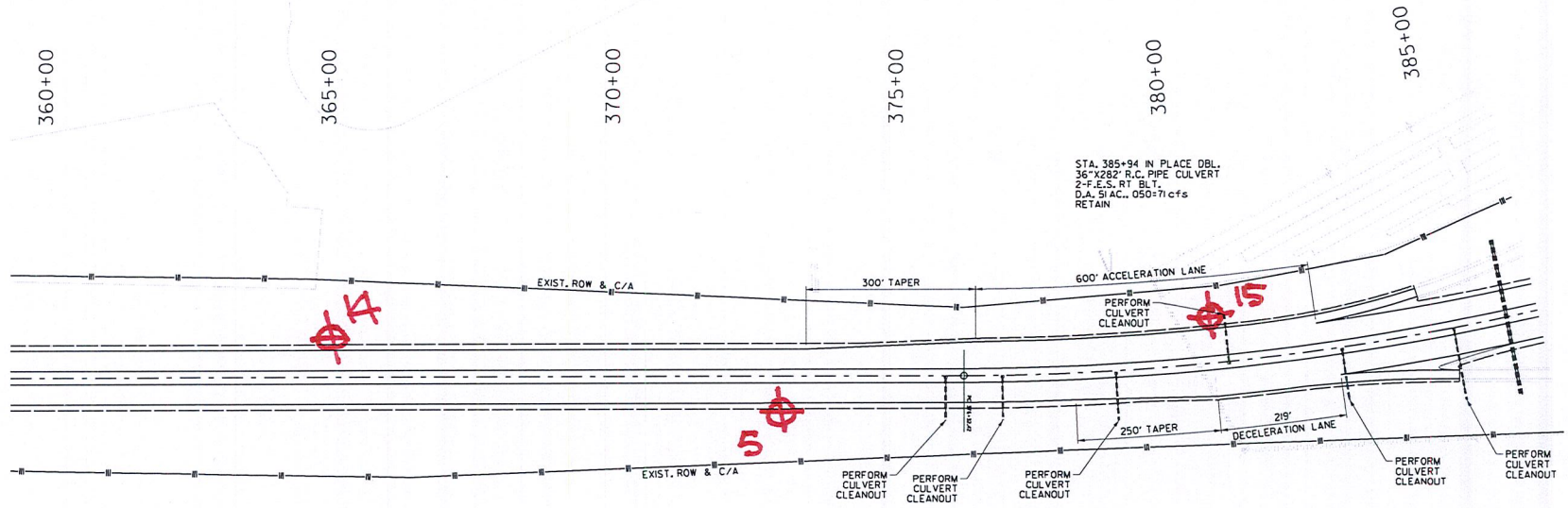
North Little Rock, Pulaski County, AR

PLATE 2b

. -440

30% SUBMITTAL
PRELIMINARY FOR REVIEW ONLY
SHAHRIAR AZAD, P.E., 12404
JANUARY-2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED./RD. DIST./NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		BB0612		TOT
				(2) PLAN STA XXX+00 TO STA XXX+00				



COMPLETING
TYPE A DROP INLETS

STA	RC. PIPE	HEIGHT	OUT LET	F.E.S.
376+00	18" X 77' (CL III)	6.00'	RT	1
377+00	18" X 77' (CL III)	6.25'	RT	1
379+00	18" X 84' (CL III)	7.50'	RT	1
381+00	18" X 86' (CL III)	7.25'	LT	1
383+00	18" X 90' (CL III)	7.00'	RT	1
385+00	18" X 128' (CL III)	10.00'	RT	1
387+00	18" X 164' (CL III)	11.50'	RT	1

PLAN of BORINGS and TEST PITS

BB0612 Ark. River Bridge-I-40 (F)

North Little Rock, Pulaski County, AR

PLATE 2c

I-440

12/29/2015 4:49:16 PM

S:\I4409\01\001\Plans\Plan\I4409_Plan_03.dgn

EXISTING GUARDRAIL LOCATION (REMOVE)					GUARDRAIL (TYPE A)
STA	391+08.XX	TO	393+05.XX	RT OF RT LANES	= 200 LIN. FT.
STA	396+16.XX	TO	398+18.XX	LT OF LT LANES	= 200 LIN. FT.
STA	411+37.XX	TO	413+37.XX	RT OF RT LANES	= 200 LIN. FT.

PROPOSED GUARDRAIL LOCATION					GUARDRAIL (TYPE A)	GUARDRAIL TERMINAL (TYPE 1)	GUARDRAIL TERMINAL (TYPE 2)	THRIE BEAM GUARDRAIL TERMINAL
STA	391+08.XX	TO	393+05.XX	RT OF RT LANES	= 200 LIN. FT.		1 EACH	1 EACH
STA	396+16.XX	TO	398+18.XX	LT OF LT LANES	= 200 LIN. FT.		1 EACH	1 EACH
STA	411+37.XX	TO	413+37.XX	RT OF RT LANES	= 200 LIN. FT.		1 EACH	1 EACH

30% SUBMITTAL

PRELIMINARY FOR REVIEW ONLY

SHAHRIAR AZAD, P.E., 12404

JANUARY-2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		BB0612		STOTS
				(2) PLAN STA XXX+00 TO STA XXX+00				

RAMP 4
STA 388+00 IN PLACE
18"X62" R.C. PIPE CULVERT
F.E.S RT & LT.
D.A. 2.7 AC., Q50=6.5 cfs
RETAIN

RAMP 4
STA. 393+67 IN PLACE
24"X64' R.C. PIPE CULVERT
(5°LT. TWD. SKEW)
F.E.S RT. & LT.
D.A. 4.6 AC.,Q50=14 CFS
RETAIN

RAMP 3
STA. 395+65 IN PLACE DBL.
30"X71'-R.C. PIPE CULVERT
2-F.E.S RT. & LT.
D.A. 18 AC., Q50=54 CFS
RETAIN

STA 406 IN PLACE
DBL. 48"X167' R.C PIPE
CULVERT 2-F.E.S. LT. & RT.
D.A.=40 AC. Q50=96 CFS
RETAIN

390+00 395+00 400+00 405+00 410+00

EXIST. ROW & C/A

EXIST. ROW & C/A

EXIST. ROW & C/A

PERFORM CULVERT CLEANOUT

PERFORM CULVERT CLEANOUT

PERFORM CULVERT CLEANOUT

PERFORM CULVERT CLEANOUT

PERFORM CULVERT CLEANOUT

PERFORM CULVERT CLEANOUT

EXIST. ROW & C/A

600' ACCELERATION LANE

305' TAPER

CL
P.I. 387+66.41
P.T. 398+55.76 BK
398+78.88 AHD
Δ=27°53' LT.
D=1°15'
T=1137.88'
R=4583.66'

RAMP 1
STA. 397+00.00 IN PLACE
30"X60" R.C. PIPE CULVERT
F.E.S RT. & LF.
D.A. 10 AC.,Q50=34 CFS
RETAIN

RAMP 2
STA. 394+96.00 IN PLACE
48"X60' R.C. PIPE CULVERT
(6°LT. FWD. SKEW)
F.E.S. RT. & LT.
D.A 25 AC., Q50=60 cfs
RETAIN

COMPLETING
TYPE A DROP INLETS

STA	RC. PIPE	HEIGHT	OUT LET	F.E.S.
389+00	18" X 107' (CL III)	13.00'	RT	1
392+00	18" X 126' (CL V)	21.00'	RT	1
397+00	18" X 132' (CL V)	22.00'	LT	1
399+00	18" X 124' (CL V)	20.00'	RT	1

PLAN of BORINGS and TEST PITS

BB0612 Ark. River Bridge-I-40 (F)

North Little Rock, Pulaski County, AR

I-440 PLATE 2d

12/29/2015 4:49:36 PM

S:\14409\GI\BDA\Plans\Plan\14409_Plan_04.dgn

12/29/2015 4:49:37 PM

S:\14409\01\DGN\Plans\Plan\14409_Plan_05.dgn

30% SUBMITTAL

PRELIMINARY
FOR REVIEW ONLY
SHAHRIAR AZAD, P.E., 12404
JANUARY-2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED./RD. DIST./NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		BB0612		TOT
				②	PLAN STA XXX+00 TO STA XXX+00			

415+00 420+00 425+00 430+00 435+00 440+00

EXIST. ROW & C/A

EXIST. ROW & C/A

B

EXISTING GUARDRAIL LOCATION (REMOVE)					GUARDRAIL (TYPE A)
STA	436+34.XX	TO	438+34.XX	LT OF LT LANES	= 200 LIN. FT.

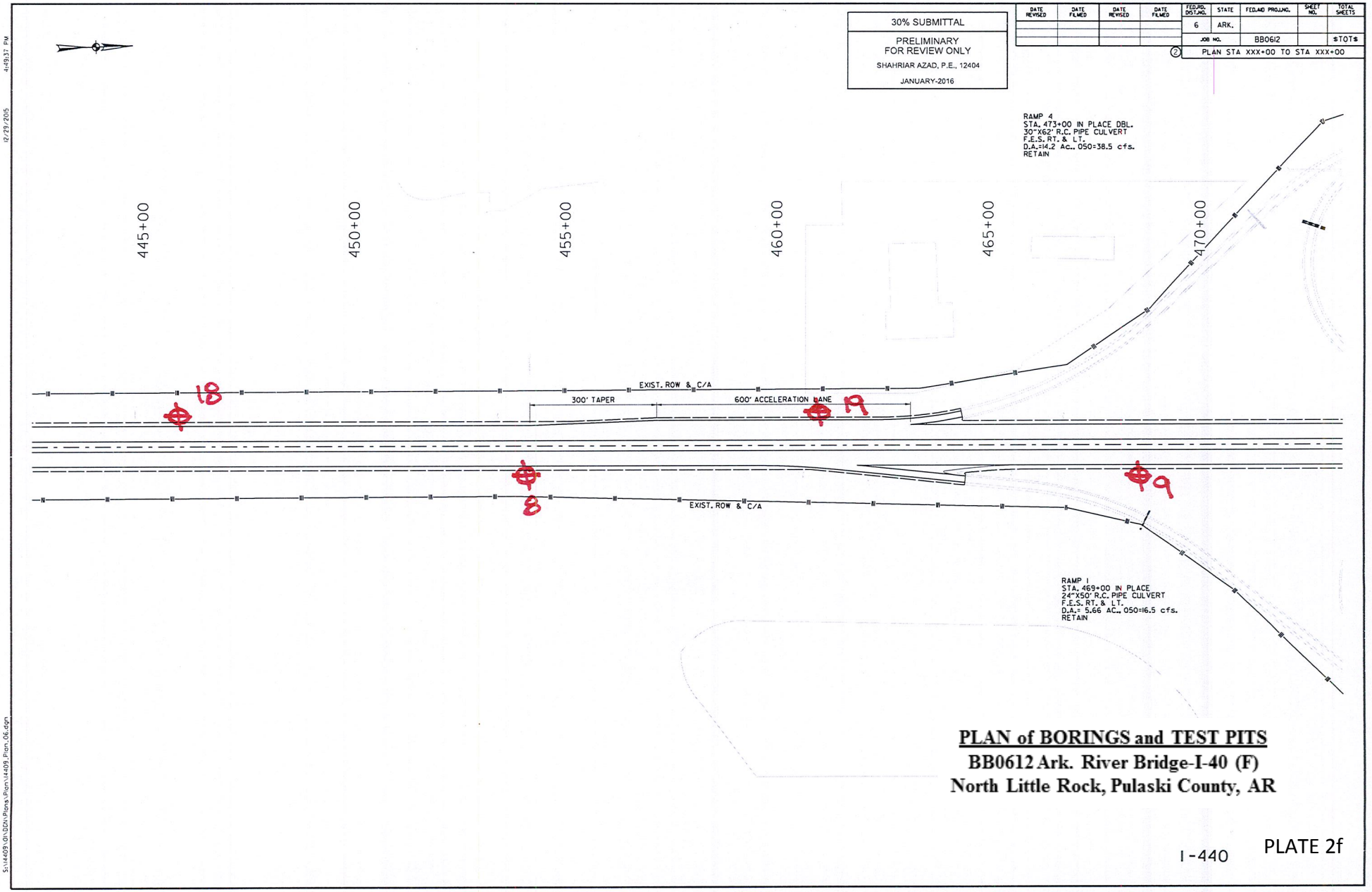
PROPOSED GUARDRAIL LOCATION					GUARDRAIL (TYPE A)	GUARDRAIL TERMINAL (TYPE I)	GUARDRAIL TERMINAL (TYPE 2)	THRIE BEAM GUARDRAIL TERMINAL
STA	436+34.XX	TO	438+34.XX	LT OF LT LANES	= 200 LIN. FT.		1 EACH	1 EACH

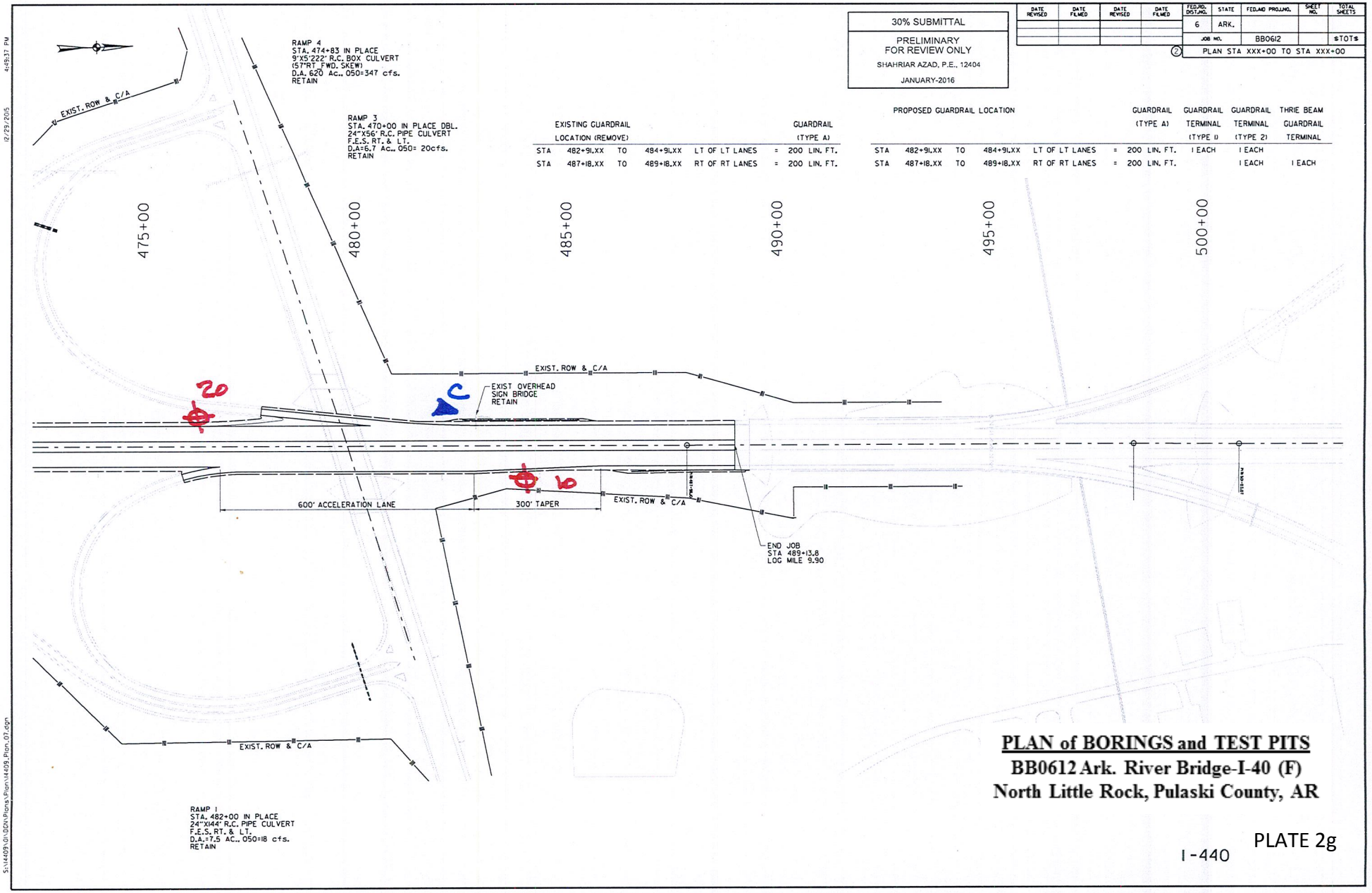
PLAN of BORINGS and TEST PITS

BB0612 Ark. River Bridge-I-40 (F)
North Little Rock, Pulaski County, AR

I-440

PLATE 2e


30% SUBMITTAL
PRELIMINARY
FOR REVIEW ONLY
SHAHRIAR AZAD, P.E., 12404
JANUARY-2016
DATE REVISED
DATE FILMED
DATE REVISED
DATE FILMED
FED.RD. DIST.NO.
STATE
FED.AID PROJ.NO.
SHEET NO.
TOTAL SHEETS
6
ARK.
JOB NO.
BB0612
TOT
PLAN STA XXX+00 TO STA XXX+00
RAMP 4
STA. 473+00 IN PLACE DBL.
30"X62' R.C. PIPE CULVERT
F.E.S. RT. & LT.
D.A.=14.2 Ac., Q50=38.5 cfs.
RETAIN
445+00
450+00
455+00
460+00
465+00
470+00
EXIST. ROW & C/A
300' TAPER
600' ACCELERATION LANE
18
19
8
9
EXIST. ROW & C/A
RAMP 1
STA. 469+00 IN PLACE
24"X50' R.C. PIPE CULVERT
F.E.S. RT. & LT.
D.A.= 5.66 Ac., Q50=16.5 cfs.
RETAIN
PLAN of BORINGS and TEST PITS
BB0612 Ark. River Bridge-I-40 (F)
North Little Rock, Pulaski County, AR
I-440
PLATE 2f


30% SUBMITTAL
PRELIMINARY
FOR REVIEW ONLY
SHAHRIAR AZAD, P.E., 12404
JANUARY-2016
DATE REVISED
DATE FILMED
DATE REVISED
DATE FILMED
FED.RD. DIST.NO.
STATE
FED.AID PROJ.NO.
SHEET NO.
TOTAL SHEETS
6
ARK.
JOB NO.
BB0612
TOT
2
PLAN STA XXX+00 TO STA XXX+00
RAMP 4
STA. 474+83 IN PLACE
9'X5'222' R.C. BOX CULVERT
(57°RT FWD. SKEW)
D.A. 620 Ac., Q50=347 cfs.
RETAIN
RAMP 3
STA. 470+00 IN PLACE DBL.
24"X56' R.C. PIPE CULVERT
F.E.S. RT. & LT.
D.A=6.7 Ac., Q50= 20cfs.
RETAIN
EXISTING GUARDRAIL LOCATION (REMOVE)
GUARDRAIL (TYPE A)
STA 482+91.XX TO 484+91.XX LT OF LT LANES = 200 LIN. FT.
STA 487+18.XX TO 489+18.XX RT OF RT LANES = 200 LIN. FT.
PROPOSED GUARDRAIL LOCATION
GUARDRAIL (TYPE A)
GUARDRAIL TERMINAL (TYPE 1)
GUARDRAIL TERMINAL (TYPE 2)
THRIE BEAM GUARDRAIL TERMINAL
STA 482+91.XX TO 484+91.XX LT OF LT LANES = 200 LIN. FT. 1 EACH 1 EACH
STA 487+18.XX TO 489+18.XX RT OF RT LANES = 200 LIN. FT. 1 EACH 1 EACH
475+00
480+00
485+00
490+00
495+00
500+00
EXIST. ROW & C/A
EXIST OVERHEAD SIGN BRIDGE RETAIN
20
C
b
600' ACCELERATION LANE
300' TAPER
EXIST. ROW & C/A
END JOB
STA 489+13.8
LOG MILE 9.90
EXIST. ROW & C/A
RAMP 1
STA. 482+00 IN PLACE
24"X44' R.C. PIPE CULVERT
F.E.S. RT. & LT.
D.A.=7.5 AC., Q50=18 cfs.
RETAIN
PLAN of BORINGS and TEST PITS
BB0612 Ark. River Bridge-I-40 (F)
North Little Rock, Pulaski County, AR
PLATE 2g
I-440

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 1

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 313+00, 75 Rt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			6 inches: Brown fine sand w/asphalt concrete and Portland cement concrete fragments and organics (fill)				
			Loose brown fine sandy silt and silty fine sand (fill)	10			
			- medium dense below 2 ft	17			
			Loose tan fine sand				
5				8			4
			- medium dense below 6 ft	27			
				23			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-26-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/26/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 2

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 328+00, 10S Rt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Loose to medium dense dark brown silty fine sand and fine sandy silt w/asphalt concrete and Portland cement concrete fragments (fill)	50/9"			
			Medium dense reddish tan fine sandy silt and silty fine sand (fill)	16		-NON-PLASTIC-	77
			- loose below 4 ft				
5				8			
			Medium dense tan silty fine sand w/brown fine sandy clay seams and layers (possible fill)	11			
			Medium dense reddish tan silty fine sand	18			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-26-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/26/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 3

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 341+20, 75 Rt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Firm brown clay w/organics (fill)				
			Loose brown fine sandy silt	8			
			- medium dense below 2 ft	23		-NON-PLASTIC-	64
5			Medium dense brown silty fine sand w/dark brown fine sandy clay seams and layers	29			
				27			
			- dark brown below 8 ft				
				48			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-26-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/26/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 4

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 358+00, 7S Rt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Loose brown clayey fine sand w/organics (fill)	10			
			Medium dense brown silty fine sand	23			45
5			- clay seam at 4.5 ft	24			
			Stiff brown clayey silt, slightly sandy w/silty fine sand seams and pockets	14			84
			- very stiff below 8.5 ft	34			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-26-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/26/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 5

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 373+00, 6S Rt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Stiff reddish brown and brown silty clay and fine sandy clay w/a little fine gravel (fill)	11			60
			Medium dense brown silt, slightly clayey w/silt pockets and fine sandy silt pockets	20			94
5				25			
			Firm dark brown clayey silt, sandy	7			
			- soft below 8 ft	6			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-26-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/26/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 6

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 388+ 00, 7S Rt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Very soft brown fine sandy clay (fill)	4			
			Loose reddish tan silty fine sand				
			- dense at 2 to 4 ft	45		-NON-PLASTIC-	40
			- medium dense below 4 ft				
5				22			
			Medium dense reddish brown fine sandy silt	15			
			Stiff dark brown fine sandy clay w/silt seams and organic inclusions	12			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-26-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/26/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 7

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 401+20, 75 Rt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Stiff dark brown fine sandy clay, silty w/organics (fill)	11			50
			Dense reddish tan fine sandy silt	42		-NON-PLASTIC-	54
5				30			
			Stiff dark brown silty clay, sandy w/fine sandy silt seams and layers	13			80
			Medium dense reddish tan fine sandy silt	25			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-26-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/26/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 8

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 454+00, 75 Rt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			6 inches: Dark brown fine sandy silt w/organics (topsoil-fill)				
			Medium dense brown fine sandy silt, slightly clayey w/organics (fill)	11			62
			Stiff brown clayey silt, slightly sandy	42			85
5			Medium dense to dense reddish brown fine sandy silt	30			
			- medium dense below 6 ft	13			
			Very stiff reddish brown fine sandy clay, silty	25			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-27-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/27/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 9

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 469+00, 75 Rt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT — WATER CONTENT — LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Loose dark brown silty clay, sandy w/organics (fill)				
			Firm reddish brown clayey silt	8			
			- stiff below 2 ft	18			95
			Very stiff brownish red silty clay	50/8"			100
5			- stiff below 6 ft	21			
			Loose to medium dense reddish tan fine sandy silt	10			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-27-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/27/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 10

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 484+00, 83 Rt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Firm to stiff dark brown and brown fine sandy clay w/crushed stone and organics (fill)	10			
			Stiff brown silty clay w/fine sand (fill)	17			91
5			Stiff brown silty clay	18			96
			Stiff brown clayey silt, sandy	23			
			Medium dense reddish tan fine sandy silt	14			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-27-16

DEPTH TO WATER IN BORING: 3.8 ft

DATE: 1/27/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 11

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger

LOCATION: Sta 320+30, 70 Lt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Medium dense tan and reddish brown silty fine sand w/occasional clay pockets (fill)	13			
			- with trace crushed stone fragments to 1 ft				
			- brown clayey silt with fine sand below 2 ft	20			
			Medium dense tan fine sand	19			3
5				20			
				20			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-28-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/28/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 12

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger

LOCATION: Sta 335+50, 70 Lt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Medium dense brown and tan fine sandy silt and silty fine sand (fill)	11		-NON-PLASTIC-	50
			- with brown fine sandy clay pockets at 2 to 4 ft	19			
5				19			
				22			
				13			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-28-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/28/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 13

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger

LOCATION: Sta 350+50, 80 Lt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Medium dense brownish tan silty fine sand and fine sandy silt w/crushed stone fragments (fill)	13		-NON-PLASTIC-	44
			- silty fine sand at 2 to 4 ft	28			
5				19			
				23			
				22			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-28-16

DEPTH TO WATER IN BORING: 2 ft

DATE: 1/28/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 14

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 35+50, 70 Lt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Medium dense reddish brown fine sandy silt, slightly clayey w/trace crushed stone base (fill)	16			58
			Dense reddish brown clayey fine sand, silty	40			79
			- with silt pockets below 4 ft				
5				50			
			Dense to very dense reddish tan silty fine sand - with occasional fine sandy clay seams to 6 to 8 ft	50/10"			
			- dense below 8 ft				
				35			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-28-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/28/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 15

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 380+50, 80 Lt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Medium dense reddish brown silty fine sand and fine sandy silt w/crushed stone fragments (fill)	11			
			Dense brownish gray fine sandy silt w/fine sandy clay and silt pockets (fill)	49		-NON-PLASTIC-	70
5			Medium dense dark brown fine sandy silt w/trace organics	26			
				14			
10				8			
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-28-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/28/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 16

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger

LOCATION: Sta 399+80, 80 Lt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Medium dense reddish tan fine sandy silt (fill)	13			51
			- reddish tan and light tan below 2 ft	25			
5			Medium dense tan to reddish tan silty fine sand	28			38
				43			
10				19			
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-28-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/28/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 17

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 411+00, 60 Lt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Loose brown and reddish tan fine sandy silt w/clay seams and organics (fill)	7			
			Medium dense brown silty fine sand w/silty clay pockets (fill)	18		-NON-PLASTIC-	39
5			Loose reddish tan fine sandy silt	10			
			- very loose to loose at 6 to 8 ft	4			
			- loose below 8 ft				
			- wet at 9 ft	8			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-27-16

DEPTH TO WATER IN BORING: Dry
DATE: 1/27/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 18

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 446+00, 85 Lt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Loose brown fine sandy silt w/crushed stone fragments (fill)	7			
			Stiff reddish tan clayey silt, sandy (fill)	16			84
			- grayish brown and tan silty fine sand below 4 ft	20			
5			- with gray fine sandy clay pockets below 6 ft	10			
			Medium dense brown fine sandy silt	19			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-27-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/27/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 19

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 461+00, 80 Lt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Loose brown and tan fine sandy silt and silty fine sand w/asphalt concrete and Portland cement concrete (fill)	10			
			Medium dense reddish brown silt, slightly clayey w/fine sandy silt seams	22			94
5				18			
			Medium dense yellowish red clayey fine sand w/silty fine sand pockets (possible fill)	16			
			Medium dense reddish tan fine sandy silt	11			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-27-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/27/2016

LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

LOG OF BORING NO. 20

BB0612: I-440 Rehabilitation
North Little Rock, Arkansas

TYPE: Auger LOCATION: Sta 476+30, 65 Lt

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WT LB/CU FT	COHESION, TON/SQ FT (0.2 0.4 0.6 0.8 1.0 1.2 1.4) / PLASTIC LIMIT — WATER CONTENT — LIQUID LIMIT (10 20 30 40 50 60 70)	- No. 200 %
			SURF. EL:				
			Soft dark brown silty clay w/fine sand and organics (fill)	5			
			Very stiff brown, tan and gray silty clay (fill)	26			95
5			Stiff reddish brown silty clay w/silty fine sand partings and pockets	13			97
			- with silt pockets below 6 ft	14			
			Loose reddish tan fine sandy silt, moist	6			
10							
15							

COMPLETION DEPTH: 10.0 ft
DATE: 1-27-16

DEPTH TO WATER IN BORING: Dry

DATE: 1/27/2016

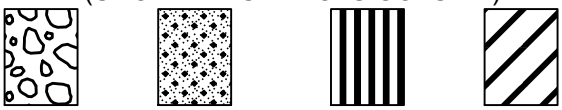
LGBNEW 15-190.GPJ 2-8-16

Grubbs, Hoskyn, Barton & Wyatt, Inc.
Consulting Engineers

SYMBOLS AND TERMS USED ON BORING LOGS

SOIL TYPES

(SHOWN IN SYMBOLS COLUMN)



Gravel Sand Silt Clay

Predominant type shown heavy

SAMPLER TYPES

(SHOWN ON SAMPLES COLUMN)

Shelby Tube | Rock Core | Split Spoon | No Recovery | Cutting

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE GRAINED SOILS (major portion retained on No. 200 sieve): Includes (I) Clean gravels and sands, and (2) silty or clayey gravels and sands. Condition is rated according to relative density, as determined by laboratory tests.

DESCRIPTIVE TERM	N-VALUE	RELATIVE DENSITY
VERY LOOSE	0-4	0-15%
LOOSE	4-10	15-35%
MEDIUM DENSE	10-30	35-65%
DENSE	30-50	65-85%
VERY DENSE	50 and above	85-100%

FINE GRAINED SOILS (major portion passing No. 200 sieve): Includes (1) Inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings or by unconfined compression tests.

DESCRIPTIVE TERM	UNCONFINED COMPRESSIVE STRENGTH TON/SQ. FT.
VERY SOFT	Less than 0.25
SOFT	0.25-0.50
FIRM	0.50-1.00
STIFF	1.00-2.00
VERY STIFF	2.00-4.00
HARD	4.00 and higher

NOTE: Slickensided and fissured clays may have lower unconfined compressive strengths than shown above, because of planes of weakness or cracks in the soil. The consistency ratings of such soils are based on penetrometer readings.

TERMS CHARACTERIZING SOIL STRUCTURE

SLICKENSIDED - having inclined planes of weakness that are slick and glossy in appearance.
FISSURED - containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
LAMINATED - composed of thin layers of varying color and texture.
INTERBEDDED - composed of alternate layers of different soil types.
CALCAREOUS - containing appreciable quantities of calcium carbonate.
WELL GRADED - having a wide range in grain sizes and substantial amounts of all intermediate particle sizes.
POORLY GRADED - predominantly of one grain size, or having a range of sizes with some intermediate sizes missing.

Terms used on this report for describing soils according to their texture or grain size distribution are in accordance with the UNIFIED SOIL CLASSIFICATION SYSTEM, as described in Technical Memorandum No.3-357, Waterways Experiment Station, March 1953

KEY 2-8-16

SUMMARY of SUBSURFACE EXPLORATION

PROJECT: BB0612 Ark. River Bridge - I-40 (F)
LOCATION: North Little Rock, Pulaski Co., Arkansas
GHBW JOB NUMBER: 15-190

Start Project	312+65	log mile:	6.44
end project EB	489+13	log mile:	9.90

Boring or Test Pit No.	Approx Sta	Centerline Offset, ft		Completion Depth (ft)
1	313+00	75	RT, SB	10
2	328+00	105	RT, SB	10
3	341+20	75	RT, SB	10
4	358+00	75	RT, SB	10
5	373+00	65	RT, SB	10
6	388+00	75	RT, SB	10
7	401+20	75	RT, SB	10
8	454+00	75	RT, SB	10
9	469+00	75	RT, SB	10
10	484+00	85	RT, SB	10
11	320+50	-70	LT, NB	10
12	335+50	-70	LT, NB	10
13	350+50	-80	LT, NB	10
14	365+50	-70	LT, NB	10
15	380+50	-80	LT, NB	10
16	399+80	-80	LT, NB	10
17	411+00	-60	LT, NB	10
18	446+00	-85	LT, NB	10
19	461+00	-80	LT, NB	10
20	476+30	-65	LT, NB	10
TP-A	329+70	75	RT, SB	1.5
TP-B	436+60	90	RT, SB	1.5
TP-C	482+30	-75	LT, NB	1.5
TP-D	402+70	-70	LT, NB	1.5

ATTACHMENT 2

SUMMARY of CLASSIFICATION TEST RESULTS

PROJECT: AHTD JOB BB0612 Ark. River Bridge-I-40 (F)
LOCATION: North Little Rock, Pulaski Co., Arkansas
GHBW JOB NUMBER: 15-190

BORING NO.	SAMPLE DEPTH (ft)	WATER CONTENT (%)	ATTERBERG LIMITS			SIEVE ANALYSIS PERCENT PASSING							UNIFIED CLASS.	AASHTO CLASS.
			LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	1 in.	3/4 in.	3/8 in.	#4	#10	#40	#200		
1	4.5-5.5	5	---	---	---	100	100	100	100	100	89	4	SP	A-2-4
2	2.5-3.5	16	NP	NP	NP	----	----	----	----	----	----	77	ML	A-4
3	2.5-3.5	15	NP	NP	NP	----	----	----	----	----	----	64	ML	A-4
4	2.5-3.5	11	---	---	---	----	----	----	----	----	----	45	SM	A-4
4	6.5-7.5	14	23	18	5	----	----	----	----	----	----	84	CL-ML	A-4
5	0.5-1.5	20	26	17	9	----	----	----	----	----	----	60	CL	A-4
5	2.5-3.5	15	25	21	4	----	----	----	----	----	----	94	CL-ML	A-4
6	2.5-3.5	12	NP	NP	NP	----	----	----	----	----	----	40	SM	A-4
7	0.5-1.5	17	27	18	9	----	----	----	----	----	----	50	CL	A-4
7	2.5-3.5	14	NP	NP	NP	----	----	----	----	----	----	54	ML	A-4
7	6.5-7.5	20	26	15	11	----	----	----	----	----	----	80	CL	A-6
8	0.5-1.5	20	23	20	3	----	----	----	----	----	----	62	ML	A-4
8	2.5-3.5	17	25	20	5	----	----	----	----	----	----	85	CL-ML	A-4
9	2.5-3.5	17	27	20	7	----	----	----	----	----	----	95	CL-ML	A-4
9	4.5-5.5	20	36	20	16	----	----	----	----	----	----	100	CL	A-6
10	2.5-3.5	18	29	18	11	----	----	----	----	----	----	91	CL	A-6
10	4.5-5.5	18	36	18	18	----	----	----	----	----	----	96	CL	A-6
11	4.5-5.5	5	---	---	---	----	----	----	----	----	----	3	SP	A-2-4
12	0.5-1.5	18	NP	NP	NP	----	----	----	----	----	----	50	ML	A-4
13	0.5-1.5	12	NP	NP	NP	----	----	----	----	----	----	44	SM	A-4

Grubbs, Hoskyn,
Barton & Wyatt, Inc.
CONSULTING ENGINEERS

SUMMARY of CLASSIFICATION TEST RESULTS

PROJECT: AHTD JOB BB0612 Ark. River Bridge-I-40 (F)
LOCATION: North Little Rock, Pulaski Co., Arkansas
GHBW JOB NUMBER: 15-190

BORING NO.	SAMPLE DEPTH (ft)	WATER CONTENT (%)	ATTERBERG LIMITS			SIEVE ANALYSIS PERCENT PASSING							UNIFIED CLASS.	AASHTO CLASS.
			LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	1 in.	3/4 in.	3/8 in.	#4	#10	#40	#200		
14	0.5-1.5	15	20	17	3	----	----	----	----	----	----	58	ML	A-4
14	2.5-3.5	11	21	17	4	----	----	----	----	----	----	79	ML	A-4
15	2.5-3.5	12	NP	NP	NP	----	----	----	----	----	----	70	ML	A-4
16	0.5-1.5	14	---	---	---	----	----	----	----	----	----	51	ML	A-4
16	4.5-5.5	15	---	---	---	100	100	100	100	100	100	38	SM	A-4
17	2.5-3.5	14	NP	NP	NP	----	----	----	----	----	----	39	SM	A-4
18	2.5-3.5	17	27	21	6	----	----	----	----	----	----	84	CL-ML	A-4
19	2.5-3.5	15	25	22	3	----	----	----	----	----	----	94	ML	A-4
20	2.5-3.5	14	22	20	2	----	----	----	----	----	----	95	ML	A-4
20	4.5-5.5	25	36	18	18	----	----	----	----	----	----	97	CL	A-6
TP-A	0.7-1.5	7	NP	NP	NP	100	100	100	99	98	97	31	SM	A-2-4
TP-B	0.7-1.5	17	NP	NP	NP	100	100	100	100	100	99	49	SM	A-4
TP-C	0.7-1.5	17	25	17	8	100	99	97	95	93	88	58	CL	A-4
TP-D	0.9-1.5	19	23	17	6	100	99	99	98	98	97	61	CL-ML	A-4

ATTACHMENT 3

SUMMARY of SUBGRADE SUPPORT TEST RESULTS

PROJECT: AHTD JOB BB0612 Ark. River Bridge-I-40 (F)
LOCATION: North Little Rock, Pulaski Co., Arkansas
GHBW JOB NUMBER: 15-190

TEST PIT NO.	DEPTH, FT	WATER CONTENT, (%)	ATTERBERG LIMITS			SIEVE ANALYSIS, %			Soil Description	UNIFIED CLASS.	AASHTO CLASS.	PROCTOR TEST RESULTS (AASHTO T-99)		CBR TEST RESULTS (AASHTO T-193)			
			LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	+#4	#4 to #200	#200				MAX DRY UNIT WT, pcf	OPTIMUM MOISTURE, %	MOLDED DRY UNIT WT, pcf	MOLDED WATER CONTENT, %	CBR VALUE	
																TOP	BOTTOM
A	0.7-1.5	7	NP	NP	NP	1	68	31	Reddish brown and gray silty fine SAND with silt pockets	SM	A-2-4	108.6	13.6	104.4	13.6	16.3	10.8
B	0.7-1.5	17.3	NP	NP	NP	0	51	49	Brown silty fine SAND	SM	A-4	107.5	13.9	103.0	14.0	18.6	15.5
C	0.9-1.5	17	25	17	8	5	37	58	Brown fine sandy CLAY with trace fine crushed stone	CL	A-4	117.9	12.8	112.2	12.8	18.6	7.5
D	0.9-1.5	19	23	17	6	2	37	61	Brown fne sandy CLAY with trace fine crushed stone	CL-ML	A-4	115.7	12.6	110.1	12.6	14.5	9.8

Grubbs, Hoskyn, Barton & Wyatt, INC.
CONSULTING ENGINEERS

P.O. Box 30970
Little Rock, Arkansas 72260-0970
#1 Trigon Place 72209
(501) 455-2536
FAX (501) 455-4137

REPORT OF STANDARD PROCTOR TEST
(AASHTO T-99 METHOD A)

Project: BB0612 - I-440 Rehabilitation
North Little Rock, Arkansas

Job No: 15-190

Material Description: Reddish brown and gray silty fine SAND with silt pockets

Location Sampled/Source:	Test Pit A, Sta 329+70, 75 ft RT
Sample Depth, ft:	0.7-1.5
Date Sampled:	1/13/2016
Date Tested:	1/20/2016
Tested By:	RSL
Report Date:	2/2/2016

LAB COMPACTION PROCEDURE: AASHTO T-99 Method: A	
Maximum Unit Dry Wt. (pcf):	108.6
Optimum Water Content (%):	13.6

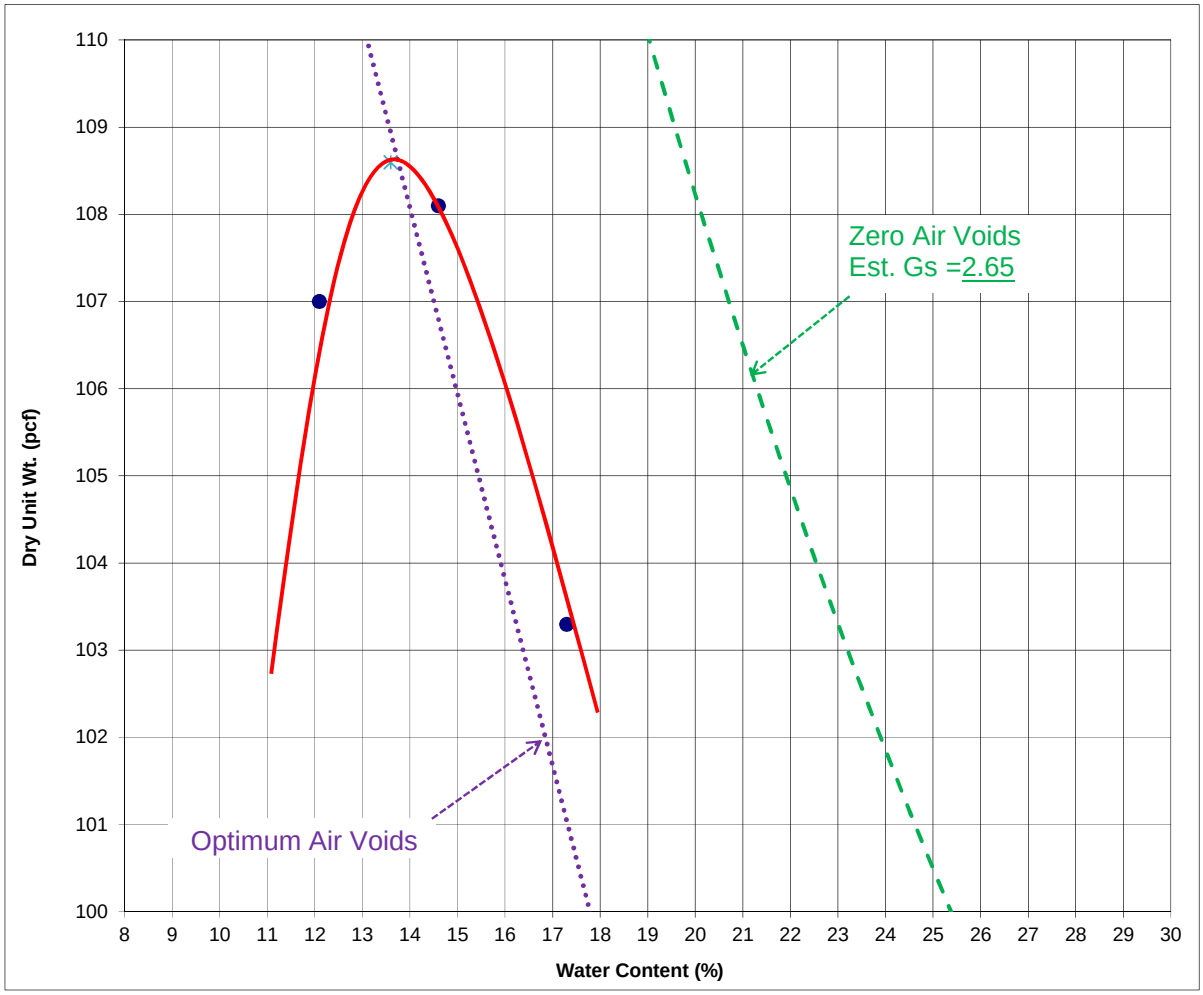
As Processed Water Content: 7.0 %

ATTERBERG LIMITS AASHTO T-89 & T-90	
Liquid Limit:	NP
Plastic Limit:	NP
Plasticity Index:	NP

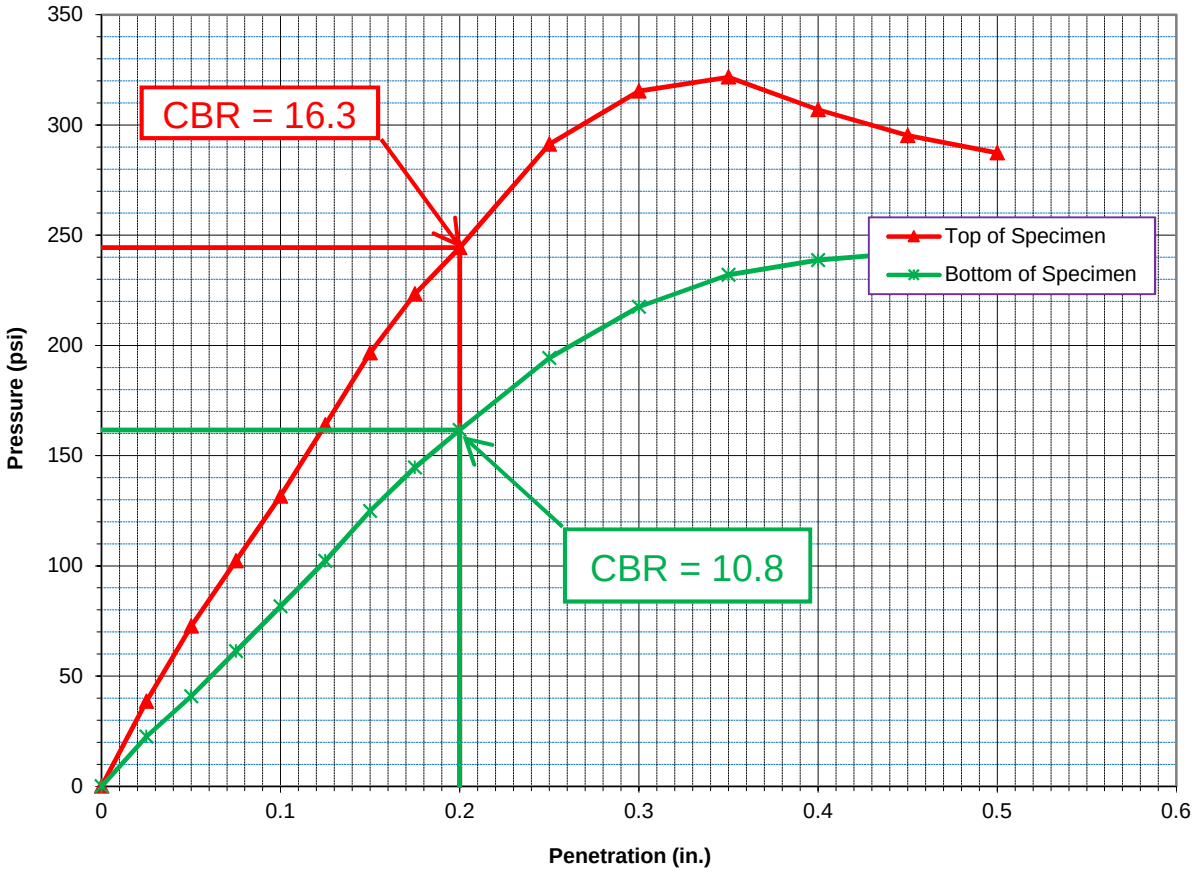
AASHTO Classification:
A-2-4

USCS Classification:
SM

GRADATION AASHTO T-88	
Sieve Number	Percent Passing
3 in.	100
2 in.	100
1 in.	100
3/4 in.	100
3/8 in.	100
#4	99
#10	98
#40	97
#200	31



Laboratory CBR Test Report
(AASHTO T-193)



Test Pit/Depth, ft	Classification		Natural Moisture Content, %	Assumed Specific Gravity	Liquid Limit, %	Plastic Limit, %	% Retained on No.4	% Passing No.200
	USCS	AASHTO						
TP-A/0.7-1.5	SM	A-2-4	7.0	2.65	NP	NP	1	31

PROCTOR TEST RESULTS (AASHTO T-99 A)	MATERIAL DESCRIPTION
Optimum Moisture Content (%)= 13.6 Maximum Dry Density (pcf) = 108.6	Reddish brown and gray silty fine SAND with silt pockets

Remarks:

As molded: Dry Unit Weight, γ_d = 104.4 pcf; Moisture Content, w = 13.6%

Grubbs, Hoskyn, Barton & Wyatt, INC.
CONSULTING ENGINEERS

Project: BB0612 - I-440 Rehabilitation
GHBW Project No.: 15-190
Location: North Little Rock, Arkansas
Sample Date: 1/13/2016
Test Date: 1/20/2016

Grubbs, Hoskyn, Barton & Wyatt, INC.
CONSULTING ENGINEERS

P.O. Box 30970
Little Rock, Arkansas 72260-0970
#1 Trigon Place 72209
(501) 455-2536
FAX (501) 455-4137

REPORT OF STANDARD PROCTOR TEST
(AASHTO T-99 METHOD A)

Project: BB0612 - I-440 Rehabilitation
North Little Rock, Arkansas

Job No: 15-190

Material Description: Brown silty fine SAND

Location Sampled/Source:	Test Pit B, Sta 436+60, 90 ft RT
Sample Depth, ft:	0.7-1.5
Date Sampled:	1/13/2016
Date Tested:	1/20/2016
Tested By:	RSL
Report Date:	2/2/2016

LAB COMPACTION PROCEDURE: AASHTO T-99 Method: A	
Maximum Unit Dry Wt. (pcf):	107.5
Optimum Water Content (%):	13.9

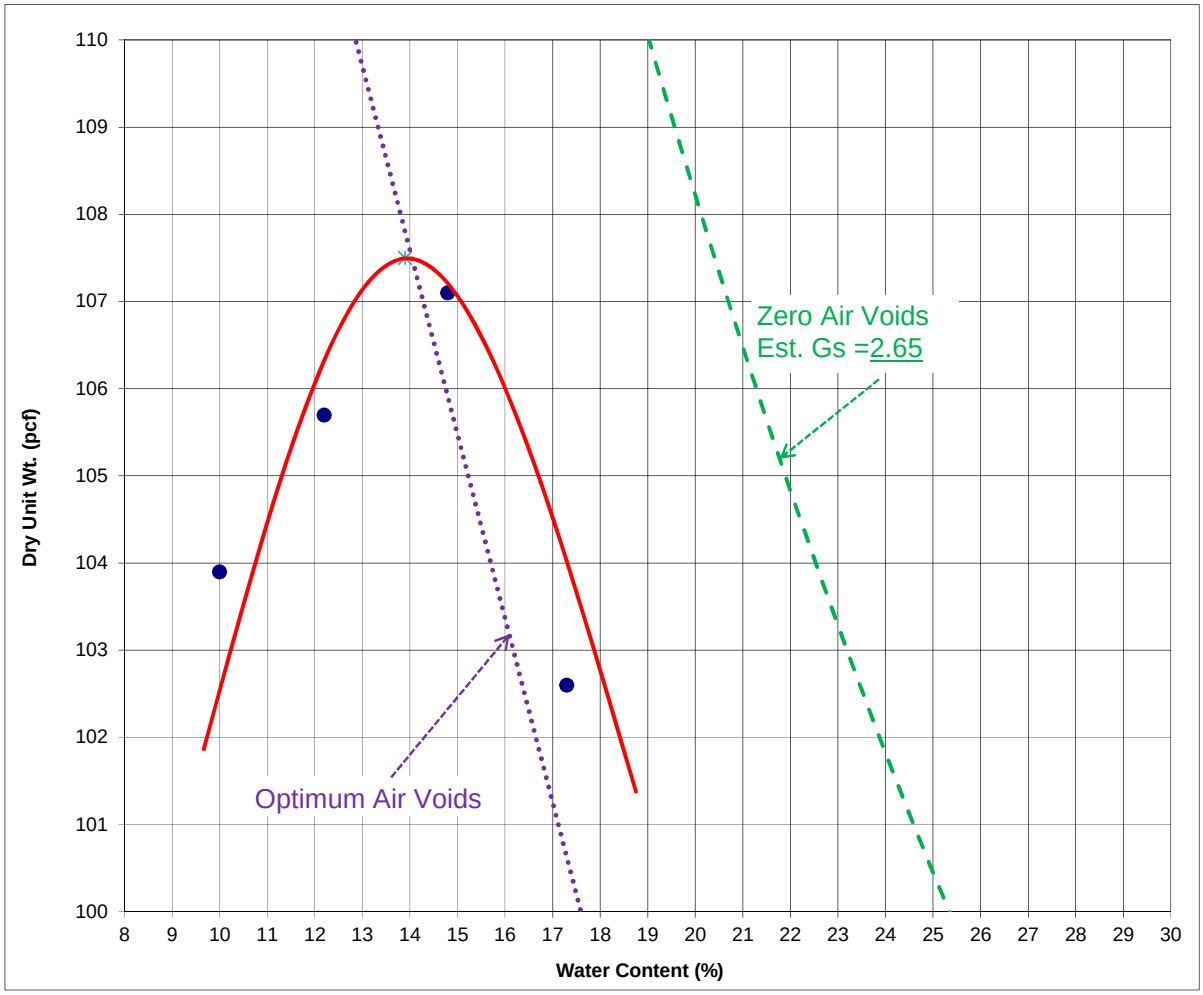
As Processed Water Content: 17.3 %

ATTERBERG LIMITS AASHTO T-89 & T-90	
Liquid Limit:	NP
Plastic Limit:	NP
Plasticity Index:	NP

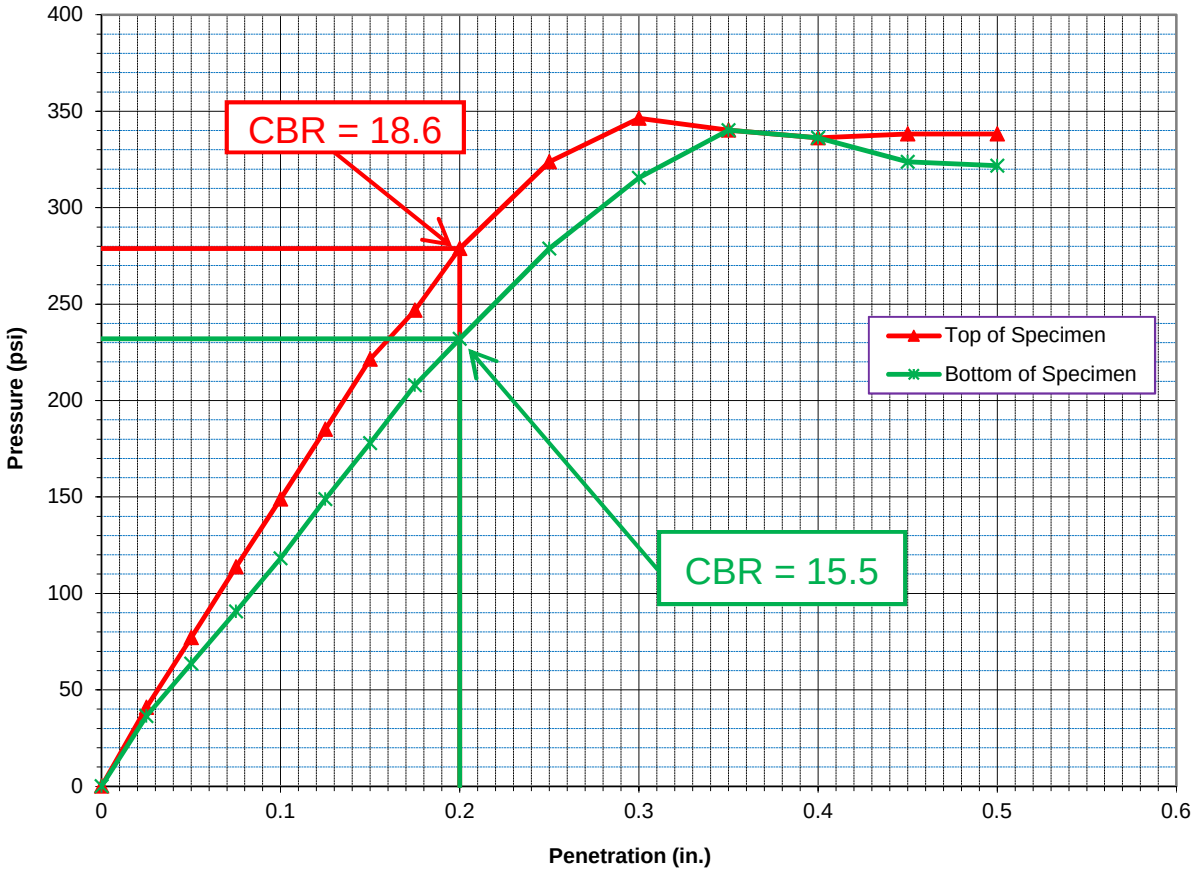
AASHTO Classification:
A-4

USCS Classification:
SM

GRADATION AASHTO T-88	
Sieve Number	Percent Passing
3 in.	100
2 in.	100
1 in.	100
3/4 in.	100
3/8 in.	100
#4	100
#10	100
#40	99
#200	49



Laboratory CBR Test Report
(AASHTO T-193)



Test Pit/Depth, ft	Classification		Natural Moisture Content, %	Assumed Specific Gravity	Liquid Limit, %	Plastic Limit, %	% Retained on No. 4	% Passing No.200
	USCS	AASHTO						
TP-B/0.7-1.5	SM	A-4	17.3	2.65	NP	NP	0	49
PROCTOR TEST RESULTS (AASHTO T-99 A)				**MATERIAL DESCRIPTION**				
Optimum Moisture Content (%)= 13.9 Maximum Dry Density (pcf) = 107.5				Brown silty fine SAND				

Remarks:

As molded: Dry Unit Weight, γ_d = 103.0 pcf; Moisture Content, w = 14.0%

Grubbs, Hoskyn, Barton & Wyatt, INC.
CONSULTING ENGINEERS

Project: BB0612 - I-440 Rehabilitation
GHBW Project No.: 15-190
Location: North Little Rock, Arkansas
Sample Date: 1/14/2016
Test Date: 1/21/2016

Grubbs, Hoskyn, Barton & Wyatt, INC.
CONSULTING ENGINEERS

P.O. Box 30970
Little Rock, Arkansas 72260-0970
#1 Trigon Place 72209
(501) 455-2536
FAX (501) 455-4137

REPORT OF STANDARD PROCTOR TEST
(AASHTO T-99 METHOD A)

Project: BB0612 - I-440 Rehabilitation
North Little Rock, Arkansas

Job No: 15-190

Material Description: Brown fine sandy CLAY with trace fine crushed stone

Location Sampled/Source:	Test Pit C, Sta 482+30, -75 ft LT
Sample Depth, ft:	0.9-1.5
Date Sampled:	1/13/2016
Date Tested:	1/16/2016
Tested By:	RSL
Report Date:	2/2/2016

LAB COMPACTION PROCEDURE: AASHTO T-99 Method: A	
Maximum Unit Dry Wt. (pcf):	117.9
Optimum Water Content (%):	12.8

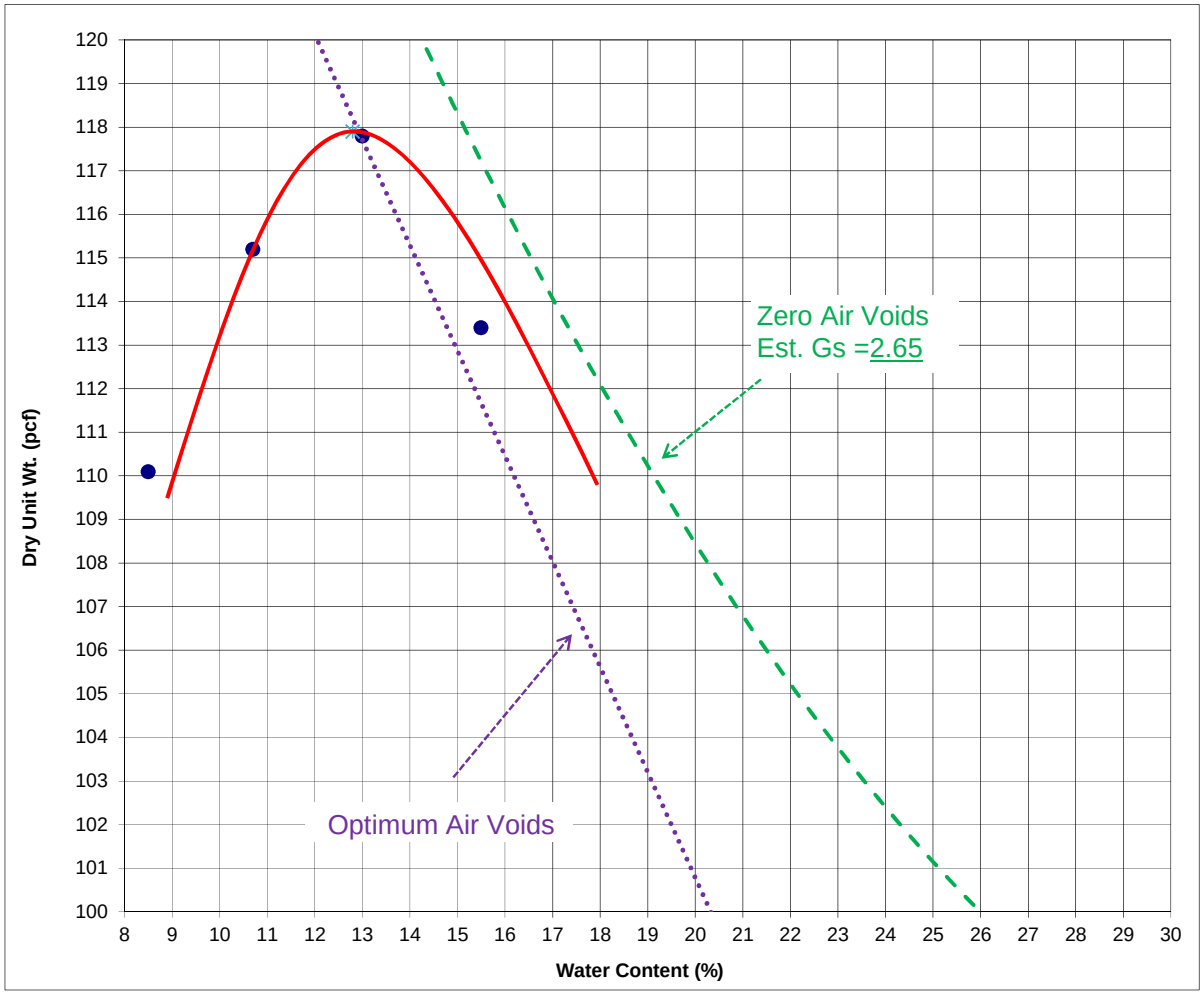
As Processed Water Content: 16.5 %

ATTERBERG LIMITS AASHTO T-89 & T-90	
Liquid Limit:	25
Plastic Limit:	17
Plasticity Index:	8

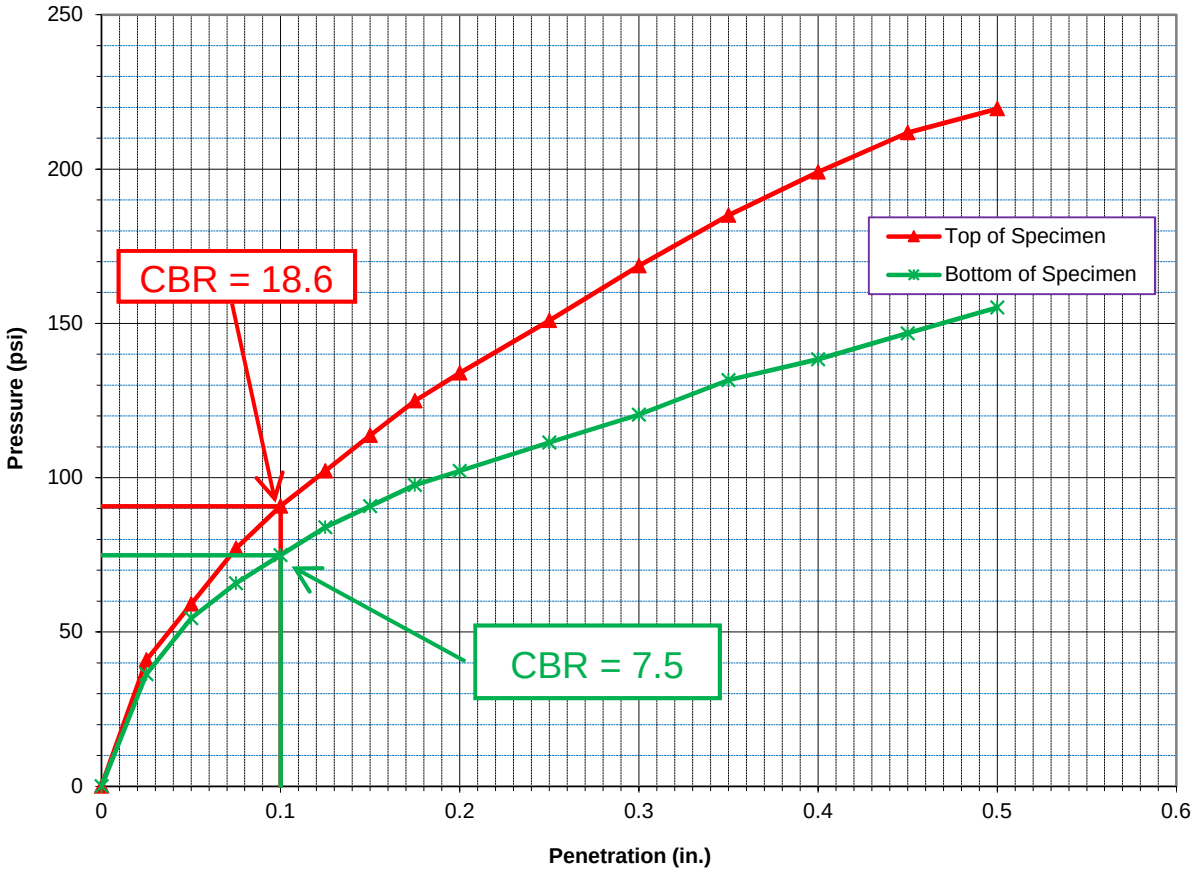
AASHTO Classification:
A-4

USCS Classification:
CL

GRADATION AASHTO T-88	
Sieve Number	Percent Passing
3 in.	100
2 in.	100
1 in.	100
3/4 in.	99
3/8 in.	97
#4	95
#10	93
#40	88
#200	58



Laboratory CBR Test Report
(AASHTO T-193)



Test Pit/Depth, ft	Classification		Natural Moisture Content, %	Assumed Specific Gravity	Liquid Limit, %	Plastic Limit, %	% Retained on No. 4	% Passing No.200
	USCS	AASHTO						
TP-C/0.9-1.5	CL	A-4	16.5	2.65	25	17	5	58

PROCTOR TEST RESULTS (AASHTO T-99 A)	MATERIAL DESCRIPTION
Optimum Moisture Content (%)= 12.8 Maximum Dry Density (pcf) = 117.9	Brown fine sandy CLAY with trace fine crushed stone

Remarks:

As molded: Dry Unit Weight, γ_d = 112.2 pcf; Moisture Content, w = 12.8%

Grubbs, Hoskyn, Barton & Wyatt, INC.
CONSULTING ENGINEERS

Project: BB0612 - I-440 Rehabilitation
GHBW Project No.: 15-190
Location: North Little Rock, Arkansas
Sample Date: 1/14/2016
Test Date: 1/21/2016

Grubbs, Hoskyn, Barton & Wyatt, INC.
CONSULTING ENGINEERS

P.O. Box 30970
Little Rock, Arkansas 72260-0970
#1 Trigon Place 72209
(501) 455-2536
FAX (501) 455-4137

REPORT OF STANDARD PROCTOR TEST
(AASHTO T-99 METHOD A)

Project: BB0612 - I-440 Rehabilitation
North Little Rock, Arkansas

Job No: 15-190

Material Description: Brown fine sandy CLAY, silty with trace fine crushed stone

Location Sampled/Source:	Test Pit D, Sta 402+70, 70 ft LT
Sample Depth, ft:	0.9-1.5
Date Sampled:	1/13/2016
Date Tested:	1/16/2016
Tested By:	RSL
Report Date:	2/2/2016

LAB COMPACTION PROCEDURE: AASHTO T-99 Method: A	
Maximum Unit Dry Wt. (pcf):	115.7
Optimum Water Content (%):	12.6

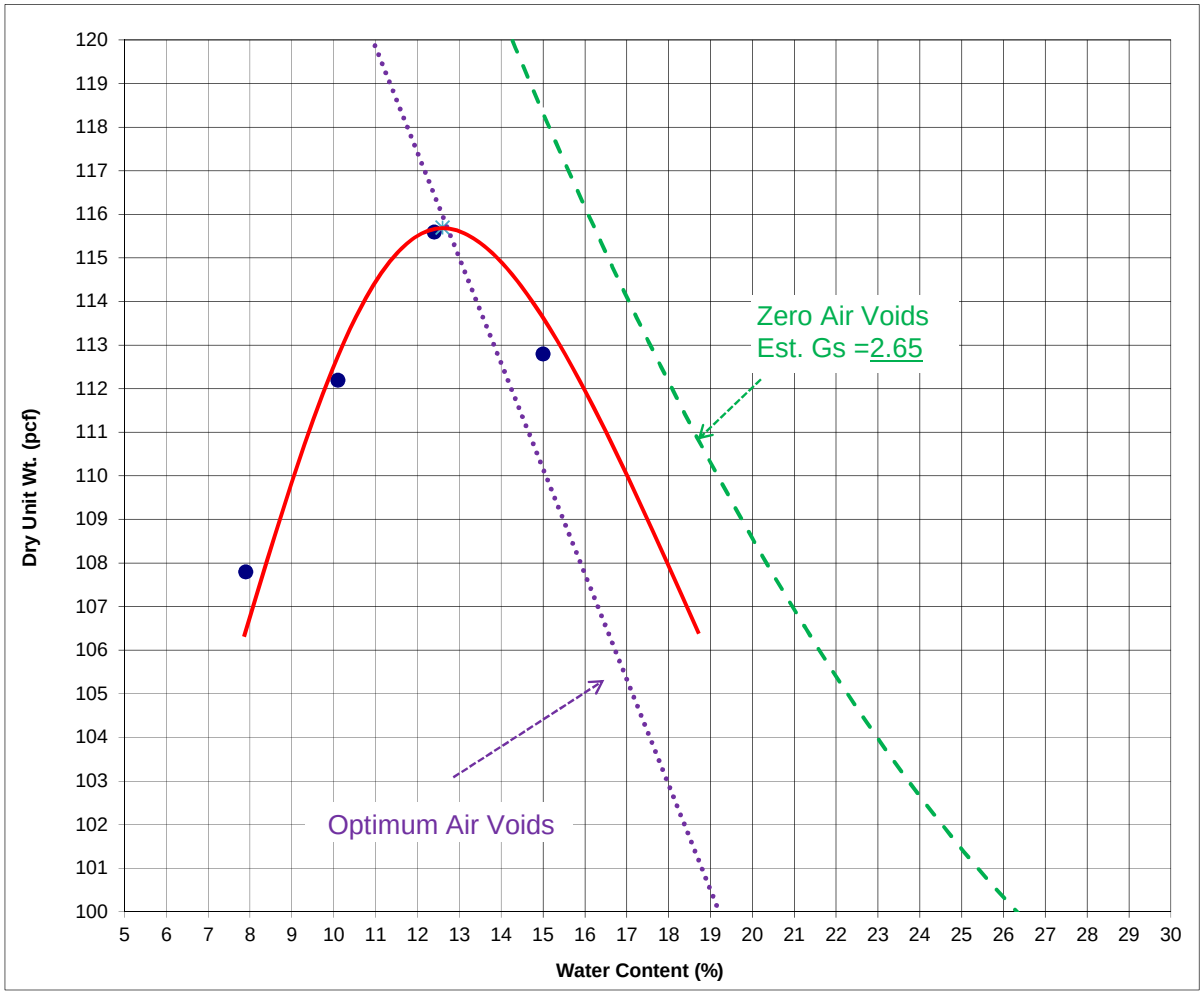
As Processed Water Content: 19.3 %

ATTERBERG LIMITS AASHTO T-89 & T-90	
Liquid Limit:	23
Plastic Limit:	17
Plasticity Index:	6

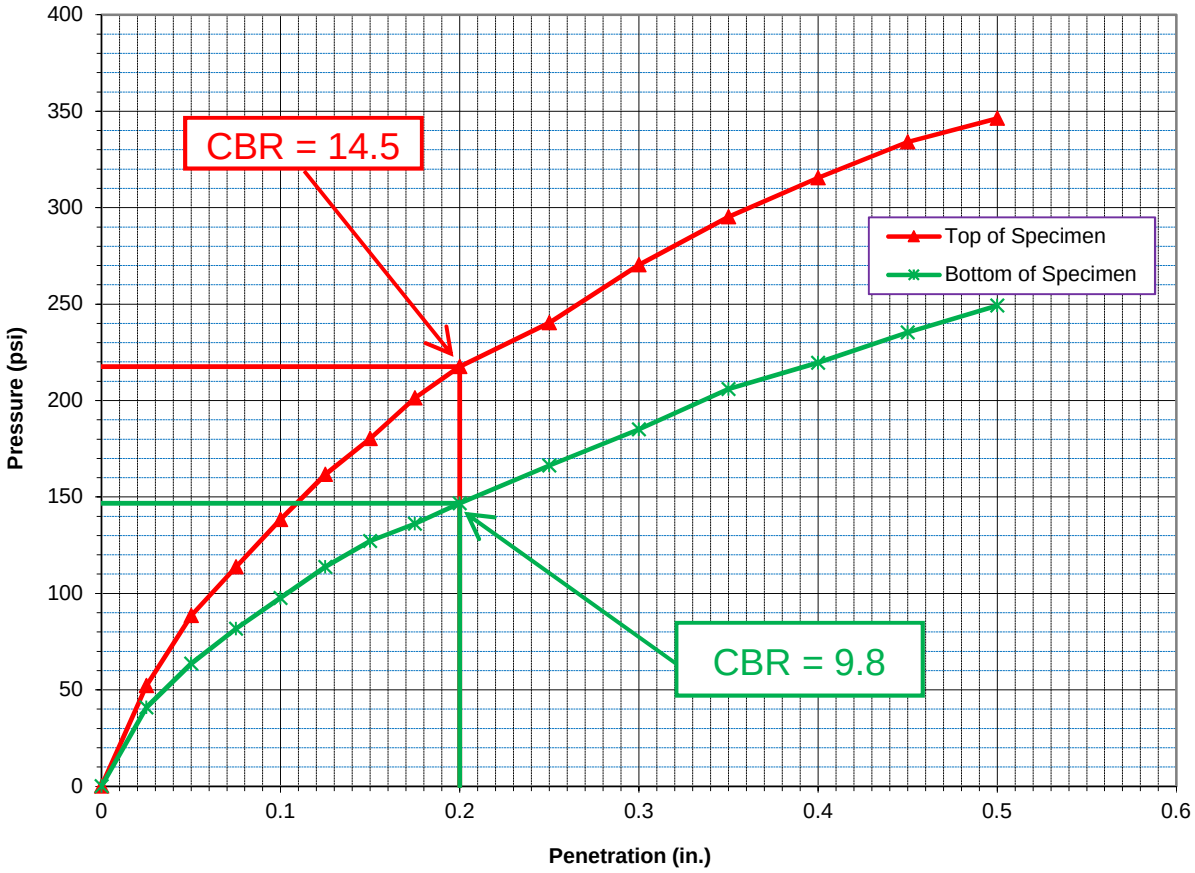
AASHTO Classification:
A-4

USCS Classification:
CL-ML

GRADATION AASHTO T-88	
Sieve Number	Percent Passing
3 in.	100
2 in.	100
1 in.	100
3/4 in.	99
3/8 in.	99
#4	98
#10	98
#40	97
#200	61



Laboratory CBR Test Report
(AASHTO T-193)



Test Pit/Depth, ft	Classification		Natural Moisture Content, %	Assumed Specific Gravity	Liquid Limit, %	Plastic Limit, %	% Retained on No. 4	% Passing No.200
	USCS	AASHTO						
TP-D/0.9-1.5	CL-ML	A-4	19.3	2.65	23	17	2	61

PROCTOR TEST RESULTS (AASHTO T-99 A)	MATERIAL DESCRIPTION
Optimum Moisture Content (%)= 12.6 Maximum Dry Density (pcf) = 115.7	Brown fine sandy CLAY, silty with trace fine crushed stone

Remarks:

As molded: Dry Unit Weight, γ_d = 110.1 pcf; Moisture Content, w = 12.6%

Grubbs, Hoskyn, Barton & Wyatt, INC.
CONSULTING ENGINEERS

Project: BB0612 - I-440 Rehabilitation
GHBW Project No.: 15-190
Location: North Little Rock, Arkansas
Sample Date: 1/14/2016
Test Date: 1/21/2016