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REFERENCE: R-1015

PROJECT: 34360

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-1015	1	54

STRUCTURE
SUBSURFACE INVESTIGATION

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COUNTY CRAVEN

PROJECT DESCRIPTION US 70 (HAVELOCK BYPASS)
 FROM NORTH OF PINE GROVE TO NORTH OF
 CARTERET COUNTY LINE

SITE DESCRIPTION DUAL BRIDGES ON US 70
 BYPASS OVER SOUTHWEST PRONG OF SLOCUM
 CREEK AT -L- STA. 287 + 62.5

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE CONTRACTOR AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL
 LAW ENGINEERING

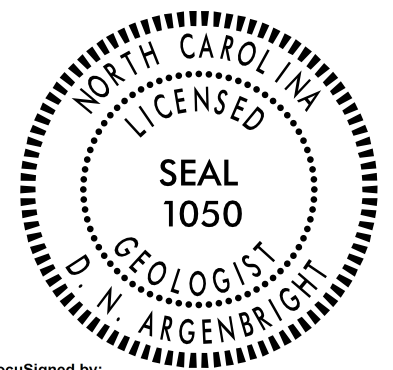
INVESTIGATED BY J.K. CRENSHAW

DRAWN BY C.P. TURNER

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE MARCH 2015



DocuSigned by:
 Dean N. Argenbright 10/24/2016

F83EDC63E4B74F8 SIGNATURE DATE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. It contains detailed technical specifications, legends for soil and rock types, symbols for various geotechnical features, and definitions for key terms used in the field.

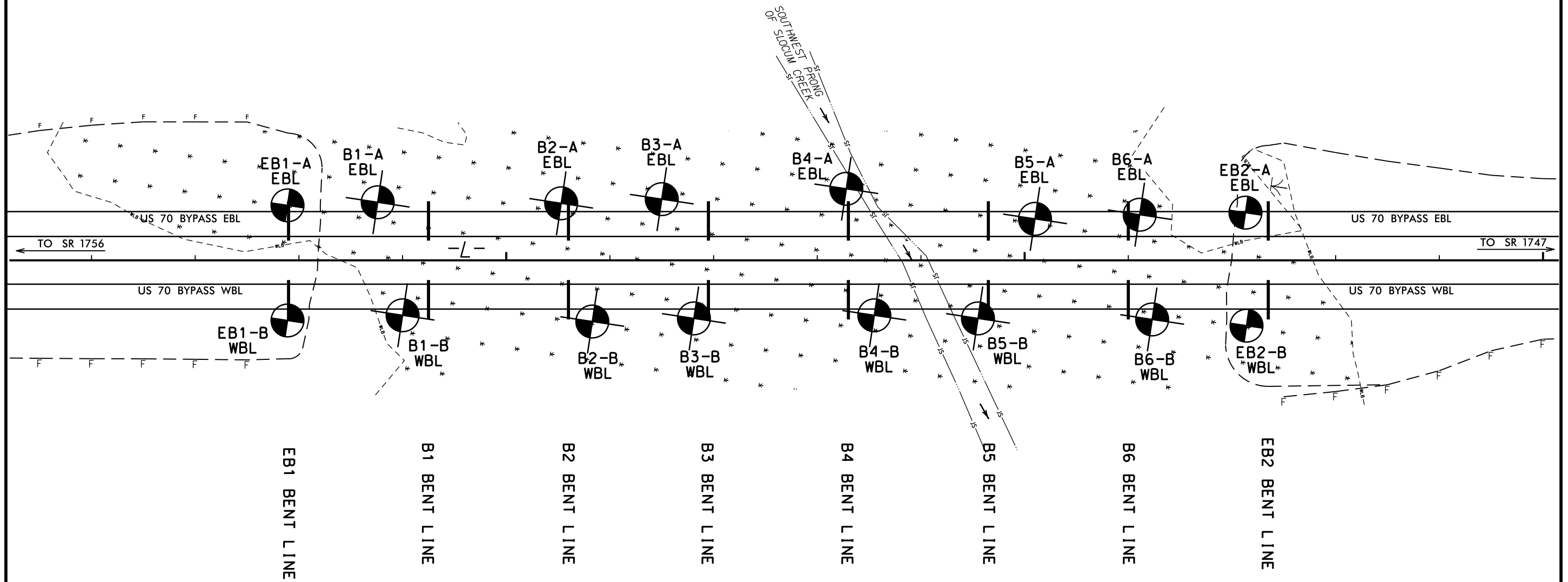


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285

290

295

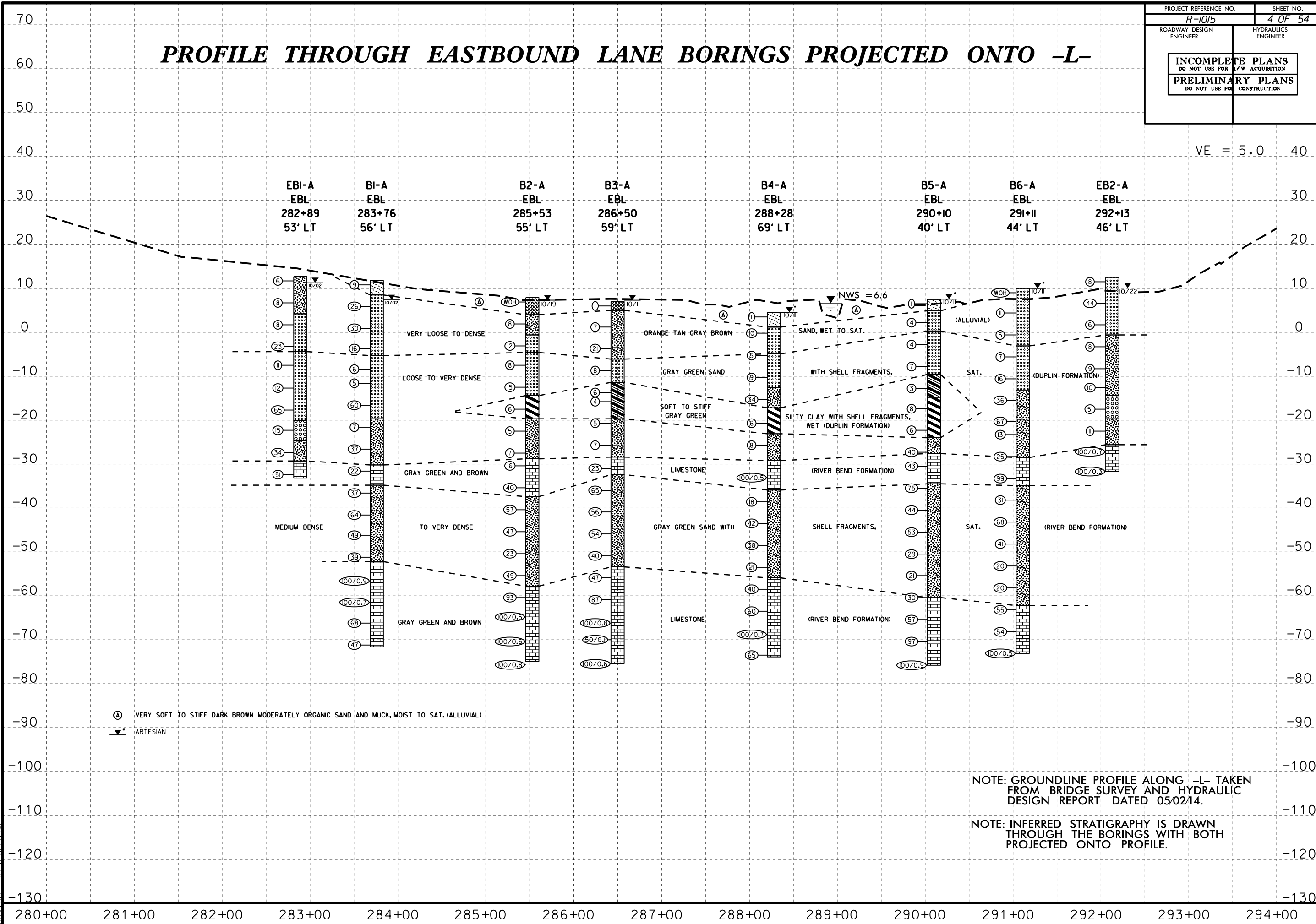


5/14/99

PROJECT REFERENCE NO. R-1015	SHEET NO. 4 OF 54
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PROFILE THROUGH EASTBOUND LANE BORINGS PROJECTED ONTO -L-

VE = 5.0 40



(A) VERY SOFT TO STIFF DARK BROWN MODERATELY ORGANIC SAND AND MUCK, MOIST TO SAT. (ALLUVIAL)

▽ ARTESIAN

NOTE: GROUNDLINE PROFILE ALONG -L- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED 05/02/14.

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

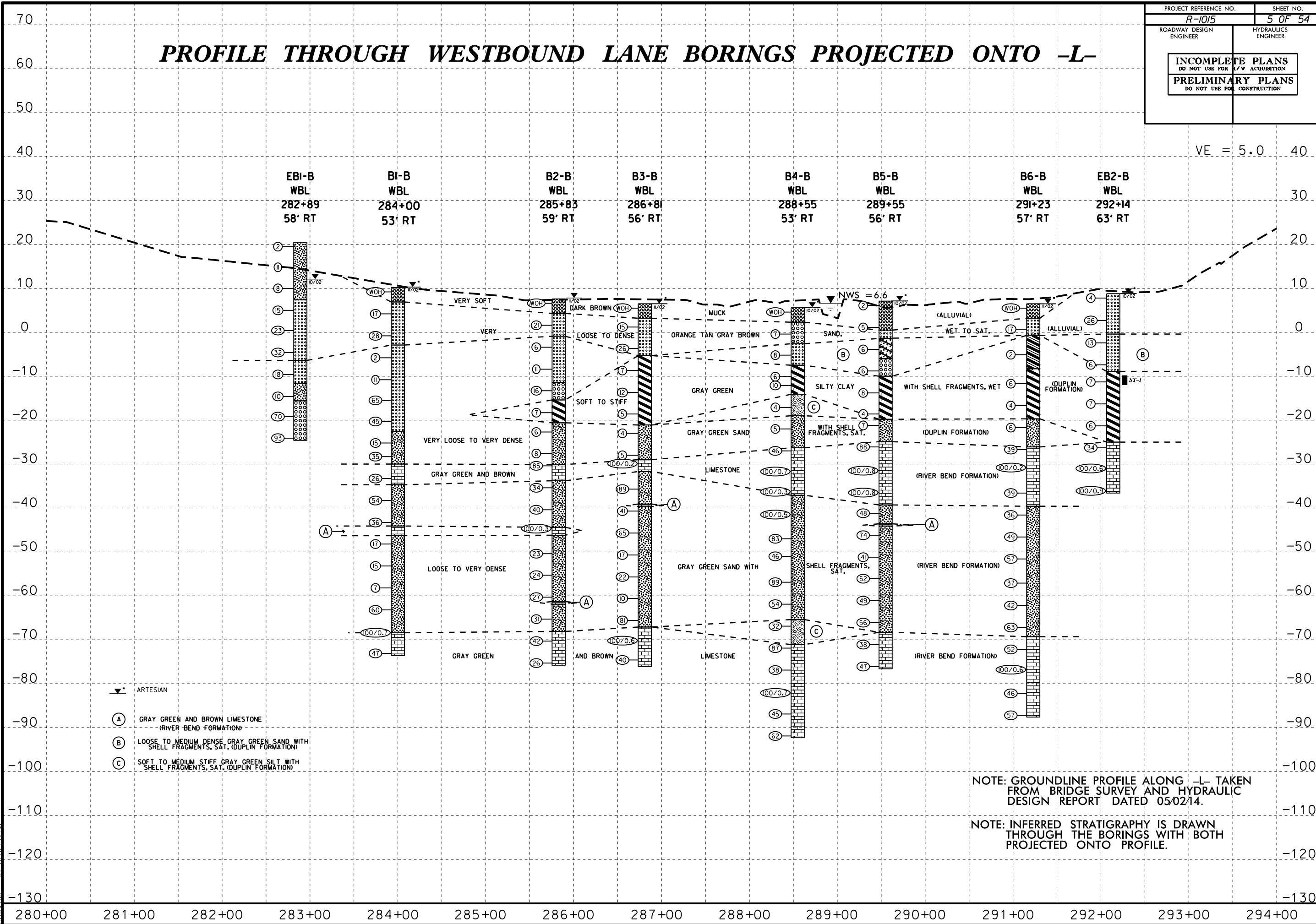
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5/14/99

PROJECT REFERENCE NO. <i>R-1015</i>	SHEET NO. <i>5 OF 54</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PROFILE THROUGH WESTBOUND LANE BORINGS PROJECTED ONTO -L-

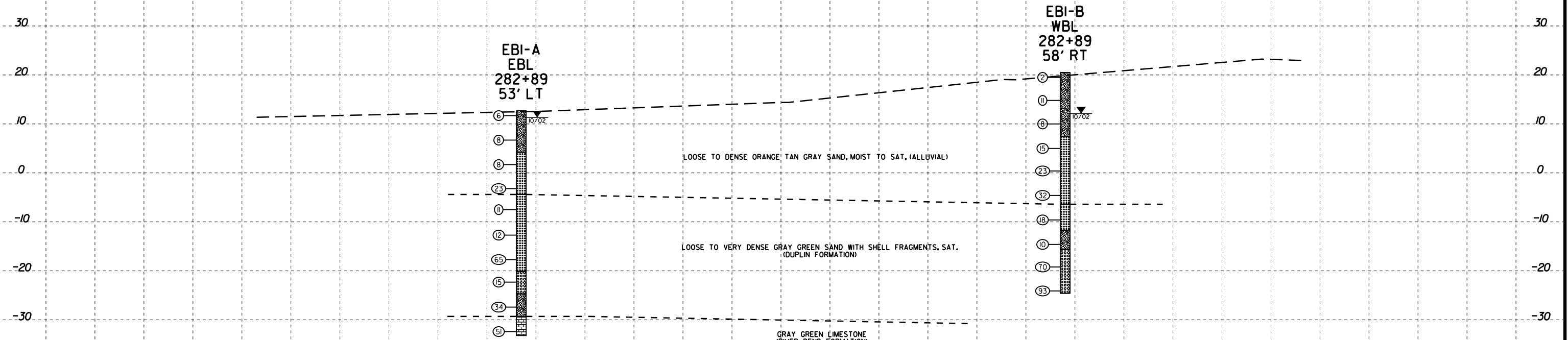
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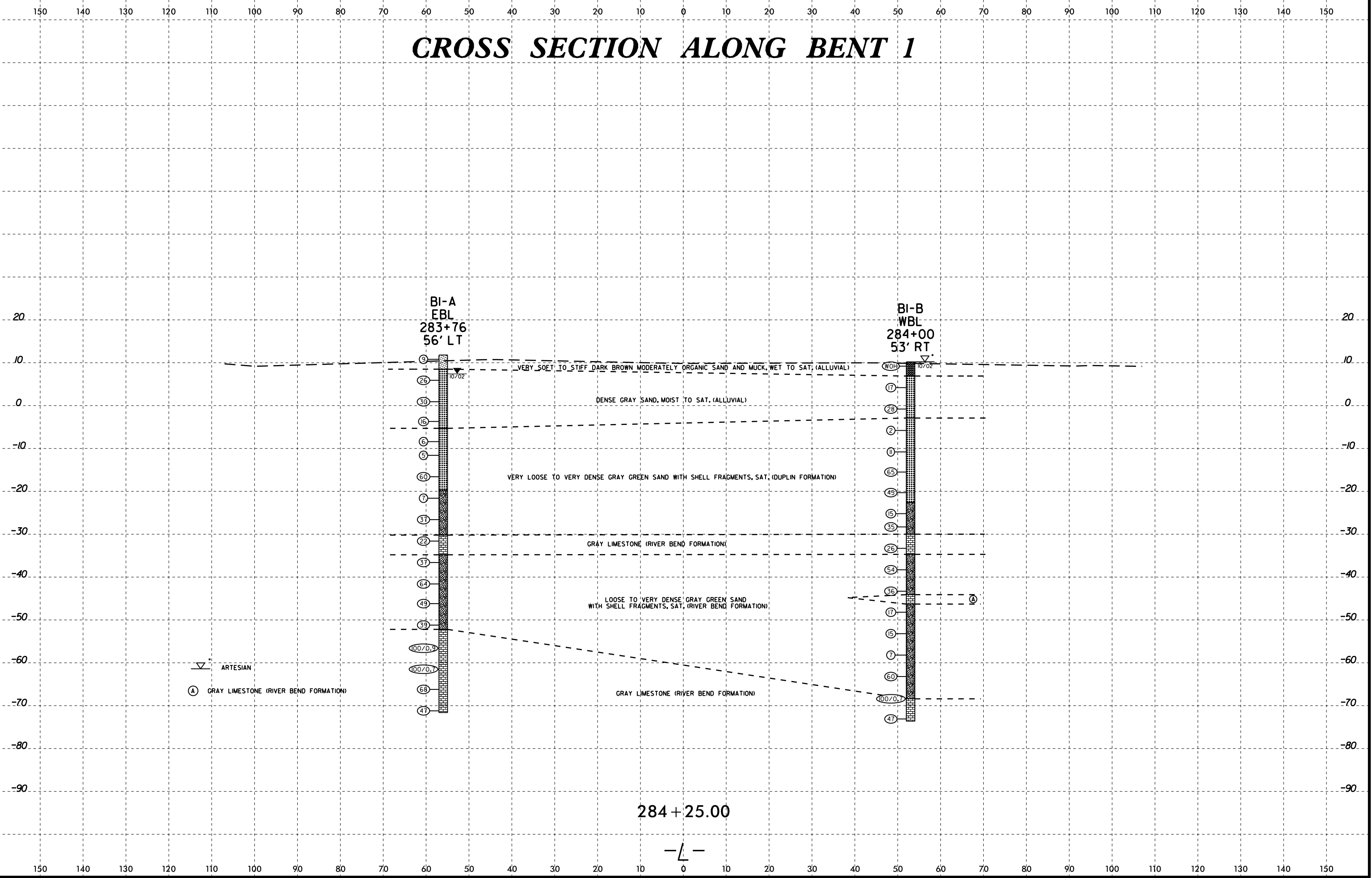
282 + 90.00

-L-

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G. Turner

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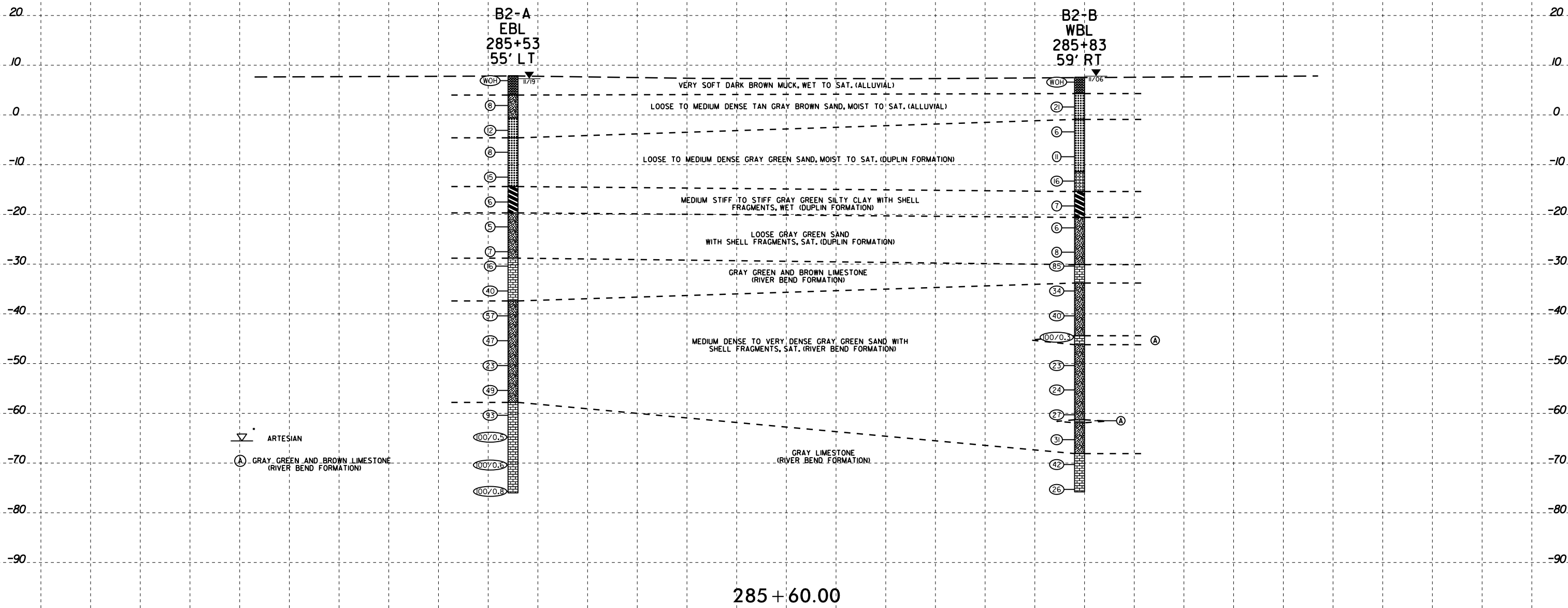


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G. Turner

8/23/99

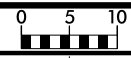
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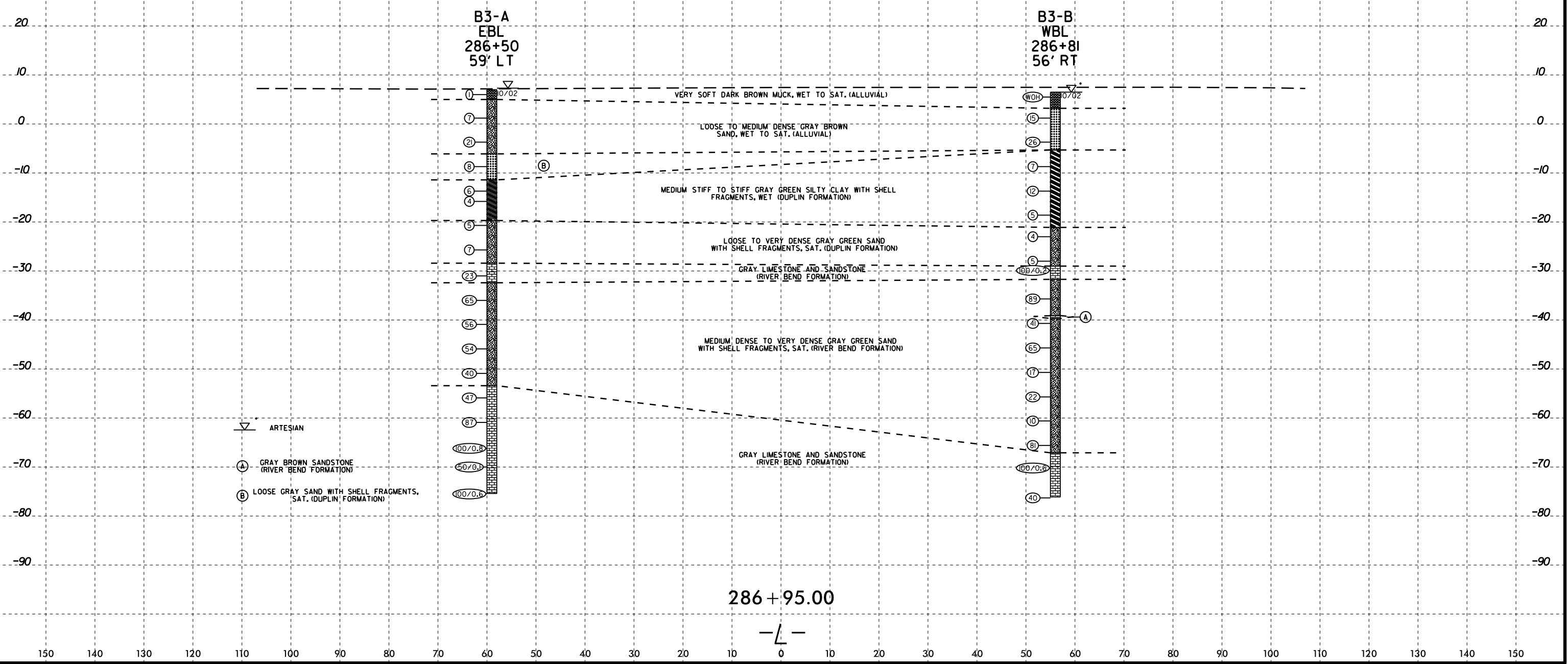
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 Atty: DE
 G. Turner

8/23/99



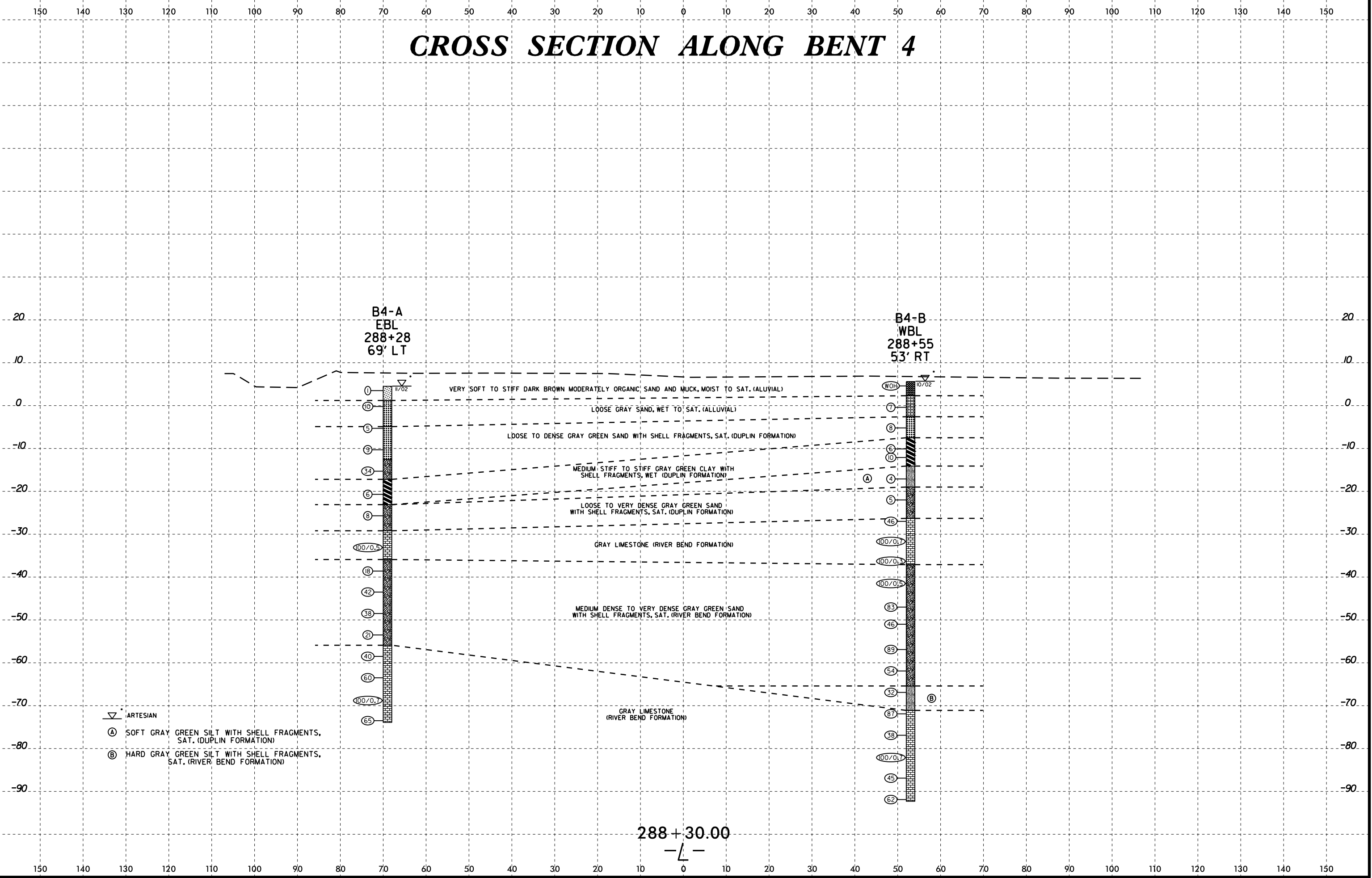
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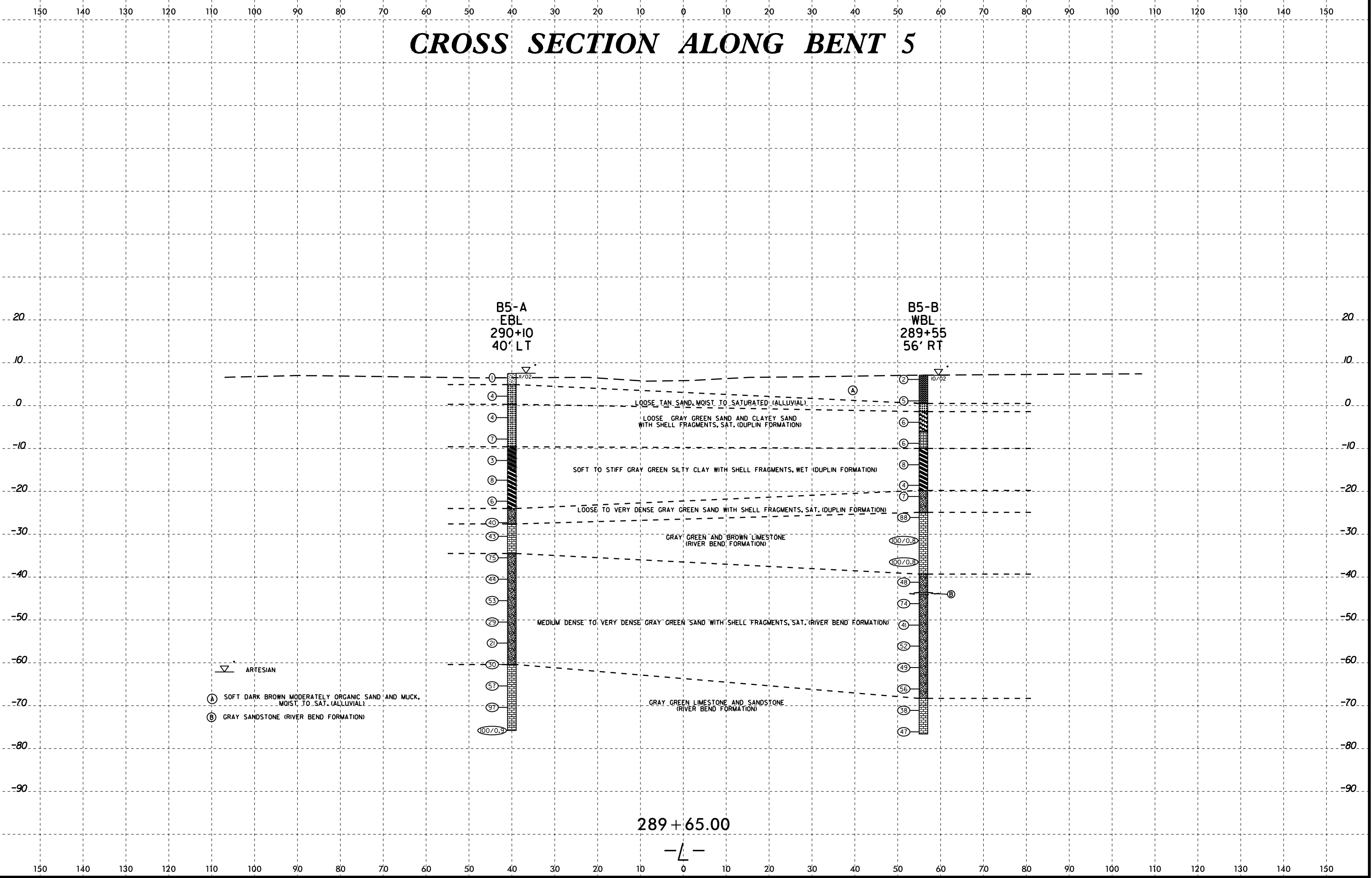
CROSS SECTION ALONG BENT 4



- ▽ ARTESIAN
- (A) SOFT GRAY GREEN SILT WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
- (B) HARD GRAY GREEN SILT WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)

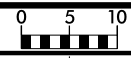
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-L-

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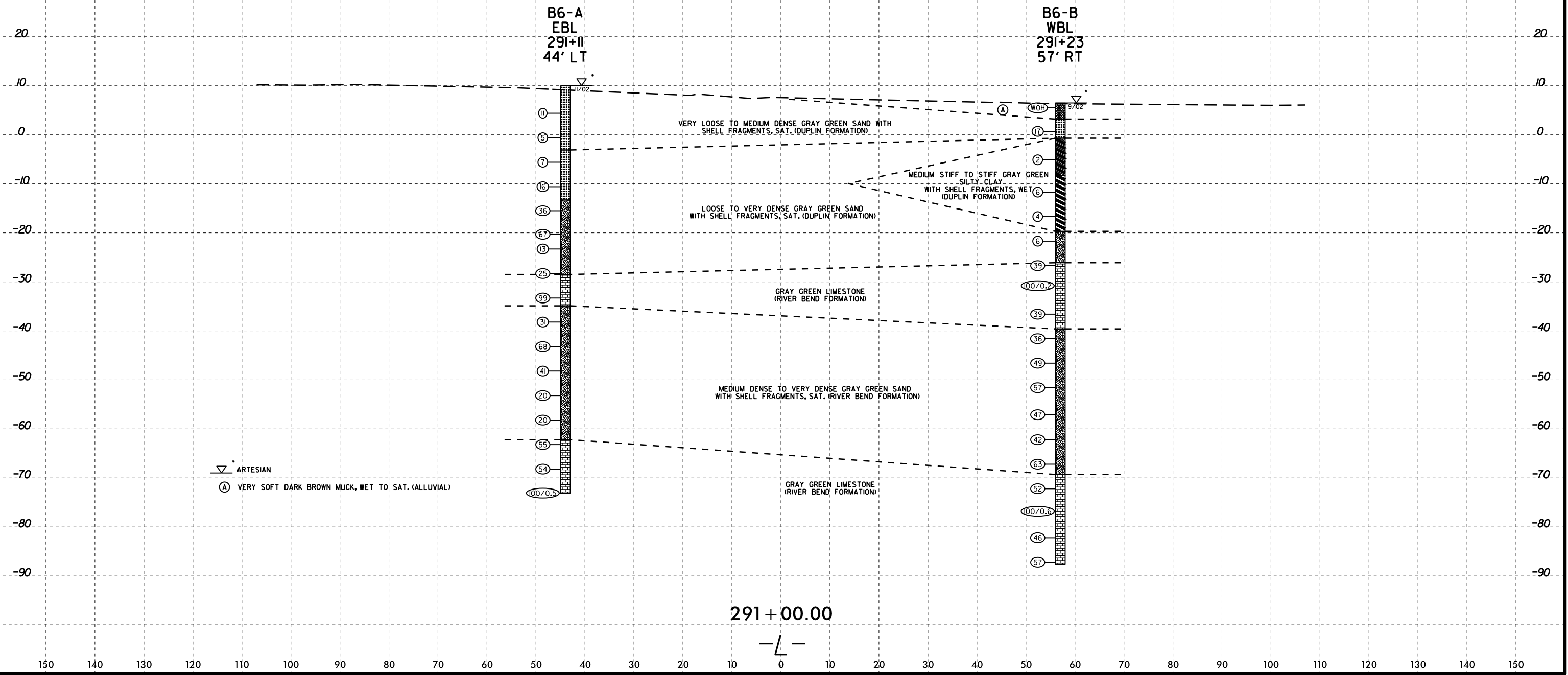
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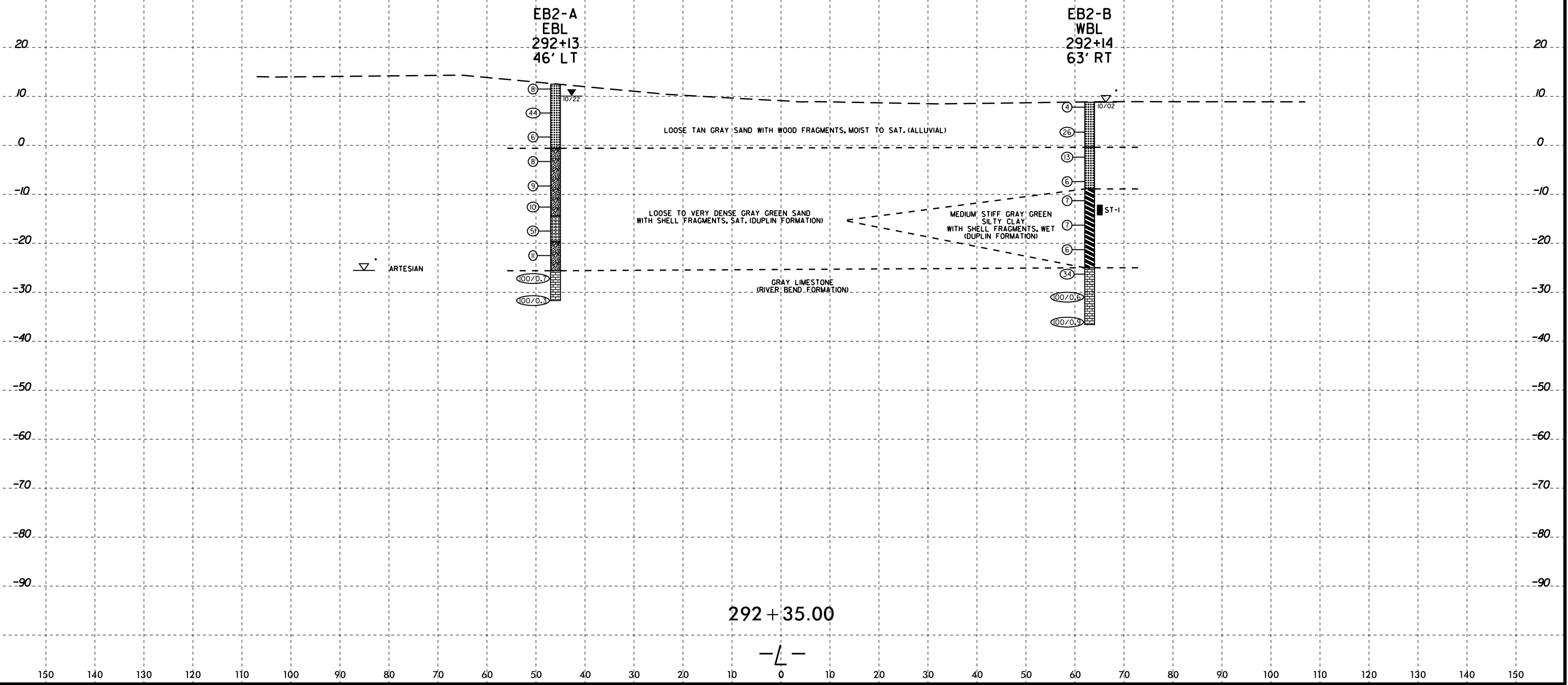
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CROSS SECTION ALONG END BENT 2



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At: UEG7730
G. Turner



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear										
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)									
BORING NO. EB1-A EBL		STATION 282+89		OFFSET 53 ft LT		ALIGNMENT -L-	0 HR. N/A									
COLLAR ELEV. 12.7 ft		TOTAL DEPTH 45.9 ft		NORTHING 416,611		EASTING 2,617,431	24 HR. 1.4									
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD Mud Rotary		HAMMER TYPE Manual										
DRILLER Contract Driller		START DATE 10/09/02		COMP. DATE 10/09/02		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
15	12.7	0.0	2	2	4									12.7	0.0	GROUND SURFACE
10	7.7	5.0	5	3	5											ALLUVIAL DARK GRAY SAND, WET TO SAT.
5	2.7	10.0	3	3	5									4.2	8.5	
0	-2.2	14.9	7	11	12						SS-46					
-5	-6.5	19.2	6	5	6									-4.4	17.1	COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-10	-11.7	24.4	4	4	8											
-15	-16.7	29.4	19	28	37											
-20	-21.3	34.0	10	8	7						SS-48			-20.1	32.8	
-25	-26.4	39.1	17	19	15									-24.7	37.4	
-30	-31.4	44.1	14	21	30						SS-49			-29.3	42.0	COASTAL PLAIN GREEN LIMESTONE (RIVER BEND FORMATION)
														-33.2	45.9	Boring Terminated at Elevation -33.2 ft in Limestone

NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. EB1-B WBL	STATION 282+89	OFFSET 58 ft RT	ALIGNMENT -L-
COLLAR ELEV. 20.5 ft	TOTAL DEPTH 45.1 ft	NORTHING 416,627	EASTING 2,617,542
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD Mud Rotary	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 10/09/02	COMP. DATE 10/09/02	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
25															
20	20.5	0.0	1	1	1								GROUND SURFACE	0.0	
15	15.8	4.7	5	5	6								ALLUVIAL TAN ORANGE SAND WITH WOOD FRAGMENTS, MOIST TO SAT.		
10	11.0	9.5	6	5	3										
5	6.0	14.5	6	5	10										
0	1.4	19.1	11	12	11										
-5	-3.6	24.1	14	14	18										
-10	-8.6	29.1	8	9	9								COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)		
-15	-13.6	34.1	5	3	7										
-20	-18.2	38.7	28	35	35										
	-23.1	43.6	27	46	47										
														Boring Terminated at Elevation -24.6 ft in Very Dense Sand	45.1

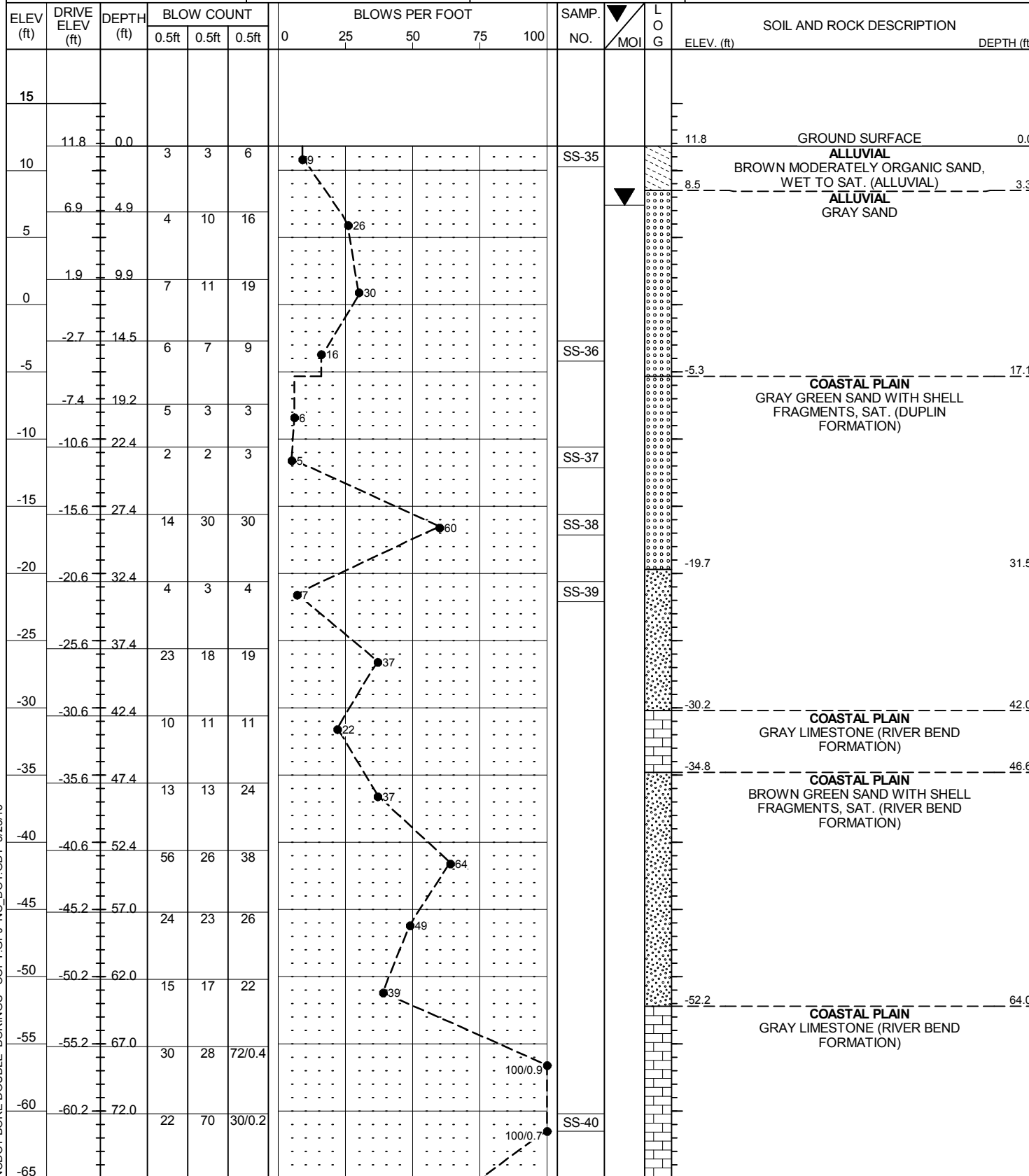
NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15



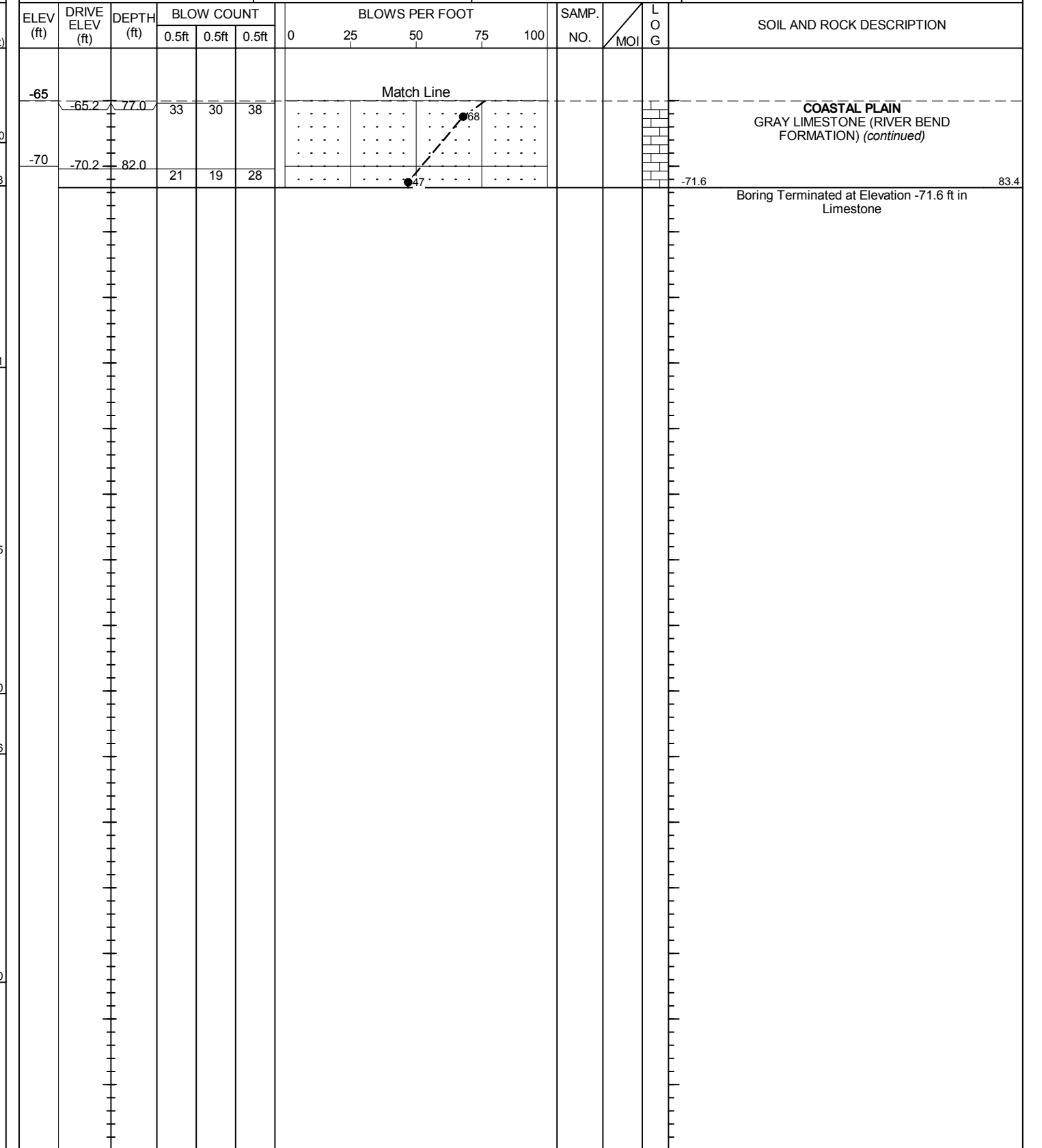
NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B1-A EBL	STATION 283+76	OFFSET 56 ft LT	ALIGNMENT -L-
COLLAR ELEV. 11.8 ft	TOTAL DEPTH 83.4 ft	NORTHING 416,698	EASTING 2,617,416
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 10/10/02	COMP. DATE 10/10/02	SURFACE WATER DEPTH N/A



WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B1-A EBL	STATION 283+76	OFFSET 56 ft LT	ALIGNMENT -L-
COLLAR ELEV. 11.8 ft	TOTAL DEPTH 83.4 ft	NORTHING 416,698	EASTING 2,617,416
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 10/10/02	COMP. DATE 10/10/02	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear							
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)						
BORING NO. B1-A EBL		STATION 283+76		OFFSET 56 ft LT		ALIGNMENT -L-							
COLLAR ELEV. 11.8 ft		TOTAL DEPTH 83.4 ft		NORTHING 416,698		EASTING 2,617,416							
DRILL RIG/HAMMER EFF./DATE CME-45			DRILL METHOD NW Casing W/SPT & Core			HAMMER TYPE Manual							
DRILLER Contract Driller		START DATE 10/10/02		COMP. DATE 10/10/02		SURFACE WATER DEPTH N/A							
CORE SIZE HQ		TOTAL RUN 43.9 ft											
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	RQD (ft) %	LOG	DESCRIPTION AND REMARKS	ELEV. (ft)	DEPTH (ft)
-8.9											Begin Coring @ 20.7 ft		
-10	-8.9	20.7	1.8	0:20/1.0	(0.0)						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION) (continued)		
-10	-10.7	22.5		0:15/0.8	0%		SS-37						
-10	-12.1	23.9		N=5									
-15	-15.6	27.4	3.5	0:20/1.0	(0.0)								
-15	-17.1	28.9		0:17/1.0	0%								
-15	-17.1	28.9		0:18/1.0	0%								
-15	-17.1	28.9		0:10/0.6			SS-38						
-15	-17.1	28.9		N=60									
-20	-20.6	32.4	3.5	0:25/1.0	(0.0)						-19.7	31.5	
-20	-22.1	33.9		0:23/1.0	0%								
-20	-22.1	33.9		0:25/1.0	0%		SS-39						
-20	-22.1	33.9		N=7									
-25	-25.6	37.4	3.5	0:25/1.0	(0.0)								
-25	-27.1	38.9		0:23/1.0	0%								
-25	-27.1	38.9		0:27/1.0	0%								
-25	-27.1	38.9		0:17/0.6									
-25	-27.1	38.9		N=37									
-30	-30.6	42.4	3.5	0:20/1.0	(0.0)						-30.2	42.0	
-30	-32.1	43.9		0:23/1.0	0%								
-30	-32.1	43.9		0:21/1.0	0%								
-30	-32.1	43.9		0:17/0.6									
-30	-32.1	43.9		N=22									
-35	-35.6	47.4	3.5	0:42/1.0	(0.0)						-34.8	46.6	
-35	-37.1	48.9		0:41/1.0	0%								
-35	-37.1	48.9		0:31/1.0	0%								
-35	-37.1	48.9		0:15/0.6									
-35	-37.1	48.9		N=37									
-40	-40.6	52.4	3.5	0:28/1.0	(0.0)								
-40	-42.0	53.8		0:23/1.0	0%								
-40	-42.0	53.8		0:25/1.0	0%								
-40	-42.0	53.8		0:12/0.6									
-40	-42.0	53.8		N=64									
-45	-45.2	57.0	3.2	1:53/1.0	(0.0)								
-45	-46.7	58.5		0:34/1.0	0%								
-45	-46.7	58.5		0:30/1.0	0%								
-45	-46.7	58.5		0:17/0.2									
-45	-46.7	58.5		N=49									
-50	-50.2	62.0	3.5	0:31/1.0	(0.0)								
-50	-51.7	63.5		0:32/1.0	0%								
-50	-51.7	63.5		0:28/1.0	0%								
-50	-51.7	63.5		0:11/0.6									
-50	-51.7	63.5		N=39									
-55	-55.2	67.0	3.5	1:37/1.0	(1.6)	46%					-52.2	64.0	
-55	-56.6	68.4		1:17/1.0	46%								
-55	-56.6	68.4		1:40/1.0									
-55	-56.6	68.4		0:42/0.6									
-55	-56.6	68.4		N=100/0.9									
-60	-60.2	72.0	3.6	1:29/1.0	(0.9)	25%							
-60	-61.3	73.1		1:15/1.0	25%								
-60	-61.3	73.1		0:31/1.0									
-60	-61.3	73.1		0:15/0.7									
-60	-61.3	73.1		N=100/0.7									
-65	-65.1	76.9	3.8	2:15/1.0	(2.9)	76%							
-65	-66.6	78.4		2:40/1.0	76%								
-65	-66.6	78.4		2:19/1.0									
-65	-66.6	78.4		2:45/0.9									
-65	-66.6	78.4		N=68									
-70	-70.1	81.9	3.5	2:37/1.0	(2.5)	71%							
-70	-70.1	81.9		2:52/1.0	71%								
-70	-70.1	81.9		1:43/1.0									
-70	-70.1	81.9		2:21/0.6									
-70	-70.1	81.9		N=47									
											-71.6	83.4	
											Boring Terminated at Elevation -71.6 ft in Limestone		

NCDOT CORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				GROUND WTR (ft)
BORING NO. B1-B WBL	STATION 284+00	OFFSET 53 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 10.2 ft	TOTAL DEPTH 83.8 ft	NORTHING 416,736	EASTING 2,617,520	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 11/13/02	COMP. DATE 11/14/02	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
15														10.2	GROUND SURFACE	0.0
10	10.2	0.0	WOH	WOH	WOH									6.9	ALLUVIAL DARK BROWN MUCK, MOIST TO SAT.	3.3
5	5.2	5.0	5	8	9										ALLUVIAL LIGHT GRAY SAND, SAT.	
0	0.2	10.0	10	14	14											
-5	-4.8	15.0	1	1	1										COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	13.1
-10	-9.8	20.0	4	4	7											
-15	-14.5	24.7	16	29	36											
-20	-19.3	29.5	17	23	22											
-25	-24.2	34.4	6	8	7											
-30	-27.3	37.5	14	16	19										COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	40.2
-35	-32.3	42.5	13	15	11											
-40	-37.3	47.5	13	20	34										COASTAL PLAIN GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	44.9
-45	-42.3	52.5	22	19	17											
-50	-47.2	57.4	4	9	8										COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	54.3
-55	-52.2	62.4	4	6	9											
-60	-57.2	67.4	12	3	4										COASTAL PLAIN GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	56.5
-65	-62.2	72.4	9	26	34											

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				GROUND WTR (ft)
BORING NO. B1-B WBL	STATION 284+00	OFFSET 53 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 10.2 ft	TOTAL DEPTH 83.8 ft	NORTHING 416,736	EASTING 2,617,520	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 11/13/02	COMP. DATE 11/14/02	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-65																
-70	-67.2	77.4	23	45	55/0.2										COASTAL PLAIN GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	78.6
	-72.1	82.3	36	18	29										COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	83.8

Match Line

Boring Terminated at Elevation -73.6 ft in Limestone
 ARTESIAN HEAD ELEVATION = 10.6



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear									
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)								
BORING NO.	B1-B WBL	STATION	284+00	OFFSET	53 ft RT	ALIGNMENT	-L-	0 HR.	N/A						
COLLAR ELEV.	10.2 ft	TOTAL DEPTH	83.8 ft	NORTHING	416,736	EASTING	2,617,520	24 HR.	FIAD						
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD		NW Casing W/SPT & Core	HAMMER TYPE			Manual					
DRILLER		Contract Driller		START DATE		11/13/02		COMP. DATE		11/14/02		SURFACE WATER DEPTH		N/A	
CORE SIZE			HQ			TOTAL RUN			33.3 ft						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	RQD (ft) %	LOG	DESCRIPTION AND REMARKS	ELEV. (ft)	DEPTH (ft)		
-25.7	-25.7	35.9	1.6	0:35/1.0	(0.0)						Begin Coring @ 35.9 ft				
	-27.3	37.5		0:13/0.6	0%						GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION) (continued)				
	-28.8	39.0		N=35								-30.0	40.2		
			3.5	0:21/1.0	(0.5)						COASTAL PLAIN				
				1:55/1.0	14%						GRAY LIMESTONE (RIVER BEND FORMATION)				
	-32.3	42.5		1:11/1.0											
	-33.8	44.0		0:10/0.5								-34.7	44.9		
			3.5	0:25/1.0	(0.0)						COASTAL PLAIN				
				0:34/1.0	0%						GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)				
	-37.3	47.5		0:32/1.0											
	-38.8	49.0		0:12/0.5											
			3.5	0:28/1.0	(0.5)										
				0:22/1.0	14%										
	-42.3	52.5		1:06/1.0											
	-43.8	54.0		0:10/0.5								-44.1	54.3		
			3.5	0:41/1.0	(2.3)						COASTAL PLAIN				
				0:44/1.0	66%						GRAY LIMESTONE (RIVER BEND FORMATION)				
	-47.3	57.5		0:32/1.0								-46.3	56.5		
	-48.8	59.0		0:15/0.5							COASTAL PLAIN				
			3.5	0:28/1.0	(0.0)						GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)				
				0:30/1.0	0%										
	-52.3	62.5		0:27/1.0											
	-53.8	64.0		0:10/0.5											
			3.5	0:37/1.0	(0.0)										
				0:22/1.0	0%										
	-57.3	67.5		0:24/1.0											
	-58.8	69.0		0:09/0.5											
			3.5	0:22/1.0	(0.0)										
				0:31/1.0	0%										
	-62.3	72.5		0:25/1.0											
	-63.8	74.0		0:15/0.5											
			3.5	0:55/1.0	(0.0)										
				0:43/1.0	0%										
	-67.3	77.5		0:42/1.0											
	-68.4	78.6		0:25/0.5								-68.4	78.6		
			3.7	2:13/1.0	(1.8)						COASTAL PLAIN				
				0:22/1.0	49%						GRAY LIMESTONE (RIVER BEND FORMATION)				
	-72.1	82.3		1:40/1.0											
				0:45/0.7								-73.6	83.8		
				N=47							Boring Terminated at Elevation -73.6 ft in Limestone				
											ARTESIAN HEAD ELEVATION = 10.6				

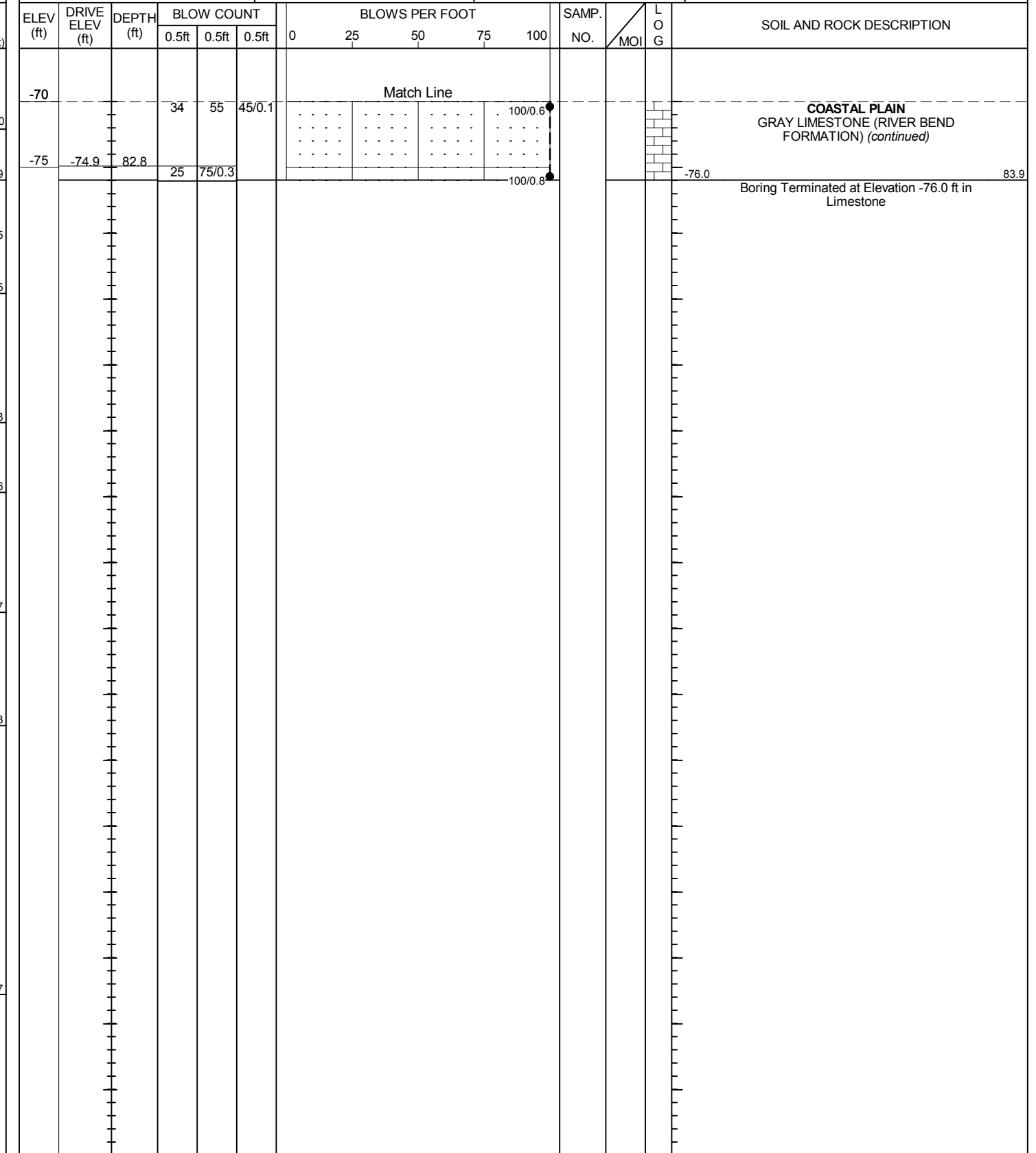
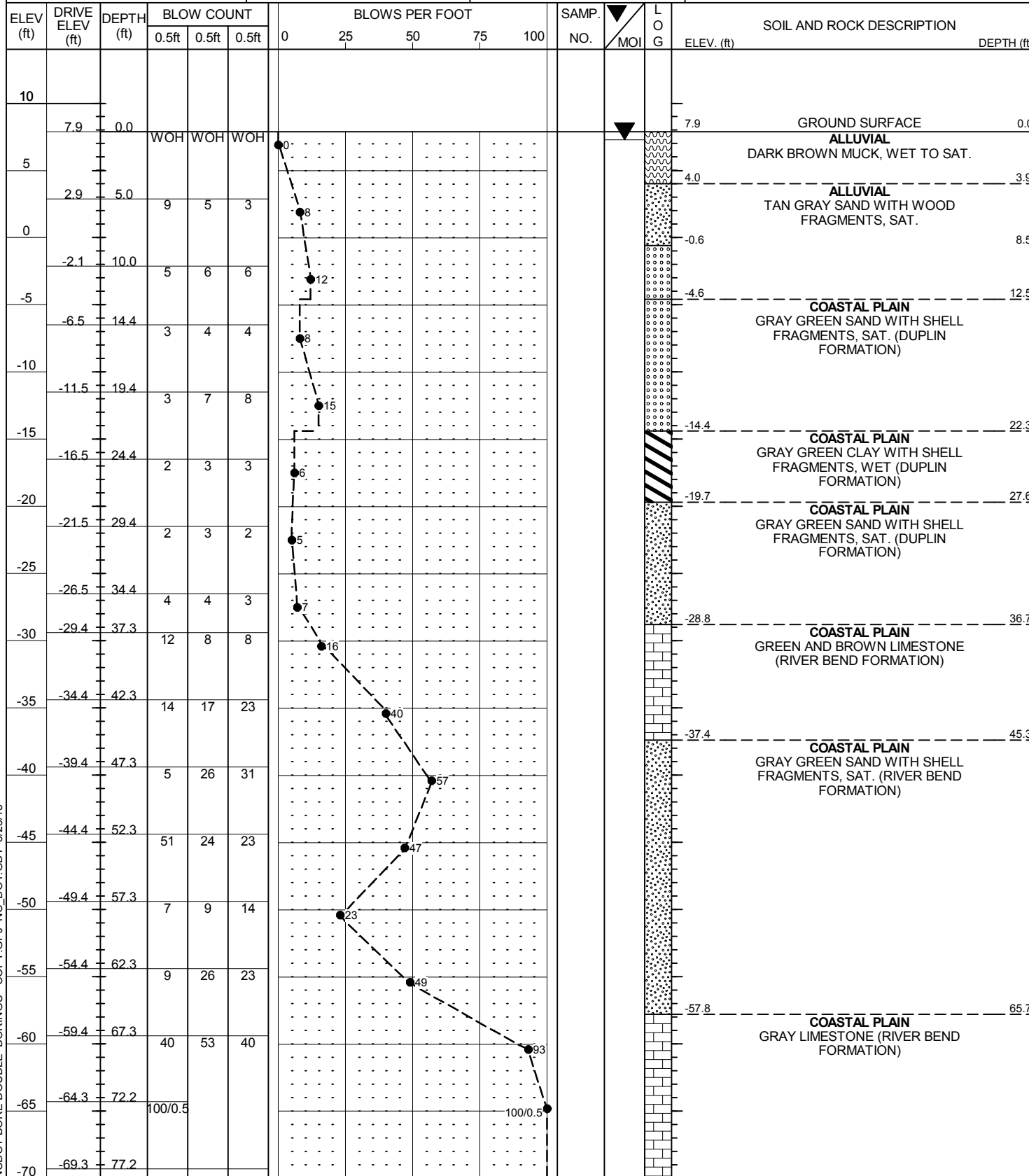
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NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear / B. Banks
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B2-A EBL	STATION 285+53	OFFSET 55 ft LT	ALIGNMENT -L-
COLLAR ELEV. 7.9 ft	TOTAL DEPTH 83.9 ft	NORTHING 416,871	EASTING 2,617,390
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 11/19/02	COMP. DATE 11/19/02	SURFACE WATER DEPTH N/A

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear / B. Banks
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B2-A EBL	STATION 285+53	OFFSET 55 ft LT	ALIGNMENT -L-
COLLAR ELEV. 7.9 ft	TOTAL DEPTH 83.9 ft	NORTHING 416,871	EASTING 2,617,390
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 11/19/02	COMP. DATE 11/19/02	SURFACE WATER DEPTH N/A



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NCDOT GEOTECHNICAL ENGINEERING UNIT

CORE BORING REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear / B. Banks						
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)					
BORING NO. B2-A EBL		STATION 285+53		OFFSET 55 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 7.9 ft		TOTAL DEPTH 83.9 ft		NORTHING 416,871		EASTING 2,617,390						
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Manual						
DRILLER Contract Driller		START DATE 11/19/02		COMP. DATE 11/19/02		SURFACE WATER DEPTH N/A						
CORE SIZE HQ		TOTAL RUN 34.4 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
-27.96											Begin Coring @ 35.9 ft	
-30	-28.0 -29.5 -30.9	35.9 37.4 38.8	1.5	0:16/1.0 0:15/0.5 N=16	(0.0) 0%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION) (continued)	36.2
-35	-34.4 -35.9	42.3 43.8	3.5	0:28/1.0 1:04/1.0 0:42/1.0 0:20/0.6 N=40	(2.3) 66%						COASTAL PLAIN GREEN AND BROWN LIMESTONE (RIVER BEND FORMATION)	
-40	-39.4 -40.9	47.3 48.8	3.5	0:31/1.0 0:25/1.0 0:16/1.0 0:10/0.6 N=57	(1.5) 44%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	45.3
-45	-44.4 -45.9	52.3 53.8	3.5	0:36/1.0 0:38/1.0 0:31/1.0 0:12/0.6 N=47	(0.0) 0%							
-50	-49.4 -50.9	57.3 58.8	3.5	0:38/1.0 0:34/1.0 0:33/1.0 0:09/0.6 N=23	(0.0) 0%							
-55	-54.4 -55.9	62.3 63.8	3.5	0:22/1.0 0:31/1.0 0:21/1.0 0:13/0.6 N=49	(0.0) 0%							
-60	-59.4 -60.8	67.3 68.7	3.5	0:31/1.0 0:30/1.0 0:35/1.0 0:12/0.6 N=93	(0.0) 0%						COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	65.7
-65	-64.3 -64.8	72.2 72.7	4.5	1:34/1.0 0:25/1.0 1:41/1.0 0:26/0.6 N=100/0.5	(1.2) 35%							
-70	-69.3 -70.4	77.2 78.3	3.9	1:16/1.0 0:46/1.0 1:00/1.0 0:23/1.0 0:35/0.6 N=100/0.6	(1.4) 31%							
-75	-74.3	82.2	3.9	1:45/1.0 1:58/1.0 0:42/1.0 0:38/1.0 N=100/0.8	(1.7) 43%							
											Boring Terminated at Elevation -76.0 ft in Limestone	83.9

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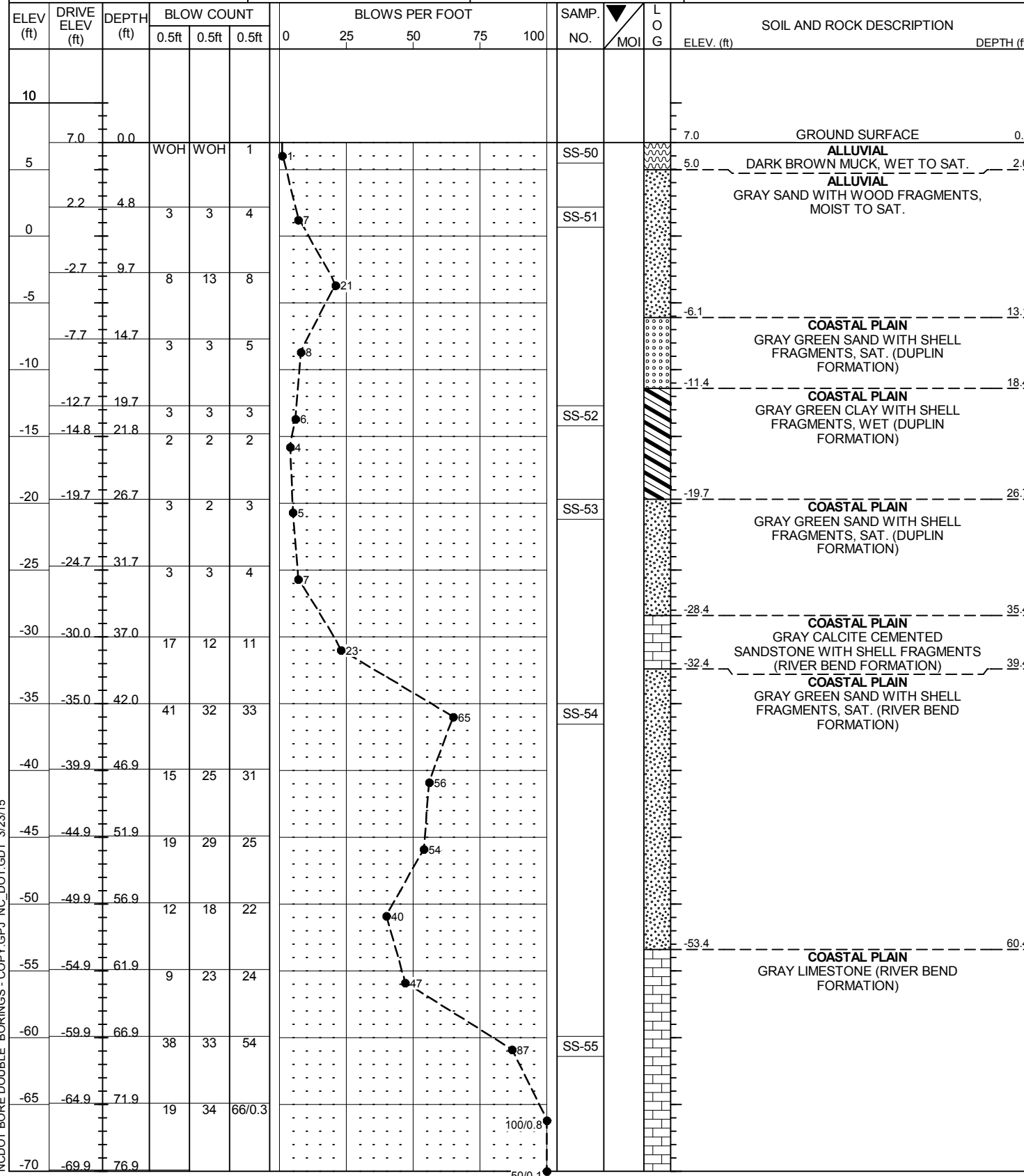
NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear						
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)					
BORING NO. B2-B WBL		STATION 285+83		OFFSET 59 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 7.6 ft		TOTAL DEPTH 83.4 ft		NORTHING 416,918		EASTING 2,617,499						
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Manual						
DRILLER Contract Driller		START DATE 11/06/02		COMP. DATE 11/07/02		SURFACE WATER DEPTH 0.2ft						
CORE SIZE HQ		TOTAL RUN 33.8 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
-28.1											Begin Coring @ 35.7 ft	
-30	-28.1 -29.4 -30.9	35.7 37.0 38.5	1.3	0:22/1.0 0:08/0.3 N=65	(0.0) 0%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION) (continued)	37.7
-35	-34.4 -35.9	42.0 43.5	3.5	1:21/1.0 0:23/1.0 2:36/1.0 0:39/0.6 N=34	(1.1) 31%						COASTAL PLAIN GRAY GREEN LIMESTONE (RIVER BEND FORMATION)	41.4
-40	-39.4 -40.9	47.0 48.5	3.5	0:34/1.0 1:03/1.0 0:24/1.0 0:29/0.6 N=40	(0.8) 23%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	
-45	-44.4 -44.8	52.0 52.4	4.5	0:23/1.0 0:22/1.0 0:26/1.0 0:18/0.6 N=100/0.3	(0.0) 0%						COASTAL PLAIN GRAY GREEN LIMESTONE (RIVER BEND FORMATION)	52.0
-50	-49.3 -50.8	56.9 58.4	3.5	0:38/1.0 0:28/1.0 0:19/1.0 0:26/1.0 0:15/0.6 N=23	(1.3) 29%						COASTAL PLAIN GRAY GREEN LIMESTONE (RIVER BEND FORMATION)	53.8
-55	-54.3 -55.8	61.9 63.4	3.5	0:25/1.0 0:25/1.0 0:26/1.0 0:10/0.6 N=24	(0.0) 0%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	
-60	-59.3 -60.8	66.9 68.4	3.5	0:48/1.0 0:27/1.0 0:27/1.0 0:12/0.6 N=27	(0.0) 0%						COASTAL PLAIN GRAY GREEN LIMESTONE (RIVER BEND FORMATION)	68.9
-65	-64.3 -65.8	71.9 73.4	3.5	2:56/1.0 2:23/1.0 0:23/1.0 0:10/0.6 N=31	(0.6) 17%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	69.5
-70	-69.3 -70.8	76.9 78.4	3.5	0:38/1.0 0:24/1.0 1:05/1.0 0:31/0.6 N=42	(1.2) 34%						COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	75.7
-75	-74.3	81.9	3.5	0:32/1.0 0:40/1.0 0:43/1.0 0:19/0.6 N=26	(1.4) 40%						COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	83.4
Boring Terminated at Elevation -75.8 ft in Limestone												
ARTESIAN FLOW												

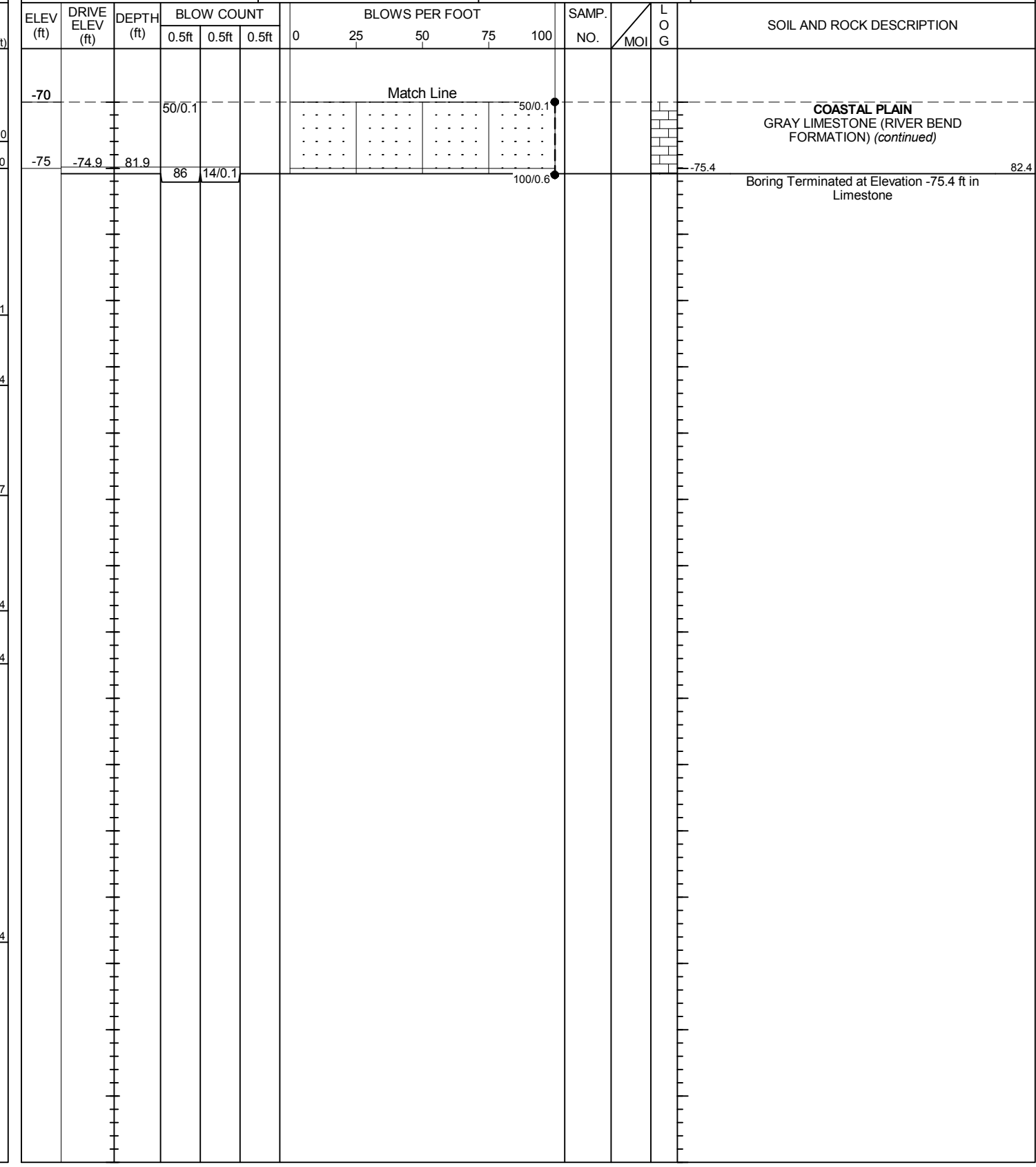
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NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B3-A EBL	STATION 286+50	OFFSET 59 ft LT	ALIGNMENT -L-
COLLAR ELEV. 7.0 ft	TOTAL DEPTH 82.4 ft	NORTHING 416,967	EASTING 2,617,373
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 10/11/02	COMP. DATE 10/16/02	SURFACE WATER DEPTH 0.3ft



WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B3-A EBL	STATION 286+50	OFFSET 59 ft LT	ALIGNMENT -L-
COLLAR ELEV. 7.0 ft	TOTAL DEPTH 82.4 ft	NORTHING 416,967	EASTING 2,617,373
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 10/11/02	COMP. DATE 10/16/02	SURFACE WATER DEPTH 0.3ft



NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear						
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)					
BORING NO. B3-A EBL		STATION 286+50		OFFSET 59 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 7.0 ft		TOTAL DEPTH 82.4 ft		NORTHING 416,967		EASTING 2,617,373						
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Manual						
DRILLER Contract Driller		START DATE 10/11/02		COMP. DATE 10/16/02		SURFACE WATER DEPTH 0.3ft						
CORE SIZE HQ		TOTAL RUN 44.5 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
-14.16											Begin Coring @ 21.2 ft	
-15	-14.2 -14.8 -16.2	21.2 21.8 23.2	0.6 3.5	0:20/0.6 N=4 0:23/1.0 0:30/1.0 0:27/1.0 0:08/0.6 N=5	(0.0) 0% (0.7) 21%						COASTAL PLAIN GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION) (continued)	
-20	-19.7 -21.2	26.7 28.2	3.5	0:25/1.0 0:21/1.0 0:22/1.0 0:09/0.6 N=7	(0.0) 0%		SS-53				COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	26.7
-25	-24.7 -26.2	31.7 33.2	3.8	0:30/1.0 0:23/1.0 0:31/1.0 0:20/0.8 N=23	(0.0) 0%						COASTAL PLAIN GRAY CALCITE CEMENTED SANDSTONE WITH SHELL FRAGMENTS (RIVER BEND FORMATION)	35.4
-30	-30.0 -31.5	37.0 38.5	3.5	0:30/1.0 0:31/1.0 0:28/1.0 0:15/0.6 N=65	(0.0) 0%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	39.4
-35	-35.0 -36.4	42.0 43.4	3.5	0:25/1.0 0:28/1.0 0:21/1.0 0:15/0.6 N=56	(0.7) 19%		SS-54					
-40	-39.9 -41.4	46.9 48.4	3.5	0:29/1.0 0:27/1.0 0:31/1.0 0:12/0.6 N=54	(1.7) 50%							
-45	-44.9 -46.4	51.9 53.4	3.5	0:20/1.0 0:20/1.0 0:20/1.0 0:11/0.6 N=40	(1.1) 32%							
-50	-49.9 -51.4	56.9 58.4	3.5	0:22/1.0 0:21/1.0 0:24/1.0 0:15/0.6 N=47	(0.3) 9%							
-55	-54.9 -56.4	61.9 63.4	3.5	1:00/1.0 0:54/1.0 0:16/1.0 0:10/0.6 N=87	(0.5) 15%		SS-55				COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	60.4
-60	-59.9 -61.4	66.9 68.4	3.5	0:57/1.0 0:45/1.0 0:37/1.0 0:39/0.6 N=100/0.8	(1.4) 39%							
-65	-64.9 -66.2	71.9 73.2	3.7	0:55/1.0 1:10/1.0 1:15/1.0 0:45/0.8 N=50/0.7	(1.8) 49%							
-70	-69.9 -69.9	76.9 76.9	4.9	1:54/1.0 1:54/1.0 1:05/1.0 1:10/1.0 0:45/1.0 0:35/1.0 N=100/0.6	(1.1) 23%							
-75	-74.8	81.8									Boring Terminated at Elevation -75.4 ft in Limestone	82.4

NCDOT CORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear									
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)								
BORING NO. B3-B WBL		STATION 286+81		OFFSET 56 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 6.5 ft		TOTAL DEPTH 82.6 ft		NORTHING 417,014		EASTING 2,617,481									
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Manual									
DRILLER Contract Driller		START DATE 11/04/02		COMP. DATE 11/05/02		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
10															
5	6.5	0.0	WOH	WOH	WOH									6.5	0.0
0	2.2	4.3	7	8	7									3.2	3.3
-5	-2.7	9.2	13	14	12									-5.3	11.8
-10	-7.7	14.2	3	3	4									-21.1	27.8
-15	-12.7	19.2	5	6	6									-29.0	35.5
-20	-17.6	24.1	2	2	3									-31.7	38.2
-25	-22.0	28.5	2	2	2									-39.1	45.6
-30	-27.0	33.5	2	2	3									-39.7	46.2
-35	-29.7	36.2	100/0.2											-44.7	51.2
-40	-34.7	41.2	43	51	38									-49.7	56.2
-45	-39.7	46.2	10	19	22									-54.7	61.2
-50	-44.7	51.2	41	36	29									-59.6	66.1
-55	-49.7	56.2	8	6	11									-64.6	71.1
-60	-54.7	61.2	8	6	16									-69.6	76.1
-65	-59.6	66.1	7	5	5										
-70	-64.6	71.1	23	38	43										
	-69.6	76.1												-67.1	73.8

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear									
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)								
BORING NO. B3-B WBL		STATION 286+81		OFFSET 56 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 6.5 ft		TOTAL DEPTH 82.6 ft		NORTHING 417,014		EASTING 2,617,481									
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Manual									
DRILLER Contract Driller		START DATE 11/04/02		COMP. DATE 11/05/02		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
-70															
-75	-74.6	81.1	31	20	20									-76.1	82.6

NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15



NCDOT GEOTECHNICAL ENGINEERING UNIT

CORE BORING REPORT

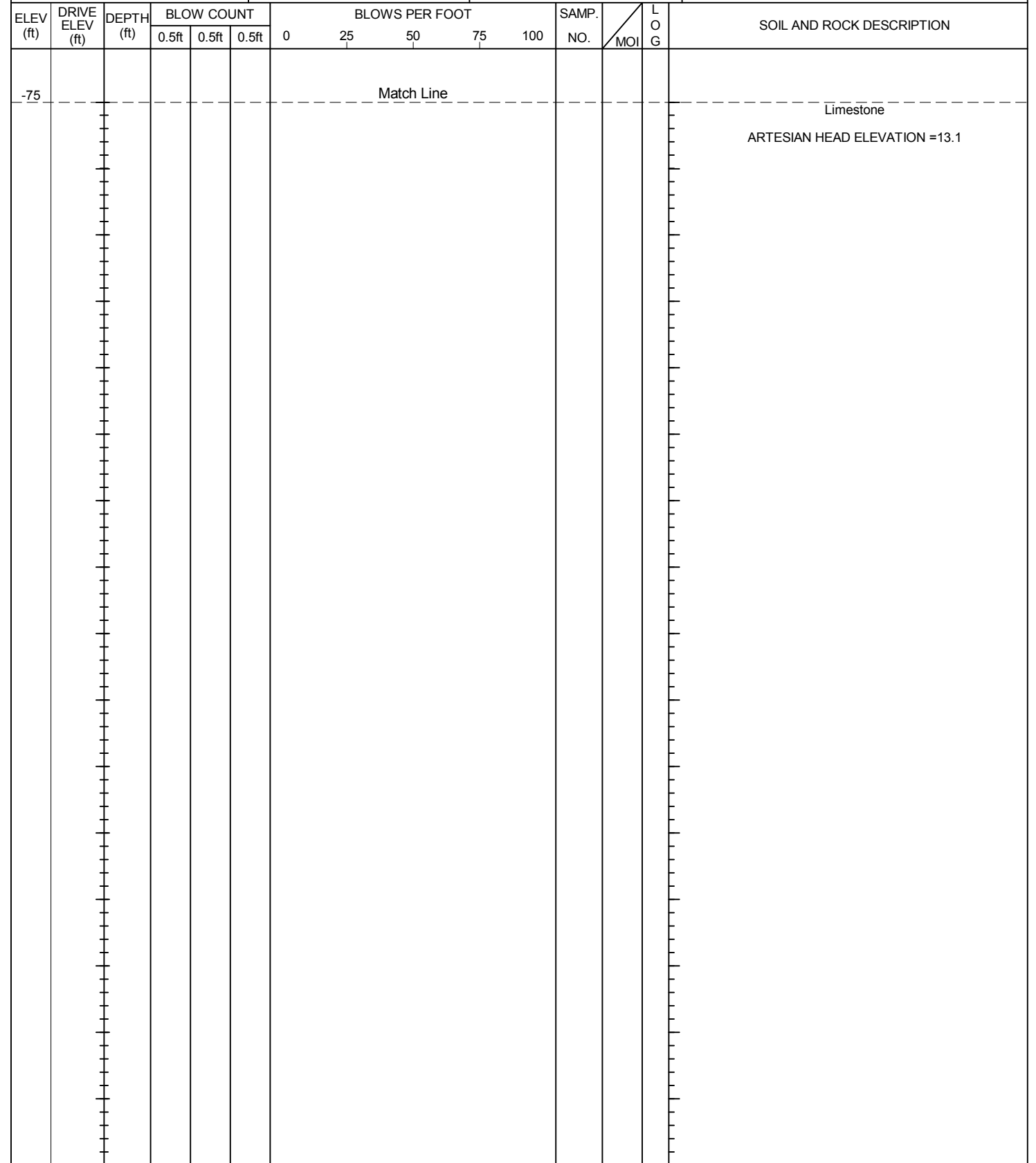
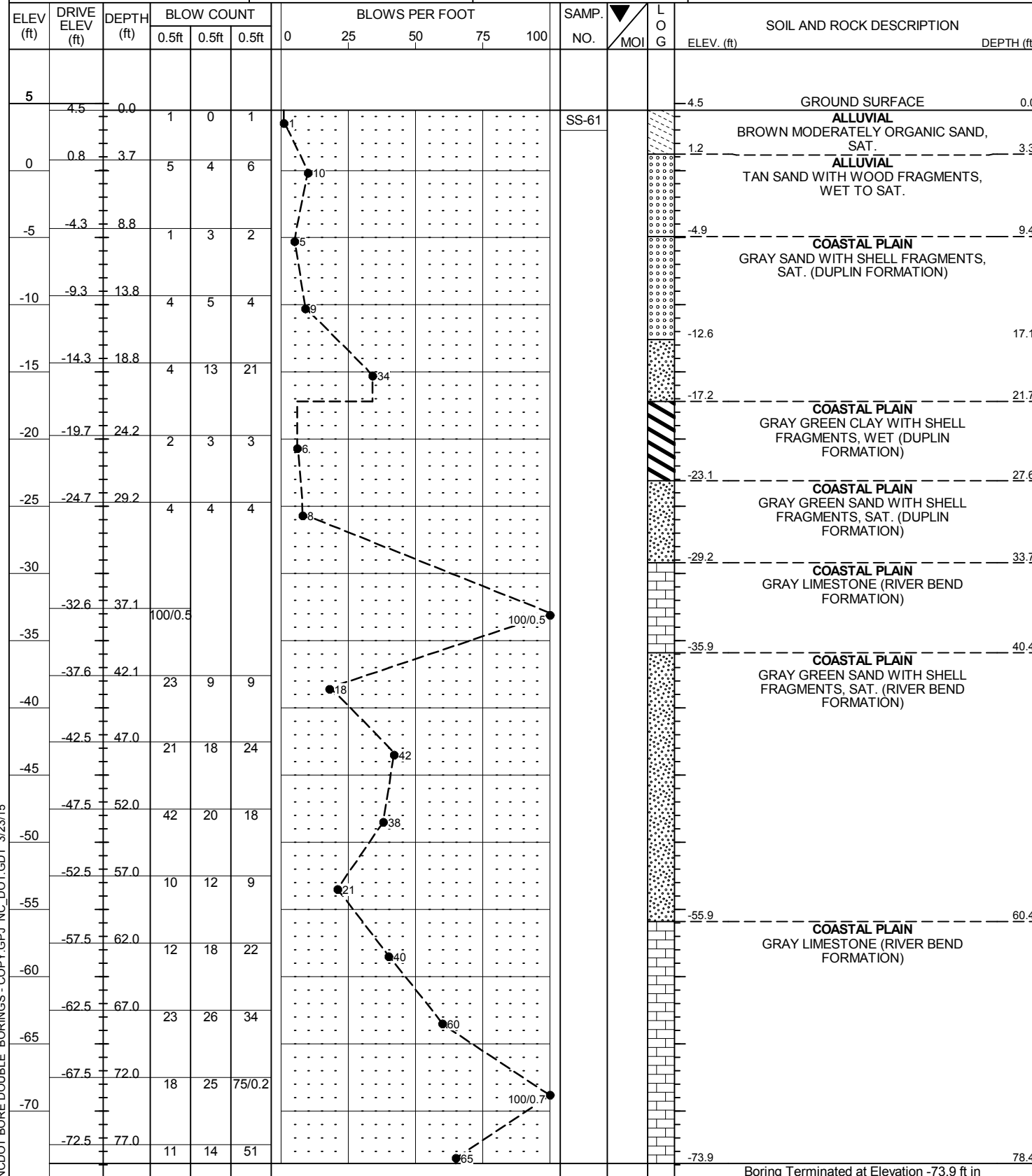
WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear						
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)					
BORING NO. B3-B WBL		STATION 286+81		OFFSET 56 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 6.5 ft		TOTAL DEPTH 82.6 ft		NORTHING 417,014		EASTING 2,617,481						
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Manual						
DRILLER Contract Driller		START DATE 11/04/02		COMP. DATE 11/05/02		SURFACE WATER DEPTH N/A						
CORE SIZE HQ		TOTAL RUN 35.0 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
-28.4	-28.4	34.9	1.3	1:17/1.0	(0.7)						Begin Coring @ 34.9 ft	
-30	-29.7	36.2	4.8	N=100/0.2 0:25/0.3 0:52/1.0 0:47/1.0 0:46/1.0 0:23/1.0 0:16/0.9	54% (1.8) 38%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION) (continued)	35.5 38.2
-35	-34.7	41.2									COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	
-35	-36.2	42.7									COASTAL PLAIN GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	
-40	-39.7	46.2	3.5	0:20/1.0 0:50/1.0 0:33/1.0 4:12/0.6	(0.6) 17%						COASTAL PLAIN GRAY CALCITE CEMENTED SANDSTONE, SAT. (RIVER BEND FORMATION)	45.6 46.2
-45	-44.7	51.2	3.5	0:31/1.0 0:43/1.0 0:21/1.0 0:12/0.6	(0.0) 0%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	
-50	-49.7	56.2	3.5	0:27/1.0 0:29/1.0 0:31/1.0 0:18/0.6	(0.0) 0%							
-50	-51.1	57.6										
-55	-54.6	61.1	3.5	N=17 0:31/1.0 0:34/1.0 0:24/1.0 0:11/0.6	(0.2) 6%							
-55	-56.1	62.6										
-60	-59.6	66.1	3.5	N=22 1:13/1.0 1:13/1.0 1:03/1.0 0:12/0.6	(0.0) 0%							
-60	-61.1	67.6										
-65	-64.6	71.1	3.5	N=10 0:22/1.0 0:33/1.0 0:29/1.0 0:10/0.6	(0.0) 0%							
-65	-66.1	72.6										
-70	-69.6	76.1	3.5	N=81 0:28/1.0 4:05/1.0 0:31/1.0 0:15/0.6	(2.2) 63%						COASTAL PLAIN GRAY SANDSTONE (RIVER BEND FORMATION)	73.6
-70	-70.2	76.7										
-75	-74.6	81.1	4.4	N=100/0.6 0:45/1.0 0:22/1.0 0:21/1.0 0:58/1.0 0:15/0.5	(1.3) 30%							
-75				N=40							Boring Terminated at Elevation -76.1 ft in Sandstone	82.6
ARTESIAN FLOW												

NCDOT CORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST B. Banks
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B4-A EBL	STATION 288+28	OFFSET 69 ft LT	ALIGNMENT -L-
COLLAR ELEV. 4.5 ft	TOTAL DEPTH 78.4 ft	NORTHING 417,142	EASTING 2,617,337
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 11/21/02	COMP. DATE 11/22/02	SURFACE WATER DEPTH N/A

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST B. Banks
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B4-A EBL	STATION 288+28	OFFSET 69 ft LT	ALIGNMENT -L-
COLLAR ELEV. 4.5 ft	TOTAL DEPTH 78.4 ft	NORTHING 417,142	EASTING 2,617,337
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 11/21/02	COMP. DATE 11/22/02	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15



NCDOT GEOTECHNICAL ENGINEERING UNIT

CORE BORING REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST B. Banks						
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)					
BORING NO. B4-A EBL		STATION 288+28		OFFSET 69 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 4.5 ft		TOTAL DEPTH 78.4 ft		NORTHING 417,142		EASTING 2,617,337						
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Manual						
DRILLER Contract Driller		START DATE 11/21/02		COMP. DATE 11/22/02		SURFACE WATER DEPTH N/A						
CORE SIZE HQ		TOTAL RUN 32.7 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
-29.2	-29.2	33.7	3.4	1:21/1.0 1:04/1.0 0:25/1.0 0:20/0.5	(1.0) 29%						Begin Coring @ 33.7 ft	33.7
-30	-32.6	37.1									COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	
-35	-33.1	37.6	4.5	N=100/0.5 1:54/1.0 0:32/1.0 4:13/1.0 0:15/1.0 0:21/0.6	(1.1) 24%							
-35.9	-37.6	42.1									COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	40.4
-40	-39.0	43.5	3.5	N=18 0:23/1.0 0:26/1.0 0:27/1.0 0:16/0.6	(0.0) 0%							
-45	-42.5	47.0										
-45	-44.0	48.5	3.5	N=42 0:23/1.0 0:17/1.0 0:23/1.0 0:12/0.6	(2.8) 80%							
-50	-47.5	52.0										
-50	-49.0	53.5	3.5	N=38 0:26/1.0 0:18/1.0 0:38/1.0 0:12/0.6	(0.0) 0%							
-55	-52.5	57.0										
-55	-54.0	58.5	3.5	N=21 0:22/1.0 0:23/1.0 0:29/1.0 0:11/0.6	(0.7) 20%						COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	60.4
-60	-57.5	62.0										
-60	-59.0	63.5	3.5	N=40 0:19/1.0 0:20/1.0 0:20/1.0 0:09/0.6	(1.4) 40%							
-65	-62.5	67.0										
-65	-64.0	68.5	3.5	N=60 0:56/1.0 0:22/1.0 1:10/1.0 0:12/0.6	(2.5) 71%							
-70	-67.5	72.0										
-70	-68.6	73.1	3.8	N=100/0.7 1:36/1.0 0:52/1.0 2:56/1.0 0:59/0.9	(2.0) 53%							
-72.4	-72.4	76.9										
												78.4
Boring Terminated at Elevation -73.9 ft in Limestone												
ARTESIAN HEAD ELEVATION =13.1												

NCDOT CORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

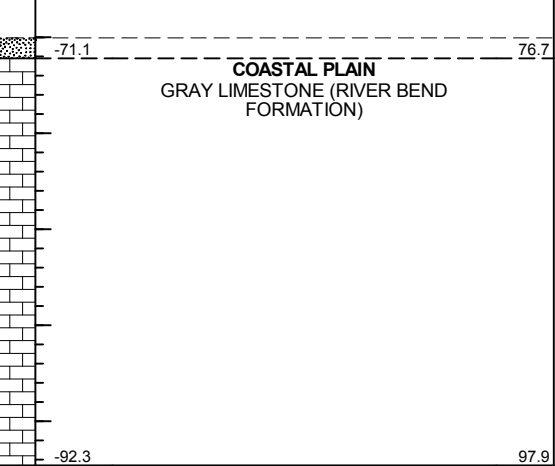
WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B4-B WBL	STATION 288+55	OFFSET 53 ft RT	ALIGNMENT -L-
COLLAR ELEV. 5.6 ft	TOTAL DEPTH 97.9 ft	NORTHING 417,186	EASTING 2,617,453
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 10/02/02	COMP. DATE 10/03/02	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
10															
5	5.6	0.0	WOH	WOH	WOH									5.6	GROUND SURFACE
0	0.6	5.0				1	3	4						2.3	ALLUVIAL DARK BROWN MUCK, WET TO SAT.
-5	-4.2	9.8				2	4	4						-2.6	COASTAL PLAIN GRAY BROWN SAND WITH WOOD FRAGMENTS, SAT. (DUPLIN FORMATION)
-10	-9.1	14.7				3	3	3						-7.5	COASTAL PLAIN GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)
-15	-11.1	16.7				5	5	5						-14.1	COASTAL PLAIN GRAY GREEN SILT WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-20	-16.1	21.7				2	2	2						-19.0	COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-25	-21.0	26.6				3	2	3						-26.3	COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)
-30	-26.0	31.6				12	27	19						-37.1	COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-35	-31.0	36.6				70	30/0.2								
-40	-36.0	41.6				100/0.3									
-45	-41.0	46.6				89	11/0.0								
-50	-46.0	51.6				18	28	55							
-55	-50.0	55.6				9	21	25							
-60	-55.9	61.5				12	43	46							
-65	-60.9	66.5				10	25	29							
-70	-65.9	71.5				7	10	22							

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B4-B WBL	STATION 288+55	OFFSET 53 ft RT	ALIGNMENT -L-
COLLAR ELEV. 5.6 ft	TOTAL DEPTH 97.9 ft	NORTHING 417,186	EASTING 2,617,453
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 10/02/02	COMP. DATE 10/03/02	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-70	-70.9	76.5				16	45	42							
-75	-75.9	81.5				38	24	14							
-80	-80.9	86.5				42	28	72/0.2							
-85	-85.9	91.5				20	20	25							
-90	-90.9	96.5				20	38	24							

NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15



Boring Terminated at Elevation -92.3 ft in Limestone
ARTESIAN HEAD ELEVATION =12.2



**NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT**

WBS 34360.1.1				TIP R-1015				COUNTY CRAVEN				GEOLOGIST M. Lear			
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK										GROUND WTR (ft)					
BORING NO. B4-B WBL			STATION 288+55				OFFSET 53 ft RT			ALIGNMENT -L-			0 HR. N/A		
COLLAR ELEV. 5.6 ft			TOTAL DEPTH 97.9 ft				NORTHING 417,186			EASTING 2,617,453			24 HR. N/A		
DRILL RIG/HAMMER EFF./DATE CME-45					DRILL METHOD NW Casing W/SPT & Core					HAMMER TYPE Manual					
DRILLER Contract Driller			START DATE 10/02/02				COMP. DATE 10/03/02			SURFACE WATER DEPTH N/A					
CORE SIZE HQ			TOTAL RUN 59.8 ft												
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS				
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		ELEV. (ft)	DEPTH (ft)			
-10.5	-10.5	18.1	0.5	0:30/0.5 N=70	(0.0)							Begin Coring @ 16.1 ft			
-15	-11.0	18.9	3.5	0:35/1.0 0:20/1.0 0:21/1.0 0:15/0.6 N=4	(0.0)							COASTAL PLAIN GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION) (continued)			
-15	-16.0	21.6										COASTAL PLAIN GRAY GREEN SILT WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)			
-15	-17.5	23.1				SS-15									
-20	-19.0		3.5	0:26/1.0 0:28/1.0 0:21/1.0 0:10/0.6 N=5	(0.0)							COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)			
-20	-21.0	26.6													
-20	-22.5	28.1				SS-16									
-25	-26.0	31.6	3.5	0:20/1.0 0:19/1.0 0:16/1.0 0:10/0.6 N=46	(0.0)							COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)			
-25	-27.5	33.1													
-30	-31.0	36.6	3.5	4:17/1.0 3:30/1.0 2:49/1.0 1:50/0.6 N=100/0.7	(2.0)										
-30	-31.7	39.3			57%										
-35	-33.0	41.8	4.3	2:30/1.0 2:31/1.0 1:59/1.0 2:27/1.0 1:00/0.4 N=100/0.7	(2.9)										
-35	-38.3	41.8			67%										
-40	-41.0	46.6	4.7	1:20/1.0 0:58/1.0 1:15/1.0 0:47/1.0 0:45/0.7 N=100/0.3	(0.6)							COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)			
-40	-41.5	47.1			13%										
-45	-46.0	51.6	4.5	0:58/1.0 1:22/1.0 0:51/1.0 0:45/1.0 0:30/0.5 N=100/0.5	(0.3)										
-45	-47.5	53.1			7%										
-50	-51.0	56.6	3.5	0:30/1.0 0:28/1.0 0:31/1.0 0:10/0.6 N=83	(0.3)							SS-17			
-50	-52.4	58.0			9%										
-55	-55.9	61.5	3.5	0:23/1.0 0:18/1.0 0:16/1.0 0:11/0.6 N=89	(0.0)										
-55	-57.4	63.0			0%										
-60	-60.9	66.5	3.5	0:28/1.0 0:25/1.0 0:21/1.0 0:10/0.6 N=54	(0.0)							SS-20			
-60	-62.4	68.0			0%										
-65	-65.9	71.5	3.5	0:21/1.0 0:19/1.0 0:27/1.0 0:09/0.6 N=32	(0.0)							SS-21			
-65	-67.4	73.0			0%										
-70	-70.9	76.5	3.5	0:25/1.0 0:37/1.0 0:30/1.0 0:15/0.6 N=87	(0.0)							SS-22			
-70	-72.4	78.0			0%										
-75	-75.9	81.5	3.5	1:00/1.0 0:54/1.0 0:45/1.0 0:20/0.6 N=38	(1.5)							COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)			
-75	-77.4	83.0			43%										
-80	-80.9	86.5	3.5	0:47/1.0 1:17/1.0 0:50/1.0 0:25/0.6 N=100/0.7	(1.7)										
-80	-82.0	87.6			49%										
-85	-85.8	91.4	3.8	2:01/1.0 1:45/1.0 1:01/1.0 0:45/0.9 N=45	(1.3)							SS-24			
-85	-87.3	92.9			34%										
-90			3.5	0:45/1.0 1:30/1.0 3:26/1.0	(2.0)										
					57%										

WBS 34360.1.1				TIP R-1015				COUNTY CRAVEN				GEOLOGIST M. Lear			
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK										GROUND WTR (ft)					
BORING NO. B4-B WBL			STATION 288+55				OFFSET 53 ft RT			ALIGNMENT -L-			0 HR. N/A		
COLLAR ELEV. 5.6 ft			TOTAL DEPTH 97.9 ft				NORTHING 417,186			EASTING 2,617,453			24 HR. N/A		
DRILL RIG/HAMMER EFF./DATE CME-45					DRILL METHOD NW Casing W/SPT & Core					HAMMER TYPE Manual					
DRILLER Contract Driller			START DATE 10/02/02				COMP. DATE 10/03/02			SURFACE WATER DEPTH N/A					
CORE SIZE HQ			TOTAL RUN 59.8 ft												
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS				
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		ELEV. (ft)	DEPTH (ft)			
-90.5	-90.8	96.4		2:12/0.6 N=62								Begin Coring @ 96.1 ft			
							SS-25					Boring Terminated at Elevation -92.3 ft in Limestone			
												ARTESIAN HEAD ELEVATION =12.2			

NCDOT CORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

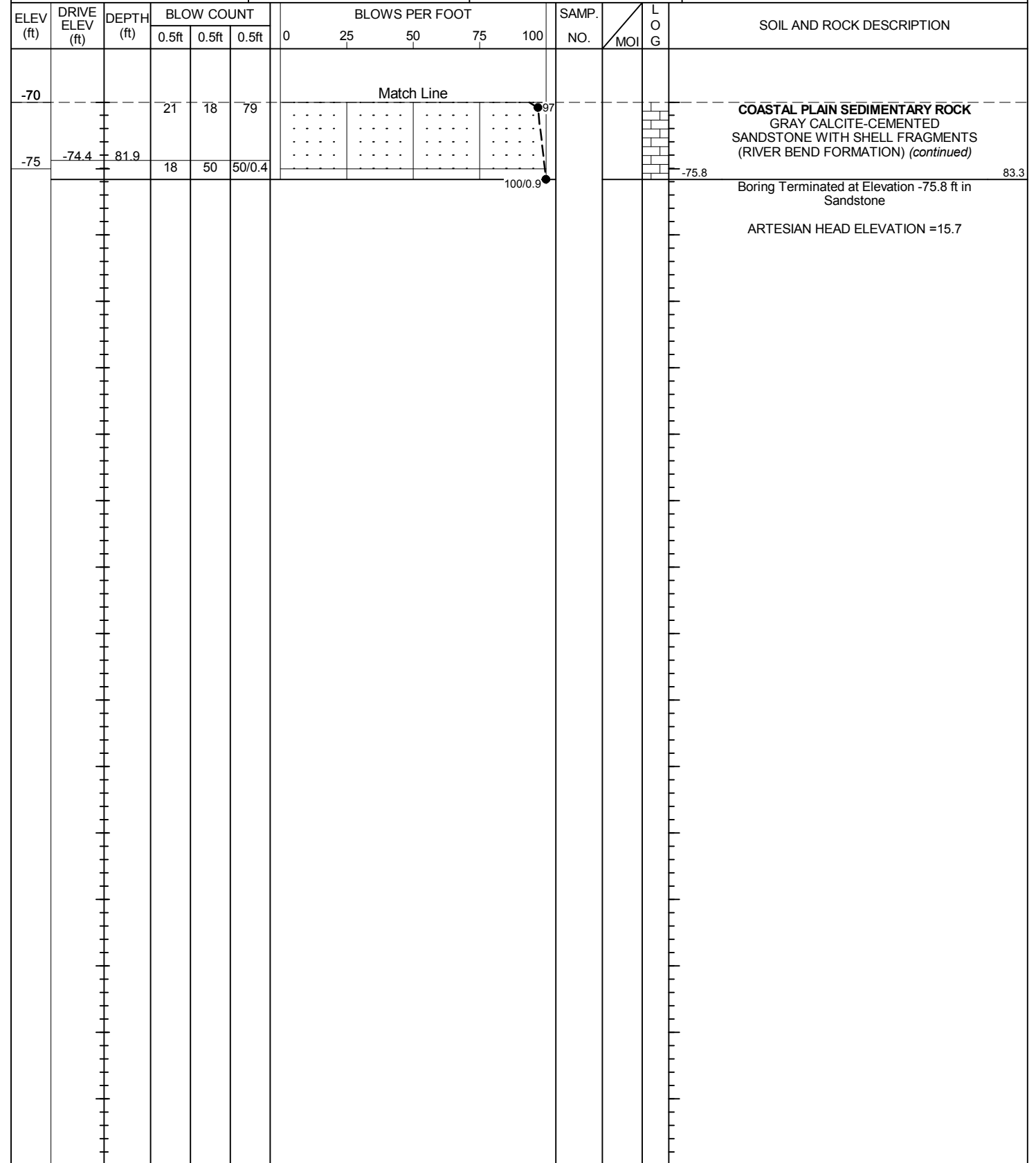
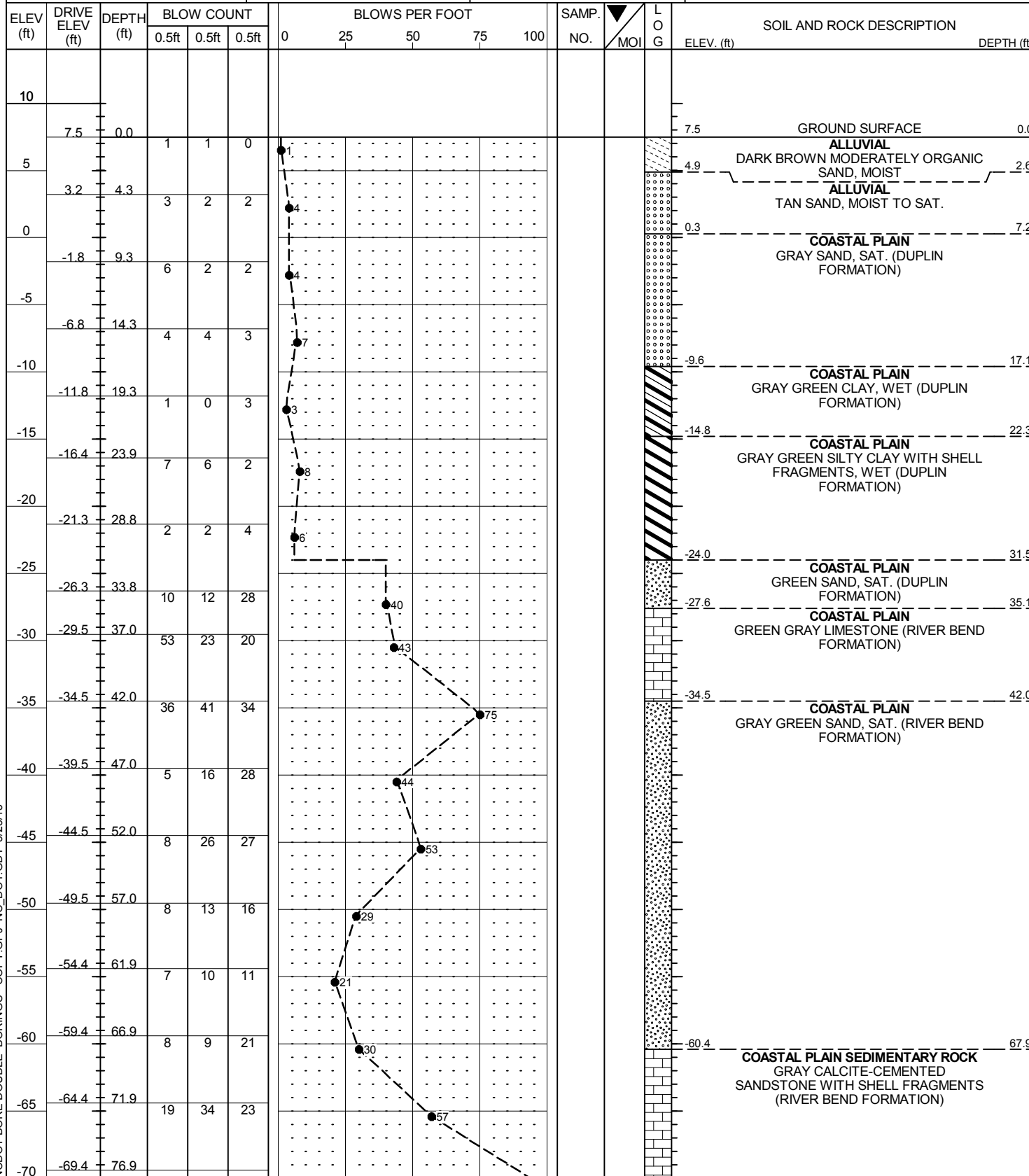


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST B. Banks
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B5-A EBL	STATION 290+10	OFFSET 40 ft LT	ALIGNMENT -L-
COLLAR ELEV. 7.5 ft	TOTAL DEPTH 83.3 ft	NORTHING 417,325	EASTING 2,617,338
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 11/22/02	COMP. DATE 11/24/02	SURFACE WATER DEPTH N/A

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST B. Banks
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B5-A EBL	STATION 290+10	OFFSET 40 ft LT	ALIGNMENT -L-
COLLAR ELEV. 7.5 ft	TOTAL DEPTH 83.3 ft	NORTHING 417,325	EASTING 2,617,338
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 11/22/02	COMP. DATE 11/24/02	SURFACE WATER DEPTH N/A



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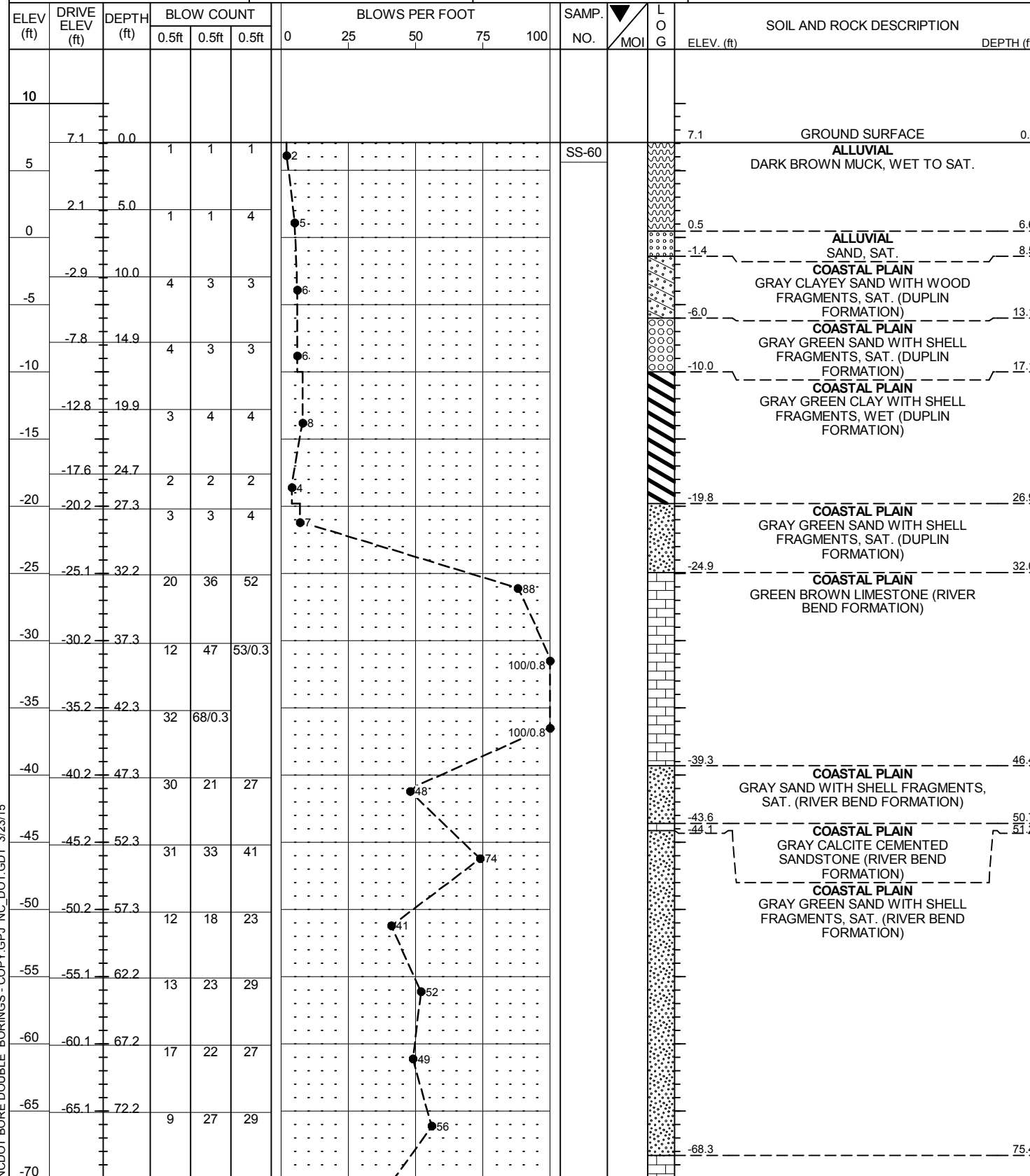
CORE BORING REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST B. Banks						
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)					
BORING NO. B5-A EBL		STATION 290+10		OFFSET 40 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 7.5 ft		TOTAL DEPTH 83.3 ft		NORTHING 417,325		EASTING 2,617,338						
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Manual						
DRILLER Contract Driller		START DATE 11/22/02		COMP. DATE 11/24/02		SURFACE WATER DEPTH N/A						
CORE SIZE HQ		TOTAL RUN 33.2 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
-27.8											Begin Coring @ 35.3 ft	
-30	-27.8 -29.5 -31.0	35.3 37.0 38.5	1.7	3:08/1.0 1:26/0.7 N=43	(0.9) 54%						COASTAL PLAIN GREEN GRAY LIMESTONE (RIVER BEND FORMATION) (continued)	
-35	-34.5 -36.0	42.0 43.5	3.5	1:26/1.0 0:32/1.0 0:52/1.0 0:17/0.6 N=75	(2.1) 60%						COASTAL PLAIN GRAY GREEN SAND, SAT. (RIVER BEND FORMATION)	34.5 42.0
-40	-39.5 -41.0	47.0 48.5	3.5	0:53/1.0 0:25/1.0 0:33/1.0 0:24/0.6 N=44	(0.2) 7%							
-45	-44.5 -45.9	52.0 53.4	3.5	0:34/1.0 1:23/1.0 0:28/1.0 0:17/1.0 N=53	(0.0) 0%							
-50	-49.4 -50.9	56.9 58.4	3.5	0:22/1.0 0:50/1.0 0:34/1.0 0:10/0.6 N=29	(0.4) 12%							
-55	-54.4 -55.9	61.9 63.4	3.5	1:20/1.0 1:08/1.0 1:24/1.0 0:17/0.6 N=21	(0.0) 0%							
-60	-59.4 -60.9	66.9 68.4	3.5	0:24/1.0 0:15/1.0 0:37/1.0 0:22/0.6 N=30	(0.0) 0%							60.4 67.9
-65	-64.4 -65.9	71.9 73.4	3.5	0:20/1.0 0:34/1.0 1:24/1.0 0:29/0.6 N=57	(1.4) 41%						COASTAL PLAIN SEDIMENTARY ROCK GRAY CALCITE-CEMENTED SANDSTONE WITH SHELL FRAGMENTS (RIVER BEND FORMATION)	
-70	-69.4 -70.9	76.9 78.4	3.5	0:34/1.0 0:49/1.0 0:38/1.0 0:20/0.6 N=97	(1.6) 45%							
-75	-74.4	81.9	3.5	0:53/1.0 1:21/1.0 1:03/1.0 0:31/0.6 N=100/0.9	(1.1) 30%							75.8 83.3
Boring Terminated at Elevation -75.8 ft in Sandstone												
ARTESIAN HEAD ELEVATION =15.7												

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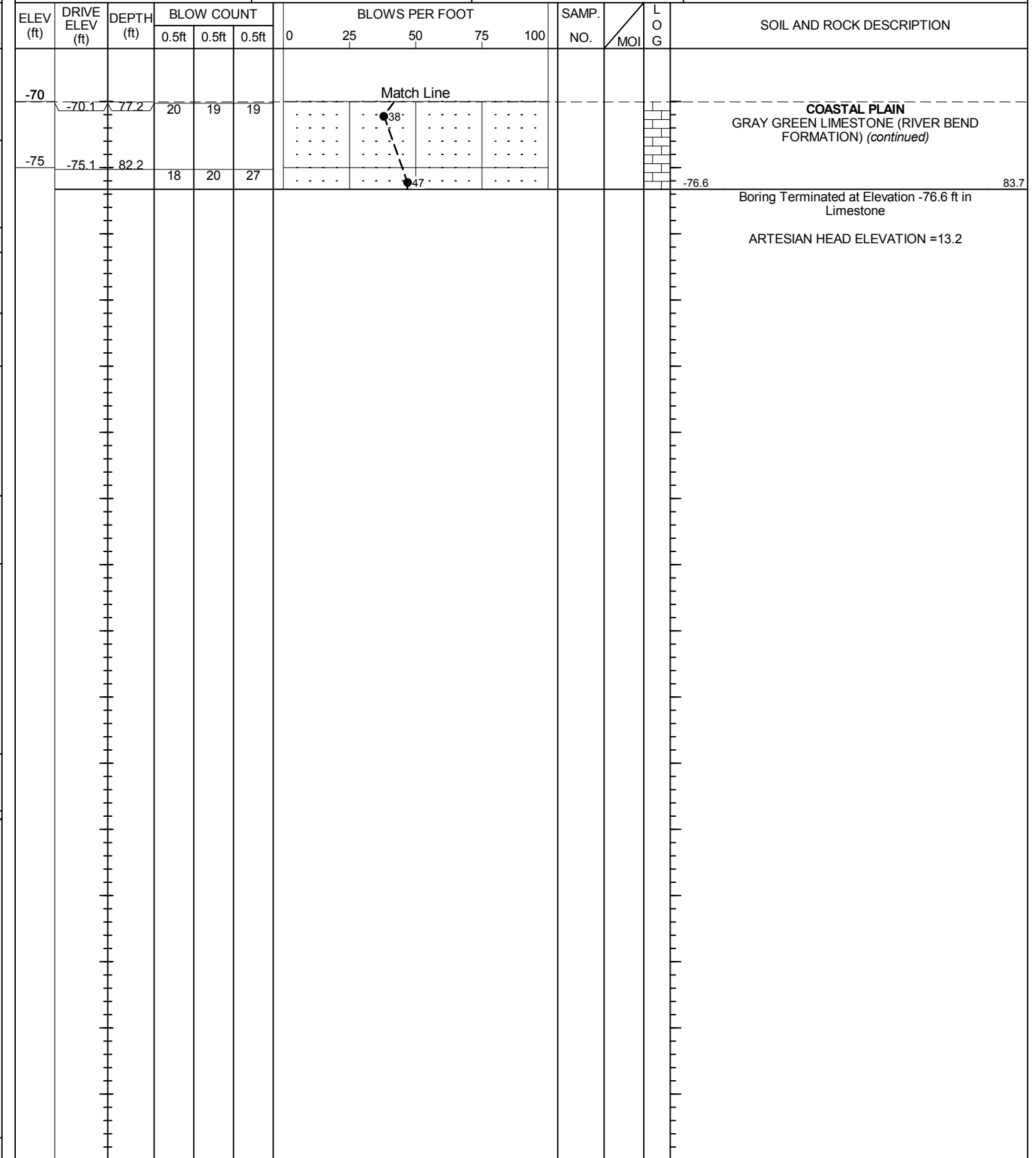
NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

Table with site information: WBS 34360.1.1, TIP R-1015, COUNTY CRAVEN, GEOLOGIST M. Lear. Includes SITE DESCRIPTION, BORING NO. B5-B WBL, STATION 289+55, OFFSET 56 ft RT, ALIGNMENT -L-, GROUND WTR (ft) 0 HR. N/A, COLLAR ELEV. 7.1 ft, TOTAL DEPTH 83.7 ft, NORTHING 417,285, EASTING 2,617,441, 24 HR. FIAD, DRILL RIG/HAMMER EFF./DATE CME-45, DRILL METHOD NW Casing W/SPT & Core, HAMMER TYPE Manual, DRILLER Contract Driller, START DATE 10/29/02, COMP. DATE 10/30/02, SURFACE WATER DEPTH N/A.



NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

Table with site information: WBS 34360.1.1, TIP R-1015, COUNTY CRAVEN, GEOLOGIST M. Lear. Includes SITE DESCRIPTION, BORING NO. B5-B WBL, STATION 289+55, OFFSET 56 ft RT, ALIGNMENT -L-, GROUND WTR (ft) 0 HR. N/A, COLLAR ELEV. 7.1 ft, TOTAL DEPTH 83.7 ft, NORTHING 417,285, EASTING 2,617,441, 24 HR. FIAD, DRILL RIG/HAMMER EFF./DATE CME-45, DRILL METHOD NW Casing W/SPT & Core, HAMMER TYPE Manual, DRILLER Contract Driller, START DATE 10/29/02, COMP. DATE 10/30/02, SURFACE WATER DEPTH N/A.





NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

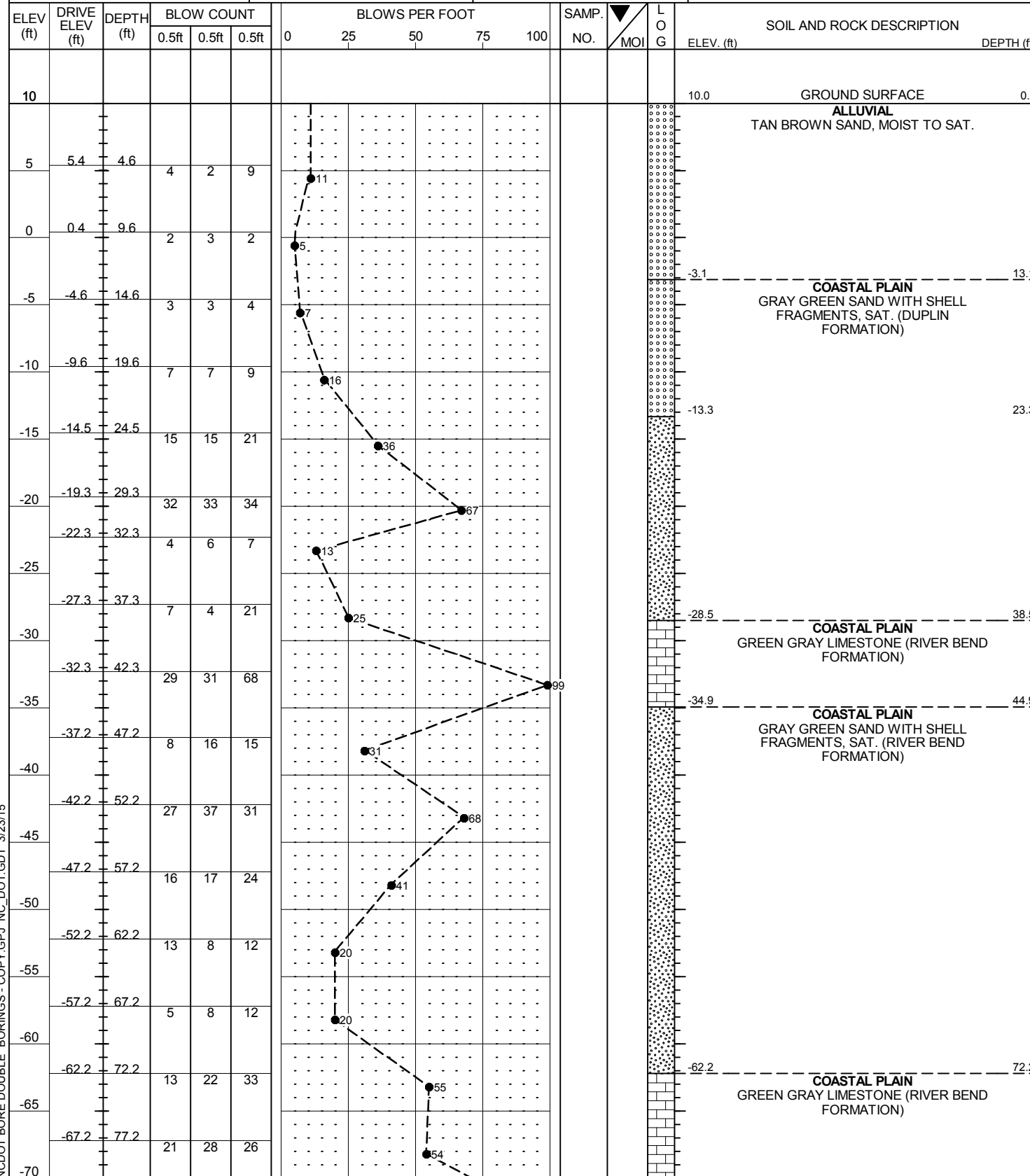
WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B5-B WBL	STATION 289+55	OFFSET 56 ft RT	ALIGNMENT -L-
COLLAR ELEV. 7.1 ft	TOTAL DEPTH 83.7 ft	NORTHING 417,285	EASTING 2,617,441
DRILL RIG/HAMMER EFF./DATE CME-45	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual	
DRILLER Contract Driller	START DATE 10/29/02	COMP. DATE 10/30/02	SURFACE WATER DEPTH N/A

CORE SIZE HQ			TOTAL RUN 40.5 ft				LOG		DESCRIPTION AND REMARKS	DEPTH (ft)
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (%)	RQD (%)	SAMP. NO.	STRATA REC. (%)		
-19.1	-19.1	28.2	1.1	0:31/1.0	(0.0)					Begin Coring @ 26.2 ft
-20	-20.2	27.3		0:05/0.1	0%					COASTAL PLAIN
	-21.7	28.8								GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION) (continued)
			3.5	0:15/1.0	(0.3)					COASTAL PLAIN
				0:14/1.0	9%					GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-25	-25.2	32.3		0:15/1.0						
	-26.7	33.8		1:28/0.6						COASTAL PLAIN
			3.5	1:15/1.0	(1.0)					GREEN BROWN LIMESTONE (RIVER BEND FORMATION)
				1:25/1.0	29%					
-30	-30.2	37.3		1:56/1.0						
	-31.5	38.6		1:21/0.6						
			3.7	1:34/1.0	(1.0)					
				1:35/1.0	27%					
-35	-35.2	42.3		0:46/1.0						
	-36.0	43.1		0:15/0.6						
			4.2	0:25/1.0	(3.2)					
				0:26/1.0	76%					
-40	-40.2	47.3		0:24/1.0						
	-41.7	48.8		0:31/0.8						COASTAL PLAIN
										GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
			3.5	0:15/1.0	(0.5)					
				0:22/1.0	14%					
-45	-45.2	52.3		0:26/1.0						
	-46.6	53.7		3:47/1.0						COASTAL PLAIN
			3.5	0:11/0.3	(0.0)					GRAY CALCITE CEMENTED SANDSTONE (RIVER BEND FORMATION)
				0:35/1.0	0%					COASTAL PLAIN
				0:31/1.0						GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-50	-50.1	57.2		0:17/1.0						
	-51.6	58.7		0:12/0.6						
			3.5	0:24/1.0	(0.0)					
				0:26/1.0	0%					
-55	-55.1	62.2		0:25/1.0						
	-56.6	63.7		0:14/0.6						
			3.5	0:42/1.0	(0.0)					
				0:21/1.0	0%					
-60	-60.1	67.2		0:22/1.0						
	-61.6	68.7		0:16/0.6						
			3.5	0:31/1.0	(0.0)					
				0:29/1.0	0%					
-65	-65.1	72.2		0:27/1.0						
	-66.6	73.7		0:13/0.6						
			3.5	0:31/1.0	(0.6)					
				0:49/1.0	17%					
-70	-70.1	77.2		1:15/1.0						
	-71.6	78.7		0:25/0.6						COASTAL PLAIN
			3.5	1:22/1.0	(0.9)					GRAY GREEN LIMESTONE (RIVER BEND FORMATION)
				1:42/1.0	26%					
-75	-75.1	82.2		1:31/1.0						
				0:35/0.6						
										Boring Terminated at Elevation -76.6 ft in Limestone
										ARTESIAN HEAD ELEVATION =13.2

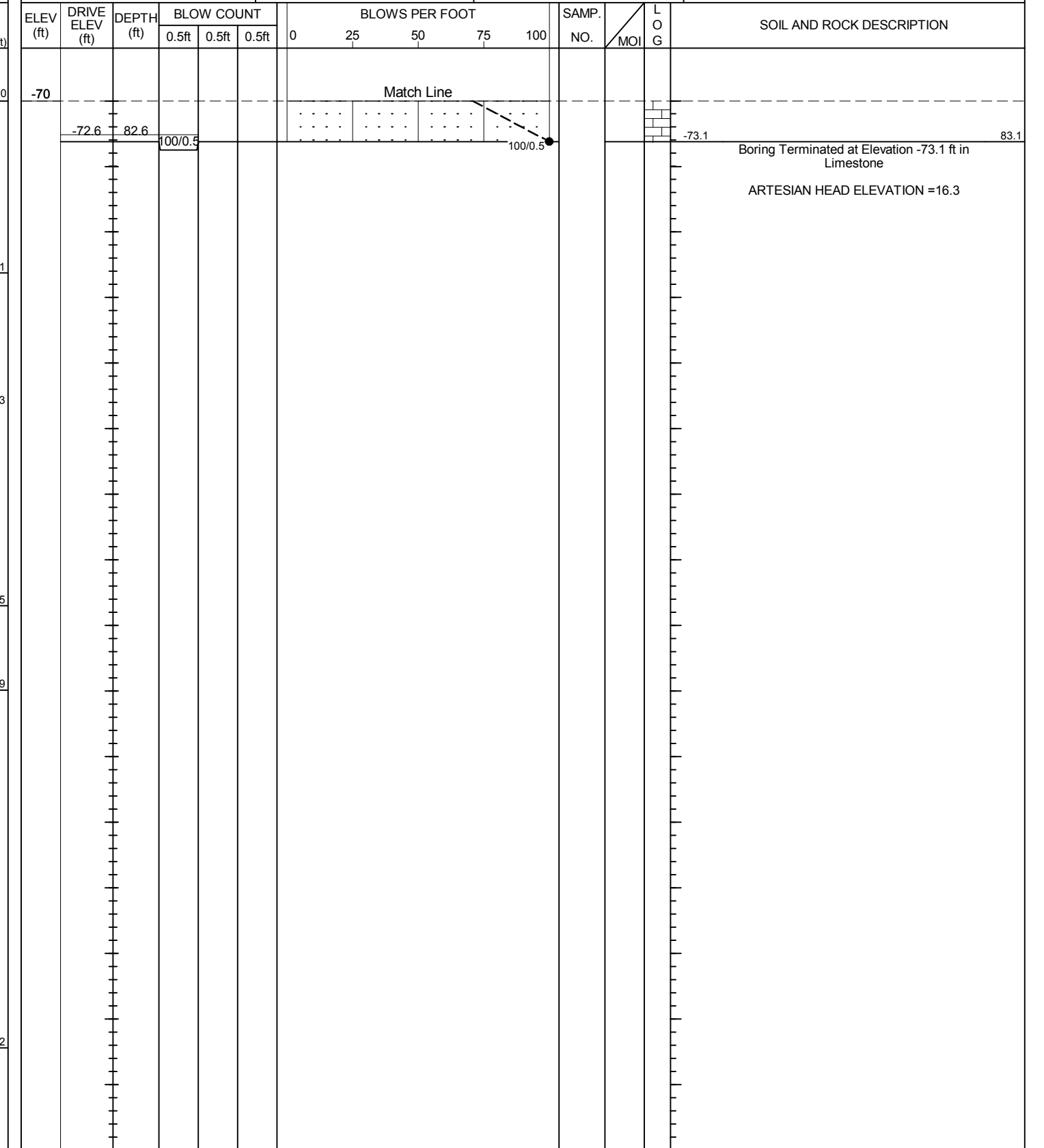
NCDOT CORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B6-A EBL	STATION 291+11	OFFSET 44 ft LT	ALIGNMENT -L-
COLLAR ELEV. 10.0 ft	TOTAL DEPTH 83.1 ft	NORTHING 417,425	EASTING 2,617,319
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 11/25/02	COMP. DATE 11/25/02	SURFACE WATER DEPTH N/A



WBS 34360.1.1	TIP R-1015	COUNTY CRAVEN	GEOLOGIST M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			GROUND WTR (ft)
BORING NO. B6-A EBL	STATION 291+11	OFFSET 44 ft LT	ALIGNMENT -L-
COLLAR ELEV. 10.0 ft	TOTAL DEPTH 83.1 ft	NORTHING 417,425	EASTING 2,617,319
DRILL RIG/HAMMER EFF./DATE CME-45		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Manual
DRILLER Contract Driller	START DATE 11/25/02	COMP. DATE 11/25/02	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15



NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear							
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)						
BORING NO. B6-A EBL		STATION 291+11		OFFSET 44 ft LT		ALIGNMENT -L-							
COLLAR ELEV. 10.0 ft		TOTAL DEPTH 83.1 ft		NORTHING 417,425		EASTING 2,617,319							
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Manual							
DRILLER Contract Driller		START DATE 11/25/02		COMP. DATE 11/25/02		SURFACE WATER DEPTH N/A							
CORE SIZE HQ		TOTAL RUN 36.5 ft											
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)	
					REC. (%)	RQD (%)		REC. (%)	RQD (%)				
-20.8	-20.8	30.8	1.5	0:19/1.0	(0.0)						Begin Coring @ 30.8 ft		
	-22.3	32.3		0:10/0.5	0%						GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION) (continued)		
	-23.8	33.8		N=13									
-25			3.5	0:21/1.0	(0.0)								
	-27.3	37.3		0:21/1.0	0%						COASTAL PLAIN GREEN GRAY LIMESTONE (RIVER BEND FORMATION)		
	-28.7	38.7		0:19/1.0									
			3.5	0:12/0.6									
-30			3.5	2:29/1.0	(0.3)								
	-32.2	42.2		1:08/1.0	9%						COASTAL PLAIN GREEN GRAY LIMESTONE (RIVER BEND FORMATION)		
	-33.7	43.7		1:07/1.0									
			3.5	0:22/0.6									
-35			3.5	1:03/1.0	(0.4)								
	-37.2	47.2		0:26/1.0	11%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)		
	-38.7	48.7		0:21/1.0									
			3.5	0:18/0.6									
-40			3.5	0:33/1.0	(0.0)								
	-42.2	52.2		1:24/1.0	0%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)		
	-43.7	53.7		0:48/1.0									
			3.5	0:22/0.6									
-45			3.5	0:38/1.0	(0.9)								
	-47.2	57.2		0:30/1.0	26%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)		
	-48.7	58.7		0:45/1.0									
			3.5	0:23/0.6									
-50			3.5	0:30/1.0	(0.7)								
	-52.2	62.2		0:28/1.0	20%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)		
	-53.7	63.7		0:17/1.0									
			3.5	N=20									
-55			3.5	0:38/1.0	(0.0)								
	-57.2	67.2		0:27/1.0	0%						COASTAL PLAIN GREEN GRAY LIMESTONE (RIVER BEND FORMATION)		
	-58.7	68.7		0:24/1.0									
			3.5	0:13/0.6									
-60			3.5	0:19/1.0	(0.0)								
	-62.2	72.2		0:34/1.0	0%						COASTAL PLAIN GREEN GRAY LIMESTONE (RIVER BEND FORMATION)		
	-63.7	73.7		0:50/1.0									
			3.5	0:16/0.6									
-65			3.5	0:40/1.0	(1.6)								
	-67.2	77.2		0:34/1.0	46%						COASTAL PLAIN GREEN GRAY LIMESTONE (RIVER BEND FORMATION)		
	-68.6	78.6		0:27/1.0									
			3.5	0:25/0.6									
-70			3.5	1:13/1.0	(1.7)								
	-72.1	82.1		1:10/1.0	49%						COASTAL PLAIN GREEN GRAY LIMESTONE (RIVER BEND FORMATION)		
			3.5	0:35/1.0									
			3.5	0:37/0.6									
				N=100/0.5									
											Boring Terminated at Elevation -73.1 ft in Limestone		
											ARTESIAN HEAD ELEVATION =16.3		

NCDOT CORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

Table with 4 columns: WBS 34360.1.1, TIP R-1015, COUNTY CRAVEN, GEOLOGIST M. Lear. Includes SITE DESCRIPTION, BORING NO., STATION, OFFSET, ALIGNMENT, COLLAR ELEV., TOTAL DEPTH, NORTHING, EASTING, DRILL RIG/HAMMER EFF./DATE, DRILL METHOD, HAMMER TYPE, DRILLER, START DATE, COMP. DATE, SURFACE WATER DEPTH.

Main borelog table with columns: ELEV (ft), DRIVE ELEV (ft), DEPTH (ft), BLOW COUNT (0.5ft, 0.5ft, 0.5ft), BLOWS PER FOOT (0, 25, 50, 75, 100), SAMP. NO., SOIL AND ROCK DESCRIPTION, DEPTH (ft). Includes blow count data and soil descriptions like 'ALLUVIAL DARK BROWN MUCK, WET TO SAT.' and 'COASTAL PLAIN GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)'.

Table with 4 columns: WBS 34360.1.1, TIP R-1015, COUNTY CRAVEN, GEOLOGIST M. Lear. Includes SITE DESCRIPTION, BORING NO., STATION, OFFSET, ALIGNMENT, COLLAR ELEV., TOTAL DEPTH, NORTHING, EASTING, DRILL RIG/HAMMER EFF./DATE, DRILL METHOD, HAMMER TYPE, DRILLER, START DATE, COMP. DATE, SURFACE WATER DEPTH.

Main borelog table with columns: ELEV (ft), DRIVE ELEV (ft), DEPTH (ft), BLOW COUNT (0.5ft, 0.5ft, 0.5ft), BLOWS PER FOOT (0, 25, 50, 75, 100), SAMP. NO., SOIL AND ROCK DESCRIPTION, DEPTH (ft). Includes blow count data and soil descriptions like 'COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION) (continued)' and 'ARTESIAN HEAD ELEVATION = 13.0'.

NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear						
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)					
BORING NO. B6-B WBL		STATION 291+23		OFFSET 57 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 6.5 ft		TOTAL DEPTH 94.1 ft		NORTHING 417,451		EASTING 2,617,417						
DRILL RIG/HAMMER EFF./DATE CME-45			DRILL METHOD NW Casing W/SPT & Core			HAMMER TYPE Manual						
DRILLER Contract Driller		START DATE 09/17/02		COMP. DATE 09/17/02		SURFACE WATER DEPTH N/A						
CORE SIZE HQ		TOTAL RUN 60.4 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (%)	RUN RQD (%)	SAMP. NO.	STRATA REC. (%)	STRATA RQD (%)	LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
-5.7	-5.7	12.2	5.0	0:20/1.0 0:22/1.0 0:13/1.0 0:09/1.0 0:25/1.0 N=6	(0.0) 0%						Begin Coring @ 12.2 ft COASTAL PLAIN GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION) (continued)	14.8
-10	-10.7	17.2										
-15	-15.7	22.2	3.5	1:30/1.0 1:15/1.0 1:08/1.0 0:31/0.6 N=4	(0.0) 0%							
-20	-20.7	27.2	3.5	0:36/1.0 0:28/1.0 0:31/1.0 0:15/0.6 N=6	(0.0) 0%						COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	26.2
-25	-25.6	32.1	3.5	0:35/1.0 0:37/1.0 0:29/1.0 0:21/0.6 N=39	(0.0) 0%							
-30	-30.6	37.1	3.5	2:31/1.0 2:27/1.0 2:20/1.0 0:52/0.6 N=100/0.2	(2.0) 57%						COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	32.8
-35	-35.7	42.2	4.8	1:56/1.0 1:58/1.0 1:36/1.0 1:35/1.0 N=39	(1.3) 27%							
-40	-40.6	47.1	3.5	3:00/0.8 1:13/1.0 1:04/1.0 0:58/1.0 N=36	(2.0) 57%						COASTAL PLAIN GRAY GREEN SAND, SAT. (RIVER BEND FORMATION)	46.1
-45	-45.6	52.1	3.5	0:24/0.6 0:30/1.0 0:21/1.0 0:22/1.0 0:15/0.6 N=49	(0.0) 0%							
-50	-50.6	57.1	3.5	0:32/1.0 0:42/1.0 0:45/1.0 0:21/0.6 N=57	(0.3) 9%							
-55	-56.1	62.6	4.0	0:20/1.0 0:21/1.0 0:16/1.0 0:10/0.6 N=37	(0.0) 0%							
-60	-61.2	67.7	3.7	0:17/1.0 0:15/1.0 0:18/1.0 0:12/0.7 N=42	(0.0) 0%							
-65	-66.2	72.7	3.5	0:18/1.0 0:15/1.0 0:16/1.0 0:11/0.6 N=63	(0.0) 0%							
-70	-71.2	77.7	3.5	0:24/1.0 0:34/1.0 0:23/1.0 0:12/0.6 N=52	(0.0) 0%						COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	75.8
-75	-78.2	82.7	3.5	1:11/1.0 2:19/1.0 0:45/1.0 0:21/0.6 N=100/0.6	(0.5) 14%							
-80	-81.1	87.6	4.4	0:31/1.0 0:35/1.0 0:32/1.0 0:25/1.0 0:15/0.5 N=46	(0.4) 9%							
-85	-82.6	89.1	3.5	0:45/1.0 0:51/1.0 0:32/1.0	(0.1) 3%							

NCDOT CORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear						
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)					
BORING NO. B6-B WBL		STATION 291+23		OFFSET 57 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 6.5 ft		TOTAL DEPTH 94.1 ft		NORTHING 417,451		EASTING 2,617,417						
DRILL RIG/HAMMER EFF./DATE CME-45			DRILL METHOD NW Casing W/SPT & Core			HAMMER TYPE Manual						
DRILLER Contract Driller		START DATE 09/17/02		COMP. DATE 09/17/02		SURFACE WATER DEPTH N/A						
CORE SIZE HQ		TOTAL RUN 60.4 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (%)	RUN RQD (%)	SAMP. NO.	STRATA REC. (%)	STRATA RQD (%)	LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
-85.7	-86.1	92.6		0:25/0.6 N=57							Begin Coring @ 92.2 ft	
											Boring Terminated at Elevation -87.6 ft in Limestone	94.1
											ARTESIAN HEAD ELEVATION = 13.0	



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear											
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)										
BORING NO. EB2-A EBL		STATION 292+13		OFFSET 46 ft LT		ALIGNMENT -L-											
COLLAR ELEV. 12.5 ft		TOTAL DEPTH 44.2 ft		NORTHING 417,525		EASTING 2,617,302											
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD Mud Rotary		HAMMER TYPE Manual											
DRILLER Contract Driller		START DATE 10/22/02		COMP. DATE 10/23/02		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)			
15														12.5	GROUND SURFACE	0.0	
10	12.5	0.0	2	3	5										ALLUVIAL TAN SAND WITH WOOD FRAGMENTS, MOIST TO SAT.		
5	7.6	4.9	13	20	24												
0	2.7	9.8	3	3	3												
-5	-2.3	14.8	4	4	4									-0.6	COASTAL PLAIN CLAYEY SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	13.1	
-10	-7.3	19.8	2	2	7												
-15	-11.6	24.1	4	5	5												
-20	-16.5	29.0	17	26	25									-14.4	COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	26.9	
-25	-21.5	34.0	4	5	6									-19.7		32.2	
-30	-26.5	39.0	17	83/0.2										-25.6	COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	38.1	
	-31.4	43.9												-31.7		44.2	
																Boring Terminated at Elevation -31.7 ft in Limestone	

NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

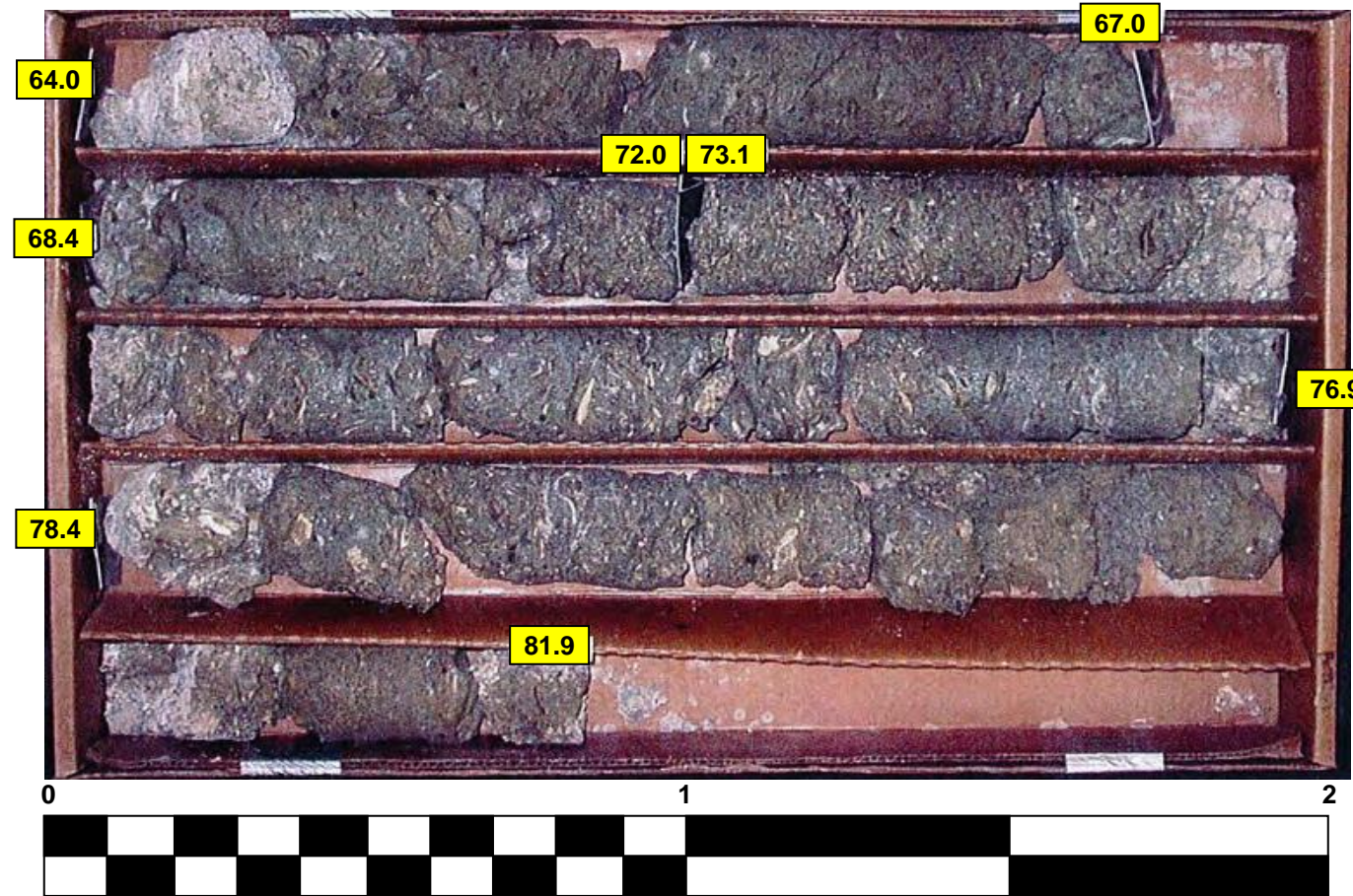
NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 34360.1.1		TIP R-1015		COUNTY CRAVEN		GEOLOGIST M. Lear									
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK							GROUND WTR (ft)								
BORING NO. EB2-B WBL		STATION 292+14		OFFSET 63 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 8.8 ft		TOTAL DEPTH 45.4 ft		NORTHING 417,542		EASTING 2,617,409									
DRILL RIG/HAMMER EFF./DATE CME-45				DRILL METHOD Mud Rotary		HAMMER TYPE Manual									
DRILLER Contract Driller		START DATE 10/23/02		COMP. DATE 10/23/02		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					ELEV. (ft)
10	8.8	0.0	1	2	2								8.8	GROUND SURFACE	0.0
5	3.7	5.1	5	14	12									ALLUVIAL GRAY SAND WITH WOOD FRAGMENTS, MOIST TO SAT.	
0	-1.4	10.2	16	8	5								-0.4	COASTAL PLAIN GRAY GREEN CLAYEY SAND, SAT. (DUPLIN FORMATION)	9.2
-5	-6.4	15.2	2	2	4										
-10	-10.3	19.1	3	3	4								-8.9	COASTAL PLAIN GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)	17.7
-15	-15.3	24.1	3	3	4										
-20	-20.3	29.1	2	3	3										
-25	-25.3	34.1	57	17	17								-25.0	COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	33.8
-30	-30.4	39.2	87	13/0.1											
-35	-35.2	44.0	12	27	73/0.4								-36.6		45.4
														Boring Terminated at Elevation -36.6 ft in Limestone	
														ARTESIAN HEAD ELEVATION =13.0	
														Other Samples: ST-1 (21.0 - 23.0)	

NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

CORE PHOTOGRAPH
B1-A EBL
Box 1 of 1 (64.0' to 81.9')

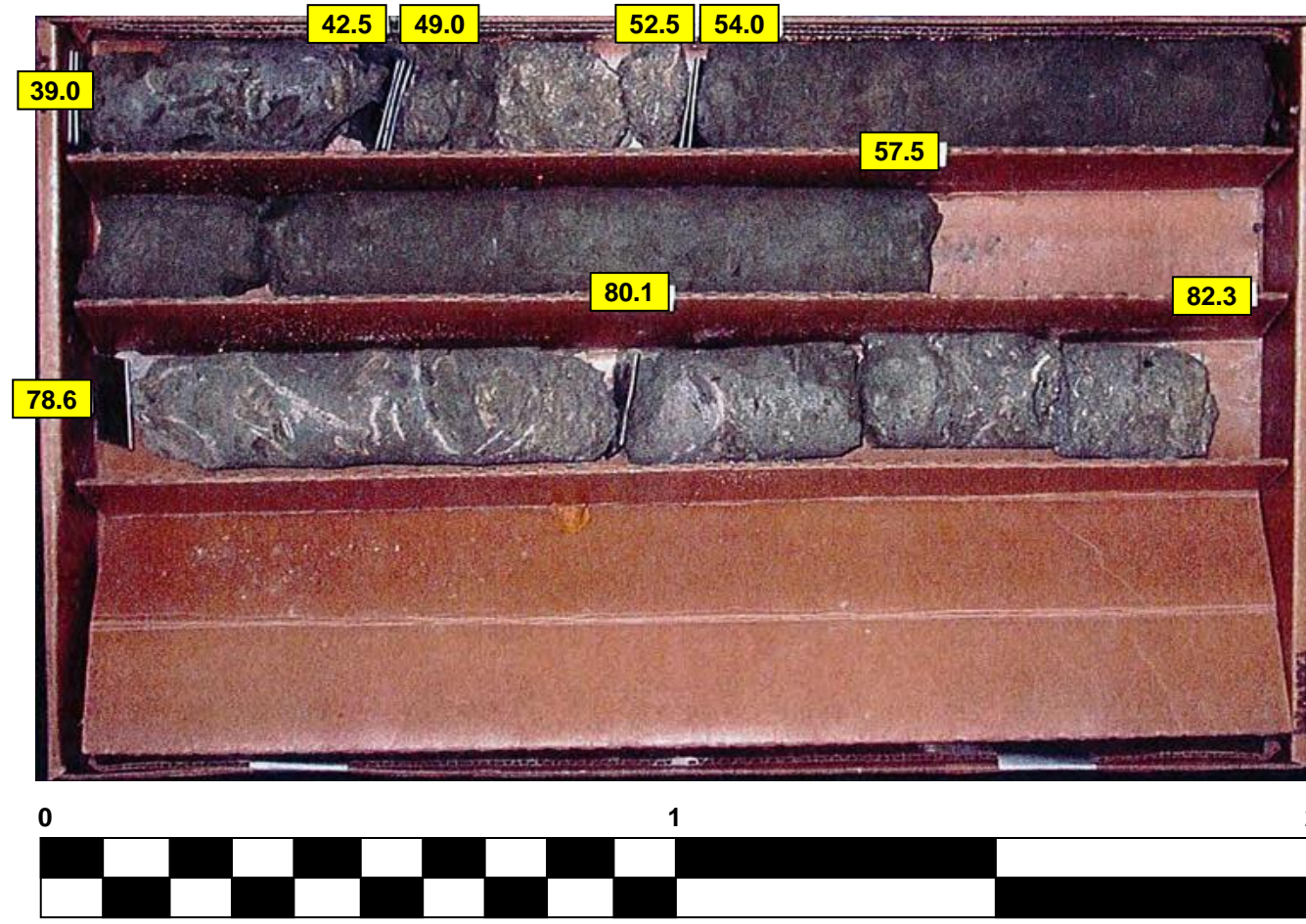


FEET

CORE PHOTOGRAPH

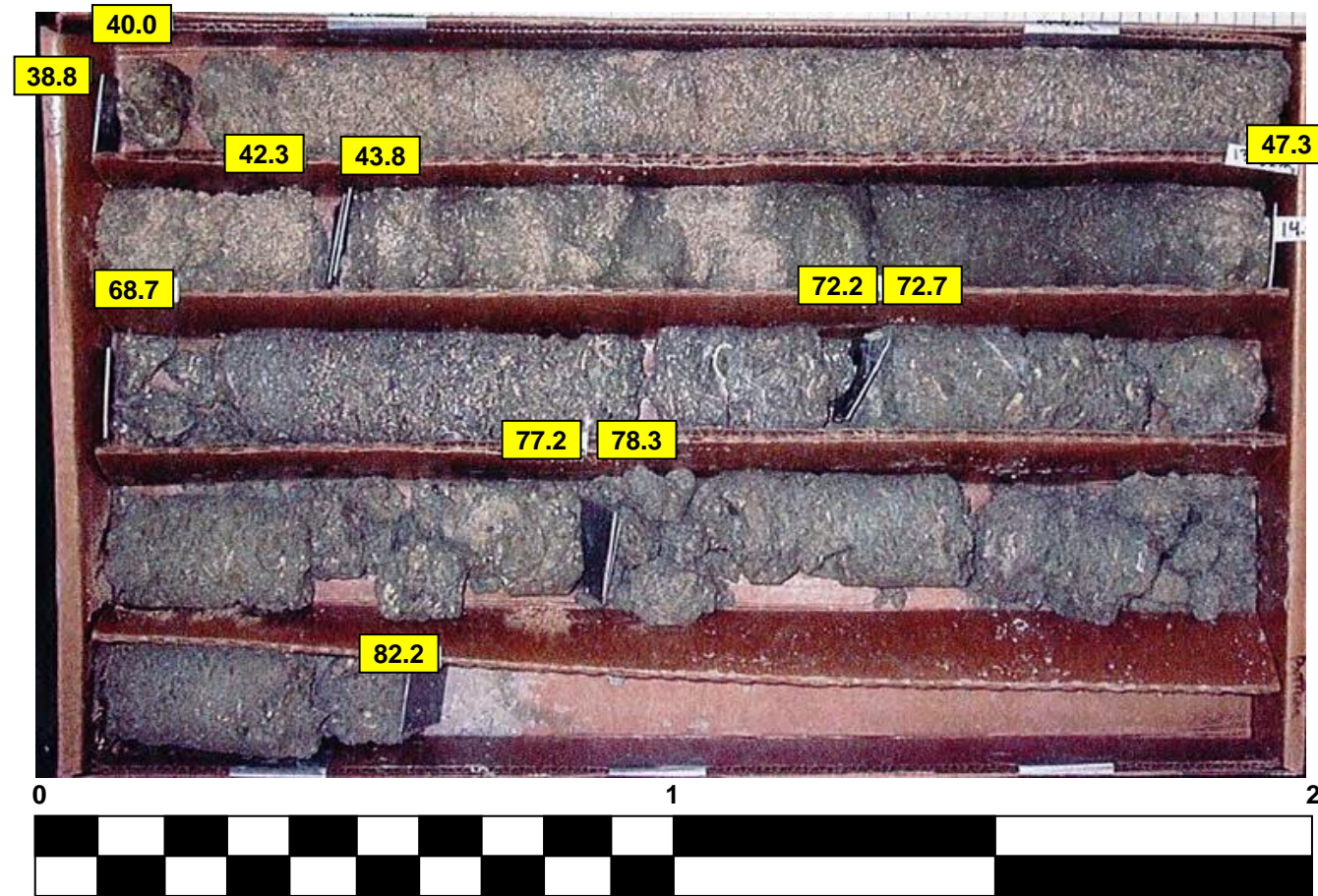
B1-B WBL

Box 1 of 1 (39.0' to 82.3')



FEET

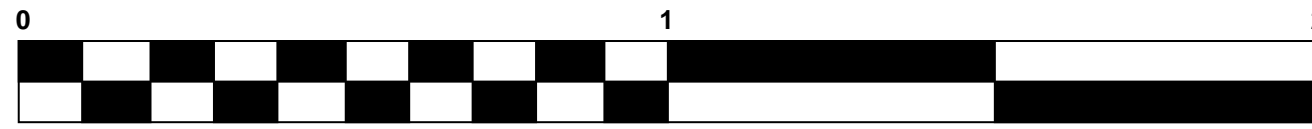
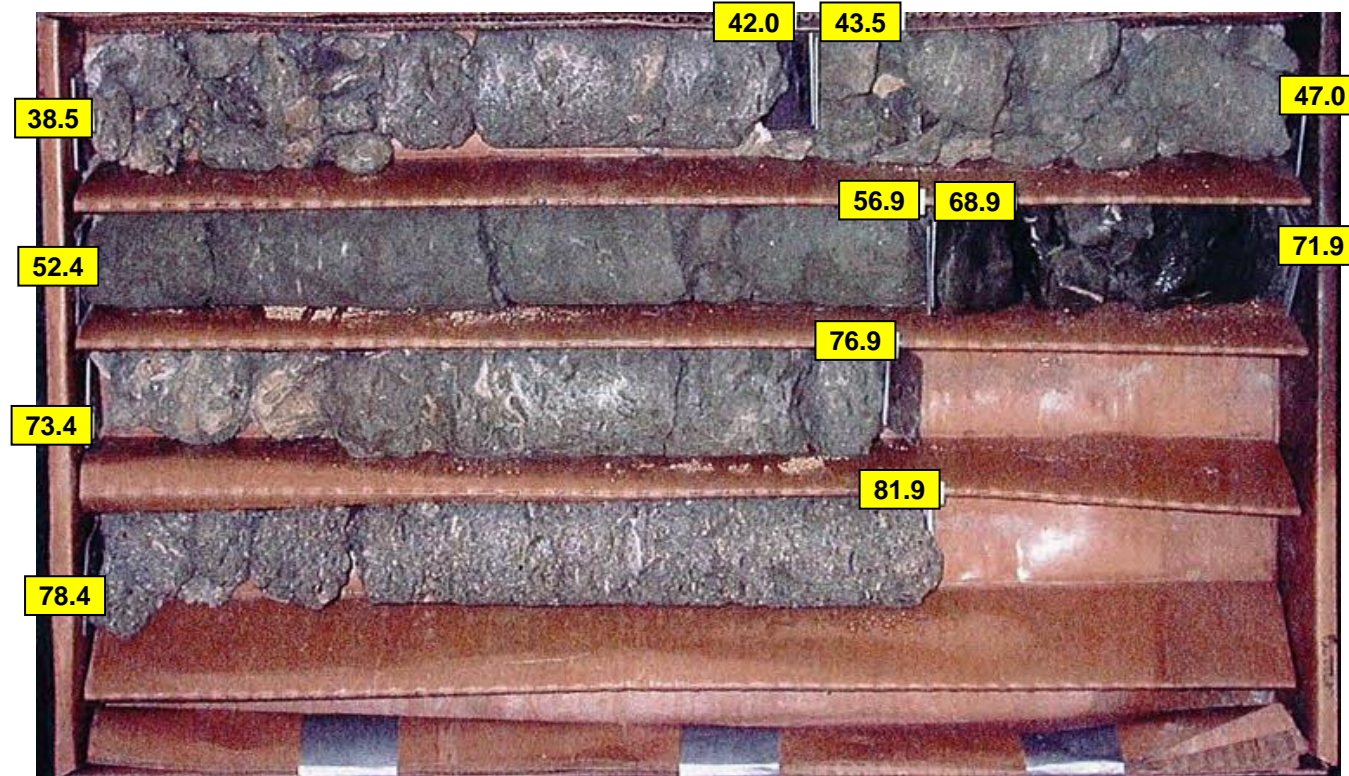
CORE PHOTOGRAPH
B2-A EBL
Box 1 of 1 (38.8' to 82.2')



FEET

CORE PHOTOGRAPH B2-B WBL

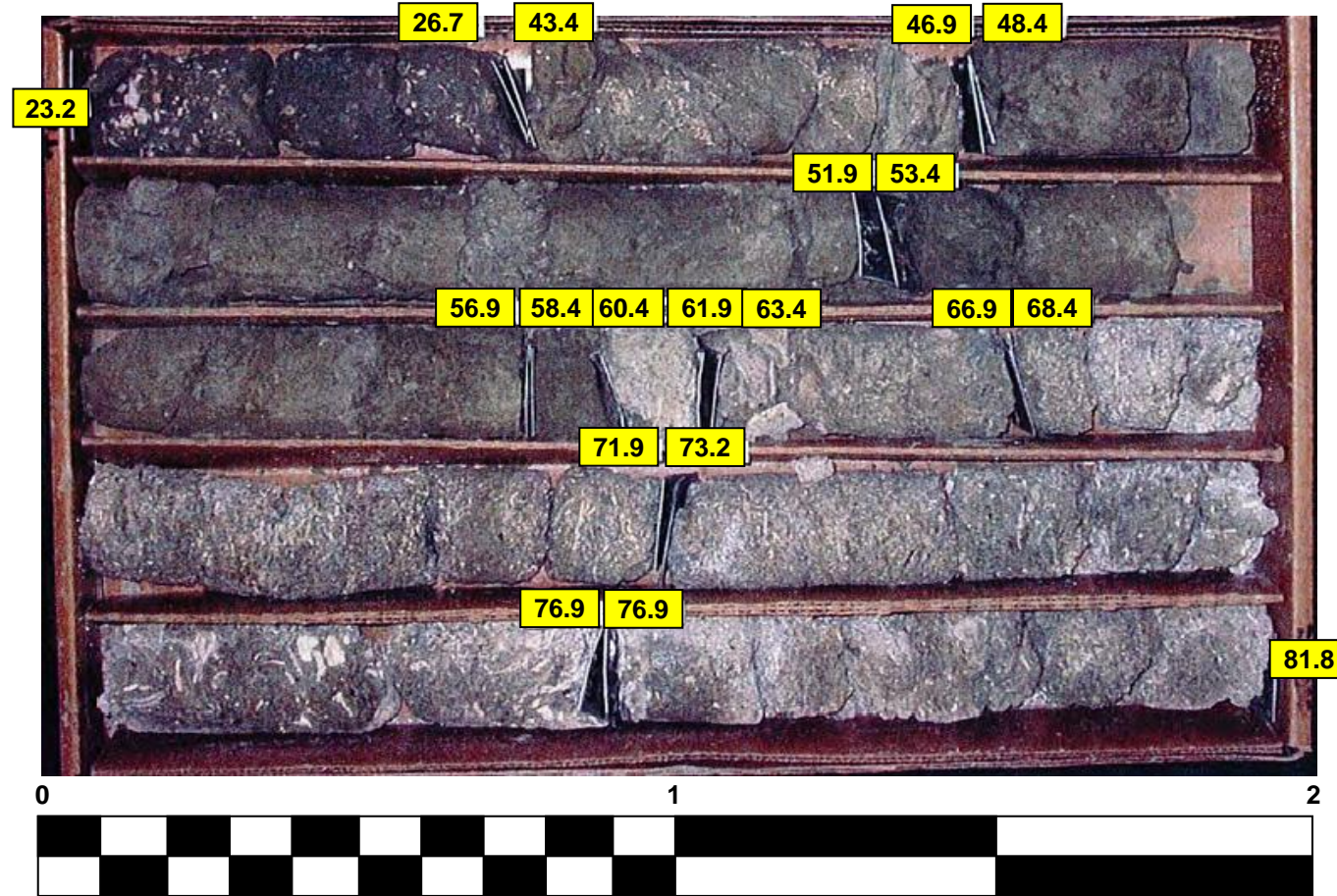
Box 1 of 1 (38.5' to 81.9')



FEET

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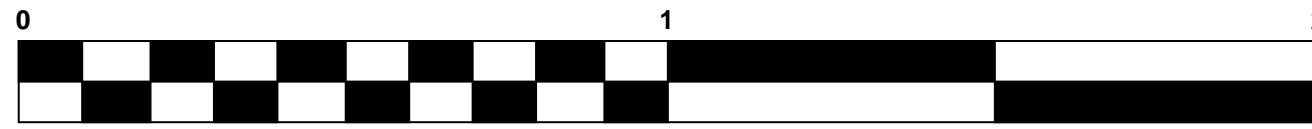
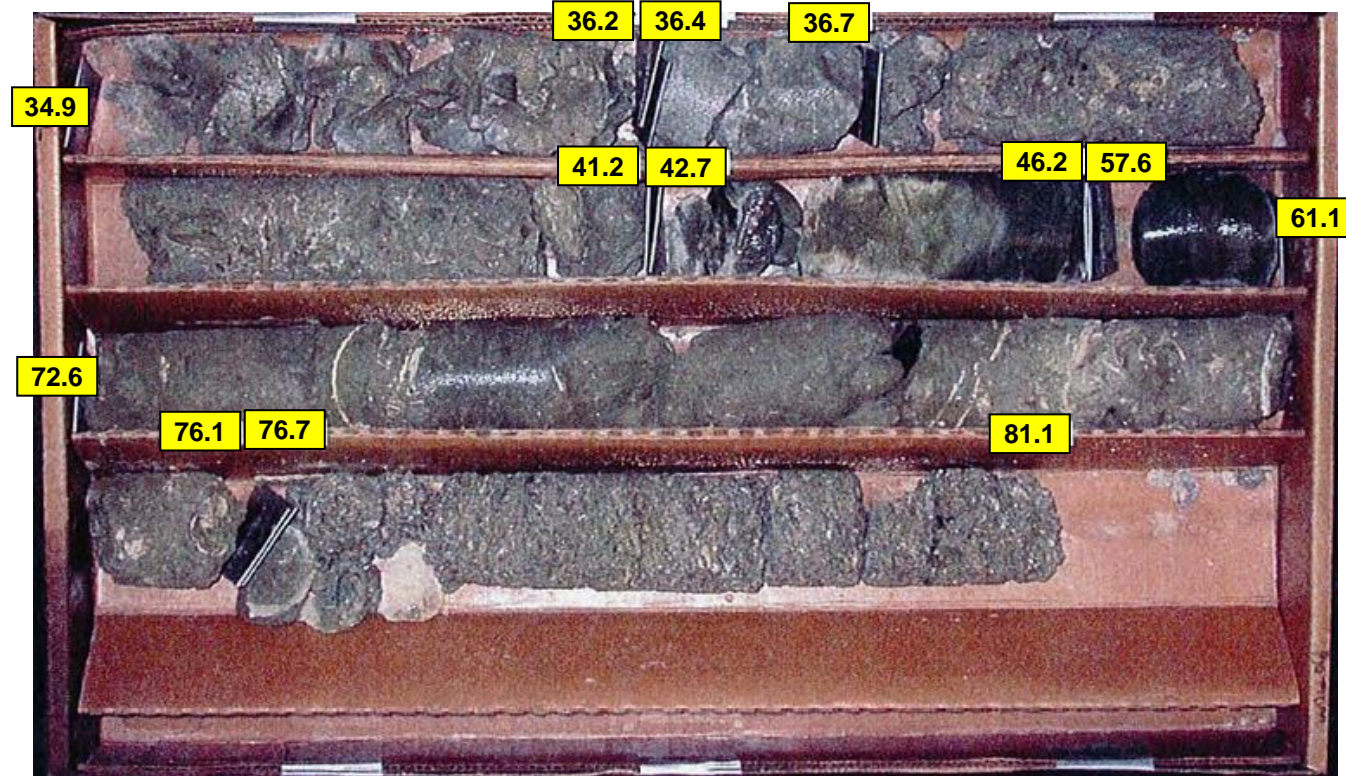
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FEET

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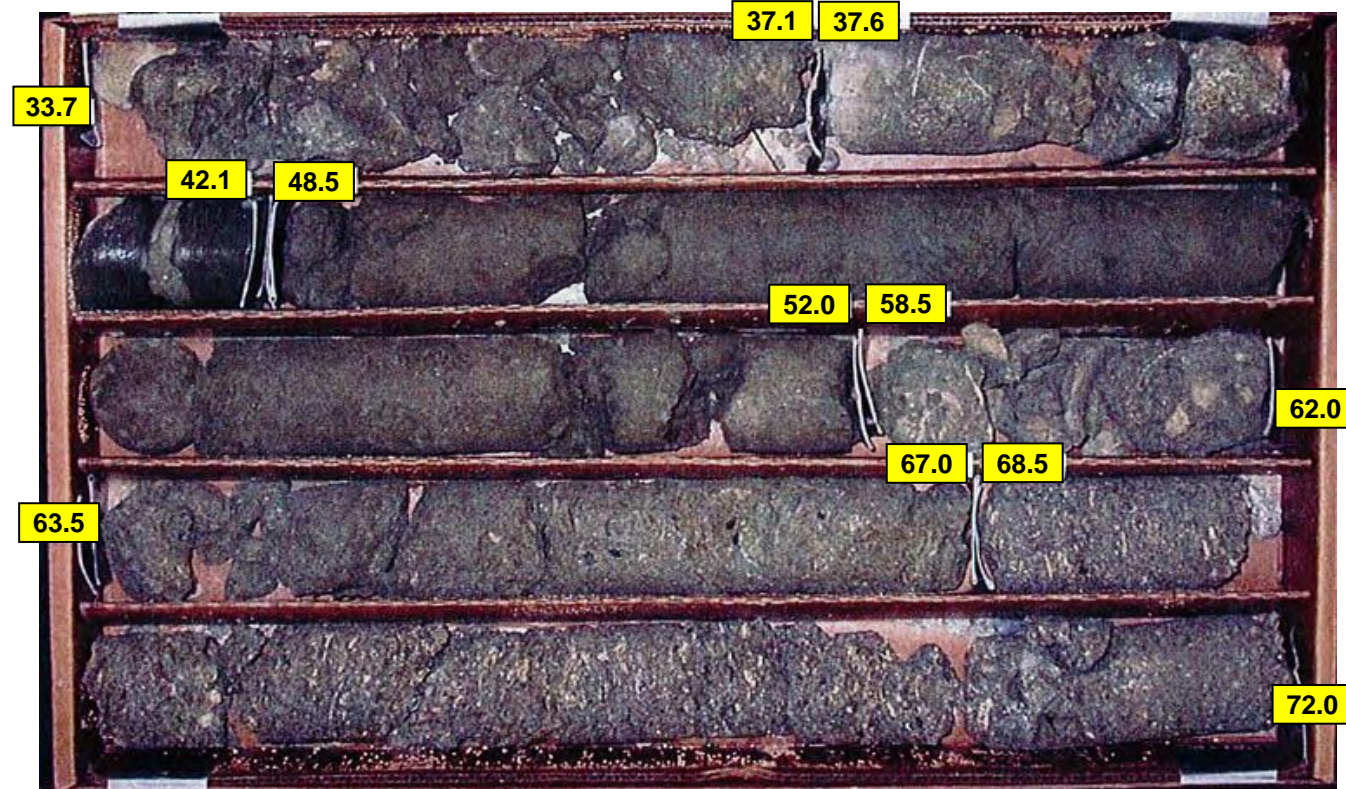
Box 1 of 1 (35.5' to 81.1')



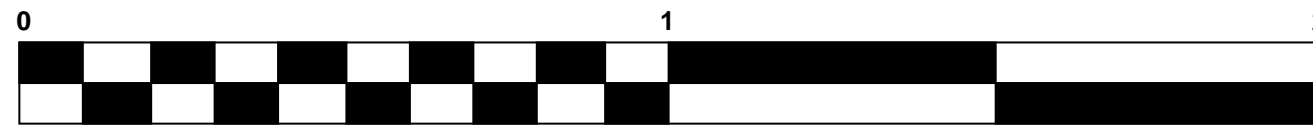
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CORE PHOTOGRAPH B4-A EBL

Box 1 of 2 (33.7' to 72.0')



Box 2 of 2 (73.1' to 77.0')



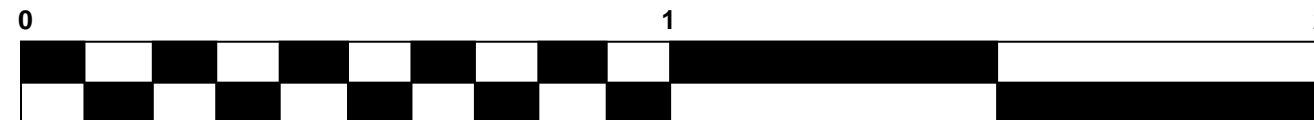
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CORE PHOTOGRAPH B4-B WBL

Box 1 of 2 (33.1' to 86.5')

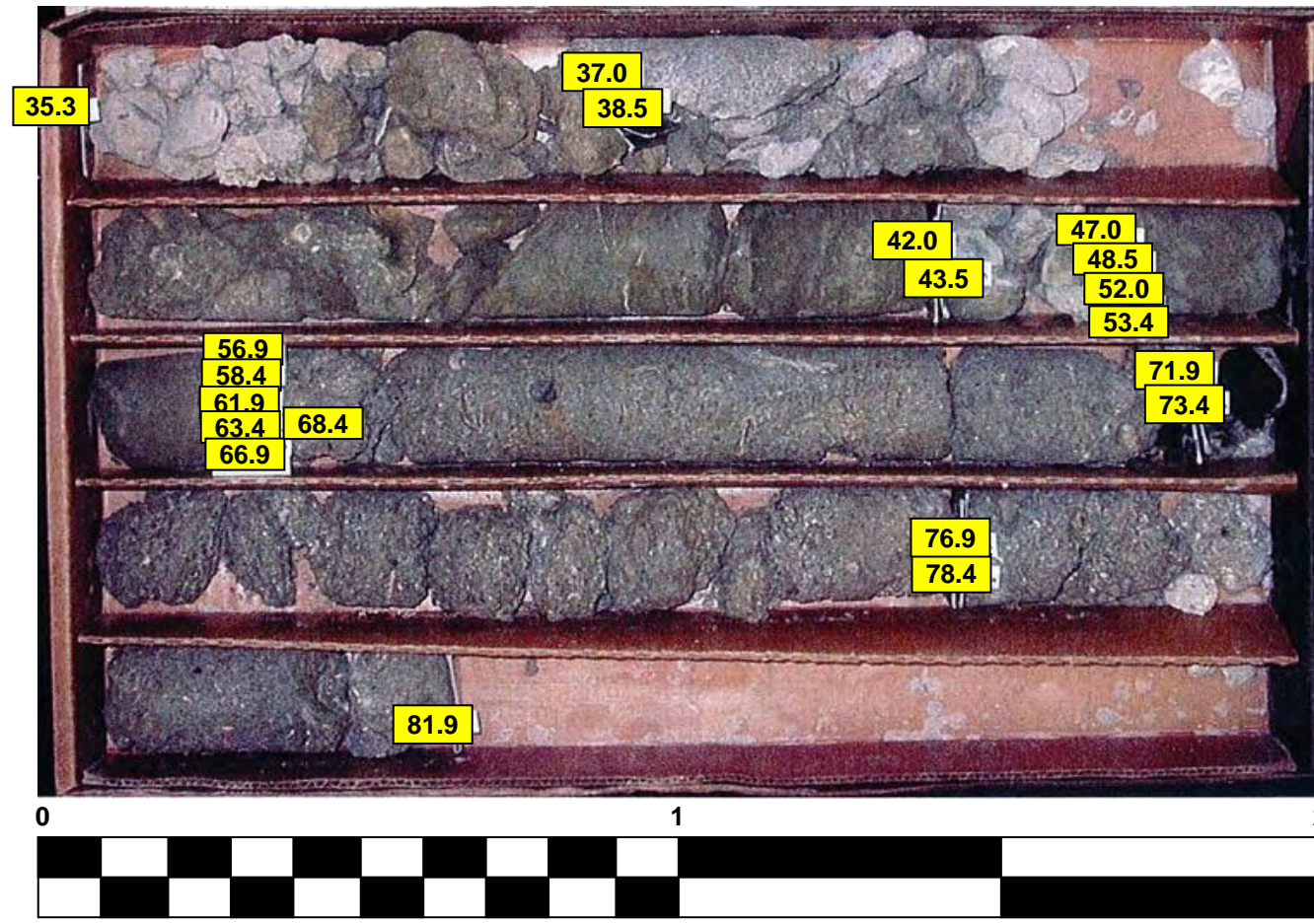


Box 2 of 2 (87.6' to 96.5')



FEET

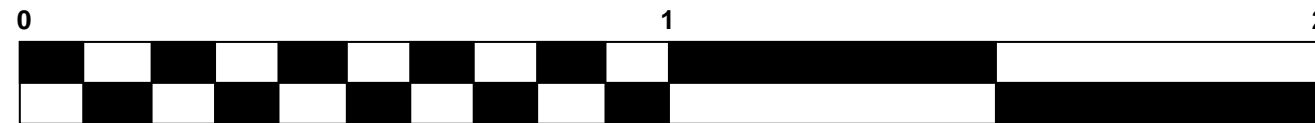
CORE PHOTOGRAPH
B5-A EBL
Box 1 of 1 35.3' to 81.9')



FEET

CORE PHOTOGRAPH B5-B WBL

Box 1 of 1 (28.8' to 82.2')



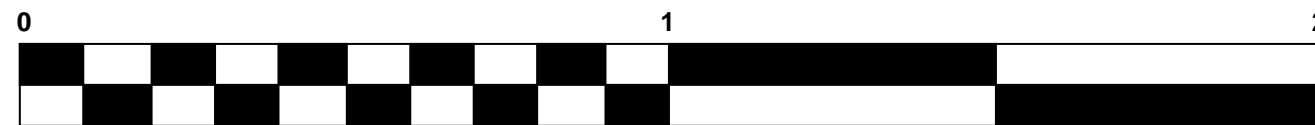
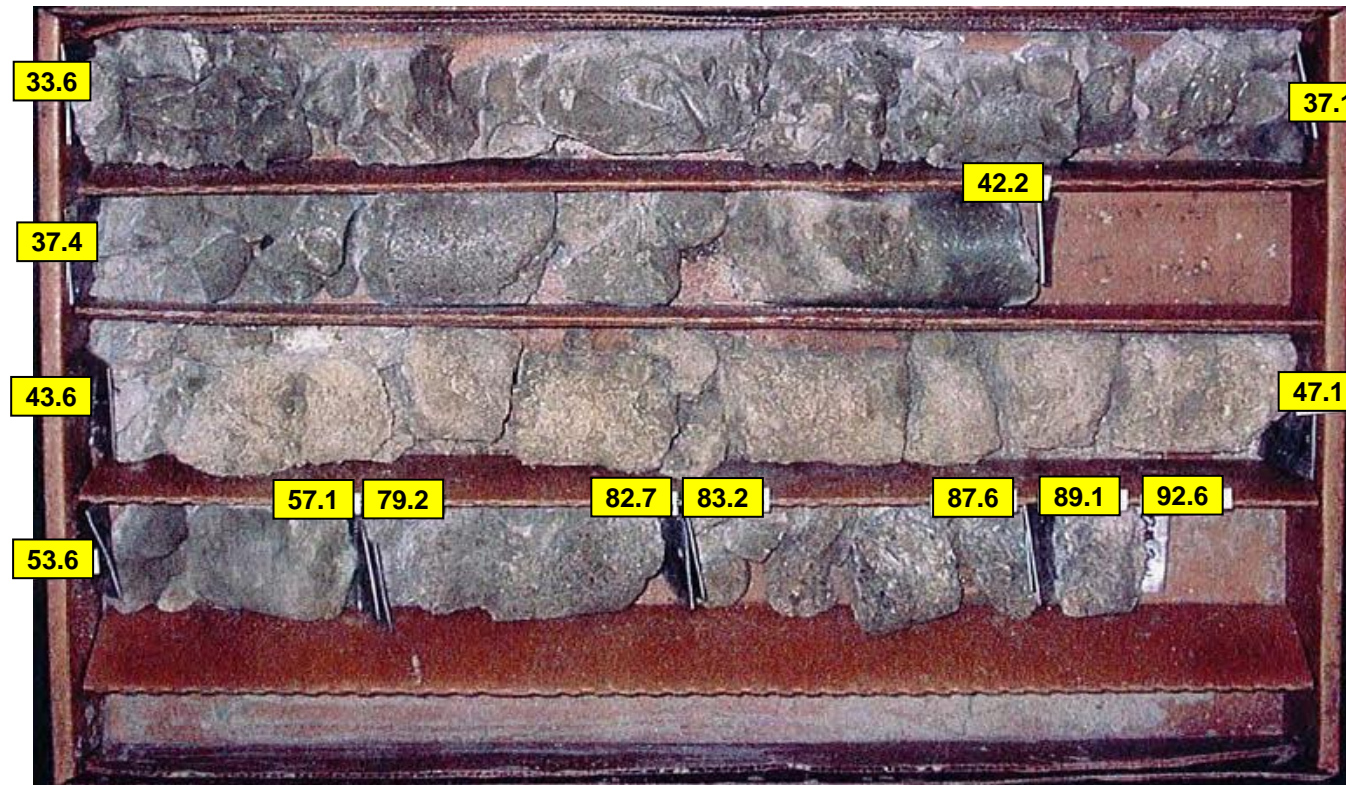
FEET

CORE PHOTOGRAPH
B6-A EBL

Box 1 of 1 (38.7' to 82.1')



CORE PHOTOGRAPH
B6-B WBL
Box 1 of 1 (33.6' to 92.7')



FEET

REFERENCE: R-1015

PROJECT: 34360

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

**STRUCTURE
SUBSURFACE INVESTIGATION**

COUNTY CRAVEN
PROJECT DESCRIPTION US 70 (HAVELOCK BYPASS)
FROM SOUTH OF CARTERET /CRAVEN COUNTY
LINE TO SOUTH OF SR 1176
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747
SUNSET DRIVE) OVER -L- (US 70 HAVELOCK
BYPASS) AT STA 44+71.82

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5	CROSS SECTION
6-9	BORE LOGS
10	SOIL TEST RESULTS
11	SITE PHOTOGRAPHS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-1015	1	11

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

ES Setnicky

RM Bleifernich

JR Helms

BR Spiro

GW Stalls

INVESTIGATED BY GET SOLUTIONS

DRAWN BY JR Helms; BR Spiro

CHECKED BY GW Stalls

SUBMITTED BY GW Stalls

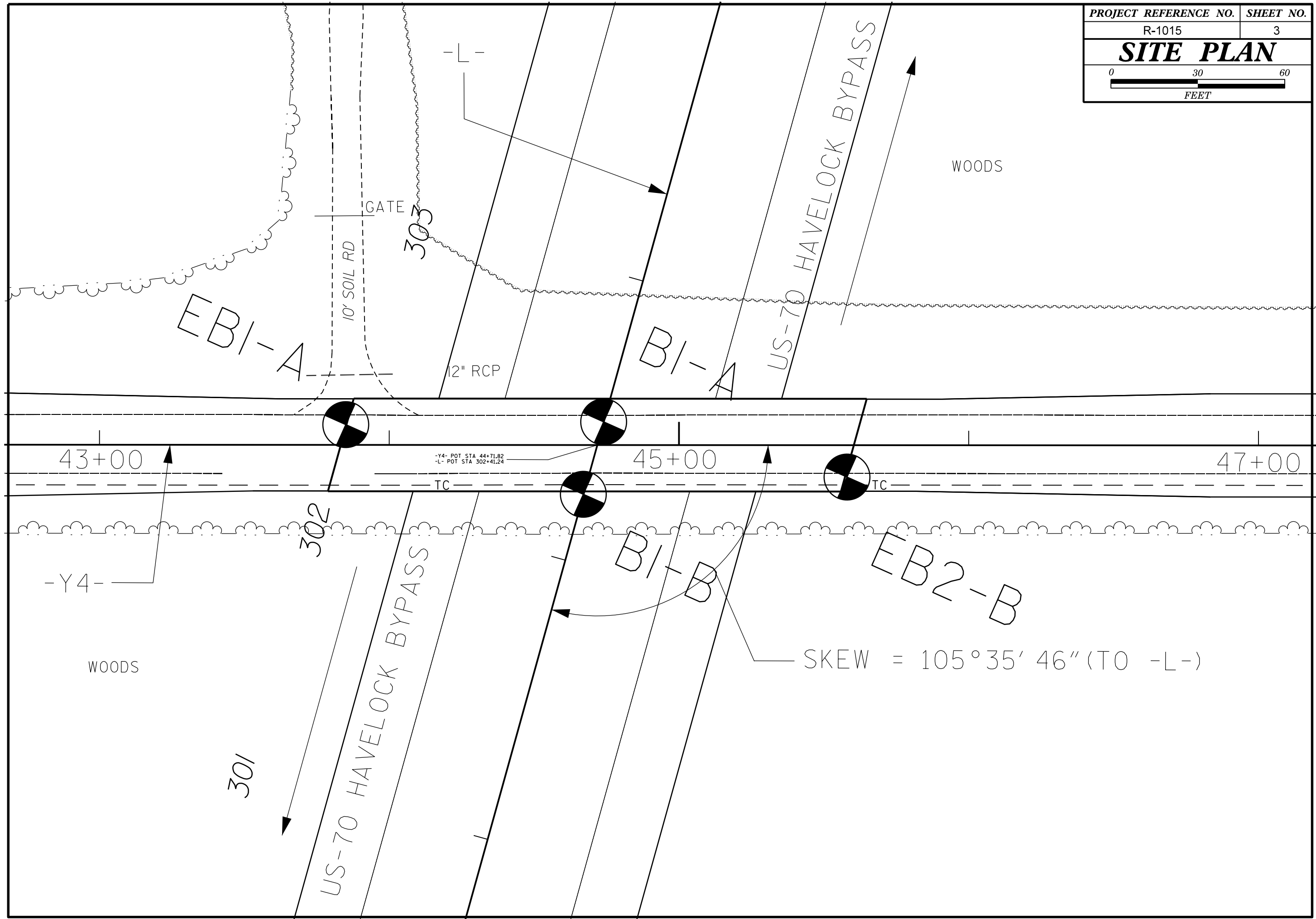
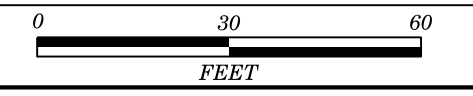
DATE April, 2016



DocuSigned by:
Gerald W. Stalls, Jr. 7/14/2016
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SIGNATURE DATE

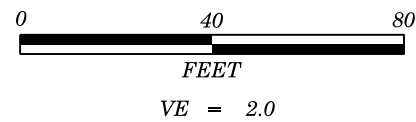
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UNLESS ALL SIGNATURES COMPLETED**

SITE PLAN

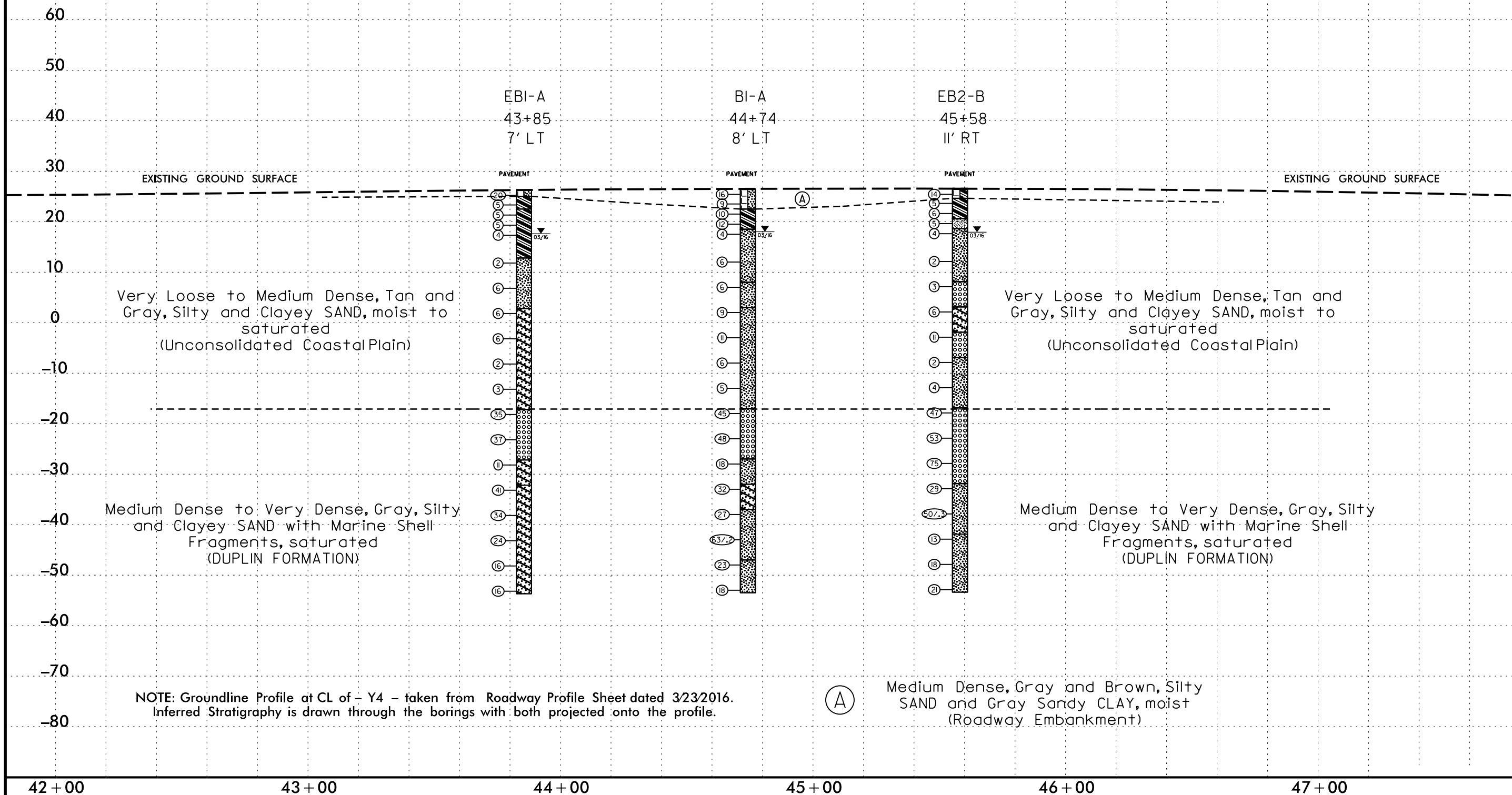


-Y4- POT STA 44+71.82
-L- POT STA 302+41.24

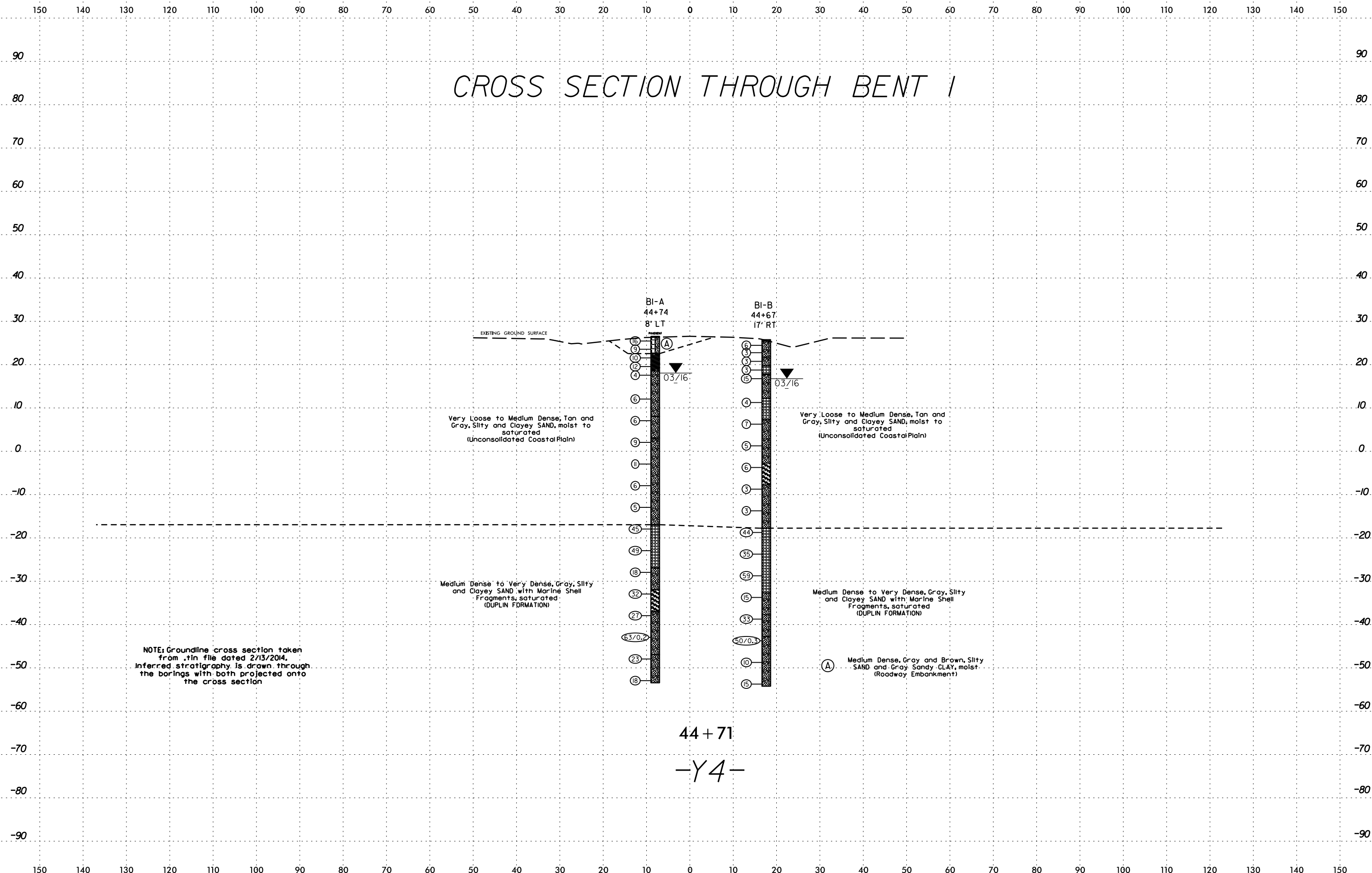
SKEW = 105°35'46" (TO -L-)



PROJECT REFERENCE NO.	SHEET NO.
R-1015	4
SUBSURFACE PROFILE ALONG -Y4- CENTERLINE	



CROSS SECTION THROUGH BENT 1



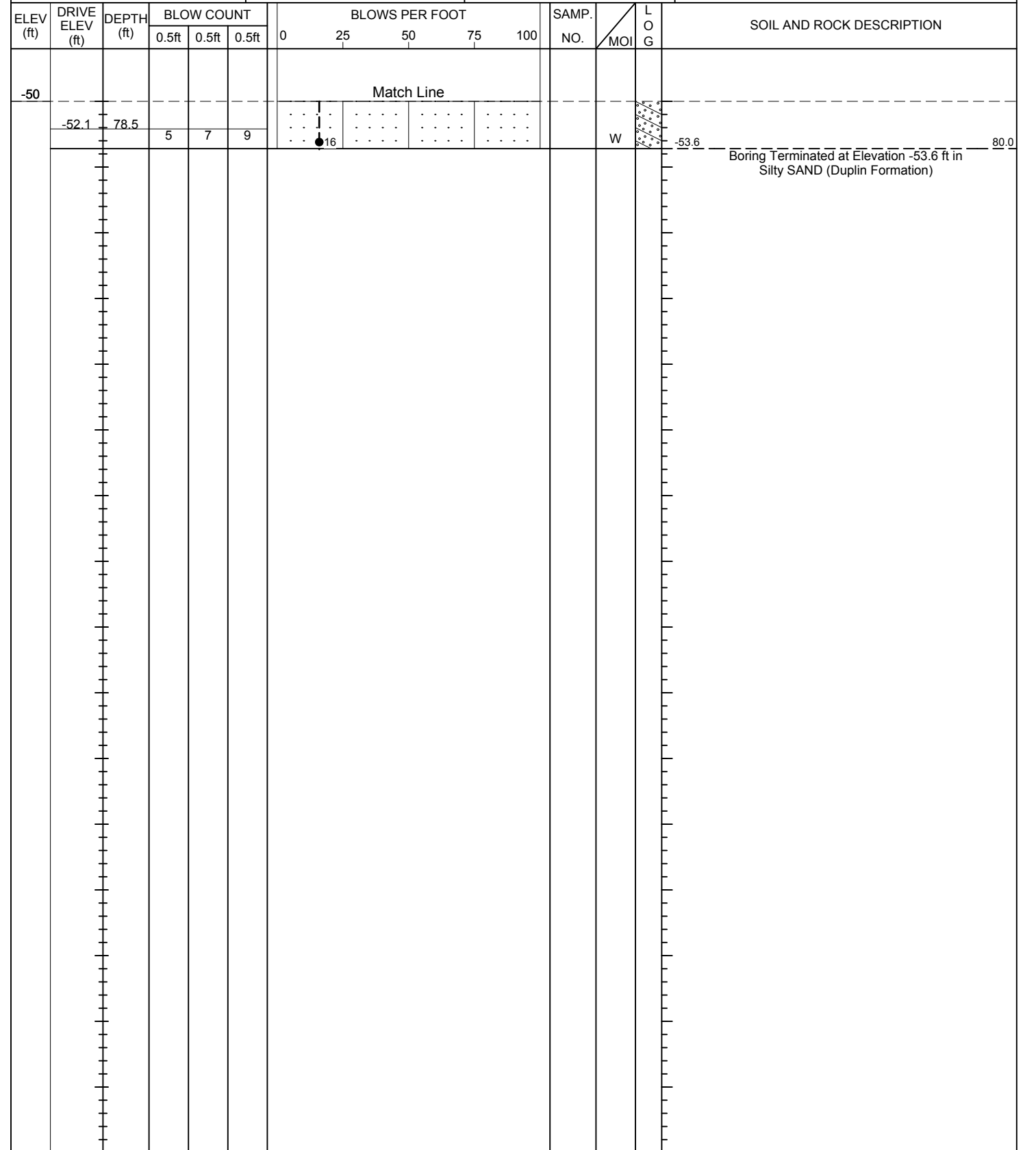
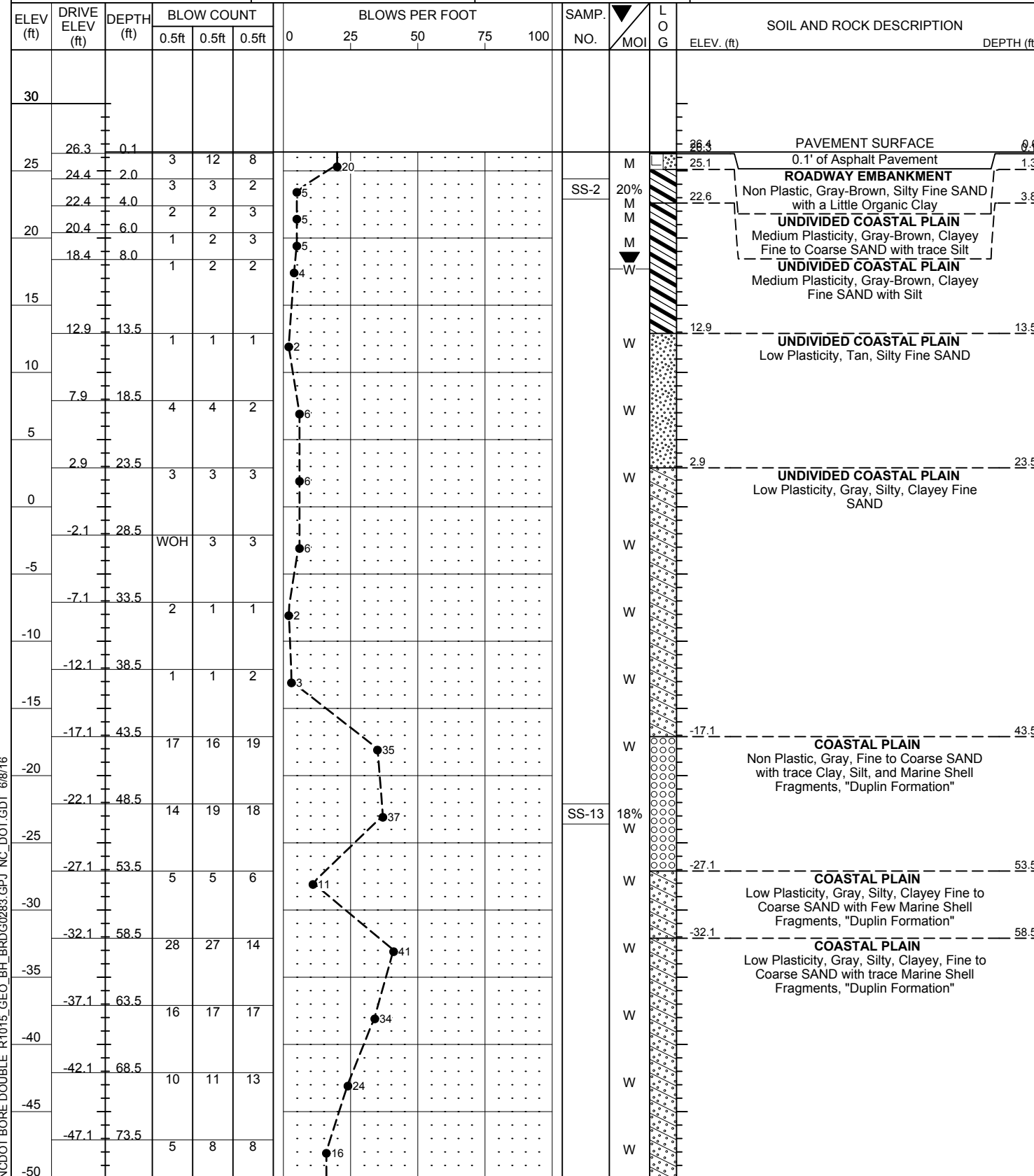
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GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34360.1.2	TIP R-1015	COUNTY CRAVEN	GEOLOGIST Bliefertich, R.
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8			GROUND WTR (ft)
BORING NO. EB1-A	STATION 43+85	OFFSET 7 ft LT	ALIGNMENT -Y4-
COLLAR ELEV. 26.4 ft	TOTAL DEPTH 80.0 ft	NORTHING 418,520	EASTING 2,617,108
DRILL RIG/HAMMER EFF./DATE GET7255 CME-55 80% 01/04/2016		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Donahue, T.	START DATE 03/24/16	COMP. DATE 03/24/16	SURFACE WATER DEPTH N/A

WBS 34360.1.2	TIP R-1015	COUNTY CRAVEN	GEOLOGIST Bliefertich, R.
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8			GROUND WTR (ft)
BORING NO. EB1-A	STATION 43+85	OFFSET 7 ft LT	ALIGNMENT -Y4-
COLLAR ELEV. 26.4 ft	TOTAL DEPTH 80.0 ft	NORTHING 418,520	EASTING 2,617,108
DRILL RIG/HAMMER EFF./DATE GET7255 CME-55 80% 01/04/2016		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Donahue, T.	START DATE 03/24/16	COMP. DATE 03/24/16	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE R1015_GEO_BH_BRDGG0283.GPJ NC_DOT.GDT 6/8/16

GEOTECHNICAL BORING REPORT BORE LOG

WBS 34360.1.2			TIP R-1015			COUNTY CRAVEN			GEOLOGIST Setnicky, E.		
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8							GROUND WTR (ft)				
BORING NO. B1-A			STATION 44+74			OFFSET 8 ft LT			ALIGNMENT -Y4-		
COLLAR ELEV. 26.6 ft			TOTAL DEPTH 80.0 ft			NORTHING 418,556			EASTING 2,617,189		
DRILL RIG/HAMMER EFF./DATE GET4354 CME-45C 81% 01/06/2016			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic					
DRILLER Riddick, W.			START DATE 03/24/16			COMP. DATE 03/24/16			SURFACE WATER DEPTH N/A		

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
30														PAVEMENT SURFACE 0.1' of Asphalt Pavement	26.6	0.0	
25	26.5	0.1	5	7	9	16							M	ROADWAY EMBANKMENT Low Plasticity, Gray, Silty Fine SAND with Trace Clay	22.6	4.0	
	24.6	2.0	3	4	5								M	UNDIVIDED COASTAL PLAIN Low Plasticity, Tan, Clayey Fine SAND with Silt	18.6	8.0	
20	22.6	4.0	6	5	5								M	UNDIVIDED COASTAL PLAIN Low Plasticity, Tan, Silty Fine SAND with Trace Clay	8.1	18.5	
	20.6	6.0	5	6	6								W				
	18.6	8.0	1	2	2								W				
15													W				
	13.1	13.5	2	1	5								W				
10													W				
	8.1	18.5	1	3	3								SS-26	23% W	UNDIVIDED COASTAL PLAIN Low Plasticity, Tan, Silty Fine to Medium SAND	3.1	23.5
5													W	UNDIVIDED COASTAL PLAIN Low Plasticity, Gray, Silty Fine SAND			
	3.1	23.5	6	3	6								W				
0													W				
	-1.9	28.5	3	4	7								W				
-5													W				
	-6.9	33.5	3	3	3								W				
-10													W				
	-11.9	38.5	3	3	2								SS-30	23% W			
-15													W				
	-16.9	43.5	10	20	25								W	COASTAL PLAIN Non Plastic, Dark Gray, Fine to Coarse SAND with Trace Marine Shell Fragments, "Duplin Formation"	-16.9	43.5	
-20													W				
	-21.9	48.5	15	21	28								W				
-25													W				
	-26.9	53.5	9	8	10								W	COASTAL PLAIN Low Plasticity, Dark Gray, Silty Fine to Coarse SAND with Trace Marine Shell Fragments, "Duplin Formation"	-26.9	53.5	
-30													W				
	-31.9	58.5	8	15	17								SS-34	19% W	COASTAL PLAIN Medium Plasticity, Gray, Silty, Clayey Fine to Coarse SAND with Trace Marine Shell Fragments and Fine Gravel, "Duplin Formation"	-31.9	58.5
-35													W				
	-36.9	63.5	7	8	19								W	COASTAL PLAIN Non Plastic, Dark Gray, Silty Fine to Coarse SAND with Trace Clay and Some Marine Shell Fragments, "Duplin Formation" SPT Refusal Noted At 68.7 Feet with 63 Blows/0.2 Feet	-36.9	63.5	
-40													W				
	-41.9	68.5	63/0.2										W				
-45													W				
	-46.9	73.5	6	9	14								W	COASTAL PLAIN Non Plastic, Dark Gray, Fine SAND with Silt and Clay, "Duplin Formation"	-46.9	73.5	
-50																	

NCDOT BORE DOUBLE R1015_GEO_BH_BRDG0283.GPJ NC_DOT_GDT 6/8/16

WBS 34360.1.2			TIP R-1015			COUNTY CRAVEN			GEOLOGIST Setnicky, E.		
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8							GROUND WTR (ft)				
BORING NO. B1-A			STATION 44+74			OFFSET 8 ft LT			ALIGNMENT -Y4-		
COLLAR ELEV. 26.6 ft			TOTAL DEPTH 80.0 ft			NORTHING 418,556			EASTING 2,617,189		
DRILL RIG/HAMMER EFF./DATE GET4354 CME-45C 81% 01/06/2016			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic					
DRILLER Riddick, W.			START DATE 03/24/16			COMP. DATE 03/24/16			SURFACE WATER DEPTH N/A		

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
-50														Match Line		
	-51.9	78.5	5	8	10								W	COASTAL PLAIN Non Plastic, Dark Gray, Fine SAND with Silt and Clay, "Duplin Formation" <i>(continued)</i> Boring Terminated at Elevation -53.4 ft in Silty SAND (Duplin Formation)	-53.4	80.0

GEOTECHNICAL BORING REPORT
BORE LOG

Table with header information for Bore Log 34360.1.2. Includes fields for WBS, TIP, COUNTY, GEOLOGIST, SITE DESCRIPTION, BORING NO., STATION, OFFSET, ALIGNMENT, GROUND WTR, COLLAR ELEV., TOTAL DEPTH, NORTHING, EASTING, DRILL RIG/HAMMER EFF./DATE, DRILL METHOD, HAMMER TYPE, DRILLER, START DATE, COMP. DATE, and SURFACE WATER DEPTH.

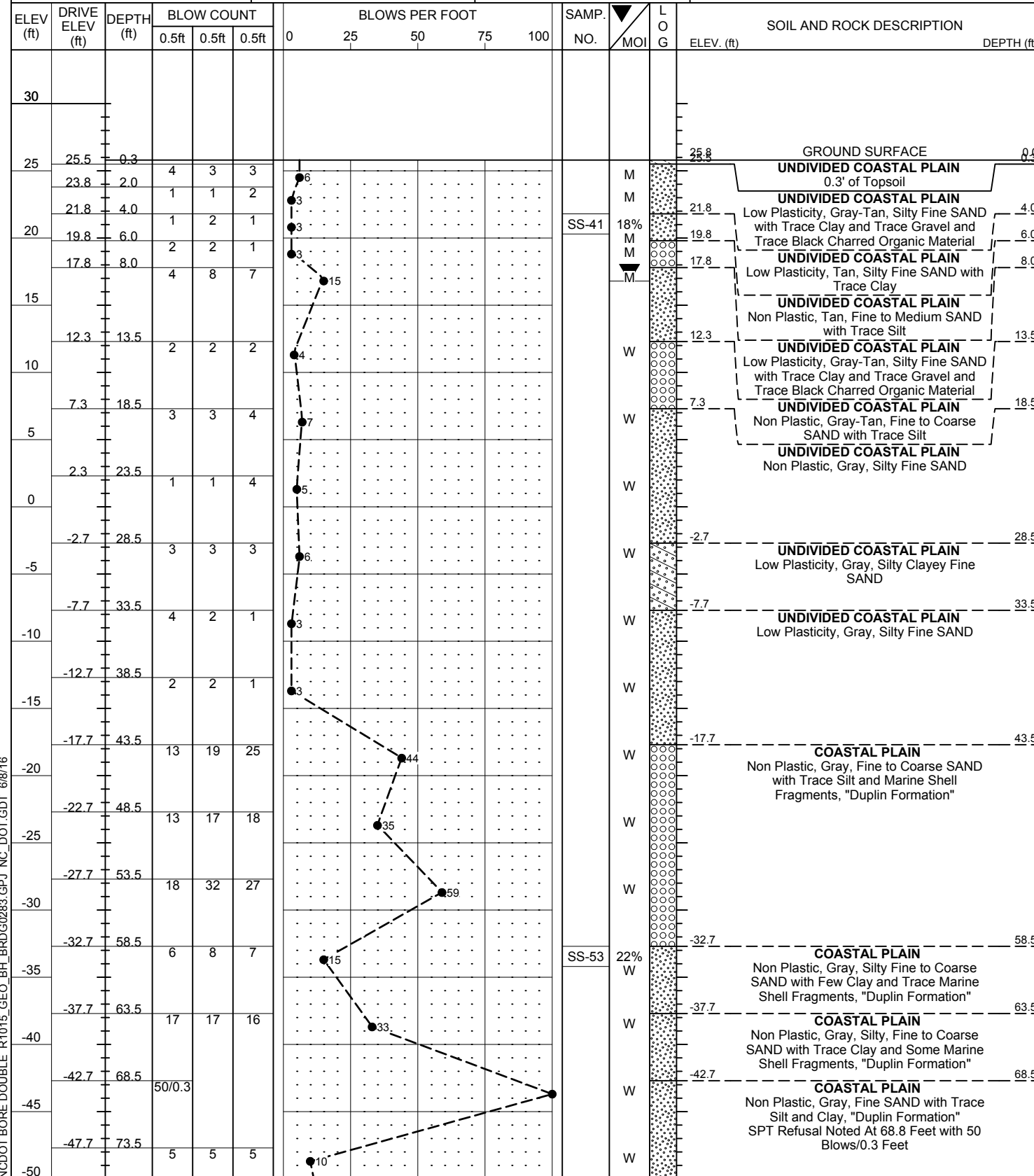
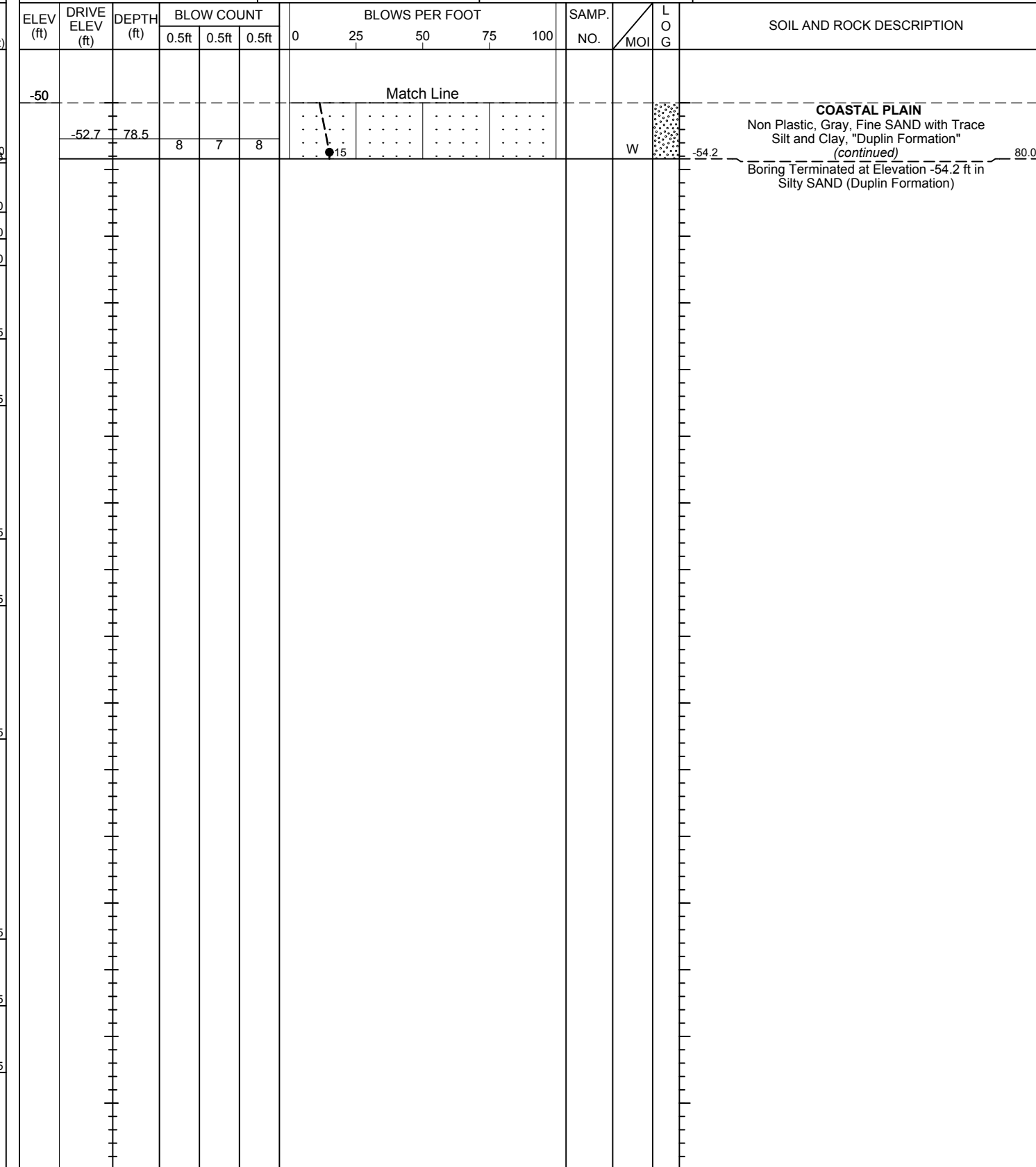


Table with header information for Bore Log 34360.1.2 (continued). Includes fields for WBS, TIP, COUNTY, GEOLOGIST, SITE DESCRIPTION, BORING NO., STATION, OFFSET, ALIGNMENT, GROUND WTR, COLLAR ELEV., TOTAL DEPTH, NORTHING, EASTING, DRILL RIG/HAMMER EFF./DATE, DRILL METHOD, HAMMER TYPE, DRILLER, START DATE, COMP. DATE, and SURFACE WATER DEPTH.



NCDOT BORE DOUBLE R1015_GEO_BH_BRDG0283.GPJ_NC_DOT.GDT 6/8/16

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34360.1.2	TIP R-1015	COUNTY CRAVEN	GEOLOGIST Setnicky, E.		
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELock BYPASS) AT STA 44+71.8					
GROUND WTR (ft)					
BORING NO. EB2-B	STATION 45+58	OFFSET 11 ft RT	ALIGNMENT -Y4-	0 HR. 8.0	
COLLAR ELEV. 26.7 ft	TOTAL DEPTH 80.0 ft	NORTHING 418,574	EASTING 2,617,274	24 HR. 8.7	
DRILL RIG/HAMMER EFF./DATE GET4354 CME-45C 81% 01/06/2016		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic	
DRILLER Riddick, W.	START DATE 03/24/16	COMP. DATE 03/24/16	SURFACE WATER DEPTH N/A		

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
30																	
26.5	26.5	0.2	9	6	8										26.5	0.2	PAVEMENT SURFACE 0.2' of Asphalt Pavement
24.7	24.7	2.0	1	2	3						SS-59	20%	20%	24.7	2.0	ROADWAY EMBANKMENT Medium Plasticity, Dark Gray, Sandy Lean CLAY	
22.7	22.7	4.0	1	2	4									20.7	6.0	UNDIVIDED COASTAL PLAIN Medium Plasticity, Tan, Clayey Fine to Coarse SAND with trace Silt	
20.7	20.7	6.0	1	2	3									18.7	8.0	UNDIVIDED COASTAL PLAIN Low Plasticity, Tan, Clayey Fine SAND with Silt	
18.7	18.7	8.0	2	2	2						W					UNDIVIDED COASTAL PLAIN Non Plastic, Tan, Silty Fine SAND	
13.2	13.2	13.5	1	1	1						W						
8.2	8.2	18.5	1	2	1						W				8.2	18.5	UNDIVIDED COASTAL PLAIN Non Plastic, Red-Tan, Fine to Medium SAND with Silt
3.2	3.2	23.5	3	3	3						W				3.2	23.5	UNDIVIDED COASTAL PLAIN Low Plasticity, Red-Tan, Silty, Clayey Fine SAND
-1.8	-1.8	28.5	3	4	7						SS-66	19%	19%	-1.8	28.5	UNDIVIDED COASTAL PLAIN Non Plastic, Tan, Fine SAND with Trace Silt	
-6.8	-6.8	33.5	1	1	1						W				-6.8	33.5	UNDIVIDED COASTAL PLAIN Low Plasticity, Dark Gray, Silty Fine SAND with Trace Clay
-11.8	-11.8	38.5	1	2	2						W						
-16.8	-16.8	43.5	11	22	25						W				-16.8	43.5	COASTAL PLAIN Non Plastic, Dark Gray, Fine to Coarse SAND with Some Silt and Trace Marine Shell Fragments, "Duplin Formation"
-21.8	-21.8	48.5	16	24	29						W						
-26.8	-26.8	53.5	11	33	42						W						
-31.8	-31.8	58.5	3	13	16						W				-31.8	58.5	COASTAL PLAIN Non Plastic, Dark Gray, Silty Fine SAND with Trace Medium Gravel and Marine Shell Fragments, "Duplin Formation"
-36.8	-36.8	63.5	50/0.3								W						SPT Refusal Noted at 63.8 Feet with 50 Blows/0.3 Feet
-41.8	-41.8	68.5	2	5	8						SS-74	34%	34%	-41.8	68.5	COASTAL PLAIN Non Plastic, Dark Gray, Fine SAND with Trace Silt and Few Clay and Marine Shell Fragments, "Duplin Formation"	
-46.8	-46.8	73.5	4	7	11						W						
-50																	

NCDOT BORE DOUBLE R1015_GEO_BH_BRDGG0283.GPJ NC_DOT.GDT 6/8/16

WBS 34360.1.2	TIP R-1015	COUNTY CRAVEN	GEOLOGIST Setnicky, E.		
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELock BYPASS) AT STA 44+71.8					
GROUND WTR (ft)					
BORING NO. EB2-B	STATION 45+58	OFFSET 11 ft RT	ALIGNMENT -Y4-	0 HR. 8.0	
COLLAR ELEV. 26.7 ft	TOTAL DEPTH 80.0 ft	NORTHING 418,574	EASTING 2,617,274	24 HR. 8.7	
DRILL RIG/HAMMER EFF./DATE GET4354 CME-45C 81% 01/06/2016		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic	
DRILLER Riddick, W.	START DATE 03/24/16	COMP. DATE 03/24/16	SURFACE WATER DEPTH N/A		

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
-50																	
-51.8	-51.8	78.5	4	9	12										-51.8	78.5	Match Line
											W						Boring Terminated at Elevation -53.3 ft in Silty SAND (Duplin Formation)

SOIL TEST RESULTS EB1-A

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-13	7 LT	43+85	48.5-50.0	A-1-b	NV	NP	84.0	11.2	0.6	4.2	99	32	5	17.7	-

SOIL TEST RESULTS B1-A

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-34	8 LT	44+74	58.5-60.0	A-2-6(1)	35	19	28.1	37.0	20.2	14.7	75	61	27	19.3	-

SOIL TEST RESULTS B1-B

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-53	17 RT	44+67	58.5-60.0	A-2-4(0)	NV	NP	23.4	54.6	12.2	9.8	86	70	21	22.0	-

SOIL TEST RESULTS EB2-B

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-59	11 RT	45+58	2.0-3.5	A-6(6)	40	22	22.1	34.9	4.8	38.2	100	97	45	20.4	-
SS-74	11 RT	45+58	68.5-70.0	A-2-4(0)	NV	NP	1.0	84.4	5.2	9.4	100	100	18	34.5	-

SITE PHOTOGRAPHS

VIEW ALONG SR 1747 (SUNSET DRIVE)
FROM EBI-A TO EB2-B



VIEW ALONG SR 1747 (SUNSET DRIVE)
FROM EB2-B TO EBI-A



REFERENCE: R-1015

PROJECT: 34360

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY CRAVEN
 PROJECT DESCRIPTION US 70 (Havelock Bypass) from North of Pine Grove to North of Carteret County Line
 SITE DESCRIPTION Site No. 8 - Dual Bridges over NCRR between SR 1747 and US 70 Station 506 + 32.25 -L- / 13 + 07.59 -RREY3-

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-8	CROSS SECTIONS
9-20	BORE LOGS
21	SOIL TEST RESULTS

APPENDICES

<u>APPENDIX</u>	<u>TITLE</u>	<u>SHEETS</u>
A	CONSOLIDATION & TRIAXIAL SHEAR TEST RESULTS	22-47

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-1015	1	47

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
- THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 - BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

P.M. WEAVER

C.R. PASTRANA

Trigon Exploration

INVESTIGATED BY ESP Associates, INC.

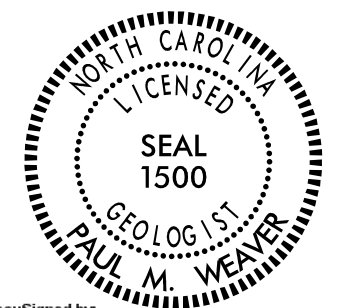
DRAWN BY C.R. PASTRANA

CHECKED BY P.M. WEAVER

SUBMITTED BY ESP Associates, INC.

DATE MAY 2018

 **ESP ASSOCIATES, INC.**
 7011 ALBERT PICK RD
 SUITE E
 GREENSBORO, NC 27409
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 WWW.ESPASSOCIATES.COM



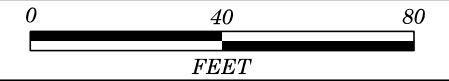
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Paul Weaver 6/6/2018
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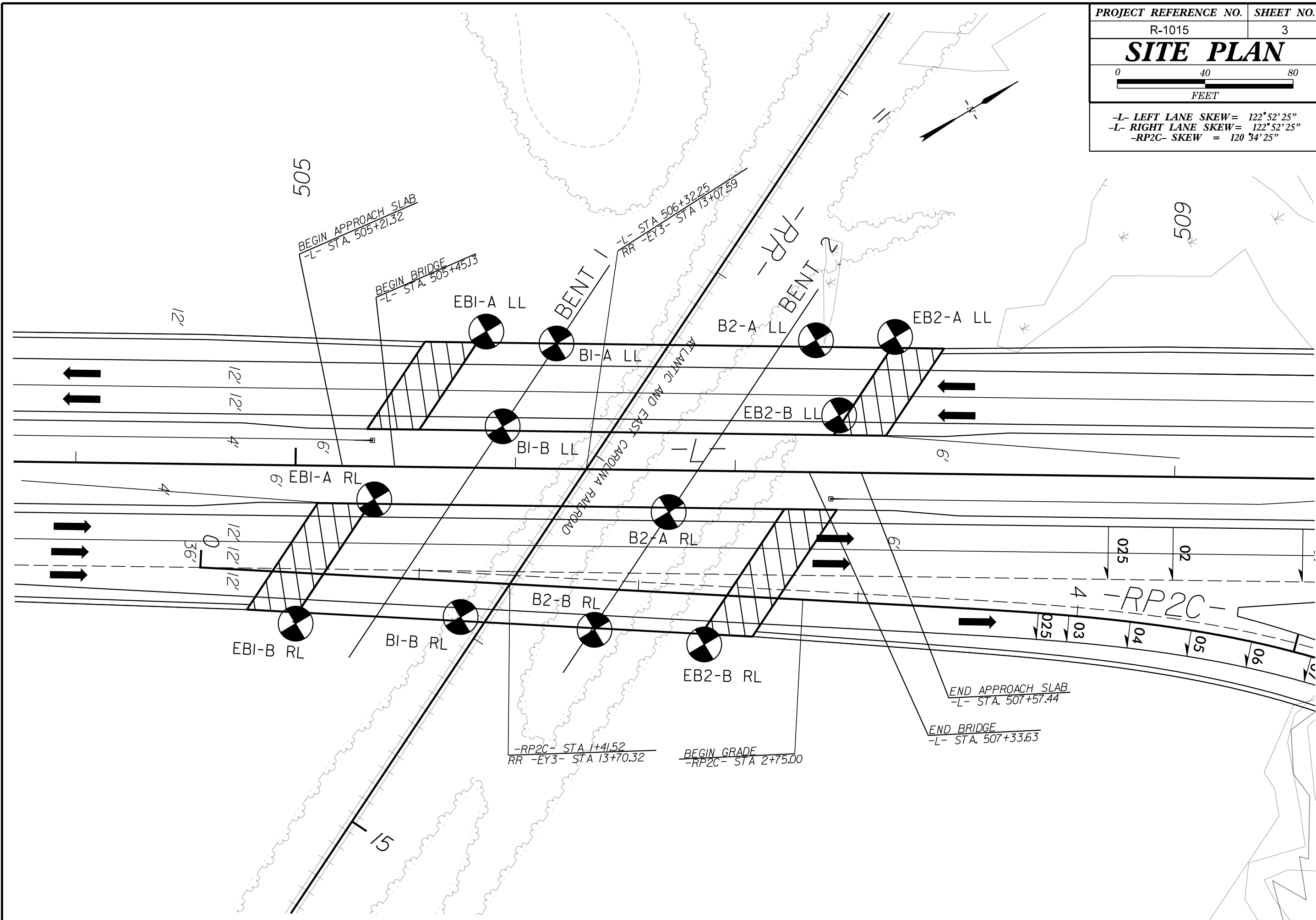
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

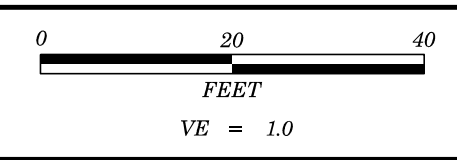
SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 208, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:										ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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BENCH MARK: BM-26; RR SPIKE IN TREE STA. 520+57.00 -L- 308' LEFT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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SITE PLAN

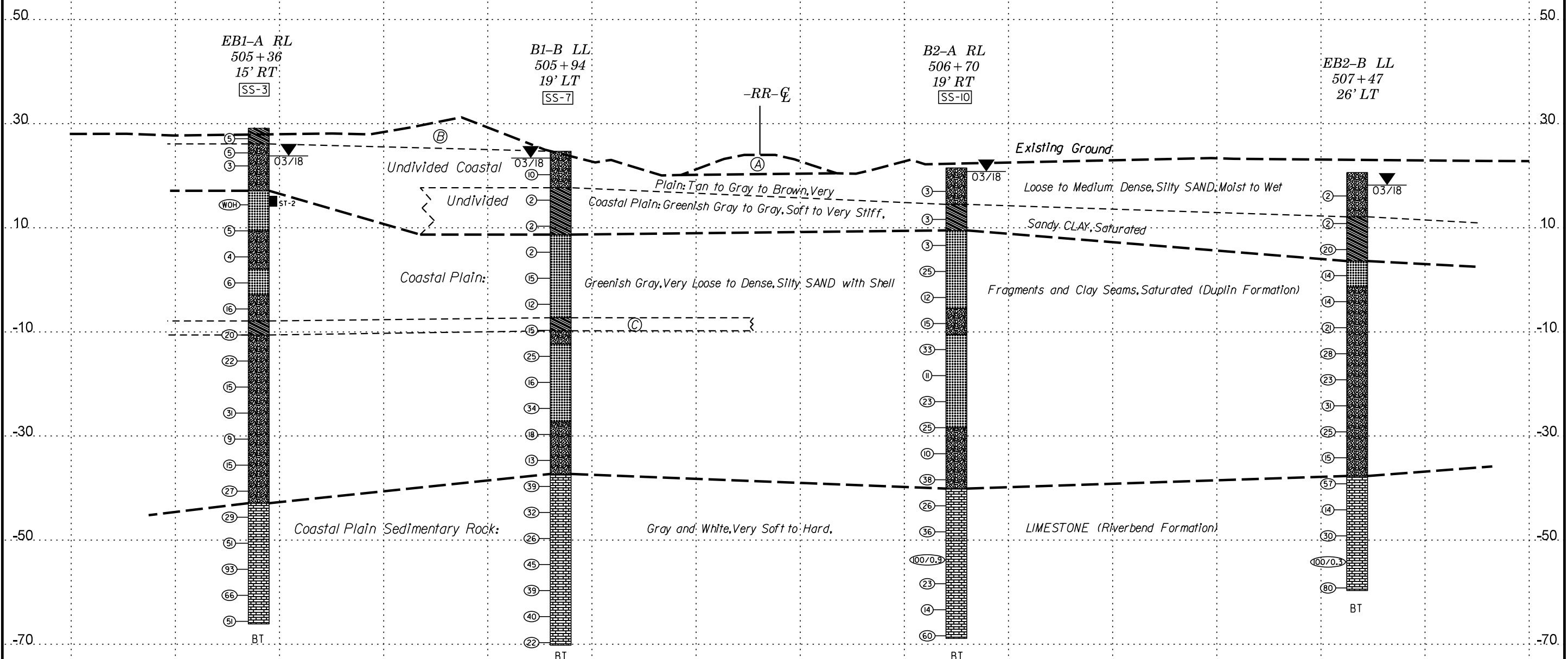


-L- LEFT LANE SKEW = 122°52'25"
 -L- RIGHT LANE SKEW = 122°52'25"
 -RP2C- SKEW = 120°34'25"





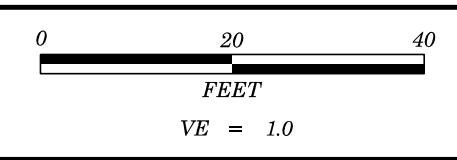
PROJECT REFERENCE NO.	SHEET NO.
R-1015	4
PROFILE BORINGS PROJECTED ALONG -L-	



- (A) Artificial Fill (Engineered): Tan-Brown, Medium Dense, Clayey SAND, Saturated (Railroad Embankment)
- (B) Undivided Coastal Plain: Brown to Tan-Brown, Medium Stiff, Sandy CLAY, Trace Roots, Moist
- (C) Coastal Plain: Greenish Gray to Brownish Gray, Medium Stiff, Sandy CLAY, Saturated (Duplin Formation)

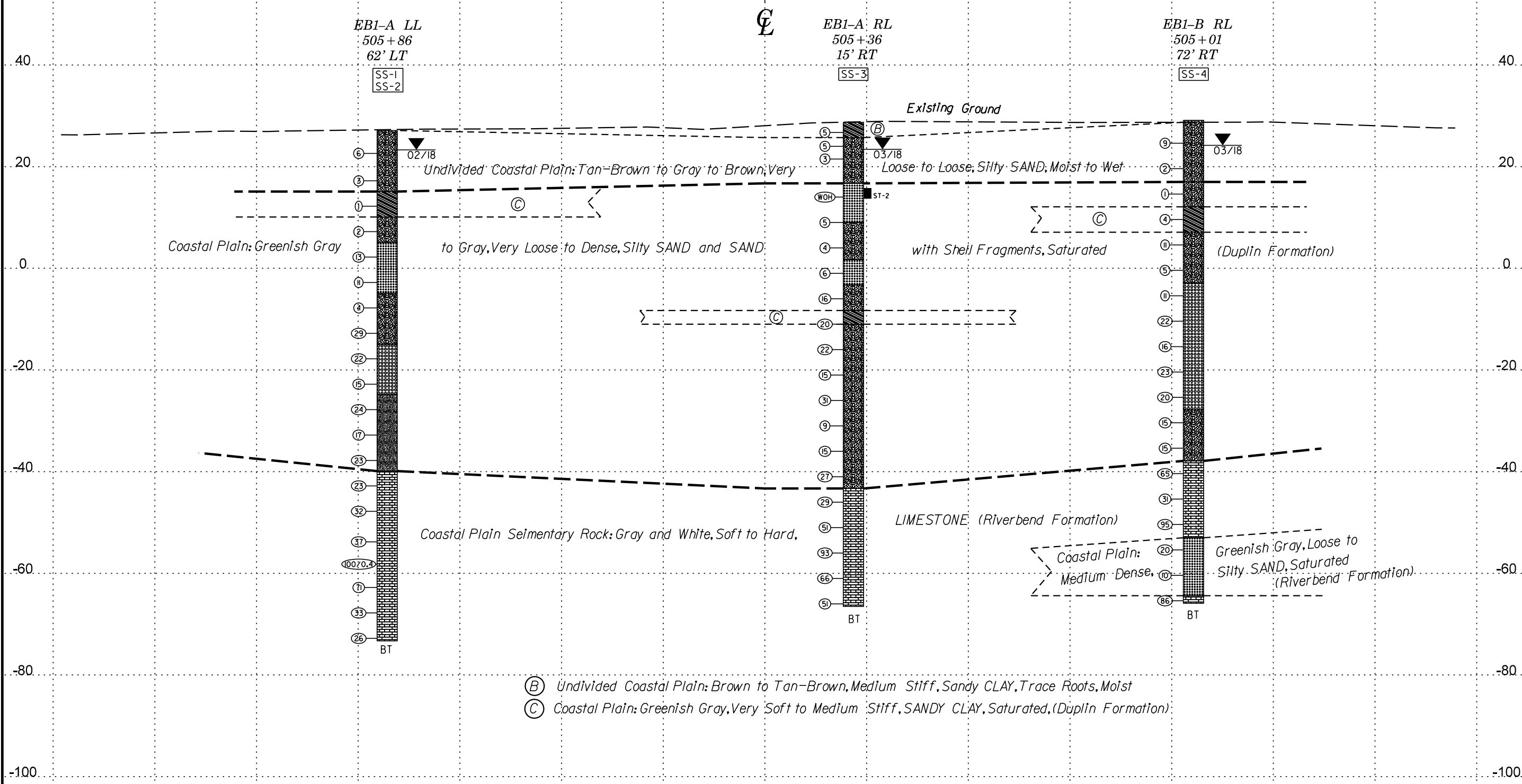
GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED 7/1/2016.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE BRIDGE PROFILE





PROJECT REFERENCE NO.	SHEET NO.
R-1015	5
SECTION THROUGH END BENT 1	

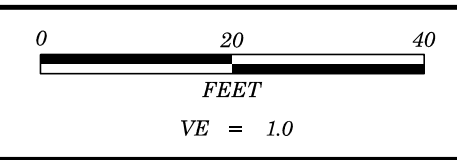
-L- STA. 505+45.12



- (B) Undivided Coastal Plain: Brown to Tan-Brown, Medium Stiff, Sandy CLAY, Trace Roots, Moist
- (C) Coastal Plain: Greenish Gray, Very Soft to Medium Stiff, SANDY CLAY, Saturated, (Duplin Formation)

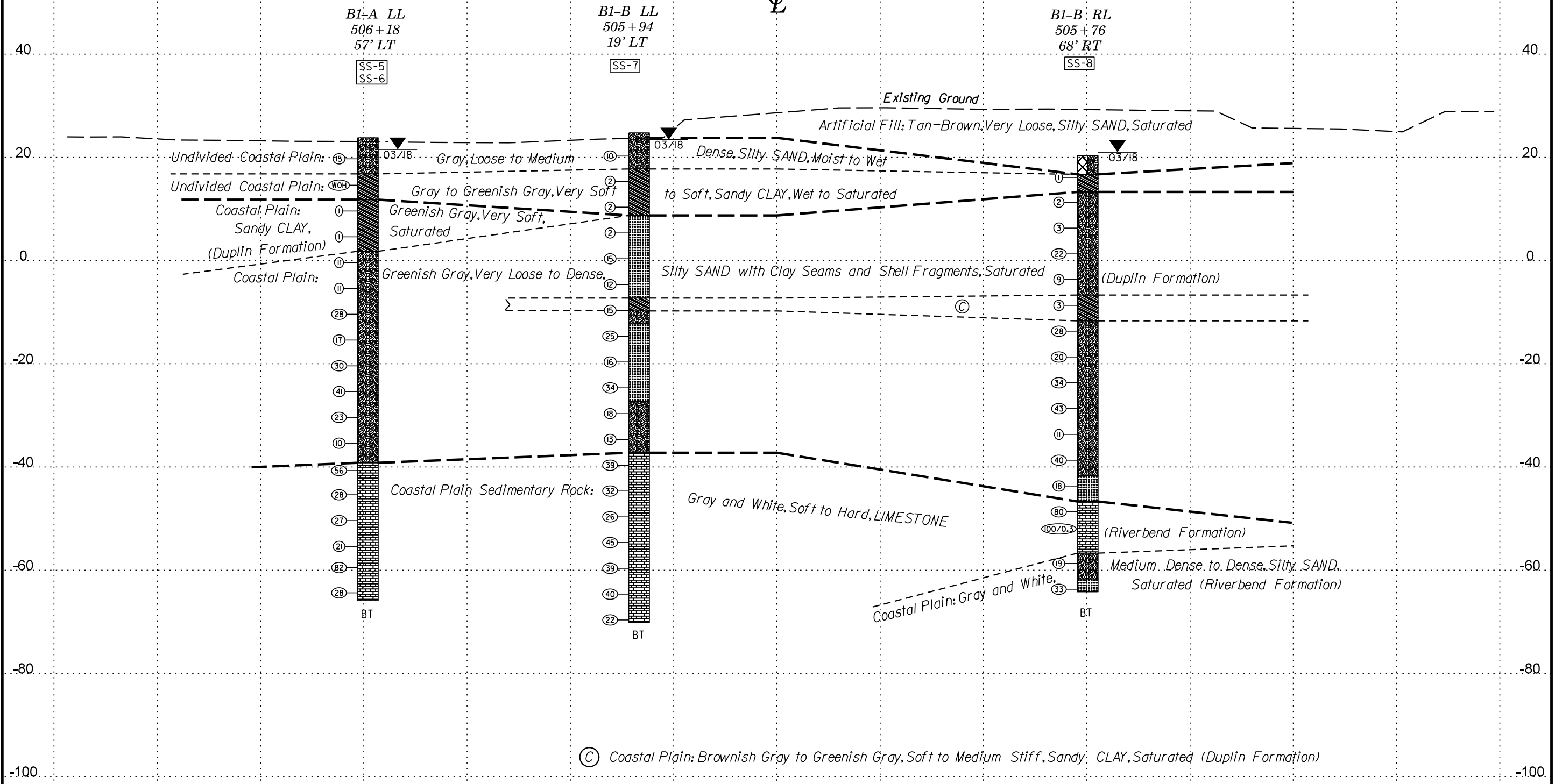
GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED: 7/11/2016.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE BRIDGE CROSS SECTION

120 100 80 60 40 20 0 20 40 60 80 100 120



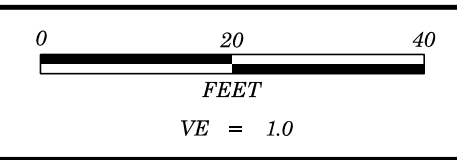
PROJECT REFERENCE NO.	SHEET NO.
R-1015	6
SECTION THROUGH BENT 1	

-L- STA. 505+81.62



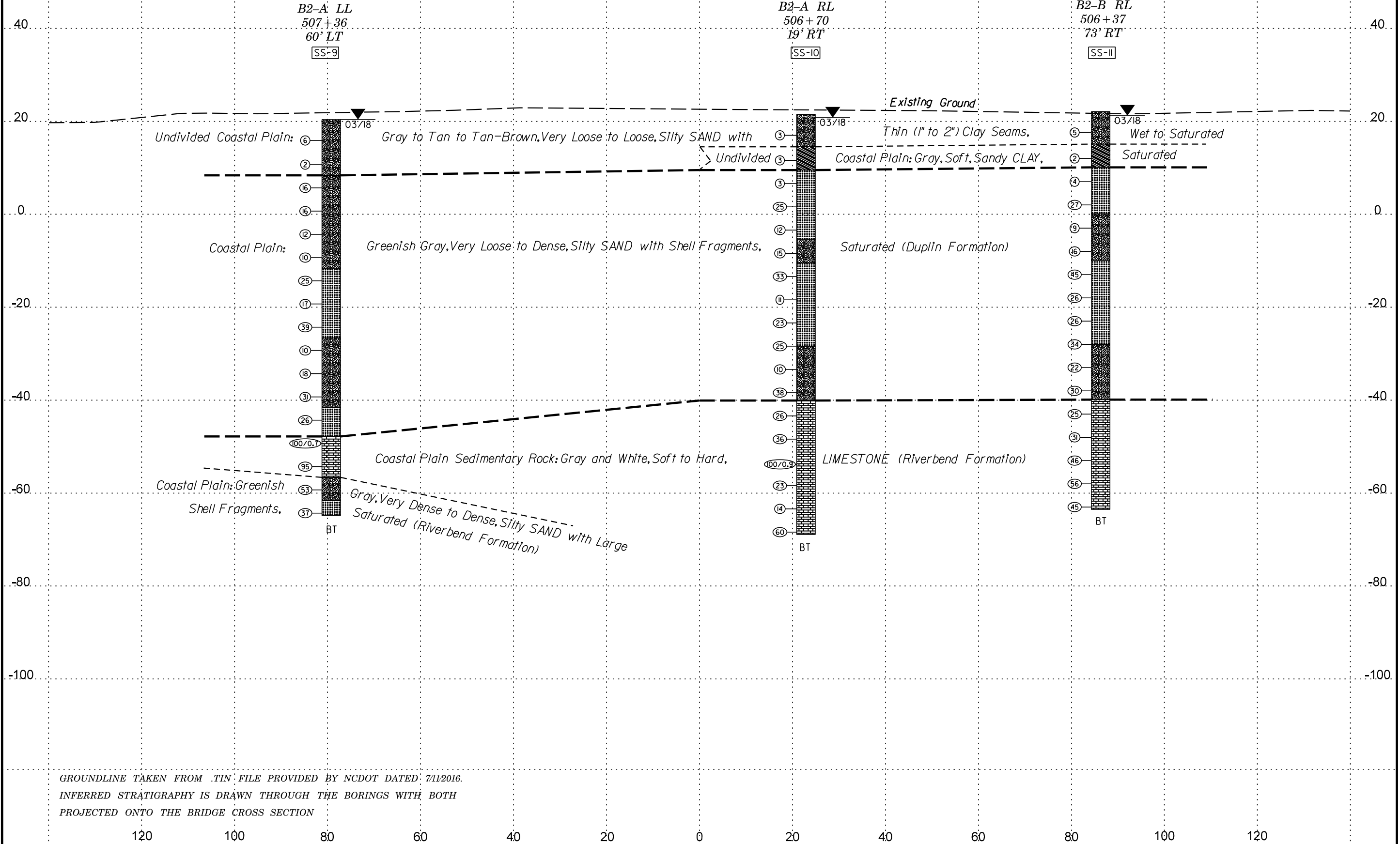
GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED: 7/11/2016.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE BRIDGE CROSS SECTION

Ⓒ Coastal Plain: Brownish Gray to Greenish Gray, Soft to Medium Stiff, Sandy CLAY, Saturated (Duplin Formation)

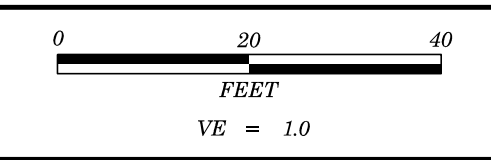


PROJECT REFERENCE NO.	SHEET NO.
R-1015	7
SECTION THROUGH BENT 2	

-L- STA. 506+82.87

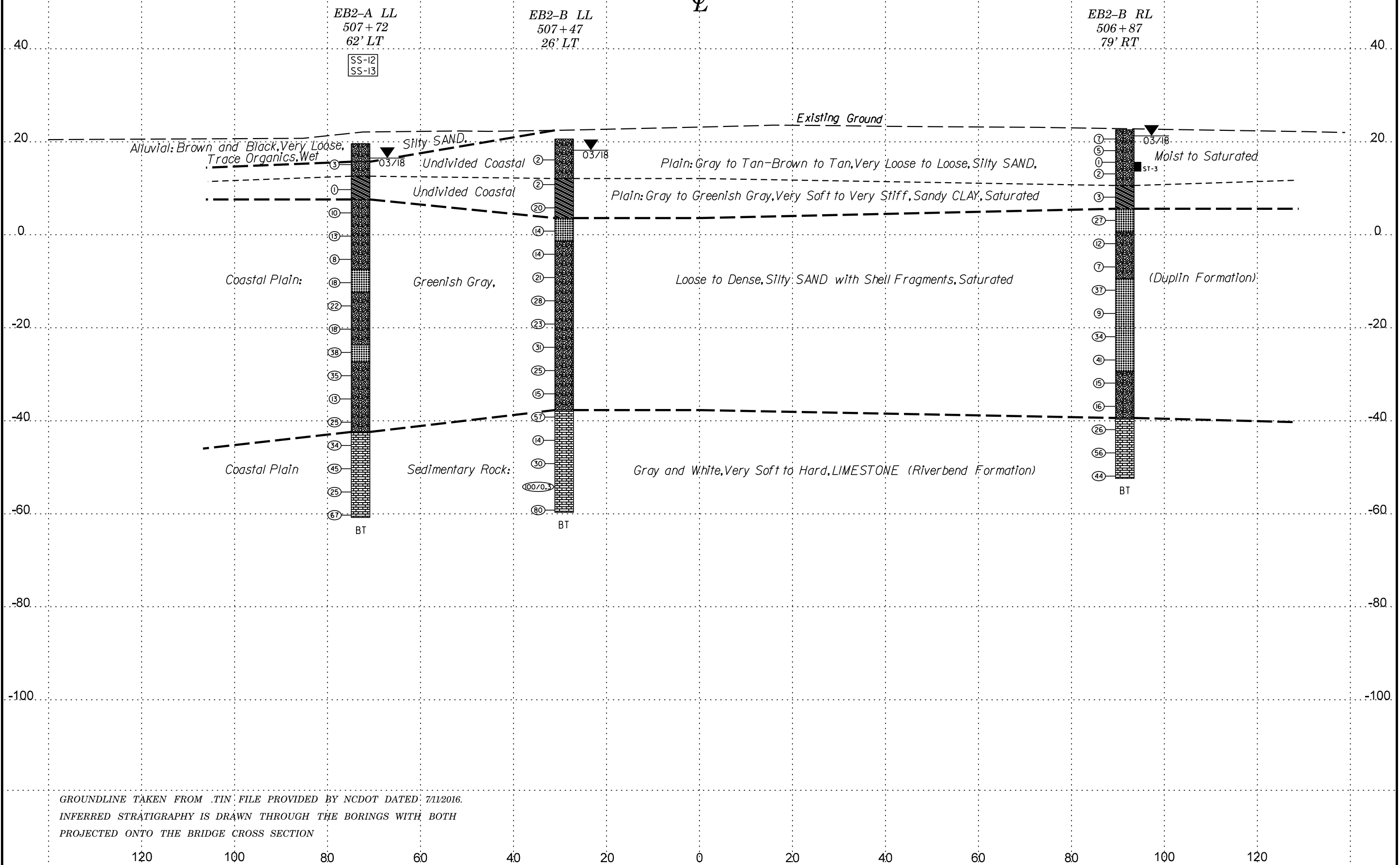


GROUNDLINE TAKEN FROM TIN FILE PROVIDED BY NCDOT DATED: 7/11/2016.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE BRIDGE CROSS SECTION



PROJECT REFERENCE NO.	SHEET NO.
R-1015	8
SECTION THROUGH END BENT 2	

-L- STA. 507+33.62

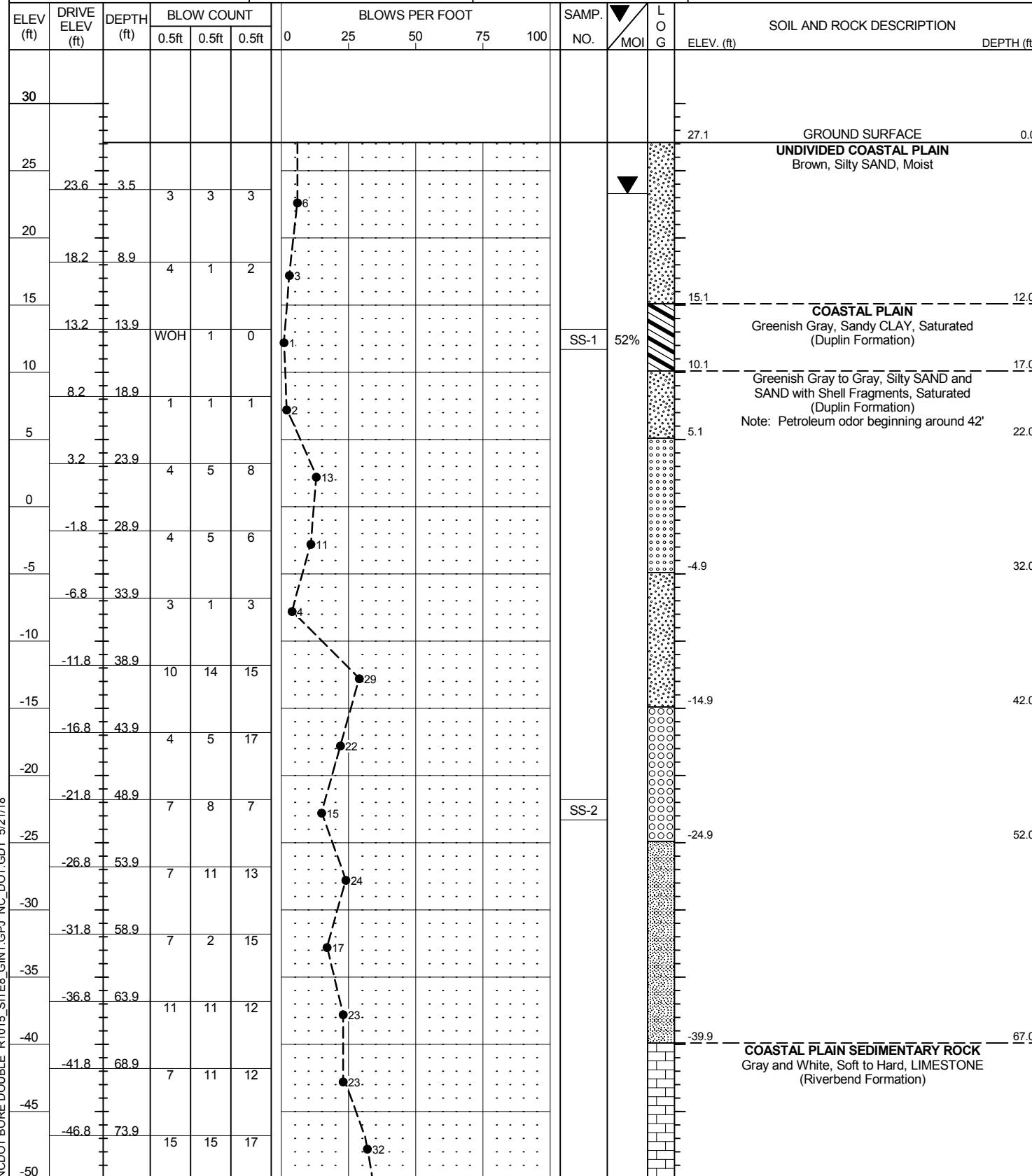


GROUNDLINE TAKEN FROM TIN FILE PROVIDED BY NCDOT DATED: 7/11/2016.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
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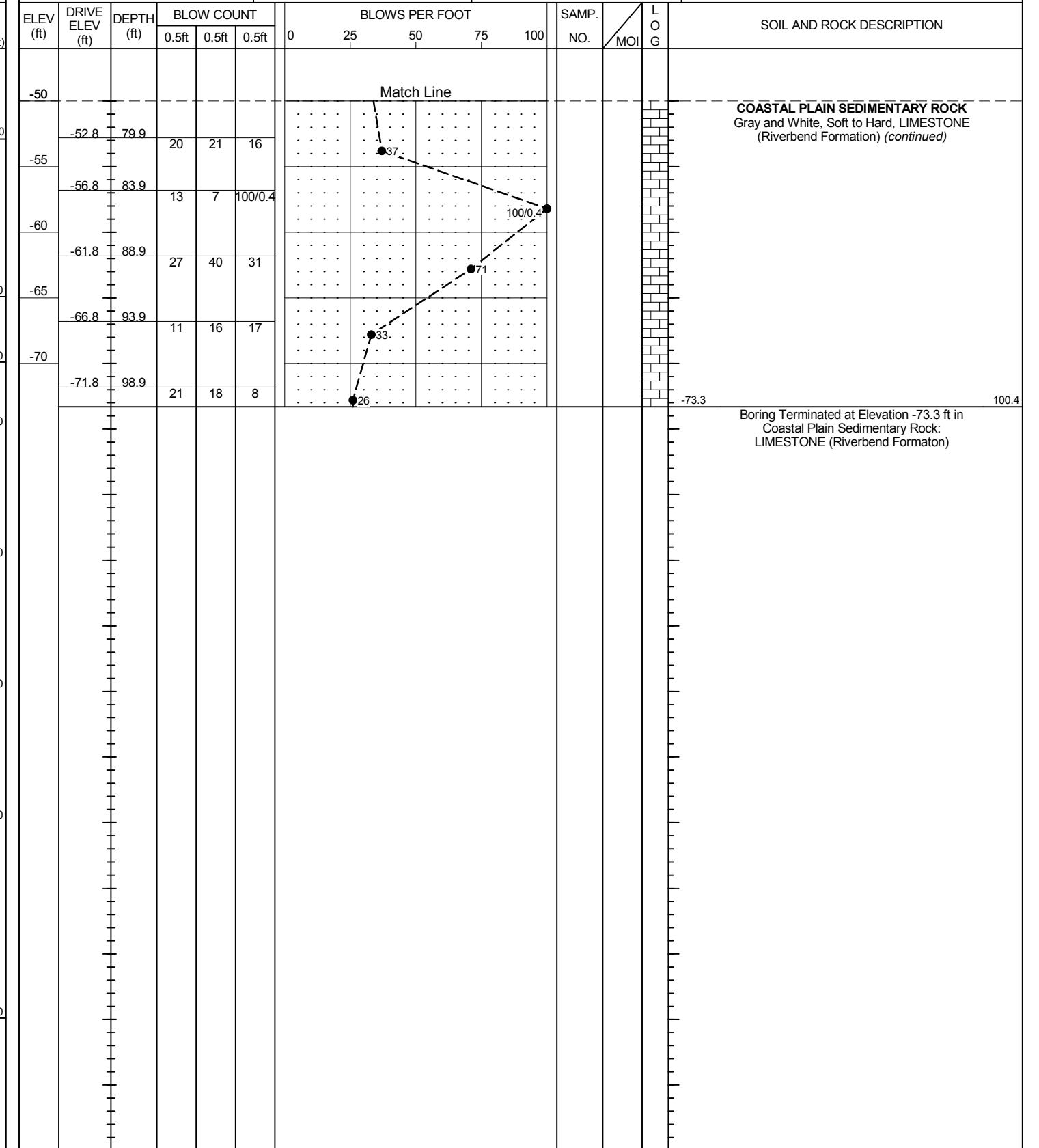
GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34360.1.2	TIP R-1015	COUNTY CRAVEN	GEOLOGIST Pastrana, C.R.
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70			GROUND WTR (ft)
BORING NO. EB1-A LL	STATION 505+86	OFFSET 62 ft LT	ALIGNMENT -L-
COLLAR ELEV. 27.1 ft	TOTAL DEPTH 100.4 ft	NORTHING 437,041	EASTING 2,613,597
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Toothman, R.	START DATE 02/27/18	COMP. DATE 02/27/18	SURFACE WATER DEPTH N/A



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NCDOT BORE DOUBLE R1015_SITES_GINT.GPJ NC_DOT_GDT 5/21/18

GEOTECHNICAL BORING REPORT

BORE LOG

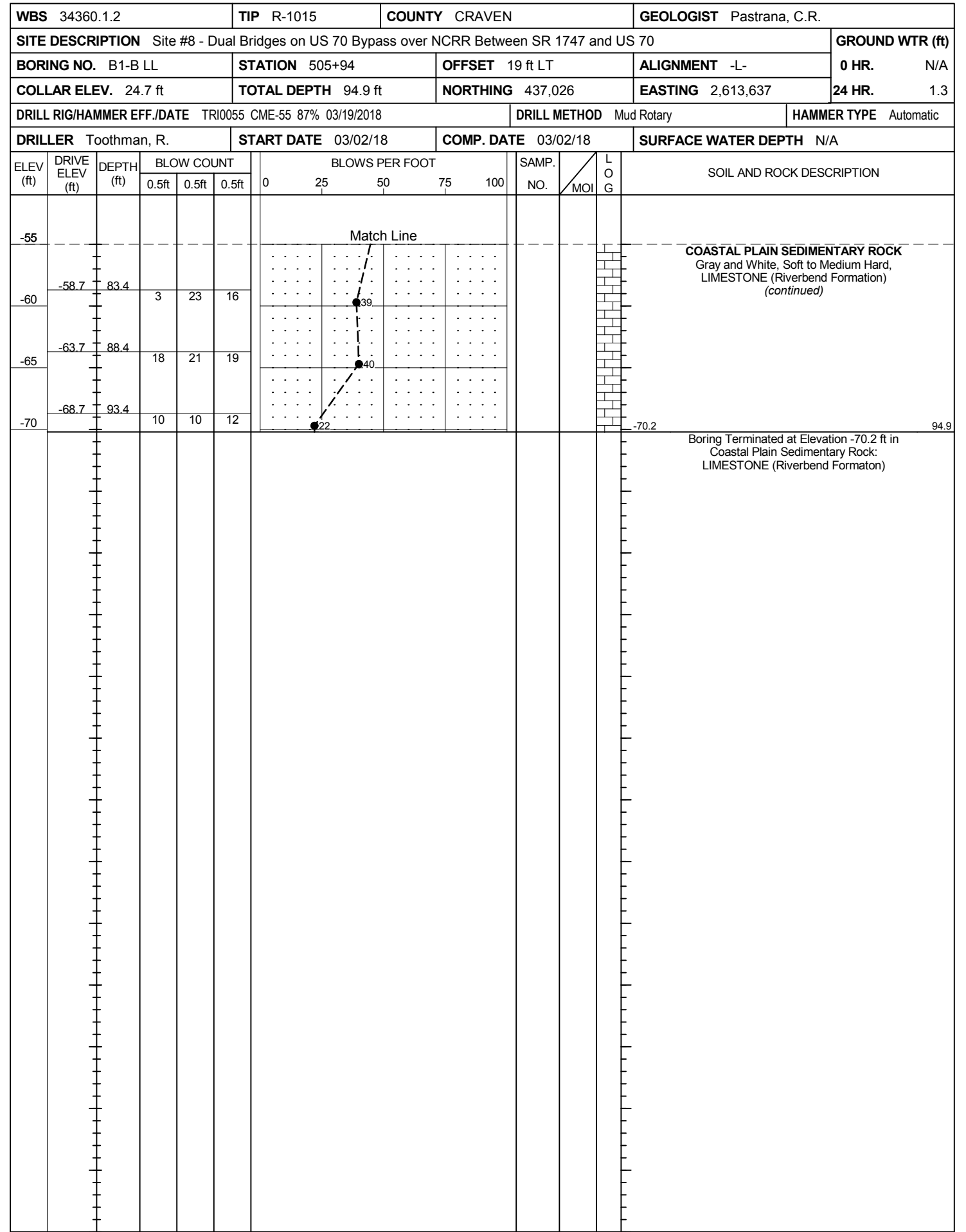
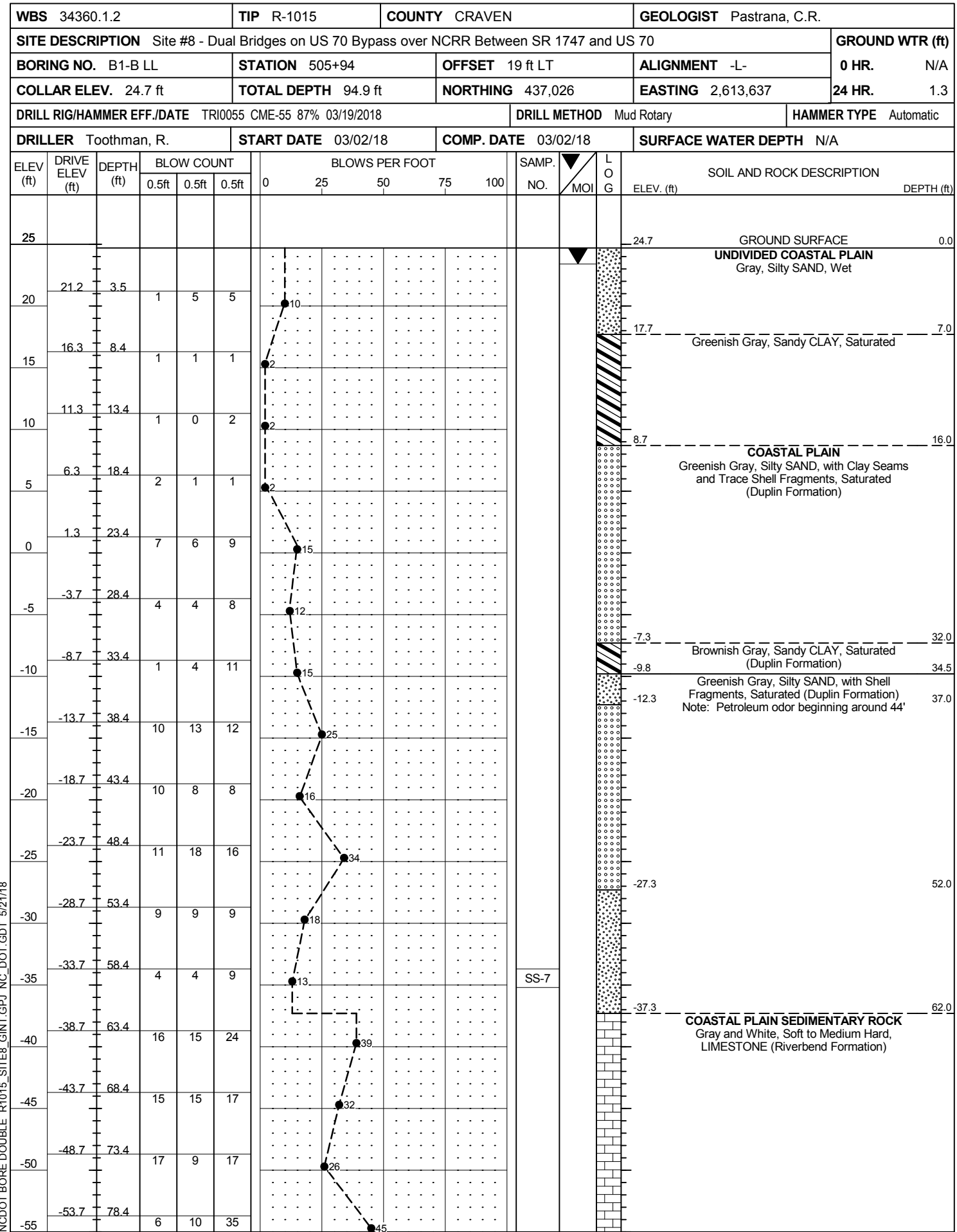
WBS 34360.1.2			TIP R-1015			COUNTY CRAVEN			GEOLOGIST Pastrana, C.R.							
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70								GROUND WTR (ft)								
BORING NO. EB1-B RL		STATION 505+01		OFFSET 72 ft RT		ALIGNMENT -L-		0 HR. N/A								
COLLAR ELEV. 28.7 ft		TOTAL DEPTH 95.0 ft		NORTHING 436,899		EASTING 2,613,666		24 HR. 4.9								
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018						DRILL METHOD Mud Rotary			HAMMER TYPE Automatic							
DRILLER Toothman, R.			START DATE 02/28/18			COMP. DATE 03/01/18			SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
30																
																28.7
																0.0
25	25.2	3.5	4	5	4											
20	20.2	8.5	3	1	1											
15	15.2	13.5	WOH	1	0											
10	10.2	18.5		1	2											
5	5.2	23.5		2	6											
0	0.2	28.5		3	2											
-5	-4.8	33.5		4	4											
-10	-9.8	38.5		5	8											
-15	-14.8	43.5		7	9											
-20	-19.8	48.5		8	10											
-25	-24.8	53.5		13	10											
-30	-29.8	58.5		14	6											
-35	-34.8	63.5		7	4											
-40	-39.8	68.5		23	30											
-45	-44.8	73.5		11	15											
-50	-49.8	78.5														

WBS 34360.1.2			TIP R-1015			COUNTY CRAVEN			GEOLOGIST Pastrana, C.R.							
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70								GROUND WTR (ft)								
BORING NO. EB1-B RL		STATION 505+01		OFFSET 72 ft RT		ALIGNMENT -L-		0 HR. N/A								
COLLAR ELEV. 28.7 ft		TOTAL DEPTH 95.0 ft		NORTHING 436,899		EASTING 2,613,666		24 HR. 4.9								
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018						DRILL METHOD Mud Rotary			HAMMER TYPE Automatic							
DRILLER Toothman, R.			START DATE 02/28/18			COMP. DATE 03/01/18			SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-50																
-55	-54.8	83.5		9	11											
-60	-59.8	88.5		7	4											
-65	-64.8	93.5		26	45											

NCDOT BORE DOUBLE R1015_SITES_GINT.GPJ NC_DOT.GDT 5/21/18

GEOTECHNICAL BORING REPORT

BORE LOG



NCDOT BORE DOUBLE R1015_SITES_GINT.GPJ NC_DOT_GDT 5/21/18

GEOTECHNICAL BORING REPORT

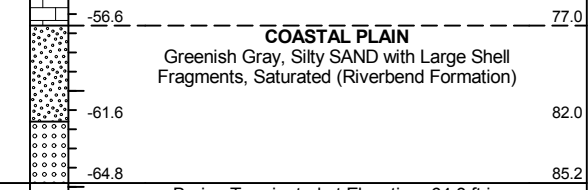
BORE LOG

WBS 34360.1.2		TIP R-1015		COUNTY CRAVEN		GEOLOGIST Pastrana, C.R.									
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70							GROUND WTR (ft)								
BORING NO. B2-A LL		STATION 507+36		OFFSET 60 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 20.4 ft		TOTAL DEPTH 85.2 ft		NORTHING 437,168		EASTING 2,613,677									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Toothman, R.		START DATE 03/09/18		COMP. DATE 03/09/18		SURFACE WATER DEPTH 0.0ft									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
25															
20															
15	16.9	3.5	5	2	4										
10	11.7	8.7	WOH	1	1										
5	6.7	13.7	4	7	9										
0	1.7	18.7	4	7	9										
-5	-3.3	23.7	3	4	8										
-10	-8.3	28.7	4	3	7										
-15	-13.3	33.7	11	13	12										
-20	-18.3	38.7	6	7	10										
-25	-23.3	43.7	6	13	26										
-30	-28.3	48.7	5	5	5										
-35	-33.3	53.7	5	7	11										
-40	-38.3	58.7	6	9	22										
-45	-43.3	63.7	10	13	13										
-50	-48.3	68.7	31	52	48/0.2										
-55	-53.3	73.7	57	47	48										

WBS 34360.1.2		TIP R-1015		COUNTY CRAVEN		GEOLOGIST Pastrana, C.R.									
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70							GROUND WTR (ft)								
BORING NO. B2-A LL		STATION 507+36		OFFSET 60 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 20.4 ft		TOTAL DEPTH 85.2 ft		NORTHING 437,168		EASTING 2,613,677									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Toothman, R.		START DATE 03/09/18		COMP. DATE 03/09/18		SURFACE WATER DEPTH 0.0ft									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
-55															
-60	-58.3	78.7	33	17	36										
	-63.3	83.7	22	16	21										

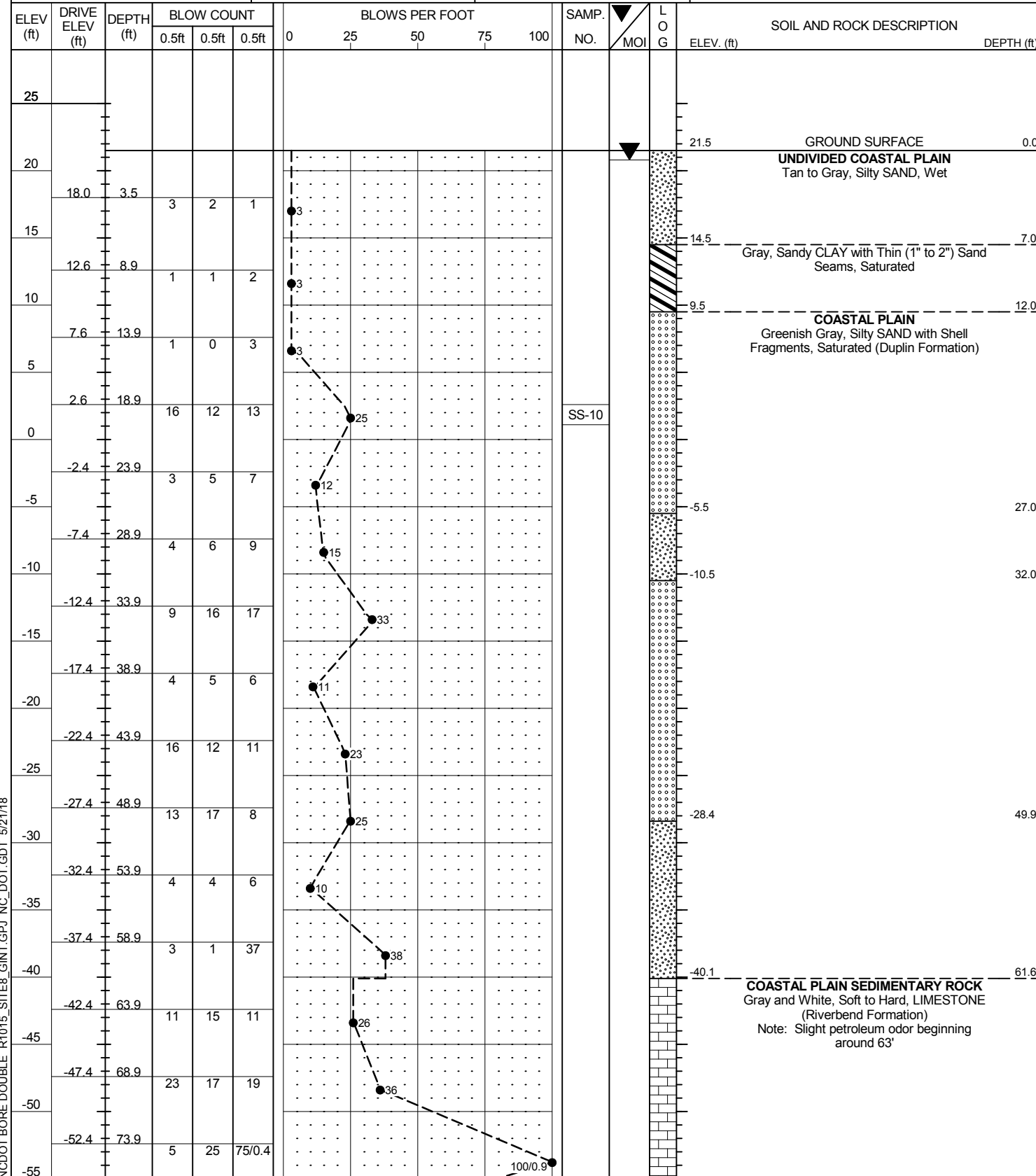
NCDOT BORE DOUBLE R1015_SITES_GINT.GPJ NC_DOT_GDT 5/21/18

Match Line



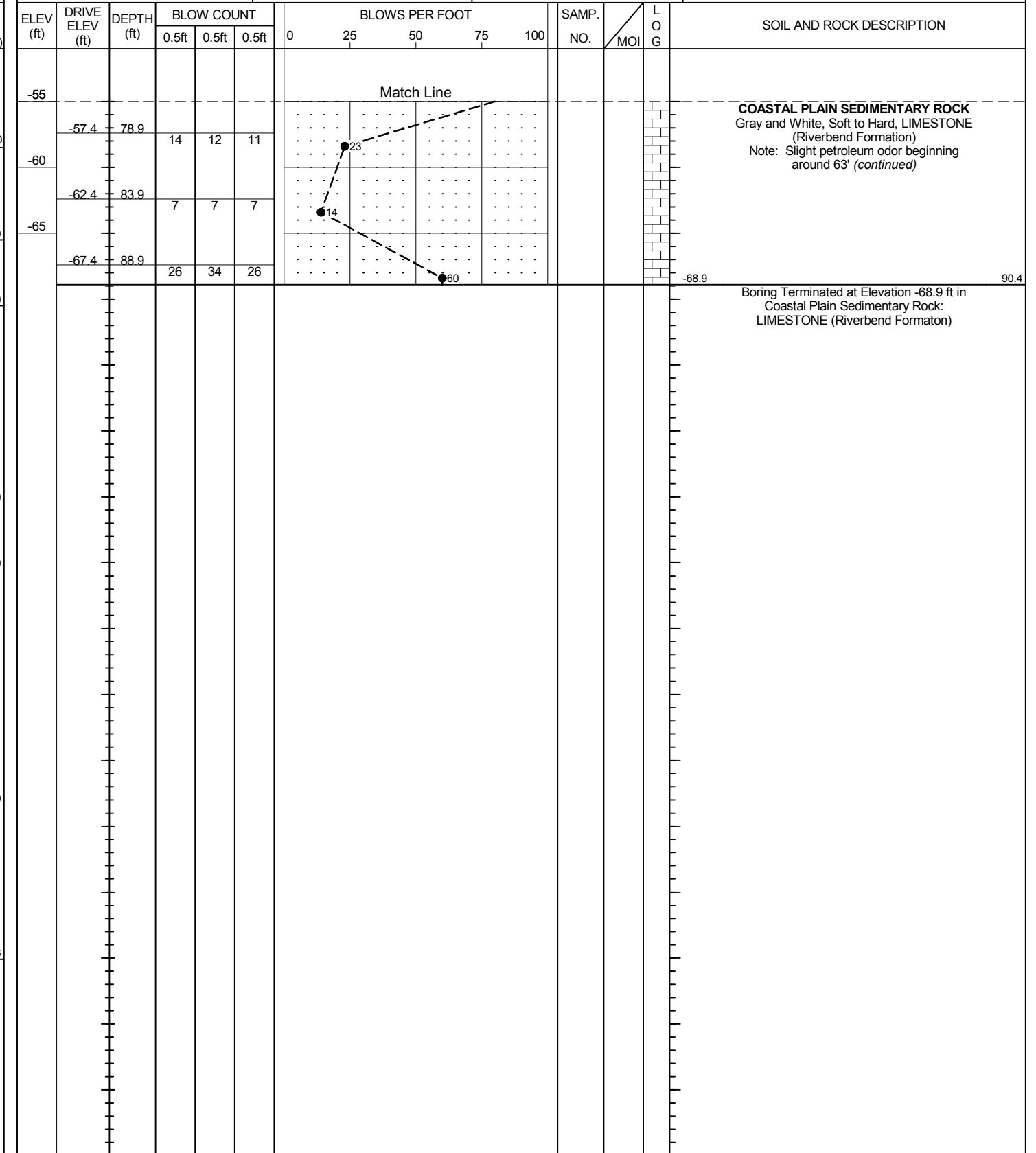
GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	TIP R-1015	COUNTY CRAVEN	GEOLOGIST Pastrana, C.R.
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70			GROUND WTR (ft)
BORING NO. B2-A RL	STATION 506+70	OFFSET 19 ft RT	ALIGNMENT -L-
COLLAR ELEV. 21.5 ft	TOTAL DEPTH 90.4 ft	NORTHING 437,070	EASTING 2,613,710
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Toothman, R.	START DATE 03/13/18	COMP. DATE 03/13/18	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE R1015_SITES_GINT.GPJ NC_DOT_GDT 5/21/18

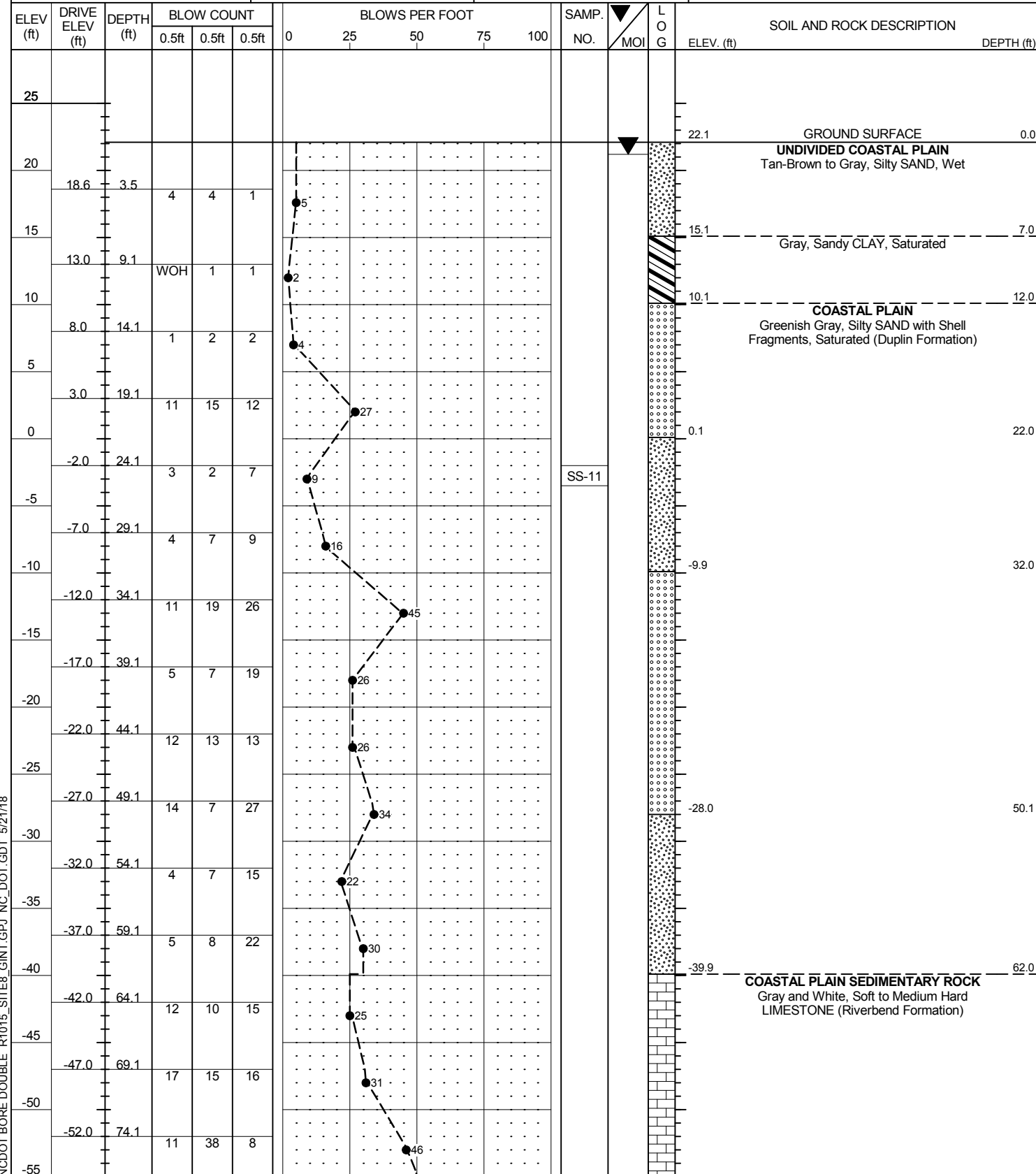
WBS 34360.1.2	TIP R-1015	COUNTY CRAVEN	GEOLOGIST Pastrana, C.R.
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70			GROUND WTR (ft)
BORING NO. B2-A RL	STATION 506+70	OFFSET 19 ft RT	ALIGNMENT -L-
COLLAR ELEV. 21.5 ft	TOTAL DEPTH 90.4 ft	NORTHING 437,070	EASTING 2,613,710
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Toothman, R.	START DATE 03/13/18	COMP. DATE 03/13/18	SURFACE WATER DEPTH N/A



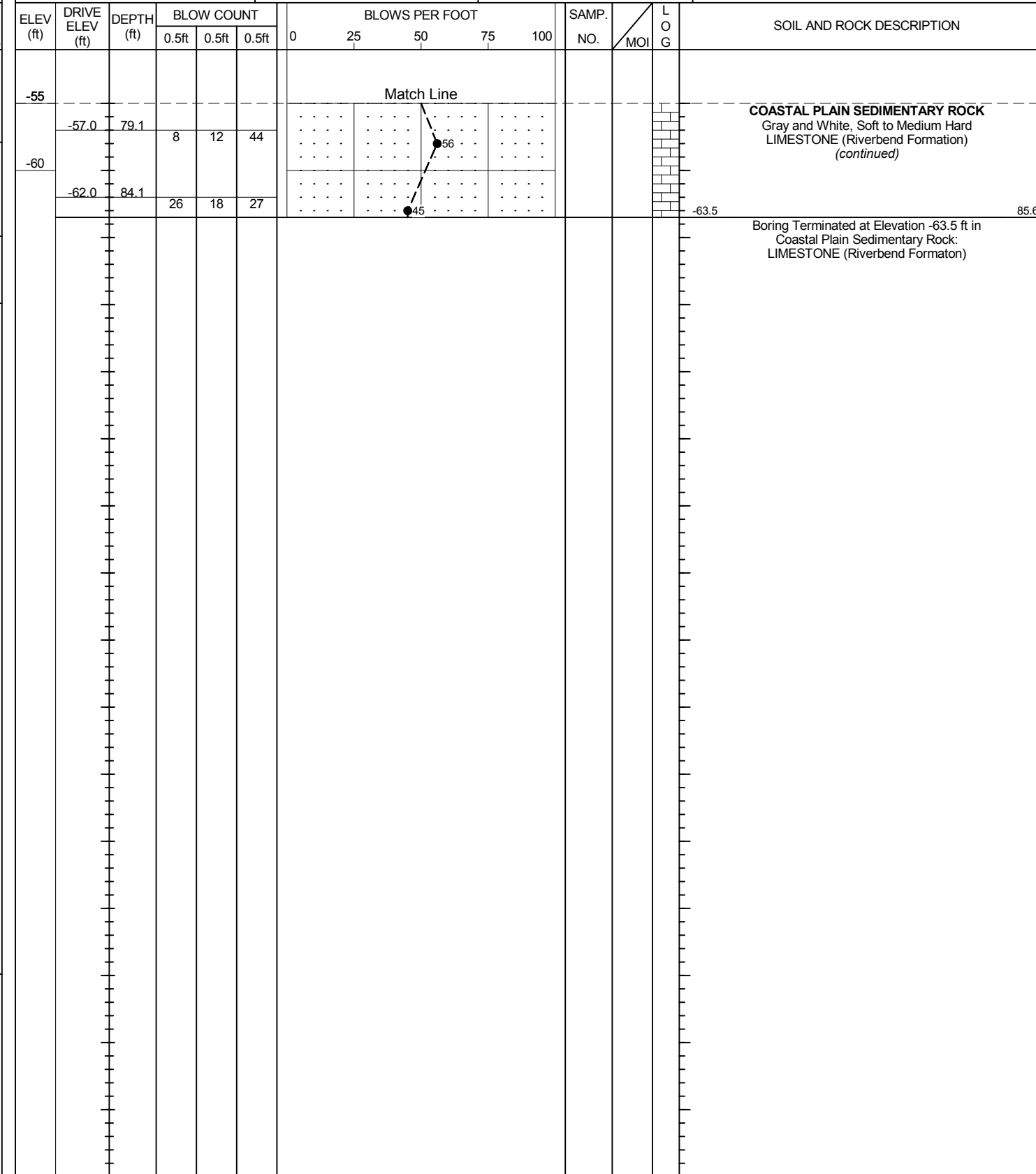
GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34360.1.2	TIP R-1015	COUNTY CRAVEN	GEOLOGIST Pastrana, C.R.
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70			GROUND WTR (ft)
BORING NO. B2-B RL	STATION 506+37	OFFSET 73 ft RT	ALIGNMENT -L-
COLLAR ELEV. 22.1 ft	TOTAL DEPTH 85.6 ft	NORTHING 437,014	EASTING 2,613,738
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Toothman, R.	START DATE 03/14/18	COMP. DATE 03/15/18	SURFACE WATER DEPTH N/A



WBS 34360.1.2	TIP R-1015	COUNTY CRAVEN	GEOLOGIST Pastrana, C.R.
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70			GROUND WTR (ft)
BORING NO. B2-B RL	STATION 506+37	OFFSET 73 ft RT	ALIGNMENT -L-
COLLAR ELEV. 22.1 ft	TOTAL DEPTH 85.6 ft	NORTHING 437,014	EASTING 2,613,738
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Toothman, R.	START DATE 03/14/18	COMP. DATE 03/15/18	SURFACE WATER DEPTH N/A

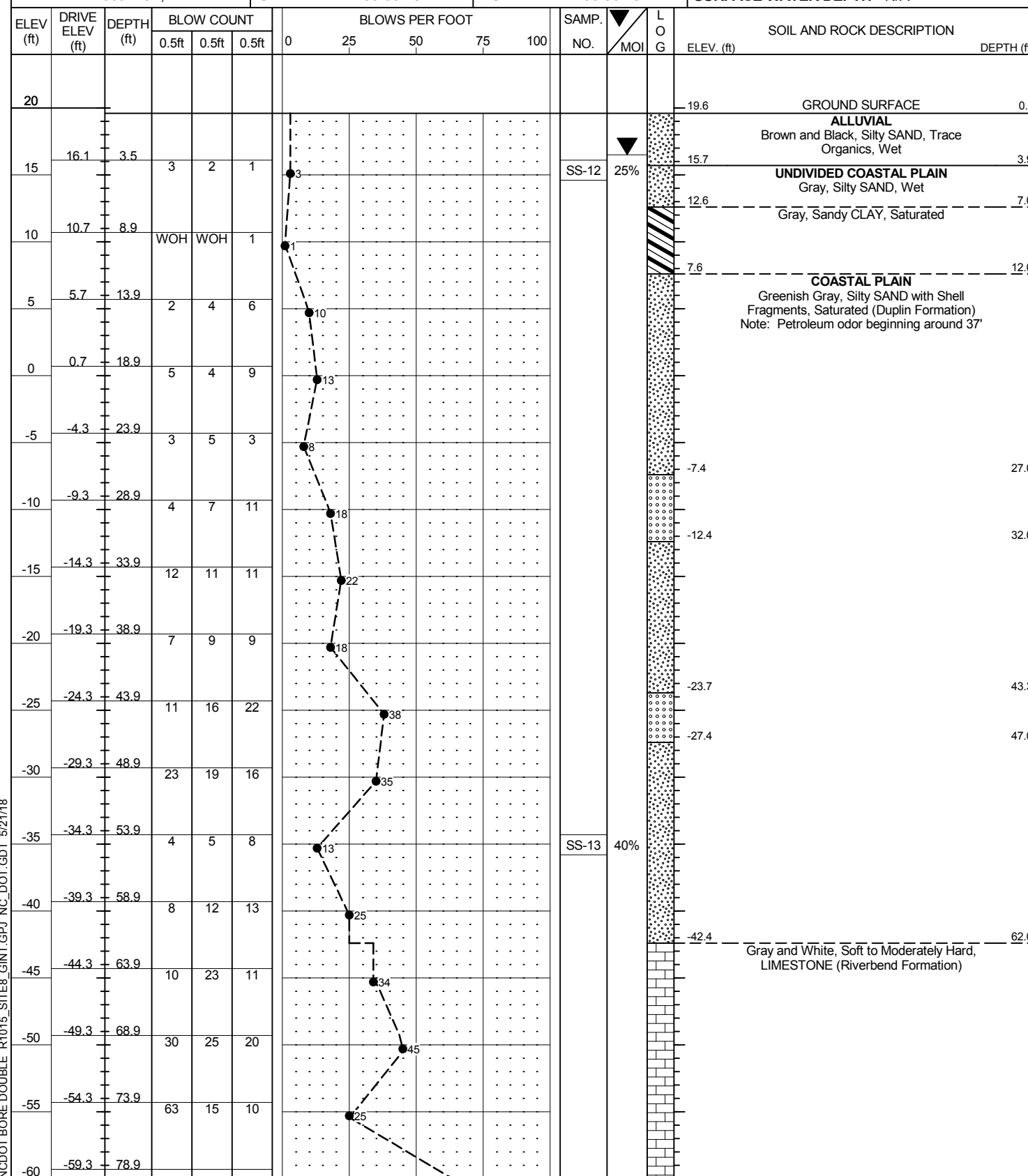


NCDOT BORE DOUBLE R1015_SITES_GINT.GPJ NC_DOT_GDT_5/21/18

GEOTECHNICAL BORING REPORT

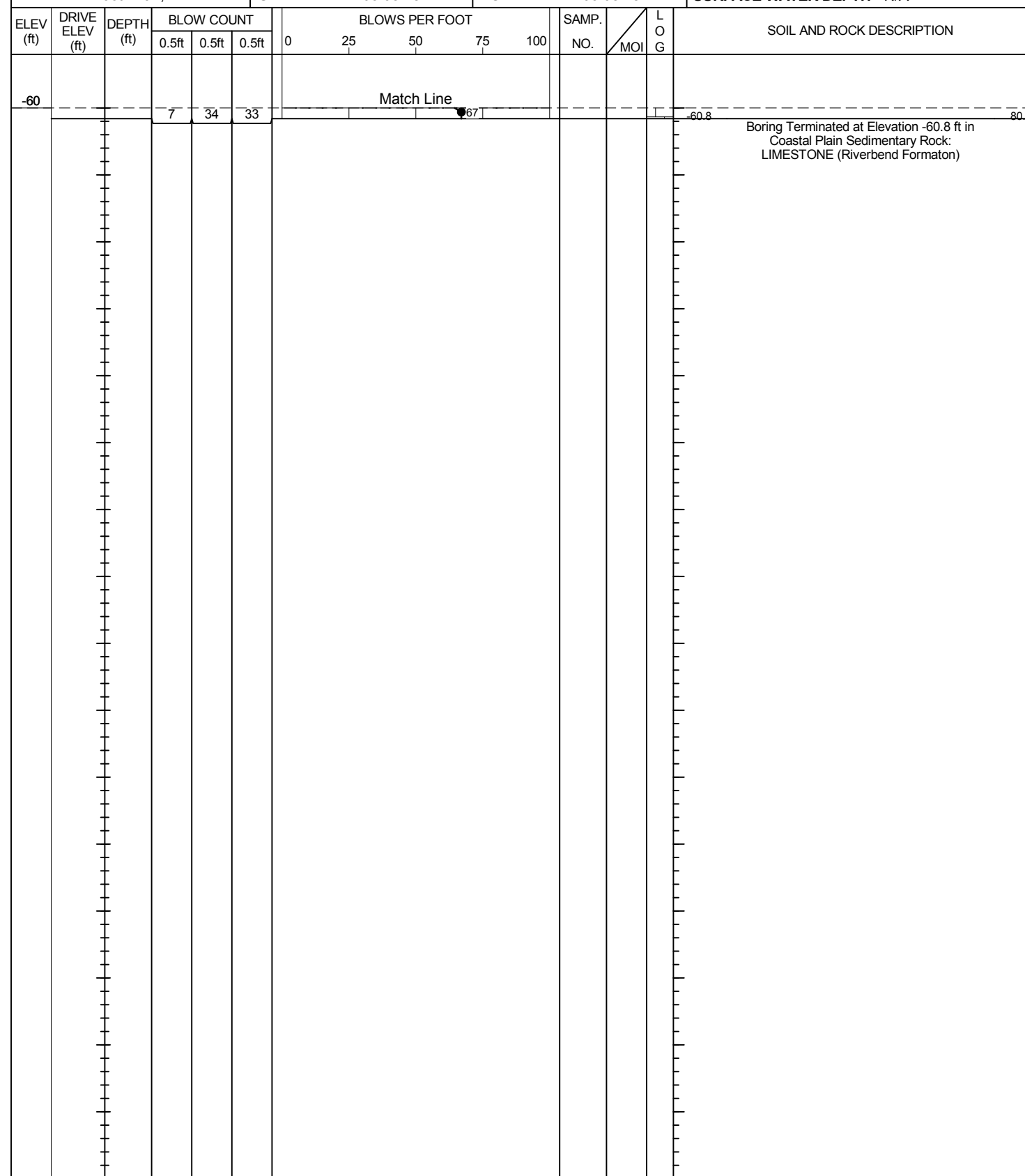
BORE LOG

WBS 34360.1.2		TIP R-1015	COUNTY CRAVEN	GEOLOGIST Pastrana, C.R.
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				GROUND WTR (ft)
BORING NO. EB2-A LL	STATION 507+72	OFFSET 62 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 19.6 ft	TOTAL DEPTH 80.4 ft	NORTHING 437,200	EASTING 2,613,694	24 HR. 3.1
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Toothman, R.		START DATE 03/08/18	COMP. DATE 03/08/18	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE R1015_SITES_GINT.GPJ NC_DOT_GDT 5/21/18

WBS 34360.1.2		TIP R-1015	COUNTY CRAVEN	GEOLOGIST Pastrana, C.R.
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				GROUND WTR (ft)
BORING NO. EB2-A LL	STATION 507+72	OFFSET 62 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 19.6 ft	TOTAL DEPTH 80.4 ft	NORTHING 437,200	EASTING 2,613,694	24 HR. 3.1
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Toothman, R.		START DATE 03/08/18	COMP. DATE 03/08/18	SURFACE WATER DEPTH N/A



GEOTECHNICAL BORING REPORT BORE LOG

WBS 34360.1.2		TIP R-1015		COUNTY CRAVEN		GEOLOGIST Pastrana, C.R.										
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70							GROUND WTR (ft)									
BORING NO. EB2-B RL		STATION 506+87		OFFSET 79 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 22.6 ft		TOTAL DEPTH 75.0 ft		NORTHING 437,053		EASTING 2,613,770										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Toothman, R.		START DATE 03/14/18		COMP. DATE 03/14/18		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
25														22.6	GROUND SURFACE	0.0
20	21.6	1.0	3	4	3										UNDIVIDED COASTAL PLAIN Tan-Brown to Gray, Silty SAND, Moist to Saturated	
15	19.1	3.5	3	2	3											
	16.6	6.0	WOH	WOH	1											
10	14.1	8.5	WOH		1											
5	9.1	13.5	1	1	2										Greenish Gray, Sandy CLAY, Saturated (Duplin Formation)	12.0
	5.6	17.0													COASTAL PLAIN Greenish Gray, Silty SAND with Shell Fragments, Saturated (Duplin Formation) Note: Petroleum odor beginning around 43'	17.0
0	4.1	18.5	11	14	13											
	0.6	22.0														
-5	-0.9	23.5	3	4	8											
	-5.9	28.5	2	3	4											
-10	-9.4	32.0														
	-10.9	33.5	9	14	23											
-15	-15.9	38.5	5	4	5											
	-19.4	42.0														
-20	-20.9	43.5	8	11	23											
	-25.9	48.5	19	22	19											
-25	-30.9	53.5	4	6	9											
	-35.9	58.5	9	5	11											
-30	-40.9	63.5	8	9	17											
	-45.9	68.5	28	25	31											
-45	-50.9	73.5	38	25	19											

WBS 34360.1.2		TIP R-1015		COUNTY CRAVEN		GEOLOGIST Pastrana, C.R.											
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70							GROUND WTR (ft)										
BORING NO. EB2-B RL		STATION 506+87		OFFSET 79 ft RT		ALIGNMENT -L-											
COLLAR ELEV. 22.6 ft		TOTAL DEPTH 75.0 ft		NORTHING 437,053		EASTING 2,613,770											
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER Toothman, R.		START DATE 03/14/18		COMP. DATE 03/14/18		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)			
-55															Match Line		
																LIMESTONE (Riverbend Formaton)	
																Other Samples: ST-3 collected at -L- Sta. 506+89, 75' RT (7.0'-9.0')	

NCDOT BORE DOUBLE R1015_SITES_GINT.GPJ_NC_DOT_GDT_5/21/18

SOILS LABORATORY TESTS RESULTS

WBS NO.: 34360.1.2

TIP NO.: R-1015

COUNTY: Craven

SITE DESCRIPTION: Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70

BORING NO.	SAMPLE NO.	Boring Location	DEPTH INTERVAL (ft.)	AASHTO CLASS	N	L.L	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
								CSE. SAND	F. SAND	SILT	CLAY	10	40	200		
EB1-A LL	SS-1	-L- 505+86, 62' LT	13.9-15.4	A-6 (4)	1	26	13	19	27	19	35	100	99	56	51.9	-
EB1-A LL	SS-2	-L- 505+86, 62' LT	48.9-50.4	A-1-b (1)	15	NP	NP	64	29	3	4	85	45	8	-	-
	ST-2	-L- 505+39, 11' RT	13.0-15.0	A-3 (1)	N/A	NP	NP	10	82	1	7	100	95	9	33.6	-
EB1-A RL	SS-3	-L- 505+36, 15' RT	63.7-65.2	A-2-4 (0)	15	28	5	1	70	20	9	99	99	33	47.9	-
EB1-B RL	SS-4	-L- 505+01, 72' RT	43.5-45.0	A-1-b (1)	16	NP	NP	81	12	2	5	94	30	8	-	-
B1-A LL	SS-5	-L- 506+18, 57' LT	8.2-9.7	A-6 (7)	0	32	17	0	44	17	39	100	100	59	69.7	-
B1-A LL	SS-6	-L- 506+18, 57' LT	23.2-24.7	A-2-4 (0)	11	NP	NP	14	69	6	11	100	92	20	31.3	-
B1-B LL	SS-7	-L- 505+94, 19' LT	58.4-59.9	A-2-4 (0)	13	NP	NP	5	79	11	5	99	98	19	-	-
B1-B RL	SS-8	-L- 505+76, 68' RT	13.0-14.5	A-2-4 (0)	3	18	5	55	21	8	16	100	86	25	36.0	-
B2-A LL	SS-9	-L- 507+36, 60' LT	48.7-50.2	A-2-4 (0)	10	NP	NP	6	74	11	9	97	94	23	33.7	-
B2-A RL	SS-10	-L- 506+70, 19' RT	18.9-20.4	A-3 (1)	25	NP	NP	39	55	3	3	100	75	8	-	-
B2-B RL	SS-11	-L- 506+37, 73' RT	24.1-25.6	A-2-4 (0)	9	NP	NP	2	81	7	10	100	100	21	-	-
EB2-A LL	SS-12	-L- 507+72, 62' LT	3.5-5.0	A-2-4 (0)	3	NP	NP	18	70	2	10	100	94	13	24.9	-
EB2-A LL	SS-13	-L- 507+72, 62' LT	53.9-55.4	A-2-4 (0)	13	NP	NP	1	90	3	6	100	100	11	40.1	-
	ST-3	-L- 506+89, 75' RT	7.0-9.0	A-2-4 (0)	N/A	18	3	1	90	2	7	100	100	9	29.0	-

Signed:



NC DOT Certification No.

129-04-0411

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
APPENDIX A
CONSOLIDATION & TRIAXIAL SHEAR TEST RESULTS

REFERENCE: R-1015

PROJECT: 34360



**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297**

Client: ESP Associates
Client Reference: R-1015 Site B CS34.324.00
Project No.: R-2018-075-001
Lab ID: R-2018-075-001-003

Boring No.: -L- STA 505+39 11'RT
Depth (ft): 13.0-15.0
Sample No.: ST-2

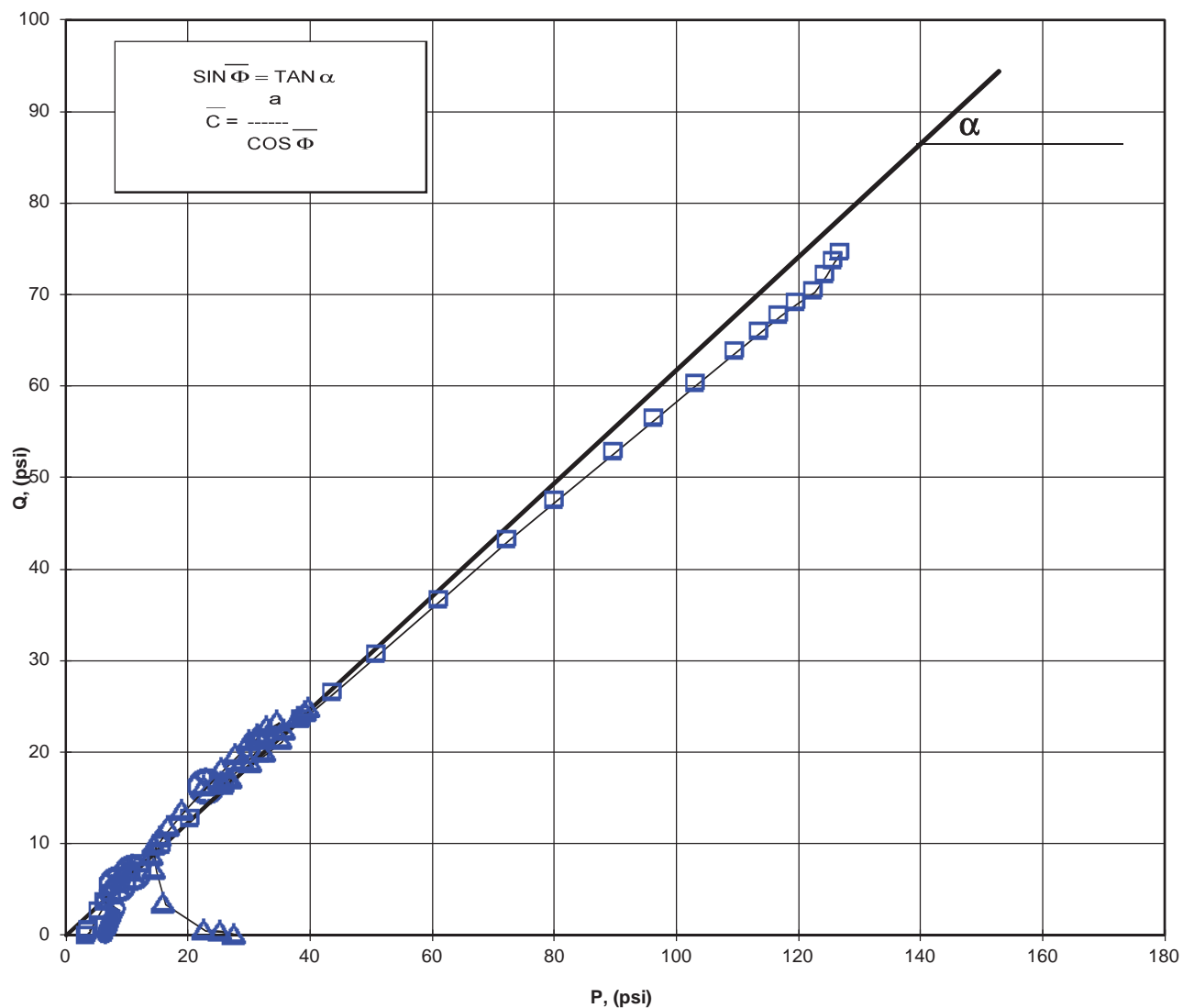
**MOHR TOTAL STRENGTH ENVELOPE
AASHTO T-297**



Client: ESP Associates
Client Reference: R-1015 Site B CS34.324.00
Project No.: R-2018-075-001
Lab ID: R-2018-075-001-003
Visual Description: TAN SAND (UNDISTURBED)

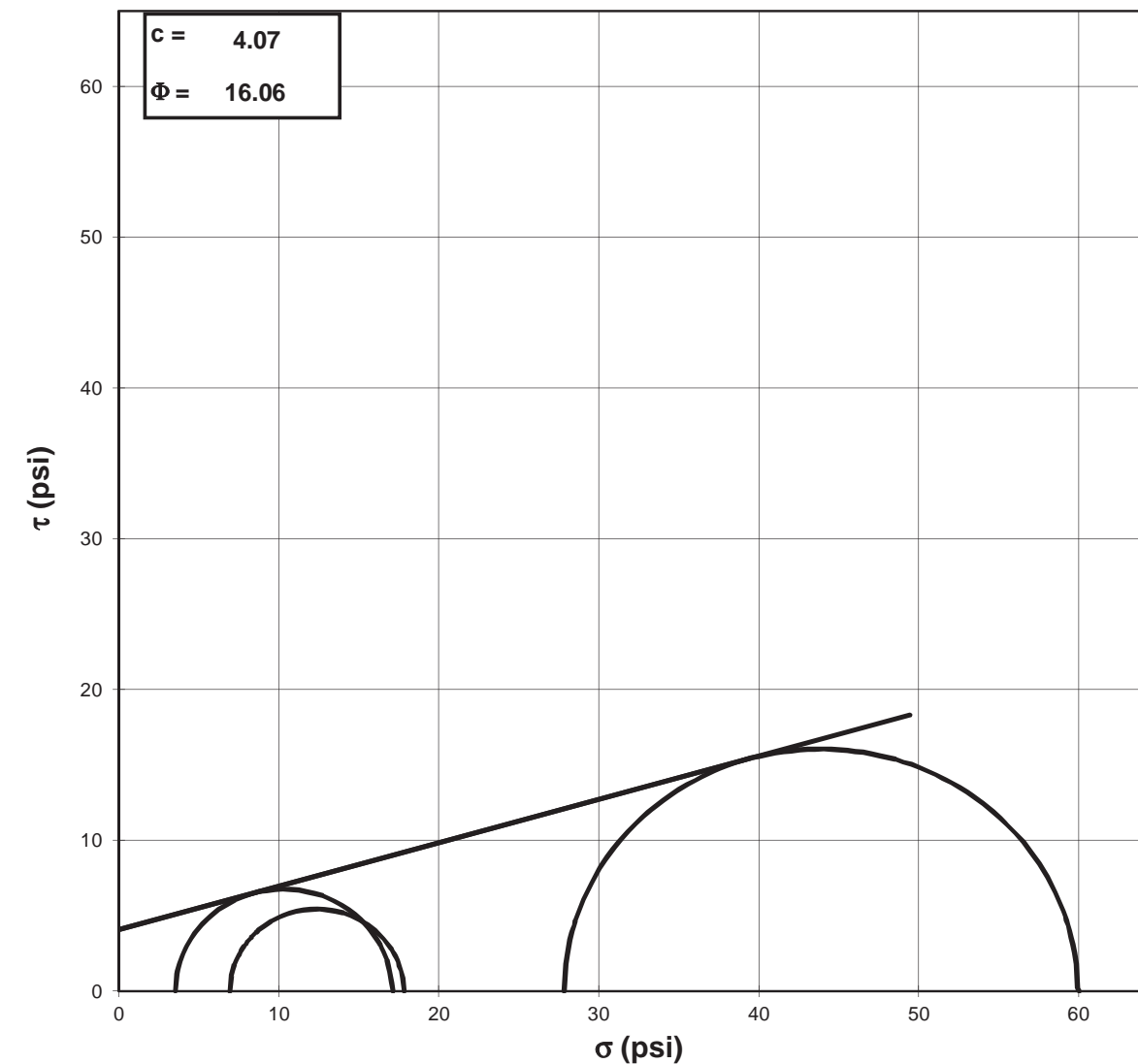
Boring No.: -L- STA 505+39 11'RT
Depth (ft): 13.0-15.0
Sample No.: ST-2

Consolidated Undrained Triaxial Test with Pore Pressure



◆ Max. Effec. Stress Ratio Points — Failure Envelope □ Test No. 1 ○ Test No. 2 ▲ Test No. 3

a	=	0.00	\bar{C}	=	0.00
α	=	31.7	$\bar{\Phi}$	=	38.11



Failure Based on Maximum Effective Principal Stress Ratio

NOTE: GRAPH NOT TO SCALE

Tested By: 129-04-0411 Date: 3/28/18 Approved By: MPS Date: 5/11/18

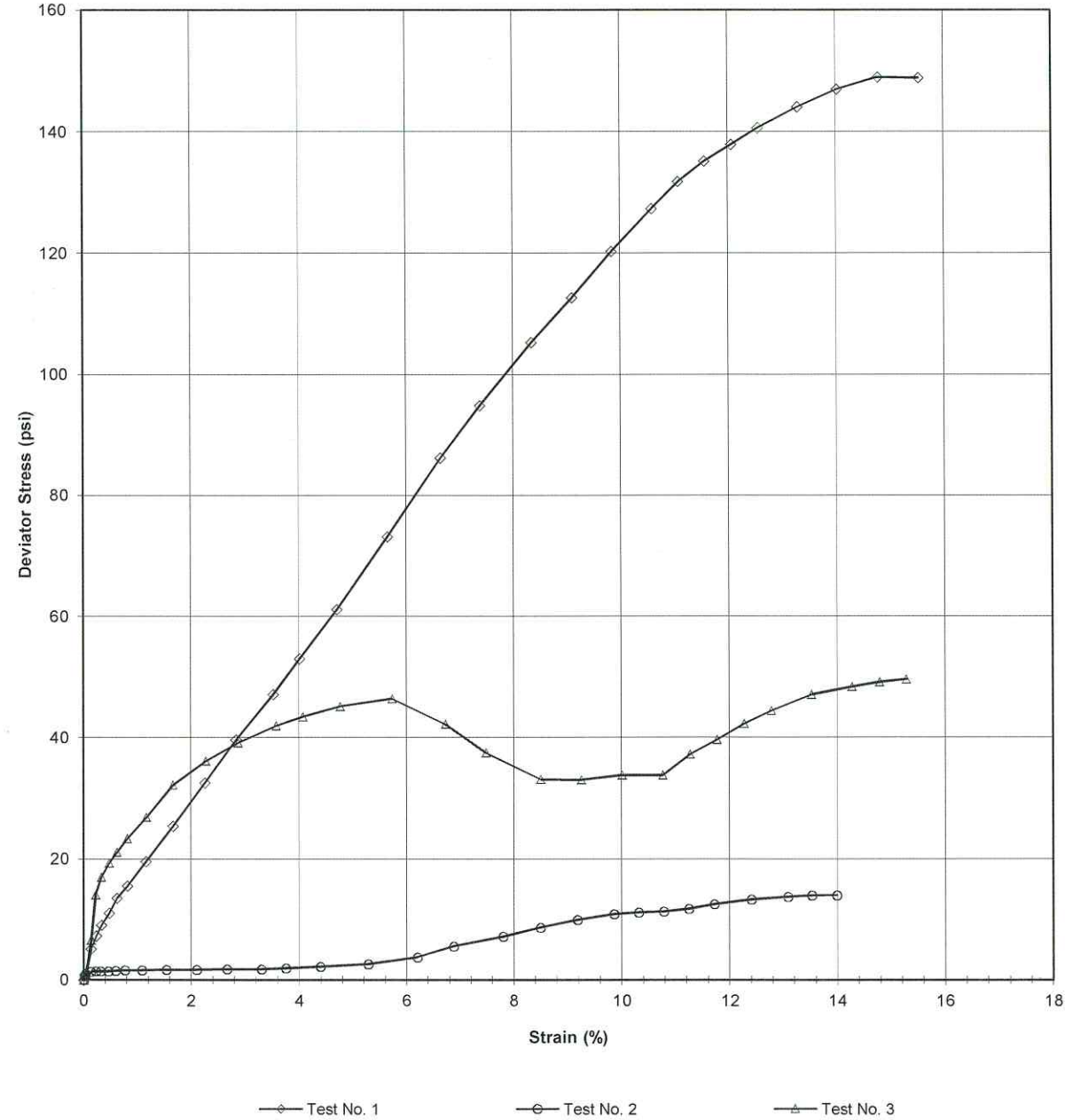
Tested By: 129-04-0411 Date: 3/28/18 Approved By: MPS Date: 5/11/18

page 2 of 11 DCN: CT-S28 DATE: 4/12/13 REVISION: 3



**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297**

Client: ESP Associates Boring No.: -L- STA 505+39 11'RT
 Client Reference: R-1015 Site B CS34.324.00 Depth (ft): 13.0-15.0
 Project No.: R-2018-075-001 Sample No.: ST-2
 Lab ID: R-2018-075-001-003
 Visual Description: TAN SAND (UNDISTURBED)



**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297**

Client: ESP Associates
 Client Reference: R-1015 Site B CS34.324.00
 Project No.: R-2018-075-001
 Lab ID: R-2018-075-001-003 Specific Gravity (Measured) 2.66
 Visual Description: TAN SAND (UNDISTURBED)

SAMPLE CONDITION SUMMARY

Boring No.:	-L- STA 505+39 11'RT	-L- STA 505+39 11'RT
Depth (ft):	13.0-15.0	13.0-15.0
Sample No.:	ST-2	ST-2
Test No.	T1	T3
Deformation Rate (in/min)	0.002	0.002
Back Pressure (psi)	50.0	50.0
Consolidation Time (days)	1	1
Moisture Content (%) (INITIAL)	33.6	33.6
Total Unit Weight (pcf)	130.9	126.5
Dry Unit Weight (pcf)	98.0	94.7
Moisture Content (%) (FINAL)	23.7	24.4
Initial State Void Ratio, e	0.694	0.752
Void Ratio at Shear, e	0.687	0.688

Tested By: 129-04-0411 Date: 3/28/18 Approved By: MPS Date: 5/11/18

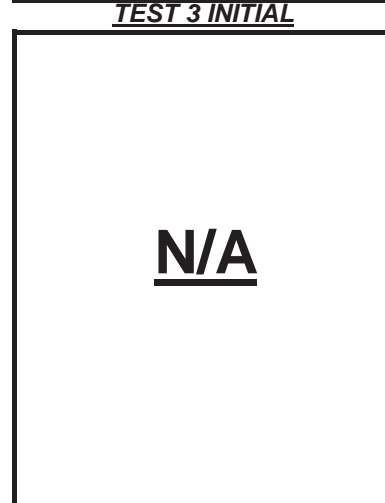
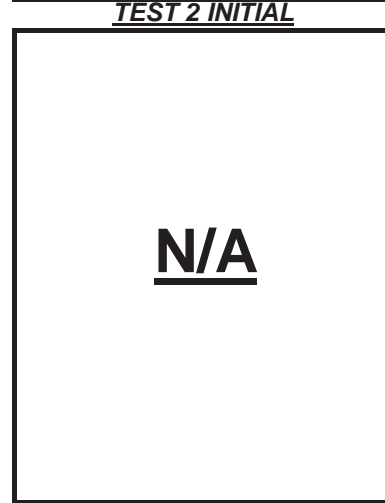
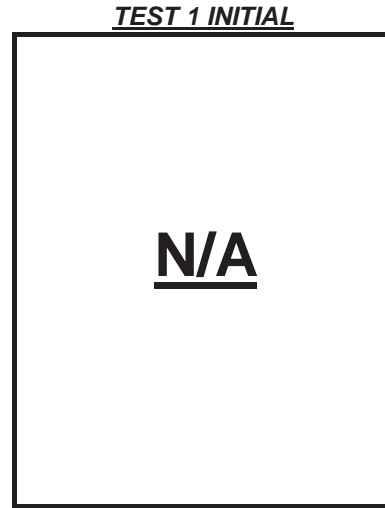
Tested By: 129-04-0411 Date: 3/28/18 Input Checked By: GEM Date: 5/11/18

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297**



Client: ESP Associates
 Client Reference: R-1015 Site B CS34.324.00
 Project No.: R-2018-075-001
 Lab ID: R-2018-075-001-003

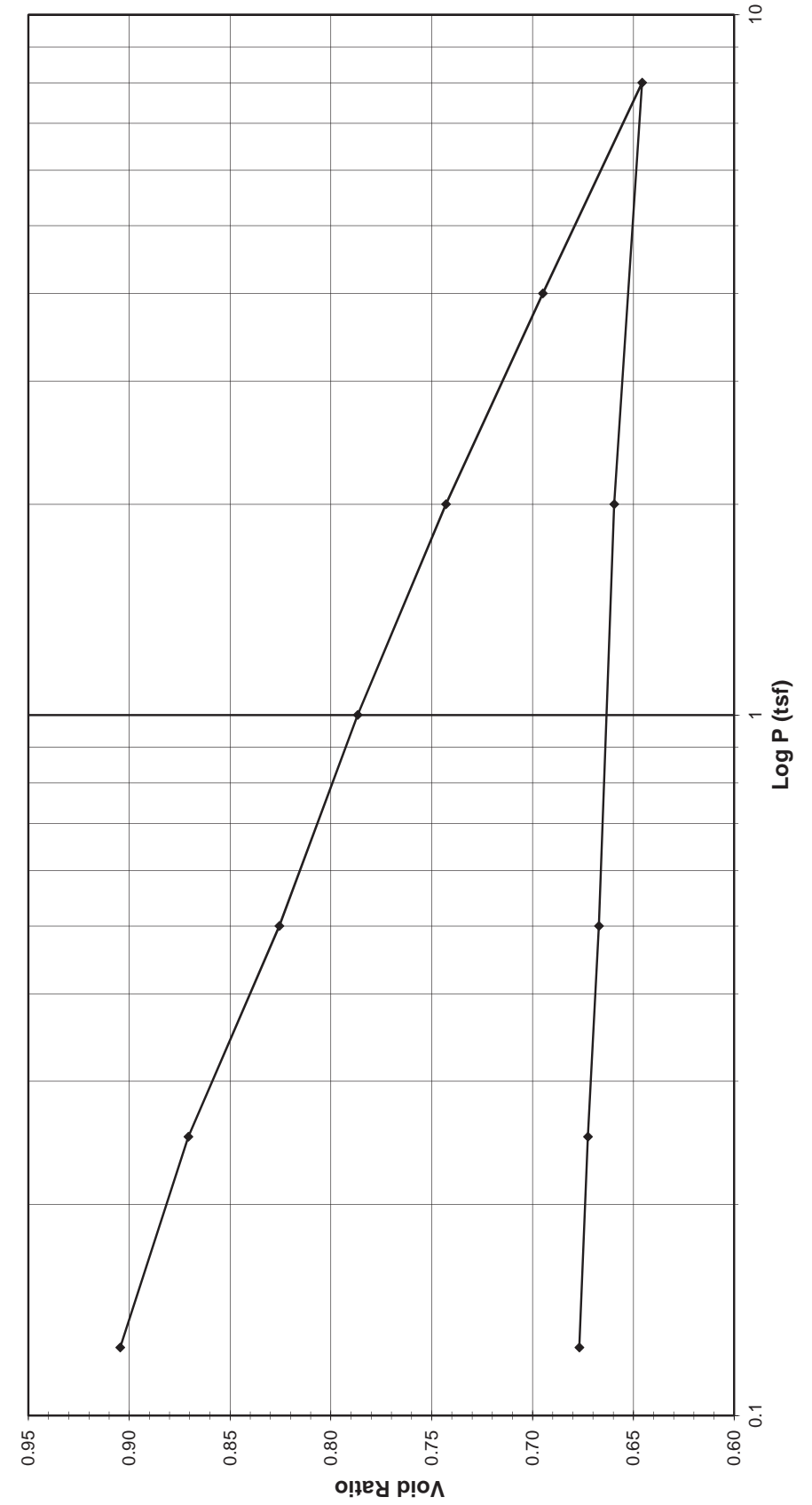
Boring No.: -L- STA 505+39 1
 Depth (ft): 13.0-15.0
 Sample No.: ST-2



**ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216**

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By 129-04-0411 Date 3/28/18 Approved By MPS Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED

Consolidometer No. R487
1 Division = 0.0001 (in.)

Sample Properties

	Initial	Final
<i>Water Content</i>		
Tare Number	SS-1	SS-8
Wt. Tare & WS (g)	395.74	226.77
Wt. Tare & DS (g)	316.52	200.61
Wt. Water (g)	79.22	26.16
Wt. Tare (g)	100.16	99.81
Wt. DS (g)	216.36	100.80
Water Content (%)	36.61	25.95
<i>Sample Parameters</i>		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.0000	0.8418
Sample Volume (cc)	80.44	67.72
Wt. Wet Sample + Ring (g)	251.20	239.75
Wt. of Ring (g)	104.45	104.45
Wt. of Wet Sample (g)	146.75	135.30
Wet Density (pcf)	113.84	124.67
Wet Density (g/cc)	1.82	2.00
Water Content (%)	36.61	25.95
Wt. of Dry Sample (g)	107.42	107.42
Dry Density (pcf)	83.33	98.98
Dry Density (g/cc)	1.34	1.59
Void Ratio	0.9919	0.6769
Saturation (%)	98.19	101.99
Specific Gravity	2.66	Measured

Test Data Summary

Applied Pressure (tsf)	Final Dial Reading (div)	Machine Deflection (div)	Corrected Reading (div)	Height of Sample (mm)	Volume (cc)	Dry Density (g/cc)	Void Ratio
Seating	0	0	0	25.400	80.440	1.33539	0.99192
0.125	442.4	3.6	438.9	24.285	76.910	1.39669	0.90450
0.25	617.3	9.0	608.4	23.855	75.546	1.42190	0.87074
0.5	855.6	21.0	834.6	23.280	73.726	1.45700	0.82567
1	1070.2	40.0	1030.2	22.783	72.153	1.48877	0.78671
2	1309.5	59.6	1249.9	22.225	70.386	1.52615	0.74295
4	1575.7	85.0	1490.7	21.614	68.448	1.56934	0.69498
8	1861.3	123.4	1737.9	20.986	66.460	1.61629	0.64574
2	1783.5	114.6	1668.9	21.161	67.015	1.60290	0.65949
0.5	1714.3	84.0	1630.3	21.259	67.326	1.59550	0.66719
0.25	1682.4	78.9	1603.5	21.327	67.542	1.59041	0.67253
0.125	1660.6	78.9	1581.7	21.383	67.717	1.58629	0.67687

page 2 of 2

DCN: CT-24E Date: 5/3/12 Revision: 6

Tested By 129-04-0411 Date 3/28/18 Input Checked By GEM Date 5/11/18

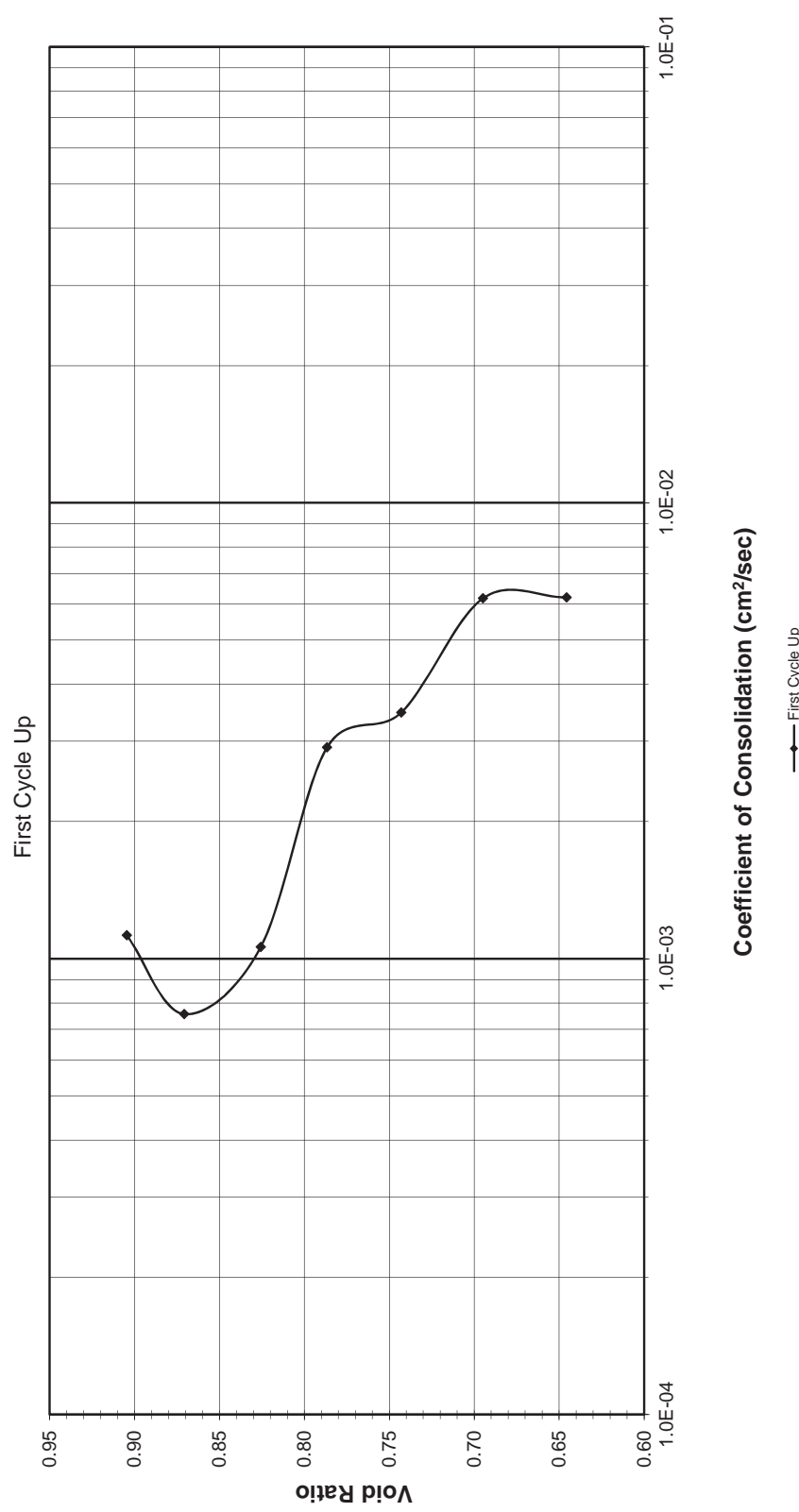
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ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216

Client ESP Associates
 Client Reference R-1015 Site B CS34.324.00
 Project No. R-2018-075-001
 Lab ID R-2018-075-001-003

Boring No. -L- STA 505+39 11'RT
 Depth (ft) 13.0-15.0
 Sample No. ST-2
 Visual Description TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED

Consolidometer No. R487
 1 Division = 0.0001 (in.)

Sample Properties

	Initial	Final
Water Content		
Tare Number	SS-1	SS-8
Wt. Tare & WS (g)	395.74	226.77
Wt. Tare & DS (g)	316.52	200.61
Wt. Water (g)	79.22	26.16
Wt. Tare (g)	100.16	99.81
Wt. DS (g)	216.36	100.80
Water Content (%)	36.61	25.95
Sample Parameters		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.000	0.842
Sample Volume (cc)	80.44	67.72
Wt. Wet Sample + Ring (g)	251.20	239.75
Wt. of Ring (g)	104.45	104.45
Wt. of Wet Sample (g)	146.75	135.30
Wet Density (pcf)	113.84	124.67
Wet Density (g/cc)	1.82	2.00
Water Content (%)	36.61	25.95
Wt. of Dry Sample (g)	107.42	107.42
Dry Density (pcf)	83.33	98.98
Dry Density (g/cc)	1.34	1.59
Void Ratio	0.9919	0.6769
Saturation (%)	98.19	101.99
Specific Gravity	2.66	Measured

Load Increment (tsf)	Dial Reading @ t ₅₀ (div)	Machine Deflection (div)	Corrected Dial Reading @ t ₅₀ (div)	Sample Height @ t ₅₀ (cm)	Time t ₅₀ (min.)	C _v (cm ² /sec)
0 - 0.125	223.3	3.6	219.7	2.484	4.50	0.00113
0.125 - 0.25	525.4	9.0	516.4	2.409	6.30	0.00076
0.25 - 0.5	740.1	21.0	719.1	2.357	4.30	0.00106
0.5 - 1	968.8	40.0	928.8	2.304	1.50	0.00291
1 - 2	1196.4	59.6	1136.8	2.251	1.20	0.00347
2 - 4	1450.0	85.0	1365.0	2.193	0.64	0.00617
4 - 8	1741.4	123.4	1618.0	2.129	0.60	0.00620
8 - 2	NA	114.6	NA	NA	NA	NA
2 - 0.5	NA	84.0	NA	NA	NA	NA
0.5 - 0.25	NA	78.9	NA	NA	NA	NA
0.25 - 0.125	NA	78.9	NA	NA	NA	NA

Tested By 129-04-0411 Date 3/28/18 Input Checked By GEM Date 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 6

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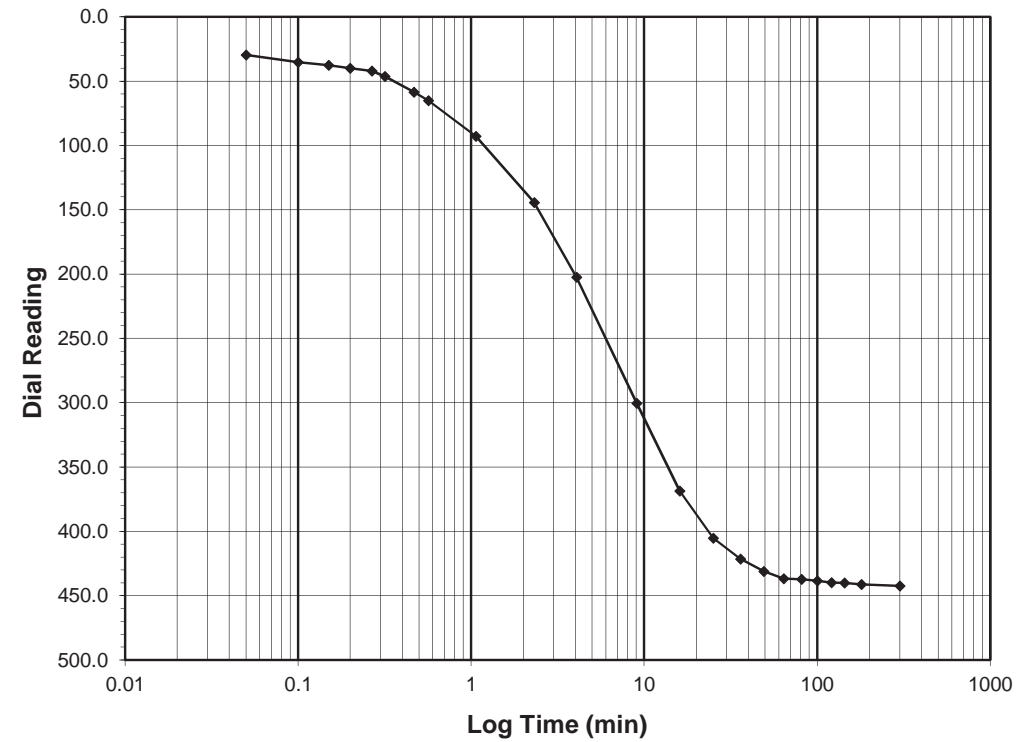
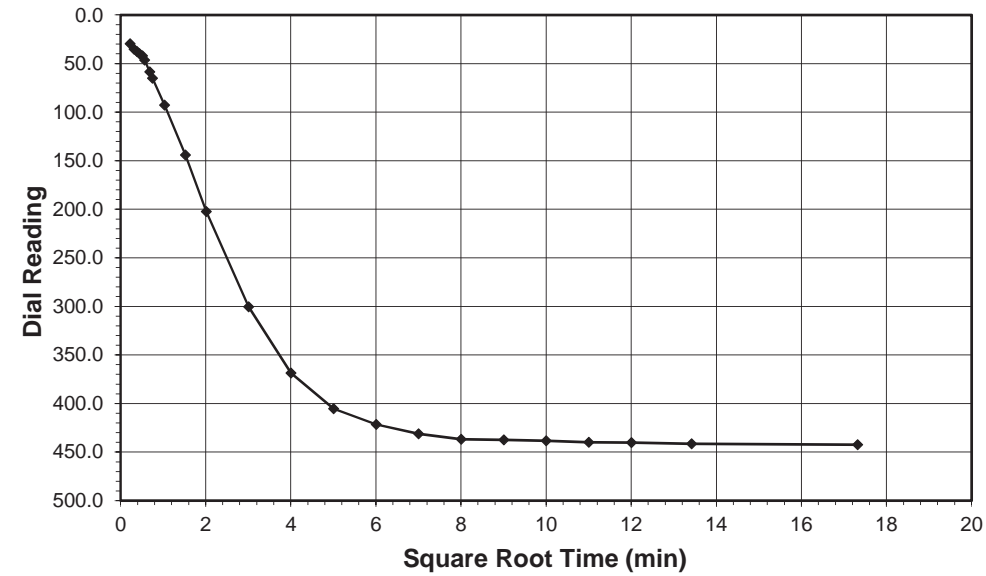


ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216

Client ESP Associates
 Client Project R-1015 Site B CS34.324.00
 Project No. R-2018-075-001
 Lab ID R-2018-075-001-003

Boring No. -L- STA 505+39 11'RT
 Depth (ft) 13.0-15.0
 Sample No. ST-2
 Visual Description TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf)	0.0-0.125
Final Reading (div)	442.4
Consolidometer No.	R487
1 Division (in)	0.0001
Start Date	3/28/18
Start Time	9:12:44

Elapsed Time (min)	Dial Reading (div)
Initial	0.0
0.05	29.6
0.10	35.2
0.15	37.6
0.20	39.9
0.27	42.1
0.32	46.4
0.47	58.4
0.57	65.2
1.07	92.9
2.32	144.2
4.07	202.4
9.07	300.4
16.07	368.6
25.07	405.2
36.07	421.5
49.07	431.2
64.08	436.9
81.08	437.3
100.08	438.3
121.08	440.0
144.08	440.1
180.08	441.4
300.08	442.4

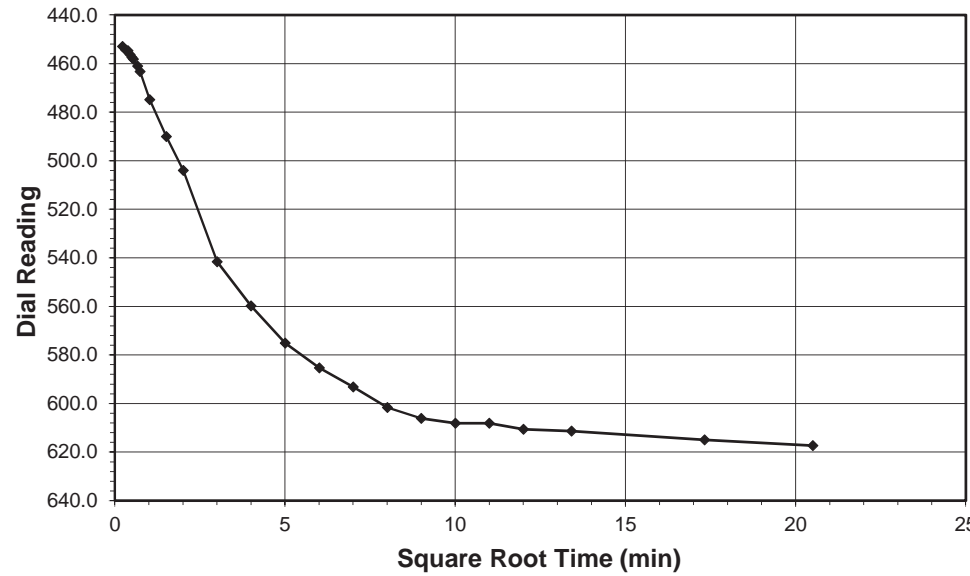
Tested By 129-04-0411 Date 3/28/18 Checked By GEM Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



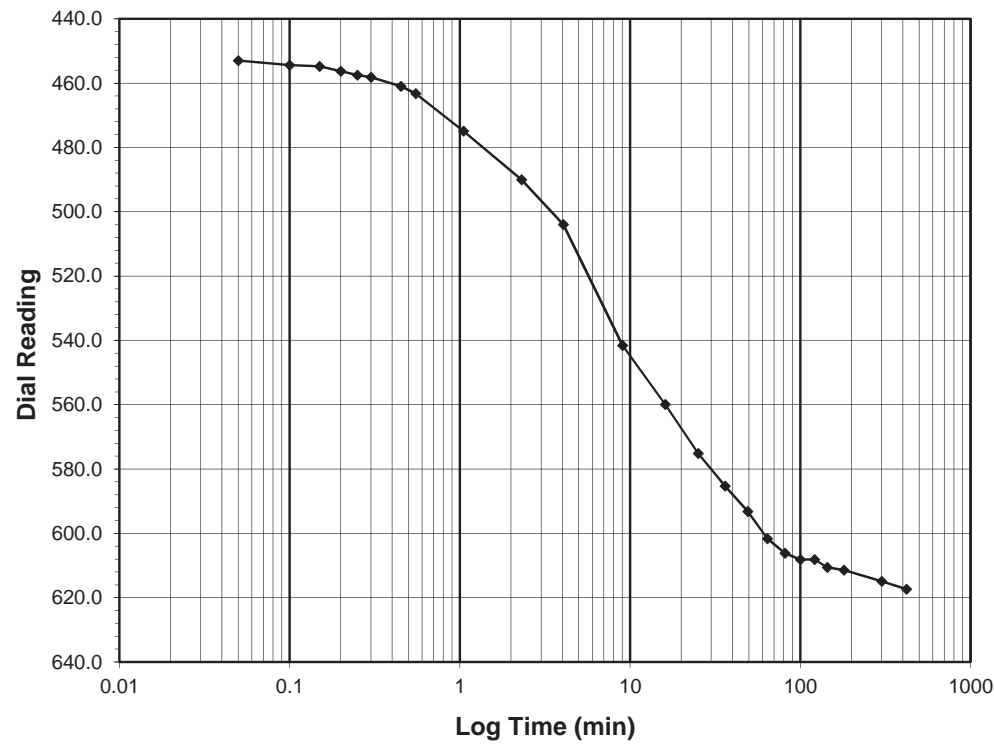
Client ESP Associates Boring No. -L- STA 505+39 11'RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 13.0-15.0
 Project No. R-2018-075-001 Sample No. ST-2
 Lab ID R-2018-075-001-003 Visual Description TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 0.125-0.25
 Final Reading (div) 617.3
 Consolidometer No. R487
 1 Division (in) 0.0001
 Start Date 3/28/18
 Start Time 16:13:12

Elapsed Time (min)	Dial Reading (div)
Initial	442.4
0.05	453.0
0.10	454.4
0.15	454.7
0.20	456.3
0.25	457.4
0.30	458.2
0.45	461.0
0.55	463.2
1.05	474.9
2.30	490.0
4.05	504.0
9.05	541.6
16.05	559.9
25.07	575.1
36.07	585.3
49.07	593.2
64.07	601.6
81.07	606.1
100.08	608.2
121.08	608.2
144.08	610.6
180.08	611.4
300.08	614.9
420.47	617.3

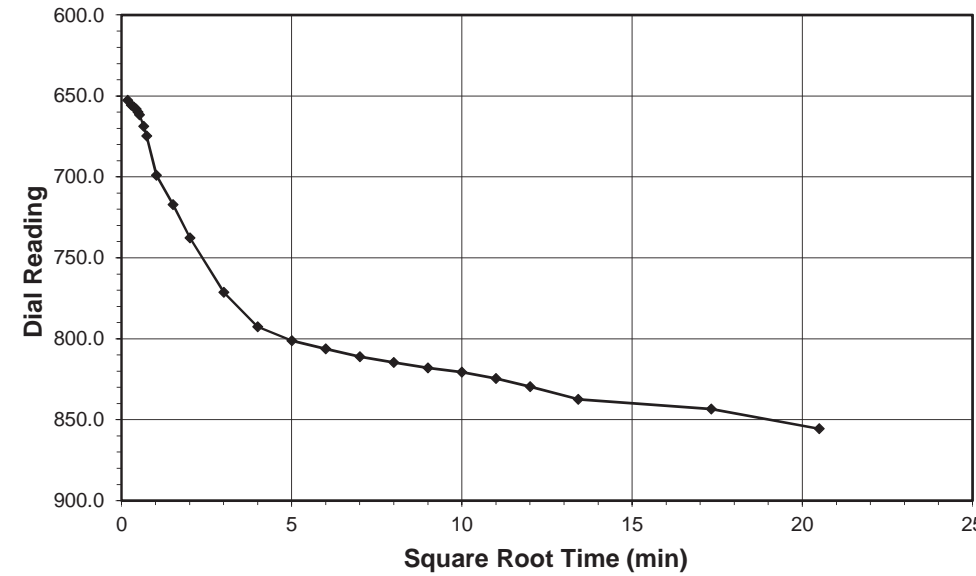


ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



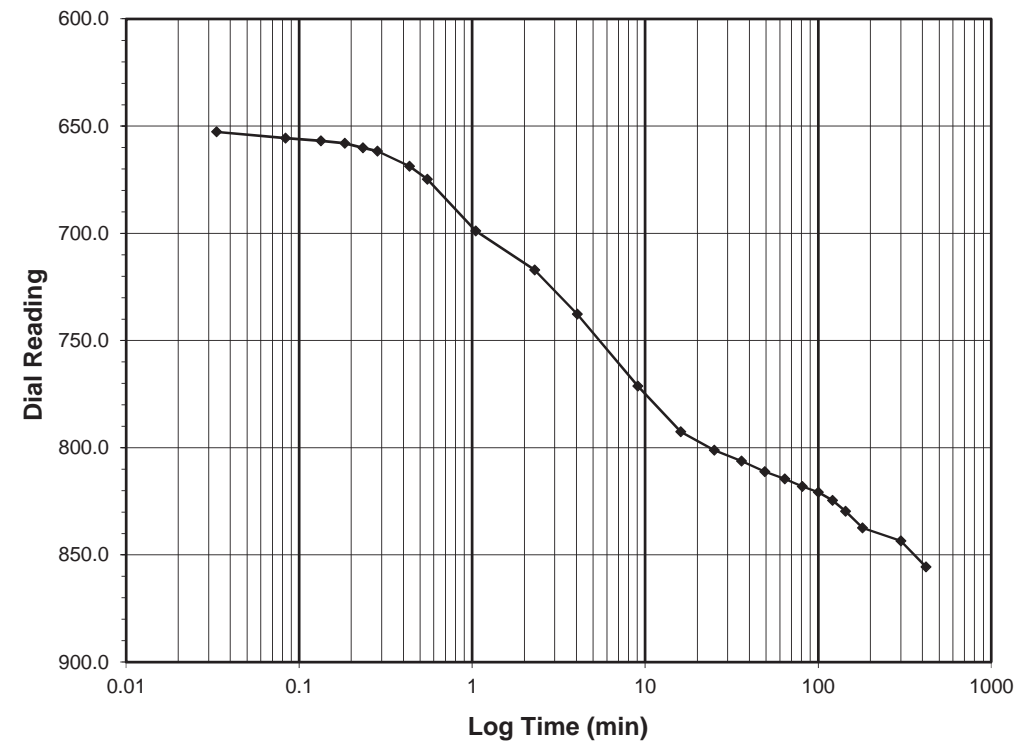
Client ESP Associates Boring No. -L- STA 505+39 11'RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 13.0-15.0
 Project No. R-2018-075-001 Sample No. ST-2
 Lab ID R-2018-075-001-003 Visual Description TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 0.25-0.5
 Final Reading (div) 855.6
 Consolidometer No. R487
 1 Division (in) 0.0001
 Start Date 3/28/18
 Start Time 23:13:40

Elapsed Time (min)	Dial Reading (div)
Initial	617.3
0.03	652.6
0.08	655.6
0.13	656.8
0.18	658.0
0.23	660.0
0.28	661.6
0.43	668.7
0.55	674.8
1.05	698.9
2.30	717.0
4.05	737.7
9.05	771.3
16.05	792.5
25.05	801.2
36.05	806.2
49.05	811.1
64.05	814.6
81.05	818.0
100.05	820.7
121.05	824.5
144.05	829.6
180.05	837.3
300.05	843.4
420.32	855.6



Tested By 129-04-0411 Date 3/28/18 Checked By GEM Date 5/11/18

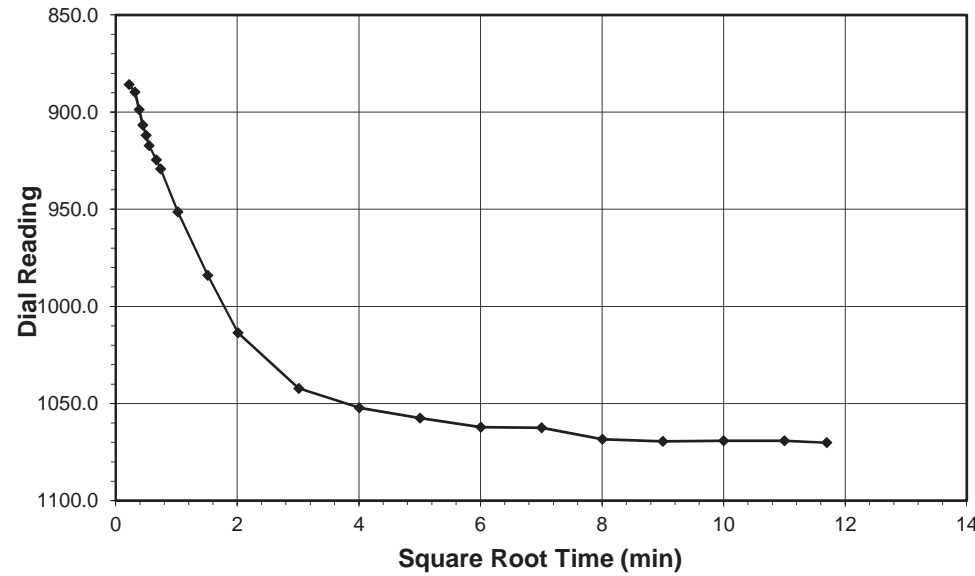
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ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



Client ESP Associates Boring No. -L- STA 505+39 11'RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 13.0-15.0
 Project No. R-2018-075-001 Sample No. ST-2
 Lab ID R-2018-075-001-003 Visual Description TAN SAND

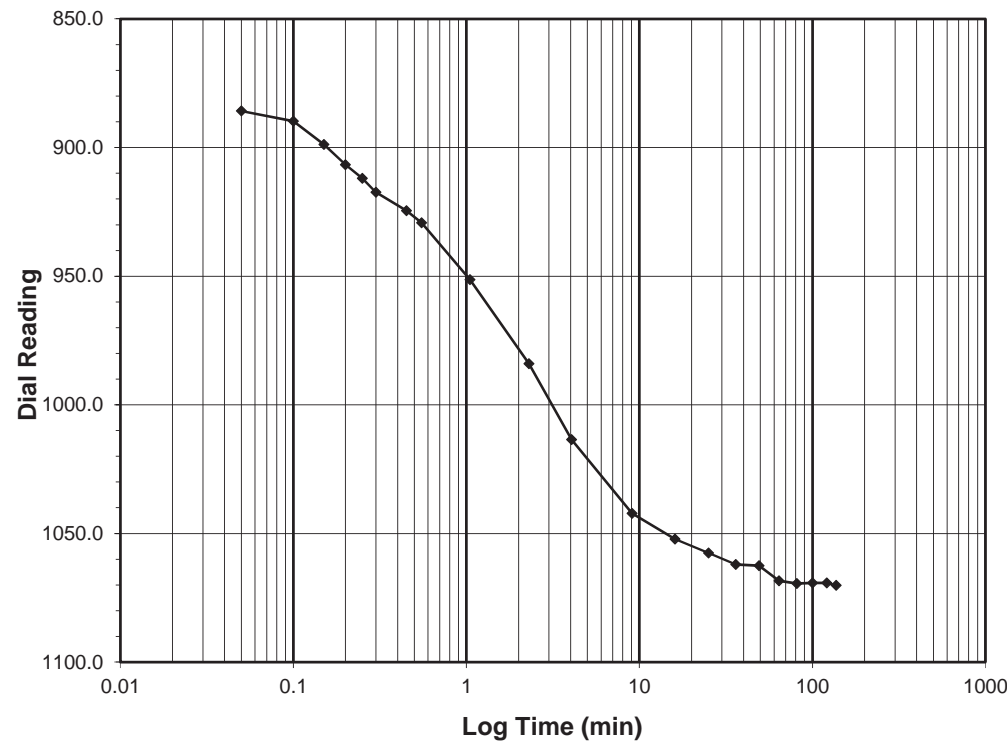
Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 0.5-1.0
Final Reading (div) 1070.2
 Consolidometer No. **R487**
 1 Division (in) 0.0001

Start Date 3/29/18
 Start Time 6:14:00

Elapsed Time (min)	Dial Reading (div)
Initial	855.6
0.05	885.8
0.10	889.7
0.15	898.8
0.20	906.7
0.25	912.0
0.30	917.3
0.45	924.5
0.55	929.2
1.05	951.4
2.30	984.0
4.05	1013.5
9.07	1042.2
16.07	1052.2
25.07	1057.5
36.07	1062.1
49.07	1062.5
64.07	1068.4
81.07	1069.4
100.07	1069.2
121.07	1069.2
136.82	1070.2

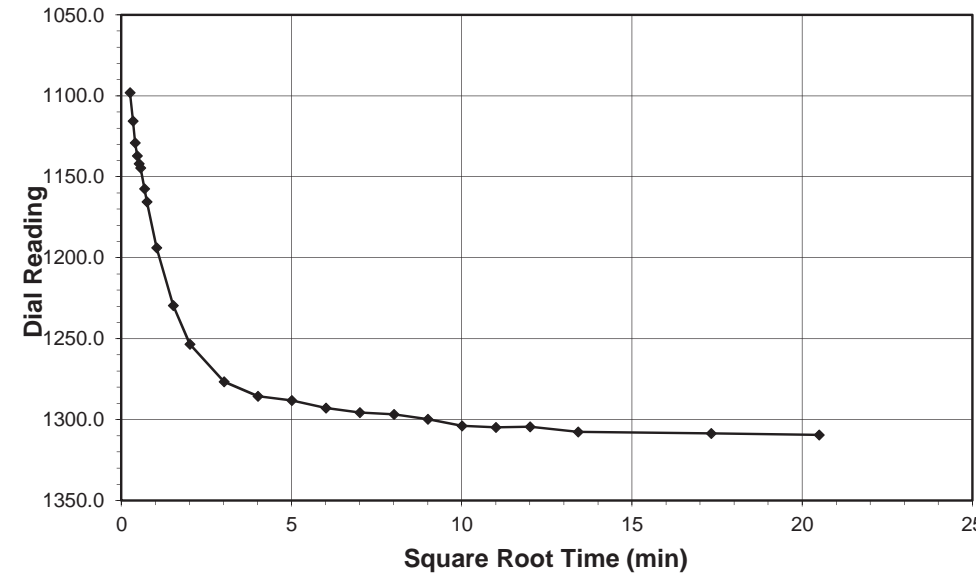


ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



Client ESP Associates Boring No. -L- STA 505+39 11'RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 13.0-15.0
 Project No. R-2018-075-001 Sample No. ST-2
 Lab ID R-2018-075-001-003 Visual Description TAN SAND

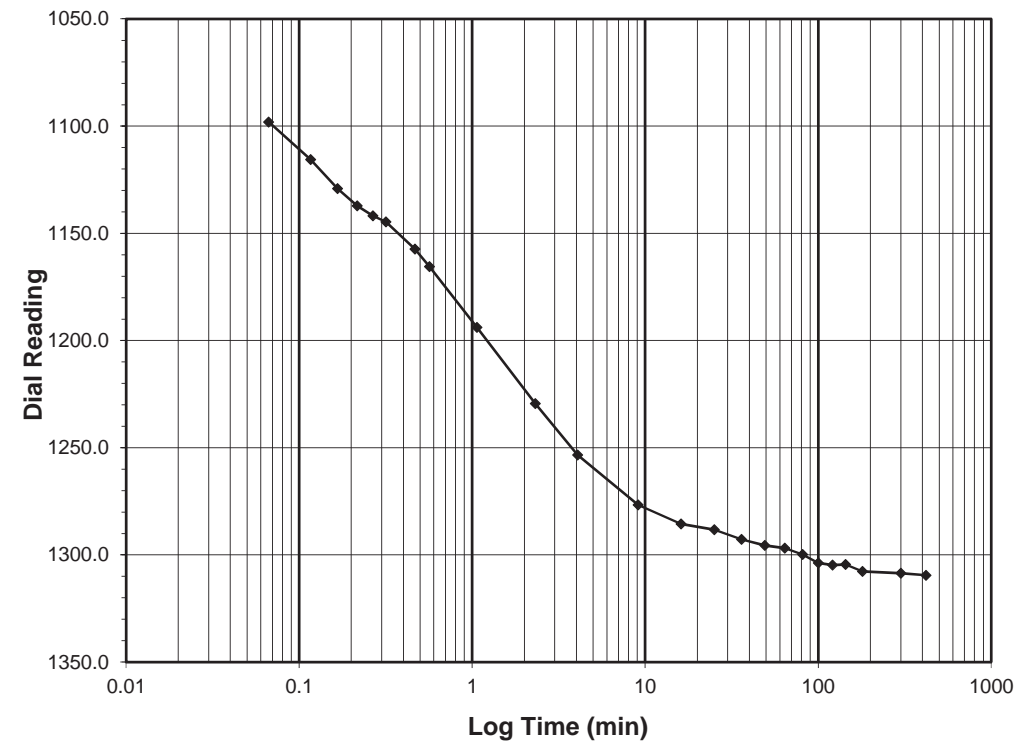
Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 1.0-2.0
Final Reading (div) 1309.5
 Consolidometer No. **R487**
 1 Division (in) 0.0001

Start Date 3/29/18
 Start Time 8:30:50

Elapsed Time (min)	Dial Reading (div)
Initial	1070.2
0.07	1098.0
0.12	1115.6
0.17	1129.1
0.22	1137.1
0.27	1141.8
0.32	1144.6
0.47	1157.3
0.57	1165.5
1.07	1193.8
2.32	1229.4
4.07	1253.4
9.08	1276.7
16.08	1285.5
25.08	1288.2
36.08	1292.8
49.08	1295.6
64.08	1296.8
81.08	1299.8
100.08	1303.8
121.08	1304.7
144.08	1304.4
180.08	1307.6
300.08	1308.5
420.23	1309.5



Tested By 129-04-0411 Date 3/29/18 Checked By GEM Date 5/11/18

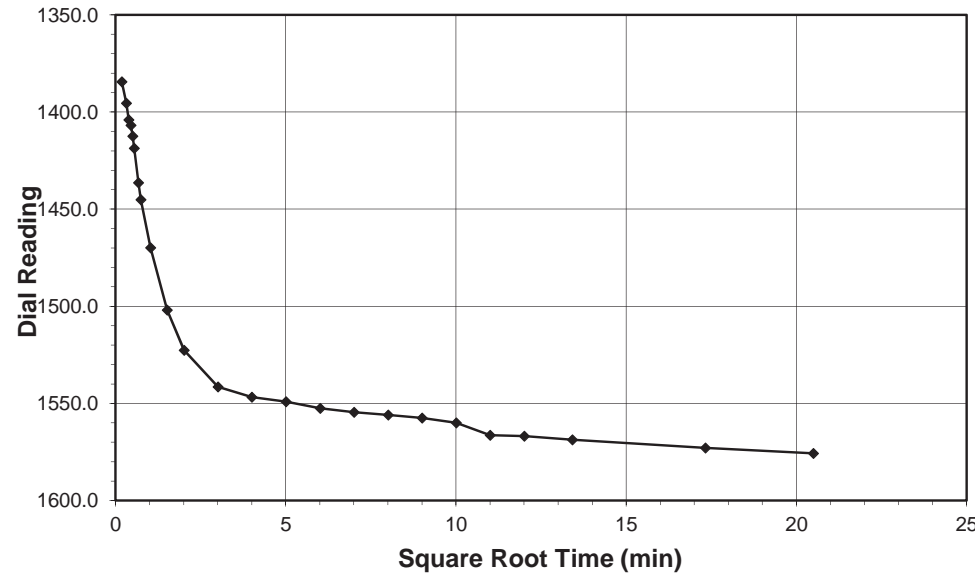
Tested By 129-04-0411 Date 3/29/18 Checked By GEM Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



Client ESP Associates Boring No. -L- STA 505+39 11'RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 13.0-15.0
 Project No. R-2018-075-001 Sample No. ST-2
 Lab ID R-2018-075-001-003 Visual Description TAN SAND

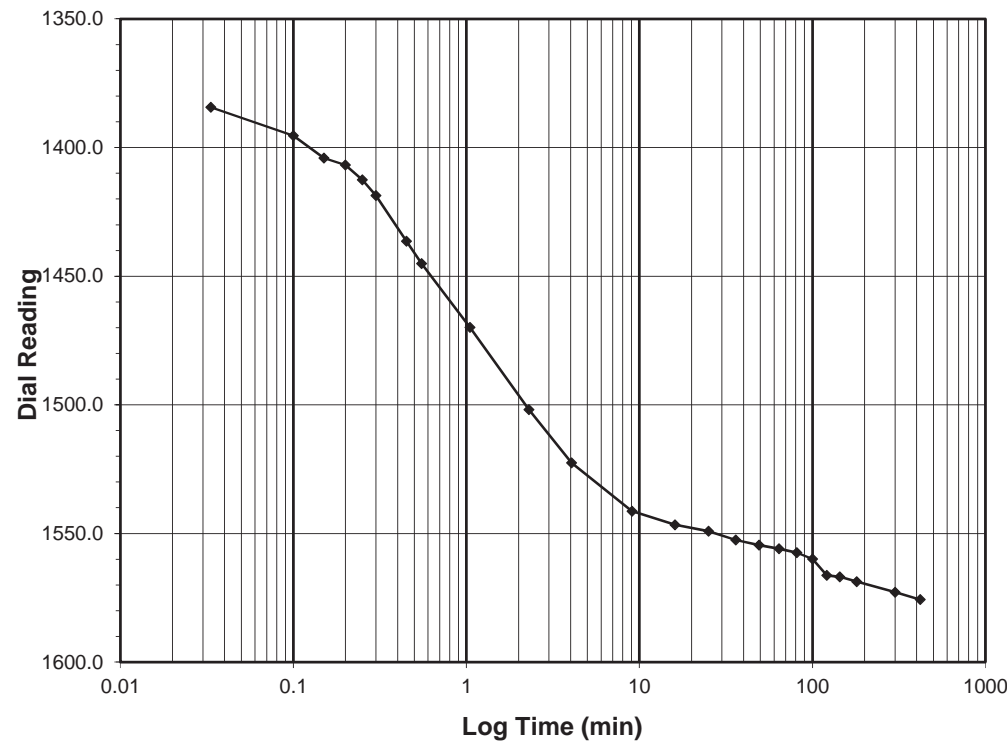
Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 2.0-4.0
Final Reading (div) 1575.7
 Consolidometer No. **R487**
 1 Division (in) 0.0001

Start Date 3/29/18
 Start Time 15:31:03

Elapsed Time (min)	Dial Reading (div)
Initial	1309.5
0.03	1384.3
0.10	1395.4
0.15	1404.1
0.20	1406.8
0.25	1412.5
0.30	1418.6
0.45	1436.4
0.55	1445.1
1.05	1469.9
2.30	1501.9
4.05	1522.6
9.05	1541.4
16.05	1546.7
25.05	1549.1
36.07	1552.5
49.07	1554.6
64.07	1555.9
81.07	1557.5
100.07	1559.9
121.07	1566.3
144.07	1566.9
180.07	1568.7
300.07	1572.9
420.27	1575.7

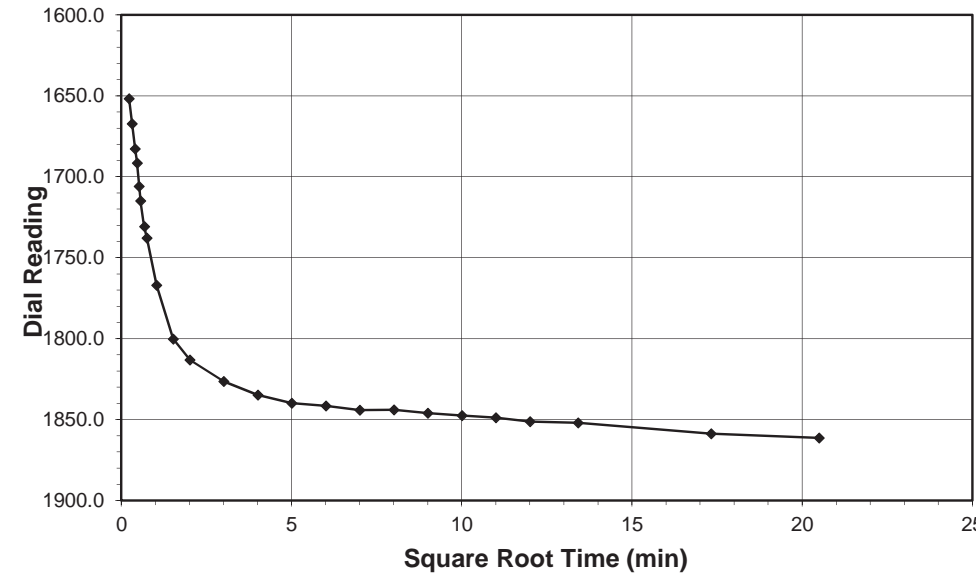


ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



Client ESP Associates Boring No. -L- STA 505+39 11'RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 13.0-15.0
 Project No. R-2018-075-001 Sample No. ST-2
 Lab ID R-2018-075-001-003 Visual Description TAN SAND

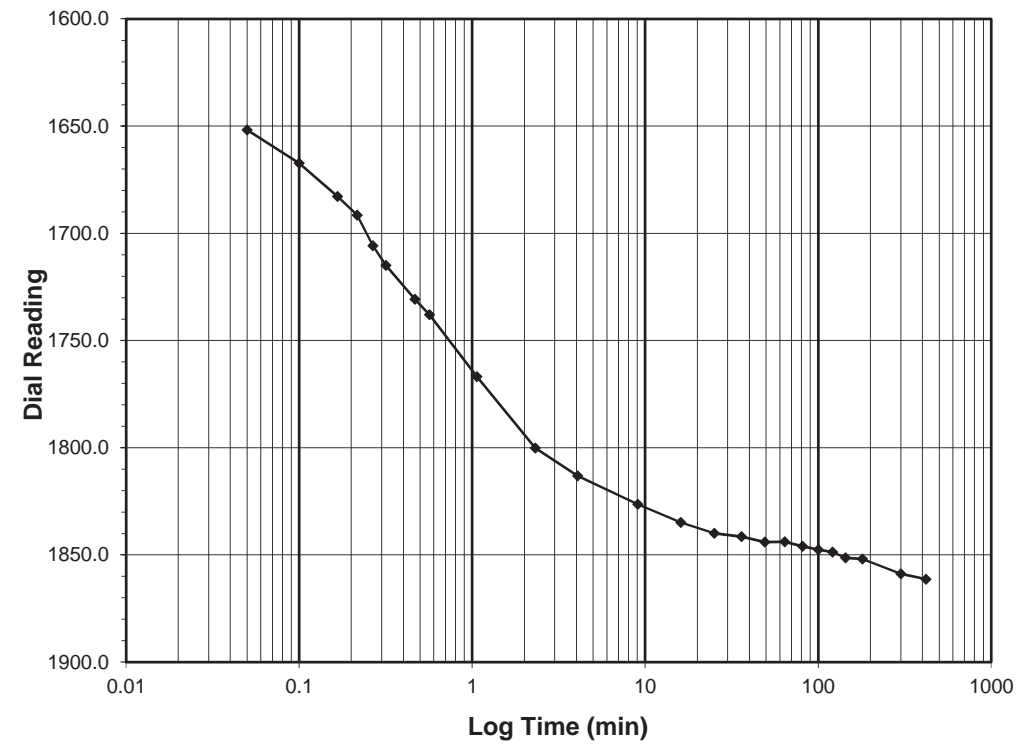
Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 4.0-8.0
Final Reading (div) 1861.3
 Consolidometer No. **R487**
 1 Division (in) 0.0001

Start Date 3/29/18
 Start Time 22:31:20

Elapsed Time (min)	Dial Reading (div)
Initial	1575.7
0.05	1651.8
0.10	1667.3
0.17	1682.7
0.22	1691.6
0.27	1705.8
0.32	1714.9
0.47	1730.8
0.57	1737.9
1.07	1766.9
2.32	1800.2
4.07	1813.1
9.07	1826.3
16.07	1834.8
25.07	1839.9
36.07	1841.5
49.07	1844.1
64.07	1843.9
81.07	1846.0
100.08	1847.5
121.08	1848.7
144.08	1851.3
180.08	1852.0
300.08	1858.8
420.28	1861.3



Tested By 129-04-0411 Date 3/29/18 Checked By GEM Date 5/11/18

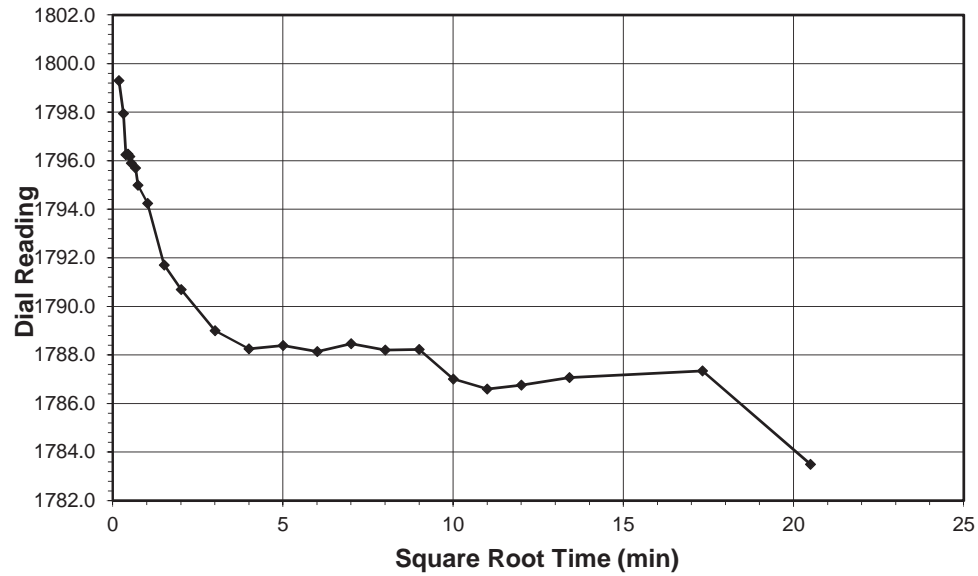
Tested By 129-04-0411 Date 3/29/18 Checked By GEM Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



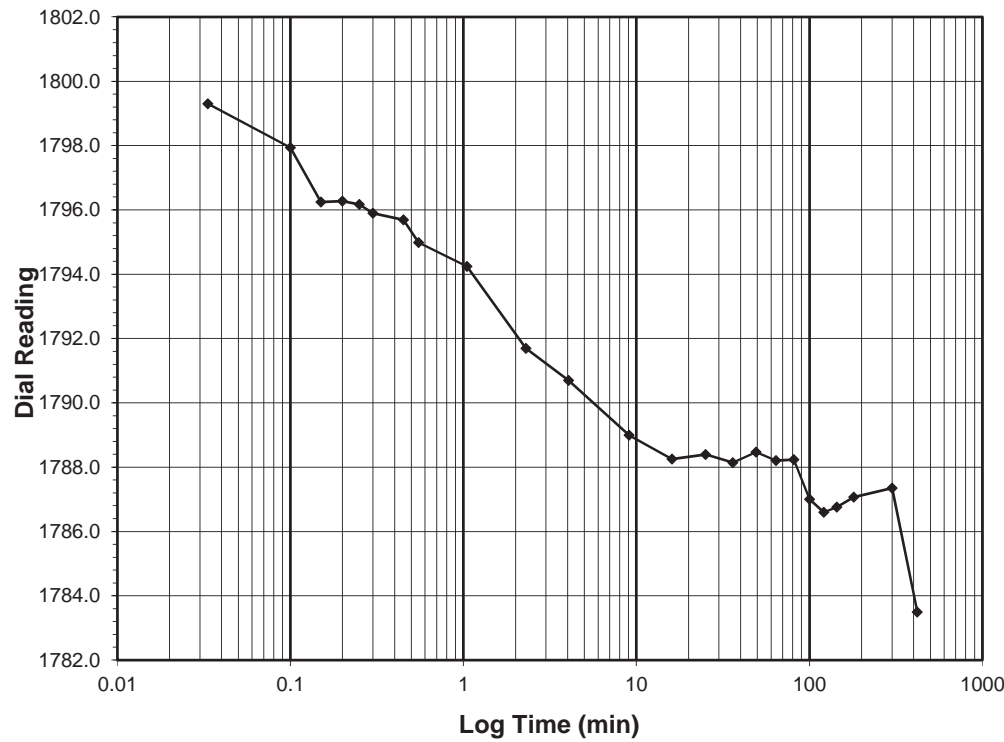
Client ESP Associates Boring No. -L- STA 505+39 11'RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 13.0-15.0
 Project No. R-2018-075-001 Sample No. ST-2
 Lab ID R-2018-075-001-003 Visual Description TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 8.0-2.0
 Final Reading (div) 1783.5
 Consolidometer No. R487
 1 Division (in) 0.0001
 Start Date 3/30/18
 Start Time 5:31:37

Elapsed Time (min)	Dial Reading (div)
Initial	1861.3
0.03	1799.3
0.10	1797.9
0.15	1796.2
0.20	1796.3
0.25	1796.2
0.30	1795.9
0.45	1795.7
0.55	1795.0
1.05	1794.2
2.30	1791.7
4.05	1790.7
9.05	1789.0
16.05	1788.2
25.05	1788.4
36.07	1788.1
49.07	1788.5
64.07	1788.2
81.07	1788.2
100.07	1787.0
121.07	1786.6
144.07	1786.8
180.07	1787.1
300.07	1787.3
420.27	1783.5



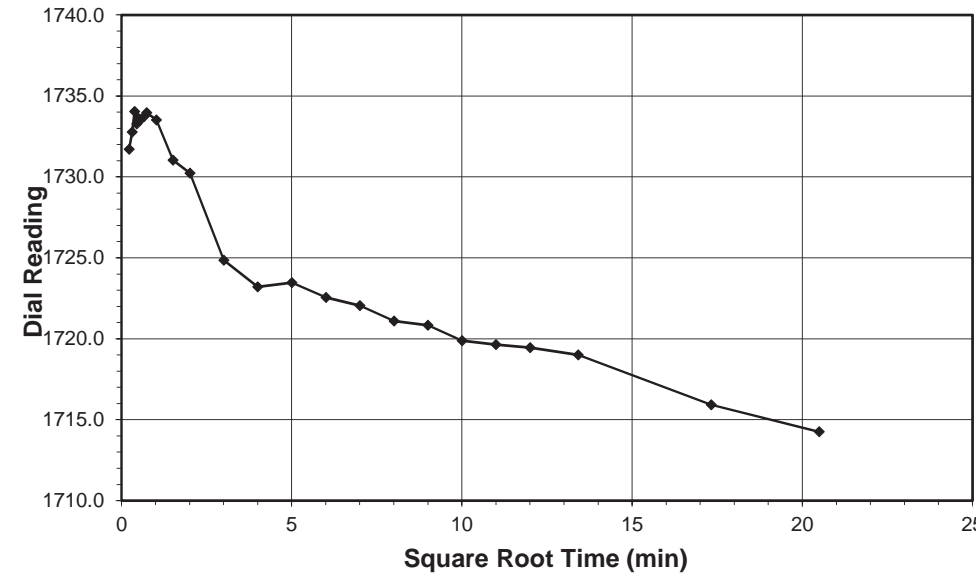
Tested By 129-04-0411 Date 3/30/18 Checked By GEM Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



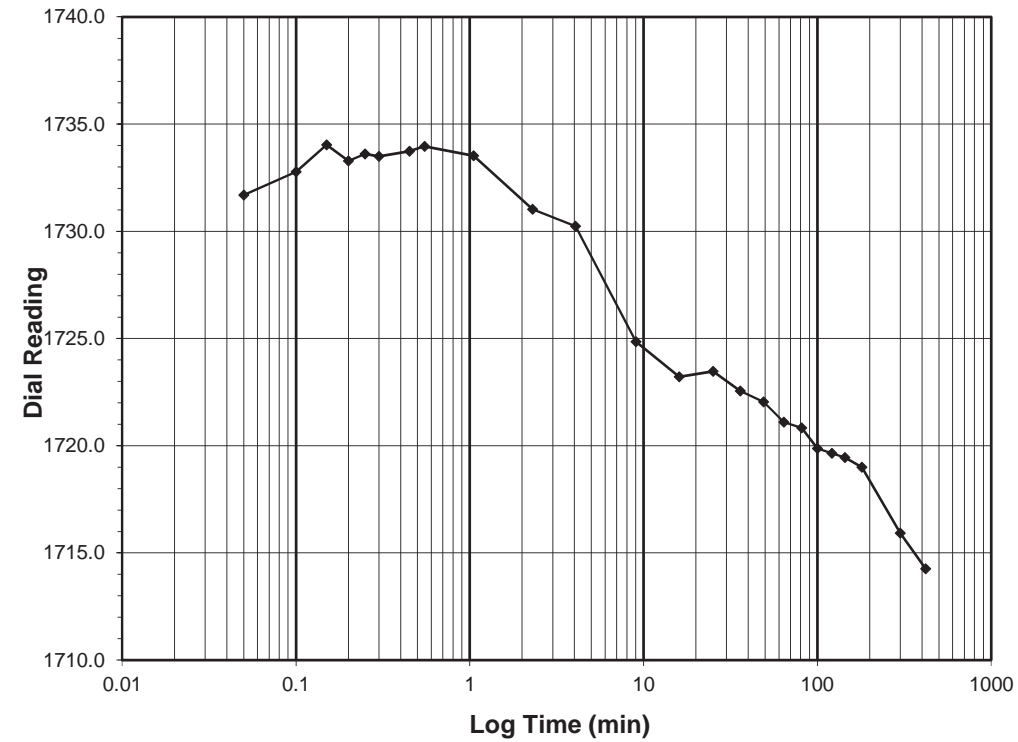
Client ESP Associates Boring No. -L- STA 505+39 11'RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 13.0-15.0
 Project No. R-2018-075-001 Sample No. ST-2
 Lab ID R-2018-075-001-003 Visual Description TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 2.0-0.5
 Final Reading (div) 1714.3
 Consolidometer No. R487
 1 Division (in) 0.0001
 Start Date 3/30/18
 Start Time 12:31:54

Elapsed Time (min)	Dial Reading (div)
Initial	1783.5
0.05	1731.7
0.10	1732.8
0.15	1734.0
0.20	1733.3
0.25	1733.6
0.30	1733.5
0.45	1733.7
0.55	1734.0
1.05	1733.5
2.30	1731.0
4.05	1730.2
9.05	1724.8
16.05	1723.2
25.07	1723.5
36.07	1722.6
49.07	1722.1
64.07	1721.1
81.07	1720.8
100.07	1719.9
121.07	1719.6
144.07	1719.4
180.08	1719.0
300.08	1715.9
420.10	1714.3



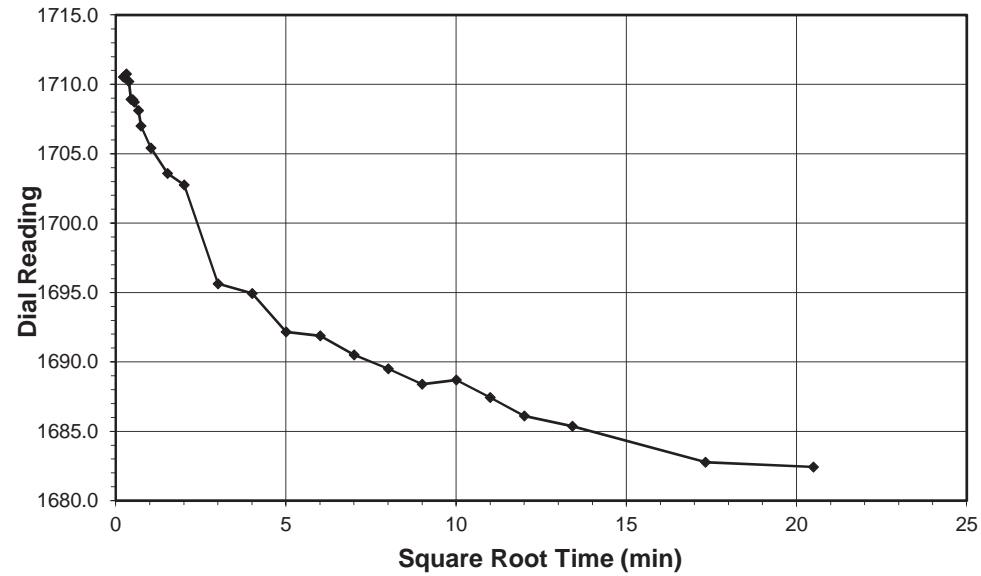
Tested By 129-04-0411 Date 3/30/18 Checked By GEM Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



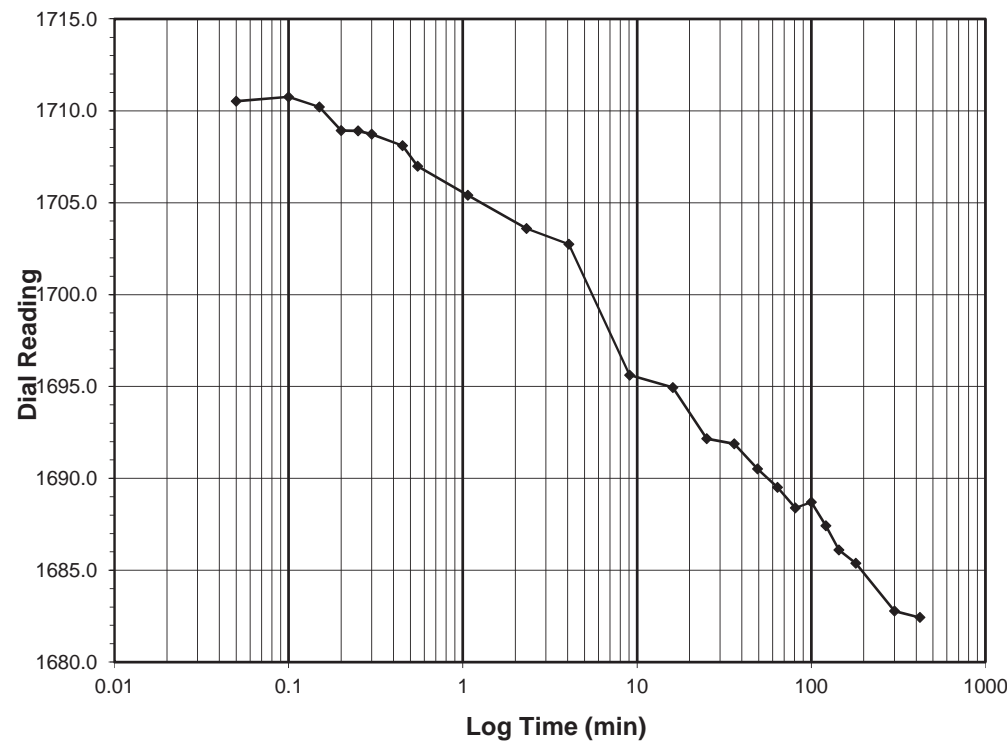
Client ESP Associates Boring No. -L- STA 505+39 11'RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 13.0-15.0
 Project No. R-2018-075-001 Sample No. ST-2
 Lab ID R-2018-075-001-003 Visual Description TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 0.5-0.25
 Final Reading (div) 1682.4
 Consolidometer No. R487
 1 Division (in) 0.0001
 Start Date 3/30/18
 Start Time 19:32:00

Elapsed Time (min)	Dial Reading (div)
Initial	1714.3
0.05	1710.5
0.10	1710.8
0.15	1710.2
0.20	1708.9
0.25	1708.9
0.30	1708.7
0.45	1708.1
0.55	1707.0
1.07	1705.4
2.32	1703.6
4.07	1702.7
9.07	1695.6
16.07	1694.9
25.07	1692.2
36.07	1691.9
49.07	1690.5
64.07	1689.5
81.07	1688.4
100.07	1688.7
121.07	1687.4
144.07	1686.1
180.07	1685.4
300.08	1682.8
420.28	1682.4



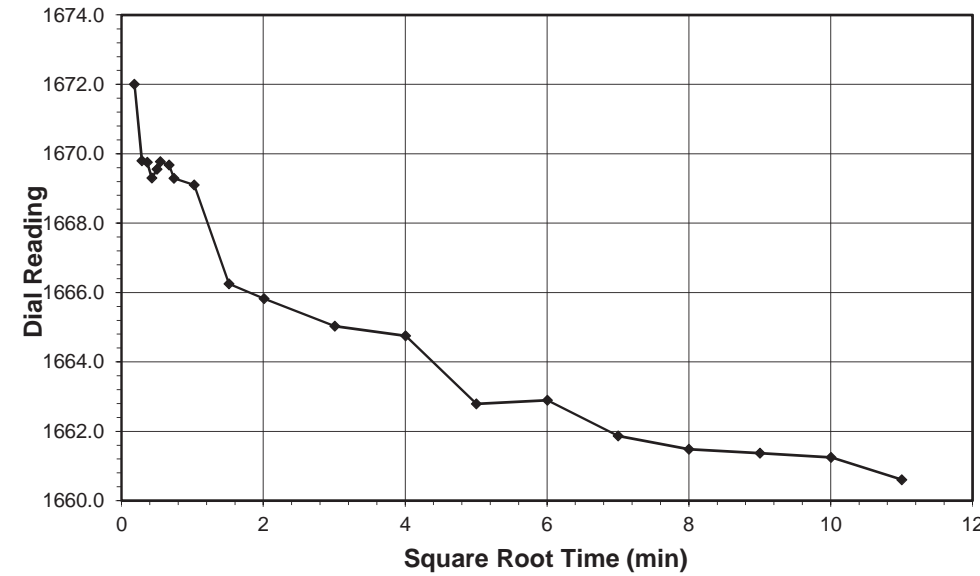
Tested By 129-04-0411 Date 3/30/18 Checked By GEM Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



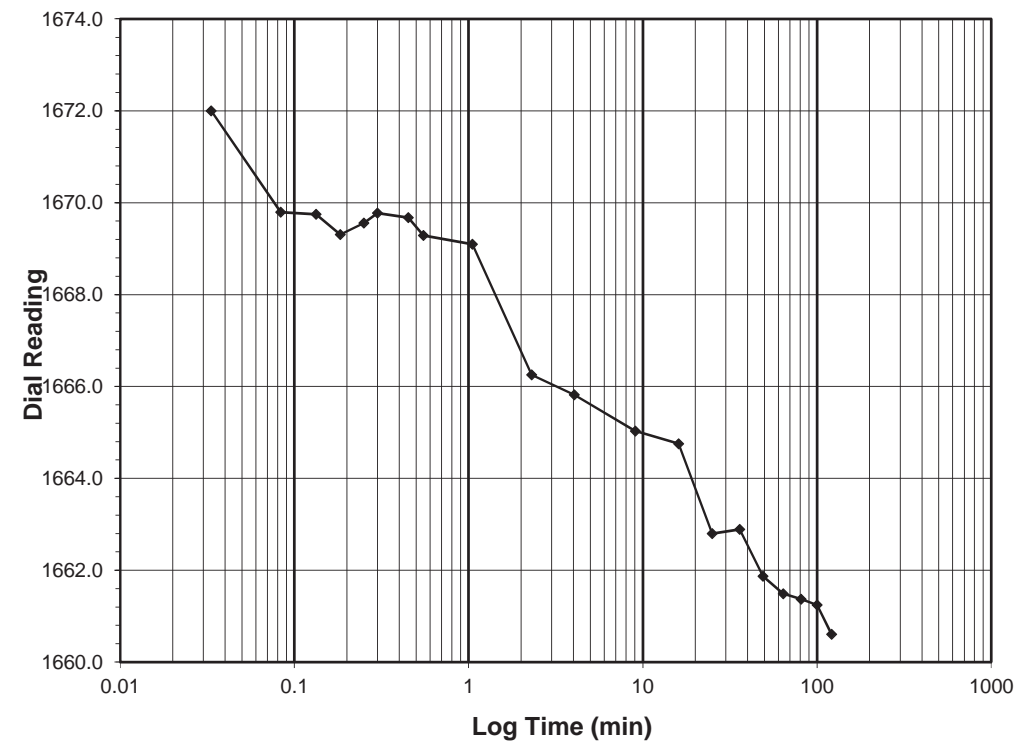
Client ESP Associates Boring No. -L- STA 505+39 11'RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 13.0-15.0
 Project No. R-2018-075-001 Sample No. ST-2
 Lab ID R-2018-075-001-003 Visual Description TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 0.25-0.125
 Final Reading (div) 1660.6
 Consolidometer No. R487
 1 Division (in) 0.0001
 Start Date 3/31/18
 Start Time 2:32:17

Elapsed Time (min)	Dial Reading (div)
Initial	1682.4
0.03	1672.0
0.08	1669.8
0.13	1669.8
0.18	1669.3
0.25	1669.6
0.30	1669.8
0.45	1669.7
0.55	1669.3
1.05	1669.1
2.30	1666.3
4.05	1665.8
9.05	1665.0
16.05	1664.8
25.05	1662.8
36.05	1662.9
49.05	1661.9
64.05	1661.5
81.07	1661.4
100.07	1661.2
121.07	1660.6



Tested By 129-04-0411 Date 3/31/18 Checked By GEM Date 5/11/18



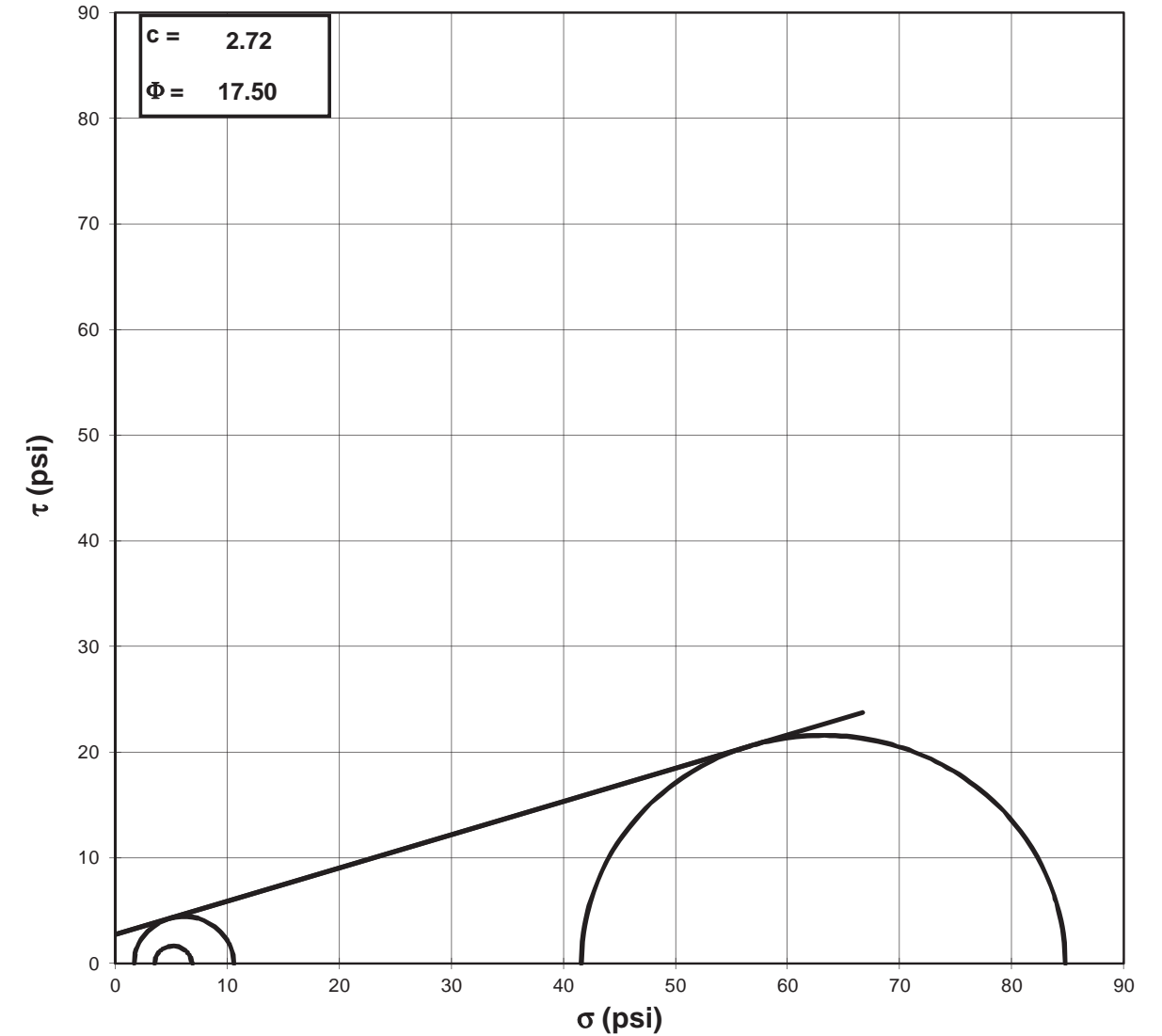
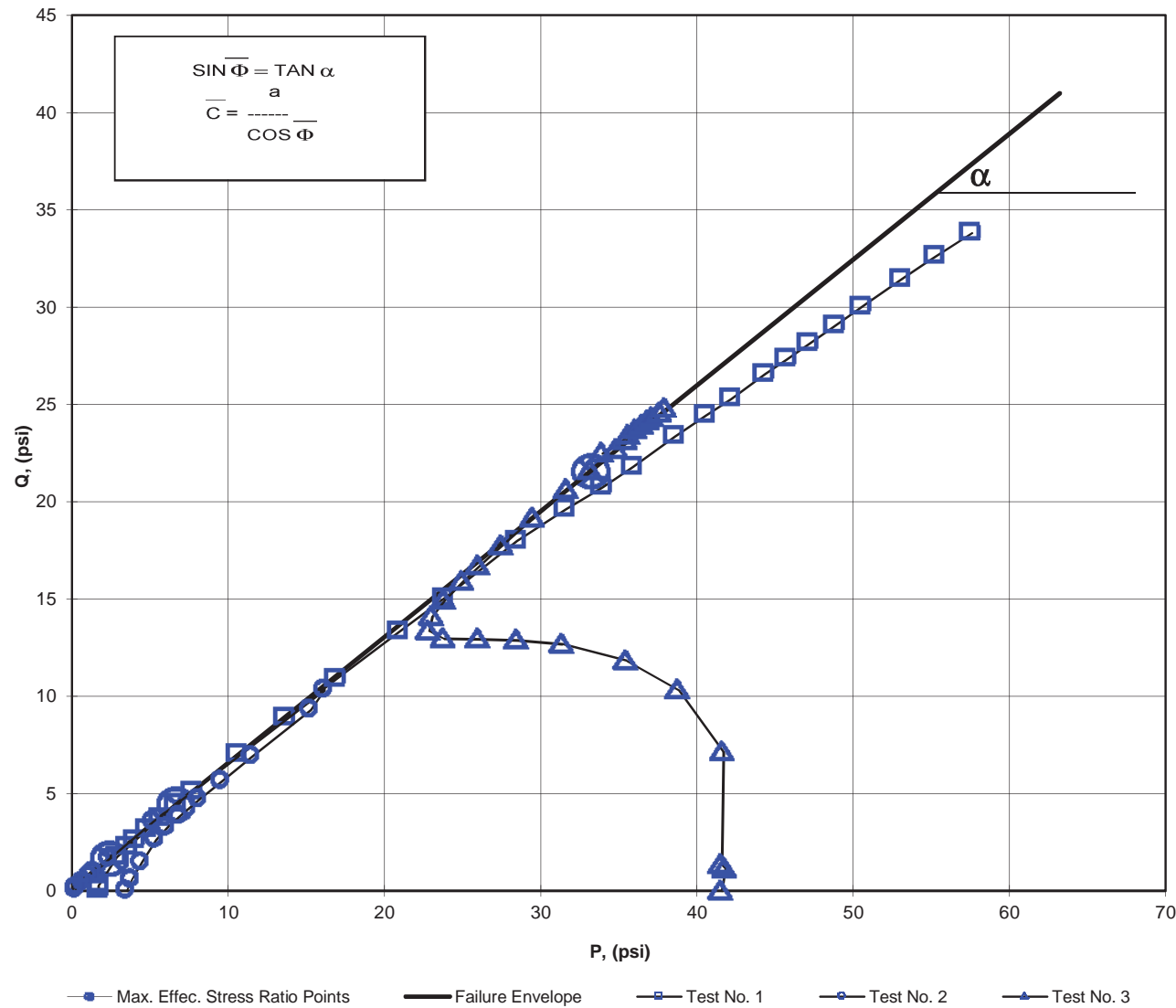
**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297**

**MOHR TOTAL STRENGTH ENVELOPE
AASHTO T-297**

Client: ESP Associates Boring No.: -L- STA. 506+89, 75' RT
 Client Reference: R-1015 Site B CS34.324.00 Depth (ft): 7.0-9.0
 Project No.: R-2018-075-001 Sample No.: ST-3
 Lab ID: R-2018-075-001-015

Client: ESP Associates Boring No.: -L- STA. 506+89, 75' RT
 Client Reference: R-1015 Site B CS34.324.00 Depth (ft): 7.0-9.0
 Project No.: R-2018-075-001 Sample No.: ST-3
 Lab ID: R-2018-075-001-015
 Visual Description: ORANGE SAND (UNDISTURBED)

Consolidated Undrained Triaxial Test with Pore Pressure



Failure Based on Maximum Effective Principal Stress Ratio

NOTE: GRAPH NOT TO SCALE

Tested By: 129-04-0411 Date: 3/29/18 Approved By: MPS Date: 5/11/18

Tested By: 129-04-0411 Date: 3/29/18 Approved By: MPS Date: 5/11/18



**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS**
AASHTO T-297

Client: ESP Associates Boring No.: -L- STA. 506+89, 75' RT
Client Reference: R-1015 Site B CS34.324.00 Depth (ft): 7.0-9.0
Project No.: R-2018-075-001 Sample No.: ST-3
Lab ID: R-2018-075-001-015

Visual Description: ORANGE SAND (UNDISTURBED)

Stage No.	1
Test No.	1

INITIAL SAMPLE DIMENSIONS (in)			
Length 1:	6.251	Diameter 1:	2.800
Length 2:	6.263	Diameter 2:	2.799
Length 3:	6.244	Diameter 3:	2.787
Length 4:	6.231	Diameter 4:	2.814
Avg. Length:	6.247	Avg. Diam.:	2.800

PRESSURES (psi)	
Cell Pressure (psi)	51.7
Back Pressure (psi)	50.0
Eff. Conf. Pressure (psi)	1.7
Pore Pressure Response (%)	95

VOLUME CHANGE	
Initial Burette Reading (ml)	24.0
Final Burette Reading (ml)	22.4
Final Change (ml)	1.6

MAXIMUM OBLIQUITY POINTS	
P	= 6.67
Q	= 4.43
Initial Dial Reading (mil)	112
Dial Reading After Saturation (mil)	112
Dial Reading After Consolidation (mil)	125

LOAD (LB)	DEFORMATION (IN)	PORE PRESSURE (PSI)
9.4	0.000	50.0
12.4	0.001	50.2
13.1	0.002	50.3
30.7	0.008	50.6
36.9	0.013	50.4
41.3	0.019	50.2
48.4	0.027	50.0
55.4	0.035	49.7
64.4	0.046	49.5
72.8	0.066	49.1
97.0	0.097	48.1
121.0	0.133	46.9
147.1	0.170	45.6
178.8	0.210	44.1
201.9	0.240	42.9
241.1	0.281	41.2
264.4	0.338	39.7
282.1	0.397	38.5
297.9	0.441	37.6
321.9	0.500	36.5
339.1	0.546	35.5
353.3	0.590	34.8
373.3	0.633	33.9
385.8	0.662	33.2
398.6	0.692	32.6
414.1	0.723	31.9
429.7	0.753	31.1
453.3	0.797	30.0
473.1	0.840	29.0
494.2	0.885	27.9
517.2	0.930	26.7

Tested By: 129-04-0411 Date: 3/29/18 Input Checked By: GEM Date: 5/11/18



**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS**
AASHTO T-297

Client: ESP Associates Boring No.: -L- STA. 506+89, 75' RT
Client Reference: R-1015 Site B CS34.324.00 Depth (ft): 7.0-9.0
Project No.: R-2018-075-001 Sample No.: ST-3
Lab ID: R-2018-075-001-015

Visual Description: ORANGE SAND (UNDISTURBED)

Effective Confining Pressure (psi)	1.7	Stage No.	1
		Test No.	1

INITIAL DIMENSIONS		VOLUME CHANGE	
Initial Sample Length (in)	6.25	Volume After Consolidation (in ³)	38.37
Initial Sample Diameter (in)	2.80	Length After Consolidation (in)	6.23
Initial Sample Area (in ²)	6.16	Area After Consolidation (in ²)	6.155
Initial Sample Volume (in ³)	38.47		

Strain (%)	Deviation Stress	Δ U	$\bar{\sigma}_1$	$\bar{\sigma}_3$	Effective Principle Stress Ratio	\bar{A}	\bar{P}	Q
0.01	0.48	0.22	1.97	1.5	1.327	0.47	1.73	0.24
0.03	0.61	0.26	2.04	1.4	1.422	0.46	1.74	0.30
0.12	3.46	0.57	4.59	1.1	4.061	0.17	2.86	1.73
0.21	4.45	0.37	5.78	1.3	4.349	0.09	3.56	2.23
0.30	5.17	0.23	6.64	1.5	4.512	0.05	4.05	2.58
0.43	6.31	0.02	7.99	1.7	4.750	0.00	4.84	3.15
0.57	7.44	-0.27	9.40	2.0	4.779	-0.04	5.68	3.72
0.75	8.87	-0.54	11.11	2.2	4.962	-0.06	6.67	4.43
1.07	10.19	-0.94	12.83	2.6	4.857	-0.10	7.73	5.09
1.55	14.02	-1.89	17.61	3.6	4.899	-0.14	10.60	7.01
2.14	17.74	-3.10	22.54	4.8	4.695	-0.18	13.67	8.87
2.72	21.77	-4.35	27.82	6.1	4.597	-0.21	16.94	10.88
3.38	26.58	-5.92	34.20	7.6	4.489	-0.23	20.91	13.29
3.84	30.07	-7.08	38.85	8.8	4.426	-0.25	23.81	15.04
4.51	35.94	-8.82	46.47	10.5	4.415	-0.26	28.50	17.97
5.42	39.18	-10.32	51.20	12.0	4.261	-0.28	31.61	19.59
6.37	41.48	-11.53	54.71	13.2	4.135	-0.29	33.97	20.74
7.07	43.55	-12.44	57.70	14.1	4.079	-0.30	35.92	21.78
8.03	46.70	-13.55	61.95	15.2	4.062	-0.31	38.60	23.35
8.76	48.87	-14.46	65.03	16.2	4.025	-0.31	40.59	24.44
9.47	50.58	-15.24	67.52	16.9	3.985	-0.32	42.23	25.29
10.15	53.12	-16.12	70.94	17.8	3.982	-0.32	44.38	26.56
10.62	54.66	-16.75	73.11	18.5	3.962	-0.32	45.78	27.33
11.10	56.22	-17.40	75.32	19.1	3.943	-0.33	47.21	28.11
11.59	58.13	-18.14	77.97	19.8	3.930	-0.33	48.90	29.06
12.08	60.03	-18.89	80.63	20.6	3.915	-0.33	50.61	30.02
12.78	62.91	-19.95	84.56	21.7	3.905	-0.33	53.11	31.45
13.48	65.19	-21.02	87.91	22.7	3.869	-0.34	55.32	32.59
14.19	67.58	-22.12	91.40	23.8	3.837	-0.34	57.61	33.79
14.92	70.19	-23.27	95.16	25.0	3.811	-0.35	60.07	35.09

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297



Client: ESP Associates Boring No.: -L- STA. 506+89, 75' RT
Client Reference: R-1015 Site B CS34.324.00 Depth (ft): 7.0-9.0
Project No.: R-2018-075-001 Sample No.: ST-3
Lab ID: R-2018-075-001-015

Visual Description: ORANGE SAND (UNDISTURBED)

Stage No.	1	INITIAL SAMPLE DIMENSIONS (in)			
Test No.	2	Length 1:	6.122	Diameter 1:	2.822
		Length 2:	6.124	Diameter 2:	2.840
		Length 3:	6.129	Diameter 3:	2.813
		Length 4:	6.128	Diameter 4:	2.801
		Avg. Length:	6.126	Avg. Diam.:	2.819
PRESSURES (psi)					
Cell Pressure (psi)	53.5				
Back Pressure (psi)	50.0				
Eff. Conf. Pressure (psi)	3.5				
Pore Pressure Response (%)	99				
VOLUME CHANGE					
		Initial Burette Reading (ml)	24.0		
		Final Burette Reading (ml)	20.9		
		Final Change (ml)	3.1		
		Initial Dial Reading (mil)	210		
		Dial Reading After Saturation (mil)	214		
		Dial Reading After Consolidation (mil)	220		
MAXIMUM OBLIQUITY POINTS					
P	=	2.42			
Q	=	1.65			

LOAD (LB)	DEFORMATION (IN)	PORE PRESSURE (PSI)
16.2	0.000	50.0
23.4	0.001	50.2
34.1	0.002	50.5
48.8	0.008	50.7
56.6	0.013	50.6
63.9	0.019	50.5
74.8	0.027	50.0
86.5	0.035	49.6
102.6	0.046	48.9
132.8	0.066	47.5
146.4	0.097	47.7
61.2	0.133	51.9
37.3	0.170	52.7
28.7	0.210	53.0
25.8	0.240	53.1
22.0	0.281	53.2
18.5	0.338	53.4
18.2	0.397	53.4
17.4	0.441	53.3
17.0	0.500	53.3
17.4	0.546	53.3
17.5	0.590	53.3
17.6	0.633	53.3
17.3	0.662	53.3
17.5	0.692	53.3
17.6	0.723	53.3
18.1	0.753	53.3
17.9	0.797	53.3
17.7	0.840	53.3
18.1	0.870	53.3
18.1	0.900	53.3

Tested By: 129-04-0411 Date: 3/29/18 Input Checked By: GEM Date: 5/11/18

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297



Client: ESP Associates Boring No.: -L- STA. 506+89, 75' RT
Client Reference: R-1015 Site B CS34.324.00 Depth (ft): 7.0-9.0
Project No.: R-2018-075-001 Sample No.: ST-3
Lab ID: R-2018-075-001-015

Visual Description: ORANGE SAND (UNDISTURBED)

Effective Confining Pressure (psi)	3.5	Stage No.	1
		Test No	2

INITIAL DIMENSIONS		VOLUME CHANGE	
Initial Sample Length (in)	6.13	Volume After Consolidation (in ³)	37.97
Initial Sample Diameter (in)	2.82	Length After Consolidation (in)	6.12
Initial Sample Area (in ²)	6.24	Area After Consolidation (in ²)	6.208
Initial Sample Volume (in ³)	38.23		

Strain (%)	Deviation Stress	Δ U	$\bar{\sigma}_1$	$\bar{\sigma}_3$	Effective Principle Stress Ratio	\bar{A}	\bar{P}	Q
0.01	1.16	0.24	4.43	3.3	1.355	0.21	3.85	0.58
0.03	2.88	0.48	5.90	3.0	1.951	0.17	4.47	1.44
0.12	5.24	0.73	8.03	2.8	2.880	0.14	5.41	2.62
0.21	6.49	0.65	9.35	2.9	3.263	0.10	6.11	3.24
0.31	7.66	0.45	10.73	3.1	3.504	0.06	6.89	3.83
0.44	9.39	0.04	12.86	3.5	3.707	0.00	8.16	4.70
0.58	11.25	-0.45	15.21	4.0	3.843	-0.04	9.58	5.63
0.76	13.80	-1.15	18.46	4.7	3.964	-0.08	11.56	6.90
1.09	18.57	-2.51	24.60	6.0	4.084	-0.14	15.31	9.29
1.58	20.63	-2.35	26.49	5.9	4.523	-0.11	16.17	10.32
2.18	7.09	1.86	8.75	1.7	5.289	0.26	5.20	3.55
2.77	3.31	2.75	4.07	0.8	5.337	0.84	2.42	1.65
3.44	1.94	3.04	2.41	0.5	5.087	1.59	1.44	0.97
3.92	1.49	3.12	1.89	0.4	4.764	2.11	1.14	0.75
4.60	0.88	3.25	1.14	0.3	4.363	3.72	0.70	0.44
5.53	0.35	3.37	0.50	0.1	3.435	9.62	0.32	0.18
6.50	0.29	3.41	0.39	0.1	4.003	11.78	0.24	0.15
7.21	0.17	3.30	0.38	0.2	1.837	19.09	0.30	0.09
8.18	0.12	3.31	0.33	0.2	1.592	27.29	0.27	0.06
8.93	0.17	3.31	0.38	0.2	1.855	19.24	0.29	0.09
9.65	0.18	3.31	0.38	0.2	1.906	18.54	0.29	0.09
10.35	0.20	3.32	0.39	0.2	1.998	17.17	0.29	0.10
10.83	0.15	3.32	0.34	0.2	1.785	22.09	0.27	0.08
11.32	0.19	3.32	0.37	0.2	1.979	18.10	0.28	0.09
11.81	0.20	3.32	0.38	0.2	2.042	17.20	0.29	0.10
12.31	0.26	3.32	0.45	0.2	2.410	12.69	0.32	0.13
13.03	0.23	3.33	0.41	0.2	2.314	14.45	0.29	0.12
13.74	0.21	3.33	0.40	0.2	2.144	15.84	0.29	0.11
14.22	0.26	3.33	0.44	0.2	2.369	13.15	0.31	0.13
14.72	0.26	3.33	0.44	0.2	2.453	12.91	0.31	0.13

CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS AASHTO T-297



Client: ESP Associates Boring No.: -L- STA. 506+89, 75' RT
Client Reference: R-1015 Site B CS34.324.00 Depth (ft): 7.0-9.0
Project No.: R-2018-075-001 Sample No.: ST-3
Lab ID: R-2018-075-001-015

Visual Description: ORANGE SAND (UNDISTURBED)

Table with Stage No. 1 and Test No. 3

INITIAL SAMPLE DIMENSIONS (in) table with Length and Diameter measurements (1-4) and Avg. values.

PRESSURES (psi)

Table of pressures: Cell Pressure (91.6), Back Pressure (50.0), Eff. Conf. Pressure (41.6), Pore Pressure, Response (%).

VOLUME CHANGE table with Initial Burette Reading (48.0), Final Burette Reading (10.8), Final Change (37.2).

MAXIMUM OBLIQUITY POINTS

Table with P = 33.22 and Q = 21.59

Table with Initial Dial Reading (50), Dial Reading After Saturation (338), Dial Reading After Consolidation (335).

Main test data table with columns: LOAD (LB), DEFORMATION (IN), PORE PRESSURE (PSI) and multiple rows of data.

CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS AASHTO T-297



Client: ESP Associates Boring No.: -L- STA. 506+89, 75' RT
Client Reference: R-1015 Site B CS34.324.00 Depth (ft): 7.0-9.0
Project No.: R-2018-075-001 Sample No.: ST-3
Lab ID: R-2018-075-001-015

Visual Description: ORANGE SAND (UNDISTURBED)

Table with Effective Confining Pressure (41.6), Stage No. 1, Test No. 3

INITIAL DIMENSIONS

Table of initial dimensions: Initial Sample Length (5.98), Initial Sample Diameter (2.79), Initial Sample Area (6.11), Initial Sample Volume (36.53).

VOLUME CHANGE

Table of volume change: Volume After Consolidation (28.99), Length After Consolidation (5.70), Area After Consolidation (5.087).

Table with columns: Strain (%), Deviation Stress, ΔU, σ1, σ3, Effective Principle Stress Ratio, A, P, Q.

Main test data table for the second test with columns: Strain (%), Deviation Stress, ΔU, σ1, σ3, Effective Principle Stress Ratio, A, P, Q and multiple rows of data.

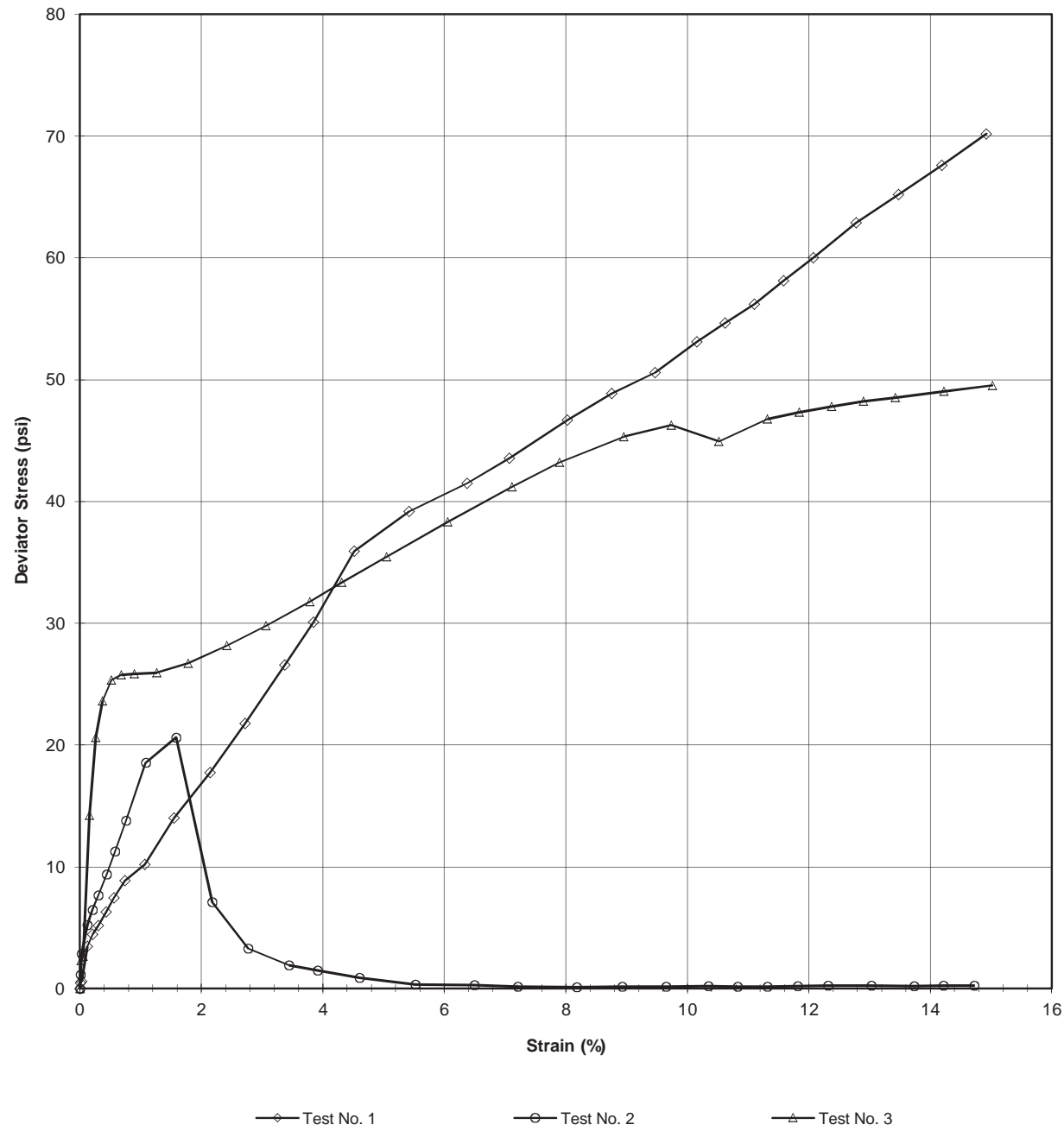
**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297**



Client: ESP Associates Boring No.: -L- STA. 506+89, 75' RT
 Client Reference: R-1015 Site B CS34.324.00 Depth (ft): 7.0-9.0
 Project No.: R-2018-075-001 Sample No.: ST-3
 Lab ID: R-2018-075-001-015
 Visual Description: ORANGE SAND (UNDISTURBED)

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297**

Client: ESP Associates
 Client Reference: R-1015 Site B CS34.324.00
 Project No.: R-2018-075-001
 Lab ID: R-2018-075-001-015 Specific Gravity (Measured) 2.66
 Visual Description: ORANGE SAND (UNDISTURBED)



SAMPLE CONDITION SUMMARY

	-L- STA. 506+89, 75' RT	-L- STA. 506+89, 75' RT	-L- STA. 506+89, 75' RT
Boring No.:	-L- STA. 506+89, 75' RT	-L- STA. 506+89, 75' RT	-L- STA. 506+89, 75' RT
Depth (ft):	7.0-9.0	7.0-9.0	7.0-9.0
Sample No.:	ST-3	ST-3	ST-3
Test No.	T1	T2	T3
Deformation Rate (in/min)	0.002	0.002	0.002
Back Pressure (psi)	50.0	50.0	50.0
Consolidation Time (days)	1	1	1
Moisture Content (%) (INITIAL)	29.1	29.1	29.1
Total Unit Weight (pcf)	116.7	120.6	123.5
Dry Unit Weight (pcf)	90.4	93.4	95.6
Moisture Content (%) (FINAL)	27.5	29.7	26.1
Initial State Void Ratio, e	0.838	0.778	0.736
Void Ratio at Shear, e	0.833	0.766	0.378

Tested By: 129-04-0411 Date: 3/29/18 Approved By: MPS Date: 5/11/18

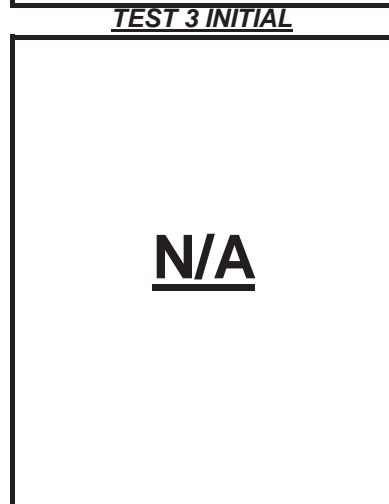
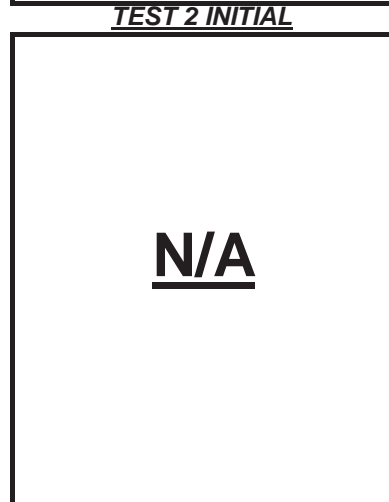
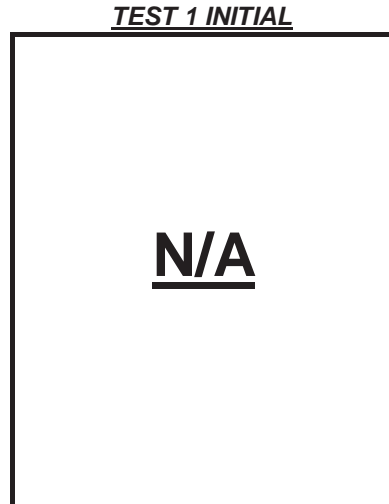
Tested By: 129-04-0411 Date: 3/29/18 Input Checked By: GEM Date: 5/11/18

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297**



Client: ESP Associates
 Client Reference: R-1015 Site B CS34.324.00
 Project No.: R-2018-075-001
 Lab ID: R-2018-075-001-015

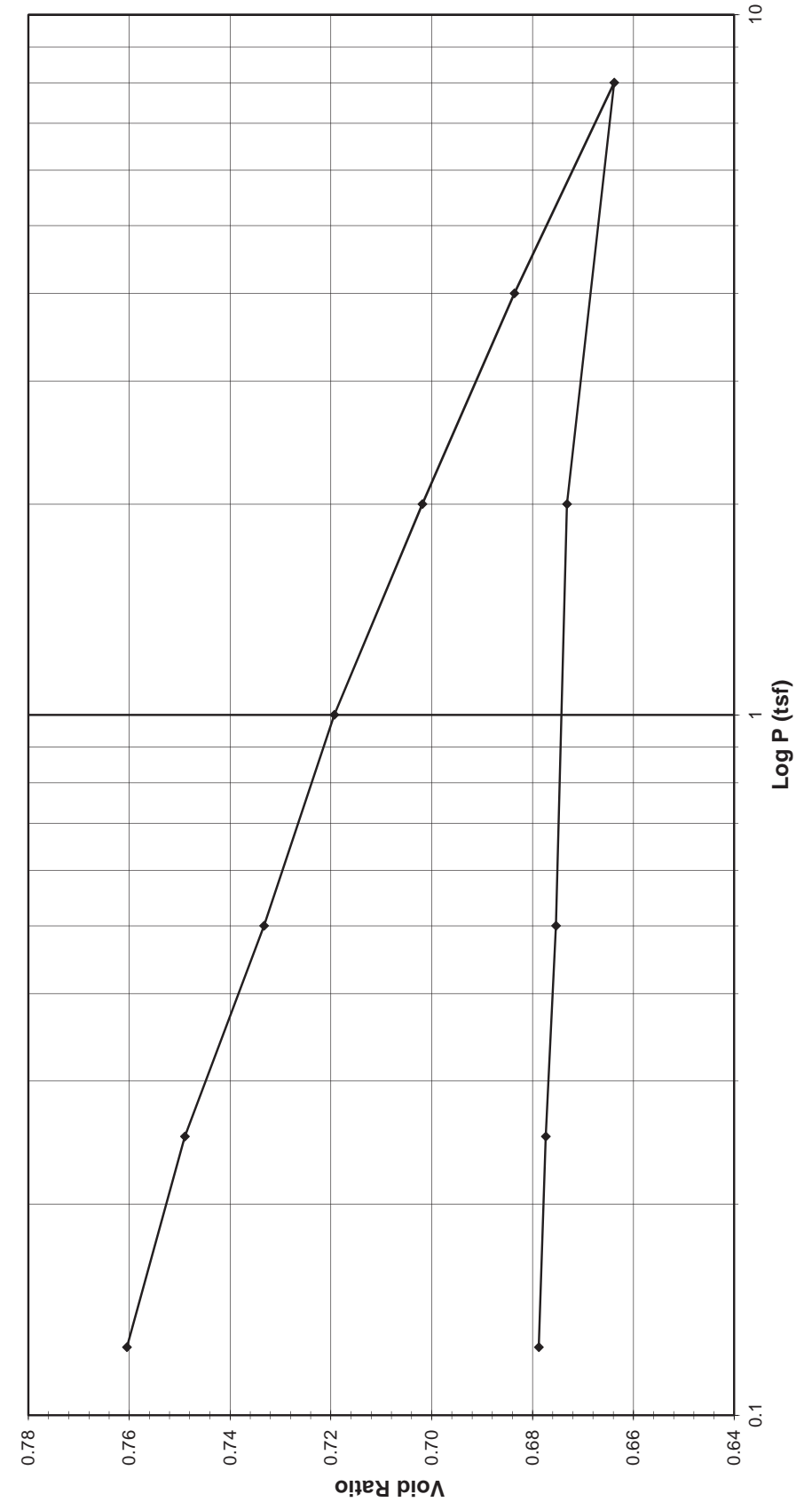
Boring No.: -L- STA. 506+89, 7
 Depth (ft): 7.0-9.0
 Sample No.: ST-3



**ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216**

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By 129-04-0411 Date 3/29/18 Approved By MPS Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED

Consolidometer No. R491
1 Division = 0.0001 (in.)

Sample Properties

	Initial	Final
<i>Water Content</i>		
Tare Number	SS-0	SS-5
Wt. Tare & WS (g)	229.19	247.60
Wt. Tare & DS (g)	200.17	218.30
Wt. Water (g)	29.02	29.30
Wt. Tare (g)	100.59	99.98
Wt. DS (g)	99.58	118.32
Water Content (%)	29.14	24.76
<i>Sample Parameters</i>		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.0000	0.9461
Sample Volume (cc)	80.44	76.10
Wt. Wet Sample + Ring (g)	370.01	364.73
Wt. of Ring (g)	214.28	214.28
Wt. of Wet Sample (g)	155.73	150.45
Wet Density (pcf)	120.81	123.36
Wet Density (g/cc)	1.94	1.98
Water Content (%)	29.14	24.76
Wt. of Dry Sample (g)	120.59	120.59
Dry Density (pcf)	93.54	98.87
Dry Density (g/cc)	1.50	1.58
Void Ratio	0.7744	0.6788
Saturation (%)	100.10	97.05
Specific Gravity	2.66	Measured

Test Data Summary

Applied Pressure (tsf)	Final Dial Reading (div)	Machine Deflection (div)	Corrected Reading (div)	Height of Sample (mm)	Volume (cc)	Dry Density (g/cc)	Void Ratio
Seating	0	0	0	25.400	80.440	1.49911	0.77439
0.125	81.9	3.6	78.4	25.201	79.809	1.51095	0.76049
0.25	152.2	9.0	143.3	25.036	79.287	1.52090	0.74897
0.5	252.8	21.0	231.8	24.811	78.575	1.53467	0.73327
1	350.3	40.0	310.3	24.612	77.944	1.54712	0.71933
2	468.4	59.6	408.8	24.362	77.151	1.56300	0.70185
4	596.5	85.0	511.5	24.101	76.325	1.57992	0.68363
8	746.4	123.4	623.0	23.817	75.428	1.59871	0.66384
2	684.9	114.6	570.3	23.951	75.852	1.58978	0.67319
0.5	642.0	84.0	558.0	23.983	75.951	1.58770	0.67538
0.25	625.5	78.9	546.6	24.012	76.043	1.58578	0.67741
0.125	617.9	78.9	539.0	24.031	76.104	1.58451	0.67876

page 2 of 2

DCN: CT-24E Date: 5/3/12 Revision: 6

Tested By 129-04-0411 Date 3/28/18 Input Checked By GEM Date 5/11/18

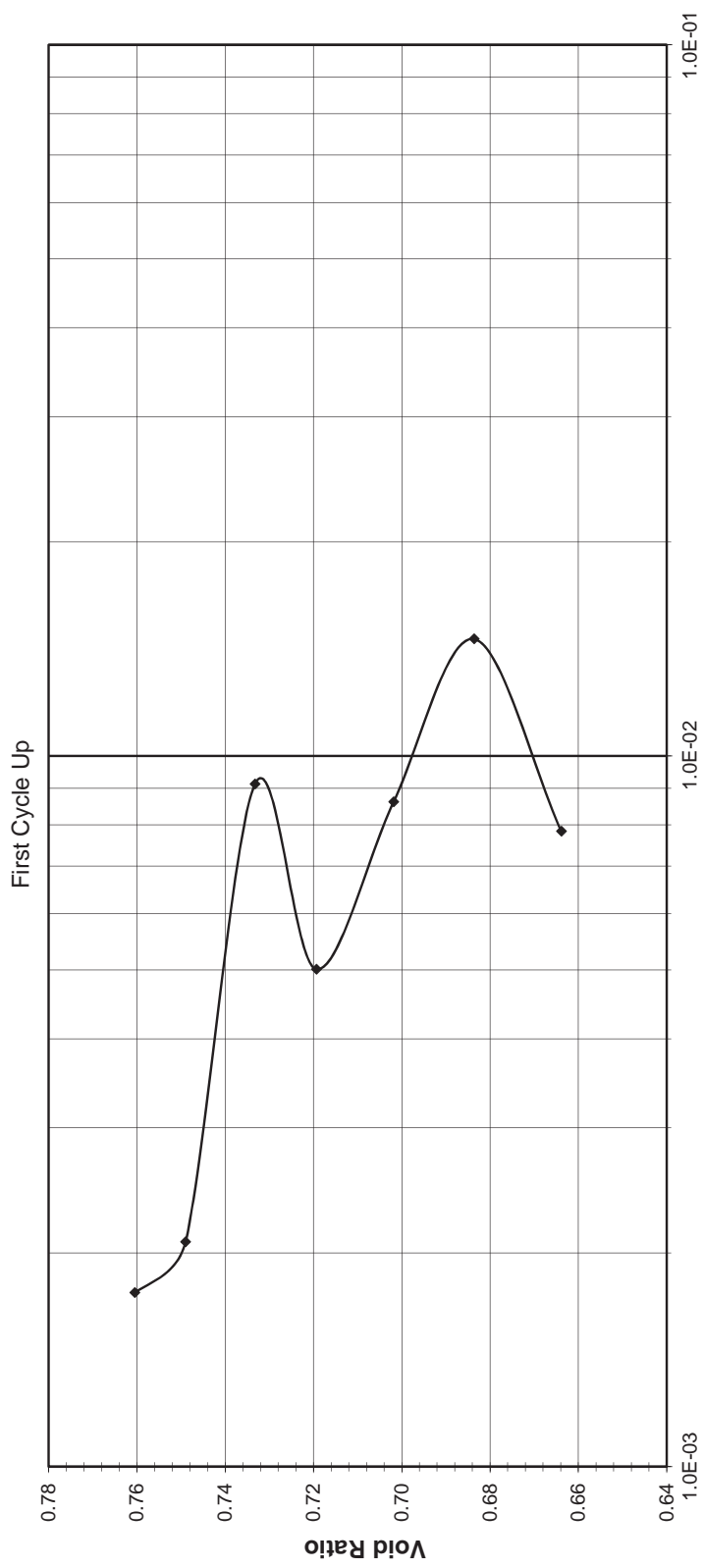
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ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Coefficient of Consolidation (cm²/sec)

← First Cycle Up

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client ESP Associates
 Client Reference R-1015 Site B CS34.324.00
 Project No. R-2018-075-001
 Lab ID R-2018-075-001-015

Boring No. -L- STA. 506+89, 75' RT
 Depth (ft) 7.0-9.0
 Sample No. ST-3
 Visual Description ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED

Consolidometer No. R491
 1 Division = 0.0001 (in.)

Sample Properties	Initial	Final
Water Content		
Tare Number	SS-0	SS-5
Wt. Tare & WS (g)	229.19	247.60
Wt. Tare & DS (g)	200.17	218.30
Wt. Water (g)	29.02	29.30
Wt. Tare (g)	100.59	99.98
Wt. DS (g)	99.58	118.32
Water Content (%)	29.14	24.76
Sample Parameters		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.000	0.946
Sample Volume (cc)	80.44	76.10
Wt. Wet Sample + Ring (g)	370.01	364.73
Wt. of Ring (g)	214.28	214.28
Wt. of Wet Sample (g)	155.73	150.45
Wet Density (pcf)	120.81	123.36
Wet Density (g/cc)	1.94	1.98
Water Content (%)	29.14	24.76
Wt. of Dry Sample (g)	120.59	120.59
Dry Density (pcf)	93.54	98.87
Dry Density (g/cc)	1.50	1.58
Void Ratio	0.7744	0.6788
Saturation (%)	100.10	97.05
Specific Gravity	2.66	Measured

Load Increment (tsf)	Dial Reading @ t ₅₀ (div)	Machine Deflection (div)	Corrected Dial Reading @ t ₅₀ (div)	Sample Height @ t ₅₀ (cm)	Time t ₅₀ (min.)	C _v (cm ² /sec)
0 - 0.125	27.2	3.6	23.6	2.534	3.00	0.00176
0.125 - 0.25	120.6	9.0	111.6	2.512	2.50	0.00207
0.25 - 0.5	197.7	21.0	176.7	2.495	0.56	0.00913
0.5 - 1	314.3	40.0	274.3	2.470	1.00	0.00501
1 - 2	430.7	59.6	371.1	2.446	0.57	0.00861
2 - 4	547.9	85.0	462.9	2.422	0.33	0.01460
4 - 8	705.2	123.4	581.8	2.392	0.60	0.00783
8 - 2	NA	114.6	NA	NA	NA	NA
2 - 0.5	NA	84.0	NA	NA	NA	NA
0.5 - 0.25	NA	78.9	NA	NA	NA	NA
0.25 - 0.125	NA	78.9	NA	NA	NA	NA

page 4 of 4
 DCN: CT-24E Date: 5/3/12 Revision: 6
 Tested By 129-04-0411 Date 3/28/18 Input Checked By GEM Date 5/11/18

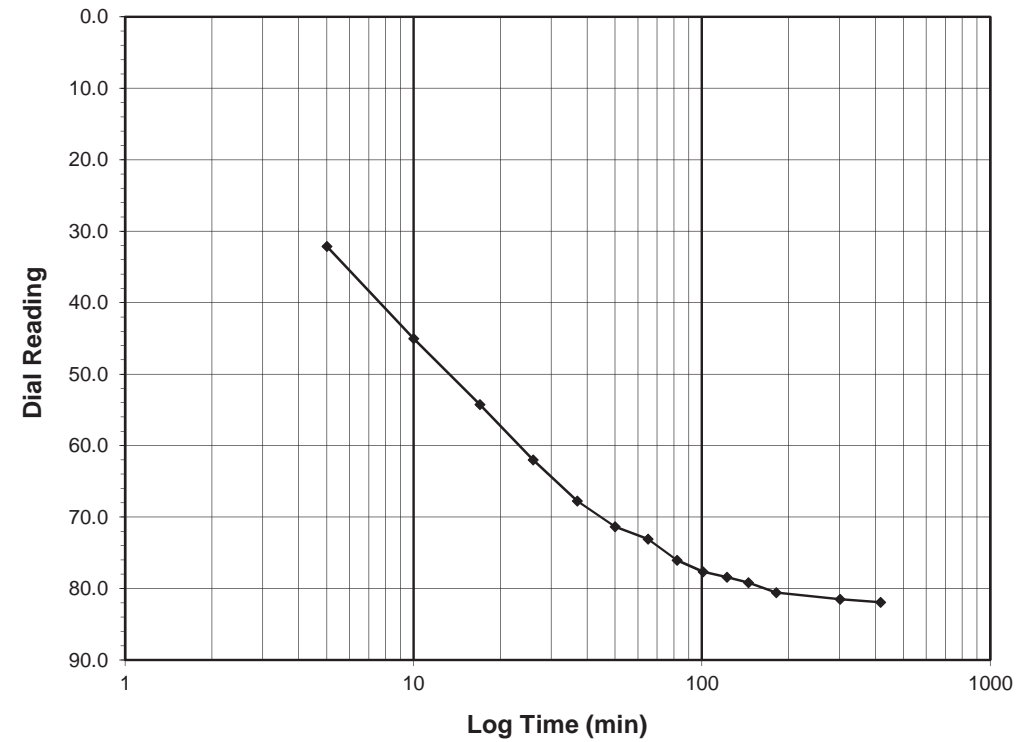
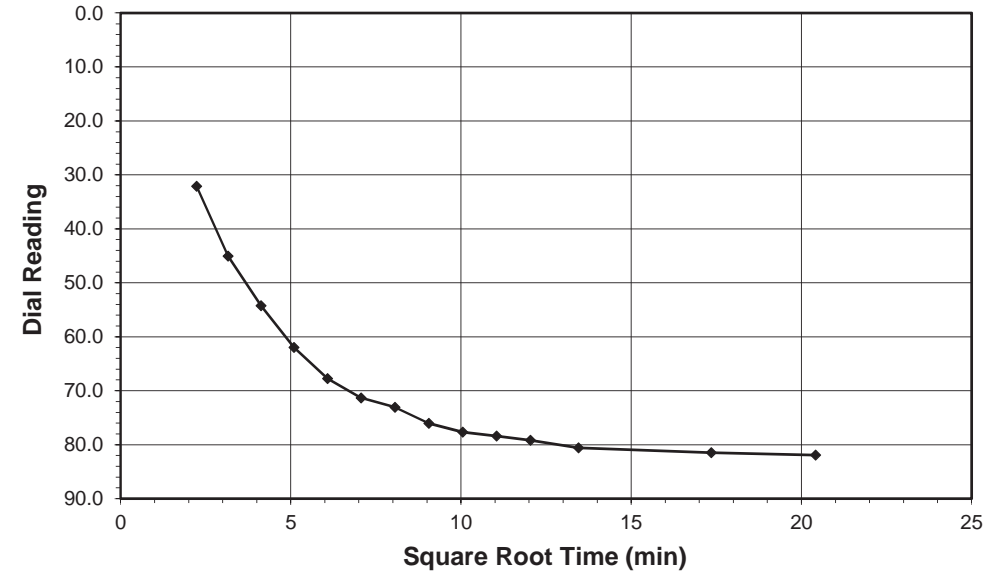
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ONE DIMENSIONAL CONSOLIDATION
 AASHTO T-216

Client ESP Associates Boring No. -L- STA. 506+89, 75' RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 7.0-9.0
 Project No. R-2018-075-001 Sample No. ST-3
 Lab ID R-2018-075-001-015 Visual Description ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 0.0-0.125
 Final Reading (div) 81.9
 Consolidometer No. R491
 1 Division (in) 0.0001
 Start Date 3/28/18
 Start Time 9:21:08

Elapsed Time (min)	Dial Reading (div)
Initial	0.0
5.00	32.1
10.00	45.0
17.00	54.2
26.00	62.0
37.00	67.7
50.00	71.4
65.00	73.1
82.00	76.1
101.00	77.7
122.00	78.4
145.00	79.2
181.00	80.6
301.00	81.5
416.82	81.9

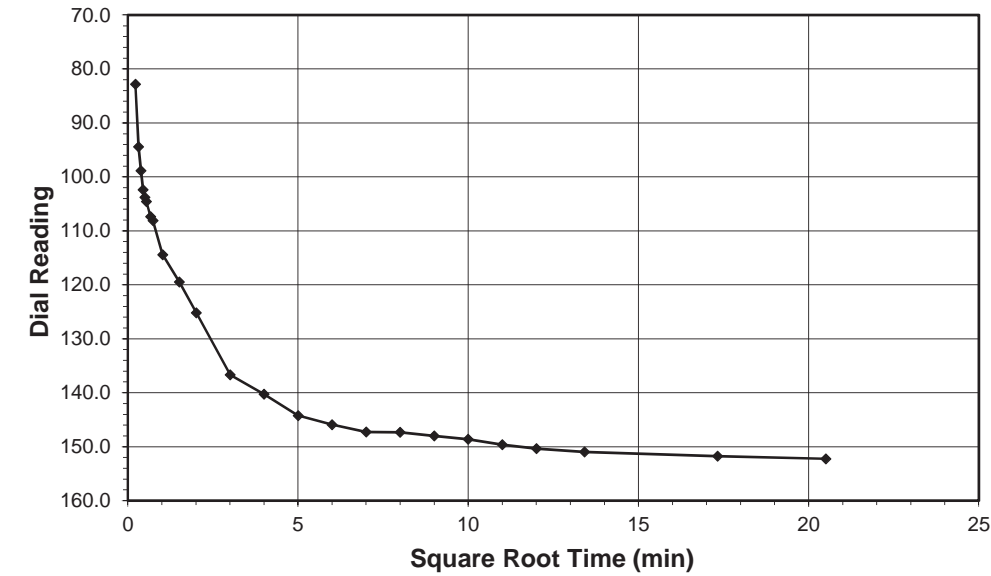
Tested By 129-04-0411 Date 3/28/18 Checked By GEM Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



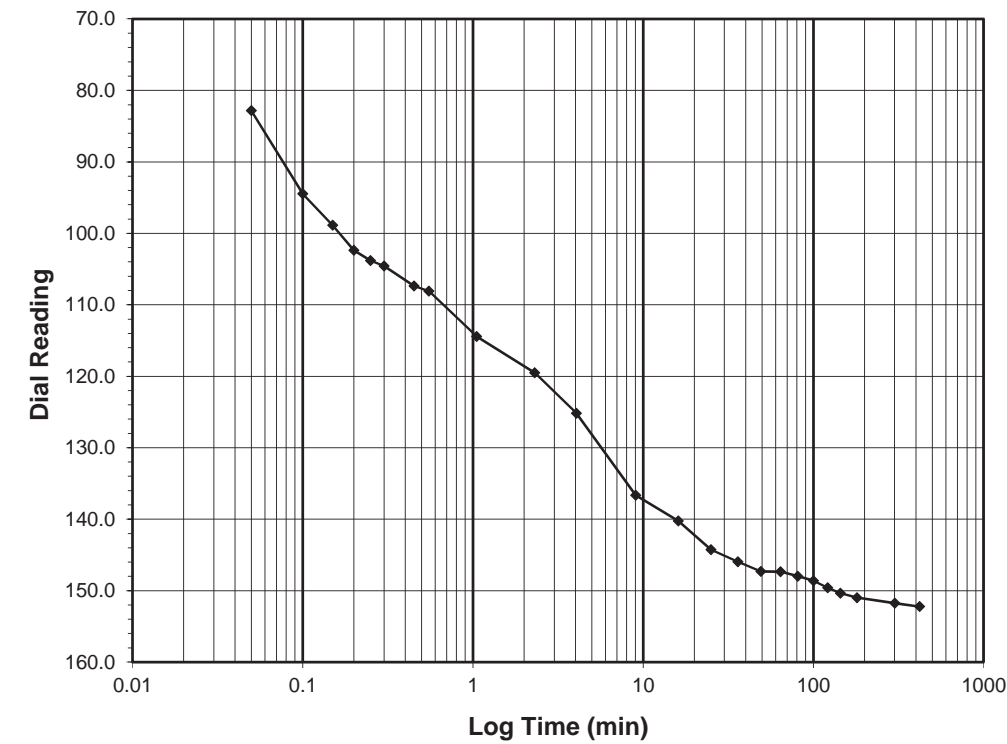
Client ESP Associates Boring No. -L- STA. 506+89, 75' RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 7.0-9.0
 Project No. R-2018-075-001 Sample No. ST-3
 Lab ID R-2018-075-001-015 Visual Description ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 0.125-0.25
Final Reading (div) 152.2
 Consolidometer No. R491
 1 Division (in) 0.0001
 Start Date 3/28/18
 Start Time 16:13:00

Elapsed Time (min)	Dial Reading (div)
Initial	81.9
0.05	82.8
0.10	94.4
0.15	98.8
0.20	102.4
0.25	103.8
0.30	104.6
0.45	107.4
0.55	108.1
1.05	114.4
2.30	119.5
4.05	125.2
9.05	136.7
16.05	140.2
25.05	144.3
36.05	145.9
49.05	147.3
64.05	147.4
81.05	148.0
100.05	148.6
121.05	149.6
144.05	150.4
180.05	151.0
300.05	151.8
420.43	152.2

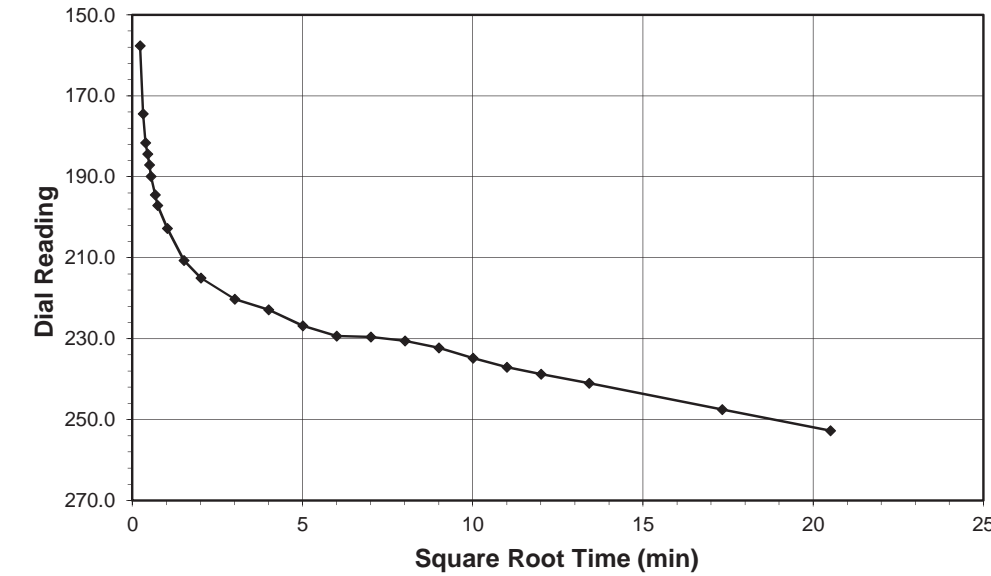


ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



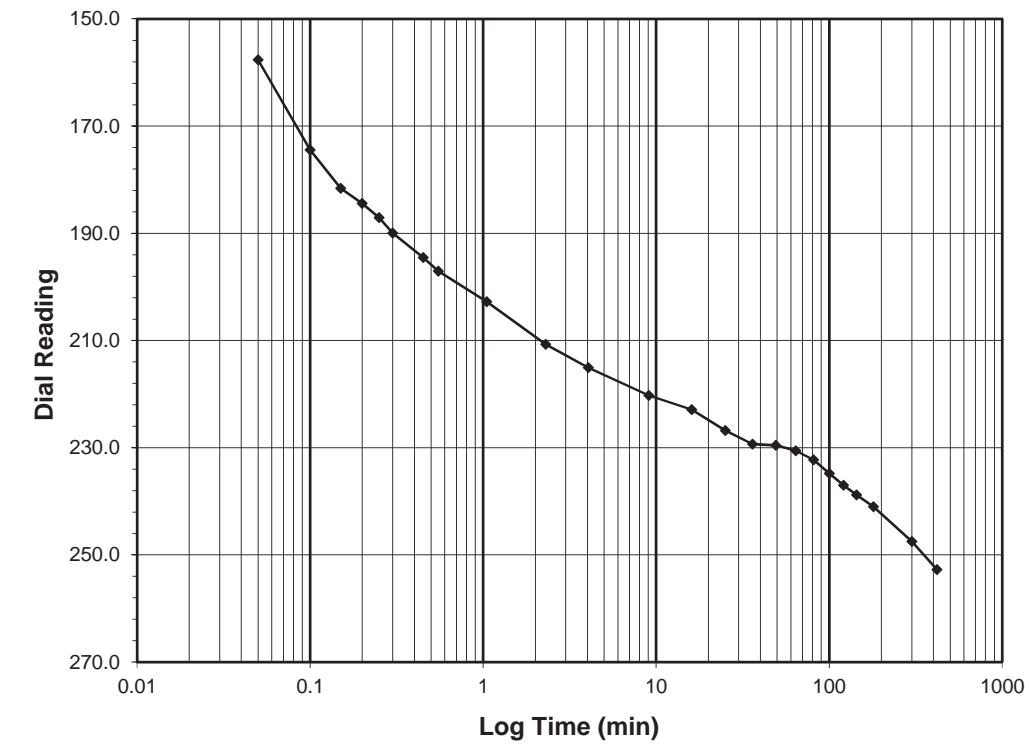
Client ESP Associates Boring No. -L- STA. 506+89, 75' RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 7.0-9.0
 Project No. R-2018-075-001 Sample No. ST-3
 Lab ID R-2018-075-001-015 Visual Description ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 0.25-0.5
Final Reading (div) 252.8
 Consolidometer No. R491
 1 Division (in) 0.0001
 Start Date 3/28/18
 Start Time 23:13:26

Elapsed Time (min)	Dial Reading (div)
Initial	152.2
0.05	157.6
0.10	174.4
0.15	181.6
0.20	184.4
0.25	187.1
0.30	189.9
0.45	194.5
0.55	197.1
1.05	202.8
2.30	210.7
4.05	215.0
9.05	220.2
16.05	222.9
25.05	226.8
36.05	229.3
49.07	229.6
64.07	230.5
81.07	232.3
100.07	234.8
121.07	237.0
144.07	238.8
180.07	241.0
300.07	247.5
420.35	252.8



Tested By 129-04-0411 Date 3/28/18 Checked By GEM Date 5/11/18

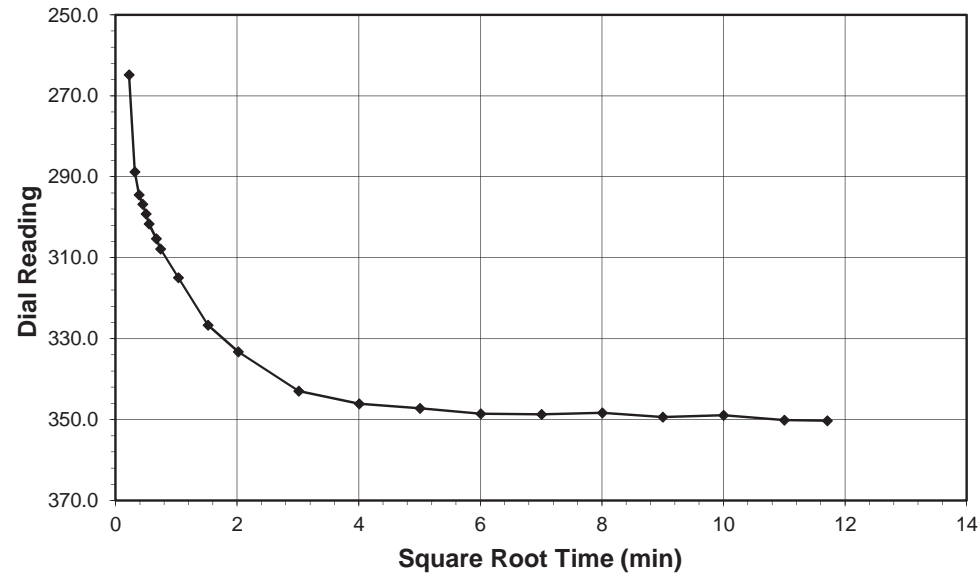
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ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



Client ESP Associates Boring No. -L- STA. 506+89, 75' RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 7.0-9.0
 Project No. R-2018-075-001 Sample No. ST-3
 Lab ID R-2018-075-001-015 Visual Description ORANGE SAND

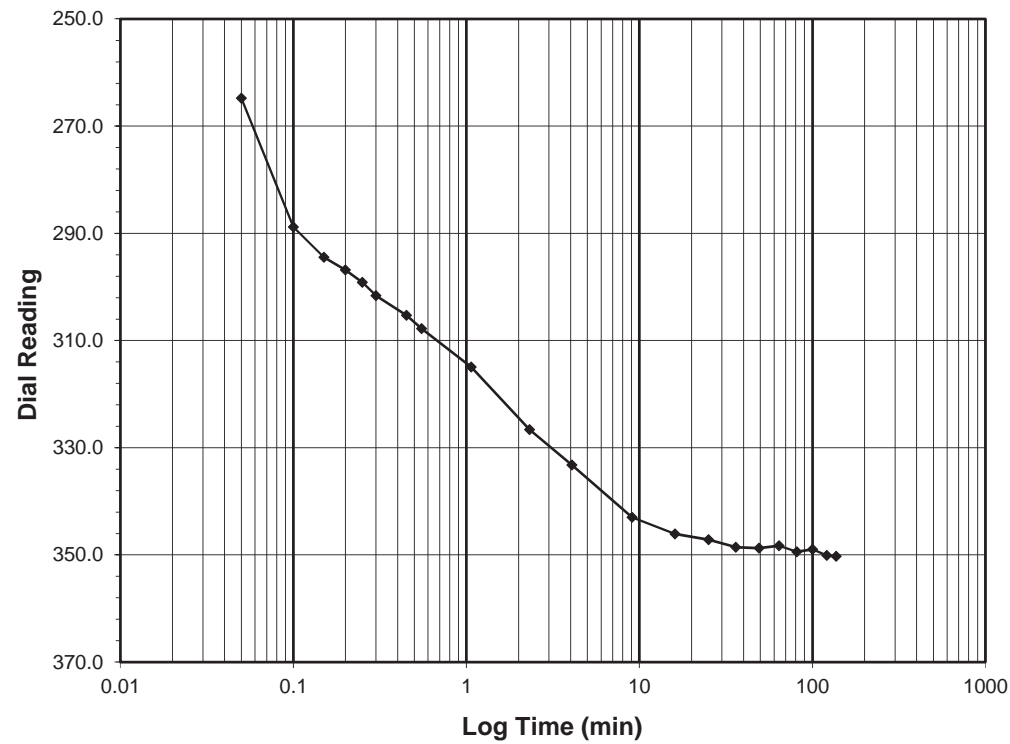
Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 0.5-1.0
Final Reading (div) 350.3
 Consolidometer No. **R491**
 1 Division (in) 0.0001

Start Date 3/29/18
 Start Time 6:13:47

Elapsed Time (min)	Dial Reading (div)
Initial	252.8
0.05	264.8
0.10	288.8
0.15	294.5
0.20	296.8
0.25	299.2
0.30	301.6
0.45	305.3
0.55	307.8
1.07	314.9
2.32	326.6
4.07	333.2
9.07	343.0
16.07	346.1
25.07	347.2
36.07	348.6
49.07	348.7
64.07	348.3
81.07	349.4
100.07	349.0
121.07	350.1
137.10	350.3



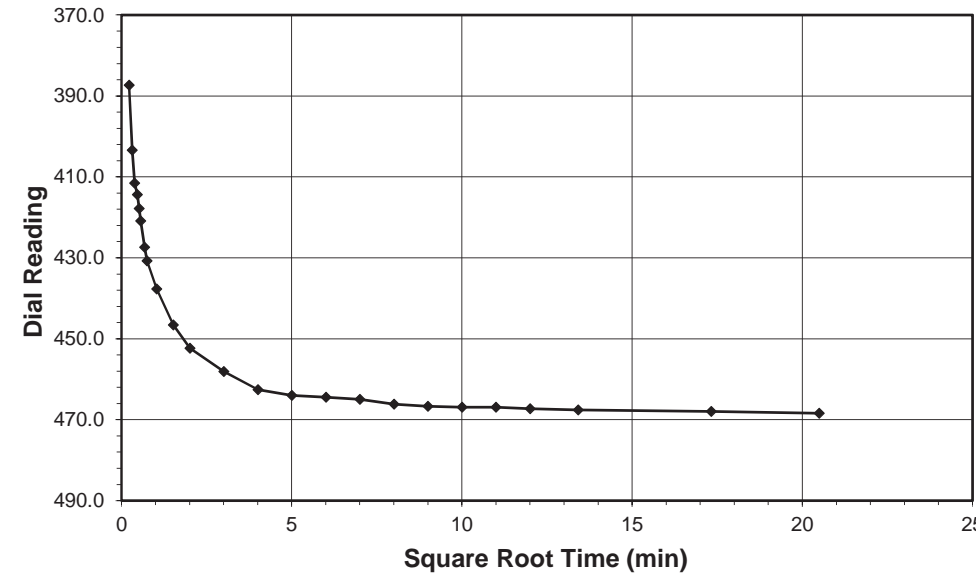
Tested By 129-04-0411 Date 3/29/18 Checked By GEM Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



Client ESP Associates Boring No. -L- STA. 506+89, 75' RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 7.0-9.0
 Project No. R-2018-075-001 Sample No. ST-3
 Lab ID R-2018-075-001-015 Visual Description ORANGE SAND

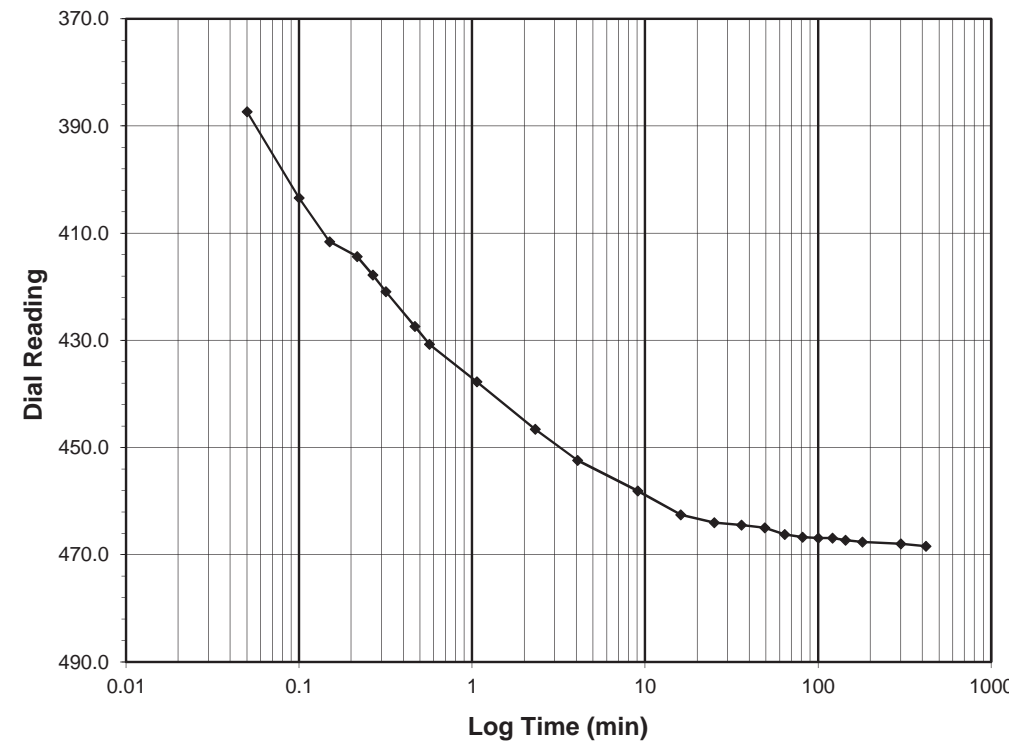
Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 1.0-2.0
Final Reading (div) 468.4
 Consolidometer No. **R491**
 1 Division (in) 0.0001

Start Date 3/29/18
 Start Time 8:30:53

Elapsed Time (min)	Dial Reading (div)
Initial	350.3
0.05	387.4
0.10	403.4
0.15	411.6
0.22	414.4
0.27	417.8
0.32	420.9
0.47	427.4
0.57	430.7
1.07	437.7
2.32	446.6
4.07	452.3
9.07	458.1
16.07	462.6
25.07	464.0
36.07	464.5
49.07	465.0
64.07	466.2
81.07	466.7
100.07	466.9
121.07	466.9
144.07	467.3
180.08	467.6
300.08	467.9
420.28	468.4



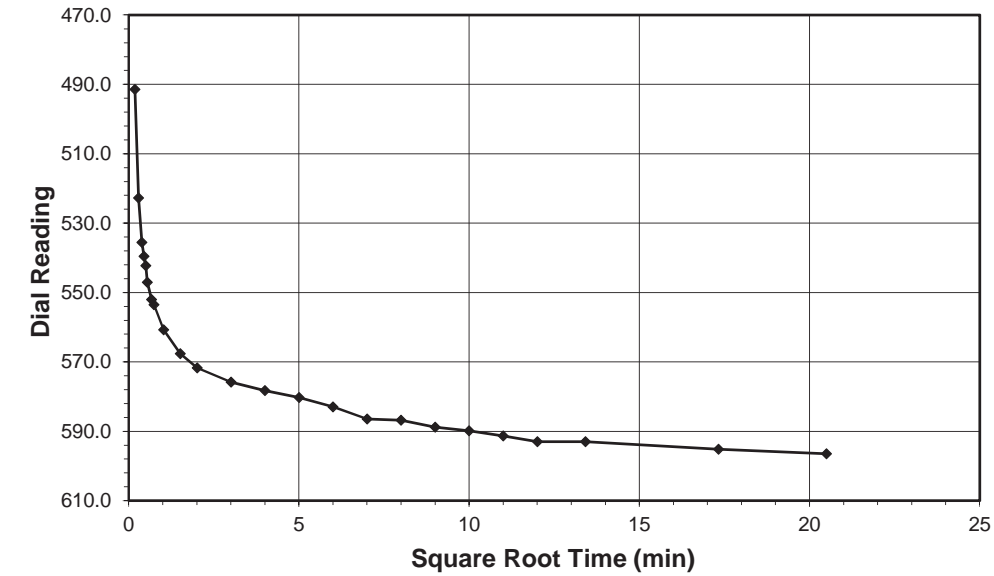
Tested By 129-04-0411 Date 3/29/18 Checked By GEM Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



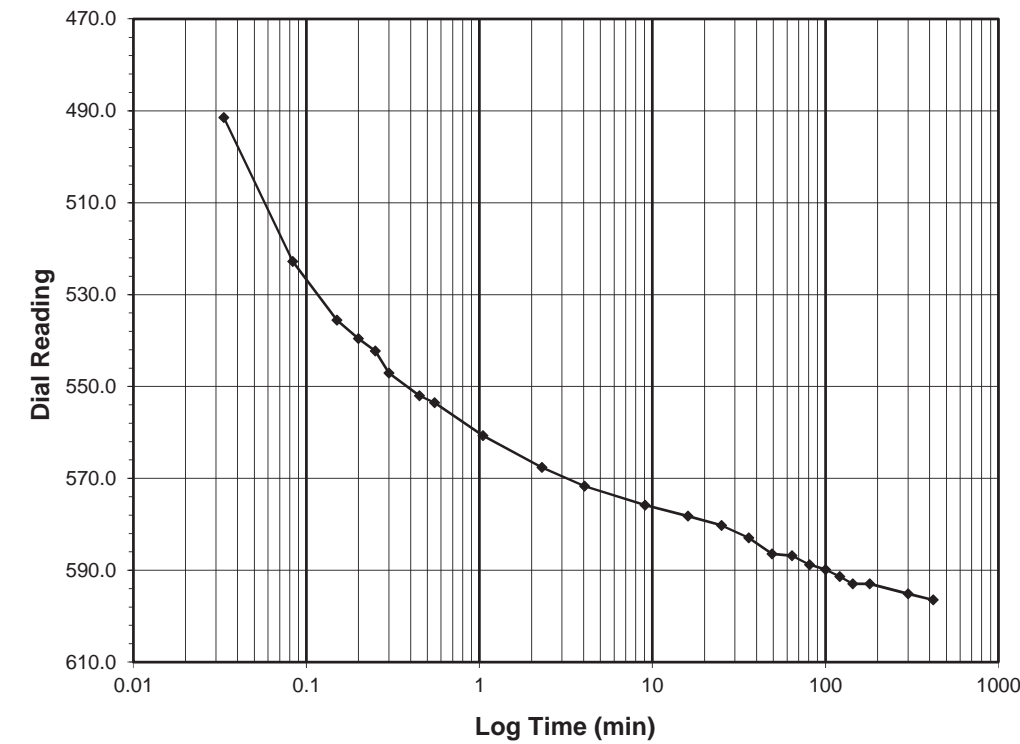
Client: ESP Associates
 Client Project: R-1015 Site B CS34.324.00
 Project No.: R-2018-075-001
 Lab ID: R-2018-075-001-015
 Boring No.: -L- STA. 506+89, 75' RT
 Depth (ft): 7.0-9.0
 Sample No.: ST-3
 Visual Description: ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf): 2.0-4.0
 Final Reading (div): 596.5
 Consolidometer No.: R491
 1 Division (in): 0.0001
 Start Date: 3/29/18
 Start Time: 15:31:10

Elapsed Time (min)	Dial Reading (div)
Initial	468.4
0.03	491.5
0.08	522.8
0.15	535.6
0.20	539.6
0.25	542.2
0.30	547.1
0.45	552.0
0.55	553.5
1.05	560.7
2.30	567.6
4.05	571.7
9.05	575.9
16.05	578.2
25.05	580.3
36.05	583.0
49.05	586.4
64.05	586.8
81.05	588.8
100.05	589.9
121.07	591.4
144.07	593.0
180.07	593.0
300.07	595.1
420.28	596.5

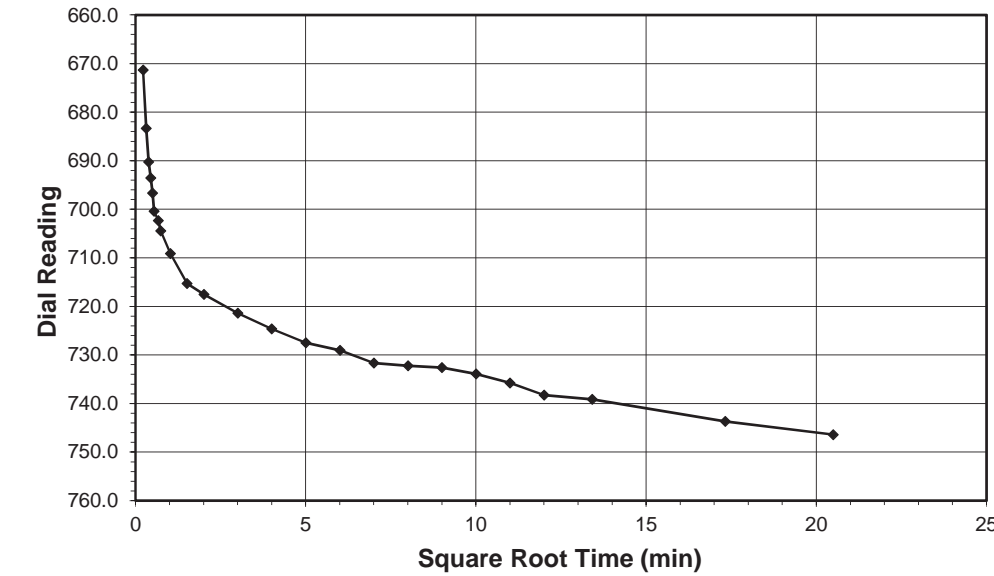


ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



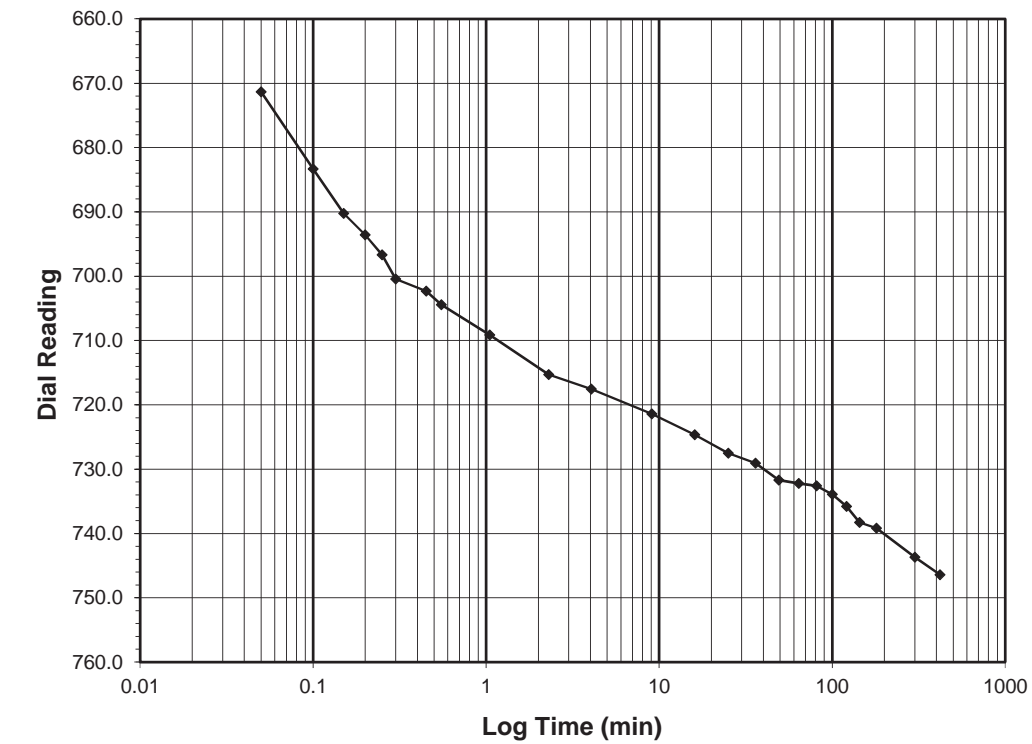
Client: ESP Associates
 Client Project: R-1015 Site B CS34.324.00
 Project No.: R-2018-075-001
 Lab ID: R-2018-075-001-015
 Boring No.: -L- STA. 506+89, 75' RT
 Depth (ft): 7.0-9.0
 Sample No.: ST-3
 Visual Description: ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf): 4.0-8.0
 Final Reading (div): 746.4
 Consolidometer No.: R491
 1 Division (in): 0.0001
 Start Date: 3/29/18
 Start Time: 22:31:28

Elapsed Time (min)	Dial Reading (div)
Initial	596.5
0.05	671.3
0.10	683.3
0.15	690.2
0.20	693.6
0.25	696.7
0.30	700.4
0.45	702.3
0.55	704.4
1.05	709.1
2.30	715.3
4.05	717.6
9.05	721.4
16.05	724.7
25.07	727.5
36.07	729.1
49.07	731.7
64.07	732.2
81.07	732.6
100.07	733.9
121.07	735.8
144.07	738.3
180.07	739.2
300.07	743.7
420.25	746.4



Tested By 129-04-0411 Date 3/29/18 Checked By GEM Date 5/11/18

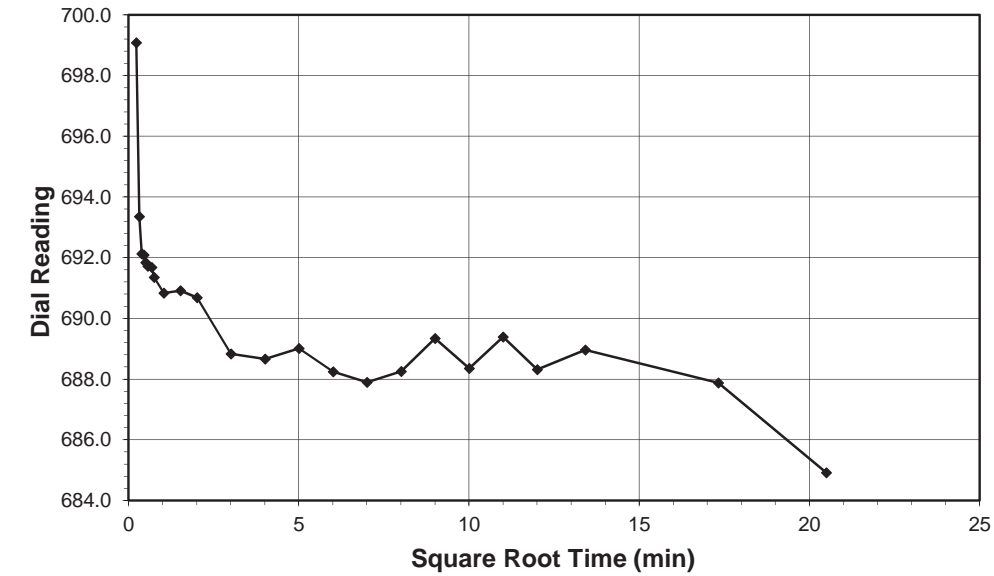
Tested By 129-04-0411 Date 3/29/18 Checked By GEM Date 5/11/18



ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216

Client: ESP Associates Boring No.: -L- STA. 506+89, 75' RT
 Client Project: R-1015 Site B CS34.324.00 Depth (ft): 7.0-9.0
 Project No.: R-2018-075-001 Sample No.: ST-3
 Lab ID: R-2018-075-001-015 Visual Description: ORANGE SAND

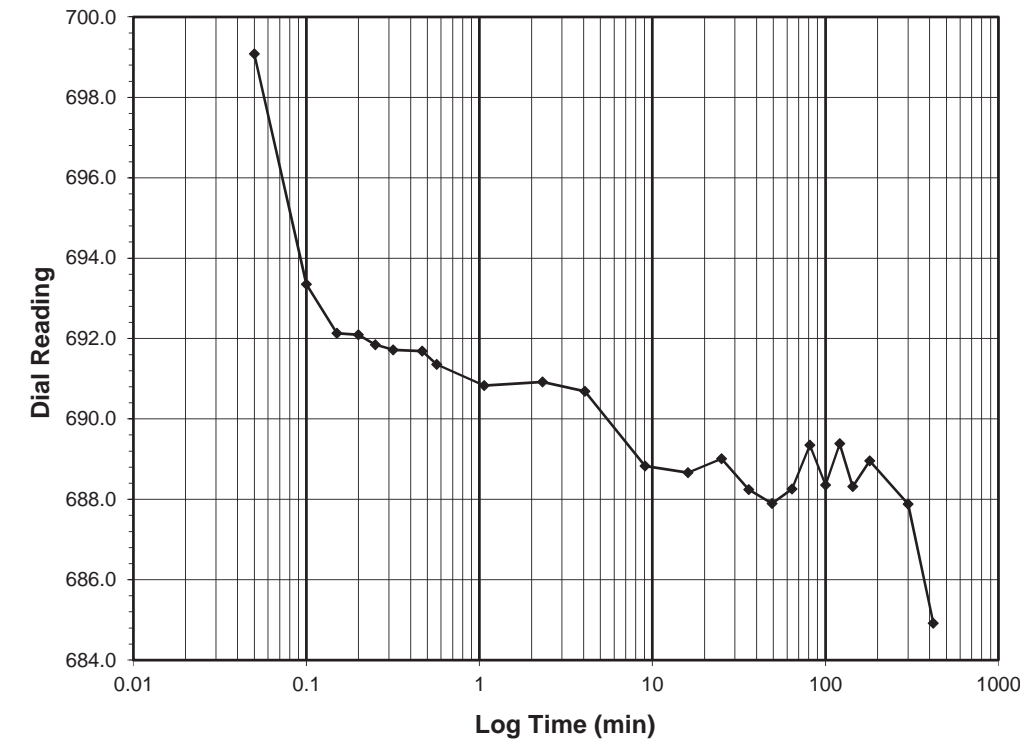
Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 8.0-2.0
Final Reading (div) 684.9
 Consolidometer No. **R491**
 1 Division (in) 0.0001

Start Date 3/30/18
 Start Time 5:31:43

Elapsed Time (min)	Dial Reading (div)
Initial	746.4
0.05	699.1
0.10	693.3
0.15	692.1
0.20	692.1
0.25	691.8
0.32	691.7
0.47	691.7
0.57	691.4
1.07	690.8
2.32	690.9
4.07	690.7
9.07	688.8
16.07	688.7
25.07	689.0
36.07	688.2
49.07	687.9
64.08	688.3
81.08	689.3
100.08	688.4
121.08	689.4
144.08	688.3
180.08	689.0
300.08	687.9
420.28	684.9



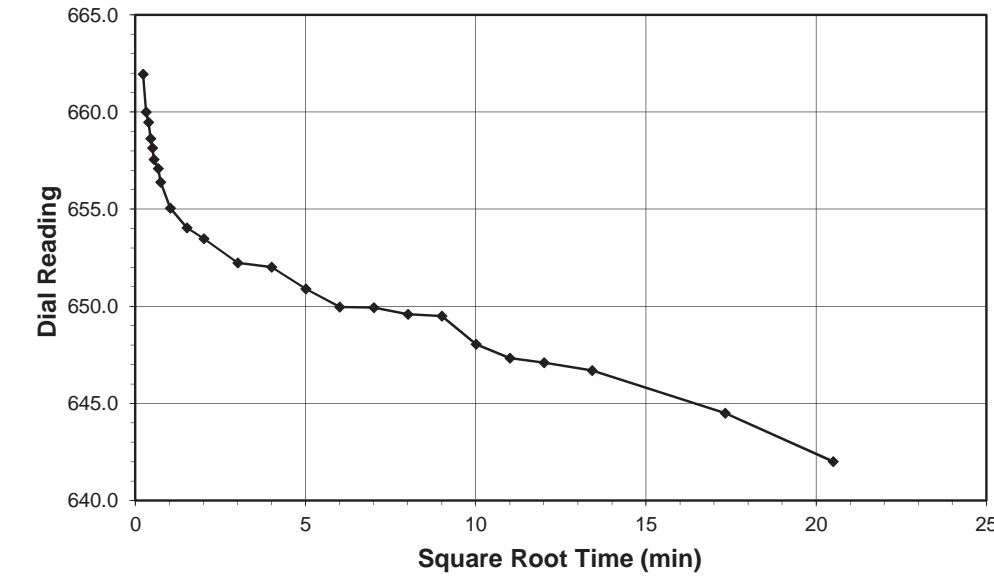
Tested By 129-04-0411 Date 3/30/18 Checked By GEM Date 5/11/18



ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216

Client: ESP Associates Boring No.: -L- STA. 506+89, 75' RT
 Client Project: R-1015 Site B CS34.324.00 Depth (ft): 7.0-9.0
 Project No.: R-2018-075-001 Sample No.: ST-3
 Lab ID: R-2018-075-001-015 Visual Description: ORANGE SAND

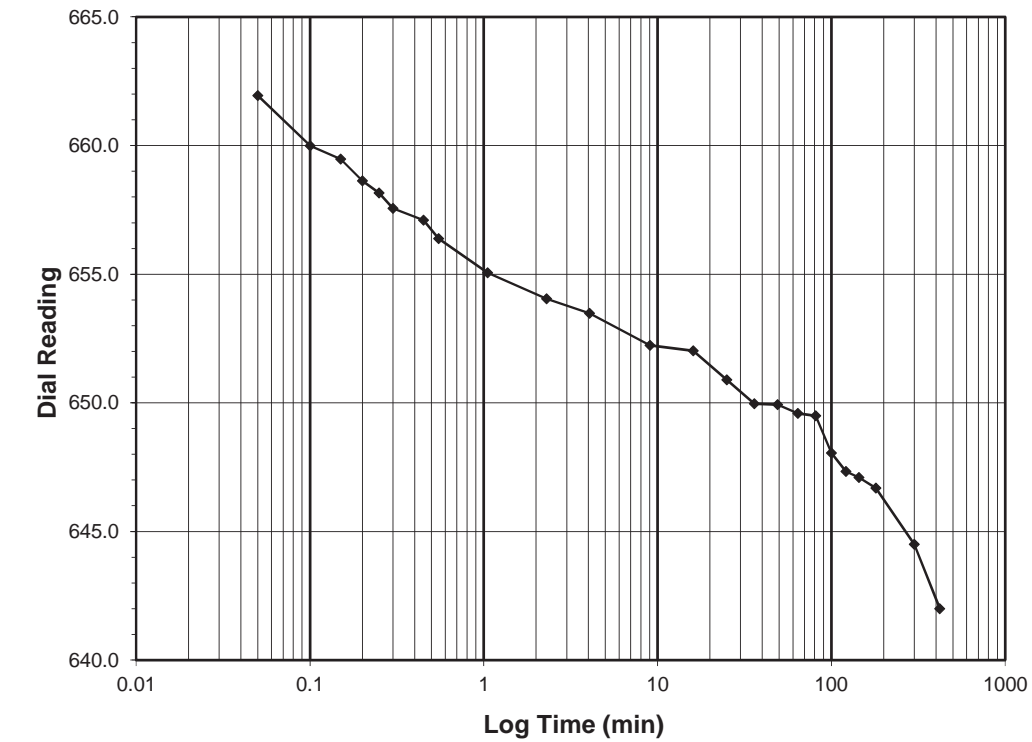
Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) 2.0-0.5
Final Reading (div) 642.0
 Consolidometer No. **R491**
 1 Division (in) 0.0001

Start Date 3/30/18
 Start Time 12:32:00

Elapsed Time (min)	Dial Reading (div)
Initial	684.9
0.05	661.9
0.10	660.0
0.15	659.5
0.20	658.6
0.25	658.2
0.30	657.6
0.45	657.1
0.55	656.4
1.05	655.1
2.30	654.0
4.05	653.5
9.05	652.2
16.05	652.0
25.05	650.9
36.05	650.0
49.07	649.9
64.07	649.6
81.07	649.5
100.07	648.1
121.07	647.3
144.07	647.1
180.07	646.7
300.07	644.5
420.22	642.0



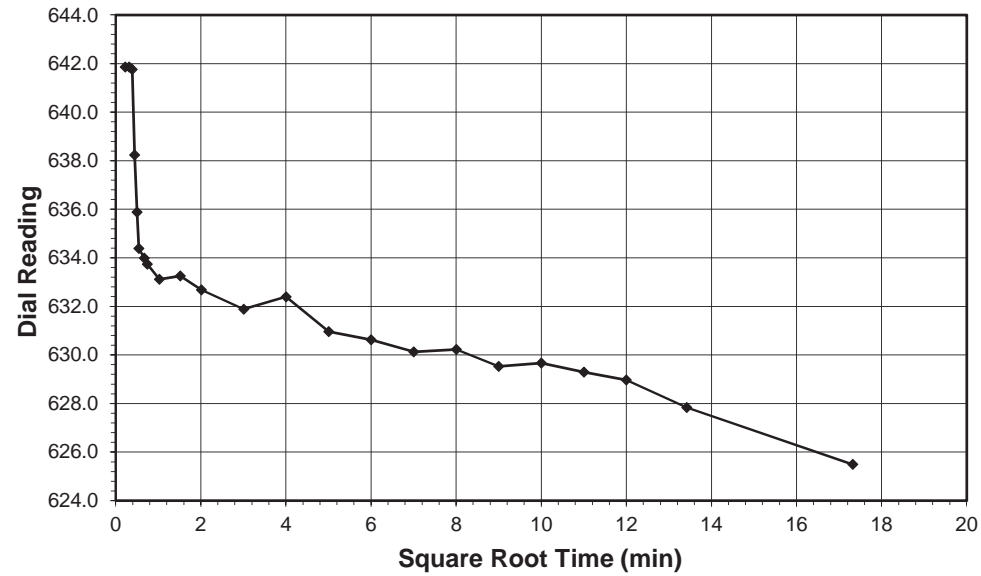
Tested By 129-04-0411 Date 3/30/18 Checked By GEM Date 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



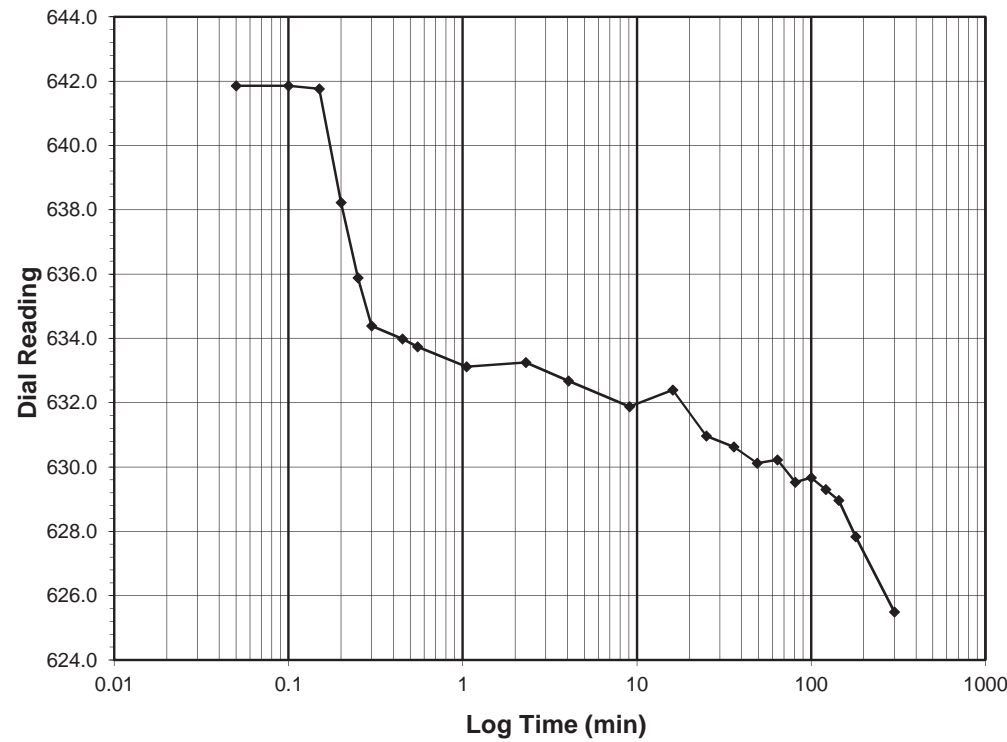
Client ESP Associates Boring No. -L- STA. 506+89, 75' RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 7.0-9.0
 Project No. R-2018-075-001 Sample No. ST-3
 Lab ID R-2018-075-001-015 Visual Description ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) **0.5-0.25**
 Final Reading (div) **625.5**
 Consolidometer No. **R491**
 1 Division (in) 0.0001
 Start Date 3/30/18
 Start Time 19:32:13

Elapsed Time (min)	Dial Reading (div)
Initial	642.0
0.05	641.9
0.10	641.9
0.15	641.8
0.20	638.2
0.25	635.9
0.30	634.4
0.45	634.0
0.55	633.7
1.05	633.1
2.30	633.3
4.05	632.7
9.05	631.9
16.05	632.4
25.05	631.0
36.05	630.6
49.05	630.1
64.07	630.2
81.07	629.5
100.07	629.7
121.07	629.3
144.07	629.0
180.07	627.8
300.07	625.5

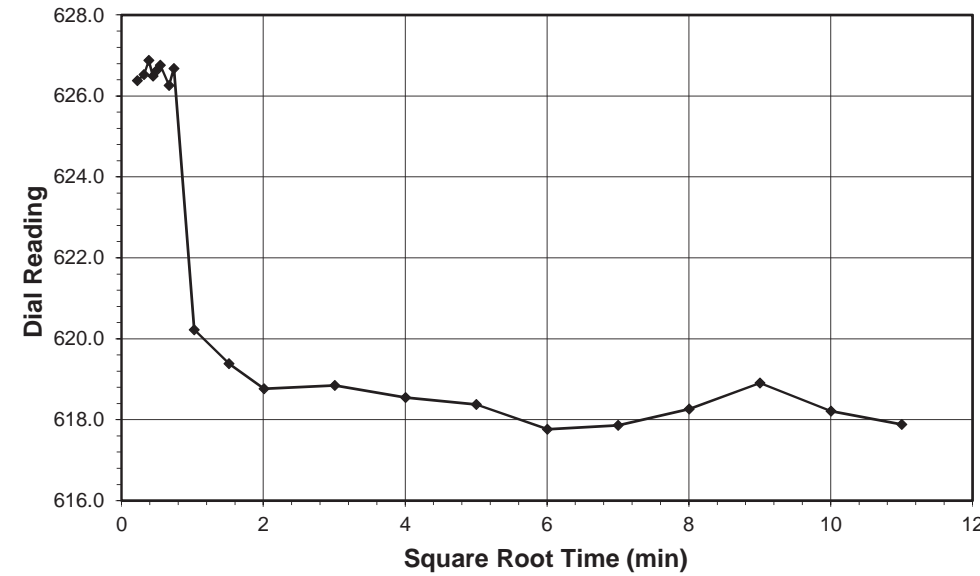


ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216



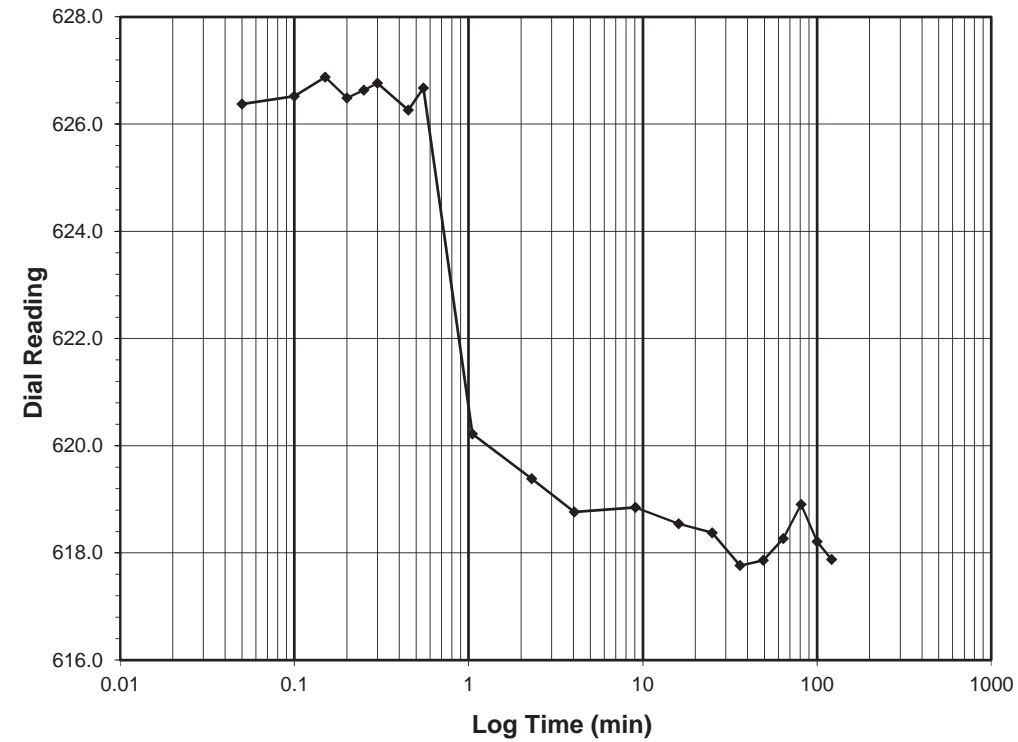
Client ESP Associates Boring No. -L- STA. 506+89, 75' RT
 Client Project R-1015 Site B CS34.324.00 Depth (ft) 7.0-9.0
 Project No. R-2018-075-001 Sample No. ST-3
 Lab ID R-2018-075-001-015 Visual Description ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load (tsf) **0.25-0.125**
 Final Reading (div) **617.9**
 Consolidometer No. **R491**
 1 Division (in) 0.0001
 Start Date 3/31/18
 Start Time 2:32:32

Elapsed Time (min)	Dial Reading (div)
Initial	625.5
0.05	626.4
0.10	626.5
0.15	626.9
0.20	626.5
0.25	626.6
0.30	626.8
0.45	626.3
0.55	626.7
1.05	626.2
2.30	619.4
4.05	618.8
9.05	618.9
16.05	618.5
25.05	618.4
36.07	617.8
49.07	617.9
64.07	618.3
81.07	618.9
100.07	618.2
121.07	617.9



Tested By 129-04-0411 Date 3/30/18 Checked By GEM Date 5/11/18

Tested By 129-04-0411 Date 3/31/18 Checked By GEM Date 5/11/18