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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>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
2A	SUPPLEMENTAL LEGEND (GSI)
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4	PROFILE(S)
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17	ROCK TEST RESULTS
18-21	CORE PHOTOGRAPH(S)
22	SITE PHOTOGRAPH(S)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3825B	1	22

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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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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

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 SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL
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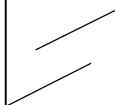
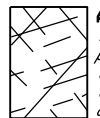
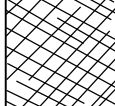

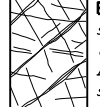



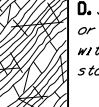

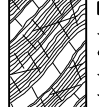
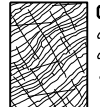

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

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)

GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)		SURFACE CONDITIONS					GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)		SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)					
From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis.		VERY GOOD	GOOD	FAIR	POOR	VERY POOR	From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.		VERY GOOD	GOOD	FAIR	POOR	VERY POOR	
STRUCTURE		DECREASING SURFACE QUALITY →					COMPOSITION AND STRUCTURE							
	INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	90			N/A	N/A		70						
	BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets	80					<i>A. Thick bedded, very blocky sandstone</i> The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.	60						
	VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets		70						50					
	BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity		60							40				
	DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces			50							30			
	LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes				40							20		
					30		<i>C, D, E, and G - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to F and H.</i>						10	
					20									
					10									
		N/A	N/A				<i>H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.</i>							

→ Means deformation after tectonic disturbance



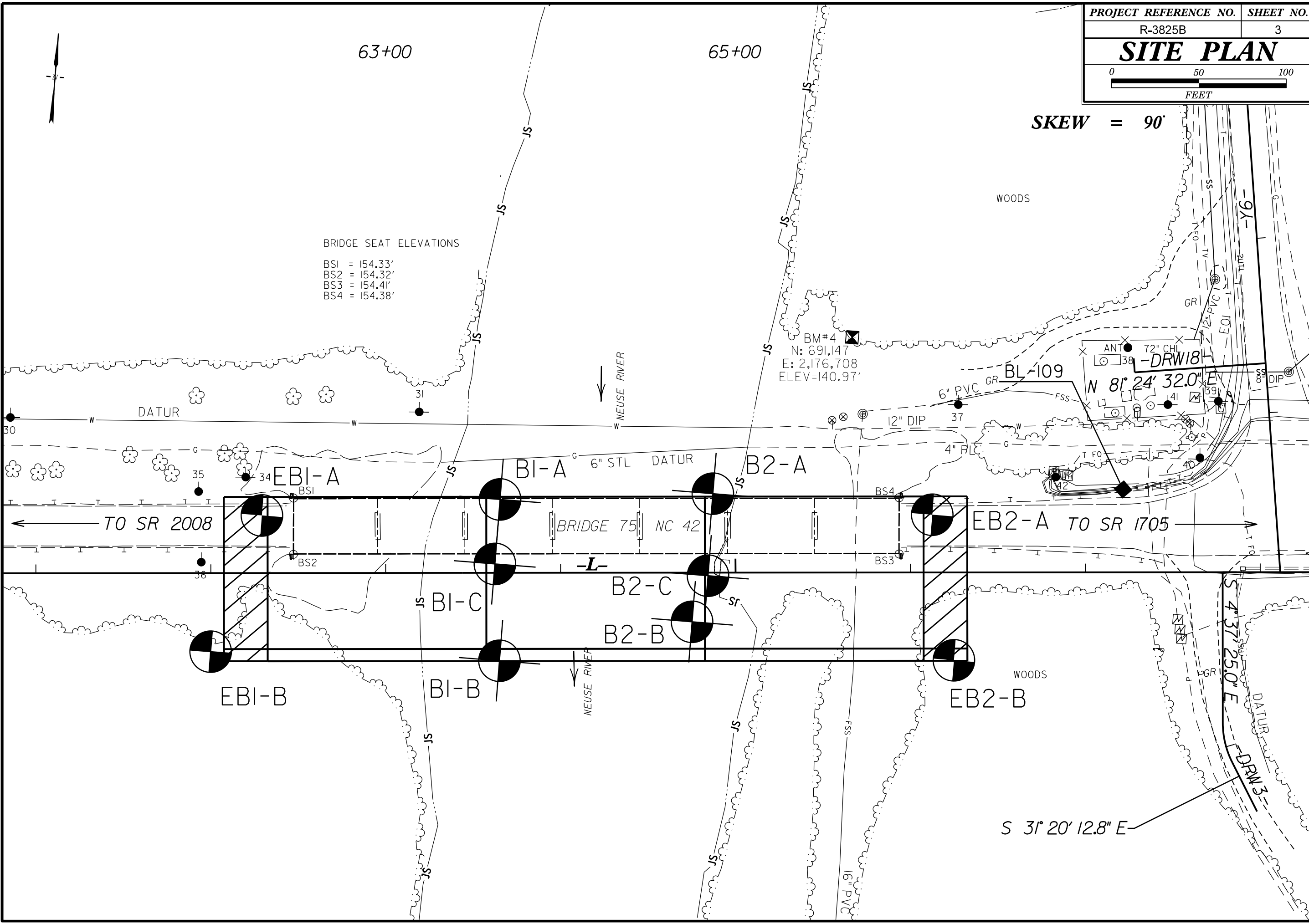
63+00

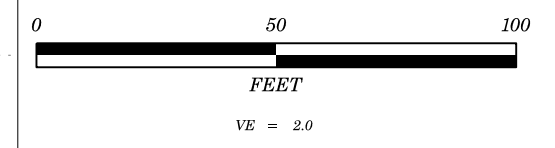
65+00

SKEW = 90'

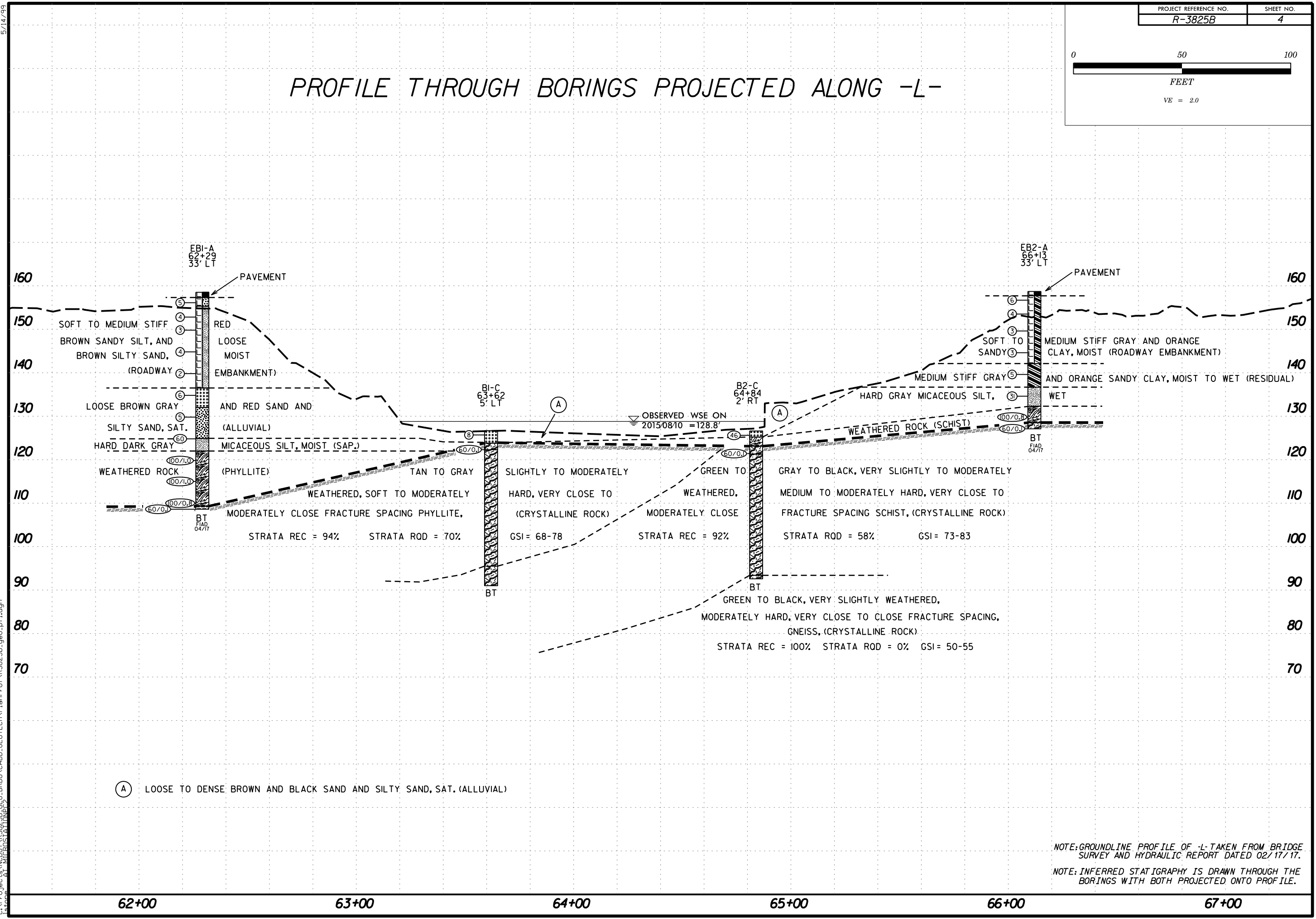
BRIDGE SEAT ELEVATIONS

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





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.

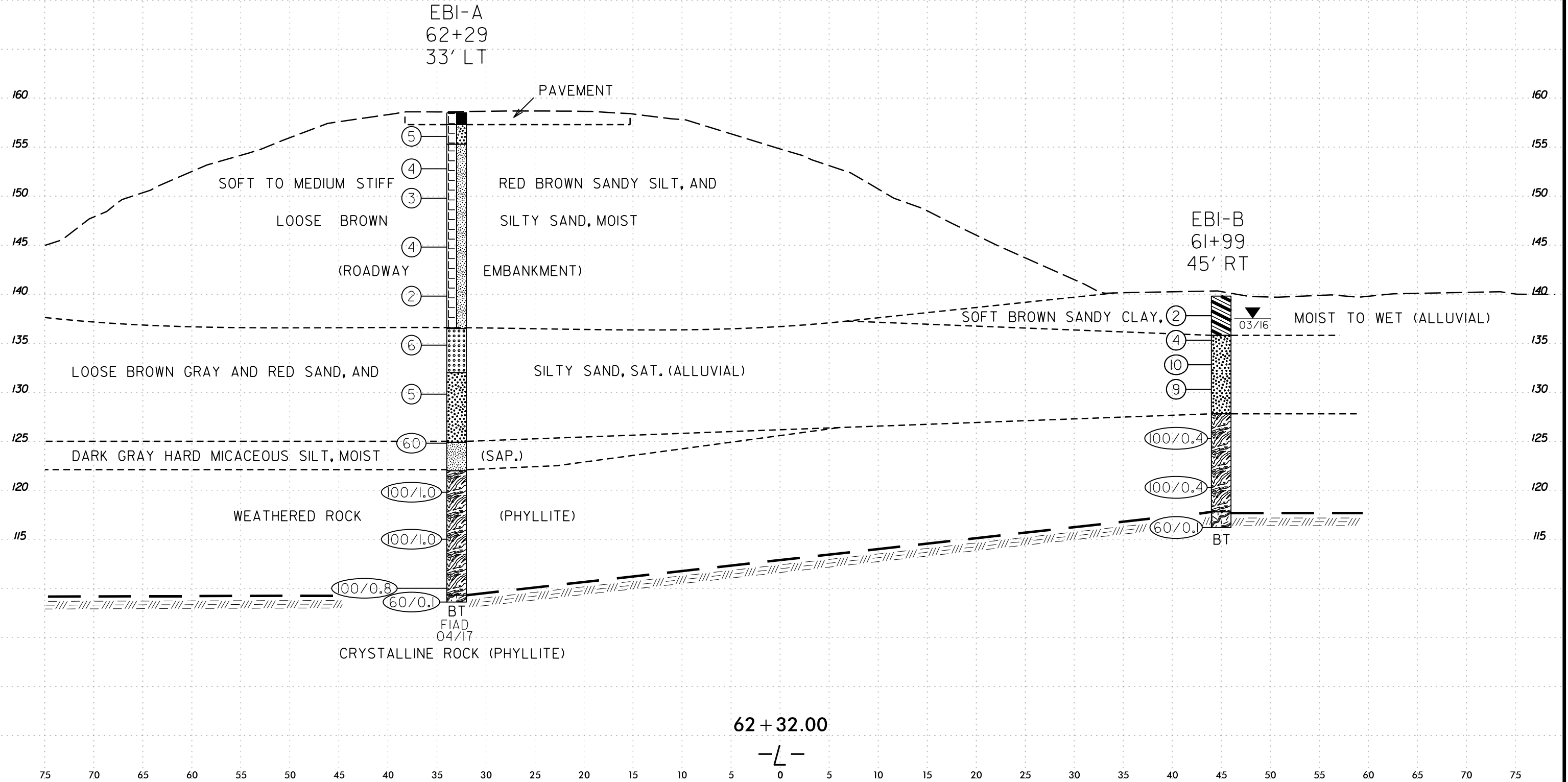
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6/23/16

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 END BENT 1



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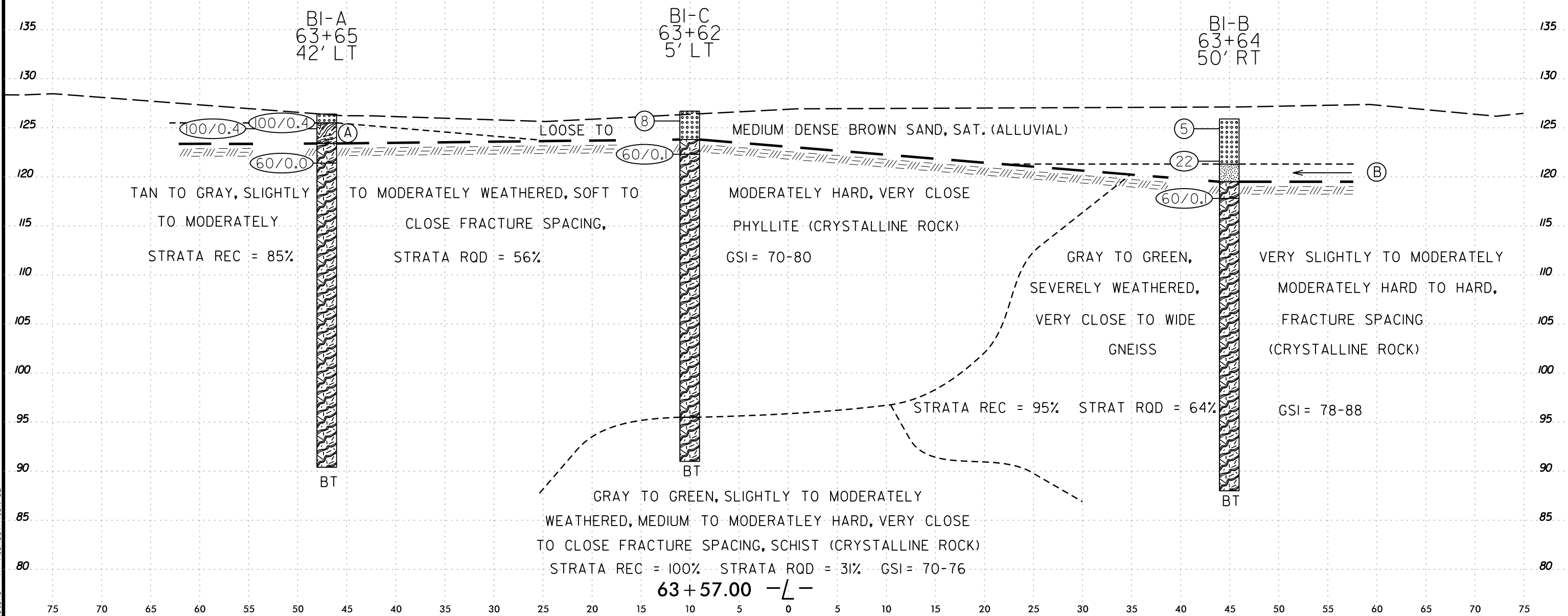
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STONE AT MICROSTATION PC2

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VE = 1:1
SKEW = 90°

CROSS SECTION THROUGH BENT 1

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

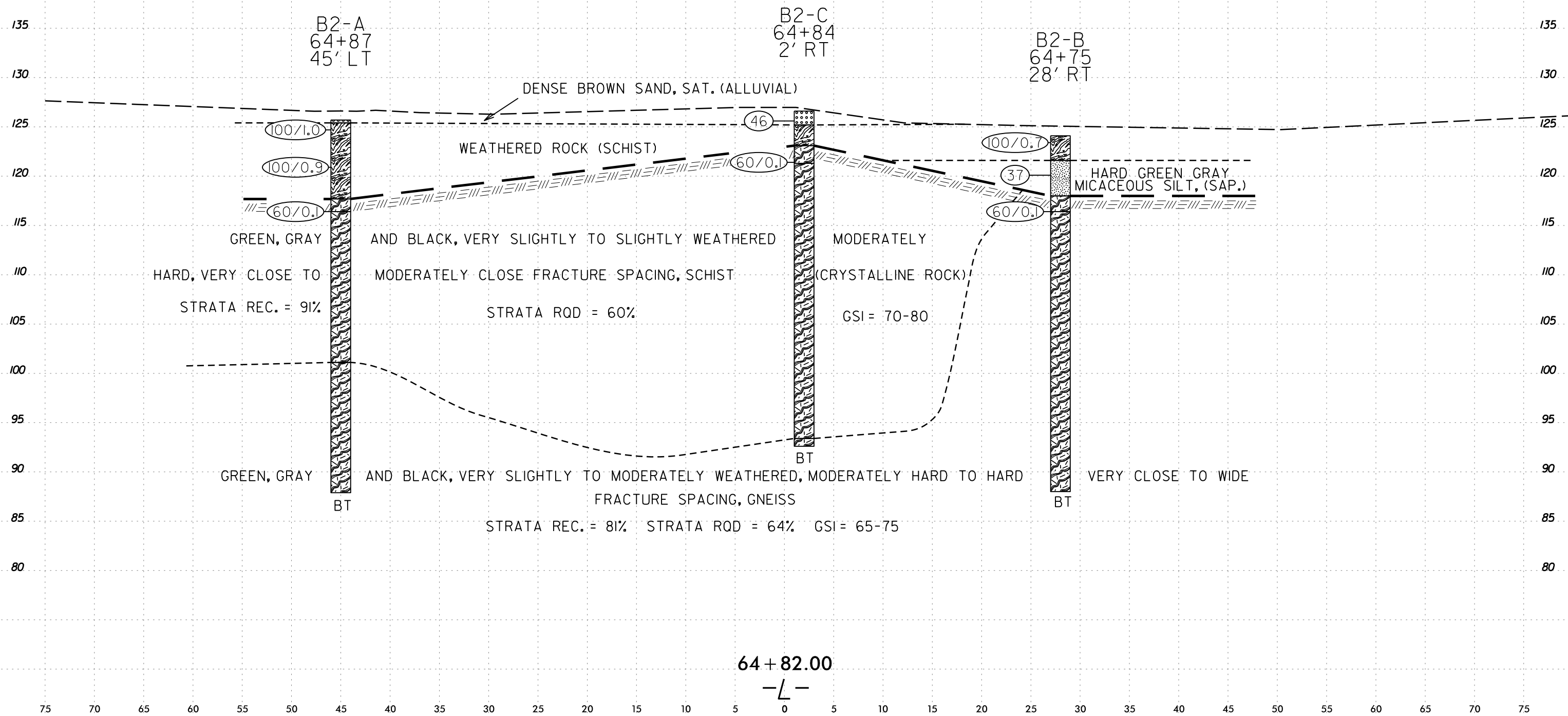


6/23/16

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VE = 1:1
SKEW = 90°

CROSS SECTION THROUGH BENT 2



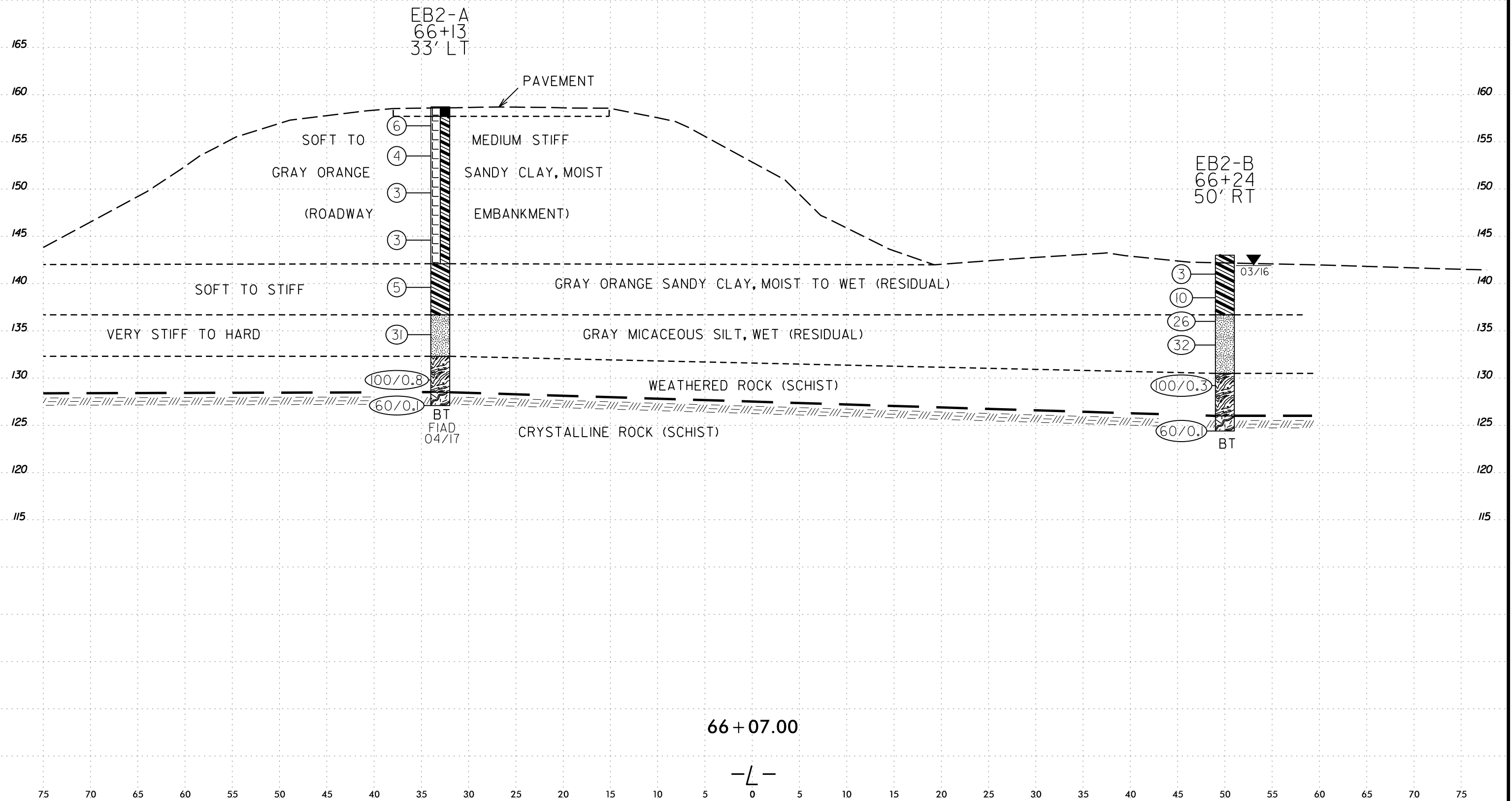
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6/23/16

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

CROSS SECTION THROUGH END BENT 2

VE = 1:1
SKEW = 90°



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 istone AT MICROSTATIONPC2

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.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
160															
	157.3	1.2	7	3	2										
155	153.8	4.7	1	2	2										
	150.8	7.7	2	2	1										
150															
	145.8	12.7	2	2	2										
145															
	140.8	17.7	2	1	1										
140															
	135.8	22.7	3	3	3										
135															
	130.8	27.7	2	2	3										
130															
	125.8	32.7	5	15	45										
125															
	120.8	37.7	29	71/0.5											
120															
	116.0	42.5	21	25	75										
115															
	110.8	47.7	50	50/0.3											
110															
	108.7	49.8	60/0.1												

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.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
140															
	138.8	1.0	1	1	1										
135															
	136.3	3.5	2	2	2										
	133.8	6.0	3	4	6										
130															
	131.3	8.5	3	4	5										
	126.3	13.5	100/0.4												
125															
	121.3	18.5	100/0.4												
120															
	116.3	23.5	60/0.1												

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	WOH	1	7										
125															
	122.4	4.3													
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	
120											
	117.3	9.4	1.8	2:36/1.0 4:50/0.8	(1.6) 89%	(1.1) 61%					
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%			
	91.0	35.7									

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											
120	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									
95			2.0	3:12/1.0 5:25/1.0	(1.0) 50%	(0.0) 0%	(1.0) 50%	(0.0) 0%		94.6	32.0
	92.6	34.0								92.6	34.0

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. B2-B		STATION 64+75		OFFSET 28 ft RT		ALIGNMENT -L-							
COLLAR ELEV. 124.1 ft		TOTAL DEPTH 36.1 ft		NORTHING 690,977		EASTING 2,176,630							
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 04/19/17		COMP. DATE 04/20/17		SURFACE WATER DEPTH 5.4ft							
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
130													WATER SURFACE (04/19/17)
125	124.1	0.0											124.1 RIVER BED 0.0
120	121.1	3.0	49	51/0.2					37		W	121.6	WEATHERED ROCK SCHIST 2.9
115	116.5	7.6	38	25	12							118.0	SAPROLITE GREEN GRAY MICACEOUS SILT 6.1
110												116.4	CRYSTALLINE ROCK GREEN TO GRAY TO BLACK VERY SLIGHTLY TO MODERATELY WEATHERED, MODERATELY HARD, VERY CLOSE TO CLOSE FRACTURE SPACING, GNEISS WITH A 1.4' SAND FILLED FRACTURE AT 10.9' AND A QUARTZ VEIN AT 31.9' REC. = 75% RQD = 55% GSI = 65-75 7.7
90											RS-4	88.0	Boring Terminated at Elevation 88.0 ft IN CRYSTALLINE ROCK (GNEISS) 36.1

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-B		STATION 64+75		OFFSET 28 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 124.1 ft		TOTAL DEPTH 36.1 ft		NORTHING 690,977		EASTING 2,176,630					
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 04/19/17		COMP. DATE 04/20/17		SURFACE WATER DEPTH 5.4ft					
CORE SIZE NQ2				TOTAL RUN 28.4 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) %		
116.4											Begin Coring @ 7.7 ft
115	116.4	7.7	4.6	11:05/1.0 8:31/1.0 17:57/1.0 19:31/0.2 2:55/0.8 6:42/0.6	(2.5) 54%	(1.2) 26%		(21.3) 75%	(15.5) 55%		116.4 GREEN TO GRAY TO BLACK VERY SLIGHTLY TO MODERATELY WEATHERED, MODERATELY HARD, VERY CLOSE TO CLOSE FRACTURE SPACING, GNEISS WITH A 1.4' SAND FILLED FRACTURE AT 10.9' AND A QUARTZ VEIN AT 31.9' GSI = 65-75 7.7
110	111.8	12.3	4.9	4:19/1.0 5:25/1.0 5:39/1.0 5:40/1.0 6:09/1.0	(4.5) 92%	(3.3) 67%					
105	106.9	17.2	5.1	6:25/1.0 5:53/1.0 5:39/1.0 7:29/1.0 5:37/1.1	(4.7) 92%	(3.5) 69%					
100	101.8	22.3	4.9	4:37/1.0 5:08/1.0 5:04/1.0 5:23/1.0 6:26/0.9	(4.5) 92%	(3.8) 78%					
95	96.9	27.2	5.0	4:25/1.0 5:35/1.0 5:11/1.0 4:01/1.0 5:22/1.0	(2.7) 54%	(2.3) 46%					
90	91.9	32.2	3.9	4:40/1.0 5:04/1.0 11:05/0.5 2:23/0.5 9:35/0.9	(2.4) 62%	(1.4) 36%					
	88.0	36.1					RS-4				88.0 Boring Terminated at Elevation 88.0 ft IN CRYSTALLINE ROCK (GNEISS) 36.1

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																
	157.7	1.0														
	157.7		3	3	3											
155	154.5	4.2														
	154.5		2	2	2											
150	150.6	8.1														
	150.6		1	1	2											
145	145.6	13.1														
	145.6		1	2	1											
140	140.6	18.1														
	140.6		1	2	3											
135	135.6	23.1														
	135.6		5	9	22											
130	130.6	28.1														
	130.6		36	64/0.3												
	127.2	31.5														
	127.2		60/0.1													

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																
	142.0	1.0														
	142.0		1	1	2											
140	139.5	3.5														
	139.5		3	5	5											
135	137.0	6.0														
	137.0		7	12	14											
130	134.5	8.5														
	134.5		4	7	25											
125	129.5	13.5														
	129.5		100/0.3													
	124.5	18.5														
	124.5		60/0.1													

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

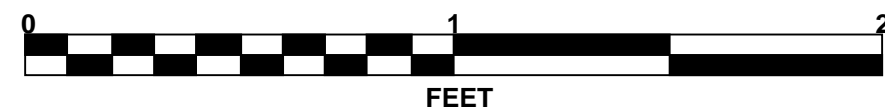
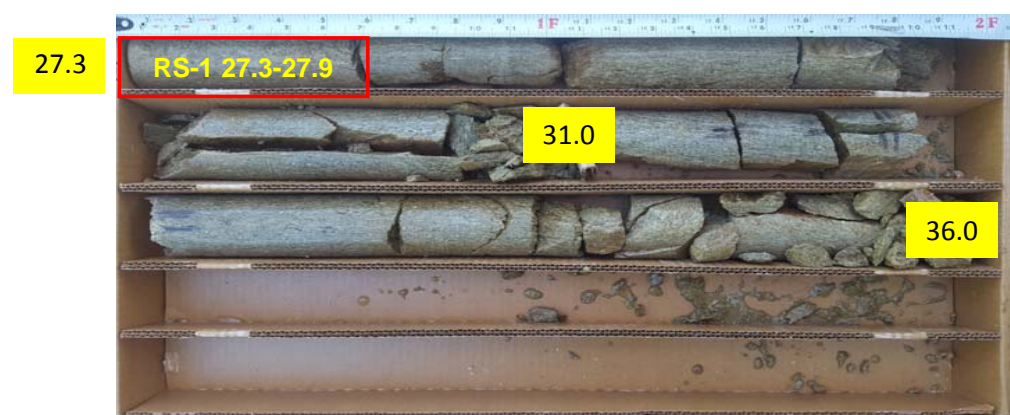
ROCK TEST RESULTS

<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

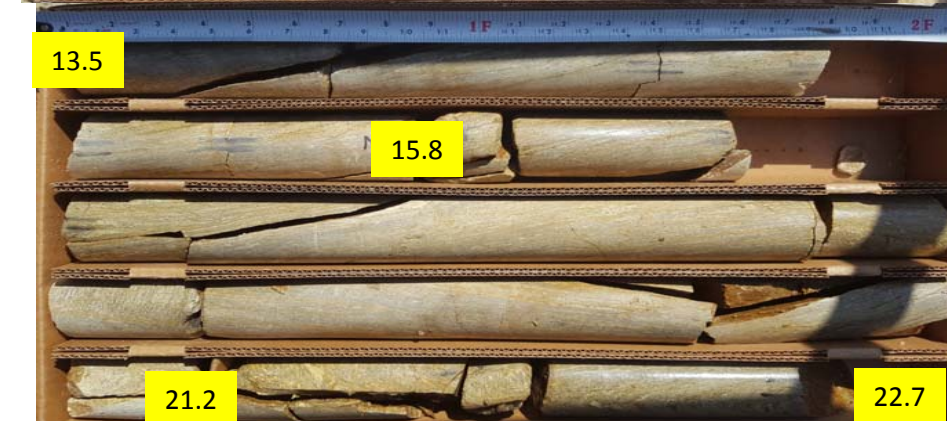
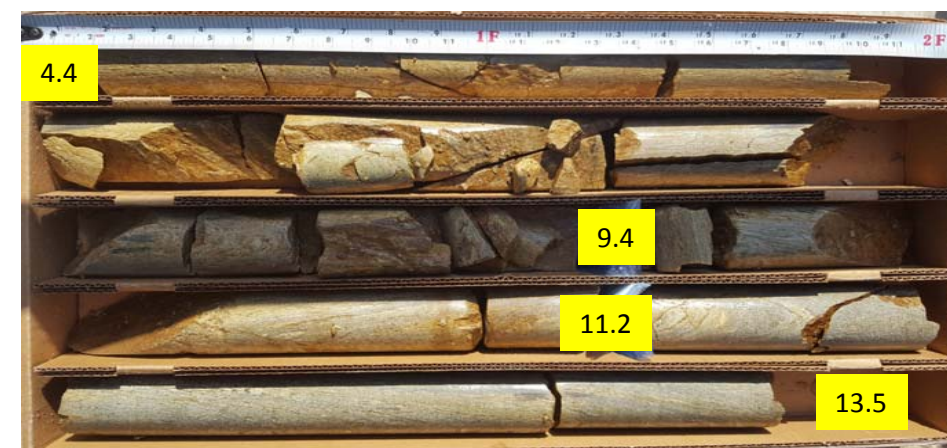
BOXES 1,2 AND 3: 5.0 TO 36.0 FEET



CORE PHOTOGRAPHS

B1-C

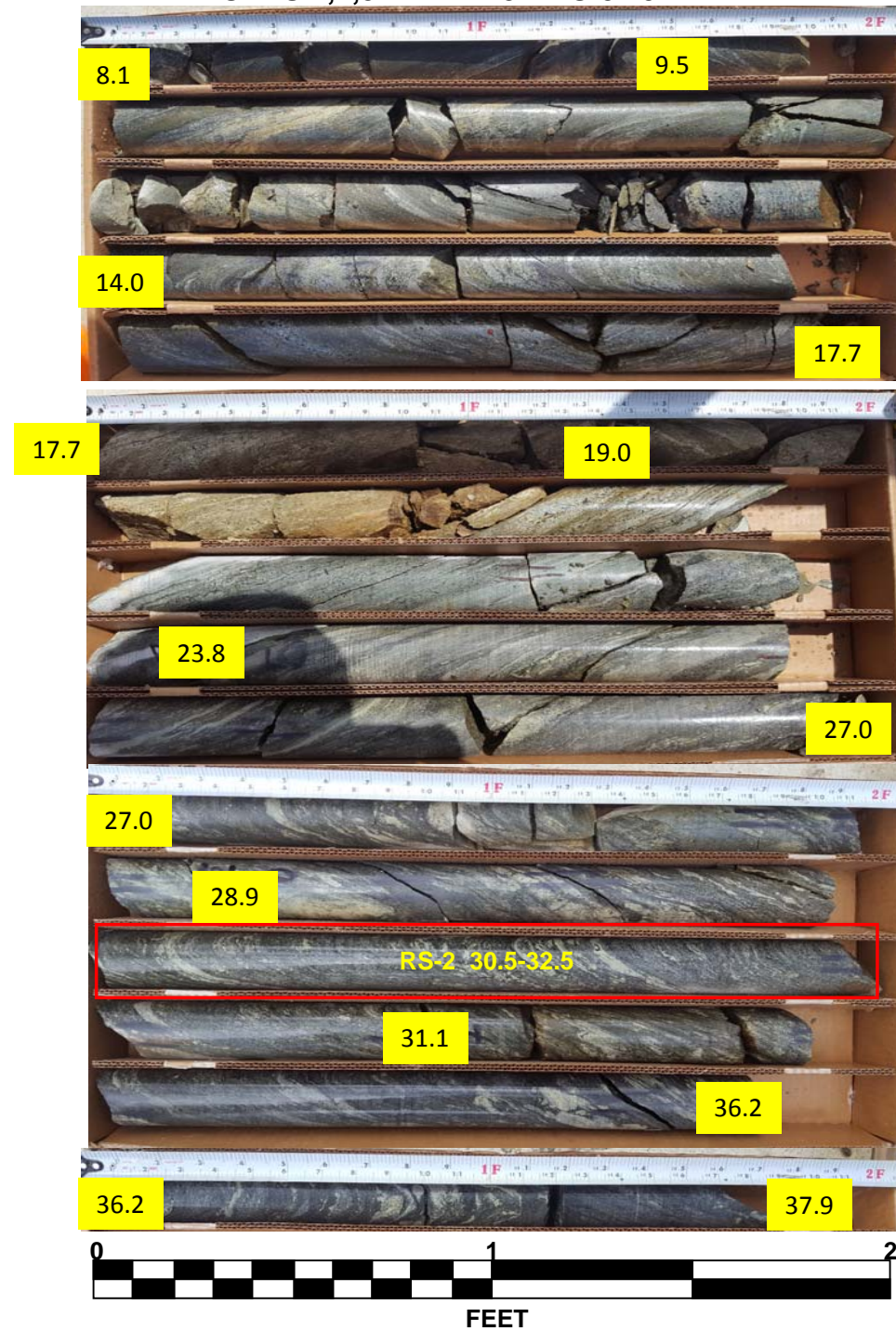
BOXES 1,2 ,3 and 4: 4.4 TO 35.7 FEET



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