

REFERENCE: B-5770

PROJECT: 45726

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY FORSYTH
 PROJECT DESCRIPTION BRIDGE NO. 243 ON
SALISBURY RIDGE ROAD OVER NC 150
(PETERS CREEK PARKWAY)
 SITE DESCRIPTION STA. 16 + 94.29

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12	SITE PHOTOGRAPH(S)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5770	1	13

CAUTION NOTICE

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 - 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

- B. SMITH, PG
- M. SHIPMAN, EI
- A. RULEY, GIT
- M.G. MOSELEY
- J. MOSELEY

INVESTIGATED BY B. SMITH, PG
 DRAWN BY B. SMITH, PG
 CHECKED BY B. WORLEY, PG
 SUBMITTED BY B. SMITH, PG
 DATE JUNE, 2019

Prepared in the Office of:

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Designed by: [Signature]
 BE61448604107E
 DATE 6/10/2019

SIGNATURE _____ DATE _____

**DOCUMENT NOT CONSIDERED FINAL
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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

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. Includes sub-sections like SOIL LEGEND AND AASHTO CLASSIFICATION, CONSISTENCY OR DENSENESS, TEXTURE OR GRAIN SIZE, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, MISCELLANEOUS SYMBOLS, RECOMMENDATION SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, and INDURATION.

**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**

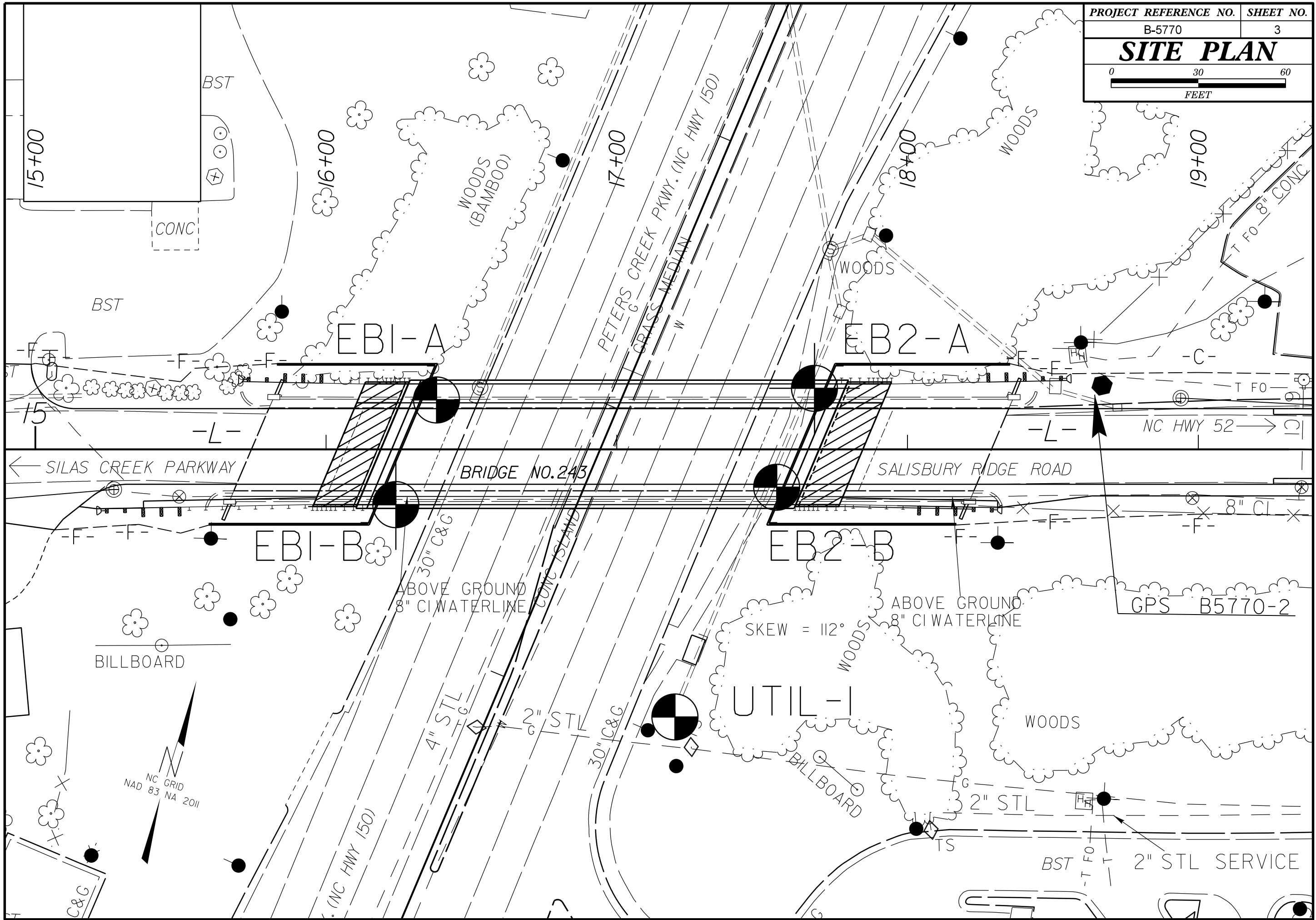
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

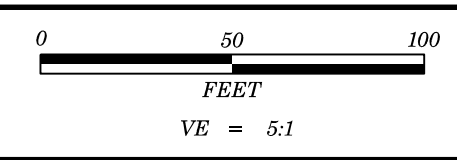
AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

<p>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</p> <p>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.</p> <p>STRUCTURE</p>	<p>SURFACE CONDITIONS</p>	<p>VERY GOOD Very rough, fresh unweathered surfaces</p>	<p>GOOD Rough, slightly weathered, iron stained surfaces</p>	<p>FAIR Smooth, moderately weathered and altered surfaces</p>	<p>POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments</p>	<p>VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings</p>
<p>STRUCTURE</p>	<p>SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)</p>	<p>VERY GOOD - Very Rough, fresh unweathered surfaces</p>	<p>GOOD - Rough, slightly weathered surfaces</p>	<p>FAIR - Smooth, moderately weathered and altered surfaces</p>	<p>POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments</p>	<p>VERY POOR - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings</p>
<p>INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities</p>	90				N/A	N/A
<p>BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets</p>	80		70			
<p>VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets</p>			60			
<p>BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity</p>				50		
<p>DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces</p>				40		
<p>LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes</p>				30		
				20		
				10		
		N/A	N/A			

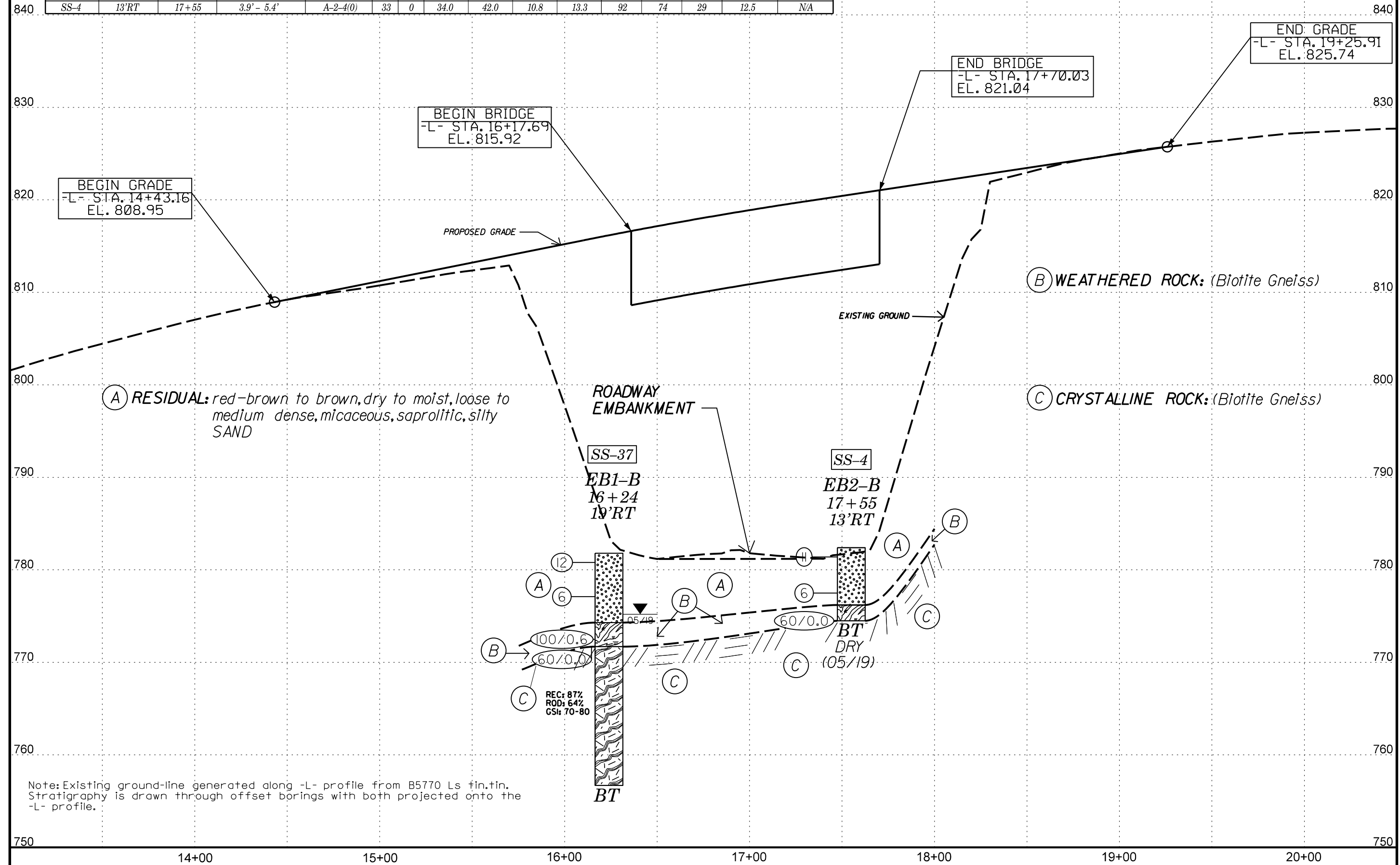
<p>GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)</p> <p>From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities 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.</p> <p>COMPOSITION AND STRUCTURE</p>	<p>VERY GOOD - Very Rough, fresh unweathered surfaces</p>	<p>GOOD - Rough, slightly weathered surfaces</p>	<p>FAIR - Smooth, moderately weathered and altered surfaces</p>	<p>POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments</p>	<p>VERY POOR - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings</p>
<p>A. Thick bedded, very blocky sandstone 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.</p>	70		A		
<p>B. Sandstone with thin inter-layers of siltstone</p>	60		B		
<p>C. Sandstone and siltstone in similar amounts</p>		50	C		
<p>D. Siltstone or silty shale with sandstone layers</p>		40	D		
<p>E. Weak siltstone or clayey shale with sandstone layers</p>			E		
<p>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.</p>			30		
<p>F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure</p>				20	
<p>G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers</p>			G		
<p>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.</p>				10	

➔ Means deformation after tectonic disturbance





SOIL TEST RESULTS															
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-37	19'RT	16+24	3.7' - 5.2'	A-2-4(0)	39	2	44.8	38.5	7.4	9.3	93	68	21	13.4	NA
SS-4	13'RT	17+55	3.9' - 5.4'	A-2-4(0)	33	0	34.0	42.0	10.8	13.3	92	74	29	12.5	NA

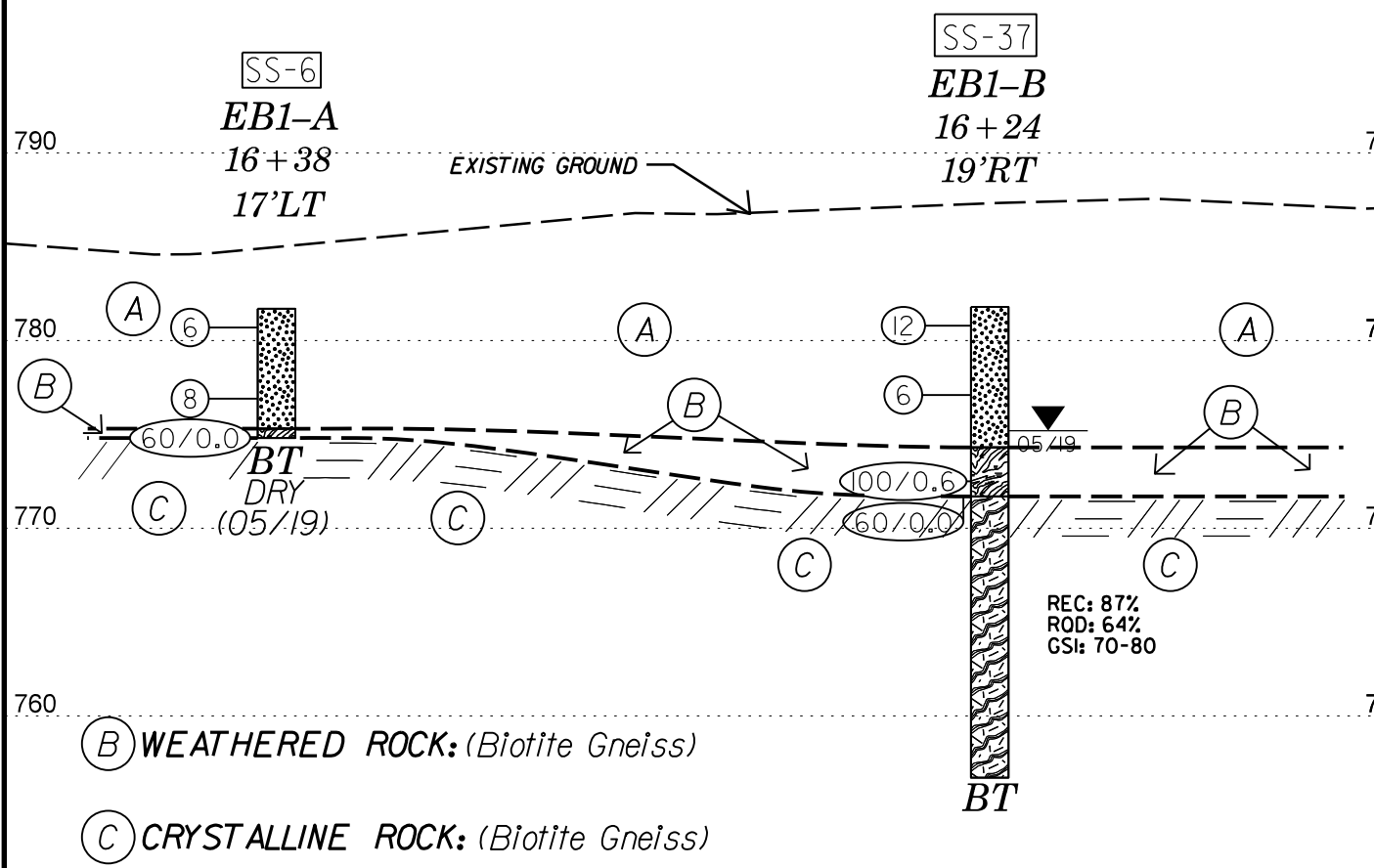


Note: Existing ground-line generated along -L- profile from B5770 Ls fin. tin. Stratigraphy is drawn through offset borings with both projected onto the -L- profile.

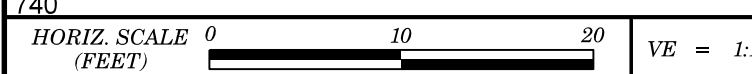
CL
-L-

SOIL TEST RESULTS															
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-6	17'LT	16+38	3.8' - 5.3'	A-2-4(0)	36	0	42.6	33.6	10.6	13.2	84	61	25	15.9	N/A
SS-37	19'RT	16+24	3.7' - 5.2'	A-2-4(0)	39	2	44.8	38.5	7.4	9.3	93	68	21	13.4	N/A

(A) **RESIDUAL:** red-brown to light-brown, dry to moist, loose to medium dense, micaceous, saprolitic, silty SAND (A-2-4) with trace gravel-sized rock fragments



Note: Existing ground-line generated along End Bent 1 from B5770 Ls tin, tin. Stratigraphy is shown drawn through offset borings with both projected onto the bent line.
Skew = 112°

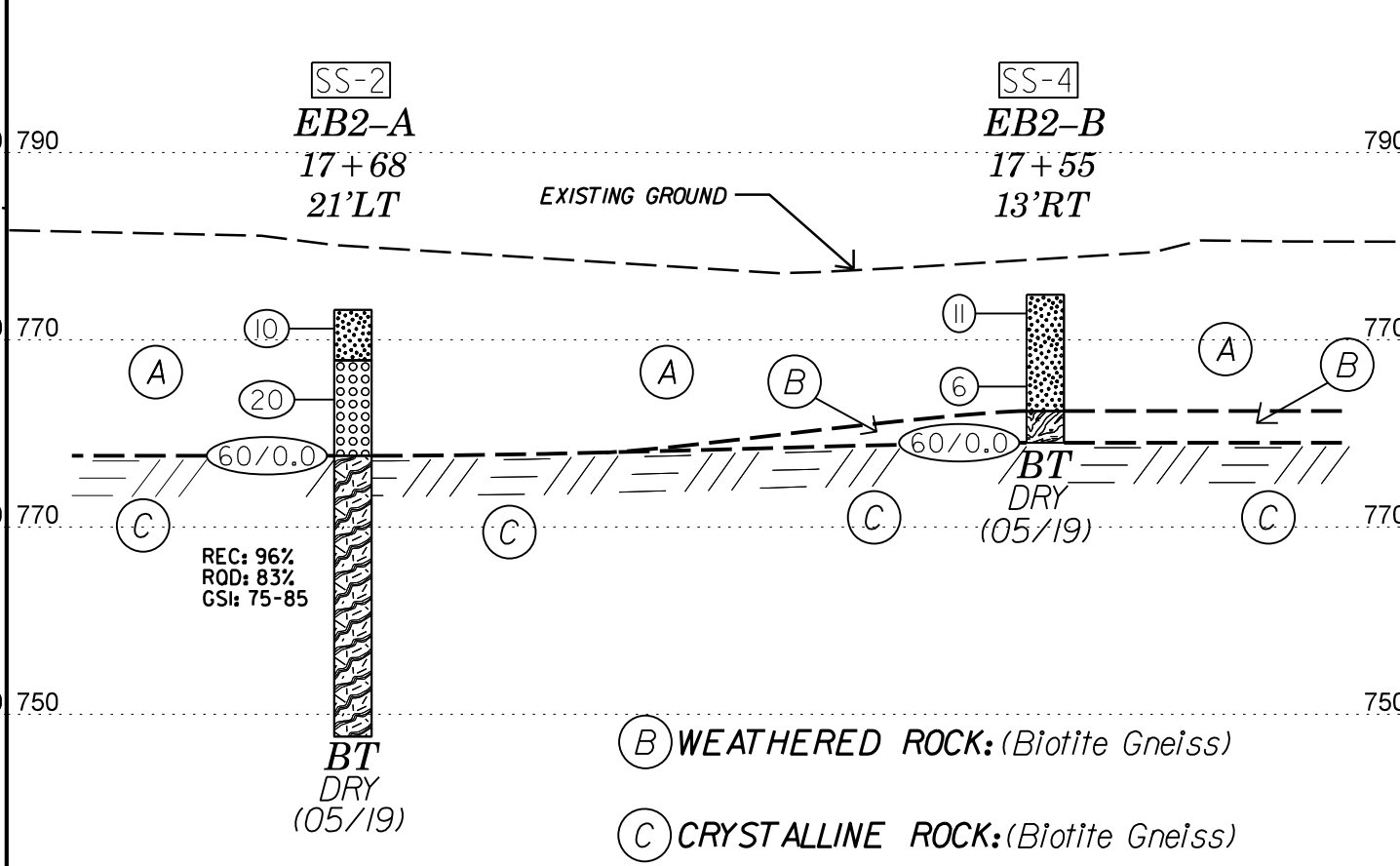


BRIDGE NO. 243 (END BENT 1)

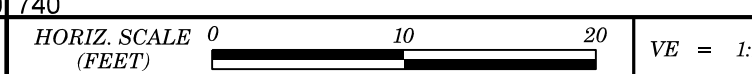
CL
-L-

SOIL TEST RESULTS															
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-2	21'LT	17+68	3.8' - 5.3'	A-1-b(0)	33	0	53.0	30.1	7.9	9.0	56	36	12	13.4	N/A
SS-4	13'RT	17+55	3.9' - 5.4'	A-2-4(0)	33	0	34.0	42.0	10.8	13.3	92	74	29	12.5	N/A

(A) **RESIDUAL:** light brown to brown, dry to moist, loose to medium dense, micaceous, saprolitic, silty SAND (A-2-4) and fine to coarse SAND (A-1-b) with some gravel-sized rock fragments



Note: Existing ground-line generated along End Bent 2 from B5770 Ls tin, tin. Stratigraphy is shown drawn through offset borings with both projected onto the bent line.
Skew = 112°



BRIDGE NO. 243 (END BENT 2)

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.										
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)										
BORING NO. EB1-A		STATION 16+38		OFFSET 17 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 781.7 ft		TOTAL DEPTH 6.9 ft		NORTHING 845,835		EASTING 1,628,127										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Moseley, M.G.		START DATE 05/09/19		COMP. DATE 05/09/19		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)	
785																
	781.7	0.0	3	3	3	6									781.7	GROUND SURFACE
780	777.9	3.8	5	5	3											RESIDUAL red-brown to light-brown, micaceous, saprolitic, silty SAND with trace gravel-sized rock fragments
775	774.8	6.9	60/0.0			60/0.0								775.3	WEATHERED ROCK (Biotite Gneiss)	
														774.8	CRYSTALLINE ROCK (Biotite Gneiss)	
																Boring Terminated with Standard Penetration Test Refusal at Elevation 774.8 ft on Crystalline Rock (Biotite Gneiss)
																- No topsoil observed. - Harder drilling reported from 6.4 - 6.9 feet interpreted as Weathered Rock. - Auger and SPT Refusal at 6.9 feet on Crystalline Rock.

NCDOT BORE SINGLE B5770_GEO_BRD0243_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/7/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.										
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)										
BORING NO. EB1-B		STATION 16+24		OFFSET 19 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 781.8 ft		TOTAL DEPTH 25.1 ft		NORTHING 845,797		EASTING 1,628,125										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Moseley, M.G.		START DATE 05/13/19		COMP. DATE 05/13/19		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)	
785																
	781.8	0.0	8	7	5										781.8	GROUND SURFACE
780	778.1	3.7	3	3	3											RESIDUAL red-brown to brown, micaceous, saprolitic, silty SAND
775	773.1	8.7	39			61/0.1								774.3	WEATHERED ROCK (Biotite Gneiss)	
	771.7	10.1	60/0.0			100/0.6								771.7	CRYSTALLINE ROCK (Biotite Gneiss)	
770																REC: 87% RQD: 64% GSI: 70-80
765																
760																
															756.7	Boring Terminated at Elevation 756.7 ft in Crystalline Rock (Biotite Gneiss)
																- 0.2 feet of topsoil observed. - Harder drilling reported at 7.5 feet interpreted as the top of Weathered Rock. - Auger and SPT Refusal at 10.1 feet on Crystalline Rock. - Begin coring at 10.1 feet.

NCDOT BORE SINGLE B5770_GEO_BRD0243_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/7/19

GEOTECHNICAL BORING REPORT CORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.						
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)						
BORING NO. EB1-B		STATION 16+24		OFFSET 19 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 781.8 ft		TOTAL DEPTH 25.1 ft		NORTHING 845,797		EASTING 1,628,125						
DRILL RIGHAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER Moseley, M.G.		START DATE 05/13/19		COMP. DATE 05/13/19		SURFACE WATER DEPTH N/A						
CORE SIZE NQ2		TOTAL RUN 15.0 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. (ft)	RQD (ft)		REC. (%)	RQD (%)			
771.71												
770	771.7	10.1	3.0	N=60/0.0 0:57/1.0 2:27/1.0 3:09/1.0	(2.3) 77%	(2.3) 77%		(13.0) 87%	(9.6) 64%		771.7 CRYSTALLINE ROCK light to dark gray, black, and white, generally slight to fresh weathering with one moderately severe weathered zone (17.0 - 17.4 feet), hard to very hard, close fracture spacing, BIOTITE GNEISS, possibly interlayered with amphibolite. Evidence of chemical weathering (dissolution) observed in several areas of the core.	10.1
765	768.7	13.1	5.0	2:46/1.0 2:37/1.0 2:33/1.0 2:29/1.0 2:50/1.0	(4.6) 92%	(3.7) 74%					GS: 70-80	
760	763.7	18.1	5.0	2:23/1.0 3:13/1.0 3:12/1.0 3:24/1.0 3:32/1.0	(4.2) 84%	(3.2) 64%						
	758.7	23.1	2.0	2:39/1.0 2:19/1.0	(1.9) 95%	(0.4) 20%						
	756.7	25.1									756.7 Boring Terminated at Elevation 756.7 ft in Crystalline Rock (Biotite Gneiss) - 0.2 feet of topsoil observed. - Harder drilling reported at 7.5 feet interpreted as the top of Weathered Rock. - Auger and SPT Refusal at 10.1 feet on Crystalline Rock. - Begin coring at 10.1 feet.	25.1

NCDOT CORE SINGLE B5770_GEO_BRDG0243_GINT_SUMMIT.GPJ NC_DOT.GDT 6/7/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.										
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)										
BORING NO. EB2-A		STATION 17+68		OFFSET 21 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 781.6 ft		TOTAL DEPTH 22.8 ft		NORTHING 845,877		EASTING 1,628,251										
DRILL RIGHAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Moseley, M.G.		START DATE 05/08/19		COMP. DATE 05/09/19		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
785																
780	781.6	0.0	4	5	5	10							M	781.6 GROUND SURFACE	0.0	
														778.9 RESIDUAL brown, silty SAND	2.7	
775	777.8	3.8	5	9	11								SS-2	13% brown, fine to coarse SAND with some gravel-sized rock fragments		
770	773.8	7.8	60/0.0											773.8 CRYSTALLINE ROCK (Biotite Gneiss) REC: 96% RQD: 83% GSI: 75-85	7.8	
765																
760																
														758.8 Boring Terminated at Elevation 758.8 ft in Crystalline Rock (Biotite Gneiss) - No topsoil observed. - Auger and SPT Refusal at 7.8 feet on Crystalline Rock. - Begin coring at 7.8 feet.	22.8	

NCDOT BORE SINGLE B5770_GEO_BRDG0243_GINT_SUMMIT.GPJ NC_DOT.GDT 6/7/19

GEOTECHNICAL BORING REPORT CORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.					
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)					
BORING NO. EB2-A		STATION 17+68		OFFSET 21 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 781.6 ft		TOTAL DEPTH 22.8 ft		NORTHING 845,877		EASTING 1,628,251					
DRILL RIGHAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic							
DRILLER Moseley, M.G.		START DATE 05/08/19		COMP. DATE 05/09/19		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 15.0 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) %			
773.77	773.8	7.8	5.0	N=60/0.0 5:47/1.0 6:13/1.0 7:24/1.0 6:54/1.0 7:18/1.0	(5.0) 100%	(3.3) 66%	(14.4) 96%	(12.5) 83%		773.8	
770	768.8	12.8	5.0	4:23/1.0 1:40/1.0 2:24/1.0 2:47/1.0 2:38/1.0	(4.4) 88%	(4.4) 88%				773.8	
765	763.8	17.8	5.0	2:07/1.0 2:26/1.0 2:34/1.0 2:56/1.0 2:55/1.0	(5.0) 100%	(4.8) 96%				758.8	
760	758.8	22.8								758.8	
<p style="text-align: center;">Begin Coring @ 7.8 ft</p> <p style="text-align: center;">CRYSTALLINE ROCK</p> <p style="text-align: center;">light to dark gray, black, and white, slight to fresh weathering, hard to very hard, close fracture spacing, BIOTITE GNEISS, possibly interlayered with amphibolite. GSI: 75-85</p> <p style="text-align: center;">Boring Terminated at Elevation 758.8 ft in Crystalline Rock (Biotite Gneiss)</p> <ul style="list-style-type: none"> - No topsoil observed. - Auger and SPT Refusal at 7.8 feet on Crystalline Rock. - Begin coring at 7.8 feet. 											

NCDOT CORE SINGLE B5770_GEO_BRD0243_GINT_SUMMIT.GPJ NC_DOT.GDT 6/7/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.										
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)										
BORING NO. EB2-B		STATION 17+55		OFFSET 13 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 782.4 ft		TOTAL DEPTH 7.9 ft		NORTHING 845,841		EASTING 1,628,248										
DRILL RIGHAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Moseley, M.G.		START DATE 05/09/19		COMP. DATE 05/09/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
785																
	782.4	0.0				8	6	5						M	782.4	0.0
780																
	778.5	3.9				7	3	3					SS-4	13%	776.2	6.2
775																
	774.5	7.9				60/0.0									774.5	7.9
<p style="text-align: center;">WEATHERED ROCK (Biotite Gneiss)</p> <p style="text-align: center;">CRYSTALLINE ROCK (Biotite Gneiss)</p> <p style="text-align: center;">Boring Terminated with Standard Penetration Test Refusal at Elevation 774.5 ft on Crystalline Rock (Biotite Gneiss)</p> <ul style="list-style-type: none"> - No topsoil observed. - Harder drilling reported from 6.2 - 7.9 feet interpreted as Weathered Rock. - Auger and SPT Refusal at 7.9 feet on Crystalline Rock. 																

NCDOT BORE SINGLE B5770_GEO_BRD0243_GINT_SUMMIT.GPJ NC_DOT.GDT 6/7/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1	TIP B-5770	COUNTY FORSYTH	GEOLOGIST Ruley, A.
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)			GROUND WTR (ft)
BORING NO. UTIL-1	STATION 17+20	OFFSET 92 ft RT	ALIGNMENT -L-
COLLAR ELEV. 780.5 ft	TOTAL DEPTH 10.0 ft	NORTHING 845,755	EASTING 1,628,238
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Moseley, M.G.	START DATE 05/10/19	COMP. DATE 05/10/19	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)	
785																
780	780.5	0.0													780.5	GROUND SURFACE
			5	5	6								M			RESIDUAL brown and orange, micaceous, saprolitic, clayey, silty SAND and silty SAND
	776.7	3.8	9	23	22								M			
775	774.5	6.0	11	21	79/0.4										774.0	WEATHERED ROCK (Biotite Gneiss)
	772.0	8.5	14	49	37					100/0.9			M		772.0	RESIDUAL brown and gray, micaceous, saprolitic, silty SAND with trace gravel-sized rock fragments
															770.5	10.0

Boring Terminated at Elevation 770.5 ft in Residual (silty SAND)

- No topsoil observed.
- Harder drilling reported from 6.5 - 8.5 feet interpreted as Weathered Rock.

NCDOT BORE SINGLE B5770_GEO_BRDG0243_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/7/19

CORE PHOTOGRAPHS

EB1-B
10.1 - 20.9 FEET



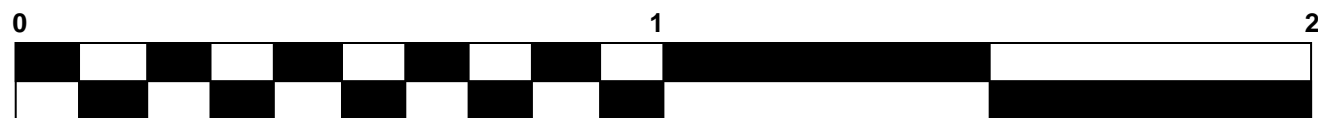
EB2-A
7.8 - 17.1 FEET



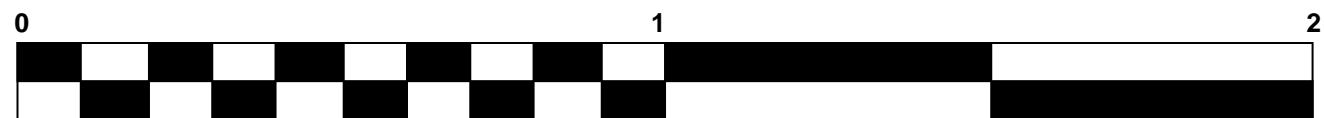
EB1-B
20.9 - 25.1 FEET



EB2-A
17.1 - 22.8 FEET



FEET



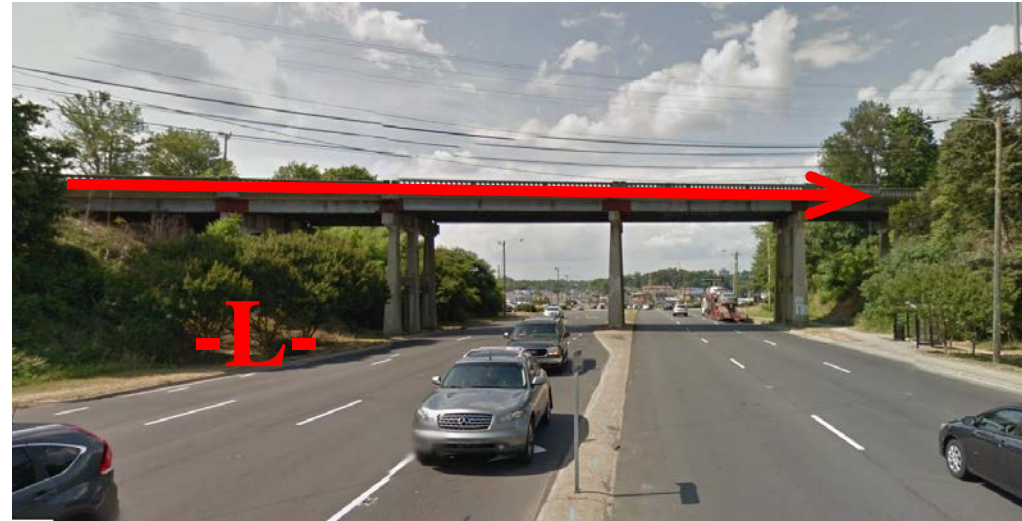
FEET

SITE PHOTOGRAPHS

Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)



Standing at End Bent 2 looking west toward End Bent 1



Standing on NC 150 (Peters Creek Parkway) looking North toward bridge



Standing at End Bent 1 Looking East toward End Bent 2

Note: Images are courtesy Google Earth street view.

REFERENCE: B-5770

PROJECT: 45726

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY FORSYTH
 PROJECT DESCRIPTION BRIDGE NO. 243 ON
SALISBURY RIDGE ROAD OVER NC 150
(PETERS CREEK PARKWAY)
 SITE DESCRIPTION MSE ABUTMENT WALLS

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
2A	SUPPLEMENTAL LEGEND (GSI)
3	SITE PLAN
4-5	PROFILE(S)
6-10	BORE LOG(S) & CORE REPORT(S)
11	SOIL TEST RESULTS
12	CORE PHOTOGRAPHS)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5770	1	13

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 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:
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.

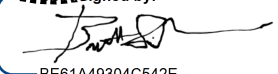
PERSONNEL

- B. SMITH, PG
- M. SHIPMAN, EI
- A. RULEY, GIT
- M.G. MOSELEY
- J. MOSELEY

INVESTIGATED BY B. SMITH, PG
 DRAWN BY B. SMITH, PG
 CHECKED BY B. WORLEY, PG
 SUBMITTED BY B. SMITH, PG
 DATE JUNE, 2019

Prepared in the Office of: 
 NC FIRM LICENSE No: P-0339 and C-487
 504 Meadowlands Drive
 Hillsborough, NC 27278
 (919) 732-3883
 (919) 732-6676 (FAX)



Signature: 
 Date: 6/10/2019

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

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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
<p>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 206, 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></p>										<p>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.</p>										<p>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:</p>										<p>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.</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-2-4</th> <th>A-2-5</th> <th>A-2-6</th> <th>A-2-7</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> </tr> <tr> <th>SYMBOL</th> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> </tr> <tr> <th>% PASSING #10 #40 #200</th> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX</td> <td>51 MN 35 MX 35 MX</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td colspan="3">GRANULAR SOILS</td> <td colspan="2">SILT-CLAY SOILS</td> <td colspan="2">MUCK, PEAT</td> </tr> <tr> <th>MATERIAL PASSING #40 LL PI</th> <td colspan="2">-</td> <td>NP</td> <td>40 MX 10 MX</td> <td>41 MN 10 MX</td> <td>41 MN 11 MN</td> <td>41 MN 11 MN</td> <td>41 MN 11 MN</td> <td>41 MN 11 MN</td> <td>41 MN 11 MN</td> <td>41 MN 11 MN</td> <td colspan="3">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td colspan="2">HIGHLY ORGANIC SOILS</td> <td colspan="2"></td> </tr> <tr> <th>GROUP INDEX</th> <td colspan="2">0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td colspan="3"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td colspan="2">STONE FRAGS. GRAVEL, AND SAND</td> <td>FINE SAND</td> <td colspan="2">SILTY OR CLAYEY GRAVEL AND SAND</td> <td colspan="2">SILTY SOILS</td> <td colspan="2">CLAYEY SOILS</td> <td colspan="3"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> </tr> <tr> <th>GEN. RATING AS SUBGRADE</th> <td colspan="5">EXCELLENT TO GOOD</td> <td colspan="5">FAIR TO POOR</td> <td colspan="2">FAIR TO POOR</td> <td colspan="2">POOR</td> <td colspan="2">UNSATURABLE</td> <td colspan="2"></td> </tr> <tr> <td colspan="10">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30</td> <td colspan="10"></td> <td colspan="10"></td> <td colspan="10"></td> </tr> <tr> <td colspan="10" style="text-align: center;">CONSISTENCY OR DENSENESS</td> <td colspan="10" style="text-align: center;">MINERALOGICAL COMPOSITION</td> <td colspan="10" style="text-align: center;">CRYSTALLINE ROCK (CR)</td> <td colspan="10" style="text-align: center;">NON-CRYSTALLINE ROCK (NCR)</td> </tr> <tr> <td colspan="10"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)</td> <td>VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE</td> <td>< 4 4 TO 10 10 TO 30 30 TO 50 > 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD</td> <td>< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30</td> <td>< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4</td> </tr> </table> </td> <td colspan="10"> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. 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BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</p> </td> <td colspan="10"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td></td> <td></td> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table> </td> </tr> <tr> <td colspan="10" style="text-align: center;">EQUIPMENT USED ON SUBJECT PROJECT</td> <td colspan="10" style="text-align: center;">ABBREVIATIONS</td> <td colspan="10" style="text-align: center;">FRACTURE SPACING</td> <td colspan="10" style="text-align: center;">INDURATION</td> </tr> <tr> <td colspan="10"> <p>DRILL UNITS: <input type="checkbox"/> CME-45C <input type="checkbox"/> CME-55 <input checked="" type="checkbox"/> CME-550X <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> PORTABLE HOIST</p> </td> <td colspan="10"> <p>ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 3.25" HOLLOW STEM AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input checked="" type="checkbox"/> TUNG-CARBIDE INSERTS <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE * STEEL TEETH <input type="checkbox"/> TRICONE * TUNG-CARB. <input checked="" type="checkbox"/> CORE BIT</p> </td> <td colspan="10"> <p>HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input checked="" type="checkbox"/> -N Q2 HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST</p> </td> <td colspan="10"> <p>AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED W - UNIT WEIGHT W_g - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO</p> </td> <td colspan="10"> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p> </td> </tr> <tr> <td colspan="10" style="text-align: center;">COLOR</td> <td colspan="10" style="text-align: center;">FRAC. SPACING</td> <td colspan="10" style="text-align: center;">INDURATION</td> <td colspan="10" style="text-align: center;">NOTES:</td> </tr> <tr> <td colspan="10"> <p>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.</p> </td> <td colspan="10"> <p>FRAC. 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BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</p>										<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td></td> <td></td> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table>										TERM	SPACING	TERM	THICKNESS	VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET	WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET	MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET	CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.16 FEET	VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET			THINLY LAMINATED	< 0.008 FEET	EQUIPMENT USED ON SUBJECT PROJECT										ABBREVIATIONS										FRACTURE SPACING										INDURATION										<p>DRILL UNITS: <input type="checkbox"/> CME-45C <input type="checkbox"/> CME-55 <input checked="" type="checkbox"/> CME-550X <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> PORTABLE HOIST</p>										<p>ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 3.25" HOLLOW STEM AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input checked="" type="checkbox"/> TUNG-CARBIDE INSERTS <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE * STEEL TEETH <input type="checkbox"/> TRICONE * TUNG-CARB. <input checked="" type="checkbox"/> CORE BIT</p>										<p>HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input checked="" type="checkbox"/> -N Q2 HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST</p>										<p>AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED W - UNIT WEIGHT W_g - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO</p>										<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>										COLOR										FRAC. SPACING										INDURATION										NOTES:										<p>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.</p>										<p>FRAC. SPACING: B5770-2 (STA. 18+66.92, OFF. 22'LT)</p>										<p>INDURATION: ELEVATION: 824.33 FEET</p>										<p>FIAD = FILLED IMMEDIATELY AFTER DRILLING</p>									
GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					ORGANIC MATERIALS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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<p>DRILL UNITS: <input type="checkbox"/> CME-45C <input type="checkbox"/> CME-55 <input checked="" type="checkbox"/> CME-550X <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> PORTABLE HOIST</p>										<p>ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 3.25" HOLLOW STEM AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input checked="" type="checkbox"/> TUNG-CARBIDE INSERTS <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE * STEEL TEETH <input type="checkbox"/> TRICONE * TUNG-CARB. <input checked="" type="checkbox"/> CORE BIT</p>										<p>HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input checked="" type="checkbox"/> -N Q2 HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST</p>										<p>AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED W - UNIT WEIGHT W_g - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO</p>										<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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<p>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.</p>										<p>FRAC. SPACING: B5770-2 (STA. 18+66.92, OFF. 22'LT)</p>										<p>INDURATION: ELEVATION: 824.33 FEET</p>										<p>FIAD = FILLED IMMEDIATELY AFTER DRILLING</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

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

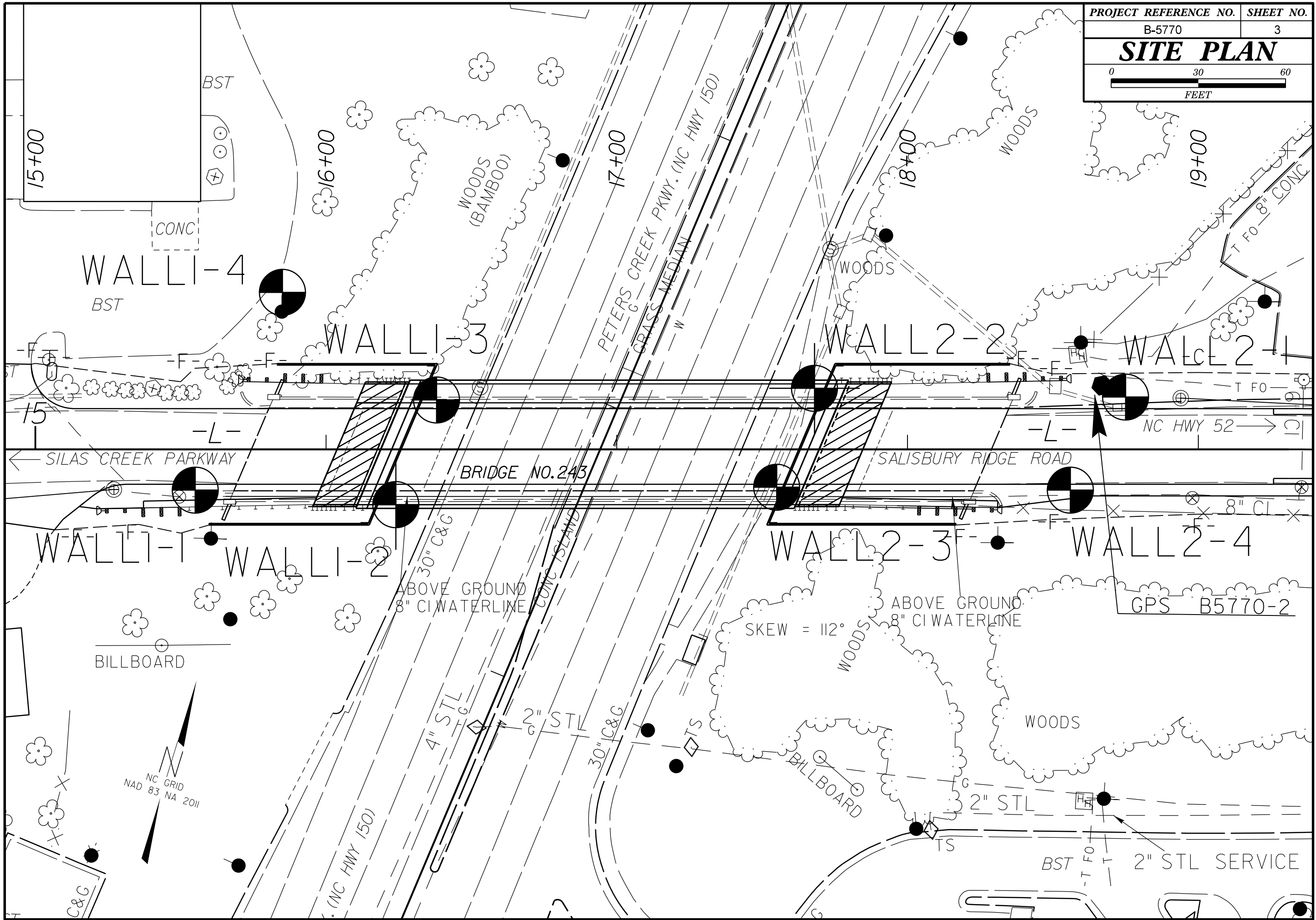
SUBSURFACE INVESTIGATION

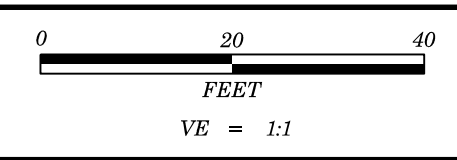
**SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS**

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)

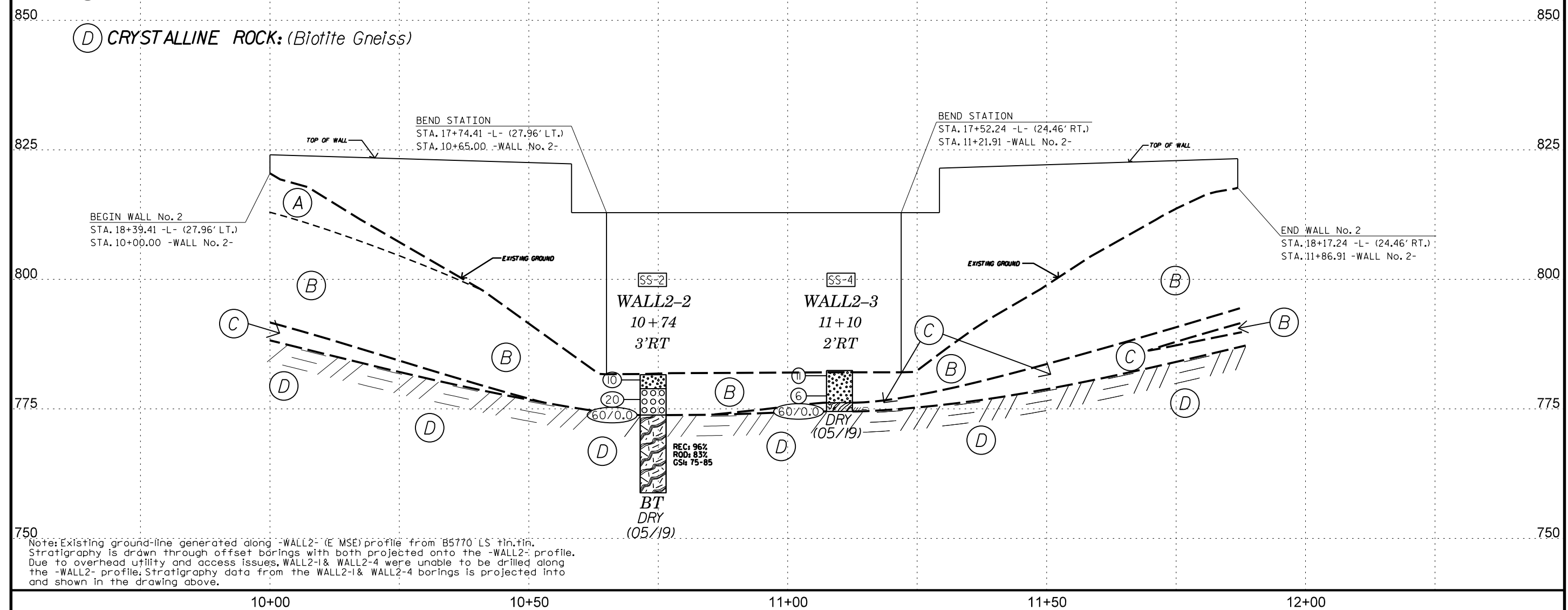
<p>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</p> <p>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. 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.</p> <p>STRUCTURE</p>		<p>SURFACE CONDITIONS</p>									
<p>GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)</p> <p>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.</p> <p>COMPOSITION AND STRUCTURE</p>		<p>SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)</p>									
<p>STRUCTURE</p>	<p>DECREASING SURFACE QUALITY →</p>	<p>VERY GOOD Very rough, fresh unweathered surfaces</p>	<p>GOOD Rough, slightly weathered, iron stained surfaces</p>	<p>FAIR Smooth, moderately weathered and altered surfaces</p>	<p>POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments</p>	<p>VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings</p>	<p>VERY GOOD - Very Rough, fresh unweathered surfaces</p>	<p>GOOD - Rough, slightly weathered surfaces</p>	<p>FAIR - Smooth, moderately weathered and altered surfaces</p>	<p>POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments</p>	<p>VERY POOR - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings</p>
<p> INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities</p> <p> BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets</p> <p> VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets</p> <p> BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity</p> <p> DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces</p> <p> LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	
<p> A. Thick bedded, very blocky sandstone 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.</p> <p> B. Sandstone with thin inter-layers of siltstone</p> <p> C. Sandstone and siltstone in similar amounts</p> <p> D. Siltstone or silty shale with sandstone layers</p> <p> E. Weak siltstone or clayey shale with sandstone layers</p> <p> F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure</p> <p> G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers</p> <p> 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.</p> <p>→ Means deformation after tectonic disturbance</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	<p>→</p>	





SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-8	(-L-) 18' LT	(-L-) 18+75	3.9' - 5.4'	A-5(0)	43	1	31.7	37.0	16.2	15.1	93	75	36	16.3	NA
SS-2	3' RT	10+74	3.8' - 5.3'	A-1-b(0)	33	0	53.0	30.1	7.9	9.0	56	36	12	13.4	NA
SS-4	2' RT	11+10	3.9' - 5.4'	A-2-4(0)	33	0	34.0	42.0	10.8	13.3	92	74	29	12.5	NA
SS-30	(-L-) 14' RT	(-L-) 18+56	9.2' - 10.7'	A-2-5(0)	50	2	37.3	48.2	7.4	7.2	97	78	21	20.7	NA

- (A) RESIDUAL: brown to brown-orange, moist, medium stiff, micaceous, highly sandy, clayey SILT
- (B) RESIDUAL: brown, red, orange, white, and black, dry to moist, loose to very dense, micaceous, saprolitic, clayey, silty SAND, silty SAND, and fine to coarse SAND with trace to some gravel-sized rock fragments
- (C) WEATHERED ROCK: (Biotite Gneiss)
- (D) CRYSTALLINE ROCK: (Biotite Gneiss)



Note: Existing ground-line generated along -WALL2- (E MSE) profile from B5770 LS tin.tin. Stratigraphy is drawn through offset borings with both projected onto the -WALL2- profile. Due to overhead utility and access issues, WALL2-1 & WALL2-4 were unable to be drilled along the -WALL2- profile. Stratigraphy data from the WALL2-1 & WALL2-4 borings is projected into and shown in the drawing above.

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.											
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)											
BORING NO. WALL1-1		STATION 15+55		OFFSET 14 ft RT		ALIGNMENT -L-											
COLLAR ELEV. 812.4 ft		TOTAL DEPTH 43.8 ft		NORTHING 845,781		EASTING 1,628,057											
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic													
DRILLER Moseley, M.G.		START DATE 05/10/19		COMP. DATE 05/10/19		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	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
815																	
	812.4	0.0													812.4	GROUND SURFACE	0.0
810	808.6	3.8	5	3	3									M	RESIDUAL red, orange, brown, and white, micaceous, saprolitic, clayey, silty SAND and silty SAND with trace gravel-sized rock fragments		
805	803.6	8.8	4	4	5									M			
800	798.6	13.8	3	2	3									M			
795	793.6	18.8	3	4	5									SS-22		20%	
790	788.6	23.8	8	7	7									M			
785	783.6	28.8	4	6	7									M			
780	778.6	33.8	6	15	36									M			
775	773.6	38.8	6	23	14									M			
770	768.6	43.8	60/0.0												771.1	WEATHERED ROCK (Biotite Gneiss)	41.3
															768.6	CRYSTALLINE ROCK (Biotite Gneiss) Boring Terminated with Standard Penetration Test Refusal at Elevation 768.6 ft on Crystalline Rock (Biotite Gneiss) - No topsoil observed. - Harder drilling reported at 41.3 feet interpreted as the top of Weathered Rock. - Auger and SPT Refusal at 43.8 feet on Crystalline Rock. - Boring does not fall on the -WALL1- (W_MSE) Profile and therefore it's location must be shown relative to -L-	43.8

NCDOT BORE SINGLE B5770_GEO_RWAL1-2_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/6/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.											
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)											
BORING NO. WALL1-2		STATION 10+63		OFFSET 6 ft RT		ALIGNMENT -WALL1-											
COLLAR ELEV. 781.8 ft		TOTAL DEPTH 25.1 ft		NORTHING 845,797		EASTING 1,628,125											
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic													
DRILLER Moseley, M.G.		START DATE 05/13/19		COMP. DATE 05/13/19		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	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
785																	
	781.8	0.0													781.8	GROUND SURFACE	0.0
780	778.1	3.7	8	7	5									M	RESIDUAL red-brown to brown, micaceous, saprolitic, silty SAND		
775	773.1	8.7	3	3	3									SS-37		13%	
770	771.7	10.1													774.3	WEATHERED ROCK (Biotite Gneiss)	7.5
															771.7	CRYSTALLINE ROCK (Biotite Gneiss) REC: 87% RQD: 64% GSI: 70-80	10.1
765																	
760																	
															756.7	Boring Terminated at Elevation 756.7 ft in Crystalline Rock (Biotite Gneiss) - 0.2 feet of topsoil observed. - Harder drilling reported at 7.5 feet interpreted as the top of Weathered Rock. - Auger and SPT Refusal at 10.1 feet on Crystalline Rock. - Begin coring at 10.1 feet. - Equivalent boring to EB1-B from the Bridge Inventory Report.	25.1

NCDOT BORE SINGLE B5770_GEO_RWAL1-2_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/6/19

GEOTECHNICAL BORING REPORT CORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.						
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)							GROUND WTR (ft)					
BORING NO. WALL1-2		STATION 10+63		OFFSET 6 ft RT		ALIGNMENT -WALL1-						
COLLAR ELEV. 781.8 ft		TOTAL DEPTH 25.1 ft		NORTHING 845,797		EASTING 1,628,125						
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER Moseley, M.G.		START DATE 05/13/19		COMP. DATE 05/13/19		SURFACE WATER DEPTH N/A						
CORE SIZE NQ2		TOTAL RUN 15.0 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. (ft)	RQD (%)		REC. (%)	RQD (%)			
771.71												
	771.7	10.1	3.0	N=60/0.0 0:57/1.0 2:27/1.0 3:09/1.0	(2.3) 77%	(2.3) 77%		(13.0) 87%	(9.6) 64%		771.7 CRYSTALLINE ROCK light to dark gray, black, and white, generally slight to fresh weathering with one moderately severe weathered zone (17.0 - 17.4 feet), hard to very hard, close fracture spacing, BIOTITE GNEISS, possibly interlayered with amphibolite. Evidence of chemical weathering (dissolution) observed in several areas of the core.	10.1
	768.7	13.1	5.0	2:46/1.0 2:37/1.0 2:33/1.0 2:29/1.0 2:50/1.0	(4.6) 92%	(3.7) 74%					GSI: 70-80	
	763.7	18.1	5.0	2:23/1.0 3:13/1.0 3:12/1.0 3:24/1.0 3:32/1.0	(4.2) 84%	(3.2) 64%						
	758.7	23.1	2.0	2:39/1.0 2:19/1.0	(1.9) 95%	(0.4) 20%						
	756.7	25.1									756.7 Boring Terminated at Elevation 756.7 ft in Crystalline Rock (Biotite Gneiss)	25.1
<p style="text-align: center;">- 0.2 feet of topsoil observed.</p> <p style="text-align: center;">- Harder drilling reported at 7.5 feet interpreted as the top of Weathered Rock.</p> <p style="text-align: center;">- Auger and SPT Refusal at 10.1 feet on Crystalline Rock.</p> <p style="text-align: center;">- Begin coring at 10.1 feet.</p> <p style="text-align: center;">- Equivalent boring to EB1-B from the Bridge Inventory Report.</p>												

NCDOT CORE SINGLE B5770_GEO_RWAL1-2_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/6/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.										
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)							GROUND WTR (ft)									
BORING NO. WALL1-3		STATION 11+02		OFFSET 5 ft RT		ALIGNMENT -WALL1-										
COLLAR ELEV. 781.7 ft		TOTAL DEPTH 6.9 ft		NORTHING 845,835		EASTING 1,628,127										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Moseley, M.G.		START DATE 05/09/19		COMP. DATE 05/09/19		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
785																
	781.7	0.0	3	3	3	6									781.7	0.0
	777.9	3.8	5	5	3											
	774.8	6.9	60/0.0												775.3 774.8	6.4 6.9
<p style="text-align: center;">WEATHERED ROCK (Biotite Gneiss)</p> <p style="text-align: center;">CRYSTALLINE ROCK (Biotite Gneiss)</p> <p style="text-align: center;">Boring Terminated with Standard Penetration Test Refusal at Elevation 774.8 ft on Crystalline Rock (Biotite Gneiss)</p> <p style="text-align: center;">- No topsoil observed.</p> <p style="text-align: center;">- Harder drilling reported from 6.4 - 6.9 feet interpreted as Weatherd Rock.</p> <p style="text-align: center;">- Auger and SPT Refusal at 6.9 feet on Crystalline Rock.</p> <p style="text-align: center;">- Equivalent boring to EB1-A from the Bridge Inventory Report.</p>																

NCDOT BORE SINGLE B5770_GEO_RWAL1-2_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/6/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.										
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)										
BORING NO. WALL1-4		STATION 11+65		OFFSET 26 ft RT		ALIGNMENT -WALL1-										
COLLAR ELEV. 808.7 ft		TOTAL DEPTH 28.8 ft		NORTHING 845,855		EASTING 1,628,066										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Moseley, M.G.		START DATE 05/09/19		COMP. DATE 05/09/19		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
810	808.7	0.0													808.7	0.0
			2	2	2											
805	804.9	3.8	4	3	4											
800	799.9	8.8	4	5	5											
795	794.9	13.8	10	9	9											
790	789.9	18.8	11	10	9											
785	784.9	23.8	10	10	15											
780	779.9	28.8	60/0.0												779.9	28.8
CRYSTALLINE ROCK (Biotite Gneiss) Boring Terminated with Standard Penetration Test Refusal at Elevation 779.9 ft on Crystalline Rock (Biotite Gneiss) - No topsoil observed.																

NCDOT BORE SINGLE B5770_GEO_RWAL1-2_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/6/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.										
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)										
BORING NO. WALL2-1		STATION 18+75		OFFSET 18 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 824.8 ft		TOTAL DEPTH 30.0 ft		NORTHING 845,906		EASTING 1,628,354										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Moseley, M.G.		START DATE 05/09/19		COMP. DATE 05/09/19		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
825	824.8	0.0	4	3	2										824.8	0.0
820	820.9	3.9	4	3	3											
815	815.9	8.9	5	6	6											
810	810.9	13.9	7	8	8											
805	805.9	18.9	10	13	16											
800	800.9	23.9	6	10	55											
795	795.9	28.9	100/0.2													
	794.8	30.0	60/0.0												794.8	30.0
CRYSTALLINE ROCK (Biotite Gneiss) Boring Terminated with Standard Penetration Test Refusal at Elevation 794.8 ft on Crystalline Rock (Biotite Gneiss) - No topsoil observed. - Harder drilling reported at 25.5 feet interpreted as the top of Weathered Rock. - Auger and SPT Refusal at 30.0 feet on Crystalline Rock. - Boring does not fall on the -WALL2- (E_MSE) Profile and therefore it's location must be shown relative to -L-																

NCDOT BORE SINGLE B5770_GEO_RWAL1-2_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/6/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.											
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)							GROUND WTR (ft)										
BORING NO. WALL2-2		STATION 10+74		OFFSET 3 ft RT		ALIGNMENT -WALL2-											
COLLAR ELEV. 781.6 ft		TOTAL DEPTH 22.8 ft		NORTHING 845,877		EASTING 1,628,251											
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Moseley, M.G.		START DATE 05/08/19		COMP. DATE 05/09/19		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	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
785																	
	781.6	0.0	4	5	5										781.6	GROUND SURFACE	0.0
780															778.9	RESIDUAL brown, silty SAND	2.7
	777.8	3.8	5	9	11											brown, fine to coarse SAND with some gravel-sized rock fragments	
775															773.8	CRYSTALLINE ROCK (Biotite Gneiss)	7.8
	773.8	7.8	60/0.0													CRYSTALLINE ROCK (Biotite Gneiss)	
																REC: 96% RQD: 83% GSI: 75-85	
770																	
765																	
760																	
																	758.8
Boring Terminated at Elevation 758.8 ft in Crystalline Rock (Biotite Gneiss) <ul style="list-style-type: none"> - No topsoil observed. - Auger and SPT Refusal at 7.8 feet on Crystalline Rock. - Begin coring at 7.8 feet. - Equivalent boring to EB2-A from the Bridge Inventory Report. 																	

NCDOT BORE SINGLE B5770_GEO_RWAL+2_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/6/19

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.						
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)							GROUND WTR (ft)					
BORING NO. WALL2-2		STATION 10+74		OFFSET 3 ft RT		ALIGNMENT -WALL2-						
COLLAR ELEV. 781.6 ft		TOTAL DEPTH 22.8 ft		NORTHING 845,877		EASTING 1,628,251						
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic							
DRILLER Moseley, M.G.		START DATE 05/08/19		COMP. DATE 05/09/19		SURFACE WATER DEPTH N/A						
CORE SIZE NQ2				TOTAL RUN 15.0 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. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
	773.77											
	773.8	7.8	5.0	N=60/0.0 5.47/1.0 6.13/1.0 7.24/1.0 6.54/1.0 7.18/1.0	(5.0) 100%	(3.3) 66%		(14.4) 96%	(12.5) 83%		Begin Coring @ 7.8 ft	
770											CRYSTALLINE ROCK	7.8
	768.8	12.8	5.0	4:23/1.0 1:40/1.0 2:24/1.0 2:47/1.0 2:38/1.0	(4.4) 88%	(4.4) 88%					light to dark gray, black, and white, slight to fresh weathering, hard to very hard, close fracture spacing, BIOTITE GNEISS, possibly interlayered with amphibolite. GSI: 75-85	
765												
	763.8	17.8	5.0	2:07/1.0 2:26/1.0 2:34/1.0 2:56/1.0 2:55/1.0	(5.0) 100%	(4.8) 96%						
760												
	758.8	22.8									Boring Terminated at Elevation 758.8 ft in Crystalline Rock (Biotite Gneiss)	22.8
- No topsoil observed. - Auger and SPT Refusal at 7.8 feet on Crystalline Rock. - Begin coring at 7.8 feet. - Equivalent boring to EB2-A from the Bridge Inventory Report.												

NCDOT CORE SINGLE B5770_GEO_RWAL+2_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/6/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.										
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)										
BORING NO. WALL2-3		STATION 11+10		OFFSET 2 ft RT		ALIGNMENT -WALL2-										
COLLAR ELEV. 782.4 ft		TOTAL DEPTH 7.9 ft		NORTHING 845,841		EASTING 1,628,248										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Moseley, M.G.		START DATE 05/09/19		COMP. DATE 05/09/19		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)	
785																
	782.4	0.0													782.4	GROUND SURFACE
			8	6	5											RESIDUAL light brown to brown, micaceous, saprolitic, silty SAND
	778.5	3.9														
			7	3	3											
	774.5	7.9													776.2	WEATHERED ROCK (Biotite Gneiss)
															774.5	CRYSTALLINE ROCK (Biotite Gneiss)
			60/0.0													

Boring Terminated with Standard Penetration Test Refusal at Elevation 774.5 ft on Crystalline Rock (Biotite Gneiss)
 - No topsoil observed.
 - Harder drilling reported from 6.2 - 7.9 feet interpreted as Weathered Rock.
 - Auger and SPT Refusal at 7.9 feet on Crystalline Rock.
 - Equivalent boring to EB2-B from the Bridge Inventory Report.

NCDOT BORE SINGLE B5770_GEO_RWAL1-2_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/6/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 45726.1.1		TIP B-5770		COUNTY FORSYTH		GEOLOGIST Ruley, A.										
SITE DESCRIPTION Bridge No. 243 on Salisbury Ridge Road over NC 150 (Peters Creek Parkway)						GROUND WTR (ft)										
BORING NO. WALL2-4		STATION 18+56		OFFSET 14 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 823.2 ft		TOTAL DEPTH 27.5 ft		NORTHING 845,870		EASTING 1,628,345										
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Moseley, M.G.		START DATE 05/10/19		COMP. DATE 05/10/19		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)	
825																
	823.2	0.0													823.2	GROUND SURFACE
			12	7	4											RESIDUAL brown, red, orange, and white, micaceous, saprolitic, clayey, silty SAND and silty SAND
	819.0	4.2														
			5	6	3											
	815	9.2														
			2	3	3											
	810	14.2														
			7	8	11											
	805	19.2														
			56	44/0.3												
	800	24.2														
	799.0	27.4														
			11	9	25											
	795.8	27.4														
			60/0.1													

Boring Terminated with Standard Penetration Test Refusal at Elevation 795.7 ft on Crystalline Rock (Biotite Gneiss)
 - No topsoil observed.
 - Harder drilling reported at 16.5 feet interpreted as top of Weathered Rock seam.
 - Harder drilling reported again at 26.0 feet interpreted as top of Weathered Rock.
 - Auger and SPT Refusal on Crystalline Rock at 27.4 feet.
 - Boring does not fall on the -WALL2- (E_MSE) Profile and therefore it's location must be shown relative to -L-

NCDOT BORE SINGLE B5770_GEO_RWAL1-2_GINT_SUMMIT.GPJ_NC_DOT.GDT 6/6/19

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY**

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T. I. P. No. B-5770

T. I. P. No. B-5770

REPORT ON SAMPLES OF Replace Bridge No. 243 on Salisbury Ridge Rd

REPORT ON SAMPLES OF Replace Bridge No. 243 on Salisbury Ridge Rd

Project 45726.1.1 **County** Forsyth **Owner** Geotech
Date: Sampled 5/1/19 **Received** 5/14/19 **Reported** 5/30/19
Sampled from MSE Wall Investigation **By** Geotech
Submitted by B. Smith 2008 Standard Specifications

Project 45726.1.1 **County** Forsyth **Owner** Geotech
Date: Sampled 5/1/19 **Received** 5/14/19 **Reported** 5/30/19
Sampled from Bridge Investigation **By** Geotech
Submitted by Brett Smith 2008 Standard Specifications

5/30/19

TEST RESULTS

Proj. Sample No.	SS-8	SS-30	SS-22	SS-14		
Boring No.	WALL2-1	WALL2-4	WALL1-1	WALL1-4		
Retained #4 Sieve	% 3	0	0	3		
Passing #10 Sieve	% 93	97	98	94		
Passing #40 Sieve	% 75	78	76	74		
Passing #200 Sieve	% 36	21	23	29		

5/30/19

TEST RESULTS

Proj. Sample No.	SS-6	SS-37	SS-2	SS-4		
Boring No.	WALL1-3	WALL1-2	WALL2-2	WALL2-3		
Retained #4 Sieve	% 5	3	38	3		
Passing #10 Sieve	% 84	93	56	92		
Passing #40 Sieve	% 61	68	36	74		
Passing #200 Sieve	% 25	21	12	29		

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 31.7	37.3	40.5	34.8		
Fine Sand Ret - #270	% 37.0	48.2	43.3	42.6		
Silt 0.05 - 0.005 mm	% 16.2	7.4	7.1	11.3		
Clay < 0.005 mm	% 15.1	7.2	9.1	11.3		
Passing #40 Sieve	% 80.7	80.7	77.4	78.8		
Passing #200 Sieve	% 39.2	22.0	23.7	31.0		

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 42.6	44.8	53.0	34.0		
Fine Sand Ret - #270	% 33.6	38.5	30.1	42.0		
Silt 0.05 - 0.005 mm	% 10.6	7.4	7.9	10.8		
Clay < 0.005 mm	% 13.2	9.3	9.0	13.3		
Passing #40 Sieve	% 72.9	73.6	64.8	81.0		
Passing #200 Sieve	% 29.3	22.6	21.3	31.4		

L. L.	43	50	53	49		
P. I.	1	2	1	2		
AASHTO Classification	A-5	A-2-5	A-2-5	A-2-5		
Group Index	0	0	0	0		
pH	N/A	N/A	N/A	N/A		
Station	18+75	18+56	15+55	11+65		
OFFSET	18' LT	14' RT	14' RT	26' RT		
ALIGNMENT	-L-	-L-	-L-	-WALL1-		
Depth (Ft)	3.9	9.2	13.8	3.8		
to	5.4	10.7	15.3	5.3		
Natural Moisture %	16.3	20.7	20.2	18.2		

L. L.	36	39	33	33		
P. I.	0	2	0	0		
AASHTO Classification	A-2-4	A-2-4	A-1-b	A-2-4		
Group Index	0	0	0	0		
pH	N/A	N/A	N/A	N/A		
Station	11+02	10+63	10+74	11+10		
OFFSET	5' RT	6' RT	3' RT	2' RT		
ALIGNMENT	-WALL1-	-WALL1-	-WALL2-	-WALL2-		
Depth (Ft)	3.8	3.7	3.8	3.9		
to	5.3	5.2	5.3	5.4		
Natural Moisture %	15.9	13.4	13.4	12.5		

Aaron Hackett
Soils Engineer

Aaron Hackett
Soils Engineer

CORE PHOTOGRAPHS

WALL1-2
10.1 - 20.9 FEET



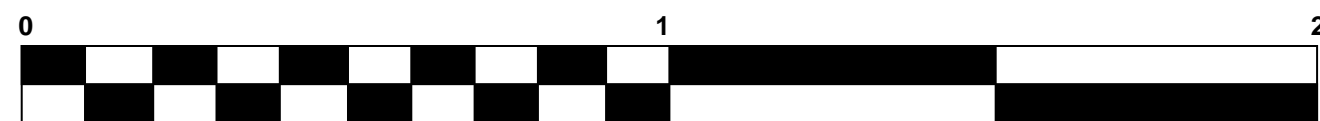
WALL2-2
7.8 - 17.1 FEET



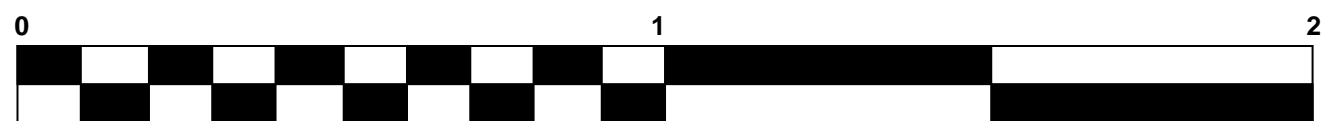
WALL1-2
20.9 - 25.1 FEET



WALL2-2
17.1 - 22.8 FEET



FEET



FEET