

REFERENCE: R-3825B

PROJECT: 34552

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY Johnston
 PROJECT DESCRIPTION NC 42 from SR 1902 (Glen Laurel Rd.) to SR 1003 (Buffalo Rd.)
 SITE DESCRIPTION Bridge No. 75 on NC 42 over the Neuse River at -L- Sta. 64 + 20

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
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17	ROCK TEST RESULTS
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3825B	1	22

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 1919 T07-6850. 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

Lindsay Pugh

Mid Atlantic Drilling

INVESTIGATED BY J.L. Stone

DRAWN BY J.L. Stone

CHECKED BY J.L. Pedro

SUBMITTED BY J.L. Stone

DATE June 2017



DocuSigned by:
Joseph L Stone 7/28/2017

443F443F329A402 SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

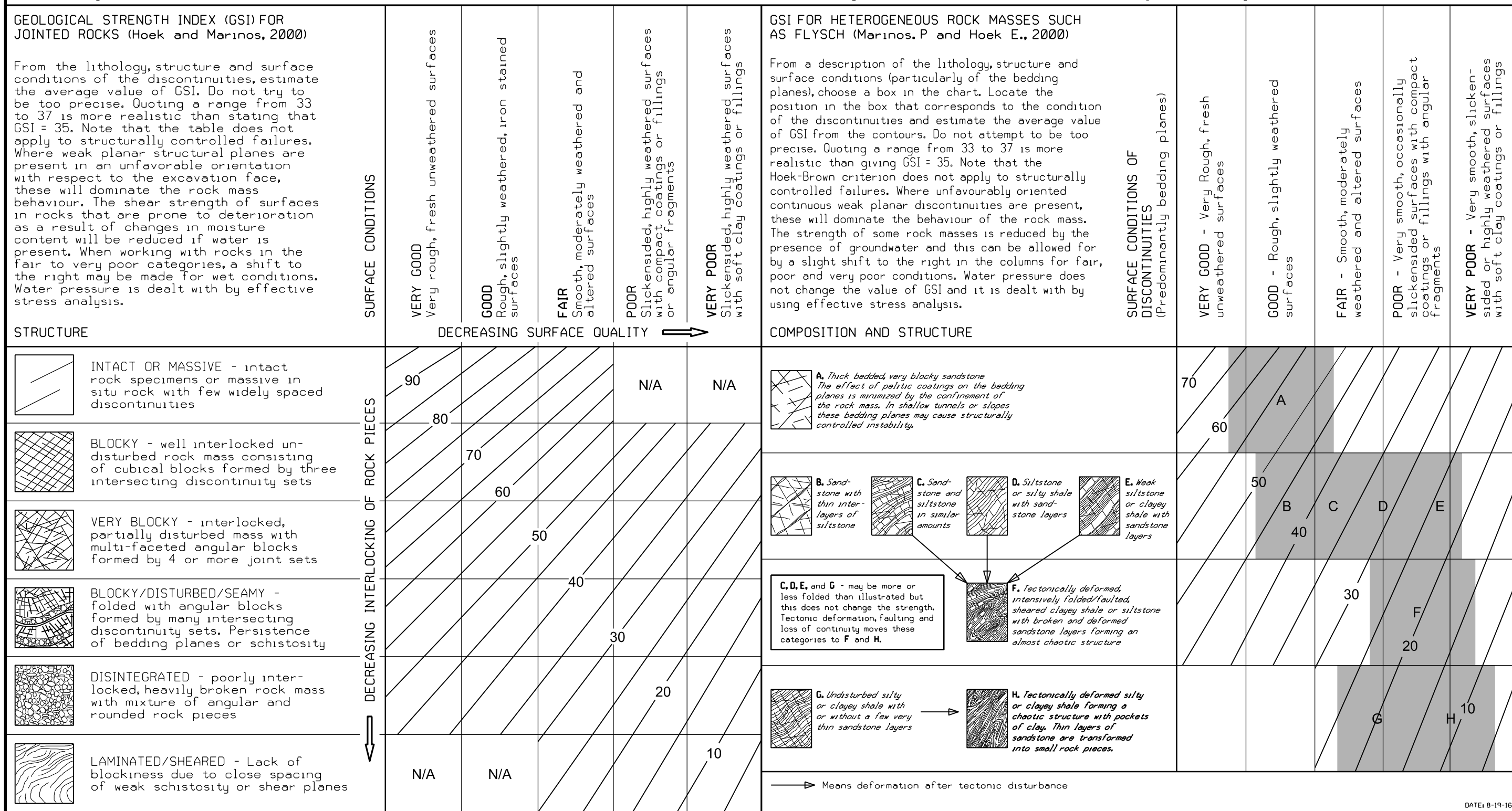
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)





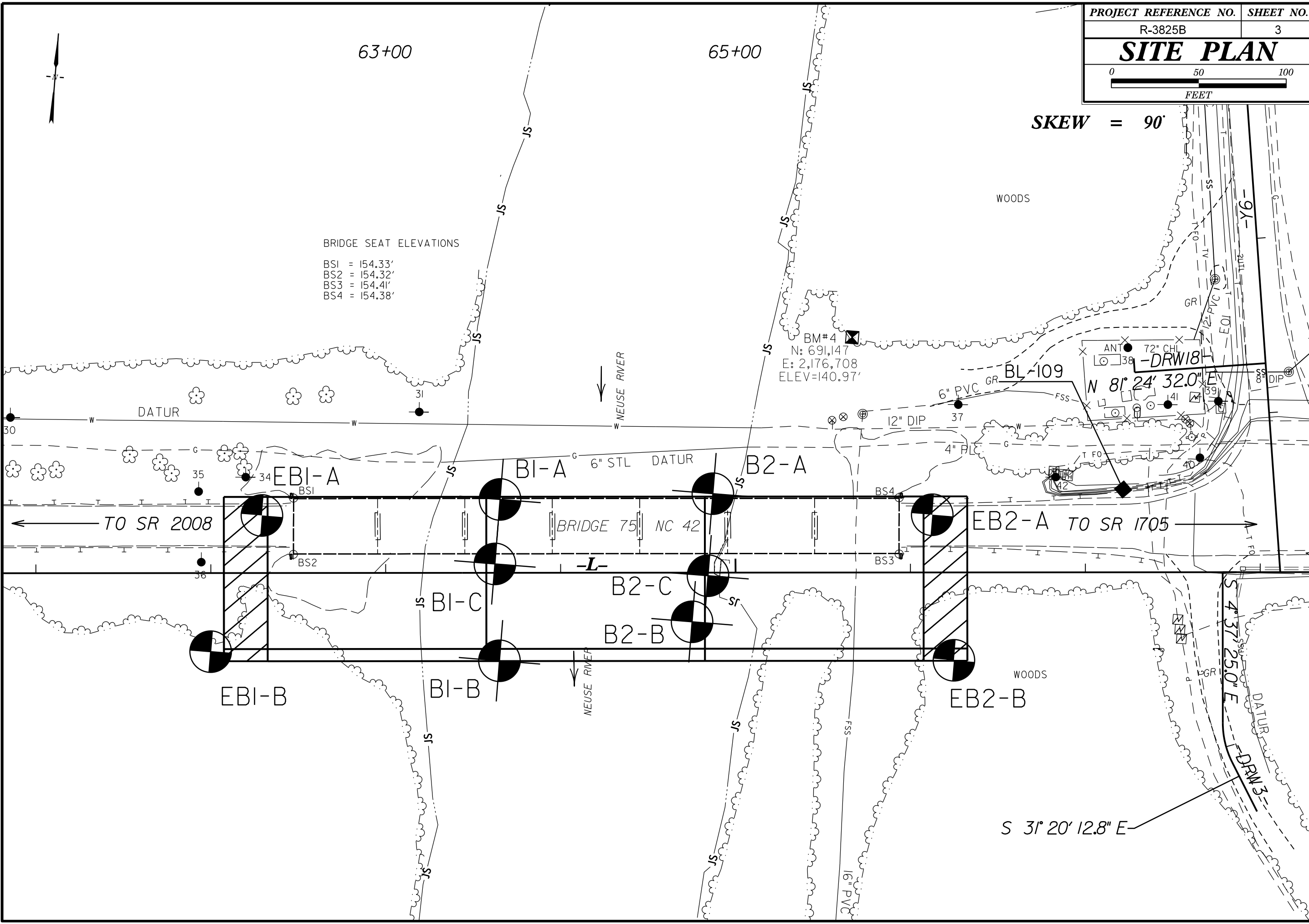
63+00

65+00

SKEW = 90'

BRIDGE SEAT ELEVATIONS

- BS1 = 154.33'
- BS2 = 154.32'
- BS3 = 154.41'
- BS4 = 154.38'

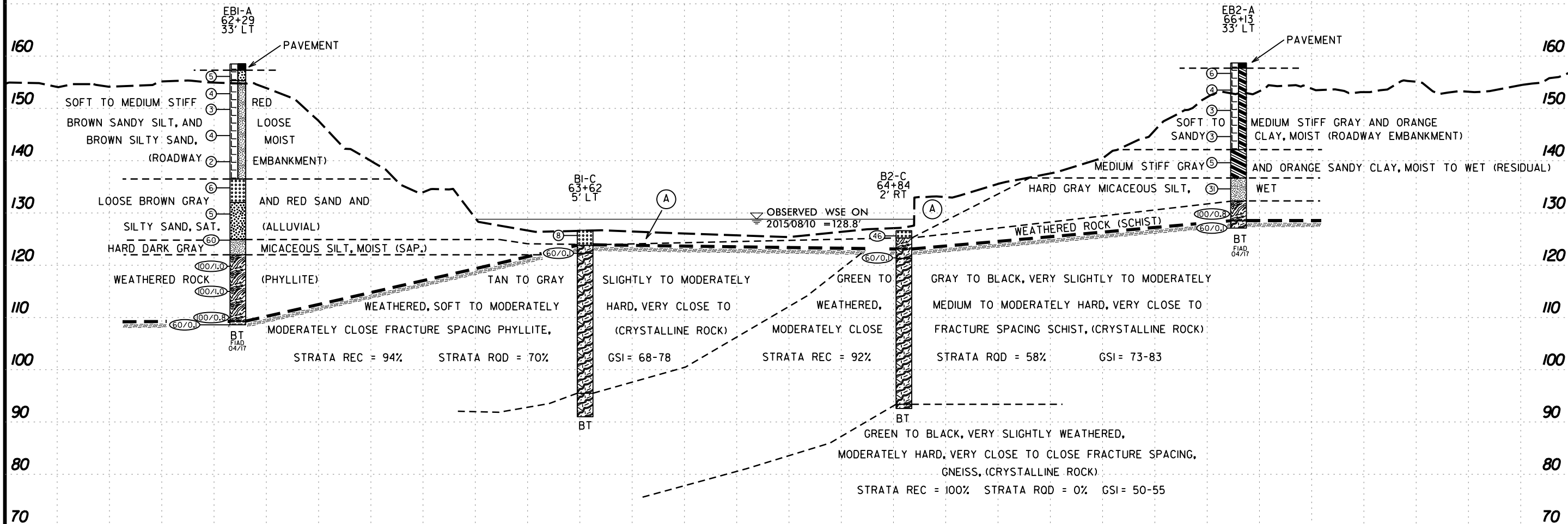
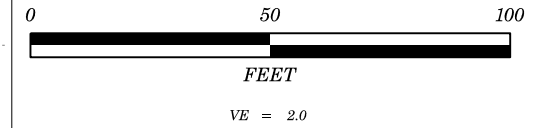


← TO SR 2008

→ EB2-A TO SR 1705

S 47° 25.0" E

PROFILE THROUGH BORINGS PROJECTED ALONG -L-



(A) LOOSE TO DENSE BROWN AND BLACK SAND AND SILTY SAND, SAT. (ALLUVIAL)

NOTE: GROUNDLINE PROFILE OF -L- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC REPORT DATED 02/17/17.
NOTE: INFERRED STATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

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08-JUN-2017 08:12
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62+00

63+00

64+00

65+00

66+00

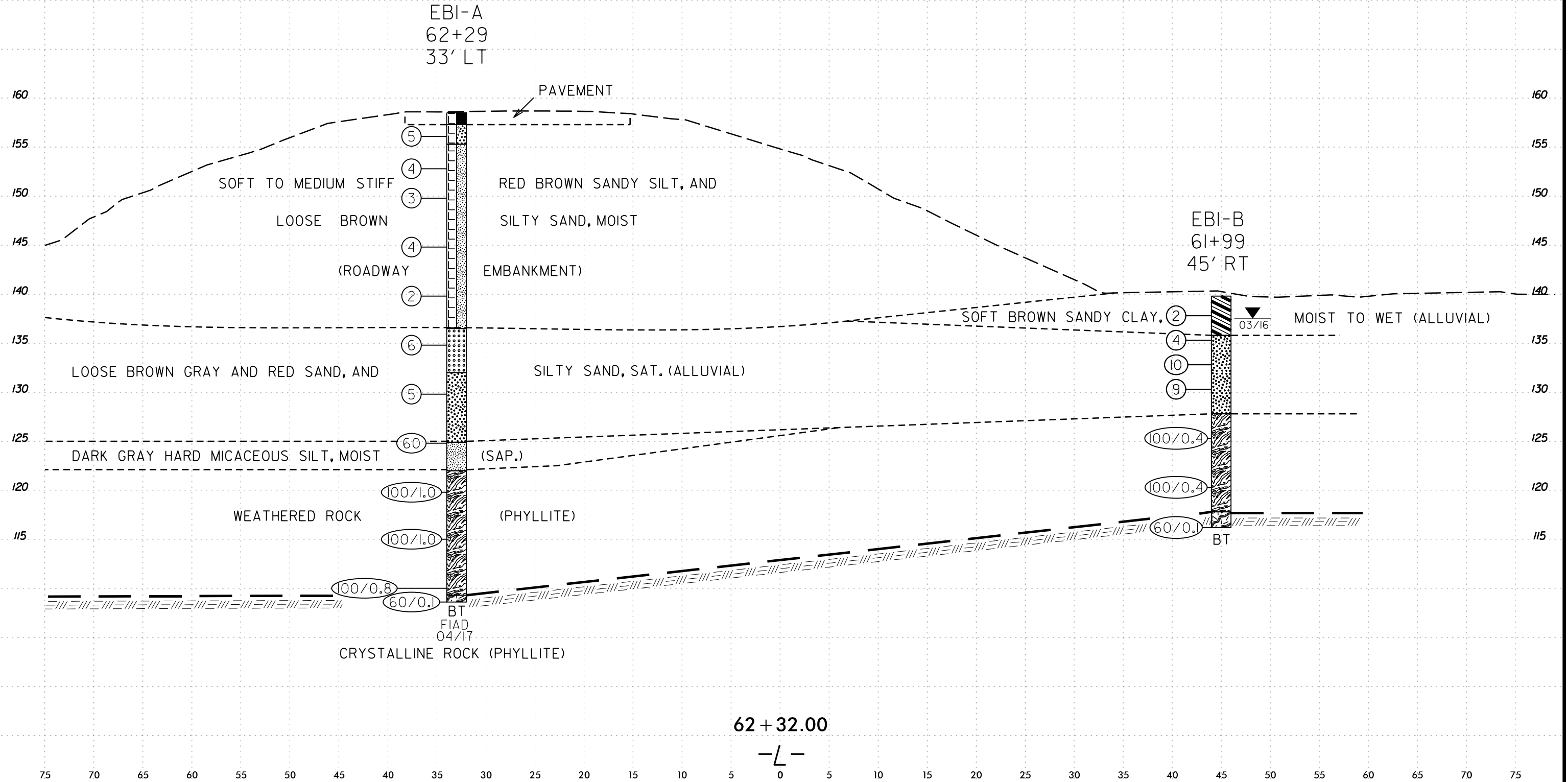
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ISTONE AT MICROSTATIONPC2

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

VE = 1:1
SKEW = 90°

CROSS SECTION THROUGH END BENT 1



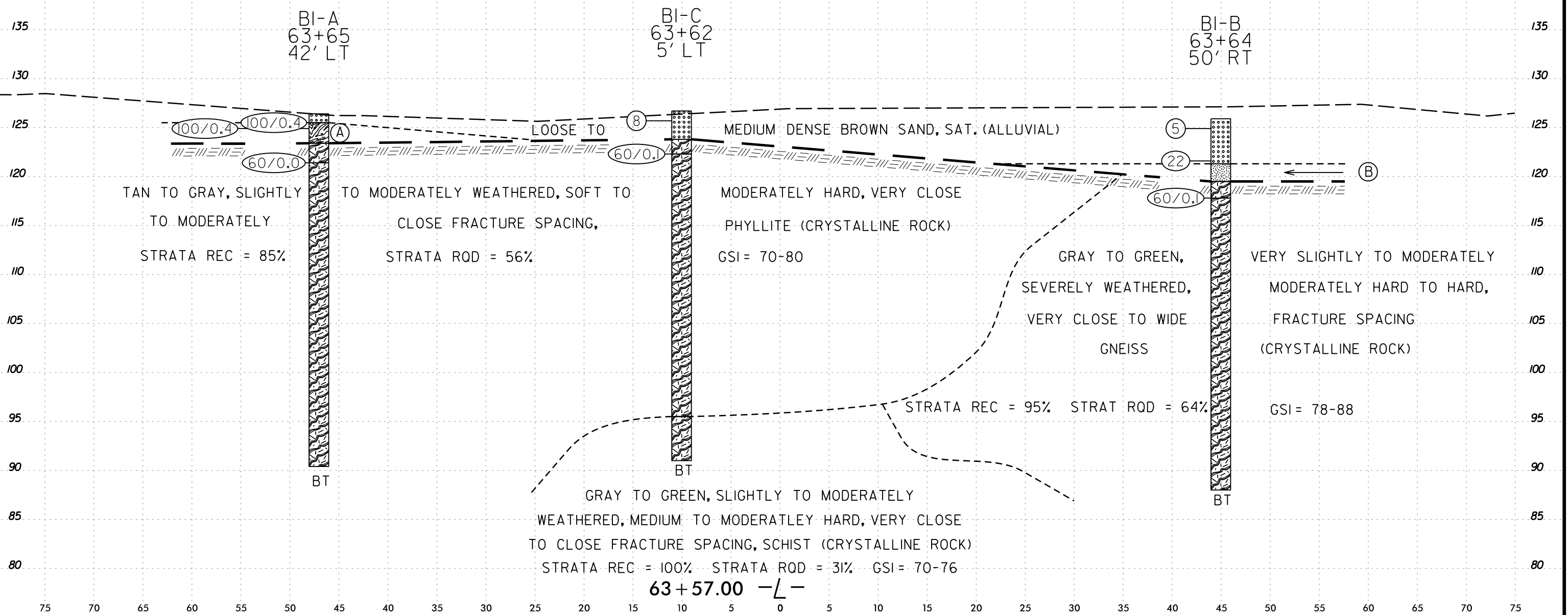
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75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

VE = 1:1
SKEW = 90°

CROSS SECTION THROUGH BENT 1

- (A) WEATHERED ROCK (PHYLLITE)
- (B) HARD DARK GREEN MICACEOUS SILT, WET (RESIDUAL)

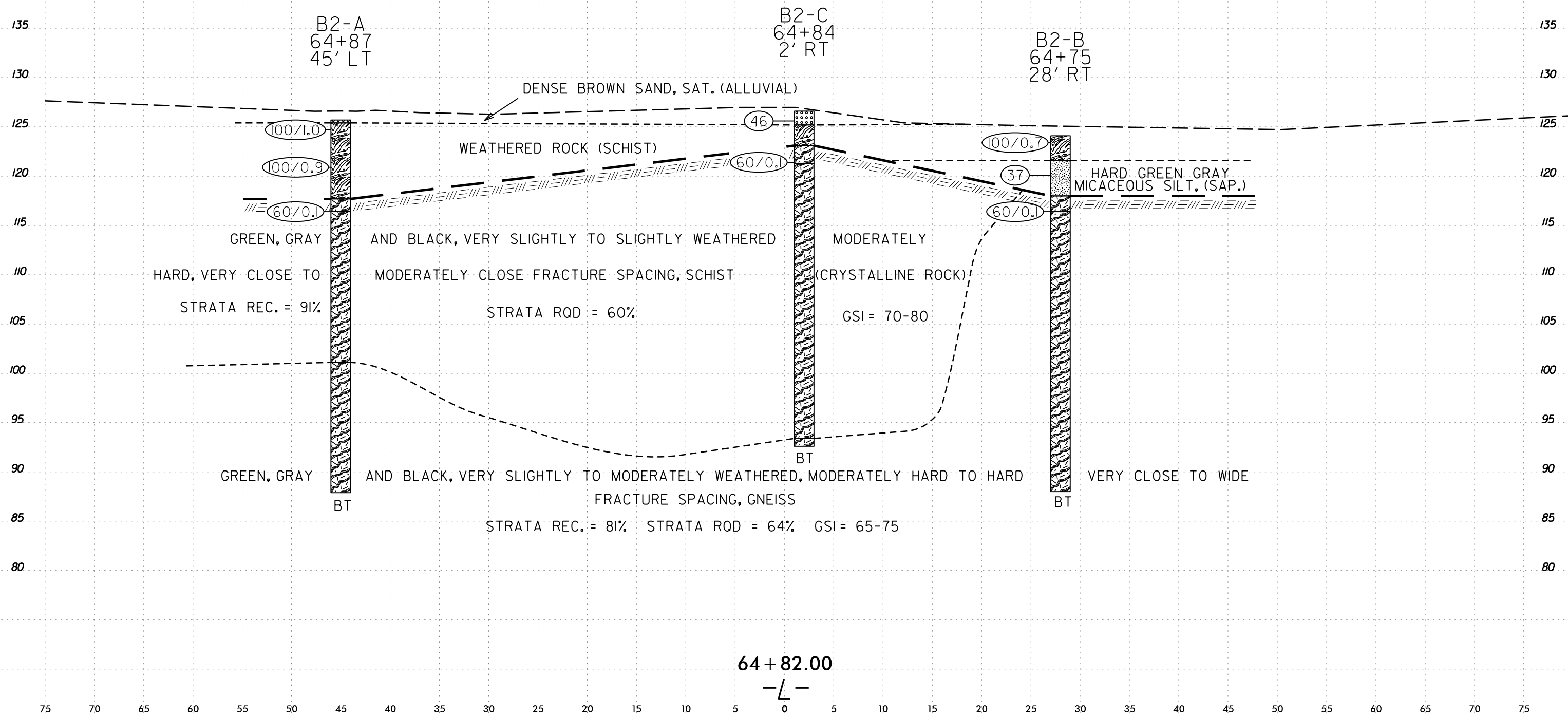


6/23/16

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

VE = 1:1
SKEW = 90°

CROSS SECTION THROUGH BENT 2

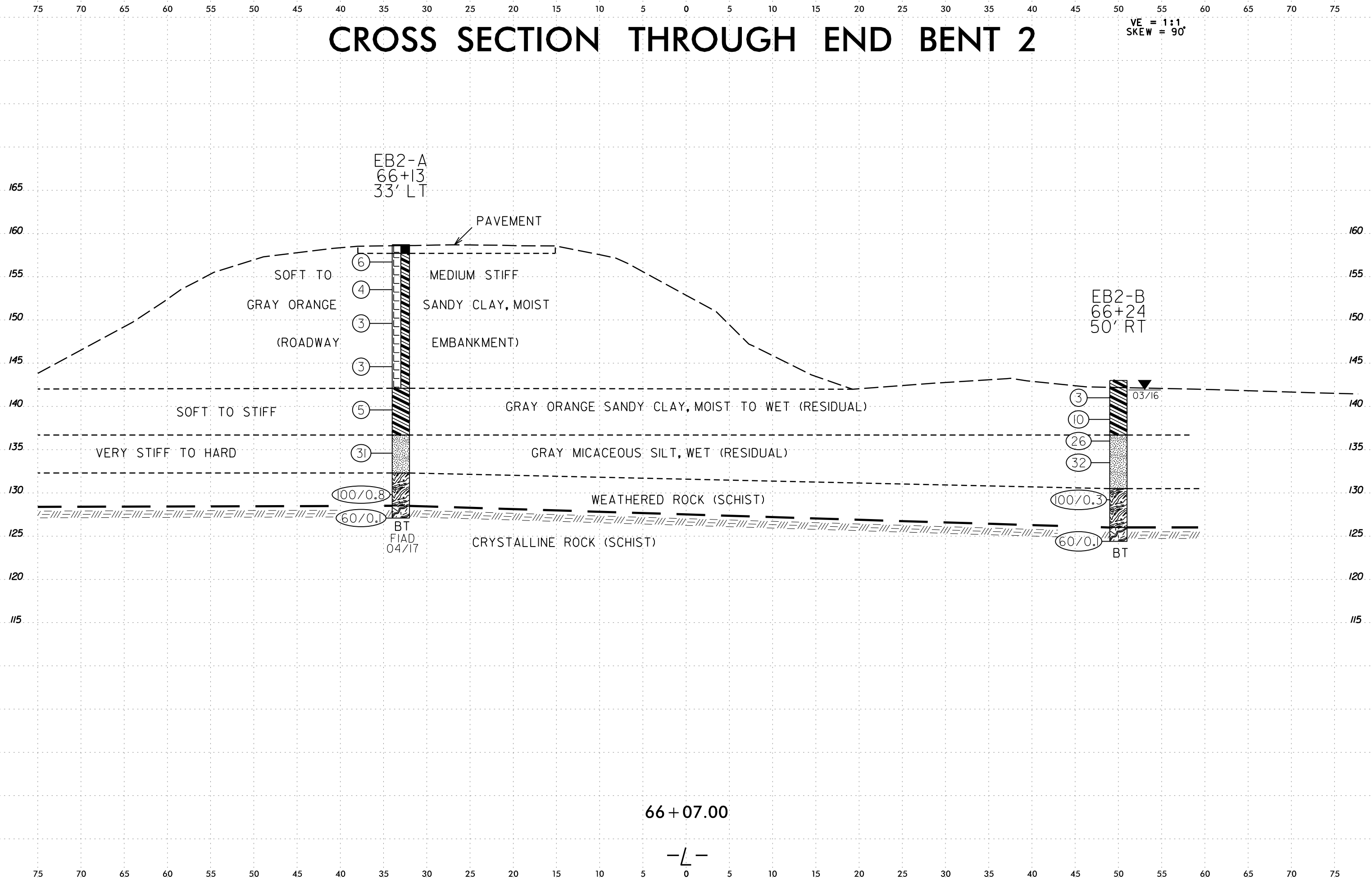


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 1:stone AT MICROSTATIONPC2

6/23/16

CROSS SECTION THROUGH END BENT 2

VE = 1:1
SKEW = 90°



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ISTONE AT MICROSTATION

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34552.1.FR3		TIP R-3825B		COUNTY JOHNSTON		GEOLOGIST Lindsay Pugh	
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER							GROUND WTR (ft)
BORING NO. EB1-A		STATION 62+29		OFFSET 33 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 158.5 ft		TOTAL DEPTH 49.9 ft		NORTHING 691,018		EASTING 2,176,380	
DRILL RIG/HAMMER EFF./DATE MID5464 CME-45C 84% 08/09/2016			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic	
DRILLER M. COOGAN		START DATE 04/22/17		COMP. DATE 04/22/17		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)	
160																
	157.3	1.2	7	3	2								M		158.5	0.0
	155.3												M		157.3	1.2
155													M		155.3	3.2
	153.8	4.7	1	2	2								M			
	150.8	7.7	2	2	1								M			
150													M			
	145.8	12.7	2	2	2								M			
145													M			
	140.8	17.7	2	1	1								M			
140													M			
	135.8	22.7	3	3	3								Sat.		136.5	22.0
135													Sat.			
	130.8	27.7	2	2	3								Sat.			
130													Sat.			
	125.8	32.7	5	15	45								M		124.9	33.6
125													M		122.0	36.5
	120.8	37.7	29	71/0.5									M			
120													M			
	116.0	42.5	21	25	75								M			
115													M			
	110.8	47.7	50	50/0.3									M			
110													M			
	108.7	49.8	60/0.1										M		109.3	49.2
													M		108.6	49.9

WBS 34552.1.FR3		TIP R-3825B		COUNTY JOHNSTON		GEOLOGIST Contract Geologist	
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER							GROUND WTR (ft)
BORING NO. EB1-B		STATION 61+99		OFFSET 45 ft RT		ALIGNMENT -L-	
COLLAR ELEV. 139.8 ft		TOTAL DEPTH 23.6 ft		NORTHING 690,938		EASTING 2,176,357	
DRILL RIG/HAMMER EFF./DATE BRI2974 CME-45C 79% 06/03/2015			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic	
DRILLER Contract Driller		START DATE 03/07/16		COMP. DATE 03/07/16		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)	
140																
	138.8	1.0	1	1	1								M		139.8	0.0
	136.3	3.5	2	2	2								M		135.8	4.0
135													M			
	133.8	6.0	3	4	6								Sat.			
	131.3	8.5	3	4	5								Sat.			
130													Sat.			
	126.3	13.5	100/0.4										Sat.			
125													Sat.			
	121.3	18.5	100/0.4										Sat.			
120													Sat.			
	116.3	23.5	60/0.1										Sat.			

NCDOT BORE DOUBLE R3825B_GEO_BRDG_BORINGS.GPJ NC_DOT.GDT 6/5/17

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34552.1.FR3		TIP R-3825B		COUNTY JOHNSTON		GEOLOGIST Lindsay Pugh									
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER							GROUND WTR (ft)								
BORING NO. B1-A		STATION 63+65		OFFSET 42 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 126.4 ft		TOTAL DEPTH 36.0 ft		NORTHING 691,038		EASTING 2,176,515									
DRILL RIG/HAMMER EFF./DATE MID0314 D-25 86% 08/04/2016			DRILL METHOD NQ2 Casing W/SPT&Core			HAMMER TYPE Automatic									
DRILLER B. Fowler		START DATE 05/01/17		COMP. DATE 05/02/17		SURFACE WATER DEPTH 5.9ft									
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					
130															
125	126.4 125.3	0.0 1.1	3 100/0.4									Sat.		126.4 125.5	0.0 0.9
120	121.4	5.0	60/0.0											123.4 121.4	3.0 5.0
115															
110															
105															
100															
95												RS-1			
														90.4	36.0
Boring Terminated at Elevation 90.4 ft IN CRYSTALLINE ROCK (PHYLLITE)															

WBS 34552.1.FR3		TIP R-3825B		COUNTY JOHNSTON		GEOLOGIST Lindsay Pugh						
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER							GROUND WTR (ft)					
BORING NO. B1-A		STATION 63+65		OFFSET 42 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 126.4 ft		TOTAL DEPTH 36.0 ft		NORTHING 691,038		EASTING 2,176,515						
DRILL RIG/HAMMER EFF./DATE MID0314 D-25 86% 08/04/2016			DRILL METHOD NQ2 Casing W/SPT&Core			HAMMER TYPE Automatic						
DRILLER B. Fowler		START DATE 05/01/17		COMP. DATE 05/02/17		SURFACE WATER DEPTH 5.9ft						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
121.4												
120	121.4 119.0	5.0 7.4	2.4	N=60/0.0 4:30/1.0 3:53/1.0 3:08/0.4	(2.3) 96%	(2.2) 92%		(23.9) 77%	(13.8) 45%		Begin Coring @ 5.0 ft	
115	114.0	12.4	5.0	3:24/1.0 4:51/1.0 4:20/1.0 3:28/1.0 4:08/1.0	(3.7) 74%	(3.1) 62%					TAN TO GRAY, SLIGHTLY TO MODERATELY WEATHERED, MEDIUM TO MODERATELY HARD, VERY CLOSE TO CLOSE FRACTURE SPACING, PHYLLITE, WITH A VOID AT 11.4 +/-, AND A CLAY SEAM AT 25.0 +/- GSI = 72-82	5.0
110			4.7	3:10/1.0 4:23/1.0 4:44/1.0 4:36/1.0	(4.7) 100%	(1.8) 38%						
105	109.3	17.1	3.9	6:04/0.7 12:40/1.0 10:04/1.0 8:40/1.0 10:54/0.9	(3.3) 85%	(1.4) 36%						
100	105.4	21.0	5.0	4:14/1.0 6:34/1.0 4:25/1.0 0:39/1.0 4:43/1.0	(2.9) 58%	(0.9) 18%						
95	100.4	26.0	5.0	4:18/1.0 5:27/1.0 5:55/1.0 5:26/1.0 8:16/1.0	(4.2) 84%	(3.1) 62%	RS-1					
90.4	95.4	31.0	5.0	5:18/1.0 5:46/1.0 6:14/1.0 1:57/1.0 2:50/1.0	(2.8) 56%	(1.3) 26%						
	90.4	36.0									Boring Terminated at Elevation 90.4 ft IN CRYSTALLINE ROCK (PHYLLITE)	36.0

NCDOT BORE DOUBLE R3825B_GEO_BRDG_BORINGS.GPJ NC_DOT.GDT 6/5/17

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34552.1.FR3		TIP R-3825B		COUNTY JOHNSTON		GEOLOGIST Lindsay Pugh									
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER							GROUND WTR (ft)								
BORING NO. B1-C		STATION 63+62		OFFSET 5 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 126.7 ft		TOTAL DEPTH 35.7 ft		NORTHING 691,001		EASTING 2,176,515									
DRILL RIG/HAMMER EFF./DATE MID0314 D-25 86% 08/04/2016			DRILL METHOD NQ2 Casing W/SPT&Core			HAMMER TYPE Automatic									
DRILLER B. Fowler		START DATE 04/20/17		COMP. DATE 04/21/17		SURFACE WATER DEPTH 2.2ft									
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					
130															
	126.7	0.0													126.7
			WOH	1	7										
125															
	122.4	4.3													122.3
120															
115															
110															
105															
100															
95															

WBS 34552.1.FR3		TIP R-3825B		COUNTY JOHNSTON		GEOLOGIST Lindsay Pugh					
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER							GROUND WTR (ft)				
BORING NO. B1-C		STATION 63+62		OFFSET 5 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 126.7 ft		TOTAL DEPTH 35.7 ft		NORTHING 691,001		EASTING 2,176,515					
DRILL RIG/HAMMER EFF./DATE MID0314 D-25 86% 08/04/2016			DRILL METHOD NQ2 Casing W/SPT&Core			HAMMER TYPE Automatic					
DRILLER B. Fowler		START DATE 04/20/17		COMP. DATE 04/21/17		SURFACE WATER DEPTH 2.2ft					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
122.3											
	122.3	4.4	5.0	3:13/1.0 3:44/1.0 5:00/1.0 3:11/1.0 4:50/1.0	(4.6) 92%	(3.6) 72%	(25.3) 94%	(18.7) 70%		Begin Coring @ 4.4 ft	122.3
120											
	117.3	9.4	1.8	2:36/1.0 4:50/0.8	(1.6) 89%	(1.1) 61%				TAN TO GRAY, SLIGHTLY TO MODERATELY SEVERELY WEATHERED, SOFT TO MODERATELY HARD, VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING, PHYLLITE GSI = 68-78	4.4
115											
	115.5	11.2	4.6	3:32/1.0 4:40/1.0 4:19/1.0 5:17/1.0 5:30/0.6	(4.6) 100%	(4.3) 93%					
110											
	110.9	15.8	5.4	3:55/1.4 3:45/1.0 4:03/1.0 3:51/1.0 5:17/1.0	(5.0) 93%	(3.1) 57%					
105											
	105.5	21.2	5.0	4:12/1.0 4:39/1.0 4:36/1.0 5:43/1.0 7:00/1.0	(5.0) 100%	(5.0) 100%					
100											
	100.5	26.2	5.0	3:39/1.0 4:01/1.0 4:10/1.0 6:57/1.0 8:25/1.0	(4.5) 90%	(1.6) 32%					
95											
	95.5	31.2	4.5	4:34/1.0 4:47/1.0 4:20/1.0 5:13/1.0 4:16/0.5	(4.5) 100%	(1.4) 31%	(4.5) 100%	(1.4) 31%		GRAY TO GREEN, MODERATELY TO SLIGHTLY WEATHERED, MEDIUM TO MODERATELY HARD, CLOSE TO VERY CLOSE FRACTURE SPACING, SCHIST GSI = 70-76	31.2
	91.0	35.7								Boring Terminated at Elevation 91.0 ft IN CRYSTALLINE ROCK (SCHIST)	35.7

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34552.1.FR3		TIP R-3825B		COUNTY JOHNSTON		GEOLOGIST Lindsay Pugh												
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER							GROUND WTR (ft)											
BORING NO. B1-B		STATION 63+64		OFFSET 50 ft RT		ALIGNMENT -L-												
COLLAR ELEV. 125.9 ft		TOTAL DEPTH 37.9 ft		NORTHING 690,946		EASTING 2,176,522												
DRILL RIG/HAMMER EFF./DATE MID0314 D-25 86% 08/04/2016			DRILL METHOD NQ2 Casing W/SPT&Core			HAMMER TYPE Automatic												
DRILLER B. Fowler		START DATE 05/03/17		COMP. DATE 05/04/17		SURFACE WATER DEPTH 8.8ft												
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)			
																		WATER SURFACE (05/03/17)
135																		
130																		
125	125.9	0.0	10	2	3													125.9 RIVER BED
120	122.6	3.3	10	12	10													ALLUVIAL BROWN SAND
115	117.9	8.0	60/0.1															RESIDUAL DARK GREEN MICACEOUS SILT
110																		CRYSTALLINE ROCK GNEISS
105																		GRAY TO GREEN, MODERATELY SEVERE TO VERY SLIGHTLY WEATHERED, MODERATELY HARD TO HARD, VERY CLOSE TO WIDE FRACTURE SPACING, GNEISS
100																		REC. = 95% RQD = 64% GSI = 78-88
95																		
90																		
																		88.0 Boring Terminated at Elevation 88.0 ft IN CRYSTALLINE ROCK (GNEISS)

WBS 34552.1.FR3		TIP R-3825B		COUNTY JOHNSTON		GEOLOGIST Lindsay Pugh									
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER							GROUND WTR (ft)								
BORING NO. B1-B		STATION 63+64		OFFSET 50 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 125.9 ft		TOTAL DEPTH 37.9 ft		NORTHING 690,946		EASTING 2,176,522									
DRILL RIG/HAMMER EFF./DATE MID0314 D-25 86% 08/04/2016			DRILL METHOD NQ2 Casing W/SPT&Core			HAMMER TYPE Automatic									
DRILLER B. Fowler		START DATE 05/03/17		COMP. DATE 05/04/17		SURFACE WATER DEPTH 8.8ft									
CORE SIZE NQ2		TOTAL RUN 29.8 ft						LOG	DESCRIPTION AND REMARKS	DEPTH (ft)					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.				STRATA REC. (ft) %	RQD (ft) %			
117.8	117.8	8.1	1.4	7:02/1.0	(1.1)	(0.4)		(28.4)	(19.2)		117.8	Begin Coring @ 8.1 ft	8.1		
115	116.4	8.5	4.5	4:44/0.4	79%	29%		95%	64%			GRAY TO GREEN, VERY SLIGHTLY TO MODERATELY SEVERELY WEATHERED, MODERATELY HARD TO HARD, VERY CLOSE TO WIDE FRACTURE SPACING, GNEISS			
				2:45/1.0	(4.1)	(1.5)									
				7:19/1.0	91%	33%									
				7:18/1.0											
				7:52/1.0											
110			5.0	8:18/0.5	(4.9)	(3.2)									
				6:22/1.0	98%	64%									
				6:18/1.0											
				5:43/1.0											
				5:02/1.0											
				7:22/1.0											
105			4.8	5:32/1.0	(4.7)	(1.7)									
				4:21/1.0	98%	35%									
				9:50/1.0											
				9:51/1.0											
100			5.1	11:56/1.0	(5.1)	(4.4)									
				9:20/1.0	100%	86%									
				11:17/1.0											
				6:34/1.0											
95			4.2	10:46/1.0	(4.2)	(4.2)									
				6:48/1.0	100%	100%									
				7:10/1.0											
				7:36/1.0											
90			4.8	5:23/0.2	(4.3)	(3.8)									
				2:51/1.0	90%	79%									
				7:49/1.0											
				9:31/1.0											
				12:58/1.0											
				14:37/0.8											
			88.0	37.9									88.0	Boring Terminated at Elevation 88.0 ft IN CRYSTALLINE ROCK (GNEISS)	37.9

NCDOT BORE DOUBLE R3825B GEO_BRDG_BORINGS.GPJ NC_DOT.GDT 6/5/17

**GEOTECHNICAL BORING REPORT
BORE LOG**

**GEOTECHNICAL BORING REPORT
CORE LOG**

WBS 34552.1.FR3			TIP R-3825B			COUNTY JOHNSTON			GEOLOGIST Lindsay Pugh					
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER									GROUND WTR (ft)					
BORING NO. B2-A			STATION 64+87			OFFSET 45 ft LT			ALIGNMENT -L-					
COLLAR ELEV. 125.7 ft			TOTAL DEPTH 37.8 ft			NORTHING 691,051			EASTING 2,176,636					
DRILL RIG/HAMMER EFF./DATE MID0314 D-25 86% 08/04/2016						DRILL METHOD NQ2 Casing W/SPT&Core			HAMMER TYPE Automatic					
DRILLER Contract Driller			START DATE 05/02/17			COMP. DATE 05/03/17			SURFACE WATER DEPTH 7.8ft					
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)
130														WATER SURFACE (05/02/17)
125	125.7	0.0	2	98/0.5					100/1.0		Sat.			RIVER BED ALLUVIAL BROWN SAND
120	121.8	3.9	43	57/0.4					100/0.9					WEATHERED ROCK SCHIST
115	116.5	9.2	60/0.1						60/0.1					CRYSTALLINE ROCK SCHIST
110														GRAY, VERY SLIGHTLY TO SLIGHTLY WEATHERED, MODERATELY HARD, VERY CLOSE TO CLOSE FRACTURE SPACING, SCHIST
105														REC. = 92% RQD = 56% GSI = 65-75
100											RS-3			GRAY, VERY SLIGHTLY TO SLIGHTLY WEATHERED, MODERATELY HARD TO HARD, MODERATELY CLOSE TO WIDE FRACTURE SPACING, GNEISS
95														REC. = 92% RQD = 87% GSI = 79-90
90														Boring Terminated at Elevation 87.9 ft IN CRYSTALLINE ROCK (GNEISS)

WBS 34552.1.FR3			TIP R-3825B			COUNTY JOHNSTON			GEOLOGIST Lindsay Pugh		
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER									GROUND WTR (ft)		
BORING NO. B2-A			STATION 64+87			OFFSET 45 ft LT			ALIGNMENT -L-		
COLLAR ELEV. 125.7 ft			TOTAL DEPTH 37.8 ft			NORTHING 691,051			EASTING 2,176,636		
DRILL RIG/HAMMER EFF./DATE MID0314 D-25 86% 08/04/2016						DRILL METHOD NQ2 Casing W/SPT&Core			HAMMER TYPE Automatic		
DRILLER Contract Driller			START DATE 05/02/17			COMP. DATE 05/03/17			SURFACE WATER DEPTH 7.8ft		
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) %		
116.4											Begin Coring @ 9.3 ft
115	116.4	9.3	1.2	4:54/1.0	(1.2)	(0.7)		(14.1)	(8.5)		GRAY, VERY SLIGHTLY TO SLIGHTLY WEATHERED, MODERATELY HARD, VERY CLOSE TO CLOSE FRACTURE SPACING, SCHIST
	115.2	10.5	4.6	5:02/0.2	100%	58%		92%	56%		GSI = 65 - 75
				5:36/1.0	(4.2)	(2.5)					
				5:33/1.0	91%	54%					
				5:16/1.0							
110	110.6	15.1	5.1	5:58/1.0	(4.3)	(2.2)					
				7:11/0.6	84%	43%					
				6:49/1.0							
				6:04/1.0							
				4:49/1.0							
				4:55/1.0							
105	105.5	20.2	4.4	3:38/1.1	(4.4)	(3.1)					
				5:31/1.0	100%	70%					
				7:38/1.0							
				8:44/1.0							
				7:57/1.0							
100	101.1	24.6	4.8	7:54/0.4	(4.6)	(4.6)	RS-3	(12.1)	(11.5)		GRAY, VERY SLIGHTLY TO SLIGHTLY WEATHERED, MODERATELY HARD TO HARD, MODERATELY CLOSE TO WIDE FRACTURE SPACING, GNEISS
				8:45/1.0	96%	96%		92%	87%		GSI = 79 TO 90
				12:05/1.0							
				12:57/1.0							
				5:58/0.1							
				14:11/1.0							
95	96.3	29.4	4.8	16:43/0.7	(3.9)	(3.3)					
				5:01/1.0	81%	69%					
				10:29/1.0							
				8:22/1.0							
				9:18/1.0							
				10:32/0.8							
90	91.5	34.2	3.6	6:15/1.0	(3.6)	(3.6)					
				10:02/1.0	100%	100%					
				11:45/1.0							
	87.9	37.8		14:37/0.6							Boring Terminated at Elevation 87.9 ft IN CRYSTALLINE ROCK (GNEISS)

NCDOT BORE DOUBLE R3825B_GEO_BRDG_BORINGS.GPJ NC_DOT.GDT 6/5/17

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34552.1.FR3		TIP R-3825B		COUNTY JOHNSTON		GEOLOGIST Lindsay Pugh										
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER							GROUND WTR (ft)									
BORING NO. B2-C		STATION 64+84		OFFSET 2 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 126.6 ft		TOTAL DEPTH 34.0 ft		NORTHING 691,004		EASTING 2,176,637										
DRILL RIG/HAMMER EFF./DATE MID0314 D-25 86% 08/04/2016			DRILL METHOD NQ2 Casing W/SPT&Core			HAMMER TYPE Automatic										
DRILLER B. Fowler		START DATE 04/18/17		COMP. DATE 04/19/17		SURFACE WATER DEPTH 2.5ft										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
130																
	126.6	0.0	3	8	38											
125																
	121.5	5.1	60/0.1													
120																
115																
110																
105																
100																
95																

WBS 34552.1.FR3		TIP R-3825B		COUNTY JOHNSTON		GEOLOGIST Lindsay Pugh					
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER							GROUND WTR (ft)				
BORING NO. B2-C		STATION 64+84		OFFSET 2 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 126.6 ft		TOTAL DEPTH 34.0 ft		NORTHING 691,004		EASTING 2,176,637					
DRILL RIG/HAMMER EFF./DATE MID0314 D-25 86% 08/04/2016			DRILL METHOD NQ2 Casing W/SPT&Core			HAMMER TYPE Automatic					
DRILLER B. Fowler		START DATE 04/18/17		COMP. DATE 04/19/17		SURFACE WATER DEPTH 2.5ft					
CORE SIZE NQ2				TOTAL RUN 28.7 ft							
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
121.3											
	121.3	5.3	5.0	4:44/1.0 4:05/1.0 4:35/1.0 4:02/1.0 5:34/1.0 3:54/1.0	(4.2) 84%	(4.0) 80%	(24.2) 91%	(16.5) 62%		121.3	5.3
	116.3	10.3									
115			5.0	8:03/1.0 7:21/1.0 5:34/1.0 6:56/1.0 6:12/1.0	(5.0) 100%	(4.4) 88%					
	111.3	15.3									
110			3.5	7:15/1.0 7:17/1.0 7:52/1.0 6:34/0.5	(3.5) 100%	(1.1) 31%					
	107.8	18.8									
105			3.8	5:31/1.0 6:20/1.0 6:23/1.0 6:03/0.8	(3.8) 100%	(3.3) 87%					
	104.0	22.6									
			4.9	2:41/1.0 3:39/1.0 4:04/1.0 4:58/1.0 3:38/0.9	(3.6) 73%	(1.9) 39%					
100			4.5	2:39/1.0 3:48/1.0 4:13/1.0 3:24/1.0 4:47/0.5	(4.1) 91%	(2.8) 62%					
	99.1	27.5									
	94.6	32.0					(1.0) 50%	(0.0) 0%		94.6	32.0
	92.6	34.0	2.0	3:12/1.0 5:25/1.0	(1.0) 50%	(0.0) 0%				92.6	34.0

NCDOT BORE DOUBLE R3825B_GEO_BRDG_BORINGS.GPJ NC_DOT.GDT 6/5/17

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34552.1.FR3	TIP R-3825B	COUNTY JOHNSTON	GEOLOGIST Lindsay Pugh
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER			GROUND WTR (ft)
BORING NO. EB2-A	STATION 66+13	OFFSET 33 ft LT	ALIGNMENT -L-
COLLAR ELEV. 158.7 ft	TOTAL DEPTH 31.6 ft	NORTHING 691,049	EASTING 2,176,762
DRILL RIG/HAMMER EFF./DATE MID5464 CME-45C 84% 08/09/2016		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER M. COOGAN	START DATE 04/22/17	COMP. DATE 04/22/17	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				
160													GROUND SURFACE	0.0
	157.7	1.0	3	3	3							M	PAVEMENT	1.0
	154.5	4.2	2	2	2							M	ROADWAY EMBANKMENT GRAY AND ORANGE SANDY CLAY	
	150.6	8.1	1	1	2							M		
	145.6	13.1	1	2	1							M		
	140.6	18.1	1	2	3							W	RESIDUAL GRAY AND ORANGE SANDY CLAY	16.6
	135.6	23.1	5	9	22							W		
	130.6	28.1	36	64/0.3								M	GRAY MICACEOUS SILT	22.0
	127.2	31.5	60/0.1									M	WEATHERED ROCK SCHIST	26.4
													CRYSTALLINE ROCK SCHIST	30.2
													Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 127.1 ft IN CRYSTALLINE ROCK (SCHIST)	31.6

WBS 34552.1.FR3	TIP R-3825B	COUNTY JOHNSTON	GEOLOGIST Contract Geologist
SITE DESCRIPTION BRIDGE NO. 75 ON -L- (NC 42) OVER THE NEUSE RIVER			GROUND WTR (ft)
BORING NO. EB2-B	STATION 66+24	OFFSET 50 ft RT	ALIGNMENT -L-
COLLAR ELEV. 143.0 ft	TOTAL DEPTH 18.6 ft	NORTHING 690,967	EASTING 2,176,781
DRILL RIG/HAMMER EFF./DATE BRI2974 CME-45C 79% 06/03/2015		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 03/08/16	COMP. DATE 03/08/16	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				
145													GROUND SURFACE	0.0
	142.0	1.0	1	1	2							M	RESIDUAL GRAY ORANGE SANDY CLAY	
	139.5	3.5	3	5	5							M		
	137.0	6.0	7	12	14							M	GRAY SANDY SILT	6.3
	134.5	8.5	4	7	25							M		
	129.5	13.5	100/0.3									M	WEATHERED ROCK (SCHIST)	12.5
	124.5	18.5	60/0.1									M	CRYSTALLINE ROCK (SCHIST)	17.0
													Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 124.4 ft IN CRYSTALLINE ROCK (SCHIST)	18.6

NCDOT BORE DOUBLE R3825B_GEO_BRDG_BORINGS.GPJ NC_DOT.GDT 6/5/17

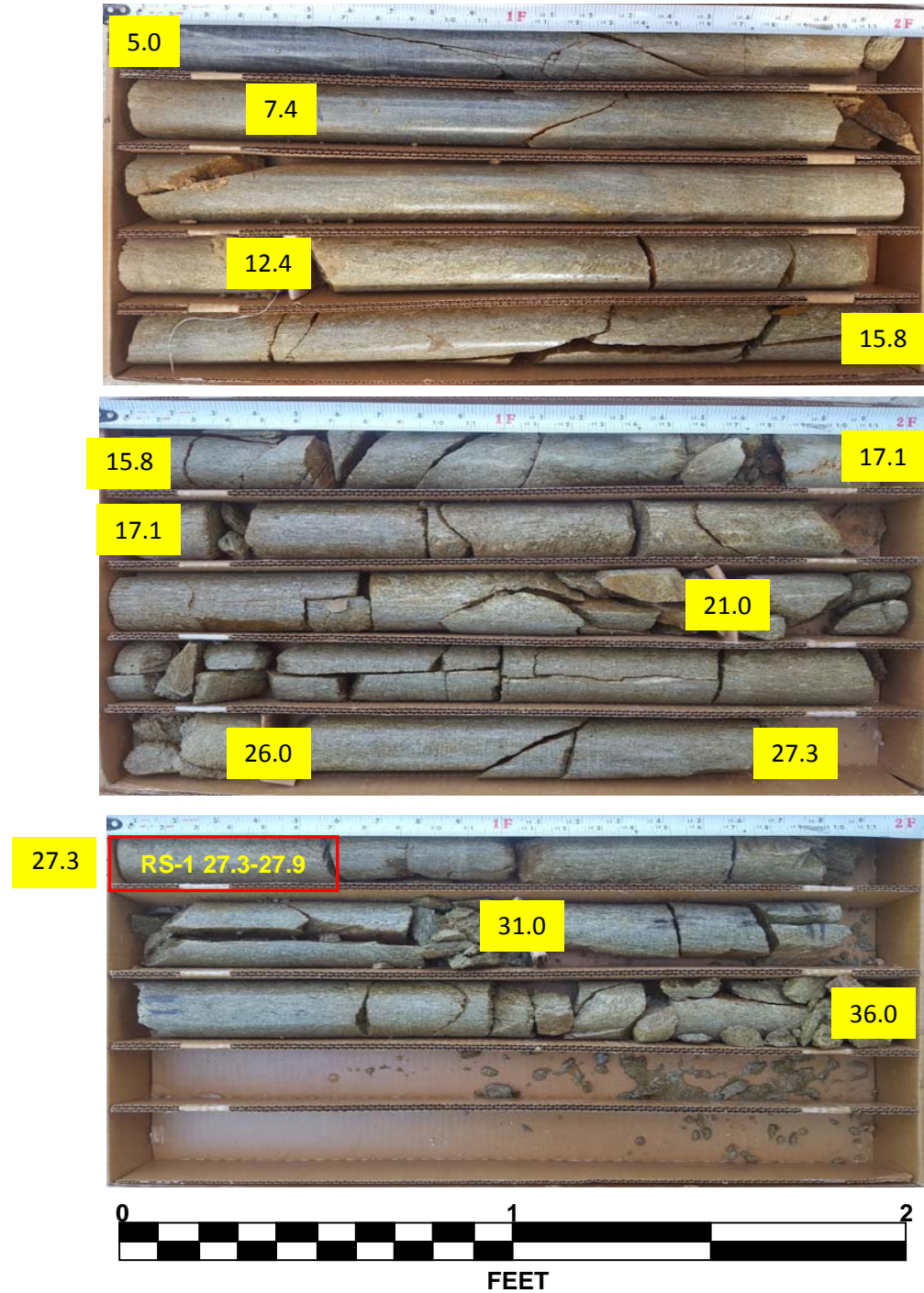
ROCK TEST RESULTS

<i>SAMPLE NO.</i>	<i>OFFSET</i>	<i>STATION</i>	<i>DEPTH INTERVAL</i>	<i>ROCK TYPE</i>	<i>UNIT WT. (lb/ft³)</i>	<i>UNIAXIAL COMPRESSIVE STRENGTH, (psi)</i>
<i>RS-1</i>	<i>42' LT</i>	<i>63+65</i>	<i>27.3' - 27.9'</i>	<i>PHYLLITE</i>	<i>165.1</i>	<i>1,570</i>
<i>RS-2</i>	<i>50' RT</i>	<i>63+64</i>	<i>30.5' - 32.5'</i>	<i>GNEISS</i>	<i>179.3</i>	<i>4,630</i>
<i>RS-3</i>	<i>45' LT</i>	<i>64+87</i>	<i>25.3' - 27.2'</i>	<i>GNEISS</i>	<i>174.2</i>	<i>7,700</i>
<i>RS-4</i>	<i>28' RT</i>	<i>64+75</i>	<i>35.4' - 36.1'</i>	<i>GNEISS</i>	<i>171.4</i>	<i>14,580</i>

CORE PHOTOGRAPHS

B1-A

BOXES 1,2 AND 3: 5.0 TO 36.0 FEET



CORE PHOTOGRAPHS

B1-C

BOXES 1,2,3 and 4: 4.4 TO 35.7 FEET



CORE PHOTOGRAPHS

B1-B

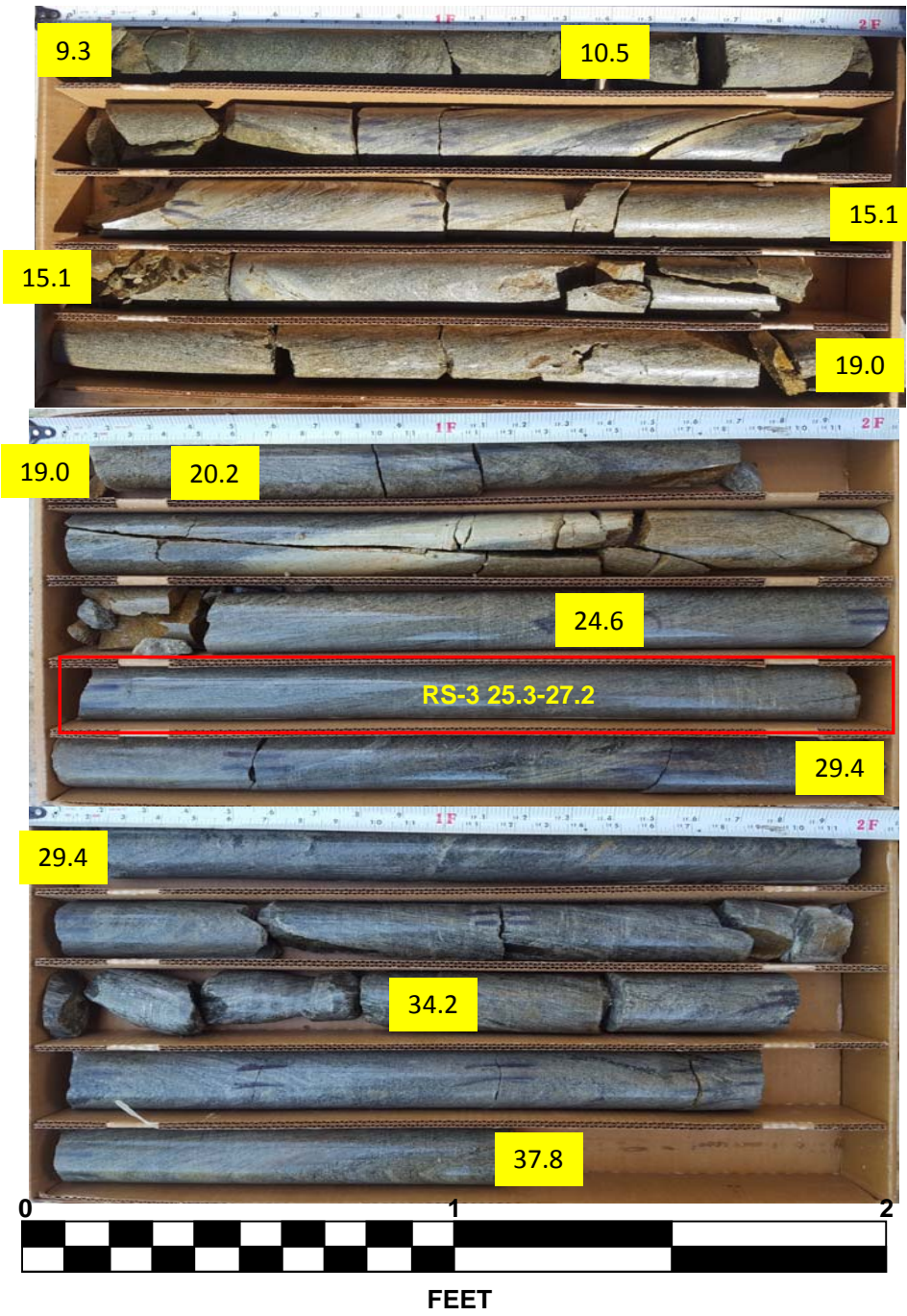
BOXES 1,2,3 AND 4: 8.1 TO 37.9 FEET



CORE PHOTOGRAPHS

B2-A

BOXES 1,2, and 3: 9.3 TO 37.8 FEET



CORE PHOTOGRAPHS

B2-C

BOXES 1,2, and 3: 5.3 TO 34.0 FEET



CORE PHOTOGRAPHS

B2-B

BOXES 1,2 , and 3: 7.7 TO 36.1 FEET



SITE PHOTOGRAPH
Bridge No. 75 on NC 42 over the Neuse River



Looking west toward End Bent 1